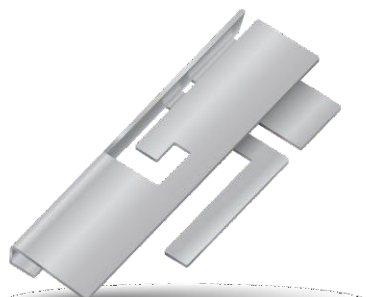


# Part No. 1000146

## Wi-Fi / BT Dual Band or CBRS/n78 Stamped Metal Embedded Antenna

2.4 / 5 GHz or 3.3 – 3.8 GHz

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



\*CBRS/n78 layout offered in Appendix 1

### Stamped Metal Wi-Fi or CBRS/n78 Embedded Antenna

2.4 GHz; 5 GHz; 3.3 - 3.8 GHz

KYOCERA AVX 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.

#### KEY BENEFITS

##### Stay-in-Tune

KYOCERA AVX 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

#### Greater Flexibility

KYOCERA AVX first-in-class IMD technology enables you to develop concept designs that are more advanced and that deliver superior performance in reception critical applications. The 1000146 can also achieve CBRS/n78 performance with proper tuning and layout shown on Appendix 1.

#### Electrical Specifications

Typical Characteristics, on 120 x 180 mm PCB

Frequency (GHz)	2.400 – 2.485	4.900 – 5.825	3.300– 3.800
Peak Gain	1.5 dBi	2.6 dBi	Refer to Appendix 1
Average Efficiency	80%	72%	
VSWR Match	1.5:1 max	1.6:1 max	
Feed Point Impedance	50 ohms unbalanced		
Polarization	Linear		
Power Handling	0.5 Watt CW		

#### Mechanical Specifications & Ordering Part Number

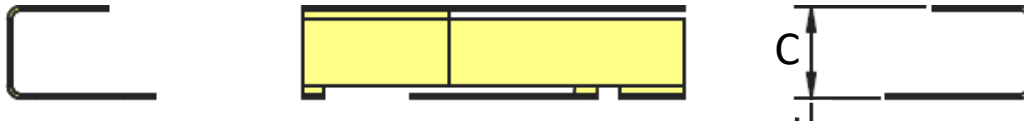
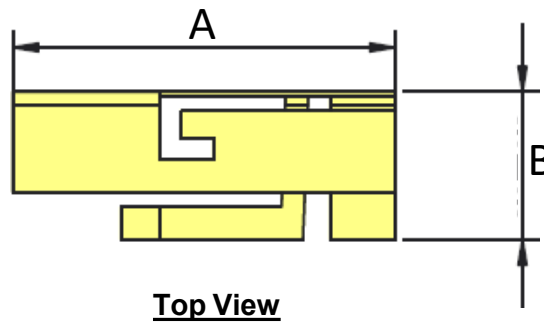
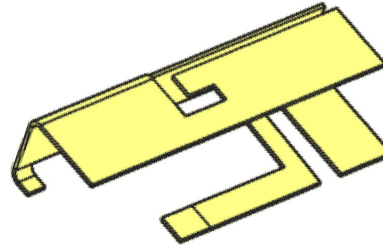
Ordering Part Number	1000146
Size (mm)	17.85 x 6.9 x 4.3
Mounting	SMT
Weight (grams)	0.35
Packaging	Tape & Reel, 1000146 – 1,200 pieces per reel
Demo Board	1000418

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

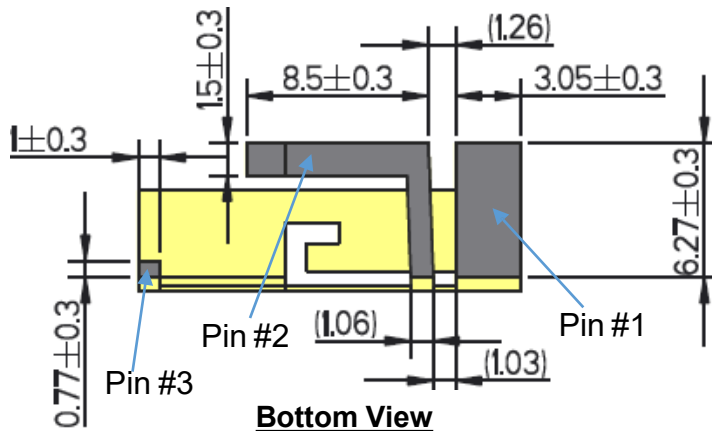
**Antenna Dimensions**

Typical antenna dimensions (mm)

Part Number	A (mm)	B (mm)	C (mm)
1000146	17.85 ± 0.3	6.9 ± 0.3	4.3 ± 0.4



**Height**

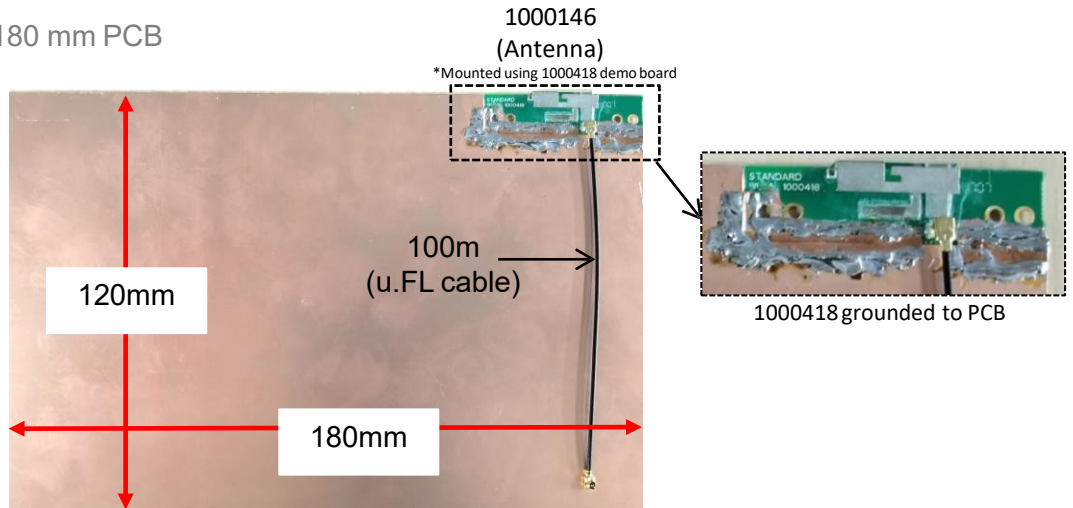


Pin	Description
1	Feed
2	Ground
3	Dummy Pad

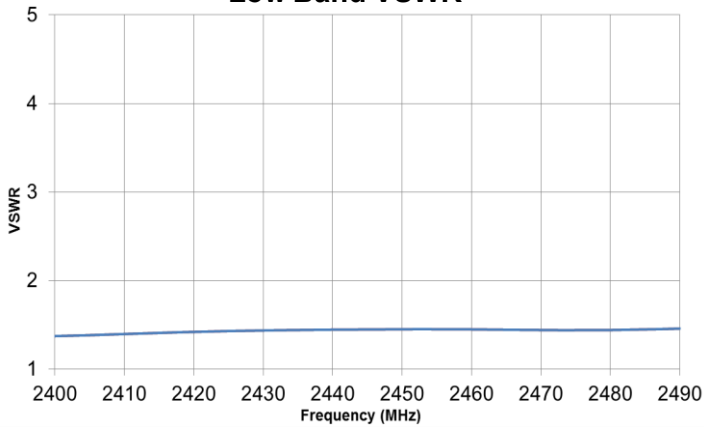
**2.4 / 5 GHz KYOCERA AVX Embedded Antenna Specifications**  
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

**VSWR and Efficiency Plots**

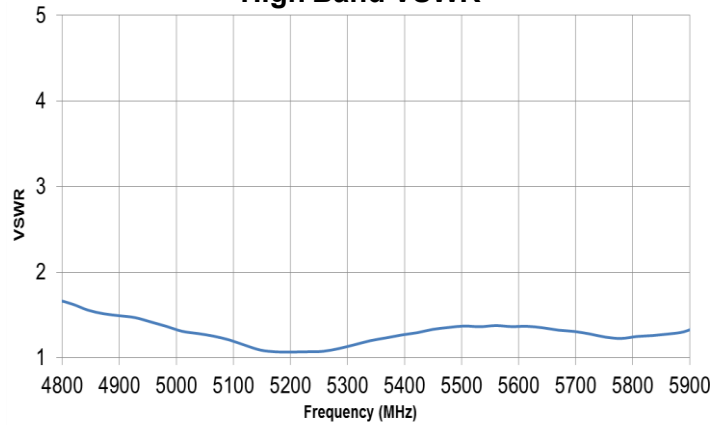
Typical Performance on 120 x 180 mm PCB



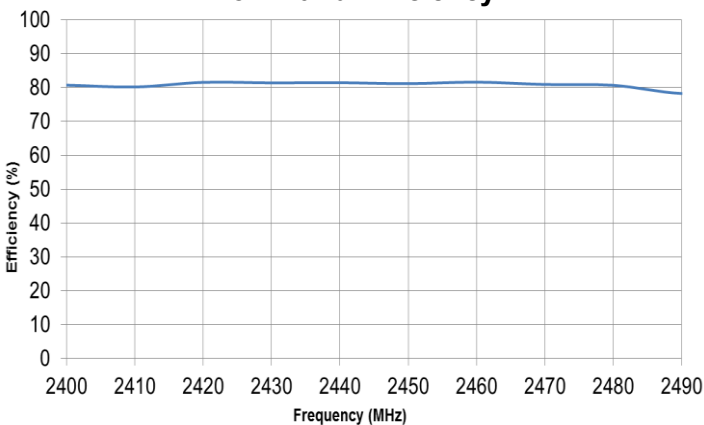
**Low Band VSWR**



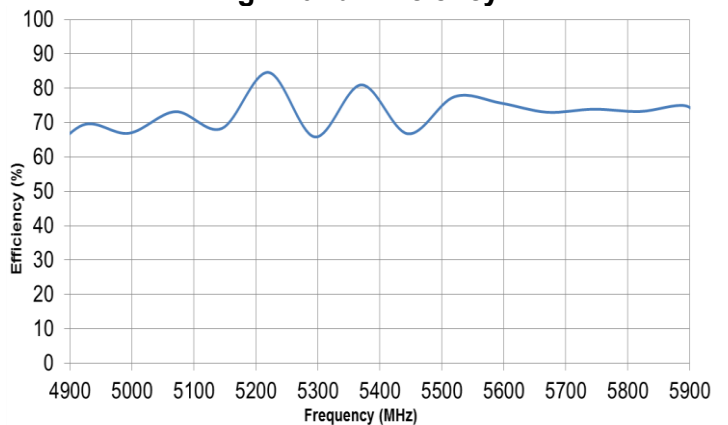
**High Band VSWR**



**Low Band Efficiency**



**High Band Efficiency**

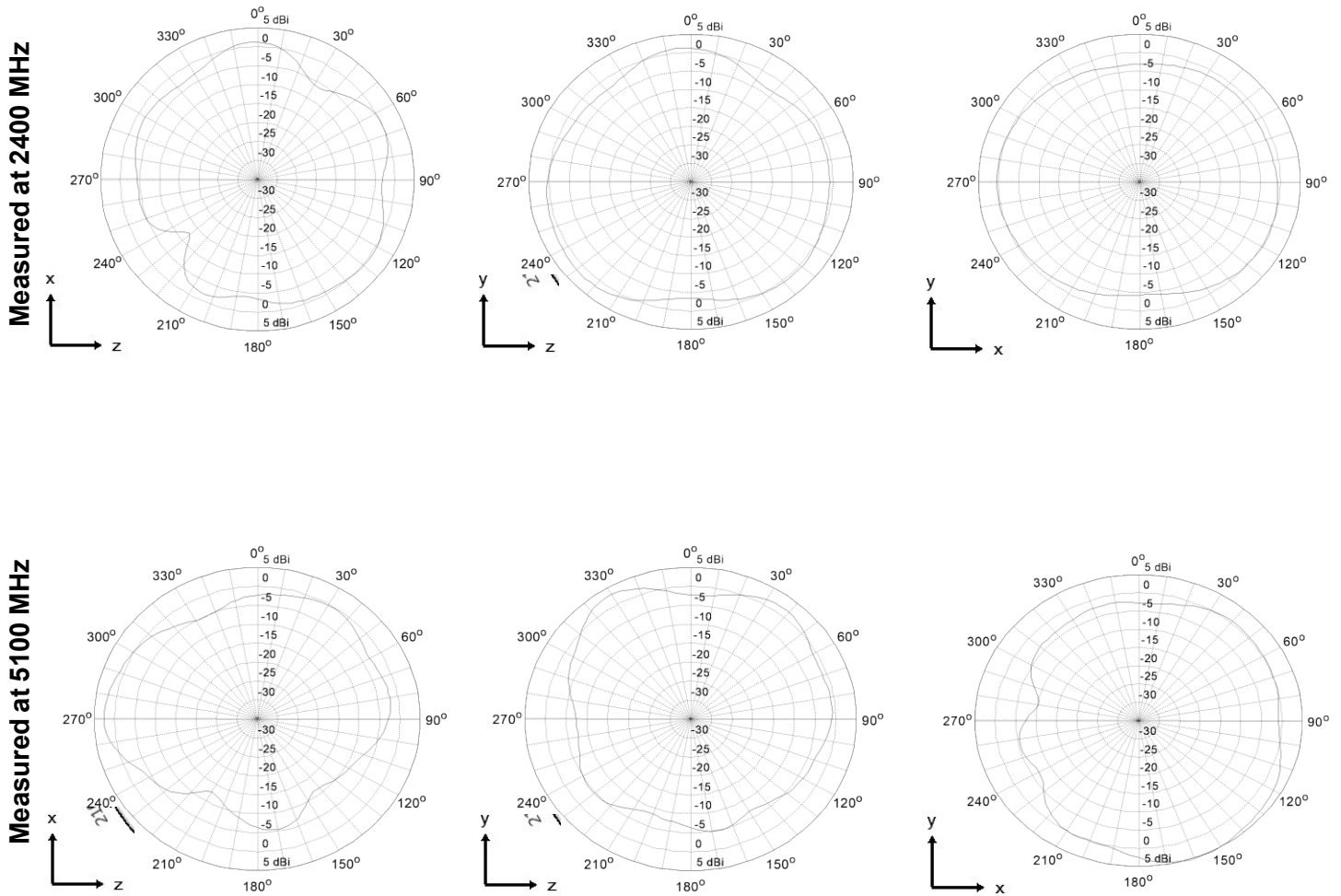
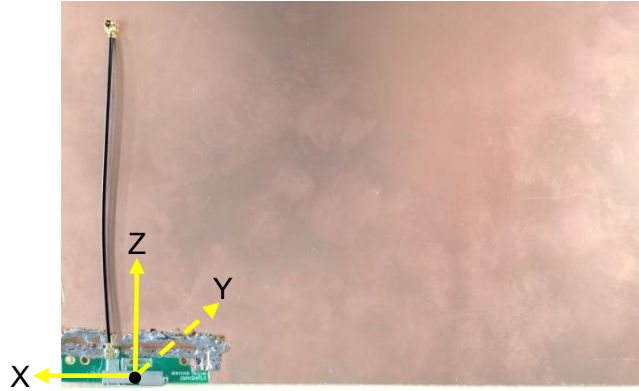


**2.4 / 5 GHz KYOCERA AVX Embedded Antenna Specifications**  
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

**Antenna Radiation Patterns**

Typical Performance on 120 x 180 mm PCB

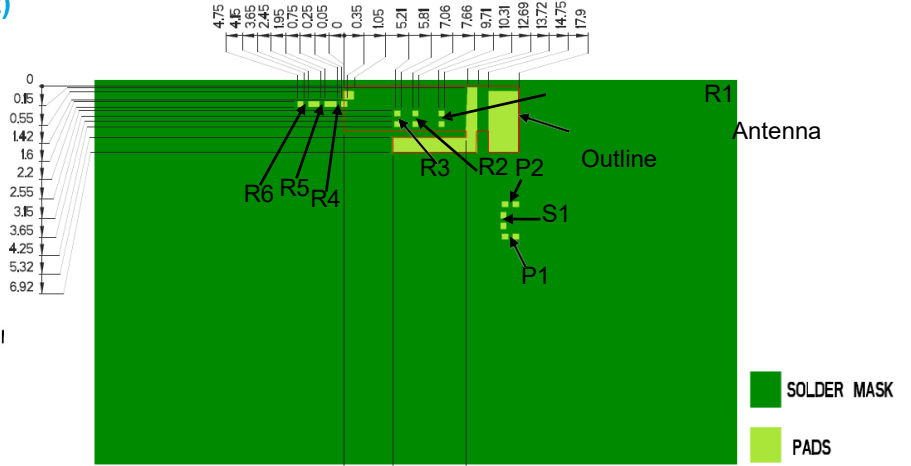
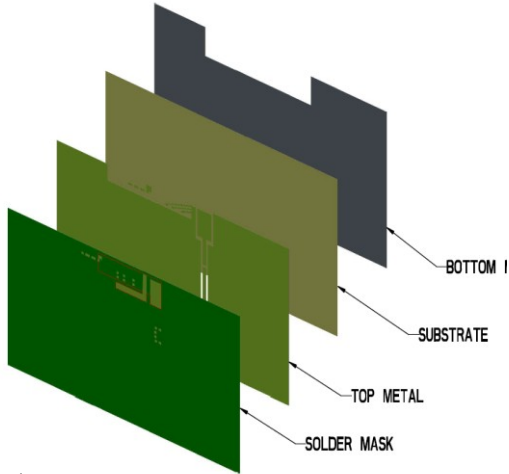
Measured @ 2400, 5100 MHz



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

**Antenna Layout (Minor Tuning Layout)**

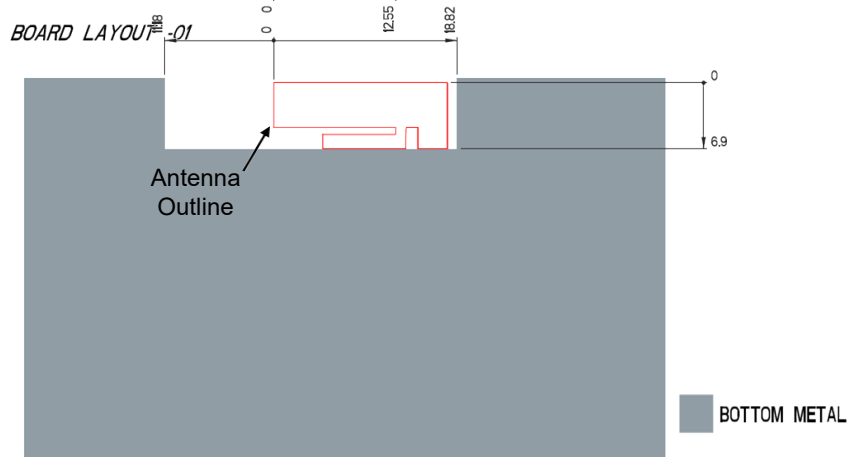
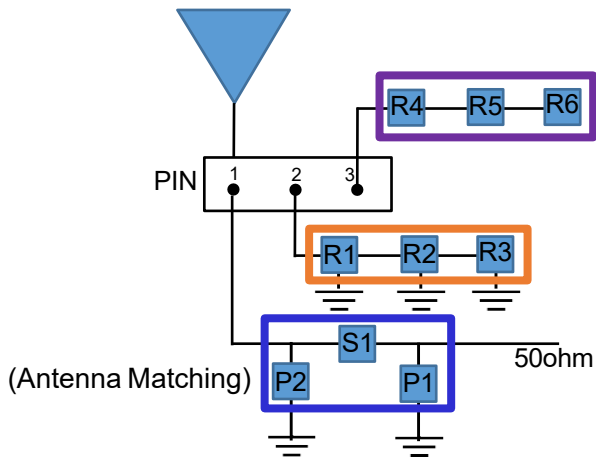
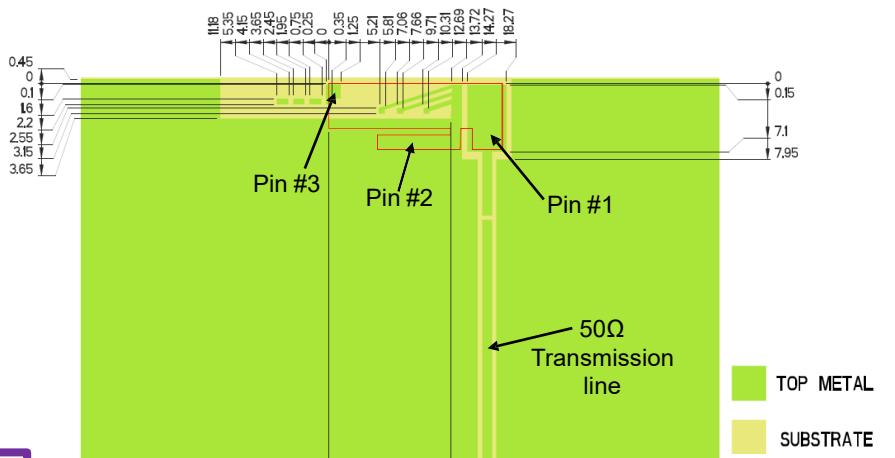
Typical layout dimensions (mm)



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

**Pin Descriptions**

Pin#	Description
1	Feed
2	Ground
3	Dummy Pad



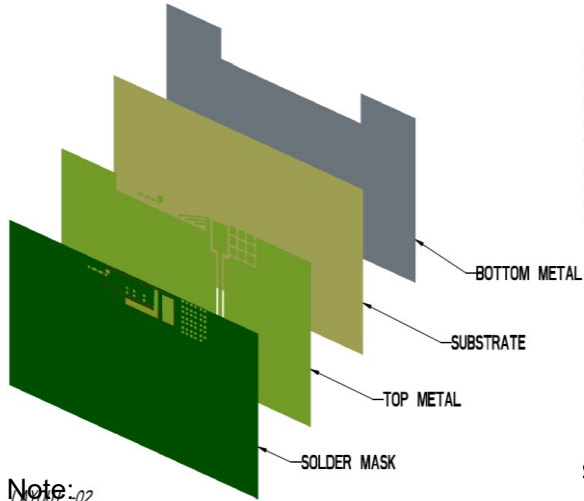
**Antenna Matching & Tuning Component Values**

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

**Antenna Layout (Major Tuning Layout)**

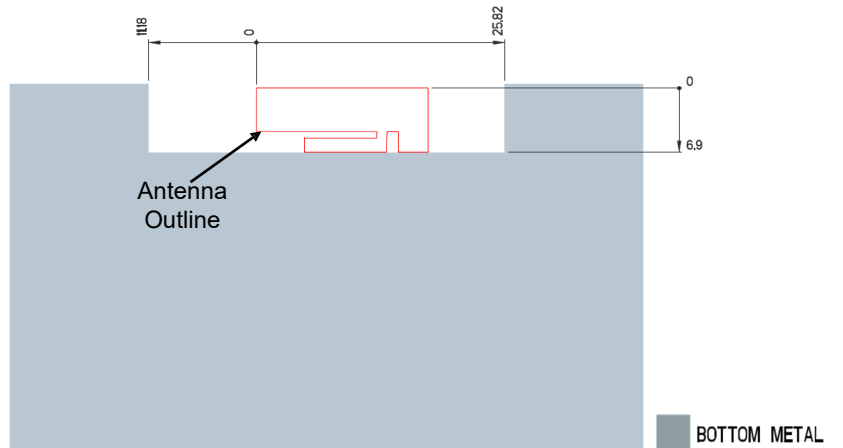
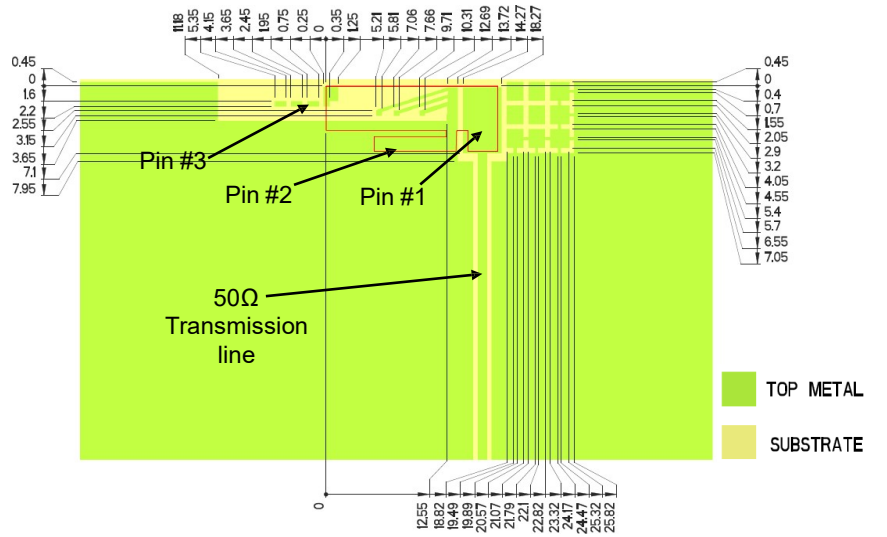
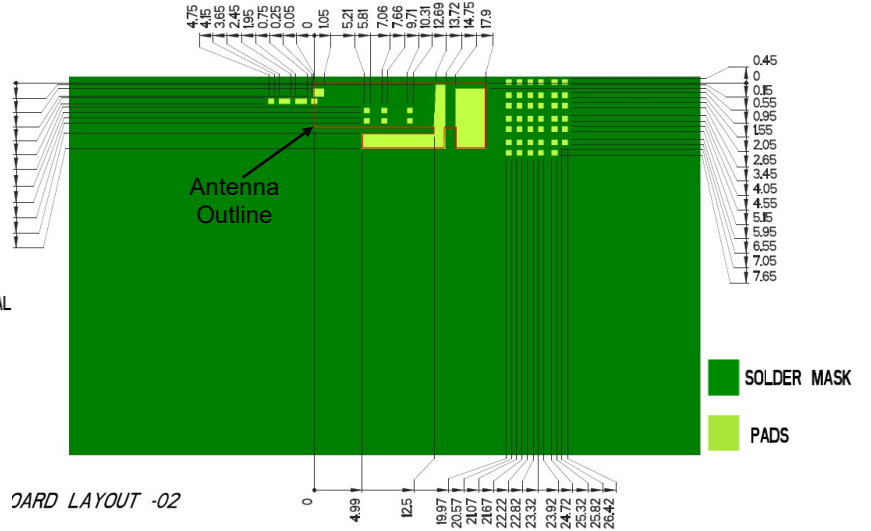
Typical layout dimensions (mm)



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

**Pin Descriptions**

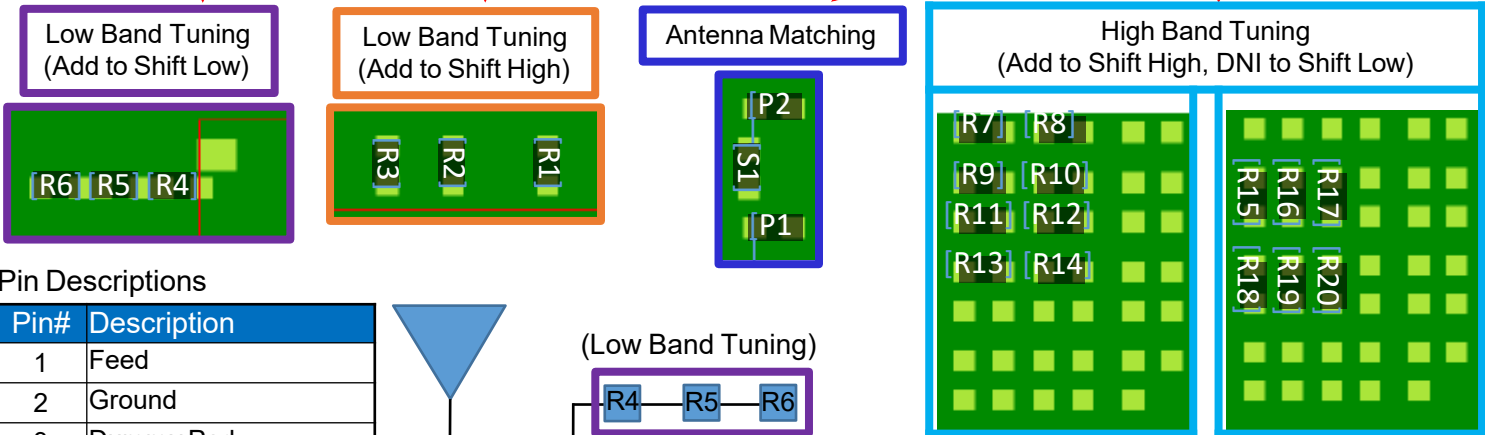
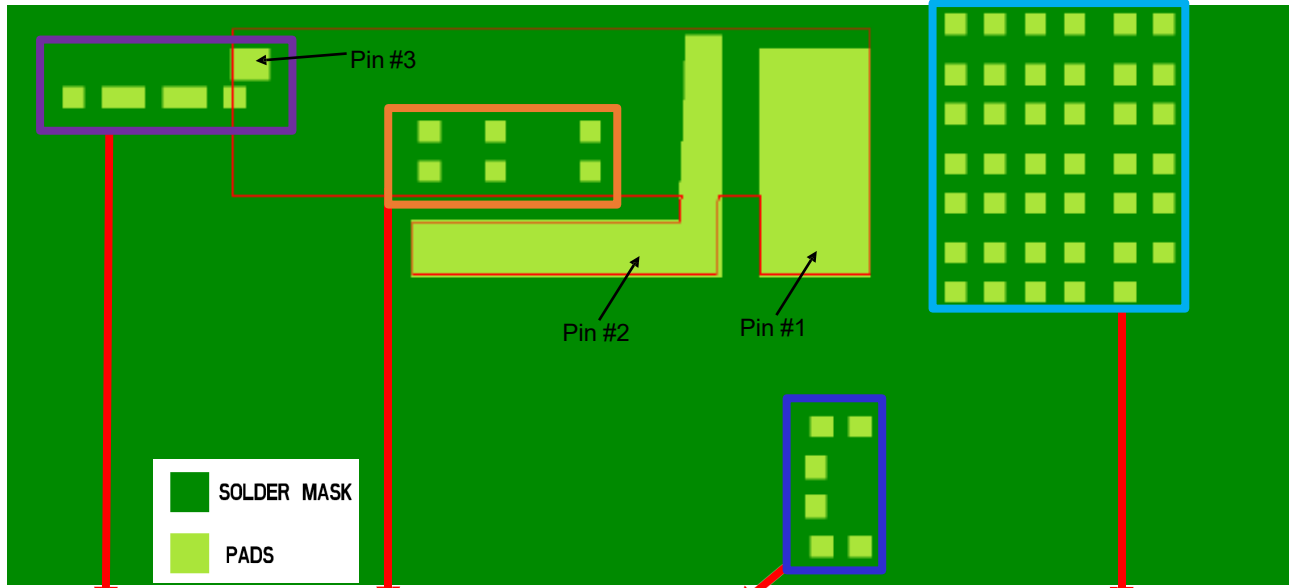
Pin#	Description
1	Feed
2	Ground
3	Dummy Pad



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

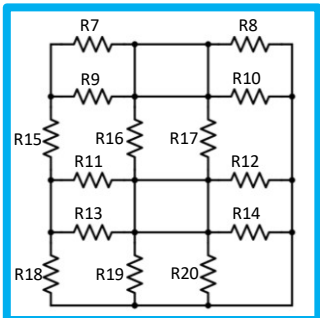
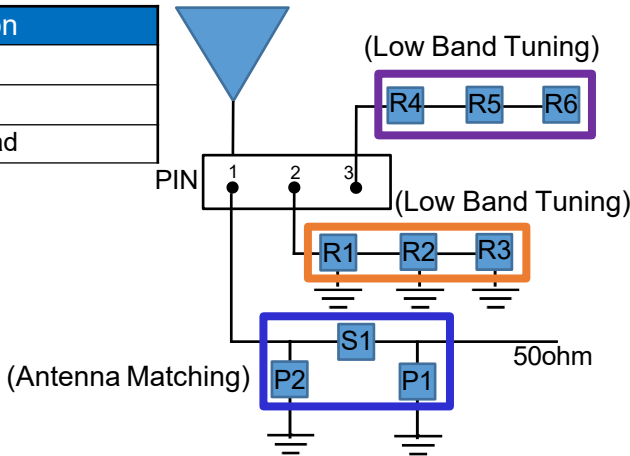
**Antenna Matching Structure (Major Tuning Structure)**

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



Appendix 1 CBRS/n78 Stamped Metal KYOCERA AVX Embedded Antenna Specifications  
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

# Appendix 1

Appendix 1 gives instructions on how to achieve CBRS/n78 performances through layout and impedance matching network.

**(3.300 – 3.800 GHz)**

Frequency (GHz)	3.300 – 3.800
Peak Gain	4.12 dBi
Average Efficiency	76%
VSWR Match	2.6:1 max
Feed Point Impedance	50 ohms unbalanced
Polarization	Linear
Power Handling	0.5 Watt CW

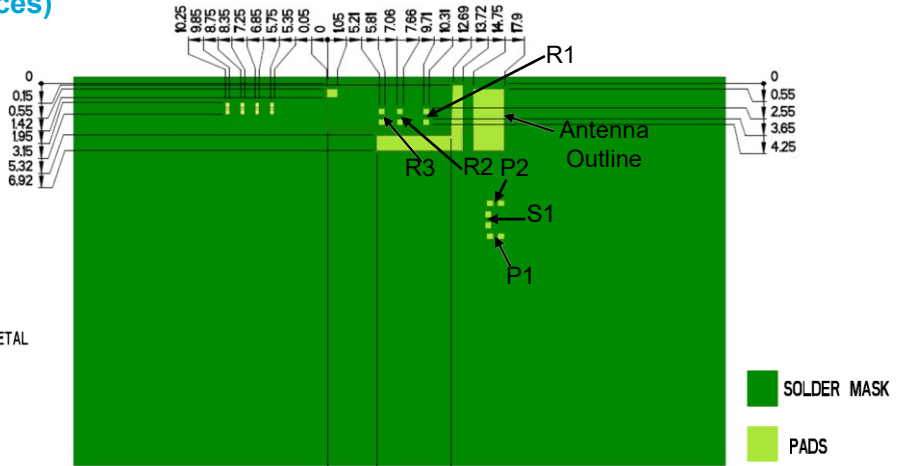
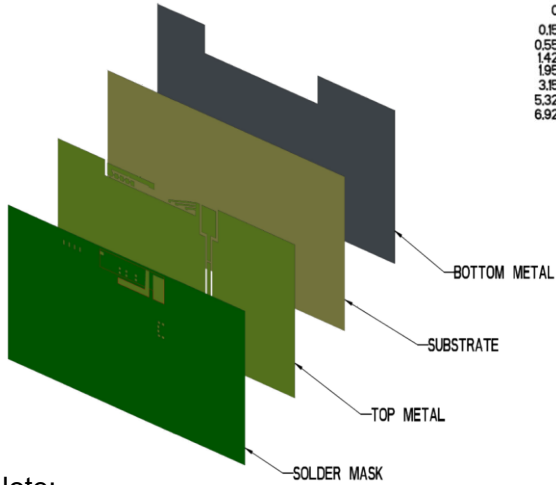
\*Data shown above has Appendix 1 matching applied on 120 x 180 mm pcb.



**Appendix 1 CBRS/n78 Stamped Metal KYOCERA AVX Embedded Antenna Specifications**  
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

**Antenna Layout (CBRS/n78 performances)**

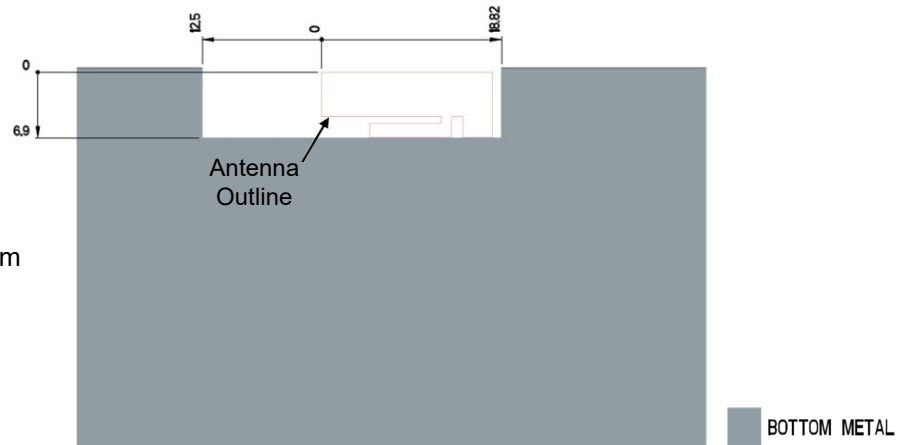
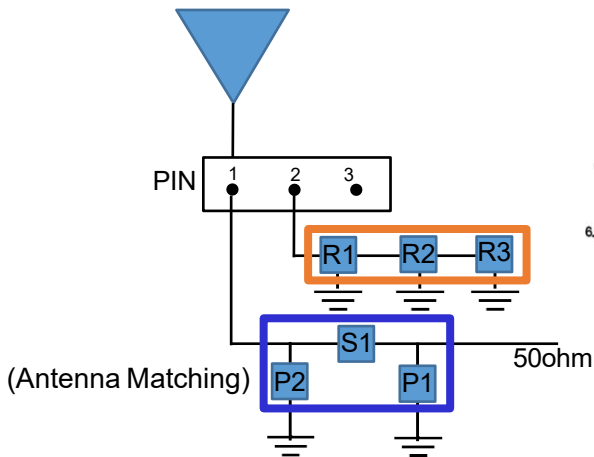
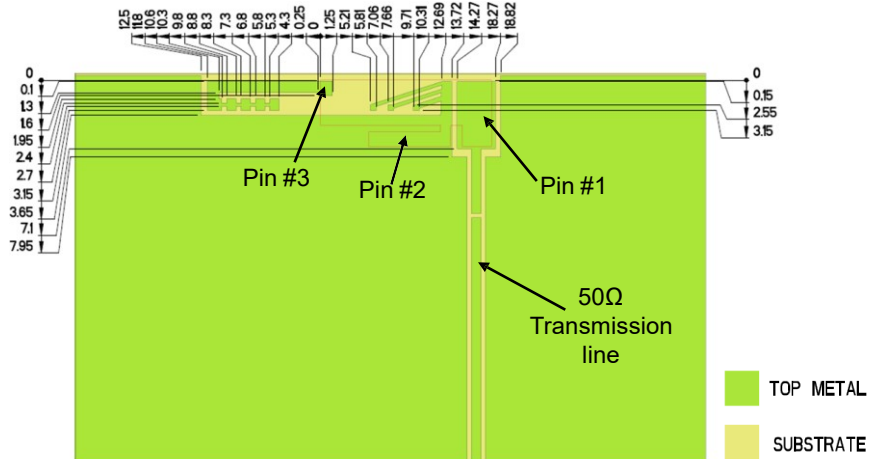
Typical layout dimensions (mm)



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

**Pin Descriptions**

Pin#	Description
1	Feed
2	Ground
3	Dummy Pad



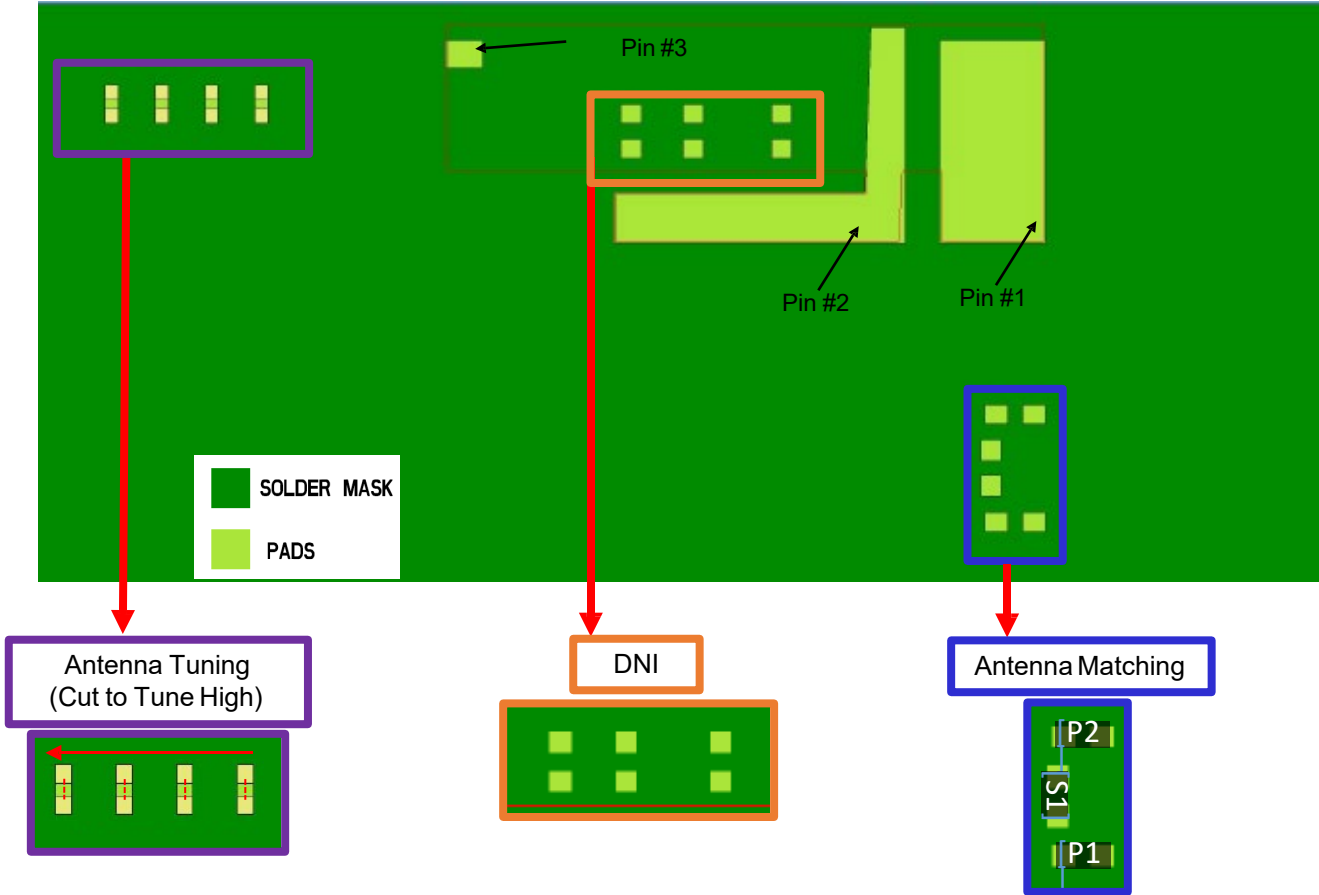
**Antenna Matching & Tuning Component Values**

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

Appendix 1 CBRS/n78 Stamped Metal KYOCERA AVX Embedded Antenna Specifications  
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

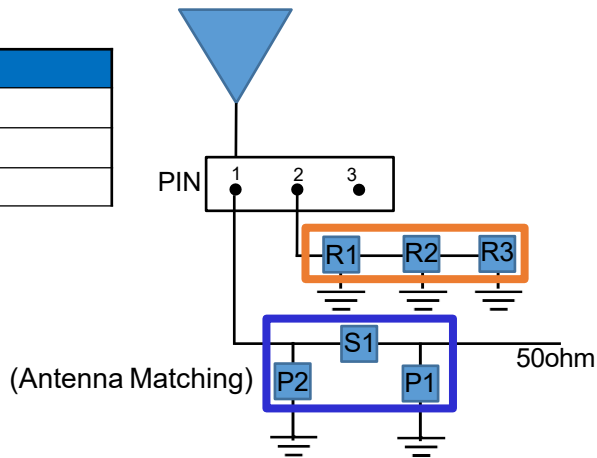
**Antenna Matching Structure**

Typical matching values on 140 x 50 mm PCB



**Pin Descriptions**

Pin#	Description
1	Feed
2	Ground
3	Dummy Pad

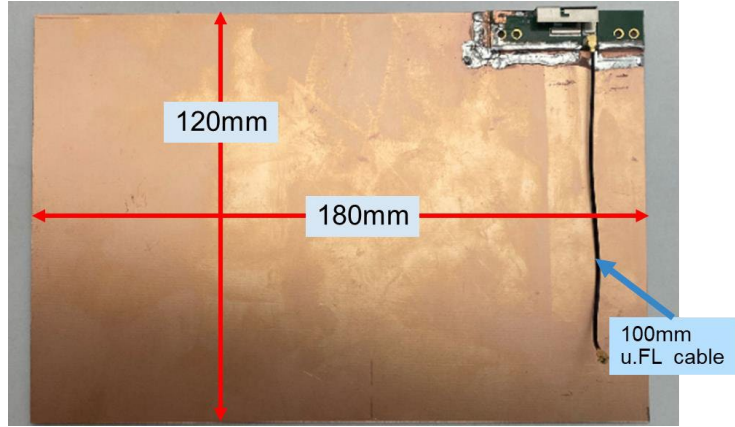


**Antenna Matching & Tuning Component Values**

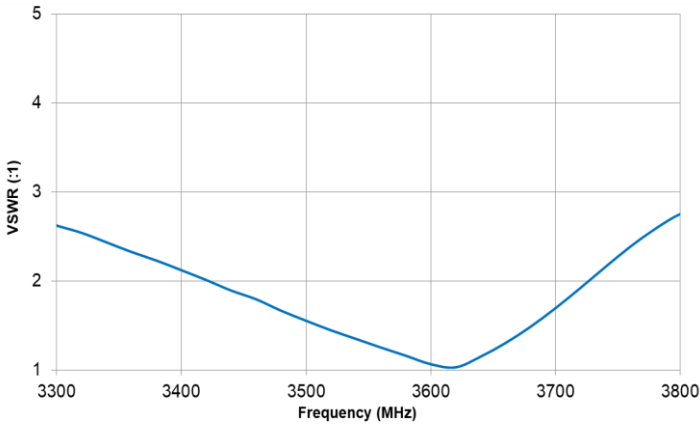
	P1	S1	P2	R1 - R3
Default Values	DNI	0Ω	DNI	DNI
Component Tolerance	N/A	N/A	N/A	N/A

**Appendix 1 CBRS/n78 Stamped Metal KYOCERA AVX Embedded Antenna Specifications**  
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

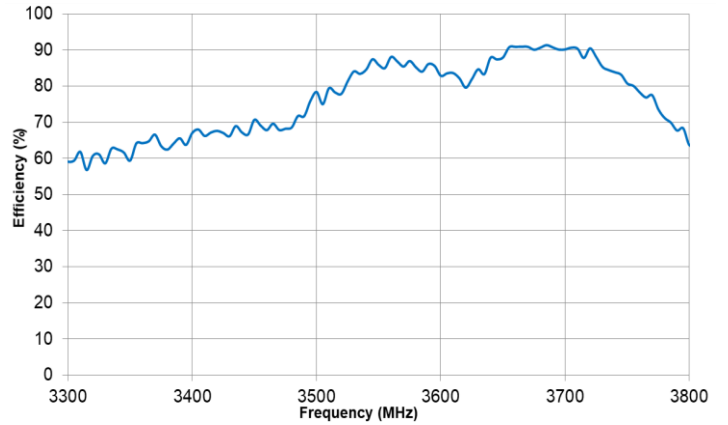
**Appendix 1 VSWR and Efficiency Plots**  
 Typical Performance on 120 x 180 mm PCB



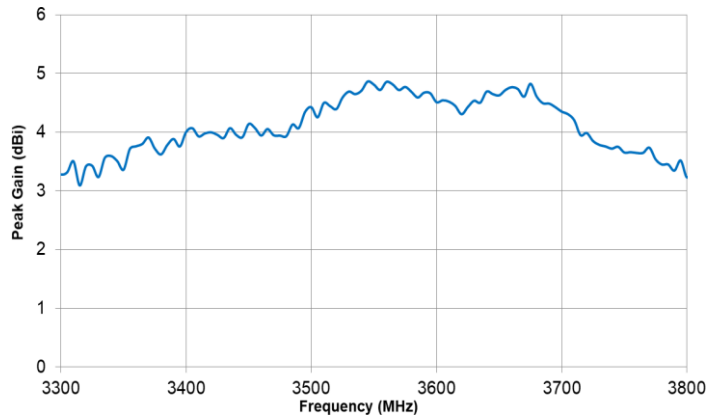
**VSWR**



**Efficiency**

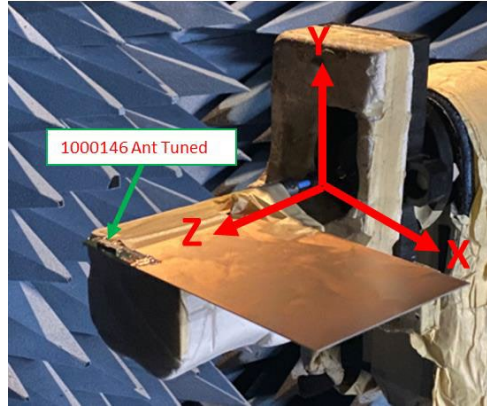


**Peak Gain**



Appendix 1 CBRS/n78 Stamped Metal KYOCERA AVX Embedded Antenna Specifications  
 KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

Appendix 1 Antenna Radiation Patterns Typical  
 Performance on 120 x 180 mm PCB Measured @  
 3500 MHz



Measured at 3500 MHz

