

**SERIES:** VBT0.25-SMT | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

- 0.25 W isolated output
- industry standard 8 pin SMT package
- single unregulated output from 3.3~48 V
- 1,000 V isolation
- short circuit protection
- efficiency up to 65%



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)			
VBT0.25-S5-S3.3-SMT	5	4.5~5.5	3.3	8	76	0.25	100	62
VBT0.25-S5-S5-SMT	5	4.5~5.5	5	5	50	0.25	100	64
VBT0.25-S5-S9-SMT	5	4.5~5.5	9	3	28	0.25	100	65
VBT0.25-S5-S12-SMT	5	4.5~5.5	12	2	21	0.25	100	67
VBT0.25-S5-S15-SMT	5	4.5~5.5	15	2	17	0.25	100	66
VBT0.25-S12-S5-SMT	12	10.8~13.2	5	5	50	0.25	100	65
VBT0.25-S12-S9-SMT	12	10.8~13.2	9	3	28	0.25	100	64
VBT0.25-S12-S12-SMT	12	10.8~13.2	12	2	21	0.25	100	63
VBT0.25-S12-S15-SMT	12	10.8~13.2	15	2	17	0.25	100	64
VBT0.25-S24-S5-SMT	24	21.6~26.4	5	5	50	0.25	100	60
VBT0.25-S24-S9-SMT	24	21.6~26.4	9	3	28	0.25	100	61
VBT0.25-S24-S12-SMT	24	21.6~26.4	12	2	21	0.25	100	63
VBT0.25-S24-S15-SMT	24	21.6~26.4	15	2	17	0.25	100	65

Notes: 1. 20 MHz bandwidth oscilloscope  
2. All specifications measured at TA=25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.

**PART NUMBER KEY**
**VBXT0.25 - SXX - SXX - SMT - X**

Base Number  
X indicates ALT PIN  
configuration, see page 3

Input Voltage

Output Voltage

Packaging Style

Package Options  
"blank" = standard  
TR = Tape & Reel

**INPUT**

parameter	conditions/description	min	typ	max	units
operating input voltage	5 V model	4.5	5	5.5	Vdc
	12 V model	10.8	12	13.2	Vdc
	24 V model	21.6	24	26.4	Vdc

**OUTPUT**

parameter	conditions/description	min	typ	max	units
line regulation	for Vin change of 1%		3.3 V model	1.5	%
			all other models	1.2	%
load regulation	measured from 10% load to full load		3.3 V model	15	%
			5 V model	12.8	%
			9 V model	8.3	%
			12 V model	6.8	%
			15 V model	6.3	%
voltage accuracy	see derating curves				
switching frequency	100% load, 5 and 12 V input		110		kHz
	100% load, 24 V input		700		kHz
temperature coefficient			±0.03		%/°C

**PROTECTIONS**

parameter	conditions/description	min	typ	max	units
short circuit protection				1	s

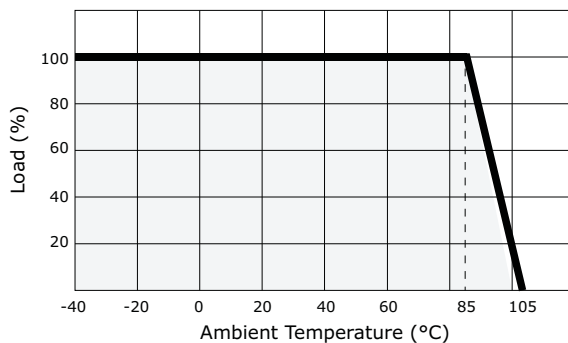
**SAFETY AND COMPLIANCE**

parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute at 1 mA max.	1,000			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
safety approvals	UL 60950-1 (E222736)				
MTBF		3,500,000			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	25	°C
lead temperature	1.5 mm from case for 10 seconds			260	°C

## DERATING CURVES

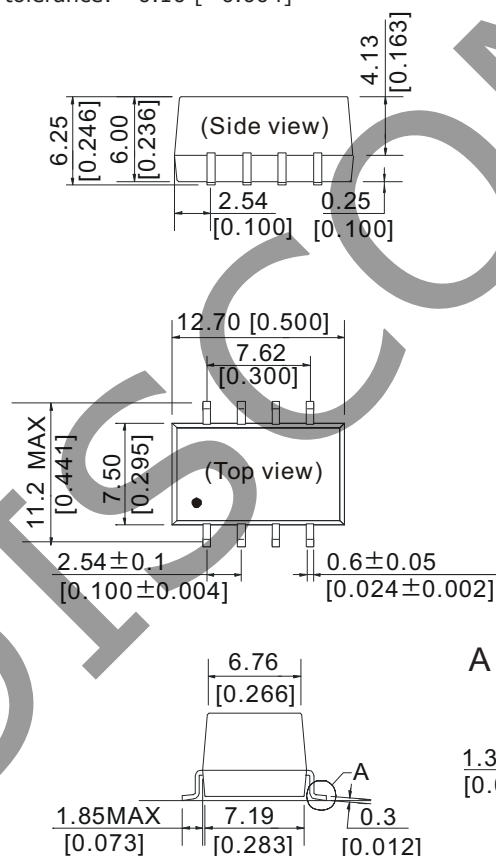


## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	0.500 x 0.441 x 0.246 (12.70 x 11.20 x 6.25 mm)				inch
case material	plastic (UL94-V0)				
weight			1.35		g

## MECHANICAL DRAWING

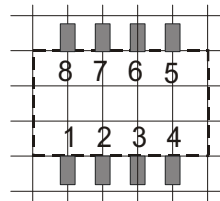
units: mm [inches]  
 tolerance:  $\pm 0.15$  [ $\pm 0.006$ ]  
 pin section tolerance:  $\pm 0.10$  [ $\pm 0.004$ ]



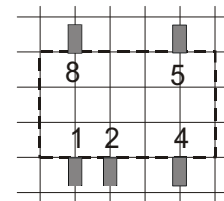
First Angle Projection

RECOMMENDED FOOTPRINT  
 Top view, grid: 2.54mm (0.1 inch)

VBTO.25-SMT



VBXT0.25-SMT



PIN CONNECTIONS		
PIN	FUNCTION	ALT FUNCTION
1	GND	GND
2	+Vin	+Vin
3	NC	No PIN
4	0 V	0 V
5	+Vo	+Vo
6	NC	No PIN
7	NC	No PIN
8	NC	NC

## APPLICATION NOTES

### 1. Requirement on Output Load

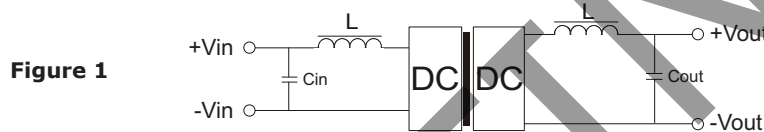
In order to ensure the product operates efficiently and reliably, make sure the specified range of input voltage is not exceeded and the minimum output load is not less than 10% load. If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency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

### 2. Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against over-current and short-circuits. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

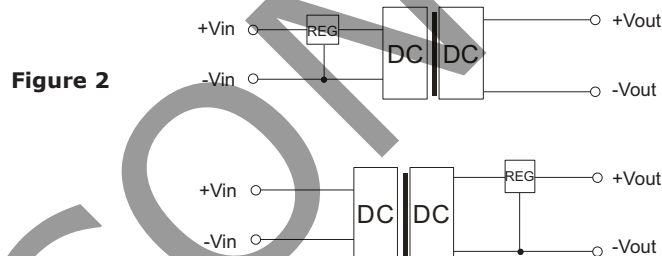
### 3. Filtering

In some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. 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 the external capacitor table. To get an extremely low ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, which may produce a more significant filtering effect. It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference (Figure 1).

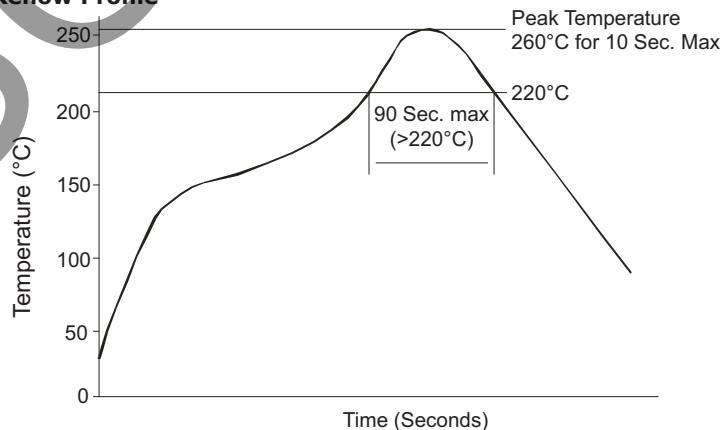


### 4. Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).



**Reflow Profile**



## REVISION HISTORY

rev.	description	date
1.0	initial release	03/06/2008
1.01	new template applied, V-Infinity branding removed	09/07/2012
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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