MQ-135 AIR QUALITY & HARMFUL GAS SENSOR BOARD

WITH ANALOG AND DIGITAL OUTPUT

SPECIAL FEATURES

- Detects benzene, ammonia, sulfide, smoke, nitrogen oxides, and other air pollutants
- Measurement range of approximately 10 to 1,000 ppm
- Analog output (0–5 V) for continuous gas concentration monitoring
- Digital threshold output with adjustable trigger via on-board potentiometer
- Operates from a standard 5 V DC supply with integrated heater circuit
- Compact sensor board with LED status indication and flexible mounting options

The MQ-135 gas sensor board is a semiconductor-based sensing module designed for the detection of various harmful gases and general air pollution. The sensor responds to benzene, ammonia, sulfide compounds, nitrogen oxides, smoke, and other air contaminants, making it suitable for air quality monitoring, environmental measurement systems, and safety-related applications. The typical detection range extends from 10 to 1,000 ppm.

The module operates from a 5 V DC supply and integrates the required heater circuitry for stable sensor operation. Gas concentration is evaluated via an analog voltage output in the range of 0 to 5 V, derived from the change in sensing resistance. In addition, a digital output is provided via an onboard comparator with an adjustable threshold, allowing direct use in alarm or switching applications without external signal conditioning.

After each power-up, the sensor requires a heat-up time of approximately 10 to 15 minutes before reliable measurements can be obtained. For initial commissioning, a burn-in period of 48 to 168 hours of continuous operation is recommended to stabilize the sensing element. Following this period, a baseline resistance measurement in clean air should be recorded as a reference value. If the sensor has been powered off for several weeks or longer, repeating the burn-in and baseline procedure is advised to maintain measurement consistency.

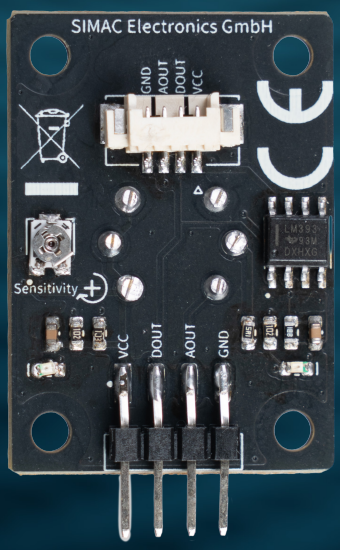
The board is equipped with power and status LEDs for visual indication of operation and detection status. For mechanical and layout flexibility, the LEDs may alternatively be soldered on the opposite side of the PCB. Electrical interfacing is provided via a 4-pin 2.54 mm header and a Molex PicoBlade connector, enabling straightforward integration into embedded systems, microcontroller platforms, and gas detection devices.

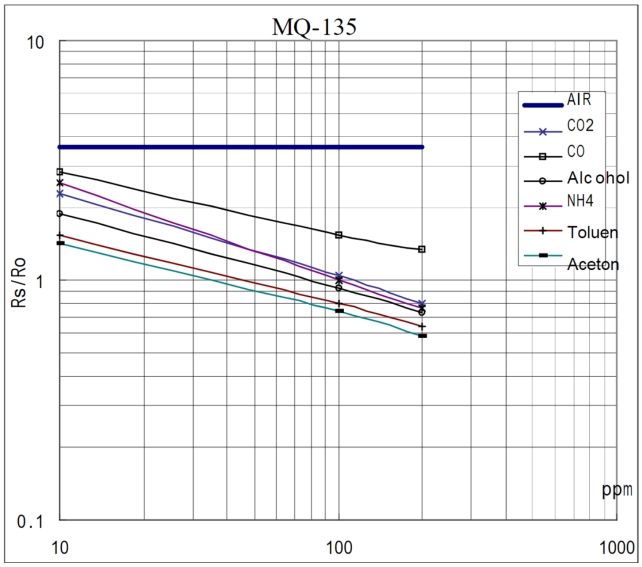
MAIN FEATURES

Measurable substances	Benzene, Ammonia, sulfide, smoke, Nitrogen oxides and other air pollution
Measurement range	10 - 1000 ppm
Application areas	Detecting gas leaks, gas alarm, robotic, microcontroller projects
Supply voltage	5 V DC
Output	Analog sensor value output 0 V - 5 V, digital threshold output 0 V / 5 V (threshold adjustable with onboard potetiometer
Heat up time	At every start of the sensor it needs to heat up for 10 to 15 minutes before the sensor can deliver a reliable value.
Burn-in time	When first used, the sensor requires a burn-in period of 48 to 168 hours of continuous operation to stabilize the sensing element; afterwards, a baseline reading should be taken in clean air to establish a reliable reference value. This procedure should be repeated if the sensor has been powered off for several weeks or longer.
LED indicator	Power LED (green), status LED (red) You can also solder the LEDs on the opposite side of the board to adapt it to the requirements of your project
Interfaces	4pin pin header (2.54 mm), molex picoblade (53261-0471)

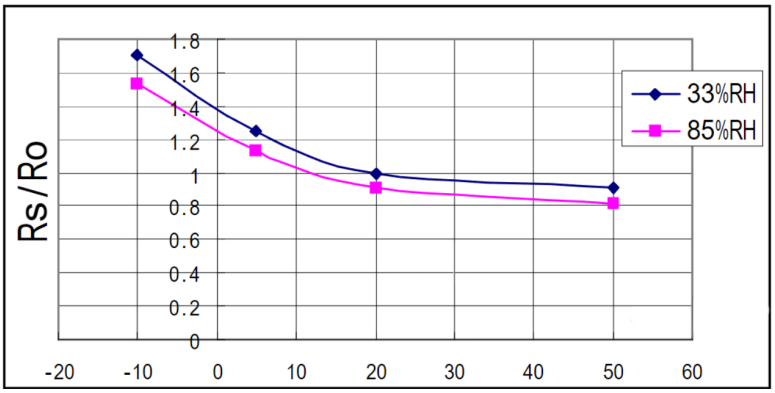
FURTHER INFORMATION

Weight	8 g
Dimensions (l x w x h)	41 x 25 x 21 mm
Article number	SEN-MQ135-V2
Scope of delivery	MQ135 sensor board
Customs tariff number	90269000
EAN	4250236830629





This shows the typical sensitivity characteristics of the MQ-135. Rs means resistance of the sensor in different gases, Ro means resistance of sensor in 1000ppm NH3.



Correlation between sensor resistance(Rs) and ambient temperature and humidity
The resistance of the sensor can be calculated with the following formula:

$$R_s = \left(\frac{V}{V_{RL}} - 1 \right) \times R_L$$

V= Supply voltage (5 V); V_{RL}= Analog pin voltage; R_L= Load resistance (1500 Ω)