SENSOR SOLUTIONS

Product Specification

Thermopile Detector TPiD 1T 0622B/ 7301

Revision - Date: 2019/06/28

Features and Benefits

- TO46 isothermal metal housing
- Thermistor included
- High signal to noise ratio

Applications

- Ear thermometry
- General purpose thermometry

1 General Characteristics

Table 1: Absolute Maximum Ratings

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
T_A	Ambient Temperature Range	-20		100	°C	Operation
T_A	Ambient Temperature Range	-40		100	°C	Storage

2 Type Characteristics

2.1 Design Characteristics

The detector fully complies with the European RoHS environmental directives against the use of hazardous materials in electrical and electronic equipment.

Table 2: Design Characteristics

Parameter	Description
Leads	(3 isolated + 1 ground) pins
Filter type	Si-based interference longpass filter
Temperature reference	Thermistor 100 kΩ
Device marking	Device number + 4 digits date code YYWW

2.2 Electrical Characteristics

Table 3: Thermopile Detector Characteristics

Symbol	Parameter	Value	Unit	Conditions
A	Sensitive Area	1.4	mm^2	Absorber area
R_{TP}	Thermopile Resistance	50…110	kΩ	25 °C
R	Responsivity	40	V/W	500 K, 1Hz, without filter
$S_{25/40}$	Sensitivity (Tdet 25 °C / Tobj 100 °C)	150	µV/K	
$S_{25/100}$	Sensitivity (Tdet 25 °C / Tobj 100 °C)	200	µV/K	
t	Time Constant	27	ms	
V_N	Noise Voltage	36	nV/√Hz	25 °C
D*	Specific Detectivity	1.3	10^8 cm√Hz/W	25 °C
TC_{RTP}	Temperature Coefficient of Resistance	0.03	%/K	
TC_R	Temperature Coefficient of Responsivity	-0.05	%/K	
R25	Thermistor Base Resistance	100 ± 5	kΩ	Tamb = 25°C
ß	Thermistor BETA -Value	4092	K	Defined at 25°C / 100°C
ß	Thermistor BETA –Value Tolerance	± 1	%	

Table 4: Tabulated Thermistor Data

Temp	R_{nom}	R_{min}	R_{max}	Temp	R_{nom}	R_{min}	R_{max}
°C	Ω	Ω	Ω	°C	Ω	Ω	Ω
-20	998530	923740	1073300	45	42950	40411	45490
-15	748670	694940	802400	50	35262	33107	37417
-10	566360	527420	605300	55	29100	27265	30935
-5	432120	403660	460580	60	24136	22569	25702
0	332400	311430	353360	65	20114	18772	21457
5	257690	242130	273250	70	16841	15688	17995
10	201270	189640	212900	75	14164	13169	15158
15	158340	149590	167090	80	11963	11103	12823
20	125420	118790	132050	85	10147	9401	10893
25	100000	95000	105000	90	8640,7	7992,1	9289,4
30	80239	76006	84473	95	7386,7	6820,9	7952,5
35	64776	61216	68335	100	6338,3	5843,4	6833,2
40	52598	49596	55600	105	5458,4	5024,2	5892,5

2.3 Optical Characteristics

Table 5: Optical Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
	Field of View		110		degree	At 50% intensity points
	Optical Axis		0	+/- 10	degree	

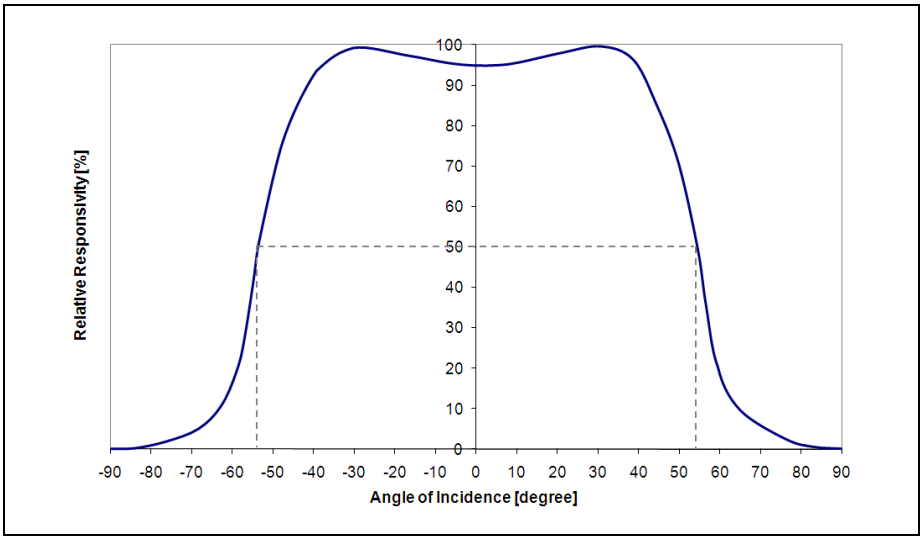

Figure 1 Field of View Curve

Table 6: Filter Parameters

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
T_A	Average Transmittance	70	> 77		%	Wavelength Range from 7.5 µm to 13.5 µm
T_A	Average Transmittance			< 0.5	%	Wavelength Range < 5 µm
λ (5 %)	Cut on Wavelength	5.2	5.5	5.8	µm	At 25°C

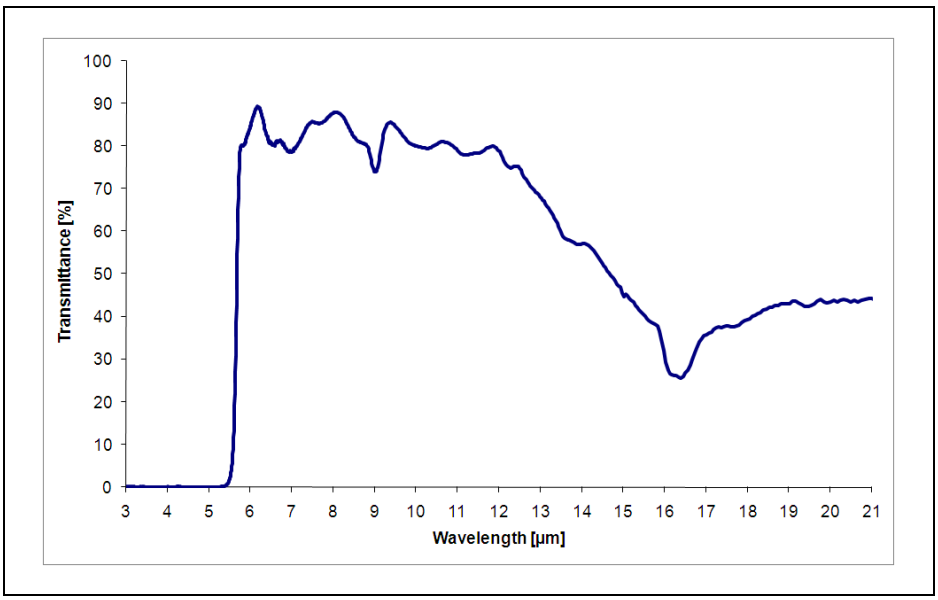

Figure 2 Typical Filter Transmission Curve

2.4 Mechanical Drawing

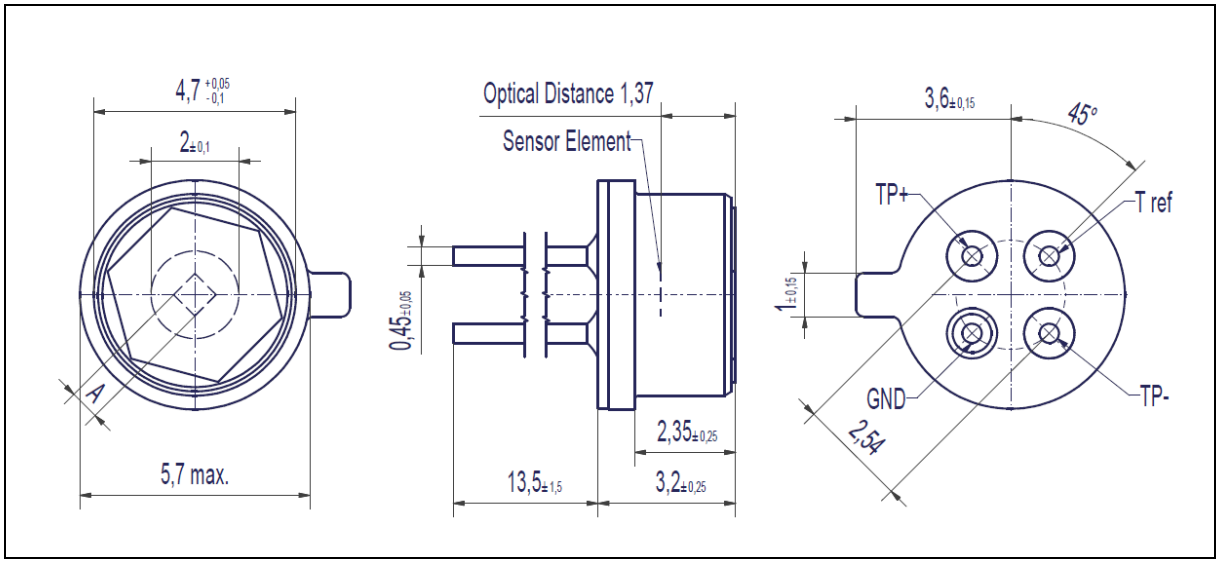

Figure 3 Mechanical Drawing of the TPD 1T 0622B (Drawing No.: 2/71828-0)

2.5 Handling Requirements

Stresses above the absolute maximum ratings may cause damages to the device. Do not expose the detector to aggressive detergents such as Freon, Trichloroethylene, etc. Windows may be cleaned with alcohol and cotton swab. Hand soldering and wave soldering may be applied by a maximum temperature of 260°C for a dwell time less than 10 s. Avoid heat exposure to the top and the window of the detector. Reflow soldering is not recommended.

3 Quality Statement

Excelitas Technologies is an ISO 9001 certified manufacturer. All devices employing PCB assemblies are manufactured according IPC-A-610 guidelines.

3.1 Liability Policy

The contents of this document are subject to change. The details of this document are valid by the specified revision date. Excelitas reserves the right to change at any time total or part of the content of this specification without individual notification. Customers should consult with Excelitas Technologies' representatives to ensure updated specifications before ordering. Customers considering the use of Excelitas Technologies devices in applications where failure may cause personal injury or property damage, or where extremely high levels of reliability are demanded, are requested to discuss their concerns with Excelitas Technologies representatives before such use. The Company's responsibility for damages will be limited to the repair or replacement of defective product. As with any semiconductor device, thermopile sensors or modules have a certain inherent rate of failure. To protect against injury, damage or loss from such failures, customers are advised to incorporate appropriate safety design measures into their product.

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