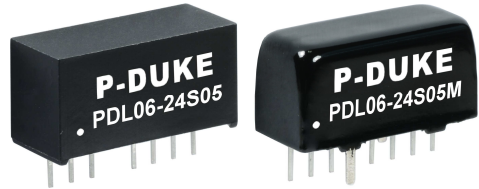


PDL06 SERIES

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

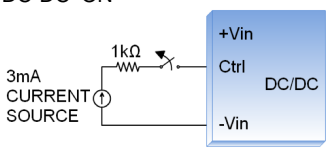
Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	µF
PDL06-05S3P3	4.5 ~ 9	3.3	1300	65mA	77	6600
PDL06-05S05	4.5 ~ 9	5	1200	105mA	81	3300
PDL06-05S09	4.5 ~ 9	9	666	105mA	83	2000
PDL06-05S12	4.5 ~ 9	12	500	105mA	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

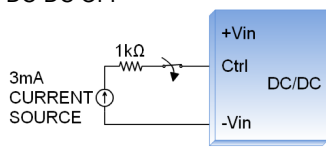
PDL06 -	48	S	05	H
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Case & Isolation Option
	05: 4.5~9 12: 9~18 24: 18~36 48: 36~75	S: Single D: Dual	3P3: 3.3 05: 5 09: 9 12: 12 15: 15 05±5 12±12 15±15	□: Standard type Plastic case 1600VDC isolation H: Plastic case 3000VDC isolation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

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	5Vin(nom) 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



DC-DC ON



DC-DC OFF

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	%
Cross regulation	Asymmetrical load 25%/100% FL	-1.0		+1.0	%
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	500VDC	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							Non-conductive black plastic Non-conductive black plastic Copper
Base material							None
Potting material							Silicone (UL94 V-0)
Weight							4.8g (0.17oz)
							4.8g (0.17oz)
							5.9g (0.21oz)
MTBF	MIL-HDBK-217F	Standard Type					2.135 x 10 ⁶ hrs
		Suffix "H"					2.135 x 10 ⁶ hrs
		Suffix "M"					2.360 x 10 ⁶ 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

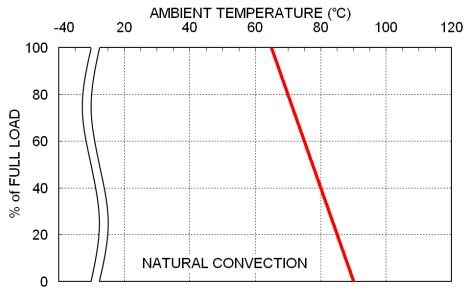
Parameter	Conditions		Level
EMI ⁽¹⁾	EN55022		Class A · Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient ⁽²⁾	EN61000-4-4	± 2kV	Perf. Criteria A
Surge ⁽²⁾	EN61000-4-5	±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6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

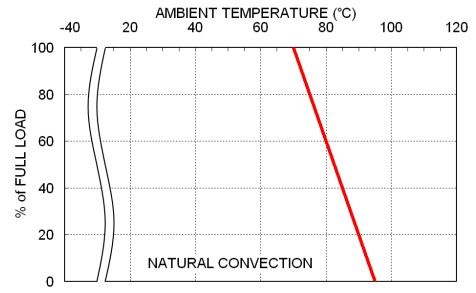
- The standard modules meet EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: 5 VDC input : Nippon chemi-con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

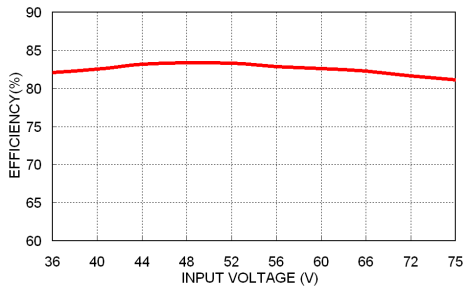
CHARACTERISTIC CURVE



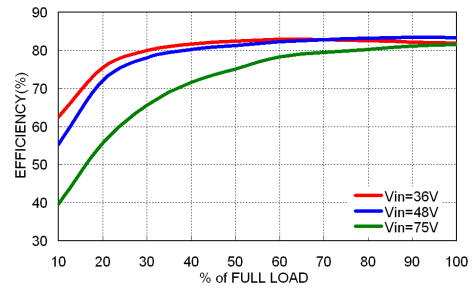
PDL06-48S05 Derating Curve



PDL06-48S05M Derating Curve



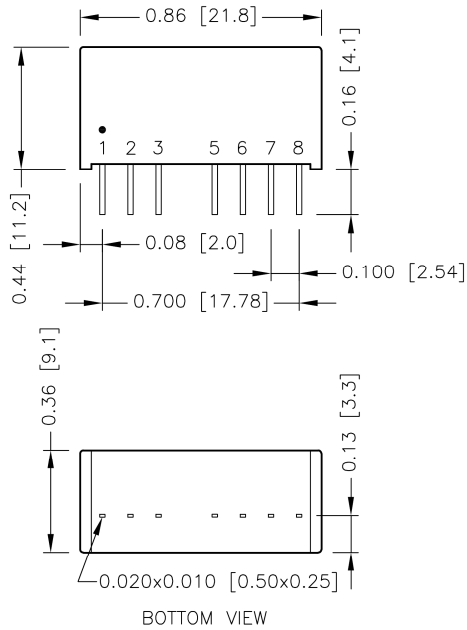
PDL06-48S05 Efficiency vs. Input Voltage



PDL06-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING

Standard type, Suffix "H"



PIN CONNECTION

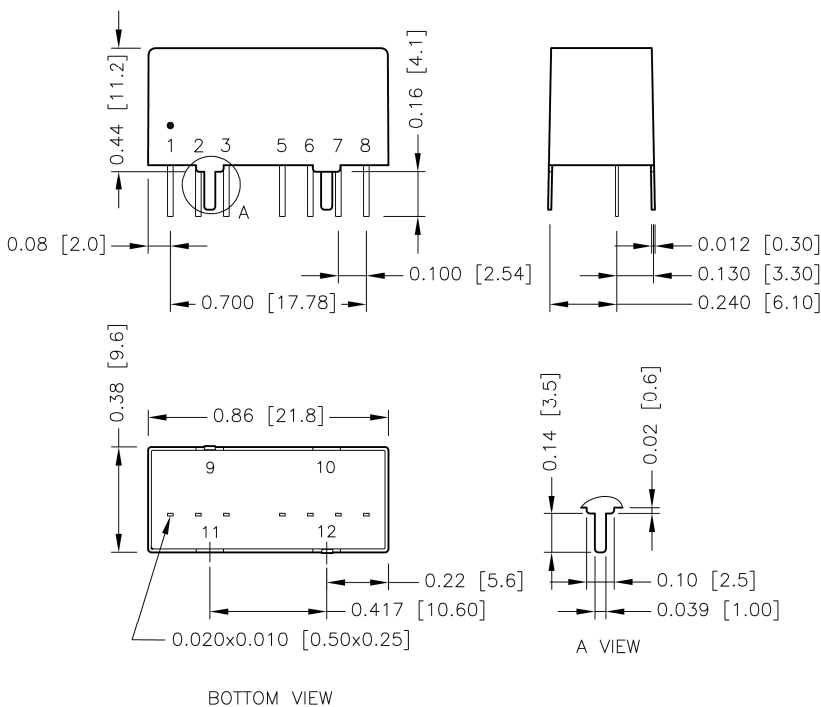
PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC*/No pin**	NC*/No pin**
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

*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]