



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

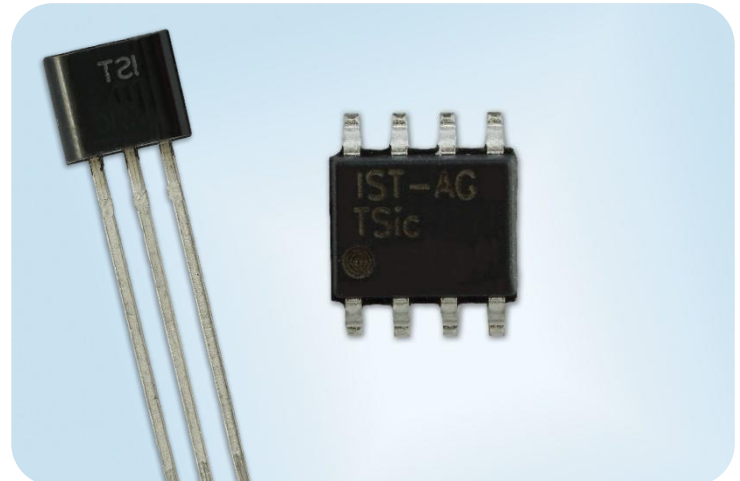
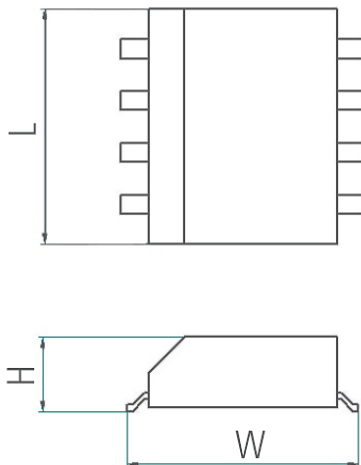
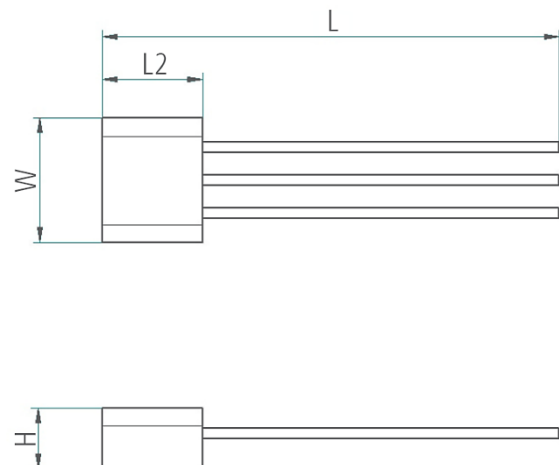


Illustration ¹⁾

SOP-8



T092



¹⁾ for actual size see dimensions in order information



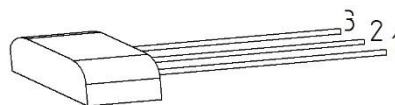
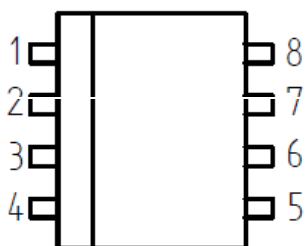
Technical Data

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	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 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 306 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



Innovative Sensor Technology IST AG • Stegrütstrasse 14 • 9642 Ebnat-Kappel • Switzerland
+41 71 992 01 00 • info@ist-ag.com • www.ist-ag.com

Technical specifications are subject to change without prior notice. The information contained in this data sheet has been carefully reviewed and is believed to be accurate; however, no liability is assumed for any errors or omissions. Continuous exposure to extreme operating conditions may impact product lifetime or reliability. The customer is solely responsible for assessing the suitability and fitness of the product for their specific application. This product is not designed, authorized, or warranted for use in life support or safety-critical applications. The customer agrees to hold the supplier harmless from any claims, damages, or liabilities arising from such use. No explicit or implied warranties, including but not limited to warranties of merchantability or fitness for a particular purpose, are provided. The material provided herein may not be reproduced, adapted, merged, translated, stored, or utilized in any form without prior written consent from the copyright holder. No transfer of any intellectual property rights is granted or implied. All rights reserved.