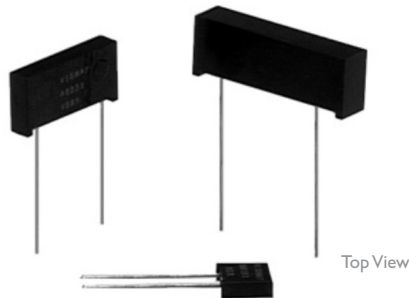


Bulk Metal® Foil Technology Industrial Precision Resistors with TCR of $\pm 4 \text{ ppm}/^\circ\text{C}$ and Tolerance of $\pm 0.01 \%$



Any value at any tolerance available within resistance range

INTRODUCTION

Bulk Metal® Foil Technology out performs all other resistor technologies available today for applications that require high precision and high stability.

This technology has been pioneered and developed by VISHAY, and products based on this technology are the most suitable for a wide range of applications.

Generally Bulk Metal® Foil technology allows us to produce customer orientated products designed to satisfy challenging and specific technical requirements.

The VSR series of resistors is a low cost version of the well established S-Series of resistors. These resistors are made of foil elements so all of the inherent performance of foil is retained. They do not however, have the same TCR or tolerance ranges (see table 1 for details). These products find a wide range of usage in high end stereo equipment and some grades of test and measurement equipment. Standoffs are dimensioned to provide a minimum lead clearance of 0.25mm between the resistor body and the printed circuit board, when the standoffs are seated on the board. This allows for proper cleaning after the soldering process.

Our Applications Engineering Department is available to advise and to make recommendations for non standard technical requirements and special applications, please contact us.

FEATURES

- Temperature Coefficient of Resistance (TCR)*
 $\pm 4 \text{ ppm}/^\circ\text{C}$ (0°C to $+60^\circ\text{C}$)
 $\pm 8 \text{ ppm}/^\circ\text{C}$ (-55°C to $+125^\circ\text{C}$, $+25^\circ\text{C}$ Ref.)
- Resistance Range: 0.5Ω to $1\text{M}\Omega$ (higher or lower values of resistance are available)
- Resistance Tolerance: to $\pm 0.01\%$
- Load Life Stability: to $\pm 0.005 \%$ at 70°C , 2000 hours at rated power
- Electrostatic Discharge above 25,000 V
- Non Inductive, Non Capacitive Design
- Rise time: 1 ns without ringing
- Current Noise: - 40dB
- Thermal EMF: $0.05 \mu\text{V}/^\circ\text{C}$ typical
- Voltage Coefficient: $< 0.1 \text{ ppm}/\text{V}$
- Inductance: $0.08\mu\text{H}$
- Matched Sets Available
- Terminal Finishes Available:
RoHS Compliant
Tin/Lead Alloy with minimum 5%, nominally 10% Lead content
- Any value available within resistance range (e.g. 1K234)
- For better performances please review the **S Series** datasheet

Note

- * For values below 50Ω please contact our Application Engineering department

APPLICATIONS

- Industrial
- Medical
- Audio (high end stereo equipment)
- Test and Measurement equipment
- Precision Amplifiers

FIGURE 1 - POWER DERATING CURVE

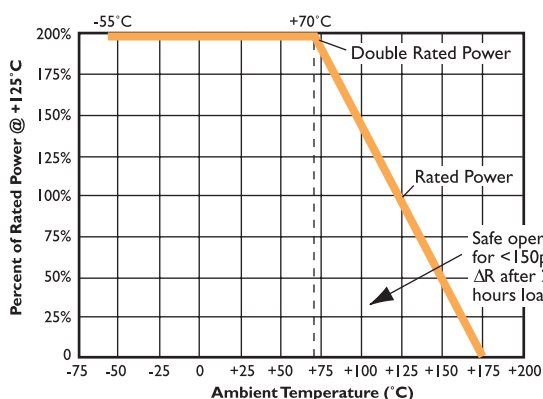
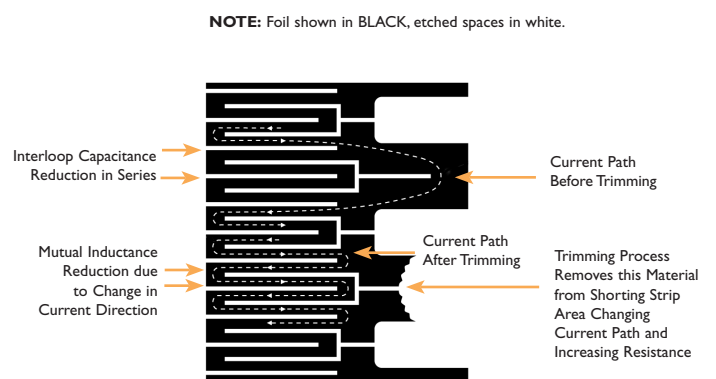


FIGURE 2 - TRIMMING TO VALUES (CONCEPTUAL ILLUSTRATION)



Bulk Metal® Foil Technology Industrial Precision Resistors
with TCR of $\pm 4 \text{ ppm}/^\circ\text{C}$ and Tolerance of $\pm 0.01 \%$

FIG 3 - STANDARD IMPRINTING AND DIMENSIONS

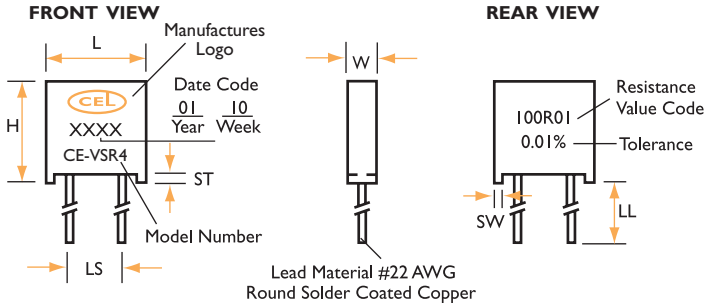


FIG 4 - TEMPERATURE COEFFICIENT OF RESISTANCE

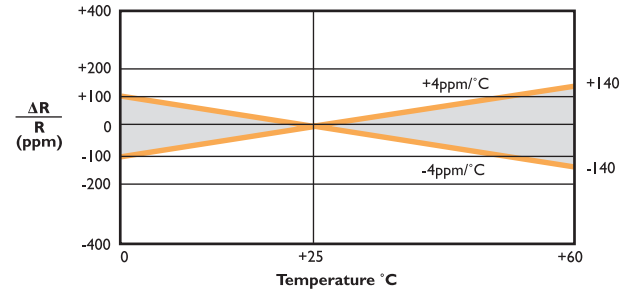


TABLE I - MODEL SELECTION

MODEL NUMBER	RESISTANCE (Ω)	POWER at $+70^\circ\text{C}$	POWER at $+125^\circ\text{C}$	MAXIMUM WORKING VOLTAGE	DIMENSIONS mm	LOAD LIFE STABILITY (MAXIMUM ΔR)	MAXIMUM TEMPERATURE COEFFICIENT OF RESISTANCE ($+25^\circ\text{C}$ REF.)	TIGHTS TOLERANCE % VS. LOWEST RESISTANCE VALUE (Ω)
CE-VSR	1 to 150K	0.3 W	0.2 W	300	W: 2.67 ± 0.25 L: 7.62 ± 0.2 H: 8.28 ± 0.25 ST: 0.254 Minimum SW: 1.02 ± 0.13 LL: 25.4 ± 3.18 LS: 3.81 ± 0.13	0.05 % 2000 hours at $+125^\circ\text{C}$	0°C to $+60^\circ\text{C}$ $\pm 4 \text{ ppm}/^\circ\text{C}$	$\pm 0.01/50$ $\pm 0.02/30$ $\pm 0.05/5$ $\pm 0.1/2$ $\pm 0.5/1$
CE-VSRJ *		0.25 W	0.15 W				-55°C to $+125^\circ\text{C}$ $\pm 8 \text{ ppm}/^\circ\text{C}$	
CE-VSR4	1 to 500K	0.5 W	0.4 W	350	W: 4.06 Maximum L: 14.61 Maximum H: 10.49 Maximum ST: 0.89 ± 0.13 SW: 1.27 ± 0.13 LL: 25.4 ± 3.18 LS: 10.16 ± 0.51			$\pm 0.01/50$ $\pm 0.02/30$ $\pm 0.05/5$ $\pm 0.1/2$ $\pm 0.5/1$
CE-VSR5	1 to 750K	0.75 W	0.6 W	350	W: 4.06 Maximum L: 20.83 Maximum H: 10.49 Maximum ST: 0.89 ± 0.13 SW: 1.27 ± 0.13 LL: 25.4 ± 3.18 LS: 16.51 ± 0.51			
CE-VSR6	0.5 to 1M	1.0 W	0.8 W	500	W: 6.60 Maximum L: 30.48 Maximum H: 10.49 Maximum ST: 0.89 ± 0.13 SW: 1.27 ± 0.13 LL: 25.4 ± 3.18 LS: 22.86 ± 0.51			

Note: * 5.08 mm lead spacing available - specify CE-VSRJ.

ORDERING INFORMATION

Specify Charcroft VSR Series resistors as follows:

CE-VSR
CE-VSRJ
CE-VSR4
CE-VSR5
CE-VSR6
MODEL NO.

T = RoHS compliant
None = Tin/Lead alloy
TERMINATION

250R00
RESISTANCE VALUE

T = $\pm 0.01\%$
Q = $\pm 0.02\%$
A = $\pm 0.05\%$
B = $\pm 0.1\%$
C = $\pm 0.25\%$
D = $\pm 0.5\%$
F = $\pm 1.0\%$
TOLERANCE

TR = Tape & Reel
(CE-VSR & CE-VSRJ only)
None = Bulk
PACKAGING