

IHK Abschlussprüfung Teil 2 – Sommer 2013	Blatt 4	
Funktions- und Systemanalyse Teil B Datenblatt DS1621	Elektroniker/-in für Geräte und Systeme	

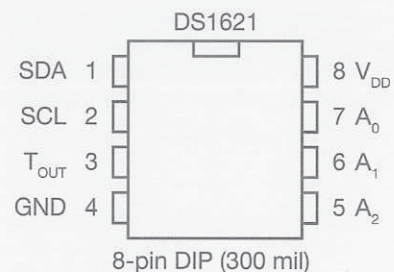
Digital Thermometer and Thermostat

FEATURES

- Temperature measurements require no external components
- Measures temperatures from $-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ in $0,5\text{ }^{\circ}\text{C}$ increments. Fahrenheit equivalent is $-67\text{ }^{\circ}\text{F}$ to $257\text{ }^{\circ}\text{F}$ in $0,9\text{ }^{\circ}\text{F}$ increments
- Temperature is read as a 9-bit value (2-byte transfer)
- Wide power supply range (2,7 V to 5,5 V)
- Converts temperature to digital word in less than 1 second
- Thermostatic settings are user definable and nonvolatile
- Data is read from/written via a 2-wire serial interface (open drain I/O lines)
- Applications include thermostatic controls, industrial systems, consumer products, thermometers, or any thermal sensitive system
- 8-pin DIP or SO package (150 mil and 208 mil)

PIN ASSIGNMENT AND DESCRIPTION

SDA	2-Wire Serial Data Input/Output
SCL	2-Wire Serial Clock
GND	Ground
TOUT	Thermostat Output Signal
A0	Chip Address Input
A1	Chip Address Input
A2	Chip Address Input
VDD	Power Supply Voltage



DESCRIPTION

The DS1621 Digital Thermometer and Thermostat provides 9-bit temperature readings, which indicate the temperature of the device. The thermal alarm output, TOUT, is active when the temperature of the device exceeds a user-defined temperature TH. The output remains active until the temperature drops below user defined temperature TL, allowing for any hysteresis necessary.

User-defined temperature settings are stored in nonvolatile memory so parts may be programmed prior to insertion in a system. Temperature settings and temperature readings are all communicated to/from the DS1621 over a simple 2-wire serial interface.

TEMPERATURE/DATA RELATIONSHIPS

TEMPERATURE	DIGITAL OUTPUT (Binary)	DIGITAL OUTPUT (Hex)
+125 °C	01111101 00000000	7D00h
+25 °C	00011001 00000000	1900h
+½ °C	00000000 10000000	0080h
+0 °C	00000000 00000000	0000h
-½ °C	11111111 10000000	FF80h
-25 °C	11100111 00000000	E700h
-55 °C	11001001 00000000	C900h

Since data is transmitted over the 2-wire bus MSB first, temperature data may be written to/ read from the DS1621 as either a single byte (with temperature resolution of $1\text{ }^{\circ}\text{C}$) or as two bytes. The second byte would contain the value of the least significant ($0,5\text{ }^{\circ}\text{C}$) bit of the temperature reading as shown in left side table. Note that the remaining 7 bits of this byte are set to all „0“s.

Temperature is represented in the DS1621 in terms of a $\frac{1}{2}\text{ }^{\circ}\text{C}$ LSB, yielding the following 9-bit format:
TEMPERATURE, TH and TL FORMAT

$$T = -25\text{ }^{\circ}\text{C}$$

MSB

1	1	1	0	0	1	1	1
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LSB

0	0	0	0	0	0	0	0
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