

# JSIR 360-4

High-end MEMS based infrared emitter with black-silicon emission layer for NDIR gas analysis in the long wave length range for ambitious medical and industrial applications.



PRELIMINARY  
DATASHEET

By implementation of a sophisticated micro-nano structured silicon-metal emissions layer at a MEMS hot-plate emitter chip, Micro-Hybrid offers infrared sources with true black body radiation characteristic.

The extraordinary performant IR emitter MEMS chips are defined by hot-plate temperatures up to 850 °C in combination with a spectral broadband emission coefficient  $\epsilon$  nearly 1. This enables highest radiation intensities over a wide infrared wavelength range. Besides the high infrared output intensity our successful development focused on the long term stability.

JSIR 360 sources are available in different TO packaging versions with cap or reflector as well as in SMD housings. Various backfill gases in hermetically sealed TO packages produce highly efficient versions and less power dissipation for e.g. battery-powered applications.

## FEATURES

- True black body radiation behavior
- Highest radiation intensities by hot-plate temperatures up to 850 °C in combination with emission coefficient  $\epsilon \sim 1$
- Long lifetime by thermal-mechanical adjusted membrane
- Spectral drift free behavior also in hermetical sealed packages
- HermeSEAL® technology empowering application in harsh environments

## APPLICATIONS

- NDIR gas analysis
- DIR & ATR spectroscopy
- Photoacoustic gas spectroscopy

## TARGET GASES

- CO<sub>2</sub>, CO, NO<sub>2</sub>, NH<sub>3</sub>, SO<sub>x</sub>, SF<sub>6</sub> and ripening gases such as C<sub>2</sub>H<sub>4</sub> (ethylene) and C<sub>2</sub>H<sub>2</sub> (acetylene)

Visit us at [www.microhybrid.com](http://www.microhybrid.com) or call us at +49 36601 5920

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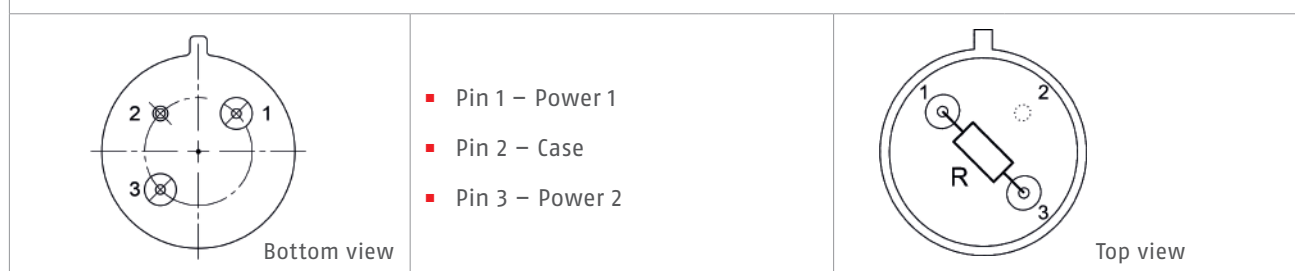


INFRARED COMPONENTS  
AND SYSTEMS

## Technical data

Technical parameter	Open / window N <sub>2</sub>	Window Kr	Unit
Spectral output range <sup>1</sup>	2 ... 15	2 ... 15	μm
Active area	2.2 x 2.2	2.2 x 2.2	mm <sup>2</sup>
Hot resistant <sup>2</sup>	19 ± 5	19 ± 5	Ω
Temperature coefficient <sup>3</sup>	1250	1250	ppm/K
Time constant <sub>0-63 %</sub>	typ. 28	typ. 50	ms
Nominal power consumption <sup>4</sup>	650	400	mW
Operation voltage <sup>5</sup>	3.5	2.8	V
Operation current <sup>5</sup>	185	145	mA
Recommended driving mode	Power mode	Power mode	
Active area temperature <sup>2,6</sup>	590 ± 30	590 ± 30	°C
Window/ filter	Available	Available	
Housing	T039 (modified)	T039 (modified)	
Estimated lifetime <sup>6,7</sup>	100000	100000	h
<b>Absolute max. ratings</b>			
Input power <sup>4,6</sup>	900	700	mW
Housing temperature	200	200	°C
Active area temperature	800	800	°C

### Pin out



<sup>1</sup> without filter

<sup>2</sup> at nominal power

<sup>3</sup> 0 °C bis 800 °C

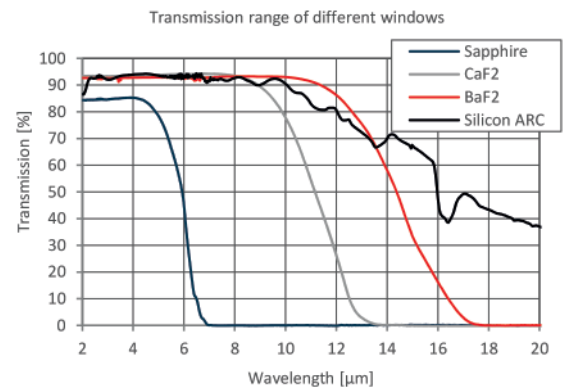
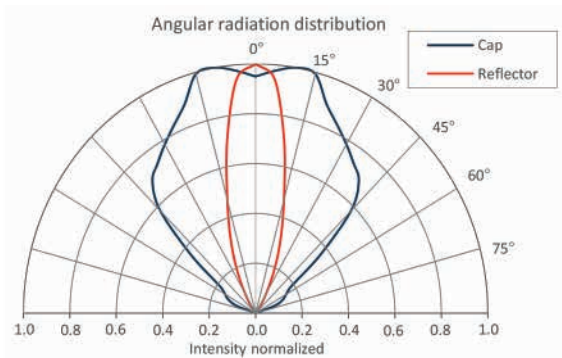
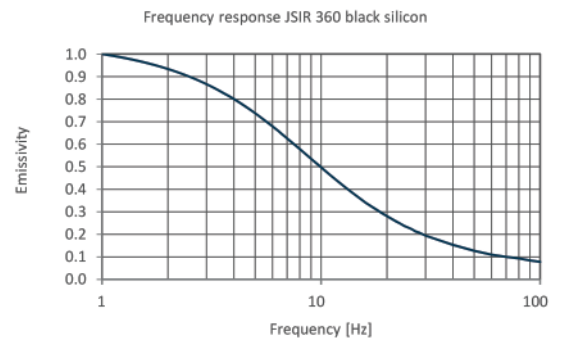
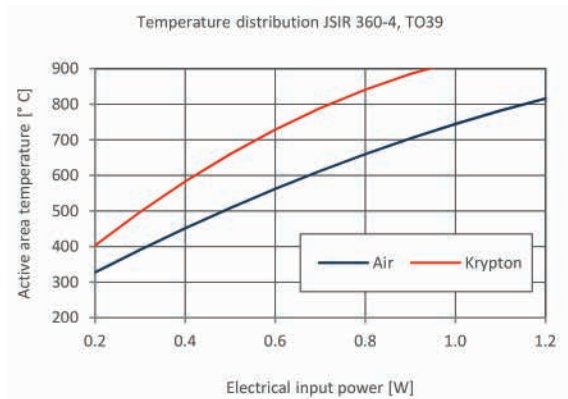
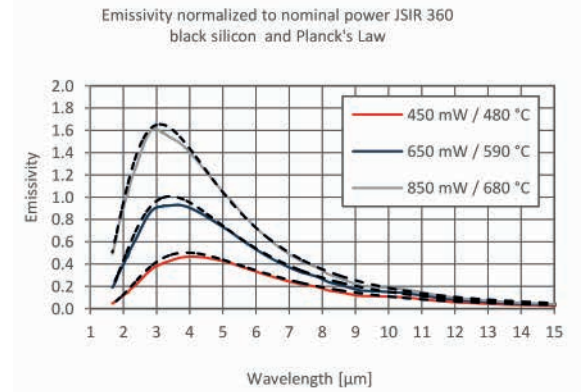
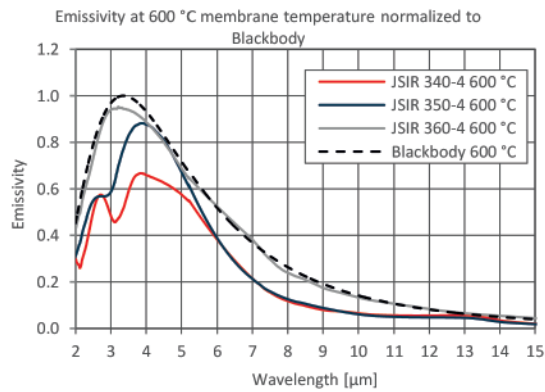
<sup>4</sup> at power on-state

<sup>5</sup> with 19 Ω

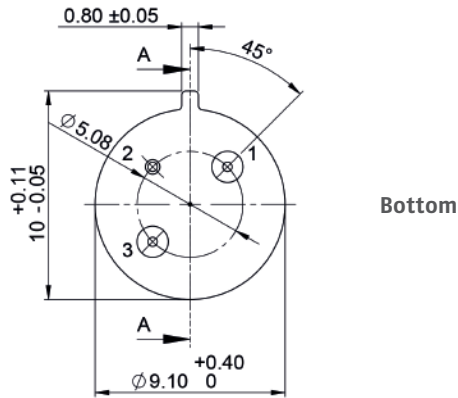
<sup>6</sup> at T<sub>amb</sub> = 25 °C

<sup>7</sup> at 1 Hz, 50 % duty cycle, MTTF 63 % (membrane fracture, preliminary results)

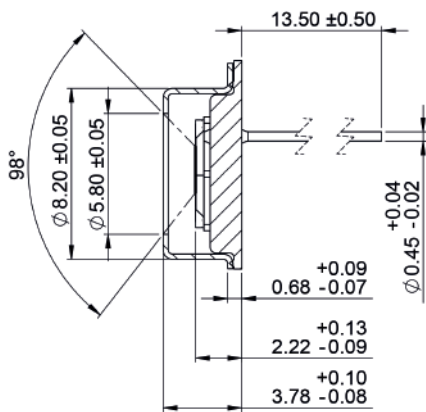
## Typical operating characteristics of IR sources > JSIR 360-4 (open / window N<sub>2</sub>)



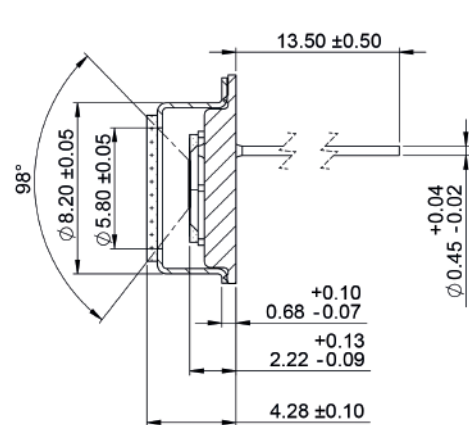
## Mechanical drawings



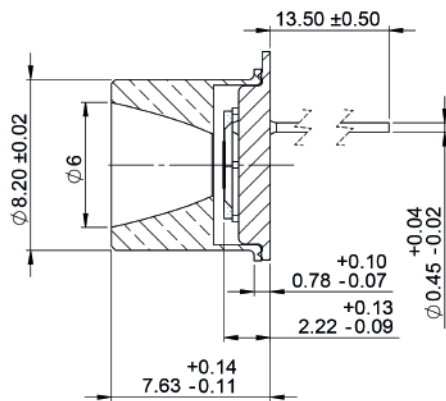
AA - JSIR 360 cap open



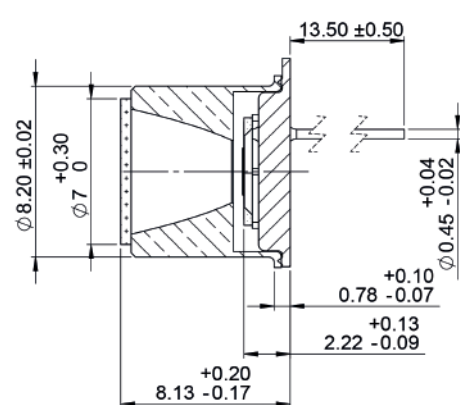
AA - JSIR 360 cap with filter



AA - JSIR 360 reflector open



AA - JSIR 360 reflector with filter



## Product overview

Article		Type	Filling gas	Temp. min	Temp. max	Aperture	Filter	Active area
JSIR360-4-AL-C-D5.8-0-0	S	T039 with cap		-20 °C	85 °C	5.8 mm	w/o	2.2 x 2.2 mm <sup>2</sup>
JSIR360-4-AL-R-D6.0-0-0	S	T039 with reflector		-20 °C	85 °C	6.0 mm	w/o	2.2 x 2.2 mm <sup>2</sup>

**S** in stock

Micro-Hybrid's offer includes IR emitter of our subsidiaries **NOVA IR** and **CMOSIR**.  
All IR emitters are supplied in a TO or SMD housing. We ship from stock and on demand.

### Micro-Hybrid-Shop

Micro-Hybrid products available at [www.microhybrid.com/shop](http://www.microhybrid.com/shop). Filter products simply by selecting the desired properties and request your quotation.

**NOVA IR** and **CMOSIR** are companies of Micro-Hybrid Electronic GmbH.  
For more information go to [www.microhybrid.com](http://www.microhybrid.com).