

SERIES: VGDS2-SIP | **DESCRIPTION:** DC-DC CONVERTER

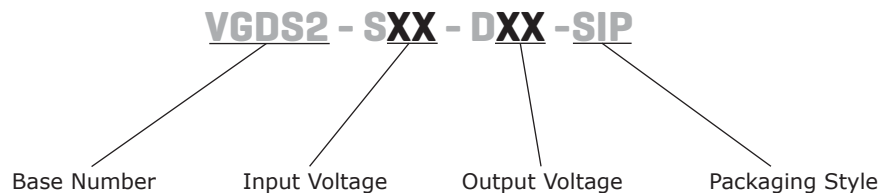
FEATURES

- 2 W isolated output
- industry standard 7 pin SIP package
- dual unregulated outputs
- 6,000 V isolation
- short circuit protection
- UL safety approvals
- wide temperature (-40~85°C)
- efficiency up to 80%



MODEL	input voltage		output voltage (Vdc)	output current		output power max (W)	ripple and noise ¹ max (mVp-p)	efficiency typ (%)
	typ (Vdc)	range (Vdc)		min (mA)	max (mA)			
VGDS2-S5-D5-SIP	5	4.5~5.5	±5	±20	±200	2	250	74
VGDS2-S5-D9-SIP	5	4.5~5.5	±9	±12	±111	2	250	77
VGDS2-S5-D12-SIP	5	4.5~5.5	±12	±9	±83	2	250	77
VGDS2-S5-D15-SIP	5	4.5~5.5	±15	±7	±67	2	250	77
VGDS2-S12-D5-SIP	12	10.8~13.2	±5	±20	±200	2	250	75
VGDS2-S12-D9-SIP	12	10.8~13.2	±9	±12	±111	2	250	78
VGDS2-S12-D12-SIP	12	10.8~13.2	±12	±9	±83	2	250	80
VGDS2-S12-D15-SIP	12	10.8~13.2	±15	±7	±67	2	250	78
VGDS2-S24-D5-SIP	24	21.6~26.4	±5	±20	±200	2	250	75
VGDS2-S24-D9-SIP	24	21.6~26.4	±9	±12	±111	2	250	77
VGDS2-S24-D12-SIP	24	21.6~26.4	±12	±9	±83	2	250	80
VGDS2-S24-D15-SIP	24	21.6~26.4	±15	±7	±67	2	250	79

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

PART NUMBER KEY


INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage	5 V model	4.5	5	5.5	Vdc
	12 V model	10.8	12	13.2	Vdc
	15 V model	21.6	24	26.4	Vdc

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	for Vin change of 1%			±1.2	%
load regulation	measured from 10% load to full load	5V	10	15	%
		9V	8.3	15	%
		12V	6.8	15	%
		15V	6.3	15	%
voltage accuracy	see derating curves				
switching frequency	100% load, typical input	5V	45		kHz
		12V	50		kHz
		24V	50		kHz
temperature coefficient			±0.03		%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection				1	s

SAFETY AND COMPLIANCE

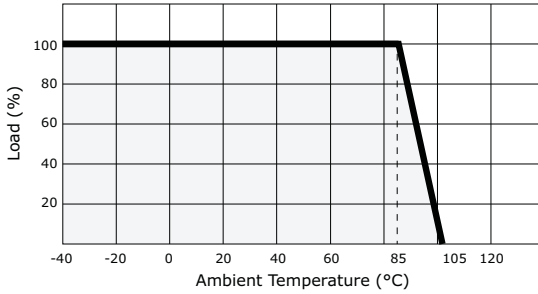
parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute at 1 mA max.	6,000			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
safety approvals	UL 60950 (E222736)				
MTBF		3,500,000			hours
RoHS compliant	yes				

ENVIRONMENTAL

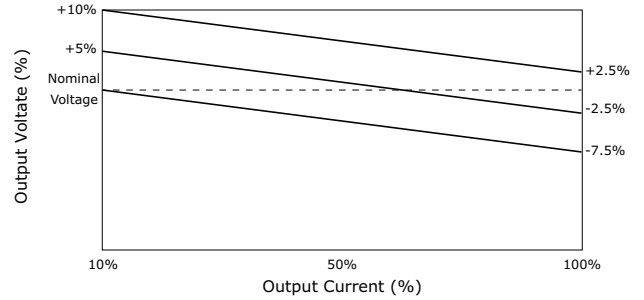
parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-55		125	°C
storage humidity	non-condensing			95	%
temperature rise	at full load		15	30	°C
lead temperature	1.5 mm from case for 10 seconds			300	°C

DERATING CURVES

1. output power vs. ambient temperature



2. output voltage vs. output current

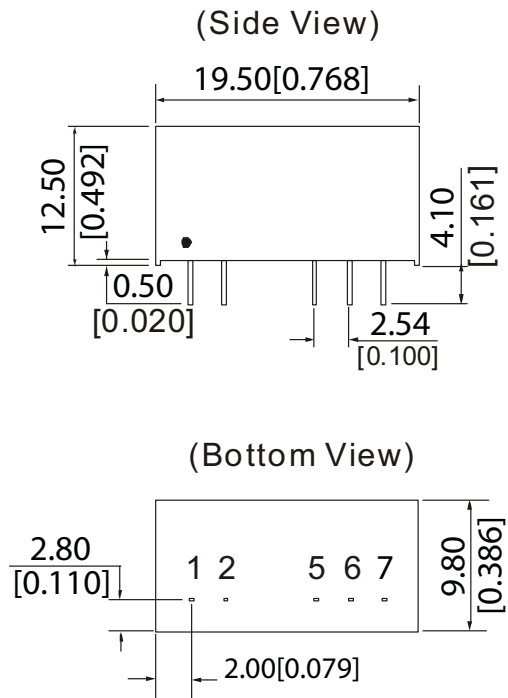


MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	0.768 x 0.386 x 0.492 (19.5 x 9.80 x 12.5 mm)				inch
case material	plastic (UL94-V0)				
weight			4.3		g

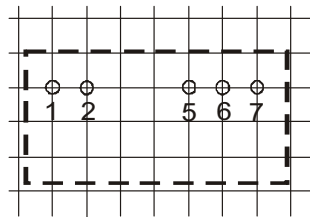
MECHANICAL DRAWING

units: mm
 tolerance: ±0.25
 pin section tolerance: ±0.10 mm



First Angle Projection

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



PIN CONNECTIONS	
PIN	FUNCTION
1	+Vin
2	GND
5	-Vo
6	0V
7	+Vo

APPLICATION NOTES

1. Requirement on output load

To ensure that this module can operate efficiently and reliably, a minimum load is specified in addition to a maximum load. During operation, make sure that the specified range of input voltage is not exceeded and that the minimum output load is not less than 10% of the full load. This product should never be operated under no load. If the output of the power supply is small, please connect a resistor with proper resistance at the output end in parallel to increase the load.

2. Recommended testing and application circuit

An output capacitor is needed to meet output ripple requirements as shown in Table 2. Output capacitance may be increased for additional filtering, but should not exceed 10 μ F or expanded to an LC network as in Figure 1.

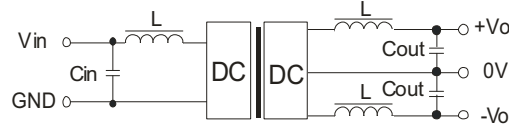


Figure 1

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 correct. If the capacitance is too large then a startup problem may arise. For every channel of output, provided that safe and reliable operation is ensured, the recommended capacitance of its filter capacitor should be as seen in Table 1.

Table 1

Vin (Vdc)	Cin (μ F)	Dual Vout (Vdc)	Cout (μ F)
5	10	± 5	4.7
12	4.7	± 9	2.2
--	--	± 12	1.0
24	2.2	± 15	0.47

It is not recommended to connect any external capacitor in the application field with less than a 0.5 W output.

3. 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 output end in series. (Figure 2)

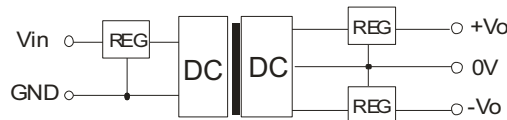


Figure 2

4. Overload protection

Under normal operating conditions, the output circuit of these dc-dc converters 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.

REVISION HISTORY

rev.	description	date
1.0	initial release	06/20/2006
1.01	new template applied, V-Infinity branding removed	09/10/2012

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



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