3 YEARS WARRANTY

RoHS COMPLIANT

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Automation | Datacom | IPC

Industry | Measurement | Telecom

Automobile | Boat | Charger

Medical | PV | Railway

CE UKCA

3000 VDC Isolation Voltage

1600 VDC Isolation Voltage

SCP

## PART NUMBER STRUCTURE

EUR01 - 05 S 05 H

| Series Name | Input Voltage (VDC) | Output Quantity | Output Voltage (VDC) | Isolation Options |
|---|---|---|---|---|
| | **33:**2.9~3.6<br>**05:**4.5~5.5<br>**12:**10.8~13.2<br>**15:**13.4~16.4<br>**24:**21.6~26.4 | **S:**Single | **33:**3.3<br>**05:**5<br>**09:**9<br>**12:**12<br>**15:**15<br>**24:**24 | □: Standard type 1600VDC isolation<br>**H:** 3000VDC isolation |



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**TECHNICAL SPECIFICATION** All specifications are typical at nominal input, full load and 25℃ unless otherwise noted

| Model Number | Input Range | Output Voltage | Output Current | | Input Current @ No Load | Efficiency | Maximum Capacitor Load |
|---|---|---|---|---|---|---|---|
| | | | @Min.Load | @Full Load | | | |
| | VDC | VDC | mA | mA | mA | % | μF |
| EUR01-33S33 | 2.9 ~ 3.6 | 3.3 | 30.3 | 303 | 65 | 72 | 150 |
| EUR01-33S05 | 2.9 ~ 3.6 | 5 | 20 | 200 | 65 | 74 | 100 |
| EUR01-33S09 | 2.9 ~ 3.6 | 9 | 11 | 110 | 85 | 78 | 22 |
| EUR01-33S12 | 2.9 ~ 3.6 | 12 | 8.3 | 83 | 85 | 78 | 47 |
| EUR01-33S15 | 2.9 ~ 3.6 | 15 | 6.6 | 66 | 85 | 80 | 33 |
| EUR01-33S24 | 2.9 ~ 3.6 | 24 | 4.2 | 42 | 90 | 79 | 33 |
| EUR01-05S33 | 4.5 ~ 5.5 | 3.3 | 30.3 | 303 | 50 | 72 | 150 |
| EUR01-05S05 | 4.5 ~ 5.5 | 5 | 20 | 200 | 50 | 70 | 100 |
| EUR01-05S09 | 4.5 ~ 5.5 | 9 | 11 | 110 | 50 | 78 | 22 |
| EUR01-05S12 | 4.5 ~ 5.5 | 12 | 8.3 | 83 | 60 | 78 | 47 |
| EUR01-05S15 | 4.5 ~ 5.5 | 15 | 6.6 | 66 | 50 | 80 | 33 |
| EUR01-05S24 | 4.5 ~ 5.5 | 24 | 4.2 | 42 | 60 | 79 | 33 |
| EUR01-12S33 | 10.8 ~ 13.2 | 3.3 | 30.3 | 303 | 25 | 72 | 150 |
| EUR01-12S05 | 10.8 ~ 13.2 | 5 | 20 | 200 | 25 | 71 | 100 |
| EUR01-12S09 | 10.8 ~ 13.2 | 9 | 11 | 110 | 25 | 73 | 22 |
| EUR01-12S12 | 10.8 ~ 13.2 | 12 | 8.3 | 83 | 25 | 76 | 47 |
| EUR01-12S15 | 10.8 ~ 13.2 | 15 | 6.6 | 66 | 25 | 74 | 33 |
| EUR01-12S24 | 10.8 ~ 13.2 | 24 | 4.2 | 42 | 25 | 79 | 33 |
| EUR01-15S33 | 13.4 ~ 16.4 | 3.3 | 30.3 | 303 | 18 | 71 | 150 |
| EUR01-15S05 | 13.4 ~ 16.4 | 5 | 20 | 200 | 18 | 71 | 100 |
| EUR01-15S09 | 13.4 ~ 16.4 | 9 | 11 | 110 | 20 | 75 | 22 |
| EUR01-15S12 | 13.4 ~ 16.4 | 12 | 8.3 | 83 | 18 | 81 | 47 |
| EUR01-15S15 | 13.4 ~ 16.4 | 15 | 6.6 | 66 | 18 | 81 | 33 |
| EUR01-15S24 | 13.4 ~ 16.4 | 24 | 4.2 | 42 | 20 | 80 | 33 |
| EUR01-24S33 | 21.6 ~ 26.4 | 3.3 | 30.3 | 303 | 14 | 71 | 150 |
| EUR01-24S05 | 21.6 ~ 26.4 | 5 | 20 | 200 | 14 | 71 | 100 |
| EUR01-24S09 | 21.6 ~ 26.4 | 9 | 11 | 110 | 14 | 75 | 22 |
| EUR01-24S12 | 21.6 ~ 26.4 | 12 | 8.3 | 83 | 14 | 81 | 47 |
| EUR01-24S15 | 21.6 ~ 26.4 | 15 | 6.6 | 66 | 14 | 81 | 33 |
| EUR01-24S24 | 21.6 ~ 26.4 | 24 | 4.2 | 42 | 14 | 80 | 33 |

## INPUT SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Operating input voltage range | | 3.3Vin(nom) | 2.9 | 3.3 | 3.6 | VDC |
| | | 5Vin(nom) | 4.5 | 5 | 5.5 | |
| | | 12Vin(nom) | 10.8 | 12 | 13.2 | |
| | | 15Vin(nom) | 13.4 | 15 | 16.4 | |
| | | 24Vin(nom) | 21.6 | 24 | 26.4 | |
| Input filter | | | C type | | | |

## OUTPUT SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Voltage accuracy | Nominal input | | See tolerance envelope curve | | | |
| Line regulation | Input voltage +/- 5% change | | 1.2%,max / 1% of Vin | | | |
| Load regulation | 10% to 100% Load | 3.3Vout, 5Vout | -15 | | +15 | % |
| | | Others | -10 | | +10 | |
| Ripple and noise | Measured by 20MHz bandwidth | | | 100 | | mVp-p |
| Temperature coefficient | | | -0.1 | | +0.1 | %/℃ |
| Short circuit protection | | | Continuous short circuit protection | | | |



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## GENERAL SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Isolation voltage | 1 minute (PIN1 to Output) | Standard Type<br>Suffix "H" (2) | 1600<br>3000 | | | VDC |
| Isolation resistance | 500VDC | | 1 | | | GΩ |
| Isolation capacitance | | | | | 80 | pF |
| Switching frequency | | 3.3Vin<br>5Vin<br>12Vin<br>15,24Vin | | 95<br>110<br>145<br>100 | | kHz |
| Safety meets | | | | | | IEC/ EN/ UL62368-1 |
| Case material | | | | | | Non-conductive black plastic |
| Base material | | | | | | None |
| Potting material | | | | | | Epoxy (UL94 V-0) |
| Weight | | | | | | 1.3g (0.046oz) |
| MTBF | MIL-HDBK-217F, Full load | | | | | 2 x $10^6$ hrs |

## ENVIRONMENTAL SPECIFICATIONS

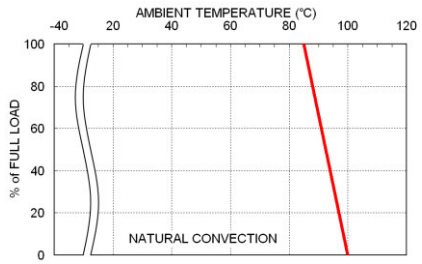
| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Operating ambient temperature | Without derating | -40 | | +85 | ℃ |
| Maximum case temperature | | | | 100 | ℃ |
| Storage temperature range | | -55 | | +125 | ℃ |
| Thermal shock | | | | | MIL-STD-810F |
| Vibration | | | | | MIL-STD-810F |
| Relative humidity | | | | | 5% to 95% RH |

**Note:**

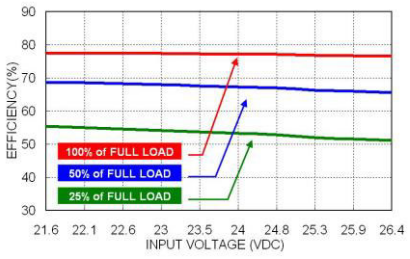
1. The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices; however they may not meet all listed specification.
2. The extra protection of the pads between input and output should be needed in order to ensure that the isolation function won't be affected after the module mounts on the PCB. (For detailed information, please refer to RECOMMENDED PAD LAYOUT.)

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

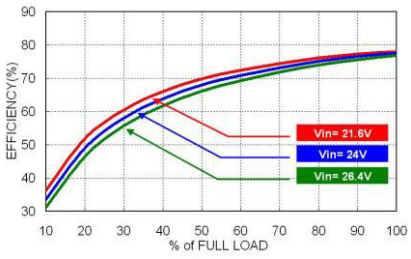
## CHARACTERISTIC CURVE



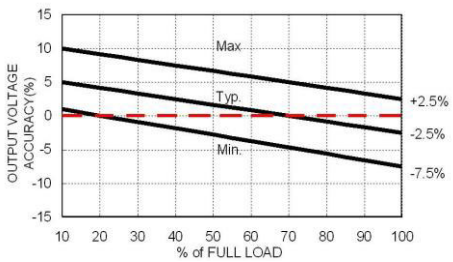

EUR01-24S12 Derating Curve




EUR01-24S12 Efficiency vs. Input Voltage




EUR01-24S12 Efficiency vs. Output Load




Tolerance Envelope



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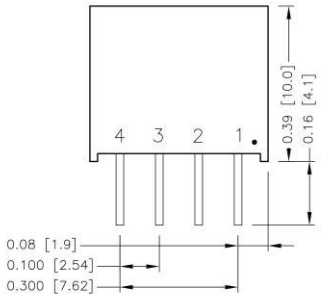
## FUSE CONSIDERATION

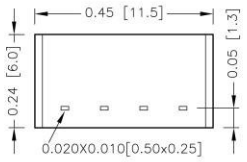
This power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing 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 |
|---|---|---|
| EUR01-33□□□ | 0.8 | Slow-Blow |
| EUR01-05□□□ | 0.5 | Slow-Blow |
| EUR01-12□□□ | 0.315 | Slow-Blow |
| EUR01-15□□□、EUR01-24□□□ | 0.16 | 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




BOTTOM VIEW

**PIN CONNECTION**

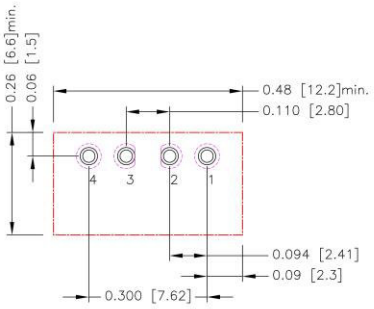
| PIN | DEFINE |
|---|---|
| 1 | -Vin |
| 2 | +Vin |
| 3 | -Vout |
| 4 | +Vout |

1. All dimensions in Inch [mm]
   Tolerance: X.XX±0.02 [X.X±0.5]
   X.XXX±0.010 [X.XX±0.25]
2. Pin pitch tolerance ±0.010[0.25]
3. Pin dimension tolerance ±0.004 [0.10]



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## RECOMMENDED PAD LAYOUT



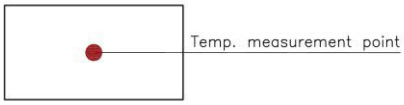

All dimensions in inch[mm]
Pad size(lead free recommended)
Through hole 1.2.3.4:Φ0.031[0.80]
Top view pad 1.2.3.4:Φ0.039[1.10]
pad 2 to pad 3 spacing:0.067[1.70]
Bottom view pad 1.2.3.4:Φ0.063[1.60]
pad 2 to pad 3 spacing:0.067[1.70]

* Suffix "H" :The extra protection of the pads between input(PIN 2) and output(PIN 3) should be needed in order to ensure that the isolation function won't be affected after the module mounts on the PCB.

## 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

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