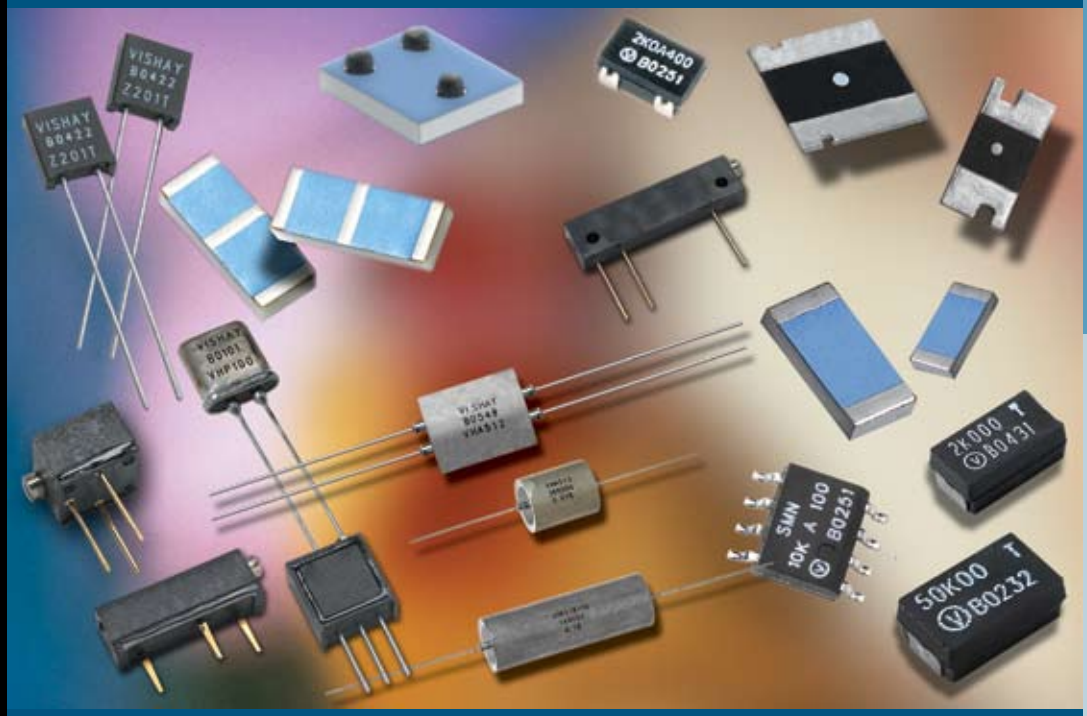
VISHAY INTERTECHNOLOGY, INC.



PROTOTYPE FASTLANE SERVICE (PFS)

ANY VALUE AT ANY TOLERANCE WITHIN THE STANDARD RESISTANCE RANGE

TURNAROUND TIME IN JUST 48 HOURS

FEATURES:

- Temperature Coefficient of Resistance (TCR)
  Absolute: ±0.05 ppm/°C (0 °C to +60 °C) typical
  Tracking: 0.1 ppm/°C typical
- Tolerance - Absolute: ±0.001 % Match: 0.001 %
- Power Coefficient of Resistance (PCR) “ΔR due to self heating”: 5 ppm typical at rated power with Z-Foil Technology
- Load Life Stability: to 0.005 % at 70 °C, 2000 hours at rated power
- Electrostatic Discharge (ESD) above 25 kV
- Any value at any tolerance within resistance range
- Matched sets available upon request

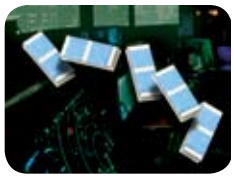
Prototype Fastlane Service (PFS)

Through our Prototype Fastlane Service (PFS), Vishay Bulk Metal® Foil precision resistors can be trimmed to any value within the resistance range for a given device and provided as a standard value (eg. 1K2345). Normally turnaround time for devices in stock is just 48 hours. Turnaround time for special-order devices is as fast as five business days.

VSMP Series
0805, 1206, 1506, 2010, 2512

- TCR ±0.05 ppm/°C*
- PCR: 5 ppm at rated power
- Tolerance: ±0.01 %
- Range: 10 Ω to 150 kΩ
- Power rating: 750 mW at 70 °C

VFCD 1505
Surface-Mount Divider

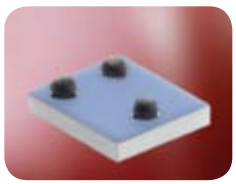


- TCR Tracking: 0.1 ppm/°C
- Absolute TCR: ±0.05 ppm/°C*
- PCR Tracking: 5 ppm at rated power
- Tolerance Match: 0.01 %
- Power rating: 100 mW at 70 °C

DSMZ Molded
Surface-Mount Divider

- TCR Tracking: 0.1 ppm/°C
- Absolute TCR: ±0.05 ppm/°C*
- PCR Tracking: 5 ppm at rated power
- Tolerance Match: 0.01 %
- Power rating: 100 mW for entire package

VFB1012D BGA
Surface-Mount Divider



- TCR Tracking: 0.1 ppm/°C
- Absolute TCR: ±0.05 ppm/°C*
- PCR Tracking: 5 ppm at rated power
- Tolerance Match: 0.01 %
- Ball Grid Array

SMRDZ Molded
Surface-Mount Resistor

- TCR: ±0.05 ppm/°C*
- PCR: 5 ppm at rated power
- Range: 5 Ω to 80 kΩ
- Flexible terminations
- Non-inductive, non-capacitive design

SMNZ Molded 4 Resistor
Surface-Mount Network

- TCR Tracking: 0.1 ppm/°C
- Absolute TCR: ±0.05 ppm/°C*
- PCR Tracking: 5 ppm at rated power
- Tolerance Match: 0.01 %
- Power rating: 100 mW per chip

CSM2512 and CSM3637 Metal Strip Element

- TCR: ±15 ppm/°C maximum
- Tolerance: ±0.1 %
- Range: 2 mΩ to 200 mΩ
- Power rating: up to 3 W at 70 °C
- Maximum current: 38 A
- Thermal EMF < 3µV/°C

*Typical, 0 °C to +60 °C

VCS1625Z, VCS1625 Current Sensor

- TCR ±0.05 ppm/°C*
- PCR: 5 ppm at rated power
- Range: 0.01 Ω to 2 Ω
- 4-terminal (Kelvin) connection
- Thermal EMF < 0.1 µV/°C

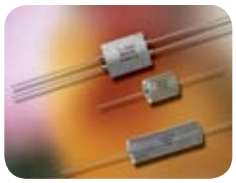
Z201 Ultra-High-Precision Z-Foil Resistor

- TCR: ±0.05 ppm/°C*
- Tolerance: ±0.005 %
- PCR: 5 ppm at rated power
- Range: 10 Ω to 100 kΩ
- Drop-in replacement for S102C

VHP100 Ultra-High Precision, Zero-TCR Resistor

- Essentially zero TCR (Window)
- Tolerance: ±0.005 % ppm
- Load life Stability: ±20 ppm
- Shelf life Stability: ±2 ppm
- Hermetically sealed, oil filled

Ultra-High-Precision Resistor for Metrology

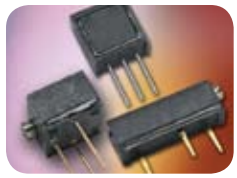


- TCR: ±0.05 ppm/°C*
- Tolerance - Absolute and Match: ±0.001 %
- PCR: 5 ppm at rated power
- Range: 5 Ω to 3.3 MΩ Hermetically sealed, oil filled
- Shelf life stability: 2 ppm after at least 10 years

Custom Networks

- TCR: ±2 ppm/°C
- High flexibility of design schematics
- Tolerance - Absolute and Match: ±0.005 %
- Any combination of resistance values from 5 Ω to 80 kΩ
- No NRE charges

Trimmers

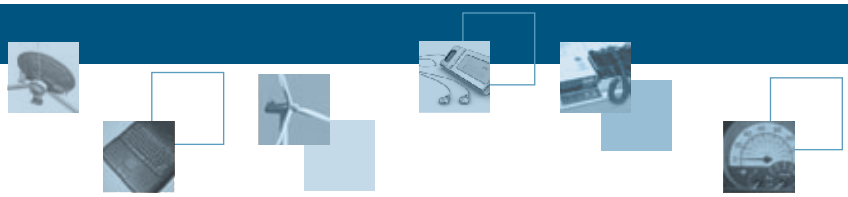


- TCR: ±25 ppm/°C Through the Wiper
- Settability: ±0.005 %
- Setting stability: to ±0.1 %
- Improved CRV
- "O" Ring seal

*Typical, 0 °C to +60 °C

At Vishay, we're dedicated to promoting successful relationships with all of our customers. One of the ways we help speed your time to market is by making prototype devices available quickly. We can provide small quantities of prototype samples—at any required value—in a very short time frame and at a surprisingly low cost. In fact, some prototype samples can be provided free of charge. To learn more, please contact us at foil@vishay.com.

So why is the Vishay Bulk Metal resistive element so stable?



Vishay's precision Bulk Metal® elements introduce a new concept in resistor and trimmer manufacturing. A proprietary Bulk Metal of known and controllable properties is applied to a special ceramic substrate. A resistive pattern is then photo-etched by an ultra-fine technique developed by Vishay. This process results in a resistive element that combines the all-important characteristics of low temperature coefficient, long-term stability, non-inductance low capacitance (fig. 2), insensitivity to ESD (fig. 4), and low noise. The Bulk Metal is a special alloy chosen for its electrical, mechanical and thermal characteristics. It is applied on the substrate in such a way that the resistive element is not subjected to metallurgical changes that occur during wire-winding or during the deposition processes used in other forms of precision resistor and trimmer manufacturing.

Because the Vishay resistive element alloy isn't drawn, wound, hardened, or stressed in any other way during the manufacturing process, the element maintains all of its original physical and electrical characteristics.

Each manufacturing step is rigidly controlled with extensive quality control ensuring that the alloy is kept in its original state. The temperature coefficient of the resistive element is carefully controlled through compensating techniques which are caused as a result of the different coefficients of expansion of the materials used.

Figure 1

LONG TERM STABILITY OVER 25.5 YEARS (0.1 W AT 70° C)
AVERAGE ΔR OF 50 SAMPLES (S102C - 10 KΩ)
(Rn - Rn-1)

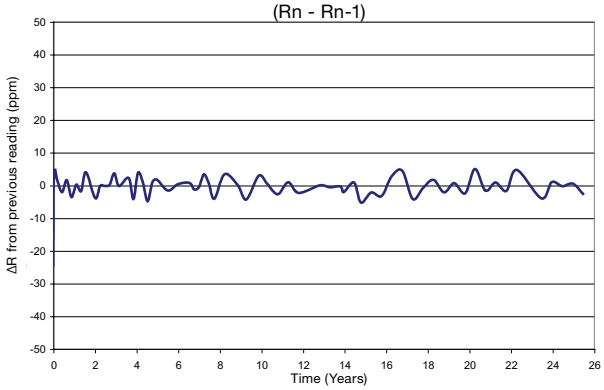
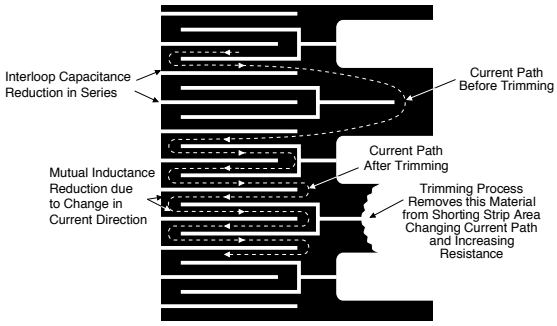


Figure 2

TRIMMING TO VALUES



NOTE: Foil shown in black, etched spaces in white.

Figure 3

RESISTANCE DEVIATION AFTER SHORT-TIME OVERLOAD OF 6.25
TIMES RATED POWER FOR 5 SECONDS

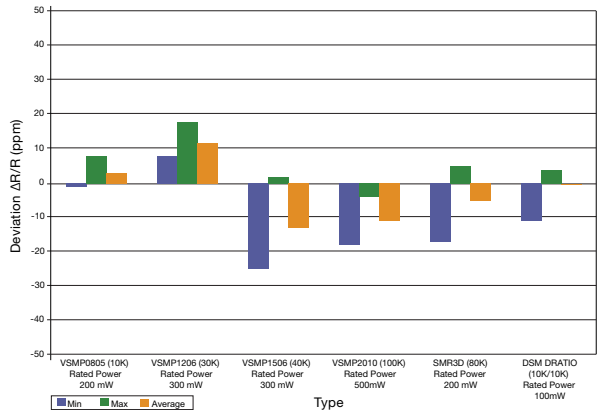
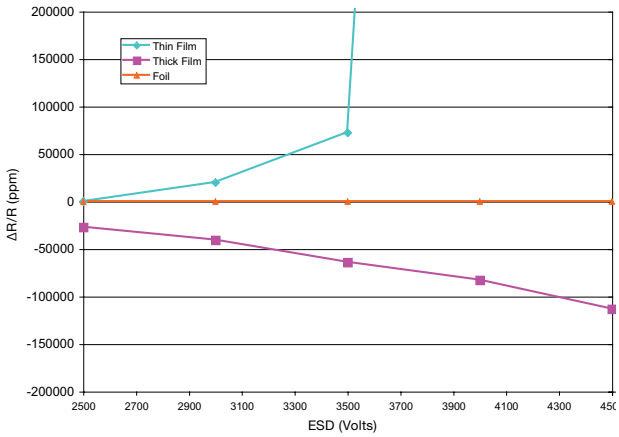


Figure 4

ESD TEST RESULTS



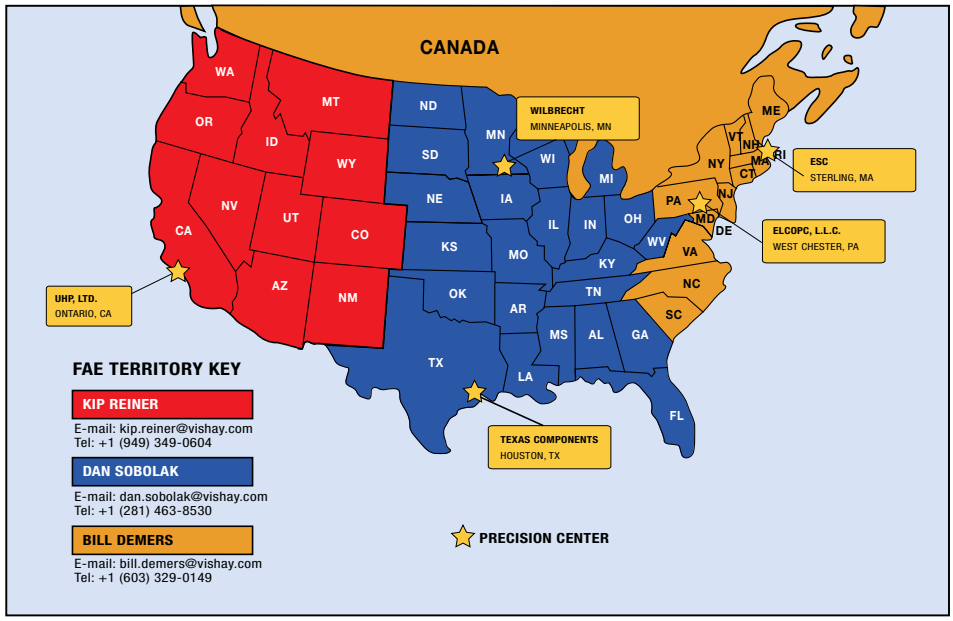
In addition to standard processes, Vishay offers a range of additional screen testing and special operations:

Short time overload, Thermal Shock, Power Conditioning, TCR Tracking, Ratio Matching, Special Marking and Packaging, Traceability and Documentation, and Test Group B and C inspections.

For information on other services, consult our Applications Engineering department at foil@vishay.com.

Vishay FAE/MTS List of Contacts

North America



For Central and South America, please contact foil@vishay.com

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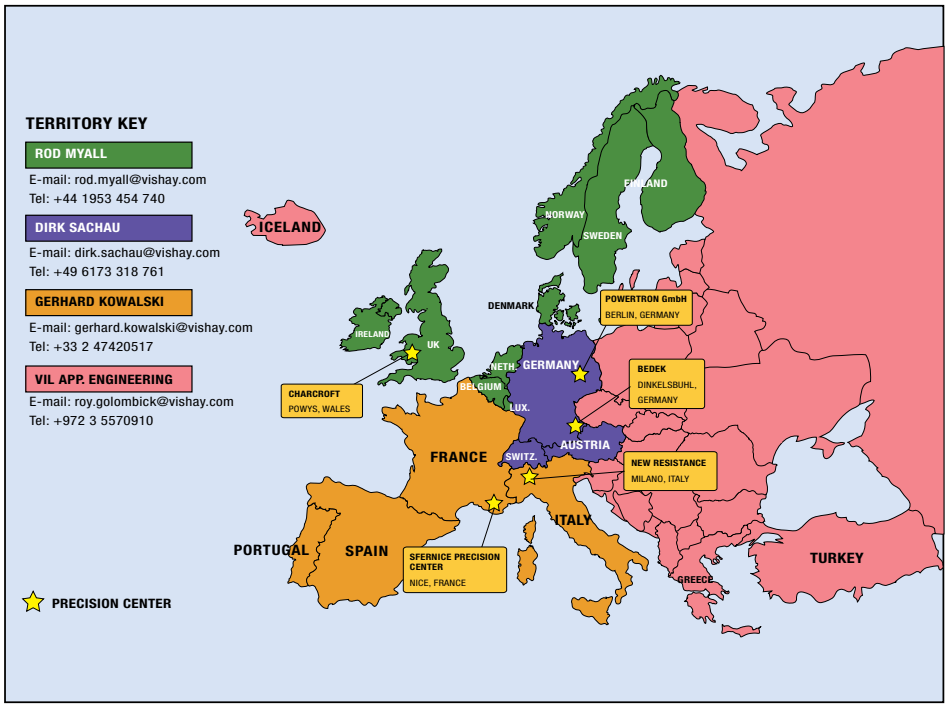

For Israel and Asia Pacific, contact VIL APP. Engineering

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