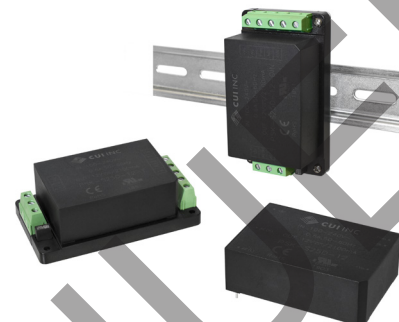


**SERIES: PSK-S25D | DESCRIPTION: AC-DC POWER SUPPLY**
**FEATURES**

- universal input (85~264 Vac)
- -40~85°C operating range
- over voltage/current protection
- 4,000 Vac input/output isolation voltage
- board/chassis/DIN-Rail configurations
- CISPR32/EN55032 Class B
- UL/EN/IEC 62368-1 certified



| MODEL                       | output<br>voltage<br>(Vdc) | output<br>current |            | output<br>power<br>max<br>(W) | ripple<br>and noise <sup>1</sup><br>max<br>(mVp-p) | efficiency <sup>2</sup><br>typ<br>(%) |
|-----------------------------|----------------------------|-------------------|------------|-------------------------------|----------------------------------------------------|---------------------------------------|
|                             |                            | min<br>(A)        | max<br>(A) |                               |                                                    |                                       |
| PSK-S25D-3 <sup>1,2</sup>   | 3.3                        | 0                 | 4.10       | 13.5                          | 100                                                | 74                                    |
| PSK-S25D-5 <sup>1,3</sup>   | 5                          | 0                 | 4.10       | 20.5                          | 100                                                | 79                                    |
| PSK-S25D-9 <sup>1,2,3</sup> | 9                          | 0                 | 2.50       | 22.5                          | 100                                                | 81                                    |
| PSK-S25D-12                 | 12                         | 0                 | 2.10       | 25.2                          | 100                                                | 83                                    |
| PSK-S25D-15 <sup>1,2</sup>  | 15                         | 0                 | 1.60       | 24                            | 100                                                | 84                                    |
| PSK-S25D-24 <sup>1,3</sup>  | 24                         | 0                 | 1.10       | 26.4                          | 100                                                | 85                                    |
| PSK-S25D-48 <sup>2,3</sup>  | 48                         | 0                 | 0.50       | 24                            | 100                                                | 87                                    |

Notes:

1. At full load, nominal input, 20 MHz bandwidth oscilloscope, with 1  $\mu$ F ceramic and 10  $\mu$ F 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.
4. Discontinued model - board mount option.
5. Discontinued model - chassis mount option.
6. Discontinued model - DIN-rail mount option.

**PART NUMBER KEY**

**PSK-S25D - XX - X**

Base Number

Output Voltage

Mounting Style:  
 "blank" = board mount  
 T = chassis mount  
 DIN = DIN-rail mount

## INPUT

| parameter                 | conditions/description | min | typ | max | units |
|---------------------------|------------------------|-----|-----|-----|-------|
| voltage                   |                        | 85  |     | 264 | Vac   |
|                           |                        | 100 |     | 370 | Vdc   |
| frequency                 |                        | 47  |     | 63  | Hz    |
| current                   | at 115 Vac             |     |     | 600 | mA    |
|                           | at 230 Vac             |     |     | 340 | mA    |
| inrush current            | at 115 Vac             |     | 20  |     | A     |
|                           | at 230 Vac             |     | 40  |     | A     |
| no load power consumption |                        |     |     | 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    |
| initial set point accuracy | 3.3 Vdc output models  |     | ±3    |        | %     |
|                            | all other models       |     | ±2    |        | %     |
| line regulation            | at full load           |     | ±0.5  |        | %     |
| load regulation            | from 0~100% load       |     | ±1    |        | %     |
| hold-up time               | at 115 Vac, full load  |     | 10    |        | ms    |
|                            | at 230 Vac, full load  |     | 60    |        | ms    |
| adjustability              | see application notes  |     | ±10   |        | %     |
| switching frequency        |                        |     | 65    |        | kHz   |
| temperature coefficient    |                        |     | ±0.02 |        | %/°C  |

## PROTECTIONS

| parameter                | conditions/description            | min | typ | max | units |
|--------------------------|-----------------------------------|-----|-----|-----|-------|
| over voltage protection  | output voltage clamp              |     |     |     |       |
|                          | 3.3, 5 Vdc output models          |     |     | 7.5 | Vdc   |
|                          | 9 Vdc output models               |     |     | 15  | Vdc   |
|                          | 12, 15 Vdc output models          |     |     | 20  | Vdc   |
|                          | 24 Vdc output models              |     |     | 30  | Vdc   |
|                          | 48 Vdc output models              |     |     | 60  | Vdc   |
| over current protection  | auto recovery                     | 140 |     |     | %     |
| short circuit protection | hiccup, continuous, auto recovery |     |     |     |       |

## SAFETY & COMPLIANCE

| parameter           | conditions/description                             | min   | typ | max | units |
|---------------------|----------------------------------------------------|-------|-----|-----|-------|
| isolation voltage   | input to output for 1 minute, 5 mA                 | 4,000 |     |     | Vac   |
|                     | input to ground for 1 minute, 5 mA                 | 2,500 |     |     | Vac   |
| safety approvals    | UL 62368-1, EN 62368-1, IEC 62368-1                |       |     |     |       |
| safety class        | Class I                                            |       |     |     |       |
| conducted emissions | CISPR32/EN55032, Class B                           |       |     |     |       |
| radiated emissions  | CISPR32/EN55032, Class B                           |       |     |     |       |
| ESD                 | IEC/EN61000-4-2, contact ±6 kV/ air ±8 kV, Class B |       |     |     |       |
| radiated immunity   | IEC/EN61000-4-3, 10 V/m, Class A                   |       |     |     |       |

**SAFETY & COMPLIANCE (CONTINUED)**

| parameter                    | conditions/description                                                                                                                                                                                   | min     | typ | max | units |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|-----|-------|
| EFT/burst                    | IEC/EN61000-4-4, $\pm 4$ kV, Class B                                                                                                                                                                     |         |     |     |       |
| surge                        | IEC/EN61000-4-5, line to line $\pm 1$ kV/ line to ground $\pm 2$ kV, Class B<br>IEC/EN61000-4-5, line to line $\pm 2$ kV/line to ground $\pm 4$ kV, Class B<br>(external circuit required, see Figure 2) |         |     |     |       |
| conducted immunity           | IEC/EN61000-4-6, 10 Vrms, Class A                                                                                                                                                                        |         |     |     |       |
| voltage dips & interruptions | IEC/EN61000-4-11 Class B, 0%-70%                                                                                                                                                                         |         |     |     |       |
| MTBF                         | as per MIL-HDBK-217F at 25°C                                                                                                                                                                             | 300,000 |     |     | hours |
| RoHS                         | yes                                                                                                                                                                                                      |         |     |     |       |

Notes: 4. The power supply is considered a component which will be installed into final equipment. The final equipment still must be tested to meet the necessary EMC directives.

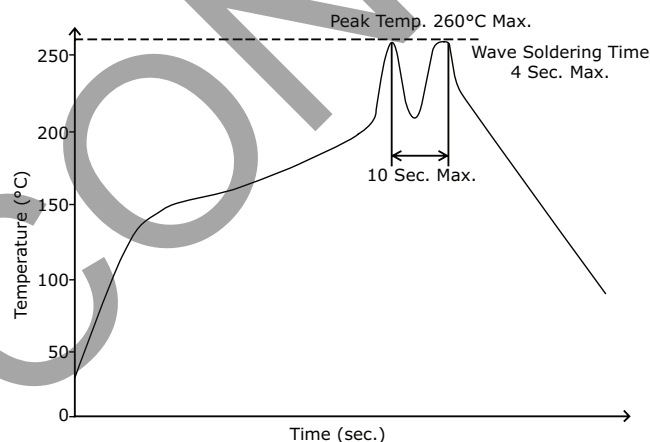
**ENVIRONMENTAL**

| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curves    | -40 |     | 85  | °C    |
| storage temperature   |                        | -40 |     | 85  | °C    |
| storage humidity      | non-condensing         |     |     | 95  | %     |

**SOLDERABILITY<sup>5</sup>**

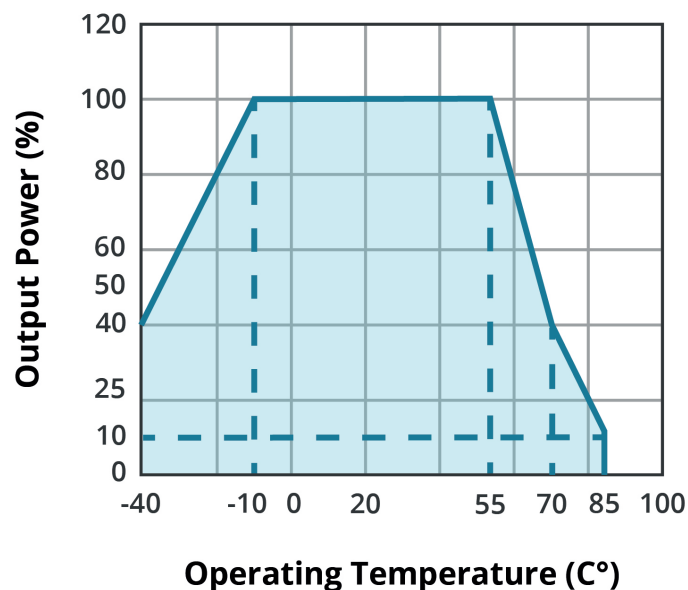
| parameter      | conditions/description | min | typ | max | units |
|----------------|------------------------|-----|-----|-----|-------|
| hand soldering | for 3~5 seconds        | 350 | 360 | 370 | °C    |
| wave soldering | for 5~10 seconds       | 255 | 260 | 265 | °C    |

Notes: 5. For board mount models only

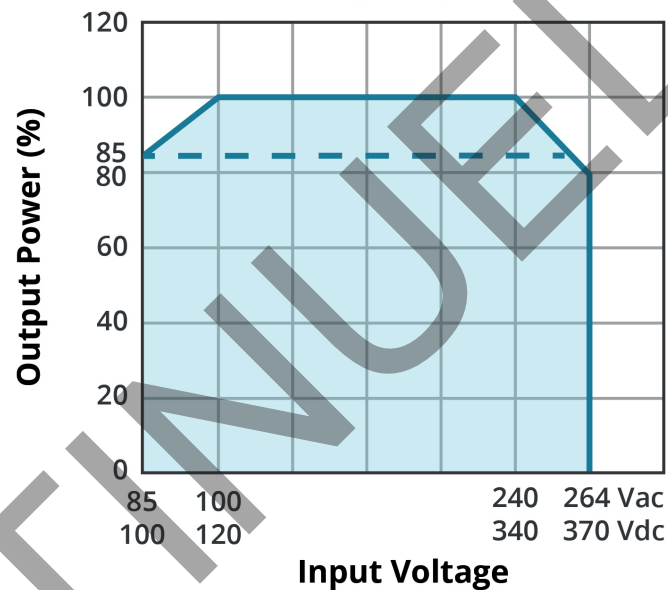


## DERATING CURVES

**TEMPERATURE DERATING CURVE**  
(85~264 Vac / 100~370 Vdc)

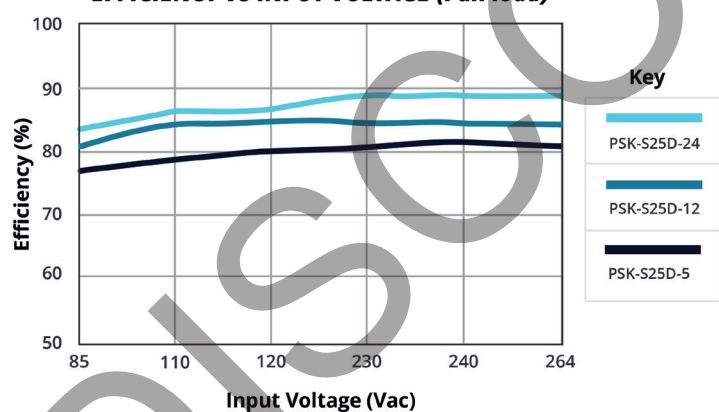


**INPUT VOLTAGE DERATING CURVE**  
(25°C)

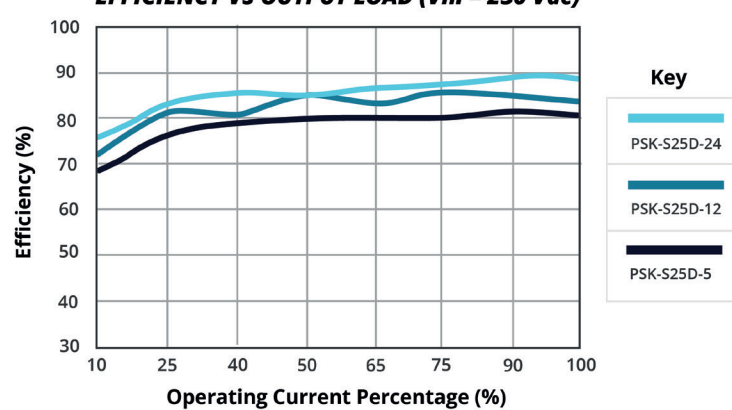


## EFFICIENCY CURVES

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



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



## MECHANICAL

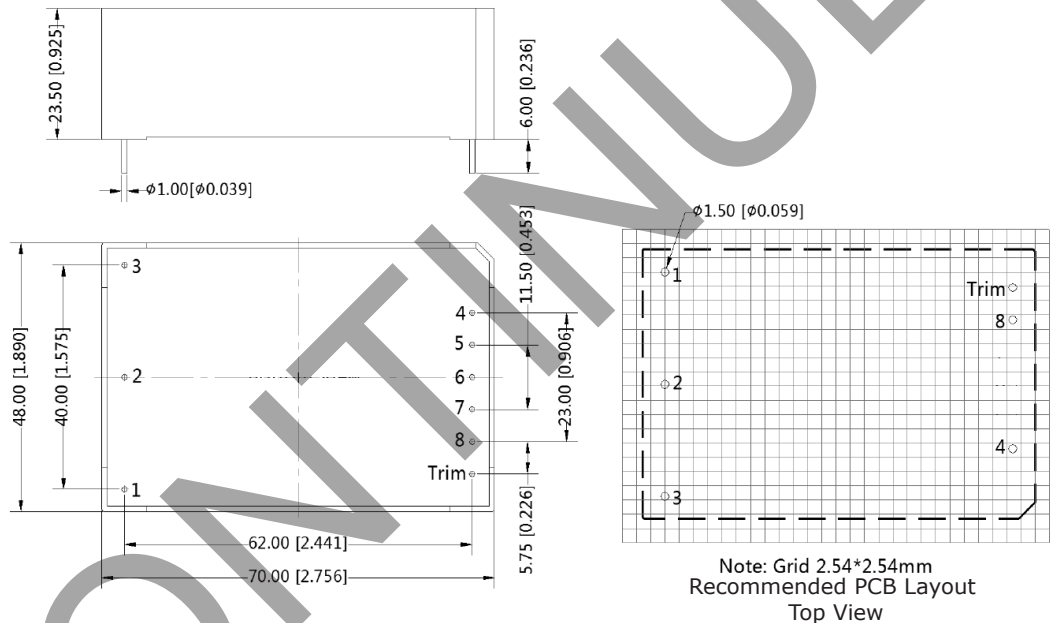
| parameter     | conditions/description                                             | min | typ | max | units |
|---------------|--------------------------------------------------------------------|-----|-----|-----|-------|
| dimensions    | board mount: 70.00 x 48.00 x 23.50 (2.756 x 1.890 x 0.925 inch)    |     |     |     | mm    |
|               | chassis mount: 96.10 x 54.00 x 32.00 (3.783 x 2.126 x 1.260 inch)  |     |     |     | mm    |
|               | DIN-Rail mount: 96.10 x 54.00 x 36.60 (3.783 x 2.126 x 1.441 inch) |     |     |     | mm    |
| case material | black flame-retardant and heat-resistant plastic (UL94V-0)         |     |     |     |       |
| weight        | board mount                                                        |     | 120 |     | g     |
|               | chassis mount                                                      |     | 170 |     | g     |
|               | DIN-Rail mount                                                     |     | 210 |     | g     |

## MECHANICAL DRAWING (BOARD MOUNT)

units: mm[inch]

tolerance:  $\pm 0.50[\pm 0.020]$ pin diameter tolerance:  $\pm 0.10[\pm 0.004]$ 

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | GND      |
| 2               | AC (N)   |
| 3               | AC (L)   |
| 4               | +Vo      |
| 5               | no pin   |
| 6               | no pin   |
| 7               | no pin   |
| 8               | -Vo      |
| trim            | trim     |



## MECHANICAL DRAWING (CHASSIS MOUNT)

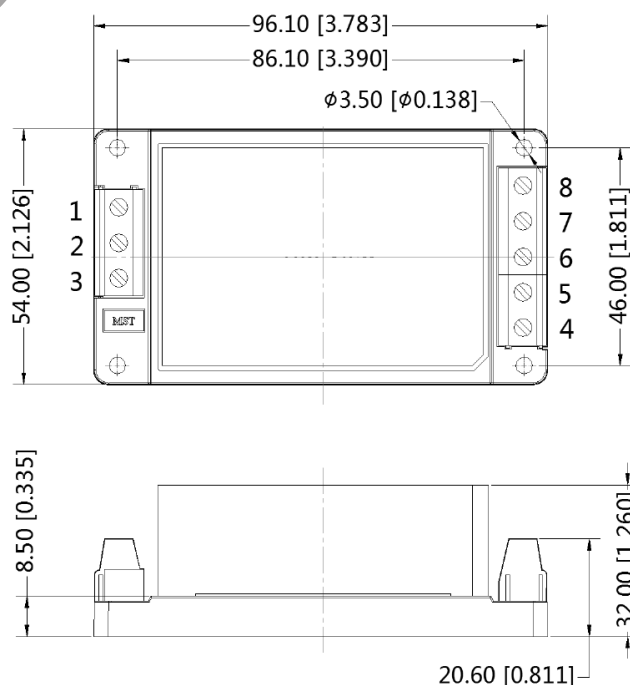
units: mm[inch]

tolerance:  $\pm 1.00[\pm 0.039]$ 

wire range: 24~12 AWG

tightening torque: max 0.4 N\*m

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

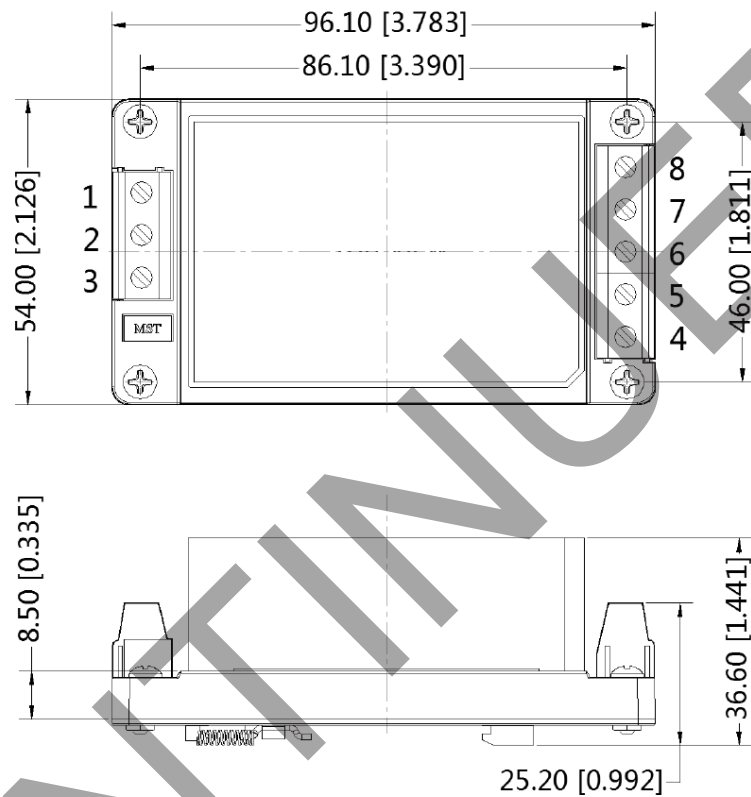


## MECHANICAL DRAWING (DIN-RAIL MOUNT)

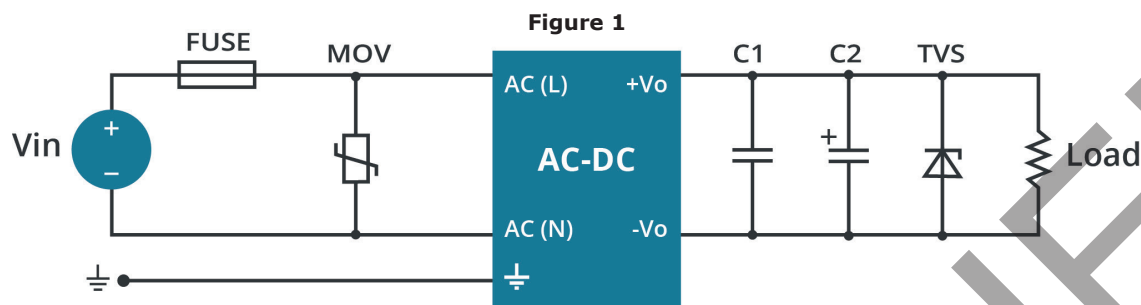
units: mm [inch]  
tolerance:  $\pm 1.00 [\pm 0.039]$

installed on DIN Rail TS35  
wire range: 24~12 AWG  
tightening torque: max 0.4 N\*m

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



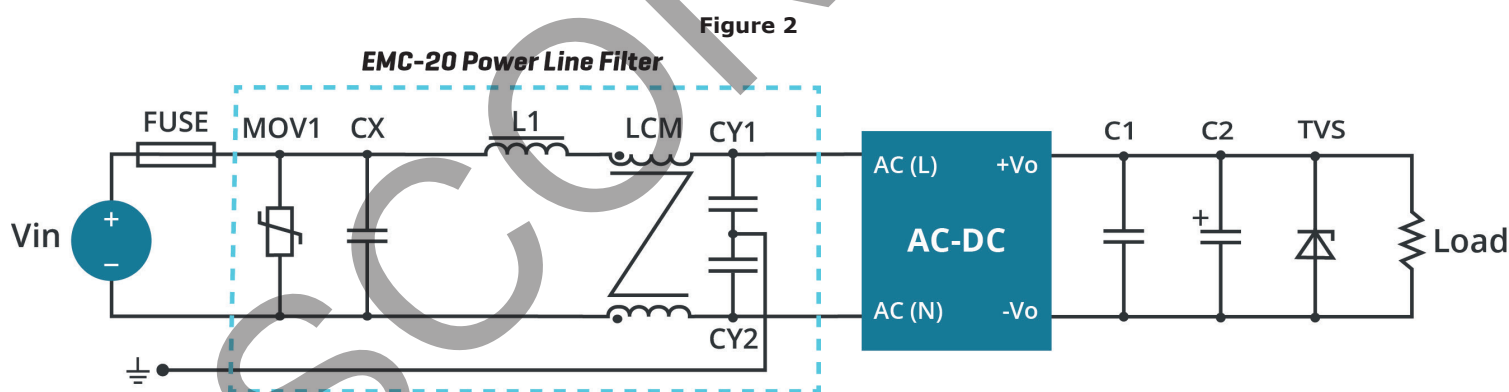
## APPLICATION CIRCUIT



**Table 1**

| Recommended External Circuit Components |            |         |           |             |          |
|-----------------------------------------|------------|---------|-----------|-------------|----------|
| Vo (Vdc)                                | FUSE       | MOV     | C1        | C2          | TVS      |
| 3.3                                     | 3.15A/250V | S14K300 | 1 $\mu$ F | 330 $\mu$ F | SMBJ7.0A |
| 5                                       | 3.15A/250V | S14K300 | 1 $\mu$ F | 330 $\mu$ F | SMBJ7.0A |
| 9                                       | 3.15A/250V | S14K300 | 1 $\mu$ F | 330 $\mu$ F | SMBJ12A  |
| 12                                      | 3.15A/250V | S14K300 | 1 $\mu$ F | 330 $\mu$ F | SMBJ20A  |
| 15                                      | 3.15A/250V | S14K300 | 1 $\mu$ F | 330 $\mu$ F | SMBJ20A  |
| 24                                      | 3.15A/250V | S14K300 | 1 $\mu$ F | 120 $\mu$ F | SMBJ30A  |
| 48                                      | 3.15A/250V | S14K300 | 1 $\mu$ F | 68 $\mu$ F  | SMBJ64A  |

## EMC RECOMMENDED CIRCUIT



**Table 2**

| Recommended External Circuit Components |                           |
|-----------------------------------------|---------------------------|
| FUSE                                    | 3.15 A/250 V, slow fusing |
| MOV                                     | S14K300                   |
| LCM                                     | 10 mH                     |
| CX                                      | 0.1 $\mu$ F/275 Vac       |
| CY1, CY2                                | 1000 pF/400 Vac           |
| L1                                      | 4.7 $\mu$ H/ 2 A          |

Note: Also refer to Table 1.

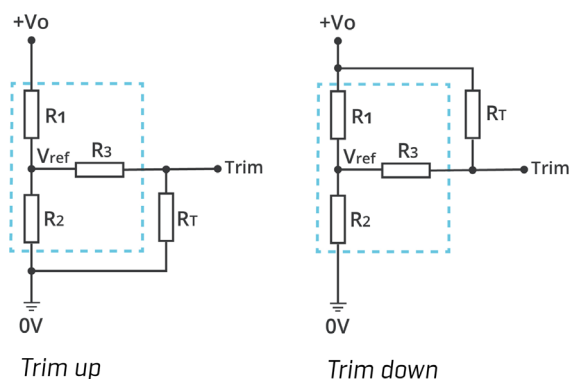
- Notes:
- C1 is a ceramic capacitor used to filter high frequency noise.
  - C2 is an electrolytic capacitor and it is recommended to be high frequency and low impedance. For capacitance and current of capacitor, refer to the datasheet provided by the manufacturer. Voltage derating of capacitor should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

## APPLICATION NOTES

Output voltage trimming  
Leave open if not used.

**Figure 3**

Application Circuit for Trim pin  
(part in broken line is the interior of models)



Formula for Trim Resistor

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \quad a = \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2$$

Note: Value for R1, R2, R3, and Vref refer to Table 3  
 $R_T$ : Trim Resistor  
 $a$ : User-defined parameter, no actual meanings  
 $Vo'$ : The trim up/down voltage

**Table 3**

| Vout (Vdc) | R1 (kΩ) | R2 (kΩ) | R3 (kΩ) | Vref (V) |
|------------|---------|---------|---------|----------|
| 3.3        | 3.3     | 1.98    | 1       | 1.24     |
| 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         | 68      | 3.73    | 1       | 2.5      |

## REVISION HISTORY

| rev. | description                                                                                                                                                                                                                | date       |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1.0  | initial release                                                                                                                                                                                                            | 03/07/2019 |
| 1.01 | company logo updated                                                                                                                                                                                                       | 12/22/2020 |
| 1.02 | curves and circuit drawings updated                                                                                                                                                                                        | 03/25/2021 |
| 1.03 | UKCA mark added                                                                                                                                                                                                            | 05/27/2022 |
| 1.04 | discontinued models PSK-S25D-3, PSK-S25D-3-T, PSK-S25D-5, PSK-S25D-5-T, PSK-S25D-5-DIN, PSK-S25D-9, PSK-S25D-9-T, PSK-S25D-9-DIN, PSK-S25D-15, PSK-S25D-15-T, PSK-S25D-24, PSK-S25D-24-DIN, PSK-S25D-48-T, PSK-S25D-48-DIN | 09/13/2022 |

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



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