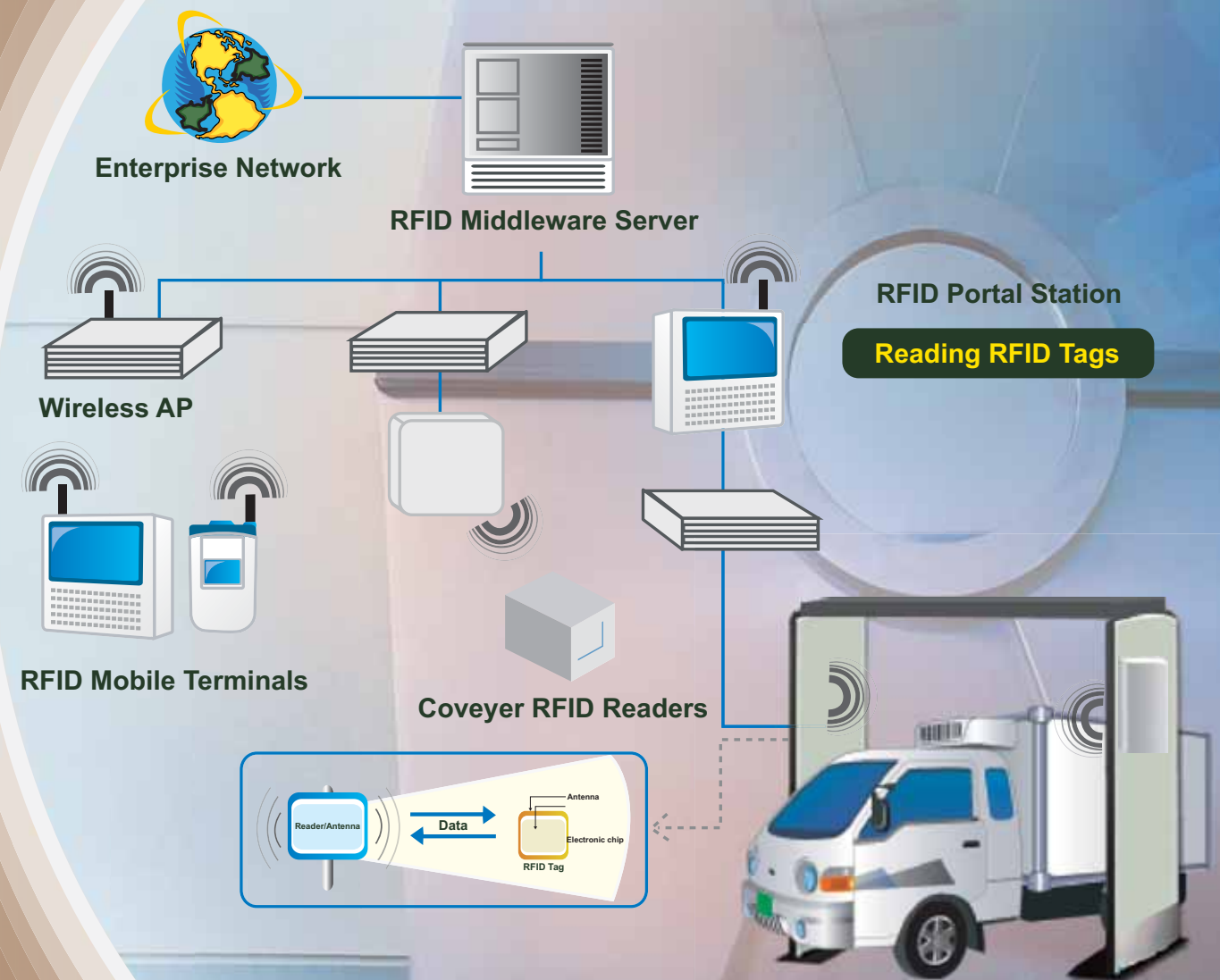


RFID



RFID (Radio-frequency identification)

RFID is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. The technology requires some extent of cooperation of an RFID reader and an RFID tag. Today, RFID is used in enterprise supply chain management to improve the efficiency of inventory tracking and management.

RFID Antenna types

The antenna used for an RFID tag is affected by the intended application and the frequency of operation. Low-frequency is 30–300 kHz. LFID or LowFID passive tags are normally inductively coupled, and because the voltage induced is proportional to frequency, many coil turns are needed to produce enough voltage to operate an integrated circuit. Compact LowFID tags, like glass-encapsulated tags used in animal and human identification, use a multilayer coil (3 layers of 100–150 turns each) wrapped around a ferrite core. High frequency is 3-30 MHz. At 13.56 MHz, a HFID or HighFID tag, using a planar spiral with 5–7 turns over a credit-card-sized form factor can be used to provide ranges of tens of centimeters. These coils are less costly to produce than LF coils, since they can be made using lithographic techniques rather than by wire winding, but two metal layers and an insulator layer are needed to allow for the crossover connection from the outermost layer to the inside of the spiral where the integrated circuit and resonance capacitor are located.

Ultrahigh-frequency or UHF is 300 MHz-3 GHz. UHFID and microwave passive tags are usually radiatively-coupled to the reader antenna and can employ conventional dipole-like antennas. Only one metal layer is required, reducing cost of manufacturing. Dipole antennas, however, are a poor match to the high and slightly capacitive input impedance of a typical integrated circuit. Folded dipoles, or short loops acting as inductive matching structures, are often employed to improve power delivery to the IC. Half-wave dipoles (16 cm at 900 MHz) are too big for many applications; for example, tags embedded in labels must be less than 10 cm (4 inches) in extent. To reduce the length of the antenna, antennas can be bent or meandered, and capacitive tip-loading or bowtie-like broadband structures are also used. Compact antennas usually have gain less than that of a dipole — that is, less than 2 dBi — and can be regarded as isotropic in the plane perpendicular to their axis. Dipoles couple to radiation polarized along their axes, so the visibility of a tag with a simple dipole-like antenna is orientation-dependent. Tags with two orthogonal or nearly-orthogonal antennas, often known as dual-dipole tags, are much less dependent on orientation and polarization of the reader antenna, but are larger and more expensive than single-dipole tags.

Patch antennas are used to provide service in close proximity to metal surfaces, but a structure with good bandwidth is 3-6 mm thick, and the need to provide a ground layer and ground connection increases cost relative to simpler single-layer structures.

RFID Spectrum & Standards

Frequency Spectrum	Standard	Comment	Application Fields
860~960MHz	ISO 18000-6A/B	Mainly Europe (866~868MHz for Europe) (950~956MHz for Japan)	* Inventory Checking System * Truck Registration * Trailer Tracking
902~928MHz	AutoID Class 0/1 (US Standard)	North America (902~928MHz for USA) (908~914MHz for Korea) (922~928MHz for Taiwan)	
2.4~2.4835GHz	ISO 18000-4		* Tollway System * Container Tracking
5.725~5.875GHz	ISO 18000-5	Rarely used for RFID	N/A

Region	North America	Korea	Australia	Argentina Brazil Peru	Europe	Singapore	Japan	New Zealand
Band (MHz)	902~928	908.5~ 914	918~926	902~928	866~868	866~869 923~925	950~956	864~929
Power	4W EIRP	2W ERP	4W EIRP	4W EIRP	2W ERP	0.5W ERP 2W in upper band	4W EIRP	0.5~4W EIRP



APPLICATIONS

* Available for RFID 902~928MHz

* Indoor/Outdoor Application

* RFID Long Distance Reader, Controlled Access System, Storehouse RFID System, Portable Reader use.



APX-036XNFX9

Patch Antenna
Outdoor, Pole Mount



Frequency: 865~870MHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 9.5 dBi
Radiation: Directional, Linear
Connector: N Jack
Size: 360*220*40 mm
Weight: 900 g
Color: White



GPX-036XNFX9

Patch Antenna
Outdoor, Pole Mount



Frequency: 902~928MHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 9.5 dBi
Radiation: Directional, Linear
Connector: N Jack
Size: 360*220*40 mm
Weight: 900 g
Color: White



GPX-020ASFR9

Patch RHCP Antenna
Outdoor, Wall Mount



Frequency: 902~928MHz
Impedance: 50Ω
SWR: ≤ 1.2
Gain: 8 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 200*180*32 mm
Weight: 580 g
Color: White



GPX-020ASFL9

Patch LHCP Antenna
Outdoor, Wall Mount



Frequency: 902~928MHz
Impedance: 50Ω
SWR: ≤ 1.2
Gain: 8 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 200*180*32 mm
Weight: 580 g
Color: White



GPX-026XNFR9

Patch RHCP Antenna
Outdoor, Pole Mount



Frequency: 902~928MHz
Impedance: 50Ω
SWR: ≤ 1.2
Gain: 8.5 dBic
Radiation: Directional, CP
Connector: N Jack
Size: 260*260*44 mm
Weight: 1230 g
Color: White



GPX-026XNFL9

Patch LHCP Antenna
Outdoor, Pole Mount



Frequency: 902~928MHz
Impedance: 50Ω
SWR: ≤ 1.2
Gain: 8.5 dBic
Radiation: Directional, CP
Connector: N Jack
Size: 260*260*44 mm
Weight: 1230 g
Color: White

▼ 865~870MHz
902~928MHz (Linear)

▼ 902~928MHz (CP)

RFID



APPLICATIONS

- * Available for RFID 2.4GHz
- * Indoor/Outdoor Application
- * RFID Long Distance Reader, Controlled Access System, Storehouse RFID System, Portable Reader use.

▲ 2.4GHz(CP)



IPF-1204SAR9

Ceiling RHCP Antenna
Indoor

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8 dBic
Radiation: Omni-directional, CP
Connector: SMA Plug
Size: 130*130*42 mm
Weight: 145 g
Cable: RG316 (300mm)



IPF-1204SAL9

Ceiling LHCP Antenna
Indoor

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8 dBic
Radiation: Omni-directional, CP
Connector: SMA Plug
Size: 130*130*42 mm
Weight: 145 g
Cable: RG316 (300mm)



IPX-010XSFR8

Patch RHCP Antenna
Outdoor, Wall Mount

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 120*120*27 mm
Weight: 272 g
Color: Gray



IPX-010XSFL8

Patch LHCP Antenna
Outdoor, Wall Mount

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 120*120*27 mm
Weight: 272 g
Color: Gray



IPX-026XNFR9

Patch RHCP Antenna
Outdoor, Pole Mount

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 13 dBic
Radiation: Directional, CP
Connector: N Jack
Size: 260*260*44 mm
Weight: 1230 g
Color: White



IPX-026XNFL9

Patch LHCP Antenna
Outdoor, Pole Mount

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 13 dBic
Radiation: Directional, CP
Connector: N Jack
Size: 260*260*44 mm
Weight: 1230 g
Color: White



APPLICATIONS

* Available for RFID 2.4GHz / 5.8GHz

* Indoor/Outdoor Application

* RFID Long Distance Reader, Controlled Access System, Storehouse RFID System, Portable Reader use.



IPX-020ASFR9

Patch RHCP Antenna
Outdoor, Wall Mount

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 12 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 200*180*32 mm
Weight: 580 g
Color: White



IPX-020ASFL9

Patch LHCP Antenna
Outdoor, Wall Mount

Frequency: 2.4~2.5GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 12 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 200*180*32 mm
Weight: 580 g
Color: White



KPF-1204SAR9

Ceiling RHCP Antenna
Indoor

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8.5 dBic
Radiation: Omni-directional, CP
Connector: SMA Plug
Size: 130*130*42 mm
Weight: 145 g
Cable: RG316 (300mm)



KPF-1204SAL9

Ceiling LHCP Antenna
Indoor

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8.5 dBic
Radiation: Omni-directional, CP
Connector: SMA Plug
Size: 130*130*42 mm
Weight: 145 g
Cable: RG316 (300mm)



KPX-003XSAR8

Patch RHCP Antenna
Indoor

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 4 dBic
Radiation: Directional, CP
Connector: SMA Plug
Size: 45*45*15 mm
Weight: 54 g
Cable: RG316 (300mm)



KPX-003XSAL8

Patch LHCP Antenna
Indoor

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 4 dBic
Radiation: Directional, CP
Connector: SMA Plug
Size: 45*45*15 mm
Weight: 54 g
Cable: RG316 (300mm)

▼ 2.4GHz(CP)

▼ 5.8GHz(CP)

RFID



APPLICATIONS

* Available for RFID 5.8GHz

* Indoor/Outdoor Application

* RFID Long Distance Reader, Controlled Access System, Storehouse RFID System, Portable Reader use.

▲ 5.8GHz(CP)



KPX-010XSFR8

Patch RHCP Antenna
Outdoor, Wall Mount

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8.5 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 120*120*27 mm
Weight: 272 g
Color: Gray



KPX-010XSFL8

Patch LHCP Antenna
Outdoor, Wall Mount

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 8.5 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 120*120*27 mm
Weight: 272 g
Color: Gray



KPX-020ASFR9

Patch RHCP Antenna
Outdoor, Wall Mount

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 15 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 200*180*32 mm
Weight: 580 g
Color: White



KPX-020ASFL9

Patch LHCP Antenna
Outdoor, Wall Mount

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 15 dBic
Radiation: Directional, CP
Connector: SMA Jack
Size: 200*180*32 mm
Weight: 580 g
Color: White



KPX-026XNFR9

Patch RHCP Antenna
Outdoor, Pole Mount

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 15 dBic
Radiation: Directional, CP
Connector: N Jack
Size: 260*260*44 mm
Weight: 1230 g
Color: White



KPX-026XNFL9

Patch LHCP Antenna
Outdoor, Pole Mount

Frequency: 5.725~5.85GHz
Impedance: 50Ω
SWR: ≤ 1.5
Gain: 15 dBic
Radiation: Directional, CP
Connector: N Jack
Size: 260*260*44 mm
Weight: 1230 g
Color: White