

Industrial Line – T20AW Series

20W SINGLE & DUAL OUTPUT HIGH PERFORMANCE DC/DC CONVERTER

Features

- Output current up to 5.5A
- 4:1 wide input voltage range
- International safety standard approval
- Six-sided continuous shield
- High efficiency up to 89%
- Standard 2" x 1" x 0.4" package
- Fixed switching frequency



Specifications

INPUT

Voltage range	24V nominal input	9-36VDC
	48V nominal input	18-75VDC
Input filter	Pi type.	
Input surge voltage	24V input	50VDC.
	100mS max 48V input	100VDC.
Reflected ripple	20mA p-p, nominal Vin and full load.	
Start up time	Power up 20mS typ. Remote on/off 20mS typ. Nominal Vin and constant resistive load.	
Start up voltage	24V input	9VDC.
	48V input	18VDC.
Shutdown voltage	24V input	9VDC.
	48V input	15VDC.
Remote ON/OFF ⁶⁾	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 Remote off input current: 2.5mA, nominal Vin.	

OUTPUT

Power	20W max.	
Voltage accuracy	±1%, FL and nominal Vin.	
Voltage adjustability	±10%, single output	
Min load	0%.	
Line regulation	Single ±0.2%. Dual ±0.5%. 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	At 20MHz bandwidth, see table (measured with a 0.1uF/50V MLCC).	
Temperature coefficient	±0.02%/°C max.	
Transient response	250uS, recovery time 25% load step change.	
Overload protection	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	(zener diode clamp).	
Overload protection	150% max, % of FL at nominal input.	
Short circuit protection	Hiccup, automatic recovery.	

ENVIRONMENTAL

Operating ambient temp	-40°C to +66°C (without derating).
	-66°C to +105°C (with derating).
Max case temperature	+105°C.
Storage temperature	-55°C to +125°C.
Thermal impedance ⁷⁾	Nature convection: 12°C/W.
	Nature convection with heat-sink: 10°C/W.
Thermal shock	MIL-STD-810F.
Relative humidity	5-95% RH.

GENERAL

Efficiency	See table.	
Isolation voltage	1600VDC min, input to output.	
	1600VDC min, input (output) to case.	
Case grounding	Connect case to -Vin with decoupling Y Cap.	
Isolation resistance	10 ⁹ ohms, min.	
Isolation capacitance	1500pF, max.	
Switching frequency	400KHz typ.	
Case material.	Nickel-coated copper.	
Base material	FR4 PCB.	
Potting material	Epoxy (UL94-V0).	
Dimensions	50.8 x 25.4 x 10.2 mm.	
Weight	27g.	
MTBF ¹⁾	BELLCORE-TR-NWT-000332	1.620 x 10 ⁶ hrs.
	MIL-HDBK-217F	6.590 x 10 ⁵ hrs.

STANDARDS

Safety standards	IEC60950-1, UL60950-1, EN60950-1.		
EMI ¹⁸⁾	EN55022 Class A.		
ESD	EN61000-4-2	Air ±8kV	Criteria B
Radiated immunity	EN61000-4-3	10V/m	Criteria A
Fast transient ⁹⁾	EN61000-4-4	±2kV	Criteria B
Surge ⁹⁾	EN61000-4-5	±1kV	Criteria A
Conducted immunity	EN61000-4-6	10Vr.m.s.	Criteria A

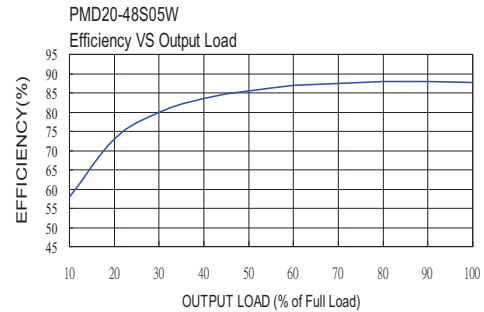
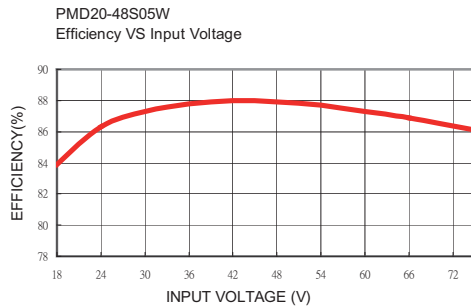
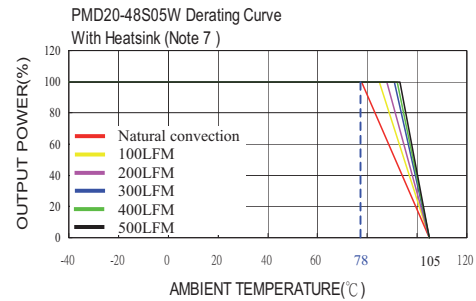
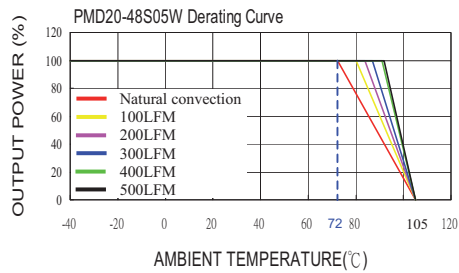
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MODEL NUMBER	INPUT RANGE	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT RIPPLE&NOISE	INPUT ³⁾ CURRENT	EFFICIENCY ⁹⁾	CAPACITOR ⁹⁾ LOAD MAX
PMD20-24S3P3W	9 – 36VDC	3.3VDC	5500mA	60mV p-p	934mA	85%	18000uF
PMD20-24S05W	9 – 36VDC	5VDC	4000mA	75mV p-p	992mA	88%	9600uF
PMD20-24S12W	9 – 36VDC	12VDC	1670mA	75mV p-p	1018mA	86%	1650uF
PMD20-24S15W	9 – 36VDC	15VDC	1330mA	75mV p-p	1014mA	86%	1050uF
PMD20-24D05W	9 – 36VDC	±5VDC	±2000mA	100mV p-p	992mA	88%	±4800uF
PMD20-24D12W	9 – 36VDC	±12VDC	±833mA	100mV p-p	1004mA	87%	±825uF
PMD20-24D15W	9 – 36VDC	±15VDC	±667mA	100mV p-p	1005mA	87%	±525uF
PMD20-48S3P3W	18 – 75VDC	3.3VDC	5500mA	60mV p-p	467mA	85%	18000uF
PMD20-48S05W	18 – 75VDC	5VDC	4000mA	75mV p-p	496mA	88%	9600uF
PMD20-48S12W	18 – 75VDC	12VDC	1670mA	75mV p-p	503mA	87%	1650uF
PMD20-48S15W	18 – 75VDC	15VDC	1330mA	75mV p-p	501mA	87%	1050uF
PMD20-48D05W	18 – 75VDC	±5VDC	±2000mA	100mV p-p	490mA	89%	±4800uF
PMD20-48D12W	18 – 75VDC	±12VDC	±833mA	100mV p-p	496mA	88%	±825uF
PMD20-48D15W	18 – 75VDC	±15VDC	±667mA	100mV p-p	496mA	88%	±525uF

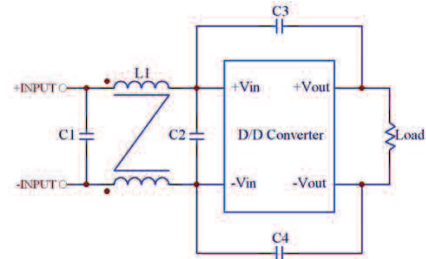
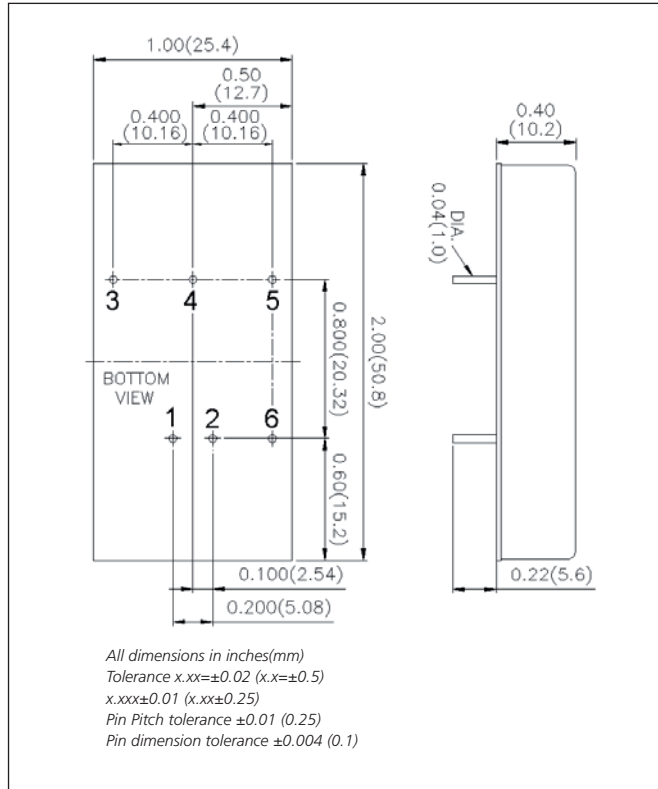
Notes:

- 1) 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).
- 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) The ON/OFF control pin voltage is referenced to -Vin. To order negative logic ON-OFF control add the suffix -N.
- 7) Heat sink is optional and PIN: 7G-0020C-F.
- 8) The T20AW series can meet EN55022 class B with parallel an external capacitor to the input pins. Recommend: 24Vin:NA. 48Vin: 1μF/100V 1210 MLCC.
- 9) An external 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.



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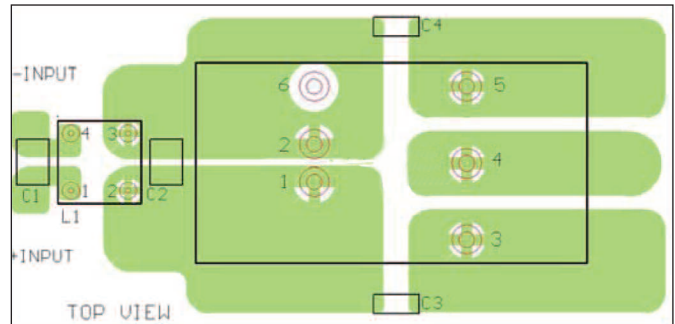


Recommended Filter for EN55022 Class B Compliance

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

	C1	C2	C3	C4	L1
PMD20-24xxxW	4.7 μ F/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	450 μ H Common Choke PMT-048
PMD20-48xxxW	2.2 μ F/100V 1812 MLCC	2.2 μ F/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325 μ H Common Choke PMT-050

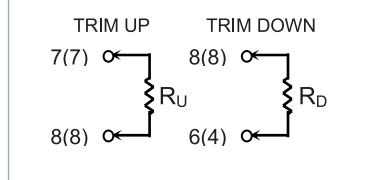
PIN CONNECTION		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	+OUTPUT	+OUTPUT
4	TRIM	COMMON
5	-OUTPUT	-OUTPUT
6	CTRL	CTRL



Recommended EN55022 Class B Filter Circuit Layout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



Specifications are subject to change without notice.