

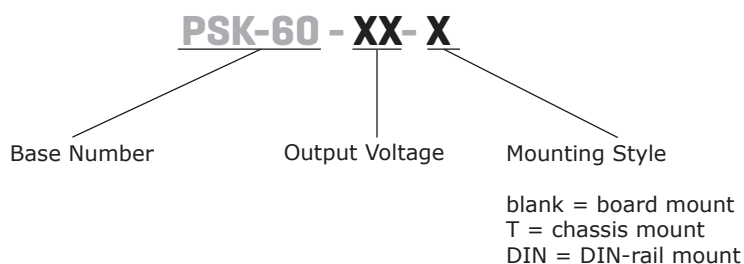
**SERIES:** PSK-60 | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY

**FEATURES**

- universal input voltage range (85~264 VAC)
- IEC/EN/UL 62368 certified
- meets CISPR32/EN 55032 Class B without external components
- 4,000 VAC isolation rating
- short-circuit, over-current, over-voltage protections



| MODEL     | output voltage | output current max | output power max | ripple and noise max | efficiency |
|-----------|----------------|--------------------|------------------|----------------------|------------|
|           | (Vdc)          | (A)                | (W)              | (mVp-p)              | typ (%)    |
| PSK-60-5  | 5              | 10.0               | 50               | 120                  | 84         |
| PSK-60-12 | 12             | 5.0                | 60               | 120                  | 87         |
| PSK-60-15 | 15             | 4.0                | 60               | 120                  | 88         |
| PSK-60-24 | 24             | 2.5                | 60               | 120                  | 89         |
| PSK-60-48 | 48             | 1.25               | 60               | 120                  | 90         |

**PART NUMBER KEY**


## INPUT

| parameter                 | conditions/description   | min | typ      | max | units |
|---------------------------|--------------------------|-----|----------|-----|-------|
| voltage                   | ac input                 | 85  |          | 264 | Vac   |
|                           | dc input                 | 100 |          | 370 | Vdc   |
| frequency                 |                          | 47  |          | 63  | Hz    |
| current                   | at 115 Vac               |     |          | 1.8 | A     |
|                           | at 230 Vac               |     |          | 1.0 | A     |
| inrush current            | at 115 Vac<br>at 230 Vac |     | 45<br>90 |     | A     |
| no load power consumption | at 230 Vac               |     |          | 0.5 | W     |

## OUTPUT

| parameter                  | conditions/description | min | typ   | max    | units |
|----------------------------|------------------------|-----|-------|--------|-------|
| capacitive load            | 5 Vdc output           |     |       | 20,000 | μF    |
|                            | 12 Vdc output          |     |       | 4,000  |       |
|                            | 15 Vdc output          |     |       | 3,000  |       |
|                            | 24 Vdc output          |     |       | 1,800  |       |
|                            | 48 Vdc output          |     |       | 470    |       |
| initial set point accuracy | at full load           |     | ±2    |        | %     |
| line regulation            | rated load             |     | ±0.5  |        | %     |
| load regulation            | 0%~100% load           |     | ±1.0  |        | %     |
| hold-up time               | at 115 Vac             |     | 8     |        | ms    |
|                            | at 230 Vac             |     | 65    |        |       |
| temperature coefficient    |                        |     | ±0.02 |        | %/°C  |

## PROTECTIONS

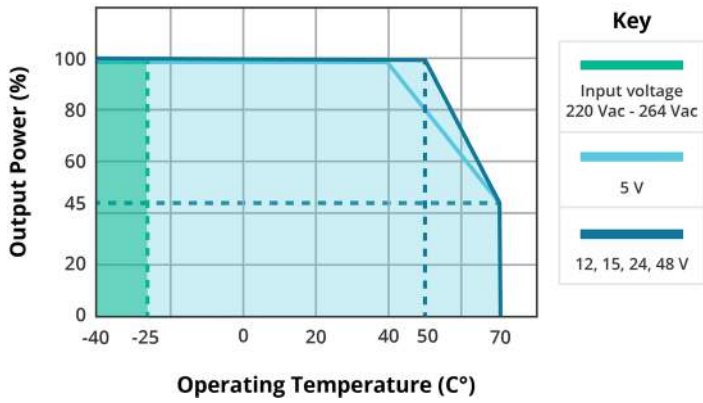
| parameter                | conditions/description            | min | typ | max | units |
|--------------------------|-----------------------------------|-----|-----|-----|-------|
| over voltage protection  | 5 Vdc output, clamp or hiccup     |     |     | 9   | Vdc   |
|                          | 12 Vdc output, clamp or hiccup    |     |     | 16  |       |
|                          | 15 Vdc output, clamp or hiccup    |     |     | 25  |       |
|                          | 24 Vdc output, clamp or hiccup    |     |     | 35  |       |
|                          | 48 Vdc output, clamp or hiccup    |     |     | 60  |       |
| over current protection  | auto recovery                     | 110 |     |     | %     |
| short circuit protection | hiccup, continuous, auto recovery |     |     |     |       |

## SAFETY & COMPLIANCE

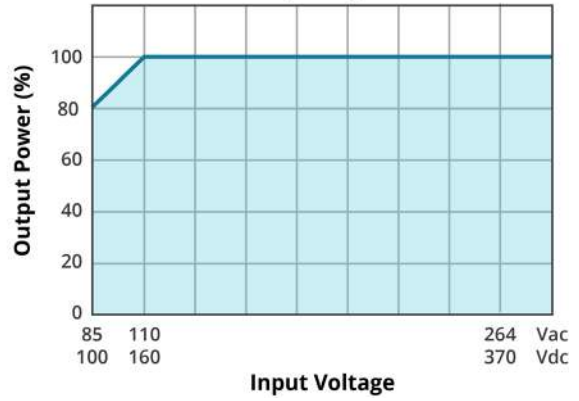
| parameter                     | conditions/description   | min     | typ | max | units |
|-------------------------------|--|---------|-----|-----|-------|
| isolation voltage             | input to output  | 4,000   |     |     | Vac   |
| safety approvals              | UL/cUL, EN, IEC 62368  |         |     |     |       |
| safety class                  | Class II   |         |     |     |       |
| EMI/EMC                       | CISPR 32/EN 55032 Class B  |         |     |     |       |
| ESD                           | IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV, perf. Criteria B   |         |     |     |       |
| radiated immunity             | IEC/EN 61000-4-3 10 V/m, perf. Criteria A  |         |     |     |       |
| EFT/burst                     | IEC/EN 61000-4-4 ±4KV, perf. Criteria B  |         |     |     |       |
| surge                         | IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV, perf. Criteria B (see recommended EMC circuit) |         |     |     |       |
|                               | IEC/EN 61000-4-5 ±1KV line to line, perf. Criteria B   |         |     |     |       |
| conducted immunity            | IEC/EN 61000-4-6 10 Vr.m.s, perf. Criteria A   |         |     |     |       |
| voltage dips and interruption | IEC/EN 61000-4-11 0%, 70%, perf. Criterial B   |         |     |     |       |
| MTBF                          | per MIL-HDBK-217F at 25 °C   | 300,000 |     |     | hours |
| RoHS                          | yes  |         |     |     |       |

## DERATING CURVES

**TEMPERATURE DERATING CURVE**

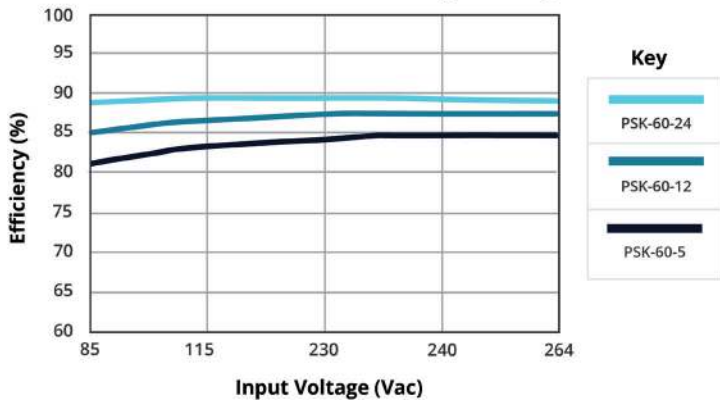


**INPUT VOLTAGE DERATING CURVE (25 °C)**

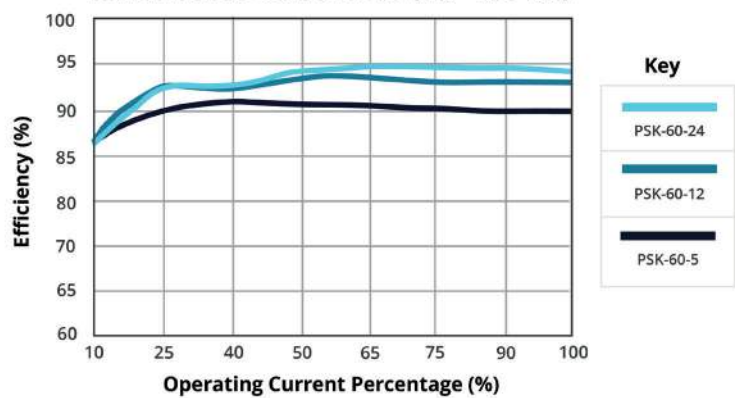


## EFFICIENCY CURVES

**EFFICIENCY VS INPUT VOLTAGE (Full load)**



**EFFICIENCY VS OUTPUT LOAD (Vin = 230 Vac)**



## ENVIRONMENTAL

| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature |                        | -40 |     | 70  | °C    |
| storage temperature   |                        | -40 |     | 85  | °C    |
| storage humidity      |                        | 0   |     | 95  | %     |

## SOLDERABILITY

| parameter      | conditions/description     | min | typ | max | units |
|----------------|----------------------------|-----|-----|-----|-------|
| wave soldering | 5~10 seconds ( $\pm 5$ °C) |     |     | 260 | °C    |
| manual welding | 3~5 seconds ( $\pm 10$ °C) |     |     | 360 | °C    |

## MECHANICAL

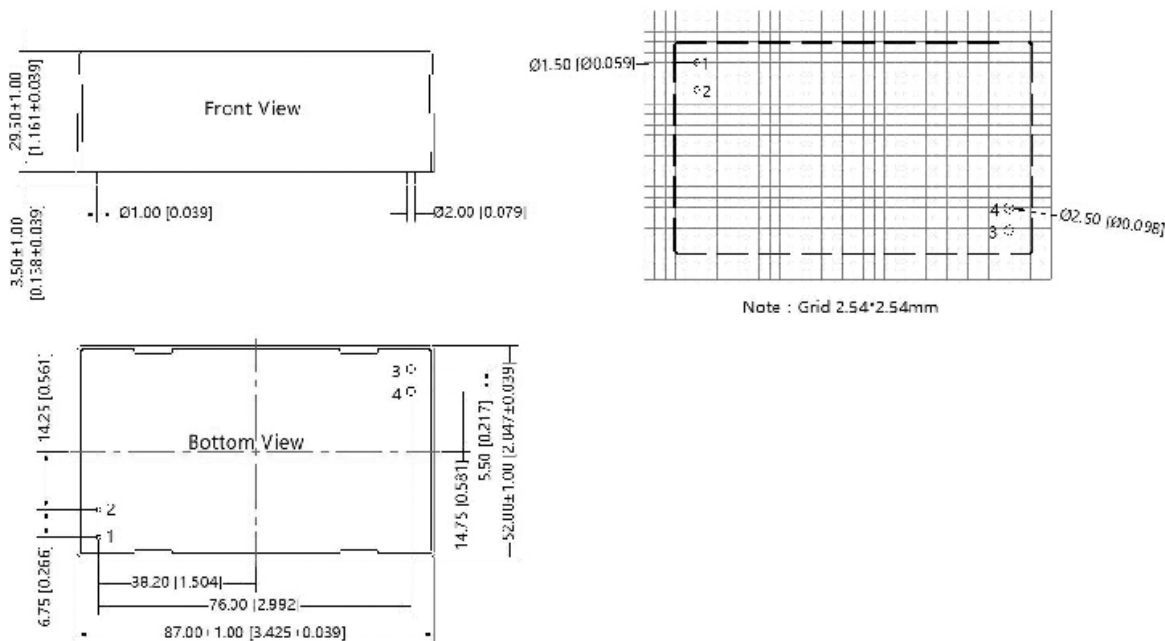
| parameter     | conditions/description                                      | min | typ | max | units |
|---------------|---|-----|-----|-----|-------|
| dimensions    | 87.00 x 52.00 x 29.50 (board mount)                         |     |     |     | mm    |
|               | 135.00 x 70.00 x 37.90 (chassis mount)                      |     |     |     | mm    |
|               | 137.00 x 70.00 x 42.40 (DIN-rail)                           |     |     |     | mm    |
| weight        | board mount   |     | 210 |     | g     |
|               | chassis mount   |     | 290 |     | g     |
|               | DIN-rail  |     | 360 |     | g     |
| cooling       | free air convection   |     |     |     |       |
| case material | black plastic, flame-retardant and heat-resistant (UL94V-0) |     |     |     |       |

## MECHANICAL DRAWING (BOARD MOUNT)

units: mm [inch]

pin diameter tolerance:  $\pm 0.1$  [ $\pm 0.004$ ]

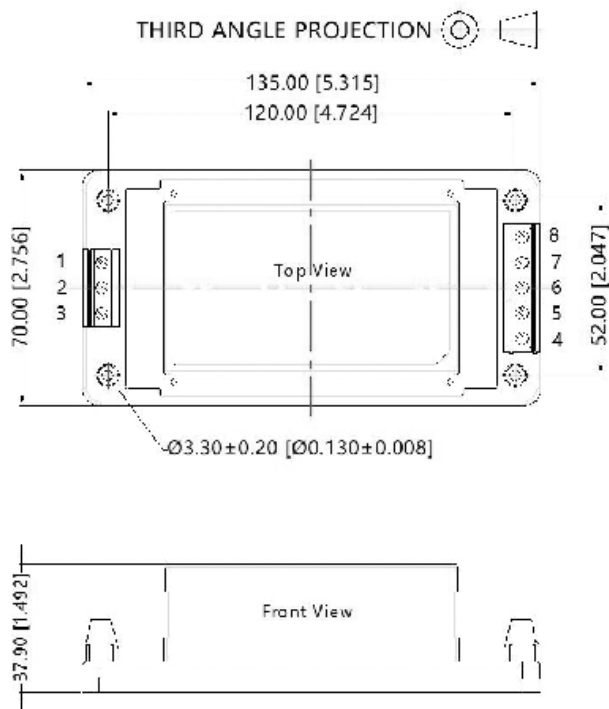
| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | AC(L)    |
| 2               | AC(N)    |
| 3               | +Vo      |
| 4               | -Vo      |



## MECHANICAL DRAWING (CHASSIS MOUNT)

units: mm [inch]  
 tolerance:  $\pm 1.00$  [ $\pm 0.040$ ]  
 wire range: 24 - 12 AWG  
 tightening torque: 0.4 N·m

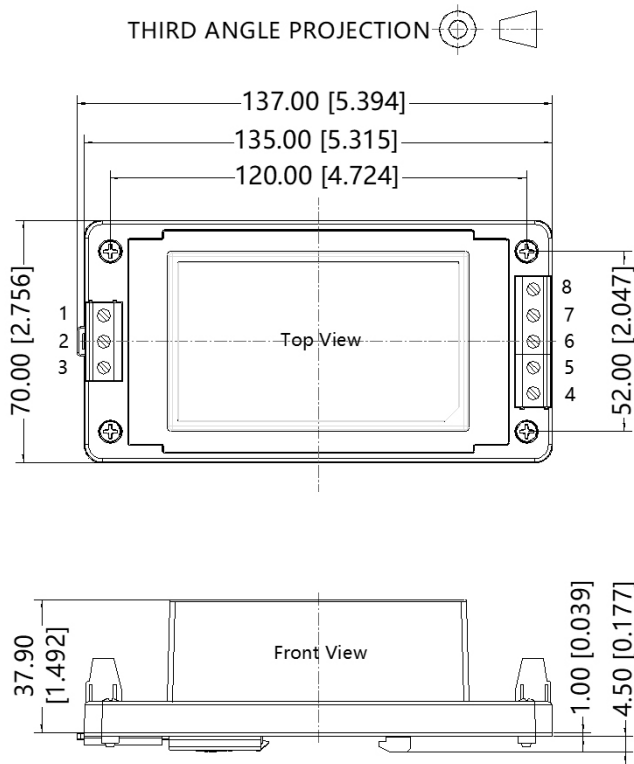
| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | AC(L)    |
| 2               | NC       |
| 3               | AC(N)    |
| 4               | +Vo      |
| 5               | -Vo      |
| 6               | NC       |
| 7               | NC       |
| 8               | NC       |



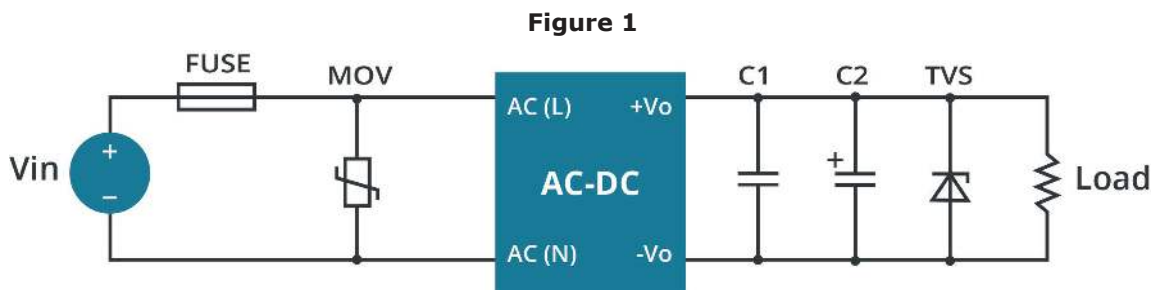
## MECHANICAL DRAWING (DIN-RAIL MOUNT)

units: mm [inch]  
 tolerance:  $\pm 1.00$  [ $\pm 0.040$ ]  
 wire range: 24 - 12 AWG  
 tightening torque: 0.4 N·m  
 installed on DIN-RAIL TS35

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | AC(L)    |
| 2               | NC       |
| 3               | AC(N)    |
| 4               | +Vo      |
| 5               | -Vo      |
| 6               | NC       |
| 7               | NC       |
| 8               | NC       |



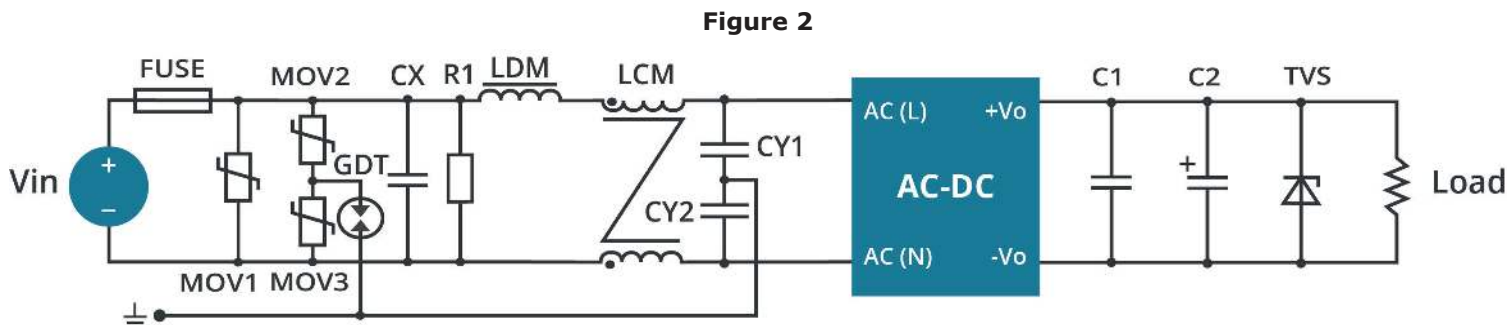
## APPLICATION CIRCUIT



**Table 1**

| Recommended External Circuit Components |           |             |                       |         |          |
|---|-----------|-------------|-----------------------|---------|----------|
| Part no.                                | C1        | C2          | FUSE                  | MOV     | TVS      |
| PSK-60-5                                | 1 $\mu$ F | 680 $\mu$ F | 3.15A/250V, slow-blow | S10K300 | SMBJ7.0A |
| PSK-60-12                               |           | 330 $\mu$ F |                       |         | SMBJ20A  |
| PSK-60-15                               |           | 330 $\mu$ F |                       |         | SMBJ20A  |
| PSK-60-24                               |           | 200 $\mu$ F |                       |         | SMBJ30A  |
| PSK-60-48                               |           | 100 $\mu$ F |                       |         | SMBJ64A  |

## EMC RECOMMENDED CIRCUIT



**Table 2**

| Component | Reccomended value               |
|-----------|---------------------------------|
| FUSE      | 3.15A/250V, slow-blow, required |
| MOV1      | S20K300                         |
| MOV2/MOV3 | S10K300                         |
| GDT       | EM3600XS                        |
| CX        | 0.22 $\mu$ F / 275 Vac          |
| CY1, CY2  | 1 nF / 400 Vac                  |
| R1        | 1 M $\Omega$ / 2 W              |
| LDM       | 4.7 $\mu$ H                     |
| LCM       | 2 mH                            |

## REVISION HISTORY

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| rev. | description                         | date       |
|------|-------------------------------------|------------|
| 1.0  | initial release                     | 07/14/2020 |
| 1.01 | din-rail mechanical drawing updated | 03/12/2021 |
| 1.02 | figure and circuit drawings updated | 03/25/2021 |
| 1.03 | UKCA mark added                     | 06/06/2022 |

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



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