

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement Equipment
Semiconductor Equipment

FEATURES

- 3 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 700mA
- SIP PACKAGE, 0.86 x 0.36x 0.44 INCH
- HIGH EFFICIENCY UP TO 85%
- 2:1 WIDE INPUT VOLTAGE RANGE
- SWITCHING FREQUENCY (100KHz, MIN)
- NO EXTERNAL INPUT AND OUTPUT CAPACITOR NEEDED
- LOW RIPPLE & NOISE
- UL94-V0 CASE POTTING MATERIALS
- INPUT TO OUTPUT ISOLATION UP TO 1.6KVDC
- CONTINUOUS SHORT CIRCUIT PROTECTION
- EXTERNAL ON/OFF CONTROL
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

OPTIONS

3KV ISOLATION

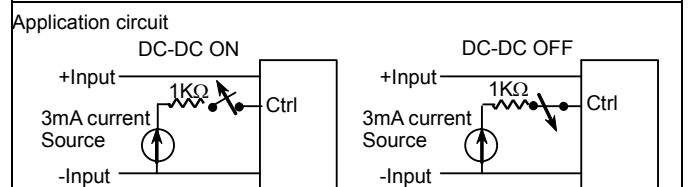
DESCRIPTION

The PDL03 series offer 3 watts of output power from a 0.86 x 0.36 x 0.44 inch package without derating to 71°C. The PDL03 series have 2:1 wide input voltage of 4.5-9, 9-18, 18-36 and 36-75VDC and features 1600VDC of isolation, short-circuit protection.

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C otherwise noted

| OUTPUT SPECIFICATIONS | | |
|----------------------------------|-------------------------------|---|
| Output power | | 3 Watts, max. |
| Voltage accuracy | Full load and nominal Vin | ± 1% |
| Minimum load | | 0% |
| Line regulation | LL to HL at Full Load | ± 0.2% |
| Load regulation | Single No load to Full load | ± 1% |
| | Dual 5% load to 100% load | ± 0.5% |
| Cross regulation (Dual) | Asymmetrical load 25%/100% FL | ±5% |
| | | |
| Ripple and noise | 20MHz bandwidth | See table |
| Temperature coefficient | | ±0.02% / °C, max. |
| Transient response recovery time | 25% load step change | 500µS, typ. |
| Short circuit protection | | Continuous, automatic recovery |
| GENERAL SPECIFICATIONS | | |
| Efficiency | | See table |
| Isolation voltage | Standard | 1600VDC, min. |
| | Suffix "H" | 3000VDC, min. |
| Isolation resistance | | 10 ⁹ ohms, min. |
| Isolation capacitance | Standard | 200pF, max. |
| | Suffix "H" | 30pF, max. |
| Switching frequency | Full load to minimum load | 100KHz, min. |
| Approvals and standard | | IEC60950-1, UL60950-1, EN60950-1 |
| Case material | | Non-conductive black plastic |
| Base material | | None |
| Potting material | | Silicon (UL94-V0) |
| Dimensions | | 0.86 X 0.36 X 0.44 Inch (21.8 X 9.1 X 11.2 mm) |
| Weight | | 4.8g (0.17oz) |
| MTBF(Note 1) | BELLCORE TR-NWT-000332 | 4.386 x 10 ⁶ hrs |
| | MIL-HDBK-217F | 2.401 x 10 ⁶ hrs |

| INPUT SPECIFICATIONS | | |
|-----------------------------------|---|---|
| Input voltage range | 5V nominal input | 4.5 – 9VDC |
| | 12V nominal input | 9 – 18VDC |
| | 24V nominal input | 18 – 36VDC |
| | 48V nominal input | 36 – 75VDC |
| Input filter | | Capacitor type |
| Input surge voltage 100mS max | 5V input | 15VDC |
| | 12V input | 36VDC |
| | 24V input | 50VDC |
| | 48V input | 100VDC |
| Input reflected ripple current | 5V input | 400mA-p-p, max. |
| | 12V input | 150mA-p-p, max. |
| | 24V input | 380mA-p-p, max. |
| | 48V input | 170mA-p-p, max. |
| Start up time | Nominal Vin and constant resistive load | Power up 30mS, typ. Remote ON/OFF 30mS, typ. |
| | | |
| Remote ON/OFF | DC-DC ON | Open or high impedance |
| | DC-DC OFF | Control pin applied current 2 ~ 4mA max(via 1KΩ) |
| Remote off state input current | Nominal Vin | 2.5mA, max. |



| ENVIRONMENTAL SPECIFICATIONS | | |
|-------------------------------|--|--|
| Operating ambient temperature | | -40°C ~ +71°C (without derating) +71°C ~ +100°C (with derating) |
| Storage temperature range | | -55°C to +105°C |
| Thermal shock | | MIL-STD-810F |
| Vibration | | MIL-STD-810F |
| Relative humidity | | 5% to 95% RH |

| EMC CHARACTERISTICS | | |
|-------------------------|-------------|----------------------------|
| EMI (Note 6) | EN55022 | Class A |
| ESD | EN61000-4-2 | Air ± 8KV |
| | | Contact ± 6KV |
| Radiated immunity | EN61000-4-3 | 10 V/m Perf. Criteria A |
| Fast transient (Note 7) | EN61000-4-4 | ± 2KV Perf. Criteria A |
| Surge (Note 7) | EN61000-4-5 | ± 1KV Perf. Criteria A |
| Conducted immunity | EN61000-4-6 | 10 Vr.m.s Perf. Criteria A |

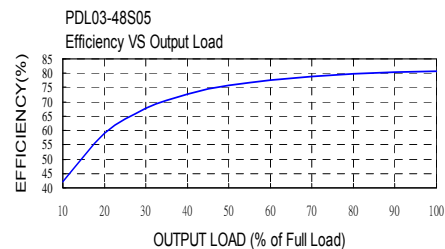
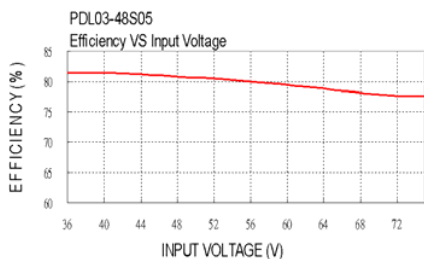
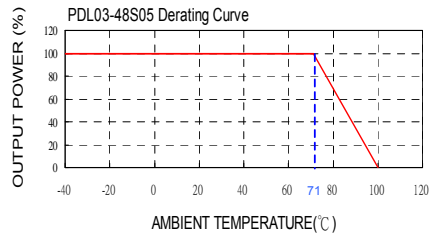


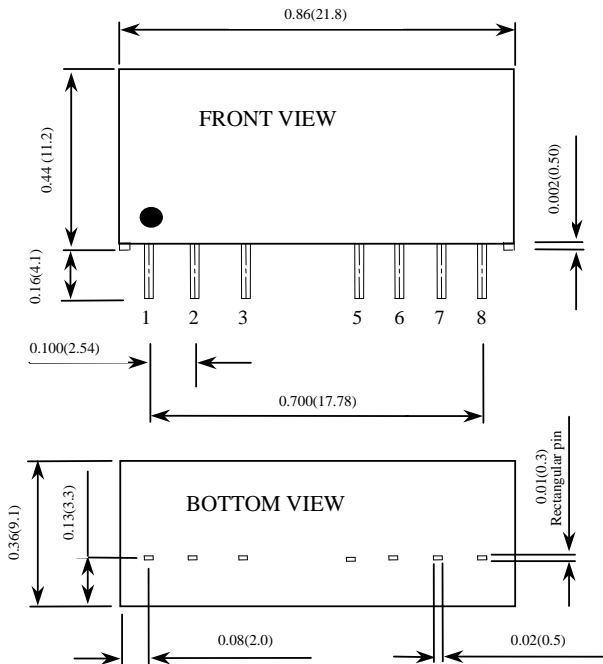


| Model Number | Input Range | Output Voltage | Output Current | | Output ⁽⁴⁾ Ripple & Noise | Input Current | | Eff ⁽⁴⁾ (%) | Capacitor ⁽⁵⁾ Load max |
|--------------|-------------|----------------|----------------|-----------|---|------------------------|--------------------------|---------------------------|--------------------------------------|
| | | | Min. load | Full load | | No load ⁽³⁾ | Full load ⁽²⁾ | | |
| PDL03-05S3P3 | 4.5 – 9 VDC | 3.3 VDC | 0mA | 700mA | 50 mVp-p | 70mA | 670mA | 73 | 1760µF |
| PDL03-05S05 | 4.5 – 9 VDC | 5 VDC | 0mA | 600mA | 50 mVp-p | 70mA | 800mA | 79 | 1000µF |
| PDL03-05S09 | 4.5 – 9 VDC | 9 VDC | 0mA | 333mA | 50 mVp-p | 70mA | 789mA | 80 | 470µF |
| PDL03-05S12 | 4.5 – 9 VDC | 12 VDC | 0mA | 250mA | 50 mVp-p | 75mA | 779mA | 81 | 170µF |
| PDL03-05S15 | 4.5 – 9 VDC | 15 VDC | 0mA | 200mA | 50 mVp-p | 75mA | 779mA | 81 | 110µF |
| PDL03-05D05 | 4.5 – 9 VDC | ±5 VDC | 0mA | ±300mA | 50 mVp-p | 70mA | 810mA | 78 | ±470µF |
| PDL03-05D12 | 4.5 – 9 VDC | ±12 VDC | 0mA | ±125mA | 50 mVp-p | 85mA | 789mA | 80 | ±100µF |
| PDL03-05D15 | 4.5 – 9 VDC | ±15 VDC | 0mA | ±100mA | 50 mVp-p | 80mA | 779mA | 81 | ±47µF |
| PDL03-12S3P3 | 9 – 18 VDC | 3.3 VDC | 0mA | 700mA | 50 mVp-p | 35mA | 275mA | 74 | 1760µF |
| PDL03-12S05 | 9 – 18 VDC | 5 VDC | 0mA | 600mA | 50 mVp-p | 35mA | 333mA | 79 | 1000µF |
| PDL03-12S09 | 9 – 18 VDC | 9 VDC | 0mA | 333mA | 50 mVp-p | 40mA | 329mA | 80 | 470µF |
| PDL03-12S12 | 9 – 18 VDC | 12 VDC | 0mA | 250mA | 50 mVp-p | 45mA | 325mA | 81 | 170µF |
| PDL03-12S15 | 9 – 18 VDC | 15 VDC | 0mA | 200mA | 50 mVp-p | 45mA | 325mA | 82 | 110µF |
| PDL03-12D05 | 9 – 18 VDC | ±5 VDC | 0mA | ±300mA | 50 mVp-p | 45mA | 329mA | 82 | ±470µF |
| PDL03-12D12 | 9 – 18 VDC | ±12 VDC | 0mA | ±125mA | 50 mVp-p | 45mA | 320mA | 83 | ±100µF |
| PDL03-12D15 | 9 – 18 VDC | ±15 VDC | 0mA | ±100mA | 50 mVp-p | 45mA | 316mA | 83 | ±47µF |
| PDL03-24S3P3 | 18 – 36 VDC | 3.3 VDC | 0mA | 700mA | 50 mVp-p | 16mA | 138mA | 74 | 1760µF |
| PDL03-24S05 | 18 – 36 VDC | 5 VDC | 0mA | 600mA | 50 mVp-p | 16mA | 162mA | 81 | 1000µF |
| PDL03-24S09 | 18 – 36 VDC | 9 VDC | 0mA | 333mA | 50 mVp-p | 17mA | 160mA | 82 | 470µF |
| PDL03-24S12 | 18 – 36 VDC | 12 VDC | 0mA | 250mA | 50 mVp-p | 18mA | 160mA | 81 | 170µF |
| PDL03-24S15 | 18 – 36 VDC | 15 VDC | 0mA | 200mA | 50 mVp-p | 18mA | 158mA | 82 | 110µF |
| PDL03-24D05 | 18 – 36 VDC | ±5 VDC | 0mA | ±300mA | 50 mVp-p | 17mA | 164mA | 80 | ±470µF |
| PDL03-24D12 | 18 – 36 VDC | ±12 VDC | 0mA | ±125mA | 50 mVp-p | 18mA | 158mA | 83 | ±100µF |
| PDL03-24D15 | 18 – 36 VDC | ±15 VDC | 0mA | ±100mA | 50 mVp-p | 18mA | 154mA | 85 | ±47µF |
| PDL03-48S3P3 | 36 – 75 VDC | 3.3 VDC | 0mA | 700mA | 50 mVp-p | 10mA | 69mA | 74 | 1760µF |
| PDL03-48S05 | 36 – 75 VDC | 5 VDC | 0mA | 600mA | 50 mVp-p | 10mA | 83mA | 79 | 1000µF |
| PDL03-48S09 | 36 – 75 VDC | 9 VDC | 0mA | 333mA | 50 mVp-p | 11mA | 82mA | 80 | 470µF |
| PDL03-48S12 | 36 – 75 VDC | 12 VDC | 0mA | 250mA | 50 mVp-p | 12mA | 82mA | 80 | 170µF |
| PDL03-48S15 | 36 – 75 VDC | 15 VDC | 0mA | 200mA | 50 mVp-p | 12mA | 81mA | 81 | 110µF |
| PDL03-48D05 | 36 – 75 VDC | ±5 VDC | 0mA | ±300mA | 50 mVp-p | 12mA | 83mA | 79 | ±470µF |
| PDL03-48D12 | 36 – 75 VDC | ±12 VDC | 0mA | ±125mA | 50 mVp-p | 12mA | 80mA | 82 | ±100µF |
| PDL03-48D15 | 36 – 75 VDC | ±15 VDC | 0mA | ±100mA | 50 mVp-p | 12mA | 79mA | 83 | ±47µF |

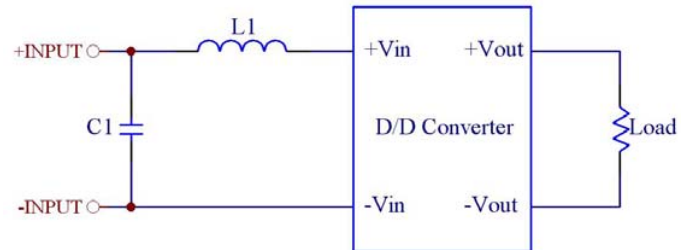
Note

- 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 PDL03 series meet EN55022 Class A with external L-C filter before the input pins to the converter. (Connect networks following Class B figure.)
Recommend: 05 Vin : C1=2.2µF/10V 1206 MLCC. L1=3.3µH 0504 SMD Inductor P/N:PMT-044.
12 Vin : C1=0.68µF/25V 1206 MLCC. L1=10µH 0504 SMD Inductor P/N:PMT-047.
24 Vin : C1=4.7µF/50V 1210 MLCC. L1=10µH 0504 SMD Inductor P/N:PMT-047.
48 Vin : C1=0.47µF/100V 1812 MLCC. L1=56µH 0504 SMD Inductor P/N:PMT-045.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ.





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



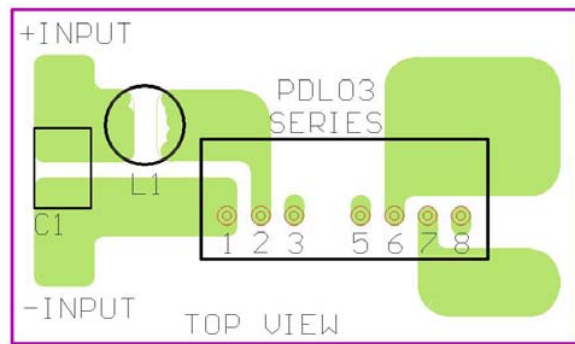
Recommended Filter for EN55022 Class B Compliance

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

| | C1 | L1 |
|-------------|-------------------------|------------------------------------|
| PDL03-05xxx | 10µF/10V 1206 MLCC | 3.3µH 0504 SMD Inductor PMT-044 |
| PDL03-12xxx | 2.2µF/25V 1206 MLCC | 18µH 0504 SMD Inductor PMT-046 |
| PDL03-24xxx | 6.8µF/50V 1812 MLCC | 18µH 0504 SMD Inductor PMT-046 |
| PDL03-48xxx | 2.2µF/100V 1812 MLCC | 56µH 0504 SMD Inductor PMT-045 |

| PIN CONNECTION | | |
|----------------|-------------|-------------|
| PIN | SINGLE | DUAL |
| 1 | - INPUT | - INPUT |
| 2 | + INPUT | + INPUT |
| 3 | CTRL | CTRL |
| 5 | NC*/No Pin* | NC*/No Pin* |
| 6 | + OUTPUT | + OUTPUT |
| 7 | - OUTPUT | COM |
| 8 | NC | - OUTPUT |

*No pin for 3KV isolation. (P/N suffix "H")
*NC pin for standard.



Recommended EN55022 Class B Filter Circuit Layout

