

JSIR340-5-BL-R-D3.6-0-0

IR emitter with low input power for mass markets in NDIR gas analysis



Applications

- NDIR gas analysis
- DIR spectroscopy
- ATR spectroscopy
- PAS spectroscopy

Product benefits

- High modulation depth - frequency range of the emitter can be adjusted for optimum operation with thermopiles or pyroelectric detectors
- Low input power enables use for mobile / battery-operated devices and hand-held measuring devices
- Design with low space requirement
- Long service life, cost-efficient product variant for MEMS IR

Features

- Time constant of 6 ms due to low thermal mass of the chip membrane
- Low input power of 300 mW required
- Long-term stable chip architecture
- Spectral bandwidth from 2 to 15 μm
- CMOSi chip technology

Additional product information

Cost-effective infrared emitter for NDIR gas analysis and other infrared measurement applications.

With only 300 mW required input power, the emitter is also suitable for mobile and hand-held measuring devices. The membrane of this CMOS-based emitter reaches membrane temperatures of up to 710 °C with long-term stable radiation output and a low time constant of 6 ms. The JSIR 340 series is suitable for high-volume applications such as building air conditioning, automation, etc. due to its excellent price-performance ratio.

The MEMS emitter chip consists of a multi-layer hotplate membrane containing a high-temperature stable metal C-MOSi layer. The emitter chip is based on a silicon substrate with a back-etched membrane. All thin-film processes are performed using standard MEMS processes and CMOS-compatible materials. The active C-MOSi resistive layer is protected against ageing and environmental influences.

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Technical data

Technical parameter	Value	Unit
Spectral output min.	2	μm
Spectral output max.	15	μm
Active area ¹	1.0 x 1.0	mm ²
Hot resistance ¹	25 ± 5	Ω
Temperature coefficient typ. ²	1200	ppm/K
Time constant 0-63 % typ.	6	ms
Nominal power consumption ³	300	mW
Operation voltage typ. ⁴	2.4	V
Operation current typ. ⁴	110	mA
Recommended driving mode	Power mode	
Estimated lifetime ^{7,8}	> 5000 h at 710 °C; > 100000 h at 585 °C	
Active area temperature ^{5,6}	585 ± 30	°C
Housing	TO46	
Input power max.	400	mW
Housing temperature max. ⁸	185	°C
Active area temperature max.	710	°C

¹ At nominal power

² 0 °C - 710 °C

³ At power on-state

⁴ With 25 Ω hot resistance

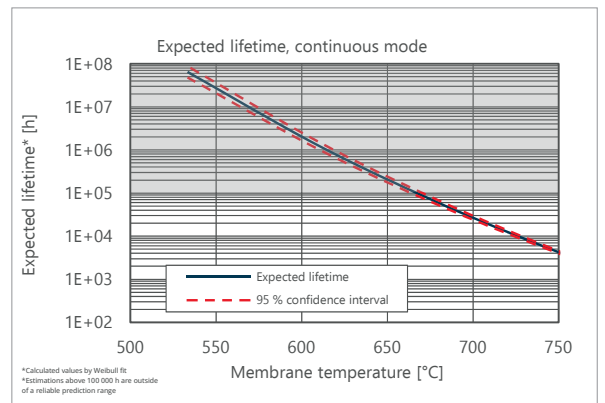
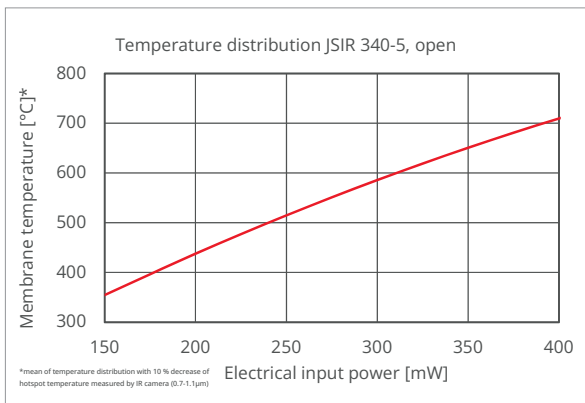
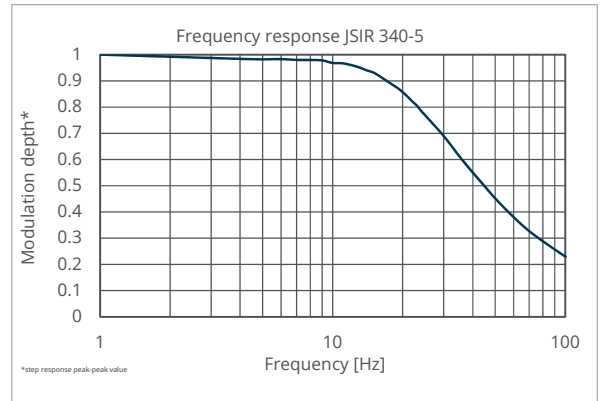
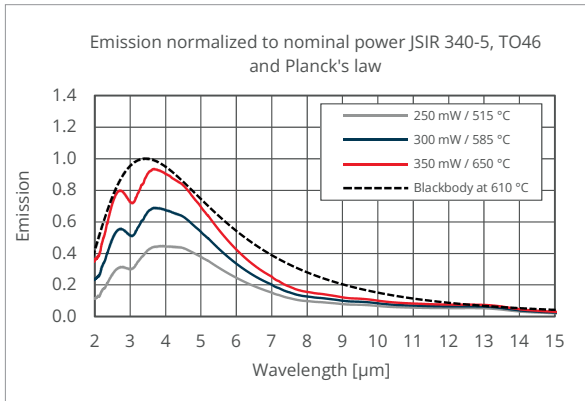
⁵ At T_{amb} = 25 °C

⁶ Mean of temperature distribution with 10 % decrease of hotspot temperature measured by IR camera (0.7 - 1.1 μm)

⁷ Continuous mode, MTTF 63 % (membrane fracture, calculated values based on Arrhenius)

⁸ Including ambient temperature

Typical operating characteristics

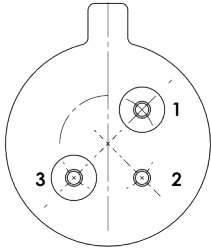


*mean of temperature distribution with 10% decrease of hotspot temperature measured by IR camera (0.7-1.1µm)

*Calculated values by Weibull fit
*Estimations above 100 000 h are outside of a reliable prediction range

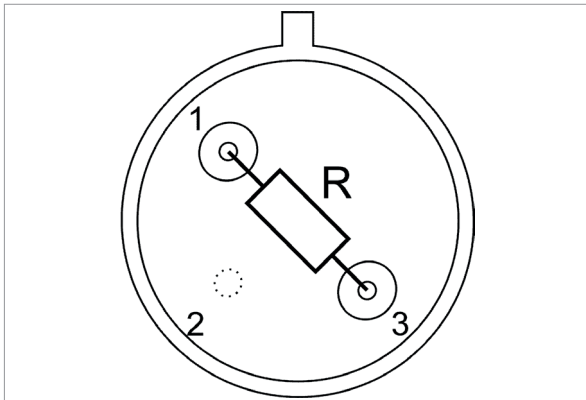
Electrical schemata

Pin out



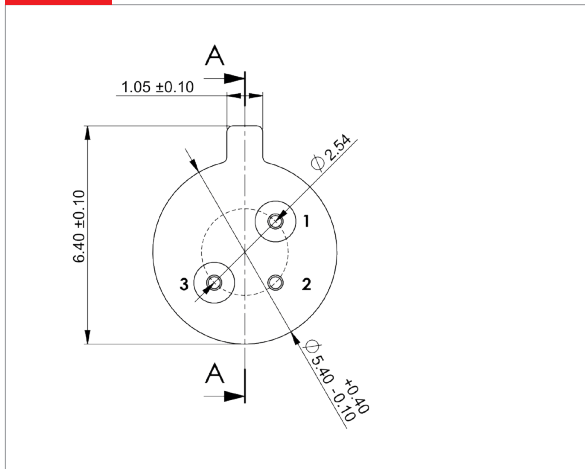
- Pin 1 – Power 1
- Pin 2 – Case
- Pin 3 – Power 2

Recommended circuits



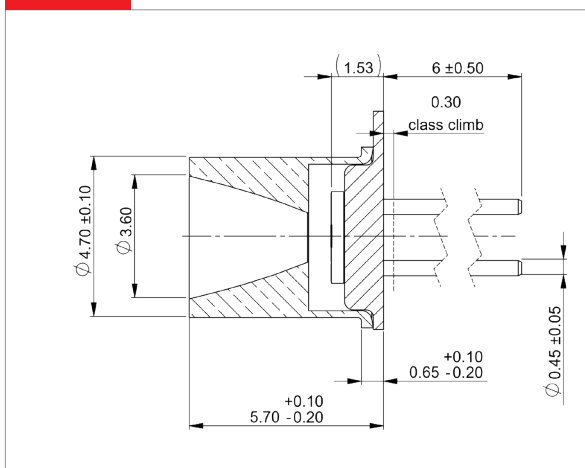
Mechanical drawings

Bottom



➔ All geometrical dimensions in mm

Sectional



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