

## Natural Gas Sensor



### AS-MLK

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  $\mu\text{m}$ -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 natural gas 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).

With an optimized operation mode, the MLK sensor is highly selective to natural gas with minimal cross-sensitivity from other chemical compounds and humidity. AppliedSensor offers comprehensive application development including complete electronics and firmware integration.

#### Key Benefits

- High sensitivity to  $\text{CH}_4$  (0.01 to 4%)
- Very low power consumption
- Long lifetime
- Low cross sensitivity
- Long term stability

#### Typical Applications

- Natural gas monitoring and leakage detection

## Features

### Dimensions

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

### Operational Conditions

Operation temperature range	300°C - 350°C
Typical operation temperature	320°C

### Environmental Conditions

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

### Electrical Characteristics

Power consumption	41 mW at 320°C
Typical sensor resistance during operation in air (50% RH)	1 MΩ range
Typical sensor resistance during operation in 0,5% CH <sub>4</sub> (50% RH)	100 kΩ range
Signal output component	Resistance

### Heater

Typical heater voltage	~2.7 V for 320°C
Temperature coefficient	TC~1700 ppm/K
Typical heater resistance at RT	95 Ω

### Sensing Properties

Concentration range	Can withstand 10% CH <sub>4</sub> in air (explosion proof version)
Sensitivity range	0.01 to 4%
Typical response / recovery time	Seconds
Expected lifetime	Years
Cross sensitivity	Limited cross sensitivity to humidity, hydrogen and hydrocarbons

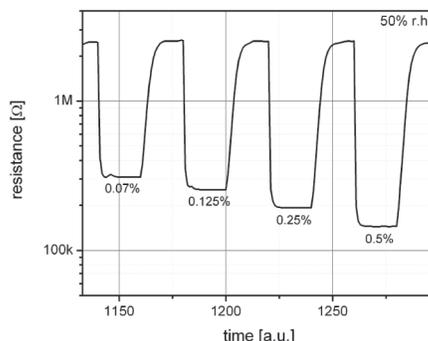
### Packaging Options

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

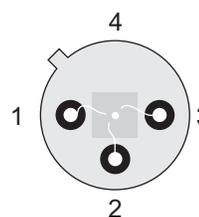
### Restrictions

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

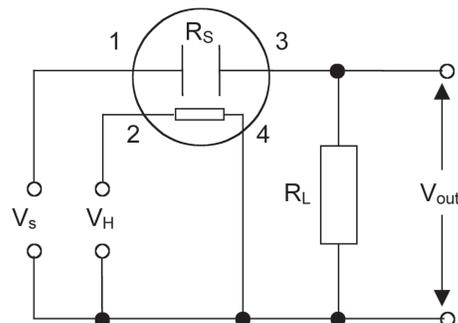


Top view AS-MLK Sensor Component

### Pin Function

<b>1</b>	Sensor electrode 1
<b>2</b>	Heater power
<b>3</b>	Sensor electrode 2
<b>4</b>	Heater ground

## Basic Measuring Circuit (Exemplified and Simplified)



AppliedSensor is not responsible for the design, implementation, manufacture or results from use of products that incorporate AppliedSensor components unless expressly agreed to in writing. Prior to using or distributing any product that incorporates AppliedSensor components, users and distributors should assure adequate design, testing and operating safeguards, and consult with AppliedSensor's technical staff, as necessary. All AppliedSensor components and services are sold subject to AppliedSensor's terms and conditions of sale. For the most current AppliedSensor product information and terms and conditions of sale visit us at [www.appliedsensor.com](http://www.appliedsensor.com). AppliedSensor and the AppliedSensor logo are trademarks of AppliedSensor Sweden AB, AppliedSensor GmbH and AppliedSensor, Inc. Copyright © 2009 AppliedSensor Sweden AB. 08.09

**AppliedSensor Sweden AB**  
Diskettgatan 11  
SE-583 35 Linköping, Sweden  
Tel: +46 13 262 929  
Fax: +46 13 262 929

**AppliedSensor GmbH**  
Gerhard-Kindler-Str. 8  
72770 Reutlingen, Germany  
Tel: +49 7141-51486-0  
Fax: +49-7121-51486-29

**AppliedSensor, Inc.**  
53 Mountain Boulevard  
Warren, NJ 07059, USA  
Tel: +1 908 222-1477  
Fax: +1 (908) 222-1478

3008 PAR 自动化 <http://www.sensor-ic.com/> TEL: 0755-83376549 FAX: 0755-83376182 E-MAIL: szss20@163.com  
[www.appliedsensor.com](http://www.appliedsensor.com)

