

PMR10D Series



10W, Encapsulated, AC/DC Converters

Features

- ▶ Rated power: 10W Max
- ▶ Universal input: 85~305VAC, 47~63Hz
- ▶ Regulated single output
- ▶ Isolation voltage 4000VAC
- ▶ Typical efficiency 74 ... 85%
- ▶ Energy saving, standby power only about 0.1W
- ▶ Operating temperature range: -40~+85°C
- ▶ RoHS compliance
- ▶ Compact DIP package
- ▶ Over voltage, over current and short circuit protection
- ▶ Certified to UL/EN/IEC 62368-1, OVC III, EN60335-1, EN61558-1, FCC, UKCA, CISPR32, EN55032 Class B with NO externals
- ▶ 5 year warranty



*UL Certification is process.

Overview

PMR10D series are compact size AC/DC power converters, featuring universal input voltage range, low stand by power consumption, high efficiency. Designed for high reliability industrial applications, these converters are encapsulated to protect from dust and moisture. They meet IEC/EN/UL62368-1, OVC III, EN60335-1, EN61558-1, FCC, UKCA and EMC performance meets CISPR32, EN55032 Class B without support from any external components, ideally suitable for industrial, and critical commercial applications.

Model Numbers

Model Number	Input Voltage [VAC]	Output Voltage [VDC]	Output Current [mA] Max.	Efficiency [%] Typ.	Capacitive Load [uF] Max.
PMR10D-033	85~305VAC 100~430VDC	3.3	2600	75	6000
PMR10D-050		5	2000	79	5000
PMR10D-090		9	1100	81	3600
PMR10D-120		12	830	83	2000
PMR10D-150		15	660	84	820
PMR10D-180		18	556	84	820
PMR10D-240		24	410	85	470

Electrical Specifications

Unless otherwise indicated, specifications are measured at $T_A=25^{\circ}\text{C}$, humidity<75%, nominal input voltage and rated output load.

Parameters	Conditions	Min.	Typ.	Max.	Unit
Input voltage range	AC in	85	-	305	VAC
	DC in	100	-	430	VDC
Input frequency		47	-	63	Hz
Nominal input voltage		100	-	277	VAC
Input current	115VAC 230VAC	-	-	0.23 0.15	A
Inrush current Cold start	115VAC 230VAC	-	25 45	-	A
Leakage current	277VAC, 50Hz	-	-	0.1	mA RMS
Output voltage accuracy		-	± 2	-	%
Line regulation	Full load	-	± 0.5	-	%
Load regulation	$I_{OUT}=0\%\sim 100\%$ of $I_{OUT, rated}$	-	± 1.0	-	%
Ripple and noise [2]	20MHz bandwidth	-	60	150	mVp-p
Temperature coefficient		-	± 0.02	-	%/ $^{\circ}\text{C}$
Standby power consumption		-	0.10	-	W
Hold up time Full load	115VAC 230VAC	-	10 40	-	mS
Over voltage protection Hiccup or clamping by zener diode	$V_{OUT}=3.3, 5\text{V}$ $V_{OUT}=9\text{V}$ $V_{OUT}=12, 15\text{V}$ $V_{OUT}=24\text{V}$	-	-	7.5 15 20 30	VDC
Over current protection	Automatic recovery	110	-	-	% I_{OUT}
Short circuit protection		Hiccup mode, automatic recovery			
Minimum load		No minimum load is required			
Recommended external fuse		2A, 300V slow blow *required*			

Note [2]: Ripple and noise measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor.

PMR10D Series

10W, Encapsulated, AC/DC Converters

General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage Tested for 1 minute	I/P to O/P	4000	-	-	VAC
Isolation resistance 500VDC, 25°C, 70%RH	I/P to O/P	100	-	-	M Ohm
Switching frequency		-	65	-	KHz
Operating temperature range	See "Derating Curve"	-40	-	85	°C
Storage temperature		-40	-	105	°C
Storage humidity		10	-	95	%RH
Maximum case temperature		-	-	95	°C
Operating altitude	See "Derating Curve"	-	-	5000	m
Soldering temperature	5 seconds	-	260	-	°C
Case material		Black plastic UL94-V0			
Cooling method		Free air convection			
Vibration		10Hz to 55Hz, 5G, 30 minutes along X, Y and Z axis			
MTBF	MIL-HDBK-217F	> 1,500,000 Hours, 25°C			
Overvoltage category		OVC III			
Safety class		Class II			
Safety standards		UL/EN/IEC 62368-1, UKCA, EN 60335-1, EN 61558-1			
EMC standards	CISPR32, EN55032	Class B with "NO External Circuit"			
ESD	IEC/EN61000-4-2	Contact ±6kV, Air ±8kV, perf. Criteria B			
Radiated	IEC/EN61000-4-3	10V/m, perf. Criteria A			
EFT, Burst	IEC/EN61000-4-4	±2kV, perf. Criteria B ^[3] ±4kV, perf. Criteria B ^[4]			
Surge	IEC/EN61000-4-5	Line to Line ±1kV, perf. Criteria B ^[3] Line to Line ±2kV, perf. Criteria B ^[4]			
Conducted	IEC/EN61000-4-6	10Vrms, perf. Criteria A			
Voltage dips and interruptions	IEC/EN 61000-4-11	0%, 70%, perf. Criteria B			
Size, and Weight		40x25.4x21.5mm, 33g			
Packing info	288 PCS/Carton	Size: 405x370x265mm, G.W. 11Kg Typ.			

Note ^[3]: with External Circuit Figure 1,

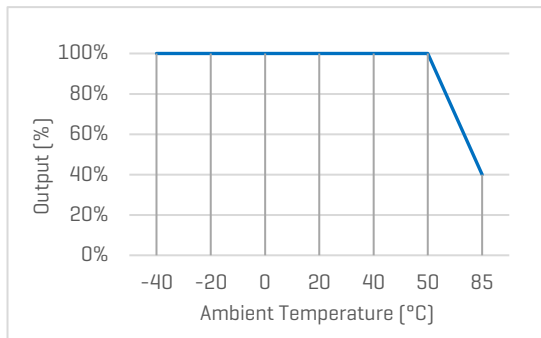
Note ^[4]: with External Circuit Figure 2

Characteristic Curves

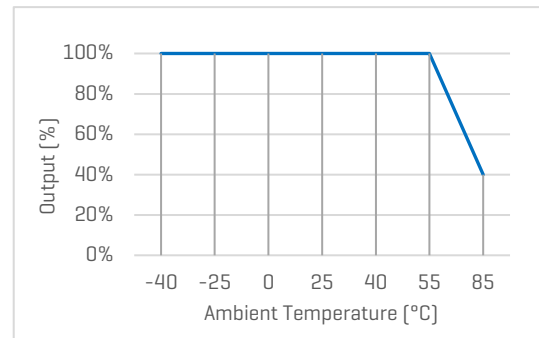
Derating Curves

Output vs Ambient Temperature

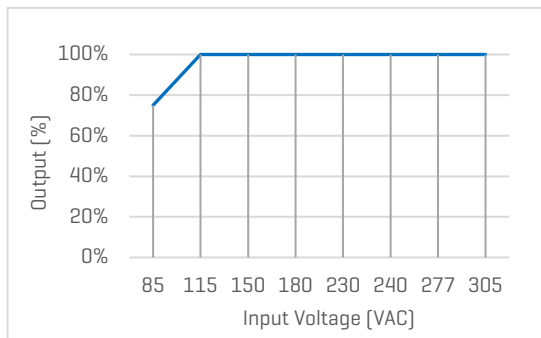
$V_{OUT}=3.3, 5V$



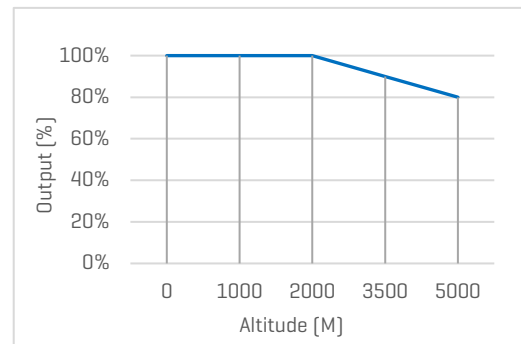
$V_{OUT}=9 \dots 24V$



Output vs Input Voltage

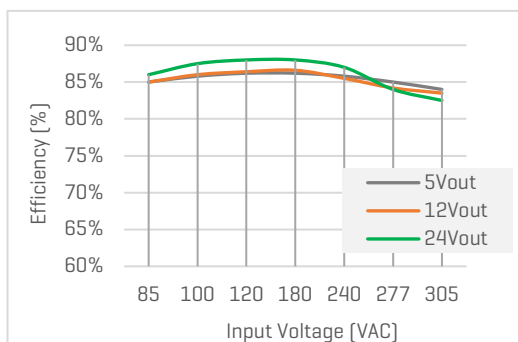


Output vs Altitude

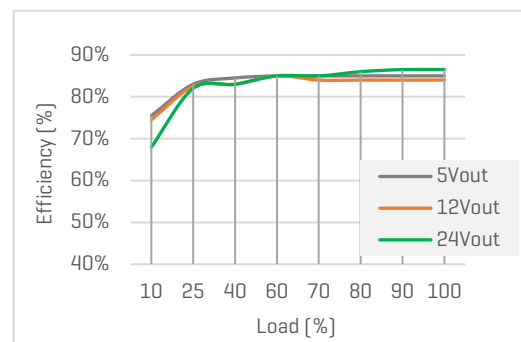


Efficiency Curves

Efficiency vs Input Voltage



Efficiency vs Load



Recommended External Circuits

Typical External Circuit

Components with "" are required. The other components are highly recommended.

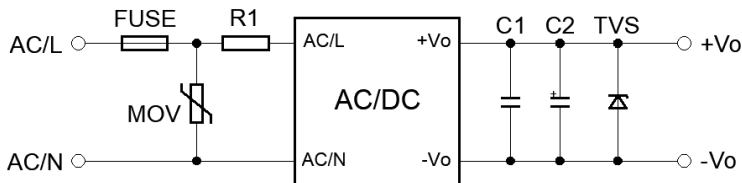


Figure 1. Typical external circuit

Recommended Components [Table 1]

SPEC	FUSE*	MOV	R1*	C1	C2	TVS
$V_{out}=3.3, 5V$	2A, 300V	14D561K	6.8 Ohm, 5W	1uF, 50V	220uF, 35V	SMBJ7.0A
$V_{out}=9, 12, 15V$	2A, 300V	14D561K	6.8 Ohm, 5W	1uF, 50V	100uF, 35V	SMBJ12A
$V_{out}=18, 24V$	2A, 300V	14D561K	6.8 Ohm, 5W	1uF, 50V	100uF, 35V	SMBJ20A

* For further questions contact one of our sales representatives.

EMC Enhancement for EN55032 Class B

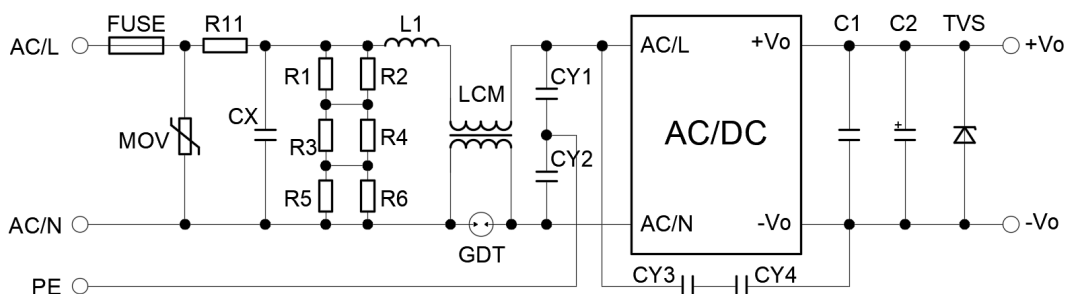


Figure 2. Circuit for EMC Enhancement

[Table 2] Recommended Components

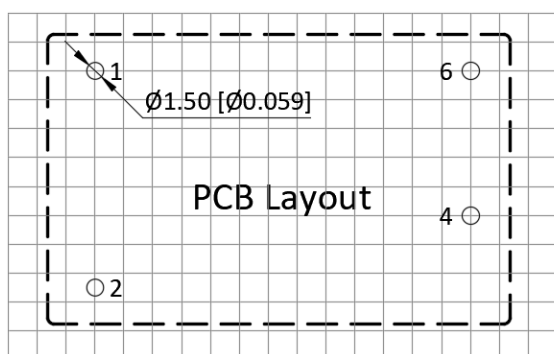
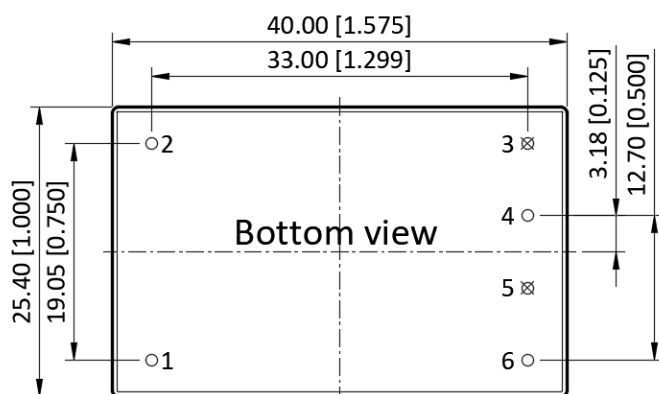
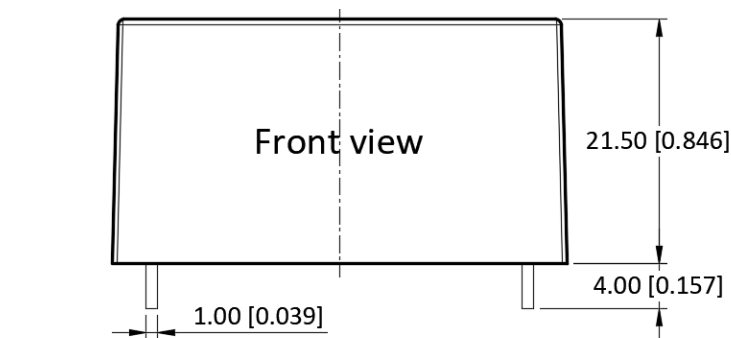
MOV	CX	R11*	L1	LCM	GDT	CY1, CY2	CY3, CY4
14D561K	0.33uF, 305VAC	12 Ohm, 5W	1.2mH, 0.5A	22mH	300V, 1KA	2.2nF, 400VAC	1nF, 400VAC

R11 is wire-wound resistor, FUSE* is required, R1 ... R6 [1.5Mohm, 1206] is the bleeder resistance of CX

*Other components see the same in Table 1

Mechanical Specifications

Default Package



Pin Definition

Pin #	Single Out
1	AC [L]
2	AC [N]
3	No Pin
4	+V _{OUT}
5	No Pin
6	-V _{OUT}

* Unless otherwise specified unit: mm [inch]

* General tolerance: ± 1.00 [± 0.040]

* Pin thickness: ± 0.15 [± 0.006]

* Pin distance: ± 0.50 [± 0.020]

* Footprint grid 2.54 x 2.54 mm