EM3870B - Evaluation Module for TGS3870

Description:
This module facilitates evaluation of the characteristics of the TGS3870 gas sensor for the detection of both methane and carbon monoxide. Testing is simplified by using a continuous output signal generated by this module. While the driving mode of TGS3870 involves a 20-second heater cycle for intermittent detection, sensor response is converted into a continuous voltage signal by the software contained in the module's microprocessor.

Dimensions:

Circuit Diagram:

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Label</th>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vin</td>
<td>Input voltage</td>
<td>4.9–5.1V DC</td>
</tr>
<tr>
<td>2</td>
<td>Vout1</td>
<td>Output (CH4)</td>
<td>VRL1</td>
</tr>
<tr>
<td>3</td>
<td>Vout2</td>
<td>Output (CO)</td>
<td>VRL2</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground</td>
<td>-</td>
</tr>
</tbody>
</table>
Driving Condition:

![Diagram of driving condition with sampling points](image)

Calculated sensor resistance (Rs) from measured Vout:

The \( V_{OUT1} \) and \( V_{OUT2} \) signals can be obtained by measuring the voltage between CN1 Pin #2 and Pin #5 for \( V_{OUT1} \), and between CH Pin #3 and Pin #5 for \( V_{OUT2} \) respectively (see CN1 Pin Connections). The \( V_{OUT} \) values update once every 20 seconds per cycle. Sensor resistance (Rs) is calculated using the measured value of \( V_{OUT1} \) or \( V_{OUT2} \) according to the following formulas:

\[
Rs(k\Omega) = \frac{V_{IN} - V_{OUT}}{V_{OUT}} \times RL
\]

\[
Rs(k\Omega) = \frac{V_{IN} - V_{OUT1}}{V_{OUT1}} \times RL1 (CH4)
\]

\[
Rs(k\Omega) = \frac{V_{IN} - V_{OUT2}}{V_{OUT2}} \times RL2 (CO)
\]

### Notes:

1. **Evaluation use only**
   This module is designed for evaluation of the TGS3870 sensor only. Please do not use this module for any other purpose.

2. **Power supply**
   Please apply the specified voltage to CN1 Pin #1 pin for proper sensor operation and performance. If excessive voltage or reverse voltage is applied to the module, the module or the sensor may be damaged. **Please note that there is no protection circuit in this module.**

3. **VR1 and VR2**
   Please do not adjust VR1 or VR2. These items have been adjusted so that standard driving conditions are applied to the sensor. If they are changed, the sensor may be damaged.

4. **Impedance of equipment connected to CN1**
   The input impedance of equipment connected to the CN1 must be more than 1M\(\Omega\) in order to make precise data acquisition.

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Before purchasing this product, please read the Warranty Statements shown in our webpage by scanning this QR code.

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