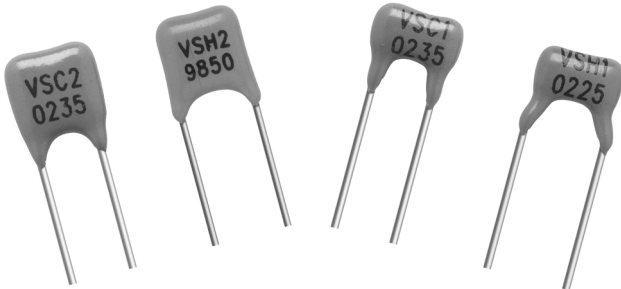


Bulk Metal® Foil Technology Low Profile Conformally Coated High Precision Resistor with Tight Tolerance from $\pm 0.01\%$ and Load Life Stability of $\pm 0.01\%$ and Instantaneous Thermal Stabilization



INTRODUCTION

Bulk Metal® Foil (BMF) technology out-performs all other resistor technologies available today for applications that require high precision and high stability, and allows production of customer oriented products designed to satisfy challenging and specific technical requirements.

The BMF provides an inherently low and predictable Temperature Coefficient of Resistance (TCR) and excellent load life stability for high precision analog applications.

Model VSH offers low TCR, excellent load life stability, tight tolerance, excellent shelf life stability, low current noise and low voltage coefficient, all in the same resistor.

Our application engineering department is available to advise and make recommendations. For non-standard technical requirements and special applications, please contact us using the e-mail address in the footer below.

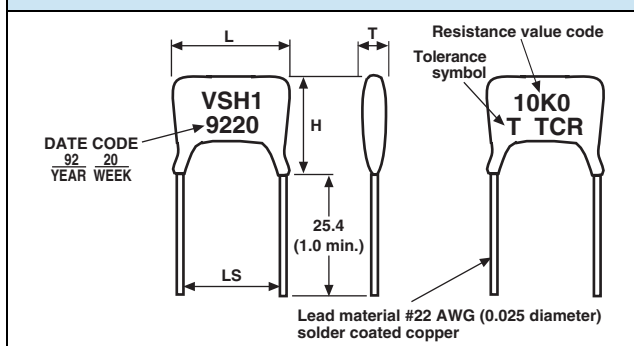
FEATURES

- Temperature coefficient of resistance (TCR): ± 2.0 ppm/°C typical (- 55 °C to + 125 °C, + 25 °C ref.) (see table 1)
- Tolerance: to $\pm 0.01\%$
- Power rating: to 300 mW at + 70 °C
- Load life stability: to $\pm 0.01\%$ at 70 °C, 2000 h at rated power
- Resistance range: 5 Ω to 120 k Ω (for higher and lower values, please contact us)
- Vishay Foil resistors are not restricted to standard values; specific “as required” values can be supplied at no extra cost or delivery (e.g. 1K2345 vs. 1K)
- Thermal stabilization time < 1 s
- **Electrostatic discharge (ESD) up to 25 000 V**
- Short time overload: $\leq 0.01\%$
- Maximum working voltage: 300 V
- Non inductive, non capacitive design
- Rise time: 1 ns effectively no ringing
- Current noise: < - 42 dB
- Voltage coefficient < 0.1 ppm/V
- Non inductive: < 0.08 μ H
- Non hot spot design
- Terminal finish: lead (Pb)-free or tin/lead alloy
- Matched sets are available per request
- Compliant to RoHS directive 2002/95/EC
- Prototype quantities available in just 5 working days or sooner. For more information, please contact foil@vishaypg.com
- For better performances please review **Z201** and **S102C** Series datasheets



RoHS
COMPLIANT

FIGURE 1 - STANDARD IMPRINTING AND DIMENSIONS in millimeters



	L	H	T	LS
VSH1	5.8 \pm 0.5 (0.228 \pm 0.02)	5.5 \pm 1 (0.216 \pm 0.04)	2.2 \pm 0.5 (0.086 \pm 0.02)	5.08 \pm 0.25 (0.200 \pm 0.01)
VSC1				3.81 \pm 0.25 (0.150 \pm 0.01)
VSH2	6.7 \pm 0.5 (0.263 \pm 0.02)	8 \pm 1 (0.315 \pm 0.04)	2.78 \pm 0.5 (0.110 \pm 0.02)	5.08 \pm 0.25 (0.200 \pm 0.01)
VSC2				3.81 \pm 0.25 (0.150 \pm 0.01)

Note

- Letters H and C indicate a difference in lead spacing and -2 is an extension range

APPLICATIONS

- Automatic test equipment (ATE)
- High precision instrumentation
- Laboratory, industrial and medical
- Audio
- EB applications (electron beam scanning and recording equipment, electron microscopes)
- Commercial aviation
- Airborne
- Down hole instrumentation
- Communication

TABLE 1 - TOLERANCE AND TCR VS. RESISTANCE VALUE (- 55 °C to + 125 °C, + 25 °C Ref.)

RESISTOR	RESISTANCE VALUE (Ω)	TYPICAL TCR AND MAX. SPREAD (ppm/°C)	TOLERANCE (%)
VSH2 VSC2	60K to 120K	± 2 ± 4.5	± 0.01 %
VSH1 VSC1	80 to < 60K	± 2 ± 4.5	± 0.01 %
VSH1 VSC1	50 to < 80	± 2 ± 5.5	± 0.02 %
VSH1 VSC1	5 to < 50	± 2 ± 6.5	± 0.05 %

TABLE 2 - PERFORMANCE SPECIFICATIONS

TEST	CONDITIONS	ΔR (%) - TYPICAL	ΔR (%) - MAXIMUM
Moisture Resistance	MIL-STD-202, method 106	± 0.005	± 0.03
Pressure Cooker Test	2 atmospheres absolute pressure, 121 °C, 100 % R.H. for 100 h	± 0.2	± 0.4
Short Time Overload	6.25 x P _{nom} , 5 s	± 0.005	± 0.05
Resistance to Solder Heat	+ 260 °C, 20 s	± 0.01	± 0.03
Terminal Strength	2 lbs, 10 s	± 0.0025	± 0.03
Insulation Resistance	DC 100 V, 2 min	> 10 000M	> 10 000M
Dielectric Withstanding Voltage	AC 300 V, 1 min	± 0.0025	± 0.03
Thermal Shock	- 65 °C to + 150 °C, 5 cycles	± 0.01	± 0.02
Shock	MIL-STD-202, method 213, condition I	± 0.005	± 0.03
Vibration	MIL-STD-202, method 204, condition D	± 0.01	± 0.03
Load Life Stability	0.3 W, + 70 °C, 2000 h	± 0.01	± 0.015
Thermal EMF	-	0.07 μV/°C	0.1 μV/°C
Current Noise	Quan-Tech	- 42 dB	- 32 dB
Low Temperature Storage	24 h at - 65 °C	± 0.005	± 0.01
Low Temperature Operation	45 min at - 65 °C	± 0.005	± 0.01
High Temperature Exposure	+ 150 °C	± 0.01	± 0.03

FIGURE 2 - TRIMMING TO VALUES
(Conceptual Illustration)

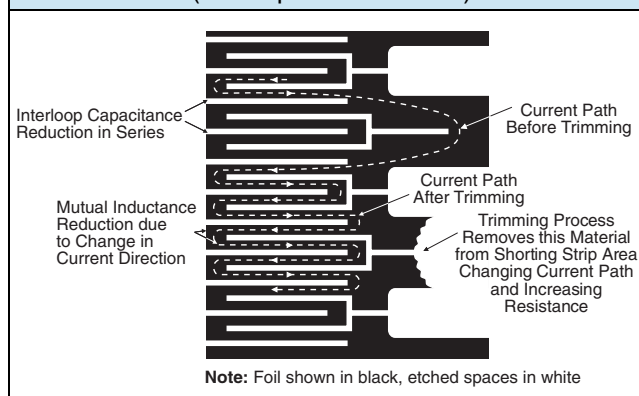


FIGURE 3 - POWER DERATING CURVE

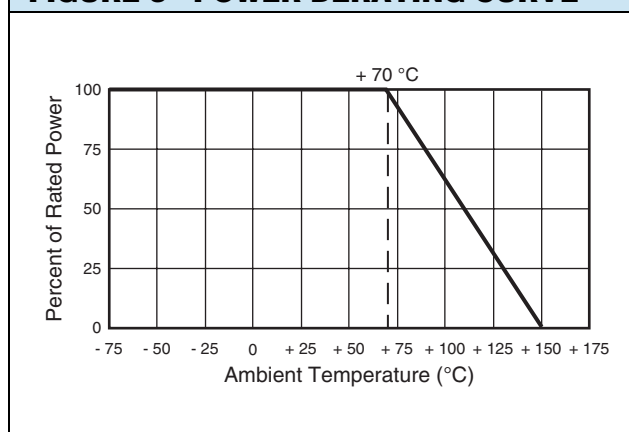
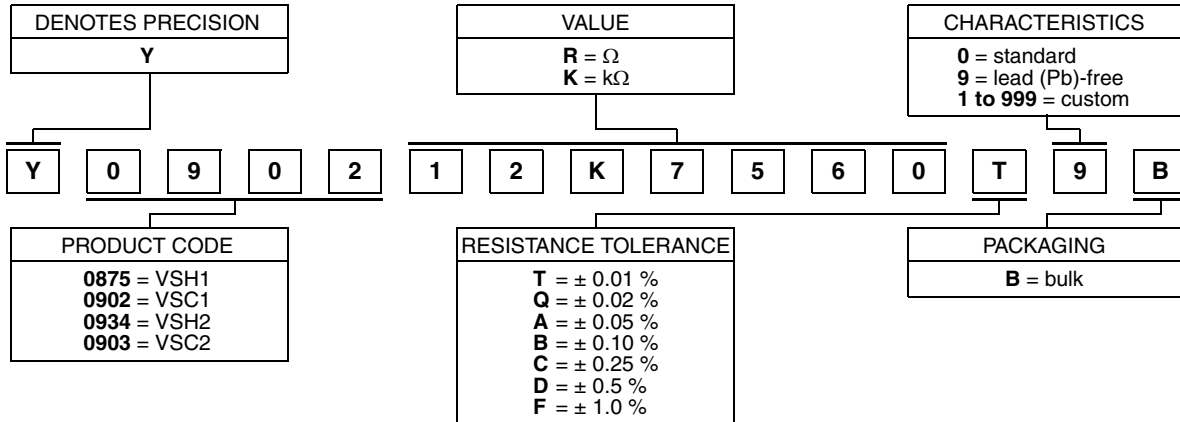


TABLE 3 - GLOBAL PART NUMBER INFORMATION (1)

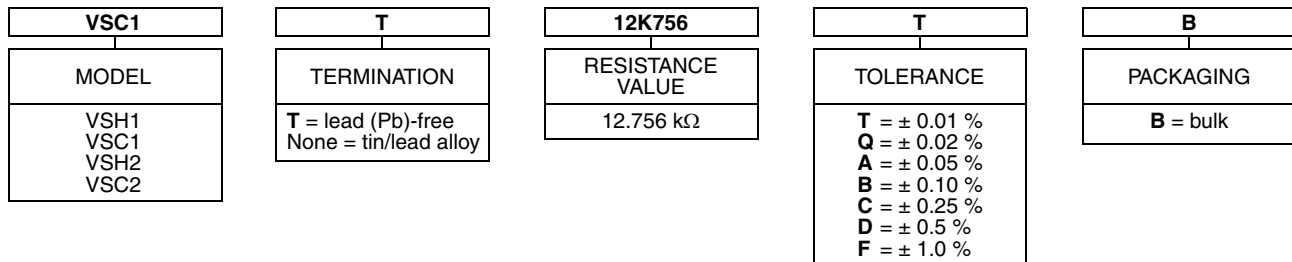
NEW GLOBAL PART NUMBER: Y090212K7560T9B (preferred part number format)



FOR EXAMPLE: ABOVE GLOBAL ORDER Y0902 12K7560 T 9 B:

TYPE: VSC1
VALUES: 12.7560 kΩ
ABSOLUTE TOLERANCE: 0.01 %
TERMINATION: lead (Pb)-free
PACKAGING: bulk

HISTORICAL PART NUMBER: VSC1 T 12K756 T B (will continue to be used)



Note

(1) For non-standard requests, please contact application engineering.

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