DC – DC

Features

- 4:1 Wide input 4.5~75V DC
- Isolation Voltage: 1600V DC & 3000V DC Depending on model
- Operating Temperature Range: -40~100°c
- Approved to cURus, UKCA, CE, RoHS, REACH
- Safety standards to IEC/EN/UL 62368-1
- Efficiency up to 84%
- EMC Class A & B Certified

Ideal Power's 43PDL02-xyz 2W Series Pin Connection DC/DC Converters are certified to cURus, UKCA, CE, RoHS, REACH & IEC/UL/EN 62368-1 Standards and comply with Efficiency Regulations. These are primarily used in ITE, Video & Audio Industries and customised solutions are available upon request.

Part Number Structure

PDL02	-	48	S	05	H
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Isolation Options
		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 1600V DC Isolation **H:** 3000V DC Isolation
			D: Dual	**05:** ±5 **12:** ±12 **15:** ±15	

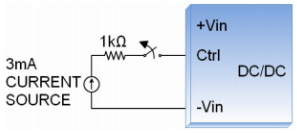
Models

Model Number	Input Range	Output Voltage	Output current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	V DC	V DC	mA	A	%	µF
43PDL02-05S33	4.5 ~ 9	3.3	500	35	76	2200
43PDL02-05S05	4.5 ~ 9	5	400	35	80	1000
43PDL02-05S09	4.5 ~ 9	9	222	40	82	470
43PDL02-05S12	4.5 ~ 9	12	167	40	81	170
43PDL02-05S15	4.5 ~ 9	15	134	40	83	110
43PDL02-05D05	4.5 ~ 9	±5	±200	40	79	±470
43PDL02-05D12	4.5 ~ 9	±12	±83	40	82	±100
43PDL02-05D15	4.5 ~ 9	±15	±67	40	81	±47
43PDL02-12S33	9 ~ 18	3.3	500	20	77	2200
43PDL02-12S05	9 ~ 18	5	400	20	81	1000
43PDL02-12S09	9 ~ 18	9	222	20	82	470
43PDL02-12S12	9 ~ 18	12	167	20	83	170
43PDL02-12S15	9 ~ 18	15	134	20	84	110
43PDL02-12D05	9 ~ 18	±5	±200	30	81	±470
43PDL02-12D12	9 ~ 18	±12	±83	30	83	±100
43PDL02-12D15	9 ~ 18	±15	±67	30	84	±47
43PDL02-24S33	18 ~ 36	3.3	500	15	78	2200
43PDL02-24S05	18 ~ 36	5	400	15	81	1000
43PDL02-24S09	18 ~ 36	9	222	15	82	470
43PDL02-24S12	18 ~ 36	12	167	15	83	170
43PDL02-24S15	18 ~ 36	15	134	15	84	110
43PDL02-24D05	18 ~ 36	±5	±200	15	80	±470
43PDL02-24D12	18 ~ 36	±12	±83	15	83	±100
43PDL02-24D15	18 ~ 36	±15	±67	15	82	±47
43PDL02-48S33	36 ~ 75	3.3	500	8	76	2200
43PDL02-48S05	36 ~ 75	5	400	8	78	1000
43PDL02-48S09	36 ~ 75	9	222	8	84	470
43PDL02-48S12	36 ~ 75	12	167	8	83	170
43PDL02-48S15	36 ~ 75	15	134	8	83	110
43PDL02-48D05	36 ~ 75	±5	±200	8	80	±470
43PDL02-48D12	36 ~ 75	±12	±83	8	81	±100
43PDL02-48D15	36 ~ 75	±15	±67	8	81	±47

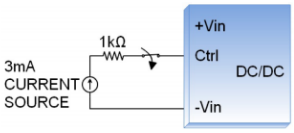
Input Specifications

Parameter	Conditions		Min	Typ	Max	Unit
Operating input voltage range		05Vin(nom)	4.5	5	9	V DC
		12Vin(nom)	9	12	18	
		24Vin(nom)	18	24	36	
		48Vin(nom)	36	48	75	
Start-up time	Constant resistive load	Power up	--	5	--	ms
		Remote ON/OFF	--	5	--	
Input surge voltage	100 Second, max.	05Vin(nom)	--	--	15	V DC
		12Vin(nom)	--	--	36	
		24Vin(nom)	--	--	50	
		48Vin(nom)	--	--	100	
Input filter			Capacitor Type			
Remote ON/OFF		DC_DC ON	Open or high impedance			
	Ctrl pin applied current via 1kΩ	DC_DC OFF	2	3	4	mA
		Remote off input current	--	--	2.5	
	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	
	5% 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		--	50	--	mVp-p
Temperature coefficient			-0.02	--	+0.02	%/°C
Transient response recovery time	25% Load step change		--	500	--	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	--	--	V DC
			Suffix "H"	3000	--	--	
Isolation resistance	500V DC			1	--	--	GΩ
Isolation capacitance			Standard Type	--	--	200	pF
			Suffix "H"	--	--	40	
Switching frequency	Full load to minimum load			100	--	--	kHz
Safety approvals	IEC/ EN/ UL62368-1						UL:E193009 CB:UL(Demko)
Case material							Non-conductive black plastic
Base material							None
Potting material							Silicone (UL94 V-0)
Weight							4.8g (0.17oz)
MTBF	MIL-HDBK-217F, Full load						4.903 x 10^6 hrs

Environmental Specifications

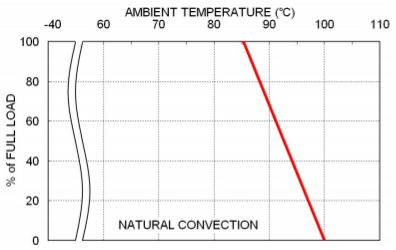
Parameter	Conditions	Min	Typ	Max	Unit
Operating ambient temperature	With derating	-40	--	+100	℃
Maximin case temperature		--	--	100	
Storage temperature range		-55	--	+125	
Thermal Shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	

EMC Specifications

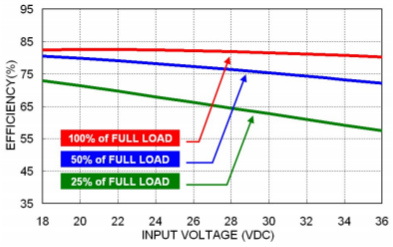
Parameter		Conditions	Level
EMI	EN55032	With external components	Class A, Class B
EMS	EN55024		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV With an external input filter capacitor (Nippon chemi-con KY series, 330µF/50V)	Perf. Criteria A
Surge	EN61000-4-5	± 1kV With an external input filter capacitor (Nippon chemi-con KY series, 330µF/50V)	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.

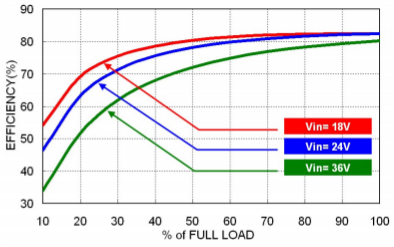
Characteristic Curve



43PDL02-24S05 Derating Curve



43PDL02-24S05 Efficiency vs. Input Voltage



43PDL02-24S05 Efficiency vs. Output Load

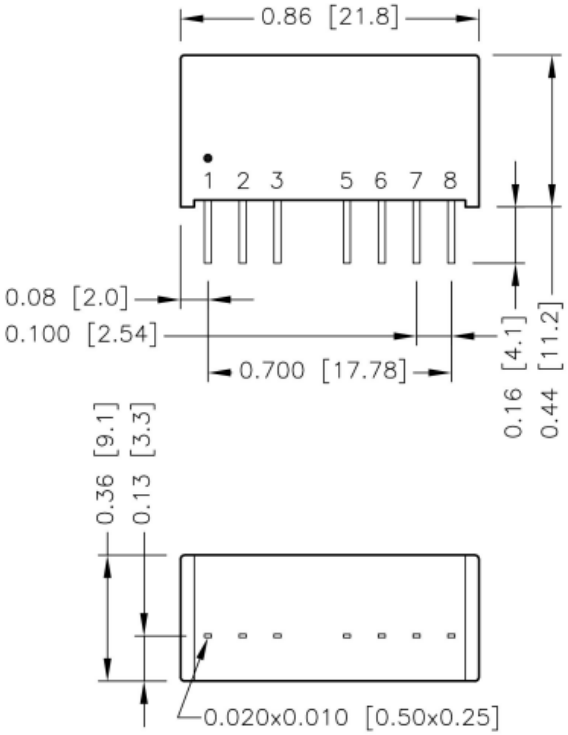
Fuse Considerations

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
43PDL02-05S□□, 43PDL02-05D□□	1.6	Slow-Blow
43PDL02-12S□□, 43PDL02-12D□□	1	Slow-Blow
43PDL02-24S□□, 43PDL02-24D□□	1	Slow-Blow
43PDL02-48S□□, 43PDL02-48D□□	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



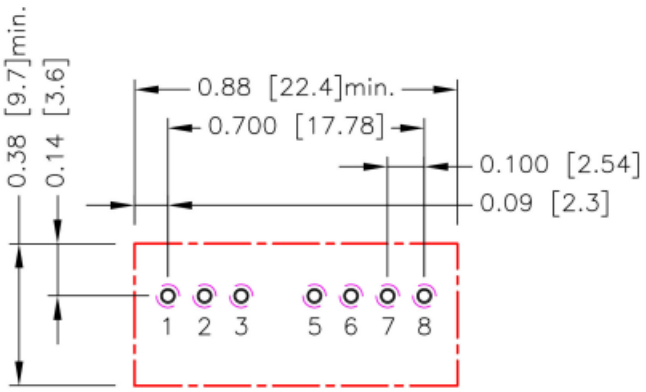
1. All dimensions in inch [mm]
2. Tolerance :x.xx±0.02 [x.x±0.5]
   x.xxx±0.01 [x.xx±0.25]
3. Pin dimension tolerance ±0.004 [0.10]

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”).

Recommended Pad Layout

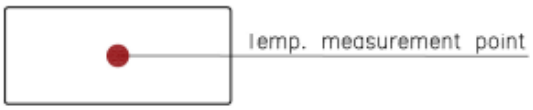


All dimensions in inch[mm]
Pad size (lead free recommended)
Through hole 1.2.3.6.7.8: Φ0.031[0.80]
Top view pad 1.2.3.6.7.8: Φ0.039[1.00]
Bottom view pad 1.2.3.6.7.8: Φ0.063[1.60]

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 “Maximum case temperature”.
When Operating, adequate cooling must be provided to maintain the test point temperature at or below “Maximum case temperature”. 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

DC – DC