TSic 206/203/201/306/303/301

Temperature Sensor IC

For a fully calibrated and accurate low power temperature measurement

Benefits & characteristics

- Fully calibrated
- Custom calibration and assembly available
- Very low power consumption
- Excellent long-term stability
- Accuracy of ±0.3 K (TSic 30x), ±0.5 K (TSic 20x)
- Accuracy range of 80 K can be shifted (default: +10 °C to +90 °C)
- Available with digital, analog and ratiometric output signal

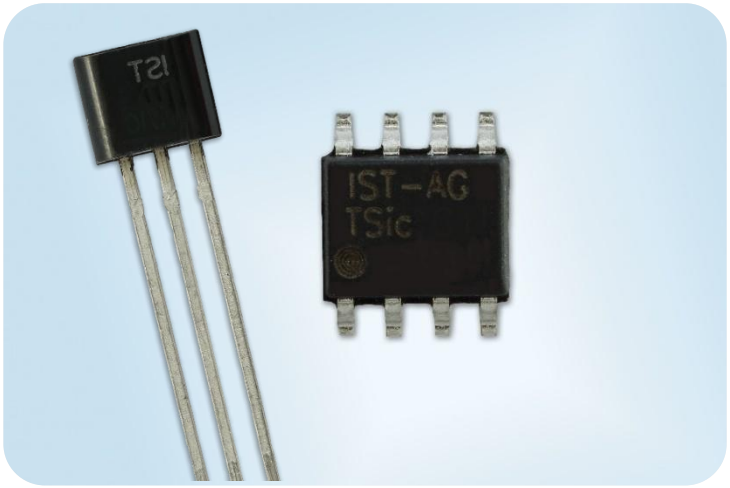
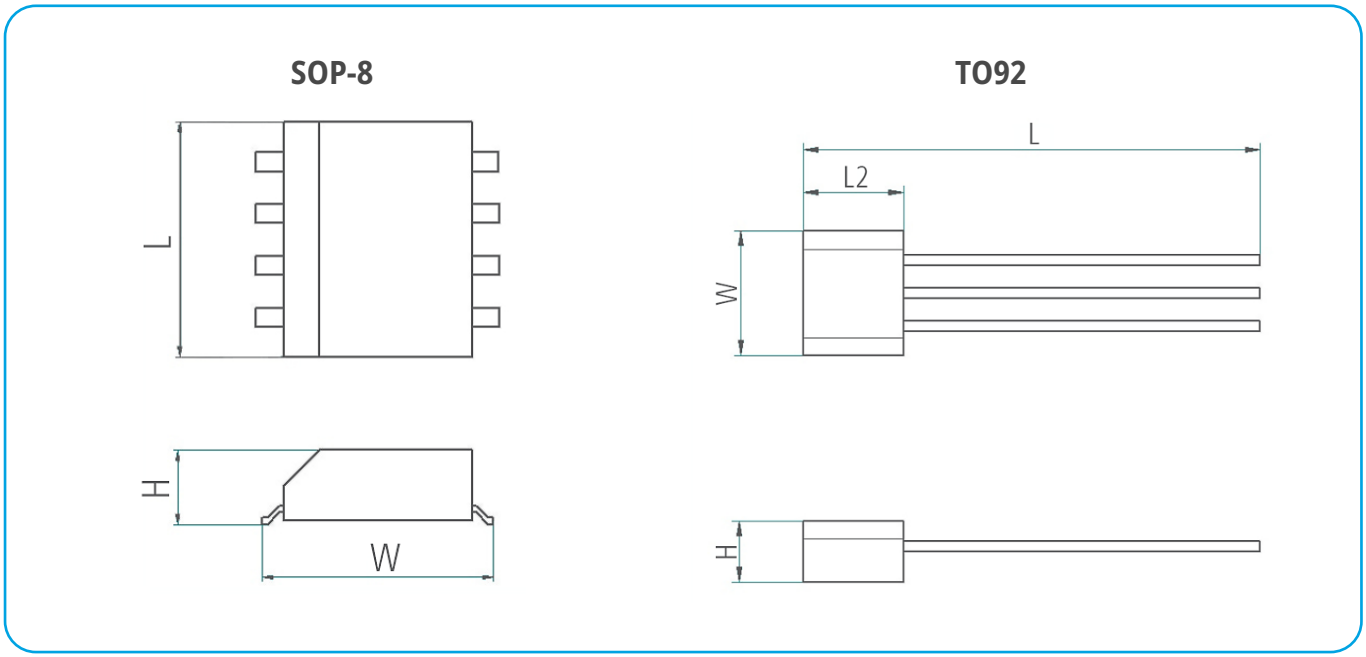


Illustration [1)]



[1)] for actual size see dimensions in order information

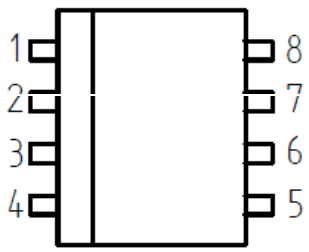
Technical Data

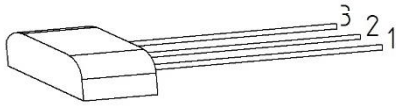
Dimensions (L / L2 x W x H in mm): [2]	4.93 x 5.99 x 1.63 (SOP-8) 17.30 / 3.81 x 4.57 x 2.3 (TO92)	
Operating temperature range:*	-50 °C to +150 °C (-47 °C to +147 °C guaranteed)	
Accuracy:*	TSic 20x	±0.5 K in the range of +10 °C to +90 °C (other ranges on request)
	TSic 30x	±0.3 K in the range of +10 °C to +90 °C (other ranges on request)
Resolution: *	0.1 K	
Sampling rate: *	10 Hz	
Supply current:	typ. 30 µA at 25 °C and V_{dd} = 3.3 V for minimal self-heating	
Packaging: *	SOP-8 or TO92 (other packaging on request)	
Output signal:	Analog (TSic xx1), ratiometric (TSic xx3), digital (TSic xx6) - see application note ATTSic_E	

* Customer-specific alternatives available

[2] For tolerances, see Application Note

Pin Assignment





	Pin 1	Pin 2	Pin 3	Pin 4
SOP-8*	V_{dd}, Supply voltage (3 V to 5.5V)	Signal		GND
TO92	GND	Signal	V_{dd}, Supply voltage (3 V to 5.5V)	

* 3, 5, 6, 7 and 8 not connected

Absolute maximal ratings

	Min	Max
Supply voltage (V_{dd})	-0.3 V	6 V
Voltages to analog I/O – Pins (V_{SIG}, V_{GND})	-0.3 V	V_{dd}+0.3 V
Storage temperature range (T_{STOR})	-20 °C	+80 °C
Non-operating temperature range	-50 °C	+150 °C

Operating conditions

	Min	Typ	Max
Supply voltage to GND (V_{dd})	2.97 V	5 V	5.5 V
Supply current (I_{Vdd}) at V_{dd} = 3.3 V,	25 µA	30 µA	60 µA
Operating temperature range (T_{amb})	-50 °C		+150 °C
Output load capacitance (C_L)			15 nF
External capacitance between V_{dd} and GND[1)]	100 nF (recommended)		
Output load resistance between signal and GND (or V_{dd})	47 kΩ		

[1)] Recommended as close to TSic V_{dd} and GND-Pins as possible

Temperature accuracies [2)]

	TSic 20x	TSic 30x
T1: +10 °C to +90 °C	±0.5 K	±0.3 K
T2: -20 °C to +110 °C	±1 K	±0.6 K
T3: -50 °C to +150 °C	±2 K	±1.2 K

[2)] The sensor is calibrated at 5 V. The provided accuracy is applicable for a supply voltage between 4.5 V and 5.5 V. The accuracy is smaller with a supply voltage between 2.97 V and 4.5 V. For applications where the best accuracy at 3 V is requested, ask for a custom specific, 3 V calibrated device. Other TSic products with custom specific calibrations are available upon request e.g. other temperature range for high accuracy. Accuracy at delivery; the assembly method can influence the accuracy!

Order Information

Output signal	Accuracy	Order code	Reference	Output type	Packaging
201	±0.5 °C	On request	TSic 201 SOP-8	Analog	SOP-8
203	±0.5 °C	103499	TSic 203 SOP-8	Analog ratiometric	SOP-8
206	±0.5 °C	103482	TSic 206 SOP-8	Digital, ZACWire	SOP-8
301	±0.3 °C	103487	TSic 301 SOP-8	Analog	SOP-8
303	±0.3 °C	On request	TSic 303 SOP-8	Analog ratiometric	SOP-8
306	±0.3 °C	103483	TSic 306 SOP-8	Digital, ZACWire	SOP-8
201	±0.5 °C	On request	TSic 201 TO92	Analog	TO92
203	±0.5 °C	103510	TSic 203 TO92	Analog ratiometric	TO92
206	±0.5 °C	103494	TSic 206 TO92	Digital, ZACWire	TO92
301	±0.3 °C	103492	TSic 301 TO92	Analog	TO92
303	±0.3 °C	103505	TSic 303 TO92	Analog ratiometric	TO92
306	±0.3 °C	103489	TSic 306 TO92	Digital, ZACWire	TO92

Additional Electronics

LabKit	Document name: DTTSicLabKit_E

Additional Documents

Application Note	Document name: ATTSic_E

Order Information

Temperature Sensor IC - Secondary reference

TSic

Accuracy

2	=	±0.5 °C at +80 °C range
3	=	±0.3 °C at +80 °C range
4	=	not defined
5	=	±0.1 °C at +40 °C range (limited measuring range from -10 °C to +60 °C)
6	=	not defined
7	=	±0.07 °C at +20 °C range (limited measuring range from -10 °C to +60 °C)

Bit size

0	=	11 bit
1	=	14 bit

Output signal

1	=	analog 0 V to 1 V
3	=	ratiometric 10 % to 90 % V_{dd}
6	=	digital ZACWire

Housing

SOP-8
TO92

Special

E.g. „250 Hz“ for a high sampling rate or „-30/70“ for temperature and tolerance range

TSic	3	0	6	TO92	-30/70

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