TPTV Thermopile Sensor Module

- **Contact less Temperature Measurement**
- **Internal Silicon Lens**
- **USB Interface**

DESCRIPTION

TPTV is a contact-less temperature measuring system based on the detection of infrared radiation.
TPTV is equipped with an infrared sensor (Thermopile) in front. The Thermopile Sensor has to be pointed at the target object of interest.
The basic working principle is:

- Detection of infrared radiation with a Thermopile sensor, which turns incoming radiation to an analogue voltage
- Determination of sensor temperature using a thermistor
- Further analogue signal processing and conditioning
- Calculation of ambient and object temperature using a processing unit
- Providing the ambient and objects temperature via USB bus

FEATURES

- 0°C – 100°C Measurement Range
- USB Interface

APPLICATIONS

- Contact less Temperature Measurement

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ABSOLUTE MAXIMUM RATINGS

Absolute maximum ratings are limiting values of permitted operation and should never be exceeded under the worst possible conditions either initially or consequently. If exceeded by even the smallest amount, instantaneous catastrophic failure can occur. And even if the device continues to operate satisfactorily, its life may be considerably shortened.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	Vcc	Measured versus GND	-0.5		6	V
Operating Temperature	Top		-10		85	°C
Storage temperature	Tstor		-40		85	°C

OPERATING CONDITIONS

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply voltage	Vcc	Measured versus GND	3.3	---	5.25	V
Emission Coefficient	ε		0.95			

OPERATING CONDITIONS

If not otherwise noted, 25°C ambient temperature, 5V supply voltage and object with ε =0.98 were applied.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Field of View	FOV			14[1]		°
Supply Current	I	Full ambient temp. range, no output load		5		mA
Data Output Rate	Fout		1			Hz

[1] Total field of view at 10% signal level

OPERATIONAL CHARACTERISTICS

If not otherwise noted, 25°C ambient temperature, 5V supply voltage and object with ε =0.98 were applied.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Object Temperature Range	Tobj			100		°C
Ambient Temperature Range	Tamb		0		85	°C
Standard Start-Up Time	tStart			3		s
Stabilization Time	tStab			3		min
Accuracy offset – prior to thermal stability time	ΔT_{stab}			±3[2]		%FS
Accuracy tolerance when 10°C < Tambient < 40°C and after 3 minutes stabilization time	ΔT	170°C < T_{object} < 190°C		±2[2]		%FS
		Outside above range		±3[2]		%FS

[2] The distance of sensor to measurement object has to be disclosed by customer in order to guaranty calibration accuracy.

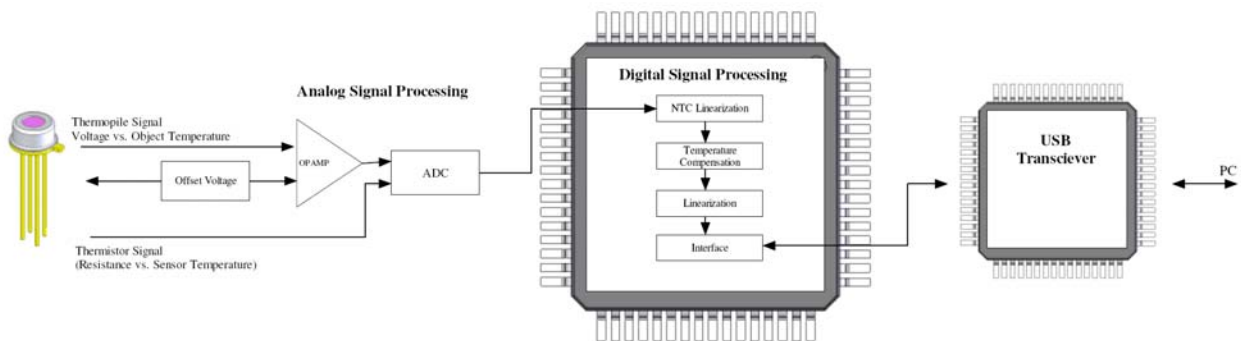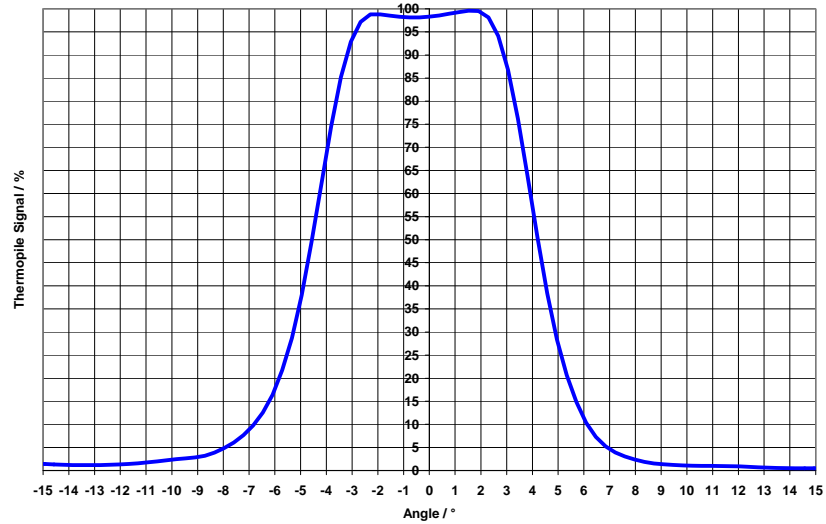# TPTV Thermopile Sensor Module

MECHANICAL DIMENSIONS
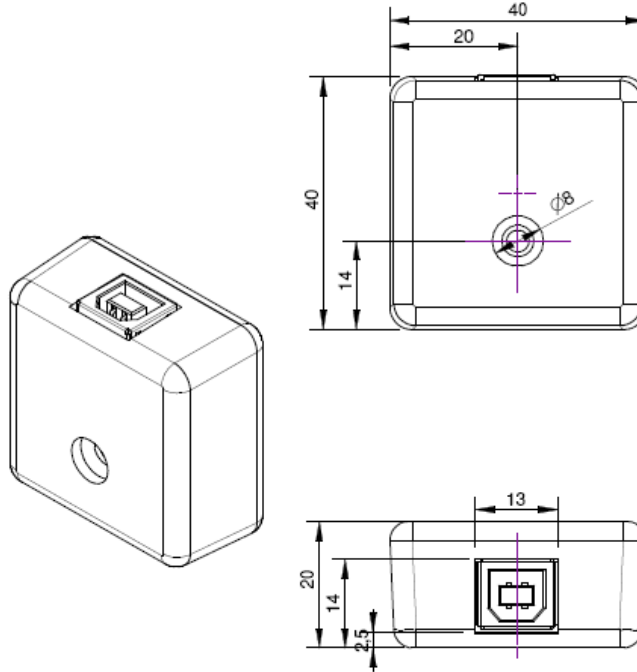
TERMINALS

Connector: Standard USB B Jack

Pin	Name	Description	Type
1	VCC	Supply Voltage (5V)	Supply
2	D-	Data-	IO
3	D+	Data+	IO
4	GND	Ground	Supply

BLOCK DIAGRAM
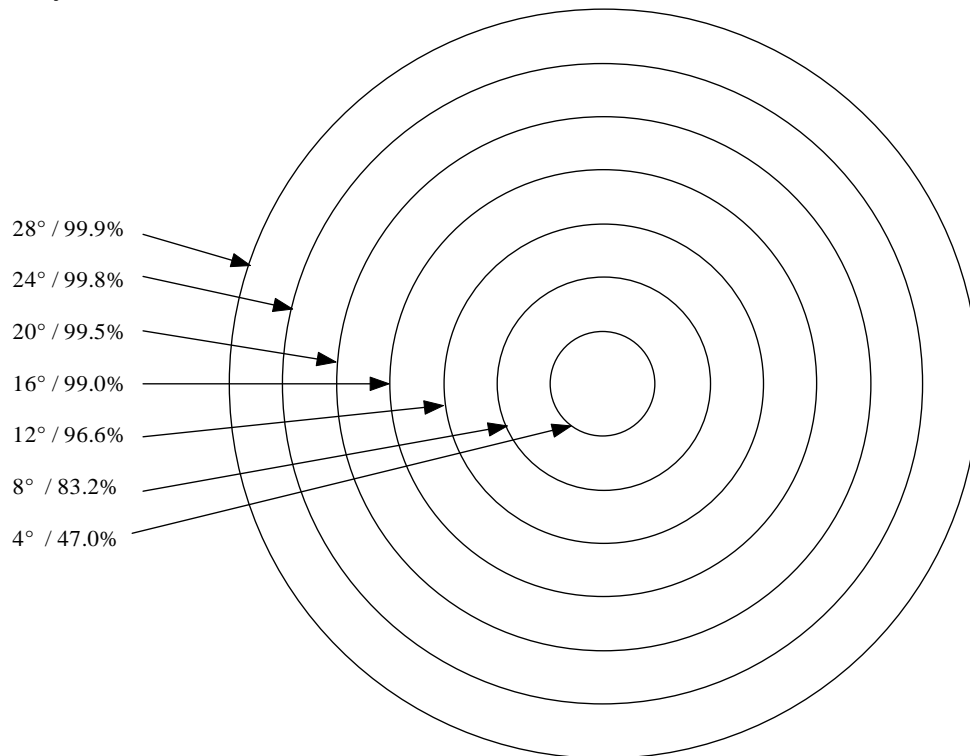
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FIELD OF VIEW

SIGNAL DISTRIBUTION

The non-ideal filter characteristics have to been considered for the correct measurement distance with respect to the measurement object surface size. To achieve most accurate measurement results, measurement object should at least cover 99% of the sensors field of view.

28° / 99.9%
24° / 99.8%
20° / 99.5%
16° / 99.0%
12° / 96.6%
8° / 83.2%
4° / 47.0%

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FUNCTION

INTERFACE CHARACTERISTICS

Parameter	Value
Digital Output Type	RS232 via USB
Data Output Rate	tbd
Data Output Settings	9600 Baud, 8 Bit, No Parity, 1 Stop Bit
PC Settings	USB drivers will be provided. Driver is emulating a serial COM-Port.

INTERFACE COMMAND REFERENCE

Ambient and Object Temperature Measurement

Please refer following table for interface commands to read object temperature and ambient temperature. Both values are transmitted in hundredth of degrees.

Command (ASCII)	Description	Reply (ASCII)	Bytes
"t"	Object temperature	Object temperature in hundredth of degree inclusive sign	6
"n"	Ambient temperature	Ambient temperature in hundredth of degree inclusive sign	6

Example of Object Temperature Measurement

PC → Sensor	Sensor → PC
"t" (ASCII)	"+02351" ASCII (+23.51°C)

ORDERING INFORMATION

Measurement Specialties (China) Ltd.

Sales email:

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