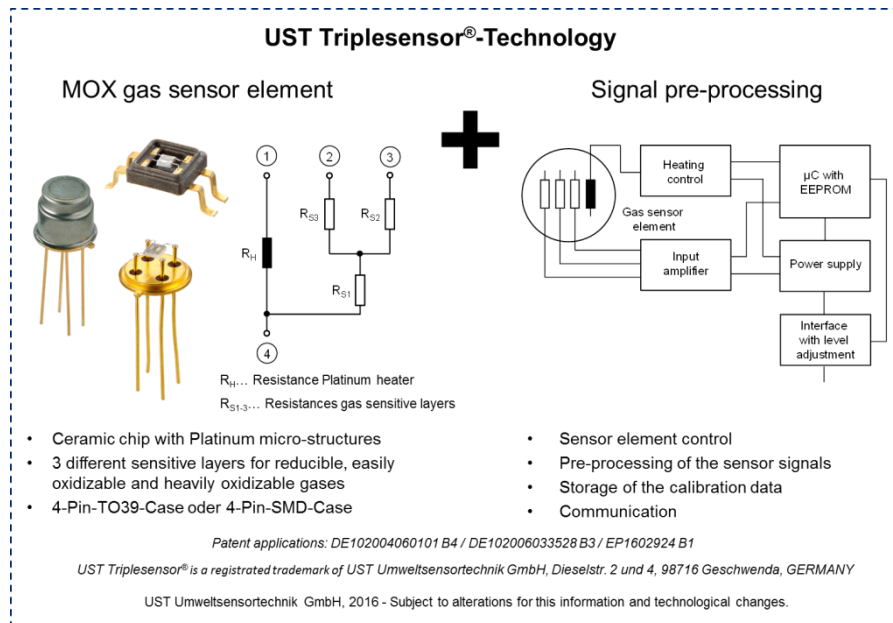


Technical information

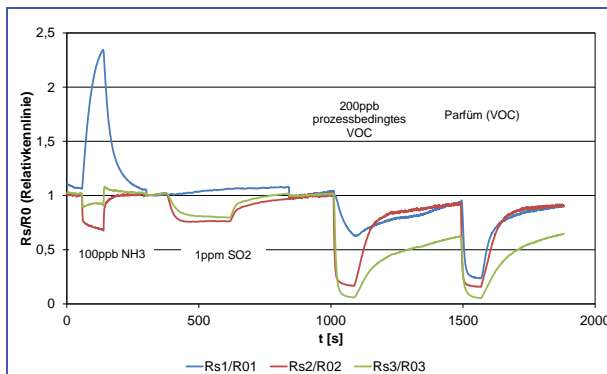
- Patented active gas sensor module for the high selective and high sensitive detection of specific gases, gas mixtures, selected VOC markers etc.
- Gas sensor element with 3 gas sensitive Metal-oxide (MOX) semi-conductor layers + electronic module for customizable control of the sensor element, data pre-processing and communication
- Interface for external data classification and analysis (e.g. PCA... Principal Component Analysis)
- Scalable technological platform for the efficient realization of customized gas sensor systems for small as well as large production runs
- Fields of application: automotive, building automation, process technology, environmental technology, safety engineering, medical engineering etc.
- Selected application examples:
 - Mobile/stationary gas leak detection (e.g. natural gas, Ammonia, Sulfur dioxide, refrigerants R134a, R1234yf etc.)
 - Air quality measurement/detection in buildings, apartments, vehicle interiors etc.
 - Detection of NO₂/NO_x at road traffic junctions
 - Early detection of smoldering fire (detection of relevant combustion gases etc.)



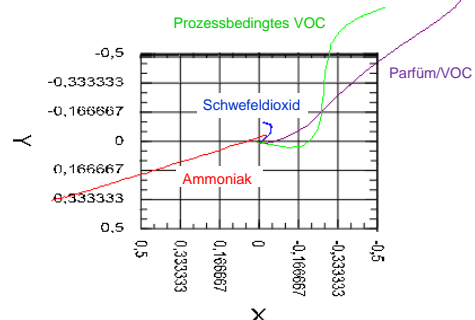
Example: Detection and signal separation of pleasant and unpleasant odors

Exposure of Ammonia (NH₃), Sulfur dioxide (SO₂), process-related VOC and Perfume aromatics/VOCs

Sensitivities



2D signal separation

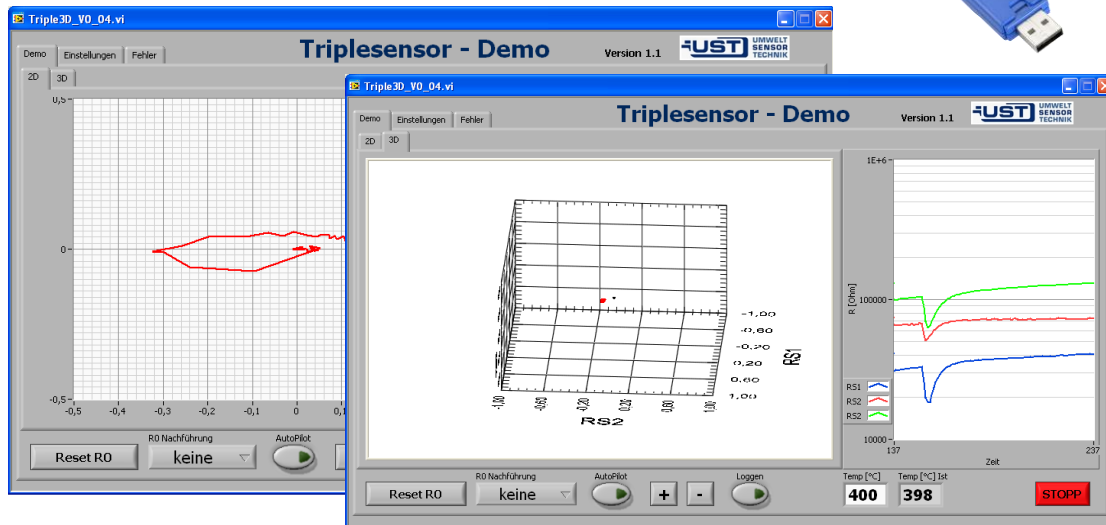


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UST Triplesensor® Evaluation Tool Kit USB

- USB-Stick with external UST Triplesensor® gas sensor element (optional UST Triplesensor® gas sensor element changeable, 4-Pin-socket)
- µC-based electronic module for signal-pre-processing, sensor control and data communication
- USB 2.0-compatible
- PC-Software tool (CD-ROM) for visualization of the sensor signals and data recording (external CSV-File)



Selected technical data

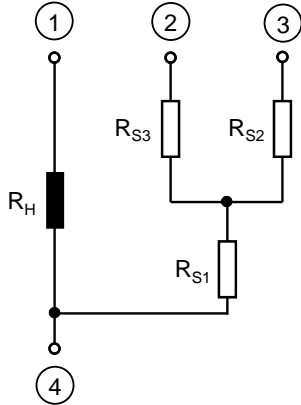
Gas sensor element	UST Triplesensor® gas sensor element 3A4P, gas sensitive MOX layers GGS 5000/3000/2000+ series, 4-Pin TO39 Case 2T (optional: iso-thermic 4-Pin SMD Case – on request)
Interface	USB 2.0
Power supply	USB 2.0
Power consumption	ca. 200 mA
Allowable operating temperature/humidity	-5 °C ... +50 °C / 20 % ... 80 % rel. H.
Allowable transport and storage temperature/ humidity	-25 °C ... +70 °C / 20 % ... 80 % rel. F.
Allowable conditions for application, transport and storage	The environments of application, transport and storage must be free of any contaminations, particularly protected against chemical substances, such as silicones etc.
Dimensions USB stick (L x W x H)	87 mm x 21 mm x 12 mm (with protective cap); 65 mm x 21 mm x 12 mm (without protective cap)
Length connection cable between USB-Stick and gas sensor/ socket	ca. 300 mm
Net weight	ca. 30 g
Conformity	2011/65/EU: Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten / Restriction of the use of Hazardous Substances Directive (RoHS)

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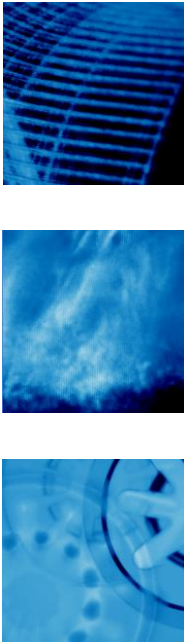


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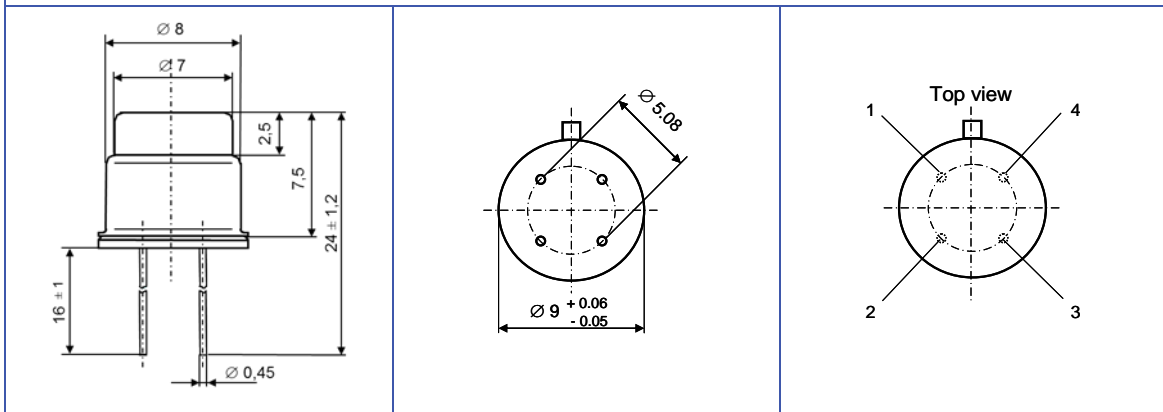
Gas sensor element - electrical circuit, pin assignment, sensor cases + dimensions



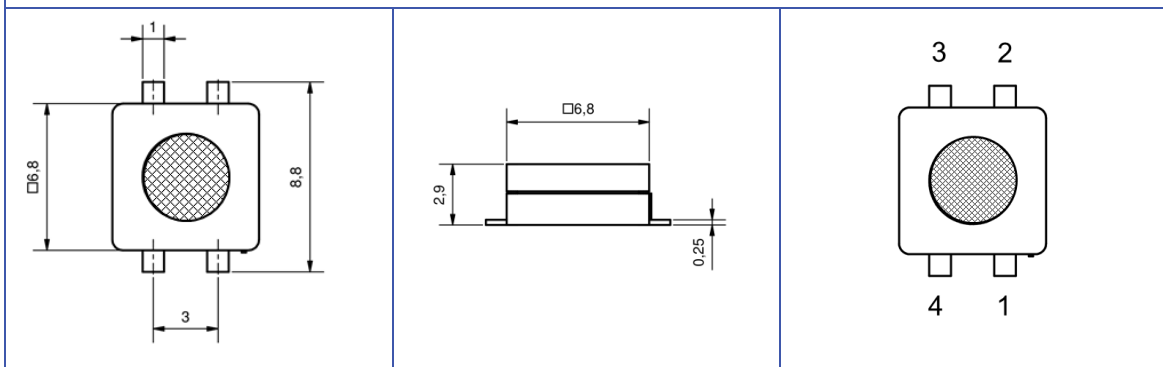
- 1: R_H ... Resistance Platinum heater
- 2: R_{S3} ... Resistance 5000 sensitive layer
- 3: R_{S2} ... Resistance 3000 sensitive layer
- 4: R_{S1} ... Resistance 2000+ sensitive layer, Resistance Platinum heater



4-Pin TO39 Case 2T



Iso-thermic 4-Pin SMD Case



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Selected gas sensitivity parameters and properties

Parameter/property	Type of gas								
	CO	SO ₂	NO ₂	O ₃	CH ₄	C ₃ H ₈	H ₂	VOC e.g. C ₂ H ₅ OH	VOC e.g. C ₆ H ₆
Measuring range	10 ppm ... 5000 ppm	0,1 ppm ... 100 ppm	0,1 ppm ... 50 ppm	0,01 ppm ... 5 ppm	10 ppm ... 1 Vol%	10 ppm ... 1 Vol%	5 ppm ... 5000 ppm	5 ppm ... 5000 ppm	0,1 ppm ... 100 ppm
Tolerance	± 20 %	± 20 %	± 20 %	± 20 %	± 20 %	± 20 %	± 20 %	± 20 %	± 20 %
Cross sensitivities	HMDS (C ₆ H ₁₉ NSi ₂), H ₂ S, humidity								
Long term stability	Depending on application and operational conditions up to 10.000 h								
Drift	Compensated by signal processing, factory-testing after 6 months use recommended								
Remark	Depending on gas type and gas concentration - specific operating conditions of the gas sensor have to be respected.								

Important remarks

Any contamination of the sensor must be avoided. The application, transport and storage environment has to be free of any contaminations, particularly protected against chemical substances, e.g. silicones.

In particular directly contact with substances containing, silicones, sulfurous substances or non-desorbing inorganic components or contaminations (e.g. smoke, fumes, oils, greases or evaporating liquids) may cause damaging the sensor or to changes in the sensor resistance and/or in the sensor characteristics.

Please ask us for customized solutions.

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