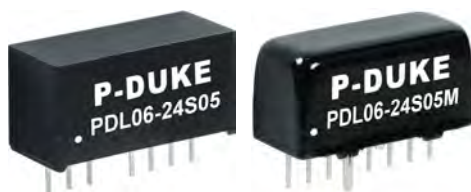


# PDL06 SERIES

DC-DC CONVERTER

2:1 WIDE INPUT RANGE  
UP TO 6 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	UVP
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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
PDL06-05S3P3	4.5 ~ 9	3.3	1300	65mA	77	6600
PDL06-05S05	4.5 ~ 9	5	1200	105mA	81	3300
PDL06-05S09	4.5 ~ 9	9	666	105mA	83	2000
PDL06-05S12	4.5 ~ 9	12	500	105mA	84	1600
PDL06-05S15	4.5 ~ 9	15	400	105mA	84	1400
PDL06-05S24	4.5 ~ 9	24	250	105mA	84	680
PDL06-05D05	4.5 ~ 9	±5	±600	105mA	81	±2000
PDL06-05D12	4.5 ~ 9	±12	±250	105mA	84	±900
PDL06-05D15	4.5 ~ 9	±15	±200	105mA	84	±660
PDL06-12S3P3	9 ~ 18	3.3	1300	40mA	78	6600
PDL06-12S05	9 ~ 18	5	1200	55mA	83	3300
PDL06-12S09	9 ~ 18	9	666	55mA	85	2000
PDL06-12S12	9 ~ 18	12	500	55mA	85	1600
PDL06-12S15	9 ~ 18	15	400	55mA	85	1400
PDL06-12S24	9 ~ 18	24	250	55mA	84	680
PDL06-12D05	9 ~ 18	±5	±600	55mA	82	±2000
PDL06-12D12	9 ~ 18	±12	±250	55mA	84	±900
PDL06-12D15	9 ~ 18	±15	±200	55mA	85	±660
PDL06-24S3P3	18 ~ 36	3.3	1300	20mA	78	6600
PDL06-24S05	18 ~ 36	5	1200	28mA	83	3300
PDL06-24S09	18 ~ 36	9	666	28mA	85	2000
PDL06-24S12	18 ~ 36	12	500	28mA	86	1600
PDL06-24S15	18 ~ 36	15	400	28mA	86	1400
PDL06-24S24	18 ~ 36	24	250	28mA	85	680
PDL06-24D05	18 ~ 36	±5	±600	28mA	82	±2000
PDL06-24D12	18 ~ 36	±12	±250	28mA	85	±900
PDL06-24D15	18 ~ 36	±15	±200	28mA	85	±660
PDL06-48S3P3	36 ~ 75	3.3	1300	14mA	78	6600
PDL06-48S05	36 ~ 75	5	1200	14mA	82	3300
PDL06-48S09	36 ~ 75	9	666	14mA	84	2000
PDL06-48S12	36 ~ 75	12	500	14mA	85	1600
PDL06-48S15	36 ~ 75	15	400	14mA	86	1400
PDL06-48S24	36 ~ 75	24	250	14mA	84	680
PDL06-48D05	36 ~ 75	±5	±600	14mA	82	±2000
PDL06-48D12	36 ~ 75	±12	±250	14mA	84	±900
PDL06-48D15	36 ~ 75	±15	±200	14mA	85	±660

**PART NUMBER STRUCTURE**

<b>PDL06</b> -	<b>48</b>	<b>S</b>	<b>05</b>	<b>H</b>
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Case & Isolation Option
	05: 4.5~9 12: 9~18 24: 18~36 48: 36~75	S: Single  D: Dual	3P3: 3.3 05: 5 09: 9 12: 12 15: 15  05: ±5 12: ±12 15: ±15	□: Standard type Plastic case 1600VDC isolation H: Plastic case 3000VDC isolation M: Metal case 1600VDC isolation

**INPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	5Vin(nom)	4.5	5	9	VDC
	12Vin(nom)	9	12	18	
	24Vin(nom)	18	24	36	
	48Vin(nom)	36	48	75	
Start up voltage	5Vin(nom)			4.5	VDC
	12Vin(nom)			9	
	24Vin(nom)			18	
	48Vin(nom)			36	
Shutdown voltage	5Vin(nom)		3.5		VDC
	12Vin(nom)		7		
	24Vin(nom)		15		
	48Vin(nom)		33		
Start up time	Constant resistive load Power up Remote ON/OFF		5	10	ms
			5	10	
Input surge voltage	1 second, max. 5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)			15	VDC
				36	
				50	
				100	
Input reflected ripple current			30		mAp-p
Input filter			Capacitor type		
Remote ON/OFF	Ctrl pin applied current via 1kΩ  Application circuit DC-DC ON	DC-DC ON	Open or high impedance		
		DC-DC OFF Remote off input current	2	3	4
				2.5	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	%
	No Load to Full Load				
Load regulation	Single	-1.0		+1.0	%
	Dual	-1.0		+1.0	%
Cross regulation	Asymmetrical load 25%/100% FL	-5.0		+5.0	%
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	1600			VDC
	Suffix "H"	3000			
Isolation resistance	Input (Output) to Case Suffix "M"	1600			GΩ
	Suffix "M"	1000			
Isolation capacitance	Standard Type			50	pF
	Suffix "H"			50	
	Suffix "M"			50	
Switching frequency	Full load to minimum load	100			kHz
Safety approvals					UL60950-1 EN60950-1 IEC60950-1
Case material	Standard Type				Non-conductive black plastic
	Suffix "H"				Non-conductive black plastic
	Suffix "M"				Copper
Base material					None
Potting material					Silicone (UL94 V-0)
Weight	Standard Type				4.8g (0.17oz)
	Suffix "H"				4.8g (0.17oz)
	Suffix "M"				5.9g (0.21oz)
MTBF	MIL-HDBK-217F Standard Type				2.135 x 10 <sup>6</sup> hrs
	Suffix "H"				2.135 x 10 <sup>6</sup> hrs
	Suffix "M"				2.360 x 10 <sup>6</sup> hrs

**ENVIRONMENTAL SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Standard type	Without derating	-40	+65	°C
		With derating	+65	+90	
	Suffix "H"	Without derating	-40	+65	
		With derating	+65	+90	
	Suffix "M"	Without derating	-40	+70	
		With derating	+70	+95	
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

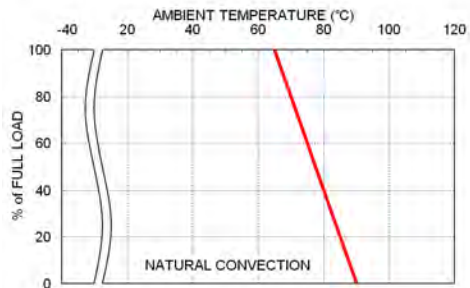
**EMC SPECIFICATIONS**

Parameter	Conditions	Level
EMI <sup>(1)</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>(2)</sup>	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge <sup>(2)</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

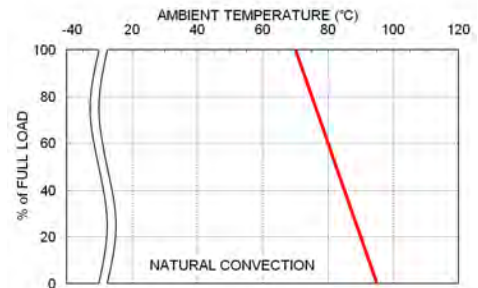
**Note:**

- The standard modules 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: 5 VDC input : Nippon chemi-con KY series, 330µF/50V.  
Others : Nippon chemi-con KY series, 220µF/100V.

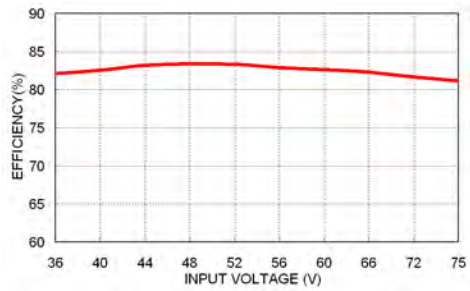
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

**CHARACTERISTIC CURVE**


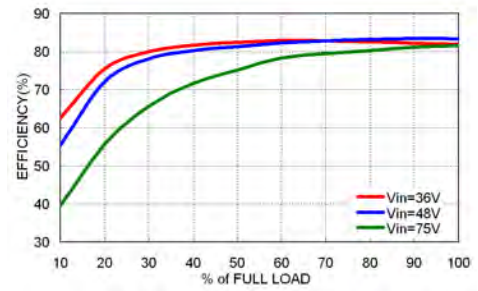
PDL06-48S05 Derating Curve



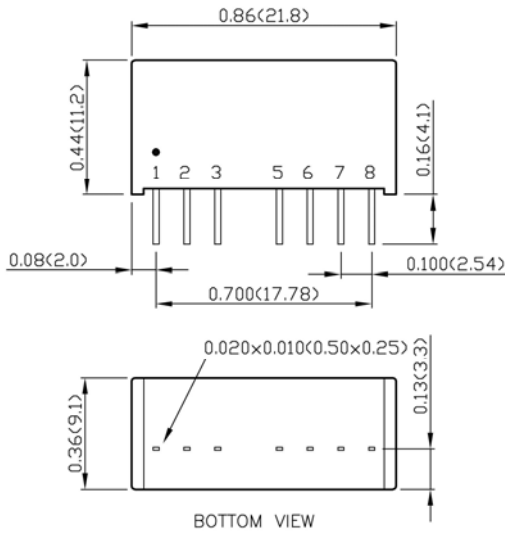
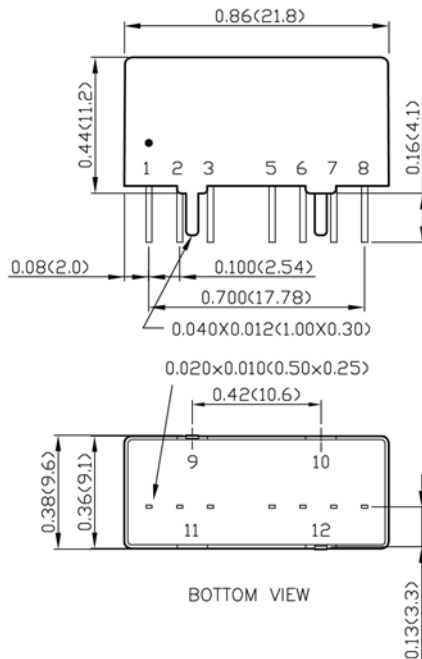
PDL06-48S05M Derating Curve



PDL06-48S05 Efficiency vs. Input Voltage



PDL06-48S05 Efficiency vs. Output Load

**MECHANICAL DRAWING**
**Standard type, Suffix "H"**

**Suffix "M"**

**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)

**PIN CONNECTION**

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout
9	Case	Case
10	Stand off	Stand off
11	Stand off	Stand off
12	Case	Case

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)