

# EM5042 - Evaluation Module for TGS5042

### Description:

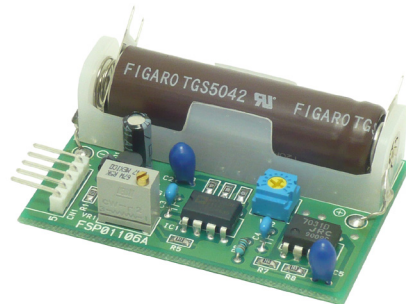
The EM5042 evaluation module is designed to perform the testing and evaluation of the electrochemical carbon monoxide sensor TGS5042, which features high selectivity to CO, high repeatability and a long life. This module is useful for evaluating basic performances of TGS5042 gas sensor, and as a reference of application circuit.

### Features:

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

### Operation:

The TGS5042 CO sensor is placed into the sensor socket. EM5042 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><sup>(\*\*\*)</sup>.



\* Sensor not included

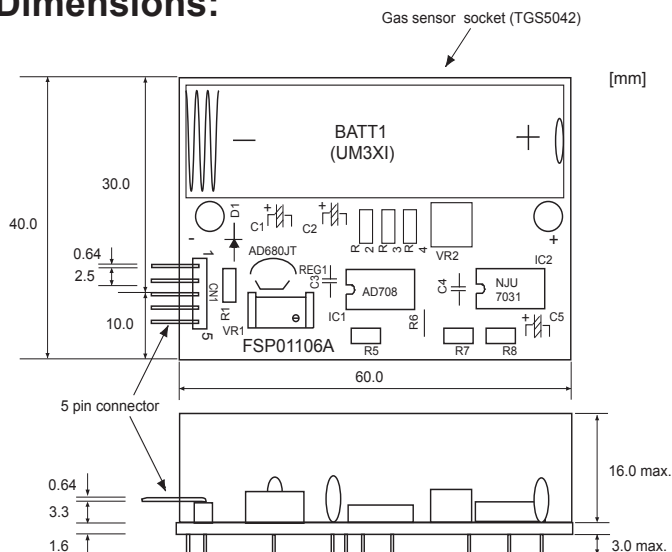
<sup>\*1</sup> For more details of characteristics and performance of TGS5042 sensor, refer to *Technical Information for TGS5042*.

<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 TGS5042* or contact Figaro.

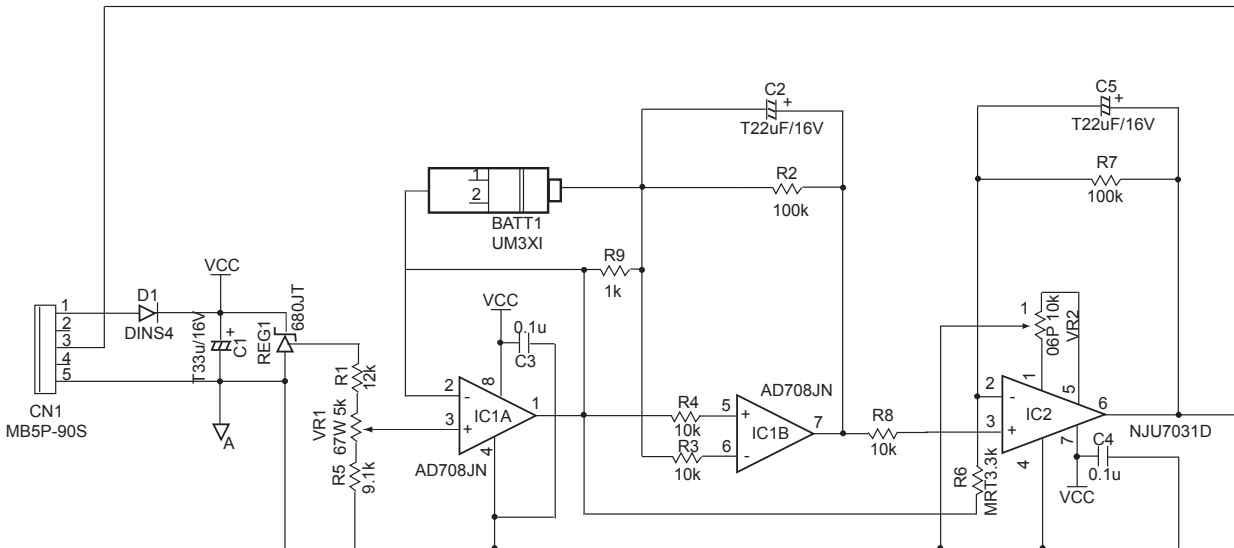
<sup>\*3</sup> A calibration curve is available upon request if this module is ordered together with the sensor. The calibration curve represents the relationship between CO gas concentration and output voltage of the module with a particular sensor. The calibration curve is provided for reference purposes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

### Dimensions:



- \* 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	V <sub>IN</sub>	Input voltage   7.0~12.0V DC
2	NC	No connection
3	V <sub>OUT</sub>	Output voltage   1.0~V <sub>IN</sub> -0.5V DC
4	NC	No connection
5	GND	Ground

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

$$I_s = (V_{OUT} - 1.0) / 3.13$$

## Specifications:

Item	Specification
Product Name	Evaluation module for TGS5042
Model No.	EM5042
Target gas	Carbon monoxide
Input voltage range ( $V_{IN}$ )	7.0~12.0V DC
Power consumption	35mW max (at 12V DC input voltage)
Output voltage ( $V_{OUT}$ )	1.0 $\pm$ 0.05V DC in zero air up to $V_{IN}$ -0.5V max in CO gas
Output amplification factor	(3.13 $\pm$ 0.3) $\times 10^6$
Operating conditions	0~60°C, <95%RH (no temp compensation)

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