

NXP UCODE I²C

Enable new RFID applications with I²C interface and 3,300-bit user memory

Equipped with two UHF interfaces and one I²C interface, this advanced RFID IC enables a new range of applications, from customization and configuration of electronic devices to wireless sensors.

Key features

- ▶ I²C interface
- ▶ 3,328-bit user memory
- ▶ Dual front-end architecture
- ▶ Best-in-class RF sensitivity
- ▶ Up to 160-bit EPC
- ▶ 96-bit TID, including 48-bit serial number
- ▶ EPCglobal 1.2.0 standard
- ▶ Switchable RF and I²C interfaces
- ▶ RF-to-I²C bridge mode (handshake) based on SRAM memory
- ▶ Interrupt output
- ▶ SOT902-3 package (1.6 x 1.6 mm, 0.5 mm thickness)

Applications

- ▶ Electronic serialization
- ▶ Provisioning
- ▶ Return management
- ▶ Device configuration/activation at the point of sale
- ▶ Customization at the end of the supply chain
- ▶ Firmware downloads
- ▶ Counterfeit protection and authentication
- ▶ Sensor applications
- ▶ Electronic shelf labels

The innovative architecture of the NXP UCODE I²C includes two independent UHF front-ends, a large user memory, and an on-chip I²C interface.

The integrated I²C interface, which connects to a standard microcontroller, makes it possible to use the UCODE I²C for a wide range of applications, including wireless and powerless product configuration. In shelf-life applications, it can take into account the temperature, humidity, shock, and other sensor information, such as data logging.

Each UHF front-end can be enabled or disabled independently, via RF or I²C. Independent antennas let the IC support different read-range requirements, and can increase customer privacy because read ranges can be switched. The set-up also makes it easier to design omni-directional antennas.



The 3,328-bit user memory, accessible via RF or I²C, can be used for software downloads, product information, advanced product configuration management, and data storage. The memory offers 20-year data retention, 50,000 cycles of write endurance, and can be read and write protected.

With support for standard (100 kHz) and Fast-mode (400 kHz) operation, the I²C interface ensures quick data transfers. Firmware downloads and upgrades are easy to implement, since there's no need for galvanic connectors or adapters on the PCB. Contactless product configuration can take place later in the supply chain, even after the product is packaged. The SDA pin of the I²C port can be used as a digital switch. The RF ports and the I²C interface can be switched on or off, permanently or not, depending on privacy and security needs. The RF-to-I²C bridge feature provides an optimized bridge for data exchanged between the RF and I²C interfaces.

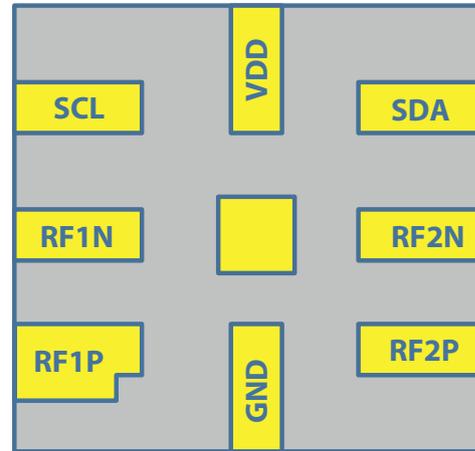
Advanced features for managing product configuration and theft deterrence increase security. For example, the device can be set to deactivate after a certain number of uses, and product functions can be managed by simply uploading the configuration. The device can be locked throughout the supply chain, and only be activated after purchase at the point-of-sale location.

The interrupt output, which can wake the system or signal the system microcontroller when new data is available, lowers system energy requirements. The interrupt signal can be used for different events, including new data in memory, new data available in bridge mode, or a preconfigured event for microcontroller wake-up. The microcontroller can stay in standby mode longer, and does not have to poll the EEPROM continuously for new data. The handshake used in bridge mode increases download speed.

Training and design tools

Technical training for the UCODE I²C is available from NXP's Customer Application Support (CAS) group. Also, to simplify development, the UCODE I²C is supported by several reference design notes available at www.nxp.com.

UCODE I²C in SOT902-3 – bottom view



Product delivery forms

Name	Features	Delivery form
SL3S4021FHK	Dual differential Front End	Plastic extremely thin quad flat SOT902-3 package; no leads; 8 terminals; body 1.6 x 1.6 x 0.5 mm
SL3S4011FHK	Single differential Front End	Plastic extremely thin quad flat SOT902-3 package; no leads; 8 terminals; body 1.6 x 1.6 x 0.5 mm



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