



NTAG I<sup>2</sup>C *plus*  
connected NFC tag  
solution by NXP

## Your entryway to NFC: The simplest, most cost-effective NFC solution

Designed to be the perfect enabler for NFC in home-automation and consumer applications, this feature-packed, next-generation connected NFC tag is the fastest, most BoM optimized way to add tap-and-go connectivity to just about any electronic device.

### KEY FEATURES

- ▶ Interoperability
  - NFC interface ISO/IEC 14443A Part 2&3 compliant
  - NFC Forum Type 2 Tag compliant
  - Input capacitance of 50 pF
  - Unique 7-byte serial number
  - GET VERSION command for easy identification of chip type and supported features
- ▶ I<sup>2</sup>C interface
  - Standard (100 kHz) and fast (400 kHz) modes
- ▶ Memory
  - 888/1912 bytes of EEPROM-based user memory
  - Clear arbitration between NFC and I<sup>2</sup>C memory access
- ▶ Data transfer
  - Pass-through mode with 64-byte SRAM buffer
  - FAST READ and FAST WRITE commands for higher data throughput
- ▶ Security and memory-access management
  - Full, read-only, or no memory access from NFC interface, based on 32-bit password protection
  - Full, read-only, or no memory access from I<sup>2</sup>C interface
  - Originality signature based on Elliptic Curve Cryptography (ECC) for simple, genuine authentication
  - NFC silence to disable the NFC interface

### ▶ Power management

- Configurable field-detection output signal for data-transfer synchronization and device wake-up
- Energy harvesting from NFC field, so as to power external devices (e.g. connected microcontroller)

### KEY BENEFITS

- ▶ Full interoperability with every NFC-enabled device
- ▶ Smooth end-user experience with super-fast data exchange via NFC and I<sup>2</sup>C interface
- ▶ Zero-power operation with non-volatile data storage
- ▶ Lowest bill of materials and smallest footprint for NFC solution in embedded electronics
- ▶ Data protection to prevent unauthorized data manipulation
- ▶ Multi-application support, enabled by memory size and segmentation options



## APPLICATIONS

- ▶ IoT nodes (home automation, smart home, etc.)
- ▶ Pairing and configuration in consumer applications
- ▶ NFC accessories (headsets, speakers, etc.)
- ▶ Wearable infotainment
- ▶ Fitness equipment
- ▶ Consumer electronics
- ▶ Healthcare
- ▶ Smart printers
- ▶ Meters
- ▶ Electronic shelf labels

NXP NTAG I<sup>2</sup>C *plus* is a family of connected NFC tags that combine a passive NFC interface with a contact I<sup>2</sup>C interface. As the second generation of NXP's industry-leading connected-tag technology, these devices maintain full backward compatibility with first-generation NTAG I<sup>2</sup>C products, while adding new, advanced features for password protection, full memory-access configuration from both interfaces, and an originality signature for protection against cloning.

The second-generation technology provides four times higher pass-through performance, along with energy harvesting capabilities, yet NTAG I<sup>2</sup>C *plus* devices are optimized for use in entry-level NFC applications and offer the lowest BoM of any NFC solution.

## DONE IN AN INSTANT

I<sup>2</sup>C and NFC communications are based on simple, standard command sets, and are augmented by the demo board OM5569/NT322E, which includes online reference source code. All that's required is a simple antenna design, with no or only limited extra components, and there are plenty of reference designs online for inspiration. The very small footprint (as low as 1.6 x 1.6 x 0.5 mm) shrinks PCB space and enables very compact designs.

## ZERO POWER BUDGET

NFC tags are passive by default, meaning they can be powered by another device, to save battery power. Energy harvesting even lets the tag power an external device, such as an MCU. The field-detection mechanism enables device wake-up as soon as an NFC field is detected, for longer battery life. Data storage can be done offline, via non-volatile memory, from the NFC or I<sup>2</sup>C interface. Also, since the NFC interface

complies with NFC Forum guidelines, the tag can interact with a full range of NFC-enabled devices.

## BEST USER EXPERIENCE

The integrated SRAM buffer offers faster data transfer than a standard EEPROM, and is a convenient mechanism for managing I<sup>2</sup>C/NFC communication handoffs while keeping both interfaces active. Fast data transfer is guaranteed by the pass-through mode, which works with the FAST READ and FAST WRITE commands to push data in one shot, and thereby limiting command overhead. The high data-transfer rates, along with reliable multi-interface communication, create smoother end-user interactions.

## SECURE DATA, CONTROLLED INTERACTIONS

Every type of memory access, including the SRAM buffer, can be fully configured for both interfaces. For NFC, a 32-bit password segments the memory into open and restricted access, to secure data according to specified access rights. For I<sup>2</sup>C, access can be restricted to ensure proper data exchange between embedded electronics and the NFC device. Anti-cloning protection is supplied by an authentication mechanism based on a 32-byte, ECC-based signature that uses a standard algorithm. The result is easy software integration of the originality check procedure, without the need for specific hardware requirements.

Feature	NTAG I <sup>2</sup> C 1k <i>plus</i>	NTAG I <sup>2</sup> C 2k <i>plus</i>
<b>Memory</b>		
User memory size [bytes]	888	1.912
Write endurance [cycles]	500	
Data retention [years]	20	
Operating temperature [°C]	-40 to +105	
Storage temperature [°C]	-55 to +125	
<b>NFC interface</b>		
ISO/IEC compliance	ISO 14443 A Part 2&3	
NFC Forum compliance	Type 2 Tag	
Baudrate [kbits/s]	106	
Resonance capacitance [pF]	50	
<b>I<sup>2</sup>C interface</b>		
Speed [kbit/s]	100/400	
Supply [V]	1.67 to 3.6	
<b>Security</b>		
Unique serial number [bytes]	7	
Access conditions	Lock bits / 32-bit password	
<b>Special features</b>		
64-byte SRAM buffer	Yes	
FAST WRITE	Yes	
FAST READ	Yes	
ECC-based originality signature	Yes	
Configurable field detection	Yes	
Wake-up signal for data-transfer synchronization	Yes	
Energy harvesting	Yes	
<b>Delivery form</b>		
Packages	XQFN8 / TSSOP8 / SO8	
Wafer	Bumped, 8 inch, 150µm, on film frame carrier	

[www.nxp.com](http://www.nxp.com)

© 2015 NXP Semiconductors N.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: December 2015

Document order number: 9397 750 17701

Printed in the Netherlands

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А