CUI INC®

SERIES: VWRBS2 | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

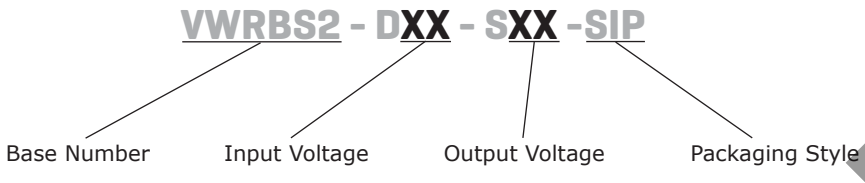
- 2 W isolated output
- wide input (2:1)
- industry standard 8 pin SIP package
- single unregulated outputs
- 1,500 V isolation
- short circuit protection
- wide temperature (-40~85°C)
- efficiency up to 80%

RoHS

MODEL	input voltage		output voltage	output current		output power	ripple and noise[1]	efficiency
	typ (Vdc)	range (Vdc)	(Vdc)	min (mA)	max (mA)	max (W)	max (mVp-p)	typ (%)
VWRBS2-D5-S3.3-SIP	5	4.5~9.0	3.3	50	500	2	100	64
VWRBS2-D5-S5-SIP	5	4.5~9.0	5	40	400	2	100	67
VWRBS2-D5-S9-SIP	5	4.5~9.0	9	22	222	2	100	72
VWRBS2-D5-S12-SIP	5	4.5~9.0	12	16	167	2	100	73
VWRBS2-D5-S15-SIP	5	4.5~9.0	15	13	133	2	100	72
VWRBS2-D5-S24-SIP	5	4.5~9.0	24	8	80	2	100	71
VWRBS2-D12-S3.3-SIP	12	9.0~18.0	3.3	50	500	2	100	68
VWRBS2-D12-S5-SIP	12	9.0~18.0	5	40	400	2	100	75
VWRBS2-D12-S9-SIP	12	9.0~18.0	9	22	222	2	100	77
VWRBS2-D12-S12-SIP	12	9.0~18.0	12	16	167	2	100	79
VWRBS2-D12-S15-SIP	12	9.0~18.0	15	13	133	2	100	80
VWRBS2-D12-S24-SIP	12	9.0~18.0	24	8	80	2	100	78
VWRBS2-D24-S3.3-SIP	24	18.0~36.0	3.3	50	500	2	100	67
VWRBS2-D24-S5-SIP	24	18.0~36.0	5	40	400	2	100	77
VWRBS2-D24-S9-SIP	24	18.0~36.0	9	22	222	2	100	79
VWRBS2-D24-S12-SIP	24	18.0~36.0	12	16	167	2	100	80
VWRBS2-D24-S15-SIP	24	18.0~36.0	15	13	133	2	100	80
VWRBS2-D24-S24-SIP	24	18.0~36.0	24	8	80	2	100	80
VWRBS2-D48-S3.3-SIP	48	36.0~72.0	3.3	50	500	2	100	71
VWRBS2-D48-S5-SIP	48	36.0~72.0	5	40	400	2	100	75
VWRBS2-D48-S9-SIP	48	36.0~72.0	9	22	222	2	100	76
VWRBS2-D48-S12-SIP	48	36.0~72.0	12	16	167	2	100	78
VWRBS2-D48-S15-SIP	48	36.0~72.0	15	13	133	2	100	78
VWRBS2-D48-S24-SIP	48	36.0~72.0	24	8	80	2	100	80

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	9.0	Vdc
	12 V model	9.0	12	18.0	Vdc
	24 V model	18.0	24	36.0	Vdc
	48 V model	36.0	48	72.0	Vdc

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	input voltage from low to high		±0.2	±0.5	%
load regulation	measured from 10% load to full load		±0.5	±0.75	%
voltage accuracy	input voltage range refer to output load		±1	±3	%
switching frequency	100% load, input voltage range	180		500	kHz
temperature coefficient			±0.03		%/°C

PROTECTIONS

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

SAFETY AND COMPLIANCE

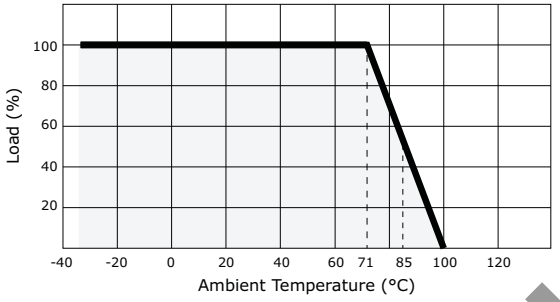
parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute at 1 mA max.	1,500			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
MTBF		1,000,000			hours
RoHS compliant	yes				

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-50		125	°C
storage humidity	non-condensing			95	%
temperature rise	at full load		15	35	°C
lead temperature	1.5 mm from case for 10 seconds			300	°C

DERATING CURVES

1. output power vs. ambient temperature

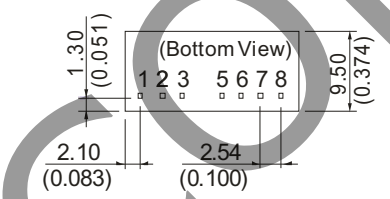


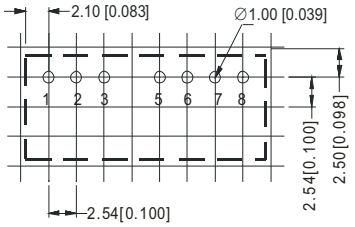
MECHANICAL

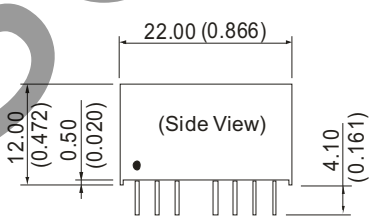
parameter	conditions/description	min	typ	max	units
dimensions	0.866 x 0.374 x 0.472 (22.00 x 9.50 x 12.00 mm)				inch
case material	plastic (UL94-V0)				
weight			5.5		g

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
5	NC
6	+Vo
7	0 V
8	CS

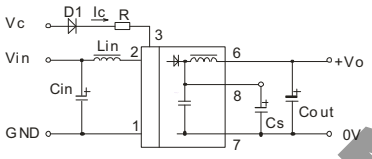
APPLICATION NOTES

1. **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 (Ic) should between 5-10mA, exceeding the maximum 20mA will cause permanence damage to the converter. The value of R Can be derived as follows :

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

2. **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 sees (Table 1).

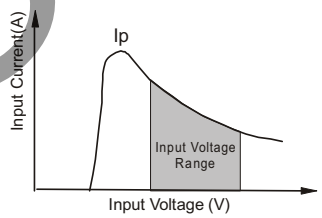
Cin	5, 12 V 24, 48 V	100 µF 10 ~ 22 µF
Lin	--	4.7 ~ 120 µH
Cout	--	100 µF (typ)
Lout	--	2.2 ~ 10 µH
Cs	--	10 ~ 22 µF

Table 1

Vin (Vdc)	Cout (µF)
3.3	2,200
5	1,000
9	820
12	680
15	560
24	470

3. **Input Current**
While using unstable power source, please ensure the output voltage and ripple voltage do not excced indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current Ipy.

General: Ip ≤1.4*Iin-max



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

REVISION HISTORY

rev.	description	date
1.0	initial release	03/12/2010
1.01	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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