

FEATURES AND APPLICATIONS

- 14 Pin SMD Package
- 1000 VDC Isolation
- Transfer Molded Package
- Extended Temperature Range
- RoHS compliant

GENERAL DESCRIPTION

The VSE series is a family of cost effective 1 W single DC-DC converters with 1kVDC 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 or 15 VDC.

SMD 14 Package - Standard Types

Type Number	Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency [% typ.]	Typ. Isolation Capacitance @ 5V Input [pF]
VSE-xx3R3S	3.3	3.3	303	65	33
VSE-xx05S	5	5	200	70	35
VSE-xx09S	9	9	111	75	43
VSE-xx12S	12	12	84	78	42
VSE-xx15S	15	15	67	80	44

xx input voltage

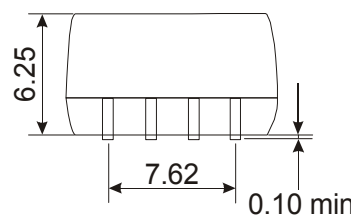
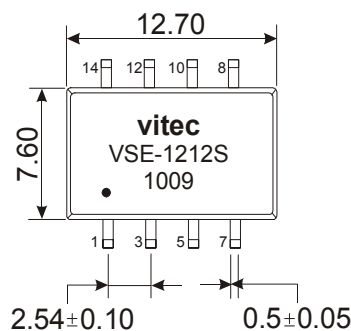
33	3.3 Vdc ± 10%
05	5.0 Vdc ± 10%
09	9.0 Vdc ± 10%
12	12 Vdc ± 10%
15	15 Vdc ± 10%

SMD 14 Package

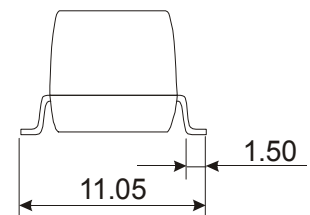
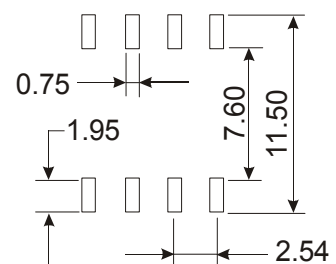
1kV Isolation	
Pin	Single Output
1	-INPUT
3	+INPUT
7	-OUTPUT
8	+OUTPUT
Other	NC

NC ... Not Connected

Add Suffix **-Q** to the part number for removed Pins 5, 10 and 12



SUGGESTED PAD LAYOUT



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.
Resistance	10 ⁹ Ω
Capacitance	see table

Output Specifications

Voltage Accuracy	±5%, max.
Ripple and Noise (20 MHz BW)	100 mVp-p, max. 85 mVp-p, max. (-Q Option)
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	15% & 9% max.
12V & 15V Output Types	7.5% & 7% max.
Temperature Coefficient	±0,02%/°C

General Specifications

Efficiency	see table
Switching Frequency	100 KHz, typ. 110 KHz, typ. (-Q Option)
MTBF (MIL-HDBK-217@25°C)	3.5 Mhrs

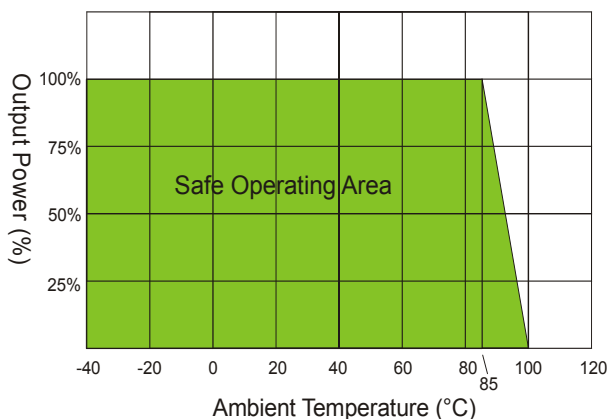
Environmental Specification

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

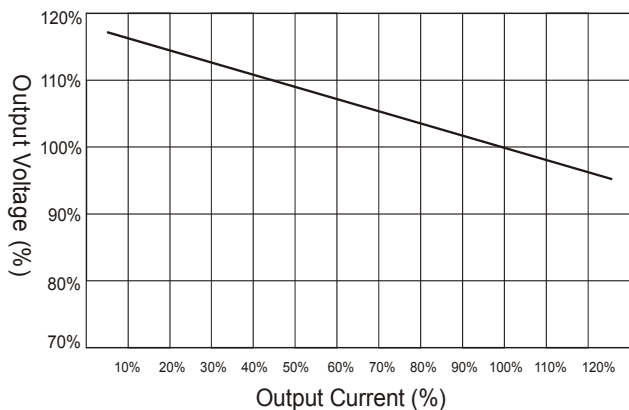
Physical Characteristics

Dimension SMD	12,70 x 11,50 x 6.25 mm
Weight	1 g
Case Material	UL 94V-0 Package material

Derating



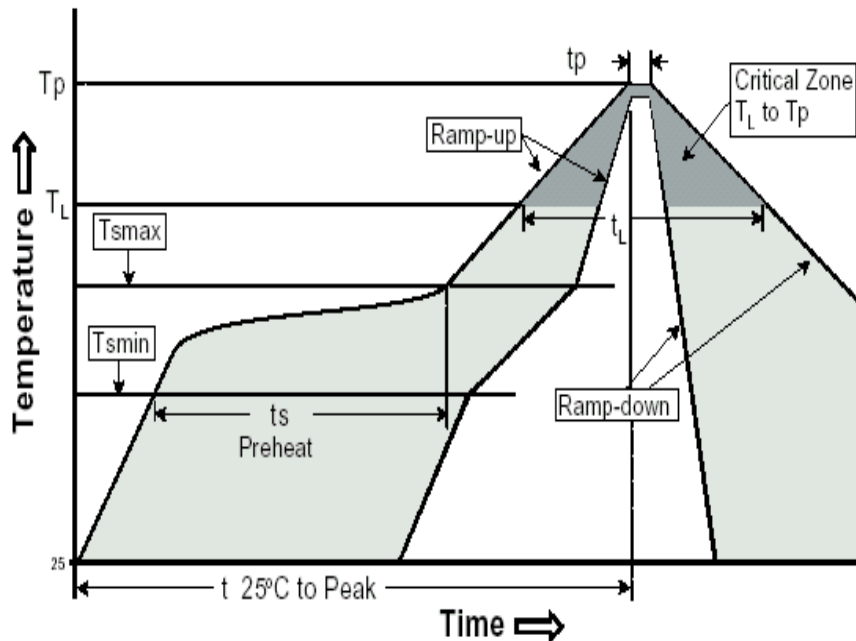
Tolerance Envelope Graph



Soldering Information (RoHS compliant type)

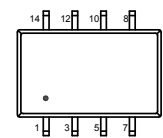
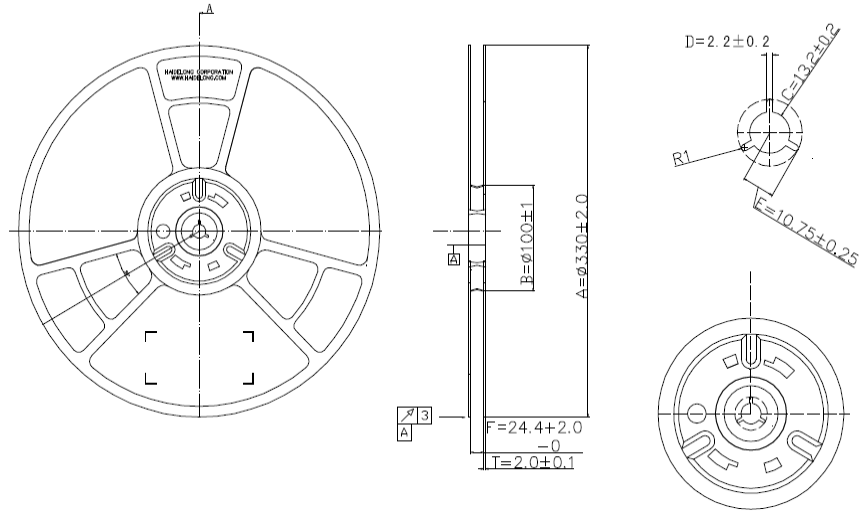
Our RoHS parts just can withstand IR Reflow peak temperature: 240°C as the following profile:

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.

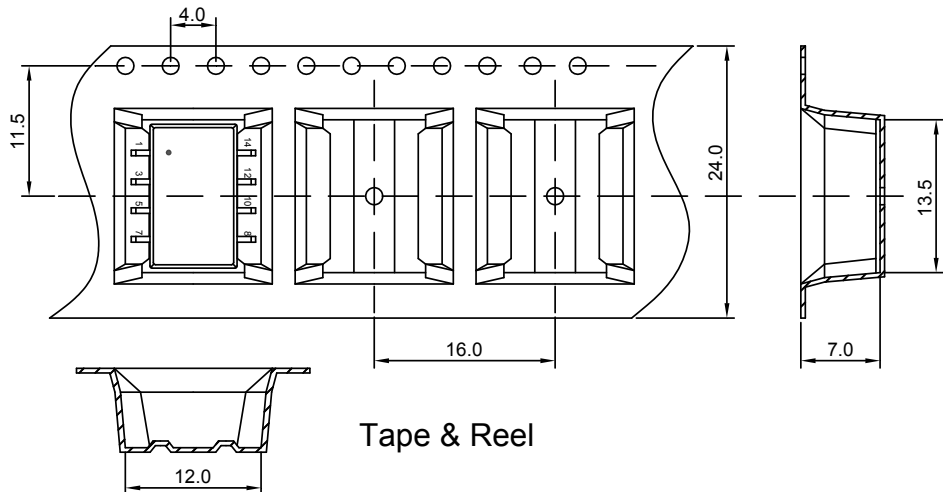


Packing Information Tape & Reel

1. Weight-----1.2 grams/pcs
2. Tape & Reel----- 350 pcs
3. outer carton unit: 3500pcs/box
4. outer carton unit: 10T&R/box
5. Weight: 9.5kg per carton



Mechanicals

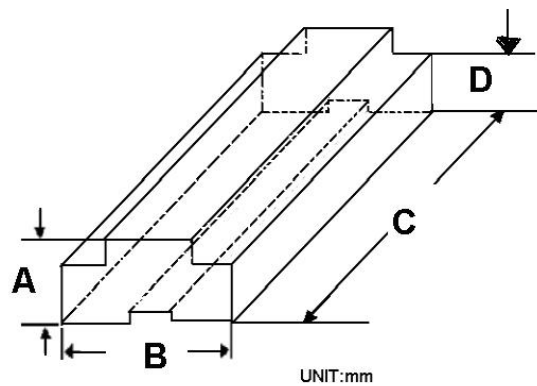


Tape & Reel

Packing Information Tube

- Weight----- 1.2 grams/pcs
TUBE ----- 40pcs
Weight: 69.7g per tube
Outer carton unit : 7360pcs/184Tube/box
Weight: 13.8kg per carton

Size (mm)	
A	10.38
B	16.33
C	530
D	7.30



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