CUI INC®

SERIES: VWQBS2-SIP | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

- 2 W isolated output
- wide input (4:1)
- industry standard 9 pin SIP package
- single unregulated outputs
- 1,500 V isolation
- short circuit protection
- wide temperature (-40~85°C)
- efficiency up to 79%

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 (%)
VWQBS2-Q24-S3.3-SIP	24	9.0~36.0	3.3	50	500	2	150	68
VWQBS2-Q24-S5-SIP	24	9.0~36.0	5	40	400	2	150	76
VWQBS2-Q24-S9-SIP	24	9.0~36.0	9	22	222	2	150	78
VWQBS2-Q24-S12-SIP	24	9.0~36.0	12	16	167	2	150	79
VWQBS2-Q24-S15-SIP	24	9.0~36.0	15	13	133	2	150	79
VWQBS2-Q48-S3.3-SIP	48	18.0~72.0	3.3	50	500	2	150	72
VWQBS2-Q48-S5-SIP	48	18.0~72.0	5	40	400	2	150	75
VWQBS2-Q48-S9-SIP	48	18.0~72.0	9	22	222	2	150	76
VWQBS2-Q48-S12-SIP	48	18.0~72.0	12	16	167	2	150	78
VWQBS2-Q48-S15-SIP	48	18.0~72.0	15	13	133	2	150	79

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

PART NUMBER KEY

VWQBS2 - SXX - SXX -SIP

Base Number | Input Voltage | Output Voltage | Packaging Style

INPUT

parameter	conditions/description		min	typ	max	units
operating input voltage	24 V model 48 V model		9.0 18.0	24 48	36.0 72.0	Vdc Vdc
surge voltage	1 second max.	24 V model 48 V model	-0.7 -0.7		50 100	Vdc Vdc
short circuit input power					1.6	W
input filter	C filter					

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	input voltage from low to high		±0.2	±0.75	%
load regulation	measured from 10% load to full load		±0.5	±1.5	%
voltage accuracy	see derating curves positive negative		 ±1 ±3	 ±3 ±5	 % %
transient recovery time	25% load step change			25	ms
transient response deviation	25% load step change		±3	±5	%
switching frequency	100% load, input voltage range		300		kHz
temperature coefficient			±0.03		%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, automatic recovery				

SAFETY AND COMPLIANCE

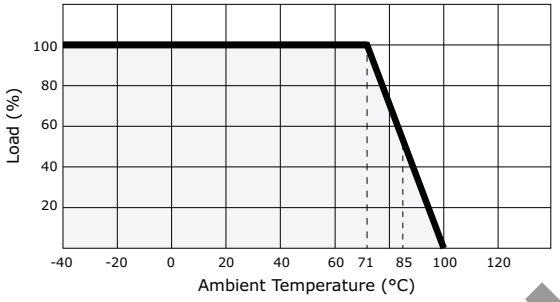
parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute at 1 mA max.	1,500			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
MTBF		1,000,000			hours
RoHS compliant	yes				

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		°C
lead temperature	1.5 mm from case for 10 seconds			300	°C

DERATING CURVES

1. output power vs. ambient temperature

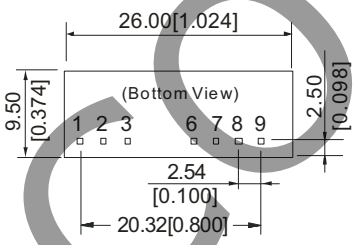


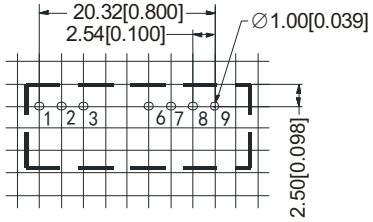
MECHANICAL

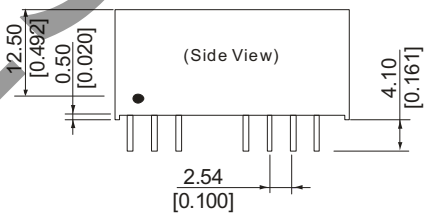
parameter	conditions/description	min	typ	max	units
dimensions	1.024 x 0.374 x 0.492 (26.00 x 9.50 x 12.50 mm)				inch
case material	plastic (UL94-V0)				
weight			5.8		g

MECHANICAL DRAWING

units: mm [inches]
tolerance: ±0.25 [±0.010]
pin section tolerance: ±0.10 mm [±0.004]







PIN CONNECTIONS	
PIN	FUNCTION
1	GND
2	+Vin
3	CTRL
6	+Vo
7	NC
8	NC
9	0 V

APPLICATION NOTES

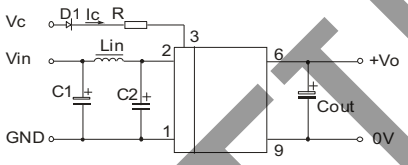
1. **Requirement on Output Load**
   To ensure this module can operate efficiently and reliably, During operation, the minimum output load is not less than 10% of the full load, and that this product should never be operated under no load! If the actual output power is very small, please connect a resistor 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.

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.

Vin (Vdc)	Fuse (slow-blow type) (mA)
24	250
48	150

3. **Recommended 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).

Figure 1



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 greatest capacitance of its filter capacitor see (Table 1).

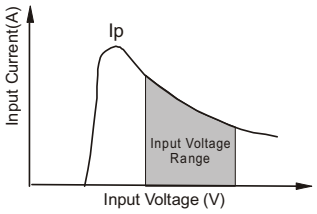
C1/C2	10 ~ 100 μF
Lin	4.7 ~ 120 μH
Cout	100 μF

4. **CTRL Terminal**
   When open or high impedance, the converter work well; When this pin is 'high'; the converter shutdown; It should be note that the input current should between 5~10 mA,exceeding the maximum 20 mA will cause permanence damage to the converter. The value of Vc not limited and desirable 5 Vdc, 12 Vdc, or directly with Vin. The value of R can be derived as follows:

$$R = \frac{V_C - V_D - 1.0}{I_C}$$

5. **Input Current**
   Nominal input voltage range. The input current of the power supply must be sufficient to the startup current (Ip) of the DC-DC module.

   General: Ip ≤1.4*Iin-max



6. **No parallel connection or plug and play**

Table 1

REVISION HISTORY

rev.	description	date
1.0	initial release	07/23/2007
1.01	new template applied	04/17/2012
1.02	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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