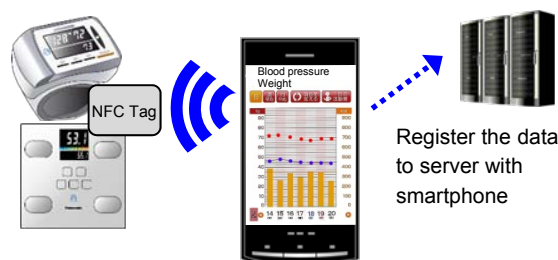


●Applications of NFC Tag

- By touching mobile phone with NFC tag, possible to communicate each other
- By embedding NFC tag LSI, an apparatus can be connected to the internet via mobile phone



- Easy pairing of Bluetooth or Wi-Fi devices with just one touch



Hand Over: By touching with smart phone, enable to connect with Wi-Fi or Bluetooth, and transfer large data from smart phone at high speed

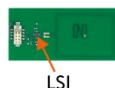
- As NFC tag communicate with no battery, it can be applied various usages i.e. the smart poster



●Evaluation board

- Evaluation boards implementing NFC tag LSI, antenna, and the interface connector to MCU are provided.

MN63Y1208
Evaluation board with the antenna



MN63Y1210A
Evaluation board with the antenna



MN63Y1212/13
Evaluation board with the antenna



MN101EF63G
MCU board

- An MCU board that can be connected to the NFC tag evaluation board is provided.

●NFC Tag Module

- We provide the NFC Tag Module embedded with NFC Tag LSI, antenna and peripheral parts. You can build an RF system by putting the NFC Tag Module on an apparatus.



*1 The part number is subject to change without notice since it is under development.

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•Bluetooth is a registered trademark of the Bluetooth SIG, Inc.
•FeliCa is a trademark of Sony Corporation.
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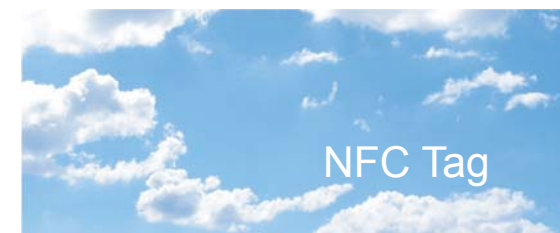
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Panasonic

NFC Tag LSIs



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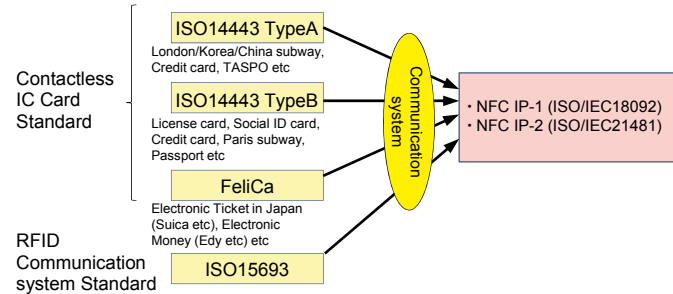
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www.semicon.panasonic.co.jp/en

What's NFC

Apply RFID technology (Contactless IC Card / RF tag) to Near Field Communication

- Communication Distance: 10cm or less
- Communication Speed: 106/ 212 /424 kbps
- Carrier Frequency : 13.56 MHz
NFC supports short distance and low speed, so the communication is established with by holding near, by touching or by tapping.



NFC is the standard of transport layer, so upper layer to execute application of each IC card such as Credit card, Electronic Ticket is defined individually. It is need to prepare the devices (SE : Secure Element) additionally to execute applications.

Specification Overview

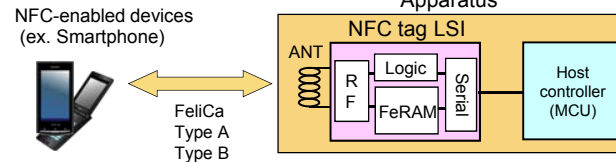
| Type | | ICs | | | | | | Modules | | | |
|---|----------------------|---|----------------------------------|--------------------------|----------------------------------|--|----------------|---|------------------------------------|-------------------------|----------------------------------|
| Parts No | | MN63Y1210A | MN63Y1208 | MN63Y1212 | MN63Y1213 | MN63Y1214 | MN63Y1217 | MN63Y3208N1 | MN63Y3212N1 | MN63Y3212 ^{*1} | MN63Y3213N1 |
| Operation Voltage | | 1.8V to 3.6V or 4.5V to 5.5V | 1.7V to 3.6V | — | 1.7V to 3.6V | | | 3.3V ± 5% | — *ON using IRQ, connect VSS | — | 1.7V to 3.6V ^{*1} |
| Operating temperature | | -20 to 85°C | | | | | | TBD | | | |
| Storage Temperature | | -40 to 85°C | | | | | | TBD | | | |
| FeRAM (Non-volatile Memory) | | Total Storage : 4K bit, User Data Area (432 Byte) | | | | Total Storage : 8K bit, User Data Area (960 Byte) | | Total Storage : 4K bit, User Data Area (432 Byte) | | | |
| | | Endurance : 100 000 000 times, Data Retention : 10 years | | | | | | | | | |
| RF Interface (Automatic protocol detection) | Type-A ^{*2} | | | | | ✓ | ✓ | | | | |
| | Type-B ^{*3} | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Type-F ^{*4} | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| NFC Forum Tag | | Type3 | Type4B, Type3 | | | Type4A, Type4B, Type3 | Type4A, Type4B | Type4B, Type3 | | | |
| Power by field | | Available | | | | | | | | | |
| Security Function | | N/A | AES128 Encryption | | | Password Protection | | AES128 Encryption | | | |
| Serial Interface | | UART (to 38.4kbps), Synchronized serial (to 1Mbps) | I ² C (to 100kbps) | N/A (only IRQ) | I ² C (to 100kbps) | I ² C (to 400kbps) | | I ² C (to 100kbps) | N/A (only IRQ) | N/A | I ² C (to 100kbps) |
| Power consumption on RF Communication | | to 1mW | | — | to 1mW | | | TBD | - | | TBD |
| Operating Current | | to 500uA | | — | to 500uA | | | TBD | - | | TBD |
| Package Type | | SSOP 16pin 5.0×6.4×1.3mm | QFN 16pin 3.2×4.2×0.77mm | SON (8pin) 2×2×0.45mm | | | | - | - | - | - |
| Module Size | | — | — | — | — | — | — | 40 × 30 mm | 11.5 × 25 mm | Φ 30mm | 9 × 30 mm |

*1: The specifications are subject to change without notice since it is under development. *2: ISO/IEC14443 TypeA [106kbps]
*3: ISO/IEC14443 TypeB [106kbps, 212kbps, 424kbps (MN63Y1214/1217)] *4: JIS X 6319-4 FeliCa [212kbps, 424kbps]

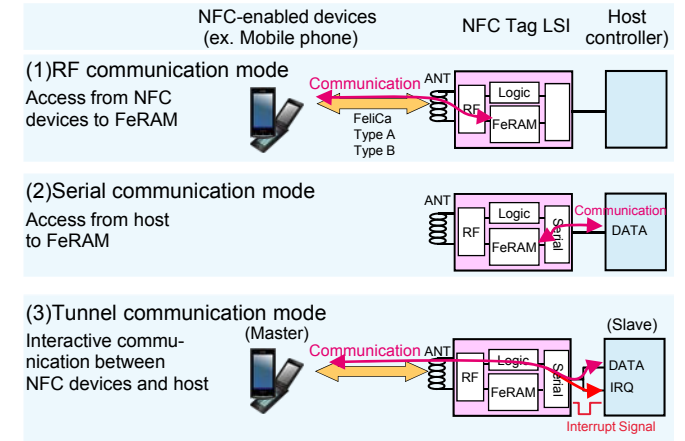
NFC Tag LSIs

Features

- Panasonic NFC Tag LSIs achieve high reliability data communication, because the LSIs use FRAM (Ferroelectric RAM) which has the features of high-speed writing, low-power consumption and high endurance.
- RF interface compliant with JISX6319-4 (FeliCa), ISO/IEC14443 Type B and ISO/IEC14443 Type A of the 13.56-MHz contactless IC. It enables stable communication with NFC terminals of the world.
- The NFC Tags can be mounted anywhere, because battery-off mode (powered by field) enables battery-less RF communication. You can check the information in NFC Tag of the Equipment also in the case of failure.
- Three communication modes of RF, serial, and tunnel mode are available. Tunnel mode, one of the features of our NFC Tag LSIs, allows communications between reader/writer and host MCU via the LSIs. It enables transfer large data exceeds FeRAM capacity to MCUs directly.



3 mode of Basic Functions



Handover Function

Only by touching with mobile phone, establish pairing with apparatus having high-speed radio connection like as Wi-Fi, Bluetooth

