PART NUMBER: VWRBT1 Series **DESCRIPTION:** dc-dc converter

description

Designed to convert a wide input voltage range into an isolated regulated voltage, the VWRBT1-SMT series is well suited for providing board-mount local supplies in a wide range of applications, including mixed analog/digital circuits, test & measurement equip., process/machine controls, datacom/telecom fields, etc...

features

- **wide (2:1) input range**
- **regulated**
- **single voltage output**
- **I/O isolation: 1500 V dc**
- **no heatsink required**
- **short circuit protection**
- **MTBF >1,000,000 hours**
- **temperature range: -40°C~+85°C**

RoHS

MODEL

	input voltage		output voltage	output current		efficiency
	nominal (V dc)	range (V dc)	max. (V dc)	(V dc)	max. (mA)	min. (mA)	typ. (%)
VWRBT1-D12-S3.3-SMT	12	9.0~18.0	22	3.3	303	30	69
VWRBT1-D12-S5-SMT	12	9.0~18.0	22	5	200	20	72
VWRBT1-D12-S9-SMT	12	9.0~18.0	22	9	111	11	74
VWRBT1-D12-S12-SMT	12	9.0~18.0	22	12	83	8	75
VWRBT1-D12-S15-SMT	12	9.0~18.0	22	15	67	6	76
VWRBT1-D24-S3.3-SMT	24	18.0~36.0	40	3.3	303	30	70
VWRBT1-D24-S5-SMT	24	18.0~36.0	40	5	200	20	74
VWRBT1-D24-S9-SMT	24	18.0~36.0	40	9	111	11	76
VWRBT1-D24-S12-SMT	24	18.0~36.0	40	12	83	8	78
VWRBT1-D24-S15-SMT	24	18.0~36.0	40	15	67	6	78

notes: 1. All specifications measured at TA=25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.

INPUT

parameter	conditions/description	min	nom	max	units
input voltage range		12	9~18	22	V dc
		24	18~36	40	V dc

OUTPUT

parameter	conditions/description	min	nom	max	units
1W output power		0.1		1	W
voltage accuracy[2]	refer to recommended circuit		±1	±2	%
ripple	@ 20MHz Bandwidth		20	30	mVpp
noise	@ 20MHz Bandwidth		40	80	mVpp
line regulation	input voltage from low to high		±0.2	±0.5	%
load regulation	10% to 100% full load		±0.5	±1.0	%
temperature coefficient	refer to recommended circuit			0.03	%/°C
switching frequency	100% load, nominal input		300		KHz

notes: 2. 3.3 V ±3% max.

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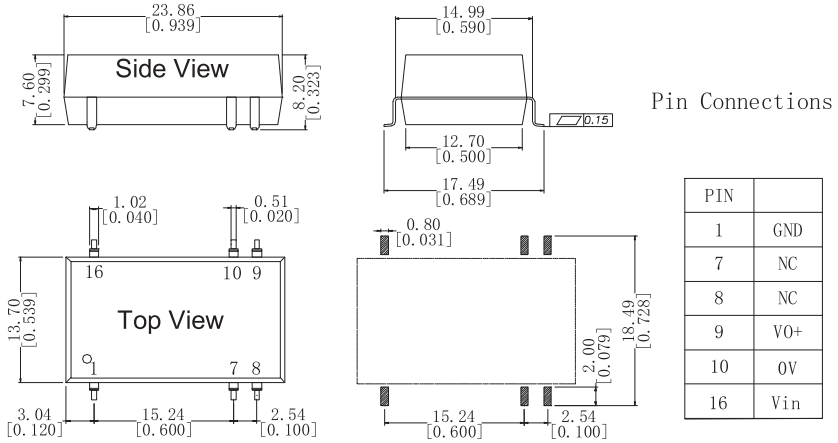
GENERAL SPECIFICATIONS

parameter	conditions/description
output short circuit protection	continuous
temperature rise at full load	15°C typ., 30°C max.
cooling	free air convection
operating temp. range	-40°C ~ +85°C
storage temp. range	-55°C ~ +125°C
reflow soldering temp.	245°C (for 10 seconds)
storage humidity range	≤95%
case material	plastic (UL94-V0)
MTBF	>1,000,000 hours

ISOLATION SPECIFICATIONS

parameter	conditions/description	min	nom	max	units
isolation voltage	flash tested for 1 minute	1500			V dc
isolation resistance	test at 500 V dc	1000			MΩ

OUTLINE DIMENSIONS & RECOMMENDED LAYOUT PATTERN

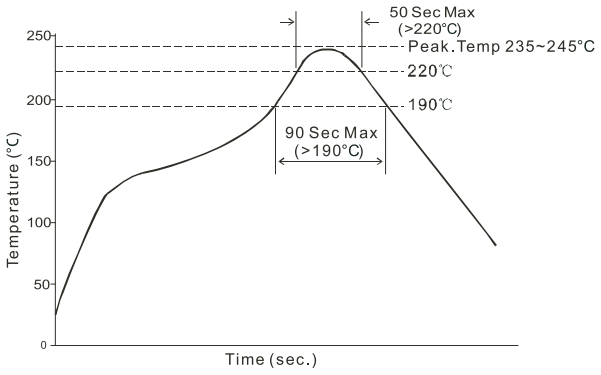


Pin Connections

PIN	
1	GND
7	NC
8	NC
9	VO+
10	OV
16	Vin

Note: All Pins on a 2.54mm pitch; Tolerance:±0.25mm

RECOMMENDED REFLOW PROFILE



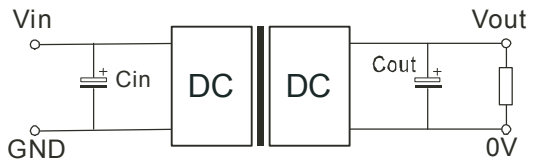
PART NUMBER: VWRBT1 Series

DESCRIPTION: dc-dc converter

Application Notes:

- All of the VWRBT1-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).

Figure 1



Recommended circuit
It is best to test with full load and not to test without load. To further reduce output ripple, you may increase the external capacitor, choose a capacitor with low ESR, or add external inductor to the circuit as shown above.

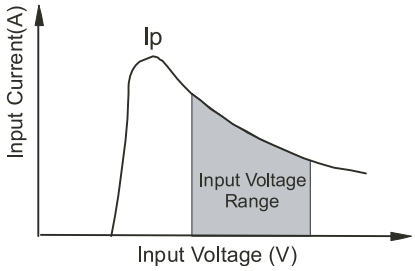
General:
Cin: 12V 100μF
24V 10μF or 22μF
Cout:100μF(typ)

Table 1

Vout(V)	Cout/μF(max)
3.3	1000
5	470
9	330
12	150
15	100

- 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 (Figure 2)

Figure 2



- Output Load
In order to ensure the product operates efficiently and reliably, make sure the specified range of input voltage is not exceeded.

No parallel connection or plug and play.

- NC Terminals
Unless otherwise specified, NC terminals of all series are used for converter's interior circuit connection, and are not allowed connection of any external circuit.

Temperature Derating Curve