Datasheet HEIMANN Sensor Integrated Module TO-Case for Gas Detection CO_2 - Type HIS A21 F4.26 4PIN

HEIMANN Sensor thermopile modules are designed for the non-contact temperature measurement based on infrared radiation. A thermopile sensor and a self-designed application specific integrated circuit (ASIC) is integrated in the sensor case. The ASIC is used for the sensor signal amplification and supplies a sensor temperature voltage.

Features of the specific sensor module type :
- **CO_2 detection by 4% grade infrared narrow band pass filter**
- **4-pin TO39-case**
- **Sensor amplification factor 5500**
- **Linear temperature reference with a sensitivity of 15mV/°C**

Field of View

parameter	*limits*			*unit*	*conditions*
	Min	*Typ*	*Max*		
field of view		70		degree	

Filter Specification

parameter	*minimum*	*typical*	*maximum*	*conditions*
Center wavelength (CWL) at 90° angle of incidence	4.21 µm	4.26 µm	4.31 µm	
Half power bandwidth (HPB)	160 nm	180 nm	200 nm	
Peak transmittance	70%			
Average transmittance from visual to band pass region			0.1%	
Peak transmission from visual to band pass region			1%	
Peak transmittance from band pass region to 8 µm			1%	
Base material		Silicon		

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Operating Conditions

Parameter	*Typical Value*	*Unit*	*Condition*
Supply voltage VDD	4.5 .. 5 .. 5.5	V	+Vs
Supply voltage VSS	0	V	-Vs , Ground
Supply current	1 .. 1.5 .. 2	mA	Without load
Output voltage range	0.3 .. VDD-0.3	V	
Start up time after POR	Max. 0.5	sec	Electrical start up
Sensor absorbing area	1.2 x 1.2	mm^2	Type TP2
Sensor amplification	5500		Output AOT
Response time sensor	10	msec	t/T = 63%
Temperature reference voltage at 25°C	1.225	V	output AOR
Sensitivity temperature reference	15	mV/°C	Linear ; output AOR
Operating temperature	-20.. 120	°C	

Pin / Device Configuration

Pin No.	*Symbol*	*Description*
1	AOT	Amplified analog sensor output voltage
2	AOR	Analog temperature reference output voltage
3	VDD	Positive supply voltage (+5V)
4	VSS	Negative supply voltage / Ground (0V)

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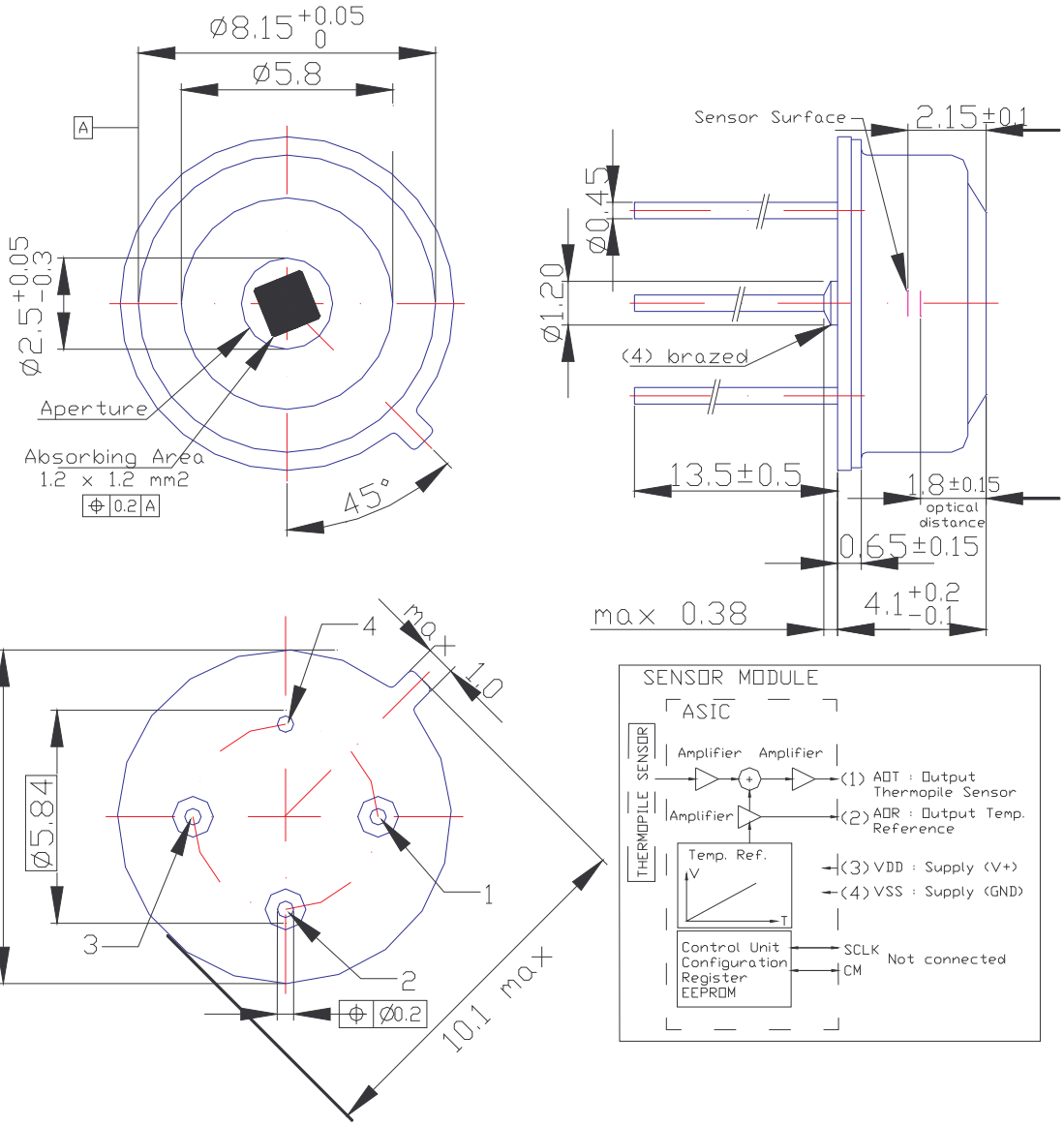
Dimensions / Pin Assignment



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Application Hints

The gas concentration can be measured by monitoring the absorption of an infrared light beam. The base equation for gas concentration measurement in the infrared way is Beer's law :

I=I(0)*exp(-k*c*L)

I	-> radiant flux at the point of measurement
I(0)	-> base radiant flux of the test system without gas absorption
k	-> constant (gas and filter specific)
L	-> measuring distance
c	-> gas concentration

The radiant flux is proportional to the output voltage of the sensor module :

U/U(0) ~ I/I(0) .

A special infrared light source is used to generate the radiant heat. The infrared source needs to be pulsed to eliminate parasitic temperature influences.
The temperature reference output (housing temperature) of the sensor module can be used to compensate ambient temperature drift effects.
Don't hesitate to contact HEIMANN Sensor for support to use our long-time experience in infrared sensors and sensor modules.

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Liability

Changes or modifications at the product which haven't influence to the performance and/or quality of the device haven't to be announced to the customers in advance. Customers are requested to consult with Heimann Sensor representatives before the use of Heimann Sensor products in special applications where failure or abnormal operation may directly affect human lives or cause physical injury or property damage. The company or their representatives will not be responsible for damage arising from such use without prior approval.

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