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POWERBOX Industrial Line PMD20 Series 20W 2:1 Single and Dual Output High Performance DC/DC Converter

Features

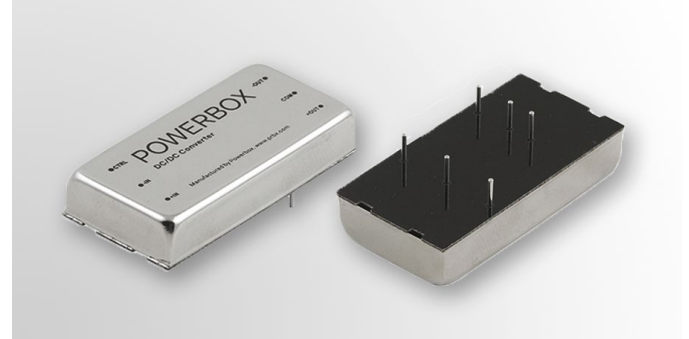
Output current up to 6A
Standard 2" x 1" x 0.4" package
High efficiency up to 89%
International safety standards
No minimum load required
6 sided shielding
RoHS compliant

Input

Input voltage range	12V nominal	9 – 18V
	24V nominal	18 – 36V
	48V nominal	36 – 75V
Filter	L-C-type	
Input surge voltage 100ms max	12V input	36VDC
	24V input	50VDC
	48V input	100VDC
Start up time	Power up 10ms typ, nominal Vin and constant resistive load	
Remote ON/OFF ⁸	DC/DC ON	Open or 3V < Vr < 12V (Positive logic)
	DC/DC OFF	Short or 0V < Vr < 1.2V
	Input current of remote control pin: ±0.5mA, nominal Vin	
	Remote off state input current: 2.5mA, nominal Vin	

Output

Power	20W max	
Voltage accuracy	Single & dual	±1%
	Full load and nominal Vin	
Voltage adjustability	single output models ±10%	
Line regulation	Single (W)	±0.2%
LL to HL at full load		
Load regulation	Single	±0.5%
Min load to full load		
Cross regulation ⁷	Dual	±5%
Ripple and noise	20MHz bandwidth, see table	
Temperature coefficient	±0.02%/°C	
Transient response recovery time	Single & Dual	250µs
	25% load step change	
Overvoltage protection zener diode clamp	3.3V output:	3.9V
	5V output:	6.2V
	12V output:	15V
	15V output:	18V
Overload protection	150% max, % of lout rated	
Short circuit protection	Continuous, automatic recovery	



Environmental

Operating temperature	-40°C to +100°C (with derating)
Max case temperature	100°C
Storage temperature	-55°C to +125°C
Thermal impedance ⁹	12°C/watt, nature convection
	10°C/watt, nature convection with heatsink
Thermal shock	MIL-STD-810F
Vibration	MIL-STD-810F
Humidity	5-95% RH
Cooling	Free air Convection

General

Efficiency	See table
Isolation voltage	1600VDC min, 1 minute
Isolation resistance	10 ⁹ Ohms, min, 500VDC
Isolation capacitance	1000pF max
Switching frequency	500kHz typ
Case material	Nickel-coated copper
Base material	Non-conductive black plastic
Potting material	Epoxy (UL94 V-0)
Dimensions	50.8 x 25.4 x 10.2 mm
Weight	27g
MTBF	1.583 x 10 ⁶ h MIL-HDBK-217F, full load

Standards

Safety standards	IEC60950-1, UL60950-1
EMC Characteristics	
EMI ⁶	EN55022, Class A, Class B
ESD	EN61000-4-2 Criteria B, air ±8kV, contact ±6kV Criteria B
Radiated immunity	EN61000-4-3 Criteria A, 10V/m
Fast transient	EN61000-4-4 Criteria B, ±2kV
Surge ¹¹	EN61000-4-5 Criteria B, ±1kV
Conducted immunity	EN61000-4-6 Criteria A, 10 Vr.m.s.
Power frequency	EN61000-4-8, 100A/m continuous,
magnetic field	1000A/m 1s

POWERBOX Industrial Line
PMD20 Series
20W 2:1 Single and Dual Output
High Performance
DC/DC Converter

Model Number	Input Range	Output Voltage	Output Current Full Load	Input Current No Load ³	Eff ⁴ %	Capacitor ⁵ Load Max
PMD20-12S1P5	9-18 VDC	1.5 VDC	6000mA	70mA	78	65000µF
PMD20-12S1P8	9-18 VDC	1.8 VDC	6000mA	75mA	79	65000µF
PMD20-12S2P5	9-18 VDC	2.5 VDC	6000mA	80mA	83	33000µF
PMD20-12S3P3	9-18 VDC	3.3 VDC	5000mA	115mA	85	13000µF
PMD20-12S05	9-18 VDC	5 VDC	4000mA	75mA	87	6800µF
PMD20-12S12	9-18 VDC	12 VDC	1670mA	90mA	86	2200µF
PMD20-12S15	9-18 VDC	15 VDC	1330mA	35mA	86	755µF
PMD20-12D12	9-18 VDC	±12 VDC	±833mA	45mA	86	±680µF
PMD20-12D15	9-18 VDC	±15 VDC	±667mA	50mA	86	±450µF
PMD20-24S1P5	18-36 VDC	1.5 VDC	6000mA	35mA	80	65000µF
PMD20-24S1P8	18-36 VDC	1.8 VDC	6000mA	45mA	81	65000µF
PMD20-24S2P5	18-36 VDC	2.5 VDC	6000mA	40mA	84	33000µF
PMD20-24S3P3	18-36 VDC	3.3 VDC	5000mA	30mA	86	13000µF
PMD20-24S05	18-36 VDC	5 VDC	4000mA	35mA	89	6800µF
PMD20-24S12	18-36 VDC	12 VDC	1670mA	55mA	87	2200µF
PMD20-24S15	18-36 VDC	15 VDC	1330mA	40mA	87	755µF
PMD20-24D12	18-36 VDC	±12 VDC	±833mA	30mA	87	±680µF
PMD20-24D15	18-36 VDC	±15 VDC	±667mA	30mA	88	±450µF
PMD20-48S1P5	36-75 VDC	1.5 VDC	6000mA	15mA	80	65000µF
PMD20-48S1P8	36-75 VDC	1.8 VDC	6000mA	20mA	82	65000µF
PMD20-48S2P5	36-75 VDC	2.5 VDC	6000mA	30mA	84	33000µF
PMD20-48S3P3	36-75 VDC	3.3 VDC	5000mA	15mA	87	13000µF
PMD20-48S05	36-75 VDC	5 VDC	4000mA	20mA	89	6800µF
PMD20-48S12	36-75 VDC	12 VDC	1670mA	35mA	88	2200µF
PMD20-48S15	36-75 VDC	15 VDC	1330mA	50mA	87	755µF
PMD20-48D12	36-75 VDC	±12 VDC	±833mA	20mA	88	±680µF
PMD20-48D15	36-75 VDC	±15 VDC	±667mA	20mA	88	±450µF

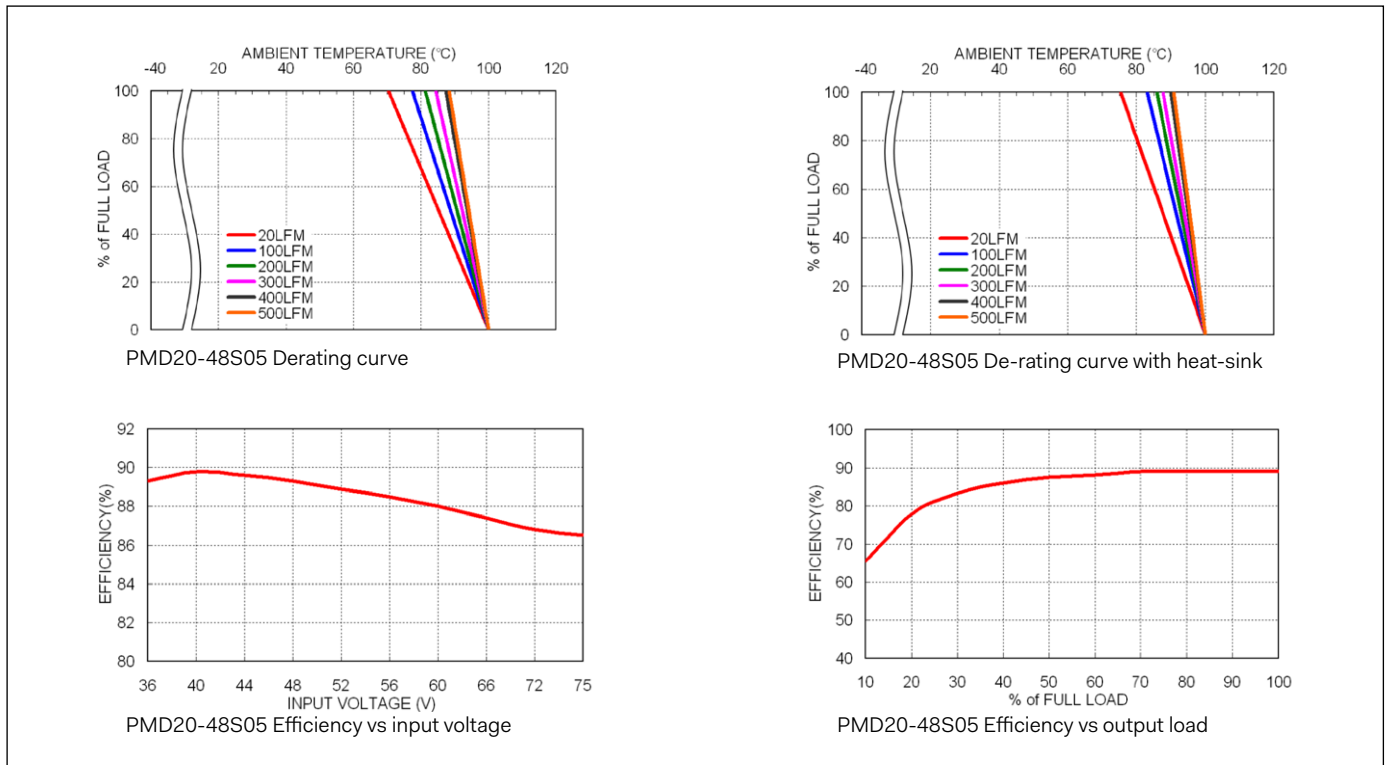
Notes:

2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum Vin and constant resistive load.
6. With external components
7. Cross regulation : Dual output. Asymmetrical load 25% to 100% full load.
8. The ON/OFF control pin voltage is referenced to -Vin
9. Heat sink is optional and P/N: 7G-0011A and the operation temperature range please see curve.

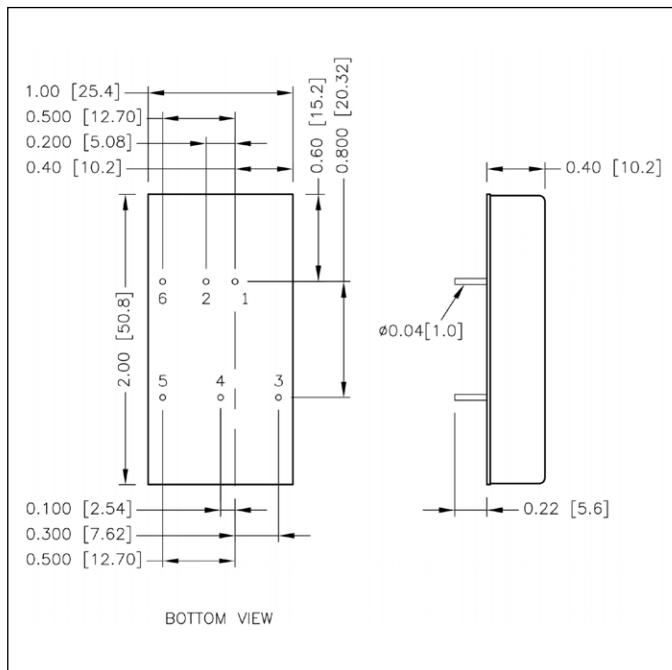
10. The PMD20 series can meet EN55022 Class A with parallel an external capacitor to the input pins. Recommend: 12Vin : 6.8µF/50V 1812 MLCC , 24Vin : N/A. 48Vin : 2.2µF/100V 1812 MLCC
11. An external filter capacitor is required if the module has to meet EN61000-4-5. The filter capacitor Powerbox suggest: Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ.
12. The PME20-24D3305 and PME20-48D3305 are safety approval pending.

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Derating Curve



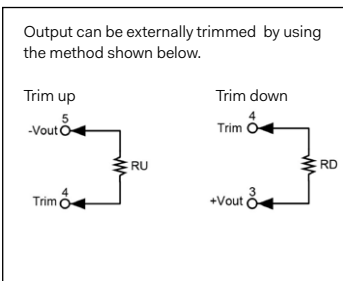
Mechanical



Pin Connection

Pin	Single	Dual
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	+OUTPUT	+OUTPUT
4	TRIM	COMMON
5	-OUTPUT	-OUTPUT
6	CTRL	CTRL

External Output Trimming



Specifications are subject to change without notice.