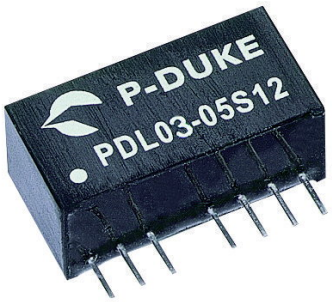
POWER MATE TECHNOLOGY CO.,LTD.

PDL03 SERIES



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 71ºC. 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 25ºC 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%
	Single: 5% load to 100% load	± 0.5%
	Dual: No Load to Full Load	± 1%
Cross regulation (Dual)	Asymmetrical load 25%/100% FL	±5%
Ripple and noise	20MHz bandwidth	See table
Temperature coefficient		±0.02% / ºC, max.
Transient response recovery time	25% load step change	500µS, typ.
Short circuit protection		Continuous, automatics recovery

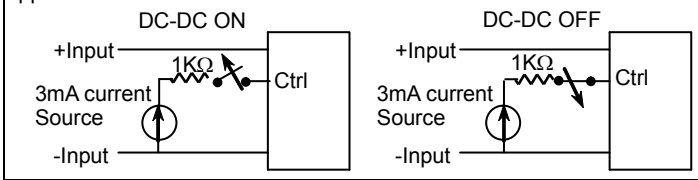
GENERAL SPECIFICATIONS

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	400mAp-p, max.
	12V input	150mAp-p, max.
	24V input	380mAp-p, max.
	48V input	170mAp-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.

Application circuit



ENVIRONMENTAL SPECIFICATIONS

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

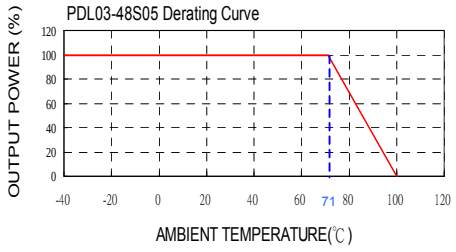
EMC CHARACTERISTICS

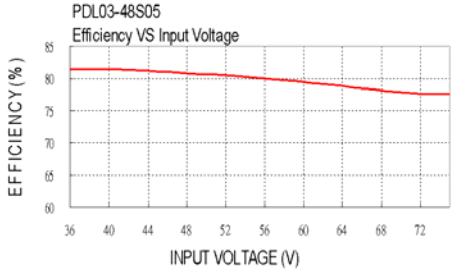
EMI (Note 6)	EN55022		Class A
ESD	EN61000-4-2	Air ± 8KV Contact ± 6KV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 7)	EN61000-4-4	± 2KV	Perf. Criteria A
Surge (Note 7)	EN61000-4-5	± 1KV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria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

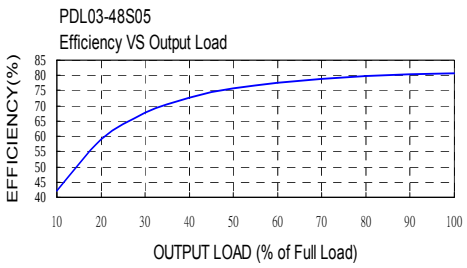
Model Number	Input Range	Output Voltage	Output Current		Output [4] Ripple & Noise	Input Current		Eff [4] (%)	Capacitor [5] Load max
			Min. load	Full load		No load[3]	Full load[2]		
PDL03-05S3P3	4.5 – 9 VDC	3.3 VDC	0mA	700mA	50 mVp-p	70mA	670mA	73	1760μF
PDL03-05S05	4.5 – 9 VDC	5 VDC	0mA	600mA	50 mVp-p	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

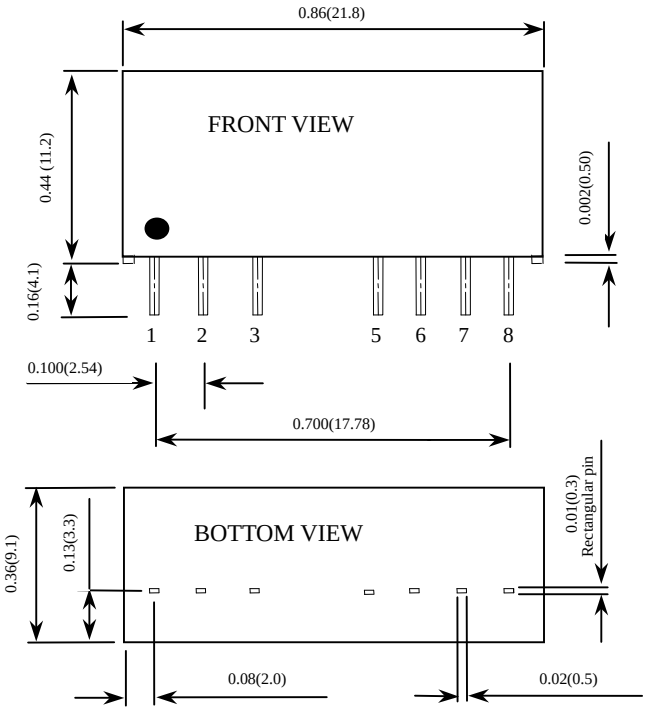
Note

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.
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 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.
7. 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.





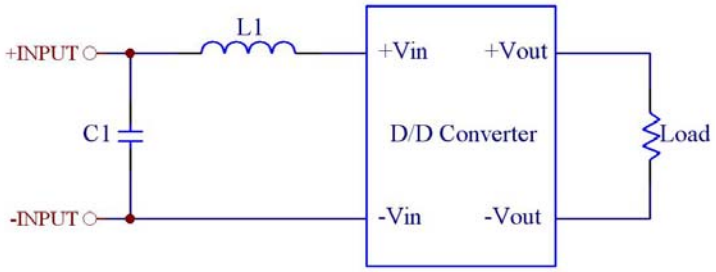




1. All dimensions in Inches (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

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

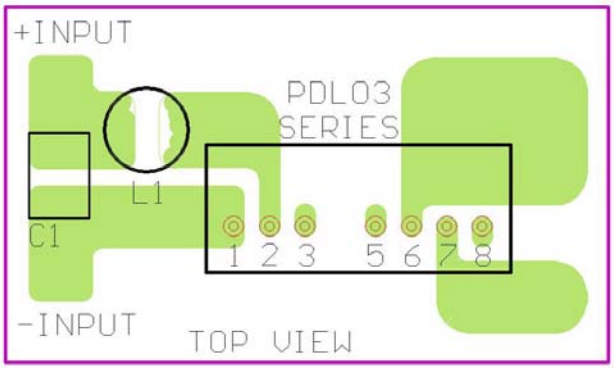
*No pin for 3KV isolation. (P/N suffix "H")
*NC pin for standard.



Recommended 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



Recommended EN55022 Class B Filter Circuit Layout