
NFC/RFID transceiver

SPECIFICATION

1 FEATURES

- UMC CMOS 180 nm technology
- Supports Near Field Communication standards NFCIP-1 and NFCIP-2
- Supports ISO14443A/B standards in both reader and card emulation mode
- Supports NFC Initiator in both Active and Passive modes with speeds 106, 212 and 424 Kbps
- Supports NFC Target in both Active and Passive modes with speeds 106, 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 ($<1 \mu\text{A}$)
- 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 utilizing 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.

4 STRUCTURE

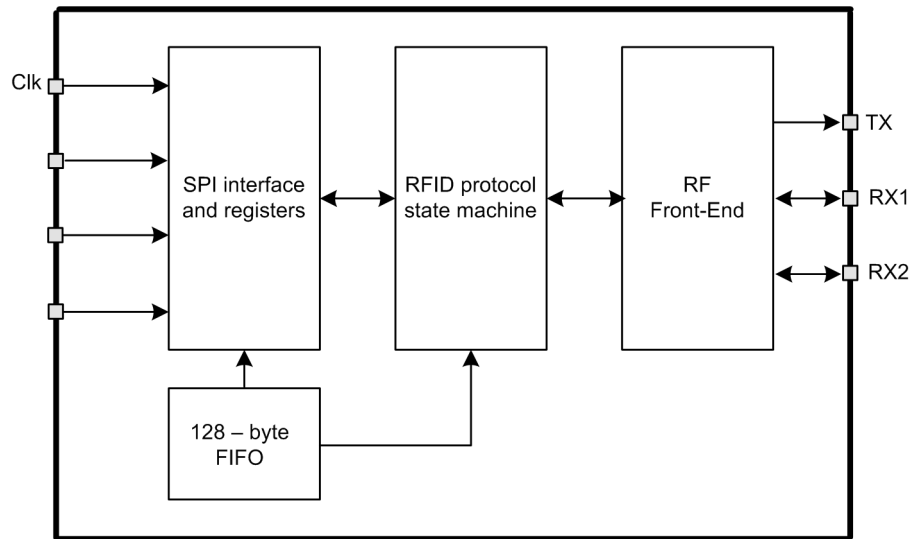


Figure 1: NT1045 NFC transceiver IC structure.

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

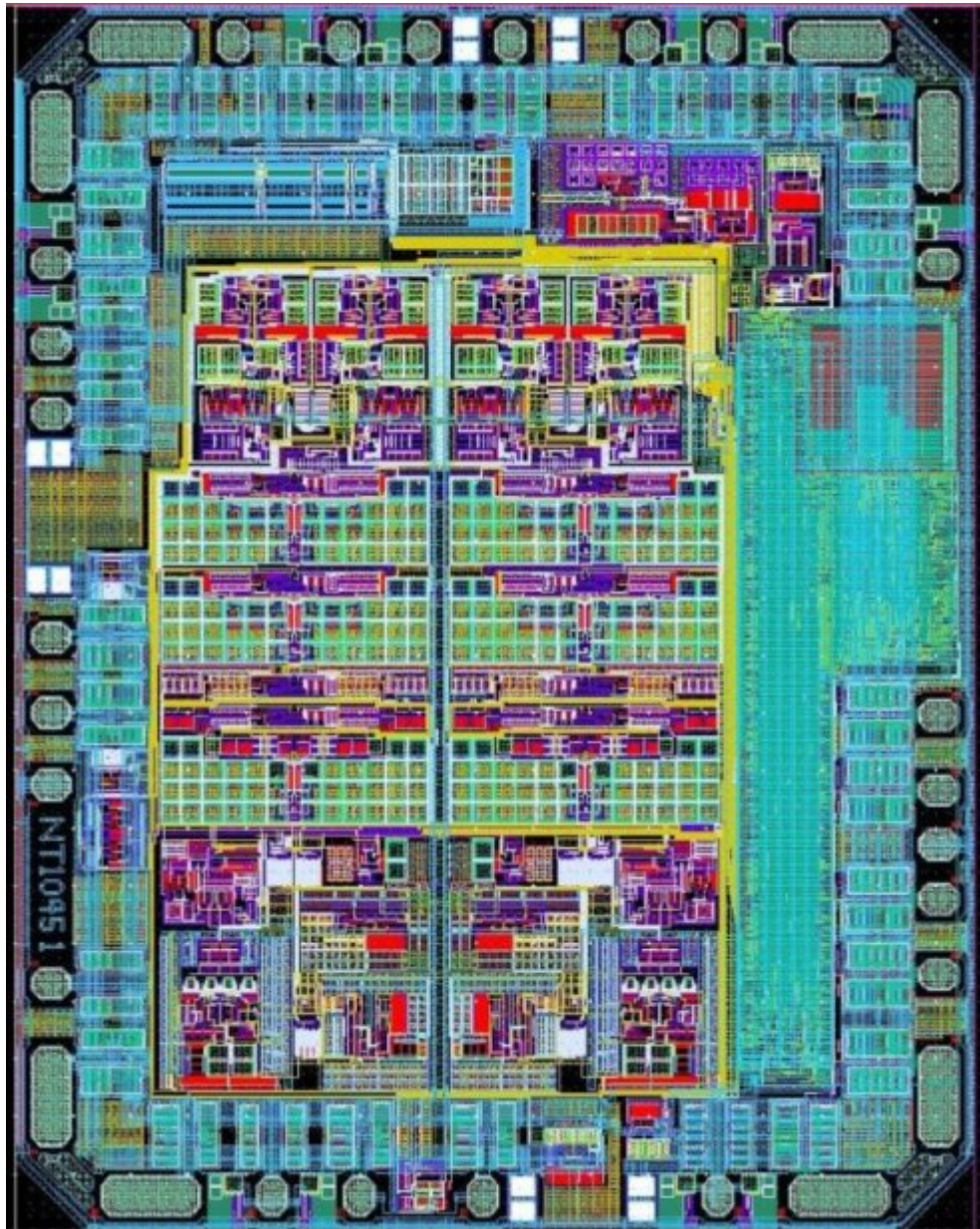


Figure 2: NT1045 NFC transceiver IC layout view.

7 OPERATION CHARACTERISTICS

7.1 TECHNICAL CHARACTERISTICS

Technology _____ UMC CMOS 180 nm
Status _____ pre-silicon verification
Area _____ 2.65 mm²

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