Part No. M620720
ISM 868 / 915 MHz Embedded Ceramic Antenna

868 MHz; 915 MHz
Supports: ISM, LoRa



ISM 868 / 915 MHz Embedded Ceramic Antenna

868 MHz; 915 MHz

KYOCERA AVX's 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. KYOCERA AVX's antennas utilize patented IMD technology to deliver a unique size and performance combination.

Electrical Specifications

Typical performance on 40 x 100 mm PCB

Frequency	902 - 928 MHz	868 - 870 MHz	868 – 928 MHz
Peak Gain	2.06 dBi	Refer to Appendix1	Refer to Appendix2
Average Efficiency	73%		
VSWR Match	2.2:1 max		
Feed Point Impedance	50 ohms unbalanced		
Polarization	Linear		
Power Handling	0.5 Watt CW		
Additional Resources	Download Application Note and Simulation Files		

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, M620720 – 1,000 pieces per reel
Demo Board	M620720-01
Additional Resources	Download DXF, Gerber and 3D FIT Files

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.

Environmental Compliance
Products are the latest RoHS version compliant.

APPLICATIONS

- Embedded design
- Cellular, Headsets, Tablets
- Gateway, Access Point
- Handheld
- Telematics
- Healthcare (FDA Class I)
- IoT, Industrial devices
- Smart Grid
- Tracking

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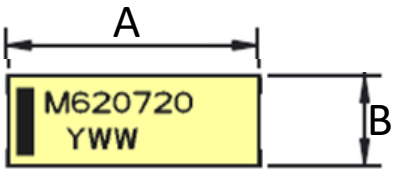
ISM 868 / 915 MHz Embedded Ceramic Antenna Specifications
KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

Antenna Dimensions

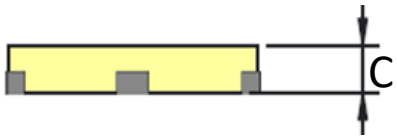
Typical antenna dimensions (mm)

Part Number	A (mm)	B (mm)	C (mm)
M620720	6.00 ± 0.2	2.00 ± 0.2	1.08 ± 0.1



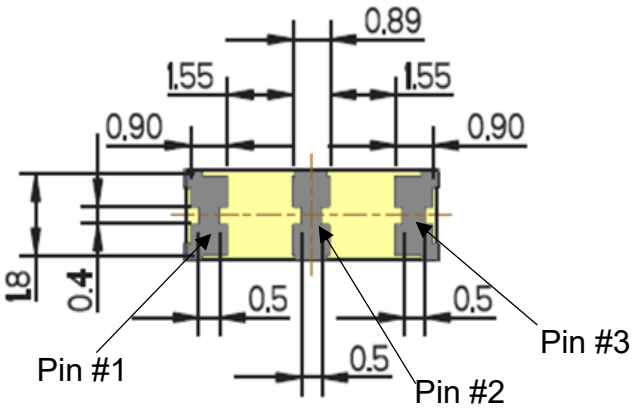


Top View



Height

Pin	Description
1	Feed
2	Dummy
3	Ground



Bottom View

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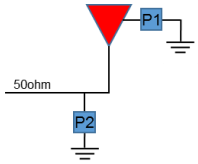
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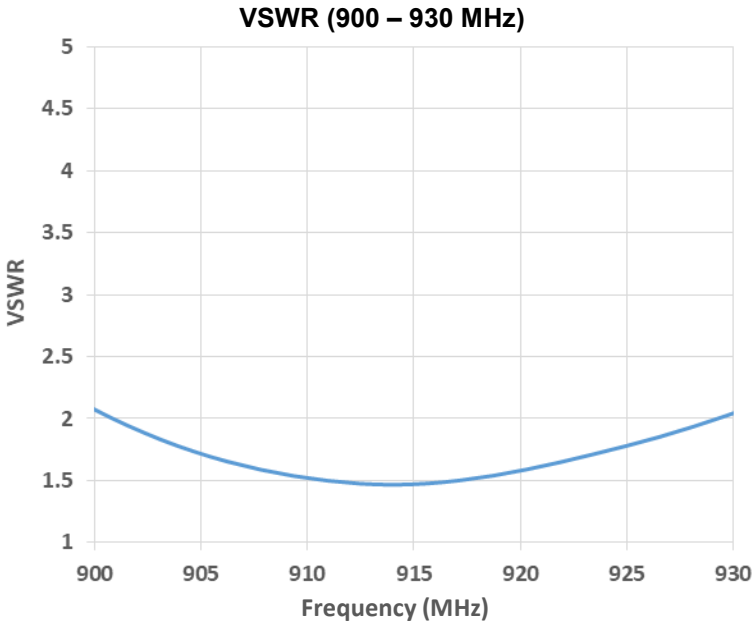
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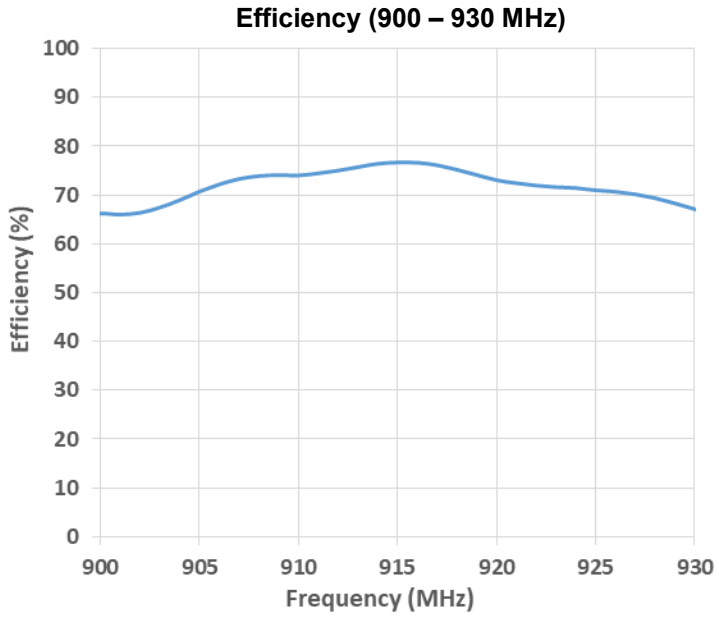
VSWR, Efficiency Plots (Tuned @ 915MHz)

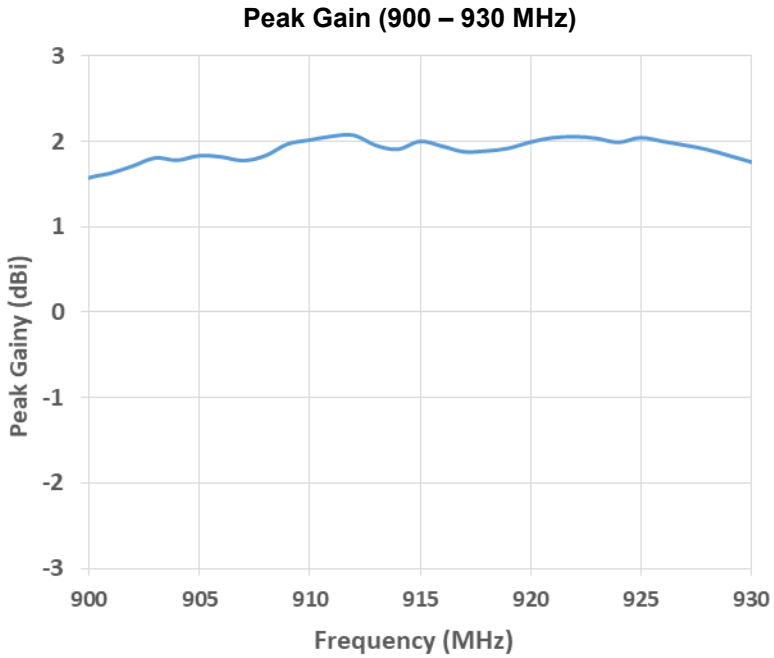
Typical performance on 40 x 100 mm PCB

	902-928 MHz		
Component	Value	KYOCERA AVX Part Number	Tolerance
P1	3.1 pF	04023J3R1ABSTR	±0.05 pF
P2	4.1 pF	04023J4R1ABSTR	± 0.05 pF









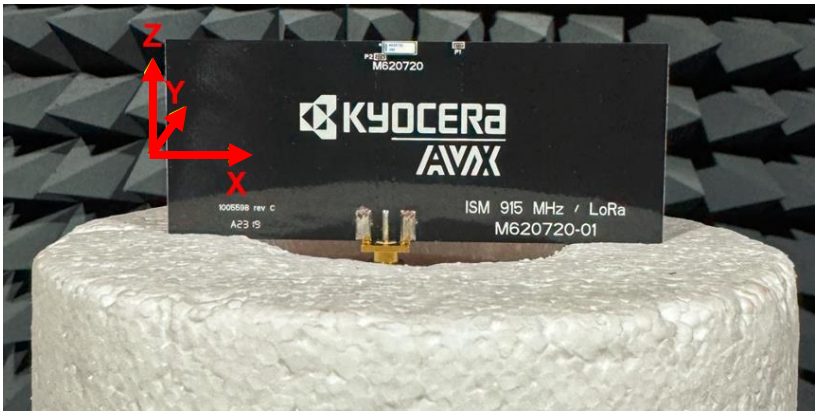
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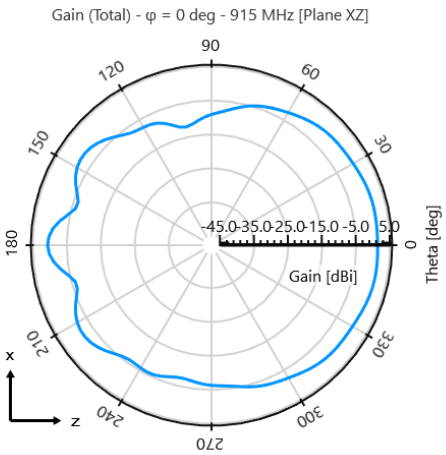
ISM 868 / 915 MHz Embedded Ceramic Antenna Specifications
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Antenna Radiation Patterns

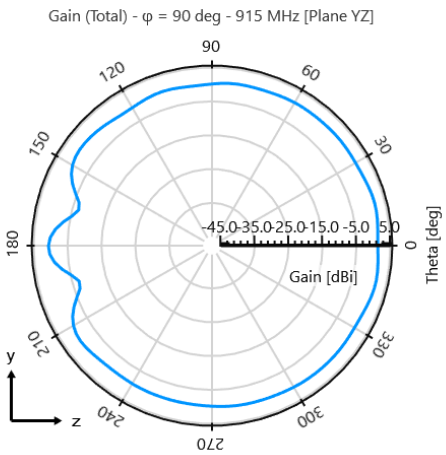
Typical performance on 40 x 100 mm PCB
Measured @ 915 MHz



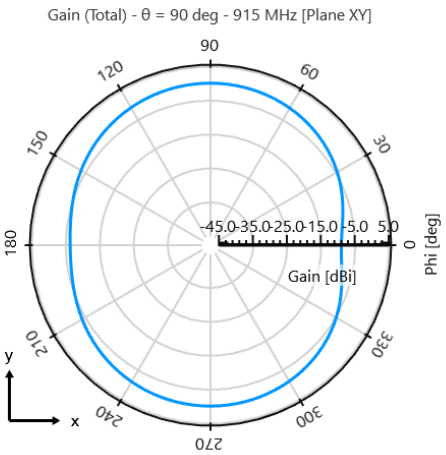
Phi = 0° Plane



Phi = 90° Plane



Theta = 90° Plane



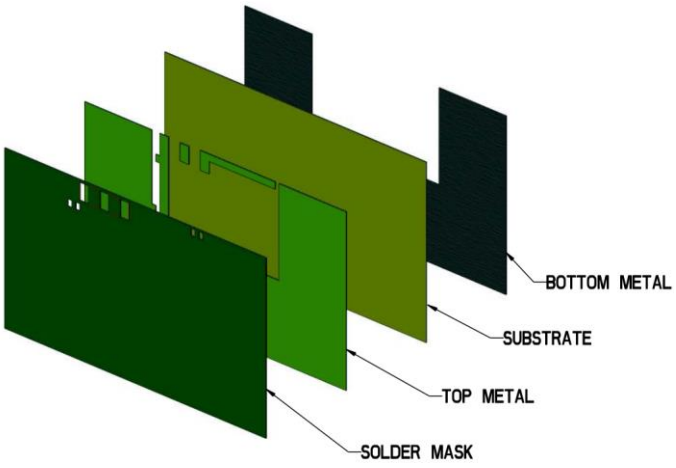
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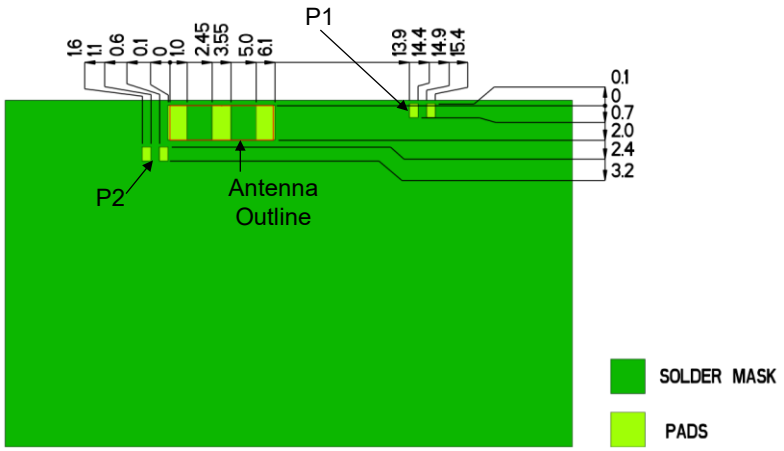
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Board Layout

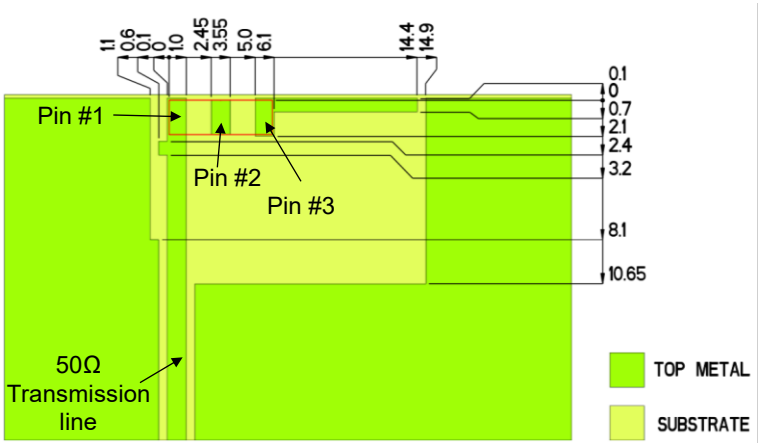
Typical layout dimensions (mm)





Pin Descriptions

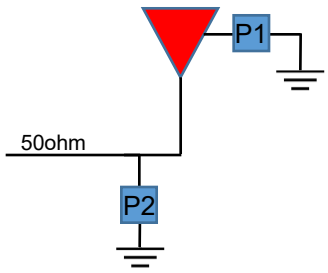
Pin#	Description
1	Feed
2	Dummy
3	Ground

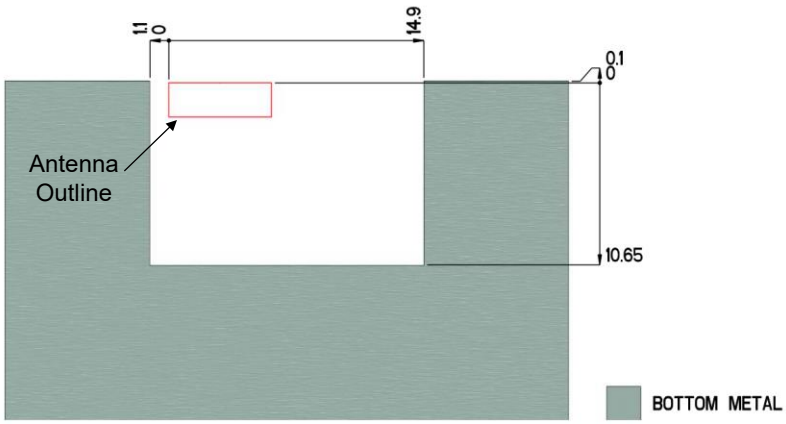


Matching Network (Demo Board)

	902-928 MHz	
Component	Value	Tolerance
P1	3.1 pF	±0.05 pF
P2	4.1 pF	±0.05 pF

*Actual matching values depend on customer design





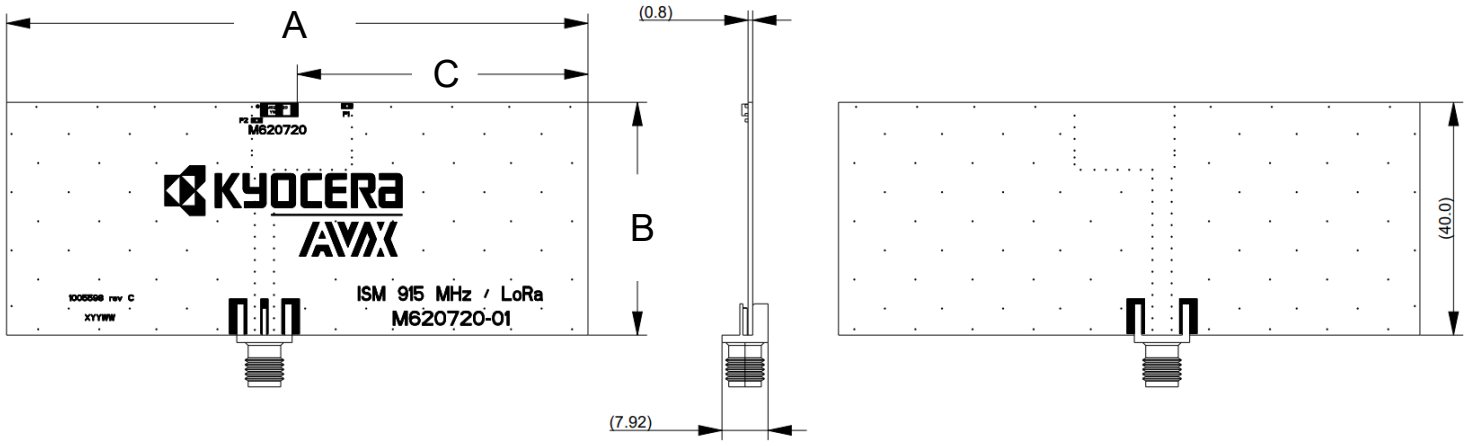
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ISM 868 / 915 MHz Embedded Ceramic Antenna Specifications
KYOCERA AVX produces a wide variety of standard and custom antennas to meet user needs.

Antenna Demo Board

Typical layout dimensions (mm)

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



FRONT VIEW SIDE VIEW BACK VIEW

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Appendix 1

Appendix 1 gives instructions on how to achieve coverage at low frequency through impedance matching network.

(868 - 870 MHz)

Electrical Specifications

Typical performance on 40 x 100 mm PCB

Frequency (MHz)	868-870 MHz
Peak Gain	1.54 dBi
Average Efficiency	69 %
VSWR Match	2:1 max
Polarization	Linear
Power Handling	0.5 Watt CW
Feed Point Impedance	50 ohms unbalanced
Additional Resources	Download Application Note and Simulation Files

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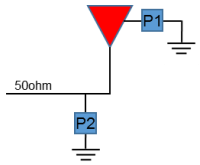
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ISM 868 / 915 MHz Embedded Ceramic Antenna Specifications
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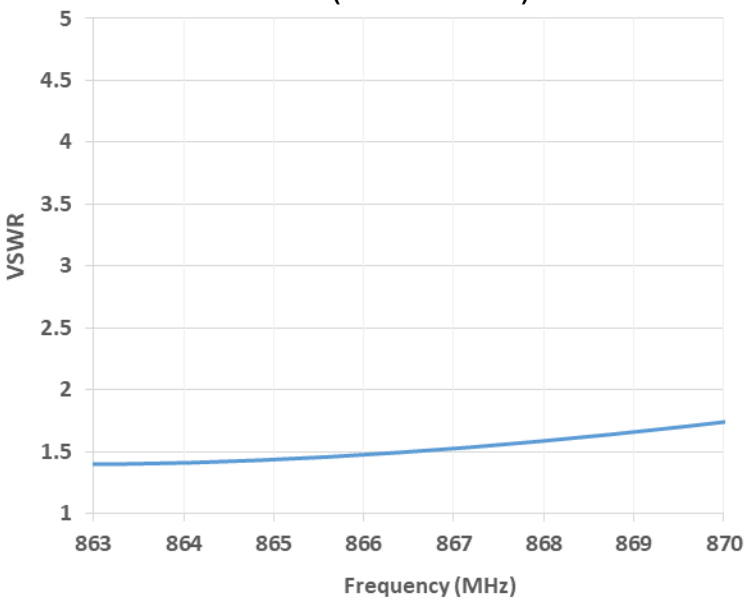
VSWR, Efficiency Plots (Tuned @ 868 MHz)

Typical performance on 40 x 100 mm PCB

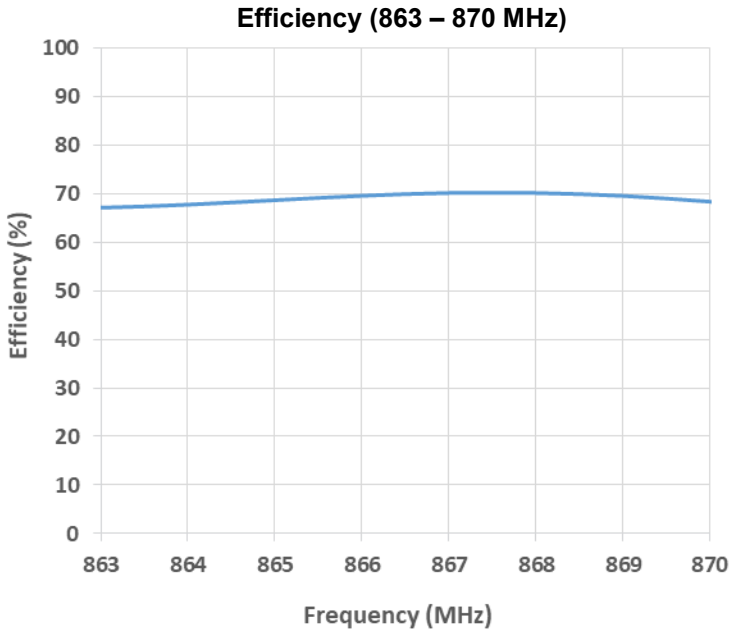
	ISM 868 MHz		
Component	Value	KYOCERA AVX Part Number	Tolerance
P1	3.9 pF	04023J3R9ABWTR	±0.05 pF
P2	5.1 pF	04023J5R1ABSTR	± 0.05 pF



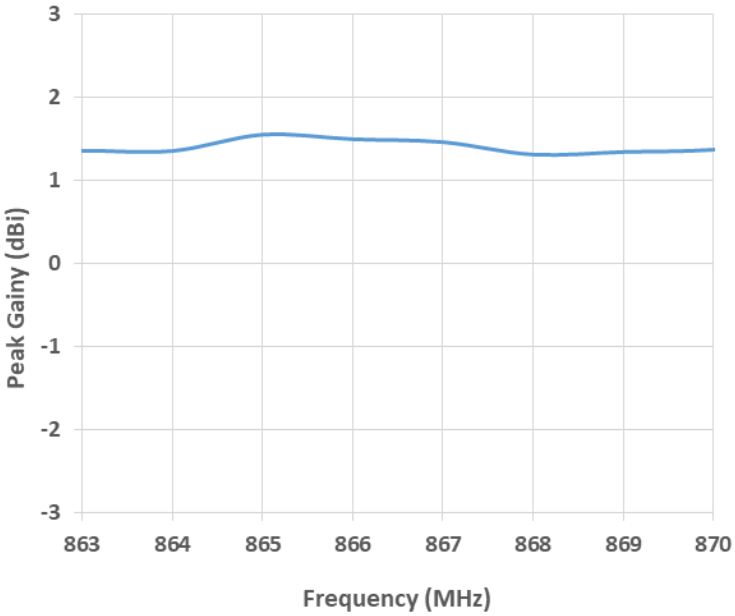
VSWR (863 – 870 MHz)



Efficiency (863 – 870 MHz)



Peak Gain (863 – 870 MHz)



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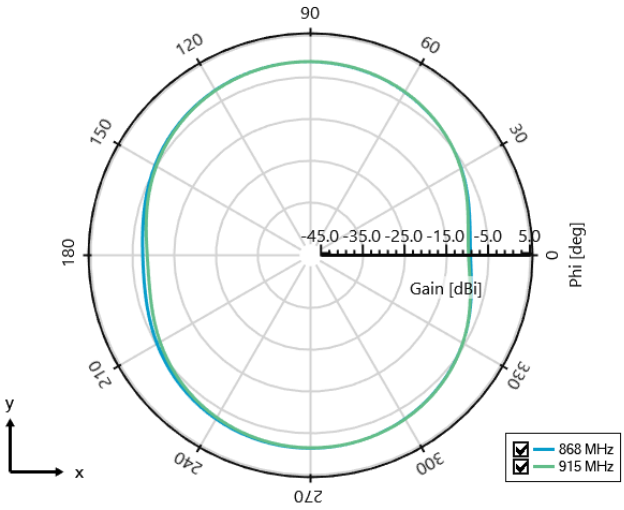
ISM 868 / 915 MHz Embedded Ceramic Antenna Specifications
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Antenna Radiation Patterns

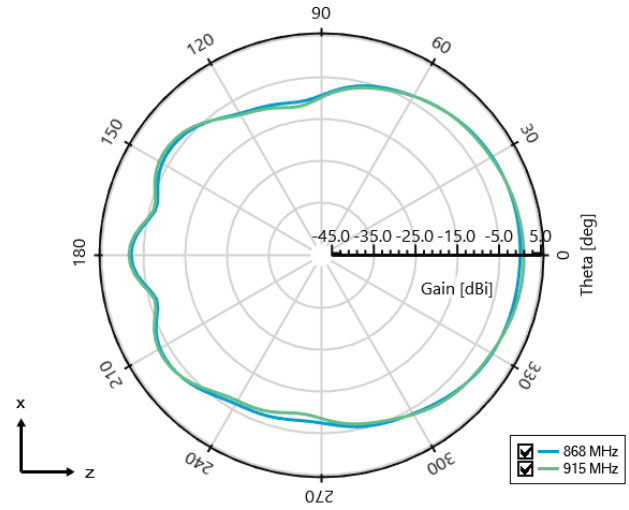
Typical performance on 40 x 100 mm PCB
Measured @ 868 and 915 MHz



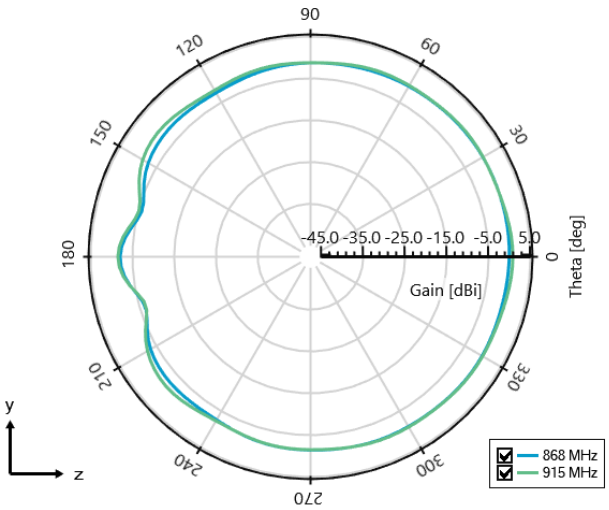
M620720 - Gain - θ = 90 deg [Plane XY]



M620720 - Gain - φ = 0 deg [Plane XZ]



M620720 - Gain - φ = 90 deg [Plane YZ]



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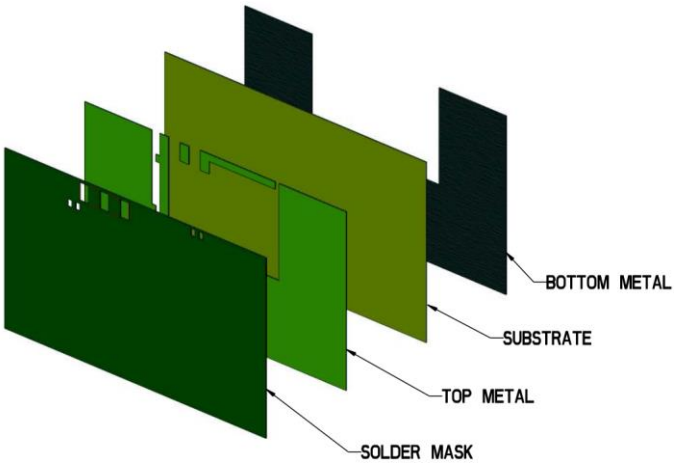
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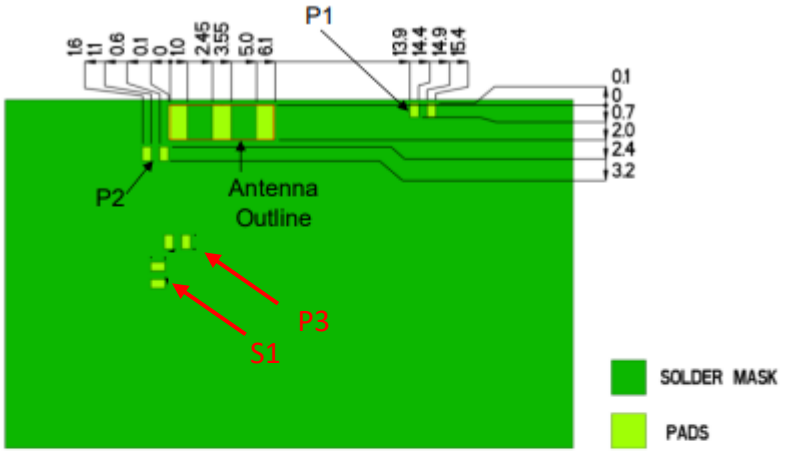
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ISM 868 / 915 MHz Embedded Ceramic Antenna Specifications
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Board Layout

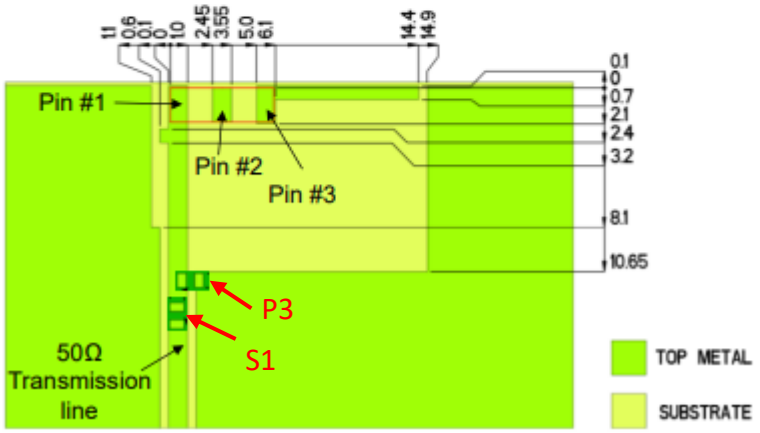
Typical layout dimensions (mm)





Pin Descriptions

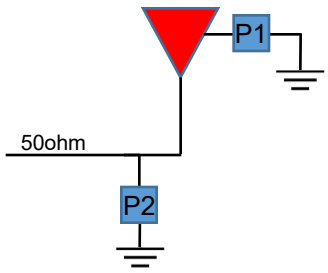
Pin#	Description
1	Feed
2	Dummy
3	Ground

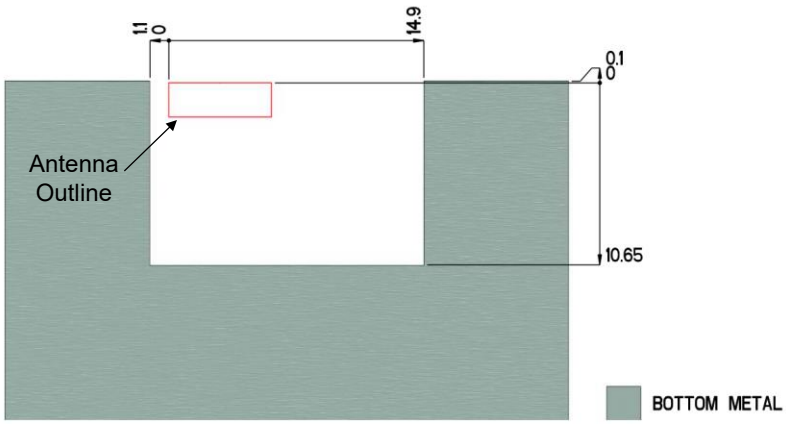


Matching Network (Demo Board)

	868-870 MHz	
Component	Value	Tolerance
P1	3.9 pF	±0.05 pF
P2	5.1 pF	±0.05 pF

*Actual matching values depend on customer design





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Appendix 2

Appendix 1 gives instructions on how to achieve coverage of both 868(EU) MHz and 915(US) MHz through impedance matching network.

(868 - 928 MHz)

Electrical Specifications

Typical performance on 40 x 100 mm PCB

Frequency (MHz)	902 - 928	868 - 870
Peak Gain	1.52 dBi	0.23 dBi
Average Efficiency	56 %	55%
VSWR Match	< 3:1	
Polarization	Linear	
Power Handling	0.5 Watt CW	
Feed Point Impedance	50 ohms unbalanced	
Additional Resources	Download Application Note and Simulation Files	

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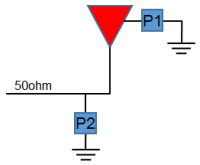
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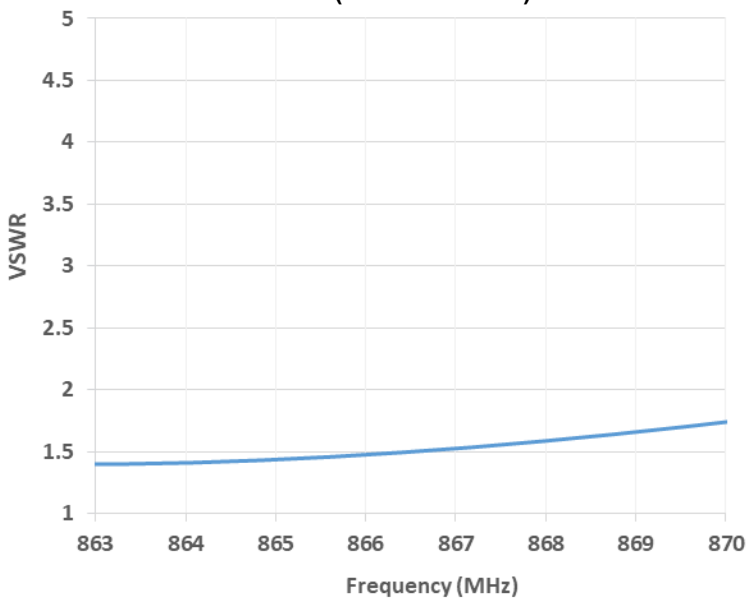
VSWR, Efficiency Plots (Tuned @ 868 MHz)

Typical performance on 40 x 100 mm PCB

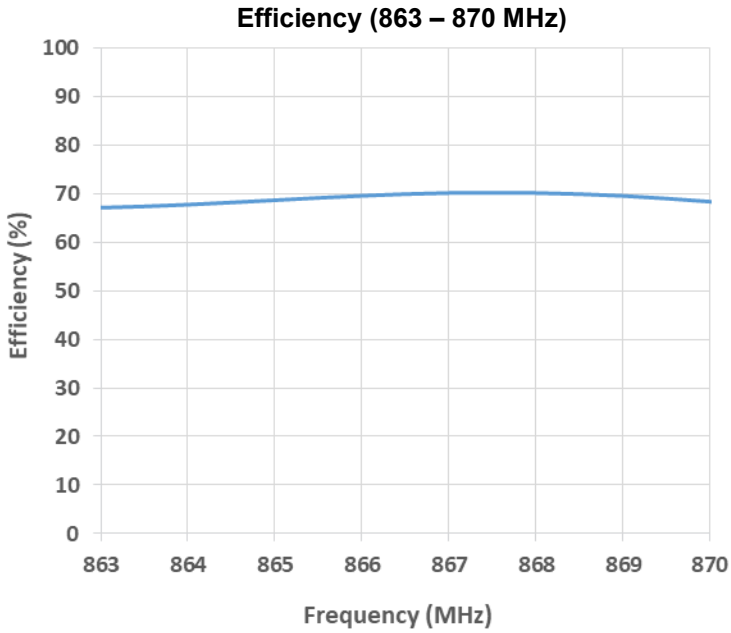
	ISM 868 MHz		
Component	Value	KYOCERA AVX Part Number	Tolerance
P1	3.9 pF	04023J3R9ABWTR	±0.05 pF
P2	5.1 pF	04023J5R1ABSTR	± 0.05 pF



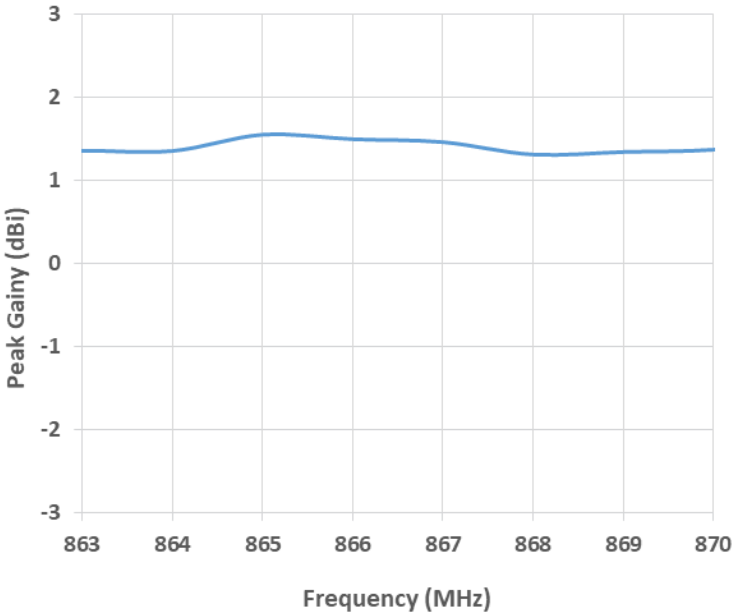
VSWR (863 – 870 MHz)



Efficiency (863 – 870 MHz)



Peak Gain (863 – 870 MHz)



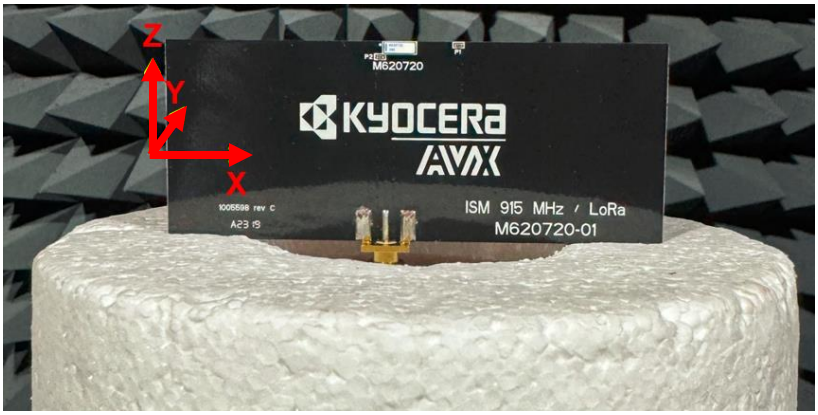
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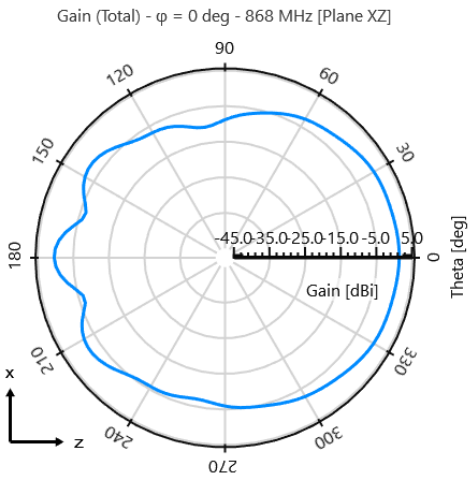
ISM 868 / 915 MHz Embedded Ceramic Antenna Specifications
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Antenna Radiation Patterns

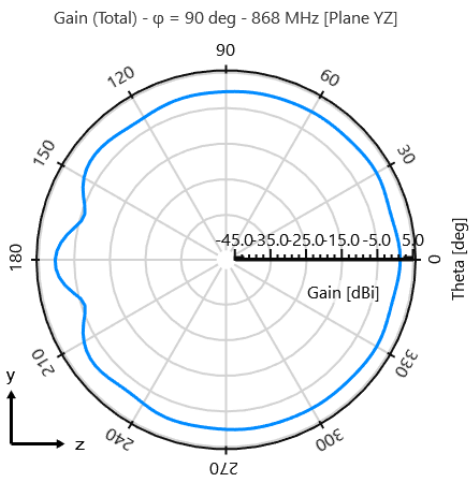
Typical performance on 40 x 100 mm PCB
Measured @ 868 MHz



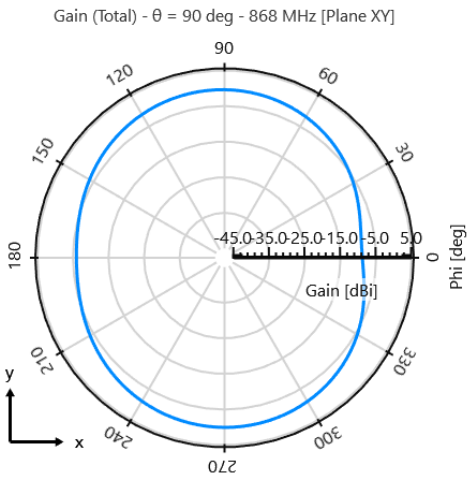
Phi = 0° Plane



Phi = 90° Plane



Theta = 90° Plane



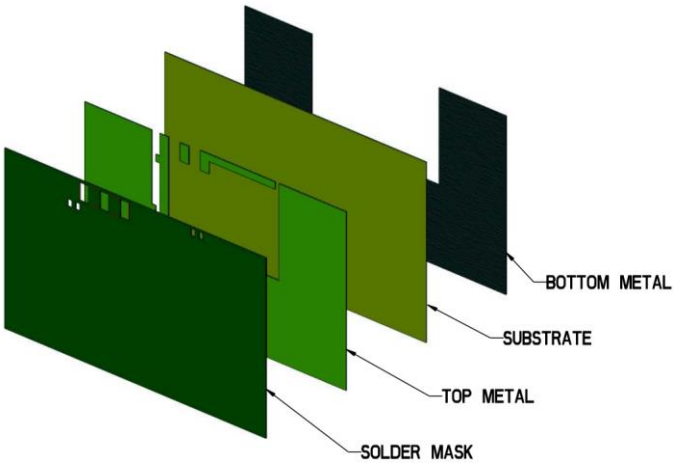
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email: antenna.info@kyocera-avx.com
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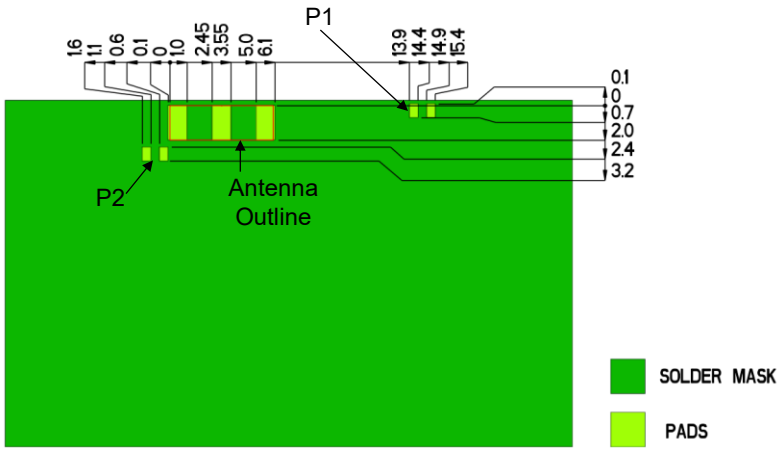
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Board Layout

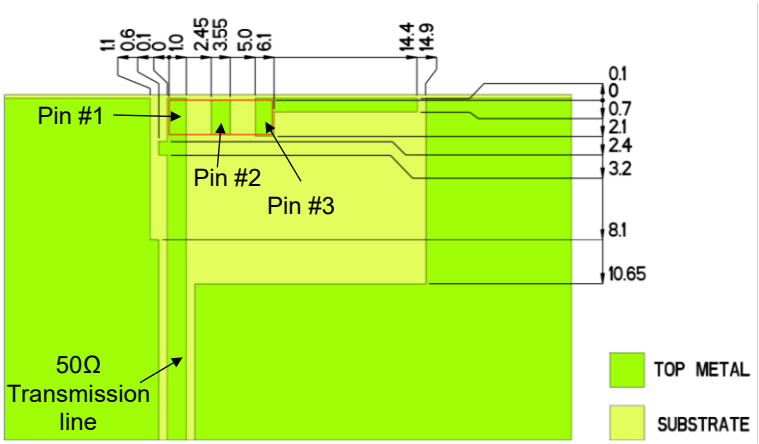
Typical layout dimensions (mm)





Pin Descriptions

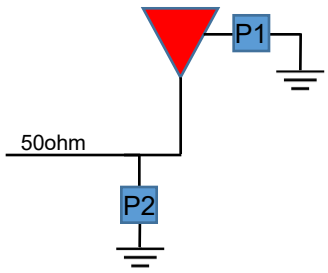
Pin#	Description
1	Feed
2	Dummy
3	Ground

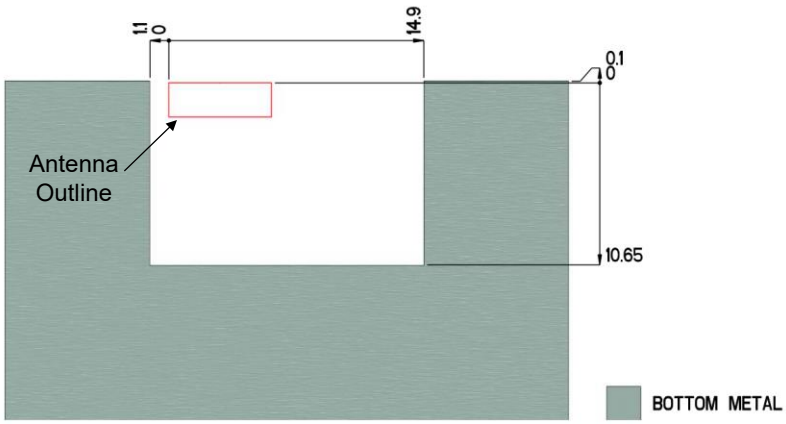


Matching Network (Demo Board)

	868-870 MHz	
Component	Value	Tolerance
P1	3.9 pF	±0.05 pF
P2	5.1 pF	±0.05 pF

*Actual matching values depend on customer design





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1 Avx Blvd, Fountain Inn, SC 29644

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Additional Resources – M620720

Simulation Files:
HFSS (23R1): https://www.kyocera-avx.com/download/antennas/ansys-hfss/23r1/M620720_23r1.zip
HFSS (19R3-22R2): https://www.kyocera-avx.com/download/antennas/ansys-hfss/22r2/M620720_22r2.zip
CST : https://www.kyocera-avx.com/download/antennas/CST/M620720&M620720-01_CST2023_06182024.zip

Application Note:
https://www.kyocera-avx.com/docs/techinfo/ApplicationNotes/Antenna-AppNotes/AVX-E_AppNote-M-Series.pdf

3D FIT File:
https://www.kyocera-avx.com/download/antennas/ME-FIT/M620720_ME_fit.zip

DXF File:
https://www.kyocera-avx.com/download/antennas/3D-DXF/M620720_3D-DXF.zip

Gerber File:
https://www.kyocera-avx.com/download/antennas/GERBER/M620720_GERBERS.zip

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