



SIC4310

228-Byte ISO14443A RFID/NFC Tag IC with
UART Interface
REV 1.2

Features Summary

Highlight Features

- Write/read through NFC smartphone/RFID NFC/RFID reader device
- Direct data transfer from RFID to UART or vice versa
- Operating from either RFID power or external DC
- 3.3-V On-chip regulator for power harvesting mode
- Up to 10 mA source to power external circuit (Depending on harvested power from RF)
- Compatible with NFC Forum Tag Type 2
- +/-2% 1.8432MHz on-chip factory-trimmed oscillator

Transmitter

- RF interface based on ISO14443A - 106 kbps
- UART interface speed from 9600 to 115200 bps
- UART interface with hand-shaking option
- 8 programmable GPIOs
- Activity indicator pins
 - RF detect
 - RF Busy
 - Reserve Power Ready

Memory

- 196 bytes user memory
- EEPROM organization enabling NDEF format
- EEPROM erase/write cycle up to 100,000 times
- EEPROM memory retention up to 10 years at 70°C
- 2 x 64-byte deep FIFO for UART data transfer – TX/RX

Operating Condition

- Operating temperature from -40 to 85°C

Package

- QFN3x3 - 16-Pin Package with Heat sink pad

Reference design/Evaluation kit

- Ready-to-use module
- Demonstration module
- Example Downloadable Android Applications
- Software / Sample firmware available

Applications

- Firmware upgrade via NFC
- NFC bridge for embedded systems
- Metering/vending machines
- Smart interactive poster
- Smart home appliances
- Customized/proprietary system RFID



Revision History

Revision	Date	Description	Change/Update/Comment
1.0	21 Feb 2014	1 st Release	• First Release
1.1	24 Feb 2022	Content Update	• Update document template • Add Ordering Information detail
1.2	26 Dec 2023	Content Update	• Update new product code



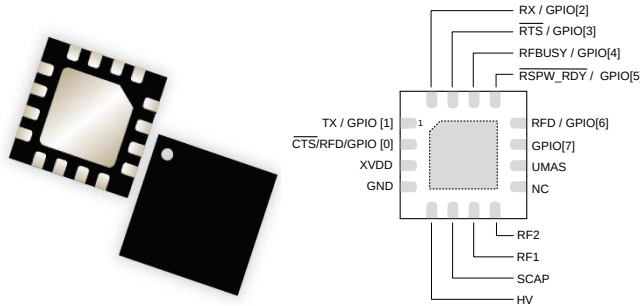
Ordering Information

Part No.	Description	Package
P10CVQK4P20UT1001T6	SIC4310-01, NFC-Forum Type-2 Tag IC with 228-bytes, UART Interface and 8 GPIOs QFN 0.85 mm, TnR, IC	QFN3x3-16 Pin

The information herein is for product information purpose. While the contents in this publication has been carefully checked; no responsibility, however, is assumed for inaccuracies. Silicon Craft Technology PLC. reserves the right to make changes to the products contained in this publication in order to improve design, performance or reliability.



General Description



16-Pin QFN3x3 Package

SIC4310 is a 228-byte NFC tag IC with UART interface. The SIC4310 consists of an RFID Analog-Front-End circuit supporting ISO14443A, an UART controller, an on-chip regulator, GPIOs, register page and 228-byte EEPROM.

The SIC4310 operates from RF energy from RFID/NFC and provides necessary features such as an on-chip regulator. The SIC4310 is intentionally designed to be a single chip for a minimized BOM NFC-tag-style application.

The SIC4310's analog front-end is designed to harvest energy from RF field efficiently up to 10mA. The on-chip regulator provides stable 3.3V to supply external load via pin XVDD such as sensor or MCU. The SIC4310 can operate in both passive mode as an ordinary RFID where power source is from RF and active mode as a peripheral device where power source is from a connected embedded system.

The EEPROM memory can be accessible and programmable from both wireless interface which is RFID/NFC, and wire interface which is UART. Apart from normal read/write EEPROM, RFID reader. NFC device can configure and control behavior of the SIC4310 via registers and transfers data through build-in UART toward UART connected end device, or vice versa, without wasting time in programming contents into EEPROM and then transferring. NFC applications can interact with the SIC4310 to create various applications for example sensor interface, battery-less interactive toy, smart poster.

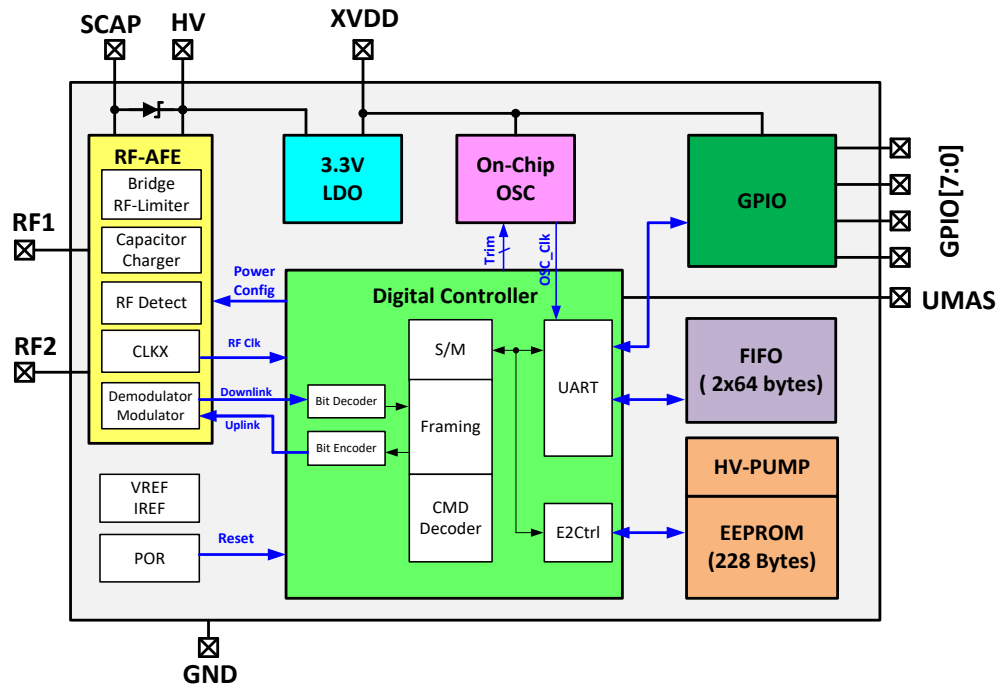
To serve the trend of internet of things, the SIC4310 provides a way to connect smart objects to internet via NFC phone.

The UART controller can be configured via control register to perform UART. The control register related to interface can be set from RF interface or reload from EEPROM during initialization. Two 64-byte FIFO buffers for wired transmission (TX of UART) and wired-reception (RX of UART) are provided for large block transfer to allow more free time for connected processors to perform other tasks. The UART interface provides connectivity to variety of devices like host-style devices such as MCU or UART-controlled slave device or PC via USB-to-UART converter. The UART signal can be converted to other communication standards such as RS-232, RS-485 via particular bridge devices. The UART speed can be configured to be from 9600 bps to 115.2 kbps. Then, by relying on display in mobile devices and communication through RFID/NFC, the SIC4310 offers the cheapest method to configure smart things wirelessly such as firmware upgrade or parameter update.

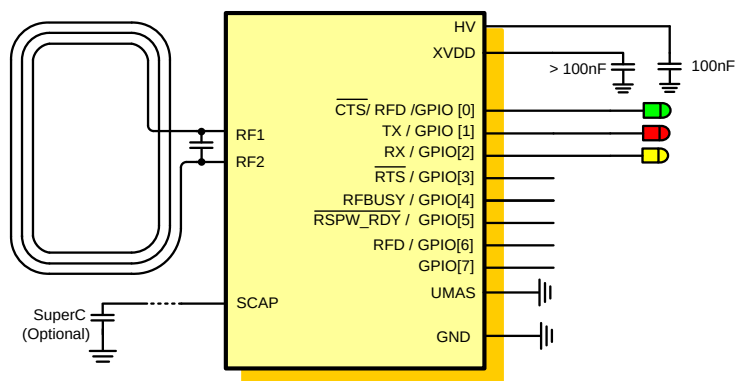
The SIC4310's input/output pins can be configured for user interactive indicator such as LEDs. 8 programmable GPIOs are provided. If power from source is enough, each I/O can drive up to 4 mA and regulator can source current up to 10 mA.

The SIC4310 is offered in a low-profile 16-pin QFN3x3.

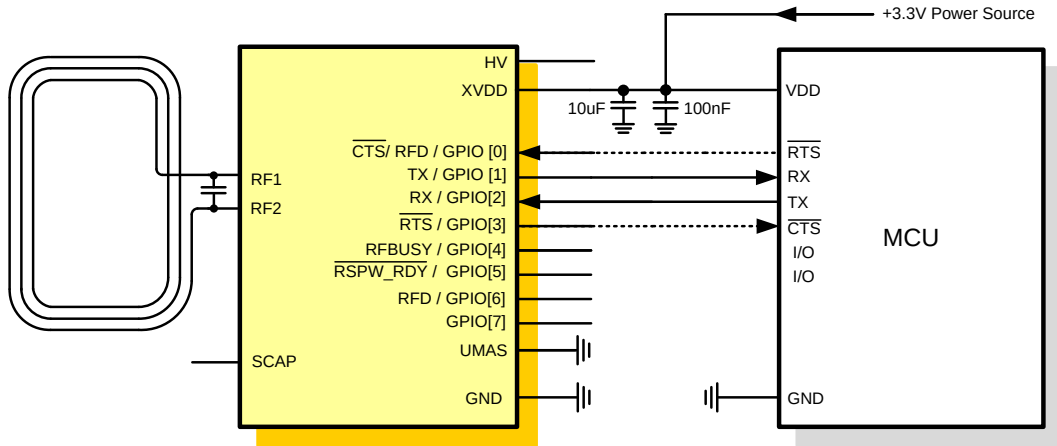




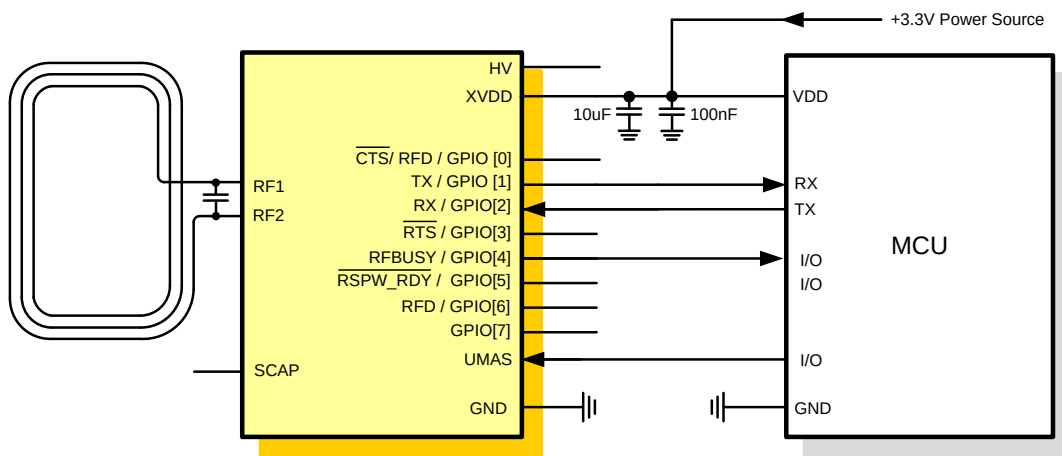
Functional Block Diagram



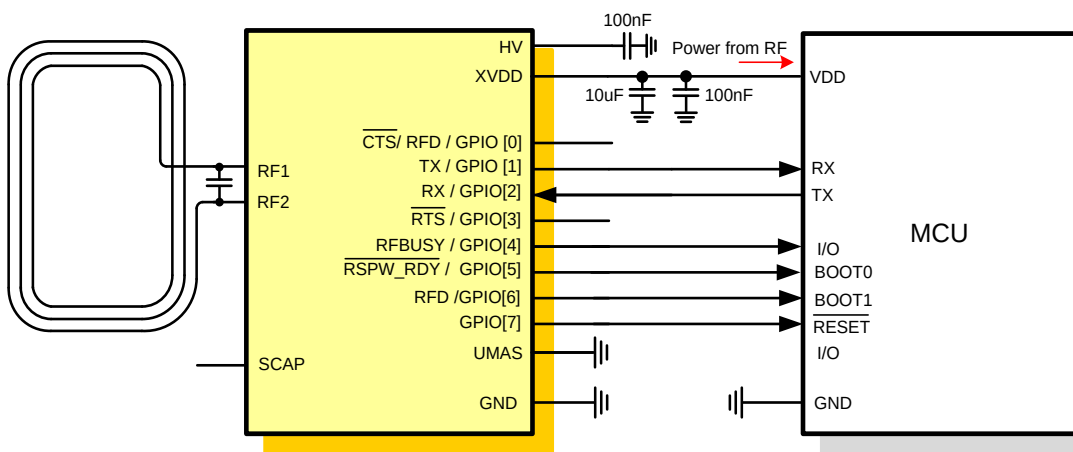
Basic configuration with LED indicator



Basic UART connection to MCU (handshake is optional)



UART connection to MCU with EEPROM accessibility (UMAS connection)



RF-powered configuration for firmware upgrade