

# Part No. M620720

## ISM 868 & 915 MHz Embedded Ceramic Antenna

**868 MHz; 915 MHz**

Supports: Tracking, Smart Home, Agriculture, Automotive, Healthcare, Digital Signage, Wearables, Industrial Devices



### ISM 868 & 915 MHz Embedded Ceramic Antenna

868 MHz; 915 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 868 and 915 MHz ISM enabled handheld devices, 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.

#### Electrical Specifications

Typical performance on 40 x 100 mm PCB

| Frequency            | 863 - 870 MHz | 902 – 928 MHz |
|----------------------|---------------|---------------|
| Peak Gain            | 0.30 dBi      | 0.75 dBi      |
| Average Efficiency   | 58%           | 60%           |
| VSWR Match           | 1.6:1 max     | 2.5:1 max     |
| Feed Point Impedance | 50 ohms       |               |
| Polarization         | Linear        |               |
| Power Handling       | 0.5 Watt CW   |               |

#### Mechanical Specifications & Ordering Part Number

| Ordering Part Number | M620720                                         |
|----------------------|-------------------------------------------------|
| Size (mm)            | 6.00 x 2.00 x 1.08                              |
| Mounting             | SMT                                             |
| Weight (grams)       | 0.1                                             |
| Packaging            | Tape & Reel,<br>M620720 – 1,000 pieces per reel |
| Demo Board           | M620720-01                                      |

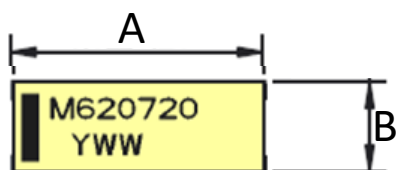


ISM 868 & 915 MHz Embedded Ceramic Antenna Specifications  
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

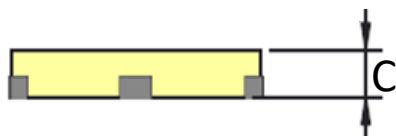
### Antenna Dimensions

Typical antenna dimensions (mm)

| Part Number | A (mm)         | B (mm)         | C (mm)         |
|-------------|----------------|----------------|----------------|
| M620720     | $6.00 \pm 0.2$ | $2.00 \pm 0.2$ | $1.08 \pm 0.1$ |

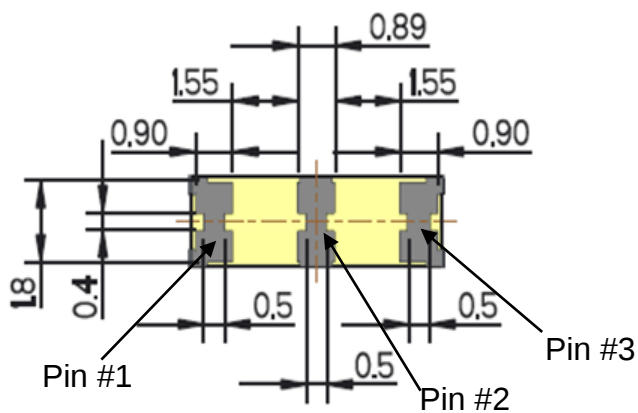


Top View



Height

| Pin | Description |
|-----|-------------|
| 1   | Feed        |
| 2   | Dummy       |
| 3   | Ground      |



Bottom View

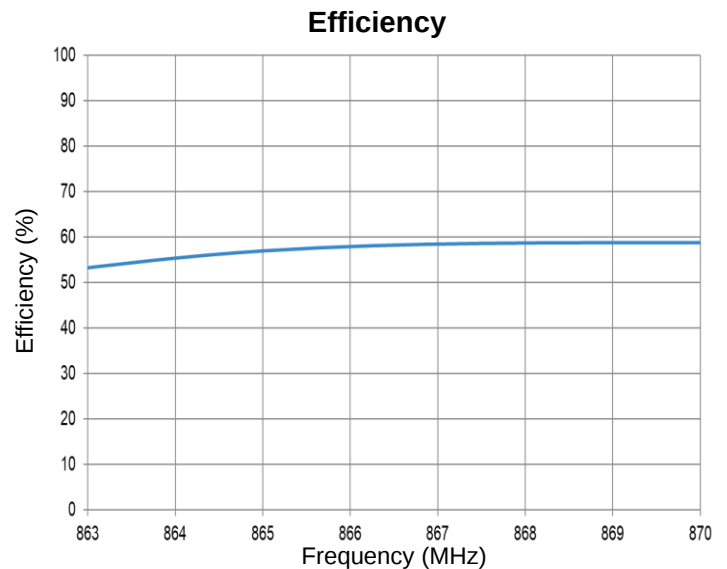
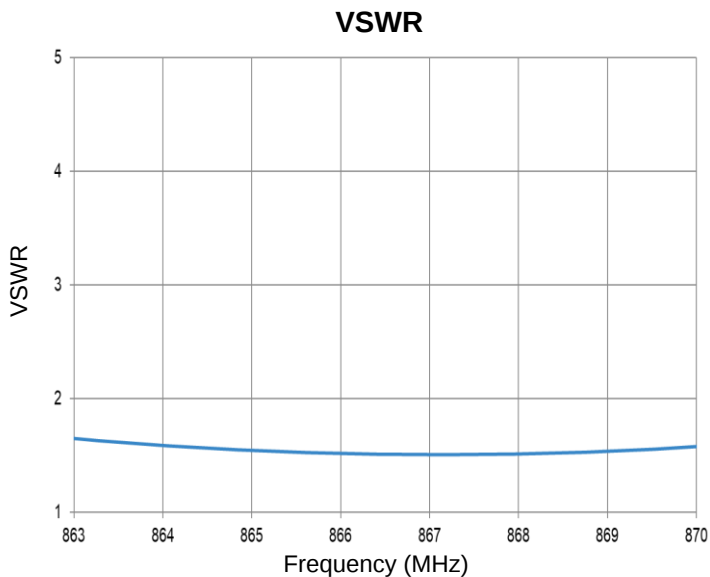
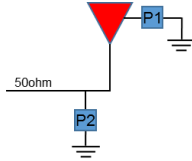


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VSWR, Efficiency Plots (Tuned @ 868 MHz)

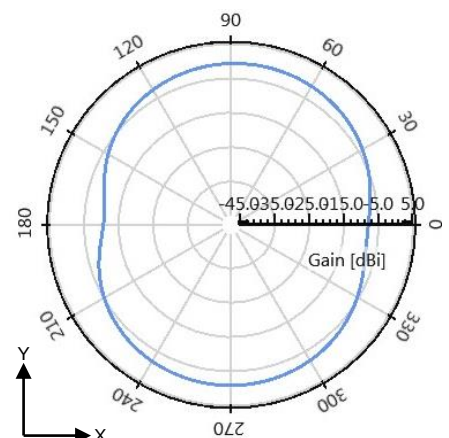
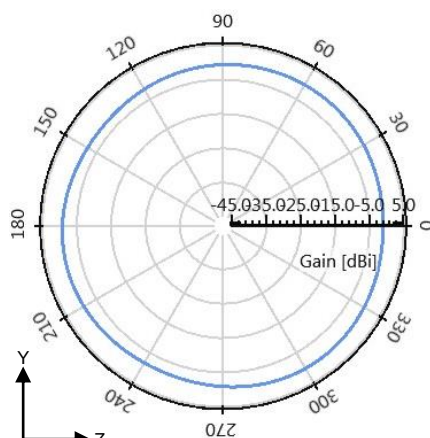
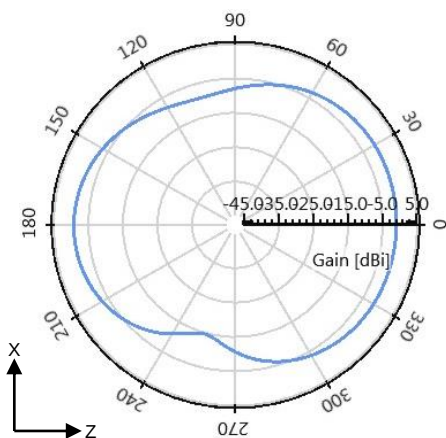
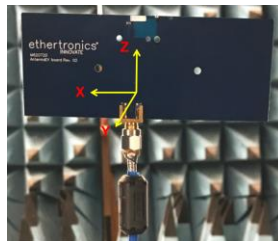
Typical performance on 40 x 100 mm PCB

| Component | 863-870 MHz |           |
|-----------|-------------|-----------|
|           | Value       | Tolerance |
| P1        | 5.0 pF      | ±0.05 pF  |
| P2        | 82 pF ± 5%  |           |



Antenna Radiation Patterns

Typical performance on 40 x 100 mm PCB  
Measured @ 868 MHz



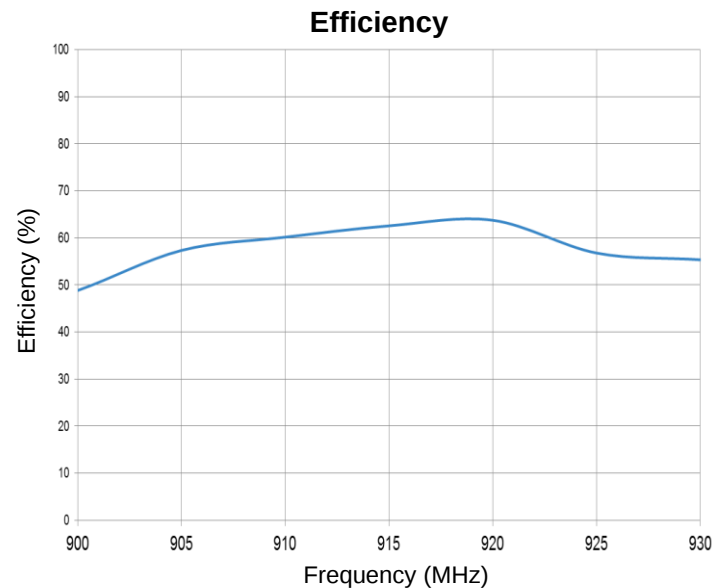
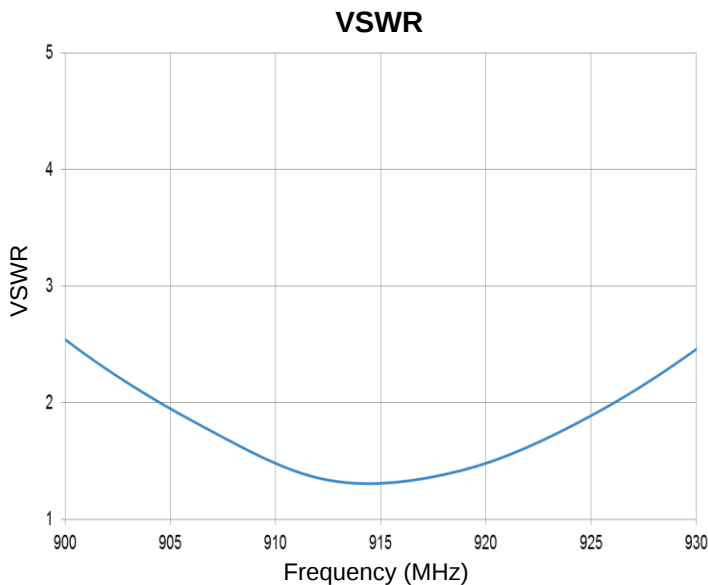
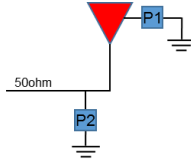


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VSWR, Efficiency Plots (Tuned @ 915 MHz)

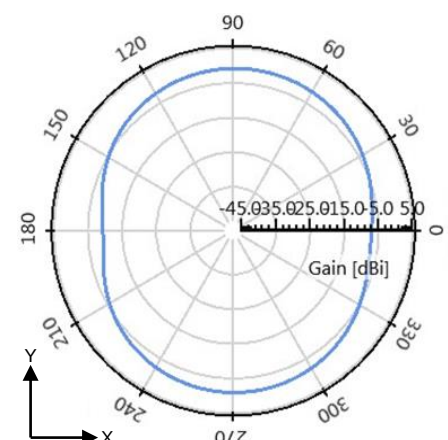
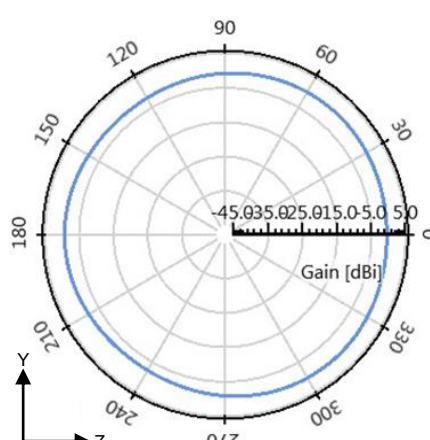
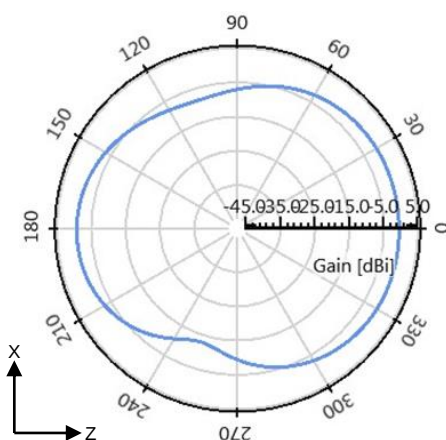
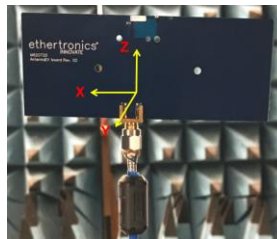
Typical performance on 40 x 100 mm PCB

| Component | 902-928 MHz |           |
|-----------|-------------|-----------|
|           | Value       | Tolerance |
| P1        | 3.6 pF      | ±0.05 pF  |
| P2        | 82 pF ± 5%  |           |



Antenna Radiation Patterns

Typical performance on 40 x 100 mm PCB  
Measured @ 915 MHz

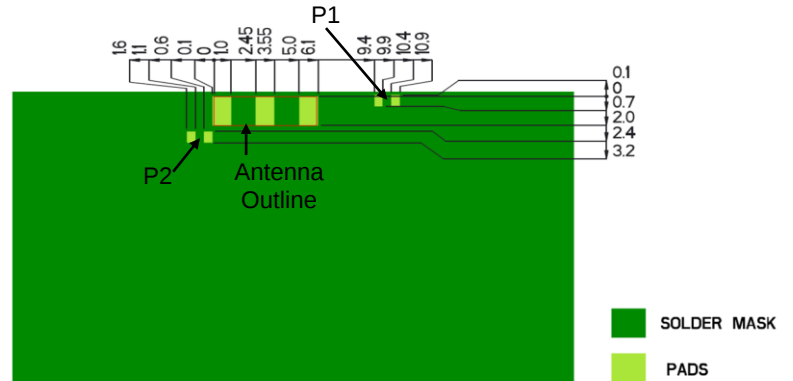
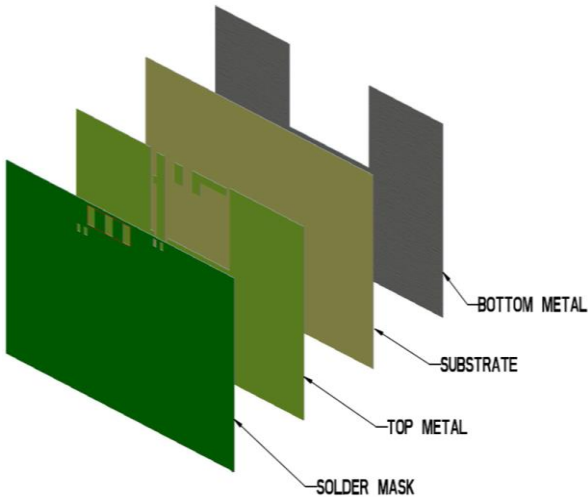




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## Antenna Layout

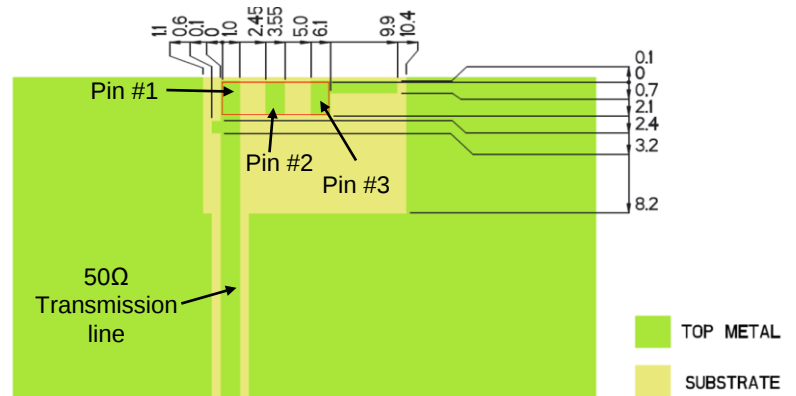
Typical layout dimensions (mm)



- 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

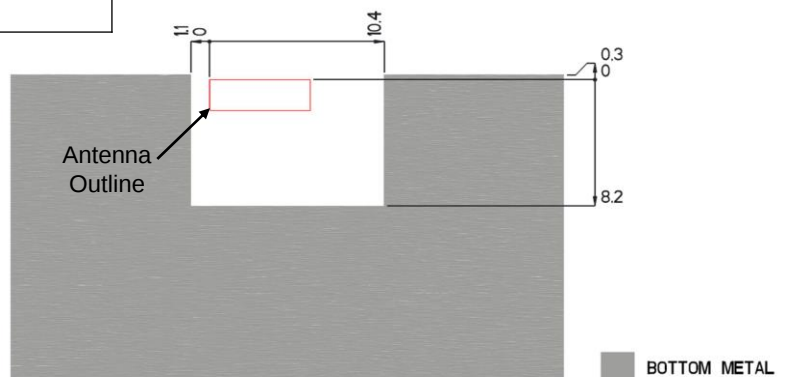
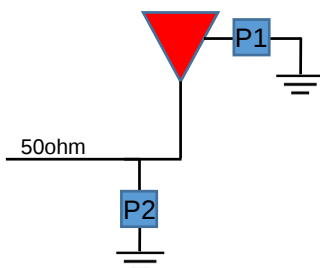
| Pin# | Description |
|------|-------------|
| 1    | Feed        |
| 2    | Dummy       |
| 3    | Ground      |



## Matching Network (Demo Board)

| Component | 863-870 MHz |           | 902-928 MHz |           |
|-----------|-------------|-----------|-------------|-----------|
|           | Value       | Tolerance | Value       | Tolerance |
| P1        | 5.0 pF      | ±0.05 pF  | 3.6 pF      | ±0.05 pF  |
| P2        | 82 pF ± 5%  |           |             |           |

\*Actual matching values depend on customer design

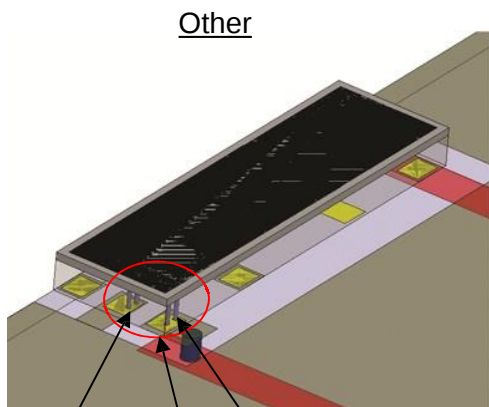




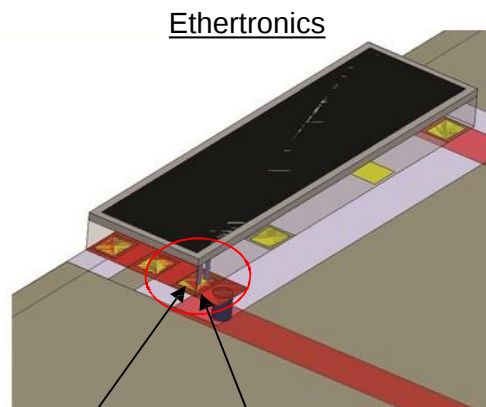
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### Antenna Layout Tips (General reference)

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.



Shorting pin      Feed pin  
Antenna tuning loop:  
Figure 1  
Typical Antenna Layout



Shorting pin and feed pin are shared in  
Ethertronics ceramic antennas

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.



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### Antenna Demo Board

Typical layout dimensions (mm)

| Part Number | A (mm) | B (mm) | C (mm) |
|-------------|--------|--------|--------|
| M620720-01  | 100.0  | 40.0   | 50.0   |

