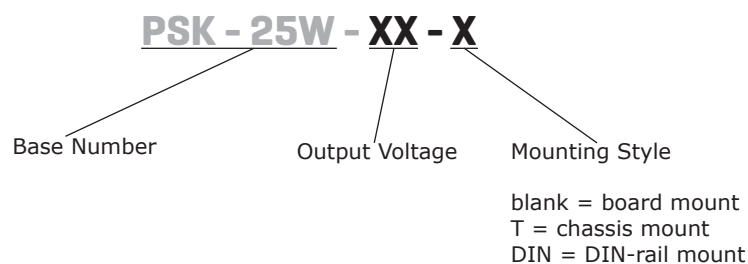


**SERIES:** PSK-25W | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY
**FEATURES**

- wide input range (85~305 Vac)
- UL/EN/IEC 62368 certified
- meets CISPR32/EN 55032 Class B without external components
- short-circuit, over-current, over-voltage protections



| MODEL      | output<br>voltage | output<br>current<br>max | output<br>power<br>max | ripple<br>and noise<br>typ | efficiency<br>typ |
|------------|-------------------|--------------------------|------------------------|----------------------------|-------------------|
|            | (Vdc)             | (A)                      | (W)                    | (mVp-p)                    | (%)               |
| PSK-25W-3  | 3.3               | 4.1                      | 13.5                   | 100                        | 75                |
| PSK-25W-5  | 5                 | 4.1                      | 20.5                   | 100                        | 78                |
| PSK-25W-9  | 9                 | 2.5                      | 22.5                   | 100                        | 80                |
| PSK-25W-12 | 12                | 2.1                      | 25.0                   | 100                        | 82                |
| PSK-25W-15 | 15                | 1.6                      | 24.0                   | 100                        | 83                |
| PSK-25W-24 | 24                | 1.1                      | 26.4                   | 100                        | 85                |
| PSK-25W-48 | 48                | 0.5                      | 24.0                   | 100                        | 87                |

**PART NUMBER KEY**

## INPUT

| parameter                 | conditions/description   | min       | typ      | max         | units      |
|---------------------------|--------------------------|-----------|----------|-------------|------------|
| voltage                   |                          | 85<br>100 |          | 305<br>430  | Vac<br>Vdc |
| frequency                 |                          | 47        |          | 63          | Hz         |
| current                   | at 155 Vac<br>at 230 Vac |           |          | 0.6<br>0.34 | A<br>A     |
| inrush current            | at 155 Vac<br>at 230 Vac |           | 20<br>40 |             | A<br>A     |
| no load power consumption | at 230 Vac               |           |          | 0.5         | W          |

## OUTPUT

| parameter               | conditions/description  | min | typ   | max    | units |
|-------------------------|-------------------------|-----|-------|--------|-------|
| capacitive load         | 3.3 Vdc output models   |     |       | 48,000 | μF    |
|                         | 5 Vdc output models     |     |       | 12,240 | μF    |
|                         | 9 Vdc output models     |     |       | 5,600  | μF    |
|                         | 12 Vdc output models    |     |       | 5,400  | μF    |
|                         | 15 Vdc output models    |     |       | 2,400  | μF    |
|                         | 24 Vdc output models    |     |       | 1,440  | μF    |
|                         | 48 Vdc output models    |     |       | 600    | μF    |
| output voltage accuracy | 3.3 V output models     |     | ±3    |        | %     |
|                         | all other voltages      |     | ±2    |        | %     |
| line regulation         |                         |     | ±0.5  |        | %     |
| load regulation         |                         |     | ±1.0  |        | %     |
| hold-up time            | at 115 Vac              |     | 10    |        | ms    |
|                         | at 230 Vac              |     | 60    |        | ms    |
| trimmability            | see application circuit |     | ±10   |        | %     |
| switching frequency     |                         |     | 65    |        | kHz   |
| temperature coefficient |                         |     | ±0.02 |        | %/°C  |

## PROTECTIONS

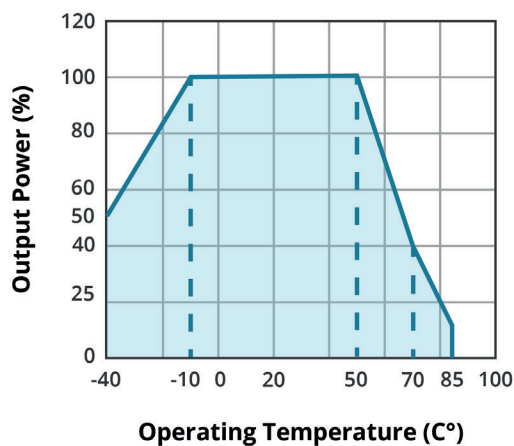
| parameter                | conditions/description            | min | typ | max | units |
|--------------------------|-----------------------------------|-----|-----|-----|-------|
| over voltage protection  | 3.3 / 5 Vdc output models         |     |     | 7.5 | V     |
|                          | 9 Vdc output models               |     |     | 15  | V     |
|                          | 12 / 15 Vdc output models         |     |     | 20  | V     |
|                          | 24 Vdc output models              |     |     | 30  | V     |
|                          | 48 Vdc output models              |     |     | 60  | V     |
| over current protection  | auto recovery                     | 120 |     | 300 | Io%   |
| short circuit protection | hiccup, continuous, auto recovery |     |     |     |       |

## SAFETY & COMPLIANCE

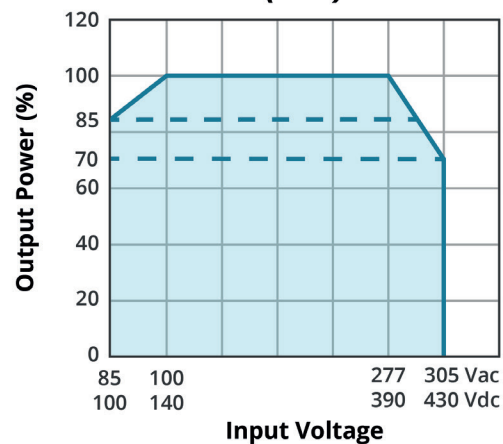
| parameter          | conditions/description                                                                                         | min            | typ | max | units      |
|--------------------|----------------------------------------------------------------------------------------------------------------|----------------|-----|-----|------------|
| isolation voltage  | input to output<br>input to earth                                                                              | 4,000<br>2,500 |     |     | Vac<br>Vac |
| safety approvals   | IEC 62368/EN 62368/UL 62368                                                                                    |                |     |     |            |
| safety class       | Class II                                                                                                       |                |     |     |            |
| EMI/EMC            | CISPR32/EN 55032: 2015 Class B                                                                                 |                |     |     |            |
| ESD                | IEC/EN 61000-4-2, Contact $\pm 6\text{KV}$ / Air $\pm 8\text{KV}$ , perf. Criteria B                           |                |     |     |            |
| radiated immunity  | EC/EN 61000-4-3, 10V/m, perf. Criteria A                                                                       |                |     |     |            |
| EFT/burst          | IEC/EN 61000-4-4, $\pm 2\text{KV}$ , perf. Criteria B<br>IEC/EN 61000-4-4, $\pm 4\text{KV}$ , perf. Criteria B |                |     |     |            |
| surge              | IEC/EN 61000-4-5, line to line $\pm 1\text{KV}$ , line to ground $\pm 2\text{KV}$ , perf. Criteria B           |                |     |     |            |
| conducted immunity | EC/EN 61000-4-6, 10Vr.m.s, perf. Criteria A                                                                    |                |     |     |            |
| MTBF               | as per MIL-HDBK-217F at 25°C                                                                                   | 300,000        |     |     | hours      |
| RoHS               | yes                                                                                                            |                |     |     |            |

## DERATING CURVE

**TEMPERATURE DERATING CURVE**

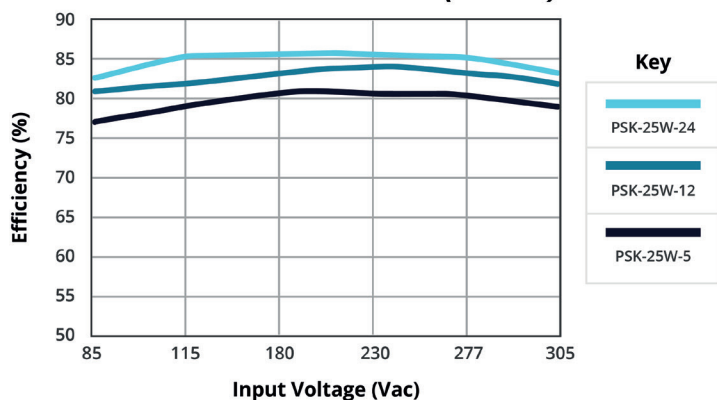


**INPUT VOLTAGE DERATING CURVE (25°C)**

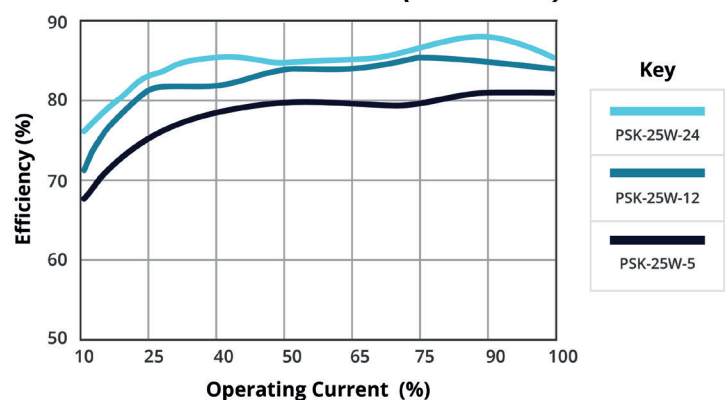


## EFFICIENCY CURVES

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



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

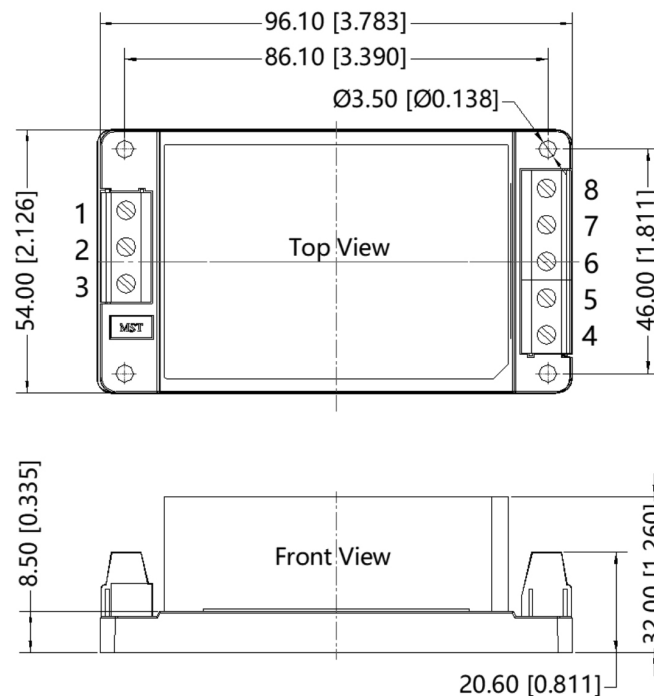




## MECHANICAL DRAWING [CHASSIS MOUNT]

units: mm [inch]  
 tolerance:  $\pm 1.00$  [ $\pm 0.039$ ]  
 wire range: 24~12 AWG  
 tightening torque: max 0.4 N·m

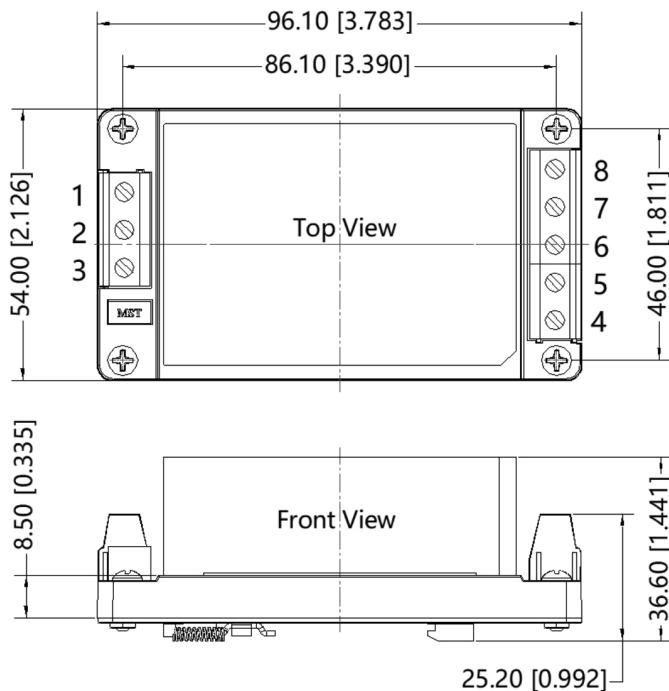
| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | $\oplus$ |
| 2               | AC (N)   |
| 3               | AC (L)   |
| 4               | +Vo      |
| 5               | NC       |
| 6               | Trim     |
| 7               | NC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



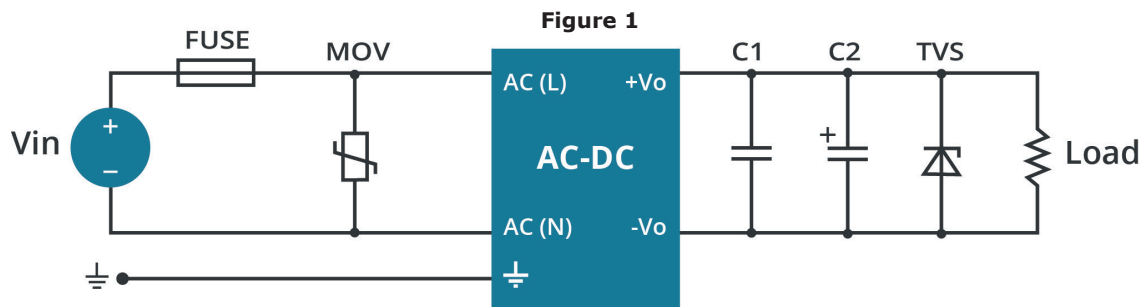
## MECHANICAL DRAWING [DIN-RAIL MOUNT]

units: mm [inch]  
 tolerance:  $\pm 1.00$  [ $\pm 0.039$ ]  
 wire range: 24~12 AWG  
 tightening torque: max 0.4 N·m

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



## APPLICATION CIRCUIT

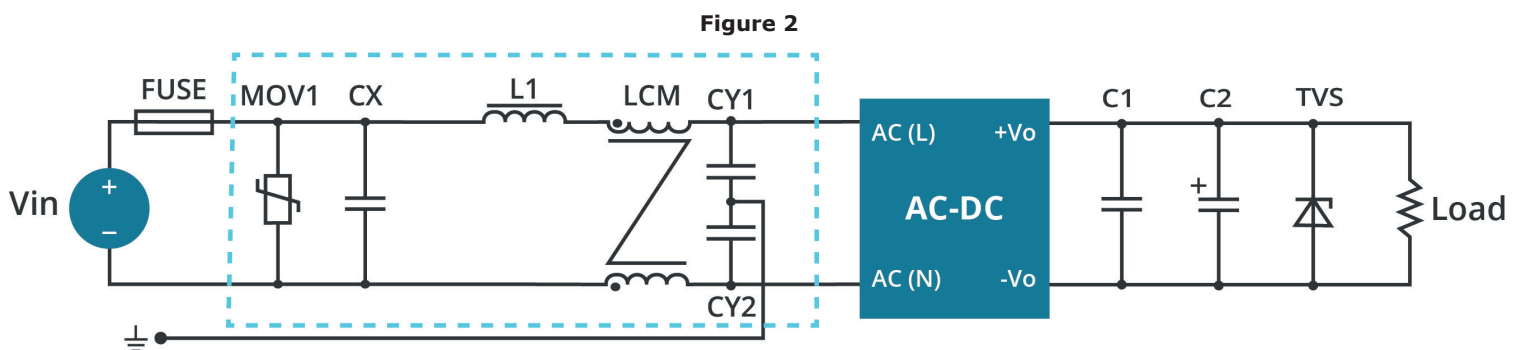


**Table 1**

| Recommended External Circuit Components |                                      |                  |           |             |          |
|-----------------------------------------|--------------------------------------|------------------|-----------|-------------|----------|
| Vo (Vdc)                                | FUSE <sup>6</sup>                    | MOV <sup>6</sup> | C1        | C2          | TVS      |
| 3.3                                     | 3.15A/300V<br>slow-blow,<br>required | S14K350          | 1 $\mu$ F | 330 $\mu$ F | SMBJ7.0A |
| 5                                       |                                      |                  |           | 330 $\mu$ F | SMBJ7.0A |
| 9                                       |                                      |                  |           | 330 $\mu$ F | SMBJ12A  |
| 12                                      |                                      |                  |           | 330 $\mu$ F | SMBJ20A  |
| 15                                      |                                      |                  |           | 330 $\mu$ F | SMBJ20A  |
| 24                                      |                                      |                  |           | 120 $\mu$ F | SMBJ30A  |
| 48                                      |                                      |                  |           | 68 $\mu$ F  | SMBJ64A  |

Notes: 6. Chassis Mount and DIN-Rail Mount versions include the fuse and MOV components.

## EMC RECOMMENDED CIRCUIT



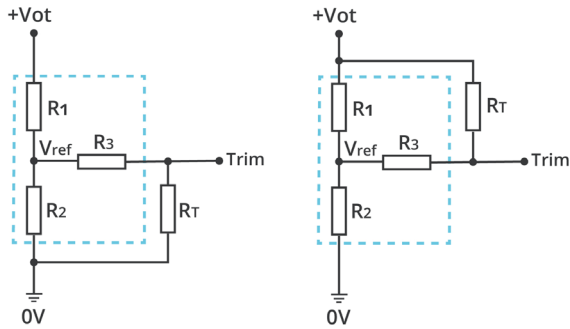
**Table 2**

| Recommended External Circuit Components |                                   |
|-----------------------------------------|-----------------------------------|
| MOV                                     | S14K350                           |
| CY1/CY2                                 | 1000 pF/400 Vac                   |
| CX                                      | 0.1 $\mu$ F/310 Vac               |
| LCM                                     | 10 mH                             |
| L1                                      | 4.7 $\mu$ H/ 2 A                  |
| FC-LX1D                                 | 2 KV/4 KV EMC filter              |
| FUSE                                    | 3.15 A/300 V, slow blow, required |

Note: Also refer to Table 1.

- Notes:
- 7. C1 is a ceramic capacitor used to filter high frequency noise.
  - 8. C2 is an electrolytic capacitor and it is recommended to be high frequency and low impedance. For capacitance and current of capacitor, refer to the datasheet provided by the manufacturer. Voltage derating of capacitor should be at least 80%.
  - 9. TVS is a recommended component to protect post-circuits (if converter fails).

## TRIM FUNCTION



Trim up

Trim down

Note: Trim resistor connection (dashed line shows internal resistor network)

$$R_{trim - up} = \frac{a R_2}{R_2 - a} - R_3$$

$$a = \frac{V_{ref}}{V_{ot} - V_{ref}} \times R_1$$

$$R_{trim - down} = \frac{a R_1}{R_1 - a} - R_3$$

$$a = \frac{V_{ot} - V_{ref}}{V_{ref}} \times R_2$$

RT = Trim Resistor Value  
a = Self-defined parameter

**Table 3**

| Vout | R1(KΩ) | R2 (KΩ) | R3 (KΩ) | Vref(V) | Vot(V)                                            |
|------|--------|---------|---------|---------|---------------------------------------------------|
| 3.3  | 2      | 1.19    | 1       | 1.24    | Output voltage after regulation, variation ≤ ±10% |
| 5    | 3.3    | 3.3     | 1       | 2.5     |                                                   |
| 9    | 7.5    | 2.87    | 1       | 2.5     |                                                   |
| 12   | 3.83   | 1       | 1       | 2.5     |                                                   |
| 15   | 7.5    | 1.5     | 1       | 2.5     |                                                   |
| 24   | 8.66   | 1       | 1       | 2.5     |                                                   |
| 48   | 27     | 1.49    | 1       | 2.5     |                                                   |

## REVISION HISTORY

| rev. | description                         | date       |
|------|-------------------------------------|------------|
| 1.0  | initial release                     | 06/30/2020 |
| 1.01 | curves and circuit drawings updated | 03/25/2021 |
| 1.02 | efficiency curves updated           | 11/04/2021 |
| 1.03 | UKCA mark added                     | 06/03/2022 |

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



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