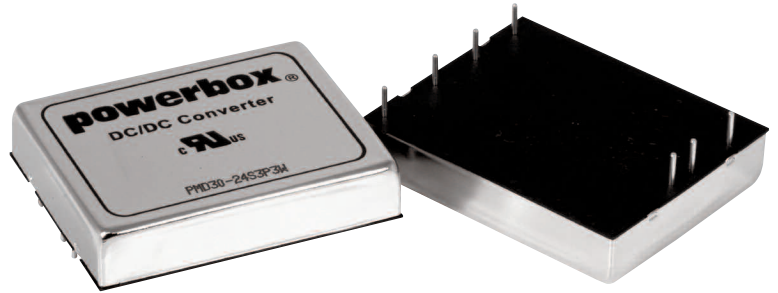


Industrial Line – T30 Series

30W 2:1 SINGLE & DUAL OUTPUT HIGH PERFORMANCE DC/DC CONVERTER

Features

- Output current up to 6A
- Standard 2" x 1.6" x 0.4" package
- High efficiency up to 90%
- 2:1 wide input voltage range
- Six-sided continuous shield
- Fixed switching frequency
- International safety approvals
- RoHS directive compliant



Specifications

INPUT

| | | |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Voltage range | 12V nominal input | 9-18VDC |
| | 24V nominal input | 18-36VDC |
| | 48V nominal input | 36-75VDC |
| Input filter | L-C type. | |
| Input surge voltage 100mS max | 12V input | 36VDC |
| | 24V input | 50VDC |
| | 48V input | 100VDC |
| Reflected ripple current | 30mA p-p, nominal Vin and full load. | |
| Start up time | Power up 25mS typ. Remote on/off 25mS typ. Nominal Vin and constant resistive load. | |
| Start-up voltage | 12V input | 9VDC |
| | 24V input | 17.8VDC |
| | 48V input | 36VDC |
| Shutdown voltage | 12V input | 8VDC |
| | 24V input | 16VDC |
| | 48V input | 33VDC |
| Remote ON/OFF ⁶ | Positive logic (standard): DC/DC ON: Open or $3V < V_r < 12V$ DC/DC OFF: Short or $0V < V_r < 1.2V$ Input current of remote control pin $-0.5mA$ to $+0.5mA$, nominal Vin. Remote off state input current: Nominal Vin: 2.5mA | |

OUTPUT

| | | |
|-------------------------|---------------------------------------------------------------------|-------------|
| Power | 30W max. | |
| Voltage accuracy | $\pm 1\%$, full load and nominal Vin. | |
| Minimum load | 0%. | |
| Voltage adjustability | $\pm 10\%$. | |
| Line regulation | Single: | $\pm 0.2\%$ |
| | Dual: | $\pm 0.5\%$ |
| | LL to HL at full load. | |
| Load regulation | Single: | $\pm 0.5\%$ |
| | Dual: | $\pm 1\%$ |
| | No load to full load. | |
| Cross regulation (dual) | $\pm 5\%$, asymmetrical load 25%/100% FL. | |
| Ripple and noise | See table, 20 MHz bandwidth (measured with a 0.1 μ F/50V MLCC). | |
| Temperature coefficient | $\pm 0.02\%/^{\circ}C$ max. | |
| Transient response | 300 μ S, 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 | $-40^{\circ}C$ to $+85^{\circ}C$ (with derating). | |
| Max case temperature | $+100^{\circ}C$. | |
| Overtemp. protection | $115^{\circ}C$ typ. | |
| Storage temperature | $-55^{\circ}C$ to $+105^{\circ}C$. | |
| Thermal impedance ⁷ | Nature convection $10^{\circ}C/Watt$. | |
| | Nature convection with heatsink $8.24^{\circ}C/Watt$. | |
| Thermal shock | MIL-STD-810F. | |
| Vibration | 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. | |
| Isolation resistance | 10^9 ohms, min. | |
| Isolation capacitance | 1000pF, max. | |
| Switching frequency | 300KHz typ. | |
| Case material. | Nickel-coated copper. | |
| Base material | FR4 PCB. | |
| Potting material | Epoxy (UL94-V0). | |
| Dimensions | 50.8 x 40.6 x 10.2 mm. | |
| Weight | 48g. | |
| MTBF ¹ | Bellcore TR-NWT-000332: 1.316×10^6 hrs. | |
| | MIL-STD-217F: 3.465×10^5 hrs. | |

STANDARDS

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

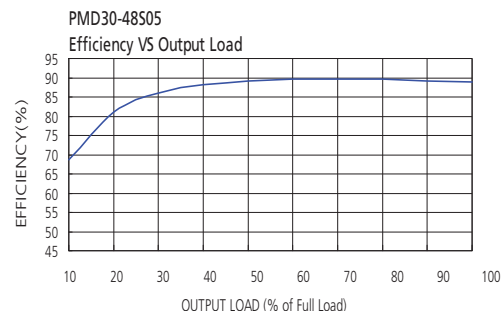
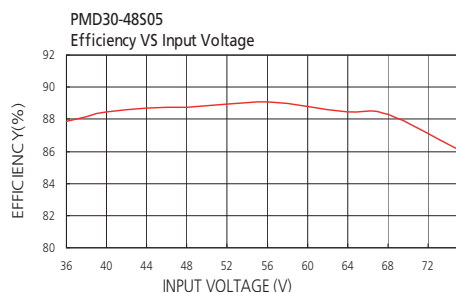
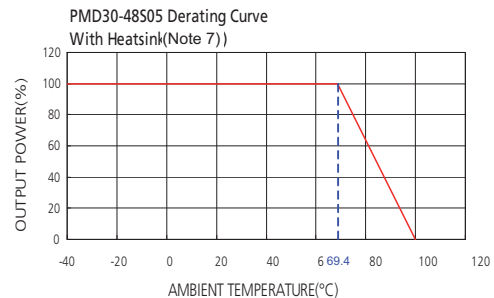
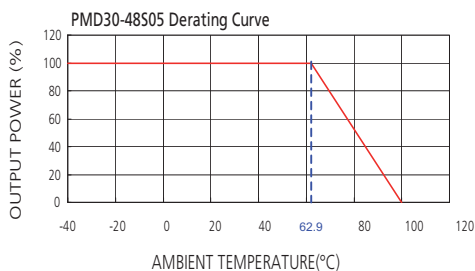
Industrial Line – T30 Series

30W 4:1 SINGLE & DUAL OUTPUT HIGH PERFORMANCE DC/DC CONVERTER

| MODEL NUMBER | INPUT RANGE | OUTPUT VOLTAGE | OUTPUT CURRENT | | OUTPUT ¹ RIPPLE&NOISE | INPUT CURRENT | | EFFICIENCY ⁴ | CAPACITOR ⁵ LOAD MAX |
|--------------|-------------|----------------|-----------------------|-----------|----------------------------------|----------------------|------------------------|-------------------------|---------------------------------|
| | | | MIN LOAD ⁶ | FULL LOAD | | NO LOAD ³ | FULL LOAD ² | | |
| PMD30-12S1P5 | 9 – 18 VDC | 1.5 VDC | 0mA | 6000mA | 50mVp-p | 100mA | 1014mA | 78% | 85800IF |
| PMD30-12S1P8 | 9 – 18 VDC | 1.8 VDC | 0mA | 6000mA | 50mVp-p | 100mA | 1169mA | 81% | 65000IF |
| PMD30-12S2P5 | 9 – 18 VDC | 2.5 VDC | 0mA | 6000mA | 50mVp-p | 110mA | 1582mA | 83% | 33000IF |
| PMD30-12S3P3 | 9 – 18 VDC | 3.3 VDC | 0mA | 6000mA | 50mVp-p | 115mA | 2037mA | 85% | 19500IF |
| PMD30-12S05 | 9 – 18 VDC | 5 VDC | 0mA | 6000mA | 50mVp-p | 95mA | 3012mA | 87% | 10200IF |
| PMD30-12S12 | 9 – 18 VDC | 12 VDC | 0mA | 2500mA | 75mVp-p | 170mA | 2976mA | 88% | 3240IF |
| PMD30-12S15 | 9 – 18 VDC | 15 VDC | 0mA | 2000mA | 75mVp-p | 210mA | 2976mA | 88% | 1100IF |
| PMD30-12D12 | 9 – 18 VDC | ±12 VDC | 0mA | ±1250mA | 100mVp-p | 60mA | 3012mA | 87% | ±1020IF |
| PMD30-12D15 | 9 – 18 VDC | ±15 VDC | 0mA | ±1000mA | 100mVp-p | 40mA | 3012mA | 87% | ±675IF |
| PMD30-24S1P5 | 18 – 36 VDC | 1.5 VDC | 0mA | 6000mA | 50mVp-p | 50mA | 493mA | 80% | 85800IF |
| PMD30-24S1P8 | 18 – 36 VDC | 1.8 VDC | 0mA | 6000mA | 50mVp-p | 35mA | 580mA | 82% | 65000IF |
| PMD30-24S2P5 | 18 – 36 VDC | 2.5 VDC | 0mA | 6000mA | 50mVp-p | 45mA | 780mA | 84% | 33000IF |
| PMD30-24S3P3 | 18 – 36 VDC | 3.3 VDC | 0mA | 6000mA | 50mVp-p | 50mA | 1010mA | 86% | 19500IF |
| PMD30-24S05 | 18 – 36 VDC | 5 VDC | 0mA | 6000mA | 50mVp-p | 50mA | 1490mA | 88% | 10200IF |
| PMD30-24S12 | 18 – 36 VDC | 12 VDC | 0mA | 2500mA | 75mVp-p | 80mA | 1470mA | 89% | 3300IF |
| PMD30-24S15 | 18 – 36 VDC | 15 VDC | 0mA | 2000mA | 75mVp-p | 90mA | 1470mA | 89% | 1100IF |
| PMD30-24D12 | 18 – 36 VDC | ±12 VDC | 0mA | ±1250mA | 100mVp-p | 30mA | 1488mA | 88% | ±1020IF |
| PMD30-24D15 | 18 – 36 VDC | ±15 VDC | 0mA | ±1000mA | 100mVp-p | 30mA | 1488mA | 88% | ±675IF |
| PMD30-48S1P5 | 36 – 75 VDC | 1.5 VDC | 0mA | 6000mA | 50mVp-p | 20mA | 244mA | 81% | 85800IF |
| PMD30-48S1P8 | 36 – 75 VDC | 1.8 VDC | 0mA | 6000mA | 50mVp-p | 20mA | 290mA | 83% | 65000IF |
| PMD30-48S2P5 | 36 – 75 VDC | 2.5 VDC | 0mA | 6000mA | 50mVp-p | 25mA | 390mA | 85% | 33000IF |
| PMD30-48S3P3 | 36 – 75 VDC | 3.3 VDC | 0mA | 6000mA | 50mVp-p | 30mA | 500mA | 87% | 19500IF |
| PMD30-48S05 | 36 – 75 VDC | 5 VDC | 0mA | 6000mA | 50mVp-p | 35mA | 740mA | 89% | 10200IF |
| PMD30-48S12 | 36 – 75 VDC | 12 VDC | 0mA | 2500mA | 75mVp-p | 35mA | 730mA | 90% | 3300IF |
| PMD30-48S15 | 36 – 75 VDC | 15 VDC | 0mA | 2000mA | 75mVp-p | 55mA | 730mA | 90% | 1100IF |
| PMD30-48D12 | 36 – 75 VDC | ±12 VDC | 0mA | ±1250mA | 100mVp-p | 20mA | 744mA | 88% | ±1020IF |
| PMD30-48D15 | 36 – 75 VDC | ±15 VDC | 0mA | ±1000mA | 100mVp-p | 20mA | 744mA | 88% | ±675IF |

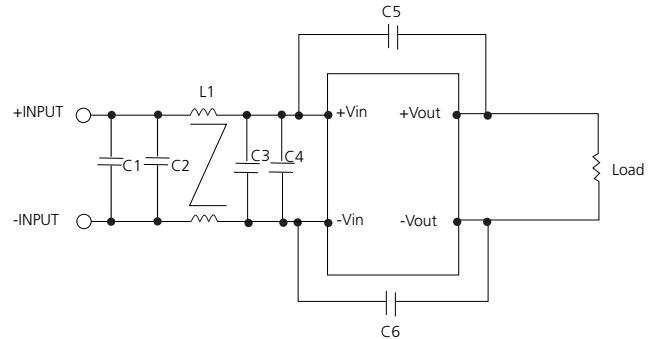
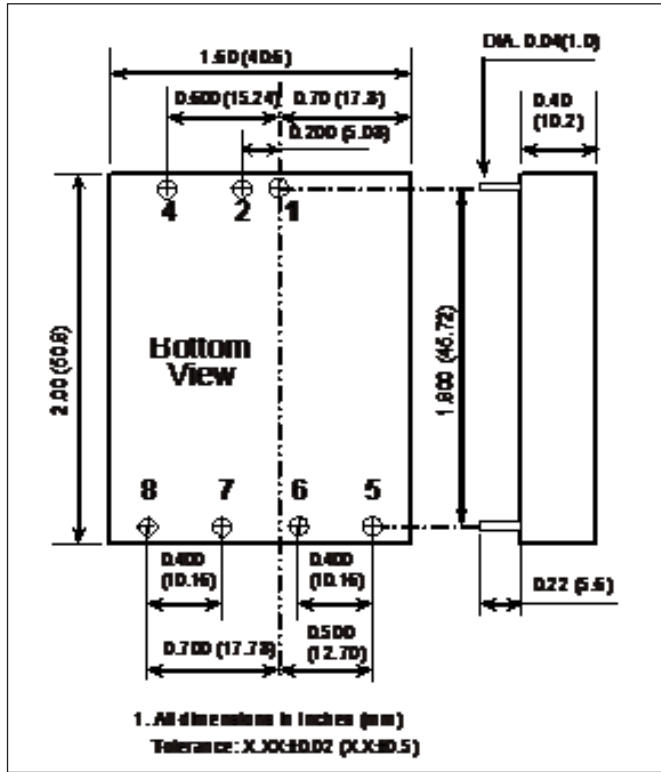
Notes:

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40oC. MIL-HDBK-217F Notice2 @Ta=25 oC, 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.
- Heat sink is optional and P/N: 7G-0011C-F.
- The PMD30 series can meet EN55022 Class A with parallel an external capacitor to the input pins. Recommend: 12Vin : 6.8fÉF/50V 1812 MLCC . 24Vin : 6.8µF/50V 1812 MLCC . 48Vin : 2.2µF/100V 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.



Industrial Line – T30 Series

30W 4:1 SINGLE & DUAL OUTPUT HIGH PERFORMANCE DC/DC CONVERTER

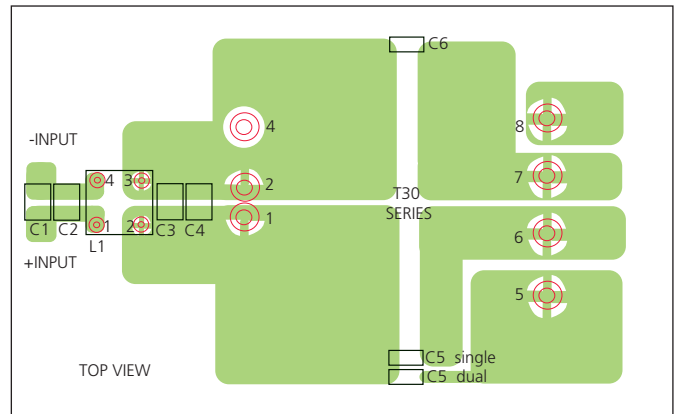
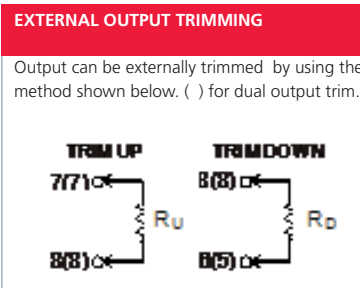


Recommended filter for EN55022 Class B compliance

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 |
|-------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------|----------------------------------------|
| PMD30-12xxx | 4.7 μ F/50V 1812 MLCC | N/A | 4.7 μ F/50V 1812 MLCC | N/A | 1000pF/2KV MLCC | 450 μ H Common Choke PMT-048 |
| PMD30-24xxx | 6.8 μ F/50V 1812 MLCC | N/A | 6.8 μ F/50V 1812 MLCC | N/A | 1000pF/2KV MLCC | 450 μ H Common Choke PMT-048 |
| PMD30-48xxx | 2.2 μ F/100V 1812 MLCC | 2.2 μ F/100V 1812 MLCC | 2.2 μ F/100V 1812 MLCC | 2.2 μ F/100V 1812 MLCC | 1000pF/2KV MLCC | 450 μ H 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 |



Recommended EN55022 Class B Filter Circuit Layout

Specifications are subject to change without notice.