

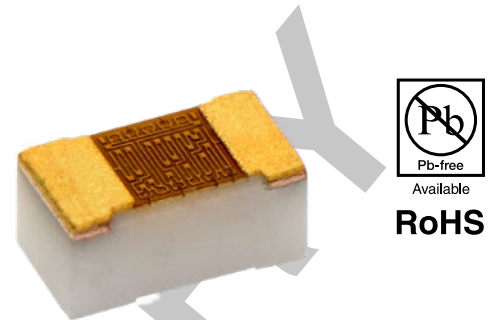
**Ultra High Precision Z1 Foil Technology Flip Chip Resistor with
standoff for Load Life Stability of 0.01% (100 ppm)
with TCR of ± 2.5 ppm/ $^{\circ}\text{C}$,
40% Space Saving vs. Wraparound Design, Power to 75mW**

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



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 (VI) 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 1 – Power Derating Curve

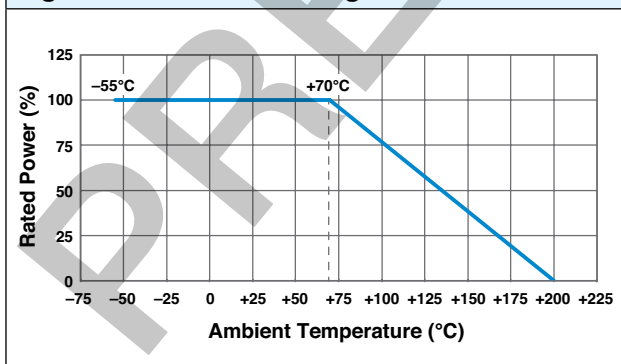
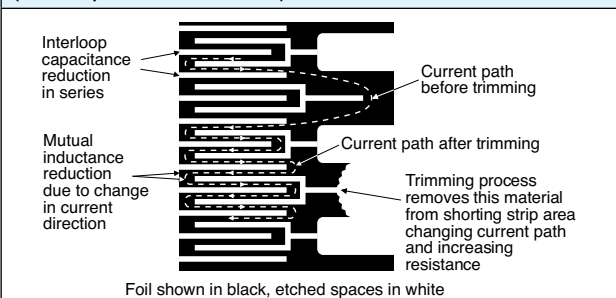


Figure 2 – Trimming to Values
(conceptual illustration)



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 +0.01 Ω to allow for measurement errors at low values.

Figure 3 – Dimensions in Inches (Millimeters)

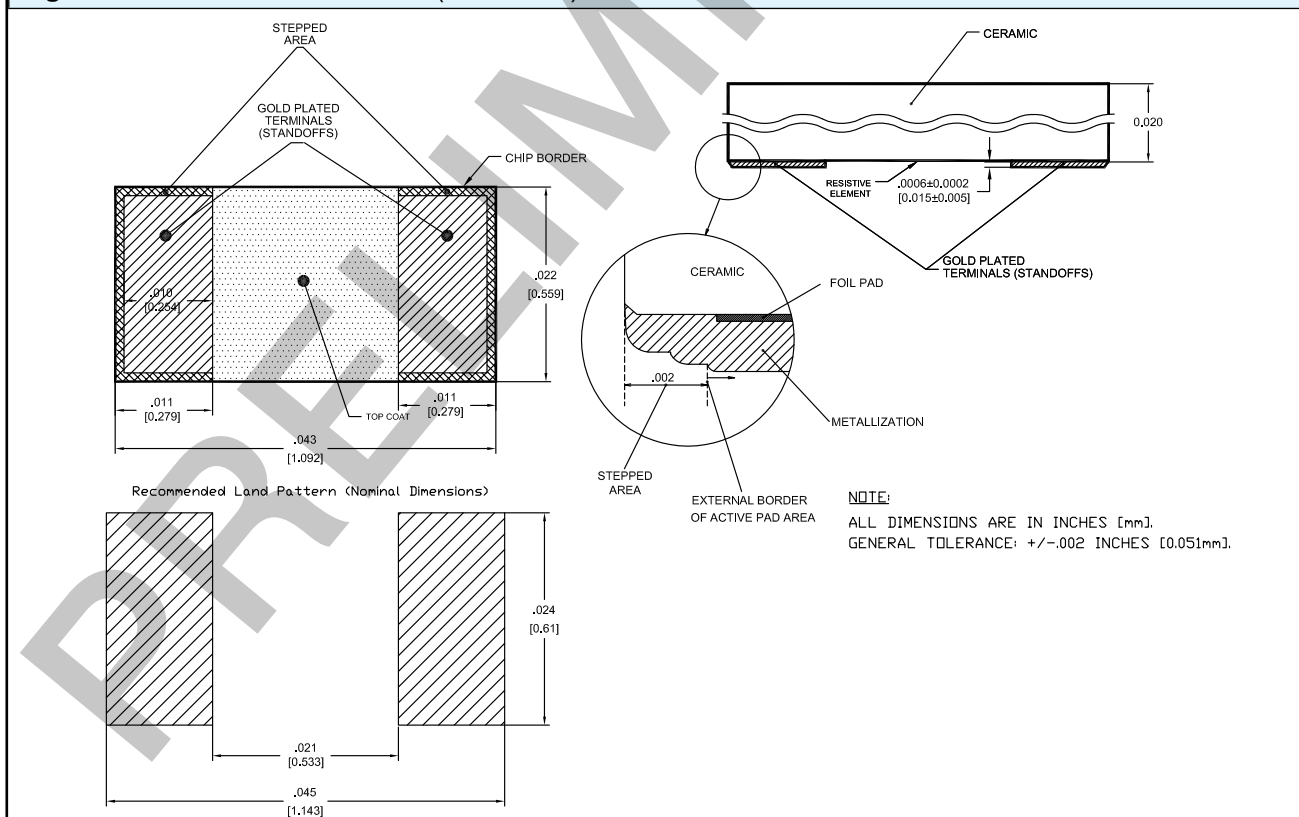
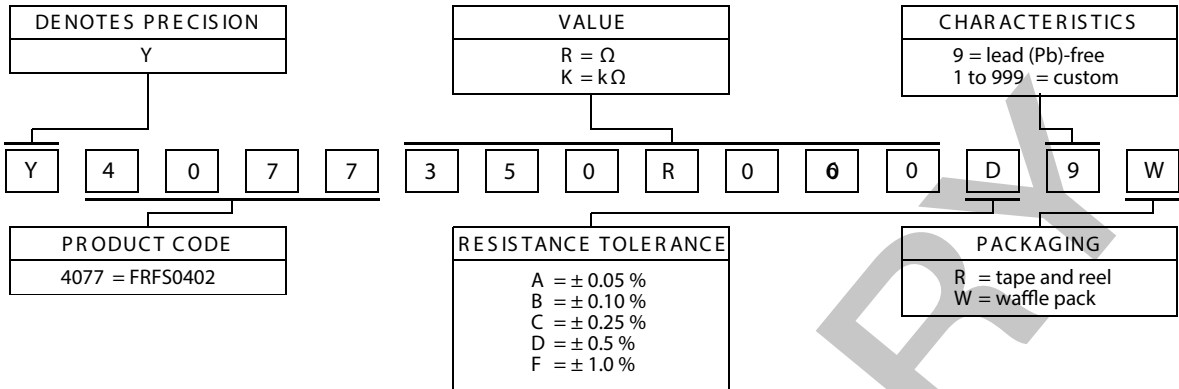


Figure 4 – Global Part Number Information⁽¹⁾

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.



Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Vishay Precision Group, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "VPG"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

The product specifications do not expand or otherwise modify VPG's terms and conditions of purchase, including but not limited to, the warranty expressed therein.

VPG makes no warranty, representation or guarantee other than as set forth in the terms and conditions of purchase. **To the maximum extent permitted by applicable law, VPG disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.**

Information provided in datasheets and/or specifications may vary from actual results in different applications and performance may vary over time. Statements regarding the suitability of products for certain types of applications are based on VPG's knowledge of typical requirements that are often placed on VPG products. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. You should ensure you have the current version of the relevant information by contacting VPG prior to performing installation or use of the product, such as on our website at vpgsensors.com.

No license, express, implied, or otherwise, to any intellectual property rights is granted by this document, or by any conduct of VPG.

The products shown herein are not designed for use in life-saving or life-sustaining applications unless otherwise expressly indicated. Customers using or selling VPG products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify VPG for any damages arising or resulting from such use or sale. Please contact authorized VPG personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Copyright Vishay Precision Group, Inc., 2014. All rights reserved.