SENSYLINK Microelectronics

(CT7433)
3-CH Remote and 1-CH Local Temperature Sensor

CT7433 is a 4-channels (3-channels Remote and 1-channel Local) Temperature Sensor with ±1°C Accuracy and SMBus Digital Interface.
It is ideally used in Temperature Sensing and Monitoring Systems, such as Computer, Server and Telecom Equipment System etc.

1. Description

The CT7433 is a high accuracy, low cost, System Management Bus (SMBus) temperature sensor. Advanced features such as Beta Compensation (to support CPU diodes requiring the BJT/transistor model) and automatic diode type detection combine to provide a robust solution for complex environmental monitoring applications.

The CT7433 monitors four temperature channels (3-CH remote and one local), providing ±0.8°C accuracy for local diode temperatures and ±1.5°C accuracy for remote diode temperatures. Beta Compensation eliminates temperature errors caused by low, variable beta transistors common in today's fine geometry processors. The automatic beta detection feature monitors the remote diode/transistor and determines the optimum sensor settings for accurate temperature measurements, regardless of processor technology. This frees the user from providing unique sensor configurations for each temperature monitoring application. These advanced features, plus ±1.5°C measurement accuracy, provide a low-cost, highly flexible and accurate solution for critical temperature monitoring applications.

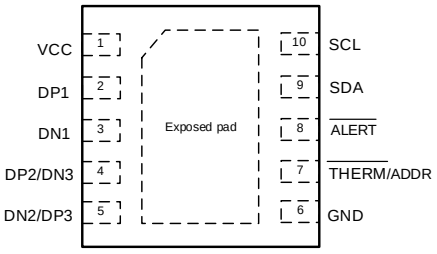
2. Features

- Programmable SMBus Address
- Support for Diodes requiring the BJT/Transistor: Supports advanced process substrate thermal diodes such as CPU, GPU and FPGACPU thermal diodes
- Digital Interface Compatible with SMBus and I^2C
- Support SMBus Alert Response Address (ARA)
- Up to 3 Remote Temperature Monitors:
  ±1.5°C max accuracy (0°C < T_{DIODE} < 100°C)
- supports up to 2.2 nF diode filter capacitor
- Local Temperature Monitor:
  0.0625°C resolution
- Programmable Temperature Limits for:
  $\overline{ALERT}$: 85°C default high limit and 0°C default low limit
  $\overline{THERM}$: 85°C default
- Lead-Free RoHS Compliant Packages
- Available Package:
  DFN3x3-10, MSOP-10 package

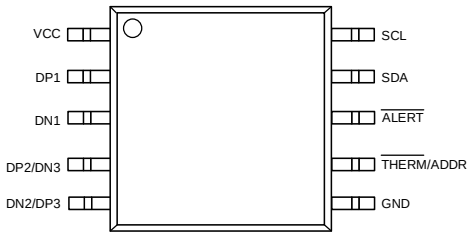
3. Applications

- Computer (Desktop & Notebook)
- Server
- Telecom Equipment, Embedded applications

4. Pin Configurations (Top View)



DFN3X3-10(Package code DN)



MSOP-10(Package Code MM)

5. Typical Application

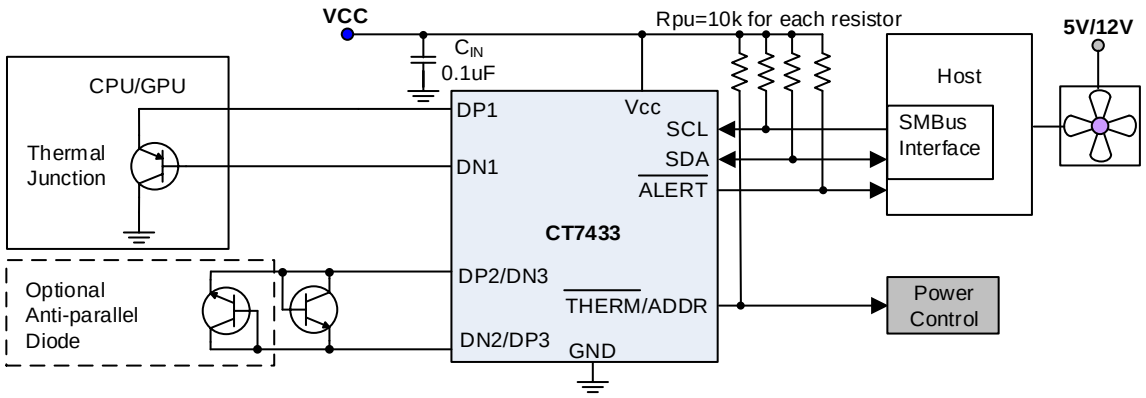


Figure 1. Typical Application of CT7433

6. Pin Descriptions

PIN No.	PIN Name	Description
1	VCC	Power supply input pin, using 0.1 uF low ESR ceramic capacitor to ground
2	DP1	Remote channel 1 positive input pin, it could be positive node of diodes, or BJT transistor (diode-connected mode). It is recommended to use bypass capacitor (C_d = 100 pF) plus serial resistor (R_s =50 ohm) to remove noise between DP1 and DN1 pin.
3	DN1	Remote channel 1 negative input pin, it could be negative node of diodes, or BJT transistor (diode-connected mode). It is recommended to use bypass capacitor (C_d = 100 pF) plus serial resistor (R_s =50 ohm) to remove noise between DP1 and DN1 pin.
4	DP2/DN3	Remote channel 2 positive input pin, it could be positive node of diodes (or Remote channel 3 negative input pin, it could be negative node of diodes), or BJT transistor (diode-connected mode). It is recommended to use bypass capacitor (C_d = 100 pF) plus serial resistor (R_s =50 ohm) to remove noise between DP2 and DN2 pin.
5	DN2/DP3	Remote channel 2 negative input pin, it could be negative node of diodes (or Remote channel 3 positive input pin, it could be positive node of diodes), or BJT transistor (diode-connected mode). It is recommended to use bypass capacitor (C_d = 100 pF) plus serial resistor (R_s =50 ohm) to remove noise between DP2 and DN2 pin.
6	GND	Ground pin.
7	$\overline{\text{THERM}}$ /ADDR	Thermal output pin, open drain 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.
		ADDR Selects SMBus address based on pull-up resistor.
8	$\overline{\text{ALERT}}$	Alert output pin, open drain 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.
9	SDA	Digital interface data input and output pin, need a pull-up resistor to VCC in application.
10	SCL	Digital interface clock input pin, need a pull-up resistor to VCC in application.
Bottom Pad	Exposed Pad	Not internally connected, but recommend grounding

7. Function Block

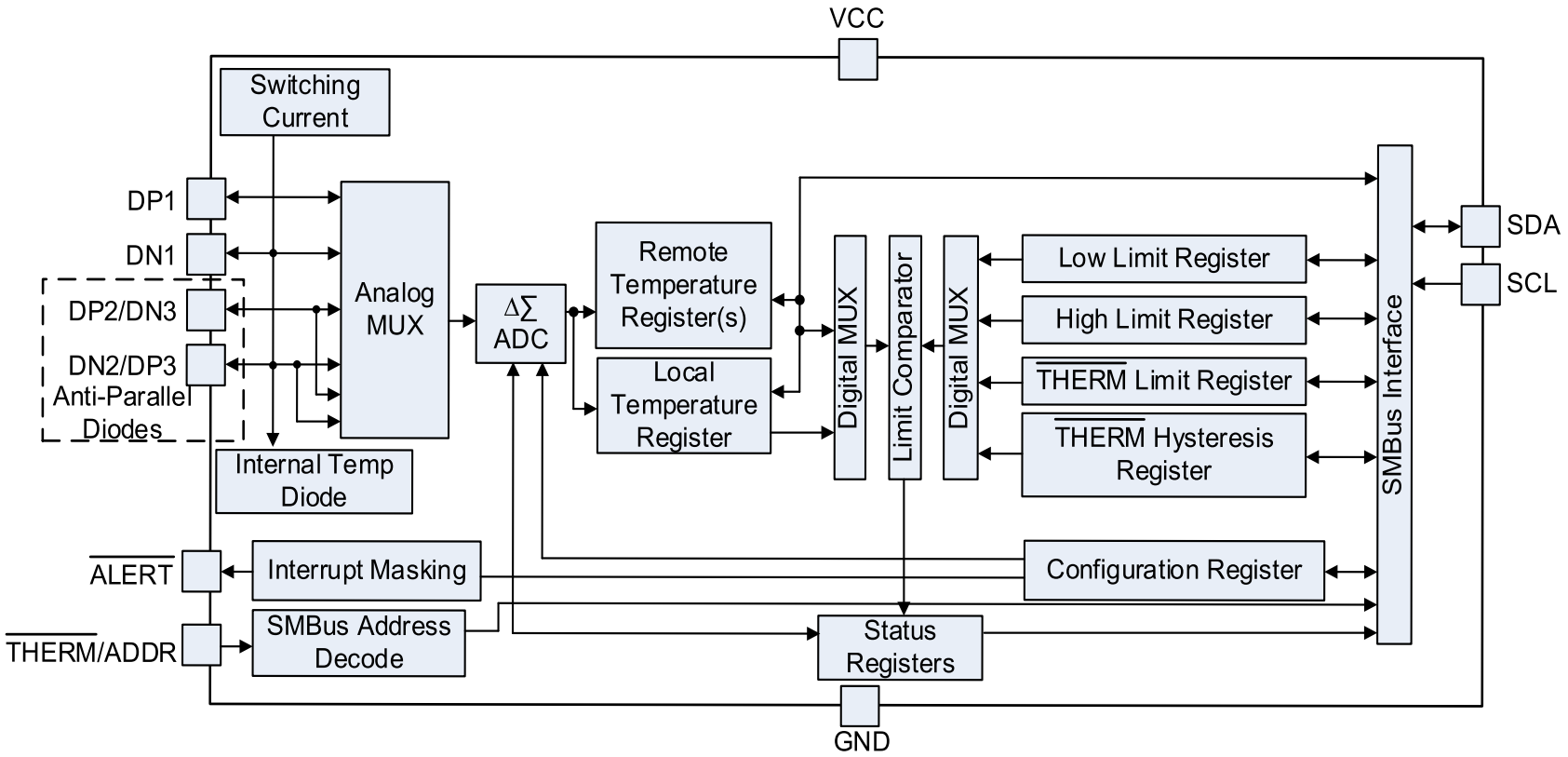
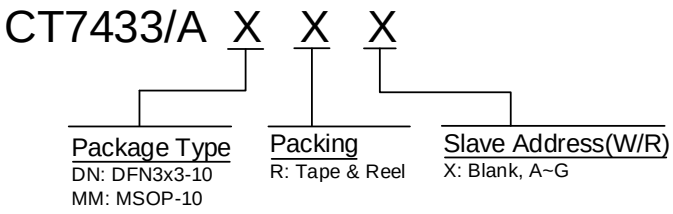


Figure 2 CT7433 Functional Block

8. Ordering Information



Order PN	Slave Address(W/R)[3]	Accuracy	Green[1]	Package	Marking ID[2]	Packing	MPQ	Operation Temperature
CT7433MMR	0x98/0x99	±1°C	Halogen free	MSOP-10	SAAS YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433MMR-A	0x90/0x91	±1°C	Halogen free	MSOP-10	SAAA YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433MMR-B	0x92/0x93	±1°C	Halogen free	MSOP-10	SAAB YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433MMR-C	0x94/0x95	±1°C	Halogen free	MSOP-10	SAAC YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433MMR-D	0x96/0x97	±1°C	Halogen free	MSOP-10	SAAD YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433MMR-E	0x9A/0x9B	±1°C	Halogen free	MSOP-10	SAAE YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433MMR-F	0x9C/0x9D	±1°C	Halogen free	MSOP-10	SAAF YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433MMR-G	0x9E/0x9F	±1°C	Halogen free	MSOP-10	SAAG YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR	XXX1_100(w/r)	±1°C	Halogen free	MSOP-10	SABS YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR-A	XXX1_000(w/r)	±1°C	Halogen free	MSOP-10	SABA YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR-B	XXX1_001(w/r)	±1°C	Halogen free	MSOP-10	SABB YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR-C	XXX1_010(w/r)	±1°C	Halogen free	MSOP-10	SABC YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR-D	XXX1_011(w/r)	±1°C	Halogen free	MSOP-10	SABD YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR-E	XXX1_101(w/r)	±1°C	Halogen free	MSOP-10	SABE YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR-F	XXX1_110(w/r)	±1°C	Halogen free	MSOP-10	SABF YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433AMMR-G	XXX1_111(w/r)	±1°C	Halogen free	MSOP-10	SABG YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433DNR	0x98/0x99	±1°C	Halogen free	DFN3x3-10	SACS YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433DNR-A	0x90/0x91	±1°C	Halogen free	DFN3x3-10	SACA YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433DNR-B	0x92/0x93	±1°C	Halogen free	DFN3x3-10	SACB YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433DNR-C	0x94/0x95	±1°C	Halogen free	DFN3x3-10	SACC YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433DNR-D	0x96/0x97	±1°C	Halogen free	DFN3x3-10	SACD YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433DNR-E	0x9A/0x9B	±1°C	Halogen free	DFN3x3-10	SACE YWWAXX	Tape & Reel	3,000	-40°C ~+125°C

(Continued)

Order PN	Slave Address(W/R)[3]	Accuracy	Green[1]	Package	Marking ID[2]	Packing	MPQ	Operation Temperature
CT7433DNR-F	0x9C/0x9D	±1°C	Halogen free	DFN3x3-10	SACF YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433DNR-G	0x9E/0x9F	±1°C	Halogen free	DFN3x3-10	SACG YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR	XXX1_100(w/r)	±1°C	Halogen free	DFN3x3-10	SADS YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR-A	XXX1_000(w/r)	±1°C	Halogen free	DFN3x3-10	SADA YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR-B	XXX1_001(w/r)	±1°C	Halogen free	DFN3x3-10	SADB YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR-C	XXX1_010(w/r)	±1°C	Halogen free	DFN3x3-10	SADC YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR-D	XXX1_011(w/r)	±1°C	Halogen free	DFN3x3-10	SADD YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR-E	XXX1_101(w/r)	±1°C	Halogen free	DFN3x3-10	SADE YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR-F	XXX1_110(w/r)	±1°C	Halogen free	DFN3x3-10	SADF YWWAXX	Tape & Reel	3,000	-40°C ~+125°C
CT7433ADNR-G	XXX1_111(w/r)	±1°C	Halogen free	DFN3x3-10	SADG YWWAXX	Tape & Reel	3,000	-40°C ~+125°C

Note1:

[1]. Sensylink can meet RoHS 2.0/REACH requirement. 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 are part number, and the 2nd row of characters are date code plus production information.

[3]. For CT7433A, Slave Address high 3bit is XXX, which means that the address of I²C is determined by the external pull-up resistance of THERM pin. For specific I²C address, please refer to 10.10.2 SMBus Address and RD/WR Bit.

SENSYLINK Microelectronics Inc.

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