ST-037-022-5000N

GENERAL

The **ST-037-022-5000N** is a Silicon Semiconductor "N"-doped bulk type Temperature Sensing Element that develops a large resistive change with temperature. This thermo-resistive device is etched from a solid piece of doped material and has a minimum of molecular slippages and/or dislocations resulting in a highly reliable device. When used as recommended, a signal resolvable to 0.001° F is possible.

Although the change in resistance with temperature is non-linear, when the temperature sensing element is used with passive resistive elements to form a bridge as shown in figure 1. the resulting signal is linearized by R3. The individual passive elements R1 and R2 have no effect on linearization and can be used to provide an offset or bridge balance at any temperature within the operating range.

The temperature sensing element can be bonded with epoxy to materials which can affect the data slightly due to the differences in thermal expansion between the silicon and the material to which it is being bonded. The effect is less than 1%/100°F for materials with a Thermal Coefficient of 10 microinch/inch/°F or less.

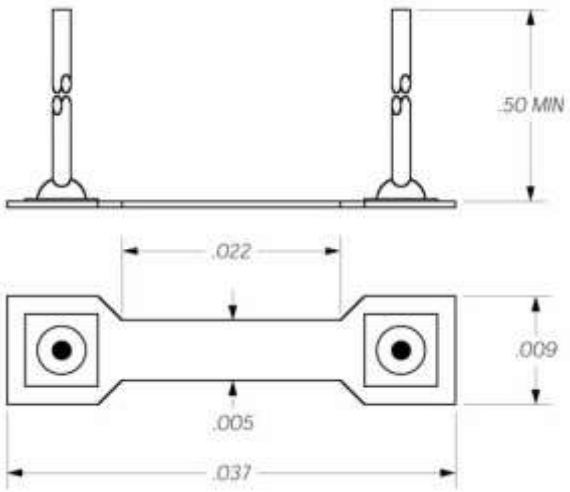
The mass of the temperature sensing element is small and will respond to a 180 deg F change of temperature in water in less than two milliseconds.

FEATURES

- HIGH RELIABILITY
- LOW COST
- FAST RESPONSE
- HIGH RESOLUTION

APPLICATIONS

Useful in Lines, Storage Tanks, Air Conditioners, Fuses and Anemometers



SPECIFICATIONS

Material	Czochralski pulled "N"-doped bulk Silicon
Resistance vs. Temperature (Nominal) 2,800 Ω (2600-3000) 5,000 Ω (4700-5300) 6,900 Ω (6500-7500)	Temperature Range -65°F 78°F 165°F
Reverse Resistance	Less than 0.2% of Reading at 78°F, Maximum
Thickness (Active Area)	.0005 inch (max)
Leads (gold)	0.0015 inch diameter with a 0.50 inch minimum length
Contact	Silicon Gold Nickel Fused
Attachment	Ball Bond
Linear Temperature Range (Bridged)	-65°F to +165°F
Operating Temperature Range	-100°F to +400°F
Linearity when operated in Bridge as specified	±0.25°F/100°F; ±0.5°F/200°F

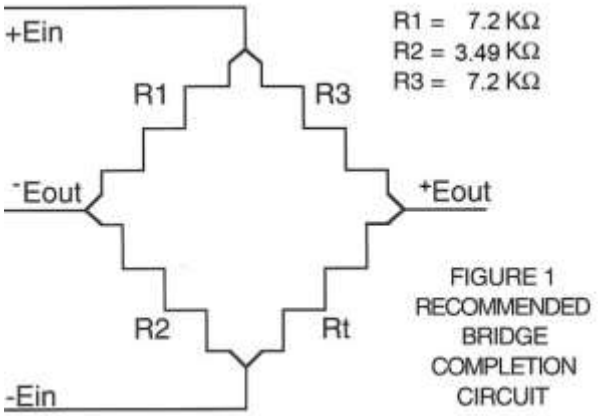


FIGURE 1
RECOMMENDED BRIDGE COMPLETION CIRCUIT

FIGURE 2
SIGNAL TO EXCITATION RATIO

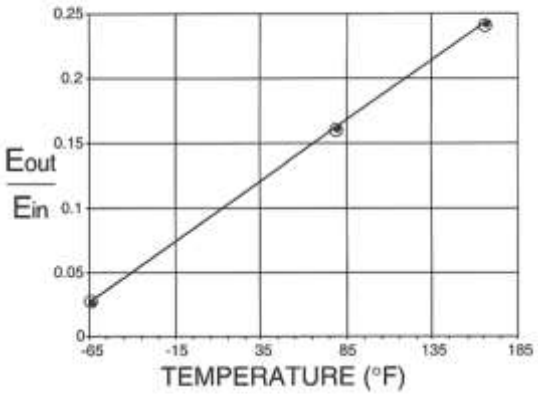
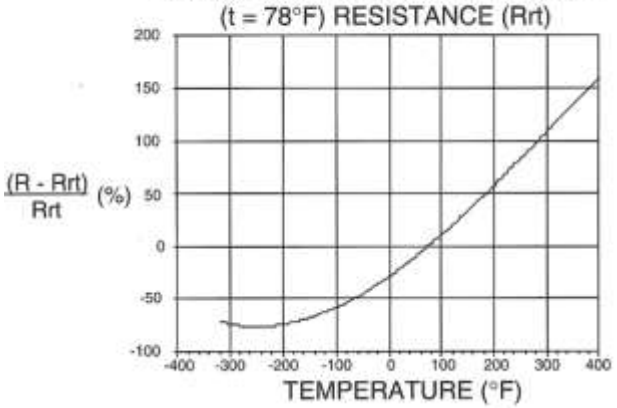


FIGURE 3
% CHANGE FROM ROOM TEMPERATURE
(t = 78°F) RESISTANCE (Rrt)



R= 0.025 T squared + 14.916 T + 3935
R= Sensor Resistance in Ohms
T= Degrees F