

# P R B X

## POWERBOX Industrial Line PMF30 Series 30W 2:1 Single and Dual Output DC/DC Converter

### Features

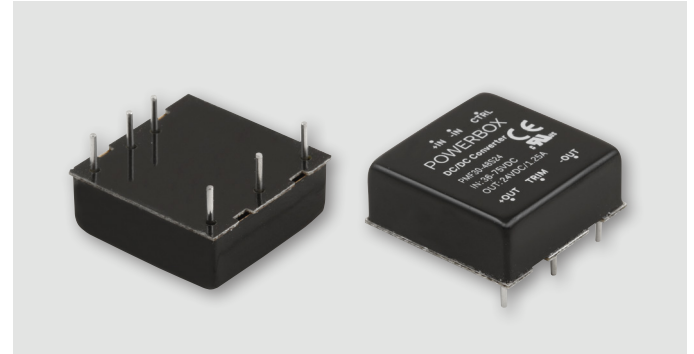
No minimum load required
1600VDC input to output isolation
Small size and low profile
Six-sided continuous shield
Remote control
Undervoltage protection, over current protection
Short circuit protection, over voltage protection, over temp protection
Low standby power
UL60950-1, EN60950-1, IEC60950-1 safety approvals
CE marked
Compliant to RoHS II and REACH

### Input

Voltage range	12Vin(nom)	9-18VDC	
	24Vin(nom)	18-36VDC	
	48Vin(nom)	36-75VDC	
Reflected ripple current	Nominal input, full load	30mA p-p	
	Start-up voltage		
	12Vin(nom)	9VDC max	
Start-up voltage	24Vin(nom)	18DC max	
	48Vin(nom)	36VDC max	
	Shutdown voltage		
12Vin(nom)	8VDC typ		
	24Vin(nom)	16VDC typ	
	48Vin(nom)	33VDC typ	
Start up time	Power up	30mS max	
	Remote ON/OFF	30mS max	
	Constant resistive load.		
Input surge voltage	12Vin(nom)	25VDC, 1sec max	
	24Vin(nom)	50VDC, 1sec max	
	48Vin(nom)	100VDC, 1 sec max	
Input filter	Pi type.		
Remote ON/OFF	Referred to -Vin pin		
	Positive logic (option)		
	DC-DC ON Open or 3~15VDC		
	DC-DC OFF Short or 0~1.2V		
	Negative logic (standard)		
	DC-DC ON Short or 0~1.2V		
	DC-DC OFF Open or 3~15VDC		
	Input current of Ctrl pin	-0.5 to +1.0mA	
	Remote off input current	2.0mA typ	

### Output

Voltage accuracy	±1.0%.	
Line regulation	Low line to high line at full load	
	Single	±0.2%
	Dual	±0.5%
Load regulation	No load to full load.	
	Single	±0.2%
	Dual	±1.0%



	10% load to 90% load	
	Single	±0.1%
	Dual	±0.8%
Cross regulation	Dual	±5.0%
	Asymmetrical load 25%/100% FL.	
Voltage adjustability <sup>2</sup>	Single 15Vout, 24Vout	-10 to +20%
	Others	±10%
Ripple and noise	Measured by 20MHz BW.	
	With a 22µF/25V X7R MLCC:	
	Single 3.3Vout, 5Vout	75mV p-p
	With 2 pcs of 22µF/25V X7R MLCC:	
	Single 12Vout, 15Vout	75mV p-p
	With 2 pcs of 6.8µF/50V X7R MLCC:	
	Single 24Vout	75mV p-p
With a 10µF/25V X7R MLCC for each output:		
Dual 12Vout 15Vout	60mV p-p	
With a 4.7µF/50V X7R MLCC for each output:		
Dual 24Vout	75mV p-p	
Temperature coefficient	±0.02%/°C.	
Transient response	250µS, recovery time 25% load step change.	
Over voltage protection	3.3Vout	3.7VDC min 5.4VDC max
	5Vout	5.6VDC min 7.0VDC max
	12Vout	13.5VDC min 19.6VDC max
	15Vout	18.3VDC min 22.0VDC max
	24Vout	29.1VDC min 32.5VDC max
Over load protection	140% of lout rated; hiccup mode.	
Short circuit protection	Continuous, automatics recovery.	

### Environmental

Operating ambient temp.	-40°C to +50°C (without derating).	
	+50°C to +100°C (with derating).	
Max case temperature	105°C.	
Over temp. protection	115°C.	
Storage temperature	-55°C to +125°C.	
Thermal impedance	Natural convection (20LFM).	
	Without heat-sink	15.0°C/W
	With heat-sink	13.8°C/W
Thermal shock	MIL-STD-810F.	
Vibration	MIL-STD-810F.	
Relative humidity	5-95% RH.	

**POWERBOX Industrial Line**  
**PMF30 Series**  
**30W 2:1 Single and Dual Output**  
**DC/DC Converter**

**General**

Isolation voltage	Input to output, 1 minute	1600VDC min
	Input(output) to case	1000VDC min
Isolation resistance	500VDC	1 GΩ min
Isolation capacitance	1500pF typ.	
Switching frequency	3.3Vout, 5Vout	275KHz typ
	Others	330KHz typ
Case material	Copper.	
Base material	FR4 PCB.	
Potting material	Silicon (UL94 V-0).	
Weight	16.5g.	
MTBF	MIL-HDBK-217F	1.303 x 10 <sup>6</sup> hrs

**Standards**

Safety standards	UL60950-1, EN60950-1, IEC60950-1.
EMC specifications	
EMI <sup>3</sup>	EN55022 Class A, Class B.
Radiated immunity	EN61000-4-3, 10V/m Criteria A.
Fast transient <sup>4</sup>	EN61000-4-4, ±2KV Criteria A.
Surge <sup>4</sup>	EN61000-4-5, ±2KV Criteria A.
Conducted immunity	EN61000-4-6, 10 Vr.m.s Criteria A.

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @No Load	Efficiency	Max Capacitor Load
PMF30-12S3P3	9 ~ 18 VDC	3.3 VDC	7000 mA	10 mA	87%	10000 µF
PMF30-12S05	9 ~ 18 VDC	5 VDC	6000 mA	10 mA	89%	7200 µF
PMF30-12S12	9 ~ 18 VDC	12 VDC	2500 mA	12 mA	89%	1200 µF
PMF30-12S15	9 ~ 18 VDC	15 VDC	2000 mA	12 mA	89%	1000 µF
PMF30-12S24	9 ~ 18 VDC	24 VDC	1250 mA	12 mA	90%	375 µF
PMF30-12D12	9 ~ 18 VDC	±12 VDC	±1250 mA	12 mA	89%	±750 µF
PMF30-12D15	9 ~ 18 VDC	±15 VDC	±1000 mA	12 mA	90%	±500 µF
PMF30-12D24	9 ~ 18 VDC	±24 VDC	±625 mA	14 mA	90%	±180 µF
PMF30-24S3P3	18 ~ 36 VDC	3.3 VDC	7000 mA	10 mA	87%	10000 µF
PMF30-24S05	18 ~ 36 VDC	5 VDC	6000 mA	10 mA	90%	7200 µF
PMF30-24S12	18 ~ 36 VDC	12 VDC	2500 mA	10 mA	91%	1200 µF
PMF30-24S15	18 ~ 36 VDC	15 VDC	2000 mA	10 mA	91%	1000 µF
PMF30-24S24	18 ~ 36 VDC	24 VDC	1250 mA	10 mA	93%	375 µF
PMF30-24D12	18 ~ 36 VDC	±12 VDC	±1250 mA	10 mA	91%	±750 µF
PMF30-24D15	18 ~ 36 VDC	±15 VDC	±1000 mA	10 mA	91%	±500 µF
PMF30-24D24	18 ~ 36 VDC	±24 VDC	±625 mA	12 mA	92%	±180 µF
PMF30-48S3P3	36 ~ 75 VDC	3.3 VDC	7000 mA	10 mA	88%	10000 µF
PMF30-48S05	36 ~ 75 VDC	5 VDC	6000 mA	10 mA	90%	7200 µF
PMF30-48S12	36 ~ 75 VDC	12 VDC	2500 mA	8 mA	90%	1200 µF
PMF30-48S15	36 ~ 75 VDC	15 VDC	2000 mA	8 mA	91%	1000 µF
PMF30-48S24	36 ~ 75 VDC	24 VDC	1250 mA	8 mA	92%	375 µF
PMF30-48D12	36 ~ 75 VDC	±12 VDC	±1250 mA	8 mA	91%	±750 µF
PMF30-48D15	36 ~ 75 VDC	±15 VDC	±1000 mA	8 mA	92%	±500 µF
PMF30-48D24	36 ~ 75 VDC	±24 VDC	±625 mA	10 mA	92%	±180 µF

**Notes:**

1. Test by minimum input and constant resistive load.
2. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the Trim pin and either +Vout pin or -Vout pin.
3. The standard modules meet EN55022 Class A and Class B with external components. For further information, please contact with Powerbox.
4. The external input components are required if the module has to meet EN61000-4-4, EN61000-4-5.

The PMF30-12XXX recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220µF/100V) and a TVS (SMDJ58A, 58V, 3000Watt peak pulse power) to connect in parallel. The PMF30-24XXX and PMF30-48XXX recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220µF/100V).

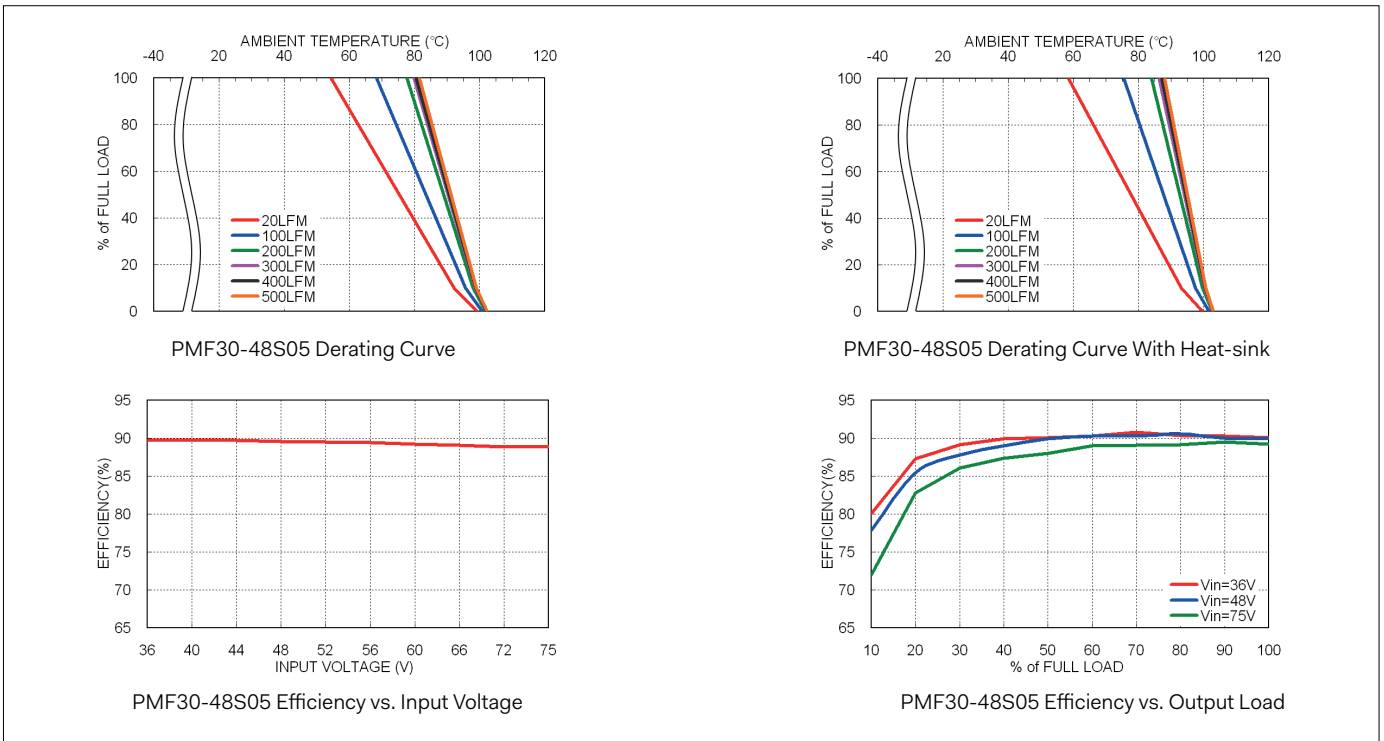
CAUTION: This power module is not internally fused. An input line fuse must always be used.

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 PMF30 Series  
 30W 2:1 Single and Dual Output  
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Part Number Structure

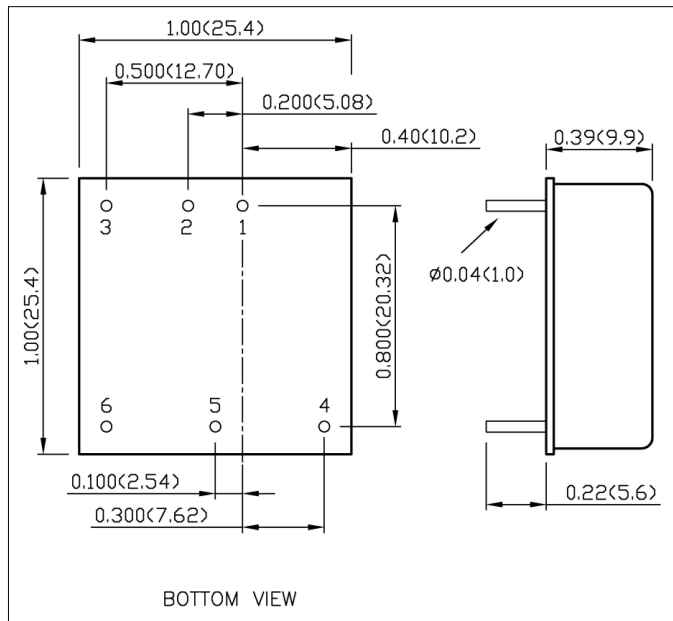
PMF30	-	48	S	05	-	A	HS
Series Name	Input Voltage	Output Quantity	Output Voltage				Option
	12: 9-18VDC	S: Single	3P3: 3.3VDC				: No assembly
	24: 18-36VDC		05: 5VDC			A: Positive logic remote ON/OFF	HS: Heat-sink
	48: 36-75VDC		12: 12VDC			B: Without CTRL pin	HC: Heat-sink with Clamp
			15: 15VDC			C: Negative logic remote ON/OFF without Trim pin	
			24: 24VDC			D: Without CTRL pin & Trim pin	
						E: Positive logic remote ON/OFF without Trim pin	
		D: Dual	12: ±12VDC				
			15: ±15VDC				
			24: ±24VDC				

Derating Curve



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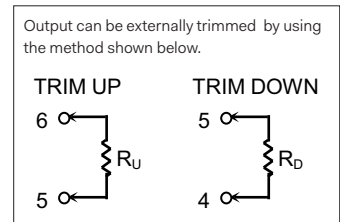
Mechanical



Pin Connection

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	Ctrl	Ctrl
4	+Vout	+Vout
5	Trim	Common
6	-Vout	-Vout

External Output Trimming



1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)  
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)