P-DUKE POWER

EDL03 Series

DC-DC Converter
Up to 3 Watts

3 YEARS WARRANTY

RoHS COMPLIANT

REACH COMPLIANT



Automation | Datacom | IPC

Industry | Measurement | Telecom

Automobile | Boat | Charger

Medical | PV | Railway

CE UKCA

1600 VDC Isolation Voltage | 2 : 1 Input Range | NO Min. Load Required | REMOTE ON OFF | SCP | UVP

PART NUMBER STRUCTURE

EDL03 - 48 S 05

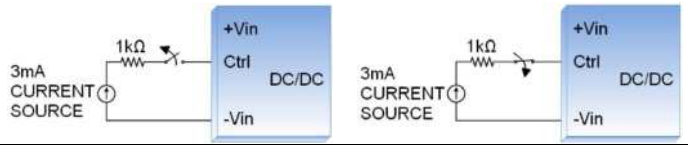
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)
	05:4.5~13.2	**S:**Single	**3P3:**3.3
	12:9~18		**05:**5
	24:18~36		**09:**9
	48:36~75		**12:**12
			15:15
			24:24
		D:Dual	**05:**±5
			12:±12
			15:±15

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25℃ 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
EDL03-05S3P3	4.5 ~ 13.2	3.3	700	40	75	4400
EDL03-05S05	4.5 ~ 13.2	5	600	50	78	2200
EDL03-05S09	4.5 ~ 13.2	9	333	60	81	1300
EDL03-05S12	4.5 ~ 13.2	12	250	60	83	1000
EDL03-05S15	4.5 ~ 13.2	15	200	60	84	820
EDL03-05S24	4.5 ~ 13.2	24	125	50	82	470
EDL03-05D05	4.5 ~ 13.2	±5	±300	50	79	±1200
EDL03-05D12	4.5 ~ 13.2	±12	±125	50	82	±520
EDL03-05D15	4.5 ~ 13.2	±15	±100	65	82	±440
EDL03-12S3P3	9 ~ 18	3.3	700	20	77	4400
EDL03-12S05	9 ~ 18	5	600	20	81	2200
EDL03-12S09	9 ~ 18	9	333	30	82	1300
EDL03-12S12	9 ~ 18	12	250	30	84	1000
EDL03-12S15	9 ~ 18	15	200	30	85	820
EDL03-12S24	9 ~ 18	24	125	30	85	470
EDL03-12D05	9 ~ 18	±5	±300	30	81	±1200
EDL03-12D12	9 ~ 18	±12	±125	30	85	±520
EDL03-12D15	9 ~ 18	±15	±100	30	83	±440
EDL03-24S3P3	18 ~ 36	3.3	700	12	77	4400
EDL03-24S05	18 ~ 36	5	600	12	82	2200
EDL03-24S09	18 ~ 36	9	333	12	83	1300
EDL03-24S12	18 ~ 36	12	250	12	85	1000
EDL03-24S15	18 ~ 36	15	200	12	86	820
EDL03-24S24	18 ~ 36	24	125	12	84	470
EDL03-24D05	18 ~ 36	±5	±300	12	82	±1200
EDL03-24D12	18 ~ 36	±12	±125	12	84	±520
EDL03-24D15	18 ~ 36	±15	±100	15	85	±440
EDL03-48S3P3	36 ~ 75	3.3	700	8	75	4400
EDL03-48S05	36 ~ 75	5	600	8	80	2200
EDL03-48S09	36 ~ 75	9	333	8	82	1300
EDL03-48S12	36 ~ 75	12	250	8	84	1000
EDL03-48S15	36 ~ 75	15	200	8	85	820
EDL03-48S24	36 ~ 75	24	125	8	86	470
EDL03-48D05	36 ~ 75	±5	±300	8	80	±1200
EDL03-48D12	36 ~ 75	±12	±125	8	86	±520
EDL03-48D15	36 ~ 75	±15	±100	8	83	±440

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		5Vin(nom)	4.5	5	13.2	VDC
		12Vin(nom)	9	12	18	
		24Vin(nom)	18	24	36	
		48Vin(nom)	36	48	75	
Start up voltage		5Vin(nom)			4.5	VDC
		12Vin(nom)			9	
		24Vin(nom)			18	
		48Vin(nom)			36	
Shutdown voltage		5Vin(nom)	2	3	4	VDC
		12Vin(nom)	6	7	8	
		24Vin(nom)	13	15	17	
		48Vin(nom)	29	32	35	
Start up time	Constant resistive load	Power up		10	20	ms
		Remote ON/OFF		10	20	
Input surge voltage	1 second, max.	5Vin(nom)			15	VDC
		12Vin(nom)			25	
		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		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	%/℃
Transient response recovery time	25% load step change			500		μs
Over current protection			140	180	240	%
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 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		5.124 x 10^6 hrs			

ENVIRONMENTAL SPECIFICATIONS

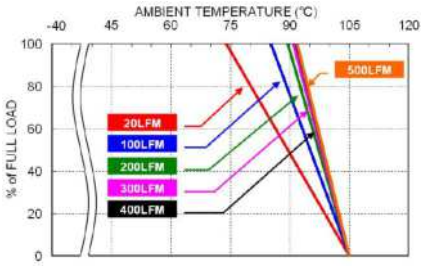
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+105	℃
Maximum case temperature				105	℃
Storage temperature range		-55		+125	℃
Thermal shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	

EMC SPECIFICATIONS

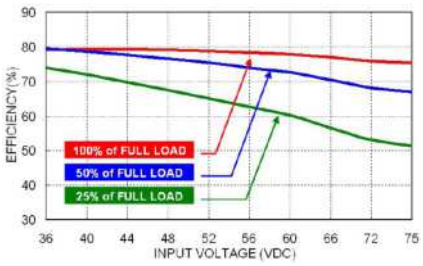
Parameter	Conditions		Level
EMI	EN55032	With external components.	Class A，Class B
EMS	EN55035		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	±2kV With an external input filter capacitor (Nippon Chemi-con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

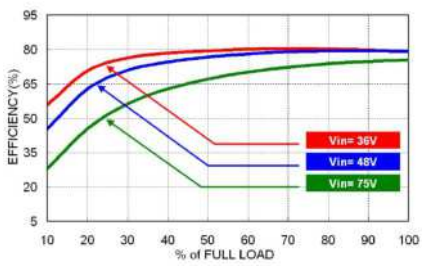
CHARACTERISTIC CURVE



EDL03-48S05 Derating Curve



EDL03-48S05 Efficiency vs. Input Voltage



EDL03-48S05 Efficiency vs. Output Load

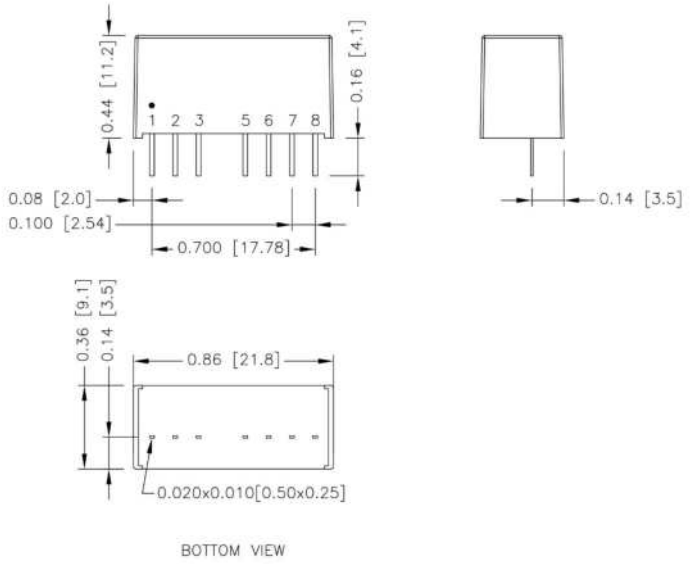
FUSE CONSIDERATION

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
EDL03-05S□□、EDL03-05D□□	1.6	Slow-Blow
EDL03-12S□□、EDL03-12D□□	0.8	Slow-Blow
EDL03-24S□□、EDL03-24D□□	0.5	Slow-Blow
EDL03-48S□□、EDL03-48D□□	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

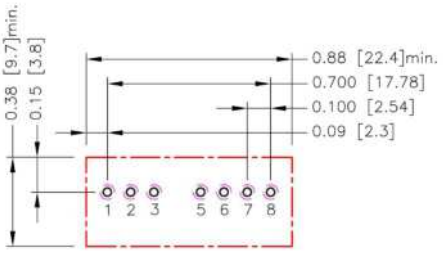


PIN CONNECTION

PIN	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	Ctrl	Ctrl
5	NC	NC
6	+Vout	+Vout
7	-Vout	Common
8	NC	-Vout

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]

RECOMMENDED PAD LAYOUT

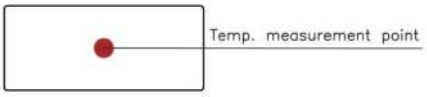


All dimensions in inch(mm)
Pad size(lead free recommended)
Through hole 1.2.3.5.6.7.8: Φ0.031[0.80]
Top view pad 1.2.3.5.6.7.8: Φ0.039[1.00]
Bottom view pad 1.2.3.5.6.7.8: Φ0.063[1.60]

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

P-DUKE Technology Co., Ltd.
Tel +886-4-2359-0668
Fax +886-4-2359-1337
Email sales@pduke.com
Web www.pduke.com
Add No. 36, 22nd Rd., Taichung Industrial Park, Taichung, Taiwan, R.O.C.