AC-DC Adapter

ADT-60W Series / ADT-060A☐A☐ B-A

ADT-060A

Highlights & Features

- Up to 89% efficiency
- Meet ErP Lot 7 & DoE VI
- No load power consumption < 0.15 W
- Over-Voltage/Load/Temperature & Short Circuit protections
- Limited Power Source (LPS) certified

Safety Standards

CB Certified for worldwide use

Model Number: ADT-060A☐A☐ B-A
Unit Weight: 180±10 grams (6.35±0.35 ounces)
Dimensions (W x L x H): 46.0 x 108.0 x 29.5 mm (1.81 x 4.25 x 1.16 inch)

General Description

The ADT-060A adapter comes with universal AC input at 85 Vac to 264 Vac. With the efficiency up to 89% and the extremely low no-load power consumption below 0.15 W, the ADT-060A is compliant with DoE level VI and ErP Lot 7 efficiency standard for energy savings. The supreme feature allows the adapter to save the energy when it is either under the operating mode or under the standby mode.

Model Information

Model Number	Input Voltage Range	Rated Output Voltage	Rated Output Current
ADT-060A12A☐ B-A	85-264 Vac	12 Vdc	5.0 A
ADT-060A15A☐ B-A		15 Vdc	4.0 A
ADT-060A19A☐ B-A		19 Vdc	3.2 A
ADT-060A24A☐ B-A		24 Vdc	2.5 A

Model Numbering

						CC Code	
ADT-	**060**	**A**	**☐**	**A**	**☐**	**B-**	**A**
Delta AC-DC Adapter	Output Power (60W series)	Family Code	Output Voltage (Single Output) 12 – 12 V 15 – 15 V 19 – 19 V 24 – 24 V	Package Type A – Power Adapter	Input Connector Type A – C6 (Class II with functional earth) B – C8	Tuning fork 5.5 x 2.1 x 9.5 mm, 180°	Delta Standard

All parameters are specified at 25°C ambient for all products unless otherwise indicated.
www.DeltaPSU.com (July 2023, Rev. 05)

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Specifications

Model Number		ADT-060A12A☐ B-A	ADT-060A15A☐ B-A	ADT-060A19A☐ B-A	ADT-060A24A☐ B-A
Input Ratings / Characteristics					
Nominal Input Voltage		100-240 Vac			
Input Voltage Range*		85-264 Vac			
Nominal Input Frequency		50-60 Hz			
Input Frequency Range		47-63 Hz			
Input Current	115 Vac	1.4 A max.			
	230 Vac	1.0 A max.			
Efficiency at 100% Load	115 Vac	87.6% typ.	87.9% typ.	88.1% typ.	88.8% typ.
	230 Vac	90.2% typ.	90.0% typ.	90.3% typ.	90.1% typ.
Average Efficiency (25%, 50%, 75%, 100%)		89% min. @ 115 Vac & 230 Vac			
Efficiency @ 10% load		79% @ 115 Vac & 230 Vac			
No Load Power Consumption		0.15 W max @ 115 Vac & 230 Vac			
Inrush Current		No damage			
Leakage Current (max.)		0.1 mA @ 240 Vac / 50 Hz			

*Output power is de-rated at low input voltage. Please refer to Fig. 3 on page 7

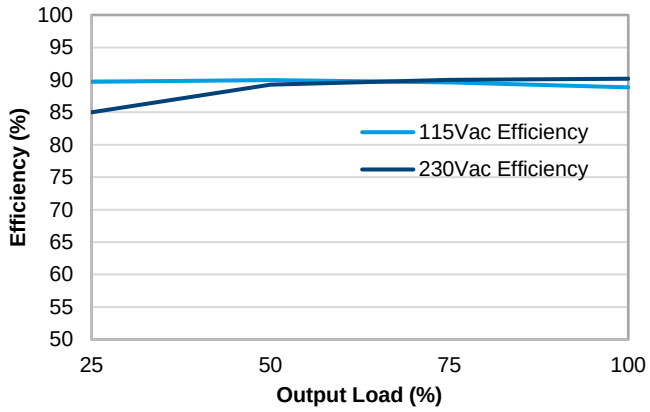

Fig. 1-1. ADT-060A12A Efficiency versus Output Load

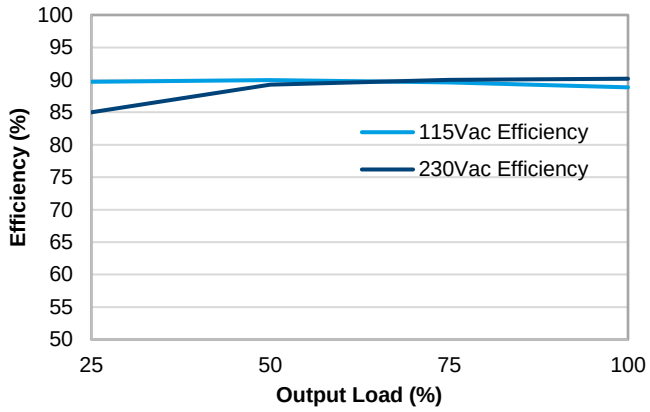

Fig. 1-2. ADT-060A15A Efficiency versus Output Load

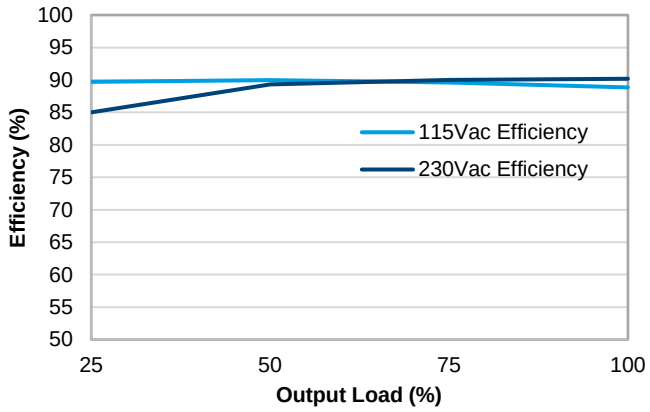

Fig. 1-3. ADT-060A19A Efficiency versus Output Load

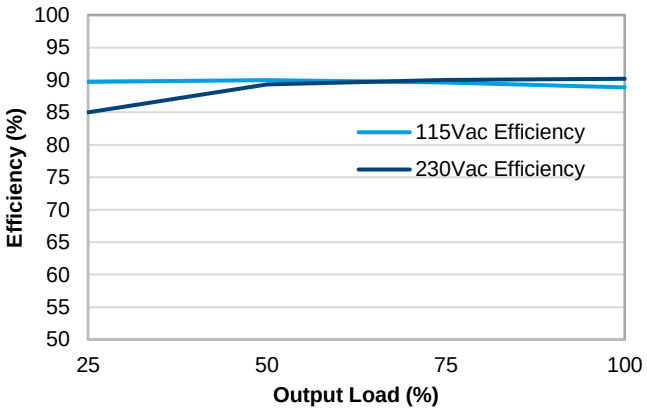

Fig. 1-4. ADT-060A24A Efficiency versus Output Load

AC-DC Adapter

ADT-60W Series / ADT-060A☐A☐ B-A

Model Number	ADT-060A12A☐ B-A	ADT-060A15A☐ B-A	ADT-060A19A☐ B-A	ADT-060A24A☐ B-A

Output Ratings / Characteristics

Nominal Output Voltage		12 Vdc	15 Vdc	19 Vdc	24 Vdc
Rated Output Current		5 A	4 A	3.2A	2.5 A
Output Power		60 W	60 W	60.8 W	60 W
Line Regulation		± 1%			
Load Regulation		± 5.0%	± 4.0%	± 3.0%	± 2.5%
Combine Regulation		± 8.0%	± 7.0%	± 5.0%	± 5.0%
PARD* (20MHz)	0°C to 40°C	< 240 mVpp	< 300 mVpp	< 380 mVpp	< 480 mVpp
	-10°C to 0°C	< 480 mVpp	< 600 mVpp	< 760 mVpp	< 960 mVpp
Rise Time	115 Vac	30 mS (typ.)			
	230 Vac				
Start-up Time	115 Vac	1000 ms (typ.)			
	230 Vac	500 ms (typ.)			
Hold-up Time	115 Vac	12 ms (typ.)			
	230 Vac	60 ms (typ.)			
Capacitive load (max)		470 uF			

*PARD is measured with an AC coupling mode, and in parallel with 0.1µF ceramic capacitor & 22µF electrolytic capacitor.

Mechanical

Case		PC	
Dimensions (W x L x H)		46.0 x 108.0 x 29.5 mm (1.81 x 4.25 x 1.16 inch)	
Unit Weight		180±10 grams (6.35±0.35 ounces)	
Cooling System		Convection	
Output Cable Specification	Length: 1200 mm UL1571	#16AWG	ADT-060A12AA B / ADT-060A12AB B
		#18AWG	ADT-060A15AA B / ADT-060A15AB B
		#20AWG	ADT-060A19AA B / ADT-060A19AB B ADT-060A24AA B / ADT-060A24AB B
Input Socket		C6	ADT-060A12AA B ADT-060A15AA B ADT-060A19AA B ADT-060A24AA B
		C8	ADT-060A12AB B ADT-060A15AB B ADT-060A19AB B ADT-060A24AB B

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AC-DC Adapter

ADT-60W Series / ADT-060A☐A☐ B-A

Model Number	ADT-060A12A☐ B-A	ADT-060A15A☐ B-A	ADT-060A19A☐ B-A	ADT-060A24A☐ B-A

Environment

Surrounding Air Temperature	Operating	-10°C to +60°C (-20°C cold start @ 100% Load)
	Storage	-40°C to +85°C
Power De-rating		> 40°C de-rating power by 2.5% / °C < 90Vac de-rating power by 2% / V
Operating Humidity		5 to 95% RH (Non-Condensing)
Storage Humidity		5 to 95% RH (Non-Condensing)
Operating Altitude		Up to 5,000 meters (up to 16,400 feet)
Ball Impact Test		Test height 130 cm, 1 sample 1 time, Steel Ball 500 g, Concrete floor
Drop Test		Test height 100 cm, 6 face for each sample, concrete floor Function test pass after drop test
Shock Test	Non-Operating	Half sine wave, 50 G, 11 ms, 1 shocks for each direction, 6 direction
Vibration	Non-Operating	5-500 Hz, 2.09 Grms, 20 minute for X,Y,Z axis

Protections

Overvoltage	13.2-18.0 V, Latch Mode	16.5-22.5 V, Latch Mode	20.9-28.5 V, Latch Mode	26.4-36.0 V, Latch Mode
Overload / Overcurrent	5.25-10.00 A	4.20-8.00 A	3.36-6.40 A	2.625-5.00 A
	Auto-Recovery when the fault is removed			
Over Temperature	Latch Mode			
Short Circuit	Auto-Recovery when the fault is removed			
Protection Against Shock	ADT-060A12AA B ADT-060A15AA B ADT-060A19AA B ADT-060A24AA B		Class II	
	ADT-060A12AB B ADT-060A15AB B ADT-060A19AB B ADT-060A24AB B			

Reliability Data

MTBF	> 700,000 hrs. per Telcordia SR-332 at Input: 115 Vac, Output: 100% load, Ta: 25°C
Expected Cap Life Time	5 years (50% load @ 25°C)

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Model Number	ADT-060A12A☐ B-A	ADT-060A15A☐ B-A	ADT-060A19A☐ B-A	ADT-060A24A☐ B-A

Safety Standards / Directives

Electrical Safety	CB scheme	IEC/UL/EN 60950-1; IEC/UL/EN 62368-1
	BSMI	CNS 14336-1
	CCC	GB 4943.1-2011
	PSE	J 60950-1(H29)
	KC	K 60950-1
Limited Power Source (LPS)	CB scheme	IEC 62368-1
CE		In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU
UKCA		In conformance with Electromagnetic Compatibility Regulations 2016 and Electrical Equipment (Safety) Regulations 2016
Galvanic Isolation	Input to Output	3000 Vac

EMC

Emissions (CE & RE)		CISPR/EN/BS EN 55032 Class B BSMI CNS 13438 FCC Part 15, ICES-003, ANSI C63.4 GB/T9254- 2008 KN32
Immunity		EN/BS EN 55024; KN35
Radiated and Conducted Emissions		Conducted Emissions: EN/BS EN 55032 Class B Radiated Emissions: EN/BS EN 55032 Class B
Flicker and Voltage Fluctuation		IEC 61000-3-3
Harmonic Current Emissions	IEC 61000-3-2	Class D; GB 17625.1-2003
Electrostatic Discharge Standard	IEC 61000-4-2	Criteria A[1)] Air Discharge: 15 kV Contact Discharge: 8 kV
Radiated Field Immunity Test	IEC 61000-4-3	Level 2 Criteria A[1)] 80 MHz – 1 GHz, 3 V/M with 1 kHz tone / 80% modulation.
Fast Transient Burst Immunity	IEC 61000-4-4	Level 2 Criteria A[1)]: 1 kV
Surge Immunity Requirement	IEC 61000-4-5	Level 3 Criteria A[1)] Common Mode: 2 kV (12Ω) – For ADT-060A☐☐AA B-A model only Differential Mode: 1 KV (2Ω)
Conducted Immunity	IEC 61000-4-6	Level 2 Criteria A[1)] 150 kHz – 80 MHz, 3 Vrms
Power Frequency Magnetic Fields	IEC 61000-4-8	Level 2 Criteria A[1)] Magnetic field strength 3 A/m
Voltage Dips, Short Interruptions Immunity	IEC 61000-4-11	Voltage Dips 70% reduction/0.5 periods (Criterion B) 40% reduction/5 periods (Criterion C) Voltage Short Interruptions 5% reduction/250 periods (Criterion C)

1) Criteria A: Normal performance within the specification limits
2) Criteria B: Output out of regulation, or shuts down during test. Automatically restore to normal operation after test.
3) Criteria C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

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Dimensions

W x L x H: 46.0 x 108.0 x 29.5 mm (1.81 x 4.25 x 1.16 inch)

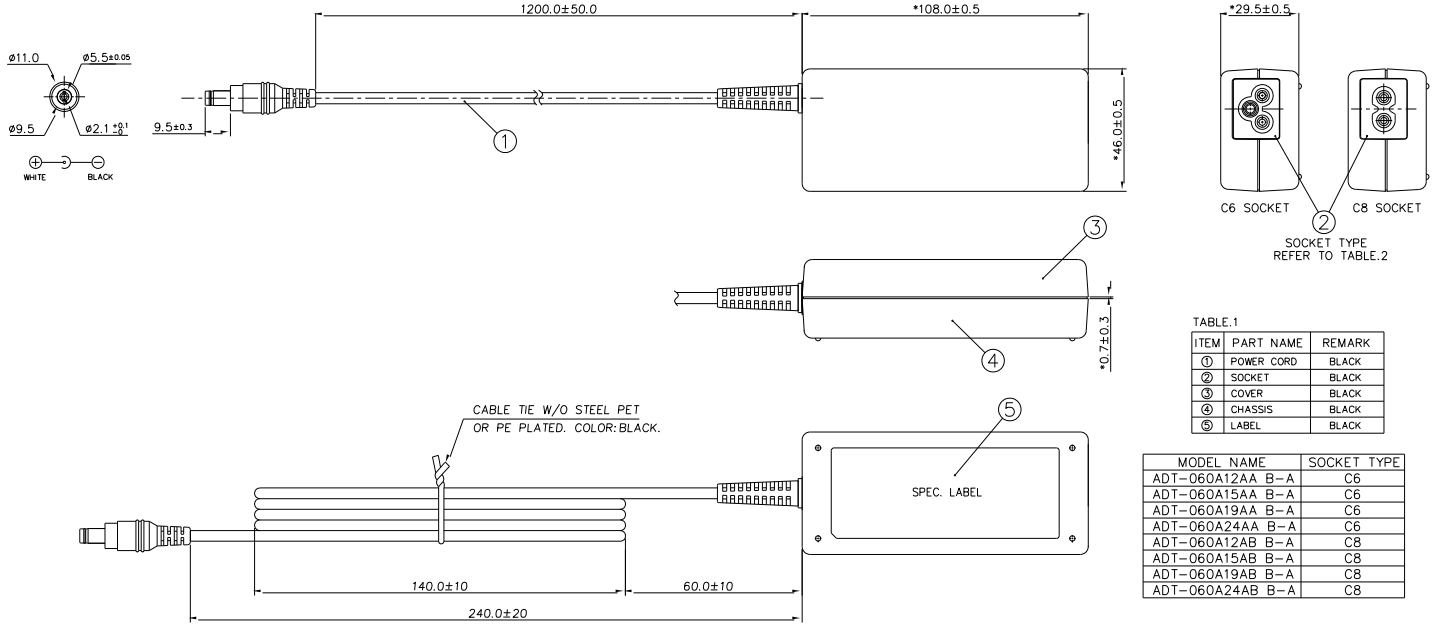

TABLE.1

ITEM	PART NAME	REMARK
①	POWER CORD	BLACK
②	SOCKET	BLACK
③	COVER	BLACK
④	CHASSIS	BLACK
⑤	LABEL	BLACK

MODEL NAME	SOCKET TYPE
ADT-060A12AA B-A	C6
ADT-060A15AA B-A	C6
ADT-060A19AA B-A	C6
ADT-060A24AA B-A	C6
ADT-060A12AB B-A	C8
ADT-060A15AB B-A	C8
ADT-060A19AB B-A	C8
ADT-060A24AB B-A	C8

Engineering Data

Output Load De-rating VS Surrounding Air Temperature

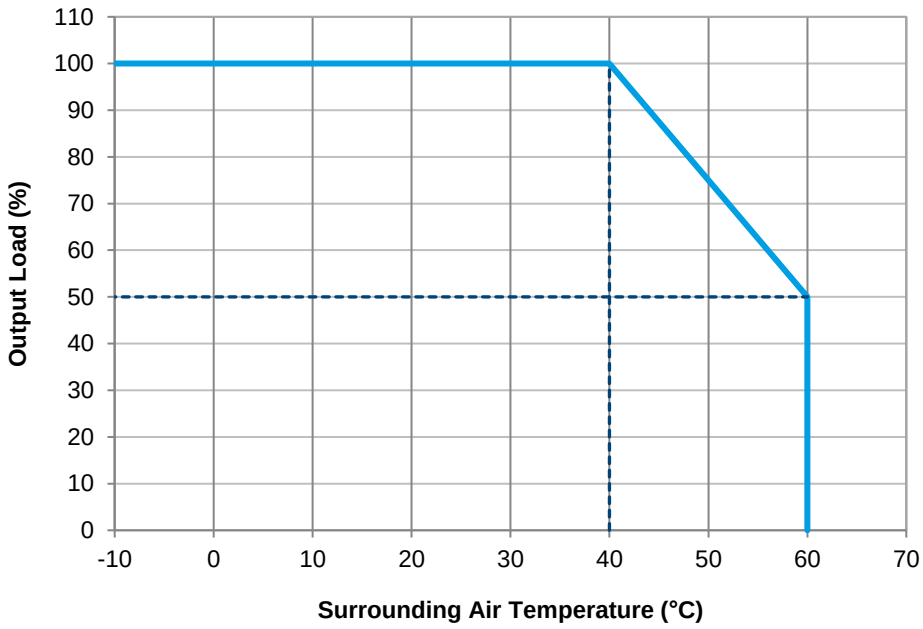

Fig. 2 De-rating for All Mounting Orientation (All Models)
> 40°C de-rate power by 2.5% / °C

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Output Load De-rating VS Input Voltage

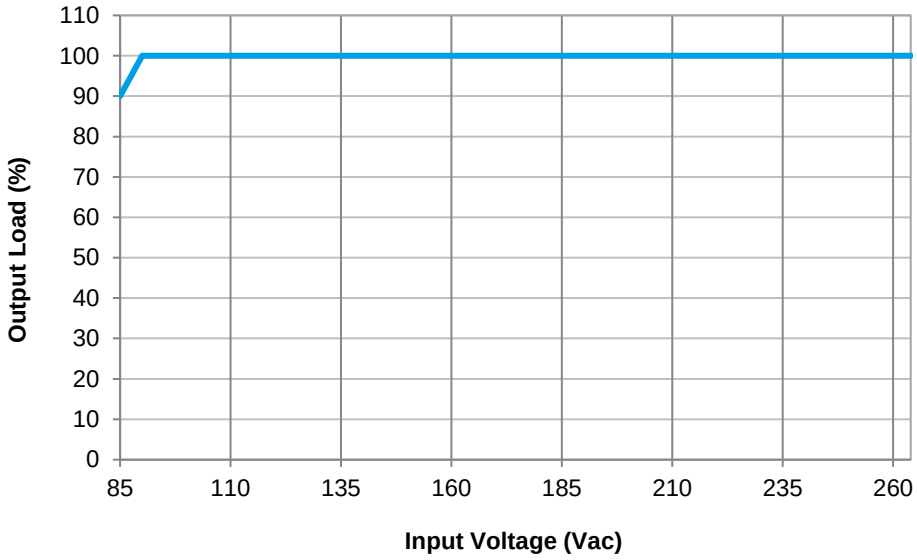
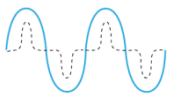


Fig. 3 De-rating for Low Input Voltage (All Models)
< 90Vac de-rate power by 2% / Vac

Others

PFC – Norm EN 61000-3-2



Line Current Harmonic content

Typically, the input current waveform is not sinusoidal due to the periodical peak charging of the input capacitor. In industrial environment, complying with EN 61000-3-2 is only necessary under special conditions. Complying to this standard can have some technical drawbacks, such as lower efficiency as well as some commercial aspects such as higher purchasing costs. Frequently, the user does not profit from fulfilling this standard, therefore, it is important to know whether it is mandatory to meet this standard for a specific application.

Attention

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