

Carbon Monoxide Sensor



AS-MLC

Whether for air quality, safety or control, sensor applications have one common requirement: a reliable sensor component. AppliedSensor's ability to micro-machine sensor chips using standard silicon wafer technology allows to produce consistently reliable sensors in high volumes for mass market applications.

Unique micro machined, low power sensor design

AppliedSensor's high-performance ML sensor components offer reduced power consumption and increased packaging flexibility. The sensors are produced by combining the benefits of thick film, thin film and patents pending technologies on silicon substrate. Heater and interdigital electrode structures are positioned on a 1 μm -thin membrane on top of which is deposited a tin dioxide sensitive layer that creates gas concentration-dependent conductivity.

The sensor component has high sensitivity and selectivity to carbon monoxide and is packaged in a standard TO-39 (solid TO-5), 4-pin header. For further cost efficiency, the low heat-generating micro-machined chip may be adhered directly to a printed circuit board (Chip on Board packaging).

AppliedSensor achieves high selectivity to CO by applying an optimized operation mode in combination with an active charcoal filter. Comprehensive application development, including complete electronics and firmware integration, is available.

Key Benefits

- High sensitivity to CO (0.5 to 500 ppm)
- Very low power consumption
- Long lifetime
- Low cross sensitivity
- Long term stability

Typical Applications

- Carbon monoxide monitoring and leakage detection

Features

Dimensions

Chip size	2x2 mm
Including header	Ø: 10 mm, height: 11 mm

Operational Conditions

Operation temperature range	250°C - 300°C
Typical operation temperature	270°C

Environmental Conditions

Ambient temperature range	-40°C - 120°C (lower than op. temp.)
Ambient humidity	0 - 95% RH

Electrical Characteristics

Power consumption	35 mW at 270°C
Typical sensor resistance during operation in air (50% RH)	100 kΩ range
Typical sensor resistance during operation in 30 ppm CO (50% RH)	1 kΩ range
Signal output component	Resistance

Heater

Typical heater voltage	~2.3 V for 270°C
Temperature coefficient rel. to R(20°C)	TC~1700 ppm/K
Typical heater resistance at RT	95 Ω

Sensing Properties

Concentration range	Can withstand 1% CO in air
Sensitivity range	0.5 - 500 ppm
Typical response / recovery time	Seconds
Expected lifetime	Years
Cross sensitivity	Limited cross sensitivity to humidity, hydrogen and hydrocarbons

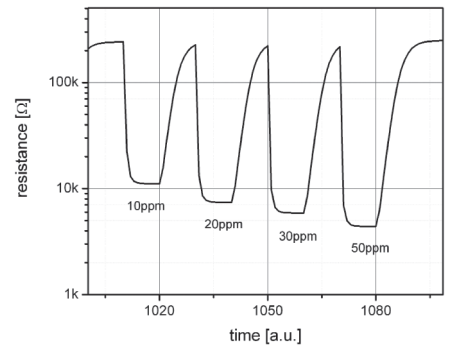
Packaging Options

Standard TO-39 (solid TO-5) package with protection membrane.
Pre-mould packages.
Chip on board solutions.

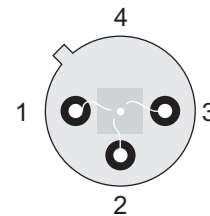
Restrictions

Contact of the sensitive layer with liquids shall be avoided.
Do not operate gas sensors in the vicinity of silicone and polysiloxanes.

Typical Sensor Response



Pin Layout

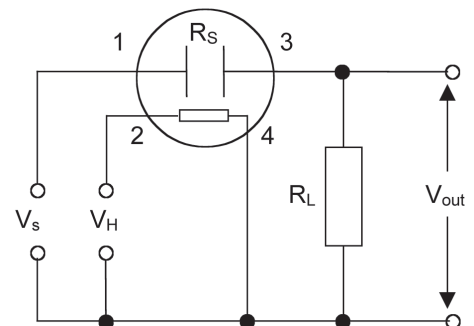


Top view AS-MLC Sensor Component

Pin Function

1	Sensor electrode 1
2	Heater power
3	Sensor electrode 2
4	Heater ground

Basic Measuring Circuit (Exemplified and Simplified)



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