

TD Temperature sensors

TD1A Fast response temperature sensor

The TD1A is a small two-terminal fast response temperature sensor packaged onto a 0.2 inch square ceramic substrate. Termination pins are located on 0.1 inch centers to permit plug-in connection or PC board mounting. Typical response time (one time constant) for the TD1A is five seconds in moving air and 14 seconds in still air. Temperature rise is .25°C/milliwatt suspended in still air by #24 wires and .13°C/milliwatt suspended in still air.

TD2A Industry standard TO-92 package temperature sensor

The TD2A is a three-terminal (center lead not connected) precision temperature sensor packaged in an industry standard TO-92 transistor package. Typical response time (one time constant) for the TD2A is nine seconds in moving air and 30 seconds in still air. Temperature rise is .23°C/milliwatt suspended in still air.

TD3A Surface temperature sensor

The TD3A is designed primarily for sensing surface temperatures. The TD3A is packaged in an industry standard TO-220 transistor package. Typical response time (one time constant) for the TD3A is 75 seconds in still air, suspended by leads. Temperature rise is .04°C/milliwatt bolted to a metal plate. However, when mounted the response time is the same as the mounting surface.

TD4A Liquid temperature sensor

The TD4A is a two-terminal (threaded anodized aluminum housing) liquid temperature sensor. The package is environmentally sealed and designed for simplicity of installation, such as in the side of a tank. The TD4A is not designed to be totally immersed into liquids. Typical response time (one time constant) for the TD4A is four minutes in still air and five seconds in still water (unmounted position). Temperature rise is .12°C/milliwatt suspended by leads in still air and .08°C/milliwatt when mounted on one square foot .25" thick aluminum plate.

TD5A Miniature temperature sensor

The TD5A is designed for small size and low cost.

TD ORDER GUIDE

Catalog Listings	Description
TD1A	Fast response temperature sensor, 0.2 inch square ceramic package, 0.1 inch centers
TD2A	Industry standard TO-92 package temperature sensor, three leads (center lead not connected)
TD3A	Surface temperature sensor, standard TO-220 transistor package, .15" diameter hole for mounting
TD4A	Liquid temperature sensor, 1.50" threaded (3/8-24 UNF-2A) anodized aluminum housing, two six-inch black teflon insulated leads
TD5A	Miniature package for small size and low cost

Other Options

MICRO SWITCH has the capability to package the TD series in plastic, aluminum, brass, stainless steel or other materials depending on customer need and volume. By designing the sensing element of the TD sensor on a silicon chip, a great deal of versatility is possible. Custom packaging can be for surface, liquid or gas temperature sensing with signal conditioning electronics circuits possible.

Temperature sensors TD

INTERCHANGEABILITY (with 1 mA Max. Current)

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

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

NOTE: Overload testing shows 10 VDC continuous for 100 hours without damage.

Linearity*

- ±2% (- 25°C to 85°C)
- ±3% (- 40°C to 150°C)

Repeatability

±1 Ω

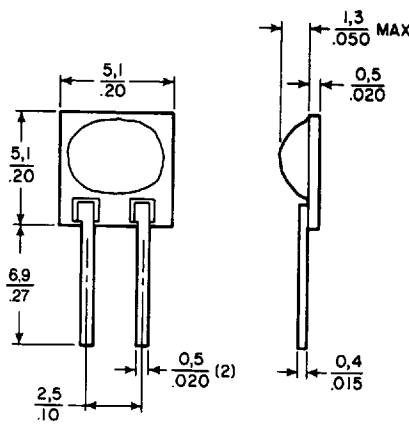
*TD sensors can be linearized to within ±.2%. Refer to TD Application Data.

Other Options

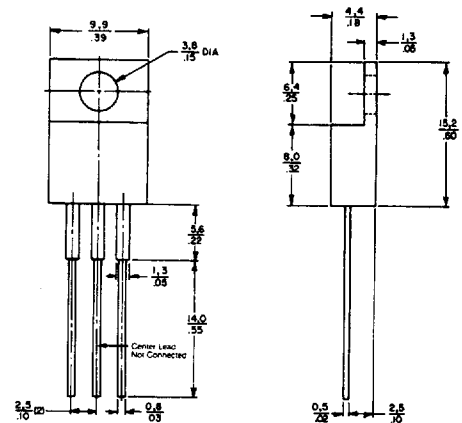
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MOUNTING DIMENSIONS (For reference only)

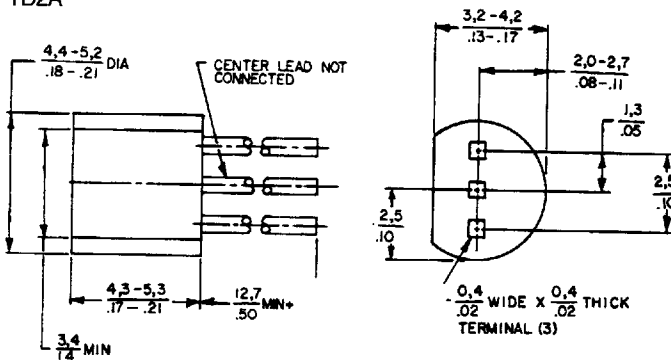
TD1A



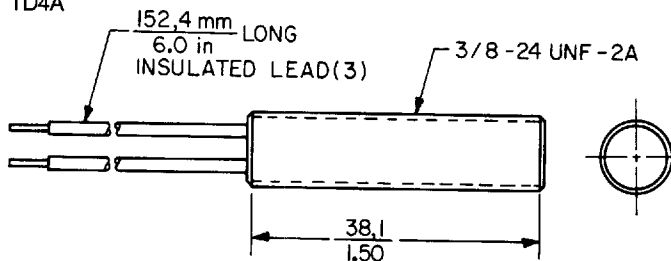
TD3A



TD2A



TD4A



TD5A

