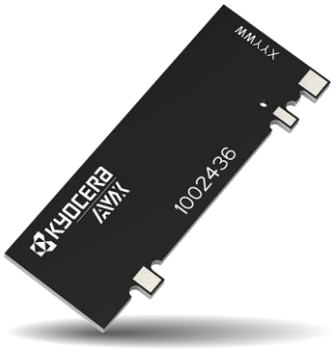
# Part No. 1002436

## Vertical Wideband FR4 Embedded LTE / LPWA Antenna

**700 / 750 / 850 / 900 / 1800 / 1900 / 2100 MHz**

Supports: Broadband LTE (OCTA-BAND), LTE CAT-M, NB-IoT, LoRa, Cellular




KYOCERA AVX Vertical Wideband Embedded LTE/LPWA antenna utilizes Isolated Magnetic Dipole™ (IMD) technology which address the challenges facing today's product designers. IMD's high performance and isolation characteristics offer better connectivity and minimal interference. A versatile solution such as the 1002436 FR4 antenna offers support for Broadband LTE, LTE CAT-M, NB-IoT, SigFox, LoRa, Cellular LPWA, RPMA applications.

### Stays in Tune

IMD antenna technology provides superior RF field containment, resulting in less interaction with surrounding components. KYOCERA AVX IMD antennas resist detuning; providing a robust radio link regardless of the usage position

**Vertical Wideband FR4 Embedded LTE / LPWA**

Low Band 700 - 960 MHz
High Band 1700 - 2700 MHz

KYOCERA AVX antennas use patented IMD technology in many antenna configurations to provide high performance. IMD antennas requires a smaller design keep-out area, carry lower program development risk which yields a quicker time-to-market, without sacrificing RF performance.

### Electrical Specifications

Typical Characteristics on 50 x 120 mm ground plane

| Frequency | 698 - 960 MHz | 1710 - 2200 MHz | 2500 – 2700 MHz |
|---|---|---|---|
| Efficiency | 69% | 63% | 53% |
| VSWR | < 3.5:1 | < 2.5:1 | < 2.5:1 |
| Peak Gain | 2.3 dBi | 3.2 dBi | 3.0 dBi |
| Polarization | Linear | | |
| Power Handling | 2 Watts CW | | |
| Radiation Pattern | Omni-directional | | |
| Feed Point Impedance | 50 ohms unbalanced | | |
| Additional Resources | Download Simulation Files | | |

### KEY BENEFITS

**Reduced Costs and Time-to-Market**

Standard antenna eliminates design fees and cycle time associated with a custom solution; getting products to market faster.

**Greater Flexibility with Unique Form Factors**

KYOCERA AVX technology helps you deliver more advanced ergonomic designs without adverse impact on product performance.

**Environmental Compliance**

Comply with latest RoHS and WEEE requirements

### APPLICATIONS

- Medical applications
- Home automation
- Smart metering
- M2M, Industrial devices
- IoT
- Firstnet
- Healthcare (FDA Class I)
- Point of Sale
- Tracking
- Cellular
- 3G Systems

### Mechanical Specifications & Ordering Part Number

| Ordering Part # | 1002436 |
|---|---|
| Dimensions (mm) | 50.6 x 19.6 x 1.6 |
| Weight (grams) | 3.05 |
| Mounting | Vertical PCB antenna with through-hole solder pads. (Hand Soldering Method Recommended) |
| Packaging | 5,000 pcs/box |
| Demo Board | 1002436-01 |
| Additional Resources | Download DXF, Gerber and 3D FIT Files |

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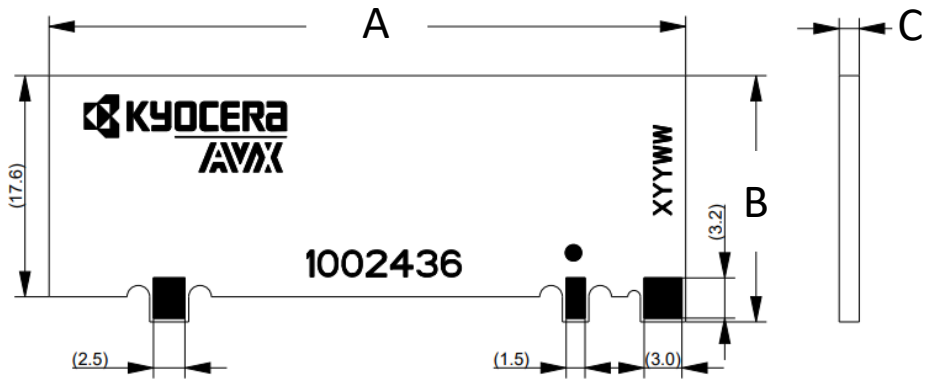
**KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.**

## Antenna Dimensions

Typical antenna dimensions (mm)

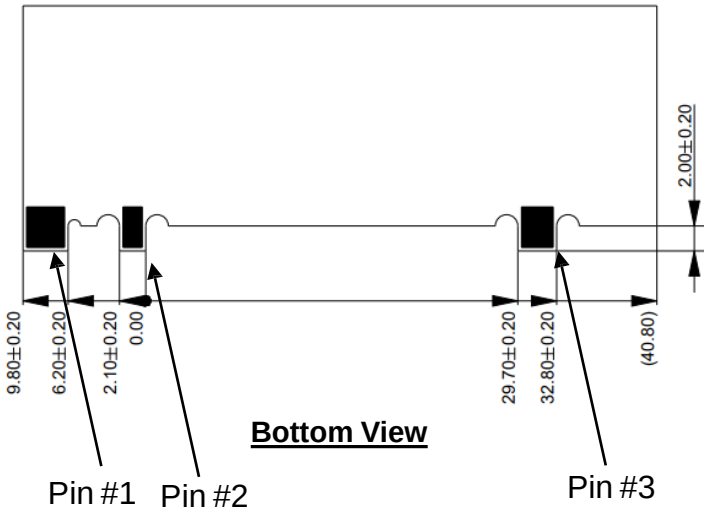
| Part Number | A | B | C |
|---|---|---|---|
| 1002436 | 50.6 ± 0.2 | 19.6 ± 0.2 | 1.6 ± 0.2 |




**Top View** **Side View**

Pin Descriptions

| Pin# | Description |
|---|---|
| 1 | Feed |
| 2 | Ground |
| 3 | Low Band Tuning |




**Bottom View**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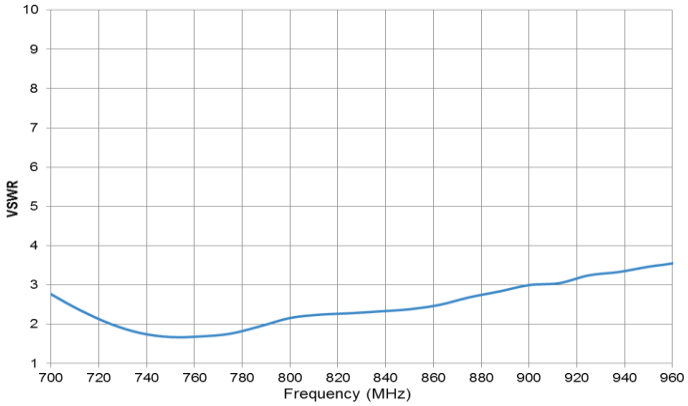
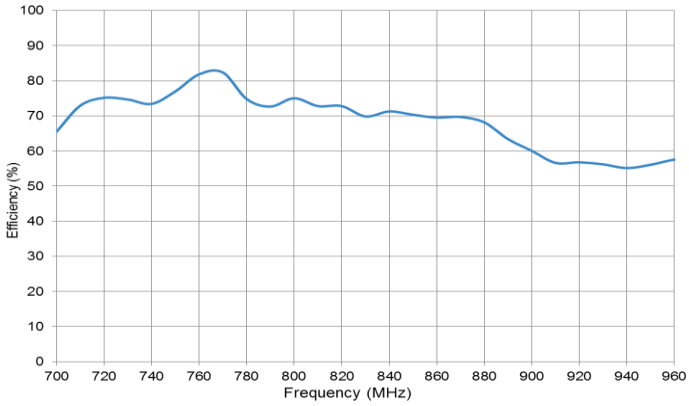
## VSWR and Efficiency Plots

Typical performance on 120 x 50 mm PCB

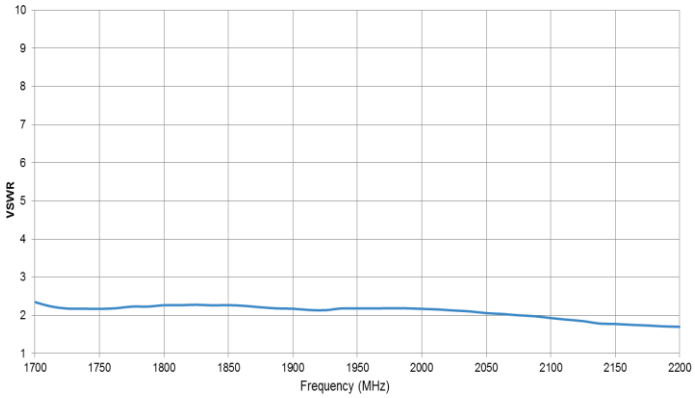
### Low Band VSWR



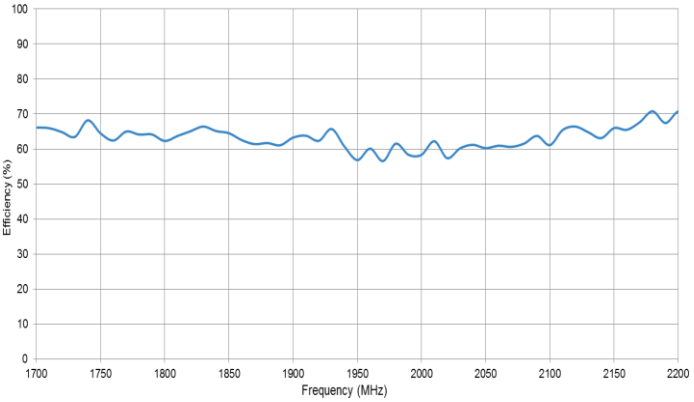

### Low Band Efficiency



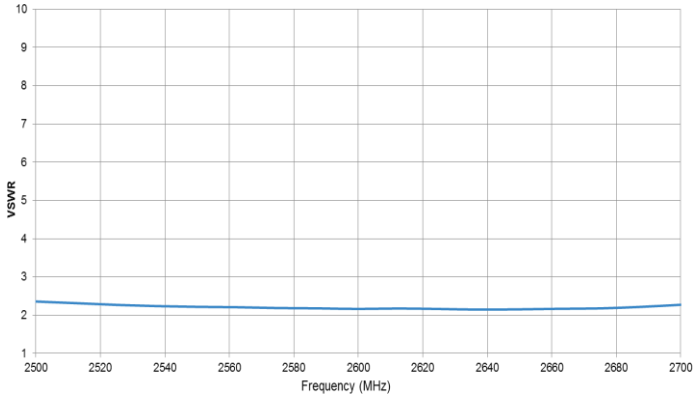

### High Band VSWR



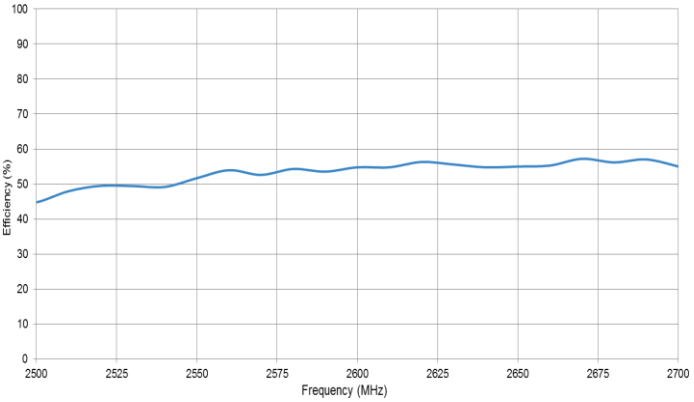

### High Band Efficiency




### High High Band VSWR




### High High Band Efficiency





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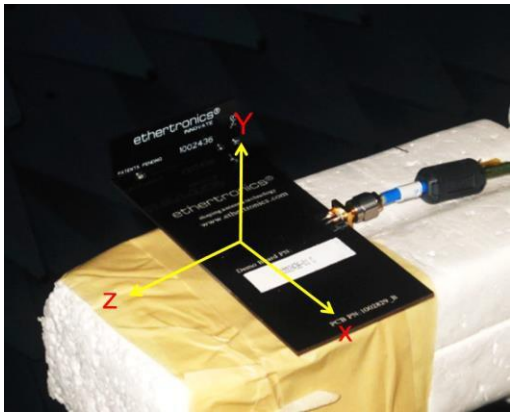
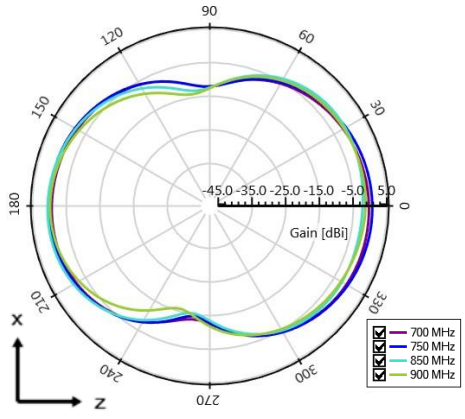
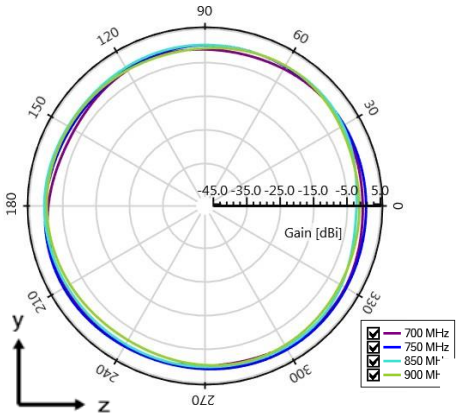
## Antenna Radiation Patterns

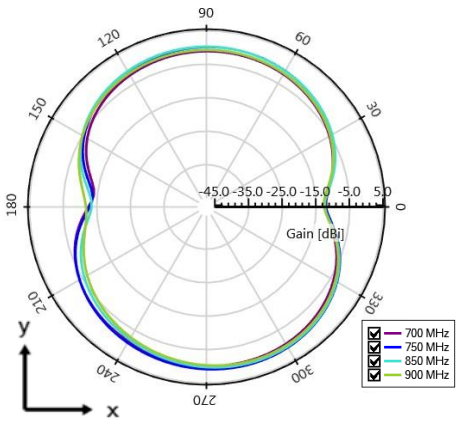
Typical performance on 120 x 50 mm PCB
Measured @ 700, 750, 850, 900, 1710, 1800, 1900, 2150 MHz



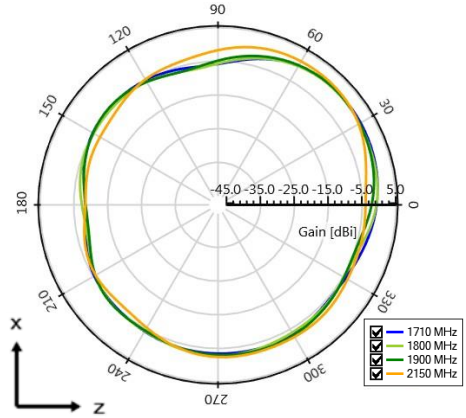

**Low Band Measured at 700, 750, 850, 900 MHz**

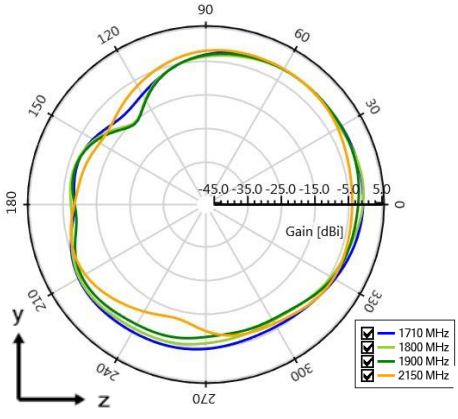


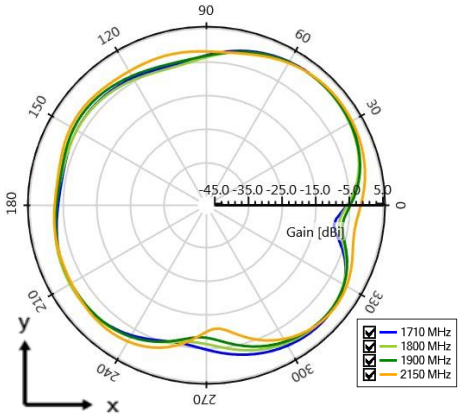




**High Band Measured at 1710, 1800, 1900, 2150 MHz**



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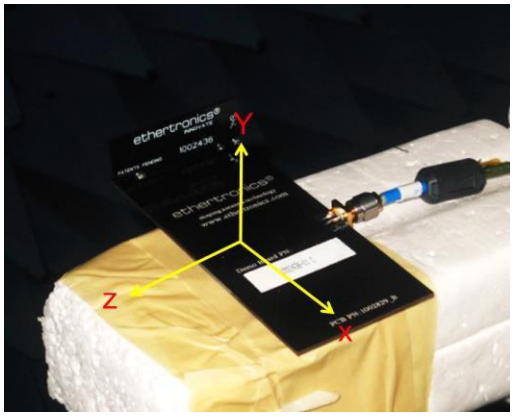
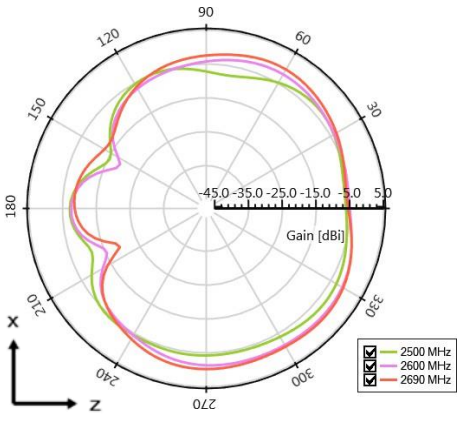
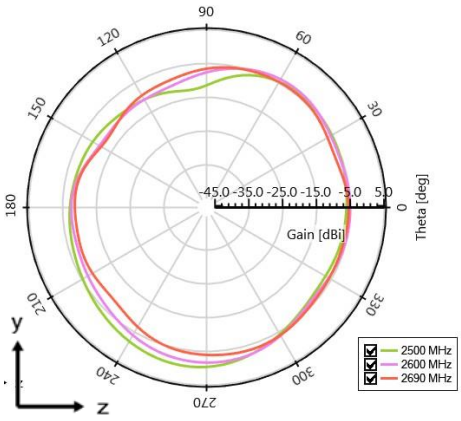
## Antenna Radiation Patterns

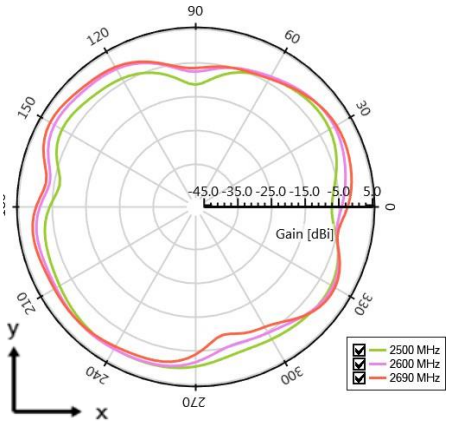
Typical performance on 120 x 50 mm PCB
Measured @ 2500, 2600, 2690 MHz




**High High Band Measured at 2500, 2600, 2690 MHz**



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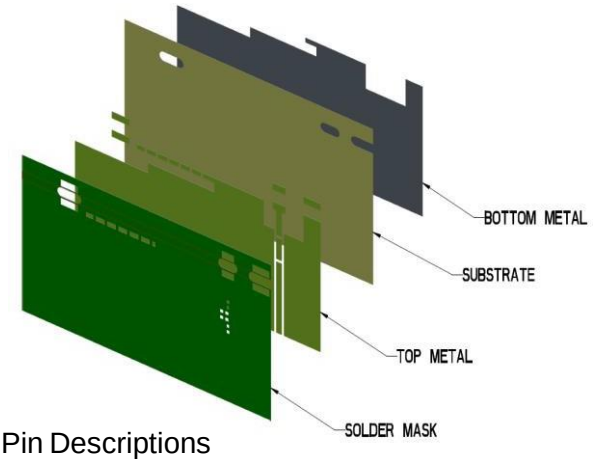
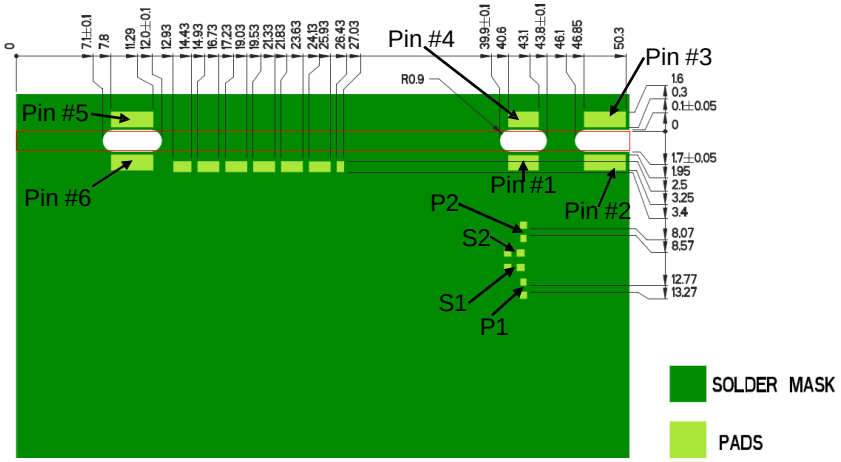
## Antenna Layout (On-Ground)

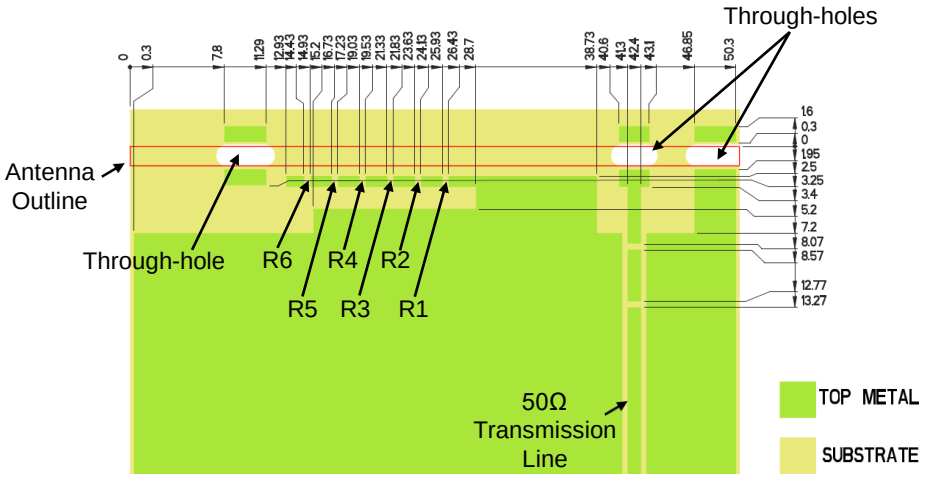
Typical layout dimensions (mm)




### Pin Descriptions

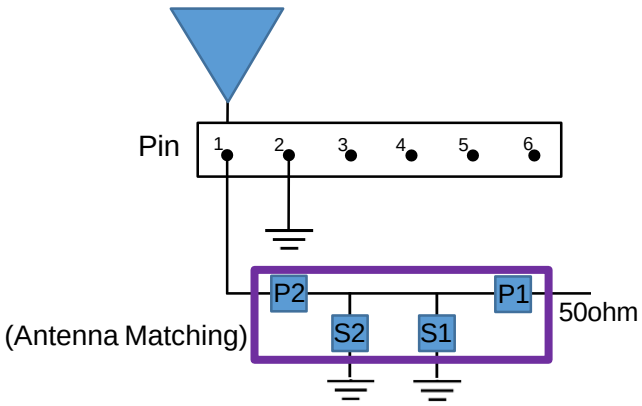
| Pin# | Description |
|---|---|
| 1 | Feed |
| 2 | Ground |
| 3 | Dummy Pad |
| 4 | Dummy Pad |
| 5 | Dummy Pad |
| 6 | Dummy Pad |

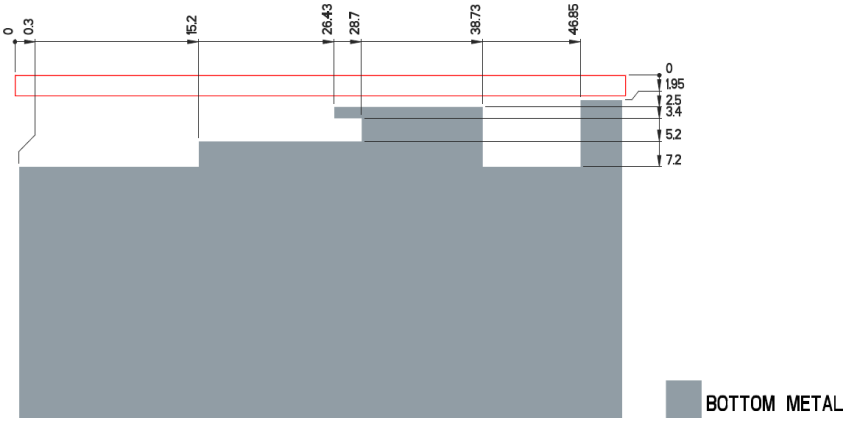



### Matching Pi Network +Tuning values

| Component | Value | Tolerance |
|---|---|---|
| P1 | 6.8pF | ±0.1pF |
| S1 | 22nH | ±5% |
| S2 | DNI | N/A |
| P2 | 0Ω | N/A |
| R1 – R6 | DNI | N/A |

Default Pi Matching Network values and (R1- R6) tuning instructions can be found under Antenna Matching Structure.





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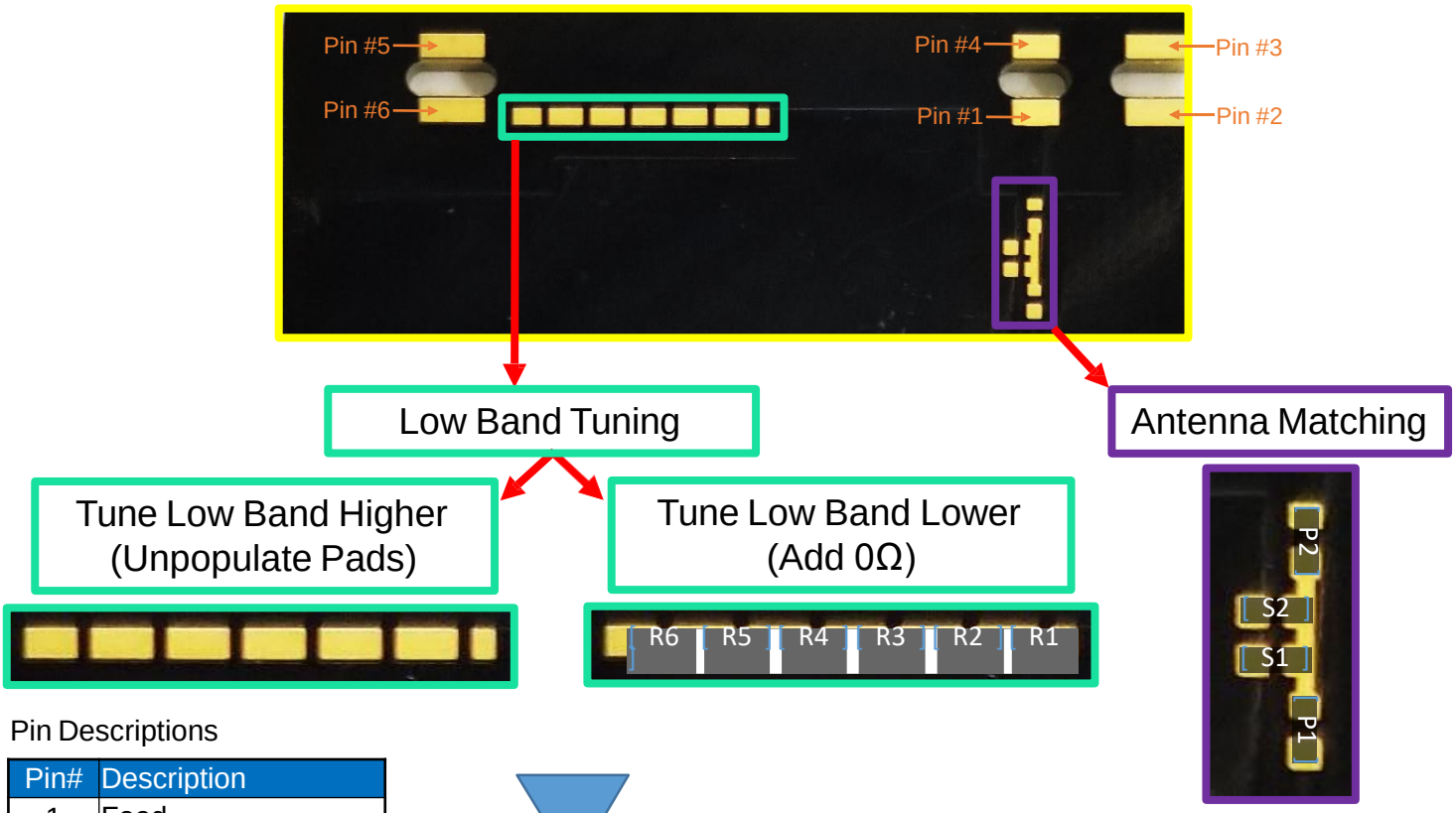
## Antenna Matching Structure

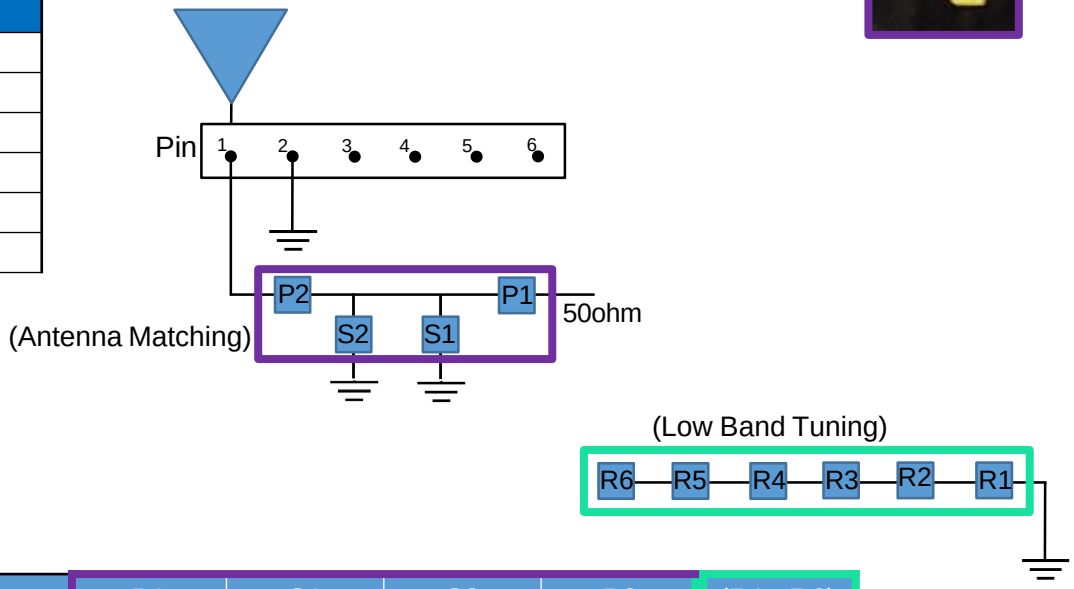
Typical matching values on 50 x 120 mm PCB

### Demo Board Front View




Pin Descriptions

| Pin# | Description |
|---|---|
| 1 | Feed |
| 2 | Ground |
| 3 | Dummy Pad |
| 4 | Dummy Pad |
| 5 | Dummy Pad |
| 6 | Dummy Pad |




| | P1 | S1 | S2 | P2 | (R1 - R6) |
|---|---|---|---|---|---|
| **Default Matching** | 6.8pF | 22nH | DNI | 0Ω | DNI |
| **Tolerance** | ±0.1pF | ± 5% | N/A | N/A | N/A |



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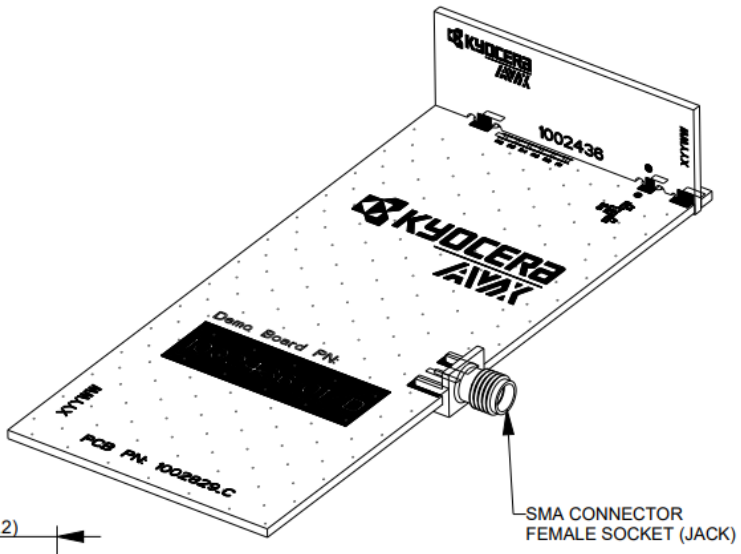
## Antenna Demo Board

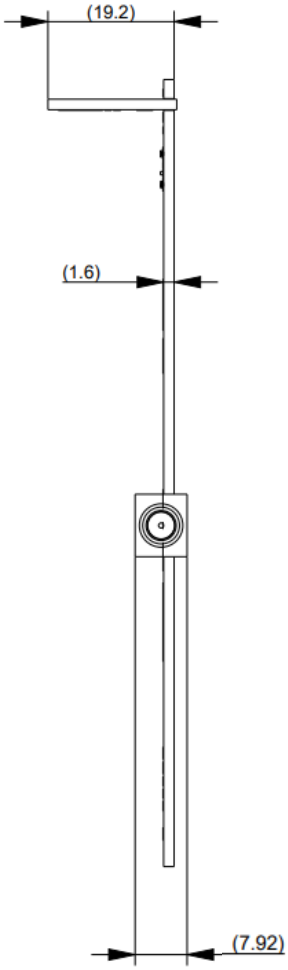
Demo Board Front/Side View

| Part Number | A (mm) | B (mm) |
|---|---|---|
| 1002436-01 | 120±0.20 | 50±0.20 |





**Front View**




**Side View**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## Additional Resources – 1002436

**Simulation Files:**
HFSS: https://www.kyocera-avx.com/download/antennas/ansys-hfss/1002436-hfss.zip
CST: https://www.kyocera-avx.com/download/antennas/CST/1002436_CST.zip

**3D FIT File:**
https://www.kyocera-avx.com/download/antennas/ME-FIT/1002436_ME_fit.zip

**DXF File:**
https://www.kyocera-avx.com/download/antennas/3D-DXF/1002436_3D-DXF.zip

**Gerber File:**
https://www.kyocera-avx.com/download/antennas/GERBER/1002436_GERBERS.zip



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