



# MiCS-VZ-89TE

## Integrated sensor board for indoor air quality monitoring

The MiCS-VZ-89TE combines state-of-the-art MOS sensor technology with intelligent detection algorithms to monitor tVOCs and CO<sub>2</sub> equivalent variations in confined spaces, e.g. meeting rooms or vehicle cabins.

The dual signal output can be used to control ventilation on-demand, saving energy and reducing cost-of-ownership.



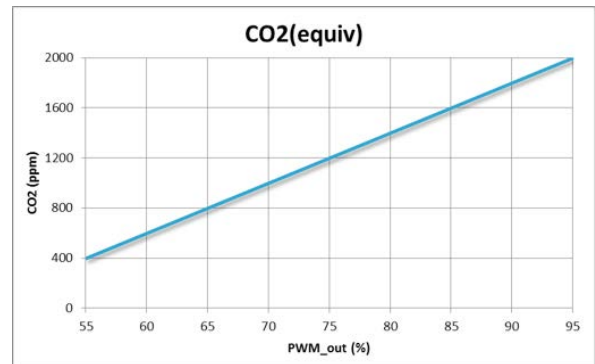
### Features

- Calibration-free
- Low power
- Wide VOCs detection range
- High sensitivity
- High resistance to shocks and vibrations

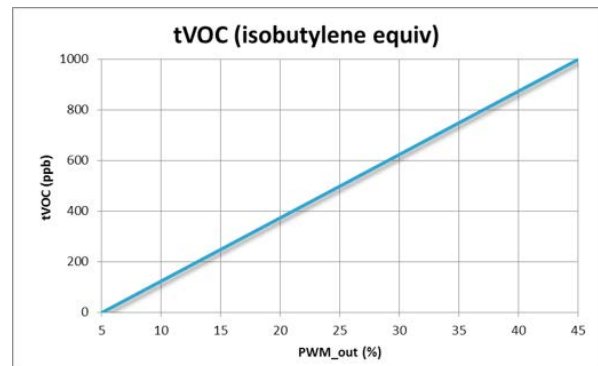
### Detectable Gases

- Volatile Organic Compounds: VOCs
- Equivalent Carbon Dioxide: CO<sub>2</sub>(equivalent)

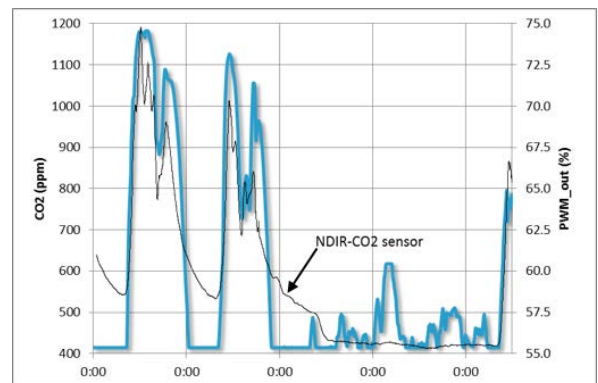
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Advanced Sensors



Conversion from PWM output signal of MiCS-VZ-89TE to equivalent Carbon Dioxide concentration in ppm



Conversion from PWM output signal of MiCS-VZ-89TE to equivalent tVOC concentration in ppb



Conversion from PWM output signal of MiCS-VZ-89TE to equivalent tVOC concentration in ppb

# MiCS-VZ-89TE Specifications

## Performance

Detection Method	Semiconductor gas sensor, detecting a wide range of VOCs
Monitoring Range	400-2000 ppm equivalent CO <sub>2</sub> 0-1000 ppb isobutylene equivalent tVOCs
PWM Output	Pin 1 : TTL output 30Hz +/-1%, Range 5...95%, duty cycle @ 3.3V Use a pull-up resistance between Pin 1 and Pin 6 Pull-up value: typ. 10kOhms
I <sup>2</sup> C Output	Pin 2 and 4 ; Pull-up of 4.7 kOhms on master SDA and SCL
Response Time	Equivalent to conventional NDIR-CO2 sensors < 5 seconds for tVOC
Refresh Output Frequency	1 Hz

## Operation

Supply Voltage	3.3V DC regulated +/- 5%
Operating Power	125 mW
Warm-up Time	15 min
Operating Temperature	0°C to 50°C
Operating Humidity	0%RH to 95%RH (non condensing)
Storage Temperature	-40°C to 80°C
Storage Humidity	0%RH to 95%RH (non condensing)

## IMPORTANT PRECAUTIONS

Read the following instructions carefully before using the indoor air quality sensor described in this document to avoid erroneous readings and to prevent the device from permanent damage.

- The sensor must not be exposed to high concentrations of organic solvents, ammonia, silicone vapor or cigarette-smoke in order to avoid poisoning the sensitive layer.
- The sensor should be protected against water and dust projections.
- Telaire strongly recommends using ESD protection equipment to handle the sensor.

# MiCS-VZ-89TE Specifications

## MiCS-VZ-89TE - Power-On Self-Test

Parameter	Criteria	Failed Diagnostic Indicator
Sensor Resistance Range	Range Check	PWM < 5 % at Power ON
Sensor Operating Power	Range Check	PWM < 5 % at Power ON

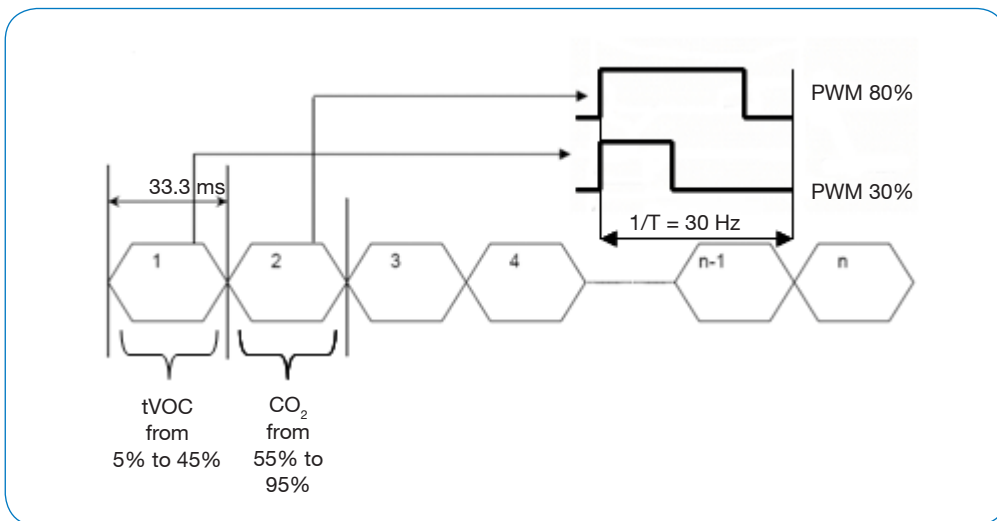
## MiCS-VZ-89TE - PWM Output

After Power-on self-test (2 seconds), the device will provide either a single “Failed Diagnostic Level” in case of sensor failure of the sensor or PWM multiplexed output indicating “CO<sub>2</sub>\_equivalent\_Level” and “tVOC\_isobutylene\_equivalent\_Level” referred to the isobutylene sensitivity unit.

A simple method to test the reactivity and sensitivity of the MiCS-VZ-89TE VOC gas sensor is to expose the sensor to the bottleneck of a container of alcohol for example.

CO <sub>2</sub> epu [ppm]	PWM Output [1%]
400	55
1027	70.7
1654	86.4
2000	95

tVOC (isobutylene) [ppb]	PWM Output [%]
0	5
200	13
500	25
1000	45



# MiCS-VZ-89TE Specifications

## MiCS-VZ-89TE - Output

Out of this initial period, the device will have the I<sup>2</sup>C data CO<sub>2</sub> equivalent [ppm] and tVOC equivalent referred to the isobutylene sensitivity unit [ppb]. For more information refer to I<sup>2</sup>C Application Note.

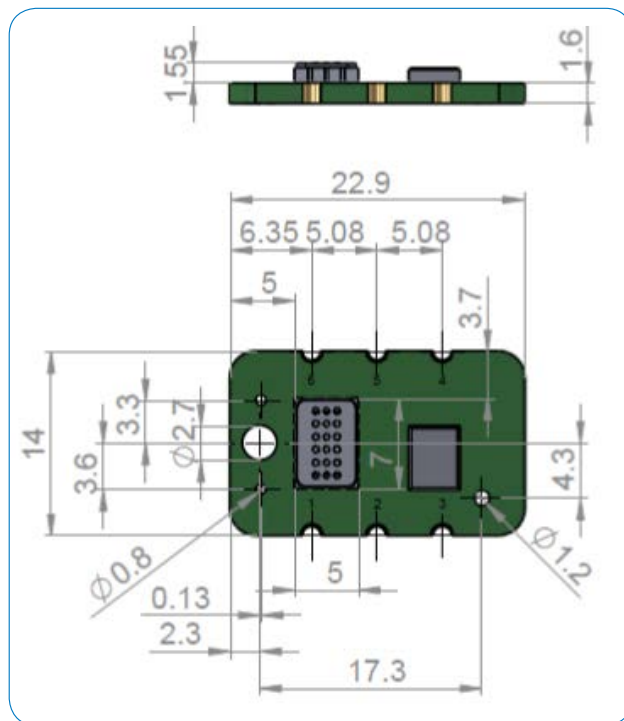
- D1: Data\_byte\_1: tVOC-signal level value
- D2: Data\_byte\_2: CO<sub>2</sub>-equivalent signal level value
- D3: Data\_byte\_3: Raw sensor value MSB
- D4: Data\_byte\_4: Raw sensor value
- D5: Data\_byte\_5: Raw sensor value LSB
- D6: Data\_byte\_6: Error status byte
- D7: Data\_byte\_7: DRC

## Package Outline Dimensions

The MiCS-VZ-89TE is available as PCB and can be mounted with a M2.5 screw in appliances.

Connections are made with soldering on card edge (cut via connector).

Pin Connection VZ-23TE		
6: + 3.3V	5: NC	4: SDA
1: PWM OUT	2: SCL	3: GND



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