



# TSic 716

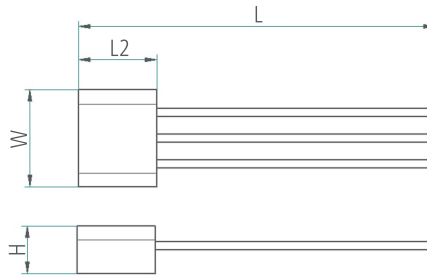
## Temperature Sensor IC

### For a fully calibrated and extremely accurate low power temperature measurement

#### Benefits & Characteristics

- Easy to integrate (digital output signal)
- Outstanding accuracy of  $\pm 0.07$  K
- Very low power consumption
- Excellent long-term stability
- Accuracy range of 20 K can be shifted (default: +25 °C to +45 °C)
- Fully calibrated (custom calibration and assembly available)
- Capable of communicating over a distance of > 10 m

#### Illustration<sup>1)</sup>



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

#### Technical Data

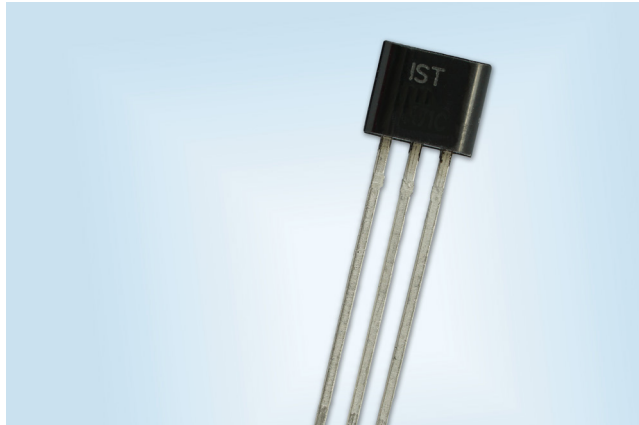
Dimensions (L / L2 x W x H in mm): <sup>2)</sup>	17.30 / 3.81 x 4.57 x 2.3
Operating temperature range:*	-10 °C to +60 °C (-7 °C to +57 °C guaranteed)
Accuracy:*	$\pm 0.07$ K in the range of +25 °C to +45 °C (other ranges upon request)
Resolution:*	4 mK
Sampling rate:*	1 Hz
Supply voltage:*	4.5 V to 5.5 V
Supply current:	typ. 45 $\mu$ A at 25 °C and 5 V for minimal self-heating
Digital signal output:	14 bit ZACWire, see application note ATTSic_E
Packaging:*	TO92

\* Customer-specific alternatives available

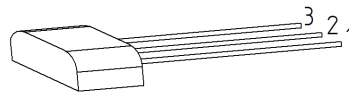
<sup>2)</sup> For tolerances, see Application Note



## Product image



## Pin Assignment



	Pin 1	Pin 2	Pin 3
T092	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	30 $\mu$ A	45 $\mu$ A	80 $\mu$ 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>

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T1: +25 °C to +45 °C	±0.07 K
T2: -10 °C to +60 °C	±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 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

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Output signal	Digital, ZACWire
716	TSic 716 TO92
Order code	103493
<i>Former order code</i>	<i>030.00048</i>

## Additional Electronics

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	Document name:
LabKit	DTTSicLabKit_E

## Additional Documents

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	Document name:
Application Note:	ATTSic_E



# Order Information

## Temperature Sensor IC

### Secondary reference

TSic

#### Accuracy

- 2 =  $\pm 0.5$  °C at +80 °C range
- 3 =  $\pm 0.3$  °C at +80 °C range
- 4 = not defined
- 5 =  $\pm 0.1$  °C at +40 °C range (limited measuring range from -10 °C to +60 °C)
- 6 = not defined
- 7 =  $\pm 0.07$  °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

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

