CUI INC
a bel group

SERIES: PSK-5D | **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 (Vdc)	output current max (A)	output power max (W)	ripple and noise[1] max (mVp-p)	efficiency[2] typ (%)
PSK-5D-3	3.3	1.515	5	100	71.5
PSK-5D-5	5	1.0	5	100	77.5
PSK-5D-9	9	0.555	5	100	80.5
PSK-5D-12	12	0.416	5	100	80.5
PSK-5D-15	15	0.333	5	100	81.5
PSK-5D-24	24	0.208	5	100	81.5

Notes: 1. Ripple & noise are measured at 20 MHz BW with 10 μF aluminum electrolytic capacitor and 1 μF 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

PSK - 5D - XX - X

- PSK - 5D: Base Number
- XX: Output Voltage
- X: Mounting Style:
  blank = board mount
  T = chassis mount
  DIN = DIN-rail mount

INPUT

parameter	conditions/description	min	typ	max	units
voltage	ac input dc input	85 100		305 430	Vac Vdc
frequency		47		63	Hz
current	115 Vac 230 Vac			0.13 0.07	A A
inrush current	115 Vac 230 Vac		15 25		A A
leakage current	277 Vac/50 Hz			0.25	mA

OUTPUT

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

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	3.3 & 5 Vdc output, latching 9 Vdc output, latching 12 Vdc output, latching 15 Vdc output, latching 24 Vdc output, latching			7.5 15 16 20 30	V V V V V
over current protection	auto recovery	130			%
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 60335: EN certified to 61558: 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				
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				

SAFETY & COMPLIANCE

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	2,602,000			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

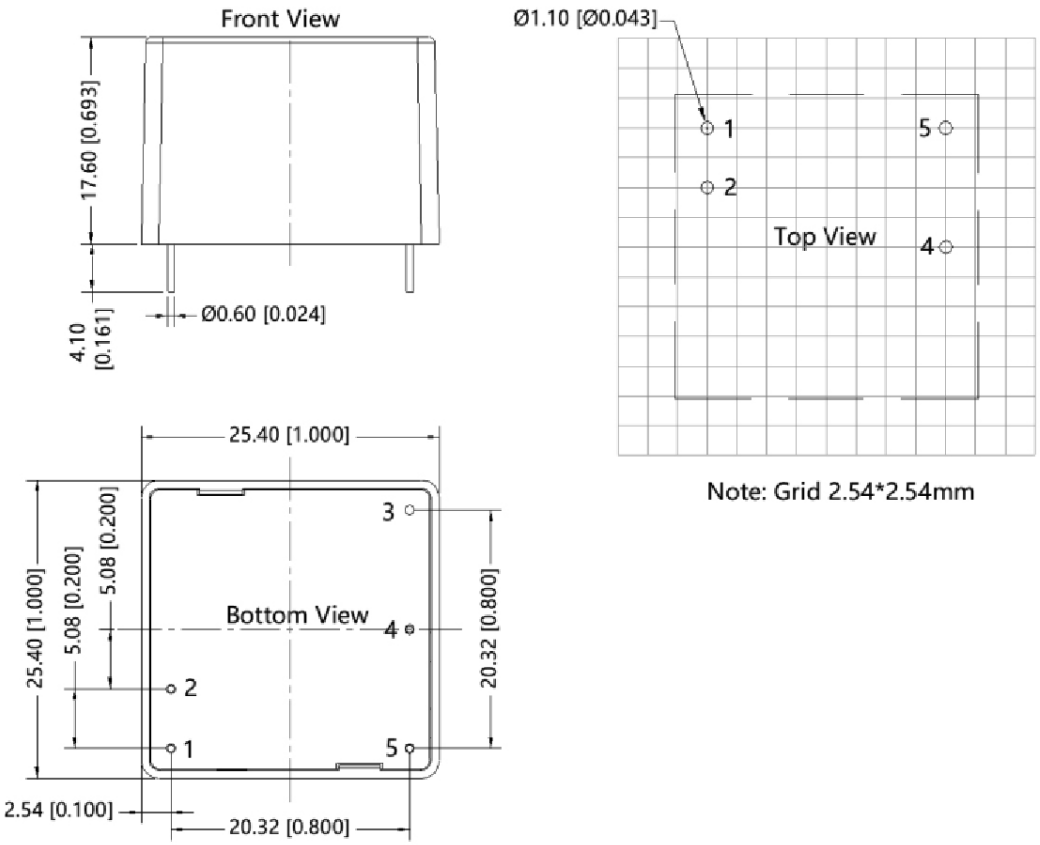
MECHANICAL

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

MECHANICAL DRAWING

units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
tolerance: ±0.50 [±0.020]

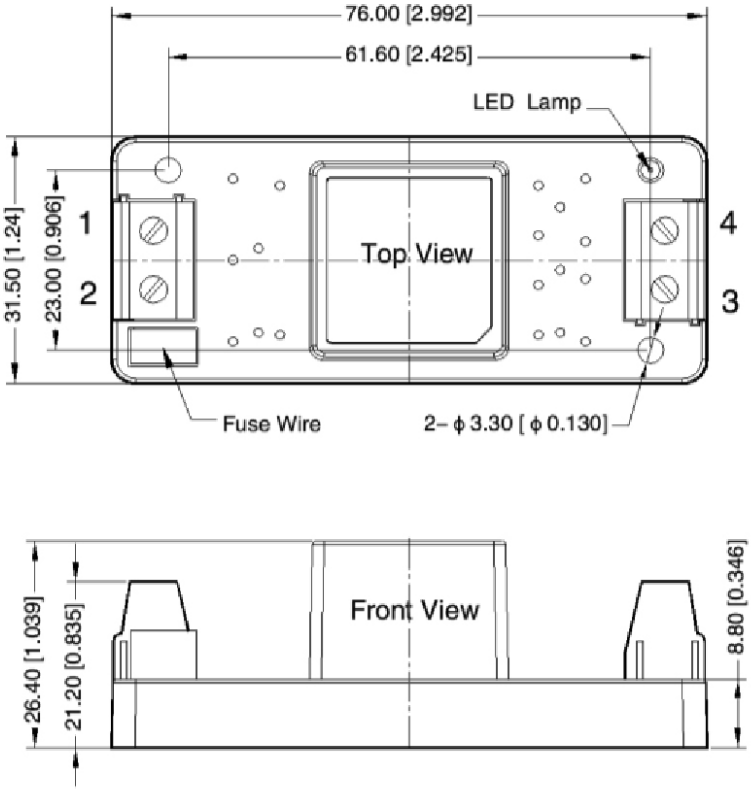
PIN CONNECTIONS	
PIN	Function
1	AC(N)
2	AC(L)
3	no pin
4	-Vo
5	+Vo



MECHANICAL DRAWING

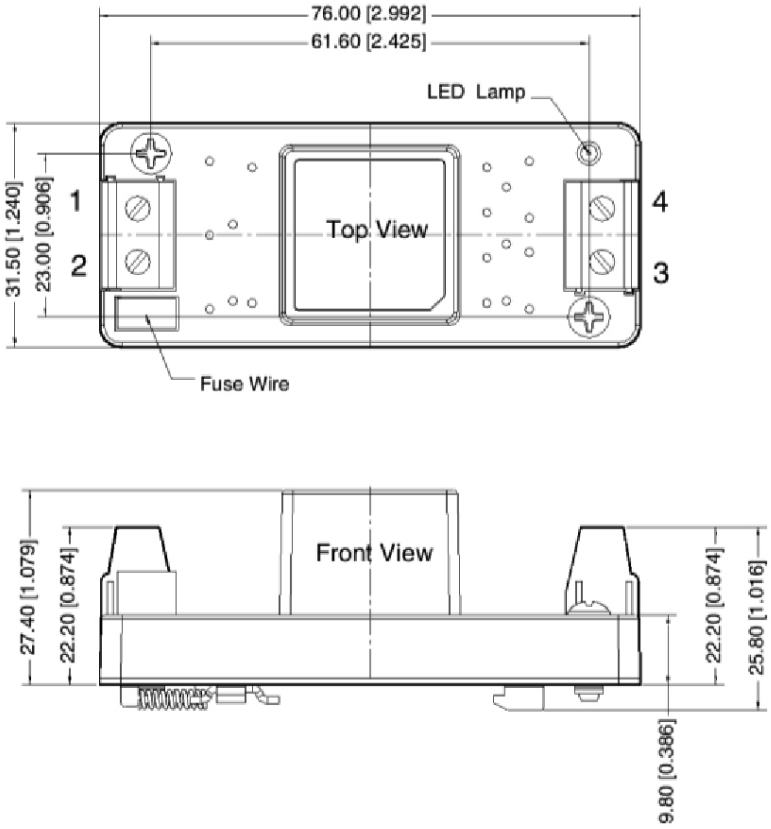
units: mm [inch]
wire range: 24~12 AWG
tightening torque:Max 0.4 N·m
tolerance: ±1.0 [±0.039]

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

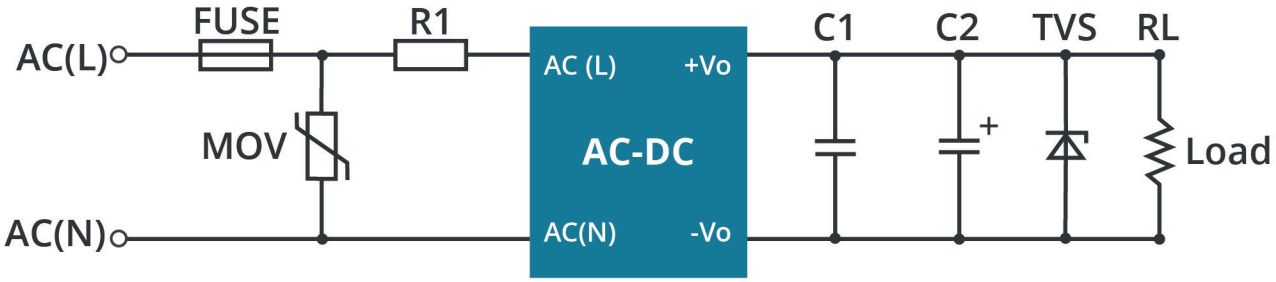


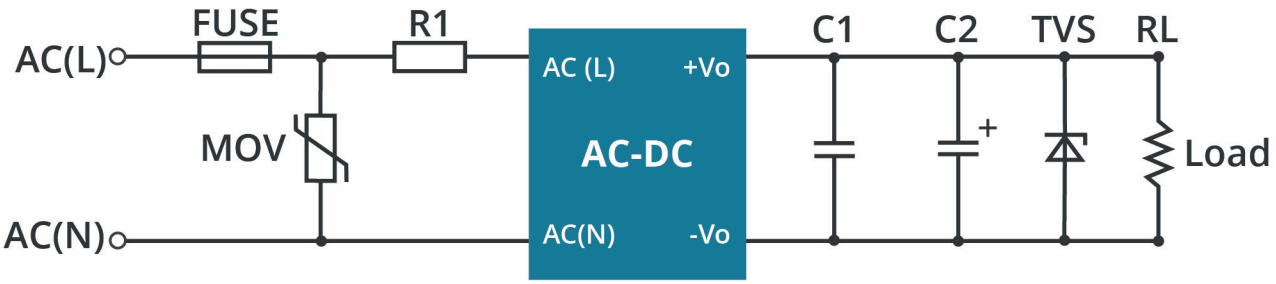
Table 1

Part No.	C1(μF)	C2(μF)	FUSE	R1	TVS	MOV
PSK-5D-3	1	150	1A/300V, slow-blow, required	12Ω/3W	SMBJ7.0A	S10K350
PSK-5D-5		150			SMBJ7.0A	
PSK-5D-9		120			SMBJ12A	
PSK-5D-12		120			SMBJ20A	
PSK-5D-15		120			SMBJ20A	
PSK-5D-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



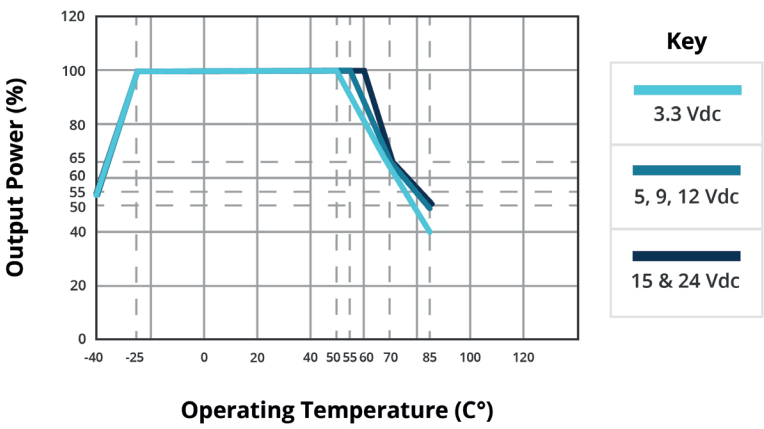
Note: EMC application circuit with higher requirements.

Table 2

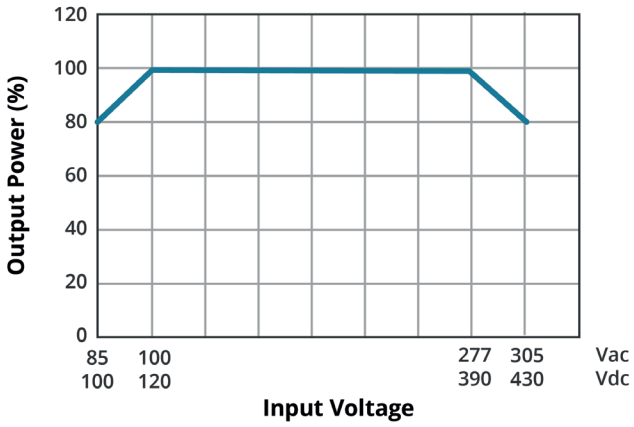
Components	Recommended Value
MOV	S14K350
R1	33Ω/3W
FUSE	2A/300V, slow-blow, required

DERATING CURVE

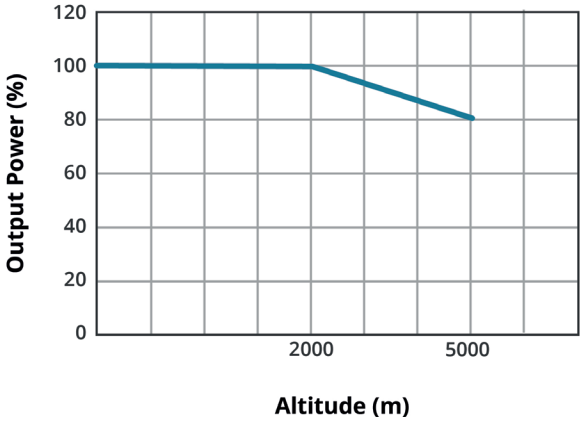
TEMPERATURE DERATING CURVE



INPUT VOLTAGE DERATING CURVE (25°C)



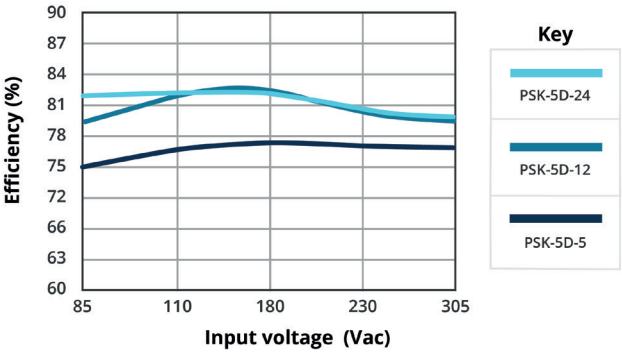
ALTITUDE DERATING CURVE (25°C)



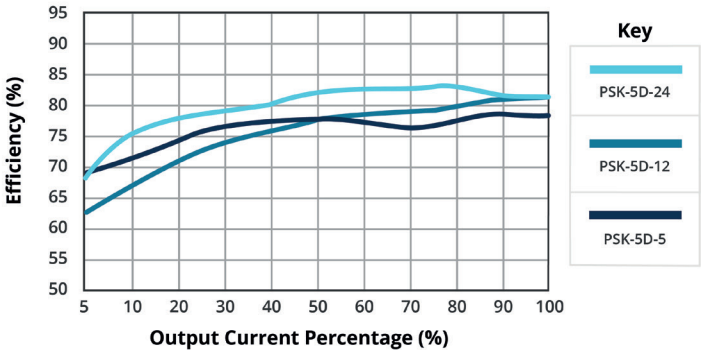
Note: 1. With an AC input between 85~100V/277~305V and a DC input between 100~120V/390~430Vdc, the output power must be derated as per temperature derating curves.
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult with CUI.

EFFICIENCY CURVES

EFFICIENCY VS INPUT VOLTAGE (full load)



EFFICIENCY VS OUTPUT LOAD (Vin = 230 Vac)



REVISION HISTORY

rev.	description	date
1.0	initial release	01/28/2021
1.01	OVP updated	09/30/2021

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

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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

CUI reserves the right to make changes to the product at any time without notice. Information provided by CUI is believed to be accurate and reliable. However, no responsibility is assumed by CUI for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

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