Microchip’s Temperature Sensors are useful in thermometer circuits, temperature compensation applications as well as a wide array of general-purpose temperature sensing applications. Microchip customers may choose from Voltage Output temperature sensors that supply a linearized output voltage directly proportional to measured temperature, Logic Output sensors that assert a logic signal when measured temperature is higher or lower than a temperature trip point and Serial Output sensors that are able to communicate thermal data with embedded microcontrollers and other digital systems.

**VOLTAGE OUTPUT TEMP SENSORS**

Microchip’s Voltage Output temperature sensors develop an output voltage proportional to temperature with a nominal temperature coefficient of 6.25mV/°C and 10mV/°C respectively. The temperature-to-voltage converters can sense a -40°C to +125°C temperature range while operating from a single 2.5V supply. The devices feature an offset voltage that allows reading negative temperatures without the need for a negative supply voltage. The extremely low operating current minimizes self-heating and maximizes battery life. An example is the TC1047, a linear output temperature sensor whose output voltage is directly proportional to measured temperature. The TC1047 can accurately measure temperature from -40°C to +125°C. For the TC1047, the output voltage range is typically 100mV at -40°C, 500mV at 0°C, 750mV at +25°C, and 1.75V at +125°C. A 10mV/°C -voltage slope allows for the wide temperature range. The TC1047 is packaged in space saving 3-Pin SOT-23B packages, making them ideal for space critical applications.

**LOGIC OUTPUT TEMP SENSORS**

Microchip’s logic output temperature sensor family offers excellent temperature accuracy (±1°C typical) with a very low operating current of less than 600µA. These devices can replace mechanical switches in a variety of sensing and control applications. The output is driven active when the temperature crosses the temperature trip point. A built-in hysteresis prevents output chattering at the temperature threshold level. An example is the TC620 and TC621 programmable logic output temperature detectors designed for use in thermal management applications. The TC620 features an on-board temperature sensor, while the TC621 connects to an external NTC thermistor for remote sensing applications. Both devices feature dual thermal interrupt outputs (HIGH LIMIT and LOW LIMIT), each of which program with a single external resistor. On the TC620, these outputs are driven active (high) when
measured temperature equals the user-programmed limits. The CONTROL (hysteresis) output is driven high when temperature equals the high limit setting, and returns low when temperature falls below the low limit setting. This output can be used to provide simple ON/OFF control to a cooling fan or heater. The TC621 provides the same output functions except that the logical states are inverted. The TC620/621 are usable over a maximum temperature range of –40°C to +125°C.

**SERIAL OUTPUT TEMP SENSORS**

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. Microchip’s 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.

Datasheets for the devices can be found at www.microchip.com/tempsensors

For additional information or pricing on these devices, contact any Microchip sales representative or authorized worldwide distributor or visit www.microchip.com.

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