



# TSic™ 206/203/201/306/303/ 301



INNOVATIVE SENSOR TECHNOLOGY

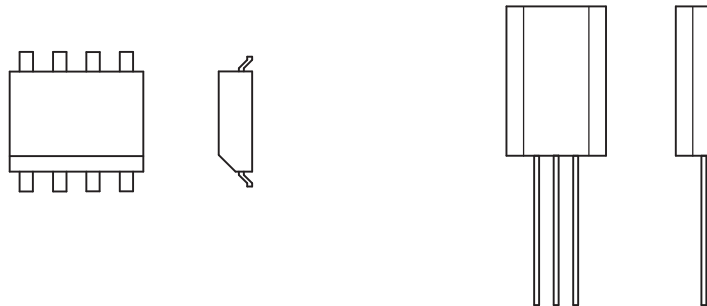
## Temperature Sensor IC

For a fully calibrated and accurate low power temperature measurement

### Benefits & Characteristics

- Fully calibrated
- Outstanding accuracy of  $\pm 0.3$  K (TSic™ 30x)
- Very low power consumption
- Excellent long-term stability
- Custom calibration and assembly available
- 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>



1) For actual size, see dimensions

### Technical Data

Operating temperature range:*	-50 °C to +150 °C ( $\pm 3$ °C of measurement limits)
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 voltage:	$V^+ = 3$ V to 5.5 V, high precision operation in range $V^+ = 4.5$ V to 5.5 V
Supply current:	typ. 30 $\mu$ A at 25 °C and $V^+ = 3.3$ V for minimal self-heating
Packaging:*	SOP-8 or TO92 (other packaging on request)

\* Customer specific alternatives available



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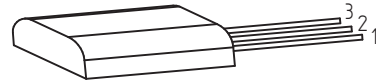
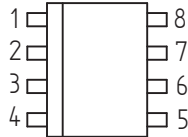


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### Pin Assignment



	Pin 1	Pin 2	Pin 3	Pin 4
SOP-8 (5, 6, 7 and 8 not used)	V <sup>+</sup> , Supply voltage (3 V to 5.5V)	Signal	Not used	GND
TO92	GND	Signal	V <sup>+</sup> , Supply voltage (3 V to 5.5 V)	

### Absolute maximal ratings

	Min	Max
Supply voltage (V <sup>+</sup> )	-0.3 V	6 V
Voltages to analog I/O – Pins (V <sub>INA</sub> , V <sub>OUTA</sub> )	-0.3 V	V <sub>DDA</sub> +0.3 V
Storage temperature range (T <sub>STOR</sub> )	-20 °C	80 °C

### Operating conditions

	Min	Typ	Max
Supply voltage to GND (V <sup>+</sup> )	2.97 V	5 V	5.5 V
Supply current (I <sub>V+</sub> ) @ V <sup>+</sup> = 3.3 V, RT	25 μA	30 μA	60 μA
Operating temperature range (T <sub>amb</sub> )	-10 °C		+60 °C
Output load capacitance (C <sub>L</sub> )			15 nF
External capacitance between V <sup>+</sup> and GND <sup>1)</sup> (C <sub>V+</sub> )	100 nF (recommended)		
Output load resistance between signal and GND (or V <sup>+</sup> )	47 kΩ		

<sup>1)</sup> Recommended as close to TSic V<sup>+</sup> and GND-Pins as possible



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

	TSic 30x	TSic 20x
T1: +10 °C to +90 °C	±0.3 K	±0.3 K
T2: -20 °C to +110 °C	±0.6 K	±1 K
T3: -50 °C to +150 °C	±1.2 K	±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 - SOP-8

Output signal	Analog	Analog ratiometric	Digital, ZACWire protocol
201/203/206	TSic 201 SOP-8	TSic 203 SOP-8	TSic 206 SOP-8
Order code	030.00038	030.00060	030.00005
301/303/306	TSic 301 SOP-8	TSic 303 SOP-8	TSic 306 SOP-8
Order code	030.00036	030.00024	030.00006

### Order Information - TO92

201/203/206	TSic 201 TO92	TSic 203 TO92	TSic 206 TO92
Order code	030.00056	030.00095	030.00049
301/303/306	TSic 301 TO92	TSic 303 TO92	TSic 306 TO92
Order code	030.00047	030.00074	030.00044

### Additional Electronics

	Document name:
LabKit	DTTSicLabKit_E

### Additional Documents

	Document name:
Application note:	ATTSic_E



# Order Information

## Temperature Sensor IC

### Secondary reference



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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<sup>+</sup>
- 6 = digital ZACWire protocol

#### Housing

- SOP-8
- TO92
- KGD („known-good-die“ in waffle pack, 100 pcs/pkg)

#### 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 without previous announcement as well as mistakes 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 • Typing errors and mistakes reserved • Product specifications are subject to change without notice • All rights reserved