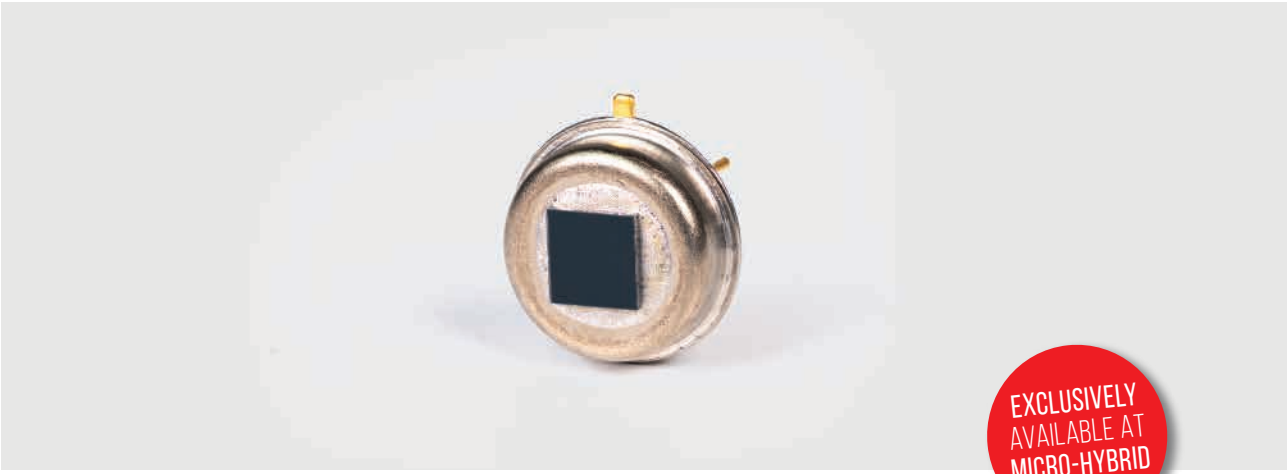
MTS1 TEMP / MTS1 HIGH-TEMP

Thermal IR detectors for temperature measurement



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

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.
The sensitive component of Micro-Hybrid thermopile detectors is a MEMS-based thin-layer system on a silicon substrate. We offer sensor chips with either 80 (TS 80) thermocouples for non contact temperature measurement or 200 (TS 200) thermocouples for NDIR gas analysis. Depending on the application, both basic types are provided with different spectral absorber layers.

FEATURES

- Environmental temperatures up to 180 °C
- Soldered filter (optional)
- High sensitivity
- Humidity resistant
- Suitable for chemical processes
- Resistent against environmental influences

APPLICATIONS

- **Glas, Paper, Plastics**: Temperature monitoring of melting processes
- **Automotive and other moving parts:** Temperature monitoring of engines, brakes
- **Life science medicals:** Contactless temperature measurement of laboratory parameters
- **Metal:** Monitoring of thermal indicated process parameters
- **Solar semiconductors**: Maintenance

BENEFITS

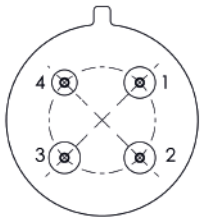
- **Excellent performance by best materials like BiSb / Sb for thermoelectrical effect:**
  - **Worlds best detectivity** up to 7.2 x 10^8 cm x $Hz^{1/2}$/W
  - High sensitivity up to 295 V/W

Visit us at www.microhybrid.com or call us at +49 36601 5920

Technical data

Technical parameter	TEMP	HIGH-TEMP	Unit
Active area	Ø 0.5	Ø 0.5	mm
Aperture	Ø 0.75	Ø 0.75	mm
Number of thermocouples	80	80	
Time constant $_{(0-63\ \%)}$ [1,3]	typ. 30	typ. 30	ms
DC output voltage[1,3]	typ. 2.2	typ. 2.2	mV
DC sensitivity[1,3]	typ. 295	typ. 295	V/W
Temperature coefficient of sensitivity[2]	typ. -0.4	typ. -0.4	%/K
Noise voltage[3]	typ. 18	typ. 18	$nV/Hz^{1/2}$
Noise equivalent power NEP[1]	typ. 0.06	typ. 0.06	$nW/Hz^{1/2}$
Specific dectivity D*[1,3]	typ. $7.2*10^8$	typ. $7.2*10^8$	$cmHz^{1/2}/W$
Resistance of thermopile[3]	20 ± 8	20 ± 8	kΩ
Temperature coefficient of resistance[2]	typ. -0.03	typ. -0.03	%/K
Thermistor	no thermistor Customer specific solution on request.	no thermistor Customer specific solution on request.	
Filling gas[4]	N_2/ Kr/ other	N_2/ Kr/ other	
Filters	Micro-Hybrid standard band pass filters (e.g. B1 8-14 µm) and more information please see document „Infrared filters". Customized filters possible on request.		
Operation temperature	-20 ... +85	-20 ... +180	°C
Housing	TO39 (modified)	TO39 (modified)	

Pin out

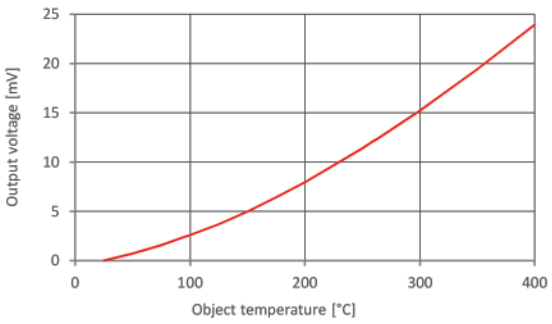


- Pin 1 – TP+
- Pin 2 – TP-
- Pin 3 – PTC
- Pin 4 – GND/CASE

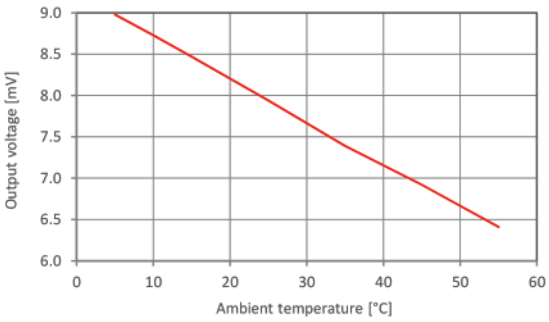
[1] on air without cap, blackbody T=500 K; E=38 W/m²
[2] temperature range from +25 to +70 °C
[3] at T_{amb} = 25 °C
[4] in case of Kr-filling increase of DC output voltage, DC sensitivity, specific detectivity and time constant by the factor 1.7. Decrease of NEP by the same factor. Other gases on customer's request.

Typical operating characteristics of IR detectors › MTS1 High-Temp with window B1

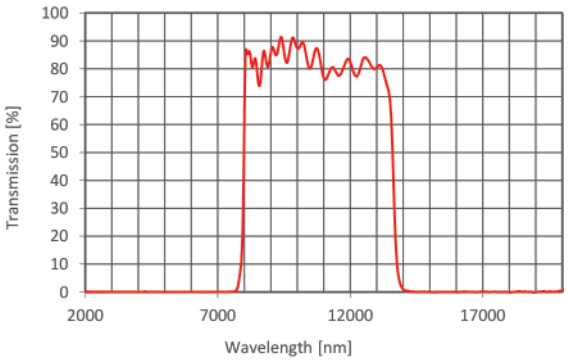
Output voltage at constant ambient temperature of 25 °C [1]



Output voltage at constant object temperatur of 200 °C



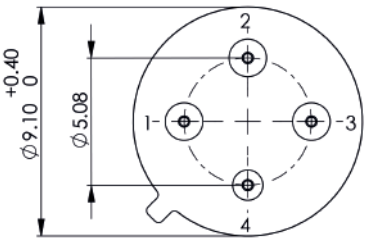
Transmission range with window B1



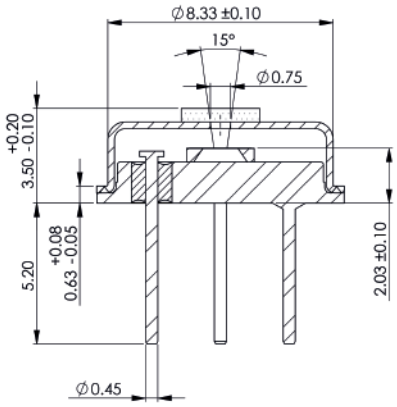
[1] assembled detectors with B1 window, full field of fiew

Mechanical drawings

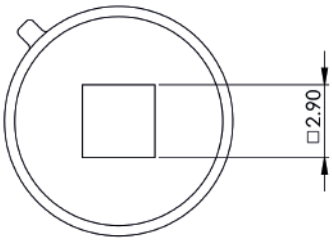
Bottom view



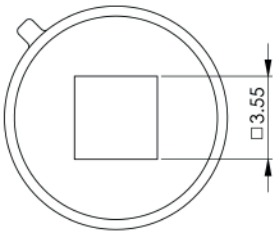
AA



Top view MTS 1 Temp



Top view MTS 1 High-Temp



all geometrical dimensions in mm

Product overview

Article		Temp. min	Temp. max	Aperture	Channel	Application
TS1x80B-A-D0.75-1-Kr-B1	S	-20 °C	85 °C	0.75 mm	1	IR temperature measurement
TS1x80B-A-D0.75-1-Kr-180	S	-20 °C	180 °C	0.75 mm	1	IR temperature measurement

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