

muRata SPEAKS

TECHNOLOGY | SOLUTIONS | INNOVATIONS

Questions & Answers



1 What can Murata offer for NFC RFID solution?

Murata offers the micro size RFID tag which can be embedded inside products. It is suitable for product traceability. Murata is not just another component (tag) supplier. We put emphasis on trying to resolve customer's concerns, focussing at application level, which include other parameters such as RFID reader/ writer antenna, RFID performance, etc.

2 What is the key difference between RFID and NFC?

RFID refers to Radio Frequency Identification. It covers a much wider operating frequency range than NFC. Typically, RFID works at LF, HF and UHF three bands. RFID system has a RFID transponder, RFID Tag and the backend, typically. (Note: a RFID tag could also be an active tag which means it could emit radio signal with build-in power.) NFC refers to Near Field Communication. The frequency range is fixed at 13.56MHz or HF band. It allows two devices to communicate with each other in peer-to-peer mode at proximity range based on ISO1444A and Felica protocol when NFC invented.

From operating frequency perspective, NFC is a subset of RFID. From operating mode, NFC has a wider coverage in reader/writer, P2P and card emulation mode. NFC tag is defined by NFC forum at data structure level to unify the data format, record type. They could be considered as kind of RFID tag working at 13.56MHz.

3 How do we achieve the maximum detection range on a RFID?

RFID performance will be affected by various factor. It depends on the RFID antenna size / RFID reader power output/ material of the object the tag will be attached to surrounding environment, the method of attachment is also one of the determining factors. However, we can recommend and advise the most appropriate method to increase the detection range.

4 QR code information could be easily extracted from a Smartphone, is it an alternative or a replacement of NFC tag?

The main advantage of QRcode is to share information at almost no hardware cost. When the data is static and made for public, for instance, an advertisement weblink, QRcode on a printed or flat panel display maybe a good choice. On the other hand, NFC tag could bring more information to the advertiser by leveraging the build-in counter. How many people have tapped this NFC tag in a particular place could be known by the advertiser easily.

Different from a transparent QR image which should be scanned under certain luminance condition, NFC tag could have many other features in password protection, AES authentication for data protection. For some use cases, "Tap-n-Go" could provide a much efficient and better experience. For example, a security guard could tap a NFC tag on his night shift duty at a dim place using his smartphone to send a record for patrol route. For electronics application like sharing data through a connected NFC tag, triggering a blue-tooth pairing, NFC tag IC would bring a much better value.

5 Which frequency band should we use to operate the RFID system - UHF (ultra-high frequency) or HF (high frequency)?

UHF frequency's range is 860 to 960MHz while HF frequency's range is 13.56MHz. Both communications are targeted at different end applications. UHF band is suitable for applications that require the communication distance of several meters to read multiple sets of data simultaneously. HF band is suitable for applications in a closer proximity area, such as those in which persons and items are validated on 1-to-1.

6 How can I compare NFC/RFID product versus a contactless Smartcard?

A contactless smartcard has a highly secure micro-processor and operating system for secure applications. Although it operates 13.56MHz, the information exchanged between the PCD and PICC are confidential for a dedicated secure application, such like ePassport, EMV Payment card, secure Access card or a store-value transit card. NFC and RFID tag at 13.56MHz are mainly for fast access of data/information. Although there is some security mechanism introduced in NFC/RFID tag, the main purpose is protecting the integrity and originality of the data. Password or AES authentication are mainly for administrative control purpose or prevention of counterfeit or manipulation of tag data.

7 How could I select NFC or RFID technology for my contactless identification application?

Nowadays, most advanced smartphone has built-in NFC function. NFC application could be developed on mobile phone to read/write an NFC tag, or even communicate with an embedded circuit via a connected NFC tag. It is convenient and cost saving in comparison to a dedicated RFID reader which has to be developed or deployed. For some applications or product requiring a built-in reader to authenticate or access a RFID tag automatically, both RFID system or NFC reader/tag could be considered. A few factors to be considered in operating range (NFC has the shortest range in comparison), material/ substance influence (for instance, LF is better for animal tagging), data length, cost and form factor, etc. RFID reader, especially higher power at industrial level, is more expensive than a NFC reader. RFID system is more suitable for logistic control, fixed or more dedicated reader infrastructure.

8 What is the lifespan of a RFID tag?

Re-write endurance = 100000 cycles; Read endurance = no data (minimum 10 years, 20 years for some UCODE and 50 years for ICODE and some UCODE products)
The maximum number of writes is specified. Within the data retention time, you can read regardless of the number of times. The data retention time is dependent on the temperature.

9 Can NFC technology be used in the field of maintenance for public use devices?

NFC technology can be used in maintenance management. End users can access information by simply getting close to the equipment with their smartphones or tablets. Besides, NFC also enable issues reporting using the NFC tag. In short, maintenance teams can identify the equipment on the field and follow the planned maintenance operation for each asset in real time by scanning the equipment attached with NFC tag.