

# 40W, AC/DC Power Converter

## SAP40H

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### Introduction

SAP40H series are compact size AC/DC power converters, featuring universal input voltage range, low stand by power consumption, high efficiency. Designed for high reliability industrial applications, these converters are encapsulated to protect from dust and moisture. They are certified to IEC/EN/UL62368-1, EN60335, EN61558 and EMC performance meets CISPR32, EN55032 Class B without external components, ideally suitable for industrial, and critical commercial applications.

### Features

- Rated power: 40W
- Max Universal input: 85~305VAC, 47~63Hz
- Regulated single output
- Isolation voltage 4200VAC
- Typical efficiency 86 ... 90%
- Energy saving, standby power only less than 0.3W
- Operating temperature range: -40~+85°C
- RoHS compliance
- Compact DIP package
- Over voltage, over current and short circuit protection
- Meet CISPR32, EN55032 Class B without external component
- \*Meet IEC/EN/UL62368 OVC III, IEC EN 60335, IEC EN 61558, UKCA, FCC etc.
- 3 year warranty

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## SAP40H



### Part numbers

| Model Number | Input Voltage (VAC)     | Output Voltage (VDC) | Output Current [mA] Max | Efficiency [%] Typ. | Capacitive Load [uF] Max. |
|--------------|-------------------------|----------------------|-------------------------|---------------------|---------------------------|
| SAP40H050    | 85~305VAC<br>100~430VDC | 5                    | 7000                    | 86                  | 6600                      |
| SAP40H120    |                         | 12                   | 3330                    | 89                  | 4400                      |
| SAP40H150    |                         | 15                   | 2666                    | 90                  | 3300                      |
| SAP40H240    |                         | 24                   | 1670                    | 89                  | 1000                      |
| SAP40H480    |                         | 48                   | 833                     | 90                  | 470                       |

\* Only typical models are listed, other models may be available, upon request.

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## SAP40H



### Electrical characteristics

Unless otherwise indicated, specifications are measured at TA=25°C, humidity <75%, nominal input voltage and rated output load.

| Parameter                                                 | Condition     | Min. | Type  | Max. | Unit   | Note |
|-----------------------------------------------------------|---------------|------|-------|------|--------|------|
| Input Voltage Range                                       | AC in         | 85   | -     | 305  | VAC    |      |
|                                                           | DC in         | 100  | -     | 430  | VDC    |      |
| Input Frequency                                           |               | 47   | -     | 63   | Hz     |      |
| Nominal Input Voltage                                     |               | 100  | -     | 277  | VAC    |      |
| Input current                                             | 115VAC 230VAC | -    | -     | 1.0  | A      |      |
|                                                           |               | -    | -     | 0.6  |        |      |
| Inrush current<br>Cold start                              | 115VAC 230VAC | -    | 30    | -    | A      |      |
|                                                           |               | -    | 60    | -    |        |      |
| Leakage current                                           | 277VAC, 50Hz  | -    | -     | 0.1  | mA RMS |      |
| Output voltage accuracy                                   |               | -    | ±2    | -    | %      |      |
| Line regulation                                           | Full load     | -    | ±0.5  | -    | %      |      |
| Load regulation<br>IOUT=0%~100% of<br>IOUT, rated         | Vout=5.0V     | -    | ±2.0  | -    | %      |      |
|                                                           | Others        | -    | ±1.0  | -    |        |      |
| Ripple and noise<br>20MHz band-<br>width, peak to<br>peak |               | -    | 100   | 150  | mV     |      |
| Temperature<br>coefficient                                |               | -    | ±0.02 | -    | %/ °C  |      |
| Standby power<br>consumption                              | 230 VAC       | -    | 0.3   | 0.55 | %/ °C  |      |
| Hold up time<br>Full load                                 | 115VAC 230VAC | -    | 8     | -    | mS     |      |
|                                                           |               |      | 50    |      |        |      |

# 40W, AC/DC Power Converter

## SAP40H



|                                                                     |                                               |                                             |   |                             |        |  |
|---------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------|---|-----------------------------|--------|--|
| <b>Over voltage protection</b><br>Hiccup or clamping by Zener diode | Vout= 5V Vout=12V Vout=15V Vout=24V Vout= 48V | -                                           | - | 6.3<br>16<br>25<br>35<br>60 | VDC    |  |
| <b>Over current protection</b>                                      | Automatic recovery                            | 130                                         | - | -                           | % Iout |  |
| <b>Short circuit protection</b>                                     |                                               | Continuous, hiccup mode, automatic recovery |   |                             |        |  |
| <b>Recommended external fuse</b>                                    |                                               | 1A, 300V, slow blow, *required*             |   |                             |        |  |
| <b>Minimum load</b>                                                 |                                               | No minimum load is required                 |   |                             |        |  |

\* Ripple and noise measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 1uF ceramic capacitor and a 10uF electrolytic capacitor in parallel.

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## SAP40H



### General Specifications

| Parameters                                              | Condition                             | Min.                                                                                                                                                                                                                                    | Typ.       | Max. | Unit  |
|---------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|-------|
| Isolation voltage<br>Tested for 1 minute                | I/P to O/P                            | 4200                                                                                                                                                                                                                                    | -          | -    | VAC   |
| Isolation resistance<br>500VDC, 25°C, 70%RH             | I/P to O/P                            | 100                                                                                                                                                                                                                                     | -          | -    | M Ohm |
| Switching frequency                                     |                                       | -                                                                                                                                                                                                                                       | 65         | -    | KHz   |
| Operating temperature range                             | See "Derating Curve"                  | -40                                                                                                                                                                                                                                     | -          | 85   | °C    |
| Storage temperature                                     |                                       | -40                                                                                                                                                                                                                                     | -          | 85   | °C    |
| Storage humidity                                        |                                       | 10                                                                                                                                                                                                                                      | -          | 95   | %RH   |
| Operating altitude                                      |                                       | -                                                                                                                                                                                                                                       | -          | 95   | m     |
| Soldering temperature                                   | Wave<br>Manual                        | -                                                                                                                                                                                                                                       | 260<br>360 | -    | °C    |
| Case material                                           |                                       | Black plastic UL94-V0                                                                                                                                                                                                                   |            |      |       |
| Cooling method                                          |                                       | Free air convection                                                                                                                                                                                                                     |            |      |       |
| Vibration                                               |                                       | 10Hz to 55Hz, 10G, 30 minutes along X, Y and Z axis                                                                                                                                                                                     |            |      |       |
| Class II power                                          |                                       | Yes, no FG                                                                                                                                                                                                                              |            |      |       |
| MTBF                                                    | MIL-HDBK-217F                         | > 1,000,000 Hours, 25°C                                                                                                                                                                                                                 |            |      |       |
| Design based on standards                               |                                       | RoHS & REACH directives, IEC/EN/UL 62368, OVC III, FCC, UKCA, IEC EN 60335, IEC EN 61558                                                                                                                                                |            |      |       |
| *Safety certifications                                  |                                       | IEC/EN/UL 62368, OVC III, FCC, UKCA, IEC EN 60335, IEC EN 61558                                                                                                                                                                         |            |      |       |
| EMC<br>(1) With External Circuit as shown in "Figure 1" | CE<br>ESD<br>RS<br>EFT<br>Surge<br>CS | CISPR32, EN55032 Class B with "NO External Circuit"<br>IEC/EN61000-4-2, Contact ±6kV, Air ±8kV, Criteria B<br>IEC/EN61000-4-3, 10V/m, Criteria A<br>IEC/EN61000-4-4, ±2kV, Criteria B<br>IEC/EN61000-4-5, Line to Line ±2kV, Criteria B |            |      |       |

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|                                                  |     |                                                                           |
|--------------------------------------------------|-----|---------------------------------------------------------------------------|
| (2) With External Circuit as shown in "Figure 2" | DIP | IEC/EN61000-4-6, 10Vrms, Criteria A IEC/EN61000-4-11, 0%, 70%, Criteria B |
| <b>Size, and Weight</b>                          |     | 69.5x39.0x24mm, 100g                                                      |

\* Certification is pending

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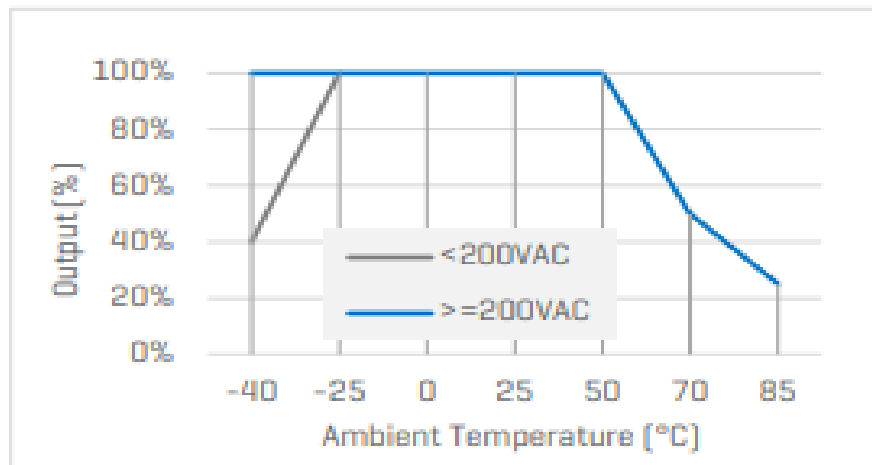
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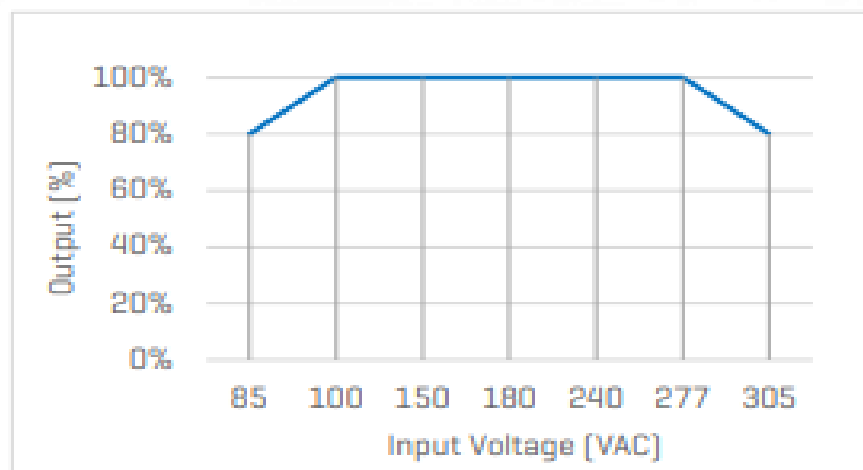
### Characteristics Curves

#### Derating Curve

#### Output vs Ambient Temperature



#### Output vs Input Voltage

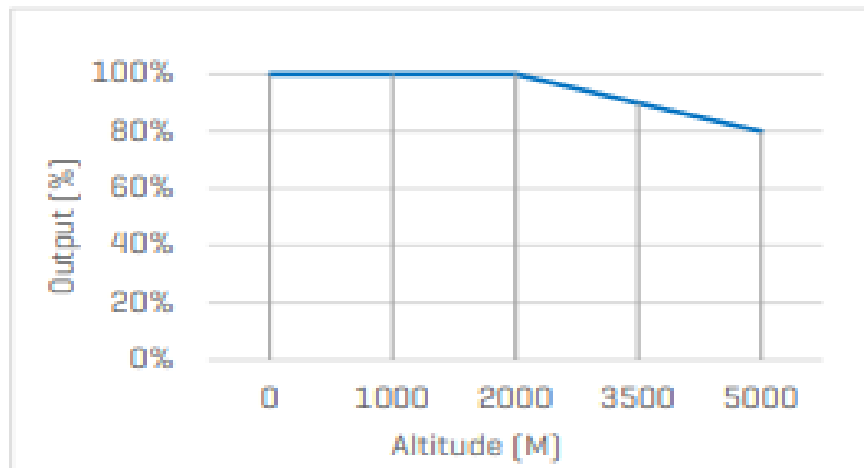


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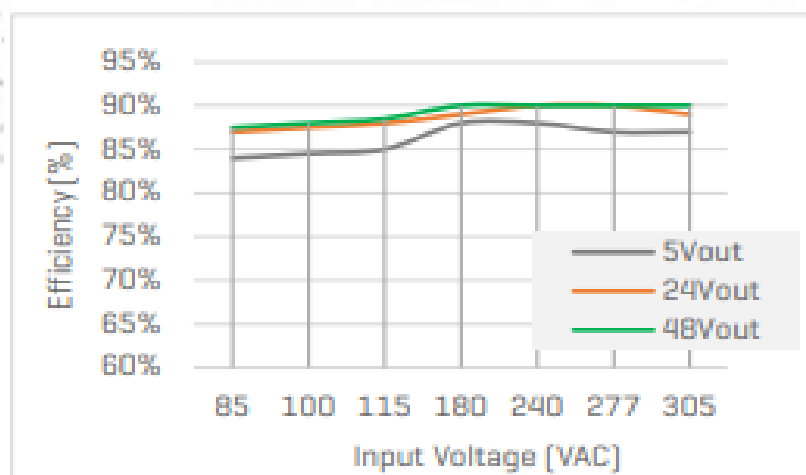
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### Output vs Altitude



### Efficiency Curves

#### Efficiency vs Input Voltage



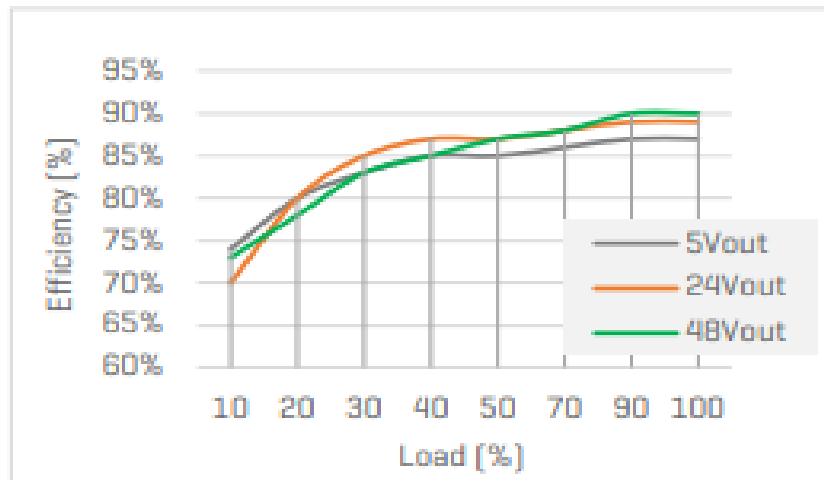


# 40W, AC/DC Power Converter

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### Efficiency vs Load

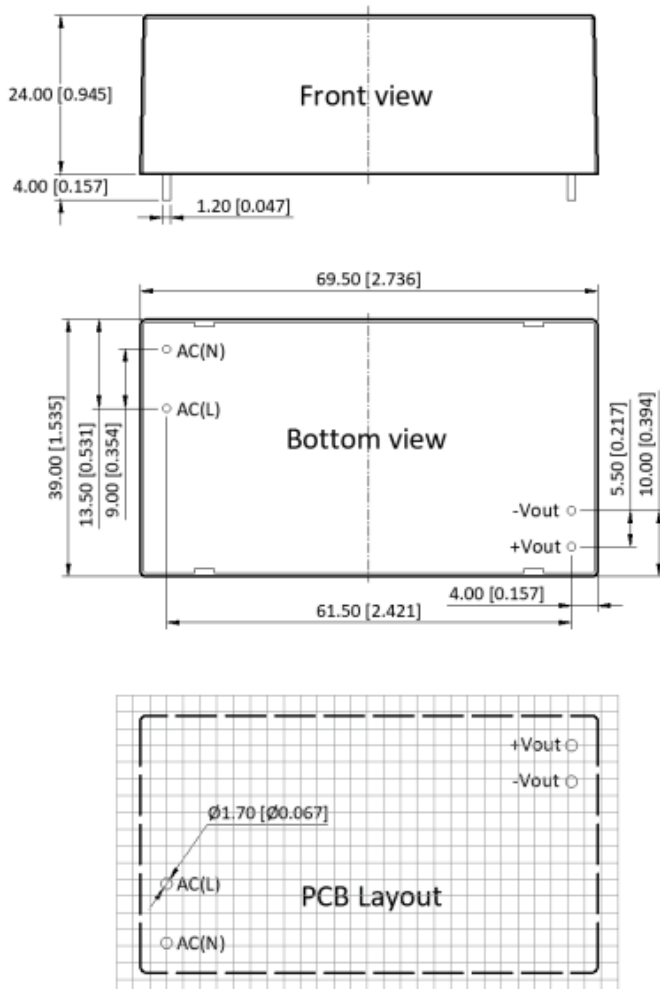


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### Mechanical Specifications



#### Pin Definition

| Pin # | Single Out        |
|-------|-------------------|
| 1     | AC (N)            |
| 2     | AC (L)            |
| 3     | No Pin            |
| 4     | +V <sub>OUT</sub> |
| 5     | -V <sub>OUT</sub> |

\* Unless otherwise specified unit:  
mm [inch]

\* General tolerance:  $\pm 1.00 [\pm 0.040]$

\* Pin thickness:  $\pm 0.15 [\pm 0.006]$

\* Pin distance:  $\pm 0.50 [\pm 0.020]$

\* Footprint grid 2.54 x 2.54 mm

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### Ordering information

Ordering can be done via [www.summit-electronics.com](http://www.summit-electronics.com) or via [info@summit-electronics.com](mailto:info@summit-electronics.com). Please contact us for more information. Customisation of the product is available on request.

### Technical support

For all product questions please contact us via [info@summit-electronics.com](mailto:info@summit-electronics.com)

### Document revision

| Rev      | Date       | Changes                 |
|----------|------------|-------------------------|
| 2025v0.1 | 26-08-2025 | First issue of document |