

**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 voltage	output current max	output power max	ripple and noise typ	efficiency typ
	(Vdc)	(A)	(W)	(mVp-p)	(%)
PSK-25W-3 <sup>1,2,3</sup>	3.3	4.1	13.5	100	75
PSK-25W-5 <sup>1,2,3</sup>	5	4.1	20.5	100	78
PSK-25W-9 <sup>1,2,3</sup>	9	2.5	22.5	100	80
PSK-25W-12 <sup>1,2,3</sup>	12	2.1	25.0	100	82
PSK-25W-15 <sup>1,2,3</sup>	15	1.6	24.0	100	83
PSK-25W-24 <sup>1,3</sup>	24	1.1	26.4	100	85
PSK-25W-48 <sup>1,2,3</sup>	48	0.5	24.0	100	87

Notes: 1. Discontinued model - board mount version.  
 2. Discontinued model - chassis mount version.  
 3. Discontinued model - DIN-rail mount version.

**PART NUMBER KEY**
**PSK - 25W - 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		305	Vac
		100		430	Vdc
frequency		47		63	Hz
current	at 155 Vac			0.6	A
	at 230 Vac			0.34	A
inrush current	at 155 Vac		20		A
	at 230 Vac		40		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	$\mu$ F
	5 Vdc output models			12,240	$\mu$ F
	9 Vdc output models			5,600	$\mu$ F
	12 Vdc output models			5,400	$\mu$ F
	15 Vdc output models			2,400	$\mu$ F
	24 Vdc output models			1,440	$\mu$ F
output voltage accuracy	3.3 V output models		$\pm 3$		%
	all other voltages		$\pm 2$		%
line regulation			$\pm 0.5$		%
load regulation			$\pm 1.0$		%
hold-up time	at 115 Vac		10		ms
	at 230 Vac		60		ms
trimmability	see application circuit		$\pm 10$		%
switching frequency			65		kHz
temperature coefficient			$\pm 0.02$		%/°C

**PROTECTIONS**

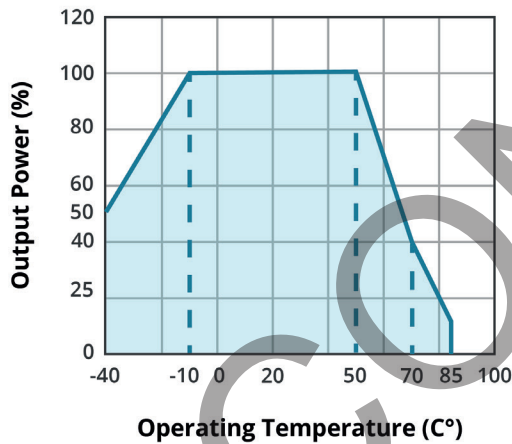
parameter	conditions/description	min	typ	max	units
over voltage protection	3.3 / 5 Vdc output models			7.5	V
	9 Vdc output models			15	V
	12 / 15 Vdc output models			20	V
	24 Vdc output models			30	V
	48 Vdc output models			60	V
over current protection	auto recovery	120		300	I <sub>o</sub> %
short circuit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

## SAFETY & COMPLIANCE

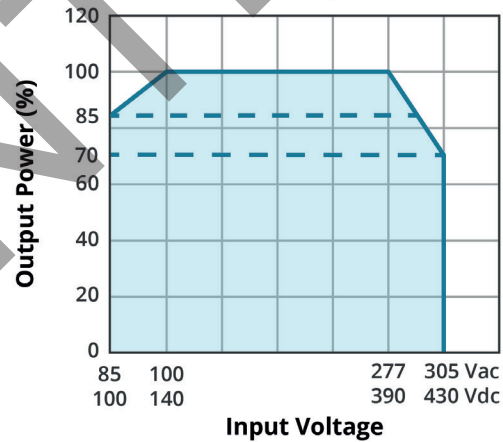
parameter	conditions/description	min	typ	max	units
isolation voltage	input to output input to earth	4,000 2,500			Vac Vac
safety approvals	IEC 62368/EN 62368/UL 62368				
safety class	Class II				
EMI/EMC	CISPR32/EN 55032: 2015 Class B				
ESD	IEC/EN 61000-4-2, Contact $\pm 6\text{KV}$ / Air $\pm 8\text{KV}$ , 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 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**

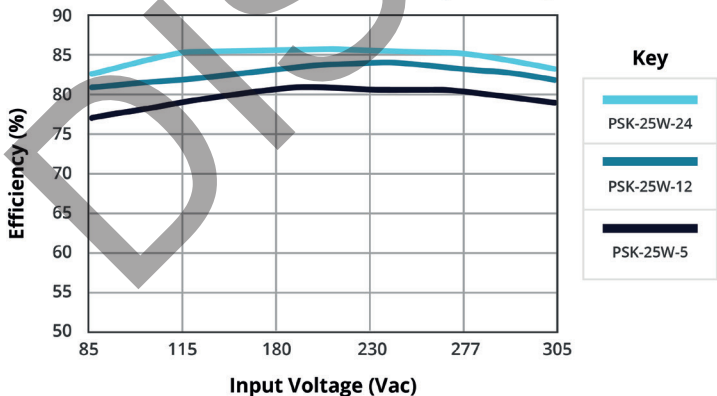


**INPUT VOLTAGE DERATING CURVE (25°C)**

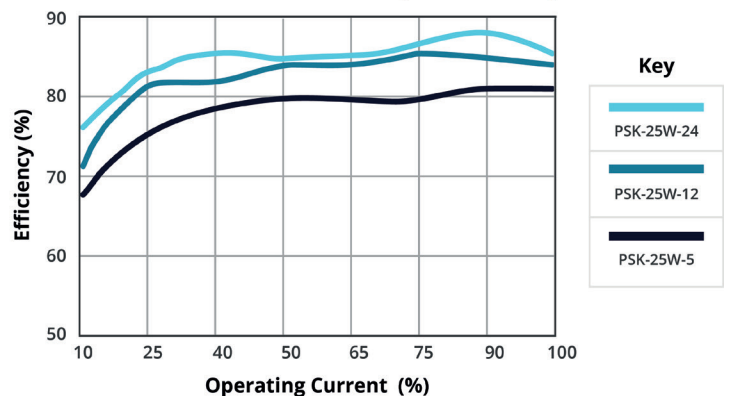


## EFFICIENCY CURVES

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



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



**ENVIRONMENTAL**

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

**SOLDERABILITY**

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

**MECHANICAL**

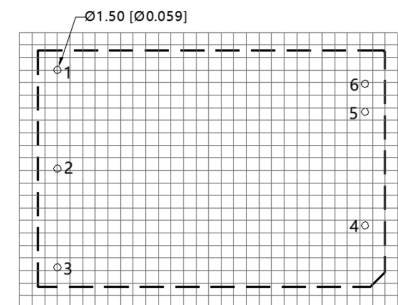
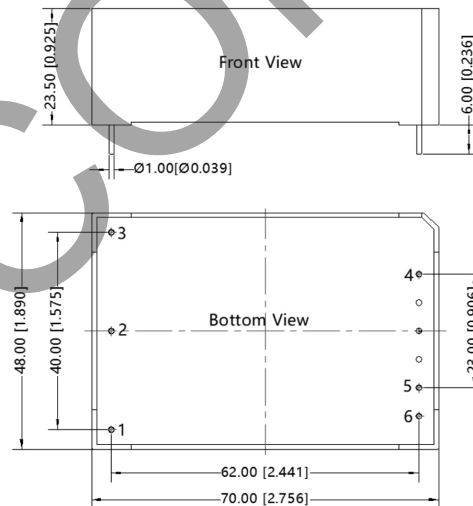
parameter	conditions/description	min	typ	max	units
dimensions	70.00 x 48.00 x 23.50 (board mount)				mm
	96.10 x 54.00 x 32.00 (chassis mount)				mm
	96.10 x 54.00 x 36.60 (DIN-rail)				mm
weight	board mount		120		g
	chassis mount		170		g
	DIN-rail		210		g
cooling	natural convection				
case material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				

**MECHANICAL DRAWING (BOARD MOUNT)**

units: mm [inch]

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

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

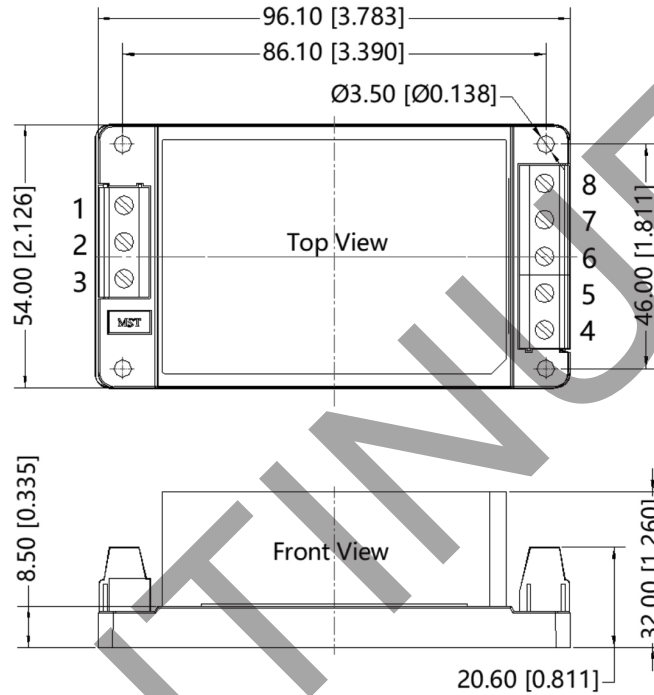


Note: Grid 2.54\*2.54mm

## 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

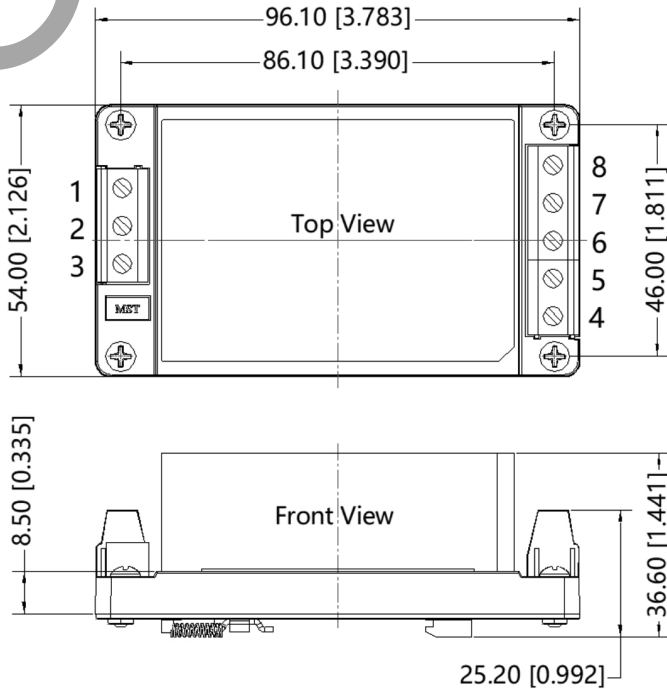
PIN CONNECTIONS	
PIN	Function
1	$\oplus$
2	AC (N)
3	AC (L)
4	+Vo
5	NC
6	Trim
7	NC
8	-Vo



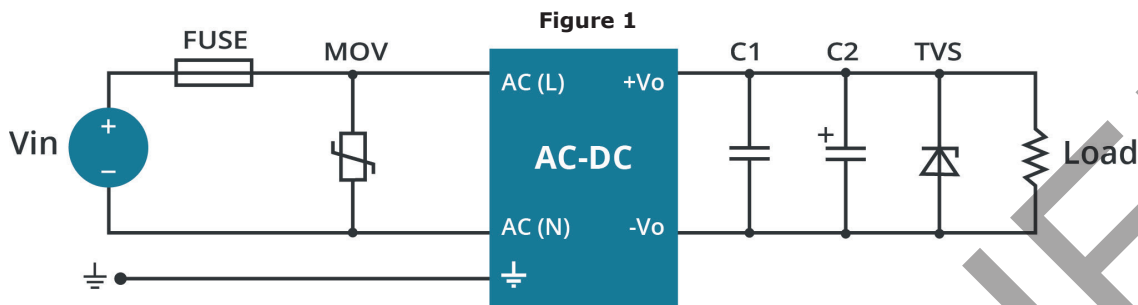
## MECHANICAL DRAWING [DIN-RAIL MOUNT]

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

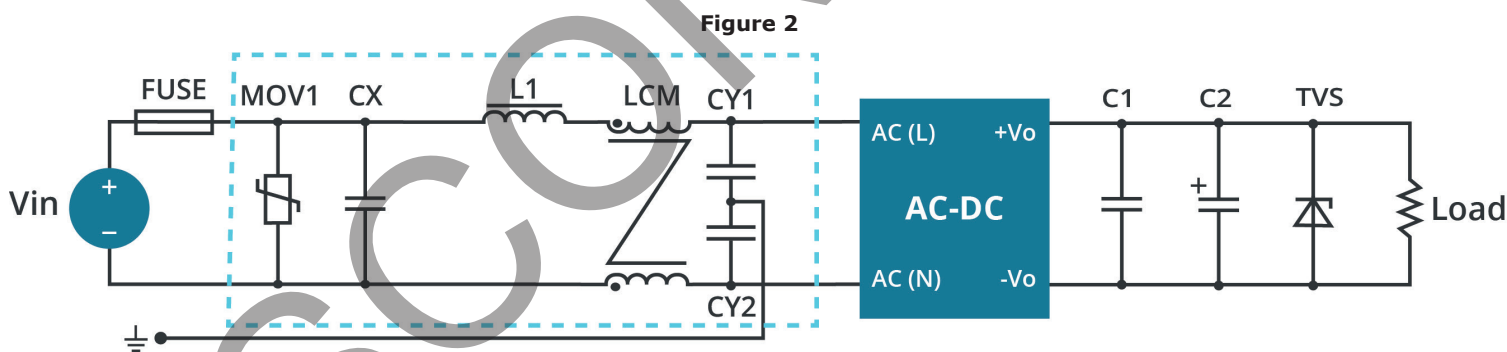


**Table 1**

Recommended External Circuit Components					
Vo (Vdc)	FUSE <sup>6</sup>	MOV <sup>6</sup>	C1	C2	TVS
3.3	3.15A/300V slow-blow, 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



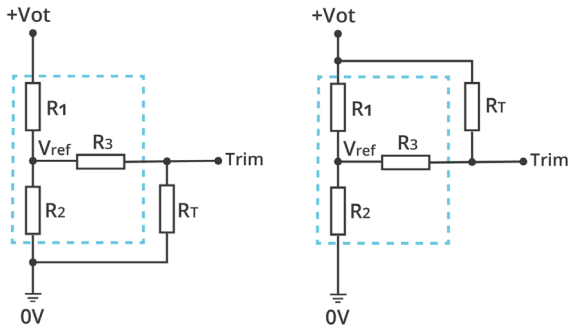
**Table 2**

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:
- 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).

## TRIM FUNCTION



Trim up

Trim down

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

$$R_{trim - up} = \frac{a R_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_{ot} - V_{ref}} \times R_1$$

$$R_{trim - down} = \frac{a R_1}{R_1 - a} - R_3 \quad a = \frac{V_{ot} - V_{ref}}{V_{ref}} \times R_2$$

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
1.04	discontinued models PSK-25-3, PSK-25-3-T, PSK-25-3-DIN, PSK-25-95, PSK-25-5-T, PSK-25-5-DIN, PSK-25-9, PSK-25-9-T, PSK-25-9-DIN, PSK-25-12, PSK-25-12-T, PSK-25-12-DIN, PSK-25-15, PSK-25-15-T, PSK-25-15-DIN, PSK-25-24, PSK-25-24-DIN, PSK-25-48, PSK-25-48-T, PSK-25-48-DIN	09/13/2022

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



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