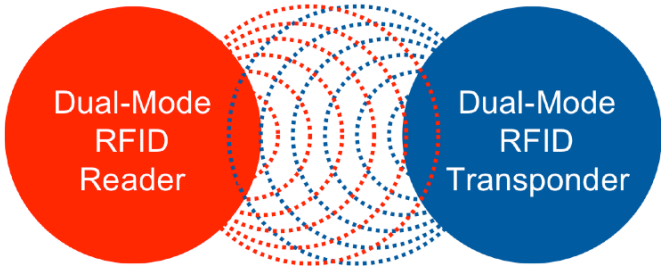
Dual-Mode RFID
Active/Passive HF RFID

For Extended Range and Higher Comfort

Advanced Product Information

13.56 MHz active/passive mode RFID system with the range of UHF



Key Features

- Frequency: 13.56 MHz
- ISO 15693 compliant
- Dual mode:
  - Active mode extended range of approx. 2m
  - Passive mode range of 15 ~ 50 cm
- Fully compatible with ISO 15693 passive mode
- Providing higher comfort with extended range (user may leave his/her key fob in the pocket)
- Active RFID with passive back-up system assuring full functionality with limited range in case of a flat battery
- Low power with average current consumption < 5µA

Applications

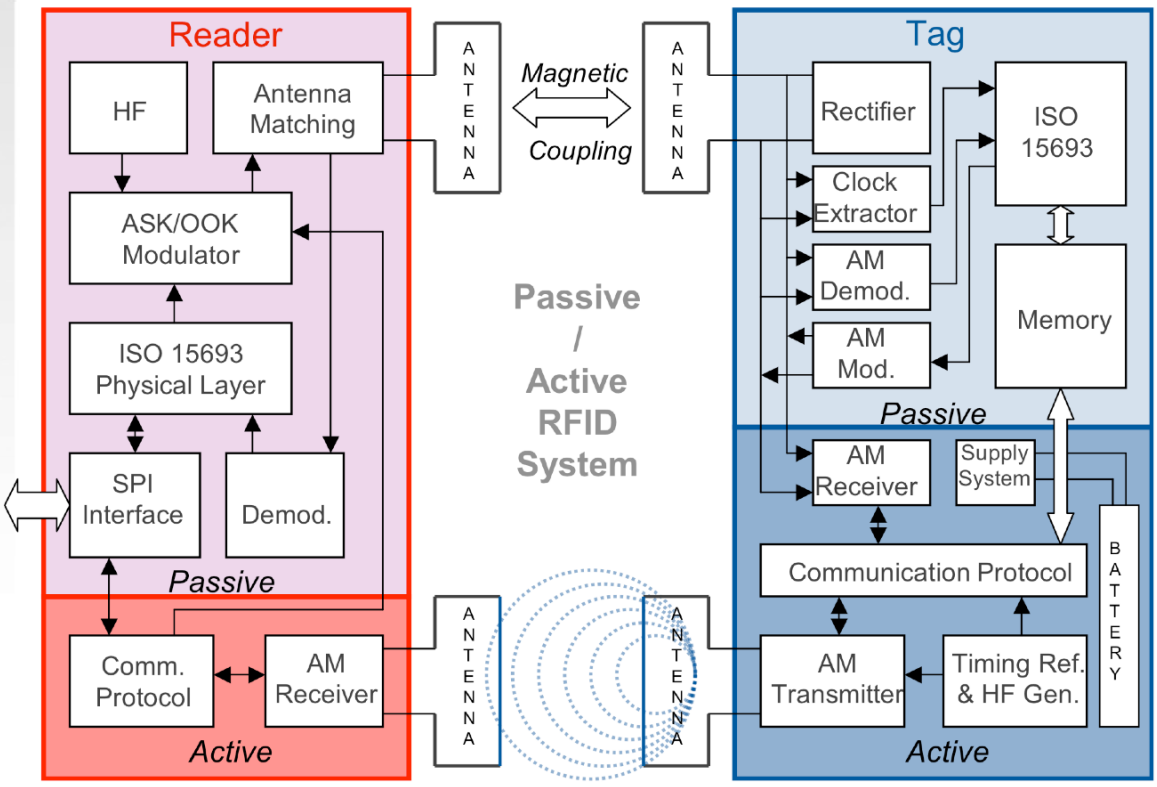
- Access control with extended range
- Security systems with enhanced comfort

Description

The proposed system is intended for access control and is based on ISO 15693 vicinity RFID systems. The additional active module extends the operation range from typically 15 ~ 50 cm to 2 meters. This drastically improves user comfort since there is no need to stop and hold the tag close to the reader to gain access to certain premises or equipment. The user may leave the tag in his/her pocket.

The HF frequency 13.56 MHz is also used for active part of the system so the communication is magnetic and the range can be limited to 2 meters, which is desirable for security access control systems.

Block Diagram



Tag Quick Reference Data

Parameter	Value	Comments
Passive Mode Protocol	ISO 15693 Compliant	
Supply Voltage	2.4 ~ 3.6V	Active mode
Transmit Current Consumption	3.5 mA	Active mode; 0 dBm
Receive Current Consumption	3 mA	Active mode
Average Current Consumption	< 5 µA	Wake-up mode
Receive Sensitivity	100 µV	Active mode
Receive Setup Time	1 ms	Active mode
Receive Wake-up Signal Detection Setup Time	100 µs	Active mode
Receive Wake-up Signal Detection Consumption	2 mA	Active mode

Reader Quick Reference Data

Parameter	Value	Comments
Supply Voltage	2.7V to 5.5V	V_{EXT}
Passive Mode	ISO 15693 protocol	Parameters similar to IDS-R13MP
Frequency	13.56 MHz	
Transmit Power	Same as in passive mode	Active mode
Receive Sensitivity	50 µV	Active mode

System Description

The block diagram shows the reader and the tag comprising two antennas each. The two-antenna solution provides optimum range and power efficiency. However, the system can also operate with one antenna on each side with a minor reduction in range or an increase in power consumption. Also, one antenna for the tag and two for the reader is a possible compromise.

To save battery, the tag will activate the active receive mode only for a short period of time followed by a much longer sleep period.

The tag will automatically use the passive mode compliant to ISO 15693 when the battery voltage is too low to support the active mode.

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