

# Part No. M310220

## Wi-Fi / BT / Zigbee Ceramic Antennas

**2.4 GHz**

Supports: Wi-Fi applications, Agriculture, Automotive, Bluetooth, Zigbee, WLAN, Smart Home, Healthcare, Digital Signage



### Ceramic Wi-Fi / Bluetooth Antenna

2400 – 2485 MHz

#### KEY BENEFITS

##### Stay-in-Tune

IMD antenna technology provides superior RF field containment, resulting in less interaction with surrounding components.

##### Quicker Time-to-Market

By optimizing antenna size, performance and emissions, customer and regulatory specifications are more easily met.

##### Reliability

Products are the latest RoHS version compliant.

#### APPLICATIONS

- Embedded design
- Cellular, Headsets, Tablets
- Gateway, Access Point
- Handheld
- Telematics
- Tracking
- Healthcare
- M2M, Industrial devices
- Smart Grid
- OBD-II

Ethertronics' series of Ceramic Isolated Magnetic Dipole™ (IMD) antennas deliver on the key needs of device designers for higher functionality and performance in smaller/thinner designs. These innovative antennas provide compelling advantages for Bluetooth® enabled cell phones, media players and other mobile devices.

#### Real-World Performance and Implementation

Ceramic antennas may look alike on the outside, but the important difference is inside. Other antennas may contain simple PiFA or monopole designs that interact with their surroundings, complicating layout or changing performance with use position. Ethertronics' antennas utilize patented IMD technology to deliver a unique size and performance combination.

#### Greater Flexibility

Ethertronics' first-in-class IMD technology enables you to develop concept designs that are more advanced and that deliver superior performance in reception critical applications.

#### Electrical Specifications

Typical performance on 40 x 60 mm PCB

| Frequency (MHz)      | 2400 – 2485        |
|----------------------|--------------------|
| Peak Gain            | 1.7 dBi            |
| Average Efficiency   | 67%                |
| VSWR Match           | 2.0:1 max          |
| Feed Point Impedance | 50 ohms unbalanced |
| Polarization         | Linear             |
| Power Handling       | 0.5 Watt CW        |

#### Mechanical Specifications & Ordering Part Number

| Ordering Part Number | M310220                                         |
|----------------------|-------------------------------------------------|
| Size (mm)            | 3.00 x 1.50 x 1.08                              |
| Mounting             | Surface mounted                                 |
| Weight (grams)       | 0.1                                             |
| Packaging            | Tape & Reel,<br>M310220 – 1,000 pieces per reel |
| Demo Board           | M310220-01                                      |

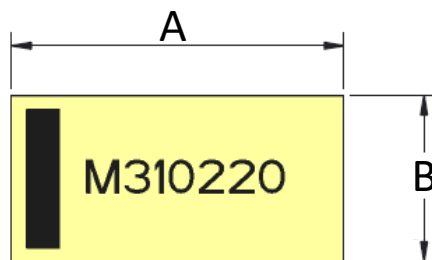
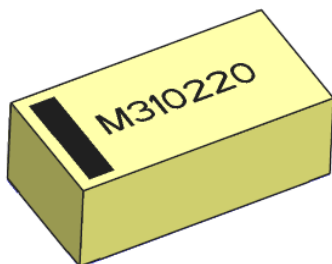


2.4 GHz Ethertronics' Embedded Antenna Specifications  
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

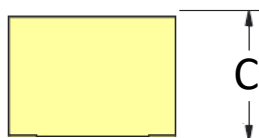
### Antenna Dimensions

Typical antenna dimensions (mm)

| Part Number | A (mm)         | B (mm)         | C (mm)         |
|-------------|----------------|----------------|----------------|
| M310220     | $3.00 \pm 0.2$ | $1.50 \pm 0.2$ | $1.08 \pm 0.1$ |

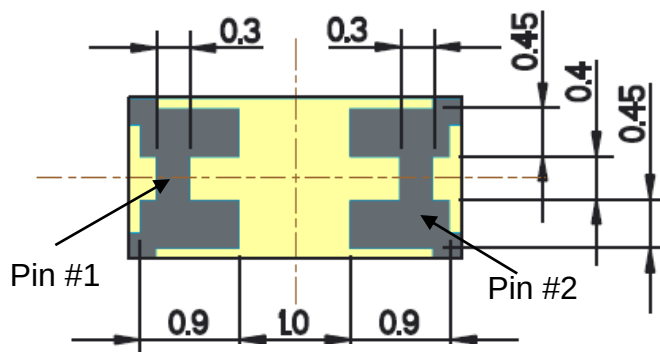


Top View



Height

| Pin | Description |
|-----|-------------|
| 1   | Feed        |
| 2   | Ground      |



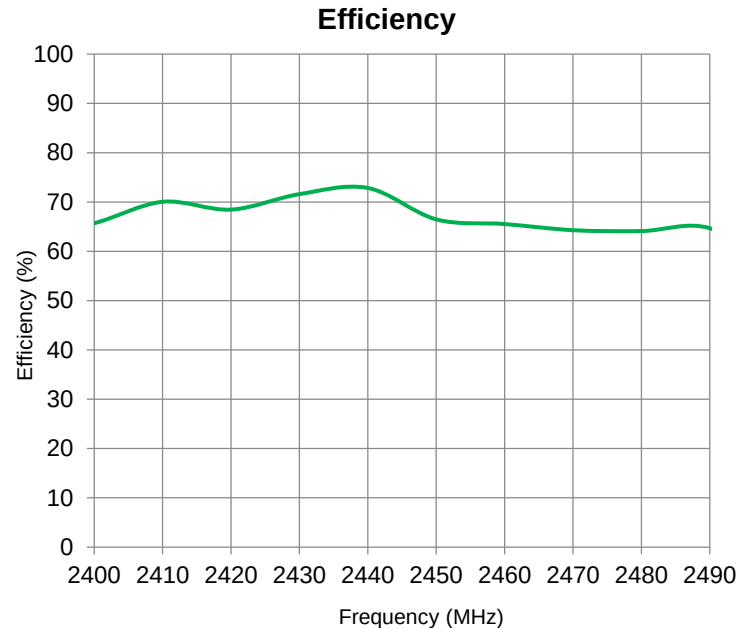
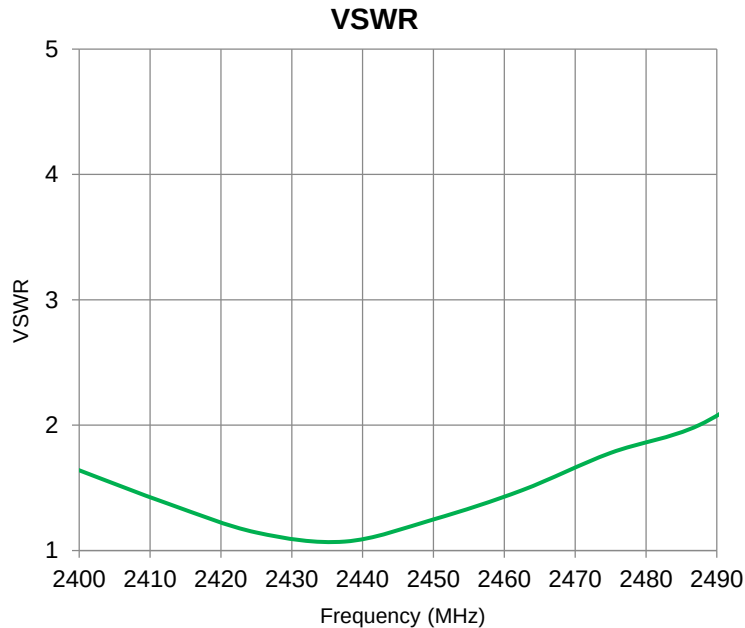
Bottom View



**2.4 GHz Ethertronics' Embedded Antenna Specifications**  
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

**VSWR, Efficiency Plots**

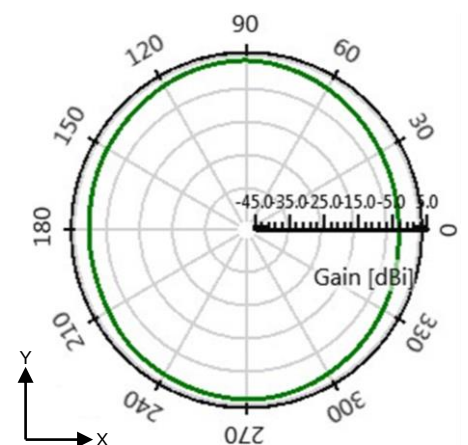
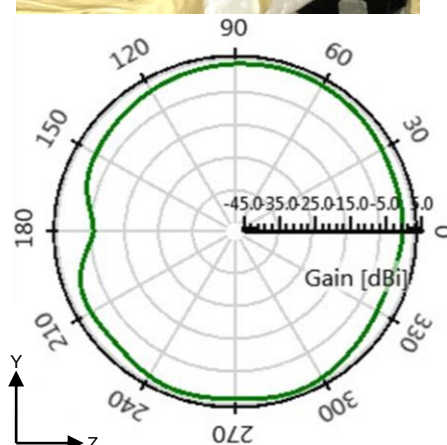
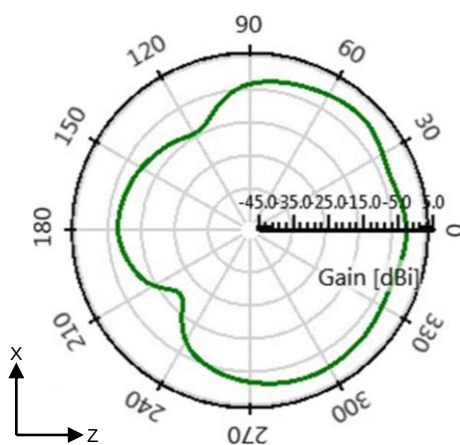
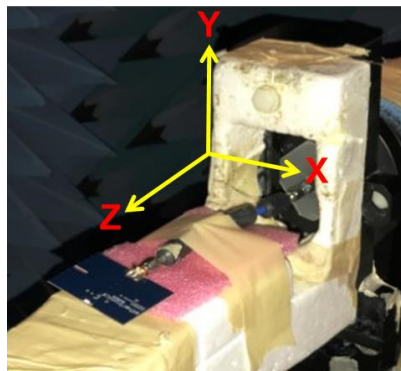
Typical performance on 40 x 60 mm PCB



**Antenna Radiation Patterns**

Typical performance on 40 x 60 mm PCB

Measured @ 2440 MHz



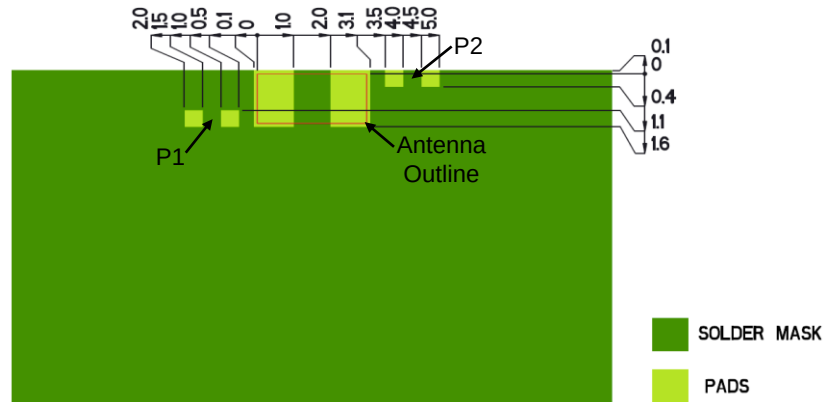
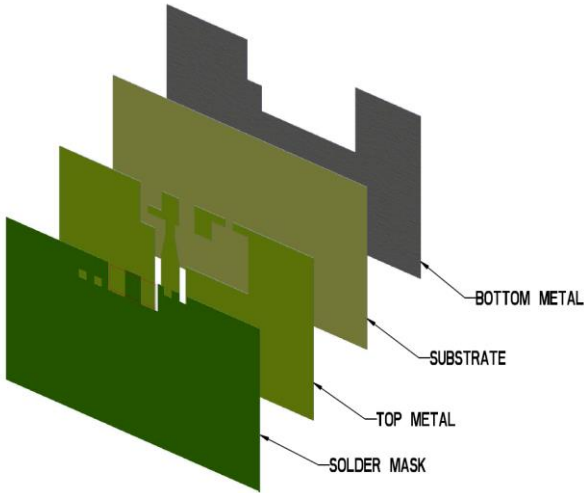


## 2.4 GHz Ethertronics' Embedded Antenna Specifications

Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

### Antenna Layout

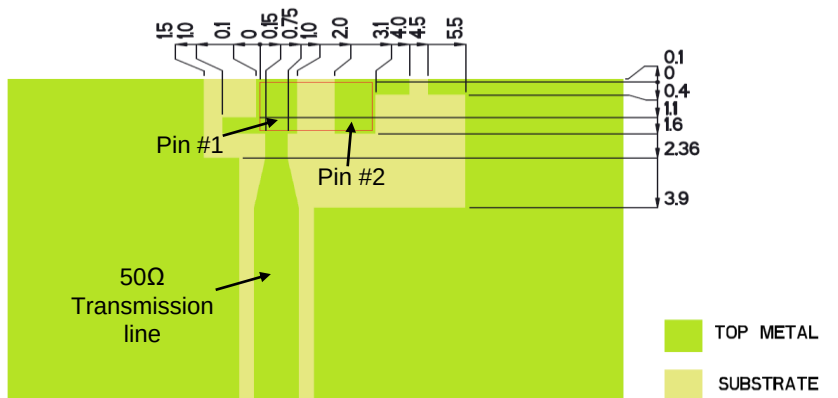
Typical layout dimensions (mm)



- Additional VIAS: Diam. 0.2mm to be placed around antenna, (no vias on transmission lines).
- Via holes must be covered by solder mask

### Pin Descriptions

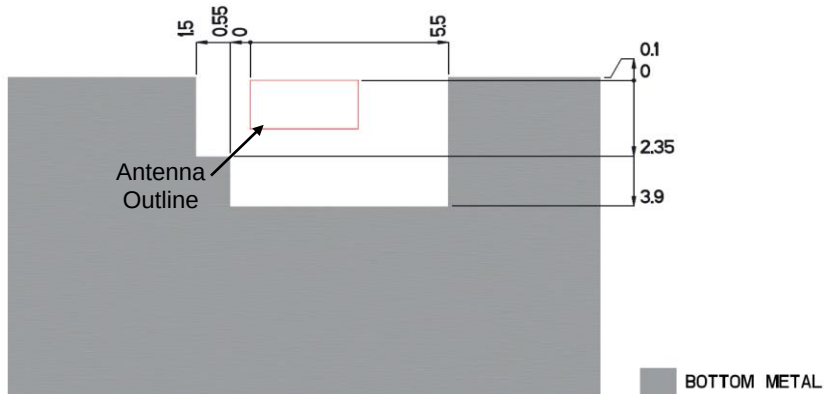
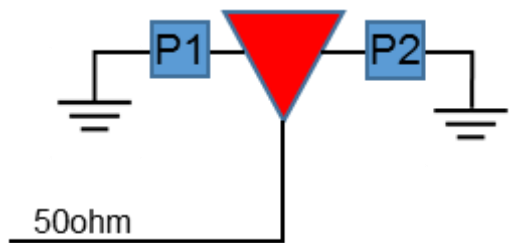
| Pin# | Description |
|------|-------------|
| 1    | Feed        |
| 2    | Ground      |



### Matching Network (Demo Board)

| Component | Value | Tolerance |
|-----------|-------|-----------|
| P1        | 4.7pF | ±0.05pF   |
| P2        | 2.7pF | ±0.05pF   |

\*Actual matching values depend on customer design





## 2.4 GHz Ethertronics' Embedded Antenna Specifications

Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

### Antenna Layout Tips (General reference)

Important, layout guidelines for correct operation of Ethertronics Ceramic Antennas. Please read guidelines below before laying out the antenna in a device. Figure 1 shows the typical antenna layout. Figure 2 shows Ethertronics' antenna layout.

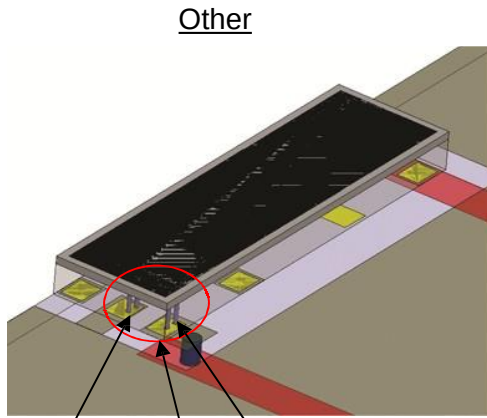


Figure 1  
Typical Antenna Layout

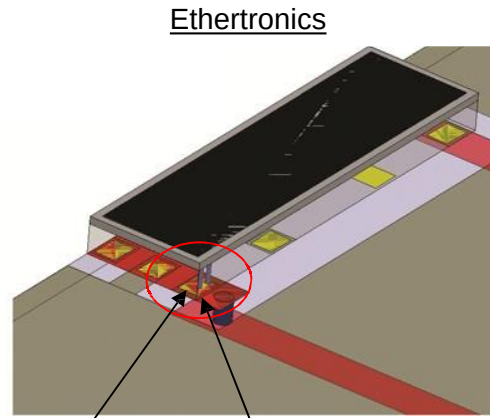


Figure 2  
Ethertronics Antenna Layout  
(Required)

- The antenna tuning loop is formed by the PCB layout.
- The feed pin and shorting pin are combined because it requires very close proximity to achieve more band- width.



2.4 GHz Ethertronics' Embedded Antenna Specifications  
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

Antenna Demo Board

Typical layout dimensions (mm)

| Part Number | A (mm) | B (mm) | C (mm) |
|-------------|--------|--------|--------|
| M310220-01  | 60.0   | 40.0   | 30.0   |

