



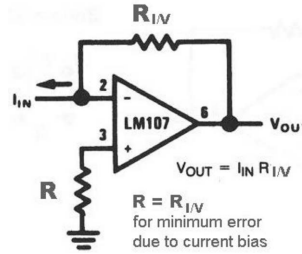
## Ultra Precise Current / Voltage Conversion Adapter

### FEATURES:

- Lightweight, compact size
- DMM direct plug-in with both banana jack and lug screw terminals.
- Full resistance range available, including from 0.1Ω to 1MΩ and beyond.
- Ultra low TCR and PCR for high precision in all conditions.
- Attaches directly to DMM or volt meter for ease of operation.
- For a IV conversion adapter with even greater stability and higher power capability see the TXATVP.

### DESCRIPTION:

The TXATV series resistor module is an ultra high precision reference standard resistor used to create a very accurate and stable voltage drop. When placed in series with the load of a circuit, it allows for a precise measurement of the current flow in that circuit. (This sometimes is referred to as current-to-voltage converter circuit, and vice versa). The TXATV is small, lightweight, features Bulk Metal® Foil, and can be attached directly to a digital voltage meter using the standard (0.75" spaced) 4mm, gold plated banana plugs.



(sample circuit only - there are many use variations)



Resistors made with Bulk Metal® Foil are known for their unique combination of unmatched performance in all major technical areas:

Temperature Coefficient of Resistance (TCR)	Tolerance
Power Coefficient of Resistance (PCR)	Thermal Stabilization
Voltage Coefficient of Resistance (VCR)	Load Life Stability
Thermal Electromotive Force (EMF)	Response Time
Electrostatic Discharge (ESD)	Noise

### The Best Available Performance Characteristics of Different Resistor Technologies

Technology	Temperature Coefficient of Resistance (TCR) -55°C to +125°C, +25°C ref.	Initial Tolerance	Accumulated End of Life Tolerance	Load Life Stability at +70°C, Rated Power at 2000 Hours and then at 10,000 Hours	ESD (V)	Thermal Stabilization	Noise (dB)
Bulk Metal® Foil	< ± 0.2 ppm/°C	From 0.001%	< 0.05 %	0.0025% (25 ppm) 0.005% (50 ppm)	25,000V	< 1 second	-42db
Thin Film	± 2 ppm/ °C	From 0.01%	< 0.4 %	0.02% (200 ppm) 0.10% (1000 ppm)	2,500V	> minutes	-35db
Thick Film	± 50 ppm/ °C	From 0.5%	< 5 %	0.5% (5000 ppm) 2% (20,000 ppm)	2,000V	> minutes	+20db
Wirewound	± 3 ppm/ °C	From 0.005%	< 0.5 %	0.05% (500 ppm) 0.15% (1500 ppm)	25,000V	> minutes	-35db

### TXATV SPECIFICATIONS

Model <sup>1</sup>	Resistance Value <sup>2</sup> (0.01Ω to 1MΩ)	Initial Resistance Tolerance/Accuracy <sup>2</sup>	Nominal Temperature Coefficient <sup>3</sup> TCR; ppm/°C (ΔR/degree due to temperature changes; typical + max spread)	Nominal Power Coefficient <sup>3</sup> PCR; ppm/watt (ΔR/watt due to self heating)	Max Working Current	Power Rating <sup>4</sup> (maximum continuous)	Max Working Voltage (or ≤ √P×R)
TXATV-0R1	0.1 Ω	1.00%	± 2.0 (± 6.0)	± 5 ppm	1000 mA	0.1 W	0.1 V
TXATV-1R0	1 Ω	0.5%	± 1.0 (± 4.5)	± 5 ppm	316 mA	0.1 W	0.316 V
TXATV-100	10 Ω	0.05%	± 0.2 (± 1.6)	± 5 ppm	100 mA	0.1 W	1 V
TXATV-101	100 Ω	0.01%	± 0.2 (± 0.8)	± 5 ppm	31.6 mA	0.1 W	3.16 V
TXATV-251	250 Ω	0.01%	± 0.2 (± 0.6)	± 5 ppm	20 mA	0.1 W	5 V
TXATV-102	1K Ω	0.005%	± 0.2 (± 0.6)	± 5 ppm	10 mA	0.1 W	10 V
TXATV-103	10K Ω	0.005%	± 0.2 (± 0.6)	± 5 ppm	3.16 mA	0.1 W	31.6 V
TXATV-104	100K Ω	0.005%	± 0.2 (± 0.6)	± 5 ppm	1 mA	0.1 W	100 V
TXATV-####	Custom <sup>2</sup>	TBD	TBD	TBD	TBD	TBD	300 V

1) For even greater long term initial tolerance stability choose the hermetically sealed "H" option. (e.g. TXATV-101H)

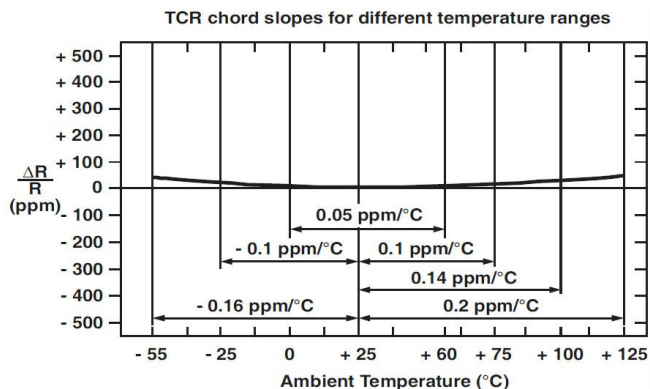
2) Do you need a specific resistance value or performance specification (greater or lesser) you don't see? Tell our engineers - we will make it for you!

3) The TXATV is uniquely designed to offset and compensate for both nominal TCR and PCR in combination, and for all other contributions to instability, to achieve a total potential value shift of less than 15 ppm due to all contributing factors, even at full power. (Total shift is directly related to the power applied.)

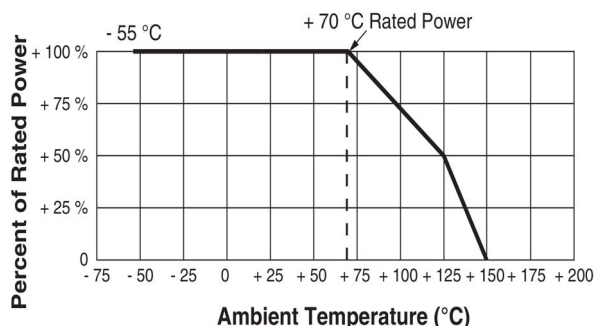
4) Do you need this stability at an even higher power rating, or even better stability at this power rating? Tell our engineers - we will make it for you!



### RESISTANCE/TEMPERATURE (TCR) CURVE [Statistically Combined Centerline for Bulk Metal® Z-Foil]

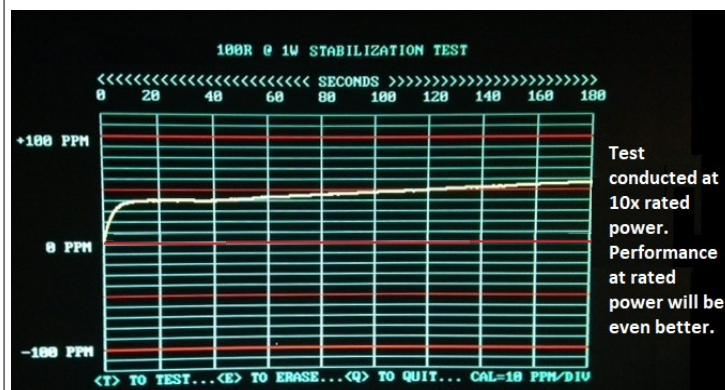


### POWER DERATING CURVE



### OTHER TXATV FEATURES & SPECIFICATIONS

- **Exceptional load life stability:** Nominally  $\pm 0.005\%$  at  $+70^\circ\text{C}$ , 2000 h and  $\pm 0.015\%$  at  $+70^\circ\text{C}$ , 10,000 h subject to applied power, but further enhanced/improved through in-house stabilization process. (Load life stability can be improved even more through further pre and post manufacturing operations, and actual use.)
- **Voltage coefficient of resistance (VCR):**  $< 0.1\text{ ppm/V}$
- **Electrostatic discharge (ESD):** at least to 25 kV
- **Capacitance:** 0.5 pF typical; 1.0 pF max (non-capacitive design)
- **Inductance:**  $< 0.08\ \mu\text{H}$  typical;  $0.1\ \mu\text{H}$  max; (non-inductive design)
- **Rise time:** 1.0 ns at  $1\text{ k}\Omega$  (effectively no ringing)
- **Current noise:**  $0.010\ \mu\text{V RMS/Volt}$  of Applied Voltage ( $< -40\text{ dB}$ )
- **Thermal EMF:**  $0.05\ \mu\text{V}/^\circ\text{C}$  typical ( $0.10\ \mu\text{V}/^\circ\text{C}$  max) and  $1\ \mu\text{V/W}$  ( $\mu\text{V}/^\circ\text{C}$  relates to EMF due to  $\Delta T$  wrt to leads and  $\mu\text{V/watt}$  due to the applied power)
- **Thermal stabilization time:**  $< 1\text{ s}$  (nominal value achieved within 10 ppm of steady state value)
- **Total accumulated  $\Delta R$  over life (EOL):** to  $\pm 0.05\%$  (an order of magnitude better than any other technology)
- **Lifetime warranty** (excluding damage or abuse)
- Made in the **USA!**



**Send us your current I/V module/resistor to test and compare, no charge!**

For more information about this subject or this product line,  
please call us at (+1) 713-468-3882  
or email us at [resistorinfo@texascomponents.com](mailto:resistorinfo@texascomponents.com)

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