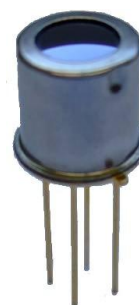


Features and Benefits

- Non-contact surface temperature detection with digital temperature output
- Thermopile Sensor and ASIC in TO-5 housing with 4 leads
- Lens optics with 8:1 D:S ratio
- Digital temperature or sensor voltage output (SMBus compatible or PWM)
- Temperature resolution < 0.1°C at T200 and SMBus compatible operation
- High accuracy over wide sensor temperature and object temperature ranges
- 3V and 5V versions available
- Complies with ROHS regulations

Ordering Information

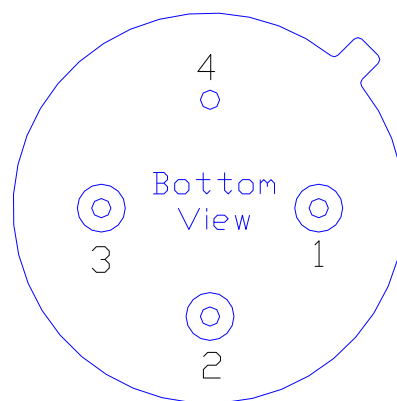
HID -> Heimann thermopile sensor and ASIC
 in a TO39 housing
 L1x -> „L“ lens cap TO39 ; „1“ sensor chip TP1
 -> „x“ ASIC supply voltage x=„4“ : 5V or x=„5“ : 3V
 TC -> optional: „TC“- compensation of interferences by fast
 thermal changings (depending on application)
 FL5.5 -> Infrared lens with 5.5mm focal length
 LS -> optional: „LS“ with lens shade, standard without
 Tx -> Object temperature range e.g. T200 for max. 200°C,
 max. object temperature on digital output 382°C
 PWM -> optional: „PWM“ output - SDA/PWM-pin adusted to pulse width
 modulation



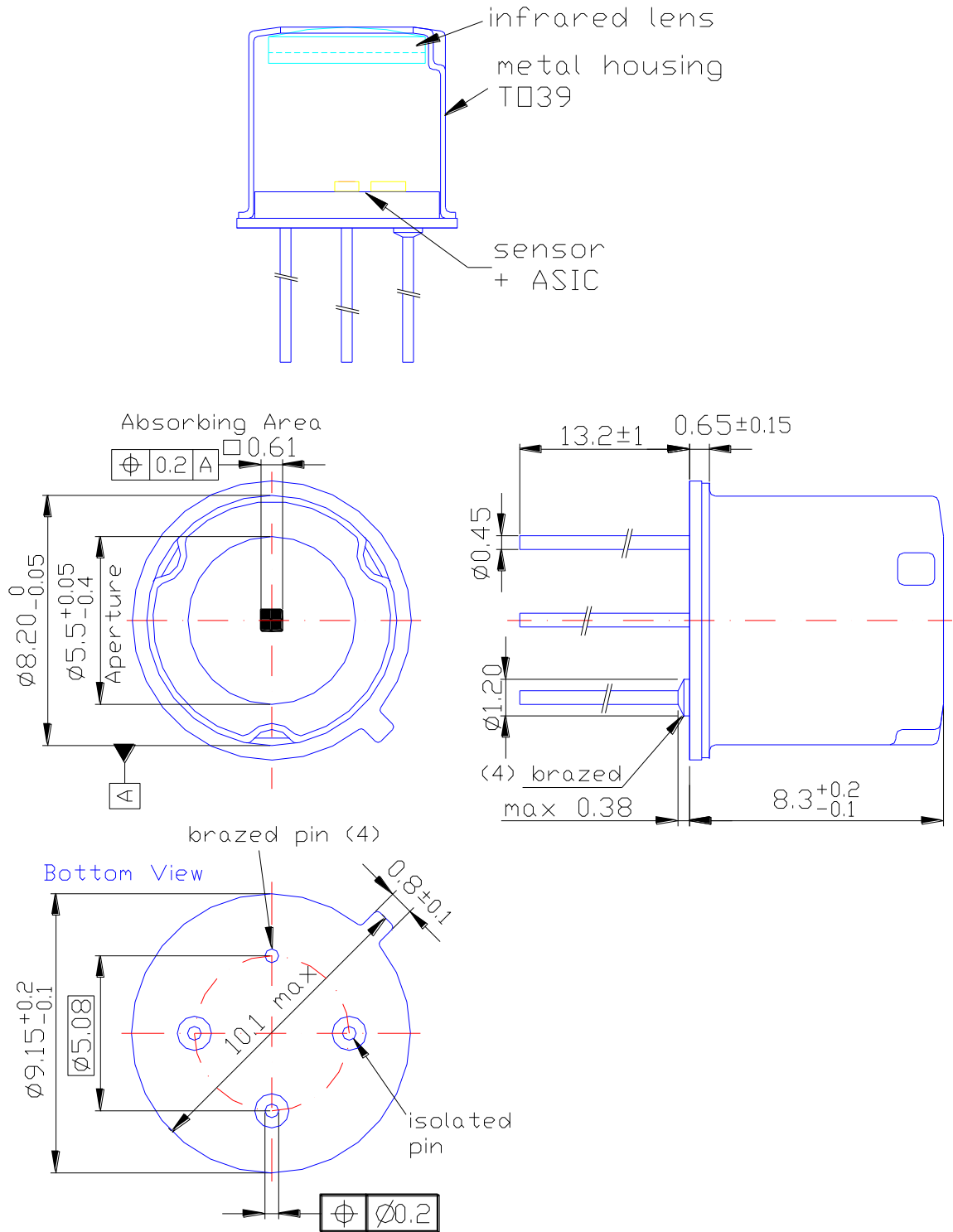
e.g. HID L14 FL5.5 T200 -> 5V supply voltage , max. gain for
 highest resolution to detect an object temperature of max. 200°C
 (picture right)

Pin Configuration

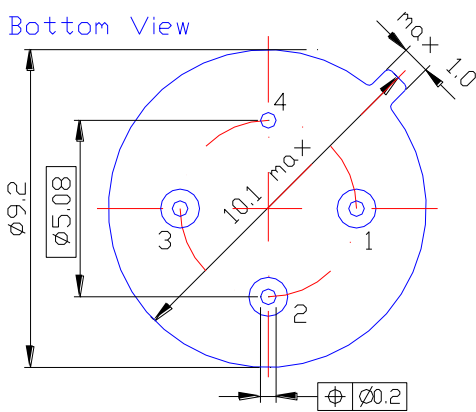
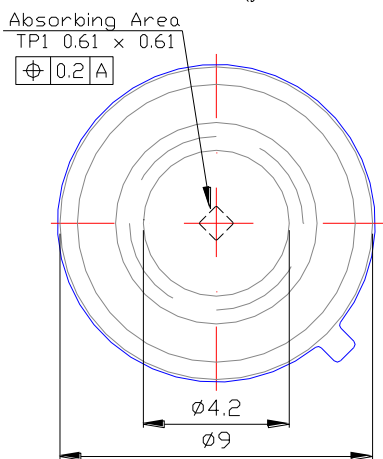
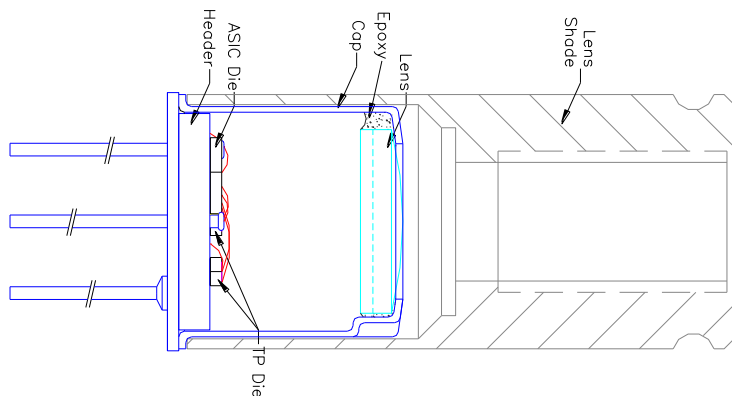
Pin	Symbol	Description
1	SCL	Digital input , serial clock in SMBus compatible mode
2	SDA/ PWM	Digital I/O , data input /output in SMBus compatible mode (open drain), pulse width modulated temperature(s) in PWM mode
3	VDD	Positive supply voltage
4	VSS	Negative supply voltage / Ground (0V) (connected to housing)



Dimensional Drawings HID L1x FL5.5 Tyy (PWM)

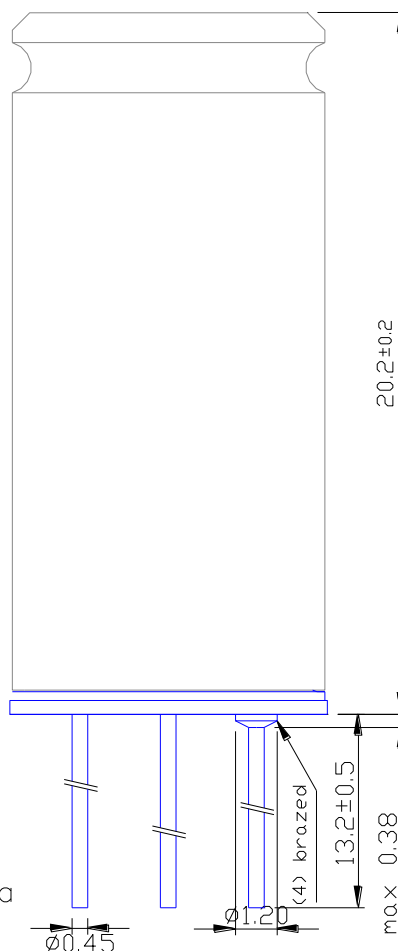


Dimensional Drawings HID with Lens Shade



Pin Assignment

- (1) SCL : Serial Clock
- (2) PWM/SDA : PWM or Serial Data
- (3) VDD : Supply (V+)
- (4) VSS : Supply (GND)



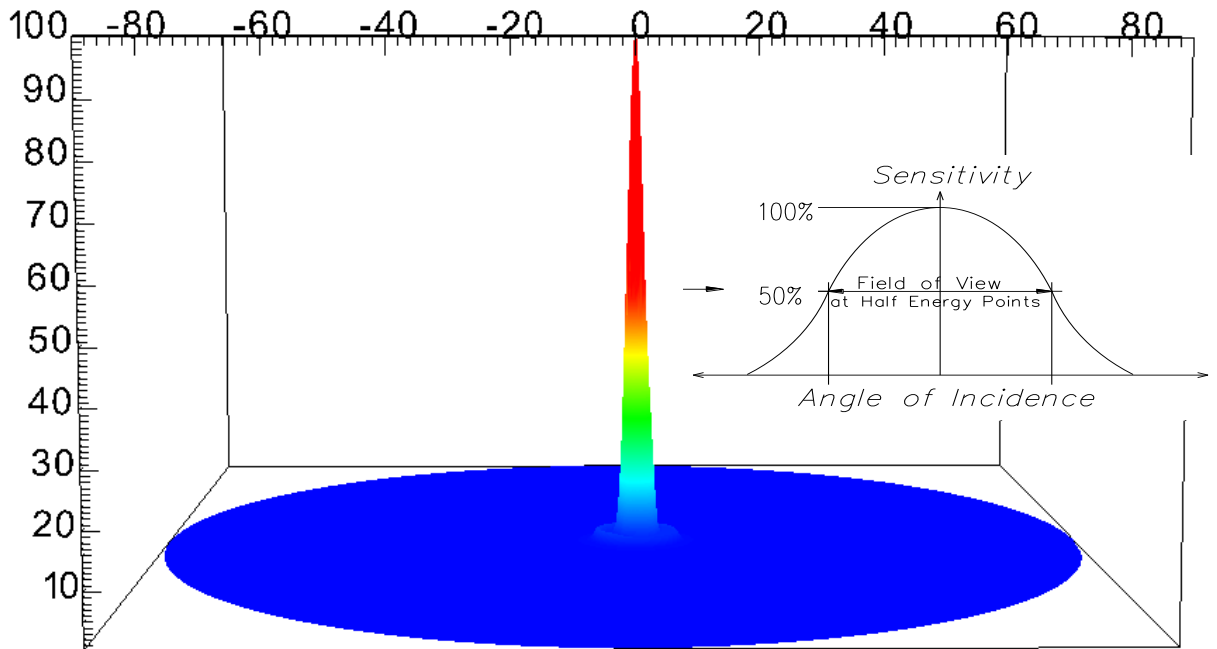
Maximum Ratings

<i>Parameter</i>	<i>Max. value</i>	<i>Unit</i>	<i>Condition</i>
Supply voltage 1 VDD	7	V	Type 5V
Supply voltage 2 VDD	5	V	Type 3V
Reverse voltage	0.4	V	Ground
ESD sensitivity	2	kV	Human body
Storage temperature	-40.. 125	°C	

Operating Conditions

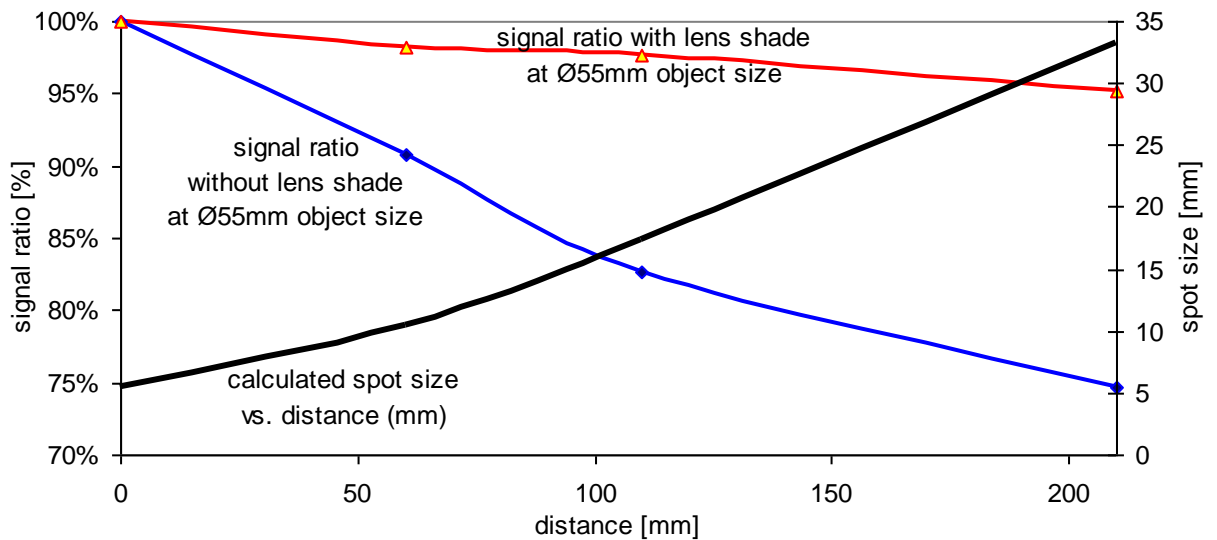
<i>Parameter</i>	<i>Typical Value</i>	<i>Unit</i>	<i>Condition</i>
Supply voltage 1 VDD	5	V	Preset option "x -> 4"
Supply voltage 2 VDD	3	V	Preset option "x -> 5"
Supply voltage VSS	0	V	Ground
Supply current	1	mA	Without load
Start up time after POR	0.15	sec	
Sensor absorbing area	0.61 x 0.61	mm ²	Type TP1
Object temperature range	-40 .. max.+380	°C	maximum "T380", typical "T300", maximum gain "T200"
Ambient temperature range	-40 .. +125	°C	
Response time	5	ms	Sensor chip
Refresh rate	100	ms	Temperature signal
IR transmission	52	%	Wavelength range 5.5µm to 13.5µm
Operating temperature	-40.. 125	°C	
Slave address	5Ah	hex	Factory default
Interface SM-Bus (default)	2-wire SMBus compatible, factory default without interface indication, output configured as open drain NMOS by default		
Interface PWM (type .. PWM)	1-wire PWM output on SDA/PWM, 10 bit resolution default settings: push-pull, single PWM, output of object temperature sensor 1, coefficients for voltage to temp. calculation Tomin: -40°C & Tomax: defined by Tyyy		

Field of View, Spot Size

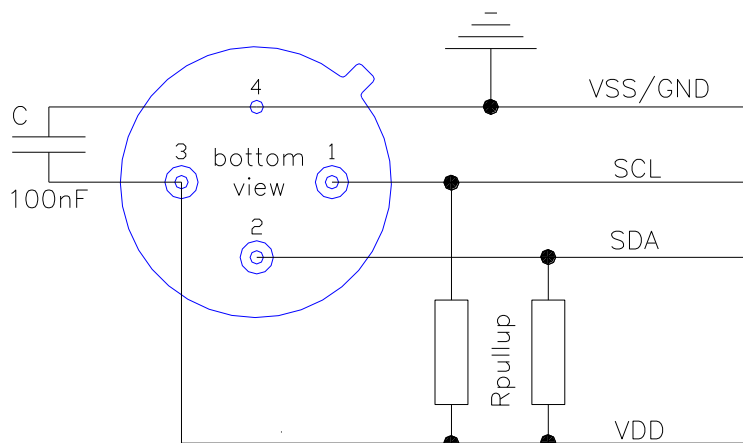


Measurement Result of an Optical Traverse Experiment

parameter	limits			unit	conditions
	Min	Typ	Max		
Optical axis	-3.5	0	+3.5	degree	Sensor view direction
Field of View		6	11	degree	50% energy points
D:S Ratio		8:1			Distance to spot size



Applications Circuitry SM-Bus Operation

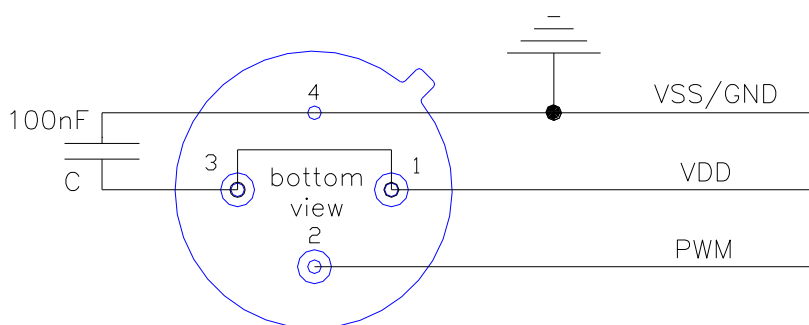


Pull-up resistor recommendation:

low power applications
 20kOhm (SM-Bus DC specification I_{pullup} 100 μ A .. 350 μ A)

high power applications
 1.5kOhm (SM-Bus DC specification I_{pullup} min. 4mA)

Applications Circuitry PWM Operation



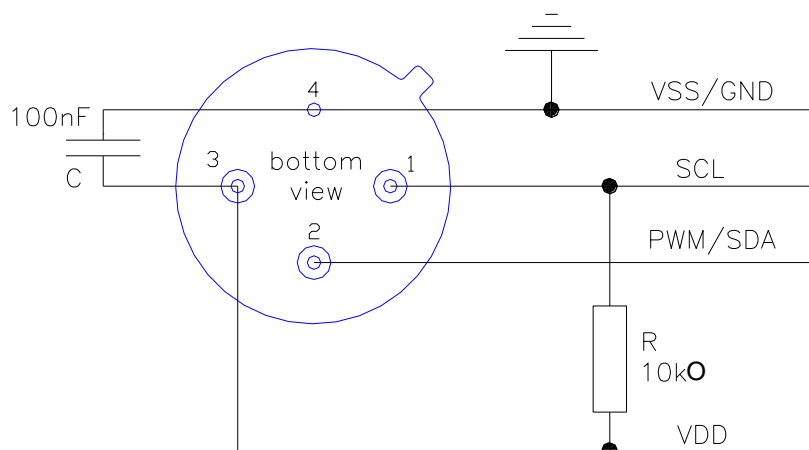
PWM mode is free running after power on.

Pin 3 (SCL) must be forced high for PWM mode

PWM output is configured as push pull

Default PWM output of object temperature 1

Applications Circuitry PWM Operation with SM-Bus Option



PWM mode is free running after power on.

SM-Bus operation available by added pull-up resistor

PWM output is configured as push pull

Default PWM output of object temperature 1

Temperature Performance

		Sensor (Ambient) Temperature [°C]				
		-40 .. 0	0 .. 50	50 .. 100	100 .. 125	
Object Temperature [°C]	-30 .. 0	±3°C	±2°C	±3°C	±4°C	Temperature Accuracy [°C]
	0 .. 60	±2°C	±1°C	±1.5°C	±2.5°C	
	60 .. 120	±3°C	±2°C	±2°C	±3°C	
	120 .. 180	±4°C	±2°C	±2.5°C	±3.5°C	
	180 .. 240	±5°C	±3°C	±3°C	±4°C	
	240 .. 300	±5°C	±4°C	±4°C	±5°C	

Notes to the temperature performance:

- The specified temperature performance presents preliminary findings based on sample investigations using special test equipment.
- The temperature accuracies are achievable by following conditions
 - thermal equilibrium of the sensor
 - no temperature differences in the sensor package
 - the object fills the sensor field of view completely
 - homogenously distributed temperature on the object surface
 - high and uniform emissivity of the object surface in the interesting infrared range

Liability

The contents of this document are subject to change without notice. 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.