

Ultra High Precision Z-Foil Surface Mount Power Resistors in TO-220 Configuration with TCR of ± 0.05 ppm/ $^{\circ}$ C, Tolerance to ± 0.01 % and Power Rating to 8 W



Any value at any tolerance available within resistance range

Model VPR220SZ, made from Vishay Bulk Metal[®] Z-Foil, offers very low TCR, high stability, tight tolerance, low PCR and fast response time in a small surface mount molded resistor.

The Z-Foil technology provides a significant reduction of the resistive components sensitivity to ambient temperature variations and applied power changes. Designers now can guarantee a high degree of stability and accuracy in fixed resistor applications using solutions based on Vishay's revolutionary Z-Foil technology.

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



RoHS*
COMPLIANT

FEATURES

- Temperature Coefficient of Resistance (TCR): ± 0.05 ppm/ $^{\circ}$ C typical (0 $^{\circ}$ C to + 60 $^{\circ}$ C) ± 0.2 ppm/ $^{\circ}$ C typical (- 55 $^{\circ}$ C to + 125 $^{\circ}$ C, - 25 $^{\circ}$ C Ref.)
- Tolerance: to ± 0.01 %
- Power Coefficient of Resistance (PCR) " Δ R due to self heating": 5 ppm at rated power
- Electrostatic Discharge (ESD) above 25 000 V
- Load Life Stability: ± 0.005 % (25 $^{\circ}$ C, 2000 hours at Rated Power)
- Resistance Range: 5 Ω to 10 k Ω
- Power Rating: 8 W chassis mounted (per MIL-PRF-39009)
- Non Inductive, Non Capacitive Design
- Current Noise: < - 40 dB
- Voltage Coefficient: < 0.1 ppm/V
- Non Inductive: < 0.08 μ H
- Non Hot Spot Design
- Thermal EMF: 0.05 μ V/ $^{\circ}$ C typical
- Terminal Finishes Available: Lead (Pb)-free Tin/Lead Alloy
- For higher performances please contact us

TABLE 1 - SPECIFICATIONS

Load Life Stability at 2000 h	± 0.05 % max Δ R under full rated power at + 25 $^{\circ}$ C
Power Rating at + 25 $^{\circ}$ C	8 W or 3 A ¹⁾ on heat sink ²⁾ 1.5 W or 3 A ¹⁾ in free air Further derating not necessary.
Current Noise	< 0.010 μ V (rms)/V of applied voltage (- 40 dB)
High Frequency Operation Rise Time Inductance ³⁾ (L) Capacitance (C)	1 ns 0.1 μ H maximum: 0.03 μ H typical 1.0 pF maximum: 0.5 pF typical
Voltage Coefficient ⁴⁾	< 0.1 ppm/V
Operating Temperature Range	- 55 $^{\circ}$ C to + 150 $^{\circ}$ C
Maximum Working Voltage	300 V. Not to exceed power rating.
Thermal EMF ⁵⁾	0.15 μ V/ $^{\circ}$ C maximum (lead effect)

Notes

1. Whichever is lower.
2. Heat sink chassis dimensions and requirements per MIL-PRF-39009:

DIMENSION	INCHES	mm
L	6.00	152.4
W	4.00	101.6
H	2.00	50.8
T	0.04	1.0

3. Inductance (L) due mainly to the leads.
4. The resolution limit of existing test equipment (within the measurement capability of the equipment, or "essentially zero").
5. μ V/ $^{\circ}$ C relates to EMF due to lead temperature difference.

TABLE 2 - VPR220SZ

RESISTANCE RANGE (Ω)	TIGHTEST RESISTANCE TOLERANCE	TCR ¹⁾ - 55 $^{\circ}$ C to + 125 $^{\circ}$ C, Ref. + 25 $^{\circ}$ C
50 to 10K	± 0.01 %	± 2.5 ppm/ $^{\circ}$ C
25 to < 50	± 0.02 %	
10 to < 25	± 0.05 %	
5 to < 10	± 0.1 %	

Weight = 1 g Maximum

Note

1. Maximum specifications.

* Pb containing terminations are not RoHS compliant, exemptions may apply

FIGURE 1 - POWER DERATING CURVE

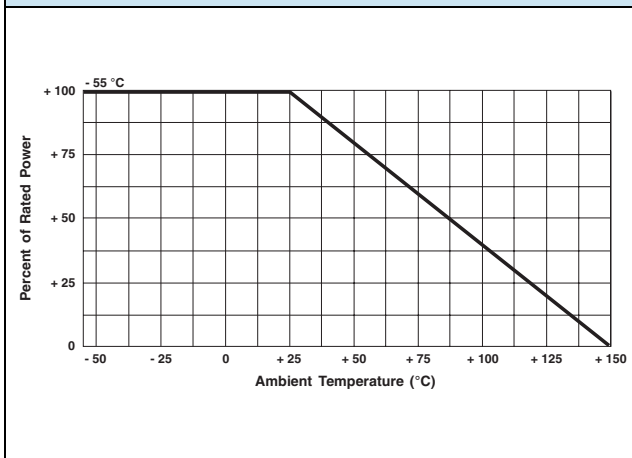


FIGURE 2 - TRIMMING TO VALUES
(Conceptual Illustration)

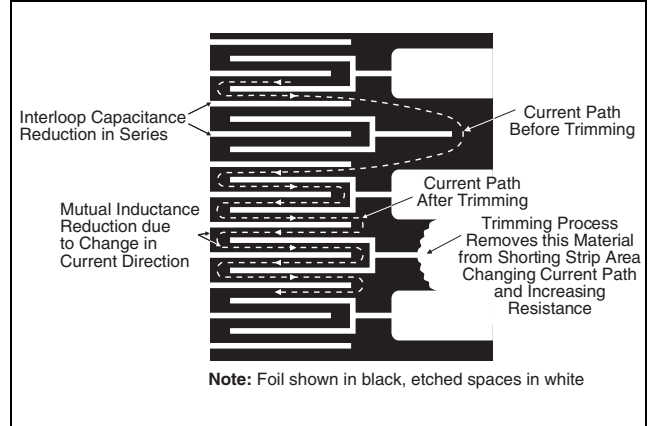


FIGURE 3 - VPR220SZ FORMING DIMENSIONS in inches (millimeters)

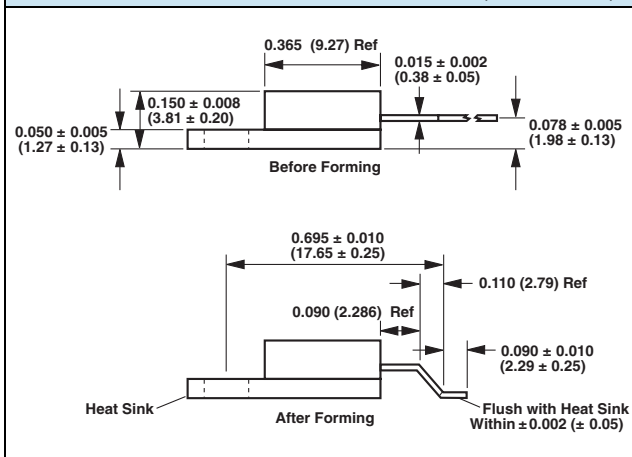


FIGURE 4 - VPR220SZ DIMENSIONS in inches (millimeters)

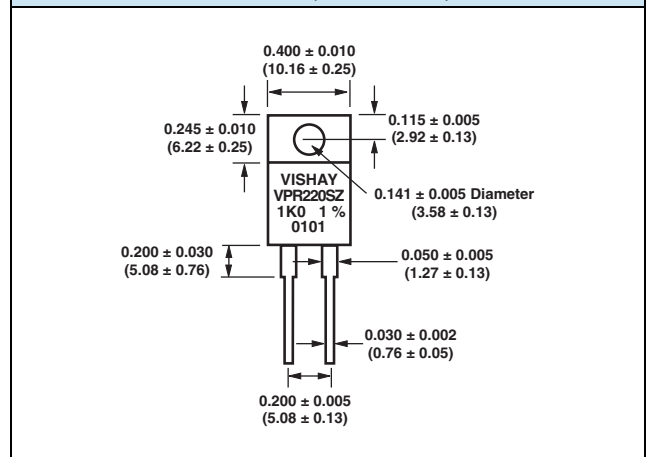


FIGURE 5 - LAND PATTERN DIMENSIONS in inches (millimeters)

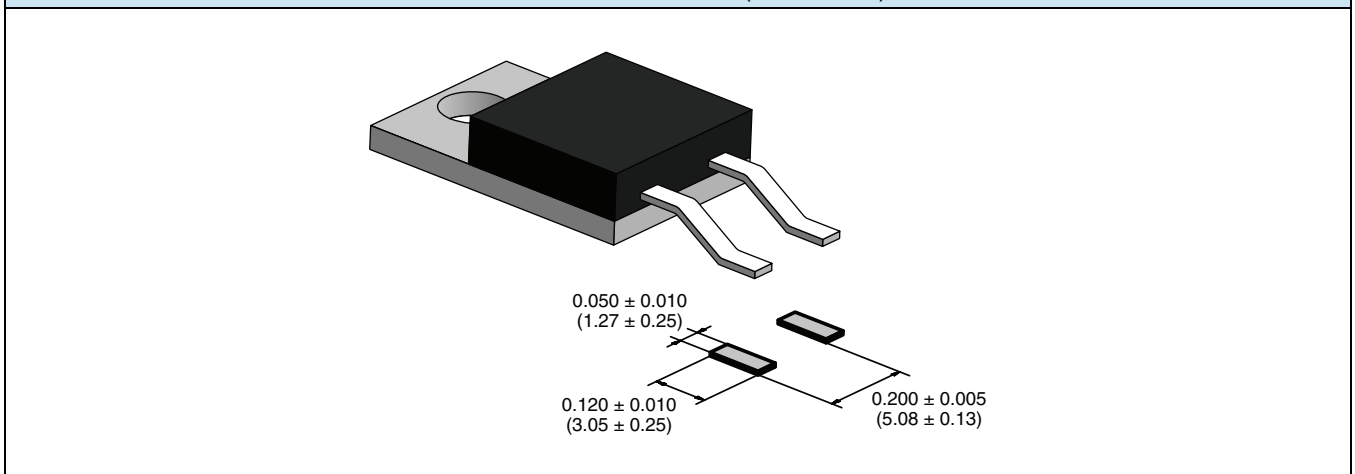
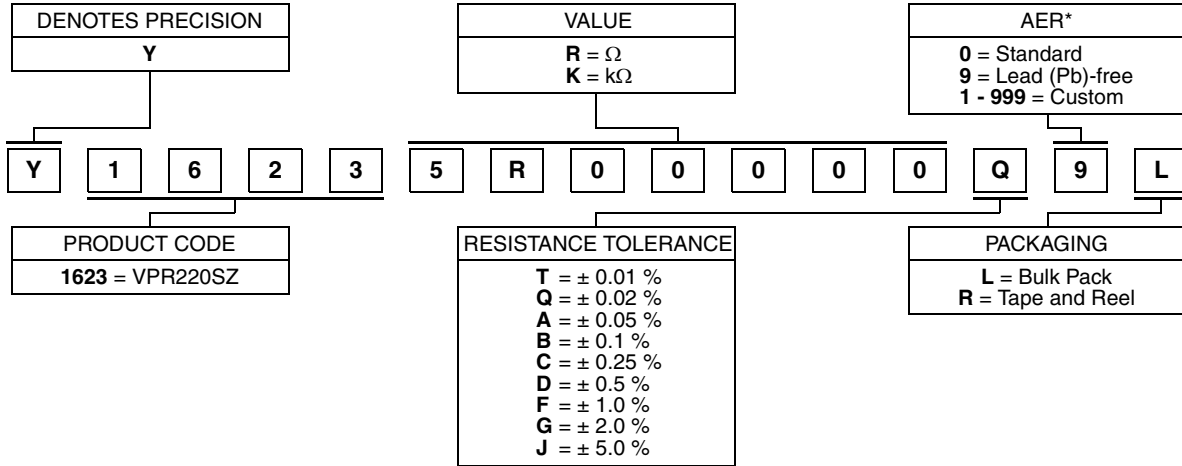


TABLE 3 - GLOBAL PART NUMBER INFORMATION

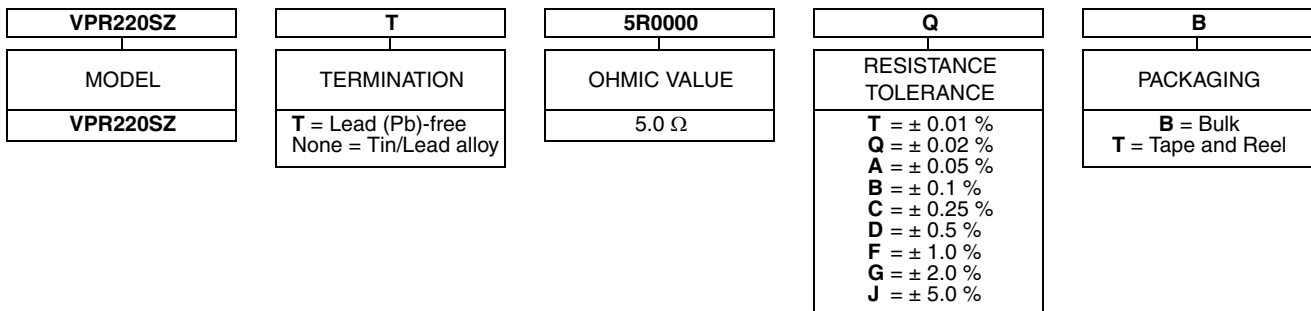
NEW GLOBAL PART NUMBER: Y16235R00000Q9L (preferred part number format)



FOR EXAMPLE: ABOVE GLOBAL ORDER Y1623 5R0000 Q 9 L:

TYPE: VPR220SZ
 VALUE: 5.0 Ω
 ABSOLUTE TOLERANCE: $\pm 0.02\%$
 TERMINATION: Lead (Pb)-free
 PACKAGING: Bulk

HISTORICAL PART NUMBER: VPR220SZT 5R0000 Q B (will continue to be used)



Note

* For non-standard requests, please contact Application Engineering.

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