

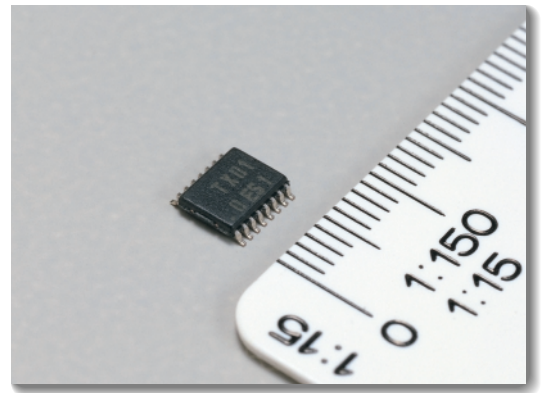
Digital Temperature Compensation IC

TC7MTX01FK

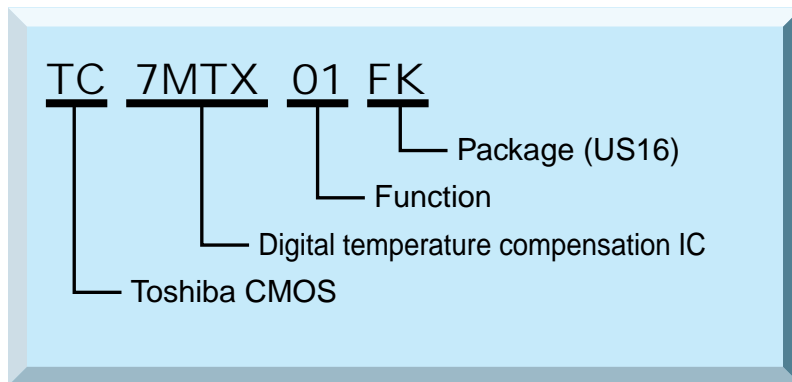
Product Overview:

In recent years, due to the demand for compactness and lower power dissipation, circuits for mobile devices are being manufactured as individual chips. In particular, during the manufacture of modular devices comprised of several individual discrete devices, significant time and effort must be devoted to adjusting the temperature characteristic of each discrete device individually. In addition, the demand for low power consumption is increasing. In response to these requirements, Toshiba have developed a digital temperature compensation IC (the TC7MTX01FK). Toshiba have implemented this device completely in CMOS, obviating the need to use combinations of individual electronic components, such as thermistors and resistors, as was the case previously. The new digital temperature compensation IC incorporates a temperature sensor, an E²PROM and a DA converter. The IC has a degree of precision of $\pm 4^{\circ}\text{C}$. To meet the demand for compactness, the IC comes in the World's smallest and flattest 16-pin package (US16).

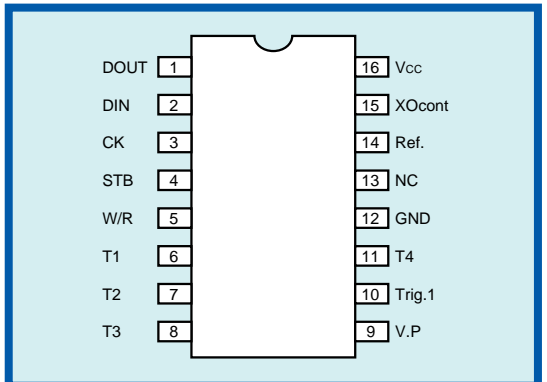
External View



Product Name:



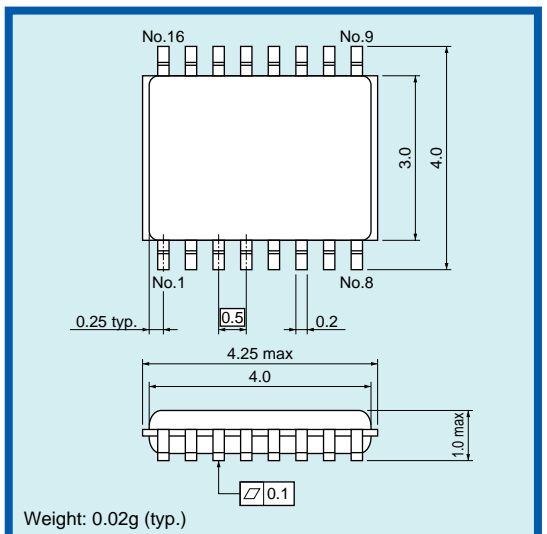
Pin Layout



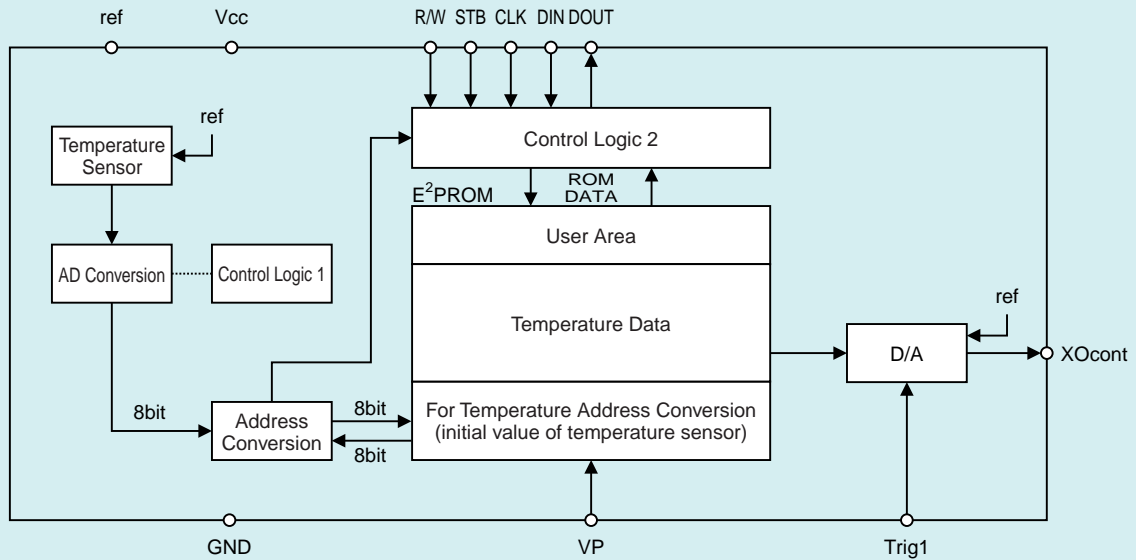
Features:

- Temperature compensation precision: $\pm 4^{\circ}\text{C}$ (in the range $-20^{\circ}\text{C}\sim 70^{\circ}\text{C}$)
- Analog output (XOcont): Outputs an analog voltage whose level corresponds to 1°C increments in the above temperature range.
Control resolution: 10.98 mV (typ.)/bit
Linearity: ± 1 LSB
Output response speed: 500 μs
- Supply voltage operating range: 2.7 V~3.3 V
- Built-in E²PROM: Write voltage 17 V (min)~19 V (max)
Write time 10 ms
- Reference voltage (Vref): 2.8 V (typ.)
Current dissipation: 1.0 mA (max) @25°C
- ESD: ± 2000 V or more (MIL-STD method)
- Latch-up: ± 200 mA or more

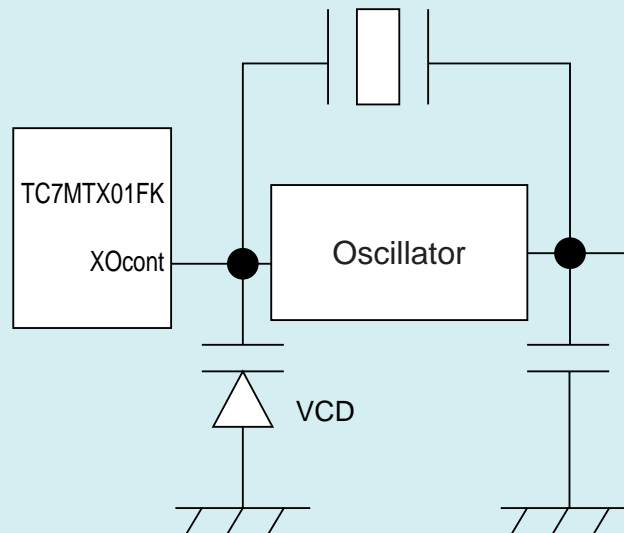
Package Dimensions



Block diagram



TCXO (temperature compensation crystal oscillator) application



Description

This IC incorporates a temperature sensor which can detect temperature with an accuracy of 1°C. An 8-bit correction value for each integer temperature value from - 20°C to 70°C is stored in the E²PROM. The 8-bit correction value for 25°C is stored at E²PROM address 0FH. The analog data output by the temperature sensor is converted to an 8-bit digital value. This value is then added to the 8-bit value stored at address 0FH and the sum is used as the E²PROM address of the correction data to be output. The 8-bit value stored at this address is converted to an analog level and output on XOcont.

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