

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

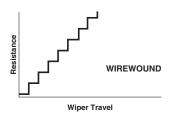
 Temperature coefficient of resistance (TCR): ± 10 ppm/°C maximum (3) (- 55 °C to + 150 °C ref. at + 25 °C); through the wiper $^{(4)}$; ± 25 ppm/°C



COMPLIANT

- 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, Δ SS Power rating: 0.5 W at + 85 °C
- Resistance range: 2 Ω to 20 k Ω
- "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)





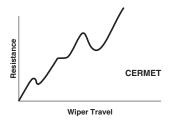


TABLE 1 - MODEL SELECTION						
MODEL	TERMINATION STYLE	AVERAGE WEIGHT (g)	POWER RATING at + 85 °C AMBIENT	NO. OF TURNS		
1202	P-In line PC pins	2.5		25 ± 2		
	Y-staggered PC pins (1)	2.5				
	L-flexible wire leads	3.3	0.5 W			
	LB-flexible wire leads with bushings	5.1				

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 ${\rm End}\text{-to-end}\ ^{(3)}$	± 10 ppm/°C maximum (- 55 °C to + 25 °C) ± 10 ppm/°C maximum (+ 25 °C to + 150 °C)			
2 Ω , 5 Ω , 10 Ω , 20 Ω Through the wiper $^{(4)}$	± 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 Δ R; 0.5 % maximum Δ R 0.1 % typical Δ R; 1.0 % maximum Δ R			
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			

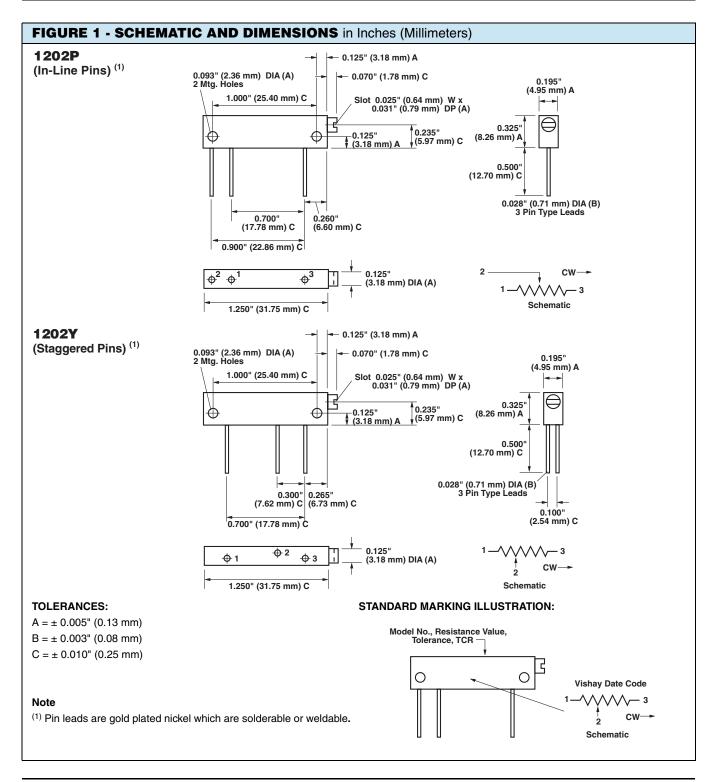
- Refer to page 4 for footnotes
- * Pb containing terminations are not RoHS compliant, exemptions may apply

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Vishay Foil Resistors

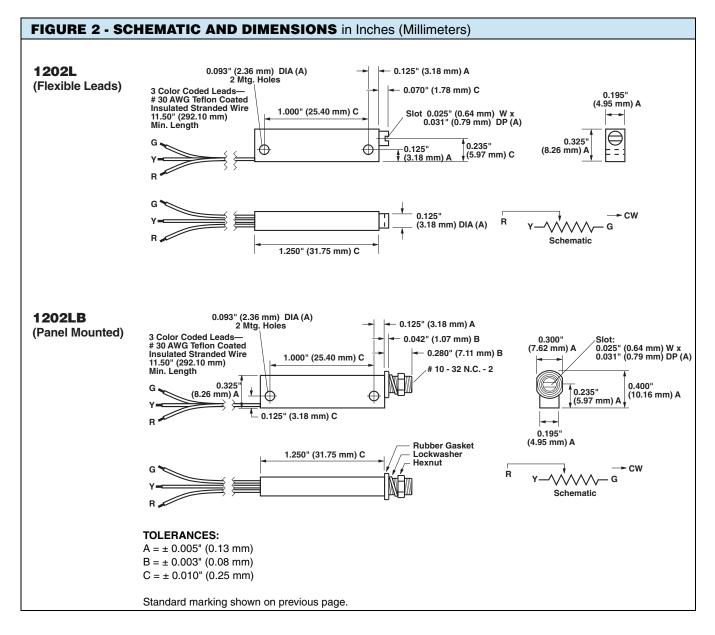


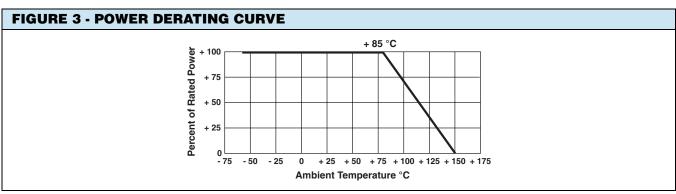
TABLE 4 - MECHANICAL SPECIFICATIONS				
Adjustment Turns	25 ± 2	Case Material	Glass fortified diallyl-phthalate (DAP); black	
Mechanical Stops	Wiper idles - no discontinuity	Shaft Torque	8 oz. in. maximum; 3 oz. in. typical	
Internal Terminations	All welded - no flux	Backlash	0.05 % typical	



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Vishay Foil Resistors



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

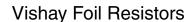
100 % for:

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

By sample for:

- TCR
- DWV

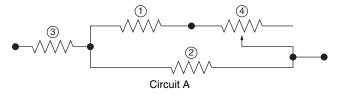
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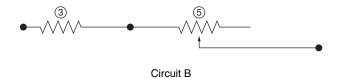


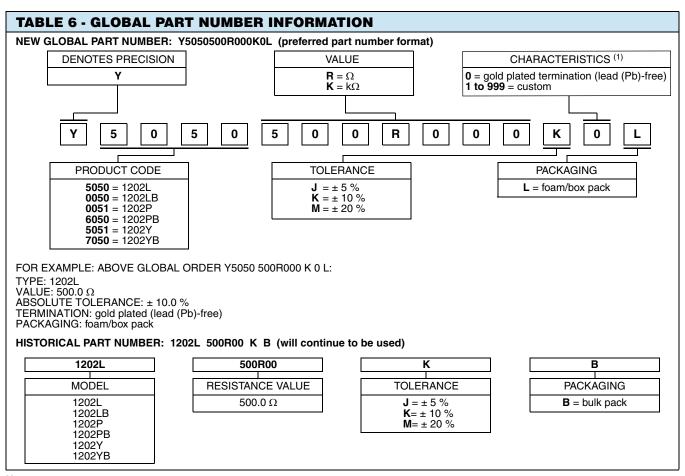


Circuit A is a conventional circuit employing a high value wire wound trimmer (4) linearized by two padding resistors (1 and 2) for the purpose of trimming resistor (3) to within less than 100 ppm absolute resistance.

Circuit 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.







Note

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

Legal Disclaimer Notice



Vishay Precision Group

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