

**SERIES: VWRAS1-SIP | DESCRIPTION: DC-DC CONVERTER**
**FEATURES**

- 1 W isolated output
- wide input (2:1)
- industry standard 8 pin SIP package
- dual unregulated outputs
- 1,500 V isolation
- short circuit protection
- wide temperature (-40~85°C)
- efficiency up to 78%



MODEL	input voltage		output voltage (Vdc)	output current		output power max (W)	ripple and noise <sup>1</sup> max (mVp-p)	efficiency typ (%)
	typ (Vdc)	range (Vdc)		min (mA)	max (mA)			
VWRAS1-D5-D5-SIP	5	4.5~9.0	±5	±10	±100	1	150	71
VWRAS1-D5-D9-SIP	5	4.5~9.0	±9	±5	±55	1	150	72
VWRAS1-D5-D12-SIP	5	4.5~9.0	±12	±4	±42	1	150	73
VWRAS1-D5-D15-SIP	5	4.5~9.0	±15	±3	±33	1	150	73
VWRAS1-D12-D5-SIP	12	9.0~18.0	±5	±10	±100	1	150	75
VWRAS1-D12-D9-SIP	12	9.0~18.0	±9	±5	±55	1	150	76
VWRAS1-D12-D12-SIP	12	9.0~18.0	±12	±4	±42	1	150	77
VWRAS1-D12-D15-SIP	12	9.0~18.0	±15	±3	±33	1	150	76
VWRAS1-D24-D5-SIP	24	18.0~36.0	±5	±10	±100	1	150	76
VWRAS1-D24-D9-SIP	24	18.0~36.0	±9	±5	±55	1	150	77
VWRAS1-D24-D12-SIP	24	18.0~36.0	±12	±4	±42	1	150	78
VWRAS1-D24-D15-SIP	24	18.0~36.0	±15	±3	±33	1	150	78
VWRAS1-D48-D9-SIP	48	36.0~72.0	±9	±5	±55	1	150	76
VWRAS1-D48-D15-SIP	48	36.0~72.0	±15	±3	±33	1	150	78

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

**PART NUMBER KEY**
**VWRAS1 - DXX - DXX -SIP**

Base Number

Input Voltage

Output Voltage

Packaging Style

**INPUT**

parameter	conditions/description	min	typ	max	units
operating input voltage	5 Vdc model	4.5	5	9.0	Vdc
	12 Vdc model	9.0	12	18.0	Vdc
	24 Vdc model	18.0	24	36.0	Vdc
	48 Vdc 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	±1.0	%
voltage accuracy	see derating curves		±1	±3	%
switching frequency	100% load, nominal input	180		550	kHz
temperature coefficient			±0.03		%/°C

**PROTECTIONS**

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

**SAFETY AND COMPLIANCE**

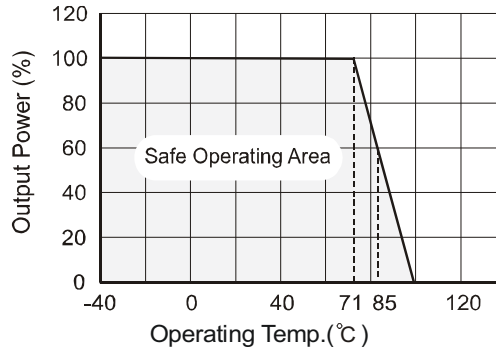
parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute at 1 mA max.	1,500			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
MTBF		1,000,000			hours
RoHS compliant	yes				

**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	35	°C
lead temperature	1.5 mm from case for 10 seconds			300	°C

## DERATING CURVES

1. output power vs. ambient temperature

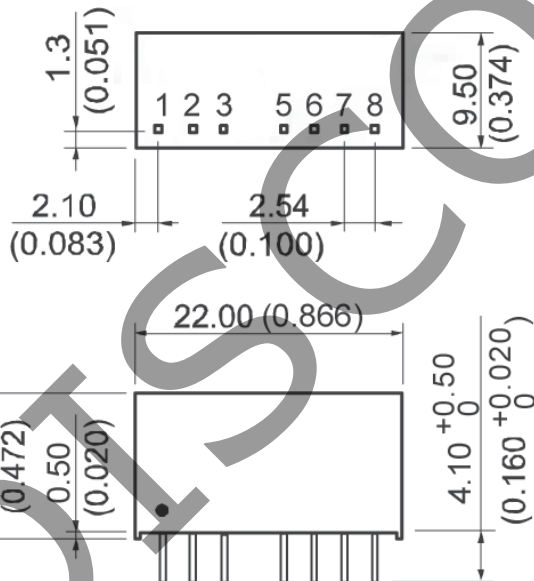


## MECHANICAL

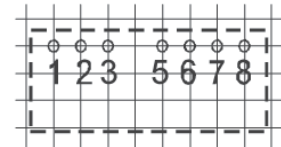
parameter	conditions/description	min	typ	max	units
dimensions	0.866 x 0.374 x 0.473 (22.00 x 9.50 x 12.00 mm)				inch
case material	plastic (UL94-V0)				

## MECHANICAL DRAWING

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



RECOMMENDED FOOTPRINT  
 Top view, grid: 2.54mm (0.1 inch),  
 diameter: 1.00mm  
 Dual Output & Single Output



PIN CONNECTIONS	
PIN	FUNCTION
1	GND
2	V <sub>in</sub>
3	CTRL
5	NC
6	+V <sub>o</sub>
7	0V
8	-V <sub>o</sub>

## APPLICATION NOTES

-All of the VWRAS1-SMT Series have been tested according to the following recommended testing circuit before leaving the factory. This series should be tested under load (Figure 1). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high (Table 1).

**Table 1**

Vout	Cout/ $\mu$ F (max)
$\pm 5$ V	$\pm 330$
$\pm 9$ V	$\pm 220$
$\pm 12$ V	$\pm 100$
$\pm 15$ V	$\pm 47$
$\pm 24$ V	$\pm 22$

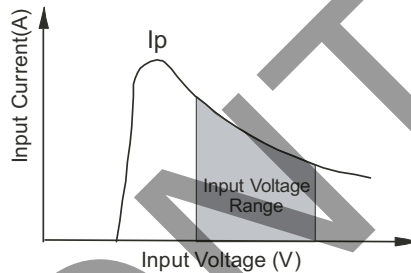
### 1. CTRL Terminal

When open or high impedance, the converter will work well; When this pin is 'high'; the converter will shutdown; It should be noted that the input current should remain between 5-10mA,exceeding the maximum 20mA will cause permanent damage to the converter.

### Input current

While using the unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current  $I_p$ . (Figure 1)

**Figure 1**



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

## REVISION HISTORY

rev.	description	date
1.0	initial release	07/23/2007
1.02	new template applied, V-Infinity branding removed, VWRAS1-D48-D5-SIP and VWRAS1-D48-D12-SIP discontinued	08/06/2012
1.03	picture updated	09/07/2012

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



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