

Features

- ◇ 3 Watt Output Power
- ◇ Regulated Output
- ◇ ±15% Input Voltage Range
- ◇ Efficiency up to 84%
- ◇ 1500VDC Isolation Voltage
- ◇ Operating Temperature Range -40°C~75°C
(Non-Derating)
- ◇ EMI EN55022 Class A Approval
(No External Components Required)
- ◇ Meets UL60950-1 Safety (Approved For Customer)
- ◇ Dual-in-line package (DIP)
- ◇ Industrial Standard Pin-out
- ◇ UL94V-0 Package Material
- ◇ 3 Years Warranty



Description

E13R series are isolated 3 Watt DC/DC converters in DIP-24pin packages, and allow a ±15% range input voltage of 12V, 24V and 48V to convert a standard and regulated output voltage of 3.3V, 5V, 12V, 15V, ±5V, ±12V and ±15V.

Applications

- △ Automatic Control System
- △ Industry Computer
- △ Communication System
- △ Distribute Power System
- △ Movable/Portable Test Equipment
- △ Local Power System
- △ Other Applications meet Specifications.

General Specifications

Parameter	Condition	Min.	Typ.	Max.
Storage Temperature	Ambient	-40	---	+125 °C
Operating Temperature	Ambient	-40	---	+75 °C
	Case	-40	---	+90 °C
Relative humidity		---	---	95 %
Isolation Voltage	Input to Output, 60 sec.	1.5 KV	---	---
Isolation Resistance	Input to Output	1 G ohm	---	---
Isolation Capacitance	Input to Output	---	---	500 pF
Switching Frequency	Max. Load	---	250 KHz	---
MTBF	Vin-N, Max. Load, 25°C	---	1 Mhrs	---
Weight	Epoxy	---	14 g	---
Case Material	Non-Conductive Black Plastic (Meets UL94V-0)			
Base Material	Non-Conductive Black Plastic (Meets UL94V-0)			
Dimensions	1.25 x 0.8 x 0.4 inch (31.8 x 20.3 x 10.2 mm)			

Selection Guide

Part Number	Input				Output			Efficiency	Cap. Load ⁽⁸⁾
	Voltage	Current		Ref. Ripple ⁽⁷⁾	Voltage	Current			
	Nominal (Low ~ High)	No Load	Max. Load	Max. Load	Typ.	Min.	Max.	Max. Load	
		Typ.	Typ.	Typ.				Typ.	
VDC	mA	mA	mA	VDC	mA	mA	%	μF	
E13R-1203S	12 (10.2 ~ 13.8)	30	318	20	3.3	18	900	78	1000
E13R-1205S			313		5	12	600	80	1000
E13R-1212S			305		12	5	250	82	1000
E13R-1215S			305		15	4	200	82	1000
E13R-1205D			313		± 5	± 6	± 300	80	470
E13R-1212D			305		± 12	± 2.5	± 125	82	470
E13R-1215D			305		± 15	± 2	± 100	82	470
E13R-2403S	24 (20.4 ~ 27.6)	15	157	10	3.3	18	900	79	1000
E13R-2405S			156		5	12	600	80	1000
E13R-2412S			149		12	5	250	84	1000
E13R-2415S			149		15	4	200	84	1000
E13R-2405D			156		± 5	± 6	± 300	80	470
E13R-2412D			149		± 12	± 2.5	± 125	84	470
E13R-2415D			149		± 15	± 2	± 100	84	470
E13R-4803S	48 (40.8 ~ 55.2)	10	79	5	3.3	18	900	79	1000
E13R-4805S			79		5	12	600	80	1000
E13R-4812S			75		12	5	250	84	1000
E13R-4815S			75		15	4	200	84	1000
E13R-4805D			79		± 5	± 6	± 300	80	470
E13R-4812D			75		± 12	± 2.5	± 125	84	470
E13R-4815D			75		± 15	± 2	± 100	84	470

Note:

- 1) All specifications are measured at nominal input voltage, constant resistive load between Min. and Max. output current, and probe bandwidth should be under 20MHz, Ta = +25°C.
- 2) When the Load is at No-Load or lower than Min. output current, the DC/DC converters will not be damaged; however, all the parameters may be not reaching all specifications listed.
- 3) Output Ripple & Noise Test please refer to E-Chin Technology Co., Ltd. proposed test-method.
- 4) Load Regulation and Line Regulation calculation please refer to E-Chin Technology Co., Ltd. proposed formula.
- 5) An external fuse is needed at the front end of DC/DC converters for a protection as a recommended settlement in order to avoid a surge current or a maximum input current.
- 6) "Vin-H" means "Vin-High", "Vin-N" means "Vin-Nominal", and "Vin-L" means "Vin-Low".
- 7) "Ref. Ripple" means "Reflected Ripple of Input Current".
- 8) The total Capacitive Loads of output should be lower than the value written above.
- 9) Other Input Voltages, Output Voltages and Specifications may be available, please contact us.

Input Specifications

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range	12VDC models	10.2	12	13.8 V
	24VDC models	20.4	24	27.6 V
	48VDC models	40.8	48	55.2 V
Power ON Voltage Range	12VDC models	9	9.6	10.2 V
	24VDC models	18	19	20.4 V
	48VDC models	36	38	40.8 V
Power OFF Voltage Range	12VDC models	---	---	10 V
	24VDC models	---	---	20 V
	48VDC models	---	---	40 V
Short Circuit Input Power	All models	---	---	2000 mW
Input Filter	Pi-Network	EMI EN55022 Class A Approval		

Output Specifications

Parameter	Condition	Min.	Typ.	Max.
Output Voltage Accuracy	Vin-N, Max. Load	---	± 0.5	± 1.0 %
Line Regulation	Vin-L to Vin-H @ Max. Load	---	± 0.2	± 0.3 %
Load Regulation	Io = 10% to 100% Load @ Vin-N	---	± 0.5	± 1.0 %
Balance Regulation	Vin-N, Max. Load, Dual Output	---	±0.5%	± 2.0 %
Temperature Drift	Lowest to Highest Temp.	---	± 0.01	± 0.02 %/°C
Ripple & Noise	Peak to Peak, Each Output, 20MHz	---	50	75 mV
Transient Recovery Time	Vin-N, 25% load step change	---	150	300 µSec
Transient Response Deviation		---	± 2.0	± 6.0 %Vo

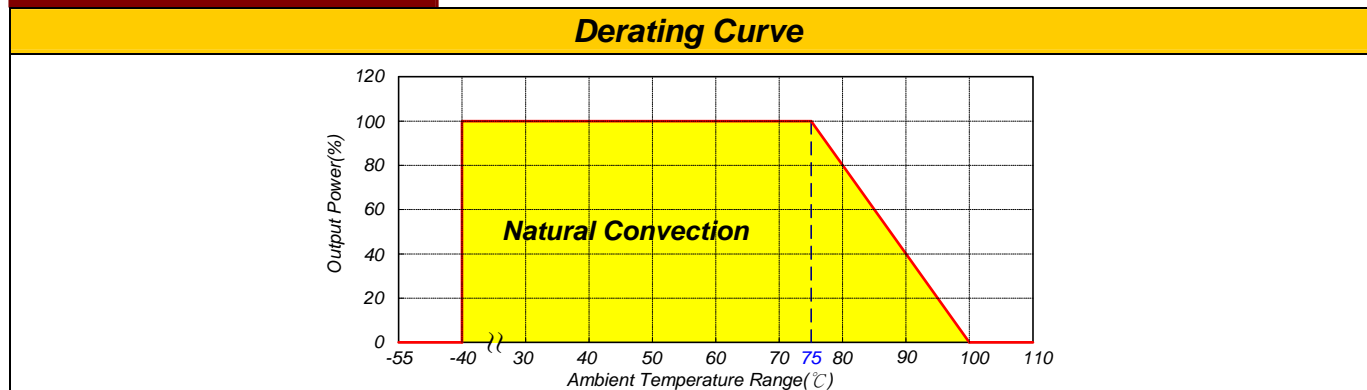
Protection Specifications

Parameter	Condition	Min.	Typ.	Max.
Over Power Protection	Vin-L to Vin-H	110%Io	---	---
Output Short Circuit Protection	Continuous, Auto-Recovery			

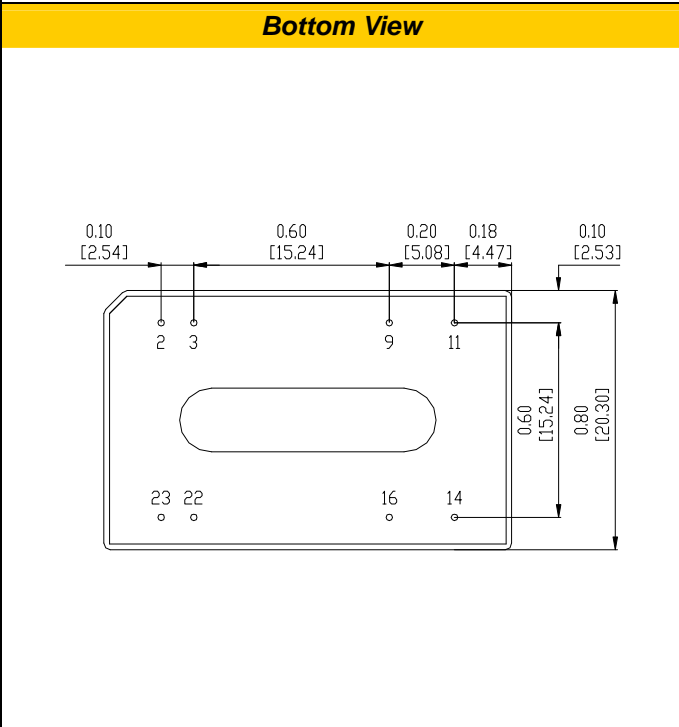
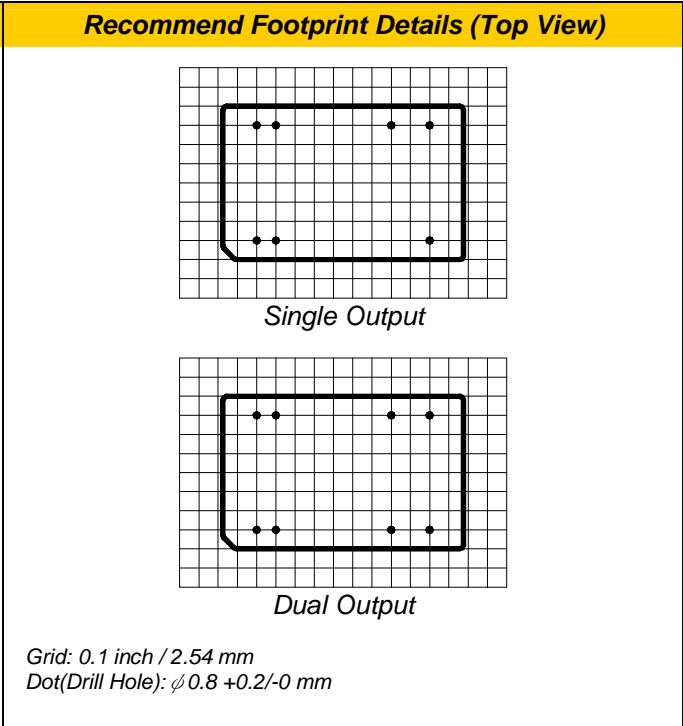
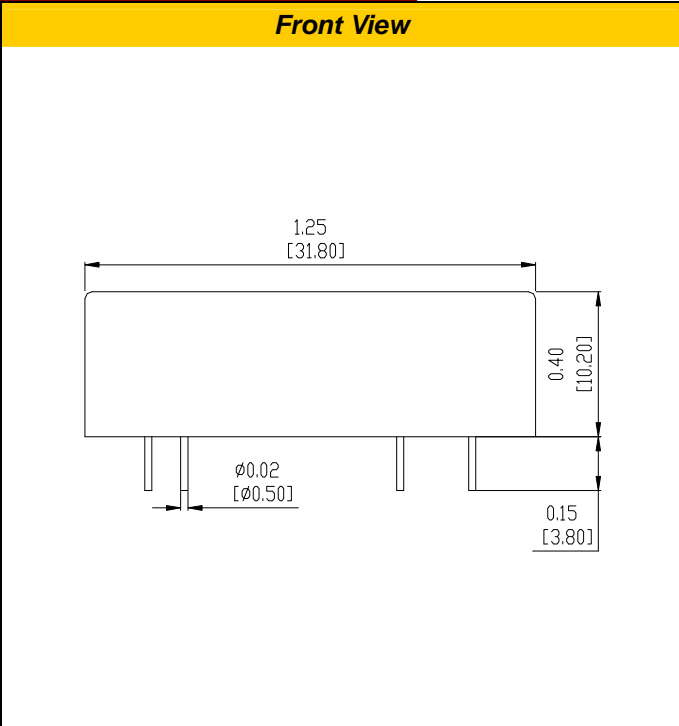
Input Fuse Selection Guide

12VDC models	24VDC models	48VDC models
700 mA Slow – Blow Type	350 mA Slow – Blow Type	200 mA Slow – Blow Type

Characteristic Curve



Package Dimension



Pin Functions

Pin No.	Single Output	Dual Output
2, 3	-Vin	-Vin
9	No Pin	Common
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22, 23	+Vin	+Vin

N.C.: No Connect

Note:
 All dimensions in inch [mm]
 Tolerance: XX.X± 0.01 [XX.X±0.25]
 XX.XX± 0.01 [XX.XX±0.25]
 Pin pitch tolerance ±0.01 [±0.25]
 Pin diameter tolerance ±0.004 [±0.1]