

## SERIES: PSK-3D | DESCRIPTION: INTERNAL AC-DC POWER SUPPLY

### FEATURES

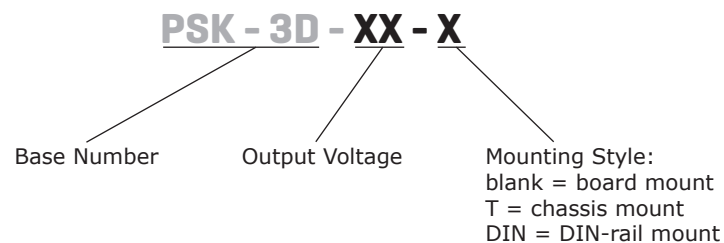
- wide input range (85 ~ 305 Vac)
- wide operating temperature range (-40 to +85 C)
- Class B emissions
- certified to 62368, 61558, and 60335 safety standards
- over voltage, over current, short circuit protections
- compact 1 x 1 inch encapsulated package



MODEL	output voltage	output current max	output power max	ripple and noise <sup>1</sup> max	efficiency <sup>2</sup> typ
	(Vdc)	(A)	(W)	(mVp-p)	(%)
PSK-3D-3	3.3	0.9	3	100	72
PSK-3D-5	5	0.6	3	100	76
PSK-3D-9	9	0.333	3	100	78
PSK-3D-12	12	0.25	3	100	78
PSK-3D-15	15	0.2	3	100	79
PSK-3D-24	24	0.125	3	100	79

Notes: 1. Ripple & noise are measured at 20 MHz BW with 10  $\mu$ F aluminum electrolytic capacitor and 1  $\mu$ F ceramic capacitor on the output. See application circuit.  
 2. Measured at 230 Vac.  
 3. All specifications are measured at Ta=25°C, humidity <75%, nominal input voltage, and rated output load unless otherwise specified.

### PART NUMBER KEY



## INPUT

parameter	conditions/description	min	typ	max	units
voltage	ac input	85		305	Vac
	dc input	100		430	Vdc
frequency		47		63	Hz
current	at 115 Vac			0.08	A
	at 230 Vac			0.06	A
inrush current	at 115 Vac		15		A
	at 230 Vac		25		A
leakage current	277 Vac/50 Hz			0.25	mA

## OUTPUT

parameter	conditions/description	min	typ	max	units
capacitive load	3.3 Vdc output model			4,000	μF
	5 Vdc output model			3,000	μF
	9 Vdc output model			1,200	μF
	12 Vdc output model			1,200	μF
	15 Vdc output model			680	μF
	24 Vdc output model			220	μF
output voltage accuracy	3.3 Vdc output model		±3		%
	all other output models		±2		%
line regulation	at full load		±0.5		%
load regulation	0~100% load		±1.0		%
hold-up time	at 115 Vac		5		ms
	at 230 Vac		50		ms
switching frequency			65		kHz
no load power consumption	at 230 Vac				
	5 Vdc & 12 Vdc output models		0.2		W
	all other output models		0.1		W

## PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	3.3 & 5 Vdc output models			7.5	V
	9 Vdc output model			15	V
	12 Vdc output model			16	V
	15 Vdc output model			20	V
	24 Vdc output model			30	V
over current protection	auto recovery			200	%
short circuit protection	continuous, auto recovery, hiccup				

## SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output, 1 min. <5mA	4,000			Vac
safety approvals	certified to 62368: IEC, EN, UL/cUL				
	certified to 61558: EN				
	certified to 60335: EN				
safety class	Class II				
EMI/EMC	CISPR32/EN55032 CLASS B EN55014-1				
ESD	IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV perf. Criteria B EN55014-2 perf. Criteria B				
radiated immunity	IEC/EN61000-4-3 10V/m perf. Criteria A EN55014-2 perf. Criteria A				

## SAFETY & COMPLIANCE

EFT/burst	IEC/EN61000-4-4 ±2KV (See Fig.1 for typical application circuit) perf. Criteria B IEC/EN61000-4-4 ±4KV (See Fig.2 for recommended circuit) perf. Criteria B EN55014-2 perf. Criteria B				
surge	IEC/EN61000-4-5 line to line ±1KV (See Fig.1 for typical application circuit) perf. Criteria B IEC/EN61000-4-5 line to line ±2KV (See Fig.2 for recommended circuit) perf. Criteria B EN55014-2 perf. Criteria B				
conducted immunity	IEC/EN61000-4-6 10Vr.m.s perf. Criteria A EN55014-2 perf. Criteria A				
voltage dips and interruption	IEC/EN61000-4-11 0%, 70% perf. Criteria B EN55014-2 perf. Criteria B				
MTBF	MIL-HDBK-217F at 25°C	2,799,000			hours
RoHS	yes				

## ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-40		105	°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

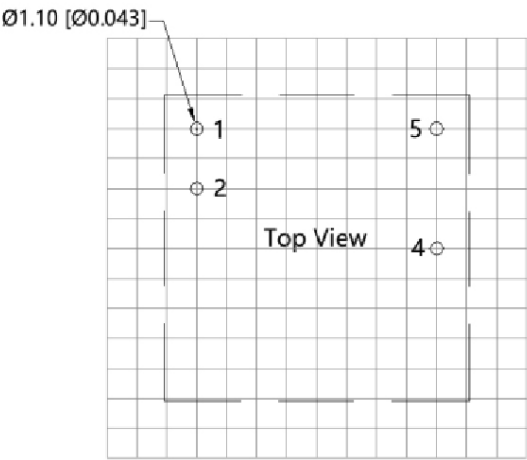
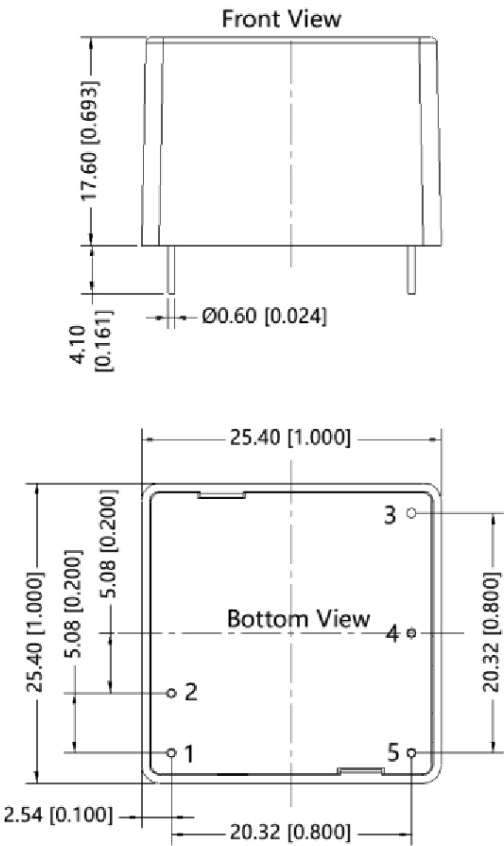
## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	horizontal package: 25.40 x 25.40 x 17.60				mm
	chassis mount: 76.00 x 31.50 x 26.40				mm
	DIN-rail: 76.00 x 31.50 x 31.00				mm
weight	horizontal package, 3.3 Vdc, 5 Vdc, 9 Vdc & 12 Vdc output		18.0		g
	horizontal package, 15 Vdc & 24 Vdc output		18.5		g
	chassis mount		38.0		g
	DIN-rail		58.0		g
case material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				

MECHANICAL DRAWING

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

PIN CONNECTIONS	
PIN	Function
1	AC(N)
2	AC(L)
3	no pin
4	-Vo
5	+Vo

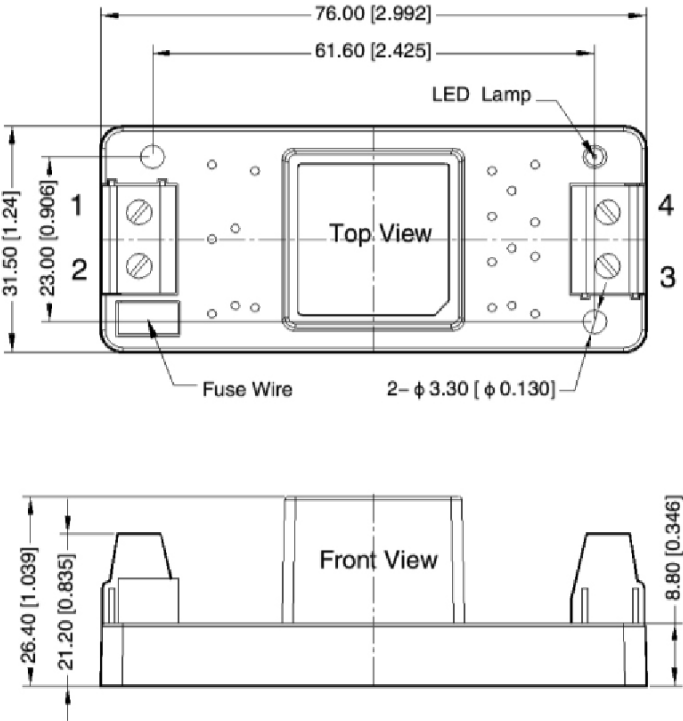


Note: Grid 2.54\*2.54mm

MECHANICAL DRAWING

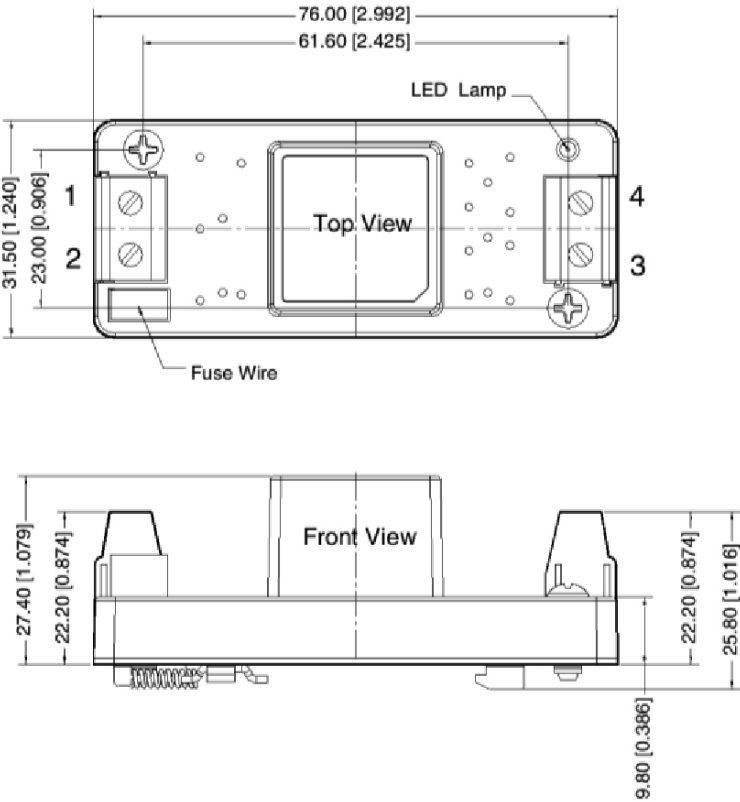
units: mm [inch]  
wire range: 24~12 AWG  
tightening torque:Max 0.4 N·m  
tolerance: ±1.0 [±0.039]

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



units: mm [inch]  
wire range: 24~12 AWG  
tightening torque:Max 0.4 N·m  
mounting rail: TS35, must be connected to safety ground  
tolerance: ±1.0 [±0.039]

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



APPLICATION DESIGN REFERENCE

Figure 1

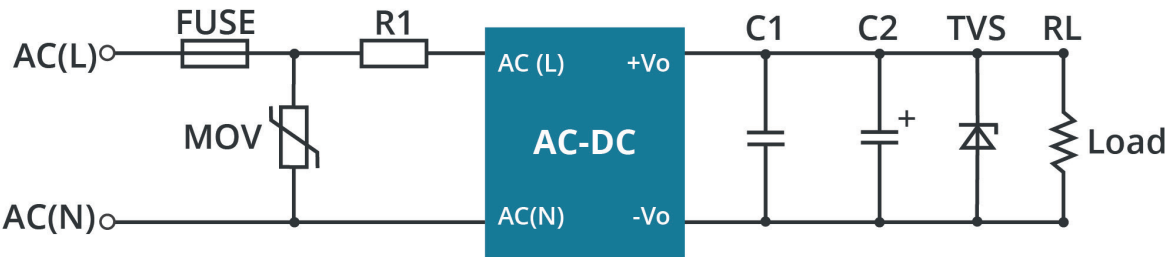


Table 1

Part No.	C1(μF)	C2(μF)	FUSE	R1	TVS	MOV
PSK-3D-3	1	150	1A/300V, slow-blow, required	12Ω/3W	SMBJ7A	S10K350
PSK-3D-5		150			SMBJ7A	
PSK-3D-9		120			SMBJ12A	
PSK-3D-12		120			SMBJ20A	
PSK-3D-15		120			SMBJ20A	
PSK-3D-24		68			SMBJ30A	

Output Filtering Components:  
An electrolytic capacitor with high frequency operation, low ESR, and at least 20% margin on rated output voltage is recommended for C2. C1 should be a ceramic capacitor and the TVS will help protect downstream electronics in the unlikely event of converter failure.

EMC RECOMMENDED CIRCUIT

Figure 2

EMC APPLICATION CIRCUIT WITH HIGHER REQUIREMENTS

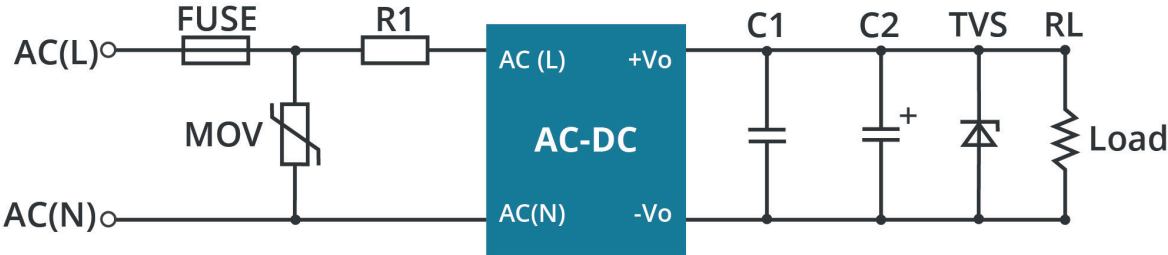
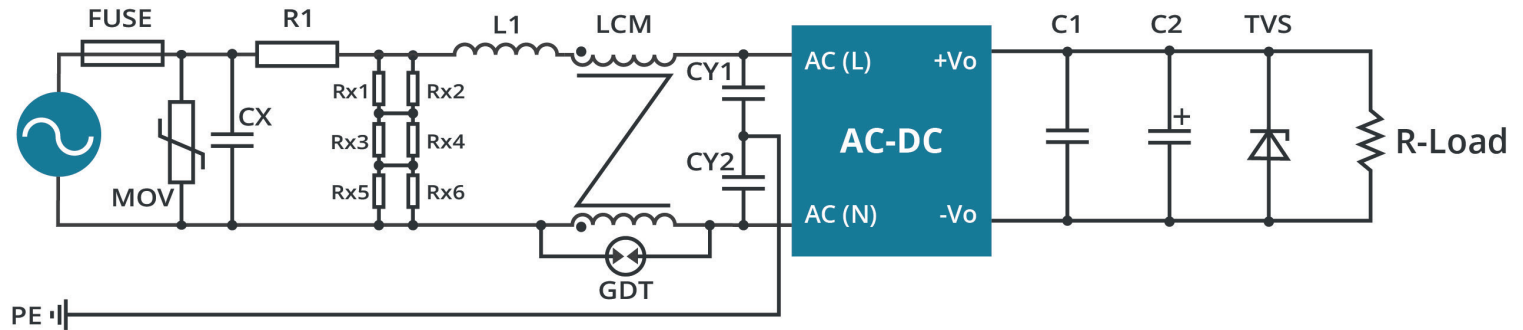


Table 2

Components	Recommended Value
MOV	S14K350
R1	33Ω/3W
FUSE	2A/300V, slow-blow, required

## EMC RECOMMENDED CIRCUIT (CONTINUED)

**Figure 3**  
**RECOMMENDED CIRCUIT FOR CLASS I EQUIPMENT**



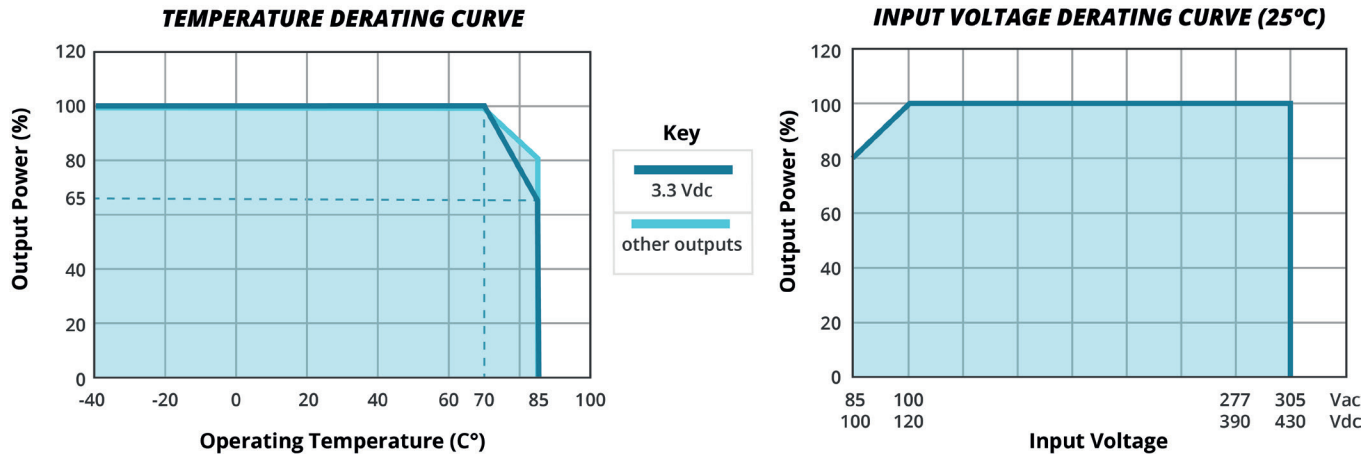
Recommended when the output terminal of the product needs to be connected to PE or connected to PE through a Y capacitor

**Table 3**

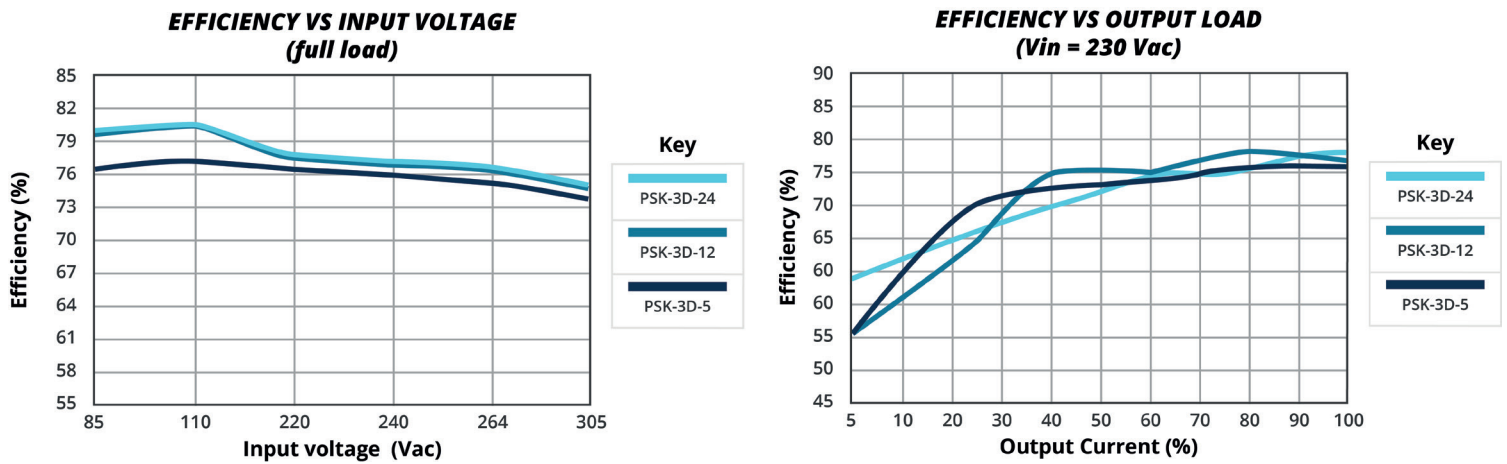
Components	Recommended Value
FUSE	2A/300V, slow-blow, required
MOV	S14K350
CX	334K/305Vac
R1	33Ω/3W (wire-wound resistor, required)
L1	1.2mH/0.3A
CY1/CY2	1nF/400Vac
GDT	300V/1KA
LCM	20mH

Note: Rx1/Rx2/Rx3/Rx4/Rx5/Rx6 is the bleeder resistance of CX, and the recommended resistance value is 1.5MΩ/150Vdc.

## DERATING CURVE



## EFFICIENCY CURVES





REVISION HISTORY

rev.	description	date
1.0	initial release	01/28/2021
1.01	derating curves updated	01/19/2022
1.02	no load power consumption updated	05/03/2022
1.03	UKCA mark added	06/13/2022
1.04	EMC circuit for Class I added	01/10/2024

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



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