

### EM5042A - Evaluation Module for TGS5042

#### Description:

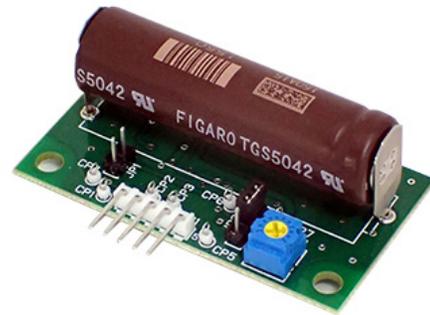
The EM5042A evaluation module is designed to perform the testing and evaluation of the electrochemical carbon monoxide sensor TGS5042, which features high selectivity to CO, high repeatability and a long life. This module is useful for evaluating basic performances of TGS5042 gas sensor, and as a reference of application circuit.

#### Features:

- \* Converts sensor output current to voltage output
- \* Module designed with electrical noise reduction for stable operation
- \* Anti-polarization circuit during power OFF period

#### Operation:

The TGS5042 CO sensor is placed into the sensor socket. EM5042A goes into normal operation within one minute after first being powered on. If CO gas is not present in ambient conditions, output voltage is 1.0V. If CO gas is present, the output current generated from the TGS5042 sensor<sup>(\*)</sup> is converted into output voltage. A linear relationship exists between output voltage and CO gas concentration. By measuring in advance the output voltage in a known CO gas concentrations, CO gas concentration can be calculated from the measured output voltage values<sup>(\*\*)(\*\*\*)</sup>.



\* Sensor not included

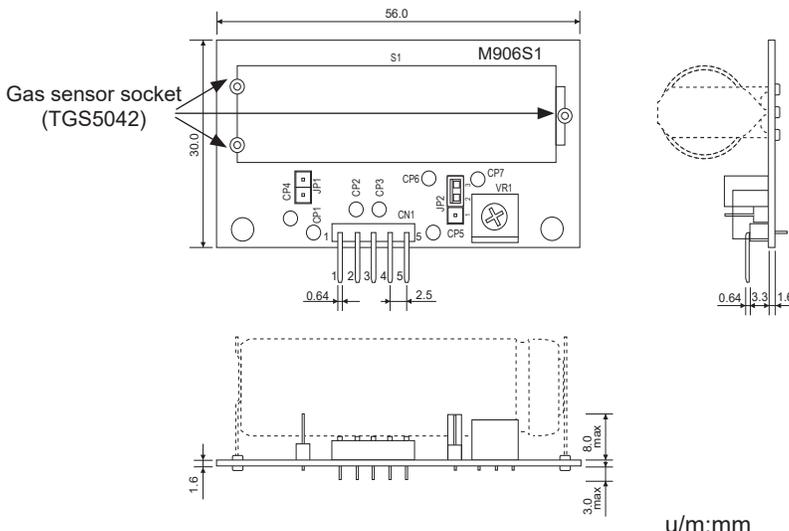
<sup>\*1</sup> For more details of characteristics and performance of TGS5042 sensor, refer to *Technical Information for TGS5042*.

<sup>\*2</sup> The main function of this module is to simply convert sensor output current into voltage output without temperature compensation. For more information on a temperature compensation circuit, refer to *Application*

*Notes for TGS5xxx* or contact Figaro.

<sup>\*3</sup> A calibration curve is available upon request if this module is ordered together with the sensor. The calibration curve represents the relationship between CO gas concentration and output voltage of the module with a particular sensor. The calibration curve is provided for reference purposes only.

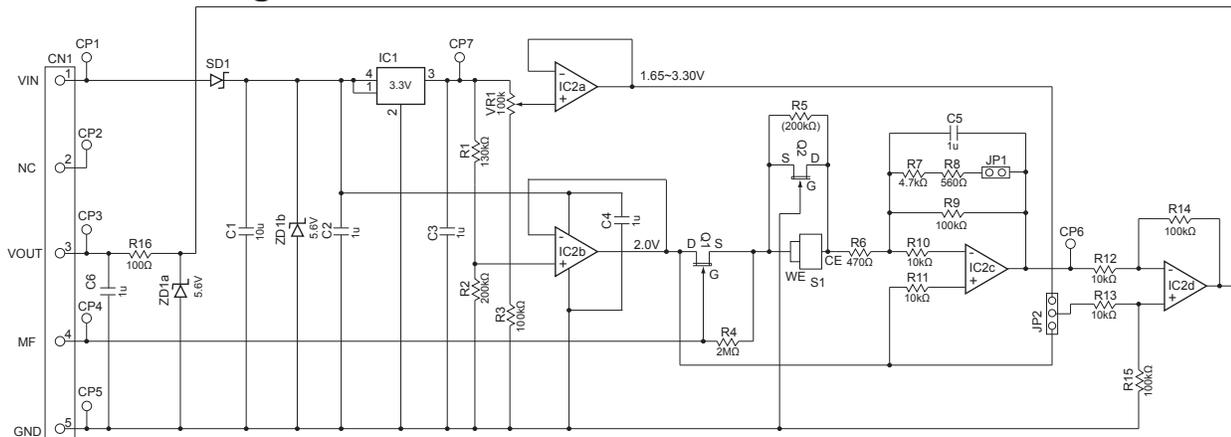
#### Dimensions:



u/m:mm

- \* The sensor is to be put in the sensor socket as shown in the above photo.
- ⚠ The pin tip of the sensor is sharp. Be careful to avoid injury when handling.
- \* Suggested female connectors mating to the 5 pin connector (JST MB5P-90S):  
JST XHP-5P or  
JST 05JQ-BT

### Schematic Diagram:



### Pin Connections:

| Pin No. | Name | Description                  |
|---------|------|------------------------------|
| 1       | VIN  | Input voltage 5.0±0.2V DC    |
| 2       | NC   | No connection                |
| 3       | VOUT | Output voltage               |
| 4       | MF   | Self-diagnosis control input |
| 5       | GND  | Ground                       |

Sensor output current  $I_s$  (A) is calculated from output voltage  $V_{OUT}$  (V) between Pin #3 ( $V_{OUT}$ ) and Pin #5 (GND) using the following formula:

$$I_s = (V_{OUT} - 1.0) / (1.0 \times 10^6)$$

### Specifications:

| Item                         | Specification   |
|------------------------------|---|
| Product Name                 | Evaluation module for TGS5042                                   |
| Model No.                    | EM5042A   |
| Target gas                   | Carbon monoxide   |
| Current consumption          | <0.5mA  |
| Output voltage ( $V_{OUT}$ ) | 1.00±0.05V DC in zero air<br>up to $V_{IN}$ -0.5V max in CO gas |
| Output amplification factor  | $1.0 \times 10^6$   |
| Operating conditions         | 0~60°C, <95%RH (no temp compensation)                           |

#### NOTE1:

Maximum measurable concentration is about 1,500ppm when input supply voltage is 5V in std specifications. For higher concentrations, please contact Figaro Engineering Inc.

#### NOTE2:

Please contact Figaro Engineering Inc. for use of self-diagnosis control input Pin No. 4.

#### NOTE3:

Please do not touch or adjust VR1, JP1 and JP2. These items have been adjusted so that standard driving conditions are applied. If changed, the sensor may be damaged.

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



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