CUI INC®

**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%

RoHS

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 -S**XX** -D**XX** -SIP

Base Number   Input Voltage   Output Voltage

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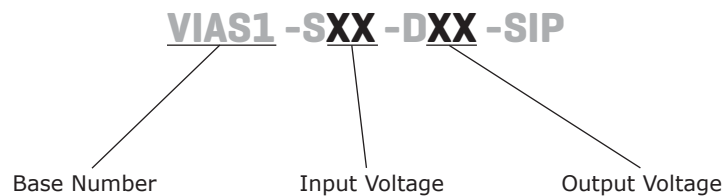
INPUT

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
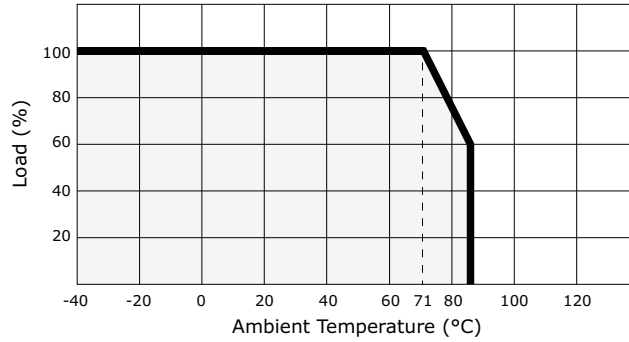
MECHANICAL

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)
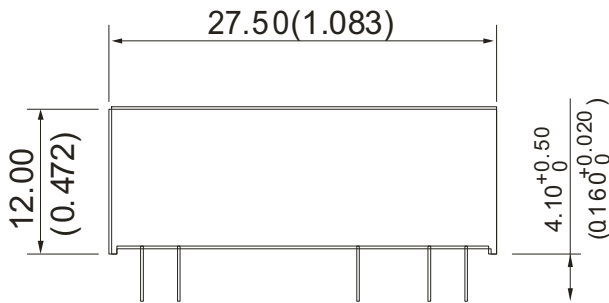
RECOMMENDED FOOTPRINT
Bottom view, grid: 2.54mm (0.1 inch), diameter: 1:00mm (0.039 inch)
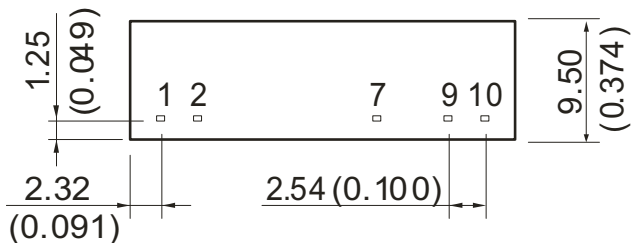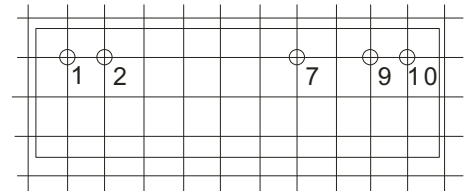
PIN CONNECTIONS	
PIN	FUNCTION
1	Vin
2	GND
7	+Vo
9	-Vo
10	0V

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

Note: All specifications measured at 25°C, humidity <75%, nominal input voltage, and full load unless otherwise noted.

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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