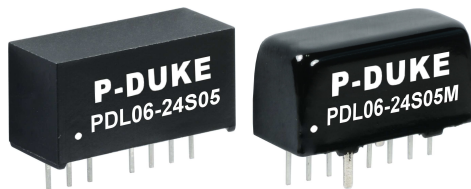


PDL06 SERIES

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	SCP	UVP
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TECHNICAL SPECIFICATION

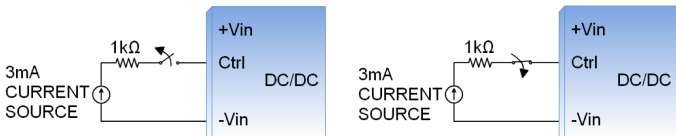
All specifications are typical at nominal input, full load and 25°C otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	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

PDL06	-	48	S	05	H
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	3P3: 3.3 05: 5 09: 9 12: 12 15: 15	□: Standard type Plastic case 1600VDC isolation H: Plastic case 3000VDC isolation M: Metal case 1600VDC 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 voltage	5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)			4.5 9 18 36	VDC
Shutdown voltage	5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)		3.5 7 15 33		VDC
Start up time	Constant resistive load Power up Remote ON/OFF		5 5	10 10	ms
Input surge voltage	1 second, max. 5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)			15 36 50 100	VDC
Input reflected ripple current			30		mAp-p
Input filter			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 Single Dual	-1.0 -1.0		+1.0 +1.0	%
Cross regulation	Asymmetrical load 25%/100% FL Dual	-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 Suffix "H" Suffix "M" Input (Output) to Case Suffix "M"	1600 3000 1600 1000			VDC
Isolation resistance	500VDC	1			GΩ
Isolation capacitance	Standard Type Suffix "H" Suffix "M"			50 50 50	pF
Switching frequency	Full load to minimum load	100			kHz
Safety approvals				UL60950-1 EN60950-1 IEC60950-1	
Case material	Standard Type Suffix "H" Suffix "M"			Non-conductive black plastic Non-conductive black plastic Copper	
Base material				None	
Potting material				Silicone (UL94 V-0)	
Weight	Standard Type Suffix "H" Suffix "M"			4.8g (0.17oz) 4.8g (0.17oz) 5.9g (0.21oz)	
MTBF	MIL-HDBK-217F Standard Type Suffix "H" Suffix "M"			2.135 x 10 ⁶ hrs 2.135 x 10 ⁶ hrs 2.360 x 10 ⁶ hrs	

ENVIRONMENTAL SPECIFICATIONS

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

EMC SPECIFICATIONS

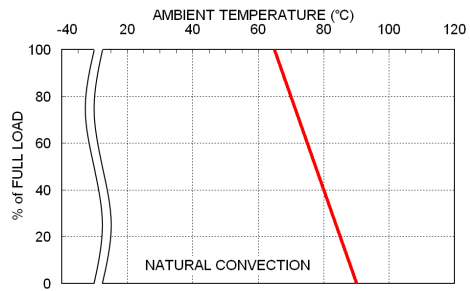
Parameter	Conditions	Level
EMI ⁽¹⁾	EN55022	Class A , Class B
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient ⁽²⁾	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge ⁽²⁾	EN61000-4-5 ±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 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:

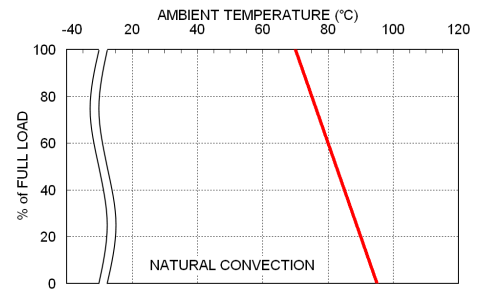
- The standard modules meet EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: 5 VDC input : Nippon chemi-con 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.

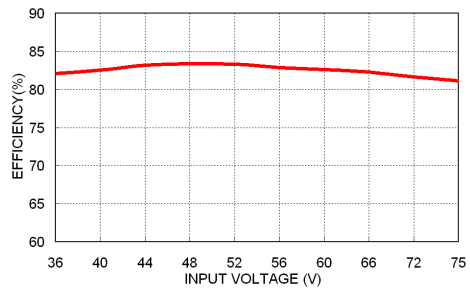
CHARACTERISTIC CURVE



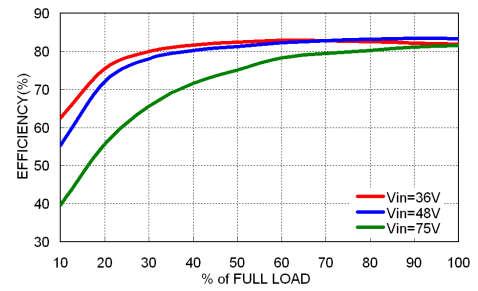
PDL06-48S05 Derating Curve



PDL06-48S05M Derating Curve



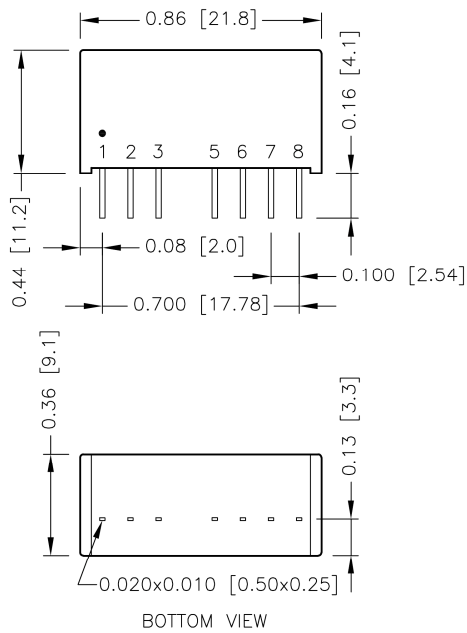
PDL06-48S05 Efficiency vs. Input Voltage



PDL06-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING

Standard type, Suffix "H"



PIN CONNECTION

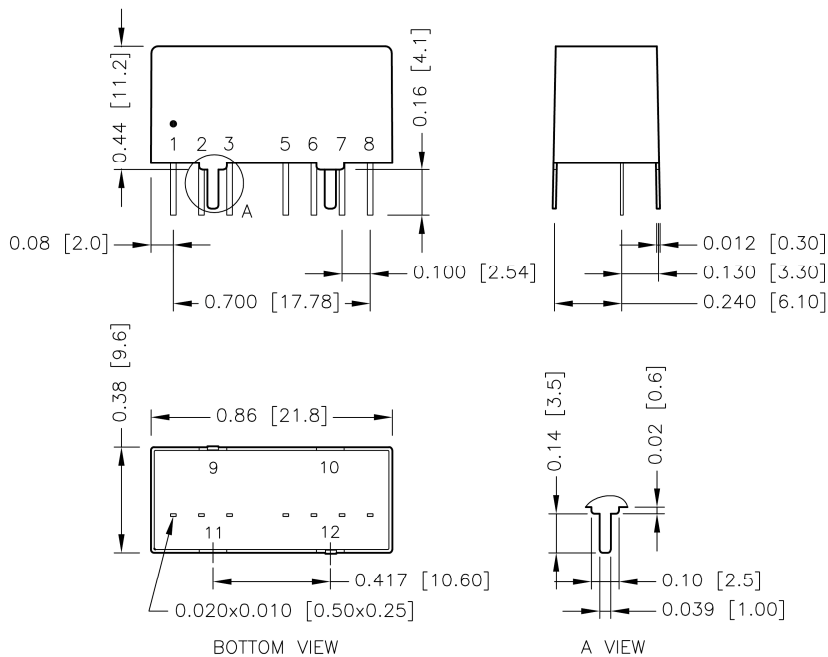
PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC*/No pin**	NC*/No pin**
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

*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]

Suffix "M"



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]