

FEATURES AND APPLICATIONS

- 22 Pin SMD Package
- Single and Dual Output
- 1000 and 3000 VDC Isolation
- Transfer Molded Package
- Extended Temperature Range
- RoHS compliant

GENERAL DESCRIPTION

The VSV series is a family of cost effective 1 W single and dual output DC-DC converters with 1 or 3 kVdc isolation. These converters achieve low cost and miniature SMD Package without compromising performance or field reliability.

Models operate from an input bus voltage of 3.3, 5, 9, 12 or 15 VDC offering output voltage levels of 3.3, 5, 9, 12, 15, ± 3.3 , ± 5 , ± 9 , ± 12 and ± 15 VDC.

SMD 22 Package - Standard Types

Type Number	Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency [% typ.]	Package Style *
VSV-xx3R3S	3.3	3.3	303	65	1
VSV-xx05S	5	5	200	70	1
VSV-xx09S	9	9	111	75	1
VSV-xx12S	12	12	84	78	2
VSV-xx15S	15	15	67	80	2
VSV-xx3R3D	3.3	± 3.3	± 150	65	1
VSV-xx05D	5	± 5	± 100	70	1
VSV-xx09D	9	± 9	± 56	75	1
VSV-xx12D	12	± 12	± 42	78	2
VSV-xx15D	15	± 15	± 34	80	2

* Note: 12Vdc and 15Vdc input voltage models use package style 2

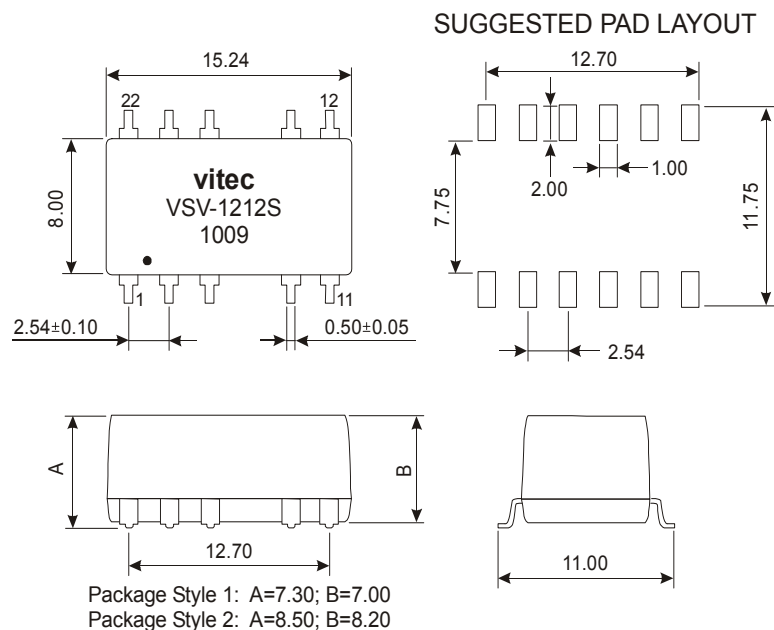
xx input voltage

33	3.3 Vdc $\pm 10\%$
05	5.0 Vdc $\pm 10\%$
09	9.0 Vdc $\pm 10\%$
12	12 Vdc $\pm 10\%$
15	15 Vdc $\pm 10\%$

Suffix H 3 kVdc isolation

SMD 22 Package

1kV and 3kV Isolation		
Pin	Single Output	Dual Output
1	-INPUT	-INPUT
3	+INPUT	+INPUT
9	-OUTPUT	COMMON
11	NC	-OUTPUT
14	+OUTPUT	+OUTPUT
Other	NC	NC



Dimensions: mm; Unless otherwise specified, all tolerances are ± 0.25

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ELECTRICAL SPECIFICATIONS

Specifications typical at +25°C, nominal Input voltage, rated output current unless otherwise specified.

Input Specifications

Voltage Range	±10%
Filter	Capacitor 1µF

Isolation Specification

Rated Voltage	1000 VDC min. 3000 VDC (Suffix H)
Resistance	10 ⁹ Ω
Capacitance	33 – 100 pF

Output Specifications

Voltage Accuracy	±5%, max.
Ripple and Noise (20 MHz BW)	75 mVp-p, max.
Short Circuit Protection	no
Line Voltage Regulation	±1.2% / 1.0% of Vin max.
Load Voltage Regulation (10 to 100 % FL)	
3.3 Output Type	15% typ.
5V & 9V Output Types	12 % & 8% max.
12V & 15V Output Types	8.5% & 7% max.
Temperature Coefficient	±0,02%/°C

General Specifications

Efficiency	see table
Switching Frequency	100 KHz, typ.
MTBF (MIL-HDBK-217@25°C)	3.5 Mhrs

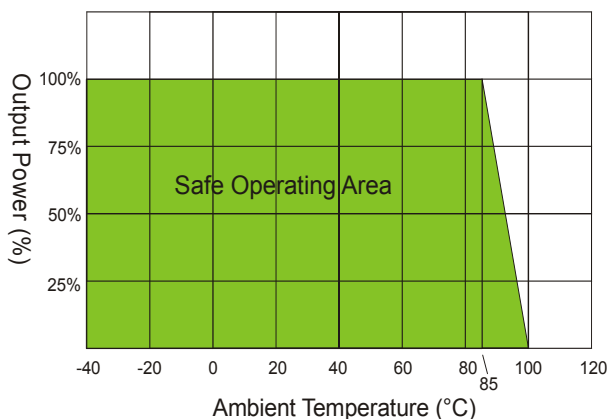
Environmental Specification

Operating Temperature	-40°C to +85°C
Max. Case Temperature	+100°C
Storage Temperature	-50 to +100°C
Derating	None
Humidity	20% to 95% not condensing
Cooling	Free-air convection
RoHS	full compliance

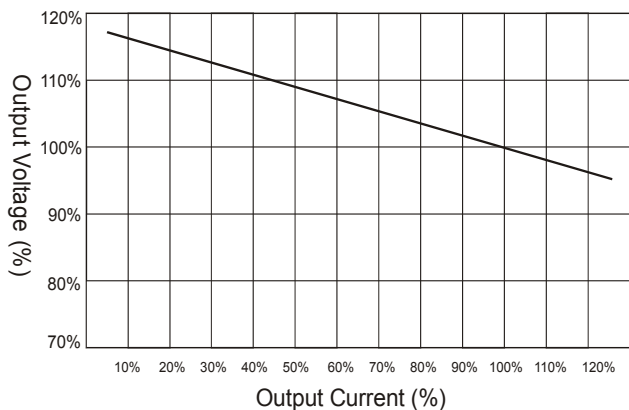
Physical Characteristics

Dimension SMD	
Package Style 1	15.24 x 8.00 x 7.30 mm
Package Style 2	15.24 x 8.00 x 8.50 mm
Weight	1.8 g
Case Material	UL 94V-0 Package material

Derating



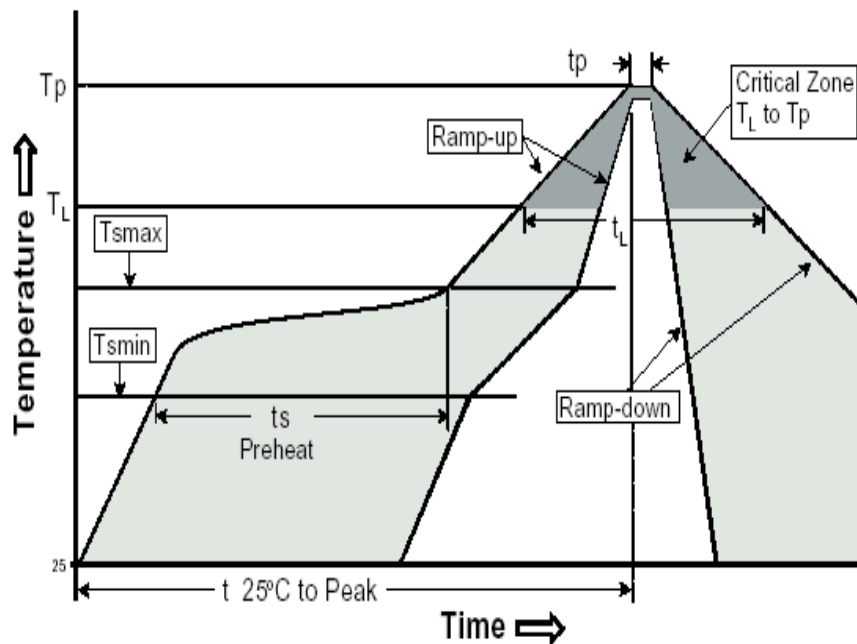
Tolerance Envelope Graph



Soldering Information (RoHS compliant type)

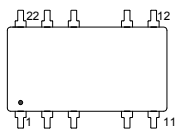
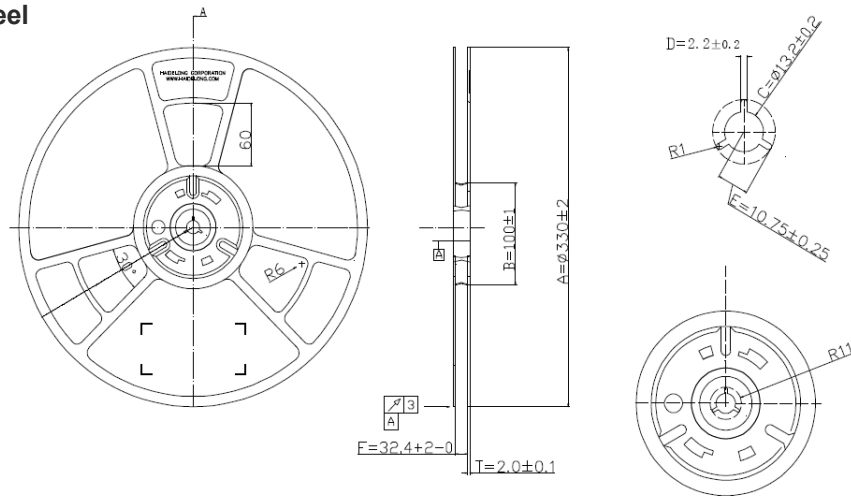
Our RoHS parts just can withstand IR Reflow peak temperature: 240°C as the following profile:

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Ts max to Tp)	3°C/second max.
Preheat -Temperature Min (Ts min) -Temperature Max (Ts max) -Time (ts min to ts max)	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) -Time (tL)	217°C 60-150 seconds
Peak/Classification Temperature (Tp)	240°C, max.
Time of actual Peak Temperature (tp)	20-40 seconds
Ramp-Down Rate	6°C/seconds max
Time 25°C to Peak Temperature	6 minutes max.

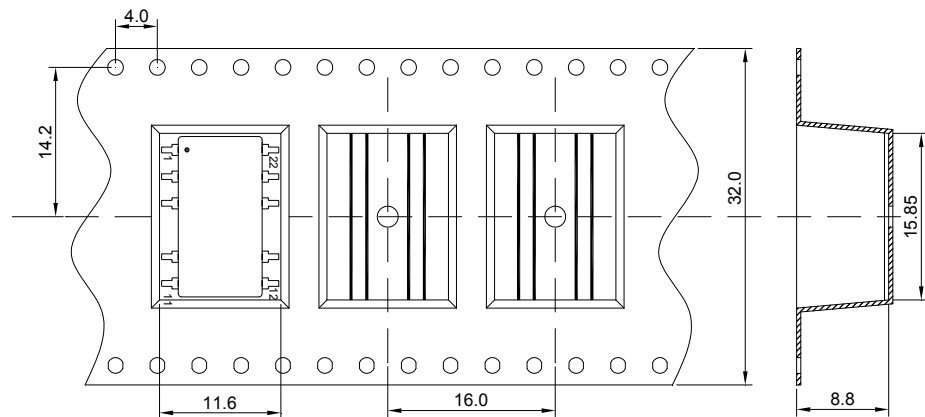


Packing Information Tape & Reel

1. Weight-----1.5 grams/pcs
2. Tape & Reel----- 350 pcs
3. Outer carton unit: 2800pcs/box
4. Outer carton unit: 8T&R/box
5. Weight: 9.2kg per carton



Mechanicals

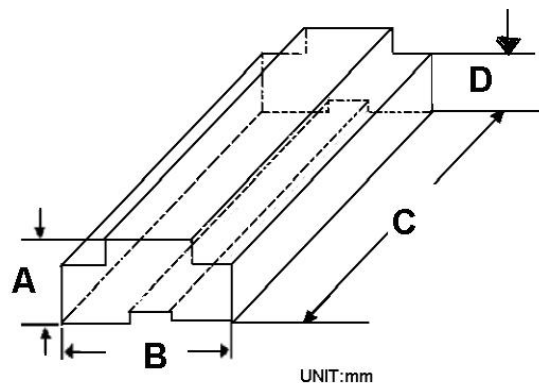


Tape & Reel

Packing Information Tube

- Weight----- 1.5 grams/pcs
 TUBE ----- 33pcs
 Weight: 73.5g per tube
 Outer carton unit: 2640pcs/80Tube/box
 Weight: 6.9kg per carton

Size (mm)	
A	12.7
B	19.2
C	520
D	7.2



Specifications can be changed without prior notice.

Products are not intended for and must not be used in life support systems, human implantation, nuclear facilities or systems or any other application where product failure or malfunction of the component could lead to loss of life or catastrophic property damage