TGS 823 - for the detection of Organic Solvent Vapors

Features:
* High sensitivity to organic solvent vapors such as ethanol
* High stability and reliability over a long period
* Long life and low cost
* Ceramic base resistant to extreme environments

Applications:
* Breath alcohol detectors
* Gas leak detectors/alarms
* Solvent detectors for factories, dry cleaners, and semiconductor industries

The sensing element of Figaro gas sensors is a tin dioxide (SnO$_2$) semiconductor which has low conductivity in clean air. In the presence of a detectable gas, the sensor's conductivity increases depending on the gas concentration in the air. A simple electrical circuit can convert the change in conductivity to an output signal which corresponds to the gas concentration.

The TGS 823 has high sensitivity to the vapors of organic solvents as well as other volatile vapors. It also has sensitivity to a variety of combustible gases such as carbon monoxide, making it a good general purpose sensor. Its ceramic base can withstand severe environments as high as 200°C.

The figure below represents typical sensitivity characteristics, all data having been gathered at standard test conditions (see reverse side of this sheet). The Y-axis is indicated as sensor resistance ratio (Rs/Ro) which is defined as follows:

\[ \frac{Rs}{Ro} = \text{Sensor resistance of displayed gases at various concentrations} \]
\[ \frac{Rs}{Ro} = \text{Sensor resistance in 300ppm ethanol} \]

Sensitivity Characteristics:

The figure below represents typical temperature and humidity dependency characteristics. Again, the Y-axis is indicated as sensor resistance ratio (Rs/Ro), defined as follows:

\[ \frac{Rs}{Ro} = \text{Sensor resistance at 300ppm of ethanol at various temperatures/humidities} \]
\[ \frac{Rs}{Ro} = \text{Sensor resistance at 300ppm of ethanol at 20°C and 65% R.H.} \]

Temperature/Humidity Dependency:

<table>
<thead>
<tr>
<th>R.H.</th>
<th>35%</th>
<th>50%</th>
<th>65%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs/Ro</td>
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IMPORTANT NOTE: OPERATING CONDITIONS IN WHICH FIGARO SENSORS ARE USED WILL VARY WITH EACH CUSTOMER’S SPECIFIC APPLICATIONS. FIGARO STRONGLY RECOMMENDS CONSULTING OUR TECHNICAL STAFF BEFORE DEPLOYING FIGARO SENSORS IN YOUR APPLICATION AND, IN PARTICULAR, WHEN CUSTOMER’S TARGET GASES ARE NOT LISTED HEREIN. FIGARO CANNOT ASSUME ANY RESPONSIBILITY FOR ANY USE OF ITS SENSORS IN A PRODUCT OR APPLICATION FOR WHICH SENSOR HAS NOT BEEN SPECIFICALLY TESTED BY FIGARO.
**Item** | **Symbol** | **Condition** | **Specification**  
--- | --- | --- | ---  
Sensor Resistance | Rs | Ethanol at 300ppm/Air | 1k ~ 10k  
Change Ratio of Sensor Resistance | Rs/Ro | Rs (Ethanol at 300ppm/Air) / Rs (Ethanol at 50ppm/Air) | 0.40 ± 0.1  
Heater Resistance | Rr | Room temperature | 38.0 ± 3.0  
Heater Power Consumption | Pw | VH=5.0V | 660mW ± 55mW  

**Sensor Resistance (Rs)** is calculated by the following formula:

\[
Rs = \left( \frac{V_C}{V_{RL}} + 1 \right) \times R_L
\]

Power dissipation across sensor electrodes (Ps) is calculated by the following formula:

\[
Ps = \frac{V_C \times Rs}{\left( Rs + R_L \right)^2}
\]

For information on warranty, please refer to Standard Terms and Conditions of Sale of Figaro USA Inc.