

PPMxx-SB-xxELF



PPM-SIP-SERIES Rev.09-2013

- ✓ **3.3 - 5 Watt**
- ✓ **Univ. 100-400VDC / 85-264VAC***
- ✓ **Single Output**
- ✓ **Short Circuit Protection**
- ✓ **Over Current Protection**
- ✓ **3 kV AC I/O Isolation**

The PPM-SIP-Series are high efficiency modules with miniature packaging provided by Peak. The features of this series are: wide input voltage, DC and AC all in one, high efficiency, high reliability, low loss, safety isolation etc. They are widely used in industrial, office and civil equipments, as well as applications where no special requirement for EMC performance. It is recommended to add EMI suppression circuit or take measure to shield when there is strict requirement for EMC performance.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

Input Specifications

Input Voltage Range	100 – 400 VDC or 85 – 264 VAC* universal		
	<u>115VAC</u>	<u>230VAC</u>	
Input Current	0.2A	0.1A	max.
Inrush Current	20A	30A	
Input Frequency	47-36 Hz		

*** Attention: For AC-Input a capacitor between PIN 5 and PIN 7 is needed!! (See page 4)**

Output Specifications

Voltage Accuracy	±1% (at 3.3Vout ±2%)
Line Regulation	±0.5%, typ.
Load Regulation (10-100%)	±1%, typ.
Ripple and Noise (20Mhz bandwidth)	50mV pk-pk typ.
Short Circuit Protection	Continuous, auto recovery
Min. Load	10%
Over Current / Over Voltage Protection	Auto Recovery
Hold-Up Time	at 115VAC 20mS ; at 230VAC 80mS

Common Specifications

Temperature Range	-25°C to +85 °C
Power Derating	1.33% / °C (above 55°C)
Surface Temperature	+100°C, max.
Storage Temperature	-40°C to +105 °C
Humidity (non condensing)	85%, max.
Temperature Coefficient	0.02%/°C
Switching Frequency	100kHz, typ.
I/O Isolation Voltage	3000VAC / 1min.
Isolation Resistance	100 MOhm
Leakage Current	0.25mA
Weight	10g
Cooling	Free air convection
Safety Standards	IEC60950/EN60950/UL60950
Safety Class	Class II
Hot Swap	Forbid
Install	PCB
Reliability Calculated MTBF	> 300,000 hrs

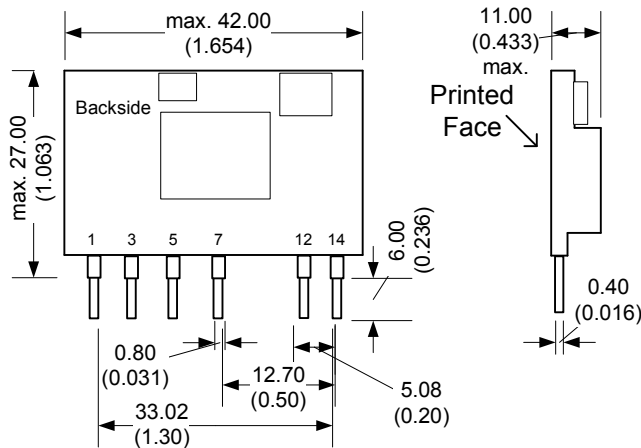
PPM-SIP-Series – PPMxx-SB-xxELF – Single Output - Plastic Case
Specification can change without a notice – We accept no liability for any inaccuracy or printing errors.

Selection Guide

Order #	Power (W)	Output Voltage (Vdc)	Output Current Full Load (mA)	Capacitive Load (uF), max.	Ripple & Noise, max.	Efficiency (%)
SINGLE OUTPUT						
PPM3.3-SIP-3R3ELF	3.3	3.3	1000	2200	150mV	65
PPM5-SIP-05ELF	5	5	1000	1500	120mV	70
PPM5-SIP-09ELF	5	9	560	680	120mV	72
PPM5-SIP-12ELF	5	12	420	470	120mV	74
PPM5-SIP-15ELF	5	15	340	330	120mV	75
PPM5-SIP-24ELF	5	24	210	100	150mV	75

If you need other specifications, please enquire.

Package / Pinning / Derating



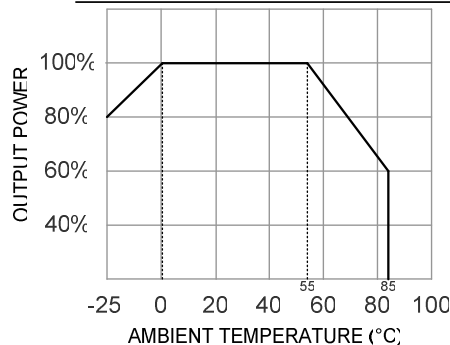
All dimensions are typical in millimeters (inches).
 - Pin section tolerance: +/-0.10 (+/-0.004)
 - Case tolerance +/-0.5 (+/-0.02)
 Specification may change without notice.

SIP – AC/DC

PIN CONNECTIONS	
#	SINGLE
1	- Vin
3	+ Vin
5	+ CAP
7	GND
12	- Vout
14	+ Vout

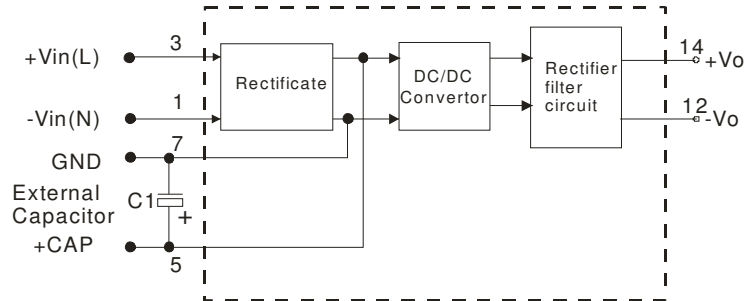
- It is necessary to add C1 between Pin 5 and Pin 7
- It is necessary to add PI-Type filter circuit to the output, such as the typical application of Figure 1

TEMPERATURE DERATING GRAPH

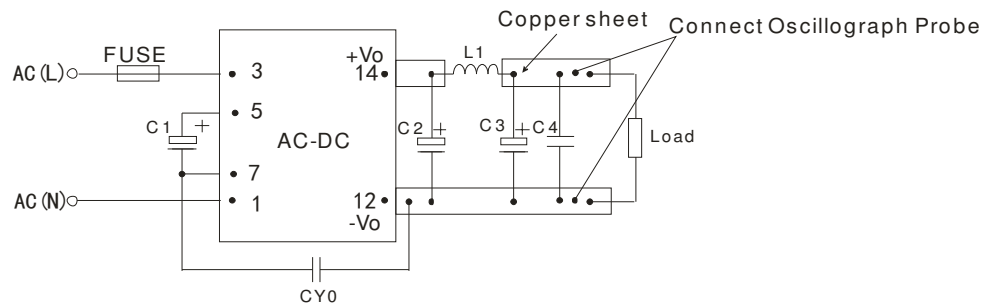


App Notes:

Structure Figure



Ripple and Noise Measure Figure



Typical Application

Fig. 1: Standard

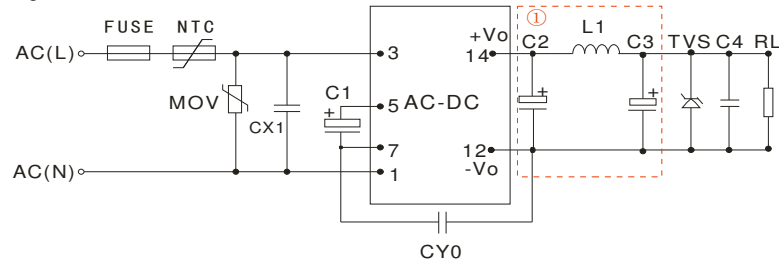
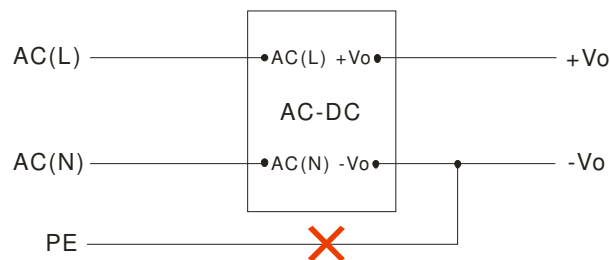


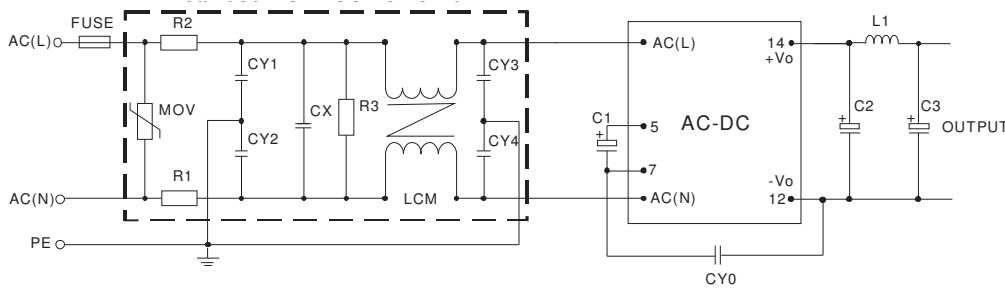
Fig. 2: This application is not supported for this Series



App Notes:

EMC Recommended Circuit PCB Layout

Fig. 3: EMC Standard



Attention: For AC-Input a capacitor (10uF/400V) between PIN 5 and PIN 7 is needed!!

External Capacitor Typical Value

Output	C1	C2	L1	C3	CX1	C4	CY0	FUSE	TVS
3.3V	22μF/400V	470μF/10V	0.47uH	150μF/35V	0.1μF/ 275VAC	0.1μF/ 50VAC	0.1μF/ 400VAC	1A/250V	SMBJ7.0A
5V		470μF/16V							SMBJ12A
9V		330μF/25V	1uH						SMBJ20A
12V			47μF/35	SMBJ30A					
15V									
24V		100μF/35V	0.47uH						

Note:

1. C1, C2 and C3 are electrolytic capacitors. They are required at AC input and DC input.

When the AC input, C1 is used as filter capacitor, the value of C1 is recommended to be 22μF /400V. When the DC input, C1 is used as EMC filter capacitor, the value of C1 is recommended to be 10μF/400V (when the input voltage is above 370VDC, the recommended value of C1 is 10μF/450V). C2 and C3 are output filter capacitors, they are recommended to be high frequency and low impedance electrolytic capacitors. Capacitance and rated ripple current of capacitors refer to the datasheets provided by the manufactures. Voltage derating of capacitors should be 80% or above. C4 is a ceramic capacitor, which is used to filter high frequency noise. C2, C3 and L1 form a pi filter circuit. Current of L1 refer to the datasheets provided by the manufactures, current derating should be 80% or above. To protect post-circuits (if converter fails), TVS is recommended. And the external NTC thermistor is recommended to be 5D-9.

2. For standard EMC requirement, please refer to figure 1. If higher EMC requirement, please refer to figure 3, recommended parameters are shown below

Components	Recommended Parameter
MOV	S14K350
CY1, CY2, CY3, CY4	1μF/400VAC
CX	0.22μF/275 VAC
R1, R2	20hm/3W Wire-wound resistor
R3	1M0hm/2W
LCM	10mH
FUSE	1A/250V Slow Blow