

**SERIES:** VIESD1-SIP | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

- isolated 1 W output
- regulated
- high efficiency to 73%
- dual voltage output
- small footprint
- SIP package style
- industry standard pinout
- UL94-V0 package
- no heatsink required
- 3,000 Vdc isolation
- temperature range: -40°C~+85°C
- no external component required
- low cost


**MODEL**

| MODEL              | input voltage |                | output voltage<br>(Vdc) | output current |             | output power<br>max (W) | ripple<br>max (mVp-p) | noise<br>max (mVp-p) | efficiency<br>typ (%) |
|--------------------|---------------|----------------|-------------------------|----------------|-------------|-------------------------|-----------------------|----------------------|-----------------------|
|                    | typ<br>(Vdc)  | range<br>(Vdc) |                         | min<br>(mA)    | max<br>(mA) |                         |                       |                      |                       |
| VIESD1-S5-D5-SIP   | 5             | 4.75 ~ 5.25    | 5                       | ±10            | ±100        | 1                       | 15                    | 15                   | 69                    |
| VIESD1-S5-D9-SIP   | 5             | 4.75 ~ 5.25    | 9                       | ±6             | ±56         | 1                       | 15                    | 15                   | 70                    |
| VIESD1-S5-D12-SIP  | 5             | 4.75 ~ 5.25    | 12                      | ±5             | ±42         | 1                       | 15                    | 15                   | 72                    |
| VIESD1-S5-D15-SIP  | 5             | 4.75 ~ 5.25    | 15                      | ±4             | ±33         | 1                       | 15                    | 15                   | 72                    |
| VIESD1-S12-D5-SIP  | 12            | 11.4 ~ 12.6    | 5                       | ±10            | ±100        | 1                       | 15                    | 15                   | 70                    |
| VIESD1-S12-D9-SIP  | 12            | 11.4 ~ 12.6    | 9                       | ±6             | ±56         | 1                       | 15                    | 15                   | 72                    |
| VIESD1-S12-D12-SIP | 12            | 11.4 ~ 12.6    | 12                      | ±5             | ±42         | 1                       | 15                    | 15                   | 73                    |
| VIESD1-S12-D15-SIP | 12            | 11.4 ~ 12.6    | 15                      | ±4             | ±33         | 1                       | 15                    | 15                   | 73                    |
| VIESD1-S24-D5-SIP  | 24            | 22.8 ~ 25.2    | 5                       | ±10            | ±100        | 1                       | 15                    | 15                   | 72                    |
| VIESD1-S24-D9-SIP  | 24            | 22.8 ~ 25.2    | 9                       | ±6             | ±56         | 1                       | 15                    | 15                   | 72                    |
| VIESD1-S24-D12-SIP | 24            | 22.8 ~ 25.2    | 12                      | ±5             | ±42         | 1                       | 15                    | 15                   | 73                    |
| VIESD1-S24-D15-SIP | 24            | 22.8 ~ 25.2    | 15                      | ±4             | ±33         | 1                       | 15                    | 15                   | 73                    |

**PART NUMBER KEY**
**VIESD1 -SXX -DXX -SIP**

Base Number

Input Voltage

Output Voltage

## INPUT

| parameter               | conditions/description | min  | typ | max  | units |
|-------------------------|------------------------|------|-----|------|-------|
| operating input voltage | 5 V model              | 4.75 | 5   | 5.75 | Vdc   |
|                         | 12 V model             | 11.4 | 12  | 12.6 | Vdc   |
|                         | 24 V model             | 22.8 | 24  | 25.2 | Vdc   |

## OUTPUT

| parameter               | conditions/description          | min | typ | max  | units |
|-------------------------|---------------------------------|-----|-----|------|-------|
| line regulation         | For Vin change of 1%, full load |     |     | 0.25 | %     |
| load regulation         | 10% to 100% full load           |     |     | 1    | %     |
| voltage accuracy        | 100% full load                  |     |     | ±3   | %     |
| switching frequency     | 100% load, nominal input        |     | 100 |      | kHz   |
| temperature coefficient |                                 |     |     | 0.03 | %/°C  |

## PROTECTIONS

| parameter                | conditions/description         | min | typ | max | units |
|--------------------------|--------------------------------|-----|-----|-----|-------|
| short circuit protection | continuous, automatic recovery |     | <1  |     | s     |

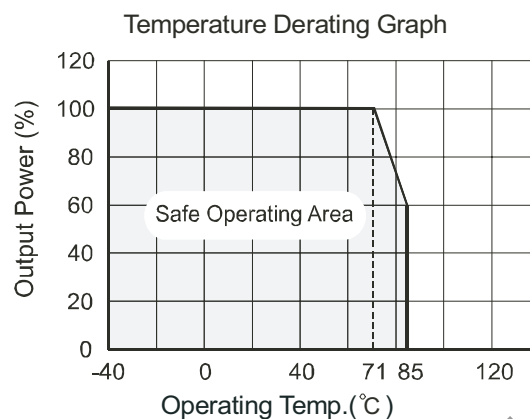
## SAFETY AND COMPLIANCE

| parameter            | conditions/description | min       | typ | max | units |
|----------------------|------------------------|-----------|-----|-----|-------|
| isolation voltage    | tested for 1 minute    | 3,000     |     |     | Vdc   |
| isolation resistance | at 500 Vdc             | 1,000     |     |     | MΩ    |
| RoHS compliant       | yes                    |           |     |     |       |
| MTBF                 |                        | 3,500,000 |     |     | hrs   |

## ENVIRONMENTAL

| parameter                  | conditions/description              | min | typ | max | units |
|----------------------------|-------------------------------------|-----|-----|-----|-------|
| case operating temperature |                                     | -40 |     | 85  | °C    |
| storage temperature        |                                     | -55 |     | 125 | °C    |
| storage humidity           | non-condensing                      |     |     | <95 | %     |
| temperature rise           | 100% load                           |     | 15  | 25  | °C    |
| lead temperature           | 1.5 mm from the case for 10 seconds |     |     | 300 | °C    |

## DERATING CURVES



## MECHANICAL

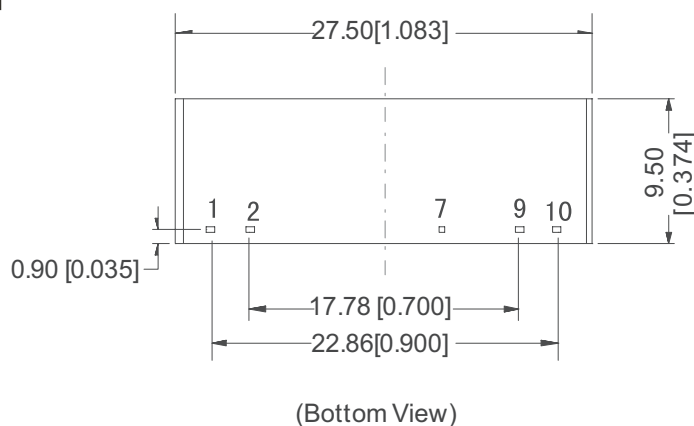
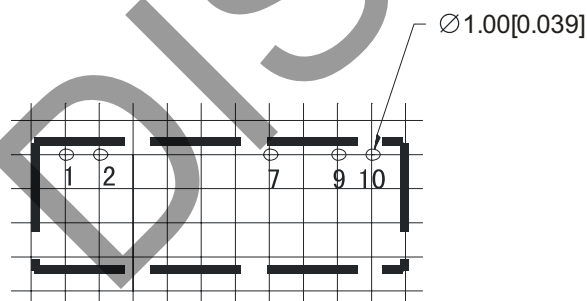
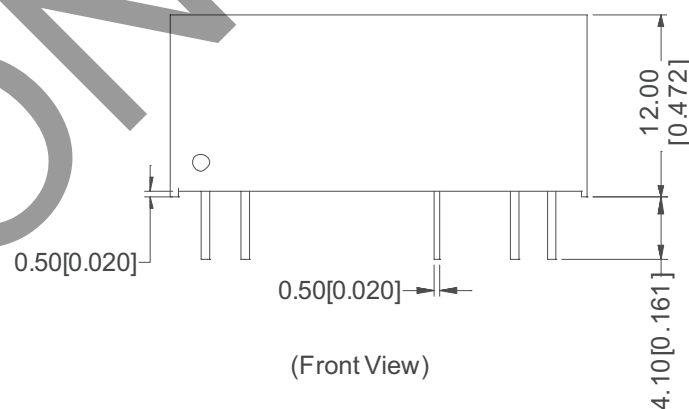
| parameter     | conditions/description                      | min | typ | max | units |
|---------------|---------------------------------------------|-----|-----|-----|-------|
| dimensions    | 27.5 x 9.5 x 12.0 (1.08 x 0.37 x 0.47 inch) |     |     |     | mm    |
| case material | Plastic (UL94-V0)                           |     |     |     |       |
| weight        |                                             |     | 5.2 |     | g     |

## MECHANICAL DRAWING

units: mm [inches]

tolerance:  $\pm 0.25\text{mm}$  [ $\pm 0.010$ ]pin section tolerance:  $\pm 0.10\text{mm}$  [ $\pm 0.004$ ]

| PIN CONNECTIONS |          |
|-----------------|----------|
| Pin             | Function |
| 1               | Vin      |
| 2               | GND      |
| 7               | +Vo      |
| 9               | -Vo      |
| 10              | 0V       |

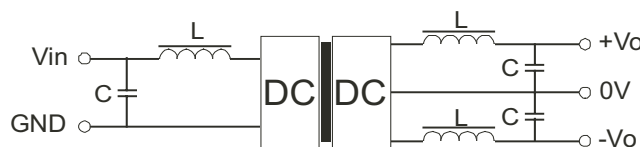


## APPLICATION NOTES

### 1. Filtering

To get an extreme low ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, which may produce a more significant filtering effect. It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference (see Figure 1).

Figure 1



In some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, providing the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor refer to the external capacitor table (see Tables 1 and 2).

Table 1

| Input Voltage (Vdc) | External Input Capacitance (μF) |
|---------------------|---------------------------------|
| 5 V                 | 4.7                             |
| 12 V                | 2.2                             |
| 24 V                | 1.0                             |

Table 2

| Vout (Vdc) | External Output Capacitance (μF) |
|------------|----------------------------------|
| ±5 V       | 4.7                              |
| ±9 V       | 2.2                              |
| ±12 V      | 1.0                              |
| ±15 V      | 0.47                             |

### 2. Overload protection

Under normal operating conditions, the output circuit of these products has no protection against over-current. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit. When the environment temperature is higher than 71°C, the product output power should be less than 60% of the rated power.

### 3. No parallel connection or plug and play

Use dual output simultaneously, forbid opening output pin(0V) to use as single output.

## REVISION HISTORY

| rev. | description                                       | date       |
|------|---------------------------------------------------|------------|
| 1.0  | initial release                                   | 06/27/2007 |
| 1.01 | new template applied, V-Infinity branding removed | 09/10/2012 |
| 1.02 | updated spec                                      | 07/11/2013 |
| 1.03 | updated drawing images                            | 02/18/2015 |

The revision history provided is for informational purposes only and is believed to be accurate.



**CUI INC®**

**Headquarters**  
20050 SW 112th Ave.  
Tualatin, OR 97062  
**800.275.4899**

Fax 503.612.2383  
**cui.com**  
techsupport@cui.com

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