Passive / Active NFC IP

This 13.56 MHz NFC IP in generic low-cost 0.18 µm CMOS targets compatibility with ISO/IEC 14443 Type A at 106 to 424 kbit/s (compatible with NFC-equipped smartphone).

It covers a legacy passive mode, (battery-less) and an active mode, (battery-assisted), for longer range or poor antenna. In passive mode, the 1.5-2.0 V supply is harvested from the magnetic field to supply < 150 µA @106 kbit/s transceiver (plus MCU supporting protocol) < 10 mA for other functionalities.
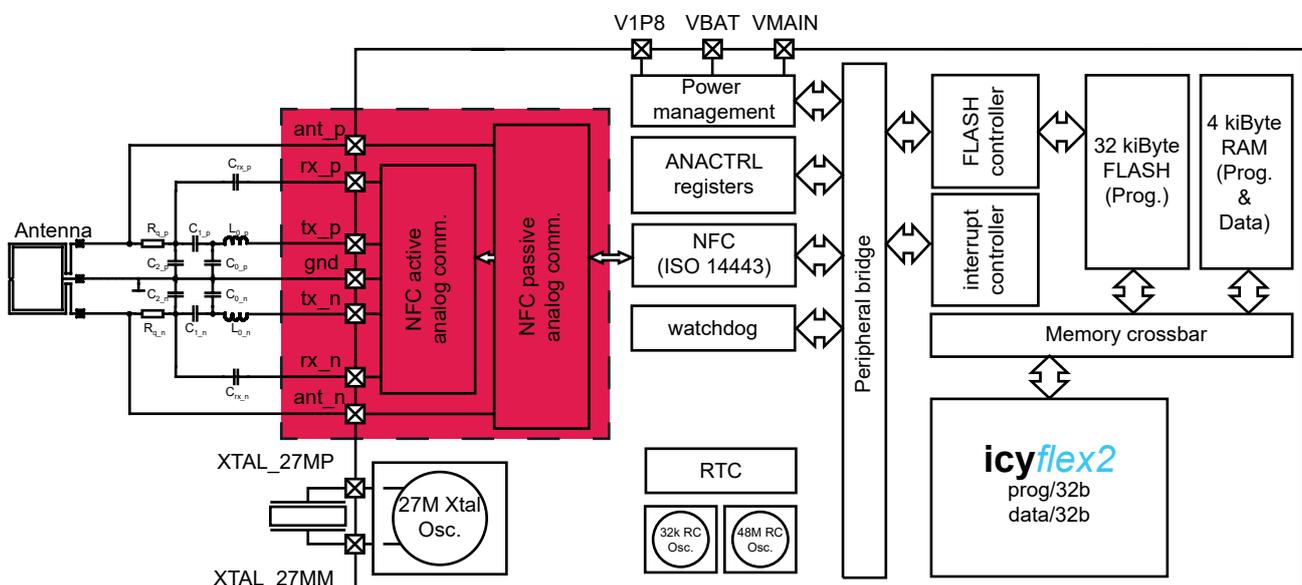
In active mode, the current consumption is 650 µA in reception and 10.5 mA typ. for 260 Ω antenna impedance in transmission. Antenna impedance is adjusted for each functionality with external serial capacitors for optimum matching to the coil. The IP can be shrinked by removal of either mode.

Features

- TSMC 180 nm 6 metals generic process without analog options (MiM, High-Voltage, etc.)
- Differential antenna interfaces with dedicated external capacitors for antenna impedance matching
- 27.56 MHz Xtal for active mode only
- Analog front-end area 0.35 mm^2
- -40 °C to +85 °C temperature range

Applications

- NFC sensor tag
- Bluetooth pairing
- Firmware updates

Example of integration in a system-on-chip

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