TEMPERATURE

FLOW

HUMIDITY

CONDUCTIVITY

TSic™ 716

Temperature Sensor IC

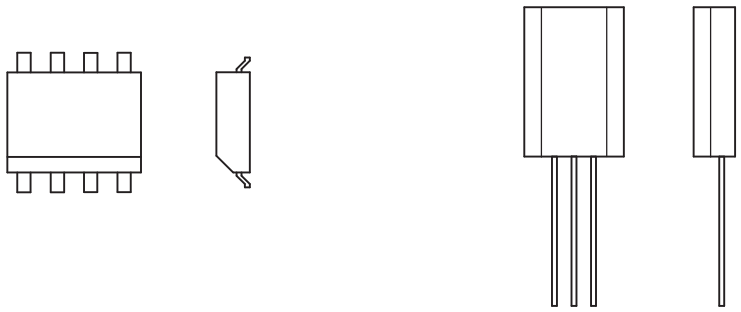
INNOVATIVE SENSOR TECHNOLOGY

For a fully calibrated and extremely accurate low power temperature measurement

Benefits & Characteristics

- Easy to integrate (digital output signal)
- Outstanding accuracy of ±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[1)]



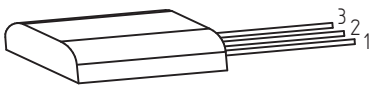
1) For actual size, see dimensions

Technical Data

Operating temperature range:*	-10 °C to +60 °C (±3 °C of measurement limits)
Accuracy:*	±0.07 K in the range of +25 °C to +45 °C (other ranges upon request)
Resolution:*	4 mK
Sampling rate:*	10 Hz
Supply voltage:*	4.5 V to 5.5 V
Supply current:	typ. 45 µA at 25 °C and 5 V for minimal self-heating
Digital signal output:	(14 bit) compatible with state-of-the-art microcontrollers using only a single signal wire
Packaging:*	TO92

* Customer specific alternatives available

Pin Assignment



	Pin 1	Pin 2	Pin 3
TO92	GND	Signal	V^+, Supply voltage (3 V to 5.5 V)

TEMPERATURE

FLOW

HUMIDITY

CONDUCTIVITY

TSic™ 716

Temperature Sensor IC

INNOVATIVE SENSOR TECHNOLOGY

For a fully calibrated and extremely accurate low power temperature measurement

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	30 µA	45 µA	80 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: +25 °C to +45 °C	±0.07 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

Output signal	Digital, ZACWire protocol
716	TSic 716 TO92
Order code	030.00048

Additional Electronics

	Document name:
LabKit	DTTSicLabKit_E

TEMPERATURE

FLOW

HUMIDITY

CONDUCTIVITY

TSic™ 716

Temperature Sensor IC

INNOVATIVE SENSOR TECHNOLOGY

For a fully calibrated and extremely accurate low power temperature measurement

Additional Documents

	Document name:
Application note:	ATTSic_E

TEMPERATURE

FLOW

HUMIDITY

CONDUCTIVITY

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

INNOVATIVE SENSOR TECHNOLOGY
Innovative Sensor Technology IST AG, Stegrütistrasse 14, CH-9642 Ebnat-Kappel, Switzerland,
Phone: +41 (0) 71 992 01 00 | Fax: +41 (0) 71 992 01 99 | E-mail: info@ist-ag.com | Web: www.ist-ag.com