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 < 0.15W
- Over-Voltage/Load/Temperature & Short Circuit protections

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 85Vac to 264Vac. With the efficiency up to 89% and the extremely low no-load power consumption below 0.15W, 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	85-264Vac	12Vdc	5.0A
ADT-060A15A☐ B-A		15Vdc	4.0A
ADT-060A19A☐ B-A		19Vdc	3.2A
ADT-060A24A☐ B-A		24Vdc	2.5A

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 – 12V 15 – 15V 19 – 19V 24 – 24V	Package Type A – Power Adapter	Input Connector Type A – C6 (Class II with functional earth) B – C8	Barrel Type 5.5x2.1x10 mm, 180°	Delta Standard

All parameters are specified at 25°C ambient for all products unless otherwise indicated.
www.DeltaPSU.com (January 2020, Rev. 01)

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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		100-240Vac			
Input Voltage Range*		85-264Vac			
Nominal Input Frequency		50-60Hz			
Input Frequency Range		47-63Hz			
Input Current	115Vac	1.4A max.			
	230Vac	1.0A max.			
Efficiency at 100% Load	115Vac	87.6% typ.	87.9% typ.	88.1% typ.	88.8% typ.
	230Vac	90.2% typ.	90.0% typ.	90.3% typ.	90.1% typ.
Average Efficiency (0%, 25%, 50%, 100%)		89% min. @ 115Vac & 230Vac			
No Load Power Consumption		0.15W max @ 115Vac & 230Vac			
Inrush Current		No damage			
Leakage Current (max.)		0.1mA @ 240Vac/50Hz			

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

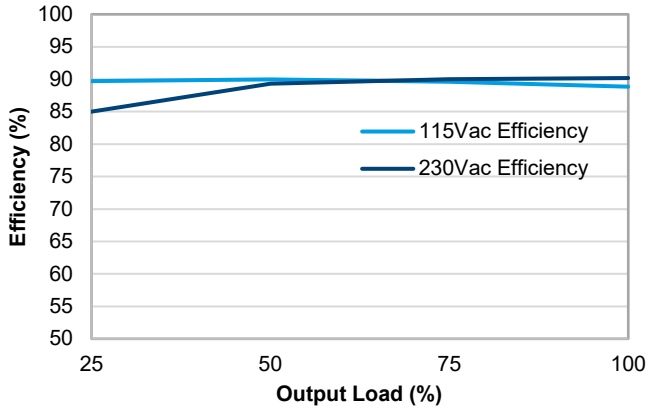

Fig. 1-1. ADT-060A12A Efficiency versus Output Load

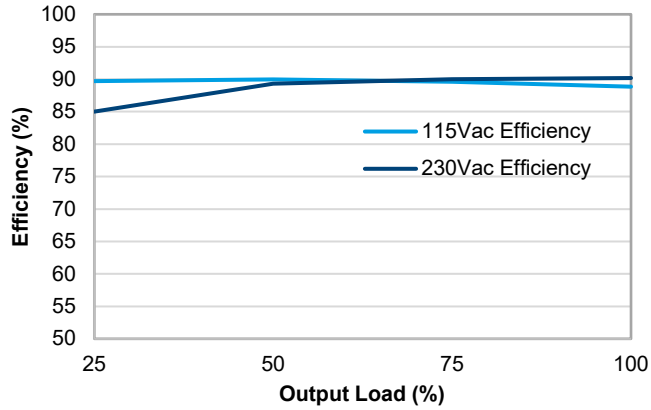

Fig. 1-2. ADT-060A15A Efficiency versus Output Load

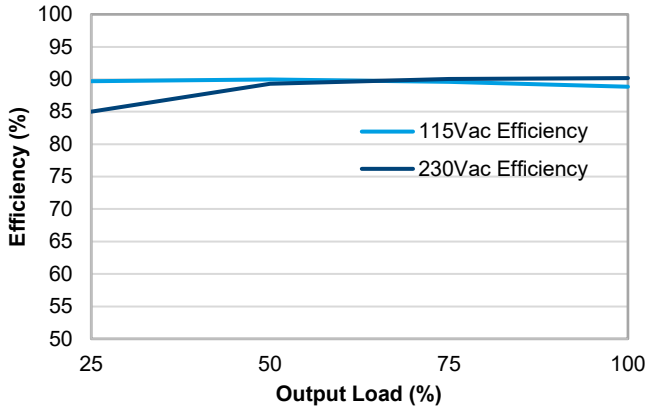

Fig. 1-3. ADT-060A19A Efficiency versus Output Load

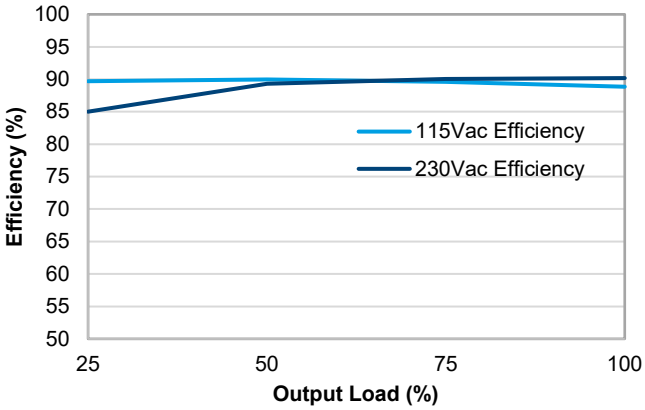

Fig. 1-4. ADT-060A24A Efficiency versus Output Load

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		12Vdc	15Vdc	19Vdc	24Vdc
Rated Output Current		5A	4A	3.2A	2.5A
Output Power		60W	60W	60.8W	60W
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	< 240mVpp	< 300mVpp	< 380mVpp	< 480mVpp
	-10°C to 0°C	< 480mVpp	< 600mVpp	< 760mVpp	< 960mVpp
Rise Time	115Vac	30mS (typ.)			
	230Vac				
Start-up Time	115Vac	1000ms (typ.)			
	230Vac	500ms (typ.)			
Hold-up Time	115Vac	12ms (typ.)			
	230Vac	60ms (typ.)			
Capacitive load (max)		470uF			

*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: 1200mm 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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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 130cm, 1 sample 1 time, Steel Ball 500g, Concrete floor
Drop Test		Test height 100cm, 6 face for each sample, concrete floor Function test pass after drop test
Shock Test	Non-Operating	Half sine wave, 50G, 11ms, 1 shocks for each direction, 6 direction
Vibration	Non-Operating	5-500Hz, 2.09Grms, 20 minute for X,Y,Z axis

Protections

Overvoltage	13.2-18.0V, Latch Mode	16.5-22.5V, Latch Mode	20.9-28.5V, Latch Mode	26.4-36.0V, Latch Mode
Overload / Overcurrent	5.25-10.00A	4.20-8.00A	3.36-6.40A	2.625-5.00A
	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: 115Vac, Output: 100% load, Ta: 25°C
Expected Cap Life Time	5 years (50% load @ 25°C)

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Safety Standards / Directives

Electrical Safety		IEC/UL/EN 60950-1; IEC/UL/EN 62368-1 BSMI CNS14336-1 CCC GB4943.1-2011 PSE J60950-1(H29) KC K60950-1
CE		In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU
Material and Parts		RoHS Directive 2011/65/EU Compliant
Galvanic Isolation	Input to Output	3000Vac

EMC

Emissions (CE & RE)		CISPR/EN 55032 Class B BSMI CNS13438 FCC Part 15, ICES-003, ANSI C63.4 GB/T9254- 2008 KN32
Immunity		EN55024; KN35
Radiated and Conducted Emissions		Conducted Emissions: EN55032 Class B Radiated Emissions: EN55032 Class B
Flicker and Voltage Fluctuation		IEC 61000-3-3
Harmonic Current Emissions	IEC 61000-3-2	Class D; GB17625.1-2003
Electrostatic Discharge Standard	IEC 61000-4-2	Criteria A[1)] Air Discharge: 15kV Contact Discharge: 8kV
Radiated Field Immunity Test	IEC 61000-4-3	Level 2 Criteria A[1)] 80MHz – 1GHz, 3V/M with 1kHz tone / 80% modulation.
Fast Transient Burst Immunity	IEC 61000-4-4	Level 2 Criteria A[1)]: 1kV
Surge Immunity Requirement	IEC 61000-4-5	Level 3 Criteria A[1)] Common Mode: 2kV (12Ω) – For ADT-060A☐☐AA B-A model only Differential Mode: 1KV (2Ω)
Conducted Immunity	IEC 61000-4-6	Level 2 Criteria A[1)] 150kHz – 80MHz, 3Vrms
Power Frequency Magnetic Fields	IEC 61000-4-8	Level 2 Criteria A[1)] Magnetic field strength 3A/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)

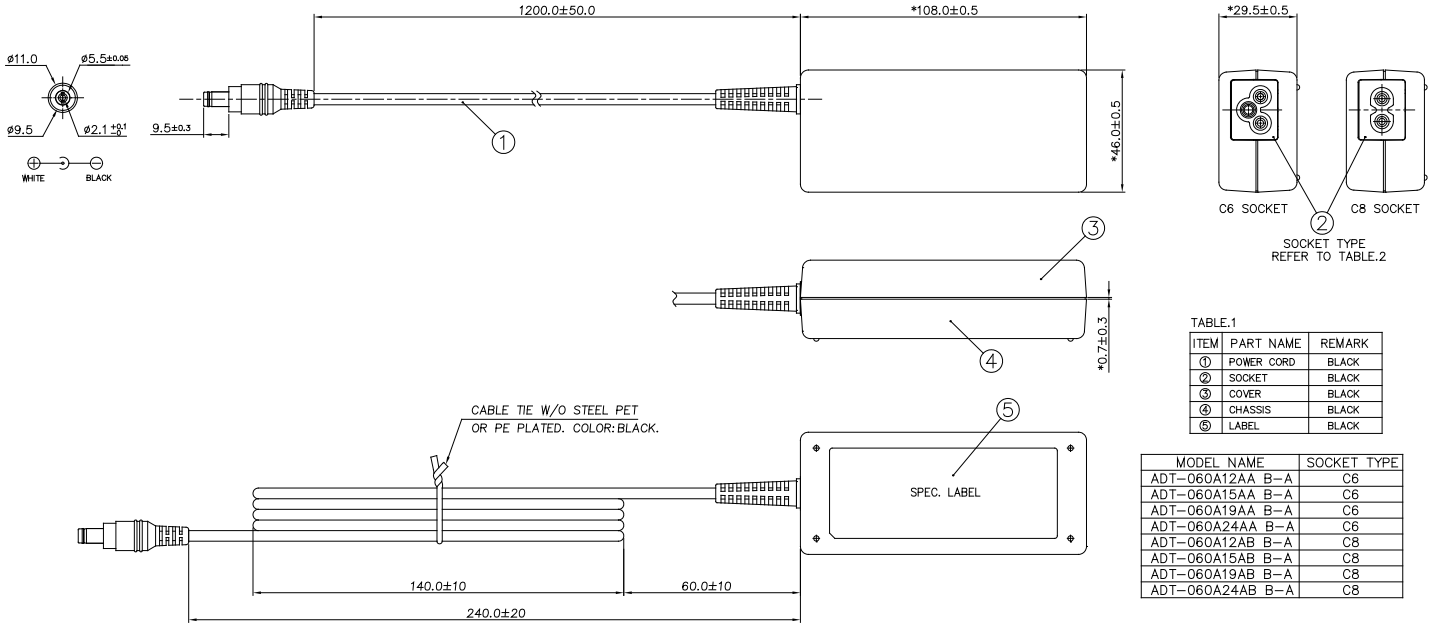

TABLE.1

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

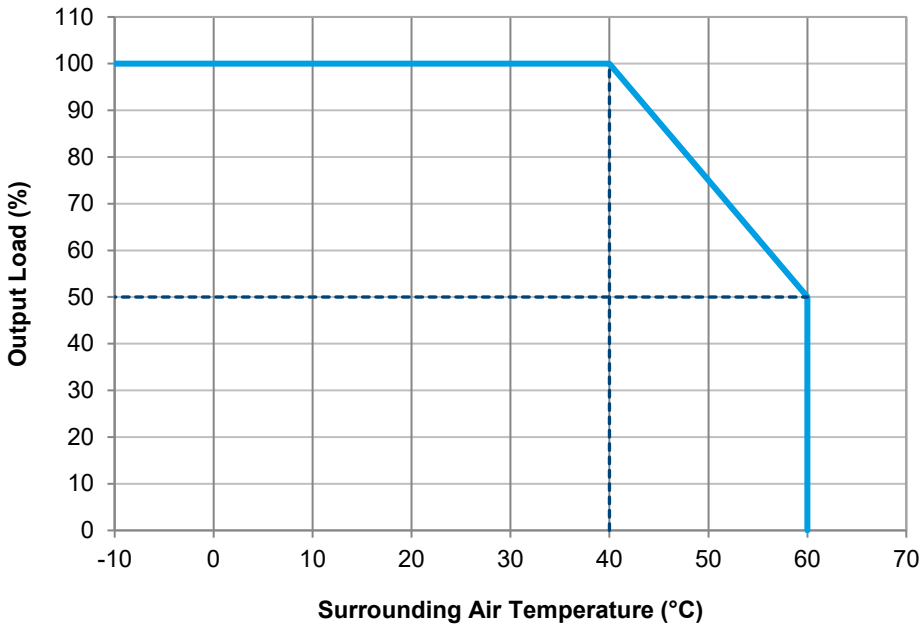

Fig. 2 De-rating for All Mounting Orientation (All Models)
> 40°C de-rate power by 2.5% / °C

Output Load De-rating VS Input Voltage

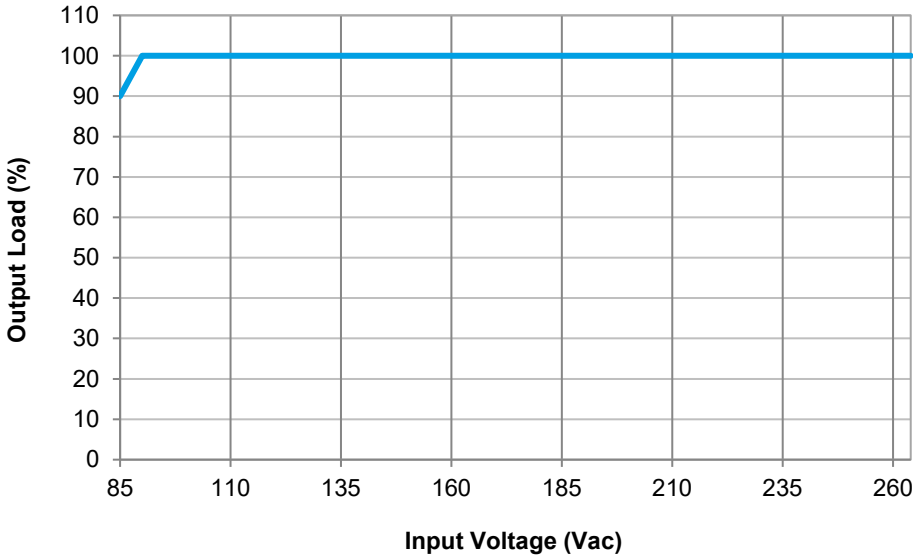

Fig. 3 De-rating for Low Input Voltage (All Models)
< 90Vac de-rate power by 2% / Vac

Others

Delta RoHS Compliant

Restriction of the usage of hazardous substances

The European directive 2011/65/EU limits the maximum impurity level of homogeneous materials such as lead, mercury, cadmium, chrome, polybrominated flame retardants PBB and PBDE for the use in electrical and electronic equipment. RoHS is the abbreviation for “Restriction of the use of certain hazardous substances in electrical and electronic equipment”.

This product conforms to this standard.

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

Delta provides all information in the datasheets on an “AS IS” basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to **www.DeltaPSU.com** for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

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