

NEAR FIELD COMMUNICATION(NFC) TECHNOLOGY

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Human communication has changed throughout history. Most methods of communication now use electromagnetic waves to carry information. One invention that revolutionized communication between devices was Near Field Communication (NFC), which uses a type of short-range radio wave. The work given offers a fundamental comprehension of the functioning of NFS technology. It also describes the differences in active and passive devices that participate in the data transfer process.

In 2004, Nokia, Sony, and Philips partnered to create a standard for Near Field Communication (NFC) technology. NFC works on the principle of near-field magnetic communication. This principle is based on inductive coupling, which is used in all communications between transmitting and receiving devices that rely on near-field magnetism. Figure 1 illustrates the simplified concept of inductive coupling. When a primary coil generates an alternating magnetic field, a secondary coil placed in the vicinity of the primary coil becomes inductively coupled with it. This results in the generation of an induced alternating magnetic field according to Faraday's law. This way it is formed the basic principle behind wireless power transfer between devices within the near-field region.

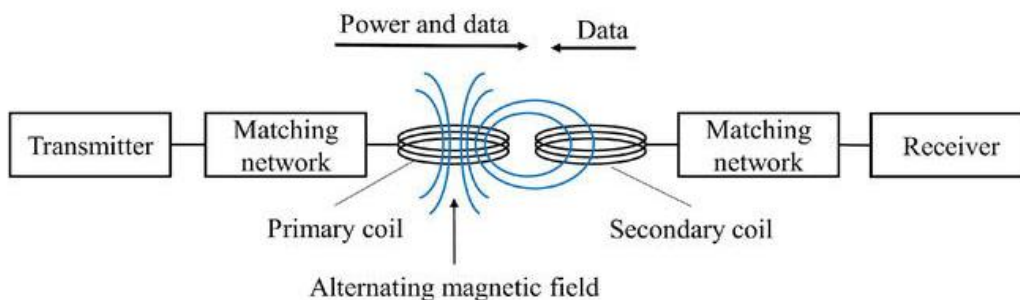


Figure 1 - Inductive coupling between transmitter and receiver coils

NFC-enabled devices can communicate with each other in two modes: active and passive. These modes determine how the devices communicate with each other, based on whether a device generates its own RF field or uses power from another device. In communication, one device is the initiator, which starts the connection, and the other is the target, which receives the signal. The main differences between passive technologies (such as NFC, Chipless RFID, and UHF RFID) and active technologies (such as Bluetooth) are their properties.

Passive Near Field Communication (NFC) devices are small electronic devices that enable the wireless transfer of data to other NFC-compatible devices within proximity. These devices do not require a power source of their own to function, relying instead on the electromagnetic energy emitted by active devices to power their data transmission. However, passive NFC devices are not capable of processing any data sent from other sources, nor are they able to connect to other passive components. One common use case for passive NFC devices is as emulated contactless smart cards, such as credit cards, debit cards, and loyalty cards.

On the other hand, active NFC devices are a step ahead of their passive counterparts, as they possess the ability to both transmit and receive data. These devices are highly versatile in their communication capabilities, as they can seamlessly interact with other active NFC devices as well as passive ones. Smartphones are a perfect illustration of active NFC devices, as they can be utilized to send and receive data from other NFC-enabled devices. Furthermore, active NFC devices like card readers in public transport and touch payment terminals have revolutionized contactless transactions by effectively utilizing this technology to provide secure and efficient transactions.

NFC technology is incredibly versatile and has many benefits. One of its most notable features is the ability to replace physical credit cards and cash with a virtual wallet stored on an NFC-enabled device. This is a convenient way for users to avoid carrying multiple cards. NFC technology is also secure with encryption and tokenization measures in place to protect sensitive credit card information during transactions. As a result, users can feel confident that their transactions and privacy is protected.

Overall, NFC technology offers substantial benefits to both businesses and customers. It is an efficient and secure option that can streamline transactions and enhance user experience.

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