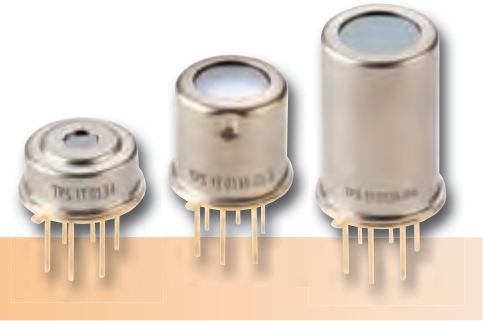


ISOthermal Thermopile Sensor

With Integrated Processing And Optics For Non-Contact Temperature Measurement



TPiS 1T 0134 ,TPiS 1T 0136 L5.5, TPS 1T 0136 IRA –
Calibrated Thermopile Sensor (TPMI® family)

Target Applications

- General-purpose Temperature Monitoring

Features and Benefits

- Internal Signal Processing
- Factory-calibrated
- Optics available
- Ambient Temperature Compensation

Product Description

This series includes the proven concept of TPMI® in TO-5 housing. It senses the thermal radiation emitted by objects and converts this to an analog voltage. The product is fully factory-calibrated for an accurate signal output over a specified temperature range and includes optional temperature compensation. The internal signal processing with 8 bit resolution of the control registers and the EEPROM technology allow for calibration as per customer requirements.

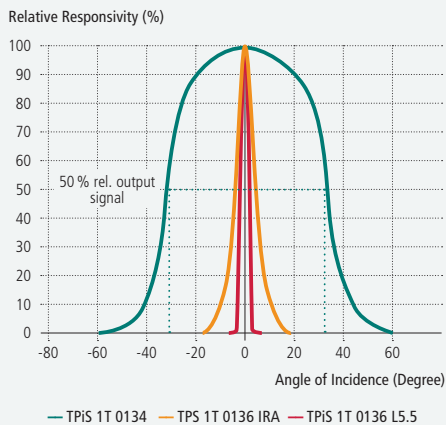
The unique and patented ISOthermal construction offers substantially better performance of the entire sensor under transient thermal conditions. The temperature accuracy of the fully adjustable integrated circuit outperforms discrete solutions. With the integration of Thermopile and electronic circuits in compact TO-5 type metal housing, the TPiS is robust and insensitive to environmental influences like leakage currents on the parent PCB, relative humidity or electromagnetic interference. For amplification of the highly sensitive thermopile signal a high resolution programmable low noise amplifier is provided. An adjustable high precision ambient temperature sensor followed by a signal processor offers accurate compensation signals with polynomial characteristics perfectly matching the thermopile output to achieve an output signal which is closely linear with object temperature. Adding these signals will result in an ambient independent object temperature signal over a large temperature range. This range can be adapted and scaled to customer requirements by means of the flexible offset and post gain adjustment.

For defined spot size requirements we offer sensors with defined Field of View, obtained by apertures, internal lenses or integrated mirrors. The TPMI sensor family includes the integrated ambient temperature compensation and the calibration to a certain temperature range. When ordering, please specify the correct temperature range needed. Excelitas offers the following pre-calibrated Sensors:

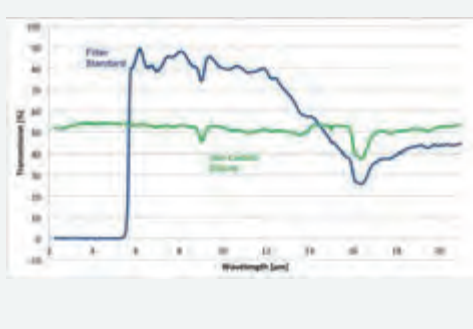
- | | |
|---------------------------------------|-------------------------------------|
| -20...60°C: TPiS 1T 0134 OAA060 | 20...120°C: TPiS 1T 0134 OAA120 |
| -20...120°C: TPiS 1T 0136 L5.5 OAA120 | -20...250°C: TPS 1T 0136 IRA OAA250 |

IRA = internal reflector L5.5 = 5.5mm focal length lens.

Field of View

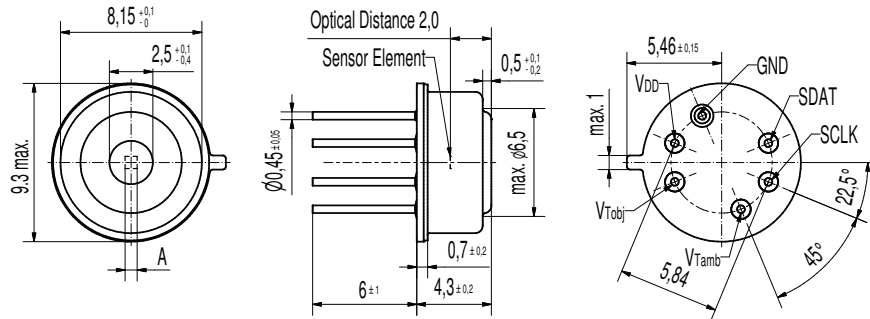
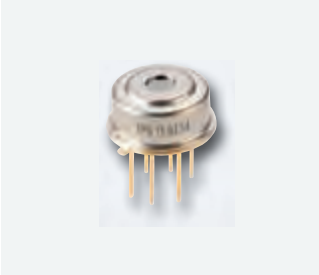


Filter



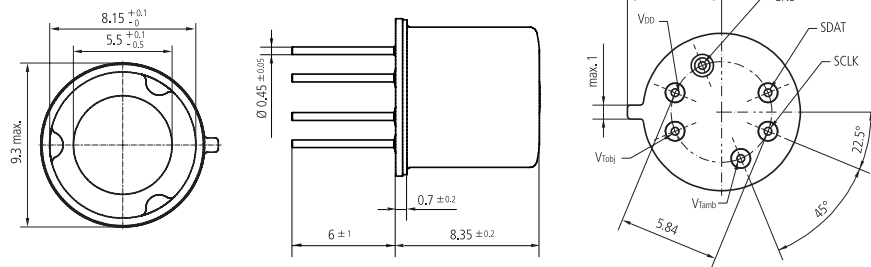
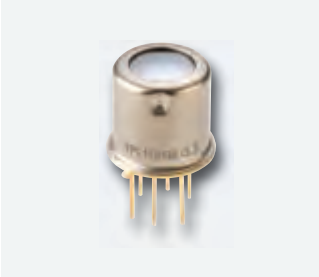
A temperature reference output is included. Upon request, other object temperature ranges can be provided. The sensors can also be supplied as "OBA" version without internal temperature compensation.

TPiS 1T 0134



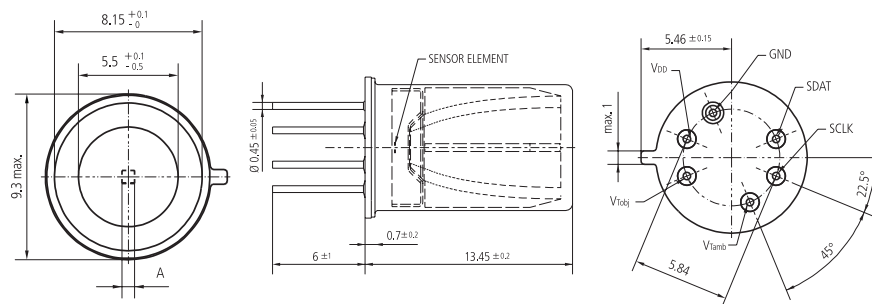
TPiS 1T 0134

TPiS 1T 0136 L5.5



TPiS 1T 0136 L5.5

TPS 1T 0136 IRA



TPS 1T 0136 IRA

TPiS 1T 0134, TPiS 1T 0136 L5.5 and TPS 1T 0136 IRA

Parameter	Symbol	TPiS 1T 0134	TPiS 1T 0136 L5.5	TPS 1T 0136 IRA	Unit	Remark
Output Voltage Swing	V_O	0,25...(V _{DD} - 0,25)	0,25...(V _{DD} - 0,25)	0,25...(V _{DD} - 0,25)	V	
Resistive Output Load	R_L	50	50	50	kΩ	min.
Object Temp Accuracy		1,5	1,5	1,5	K	+ / -
Response Time	t_{resp}	100	100	100	ms	typ.
Supply Voltage	V_{DD}	4,5...5,5	4,5...5,5	4,5...5,5	V	
Supply Current	I_{DD}	1,5	1,5	1,5	mA	typ.; $R_L > 1M\Omega$
Operating Temp range		-25...+100	-25...+100	-25...+100	°C	
Storage Temp range		-40...+100	-40...+100	-40...+100	°C	
ESD tolerance		2,5	2,5	2,5	kV	human body model
Soldering Temp		300	300	300	°C	max., 10 s
Sensitive area	A	0,2	0,2	0,2	mm ²	
Field of View , typ.	FoV	67	4,5	11	Degrees	at 50% point
Distance to Spot size ratio		-	11:1	-		
Parameter	Symbol	TPiS 1T 0234	TPiS 1T 0236 L5.5	TPS 1T 0236 IRA	Unit	Remark
Sensitive area	A	0,7 x 0,7	0,7 x 0,7	0,7 x 0,7	mm ²	
Field of View , typ.	FoV	70	7	15	Degrees	at 50% point
Distance to Spot size ratio		-	8:1	-		