

Ultra High Precision Z1 Foil Technology Flip Chip Resistor with standoff for Load Life Stability of 0.01% (100 ppm)

with TCR of ± 2.5 ppm/ $^{\circ}\text{C}$,
40% Space Saving vs. Wraparound Design, Power to 75mW

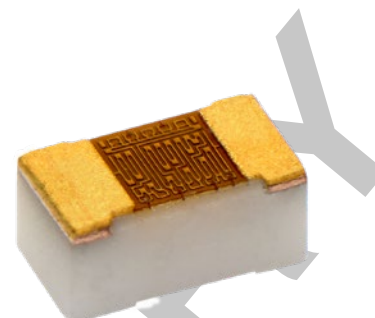
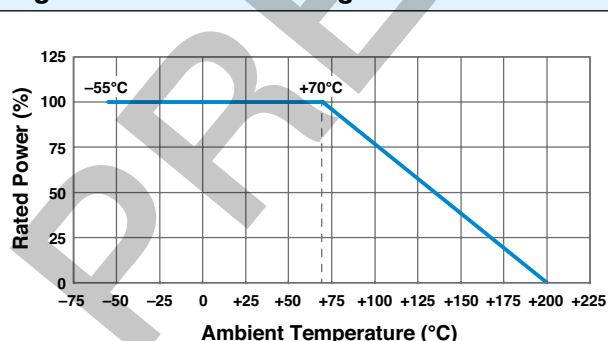
FEATURES

- Temperature coefficient of resistance (TCR): ± 2.5 ppm/ $^{\circ}\text{C}$ Max (- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$, + 25 $^{\circ}\text{C}$ ref.)
- Resistance range: 170 Ω up to 1 k Ω
- Tolerance: to ± 0.05 % (500 ppm)
- Power rating: 75 mW at + 70 $^{\circ}\text{C}$
- Load life stability: ± 0.01 % typical at 70 $^{\circ}\text{C}$, 2000 h (rated power)
- Non-inductive, non-capacitive design
- Short Time Overload ≤ 0.01 % (100 ppm)
- Non hot spot design
- Gold finished solderable terminals, intended for high temperature applications (above 200 $^{\circ}\text{C}$)
- Prototype quantities are available, please contact foil@vpgsensors.com

APPLICATIONS

- Medical
- Automatic Test Equipment (ATE)
- Measurement systems
- Telecommunications
- Weighing systems
- Laboratory
- Industrial
- High Temperature Applications

Figure 1 – Power Derating Curve



Available
RoHS

INTRODUCTION

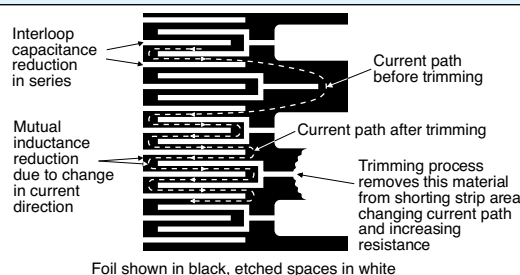
The FRFS is based on the new generation Z1 Foil Technology of the Bulk Metal® Precision Foil resistor elements by Vishay Precision Group (VPG),

The flip chip configuration provides a substantial PCB space saving 40 % vs. a surface mount chip with wraparound terminations.

The standoff construction allows visual inspection of the solder connection after mounting (this VI is impossible in standard flip chip construction due to close attachment to the PCB). Furthermore, this construction increases the rated power, due to enlarged heat dissipation through the thick terminals.

The FRFS is available in any value within the specified resistance range.

Figure 2 – Trimming to Values
(conceptual illustration)



Note
To acquire a precision resistance value, the Bulk Metal® Foil chip is trimmed by selectively removing built-in "shorting bars." To increase the resistance in known increments, marked areas are cut, producing progressively smaller increases in resistance. This method reduces the effect of "hot spots" and improves the long-term stability of Bulk Metal® Foil resistors.

Table 1 – Specifications

Rated Power at +70°C (mW)	Max. Working Voltage ($\leq \sqrt{P \times R}$, V)	Resistance Range (Ω)	Tolerance ⁽¹⁾ %	TCR max., (-55°C to +125°C, +25°C Ref.) (ppm/°C)	Max. Weight (mg)
75	27	170 to 1k	to ± 0.05	± 2.5	1.3

Note
⁽¹⁾ For non-standard values and tighter Tolerance, please contact application engineering at foil@vpgsensors.com

Table 2 – Performances (Based on MIL-PRF-55342 & MIL-PRF-32663)⁽¹⁾

Test	Conditions	Typical Limit % (ppm)	Max Limit % (ppm)
Short Time Overload	6.25 x P _{nom}	± 0.010 (100)	± 0.010 (100)
High Temperature Exposure	+150°C, 100 h	± 0.003 (30)	± 0.005 (50)
Low Temperature Operation	-65°C, 45 min @ rated power (see table 1)	± 0.002 (20)	± 0.004 (40)
Resistance to Soldering Heat	Per MIL-PRF-55342 (p.4.8.8.1)	± 0.012 (120)	± 0.015 (150)
Moisture Resistance	Per MIL-PRF-55342 (p. 4.8.9)	± 0.007 (70)	± 0.010 (100)
Load-Life Test, 70°C, 2,000 h	@ rated power (see Table 1)	± 0.007 (70)	± 0.010 (100)
Thermal Shock	5 x (-65°C to +150°C)	± 0.005 (50)	± 0.010 (100)
	100 x (-65°C to +150°C)	± 0.001 (10)	± 0.005 (50)

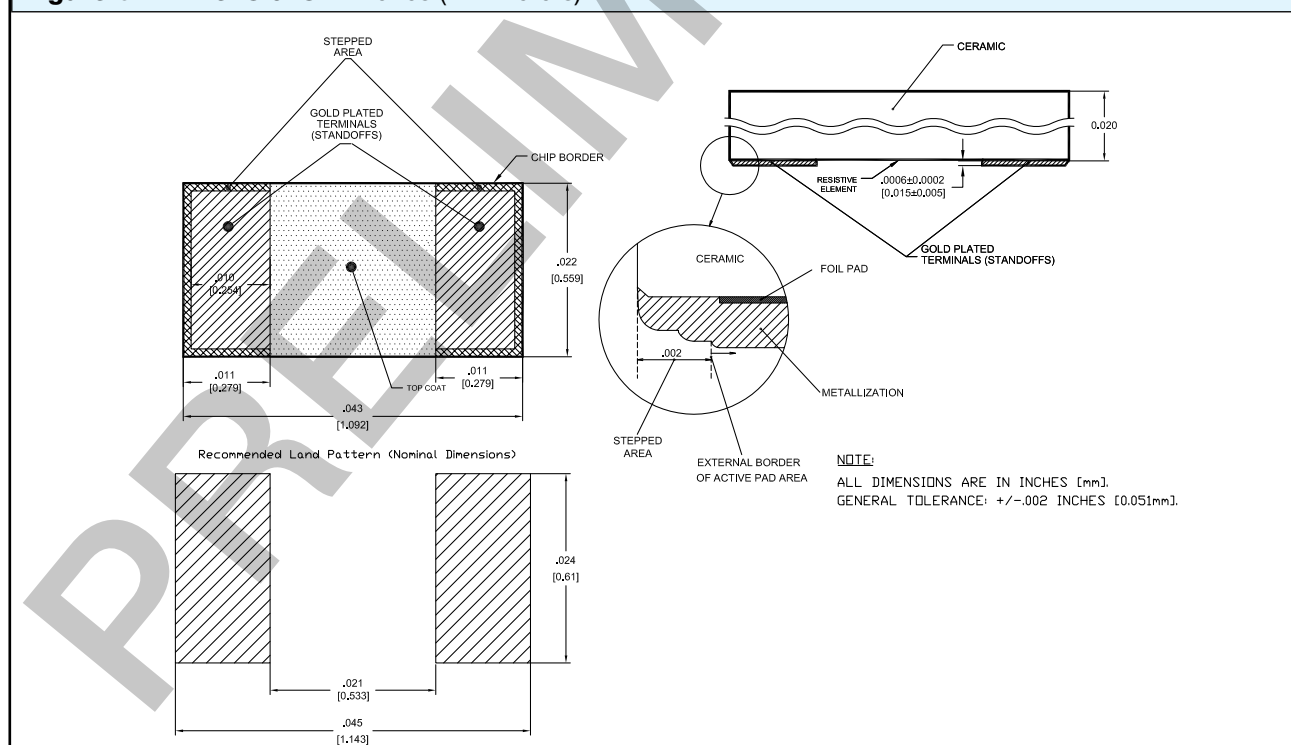
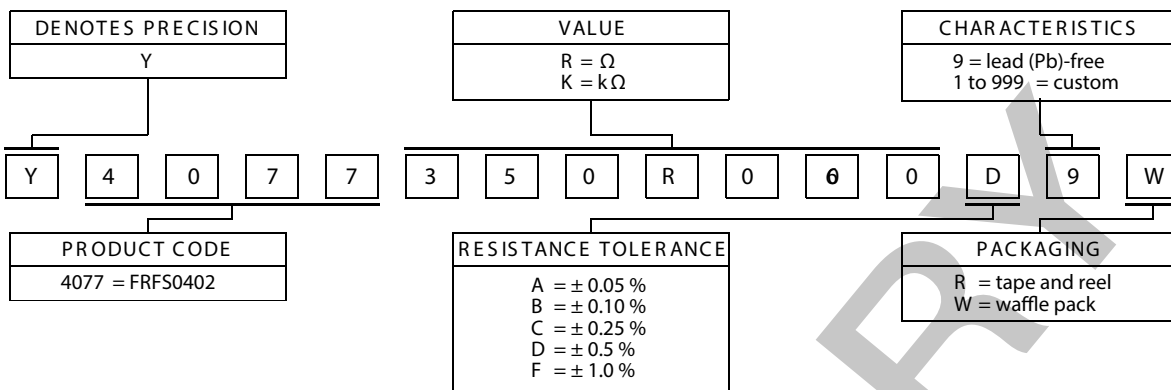
Note
⁽¹⁾ As shown $\pm 0.01 \Omega$ to allow for measurement errors at low values.
Figure 3 – Dimensions in Inches (Millimeters)

Figure 4—Global Part Number Information⁽¹⁾

GLOBAL PART NUMBER: Y4077350R00D9W



FOR EXAMPLE: ABOVE GLOBAL ORDER Y4077 350R000 D 9 W :

TYPE: FRFS0402
VALUES: 350 Ω
ABSOLUTE TOLERANCE: $\pm 0.5\%$
TERMINATION: lead (Pb)-free
PACKAGING: waffle pack

Note

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