

## 1. General description

The @RFID's IOTag sensor series' TSTag Dual RFID, TTag Dual RFID, TTag NFC are a family of ICs with ARM Cortex-M0+ IC optimized for temperature monitoring, impact recognition and logging with NFC and UHF interface.

The device is an effective system solution for wide field of applications.

The solution includes a mobile app, a cloud-based data warehousing service and a choice of data loggers for temperature-sensitive storage monitoring, logistics and distribution.



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## 2. Features and benefits

### ■ System

- ◆ ARM Cortex-M0+ processor running at frequencies of up to 8 MHz
- ◆ ARM Cortex-M0+ built-in Nested Vectored Interrupt Controller (NVIC)
- ◆ ARM Serial Wire Debug (SWD)
- ◆ System tick timer
- ◆ IC reset input

### ■ Memory

- ◆ 32 kB on-chip flash programming memory
- ◆ 4 kB on-chip EEPROM of which 256 byte can be write protected
- ◆ 8 kB SRAM
- ◆ Store up to 28k logs
- ◆

### ■ Communication interfaces

- ◆ NFC/RFID ISO 14443 type A interface
  - ISO/IEC14443A part 1 to part 3 compatible
  - MIFARE (Ultralight) EV1 compatible
  - NFC Forum Type 2 compatible
  - Easy interfacing with standard user memory space READ/WRITE commands
  - Passive operation possible
- ◆ UHF interface Compliant to EPC global Radio-Frequency Identity Protocols Class-1 Gen-2
- ◆ UHF RFID Protocol for communications at 860 MHz to 960 MHz version 1.2.0
  - 18 dBm READ sensitivity
  - 11 dBm WRITE sensitivity
  - 23 dBm READ and WRITE sensitivity with the chip powered
  - Wide RF interface temperature range: from 40 °C up to +85 °C

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- Power control
  - ◆ The device can also be powered from the NFC field
  - ◆ Activation via NFC possible
  - ◆ Integrated Power Management Unit (PMU) for versatile control of power consumption
  - ◆ Four reduced power modes for ARM Cortex-M0+: Sleep, Deep-sleep, Deep power-down and Battery-off
  - ◆ Power gating for each analog peripheral for ultra-low power operation
  - ◆ < 50 nA IC current consumption in Battery-off mode at 3.0 V
  - ◆ Power-On Reset (POR)
  - ◆
- Unique device serial number for identification

### 3. Static characteristics

$T_{amb} = 40\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$ , unless otherwise stated.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Supply pins						
V <sub>DD</sub>	supply voltage			3.0		V
I <sub>DD</sub>	supply current		-	-	-	uA
I <sub>L(off)</sub>	off-state leakage current		-	-	50	nA
I <sub>DD(pd)</sub>	power-down mode supply current	Deep power-down mode	-	3	-	uA

\*TSTag Dual RFID– Temperature and Accelerometer sensor, combo NFC & UHF communication

\*TTag Dual RFID - Temperature sensor, combo NFC & UHF communication

\*TTag NFC - Temperature sensor, NFC only

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## 4. Applications

- Temperature measurement
- Temperature logging
- Temperature and shock controlled transport
- Temperature and shock controlled storage
- 6D/4D orientation detection
- Free-fall detection
- Motion detection
- Cold chain validation
- Pharmaceutical supply chain and medical applications;
- Fresh food transportation;
- Your application

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## 5. Temperature + Acceleration Monitoring with your Smartphone

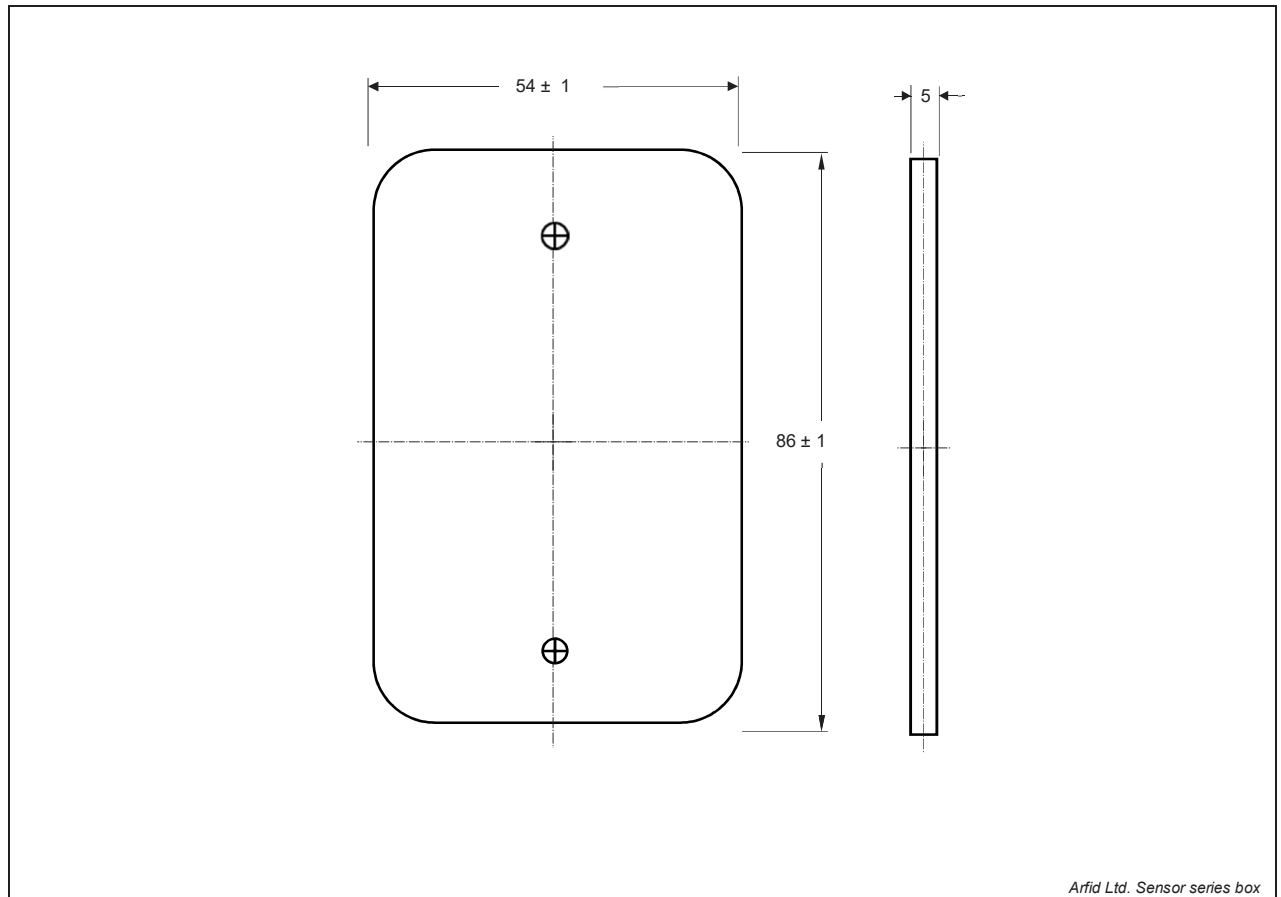


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## 6. Dimensions [mm]



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