

SERIES: VFSD1-SIP Series | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

- 1 W isolated output
- industry standard pinout
- unregulated
- single output (3.3~24 V)
- small footprint
- 3,000 V isolation
- short circuit protection
- temperature range (-40~85°C)
- high efficiency to 83%


V-Infinity


MODEL	input voltage range (Vdc)	output voltage (Vdc)	output current		output power max (W)	ripple noise max (mVp-p)	efficiency typ (%)	UL60950
			min (mA)	max (mA)				
VFSD1-S3.3-S3.3-SIP	3 ~ 3.6	3.3	31	303	1	100	69	NO
VFSD1-S3.3-S5-SIP	3.3 ~ 3.6	5	20	200	1	100	74	NO
VFSD1-S5-S3.3-SIP	4.5 ~ 5.5	3.3	30	303	1	100	73	NO
VFSD1-S5-S5-SIP	4.5 ~ 5.5	5	20	200	1	100	72	YES
VFSD1-S5-S9-SIP	4.5 ~ 5.5	9	12	111	1	100	76	YES
VFSD1-S5-S12-SIP	4.5 ~ 5.5	12	9	83	1	100	79	YES
VFSD1-S5-S15-SIP	4.5 ~ 5.5	15	7	67	1	100	78	YES
VFSD1-S5-S24-SIP	10.8 ~ 13.2	24	5	42	1	150	79	NO
VFSD1-S12-S5-SIP	10.8 ~ 13.2	5	20	200	1	100	70	YES
VFSD1-S12-S9-SIP	10.8 ~ 13.2	9	12	111	1	100	75	YES
VFSD1-S12-S12-SIP	10.8 ~ 13.2	12	9	83	1	100	78	YES
VFSD1-S12-S15-SIP	10.8 ~ 13.2	15	7	67	1	100	79	YES
VFSD1-S12-S24-SIP	10.8 ~ 13.2	24	5	42	1	150	79	NO
VFSD1-S24-S3.3-SIP	21.6 ~ 26.4	3.3	31	303	1	100	70	NO
VFSD1-S24-S5-SIP	21.6 ~ 26.4	5	20	200	1	100	71	YES
VFSD1-S24-S9-SIP	21.6 ~ 26.4	9	12	111	1	100	76	YES
VFSD1-S24-S12-SIP	21.6 ~ 26.4	12	9	83	1	100	78	YES
VFSD1-S24-S15-SIP	21.6 ~ 26.4	15	7	67	1	100	80	YES
VFSD1-S24-S15-SIP-A	21.6 ~ 26.4	15	7	67	1	150	83	NO
VFSD1-S24-S24-SIP	21.6 ~ 26.4	24	5	42	1	150	77	NO

Note: 1. Ripple and noise measured at 20 mHz BW

INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage		3	3.3	3.6	Vdc
		4.5	5	5.5	Vdc
		10.8	12	13.2	Vdc
		13.5	15	16.5	Vdc
		21.6	24	26.4	Vdc

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	For Vin change of 1%, full load	3.3 V output all other models		±1.5	%
				±1.2	%
load regulation	10% to 100% full load, nominal line	VFSD1-S24-S15-SIP-A all other models	2	3	%
			±10	±15	%
voltage accuracy	See tolerance envelope graph		±1	±3	%
switching frequency	100% load, input voltage range		100		kHz
Temperature coefficient				0.03	%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	Supply voltage must be discontinued at end of short circuit duration				

SAFETY AND COMPLIANCE

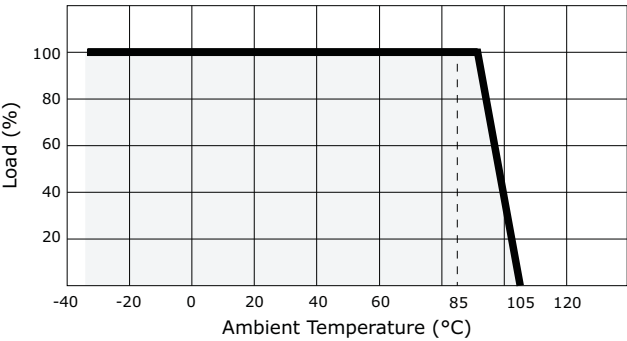
parameter	conditions/description	min	typ	max	units
isolation voltage	tested for 1 minute at 1 mA max.	3,000			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
isolation capacitance	input to output, 100 kHz / 1 V		1,000		pF
RoHS compliant	yes				
MTBF		3,500,000			hours

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

Note: 1. All specifications measured at TA=25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.

DERATING CURVES



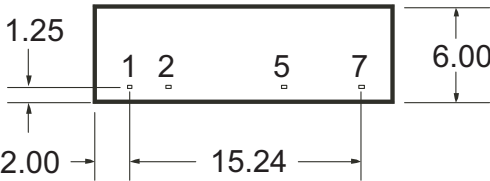
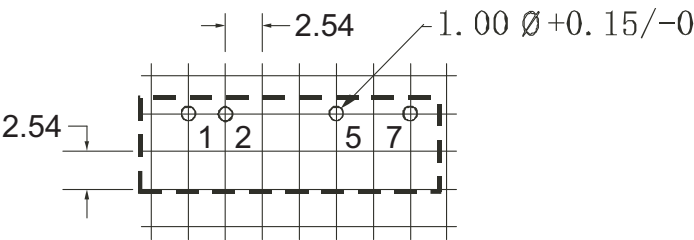
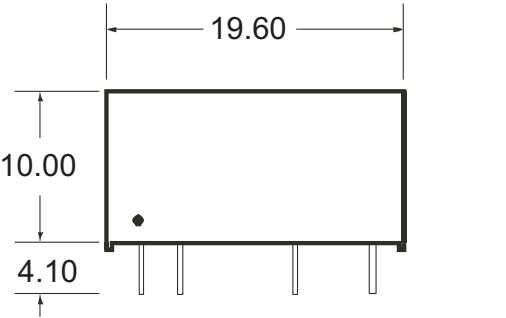
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	0.77 x 0.24 x 0.39 inch (19.6 x 6.0 x 10.0 mm)				
case material	Plastic (UL94-V0)				
weight			2.1		g

MECHANICAL DRAWING

units: mm
All pins on a 2.54mm pitch
All pin diameters are 0.50mm

Recommended Footprint



PIN CONNECTIONS	
1	+Vin
2	-Vin
5	-Vout
7	+Vout

BOTTOM VIEW

APPLICATION NOTES

1. Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load could not be less than 10% of the full 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 (E_S-W25&F_S-W25).

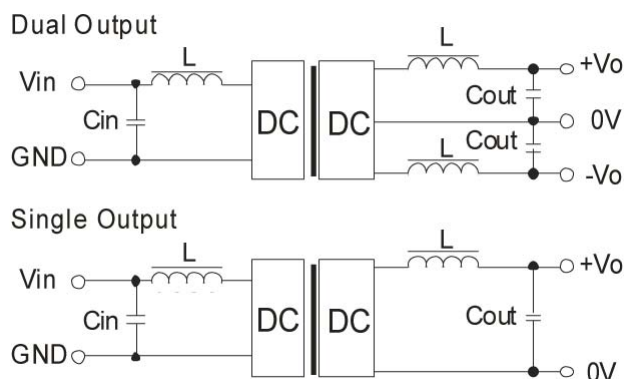
2. Overload Protection

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

3. Recommended testing and application circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1). 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. 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, provided the safe and reliable operation is ensured, the recommended capacitance of its filter capacitor sees (Table 1).

Figure 1



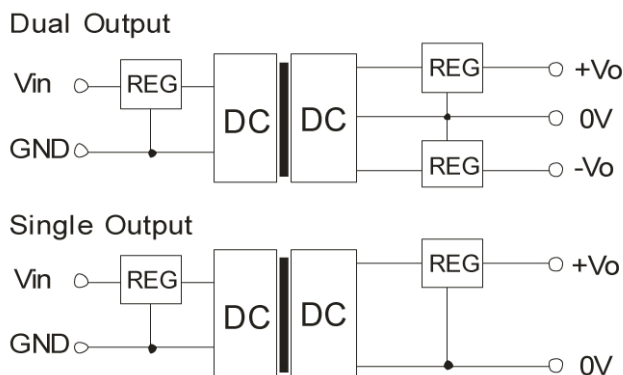
External Capacitor Table (Table 1)

Vin (Vdc)	Cin (μF)	Single Vout (Vdc)	Cout (μF)	Dual Vout (Vdc)	Cout (μF)
3.3, 5	4.7	3.3, 5	10	±5	4.7
12	2.2	9.0	4.7	±9	2.2
15	2.2	12	2.2	±12	1.0
24	1.0	15, 24	1.0	±15	0.47

4. Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).

Figure 2



5. No parallel connection or plug and play

REVISION HISTORY

rev.	description	date
1.0	initial release	10/04/2007

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.

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