

SERIES: VIAS1-SIP | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

- isolated 1 W output
- regulated
- dual voltage output
- small footprint
- industry standard 10 pin DIP package
- UL94-V0 package
- no heatsink required
- 1,000 Vdc isolation
- temperature range: -40°C~+85°C
- no external component required
- efficiency up to 66%


MODEL

| MODEL | input voltage | | output voltage | output current | | output power | ripple ¹ | noise ¹ | efficiency |
|-------------------|---------------|-------------|----------------|----------------|----------|--------------|---------------------|--------------------|------------|
| | typ (Vdc) | range (Vdc) | (Vdc) | min (mA) | max (mA) | max (W) | max (mVp-p) | max (mVp-p) | typ (%) |
| VIAS1-S5-D5-SIP | 5 | 4.75 ~ 5.25 | ±5 | ±10 | ±100 | 1 | 20 | 100 | 54 |
| VIAS1-S5-D9-SIP | 5 | 4.75 ~ 5.25 | ±9 | ±6 | ±56 | 1 | 20 | 100 | 64 |
| VIAS1-S5-D12-SIP | 5 | 4.75 ~ 5.25 | ±12 | ±5 | ±42 | 1 | 20 | 100 | 64 |
| VIAS1-S5-D15-SIP | 5 | 4.75 ~ 5.25 | ±15 | ±4 | ±33 | 1 | 20 | 100 | 64 |
| VIAS1-S12-D5-SIP | 12 | 11.4 ~ 12.6 | ±5 | ±10 | ±100 | 1 | 20 | 100 | 55 |
| VIAS1-S12-D9-SIP | 12 | 11.4 ~ 12.6 | ±9 | ±6 | ±56 | 1 | 20 | 100 | 60 |
| VIAS1-S12-D12-SIP | 12 | 11.4 ~ 12.6 | ±12 | ±5 | ±42 | 1 | 20 | 100 | 66 |
| VIAS1-S12-D15-SIP | 12 | 11.4 ~ 12.6 | ±15 | ±4 | ±33 | 1 | 20 | 100 | 64 |
| VIAS1-S24-D5-SIP | 24 | 22.8 ~ 25.2 | ±5 | ±10 | ±100 | 1 | 20 | 100 | 54 |
| VIAS1-S24-D9-SIP | 24 | 22.8 ~ 25.2 | ±9 | ±6 | ±56 | 1 | 20 | 100 | 64 |
| VIAS1-S24-D12-SIP | 24 | 22.8 ~ 25.2 | ±12 | ±5 | ±42 | 1 | 20 | 100 | 64 |
| VIAS1-S24-D15-SIP | 24 | 22.8 ~ 25.2 | ±15 | ±4 | ±33 | 1 | 20 | 100 | 64 |

Notes: 1. ripple and noise are measured at 20 MHz BW

PART NUMBER KEY
VIAS1 -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 |
| no load power consumption | 10% nominal power (typical) | | | | |

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 |

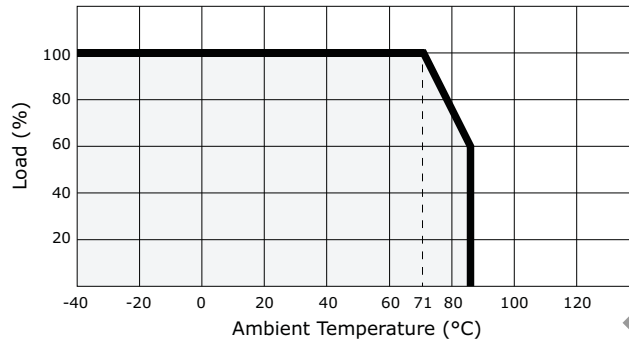
SAFETY AND COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|----------------------|------------------------|-----------|-----|-----|-------|
| isolation voltage | tested for 1 minute | 1,000 | | | 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

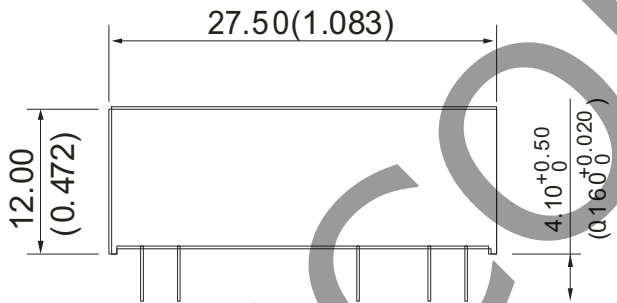


MECHANICAL

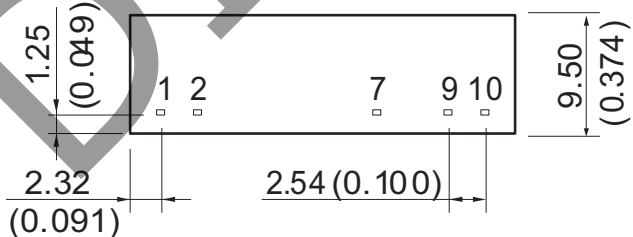
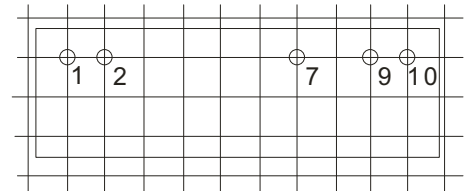
| parameter | conditions/description | min | typ | max | units |
|---------------|--|-----|-----|-----|-------|
| dimensions | 27.5 x 9.50 x 12.0 (1.08 x 0.37 x 0.47 inch) | | | | mm |
| case material | Plastic (UL94-V0) | | | | |
| weight | | | 5.2 | | g |

MECHANICAL DRAWING

units: mm (inches)
 tolerance: ± 0.25 (± 0.010)
 pin section tolerance: ± 0.10 mm (± 0.004)



RECOMMENDED FOOTPRINT
 Bottom view, grid: 2.54mm (0.1inch),
 diameter: 1.00mm (0.039inch)



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

APPLICATION NOTES

1. Requirement on output load

To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load is not less than 10% of the full load, that this product should never be operated under no load! If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power (VIAS1-SIP series).

2. Filtering

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 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. 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).

3. Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against over-current and short-circuits. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

External Capacitor Table

| Vin | External capacitor | Vout | External capacitor |
|--------|--------------------|--------|--------------------|
| 5 Vdc | 4.7 uF | 5 Vdc | 4.7 μF |
| 12 Vdc | 2 .2uF | 9 Vdc | 2.2 μF |
| 24 Vdc | 1 uF | 12 Vdc | 1.0 μF |
| -- | -- | 15 Vdc | 0.47 μF |

REVISION HISTORY

| rev. | description | date |
|------|---|------------|
| 1.0 | initial release | 06/19/2006 |
| 1.01 | new template applied | 01/11/2008 |
| 1.02 | new template applied, V-Infinity branding removed | 09/07/2012 |
| 1.03 | updated spec | 07/11/2013 |

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



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