

# ***SENSYLINK Microelectronics***

***(CT7451)***

## ***Digital Temperature Sensor***

***CT7451 is a 2-CH (1-CH Remote + 1-CH Local) Digital Temperature Sensor Compatible with SMBus and I<sup>2</sup>C Digital Interface. The chip builds in n-factor correction and serial resistance cancellation feature.***

***It is ideally used in CPU, FPGA, Server and Telecom Equipment etc.***

# ±1.0°C 2-CH (1 Local + 1 Remote) Digital Temperature Sensor

## Description

CT7451 is a 2 channels (1 remote channel + 1 local channel) digital temperature sensor. Temperature data can be read out directly via digital interface (compatible with SMBus and I<sup>2</sup>C with speed up to 400 kHz) by MCU, Bluetooth Chip or SoC chip.

Each chip is specially calibrated ±1.0°C(Max.) accuracy for both remote and local channel over 0°C to 85°C temperature range in factory before shipment to customers.

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, and a digital interface block.

It has a feature of series resistance cancellation for remote channel. It also has non-ideality factor correction feature for remote channel by programming register.

Available Package: DFN2x2-8 package

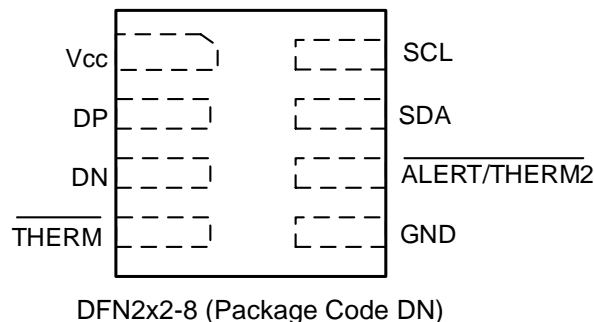
## Features

- Operation Voltage: 1.7V to 5.5V
- Average Operating Current: 30uA(Typ.) at 1 Con/s rate, 3.3V
- Shutdown Current: 3.0uA (typ.)
- Temperature Accuracy without calibration:
  - ±1.0°C(Max.) from 0°C to 85°C
  - ±2.0°C(Max.) from -40°C to 125°C
- 12 bit ADC for 0.0625°C resolution
- Support continuous measurement mode or single measurement mode
- Series Resistance Cancellation
- n-Factor Correction
- Compatible with SMBus, 2-wire and I<sup>2</sup>C interface with speed up to 400kHz
- External Diodes Fault detection
- Temperature range -40 °C to 125°C

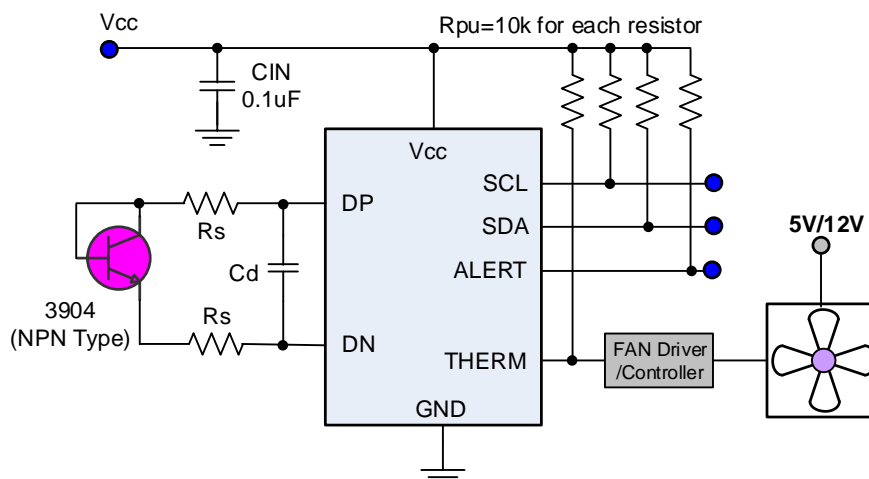
## Applications

- CPU, FPGA
- Server
- Telecom Equipment

## PIN Configurations (Top View)



## Typical Application



# ±1.0°C 2-CH (1 Local + 1 Remote) Digital Temperature Sensor

Figure 1. Typical Application of CT7451

## Pin Description

PIN No.	PIN Name	Description
1	Vcc	Power supply input pin, using 0.1uF low ESR ceramic capacitor to ground
2	DP	Remote channel positive input pin, it could be positive node of Diode or BJT transistor (diode-connected or transistor-connected mode).
3	DN	Remote channel negative input pin, it could be negative node of Diodes or BJT transistor (diode-connected or transistor-connected mode).
4	<b>THERM</b>	Open drain output with active low. Need a pull-up resistor to Vcc If the measured temperature exceeds THERM-limit (programmable by user), this pin will be activated. This pin can be used to control Fan on/off.
5	GND	Ground pin.
6	<b>ALERT/THERM2</b>	Open drain output with active low. Need a pull-up resistor to Vcc. If the measured temperature drops below the low-limit or exceeds high-limit, this pin will be activated. Both low-limit and high-limit are programmable by user. Also this pin can be used as the other THERM pin.
7	SDA	Digital interface data input or output pin, need a pull-up resistor to Vcc.
8	SCL	Digital interface clock input pin, need a pull-up resistor to Vcc.

## Function Block

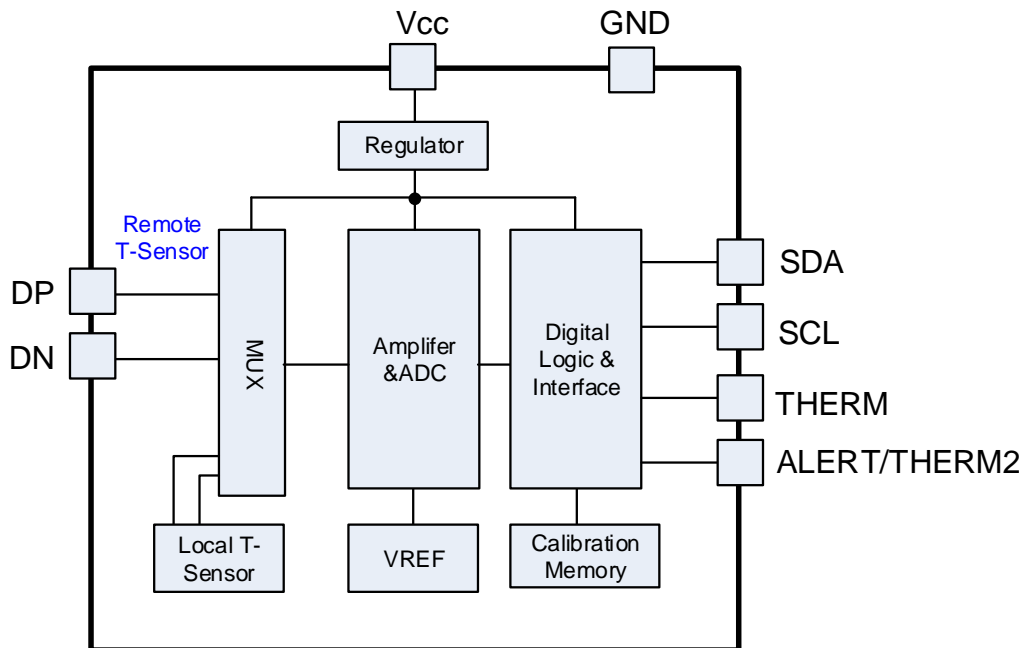
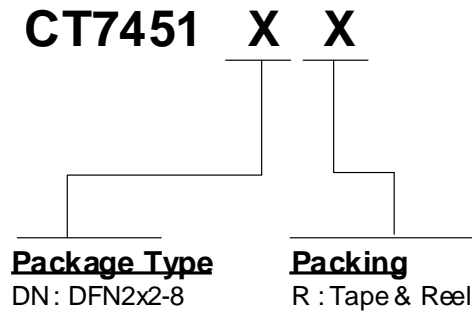


Figure 2. CT7451 function block

**±1.0°C 2-CH (1 Local + 1 Remote) Digital Temperature Sensor**
**Ordering Information**


Order PN	Accuracy	Green <sup>NOTE1</sup>	Package	Marking ID <sup>2</sup>	Packing	MPQ	Operation Temperature
CT7451DNR	±1 °C	Halogen free	DFN2x2-8	CA YWXA	Tape & Reel	3,000	-40°C~+125°C

**Note1**

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 includes 2 rows of characters. In general, the 1<sup>st</sup> row of characters are part number, and the 2<sup>nd</sup> row of characters are date code plus production information.

3. for this sensor, the default slave address of I<sup>2</sup>C/SMBus is 0x98/0x99 in write/read operation. Please contact Sensylink sales for other slave address.



## ***SENSYLINK Microelectronics Inc.***

[www.sensylink.com](http://www.sensylink.com)

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