

# P R B X

## POWERBOX Industrial Line PMD30W Series 30W 4:1 Single and Dual Output High Performance DC/DC Converter

### Features

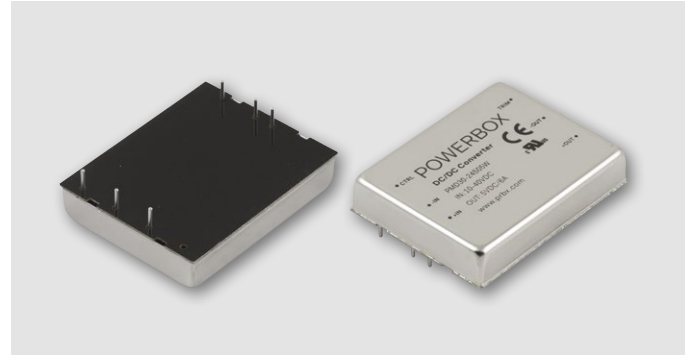
Output current up to 8A
Standard 2" x 1.6" x 0.4" package
High efficiency up to 88%
4:1 wide input voltage range
Six-sided continuous shield
Fixed switching frequency
International safety approvals
RoHS directive compliant

### Input

Voltage range	24V nominal input	10-40VDC
	48V nominal input	18-75VDC
Input filter	L-C type	
Voltage variation, dv/dt	5V/ms, max (complies with ETS300 132 part 4.4)	
Input surge voltage	24V input	50VDC
100ms max	48V input	100VDC
Reflected ripple current	20mA p-p, nominal Vin and full load	
Start up time	Power up 10ms typ. Remote on/off 10ms typ Nominal Vin and constant resistive load	
Start-up voltage	24V input	10VDC
	48V input	18VDC
Shutdown voltage	24V input	8VDC
	48V input	16VDC
Remote ON/OFF <sup>6</sup>	Positive logic (standard): DC/DC ON: Open or 3V < Vr < 12V DC/DC OFF: Short or 0V < Vr < 1.2V Negative logic (option): DC/DC ON: Short or 0V < Vr < 1.2V DC/DC OFF: Open or 3V < Vr < 12V Input current of remote control pin -0.5mA-+0.5mA, nominal Vin. Remote off state input current: Nominal Vin: 3mA	

### Output

Power	30W max	
Voltage accuracy	±1%, full load and nominal Vin	
Minimum load	See table	
Voltage adjustability	±10%	
Line regulation	±0.5%, LL to HL at full load	
Load regulation <sup>a</sup>	Single: ±0.5%	
No load to full load	Dual: ±1%	
Cross regulation	±5%, asymmetrical load 25%/100% FL	
Ripple and noise	See table, 20 MHz bandwidth (measured with a 0.1µF/50V MLCC)	
Temperature coefficient	±0.02%/°C max	
Transient response	250µs, recovery time 25% load step change	
Overvoltage protection (zener diode clamp)	1.5V output	3.9V
	1.8V output	3.9V



	2.5V output	3.9V
	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
Overload protection	150% max, % of FL at nominal input	
Short circuit protection	Hiccup, automatic recovery	

### Environmental

Operating temperature	-40°C to +85°C (with derating)	
Max case temperature	+100°C	
Overtemp. protection	115°C typ	
Storage temperature	-55°C to +105°C	
Thermal impedance <sup>7</sup>	Nature convection 10°C/W	
	Nature convection with heatsink 8.24°C/W	
Thermal shock	MIL-STD-810F	
Vibration	10-55Hz, 10G, 30 minutes along x, y and z	
Relative humidity	5-95% RH	

### General

Efficiency	See table	
Isolation voltage	1600VDC min, input to output	
	1600VDC min, input (output) to case.	
Isolation resistance	10 <sup>9</sup> ohms, min	
Isolation capacitance	1000pF, max	
Switching frequency	300KHz typ	
Case material	Nickel-coated copper	
Base material	Non-conductive black plastic	
Potting material	Epoxy (UL 94 V-0)	
Dimensions	50.8 x 40.6 x 10.2 mm	
Weight	48g	
MTBF <sup>1</sup>	Bellcore TR-NWT-000332: 1.315 x 10 <sup>6</sup> h	
	MIL-STD-217F: 3.456 x 10 <sup>5</sup> h	

### Standards

Safety standards	IEC60950-1, UL60950-1, EN60950-1	
EMC		
EMI <sup>8</sup>	EN55022 Class A	
ESD	EN61000-4-2 Criteria B, air ±8kV, contact ±6kV	
Radiated immunity	EN61000-4-3 Criteria A, 10V/m	
Fast transient <sup>9</sup>	EN61000-4-4 Criteria A, 2kV	
Surge <sup>9</sup>	En61000-4-5 Criteria B, 1kV	
Conducted immunity	EN61000-4-6 Criteria A, 10 Vr.m.s.	

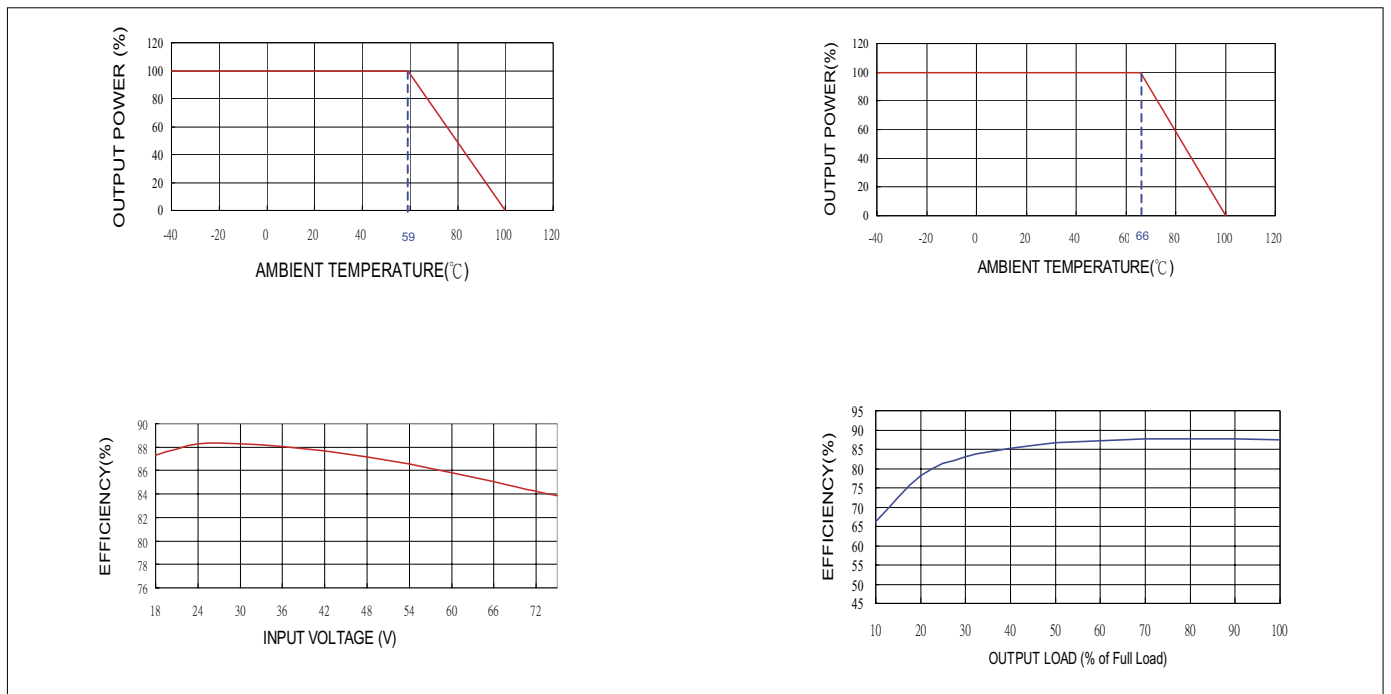
**POWERBOX Industrial Line**  
**PMD30W Series**  
**30W 4:1 Single and Dual Output**  
**High Performance**  
**DC/DC Converter**

Model Number	Input Rane	Output Voltage	Output Current		Output <sup>4</sup> Ripple&Noise	Input Current		Eff <sup>4</sup>	Capacitor <sup>5</sup> Load Max
			Min Load <sup>8</sup>	Full Load		No Load <sup>3</sup>	Full Load <sup>2</sup>		
PMD30-24S1P5W	10 - 40 VDC	1.5 VDC	0mA	8000mA	60mVp-p	35mA	658mA	80%	65000μF
PMD30-24S1P8W	10 - 40 VDC	1.8 VDC	0mA	8000mA	60mVp-p	35mA	759mA	83%	65000μF
PMD30-24S2P5W	10 - 40 VDC	2.5 VDC	0mA	8000mA	60mVp-p	40mA	1029mA	85%	33000μF
PMD30-24S3P3W	10 - 40 VDC	3.3 VDC	0mA	6000mA	60mVp-p	50mA	994mA	87%	19500μF
PMD30-24S05W	10 - 40 VDC	5 VDC	0mA	6000mA	75mVp-p	65mA	1506mA	87%	10200μF
PMD30-24S12W	10 - 40 VDC	12 VDC	0mA	2500mA	100mVp-p	65mA	1506mA	87%	3300μF
PMD30-24S15W	10 - 40 VDC	15 VDC	0mA	2000mA	100mVp-p	70mA	1488mA	88%	1100μF
PMD30-24D12W	10 - 40 VDC	±12 VDC	0mA	±1250mA	100mVp-p	30mA	1563mA	84%	±1000μF
PMD30-24D15W	10 - 40 VDC	±15 VDC	0mA	±1000mA	100mVp-p	35mA	1543mA	85%	±680μF
PMD30-48S1P5W	18 - 75 VDC	1.5 VDC	0mA	8000mA	60mVp-p	20mA	329mA	80%	65000μF
PMD30-48S1P8W	18 - 75 VDC	1.8 VDC	0mA	8000mA	60mVp-p	20mA	380mA	83%	65000μF
PMD30-48S2P5W	18 - 75 VDC	2.5 VDC	0mA	8000mA	60mVp-p	25mA	508mA	86%	33000μF
PMD-48S3P3W	18 - 75 VDC	3.3 VDC	0mA	6000mA	60mVp-p	30mA	497mA	87%	19500μF
PMD30-48S05W	18 - 75 VDC	5 VDC	0mA	6000mA	75mVp-p	30mA	744mA	88%	10200μF
PMD30-48S12W	18 - 75 VDC	12 VDC	0mA	2500mA	100mVp-p	35mA	753mA	87%	3300μF
PMD30-48S15W	18 - 75 VDC	15 VDC	0mA	2000mA	100mVp-p	45mA	744mA	88%	1100μF
PMD30-48D12W	18 - 75 VDC	±12 VDC	0mA	±1250mA	100mVp-p	25mA	772mA	85%	±1000μF

**Notes:**

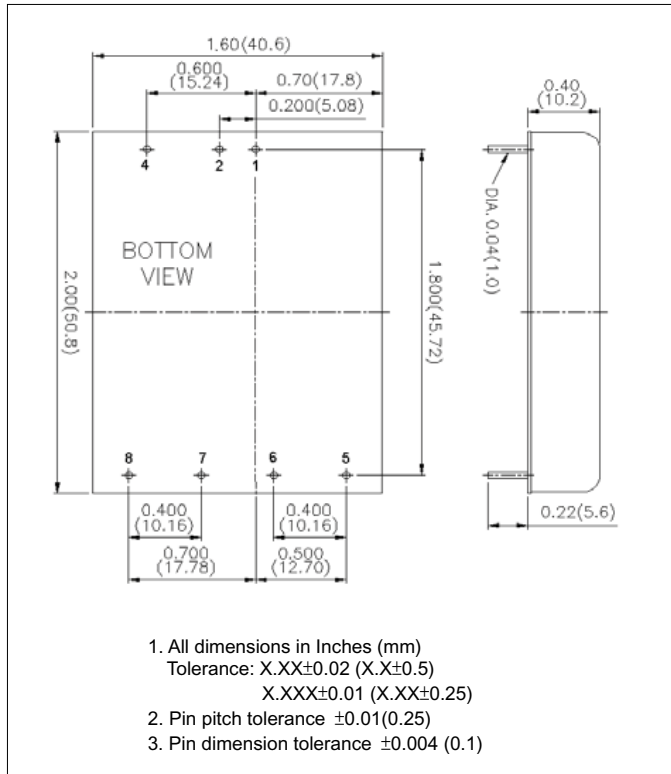
- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment).
- Maximum value at nominal input voltage and full load.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.
- The ON/OFF control pin voltage is referenced to -Vin. To order negative logic ON-OFF control add the suffix-N (Ex: PMD30-24S05W-N).
- Heat sink is optional and P/N: 7G-0011C-F.
- The PMD30W series can meet EN55022 Class A with parallel an external capacitor to the input pins. Recommend: 24Vin : 6.8?F/50V 1812 MLCC. 48Vin : 2.2?F/100V\*2 PCS 1812 MLCC.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Powerbox suggest: Nippon chemi-con KY series, 220μF/100V, ESR 48mΩ

**Derating Curve**

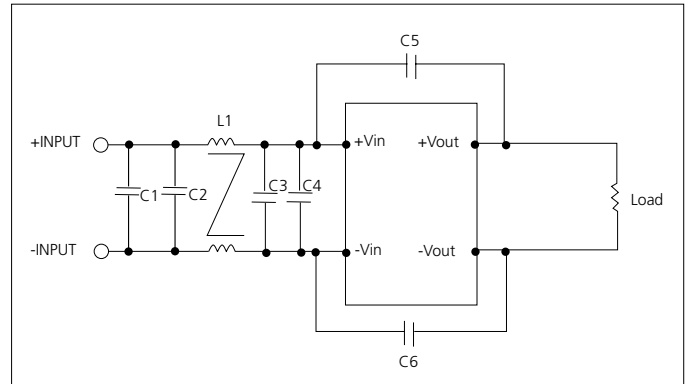


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Mechanical



Filter



Recommended filter for EN55022 Class B compliance

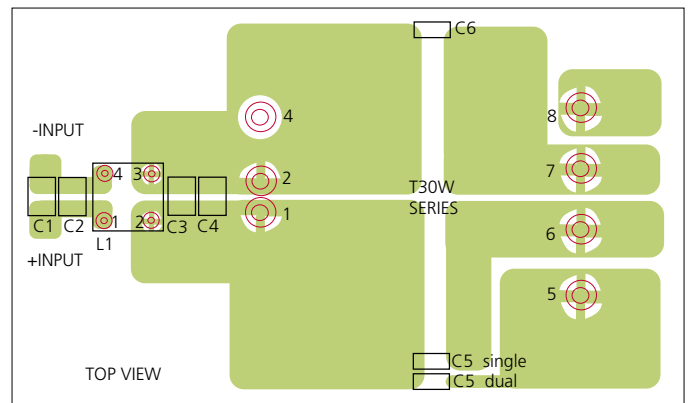
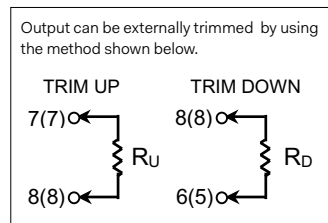
The components used in the above figure, together with the manufacturer's part numbers for these components, are as follows:

	C1	C2	C3	C4	C5&C6	L1
PMD30-24xxxW	6.8µF/50V 1812 MLCC	N/A	6.8µF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	450µH Common Choke PMT-048
PMD30-48xxxW	2.2µF/100V 1812 MLCC	2.2µF/100V 1812 MLCC	2.2µF/100V 1812 MLCC	2.2µF/100V 1812 MLCC	1000pF/2KV MLCC	450µH Common Choke PMT-048

Pin Connection

Pin	Single	Dual
1	+INPUT	+INPUT
2	-INPUT	-INPUT
4	CTRL	CTRL
5	NO PIN	+OUTPUT
6	+OUTPUT	COM
7	-OUTPUT	-OUTPUT
8	TRIM	TRIM

External Output Trimming



Recommended EN55022 Class B Filter Circuit Layout

Specifications are subject to change without notice.