



# **TSic 716** Temperature Sensor IC For a fully calibrated and extremely accurate low power temperature measurement

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## Benefits & Characteristics

- Easy to integrate (digital output signal)
- Outstanding accuracy of ±0.07 K
- Very low power consumption
- Excellent long-term stability

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

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

L2

L

1) For actual size, see dimensions

### 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:*	$\pm$ 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:*	T092

\* Customer-specific alternatives available

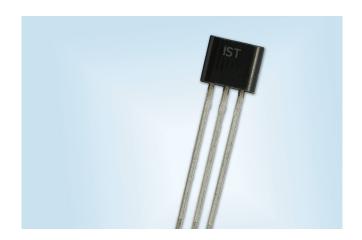
<sup>2)</sup> For tolerances, see Application Note



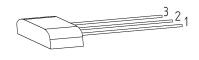
physical. chemical. biological.

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### Product image



## 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 <sub>dd</sub> )	-0.3 V	6 V
Voltages to analog I/O – Pins ( $V_{SIG}$ , $V_{GND}$ )	-0.3 V	V <sub>dd</sub> +0.3 V
Storage temperature range (T <sub>stor</sub> )	-10 °C	+60 °C
Non-operating temperature range		

# Operating conditions

	Min	Тур	Max
Supply voltage to GND (V <sup>+</sup> )	2.97 V	5 V	5.5 V
Supply current ( $I_{vdd}$ ) at $V_{dd}$ = 3.3 V, RT	30 µA	45 μΑ	80 µA
Operating temperature range (T <sub>amb</sub> )	-10 °C		+60 °C
Output load capacitance (C <sub>L</sub> )			15 nF
External capacitance between $V_{\rm dd}$ and ${\rm GND^{1)}}$	100 nF (recommer	nded)	
Output load resistance between signal and GND (or $V_{dd}$ )	47 kΩ		

 $^{\mbox{\tiny 1)}}$  Recommended as close to TSic  $V_{\mbox{\tiny dd}}$  and GND-Pins as possible



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

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	
Output signal	Digital, ZACWire
Output signal	
716	TSic 716 TO92
Order code	103493
Former order code	030.00048
Additional Electronics	
	Document name:
LabKit	DTTSicLabKit_E
Additional Documents	
	Document name:
Application Note:	ATTSic_E



# Order Information Temperature Sensor IC Secondary reference

TSic

Ac	cura	асу														
2	=	±0	.5 °	C at	+8	0 °C	rang	le								
3	=	±0	.3 °	C at	+8	0 °C	rang	le								
4	=	no	t de	fine	d											
5	=	±0	.1 °	C at	+4	0 °C	rang	e (lin	ited measurin	g range fr	om -1	0 °C to	+60 °C)	)		
6	=	no	t de	fine	d											
7	=	±0	.07	°C a	at +	20 °	C rar	ige (li	mited measur	ng range t	from -	10 °C t	o +60 °(	C)		
			Bit	size												
			0	=	11	bit										
			1	=	14	bit										
					(	Dutp	ut sig									
					1				g 0 V to 1 V							
					3	3			netric 10 % to	90 % V <sub>dd</sub>						
					6	5	= (	digita	ZACWire							
								using								
							TO	92								
								1	c							
									Special						6	
									E.g. "250 Hz <sup>4</sup> and tolerance	' tor a hig range	h sam	pling ra	te or "-3	30/70″	for tem	perat

RoHS

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