

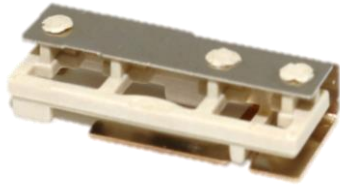


## Part No. 1004454

# WLAN / BT / Zigbee Embedded Stamped Metal Antenna

**2.4 / 5.2 / 5.8 GHz (802.11 a/b/g/n/c + Japan)**

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



### Wi-Fi Dual Band Stamped Metal Embedded Antenna

2.4 GHz; 5 GHz

#### KEY BENEFITS

##### Stay-in-Tune

Ethertronics 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' Stamped Metal series of 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 full WIFI dual-band enabled handheld devices, media players and other mobile devices.

#### 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 Characteristics, on 120 x 180 mm PCB

| Frequency            | 2400 – 2485 MHz    | 5100 – 5825 MHz |
|----------------------|--------------------|-----------------|
| Peak Gain            | 2.7 dBi            | 4.8 dBi         |
| Average Efficiency   | 74%                | 67%             |
| VSWR Match           | 1.4:1 max          | 1.7:1 max       |
| Feed Point Impedance | 50 ohms unbalanced |                 |
| Polarization         | Linear             |                 |
| Power Handling       | 0.5 Watt CW        |                 |

#### Mechanical Specifications & Ordering Part Number

| Ordering Part Number | 1004454   |
|----------------------|---|
| Size (mm)            | 17.85 x 6.9 x 4.3                               |
| Mounting             | SMT   |
| Weight (grams)       | 0.48  |
| Packaging            | Tape & Reel,<br>1004454 – 5,000 pieces per reel |
| Demo Board           | 1004454-01                                      |

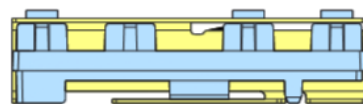
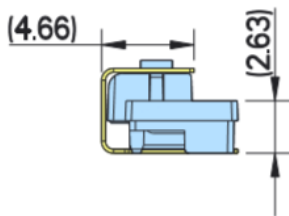
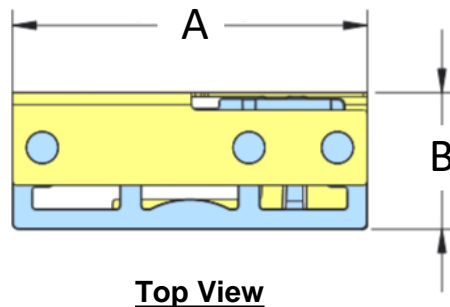
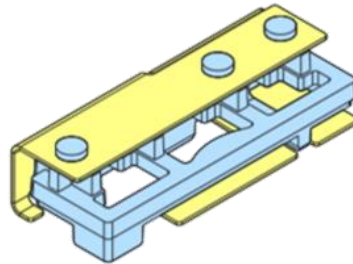


2.4 / 5 GHz Ethertronics' Embedded Antenna Specifications  
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

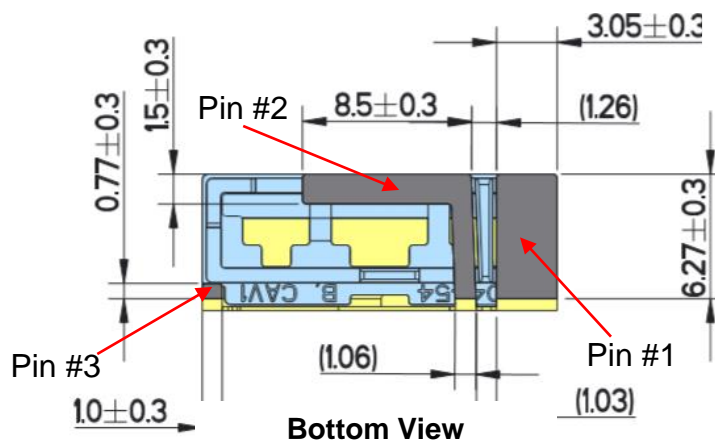
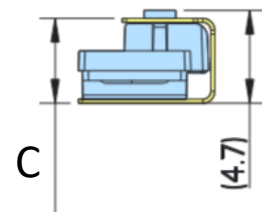
### Antenna Dimensions

Typical antenna dimensions (mm)

| Part Number | A (mm)      | B (mm)    | C (mm)    |
|-------------|-------------|-----------|-----------|
| 1004454     | 17.85 ± 0.3 | 6.9 ± 0.3 | 4.3 ± 0.4 |



**Front View**



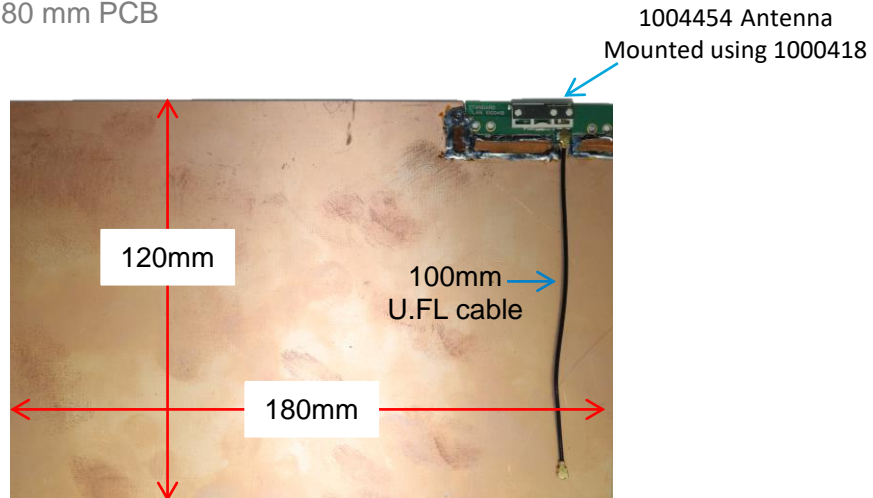
| Pin | Description |
|-----|-------------|
| 1   | Feed        |
| 2   | Ground      |
| 3   | Dummy Pad   |



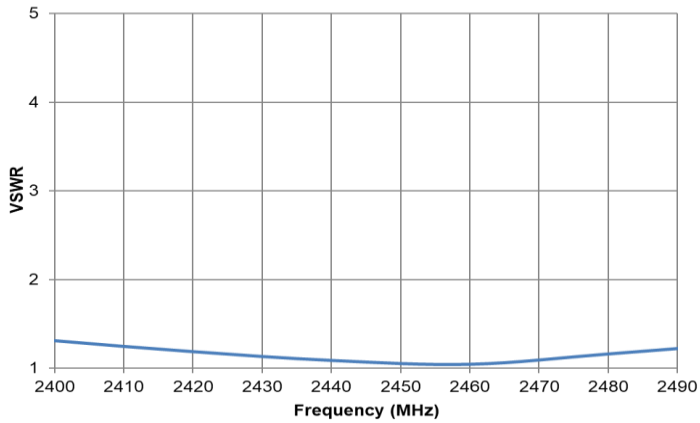
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VSWR and Efficiency Plots

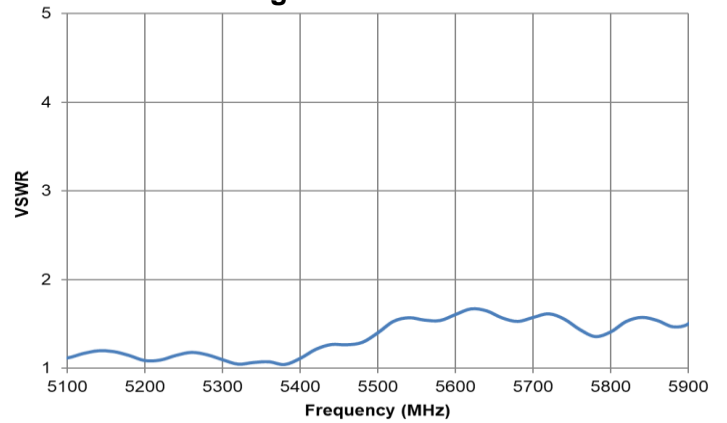
Typical Performance on 120 x 180 mm PCB



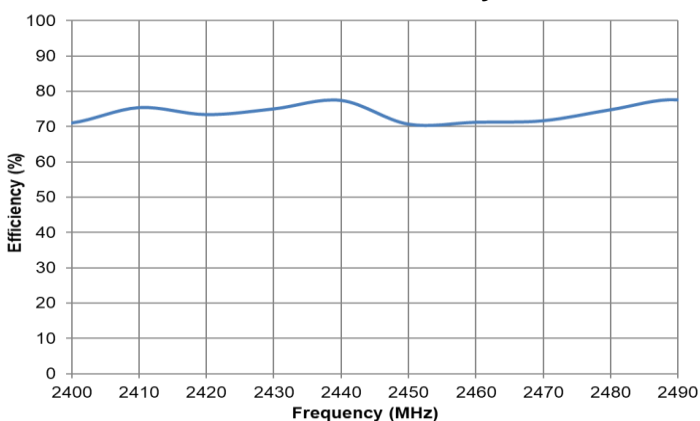
Low Band VSWR



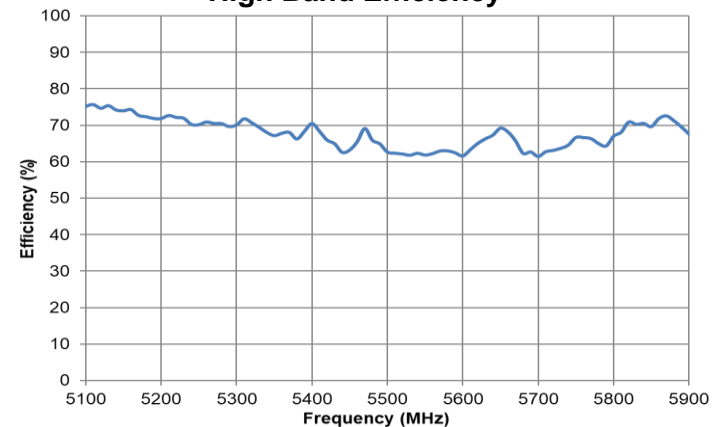
High Band VSWR



Low Band Efficiency



High Band Efficiency

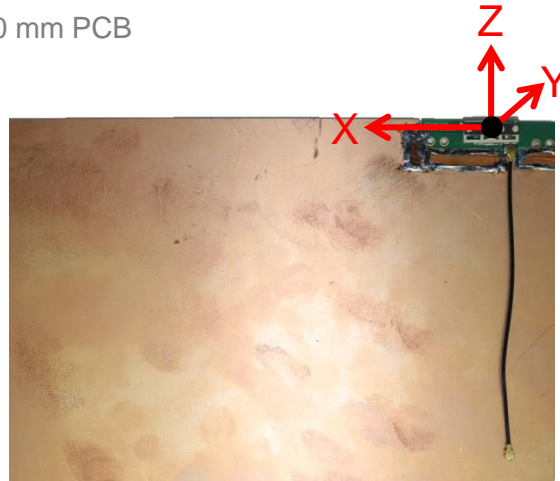




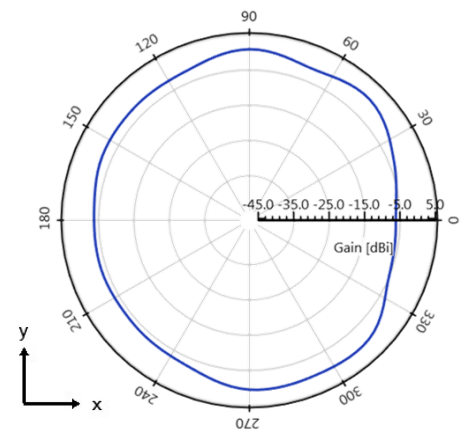
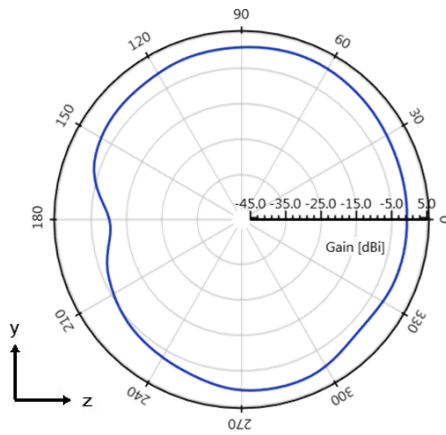
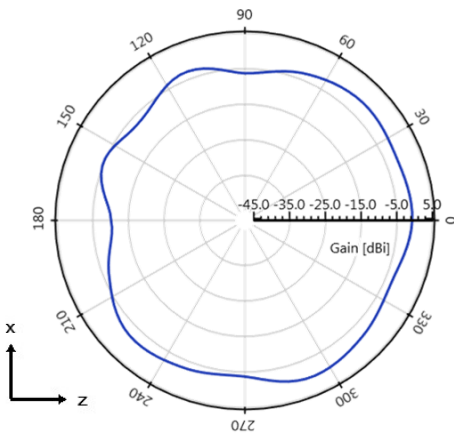
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Antenna Radiation Patterns

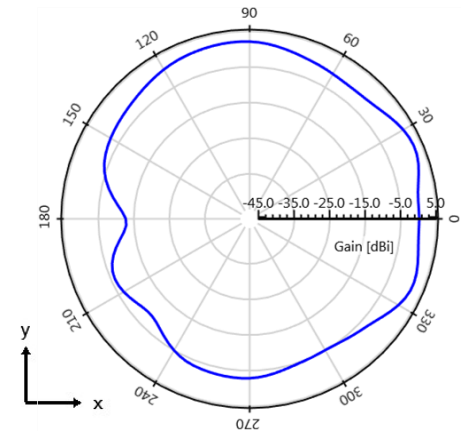
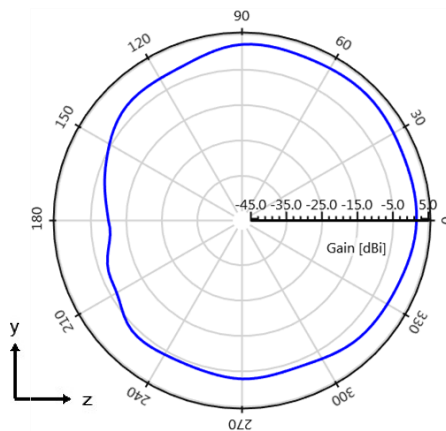
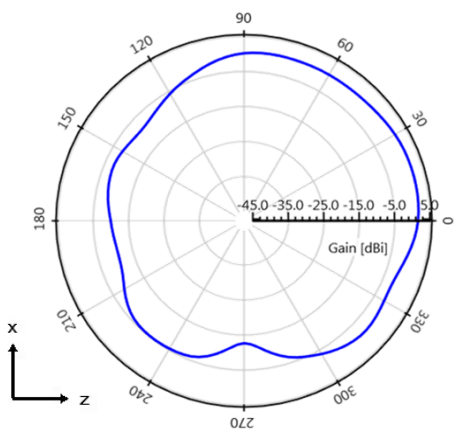
Typical Performance on 120 x 180 mm PCB  
Measured @ 2400, 5100 MHz



Measured at 2400 MHz



Measured at 5100 MHz



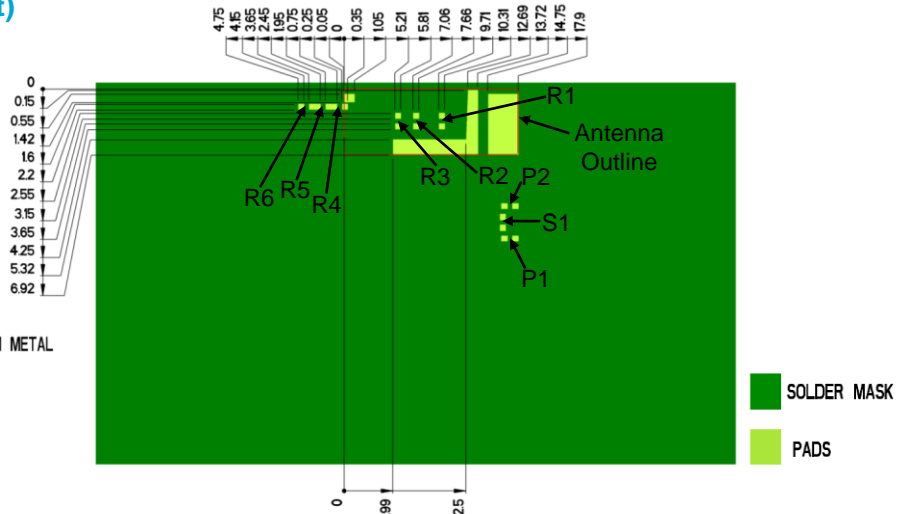
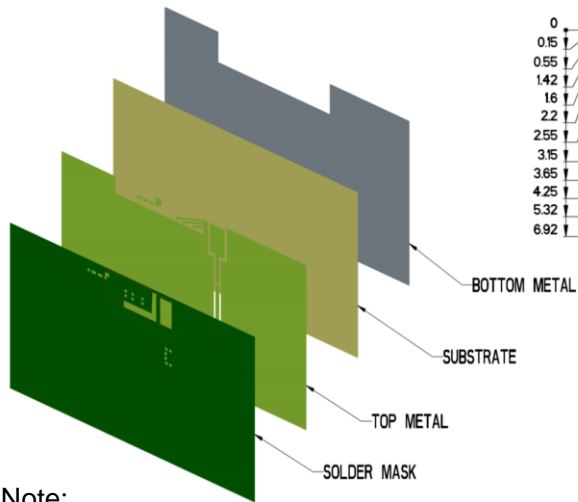


2.4 / 5 GHz Ethertronics' Embedded Antenna Specifications

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Antenna Layout (Minor Tuning Layout)

Typical layout dimensions (mm)



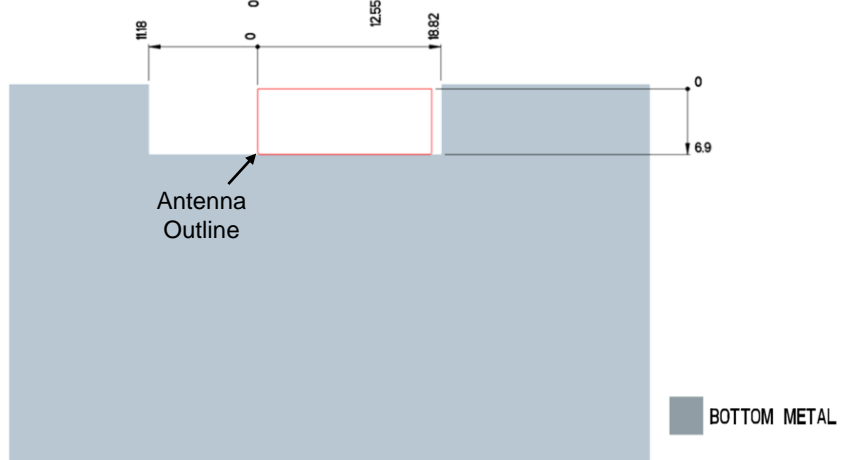
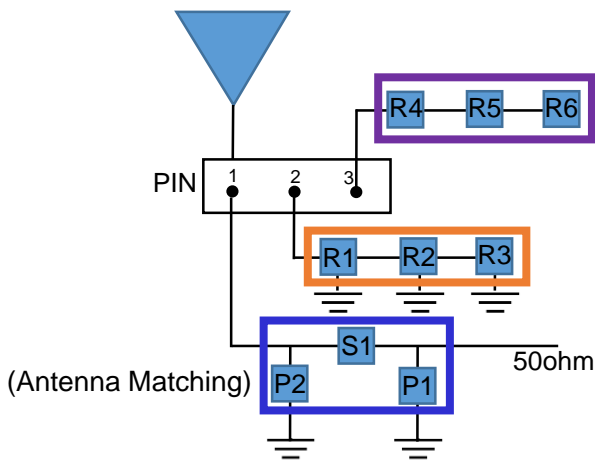
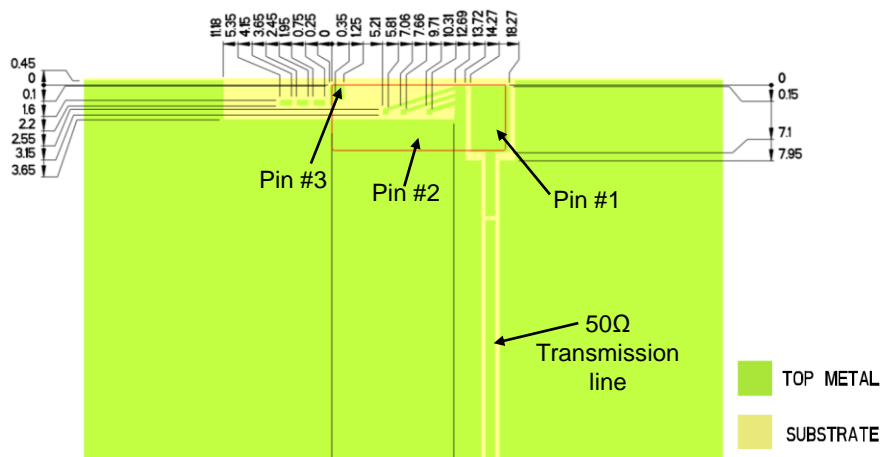
Note:

Layout has minor tuning capabilities to allow for small antenna footprint.

- 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      |
| 3    | Dummy Pad   |



Antenna Matching & Tuning Component Values

|                     | P1  | S1  | P2  | R1 – R3 | R4 – R6 |
|---------------------|-----|-----|-----|---------|---------|
| Default Values      | DNI | 0Ω  | DNI | DNI     | DNI     |
| Component Tolerance | N/A | N/A | N/A | N/A     | N/A     |

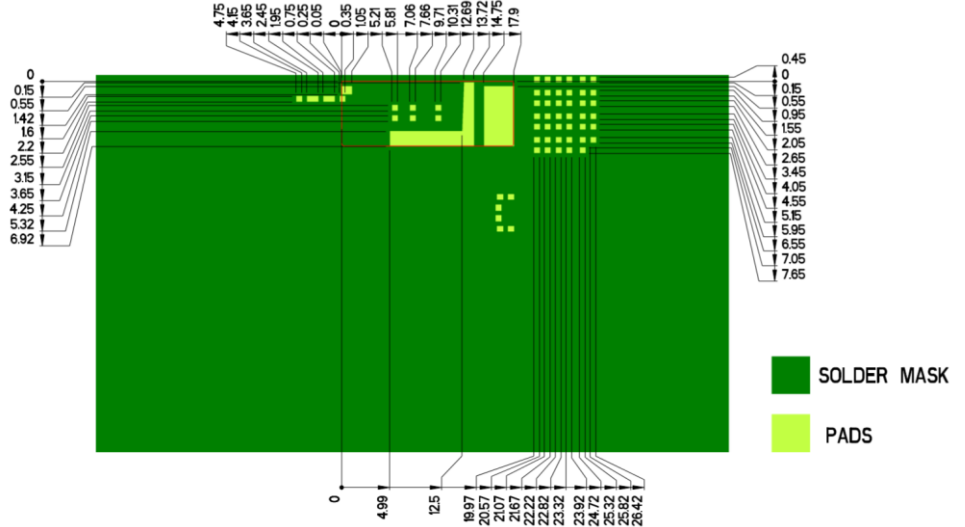
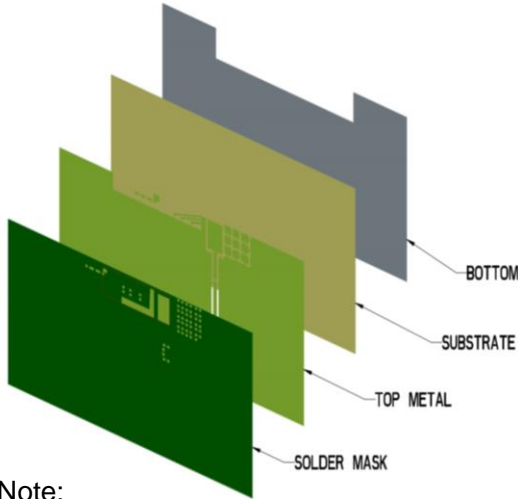


2.4 / 5 GHz Ethertronics' Embedded Antenna Specifications

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

Antenna Layout (Major Tuning Layout)

Typical layout dimensions (mm)



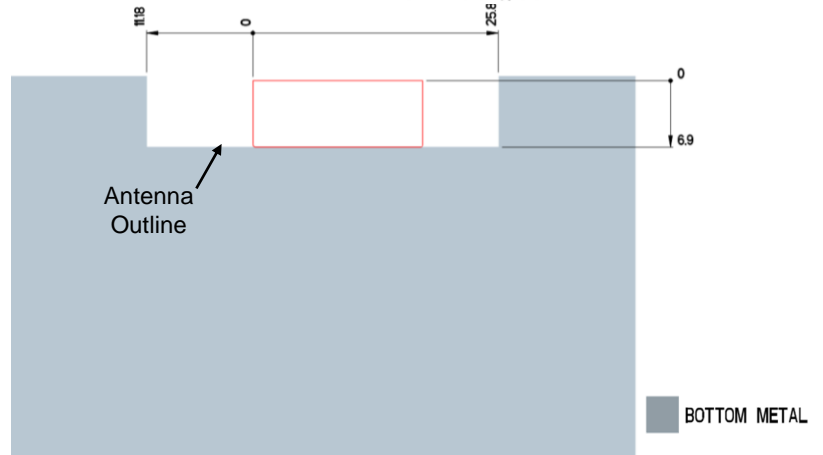
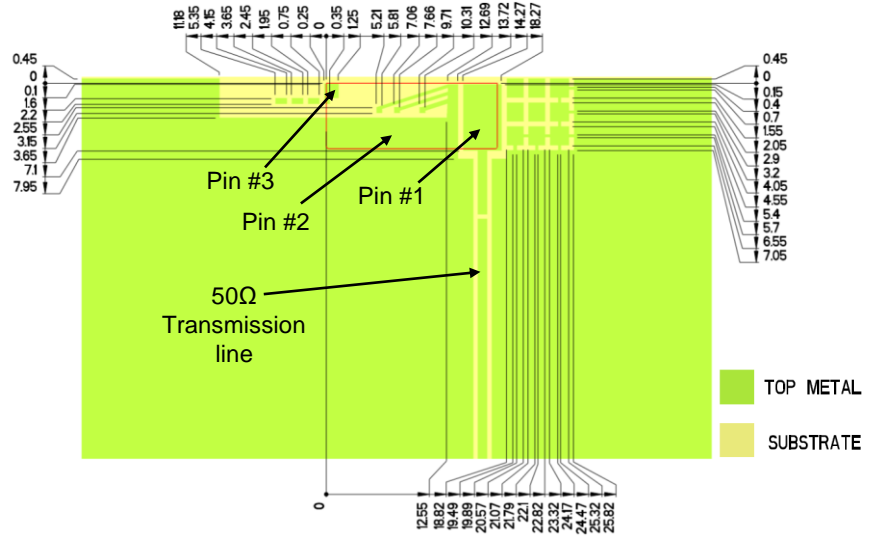
Note:

Layout has Major tuning capabilities to allow for robust tuning after board spin, instructions on [Antenna Matching Structure](#) page.

- 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      |
| 3    | Dummy Pad   |

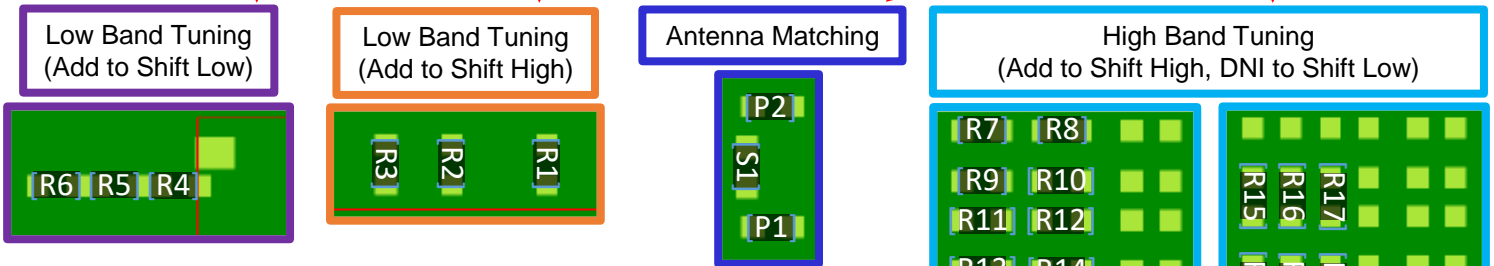
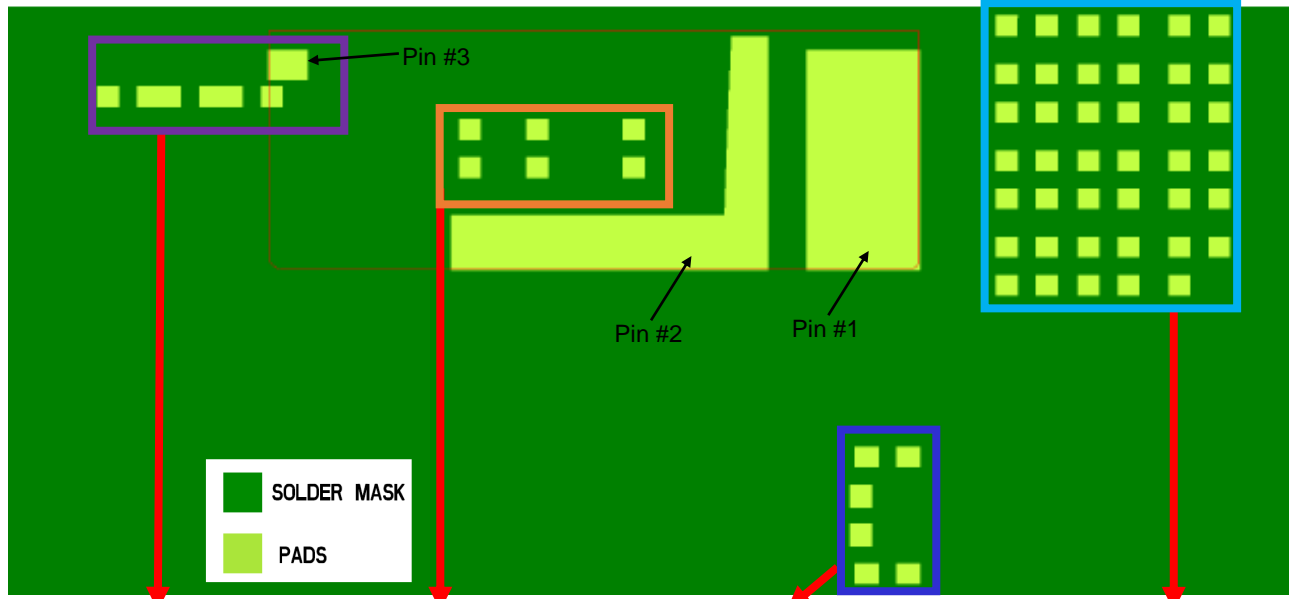




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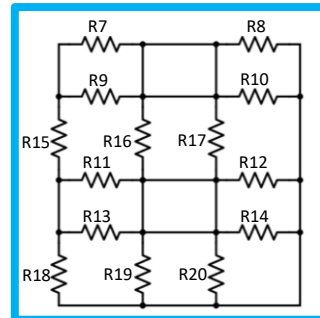
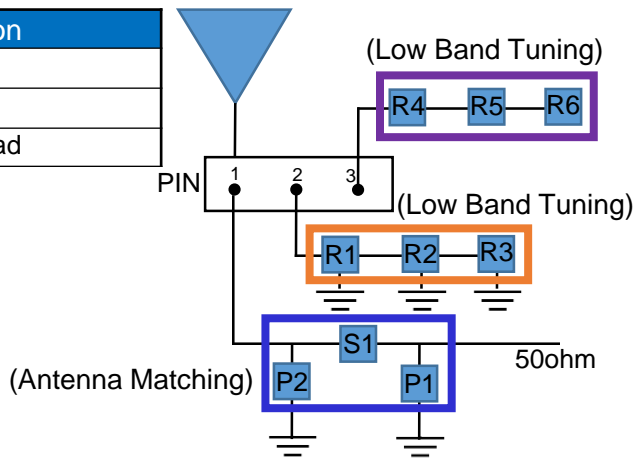
### Antenna Matching Structure (Major Tuning Structure)

Typical matching values on 140 x 50 mm PCB



#### Pin Descriptions

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



\*Extend ground towards antenna feed with 0Ω component(s). R7- R20 can improve high band bandwidth/performance with ground coupling.

|                | P1  | S1  | P2  | R1 - R3 | R4 - R6 | R7 - R14 | R15 - R20 |
|----------------|-----|-----|-----|---------|---------|----------|-----------|
| Default Values | DNI | 0Ω  | DNI | DNI     | DNI     | DNI      | DNI       |
| Tolerance      | N/A | N/A | N/A | N/A     | N/A     | N/A      | N/A       |