



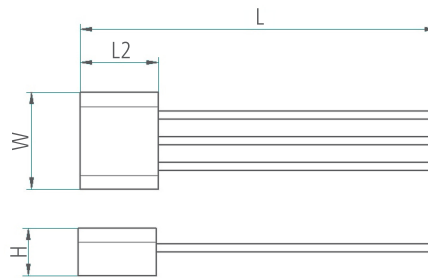
TSic 506F/503F/501F Temperature Sensor IC

For a fully calibrated and very accurate low power temperature measurement

Benefits & Characteristics

- Fully calibrated
- Outstanding accuracy of ± 0.1 K
- Very low power consumption
- Excellent long-term stability
- Custom calibration and assembly available
- Available with digital, analog and ratiometric output signal
- Accuracy range of 40 K can be shifted (default: +5 °C to +45 °C)

Illustration¹⁾



¹⁾ For actual size, see dimensions

Technical Data

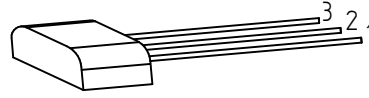
Dimensions (L / L2 x W x H in mm): ²⁾	17.30 / 3.81 x 4.57 x 2.3
Operating temperature range:*	-10 °C to +60 °C (-7 °C to +57 °C guaranteed)
Accuracy:*	± 0.1 K in the range of +5 °C to +45 °C (other ranges upon request)
Resolution:*	0.034 K
Sampling rate:*	10 Hz
Supply voltage:	$V_{dd} = 3$ V to 5.5 V, high precision operation in range $V_{dd} = 4.5$ V to 5.5 V
Supply current:	typ. 30 μ A at 25 °C and $V_{dd} = 3.3$ V for minimal self-heating
Packaging:*	TO92
Signal output:	Analog (TSic 501F), ratiometrisch (TSic 503F), digital (TSic 506F) - see application note ATTSic_E

* Customer specific alternatives available

²⁾ For tolerances, see Application Note



Pin Assignment



	Pin 1	Pin 2	Pin 3
TO92	GND	Signal	V_{dd} Supply voltage (3 V 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})	-10 °C	+60 °C
Non-operating temperature range		

Operating conditions

	Min	Typ	Max
Supply voltage to GND (V^+)	2.97 V	5 V	5.5 V
Supply current ($I_{V_{dd}}$) at $V_{dd} = 3.3$ V, RT	25 μ A	30 μ A	60 μ A
Operating temperature range (T_{amb})	-10 °C		+60 °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⁾

T1: +5 °C to +45 °C	± 0.1 K
T2: -10 °C to +60 °C	± 0.2 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 - TO92

501/503/506	TSic 501F TO92	TSic 503 TO92 5V	TSic 506F TO92
Order code	030.00046	030.00115	030.00045



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



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