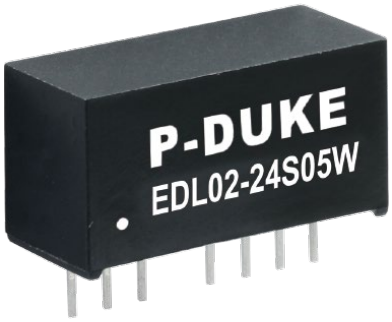
DC – DC

Features

- 4:1 Wide Input Range
- Operating Temperature Range: -40~105°c
- Approved to UKCA, CE, RoHS & REACH
- Safety Standards to IEC/UL/EN62368-1
- Efficiency up to 82%
- EMC Class A & B



Ideal Power's 43EDL02-xyW 2W Series Pin Connection DC/DC Converters are certified to 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

43EDL02 -	48	S	05	W
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range
	05:4.5~13.2	**S:** Single	**3P3:**3.3	**4:1**
	12:9~18		**05:**5	
	24:18~36		**09:**9	
	48:36~75		**12:**12	
			15:15	
			24:24	
		D: Dual	**05:**±5	
			12:±12	
			15:±15	

Models

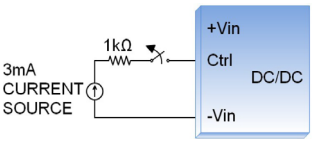
Model Number	Input Range	Output Voltage	Output Current @Full Load mA	Input Current @No Load mA	Efficiency %	Maximum Capacitor Load µF
43EDL02-12S3P3W	4.5 ~ 18	3.3	500	30	75	3300
43EDL02-12S05W	4.5 ~ 18	5	400	30	80	1680
43EDL02-12S09W	4.5 ~ 18	9	222	35	81	1000
43EDL02-12S12W	4.5 ~ 18	12	167	35	81	820
43EDL02-12S15W	4.5 ~ 18	15	134	40	82	680
43EDL02-12S24W	4.5 ~ 18	24	83	40	82	220
43EDL02-12D05W	4.5 ~ 18	±5	±200	35	80	±1000
43EDL02-12D12W	4.5 ~ 18	±12	±83	40	82	±470
43EDL02-12D15W	4.5 ~ 18	±15	±67	45	81	±330
43EDL02-24S3P3W	9 ~ 36	3.3	500	20	76	3300
43EDL02-24S05W	9 ~ 36	5	400	20	80	1680
43EDL02-24S09W	9 ~ 36	9	222	20	80	1000
43EDL02-24S12W	9 ~ 36	12	167	20	82	820
43EDL02-24S15W	9 ~ 36	15	134	20	82	680
43EDL02-24S24W	9 ~ 36	24	83	20	82	220
43EDL02-24D05W	9 ~ 36	±5	±200	20	79	±1000
43EDL02-24D12W	9 ~ 36	±12	±83	20	82	±470
43EDL02-24D15W	9 ~ 36	±15	±67	20	80	±330
43EDL02-48S3P3W	18 ~ 75	3.3	500	10	74	3300
43EDL02-48S05W	18 ~ 75	5	400	10	79	1680
43EDL02-48S09W	18 ~ 75	9	222	10	81	1000
43EDL02-48S12W	18 ~ 75	12	167	10	82	820
43EDL02-48S15W	18 ~ 75	15	134	10	81	680
43EDL02-48S24W	18 ~ 75	24	83	10	81	220
43EDL02-48D05W	18 ~ 75	±5	±200	10	79	±1000
43EDL02-48D12W	18 ~ 75	±12	±83	10	81	±470
43EDL02-48D15W	18 ~ 75	±15	±67	10	81	±330

Input Specifications

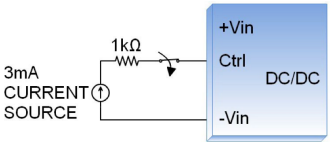
Parameter		Conditions	Min	Typ	Max	Unit
Operating input voltage range		12Vin(nom)	4.5	12	18	VDC
		24Vin(nom)	9	24	36	
		48Vin(nom)	18	48	75	
Start-up voltage		12Vin(nom)	--	--	4.5	VDC
		24Vin(nom)	--	--	9	
		48Vin(nom	--	--	18	
Shutdown voltage		12Vin(nom)	2	3	4	VDC
		24Vin(nom)	6	7	8	
		48Vin(nom	13	15	17	
Start-up time	Constant resistive load	Power up	--	10	20	ms
		Remote ON/OFF	--	10	20	
Input surge voltage	1 second, max.	12Vin(nom)	--	--	25	VDC
		24Vin(nom)	--	--	50	
		48Vin(nom	--	--	100	
Input filter				Capacitor type		
Remote ON/OFF	Ctrl pin applied current via 1kΩ	DC-DC ON		Open or high impedance		
		DC-DC OFF	2	3	4	mA
		Remote off input current		2.5		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 90% 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	Measured by 20MHz bandwidth		--	75	--	mVp-p
Temperature coefficient			-0.02	--	+0.02	%/°C
Transient response recovery time	25% load step change		--	500	--	µs
Over current protection			130	170	230	%
Short circuit protection			Continuous, automatics recovery			

General Specifications

Parameter	Conditions		Min	Typ	Max	Unit
Isolation voltage	1 minute	Input to Output	1600	--	--	VDC
Isolation resistance	500VDC		1	--	--	GΩ
Isolation capacitance			--	--	50	pF
Switching frequency	Full load to minimum load		100	--	--	kHz
Safety approvals						IEC/ EN/ UL 62368-1
Case material						Non-conductive black plastic
Potting material						Silicone (UL94 V-0)
Weight						4.5g (0.16oz)
MTBF	MIL-HDBK-217F					6.621 x 10^6 hrs

Environmental Specifications

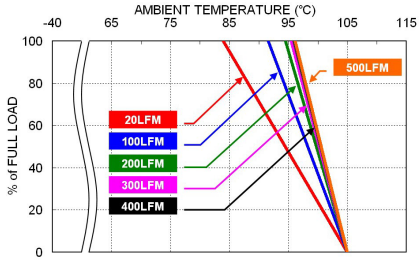
Parameter	Conditions	Min	Typ	Max	Unit
Operating base-plate temperature	With derating	-40	--	+105	℃
Maximum case temperature		--	--	105	℃
Storage temperature range		-55	--	+125	℃
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

EMC Specifications

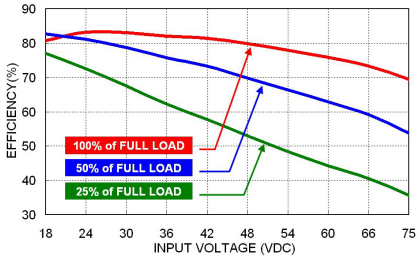
Parameter		Conditions	Level
EMI	EN55032	With external components	Class A, Class B
EMS	EN55024		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV With an external input filter capacitor (Nippon chemi-con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

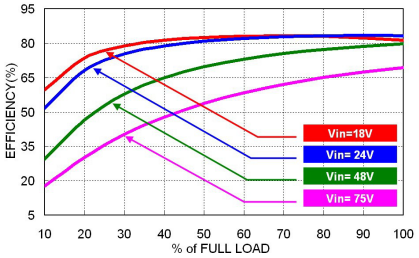
Characteristic Curve



43EDL02-48S05W Derating Curve



43EDL02-48S05W Efficiency vs. Input Voltage



43EDL02-48S05W Efficiency vs. Output Load

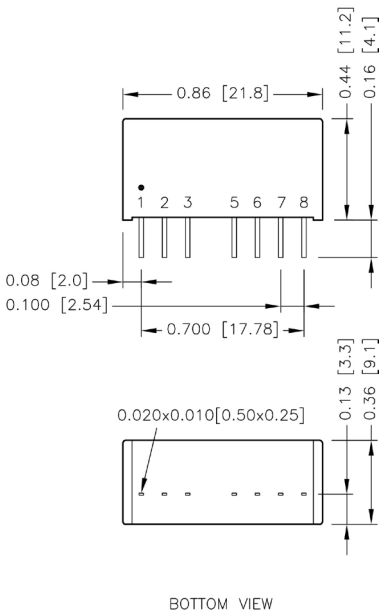
Fuse Consideration

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
43EDL02-12S□□W, 43EDL02-12D□□W	1	Slow-Blow
43EDL02-24S□□W, 43EDL02-24D□□W	0.5	Slow-Blow
43EDL02-48S□□W, 43EDL02-48D□□W	0.315	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

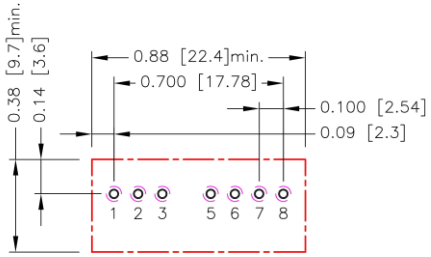


1. All dimensions in inch [mm]
2. Tolerance: x.xx±0.02 [x.x±0.5]
   x.xxx±0.01 [x.xx±0.25]
3. Pin dimension tolerance ±0.004[0.10]

Pin Connection

Pin	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

Recommended Pad Layout

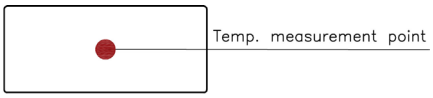


All dimensions in inch(mm)
Pad size(lead free recommended)
Through hole 1.2.3.5.6.7.8: Ø 0.031[0.80]
Top view pad 1.2.3.5.6.7.8: Ø 0.039[1.00]
Bottom view pad 1.2.3.5.6.7.8: Ø0.063[1.60]

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