

NFC Sensor Tag and Data Logger

www.ams.com/AS39513



AS39513 – NFC smart sensor IC

- For traceable, accurate and disposable wireless temperature loggers
- Ultra-low power, low voltage design for extended battery lifetime
- High accuracy integrated temperature sensor tailored for cold chain applications

**Sensing
is life.**

General Description

The AS39513 is an NFC sensor tag and data logger IC for smart labels which enables more efficient and accurate monitoring of the condition of assets such as food, pharmaceuticals and healthcare products in storage and in transit.

Smart labels based on the AS39513 enable manufacturers, shippers and retailers to examine detailed logs of the conditions in which individual packages in a shipment have been kept, and to establish for instance whether perishable goods such as fresh food are in perfect condition on arrival.

The new device is a complete digital sensor with an NFC front end that can easily be integrated into smart labels. A unique ID as well as logged temperature and other data stored in its internal memory can be read by any authorized NFC reader such as a smartphone or tablet.

The AS39513 is ideal for applications using thin and flexible batteries but it also supports fully passive operation without a battery using the RF field from an RFID reader as a power source.

The RFID interface is fully ISO 15693 and NFC-V (T5T) compliant. External power can be supplied from a single-cell battery (typically 1.5 V) or a dual-cell battery (typically 3 V). The chip, when operating in passive mode, can harvest energy from a reader's incoming RF field, supplying external circuitry with a current of up to 3mA.

The chip has a fully integrated temperature sensor with a programmable temperature range (default -20°C to 55°C). The external sensor interface (SEXT) is an analog input and allows the connection of an external sensor.

A real-time clock can be used to generate logging times and track the device lifetime. An SPI-like interface is available for chip initialization or communication with a micro-controller. The chip has the capability to energy harvesting from reader field up to 3mA. Configuration and logging data is stored on a configurable 9kbit EEPROM.

Benefits

- Versatile data logging with selectable option
- Logging storage capacity up to 1,020 events with time stamp
- Supports data logging from various sensors
- On-chip temperature sensor
- Flexible supply options
- Provides supply for external circuitry

Features

- Programmable logging modes
- On-chip 9kbit EEPROM
- Real-time clock (RTC)
- On-chip temperature sensor default temperature range: -20°C to 55°C
- Analog input for external resistive sensor
- Accuracy $\pm 0.5^\circ\text{C}$ from -20°C to 10°C
- Programmable temperature range
- Fully passive mode operation
- Semi-passive (BAP) mode: 1.5V or 3V battery
- Energy harvesting from reader field up to 3mA

Applications

- Cold chain management for food and pharma logistics
- Material integrity monitoring for civil engineering (concrete, plaster)
- Process monitoring and optimization
- Environmental monitoring
- Personal healthcare

AS39513 Block Diagram

