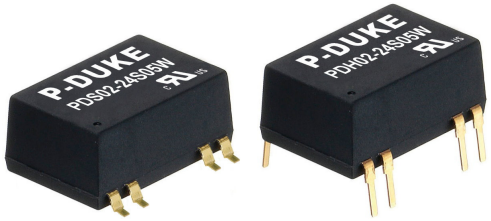
PDS02W · PDH02W Series

DC-DC Converter
Up to 2 Watts

3 YEARS WARRANTY

RoHS COMPLIANT

REACH COMPLIANT



Automation · Datacom · IPC · Industry · Measurement · Telecom · Automobile · Boat · Charger · Medical · PV · Railway

3000 VDC Isolation Voltage | 1600 VDC Isolation Voltage | 4 : 1 Wide Input Range | TINY Output Ripple | NO Min. Load Required | REMOTE ON OFF | SCP

PART NUMBER STRUCTURE

PDS02	- 48	S	05	W	H
Series Name	**Input Voltage (VDC)**	**Output Quantity**	**Output Voltage (VDC)**	**Input Range**	**Isolation Option**
PDS: SMD type **PDH**: DIP type	**12:**4.5~18 **24:**9~36 **48:**18~75	**S:**Single	**3P3:**3.3 **05:**5 **09:**9 **12:**12 **15:**15	4 : 1	□:Standard type 1600VDC isolation **H:**3000VDC isolation
		D:Dual	**05:**±5 **12:**±12 **15:**±15		

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25℃ unless otherwise noted

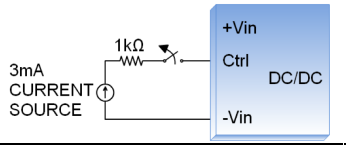
Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
PDS(H)02-12S3P3W	4.5 ~ 18	3.3	500	30	74	3300
PDS(H)02-12S05W	4.5 ~ 18	5	400	30	79	1680
PDS(H)02-12S09W	4.5 ~ 18	9	222	35	79	1000
PDS(H)02-12S12W	4.5 ~ 18	12	167	30	80	820
PDS(H)02-12S15W	4.5 ~ 18	15	134	35	81	680
PDS(H)02-12D05W	4.5 ~ 18	±5	±200	35	76	±1000
PDS(H)02-12D12W	4.5 ~ 18	±12	±83	35	81	±470
PDS(H)02-12D15W	4.5 ~ 18	±15	±67	35	81	±330
PDS(H)02-24S3P3W	9 ~ 36	3.3	500	20	74	3300
PDS(H)02-24S05W	9 ~ 36	5	400	20	79	1680
PDS(H)02-24S09W	9 ~ 36	9	222	20	79	1000
PDS(H)02-24S12W	9 ~ 36	12	167	20	80	820
PDS(H)02-24S15W	9 ~ 36	15	134	20	82	680
PDS(H)02-24D05W	9 ~ 36	±5	±200	20	76	±1000
PDS(H)02-24D12W	9 ~ 36	±12	±83	20	81	±470
PDS(H)02-24D15W	9 ~ 36	±15	±67	20	81	±330
PDS(H)02-48S3P3W	18 ~ 75	3.3	500	10	74	3300
PDS(H)02-48S05W	18 ~ 75	5	400	10	78	1680
PDS(H)02-48S09W	18 ~ 75	9	222	10	79	1000
PDS(H)02-48S12W	18 ~ 75	12	167	10	81	820
PDS(H)02-48S15W	18 ~ 75	15	134	10	82	680
PDS(H)02-48D05W	18 ~ 75	±5	±200	10	76	±1000
PDS(H)02-48D12W	18 ~ 75	±12	±83	10	81	±470
PDS(H)02-48D15W	18 ~ 75	±15	±67	10	81	±330

INPUT SPECIFICATIONS

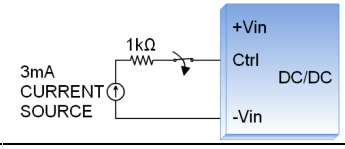
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		12Vin(nom) 24Vin(nom) 48Vin(nom)	4.5 9 18	12 24 48	18 36 75	VDC
Start up time	Constant resistive load	Power up Remote ON/OFF		5 5		ms
Input surge voltage	1 second, max.	12Vin(nom) 24Vin(nom) 48Vin(nom)			25 50 100	VDC
Input filter				Capacitor type		
Remote ON/OFF		DC-DC ON DC-DC OFF Remote off input current		Open or high impedance		
	Ctrl pin applied current via 1kΩ		2	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	-1.0		+1.0	%
		Dual	-1.0		+1.0	
	10% Load to 100% Full Load	Single	-0.5		+0.5	
		Dual	-0.8		+0.8	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Ripple and noise	20MHz bandwidth			30		mVp-p
Temperature coefficient			-0.02		+0.02	%/℃
Transient response recovery time	25% load step change			250		μs
Short circuit protection				Continuous, automatics 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			1			GΩ
Isolation capacitance			Standard Type			50	pF
			Suffix "H"			50	
Switching frequency	Full load to minimum load			100			kHz
Safety approvals	IEC /UL/ EN60950-1					UL:E193009 CB:UL(Demko)	
Weight						4.5g (0.16oz)	
MTBF	MIL-HDBK-217F					6.594×10^6 hrs	

ENVIRONMENTAL SPECIFICATIONS

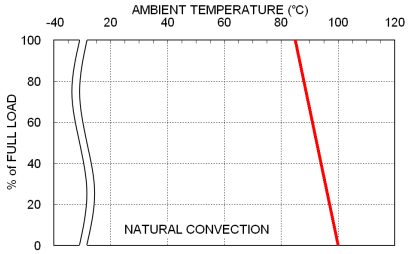
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature		Without derating	-40		+85	℃
		With derating	+85		+100	
Storage temperature range			-55		+125	℃
Thermal shock					MIL-STD-810F	
Vibration					MIL-STD-810F	
Relative humidity					5% to 95% RH	
Lead-free reflow solder process					IPC J-STD-020D	
Moisture sensitivity level	MSL				IPC J-STD-033B Level 2a	

EMC SPECIFICATIONS

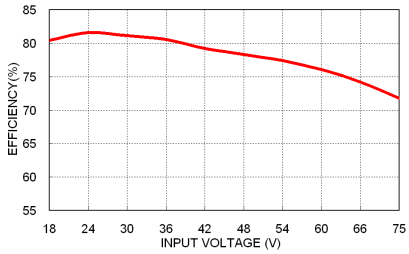
Parameter	Conditions		Level
EMI	EN55032	With external components	Class A，Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV With an external input filter capacitor (Nippon chemi-con KY series, 220μF/100V)	Perf. Criteria A
Surge	EN61000-4-5	±1kV With An external input filter capacitor (Nippon chemi-con KY series, 220μF/100V)	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

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

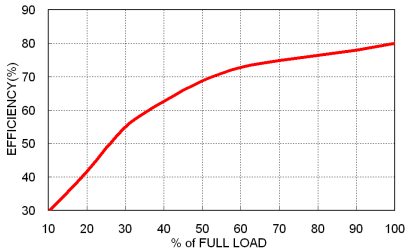
CHARACTERISTIC CURVE



PDS02-48S05W Derating Curve



PDS02-48S05W Efficiency vs. Input Voltage



PDS02-48S05W Efficiency vs. Output Load

FUSE CONSIDERATION

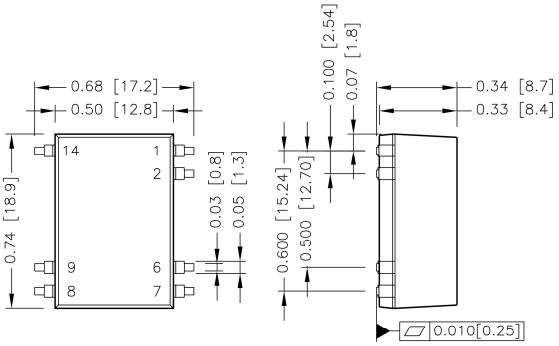
This power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.
The input line fuse suggest as below：

Model	Fuse Rating (A)	Fuse Type
PDS(H)02-12S□□W、PDS(H)02-12D□□W	1.6	Slow-Blow
PDS(H)02-24S□□W、PDS(H)02-24D□□W	1	Slow-Blow
PDS(H)02-48S□□W、PDS(H)02-48D□□W	1	Slow-Blow

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

MECHANICAL DRAWING

PDS02W



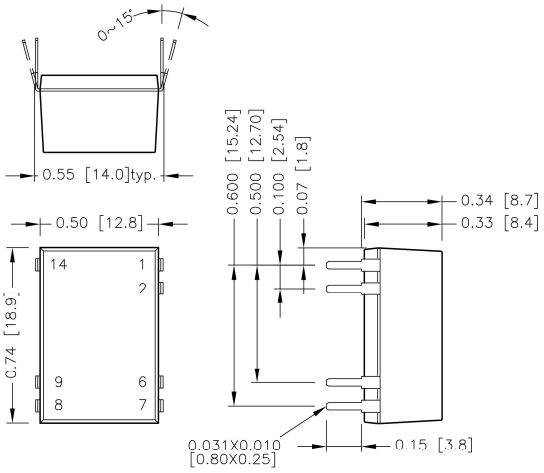
BOTTOM VIEW

PIN CONNECTION

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	Ctrl	Ctrl
6	NC	Common
7	NC	-Vout
8	+Vout	+Vout
9	-Vout	Common
14	+Vin	+Vin

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[0.10]

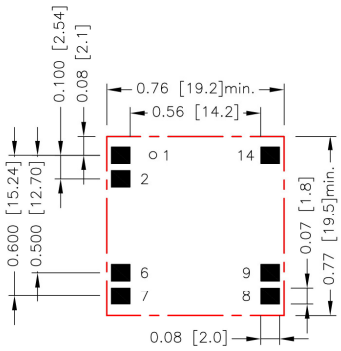
PDH02W



BOTTOM VIEW

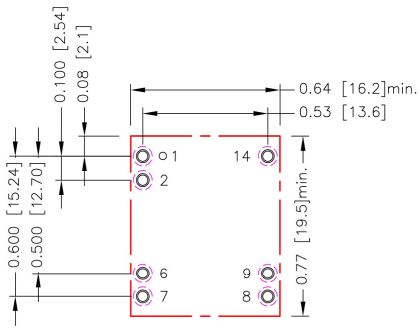
RECOMMENDED PAD LAYOUT

PDS02W



All dimensions in inch[mm]
Pad size(lead free recommended)
Top view pad:0.080x0.070[2.00x1.80]

PDH02W

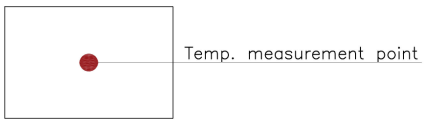


All dimensions in inch[mm]
Pad size(lead free recommended)
Through hole1.2.6.7.8.9.14: Φ0.043[1.10]
Top view pad1.2.6.7.8.9.14: Φ0.055[1.40]
Bottom view pad1.2.6.7.8.9.14: Φ0.080[2.04]

THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments.
However, sufficient cooling should be provided to help ensure reliable operation of the unit.
Heat is removed by conduction, convection, and radiation to the surrounding Environment.
Proper cooling can be verified by measuring the point as the figure below.
The temperature at this location should not exceed 100℃.
When Operating, adequate cooling must be provided to maintain the test point temperature at or below 100℃.
Although the maximum point Temperature of the power modules is 100℃, you can limit this Temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM).



TOP VIEW

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