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POWERBOX Industrial Line
PME10 Series
10W 2:1 and 4:1 Single and Dual Output
High Performance
DC/DC Converter

Features

Output current up to 2.5A
Standard 2.0 x 1.0 x 0.4 inch package
High efficiency up to 87%
2:1 and 4:1 wide input voltage range
Six-sided continuous shield
Fixed switching frequency (300KHz)
International safety standard approval
Compliant to RoHS EU Directive 2002/95/EC

Input

Voltage range		
PME10	12V nominal input	9-18VDC
	24V nominal input	18-36VDC
	48V nominal input	36-75VDC
Voltage range PME10W	24V nominal input	9-36VDC
	48V nominal input	18-75VDC
Input filter	Pi type	
Input surge voltage	12V input	36VDC
100ms max	24V input	50VDC
	48V input	100VDC
Reflected ripple current	30mA p-p, nominal Vin and full load	
Start-up time	Power up 20ms typ	
	Nominal Vin and constant resistive load	
Remote ON/OFF[6]	Positive logic	
	DC/DC ON: Open or 3.5V < Vr < 12V	
	DC/DC OFF: Short or 0V < Vr < 1.2V	
	Negative logic:	
	DC/DC ON: Short or 0V < Vr < 1.2V	
	DC/DC OFF: Open or 3.5V < Vr < 12V	
	Input current of remote control pin:	
	–0.5-+1mA, nominal Vin.	
	Remote off state input current: 20mA, nominal Vin	

Output

Power	10W max	
Voltage accuracy	±1%, full load and nominal Vin	
Minimum load	0%	
Line regulation	±0.2%, LL to HL at full load	
Load regulation	Single ±0.5%. Dual ±1%	
	No load to full load	
Cross regulation (dual)	±5%. Asymmetrical load 25%/100% FL	
Ripple and noise 20MHz BW	See table	
Temperature coefficient	±0.02%/°C max	
Transient response	250µs recovery time, 25% load step change.	
Overvoltage protection	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V.

Overload protection	150% typ, % of FL at nominal input
Short circuit protection	Hiccup, automatic recovery

Environmental

Operating temperature	Standard: –25°C to +85°C (with derating)
	M1[7]: –40°C to +85°C (non-derating)
	M2 (W series): –40°C to +85°C (with derating)
	(reference derating curve)
Max case temperature	+105°C
Storage temperature	–55°C to +105°C
Thermal impedance[8]	12°C/W natural convection
	10°C/W natural convection with heatsink
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
Isolation resistance	10^9 ohms, min
Isolation capacitance	300pF, max
Switching frequency	300KHz ty.
Case material	Nickel-coated copper
Base material	Non-conductive black plastic
Potting material	Epoxy (UL 94 V-0)
Dimensions	50.8 x 25.4 x 10.2 mm
Weight	27g
MTBF[1]	BELLCORE-TR-NWT-000332 1.976 x 10^5 h
	MIL-STD-217F 1.416 x 10^6 h

Standards

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

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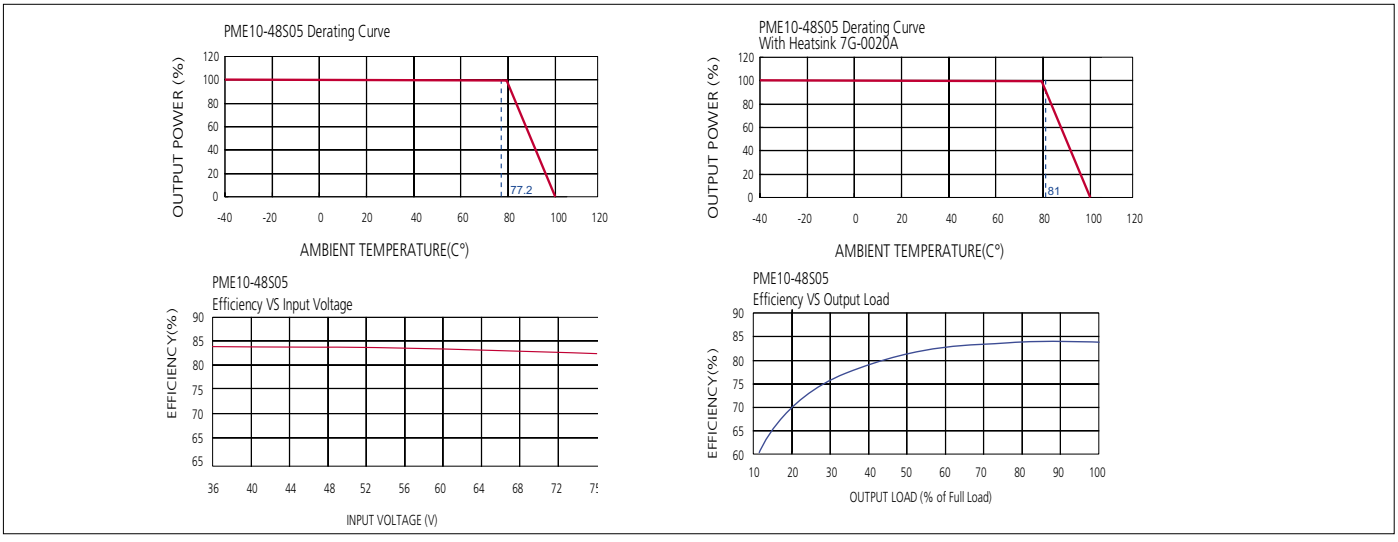
Model Number	Input Range	Output Voltage	Output Min Load	Full Load	Output Ripple&Noise	Input No Load[3]	Full Load[2]	Eff[4]	Cap.[5] Load Max
PME10-12S33	9 – 18 VDC	3.3 VDC	0mA	2000mA	50mVp-p	17mA	24mA	80%	6800μF
PME10-12S05	9 – 18 VDC	5 VDC	0mA	2000mA	50mVp-p	21mA	1082mA	81%	4700μF
PME10-12S12	9 – 18 VDC	12 VDC	0mA	830mA	50mVp-p	38mA	1037mA	84%	690μF
PME10-12S15	9 – 18 VDC	15 VDC	0mA	670mA	50mVp-p	36mA	1046mA	84%	470μF
PME10-12D05	9 – 18 VDC	±5 VDC	0mA	±1000mA	75mVp-p	39mA	1042mA	84%	±680μF
PME10-12D12	9 – 18 VDC	±12 VDC	0mA	±416mA	75mVp-p	47mA	1053mA	83%	±330μF
PME10-12D15	9 – 18 VDC	±15 VDC	0mA	±333mA	75mVp-p	45mA	1041mA	84%	±110μF
PME10-24S33 (W)	18 – 36 (9 – 36) VDC	3.3 VDC	0mA	2000(2500mA)	50mVp-p	15(13mA)	362(465mA)	80(78)%	6800μF
PME10-24S05 (W)	18 – 36 (9 – 36) VDC	5 VDC	0mA	2000mA	50mVp-p	22(11mA)	534 (548mA)	82 (80)%	4700μF
PME10-24S12 (W)	18 – 36 (9 – 36) VDC	12 VDC	0mA	830mA	50mVp-p	18(16mA)	519 (519mA)	84 (84)%	690μF
PME10-24S15 (W)	18 – 36 (9 – 36) VDC	15 VDC	0mA	670mA	50mVp-p	36(26mA)	523 (544mA)	84 (81)%	470μF
PME10-24D05 (W)	18 – 36 (9 – 36) VDC	±5 VDC	0mA	±1000mA	75mVp-p	28(15mA)	527 (534mA)	83 (82)%	±680μF
PME10-24D12 (W)	18 – 36 (9 – 36) VDC	±12 VDC	0mA	±416mA	75mVp-p	24(15mA)	513 (547mA)	85 (80)%	±330μF
PME10-24D15 (W)	18 – 36 (9 – 36) VDC	±15 VDC	0mA	±333mA	75mVp-p	31(22mA)	520 (548mA)	84 (80)%	±110μF
PME10-48S33 (W)	36 – 75 (18 – 75) VDC	3.3 VDC	0mA	2000(2500mA)	50mVp-p	11(10mA)	181(239mA)	80(76)%	6800μF
PME10-48S05 (W)	36 – 75 (18 – 75) VDC	5 VDC	0mA	2000mA	50mVp-p	14(9mA)	260 (270mA)	84 (81)%	4700μF
PME10-48S12 (W)	36 – 75 (18 – 75) VDC	12 VDC	0mA	830mA	50mVp-p	14(9mA)	253 (259mA)	86 (84)%	690μF
PME10-48S15 (W)	36 – 75 (18 – 75) VDC	15 VDC	0mA	670mA	50mVp-p	10(11mA)	252 (262mA)	87 (84)%	470μF
PME10-48D05 (W)	36 – 75 (18 – 75) VDC	±5 VDC	0mA	±1000mA	75mVp-p	16(12mA)	260 (267mA)	84 (82)%	±680μF
PME10-48D12 (W)	36 – 75 (18 – 75) VDC	±12 VDC	0mA	±416mA	75mVp-p	19(20mA)	254 (281mA)	86 (78)%	±330μF
PME10-48D15 (W)	36 – 75 (18 – 75) VDC	±15 VDC	0mA	±333mA	75mVp-p	16(20mA)	256 (270mA)	85 (81)%	±110μF
PMC30-48S12W	18 – 75 VDC	12 VDC	0mA	2500mA	150mVp-p	60mA	727mA	90%	3000μF
PMC30-48S15W	18 – 75 VDC	15 VDC	0mA	2000mA	150mVp-p	50mA	718mA	91%	2000μF
PMC30-48D05W	18 – 75 VDC	±5VDC	0mA	±3000mA	100mVp-p	50mA	744mA	88%	±3000μF
PMC30-48D12W	18 – 75 VDC	±12VDC	0mA	±1250mA	150mVp-p	15mA	744mA	88%	±2000μF
PMC30-48D15W	18 – 75 VDC	±15VDC	0mA	±1000mA	150mVp-p	15mA	744mA	88%	±1300μF

Notes:

1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40oC. MIL-HDBK-217F Notice2 @Ta=25 oC, Full load(Ground, Benign, controlled environment).
2. Maximum value at nominal input voltage and full load of standard type.
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. The ON/OFF control pin voltage is referenced to -Vin. To order positive logic ON/OFF control add the suffix-P (Ex: PME10-12S05-P); To order negative logic ON-OFF control add the suffix-N (Ex: PME10-12S05-N)
7. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard and M2 version.
8. Heat sink is optional and P/N: 7G-0020A.
9. The PME10 series can meet EN55022 Class A with parallel an external capacitor to the input pins.
   Recommend: 12Vin : 4.7μF/25V 1210 MLCC.
   24Vin : 2.2μF/50V 1812 MLCC.
   48Vin : 1.5μF/100V 1812 MLCC.
10. An external filter capacitor is required if the module has to meet EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF/100V, ESR 48mΩ.

Derating Curve



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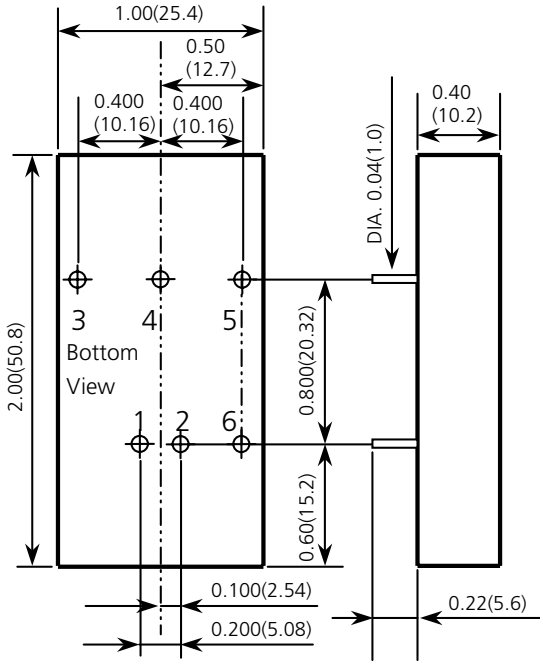
Mechanical

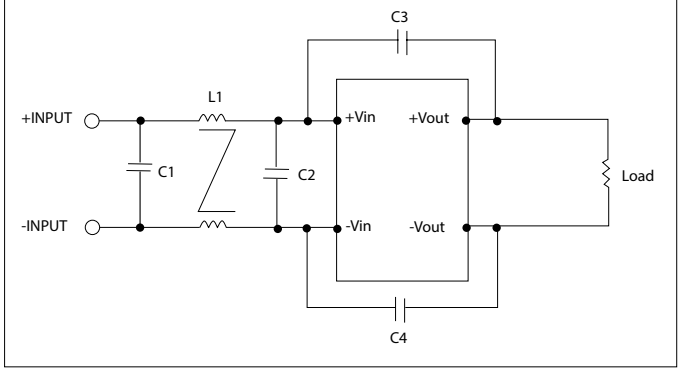


1. All dimensions in Inches (mm)
   Tolerance: X.XX ±0.02 (X.X ±0.5)
   X.XXX ±0.01 (X.XX ±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

Pin Connection

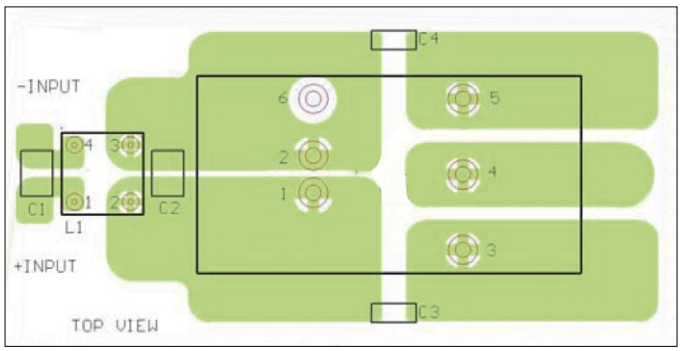
Pin	Single	Dual
1	+INPUT	+INPUT
2	–INPUT	–INPUT
3	+OUTPUT	+OUTPUT
4	NO PIN	COMMON
5	–OUTPUT	–OUTPUT
6	CTRL (Option)	CTRL (Option)

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	L1
PME10-	3.3uF/50V	N/A	1000pf/2KV	1000pF/2KV	325µH
12xxx	1812 MLCC		MLCC	MLCC	Choke
					PMT-050
PME10-	2.2uF/50V	N/A	1000pf/2KV	1000pF/2KV	325µH
24xxx	1812 MLCC		MLCC	MLCC	Choke
					PMT-050
PMD12-	2.2uF/100V	2.2uF/100V	1000pf/2KV	1000pF/2KV	145µH
48xxxW	1812 MLCC	1812 MLCC	MLCC	MLCC	Choke
					PMT-051



Recommended EN55022 Class B Filter Circuit Layout

Specifications are subject to change without notice.