ECHIN Technology Co., Ltd

# E13W(-R) Series

## Features

- 3 Watts Output Power
- Regulation Output
- 2:1 Wide Range Input Voltage
- Efficiency up to 84%
- 1500 VDC Isolation Voltage
- Operating Temperature -40℃~75℃ (Non-Derating)
- Meets EMI EN55022 Class A ( No External Components Required )
- Dual-in-line package (DIP)
- Industrial Standard Pin-out
- RoHS Compliance
- UL94V-0 Package Material
- Remote ON/OFF - Enable-High (Option)
- Reasonable Cost
- 3 Years Warranty


## Description

E13W(-R) is a 3 Watts series in a DIP package, and allows a 2:1 wide range input voltage of 12V, 24V and 48V to provide a standard output voltage of 3.3V, 5V, 12V, 15V, ±5V, ±12V and ±15V.

E13W(-R) series has the Remote ON/OFF as an optional function, the part number coding is suffixed "-R".

## 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 ℃** |
| **Operating Temperature** | Ambient | **-40** | **---** | **+75 ℃** |
| | Case | **-40** | **---** | **+90 ℃** |
| **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 ,Depend on Vin & Load | **---** | **300 KHz** | **---** |
| **MTBF** | Vin-N, Max. Load, 25℃ | **---** | **1 MHrs** | **---** |
| **Weight** | Epoxy | **---** | **10 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 ) | | | |

# E13W(-R) Series

## 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 | Max. |
| | | Typ. | Typ. | Typ. | | | | Typ. | |
| | VDC | mA | mA | mA | VDC | mA | mA | % | μF |
| E13W-0503S(-R) | 5 ( 4.5 ~ 9 ) | 70 | 697 | 30 | 3.3 | 75 | 750 | 71 | 3300 |
| E13W-0505S(-R) | | | 811 | | 5 | 60 | 600 | 74 | 3300 |
| E13W-0512S(-R) | | | 769 | | 12 | 25 | 250 | 78 | 3300 |
| E13W-0515S(-R) | | | 769 | | 15 | 20 | 200 | 78 | 3300 |
| E13W-0505D(-R) | | | 811 | | ± 5 | ± 30 | ± 300 | 74 | 1000 |
| E13W-0512D(-R) | | | 769 | | ± 12 | ± 12 | ± 125 | 78 | 1000 |
| E13W-0515D(-R) | | | 769 | | ± 15 | ± 10 | ± 100 | 78 | 1000 |
| E13W-1203S(-R) | 12 ( 9 ~ 18 ) | 30 | 268 | 30 | 3.3 | 75 | 750 | 77 | 3300 |
| E13W-1205S(-R) | | | 313 | | 5 | 60 | 600 | 80 | 3300 |
| E13W-1212S(-R) | | | 298 | | 12 | 25 | 250 | 84 | 3300 |
| E13W-1215S(-R) | | | 298 | | 15 | 20 | 200 | 84 | 3300 |
| E13W-1205D(-R) | | | 313 | | ± 5 | ± 30 | ± 300 | 80 | 1000 |
| E13W-1212D(-R) | | | 298 | | ± 12 | ± 12 | ± 125 | 84 | 1000 |
| E13W-1215D(-R) | | | 298 | | ± 15 | ± 10 | ± 100 | 84 | 1000 |
| E13W-2403S(-R) | 24 ( 18 ~ 36 ) | 15 | 132 | 15 | 3.3 | 75 | 750 | 78 | 3300 |
| E13W-2405S(-R) | | | 154 | | 5 | 60 | 600 | 81 | 3300 |
| E13W-2412S(-R) | | | 149 | | 12 | 25 | 250 | 84 | 3300 |
| E13W-2415S(-R) | | | 149 | | 15 | 20 | 200 | 84 | 3300 |
| E13W-2405D(-R) | | | 154 | | ± 5 | ± 30 | ± 300 | 81 | 1000 |
| E13W-2412D(-R) | | | 149 | | ± 12 | ± 12 | ± 125 | 84 | 1000 |
| E13W-2415D(-R) | | | 149 | | ± 15 | ± 10 | ± 100 | 84 | 1000 |
| E13W-4803S(-R) | 48 ( 36 ~ 75 ) | 10 | 66 | 10 | 3.3 | 75 | 750 | 78 | 3300 |
| E13W-4805S(-R) | | | 77 | | 5 | 60 | 600 | 81 | 3300 |
| E13W-4812S(-R) | | | 75 | | 12 | 25 | 250 | 84 | 3300 |
| E13W-4815S(-R) | | | 75 | | 15 | 20 | 200 | 84 | 3300 |
| E13W-4805D(-R) | | | 77 | | ± 5 | ± 30 | ± 300 | 81 | 1000 |
| E13W-4812D(-R) | | | 77 | | ± 12 | ± 12 | ± 125 | 82 | 1000 |
| E13W-4815D(-R) | | | 75 | | ± 15 | ± 10 | ± 100 | 84 | 1000 |

**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℃.*
2) *When Load is lower than Min. Output Current or under no-Load, will not damage these devices; however, it may not meet all specifications.*
3) *Output Ripple & Noise Test please refer to E-Chin Technology Co., Ltd. proposed test-method.*
4) *Load Regulation and Line Regulation calculating 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 protection based on surge current and maximum input current when settle it in recommended.*
6) *"Vin-H" means "Vin-High", "Vin-N" means "Vin-Nominal", and "Vin-L" means "Vin-Low".*
7) *"Reflected Ripple" means "Reflected Ripple of Input Current".*
8) *Total Capacitive Loads of output should be lower than this value.*
9) *Other Input Voltages, Output Voltages and Specifications may be available, please contact us.*

## Input Specifications

| Parameter | Condition | Min. | Typ. | Max. |
|---|---|---|---|---|
| Input Voltage Range | 5VDC models | 4.5 | 5 | 9 VDC |
| | 12VDC models | 9 | 12 | 18 VDC |
| | 24VDC models | 18 | 24 | 36 VDC |
| | 48VDC models | 36 | 48 | 75 VDC |
| Power ON Voltage Range | 5VDC models | 3.5 | 4 | 4.5VDC |
| | 12VDC models | 7 | 8 | 9 VDC |
| | 24VDC models | 14 | 16 | 18 VDC |
| | 48VDC models | 30 | 33 | 36 VDC |
| Power OFF Voltage Range | 5VDC models | --- | --- | 4.3VDC |
| | 12VDC models | --- | --- | 8.5 VDC |
| | 24VDC models | --- | --- | 17 VDC |
| | 48VDC models | --- | --- | 35 VDC |
| Short Circuit Input Power | All models | --- | --- | 2000 mW |
| Stand-by Input Current | Vin-L to Vin-H | --- | --- | 2 mA |
| Input Filter | Pi-Network | Meets EMI EN55022 Class A | | |

## Output Specifications

| Parameter | Condition | Min. | Typ. | Max. |
|---|---|---|---|---|
| Output Voltage Accuracy | Vin-N, Max. Load | --- | ± 0.5 | ± 1 % |
| 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 %/℃ |
| Ripple & Noise | Peak to Peak, Each Output, 20MHz | --- | 30 | 45 mV |
| Transient Recovery Time | Vin-N, 25% load step change | --- | 150 | 300 µSec |
| Transient Response Deviation | | --- | ± 2 | ± 6 %Vo |
| Start-Up Delay Time | Vin-N, Max. Load | --- | 1 mSec | --- |

## Protection Specifications

| Parameter | Condition | Min. | Typ. | Max. |
|---|---|---|---|---|
| Over Power Protection | Vin-L to Vin-H | 110%Io | --- | --- |

## Input Fuse Selection Guide

| 5VDC models | 12VDC models | 24VDC models | 48VDC models |
|---|---|---|---|
| 1.5 A Slow – Blow Type | 0.7 A Slow – Blow Type | 0.4 A Slow – Blow Type | 0.2 A Slow – Blow Type |

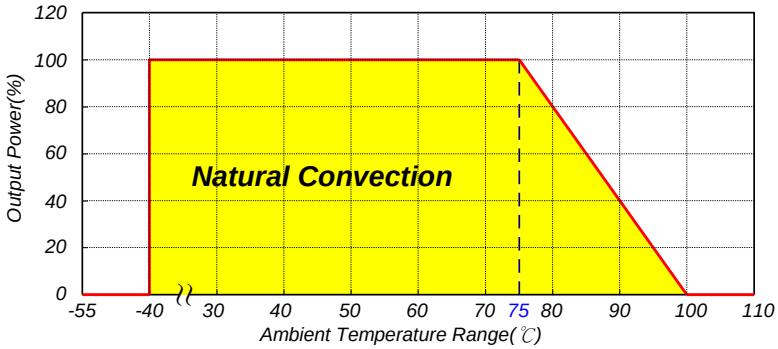
## External Functions Specifications

**Remote Control Function** ---Enable High

| Parameter | Condition | Min. | Typ. | Max. |
|---|---|---|---|---|
| System Disable | V-Remote | -0.5 | --- | 0.8 (V) |
| | I-Remote | --- | --- | -600 (µA) |
| System Enable | V-Remote | 2.5 V | --- | Vin-H |
| | I-Remote | --- | --- | -500 (µA) |
| | Floating Remote ON/OFF Pin | | | |
| Note: Control Voltage Reference to Negative Input | | | | |

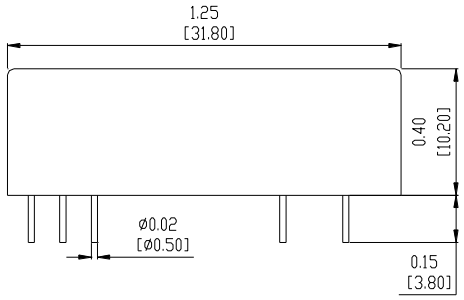
# Characteristic Curve

## Derating Curve

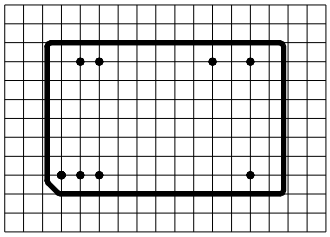



# Package Dimension

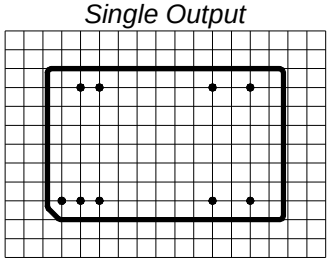
## Front View




## Recommend Footprint Details (Top View)



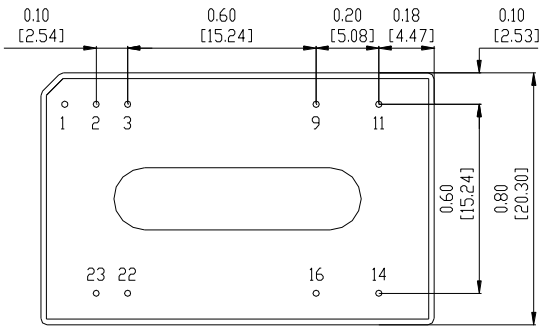
Single Output



Dual Output

Grid : 0.1 inch / 2.54 mm
Dot(Drill Hole) :ψ 0.8 +0.2/-0 mm

## Bottom View




## Pin Functions

| Pin No. | Single Output | Dual Output |
|---|---|---|
| 1 | No-Pin (Remote) | No-Pin (Remote) |
| 2,3 | -Vin | -Vin |
| 9 | No-Pin | Com |
| 11 | N.C. | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Com |
| 22,23 | +Vin | +Vin |

N.C.: No Connect
Remote: Only for suffix "-R" models

Note:

All dimensions in inch [mm]

Tolerance : XX.X± 0.01 [XX.X±0.25]

XX.XX± 0.005 [XX.XX±0.13]

Pin pitch tolerance ±0.01[±0.25]

Pin dimension tolerance ±0.004 [±0.1]