

SERIES: PSK-15D | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY

FEATURES

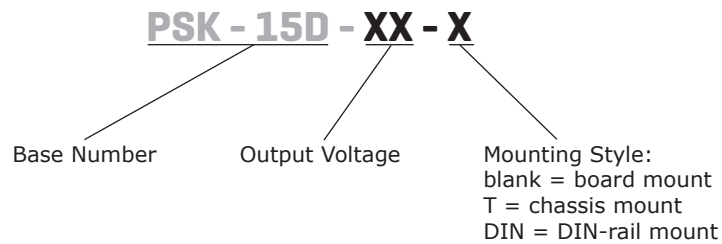
- wide input range (85 ~ 305 Vac)
- wide operating temperature range (-40 to +85 C)
- Class B emissions
- certified to 62368, 61558, and 60335 safety standards
- designed to meet 60601 medical safety standard (2xMOPP)
- over voltage, over current, short circuit protections
- input over voltage category III for fixed installations



MODEL	output voltage	output current	output power	ripple and noise	efficiency
	(Vdc)	max (A)	max (W)	max (mVp-p)	typ (%)
PSK-15D-3	3.3	4.0	13.2	120	82
PSK-15D-5	5	3.0	15.0	120	85
PSK-15D-9	9	1.67	15.0	120	84
PSK-15D-12	12	1.25	15.0	120	85
PSK-15D-15	15	1.0	15.0	120	85
PSK-15D-24	24	0.625	15.0	120	86

Notes: 1. At full load, nominal input, 20 MHz bandwidth oscilloscope, with output capacitors outlined in Figure/Table 1 below.
 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.

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			0.45	A
	at 230 Vac			0.30	A
inrush current	at 230 Vac		60		A
leakage current	at 277 Vac/50 Hz			0.1	mA
no load power consumption	3.3, 5, 9, 12, 15 Vdc output models			0.1	W
	24 Vdc output model			0.12	W

OUTPUT

parameter	conditions/description	min	typ	max	units
capacitive load	3.3 Vdc output model			6,600	μF
	5 Vdc output model			5,000	μF
	9 Vdc output model			3,000	μF
	12 Vdc output model			2,000	μF
	15 Vdc output model			1,500	μF
	24 Vdc output model			680	μF
output voltage accuracy			±2		%
line regulation	at full load		±0.5		%
load regulation	0~100% load		±1.0		%
hold-up time	at 115 Vac		10		ms
	at 230 Vac		55		ms
switching frequency			65		kHz

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	clamp or hiccup				
	3.3 & 5 Vdc output models			7.5	V
	9 Vdc output model			15	V
	12 & 15 Vdc output models			20	V
	24 Vdc output model			30	V
over current protection	auto recovery	110			%
short circuit protection	continuous, auto recovery, hiccup				

SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output, 1 min., <5mA	4,200			Vac
safety approvals	certified to 62368: IEC, EN, UL/cUL certified to 60335: EN certified to 61558: EN designed to meet 60601: IEC, EN, UL/cUL				
safety class	Class II				
EMI/EMC	CISPR32/EN 55032 CLASS B CISPR11/EN 55011 CLASS B EN 55014-1				
ESD	IEC/EN 61000-4-2 Contact ±8KV perf. Criteria B IEC/EN 55014-2 perf. Criteria B				
radiated immunity	IEC/EN 61000-4-3 10V/m perf. Criteria A IEC/EN 55014-2 perf. Criteria A				
EFT/burst	IEC/EN 61000-4-4 ±2KV perf. Criteria B IEC/EN 61000-4-4 ±4KV (See Fig.2 for recommended circuit) perf. Criteria B IEC/EN 55014-2 perf. Criteria B				

SAFETY & COMPLIANCE

surge	IEC/EN 61000-4-5 line to line $\pm 1\text{KV}$ perf. Criteria B IEC/EN 61000-4-5 line to line $\pm 2\text{KV}$ (See Fig.2 for recommended circuit) perf. Criteria B IEC/EN 55014-2 perf. Criteria B		
conducted immunity	IEC/EN 61000-4-6 10Vr.m.s perf. Criteria A IEC/EN 55014-2 perf. Criteria A		
voltage dips and interruption	IEC/EN 61000-4-11 0%, 70% perf. Criteria B IEC/EN 55014-2 perf. Criteria B		
MTBF	MIL-HDBK-217F at 25°C	3,200,000	hours
RoHS	yes		

ENVIRONMENTAL

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

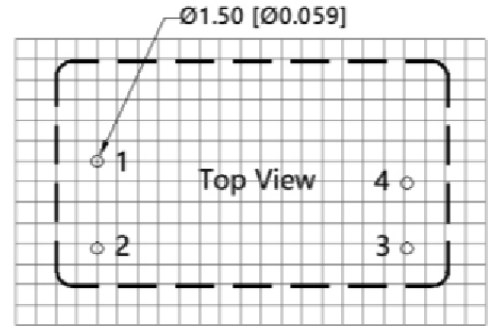
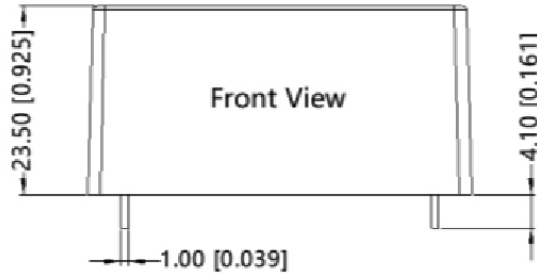
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	DIP: 47.60 x 26.80 x 23.50 chassis mount: 76.00 x 31.50 x 32.30 DIN-rail: 76.00 x 31.50 x 36.90				mm mm mm
weight	DIP chassis mount DIN-rail		48 68 88		g g g
case material	lack plastic, flame-retardant and heat-resistant (UL94V-0)				

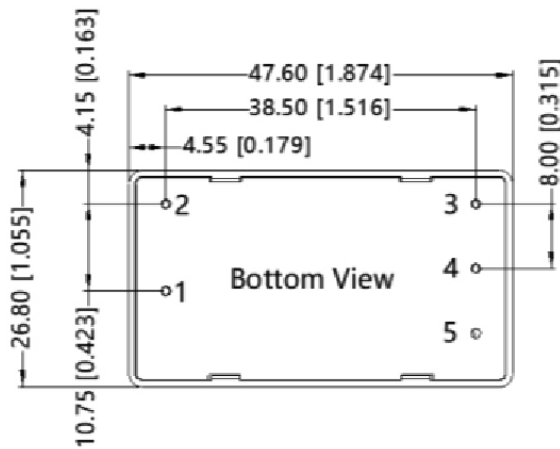
MECHANICAL DRAWING

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

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



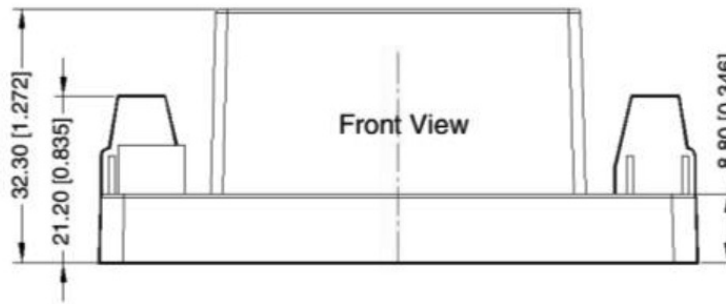
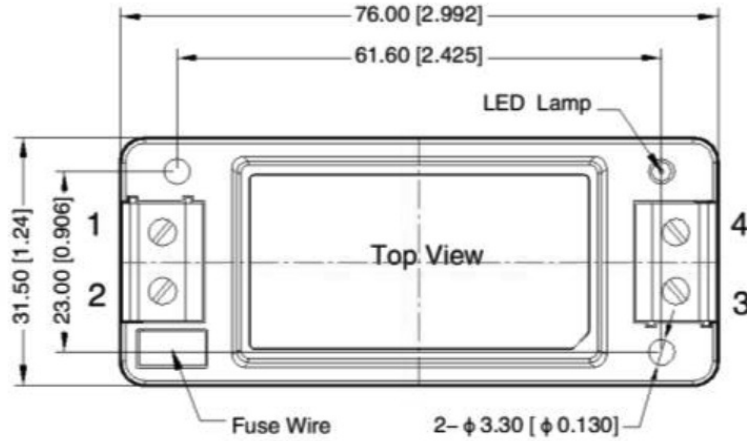
Note: Grid 2.54*2.54mm



MECHANICAL DRAWING

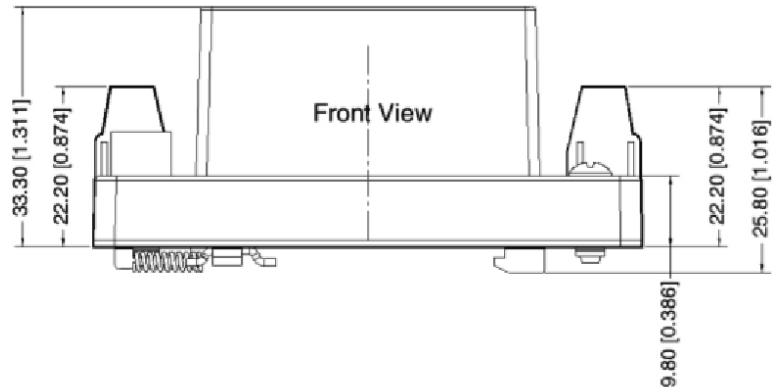
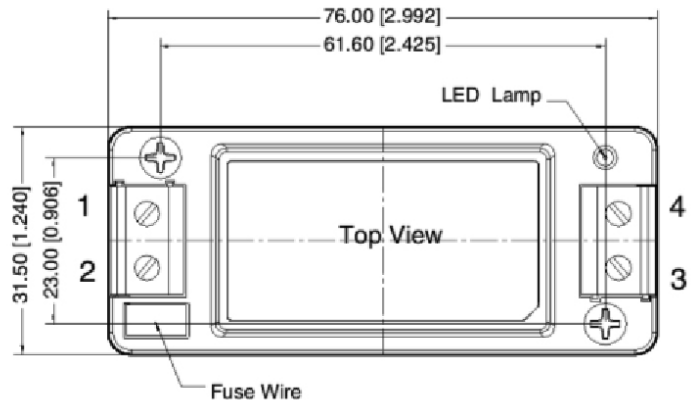
units: mm [inch]
 wire range: 24~12 AWG
 tightening torque: Max 0.4 N·m
 tolerance: ±1.0 [±0.039]

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

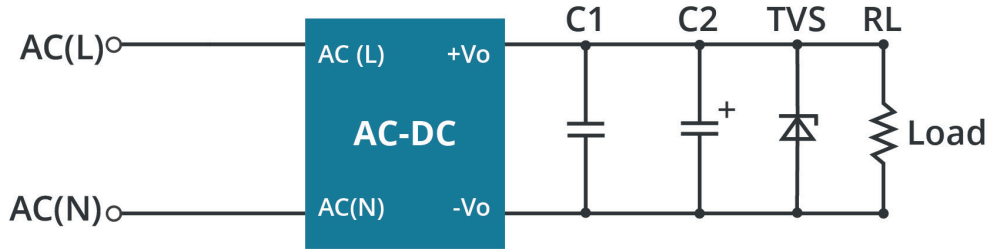


Table 1

Part No.	C1(μF)	C2(μF)	TVS
PSK-15D-3	1μF/50V	220μF/16V	SMBJ7.0A
PSK-15D-5		220μF/16V	SMBJ7.0A
PSK-15D-9		100μF/25V	SMBJ12A
PSK-15D-12		100μF/25V	SMBJ20A
PSK-15D-15		100μF/25V	SMBJ20A
PSK-15D-24		100uF/35V	SMBJ30A

Note: 2A / 300V, slow-blow fuse integrated into unit.

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

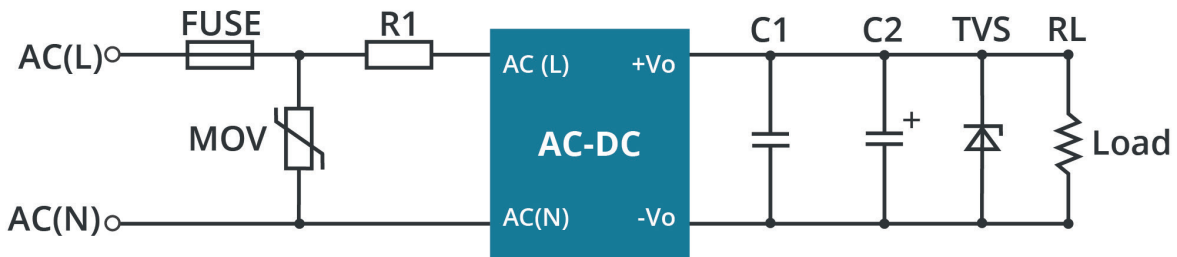
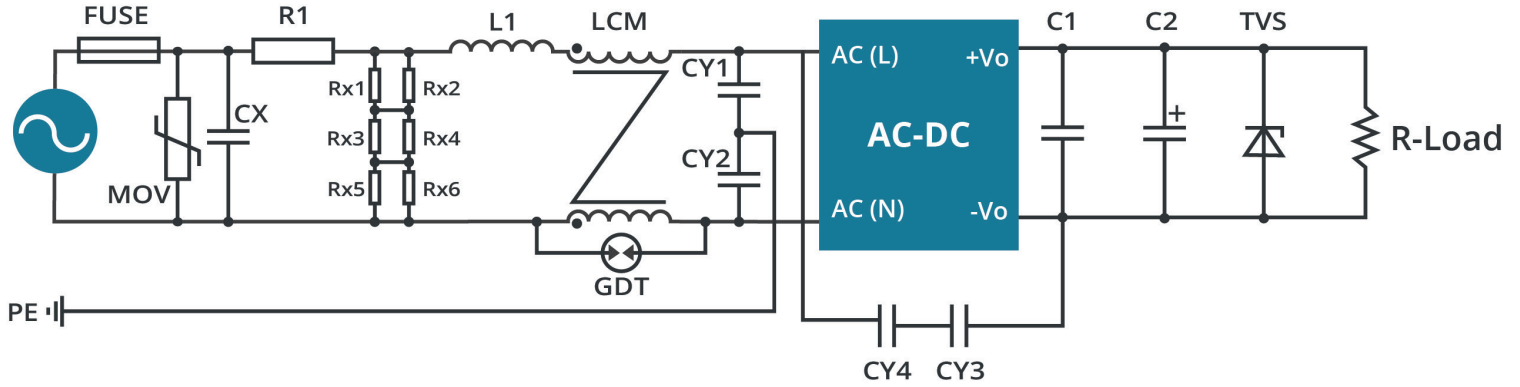


Table 2

Components	Recommended Value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
R1	6.8Ω/3W

EMC RECOMMENDED CIRCUIT (CONTINUED)

Figure 3
RECCOMENDED 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

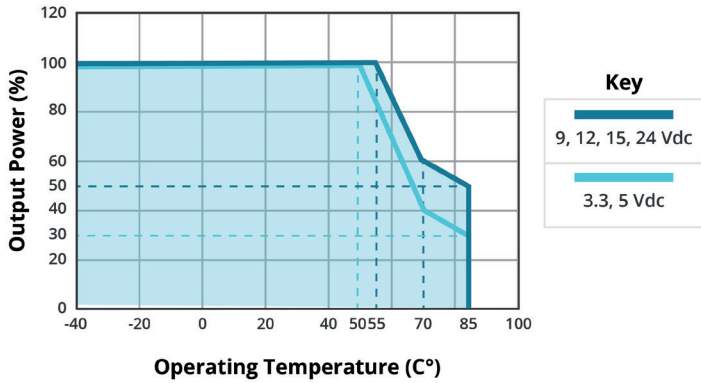
Table 3

Components	Recommended Value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
CX	334K/305Vac
R1	12Ω/5W (wire-wound resistor, required)
L1	1.2mH/0.5A
CY1/CY2	2.2nF/400Vac
CY3/CY4	1nF/400Vac
GDT	300V/1KA
LCM	20mH

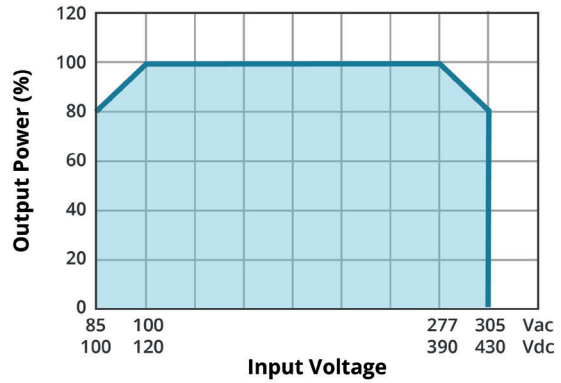
Note: Rx1/Rx2/Rx3/Rx4/Rx5/Rx6 is the bleeder resistance of CX, and the recommended resistance value is 1.5MΩ/150Vdc.

DERATING CURVE

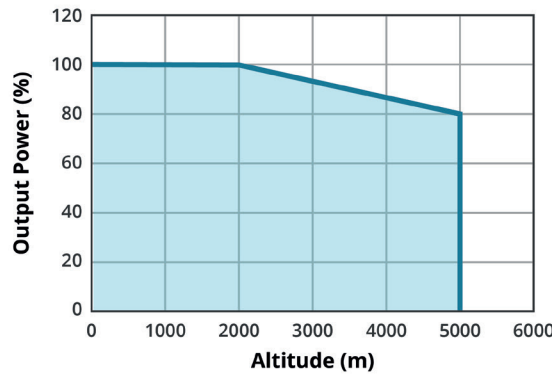
TEMPERATURE DERATING CURVE



INPUT VOLTAGE DERATING CURVE (25°C)



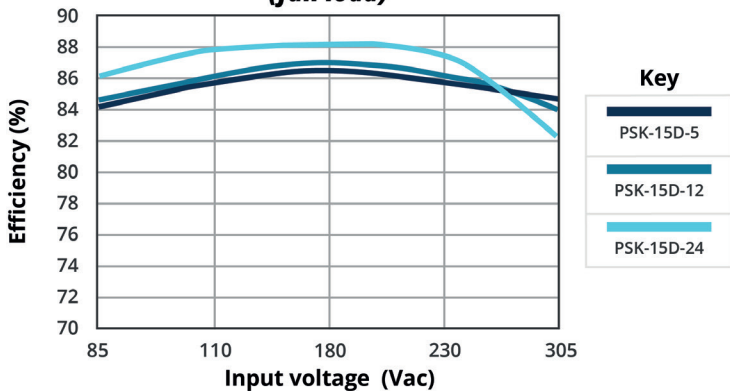
ALTITUDE DERATING CURVE (25°C)



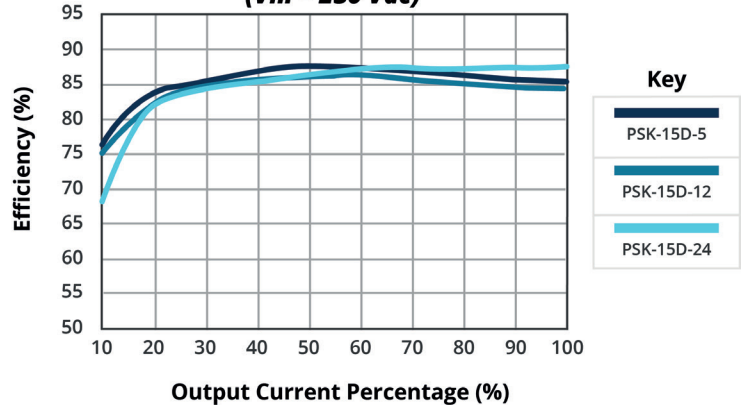
Note: 1. With an AC input between 85~100V/277~305Vac and a DC input between 100~120V/390~430Vdc, the output power must be derated as per temperature derating curves.
 2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult with CUI.

EFFICIENCY CURVES

EFFICIENCY VS INPUT VOLTAGE (full load)



EFFICIENCY VS OUTPUT LOAD (Vin = 230 Vac)



REVISION HISTORY

rev.	description	date
1.0	initial release	02/15/2021
1.01	over voltage category added to features	04/06/2021
1.02	per PCN-65631480R-01, the no-load power consumption of the 5 Vdc and 12 Vdc output variants was modified to 0.3 W (max) for all date codes 2148 (YYWW) or later	12/13/2021
1.03	derating and efficiency curves updated	01/25/2022
1.04	no load power consumption updated	05/03/2022
1.05	added UKCA	05/26/2022
1.06	medical icon added	05/04/2023
1.07	isolation voltage updated, EMC circuit for Class I added	01/10/2024
1.08	no load power consumption updated	03/05/2024

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



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