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MiCS-BGSM2 Evaluation Kit

This data sheet describes the MiCS-BGSM2 customer evaluation kit. The BGSM2 is a basic module for customer evaluation of all TO 39 metal can type gas sensors. As such it cannot be used to evaluate any surface mounted MiCS gas sensor types. The kit comprises one evaluation circuit board and five MiCS sensors, which can be individually connected to the BGSM2 to enable customer evaluation and general performance testing (see below).

ORDERING CODES

BGSM2-5135 - Evaluation Kit plus five MiCs-5135, VOC sensor.

BGSM2-2610 - Evaluation Kit plus five MiCs-2610, ozone sensor.

BGSM2-XXXX - Evaluation Kit plus five MiCs-XXXX, XXX sensor.

All types of MiCS gas sensor need a voltage (V_h) to power the heater in order to heat up the sensitive layer to provide a response to the target gas. Dependent upon the application, this voltage can be either a constant DC voltage, or pulsed. The BGSM2 is operated from a standard 12 V constant voltage power supply unit. When operating the heater in constant voltage mode, the BGSM allows a fine adjustment of the heater voltage via R2 trimmer.

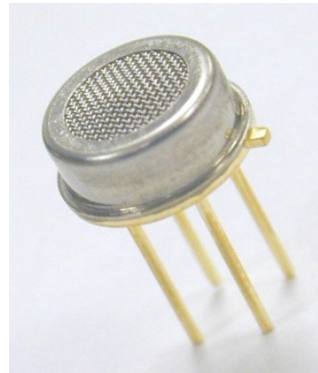
For pulsed operation, the pulse voltage V_h must be supplied externally on pin 2 and the jumper J2 must be disconnected (see relevant data sheet for the heater voltage limits).

The output signal is read between the sensitive layer resistance R_s and the load resistor: pin Sensor Out.

DESCRIPTION OF THE CIRCUIT BOARD

The module is mounted on a 33 x 25 mm single-layer PCB (thickness 1.6 mm) as illustrated below. It includes the following components:

- A 4-pin socket to plug the MiCS sensor, note pin positioning.
- A 4-pin connector (J1) to power the module and read the sensor output signal.
- A regulator (U1) to power the sensitive layer (5 V).
- A regulator (U2) to power the heater (adjustable voltage with R2 trimmer).
- A load resistance R1 (the value can be changed).
- A jumper (J2) to select if the heater resistance is powered with the internal voltage regulator or with an external power supply applied to "Heater+".



Sensor in TO 39 Package

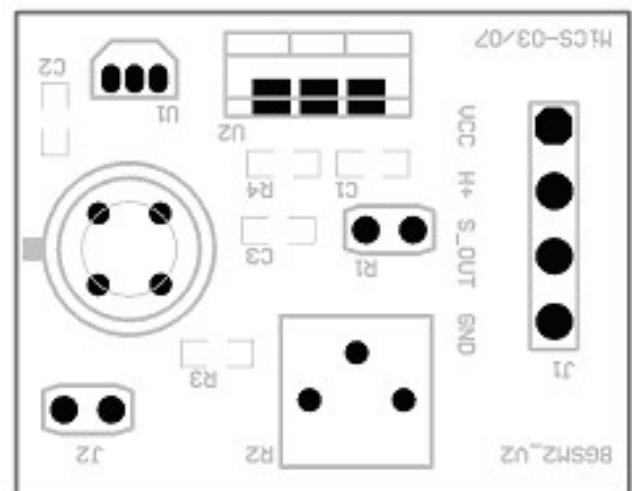


Illustration of PCB



Basic Module (without sensor)

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BGSM2 TEST BOARD OPERATION

Constant Heater Voltage Mode (Isothermal)

Initial setting of heater voltage (without the sensor in place).

- Plug a 75 Ω resistor between the heater pins of the G1 socket.
- Apply 12 V between Vcc input and GND.
- Monitor the voltage applied to this dummy "heater" resistance between Heater+ pin and GND.
- Adjust the potentiometer R2 so that the voltage measured between Heater+ pin and GND equals the value specified in the sensor data sheet.
- Unplug the 75 Ω resistor.
- Turn the 12 V supply off.
- Plug in the sensor. Make sure the mark on the sensor housing is aligned to the mark on the socket.
- Adjust the heating power by carefully tuning the Heater+ voltage according to the data sheet.
- Monitor the sensor signal voltage on Sensor Out pin

It may be necessary to change the load resist unit, or (ref R1), supplied with the unit. The following resistor values are supplied with the BGSM2 unit: 10 k Ω , 33 k Ω , 100 k Ω and 300 k Ω . These load resistors, when fitted into sockets marked R1, are used to change the load resistor value. The value of this load resistor should be set to be close to that of the resistance of the sensor sensitive layer allowing the voltage at the "Sensor Out" terminal referenced to GND to be approximately 2.5 V.

The value of R_S is given by:

$$R_S = (R_L \times V_S) / (V_{CC} - V_S)$$

V_S = voltage monitored on pin Sensor Out

R_L = load resistor (R_{load})

V_{CC} = 5 Volts.

Pulsed Heater Voltage Mode

- Apply 12 V between Vcc (J1: pin VCC) and GND (J1: pin GND).
- There must be no jumper on J1.
- Apply the required pulsed voltage on pin Heater+.
- Monitor the sensor voltage on Sensor Out.

For further technical advice, contact e2v technologies ltd.