Datasheet

TSE34

Thermopile Temperature Sensor

TO-39 Package

Features

- Non-contact surface temperature measuring
- TO housing with an F5.5 infrared filter
- Using IC for ambient temperature compensation
- Suitable for human body temperature detecting and Industrial temperature measurement
- FOV 80° (The test distance and test area will be determined by the FOV)
- High sensitivity,standard accuracy of ±2%

Applications

- Non-contact infrared thermometer
- Automatic induction equipment
- Heating, Ventilation and Air Conditioning(HVAC)
- Appliance

Descriptions

The TSE34 is a digital interface thermopile temperature sensor based on MEMS (Micro-ElectroMechanical Systems) technology. This thermopile detector consists of a thermopile MEMS chip, silicon filter, a mixed signal processor IC and a small size TO-39 package.

Table 1 Pin Names and Description

Pin	Function	Description
1	VCC	External power supply pin.
2	SDA	IIC serial data pin.
3	SCL	IIC serial clock pin.
4	GND	Ground pin.

Figure 1 Thermopile TSE34

Outline of Sensor Package

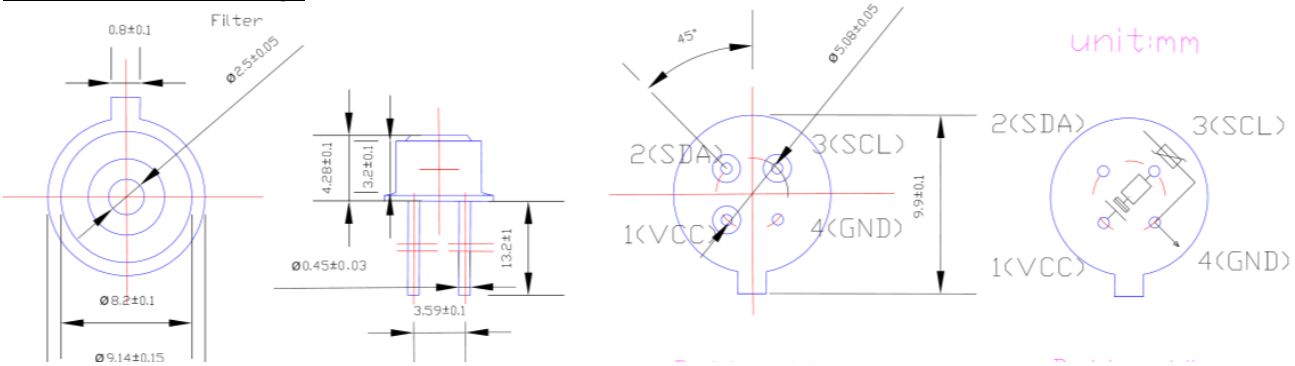

Figure 2 Outline of Sensor Package

Sensitivity Output Curve

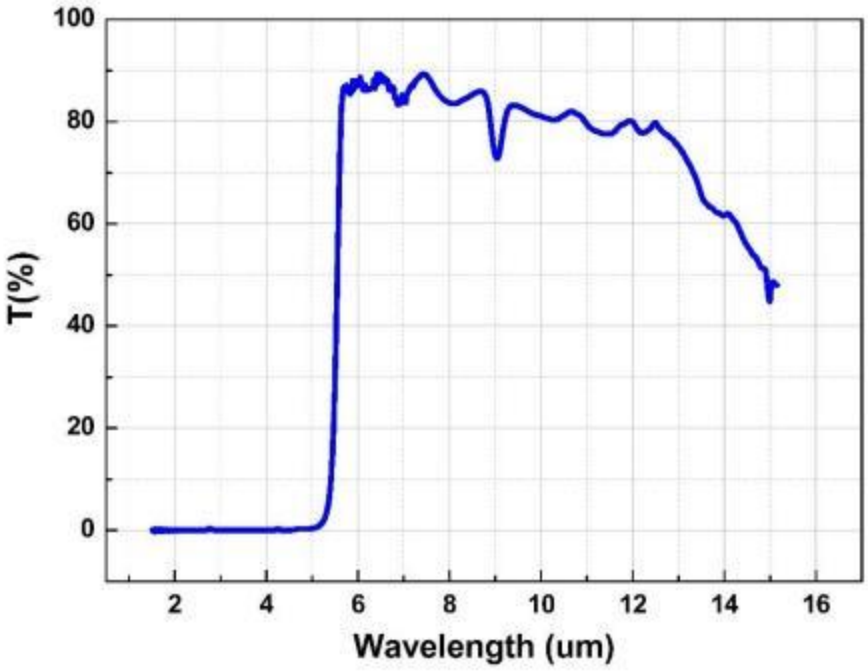

Figure 3 Filter Transmission Curve

ABSOLUTE MAXIMUM RATING				
Parament	Min	Type	Max	Unit
Supply Voltage(VDD)	-0.3		6.5	V
Digital output voltage	-0.3		VDD+0.3	V
ESD Susceptibility(HBM)		2		kV
Storage temperature	-40		125	℃

ELECTRICAL CHARACTERISITICS					
Parameter	Symbol	Min	Type	Max	Unit
Supply Voltage	VDD	3.0		5.5	V
Operation temp	Ta	-40		125	℃
Supply Current@25 ℃ on during conversion	IDD		1600		uA
Standby current	I		200		nA
Resolution	N		24		Bits
Gain setting	GAIN	1		256	
Integral Nonlinearity	INL			15	ppm of FS
Field of View			78		Deg
Power Supply Rejection	PSRR	90	120		dB

I2C INTERFACE

I²C bus uses SCL and SDA as signal lines. Both lines are connected to VDDIO externally via pull-up resistors so that they are pulled high when the bus is free. The I²C device address of TSE34 is shown below.

Descriptions

Table 6 I²C address.

A7	A6	A5	A4	A3	A2	A1	WR
1	1	1	1	1	1	1	0/1

Table Electrical specification of the I²C interface pins

Symbol	Parameter	Min	Max	Unit
f_{scl}	Clock frequency		400	KHz
t_{low}	SCL low pulse	1.2		us
t_{high}	SCL High pulse	0.7		us
t_{sudat}	SDA setup time	0.1		us
t_{hddat}	SDA hold time	0.0		us
t_{susat}	Setup Time for a repeated start condition	0.6		us
t_{hdsta}	Hold time for a stop condition	0.6		us
t_{susto}	Setup time for a stop condition	0.6		us
t_{buf}	Time before a new transmission can start	1.3		us

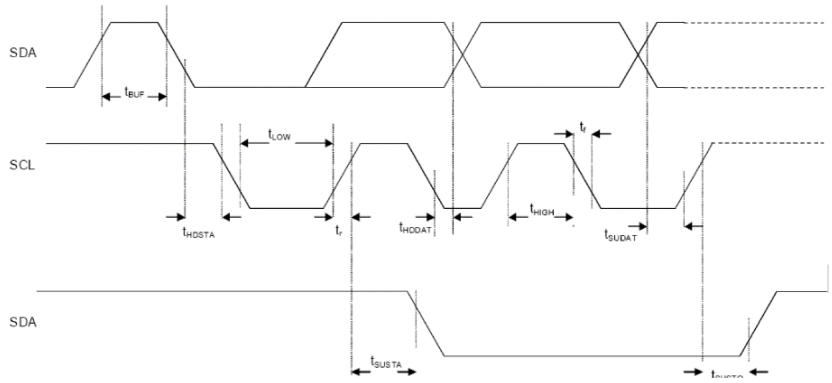

Figure 4 I²C Timing Diagram

The I2C interface protocol has special bus signal conditions. Start (S), stop (P) and binary data conditions are shown below. At start condition, SCL is high and SDA has a falling edge. Then the slave address is sent. After the 7 address bits, the direction control bit R/W selects the read or write operation. When a slave device recognizes that it is being addressed, it should acknowledge by pulling SDA low in the ninth SCL (ACK) cycle.

At stop condition, SCL is also high, but SDA has a rising edge. Data must be held stable at SDA when SCL is high. Data can change value at SDA only when SCL is low.

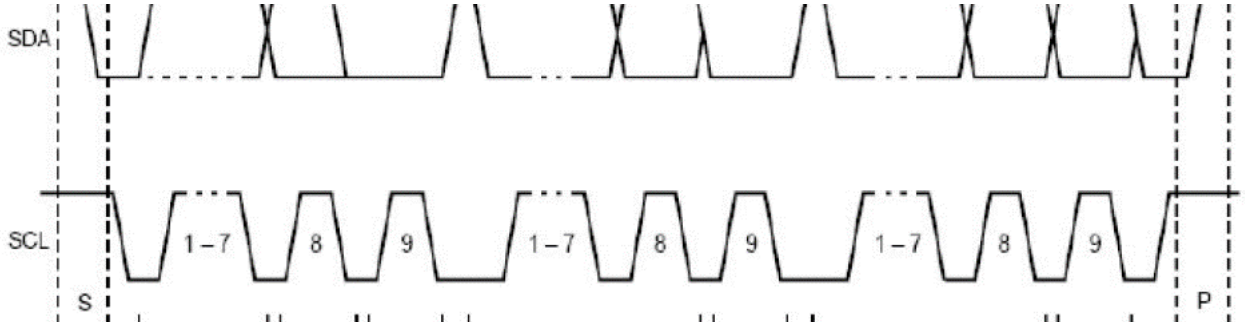

Figure 5 I²C Protocol