



# P-DUKE POWER

## EDL02W 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

CE UK  
CA

**1600**  
VDC  
Isolation  
Voltage

**4 : 1**  
Wide  
Input  
Range

**NO**  
Min. Load  
Required

REMOTE  
**ON**  
**OFF**

**SCP**

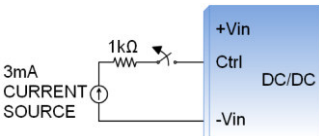
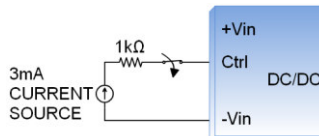
**UVP**

### PART NUMBER STRUCTURE

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

**TECHNICAL SPECIFICATION** All specifications are typical at nominal input, full load and 25°C unless 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
EDL02-12S3P3W	4.5 ~ 18	3.3	500	30	75	3300
EDL02-12S05W	4.5 ~ 18	5	400	30	80	1680
EDL02-12S09W	4.5 ~ 18	9	222	35	81	1000
EDL02-12S12W	4.5 ~ 18	12	167	35	81	820
EDL02-12S15W	4.5 ~ 18	15	134	40	82	680
EDL02-12S24W	4.5 ~ 18	24	83	40	82	220
EDL02-12D05W	4.5 ~ 18	±5	±200	35	80	±1000
EDL02-12D12W	4.5 ~ 18	±12	±83	40	82	±470
EDL02-12D15W	4.5 ~ 18	±15	±67	45	81	±330
EDL02-24S3P3W	9 ~ 36	3.3	500	20	76	3300
EDL02-24S05W	9 ~ 36	5	400	20	80	1680
EDL02-24S09W	9 ~ 36	9	222	20	80	1000
EDL02-24S12W	9 ~ 36	12	167	20	82	820
EDL02-24S15W	9 ~ 36	15	134	20	82	680
EDL02-24S24W	9 ~ 36	24	83	20	82	220
EDL02-24D05W	9 ~ 36	±5	±200	20	79	±1000
EDL02-24D12W	9 ~ 36	±12	±83	20	82	±470
EDL02-24D15W	9 ~ 36	±15	±67	20	80	±330
EDL02-48S3P3W	18 ~ 75	3.3	500	10	74	3300
EDL02-48S05W	18 ~ 75	5	400	10	79	1680
EDL02-48S09W	18 ~ 75	9	222	10	81	1000
EDL02-48S12W	18 ~ 75	12	167	10	82	820
EDL02-48S15W	18 ~ 75	15	134	10	81	680
EDL02-48S24W	18 ~ 75	24	83	10	81	220
EDL02-48D05W	18 ~ 75	±5	±200	10	79	±1000
EDL02-48D12W	18 ~ 75	±12	±83	10	81	±470
EDL02-48D15W	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 1k $\Omega$	DC-DC ON	Open or high impedance			mA
		DC-DC OFF	2	3	4	
		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		-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		$\mu$ s
Over current protection			130	170	230	%
Short circuit protection			Continuous, automatic recovery			

GENERAL SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600			VDC
Isolation resistance	500VDC		1			G $\Omega$
Isolation capacitance					50	pF
Switching frequency	Full load to minimum load		100			kHz
Safety meets			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 <sup>6</sup> hrs			

## ENVIRONMENTAL SPECIFICATIONS

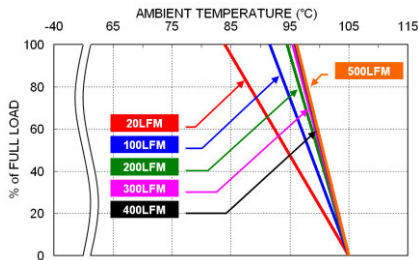
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+105	°C
Maximum case temperature				105	°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

## EMC SPECIFICATIONS

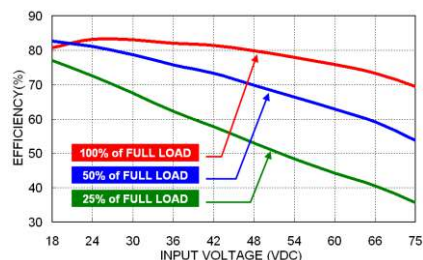
Parameter	Conditions	Level
EMI	EN55032 With external components	Class A · Class B
EMS	EN55035	
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ±2kV With an external input filter capacitor (Nippon chemi-con KY 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.

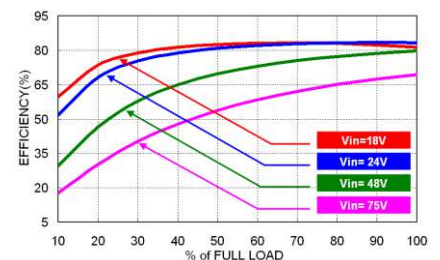
## CHARACTERISTIC CURVE



EDL02-48S05W Derating Curve



EDL02-48S05W Efficiency vs. Input Voltage



EDL02-48S05W Efficiency vs. Output Load

## FUSE CONSIDERATION

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

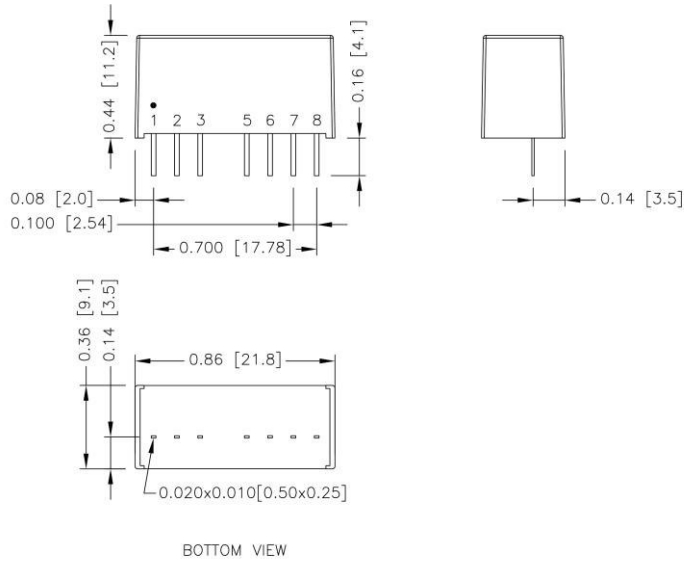
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.

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 :

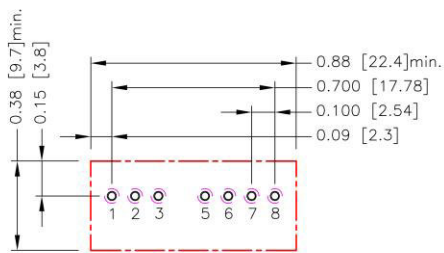
Model	Fuse Rating (A)	Fuse Type
EDL02-12S□□W · EDL02-12D□□W	1	Slow-Blow
EDL02-24S□□W · EDL02-24D□□W	0.5	Slow-Blow
EDL02-48S□□W · EDL02-48D□□W	0.315	Slow-Blow

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

**MECHANICAL DRAWING**

**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

- All dimensions in inch [mm]
- Tolerance :x.xx±0.02 [x.x±0.5]  
x.xxx±0.010 [x.xx±0.25]
- Pin dimension tolerance ±0.004 [0.10]

**RECOMMENDED PAD LAYOUT**


All dimensions in inch(mm)  
 Pad size(lead free recommended)  
 Through hole 1.2.3.5.6.7.8:  $\varnothing 0.031$ [0.80]  
 Top view pad 1.2.3.5.6.7.8:  $\varnothing 0.039$ [1.00]  
 Bottom view pad 1.2.3.5.6.7.8:  $\varnothing 0.063$ [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.

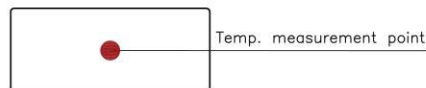
Proper cooling can be verified by measuring the point as the figure below.

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