

INFRA·SOLID[®]



HISbasic series

TO-39/TO-5 Thermal Infrared Emitters

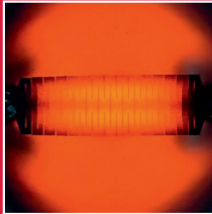
HISbasic series

Thermal Infrared Emitters

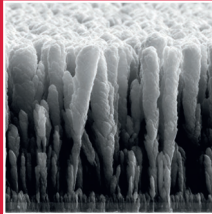
Infrasolid's infrared radiation sources are pulsable thermal emitters with a near black-body emittance. Based on a patented nanotechnology and a patented emitter set-up made of a high-melting metal, the free-standing monolithic radiating element and the nanostructured emitter surface offer numerous advantages in many applications.

HISbasic series emitters have an integrated gold plated reflector that directs the radiation emitted from the rear to the front in order to achieve maximum efficiency. All our emitters offer minimum drift at a constant electrical resistance. Infrasolids IR emitters are characterized by a very low temperature coefficient of electrical resistance. Therefore the hot resistance and the cold resistance are almost identical which eases the electrical control of the IR sources.

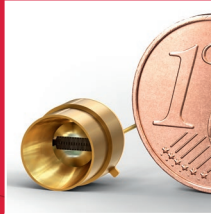
Key features



High radiant power



High efficiency



Low cost

- ✓ Pulsable thermal black-body infrared source mounted in an industry standard TO-39/TO-5 package.
- ✓ Patented nanostructured radiating element generates black-body spectrum with up to 1000 % more detection signal compared to competitors.
- ✓ Glued, high-quality filter windows guarantee long-term stable operation.
- ✓ Wide wavelength range enables a broad range of applications.

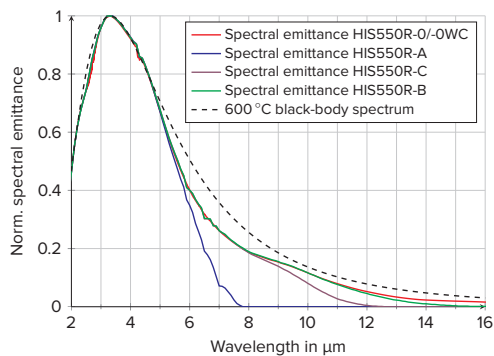
*innovative infrared sources for
gas detection & spectroscopy*

Main specifications

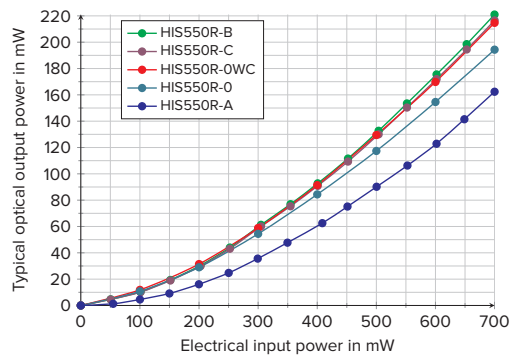
Parameter	HIS550R-0	HIS550R-0WC	HIS550R-A	HIS550R-B	HIS550R-C
Package	TO-39 / TO-5	TO-39 / TO-5	TO-39 / TO-5	TO-39 / TO-5	TO-39 / TO-5
Radiating element area	11 mm ²	11 mm ²	11 mm ²	11 mm ²	11 mm ²
Radiating element emissivity	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9
Radiating element temperature	600 °C at 650 mW	600 °C at 650 mW	600 °C at 650 mW	600 °C at 650 mW	600 °C at 650 mW
Optical output power	up to 195 mW	up to 215 mW	up to 160 mW	up to 220 mW	up to 215 mW
Max. electrical power (DC)	700 mW	700 mW	700 mW	700 mW	700 mW
Max. electrical voltage	4.0 V	4.0 V	4.0 V	4.0 V	4.0 V
Max. electrical current	175 mA	175 mA	175 mA	175 mA	175 mA
Electrical cold resistance	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)
Electrical hot resistance	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)	22 +/- 3 Ω (typ. 21...23 Ω)
Modulation frequency*	6 Hz	6 Hz	6 Hz	6 Hz	6 Hz
Filter	None (open)	None (open)	Sapphire (soldered)	BaF ₂ (glued)	CaF ₂ (glued)
Wavelength range	2 to 20 μm	2 to 20 μm	2 to 6 μm	2 to 14 μm	2 to 11 μm
Filling gas	None	None	Nitrogen	Nitrogen	Nitrogen

* 50 % modulation depth, square wave signal, 50 % duty cycle

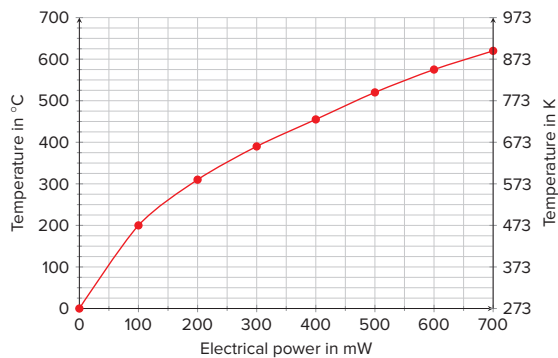
Optical specifications



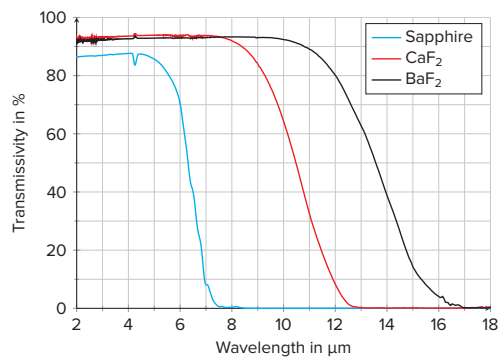
Optical output power



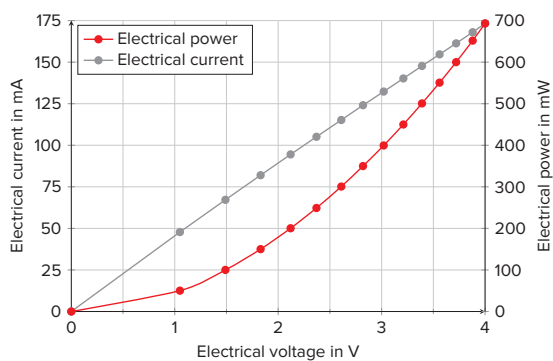
Radiating element temperature



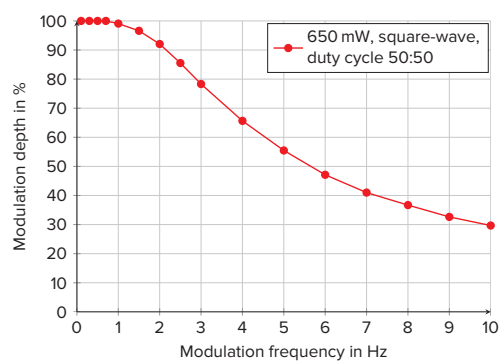
Window material transmissivity

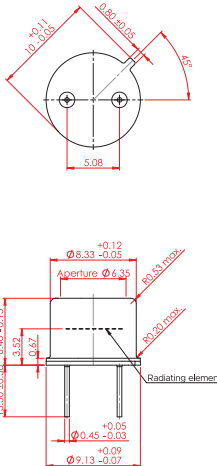
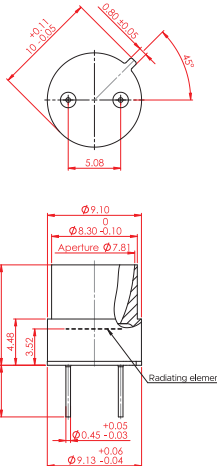
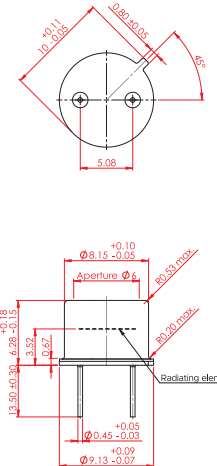
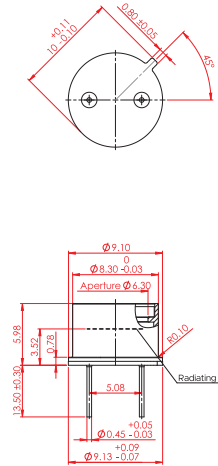
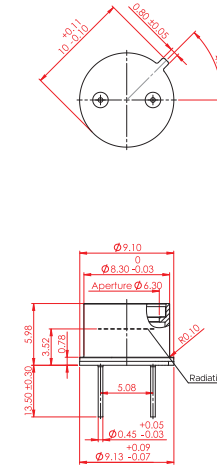


Electrical specifications

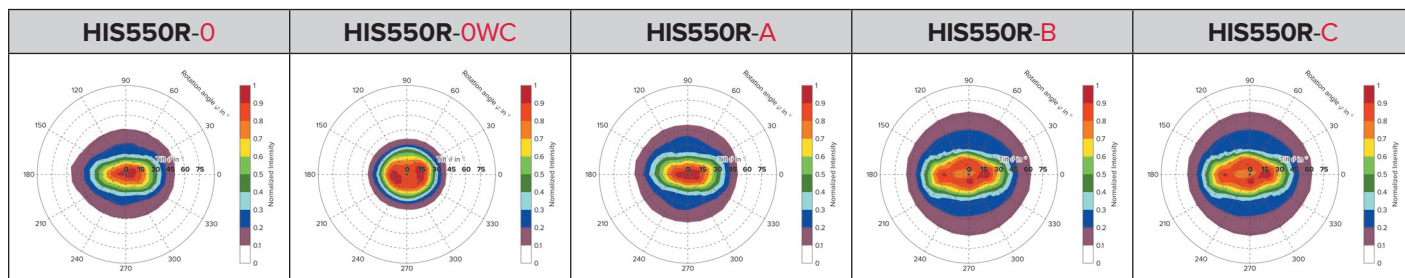


Modulation depth



HIS550R-0	HIS550R-0WC	HIS550R-A	HIS550R-B	HIS550R-C
				
Without window (open version)	Without window (open version)	Soldered sapphire window Hermetically sealed	Glued BaF ₂ window Hermetically sealed	Glued CaF ₂ window Hermetically sealed
With gold plated reflector	With gold plated reflector and Winston cone collimator	With gold plated reflector	With gold plated reflector	With gold plated reflector
No gas filling	No gas filling	Nitrogen	Nitrogen	Nitrogen
				

Angular radiation distribution

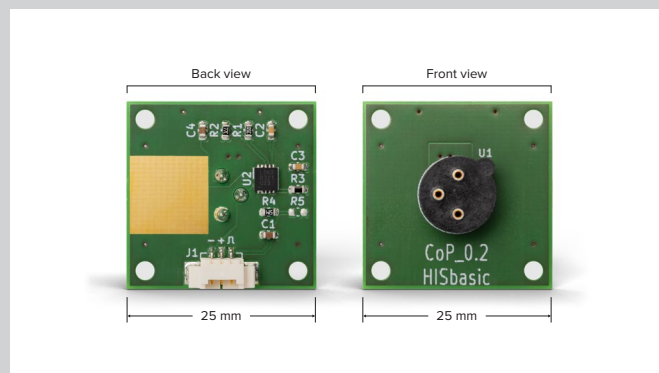


Driver Circuit Board (DCB):

We provide several Driver Circuit Boards (DCBs) for our HIS_{smd}, HIS_{basic} and HIS_{power} series emitters to support a quick evaluation in your applications. All DCBs are small and use a low-cost driving circuit with a maximum stability close to a power regulated mode. Only a supply voltage and a pulse signal have to be applied. For more information about its function, see our technical notes.

The DCBs are available at:

www.infrasolid.com/accessories



INFRA·SOLID[®]



HISpower series

TO-8 Thermal Infrared Emitters

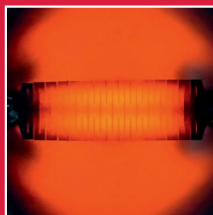
HISpower series

Thermal Infrared Emitters

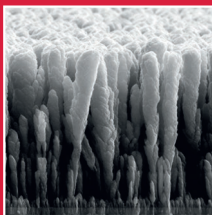
Infrasolid's infrared radiation sources are pulsable thermal emitters with a near black-body emittance. Based on a patented nanotechnology and a patented emitter set-up made of a high-melting metal, the free-standing monolithic radiating element and the nanostructured emitter surface offer numerous advantages in many applications.

HISpower series emitters have an integrated reflector that directs the radiation emitted from the rear to the front through the housing window in order to achieve maximum efficiency. Infrasolid's advanced packaging technology allows soldered sapphire, CaF_2 and BaF_2 windows for use in a wide temperature range of -25°C up to $+85^\circ\text{C}$.

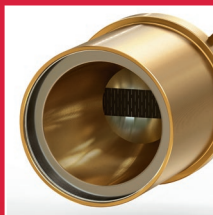
Key features



High radiant power



High efficiency



Hermetic housing

- ✓ Pulsable thermal black-body infrared source mounted in an industry standard TO-8 package.
- ✓ Patented nanostructured radiating element achieves up to 500% more detection signal!
- ✓ Lower radiating element temperature of 630°C increases lifetime!
- ✓ Soldered, high-quality filter windows guarantee considerably less drift. Leakage tested!
- ✓ Wide wavelength range enables a broad range of applications.

*innovative infrared sources for
gas detection & spectroscopy*

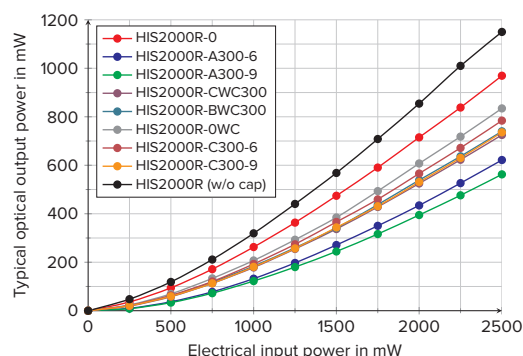
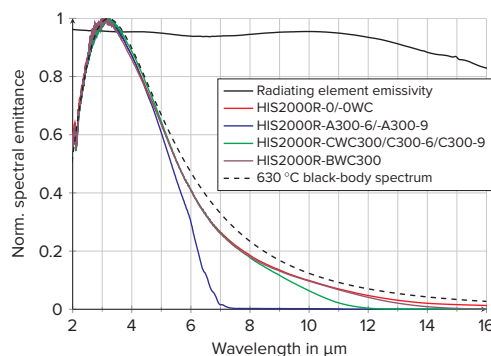
Main specifications

Parameter	HISpower series
Package	TO-8
Radiating element area	40 mm^2
Radiating element emissivity	> 0.9
Radiating element temperature	630°C at 2.5 W
Optical output power**	up to 1 W
Max. electrical power (DC)	2.5 W
Max. electrical voltage	3.8 V
Max. electrical current	660 mA
Electrical resistance	5...6 Ω
Modulation frequency*	4 Hz
Filter/Window	Sapphire, CaF_2 , BaF_2
Wavelength range**	2 to $20\text{ }\mu\text{m}$

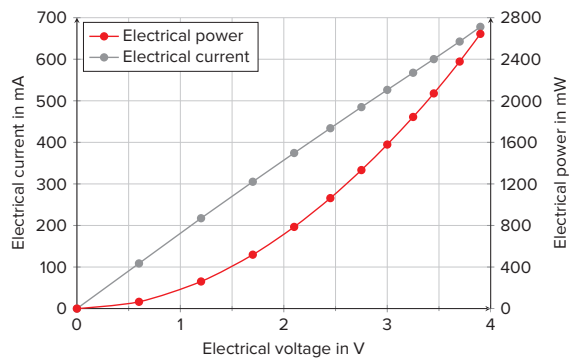
* 50 % modulation depth, square wave signal, 50 % duty cycle
** depending on filter transmissivity

For detailed technical specifications refer to the individual datasheet.

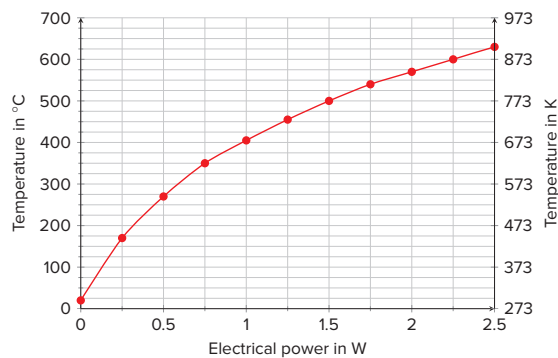
Optical specifications



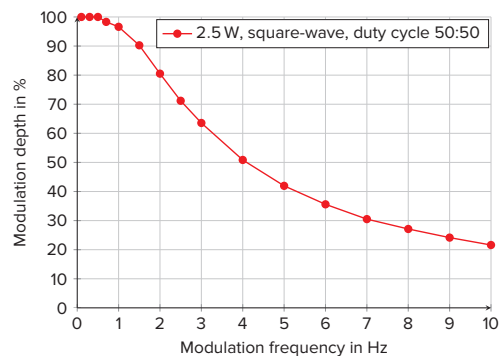
Electrical specifications



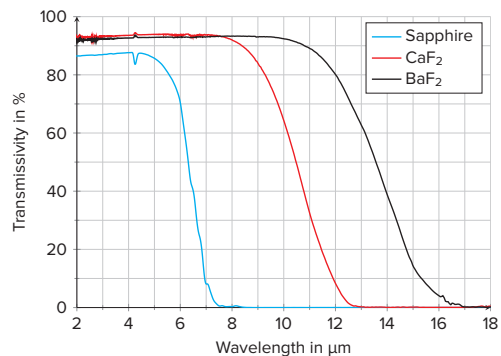
Radiating element temperature

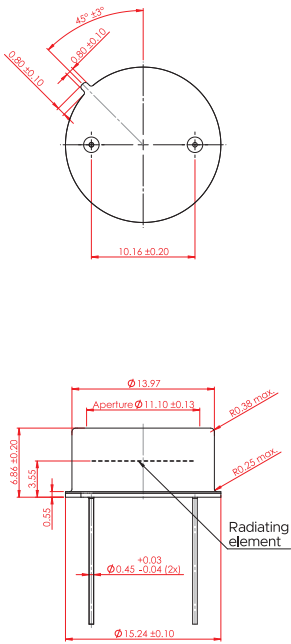
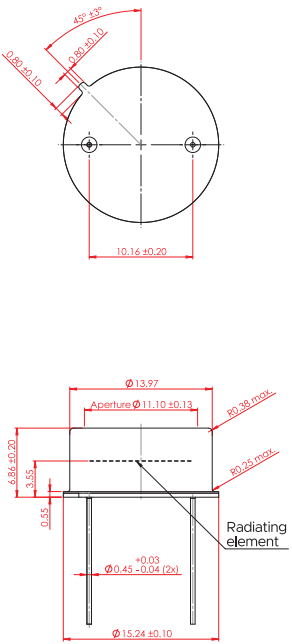
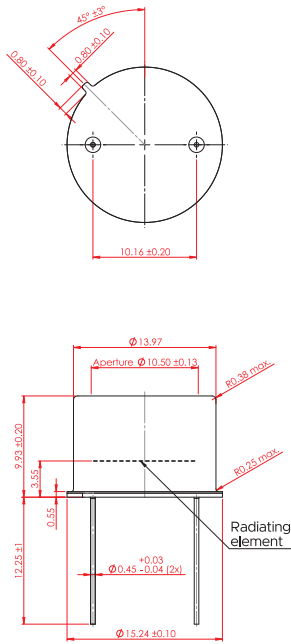


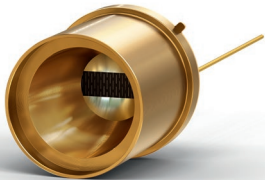
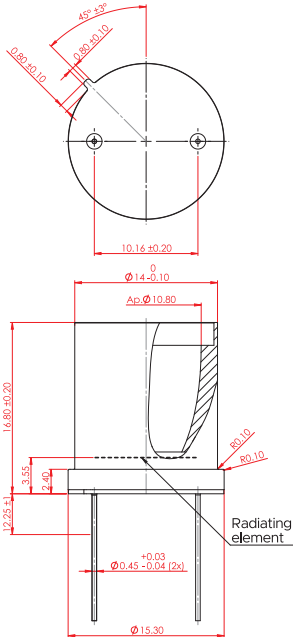
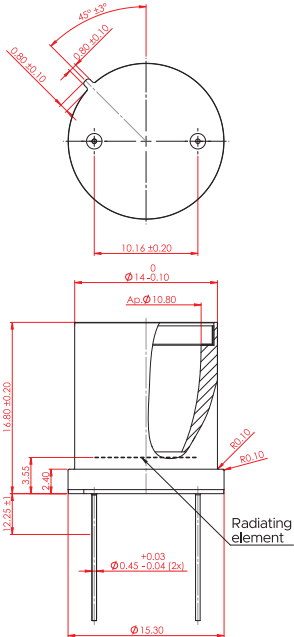
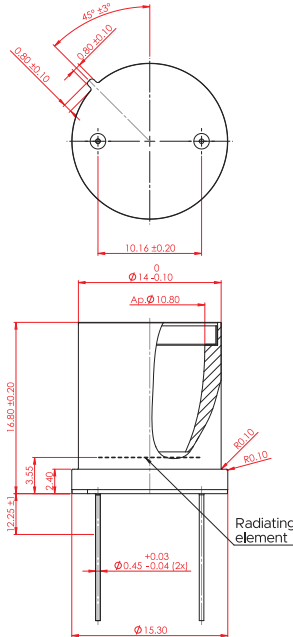
Modulation depth



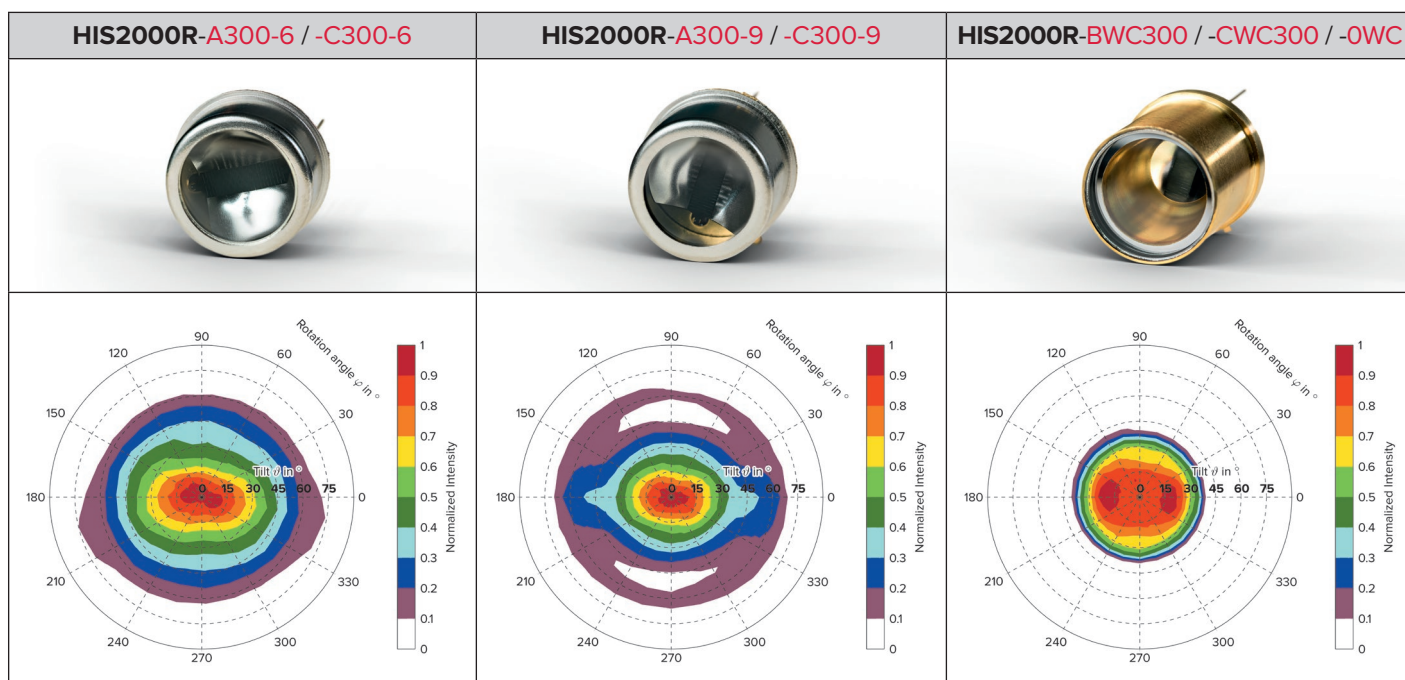
Window material transmissivity



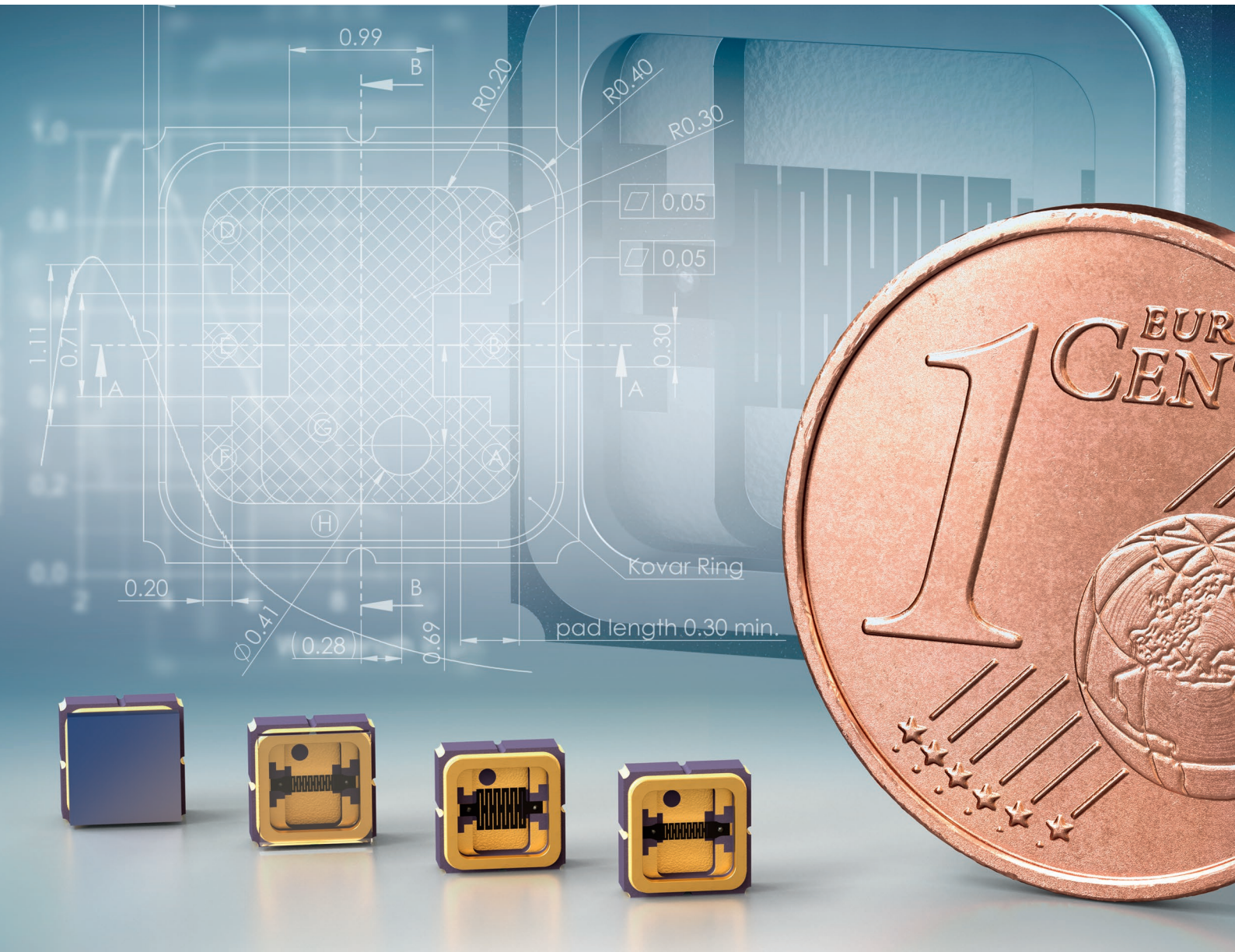
HIS2000R-0	HIS2000R-A300-6 / -C300-6	HIS2000R-A300-9 / -C300-9
		
HIS2000R-0 Without window (open version)	HIS2000R-A300-6 Soldered sapphire window HIS2000R-C300-6 Glued CaF ₂ window Other windows on request	HIS2000R-A300-9 Soldered sapphire window HIS2000R-C300-9 Glued CaF ₂ window Other windows on request
With reflector, no collimator	With reflector, no collimator	With reflector, no collimator
No gas filling	N ₂ gas filling (other gases possible)	N ₂ gas filling (other gases possible)
		

HIS2000R-OWC	HIS2000R-CWC300	HIS2000R-BWC300
		
HIS2000R-OWC Without window (open version)	HIS2000R-CWC300 Soldered CaF_2 window	HIS2000R-BWC300 Soldered BaF_2 window
Winston cone collimator	Winston cone collimator	Winston cone collimator
No gas filling	N_2 gas filling (other gases possible)	N_2 gas filling (other gases possible)
		

Angular radiation distribution



INFRASOLID®



HSsmd series

Thermal Infrared Emitters

HISsmd series

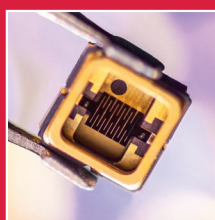
Thermal Infrared Emitters

HISsmd series emitters are small, powerful infrared radiation sources that meet the demands for reliable miniaturized gas sensors and offer a wide range of new application scenarios. The low energy consumption, the high efficiency and the small size allow the use in portable, battery-powered, and mobile applications. These innovative infrared light sources are used, for instance, in respiratory gas analysis, e.g. for the detection of CO₂ and breath alcohol, and in Smart Home and Smartphone applications.

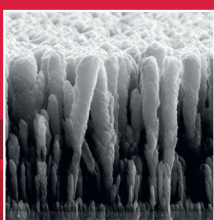
The pioneering SMD package enables a fully automated production in high-volume markets.

Infrasolid's infrared radiation sources are pulsable thermal emitters with a near black-body emittance. Based on a patented nanotechnology and a patented emitter set-up made of a high-melting metal, the free-standing monolithic radiating element and the nanostructured emitter surface offer numerous advantages in many applications.

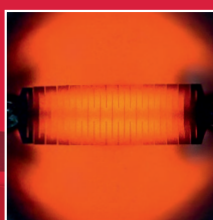
Key features



Very small size



High efficiency



High radiant power

- ✓ Pulsable thermal black-body infrared source mounted in a SMD package with a size of 3x3 mm².
- ✓ Patented nanostructured radiating element achieves up to 500% more detection signal!
- ✓ Innovative surface technology for customized SMD products.
- ✓ Wide wavelength range enables applications in mobile, portable devices and various wearables, for miniaturized gas measurement sensors and hand-held spectrometers.

innovative infrared sources for gas detection & spectroscopy

Main specifications

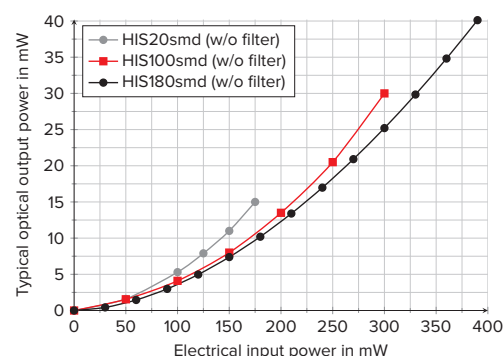
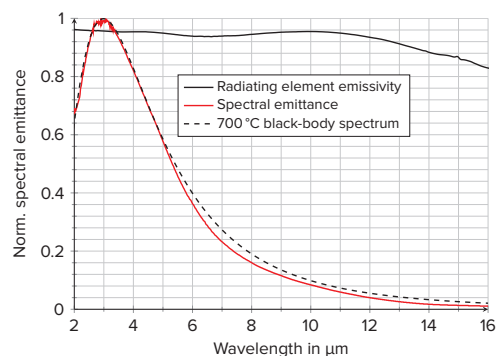
Parameter	HIS20smd	HIS100smd	HIS180smd
Package	SMD3	SMD3	SMD3
Radiating element area	0.32 mm ²	1 mm ²	1.8 mm ²
Radiating element emissivity	> 0.9	> 0.9	> 0.9
Radiating element temperature	700 °C at 175 mW	600 °C at 290 mW	550 °C at 390 mW
Optical output power**	up to 15 mW	up to 30 mW	up to 40 mW
Max. electrical power (DC)	175 mW	290 mW	390 mW***
Max. electrical voltage	1.25 V	1.7 V	2.8 V***
Max. electrical current	140 mA	170 mA	140 mA***
Electrical resistance	8...9 Ω	9...10 Ω	19...21 Ω
Modulation frequency*	14 Hz	10 Hz	8 Hz
Filter (glued window)	Si-ARC, Sapphire	Si-ARC, Sapphire	Si-ARC, Sapphire
Wavelength range**	2 to 20 μm	2 to 20 μm	2 to 20 μm

* 50 % modulation depth, square wave signal, 50 % duty cycle

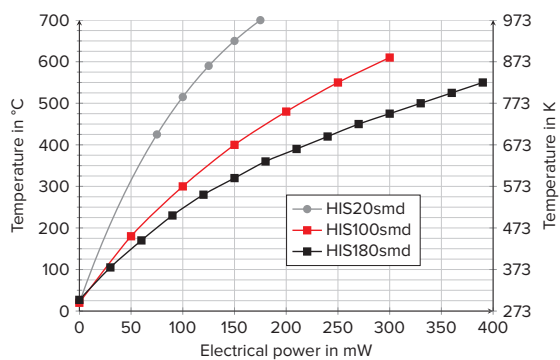
** depending on filter transmissivity

*** for open emitters we recommend 2.6 V / 125 mA / 330 mW, which corresponds to an emitter temperature of 500 °C

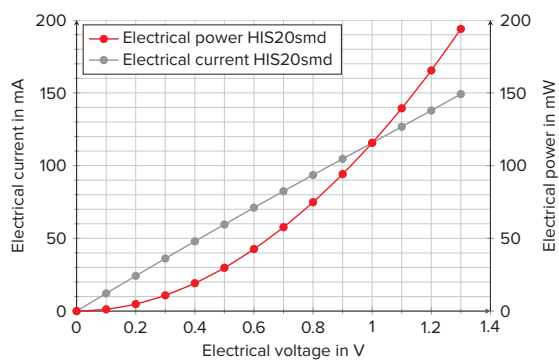
Optical specifications



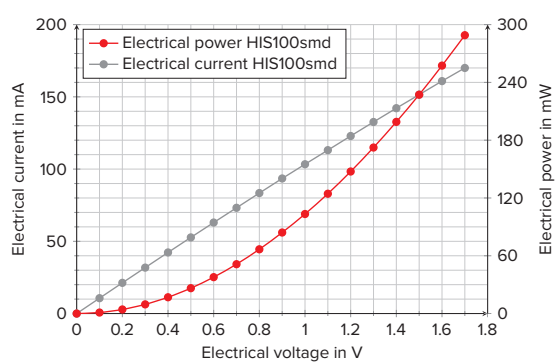
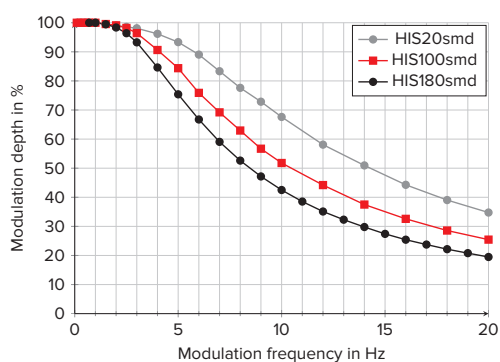
Radiating element temperature



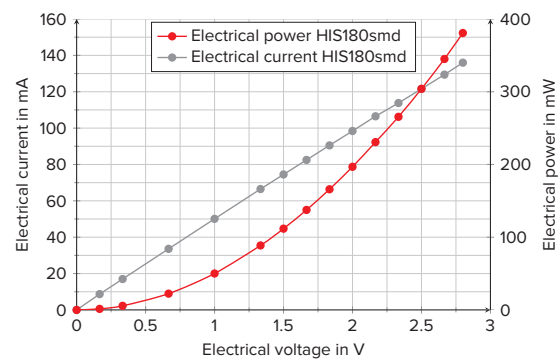
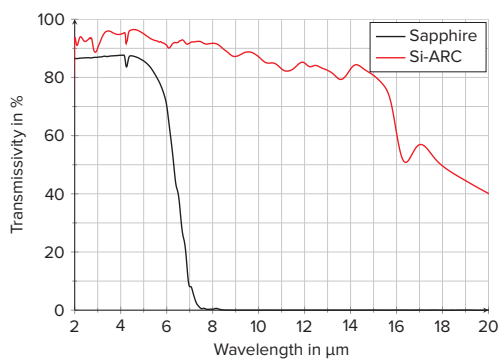
Electrical specifications



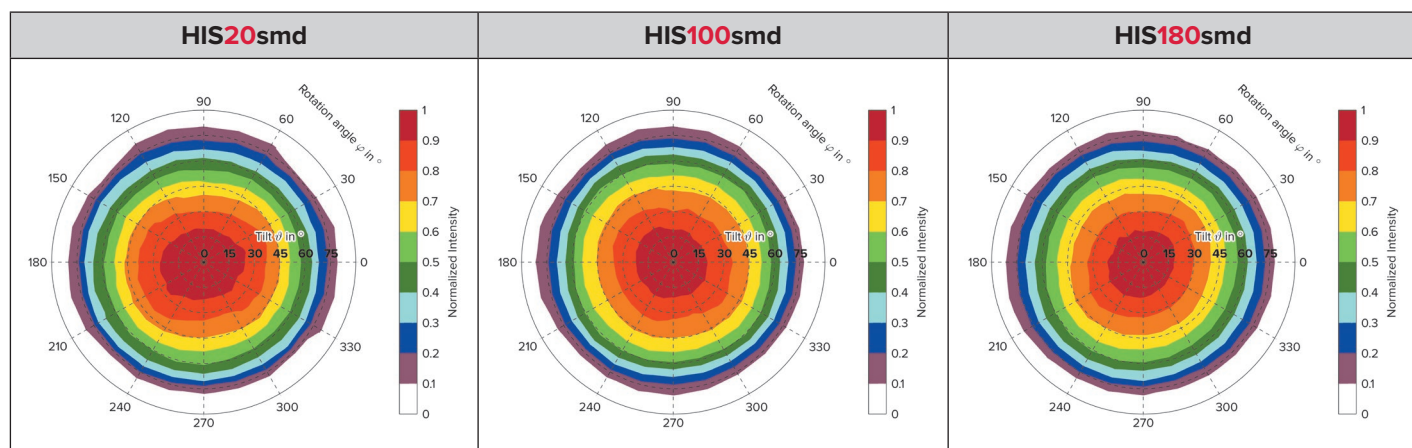
Modulation depth

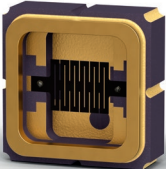
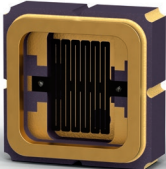
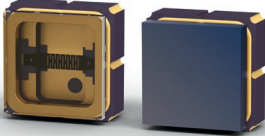
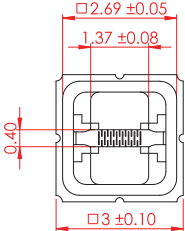
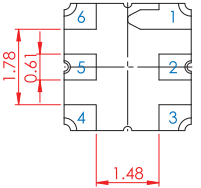
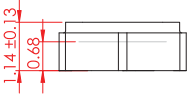
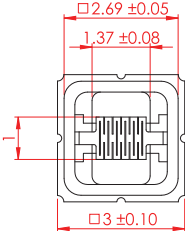
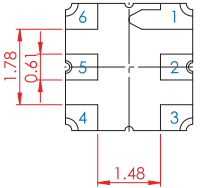
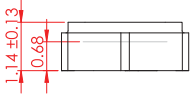
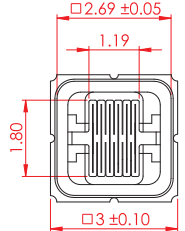
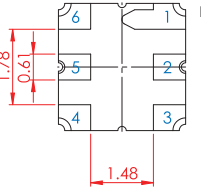
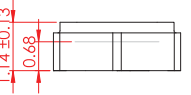
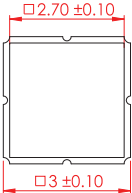
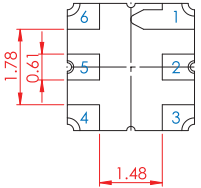
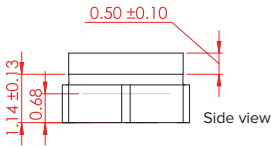


Window material transmissivity



Angular radiation distribution



HIS20smd	HIS100smd	HIS180smd	Window options
			
Without window	Without window	Without window	Si-ARC, Sapphire
 Top view  Bottom view  Side view	 Top view  Bottom view  Side view	 Top view  Bottom view  Side view	 Top view  Bottom view  Side view

Connection table	Lead	1	2	3	4	5	6
	Connection	Case	Power 1	Case	Case	Power 2	Case