

MTS4SENS

The thermo-electric IR detectors of the MTS series (Micro-Hybrid thermopile sensors) are characterized by a particularly high detectivity and durability.



Features

- Multi-gas solution
- Backfilling with different gases to adapt performance
- Customization feasible

Product benefits

- Excellent performance due to best materials like BiSb / Sb for thermoelectrical effect (MTS200)
- Best detectivity
- High sensitivity

Additional product information

The base of each thermopile detector is formed by the so-called thermocouple. Due to thermal diffusion currents of two different metals (Seebeck effect), it generates an electrical voltage – the measurement signal. These serially connected thermocouples, called thermopiles, achieve a higher output voltage.

Applications

- Medical technology: anesthesia equipment, patient monitoring
- Environmental engineering: monitoring CH₄ in biogas plants
- Laboratory technology / bioengineering: measurement of CO₂ and H₂O in cell and tissue growth, C₂H₅OH-detection
- Industrial process control: detecting SO₂, NO, CO and other process relevant gases
- Safety technology / explosion protection: CO₂-, CO-, CH₄- detection

The sensitive component of Micro-Hybrid thermopile detectors is a MEMS-based thin-layer system on a silicon substrate. We offer thermopile detectors with either 200 or 44 thermocouples for NDIR gas analysis.

PRODUCT DATA SHEET - IR detectors - MTS4SENS | © Micro-Hybrid-Electronic GmbH | 2022-04 | All rights reserved.

Online shop for IR components and sensors

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 microhybrid.com/shop



Technical data

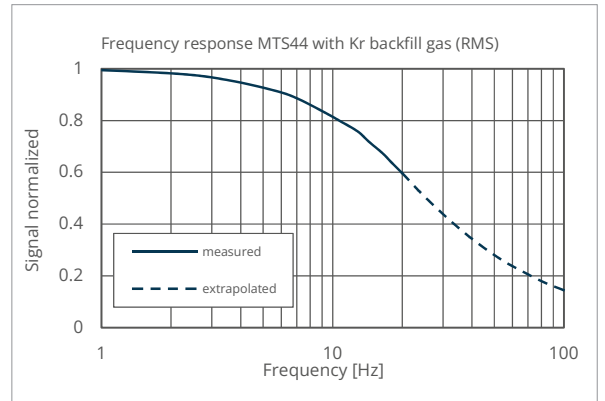
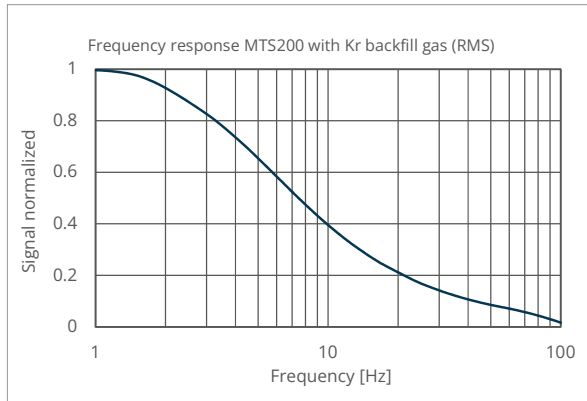
Technical parameter	TS 200	TS 44	Unit
Active area	4 x (1.2 x 1.2)	4 x (1.0 x 1.0)	mm ²
Aperture	4 x (1.5 x 1.5)	4 x (1.5 x 1.5)	mm ²
Number of thermocouples	200	44	
Time constant _{0-63 %} ^{1,2,3}	typ. 51	typ. 16.8	ms
DC output voltage ^{1,2,3}	typ. 9.35	typ. 1.68	mV
DC sensitivity ^{1,2,3}	typ. 171	typ. 44	V/W
Noise voltage ²	typ. 33	typ. 24	nV/Hz ^{1/2}
Noise equivalent power NEP ^{1,2,3}	typ. 0.19	typ. 0.55	nW/Hz ^{1/2}
Specific dectivity D* ^{1,2,3}	typ. 6.27*10 ⁸	typ. 1.82*10 ⁸	cmHz ^{1/2} /W
Resistance of thermopile ²	typ. 65	typ. 36	kΩ
Thermistor	PTC Ni1000, other on request: Technical specifications see document „Thermistors“.		
Filling gas ³	Kr, other on request		
Filters	See document „Infrared filters“, customized filters on request.		
Operating temperature	-20 ... +85	-20 ... +85	°C
Housing	TO39	TO39	

¹ T=500 K, E=38 W/m², without influence of filter characteristic

² At T_{amb} = 25 °C

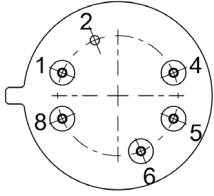
³ With Kr-filling, other gases on customer's request

Typical operating characteristics



Electrical schemata

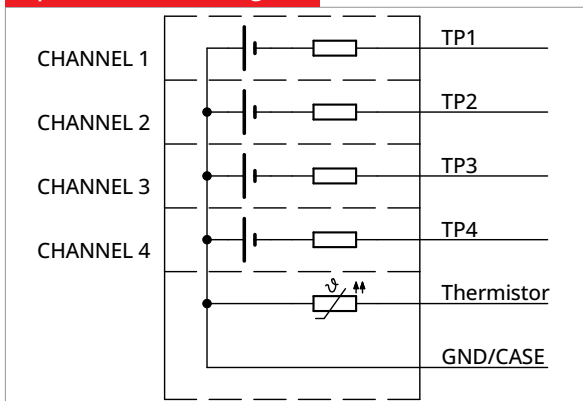
Pin out (bottom view)



- Pin 1 - TP4 +
- Pin 2 - GND/Case
- Pin 4 - TP3 +
- Pin 5 - TP2 +
- Pin 6 - Thermistor
- Pin 8 - TP1 +

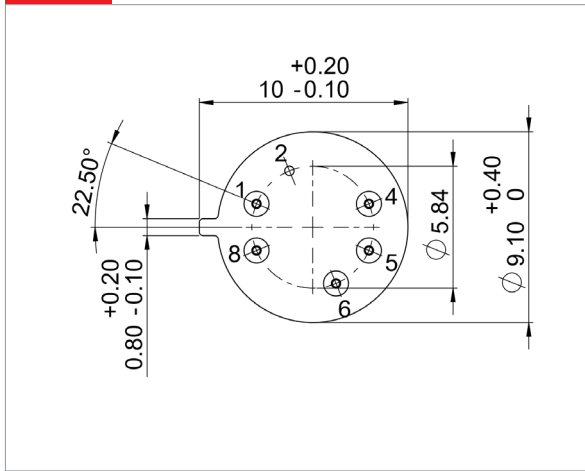
Circuits

Equivalent circuit diagram

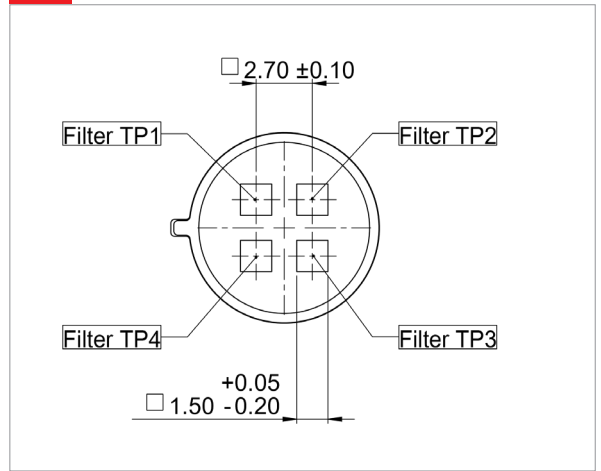


Mechanical drawings

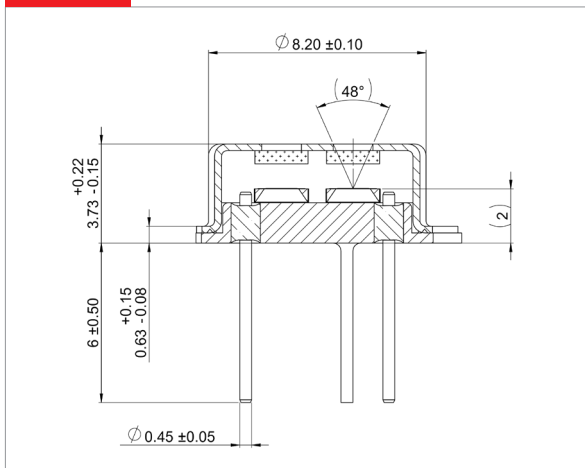
Bottom



Top



Sectional



➔ All geometrical dimensions in mm

Product overview

Article	Type	Filling gas	Temp. min	Temp. max	Aperture	Application
TS4x200B-A-S1.5-1-Kr-D2/E1/F1/G2	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	3C with low CO ₂ concentration
TS4x200B-A-S1.5-1-Kr-D2/E2/F1/G2	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	3C with high CO ₂ concentration
TS4x200B-A-S1.5-1-Kr-E1/K1/V1/W1	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	Anesthesia
TS4x200B-A-S1.5-1-Kr-I1/E1/M1/D2	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	Testing
TS4x200B-A-S1.5-1-Kr-I1/L1/H1/D5	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	NOX
TS4x44S-A-S1.5-1-Kr-D2/E1/F1/G2	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	3C with low CO ₂ concentration
TS4x44S-A-S1.5-1-Kr-D2/E2/F1/G2	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	3C with high CO ₂ concentraion
TS4x44S-A-S1.5-1-Kr-I1/E1/M1/D2	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	Testing
TS4x44S-A-S1.5-1-Kr-I1/L1/H1/D5	TO39 with cap	Kr	-20 °C	85 °C	1.5 mm	NOX

Disclaimer

All rights reserved. All information in this data sheet are based on latest knowledge, results of practical experience and tests carried out. Earlier specifications are hereby invalid. All specifications – technical included – are subject to change without notice. It is the customer’s responsibility to ensure that the performance of the product is suitable for customer’s specific application. No liability is accepted for indirect damage, in particular for the use or inability to use the product. Any liability we may have is limited to the value of the product itself.