TEMPERATURE

FLOW

HUMIDITY

CONDUCTIVITY

TSic™ 506F/503F/501F

Temperature Sensor IC

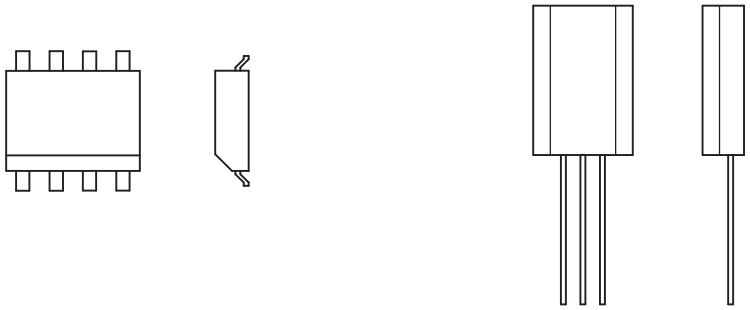
For a fully calibrated and very accurate low power temperature measurement

INNOVATIVE SENSOR TECHNOLOGY

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

Technical Data

Operating temperature range:*	-10 °C to +60 °C (±3 °C of measurement limits)
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^+ = 3 V to 5.5 V, high precision operation in range V^+ = 4.5 V to 5.5 V
Supply current:	typ. 30 µA at 25 °C and V^+ = 3.3 V for minimal self-heating
Packaging:*	SOP-8 or TO92

* Customer specific alternatives available

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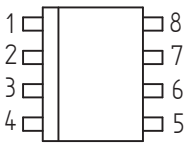
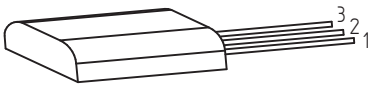
Pin Assignment





	Pin 1	Pin 2	Pin 3	Pin 4
SOP-8	V+, Supply voltage (3 V to 5.5V)	Signal	Not used	GND
TO92	GND	Signal	V+, Supply voltage (3 V to 5.5 V)	

Absolute maximal ratings

	Min	Max
Supply voltage (V+)	-0.3 V	6 V
Voltages to analog I/O – Pins (V_{INA}, V_{OUTA})	-0.3 V	V_{DDA}+0.3 V
Storage temperature range (T_{STOR})	-20 °C	80 °C

Operating conditions

	Min	Typ	Max
Supply voltage to GND (V+)	2.97 V	5 V	5.5 V
Supply current (I_{V+}) @ V+ = 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+ and GND[1] (C_{V+})	100 nF (recommended)		
Output load resistance between signal and GND (or V+)	47 kΩ		

[1] Recommended as close to TSic V+ and GND-Pins as possible

Temperature accuracies[2]

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!

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Order Information - SOP-8

Output signal	Analog	Analog ratiometric	Digital, ZACWire protocol
501/503/506	TSic 501F SOP-8	TSic 503F SOP-8	TSic 506F SOP-8
Order code	030.00034	030.00054	030.00007

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

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Order Information
Temperature Sensor IC
Secondary reference

INNOVATIVE SENSOR TECHNOLOGY

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^+
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

ISO 9001

RoHS

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