

THOR – NFC / Multiprotocol data logger IC

Including on-chip temperature sensor

Key features

- Compliant to ISO 14443A and ISO 15693
- openMSP430 CPU with debug interface
- Temperature accuracy after factory calibration: $\pm 1.5^{\circ}\text{C}$ (abs), $\pm 0.1^{\circ}\text{C}$ (relative)
- Temperature accuracy after customer's own two-point temperature calibration: $\pm 0.5^{\circ}\text{C}$ (abs), $\pm 0.1^{\circ}\text{C}$ (relative)
- Temperature range -20°C to $+85^{\circ}\text{C}$
- 16 bits linear low-offset instrumentation $\Sigma\Delta$ ADC
- Up to 24 KB storage capacity
- SPI master interface for auxiliary slave
- Optional ultra-low power crystal clock
- Can be operated with and without battery power
- Firmware upgradable
- Ultra-low power tag storage mode ($< 0.1 \mu\text{A}$)
- DES encryption hardware support
- Tested dies (KGD)

Description

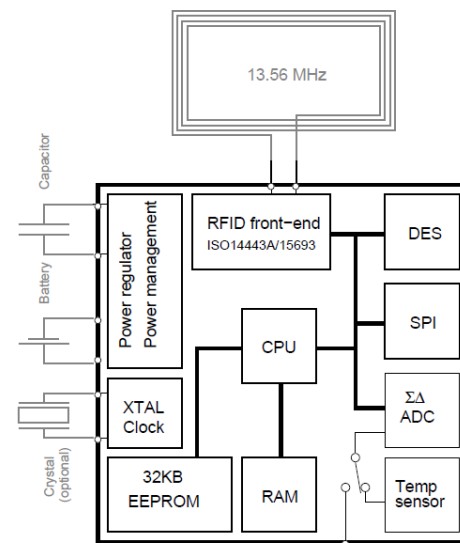
The DELTA Microelectronics THOR is a multiprotocol transponder chip (PICC) that can perform measurements and store results with a configurable time interval (0.1 s to 10 h). It supports both ISO 14443A (NFC Type 2) and ISO 15693. Protocol type is automatically detected.

Measurements can originate from the on-chip high precision temperature sensor, an external differential analog signal or from the SPI master interface. The logging capacity is up to 24 KB. At 16 bit precision capacity is up to 11 K samples. Data transfer rate is up to 848 kb/s at short distances. With a credit card size antenna, operation 80 cm from reader is possible (26.48 kb/s).

For autonomous logging the device can be mounted with a 2.7 – 5.5V battery. When no measurement is performed standby current consumption is below 1 μA . When an RF field is applied,

the internal power supply switches to power extracted from the RF field. In this way, data from the memory can be accessed even with an expired battery. The chip can also supply an auxiliary slave, e.g. a sensor with SPI interface, designed for 2.7 – 5.5V range. Typical output from the chip is 3.1V.

The embedded EEPROM memory size is 32 K bytes. Apart from measurement results and default drivers, it can also hold custom SW applications. Tamper detection can also be supported. DES hardware encryption is available for data privacy.



Applications

Temperature logging for temperature sensitive objects/parcels or RF interface to various SPI controlled sensors e.g. pressure, tilt, voltage, light etc.

Buy the evaluation kit

- PCB with THOR, antenna and battery
- Windows GUI tool for logging set-up and readout
- Optional PCB for openMSP430 debug

For further information please contact us: asic@delta.dk