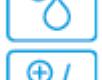




# TSic 206/203/201/306/303/301

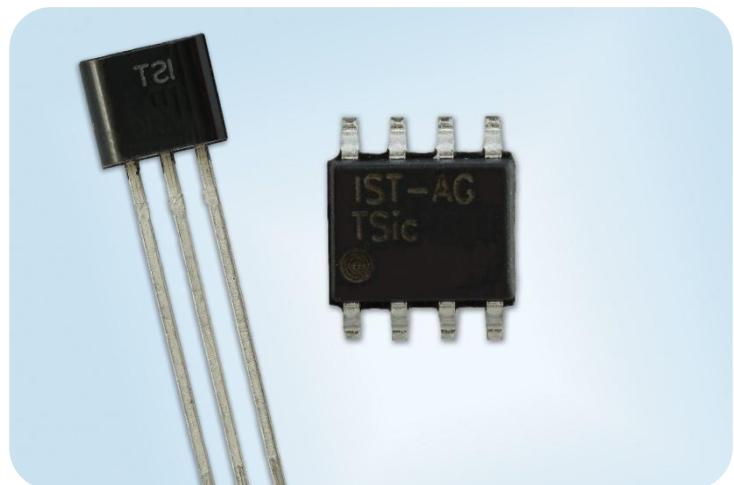


## Temperature Sensor IC

### For a fully calibrated and accurate low power temperature measurement

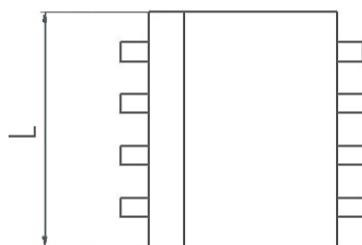
#### Benefits & characteristics

- Fully calibrated
- Custom calibration and assembly available
- Very low power consumption
- Excellent long-term stability
- Accuracy of  $\pm 0.3$  K (TSic 30x),  $\pm 0.5$  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

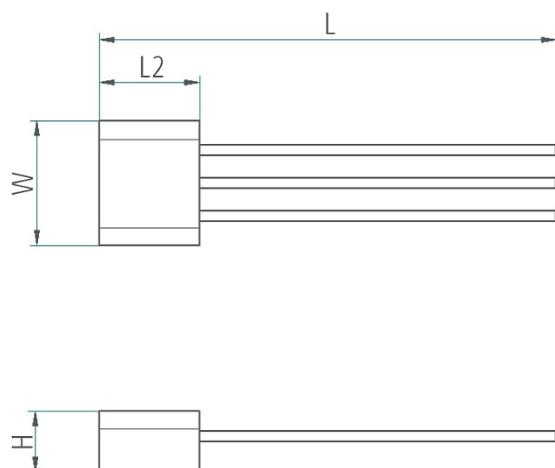


#### Illustration <sup>1)</sup>

SOP-8



TO92



<sup>1)</sup> for actual size see dimensions in order information



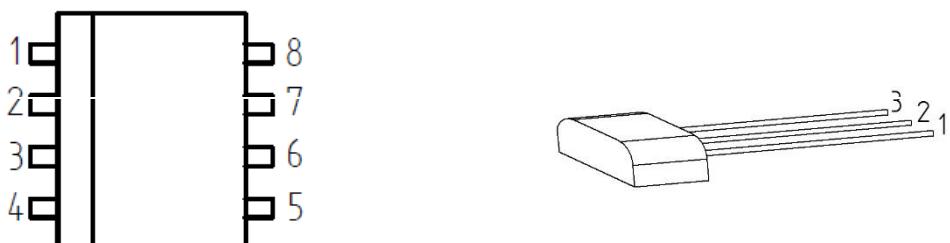
## Technical Data

Dimensions (L / L2 x W x H in mm): <sup>2)</sup>	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 $\pm 0.5$ K in the range of +10 °C to +90 °C (other ranges on request) TSic 30x $\pm 0.3$ 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 $\mu$ A 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 ATT Sic_E

\* Customer-specific alternatives available

<sup>2)</sup> 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 $\mu$ A	30 $\mu$ A	60 $\mu$ A
Operating temperature range ( $T_{amb}$ )	-50 °C		+150 °C
Output load capacitance ( $C_L$ )			15 nF
External capacitance between $V_{dd}$ and GND <sup>1)</sup>	100 nF (recommended)		
Output load resistance between signal and GND (or $V_{dd}$ )	47 k $\Omega$		

<sup>1)</sup> Recommended as close to TSic  $V_{dd}$  and GND-Pins as possible

## Temperature accuracies<sup>2)</sup>

	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

<sup>2)</sup> 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	$\pm 0.5 \text{ }^{\circ}\text{C}$	On request	TSic 201 SOP-8	Analog	SOP-8
203	$\pm 0.5 \text{ }^{\circ}\text{C}$	103499	TSic 203 SOP-8	Analog ratiometric	SOP-8
206	$\pm 0.5 \text{ }^{\circ}\text{C}$	10348	TSic 206 SOP-8	Digital, ZACWire	SOP-8
301	$\pm 0.3 \text{ }^{\circ}\text{C}$	103487	TSic 301 SOP-8	Analog	SOP-8
303	$\pm 0.3 \text{ }^{\circ}\text{C}$	On request	TSic 303 SOP-8	Analog ratiometric	SOP-8
306	$\pm 0.3 \text{ }^{\circ}\text{C}$	103483	TSic 306 SOP-8	Digital, ZACWire	SOP-8
201	$\pm 0.5 \text{ }^{\circ}\text{C}$	On request	TSic 201 TO92	Analog	TO92
203	$\pm 0.5 \text{ }^{\circ}\text{C}$	103510	TSic 203 TO92	Analog ratiometric	TO92
206	$\pm 0.5 \text{ }^{\circ}\text{C}$	103494	TSic 206 TO92	Digital, ZACWire	TO92
301	$\pm 0.3 \text{ }^{\circ}\text{C}$	103492	TSic 301 TO92	Analog	TO92
303	$\pm 0.3 \text{ }^{\circ}\text{C}$	103505	TSic 303 TO92	Analog ratiometric	TO92
306	$\pm 0.3 \text{ }^{\circ}\text{C}$	103489	TSic 301 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	=	$\pm 0.5^\circ\text{C}$ at $+80^\circ\text{C}$ range
3	=	$\pm 0.3^\circ\text{C}$ at $+80^\circ\text{C}$ range
4	=	not defined
5	=	$\pm 0.1^\circ\text{C}$ at $+40^\circ\text{C}$ range (limited measuring range from $-10^\circ\text{C}$ to $+60^\circ\text{C}$ )
6	=	not defined
7	=	$\pm 0.07^\circ\text{C}$ at $+20^\circ\text{C}$ range (limited measuring range from $-10^\circ\text{C}$ to $+60^\circ\text{C}$ )

#### 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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All mechanical dimensions are valid at 25 °C ambient temperature, if not differently indicated • All data except the mechanical dimensions only have information purposes and are not to be understood as assured characteristics • Technical changes or product specifications without previous announcement reserved • The information on this data sheet was examined carefully and will be accepted as correct; No liability in case of mistakes • Load with extreme values during a longer period can affect the reliability • The material contained herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner • All rights reserved.



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