

# Datasheet Dual Integrated Sensor Type HIS E222 F1 F2 Gx

## Features and Benefits

- Dual-channel thermopile sensor with integrated ASIC
- 4-pin metal housing of size TO-5 / TO-39
- 2 separate outputs supply analog thermopile voltages
- gain preset of selectable factor 4300 or 2150
- Wide operating range 2.7V to 5.5V , -40°C to 120°C
- Large variety of available filter types for different applications

## Ordering Information

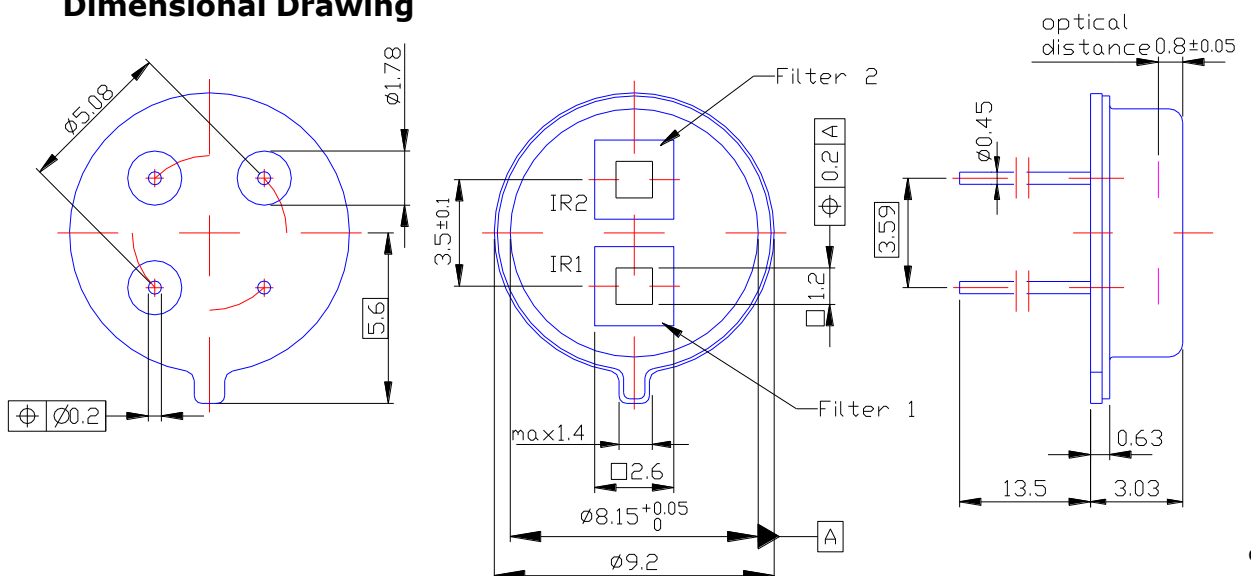
- HIS -> Heimann thermopile sensor and ASIC in a TO-5 housing  
 E222 -> „E“ dual cap TO39 ; „22“ 2x sensor chip TP2 ; „2“ ASIC STP1  
 F1 -> Filter 1 : application-specific filter type (list)  
 F2 -> Filter 2 : application-specific filter type (list)  
 Gx -> sensor gain preset G2150 or G4300

e.g. HIS E222 F3.91-90 F4.26-180 G4300

Filter Selection		
Filter Type	Application	Specification
F4.26-180	CO2 gas detection	NBP CWL 4.26µm HPB 180nm
F4.27-90	CO2 gas detection	NBP CWL 4.27µm HPB 90nm
F4.43-60	CO2 gas detection	NBP CWL 4.43µm HPB 60nm
F4.64-180	CO gas detection	NBP CWL 4.64µm HPB 180nm
F3.30-160	HC gas detection	NBP CWL 3.30µm HPB 160nm
F3.37-190	HC gas detection	NBP CWL 3.375µm HPB 190nm
F3.91-90	gas reference	NBP CWL 3.91µm HPB 90nm
F5.30-180	NOx gas detection	NBP CWL 5.30µm HPB 180nm

Please contact Heimann customer service for special filter requirements.

## Dimensional Drawing



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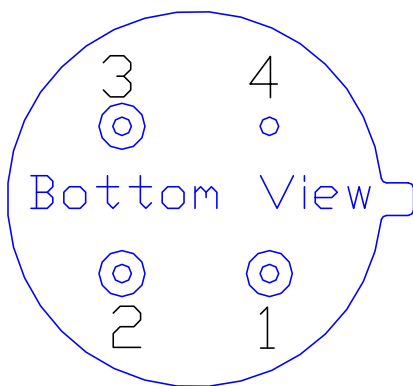
**Operating Conditions / Electrical Specification**

Parameter	Typical Value	Unit	Condition
Supply voltage VDD	(2.7).. 3 .. 5..(5.5)	V	+Vs
Supply voltage VSS	0	V	-Vs , Ground
Supply current	2	mA	Without load
Operating temperature	-40.. 120	°C	
Absorbing area	1.2 x 1.2	mm <sup>2</sup>	Thermopile Chip
Voltage Sensitivity	38	V/W	Thermopile Chip
Voltage response	55	Vmm <sup>2</sup> /W	Thermopile Chip
Time constant	8	ms	
Open loop gain	90	dB	ASIC
PSRR	>40	dB	
Output voltage range	0.15 .. (VDD-0.15)	V	
Noise voltage	45	nV/√Hz	Input related
Zero input sensor signal	1.2 (±0.6)	V	Sensor output TPO
Sensor gain	4300 or 2150	V/V	preset

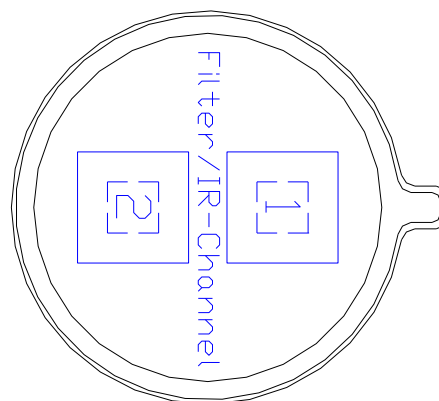
**Pin Assignment**

Pin No	Symbol	Description
1	TPO1	Analog output voltage sensor 1 – IR-channel 1 – Filter 1
2	TPO2	Analog output voltage sensor 2 – IR-channel 2 – Filter 2
3	VDD	Positive supply voltage
4	VSS	Negative supply voltage / Ground (0V)

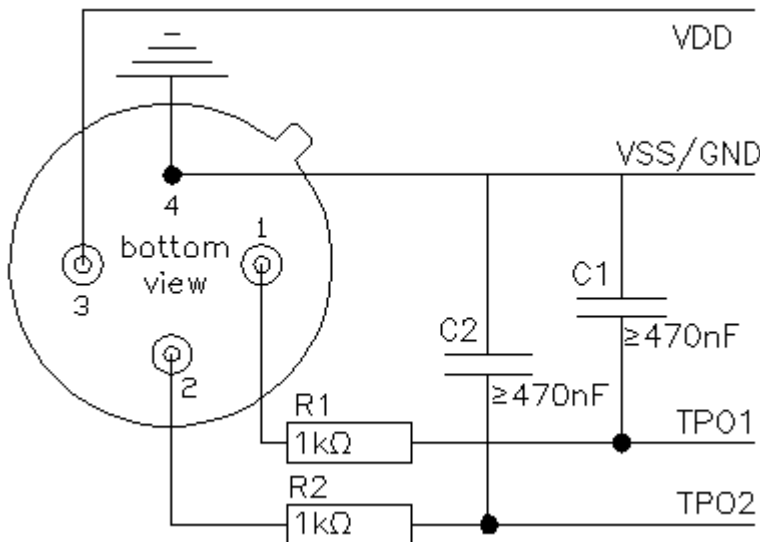
**Bottom View**



**Top View**



## Application Circuitry



## Output Signal

Due to use of chopper-stabilized amplifiers residual ripples of chopping frequency can interfere on the outputs in the range of 20kHz.

Software filtering or low pass filtering can be used to suppress the ripple.

Sample circuitry for simple RC low pass filtering (at resistive loads of  $>1\text{M}\Omega$ ) is shown in alongside picture.

## ESD and SEL Avoidance

Integrated sensors can be damaged by electrostatic discharges and single event latch-up. Please take appropriate precautions for the handling to avoid such events. To prevent thermal damages by latch-up condition, no voltage greater than 0.3V beyond supply voltage should be applied to any pin. Supply voltages must be established before or at least at same time before any other connections are applied.

Stresses above the absolute maximum ratings may cause damages to the device.

## Cleaning and Soldering Advise

Do not expose the sensors to aggressive detergents. Windows may be cleaned with alcohol and cotton swab.

Wave soldering may be applied by a maximum temperature of 280° C for a dwell time less than 10s. Avoid solder exposure to the top and the window of the detector. For hand soldering the maximum applicable temperature is 350° C for a dwell time less than 3s. The minimum distance between the housing body and the liquid solder should be for 280° C at least 0.6mm and for 350° C at least 1.5mm.

## Disclaimer

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.