



# TEMPERATURE SENSOR

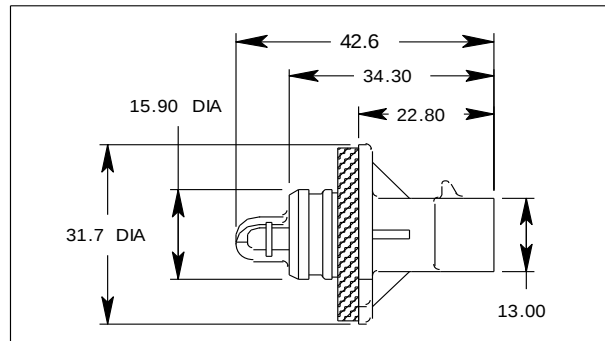
## PRODUCT DATA

### AIR TEMPERATURE SENSOR

PART NUMBER 12160245

#### FEATURES:

- Design for Manufacturability
- Cost Effective
- Robust Design
- Few Components
- Few Assembly Processes
- Thermistor Technology



#### THERMAL & ELECTRICAL PROPERTIES

Typical Voltage Supply: **5V DC**

Operating Temperature: **-40 C to 135 C**

Resistive Range (Ohms): **See Table**

Dissipation Constant: \* **9 mW/°C**

Thermal Time Constant: \*\* **< 15 sec**

Accuracy: **See Table**

#### MECHANICAL PROPERTIES

Sensor Body Material: **PBT 30% GF**

Mating Connector & Seal: **15335987 or**

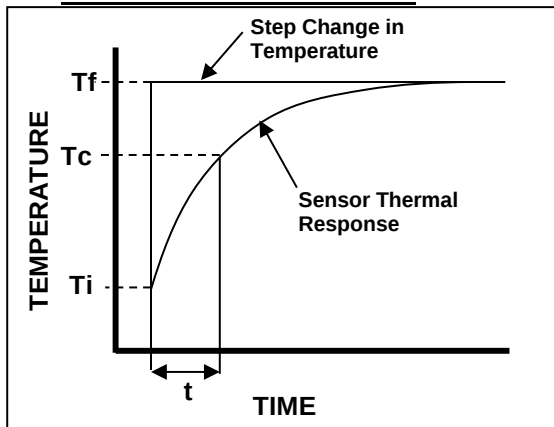
**equivalent**

Gasket Material: **Silicone Foam**

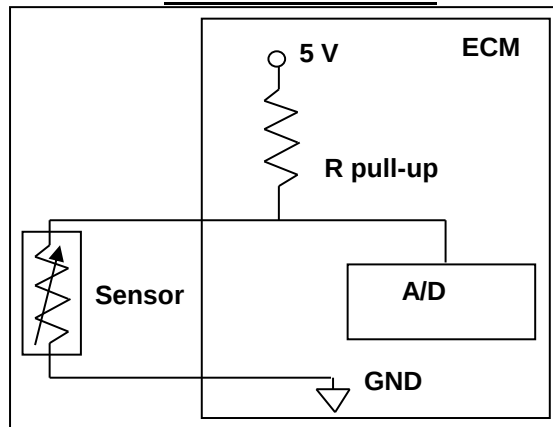
Overall Weight: **9.39 g**

Color: **Black**

#### THERMAL TIME CONSTANT



#### CIRCUIT SCHEMATIC



\* The ratio, at a specified ambient temperature, of the change in the power dissipation of the sensor to the resultant temperature change of the thermistor. Test medium: dry air stream flowing at 5000 mm/sec.

\*\* The time required for the sensor to achieve 63.2% of its steady state value when subjected to a step change in ambient temperature [ $T_c = (T_f - T_i) * 63.2\% + T_i$ ]. Test medium: dry air stream flowing at 5000 mm/sec.

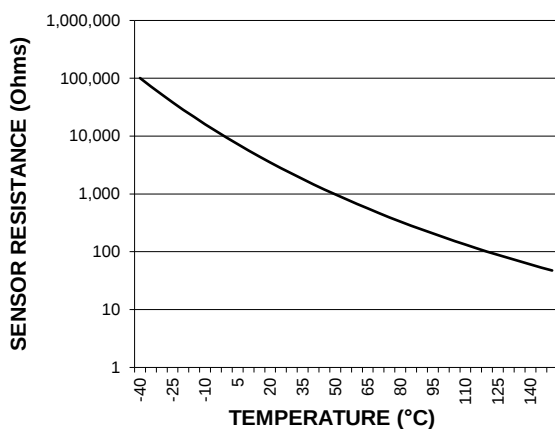
Part Revision Level: **001**  
Data Sheet Revision Date: **8/27/2020**



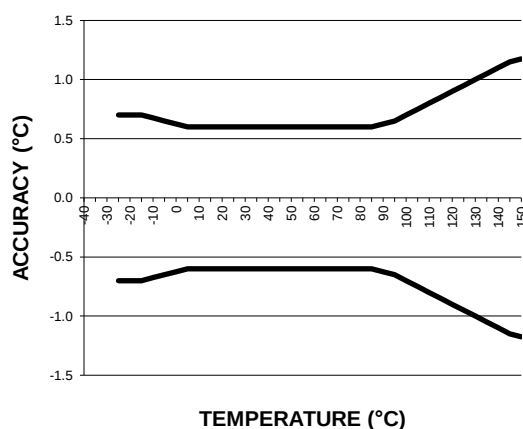
# TEMPERATURE SENSOR

## PRODUCT DATA

UNLOADED RESISTANCE vs TEMPERATURE  
CHARACTERISTIC CHART



TEMPERATURE ACCURACY CHART



| Temp<br>(°C) | Res<br>(Ohms) | Res<br>(±%) | Ref Acc<br>(±°C) | Temp<br>(°C) | Res<br>(Ohms) | Res<br>(±%) | Ref Acc<br>(±°C) | Temp<br>(°C) | Res<br>(Ohms) | Res<br>(±%) | Ref Acc<br>(±°C) |
|--------------|---------------|-------------|------------------|--------------|---------------|-------------|------------------|--------------|---------------|-------------|------------------|
| -40          | 100865        | 4.87        | 0.70             | 25           | 2795          | 2.50        | 0.60             | 90           | 241.8         | 2.10        | 0.70             |
| -35          | 72437         | 4.64        | 0.70             | 30           | 2240          | 2.45        | 0.60             | 95           | 207.1         | 2.21        | 0.70             |
| -30          | 52594         | 4.43        | 0.70             | 35           | 1806          | 2.40        | 0.60             | 100          | 178.0         | 2.31        | 0.80             |
| -25          | 38583         | 4.21        | 0.70             | 40           | 1465          | 2.36        | 0.60             | 105          | 153.6         | 2.42        | 0.80             |
| -20          | 28582         | 4.00        | 0.70             | 45           | 1195          | 2.31        | 0.60             | 110          | 133.1         | 2.52        | 0.90             |
| -15          | 21371         | 3.80        | 0.70             | 50           | 980           | 2.27        | 0.60             | 115          | 115.7         | 2.61        | 0.90             |
| -10          | 16120         | 3.60        | 0.60             | 55           | 809           | 2.23        | 0.60             | 120          | 100.9         | 2.68        | 1.00             |
| -5           | 12261         | 3.40        | 0.60             | 60           | 671           | 2.19        | 0.60             | 125          | 88.3          | 2.75        | 1.00             |
| 0            | 9399          | 3.21        | 0.60             | 65           | 559           | 2.15        | 0.60             | 130          | 77.5          | 2.80        | 1.10             |
| 5            | 7263          | 3.06        | 0.60             | 70           | 469           | 2.11        | 0.60             | 135          | 68.3          | 2.84        | 1.10             |
| 10           | 5658          | 2.92        | 0.60             | 75           | 395           | 2.07        | 0.60             | 140          | 60.3          | 2.87        | 1.20             |
| 15           | 4441          | 2.78        | 0.60             | 80           | 334           | 2.04        | 0.60             | 145          | 53.4          | 2.89        | 1.20             |
| 20           | 3511          | 2.64        | 0.60             | 85           | 283           | 2.00        | 0.60             | 150          | 47.5          | 2.90        | 1.20             |

**Important:** The values above are for the unloaded thermistor, as shipped from Merit Automotive Electronics Systems, and does not reflect the effects of application system errors and aging.

**Notes:** Please contact Merit Automotive Engineering for the resistance vs temperature curve for your temperature sensor application. Due to self-heating effects of the thermistor, the resistance is dependent upon the application.

Since thermistors are "continuous function devices", resistance vs temperature data is available for numbers beyond those specified above.