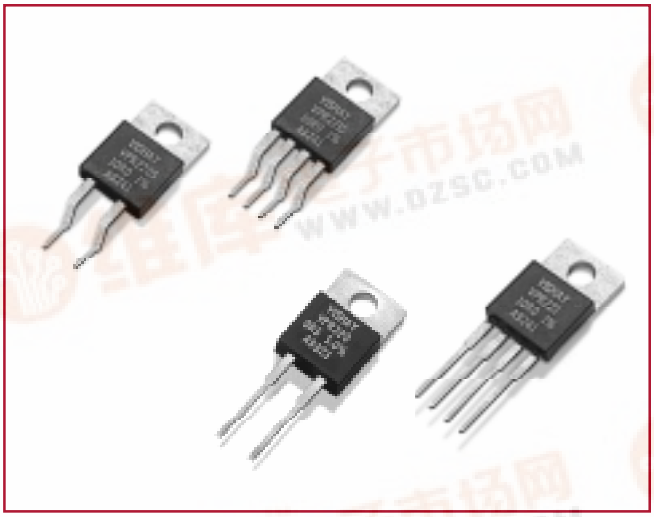
VISHAY MODELS VPR220 AND VPR221

Precision Foil Power Resistors in TO 220 Configuration

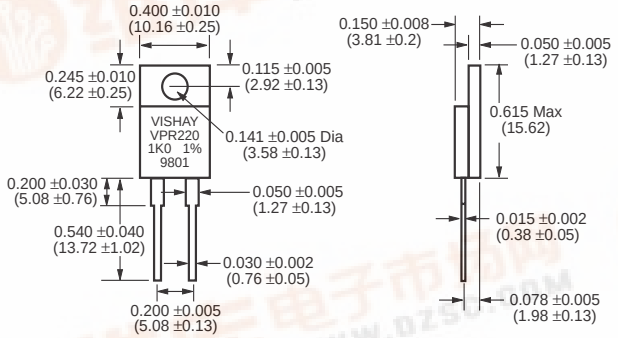


Models VPR220 AND VPR221, made from Vishay Bulk Metal® foil, offer low TCR, high stability, tight tolerance and fast response time in a small, molded resistor. Model VPR220 is a 2 lead device. Model VPR221 is a 4 lead Kelvin connected device. The 4 leaded version is highly recommended for precision applications requiring ohmic values of 100R or less.

FEATURES

- Power: 8 watts chassis mounted (per MIL-R-39009)
- Load Life Stability: ±0.05% maximum ΔR at rated power and temperature for 2,000 hours
- Temperature Coefficient of Resistance: to ±5 ppm/°C
- Resistance Range: 0.5 to 10K Ω
- Tolerance: To ±0.01%
- Low Thermal EMF: 0.15 µV/°C maximum (lead effect)
- Non-Inductive Construction
- Heat sink is Isolated

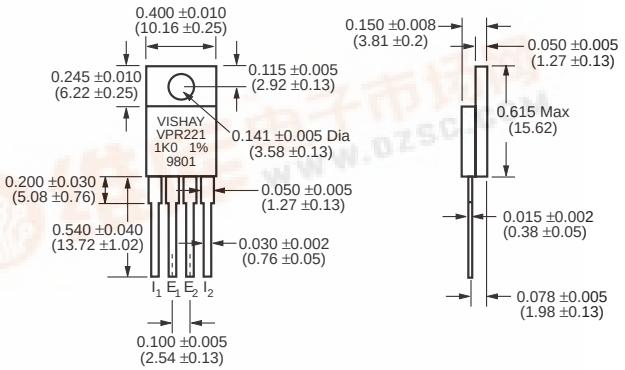
FIGURE 1 - VPR220 DIMENSIONS



Resistance Range (Ω)	Tightest Resistance Tolerance	TCR*
50 to 10K	±0.01%	±5 ppm/°C
25 to <50	±0.02%	±7 ppm/°C
10 to <25	±0.05%	±10 ppm/°C
5 to <10	±0.1%	±13 ppm/°C

Weight = 1 gm Max. * Maximum specifications.
Lower values available but not recommended due to high TCR.

FIGURE 2 - VPR221 DIMENSIONS



Resistance Range (Ω)	Tightest Resistance Tolerance	TCR*
10 to 500	±0.01%	±5 ppm/°C
1 to <10	±0.02%	±5 ppm/°C
0.5 to <1	±0.05%	±5 ppm/°C

Weight = 1.2 gms Max. * Maximum specifications.
Higher values available.
0.1 Ohms Available soon.

THROUGH HOLE

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TABLE 1 - SPECIFICATIONS

Load Life Stability at 2,000 hrs	±0.05% max ΔR under full rated power @ +25°C
Shelf Life Stability	±0.0025% ΔR/yr
Power Rating @ +25°C	8 watts or 3 amps[2] on heat sink[3] 1.5 watts or 3 amps[2] in free air *Further derating not necesary.*
Current Noise	<0.010 μV (rms)/volt of applied voltage (–40 dB)
High Frequency Operation Rise/Decay Time Inductance[4] (L) Capacitance (C)	 0.2 ns @ 1 Ω 0.1 μH maximum: 0.03 μH typical[1] 1.0 pF maximum: 0.5 pF typical[1]
Voltage Coefficient[5]	<0.1 ppm/V
Operating Temperature Range	–55°C to +150°C
Maximum Working Voltage	300 V. Not to exceed power rating.
Thermal EMF[6]	0.15 μV/°C maximum (lead effect)

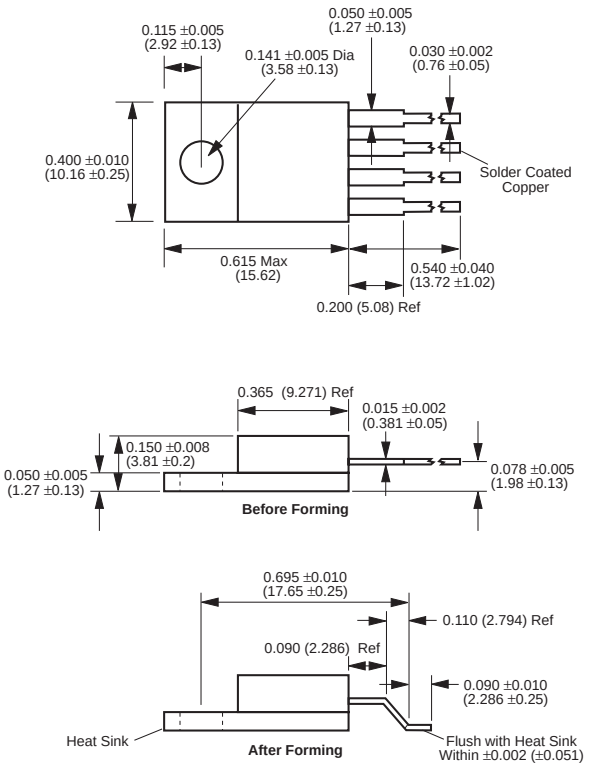
NOTES:

1. Maximum is 1.0% A.Q.L. standard for all specifications except TCR. Typical is a designers reference which represents that 85% of the units supplied, over a long period of time, will be at least the figure shown or better.
2. Whichever is lower.
3. Heat sink chassis dimensions and requirements per MIL-R-39009/1B:

Dimension	Inches	mm
L	6.00	152.4
W	4.00	101.6
H	2.00	50.8
T	0.04	1.0

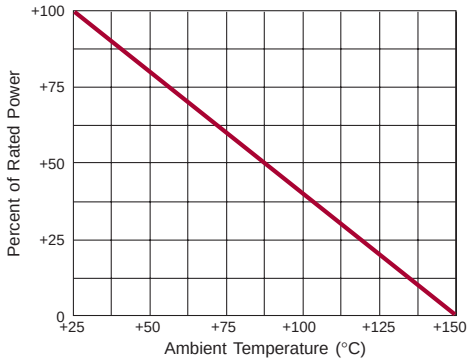
4. Inductance (L) due mainly to the leads.
5. The resolution limit of existing test equipment (within the measurement capability of the equipment, "essentially zero").
6. μV/°C relates to EMF due to lead temperature difference.

FIGURE 3 - VPR221S DIMENSIONS



VPR220S dimensions similar.

FIGURE 4 - POWER DERATING CURVE



HOW TO ORDER VPR220 AND VPR221 PARTS:

Specify Vishay VPR220 or VPR221 resistors as follows:

Example: **VPR221** (Model No.) **5R0000** (Resistance Value) **1.0%** (Tolerance)

Specify Vishay VPR220S or VPR221S for surface mount resistors as follows:

Example: **VPR221S** (Model No.) **5R0000** (Resistance Value) **1.0%** (Tolerance)

Resistance value, in ohms, is expressed by a series of 6 characters, 5 of which represent significant digits while the 6th is a dual purpose letter that designates both the multiplier and the location of the comma or decimal.

Resistance Range	Letter Designator	Multiplier Factor	Example
0.5 Ω to < 1K Ω	R	x1	100R01 = 100.01 Ω
1K Ω to 10K Ω	K	x10[3]	5K2310 = 5,231 Ω