



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

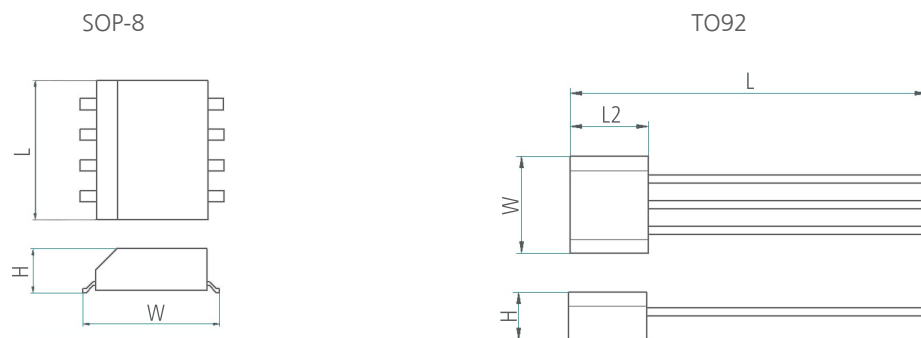
Temperature Sensor IC

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

Illustration¹⁾



1) For actual size, see dimensions

Technical Data

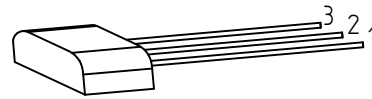
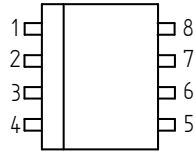
Dimensions (L / L2 x W x H in mm): ²⁾	4.93 x 5.99 x 1.63 (SOP-8) 17.30 / 3.81 x 4.57 x 2.3 (TO92)
Operating temperature range:*	-50 °C to +150 °C (-47 °C to +147 °C guaranteed)
Accuracy:*	TSic 20x ± 0.5 K in the range of +10 °C to +90 °C (other ranges on request) TSic 30x ± 0.3 K in the range of +10 °C to +90 °C (other ranges on request)
Resolution:*	0.1 K
Sampling rate:*	10 Hz
Supply current:	typ. 30 μ 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 ATTSic_E

* Customer-specific alternatives available

²⁾ For tolerances, see Application Note



Pin Assignment



	Pin 1	Pin 2	Pin 3	Pin 4
SOP-8 (3, 5, 6, 7 and 8 not connected)	V_{dd} Supply voltage (3V to 5.5V)	Signal		GND
TO92	GND	Signal	V_{dd} Supply voltage (3V to 5.5 V)	

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 $V_{dd} = 3.3 V$, RT	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 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	$\pm 0.5 K$	$\pm 0.3 K$
T2: -20 °C to +110 °C	$\pm 1 K$	$\pm 0.6 K$
T3: -50 °C to +150 °C	$\pm 2 K$	$\pm 1.2 K$

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 - SOP-8

Output signal	Analog	Analog ratiometric	Digital, ZACWire
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

TSic

- Accuracy
 - 2 = $\pm 0.5\text{ }^{\circ}\text{C}$ at $+80\text{ }^{\circ}\text{C}$ range
 - 3 = $\pm 0.3\text{ }^{\circ}\text{C}$ at $+80\text{ }^{\circ}\text{C}$ range
 - 4 = not defined
 - 5 = $\pm 0.1\text{ }^{\circ}\text{C}$ at $+40\text{ }^{\circ}\text{C}$ range (limited measuring range from $-10\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$)
 - 6 = not defined
 - 7 = $\pm 0.07\text{ }^{\circ}\text{C}$ at $+20\text{ }^{\circ}\text{C}$ range (limited measuring range from $-10\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$)
- 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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