

NTAG213/215/216

NFC Forum Type 2 Tag compliant IC with 144/504/888 bytes user memory

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Product data sheet
COMPANY PUBLIC

1. General description

NTAG213, NTAG215 and NTAG216 have been developed by NXP Semiconductors as standard NFC tag ICs to be used in mass market applications such as retail, gaming and consumer electronics, in combination with NFC devices or NFC compliant Proximity Coupling Devices. NTAG213, NTAG215 and NTAG216 (from now on, generally called NTAG21x) are designed to fully comply to NFC Forum Type 2 Tag ([Ref. 2](#)) and ISO/IEC14443 Type A ([Ref. 1](#)) specifications.

Target applications include Out-of-Home and print media smart advertisement, SoLoMo applications, product authentication, NFC shelf labels, mobile companion tags.

Target use cases include Out-of-Home smart advertisement, product authentication, mobile companion tags, Bluetooth or Wi-Fi pairing, electronic shelf labels and business cards. NTAG21x memory can also be segmented to implement multiple applications at the same time.

Thanks to the high input capacitance, NTAG21x tag ICs are particularly tailored for applications requiring small footprints, without compromise on performance. Small NFC tags can be more easily embedded into e.g. product labels or electronic devices.

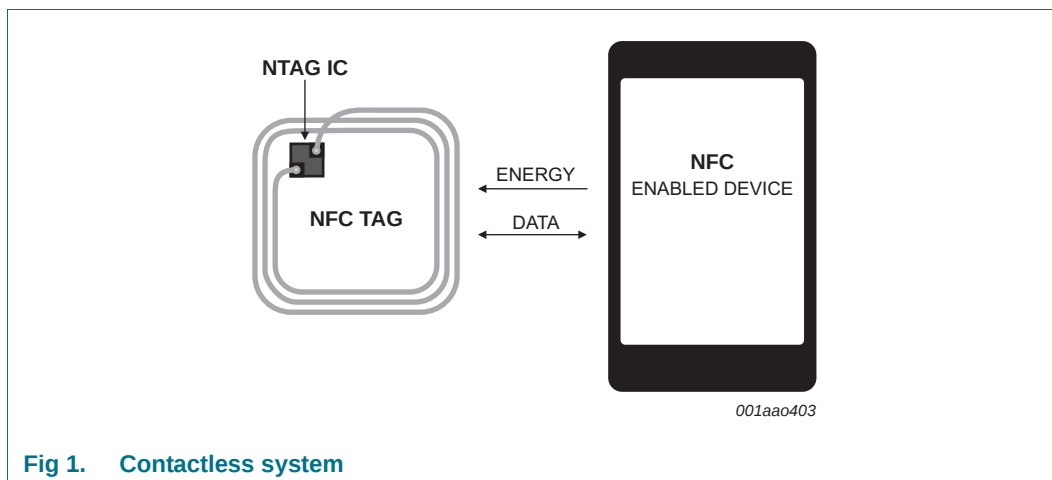
The mechanical and electrical specifications of NTAG21x are tailored to meet the requirements of inlay and tag manufacturers.

1.1 Contactless energy and data transfer

Communication to NTAG21x can be established only when the IC is connected to an antenna. Form and specification of the coil is out of scope of this document.

When NTAG21x is positioned in the RF field, the high speed RF communication interface allows the transmission of the data with a baud rate of 106 kbit/s.





1.2 Simple deployment and user convenience

NTAG21x offers specific features designed to improve integration and user convenience:

- The fast read capability allows to scan the complete NDEF message with only one FAST_READ command, thus reducing the overhead in high throughput production environments
- The improved RF performance allows for more flexibility in the choice of shape, dimension and materials
- The option for 75 μm IC thickness enables the manufacturing of ultrathin tags, for a more convenient integration in e.g. magazines or gaming cards.

1.3 Security

- Manufacturer programmed 7-byte UID for each device
- Pre-programmed Capability container with one time programmable bits
- Field programmable read-only locking function
- ECC based originality signature
- 32-bit password protection to prevent unauthorized memory operations

1.4 NFC Forum Tag 2 Type compliance

NTAG21x IC provides full compliance to the NFC Forum Tag 2 Type technical specification (see [Ref. 2](#)) and enables NDEF data structure configurations (see [Ref. 3](#)).

1.5 Anticollision

An intelligent anticollision function allows to operate more than one tag in the field simultaneously. The anticollision algorithm selects each tag individually and ensures that the execution of a transaction with a selected tag is performed correctly without interference from another tag in the field.

2. Features and benefits

- Contactless transmission of data and supply energy
- Operating frequency of 13.56 MHz
- Data transfer of 106 kbit/s
- Data integrity of 16-bit CRC, parity, bit coding, bit counting
- Operating distance up to 100 mm (depending on various parameters as e.g. field strength and antenna geometry)
- 7-byte serial number (cascade level 2 according to ISO/IEC 14443-3)
- UID ASCII mirror for automatic serialization of NDEF messages
- Automatic NFC counter triggered at read command
- NFC counter ASCII mirror for automatic adding the NFC counter value to the NDEF message
- ECC based originality signature
- Fast read command
- True anticollision
- 50 pF input capacitance

2.1 EEPROM

- 180, 540 or 924 bytes organized in 45, 135 or 231 pages with 4 bytes per page
- 144, 504 or 888 bytes freely available user Read/Write area (36, 126 or 222 pages)
- 4 bytes initialized capability container with one time programmable access bits
- Field programmable read-only locking function per page for the first 16 pages
- Field programmable read-only locking function above the first 16 pages per double page for NTAG213 or per 16 pages for NTAG215 and NTAG216
- Configurable password protection with optional limit of unsuccessful attempts
- Anti-tearing support for capability container (CC) and lock bits
- ECC supported originality check
- Data retention time of 10 years
- Write endurance 100.000 cycles

3. Applications

- Smart advertisement
- Goods and device authentication
- Call request
- SMS
- Call to action
- Voucher and coupons
- Bluetooth or Wi-Fi pairing
- Connection handover
- Product authentication
- Mobile companion tags
- Electronic shelf labels
- Business cards