NFC/RFID Transceiver

SPECIFICATION

1 FEATURES

- UMC CMOS 180 nm technology
- Supports ISO14443A* and ISO14443B standards in both reader and card emulation mode
- Supports NFC Initiator in both Active and Passive modes with speeds 212 and 424 Kbps
- Supports NFC Target in both Active and Passive modes with speeds 212 and 424 Kbps
- Supports ISO15693 standard in reader mode
- Supports high-speed transmissions up to 848 Kbps
- Sleep mode with ultra-low power consumption (<1 µA)
- Wake-up with programmable RF field level
- SPI interface for communications with master MCU
- Dual channel receiver architecture for elimination of "blind spots"
- Integrated voltage regulators for analog and digital parts and I/O

2 APPLICATIONS

- Mobile devices (tablets, handsets)
- Secure pairing (Bluetooth, Wi-Fi, other paired wireless networks)
- Public transport or event ticketing
- Passport or payment (POS) reader systems
- Short-range wireless communication tasks (firmware updates)
- Product identification or authentication
- Medical equipment or consumables
- Access control, digital door locks
- Sharing of electronic business cards

3 OVERVIEW

The NFC transceiver IC is intended for adding NFC functionality to mobile devices and other applications having embedded MCU. The device can perform in one of three modes: RFID/NFC reader, NFC Peer, or Card Emulation mode.

NT1045 is composed of an integrated RF front-end, SPI interface for communications with MCU, 128-byte FIFO for payload data, and RFID framing engine supporting ISO15693, ISO14443A*, ISO14443B and NFCIP standards.

Extension of standards set and implementation of custom RFID protocols can be achieved by using direct modes with MCU-controlled bit coding and framing. Direct access to RF Frontend control registers allows fine tuning of various parameters at physical layer.

* The costs of intellectual property licenses under applicable patents belonging to NXP Semiconductors are not included in this NTLab product. If you plan to use and/or enable the ISO/IEC 14443A protocol please contact NXP Semiconductors for the appropriate patent license via an inquiry to the following:

- NXP Semiconductors
- Intellectual Property & Licensing Department

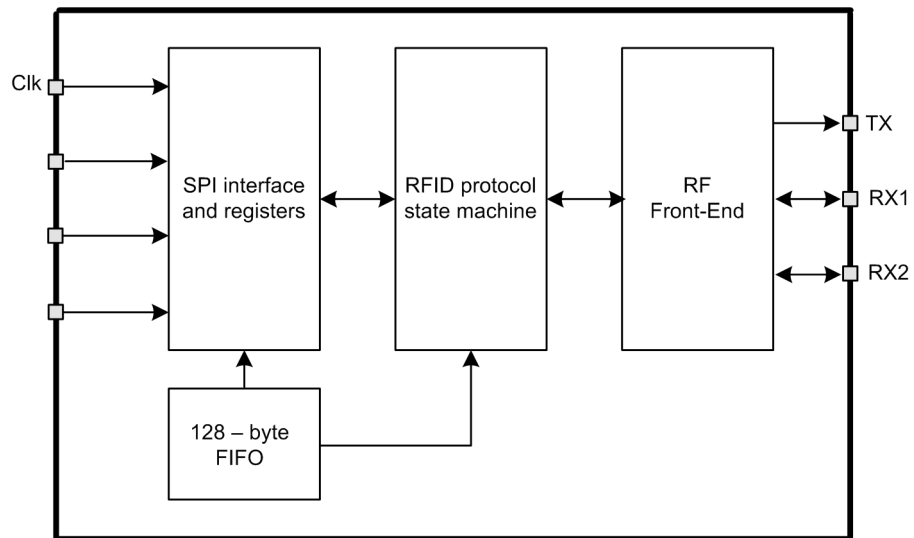Attn: Aaron Waxler (aaron.waxler@nxp.com)

4   STRUCTURE

Figure 1: NT1045 NFC transceiver IC structure.

5 PIN DESCRIPTION

Name	Direction	Description
V_in	IO	External supply
Vdd_a	O	Internal regulated supply for analog part
Vdd_io	O	Internal regulated supply for I/O
Vdd_rf	O	Internal supply for RF power amplifier
Vdd_pa	I	Supply input for power RF power amplifier
TX_OUT	O	RF power amplifier output
RX_IN1	I	Main RX input
RX_IN2	I	Auxiliary RX input
BAND_GAP	O	Internal analog voltage reference
IRQ	O	Interrupt request output
SS	I	Slave Select SPI input
DATA_CLK	I	SPI clock input
MOSI	I	SPI data input
MISO	O	SPI data output
RST	I	Reset input
PD	I	Power down input
OSC_OUT	O	Crystal or oscillator output
OSC_IN	I	Crystal or oscillator input
GND	IO	Ground

6 LAYOUT DESCRIPTION

The IC dimensions are given in the table 1.

Table 1: IC dimensions.

Dimension	Value	Unit
Height	1840	µm
Width	1440	µm
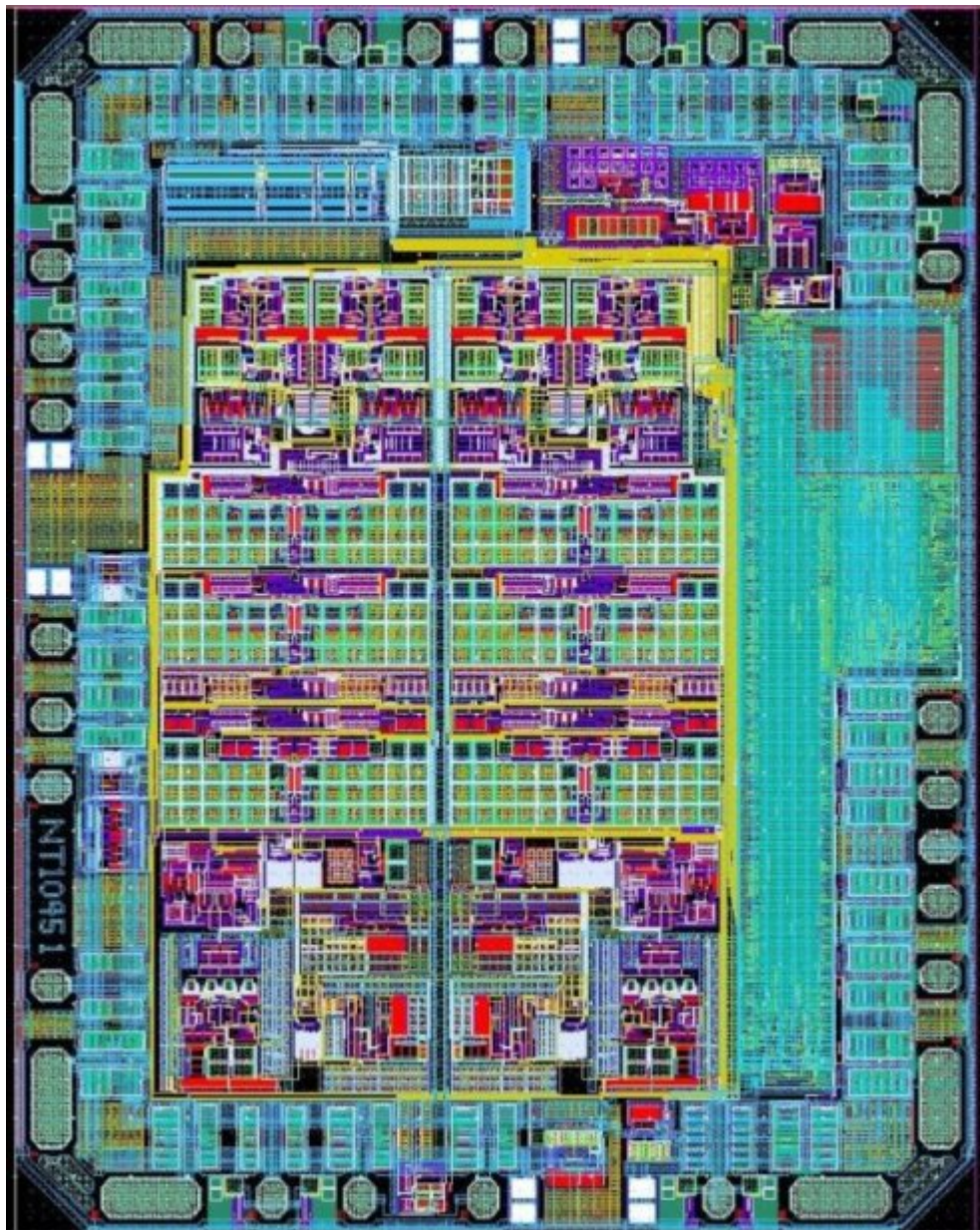
7 OPERATION CHARACTERISTICS

7.1 TECHNICAL CHARACTERISTICS

Technology _____UMC CMOS 180 nm
Status_____ silicon proven
Area_____2.65 mm^2

7.2 ELECTRICAL CHARACTERISTICS (OPERATING CONDITIONS)

Parameter	Symbol	Value			Unit
		min	typ	max	
Operating input voltage	V_{in}	2.7	3.3	3.6	V
Operating ambient temperature	T_a	-40	27	85	°C

8 DELIVERABLES

IP contents:

- Datasheet
- Layout View (GDSII)
- Evaluation kit based on packaged IC
- Characterization Report
- Behavioral Model
- SPICE netlist (.cdl)
- Integration Support

REVISION HISTORY

From version 1.2:
- Section 1 updated
- Section 2 updated

From version 1.1:
- Section 1 updated
- Section 2 updated