**RFID (**[radio frequency identification](http://searchmanufacturingerp.techtarget.com/definition/RFID)**)**

**Active RFID (**[**radio frequency identification**](http://searchmanufacturingerp.techtarget.com/definition/RFID)**)** tags are continuously operating, [**battery-powered sensors**](http://whatis.techtarget.com/definition/active-sensor) that gather and **transmit data to a reading device.**

An active RFID system consists of a **reader, tag and**[**antenna**](http://searchmobilecomputing.techtarget.com/definition/antenna). Unlike ***passive RFID tags that contains merely an antenna and a microchip with no internal power source***, an **active RFID tag has its own power source -- an on-board, long-lasting battery** that enables the tag to **transmit data continuously**, regardless of whether it's in the **field range of a reader.** The RFID tag has non-volatile memory storage, and can included either fixed or programmable logic for processing transmission and sensor data.. **RFID tags contain an integrated circuit &** processing information and an **antenna,** which is used to **transmit data to the RFID reader (also called an interrogator)**. The ***reader then converts the radio waves to a more usable form of data***. ***Information collected from the tags*** is then ***transferred through a communications interface to a host computer system***, where the ***data can be stored in a database*** and analyzed at a later time.

There are two kinds of active **RFID tags:**[**transponders**](http://searchmobilecomputing.techtarget.com/definition/transponder)**and**[**beacons**](http://searchcrm.techtarget.com/definition/Apple-iBeacon). A **transponder only communicates** when **it's in the immediate vicinity of a reader**. A **beacon broadcasts constantly**. A number of ***unique characteristics*** are specific to active RFID tags. Because *the tags are often required to survive in harsh environmental conditions like extreme temperatures or precipitation, some are encased in a protective shell*. Given the size requirements of the **battery, wiring and the durable exterior, active RFID tags are larger than passive tags**. Some also have **on-board sensors** that track environmental parameters like the ***temperature, humidity, fluid and power consumption***. They can also be used for highly specific use cases, such as sensing when a container door is open and there is a change in temperature. This gives shippers an extra insight(accurate and clear understanding) that allows them to make important adjustments, like rerouting a shipment if it spoils.

Active RFID tags **require low signal strength to communicate and can broadcast** up to and even beyond a **range of 100 meters.** The **cost per tag ranges** anywhere from **$15** to more than **$100**, *depending on its capabilities*. The high cost generally makes active RFID tags too expensive for simple inventory applications. They are **better for tracking high-value items like cargo**. Industries that commonly use active RFID tags in addition to shipping and logistics include automobile sales manufacturing, health and medical, construction, mining, remote monitoring and IT asset management.

### Frequencies`

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| **RFID frequency bands**[**[12]**](https://en.wikipedia.org/wiki/Radio-frequency_identification#cite_note-Sen09-12)[**[13]**](https://en.wikipedia.org/wiki/Radio-frequency_identification#cite_note-Weis-13) | | | | | | |
| **Band** | **Regulations** | **Range** | **Data speed** | [**ISO/IEC 18000**](https://en.wikipedia.org/wiki/ISO/IEC_18000)**Section** | **Remarks** | **Approximate tag cost in volume (2006) US $** |
| **120–150 kHz (LF)** | **Unregulated** | **10 cm** | **Low** | [**Part 2**](http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?csnumber=46146) | **Animal identification, factory data collection** | **$1** |
| **13.56 MHz (HF)** | [**ISM band**](https://en.wikipedia.org/wiki/ISM_band)**worldwide** | **10 cm–1 m** | **Low to moderate** | [**Part 3**](https://en.wikipedia.org/wiki/ISO/IEC_18000-3) | **Smart cards (**[**ISO/IEC 15693**](https://en.wikipedia.org/wiki/ISO/IEC_15693)**,**[**ISO/IEC 14443**](https://en.wikipedia.org/wiki/ISO/IEC_14443)**A,B). Non fully ISO compatible memory cards ([Mifare](https://en.wikipedia.org/wiki/Mifare" \o "Mifare) Classic, iCLASS, Legic, Felica ...). Micro processor ISO compatible cards (Desfire EV1, Seos)** | **$0.50 to $5** |
| **433 MHz (UHF)** | **Short Range Devices** | **1–100 m** | **Moderate** | [**Part 7**](http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?csnumber=50368) | **Defense applications, with active tags** | **$5** |
| **865-868 MHz (Europe) 902-928 MHz (North America) UHF** | **ISM band** | **1–12 m** | **Moderate to high** | [**Part 6**](http://www.iso.org/iso/catalogue_detail.htm?csnumber=46149) | **EAN, various standards** | **$0.15 (passive tags)** |
| **2450-5800 MHz (**[**microwave**](https://en.wikipedia.org/wiki/Microwave)**)** | **ISM band** | **1–2 m** | **High** | [**Part 4**](http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?csnumber=62539) | **802.11 WLAN, Bluetooth standards** | **$25 (active tags)** |
| **3.1–10 GHz (microwave)** | **Ultra wide band** | **up to 200 m** | **High** | **Not Defined** | **requires semi-active or active tags** | **$5 projected** |

Applications

* Goods management and tracking
* Person and animal tracking
* Contactless payments
* Travel documents
* Barcodes and security tags
* Healthcare data management
* Timing