VPG's Z-Foil Through-Hole Resistors Feature Extended Range Down to 5 Ω

WDD Staff

Vishay Precision Group [1] (Malvern, PA) recently announced that its Vishay Foil Resistors brand (VFR) has enhanced the Z Series of ultra-high-precision Bulk Metal Z-Foil through-hole commercial off-the-shelf (COTS) resistors with an extended resistance range down to 5 Ω. For high-precision applications in harsh environments, the devices provide very low nominal TCR of ±0.05 ppm/°C from 0 to +60°C, down to ±0.2 ppm/°C nominal and a 0.6 ppm/°C spread from -55 to +125°C, +25°C ref.; tight tolerances of ±0.005% (50 ppm); and a load-life stability of ±0.005% at 70°C for 2,000 hours or to ±0.015% at 70°C for 10,000 hours.

The Z Series now offers resistance range from 5 Ω to 600 kΩ for high-precision industrial, alternative energy, military, aerospace, medical, down-hole, shunt calibration, and RTD calibration and simulation. Any conceivable ohmic value within this range, to six digits, is available with no additional cost or lead time effect.

Total accumulated change in resistance end of life (EOL) for the devices is <0.1%, or better with post manufacturing operations (PMO).

The resistors feature:

- Rated power to 1 W at +125°C.
- Rise time of 1 ns with effectively no ringing.
- Current noise of ≤0.010 µVrms/V of applied voltage (<-40 dB).
- Thermal EMF of 0.05 µV/°C typical.
- Voltage coefficient of <0.1 ppm/V.

Z Series molded precision resistors are configured in a rectangular block with through-hole leads extending through the bottom surface to minimize board space, while stand-offs allow for reliable cleaning underneath. Unlike SMD chip resistors,

the board pads and solder attachment do not extend beyond the resistor's own footprint. While some through-hole resistors require added height for stress-relieving bends in the leads, VFR devices feature a built-in stress relief system.

For harsh environments, the devices' outer molded shell offers much greater resistance to moisture and contaminates than chip resistors, making them ideal for conditions such as the extreme temperatures and radiation-rich environments of down-hole oil well logging applications; in the frigid arctic; under the sea; or in deep space. In addition, encapsulated molded foil resistors have a greater surface area, enabling higher resistor values on the vertical surface, very tight tolerances, and reduced inductance, capacitance, and reactance.

Offering the utmost in ESD immunity, Z Series resistors withstand electrostatic discharges of at least 25 kV, for increased reliability, and offer a non-inductive (<0.08 µH), non-capacitive design. The devices are available with RoHS-compliant, lead (Pb)-free terminations, or tin/lead-plated terminations.

For more information, please visit www.vishaypg.com [1]

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[1] http://www.vishaypg.com