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)

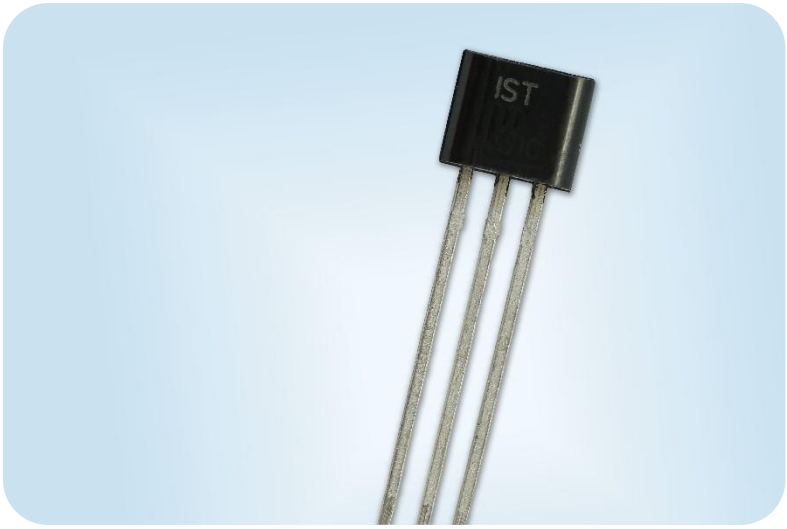
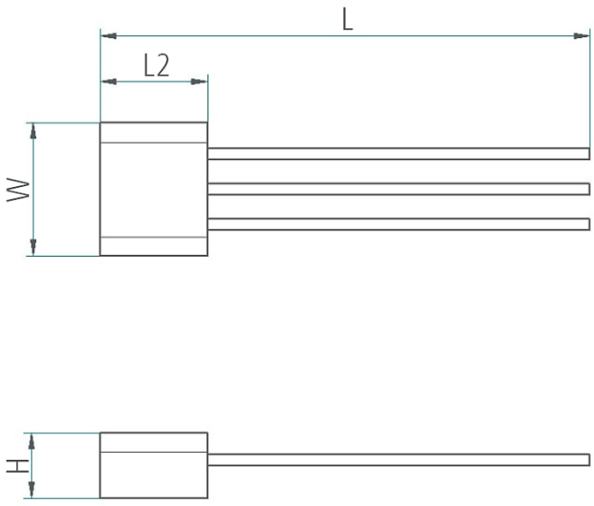


Illustration [1)]



[1)] for actual size see dimensions in order information

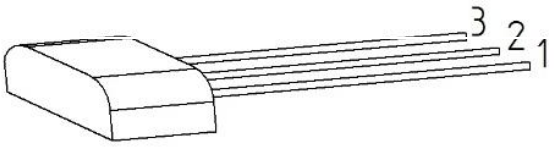
Technical Data

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 µA at 25 °C and V_{dd} = 3.3 V for minimal self-heating
Packaging:*	TO92
Signal output:	Analog (TSic 501F), ratiometric (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

Operating conditions

	Min	Typ	Max
Supply voltage to GND (V^+)	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})	-10 °C		+60 °C
Output load capacitance (C_L)			15 nF
External capacitance between V_{dd} and GND[3)]	100 nF (recommended)		
Output load resistance between signal and GND (or V_{dd})	47 kΩ		

[3)] Recommended as close to TSic V_{dd} and GND-Pins as possible

Temperature accuracies [4)]

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

[4)] 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 customer 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

Output signal	Accuracy	Order code	Reference	Output type	Packaging
501	±0.1 °C	103491	TSic 501F TO92	Analog	TO92
503	±0.1 °C	103519	TSic 503 TO92 5V	Analog ratiometric	TO92
506	±0.1 °C	103490	TSic 506F TO92	Digital, ZACWire	TO92

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
TO92

Special

E.g. „250 Hz“ for a high sampling rate or „-30/70“ for temperature and tolerance range

TSic	5	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 or product specifications without previous announcement 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 • All rights reserved.