

# Part No. 1002232

## ISM & WLAN FR4 Embedded Antenna

868 MHz, 915 MHz, 2.4 GHz

Supports: WLAN applications, Agriculture, Automotive, Bluetooth, Tracking, Smart Home, Healthcare, Digital Signage, LoRa, Sigfox



### ISM & WLAN FR4 Embedded Antenna

863-928 MHz, 2.400 - 2500 GHz

#### KEY BENEFITS

##### Versatile Antenna

1002232 can be used to support ISM and WLAN combined, allowing reduced BOM complexity while maintaining great performances.

##### 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
- SRD868
- Telematics
- Tracking
- Healthcare
- M2M, Industrial devices
- Smart Grid
- OBD-II

Ethertronics' 1002232 FR4 antenna delivers the device designers' key needs for higher functionality and performance in smaller/thinner designs. This innovative antenna provides compelling advantages for all ISM and WLAN enabled devices.

#### Unique Form Factors Support Advanced Industrial Designs

Smaller, more efficient on-board embedded antennas break through restrictive design rules and provide new freedom in component placement.

#### Electrical Specifications

Typical performance on 110 x 50 mm PCB in free space.

Frequency	ISM EU 863 - 870 MHz	ISM US 902 - 928 MHz	WLAN 2400 - 2500 MHz
Peak Gain	0.51 dBi	0.21 dBi	1.5 dBi
Average Efficiency	63%	60%	59%
VSWR Match	2.0:1 max		
Feed Point Impedance	50 ohms unbalanced		
Polarization	Linear		
Power Handling	2 Watt CW		

#### Mechanical Specifications & Ordering Part Number

Ordering Part Number	1002232
Size (mm)	35.0 x 9.0 x 3.2
Weight (grams)	2.0
Mounting	SMT (P&P)
Packaging	Tape & Reel, 5,600 pieces per box, 1,120 per reel
Demo Board	1002232-01

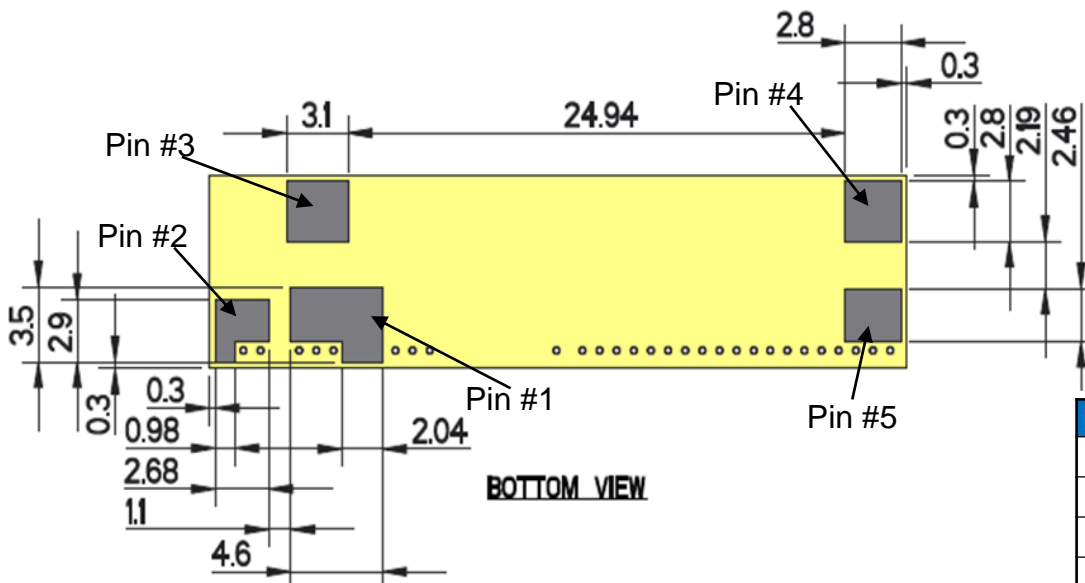
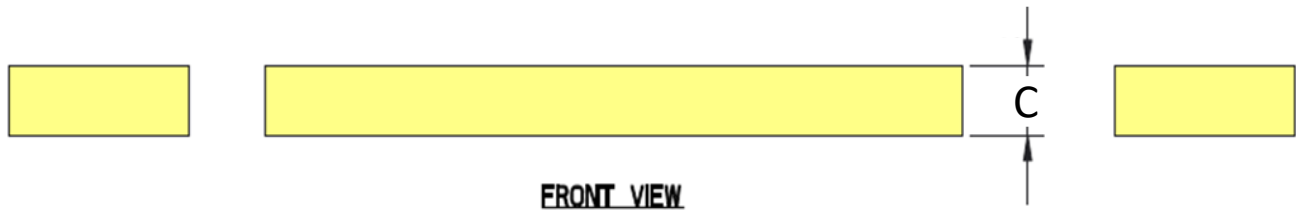
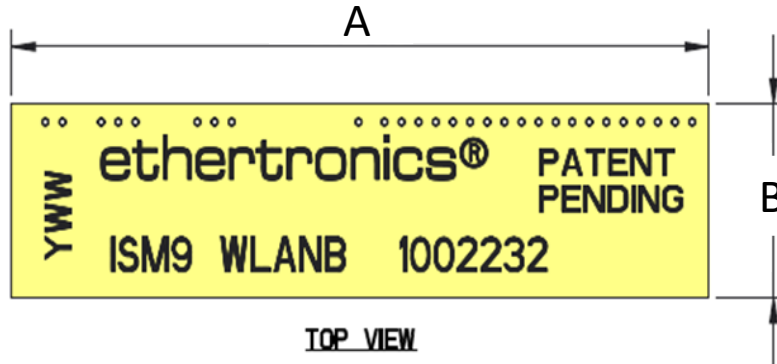


ISM / WLAN FR4 Ethertronics' Antenna Specifications  
Ethertronics produces a wide variety of standard and custom antennas to meet user needs.

### Antenna Dimensions (1002232)

Typical antenna dimensions (mm)

Part Number	A (mm)	B (mm)	C (mm)
1002232	35.0 ± 0.3	9.0 ± 0.2	3.2 ± 0.3



Pin#	Description
1	Feed
2	Ground
3	Dummy Pad
4	Dummy Pad
5	Dummy Pad



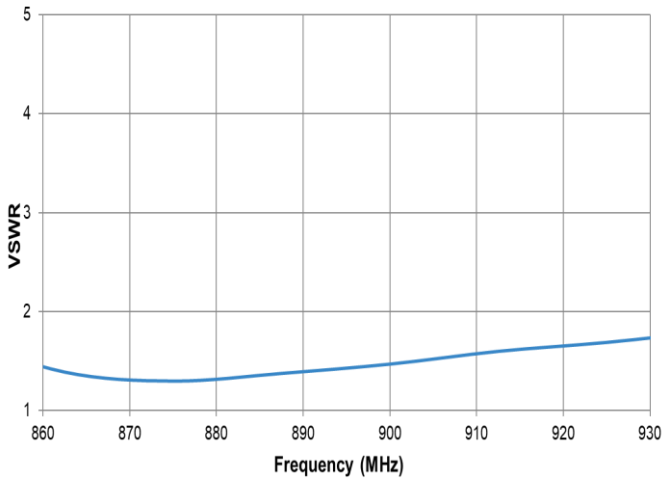
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**VSWR and Efficiency Plots**

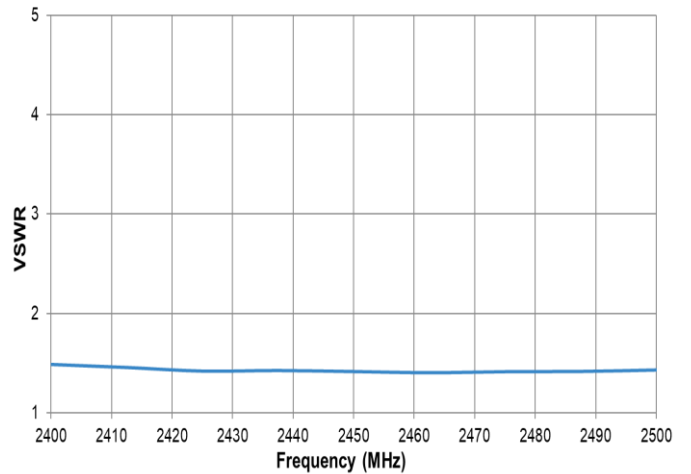
Typical performance on 110 x 50 mm PCB



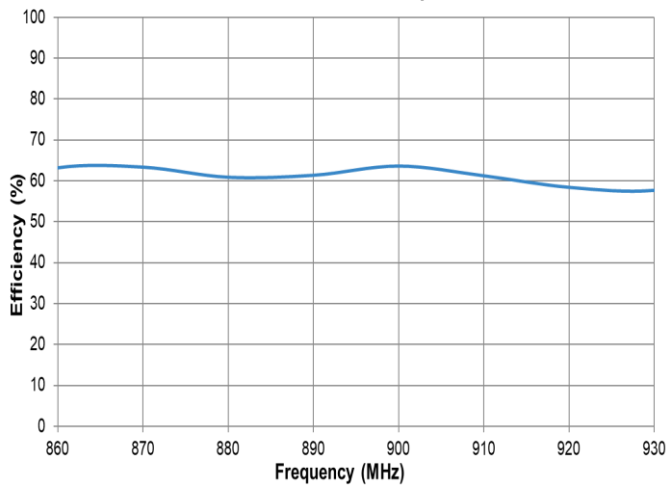
**ISM VSWR**



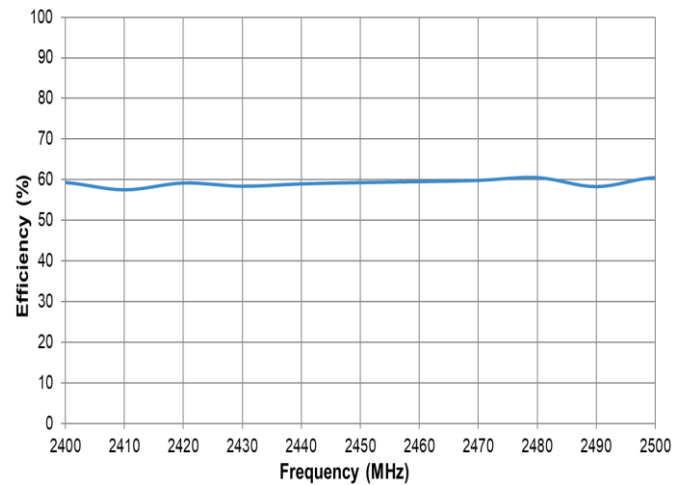
**WLAN VSWR**



**ISM Efficiency**



**WLAN Efficiency**



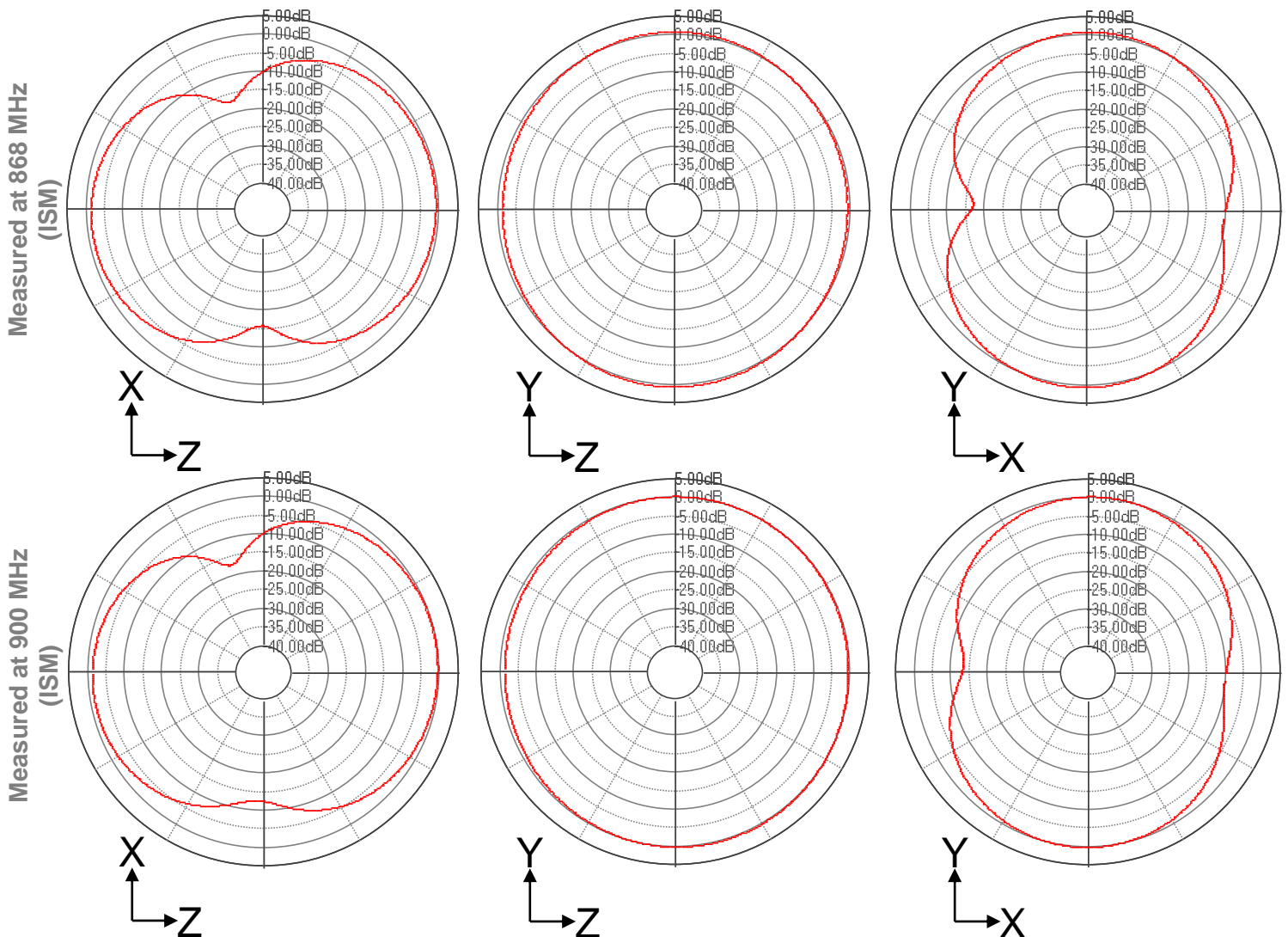
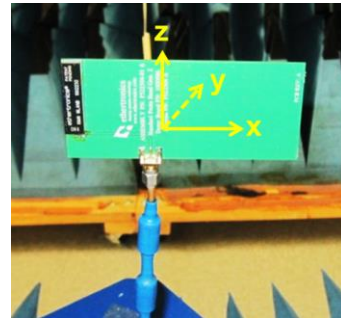
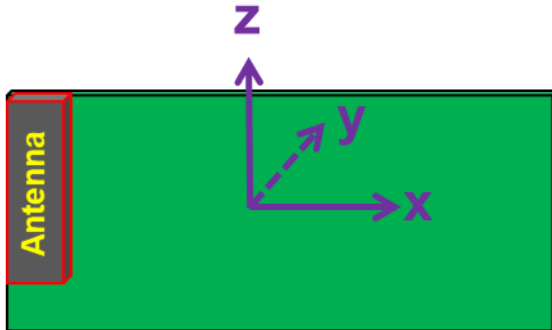


ISM / WLAN FR4 Ethertronics' Antenna Specifications

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**Antenna Radiation Patterns**

Typical performance on 110 x 50 mm PCB  
Measured @ 868, 900, 2400 MHz



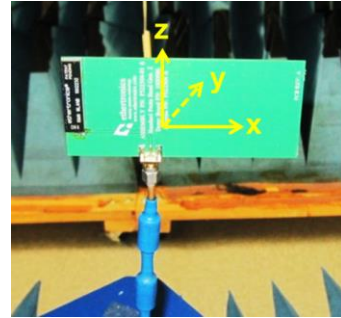
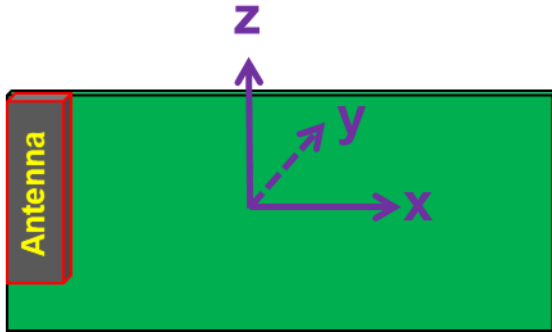


ISM / WLAN FR4 Ethertronics' Antenna Specifications

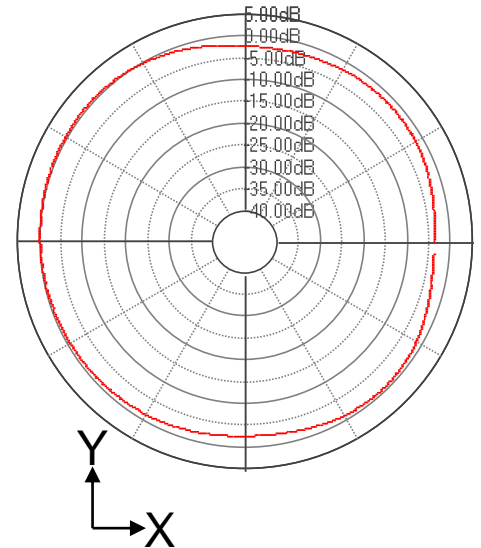
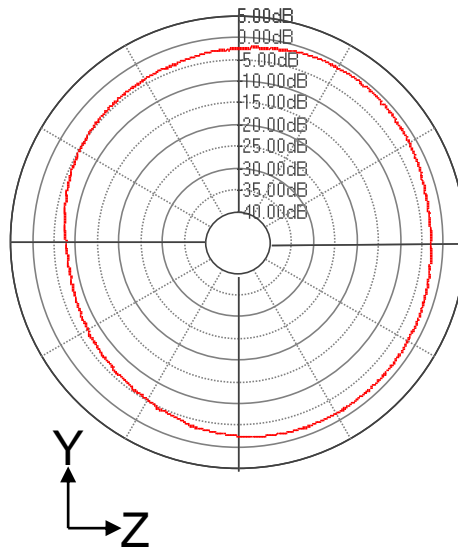
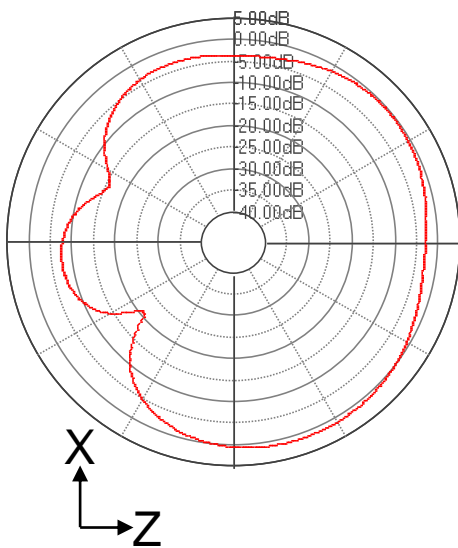
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**Antenna Radiation Patterns**

Typical performance on 110 x 50 mm PCB  
Measured @ 868, 900, 2400 MHz



Measured at 2400 MHz  
(WLAN)

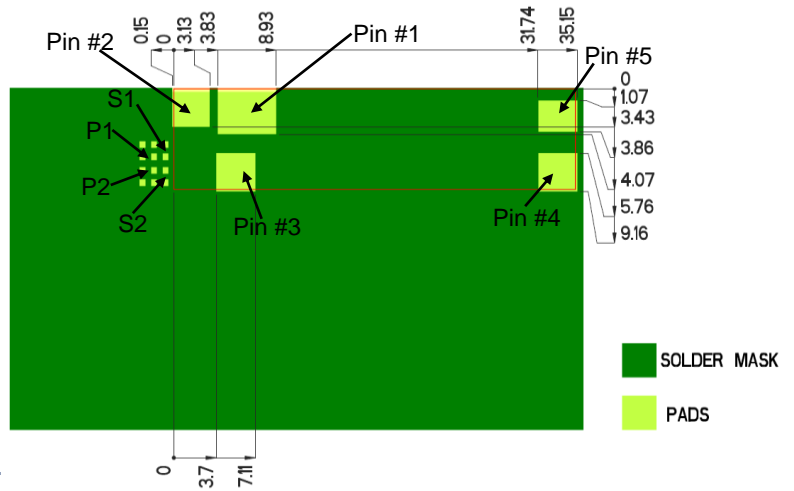
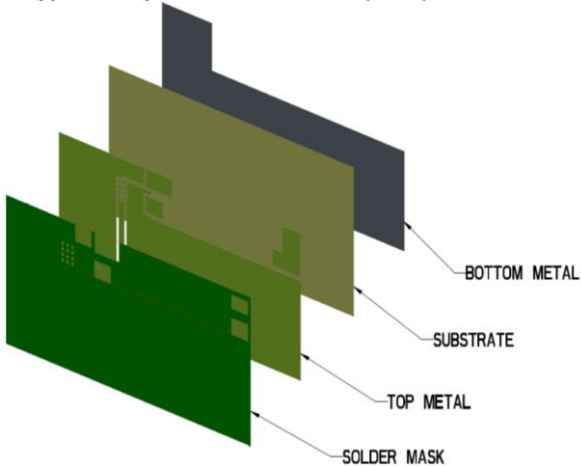




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Antenna Layout

Typical layout dimensions (mm)



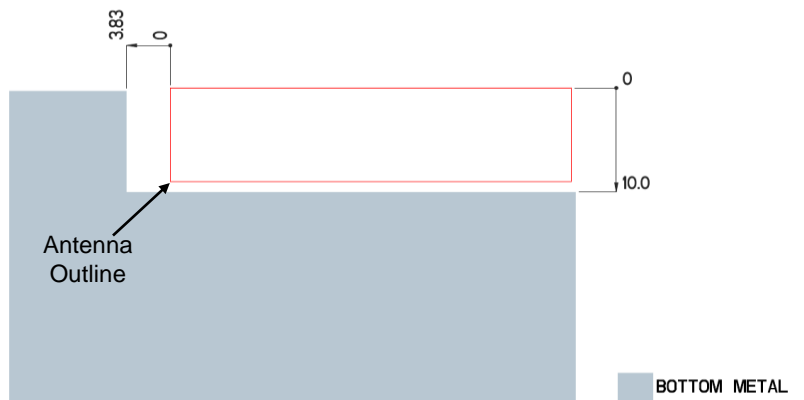
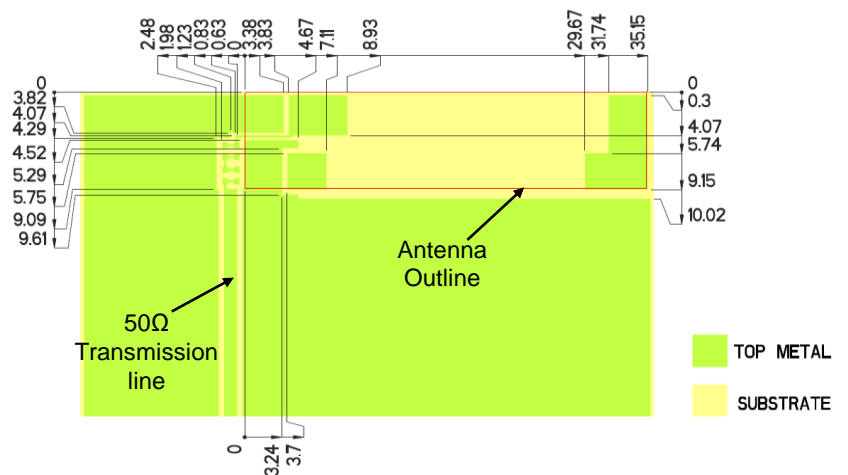
\* VIAS: Diam. 0.2mm, (no vias on transmission lines).  
Via holes must be covered by solder mask

Pin Descriptions

Pin#	Description
1	Feed
2	Ground
3	Dummy Pad
4	Dummy Pad
5	Dummy Pad

Matching & Tuning Component Values

Component	Value	Tolerance
S1	2.0pF	±0.05pF
P1	N/A	N/A
P2	0.5pF	±0.05pF
S2	3.3nH	±0.1nH



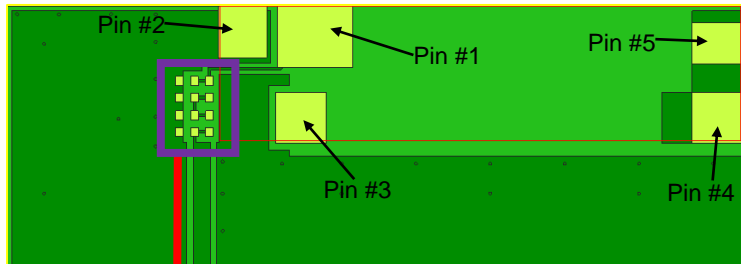


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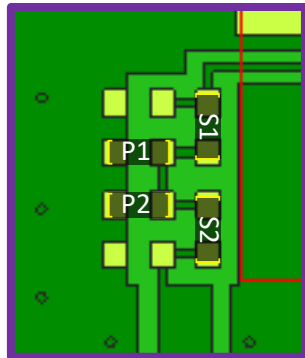
### Antenna Matching Structure

Typical matching values on 50 x 110 mm PCB

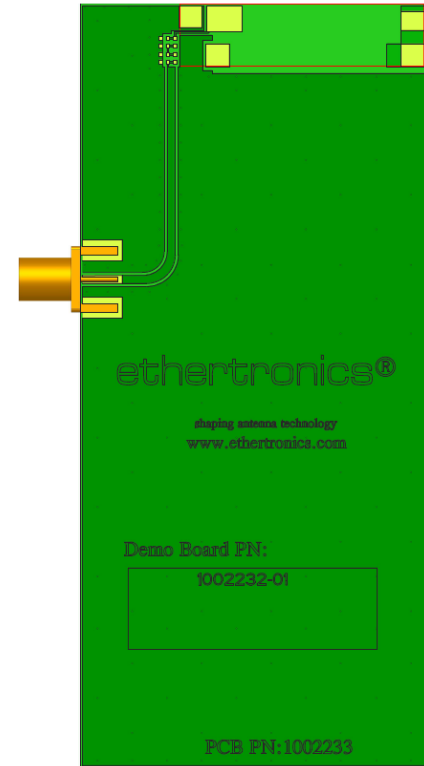
Demo Board Front View



#### Antenna Matching

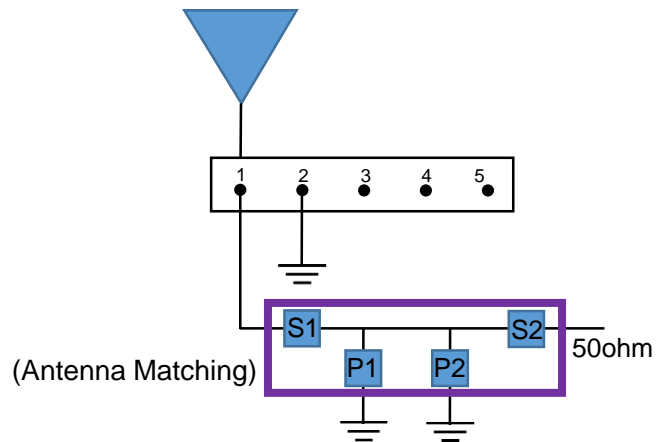


(Antenna Matching):  
pads are directly inline with  
the antenna feed trace.



#### Pin Descriptions

Pin#	Description
1	Feed
2	Ground
3	Dummy Pad
4	Dummy Pad
5	Dummy Pad



	S1	P1	P2	S2
<b>Default Matching</b>	2.0pF	N/A	0.5pF	3.3nH
<b>Tolerance</b>	±0.05pF	N/A	±0.05pF	± 0.1nH



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**Antenna Demo Board (1002232)**

Demo Board Front view (mm)

