



TSD305

DIGITAL TEMPERATURE SENSORS

Product Description

The TSD Series are digital thermopile sensors in a TO5 package. The TSD sensors include an infrared sensor (thermopile) and a sensor signal conditioner.

The TSD sensors can be interfaced to any microcontroller by an I²C interface. This microcontroller has to calculate the temperature results based on the ADC values and the calibration parameters

Features

- 0°C ... up to +300°C measurement ranges
- Small size
- Small field of view available
- Up to $\pm 1^\circ\text{C}$ accuracy
- I²C Interface
- Low current consumption
- Operating Temperature Range: -10°C ... +85°C

Applications

- Contactless temperature measurement
- Climate control
- Industrial process control
- Household applications

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. Even if the device continues to operate satisfactorily, its life may be considerably shortened.

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply voltage	V_{DD}	---	-0.3	---	+3.63	V
Storage temperature	T_{stor}	dry	-20	---	+85	°C
Voltage at supply and IO pins	V_{DD} V_{IO}	---	-0.5	---	$V_{DD} + 0.5$	V
Current into supply and IO pins	I_{IN}	---	-100	---	100	mA
ESD rating	ESD	Human Body Model	-2	---	+2	kV
Humidity	Hum	---	Non condensing			---

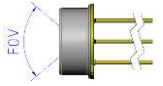
OPERATING CONDITIONS

If not otherwise noted, 3.3V supply voltage is applied.

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating supply voltage	V_{DD}	stabilized, 100nF	1.68	---	3.6	V
VDD rise time	t_{VDD}	---	---	---	200	μs
Operating temperature	T_{op}	---	-20	---	+85	°C
Resolution	RES	---	---	---	0.1	°C
Supply Current	I_{VDD}	Active state, average	---	1050	1500	μA
		Sleep state, idle current	---	20	25	nA
Serial data clock I2C	F_{SCL}	---	10	100	400	kHz
Self-heating	SH	1 sample/s, still air, 60s	---	---	+0.2	°C
VDD capacitor	C_{VDD}	Place close to the sensor	---	100	---	nF

THERMOPILE COMPONENT

If not otherwise noted, 3.3V supply voltage is applied.

Parameter	Symbol	Condition	Sensor	Min	Typ	Max	Unit
Absorber area	A	---	---	0.8 x 0.8			mm
Field of view	FOV	At 50% of maximum signal 	TSD305-1C55 TSD305-2C55 TSD305-3C55	---	88	---	deg
			TSD305-1SL10	---	10	---	deg
Filter transmission range	---	Long wave pass	TSD305-1C55 TSD305-2C55 TSD305-3C55	>5.5			μm
		Silicon lens, no coating	TSD305-1SL10	≥1.1			μm