

# PDL03 SERIES

DC-DC CONVERTER

2:1 WIDE INPUT RANGE  
UP TO 3 Watts



## FEATURES

- NO MINIMUM LOAD REQUIRED
- UP TO 3000VDC INPUT TO OUTPUT ISOLATION
- SMALL SIZE AND LOW PROFILE : 0.86 X 0.36 X 0.44 INCH
- LOW OUTPUT RIPPLE AND NOISE
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

3000VDC ISOLATION	1600VDC ISOLATION	REMOTE CONTROL	OCP	SCP
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**TECHNICAL SPECIFICATION** All specifications are typical at nominal input, full load and 25°C otherwise noted

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
PDL03-05S3P3	4.5 ~ 9	3.3	700	45	75	3300
PDL03-05S05	4.5 ~ 9	5	600	45	79	1680
PDL03-05S09	4.5 ~ 9	9	333	55	80	1000
PDL03-05S12	4.5 ~ 9	12	250	55	81	820
PDL03-05S15	4.5 ~ 9	15	200	55	82	680
PDL03-05D05	4.5 ~ 9	±5	±300	55	78	±1000
PDL03-05D12	4.5 ~ 9	±12	±125	60	81	±470
PDL03-05D15	4.5 ~ 9	±15	±100	60	81	±330
PDL03-12S3P3	9 ~ 18	3.3	700	25	77	3300
PDL03-12S05	9 ~ 18	5	600	25	81	1680
PDL03-12S09	9 ~ 18	9	333	30	80	1000
PDL03-12S12	9 ~ 18	12	250	30	83	820
PDL03-12S15	9 ~ 18	15	200	30	83	680
PDL03-12D05	9 ~ 18	±5	±300	30	82	±1000
PDL03-12D12	9 ~ 18	±12	±125	30	83	±470
PDL03-12D15	9 ~ 18	±15	±100	30	83	±330
PDL03-24S3P3	18 ~ 36	3.3	700	16	76	3300
PDL03-24S05	18 ~ 36	5	600	16	82	1680
PDL03-24S09	18 ~ 36	9	333	17	82	1000
PDL03-24S12	18 ~ 36	12	250	18	83	820
PDL03-24S15	18 ~ 36	15	200	18	84	680
PDL03-24D05	18 ~ 36	±5	±300	17	80	±1000
PDL03-24D12	18 ~ 36	±12	±125	18	83	±470
PDL03-24D15	18 ~ 36	±15	±100	18	85	±330
PDL03-48S3P3	36 ~ 75	3.3	700	10	74	3300
PDL03-48S05	36 ~ 75	5	600	10	79	1680
PDL03-48S09	36 ~ 75	9	333	11	80	1000
PDL03-48S12	36 ~ 75	12	250	12	81	820
PDL03-48S15	36 ~ 75	15	200	12	82	680
PDL03-48D05	36 ~ 75	±5	±300	12	79	±1000
PDL03-48D12	36 ~ 75	±12	±125	12	82	±470
PDL03-48D15	36 ~ 75	±15	±100	12	83	±330

**PART NUMBER STRUCTURE**

<b>PDL03</b> -	<b>48</b>	<b>S</b>	<b>05</b>	<b>H</b>
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Isolation Option
	05: 4.5~9 12: 9~18 24: 18~16 48: 36~75	S: Single	3P3: 3.3 05: 5 09: 9 12: 12 15: 15	□: Standard type 1600VDC isolation H: 3000VDC isolation
		D: Dual	05: ±5 12: ±12 15: ±15	

**INPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)	4.5 9 18 36	5 12 24 48	9 18 36 75	VDC
Start up time	Constant resistive load Power up Remote ON/OFF		30 30		ms
Input surge voltage	100 ms, max. 5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)			15 36 50 100	VDC
Input reflected ripple current	5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)		400 150 380 170		mAp-p
Input filter <sup>(1)</sup>					Capacitor type
Remote ON/OFF	Ctrl pin applied current via 1kΩ DC-DC ON DC-DC OFF Remote off input current  Application circuit DC-DC ON DC-DC OFF 	2	3	4 2.5	mA mA

**OUTPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy		-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load	-1.0		+1.0	%
	5% Load to 100% Full Load	-1.0		+1.0	%
Cross regulation	Asymmetrical load 25%/100% FL	-0.5		+0.5	%
Ripple and noise	20MHz bandwidth		50		mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		500		µs
Short circuit protection					Continuous, automatic recovery

**GENERAL SPECIFICATIONS**

Parameter	Conditions			Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	Standard Type Suffix "H"	1600			VDC
Isolation resistance	500VDC			3000			GΩ
Isolation capacitance			Standard Type Suffix "H"	1		200	pF
Switching frequency	Full load to minimum load			100		40	kHz
Safety approvals							UL60950-1 EN60950-1 IEC60950-1
Case material							Non-conductive black plastic
Base material							None
Potting material							Silicone (UL94 V-0)
Weight							4.8g (0.17oz)
MTBF	MIL-HDBK-217F						4.871 x 10 <sup>6</sup> hrs

**ENVIRONMENTAL SPECIFICATIONS**

Parameter	Conditions			Min.	Typ.	Max.	Unit
Operating ambient temperature		Without derating		-40		+71	°C
		With derating		+71		+100	°C
Storage temperature range				-55		+125	°C
Thermal shock							MIL-STD-810F
Vibration							MIL-STD-810F
Relative humidity							5% to 95% RH

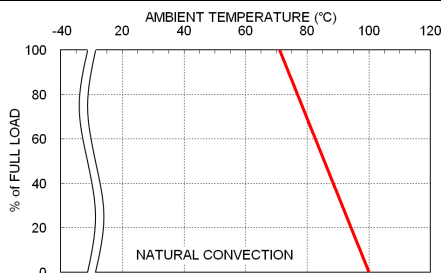
**EMC SPECIFICATIONS**

Parameter	Conditions		Level
EMI <sup>(2)</sup>	EN55022		Class A · Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient <sup>(3)</sup>	EN61000-4-4	± 2kV	Perf. Criteria A
Surge <sup>(3)</sup>	EN61000-4-5	±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

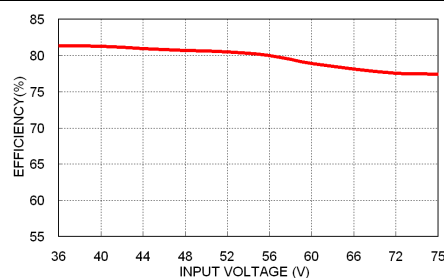
**Note:**

- It will not damage the device without installing external input capacitors. It's helpful to reduce input reflected ripple current if external input capacitors are installed.
- The standard module meet EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
- 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.

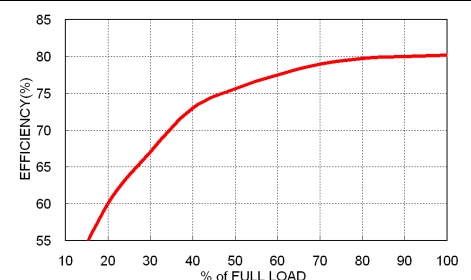
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

**CHARACTERISTIC CURVE**


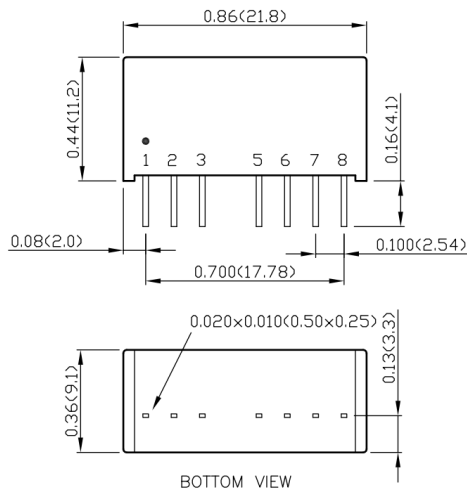
PDL03-48S05 Derating Curve



PDL03-48S05 Efficiency vs. Input Voltage



PDL03-48S05 Efficiency vs. Output Load

**MECHANICAL DRAWING**

**PIN CONNECTION**

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC*/No pin**	NC*/No pin**
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

\*NC pin for standard type model.

\*\*No pin for 3kVDC isolation model (suffix "H").

1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)  
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)