DATA SHEET

TSIC™ Digital Semiconductor Temperature Sensors TSIC 206 / 306

B+B SENSORS

Description

Characteristic features

- Fast response behaviour
- Excellent long term stability
- Accuracy 0.5 / 0.3 K (TSic 206 / 306)
- Wider temperature range 50 ... +150 °C
- Compact housing TO92 / SO8
- Minimum development cost and time
- Simple integration

Typical areas of applications

- Measuring and control systems
- Medical applications
- Temperature monitoring
- Battery operated systems
- Industrial measuring systems

Technical data

Digital Temperature sensors		
Measuring range	-50 ... +150 °C	
Connection	Digital connection, 11 Bit	
Accuracy (in range 10 ... 90 °C)	TSic 206 TSic 306	±0.5 K ±0.3 K
Resolution	0.1 K	
Measuring rate	10 Hz	
Operating voltage	2.97 ... 5.5 V	
Operating current (at 3.3 V)	< 80 µA at 25 °C (30 ... 80 µA)	
Load at output	R_L > 10 kOhm C_L < 10 nF	
V_{DD} Capacitor	80 ... 470 nF	
Housing	3-pin TO92 (wire terminals) or 8-pin SO8 (SMD)	
Rights reserved for change in technical data due to technological advancements		

Features

TSIC™ temperature sensors are known for its high accuracy, fast response behaviour and also its special long term stability Against other semiconductor temperature sensors, they offer an extended measuring range of -50... 150 °C with a resolution of 0.1K.
Through the digital interface, connection to a micro-controller is very simple otherwise an additional analog-digital converter is required.
The sensors are calibrated, hence any further adjustment work by the device manufacturer or the customer is not necessary
These innovative semiconductor sensors are powerful and cost effective solution for temperature measurements in industrial measurement and regulation systems.

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TSIC™ DIGITAL SEMICONDUCTOR TEMPERATURE SENSORS

Digital Temperature value

Measuring range –50 .. +150 °C / -58 ..+302 °F		
Temp (°C)	Temp (°F)	Tsic 206 / 306 (digital)
-50	-58	0x000
-10	14	0x199
0	32	0x200
25	77	0x2FF
60	140	0x465
125	257	0x6FE
150	302	0x7FF

Absolute Limits

Parameter	Min	Max	Units
Operating voltage (V+)	-0.3	6.0	V
Voltage at Analog output I/O –Pins (V_{INA}, V_{OUTA})	-0.3	V_{DDA} + 0.3	V
Storage temperature range	-50	150	°C

Operating data

Parameter	Min	Typ	Max	Units
Operating voltage[1]	2.97	5.0	5.5	V
Supply current (I_{V+}) @ V+ = 3.3 V, RT	30	45	80	µA
Ambient temperature range (T_{amb})	-50	--	150	°C
Output capacitance (C_L)	--	--	15	nF
External capacitance between V+ and Gnd[3] (C_{V+})	80	100	470	nF
Output load resistance between signal and Gnd (or V+)	47	--	--	kΩ

[1]Operation in voltage range of 2.7 ... 2.97 V is possible with reduced accuracy.

[3]The connection of the blocking capacitor must be done as near as possible to the connection pins of the component.

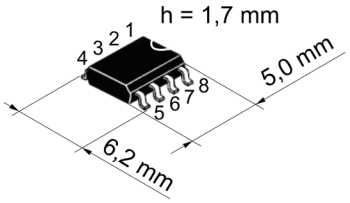
Temperature accuracy TSIC 206

Parameter	Min	Typ	Max	Units
T1: +10 ... 90 °C	-0.5		0.5	°C
T2: -20 ... 110 °C	-0.2	+0.4	0.95	°C
T3: -50 ... 150 °C	0	+0.9	2.0	°C
Accuracy level as 2σ value plus 1 digit quantising error				

Temperature accuracy TSIC 306

Parameter	Min	Typ	Max	Units
T1: +10 ... 90 °C	-0.3	±0.3	0.3	°C
T2: -20 ... 110 °C	-0.2	+0.3	0.95	°C
T3: -50 ... 150 °C	0	+0.9	2.0	°C
Accuracy level as 2σ value plus 1 digit quantising error				

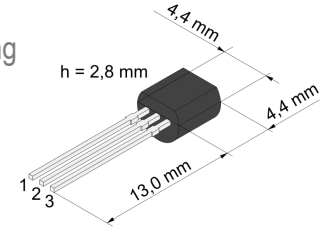
SO8-Housing



SO8 Housing (150 mil, Standard SMT Technology, SOIC-8) as per IEC 191-2Q: Type 076E35 B

Pin Nr.	Name	Description
1	V+	Operating voltage (3 ... 5.5 V)
2	Signal	Temperature output signal
4	Gnd	Ground
3, 5 - 8	TP/NC	Test Pin / NC (not connected)

TO92-Housing



Small THT Housing, TO92 type

Pin Nr.	Name	Description
1	V+	Operating voltage (3 ... 5.5 V)
2	Signal	Temperature output signal
3	Gnd	Ground