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| HEIMANN Sensor GmbH | | Product Specification: Thermopile Sensor HMS K1C1 F5.5 |
| Author(s): W. Leneke, M. Simon | Rev.: R 02/ 04.04.2016 | Page 1 of 5 |

Specification Thermopile Sensor HMS K1C1 F5.5 *Part No. 1052*

R 02

Author(s):

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Revision History

| Version | Date | Remarks |
|---------|------------|---------------------------------|
| R 01 | 23.05.2008 | 1. Draft of HEIMANN Sensor GmbH |
| R 02 | 04.04.2016 | Update drawing |
| | | |
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TABLE OF CONTENTS

| | |
|---|----------|
| 1. Purpose, Scope | 2 |
| 2. Absolute Maximum Ratings | 2 |
| 3. General and Electrical Parameter Thermopile | 2 |
| 4. General and Electrical Parameter Thermistor | 3 |
| 5. Filter Characteristics | 4 |
| 6. Drawing and Pin Assignment | 5 |
| 7. General Directions for Further Processing | 5 |
| 8. Liability | 5 |

1. Purpose, Scope

The new thermopile infrared sensor from Heimann Sensor, comprising a new type CMOS compatible sensor chip plus a thermistor reference chip, features good sensitivity, small temperature coefficient of sensitivity as well as high reproducibility and reliability. The sensor meets the requirements of the European Union RoHS (Regulation of Hazardous Substances) Directive.

The sensor will be available in standard transistor outline packages in different sizes, equipped with an IR transmitting filter window (transmission curve as shown below).

2. Absolute Maximum Ratings

| <i>Parameter</i> | <i>Symbol</i> | <i>Limits</i> | | | <i>Units</i> | <i>Conditions</i> |
|-----------------------|---------------|---------------|-------------|------------|--------------|-------------------|
| | | <i>Min</i> | <i>Typ.</i> | <i>Max</i> | | |
| storage temperature | | -40 | | 100 | °C | |
| operating temperature | | -20 | | 100 | °C | |

3. General and Electrical Parameter Thermopile

| <i>Parameter</i> | <i>Symbol</i> | <i>Limits</i> | | | <i>Units</i> | <i>Conditions</i> |
|-----------------------|------------------|---------------|----------------------|------------|-----------------|--|
| | | <i>Min</i> | <i>Typ.</i> | <i>Max</i> | | |
| element size | | | 0.76*0.76 | | mm ² | absorbing area |
| resistance | R _{TS} | 50 | 75 | 110 | kΩ | -40°C to 100°C |
| voltage sensitivity | S _V | 18 | 32 | 45 | V/W | filter F5.5, 500K, 1Hz |
| time constant | τ | | 8 | 13 | ms | |
| noise voltage | V _{RMS} | | 35 | | nV/√Hz | r.m.s., 25°C |
| detectivity | D* | | 6.9 *10 ⁷ | | cm√Hz/W | filter F5.5, 500K, 1Hz |
| insulation resistance | R _{iso} | 5 | | | GΩ | 10V, 25°C, 60% r.h., between pin 1 or 3 and 4 (ground) |

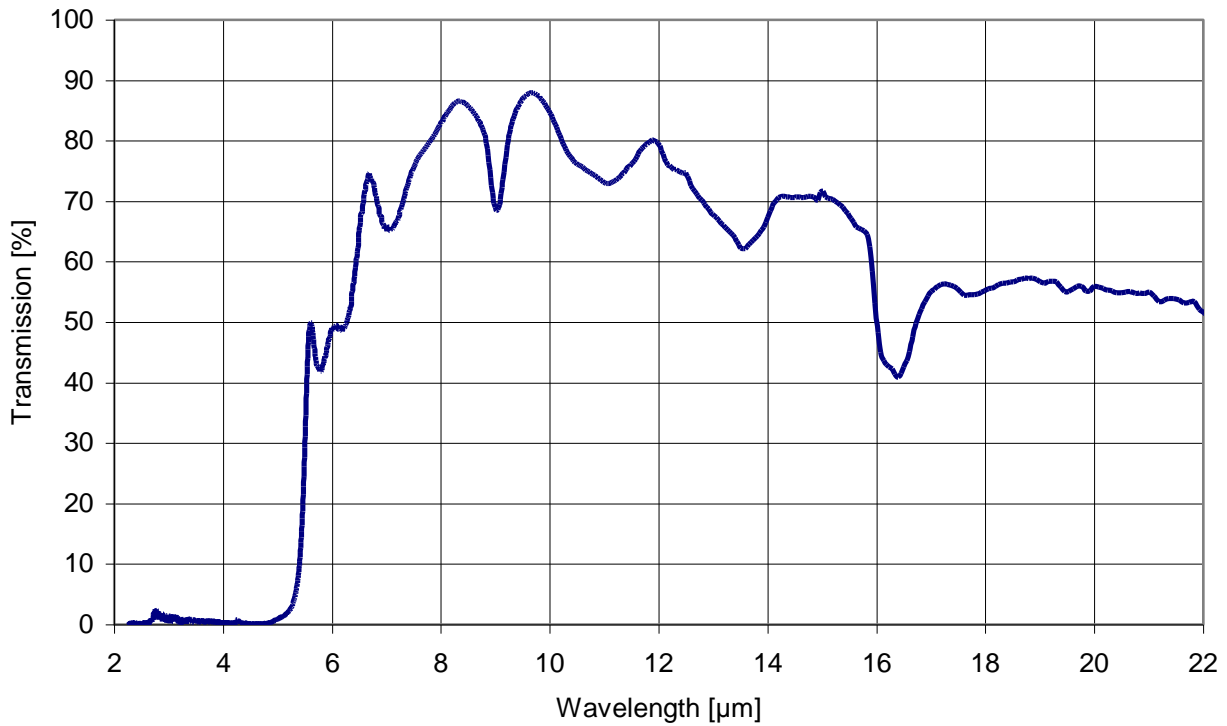
4. General and Electrical Parameter Thermistor

| Type | Thermistor 100kΩ | | | | | |
|------------|------------------|--------|------|------|-------|------------|
| Parameter | Symbol | Limits | | | Units | Conditions |
| | | Min | Typ. | Max | | |
| resistance | R _{TH} | 95 | 100 | 105 | kΩ | 25°C |
| BETA-value | β | 3900 | 3940 | 3980 | K | 25°C/50°C |

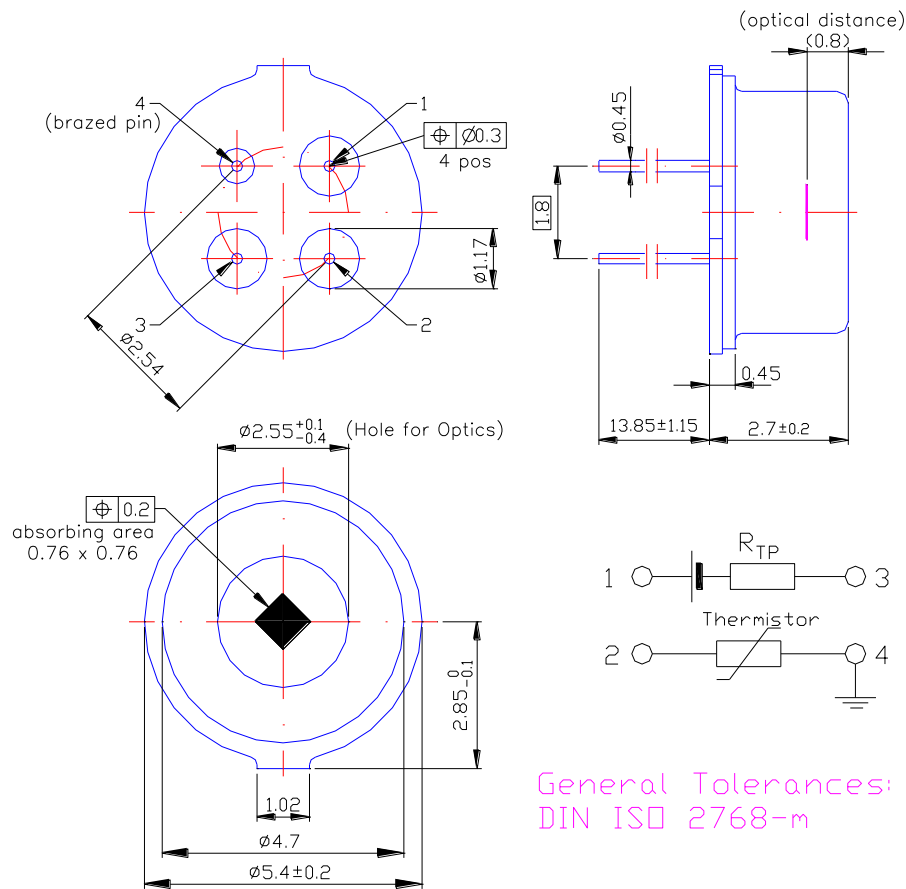
| T / °C | Rth_min / Ohm | Rth_nom / Ohm | Rth_max / Ohm |
|--------|---------------|---------------|---------------|
| -30 | 1557900 | 1655000 | 1753100 |
| -25 | 1163320 | 1234000 | 1306680 |
| -20 | 875826 | 928700 | 981974 |
| -15 | 665010 | 704500 | 744190 |
| -10 | 508730 | 538500 | 568370 |
| -5 | 392108 | 414600 | 437292 |
| 0 | 304466 | 321700 | 338934 |
| 5 | 238072 | 251400 | 264728 |
| 10 | 187444 | 197800 | 208056 |
| 15 | 148568 | 156600 | 164632 |
| 20 | 118404 | 124800 | 131096 |
| 25 | 95000 | 100000 | 105000 |
| 30 | 76537 | 80630 | 84713 |
| 35 | 62032 | 65380 | 68738 |
| 40 | 50543 | 53310 | 56077 |
| 45 | 41386 | 43680 | 45984 |
| 50 | 34070 | 35980 | 37890 |
| 55 | 28174 | 29770 | 31366 |
| 60 | 23405 | 24750 | 26095 |
| 65 | 19536 | 20670 | 21804 |
| 70 | 16383 | 17340 | 18297 |
| 75 | 13788 | 14600 | 15422 |
| 80 | 11653 | 12350 | 13047 |
| 85 | 9890 | 10480 | 11080 |
| 90 | 8421 | 8930 | 9444 |
| 95 | 7197 | 7635 | 8076 |
| 100 | 6172 | 6551 | 6935 |

5. Filter Characteristics

| Filter F5.5 | | | | | |
|----------------------|--------|-----|-----|-------|-----------------|
| Parameter | Limits | | | Units | Conditions |
| | Min | Typ | Max | | |
| average transmission | 75 | | | % | 7.5µm to 13.5µm |
| average transmission | | | 1 | % | visual to 5µm |
| cut on | 5.2 | 5.5 | 5.8 | µm | 25°C |



6. Drawing and Pin Assignment



General Tolerances:
DIN ISO 2768-m

7. General Directions for Further Processing

Stresses above the absolute maximum ratings may cause damages to the device. The sensor can be damaged by electrostatic discharges. Please take appropriate precautions for the handling.

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. 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.

Avoid heat exposure to the top and the window of the detector. Reflow soldering is not recommended.

8. Liability

Important product or process changes require a customer release. 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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