



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



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
12:9~18
24:18~36
48:36~75

S:Single

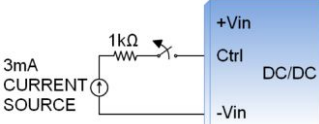
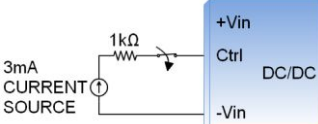
3P3:3.3
05:5
09:9
12:12
15:15
24:24

D: Dual

05:±5
12:±12
15:±15

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°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 |
| 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 |
| 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 | Ctrl pin applied current via 1K ω | 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 | | μ s |
| Over current protection | | | 140 | 180 | 240 | % |
| 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 Ω |
| 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 |

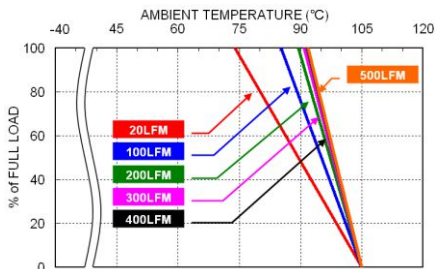
ENVIRONMENTAL SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|---------------|------|------|--------------|------|
| Operating ambient temperature | With derating | -40 | | +105 | °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 | |

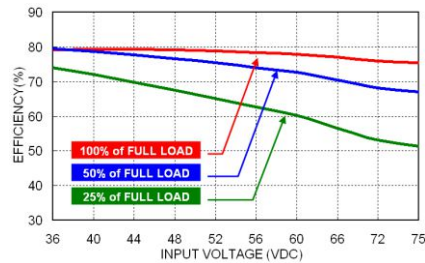
EMC SPECIFICATIONS

| Parameter | Conditions | Level |
|--------------------------------|--|-------------------|
| EMI | EN55032 | Class A + Class B |
| EMS | EN55035 | |
| ESD | EN61000-4-2 | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 | Perf. Criteria A |
| Fast transient | EN61000-4-4 | Perf. Criteria A |
| Surge | EN61000-4-5 | Perf. Criteria A |
| | With an external input filter capacitor (Nippon Chemi-con KY series, 220µF/100V) | |
| Conducted immunity | EN61000-4-6 | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 | Perf. Criteria A |

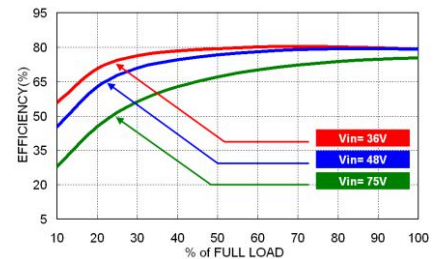
CAUTION: This power module is not internally fused. An input line fuse must always be used.

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.

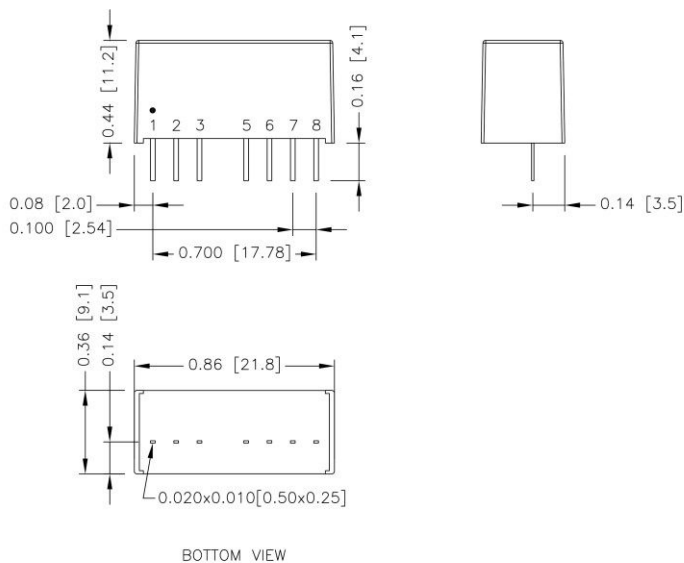
To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

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

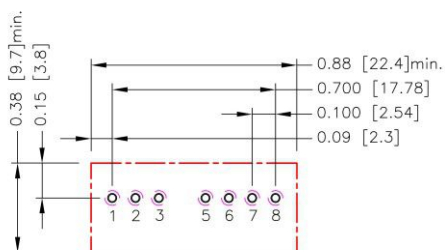


PIN CONNECTION

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

- All dimensions in inch [mm]
- Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [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: 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]

