

ABSOLUTE MAXIMUM RATINGS

Operating temperature range	-40 to +150°C (-40 to +302°F)
Storage temperature range	-55 to 165°C (-67 to +338°F)
Voltage	10 VDC Continuous (24 hours)

INTERCHANGEABILITY (with 100 mA maximum current)

Temperature	Resistance (Ohms)	Temperature	Resistance (Ohms)
-40°C (-40°F)	1584 ± 12 (1.9°C)	+60°C (140°F)	2314 ± 9 (1.1°C)
-30°C (-22°F)	1649 ± 11 (1.7°C)	+70°C (158°F)	2397 ± 10 (1.2°C)
-20°C (-4°F)	1715 ± 10 (1.5°C)	+80°C (176°F)	2482 ± 12 (1.4°C)
-10°C (14°F)	1784 ± 9 (1.3°C)	+90°C (194°F)	2569 ± 14 (1.6°C)
0°C (32°F)	1854 ± 8 (1.1°C)	+100°C (212°F)	2658 ± 16 (1.8°C)
+10°C (50°F)	1926 ± 6 (0.8°C)	+110°C (230°F)	2748 ± 18 (2.0°C)
+20°C (68°F)	2000 ± 5 (0.7°C)	+120°C (248°F)	2840 ± 19 (2.0°C)
+30°C (86°F)	2076 ± 5 (0.7°C)	+130°C (266°F)	2934 ± 21 (2.2°C)
+40°C (104°F)	2153 ± 6 (0.8°C)	+140°C (284°F)	3030 ± 23 (2.4°C)
+50°C (122°F)	2233 ± 7 (0.9°C)	+150°C (302°F)	3128 ± 25 (2.5°C)

It is recommended that resistance measurements be made at 100 μA or less to minimize internal heating of the sensor. Measurements at currents up to 1mA will not damage the sensor, but the resistance characteristics should be adjusted for internal heating.

Equation for computing resistance:

$$R_T = R_0 + (3.84 \times 10^{-3} \times R_0 \times T) + (4.94 \times 10^{-6} \times R_0 \times T^2)$$

R_T = Resistance at temperature T

R_0 = Resistance at 0°C

T = Temperature in °C

Figure 2
Linear Output Voltage Circuit

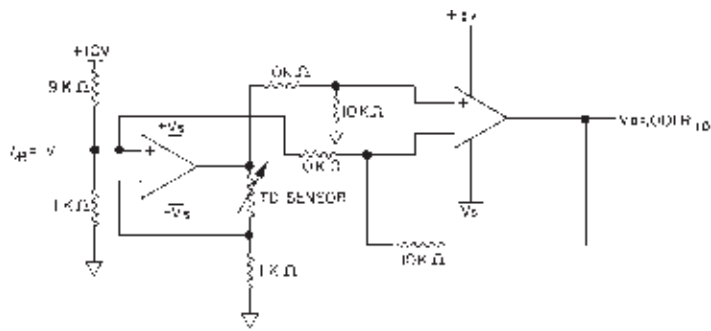
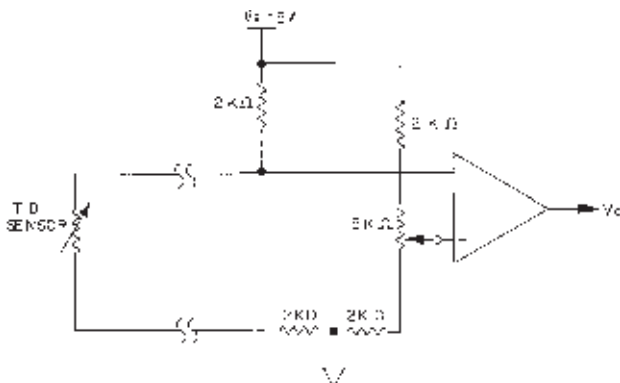


Figure 3
Adjustable Point (Comparator) Interface



Linearity

±2% (-25 to 85°C)

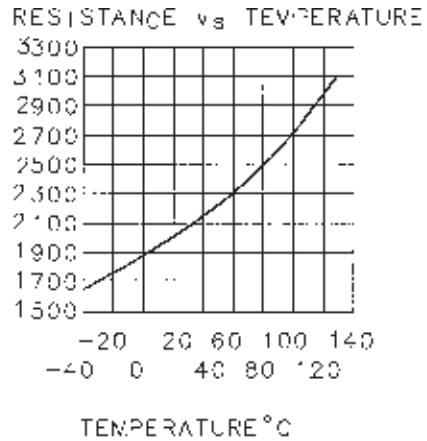
±3% (-40 to 150°C)

TD sensors can be linearized to within ±0.2%.

Repeatability

±1 Ω

Figure 1
TD Series Resistance vs Temperature



ELECTRICAL INTERFACING

The high nominal resistance, positive temperature coefficient and linear sensitivity characteristics of the TD Series temperature sensors simplifies the task of designing the electrical interface. Figure 2 is a simple circuit that can be used to linearize the voltage output to within 0.2% or a ±0.4°C error over a range of -40° to +150°C (-40° to +302°F).

In some applications, it may be desirable to detect one particular temperature. Figure 3 illustrates one way this can be accomplished. In the comparator circuit shown, the potentiometer can be adjusted to correspond to the desired temperature.