



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

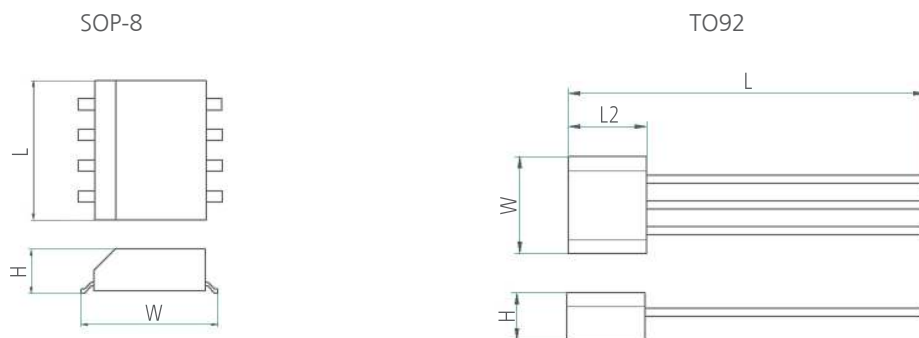
Temperature Sensor IC

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

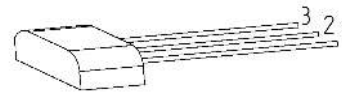
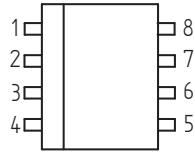
| | |
|--|--|
| Dimensions (L / L2 x W x H in mm): ²⁾ | 4.93 x 5.99 x 1.63 (SOP-8) 17.30 / 3.81 x 4.57 x 2.3 (TO92) |
| Operating temperature range:* | -50 °C to +150 °C (-47 °C to +147 °C guaranteed) |
| Accuracy:* | TSic 20x ± 0.5 K in the range of $+10$ °C to $+90$ °C (other ranges on request) TSic 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, | 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 - 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 | On request | 103499 | 103482 |
| <i>Former order code</i> | <i>030.00038</i> | <i>030.00060</i> | <i>030.00005</i> |
| 301/303/306 | TSic 301 SOP-8 | TSic 303 SOP-8 | TSic 306 SOP-8 |
| Order code | 103487 | On request | 103483 |
| <i>Former order code</i> | <i>030.00036</i> | <i>030.00024</i> | <i>030.00006</i> |

Order Information - TO92

| | | | |
|--------------------------|------------------|------------------|------------------|
| 201/203/206 | TSic 201 TO92 | TSic 203 TO92 | TSic 206 TO92 |
| Order code | On request | 103510 | 103494 |
| <i>Former order code</i> | <i>030.00056</i> | <i>030.00095</i> | <i>030.00049</i> |
| 301/303/306 | TSic 301 TO92 | TSic 303 TO92 | TSic 306 TO92 |
| Order code | 103492 | 103505 | 103489 |
| <i>Former order code</i> | <i>030.00047</i> | <i>030.00074</i> | <i>030.00044</i> |

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 = ± 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
- 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

