PMR05D Series

5W, Encapsulated, AC/DC Converters

Features

- Rated power: 5W Max
- Universal input: 85~305VAC, 47~63Hz
- Regulated single output
- Isolation voltage 4000VAC
- Typical efficiency 70 ... 79%
- Energy saving, standby power only 0.1W
- Over voltage, over current and short circuit protection
- Operating temperature range: -40~+85°C
- RoHS compliance
- Compact 1"x1" package with Optional chassis for chassis and DIN Rail installation
- Low profile 15mm height
- Certified to UL/EN/IEC 62368-1, OVC II, EN60335-1, EN61558-1, FCC, UKCA, CISPR32, EN55032 Class B with NO externals
- 3 year warranty

Overview

PMR05D 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 are certified to UL/EN/IEC 62368-1, 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 [1]	Input Voltage [VAC]	Output Voltage [VDC]	Output Current [mA] Max.	Efficiency [%] Typ.	Capacitive Load [uF] Max.
PMR05D-033	85~305VAC 100~430VDC	3.3	1200	70	3000
PMR05D-050		5	1000	74	3000
PMR05D-090		9	555	78	1200
PMR05D-120		12	416	79	1200
PMR05D-150		15	333	79	680
PMR05D-240		24	208	79	220

Note [1]: To indicate optional configurations, please add suffixes to the model numbers: For example, **PMR05D-120CR** for a unit equipped with terminal block chassis for DIN Rail installation. Optional chassis will result in a 2% efficiency reduction. Efficiency is tested under 230VAC

Electrical Specifications

Unless otherwise indicated, specifications are measured at T_A=25°C, humidity<75%, nominal input voltage and rated output load.

Parameters	Conditions	Min.	Typ.	Max.	Unit
Input voltage range	AC in DC in	85 100	-	305 430	VAC VDC
Input frequency		47	-	63	Hz
Nominal input voltage		100	-	277	VAC
Input current	115VAC 230VAC	-	-	0.12 0.07	A
Inrush current Cold start	115VAC 230VAC	-	15 25	-	A
Leakage current	277VAC, 50Hz	-	-	0.25	mA RMS
Output voltage accuracy		-	±3	-	%
Line regulation	Full load	-	±0.5	-	%
Load regulation	I_{OUT}=0%~100% of $I_{OUT, rated}$	-	±1.0	-	%
Ripple and noise [2]	20MHz bandwidth	-	50	100	mVp-p
Temperature coefficiency		-	±0.02	-	%/°C
Standby power consumption		-	0.1	-	W
Hold up time Full load	115VAC 230VAC	-	5 50	-	mS
Over voltage protection Hiccup or clamping by zener diode	V_{OUT}=3.3, 5V V_{OUT}=9, 12V V_{OUT}=15V V_{OUT}=24V	-	-	7.5 17 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		1A, 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.

General Specifications

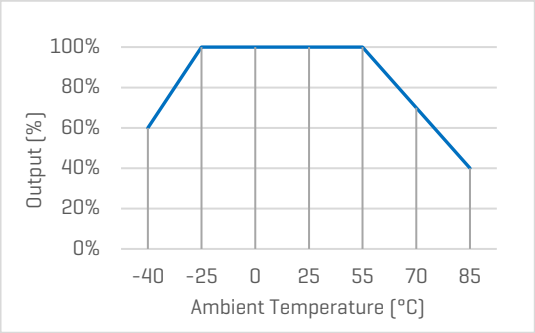
Parameters	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage Tested for 1 minute	I/P to O/P	4000	-	-	VAC
Isolation resistance 500VDC, 25°C, 70%RH	I/P to O/P	100	-	-	M Ohm
Switching frequency		-	65	-	KHz
Operating temperature range	See "Derating Curve"	-40	-	85	°C
Storage temperature		-40	-	105	°C
Storage 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 II			
Safety class		Class II			
Safety approvals		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		25.4x25.4x15mm, 16g			
Packing info	720 PCS/Carton	421x368x258mm, 13Kg G.W.			

Note [3]: with External Circuit Figure 1, Note [4]: with External Circuit Figure 2

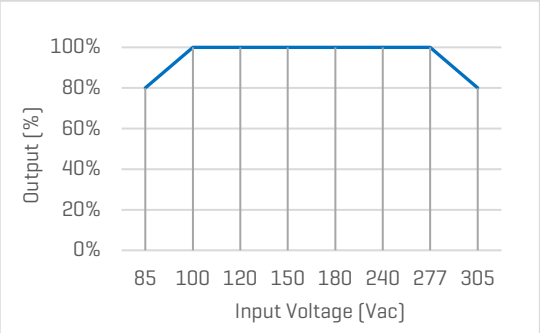
Characteristic Curves

Derating Curves

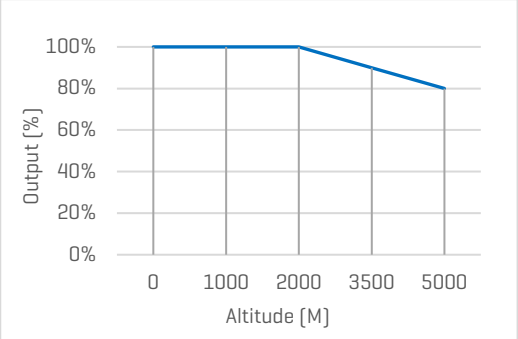
Output vs Ambient Temperature



Output vs Input Voltage

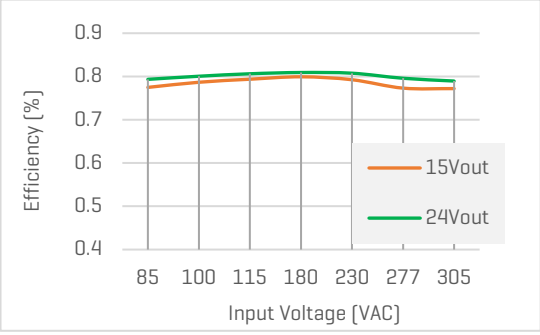


Output vs Altitude

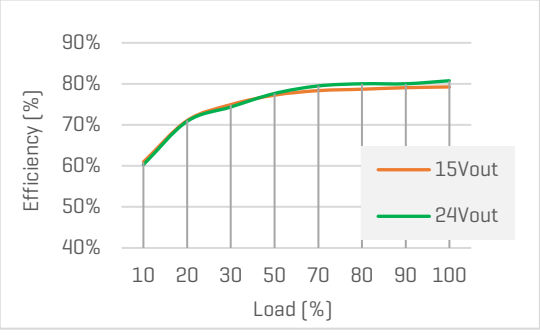


Efficiency Curves

Efficiency vs Input Voltage



Efficiency vs Load



Recommended External Circuits

Typical External Circuit

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

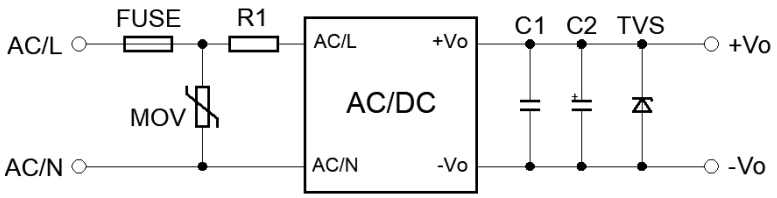


Figure 1. Typical external circuit

Recommended Components [Table 1]

SPEC	FUSE*	MOV	R1*	C1	C2	TVS
V_{OUT}=3.3, 5V	1A, 300V	10D681K	12 Ohm, 3W	1uF, 50V	150uF, 16V	SMBJ7.0A
V_{OUT}=9V	1A, 300V	10D681K	12 Ohm, 3W	1uF, 50V	120uF, 35V	SMBJ12A
V_{OUT}=12, 15V	1A, 300V	10D681K	12 Ohm, 3W	1uF, 50V	120uF, 35V	SMBJ20A
V_{OUT}=24V	1A, 300V	10D681K	12 Ohm, 3W	1uF, 50V	68uF, 35V	SMBJ30A

* For further questions contact one of our sales representatives.

EMC Enhancement for EN55032 Class B

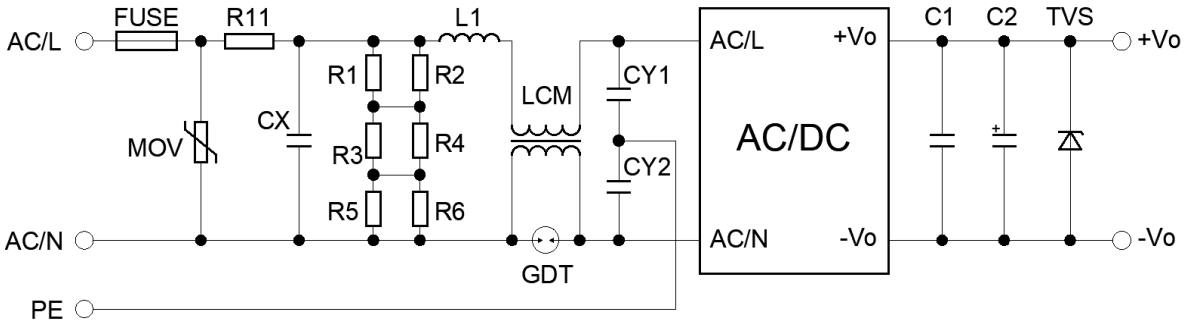


Figure 2. Circuit for EMC Enhancement

[Table 2] Recommended Components

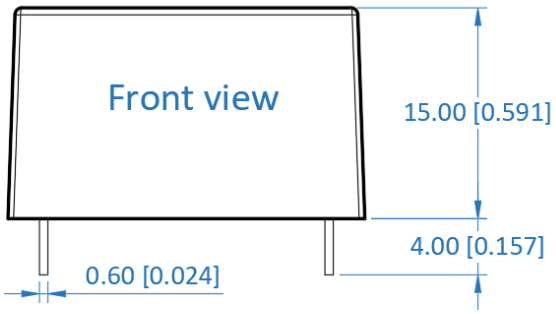
MOV	CX	R11	L1	LCM	GDT	CY1, CY2
14D681K	334K, 305VAC	33 Ohm, 3W	1.2mH, 0.3A	20mH	300V, 1KA	1nF, 400VAC

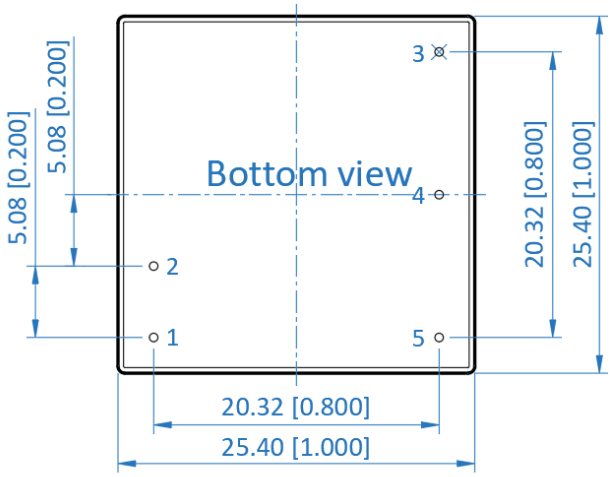
*FUSE to be 2A, 300V, slow blow. *R1 ... R6 is the bleeder resistance of CX – 1.5Mohm, 150VDC
*Other components see the same in Table 1

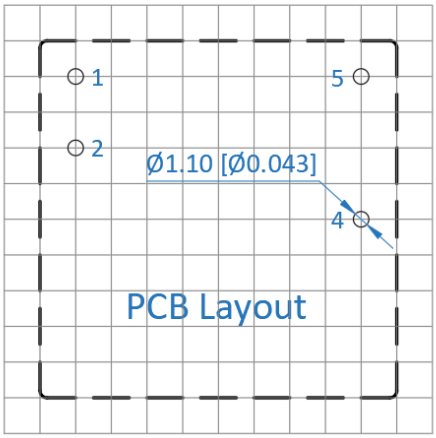
Mechanical Specifications

Default Package

Model numbers with no suffix







Pin Definition

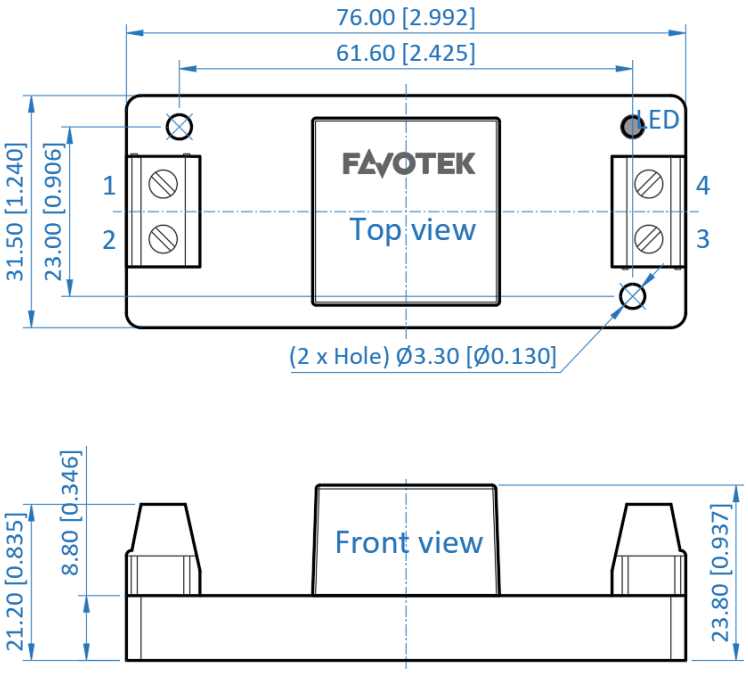
Pin #	Single Out
1	AC [N]
2	AC [L]
3	No Pin
4	$-V_{OUT}$
5	$+V_{OUT}$

* 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

Mechanical Specifications

Suffix "CT" for Chassis Installation

Add suffix "CT" to the model numbers for an optional chassis equipped for chassis installation.



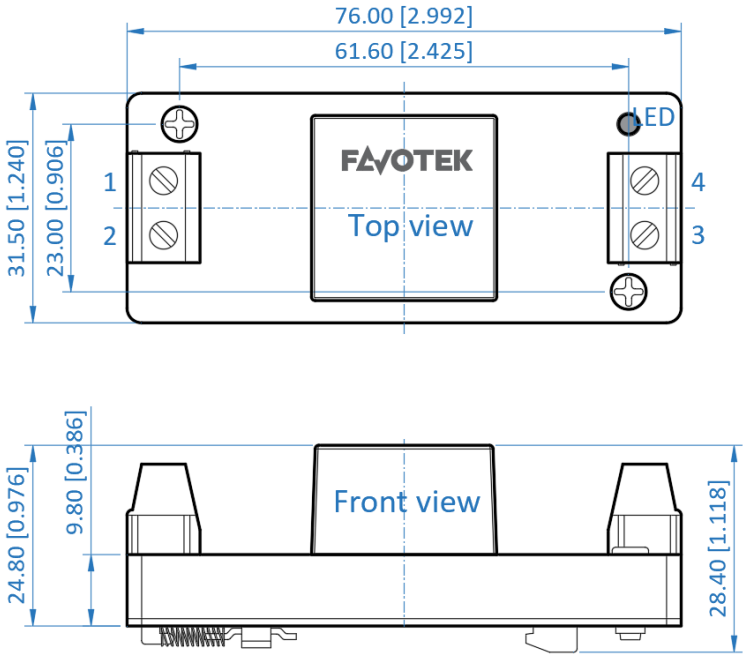
Pin Definition

Pin #	Single Out
1	AC (L)
2	AC (N)
3	$-V_{OUT}$
4	$+V_{OUT}$

* Unless otherwise specified unit: mm [inch]
* General tolerance: ±1.00 [±0.040]
* Tightening torque: 0.4 Nm Max.
* Wire gauge to chassis: 12~24 AWG

Suffix "CR" for DIN Rail Installation

Add suffix "CR" to the model numbers for an optional chassis equipped for DIN Rail installation.



Pin Definition

Pin #	Single Out
1	AC (L)
2	AC (N)
3	$-V_{OUT}$
4	$+V_{OUT}$

* Unless otherwise specified unit: mm [inch]
* General tolerance: ±1.00 [±0.040]
* Tightening torque: 0.4 Nm Max.
* Wire gauge to chassis: 12~24 AWG