

PDL02 SERIES

DC-DC CONVERTER

2:1 WIDE INPUT RANGE
UP TO 2 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
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TECHNICAL SPECIFICATION

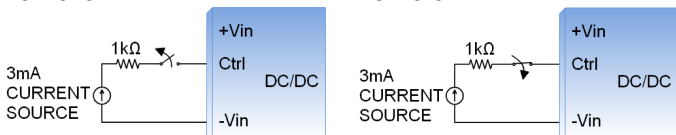
All specifications are typical at nominal input, full load and 25°C otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	µF
PDL02-05S33	4.5 ~ 9	3.3	500	35	76	2200
PDL02-05S05	4.5 ~ 9	5	400	35	80	1000
PDL02-05S09	4.5 ~ 9	9	222	40	82	470
PDL02-05S12	4.5 ~ 9	12	167	40	81	170
PDL02-05S15	4.5 ~ 9	15	134	40	83	110
PDL02-05D05	4.5 ~ 9	±5	±200	40	79	±470
PDL02-05D12	4.5 ~ 9	±12	±83	40	82	±100
PDL02-05D15	4.5 ~ 9	±15	±67	40	81	±47
PDL02-12S33	9 ~ 18	3.3	500	20	77	2200
PDL02-12S05	9 ~ 18	5	400	20	81	1000
PDL02-12S09	9 ~ 18	9	222	20	82	470
PDL02-12S12	9 ~ 18	12	167	20	83	170
PDL02-12S15	9 ~ 18	15	134	20	84	110
PDL02-12D05	9 ~ 18	±5	±200	30	81	±470
PDL02-12D12	9 ~ 18	±12	±83	30	83	±100
PDL02-12D15	9 ~ 18	±15	±67	30	84	±47
PDL02-24S33	18 ~ 36	3.3	500	15	78	2200
PDL02-24S05	18 ~ 36	5	400	15	81	1000
PDL02-24S09	18 ~ 36	9	222	15	82	470
PDL02-24S12	18 ~ 36	12	167	15	83	170
PDL02-24S15	18 ~ 36	15	134	15	84	110
PDL02-24D05	18 ~ 36	±5	±200	15	80	±470
PDL02-24D12	18 ~ 36	±12	±83	15	83	±100
PDL02-24D15	18 ~ 36	±15	±67	15	82	±47
PDL02-48S33	36 ~ 75	3.3	500	8	76	2200
PDL02-48S05	36 ~ 75	5	400	8	78	1000
PDL02-48S09	36 ~ 75	9	222	8	84	470
PDL02-48S12	36 ~ 75	12	167	8	83	170
PDL02-48S15	36 ~ 75	15	134	8	83	110
PDL02-48D05	36 ~ 75	±5	±200	8	80	±470
PDL02-48D12	36 ~ 75	±12	±83	8	81	±100
PDL02-48D15	36 ~ 75	±15	±67	8	81	±47

PART NUMBER STRUCTURE

PDL02 -	48	S	05	H
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Isolation Option
	05: 4.5~9 12: 9~18 24: 18~36 48: 36~75	S: Single	33: 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		5 5		ms
Input surge voltage	100 ms, max. 5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)			15 36 50 100	VDC
Input reflected ripple current	With external input capacitors 5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)		400 150 380 170		mAp-p
Input filter (1)			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	%
	10% Load to 90% Full Load	-0.5		+0.5	%
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 Suffix "H"	1600		3000	VDC
Isolation resistance	500VDC			1			GΩ
Isolation capacitance			Standard Type Suffix "H"			200 40	pF
Switching frequency	Full load to minimum load			100			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					4.903 x 10 ⁶ hrs	

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions			Min.	Typ.	Max.	Unit
Operating ambient temperature		Without derating		-40		+85	°C
		With derating		+85		+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

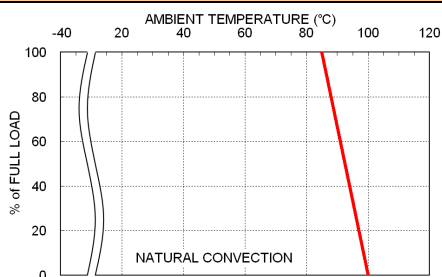
Parameter	Conditions		Level
EMI ⁽²⁾	EN55022		Class A · Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient ⁽³⁾	EN61000-4-4	± 2kV	Perf. Criteria A
Surge ⁽³⁾	EN61000-4-5	± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6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

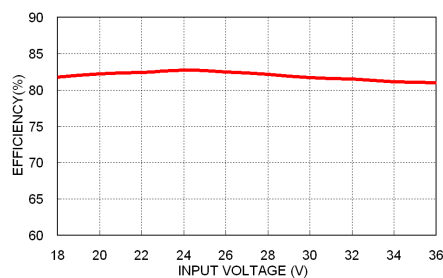
- It will not damage the device without installing external input capacitors. It's helpful to reduce input reflected ripple current if external input capacitors are installed.
- The standard module meets EMI Class A or Class B with external components. For further information, please contact with P-DUKE.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

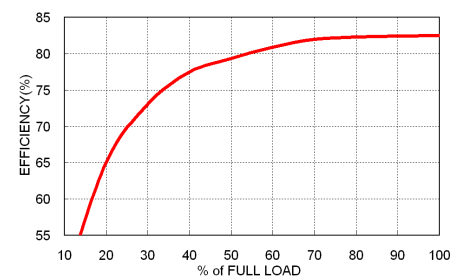
CHARACTERISTIC CURVE



PDL02-24S05 Derating Curve

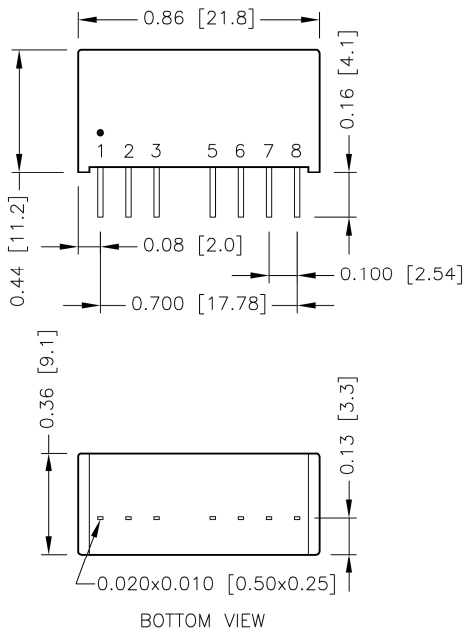


PDL02-24S05 Efficiency vs. Input Voltage



PDL02-24S05 Efficiency vs. Output Load

MECHANICAL DRAWING



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

*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.xx±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]