VPR220SZ (Z-Foil)

Vishay Foil Resistors

Ultra High Precision Z-Foil Surface Mount Power Resistors in TO-220 Configuration with TCR of ± 0.05 ppm/°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.

FEATURES

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

Pb-free Available

RoHS* COMPLIANT

TABLE 1 - SPECIFICATIONS	
Load Life Stability at 2000 h	± 0.05 % max ΔR under full rated power at + 25 °C
Power Rating at + 25 °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 µV (rms)/V of applied voltage (- 40 dB)
High Frequency Operation Rise Time Inductance[3] (L) Capacitance (C)	 1 ns 0.1 µH maximum: 0.03 µH typical 1.0 pF maximum: 0.5 pF typical
Voltage Coefficient[4]	< 0.1 ppm/V
Operating Temperature Range	- 55 °C to + 150 °C
Maximum Working Voltage	300 V. Not to exceed power rating.
Thermal EMF[5]	0.15 µV/°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. µV/°C relates to EMF due to lead temperature difference.

TABLE 2 - VPR220SZ		
RESISTANCE RANGE (Ω)	**TIGHTEST RESISTANCE TOLERANCE**	**TCR[1] - 55 °C to + 125 °C, Ref. + 25 °C**
50 to 10K	± 0.01 %	± 2.5 ppm/°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

For any questions, contact: foil@vishay.com

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FIGURE 1 - POWER DERATING CURVE

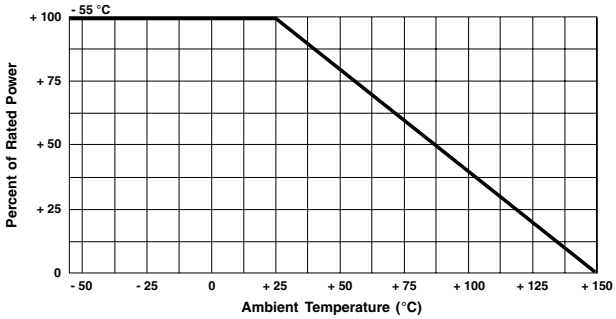
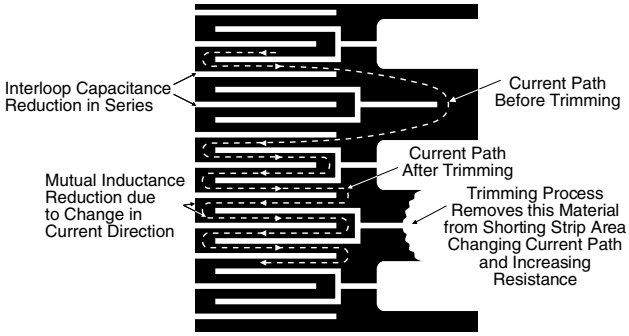


FIGURE 2 - TRIMMING TO VALUES
(Conceptual Illustration)



Note: Foil shown in black, etched spaces in white

FIGURE 3 - VPR220SZ FORMING DIMENSIONS in inches (millimeters)

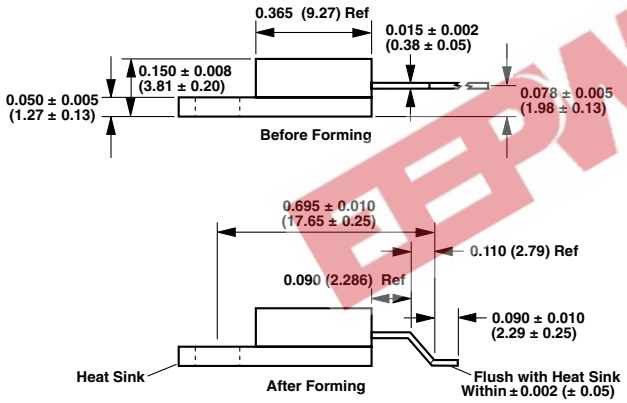


FIGURE 4 - VPR220SZ DIMENSIONS
in inches (millimeters)

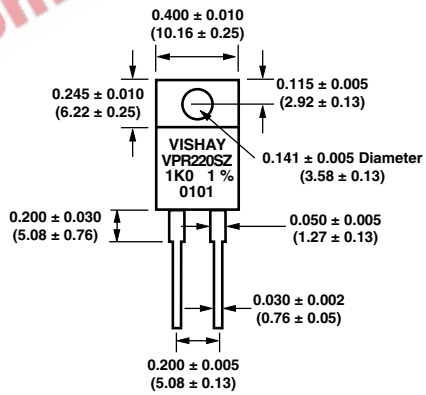


FIGURE 5 - LAND PATTERN DIMENSIONS in inches (millimeters)

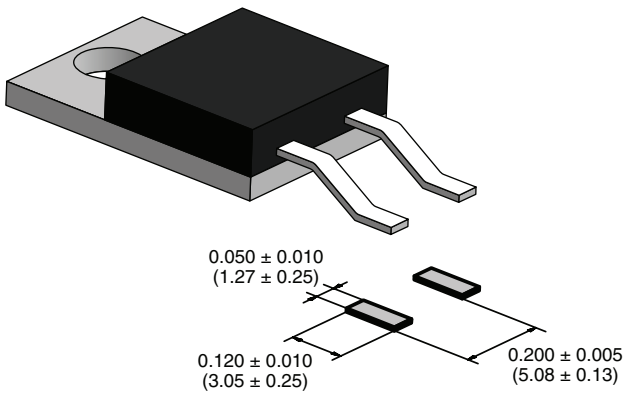


TABLE 3 - GLOBAL PART NUMBER INFORMATION

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

DENOTES PRECISION	VALUE	AER*
Y	**R** = Ω **K** = kΩ	**0** = Standard **9** = Lead (Pb)-free **1 - 999** = Custom

Y	1	6	2	3	5	R	0	0	0	0	0	Q	9	L

PRODUCT CODE	RESISTANCE TOLERANCE	PACKAGING
1623 = VPR220SZ	**T** = ± 0.01 % **Q** = ± 0.02 % **A** = ± 0.05 % **B** = ± 0.1 % **C** = ± 0.25 % **D** = ± 0.5 % **F** = ± 1.0 % **G** = ± 2.0 % **J** = ± 5.0 %	**L** = Bulk Pack **R** = Tape and Reel

FOR EXAMPLE: ABOVE GLOBAL ORDER Y1623 5R00000 Q 9 L:
TYPE: VPR220SZ
VALUE: 5.0 Ω
ABSOLUTE TOLERANCE: ± 0.02 %
TERMINATION: Lead (Pb)-free
PACKAGING: Bulk

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

VPR220SZ	T	5R0000	Q	B
MODEL	TERMINATION	OHMIC VALUE	RESISTANCE TOLERANCE	PACKAGING
VPR220SZ	**T** = Lead (Pb)-free None = Tin/Lead alloy	5.0 Ω	**T** = ± 0.01 % **Q** = ± 0.02 % **A** = ± 0.05 % **B** = ± 0.1 % **C** = ± 0.25 % **D** = ± 0.5 % **F** = ± 1.0 % **G** = ± 2.0 % **J** = ± 5.0 %	**B** = Bulk **T** = Tape and Reel

Note

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

Disclaimer

All product specifications and data are subject to change without notice.

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