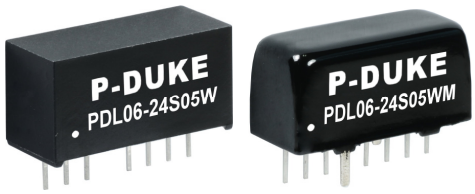
POWER MATE TECHNOLOGY CO., LTD.

PDL06W SERIES

DC-DC CONVERTER



4:1 ULTRA 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
- 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	LOW STANDBY POWER

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25℃ 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
PDL06-24S3P3W	9 ~ 36	3.3	1500	4	81	2200
PDL06-24S05W	9 ~ 36	5	1200	4	84	1100
PDL06-24S09W	9 ~ 36	9	666	4	86	680
PDL06-24S12W	9 ~ 36	12	500	4	87	470
PDL06-24S15W	9 ~ 36	15	400	4	88	470
PDL06-24S24W	9 ~ 36	24	250	4	87	180
PDL06-24D05W	9 ~ 36	±5	±600	6	84	±680
PDL06-24D12W	9 ~ 36	±12	±250	6	87	±330
PDL06-24D15W	9 ~ 36	±15	±200	8	87	±180
PDL06-48S3P3W	18 ~ 75	3.3	1500	4	81	2200
PDL06-48S05W	18 ~ 75	5	1200	4	84	1100
PDL06-48S09W	18 ~ 75	9	666	4	85	680
PDL06-48S12W	18 ~ 75	12	500	4	87	470
PDL06-48S15W	18 ~ 75	15	400	4	87	470
PDL06-48S24W	18 ~ 75	24	250	4	87	180
PDL06-48D05W	18 ~ 75	±5	±600	6	84	±680
PDL06-48D12W	18 ~ 75	±12	±250	6	87	±330
PDL06-48D15W	18 ~ 75	±15	±200	8	87	±180

PART NUMBER STRUCTURE

PDL06 - 48 S 05 W H

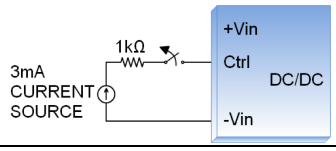
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range	Case & Isolation Option
	24: 9~36 **48:**18~75	**S:**Single	**3P3:** 3.3 **05:** 5 **09:** 9 **12:**12 **15:**15 **24:**24	4 : 1	**□:** Standard type Plastic case 1600VDC isolation **H:** Plastic case 3000VDC isolation **M:** Metal case 1600VDC isolation
		D: Dual	**05:**± 5 **12:**±12 **15:**±15		

INPUT SPECIFICATIONS

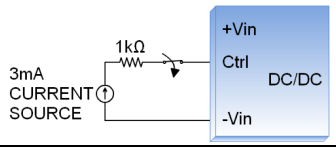
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		24Vin(nom) 48Vin(nom)	9 18	24 48	36 75	VDC
Start up time	Constant resistive load	Power up Remote ON/OFF		30 30		ms
Input surge voltage	1 second, max.	24Vin(nom) 48Vin(nom)			50 100	VDC
Input reflected ripple current		24Vin(nom) 48Vin(nom)		20 40		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		Open or high impedance 3	4 2.5	mA mA

Application circuit

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	Single Dual	-0.5 -1.0		+0.5 +1.0	%
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Ripple and noise	20MHz bandwidth	3.3Vout 5Vout, 9Vout 12Vout, 15Vout 24Vout		50 75		mVp-p
Temperature coefficient			-0.02		+0.02	%/℃
Transient response recovery time	25% load step change			250		μs
Over load protection	% of Iout rated; Hiccup mode			180		%
Short circuit protection				Continuous, automatics recovery		

GENERAL SPECIFICATIONS

Parameter	Conditions			Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	Standard Type Suffix ”H” Suffix ”M”	1600 3000 1600			VDC
		Input (Output) to Case	Suffix ”M”	1000			
Isolation resistance	500VDC			1			GΩ
Isolation capacitance			Standard Type Suffix ”H” Suffix ”M”			50 50 50	pF
Switching frequency				522	580	638	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”				2.928×10^6 hrs 2.928×10^6 hrs 3.161×10^6 hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	Standard type	Without derating	-40		+71	℃
		With derating	+71		+100	
	Suffix "H"	Without derating	-40		+71	
		With derating	+71		+100	
	Suffix "M"	Without derating	-40		+75	
		With derating	+75		+100	
Storage temperature range			-55		+125	℃
Thermal shock					MIL-STD-810F	
Vibration					MIL-STD-810F	
Relative humidity					5% to 95% RH	

EMC SPECIFICATIONS

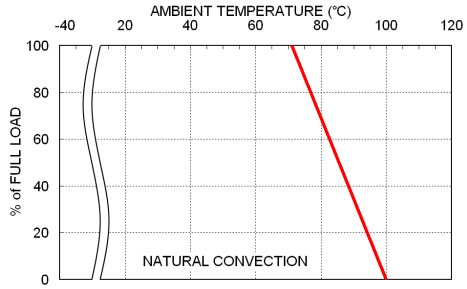
Parameter	Conditions		Level
EMI(1)	EN55022		Class A、Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	20 V/m	Perf. Criteria A
Fast transient (2)	EN61000-4-4	± 2kV	Perf. Criteria A
Surge (2)	EN61000-4-5	±2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

Note:

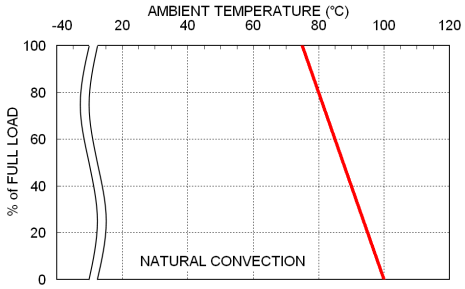
1. The standard modules meet EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
2. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
   The filter Power Mate suggested:
   The PDL06-24□□□W recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220μF/100V) and a TVS (SMDJ70A, 70V, 3000Watt peak pulse power) to connect in parallel.
   The PDL06-48□□□W recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220μF/100V) and a TVS (SMDJ120A, 120V, 3000Watt peak pulse power) to connect in parallel.

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

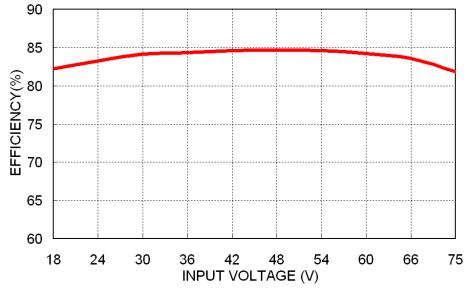
CHARACTERISTIC CURVE



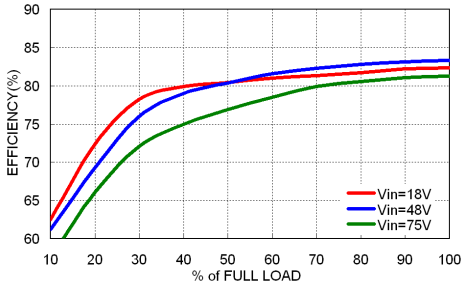
PDL06-48S05W Derating Curve



PDL06-48S05WM Derating Curve



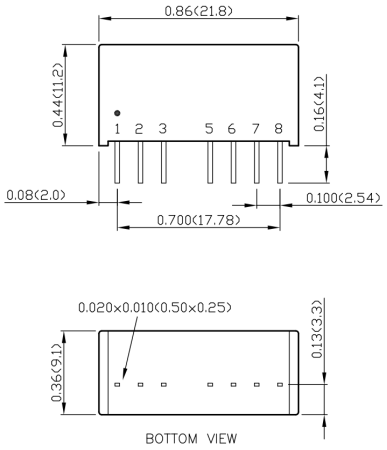
PDL06-48S05W Efficiency vs. Input Voltage



PDL06-48S05W Efficiency vs. Output Load

MECHANICAL DRAWING

Standard type, Suffix "H"



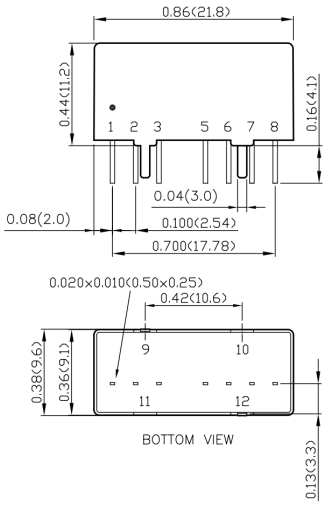
PIN CONNECTION

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)