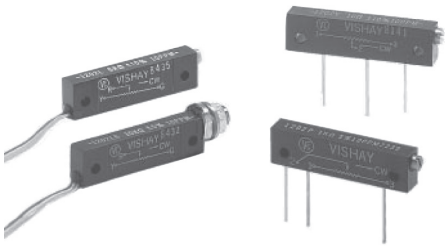
Bulk Metal® Foil Ultra High Technology Precision Trimming Potentiometers, 1 1/4" Rectilinear, RJ12 Style, Designed to Meet or Exceed The Requirements of MIL-PRF-22097, Char. F with Smooth and Unidirectional Output



INTRODUCTION

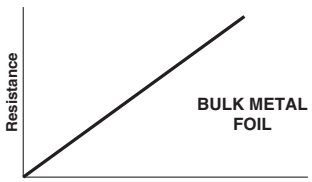
Vishay Foil precision trimmers have the Bulk Metal® Foil resistive element which possesses a unique inherent temperature and load life stability. Plus, their advanced virtually back lash-free adjustment mechanism makes them easy to set quickly and accurately and keeps the setting exactly on target.

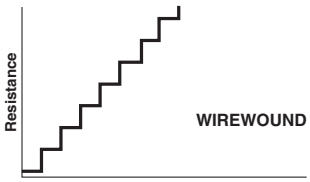
FEATURES

- Temperature coefficient of resistance (TCR): ± 10 ppm/°C maximum [3] (- 55 °C to + 150 °C ref. at + 25 °C); through the wiper [4]; ± 25 ppm/°C
- A smooth and unidirectional resistance with leadscrew adjustment
- Load life stability: 0.1 % typical ΔR, 0.5 % maximum ΔR under full rated power at + 85 °C for 2000 h
- Settability: 0.05 % typical; 0.1 % maximum
- Setting stability: 0.1 % typical; 0.5 % maximum, ΔSS
- Power rating: 0.5 W at + 85 °C
- Resistance range: 2 Ω to 20 kΩ
- "O"-ring prevents ingress of fluids during any board cleaning operation
- Electrostatic discharge (ESD) up to 25 000 V
- Terminal finish: gold plated (tin/lead finish is available on request)

Pb-free Available

RoHS* COMPLIANT





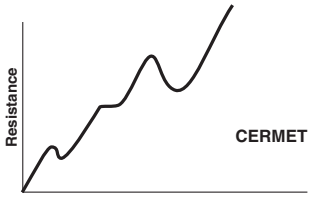


TABLE 1 - MODEL SELECTION

MODEL	TERMINATION STYLE	AVERAGE WEIGHT (g)	POWER RATING at + 85 °C AMBIENT	NO. OF TURNS
1202	P-In line PC pins	2.5	0.5 W	25 ± 2
	Y-staggered PC pins [1]	2.5		
	L-flexible wire leads	3.3		
	LB-flexible wire leads with bushings	5.1		

TABLE 2 - VALUES VS. TOLERANCES

STANDARD RESISTANCE VALUES (in Ω)	STANDARD TOLERANCES
2, 5, 10	± 10 % [2], ± 20 %
20, 50, 100, 200, 250, 500, 1K, 2K, 5K, 10K, 20K	5 %, 10 %

Note
• See Figures 1 and 2

TABLE 3 - 1202 (RJ12) SERIES ELECTRICAL SPECIFICATIONS

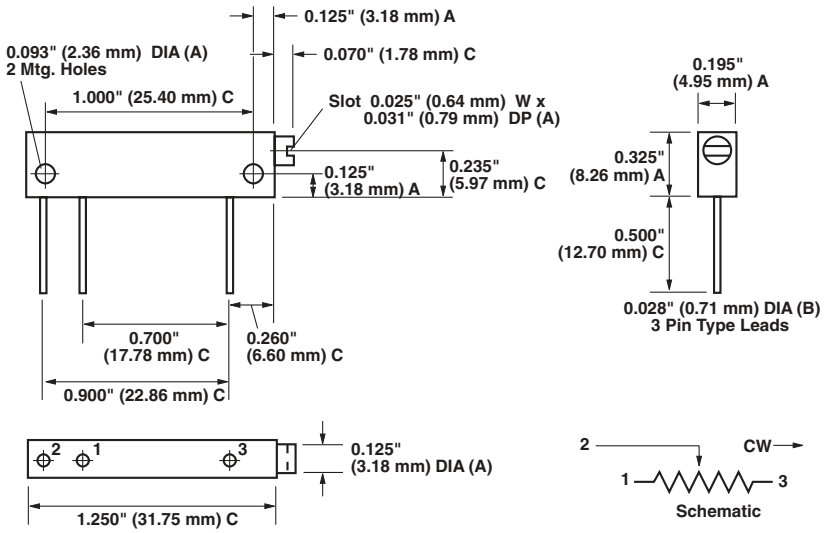
Temperature Coefficient of Resistance (TCR), 50 Ω and up End-to-end [3] 2 Ω, 5 Ω, 10 Ω, 20 Ω Through the wiper [4]	± 10 ppm/°C maximum (- 55 °C to + 25 °C) ± 10 ppm/°C maximum (+ 25 °C to + 150 °C) ± 20 ppm/°C (- 55 °C to + 150 °C, ref. + 25 °C) ± 25 ppm/°C (- 55 °C to + 150 °C, ref. + 25 °C)
Stability Load life at 2000 h, under full rated power of 0.5 W at + 85 °C Load life at 10 000 h, under full rated power of 0.5 W at + 85 °C	 0.1 % typical ΔR; 0.5 % maximum ΔR 0.1 % typical ΔR; 1.0 % maximum ΔR
Power Rating [5]	0.5 W at + 85 °C
Settability	0.05 % typical; 0.1 % maximum
Setting Stability	0.1 % typical; 0.5 % maximum
Contact Resistance variation - CRV (noise)	3 Ω typical; 10 Ω maximum
Hop-off	0.25 % typical; 1.0 % maximum
High-Frequency Operation Rise time Inductance Capacitance	to 100 MHz 10 ns at 1 kΩ 0.08 µH typical 0.5 pF typical
Operating Temperature Range	- 55 °C to + 150 °C

Note
• Refer to page 4 for footnotes
* Pb containing terminations are not RoHS compliant, exemptions may apply

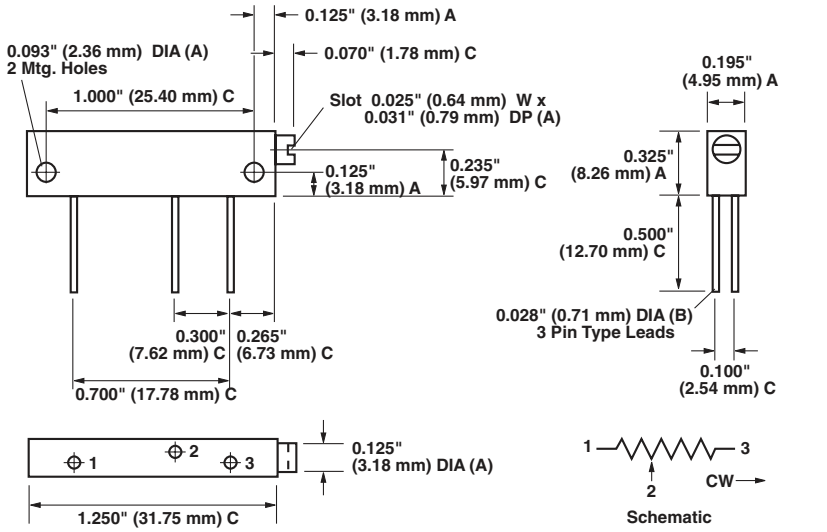
TABLE 4 - MECHANICAL SPECIFICATIONS			
Adjustment Turns	25 ± 2	**Case Material**	Glass fortified diallyl-phthalate (DAP); black
Mechanical Stops	Wiper idles - no discontinuity	**Shaft Torque**	8 oz. in. maximum; 3 oz. in. typical
Internal Terminations	All welded - no flux	**Backlash**	0.05 % typical

FIGURE 1 - SCHEMATIC AND DIMENSIONS in Inches (Millimeters)

1202P
(In-Line Pins) (1)



1202Y
(Staggered Pins) (1)



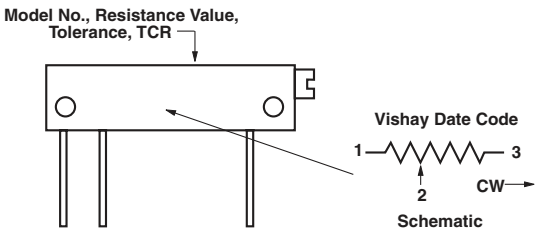
TOLERANCES:

A = ± 0.005" (0.13 mm)

B = ± 0.003" (0.08 mm)

C = ± 0.010" (0.25 mm)

STANDARD MARKING ILLUSTRATION:

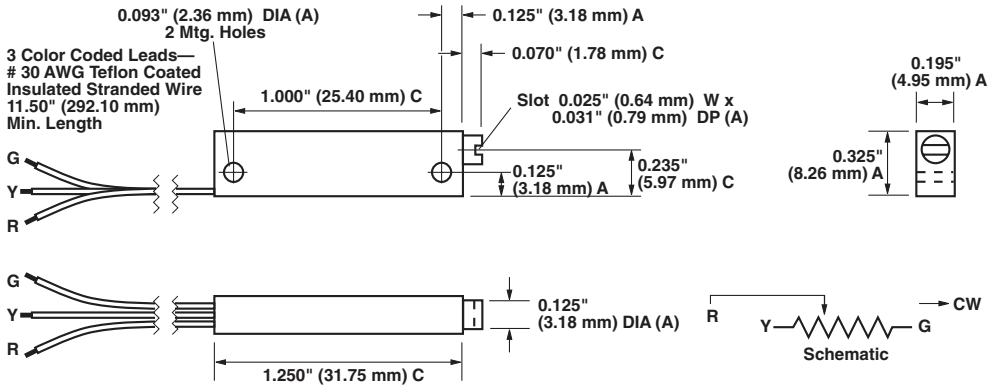


Note

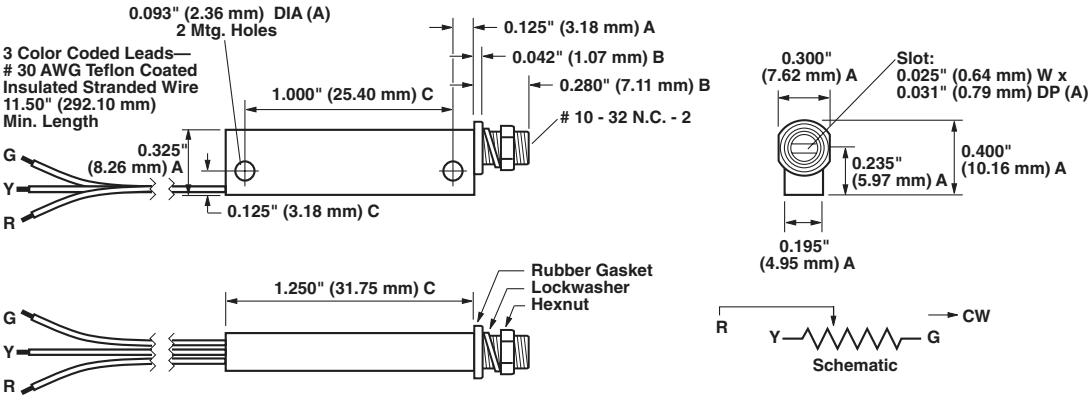
(1) Pin leads are gold plated nickel which are solderable or weldable.

FIGURE 2 - SCHEMATIC AND DIMENSIONS in Inches (Millimeters)

1202L
(Flexible Leads)



1202LB
(Panel Mounted)



TOLERANCES:
A = ± 0.005" (0.13 mm)
B = ± 0.003" (0.08 mm)
C = ± 0.010" (0.25 mm)

Standard marking shown on previous page.

FIGURE 3 - POWER DERATING CURVE

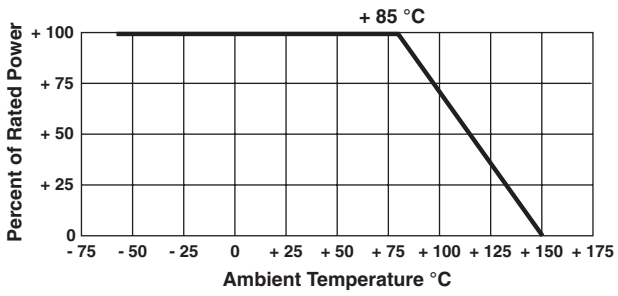


TABLE 5 - COMPARISON		
	MIL-PRF-22097/2 CHARACTERISTIC F (7)	**1202 MAXIMUM (Worst Case)**
TEST GROUP I		
Visual and mechanical	No failures	No failures
Total resistance	± 10 %	± 10 %
Actual effective electrical travel	17 to 27 turns	25 ± 2 turns
End resistance	± 2 % or 20 Ω (7)	2 Ω
Contact resistance variation - CRV (noise)	± 3.0 % or 3 Ω (7)	3 Ω typical, 10 Ω maximum
Dielectric withstanding voltage - DWV		
Per MIL-STD-202, methods 301 and 105		
Atmospheric pressure	900 V_{AC}, 1 min	900 V_{AC}, 1 min
Barometric pressure	350 V_{AC}, 1 min	350 V_{AC}, 1 min
Insulation resistance	≥ 1000 MΩ	≥ 1000 MΩ
Shaft torque	8 oz. in. maximum	8 oz. in. maximum
Thermal shock	± 1.0 %	± 1.0 %
TEST GROUP II		
Resistance temperature characteristic - TCR	± 0.01 % (± 100 ppm/°C)	± 0.001 % (± 10 ppm/°C)
Moisture resistance	± 1.0 %	± 0.5 %
Contact resistance variation - CRV (noise)	3.0 % or 3 Ω (7)	3 Ω typical, 10 Ω maximum
TEST GROUP III		
Shock (specified pulse)	± 1.0 %	± 0.5 %
Vibration (high-frequency)	± 1.0 %	± 0.5 %
Contact resistance variation - CRV (noise)	± 3.0 % or 3 Ω (7)	3 Ω typical, 10 Ω maximum
Salt spray	No corrosion	No corrosion
TEST GROUP IV		
Solder heat	± 1.0 %	± 0.05 %
Life (1000 h at + 85 °C) (8)	± 2.0 %	± 0.5 %
Contact resistance variation - CRV (noise)	± 3.0 % or 3 Ω (7)	3 Ω typical, 10 Ω maximum
TEST GROUP V		
Low-temperature operation	± 1.0 %	± 0.5 %
High-temperature exposure	± 2.0 %	± 0.5 %
Contact resistance variation - CRV (noise)	± 3.0 % or 3 Ω (7)	3 Ω typical, 10 Ω maximum
TEST GROUP VI		
Rotational life	± 2.0 %	± 2.0 %
Contact resistance variation - CRV (noise)	± 3.0 % or 3 Ω (7)	3 Ω typical, 10 Ω maximum
Terminal strength	2 lbs	2 lbs
TEST GROUP VII		
Solderability (excluding terminations L and LB)	MIL-STD-202 method 208	MIL-STD-202 method 208
Immersion (excluding terminations L and LB)	No continuous stream of bubbles	No continuous stream of bubbles
TEST GROUP VIII	MIL-STD-810 method 508	MIL-STD-810 method 508
Fungus	No mechanical damage	No mechanical damage

Notes

(1) Preferred termination style for current 1-1/4 inch rectilinear trimmers (staggered PC pins present a sturdier mounting arrangement for shock, vibration, and impact situations).

(2) 10 Ω at ± 5 % available on special order.

(3) Maximum TCR applies to the 3 σ (sigma) limit or 99.73 % of a production lot. (Measured end-to-end with wiper off the element.)

(4) Measurements of TCR through the wiper are influenced more by setting stability and the percentage of the total resistance in use (at the wiper) than by fundamental resistance change due to temperature alone. The parameter shown in Table 3 is a 2 σ distribution typifying the behavior of the device when used with 40 % or more of the total resistance in use.

(5) Derated linearly from full power at + 85 °C to zero power at + 150 °C. See Figure 3 in this datasheet.

(6) All ΔR's are measured to the tolerance specified + 0.01 Ω.

(7) Whichever is greater.

(8) Load-Life test performed at nominal rated power, 0.5 W, at + 85 °C.

Special Available Options:

Special marking
Special lengths for lead wires (L, LB Style)
Hooked leads
Alternate bushing and PC combinations
Power conditioning and screening operations

VISHAY TRIMMERS ARE INSPECTED

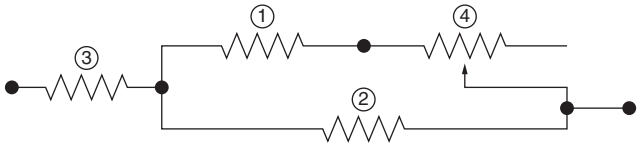
100 % for:

- Immersion
- Resistance tolerance check
- End resistance
- Visual-mechanical
- Dynamic tests for continuity, CRV

By sample for:

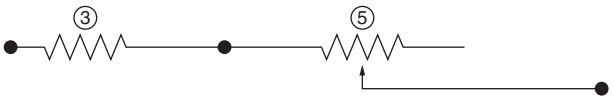
- TCR
- DWV

Circuit A is a conventional circuit employing a high value wire wound trimmer (4) linearized by two padding resistors (1 and 2) for the purpose of trimming resistor (3) to within less than 100 ppm absolute resistance.



Circuit A

Circuit B uses only a low value infinite resolution Vishay trimming potentiometer (5) to accomplish the same results. Saving in cost and board space is achieved. A low value wire wound trimmer cannot be used because of poor resolution.



Circuit B

TABLE 6 - GLOBAL PART NUMBER INFORMATION

NEW GLOBAL PART NUMBER: Y5050500R000K0L (preferred part number format)

DENOTES PRECISION	VALUE	CHARACTERISTICS (1)
Y	**R** = Ω **K** = kΩ	**0** = gold plated termination (lead (Pb)-free) **1 to 999** = custom

Y	5	0	5	0	5	0	0	R	0	0	0	K	0	L

PRODUCT CODE	TOLERANCE	PACKAGING
5050 = 1202L **0050** = 1202LB **0051** = 1202P **6050** = 1202PB **5051** = 1202Y **7050** = 1202YB	**J** = ± 5 % **K** = ± 10 % **M** = ± 20 %	**L** = foam/box pack

FOR EXAMPLE: ABOVE GLOBAL ORDER Y5050 500R000 K 0 L:
TYPE: 1202L
VALUE: 500.0 Ω
ABSOLUTE TOLERANCE: ± 10.0 %
TERMINATION: gold plated (lead (Pb)-free)
PACKAGING: foam/box pack

HISTORICAL PART NUMBER: 1202L 500R00 K B (will continue to be used)

1202L	500R00	K	B
MODEL	RESISTANCE VALUE	TOLERANCE	PACKAGING
1202L 1202LB 1202P 1202PB 1202Y 1202YB	500.0 Ω	**J** = ± 5 % **K**= ± 10 % **M**= ± 20 %	**B** = bulk pack

Note

(1) For non-standard requests, please contact application engineering.

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