Ref. Certif. No.

JPTUV-156692-M1

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

# CB TEST CERTIFICATE

| | |
|---|---|
| Product | SWITCHING POWER SUPPLY |
| Name and address of the applicant | Delta Electronics, Inc.<br>3, Tungyuan Road,<br>Chungli Industrial Zone, Taoyuan City 32063, Taiwan |
| Name and address of the manufacturer | Delta Electronics, Inc.<br>3, Tungyuan Road,<br>Chungli Industrial Zone, Taoyuan City 32063, Taiwan |
| Name and address of the factory | See additional page(s) |
| Ratings and principal characteristics | Input : AC 100-240V; 15-7.5A; 50-60Hz; Class I<br>Output: 1. DC 24V/50A Max.;DC 5Vsb/2A;Total Power 1210W Max.<br>2. DC 48V/25A Max.;DC 5Vsb/2A;Total Power 1210W Max. |
| Trademark (if any) | Trademark of Delta Electronics, Inc. |
| Customer's Testing Facility (CTF) Stage used | CTF Stage 1 |
| Model / Type Ref. | 1. PMS-24V1K2W1BT,<br>2. PMS-48V1K2W1BT |
| Additional information (if necessary may also be reported on page 2) | Additionally evaluated to EN 62368-1:2014+A11:2017.<br>Additionally evaluated to BS EN 62368-1:2014+A11:2017.<br>For model differences, refer to the test report.<br>Re-issue of JPTUV-156692 dated 2024-01-17,<br>due to first modification. |
| A sample of the product was tested and found to be in conformity with | IEC 62368-1:2014<br>See Test Report for National Differences |
| As shown in the Test Report Ref. No. which forms part of this Certificate | CN234JSZ 002 |

This CB Test Certificate is issued by the National Certification Body

TÜVRheinland®

TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021, Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web : www.tuv.com

Date: 2024-11-19

Signature:

Dipl.-Ing. Th. Illing

10/0861 CB 06/20v9 rk

1. Delta Electronics (Dongguan) Co., Ltd.
   No.33, Pantao Road, Shijie Town,
   Dongguan, Guangdong 523308,
   P.R. China

2. Delta Electronics (Dongguan) Co., Ltd.
   Southwest Branch
   No.33, Pantao Road, Shijie Town,
   Dongguan, Guangdong 523308,
   P.R. China

3. DELTA ELECTRONICS (WUHU) LTD.
   No. 138, Jiuhua North Road
   LongShan Street
   Economic-technical Development Area
   Wuhu City, Anhui Province, P.R. China

4. Delta Electronics (Jiangsu) Ltd.
   215200, No.1688, Jiangxing East Road,
   Wujiang Economic and Technological
   Development Zone
   Suzhou City, Jiangsu Province, P.R. China

5. Delta Electronics (Thailand) Public
   Co., Ltd.
   909 Soi 9 Moo 4, Bangpoo Industrial
   Estate (E.P.Z.), Pattana 1 Road,
   Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand

6. Delta Electronics (Thailand) Public
   Co., Ltd.
   111/6 Moo 9, Wellgrow Industrial Estate,
   Bangna-Trad Road, Tambol Bangwua,
   Amphur Bangpakong, Chachoengsao 24180, Thailand

7. Delta Electronics India Private Limited
   SEZ Unit
   SY No.16/1b2b(Part) & 16/1b2a(Part),
   Plot No.1, Industrial Park,
   Kurubarapalli Village, Krishnagiri, Tamilnadu, 635115, India

**Additional information (if necessary)** Report Ref. No. : CN234JSZ 002

Date: 2024-11-19 Signature: Dipl.-Ing. Th. Illing

8. Delta Electronics (Chongqing) Co.,LTD.
   3rd & 4th Floor, Plant 2.
   Mengxun Technology Park. No.6
   Jidianyizhi Road, Chayuan, Nan'an District,
   Chongqing, 401336, P.R. China

9. Delta Electronics (Chongqing) Co.,LTD.
   Building 10, No.1,
   Jiangxia Road, Nan'an District,
   Chongqing,
   P.R. China

**Additional information (if necessary)** Report Ref. No. : CN234JSZ 002

Date: 2024-11-19 Signature: Dipl.-Ing. Th. Illing

Test Report issued under the responsibility of:

TÜVRheinland®

**TEST REPORT**
**IEC 62368-1**
**Audio/video, information and communication technology equipment**
**Part 1: Safety requirements**

| | |
|---|---|
| **Report Number.....:** | CN234JSZ 002 |
| Date of issue.....: | 2024-11-18 |
| Total number of pages .....: | 49 |
| **Name of Testing Laboratory preparing the Report.....:** | TÜV Rheinland Taiwan Ltd., Taoyuan Testing Laboratories 4F-1, No. 38, Huaya 1st Road, Guishan District, Taoyuan City 333, Taiwan |
| **Applicant's name .....:** | Delta Electronics, Inc. |
| Address .....: | 3 Tungyuan Road, Chungli Industrial Zone, Taoyuan City 32063, Taiwan |
| **Test specification:** | |
| Standard .....: | IEC 62368-1:2014 |
| Test procedure.....: | CB Scheme |
| Non-standard test method .....: | N/A |
| **TRF template used .....:** | IECEE OD-2020-F1:2021, Ed.1.4 |
| **Test Report Form No.....:** | IEC62368_1D |
| **Test Report Form(s) Originator ..:** | UL(US) |
| **Master TRF .....:** | Dated 2022-04-14 |



**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

| | |
|---|---|
| Test Item description .....: | SWITCHING POWER SUPPLY |
| **Trade Mark(s)** .....: |  (Trademark of Delta Electronics, Inc.) |
| Manufacturer.....: | Same as applicant. |
| Model/Type reference .....: | 1. **PMS-24V1K2W1BT**<br>2. **PMS-48V1K2W1BT** |
| Ratings .....: | See Table “Product Information” in Section “General product information and other remarks” for details. |

| Responsible Testing Laboratory (as applicable), testing procedure and testing location(s): | | | |
|---|---|---|---|
| ☒ | **CB Testing Laboratory:** | TÜV Rheinland Taiwan Ltd., Taoyuan Testing Laboratories | |
| **Testing location/ address.....** : | | 4F-1, No. 38, Huaya 1st Road, Guishan District, Taoyuan City 333, Taiwan | |
| **Tested by (name, function, signature).....:** | | Nick Hsu (Project Handler) | |
| **Approved by (name, function, signature).....:** | | Henli Lin (Reviewer) | |
| | | | |
| ☒ | **Testing procedure: CTF Stage 1:** | | |
| **Testing location/ address.....** : | | Refer to CN234JSZ 001 of 2024-01-16 (ref. OD-2037:2023, clause 12) | |
| **Tested by (name, function, signature).....** : | | | |
| **Approved by (name, function, signature).....** : | | | |
| | | | |
| ☐ | **Testing procedure: CTF Stage 2:** | N/A | |
| **Testing location/ address.....** : | | | |
| **Tested by (name, function, signature).....** : | | | |
| **Witnessed by (name, function, signature).....** : | | | |
| **Approved by (name, function, signature).....** : | | | |
| | | | |
| ☐ | **Testing procedure: CTF Stage 3 :** | N/A | |
| ☐ | **Testing procedure: CTF Stage 4:** | N/A | |
| **Testing location/ address.....** : | | | |
| **Tested by (name, function, signature).....** : | | | |
| **Witnessed by (name, function, signature).....** : | | | |
| **Approved by (name, function, signature).....** : | | | |
| **Supervised by (name, function, signature) .....** : | | | |
| | | | |

| **List of Attachments (including a total number of pages in each attachment):** |
|---|
| - ATTACHMENT (including evaluation of voltage limiting components, embedded in this report) |
| **Summary of testing:** |

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| No tests performed. | See page 3. |

**Summary of compliance with National Differences (List of countries addressed):**

EU Group Differences, EU Special National Conditions, AU, CA, DK, IT, JP, NZ, US.
Explanation of used codes: AU=Australia, CA=Canada, DK=Denmark, IT=Italy, JP=Japan, NZ=New Zealand, US=United States of America.

☒ **The product fulfils the requirements of EN 62368-1:2014+A11:2017**

☒ **The product fulfils the requirements of BS EN 62368-1:2014+A11:2017**

For National Differences see corresponding in previous report CN234JSZ 001.

**Use of uncertainty of measurement for decisions on conformity (decision rule) :**

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:… (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

**Information on uncertainty of measurement:**

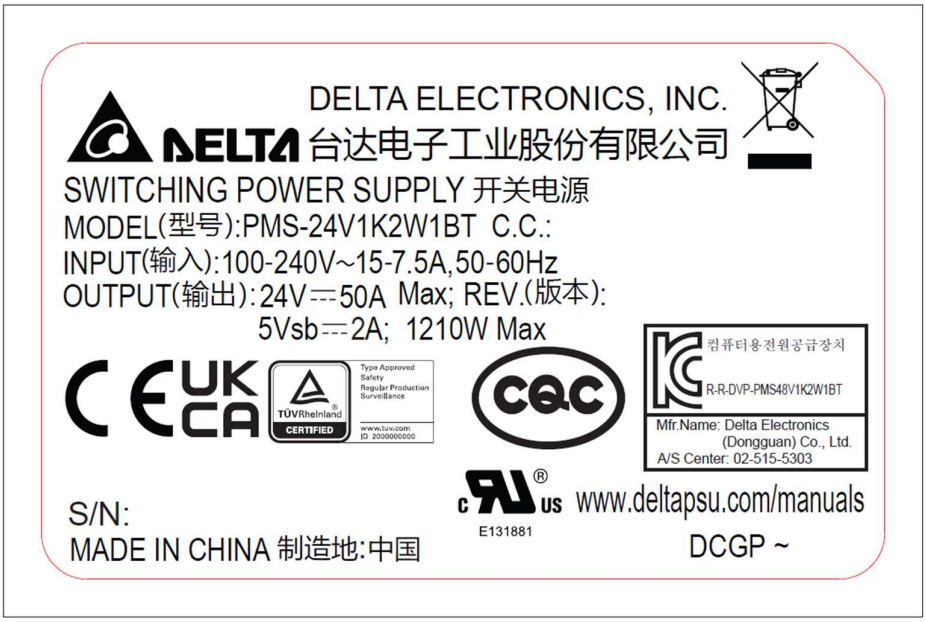
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

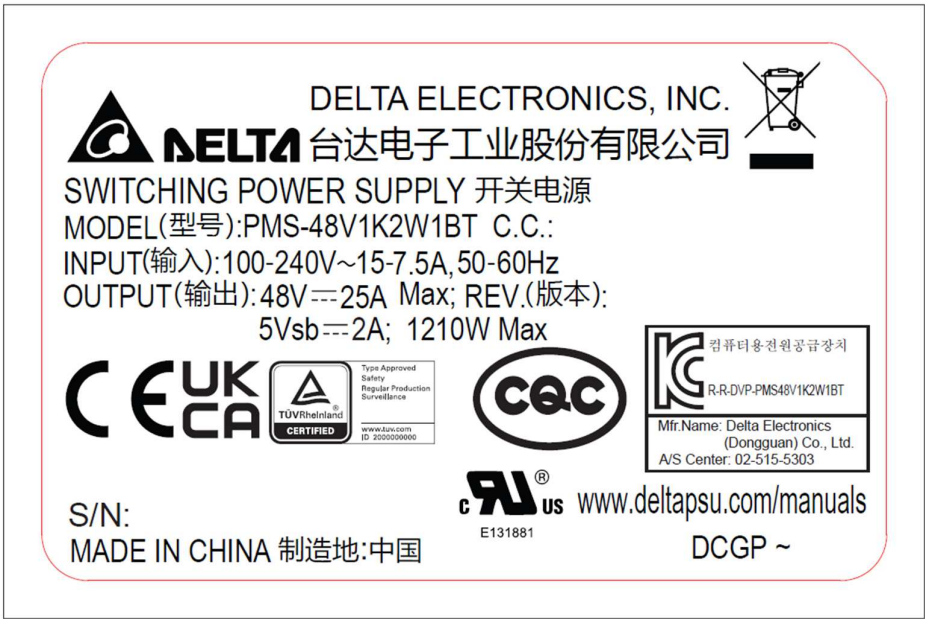
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**



| **TEST ITEM PARTICULARS:** | |
|---|---|
| Classification of use by.....: | ☒ Ordinary person<br>☐ Instructed person<br>☐ Skilled person<br>☐ Children likely to be present<br>*Building-in type power supply, overall compliance shall be evaluated in the final system assembly.* |
| Supply Connection.....: | ☒ AC Mains ☐ DC Mains<br>☐ External Circuit - not Mains connected<br>- ☐ ES1 ☐ ES2 ☐ ES3 |
| Supply % Tolerance .....: | ☒ +10%/-10%<br>☐ +20%/-15%<br>☐ +____%/ -_____%<br>☐ None |
| Supply Connection – Type .....: | ☐ pluggable equipment type A -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ direct plug-in<br>☐ mating connector<br>☐ pluggable equipment type B -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ permanent connection<br>☐ mating connector ☒ other: Terminal block |
| Considered current rating of protective device as part of building or equipment installation.....: | 16 A, 13 A (GB) or 20 A (US and Canada) (for building)<br>See section “Markings of fuse” in previous report CN234JSZ 001 for equipment.<br>Installation location: ☒ building; ☒ equipment |
| Equipment mobility.....: | ☐ movable ☐ hand-held ☐ transportable<br>☐ stationary ☒ for building-in ☐ direct plug-in<br>☐ rack-mounting ☐ wall-mounted |
| Over voltage category (OVC) .....: | ☐ OVC I ☒ OVC II ☐ OVC III<br>☐ OVC IV ☐ other: _____ |
| Class of equipment .....: | ☒ Class I ☐ Class II ☐ Class III<br>☐ Class II with functional earthing<br>☐ Not classifed |
| Access location .....: | ☐ restricted access area ☒ N/A<br>*Building-in type power supply, overall compliance shall be evaluated in the final system assembly.* |
| Pollution degree (PD) .....: | ☐ PD 1 ☒ PD 2 ☐ PD 3 |
| Manufacturer’s specified maximum operating ambient.....: | See section “**Summary of testing**” and appended table 5.4.1.4, 6.3.2, 9.0, B.2.6 in previous report CN234JSZ 001. |
| IP protection class .....: | ☐ IPX0 ☒ IP00 |

| | |
|---|---|
| Power Systems .....: | ☒ TN ☐ TT ☒ IT - 230 V $_{L-L}$ ☐ dc mains ☐ N/A |
| Altitude during operation (m) .....: | ☐ 2000 m or less ☒ Up to 5000 m |
| Altitude of test laboratory (m) .....: | ☒ 2000 m or less ☐ _____ m |
| Mass of equipment (kg) .....: | ☒ Approx. 1.52 kg |
| | |
| **POSSIBLE TEST CASE VERDICTS:** | |
| - test case does not apply to the test object..... : | N/A |
| - test object does meet the requirement ..... : | P (Pass) |
| - test object does not meet the requirement..... : | F (Fail) |
| **TESTING:** | |
| Date of receipt of test item..... : | No samples requested. |
| Date (s) of performance of tests..... : | No tests performed. |
| | |
| **GENERAL REMARKS:** | |
| **"(See Enclosure #)" refers to additional information appended to the report.**<br>**"(See appended table)" refers to a table appended to the report.**<br><br>**Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** | |
| **Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:** | |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... : | ☐ **Yes**<br>☒ **Not applicable (no samples required for this amendment report)** |
| **When differences exist; they shall be identified in the General product information section.** | |
| **Name and address of factory (ies) .....:** | 1. Delta Electronics (Dongguan) Co., Ltd.<br>No.33, Pantao Road, Shijie Town, Dongguan, Guangdong 523308, P.R. China<br>2. Delta Electronics (Dongguan) Co., Ltd. Southwest Branch<br>No.33, Pantao Road, Shijie Town, Dongguan, Guangdong 523308, P.R. China<br>3. DELTA ELECTRONICS (WUHU) LTD.<br>No. 138, Jiuhua North Road, LongShan Street, Economic-technical Development Area, Wuhu City, Anhui Province, P.R. China<br>4. Delta Electronics (Jiangsu) Ltd.<br>215200, No.1688, Jiangxing East Road, Wujiang Economic and Technological Development Zone, Suzhou City, Jiangsu Province, P.R. China<br>5. Delta Electronics (Thailand) Public Co., Ltd.<br>909 Soi 9 Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand<br>6. Delta Electronics (Thailand) Public Co., Ltd. |

| | |
|---|---|
| | 111/6 Moo 9, Wellgrow Industrial Estate, Bangna-Trad Road, Tambol Bangwua, Amphur Bangpakong, Chachoengsao 24180, Thailand<br>7. Delta Electronics India Private Limited SEZ Unit SY No.16/1b2b(Part) & 16/1b2a(Part), Plot No.1, Industrial Park, Kurubarapalli Village, Krishnagiri, Tamilnadu, 635115, India<br>8. Delta Electronics (Chongqing) Co.,LTD. 3rd & 4th Floor, Plant 2. Mengxun Technology Park. No.6 Jidianyizhi Road, Chayuan, Nan'an District, Chongqing, 401336, P.R. China<br>9. Delta Electronics (Chongqing) Co.,LTD. Building 10, No.1, Jiangxia Road, Nan'an District, Chongqing, P.R. China |

**GENERAL PRODUCT INFORMATION:**

**Product description –**

The items of equipment are switching mode power supplies intended for building-in into Class I audio/video, information and communication technology equipment in the scope of this standard.

The further evaluation and testing must be checked and performed in the final system for this equipment.

The below PCB boards are used:

- Model **PMS-24V1K2W1BT**:
  - MEB-1K2A24T AAA (main board, primary and secondary circuits, four layers, multilayer PCB)
  - TDC-585 (secondary circuit, four layers, multilayer PCB)
  - TDC-587 (secondary circuit, four layers, multilayer PCB)
  - TDC-588 (secondary circuit, single layer double sided PCB)
- Model **PMS-48V1K2W1BT**:
  - MEB-1K2A48T AAA (main board, primary and secondary circuits, four layers, multilayer PCB)
  - TDC-811 (secondary circuit, four layers, multilayer PCB)
  - TDC-587 (secondary circuit, four layers, multilayer PCB)
  - TDC-588 (secondary circuit, single layer double sided PCB)

**Product Information:**

| No. | Model/Type reference | Ratings – AC Input | Ratings – DC Output | Max. Ambient Temperature (Tma) |
|---|---|---|---|---|
| 1. | **PMS-24V1K2W1BT** | 100-240V⁓, 15-7.5A, 50-60Hz | 24Vdc / 50A Max, 5Vsb / 2A, 1210W Max | 50°C for full 100% rated output load condition and 70°C for de-rating 50% rated output load condition. |
| 2. | **PMS-48V1K2W1BT** | 100-240V⁓, 15-7.5A, 50-60Hz | 48Vdc / 25A Max, 5Vsb / 2A, 1210W Max | |

Description of change(s):

The previously approved modes in test report CN234JSZ 001 was modified as below:

1. The construction of previously approved models was modified as below:

| Model / Item | (Previously report) | (Change to) |
|---|---|---|
| | PMS-24V1K2W1BTD | **PMS-24V1K2W1BT** |

| | | |
|---|---|---|
| Model/Type reference | PMS-48V1K2W1BTD | **PMS-48V1K2W1BT** |

2. Updated the manufacturer information of Insulator as below:

| Original | New |
|---|---|
| Mfr.: SABIC JAPAN L L C<br>Type: FR1 | Mfr.: POLYVANTIS F&S China Co., LTD.<br>Type: FR1 |
| Mfr.: SABIC INNOVATIVE PLASTICS US L L C<br>Type: FR25A | Mfr.: F&S US LLC<br>Type: FR25A |

3. Cancel the source of Insulator as below:
   - Mfr.: SABIC INNOVATIVE PLASTICS JAPAN L L C, type: FR25A

For the above described change(s) the following was considered to be necessary:

| Change | Testing | Comments |
|---|---|---|
| 1. | • List of critical components (Cl. 4.1.2)<br>• Classification of electrical energy sources (Table 5.2)<br>• Temperature measurements (Table 5.4.1.4, 6.3.2, 9.0, B.2.6)<br>• Electrical power sources (PS) measurements for classification (Table 6.2.2)<br>• Input test (Table B.2.5)<br>• Abnormal operating condition tests (Table B.3)<br>• Fault condition tests (Table B.4)<br>• Evaluation of voltage limiting components in SELV circuits (Table 5.1)<br>• Working voltage measurement (Table 5.4.1.8) | Change the model mane only. No safety impact.<br>See copy of marking plates and appended test report with **bold** for details. |
| 2. | • List of critical components (Cl. 4.1.2) | Checked and updated the certificate validity of UL recognized critical components. No safety impact.<br>See the items with **bold** in appended table 4.1.2. |
| 3. | • N/A | No safety impact. |

**Model Differences –**

Both models are similar to each other except for the model designation, output ratings and components as mentioned below table.

| Item \ Model | PMS-24V1K2W1BT | PMS-48V1K2W1BT |
|---|---|---|
| Ratings – AC Input | 100-240V~, 15-7.5A, 50-60Hz | |
| Ratings – DC Output | 24Vdc / 50A Max, 5Vsb / 2A, 1210W Max | 48Vdc / 25A Max, 5Vsb / 2A, 1210W Max |
| Operation maximum ambient temperature (Tma) | 50°C for full 100% rated output load condition and 70°C for de-rating 50% rated output load condition. | |
| Pollution degree | PD2 | |
| Main PCB | MEB-1K2A24T AAA | MEB-1K2A48T AAA |
| Secondary circuit PCB | TDC-585 | TDC-811 |
| MOSFETs (Q5, Q6) | 600V min., 50A min. | 600V min., 38.8Amin. |
| Isolating Transformers (T1, T2) | MV-MPS16030-A | MV-MPS17014-A |
| Isolating Transformer (T401) | AV-MPS16030-A | AV-MPS17015-A |
| Y-Capacitors (CY5, CY6) | 2200 pF max. | 3300 pF max. |
| ZD1 | With | Without |
| ZD2 | With | Without |
| C20 | Without | With |
| C21 | Without | With |
| C28 | Without | With |
| C29 | Without | With |
| C30 | Without | With |
| C96 | Without | With |
| C97 | Without | With |
| C98 | Without | With |

**Markings of fuse –**

See previous test report CN234JSZ 001.

**Additional application considerations – (Considerations used to test a component or sub-assembly) –**

See previous test report CN234JSZ 001.

**History of amendments and modifications:**

Ref. No. CN234JSZ 001, dated 2024-01-16 (original test report),

Ref. No. CN234JSZ 002, dated 2024-11-18 (1st modification)

**The report is not valid without the original CB test report**

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 4.1.2 | TABLE: List of critical components | | | | P |
|---|---|---|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity[1] |
| The following are for change model name of **PMS-24V1K2W1BT** and **PMS-48V1K2W1BT**: | | | | | |
| Isolating Transformers (T1, T2) (for model **PMS-24V1K2W1BT**) | Delta Electronics, Inc. * see note | MV-MPS16030-A | Class F (UL insulation system MP-155G) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013, IEC 62368-1:2014, EN 62368-1: 2014+A11, IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11, UL 1446 | Tested and accepted by TÜV Rheinland, UL |
| Isolating Transformers (T1, T2) (for model **PMS-48V1K2W1BT**) | Delta Electronics, Inc. * see note | MV-MPS17014-A | Class F (UL insulation system MP-155G) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013, IEC 62368-1:2014, EN 62368-1: 2014+A11, IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11, UL 1446 | Tested and accepted by TÜV Rheinland, UL |
| - Bobbin Material (used for Isolating Transformers (T1, T2)) | SUMITOMO BAKELITE CO LTD | PM-9630 | Phenolic, V-0, 150°C, thickness 0.51mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | CELANESE INTERNATIONAL CORP | FR530 | PET, V-0, 155°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| - Triple Insulated Wire (used in Isolating Transformers (T1, T2)) | Great Leoflon Industrial Co., Ltd. (for VDE), GREAT LEOFLON INDUSTRIAL CO LTD (for UL) | TRW(F), TRW(F)-M | 155°C | IEC 62368-1: 2014, EN 62368-1:2014+ A11, IEC/EN 61558-1:2005+A1, IEC/EN 61558-2-16:2009+A1 (Annex K), UL 2353, CSA-C22.2 No. 1 | VDE, UL, CSA |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| Isolating Transformer (T401)<br>(for model **PMS-24V1K2W1BT**) | Delta Electronics, Inc.<br>* see note | AV-MPS16030-A | Class B (UL insulation system MP-130N) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013; IEC 62368-1:2014, EN 62368-1: 2014+A11; IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11; UL 1446 | Tested and accepted by TÜV Rheinland, UL |
| Isolating Transformer (T401)<br>(for model **PMS-48V1K2W1BT**) | Delta Electronics, Inc.<br>* see note | AV-MPS17015-A | Class B (UL insulation system MP-130N) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013; IEC 62368-1:2014, EN 62368-1: 2014+A11; IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11; UL 1446 | Tested and accepted by TÜV Rheinland, UL |
| - Bobbin Material (used for Isolating Transformer (T401)) | SUMITOMO BAKELITE CO LTD | PM-9630 | Phenolic, V-0, 150°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | CELANESE INTERNATIONAL CORP | FR530 | PET, V-0, 155°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| - Triple Insulated Wire (used in Isolating transformer (T401)) | Great Leoflon Industrial Co., Ltd. (for VDE),<br>GREAT LEOFLON INDUSTRIAL CO LTD (for UL) | TRW(B), TRW(B)-M | 130°C | IEC 62368-1: 2014, EN 62368-1:2014+ A11, IEC/EN 61558-1:2005+A1, IEC/EN 61558-2-16:2009+A1 (Annex K), UL 2353, CSA-C22.2 No. 1 | VDE, UL, CSA |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| Y-Capacitors (CY5, CY6 at secondary circuits)<br>CY5 = CY6 = 2200pF max. (for model **PMS-24V1K2W1BT**)<br>CY5 = CY6 = 3300pF max. (for model **PMS-48V1K2W1BT**) | Murata Mfg. Co., Ltd. (for VDE),<br>MURATA MFG CO LTD (for UL) | KX | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Walsin Technology Corp. (for VDE),<br>WALSIN TECHNOLOGY CORP (for UL) | AH | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | TDK Corporation (for VDE),<br>TDK CORPORATION (for UL) | CD | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Kunshan Wansheng Electronics Co., Ltd. (for VDE),<br>KUNSHAN WANSHENG ELECTRONICS CO LTD (for UL) | CT7 | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | MURATA MANUFACTURING CO. LTD | RA | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| **Functional component** | -- | -- | -- | -- | -- |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| MOSFETs (Q5, Q6)<br>(for model **PMS-24V1K2W1BT**) | Interchangeable | Interchangeable | 600V min., 50A min. | -- | -- |
| MOSFETs (Q5, Q6)<br>(for model **PMS-48V1K2W1BT**) | Interchangeable | Interchangeable | 600V min., 38.8Amin. | -- | -- |
| Updated the manufacturer information of Insulator: | | | | | |
| Insulator<br>(on cover)<br>(between PCB and chassis) | **POLYVANTIS F&S China Co., LTD** | FR1 | V-0, 120°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SABIC INNOVATIVE PLASTICS US L L C | FR1 | V-0, 120°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| Insulator<br>(between F2 and PCB type TDC-587)<br>(between C6, C15 and PCB type TDC-587)<br>(between T1, T2 and T401)<br>(between CY1, CY2 and T2) | **F&S US LLC** | FR25A | V-0, 125°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| Supplementary information:<br>1. [1)] Provided evidence ensures the agreed level of compliance. See OD-2039.<br>2. All other components then the ones above, listed in the CN234JSZ 001 report, are still applicable for this modification. | | | | | |

| **5.2** | **TABLE: Classification of electrical energy sources** | | | | | | P |
|---|---|---|---|---|---|---|---|
| 5.2.2.2 – Steady State Voltage and Current conditions | | | | | | | |
| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
| | | | | U (Vrms or Vpk) | I (Apk or Arms) | Hz | |
| Model: **PMS-24V1K2W1BT** | | | | | | | |
| 1. | 264 Vac, 60 Hz | 24 Vdc output to RTN | Normal | 24.12 Vdc | -- | -- | ES1 |

| IEC 62368-1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Clause | Requirement + Test | | | Result - Remark | | | Verdict |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | 24.13 Vdc | -- | -- | |
| | | | Single fault – SC/OC (see table B.4 for details) (recorded only the worst case value) | 24.13 Vdc | -- | -- | |
| 2. | 264 Vac, 60 Hz | 5Vsb output to RTN | Normal | 5.02 Vdc | -- | -- | ES1 |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | 5.02 Vdc | -- | -- | |
| | | | Single fault – SC/OC (see table B.4 for details) (recorded only the worst case value) | 5.02 Vdc | -- | -- | |
| 3. | 264 Vac, 60 Hz | Output to RTN | Normal | -- | 0.18 mApk | -- | ES1 |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | -- | 0.19 mApk | -- | |
| | | | Single fault – SC/OC (C1 SC) | -- | 0.23 mApk | -- | |
| | | | Single fault – SC/OC (C1 OC) | -- | 0.19 mApk | -- | |
| Model: **PMS-48V1K2W1BT** | | | | | | | |
| 1. | 264 Vac, 60 Hz | 48 Vdc output to RTN | Normal | 48.1 Vdc | -- | -- | ES1 |

| IEC 62368-1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Clause | Requirement + Test | | | Result - Remark | | | Verdict |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | 48.1 Vdc | -- | -- | |
| | | | Single fault – SC/OC (see table B.4 for details) (recorded only the worst case value) | 48.1 Vdc | -- | -- | |
| 2. | 264 Vac, 60 Hz | 5Vsb output to RTN | Normal | 5.02 Vdc | -- | -- | ES1 |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | 5.02 Vdc | -- | -- | |
| | | | Single fault – SC/OC (see table B.4 for details) (recorded only the worst case value) | 5.02 Vdc | -- | -- | |
| 3. | 264 Vac, 60 Hz | Output to RTN | Normal | -- | 0.18 mApk | -- | ES1 |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | -- | 0.19 mApk | -- | |
| | | | Single fault – SC/OC (C1 SC) | -- | 0.23 mApk | -- | |
| | | | Single fault – SC/OC (C1 OC) | -- | 0.19 mApk | -- | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Test Conditions: Normal – No load or normal load condition.
Abnormal – See table B.3 for details.
Supplementary information:
SC = Short-circuited, OC = Open-circuited
Overall capacity: Y-Capacitors (CY3 = CY4 = 1000 pF, CY7 = CY8 = 220 pF);
Bridging Capacitors (CY1 = CY2 = 2200 pF)
Overall resistance: Bridging Resistors (R33 = R34 = R35 = R36 = R37 = R39 = R102 = 9.1 MΩ)

| 5.4.1.4, 6.3.2, 9.0, B.2.6 | **TABLE: Temperature measurements** | | P |
|---|---|---|---|
| | Supply voltage (V) .....: | See below. | — |
| | Ambient $T_{min}$ (°C) .....: | See below. | — |
| | Ambient $T_{max}$ (°C) .....: | See below. | — |
| | Tma (°C) .....: | See below. | — |

| Maximum measured temperature T of part/at..: | T (°C) | | | | | Allowed $T_{max}$ (°C) |
|---|---|---|---|---|---|---|
| Model: **PMS-24V1K2W1BT** | | | | | | |
| Test Voltage: | 90V/60Hz (Load condition A) | 264V/50Hz (Load condition A) | 90V/60Hz (Load condition C) | 90V/60Hz (Load condition B) | 90V/60Hz (Load condition D) | -- |
| 1. Ambient | 49.9 | 50.1 | 49.7 | 68.6 | 69.0 | -- |
| 2. T1 coil near Q102 (sec.) | 71.8 | 73.7 | 52.5 | 83.9 | 71.6 | 130 |
| 3. T1 core | 73.7 | 71.8 | 52.9 | 86.2 | 71.9 | 130 |
| 4. T2 coil near T401 (pri.) | 77.6 | 77.2 | 52.8 | 88.2 | 71.9 | 130 |
| 5. T2 core | 70.3 | 69.9 | 53.0 | 86.3 | 72.1 | 130 |
| 6. T401 coil | 56.8 | 55.9 | 56.0 | 75.0 | 73.6 | 110 |
| 7. T401 core | 55.7 | 54.1 | 54.7 | 74.3 | 72.7 | 110 |
| 8. IC51 | 58.3 | 57.9 | 53.5 | 77.7 | 71.9 | 110 |
| 9. IC60 (near IC52, IC53) | 55.9 | 55.5 | 53.9 | 75.2 | 72.1 | 110 |
| 10. IC404 (near IC54) | 54.8 | 54.0 | 54.6 | 74.9 | 72.7 | 110 |
| 11. PCB near BD1 | 74.0 | 58.7 | 56.8 | 86.2 | 74.2 | 130 |
| 12. CY2 near Q101 (CY1) (pri. to sec.) | 61.5 | 61.5 | 52.2 | 78.3 | 71.5 | 125 |
| 13. CY7 near CN1 (CY8) (pri. to GND) | 72.2 | 58.1 | 56.4 | 83.8 | 74.0 | 125 |
| 14. CY4 near FL1 (CY3) (pri. to GND) | 79.3 | 56.9 | 55.3 | 85.0 | 73.2 | 125 |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| 15. CN1 body | 75.7 | 57.4 | 55.3 | 84.1 | 73.3 | 110 |
| 16. CX2 near BD2 | 73.8 | 55.6 | 55.0 | 82.6 | 73.1 | 100 |
| 17. FL2 near BD2 | 79.9 | 55.8 | 54.6 | 84.9 | 72.7 | 130 |
| 18. FL1 near BD2 | 87.5 | 57.5 | 54.8 | 88.4 | 72.9 | 130 |
| 19. L2 coil | 65.3 | 54.4 | 54.9 | 78.2 | 73.0 | 130 |
| 20. L5 coil | 61.2 | 53.3 | 53.3 | 74.8 | 72.2 | 130 |
| 21. CT1 near Q3 (CT2) | 61.7 | 54.7 | 55.9 | 78.1 | 73.8 | 130 |
| 22. C2 near Q3 (C1) | 58.0 | 54.5 | 54.4 | 75.7 | 73.0 | 105 |
| 23. L3 coil near Q3 | 57.9 | 57.2 | 53.2 | 74.8 | 72.0 | 130 |
| 24. T4 coil near Q6 | 51.9 | 51.9 | 51.3 | 71.2 | 70.9 | 130 |
| 25. C111 near T1 (C112-117) | 73.9 | 73.3 | 54.8 | 86.7 | 72.8 | 105 |
| 26. RL1 coil | 65.1 | 61.0 | 64.0 | 82.3 | 80.5 | 85 |
| 27. CX1 near FL1 | 77.8 | 56.5 | 54.9 | 85.0 | 73.0 | 100 |
| Test position | Label up | | | | | -- |

| | | | | | |
|---|---|---|---|---|---|
| Model: **PMS-48V1K2W1BT** | | | | | |
| Test Voltage: | 90V/60Hz (Load condition E) | 90V/60Hz (Load condition F) | 90V/50Hz (Load condition C) | 90V/50Hz (Load condition D) | -- |
| 1. Ambient | 50.1 | 70.7 | 49.8 | 69.8 | -- |
| 2. T1 coil near Q102 (sec.) | 82.6 | 88.1 | 52.6 | 73.5 | 130 |
| 3. T1 core | 76.6 | 84.9 | 52.7 | 73.5 | 130 |
| 4. T2 coil near T401 (pri.) | 69.2 | 82.6 | 52.5 | 73.5 | 130 |
| 5. T2 core | 62.8 | 79.0 | 52.4 | 73.5 | 130 |
| 6. T401 coil | 62.8 | 78.7 | 57.1 | 76.0 | 110 |
| 7. T401 core | 59.4 | 77.1 | 55.1 | 74.8 | 110 |
| 8. C2 near Q3 | 59.6 | 76.2 | 53.8 | 74.0 | 105 |
| 9. RL1 coil | 64.0 | 78.1 | 54.7 | 74.6 | 85 |
| Test position | Label up | | | | -- |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:

Note 1: The temperatures were measured under the worse case normal mode defined in table B.2.5.

Note 2: The apparatus was submitted and evaluated for maximum manufacturer's recommended ambient (Tma).

Note 3: All temperatures above for T(°C) have been retrieved by measurement and have been calculated/adjusted to Tma 50°C or Tma 70°C as follows:

T + (Tma – Tamb), where T is the maximum temperature measured during test, Tamb is the ambient temperature during test and Tma is the maximum ambient temperature by the manufacturer's specification.

Winding components providing safety isolation:

- T1, T2 of class F → $T_{max}$= 140°C-10°C (thermocouple)= 130°C
- T401 of class B → $T_{max}$= 120°C-10°C (thermocouple)= 110°C

Note 4: The load conditions used in this report, see **"Summary of testing**" in previous test report CN234JSZ 001.

| Temperature T of winding: | $t_1$ (°C) | $R_1$ (Ω) | $t_2$ (°C) | $R_2$ (Ω) | T (°C) | Allowed $T_{max}$ (°C) | Insulation class |
|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- |

Supplementary information:

Note 1: Tma should be considered as directed by appliable requirement.

Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9).

| 6.2.2 | TABLE: Electrical power sources (PS) measurements for classification | | | | P |
|---|---|---|---|---|---|
| Source | Description | Measurement | Max Power after 3 s | Max Power after 5 s*) | PS Classification |
| Model: **PMS-24V1K2W1BT** | | | | | |
| T1, T2 | 24 Vdc output | Power (W) : | 1340 | 1340 | PS3 |
| | | $V_A$ (V) : | 24.2 | 24.2 | |
| | | $I_A$ (A) : | 56.9 | 56.9 | |
| T401 | 5Vsb output | Power (W) : | 11.9 | -- | PS1 |
| | | $V_A$ (V) : | 5.0 | -- | |
| | | $I_A$ (A) : | 2.49 | -- | |
| Model: **PMS-48V1K2W1BT** | | | | | |
| T1, T2 | 48 Vdc output | Power (W) : | 1371 | 1371 | PS3 |
| | | $V_A$ (V) : | 48.3 | 48.3 | |
| | | $I_A$ (A) : | 28.6 | 28.6 | |
| T401 | 5Vsb output | Power (W) : | 10.4 | -- | PS1 |
| | | $V_A$ (V) : | 4.97 | -- | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| | | $I_A$ (A) : | 2.19 | -- | |

Supplementary information:
(*) Measurement taken only when limits at 3 seconds exceed PS1 limits.
**Note:** The worst case is considered at the power measurement for worst-case fault.

| B.2.5 | TABLE: Input test | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| U (V) | Hz | I (A) | I rated (A) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status |
| Model: **PMS-24V1K2W1BT** | | | | | | | | |
| 90 Vac | 50 | 15.6 | -- | 1373 | -- | F1/F2 | 15.6 | Load condition A |
| 100 Vac | 50 | 13.7 | 15 | 1355 | -- | F1/F2 | 13.7 | See above |
| 240 Vac | 50 | 5.60 | 7.5 | 1323 | -- | F1/F2 | 5.60 | See above. |
| 254 Vac | 50 | 5.31 | -- | 1321 | -- | F1/F2 | 5.31 | See above |
| 264 Vac | 50 | 5.14 | -- | 1318 | -- | F1/F2 | 5.14 | See above. |
| 90 Vac | 60 | 15.5 | -- | 1374 | -- | F1/F2 | 15.5 | See above |
| 100 Vac | 60 | 13.7 | 15 | 1356 | -- | F1/F2 | 13.7 | See above |
| 240 Vac | 60 | 5.61 | 7.5 | 1324 | -- | F1/F2 | 5.61 | See above. |
| 254 Vac | 60 | 5.32 | -- | 1321 | -- | F1/F2 | 5.32 | See above |
| 264 Vac | 60 | 5.15 | -- | 1319 | -- | F1/F2 | 5.15 | See above. |
| Model: **PMS-48V1K2W1BT** | | | | | | | | |
| 90 Vac | 50 | 15.7 | -- | 1394 | -- | F1/F2 | 15.7 | Load condition E |
| 100 Vac | 50 | 13.9 | 15 | 1372 | -- | F1/F2 | 13.9 | See above |
| 240 Vac | 50 | 5.51 | 7.5 | 1298 | -- | F1/F2 | 5.51 | See above. |
| 254 Vac | 50 | 5.22 | -- | 1296 | -- | F1/F2 | 5.22 | See above |
| 264 Vac | 50 | 5.06 | -- | 1295 | -- | F1/F2 | 5.06 | See above. |
| 90 Vac | 60 | 15.7 | -- | 1393 | -- | F1/F2 | 15.7 | See above |
| 100 Vac | 60 | 13.9 | 15 | 1371 | -- | F1/F2 | 13.9 | See above |
| 240 Vac | 60 | 5.50 | 7.5 | 1296 | -- | F1/F2 | 5.50 | See above. |
| 254 Vac | 60 | 5.21 | -- | 1295 | -- | F1/F2 | 5.21 | See above |
| 264 Vac | 60 | 5.05 | -- | 1294 | -- | F1/F2 | 5.05 | See above. |

Supplementary information:
The measured input current at rated voltage shall be less than or equal to 110 % of rated current.
See "**Summary of testing**" for the detailed output load conditions in previous test report CN234JSZ 001.

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| B.3 | TABLE: Abnormal operating condition tests | | | | | | | | P |
|---|---|---|---|---|---|---|---|---|---|
| Ambient temperature (°C) .....: | | | 25 °C, if not specified | | | | | | — |
| Power source for EUT: Manufacturer, model/type, output rating .....: | | | -- | | | | | | — |
| Component No. | Abnormal condition / Fault condition | Supply voltage, (V) | Test time (ms) | Fuse No. | Fuse current, (A) | T-couple | Temp. (°C) | Observation | |
| Model: **PMS-24V1K2W1BT** | | | | | | | | | |
| Ventilation openings | Blocked | 264Vac | 2.24h | F1/F2 | 5.14 ~ 0.27 | → | Highest temperature at: Ambient: 51.4°C, T1 coil : 86.0°C, T2 coil : 95.0°C, T401 coil: 62.4°C. | NB, NC, NT, I/P: 1319.80W ~ 17.94W. O/P: 5Vsb normal, others foldback. LC: A No hazards. | |
| 24Vdc output | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 24W. O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal. LC: A No hazards. | |
| 5Vsb output | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.08 | -- | -- | NB, NC, NT, I/P: 1300W. O/P: 24Vdc normal, 5Vsb shutdown, Fan1 & Fan2 normal. LC: A No hazards. | |

| IEC 62368-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clause | Requirement + Test | | | | Result - Remark | | | Verdict |
| 24Vdc output | Overload | 264Vac | 7.52h | F1/F2 | 5.76 ~ 0 | → | Highest temperature at: Ambient: 51.9°C, T1 coil : 76.6°C, T2 coil : 82.7°C, T401 coil: 57.2°C. | NB, NC, NT. I/P=1482.30 W ~ 0.00W. Output overloaded up to 58.00A before 5Vsb normal, others oscillate. LC: A No hazards. |
| 5Vsb output | Overload | 264Vac | 11.53h | F1/F2 | 7.70 ~ 0 | → | Highest temperature at: Ambient: 70.9°C, T1 coil : 84.4°C, T2 coil : 87.0°C, T401 coil: 76.2°C. | NB, NC, NT. I/P=692.45 W ~ 670.65W. Output overloaded up to 2.60A before 24V normal, 5Vsb foldback. LC: B No hazards. |
| CN602 pin7/8 to CN102 (5Vsb to 24Vdc output) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.45 | -- | -- | NB, NC, NT, I/P: 18W. O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown. LC: A No hazards. |
| Model: **PMS-48V1K2W1BT** | | | | | | | | |
| Ventilation openings | Blocked | 264Vac | 3.49h | F1/F2 | 2.58 ~ 0.25 | → | Highest temperature at: Ambient: 72.0°C, T2 coil: 95.9°C. | NB, NC, NT, I/P: 653.90W ~ 22.36W. O/P: 5Vsb normal, others oscillate. LC: F No hazards. |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CN602 pin7/8 to CN102 (5Vsb to 48Vdc output) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W<br>O/P: All shutdown. LC: E<br>No hazards |

Supplementary information:

Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column “Abnormal/Fault.” Specify if test condition by indicating “Abnormal” then the condition for a Clause B.3 test or “Single Fault” then the condition for Clause B.4.

1) o-l: Overloaded; s-c: Short-circuited; o-c: Open-circuited.
2) The test result shown all safeguards remained effective and didn’t lead to a single fault condition during abnormal operating condition; besides, all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.
3) The overloaded condition is according to annex G.5.3.3.
4) See “**Summary of testing**” for the detailed output load conditions in previous test report CN234JSZ 001.
5) Maximum permitted temperature are as follows:
   - Winding wires (providing safety isolation):
     - T1, T2 of insulation system Class F, Tmax= 155°C (200°C-(70°C-25°C))
     - T401 of insulation system Class B, Tmax= 130°C (175°C-(70°C-25°C))

Abbreviations below may be used.

IP - Internal protection operated (list component)
CT - Constant temperatures were obtained
TW - Transformer winding opened
CD - Components damaged (list damaged components)
NB - No indication of dielectric breakdown
YB - Dielectric breakdown (indicate time and location)
NC - Cheesecloth remained intact
LC – Load Condition
I/P - Input
YC - Cheesecloth charred or flamed
NT - Tissue paper remained intact
YT - Tissue paper charred or flamed
RA - The unit can recover automatically when removing the abnormal condition
BT - Breaker trip (B type)
N - Frighten Noise
@ - Test repeat two more times with same results observed
O/P - Output

| B.4 | TABLE: Fault condition tests | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| Ambient temperature (°C) ..... : | | | | 25 °C, if not specified | | | | — |
| Power source for EUT: Manufacturer, model/type, output rating ..... : | | | | -- | | | | — |
| Component No. | Fault condition | Supply voltage, (V) | Test time (ms) | Fuse No. | Fuse current, (A) | T-couple | Temp. (°C) | Observation |
| Model: **PMS-24V1K2W1BT** | | | | | | | | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DC Fan1 and Fan 2 | Stalled | 264Vac | 2.47h | F1/F2 | 5.14 ~ 0.00 | → | Highest temperature at: Ambient: 51.4°C, T1 coil : 97.7°C, T2 coil : 88.2°C, T401 coil: 66.6°C. | NB, NC, NT, I/P: 1318.60W ~ 0.00W. O/P: All output oscillate LC: A No hazards. |
| FL1 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No LC: A No hazards. |
| R10 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1311W, O/P: Normal. LC: A No hazards. |
| BD1, AC to - | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: BD1. LC: A No hazards. |
| BD1, AC to + | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: BD1. LC: A No hazards. |
| C2 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: C1, BD1. LC: A No hazards. |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IC51 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 20.1W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC51 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 20.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC51 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 20.6W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC51 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 20.6W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| IC52 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC52 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 20.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC52 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.0 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC52 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC53 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC53 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 8.2W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

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| IC53 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC53 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC54 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.24 | -- | -- | NB, NC, NT, I/P: 0.3W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC54 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.1 | -- | -- | NB, NC, NT, I/P: 1301W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC54 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC54 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| IC60 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.323 | -- | -- | NB, NC, NT, I/P: 18.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC60 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC60 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.322 | -- | -- | NB, NC, NT, I/P: 18.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC60 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.321 | -- | -- | NB, NC, NT, I/P: 18.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| IC404 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.24 | -- | -- | NB, NC, NT, I/P: 0.5W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC404 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.245 | -- | -- | NB, NC, NT, I/P: 0.5W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC404 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 0.9W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC404 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 0.89W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |

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| T1 pin 1 to pin 2 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T1 pin 1 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T1 pin 2 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T2 pin 1 to pin 2 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T2 pin 1 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| T2 pin 2 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T401 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output.<br>LC: A<br>No hazards. |
| T401 pin 4 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output.<br>LC: A<br>No hazards. |
| Q4 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.45 | -- | -- | NB, NC, NT, I/P: 18W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| Q4 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | | NB, NC, NT, IP: F1, F2 open, O/P: No output.<br>LC: A<br>No hazards. |

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| Q4 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | | NB, NC, NT, IP: F1, F2 open, O/P: No output.<br>LC: A<br>No hazards. |
| Q1 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | | NB, NC, NT, I/P: 0.3W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| Q1 G to D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output. CD: IC32, R464, R73, Q31, R468.<br>LC: A<br>No hazards. |
| Q1 D to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output. CD: IC32, R464, R73, Q31.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Q5 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.285 | -- | -- | NB, NC, NT, I/P: 20W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| Q5 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| Q5 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| Q6 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.298 | -- | -- | NB, NC, NT, I/P: 21W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| Q6 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |

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| Q6 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| CN603 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: 24Vdc normal, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| R305 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.08 | -- | -- | NB, NC, NT, I/P: 1306W, O/P:<br>Normal, CN603 pin 1 to pin 2: 5.02Vdc.<br>LC: A<br>No hazards. |
| D304 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 5.1W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |
| IC303 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: Normal, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |

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| IC303 pin 1 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: Normal, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |
| IC303 pin 2 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: Normal, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |
| T1 pin A to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 30W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T1 pin B to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 30W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T1 pin A to pin B | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 30W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

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| T401 pin 10 to pin 12 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| T401 pin 7 to pin 8 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| L2 pin 4 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| CT1 pin 1 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.22 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | | | | | Result - Remark | | Verdict |
| CT1 pin 4 to pin 5 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.21 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown. LC: A No hazards. |
| RL1 pin 2 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal. LC: A No hazards. |
| L3 pin 2 to pin 7 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal. LC: A No hazards. |
| IC36 pin 2 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output, CD: IC36, ZD403. LC: A No hazards. |
| T4 pin 9 to pin 10 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.3 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal. LC: A No hazards. |

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| T4 pin 6 to pin 7 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.3 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T4 pin 2 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T1 Pin C, D to GND before R232 | Overload | 90Vac | 9.5h | F1/F2 | 15.55~ 0.27 | → | Highest temperature at:<br>Ambient: 70.6°C,<br>T1 coil : 91.6°C,<br>T2 coil : 96.2°C,<br>T401 coil: 79.2°C. | NB, NC, NT. I/P=1386W ~ 20.7W. Output overloaded up to 24.00A before 5Vsb normal, others oscillate.<br>LC: B<br>No hazards. |
| T401 Pin 10 after D303 to GND | Overload | 90Vac | 3.52h | F1/F2 | 7.82 ~ 0.06 | → | Highest temperature at:<br>Ambient: 70.2°C,<br>T1 coil : 84.3°C,<br>T2 coil : 86.8°C,<br>T401 coil: 78.6°C. | NB, NC, NT. I/P=705W ~ 0.1W. Output overloaded up to 1.50A before all foldback.<br>LC: B<br>No hazards. |
| Model: **PMS-48V1K2W1BT** | | | | | | | | |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| DC Fan1 | Stalled | 264Vac | 2.84h | F1/F2 | 2.58 ~ 0.23 | → | Highest temperature at:<br>Ambient: 71.6°C, Tmax: T1 core: 89.0°C. | NB, NC, NT, I/P: 653.70W ~<br>17.76W. O/P: 5Vsb normal, others foldback<br>LC: F<br>No hazards. |
| DC Fan2 | Stalled | 264 | 2.98h | F1/F2 | 2.58 ~ 0.23 | → | Highest temperature at:<br>Ambient: 72.7°C, Tmax: T1 core: 92.9°C. | NB, NC, NT, I/P: 653.80W ~<br>18.03W. O/P: 5Vsb normal, others foldback<br>LC: F<br>No hazards. |
| T1 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | → | Highest temperature at:<br>Ambient: 72.0°C, Tmax: T2 coil : 95.9°C. | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: F<br>No hazards. |
| T1 pin 1 to pin 3 ((=T2 pin2 to pin3) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards. |
| T1 pin 2 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards. |

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| T2 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 48Vdc shutdown, 5Vsb normal. LC: E No hazards. |
| T2 pin 1 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 48Vdc shutdown, 5Vsb normal LC: E No hazards. |
| T2 pin 2 to pin 3(=T1 pin1 to pin3) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 48Vdc shutdown, 5Vsb normal. LC: E No hazards |
| T401 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W, O/P: All shutdown. LC: E No hazards |
| T401 pin 4 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W, O/P: All shutdown. LC: E No hazards |
| Q4 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output CD: Q4, R43, R45, D48. LC: E No hazards |

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| Clause | Requirement + Test | | | | | Result - Remark | | Verdict |
| Q4 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: Q4, R42<br>LC: E<br>No hazards |
| Q5 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |
| Q5 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |
| Q6 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |
| Q6 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| 48Vdc output | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22 W<br>O/P: 48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| 5Vsb output | Short-circuited | 264Vac | 5 min. | F1/F2 | 4.99 | -- | -- | NB, NC, NT, I/P: 1277W<br>O/P: 48Vdc Normal , 5Vsb Shutdown. LC: E<br>No hazards |
| T1 pin A to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| T1 pin B to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| T1 pin A to pin B | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| T401 pin 10 to pin 12 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W<br>O/P: All shutdown. LC: E<br>No hazards |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| T401 pin 7 to pin 8 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W<br>O/P: All shutdown.<br>LC: E<br>No hazards |
| T1 pin C,D to GND before R232 | Overload | 90Vac | 3.68h | F1/F2 | 20.36 ~ 0.06 | → | Highest temperature at: Ambient= 50.8°C, T1 core= 99.1°C. | NB, NC, NT. I/P=1822.40 W ~ 0.04W.<br>Output overloaded up to 6.00A before all fold back,<br>LC: E<br>No hazards |
| T1 pin C,D to GND before R232 | Overload | 90Vac | 11.2h | F1/F2 | 12.51 ~ 0.33 | → | Highest temperature at: Ambient= 72°C, T1 core= 95.5°C. | NB, NC, NT. I/P=1121.80 W ~<br>26.44W. Output overloaded up to 10.00A before 5Vsb foldback, others other state.<br>LC: F<br>No hazards |
| T401 pin 10 after D303 to GND | Overload | 90Vac | 8.67h | F1/F2 | 7.75 ~ 0.07 | → | Highest temperature at: Ambient= 71.5°C, T1 core= 93.8°C. | NB, NC, NT. I/P=694.60 W ~ 0.05W.<br>Output overloaded up to 2.40A before 5Vsb foldback, others other state.<br>LC: F<br>No hazards |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 48Vdc output | Overload | 264Vac | 7.16h | F1/F2 | 5.80 ~ 0.24 | → | Highest temperature at: Ambient= 50.8°C, T1 core= 88.0°C. | NB, NC, NT. I/P=1493.90 W ~ 13.79W. Output overloaded up to 30.00A before all output foldback. LC: E No hazards |
| 48Vdc output | Overload | 264Vac | 6.32h | F1/F2 | 2.96 ~ 0.25 | → | Highest temperature at: Ambient= 71.1°C, T1 coil near Q102 (sec.)= 89.8°C. | NB, NC, NT. I/P=752.50 W ~ 23.42W. Output overloaded up to 16.50A before all output foldback. LC: F No hazards |
| 5Vsb output | Overload | 264Vac | 11.2h | F1/F2 | 0.25 ~ 0.23 | -- | Highest temperature at: Ambient= 71.9°C, T401 coil= 76.1°C. | NB, NC, NT. I/P=23.22W ~ 17.44W. Output overloaded up to 2.40A before 5Vsb fold back. LC: D No hazards |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:

1) o-l: Overloaded; s-c: Short-circuited; o-c: Open-circuited.
2) The test result shown no accessible parts become Class 3 level during and after single fault condition.
3) See "**Summary of testing**" for the detailed output load conditions in previous test report CN234JSZ 001.
4) Maximum permitted temperature are as follows:
   - Winding wires (providing safety isolation):
     - T1, T2 of insulation system Class F, Tmax= 155°C (200°C-(70°C-25°C))
     - T401 of insulation system Class B, Tmax= 130°C (175°C-(70°C-25°C))

Abbreviations below may be used.

IP - Internal protection operated (list component)

CT - Constant temperatures were obtained

TW - Transformer winding opened

CD - Components damaged (list damaged components)

NB - No indication of dielectric breakdown

YB - Dielectric breakdown (indicate time and location)

NC - Cheesecloth remained intact

LC – Load Condition

I/P - Input

YC - Cheesecloth charred or flamed

NT - Tissue paper remained intact

YT - Tissue paper charred or flamed

RA - The unit can recover automatically when removing the abnormal condition

BT - Breaker trip (B type)

N - Frighten Noise

@ - Test repeat two more times with same results observed

O/P - Output

**List of test equipment used:**

“No listing of test equipment used necessary for chosen test procedure.”

# ATTACHMENT



| 5.1 | TABLE: Evaluation of voltage limiting components in SELV circuits | | P |
|---|---|---|---|
| Component (measured between) | max. voltage (V) (normal operation) | | Voltage Limiting Components |
| | V peak | V d.c. | |
| Model: **PMS-24V1K2W1BT** | | | |
| T1 pin A to GND (CN101) | 40.8 | -- | -- |
| T1 pin B to GND (CN101) | 39.6 | -- | -- |
| T1 pin C, D to GND (CN101) | 24.6 | -- | -- |
| T401 pin 10 to pin 12 | 36.0 | -- | -- |
| T401 pin 8 to pin 7 | 26.0 | -- | -- |
| Model: **PMS-48V1K2W1BT** | | | |
| T1 pin A to pin C, D | 72.4 | -- | -- |
| T1 pin B to pin C, D | 68.8 | -- | -- |
| T1 pin B to GND (CN101) | 118 | -- | -- |
| T1 pin A to GND (CN101) | 122 | -- | -- |
| T1 pin A after R226 to GND (CN101) | 113 | -- | -- |
| T1 pin A after Q104(D-S) to GND (CN101) | 0.98 | -- | Q104(D-S) |
| T1 pin A after Q104(D-G) to GND (CN101) | 9.4 | -- | Q104(D-G) |
| T1 pin A after Q102(D-G) to GND (CN101) | 9.3 | -- | Q102(D-G) |
| T1 pin A after R224 to GND (CN101) | 112 | -- | -- |
| T1 pin A after IC102 Pin 5,1 to GND (CN101) | 0.7 | -- | IC102 Pin 5,1 |
| T1 pin A after IC102 Pin 6 to GND (CN101) | 13.4 | -- | IC102 Pin 6 |
| T1 pin A after IC102 Pin 3 to GND (CN101) | 3.08 | -- | IC102 Pin 3 |
| T1 pin C, D to GND (CN101) | -- | 51.2 | -- |
| T401 pin 10 to pin 12 | 36.0 | -- | -- |
| T401 pin 8 to pin 7 | 23.0 | -- | -- |
| Fault test performed on voltage limiting components | Voltage measured (V) (V peak or V d.c.) | | |
| Model: **PMS-48V1K2W1BT** | | | |
| Q104(D-S) short | 0.4Vdc | | |
| Q104(D-G) short | 0.4Vdc | | |
| Q102(D-G) short | 0.4Vdc | | |
| IC102 Pin( 4-5,1) short | 48.4Vdc | | |
| IC102 Pin( 4-2) short | 48.8Vdc | | |
| IC102 Pin(4- 6) short | 49.2Vdc | | |
| IC102 Pin(4- 3) short | 48.0Vdc | | |
| IC102 Pin(4- 8) short | 48.8Vdc | | |
| C101 short | 48.8Vdc | | |

# ATTACHMENT



| Supplementary information:<br>Input voltage: 240 Vac/60 Hz |
|---|

| 5.4.1.8 | TABLE: Working voltage measurement | | P |
|---|---|---|---|
| Location | RMS voltage (V) | Peak voltage (V) | Comments |
| Model: **PMS-24V1K2W1BT** | | | |
| Transformers (T1, T2): | | | |
| T1 pin 1 to pin A | 186 | 385 | Test at 240Vac, 60Hz, load condition A |
| T1 pin 1 to pin B | 163 | 337 | See above |
| T1 pin 1 to pin C, D | 172 | 361 | See above |
| T1 pin 1 to CN101 (sec. GND) | 173 | 385 | See above |
| T1 pin 2 to pin A | 162 | 316 | See above |
| T1 pin 2 to pin B | 173 | 337 | See above |
| T1 pin 2 to pin C, D | 166 | 305 | See above |
| T1 pin 2 to CN101 (sec. GND) | 168 | 329 | See above |
| T1 pin 3 to pin A | 190 | 411 | See above |
| T1 pin 3 to pin B | 192 | 417 | See above |
| T1 pin 3 to pin C, D | 189 | 382 | See above |
| T1 pin 3 to CN101 (sec. GND) | 191 | 406 | See above |
| T2 pin 1 to pin A | **263*** | **512*** | See above |
| T2 pin 1 to pin B | 219 | 429 | See above |
| T2 pin 1 to pin C, D | 238 | 462 | See above |
| T2 pin 1 to CN101 (sec. GND) | 240 | 486 | See above |
| T2 pin 2 to pin A | 186 | 385 | See above |
| T2 pin 2 to pin B | 163 | 337 | See above |
| T2 pin 2 to pin C, D | 172 | 361 | See above |
| T2 pin 2 to CN101 (sec. GND) | 175 | 385 | See above |
| T2 pin 3 to pin A | 190 | 411 | See above |
| T2 pin 3 to pin B | 192 | 417 | See above |
| T2 pin 3 to pin C, D | 189 | 382 | See above |
| T2 pin 3 to CN101 (sec. GND) | 192 | 407 | See above |
| T2 pin 1 to pin A | 253 | 484 | Test at 100Vac, 60Hz, load condition A |
| Transformer (T401): | | | |
| T401 pin 1 to pin 7 | 173 | 412 | Test at 240Vac, 60Hz, load condition A |

# ATTACHMENT



| | | | |
|---|---|---|---|
| T401 pin 1 to pin 8 | 170 | 380 | See above |
| T401 pin 1 to pin 10 | 172 | 368 | See above |
| T401 pin 1 to pin 12 (GND) | 172 | 416 | See above |
| T401 pin 2 to pin 7 | 170 | 352 | See above |
| T401 pin 2 to pin 8 | 170 | 360 | See above |
| T401 pin 2 to pin 10 | 170 | 372 | See above |
| T401 pin 2 to pin 12 (GND) | 170 | 360 | See above |
| T401 pin 4 to pin 7 | 379 | 640 | See above |
| T401 pin 4 to pin 8 | 376 | 632 | See above |
| T401 pin 4 to pin 10 | 380 | 620 | See above |
| T401 pin 4 to pin 12 (GND) | 383 | **652*** | See above |
| T401 pin 6 to pin 7 | 327 | 352 | See above |
| T401 pin 6 to pin 8 | 328 | 460 | See above |
| T401 pin 6 to pin 10 | 332 | 476 | See above |
| T401 pin 6 to pin 12 (GND) | 331 | 444 | See above |
| T401 pin 4 to pin 12 (GND) | **419*** | 640 | Test at 100Vac, 60Hz, load condition A |
| Model: **PMS-48V1K2W1BT** | | | |
| T1 pin 3 to pin B | 211 | 450 | Test at 240Vac, 60Hz, load condition E |
| T2 pin 1 to pin A | **278*** | **480*** | See above |
| T401 pin 4 to pin 12 (GND) | **375*** | **640*** | See above |
| T401 pin 4 to pin 8 | 191 | 545 | See above |

Supplementary information:

1. The unit was connected to 240 Vac, 60 Hz.
2. An asterisk indicates the highest measured working voltage.
3. All other trace to trace measurements have been < 420 Vpk and < 250 Vrms.
4. Working frequency of T2: 98kHz max. for **PMS-24V1K2W1BT**.
6. See "**Summary of testing"** for the detailed load conditions in previous test report CN234JSZ 001.

Ref. Certif. No.

JPTUV-156692

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

# CB TEST CERTIFICATE

| | |
|---|---|
| Product | SWITCHING POWER SUPPLY |
| Name and address of the applicant | Delta Electronics, Inc.<br>3, Tungyuan Road,<br>Chungli Industrial Zone, Taoyuan City 32063 Taiwan |
| Name and address of the manufacturer | Delta Electronics, Inc.<br>3, Tungyuan Road,<br>Chungli Industrial Zone, Taoyuan City 32063 Taiwan |
| Name and address of the factory | See additional page(s) |
| Ratings and principal characteristics | Input : AC 100-240V; 15-7.5A; 50-60Hz; Class I<br>Output: 1. DC 24V/50A Max.;DC 5Vsb/2A;Total Power 1210W Max.<br>2. DC 48V/25A Max.;DC 5Vsb/2A;Total Power 1210W Max. |
| Trademark (if any) | Trademark of Delta Electronics, Inc. |
| Customer's Testing Facility (CTF) Stage used | CTF Stage 1 |
| Model / Type Ref. | 1. PMS-24V1K2W1BTD<br>2. PMS-48V1K2W1BTD |
| Additional information (if necessary may also be reported on page 2) | Additionally evaluated to EN 62368-1:2014+A11:2017.<br>Additionally evaluated to BS EN 62368-1:2014+A11:2017.<br>For model differences, refer to the test report. |
| A sample of the product was tested and found to be in conformity with | IEC 62368-1:2014<br>See Test Report for National Differences |
| As shown in the Test Report Ref. No. which forms part of this Certificate | CN234JSZ 001 |

This CB Test Certificate is issued by the National Certification Body

TÜVRheinland®

TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021, Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web : www.tuv.com

Date: 2024-01-17

Signature:

Dipl.-Ing. Th. Illing

10/0861 CB 06/2019 rk

1. Delta Electronics (Dongguan) Co., Ltd.
   No.33, Pantao Road, Shijie Town,
   Dongguan, Guangdong 523308,
   P.R. China

2. Delta Electronics (Dongguan) Co., Ltd.
   Southwest Branch
   No.33, Pantao Road, Shijie Town,
   Dongguan, Guangdong 523308,
   P.R. China

3. DELTA ELECTRONICS (WUHU) LTD.
   No. 138, Jiuhua North Road
   LongShan Street
   Economic-technical Development Area
   Wuhu City, Anhui Province, P.R. China

4. Delta Electronics (Jiangsu) Ltd.
   215200, No.1688, Jiangxing East Road,
   Wujiang Economic and Technological
   Development Zone
   Suzhou City, Jiangsu Province, P.R. China

5. Delta Electronics (Thailand) Public
   Co., Ltd.
   909 Soi 9 Moo 4, Bangpoo Industrial
   Estate (E.P.Z.), Pattana 1 Road,
   Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand

6. Delta Electronics (Thailand) Public
   Co., Ltd.
   111/6 Moo 9, Wellgrow Industrial Estate,
   Bangna-Trad Road, Tambol Bangwua,
   Amphur Bangpakong, Chachoengsao 24180, Thailand

7. Delta Electronics India Private Limited
   SEZ Unit
   SY No.16/1b2b(Part) & 16/1b2a(Part),
   Plot No.1, Industrial Park,
   Kurubarapalli Village, Krishnagiri, Tamilnadu, 635115, India

**Additional information (if necessary)** Report Ref. No. : CN234JSZ 001

Date: 2024-01-17 Signature: Dipl.-Ing. Th. Illing

8. Delta Electronics (Chongqing) Co.,LTD.
   3rd & 4th Floor, Plant 2.
   Mengxun Technology Park. No.6
   Jidianyizhi Road, Chayuan, Nan'an District,
   Chongqing, 401336, P.R. China

9. Delta Electronics (Chongqing) Co.,LTD.
   Building 10, No.1,
   Jiangxia Road, Nan'an District,
   Chongqing,
   P.R. China

**Additional information (if necessary)** Report Ref. No. : CN234JSZ 001

Date: 2024-01-17 Signature: Dipl.-Ing. Th. Illing

Test Report issued under the responsibility of:

TÜVRheinland®

# TEST REPORT
## IEC 62368-1
## Audio/video, information and communication technology equipment
## Part 1: Safety requirements

| | |
|---|---|
| **Report Number.....:** | CN234JSZ 001 |
| **Date of issue .....:** | 16 January, 2024 |
| **Total number of pages .....:** | 131 |
| **Name of Testing Laboratory preparing the Report .....:** | TÜV Rheinland Taiwan Ltd., Taoyuan Testing Laboratories<br>4F-1, No. 38, Huaya 1st Road, Guishan District, Taoyuan City 333, Taiwan |
| **Applicant's name.....:** | Delta Electronics, Inc. |
| **Address .....:** | 3, Tungyuan Road, Chungli Industrial Zone, Taoyuan City 32063 Taiwan |
| **Test specification:** | |
| **Standard .....:** | IEC 62368-1:2014 |
| **Test procedure.....:** | CB Scheme |
| **Non-standard test method.....:** | N/A |
| **TRF template used .....:** | IECEE OD-2020-F1:2021, Ed.1.4 |
| **Test Report Form No.....:** | IEC62368_1D |
| **Test Report Form(s) Originator....:** | UL(US) |
| **Master TRF .....:** | Dated 2022-04-14 |



**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

| | | |
|---|---|---|
| **Test Item description .....:** | SWITCHING POWER SUPPLY | |
| **Trade Mark(s) .....:** | DELTA (Trademark of Delta Electronics, Inc.) | |
| **Manufacturer .....:** | Same as applicant | |
| **Model/Type reference .....:** | 1. PMS-24V1K2W1BTD<br>2. PMS-48V1K2W1BTD | |
| **Ratings .....:** | See Table "Product Information" in Section "General product information and other remarks" for details. | |
| | | |
| **Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):** | | |
| ☒ **CB Testing Laboratory:** | TÜV Rheinland Taiwan Ltd., Taoyuan Testing Laboratories | |
| **Testing location/ address .....:** | 4F-1, No. 38, Huaya 1st Road, Guishan District, Taoyuan City 333, Taiwan | |
| **Tested by (name, function, signature) .....:** | Thomas Huang (Project Handler) |  |
| **Approved by (name, function, signature) .....:** | Henli Lin (Reviewer) |  |
| | | |
| ☒ **Testing procedure: CTF Stage 1** | See "**Summary of testing:**" and "**Testing location**" (ref. OD-2037:2023, clause 12) | |
| **Testing location/ address.....:** | | |
| **Tested by (name, function, signature) .....:** | | |
| **Approved by (name, function, signature) .....:** | | |
| | | |
| ☐ **Testing procedure: CTF Stage 2** | N/A | |
| **Testing location/ address .....:** | | |
| **Tested by (name, function, signature) .....:** | | |
| **Witnessed by (name, function, signature) .....:** | | |
| **Approved by (name, function, signature) .....:** | | |
| | | |
| ☐ **Testing procedure: CTF Stage 3** | N/A | |
| ☐ **Testing procedure: CTF Stage 4** | N/A | |
| **Testing location/ address .....:** | | |
| **Tested by (name, function, signature) .....:** | | |
| **Witnessed by (name, function, signature) .....:** | | |
| **Approved by (name, function, signature) .....:** | | |
| **Supervised by (name, function, signature)....:** | | |

**List of Attachments (including a total number of pages in each attachment):**

– ATTACHMENT (included evaluation of voltage limiting components, working voltage measurement and transformer specifications, embedded in this report)

– National Differences (60 pages)

– Photo Documentation (13 pages)

Total number of pages in each attachment is indicated in each individual attachment if not otherwise specified.

**Summary of testing:**

This CB test report is re-issued per manufacturers' request which is based on the previous approved CB test report issued by NCB TÜV Rheinland Japan, details as below:

| Test report number | Certification number | Testing procedure | Date of receipt of test item | Date (s) of performance of tests |
|---|---|---|---|---|
| NN208DUN 001 | JPTUV-116269 | CTF1 | 2020-08-21 (CTF laboratory); 2020-08-26 (CBTL) | 2020-08-24 to 2020-08-25 (CTF laboratory); 2020-09-25 to 2020-09-28 (CBTL) |
| NN208DUN 002 | JPTUV-116269-M1 | CBTL | No samples required | No tests performed |
| NN208DUN 003 | JPTUV-116269-M2 | CBTL | 2021-11-23 (CBTL) | 2021-12-08 to 2021-12-21 (CBTL) |
| NN208DUN 004 | JPTUV-116269-M3 | CTF1 | 2023-02-06 (CTF laboratory) | 2023-02-07 to 2023-02-10 (CTF laboratory) |

No technical changes in between as declared by the manufacturer except for listed in the table below:

<table>
<tr><td>No.</td><td>Modification items</td></tr>
<tr><td>1.</td><td>
<table>
<tr><td>Item</td><td>Original model in previous CB test reports</td><td>New model in this CB test report</td></tr>
<tr><td rowspan="2">Model</td><td>MEB-1K2A24T</td><td>PMS-24V1K2W1BTD</td></tr>
<tr><td>MEB-1K2A48T</td><td>PMS-48V1K2W1BTD</td></tr>
</table>
The constructions are identical to original except for model designation only. No further tests were considered to be necessary.
</td></tr>
<tr><td>2.</td><td>Change factory:
<table>
<tr><td>Item</td><td>Original</td><td>New</td></tr>
<tr><td>Factory</td><td>Delta Electronics India Private Limited-SEZ Unit<br>Delta SEZ Notified at SY No. 16/1B2B Part & 16/1B2A Part Plot No.1, Industrial Park, Kurubarapalli Village Krishnagiri Dist, Tamil Nadu, 635115, India</td><td>Delta Electronics India Private Limited SEZ Unit<br>SY No.16/1b2b(Part) & 16/1b2a(Part), Plot No.1, Industrial Park, Kurubarapalli Village, Krishnagiri, Tamilnadu, 635115, India</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Add factories:<br>▪ Delta Electronics (Chongqing) Co., LTD.<br>3rd & 4th Floor, Plant 2. Mengxun Technology Park. No.6 Jidianyizhi Road, Chayuan, Nan'an District, Chongqing, 401336, P.R. China<br>▪ Delta Electronics (Chongqing) Co., LTD.<br>Building 10, No.1, Jiangxia Road, Nan'an District, Chongqing, P.R. China</td></tr>
</table>

Except stated above, all test data are derived from the original CB test report.

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| All applicable tests as described in Test Case and Measurement Sections were performed.<br>The equipment have been evaluated for a maximum ambient temperature of 50°C with full 100% rated output load condition and 70°C with de-rating 50% rated output load condition.<br>Unless otherwise specified, the tests were performed at around +25°C ambient temperature in an open bench at label side upward position (components side upward) declared by manufacturer.<br>The following load conditions were used during testing:<br>▪ Load condition A: 24Vdc/50A, 5Vsb/2A (@ tma 50°C);<br>▪ Load condition B: 24Vdc/25A, 5Vsb/1A (@ tma 70°C);<br>▪ Load condition C: 24Vdc/48Vdc turn off, 5Vsb/2A (standby mode @ tma 50°C);<br>▪ Load condition D: 24Vdc/48Vdc turn off, 5Vsb/1A (standby mode @ tma 70°C);<br>▪ Load condition E: 48Vdc/25A, 5Vsb/2A (@ tma 50°C);<br>▪ Load condition F: 48Vdc/12.5A, 5Vsb/1A (@ tma 70°C).<br>The equipment is designed for maximum operating altitudes up to and including 5000m above sea level. A correction factor of 1.48 was used.<br>The test samples are pre-production without any serial numbers. | All tests as described in Test Case and Measurement Sections were performed at the laboratory described on previous page. |

**Summary of compliance with National Differences (List of countries addressed):**

EU Group Differences, EU Special National Conditions, AU, CA, DK, IT, JP, NZ, US.
Explanation of used codes: AU=Australia, CA=Canada, DK=Denmark, IT=Italy, JP=Japan, NZ=New Zealand, US=United States of America.

☒ **The product fulfils the requirements of EN 62368-1:2014+A11:2017**

☒ **The product fulfils the requirements of BS EN 62368-1:2014+A11:2017**

For National Differences see corresponding Attachment.

**Use of uncertainty of measurement for decisions on conformity (decision rule):**

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:

**Information on uncertainty of measurement:**

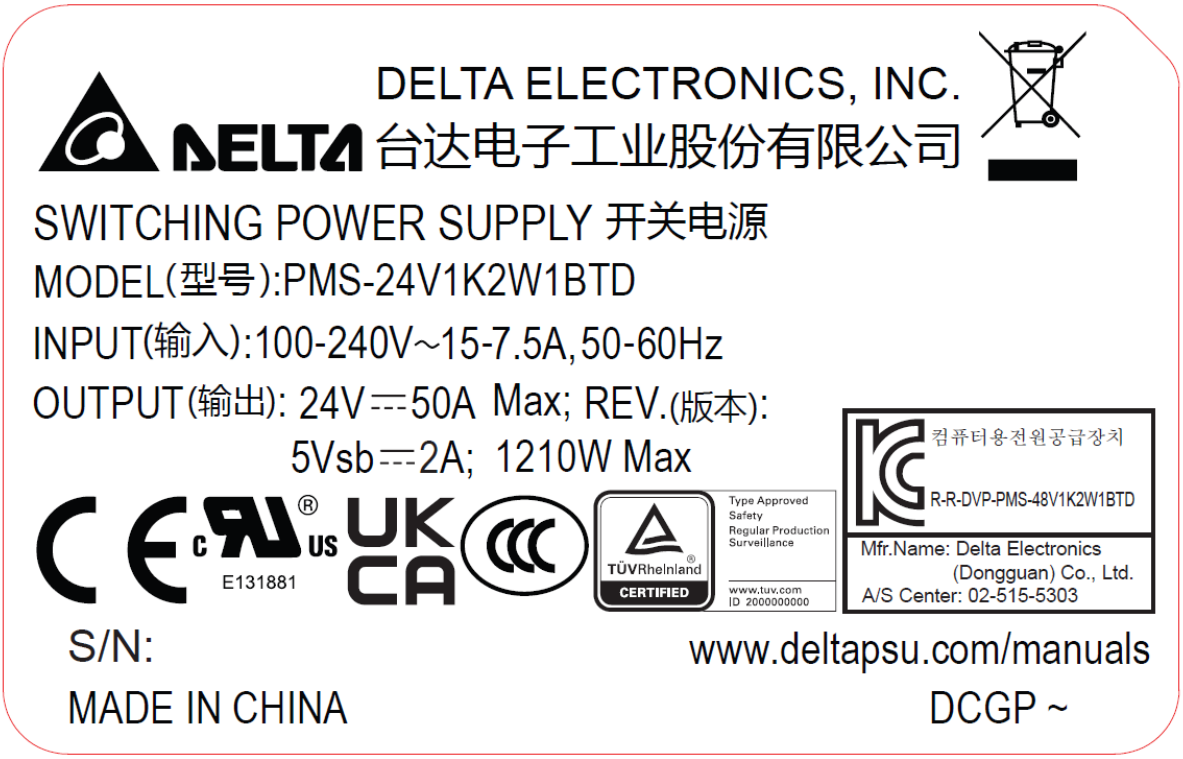
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

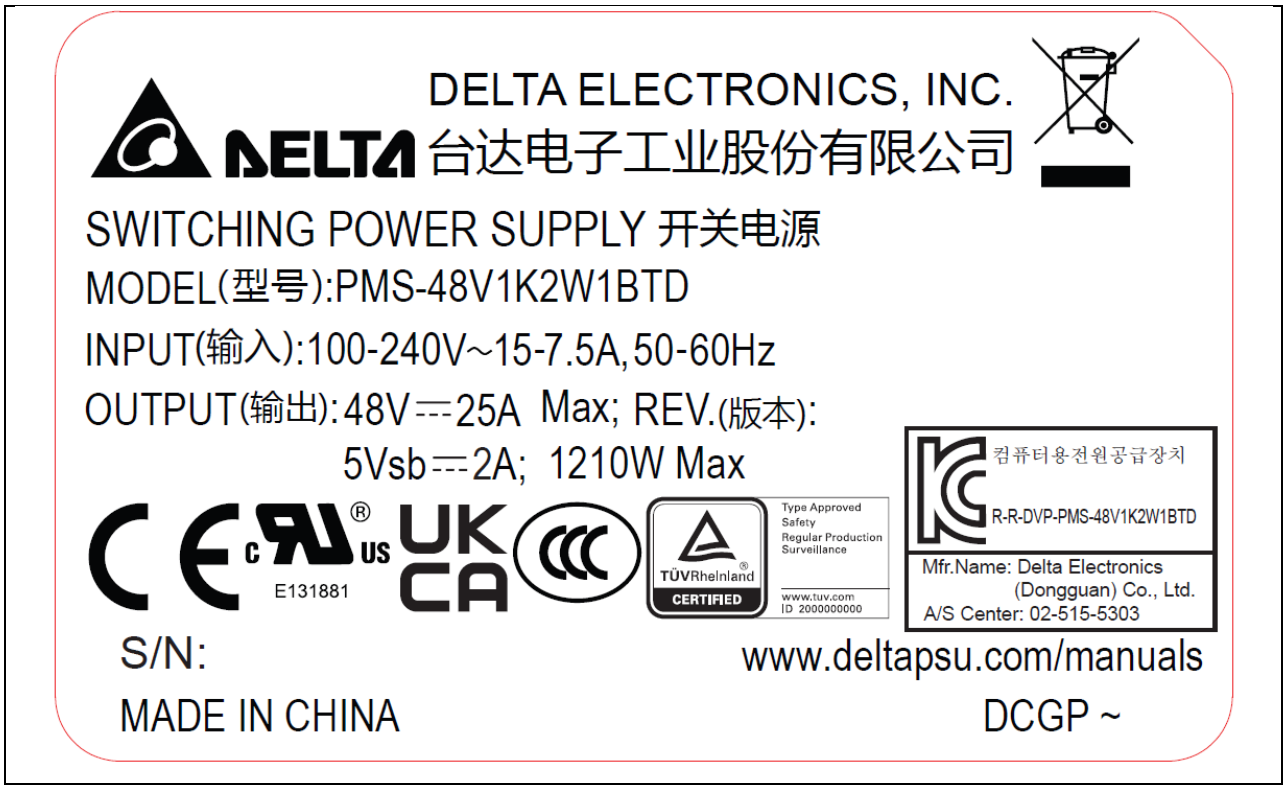
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**




DELTA ELECTRONICS, INC.
台达电子工业股份有限公司
SWITCHING POWER SUPPLY 开关电源
MODEL(型号):PMS-48V1K2W1BTD
INPUT(输入):100-240V~15-7.5A,50-60Hz
OUTPUT(输出):48V ⎓ 25A Max; REV.(版本):
5Vsb ⎓ 2A; 1210W Max
E131881
Type Approved
Safety
Regular Production
Surveillance
TÜVRheinland
CERTIFIED
www.tuv.com
ID 2000000000
컴퓨터용전원공급장치
R-R-DVP-PMS-48V1K2W1BTD
Mfr.Name: Delta Electronics
(Dongguan) Co., Ltd.
A/S Center: 02-515-5303
S/N:
www.deltapsu.com/manuals
MADE IN CHINA
DCGP ~

| **TEST ITEM PARTICULARS:** | |
|---|---|
| **Classification of use by.....:** | ☒ Ordinary person<br>☐ Instructed person<br>☐ Skilled person<br>☐ Children likely to be present<br>*Building-in type power supply, overall compliance shall be evaluated in the final system assembly.* |
| **Supply Connection .....:** | ☒ AC Mains ☐ DC Mains<br>☐ External Circuit - not Mains connected<br>- ☐ ES1 ☐ ES2 ☐ ES3 |
| **Supply % Tolerance .....:** | ☒ +10%/-10%<br>☐ +20%/-15%<br>☐ +____%/ -_____%<br>☐ None |
| **Supply Connection – Type .....:** | ☐ pluggable equipment type A -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ direct plug-in<br>☐ mating connector<br>☐ pluggable equipment type B -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ permanent connection<br>☐ mating connector ☒ other: Terminal block |
| **Considered current rating of protective device as part of building or equipment installation ....:** | 16A, 13A (GB) or 20A (US and Canada) (for building)<br>See section "Markings of fuse" for equipment.<br>Installation location: ☒ building; ☒ equipment |
| **Equipment mobility .....:** | ☐ movable ☐ hand-held ☐ transportable<br>☐ stationary ☒ for building-in ☐ direct plug-in<br>☐ rack-mounting ☐ wall-mounted |
| **Over voltage category (OVC) .....:** | ☐ OVC I ☒ OVC II ☐ OVC III<br>☐ OVC IV ☐ other: _____ |
| **Class of equipment .....:** | ☒ Class I ☐ Class II ☐ Class III<br>☐ Class II with functional earthing<br>☐ Not classifed |
| **Access location .....:** | ☐ restricted access area ☒ N/A<br>*Building-in type power supply, overall compliance shall be evaluated in the final system assembly.* |
| **Pollution degree (PD) .....:** | ☐ PD 1 ☒ PD 2 ☐ PD 3 |
| **Manufacturer's specified maximum operating ambient.....:** | See section "**Summary of testing**" and appended table 5.4.1.4, 6.3.2, 9.0, B.2.6 for details. |
| **IP protection class .....:** | ☐ IPX0 ☒ IP00 |
| **Power Systems .....:** | ☒ TN ☐ TT ☒ IT - 230 V $_{L-L}$ ☐ dc mains<br>☐ N/A |
| **Altitude during operation (m) .....:** | ☐ 2000 m or less ☒ 5000 m |

| | |
|---|---|
| **Altitude of test laboratory (m) .....:** | ☒ 2000 m or less ☐ _____ m |
| **Mass of equipment (kg) .....:** | ☒ Approx. 1.52kg |
| | |
| **Possible test case verdicts:** | |
| **- test case does not apply to the test object .....:** | N/A |
| **- test object does meet the requirement .....:** | P (Pass) |
| **- test object does not meet the requirement .....:** | F (Fail) |
| **Testing .....:** | |
| **Date of receipt of test item .....:** | 2020-08-21 (CTF laboratory), 2020-08-26 (CBTL);<br>2021-11-23 (CBTL);<br>2023-02-06 (CTF laboratory) |
| **Date (s) of performance of tests .....:** | 2020-08-24 to 2020-08-25 (CTF laboratory),<br>2020-09-25 to 2020-09-28 (CBTL);<br>2021-12-08 to 2021-12-21 (CBTL);<br>2023-02-07 to 2023-02-10 (CTF laboratory) |
| | |
| **General remarks:** | |
| "(See Enclosure #)" refers to additional information appended to the report.<br>"(See appended table)" refers to a table appended to the report.<br><br>**Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** | |
| **Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:** | |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....: | ☒ **Yes**<br>☐ **Not applicable** |
| **When differences exist; they shall be identified in the General product information section.** | |

| | |
|---|---|
| **Name and address of factory (ies)..... :** | 1. Delta Electronics (Dongguan) Co., Ltd.<br>No.33, Pantao Road, Shijie Town, Dongguan, Guangdong 523308, P.R. China<br>2. Delta Electronics (Dongguan) Co., Ltd.<br>Southwest Branch<br>No.33, Pantao Road, Shijie Town, Dongguan, Guangdong 523308, P.R. China<br>3. DELTA ELECTRONICS (WUHU) LTD.<br>No. 138, Jiuhua North Road, LongShan Street, Economic-technical Development Area, Wuhu City, Anhui Province, P.R. China<br>4. Delta Electronics (Jiangsu) Ltd.<br>215200, No.1688, Jiangxing East Road, Wujiang Economic and Technological Development Zone, Suzhou City, Jiangsu Province, P.R. China<br>5. Delta Electronics (Thailand) Public Co., Ltd.<br>909 Soi 9 Moo 4, Bangpoo Industrial Estate (E.P.Z.), Pattana 1 Road, Tambol Phraksa, Amphur Muang, Samutprakarn 10280, Thailand<br>6. Delta Electronics (Thailand) Public Co., Ltd.<br>111/6 Moo 9, Wellgrow Industrial Estate, Bangna-Trad Road, Tambol Bangwua, Amphur Bangpakong, Chachoengsao 24180, Thailand<br>7. Delta Electronics India Private Limited SEZ Unit<br>SY No.16/1b2b(Part) & 16/1b2a(Part), Plot No.1, Industrial Park, Kurubarapalli Village, Krishnagiri, Tamilnadu, 635115, India<br>8. Delta Electronics (Chongqing) Co., LTD.<br>3rd & 4th Floor, Plant 2. Mengxun Technology Park. No.6 Jidianyizhi Road, Chayuan, Nan'an District, Chongqing, 401336, P.R. China<br>9. Delta Electronics (Chongqing) Co., LTD.<br>Building 10, No.1, Jiangxia Road, Nan'an District, Chongqing, P.R. China |
| **General product information and other remarks:** | |
| **Product Description –**<br>The items of equipment are switching mode power supplies intended for building-in into Class I audio/video, information and communication technology equipment in the scope of this standard.<br>The further evaluation and testing must be checked and performed in the final system for this equipment.<br><br>The below PCB boards are used:<br>▪ Model PMS-24V1K2W1BTD:<br>– MEB-1K2A24T AAA (main board, primary and secondary circuits, four layers, multilayer PCB)<br>– TDC-585 (secondary circuit, four layers, multilayer PCB)<br>– TDC-587 (secondary circuit, four layers, multilayer PCB)<br>– TDC-588 (secondary circuit, single layer double sided PCB)<br>▪ Model PMS-48V1K2W1BTD:<br>– MEB-1K2A48T AAA (main board, primary and secondary circuits, four layers, multilayer PCB)<br>– TDC-811 (secondary circuit, four layers, multilayer PCB)<br>– TDC-587 (secondary circuit, four layers, multilayer PCB)<br>– TDC-588 (secondary circuit, single layer double sided PCB) | |

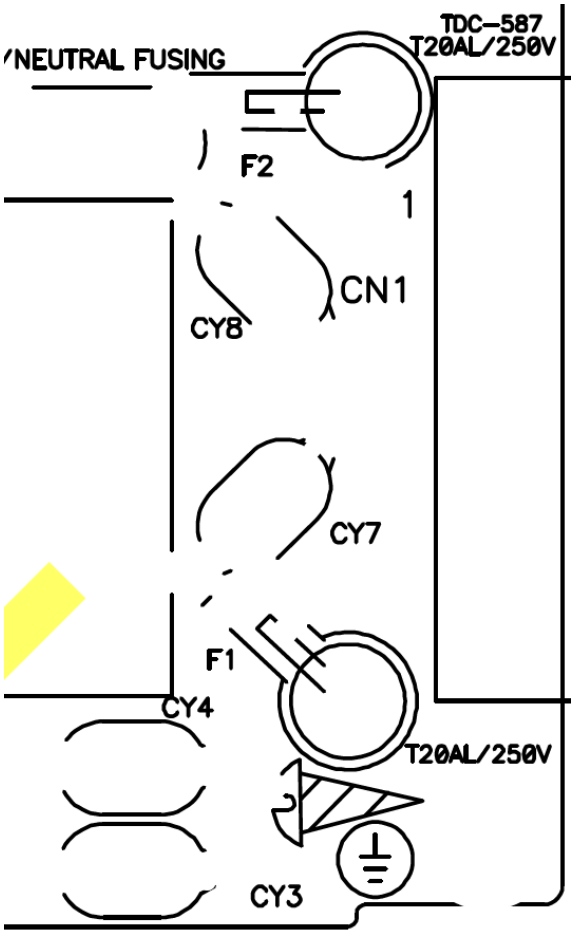
**Product Information:**

| No. | Model/Type reference | Ratings – AC Input | Ratings – DC Output | Max. Ambient Temperature (Tma) |
|---|---|---|---|---|
| 1. | PMS-24V1K2W1BTD | 100-240V~, 15-7.5A, 50-60Hz | 24Vdc / 50A Max, 5Vsb / 2A, 1210W Max | 50°C for full 100% rated output load condition and 70°C for de-rating 50% rated output load condition. |
| 2. | PMS-48V1K2W1BTD | 100-240V~, 15-7.5A, 50-60Hz | 48Vdc / 25A Max, 5Vsb / 2A, 1210W Max | |

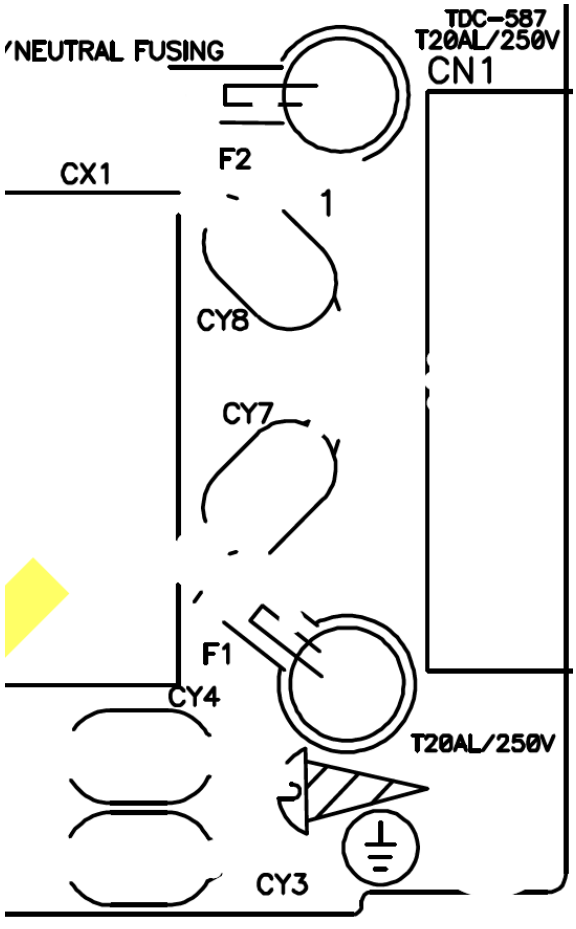
**Markings of fuse –**

The fuse is located within the equipment and **NOT** replaceable by an ordinary person or an instructed person. The fuse marking is marked on PCB near fuse:

Model: PMS-24V1K2W1BTD




Model: PMS-48V1K2W1BTD



**Model Differences –**

Both models are similar to each other except for the model designation, output ratings and components as mentioned below table.

| Item \ Model | PMS-24V1K2W1BTD | PMS-48V1K2W1BTD |
|---|---|---|
| Ratings – AC Input | 100-240V~, 15-7.5A, 50-60Hz | |
| Ratings – DC Output | 24Vdc / 50A Max, 5Vsb / 2A, 1210W Max | 48Vdc / 25A Max, 5Vsb / 2A, 1210W Max |
| Operation maximum ambient temperature (Tma) | 50°C for full 100% rated output load condition and 70°C for de-rating 50% rated output load condition. | |
| Pollution degree | PD2 | |
| Main PCB | MEB-1K2A24T AAA | MEB-1K2A48T AAA |
| Secondary circuit PCB | TDC-585 | TDC-811 |
| MOSFETs (Q5, Q6) | 600V min., 50A min. | 600V min., 38.8Amin. |
| Isolating Transformers (T1, T2) | MV-MPS16030-A | MV-MPS17014-A |
| Isolating Transformer (T401) | AV-MPS16030-A | AV-MPS17015-A |
| Y-Capacitors (CY5, CY6) | 2200 pF max. | 3300 pF max. |
| ZD1 | With | Without |
| ZD2 | With | Without |
| C20 | Without | With |
| C21 | Without | With |
| C28 | Without | With |
| C29 | Without | With |
| C30 | Without | With |
| C96 | Without | With |
| C97 | Without | With |
| C98 | Without | With |

**Additional application considerations – (Considerations used to test a component or sub-assembly) –**

The product is a component intended for incorporation in audio/video, information and communication technology equipment, the overall compliance shall be investigated in the complete audio/video, information and communication technology equipment.

**Abbreviations used in the report:**

| | | | |
|---|---|---|---|
| **- normal conditions** | **N.C.** | **- single fault conditions** | **S.F.C** |
| **- functional insulation** | **OP** | **- basic insulation** | **BI** |
| **- double insulation** | **DI** | **- supplementary insulation** | **SI** |
| **- between parts of opposite polarity** | **BOP** | **- reinforced insulation** | **RI** |

IP Internal protection operated (list component)

CT Constant temperatures were obtained

TW Transformer winding opened

CD Components damaged (list damaged components)

NB No indication of dielectric breakdown

YB Dielectric breakdown (indicate time and location)

NC Cheesecloth remained intact

YC Cheesecloth charred or flamed

NT Tissue paper remained intact

YT Tissue paper charred or flamed

RA The unit can recover automatically when

BT Breaker trip (B type)

LC Load condition

**Indicate used abbreviations (if any)**

| **ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:** | |
|---|---|
| (Note 1: Identify the following six (6) energy source forms based on the origin of the energy.)<br>(Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3. | |
| **Electrically-caused injury (Clause 5):**<br>(Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification)<br>Example: +5 V dc input ES1 | |
| **Source of electrical energy** | **Corresponding classification (ES)** |
| X-Capacitors connected between Line and Neutral<br>Assume accessible pins of screw wiring terminal block after disconnection of a mains device/screw wiring terminal block | ES3 |
| All circuits except for output circuits | ES3 |
| Secondary circuit before rectifier circuits of isolation transformer | ES3 |
| Output circuits | ES1 |
| **Electrically-caused fire (Clause 6):**<br>(Note: List sub-assembly or circuit designation and corresponding energy source classification)<br>Example: Battery pack (maximum 85 watts): PS2 | |
| **Source of power or PIS** | **Corresponding classification (PS)** |
| All circuits | PS3 |
| Output circuits (screw wiring terminal block) (24Vdc) | PS3 |
| Output circuits (screw wiring terminal block) (48Vdc) | PS3 |
| Output circuits (5Vsb) | PS1 |
| **Injury caused by hazardous substances (Clause 7)**<br>(Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.)<br>Example: Liquid in filled component Glycol | |
| **Source of hazardous substances** | **Corresponding chemical** |
| N/A | N/A |
| **Mechanically-caused injury (Clause 8)**<br>(Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.)<br>Example: Wall mount unit MS2 | |
| **Source of kinetic/mechanical energy** | **Corresponding classification (MS)** |
| Sharp edges and corners | MS1 |
| Moving parts (DC fans) | MS3 |
| Equipment mass (< 7kg) | MS1 |
| **Thermal burn injury (Clause 9)**<br>(Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.)<br>Example: Hand-held scanner – thermoplastic enclosure TS1 | |
| **Source of thermal energy** | **Corresponding classification (TS)** |

| | |
|---|---|
| N/A | Building-in type power supply, overall compliance shall be evaluated in the final system assembly. |
| **Radiation (Clause 10)**<br>(Note: List the types of radiation present in the product and the corresponding energy source classification.)<br>Example: DVD – Class 1 Laser Product RS1 | |
| **Type of radiation** | **Corresponding classification (RS)** |
| N/A | N/A |

| **ENERGY SOURCE DIAGRAM** |
|---|
| Indicate which energy sources are included in the energy source diagram. Insert diagram below |
| **See "ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE"**<br>☐ **ES** ☐ **PS** ☐ **MS** ☐ **TS** ☐ **RS** |

| **OVERVIEW OF EMPLOYED SAFEGUARDS** | | | | |
|---|---|---|---|---|
| **Clause** | **Possible Hazard** | | | |
| 5.1 | Electrically-caused injury | | | |
| Body Part (e.g. Ordinary) | Energy Source (ES3: Primary Filter circuit) | Safeguards | | |
| | | Basic | Supplementary | Reinforced (Enclosure) |
| Ordinary (accessible pins from mains supply which connected to screw wiring terminal block are assumed to be accessible by ordinary person in the end product) | ES3: X-Capacitors connected between Line and Neutral | N/A | N/A | A safeguard provided by approved bleeder resistors (R1, R2, R3, R4) |
| Ordinary (output circuit assumed to be accessible by ordinary person in the end product) | ES3: Primary circuits | Bridging capacitor (CY1) | Bridging capacitor (CY2) | Isolating transformers (T1, T2, T401),<br>Optocouplers (IC51, IC52, IC53, IC54, IC60, IC404),<br>Bridging Resistors (R33, R34, R35, R36, R37, R39, R102 in series) and PCB traces |
| Ordinary (metal chassis assumed to be direct or indirect accessible by ordinary person in the end product) | ES3: Primary circuits | Y-Capacitors (CY3, CY4, CY7, CY8) | Protective earthed chassis | N/A |

| | | | | |
|---|---|---|---|---|
| Ordinary<br>(See appended table in "**ATTACHMENT**" for evaluation of single fault condition of voltage limiting components) | ES3: Secondary circuit before rectifiers (separated from ES3 mains by double or reinforced insulation) | N/A (secondary rectifier circuits, see measured data in attachment for details) | N/A | N/A |
| Ordinary | ES1: Output (screw wiring terminal block) | N/A | N/A | N/A |
| 6.1 | Electrically-caused fire | | | |
| Material part (e.g. mouse enclosure) | Energy Source (PS2: 100 Watt circuit) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| Combustible materials within equipment fire enclosure | PS3: > 100Watt circuit (primary and secondary circuits) | Equipment safeguards (no ignition occurs and no such temp. attained specified in 6.3.1 (a)) | Equipment safeguards (e.g. min. rated V-1 PCB, combustible material rated V-2 min.) | N/A |
| Fire enclosure (to be determinied by the end product use) | PS3: > 100Watt circuit (primary and secondary circuits) | N/A | N/A | N/A |
| Internal wiring material (also to be determinied by the end product use) | PS3: > 100Watt circuit (secondary circuits) | See above and subclause 6.3.1 (a) | Equipment safeguards (rated VW-1, see subclause 6.5) | N/A |
| External wiring material (to be determinied by the end product use) | PS3: > 100Watt circuit (primary and secondary circuits) | N/A | N/A | N/A |
| Output connector of outside enclosure | PS3: > 100Watt circuit (Secondary circuits) | See above and subclause 6.3.1 (a) | Equipment safeguards (at least rated V-2 class material for connector, see 6.4.5 and 6.4.6) | N/A |
| 7.1 | Injury caused by hazardous substances | | | |
| Body Part (e.g., skilled) | Energy Source (hazardous material) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| N/A | N/A | N/A | N/A | N/A |
| 8.1 | Mechanically-caused injury | | | |
| Body Part (e.g. Ordinary) | Energy Source (MS3: High Pressure Lamp) | Safeguards | | |
| | | Basic | Supplementary | Reinforced (Enclosure) |
| N/A | N/A | N/A | N/A | N/A |

| 9.1 | Thermal Burn | | | |
|---|---|---|---|---|
| Body Part (e.g., Ordinary) | Energy Source (TS2) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| N/A | N/A | N/A | N/A | N/A |
| 10.1 | Radiation | | | |
| Body Part (e.g., Ordinary) | Energy Source (Output from audio port) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| N/A | N/A | N/A | N/A | N/A |
| Supplementary information:<br>(1) See attached energy source diagram for additional details.<br>(2) “N” – Normal Condition; “A” – Abnormal Condition; “S” – Single Fault. | | | | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4** | **GENERAL REQUIREMENTS** | | P |
| 4.1.1 | Acceptance of materials, components and subassemblies | (See appended table 4.1.2) | P |
| 4.1.2 | Use of components | Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. | P |
| 4.1.3 | Equipment design and construction | Building-in type power supply. However, no accessible output part which could cause injury. Overall compliance shall be evaluated during the final system approval. | P |
| 4.1.15 | Markings and instructions ..... : | (See Annex F) | P |
| 4.4.4 | Safeguard robustness | See below. | P |
| 4.4.4.2 | Steady force tests ..... : | The equipment is a building-in type and evaluation is also to be made during the final system approval. | N/A |
| 4.4.4.3 | Drop tests ..... : | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 4.4.4.4 | Impact tests ..... : | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 4.4.4.5 | Internal accessible safeguard enclosure and barrier tests ..... : | No such consideration for building-in type equipment. | N/A |
| 4.4.4.6 | Glass Impact tests ..... : | No such glass is used. | N/A |
| 4.4.4.7 | Thermoplastic material tests ..... : | The metal chassis is provided. The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 4.4.4.8 | Air comprising a safeguard ..... : | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 4.4.4.9 | Accessibility and safeguard effectiveness | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 4.5 | Explosion | No explosion occurs during normal/abnormal operation and single fault conditions. | P |
| 4.6 | Fixing of conductors | See below. | P |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.6.1 | Fix conductors not to defeat a safeguard | Internal wires are secured by either quick connector or solder with double crimp solder pin and tubed at PCB terminations so that a loosening of the terminal connection to defeat a safeguard is unlikely. | P |
| 4.6.2 | 10 N force test applied to ..... .: | Compliance checked. 10N applied to all components. | P |
| 4.7 | Equipment for direct insertion into mains socket - outlets | The equipment is not for direct insertion into mains socket-outlets. | N/A |
| 4.7.2 | Mains plug part complies with the relevant standard..... : | See above. | N/A |
| 4.7.3 | Torque (Nm) ..... : | See above. | N/A |
| 4.8 | Products containing coin/button cell batteries | No lithium coin/button batteries are used. | N/A |
| 4.8.2 | Instructional safeguard | See above. | N/A |
| 4.8.3 | Battery Compartment Construction | See above. | N/A |
| | Means to reduce the possibility of children removing the battery..... : | See above. | — |
| 4.8.4 | Battery Compartment Mechanical Tests ..... : | See above. | N/A |
| 4.8.5 | Battery Accessibility | See above. | N/A |
| 4.9 | Likelihood of fire or shock due to entry of conductive object..... : | The equipment is a building-in type and evaluation is also to be made during the final system approval. | N/A |

| **5** | **ELECTRICALLY-CAUSED INJURY** | | P |
|---|---|---|---|
| 5.2.1 | Electrical energy source classifications.....: | (See appended table 5.2) | P |
| 5.2.2 | ES1, ES2 and ES3 limits | See below. | P |
| 5.2.2.2 | Steady-state voltage and current .....: | (See appended table 5.2) | P |
| 5.2.2.3 | Capacitance limits.....: | See subclause 5.2.2.2. | P |
| 5.2.2.4 | Single pulse limits .....: | No such single pulse with the equipment. | N/A |
| 5.2.2.5 | Limits for repetitive pulses .....: | Continuous wave less than 3 s, same as 5.2.2.2 (see appended table 5.2). | P |
| 5.2.2.6 | Ringing signals .....: | No such ringing signals with the equipment. | N/A |
| 5.2.2.7 | Audio signals .....: | No such audio signals with the equipment. | N/A |
| 5.3 | Protection against electrical energy sources | (See appended table "**OVERVIEW OF EMPLOYED SAFEGUARDS**"). | P |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | See above. | P |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | Bare parts of ES2 or ES3 source cannot access by ordinary persons via the output circuits.<br>Double or reinforced safeguard is provided between ES2 or ES3 and ordinary persons.<br>However, the equipment is a building-in type, evaluation shall be made during the final system approval | P |
| 5.3.2.2 | Contact requirements | See above. | N/A |
| | a) Test with test probe from Annex V.....: | See above. | N/A |
| | b) Electric strength test potential (V) .....: | See above. | N/A |
| | c) Air gap (mm) .....: | See above. | N/A |
| 5.3.2.4 | Terminals for connecting stripped wire | No such terminals intended to be used by ordinary person. | N/A |
| 5.4 | Insulation materials and requirements | | P |
| 5.4.1.2 | Properties of insulating material | The choice and application have taken into account as specified in this Clause 5 and Annex T except for natural rubber, hygroscopic materials or asbestos are not used as insulation. | P |
| 5.4.1.3 | Humidity conditioning..... : | See subclause 5.4.8. | P |
| 5.4.1.4 | Maximum operating temperature for insulating materials .....: | (See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6) | P |
| 5.4.1.5 | Pollution degree .....: | See Pollution Degree addressed in section "**TEST ITEM PARTICULARS**". | — |
| 5.4.1.5.2 | Test for pollution degree 1 environment and for an insulating compound | See above. | N/A |
| 5.4.1.5.3 | Thermal cycling | The certified sources of optocouplers are used. | N/A |
| 5.4.1.6 | Insulation in transformers with varying dimensions | No such transformers within the equipment. | N/A |
| 5.4.1.7 | Insulation in circuits generating starting pulses | No such circuits within the equipment. | N/A |
| 5.4.1.8 | Determination of working voltage | See appended table 5.4.1.8 in "**ATTACHMENT**" for working voltage measurement. | P |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.1.9 | Insulating surfaces | No such accessible insulating surface.<br>The equipment is built-in type, overall compliance shall be evaluated in the final system approval. | N/A |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | The phenolic materials used for the bobbin of inductors and transformers. No further test considered necessary.<br>For others see appended table 5.4.1.10.3. | P |
| 5.4.1.10.2 | Vicat softening temperature.....: | See above. | N/A |
| 5.4.1.10.3 | Ball pressure .....: | Phenolic materials used are accepted without test due to its physical characteristics is clear from examination (see appended table 5.4.1.10.3). | P |
| 5.4.2 | Clearances | See below. | P |
| 5.4.2.2 | Determining clearance using peak working voltage | (See appended table 5.4.2.2, 5.4.2.4 and 5.4.3) | P |
| 5.4.2.3 | Determining clearance using required withstand voltage .....: | (See appended table 5.4.2.3) | P |
| | a) a.c. mains transient voltage.....: | 2500 Vpeak | — |
| | b) d.c. mains transient voltage .....: | See above. | — |
| | c) external circuit transient voltage.....: | See above. | — |
| | d) transient voltage determined by measurement : | See above. | — |
| 5.4.2.4 | Determining the adequacy of a clearance using an electric strength test | Not applicable. | N/A |
| 5.4.2.5 | Multiplication factors for clearances and test voltages .....: | The equipment is specified to be operated up to 5000 m above sea level, the required clearance is multiplied by the altitude correction factor 1.48 according to Table 17 (See appended table 5.4.2.2, 5.4.2.4 and 5.4.3). | P |
| 5.4.3 | Creepage distances.....: | (See appended table 5.4.2.2, 5.4.2.4 and 5.4.3) | P |
| 5.4.3.1 | General | See below. | P |
| 5.4.3.3 | Material Group .....: | Material group IIIb is assumed. | — |
| 5.4.4 | Solid insulation | See below. | P |
| 5.4.4.2 | Minimum distance through insulation .....: | (See appended table 5.4.4.2, 5.4.4.5 c), 5.4.4.9) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.4.3 | Insulation compound forming solid insulation | The certified sources of optocouplers are used.<br>The source details see appended table 4.1.2. | P |
| 5.4.4.4 | Solid insulation in semiconductor devices | The certified sources of optocouplers are used.<br>The source details see appended table 4.1.2. | P |
| 5.4.4.5 | Cemented joints | The certified sources of optocouplers are used. | P |
| 5.4.4.6 | Thin sheet material | See below. | P |
| 5.4.4.6.1 | General requirements | Two layers of insulation tape is used for basic insulation or reinforced insulation and not subjected to handling or abrasion during ordinary person servicing. | P |
| 5.4.4.6.2 | Separable thin sheet material | Two layers insulating tapes provides as reinforced insulation and any one layer passed the electric strength test for reinforced insulation. | P |
| | Number of layers (pcs) .....: | (see appended table 5.4.9) | P |
| 5.4.4.6.3 | Non-separable thin sheet material | The certified source is used (see appended table 4.1.2). | P |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material ..... : | See above. | N/A |
| 5.4.4.6.5 | Mandrel test | See above. | N/A |
| 5.4.4.7 | Solid insulation in wound components | Approved triple insulated wire is used in transformer, and the insulation on winding wire or other wire complied with G.5 and G.6. | P |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz ..... : | The solid insulations at frequencies ≥ 30 kHz was considered and as basic insulation.<br>(see appended table 5.4.4.9 and alternative electric strength test in appended table 5.4.9) | P |
| 5.4.5 | Antenna terminal insulation | No antenna is used. | N/A |
| 5.4.5.1 | General | See above. | N/A |
| 5.4.5.2 | Voltage surge test | See above. | N/A |
| | Insulation resistance (MΩ) ..... : | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard ..... : | No such insulation of internal wire as part of supplementary safeguard.<br>The heat shrinkable tubing is covered on the wires of DC fans as part of supplementary safeguard. The heat shrinkable tubing is held in place by length. The source details see appended table 4.1.2.<br>However, the equipment is a building-in type and evaluation is also to be made during the final system approval. | N/A |
| 5.4.7 | Tests for semiconductor components and for cemented joints | The certified sources of optocouplers are used. | P |
| 5.4.8 | Humidity conditioning | Electric strength tests were conducted after humidity conditioning.<br>All sources of transformers were performed the test with 120 hours, see appended transformer construction table G.5.3.2 in "**ATTACHMENT**" for source details.<br>The transformer manufactured by each factory passed the test. | P |
| | Relative humidity (%)..... : | 93 % | — |
| | Temperature (°C) .....: | 40 °C | — |
| | Duration (h) ..... : | 120 h | — |
| 5.4.9 | Electric strength test ..... : | Electric strength tests were conducted after 5.4.8 Humidity conditioning.<br>All sources of transformer were performed the test with 120 hours, see appended transformer consruction table G.5.2.3 in "**ATTACHMENT**" for source details. The transformer manufactured by each factory passed the test.<br>(see appended table 5.4.9) | P |
| 5.4.9.1 | Test procedure for a solid insulation type test | Compliance was checked immediately following temperature test in subclause 5.4.1.4 (see appended table 5.4.9). | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.9.2 | Test procedure for routine tests | No routine tests under consideration for CB scheme. | N/A |
| 5.4.10 | Protection against transient voltages between external circuit | No such external circuits. | N/A |
| 5.4.10.1 | Parts and circuits separated from external circuits | See above. | N/A |
| 5.4.10.2 | Test methods | See above. | N/A |
| 5.4.10.2.1 | General | See above. | N/A |
| 5.4.10.2.2 | Impulse test ..... : | See above. | N/A |
| 5.4.10.2.3 | Steady-state test..... : | See above. | N/A |
| 5.4.11 | Insulation between external circuits and earthed circuitry ..... : | No such external circuit within the equipment. | N/A |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | No such external circuit within the equipment. | N/A |
| 5.4.11.2 | Requirements | See above. | N/A |
| | Rated operating voltage $U_{op}$ (V)..... : | See above. | — |
| | Nominal voltage $U_{peak}$ (V)..... : | See above. | — |
| | Max increase due to variation $U_{sp}$ ..... : | See above. | — |
| | Max increase due to ageing $\Delta U_{sa}$ ..... : | See above. | — |
| | $U_{op}= U_{peak} + \Delta U_{sp} + \Delta U_{sa}$ ..... : | See above. | — |
| 5.5 | Components as safeguards | | |
| 5.5.1 | General | See the following details. | P |
| 5.5.2 | Capacitors and RC units | X and Y capacitors are IEC/EN 60384-14+A1 approval components and complied with Annex G.11. | P |
| 5.5.2.1 | General requirement | See below. | P |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector..... : | (See appended table 5.5.2.2) | P |
| 5.5.3 | Transformers | (See Annex G.5.3) | P |
| 5.5.4 | Optocouplers | (See subclause 5.4 or Annex G.12) | P |
| 5.5.5 | Relays | The insulation of relay is not used as a safeguard. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.5.6 | Resistors | Approved bleeder resistors and bridging resistor are used.<br>See clause G.10.<br>The bleeder resistors are served as safeguard but not across basic, supplementary or reinforced insulations, no energy hazards between primary access screw wiring terminal block and ordinary person, see clause 5.2.2.3 (see appended table 4.1.2). | P |
| 5.5.7 | SPD's | No Varistors. | N/A |
| 5.5.7.1 | Use of an SPD connected to reliable earthing | See above. | N/A |
| 5.5.7.2 | Use of an SPD between mains and protective earth | See above. | N/A |
| 5.5.8 | Insulation between the mains and external circuit consisting of a coaxial cable ..... : | No such external circuits. | N/A |
| 5.6 | Protective conductor | | P |
| 5.6.2 | Requirement for protective conductors | See below. | P |
| 5.6.2.1 | General requirements | No switches, current limiting devices or overcurrent protective devices are provided in protective earthing conductors and protective bonding conductors. | P |
| 5.6.2.2 | Colour of insulation | The certified sources of screw wiring terminal block is provided.<br>Building-in equipment, shall be evaluated in the final system assembly. | N/A |
| 5.6.3 | Requirement for protective earthing conductors | The certified sources of screw wiring terminal block is provided.<br>The equipment is suitable for building-in into a Class I final system.<br>However, the equipment is built-in type, overall compliance shall be evaluated in the final system approval. | N/A |
| | Protective earthing conductor size ($mm^2$) ..... : | No power supply cord is provided. | — |
| 5.6.4 | Requirement for protective bonding conductors | Building-in equipment, no protective earthing terminal provided.<br>The metal case and PCB CY3/CY4 mounting hole trace are evaluated as protective bonding conductor. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.6.4.1 | Protective bonding conductors | Compliance is checked by the test of 5.6.6 and Annex R. | P |
| | Protective bonding conductor size ($mm^2$). ..... : | | — |
| | Protective current rating (A) ..... : | | — |
| 5.6.4.3 | Current limiting and overcurrent protective devices | No other components connected in parallel with current limiting and overcurrent protective devices. | P |
| 5.6.5 | Terminals for protective conductors | The equipment is for building-in. The connection of protective earthing of the equipment shall be evaluated in the final system assembly.<br>Approved screw wiring terminal block used.<br>The metal chassis are considered as protective bonding conductor.<br>In addition, the protective PCB bonding trace (CY3/CY4) and chassis, are bonded together by a machine screw (nominal thread diameter of 3.0mm) with a flat and a spring washer (see subclause 5.6.6). | P |
| 5.6.5.1 | Requirement | Compliance is checked by the test of 5.6.6 and Annex R. | P |
| | Conductor size ($mm^2$), nominal thread diameter (mm). ..... : | See above. | N/A |
| 5.6.5.2 | Corrosion | See above. | N/A |
| 5.6.6 | Resistance of the protective system | See below. | P |
| 5.6.6.1 | Requirements | Compliance checked. | P |
| 5.6.6.2 | Test Method Resistance (Ω)..... : | (see appended table 5.6.6.2) | P |
| 5.6.7 | Reliable earthing | The equipment is not permanently connected equipment. | N/A |
| 5.7 | Prospective touch voltage, touch current and protective conductor current | | P |
| 5.7.2 | Measuring devices and networks | Figure 4 of IEC 60990 was used in determining of the limit of ES1.<br>Figure 5 of IEC 60990 was used in determining of the limit of ES2. | P |
| 5.7.2.1 | Measurement of touch current..... : | (See appended tables 5.2.2.2 and 5.7.2.2, 5.7.4) | P |
| 5.7.2.2 | Measurement of prospective touch voltage | (see appended table 5.2.2.2) | P |
| 5.7.3 | Equipment set-up, supply connections and earth connections | Clause 4, 5.3 and 5.4 of IEC 60990:1999 are applied. | P |
| | System of interconnected equipment (separate connections/single connection) ..... : | Single equipment. | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Multiple connections to mains (one connection at a time/simultaneous connections) ..... : | Single connection. | — |
| 5.7.4 | Earthed conductive accessible parts ..... : | Following fault conditions of 6.1 and 6.2.2 of IEC 60990 for touch current measurement.<br>(see appended table 5.7.2.2, 5.7.4) | P |
| 5.7.5 | Protective conductor current | The protective conductor current does not exceed the ES2 limits. | P |
| | Supply Voltage (V) ..... : | 264Vac, 60Hz. | — |
| | Measured current (mA) ..... : | 1.94mA(rms) < 5mA(rms) | — |
| | Instructional Safeguard ..... : | See above. | N/A |
| 5.7.6 | Prospective touch voltage and touch current due to external circuits | No external circuits. | N/A |
| 5.7.6.1 | Touch current from coaxial cables | See above. | N/A |
| 5.7.6.2 | Prospective touch voltage and touch current from external circuits | See above. | N/A |
| 5.7.7 | Summation of touch currents from external circuits | No external circuits. | N/A |
| | a) Equipment with earthed external circuits Measured current (mA) ..... : | See above. | N/A |
| | b) Equipment whose external circuits are not referenced to earth. Measured current (mA) .. : | See above. | N/A |

| **6** | **ELECTRICALLY- CAUSED FIRE** | | P |
|---|---|---|---|
| 6.2 | Classification of power sources (PS) and potential ignition sources (PIS) | | P |
| 6.2.2 | Power source circuit classifications | PS (power source) classification determined by measuring the maximum power in Figure 34 and Figure 35 for load and power source circuits. | P |
| 6.2.2.1 | General | See the following details. | P |
| 6.2.2.2 | Power measurement for worst-case load fault .: | (See appended table 6.2.2) | P |
| 6.2.2.3 | Power measurement for worst-case power source fault .....: | (See appended table 6.2.2) | P |
| 6.2.2.4 | PS1 .....: | (See appended table 6.2.2) | N/A |
| 6.2.2.5 | PS2 .....: | (See appended table 6.2.2) | N/A |
| 6.2.2.6 | PS3 .....: | All circuits within the chassis are treated as PS3 (see appended table 6.2.2). | P |
| 6.2.3 | Classification of potential ignition sources | See the following details. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.2.3.1 | Arcing PIS .....: | Except for relay complied with IEC 61810-1 and IEC 62368-1, Annex G.2, other components located within the equipment are not considered as arcing PIS (see appended table 6.2.3.1). | P |
| 6.2.3.2 | Resistive PIS .....: | The available power is exceeding 15 W and resistive PIS is considered existed in any part of PS2 or PS3 circuits within the equipment (see appended table 6.2.3.2). | P |
| 6.3 | Safeguards against fire under normal operating and abnormal operating conditions | | P |
| 6.3.1 (a) | No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials..... : | No ignition and such temperature attained (see appended table 5.4.1.4, 6.3.2, 9.0, B.2.6). | P |
| 6.3.1 (b) | Combustible materials outside fire enclosure | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 6.4 | Safeguards against fire under single fault conditions | | P |
| 6.4.1 | Safeguard Method | Method by control of fire spread considered.<br>However the equipment is a building-in type and evaluation is to be made during the final system approval. | P |
| 6.4.2 | Reduction of the likelihood of ignition under single fault conditions in PS1 circuits | See above. | N/A |
| 6.4.3 | Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits | See above. | N/A |
| 6.4.3.1 | General | < 4000 W. | N/A |
| 6.4.3.2 | Supplementary Safeguards | See above. | N/A |
| | Special conditions if conductors on printed boards are opened or peeled | No such case happened. | N/A |
| 6.4.3.3 | Single Fault Conditions.....: | (see appended table B.4) | N/A |
| | Special conditions for temperature limited by fuse | No such consideration. | N/A |
| 6.4.4 | Control of fire spread in PS1 circuits | All considered as PS3 circuits inside the equipment. | N/A |
| 6.4.5 | Control of fire spread in PS2 circuits | See below. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.5.2 | Supplementary safeguards ..... : | Compliance detailed as follows:<br>– Printed board: rated min. V-1 class material.<br>– Wire insulation and tubing: complying with Clause 6.<br>– All other components: at least V-2 except for mounted on min. V-1 material or small parts of combustible material.<br>– Relay: complying with G.2.<br>– Isolating transformers: complying with G.5.3.<br>– DC fans: complying with G.5.4.<br>– Mains fuses: using protective device that complies with G.3.4.<br>– Components associated with the mains: comply with the relevant IEC component standards and requirements of this standard.<br>– Single fault conditions as specified in 6.4.3.3: Not ignite during testing for the conditions of clause B.4.<br>(see appended tables 4.1.2 and Annex G)<br>However, the equipment is a building-in type and evaluation is also to be made during the final system approval. | P |
| 6.4.6 | Control of fire spread in PS3 circuit | Compliance detailed as follows:<br>– Conductors and devices meet the requirement of 6.4.5<br>(see appended tables 4.1.2)<br>However, the equipment is a building-in type and evaluation is also to be made during the final system approval. | P |
| 6.4.7 | Separation of combustible materials from a PIS | See the following details. | N/A |
| 6.4.7.1 | General ..... : | (see appended tables 6.2.3.1 and 6.2.3.2) | N/A |
| 6.4.7.2 | Separation by distance | All components and combustible materials other than small parts are either rated at least V-2 class material or mounted on PCB material with rated min. V-1 class material. | N/A |
| 6.4.7.3 | Separation by a fire barrier | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.8 | Fire enclosures and fire barriers | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 6.4.8.1 | Fire enclosure and fire barrier material properties | See the following details. | N/A |
| 6.4.8.2.1 | Requirements for a fire barrier | See above. | N/A |
| 6.4.8.2.2 | Requirements for a fire enclosure | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | See above. | N/A |
| 6.4.8.3.2 | Fire barrier dimensions | See above. | N/A |
| 6.4.8.3.3 | Top Openings in Fire Enclosure: dimensions (mm) .....: | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| | Needle Flame test | See above. | N/A |
| 6.4.8.3.4 | Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) .....: | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| | Flammability tests for the bottom of a fire enclosure .....: | See above. | N/A |
| 6.4.8.3.5 | Integrity of the fire enclosure, condition met: a), b) or c) ..... : | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 6.4.8.4 | Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating ... : | The equipment is a building-in type and evaluation is to be made during th efinal system approval. | N/A |
| 6.5 | Internal and external wiring | | P |
| 6.5.1 | Requirements | UL recognized wiring which is PVC insulated and rated VW-1 of the internal wires.<br>The test method described in IEC TS 60695-11-21 is considered equivalent to that test wiring materials for VW-1. | P |
| 6.5.2 | Cross-sectional area ($mm^2$) .....: | See above. | — |
| 6.5.3 | Requirements for interconnection to building wiring..... : | No such interconnection to building wiring. | N/A |
| 6.6 | Safeguards against fire due to connection to additional equipment | No such connection to additional equipment.<br>The equipment is a building-in type and evaluation is also to be made during the final system approval. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | External port limited to PS2 or complies with Clause Q.1 | See above. | N/A |
| **7** | **INJURY CAUSED BY HAZARDOUS SUBSTANCES** | | N/A |
| 7.2 | Reduction of exposure to hazardous substances | No hazardous chemicals within the equipment.<br>The equipment is a building-in type and evaluation is also to be made during the final system approval. | N/A |
| 7.3 | Ozone exposure | No ozone production within the equipment.<br>The equipment is a building-in type and evaluation is also to be made during the final system approval. | N/A |
| 7.4 | Use of personal safeguards (PPE) | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| | Personal safeguards and instructions ..... : | See above. | — |
| 7.5 | Use of instructional safeguards and instructions | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| | Instructional safeguard (ISO 7010)..... : | (see Annex F) | — |
| 7.6 | Batteries..... : | No batteries are used. | N/A |
| **8** | **MECHANICALLY-CAUSED INJURY** | | N/A |
| 8.1 | General | See the following details. | N/A |
| 8.2 | Mechanical energy source classifications | The equipment is a building-in type and evaluation is to be made during final system approval. | N/A |
| 8.3 | Safeguards against mechanical energy sources | See above. | N/A |
| 8.4 | Safeguards against parts with sharp edges and corners | The equipment is a building-in type and evaluation is to be made during final system approval. | N/A |
| 8.4.1 | Safeguards | See above. | N/A |
| 8.5 | Safeguards against moving parts | The equipment is a building-in type and evaluation is to be made during final system approval. | N/A |
| 8.5.1 | MS2 or MS3 part required to be accessible for the function of the equipment | See above. | N/A |
| 8.5.2 | Instructional Safeguard..... : | See above. | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.5.4 | Special categories of equipment comprising moving parts | See above. | N/A |
| 8.5.4.1 | Large data storage equipment | See above. | N/A |
| 8.5.4.2 | Equipment having electromechanical device for destruction of media | See above. | N/A |
| 8.5.4.2.1 | Safeguards and Safety Interlocks .....: | See above. | N/A |
| 8.5.4.2.2 | Instructional safeguards against moving parts | See above. | N/A |
| | Instructional Safeguard.....: | See above. | — |
| 8.5.4.2.3 | Disconnection from the supply | See above. | N/A |
| 8.5.4.2.4 | Probe type and force (N) .....: | | N/A |
| 8.5.5 | High Pressure Lamps | See above. | N/A |
| 8.5.5.1 | Energy Source Classification | See above. | N/A |
| 8.5.5.2 | High Pressure Lamp Explosion Test.....: | See above. | N/A |
| 8.6 | Stability | The equipment is a building-in type and evaluation is to be made during final system approval. | N/A |
| 8.6.1 | Product classification | See above. | N/A |
| | Instructional Safeguard.....: | See above. | — |
| 8.6.2 | Static stability | See above. | N/A |
| 8.6.2.2 | Static stability test | See above. | N/A |
| | Applied Force .....: | See above. | — |
| 8.6.2.3 | Downward Force Test | See above. | N/A |
| 8.6.3 | Relocation stability test | See above. | N/A |
| | Unit configuration during 10° tilt.....: | See above. | — |
| 8.6.4 | Glass slide test | See above. | N/A |
| 8.6.5 | Horizontal force test (Applied Force).....: | See above. | N/A |
| | Position of feet or movable parts.....: | See above. | — |
| 8.7 | Equipment mounted to wall or ceiling | The equipment is for building-in type and not mounted to wall or ceiling. | N/A |
| 8.7.1 | Mounting Means (Length of screws (mm) and mounting surface) .....: | See above. | N/A |
| 8.7.2 | Direction and applied force .....: | See above. | N/A |
| 8.8 | Handles strength | No such handles. | N/A |
| 8.8.1 | Classification | See above. | N/A |
| 8.8.2 | Applied Force .....: | See above. | N/A |
| 8.9 | Wheels or casters attachment requirements | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 8.9.1 | Classification | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.9.2 | Applied force .....: | See above. | — |
| 8.10 | Carts, stands and similar carriers | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| 8.10.1 | General | See above. | N/A |
| 8.10.2 | Marking and instructions | See above. | N/A |
| | Instructional Safeguard.....: | See above. | — |
| 8.10.3 | Cart, stand or carrier loading test and compliance | See above. | N/A |
| | Applied force .....: | See above. | — |
| 8.10.4 | Cart, stand or carrier impact test | See above. | N/A |
| 8.10.5 | Mechanical stability | See above. | N/A |
| | Applied horizontal force (N) .....: | See above. | — |
| 8.10.6 | Thermoplastic temperature stability (°C).....: | See above. | N/A |
| 8.11 | Mounting means for rack mounted equipment | The equipment is for building-in type and not intended to be rack mounted. | N/A |
| 8.11.1 | General | See above. | N/A |
| 8.11.2 | Product Classification | See above. | N/A |
| 8.11.3 | Mechanical strength test, variable *N* .....: | See above. | N/A |
| 8.11.4 | Mechanical strength test 250N, including end stops | See above. | N/A |
| 8.12 | Telescoping or rod antennas.....: | No such devices are provided within the equipment. | N/A |
| | Button/Ball diameter (mm).....: | See above. | — |

| **9** | **THERMAL BURN INJURY** | | N/A |
|---|---|---|---|
| 9.2 | Thermal energy source classifications | The equipment is a building-in type, evaluation shall be made during the final system approval. | N/A |
| 9.3 | Safeguard against thermal energy sources | See above. | N/A |
| 9.4 | Requirements for safeguards | | N/A |
| 9.4.1 | Equipment safeguard | See above. | N/A |
| 9.4.2 | Instructional safeguard .....: | See above. | N/A |

| **10** | **RADIATION** | | N/A |
|---|---|---|---|
| 10.2 | Radiation energy source classification | See below. | N/A |
| 10.2.1 | General classification | No such radiation generated from the equipment. | N/A |
| 10.3 | Protection against laser radiation | No such radiation generated from the equipment. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Laser radiation that exists equipment: | See above. | — |
| | Normal, abnormal, single-fault..... : | See above. | N/A |
| | Instructional safeguard ..... : | See above. | — |
| | Tool..... : | See above. | — |
| 10.4 | Protection against visible, infrared, and UV radiation | No such radiation generated from the equipment. | N/A |
| 10.4.1 | General | See above. | N/A |
| 10.4.1.a) | RS3 for Ordinary and instructed persons ..... : | See above. | N/A |
| 10.4.1.b) | RS3 accessible to a skilled person..... : | See above. | N/A |
| | Personal safeguard (PPE) instructional safeguard..... : | See above. | — |
| 10.4.1.c) | Equipment visible, IR, UV does not exceed RS1..... : | See above. | N/A |
| 10.4.1.d) | Normal, abnormal, single-fault conditions ..... : | See above. | N/A |
| 10.4.1.e) | Enclosure material employed as safeguard is opaque..... : | See above. | N/A |
| 10.4.1.f) | UV attenuation..... : | See above. | N/A |
| 10.4.1.g) | Materials resistant to degradation UV ..... : | See above. | N/A |
| 10.4.1.h) | Enclosure containment of optical radiation..... : | See above. | N/A |
| 10.4.1.i) | Exempt Group under normal operating conditions..... : | See above. | N/A |
| 10.4.2 | Instructional safeguard ..... : | See above. | N/A |
| 10.5 | Protection against x-radiation | No such x-radiation generated from the equipment. | N/A |
| 10.5.1 | X- radiation energy source that exists equipment .....: | See above. | N/A |
| | Normal, abnormal, single fault conditions | See above. | N/A |
| | Equipment safeguards..... : | See above. | N/A |
| | Instructional safeguard for skilled person..... : | See above. | N/A |
| 10.5.3 | Most unfavourable supply voltage to give maximum radiation ..... : | See above. | — |
| | Abnormal and single-fault condition ..... : | See above. | N/A |
| | Maximum radiation (pA/kg)..... : | See above. | N/A |
| 10.6 | Protection against acoustic energy sources | No such consideration for the purpose of personal music players. | N/A |
| 10.6.1 | General | See above. | N/A |
| 10.6.2 | Classification | See above. | N/A |
| | Acoustic output, dB(A)..... : | See above. | N/A |
| | Output voltage, unweighted r.m.s..... : | See above. | N/A |
| 10.6.4 | Protection of persons | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Instructional safeguards ..... : | See above. | N/A |
| | Equipment safeguard prevent ordinary person to RS2..... : | See above. | — |
| | Means to actively inform user of increase sound pressure..... : | See above. | — |
| | Equipment safeguard prevent ordinary person to RS2 .....: | See above. | — |
| 10.6.5 | Requirements for listening devices (headphones, earphones, etc.) | See above. | N/A |
| 10.6.5.1 | Corded passive listening devices with analog input | See above. | N/A |
| | Input voltage with 94 dB(A) $L_{Aeq}$ acoustic pressure output..... : | See above. | — |
| 10.6.5.2 | Corded listening devices with digital input | See above. | N/A |
| | Maximum dB(A)..... : | See above. | — |
| 10.6.5.3 | Cordless listening device | See above. | N/A |
| | Maximum dB(A)..... : | See above. | — |
| **B** | **NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS** | | P |
| B.2 | Normal Operating Conditions | See the following details. | P |
| B.2.1 | General requirements..... : | (See **TEST ITEM PARTICULARS** and appended test tables) | P |
| | Audio Amplifiers and equipment with audio amplifiers ..... : | Not such equipment. | N/A |
| B.2.3 | Supply voltage and tolerances | (see **TEST ITEM PARTICULARS** and appended test tables) | P |
| B.2.5 | Input test..... : | (See appended table B.2.5) | P |
| B.3 | Simulated abnormal operating conditions | | P |
| B.3.1 | General requirements..... : | (see appended table B.3) | P |
| B.3.2 | Covering of ventilation openings | The equipment is a building-in type, evaluation shall also be made during the final system approval (see appended table B.3). | P |
| B.3.3 | D.C. mains polarity test | The equipment is not connected to a D.C. mains. | N/A |
| B.3.4 | Setting of voltage selector ..... : | No setting of voltage selector within the equipment. | N/A |
| B.3.5 | Maximum load at output terminals..... : | (see appended table B.3) | P |
| B.3.6 | Reverse battery polarity | No battery within the equipment. | N/A |
| B.3.7 | Abnormal operating conditions as specified in Clause E.2. | Not such equipment. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| B.3.8 | Safeguards functional during and after abnormal operating conditions | All safeguards remained effectively. | P |
| B.4 | Simulated single fault conditions | | P |
| B.4.2 | Temperature controlling device open or short-circuited ..... : | No such devices. | N/A |
| B.4.3 | Motor tests | Approved DC fans sources are used. | P |
| B.4.3.1 | Motor blocked or rotor locked increasing the internal ambient temperature ..... : | (see appended table B.4) | P |
| B.4.4 | Short circuit of functional insulation | For clearance/creepage before fuse, basic insulation complied, others are covered by short-circuit tests.<br>See the following for details. | P |
| B.4.4.1 | Short circuit of clearances for functional insulation | Circuits before fuses (F1, F2) are in compliance with clearance and creepage distance requirements, others are verified by short-circuit tests (see appended table B.4). | P |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | See above. | P |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | No coated printed boards within the equipment. | N/A |
| B.4.5 | Short circuit and interruption of electrodes in tubes and semiconductors | (see appended table B.4) | P |
| B.4.6 | Short circuit or disconnect of passive components | (see appended table B.4) | P |
| B.4.7 | Continuous operation of components | The equipment is continuous operating type and no such components intended for short time operation or intermittent operation. | N/A |
| B.4.8 | Class 1 and Class 2 energy sources within limits during and after single fault conditions | (see appended table B.4) | P |
| B.4.9 | Battery charging under single fault conditions: | No battery involved in the equipment. | N/A |
| **C** | **UV RADIATION** | | N/A |
| C.1 | Protection of materials in equipment from UV radiation | No such UV generated from the equipment. | N/A |
| C.1.2 | Requirements | See above. | N/A |
| C.1.3 | Test method | See above. | N/A |
| C.2 | UV light conditioning test | See above. | N/A |
| C.2.1 | Test apparatus | See above. | N/A |
| C.2.2 | Mounting of test samples | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| C.2.3 | Carbon-arc light-exposure apparatus | See above. | N/A |
| C.2.4 | Xenon-arc light exposure apparatus | See above. | N/A |
| **D** | **TEST GENERATORS** | | N/A |
| D.1 | Impulse test generators | No such consideration. | N/A |
| D.2 | Antenna interface test generator | See above. | N/A |
| D.3 | Electronic pulse generator | See above. | N/A |
| **E** | **TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS** | | N/A |
| E.1 | Audio amplifier normal operating conditions | Not such equipment. | N/A |
| | Audio signal voltage (V)……..: | See above. | — |
| | Rated load impedance (Ω) ……: | See above. | — |
| E.2 | Audio amplifier abnormal operating conditions | See above. | N/A |
| **F** | **EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS** | | P |
| F.1 | General requirements | See the following details. | P |
| | Instructions – Language ..... : | English.<br>The other languages shall be evaluated during the national approval. | — |
| F.2 | Letter symbols and graphical symbols | See the following details. | P |
| F.2.1 | Letter symbols according to IEC 60027-1 | Letter symbols “L” and “N” marked on the top metal chassis. | P |
| F.2.2 | Graphic symbols IEC, ISO or manufacturer specific | Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010, or manufacturer specific. | P |
| F.3 | Equipment markings | | P |
| F.3.1 | Equipment marking locations | The equipment marking is located on the exterior surface and it is easily visible. | P |
| F.3.2 | Equipment identification markings | See the following details. | P |
| F.3.2.1 | Manufacturer identification ..... : | See copy of marking plate. | — |
| F.3.2.2 | Model identification ..... : | See copy of marking plate. | — |
| F.3.3 | Equipment rating markings | See the following details. | P |
| F.3.3.1 | Equipment with direct connection to mains | The equipment is connected to AC mains supply. | P |
| F.3.3.2 | Equipment without direct connection to mains | See above. | N/A |
| F.3.3.3 | Nature of supply voltage..... : | “Hz” and “~” are used to specify the nature of the supply voltage.<br>See copy of marking plate. | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.3.4 | Rated voltage..... : | See copy of marking plate. | — |
| F.3.3.4 | Rated frequency ..... : | See copy of marking plate | — |
| F.3.3.6 | Rated current or rated power..... : | See copy of marking plate. | — |
| F.3.3.7 | Equipment with multiple supply connections | Only one supply connection. | N/A |
| F.3.4 | Voltage setting device | No such devices within the equipment. | N/A |
| F.3.5 | Terminals and operating devices | See below. | P |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings ..... : | No such devices within the equipment. | N/A |
| F.3.5.2 | Switch position identification marking..... : | No such switch within the equipment. | N/A |
| F.3.5.3 | Replacement fuse identification and rating markings ..... : | The fuses are located within the equipment and they are not replaceable by an ordinary person or an instructed person.<br>However fuse marking is marked on PCB near fuses.<br>(See **General product information and other remarks**) | P |
| F.3.5.4 | Replacement battery identification marking ... : | No such battery within the equipment. | N/A |
| F.3.5.5 | Terminal marking location | See markings specified in F.3.6.1 and F.3.6.2.2 are not placed on removable parts such as screws, removable washers, or other parts. | P |
| F.3.6 | Equipment markings related to equipment classification | The equipment is a building-in type and evaluation is also to be made during the final system approval. | P |
| F.3.6.1 | Class I Equipment | The equipment is suitable for building-in into a Class I final system.<br>See the following details. | P |
| F.3.6.1.1 | Protective earthing conductor terminal | The primary screw wiring terminal block is used. | P |
| F.3.6.1.2 | Neutral conductor terminal | The equipment is for building-in type, shall be evaluated in the final system assembly, however it's marked besides bonding terminal of enclosure with the capital letter "N" for reference. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.6.1.3 | Protective bonding conductor terminals | The equipment is a building-in type, terminals for protective bonding conductors need not be identified.<br>However, the symbol  (IEC 60417-5019) provided on the on top chassis near screw wiring terminal block (CN1). | P |
| F.3.6.2 | Class II equipment (IEC 60417-5172) | The equipment is suitable for building-in into a Class I final system. | N/A |
| F.3.6.2.1 | Class II equipment with or without functional earth | See above. | N/A |
| F.3.6.2.2 | Class II equipment with functional earth terminal marking | See above. | N/A |
| F.3.7 | Equipment IP rating marking ..... : | This equipment is classified as IP00. | — |
| F.3.8 | External power supply output marking | The equipment is for building-in type, shall be evaluated in the final system assembly, however see copy of marking plate for reference. | N/A |
| F.3.9 | Durability, legibility and permanence of marking | See the following details. | P |
| F.3.10 | Test for permanence of markings | The marking plate was subjected to the permanence of marking test. The marking plate was rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit.<br>After each test, there was no damage to the marking plate. The marking on the label did not fade. There was no curling of the marking plate and removed by hand. | P |
| F.4 | Instructions | | P |
| | a) Equipment for use in locations where children not likely to be present - marking | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | b) Instructions given for installation or initial use | Installation instruction with directions to maintain the requirements of IEC/EN 62368-1 with installation into the end system.<br>Included are directions regarding the maximum output, the maximum ambient temperature, and that the requirements of the IEC/EN 62368-1 must be observed with the installation in the final system assembly. | P |
| | c) Equipment intended to be fastened in place | No such consideration. | N/A |
| | d) Equipment intended for use only in restricted access area | The equipment is not intended for use only in restricted access area. | N/A |
| | e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1 | No such terminals are provided. | N/A |
| | f) Protective earthing employed as safeguard | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| | g) Protective earthing conductor current exceeding ES2 limits | < ES2 limit. | N/A |
| | h) Symbols used on equipment | No such consideration. | N/A |
| | i) Permanently connected equipment not provided with all-pole mains switch | The equipment is building-in type and evaluation is to be made during final system approval. | N/A |
| | j) Replaceable components or modules providing safeguard function | No such replaceable components or modules. | N/A |
| F.5 | Instructional safeguards | No instructional safeguard is considered as necessary. | N/A |
| | Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction | No instructional safeguard required in the equipment. | N/A |

| | | | |
|---|---|---|---|
| **G** | **COMPONENTS** | | P |
| **G.1** | **Switches** | | N/A |
| G.1.1 | General requirements | No such switch as disconnect devices are provided within the equipment. | N/A |
| G.1.2 | Ratings, endurance, spacing, maximum load | See above. | N/A |
| **G.2** | **Relays** | | P |
| G.2.1 | General requirements | Approved relay with suitable charateristics is provided within the equipment and, tested according to IEC 61810-1:2015 and IEC 62368-1, Annex G.2 (see appended table 4.1.2). | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.2.2 | Overload test | See above. | P |
| G.2.3 | Relay controlling connectors supply power | No such mains relay. | N/A |
| G.2.4 | Mains relay, modified as stated in G.2 | Complied. | P |
| **G.3** | **Protection Devices** | | P |
| G.3.1 | Thermal cut-offs | No thermal cut-off is provided within the equipment. | N/A |
| G.3.1.1a) &b) | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | See above. | N/A |
| G.3.1.1c) | Thermal cut-outs tested as part of the equipment as indicated in c) | See above. | N/A |
| G.3.1.2 | Thermal cut-off connections maintained and secure | See above. | N/A |
| G.3.2 | Thermal links | | N/A |
| G.3.2.1a) | Thermal links separately tested with IEC 60691 | No thermal link is provided within the equipment. | N/A |
| G.3.2.1b) | Thermal links tested as part of the equipment | See above. | N/A |
| | Aging hours (H)..... : | See above. | — |
| | Single Fault Condition ..... : | See above. | — |
| | Test Voltage (V) and Insulation Resistance (Ω)..... : | See above. | — |
| G.3.3 | PTC Thermistors | No PTC thermistor is provided within the equipment. | N/A |
| G.3.4 | Overcurrent protection devices | All sources of fuse (F1) complied with IEC/EN 60127-1 and IEC/EN 60127-2 (see appended table 4.1.2). | P |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.5 | | N/A |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | No such components. | N/A |
| G.3.5.2 | Single faults conditions..... : | (See appended table B.4) | N/A |
| **G.4** | **Connectors** | | P |
| G.4.1 | Spacings | The certified sources of construction for screw wiring terminal block.<br>The equipment is a building-in type and evaluation is to be made during the final system approval. | P |
| G.4.2 | Mains connector configuration ..... : | See above. | N/A |
| G.4.3 | Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely | No misconnection likely. However, the equipment is a building-in type, shall be evaluated in the final system assembly. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **G.5** | **Wound Components** | | P |
| G.5.1 | Wire insulation in wound components ..... .: | See Annex J. | P |
| G.5.1.2 a) | Two wires in contact inside wound component, angle between 45° and 90° | The tubing and insulation tape are provided to protect against mechanical stress between primary and secondary. | P |
| G.5.1.2 b) | Construction subject to routine testing | The triple insulated wire used in transformer windings that is in compliance with Annex J.<br>Routine electrical strength test specified in the transformer specifications. | P |
| G.5.2 | Endurance test on wound components | The triple insulated wire used in isolating transformers (T1, T2, T401) is approved component (see appended table 4.1.2). | N/A |
| G.5.2.1 | General test requirements | See above. | N/A |
| G.5.2.2 | Heat run test | See above. | N/A |
| | Time (s)..... : | See above. | — |
| | Temperature (°C)..... : | See above. | — |
| G.5.2.3 | Wound Components supplied by mains | See above. | N/A |
| **G.5.3** | **Transformers** | | P |
| G.5.3.1 | Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1) ..... : | The isolating transformer meets the requirements given in subclauses G.5.3.2 and G.5.3.3. | P |
| | Position ..... : | T1, T2 and T401. | — |
| | Method of protection ..... : | Over current protection by circuit design. | — |
| G.5.3.2 | Insulation | The primary windings and secondary windings of transformers are isolated by double/reinforced insulation.<br>(the core of transformers (T1, T2) is considered as secondary)<br>(the core of transformer (T401) is considered as primary) | P |
| | Protection from displacement of windings..... : | The end-turn of each winding is fixed by insulating tape. | — |
| G.5.3.3 | Overload test ..... : | (See appended table B.3) | P |
| G.5.3.3.1 | Test conditions | Tested in the complete equipment. | P |
| G.5.3.3.2 | Winding Temperatures testing in the unit | (See appended table B.3) | P |
| G.5.3.3.3 | Winding Temperatures - Alternative test method | Alternative test method was not considered. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **G.5.4** | **Motors** | | P |
| G.5.4.1 | General requirements | Approved DC fans sources are used (see appended table 4.1.2). | P |
| | Position ..... : | See above. | — |
| G.5.4.2 | Test conditions | See above. | N/A |
| G.5.4.3 | Running overload test | See above. | N/A |
| G.5.4.4 | Locked-rotor overload test | See above. | N/A |
| | Test duration (days) ..... : | See above. | — |
| G.5.4.5 | Running overload test for d.c. motors in secondary circuits | See above. | N/A |
| G.5.4.5.2 | Tested in the unit | See above. | N/A |
| | Electric strength test (V) ..... : | See above. | — |
| G.5.4.5.3 | Tested on the Bench - Alternative test method; test time (h) ..... : | See above. | N/A |
| | Electric strength test (V) ..... : | See above. | — |
| G.5.4.6 | Locked-rotor overload test for d.c. motors in secondary circuits | See above. | N/A |
| G.5.4.6.2 | Tested in the unit | See above. | N/A |
| | Maximum Temperature ..... : | See above. | N/A |
| | Electric strength test (V) ..... : | See above. | N/A |
| G.5.4.6.3 | Tested on the bench - Alternative test method; test time (h)..... : | See above. | N/A |
| | Electric strength test (V) ..... : | See above. | N/A |
| G.5.4.7 | Motors with capacitors | See above. | N/A |
| G.5.4.8 | Three-phase motors | See above. | N/A |
| G.5.4.9 | Series motors | See above. | N/A |
| | Operating voltage ..... : | See above. | — |
| **G.6** | **Wire Insulation** | | P |
| G.6.1 | General | The triple insulated wire is used as reinforced safeguard in the transformers that complied with Annex J. | P |
| G.6.2 | Solvent-based enamel wiring insulation | Insulation is not relied on solvent-based enamel. | N/A |
| **G.7** | **Mains supply cords** | | N/A |
| G.7.1 | General requirements | The primary screw wiring terminal block is provided. No power supply cords.<br>The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| | Type..... : | See above. | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Rated current (A) ..... : | See above. | — |
| | Cross-sectional area ($mm^2$), (AWG)..... : | See above. | — |
| G.7.2 | Compliance and test method | See above. | N/A |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | See above. | N/A |
| G.7.3.2 | Cord strain relief | See above. | N/A |
| G.7.3.2.1 | Requirements | See above. | N/A |
| | Strain relief test force (N)..... : | See above. | — |
| G.7.3.2.2 | Strain relief mechanism failure | See above. | N/A |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm): | See above. | — |
| G.7.3.2.4 | Strain relief comprised of polymeric material | See above. | N/A |
| G.7.4 | Cord Entry..... : | See above. | N/A |
| G.7.5 | Non-detachable cord bend protection | See above. | N/A |
| G.7.5.1 | Requirements | See above. | N/A |
| G.7.5.2 | Mass (g) ..... : | See above. | — |
| | Diameter (m)..... : | See above. | — |
| | Temperature (°C)..... : | See above. | — |
| G.7.6 | Supply wiring space | See above. | N/A |
| G.7.6.2 | Stranded wire | See above. | N/A |
| G.7.6.2.1 | Test with 8 mm strand | See above. | N/A |
| **G.8** | **Varistors** | | N/A |
| G.8.1 | General requirements | No Varistors. | N/A |
| G.8.2 | Safeguard against shock | See above. | N/A |
| G.8.3 | Safeguard against fire | | N/A |
| G.8.3.2 | Varistor overload test..... : | See above. | N/A |
| G.8.3.3 | Temporary overvoltage..... : | See above. | N/A |
| **G.9** | **Integrated Circuit (IC) Current Limiters** | | N/A |
| G.9.1 a) | Manufacturer defines limit at max. 5A. | No IC current limiters are provided within the equipment. | N/A |
| G.9.1 b) | Limiters do not have manual operator or reset | See above. | N/A |
| G.9.1 c) | Supply source does not exceed 250 VA ..... : | See above. | — |
| G.9.1 d) | IC limiter output current (max. 5A)..... : | See above. | — |
| G.9.1 e) | Manufacturers' defined drift ..... : | See above. | — |
| G.9.2 | Test Program 1 | See above. | N/A |
| G.9.3 | Test Program 2 | See above. | N/A |
| G.9.4 | Test Program 3 | See above. | N/A |
| **G.10** | **Resistors** | | P |
| G.10.1 | General requirements | See the following details. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.10.2 | Resistor test | The bleeder resistors and bridging resistors used as safeguard which have been tested and in compliance with G.10.<br>(see appended table 4.1.2) | P |
| G.10.3 | Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable | No such resistors. | N/A |
| G.10.3.1 | General requirements | See above. | N/A |
| G.10.3.2 | Voltage surge test | See above. | N/A |
| G.10.3.3 | Impulse test | See above. | N/A |
| **G.11** | **Capacitor and RC units** | | P |
| G.11.1 | General requirements | X-Capacitors and Y-Capacitors are used as safeguard and complied with IEC/EN 60384-14:2013+A1 (see appended table 4.1.2). | P |
| G.11.2 | Conditioning of capacitors and RC units | At least 21 days at 40 ± 2 °C and 93 ± 3 % R.H. | P |
| G.11.3 | Rules for selecting capacitors | The selection followed with tables G.9 and G.12. | P |
| **G.12** | **Optocouplers** | | P |
| | Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) ..... : | The optocouplers are used in the equipment and complied with IEC/EN 60747-5-5 or the requirements of subclause 5.4 (see appended table 4.1.2). | P |
| | Type test voltage Vini ..... : | See above. | — |
| | Routine test voltage, Vini,b ..... : | See above. | — |
| **G.13** | **Printed boards** | | P |
| G.13.1 | General requirements | See the following details. | P |
| G.13.2 | Uncoated printed boards | The insulation between conductors on the outer surfaces of an uncoated printed board complied with the minimum clearance and creepage distance requirements. | P |
| G.13.3 | Coated printed boards | No coated printed boards provided within the equipment. | N/A |
| G.13.4 | Insulation between conductors on the same inner surface | Reinforced insulation provided by distance between primary and secondary at same layers of the PCBs. | N/A |
| | Compliance with cemented joint requirements (Specify construction) ..... : | See above. | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.13.5 | Insulation between conductors on different surfaces | No reinforced insulation provided by distance through insulation between primary and secondary at different layers of the PCBs. | N/A |
| | Distance through insulation ..... : | See above. | N/A |
| | Number of insulation layers (pcs) ..... : | See above. | — |
| G.13.6 | Tests on coated printed boards | No coated printed boards are provided within the equipment. | N/A |
| G.13.6.1 | Sample preparation and preliminary inspection | See above. | N/A |
| G.13.6.2a) | Thermal conditioning | See above. | N/A |
| G.13.6.2b) | Electric strength test | See above. | N/A |
| G.13.6.2c) | Abrasion resistance test | See above. | N/A |
| **G.14** | **Coating on components terminals** | | N/A |
| G.14.1 | Requirements ..... : | No coating on components terminals. | N/A |
| **G.15** | **Liquid filled components** | | N/A |
| G.15.1 | General requirements | No such components are provided within the equipment. | N/A |
| G.15.2 | Requirements | See above. | N/A |
| G.15.3 | Compliance and test methods | See above. | N/A |
| G.15.3.1 | Hydrostatic pressure test | See above. | N/A |
| G.15.3.2 | Creep resistance test | See above. | N/A |
| G.15.3.3 | Tubing and fittings compatibility test | See above. | N/A |
| G.15.3.4 | Vibration test | See above. | N/A |
| G.15.3.5 | Thermal cycling test | See above. | N/A |
| G.15.3.6 | Force test | See above. | N/A |
| G.15.4 | Compliance | See above. | N/A |
| **G.16** | **IC including capacitor discharge function (ICX)** | | N/A |
| a) | Humidity treatment in accordance with sc 5.4.8 – 120 hours | No such ICX is provided within the equipment. | N/A |
| b) | Impulse test using circuit 2 with Uc = to transient voltage ..... : | See above. | N/A |
| C1) | Application of ac voltage at 110% of rated voltage for 2.5 minutes | See above. | N/A |
| C2) | Test voltage ..... : | See above. | — |
| D1) | 10,000 cycles on and off using capacitor with smallest capacitance and a resistor with largest resistance specified by manufacturer | See above. | N/A |
| D2) | Capacitance ..... : | See above. | — |
| D3) | Resistance ..... : | See above. | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **H** | **CRITERIA FOR TELEPHONE RINGING SIGNALS** | | N/A |
| H.1 | General | No telephone ringing signal generated within the equipment. | N/A |
| H.2 | Method A | See above. | N/A |
| H.3 | Method B | See above. | N/A |
| H.3.1 | Ringing signal | See above. | N/A |
| H.3.1.1 | Frequency (Hz) ..... : | See above. | — |
| H.3.1.2 | Voltage (V) ..... : | See above. | — |
| H.3.1.3 | Cadence; time (s) and voltage (V) ..... : | See above. | — |
| H.3.1.4 | Single fault current (mA):..... : | See above. | — |
| H.3.2 | Tripping device and monitoring voltage..... : | See above. | N/A |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage complied with | See above. | N/A |
| H.3.2.2 | Tripping device | See above. | N/A |
| H.3.2.3 | Monitoring voltage (V) ..... : | See above. | — |

| | | | |
|---|---|---|---|
| **J** | **INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION** | | P |
| | General requirements | The triple insulated wire is used as reinforced safeguard in the isolating transformer that had been evaluated with Annex J. | P |

| | | | |
|---|---|---|---|
| **K** | **SAFETY INTERLOCKS** | | N/A |
| K.1 | General requirements | No safety interlock is provided within the equipment. | N/A |
| K.2 | Components of safety interlock safeguard mechanism ..... .: | See above. | N/A |
| K.3 | Inadvertent change of operating mode | See above. | N/A |
| K.4 | Interlock safeguard override | See above. | N/A |
| K.5 | Fail-safe | See above. | N/A |
| | Compliance..... : | See above. | N/A |
| K.6 | Mechanically operated safety interlocks | See above. | N/A |
| K.6.1 | Endurance requirement | See above. | N/A |
| K.6.2 | Compliance and Test method..... : | See above. | N/A |
| K.7 | Interlock circuit isolation | See above. | N/A |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements (type and circuit location) ..... : | See above. | N/A |
| K.7.2 | Overload test, Current (A) ..... : | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| K.7.3 | Endurance test | See above. | N/A |
| K.7.4 | Electric strength test ..... : | See above. | N/A |
| **L** | **DISCONNECT DEVICES** | | N/A |
| L.1 | General requirements | The screw wiring terminal block is provided for connection to mains.<br>The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| L.2 | Permanently connected equipment | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| L.3 | Parts that remain energized | When the equipment is disconnected from mains, no remaining parts at hazardous voltage in the equipment.<br>However, the equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| L.4 | Single phase equipment | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| L.5 | Three-phase equipment | The equipment is single phase equipment. | N/A |
| L.6 | Switches as disconnect devices | No such switch is provided on the equipment. | N/A |
| L.7 | Plugs as disconnect devices | The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| L.8 | Multiple power sources | Only one mains power source connection. | N/A |
| **M** | **EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS** | | N/A |
| M.1 | General requirements | No such batteries within the equipment. | N/A |
| M.2 | Safety of batteries and their cells | See above. | N/A |
| M.2.1 | Requirements | See above. | N/A |
| M.2.2 | Compliance and test method (identify method) ..... : | See above. | N/A |
| M.3 | Protection circuits | See above. | N/A |
| M.3.1 | Requirements | See above. | N/A |
| M.3.2 | Tests | See above. | N/A |
| | - Overcharging of a rechargeable battery | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - Unintentional charging of a non-rechargeable battery | See above. | N/A |
| | - Reverse charging of a rechargeable battery | See above. | N/A |
| | - Excessive discharging rate for any battery | See above. | N/A |
| M.3.3 | Compliance ..... : | See above. | N/A |
| M.4 | Additional safeguards for equipment containing secondary lithium battery | See above. | N/A |
| M.4.1 | General | See above. | N/A |
| M.4.2 | Charging safeguards | See above. | N/A |
| M.4.2.1 | Charging operating limits | See above. | N/A |
| M.4.2.2a) | Charging voltage, current and temperature.... : | See above. | — |
| M.4.2.2 b) | Single faults in charging circuitry ..... : | See above. | — |
| M.4.3 | Fire Enclosure | See above. | N/A |
| M.4.4 | Endurance of equipment containing a secondary lithium battery | See above. | N/A |
| M.4.4.2 | Preparation | See above. | N/A |
| M.4.4.3 | Drop and charge/discharge function tests | See above. | N/A |
| | Drop | See above. | N/A |
| | Charge | See above. | N/A |
| | Discharge | See above. | N/A |
| M.4.4.4 | Charge-discharge cycle test | See above. | N/A |
| M.4.4.5 | Result of charge-discharge cycle test | See above. | N/A |
| M.5 | Risk of burn due to short circuit during carrying | See above. | N/A |
| M.5.1 | Requirement | See above. | N/A |
| M.5.2 | Compliance and Test Method (Test of P.2.3) | See above. | N/A |
| M.6 | Prevention of short circuits and protection from other effects of electric current | See above. | N/A |
| M.6.1 | Short circuits | See above. | N/A |
| M.6.1.1 | General requirements | See above. | N/A |
| M.6.1.2 | Test method to simulate an internal fault | See above. | N/A |
| M.6.1.3 | Compliance (Specify M.6.1.2 or alternative method) ..... : | See above. | N/A |
| M.6.2 | Leakage current (mA) ..... : | See above. | N/A |
| M.7 | Risk of explosion from lead acid and NiCd batteries | See above. | N/A |
| M.7.1 | Ventilation preventing explosive gas concentration | See above. | N/A |
| M.7.2 | Compliance and test method | See above. | N/A |
| M.8 | Protection against internal ignition from external spark sources of lead acid batteries | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.8.1 | General requirements | See above. | N/A |
| M.8.2 | Test method | See above. | N/A |
| M.8.2.1 | General requirements | See above. | N/A |
| M.8.2.2 | Estimation of hypothetical volume *Vz* ($m^3/s$) .. : | See above. | — |
| M.8.2.3 | Correction factors ..... : | See above. | — |
| M.8.2.4 | Calculation of distance *d* (mm) ..... : | See above. | — |
| M.9 | Preventing electrolyte spillage | See above. | N/A |
| M.9.1 | Protection from electrolyte spillage | See above. | N/A |
| M.9.2 | Tray for preventing electrolyte spillage | See above. | N/A |
| M.10 | Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) ..... : | See above. | N/A |
| **N** | **ELECTROCHEMICAL POTENTIALS** | | P |
| | Metal(s) used..... : | Complied, the combined electrochemical potential < 0.6V. The equipment is a building-in type and evaluation is also to be made during the final system approval. | — |
| **O** | **MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES** | | P |
| | Figures O.1 to O.20 of this Annex applied ..... : | Considered. | — |
| **P** | **SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS** | | N/A |
| P.1 | General requirements | See the following details. | N/A |
| P.2.2 | Safeguards against entry of foreign object | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| | Location and Dimensions (mm) ..... : | See above. | — |
| P.2.3 | Safeguard against the consequences of entry of foreign object | See above. | N/A |
| P.2.3.1 | Safeguards against the entry of a foreign object | See above. | N/A |
| | Openings in transportable equipment | Not transportable equipment. | N/A |
| | Transportable equipment with metalized plastic parts..... : | See above. | N/A |
| P.2.3.2 | Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) ..... : | See above. | N/A |
| P.3 | Safeguards against spillage of internal liquids | No such consideration. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| P.3.1 | General requirements | See above. | N/A |
| P.3.2 | Determination of spillage consequences | See above. | N/A |
| P.3.3 | Spillage safeguards | See above. | N/A |
| P.3.4 | Safeguards effectiveness | See above. | N/A |
| P.4 | Metallized coatings and adhesive securing parts | No such construction. | N/A |
| P.4.2 a) | Conditioning testing | See above. | N/A |
| | Tc (°C) ..... : | See above. | — |
| | Tr (°C) ..... : | See above. | — |
| | Ta (°C) ..... : | See above. | — |
| P.4.2 b) | Abrasion testing ..... : | See above. | N/A |
| P.4.2 c) | Mechanical strength testing ..... : | See above. | N/A |
| **Q** | **CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING** | | N/A |
| Q.1 | Limited power sources | The output is not complying with limited power sources (LPS). | N/A |
| Q.1.1 a) | Inherently limited output | See above. | N/A |
| Q.1.1 b) | Impedance limited output | See above. | N/A |
| | - Regulating network limited output under normal operating and simulated single fault condition | See above. | N/A |
| Q.1.1 c) | Overcurrent protective device limited output | See above. | N/A |
| Q.1.1 d) | IC current limiter complying with G.9 | See above. | N/A |
| Q.1.2 | Compliance and test method | See above. | N/A |
| Q.2 | Test for external circuits – paired conductor cable | No such circuit within the equipment. | N/A |
| | Maximum output current (A) ..... : | See above. | — |
| | Current limiting method ..... : | See above. | — |
| **R** | **LIMITED SHORT CIRCUIT TEST** | | P |
| R.1 | General requirements | See below.<br>Tested from protective bonding terminal block pin (⏚) to chassis via the protective bonding trace and protective bonding screw. | P |
| R.2 | Determination of the overcurrent protective device and circuit | Circuit breaker 20A used and connected to the unit under test with a test cord of 12 AWG and 1 meter long. | P |
| R.3 | Test method Supply voltage (V) and short-circuit current (A)). ..... : | Source voltage 240V and short-circuit current 1500A. | P |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| S | TESTS FOR RESISTANCE TO HEAT AND FIRE | | N/A |
|---|---|---|---|
| S.1 | Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W | The fire barrier was made of metal. The equipment is building-in type and evaluation is also to be made during the final system approval. | N/A |
| | Samples, material ..... : | See above. | — |
| | Wall thickness (mm) ..... : | See above. | — |
| | Conditioning (°C) ..... : | See above. | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | See above. | N/A |
| | - Material not consumed completely | See above. | N/A |
| | - Material extinguishes within 30s | See above. | N/A |
| | - No burning of layer or wrapping tissue | See above. | N/A |
| S.2 | Flammability test for fire enclosure and fire barrier integrity | See above. | N/A |
| | Samples, material ..... : | See above. | — |
| | Wall thickness (mm) ..... : | See above. | — |
| | Conditioning (°C) ..... : | See above. | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | See above. | N/A |
| | Test specimen does not show any additional hole | See above. | N/A |
| S.3 | Flammability test for the bottom of a fire enclosure | See above. | N/A |
| | Samples, material ..... : | See above. | — |
| | Wall thickness (mm) ..... : | See above. | — |
| | Cheesecloth did not ignite | See above. | N/A |
| S.4 | Flammability classification of materials | See above. | N/A |
| S.5 | Flammability test for fire enclosure materials of equipment with a steady-state power exceeding 4000 W | See above. | N/A |
| | Samples, material ..... : | See above. | — |
| | Wall thickness (mm) ..... : | See above. | — |
| | Conditioning (test condition), (°C)..... : | See above. | — |
| | Test flame according to IEC 60695-11-20 with conditions as set out | See above. | N/A |
| | After every test specimen was not consumed completely | See above. | N/A |
| | After fifth flame application, flame extinguished within 1 min | See above. | N/A |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **T** | **MECHANICAL STRENGTH TESTS** | | P |
| T.1 | General requirements | See the following details. However, the equipment is a building-in type and evaluation is also to be made during the final system approval. | P |
| T.2 | Steady force test, 10 N ..... : | 10 N applied to all components other than the parts serving as an enclosure. | P |
| T.3 | Steady force test, 30 N ..... : | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| T.4 | Steady force test, 100 N ..... : | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| T.5 | Steady force test, 250 N ..... : | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| T.6 | Enclosure impact test | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| | Fall test | See above. | N/A |
| | Swing test | See above. | N/A |
| T.7 | Drop test ..... : | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| T.8 | Stress relief test..... : | | N/A |
| T.9 | Impact Test (glass) | No such glass is provided within the equipment. | N/A |
| T.9.1 | General requirements | See above. | N/A |
| T.9.2 | Impact test and compliance | See above. | N/A |
| | Impact energy (J).....: | See above. | — |
| | Height (m).....: | See above. | — |
| T.10 | Glass fragmentation test.....: | (See subclause 4.4.4.9) | N/A |
| T.11 | Test for telescoping or rod antennas | No such antennas are provided within the equipment. | N/A |
| | Torque value (Nm) ..... : | See above. | — |

| | | | |
|---|---|---|---|
| **U** | **MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFECTS OF IMPLOSION** | | N/A |
| U.1 | General requirements | No CRT is provided within the equipment. | N/A |
| U.2 | Compliance and test method for non-intrinsically protected CRTs | See above. | N/A |
| U.3 | Protective Screen.....: | See above. | N/A |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **V** | **DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)** | | N/A |
| V.1 | Accessible parts of equipment | The equipment is building-in type and evaluation is to be made during the final system approval. | N/A |
| V.2 | Accessible part criterion | See above. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 4.1.2 | TABLE: List of critical components | | | | P |
|---|---|---|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity[1] |
| **Critical component** | -- | -- | -- | -- | -- |
| Terminal Block (CN1) | Anytek Technology Corp. (for TÜV), ANYTEK TECHNOLOGY CORP (for UL) | YK50Axxyzuvvw (for TÜV), YK50A (@@139a) (for UL) | 300Vac/Vdc, 32A, 105°C (for TÜV); 300Vac, 30A, 115°C (for UL) | IEC 60998-1: 2002, IEC 60998-2-1: 2002, EN 60998-1: 2004, EN 60998-2-1: 2004, UL 1059, UL 486E, CSA-C22.2 No. 158 | TÜV, UL, cUL |
| | Dinkle Enterprise Co., Ltd. | DT-5C-B84W | 630V, 24A, 120°C for VDE, 300V, 20A, 110°C for UL | DIN EN IEC 60947-7-4 (VDE 0611-7-4):2019-10; EN IEC 60947-7-4:2019, IEC 60947-7-4:2019, IEC 60998-1: 2002, IEC 60998-2-1: 2002, EN 60998-1: 2004, EN 60998-2-1: 2004, UL 1059, UL 486E | VDE, TÜV, UL |
| Fuses (F1, F2) | Littelfuse Inc. (for TÜV, S), LITTELFUSE INC (for UL) | 215020 (TÜV), 215*+ (UL), 0215* (S) | T20AL, 250Vac | IEC/EN 60127-1:2006+A1: 2011+A2:2015, IEC/EN 60127-2:2014, UL 248-1, UL 248-14, CSA-C22.2 No. 248-1-00, CSA-C22.2 No. 248-14-00 | TÜV, S, UL, cUL |
| | Conquer Electronics Co., Ltd. (for TÜV), CONQUER ELECTRONICS CO LTD (for UL) | UDA-A series (TÜV), UDA-A (UL) | T20AL, 250Vac | IEC/EN 60127-1:2006+A1: 2011+A2:2015, IEC/EN 60127-2:2014, UL 248-1, UL 248-14, CSA-C22.2 No. 248-1-00, CSA-C22.2 No. 248-14-00 | TÜV, UL, cUL |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| Fuse (F401) | Conquer Electronics Co., Ltd. | MST | T3.15AL, 250Vac | DIN EN 60127-1 (VDE 0820-1):2015-12; EN 60127-1:2006+A1:2011+A2:2015, DIN EN 60127-3 (VDE 0820-3):2021-08; EN 60127-3:2015+A1:2020, IEC 60127-1:2006/AMD1:2011, IEC 60127-1:2006/AMD2:2015, IEC 60127-3:2015, IEC 60127-3:2015/AMD1:2020, IEC 60127-1:2006, UL 248-14, CSA-C22.2 No. 248-1-00, CSA-C22.2 No. 248-14-00 | VDE, UL/cUL |
| | Suzhou Walter Electronic Co., Ltd. | 2010 | T3.15AL, 250Vac | DIN EN 60127-3 (VDE 0820-3):2021-08; EN 60127-3:2015+A1:2020, IEC 60127-1:2006, IEC 60127-1:2006/AMD1:2011, IEC 60127-1:2006/AMD2:2015, IEC 60127-3:2015, IEC 60127-3:2015/AMD1:2020, DIN EN 60127-1 (VDE 0820-1):2015-12; EN 60127-1:2006+A1:2011+A2:2015, UL 248-14, CSA-C22.2 No. 248-1-00, CSA-C22.2 No. 248-14-00 | VDE, UL/cUL |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| | Hollyland Company Limited | 5ET | T3.15AL, 250Vac | DIN EN 60127-3 (VDE 0820-3):2021-08; EN 60127-3:2015+A1:2020, IEC 60127-1:2006, IEC 60127-1:2006/AMD1:2011, IEC 60127-1:2006/AMD2:2015, IEC 60127-3:2015, IEC 60127-3:2015/AMD1:2020, DIN EN 60127-1 (VDE 0820-1):2015-12; EN 60127-1:2006+A1:2011+A2:2015, UL 248-14 | VDE, UL |
| | Dongguan Better Electronics Technology Co., Ltd. | 932 | T3.15AL, 250Vac | DIN EN 60127-3 (VDE 0820-3):2021-08; EN 60127-3:2015+A1:2020, IEC 60127-1:2006, IEC 60127-1:2006/AMD1:2011, IEC 60127-1:2006/AMD2:2015, IEC 60127-3:2015, IEC 60127-3:2015/AMD1:2020, DIN EN 60127-1 (VDE 0820-1):2015-12; EN 60127-1:2006+A1:2011+A2:2015, UL 248-14, CSA-C22.2 No. 248-1-00, CSA-C22.2 No. 248-14-00 | VDE, UL/cUL |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| Y-Capacitors (CY3, CY4, CY7, CY8) | Murata Mfg. Co., Ltd. (for VDE), MURATA MFG CO LTD (for UL) | KX | CY3 = CY4 = 1000pF max., CY7 = CY8 = 220pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Walsin Technology Corp. (for VDE), WALSIN TECHNOLOGY CORP (for UL) | AH | CY3 = CY4 = 1000pF max., CY7 = CY8 = 220pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | TDK Corporation (for VDE), TDK CORPORATION (for UL) | CD | CY3 = CY4 = 1000pF max., CY7 = CY8 = 220pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Kunshan Wansheng Electronics Co., Ltd. (for VDE), KUNSHAN WANSHENG ELECTRONICS CO LTD (for UL) | CT7 | CY3 = CY4 = 1000pF max., CY7 = CY8 = 220pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | MURATA MANUFACTURING CO. LTD | RA | CY3 = CY4 = 1000pF max., CY7 = CY8 = 220pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| X-Capacitors (CX1, CX2) | KEMET ELECTRONICS CORPORATION (for ENEC), KEMET ELECTRONICS ITALIA SRL (for UL), KEMET Electronics Corporation (for CQC) | R.46 | 1µF max., 250Vac min., 100°C min., X2 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | ENEC, UL, cUL, CQC |
| | TDK (Zhuhai FTZ) Co., Ltd. | B3292 (for VDE, CQC), B3292# (for UL) | 1µF max., 250Vac min., 100°C min., X2 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Europtronic (SuZhou) Co., Ltd. (for ENEC), EUROPTRONIC (SUZHOU) CO LTD (for UL) | MPX2 | 1µF max., 250Vac min., 110°C min., X2 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | ENEC, UL, cUL, CQC |
| | Xianmen Faratronic Co., Ltd. (for ENEC), XIAMEN FARATRONIC CO LTD (for UL) | MKP62 | 1µF max., 250Vac min., 100°C min., X2 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | ENEC, UL, cUL, CQC |
| | ZhuHai Sung Ho Electronics Co. Ltd. (for VDE), ZHUHAI SUNG HO ELECTRONICS CO LTD (for UL) | CMPP | 1µF max., 275Vac min., 105°C min., X2 type | IEC/EN 60384-14:2013+A1:2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | ENEC, UL, cUL, CQC |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| | Strong Components Co., Ltd. (for VDE),<br>STRONG COMPONENTS CO LTD (for UL) | MPX | 1µF max., 250Vac min., 110°C min., X2 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Hua Jung Components Co., Ltd. (for ENEC),<br>HUA JUNG COMPONENTS CO LTD (for UL) | MKP | 1µF max., 250Vac min., 110°C min., X2 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | ENEC, UL, cUL, CQC |
| | Europtronic (SuZhou) Co., Ltd. (for ENEC),<br>EUROPTRONIC (SUZHOU) CO LTD (for UL) | MPX | 1µF max., 250Vac min., 105°C min., X2 type | IEC/EN 60384-14:2013+A1: 2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | ENEC, UL, cUL, CQC |
| Bleeder Resistors (R1, R2, R3, R4) | KAMAYA ELECTRIC CO LTD | RVC32,<br>RVAC32 | 210kΩ max., 1/4W, SMD type | IEC 62368-1: 2014, Annex G.10 | Type tested by UL, E499156-A6001-CB-1 |
| | PROSPERITY DIELECTRICS CO LTD | FVS06 | 210kΩ max., 1/4W, SMD type | IEC 62368-1: 2014, Annex G.10 | Type tested by UL, E358325-4787421405-1 Original |
| | TA-I TECHNOLOGY CO., LTD. | RH12 | 210kΩ max., 1/4W, SMD type | IEC 62368-1: 2014, Annex G.10 | Type tested by UL, E494441-4788023982-1 Original |
| | Yageo Corporation | RV1206 | 210kΩ max., 1/4W, SMD type | IEC 62368-1: 2014, Annex G.10 | Type tested by UL, E491387-4787887815-1 Original |
| Line Filters (FL1, FL2) | Delta Electronics, Inc. | HFV-MPS16031-A | 130°C | -- | -- |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Relay (RL1) | Xiamen Hongfa Electroacoustics Co., Ltd. | HF161F/12-HT | 250Vac, 20A (for contacts), 12Vdc (for coil) 85°C, Electrical endurance/ switching cycles: 10000 | IEC 61810-1: 2015+A1:2019, EN 61810-1: 2015+A1:2020, UL 508, CSA-C22.2 No. 14, GB15092.1-2003, GB/T 21711.1-2008, IEC/EN 62368-1:2014 Annex G.2 | VDE, UL, cUL, CQC |
| Line Filters (L2, L5) | Delta Electronics, Inc. | PFCH-MPS16006-A | 130°C | -- | -- |
| - Bobbin Material (used for Line Filters (L2, L5)) | SUMITOMO BAKELITE CO LTD | PM-9820, PM-9630 | Phenolic, V-0, 150°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| Sensor Transformers (CT1, CT2) (all in primary) | Delta Electronics, Inc. | SH-MPS14006-B | 130°C | -- | -- |
| - Bobbin Material (used for Sensor Transformers (CT1, CT2)) | SUMITOMO BAKELITE CO LTD | PM-9630, PM-9820 | Phenolic, V-0, 150°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SUMITOMO CHEMICAL CO LTD | E4008 | LCP, V-0, 200°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| Isolating Transformers (T1, T2) (for model PMS-24V1K2W1BTD) | Delta Electronics, Inc. *** see Supplementary information** | MV-MPS16030-A | Class F (UL insulation system MP-155G) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013, IEC 62368-1:2014, EN 62368-1: 2014+A11, IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11, UL 1446 | Tested and accepted by TÜV Rheinland, UL |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Isolating Transformers (T1, T2)<br>(for model PMS-48V1K2W1BTD) | Delta Electronics, Inc.<br>*** see Supplementary information** | MV-MPS17014-A | Class F (UL insulation system MP-155G) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013, IEC 62368-1:2014, EN 62368-1: 2014+A11, IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11, UL 1446 | Tested and accepted by TÜV Rheinland, UL |
| - Bobbin Material (used for Isolating Transformers (T1, T2)) | SUMITOMO BAKELITE CO LTD | PM-9630 | Phenolic, V-0, 150°C, thickness 0.51mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | CELANESE INTERNATIONAL CORP | FR530 | PET, V-0, 155°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| - Triple Insulated Wire (used in Isolating Transformers (T1, T2)) | Great Leoflon Industrial Co., Ltd. (for VDE),<br>GREAT LEOFLON INDUSTRIAL CO LTD (for UL) | TRW(F), TRW(F)-M | 155°C | IEC 62368-1: 2014, EN 62368-1:2014+ A11, IEC/EN 61558-1:2005+A1, IEC/EN 61558-2-16:2009+A1 (Annex K), UL 2353, CSA-C22.2 No. 1 | VDE, UL, CSA |
| Isolating Transformer (T401)<br>(for model PMS-24V1K2W1BTD) | Delta Electronics, Inc.<br>*** see Supplementary information** | AV-MPS16030-A | Class B (UL insulation system MP-130N) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013; IEC 62368-1:2014, EN 62368-1: 2014+A11; IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11; UL 1446 | Tested and accepted by TÜV Rheinland, UL |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Isolating Transformer (T401)<br>(for model PMS-48V1K2W1BTD) | Delta Electronics, Inc.<br>*** see Supplementary information** | AV-MPS17015-A | Class B (UL insulation system MP-130N) | Acc. to IEC/EN 60085, IEC 60950-1: 2005, AMD1: 2009, AMD2: 2013; IEC 62368-1:2014, EN 62368-1: 2014+A11; IEC 62368-1: 2018, EN IEC 62368-1:2020 +A11; UL 1446 | Tested and accepted by TÜV Rheinland, UL |
| - Bobbin Material (used for Isolating Transformer (T401)) | SUMITOMO BAKELITE CO LTD | PM-9630 | Phenolic, V-0, 150°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | CELANESE INTERNATIONAL CORP | FR530 | PET, V-0, 155°C, thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| - Triple Insulated Wire (used in Isolating transformer (T401)) | Great Leoflon Industrial Co., Ltd. (for VDE),<br>GREAT LEOFLON INDUSTRIAL CO LTD (for UL) | TRW(B), TRW(B)-M | 130°C | IEC 62368-1: 2014, EN 62368-1:2014+ A11, IEC/EN 61558-1:2005+A1, IEC/EN 61558-2-16:2009+A1 (Annex K), UL 2353, CSA-C22.2 No. 1 | VDE, UL, CSA |
| Transformer (T4) (all in primary) | Delta Electronics, Inc. | DV-MPS14004-B | 130°C min. | -- | -- |
| Bridging Capacitors (CY1, CY2) | Murata Mfg. Co., Ltd. (for VDE),<br>MURATA MFG CO LTD (for UL) | KX | 2200pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| | Walsin Technology Corp. (for VDE), WALSIN TECHNOLOGY CORP (for UL) | AH | 2200pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | TDK Corporation (for VDE), TDK CORPORATION (for UL) | CD | 2200pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Kunshan Wansheng Electronics Co., Ltd. (for VDE), KUNSHAN WANSHENG ELECTRONICS CO LTD (for UL) | CT7 | 2200pF max., 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| Bridging Resistors (R33, R34, R35, R36, R37, R39, R102) | KAMAYA ELECTRIC CO LTD | RVC32 | 9.1MΩ, 1/4W, SMD type, distance between terminations 1.26mm min. | IEC 62368-1: 2014, Annex G.10 | Type tested by UL, E499156-A6001-CB-1 |
| | TA-I TECHNOLOGY CO LTD | RH12 | 9.1MΩ, 1/4W, SMD type, distance between terminations 1.26mm min. | IEC 62368-1: 2014, Annex G.10 | Type tested by UL, E494441-4788023982-1 Original |
| | PROSPERITY DIELECTRICS CO LTD | FVS06 | 9.1MΩ, 1/4W, SMD type, distance between terminations 1.26mm min. | IEC 62368-1: 2014, Annex G.10 | Type tested by UL, E358325-4787421405-1 Original |
| | Yageo Corporation | 2322 79xxxxxx | 9.1MΩ, 1/4W, SMD type, distance between terminations 1.26mm min. | IEC 62368-1: 2018, Annex G.10.2 & G.10.6 | Type tested by UL, E491387-4789692703-1 Original-UL |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Optocouplers (IC51, IC52, IC53, IC54, IC60, IC404) | Lite-On Technology Corporation (for VDE), LITE-ON TECHNOLOGY CORP (for UL) | LTV-100X (X = 0-9) (for UL, CQC, VDE), LTV-10XX (X = 0-9) (for N, D) | dti. > 0.4mm, ext. cr. ≧ 8.0mm, 115°C (thermal cycling tested, isolation: AC 4.8kV min.) | EN IEC 60747-5-5:2020, IEC 60747-5-5: 2020, EN IEC 62368-1:2020+ A11:2020, IEC 62368-1:2018, UL 1577, CSA Component Acceptance Service Notice No. 5A, GB4943-2022 | VDE, N, D, UL, cUL, CQC |
| | Toshiba Electronic Devices & Storage Corporation | TLP385 | dti. > 0.4mm, ext. cr. > 8.0mm, 110°C (thermal cycling tested, isolation: AC 4.8kV min.) | EN IEC 60747-5-5:2020, IEC 60747-5-5: 2020, EN IEC 62368-1:2020+ A11:2020, IEC 62368-1:2018, UL 1577, CSA Component Acceptance Service Notice No. 5A, GB4943-2022 | VDE, S, UL, cUL, CQC |
| Choke (L3) | Delta Electronics, Inc. | CPH-MPS16006-A | 130°C | -- | -- |
| DC Fan (two provided) | Delta Electronics, Inc. (for TÜV), DELTA ELECTRONICS INC (for UL) | THA0412AD(Y) series | DC 12V, 0.6A, 18.5CFM min. | IEC/EN 62368-1:2014, IEC 62368-1: 2018, EN IEC 62368-1:2020+ A11:2020, UL 507, CSA-C22.2 No. 113 | TÜV, UL, cUL |
| Insulator (on cover) (between PCB and chassis) | ITW Materials Technology (Shanghai) Co., LTD. | FORMEX GK-10 | VTM-0 min., 115°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SABIC JAPAN L L C | FR1 | V-0, 120°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SABIC INNOVATIVE PLASTICS US L L C | FR1 | V-0, 120°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| | SUMITOMO BAKELITE CO LTD | PHF150MA | VTM-0, 130°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SUMITOMO BAKELITE CO LTD | PHF150MAB | VTM-0, 130°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | RP TOPLA LIMITED | VS520a | V-0, 130°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | RP TOPLA LIMITED | VS120a | V-0, 130°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SHENZHEN BORNSUN INDUSTRIAL CO LTD | BN-ZD16 | VTM-0 min., 115°C min., thickness 0.21mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| Insulator (between F2 and PCB type TDC-587) (between C6, C15 and PCB type TDC-587) (between T1, T2 and T401) (between CY1, CY2 and T2) | SICHUAN DONGFANG INSULATING MATERIAL CO LTD | DFR117ECO | V-0, 130°C min., thickness 0.43mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SICHUAN DONGFANG INSULATING MATERIAL CO LTD | DFR3732A | V-0, 120°C min., thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SABIC JAPAN L L C | FR25A | V-0, 125°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SABIC INNOVATIVE PLASTICS US L L C | FR25A | V-0, 125°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SHENZHEN BORNSUN INDUSTRIAL CO LTD | BN-ZD16 | VTM-0 min., 115°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| | FORMEX, DIV OF ILLINOIS TOOL WORKS INC | FORMEX GK-17 | VTM-0 min., 115°C min., thickness 0.4mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SUMITOMO BAKELITE CO LTD | PHF150MA | VTM-0, 130°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | SUMITOMO BAKELITE CO LTD | PHF150MAB | VTM-0, 130°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | RP TOPLA LIMITED | VS520a | V-0, 130°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| | RP TOPLA LIMITED | VS120a | V-0, 130°C min., thickness 0.45mm min. | UL 94, UL 746C, CSA-C22.2 No. 0.17 | UL, cUL |
| Heat Shrinkable Tubing (covered on the wires of DC fans as reinforced insulation) | Sumitomo Electric Fine Polymer Inc | Sumitube F32 | Rating 125°C, VW-1, isolation: AC 3000V, min. 0.44mm thickness | UL 224 | UL |
| | Tyco Electronics Corp (RAYCHEM) | Versafit | Rating 125°C, VW-1, isolation: AC 3000V, min. 0.44mm thickness | UL224 | UL |
| | Tyco Electronics Corp (RAYCHEM) | Versafit V2 | Rating 125°C, VW-1, isolation: AC 3000V, min. 0.44mm thickness | UL224 | UL |
| | DONGGUAN SALIPT CO LTD | SALIPT S-901-600 | Rating 125°C, VW-1, isolation: AC 3000V, min. 0.44mm thickness | UL224 | UL |
| Insulation Tape (for DC Fans) | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 1350F-1 | 130°C, three layers min. | IEC 61558-1: 2005+A1, cl. 26.3.3, CAN/UL 510A, CSA-C22.2 No. 197-M1983 | Type tested by TÜV SÜD test report No. 611101102801 (also checked and complies with IEC 62368-1:2014), UL, CSA |

| IEC 62368-1 | | | |
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| | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 1350T-3 (3 layers composite) | 130°C | IEC 61558-1: 2005+A1, cl. 26.3.3, CAN/UL 510A, CSA-C22.2 No. 197-M1983 | Type tested by TÜV Rheinland test report No. CN22GZSU 001 (also checked and complies with IEC 62368-1: 2014), UL, CSA |
| | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 92 | 180°C, three layers min. | IEC 61558-1: 2005+A1, cl. 26.3.3, CAN/UL 510A, CSA-C22.2 No. 197-M1983 | Type tested by TÜV SÜD test report No. 611001601601 (also checked and complies with IEC 62368-1:2014), UL, CSA |
| | SYMBIO INC | 35660Y | 130°C, three layers min. | CAN/UL 510A, CSA-C22.2 No. 197-M1983 | UL, CSA |
| | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | CT | 130°C, three layers min. | CAN/UL 510A, CSA-C22.2 No. 197-M1983 | UL, CSA |
| Y-Capacitors (CY5, CY6 at secondary circuits)<br>CY5 = CY6 = 2200pF max. (for model PMS-24V1K2W1BTD)<br>CY5 = CY6 = 3300pF max. (for model PMS-48V1K2W1BTD) | Murata Mfg. Co., Ltd. (for VDE),<br>MURATA MFG CO LTD (for UL) | KX | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Walsin Technology Corp. (for VDE),<br>WALSIN TECHNOLOGY CORP (for UL) | AH | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1: 2016, UL 60384-14, CAN/CSA-E 60384-14:14, GB/T6346.14-2015 | VDE, UL, cUL, CQC |

| IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| | TDK Corporation (for VDE),<br>TDK CORPORATION (for UL) | CD | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | Kunshan Wansheng Electronics Co., Ltd. (for VDE),<br>KUNSHAN WANSHENG ELECTRONICS CO LTD (for UL) | CT7 | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| | MURATA MANUFACTURING CO. LTD | RA | 250Vac min., 125°C min., Y1 type | IEC/EN 60384-14:2013+A1:2016,<br>UL 60384-14,<br>CAN/CSA-E 60384-14:14,<br>GB/T6346.14-2015 | VDE, UL, cUL, CQC |
| **Functional component** | **--** | **--** | **--** | **--** | **--** |
| Cover Chassis and Bottom Chassis | Interchangeable | Interchangeable | SGCC, thickness 0.8mm min. | -- | -- |
| Bridge Rectifiers (BD1, BD2) | Interchangeable | Interchangeable | 800V min., 25A min. | -- | -- |
| Electrolytic Capacitor (C1) | Interchangeable | Interchangeable | 330µF, 450V min., 105°C min. | -- | -- |
| Electrolytic Capacitor (C2) | Interchangeable | Interchangeable | 390µF, 450V min., 105°C min. | -- | -- |
| MOSFET (Q1) | Interchangeable | Interchangeable | 800V min., 11A min. | -- | -- |
| MOSFETs (Q5, Q6)<br>(for model PMS-24V1K2W1BTD) | Interchangeable | Interchangeable | 600V min., 50A min. | -- | -- |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| MOSFETs (Q5, Q6)<br>(for model PMS-48V1K2W1BTD) | Interchangeable | Interchangeable | 600V min., 38.8Amin. | -- | -- |
| Thermistors (NTC131) | Interchangeable | Interchangeable | 470kΩ at 25°C | UL 1434 | UL |
| Protective Bonding Traces | Interchangeable | Interchangeable | Width = 4.2mm min., thickness 50µm min. | -- | -- |
| PCB | Interchangeable | Interchangeable | V-0 min., 130°C | UL 94,<br>UL 796 | UL |
| Internal Plastic Material | Interchangeable | Interchangeable | V-2 min. | UL 94, UL 746C | -- |
| Insulating Tubing/Sleeving | Interchangeable | Interchangeable | FEP, PTFE, PVC, TFE, neoprene, polyimide or marked VW-1 or FT-1; 125°C, 300 V. | UL 1441, UL 224 | -- |
| Internal Wiring (secondary ELV/SELV circuits) | Interchangeable | Interchangeable | FEP, PTFE, PVC, TFE, neoprene, polyimide or marked VW-1 or FT-1; min 30V, 80°C min. routed away from secondary (SEC, ELV, SELV) uninsulated live parts | UL 758 | UL |
| Connectors and Receptacles (secondary SELV circuits) | Interchangeable | Interchangeable | Metal/Plastic, Copper alloy pins housed in bodies of plastic rated V-2 min | UL 94,<br>UL 746C,<br>UL 1977 | UL |
| Electrolytic Capacitor (C111) | Interchangeable | Interchangeable | 105°C min. | -- | -- |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:

1. [1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.
2. In optocoupler technical data column, where “dti.” means distance through insulation, “int. cr.” means internal creepage distance, “ext. cr.” means external creepage distance.
3. * Transformer manufacturing plants of Delta Electronics, Inc.:
   - Delta Electronics (Thailand) Public Co., Ltd.
   - Delta Electronics (Jiangsu) Ltd.
   - DELTA ELECTRONICS (WUHU) LTD.
   - Delta Electronics (Chen Zhou) Co., Ltd.

| | | |
|---|---|---|
| **4.8.4, 4.8.5** | **TABLE: Lithium coin/button cell batteries mechanical tests** | N/A |

**(The following mechanical tests are conducted in the sequence noted.)**

| | | | |
|---|---|---|---|
| **4.8.4.2** | **TABLE: Stress Relief test** | | — |
| **Part** | **Material** | **Oven Temperature (°C)** | **Comments** |
| | | | |

| | | | |
|---|---|---|---|
| **4.8.4.3** | **TABLE: Battery replacement test** | | — |
| Battery part no. ..... : | | | — |
| Battery Installation/withdrawal | | Battery Installation/Removal Cycle | Comments |
| | | 1 | |
| | | 2 | |
| | | 3 | |
| | | 4 | |
| | | 5 | |
| | | 6 | |
| | | 8 | |
| | | 9 | |
| | | 10 | |

| | | | |
|---|---|---|---|
| **4.8.4.4** | **TABLE: Drop test** | | — |
| Impact Area | Drop Distance | Drop No. | Observations |
| | | 1 | |
| | | 2 | |
| | | 3 | |

| | | | |
|---|---|---|---|
| **4.8.4.5** | **TABLE: Impact** | | — |
| **Impacts per surface** | **Surface tested** | **Impact energy (Nm)** | **Comments** |
| | | | |

| | | |
|---|---|---|
| **4.8.4.6** | **TABLE: Crush test** | — |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| Test position | Surface tested | Crushing Force (N) | Duration force applied (s) |
|---|---|---|---|
| | | | |
| Supplementary information: | | | |

| 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical test result | | N/A |
|---|---|---|---|
| **Test position** | **Surface tested** | **Force (N)** | **Duration force applied (s)** |
| | | | |
| Supplementary information: | | | |

| 5.2 | TABLE: Classification of electrical energy sources | | | | | | P |
|---|---|---|---|---|---|---|---|
| 5.2.2.2 – Steady State Voltage and Current conditions | | | | | | | |
| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
| | | | | U (Vrms or Vpk) | I (Apk or Arms) | Hz | |
| Model: PMS-24V1K2W1BTD | | | | | | | |
| 1. | 264 Vac, 60 Hz | 24 Vdc output to RTN | Normal | 24.12 Vdc | -- | -- | ES1 |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | 24.13 Vdc | -- | -- | |
| | | | Single fault – SC/OC (see table B.4 for details) (recorded only the worst case value) | 24.13 Vdc | -- | -- | |
| 2. | 264 Vac, 60 Hz | 5Vsb output to RTN | Normal | 5.02 Vdc | -- | -- | ES1 |
| | | | Abnormal – (see table B.3 for details) (recorded only the worst case value) | 5.02 Vdc | -- | -- | |

| IEC 62368-1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Clause | Requirement + Test | | | Result - Remark | | | Verdict |
| | | | Single fault – SC/OC<br>(see table B.4 for details)<br>(recorded only the worst case value) | 5.02 Vdc | -- | -- | |
| 3. | 264 Vac, 60 Hz | Output to RTN | Normal | -- | 0.18 mApk | -- | ES1 |
| | | | Abnormal –<br>(see table B.3 for details)<br>(recorded only the worst case value) | -- | 0.19 mApk | -- | |
| | | | Single fault – SC/OC<br>(C1 SC) | -- | 0.23 mApk | -- | |
| | | | Single fault – SC/OC<br>(C1 OC) | -- | 0.19 mApk | -- | |
| Model: PMS-48V1K2W1BTD | | | | | | | |
| 1. | 264 Vac, 60 Hz | 48 Vdc output to RTN | Normal | 48.1 Vdc | -- | -- | ES1 |
| | | | Abnormal –<br>(see table B.3 for details)<br>(recorded only the worst case value) | 48.1 Vdc | -- | -- | |
| | | | Single fault – SC/OC<br>(see table B.4 for details)<br>(recorded only the worst case value) | 48.1 Vdc | -- | -- | |
| 2. | 264 Vac, 60 Hz | 5Vsb output to RTN | Normal | 5.02 Vdc | -- | -- | ES1 |
| | | | Abnormal –<br>(see table B.3 for details)<br>(recorded only the worst case value) | 5.02 Vdc | -- | -- | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Single fault – SC/OC<br>(see table B.4 for details)<br>(recorded only the worst case value) | 5.02 Vdc | -- | -- | |
| 3. | 264 Vac, 60 Hz | Output to RTN | Normal | -- | 0.18 mApk | -- | ES1 |
| | | | Abnormal –<br>(see table B.3 for details)<br>(recorded only the worst case value) | -- | 0.19 mApk | -- | |
| | | | Single fault – SC/OC<br>(C1 SC) | -- | 0.23 mApk | -- | |
| | | | Single fault – SC/OC<br>(C1 OC) | -- | 0.19 mApk | -- | |

5.2.2.3 - Capacitance Limits

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | ES Class |
|---|---|---|---|---|---|---|
| | | | | Capacitance, nF | Upk (V) | |
| 1. | 264 Vac, 60 Hz | Phase to Neutral (CX1, CX2) | Normal | CX1 = CX2 = 1 µF max. (nominal, tolerance +20 %) | 374 | ES3 |
| | | | Abnormal | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | |

5.2.2.4 - Single Pulses

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
|---|---|---|---|---|---|---|---|
| | | | | Duration (ms) | Upk (V) | Ipk (mA) | |
| -- | -- | -- | Normal | -- | -- | -- | -- |
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |

5.2.2.5 - Repetitive Pulses

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
|---|---|---|---|---|---|---|---|
| | | | | Duration (ms) | Upk (V) | Ipk (mA) | |
| -- | -- | -- | Normal | -- | -- | -- | -- |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |

Test Conditions: Normal – No load or normal load condition.

Abnormal – See table B.3 for details.

Supplementary information:

SC = Short-circuited, OC = Open-circuited

Overall capacity: Y-Capacitors (CY3 = CY4 = 1000 pF, CY7 = CY8 = 220 pF);
Bridging Capacitors (CY1 = CY2 = 2200 pF)

Overall resistance: Bridging Resistors (R33 = R34 = R35 = R36 = R37 = R39 = R102 = 9.1 MΩ)

| 5.4.1.4, 6.3.2, 9.0, B.2.6 | **TABLE: Temperature measurements** | | P |
|---|---|---|---|
| | Supply voltage (V) .....: | See below. | — |
| | Ambient $T_{min}$ (°C) .....: | See below. | — |
| | Ambient $T_{max}$ (°C) .....: | See below. | — |
| | Tma (°C) .....: | See below. | — |

| Maximum measured temperature T of part/at..: | T (°C) | | | | | Allowed $T_{max}$ (°C) |
|---|---|---|---|---|---|---|
| Model: PMS-24V1K2W1BTD | | | | | | |
| Test Voltage: | 90V/60Hz (Load condition A) | 264V/50Hz (Load condition A) | 90V/60Hz (Load condition C) | 90V/60Hz (Load condition B) | 90V/60Hz (Load condition D) | -- |
| 1. Ambient | 49.9 | 50.1 | 49.7 | 68.6 | 69.0 | -- |
| 2. T1 coil near Q102 (sec.) | 71.8 | 73.7 | 52.5 | 83.9 | 71.6 | 130 |
| 3. T1 core | 73.7 | 71.8 | 52.9 | 86.2 | 71.9 | 130 |
| 4. T2 coil near T401 (pri.) | 77.6 | 77.2 | 52.8 | 88.2 | 71.9 | 130 |
| 5. T2 core | 70.3 | 69.9 | 53.0 | 86.3 | 72.1 | 130 |
| 6. T401 coil | 56.8 | 55.9 | 56.0 | 75.0 | 73.6 | 110 |
| 7. T401 core | 55.7 | 54.1 | 54.7 | 74.3 | 72.7 | 110 |
| 8. IC51 | 58.3 | 57.9 | 53.5 | 77.7 | 71.9 | 110 |
| 9. IC60 (near IC52, IC53) | 55.9 | 55.5 | 53.9 | 75.2 | 72.1 | 110 |
| 10. IC404 (near IC54) | 54.8 | 54.0 | 54.6 | 74.9 | 72.7 | 110 |
| 11. PCB near BD1 | 74.0 | 58.7 | 56.8 | 86.2 | 74.2 | 130 |
| 12. CY2 near Q101 (CY1) (pri. to sec.) | 61.5 | 61.5 | 52.2 | 78.3 | 71.5 | 125 |
| 13. CY7 near CN1 (CY8) (pri. to GND) | 72.2 | 58.1 | 56.4 | 83.8 | 74.0 | 125 |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14. CY4 near FL1 (CY3) (pri. to GND) | 79.3 | 56.9 | 55.3 | 85.0 | 73.2 | 125 |
| 15. CN1 body | 75.7 | 57.4 | 55.3 | 84.1 | 73.3 | 110 |
| 16. CX2 near BD2 | 73.8 | 55.6 | 55.0 | 82.6 | 73.1 | 100 |
| 17. FL2 near BD2 | 79.9 | 55.8 | 54.6 | 84.9 | 72.7 | 130 |
| 18. FL1 near BD2 | 87.5 | 57.5 | 54.8 | 88.4 | 72.9 | 130 |
| 19. L2 coil | 65.3 | 54.4 | 54.9 | 78.2 | 73.0 | 130 |
| 20. L5 coil | 61.2 | 53.3 | 53.3 | 74.8 | 72.2 | 130 |
| 21. CT1 near Q3 (CT2) | 61.7 | 54.7 | 55.9 | 78.1 | 73.8 | 130 |
| 22. C2 near Q3 (C1) | 58.0 | 54.5 | 54.4 | 75.7 | 73.0 | 105 |
| 23. L3 coil near Q3 | 57.9 | 57.2 | 53.2 | 74.8 | 72.0 | 130 |
| 24. T4 coil near Q6 | 51.9 | 51.9 | 51.3 | 71.2 | 70.9 | 130 |
| 25. C111 near T1 (C112-117) | 73.9 | 73.3 | 54.8 | 86.7 | 72.8 | 105 |
| 26. RL1 coil | 65.1 | 61.0 | 64.0 | 82.3 | 80.5 | 85 |
| 27. CX1 near FL1 | 77.8 | 56.5 | 54.9 | 85.0 | 73.0 | 100 |
| Test position | Label up | | | | | -- |
| | | | | | | |
| Model: PMS-48V1K2W1BTD | | | | | | |
| Test Voltage: | 90V/60Hz (Load condition E) | 90V/60Hz (Load condition F) | 90V/50Hz (Load condition C) | 90V/50Hz (Load condition D) | | -- |
| 1. Ambient | 50.1 | 70.7 | 49.8 | 69.8 | | -- |
| 2. T1 coil near Q102 (sec.) | 82.6 | 88.1 | 52.6 | 73.5 | | 130 |
| 3. T1 core | 76.6 | 84.9 | 52.7 | 73.5 | | 130 |
| 4. T2 coil near T401 (pri.) | 69.2 | 82.6 | 52.5 | 73.5 | | 130 |
| 5. T2 core | 62.8 | 79.0 | 52.4 | 73.5 | | 130 |
| 6. T401 coil | 62.8 | 78.7 | 57.1 | 76.0 | | 110 |
| 7. T401 core | 59.4 | 77.1 | 55.1 | 74.8 | | 110 |
| 8. C2 near Q3 | 59.6 | 76.2 | 53.8 | 74.0 | | 105 |
| 9. RL1 coil | 64.0 | 78.1 | 54.7 | 74.6 | | 85 |
| Test position | Label up | | | | | -- |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:

Note 1: The temperatures were measured under the worse case normal mode defined in table B.2.5.

Note 2: The apparatus was submitted and evaluated for maximum manufacturer's recommended ambient (Tma).

Note 3: All temperatures above for T(°C) have been retrieved by measurement and have been calculated/adjusted to Tma 50°C or Tma 70°C as follows:

T + (Tma – Tamb), where T is the maximum temperature measured during test, Tamb is the ambient temperature during test and Tma is the maximum ambient temperature by the manufacturer's specification.

Winding components providing safety isolation:

- T1, T2 of class F $\rightarrow T_{max}$= 140°C-10°C (thermocouple)= 130°C
- T401 of class B $\rightarrow T_{max}$= 120°C-10°C (thermocouple)= 110°C

Note 4: The load conditions used in this report, see **"Summary of testing**".

| Temperature T of winding: | $t_1$ (°C) | $R_1$ (Ω) | $t_2$ (°C) | $R_2$ (Ω) | T (°C) | Allowed $T_{max}$ (°C) | Insulation class |
|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- |

Supplementary information:

Note 1: Tma should be considered as directed by appliable requirement.

Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9).

| 5.4.1.10.2 | TABLE: Vicat softening temperature of thermoplastics | | N/A |
|---|---|---|---|
| Penetration (mm)..... : | -- | | — |
| Object/ Part No./Material | Manufacturer/trademark | T softening (°C) | |
| -- | -- | -- | |
| Supplementary information: | | | |

| 5.4.1.10.3 | TABLE: Ball pressure test of thermoplastics | | P |
|---|---|---|---|
| Allowed impression diameter (mm) ..... : | ≤ 2 mm | | — |
| Object/Part No./Material | Manufacturer/trademark | Test temperature (°C) | Impression diameter (mm) |
| Bobbin material:<br>Type: FR530 | Mfr: CELANESE INTERNATIONAL CORP | 125 | 1.0 |
| Bobbin material:<br>Type: E4008 | Mfr: SUMITOMO CHEMICAL CO LTD | 125 | 1.0 |
| Supplementary information:<br>Phenolic materials used are accepted without test due to its physical characteristics is clear from examination (See appended table 4.1.2). | | | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 5.4.2.2, 5.4.2.4 and 5.4.3 | **TABLE: Minimum Clearances/Creepage distance** | | | | | | P |
|---|---|---|---|---|---|---|---|
| Clearance (cl) and creepage distance (cr) at/of/between: | Up (V) | U r.m.s. (V) | Frequency (kHz) [1] | Required cl (mm) | cl (mm) [2] | Required[3] cr (mm) | cr (mm) |
| Line and Neutral before current fuse (F1, F2) | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 8.0 | 2.5 | 8.0 |
| Two pins of current fuses (F1/F2) | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 3.0 | 2.5 | 3.0 |
| **Basic/supplementary:** | | | | | | | |
| Primary (F1 traces) and earthing/Metal Enclosure | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 4.2 | 2.5 | 4.2 |
| Two sides of CY1 | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 6.5 | 2.5 | 6.5 |
| Two sides of CY2 | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 7.4 | 2.5 | 7.4 |
| Two sides of CY3/CY4 | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 5.6 | 2.5 | 5.6 |
| Two sides of CY7 | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 5.6 | 2.5 | 5.6 |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Two sides of CY8 | ≤420 | ≤250 | -- | 1.9 (1.27*1.48) 2.3 (1.5*1.48) for appended table 5.4.2.3 | 6.2 | 2.5 | 6.2 |
| **Reinforced:** | | | | | | | |
| Primary and secondary (two sides of IC51) | ≤420 | ≤250 | -- | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 7.3 | 2.5 | 7.3 |
| Primary and secondary (two sides of IC52/IC53/IC60) | ≤420 | ≤250 | -- | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 7.3 | 2.5 | 7.3 |
| Primary and secondary (two sides of IC54/IC404) | ≤420 | ≤250 | -- | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 7.3 | 2.5 | 7.3 |
| Primary and secondary (R33, R34, R35, R36, R37, R39 and R102) | ≤420 | ≤250 | -- | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 8.8 (7*1.26) | 2.5 | 8.8 (7*1.26) |
| Model: PMS-24V1K2W1BTD | | | | | | | |
| T1, T2: Primary traces and secondary traces, | 512 | 263 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 9.7 | 5.4 | 9.7 |
| T1, T2: Primary windings and secondary windings/core | 512 | 263 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 12.0 | 5.4 | 12.0 |
| T2: Primary (HS3) and secondary windings/core | 512 | 263 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 11.5 | 5.4 | 11.5 |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| T401: Primary traces and secondary traces | 652 | 419 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 14.3 | 8.4 | 14.3 |
| T401: Primary windings/core and secondary windings | 652 | 419 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 12.0 | 8.4 | 12.0 |
| T401: Primary windings/core and secondary (D303) | 652 | 419 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 9.0 | 8.4 | 9.0 |
| Model: PMS-48V1K2W1BTD | | | | | | | |
| T1, T2: Primary traces and secondary traces, | 480 | 278 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 9.7 | 5.6 | 9.7 |
| T1, T2: Primary windings and secondary windings/core | 480 | 278 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 12.0 | 5.6 | 12.0 |
| T2: Primary (HS3) and secondary windings/core | 480 | 278 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 11.5 | 5.6 | 11.5 |
| T401: Primary traces and secondary traces | 640 | 375 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 14.3 | 7.6 | 14.3 |
| T401: Primary windings/core and secondary windings | 640 | 375 | >30 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 12.0 | 7.6 | 12.0 |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| T401: Primary windings/core and secondary (D303) | 640 | 375 | >30 | 3.8 (2.54*1.48)<br>4.5 (3.0*1.48)<br>for appended table 5.4.2.3 | 9.0 | 7.6 | 9.0 |

Supplementary information:

1. Glued components (safety spacing relevant): CY3, CY4, CY7, CY8, C1, C2, between CY1 and CY2.
2. The core of transformer (T1, T2) is considered as secondary windings and triple insulated wire is used in primary windings.
3. The core of transformer (T401) is considered as primary windings and triple insulated wire is used in secondary windings.
4. The equipment to be operated up to 5000 m above sea level, each clearance multiplied with an altitude correction factor of 1.48.
5. Note 1: Only for frequency above 30 kHz.
   Note 2: See table 5.4.2.4 if this is based on electric strength test.
   Note 3: Provide Material Group.
6. FI: Functional insulation; BI: Basic insulation; SI: Supplementary insulation; RI: Reinforced insulation.

| **5.4.2.3** | **TABLE: Minimum Clearances distances using required withstand voltage** | P |
|---|---|---|
| | **Overvoltage Category (OV):** | II |
| | **Pollution Degree:** | 2 |

| Clearance distanced between: | Required withstand voltage | Required cl (mm) | Measured cl (mm) |
|---|---|---|---|
| See table 5.4.2.2, 5.4.2.4 and 5.4.3 for locations (FI) | 2500 | 2.3 (1.5*1.48) | See table 5.4.2.2, 5.4.2.4 and 5.4.3 for measurements |
| See table 5.4.2.2, 5.4.2.4 and 5.4.3 for locations (BI / SI) | 2500 | 2.3 (1.5*1.48) | See table 5.4.2.2, 5.4.2.4 and 5.4.3 for measurements |
| See table 5.4.2.2, 5.4.2.4 and 5.4.3 for locations (RI) | 2500 | 4.5 (3.0*1.48) | See table 5.4.2.2, 5.4.2.4 and 5.4.3 for measurements |

Supplementary information:

1. BI: Basic insulation; SI: Supplementary insulation; RI: Reinforced insulation.
2. The equipment to be operated up to 5000 m above sea level, each clearance multiplied with an altitude correction factor of 1.48.

| **5.4.2.4** | **TABLE: Clearances based on electric strength test** | N/A |
|---|---|---|

| Test voltage applied between: | Required cl (mm) | Test voltage (kV) peak / r.m.s. / d.c. | Breakdown Yes / No |
|---|---|---|---|
| -- | -- | -- | -- |

Supplementary information:

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 5.4.4.2, 5.4.4.5 c) 5.4.4.9 | **TABLE: Distance through insulation measurements** | P |
|---|---|---|

| Distance through insulation di at/of: | Peak voltage (V) | Frequency (kHz) | Material | Required DTI (mm) | DTI (mm) |
|---|---|---|---|---|---|
| Insulator<br>(on cover)<br>(between PCB and chassis)<br>(BI) | ≤420 | >30 | See appended table 4.1.2 | -- | 0.21<br>(see appended table 4.1.2) |
| Insulator<br>(between F2 and PCB type TDC-587)<br>(between C6, C15 and PCB type TDC-587)<br>(between T1, T2 and T401)<br>(between CY1, CY2 and T2)<br>(RI) | ≤420 | >30 | See appended table 4.1.2 | 0.4 | ≥0.4<br>(see appended table 4.1.2) |
| Heat shrinkable tubing covered on the wires of DC fans<br>(RI) | ≤420 | >30 | See appended table 4.1.2 | 0.4 | ≥0.4<br>(see appended table 4.1.2) |
| Optocouplers<br>(RI) | ≤420 | -- | See appended table 4.1.2 | 0.4 | ≥0.4<br>(see appended table 4.1.2) |

Supplementary information:

1. BI: Basic insulation; SI: Supplementary insulation; RI: Reinforced insulation.
2. All above sources are checked and listed in table 4.1.2.

Note 1: Only for frequency above 30 kHz.

| 5.4.9 | **TABLE: Electric strength tests** | P |
|---|---|---|

| Test voltage applied between: | Voltage shape (AC, DC) | Test voltage (V) | Breakdown Yes / No |
|---|---|---|---|
| Functional: | | | |
| -- | -- | -- | -- |
| Basic/supplementary: | | | |
| Primary and protective earthing/bonding conductors (BI) | DC | 2500 V | No |
| Insulation tape (one layer as BI) | DC | 2500 V | No |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| Insulator (on cover) (between PCB and chassis) (BI) | DC | 2500 V | No |
| Reinforced: | | | |
| Unit: Primary and secondary | AC | 4242 Vp | No |
| T1, T2: primary and secondary / core[1)] | AC | 4242 Vp | No |
| T401: primary / core and secondary[1)] | AC | 4242 Vp | No |
| Insulator<br>(between F2 and PCB type TDC-587)<br>(between C6, C15 and PCB type TDC-587)<br>(between T1, T2 and T401)<br>(between CY1, CY2 and T2) (RI) | AC | 4242 Vp | No |
| Heat shrinkable tubing covered on the wires of DC fans (RI) | AC | 4242 Vp | No |
| Insulation tape (two layers as RI) | AC | 4242 Vp<br>/ each layer | No |
| Optocouplers | AC | 4242 Vp | No |
| Supplementary information:<br>Note 1: For details refer to appended table 4.1.2.<br>Note 2: BI = Basic Insulation; SI = Supplementary Insulation; RI = Reinforced Insulation.<br>[1)] Considered for each sources of transformer after 120 hrs/40 °C humidity conditioning. | | | |

| 5.5.2.2 | TABLE: Stored discharge on capacitors | | | | P |
|---|---|---|---|---|---|
| Supply Voltage (V), Hz | Test Location | Operating Condition (N, S) | Switch position On or off | Measured Voltage (after 2 seconds) | ES Classification |
| 264Vac, 60Hz | Phase to Neutral | N | No switch | 0 | ES1 |
| 264Vac, 60Hz | Phase to Neutral | S<br>(BD1 OC) | No switch | 2 | ES1 |
| 264Vac, 60Hz | Phase to Neutral | S<br>(R10 OC) | No switch | 2 | ES1 |
| 264Vac, 60Hz | Phase to Neutral | S<br>(R411 OC) | No switch | 2 | ES1 |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:
X-capacitors installed for testing are: 2 µF (CX1 = CX2 = 1 µF)
☒ bleeding resistor rating: 0.21 MΩ (R1 = R2 = R3 = R4 = 210 kΩ)
☐ ICX:
Notes:
A. Test Location:
Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth.
B. Operating condition abbreviations:
N – Normal operating condition (e.g., normal operation, or open fuse); S – Single fault condition;
SC – Short-circuited; OC – Open-circuited.

| 5.6.6.2 | TABLE: Resistance of protective conductors and terminations | | | | P |
|---|---|---|---|---|---|
| Accessible part | | Test current (A) | Duration (min) | Voltage drop (V) | Resistance (mΩ) |
| From grounding pin of CN1 to the farthest metal chassis | | 40 | 2 | 0.4 | 10 |
| Supplementary information: | | | | | |

| 5.7.2.2, 5.7.4 | TABLE: Earthed accessible conductive part | P |
|---|---|---|
| Supply voltage .....…: | 264 Vac, 60 Hz | — |
| Location | Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7 | Touch current (mA) |
| Line/Neutral to metal chassis (earth) | 1 (Switch “e” opened, normal and reverse polarity) | Max. 0.464 mApk |
| | 2* | -- |
| | 3 | -- |
| | 4 | -- |
| | 5 | -- |
| | 6 | -- |
| | 8 | -- |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:

Notes:

[1] Supply voltage is the anticipated maximum Touch Voltage.

[2] Earthed neutral conductor [Voltage differences less than 1% or more].

[3] Specify method used for measurement as described in IEC 60990 subclause 4.3.

[4] IEC 60990, subclause 6.2.2.7, Fault 7 not applicable.

[5] (*) IEC 60990, subclause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.

Test voltage: 264 Vac/60 Hz

Overall capacity: Y-Capacitors (CY3 = CY4 = 1000 pF, CY7 = CY8 = 220 pF);
Bridging Capacitors (CY1 = CY2 = 2200 pF)

Overall resistance: Bridging Resistors (R33 = R34 = R35 = R36 = R37 = R39 = R102 = 9.1 MΩ)

| 6.2.2 | TABLE: Electrical power sources (PS) measurements for classification | | | | P |
|---|---|---|---|---|---|
| Source | Description | Measurement | Max Power after 3 s | Max Power after 5 s*) | PS Classification |
| Model: PMS-24V1K2W1BTD | | | | | |
| T1, T2 | 24 Vdc output | Power (W) : | 1340 | 1340 | PS3 |
| | | $V_A$ (V) : | 24.2 | 24.2 | |
| | | $I_A$ (A) : | 56.9 | 56.9 | |
| T401 | 5Vsb output | Power (W) : | 11.9 | -- | PS1 |
| | | $V_A$ (V) : | 5.0 | -- | |
| | | $I_A$ (A) : | 2.49 | -- | |
| Model: PMS-48V1K2W1BTD | | | | | |
| T1, T2 | 48 Vdc output | Power (W) : | 1371 | 1371 | PS3 |
| | | $V_A$ (V) : | 48.3 | 48.3 | |
| | | $I_A$ (A) : | 28.6 | 28.6 | |
| T401 | 5Vsb output | Power (W) : | 10.4 | -- | PS1 |
| | | $V_A$ (V) : | 4.97 | -- | |
| | | $I_A$ (A) : | 2.19 | -- | |

Supplementary information:

(*) Measurement taken only when limits at 3 seconds exceed PS1 limits.

**Note:** The worst case is considered at the power measurement for worst-case fault.

| 6.2.3.1 | TABLE: Determination of Potential Ignition Sources (Arcing PIS) | | | N/A |
|---|---|---|---|---|
| Location | Open circuit voltage After 3 s (Vp) | Measured r.m.s current (Irms) | Calculated value ($V_p$ x $I_{rms}$) | Arcing PIS? Yes / No |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | |
|---|---|---|---|---|
| 2) | 2) | 2) | 2) | 2) |

Supplementary information:

1) An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage ($V_p$) and normal operating condition rms current ($I_{rms}$) is greater than 15.

2) All components located within the EUT are considered as arcing PIS.

| 6.2.3.2 | TABLE: Determination of Potential Ignition Sources (Resistive PIS) | | | | N/A |
|---|---|---|---|---|---|
| Circuit Location (x-y) | Operating Condition (Normal / Describe Single Fault) | Measured wattage or VA During first 30 s (W / VA) | Measured wattage or VA After 30 s (W / VA) | Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment) | Resistive PIS? Yes/No |
| 3) | 3) | 3) | 3) | 3) | 3) |

Supplementary information:

1) A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter. If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification.

2) A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.

3) All components located within the EUT are considered as resistive PIS.

| 8.5.5 | TABLE: High Pressure Lamp | N/A |
|---|---|---|
| Description | Values | Energy Source Classification |
| Lamp type.....: | -- | — |
| Manufacturer .....: | -- | — |
| Cat no. .....: | -- | — |
| Pressure (cold) (MPa).....: | -- | MS_ |
| Pressure (operating) (MPa) .....: | -- | MS_ |
| Operating time (minutes) .....: | -- | — |
| Explosion method.....: | -- | — |
| Max particle length escaping enclosure (mm) .: | -- | MS_ |
| Max particle length beyond 1 m (mm).....: | -- | MS_ |
| Overall result .....: | -- | |
| Supplementary information: | | |

| B.2.5 | TABLE: Input test | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| U (V) | Hz | I (A) | I rated (A) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status |
| Model: PMS-24V1K2W1BTD | | | | | | | | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 90 Vac | 50 | 15.6 | -- | 1373 | -- | F1/F2 | 15.6 | Load condition A |
| 100 Vac | 50 | 13.7 | 15 | 1355 | -- | F1/F2 | 13.7 | See above |
| 240 Vac | 50 | 5.60 | 7.5 | 1323 | -- | F1/F2 | 5.60 | See above. |
| 254 Vac | 50 | 5.31 | -- | 1321 | -- | F1/F2 | 5.31 | See above |
| 264 Vac | 50 | 5.14 | -- | 1318 | -- | F1/F2 | 5.14 | See above. |
| 90 Vac | 60 | 15.5 | -- | 1374 | -- | F1/F2 | 15.5 | See above |
| 100 Vac | 60 | 13.7 | 15 | 1356 | -- | F1/F2 | 13.7 | See above |
| 240 Vac | 60 | 5.61 | 7.5 | 1324 | -- | F1/F2 | 5.61 | See above. |
| 254 Vac | 60 | 5.32 | -- | 1321 | -- | F1/F2 | 5.32 | See above |
| 264 Vac | 60 | 5.15 | -- | 1319 | -- | F1/F2 | 5.15 | See above. |
| Model: PMS-48V1K2W1BTD | | | | | | | | |
| 90 Vac | 50 | 15.7 | -- | 1394 | -- | F1/F2 | 15.7 | Load condition E |
| 100 Vac | 50 | 13.9 | 15 | 1372 | -- | F1/F2 | 13.9 | See above |
| 240 Vac | 50 | 5.51 | 7.5 | 1298 | -- | F1/F2 | 5.51 | See above. |
| 254 Vac | 50 | 5.22 | -- | 1296 | -- | F1/F2 | 5.22 | See above |
| 264 Vac | 50 | 5.06 | -- | 1295 | -- | F1/F2 | 5.06 | See above. |
| 90 Vac | 60 | 15.7 | -- | 1393 | -- | F1/F2 | 15.7 | See above |
| 100 Vac | 60 | 13.9 | 15 | 1371 | -- | F1/F2 | 13.9 | See above |
| 240 Vac | 60 | 5.50 | 7.5 | 1296 | -- | F1/F2 | 5.50 | See above. |
| 254 Vac | 60 | 5.21 | -- | 1295 | -- | F1/F2 | 5.21 | See above |
| 264 Vac | 60 | 5.05 | -- | 1294 | -- | F1/F2 | 5.05 | See above. |

Supplementary information:

The measured input current at rated voltage shall be less than or equal to 110 % of rated current.

See "**Summary of testing**" for the detailed output load conditions.

| **B.3** | **TABLE: Abnormal operating condition tests** | P |
|---|---|---|
| Ambient temperature (°C) .....: | 25 °C, if not specified | — |
| Power source for EUT: Manufacturer, model/type, output rating .....: | -- | — |

| Component No. | Abnormal condition / Fault condition | Supply voltage, (V) | Test time (ms) | Fuse No. | Fuse current, (A) | T-couple | Temp. (°C) | Observation |
|---|---|---|---|---|---|---|---|---|
| Model: PMS-24V1K2W1BTD | | | | | | | | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ventilation openings | Blocked | 264Vac | 2.24h | F1/F2 | 5.14 ~ 0.27 | → | Highest temperature at: Ambient: 51.4°C, T1 coil : 86.0°C, T2 coil : 95.0°C, T401 coil: 62.4°C. | NB, NC, NT, I/P: 1319.80W ~ 17.94W. O/P: 5Vsb normal, others foldback. LC: A No hazards. |
| 24Vdc output | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 24W. O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal. LC: A No hazards. |
| 5Vsb output | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.08 | -- | -- | NB, NC, NT, I/P: 1300W. O/P: 24Vdc normal, 5Vsb shutdown, Fan1 & Fan2 normal. LC: A No hazards. |
| 24Vdc output | Overload | 264Vac | 7.52h | F1/F2 | 5.76 ~ 0 | → | Highest temperature at: Ambient: 51.9°C, T1 coil : 76.6°C, T2 coil : 82.7°C, T401 coil: 57.2°C. | NB, NC, NT. I/P=1482.30 W ~ 0.00W. Output overloaded up to 58.00A before 5Vsb normal, others oscillate. LC: A No hazards. |

| IEC 62368-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clause | Requirement + Test | | | | Result - Remark | | | Verdict |
| 5Vsb output | Overload | 264Vac | 11.53h | F1/F2 | 7.70 ~ 0 | → | Highest temperature at: Ambient: 70.9°C, T1 coil : 84.4°C, T2 coil : 87.0°C, T401 coil: 76.2°C. | NB, NC, NT. I/P=692.45 W ~ 670.65W. Output overloaded up to 2.60A before 24V normal, 5Vsb foldback. LC: B No hazards. |
| CN602 pin7/8 to CN102 (5Vsb to 24Vdc output) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.45 | -- | -- | NB, NC, NT, I/P: 18W. O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown. LC: A No hazards. |
| Model: PMS-48V1K2W1BTD | | | | | | | | |
| Ventilation openings | Blocked | 264Vac | 3.49h | F1/F2 | 2.58 ~ 0.25 | → | Highest temperature at: Ambient: 72.0°C, T2 coil: 95.9°C. | NB, NC, NT, I/P: 653.90W ~ 22.36W. O/P: 5Vsb normal, others oscillate. LC: F No hazards. |
| CN602 pin7/8 to CN102 (5Vsb to 48Vdc output) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W O/P: All shutdown. LC: E No hazards |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:

Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column “Abnormal/Fault.” Specify if test condition by indicating “Abnormal” then the condition for a Clause B.3 test or “Single Fault” then the condition for Clause B.4.

1) o-l: Overloaded; s-c: Short-circuited; o-c: Open-circuited.
2) The test result shown all safeguards remained effective and didn’t lead to a single fault condition during abnormal operating condition; besides, all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.
3) The overloaded condition is according to annex G.5.3.3.
4) See “**Summary of testing**” for the detailed output load conditions.
5) Maximum permitted temperature are as follows:
   - Winding wires (providing safety isolation):
     - T1, T2 of insulation system Class F, Tmax= 155°C (200°C-(70°C-25°C))
     - T401 of insulation system Class B, Tmax= 130°C (175°C-(70°C-25°C))

Abbreviations below may be used.

IP - Internal protection operated (list component)

CT - Constant temperatures were obtained

TW - Transformer winding opened

CD - Components damaged (list damaged components)

NB - No indication of dielectric breakdown

YB - Dielectric breakdown (indicate time and location)

NC - Cheesecloth remained intact

LC – Load Condition

I/P - Input

YC - Cheesecloth charred or flamed

NT - Tissue paper remained intact

YT - Tissue paper charred or flamed

RA - The unit can recover automatically when removing the abnormal condition

BT - Breaker trip (B type)

N - Frighten Noise

@ - Test repeat two more times with same results observed

O/P - Output

| **B.4** | **TABLE: Fault condition tests** | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| Ambient temperature (°C) .....: | | | | 25 °C, if not specified | | | | — |
| Power source for EUT: Manufacturer, model/type, output rating .....: | | | | -- | | | | — |
| Component No. | Fault condition | Supply voltage, (V) | Test time (ms) | Fuse No. | Fuse current, (A) | T-couple | Temp. (°C) | Observation |
| Model: PMS-24V1K2W1BTD | | | | | | | | |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DC Fan1 and Fan 2 | Stalled | 264Vac | 2.47h | F1/F2 | 5.14 ~ 0.00 | → | Highest temperature at: Ambient: 51.4°C, T1 coil : 97.7°C, T2 coil : 88.2°C, T401 coil: 66.6°C. | NB, NC, NT, I/P: 1318.60W ~ 0.00W. O/P: All output oscillate LC: A No hazards. |
| FL1 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No LC: A No hazards. |
| R10 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1311W, O/P: Normal. LC: A No hazards. |
| BD1, AC to - | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: BD1. LC: A No hazards. |
| BD1, AC to + | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: BD1. LC: A No hazards. |
| C2 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: C1, BD1. LC: A No hazards. |

| IEC 62368-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clause | Requirement + Test | | | | | Result - Remark | | Verdict |
| IC51 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 20.1W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC51 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 20.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC51 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 20.6W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC51 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 20.6W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IC52 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC52 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.34 | -- | -- | NB, NC, NT, I/P: 20.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC52 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.0 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC52 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC53 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC53 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 8.2W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IC53 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC53 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC54 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.24 | -- | -- | NB, NC, NT, I/P: 0.3W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC54 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.1 | -- | -- | NB, NC, NT, I/P: 1301W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC54 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC54 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

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| IC60 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.323 | -- | -- | NB, NC, NT, I/P: 18.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC60 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1309W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC60 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.322 | -- | -- | NB, NC, NT, I/P: 18.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| IC60 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.321 | -- | -- | NB, NC, NT, I/P: 18.4W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| IC404 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.24 | -- | -- | NB, NC, NT, I/P: 0.5W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC404 pin 3 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.245 | -- | -- | NB, NC, NT, I/P: 0.5W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC404 pin 1 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 0.9W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| IC404 pin 4 | Open-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 0.89W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| T1 pin 1 to pin 2 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T1 pin 1 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T1 pin 2 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T2 pin 1 to pin 2 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T2 pin 1 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| T2 pin 2 to pin 3 | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output, CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| T401 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output.<br>LC: A<br>No hazards. |
| T401 pin 4 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output.<br>LC: A<br>No hazards. |
| Q4 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.45 | -- | -- | NB, NC, NT, I/P: 18W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| Q4 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | | NB, NC, NT, IP: F1, F2 open, O/P: No output.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Q4 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | | NB, NC, NT, IP: F1, F2 open, O/P: No output.<br>LC: A<br>No hazards. |
| Q1 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | | NB, NC, NT, I/P: 0.3W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| Q1 G to D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output. CD: IC32, R464, R73, Q31, R468.<br>LC: A<br>No hazards. |
| Q1 D to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401 open immediately, O/P: No output. CD: IC32, R464, R73, Q31.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | | | | Result - Remark | | | Verdict |
| Q5 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.285 | -- | -- | NB, NC, NT, I/P: 20W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| Q5 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| Q5 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| Q6 G to S | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.298 | -- | -- | NB, NC, NT, I/P: 21W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| Q6 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Q6 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output. CD: D11, D12, D13, Q6.<br>LC: A<br>No hazards. |
| CN603 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: 24Vdc normal, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| R305 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.08 | -- | -- | NB, NC, NT, I/P: 1306W, O/P:<br>Normal, CN603 pin 1 to pin 2: 5.02Vdc.<br>LC: A<br>No hazards. |
| D304 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 5.1W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |
| IC303 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: Normal, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| IC303 pin 1 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: Normal, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |
| IC303 pin 2 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.13 | -- | -- | NB, NC, NT, I/P: 1313W, O/P: Normal, CN603 pin 1 to pin 2: 0V.<br>LC: A<br>No hazards. |
| T1 pin A to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 30W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T1 pin B to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 30W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T1 pin A to pin B | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 30W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | | | | Result - Remark | | | Verdict |
| T401 pin 10 to pin 12 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| T401 pin 7 to pin 8 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.23 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| L2 pin 4 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| CT1 pin 1 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.22 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| CT1 pin 4 to pin 5 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.21 | -- | -- | NB, NC, NT, I/P: 3.8W, O/P: 24Vdc shutdown, 5Vsb shutdown, Fan1 & Fan2 shutdown.<br>LC: A<br>No hazards. |
| RL1 pin 2 | Open-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| L3 pin 2 to pin 7 | Short-circuited | 264Vac | 5 min. | F1/F2 | 5.12 | -- | -- | NB, NC, NT, I/P: 1310W, O/P: Normal.<br>LC: A<br>No hazards. |
| IC36 pin 2 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.2 | -- | -- | NB, NC, NT, I/P: 0.6W, IP: F401<br>open immediately, O/P: No output, CD: IC36, ZD403. LC: A<br>No hazards. |
| T4 pin 9 to pin 10 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.3 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |

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| Clause | Requirement + Test | | | | Result - Remark | | | Verdict |
| T4 pin 6 to pin 7 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.3 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T4 pin 2 to pin 4 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.28 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 24Vdc shutdown, 5Vsb normal, Fan1 & Fan2 normal.<br>LC: A<br>No hazards. |
| T1 Pin C, D to GND before R232 | Overload | 90Vac | 9.5h | F1/F2 | 15.55~ 0.27 | → | Highest temperature at:<br>Ambient: 70.6°C,<br>T1 coil : 91.6°C,<br>T2 coil : 96.2°C,<br>T401 coil: 79.2°C. | NB, NC, NT. I/P=1386W ~ 20.7W. Output overloaded up to 24.00A before 5Vsb normal, others oscillate.<br>LC: B<br>No hazards. |
| T401 Pin 10 after D303 to GND | Overload | 90Vac | 3.52h | F1/F2 | 7.82 ~ 0.06 | → | Highest temperature at:<br>Ambient: 70.2°C,<br>T1 coil : 84.3°C,<br>T2 coil : 86.8°C,<br>T401 coil: 78.6°C. | NB, NC, NT. I/P=705W ~ 0.1W. Output overloaded up to 1.50A before all foldback.<br>LC: B<br>No hazards. |
| Model: PMS-48V1K2W1BTD | | | | | | | | |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| DC Fan1 | Stalled | 264Vac | 2.84h | F1/F2 | 2.58 ~ 0.23 | → | Highest temperature at:<br>Ambient: 71.6°C, Tmax: T1 core: 89.0°C. | NB, NC, NT, I/P: 653.70W ~<br>17.76W. O/P: 5Vsb normal, others foldback<br>LC: F<br>No hazards. |
| DC Fan2 | Stalled | 264 | 2.98h | F1/F2 | 2.58 ~ 0.23 | → | Highest temperature at:<br>Ambient: 72.7°C, Tmax: T1 core: 92.9°C. | NB, NC, NT, I/P: 653.80W ~<br>18.03W. O/P: 5Vsb normal, others foldback<br>LC: F<br>No hazards. |
| T1 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | → | Highest temperature at:<br>Ambient: 72.0°C, Tmax: T2 coil : 95.9°C. | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: F<br>No hazards. |
| T1 pin 1 to pin 3 ((=T2 pin2 to pin3) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards. |
| T1 pin 2 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards. |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| T2 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 48Vdc shutdown, 5Vsb normal. LC: E No hazards. |
| T2 pin 1 to pin 3 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 48Vdc shutdown, 5Vsb normal LC: E No hazards. |
| T2 pin 2 to pin 3(=T1 pin1 to pin3) | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P: 48Vdc shutdown, 5Vsb normal. LC: E No hazards |
| T401 pin 1 to pin 2 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W, O/P: All shutdown. LC: E No hazards |
| T401 pin 4 to pin 6 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W, O/P: All shutdown. LC: E No hazards |
| Q4 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open, O/P: No output CD: Q4, R43, R45, D48. LC: E No hazards |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| Q4 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: Q4, R42<br>LC: E<br>No hazards |
| Q5 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |
| Q5 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |
| Q6 G to D | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |
| Q6 D to S | Short-circuited | 264Vac | Immed. | F1/F2 | -- | -- | -- | NB, NC, NT, IP: F1, F2 open,<br>O/P: No output CD: D11, D12, D13, Q6, Q5. LC: E<br>No hazards |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| 48Vdc output | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22 W<br>O/P: 48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| 5Vsb output | Short-circuited | 264Vac | 5 min. | F1/F2 | 4.99 | -- | -- | NB, NC, NT, I/P: 1277W<br>O/P: 48Vdc Normal , 5Vsb Shutdown. LC: E<br>No hazards |
| T1 pin A to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| T1 pin B to pin C/D | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| T1 pin A to pin B | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.26 | -- | -- | NB, NC, NT, I/P: 22W, O/P:<br>48Vdc shutdown, 5Vsb normal. LC: E<br>No hazards |
| T401 pin 10 to pin 12 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W<br>O/P: All shutdown. LC: E<br>No hazards |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| T401 pin 7 to pin 8 | Short-circuited | 264Vac | 5 min. | F1/F2 | 0.19 | -- | -- | NB, NC, NT, I/P: 2.8W<br>O/P: All shutdown.<br>LC: E<br>No hazards |
| T1 pin C,D to GND before R232 | Overload | 90Vac | 3.68h | F1/F2 | 20.36 ~ 0.06 | → | Highest temperature at: Ambient= 50.8°C, T1 core= 99.1°C. | NB, NC, NT. I/P=1822.40 W ~ 0.04W.<br>Output overloaded up to 6.00A before all fold back,<br>LC: E<br>No hazards |
| T1 pin C,D to GND before R232 | Overload | 90Vac | 11.2h | F1/F2 | 12.51 ~ 0.33 | → | Highest temperature at: Ambient= 72°C, T1 core= 95.5°C. | NB, NC, NT. I/P=1121.80 W ~<br>26.44W. Output overloaded up to 10.00A before 5Vsb foldback, others other state.<br>LC: F<br>No hazards |
| T401 pin 10 after D303 to GND | Overload | 90Vac | 8.67h | F1/F2 | 7.75 ~ 0.07 | → | Highest temperature at: Ambient= 71.5°C, T1 core= 93.8°C. | NB, NC, NT. I/P=694.60 W ~ 0.05W.<br>Output overloaded up to 2.40A before 5Vsb foldback, others other state.<br>LC: F<br>No hazards |

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| Clause | Requirement + Test | Result - Remark | Verdict |

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| 48Vdc output | Overload | 264Vac | 7.16h | F1/F2 | 5.80 ~ 0.24 | → | Highest temperature at: Ambient= 50.8°C, T1 core= 88.0°C. | NB, NC, NT. I/P=1493.90 W ~ 13.79W. Output overloaded up to 30.00A before all output foldback. LC: E No hazards |
| 48Vdc output | Overload | 264Vac | 6.32h | F1/F2 | 2.96 ~ 0.25 | → | Highest temperature at: Ambient= 71.1°C, T1 coil near Q102 (sec.)= 89.8°C. | NB, NC, NT. I/P=752.50 W ~ 23.42W. Output overloaded up to 16.50A before all output foldback. LC: F No hazards |
| 5Vsb output | Overload | 264Vac | 11.2h | F1/F2 | 0.25 ~ 0.23 | -- | Highest temperature at: Ambient= 71.9°C, T401 coil= 76.1°C. | NB, NC, NT. I/P=23.22W ~ 17.44W. Output overloaded up to 2.40A before 5Vsb fold back. LC: D No hazards |

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| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information:

1) o-l: Overloaded; s-c: Short-circuited; o-c: Open-circuited.
2) The test result shown no accessible parts become Class 3 level during and after single fault condition.
3) See "**Summary of testing**" for the detailed output load conditions.
4) Maximum permitted temperature are as follows:
   - Winding wires (providing safety isolation):
     - T1, T2 of insulation system Class F, Tmax= 155°C (200°C-(70°C-25°C))
     - T401 of insulation system Class B, Tmax= 130°C (175°C-(70°C-25°C))

Abbreviations below may be used.

IP - Internal protection operated (list component)
CT - Constant temperatures were obtained
TW - Transformer winding opened
CD - Components damaged (list damaged components)
NB - No indication of dielectric breakdown
YB - Dielectric breakdown (indicate time and location)
NC - Cheesecloth remained intact
LC – Load Condition
I/P - Input
YC - Cheesecloth charred or flamed
NT - Tissue paper remained intact
YT - Tissue paper charred or flamed
RA - The unit can recover automatically when removing the abnormal condition
BT - Breaker trip (B type)
N - Frighten Noise
@ - Test repeat two more times with same results observed
O/P - Output

| **Annex M** | **TABLE: Batteries** | | | | | | | | | N/A |
|---|---|---|---|---|---|---|---|---|---|---|
| The tests of Annex M are applicable only when appropriate battery data is not available | | | | | | | | | | N/A |
| Is it possible to install the battery in a reverse polarity position?.....: | | | | | | | -- | | | N/A |
| | Non-rechargeable batteries | | | Rechargeable batteries | | | | | | |
| | Discharging | | Un-intentional charging | Charging | | Discharging | | Reversed charging | | |
| | Meas. current | Manuf. Specs. | | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | |
| Max. current during normal condition | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Max. current during fault condition | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| | | | | | | | | | | |
| Test results: | | | | | | | -- | | | Verdict |
| - Chemical leaks | | | | | | | -- | | | N/A |
| - Explosion of the battery | | | | | | | -- | | | N/A |

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| - Emission of flame or expulsion of molten metal | -- | N/A |
| - Electric strength tests of equipment after completion of tests | -- | N/A |
| Supplementary information: | | |

| **Annex M.4** | **Table: Additional safeguards for equipment containing secondary lithium batteries** | N/A |
|---|---|---|

| Battery/Cell No. | Test conditions | Measurements | | | Observation |
|---|---|---|---|---|---|
| | | U | I (A) | Temp (C) | |
| -- | Normal | -- | -- | -- | -- |
| -- | Abnormal | -- | -- | -- | -- |
| -- | Single fault –SC/OC | -- | -- | -- | -- |
| -- | Normal | -- | -- | -- | -- |
| -- | Abnormal | -- | -- | -- | -- |
| -- | Single fault – SC/OC | -- | -- | -- | -- |

Supplementary Information:

| Battery identification | Charging at $T_{lowest}$ (°C) | Observation | Charging at $T_{highest}$ (°C) | Observation |
|---|---|---|---|---|
| -- | -- | -- | -- | -- |

Supplementary Information:

| **Annex Q.1** | **TABLE: Circuits intended for interconnection with building wiring (LPS)** | N/A |
|---|---|---|

Note: Measured UOC (V) with all load circuits disconnected:

| Output Circuit | Components | $U_{oc}$ (Vdc) | $I_{sc}$ (A) | | S (VA) | |
|---|---|---|---|---|---|---|
| | | | Meas. | Limit | Meas. | Limit |
| -- | -- | -- | -- | -- | -- | -- |

Supplementary information:
SC = Short-circuited; OC = Open-circuited.

| **T.2, T.3, T.4, T.5** | **TABLE: Steady force test** | N/A |
|---|---|---|

| Part/Location | Material | Thickness (mm) | Force (N) | Test duration (sec) | Observation |
|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- |

Supplementary information:

| **T.6, T.9** | **TABLE: Impact tests** | N/A |
|---|---|---|

| IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| Part/Location | Material | Thickness (mm) | Vertical distance (mm) | Observation |
|---|---|---|---|---|
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |

| T.7 | TABLE: Drop tests | | | N/A |
|---|---|---|---|---|
| Part/Location | Material | Thickness (mm) | Drop height (mm) | Observation |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |

| T.8 | TABLE: Stress relief test | | | | N/A |
|---|---|---|---|---|---|
| Part/Location | Material | Thickness (mm) | Oven temperature (°C) | Duration (h) | Observation |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Customer's Testing Facility according to CTF stage 1 procedure has been used.

All applicable tests were conducted before equipment's calibration due date.

Below for the tests performed from 24 August, 2020 to 25 August, 2020 at CTF1.

| Instr. Code | Instrument I.D. | Instrument Type | Range Used and/or Function Used | Make and Model | Calibration Date | |
|---|---|---|---|---|---|---|
| | | | | | Last | Due |
| See attachments attached behind all test datasheet for details. | | | | | | |
| 3 | E18-1641 | DC Load | 80V/60A | Chroma, 6334 | 2019-11-28 | 2020-11-27 |
| 8 | E18-2066 | DC Load | 80V/60A | Chroma, 6334 | 2020-06-17 | 2021-06-16 |
| 13 | E18-2230 | DC Load | 80V/60A | Chroma, 6334 | 2019-10-18 | 2020-10-17 |
| 52 | E18-T147 | AC Voltage converter | 300V/10A | Toptek, TK-2010 | N.C | N.C |
| 55 | E18-T195 | AC Voltage converter | 300V/19A | Toptek, TK-2020 | N.C | N.C |
| 73 | E09-231 | Power Meter (CF=3) | (A) 500V/10A (B) 500V/3A (C) 500V/0.3A | Chroma, 2100 | 2020-03-09 | 2021-03-08 |
| 95 | E07-1088 | Oscilloscope | 300MHS 2.5GS/s | Tektronix,TDS3032C | 2019-09-16 | 2020-09-15 |
| 99 | E26-064 | Touch Current Tester | 0-10mA | EXTECH 7630 | 2020-08-16 | 2021-08-15 |
| 106 | E20-329 | High Voltage Probe | 20kV DC / 40kV pk / 100M ohm / 3.0pF | Tektronix P6015A | 2020-05-18 | 2021-05-17 |
| 109 | E24-715 | Thermo-Hygrometer | 30-85%RH/ ~ 15-40°C | DICKSON,TM320 | 2020-03-17 | 2021-03-16 |
| 139 | E10-883 | Digital Multi-meter | DCV/1000V, DCA/10A, 10 ohm~19M ohm | ZENTECH, 2041 | 2019-10-17 | 2020-10-16 |
| E | TF-02 | Capacitance Discharge Test Fixture | N/A | DELTA | N.C | N.C |

Below for the tests performed from 07 February, 2023 to 10 February, 2023 at CTF1.

| Instr. Code | Instrument I.D. | Instrument Type | Range Used and/or Function Used | Make and Model | Calibration Date | |
|---|---|---|---|---|---|---|
| | | | | | Last | Due |
| See attachments attached behind all test datasheet for details. | | | | | | |
| 11 | E18-2104 | DC Load | 80V/60A | Chroma, 6334 | 2022-10-05 | 2023-10-04 |
| 12 | E18-2229 | DC Load | 80V/60A | Chroma, 6334 | 2022-10-05 | 2023-10-04 |
| 19 | E18-1767 | DC Load | 64V/60A 256V/10A | Chroma, 6304 | 2022-12-16 | 2023-12-15 |
| 30 | E18-1065 | DC Load | 80V/240A | Chroma, 63112 | 2022-08-24 | 2023-08-23 |
| 31 | E18-2305 | DC Load | 80V/240A | Chroma,63112 | 2022-09-23 | 2023-09-22 |
| 42 | E18-1530 | AC converter | 300V/125A 45Hz~120Hz | IDRC CIF-1530AP | N.C | N.C |
| 45 | E18-2054 | AC Voltage converter | 300V/19A | IDRC PS-102EX | N.C | N.C |

| | | | | | | |
|---|---|---|---|---|---|---|
| 52 | E18-T147 | AC Voltage converter | 300V/10A | Toptek, TK-2010 | N.C | N.C |
| 67 | E24-844 | Temp. Chamber | Ambient: 90°C | Longwin, LW-9022H-RS | 2022-03-16 | 2023-03-15 |
| 73 | E09-231 | Power Meter (CF=3) | (A) 500V/10A (B) 500V/3A (C) 500V/0.3A | Chroma, 2100 | 2022-01-26 | 2023-01-25 |
| 74 | E09-282 | Digital Power Meter (CF=4) | (H)500V/20A (L)500V/2A | Chroma, 66202 | 2022-04-27 | 2023-04-26 |
| 89 | E10-2317 | Temp. collector | (T) T-type: 0°C - 200°C | KEYSIGHT,34970A | 2022-10-06 | 2023-10-05 |
| 91 | E24-751 | Chamber (4F Environment Test Room) | 20-95%RH / -40°C-150°C | Terchy, MHE-408AJ | 2022-10-26 | 2023-10-25 |
| 95 | E07-1088 | Oscilloscope | 300MHS 2.5GS/s | Tektronix,TDS3032C | 2022-10-05 | 2023-10-04 |
| 97 | E12-317 | Electrical Safety Analyzer | 5KVac/6KVdc/ 40A (500VA) | Chroma 19032-P | 2022-06-01 | 2023-05-31 |
| 98 | E12-210 | Withstanding Voltage Tester | 10KV (>500VA) | KiKusui, Tos5101 | 2022-08-02 | 2023-02-01 |
| 99 | E26-064 | Touch Current Tester | 0-10mA | EXTECH 7630 | 2022-07-31 | 2023-07-30 |
| 117 | E22-800 (LAB) | Caliper | 150mm/6in | Mitutoyo Digmatic | 2022-09-28 | 2023-09-27 |
| 142 | E08-191 | Timer | 24Hrs | Timer | 2022-08-10 | 2023-08-09 |
| 150 | E24-987 | Thermo-Hygrometer | 10-95%RH/ ~ 0-55°C | T&D, TR-72nw | 2022-07-26 | 2023-07-25 |
| O | N/A | Cheese cloth | 39.2 g/m$^2$ | ED&D ,ACC-01 | N.C | N.C |
| P | N/A | Tissue paper | 20.5 g/m$^2$ | ED&D,ATP-01 | N.C | N.C |
| AC | E21-388 | Dielectric strength test instrument(IEC 60065,Figure 6) | 100g | DELTA | 2022-12-05 | 2025-12-04 |

| 5.1 | TABLE: Evaluation of voltage limiting components in SELV circuits | | P |
|---|---|---|---|
| Component (measured between) | max. voltage (V) (normal operation) | | Voltage Limiting Components |
| | V peak | V d.c. | |
| Model: PMS-24V1K2W1BTD | | | |
| T1 pin A to GND (CN101) | 40.8 | -- | -- |
| T1 pin B to GND (CN101) | 39.6 | -- | -- |
| T1 pin C, D to GND (CN101) | 24.6 | -- | -- |
| T401 pin 10 to pin 12 | 36.0 | -- | -- |
| T401 pin 8 to pin 7 | 26.0 | -- | -- |
| Model: PMS-48V1K2W1BTD | | | |
| T1 pin A to pin C, D | 72.4 | -- | -- |
| T1 pin B to pin C, D | 68.8 | -- | -- |
| T1 pin B to GND (CN101) | 118 | -- | -- |
| T1 pin A to GND (CN101) | 122 | -- | -- |
| T1 pin A after R226 to GND (CN101) | 113 | -- | -- |
| T1 pin A after Q104(D-S) to GND (CN101) | 0.98 | -- | Q104(D-S) |
| T1 pin A after Q104(D-G) to GND (CN101) | 9.4 | -- | Q104(D-G) |
| T1 pin A after Q102(D-G) to GND (CN101) | 9.3 | -- | Q102(D-G) |
| T1 pin A after R224 to GND (CN101) | 112 | -- | -- |
| T1 pin A after IC102 Pin 5,1 to GND (CN101) | 0.7 | -- | IC102 Pin 5,1 |
| T1 pin A after IC102 Pin 6 to GND (CN101) | 13.4 | -- | IC102 Pin 6 |
| T1 pin A after IC102 Pin 3 to GND (CN101) | 3.08 | -- | IC102 Pin 3 |
| T1 pin C, D to GND (CN101) | -- | 51.2 | -- |
| T401 pin 10 to pin 12 | 36.0 | -- | -- |
| T401 pin 8 to pin 7 | 23.0 | -- | -- |
| Fault test performed on voltage limiting components | Voltage measured (V) (V peak or V d.c.) | | |
| Model: PMS-48V1K2W1BTD | | | |
| Q104(D-S) short | 0.4Vdc | | |
| Q104(D-G) short | 0.4Vdc | | |
| Q102(D-G) short | 0.4Vdc | | |
| IC102 Pin( 4-5,1) short | 48.4Vdc | | |
| IC102 Pin( 4-2) short | 48.8Vdc | | |
| IC102 Pin(4- 6) short | 49.2Vdc | | |
| IC102 Pin(4- 3) short | 48.0Vdc | | |
| IC102 Pin(4- 8) short | 48.8Vdc | | |
| C101 short | 48.8Vdc | | |

| |
|---|
| Supplementary information:<br>Input voltage: 240 Vac/60 Hz |

| **5.4.1.8** | **TABLE: Working voltage measurement** | | P |
|---|---|---|---|
| Location | RMS voltage (V) | Peak voltage (V) | Comments |
| Model: PMS-24V1K2W1BTD | | | |
| Transformers (T1, T2): | | | |
| T1 pin 1 to pin A | 186 | 385 | Test at 240Vac, 60Hz, load condition A |
| T1 pin 1 to pin B | 163 | 337 | See above |
| T1 pin 1 to pin C, D | 172 | 361 | See above |
| T1 pin 1 to CN101 (sec. GND) | 173 | 385 | See above |
| T1 pin 2 to pin A | 162 | 316 | See above |
| T1 pin 2 to pin B | 173 | 337 | See above |
| T1 pin 2 to pin C, D | 166 | 305 | See above |
| T1 pin 2 to CN101 (sec. GND) | 168 | 329 | See above |
| T1 pin 3 to pin A | 190 | 411 | See above |
| T1 pin 3 to pin B | 192 | 417 | See above |
| T1 pin 3 to pin C, D | 189 | 382 | See above |
| T1 pin 3 to CN101 (sec. GND) | 191 | 406 | See above |
| T2 pin 1 to pin A | **263*** | **512*** | See above |
| T2 pin 1 to pin B | 219 | 429 | See above |
| T2 pin 1 to pin C, D | 238 | 462 | See above |
| T2 pin 1 to CN101 (sec. GND) | 240 | 486 | See above |
| T2 pin 2 to pin A | 186 | 385 | See above |
| T2 pin 2 to pin B | 163 | 337 | See above |
| T2 pin 2 to pin C, D | 172 | 361 | See above |
| T2 pin 2 to CN101 (sec. GND) | 175 | 385 | See above |
| T2 pin 3 to pin A | 190 | 411 | See above |
| T2 pin 3 to pin B | 192 | 417 | See above |
| T2 pin 3 to pin C, D | 189 | 382 | See above |
| T2 pin 3 to CN101 (sec. GND) | 192 | 407 | See above |
| T2 pin 1 to pin A | 253 | 484 | Test at 100Vac, 60Hz, load condition A |
| Transformer (T401): | | | |
| T401 pin 1 to pin 7 | 173 | 412 | Test at 240Vac, 60Hz, load condition A |
| T401 pin 1 to pin 8 | 170 | 380 | See above |

| | | | |
|---|---|---|---|
| T401 pin 1 to pin 10 | 172 | 368 | See above |
| T401 pin 1 to pin 12 (GND) | 172 | 416 | See above |
| T401 pin 2 to pin 7 | 170 | 352 | See above |
| T401 pin 2 to pin 8 | 170 | 360 | See above |
| T401 pin 2 to pin 10 | 170 | 372 | See above |
| T401 pin 2 to pin 12 (GND) | 170 | 360 | See above |
| T401 pin 4 to pin 7 | 379 | 640 | See above |
| T401 pin 4 to pin 8 | 376 | 632 | See above |
| T401 pin 4 to pin 10 | 380 | 620 | See above |
| T401 pin 4 to pin 12 (GND) | 383 | **652*** | See above |
| T401 pin 6 to pin 7 | 327 | 352 | See above |
| T401 pin 6 to pin 8 | 328 | 460 | See above |
| T401 pin 6 to pin 10 | 332 | 476 | See above |
| T401 pin 6 to pin 12 (GND) | 331 | 444 | See above |
| T401 pin 4 to pin 12 (GND) | **419*** | 640 | Test at 100Vac, 60Hz, load condition A |
| Model: PMS-48V1K2W1BTD | | | |
| T1 pin 3 to pin B | 211 | 450 | Test at 240Vac, 60Hz, load condition E |
| T2 pin 1 to pin A | **278*** | **480*** | See above |
| T401 pin 4 to pin 12 (GND) | **375*** | **640*** | See above |
| T401 pin 4 to pin 8 | 191 | 545 | See above |

Supplementary information:

1. The unit was connected to 240 Vac, 60 Hz.
2. An asterisk indicates the highest measured working voltage.
3. All other trace to trace measurements have been < 420 Vpk and < 250 Vrms.
4. Working frequency of T2: 98kHz max. for PMS-24V1K2W1BTD.
6. See "**Summary of testing"** for the detailed load conditions.

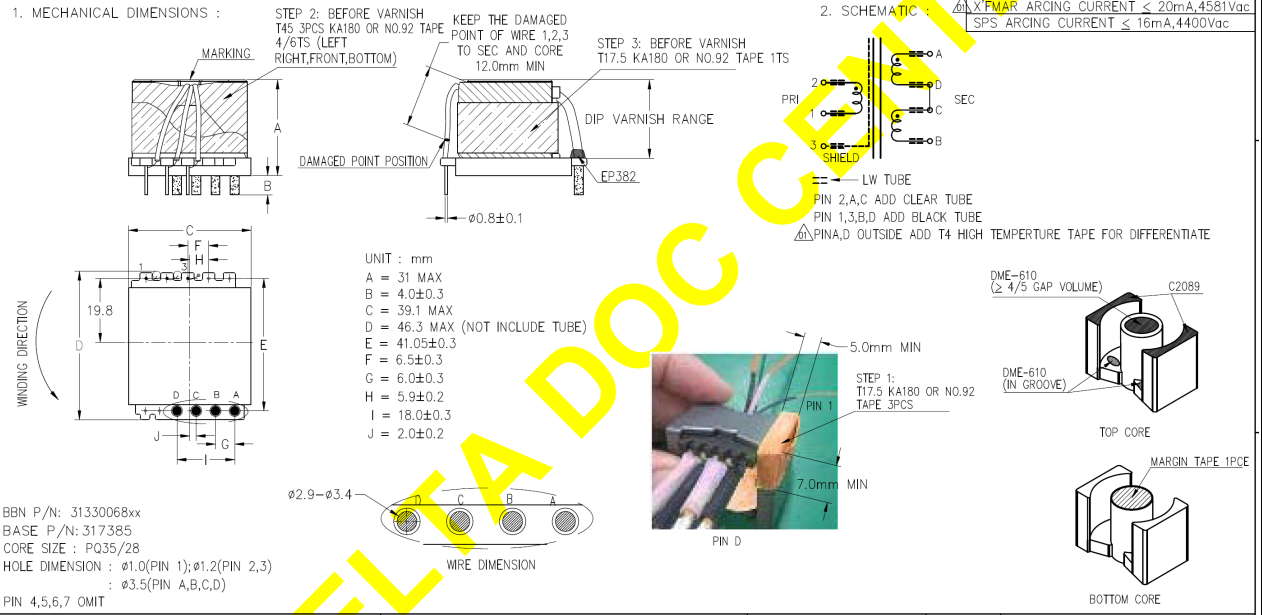
| **G.5.3.2** | **TABLE: Transformers** | | | | | | P |
|---|---|---|---|---|---|---|---|
| Loc. | Tested insulation | Working voltage peak / V (5.4.1.8) | Working voltage rms / V (5.4.1.8) | Required electric strength (5.4.9) | Required clearance / mm (5.4.2) | Required creepage distance / mm (5.4.3) | Required distance thr. insul. (5.4.4) |
| T1, T2 (type MV-MPS16030-A) | Primary to secondary (RI) | 512 | 263 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 5.4 | 0.4 mm or 2 layers min. or TIW |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Primary to core (RI) | 512 | 263 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 5.4 | 0.4 mm or 2 layers min. or TIW |
| | Core to secondary (OP) | -- | -- | -- | -- | -- | -- |
| Loc. | Tested insulation | | | Test voltage/ V | Measured clearance / mm | Measured creepage dist./ mm | Measured distance thr. insul. / mm; number of layers |
| Internal: | | | | | | | |
| T1, T2 (type MV-MPS16030-A) | Primary windings to secondary windings (RI) | | | See appended table 5.4.9 | TIW on primary wire used | TIW on primary wire used | TIW |
| | Primary windings to secondary core (RI) | | | See appended table 5.4.9 | TIW on primary wire used | TIW on primary wire used | TIW |
| | Secondary core to secondary winding exits (OP) | | | -- | -- | -- | -- |
| External: | | | | | | | |
| T1, T2 (type MV-MPS16030-A) | Primary solder pin to secondary solder pin (RI) | | | See appended table 5.4.9 | 41.0 | 41.0 | -- |
| | Primary winding exits/solder pin to secondary winding (RI) | | | See appended table 5.4.9 | 12.0 | 12.0 | -- |
| | Primary winding exits/solder pin to secondary core (RI) | | | See appended table 5.4.9 | 12.0 | 12.0 | -- |
| Supplementary information:<br>The equipment to be operated up to 5000 m above sea level, each clearance multiplied with an altitude correction factor of 1.48.<br>TIW denotes Triple Insulated Wire. | | | | | | | |

| **G.5.3.2** | **TABLE: Transformers** | P |
|---|---|---|
| Construction of transformer (T1, T2), type MV-MPS16030-A: | | |

| TEST TERMINAL | TEST CONDITION | L(uH) | Lk(uH) | DCR(mΩ) | TURN RATIO(mV) | TURNS | WIRE GAUGE | HI-POT TEST @50Hz/60Hz,2s |
|---|---|---|---|---|---|---|---|---|
| 2-1 | 40kHz,1V | 75±5% | 9.3 MAX | 34.6 MAX | 20kHz,1V | 17 | ø0.5x3 TRW(F)-M | PRI TO SEC 4581Vac △01 |
| SHIELD TO PIN3 | | | SEC SHORT | | | △01 3/4 | T15x0.001"Cu | SEC TO CORE 500Vac; PRI TO CORE 3000Vac |
| A-D } BIFILAR | | | | 11 MAX | 235.3±5% | 4 | ø0.1x350C 2UEWN MW80 | PRI TO PRI 500Vac |
| C-B } | | | | 11 MAX | 235.3±5% | 4 | △02 ø0.1x350C 2UEWN MW80 | INDUCED VOLTAGE |
| | | | | | | | | L(2-1) 1.0KVo-p MAX/1s |
| | | | | | | | | L(A,C-B,D) 1.0KVo-p MAX/1s A SHORT C,B SHORT D WHEN TEST |
| | | | | | | | | LEAKAGE CURRENT ≤ 1.0mA |
| | | | | | | | | △01 X'FMAR ARCING CURRENT ≤ 20mA,4581Vac |
| | | | | | | | | SPS ARCING CURRENT ≤ 16mA,4400Vac |

1. MECHANICAL DIMENSIONS :




2. SCHEMATIC :










| Vendor P/N: MV-MPS16030-A | THIRD ANGLE PROJECTION | DESCRIPTION: TRANSFORMER |
|---|---|---|
| Drawn: 葛麗華 05/22'17 | A4 SIZE | PART NO.: 2870534800 REV. 04 |
| Design: 朱少華 05/22'17 | | SHEET 2 OF 4 |

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DIMENSIONAL TOLERANCES

( ) <30 : ±0.25; >30~100 : ±0.35; >100~300 : ±0.5; ABOVE 300 : ±0.6; HOLES : ±0.05

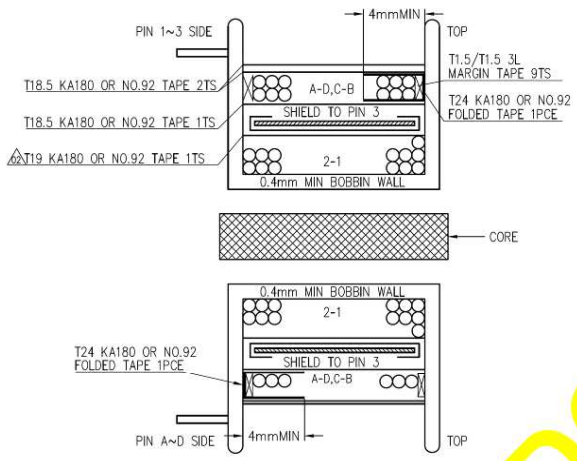
(✓) DECIMALS X : ±0.3; X.X : ±0.2; X.XX : ±0.1; ANGLES : ±0.5°

( ) UP~100 : ±0.2; 100~150 : ±0.25; 150~200 : ±0.3; 200~250 : ±0.35; 250~300 : ±0.4; 300~350 : ±0.45; 350~400 : ±0.5

( ) UP~600 : ±1.5; 600~900 : ±2.4; 900~OVER: ±3.1

SCALE | UNIT mm | USED ON

3. WINDING CONSTRUCTION : △01



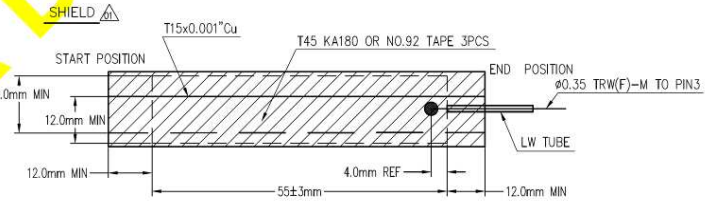

4. PACKAGE MUST BE IN COMPLIANCE WITH PACKING SPEC. NO. : 3526436000
103.5g/PC 14.75Kg/CARTON 128PCS/CARTON

5. MARKING OR LASER MARKING : ON THE TOP BLACK INK

MP-155G (00)
MV-MPS16030-A DELTA
XXXX(XX) **

XX : REV NO.
XXXX : DATE CODE
** : WORKING TEAM
□ : PLANT CODE
DET : DELTA THAILAND PLANT
DCWM : DELTA WUJIANG PLANT
DCUM : DELTA WUHU PLANT
DCZM : DELTA CHENZHOU PLANT
OK LABEL MUST STAMPED UL MARK AND "OBJY2"

6. CORE GAP : 0.92mm REF (ON THE CENTER OF TOP CORE)
7. VARNISH :BC-346-A (VACUUM)(CONSISTENCY 14±1 SEC)
8. FOR ENVIRONMENT CONCERNS , ALL PARTS MUST FOLLOW DELTA'S SPECIFICATION "10000-0162"(THE MANAGEMENT STANDARDS FOR ENVIRONMENT-RELATED SUBSTANCE.)
9. ø0.1x350C WIRE TWIST: 40±5(TURNS/M)
10. SAFETY DISTANCE DESIGN :PRI TO SEC 12.0mm MIN
PRI TO CORE 12.0mm MIN
CORE IS SEC
11. BASE AND BOTTOM CORE FIX TOGETHER WITH DME-610( > 4/5 BASE VOLUME)
12. WINDING(A-D);(C-B) FROM TOP TO TOP; WINDING(2-1) FROM TOP TO TOP;
13. THE TUBES OF PIN 1,2,3 NEED TO BE INTO THE SLOT FOR MEETING D DIMENSION.
14. SHIELD DIRECTION IS SAME AS WINDING DIRECTION.
15. ADD TEST SEC TO SEC 200Vac,ARCING CURRENT ≤ 10mA




| Vendor P/N: MV-MPS16030-A | THIRD ANGLE PROJECTION | DESCRIPTION: TRANSFORMER |
|---|---|---|
| Drawn: 葛麗華 05/22'17 | A4 SIZE | PART NO.: 2870534800 REV. 04 |
| Design: 朱少華 05/22'17 | | SHEET 3 OF 4 |

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DIMENSIONAL TOLERANCES

( ) <30 : ±0.25; >30~100 : ±0.35; >100~300 : ±0.5; ABOVE 300 : ±0.6; HOLES : ±0.05

(✓) DECIMALS X : ±0.3; X.X : ±0.2; X.XX : ±0.1; ANGLES : ±0.5°

( ) UP~100 : ±0.2; 100~150 : ±0.25; 150~200 : ±0.3; 200~250 : ±0.35; 250~300 : ±0.4; 300~350 : ±0.45; 350~400 : ±0.5

( ) UP~600 : ±1.5; 600~900 : ±2.4; 900~OVER: ±3.1

SCALE | UNIT mm | USED ON

16. MATERIAL LIST :

| NO. | PART | MANUFACTURER | MANUFACTURER PART NO. | DESCRIPTION | UL FILE NO. |
|---|---|---|---|---|---|
| 1 | BOBBIN | SUMITOMO BAKELITE CO LTD | 150℃ 94V-0 PM-9630 (0.4mm MIN BOBBIN WALL) | PHENOLIC (PF), "SUMIKON",FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| | | E I DUPONT DE NEMOURS & CO INC | 155℃ 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE (PET), GLASS REINFORCED, FLAME RETARDANT, "RYNITE",FURNISHED AS PELLETS | E41938 |
| 2 | BASE | SUMITOMO BAKELITE CO LTD | 150℃ 94V-0 PM-9630 (0.4mm MIN BOBBIN WALL) | PHENOLIC (PF), "SUMIKON",FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| | | E I DUPONT DE NEMOURS & CO INC | 155℃ 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE (PET), GLASS REINFORCED, FLAME RETARDANT, "RYNITE",FURNISHED AS PELLETS | E41938 |
| 3 | TAPE | SYMBIO INC | 200℃ NO.KA180 (04) | POLYIMIDE FILM INSULATING TAPE WITH SILICONE BASE ADHESIVE | E50292 |
| | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 180℃ NO.92 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| 4 | TUBING | GREAT HOLDING INDUSTRIAL CO LTD | 200℃ TFL VW-1<br>200℃ TFT VW-1 | NOT HEAT-SHRINKABLE POLYTETRAFLUOROETHYLENE (PTFE) TUBING. | E156256 |
| 5 | MAGNET WIRE | UL RECOGNIZED | UL RECOGNIZED | 155℃ MW79<br>155℃ MW80<br>180℃ MW-82<br>180℃ MW-83 | UL RECOGNIZED |
| | | GREAT LEOFLON INDUSTRIAL CO LTD | 155℃ NO: TRW(F)-M (VDE NO:136581)<br>155℃ NO: TRW(F) (VDE NO:136581) | SINGLE-AND MULTI-LAYER INSULATED WINDING WIRE | E211989 |
| 6 | MARGIN TAPE | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 155℃ MATERIAL GROUP I NO.SUPER 10,20 | FLAME RETARDANT POLYESTER FILM /EPOXY RESIN COMPOSITE INSULATING TAPE | E17385 |
| 7 | VARNISH | JOHN C DOLPH CO | 200℃ NO.BC-346-A | | E317427 |
| | | ELANTAS ELECTRICAL INSULATION ELANTAS PDG INC | 130℃ V1380FC | | E75225 |
| | | | | | |

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DIMENSIONAL TOLERANCES

( ) DECIMALS: <30 : ±0.25; >30~100 : ±0.35; >100~300 : ±0.5; ABOVE 300 : ±0.6; HOLES : ±0.05

(✓) DECIMALS: X : ±0.3; X.X : ±0.2; X.XX : ±0.1; ANGLES : ±0.5°

( ) UP~100 : ±0.2; 100~150 : ±0.25; 150~200 : ±0.3; 200~250 : ±0.35; 250~300 : ±0.4; 300~350 : ±0.45; 350~400 : ±0.5

( ) UP~600 : ±1.5; 600~900 : ±2.4; 900~OVER: ±3.1

SCALE | UNIT mm | USED ON

Vendor P/N: MV-MPS16030-A

Drawn: 葛麗華 05/22'17

Design: 朱少華 05/22'17

THIRD ANGLE PROJECTION

A4 SIZE

DESCRIPTION: TRANSFORMER

PART NO.: 2870534800 REV. 04

SHEET 4 OF 4



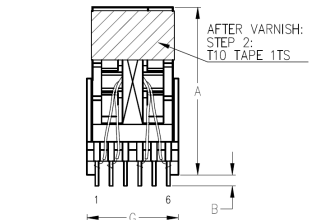
| G.5.3.2 | TABLE: Transformers | | | | | | P |
|---|---|---|---|---|---|---|---|
| Loc. | Tested insulation | Working voltage peak / V (5.4.1.8) | Working voltage rms / V (5.4.1.8) | Required electric strength (5.4.9) | Required clearance / mm (5.4.2) | Required creepage distance / mm (5.4.3) | Required distance thr. insul. (5.4.4) |
| T401 (type AV-MPS16030-A) | Primary to secondary (RI) | 652 | 419 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 8.4 | 0.4 mm or 2 layers min. or TIW |
| | Primary to core (OP) | -- | -- | -- | -- | -- | -- |
| | Primary core to secondary (RI) | 652 | 419 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 8.4 | 0.4 mm or 2 layers min. or TIW |

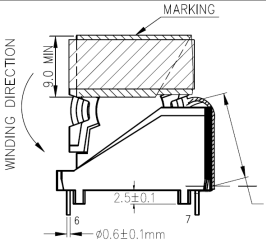
| Loc. | Tested insulation | | | Test voltage/ V | Measured clearance / mm | Measured creepage dist./ mm | Measured distance thr. insul. / mm; number of layers |
|---|---|---|---|---|---|---|---|
| Internal: | | | | | | | |
| T401 (type AV-MPS16030-A) | Primary windings to secondary windings (RI) | | | See appended table 5.4.9 | TIW on secondary wire used | TIW on secondary wire used | TIW |
| | Primary windings to core (OP) | | | -- | -- | -- | -- |
| | Primary core to secondary windings (RI) | | | See appended table 5.4.9 | TIW on secondary wire used | TIW on secondary wire used | TIW |
| External: | | | | | | | |
| T401 (type AV-MPS16030-A) | Primary solder pins to secondary winding exit ends (RI) | | | See appended table 5.4.9 | 23.0 | 23.0 | -- |
| | Primary windings to secondary exit ends (RI) | | | See appended table 5.4.9 | 12.0 | 12.0 | -- |
| | Primary core to secondary winding exit ends (RI) | | | See appended table 5.4.9 | 12.0 | 12.0 | -- |
| Supplementary information:<br>The equipment to be operated up to 5000 m above sea level, each clearance multiplied with an altitude correction factor of 1.48.<br>TIW denotes Triple Insulated Wire. | | | | | | | |

| **G.5.3.2** | **TABLE: Transformers** | P |
|---|---|---|
| Construction of transformer (T401), type AV-MPS16030-A: | | |

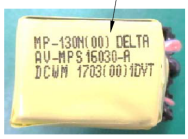
| TEST TERMINAL | TEST CONDITION | L(mH) | LK(uH) | DCR(mΩ) | TURN RATIO(mV) | TURNS | WIRE GAUGE | HI-POT TEST @50/60Hz.,2s |
|---|---|---|---|---|---|---|---|---|
| 4-X-6 | 40kHz,1.0V | 1.4±10% | 20 MAX | 1412 MAX | @20kHz,1.0V | 19+19 | | PRI TO SEC 4400Vac |
| 4-X | | | SEC SHORT | | | 19 | ø0.2 2UEWN | SEC TO CORE 4400Vac |
| 1-2 | | | | 226 MAX | 131.6±5% | 5 | ø0.2 2UEWN | PRI TO PRI 500Vac |
| 10-12 | | | | 57.8 MAX | 78.9±5% | 3 | ø0.45x2 TRW(B)-M | PRI TO CORE 500Vac |
| 8-7 | | | | 92.4 MAX | 52.6±5% | 2 | ø0.3 TRW(B)-M | SEC TO SEC 500Vac |
| X-6 | | | | | | 19 | ø0.2 2UEWN | PIN 11 TO PIN 12 & PIN 10 500Vac 01 |
| | | | | | | | | LAYER TEST (4-6) :1.5kVo-p MAX/1s |
| | | | | | | | | LEAKAGE CURRENT <=1.0mA |
| | | | | | | | | ARCING CURRENT <=15.0mA |

1. MECHANICAL DIMENSIONS :

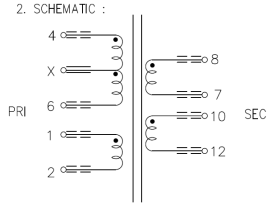


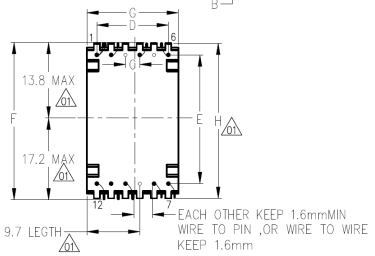

01 AFTER VARNISH:
STEP 1: T25 TAPE 3PCE
COVER 4 SIDE TOP,
FRONT, RIGHT,LEFT



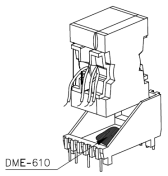

2. SCHEMATIC :




: T10 TAPE 3±1TS
: TEFLON TUBE
PIN 2,6,8,12 CLEAR LW TUBE
PIN 1,4,7,10 BLACK LW TUBE




UNIT : mm 01
A = 31.7 MAX
B = 4.0±0.3
C = 2.6±0.3
D = 13.0±0.3
E = 23.35±0.3
F = 31 MAX (FOR PIN1~6 TO PIN10~12 SIDE IN 9.7mm LENGTH AREA)
G = 17.0 MAX
H=30.3 MAX (FOR PIN1~6 SIDE TO PIN7~9 SIDE)




BASE P/N: 317316
BOBBIN P/N: 31320786xx
CORE SIZE : PQI26/20
HOLE DIMENSION : ø1.0(FOR PIN 2,4,7,8,10,11); ø0.8(FOR PIN 1,6,12)
PIN 3,5,9,OMIT

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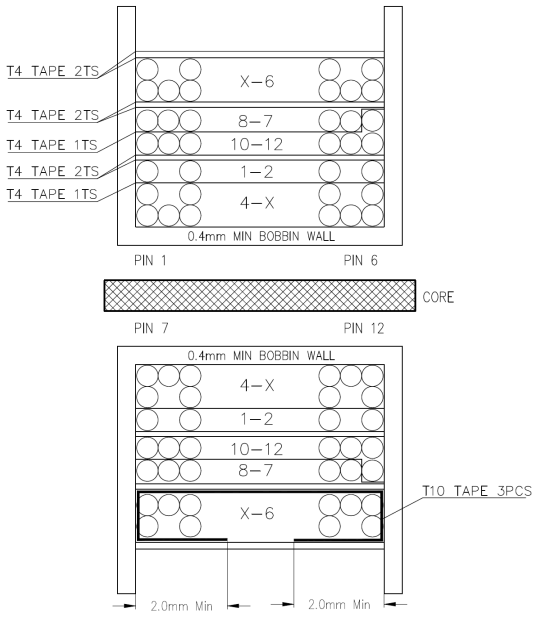
DIMENSIONAL TOLERANCES
( ) : <30 ±0.25; >30~100 ±0.35; >100~300 ±0.5; ABOVE 300 ±0.6; HOLES ±0.05
(✓) DECIMALS: X ±0.3; X.X ±0.2; X.XX ±0.1; ANGLES ±0.5°
( ) UP~100 ±0.2; 100~150 ±0.25; 150~200 ±0.3; 200~250 ±0.35; 250~300 ±0.4; 300~350 ±0.45; 350~400 ±0.5
( ) UP~600 ±1.5; 600~900 ±2.4; 900~OVER: ±3.1
SCALE | UNIT mm | USED ON

Vendor P/N: AV-MPS16030-A
Drawn: 葛麗華 05/22'17
Design: 朱少华 05/22'17

THIRD ANGLE PROJECTION
A4 SIZE

DESCRIPTION: TRANSFORMER
PART NO.: 2873176100
REV. 02
SHEET 2 OF 5

3. WINDING CONSTRUCTION :

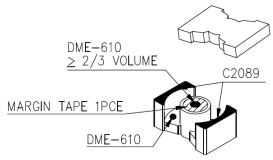



4. PACKAGE MUST BE IN COMPLIANCE WITH PACKING
SPEC. NO. : 3525182200
30g/PC 9.9Kg/CARTON 280PCS/CARTON

5. MARKING : ON THE CENTER OF TOP
BLACK INK
MP-130N(00) DELTA
AV-MPS16030-A
XXXX(XX)**
XXXX : DATE CODE
XX : REV NO.
** : WORKING TEAM.
: FACTORY REQUIRE
DET : DELTA THAILAND PLANT
DCWM : DELTA WUJIANG PLANT
DCUM : DELTA WUHU PLANT
DCZM : DELTA CHENZHOU PLANT
OK LABEL MUST STAMPED UL MARK
AND "OBJY2"

6. CORE GAP : 0.15mm.(REF)(ON THE CENTER LEG OF PQ CORE)
7. VARNISH : BC-346-A.(VACUUM)(CONSISTENCY 14±1SEC)
8. FOR ENVIRONMENT CONCERNS , ALL PARTS MUST FOLLOW DELTA'S SPECIFICATION "10000-0162"(THE MANAGEMENT STANDARDS FOR ENVIRONMENT-RELATED SUBSTANCE.)
9. SAFETY DISTANCE DESIGN:
INSIDE WINDING: PRI TO SEC 12.0mm MIN
SEC TO CORE 12.0 mm MIN
THE CORE BELONG TO PRI
10. X WIRE DO NOT CUT OFF DURING WINDING.
11. THE TEFLON TUBE MUST ENTER TO WINDING DEEPLY 2.0mm MIN

I CORE ON THE PIN 6 & 7 SIDE




PQ CORE ON THE PIN 1 & 12 SIDE

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DIMENSIONAL TOLERANCES
( ) : <30 ±0.25; >30~100 ±0.35; >100~300 ±0.5; ABOVE 300 ±0.6; HOLES ±0.05
(✓) DECIMALS: X ±0.3; X.X ±0.2; X.XX ±0.1; ANGLES ±0.5°
( ) UP~100 ±0.2; 100~150 ±0.25; 150~200 ±0.3; 200~250 ±0.35; 250~300 ±0.4; 300~350 ±0.45; 350~400 ±0.5
( ) UP~600 ±1.5; 600~900 ±2.4; 900~OVER: ±3.1
SCALE | UNIT mm | USED ON

Vendor P/N: AV-MPS16030-A
Drawn: 葛麗華 05/22'17
Design: 朱少华 05/22'17

THIRD ANGLE PROJECTION
A4 SIZE

DESCRIPTION: TRANSFORMER
PART NO.: 2873176100
REV. 02
SHEET 3 OF 5

12. MATERIAL LIST :

| NO. | PART | MANUFACTURER | MANUFACTURER PART NO. | DESCRIPTION | UL FILE NO. |
|---|---|---|---|---|---|
| 1 | BOBBIN | E I DUPONT DE NEMOURS & CO INC | 155°C 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE | E41938 |
| | | SUMITOMO BAKELITE CO LTD | 150°C 94V-0 PM-9630 (0.4mm MIN BOBBIN WALL) | PHENOLIC (PF),"SUMIKON",FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| 2 | BASE | E I DUPONT DE NEMOURS & CO INC | 155°C 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE | E41938 |
| | | SUMITOMO BAKELITE CO LTD | 150°C 94V-0 PM-9630 (0.4mm MIN BOBBIN WALL) | PHENOLIC (PF), "SUMIKON", FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| 3 | TAPE | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 130°C MATERIAL GROUP II NO.1350F-1 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 130°C MATERIAL GROUP II NO.1350T-3 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 180°C NO.92 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| | | SYMBIO INC | 130°C MATERIAL GROUP I(FOR UL), GROUP II(FOR TUV) NO.35660Y | POLYETHYLENE-TERETHALATE FILM INSULATING TAPE WITH ACRYLIC ADHESIVE | E50292 |
| | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | 130°C MATERIAL GROUP I NO.CT | POLYETHYLENE TEREPTHALATE FILM TAPE | E165111 |
| 4 | TUBING | GREAT HOLDING INDUSTRIAL CO LTD | 200°C TFL VW-1<br>200°C TFT VW-1 | NOT HEAT-SHRINKABLE POLYTETRAFLUOROETHYLENE (PTFE) TUBING. | E156256 |
| 5 | MAGNET WIRE | UL RECOGNIZED | UL RECOGNIZED | 130°C MW28<br>130°C MW75<br>155°C MW79<br>155°C MW80<br>180°C MW-82<br>180°C MW-83 | UL RECOGNIZED |
| | | GREAT LEOFLON INDUSTRIAL CO LTD | 130°C NO:TRW(B)-M<br>(VDE NO:136581)<br>130°C NO:TRW(B)<br>(VDE NO:136581) | SINGLE-AND MULTI-LAYER INSULATED WINDING WIRE | E211989 |
| 6 | VARNISH | JOHN C DOLPH CO | 200°C NO.BC-346-A | | E317427 |

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DELTA ELECTRONICS, INC.



DIMENSIONAL TOLERANCES

| ( ) | (✓) | ( ) | ( ) |
|---|---|---|---|
| <30 : ±0.25 | DECIMALS | UP~100 : ±0.2 | UP~600 : ±1.5 |
| >30~100 : ±0.35 | X : ±0.3 | 100~150 : ±0.25 | 600~900 : ±2.4 |
| >100~300 : ±0.5 | X.X : ±0.2 | 150~200 : ±0.3 | 900~OVER: ±3.1 |
| ABOVE 300 : ±0.6 | X.XX : ±0.1 | 200~250 : ±0.35 | |
| HOLES : ±0.05 | ANGLES : ±0.5° | 250~300 : ±0.4 | |
| | | 300~350 : ±0.45 | |
| | | 350~400 : ±0.5 | |

SCALE | UNIT mm | USED ON

Vendor P/N: AV-MPS16030-A
Drawn: 葛麗華 05/22'17
Design: 朱少华 05/22'17

THIRD ANGLE PROJECTION
A4 SIZE

DESCRIPTION: TRANSFORMER
PART NO.: 2873176100
REV. 02
SHEET 4 OF 5

12. MATERIAL LIST :

| NO. | PART | MANUFACTURER | MANUFACTURER PART NO. | DESCRIPTION | UL FILE NO. |
|---|---|---|---|---|---|
| 7 | MARGIN TAPE | SYMBIO INC | 130°C MATERIAL GROUP I NO.35661 | POLYETHYLENE-TEREPHTHALATE FILM INSULATING TAPE WITH ACRYLIC ADHESIVE | E50292 |
| | | 3M COMPANY ELECTRICAL | 130°C MATERIAL GROUP I NO.44,44-A,44D-A,44T-A | POLYESTER FILM/NONWOVEN COMPOSITE INSULATINGTAPES | E17385 |

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DIMENSIONAL TOLERANCES

| ( ) | (✓) | ( ) | ( ) |
|---|---|---|---|
| <30 : ±0.25 | DECIMALS | UP~100 : ±0.2 | UP~600 : ±1.5 |
| >30~100 : ±0.35 | X : ±0.3 | 100~150 : ±0.25 | 600~900 : ±2.4 |
| >100~300 : ±0.5 | X.X : ±0.2 | 150~200 : ±0.3 | 900~OVER: ±3.1 |
| ABOVE 300 : ±0.6 | X.XX : ±0.1 | 200~250 : ±0.35 | |
| HOLES : ±0.05 | ANGLES : ±0.5° | 250~300 : ±0.4 | |
| | | 300~350 : ±0.45 | |
| | | 350~400 : ±0.5 | |

SCALE | UNIT mm | USED ON

Vendor P/N: AV-MPS16030-A
Drawn: 葛麗華 05/22'17
Design: 朱少华 05/22'17

THIRD ANGLE PROJECTION
A4 SIZE

DESCRIPTION: TRANSFORMER
PART NO.: 2873176100
REV. 02
SHEET 5 OF 5

| G.5.3.2 | TABLE: Transformers | | | | | | P |
|---|---|---|---|---|---|---|---|
| Loc. | Tested insulation | Working voltage peak / V (5.4.1.8) | Working voltage rms / V (5.4.1.8) | Required electric strength (5.4.9) | Required clearance / mm (5.4.2) | Required creepage distance / mm (5.4.3) | Required distance thr. insul. (5.4.4) |
| T1, T2 (type MV-MPS17014-A) | Primary to secondary (RI) | 480 | 278 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 5.6 | 0.4 mm or 2 layers min. or TIW |
| | Primary to core (RI) | 480 | 278 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 5.6 | 0.4 mm or 2 layers min. or TIW |
| | Core to secondary (OP) | -- | -- | -- | -- | -- | -- |
| Loc. | Tested insulation | | | Test voltage/ V | Measured clearance / mm | Measured creepage dist./ mm | Measured distance thr. insul. / mm; number of layers |
| Internal: | | | | | | | |
| T1, T2 (type MV-MPS17014-A) | Primary windings to secondary windings (RI) | | | See appended table 5.4.9 | TIW on primary wire used | TIW on primary wire used | TIW |
| | Primary windings to secondary core (RI) | | | See appended table 5.4.9 | TIW on primary wire used | TIW on primary wire used | TIW |
| | Secondary core to secondary winding exits (OP) | | | -- | -- | -- | -- |
| External: | | | | | | | |
| T1, T2 (type MV-MPS17014-A) | Primary solder pin to secondary solder pin (RI) | | | See appended table 5.4.9 | 41.0 | 41.0 | -- |
| | Primary winding exits/solder pin to secondary winding (RI) | | | See appended table 5.4.9 | 12.0 | 12.0 | -- |
| | Primary winding exits/solder pin to secondary core (RI) | | | See appended table 5.4.9 | 12.0 | 12.0 | -- |

Supplementary information:

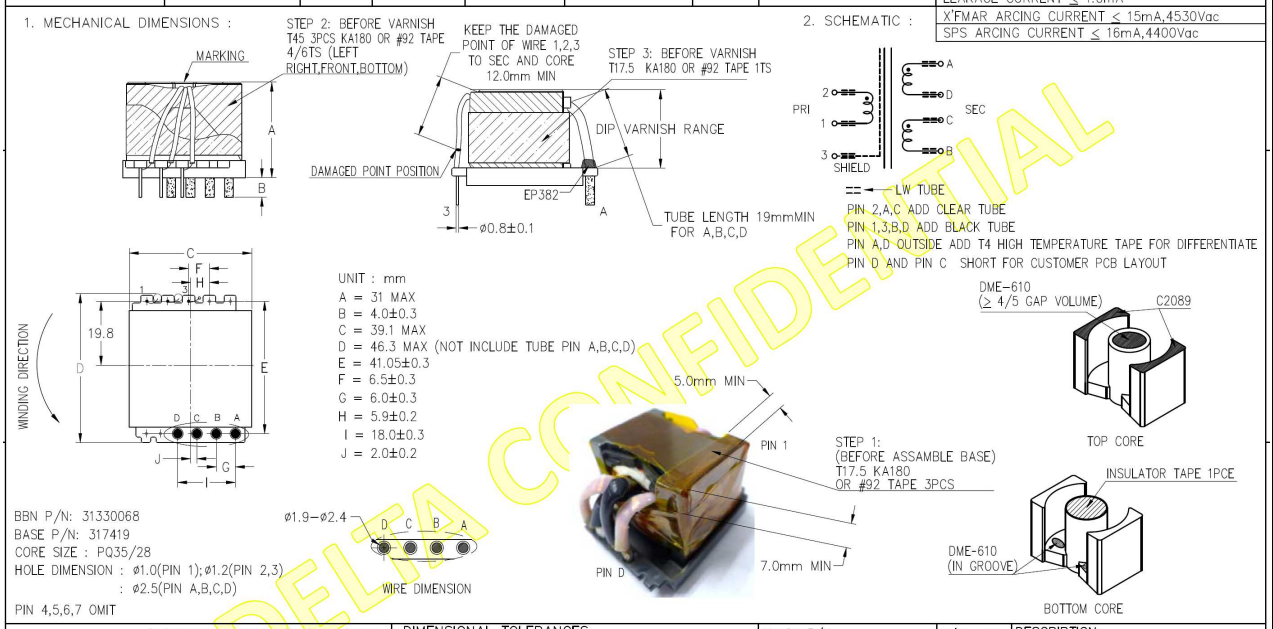
The equipment to be operated up to 5000 m above sea level, each clearance multiplied with an altitude correction factor of 1.48.

TIW denotes Triple Insulated Wire.

| G.5.3.2 | **TABLE: Transformers** | P |
|---|---|---|

Construction of transformer (T1, T2), type MV-MPS17014-A:

| TEST TERMINAL | TEST CONDITION | L(uH) | Lk(uH) | DCR(mΩ) | TURN RATIO(mV) | TURNS | WIRE GAUGE | HI-POT TEST @50Hz/60Hz,2s |
|---|---|---|---|---|---|---|---|---|
| 2-1 | 40kHz,1V | 75±5% | 7.5 MAX | 37 MAX | 20kHz,1V | 18 | ø0.5x3 TRW(F)-M | PRI TO SEC 4530Vac |
| SHIELD TO PIN3 | | | SEC SHORT | | | 3/4 | T15x0.001"Cu | SEC TO CORE 500Vac |
| A-D } BIFILAR | | | | 15 MAX | 444±5% | 8 | ø0.1x180C 2UEWN MW80 | PRI TO PRI 500Vac |
| C-B | | | | 15 MAX | 444±5% | 8 | ø0.1x180C 2UEWN MW80 | INDUCED VOLTAGE |
| | | | | | | | | L(2-1) 1.0KVo-p MAX/1s |
| | | | | | | | | L(A,C-B,D) 1.0KVo-p MAX/1s A SHORT C,B SHORT D WHEN TEST |
| | | | | | | | | LEAKAGE CURRENT ≤ 1.0mA |
| | | | | | | | | X'FMAR ARCING CURRENT ≤ 15mA,4530Vac |
| | | | | | | | | SPS ARCING CURRENT ≤ 16mA,4400Vac |






台達電子工業股份有限公司 DELTA ELECTRONICS, INC.



DIMENSIONAL TOLERANCES

( ) <30 : ±0.25; >30~100 : ±0.35; >100~300 : ±0.5; ABOVE 300 : ±0.6; HOLES : ±0.05

(✓) DECIMALS X : ±0.3; X.X : ±0.2; X.XX : ±0.1; ANGLES : ±0.5'

( ) UP~100 : ±0.2; 100~150 : ±0.25; 150~200 : ±0.3; 200~250 : ±0.35; 250~300 : ±0.4; 300~350 : ±0.45; 350~400 : ±0.5

( ) UP~600 : ±1.5; 600~900 : ±2.4; 900~OVER: ±3.1

SCALE UNIT mm USED ON

Vendor P/N: MV-MPS17014-A

Drawn: 王春梅 07/17/17

Design: 朱少华 07/17/17

THIRD ANGLE PROJECTION

DESCRIPTION: TRANSFORMER

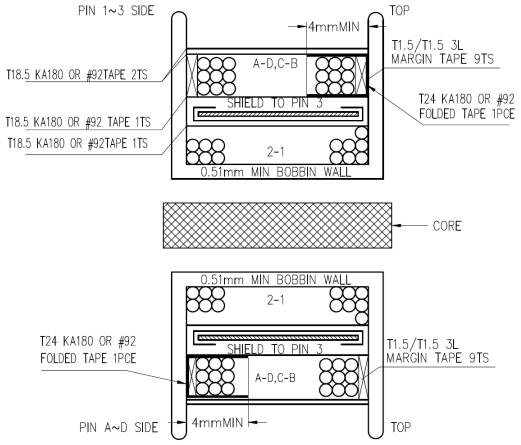
A4 SIZE

PART NO.: 2870555900

REV. 00

SHEET 2 OF 4

3. WINDING CONSTRUCTION :



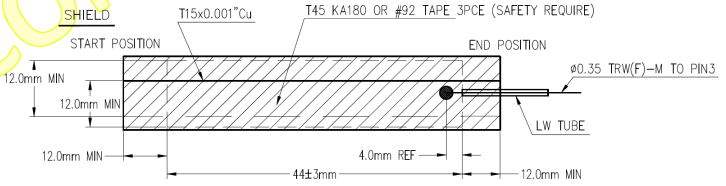

4. PACKAGE MUST BE IN COMPLIANCE WITH PACKING
SPEC. NO. : 3526436000
103.5g/PC 14.75Kg/CARTON 128PCS/CARTON

5. MARKING : ON THE CENTER OF TOP

MP-155G (00)
MV-MPS17014-A DELTA
□ XXXX(XX) **

BLACK INK
XX : REV NO.
XXXX : DATE CODE
** : WORKING TEAM
□ : PLANT CODE
DET : DELTA THAILAND PLANT
DCWM : DELTA WUJIANG PLANT
DCUM : DELTA WUHU PLANT
DCZM : DELTA CHENZHOU PLANT
OK LABEL MUST STAMPED UL MARK
AND "OBJY2"

6. CORE GAP : 0.55±2mm REF (ON THE CENTER OF TOP CORE)
7. VARNISH :BC-346-A (VACUUM)(CONSISTENCY 14±1 SEC)
8. FOR ENVIRONMENT CONCERNS , ALL PARTS MUST FOLLOW DELTA'S SPECIFICATION "10000-0162"(THE MANAGEMENT STANDARDS FOR ENVIRONMENT-RELATED SUBSTANCE.)
9. ø0.1x180C WIRE TWIST: 40±5(TURNS/M)
10. SAFETY DISTANCE DESIGN :PRI TO SEC 12.0mm MIN
PRI TO CORE 12.0mm MIN
CORE IS SEC
11. BASE AND BOTTOM CORE FIX TOGETHER WITH DME-610( > 4/5 BASE VOLUME)
12. WINDING(A-D);(C-B) FROM TOP TO TOP; WINDING(2-1) FROM TOP TO TOP;
13. THE TUBES OF PIN 1,2,3 NEED TO BE INTO THE SLOT FOR MEETING D DIMENSION.
14. SHIELD DIRECTION IS SAME AS WINDING DIRECTION.
15. ADD TEST SEC TO SEC 200Vac,ARCING CURRENT ≤ 10mA
16. ALL MATERIALS USE HIGH TEMPERTURE MATERIALS




台達電子工業股份有限公司 DELTA ELECTRONICS, INC.



DIMENSIONAL TOLERANCES

| ( ) | | (✓) | | ( ) | | ( ) | |
|---|---|---|---|---|---|---|---|
| <30 | ±0.25 | DECIMALS | | UP~100 | ±0.2 | UP~600 | ±1.5 |
| >30~100 | ±0.35 | X | ±0.3 | 100~150 | ±0.25 | 600~900 | ±2.4 |
| >100~300 | ±0.5 | X.X | ±0.2 | 150~200 | ±0.3 | 900~OVER: | ±3.1 |
| ABOVE 300 | ±0.6 | X.XX | ±0.1 | 200~250 | ±0.35 | | |
| HOLES | ±0.05 | ANGLES | ±0.5° | 250~300 | ±0.4 | | |
| | | | | 300~350 | ±0.45 | | |
| | | | | 350~400 | ±0.5 | | |

SCALE | UNIT mm | USED ON

Vendor P/N: MV-MPS17014-A
Drawn: 王春梅 07/17/17
Design: 朱少华 07/17/17

THIRD ANGLE PROJECTION

DESCRIPTION: TRANSFORMER

A4 SIZE

PART NO.: 2870555900 REV. 00

SHEET 3 OF 4

17. MATERIAL LIST :

| NO. | PART | MANUFACTURER | MANUFACTURER PART NO. | DESCRIPTION | UL FILE NO. |
|---|---|---|---|---|---|
| 1 | BOBBIN | SUMITOMO BAKELITE CO LTD | 150°C 94V-0 PM-9630 (0.51mm MIN BOBBIN WALL) | PHENOLIC (PF), "SUMIKON",FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| | | E I DUPONT DE NEMOURS & CO INC | 155°C 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE (PET), GLASS REINFORCED, FLAME RETARDANT, "RYNITE",FURNISHED AS PELLETS | E41938 |
| 2 | BASE | SUMITOMO BAKELITE CO LTD | 150°C 94V-0 PM-9630 (0.51mm MIN BOBBIN WALL) | PHENOLIC (PF), "SUMIKON",FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| | | E I DUPONT DE NEMOURS & CO INC | 155°C 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE (PET), GLASS REINFORCED, FLAME RETARDANT, "RYNITE",FURNISHED AS PELLETS | E41938 |
| 3 | TAPE | SYMBIO INC | 200°C NO.KA180 | POLYIMIDE FILM INSULATING TAPE WITH SILICONE BASE ADHESIVE | E50292 |
| | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 180°C NO.92 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| 4 | TUBING | GREAT HOLDING INDUSTRIAL CO LTD | 200°C TFL VW-1<br>200°C TFT VW-1 | NOT HEAT-SHRINKABLE POLYTETRAFLUOROETHYLENE (PTFE) TUBING. | E156256 |
| 5 | WIRE | UL RECOGNIZED | UL RECOGNIZED | 155°C MW79<br>155°C MW80<br>180°C MW-82<br>180°C MW-83 | |
| | | GREAT LEOFLON INDUSTRIAL CO LTD | 155°C NO:TRW(F)-M (VDE NO:136581)<br>155°C NO:TRW(F) (VDE NO:136581) | SINGLE-AND MULTI-LAYER INSULATED WINDING WIRE | E211989<br>UL RECOGNIZED |
| 6 | MARGIN TAPE | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 155°C MATERIAL GROUP I NO.SUPER 10,20 | FLAME RETARDANT POLYESTER FILM /EPOXY RESIN COMPOSITE INSULATING TAPE | E17385 |
| 7 | VARNISH | JOHN C DOLPH CO | 200°C NO.BC-346-A | | E317427 |

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DIMENSIONAL TOLERANCES

SCALE | UNIT mm | USED ON

Vendor P/N: MV-MPS17014-A
Drawn: 王春梅 07/17/17
Design: 朱少华 07/17/17

THIRD ANGLE PROJECTION

DESCRIPTION: TRANSFORMER

A4 SIZE

PART NO.: 2870555900 REV. 00

SHEET 4 OF 4

| G.5.3.2 | TABLE: Transformers | | | | | | P |
|---|---|---|---|---|---|---|---|
| Loc. | Tested insulation | Working voltage peak / V (5.4.1.8) | Working voltage rms / V (5.4.1.8) | Required electric strength (5.4.9) | Required clearance / mm (5.4.2) | Required creepage distance / mm (5.4.3) | Required distance thr. insul. (5.4.4) |
| T401 (type AV-MPS17015-A) | Primary to secondary (RI) | 640 | 375 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 7.6 | 0.4 mm or 2 layers min. or TIW |
| | Primary to core (OP) | -- | -- | -- | -- | -- | -- |
| | Primary core to secondary (RI) | 640 | 375 | See appended table 5.4.9 | 3.8 (2.54*1.48) 4.5 (3.0*1.48) for appended table 5.4.2.3 | 7.6 | 0.4 mm or 2 layers min. or TIW |
| Loc. | Tested insulation | | | Test voltage/ V | Measured clearance / mm | Measured creepage dist./ mm | Measured distance thr. insul. / mm; number of layers |
| Internal: | | | | | | | |
| T401 (type AV-MPS17015-A) | Primary windings to secondary windings (RI) | | | See appended table 5.4.9 | TIW on secondary wire used | TIW on secondary wire used | TIW |
| | Primary windings to core (OP) | | | -- | -- | -- | -- |
| | Primary core to secondary windings (RI) | | | See appended table 5.4.9 | TIW on secondary wire used | TIW on secondary wire used | TIW |
| External: | | | | | | | |
| T401 (type AV-MPS17015-A) | Primary solder pins to secondary winding exit ends (RI) | | | See appended table 5.4.9 | 23.0 | 23.0 | -- |
| | Primary windings to secondary exit ends (RI) | | | See appended table 5.4.9 | 16.0 | 16.0 | -- |
| | Primary core to secondary winding exit ends (RI) | | | See appended table 5.4.9 | 16.0 | 16.0 | -- |

Supplementary information:

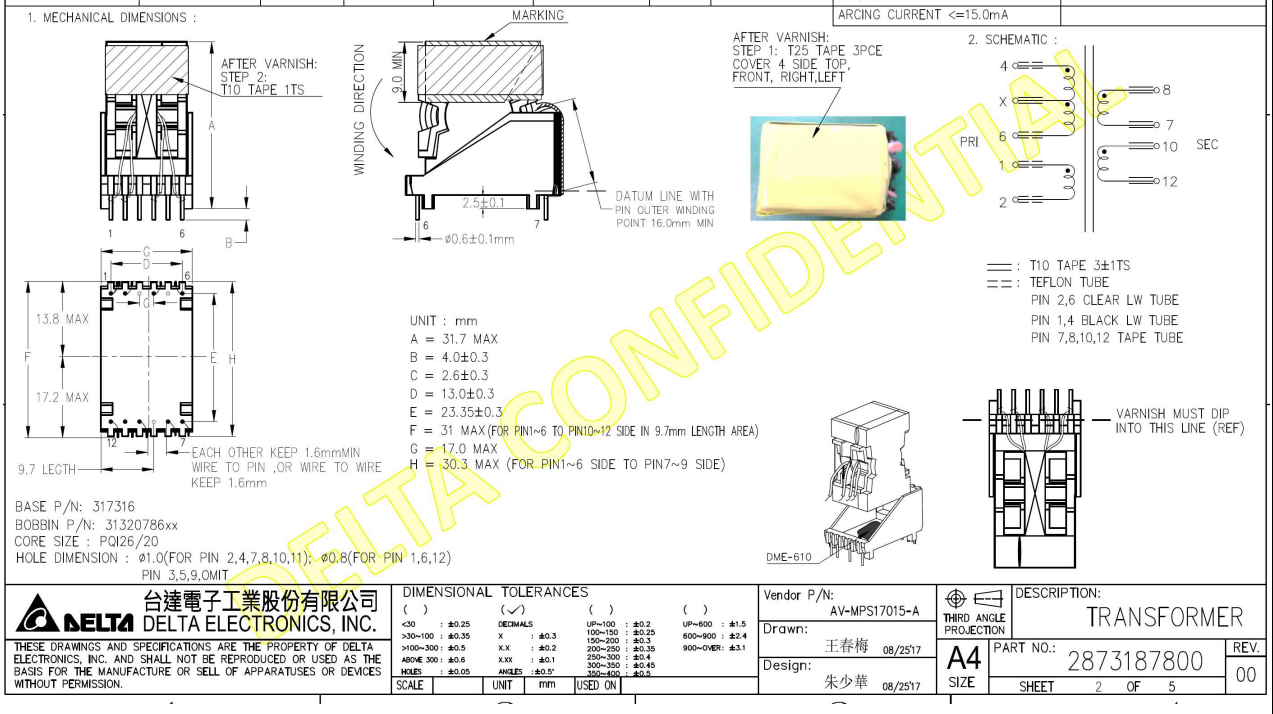
The equipment to be operated up to 5000 m above sea level, each clearance multiplied with an altitude correction factor of 1.48.

TIW denotes Triple Insulated Wire.

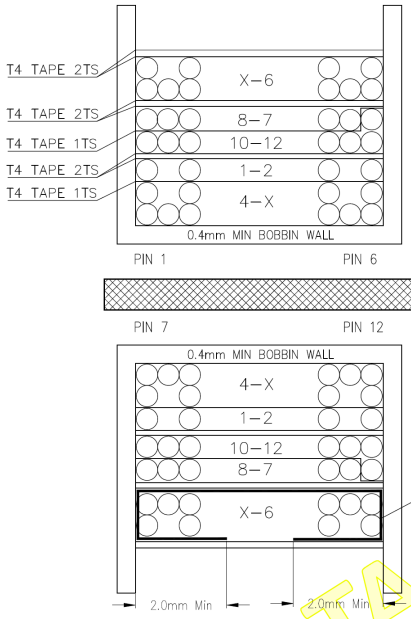
| G.5.3.2 | **TABLE: Transformers** | P |
|---|---|---|

Construction of transformer (T401), type AV-MPS17015-A:

| TEST TERMINAL | TEST CONDITION | L(mH) | LK(uH) | DCR(mΩ) | TURN RATIO(mV) | TURNS | WIRE GAUGE | HI-POT TEST1 @50/60Hz.,2s | HI-POT TEST2 @50/60Hz.,2s |
|---|---|---|---|---|---|---|---|---|---|
| 4-X-6 | 40kHz,1.0V | 1.4±10% | 20 MAX | 1412 MAX | @20kHz,1.0V | 19+19 | | PRI TO SEC 4400Vac | PRI SHORT CORE TO SEC 5000Vac |
| 4-X | | | SEC SHORT | | | 19 | ø0.2 2UEWN | SEC TO CORE 4400Vac | DO NOT TEST ARCING |
| 1-2 | | | | 226 MAX | 131.6±5% | 5 | ø0.2 2UEWN | PRI TO PRI 500Vac | LEAKAGE CURRENT <=1.0mA |
| 10-12 | | | | 57.8 MAX | 78.9±5% | 3 | ø0.45x2 TRW(B)-M | PRI TO CORE 500Vac | |
| 8-7 | | | | 92.4 MAX | 52.6±5% | 2 | ø0.3 TRW(B)-M | SEC TO SEC 500Vac | |
| X-6 | | | | | | 19 | ø0.2 2UEWN | PIN 11 TO PIN 12 & PIN 10 500Vac | |
| | | | | | | | | INDUCED VOLTAGE (4-6) :1.5kVo-p MAX/1s | |
| | | | | | | | | LEAKAGE CURRENT <=1.0mA | |
| | | | | | | | | ARCING CURRENT <=15.0mA | |



3. WINDING CONSTRUCTION :




4. PACKAGE MUST BE IN COMPLIANCE WITH PACKING SPEC. NO. : 3525182200
30g/PC 9.9Kg/CARTON 280PCS/CARTON

5. MARKING :ON THE CENTER OF TOP
BLACK INK
MP-130N(00) DELTA
AV-MPS17015-A
▭ XXXX(XX)**
XXXX : DATE CODE
XX : REV NO.
** : WORKING TEAM.
▭ : FACTORY REQUIRE
DET : DELTA THAILAND PLANT
DCWM : DELTA WUJIANG PLANT
DCUM : DELTA WUHU PLANT
DCZM : DELTA CHENZHOU PLANT
OK LABEL MUST STAMPED UL MARK AND "OBJY2"

6. CORE GAP : 0.15mm.(REF)(ON THE CENTER LEG OF PQ CORE)

7. VARNISH : BC-346-A.(VACUUM)(CONSISTENCY 14±1SEC)

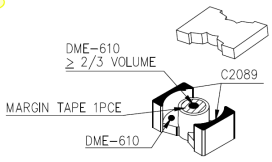
8. FOR ENVIRONMENT CONCERNS , ALL PARTS MUST FOLLOW DELTA'S SPECIFICATION "10000-0162"(THE MANAGEMENT STANDARDS FOR ENVIRONMENT-RELATED SUBSTANCE.)

9. SAFETY DISTANCE DESIGN:
INSIDE WINDING:PRI TO SEC 16.0mm MIN
SEC TO CORE 16.0 mm MIN
THE CORE BELONG TO PRI

10. X WIRE DO NOT CUT OFF DURING WINDING.

11. THE TEFLON TUBE MUST ENTER TO WINDING DEEPLY 2.0mm MIN

I CORE ON THE PIN 6 & 7 SIDE




PQ CORE ON THE PIN 1 & 12 SIDE

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DIMENSIONAL TOLERANCES
( ) DECIMALS <30 : ±0.25, >30~100 : ±0.35, >100~300 : ±0.5, ABOVE 300 : ±0.6, HOLES : ±0.05
(✓) DECIMALS X : ±0.3, X.X : ±0.2, X.XX : ±0.1, ANGLES : ±0.5°
( ) UP~100 : ±0.2, 100~150 : ±0.25, 150~200 : ±0.3, 200~250 : ±0.35, 250~300 : ±0.4, 300~350 : ±0.45, 350~400 : ±0.5
( ) UP~600 : ±1.5, 600~900 : ±2.4, 900~OVER: ±3.1
SCALE | UNIT mm | USED ON

Vendor P/N: AV-MPS17015-A
Drawn: 王春梅 08/25'17
Design: 朱少華 08/25'17

THIRD ANGLE PROJECTION
A4 SIZE

DESCRIPTION: TRANSFORMER
PART NO.: 2873187800
SHEET 3 OF 5
REV. 00

12. MATERIAL LIST :

| NO. | PART | MANUFACTURER | MANUFACTURER PART NO. | DESCRIPTION | UL FILE NO. |
|---|---|---|---|---|---|
| 1 | BOBBIN | E I DUPONT DE NEMOURS & CO INC | 155°C 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE | E41938 |
| | | SUMITOMO BAKELITE CO LTD | 150°C 94V-0 PM-9630 (0.4mm MIN BOBBIN WALL) | PHENOLIC (PF),"SUMIKON",FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| 2 | BASE | E I DUPONT DE NEMOURS & CO INC | 155°C 94V-0 FR530 (0.4mm MIN BOBBIN WALL) | POLYETHYLENE TEREPHTHALATE | E41938 |
| | | SUMITOMO BAKELITE CO LTD | 150°C 94V-0 PM-9630 (0.4mm MIN BOBBIN WALL) | PHENOLIC (PF), "SUMIKON", FURNISHED AS PELLETS,GRANULAR MATERIAL. | E41429 |
| 3 | TAPE | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 130°C MATERIAL GROUP II NO.1350F-1 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 130°C MATERIAL GROUP II NO.1350T-3 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 180°C NO.92 | FLAME RETARDANT POLYESTER FILM INSULATING TAPE | E17385 |
| | | SYMBIO INC | 130°C MATERIAL GROUP I(FOR UL), GROUP II(FOR TUV) NO.35660Y | POLYETHYLENE-TERETHALATE FILM INSULATING TAPE WITH ACRYLIC ADHESIVE | E50292 |
| | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | 130°C MATERIAL GROUP I NO:CT | POLYETHYLENE TEREPTHALATE FILM TAPE | E165111 |
| 4 | TUBING | GREAT HOLDING INDUSTRIAL CO LTD | 200°C TFL VW-1<br>200°C TFT VW-1 | NOT HEAT-SHRINKABLE POLYTETRAFLUOROETHYLENE (PTFE) TUBING. | E156256 |
| 5 | MAGNET WIRE | UL RECOGNIZED | UL RECOGNIZED | 130°C MW28<br>130°C MW75<br>155°C MW79<br>155°C MW80<br>180°C MW-82<br>180°C MW-83 | UL RECOGNIZED |
| | | GREAT LEOFLON INDUSTRIAL CO LTD | 130°C NO:TRW(B)-M (VDE NO:136581)<br>130°C NO:TRW(B) (VDE NO:136581) | SINGLE-AND MULTI-LAYER INSULATED WINDING WIRE | E211989 |
| 6 | VARNISH | JOHN C DOLPH CO | 200°C NO.BC-346-A | | E317427 |

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DIMENSIONAL TOLERANCES
( ) DECIMALS <30 : ±0.25, >30~100 : ±0.35, >100~300 : ±0.5, ABOVE 300 : ±0.6, HOLES : ±0.05
(✓) DECIMALS X : ±0.3, X.X : ±0.2, X.XX : ±0.1, ANGLES : ±0.5°
( ) UP~100 : ±0.2, 100~150 : ±0.25, 150~200 : ±0.3, 200~250 : ±0.35, 250~300 : ±0.4, 300~350 : ±0.45, 350~400 : ±0.5
( ) UP~600 : ±1.5, 600~900 : ±2.4, 900~OVER: ±3.1
SCALE | UNIT mm | USED ON

Vendor P/N: AV-MPS17015-A
Drawn: 王春梅 08/25'17
Design: 朱少華 08/25'17

THIRD ANGLE PROJECTION
A4 SIZE

DESCRIPTION: TRANSFORMER
PART NO.: 2873187800
SHEET 4 OF 5
REV. 00

12. MATERIAL LIST :

| NO. | PART | MANUFACTURER | MANUFACTURER PART NO. | DESCRIPTION | UL FILE NO. |
|---|---|---|---|---|---|
| 7 | MARGIN TAPE | SYMBIO INC | 130°C MATERIAL GROUP I NO.35661 | POLYETHYLENE-TEREPHTHALATE FILM INSULATING TAPE WITH ACRYLIC ADHESIVE | E50292 |
| | | 3M COMPANY ELECTRICAL | 130°C MATERIAL GROUP I NO.44,44-A,44D-A,44T-A | POLYESTER FILM/NONWOVEN COMPOSITE INSULATINGTAPES | E17385 |



台達電子工業股份有限公司
DELTA ELECTRONICS, INC.



DIMENSIONAL TOLERANCES

| ( ) | | (✓) | | ( ) | | ( ) | |
|---|---|---|---|---|---|---|---|
| <30 | ±0.25 | DECIMALS | | UP~100 | ±0.2 | UP~600 | ±1.5 |
| >30~100 | ±0.35 | X | ±0.3 | 100~150 | ±0.25 | 600~900 | ±2.4 |
| >100~300 | ±0.5 | X.X | ±0.2 | 150~200 | ±0.3 | 900~OVER | ±3.1 |
| ABOVE 300 | ±0.6 | X.XX | ±0.1 | 200~250 | ±0.35 | | |
| HOLES | ±0.05 | ANGLES | ±0.5° | 250~300 | ±0.4 | | |
| | | | | 300~350 | ±0.45 | | |
| | | | | 350~400 | ±0.5 | | |

SCALE | UNIT mm | USED ON

Vendor P/N: AV-MPS17015-A

Drawn: 王春梅 08/25'17

Design: 朱少華 08/25'17

THIRD ANGLE PROJECTION

A4 SIZE

DESCRIPTION: TRANSFORMER

PART NO.: 2873187800 REV. 00

SHEET 5 OF 5

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT**

**IEC 62368-1**

**EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

(Audio/video, information and communication technology equipment - Part 1: Safety requirements)

**Differences according to**.....: EN 62368-1:2014+A11:2017

**Attachment Form No**.....: EU_GD_IEC62368_1D_II

**Attachment Originator** .....: Nemko AS

**Master Attachment**.....: Date 2021-02-04



| | | | |
|---|---|---|---|
| | **CENELEC COMMON MODIFICATIONS (EN)** | | P |
| | Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed "Z". | | P |
| CONTENTS | **Add** the following annexes:<br>Annex ZA (normative) Normative references to international publications with their corresponding European publications<br>Annex ZB (normative) Special national conditions<br>Annex ZC (informative) A-deviations<br>Annex ZD (informative) IEC and CENELEC code designations for flexible cords | | P |
| | **Delete** all the "country" notes in the reference document (IEC 62368-1:2014) according to the following list: | | P |
| | For special national conditions, see Annex ZB. | | P |
| 1 | **Add** the following note:<br>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU. | Added. | P |

| | | | | | |
|---|---|---|---|---|---|
| 0.2.1 | Note | 1 | Note 3 | 4.1.15 | Note |
| 4.7.3 | Note 1 and 2 | 5.2.2.2 | Note | 5.4.2.3.2.2 Table 13 | Note c |
| 5.4.2.3.2.4 | Note 1 and 3 | 5.4.2.5 | Note 2 | 5.4.5.1 | Note |
| 5.5.2.1 | Note | 5.5.6 | Note | 5.6.4.2.1 | Note 2 and 3 |
| 5.7.5 | Note | 5.7.6.1 | Note 1 and 2 | 10.2.1 Table 39 | Note 2, 3 and 4 |
| 10.5.3 | Note 2 | 10.6.2.1 | Note 3 | F.3.3.6 | Note 3 |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.Z1 | **Add** the following new subclause after 4.9:<br>To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. **mains**, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):<br>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;<br>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;<br>c) it is permitted for **pluggable equipment type B** or **permanently connected equipment**, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.<br>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet. | Added. | P |
| 5.4.2.3.2.4 | **Add** the following to the end of this subclause:<br>The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009. | Added. No external circuits. | N/A |
| 10.2.1 | Add the following to [c] and [d] in table 39:<br>For additional requirements, see 10.5.1. | Added. No such radiation from the equipment. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.5.1 | **Add** the following after the first paragraph:<br>*For RS1 compliance is checked by measurement under the following conditions:*<br>*In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or presets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.*<br>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.<br>*The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus.*<br>*Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.*<br>*For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.*<br>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996. | Added. No such x-radiation generated from the equipment. | N/A |
| 10.6.1 | **Add** the following paragraph to the end of the subclause:<br>EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply. | Added. No such consideration for the purpose of personal music players. | N/A |
| 10.Z1 | **Add** the following new subclause after 10.6.5.<br>**10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz**<br>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).<br>For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body-mounted devices, attention is drawn to EN 50360 and EN 50566 | Added. No such consideration for the purpose of personal music players. | N/A |
| G.7.1 | **Add** the following note:<br>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD. | Added. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Bibliography | **Add** the following standards:<br>**Add** the following notes for the standards indicated:<br>IEC 60130-9 NOTE Harmonized as EN 60130-9.<br>IEC 60269-2 NOTE Harmonized as HD 60269-2.<br>IEC 60309-1 NOTE Harmonized as EN 60309-1.<br>IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series.<br>IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4.<br>IEC 60664-5 NOTE Harmonized as EN 60664-5.<br>IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified).<br>IEC 61508-1 NOTE Harmonized as EN 61508-1.<br>IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1.<br>IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4.<br>IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6.<br>IEC 61643-1 NOTE Harmonized as EN 61643-1.<br>IEC 61643-21 NOTE Harmonized as EN 61643-21.<br>IEC 61643-311 NOTE Harmonized as EN 61643-311.<br>IEC 61643-321 NOTE Harmonized as EN 61643-321.<br>IEC 61643-331 NOTE Harmonized as EN 61643-331. | Added. | P |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ZB** | **ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)** | | **P** |
|---|---|---|---|
| 4.1.15 | **Denmark, Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>**Class I pluggable equipment type A** intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and **accessible** parts, have a marking stating that the equipment shall be connected to an earthed **mains** socket-outlet.<br>The marking text in the applicable countries shall be as follows:<br>In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.”<br>In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"<br>In **Norway**: “Apparatet må tilkoples jordet stikkontakt”<br>In **Sweden**: “Apparaten skall anslutas till jordat uttag” | Added. The equipment is for building-in into a Class I equipment. The marking text must be provided when marketed in the applicable countries. | N/A |
| 4.7.3 | **United Kingdom**<br>To the end of the subclause the following is added:<br>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex | Added. The equipment is not direct plug-in equipment. | N/A |
| 5.2.2.2 | **Denmark**<br>After the 2nd paragraph add the following:<br>A warning (marking **safeguard**) for high **touch current** is required if the **touch current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | Added. No high touch current is generated. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.11.1 and Annex G | **Finland and Sweden**<br>To the end of the subclause the following is added:<br>For separation of the telecommunication network from earth the following is applicable:<br>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either<br>• two layers of thin sheet material, each of which shall pass the electric strength test below, or<br>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.<br>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition<br>• passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and<br>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV.<br>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.<br>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:<br>• the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11;<br>• the additional testing shall be performed on all the test specimens as described in EN 60384-14;<br>the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14. | Added. No TNV circuits within the equipment. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.5.2.1 | **Norway**<br>After the 3rd paragraph the following is added:<br>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V). | Added. Considered. | P |
| 5.5.6 | **Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>Resistors used as **basic safeguard** or bridging **basic insulation** in **class I pluggable equipment type A** shall comply with G.10.1 and the test of G.10.2. | Added. No such resistors are used. | N/A |
| 5.6.1 | **Denmark**<br>**Add** to the end of the subclause<br>Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment.<br>*Justification:*<br>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. | Added. Considered. | P |
| 5.6.4.2.1 | **Ireland and United Kingdom**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug. | Added. | N/A |
| 5.6.5.1 | To the second paragraph the following is added:<br>The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is:<br>1,25 $mm^2$ to 1,5 $mm^2$ in cross-sectional area. | Added. | N/A |
| 5.7.5 | **Denmark**<br>To the end of the subclause the following is added:<br>The installation instruction shall be affixed to the equipment if the **protective conductor current** exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | Added. No high protective conductor current. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.7.6.1 | **Norway and Sweden**<br>To the end of the subclause the following is added:<br>The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.<br>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.<br>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:<br>“Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)”<br>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.<br><br>Translation to Norwegian (the Swedish text will also be accepted in Norway):<br>“Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.”<br>Translation to Swedish:<br>”Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.”. | Added. Not such system. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.7.6.2 | **Denmark**<br>To the end of the subclause the following is added:<br>The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA . | Added. | N/A |
| B.3.1 and B.4 | **Ireland and United Kingdom**<br>The following is applicable:<br>To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32 A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met | Added. The equipment is not direct plug-in equipment. | N/A |
| G.4.2 | **Denmark**<br>To the end of the subclause the following is added:<br>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.<br>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.<br>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.<br>Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.<br>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.<br>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a<br>*Justification:*<br>Heavy Current Regulations, Section 6c | Added. The equipment is for building-in into a Class I equipment. No socket outlets are provided. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.4.2 | **United Kingdom**<br>To the end of the subclause the following is added:<br>The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply. | Added. The equipment is not direct plug-in equipment. | N/A |
| G.7.1 | **United Kingdom**<br>To the first paragraph the following is added:<br>Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations.<br>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug. | Added. The primary screw wiring terminal block is provided. No power supply cords.<br>The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| G.7.1 | **Ireland**<br>To the first paragraph the following is added:<br>Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard | Added. See above. | N/A |
| G.7.2 | **Ireland and United Kingdom**<br>To the first paragraph the following is added:<br>A power supply cord with a conductor of 1,25 $mm^2$ is allowed for equipment which is rated over 10 A and up to and including 13 A. | Added. See above. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| **ZC** | **ANNEX ZC, NATIONAL DEVIATIONS (EN)** | | **P** |
|---|---|---|---|
| 10.5.2 | **Germany**<br>The following requirement applies:<br>For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking.<br>*Justification:*<br>German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.<br>**NOTE** Contact address:<br>Physikalisch-Technische Bundesanstalt, Bundesallee 100,<br>D-38116 Braunschweig,<br>Tel.: Int +49-531-592-6320,<br>Internet: http://www.ptb.de | Added. No cathode ray tube is used. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT IEC 62368-1**
**DENMARK NATIONAL DIFFERENCES**

Audio/video, information and communication technology equipment –
Part 1: Safety requirements

| | |
|---|---|
| **Differences according to**.....: | DS/EN 62368-1:2014 |
| **Attachment Form No**.....: | DK_ND_IEC62368_1D |
| **Attachment Originator .....**: | UL (Demko) |
| **Master Attachment**.....: | 2021-02-04 |



| | **National Differences** | | P |
|---|---|---|---|
| 4.1.15 | To the end of the subclause the following is added:<br>Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet.<br>The marking text in the applicable countries shall be as follows:<br>“Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.” | Added. The equipment is for building-in into a Class I equipment. The marking text must be provided when marketed in Denmark. | N/A |
| 5.2.2.2 | After the 2nd paragraph add the following:<br>A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | Added. No high touch current is generated. | N/A |
| 5.6.1 | Add to the end of the subclause:<br>Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment.<br>Justification:<br>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. | Added. No socket outlet is provided. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.7.5 | To the end of the subclause the following is added:<br>The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | Added. No protective conductor current exceeded. | N/A |
| 5.7.6.2 | To the end of the subclause the following is added:<br>The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA. | Added. No protective current exceeded. | N/A |
| G.4.2 | To the end of the subclause the following is added:<br>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.<br>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.<br>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.<br>Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.<br>Other current rating socket outlets shall be in compliance with Standard Sheet<br>DKA 1-3a or DKA 1-1c.<br>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a<br>Justification:<br>Heavy Current Regulations, Section 6c | Added. The equipment is for building-in into a Class I equipment. No socket outlets are provided. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT**

**IEC 62368-1**

**ITALY NATIONAL DIFFERENCES**

(Audio/video, information and communication technology equipment – Part 1: Safety requirements)

**Differences according to**.....: CEI EN 62368-1:2016

**Attachment Form No**.....: IT_ND_IEC62368_1D

**Attachment Originator .....**: IMQ S.p.A.

**Master Attachment**.....: Date 2021-02-04



| | **National Differences** | | P |
|---|---|---|---|
| F.1 | **Italy**<br>The following requirements shall be fulfilled:<br>• The power consumption in Watts (W) shall be indicated on TV receivers and in their instruction for use (Measurement according to EN 60555-2).<br>Note: *EN 60555-2 has since been replaced by IEC 60107-1:1997.*<br>• TV receivers shall be provided with an instruction for use, schematic diagrams and adjustments procedure in Italian language.<br>• Marking for controls and terminals shall be in Italian language. Abbreviation and international symbols are allowed provided that they are explained in the instruction for use.<br>• The ECC manufacturers are bound to issue a conformity declaration according to the above requirements in the instruction manual. The correct statement for conformity to be written in the instruction manual, shall be:<br>*Questo apparecchio è fabbricato nella CEE nel rispetto delle disposizioni del D.M. marzo 1992 ed è in particolare conforme alle prescrizioni dell'art. 1 dello stesso D.M.*<br>• The first importers of TV receivers manufactured outside EEC are bound to submit the TV receivers for previous conformity certification to the Italian Post Ministry (PP.TT). The TV receivers shall have on the backcover the certification number in the following form:<br>D.M. 26/03/1992 xxxxx/xxxxx/S or T or pT<br>S for stereo<br>T for Teletext<br>pT for retrofitable teletext | Not such equipment. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | *Justification:*<br>Ministerial Decree of 26 March 1992 : National rules for television receivers trade.<br><br>NOTE/: *Ministerial decree above contains additional, but not safety relevant requirements* | | |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT**

**IEC 62368-1**

**(JAPAN) NATIONAL DIFFERENCES**

(Audio/video, information and communication technology equipment – Part 1: Safety requirements)

**Differences according to**.....: J62368-1 (2020)

**TRF template used: .....:** IECEE OD-2020-F3, Ed. 1.1

**Attachment Form No**.....: JP_ND_IEC62368_1D

**Attachment Originator .....**: UL (JP)

**Master Attachment**.....: Date 2021-02-04



| | **National Differences** | | — |
|---|---|---|---|
| 4.1.2 | Where the component, or a characteristic of a component, is a safeguard or a part of a safeguard, components shall comply with the requirements of this standard or, where specified in a requirements clause, with the safety aspects of the relevant JIS component standards or IEC component standards, or components shall have properties equivalent to or better than these. | Replaced. | P |
| 5.6.1 | Mains socket-outlet and appliance outlet shall comply with Clause G.4.2A if they are incorporated as part of the equipment. | Added. No mains socket-outlet and appliance outlet. | N/A |
| 5.6.2.1 | Mains connection of class 0I equipment: Instructional safeguard in accordance with Clause F.3.6.1A;<br>Mains plug having a lead wire for protective earthing connection of class 0I equipment;<br>Independent main protective earthing terminal installed by ordinary person. | Added. Not class 0I equipment. | N/A |
| 5.6.2.2 | This requirement does not apply to internal conductor of the cord set that is covered by the sheath of mains cord and is formed together with mains plug and appliance connector. | Added. No mains cords is provided. | N/A |
| 5.6.3 | In case of class 0I equipment using power supply cord having two conductors (no earthing conductor), the conductor of protective earthing lead wire shall comply with either of the following:<br>– use of annealed copper wire with 1.6 mm diameter or corrosion-inhibiting metal wire having size and strength that are equivalent to or more than the above copper wire<br>– single core cord or single core cab tire cable with 1.25 $mm^2$ or more cross-sectional area | Added. Not class 0I equipment. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.7.3 | For class 0I equipment that is provided with mains socket-outlet in the configuration as specified in JIS C 8282 series or JIS C 8303, or otherwise being considered to comply with relevant regulations, or that is provided with mains appliance outlet as specified in JIS C 8283-2-2 for the purpose of interconnection, the measurement is conducted on the system of the interconnected equipment having a single connection to the mains. | Added. Not class 0I equipment. | N/A |
| 5.7.4 | In case of class 0I equipment, touch current shall not exceed 1.41 mA peak or for sinusoidal wave, 1.0 mA r.m.s. when measured using the network specified in Figure 4 of IEC 60990. | Added. Not class 0I equipment. | N/A |
| 6.4.3.3 | A fuse complying with JIC C 6575 series or a fuse having equivalent characteristics shall open within 1 s.<br>For Class A fuse of JIS C 6575, replace “2.1 times” by “1.35 times” and in case of Class B fuse of JIS C 6575, replace “2.1 times” by “1.6 times”. A fuse not complying with JIS C 6575 series shall be tested with the breaking capacity taken into account. | Replaced. | N/A |
| 8.5.4.2.1 | Only three-phase stationary equipment rated more than 200 V ac can be considered as being for use in locations where children are not likely to be present, when complying with Clause F.4. | Replaced. No such equipment. | N/A |
| 8.5.4.2.2 | For equipment installed where children may be present, an instructional safeguard shall be provided by easily understandable wording in accordance with Clause F.5, except that element 3 is optional. | Replaced. No such equipment. | N/A |
| 8.5.4.2.4 | The media destruction device is tested according to Clause V.1.2 with applicable jointed test probes to the opening. And then the wedge probe per Figure V.4 shall not contact any moving part. | Replaced. No such device. | N/A |
| 8.5.4.2.5 | The wedge probe of Figure V.4 and applicable jointed test probes specified in Clause V.1.2 shall not contact any moving part.<br>Instructional safeguard shall not be used instead of equipment safeguard for preventing access to hazardous moving parts. | Replaced. No such device. | N/A |
| 9.2.6, Table 38 | Handles, Knobs, grips, etc. and external surfaces either held, touched or worn against the body in normal use (> 1 min) [b,c] | Added. The equipment is a building-in type, evaluation shall be made during the final system approval. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.5.1 | Instructional safeguard of class 0I equipment in accordance with Clause F.5 when a mains socket-outlet as specified in JIS C 8282 series, JIS C 8303 or relevant regulation to which class I equipment can be connected is provided in accordance with Clause G.4.2A except for the cases where the socket-outlet is accessible only to skilled persons. | Added. Not class 0I equipment. | N/A |
| F.3.5.3 | If the fuse is necessary for the safeguard function, the symbols indicating pre-arcing time-current characteristic. | Added. Not replaceable. | N/A |
| F.3.6.1A | Marking for class 0I equipment<br>The requirements of Clauses F.3.6.1.1 and F.3.6.1.3 shall be applied to class 0I equipment.<br>For class 0I equipment, a marking of instructions and instructional safeguard shall be provided regarding the earthing connection. | Added. Not class 0I equipment. | N/A |
| F.3.6.2.1 | Symbols, IEC 60417-5172 (2003-02) or IEC 60417-6092 (2011-10), shall not be used for class I equipment or class 0I equipment. | Added. Not be used for class I equipment or class 0I equipment. | N/A |
| F.4 | Instruction for audio equipment with terminals classified as ES3 in accordance with Table E.1, and for other equipment with terminals marked in accordance with F.3.6.1 and F.3.6.1A.<br>Installation instruction for the protective earthing connection for class 0I equipment provided with independent main protective earthing terminal, where the cord for the protective earthing connection is not provided within the package for the equipment. | Replaced. | N/A |
| G.3.2.1 | The thermal link when tested as a separate component, shall comply with the requirements of JIS C 6691 or have properties equivalent to or better than that. | Replaced. No such device. | N/A |
| G.3.4 | Except for devices covered by Clause G.3.5, overcurrent protective devices used as a safeguard shall comply with the relevant part of JIS C 6575 (corresponding to IEC 60127) or shall have equivalent characteristics.<br>If there are no applicable IEC standards, overcurrent protective devices used as a safeguard shall comply with their applicable IEC standards. | Replaced. All sources of fuse complied with IEC 60127. | P |
| G.4.1 | This requirement is not applicable to Clauses G.4.2 and G.4.2A. | Added. No such device. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.4.2 | Mains connector shall comply with JIS C 8282 series, JIS C 8283 series, JIS C 8285, JIS C 8303 or IEC 60309 series.<br>Mains plugs and socket-outlets shall comply with JIS C 8282 series, JIS C 8303, IEC 60309 series, or have equivalent or better performance.<br>A power supply cord set provided with appliance connector that can fit appliance inlet complying with JIS C 8283-1 shall comply with JIS C 8286.<br>Construction preventing mechanical stress not to transmit to the soldering part of inlet terminal. Consideration for an equipment rated not more than 125 V provided with Type C14 and C18 appliance coupler complying with JIS C 8283 series. | Replaced. Certified sources of screw wiring terminal block is provided. | N/A |
| G.4.2A | Mains socket-outlet and interconnection coupler provided with the class II, class I and class 0I equipment respectively. | Added. No such device. | N/A |
| G.7.1 | A mains supply cord need not include the protective earthing conductor for class 0I equipment provided with independent protective earthing conductor. | Replaced. Not class 0I equipment. No such device. | N/A |
| G.8.3.3 | Withstand 1,71 × 1.1 × $U_0$ for 5 s. | Replaced. No such device. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

## ATTACHMENT TO TEST REPORT IEC 62368-1 2th Ed.
## U.S.A. NATIONAL DIFFERENCES

Audio/video, information and communication technology equipment – Part 1: Safety requirements

| | |
|---|---|
| **Differences according to**.....: | CSA/UL 62368-1:2014 |
| **TRF template used: .....:** | IECEE OD-2020-F3, Ed. 1.1 |
| **Attachment Form No**.....: | US_CA_ND_IEC62368_1D |
| **Attachment Originator .....**: | UL(US) |
| **Master Attachment**.....: | Dated 2021-02-04 |



| **IEC 62368-1 - US and Canadian National Differences<br>Special National Conditions based on Regulations and Other National Differences** | | | |
|---|---|---|---|
| 1.1 | All equipment is to be designed to allow installation according to the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2.<br>Also, for such equipment marked or otherwise identified, installation is allowed per the Standard for the Protection of Information Technology Equipment, ANSI/NFPA 75. | In accordance with the National Electrical Code (NEC) and the Canadian Electrical Code (CEC) part 1 CAN/CSA C22.1, ANSI/NFPA 70, and unless marked or otherwise identified, the Standard for Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75. | P |
| 1.4 | Additional requirements apply to some forms of power distribution equipment, including sub-assemblies. | Considered. | P |
| 4.1.17 | For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the NEC. | No external interconnecting flexible cord and cable assemblies are provided. Overall acceptance has to be evaluated during the national approval process. | N/A |
| | For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the NEC generally are required to have special construction features and identification markings. | See above. | N/A |
| 4.8 | Lithium coin / button cell batteries have modified special construction and performance requirements. | No such parts. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.6.3 | Protective earthing conductors comply with the minimum conductor sizes in Table G.5, except as required by Table G.7ADV.1 for cord connected equipment, or Annex DVH for permanently connected equipment | Certified sources of screw wiring terminal block is provided.<br>The equipment is suitable for building-in into a Class I final system.<br>However, the equipment is built-in type, overall compliance shall be evaluated in the final system approval. | N/A |
| 5.7.7 | Equipment intended to receive telecommunication ringing signals complies with a special touch current measurement tests. | No TNV circuits within the equipment. | N/A |
| 6.5.1 | PS3 wiring outside a fire enclosure complies with single fault testing in B.4, or be current limited per one of the permitted methods. | No such parts. | N/A |
| Annex F<br>(F.3.3.8) | Output terminals provided for supply of other equipment, except mains, supply are marked with a maximum rating or references to which equipment it is permitted to be connected. | The equipment is a building-in type, and see copy of marking plate. | P |
| Annex G<br>(G.7.1) | Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs. | The equipment is not permanent connection equipment. | N/A |
| Annex G<br>(G.7.3) | Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment. | The primary screw wiring terminal block is provided. No power supply cords.<br>The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| | Flexible power supply cords are required to be compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC. | See above. | N/A |
| Annex G<br>(G.7.5) | Minimum cord length is required to be 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement. Power supply cords are required to be no longer than 4.5 m in length if used in ITE Rooms. | See above. | N/A |
| Annex H.2 | Continuous ringing signals under normal operating conditions up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions. | No TNV circuits within the equipment. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Annex H.4 | For circuits with other than ringing signals and with voltages exceeding 42.4 $V_{peak}$ or 60 V d.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions. | No TNV circuits within the equipment. | N/A |
| Annex M | Battery packs for stationary applications comply with special component requirements. | Not such application. | N/A |
| Annex DVA (1) | Equipment intended for use in spaces used for environmental air are subjected to special flammability requirements for heat and visible smoke release. | The equipment not intended to be used within such environments. | N/A |
| | For ITE room applications, automated information storage systems with combustible media greater than 0.76 $m^3$ (27 cu ft) have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge. | Not such equipment. | N/A |
| | Consumer products designed or intended primarily for children 12 years of age or younger are subject to additional requirements in accordance with U.S. & Canadian Regulations. | The equipment is not for children used. | N/A |
| | Baby monitors additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors. | Not a baby monitors. | N/A |
| Annex DVA (5.6.3) | For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A. | Considered. | P |
| Annex DVA (6.3) | The maximum quantity of flammable liquid stored in equipment complies with NFPA 30. | No flammable liquids within the equipment. | N/A |
| Annex DVA (6.4.8) | For ITE room applications, enclosures with combustible material measuring greater than 0.9 $m^2$ (10 sq ft) or a single dimension greater than 1.8 m (6 ft) have a flame spread rating of 50 or less. For equipment with the same dimensions for other applications, an external surface that is not a fire enclosure requires a min. flammability classification of V-1. | No such application. | N/A |
| Annex DVA (10.3.1) | Equipment with lasers meets the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370). | No such parts. | N/A |
| Annex DVA (10.5.1) | Equipment that produces ionizing radiation complies with the U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370). | No such parts. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Annex DVA (F.3.3.3) | Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. Additional considerations apply for voltage ratings that exceed the attachment cap rating or are lower than the “Normal Operating Condition” in Table 2 of CAN/CSA C22.2 No. 235.” | Single phase only. | N/A |
| Annex DVA (F.3.3.5) | Equipment identified for ITE (computer) room installation is marked with the rated current | Not such application. | N/A |
| Annex DVA (G.1) | Vertically-mounted disconnect switches and circuit breakers have the "on" position indicated by the handle in the up position | No such parts. | N/A |
| Annex DVA (G.3.4) | Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable. | No standard supply outlets, receptacles, medium-base or smaller lampholders are provided. | N/A |
| Annex DVA (G.4.2) | Equipment with isolated ground (earthing) receptacles complies with NEC 250.146(D) and CEC 10-112 and 10-906(8). | No such parts. | N/A |
| Annex DVA (G.4.3) | Where a fuse is used to provide Class 2 or Class 3 current limiting, it is not operator-accessible unless it is non- interchangeable. | No such parts. | N/A |
| Annex DVA (G.5.3) | Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require special transformer overcurrent protection. | No such parts. | N/A |
| Annex DVA (G.5.4) | Motor control devices are required for cord-connected equipment with a mains-connected motor if the equipment is rated more than 12 A, or if the equipment has a nominal voltage rating greater than 120 V, or if the motor is rated more than 1/3 hp (locked rotor current over 43 A). | No such parts. | N/A |
| Annex DVA (Annex M) | For ITE room applications, equipment with battery systems capable of supplying 750 VA for five minutes have a battery disconnect means that may be connected to the ITE room remote power-off circuit. | Not such application. | N/A |
| Annex DVA (Q) | Wiring terminals intended to supply Class 2 outputs according to the NEC or CEC Part 1are marked with the voltage rating and “Class 2” or equivalent; marking is located adjacent to the terminals and visible during wiring. | Not applicable for the equipment. | N/A |
| Annex DVB (1) | Additional requirements apply for equipment used for entertainment purposes intended for installation in general patient care areas of health care facilities. | Not such application. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Annex DVC (1) | Additional requirements apply for equipment intended for mounting under kitchen cabinets. | Not such application. | N/A |
| Annex DVE (4.1.1) | Some equipment, components, sub-assemblies and materials associated with the risk of fire, electric shock, or personal injury have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. Components required to comply include: appliance couplers, attachment plugs, battery back-up systems, battery packs, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), power supply cords, direct plug-in equipment, electrochemical capacitor modules (energy storage modules with ultra-capacitors), enclosures (outdoor), flexible cords and cables, fuses (branch circuit), ground-fault current interrupters, interconnecting cables, data storage equipment, printed wiring, protectors for communications circuits, receptacles, surge protective devices, vehicle battery adapters, wire connectors, and wire and cables. | UL approved components used. Refer to table 4.1.2 of IEC 62368-1 test report for details. | P |
| Annex DVH | Equipment for permanent connection to the mains supply is subjected to additional requirements. | The equipment is not permanently connected equipment. | N/A |
| Annex DVH (DVH.1) | Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains are in accordance with the NEC/CEC. | The equipment is for building-in, shall be evaluated in the final system assembly. | N/A |
| Annex DVH (DVH.3.2) | Terminals for permanent wiring, including protective earthing terminals, are suitable for U.S./Canadian wire gauge sizes, rated 125 percent of the equipment rating, and are specially marked when specified. | No terminals for permanent wiring. | N/A |
| Annex DVH (DVH.3.2) | Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 $mm^2$). | No wire binding screws. | N/A |
| Annex DVH (DVH.4) | Permanently connected equipment is required to have a suitable wiring compartment and wire bending space. | The equipment is not permanently connected equipment. | N/A |
| Annex DVH (DVH 5.5) | Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, complies with special earthing, wiring, marking and installation instruction requirements. | The equipment not connected to a centralized d.c. power system. | N/A |

| IEC62368_1D - ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Annex DVI (6.7 ) | Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses. | No TNV circuits within the equipment. | N/A |
| Annex DVJ (10.6.1 ) | Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements. | No TNV circuits within the equipment. | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

**ATTACHMENT TO TEST REPORT**

IEC 62368-1

(AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES

(**Audio/video, information and communication technology equipment**)

**Differences according to**.....: AS/NZS 62368.1:2018

**TRF template used:.....:** IECEE OD-2020-F3:2022, Ed. 1.2

**Attachment Form No**.....: AU_NZ_ND_IEC62368_1D

**Attachment Originator .....**: JAS-ANZ

**Master Attachment**.....: 2023-11-14



| | | | |
|---|---|---|---|
| | **National Differences** | | P |
| **Appendix ZZ** | Variations to IEC 62368-1:2014 (ED. 2.0) for Australia and New Zealand | | P |
| **ZZ1 Scope** | This Appendix lists the normative variations to IEC 62368-1:2014 (ED. 2.0) | | P |
| **ZZ2 Variations** | The following modifications are required for Australian/New Zealand conditions: | | P |
| **2** | *Add* the following to the list of normative references:<br>The following normative documents are referenced in Appendix ZZ:<br>-AS/NZS 3112, *Approval and test specification—Plugs and socket-outlets*<br>-AS/NZS 3123, *Approval and test specification—Plugs, socket-outlets and couplers for general industrial application*<br>-AS/NZS 3191, *Electric flexible cords*<br>-AS/NZS 60065, *Audio, video and similar electronic apparatus—Safety requirements*<br>*(IEC 60065:2015 (ED.8.0) MOD)*<br>-AS/NZS 60320.1, *Appliance couplers for household and similar general purposes,*<br>*Part 1: General requirements (IEC 60320-1, Ed.2.1 (2007) MOD)*<br>-AS/NZS 60320.2.2, *Appliance couplers for household and similar general purposes*<br>*Part 2.2: Interconnection couplers for household and similar equipment (IEC 60320-2-*<br>*2, Ed.2.0 (1998) MOD)*<br>-AS/NZS 60695.2.11, *Fire hazard testing, Part 2.11: Glowing/hot wire based test methods—Glow-wire flammability test method for end-* | Added. | P |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | *products*<br>-AS/NZS 60695.11.5, *Fire hazard testing, Part 11.5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance*<br>-AS/NZS 60695.11.10, *Fire hazard testing, Part 11.10: Test flames—50 W*<br>*horizontal and vertical flame test methods*<br>-AS/NZS 60884.1, *Plugs and socket-outlets for household and similar purposes,*<br>*Part 1: General requirements*<br>-AS/NZS 60950.1:2015, *Information technology equipment—Safety*, Part 1: *General requirements (IEC 60950-1, Ed.2.2 (2013), MOD)*<br>IEC 61032:1997, *Protection of persons and equipment by enclosures—Probes for*<br>*verification*<br>-AS/NZS 61558.1:2008 (including Amendment 2:2015), *Safety of Power Transformers,*<br>*Power Supplies, Reactors and Similar Products, Part 1: General requirements and*<br>*tests (IEC 61558-1 Ed 2.1, MOD)*<br>-AS/NZS 61558.2.16, *Safety of transformers, reactors, power supply units and similar*<br>*products for voltages up to 1 100 V, Part 2.16:*<br>*Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units.* | | |
| **4.1.1** | **Application of requirements and acceptance of materials, components and subassemblies**<br>1 *Replace* the text 'IEC 60950-1' with 'AS/NZS 60950.1:2015'.<br>2 *Replace* the text 'IEC 60065' with 'AS/NZS 60065'. | Replaced. | P |
| **4.7** | Equipment for direct insertion into mains socket-outlets | | N/A |
| **4.7.2** | **Requirements**<br>*Delete* the text of the second paragraph and *replace* with the following:<br>Equipment with a plug portion, suitable for insertion into a 10 A 3-pin flat-pin socket-outlet complying with AS/NZS 3112 shall comply with the requirements in AS/NZS 3112 for equipment with integral pins for insertion into socket-outlets. | Deleted. The equipment is not direct plug-in equipment. | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4.7.3** | **Compliance Criteria**<br>*Delete* the first paragraph and Note 1 and Note 2 and *replace* with the following:<br>*Compliance is checked by inspection and, if necessary, by the tests in AS/NZS 3112.* | Deleted. The equipment is not direct plug-in equipment. | N/A |
| **4.8** | *Delete* existing clause title and *replace* with the following:<br>**4.8 Products containing coin/button cell batteries** | | N/A |
| **4.8.1** | **General**<br>1 Second dashed point, *delete* the text and *replace* with the following:<br>– include coin/button cell batteries with a diameter of 32 mm or less.<br>2 After the second dashed point, *insert* the following Note:<br>NOTE 1: Batteries are specified in IEC 60086-2.<br>3 After the third dashed point, *renumber* the existing Note as 'NOTE 2'.<br>4 Fifth dashed point, *delete* the word 'lithium'. | Deleted and replaced. No lithium coin/button batteries are used.<br><br>Inserted.<br><br>Renumbered.<br>Deleted. | N/A |
| **4.8.2** | **Instructional Safeguard**<br>First line, *delete* the word 'lithium'. | Deleted. | N/A |
| **4.8.3** | **Construction**<br>First line, after the word 'Equipment' *insert* the words 'containing one or more<br>coin/button batteries and' | Inserted. | N/A |
| **4.8.5** | **Compliance criteria**<br>*Delete* the first paragraph and *replace* with the following:<br>*Compliance is checked by applying a force of 30 N +/-1 N for 10 s to the battery compartment door/cover by a rigid test finger according to test probe 11 of IEC 61032:1997 at the most unfavourable place and in the most unfavourable direction. The force shall be applied in one direction at a time.* | Deleted. | N/A |
| **5.4.10.2** | **Test methods** | | N/A |
| **5.4.10.2.1** | **General**<br>*Delete* the first paragraph and *replace* with the following:<br>In Australia only, the separation is checked by the test of both Clause 5.4.10.2.2 and Clause 5.4.10.2.3. In New Zealand, the separation is checked by the test of either Clause 5.4.10.2.2 or Clause 5.4.10.2.3. | Deleted and replaced. No such external circuits. | N/A |
| **Table 29** | *Replace* the table with the following: | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| Parts | Impulse test | | Steady state test | |
|---|---|---|---|---|
| | New Zealand | Australia | New Zealand | Australia |
| Parts indicated in Clause 5.4.10.1 a) [a] | 2.5 kV 10/700 µs | 7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment. 10/700 µs | 1.5 kV | 3 kV |
| Parts indicated in Clause 5.4.10.1 b) and c) [b] | 1.5 kV 10/700 µs [c] | | 1.0 kV | 1.5 kV |

[a] Surge suppressors shall not be removed.

[b] Surge suppressors may be removed, provided that such devices pass the impulse test of Clause 5.4.10.2.2 when tested as components outside the equipment.

[c] During this test, it is allowed for a surge suppressor to operate and for a sparkover to occur in a GDT.

| | | | |
|---|---|---|---|
| **5.4.10.2.2** | After the first paragraph, *insert* new Notes 201 and 202 as follows:<br>NOTE 201 For Australia, the 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines.<br>NOTE 202 For Australia, the value of 2.5 kV for Clause 5.4.10.1 a) was chosen to ensure the adequacy of the insulation concerned and does not necessarily simulate likely overvoltages. | Inserted. | N/A |
| **5.4.10.2.3** | After the first paragraph, *insert* new Notes 201 and 202 as follows:<br>NOTE 201 For Australia, where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used.<br>NOTE 202 The 3 kV and 1.5 kV values for Australia have been determined considering the low frequency induced voltages from the power supply distribution system. | Inserted. | N/A |
| **6** | **Electrically-caused fire** | See below. | P |
| **6.1** | **General**<br>After the first paragraph, *insert* the following new paragraph:<br>Alternatively, the requirements of Clauses 6.2 to 6.5.2 are considered to be fulfilled if the equipment complies with the requirements of Clause 6.202 | Inserted. However, equipment under test materials are used and components in compliance with requirements of IEC 62368-1. Alternative test methods were not considered. | N/A |
| **6.6** | After Clause 6.6, *add* the new Clauses 6.201 and 6.202 as follows:<br>**6.201 External power supplies, docking stations and other similar devices** and<br>**6.202 Resistance to fire—Alternative tests**<br>(see special national conditions) | | P |
| **8.5.4** | **Special categories of equipment comprising moving parts** | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **8.5.4.1** | **Large data storage equipment**<br>In the first dashed row and the second dashed rows *replace* 'IEC 60950-1:2005' with 'AS/NZS 60950.1:2015'. | Replaced. Not such equipment. | N/A |
| **8.6** | **Stability of equipment** | | N/A |
| **8.6.1 and Table 36** | **Requirements**<br>1. Table 36, *insert* Footnote c at the end of the 'Glass slide' heading, and *add* a new Footnote c after the text of Footnote b in the last row of Table 36 as follows:<br>[c] The glass slide test is not applicable to floor standing equipment, even though the equipment may have controls or a display.<br>2. Table 36, fifth row, *insert* '[201]' at the end of 'No stability requirements'<br>3. Table 36, ninth row, *insert* '[201]' at the end of 'No stability requirements'<br>4. Table 36, *add* the following new footnote:<br>[201] MS2 and MS3 television sets and display devices, designed only for fixing to a wall, ceiling or equipment rack, are not subjected to stability requirements only if the instructional safeguard of Clause 8.6.1.201 is provided. Otherwise, the glass slide requirements of Clause 8.6.4 and horizontal force requirements of Clause 8.6.5 apply.<br>5. Second paragraph beneath Table 36, *delete* the words 'MS2 and MS3 television sets' and *replace* with 'MS2 and MS3 television sets and display devices' | Inserted. Equipment mass < 7 kg, classified as MS1. No stability requirement. | N/A |
| **8.6.1** | After Clause 8.6.1 *add* the following new clauses:<br>**8.6.1.201 Instructional safeguard for fixed-mount television sets**<br>(see special national conditions) | Added. Not such devices. | N/A |
| **Annex F**<br>**Paragraph F.3.5.1** | **Mains appliance outlet and socket-outlet markings**<br>*Replace* 'IEC 60320-2-2' with 'AS/NZS 60320.2.2'. | Replaced. No such devices within the equipment. | N/A |
| **Annex G**<br>**Paragraph G.4.2** | **Mains connectors**<br>1 In the second line *insert* 'or AS/NZS 3123' after 'IEC 60906-1'.<br>2 In the second line *insert* 'or AS/NZS 60320 series' after 'IEC 60320 series'<br>3 *Add* the following new paragraph:<br>10 A or 15 A 250 V flat pin plugs for the connection of equipment to mains-powered socket-outlets for household or similar general use shall comply with AS/NZS 3112 or AS/NZS 60884.1. | Inserted.<br>Inserted.<br>Added.<br>Certified sources of construction for screw wiring terminal block.<br>The equipment is a building-in type and evaluation is to be made during the final system approval. | P |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **Paragraph G.5.3.1** | **Transformers, General**<br>1 In the third dashed point *replace* 'IEC 61558-1 and the relevant parts of IEC 61558-2' with 'AS/NZS 61558-1 and the relevant parts of AS/NZS 61558.2'<br>2 In the fourth dashed point *replace* 'IEC 61558-2-16' with 'AS/NZS 61558.2.16'. | Replaced. | N/A |
| **Paragraph G.7.1** | **Mains supply cords, General**<br>In the fourth dashed paragraph, *replace* 'IEC 60320-1' with 'AS/NZS 60320.1' | Replaced. The primary screw wiring terminal block is provided. No power supply cords.<br>The equipment is a building-in type and evaluation is to be made during the final system approval. | N/A |
| **Table G.5** | **Sizes of conductors**<br>1 In the second row, first column, *delete* '6' and *replace* with '7.5'<br>2 In the second row, second column, *delete* '0,75' and *replace* with '0.75[b]<br>3 *Delete* Note 1.<br>4 *Replace* 'NOTE 2' with 'NOTE:'.<br>5 *Delete* the text of 'Footnote b' and *replace* with the following:<br>[b] This nominal cross-sectional area is only allowed for Class II appliances if the length of the power supply cord, measured between the point where the cord, or cord guard, enters the appliance, and the entry to the plug does not exceed 2 m (0.5 mm2 three-core supply flexible cords are not permitted; see AS/NZS 3191).<br>6 In Footnote c *replace* 'IEC 60320-1' with 'AS/NZS 60320.1'<br>7 In Footnote d *replace* 'IEC 60320-1' with 'AS/NZS 60320.1' | Deleted.<br>Deleted.<br>Deleted.<br>Replaced.<br>Deleted and replaced.<br>Replaced.<br>Replaced. | N/A |
| **Annex M**<br>**Paragraph M.3.2** | **Protection circuits for batteries provided within the equipment, Test method**<br>After the first dashed point *add* the following Note:<br>NOTE 201: In cases where the voltage source is provided by power from an unassociated power source, consideration should be given to the effects of possible single fault conditions in the unassociated equipment. If the power source is unknown then it should be assumed that the maximum limit of SELV may be applied to the source input under assumed single fault conditions in the source when assessing the charging circuit in the equipment under test. | Added. | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
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| | **Special national conditions (if any)** | See below. | P |
| **6.201** | **External power supplies, docking stations and other similar devices**<br>For external power supplies, docking stations and other similar devices, during and after abnormal operating conditions and during single fault conditions the output voltage—<br>– at all ES1 outlets or connectors shall not increase by more than 10% of its rated output voltage under normal operating condition; and<br>– of a USB outlet or connector shall not increase by more than 3 V or 10% of its rated output voltage under normal operating conditions, whichever is higher.<br>For equipment with multiple rated output voltages, the requirements apply with the equipment configured for each rated output voltage in turn.<br>NOTE: This is intended to reduce the possibility of battery fire or explosion in attached equipment or accessories when charging secondary lithium batteries.<br>*Compliance shall be checked by measurement, taking into account the abnormal operating conditions of Annex B.3 and the simulated single-fault conditions of Annex B.4* | Added. Compliance checked. The output voltage not increase by more than 10% of its rated output voltage during and after abnormal operating conditions and during single fault conditions. See appended table 5.2.2.2 of IEC 62368-1 test report. | P |
| **6.202** | **Resistance to fire—Alternative tests** | See below. | N/A |
| **6.202.1** | **General**<br>Parts of non-metallic material shall be resistant to ignition and spread of fire.<br>This requirement does not apply to decorative trims, knobs and other parts unlikely to be ignited or to propagate flames from inside the equipment, or the following:<br>a) Components that are contained in an enclosure having a flammability category of V-0 according to AS/NZS 60695.11.10 and having openings only for the connecting wires filling the openings completely, and for ventilation not exceeding 1 mm in width regardless of length.<br>b) The following parts which would contribute negligible fuel to a fire:<br>– small mechanical parts, the mass of which does not exceed 4 g, such as mounting parts, gears, cams, belts and bearings;<br>– small electrical components, such as capacitors with a volume not exceeding 1 750 $mm^3$, | However, equipment under test materials are used and components in compliance with requirements of IEC 62368-1. Alternative test methods were not considered. | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | integrated circuits, transistors and optocoupler packages, if these components are mounted on material of flammability category V-1, or better, according to AS/NZS 60695.11.10.<br>NOTE: In considering how to minimize propagation of fire and what 'small parts' are, account should be taken of the cumulative effect of small parts adjacent to each other for the possible effect of propagating the fire from one part to another. | | |
| | *Compliance shall be checked by the tests of Clauses 6.202.2, 6.202.3 and 6.202.4.*<br>For the base material of printed boards, compliance shall be checked by the test of Clause 6.202.5.<br>The tests shall be carried out on parts of non-metallic material which have been removed from the equipment. When the glow-wire test is carried out, the parts shall be placed in the same orientation as they would be in normal use.<br>These tests are not carried out on internal wiring. | See above. | N/A |
| **6.202.2** | **Testing of non-metallic materials**<br>Parts of non-metallic material shall be subject to the glow-wire test of AS/NZS 60695.2.11 which shall be carried out at 550°C.<br>Parts for which the glow-wire test cannot be carried out, such as those made of soft or foamy material, shall meet the requirements specified in ISO 9772 for category FH-3 material. The glow-wire test shall be not carried out on parts of material classified at least FH-3 according to ISO 9772 provided that the relevant part is not thinner than the sample tested. | See above. | N/A |
| **6.202.3** | **Testing of insulating materials**<br>Parts of insulating material supporting Potential Ignition Sources shall be subject to the glow-wire test of AS/NZS 60695.2.11 which shall be carried out at 750°C.<br>The test shall be also carried out on other parts of insulating material which are within a distance of 3 mm of the connection.<br>NOTE: Contacts in components such as switch contacts are considered to be connections | See above. | N/A |
| | For parts which withstand the glow-wire test but produce a flame, other parts above the connection within the envelope of a vertical cylinder having a diameter of 20 mm and a height of 50 mm shall be subjected to the needle-flame test.<br>However, parts shielded by a barrier which meets the needle-flame test need not be tested | See above. | N/A |
| | The needle-flame test shall be made in | See above. | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |

accordance with AS/NZS 60695.11.5 with the following modifications:

| **Clause of AS/NZS 60695.11.5** | Change |
|---|---|
| **9 Test procedure** | |
| **9.2 Application of needle-flame** | *Delete* the first and second paragraphs and *replace* with the following:<br>The specimen shall be arranged so that the flame can be applied to a vertical or horizontal edge as shown in the examples of Figure 1. If possible the flame shall be applied at least 10 mm from a corner.<br>The duration of application of the test flame shall be 30 s ± 1 s. |
| **9.3 Number of test specimens** | *Replace* with the following:<br>The test shall be made on one specimen. If the specimen does not withstand the test, the test may be repeated on two further specimens, both of which shall withstand the test. |
| **11 Evaluation of test results** | *Replace* with the following:<br>The duration of burning (tb) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15 s. |

The needle-flame test shall not be carried out on parts of material classified as V-0 or V-1 according to AS/NZS 60695.11.10, provided that the relevant part is not thinner than the sample tested.

| IEC62368_1D ATTACHMENT | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| **6.202.4** | **Testing in the event of non-extinguishing material**<br>If parts, other than enclosures, do not withstand the glow wire tests of Clause 6.202.3, by failure to extinguish within 30 s after the removal of the glow wire tip, the needle-flame test detailed in Clause 6.202.3 shall be made on all parts of non-metallic material which are within a distance of 50 mm or which are likely to be impinged upon by flame during the tests of Clause 6.202.3. Parts shielded by a separate barrier which meets the needle-flame test need not be tested.<br>NOTE 1: If the enclosure does not withstand the glow-wire test the equipment is considered to have failed to meet the requirements of Clause 6.202 without the need for consequential testing.<br>NOTE 2: If other parts do not withstand the glow-wire test due to ignition of the tissue paper and if this indicates that burning or glowing particles can fall onto an external surface underneath the equipment, the equipment is considered to have failed to meet the requirements of Clause 6.202 without the need for consequential testing.<br>NOTE 3: Parts likely to be impinged upon by the flame are considered to be those within the envelope of a vertical cylinder having a radius of 10 mm and a height equal to the height of the flame, positioned above the point of the material supporting, in contact with, or in close proximity to, connections. | See above. | N/A |
| **6.202.5** | **Testing of printed boards**<br>The base material of printed boards shall be subjected to the needle-flame test of Clause 6.202.3. The flame shall be applied to the edge of the board where the heat sink effect is lowest when the board is positioned as in normal use. The flame shall not be applied to an edge, consisting of broken perforations, unless the edge is less than 3 mm from a potential ignition source.<br><br>The test is not carried out if—<br>– the printed board does not carry any potential ignition source;<br>– the base material of printed boards, on which the available apparent power at a connection exceeds 15 VA operating at a voltage exceeding 50 V and<br>equal or less than 400 V (peak) a.c. or d.c. under normal operating conditions, is of flammability category V-1 or better according to AS/NZS 60695.11.10, or the printed boards are protected by an enclosure meeting the flammability category V-0 according to AS/NZS 60695.11.10, or made of metal, having openings only for connecting wires which fill the openings | For PCB material refer to appended table 4.1.2 of IEC 62368-1 test report. | N/A |

| IEC62368_1D ATTACHMENT | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | completely; or<br>– the base material of printed boards, on which the available equipment power at a connection exceeds 15 VA operating at a voltage exceeding 400 V (peak) a.c. or d.c. under normal operating conditions, and base material of printed boards supporting spark gaps which provides protection against overvoltages, is of flammability category V-0 according to AS/NZS 60695.11.10 or the printed boards are contained in a metal enclosure, having openings only for connecting wires which fill the openings completely.<br>*Conformance shall be determined using the smallest thickness of the material.*<br>NOTE: Available apparent power is the maximum apparent power which can be drawn from the supplying circuit through a resistive load whose value is chosen to maximize the apparent power for more than 2 min when the circuit supplied is disconnected. | | |
| **6.202.6** | **For open circuit voltages greater than 4 kV**<br>Potential ignition sources with open circuit voltages exceeding 4 kV (peak) a.c. or d.c. under normal operating conditions shall be contained in a FIRE ENCLOSURE which shall comply with flammability category V-1 or better according to AS/NZS 60695.11.10. | See above. | N/A |
| **8.6.1.201** | **8.6.1.201 Instructional safeguard for fixed-mount television sets**<br>MS2 and MS3 television sets and display devices designed only for fixed mounting to a wall of ceiling or equipment rack shall, where required in Table 36, footnote 201, have an instructional safeguard in accordance with Clause F.5 which may be on the equipment or included in the installation instructions or equivalent document accompanying the equipment.<br>The elements of the instructional safeguard shall be as follows:<br>– element 1a: not available;<br>– element 2: 'Stability Hazard' or equivalent wording;<br>– element 3: 'The television set may fall, causing serious personal injury or death' or equivalent text;<br>– element 4: the following or equivalent text:<br>To prevent injury, this television set must be securely attached to the floor/wall in accordance with the installation instructions | Not such devices. | N/A |

| IEC62368_1D ATTACHMENT | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| **8.6.1.202** | **Restraining device**<br>MS2 and MS3 television sets and display devices that are not solely fixed-mounted should be provided with a restraining device such as a fixing point to facilitate restraining the equipment from toppling forward. The restraining device shall be capable of withstanding a pull of 100 N in all directions without damage.<br>Where a restraining device is provided, instructions shall be provided in the instructions for installation or instructions for use to ensure correct and safe installation. | See above. | N/A |

| IEC62368_1D ATTACHMENT | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

| AS_NZS_3112:2017_Appendix J ATTACHMENT | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| **ATTACHMENT TO TEST REPORT**<br>**AS_NZS_3112:2017_+A1:2021 Appendix J**<br>**AUSTRALIAN / NEW ZEALAND NATIONAL DIFFERENCES**<br>**(Approval and test specification—Plugs and socket-outlets)** | | | |
| **Differences according to**.....: AS_NZS_3112:2017_Amendment 1:2021_Appendix J | | | |
| **TRF template used: .....:** IECEE OD-2020-F3, Ed. 1.1 | | | |
| **Attachment Form No**.....: AS_NZS_3112:2017_Appendix J<br>**Attachment Originator .....**: JAS-ANZ<br>**Master Attachment**.....: 2021-11 | | | |
|  | | | |
| | | | |
| **Note:** | **This TRF only relates to Appendix J requirements** | | N/A |
| | Accreditation | | N/A |
| | APPENDIX J<br>INTEGRAL OR DETACHABLE PLUG PORTIONS OF EQUIPMENT FOR INSERTION INTO SOCKET-OUTLETS | | N/A |
| J1<br>SCOPE | General: This Appendix specifies additional dimensional and constructional requirements for detachable plug portions, or equipment incorporating integral supply pins or equipment incorporating detachable plug portions.<br>This Appendix shall be read in conjunction with Section 2 of this Standard.<br>For the purposes of this Appendix, where the term ‘plug’ is used in Section 2 it shall be taken to mean the plug portion of equipment or the detachable plug portion.<br>The equipment shall comply with the relevant product Standard. The tests and requirements specified in this Appendix are in addition to any test and requirements of the relevant product Standard for the equipment.<br>(AS/NZS 3112:2017/A1:2021) | | N/A |

| IEC62368_1D ATTACHMENT | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |

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| J2 | DEFINITION | N/A |
| J2.1 | Detachable plug portion<br>A plug portion that is detachable from the equipment and with connections including the following standardized outputs and other contacts<br>(a) Type A (see Figure J1):<br>A detachable plug portion with a connection intended for plugging directly into equipment. The connection being via the equipment group 1 appliance inlet within the scope of AS/NZS 60320.1.<br>(b) Type B (see Figure J2):<br>A detachable plug portion with a non-standardized connection intended for plugging directly into equipment<br>(c) Type C (see Figure J3):<br>A detachable plug portion with a connection intended for use with an adaptor connected to a flexible cord so as to replicate a supply plug and flexible cord configuration. The connection being via a group 1 appliance outlet within scope of AS/NZS 60320.2.2, which is integral with the plug portion<br>(AS/NZS 3112:2017) | N/A |
| J2.2 | Integral plug portion<br>A plug portion that is integral to the equipment enclosure and is not detachable<br>(AS/NZS 3112:2017) | N/A |
| J2.3 | Plug portion<br>A plug portion is that portion of equipment with pins for insertion into a socket-outlet, including the plug pins, terminals of the plug pins, external dimensions of the 'maximum projection' and any connections of a detachable plug portion.<br>(AS/NZS 3112:2017/A1:2021) | N/A |

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| **J3** | **REQUIREMENTS FOR THE PLUG PORTION** | N/A |

| | | | |
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| J3.1 | General<br>The following provisions apply to the dimensional and constructional requirements of plug portions of equipment and any detachable connection between the plug portion and the equipment: | | N/A |
| (a) | For detachable plug portions intended for connection to the equipment in multiple orientations, the relevant tests are performed in the most onerous orientation. | | N/A |
| (b) | For Type A detachable plug portion, the relevant requirements of AS/NZS 3105:2014 are applicable, in addition to conformance with relevant clauses of this Appendix | | N/A |
| (c) | For Type B detachable plug portions, the conformance is shown by the relevant clauses of this Appendix. | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| (d) | For Type C detachable plug portions, conformance is shown by assessment to Section 2 _of this Standard (plugs) and relevant clauses of this Appendix<br>(AS/NZS 3112:2017) | | N/A |
| J3.2 | **Plug pins of plug portions**<br>The requirements of Clause 2.2 are applicable for plug pins. | | N/A |
| 2.2 | PLUG PINS | | N/A |
| 2.2.1 | Current carrying parts of plug pins of metal having sufficient mechanical strength, electrical conductivity and resistance to corrosion adequate for the intended use | | N/A |
| | Plug pin material? | | N/A |
| 2.2.2 | Pins that may become detached from plug yet remain attached to cord conductors; not possible for plug to be assembled with any pin located in a position other than that intended | | N/A |
| | Plug made of resilient insulating material; pins and terminals held securely in position<br>(AS/NZS 3112:2017) | | N/A |
| 2.2.3 | Plug pins adequately proportioned throughout and portion adjacent to the connection designed to not introduce a stress concentration which may lead to a fracture of the pin, and suitably shaped to prevent abrasion or cutting of conductor strands due to flexure in normal use | | N/A |
| | Exposed ends of plug pins have a lead-in, bevel or radius to facilitate entry into socket-outlets and to operate shutters | | N/A |
| | Round pins have a semi-circular end profile | | N/A |
| | Flat-pins with the following profile are deemed to comply: | | N/A |
| (a) | Flat-pins with a radius on the end with side bevels may have a width and thickness profile as specified in Figure 2.1(h) | | N/A |
| (b) | Flat-pins square on the end with corner and side bevels may have a width and thickness profile as specified in Figure 2.1(i) | | N/A |
| (c) | Flat-pins square on the end with corner bevels and a radius on the sides may have a width and thickness profile as specified in Figure 2.1(j) | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Contact portion of the pins smooth and free from openings or indentations | | N/A |
| | Flat pin plugs having a longitudinal seam or opening in the contact portion of one face; width not exceeding 0.3 mm and | | N/A |
| | Thickness not exceeding 1.58 mm | | N/A |
| | Exposed portion of earthing pins and pins other than insulated pins free from any non-metallic coverings or coatings<br>(AS/NZS 3112:2017) | | N/A |
| 2.2.4 | Live parts of insulated pin plugs not exposed when plug is partially or fully engaged with associated socket | | N/A |
| | Compliance by measurement to Figure 2.4 | (see appended table) | N/A |
| | Lacquer, enamel or sprayed insulating coating not considered to be insulation material | | N/A |
| | All live pins on low voltage plugs except for those shown in Figure 2.1 (a2), (b) and (g) of the insulated pin type | | N/A |
| | Colour green or green / yellow not used for insulation of insulated pins<br>(AS/NZS 3112:2017) | | N/A |
| J3.3 | **Ratings and dimensions for low-voltage plug portions**<br>Requirements of clauses 2.8.1 and 2.8.4 apply for rating and dimensions | | N/A |
| 2.8 | Ratings and Dimensions of Low Voltage Plugs | | N/A |
| 2.8.1 | Low voltage flat-pin plugs and low voltage plugs having one round earth pin and two flat pins or two round live pins and one flat earth pin, having ratings up to and including 20A; compliance with Figure 2.1 | (see appended results) | N/A |
| | Rating of plug | ___A | N/A |
| | Nominal dimensions covering disposition of pins checked by gauge of Appendix A | | N/A |
| | Distance between live pin and edge of moulding to not less than 9 mm | | N/A |
| | Measured distance | ___mm | N/A |
| | No point on plug face protrudes more than 0.5 mm | | N/A |
| | Measured protrusion | ___mm | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Dimensional requirements of Figure 2.1(e2) did not applied to plugs with greater than three pins<br>(AS/NZS 3112:2017) | | N/A |
| 2.8.4 | Low voltage plugs comply with dimensions of Figure 2.1 | (see appended table 2.8.1) | N/A |
| | Disposition of pins checked by gauge complying with Appendix A, B or F as appropriate | | N/A |
| | Low voltage plug having rating up to 15A and of the Figure 2.1 (a1), (c), (d), (f) or (g) type; comply with dimensional requirements of Figure 2.1 (e1 and e2) | | N/A |
| | 20A plug of Figure 2.1(a2) type complies with dimensional requirements of Figure 2.1 (e2) | | N/A |
| | Plugs with insulated pins need not comply with dimension R20.0 ± 1 mm requirement of Figure 2.1 (e3) provided there is at least 9mm from the edge of the live pins to the edge of the plug face Figure 2.1(e3).<br>(AS/NZS 3112:2017) | | N/A |
| J3.4 | **Internal connections for plug portions**<br>Requirements of clause 2.9 apply for internal connections; unless requirements contained in the relevant product standard<br>(AS/NZS 3112:2017) | | N/A |
| 2.9 | INTERNAL CONNECTIONS | | N/A |
| | Plug provided with earthing connections designed and constructed so that when plug is correctly wired and assembled: | | N/A |
| (a) | Loose terminal screw or conductive material cannot bridge any live or earthed parts | | N/A |
| (b) | Earthing parts effectively isolated from contact with live conductor which may become detached | | N/A |
| (c) | Live parts effectively isolated from contact with any earthing conductor which may become detached | | N/A |
| | Any connections for auxiliary devices comply with above requirements<br>(AS/NZS 3112:2017) | | N/A |
| J3.5 | **Arrangement of earthing connections for plug portions**<br>Requirements of clause 2.10 apply for arrangement of earthing connections | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.10 | Arrangement of earthing connections | | N/A |
| | Earthing pin radial to the circle embracing the pins<br>(AS/NZS 3112:2017) | | N/A |
| J3.6 | **Configuration of plug portions**<br>Requirements of clause 2.12.6 apply for configuration of the plug portion<br>(AS/NZS 3112:2017) | | N/A |
| 2.12 | Marking | | N/A |
| 2.12.6 | Configuration of plugs | | N/A |
| | Pins disposed so that configuration, as viewed from the pins, is earth, neutral and active in a clockwise direction | | N/A |
| | Where there is no earthing pin; live pins conform to this configuration<br>(AS/NZS 3112:2017) | | N/A |
| J4 | **Tests** | | N/A |
| J4.1 | General<br>Plug portions of equipment shall be subjected to the following tests and unless stated otherwise, shall comply with the requirements specified in Section 2 for each test. The number of test samples shall be in accordance with Table J1<br>For equipment with a detachable plug portion, the assessment(s) of Table J1 tests 2, 3, 5, 10 and 11 shall be conducted on the—<br>(a) assembled equipment with the detachable plug portion connected; and<br>(b) the detachable plug portion after it has been separated from the equipment<br>(AS/NZS 3112:2017/A1:2021) | | N/A |
| J4.2 | **High voltage test**<br>The requirements of Clause 2.13.3 are applicable unless requirements are contained in the relevant product standard<br>(AS/NZS 3112:2017) | | N/A |
| 2.13.3 | Test No.1 - High voltage test | | N/A |
| | Plug withstands without failure electric strength test as specified<br>(AS/NZS 3112:2017) | (see appended table) | |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| J4.3 | **Mechanical strength** | N/A |
| J4.3.1 | **Tumbling barrel test**<br>The tumbling barrel test is applied to determine the mechanical strength of the plug portions and equipment having integral or detachable plug portions.<br>For equipment with a detachable plug portion, the detachable plug portion may become detached during the test. If this occurs the detachable plug portion shall be reassembled with the equipment when the pins are straightened as per (a) and (b) below.<br>Three samples that have not been subjected to any previous test are tested as specified in Clause 2.13.7.1, however the test is modified as follows: | N/A |
| | A sample is dropped—<br>(a) 500 times if the mass of the specimen does not exceed 250 g.<br>The pins being straightened after each 100 drops and at the completion of the test to pass through the appropriate gauge of Figure A1, Figure B1 or Figure F1; and<br>(b) 250 times if the mass of the specimen exceeds 250 g. The pins being straightened after each 25 drops and at the completion of the test to pass through the appropriate gauge of Figures A1, Figure B1 or Figure F1.<br>(AS/NZS 3112:2017/A1:2021) | N/A |

| | | | |
|---|---|---|---|
| 2.13.7.1 | Test No.2 – Tumbling barrel test | | N/A |
| | Three plugs tested as specified in tumbling barrel as specified | | N/A |
| | Mass of sample | grams | N/A |
| | Number of drops | 500 / 250 | N/A |
| | After the test, samples show no damage and in particular: | | N/A |
| (a) | Live parts not exposed to the standard test finger | | N/A |
| (b) | Earth pin resistance complies with clause 3.14.7; resistance not exceeding 0.1 Ω | | N/A |
| | Measured earth pin resistance | ___Ω | N/A |
| (c) | Functions affecting safety not impaired | | N/A |
| (d) | No live part detached or loosened | | N/A |
| (e) | Pins not broken or showing signs of cracking<br>(AS/NZS 3112:2017) | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| J4.3.2 | Test No.3 **Impact test.**<br>Plug portions and equipment having integral plug portions or detachable plug portions shall withstand lateral impact forces.<br>All samples that were subjected to the tests in Paragraph J4.3.1 shall be tested as follows: | | N/A |
| | (a) The sample shall be positioned at the centre of a steel plate with a thickness of at least 6 mm. Apertures in the steel plate for the plug pins to pass through shall conform to the corresponding socket Standard. The sample shall be held against the steel plate by clamping all the pins. | | N/A |
| | (b) Samples shall be subjected to blows, with an impact energy of 1.0 ± 0.05 J by any means having the same performance as the spring-operated impact-test apparatus of AS/NZS 3100. | | N/A |
| | (c) Three blows shall be applied to every point that is most likely to directly or indirectly stress the enclosure joints of the sample | | N/A |
| | Compliance shall be checked by Paragraph J4.3.3 | | N/A |
| J4.3.3 | **Specific compliance criteria**<br>This Paragraph provides the common compliance assessment criteria for tests specified in Paragraphs J4.3.1 and J4.3.2. | | N/A |
| | For equipment with an integral plug portion, the assessment(s) shall be made on the complete equipment. | | N/A |
| | For equipment with a detachable plug portion, the assessment(s) shall be conducted on the—<br>(a) assembled equipment with the detachable plug portion connected; and<br>(b) the detachable plug portion after it has been separated from the equipment | | N/A |
| | Following each test the samples shall comply with Clause 2.13.7.1 | | N/A |
| | (a) assembled equipment with the detachable plug portion connected; | | N/A |
| | (a) Live parts shall not have become exposed to the standard test finger. | | N/A |
| | (b) For earth pins, the resistance of the plug/socket-outlet circuit shall be such that conformance with Clause 3.14.7 is maintained<br>The resistance shall not exceed 0.1 Ω. | ___ Ω. | N/A |
| | (c) Any other function affecting safety shall not be impaired | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | (d) No live part shall have become detached or loosened, to the extent that a hazardous situation is created | | N/A |
| | The sample shall conform to the 'Guarding of live parts' requirements of AS/NZS 3100:2015 cl 5.1. | | N/A |
| | Following each test, no internal conductive material or conductive part shall have become detached or loosened, to the extent that it creates a hazardous situation. The sample shall conform to the 'Separation of live parts from non-current-carrying conductive parts' requirements of AS/NZS 3100.<br>*NOTE Specific attention is drawn to the separation of any live parts to exposed metal parts or low voltage to extra low voltage parts*. | | N/A |
| | (e) The pins shall be inspected with normal, or corrected to normal, vision. Insulation may be removed if necessary. Pins shall not be broken or show cracking. | | N/A |
| | (b) the detachable plug portion after it has been separated from the equipment. | | N/A |
| | (a) Live parts shall not have become exposed to the standard test finger. | | N/A |
| | (b) For earth pins, the resistance of the plug/socket-outlet circuit shall be such that conformance with Clause 3.14.7 is maintained<br>The resistance shall not exceed 0.1 Ω. | ___ Ω. | N/A |
| | (c) Any other function affecting safety shall not be impaired | | N/A |
| | (d) No live part shall have become detached or loosened, to the extent that a hazardous situation is created | | N/A |
| | (e) The pins shall be inspected with normal, or corrected to normal, vision. Insulation may be removed if necessary. Pins shall not be broken or show cracking. | | N/A |
| | The sample shall conform to the 'Guarding of live parts' requirements of AS/NZS 3100:2015 cl 5.1. | | N/A |
| | Following each test, no internal conductive material or conductive part shall have become detached or loosened, to the extent that it creates a hazardous situation. The sample shall conform to the 'Separation of live parts from non-current-carrying conductive parts' requirements of AS/NZS 3100.<br>*NOTE Specific attention is drawn to the* | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | *separation of any live parts to exposed metal parts or low voltage to extra low voltage parts*.<br>(AS/NZS 3112:2017/A1:2021) | | |
| J4.3.4 | **Pin bending test**<br>The pins of the plug portion of three samples not subjected to any previous tests shall be tested for compliance with the pin bending test of Clause 2.13.7.2<br>(AS/NZS 3112:2017/A1:2021) | | N/A |
| 2.13.7.2 | Test No.4 – Pin bending test | | N/A |
| | All flat–pin plugs rated up to and including 15 A shall be subjected to the pin bending test | | N/A |
| | Three samples are subjected by clamping the plug in a rigid holding block and applying the bending force as specified | | N/A |
| | After the test the pins shall not be broken off.<br>(AS/NZS 3112:2017) | | N/A |
| J4.8.3 | Test No.5 **Plug portion detachment requirements** | | N/A |
| | For all Type B or C devices and for Type A devices where the outlet of the detachable plug portion is parallel to the plug supply pins, disengagement of the detachable plug portion from the equipment shall require at least two simultaneous independent actions or the use of a tool. | | N/A |
| | Disengagement of the detachable plug portion requires two simultaneous independent actions, or | | N/A |
| | The plug portion and the equipment/adaptor shall be connected and disconnected 50 times (100 strokes). | | N/A |
| | Compliance is verified by inspection and the plugging test. | | N/A |
| | During the test plug portion was not separated | | N/A |
| | The test of AS/NZS 3112 ‘temperature rise test’ for plugs shall be conducted immediately after the above test without disturbing the sample.<br>(AS/NZS 3112:2017/A1:2021) | | N/A |
| J4.4 | **Temperature rise test**<br>The relevant requirements of Clause 2.13.8 are applicable for the temperature rise test, except that the test current shall be that specified in the relevant product standard | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The temperature rise of the pins shall not exceed 45 K irrespective of the temperature rise of parts specified in end-product standards. | | N/A |
| | For detachable plug portions the temperature rise of terminals and contacts shall not exceed 45 K.<br>(AS/NZS 3112:2017) | | N/A |
| 2.13.8 | Test No.6 – Temperature rise test | | N/A |
| (a) | Non-rewireable plugs tested as delivered with minimum cross-sectional area of conductor size for each respective current rating | | N/A |
| (b) | Rewireable plugs fitted with PVC flexible cords having minimum cross-sectional area specified in manufacturer's instructions | | N/A |
| | Terminal screws or nuts tightened with torque equal to two-thirds of value specified in Table 2.2. | | N/A |
| | Conductors have length of at least 1 m | | N/A |
| | Plug tested in draught free environment as specified using clamping units as specified in Figure 2.10 | | N/A |
| | Plug fitted with cord and inserted into socket-outlet as specified | | N/A |
| | Test Current | | N/A |
| | Temperature of terminals and contacts of detachable plug portion not exceeding 45 K<br>(AS/NZS 3112:2017) | (see appended table) | N/A |
| J4.5 | **Securement of pins of the plug portion**<br>The requirements of Clause 2.13.9 are applicable for the securement of pins.<br>(AS/NZS 3112:2017) | | N/A |
| 2.13.9 | Test No.7. **Securement of pins** | | N/A |
| 2.13.9.1 | Movement of pins | | N/A |
| | Plug pins clamped 5 ± 0.5 mm from pin face; test equipment and sample pre-conditioning for 1 h at 40 ± 1°C | | N/A |
| | Force of 18 ± 1 N applied to pin 14 ± 0.5 mm from plug face; applied gradually over 10 s and maintained for 10 s; applied in four directions | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Maximum deflection during test not exceeding 2.0 mm | (see appended results) | N/A |
| | Any distortion 5 minutes after test does not prevent insertion of plug into standard gauge(s)<br>(AS/NZS 3112:2017 + A1:2021) | | N/A |
| 2.13.9.2 | **Fixing of pins** | | N/A |
| | Plug heated to 50 ± 2°C for 1h | | N/A |
| | Force of 60 ± 0.6 N applied to each pin over 10 s and maintained for 10 minutes; applied in two directions along length of pin | | N/A |
| | Maximum displacement during test not exceeding 2.4 mm | | N/A |
| | Maximum measured displacement | | N/A |
| | Pin returns to within 0.8 mm of nominal length within 5 minutes of removal of test force<br>(AS/NZS 3112:2017) | | N/A |
| J4.6 | **Tests on the insulation material of insulated pin-plug portions**<br>The requirements of Clause 2.13.13 are applicable for insulating material of insulated plug pins.<br>(AS/NZS 3112:2017) | | N/A |
| 2.13.13 | Test No.8 **Tests for insulation material of insulated pin plugs** | | N/A |
| 2.13.13.1 | Material of pin-insulation resistant to stresses at temperature likely to occur | | N/A |
| 2.13.13.2 | Pressure test at high temperature | | N/A |
| | Specimen tested as per Figure 2.5 with force of 2.5 N applied as specified; maintained for 2 h at 160 ± 5°C; removed and cooled by immersion in water within 10 s | | N/A |
| | Thickness of insulation at point of impression not reduced by more than 50% | | N/A |
| | Initial thickness | mm | N/A |
| | Thickness after test | mm | N/A |
| | No visible cracks on insulation material | | N/A |
| | Dimension of insulating material not below minimum size in Figure 2.4<br>(AS/NZS 3112:2017) | | N/A |
| 2.13.13.3 | **Static damp heat test** | | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Specimen subjected to two damp heat cycles in accordance with AS 60068.2.30; Db (12 + 12h), 95% RH, 25 ± 3°C; 40°C | | N/A |
| | After this treatment and recovery to room temperature; specimen subjected to: | | N/A |
| (a) | Insulation resistance test in accordance with clause 2.13.2 (e) | (see appended table) | N/A |
| (b) | High voltage test in accordance with clause 2.13.3 | (see appended table) | N/A |
| (c) | Abrasion test in accordance with clause 2.13.13.6 | | N/A |
| 2.13.13.4 | **Low temperature test** | | N/A |
| | Plug maintained at –15 ± 2°C for minimum of 24 h and returned to room temperature; after which specimen subjected to: | | N/A |
| (a) | Insulation resistance test in accordance with clause 2.13.2 (e) | (see appended table) | N/A |
| (b) | High voltage test in accordance with clause 2.13.3 | (see appended table) | N/A |
| (c) | Abrasion test in accordance with clause 2.13.13.6 | | N/A |
| 2.13.13.5 | **Impact test at low temperature** | | N/A |
| | Specimen maintained at –15 ± 2°C for 24 h | | N/A |
| | Specimen placed in position and subjected to impact test as per Figure 2.6; mass of 100 ±1 g falling through 100 mm | | N/A |
| | Four impacts applied; specimen rotated through 90° between impacts | | N/A |
| | After return to room temperature; no visible cracks of insulating material | | N/A |
| 2.13.13.6 | **Abrasion test** | | N/A |
| | Plug held in clamp and tested as per Figure 2.7; pin loaded at 4 N; 20 000 movements | | N/A |
| | After test; pins show no damage affecting safety or impairing further use of the plug | | N/A |
| | Insulating sleeve not punctured or rucked up<br>(AS/NZS 3112:2017) | | N/A |

| | | | |
|---|---|---|---|
| J4.7 | Test no.9 **Equipment with a plug portion intended to be supported by the contacts of a socket-outlet** | | N/A |
| | Equipment with pins intended to be introduced into fixed socket-outlets not imposing undue strain on socket-outlet | | N/A |
| | Applied torque not exceeding 0.25 Nm | | N/A |
| | Measured torque<br>(AS/NZS 3112:2017) | Nm | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| J4.8 | **Additional requirements for detachable plug portions** | | N/A |
| J4.8.1 | Test no.10 **Access to live parts** | | N/A |
| | Small test finger of Figure 13 of IEC 61032 was not possible to contact live parts with the force of 20N | | N/A |
| | incorrectly assemble the plug portion was not possible<br>(AS/NZS 3112:2017) | | N/A |

| | | | |
|---|---|---|---|
| J4.8.2 | Test No.11 **Construction of detachable contacts where the input current of the equipment exceeds 0.2 A** | | N/A |
| | Contacts of the equipment shall be such that they make and maintain, under normal service conditions, satisfactory electrical and mechanical contact with the corresponding contact of the detachable plug portion. | | N/A |
| | For connections intended to accommodate pins, contact shall be made on two surfaces diametrically opposite, except if a single spring-assisted contact is used. | | N/A |
| | Contacts shall not rely exclusively on the resilience of the contact material and shall have an opposite face of material other than thermoplastic or resilient insulating material. | | N/A |
| | The alignment and contact-making properties of contacts shall be independent of terminal screws | | N/A |
| | The effectiveness of the contacts shall be independent of pressure from any thermoplastic or resilient moulding. | | N/A |
| | Effectiveness of the contacts independent of pressure from thermoplastic or resilient moulding checked by J4.8.3 | | N/A |
| | Visual inspection to determine interference between metal contacts and thermoplastic or resilient moulding to provide supplementary contact pressure to metal contacts<br>(AS/NZS 3112:2017) | | N/A |

| | | |
|---|---|---|
| J4.8.4 | **Resistance of insulating material to heat and fire** | N/A |
| J4.8.4.1 | Test no.12 **Resistance to heat**<br>For Type B detachable plug portions parts of non-metallic material, parts of insulating material supporting live parts including connections, and parts of thermoplastic material providing supplementary insulation or reinforced insulation, shall be sufficiently resistant to heat if their deterioration could cause the appliance to fail to comply with this Standard. | N/A |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| | Ball pressure test at | | N/A |
| (a) | 75°C ± 2°C, for external parts; | | N/A |
| (b) | 125°C ± 2°C, for parts supporting live parts. | | N/A |

| | | | |
|---|---|---|---|
| J4.8.4.2 | Test no.13 **Resistance to fire** | | N/A |
| | Plug portions comply with resistance to fire requirements of AS/NZS 3100 as follows: | | N/A |
| | The glow wire test temperature 'T' for 'retaining parts' of fixed socket outlets shall be 750 °C<br>(AS/NZS 3112:2017) | | N/A |

**TABLES OF RESULTS**

| 2.2.4 | TABLE: Dimensions of insulation on insulated pin plugs | | N/A |
|---|---|---|---|
| Dimension (Figure 2.1 designation) | | Measured (mm) | Allowed (mm) |
| Phase pin | | | 8.7 ± 0.5 |
| Neutral pin | | | 8.7 ± 0.5 |

| 2.8.1 | TABLE: Dimensions of plugs- 10A (a1) | | N/A |
|---|---|---|---|
| Dimension (Figure 2.1 designation) | | Measured (mm) | Allowed (mm) |
| Phase and neutral pin width (A) | | | 6.35 ± 0.15 |
| Earth pin width (B) | | | 6.35 ± 0.15 |
| Pin thickness (C) | | | 1.63 + 0.15, -0.05 |
| Pin disposition (D) | | | checked by test gauge |
| Pin disposition (E) | | | checked by test gauge |
| Phase and neutral pin length (F) | | | 17.06 ± 0.4 |
| Earth pin length (G) | | | 19.94 ± 0.8 |
| Pin boss radius - maximum | | | 21.0 max |
| Pin boss height | | | 8.6 min |

| 2.8.1 | TABLE: Dimensions of plugs- 15A (a1) | | N/A |
|---|---|---|---|
| Dimension (Figure 2.1 designation) | | Measured (mm) | Allowed (mm) |
| Phase and neutral pin width (A) | | | 6.35 ± 0.15 |
| Earth pin width (B) | | | 9.08 ± 0.15 |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| Pin thickness (C) | | 1.63 + 0.15, -0.05 |
| Pin disposition (D) | | checked by test gauge |
| Pin disposition (E) | | checked by test gauge |
| Phase and neutral pin length (F) | | 17.06 ± 0.4 |
| Earth pin length (G) | | 19.94 ± 0.8 |
| Pin boss radius - maximum | | 21.0 max |
| Pin boss height | | 8.6 min |

| 2.8.1 | TABLE: Dimensions of plugs-20A (a2) | N/A |
|---|---|---|
| Dimension (Figure 2.1 designation) | Measured (mm) | Allowed (mm) |
| Phase and neutral pin width (A) | | 9.08 ± 0.15 |
| Earth pin width (B) | | 9.08 ± 0.15 |
| Pin thickness (C) | | 1.63 + 0.15, -0.05 |
| Pin disposition (D) | | checked by test gauge |
| Pin disposition (E) | | checked by test gauge |
| Phase and neutral pin length (F) | | 17.06 ± 0.4 |
| Earth pin length (G) | | 19.94 ± 0.8 |
| Pin boss radius - maximum | | 21.0 max |
| Pin boss height | | 8.6 min |

| 2.8.1 | TABLE: Projection from plug face centroid | N/A |
|---|---|---|
| Direction of projection | Measured (mm) | Allowed (mm) |
| Left | | ≤ 21.9 or ≥ 27.0 |
| Right | | ≤ 21.9 or ≥ 27.0 |
| Up | | ≤ 21.9 or ≥ 27.0 |
| Down | | ≤ 21.9 or ≥ 27.0 |

| 2.13.3 | TABLE: Test No. 1 – High voltage test | N/A |
|---|---|---|
| Test voltage applied between: | Test voltage (V) | Breakdown |
| All poles of the plug; taken in pairs | 1000 | Yes / No |
| Live poles of the plug and any external metal | 3500 | Yes / No |
| Live poles of the plug and the earthing terminal | 1000 | Yes / No |
| Live poles of the plug and a flexible electrode | 3500 | Yes / No |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| Live poles and metal foil applied around insulation on pins | 1250 | Yes / No |

| | | | |
|---|---|---|---|
| 2.13.8 | TABLE: Test No. 6 - Temperature rise test | | N/A |
| | Ambient temperature | °C | |
| | Test current | A | |
| Measured part | | dT measured (K) | dT allowed (K) |
| Active (phase) terminal | | | 45 |
| Neutral terminal | | | 45 |
| Earthing terminal | | | 45 |

| | | | |
|---|---|---|---|
| 2.13.9.1 | TABLE: Movement of pins | | N/A |
| | Earth and neutral pins clamped – phase pin loaded | | |
| Force direction | | Measured deflection (mm) | Allowed deflection (mm) |
| Force towards neutral plane parallel to pin plane | | | 2.0 |
| Force from neutral plane parallel to pin plane | | | 2.0 |
| Force outwards at 90° to pin plane | | | 2.0 |
| Force inwards at 90° to pin plane | | | 2.0 |

| | | | |
|---|---|---|---|
| 2.13.9.1 | TABLE: Movement of pins | | N/A |
| | Phase and neutral pins clamped – earth pin loaded | | |
| Force direction | | Measured deflection (mm) | Allowed deflection (mm) |
| Force inwards parallel to pin plane | | | 2.0 |
| Force outwards parallel to pin plane | | | 2.0 |
| Force towards neutral | | | 2.0 |
| Force towards phase | | | 2.0 |

| | | | |
|---|---|---|---|
| 2.13.9.1 | TABLE: Movement of pins | | N/A |
| | Phase and earth pins clamped – neutral pin loaded | | |
| Force direction | | Measured deflection (mm) | Allowed deflection (mm) |
| Force towards phase plane parallel to pin plane | | | 2.0 |
| Force from phase plane parallel to pin plane | | | 2.0 |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| Force outwards at 90° to pin plane | | 2.0 |
| Force inwards at 90° to pin plane | | 2.0 |

| 2.13.13.3 | TABLE: Test No.13(b) – Insulation resistance test after static damp heat test | | N/A |
|---|---|---|---|
| Applied between: | | Insulation resistance (MΩ) | Minimum required (MΩ) |
| Live poles and metal foil applied around insulation on pins | | | 5 |

| 2.13.13.3 | TABLE: Test No.1 – High voltage test after static damp heat test | | N/A |
|---|---|---|---|
| Test voltage applied between: | | Test voltage (V) | Breakdown |
| Live poles and metal foil applied around insulation on pins | | 1250 | Yes / No |

| 2.13.13.4 | TABLE: Test No.1 – Insulation resistance test after low temperature test | | N/A |
|---|---|---|---|
| Applied between: | | Insulation resistance (MΩ) | Minimum required (MΩ) |
| Live poles and metal foil applied around insulation on pins | | | 5 |

| 2.13.13.4 | TABLE: Test No.1 – High voltage test after low temperature test | | N/A |
|---|---|---|---|
| Test voltage applied between: | | Test voltage (V) | Breakdown |
| Live poles and metal foil applied around insulation on pins | | 1250 | Yes / No |

| J4.8.4.1 | TABLE: Test no.12 Resistance to heat | | N/A |
|---|---|---|---|
| Component tested | | Temperature (°C) | Diameter of impression (mm) |
| | | | |

Conformance is checked by subjecting the relevant part to the ball pressure test of IEC 60695-10-2.

| J4.8.4.2 | TABLE: Test no.13 Resistance to Fire | N/A |
|---|---|---|
| | Plug portions shall comply with the requirements for resistance to fire in accordance with AS/NZS 3100:2017 Annex A. The glow-wire test temperature 'T' shall be 750°C. | N/A |

Glow-wire testing was conducted in accordance with IEC 60695-2-10 and IEC 60695-2-11.

Test specimens arranged so that the surface in contact with the tip of the glow-wire was vertical and glow wire tip applied to surface of the specimen likely to be subjected to thermal stresses in normal use.

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

A layer of white pine board and wrapping tissue was placed beneath the sample at 200mm ± 5mm distance.

| SPECIMEN NUMBER | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| SPECIMEN DESCRIPTION | | | | |
| Material | | | | |
| Colour | | | | |
| Test specimen | | | | |
| Glow wire tip temperature (°C) | 750 | 750 | 750 | 750 |
| Duration of glow wire application ($t_a$) (s) | 30 | 30 | 30 | 30 |
| **OBSERVATIONS** | | | | |
| Duration from beginning of glow-wire tip application to ignition of specimen or layer ($t_i$) (s) | | | | |
| Duration from beginning of glow-wire tip application to when flames extinguish ($t_e$) (s) | | | | |
| Maximum height of flames after initial 1s (to nearest 5 mm) (mm) | | | | |
| Flame impingement on other parts | | | | |
| Degree of tip penetration | | | | |
| Degree of specimen distortion | | | | |
| Scorching of pinewood board | | | | |
| **EVALUATION CRITERIA** | | | | |
| Visible flame or sustained glowing | | | | |
| Visible Flame Duration in Seconds during test. | | | | |
| Duration of flaming or glowing after tip removal (max. allowable 30 s) (s) | | | | |
| Surrounding parts burned away completely (not permitted) | | | | |
| Ignition of wrapping tissue layer (not permitted) | | | | |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | |
|---|---|---|---|---|
| **RESULTS**<br>If parts tested withstand the glow-wire test, but during the test produce a flame that persists for longer than 2 s, then the consequential needle flame test of AS/NZS 3100:2017 Annex A 6.1.5 applies. | | | | |

LEGEND:

| | | | | | |
|---|---|---|---|---|---|
| CE | Complete Equipment | SA | Sub Assembly | SE | Self Extinguished |
| EBD | Emitted Burning Droplets | SBD | Specimen Burned and Distorted | SMD | Specimen Melted and Distorted |
| ME | Manually Extinguished | SC | Separate Component | SS | Specimen Scorched |
| NA | Not Applicable | SCC | Specimen Completely Consumed | WPNI | Wall Penetrated but no Ignition |
| NI | No Ignition | X | Flame Appeared for an Instant | | |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

Glow-wire testing was conducted in accordance with IEC 60695-2-10 and IEC 60695-2-11.

Test specimens arranged so that the surface in contact with the tip of the glow-wire was vertical and glow wire tip applied to surface of the specimen likely to be subjected to thermal stresses in normal use. A layer of white pine board and wrapping tissue was placed beneath the sample at 200mm ± 5mm distance.

| SPECIMEN NUMBER | 5 | 6 | 7 | 8 |
|---|---|---|---|---|
| SPECIMEN DESCRIPTION | | | | |
| Material | | | | |
| Colour | | | | |
| Test specimen | | | | |
| Glow wire tip temperature (°C) | | | | |
| Duration of glow wire application ($t_a$) (s) | 30 | 30 | 30 | 30 |
| **OBSERVATIONS** | | | | |
| Duration from beginning of glow-wire tip application to ignition of specimen or layer ($t_i$) (s) | | | | |
| Duration from beginning of glow-wire tip application to when flames extinguish ($t_e$) (s) | | | | |
| Maximum height of flames after initial 1s (to nearest 5 mm) (mm) | | | | |
| Flame impingement on other parts | | | | |
| Degree of tip penetration | | | | |
| Degree of specimen distortion | | | | |
| Scorching of pinewood board | | | | |
| **EVALUATION CRITERIA** | | | | |
| Visible flame or sustained glowing | | | | |
| Visible Flame Duration in Seconds during test. | | | | |
| Duration of flaming or glowing after tip removal (max. allowable 30 s) (s) | | | | |
| Surrounding parts burned away completely (not permitted) | | | | |
| Ignition of wrapping tissue layer (not permitted) | | | | |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | |
|---|---|---|---|---|
| **RESULTS**<br>If parts tested withstand the glow-wire test, but during the test produce a flame that persists for longer than 2 s, then the consequential needle flame test of AS/NZS 3100:2017 Annex A 6.1.5 applies | | | | |

LEGEND:

| | | | | | |
|---|---|---|---|---|---|
| CE | Complete Equipment | SA | Sub Assembly | SE | Self Extinguished |
| EBD | Emitted Burning Droplets | SBD | Specimen Burned and Distorted | SMD | Specimen Melted and Distorted |
| ME | Manually Extinguished | SC | Separate Component | SS | Specimen Scorched |
| NA | Not Applicable | SCC | Specimen Completely Consumed | WPNI | Wall Penetrated but no Ignition |
| NI | No Ignition | X | Flame Appeared for an Inst | | |

| | **TABLE: Needle- flame test (NFT)** | | | | **N/A** |
|---|---|---|---|---|---|
| **Object/ Part No./ Material** | **Manufacturer/ trademark** | **Duration of application of test flame (ta); (s)** | **Ignition of specified layer Yes/No** | **Duration of burning (tb) (s)** | **Verdict** |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Supplementary information:<br>- NFT not relevant (or applicable) for Parts of material classified as V-0 or V-1<br>- NFT not relevant (or applicable) for Base material of PCBs classified as V-0 or if relevant VTM-0 | | | | | |

| IEC62368_1D ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | PHOTOGRAPHS | |
|---|---|---|

Product: SWITCHING POWER SUPPLY

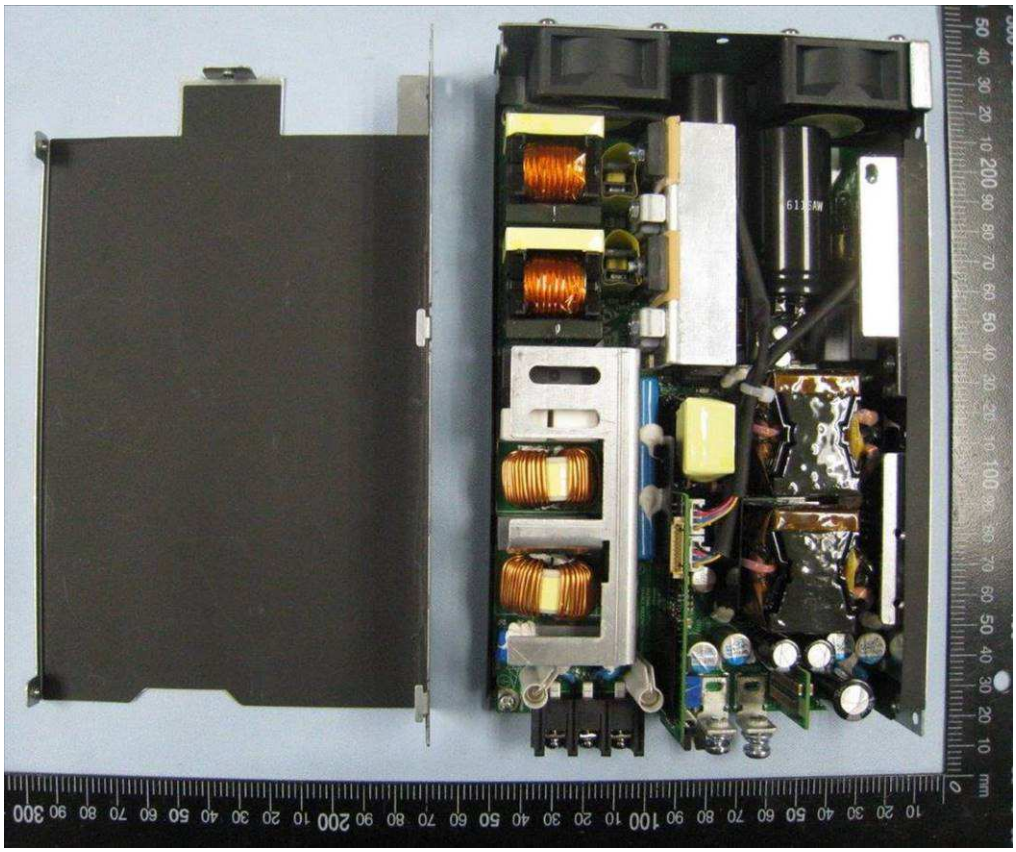
Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD

Picture 1 Construction of external chassis for all models

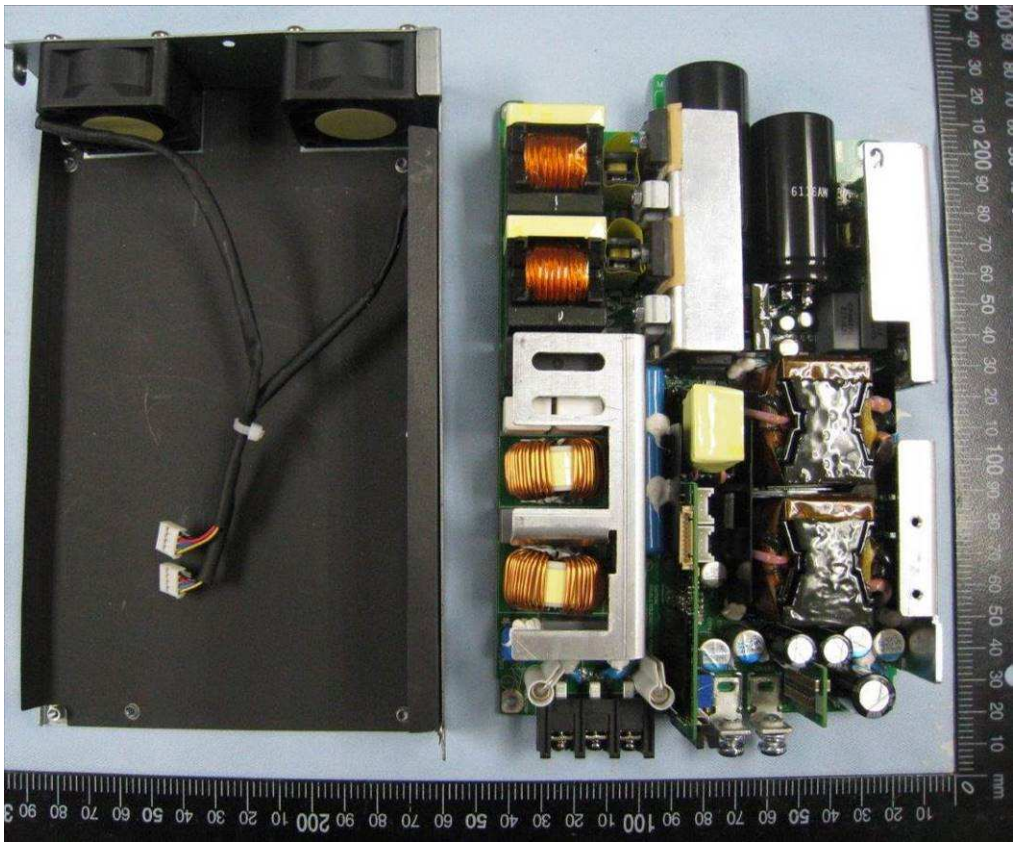

Picture 2 Construction of external chassis for all models

Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD



Picture 3 Construction of external chassis for all models

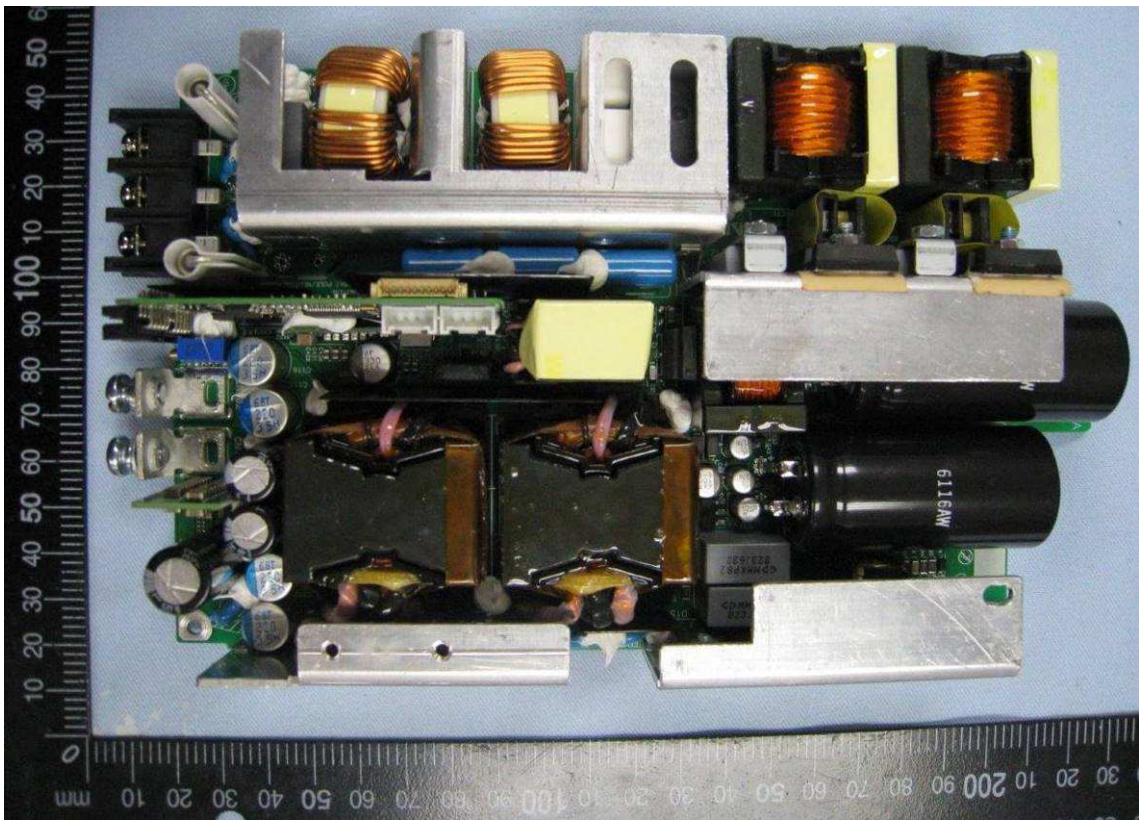


Picture 4 Construction of external chassis for all models

Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD

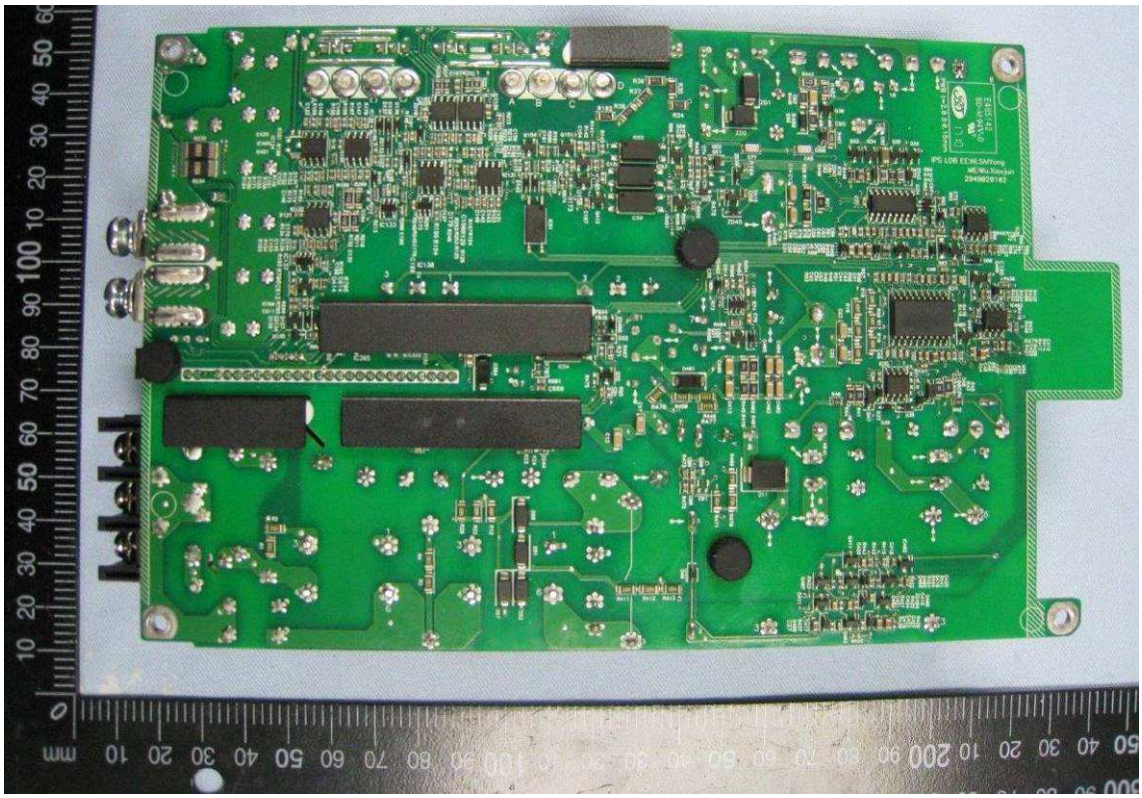
Picture 5 Construction for model PMS-24V1K2W1BTD



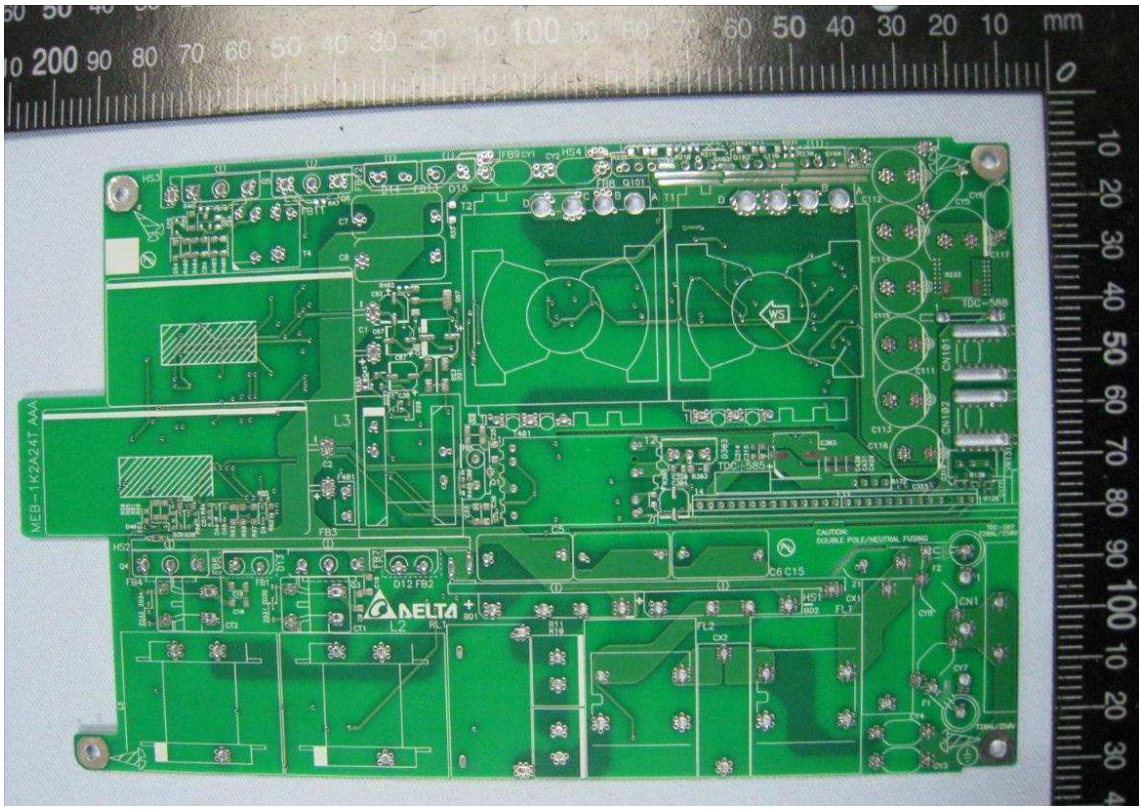
Picture 6 Construction for model PMS-24V1K2W1BTD

Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD



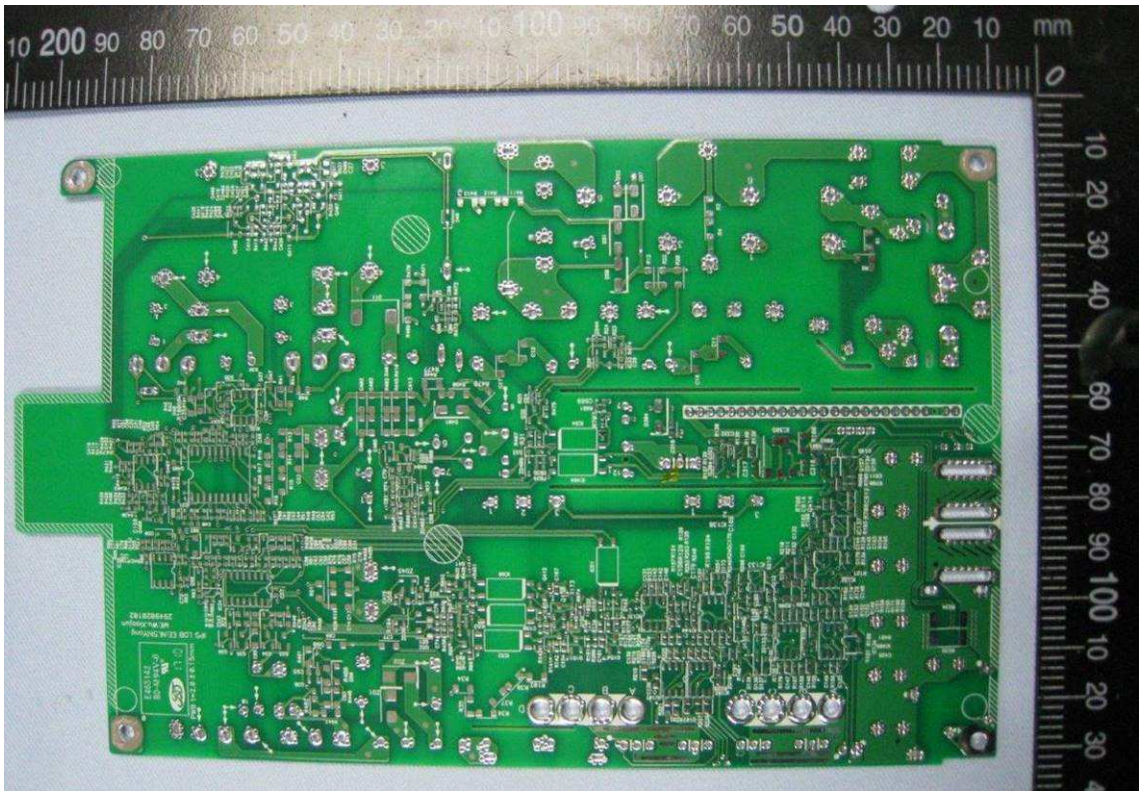
Picture 7 Construction for model PMS-24V1K2W1BTD



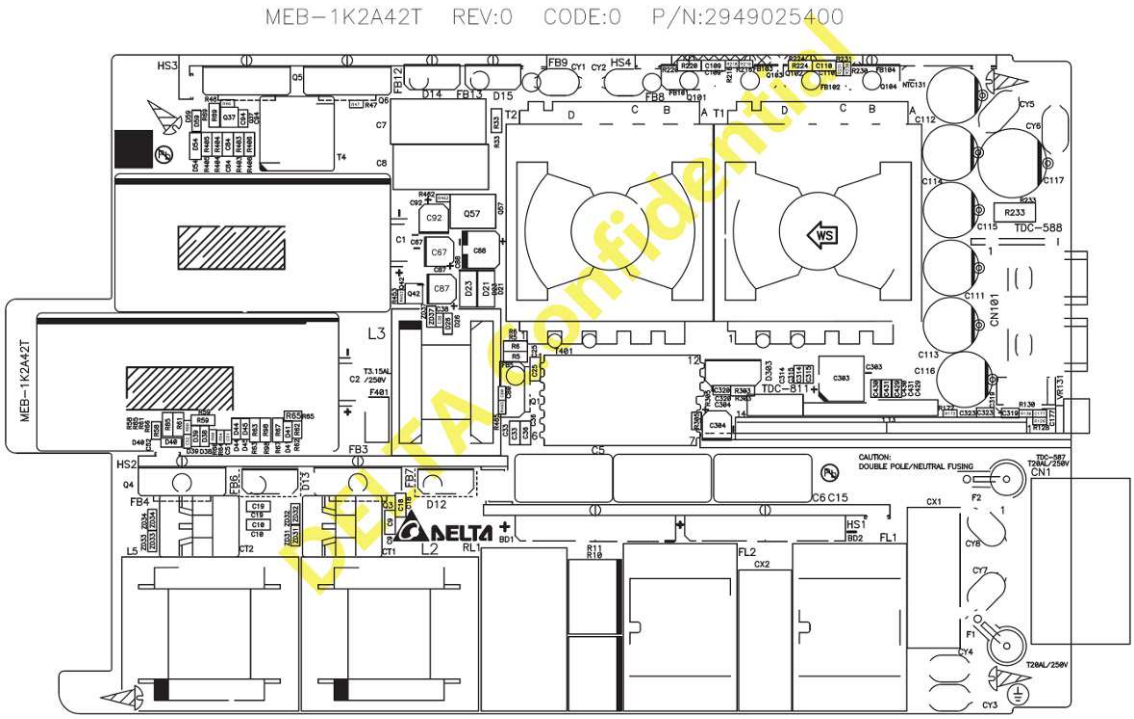
Picture 8 Construction for model PMS-24V1K2W1BTD

Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD



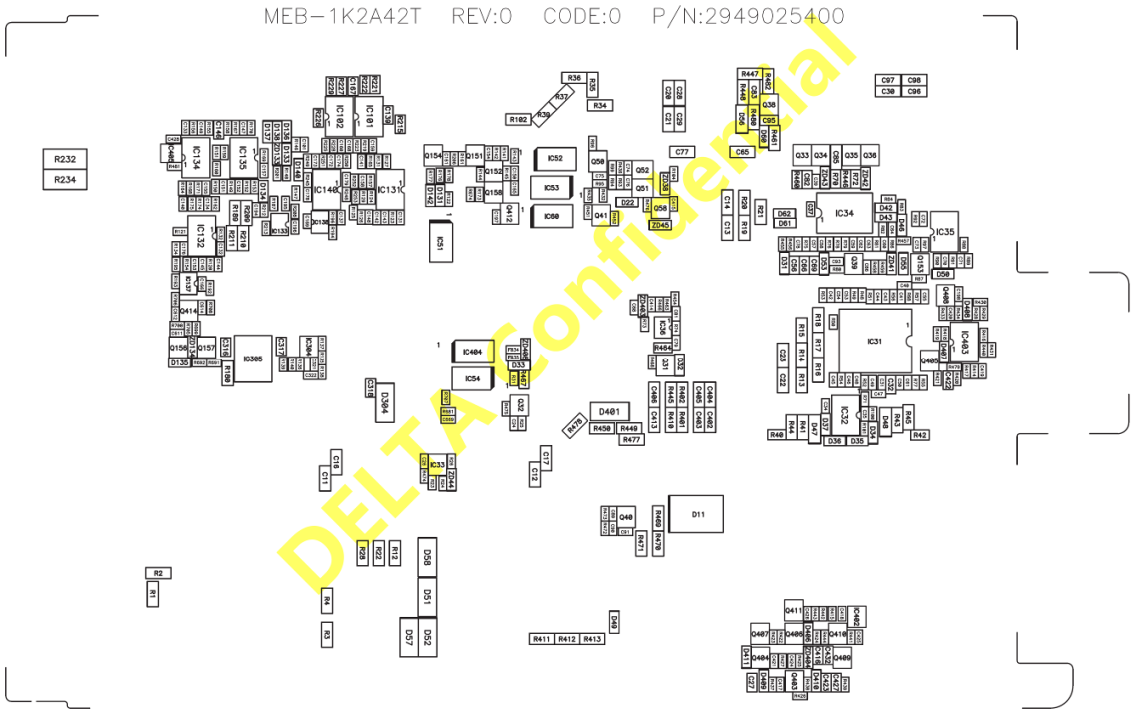
Picture 9 Construction for model PMS-24V1K2W1BTD



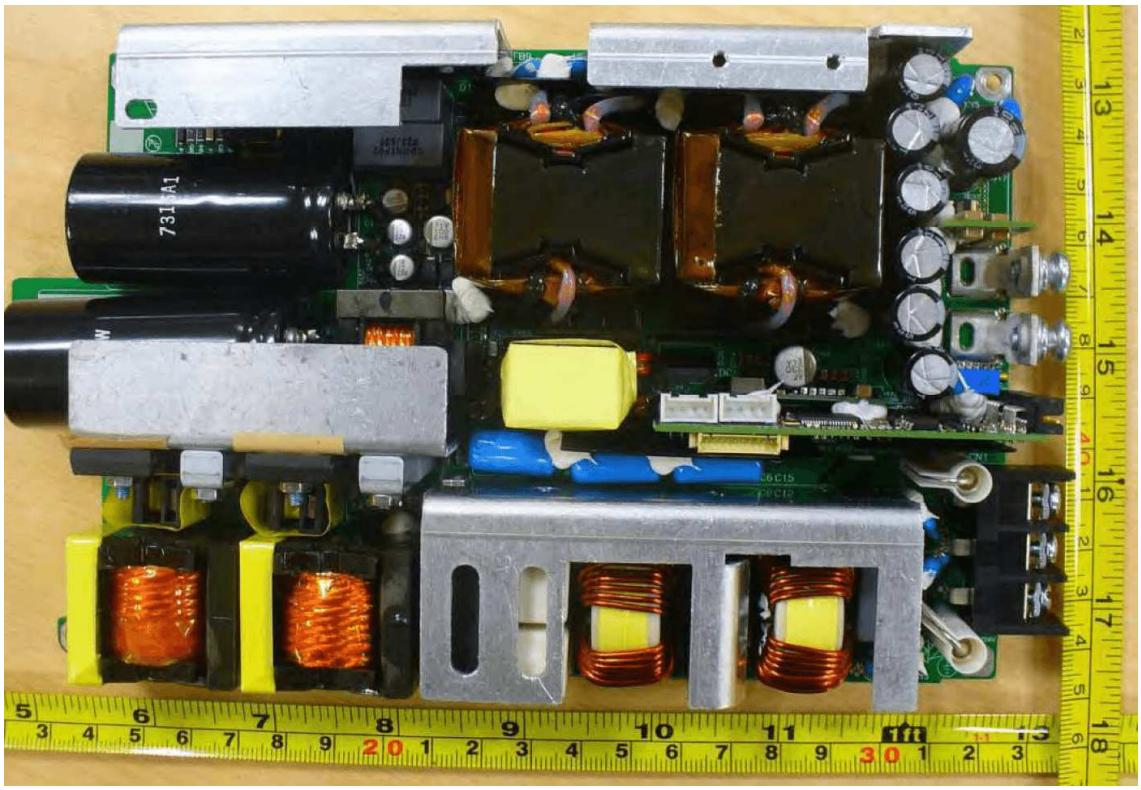

Picture 10 PCB, type MEB-1K2A24T AAA for model PMS-24V1K2W1BTD

Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD



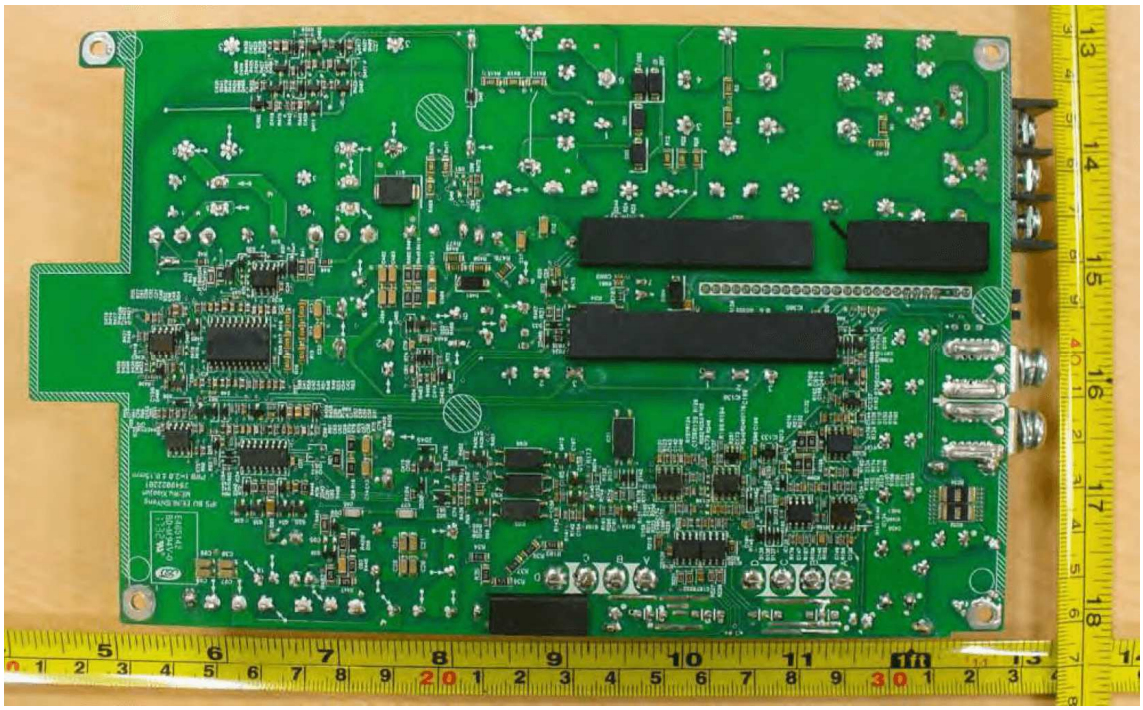

Picture 11 PCB, type MEB-1K2A24T AAA for model PMS-24V1K2W1BTD



Picture 12 Construction for model PMS-48V1K2W1BTD

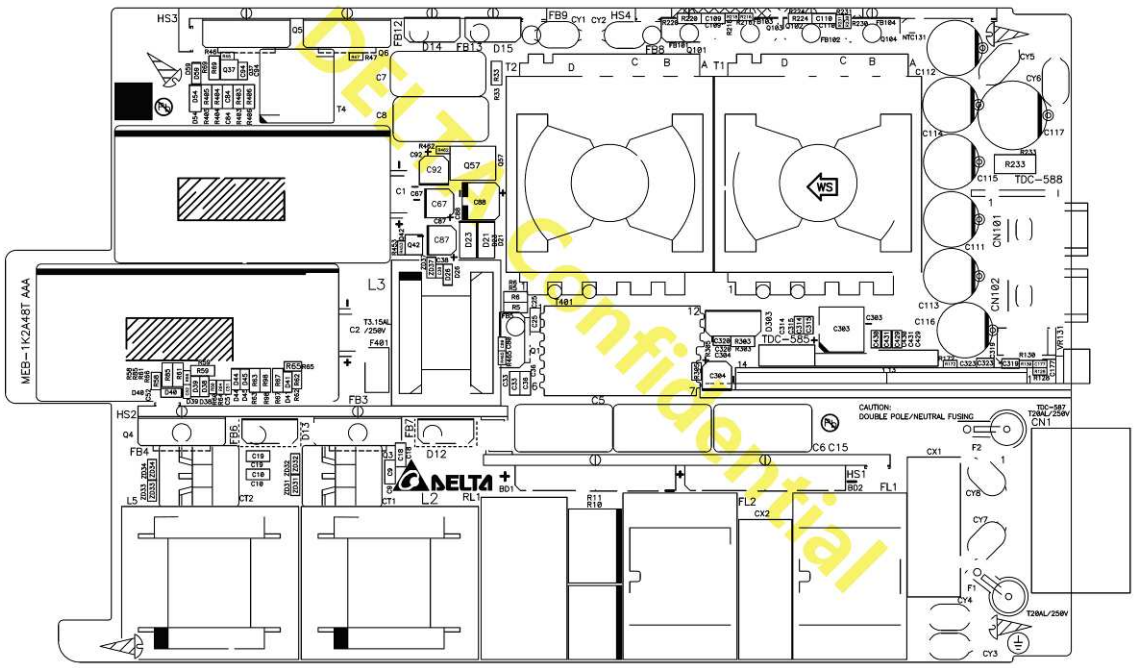
Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD



Picture 13 Construction for model PMS-48V1K2W1BTD

MEB-1K2A48T AAA REV:1 CODE:1 P/N:2949022201





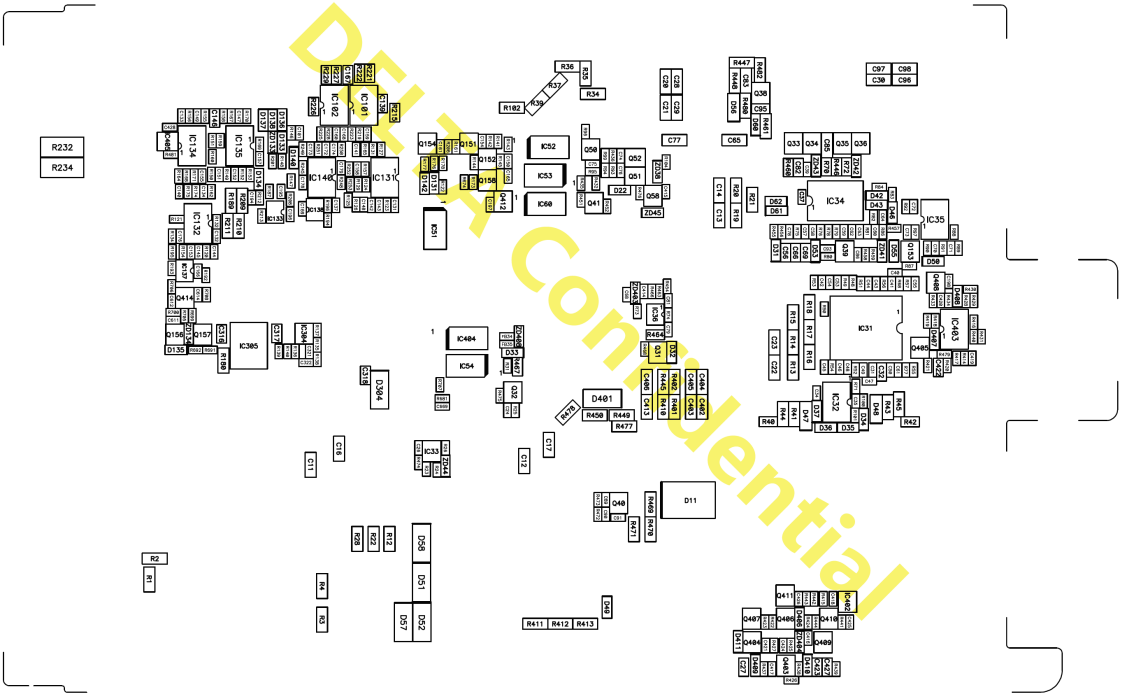

Picture 14 PCB, type MEB-1K2A48T AAA for model PMS-48V1K2W1BTD

Product: SWITCHING POWER SUPPLY

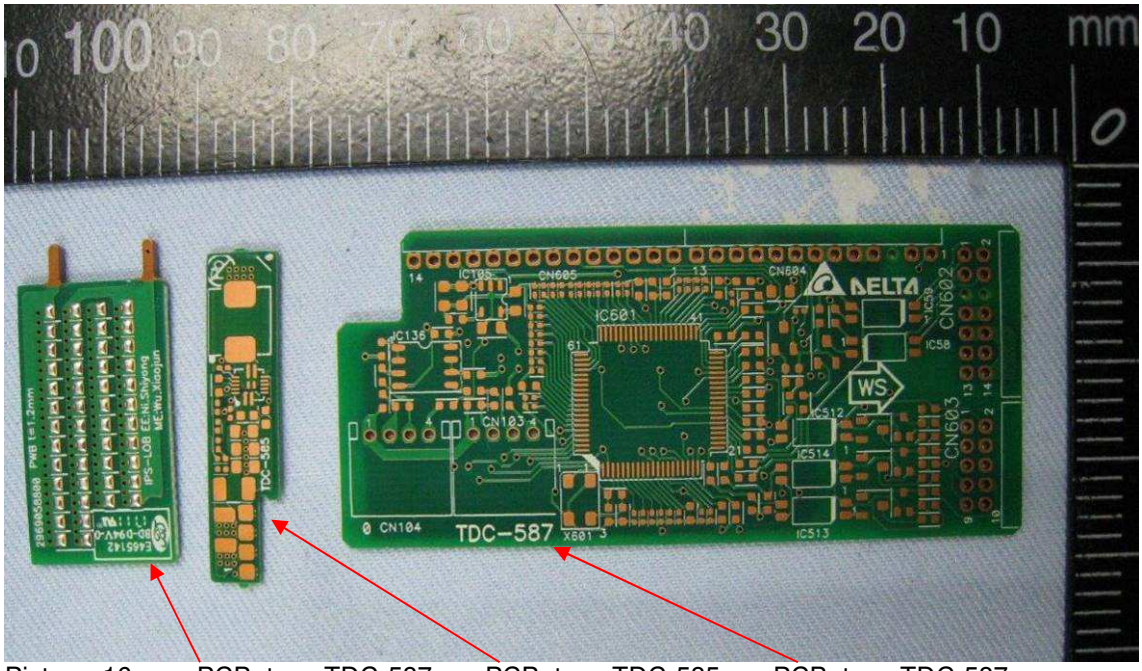
Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD

MEB-1K2A48T AAA REV:1 CODE:1 P/N:2949022201





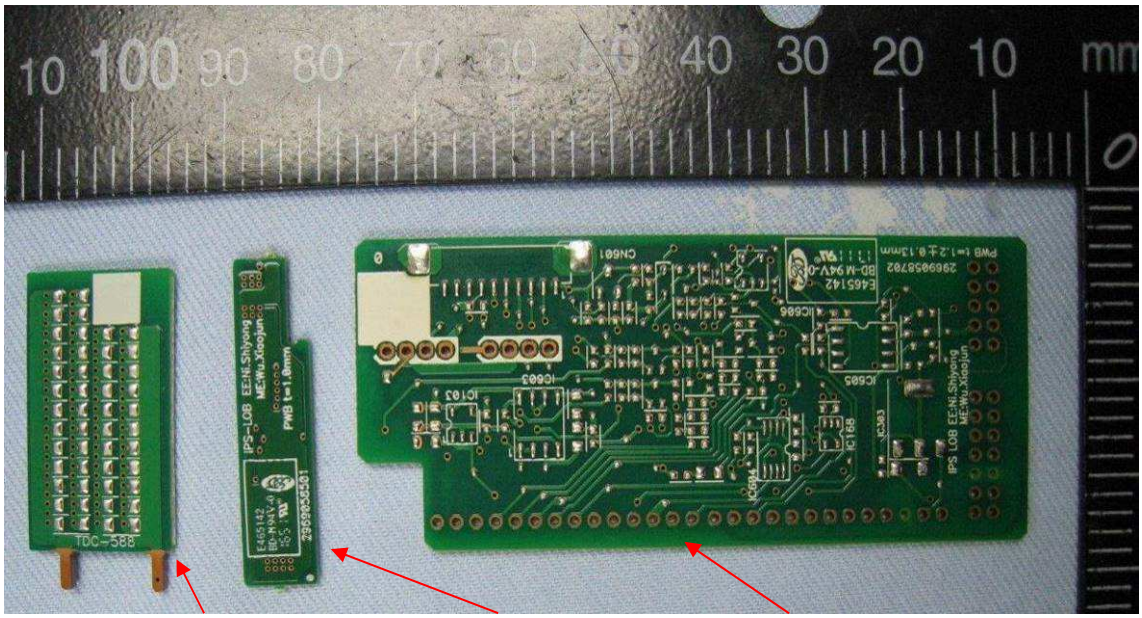
Picture 15 PCB, type MEB-1K2A48T AAA for model PMS-48V1K2W1BTD




Picture 16 PCB, type TDC-587 PCB, type TDC-585 PCB, type TDC-587

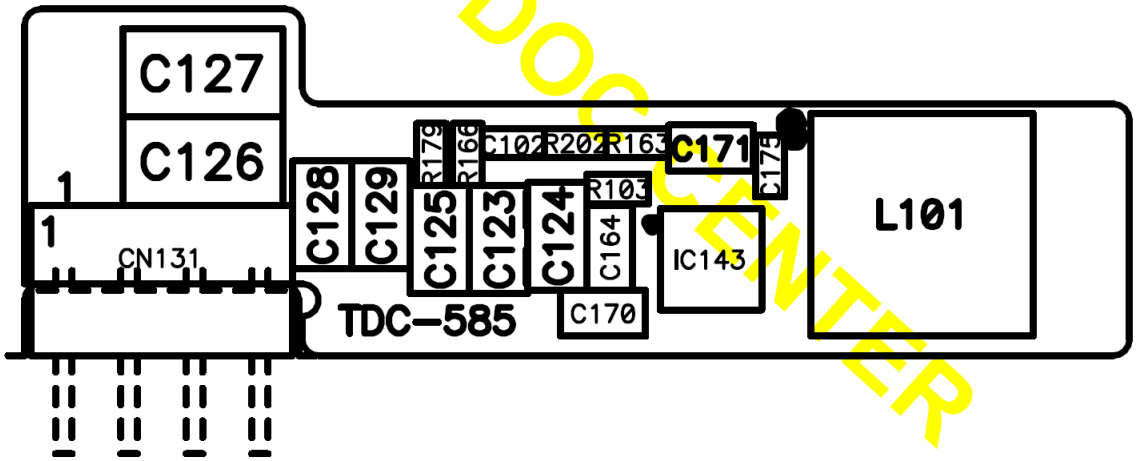
Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD




Picture 17 PCB, type TDC-588 PCB, type TDC-585 PCB, type TDC-587





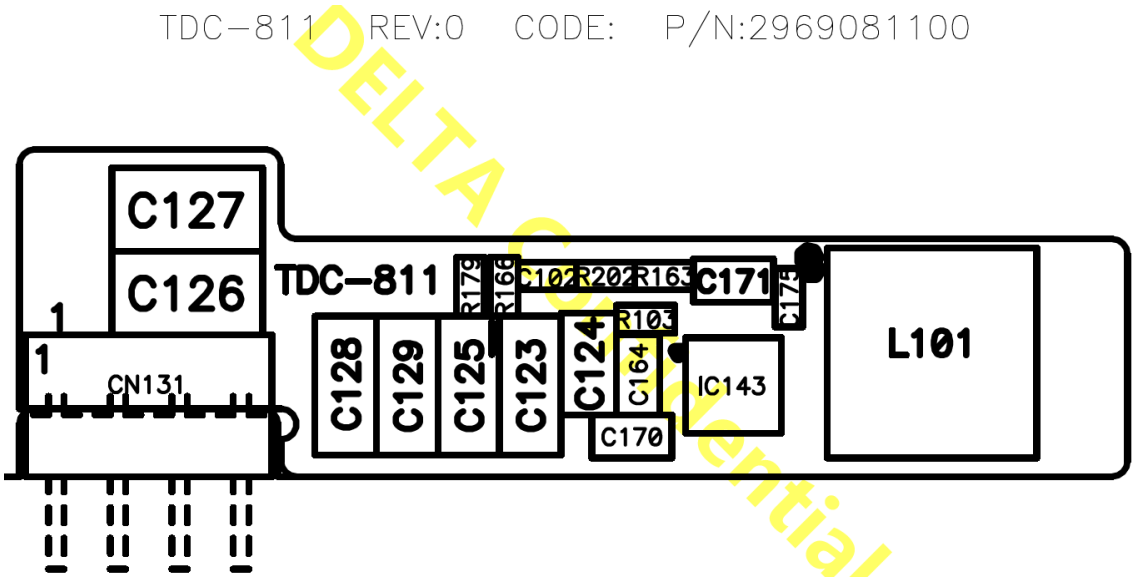



Picture 18 PCB, type TDC-585 for model PMS-24V1K2W1BTD

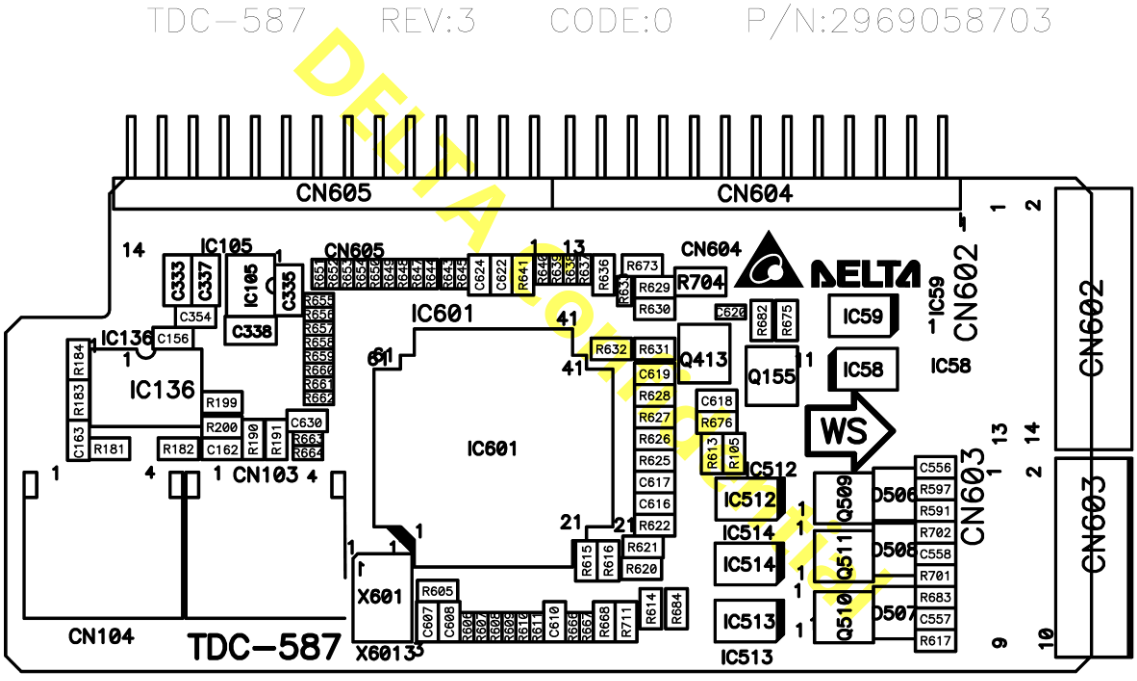
Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD






Picture 19 PCB, type TDC-811 for model PMS-48V1K2W1BTD

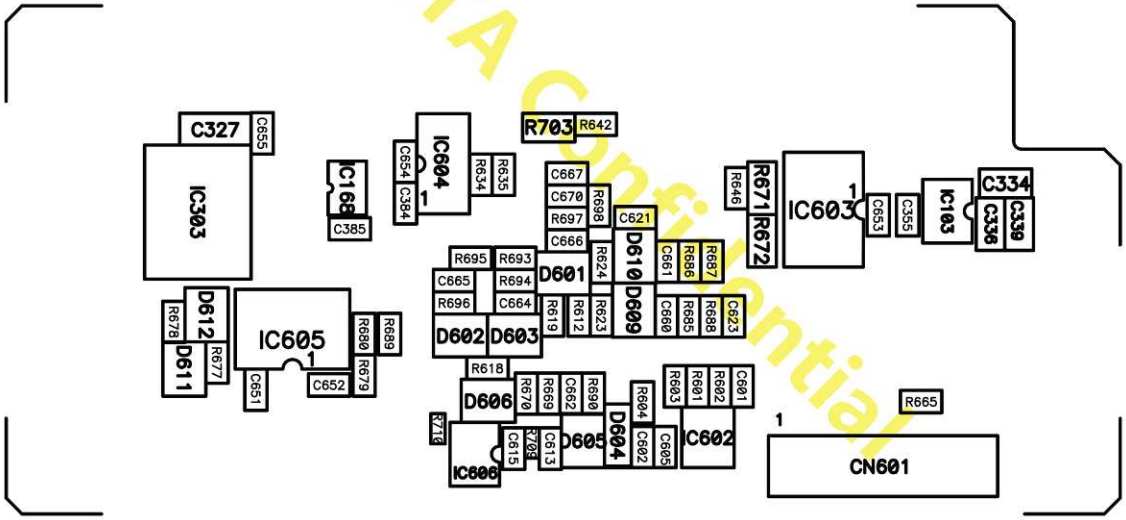



Picture 20 PCB, type TDC-587 for all models

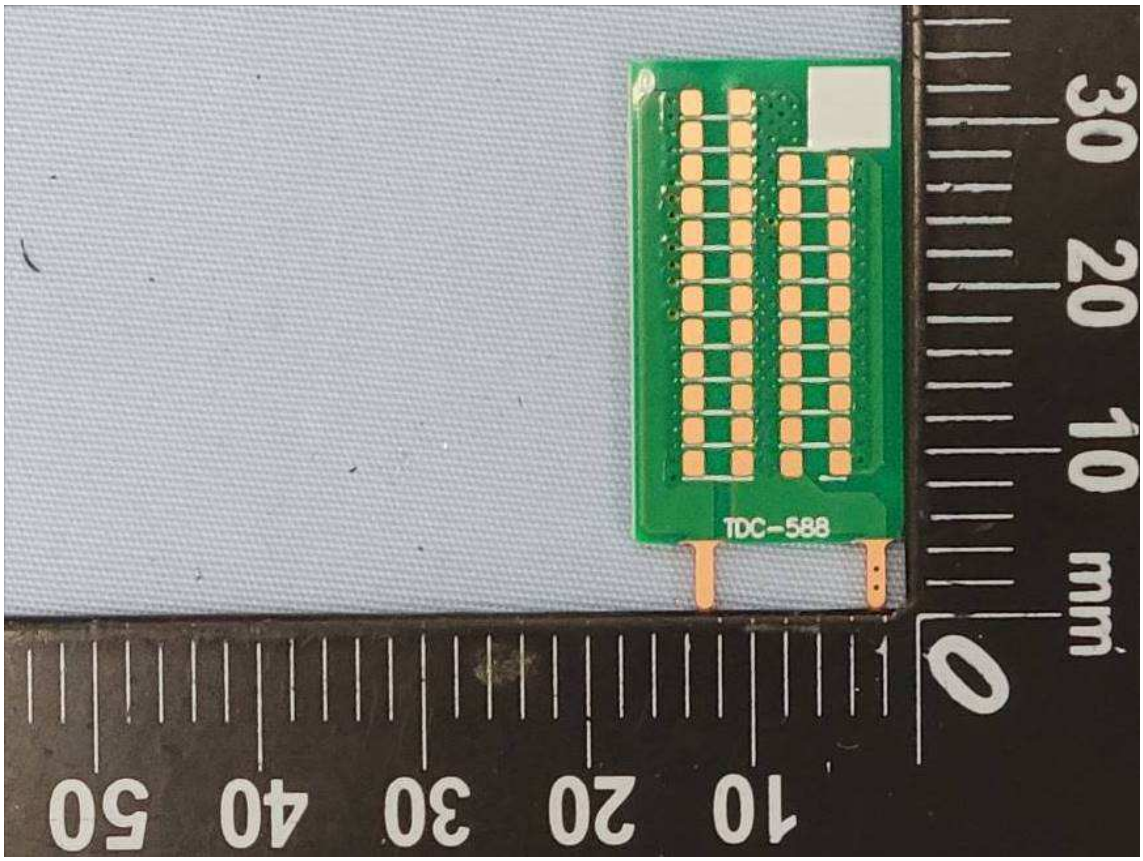
Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD





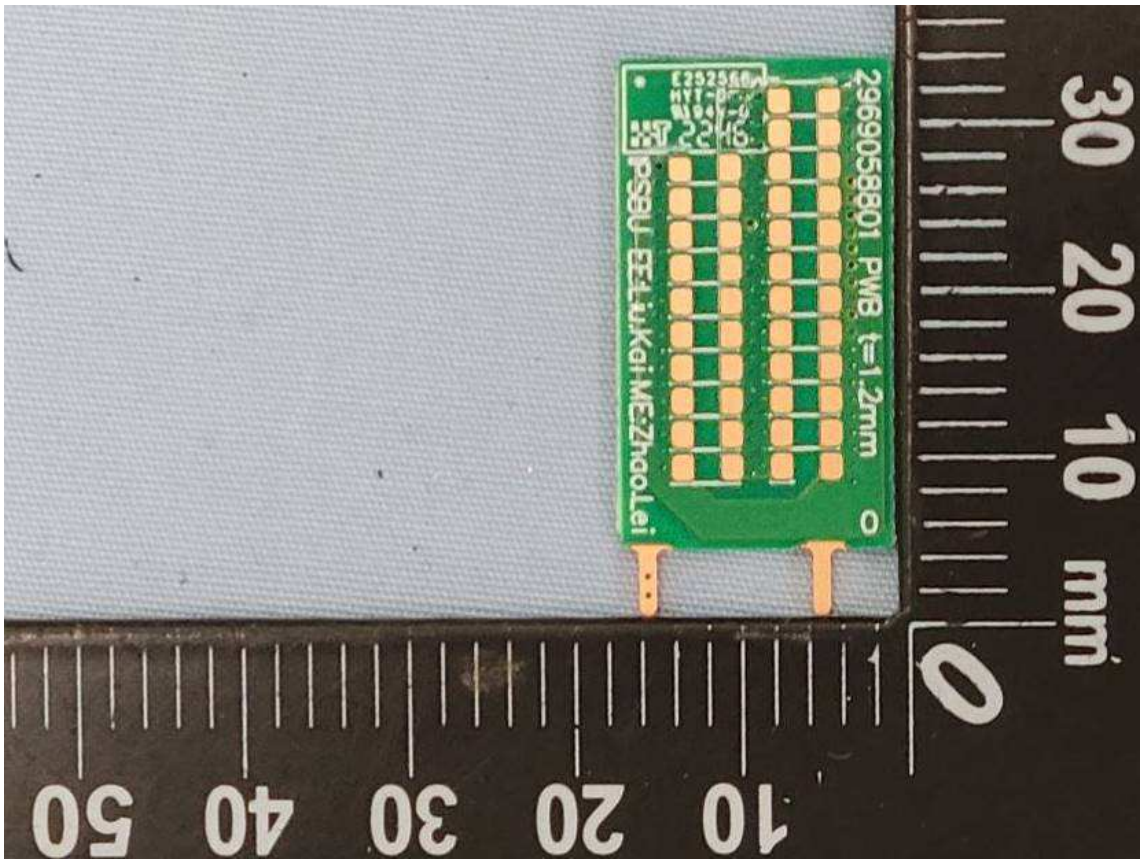

Picture 21 PCB, type TDC-587 for all models



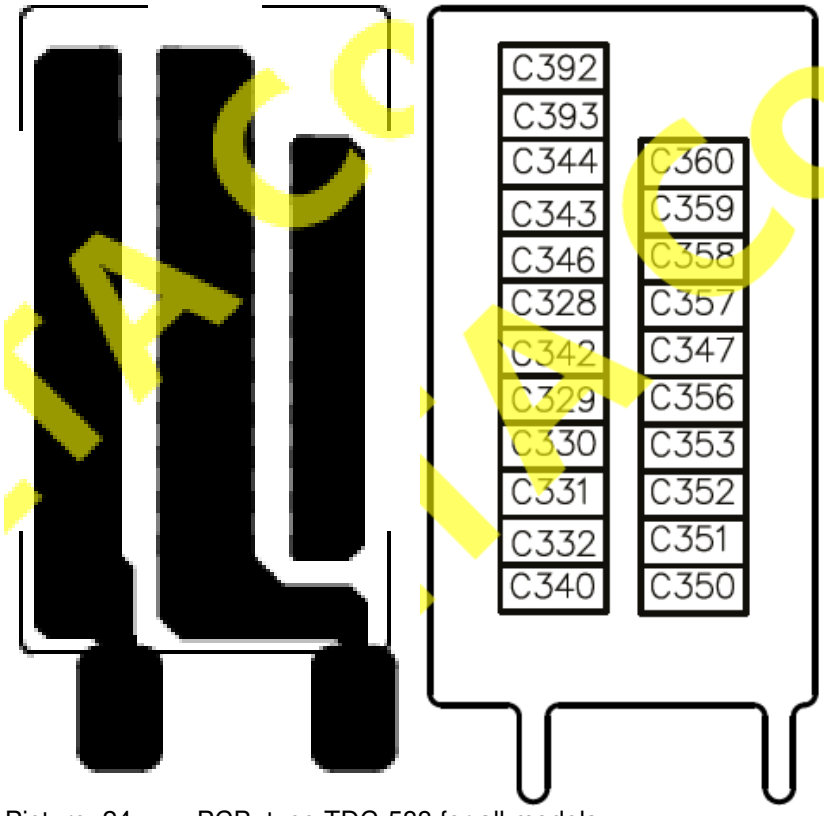

Picture 22 PCB, type TDC-588 for all models

Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD



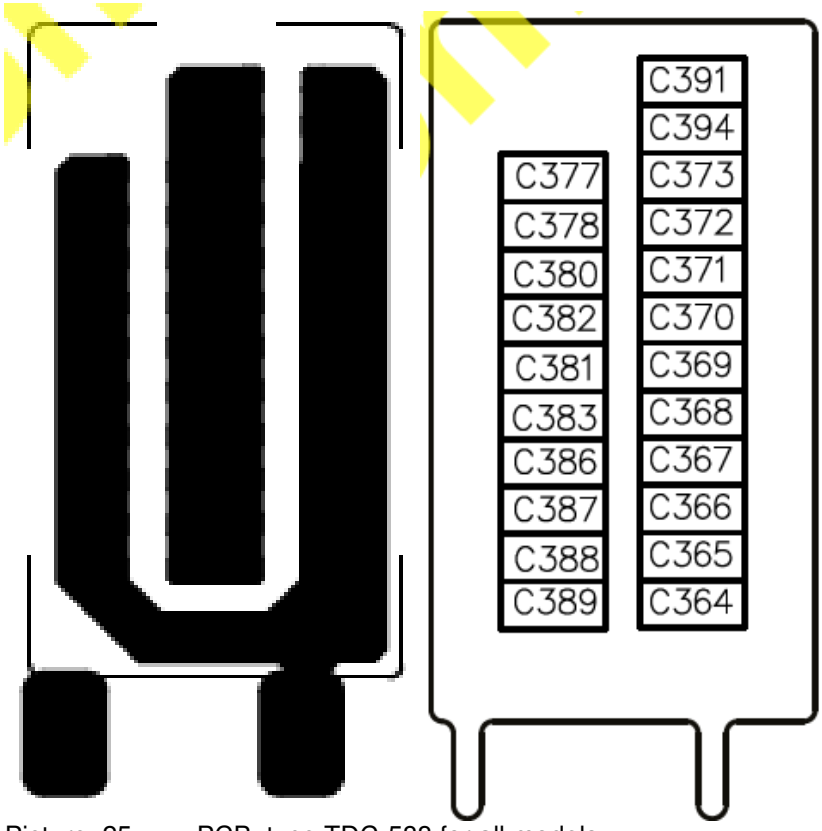

Picture 23 PCB, type TDC-588 for all models



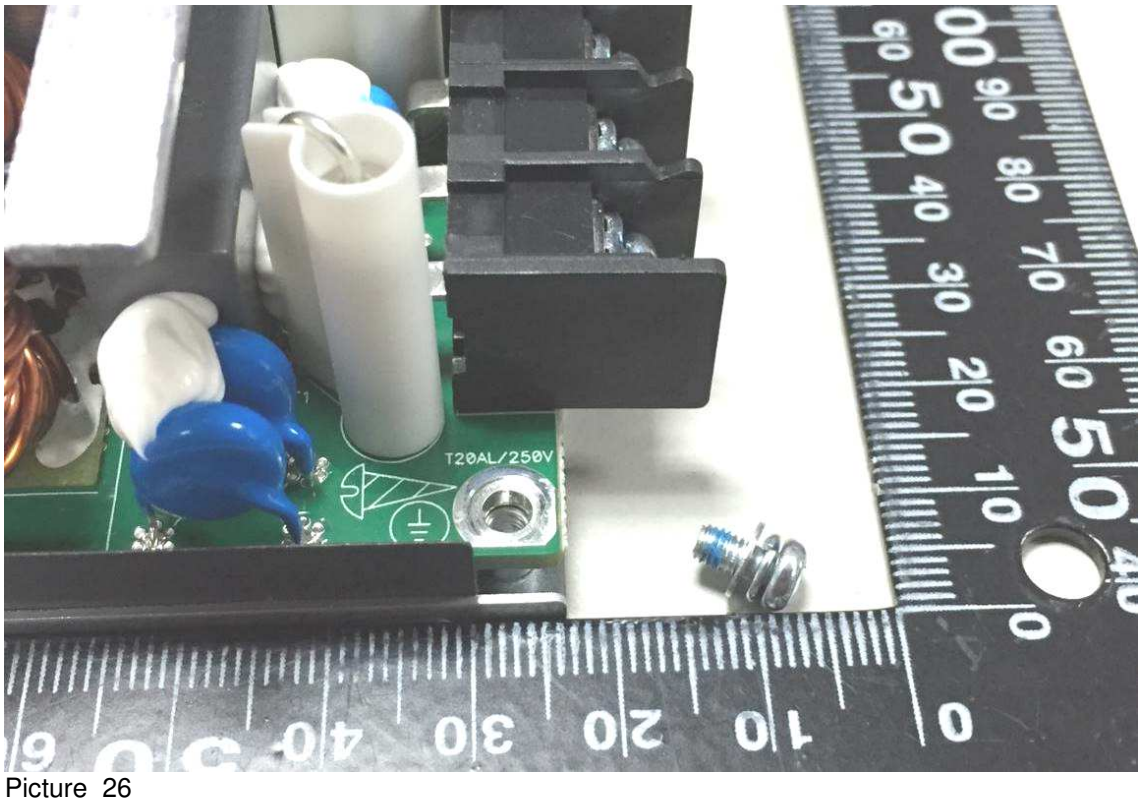

Picture 24 PCB, type TDC-588 for all models

Product: SWITCHING POWER SUPPLY

Type Designation: 1. PMS-24V1K2W1BTD
2. PMS-48V1K2W1BTD




Picture 25 PCB, type TDC-588 for all models




Picture 26