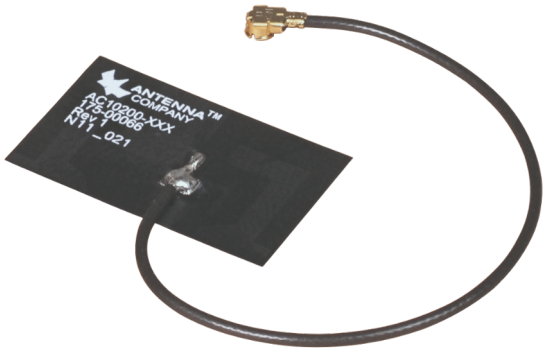
Datasheet

AC10200
2.4 GHz Bluetooth/BLE/ISM FPC Antenna

The AC10200 flexible printed circuit (FPC) antenna supports the 2.4 GHz industrial scientific and medical (ISM) band (2400-2500MHz), serving a multitude of Internet of Things (IoT) applications.

The flexibility and peel-and-stick adhesive backing make the AC10200 antenna easy to mount in unique and custom enclosures. Connection is made to the radio via a 1.13 mm coaxial cable terminated in a U.FL-type plug connector. Various cable length options are available (See Ordering Information).



AC10200 embedded WiFi antenna

Features

- Very high efficiency
- Ground plane independent
- Dimensions 26.1 mm x 16.0 mm x 0.27 mm
- Performance at 2.4 GHz to 2.5 GHz
  - VSWR: 1.9
  - Peak Gain: 2.8 dBi
  - Efficiency: 83%
- MHF1/U.FL compatible plug termination

Applications

- 2.4 GHz ISM applications
  - Bluetooth®
  - BLE
  - ZigBee®
- WiFi/WLAN Coverage
  - 802.11b
  - 802.11g
- Internet of Things (IoT) devices

Ordering Information

Part Number	Cable Length	Connector
AC10200-050	50 mm (1.97 in)	MHF1/U.FL-type plug (male)
AC10200-100	100 mm (3.94 in)	MHF1/U.FL-type plug (male)
AC10200-200	200 mm (7.87 in)	MHF1/U.FL-type plug (male)
AC10200-300	300 mm (11.80 in)	MHF1/U.FL-type plug (male)

Available from The Antenna Company (sales@antennacompany.com) and select distributors and representatives.

Table 1. RF/Electrical Specifications

AC10200	ISM/WiFi
Parameter	2400 MHz to 2500 MHz
VSWR (max)	1.9
Peak Gain (dBi)	2.8
Average Gain (dBi)	-1.0
Average Efficiency (%)	79.7
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omnidirectional
Wavelength	½-wave
Max Power	2 W
Electrical Type	Dipole

Electrical specifications and plots measured with the antenna mounted on a 2 mm (0.08 in) thick sheet of ABS plastic.

Table 2. Mechanical Specifications

Part Number	Connection	Coaxial cable, minimum inside bend radius	Weight
AC10200-050	MHF1/U.FL-type plug (male)	1.13 mm: 5.0 mm (0.20 in)	0.5 g (0.02 oz)
AC10200-100	MHF1/U.FL-type plug (male)	1.13 mm: 5.0 mm (0.20 in)	0.5 g (0.02 oz)
AC10200-200	MHF1/U.FL-type plug (male)	1.13 mm: 5.0 mm (0.20 in)	0.6 g (0.02 oz)
AC10200-300	MHF1/U.FL-type plug (male)	1.13 mm: 5.0 mm (0.20 in)	0.6 g (0.02 oz)
Dimensions	26.1 mm x 16.0 mm x 0.27 mm (1.03 in x 0.63 in x 0.01 in)		
Operating Temp. Range	-40 °C to +85 °C (-40 °F to 185 °F)		

Antenna Mounting

The AC10200 antenna is a flexible, adhesive-backed antenna that allows it to be permanently installed onto non-metallic surfaces. The adhesive backing is 3M 467MP™, which provides outstanding adhesion to high surface energy plastics. The adhesive delivers excellent shear strength to resist slippage and edge lifting, but can be repositioned before the adhesive cures, allowing for accurate positioning. This adhesive is highly resistant to solvents, humidity and moisture, as well as heat up to 204 °C (400 °F) for short periods.

The antenna should never be bent to the point of creating a crease or allowing the angle of the bend to fall below 90 degrees (i.e. become acute) as this will impair function and may cause permanent damage.

Antenna Dimensions

The dimensions for the AC10200 are shown below in Figure 1.

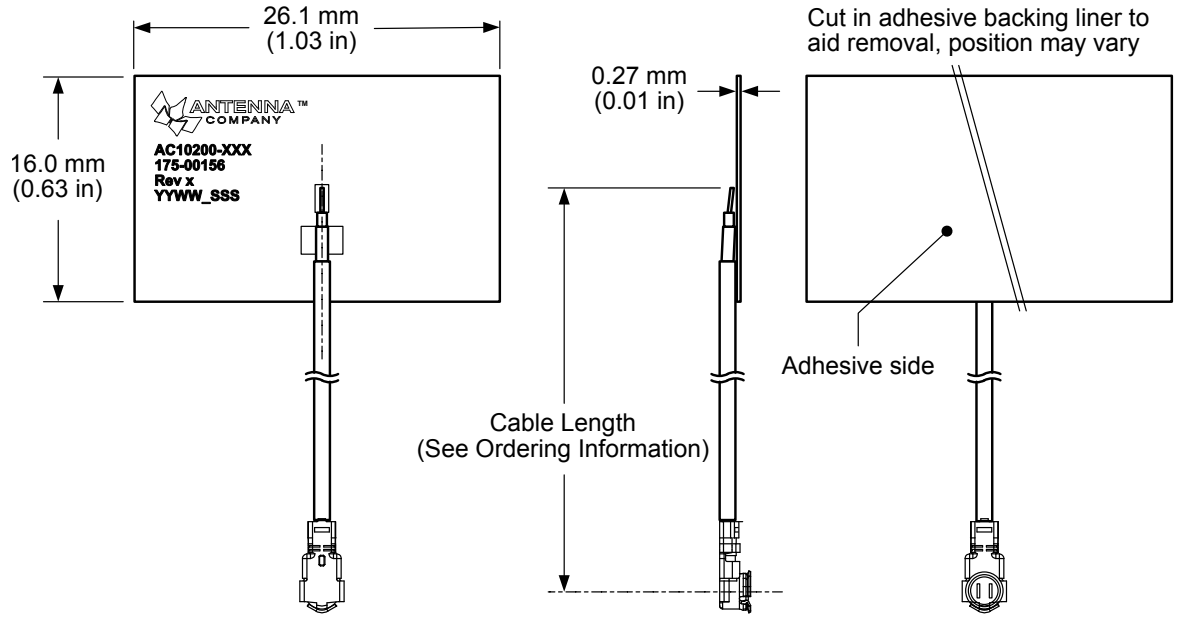


Figure 1. AC10200 Antenna Dimensions

VSWR

Figure 2 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR characterizes the power reflected from the antenna back to the transmitter. A lower VSWR value indicates better antenna performance at a given frequency. Reflected power is also shown on the right-side vertical axis as a measure of the percentage of transmitter power reflected back from the antenna.

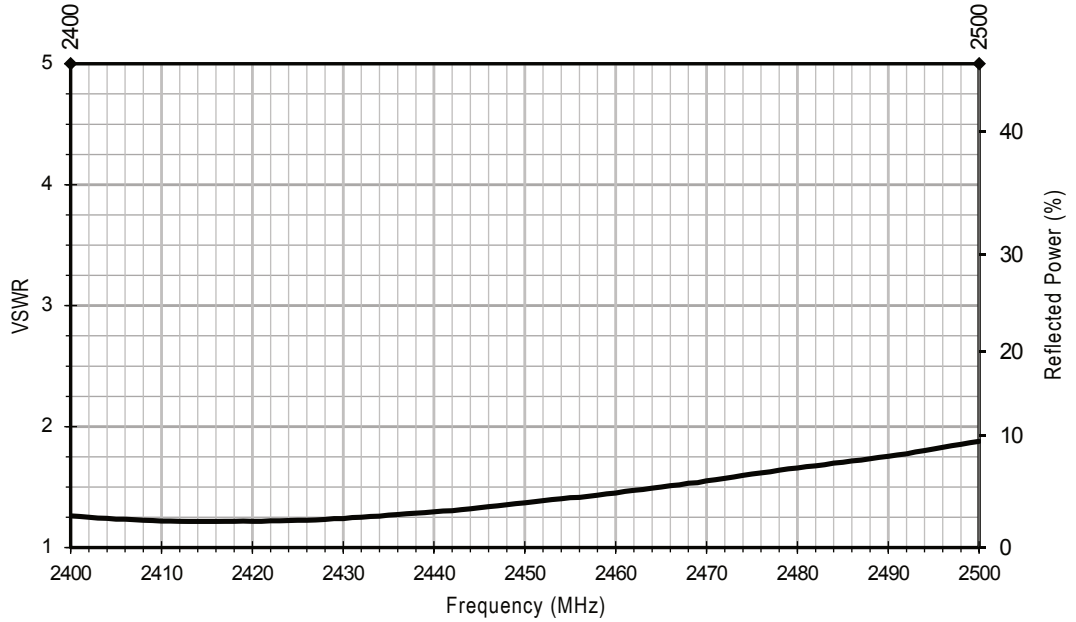


Figure 2. AC10200 Antenna VSWR with Frequency Band Highlights

Return Loss

Return loss (Figure 3), represents the loss in power at the antenna due to reflected signals. A higher magnitude return loss indicates better performance. Return loss is the negative of input reflection coefficient, in decibels (dB), and the two values are often used interchangeably.

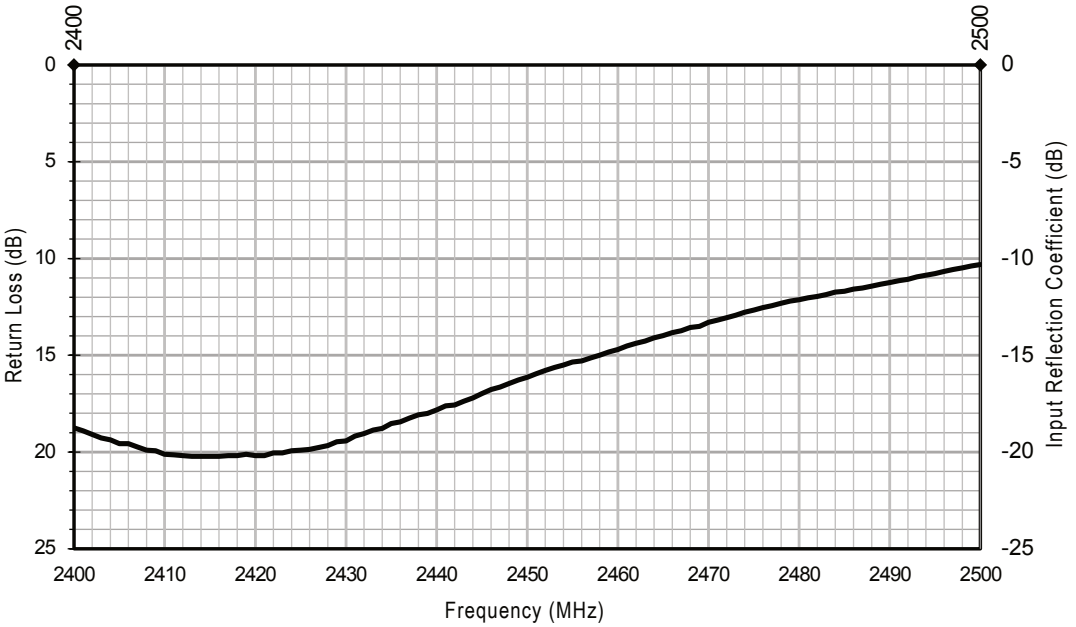


Figure 3. AC10200 Antenna Return Loss with Frequency Band Highlights

Peak Gain

Peak gain, (See Figure 4) provides a measure of the maximum conversion of antenna input power to radio waves at a given frequency. Peak gain does not account for the directionality of gain in 3-dimensional space.

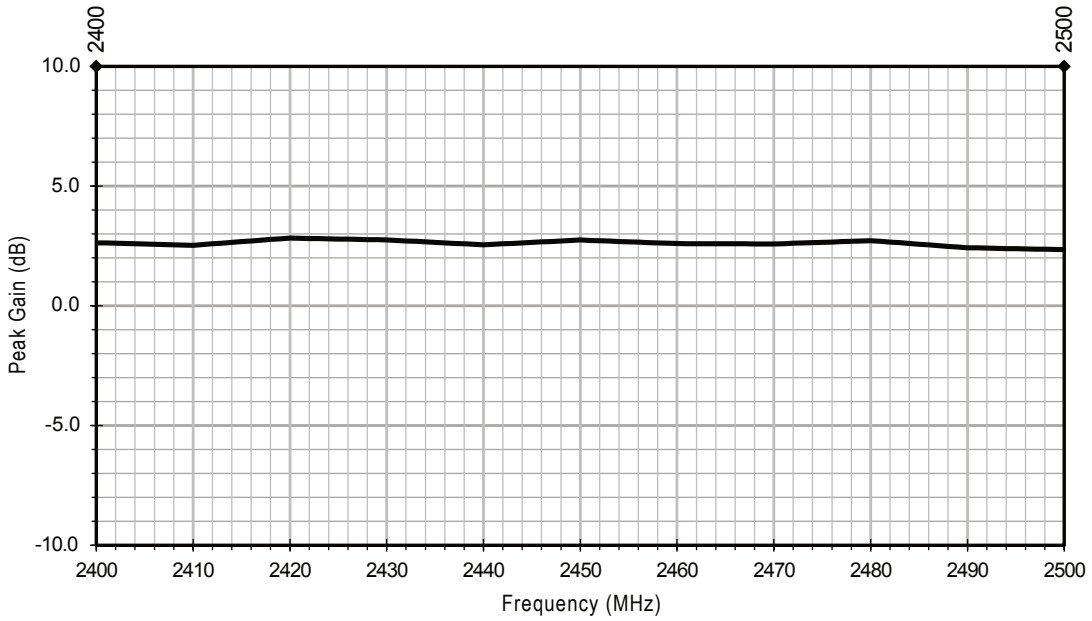


Figure 4. AC10200 Antenna Peak Gain with Frequency Band Highlights

Average Gain

Average gain (Figure 5), is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

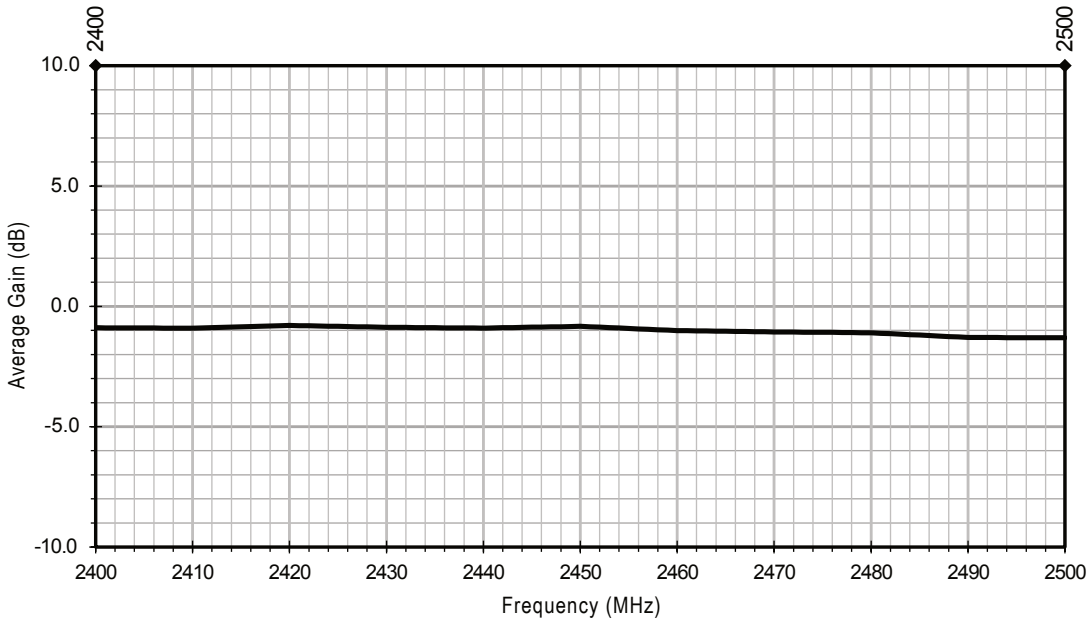


Figure 5. AC10200 Antenna Average Gain with Frequency Band Highlights

Radiation Efficiency

Radiation efficiency (Figure 6), is the ratio of power delivered to the antenna relative to the power radiated at the antenna, expressed as a percentage, where a higher percentage indicates better performance at a given frequency.

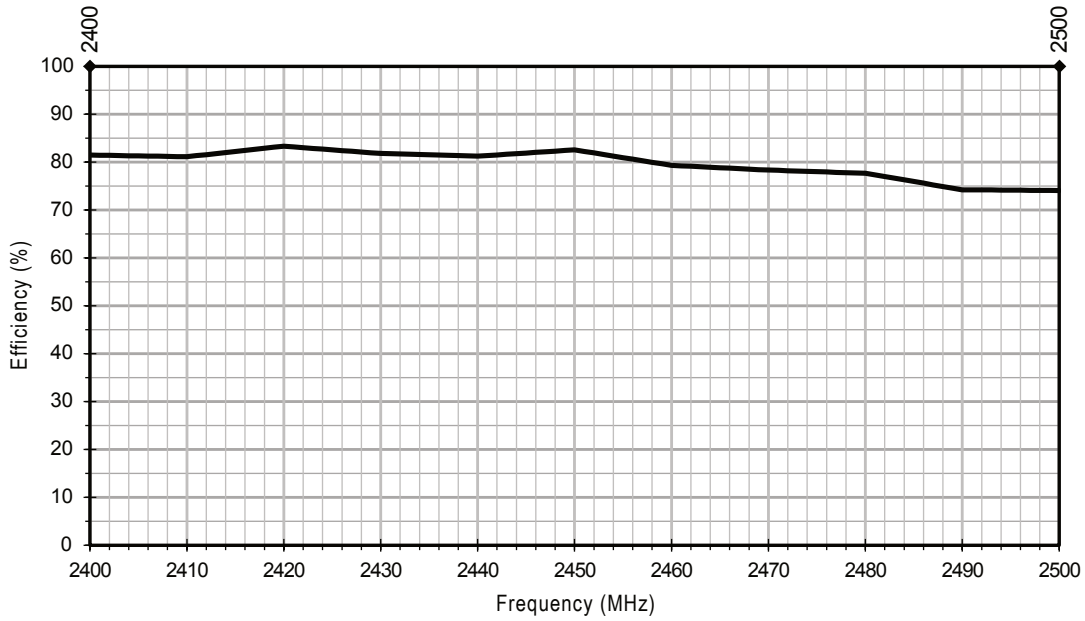
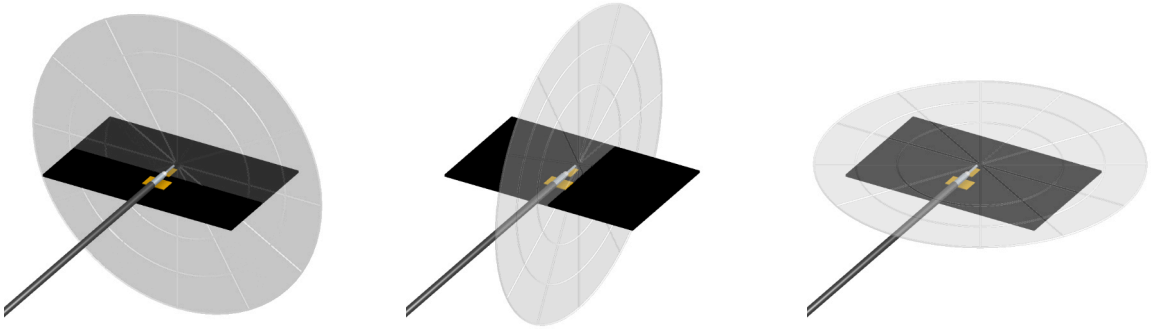


Figure 6. AC10200 Antenna Radiation Efficiency with Frequency Band Highlights

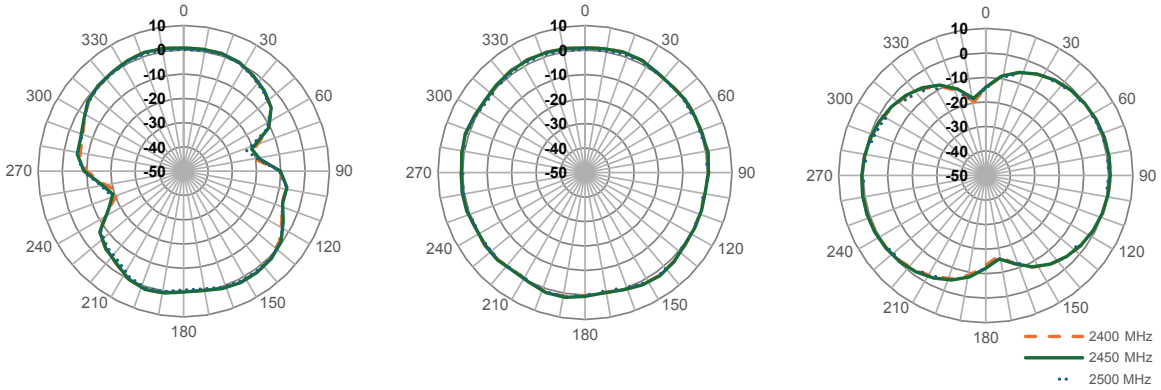
Radiation Patterns

Radiation patterns provide information about the directional performance of the antenna by plotting gain in three orthogonal planes at the high-, low- and center-frequencies of an antenna frequency band. Antenna radiation patterns (Figure 7), are shown using polar plots covering 360 degrees with the plane of reference depicted above the plots. Note: when viewed with typical PDF viewing software, zooming into radiation patterns is possible to reveal fine detail.



XZ-Plane Gain YZ-Plane Gain XY-Plane Gain

2400 MHz to 2500 MHz (2450 MHz)



XZ-Plane Gain YZ-Plane Gain XY-Plane Gain

Figure 7. Radiation Patterns for the AC10200 Antenna

Packaging Information

The AC10200 antenna is individually packaged in a labeled polyethylene bag and then bulk packaged in a polyethylene bag in quantities of 100 pcs. Sealed bulk polyethylene bags are packed in cartons in quantities of 20 yielding 2000 pieces per carton. Carton dimensions are 340 mm x 340 mm x 200 mm (13.4 in x 13.4 in x 7.9 in).

Website: http://www.antennacompany.com
Offices: Eindhoven, The Netherlands
EMAIL: sales@antennacompany.com

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