



# P-DUKE POWER

## EUR01 Series

Unregulated DC-DC Converter  
1 Watts Output Power

# 3

YEARS  
WARRANTY

ROHS  
COMPLIANT

REACH  
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway



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 05:4.5~5.5 12:10.8~13.2 15:13.4~16.4 24:21.6~26.4	S:Single	33:3.3 05:5 09:9 12:12 15:15 24:24	□: Standard type 1600VDC isolation H: 3000VDC isolation

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

Model Number	Input Range VDC	Output Voltage VDC	Output Current		Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
			@Min. Load mA	@Full Load mA			
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	-15		+15	%
	Others	-10		+10	
Ripple and noise	Measured by 20MHz bandwidth	100			mVp-p
Temperature coefficient		-0.1		+0.1	%/°C
Short circuit protection		Continuous short circuit protection			

**GENERAL SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute (PIN1 to Output) Standard Type Suffix "H" (2)	1600			VDC
Isolation resistance		3000			GΩ
Isolation capacitance				80	pF
Switching frequency	3.3Vin 5Vin 12Vin 15,24Vin		95 110 145 100		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 <sup>6</sup> hrs

**ENVIRONMENTAL SPECIFICATIONS**

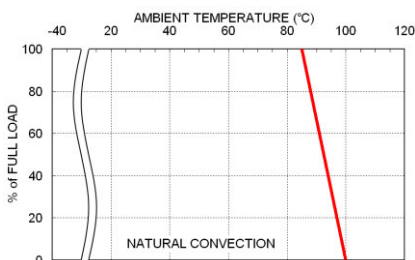
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+85	°C
Maximum case temperature				100	°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

**Note:**

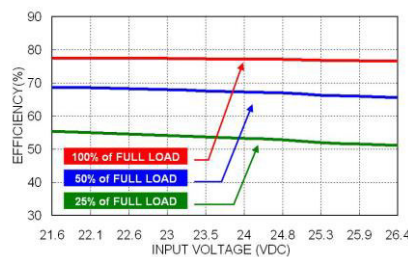
1. The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices; however they may not meet all listed specification.
2. The extra protection of the pads between input and output should be needed in order to ensure 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.

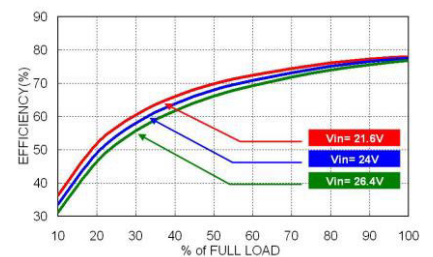
**CHARACTERISTIC CURVE**



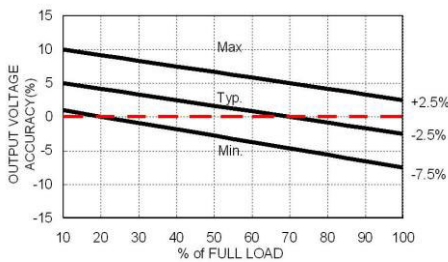
EUR01-24S12 Derating Curve



EUR01-24S12 Efficiency vs. Input Voltage



EUR01-24S12 Efficiency vs. Output Load



Tolerance Envelope

**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.

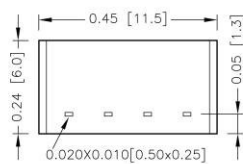
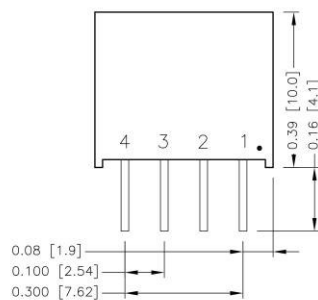
To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

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**



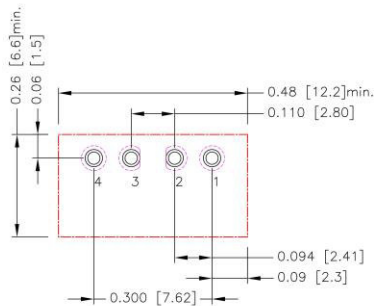
BOTTOM VIEW

**PIN CONNECTION**

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

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

## RECOMMENDED PAD LAYOUT



All dimensions in inch[mm]  
 Pad size(lead free recommended)  
 Through hole 1.2.3.4: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.

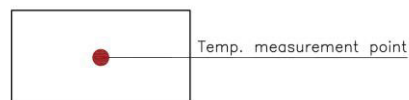
Proper cooling can be verified by measuring the point as the figure below.

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