

ANALOGUE TO DIGITAL CONVERTER

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Resolution	ADC _{RES}	---	---	16	---	bit
Conversion time	t _{CONV}	---	---	44.8	59.2	ms
Rise time	t ₆₃	Including rise time of sensor element	---	---	44.8	ms
Resolution internal temperature sensor	ITS _{RES}	---	---	0.003	---	K/LSB

TOLERANCES

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

T_{sen} = sensor temperature, T_{obj} = object temperature

Parameter	Symbol	Sensor Tempo	Object Temp	Max	Unit
Accuracy Standard Temp ¹⁾	ACC _S	+10°C < T _{sen} < +40°C	+170°C < T _{obj} < +190°C	±1.5	%FS
Accuracy Extended Temp. ²⁾	ACC _{E1}	Complete range	Complete range	±2.5	%FS

Other temperature ranges and accuracies are available on request.

¹⁾ Proved while production

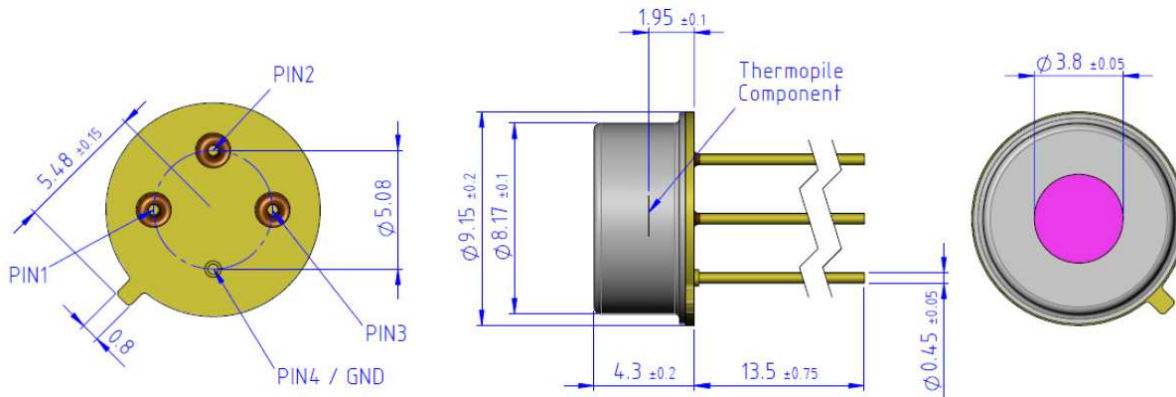
²⁾ Proved by design

POWER & RESET

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Start up time	t _{STA1}	V _{DD} ramp up to interface communication	---	---	1	ms
	t _{STA2}	V _{DD} ramp to first ADC measurement	---	---	2.5	ms
Wake up time	t _{WUP1}	Sleep to active state interface communication	---	---	0.5	ms
	t _{WUP2}	Sleep to first ADC measurement	---	---	2	ms
Power down time for reset	t _{RESET}	V _{DDlow}	3	---	---	µs
VDD low level	V _{DDlow}	---	0	---	0.2	V
VDD rising slope	SR _{VDD}	---	10	---	---	V/ms

DIMENSIONS

If not specified, all tolerances according DIN ISO 2768-m.



TSD305-2C55

Digital Thermopile Sensor

PIN FUNCTION TABLE

Pin	Name	Type	Function
1	SCL	DI	I ² C Clock
2	SDA	DIO	I ² C Data
3	V _{DD}	P	Supply Voltage
4	V _{SS}	P	Ground

I²C INTERFACE

An I²C communication message starts with a start condition and it is ended by a stop condition.

Most commands consist of two bytes: the address byte and command byte.

I²C ADDRESS

The standard I²C address is 0x00 (0b0000000X).

- X = 0: I²C Write
- X = 1: I²C Read

STATUS BYTE

Each return starts with a status byte followed by the requested data word.

Bit	7	6	5	4	3	2	1	0
Meaning	---	---	Busy	---	---	Memory Error	---	---

- Busy: 1 = Sensor is busy. The requested data is not available yet.
- Memory Error: 1 = Memory integrity check failed. Memory was changed after factory calibration.

COMMANDS

Note: Each return starts with a status byte followed by the requested data word.

Command	Return	Description
0x00 ... 0x39	16 bit EEPROM data	Read data from EEPROM address (0x00 ... 0x39) matching the command
0xAF	24 bit object temperature ADC, 24 bit sensor temperature ADC	Measure object temperature and sensor temperature ADC 16 times and calculates mean value. Store data in output buffer.

Read EEPROM

Write Command:

S	Slave Address	0	A	Command	A	P
---	---------------	---	---	---------	---	---

Read EEPROM Data:

S	Slave Address	1	A	Status Byte	A	EEPROM Data [15:8]	A	EEPROM Data [7:0]	N	P
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