SENSYLINK Microelectronics

(CT1820)

Single-Wire Digital Temperature Sensor

CT1820 is a Digital Temperature Sensor with±0.5°C Accuracy Compatible with 1-wire Interface.
It is ideally used in HVAC, Thermal management and Smart Farm etc.

$\pm 0.5\,°C$ Temperature Sensor with Single-Wire Digital Interface

Description

CT1820 is a digital temperature sensor with $\pm$ 0.5°C accuracy. Temperature data can be read out directly via Single-Wire interface (compatible with 1-wire bus in protocol) by MCU.

It includes a high precision band-gap circuit, a 12-bit analog to digital converter that can offer 0.0625°C resolution, a calibration unit with non-volatile memory, 8-bit CRC generator and a digital interface block.

The chip is specially calibrated for $\pm 0.5\,°C$(Max.) accuracy over -10°C to 85°C range in factory before shipment to customers.

Each chip has a unique 64-bit ROM ID, which allows multiple devices to connect the same Single-Wire bus. MCU can distinguish and access each device individually by different ROM ID.

It has programmable temperature Alarm function for upper and lower trigger temperature.

Available Package: TO-92, TO-92S, TO-92S-2, MSOP-8, SOT-23 package.

Features

- Operation Voltage: 2.5V to 5.5V
- Average Quiescent Current: 36uA during Temperature conversion;
- Standby Current: 0.1uA (Typ.), 1.0uA (Max.)
- Temperature Conversion time: 30ms at 12-bit resolution
- Temperature Accuracy without calibration:
    $\pm$0.5°C(Max.) from -10°C to 85°C
    $\pm$1.0°C(Max.) from -10°C to 100°C
    $\pm$2.0°C(Max.) from -55°C to 125°C
- 12 bit ADC for 0.0625°C resolution
- Compatible with 1-wire interface
- Programmable Upper/Lower trigger Temperature
- Compatible with DS18B20 and performance improved.
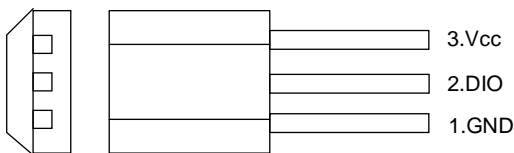- Temperature Range: -55°C to 125°C

Applications

- Smart HVAC System
- Thermal Management
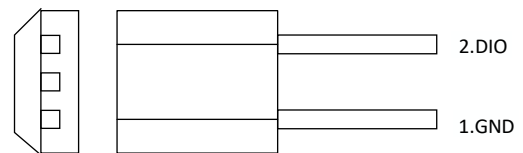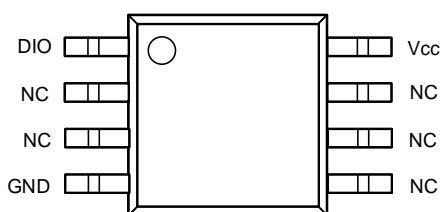- Smart Farm

PIN Configurations (Top View)
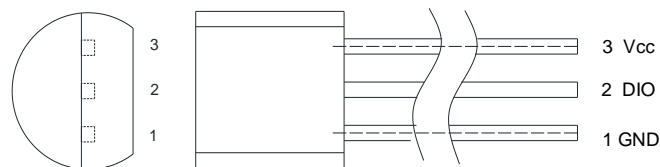
TO-92 (package code Z)

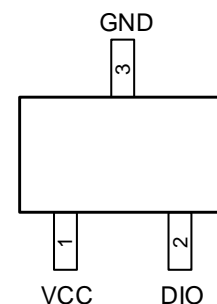TO-92S (package code Z3)

TO-92S-2 (package code Z2)
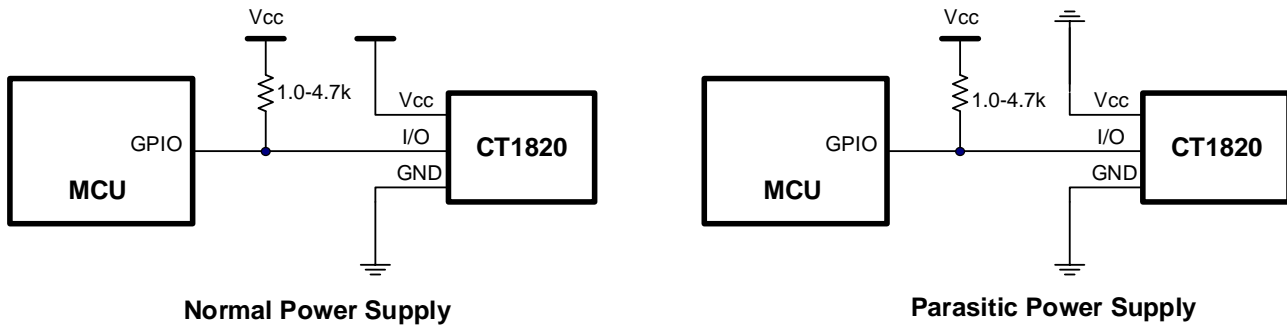

MSOP-8(package code MM)

SOT-23(package code K)

±0.5℃ Temperature Sensor with Single-Wire Digital Interface

Typical Application

Figure 1. Typical Application of CT1820

Pin Description

PIN No					PIN Name	Description
TO-92	TO-92S	TO-92S-2	MSOP-8	SOT-23		
1	1	1	4	3	GND	Ground pin.
2	2	2	1	2	DIO	Digital interface data input and output pin, Generally it is ok to connect a pull-up resistor (between 1.0k and 3.0k) to Vcc in single sensor and normal power supply applications. In long distance cable communication, with multi sensors and parasitic power supply application, it is better to use strong pull-up design, like using an individual MOSFET instead of pull-up resistor.
3	3		8	1	Vcc	Power supply input pin.In normal power supply mode, connect a 100nF to 1.0uF ceramic cap to ground. In parasitic power supply mode, connect to ground.
			2,3,5,6,7		NC	Not connected

Function Block
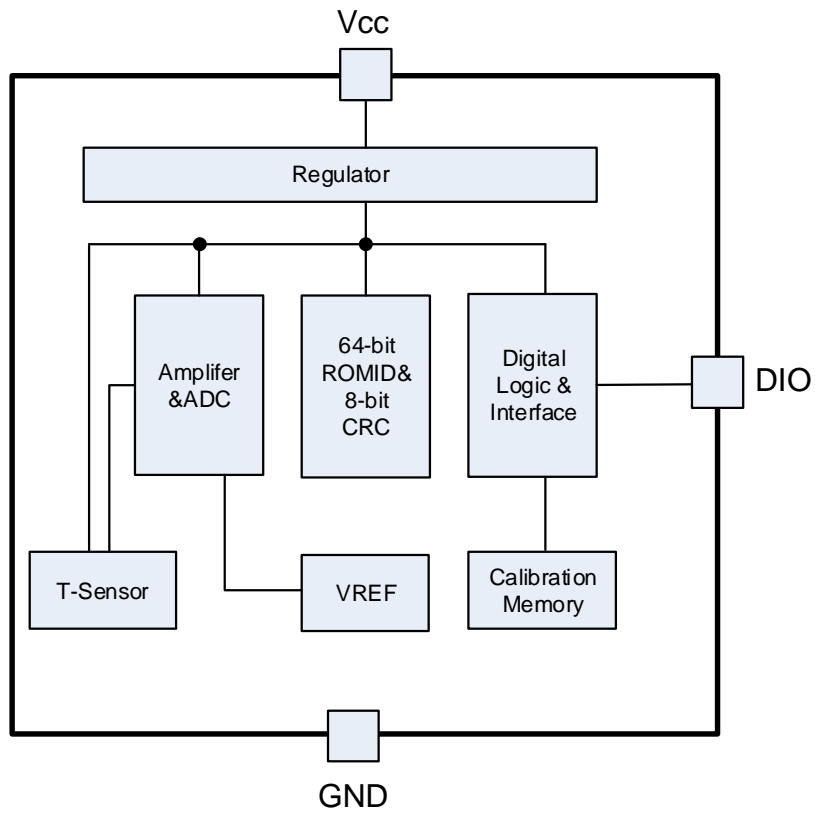
Figure 2. CT1820 function block

Ordering Information

CT1820　X　X

Package Type
Z : TO-92
Z3：TO-92S
Z2：TO-92S-2
MM：MSOP-8
K：SOT-23

Packing
Blank：Bulk
R：Tape&Reel
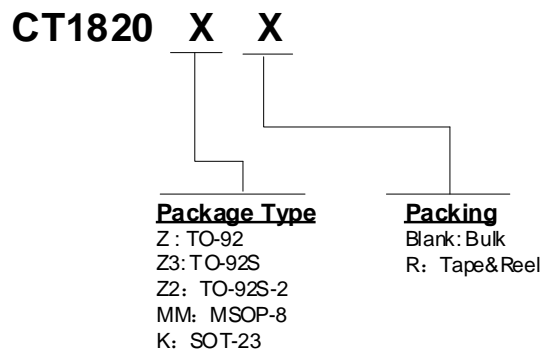
Order PN	Accuracy	Green[1]	Package	Marking ID[2]	Packing	MPQ	Operation Temperature
CT1820Z	±0.5℃	Halogen free	TO-92	1820 YWWAXX	Bulk	1,000	-55℃~+125℃
CT1820Z3	±0.5℃	Halogen free	TO-92S	1820 YWWAXX	Bulk	1,000	-55℃~+125℃
CT1820Z2	±0.5℃	Halogen free	TO-92S-2	1820 YWWAXX	Bulk	1,000	-55℃~+125℃
CT1820MMR	±0.5℃	Halogen free	MSOP-8	1820 YWWAXX	Tape&Reel	3,000	-55℃~+125℃
CT1820KR	±0.5℃	Halogen free	SOT-23	ARWW	Tape&Reel	3,000	-55℃~+125℃

Notes

1. Based on ROHS Y2012 spec, Halogen free covers lead free. So most package types Sensylink offers only states halogen free, instead of lead free.

2. Marking ID includes 2 rows of characters. In general, the 1st row of characters is part number, and the 2nd row of characters are date code plus production information and trace code.

SENSYLINK Microelectronics Inc.

www.sensylink.com

IMPORTANT NOTICE