



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

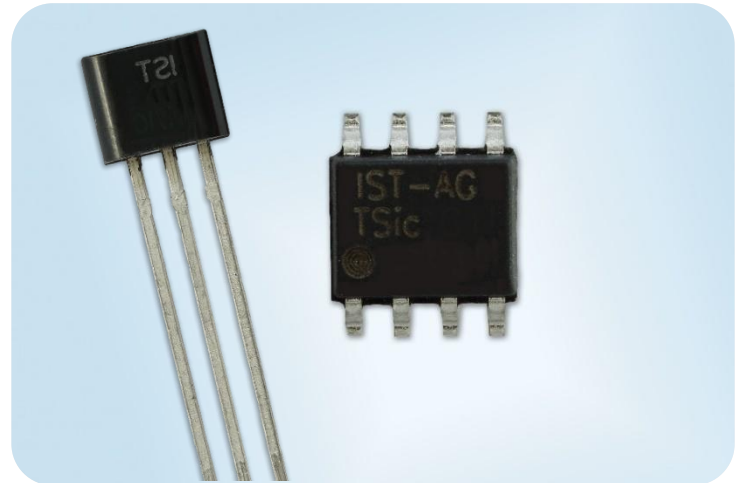
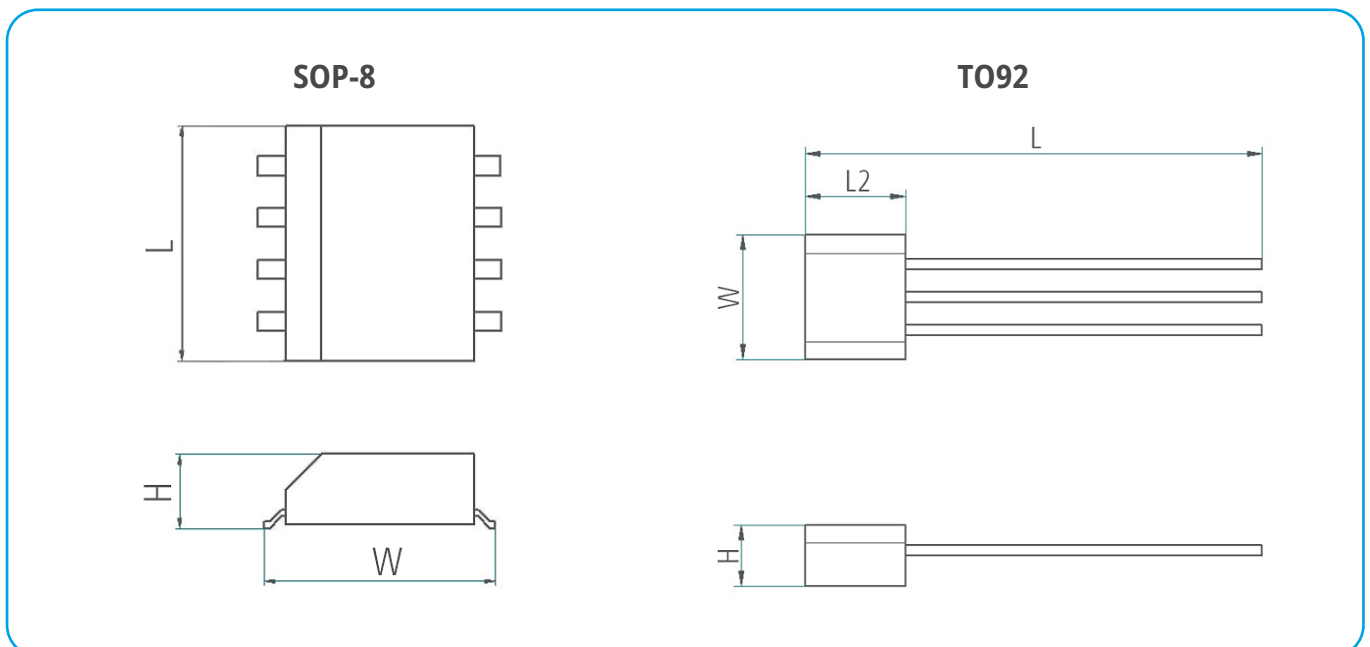


Illustration ¹⁾



¹⁾ for actual size see dimensions in order information



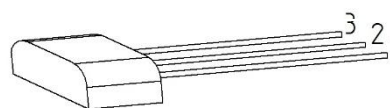
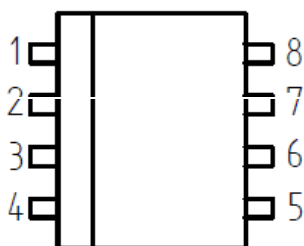
Technical Data

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 μ A	30 μ A	60 μ A
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 k Ω		

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

Temperature accuracies²⁾

	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	10348	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 T092	Analog	T092
203	±0.5 °C	103510	TSic 203 T092	Analog ratiometric	T092
206	±0.5 °C	103494	TSic 206 T092	Digital, ZACWire	T092
301	±0.3 °C	103492	TSic 301 T092	Analog	T092
303	±0.3 °C	103505	TSic 303 T092	Analog ratiometric	T092
306	±0.3 °C	103489	TSic 301 T092	Digital, ZACWire	T092

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
- T092

Special

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

TSic 3 0 6 T092 -30/70



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