

## 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,  $\pm 3.3$ ,  $\pm 5$ ,  $\pm 9$ ,  $\pm 12$  and  $\pm 15$  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                 | $\pm 3.3$            | $\pm 150$           | 65                  | 1               |
| VSV-xx05D   | 5                   | $\pm 5$              | $\pm 100$           | 70                  | 1               |
| VSV-xx09D   | 9                   | $\pm 9$              | $\pm 56$            | 75                  | 1               |
| VSV-xx12D   | 12                  | $\pm 12$             | $\pm 42$            | 78                  | 2               |
| VSV-xx15D   | 15                  | $\pm 15$             | $\pm 34$            | 80                  | 2               |

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

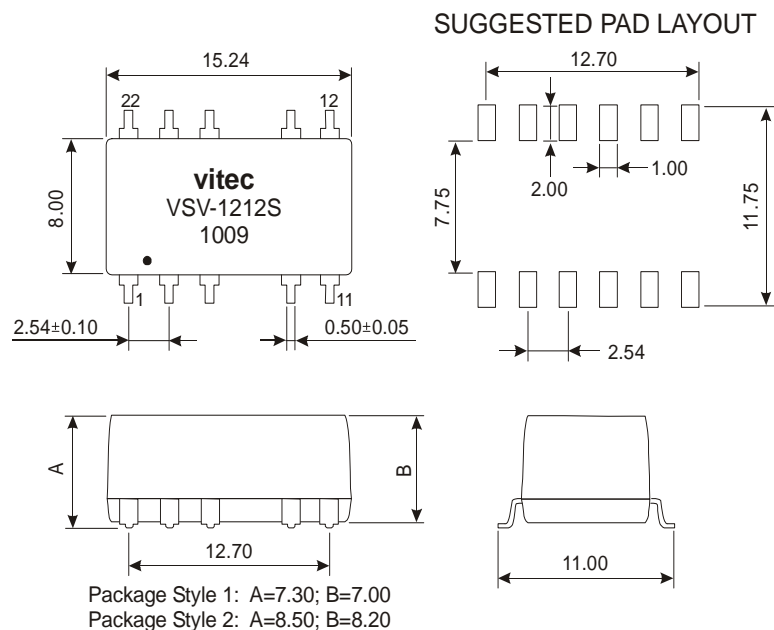
xx input voltage

|    |                    |
|----|--------------------|
| 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 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  $\pm 0.25$

**V i t e c** POWER GmbH

### 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.<br>3000 VDC (Suffix H) |
| Resistance    | 10 <sup>9</sup> 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<br>(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      |

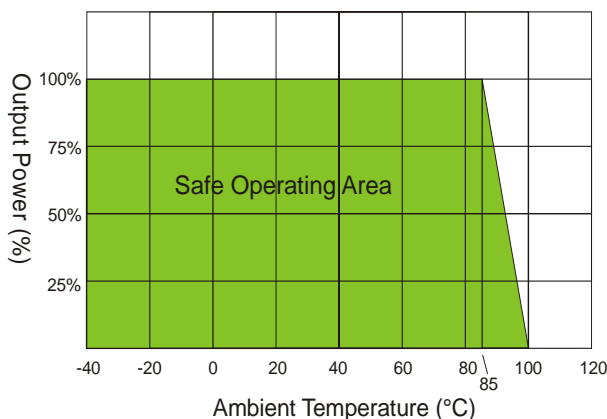
#### Environmental Specification

|                       |                           |
|-----------------------|---------------------------|
| 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           |

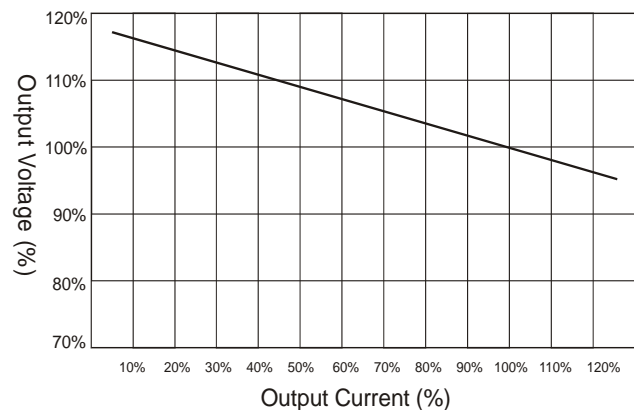
#### Physical Characteristics

|                 |                           |
|-----------------|---------------------------|
| 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



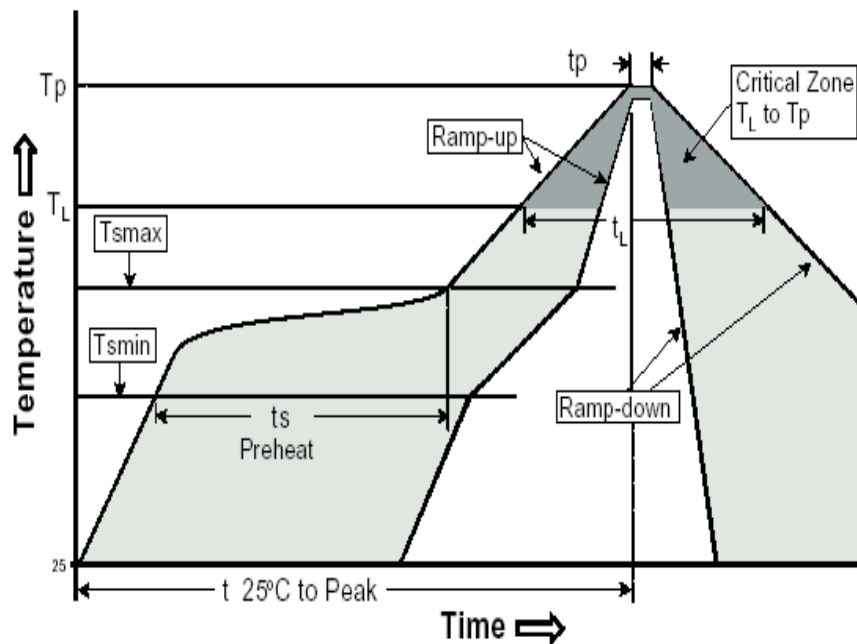
#### Tolerance Envelope Graph



### Soldering Information (RoHS compliant type)

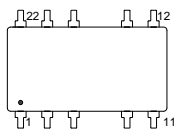
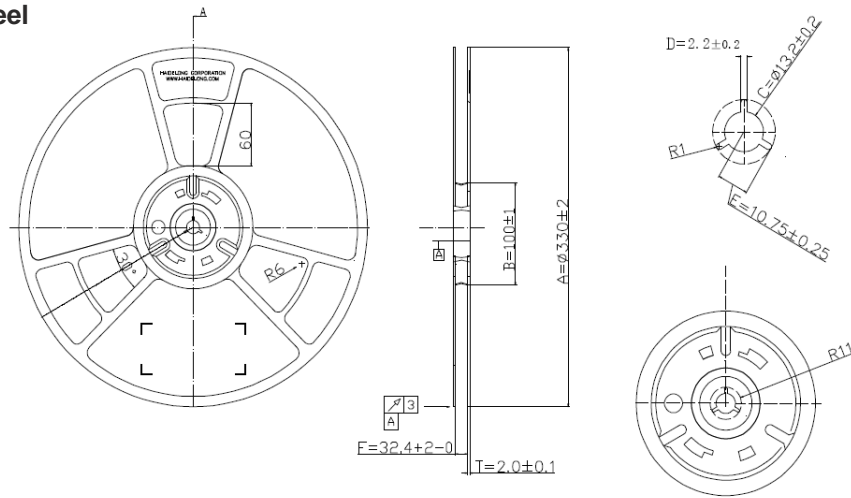
Our RoHS parts just can withstand IR Reflow peak temperature: 240°C+/-5°C as the following profile:

| Profile Feature  | Pb-Free Assembly                 |
|--|----------------------------------|
| Average Ramp-Up Rate (Ts max to Tp)  | 3°C/second max.                  |
| <b>Preheat</b><br>-Temperature Min (Ts min)<br>-Temperature Max (Ts max)<br>-Time (ts min to ts max) | 150°C<br>200°C<br>60-180 seconds |
| <b>Time maintained above:</b><br>-Temperature (TL)<br>-Time (tL)                                     | 217°C<br>60-150 seconds          |
| Peak/Classification Temperature (Tp)   | 240±5°C                          |
| Time within 5°C of actual Peak Temperature (tp)  | 20-40 seconds                    |
| Ramp-Down Rate   | 6°C/seconds max                  |
| Time 25°C to Peak Temperature  | 6 minutes max.                   |

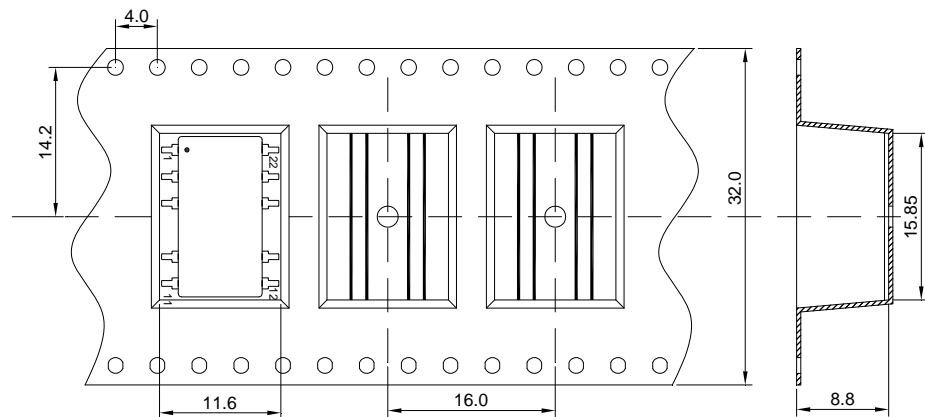


### Packing Information Tape & Reel

- 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

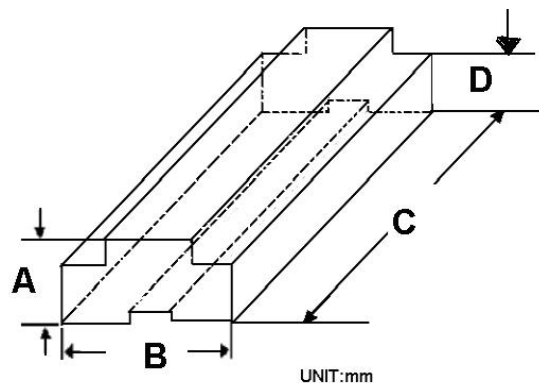


Tape & Reel

### 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

August 2011