CUI INC®

SERIES: VIFSD1-DIP | **DESCRIPTION:** DC-DC CONVERTER

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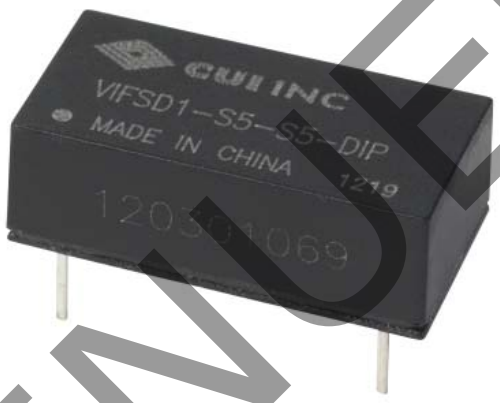
FEATURES

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



RoHS

MODEL

MODEL	input voltage typ (Vdc)	input voltage range (Vdc)	output voltage (Vdc)	output current min (mA)	output current max (mA)	output power max (W)	ripple and noise[1] max (mVp-p)	efficiency typ (%)
VIFSD1-S5-S5-DIP	5	4.75 ~ 5.25	5	15	150	1	15	69
VIFSD1-S5-S9-DIP	5	4.75 ~ 5.25	9	12	111	1	15	70
VIFSD1-S5-S12-DIP	5	4.75 ~ 5.25	12	9	83	1	15	71
VIFSD1-S5-S15-DIP	5	4.75 ~ 5.25	15	7	67	1	15	72
VIFSD1-S12-S5-DIP	12	11.4 ~ 12.6	5	15	150	1	15	69
VIFSD1-S12-S9-DIP	12	11.4 ~ 12.6	9	12	111	1	15	71
VIFSD1-S12-S12-DIP	12	11.4 ~ 12.6	12	9	83	1	15	72
VIFSD1-S12-S15-DIP	12	11.4 ~ 12.6	15	7	67	1	15	72
VIFSD1-S24-S5-DIP	24	22.8 ~ 25.2	5	15	150	1	15	70
VIFSD1-S24-S9-DIP	24	22.8 ~ 25.2	9	12	111	1	15	72
VIFSD1-S24-S12-DIP	24	22.8 ~ 25.2	12	9	83	1	15	73
VIFSD1-S24-S15-DIP	24	22.8 ~ 25.2	15	7	67	1	15	73

Notes: 1. Ripple and noise are measured at 20 MHz BW with 220 µF aluminum capacitor accross the input. Add 470 µF aluminum, 1 µF ceramic, 10 µF tantalum capacitors across output.

PART NUMBER KEY

VIFSD1 -SXX -SXX -DIP

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	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

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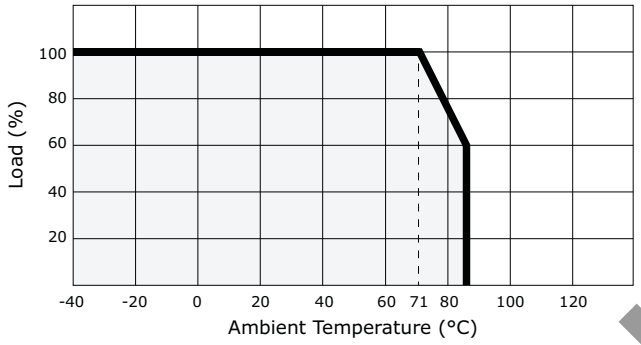
DERATING CURVES



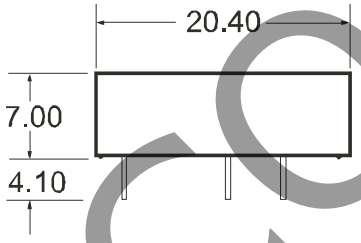
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	20.4 x 10.00 x 7.0 (0.77 x 0.39 x 0.27 inch)				mm
case material	Plastic (UL94-V0)				
weight			2.1		g

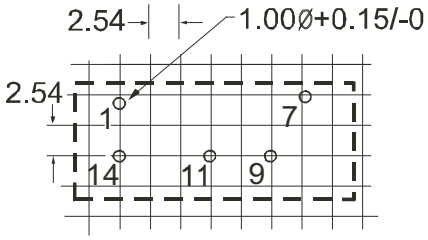
MECHANICAL DRAWING

units: mm

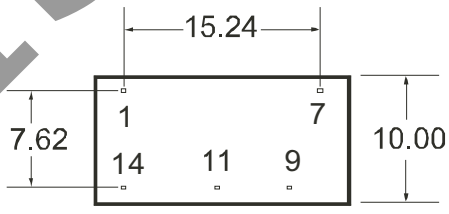
Side View



Layout



Bottom View



PIN CONNECTIONS	
PIN	FUNCTION
1	-Vin
7	NC
9	+Vo
11	-Vo
14	+Vin

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APPLICATION NOTES

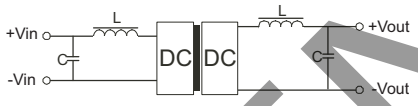
1. **Input filtering**
To reduce the reflected ripple current and minimize EMI, especially when the converter input is more than 2" away from the DC source, it is recommended to connect a low ESR electrolytic capacitor between Vin and Gnd. The values suggested are as shown in Table 1. If additional filtering is required, the capacitance may be increased, or expanded to an LC network as shown in Figure 1.

Table 1

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

2. **Recommended Circuit**
The VIFSD1-DIP series has been tested according to the following recommended testing circuit. This series should be tested under load. (see Figure 1)

Figure 1



3. **Output filtering**
An output capacitor as shown in Table 2 may be used to reduce output ripples and noise. requirements as shown in Table 2. Output capacitance may be increased for additional filtering, but should not exeed 10µF. It can also be expanded to an LC network as in Figure 1.

Table 2

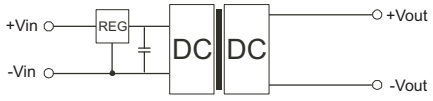
Vout (Vdc)	External Output Capacitance (µF)
5 V	10
9 V	4.7
12 V	2.2
15 V	1.0

4. **Minimum loading**
The converter needs a minimum of 10% loading to maintain output regulation. Operation under no-load conditions will not cause immediate damages but may reduce reliability, and cause performance not to meet specifications.

5. **Protection**
The converter has minimal protection against input over-voltage or output over-load, and may be permanently damaged if exposed to these conditions. An input clamping device can be used for input voltage limiting. An input fuse or an output fuse can also be used to protect against over-loading.

6. **Unregulated input**
As fixed input converters, this series can accept voltages within a limited range of the nominal input. Otherwise the converter may not function properly or may be damaged. An optional regulator can be used at the input to bring voltage within regulation, as shown in Figure 2.

Figure 2



7. **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.
When the environment temperature is higher than 70°C, the product output power should be less then 60% of the rated power.

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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	01/01/2006
1.01	new template applied	07/13/2011
1.02	V-Infinity branding removed	09/04/2012
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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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

CUI reserves the right to make changes to the product at any time without notice. Information provided by CUI is believed to be accurate and reliable. However, no responsibility is assumed by CUI for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

CUI products are not authorized or warranted for use as critical components in equipment that requires an extremely high level of reliability. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.