

65ACO_3 series

65W - Single Output AC-DC Converter - Universal input - Isolated & Regulated

AC-DC Converter 65 Watt

- ⊕ 85 - 264V Universal AC or wide 100 - 370V DC Input
- ⊕ 3x2 inch high power density
- ⊕ Operating ambient temp. range: -25°C to +70°C
- ⊕ Regulated output, low ripple & noise
- ⊕ Output short circuit, over-current, over-voltage protection
- ⊕ High efficiency, high reliability
- ⊕ EMI performance meets CISPR32 / EN55032 CLASS B
- ⊕ UL/EN/IEC62368 approved



The 65ACO_3 is one of GAPTEC's compact size power converter. It features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4 and CISPR32/EN55032 and meets IEC/EN/UL62368 standards. The converters are widely used in industrial, office and civil applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

| Common specifications | | | | | |
|--------------------------|---|------------------------------|-----|-----|--------------------------------|
| Item | Test conditions | Min | Typ | Max | Units |
| Isolation (input-output) | Electric Strength Test for 1min. (leakage current<5mA) | 3000 | | | VAC |
| Short circuit protection | Hiccup, continuous, self-recovery | | | | |
| Operating temperature | | -25 | | +70 | °C |
| Storage temperature | | -25 | | +85 | °C |
| Storage humidity | | | | 90 | %RH |
| Switching Frequency | | | 65 | | kHz |
| Power derating | • -25°C to -10°C • +50°C to +70°C • 85VAC-166VAC • 240VAC - 264VAC | 2.0 2.5 0.375 0.833 | | | %/°C %/°C %/VAC %/VAC |
| Safety standard | IEC62368/UL62368/EN62368 | | | | |
| Safety certification | CE62368/EN62368 | | | | |
| Safety class | CLASS II | | | | |
| MTBF | MIL-HDBK-217F@25°C | >300,000 h | | | |
| Dimensions | 76.20 x 50.80 x 30.00 mm | | | | |
| Weight | 95g TYP. | | | | |
| Cooling Method | Free air convection | | | | |

| Input specifications | | | | | |
|----------------------|--------------------------|-----------|----------|------------|------------|
| Item | Test conditions | Min | Typ | Max | Units |
| Input Voltage Range | • AC input • DC input | 85 100 | | 264 370 | VAC VDC |
| Input frequency | | 47 | | 63 | Hz |
| Input current | • 115VAC • 230VAC | | | 1.6 0.9 | A A |
| Inrush current | • 115VAC • 230VAC | | 35 50 | | A A |
| Hot plug | Unavailable | | | | |

| Output specifications | | | | | |
|----------------------------|--|-----|-------|---|-------|
| Item | Test conditions | Min | Typ | Max | Units |
| Output voltage accuracy | | | ±2.0 | | % |
| Line regulation | Full load | | ±0.5 | | % |
| Load regulation | 0% - 100% load | | ±1.0 | | % |
| Ripple & noise* | 20MHz bandwidth (peak-to-peak value) | | | 150 | mV |
| Stand-by power consumption | | | | 0.5 | W |
| Temperature coefficient | | | ±0.02 | | %/°C |
| Over-current protection | | | | 120% - 300%Io, self-recovery | |
| Over-voltage protection** | 5VDC Output 9VDC Output 12VDC Output 15VDC Output 24VDC Output 48VDC Output | | | ≤9VDC ≤16VDC ≤20VDC ≤24VDC ≤35VDC ≤60VDC | |
| Minimum load | | | 0 | | % |
| Hold-up time | 230VAC input | | | 35 | ms |

*The "parallel cable" method is used for Ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.

** Output voltage clamp or turn off

Example: 65ACO_24S3

**65 = 65Watt; AC = AC-DC; O = series; 24 = 24 Vout;
S = single output; 3 = 3kVAC isolation**

Note:

- There will be noise generated when product working at light load, but it does not affect the performance and reliability;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25 °C, humidity <75% with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our Company's corporate standards;
- We can provide product customization service;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

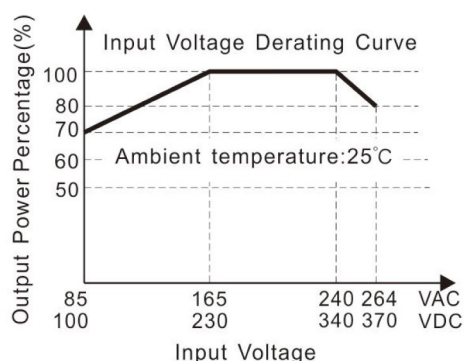
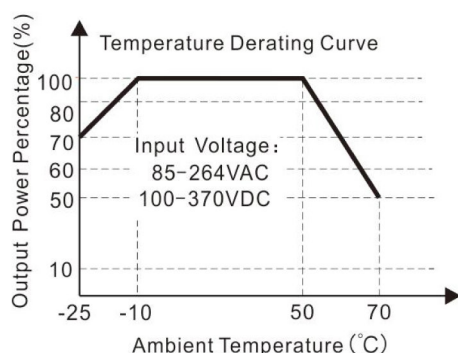
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| EMC specifications | | | | |
|--------------------|---|------------------|-------------------|------------------|
| Emissions | CE | CISPR32/EN55032 | CLASS B | |
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| Immunity | ESD | IEC/EN61000-4-2 | Contact ±6KV | perf. Criteria B |
| Immunity | RS | EC/EN61000-4-3 | 10V/m | perf. Criteria A |
| Immunity | EFT | IEC/EN61000-4-4 | ±2KV | perf. Criteria B |
| Immunity | Surge | IEC/EN61000-4-5 | line to line ±1KV | perf. Criteria B |
| Immunity | CS | IEC/EN61000-4-6 | 10Vr.m.s | perf. Criteria A |
| Immunity | Voltage dips, short interruptions and voltage variations immunity | IEC/EN61000-4-11 | 0%,70% | perf. Criteria B |

| Selection Guide | | | | | |
|-----------------|------------|------------------|--|-------------------------------|-------------------------------|
| Approval | Model | Output Power [W] | Nominal Output Voltage and Current [Vo/Io] | Efficiency at 220VAC [%, typ] | Max. Capacitive Load (µF max) |
| UL/CE (Pending) | 65ACO_05S3 | 50 | 5V/10000mA | 80 | 40000 |
| UL/CE (Pending) | 65ACO_09S3 | 60 | 9V/6600mA | 83 | 12000 |
| UL/CE (Pending) | 65ACO_12S3 | 65 | 12V/5420mA | 85 | 8000 |
| UL/CE (Pending) | 65ACO_15S3 | 65 | 15V/4340mA | 85 | 7000 |
| UL/CE (Pending) | 65ACO_24S3 | 65 | 24V/2710mA | 87 | 1500 |
| UL/CE (Pending) | 65ACO_48S3 | 65 | 48V/1360mA | 87 | 1000 |

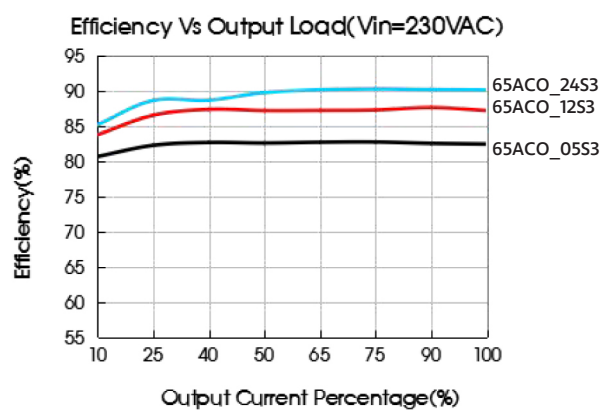
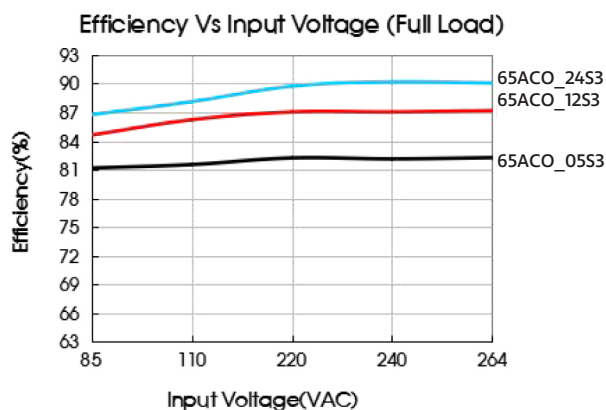
Product Characteristic Curve



Note:

- With an AC input between 85-165V/240-264VAC and a DC input between 100-230V/340-370VDC, the output power must be derated as per temperature derating curves;
- This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

Efficiency



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Typical application

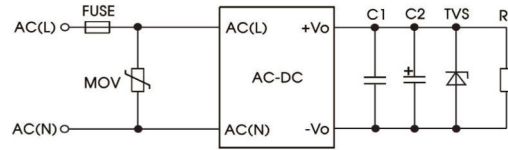


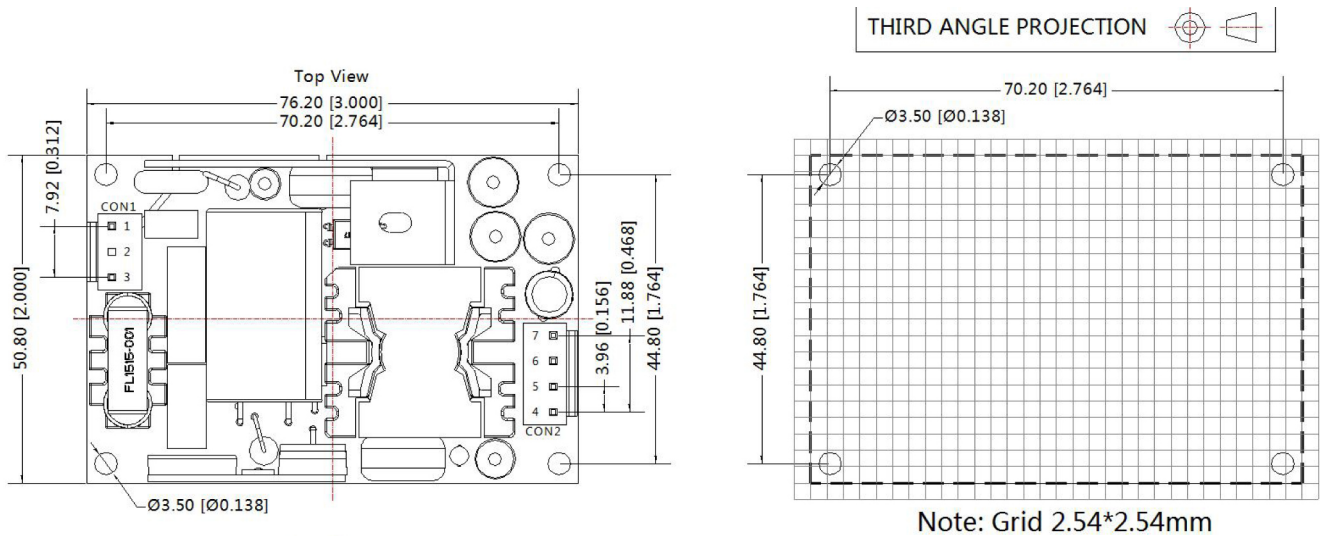
Fig. 1: Typical circuit diagram

| Model | FUSE | MOV | C2(μF) | C1(μF) | TVS |
|------------|-------------------------|---------|--------|--------|----------|
| 65ACO_05S3 | 3.15A/250V slow-blow | S14K300 | 1 | 330 | SMBJ7.0A |
| 65ACO_09S3 | | | | | SMBJ12A |
| 65ACO_12S3 | | | | 47 | SMBJ20A |
| 65ACO_15S3 | | | | | SMBJ20A |
| 65ACO_24S3 | | | | | SMBJ30A |
| 65ACO_48S3 | | | | | SMBJ64A |

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

Dimensions and Recommended Layout



Note: Grid 2.54*2.54mm

Note:

Unit: mm[inch]

General tolerances: $\pm 0.50[\pm 0.020]$

In CON1 model: VH-3A, Recommend terminal: VH-3Y

Out CON2 model: VH-4A, Recommend terminal: VH-4Y

Mounting hole screwing torque: Max 0.4 N·m

| Pin-Out | | | |
|---------|----------|--|---|
| Pin | Function | Connector | Terminal |
| 1 | AC(L) | VH-3A or B2P3-VH or the same Spec. | VH-3Y or VHR-3N or the same Spec. |
| 2 | NoPin | | |
| 3 | AC(N) | | |
| 4 | -Vo | VH-4A or B4P-VH or the same Spec. | VH-4Y or VHR-4N or the same Spec. |
| 5 | -Vo | | |
| 6 | +Vo | | |
| 7 | +Vo | | |