CUI INC®

SERIES: VWRAT2 | DESCRIPTION: DC-DC CONVERTER

FEATURES

- 2 W isolated output
- wide input (2:1)
- industry standard 16 pin SMT package style
- dual regulated outputs
- 1,500 V isolation
- short circuit protection
- wide temperature (-40~85°C)
- efficiency up to 78%

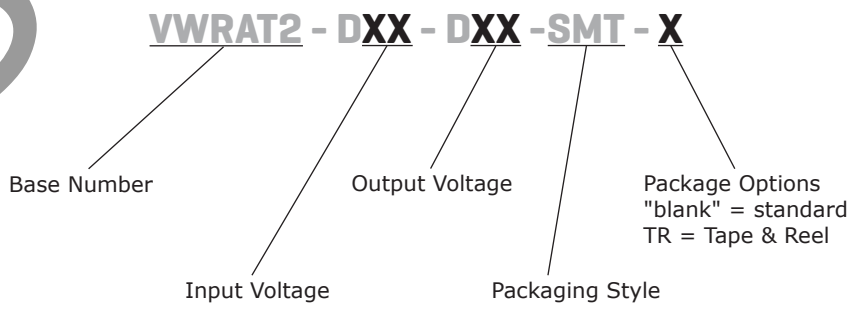
RoHS

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] typ (mVp-p)	efficiency typ (%)
VWRAT2-D12-D5-SMT	12	9~18	±5	±20	±200	2	35	74
VWRAT2-D12-D9-SMT	12	9~18	±9	±11	±111	2	35	78
VWRAT2-D12-D12-SMT	12	9~18	±12	±8	±83	2	35	78
VWRAT2-D12-D15-SMT	12	9~18	±15	±7	±67	2	35	78
VWRAT2-D24-D5-SMT	24	18~36	±5	±20	±200	2	35	74
VWRAT2-D24-D9-SMT	24	18~36	±9	±11	±111	2	35	79
VWRAT2-D24-D12-SMT	24	18~36	±12	±8	±83	2	35	78
VWRAT2-D24-D15-SMT	24	18~36	±15	±7	±67	2	35	78

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	12 V model 24 V model	9 18	12 24	18 36	Vdc Vdc

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	measured from low line to high line		±0.2	±0.5	%
load regulation	measured from 10% to 100% full load		±0.5	±1	%
voltage accuracy	positive negative refer to recommended circuit		±1 ±3	±3 ±5	% %
ripple & noise			35	150	mVp-p
switching frequency	100% load, nominal input voltage		300		kHz
temperature coefficient				±0.03	%/°C

PROTECTIONS

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

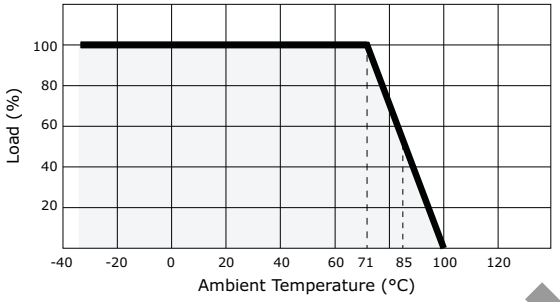
SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	tested for 1 minute, at 1 mA max.	1,500			Vdc
insulation resistance	at 500 Vdc	1,000			MΩ
isolation capacitance	input to output		85		pF
RoHS compliant	yes				
MTBF		1,000,000			hours

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	for 10 seconds			300	°C

DERATING CURVES

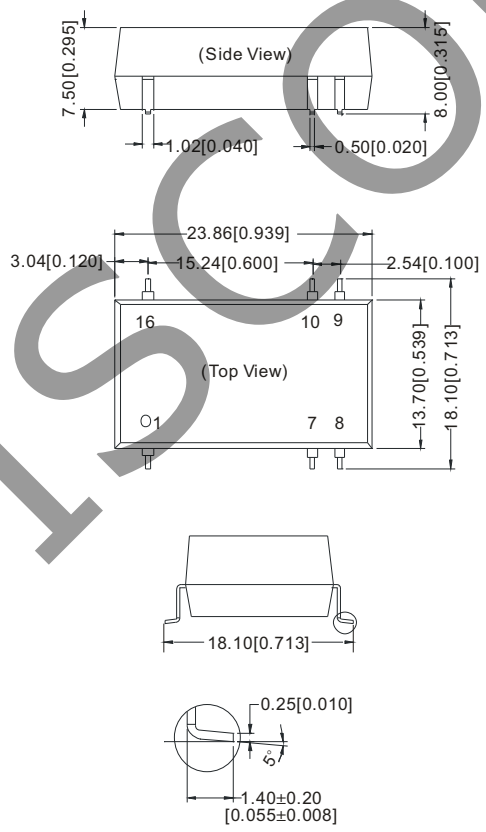


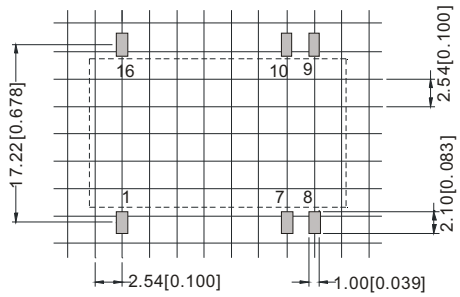
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	0.939 x 0.713 x 0.315 (23.86 x 18.10 x 8.10 mm)				inch
case material	UL94-V0 epoxy resin				
weight			5.2		g

MECHANICAL DRAWING

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





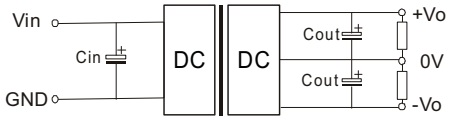
PIN CONNECTIONS	
PIN	FUNCTION
1	GND
7	NC
8	0 V
9	+Vo
10	-Vo
16	+Vin

APPLICATION NOTES

1. **Requirement on Output Load**
   In order to ensure the product operates efficiently and reliably, make sure the specified range of input voltage is not exceeded and the minimum output load is not less than 10% load. If the actual load is less than the specifi ed minimum load, the output ripple may increase sharply while its effi ciency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading.

2. **Recommended Circuit**
   All VWRBT2 converters have been tested according to the following recommended testing circuit before leaving the factory. This series should be tested under load, never under no load (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).

General:

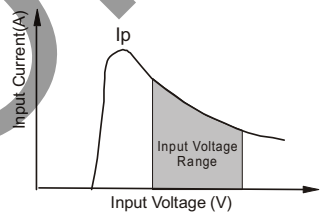
Cin	12 V 24, 48 V	100 µF 10 ~ 47 µF
Cout	10 µF / 100 mA	

Table 1

Vout (Vdc)	Cout (µF)
±5	680
±9	470
±12	330
±15	220

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 Ip.

   General: Ip ≤1.4*Iin-max



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

5. **Solderability**
   reflow soldering, 240°C max.

REVISION HISTORY

rev.	description	date
1.0	initial release	06/16/2008
1.01	new template applied, V-Infinity branding removed, application notes updated	09/10/2012
1.02	added TR package option	11/01/2012

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

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