# **SERIES:** PSK-40D | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY

## FEATURES

- universal 85-305Vac or 100-430Vdc input voltage
- operating ambient temperature range: -40°C ~ 85°C
- high I/O isolation test voltage up to 4200Vac
- up to 90% efficiency
- compact size, high power density
- output short circuit, over-current, over-voltage protection
- OVC III (meet EN 62477, 5000m altitude)
- 5000m altitude application
- meets Emissions CLASS B and surge ±2KV without external circuits



## MODEL

| MODEL | output voltage (Vdc) | output current max (A) | output power max (W) | ripple and noise[1] max (mVp-p) | efficiency[2] typ (%) |
|---|---|---|---|---|---|
| PSK-40D-5 | 5 | 7.0 | 35 | 150 | 86 |
| PSK-40D-12 | 12 | 3.33 | 40 | 150 | 89 |
| PSK-40D-15 | 15 | 2.67 | 40 | 150 | 90 |
| PSK-40D-24 | 24 | 1.67 | 40 | 150 | 89 |
| PSK-40D-48 | 48 | 0.83 | 40 | 150 | 90 |

Notes: 1. At full load, nominal input, 20 MHz bandwidth oscilloscope, with 1 μF ceramic and 10 μF electrolytic capacitors on the output.
2. At 230 Vac input.
3. All specifications are measured at Ta=25°C, humidity <75%, nominal input voltage, and rated output load unless otherwise specified.

## PART NUMBER KEY






Please read our datasheet & drawing disclaimer here.

## INPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| voltage | ac input<br>dc input | 85<br>100 | | 305<br>430 | Vac<br>Vdc |
| frequency | | 47 | | 63 | Hz |
| current | 115 Vac<br>230 Vac | | | 1.0<br>0.6 | A<br>A |
| inrush current | 115 Vac<br>230 Vac | | 30<br>60 | | A<br>A |
| leakage current | 277 Vac/50 Hz | | | 0.1 | mA |
| recommended external input fuse | 3.15A/300V, slow-blow, required | | | | |

## OUTPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| capacitive load | 5 Vdc output model<br>12 Vdc output model<br>15 Vdc output model<br>24 Vdc output model<br>48 Vdc output model | | | 6,600<br>4,400<br>3,000<br>1,500<br>470 | µF<br>µF<br>µF<br>µF<br>µF |
| output voltage accuracy | | | ±2 | | % |
| line regulation | at full load | | ±0.5 | | % |
| load regulation | 0~100% load<br>5 Vdc output model<br>all other output models | | <br>±2<br>±1 | | <br>%<br>% |
| hold-up time | 115 Vac<br>230 Vac | | 8<br>50 | | ms<br>ms |
| temperature coefficient | | | ±0.02 | | %/°C |
| no load power consumption | | | 0.3 | | W |

## PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| over voltage protection | clamp or hiccup<br>5 Vdc output<br>12 Vdc output<br>15 Vdc output<br>24 Vdc output<br>48 Vdc output | | | <br>6.3<br>16<br>25<br>35<br>60 | <br>Vdc<br>Vdc<br>Vdc<br>Vdc<br>Vdc |
| over current protection | auto recovery | 130 | | | % |
| short circuit protection | continuous, auto recovery, hiccup | | | | |

## SAFETY & COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| isolation voltage | input to output for 1 min., 5mA max | 4,200 | | | Vac |
| safety approvals | certified to 62368: UL, IEC, EN | | | | |
| safety class | Class II | | | | |
| EMI/EMC | CISPR32/EN55032 Class B<br>CISPR32/EN55032 Class B | | | | |
| ESD | IEC/EN61000-4-2 Contact ±6KV/Air ±8KV, perf. Criteria A | | | | |
| radiated immunity | IEC/EN61000-4-3 10V/m, perf. Criteria A | | | | |
| EFT/burst | IEC/EN61000-4-4 ±2KV, perf. Criteria A<br>IEC/EN61000-4-4 ±4KV (See recommended circuit), perf. Criteria A | | | | |
| surge | IEC/EN61000-4-5 line to line ±2KV/line to PE ±4KV, perf. Criteria A | | | | |

## SAFETY & COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| conducted immunity | IEC/EN61000-4-6 10Vrms, perf. Criteria A | | | | |
| voltage dips and interruption | IEC/EN61000-4-11 0%, 70% perf. Criteria B | | | | |
| MTBF | MIL-HDBK-217F at 25°C | 500,000 | | | hours |
| RoHS | yes | | | | |

## ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| operating temperature | | -40 | | 85 | °C |
| storage temperature | | -40 | | 85 | °C |
| storage humidity | | 0 | | 95 | % |

## SOLDERABILITY

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| wave soldering | 5~10 seconds max | 255 | 260 | 265 | °C |
| hand soldering | 3~5 seconds max | 350 | 360 | 370 | °C |

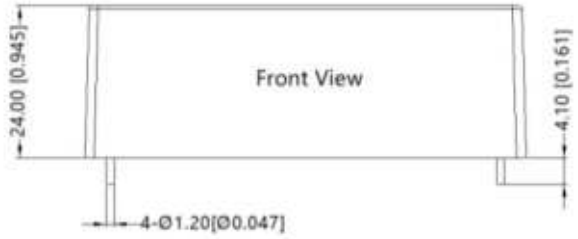
## MECHANICAL

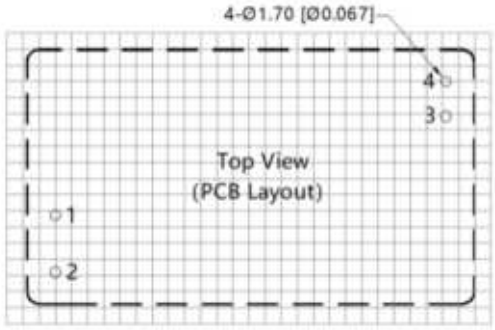
| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| dimensions | 69.50 x 39.00 x 24.00 | | | | mm |
| weight | | | 100 | | g |
| case material | Black plastic, flame-retardant and heat-resistant (UL94V-0) | | | | |
| cooling method | natural convection | | | | |

## MECHANICAL DRAWING

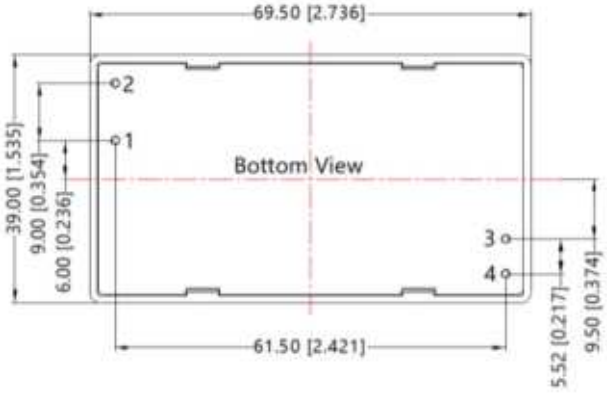
units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
tolerance: ±0.50 [±0.020]

| PIN CONNECTIONS | |
|---|---|
| PIN | Function |
| 1 | AC(L) |
| 2 | AC(N) |
| 3 | -Vo |
| 4 | +Vo |

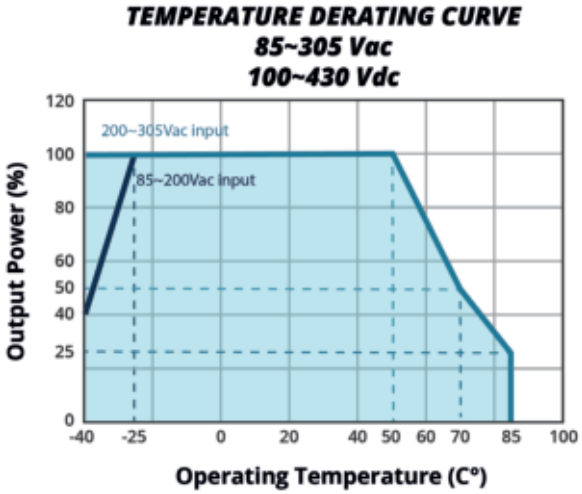


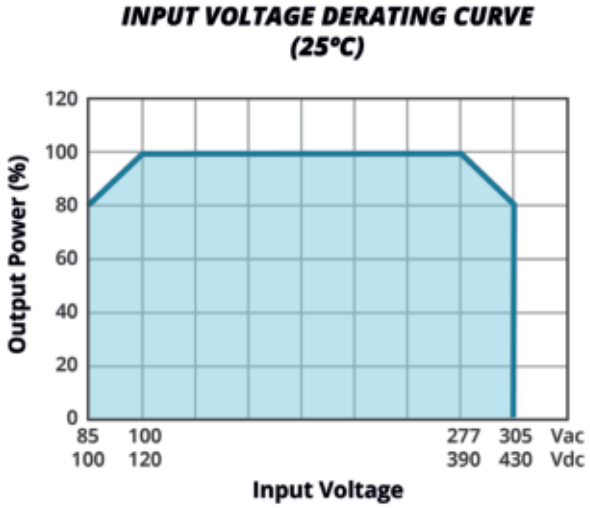



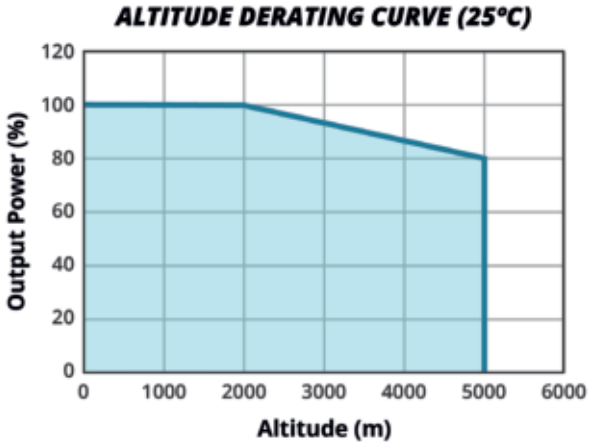

Note: Grid 2.54*2.54mm



## DERATING CURVE

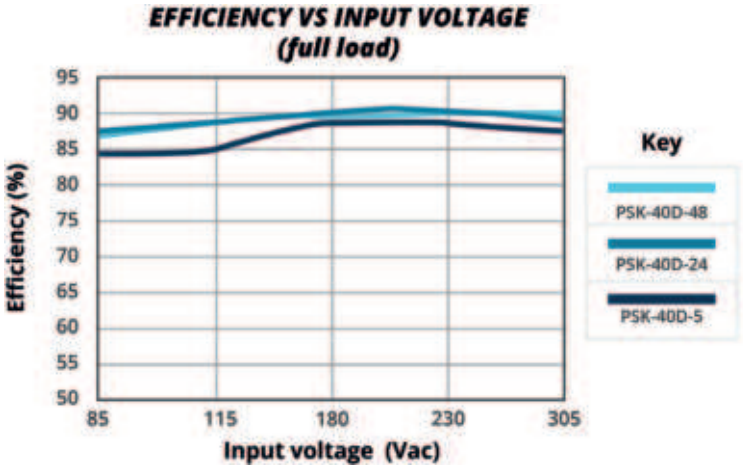


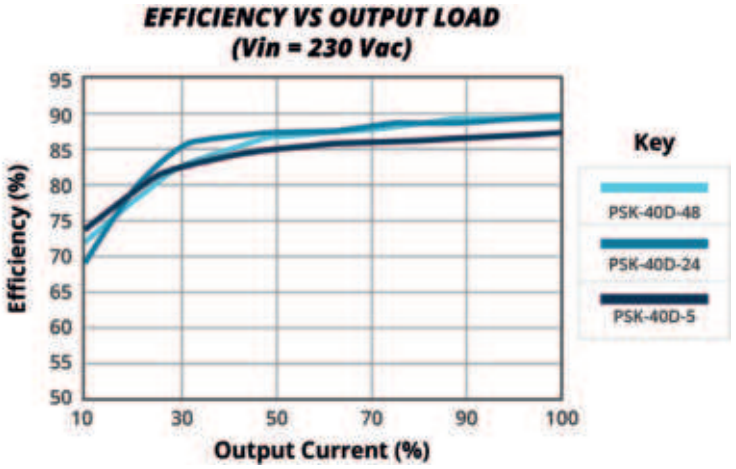




Note: 1. With an AC input between 85~100V/277~305Vac and a DC input between 100~120V/390~430Vdc, the output power must be derated as per temperature derating curves.
2. This product is suitable for applications using natural air cooling; for applications in closed enviroment please consult with CUI.

## EFFICIENCY CURVES



## APPLICATION DESIGN REFERENCE

Output Filtering 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.

**Figure 1**

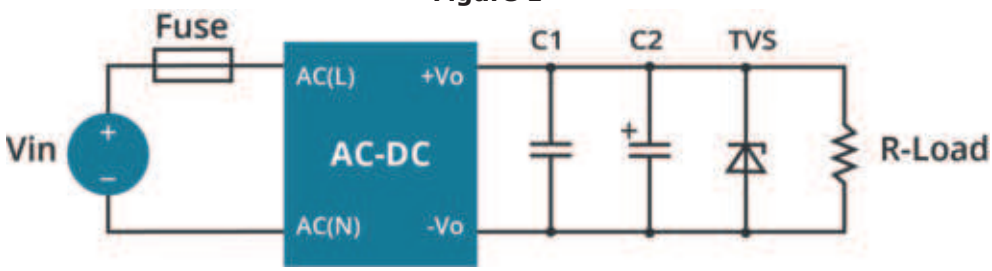
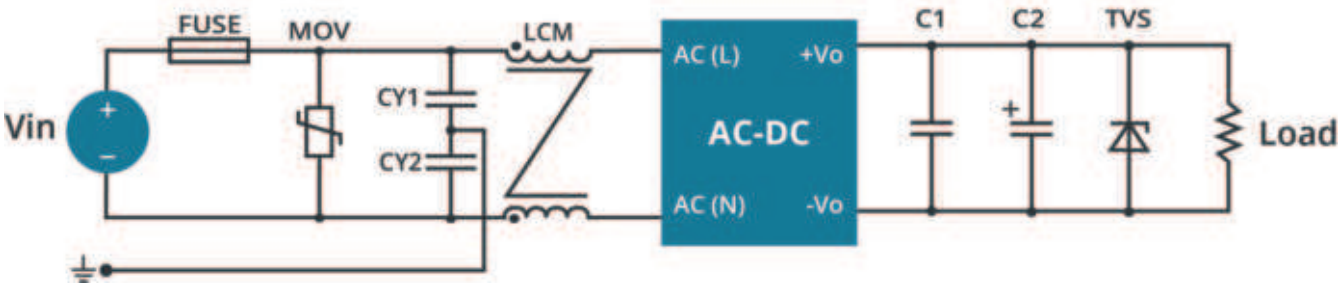



**Table 1**

| Part No. | FUSE | C1 | C2 | TVS |
|---|---|---|---|---|
| PSK-40D-5 | 3.15/300V slow-blow required | 1μF/50V | 330μF/16V | SMBJ7.0A |
| PSK-40D-12 | | | 330μF/16V | SMBJ20A |
| PSK-40D-15 | | | 220μF/25V | SMBJ20A |
| PSK-40D-24 | | | 100μF/35V | SMBJ30A |
| PSK-40D-48 | | | 47μF/63V | SMBJ64A |

## EMC RECOMMENDED CIRCUIT

**Figure 2**




Note: EMC application circuit with higher requirements.

**Table 2**

| Components | Recommended Value |
|---|---|
| FUSE | 3.15A/300V, slow-blow, required |
| MOV | S14K350 |
| CY1/CY2 | 1nF/400Vac |
| LCM | 10mH |

## REVISION HISTORY

| rev. | description | date |
|---|---|---|
| 1.0 | initial release | 02/15/2023 |
| 1.01 | safety marks updated | 10/31/2023 |

The revision history provided is for informational purposes only and is believed to be accurate.

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