



# TSic 506F/503F/501F

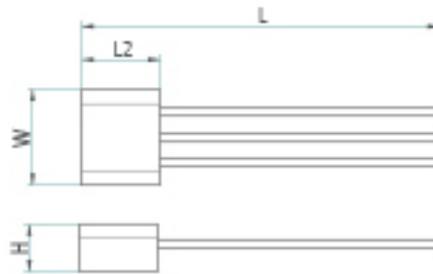
## Temperature Sensor IC

For a fully calibrated and very accurate low power temperature measurement

### Benefits & Characteristics

- Fully calibrated
- Outstanding accuracy of  $\pm 0.1$  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<sup>1)</sup>



<sup>1)</sup> For actual size, see dimensions

### Technical Data

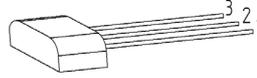
Dimensions (L / L2 x W x H in mm): <sup>2)</sup>	17.30 / 3.81 x 4.57 x 2.3
Operating temperature range:*	-10 °C to +60 °C (-7 °C to +57 °C guaranteed)
Accuracy:*	$\pm 0.1$ K in the range of +5 °C to +45 °C (other ranges upon request)
Resolution:*	0.034 K
Sampling rate:*	10 Hz
Supply voltage:	$V_{dd} = 3$ V to 5.5 V, high precision operation in range $V_{dd} = 4.5$ V to 5.5 V
Supply current:	typ. 30 $\mu$ A 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

<sup>2)</sup> 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 ( $I_{V_{dd}}$ ) at $V_{dd} = 3.3$ V, RT	25 $\mu$ A	30 $\mu$ A	60 $\mu$ A
Operating temperature range ( $T_{amb}$ )	-10 °C		+60 °C
Output load capacitance ( $C_L$ )			15 nF
External capacitance between $V_{dd}$ and GND <sup>1)</sup>	100 nF (recommended)		
Output load resistance between signal and GND (or $V_{dd}$ )	47 k $\Omega$		

<sup>1)</sup> Recommended as close to TSic  $V_{dd}$  and GND-Pins as possible

### Temperature accuracies<sup>2)</sup>

T1: +5 °C to +45 °C	$\pm 0.1$ K
T2: -10 °C to +60 °C	$\pm 0.2$ K

<sup>2)</sup> 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!



## Product Photo



## Order Information - TO92

501/503/506	TSic 501F TO92	TSic 503 TO92 5V	TSic 506F TO92
Order code	103491	103519	103490
Former 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

