SERIES: PSK-20D | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY

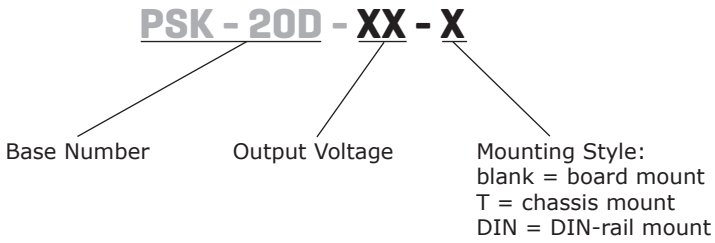
FEATURES

- 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 (Vdc)	output current max (A)	output power max (W)	ripple and noise[1] max (mVp-p)	efficiency[2] typ (%)
PSK-20D-3	3.3	4.5	14.85	150	81
PSK-20D-5	5	4.0	20.0	150	85
PSK-20D-9	9	2.2	20.0	150	85
PSK-20D-12	12	1.67	20.0	150	86
PSK-20D-15	15	1.33	20.0	150	87
PSK-20D-24	24	0.83	20.0	150	87

Notes: 1. At full load, nominal input, 20 MHz bandwidth oscilloscope, with 1 µF ceramic and 10 µF 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.

PART NUMBER KEY



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			0.5 0.3	A A
inrush current	115 Vac 230 Vac		25 45		A A
leakage current	277 Vac/50 Hz			0.1	mA

OUTPUT

parameter	conditions/description	min	typ	max	units
capacitive load	3.3 Vdc 5 Vdc 9 Vdc 12 Vdc 15 Vdc 24 Vdc			8,000 8,000 5,400 4,000 3,000 1,000	µF µF µF µF µF µF
output voltage accuracy			±1.5		%
line regulation	at full load		±0.5		%
load regulation	0~100% load		±1.0		%
hold-up time	115 Vac 230 Vac		8 50		ms ms
switching frequency			65		kHz
no load power consumption	230 Vac 3.3 Vdc, 5 Vdc, 9 Vdc, 12 Vdc, 15 Vdc outputs 24 Vdc output		 0.1 0.12		 W W

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	clamp or hiccup 3.3 & 5 Vdc output 9 Vdc output 12 & 15 Vdc output 24 Vdc output			 7.5 15 20 30	 V V V 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/EN55032 CLASS B CISPR11/EN55011 CLASS B EN55014-1				
ESD	IEC/EN 61000-4-2 Contact ±6KV / Air ±8KV perf. Criteria A IEC/EN55014-2 perf. Criteria A				
radiated immunity	IEC/EN61000-4-3 10V/m perf. Criteria A IEC/EN55014-2 perf. Criteria A				

SAFETY & COMPLIANCE

EFT/burst	IEC/EN61000-4-4 ±2KV perf. Criteria A IEC/EN61000-4-4 ±4KV (See Fig.2 for recommended circuit) perf. Criteria A IEC/EN55014-2 perf. Criteria A				
surge	IEC/EN61000-4-5 line to line ±1KV perf. Criteria A IEC/EN61000-4-5 line to line ±2KV (See Fig.2 for recommended circuit) perf. Criteria A IEC/EN55014-2 perf. Criteria A				
conducted immunity	IEC/EN61000-4-6 10Vr.m.s perf. Criteria A IEC/EN55014-2 perf. Criteria A				
voltage dips and interruption	IEC/EN61000-4-11 0%, 70% perf. Criteria B IEC/EN55014-2 perf. Criteria B				
MTBF	MIL-HDBK-217F at 25°C	1,500,000			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

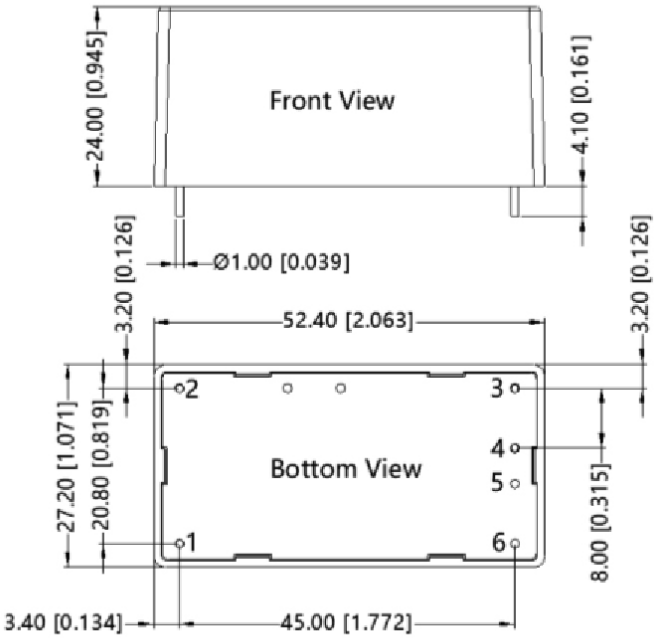
MECHANICAL

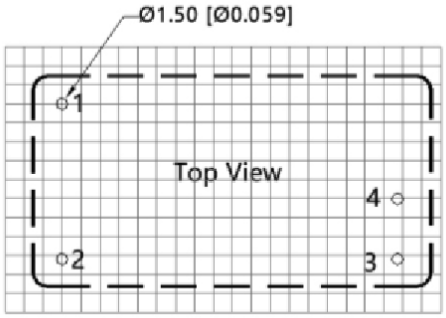
parameter	conditions/description	min	typ	max	units
dimensions	DIP: 52.40 x 27.20 x 24.00 chassis mount: 76.00 x 31.50 x 32.80 DIN-rail: 76.00 x 31.50 x 37.40				mm mm mm
weight	DIP chassis mount DIN-rail		55 75 95		g g g
case material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				

MECHANICAL DRAWING

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

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



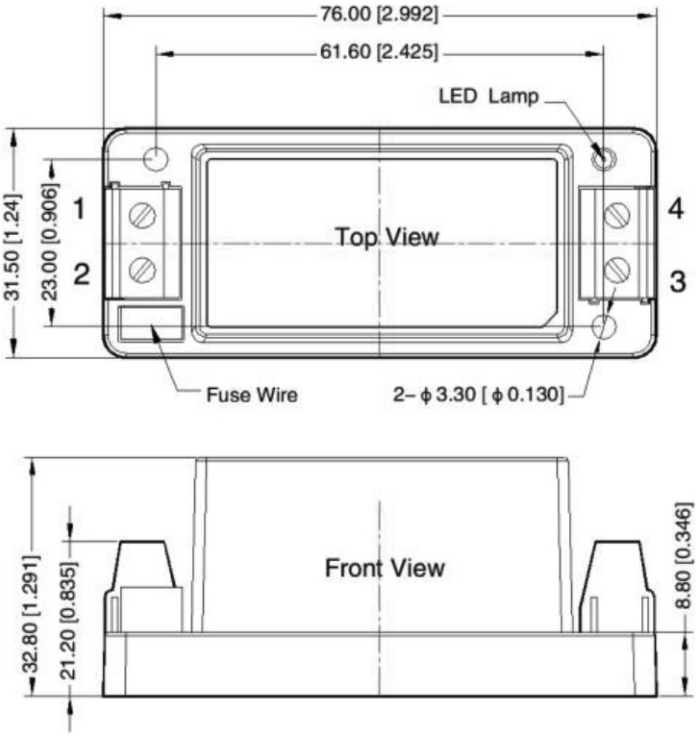


Note: Grid 2.54*2.54mm

MECHANICAL DRAWING

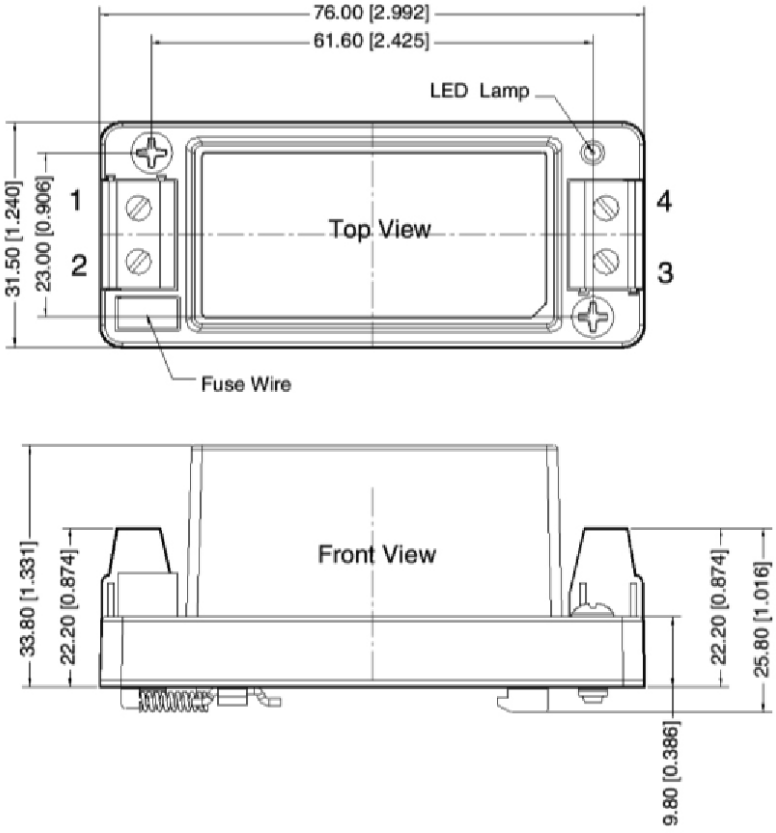
units: mm [inch]
wire range: 24~12 AWG
tightening torque: Max 0.4 N·m
tolerance: ±1.0 [±0.039]

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

Output Filtering Components:
C1 should be a ceramic capacitor and the TVS will help protect downstream electronics in the unlikely event of converter failure.

Figure 1

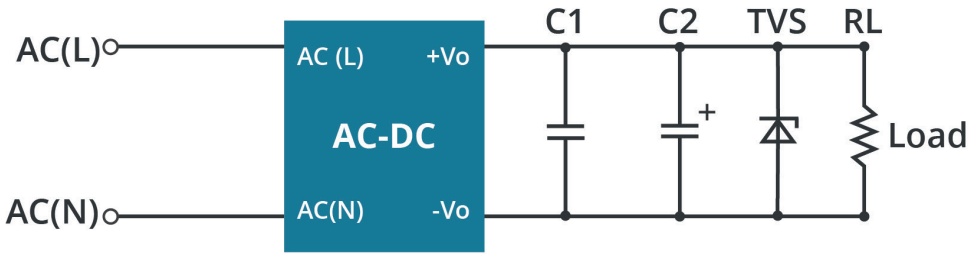


Table 1

Part No.	C1(μF)	C2(μF)	TVS
PSK-20D-3	1μF/50V	10μF/16V	SMBJ7.0A
PSK-20D-5		10μF/16V	SMBJ7.0A
PSK-20D-9		10μF/25V	SMBJ12A
PSK-20D-12		10μF/25V	SMBJ20A
PSK-20D-15		10μF/25V	SMBJ20A
PSK-20D-24		10μF/35V	SMBJ30A

Note: 3.15A / 300V, slow-blow fuse integrated into unit

EMC RECOMMENDED CIRCUIT

Figure 2
EMC APPLICATION CIRCUIT WITH HIGHER REQUIREMENTS

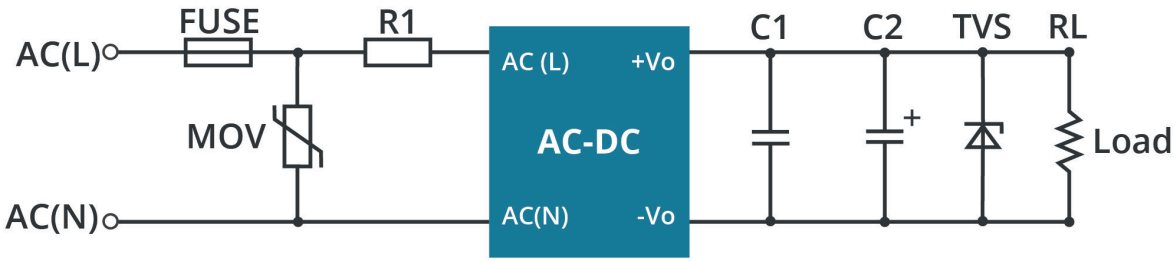
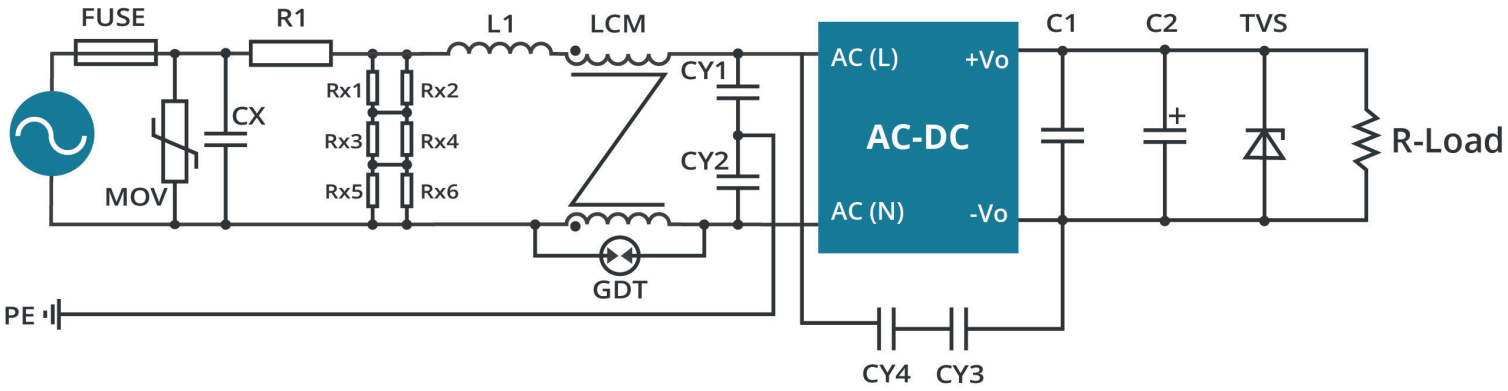


Table 2

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

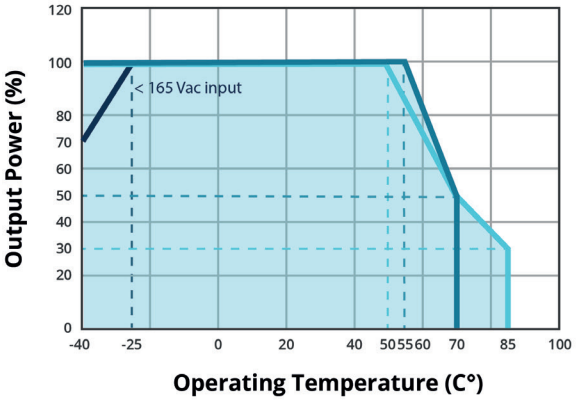
Table 3

Components	Recommended Value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
CX	334K/305Vac
R1	6.8Ω/5W (wire-wound resistor, required)
L1	1.2mH/0.5A
CY1/CY2	2.2nF/400Vac
CY3/CY4	1nF/400Vac
GDT	300V/1KA
LCM	20mH

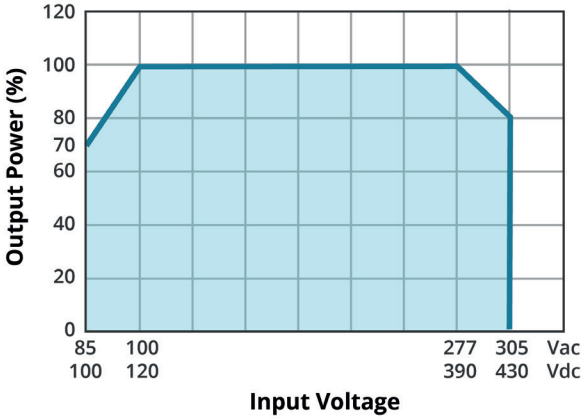
Note: Rx1/Rx2/Rx3/Rx4/Rx5/Rx6 is the bleeder resistance of CX, and the recommended resistance value is 1.5MΩ/150Vdc.

DERATING CURVE

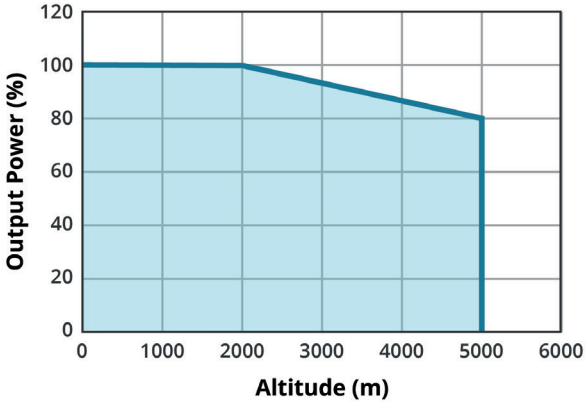
TEMPERATURE DERATING CURVE



INPUT VOLTAGE DERATING CURVE (25°C)



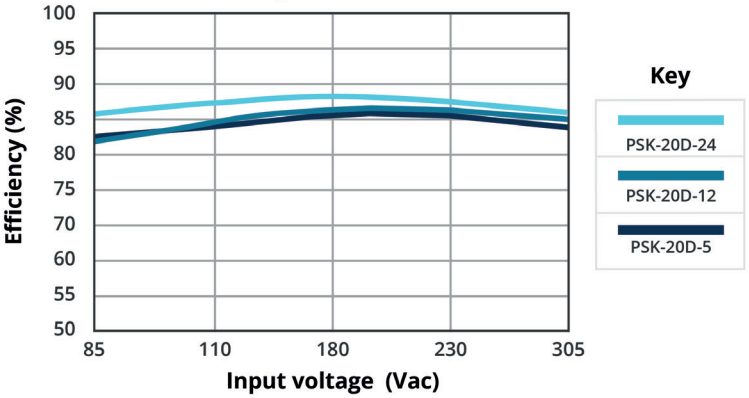
ALTITUDE DERATING CURVE (25°C)



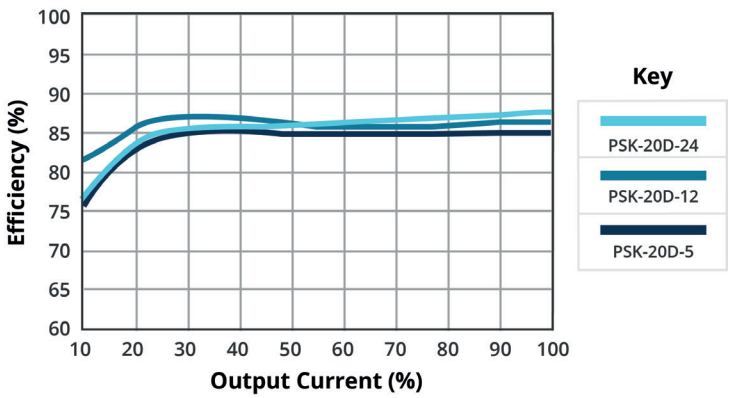
Note: 1. With an AC input between 85~100V/277~305Vac and a DC input between 100~120V/390~430Vdc, the output power must be derated as per temperature derating curves.
2. This product is suitable for applications using natural air cooling; for applications in closed enviroment please consult with CUI.

EFFICIENCY CURVES

EFFICIENCY VS INPUT VOLTAGE (full load)



EFFICIENCY VS OUTPUT LOAD (Vin = 230 Vac)



REVISION HISTORY

rev.	description	date
1.0	initial release	01/27/2021
1.01	over voltage category added to features	04/06/2021
1.02	derating and efficiency curves updated	01/27/2022
1.03	UKCA mark added	06/13/2022
1.04	safeties updated	01/16/2023
1.05	medical icon added	05/04/2023
1.06	isolation voltage updated, 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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