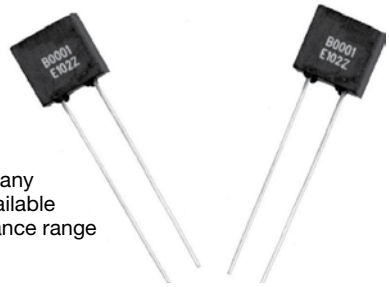
# Ultra High Precision Bulk Metal® Z Foil Extended Value Range Resistor

## with TCR of 0.2 ppm/°C, PCR of 5 ppm Rated Power, Tolerance to 0.005%, and Power Rated at 0.6 W

### FEATURES

- Temperature coefficient of resistance (TCR): –55°C to +125°C, +25°C ref. 0.2 ppm/°C typical
- Rated power: to 0.3 W at +125°C, 0.6 W at +70°C
- Tolerance: ±0.005%
- Load life stability: to ±0.005% at 70°C, 2000 h at rated power
- Resistance range: 100 kΩ to 200 kΩ (higher and lower values of resistance are available)
- Electrostatic discharge (ESD): at least to 25 kV
- Non inductive, non capacitive design
- Rise time: 1 ns without ringing
- Current noise: <–40 dB
- Thermal EMF: 0.05 µV/°C typical
- Voltage coefficient <0.1 ppm/V
- Low inductance: <0.08 µH typical
- Non hot spot design
- Terminal finishes available: lead (Pb)-free tin/lead alloy
- Matched sets are available on request (TCR tracking: to 0.5 ppm/°C)




Any value at any tolerance available within resistance range

Pb-free Available

RoHS* COMPLIANT

### INTRODUCTION

The Z Foil technology provides a significant reduction of the resistive component´s sensitivity to ambient temperature variations (TCR) and applied power changes (PCR).

Designers can guarantee a high degree of stability and accuracy in fixed-resistor applications using solutions based on Vishay Foil Resistors revolutionary Z Foil technology.

The E102Z (0.150" lead spacing) and E102JZ (0.200" lead spacing) extends the range of the ultra high precision Z201 and Z201L.

Our application engineering department is available to advise and to make recommendations. For non-standard technical requirements and special applications, please contact us.

**Figure 1—Typical TCR Curve Z Foil**

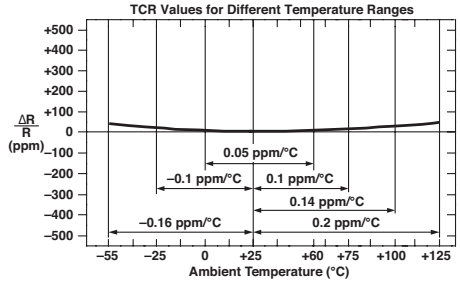



**Figure 2—Power Derating Curve**

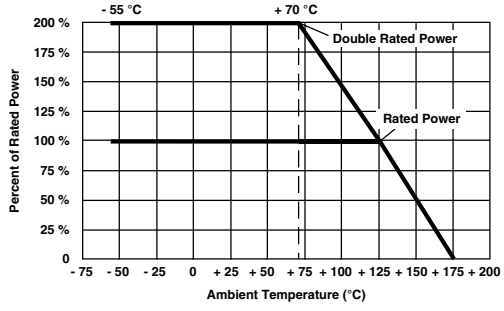
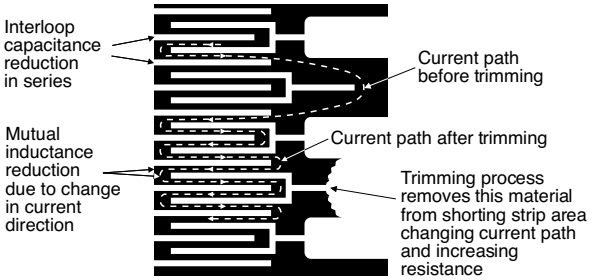



**Table 1—E102Z Specifications**

| | |
|---|---|
| **Temperature Coefficient of Resistance (TCR) –55°C to +125°C, +25°C ref.** | 0.2 ppm/°C typical, 0.8 ppm/°C maximum |
| **Stability**<br>Load life at 2 000 h<br><br>Load life at 10 000 h | <br>±0.005% maximum ΔR at 0.1 W/+70°C<br>±0.015% maximum ΔR at 0.3 W/+125°C<br>±0.01% maximum ΔR at 0.05 W/+125°C<br>±0.05% maximum ΔR at 0.3 W/+125°C |
| **Current Noise** | <–40 dB |
| **High Frequency Operation**<br>Rise time<br>Inductance (L)<br>Capacitance (C) | <br>1.0 ns<br>0.1 µH maximum; 0.08 µH typical<br>1.0 pF maximum; 0.5 pF typical |
| **Voltage Coefficient** | <0.1 ppm/V |
| **Thermal EMF** | 0.1 µV/°C maximum; 0.05 µV/°C typical |

* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS compliant. Please see the information/tables in this datasheet for details.

## Figure 3—Trimming to Values
(conceptual illustration)

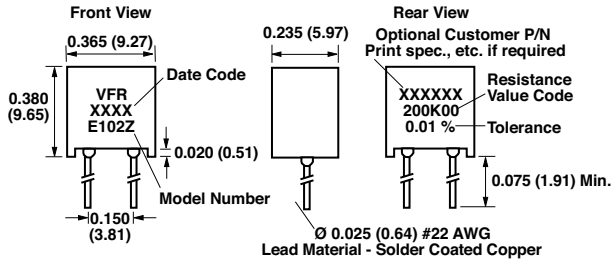



Foil shown in black, etched spaces in white

**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.

## Figure 4—Standard Imprinting and Dimensions




Tolerance: ±0.010 (0.25)
E102Z lead spacing = 0.150" (3.81)
E102JZ lead spacing = 0.200" (5.08)
(numbers in parentheses indicate millimeters)

## Figure 5—Global Part Number Information

**NEW GLOBAL PART NUMBER: Y1183150K000T9L (preferred part number format)**

| DENOTES PRECISION | VALUE | AER* |
|---|---|---|
| **Y** | **K** = kΩ | **0** = standard part, tin/lead termination<br>**9** = standard part, lead (Pb)-free termination<br>**1 - 999** = custom |

| Y | 1 | 1 | 8 | 3 | 1 | 5 | 0 | K | 0 | 0 | 0 | T | 9 | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| PRODUCT CODE | RESISTANCE TOLERANCE | PACKAGING |
|---|---|---|
| **1183** = E102Z<br>**1182** = E102JZ | **V** = ± 0.005 %<br>**T** = ± 0.01 %<br>**Q** = ± 0.02 %<br>**A** = ± 0.05 %<br>**B** = ± 0.1 %<br>**C** = ± 0.25 %<br>**D** = ± 0.5 %<br>**F** = ± 1.0 % | **L** = bulk pack |

FOR EXAMPLE: ABOVE GLOBAL ORDER Y1183 150K000 T 9 L:
TYPE: E102Z
VALUE: 150.0 kΩ
ABSOLUTE TOLERANCE: ± 0.01 %
TERMINATION: lead (Pb)-free
PACKAGING: bulk pack

**HISTORICAL PART NUMBER: E102Z T 150K00 T B (will continue to be used)**

| E102Z | T | 150K00 | T | B |
|---|---|---|---|---|
| MODEL | TERMINATION | OHMIC VALUE | RESISTANCE TOLERANCE | PACKAGING |
| **E102Z**<br>**E102JZ** | **T** = lead (Pb)-free<br>None = tin/lead alloy | **150K00** = 150.0 kΩ | **V** = ± 0.005 %<br>**T** = ± 0.01 %<br>**Q** = ± 0.02 %<br>**A** = ± 0.05 %<br>**B** = ± 0.1 %<br>**C** = ± 0.25 %<br>**D** = ± 0.5 %<br>**F** = ± 1.0 % | **B** = bulk pack |

**Note**

* Application engineering release: for non-standard requests, please contact application engineering.

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