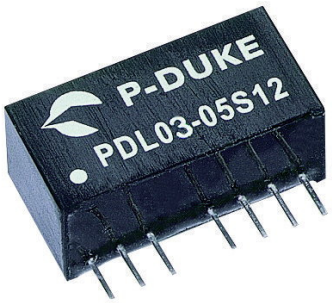
POWER MATE TECHNOLOGY CO., LTD.

PDL03 SERIES

3 WATTS DC-DC CONVERTER



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: 1600VDC**
- **CONTINUOUS SHORT CIRCUIT PROTECTION**
- **EXTERNAL ON/OFF CONTROL**
- **CE MARK MEETS 2006/95/EC, 2011/95/EC AND 2004/108/EC**
- **SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1**
- **ISO9001 CERTIFIED MANUFACTURING FACILITIES**
- **COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU**

OPTIONS

3000VDC ISOLATION

APPLICATIONS

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

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			± 1%
Minimum load			0%
Line regulation	LL to HL at Full Load		± 0.2%
Load regulation	Single	No load to Full load	± 1%
		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
Short circuit protection	Continuous, automatics recovery		

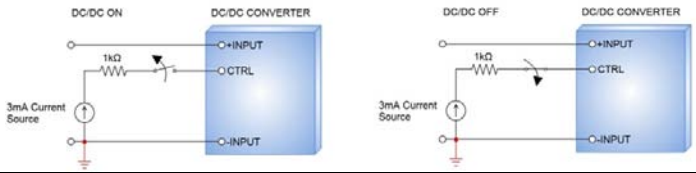
GENERAL SPECIFICATIONS

Efficiency			See table
Isolation voltage		Standard	1600VDC, min. 1minute
		Suffix "H"	3000VDC, min. 1minute
Isolation resistance	500VDC		10^9 ohms, min.
Isolation capacitance		Standard	200pF, max.
		Suffix "H"	40pF, max.
Switching frequency	Full load to minimum load		100kHz, min.
Design meet safety 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		4.386×10^6 hrs
	MIL-HDBK-217F		2.401×10^6 hrs

INPUT SPECIFICATIONS

Input voltage range	5VDC nominal input		4.5 ~ 9VDC
	12VDC nominal input		9 ~ 18VDC
	24VDC nominal input		18 ~ 36VDC
	48VDC nominal input		36 ~ 75VDC
Input filter			Capacitor type
Input surge voltage	5VDC input		15VDC 100ms, max.
	12VDC input		36VDC 100ms, max.
	24VDC input		50VDC 100ms, max.
	48VDC input		100VDC 100ms, max.
Input reflected ripple current	5VDC input		400mAp-p, max.
	12VDC input		150mAp-p, max.
	24VDC input		380mAp-p, max.
	48VDC input		170mAp-p, max.
Start up time	Nominal input and constant resistive load	Power up	30ms
		Remote ON/OFF	30ms
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 input		2.5mA, max.

Application circuit



ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature	-40ºC ~ +71ºC (without derating) +71ºC ~ +100ºC (with derating)
Storage temperature range	-55ºC ~ +125ºC
Thermal shock	MIL-STD-810F
Vibration	MIL-STD-810F
Relative humidity	5% to 95% RH

EMC CHARACTERISTICS

EMI (Note 6)	EN55022			Class A, Class B
ESD	EN61000-4-2	Air	± 8kV	Perf. Criteria A
		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

PDL03 SERIES

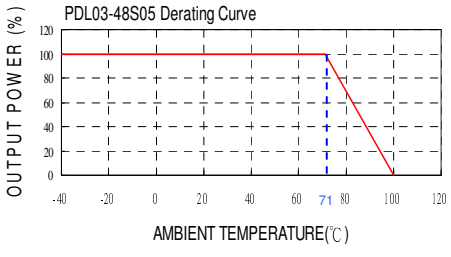
3 WATTS DC-DC CONVERTER

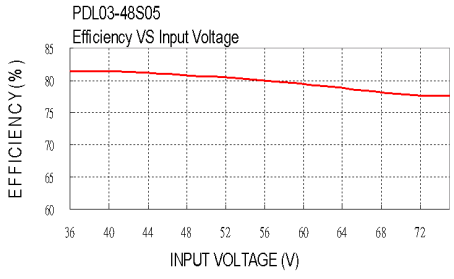
Model Number	Input Range	Output Voltage	Output Current		Output [2] Ripple & Noise	No load[3] Input Current	Eff [4] (%)	Capacitor [5] Load max
			Min. load	Full load				
PDL03-05S3P3	4.5 ~ 9 VDC	3.3 VDC	0mA	700mA	50 mVp-p	45mA	75	3300μF
PDL03-05S05	4.5 ~ 9 VDC	5 VDC	0mA	600mA	50 mVp-p	45mA	79	1680μF
PDL03-05S09	4.5 ~ 9 VDC	9 VDC	0mA	333mA	50 mVp-p	55mA	80	1000μF
PDL03-05S12	4.5 ~ 9 VDC	12 VDC	0mA	250mA	50 mVp-p	55mA	81	820μF
PDL03-05S15	4.5 ~ 9 VDC	15 VDC	0mA	200mA	50 mVp-p	55mA	82	680μF
PDL03-05D05	4.5 ~ 9 VDC	±5 VDC	0mA	±300mA	50 mVp-p	55mA	78	±1000μF
PDL03-05D12	4.5 ~ 9 VDC	±12 VDC	0mA	±125mA	50 mVp-p	60mA	81	±470μF
PDL03-05D15	4.5 ~ 9 VDC	±15 VDC	0mA	±100mA	50 mVp-p	60mA	81	±330μF
PDL03-12S3P3	9 ~ 18 VDC	3.3 VDC	0mA	700mA	50 mVp-p	25mA	77	3300μF
PDL03-12S05	9 ~ 18 VDC	5 VDC	0mA	600mA	50 mVp-p	25mA	81	1680μF
PDL03-12S09	9 ~ 18 VDC	9 VDC	0mA	333mA	50 mVp-p	30mA	80	1000μF
PDL03-12S12	9 ~ 18 VDC	12 VDC	0mA	250mA	50 mVp-p	30mA	83	820μF
PDL03-12S15	9 ~ 18 VDC	15 VDC	0mA	200mA	50 mVp-p	30mA	83	680μF
PDL03-12D05	9 ~ 18 VDC	±5 VDC	0mA	±300mA	50 mVp-p	30mA	82	±1000μF
PDL03-12D12	9 ~ 18 VDC	±12 VDC	0mA	±125mA	50 mVp-p	30mA	83	±470μF
PDL03-12D15	9 ~ 18 VDC	±15 VDC	0mA	±100mA	50 mVp-p	30mA	83	±330μF
PDL03-24S3P3	18 ~ 36 VDC	3.3 VDC	0mA	700mA	50 mVp-p	16mA	76	3300μF
PDL03-24S05	18 ~ 36 VDC	5 VDC	0mA	600mA	50 mVp-p	16mA	82	1680μF
PDL03-24S09	18 ~ 36 VDC	9 VDC	0mA	333mA	50 mVp-p	17mA	82	1000μF
PDL03-24S12	18 ~ 36 VDC	12 VDC	0mA	250mA	50 mVp-p	18mA	83	820μF
PDL03-24S15	18 ~ 36 VDC	15 VDC	0mA	200mA	50 mVp-p	18mA	84	680μF
PDL03-24D05	18 ~ 36 VDC	±5 VDC	0mA	±300mA	50 mVp-p	17mA	80	±1000μF
PDL03-24D12	18 ~ 36 VDC	±12 VDC	0mA	±125mA	50 mVp-p	18mA	83	±470μF
PDL03-24D15	18 ~ 36 VDC	±15 VDC	0mA	±100mA	50 mVp-p	18mA	85	±330μF
PDL03-48S3P3	36 ~ 75 VDC	3.3 VDC	0mA	700mA	50 mVp-p	10mA	74	3300μF
PDL03-48S05	36 ~ 75 VDC	5 VDC	0mA	600mA	50 mVp-p	10mA	79	1680μF
PDL03-48S09	36 ~ 75 VDC	9 VDC	0mA	333mA	50 mVp-p	11mA	80	1000μF
PDL03-48S12	36 ~ 75 VDC	12 VDC	0mA	250mA	50 mVp-p	12mA	81	820μF
PDL03-48S15	36 ~ 75 VDC	15 VDC	0mA	200mA	50 mVp-p	12mA	82	680μF
PDL03-48D05	36 ~ 75 VDC	±5 VDC	0mA	±300mA	50 mVp-p	12mA	79	±1000μF
PDL03-48D12	36 ~ 75 VDC	±12 VDC	0mA	±125mA	50 mVp-p	12mA	82	±470μF
PDL03-48D15	36 ~ 75 VDC	±15 VDC	0mA	±100mA	50 mVp-p	12mA	83	±330μF

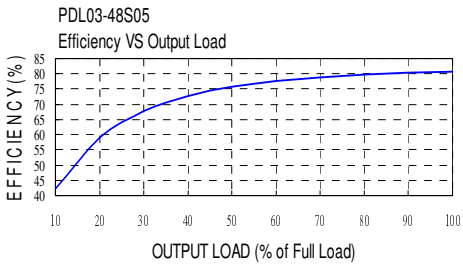
Note

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. Typical value at nominal input and full load. (20MHz BW.)
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. The PDL03 series standard module meets EN55022 Class A and Class B with external components.
   For more detail information, please contact with P-DUKE.
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.

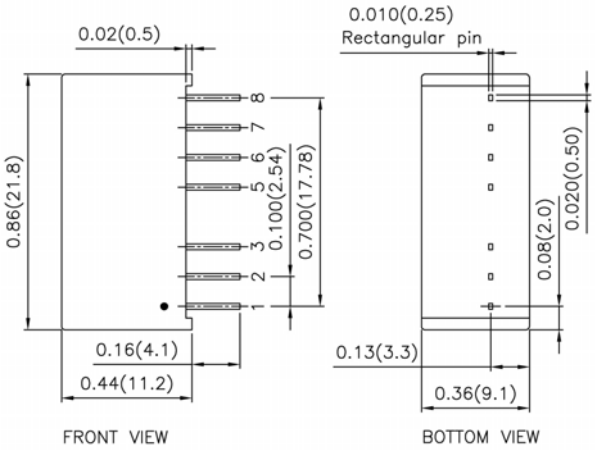
CAUTION: This power module is not internally fused. An input line fuse must always be used.







MECHANICAL DRAWING :



1. All dimensions in Inch (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	COMMON
8	NC	-OUTPUT

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