

muRata SPEAKS

TECHNOLOGY | SOLUTIONS | INNOVATIONS

Questions & Answers



1 What is the lifespan of RFID tag?

Re-write endurance = 100000 cycles / read endurance = no data (50 years)

The maximum number of writes is specified, but the number of reads is not. Within the data retention time, you can read regardless of the number of times. The data retention time is temperature dependent.

2 Since Murata only supply RFID tag, can Murata recommend a RFID reader that best matches our requirement?

Yes, we have partnership with some of the RFID integrators. Alternatively, we can also help to recommend the suitable RFID reader to match your application needs.

Murata tag can be detected by using handheld/fixed /IC reader which is compliance to the RFID standard. For instance, UHF reader needs ISO18000-63 / EPC Global Gen2v2 compliance while HF reader requires ISO15693/ISO14443 compliance.

3 How does your RFID store data?

The RFID tag consists of EPC (electronic product code) memory - your first writable memory bank and most of them exist in 128bit/96 bit. If the user requires more memory to store his/her data, the memory will occupy the secondary writable place in the RFID tag. Additionally, RFID does have TID (Tag identification) memory which is used only to store a unique identification number assigned by the manufacturer who produced the tag. This part of the memory cannot be changed.

4 How do we define the flexibility of Murata RFID for the various applications?

Murata RFID tag is integrated with the RFID tag antenna, so it can be directly attached on any product regardless of metal/non-metal material. It can be easily detected by using the RFID reader.

5 What is the flow of RFID communication and system architecture?

The RFID reader/writer will retrieve the unique ID of the tag and other information that is written into the RFID tag and process the information at the user's backhaul system.

- Reader/writer transmits radio waves
- The antenna inside the IC tag receives radio waves from the reader/writer
- Electric current flows through the IC, converting the data in the chip into signals
- Signals are transmitted from the antenna which is electrode-printed on the IC tag
- The antenna in the reader/writer receives signals returned from the IC tag
- Data is processed by PC via the reader/writer controller

6 Which frequency band should we select 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 of the communication are targeted at different end application.

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.

7 Why Murata RFID tag is robust compared to others?

Murata makes use of LTCC technology which stand for "low temperature co-fire ceramic" to develop the internal matching circuit and RF antenna, enabling us to make the smallest size of RFID tag. The tag is covered by resin to protect the chip, making it more durable in comparison to the others.

8 Is Murata tag medical certified?

No, it is not. However, we can make use of medical certified resin to cover the RFID tag. We have several medical related success use cases that have been implemented with such method.

9 How to achieve the maximum detection range?

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.

10 What is the attachment method for PCB tags?

PCB tag can go through the surface mounting technology and be placed directly on the PCB. When products are immersed in solvent after mounting, we need to maintain the temperature difference within 100°C. The tag also able to withstand up to 260°C of the reflow/ assembly process. The characteristics of the products may vary - depending on the pattern drawing method, grounding method, land dimensions, PCB material, and thickness. If you are interested in Murata's PCB tag, please contact us.

11 Is there any recommended antenna size for the reader-writer?

It depends on the distance and the surrounding environment when doing detection of RFID.

We have several recommended UHF antenna size for the reader writer:

- Standard loop antenna (LXRF-036) → φ 15 (stable reading)
- Ultra small loop antenna → 5 x 3.5 (possible for on-metal application reading)
- Large loop Antenna → φ 50/φ 70 (simultaneous reading of multiple tags within antenna range)

HF antenna is different. The dimension of the HF antenna size for the reader is roughly 5mm x 5mm to 50mm x 50mm. If the antenna size is bigger, sensitivity towards the surrounding increases, resulting in the reading of unwanted tags. Hence, we would suggest you to speak to us before your implementation. We will be able to provide you with some design guidelines base on your specific use case.

12 Will Zigbee and LoRa have the same effect as the RFID technology?

Zigbee vs RFID:

RFID technology is different with Zigbee and LoRa. ZigBee requires line-of-sight and It is used for low-rate data applications which require a long battery life. Its data transmission range is limited to 10-100 meters. It is most suitable for equipment that requires low-rate wireless data transfer.

LoRa vs RFID:

LoRa is designed to enable battery-powered devices to operate with a long read range of 2 to 3 kilometers (1.24 to 1.86 miles).

Low-power wide-area network (LoRaWAN) devices have very slow data-transfer rate but it is useful for transmitting sensor data. Some of the known use cases for LoRa are smart cities, smart homes and buildings, smart agriculture, etc.

The frequencies used by LoRaWAN systems will not interfere with the UHF RFID as they differ by region and country, with pre-defined standards in dedicated frequency bands.

On the other hand, the passive RFID does not require battery to operate, making it easier to maintain and manage. It is mainly used for tracking objects in the assembly line, product tracking, brand protection, after-sale maintenance, etc.

13 How about the power supply for RFID tag?

Murata RFID is a passive RFID tag, hence it does not have any power of its own. It is powered by the radio frequency energy transmitted from the RFID readers/ antennas. The signal sent by the reader and antenna is used to power on the tag and reflect the energy back to the reader.