

## AC-DC Adapter

ADT-60W Series / ADT-060A□A□ B-A

## ADT-060A

## Highlights &amp; 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)<br>12 – 12V<br>15 – 15V<br>19 – 19V<br>24 – 24V | Package Type<br>A – Power Adapter | Input Connector Type<br>A – C6 (Class II with functional earth)<br>B – C8 | Barrel Type<br>5.5x2.1x10 mm, 180° | Delta Standard |

# AC-DC Adapter

## ADT-60W Series / ADT-060A□□A□ B-A

### 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

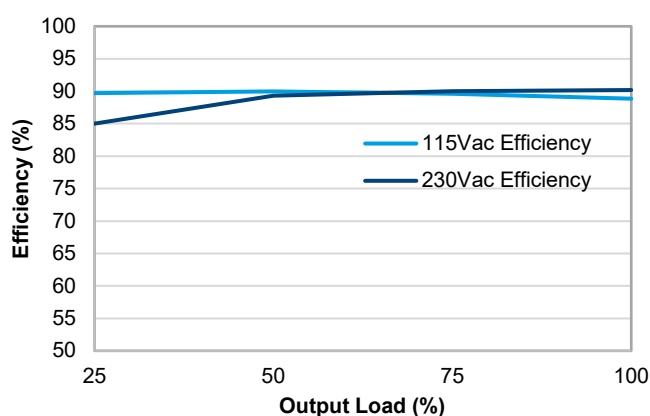


Fig. 1-1. ADT-060A12A Efficiency versus Output Load

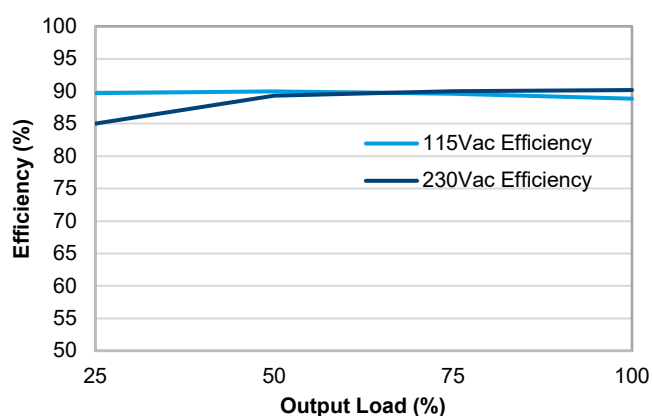


Fig. 1-2. ADT-060A15A Efficiency versus Output Load

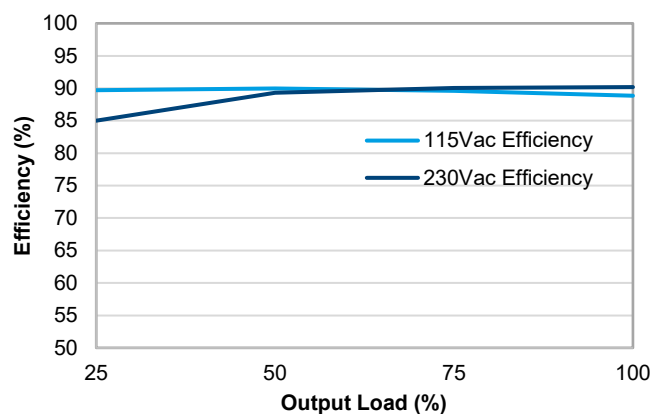


Fig. 1-3. ADT-060A19A Efficiency versus Output Load

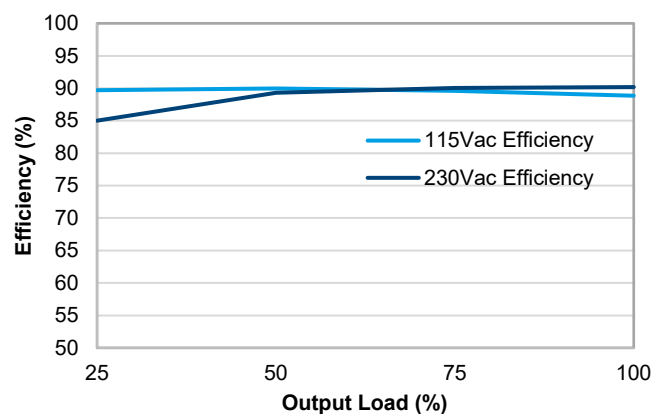


Fig. 1-4. ADT-060A24A Efficiency versus Output Load

# 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<br>UL1571                         | #16AWG                                                                     | ADT-060A12AA B / ADT-060A12AB B                                    |
|                            |                                                  | #18AWG                                                                     | ADT-060A15AA B / ADT-060A15AB B                                    |
|                            |                                                  | #20AWG                                                                     | ADT-060A19AA B / ADT-060A19AB B<br>ADT-060A24AA B / ADT-060A24AB B |
| Input Socket               | C6                                               | ADT-060A12AA B<br>ADT-060A15AA B<br>ADT-060A19AA B<br>ADT-060A24AA B       |                                                                    |
|                            |                                                  | C8<br>ADT-060A12AB B<br>ADT-060A15AB B<br>ADT-060A19AB B<br>ADT-060A24AB B |                                                                    |

# 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<br>(-20°C cold start @ 100% Load)                                                |
|                             | Storage       | -40°C to +85°C                                                                                  |
| Power De-rating             |               | > 40°C de-rating power by 2.5% / °C<br>< 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<br>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,<br>Latch Mode                                            | 16.5-22.5V,<br>Latch Mode | 20.9-28.5V,<br>Latch Mode | 26.4-36.0V,<br>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<br>ADT-060A15AA B<br>ADT-060A19AA B<br>ADT-060A24AA B |                           | Class II                  |                           |
|                          | ADT-060A12AB B<br>ADT-060A15AB B<br>ADT-060A19AB B<br>ADT-060A24AB B |                           |                           |                           |

### Reliability Data

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

# AC-DC Adapter

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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  | IEC/UL/EN 60950-1; IEC/UL/EN 62368-1<br>BSMI CNS14336-1<br>CCC GB4943.1-2011<br>PSE J60950-1(H29)<br>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<br>BSMI CNS13438<br>FCC Part 15, ICES-003, ANSI C63.4<br>GB/T9254- 2008<br>KN32 |                                                                                                                                                                               |  |  |
| Immunity                                   | EN55024; KN35                                                                                          |                                                                                                                                                                               |  |  |
| Radiated and Conducted Emissions           | Conducted Emissions: EN55032 Class B<br>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 <sup>1)</sup><br>Air Discharge: 15kV<br>Contact Discharge: 8kV                                                                                                     |  |  |
| Radiated Field Immunity Test               | IEC 61000-4-3                                                                                          | Level 2 Criteria A <sup>1)</sup><br>80MHz – 1GHz, 3V/M with 1kHz tone / 80% modulation.                                                                                       |  |  |
| Fast Transient Burst Immunity              | IEC 61000-4-4                                                                                          | Level 2 Criteria A <sup>1)</sup> : 1kV                                                                                                                                        |  |  |
| Surge Immunity Requirement                 | IEC 61000-4-5                                                                                          | Level 3 Criteria A <sup>1)</sup><br>Common Mode: 2kV (12Ω) – For ADT-060A□□AA B-A model only<br>Differential Mode: 1kV (2Ω)                                                   |  |  |
| Conducted Immunity                         | IEC 61000-4-6                                                                                          | Level 2 Criteria A <sup>1)</sup><br>150kHz – 80MHz, 3Vrms                                                                                                                     |  |  |
| Power Frequency Magnetic Fields            | IEC 61000-4-8                                                                                          | Level 2 Criteria A <sup>1)</sup><br>Magnetic field strength 3A/m                                                                                                              |  |  |
| Voltage Dips, Short Interruptions Immunity | IEC 61000-4-11                                                                                         | Voltage Dips<br>70% reduction/0.5 periods (Criterion B)<br>40% reduction/5 periods (Criterion C)<br><br>Voltage Short Interruptions<br>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.

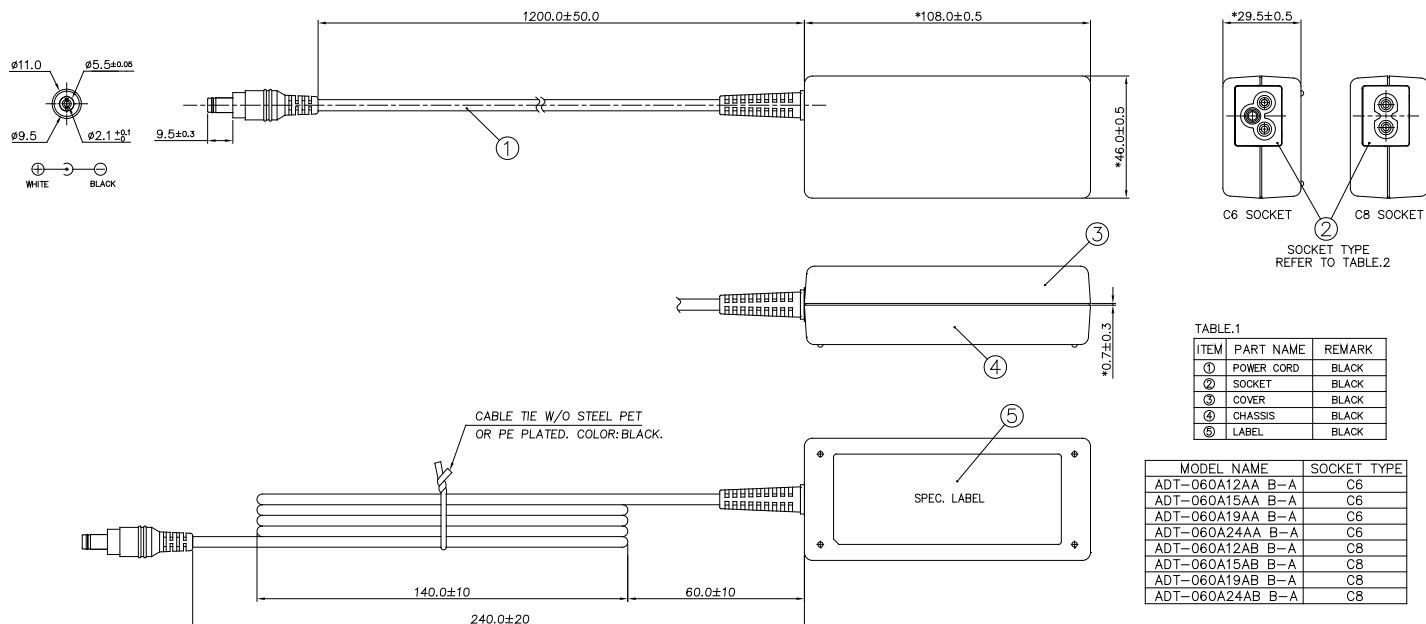
3) Criteria C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

# AC-DC Adapter

## ADT-60W Series / ADT-060A□A□ B-A

### Dimensions

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



### Engineering Data

#### Output Load De-rating VS Surrounding Air Temperature

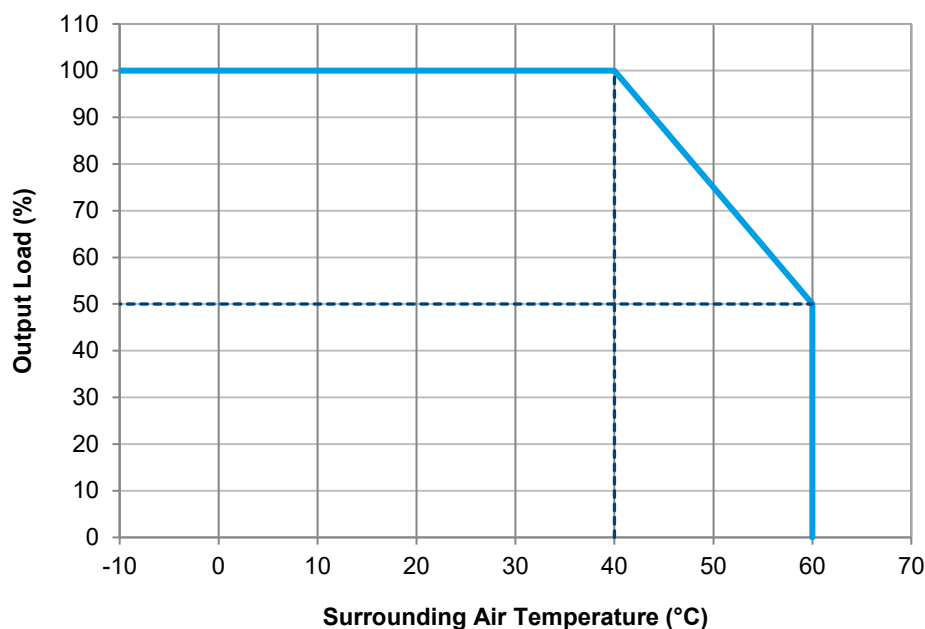
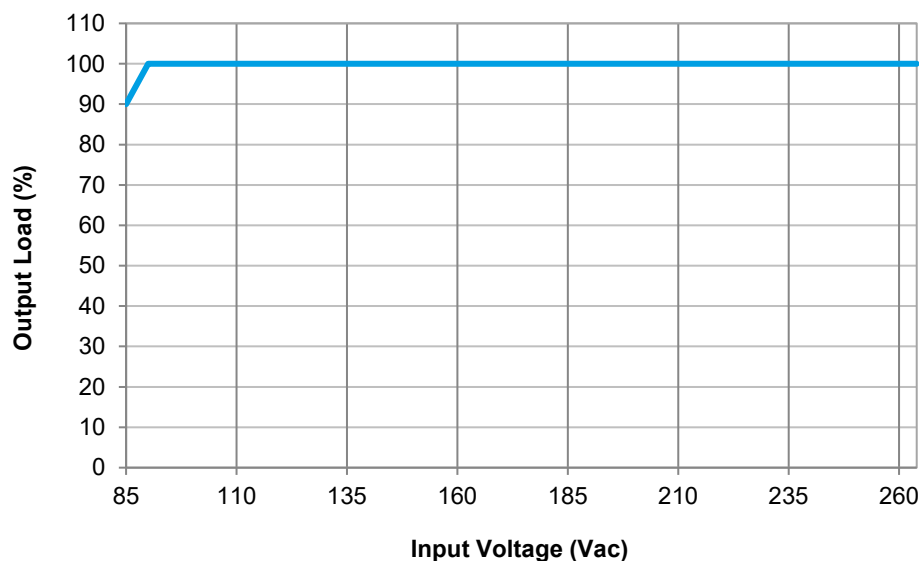


Fig. 2 De-rating for All Mounting Orientation (All Models)  
> 40°C de-rate power by 2.5% / °C

# AC-DC Adapter

## ADT-60W Series / ADT-060A□A□ B-A

### Output Load De-rating VS Input Voltage



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

### Others

#### Delta RoHS Compliant



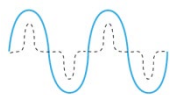
#### Restriction of the usage of hazardous substances

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](http://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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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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