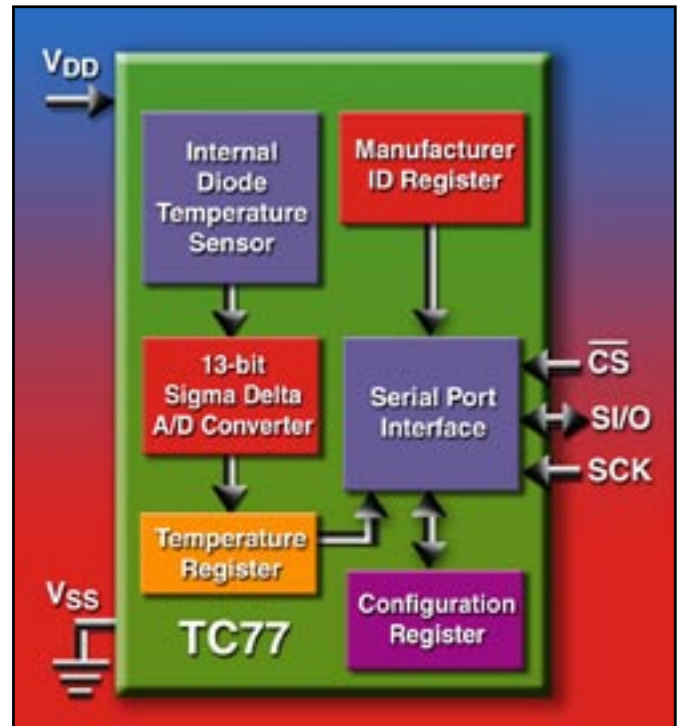# Serial Output Temperature Sensor Family

The **TC74** is a temperature sensor with an on-board thermal diode and an SMBus™ compatible interface. The **TCN75** is a temperature sensor with an on-board thermal diode and a 2-wire serial interface. The **TC72** and **TC77** are temperature sensors with an on-board thermal diode and an SPI™ compatible interface.

Microchip's serial (digital) output temperature sensors offer excellent temperature accuracy (±0.5°C typical) with a very low operating current of less than 250 µA. Communication with the devices is accomplished via an industry standard SMBus or SPI compatible interface protocol. A standby mode is also available for further reducing the devices' total current. All devices are offered in space saving packages and feature very fast temperature conversion times. Temperature resolution for the entire family ranges from 0.0625°C to 1°C.

These temperature sensors are fully specified from 2.7V to 5.5V and allow temperature measurement over an extended -55°C to +125°C temperature range, (-40°C to +125°C for the TC74). Several features provided on select devices, address a broad application spectrum: interrupt output for thermal event alarm, external address pins for multi-drop capability, programmable trip point for maximum flexibility and small footprints for saving board space.

High accuracy, low operating current, small size and ease of use make these devices ideal for implementing sophisticated thermal management schemes in a variety of systems. Typical applications include, PCs, servers, datacom equipment, hard drives, set-top boxes, storage equipment, consumer electronics, power supplies, communication devices, office electronics and amplifiers.

Features:
- Typical accuracy as high as ±0.5°C
- Operating current as low as 200 µA
- 2-wire SMBus™ compatible interface
- 3-wire to 4-wire SPI™ compatible interfaces
- Standby mode for power savings, (as low as 0.1 µA)
- High temperature resolution (0.0625°C to 1°C)
- Fast temperature conversion times
- Small SOT-23, MSOP and DFN packages

Related Application Note:
- AN679   Temperature Sensing Technologies

MICROCHIP

Thermal Management

Additional Information:

- Microchip's web site: www.microchip.com
- Microchip's *Technical Library CD-ROM*, Order No. DS00161
- *Analog & Interface Families Data Book 2002*, Order No. DS00207
- *Product Line Card*, Order No. DS00148
- *2002 Technical Documentation Analog & Interface Product Familie*s CD-ROM, Order No. DS51205
- *TC72 Data Sheet*, DS21743
- *TC74 Data Sheet*, DS21462
- *TC77 Data Sheet*, DS20092
- *TCN75 Data Sheet*, DS21490

Development Tools Support:

TC74 Evaluation and Demonstration Kit (DS21557): The TC74 Demo is an evaluation and demonstration board specifically designed to support Microchip's TC74, a 2-wire serial temperature sensor. Communication with the TC74 is accomplished with a PC running the communication software.

Serial Output Temperature Sensor Family									
Product	Interface	Max Accuracy (+25°C to +65°C)	Temperature Range	V_{CC} Range	Typical I_Q	Typical I_{SHDN}	Resolution	# of Pins/ Package	Features
TC72	4-wire SPI™	±1.5°C	-55°C to 125°C	2.65V to 5.5V	250 µA	0.1 µA	0.25°C	8MS, 8MF	Leadless package
TC74	2-wire SMBus™	±2°C	-40°C to 125°C	2.7V to 5.5V	200 µA	5 µA	1°C	5AT, 5CT	TO-220 package
TC77	3-wire SPI	±1°C	-55°C to 125°C	2.7V to 5.5V	250 µA	0.1 µA	0.0625°C	8MS, 5CT	High resolution
TCN75	2-wire SMBus	±2°C	-55°C to 125°C	2.7V to 5.5V	250 µA	1 µA	0.5°C	8MS, 8SN	Multi-droppable, Interrupt output

Package Key: **AT** = TO-220   **CT** = SOT-23   **MS** = MSOP   **SN** = SOIC   **MF** = DFN

Development Tools for Analog and Interface Products from Microchip	
FilterLab™	Active Filter Software Design Tool
MCP2510 CAN Developer's Kit	MCP2510 CAN Evaluation/Development Tool
MCP2120/2150 Developer's Kit	Infrared Products Developer's Kit
MCP250XX CAN I/O Expanders Developer's Kit	MCP250XX CAN Evaluation/Development Tool
MXDEV® 1 Analog Evaluation System	Evaluation Kit for MCP Devices
MCP3201/02 Evaluation Daughter Kit	Analog-to-Digital Converter - Four Channel*
MCP3204/08 Evaluation Daughter Kit	Analog-to-Digital Converter - Four Channel*
MCP41XXX/MCP42XXX Evaluation Daughter Kit	Digital Pot Evaluation and Demonstration*
TC642 Demo Board	Fan Control Module for TC64X Devices
TC642 Evaluation Kit	Evaluation Kit for TC64X Fan Controllers
TC650 Demo Board	Demo Board for TC650/TC651 Fan Control ICs
TC652 Demo Board	Demo Board for TC652/TC653 Fan Control ICs
TC74 Demo Board	Demo Board for TC74 Digital Thermal Sensor

*Note: Requires MXDEV® Analog Evaluation Kit.

Visit our web site at www.microchip.com for additional product information and your local sales office.

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