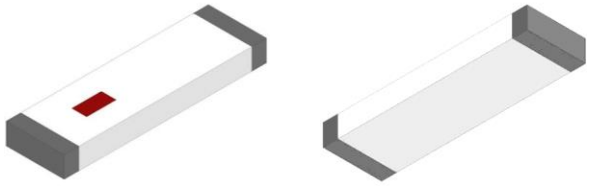
LTE Multi-Band RF Chip Antenna

- 700-800 / 1710-2100 and 824-960 / 1710-2690 MHz Operational Frequency
- Ideal for Cellular, IoT, CAT M1 and Narrow Band Applications
- SMD, 15.0x4.0x1.5mm (LxWxT)
- End mount
- RoHS compliant

Johanson Technology, Inc. (JTI) miniature RF ceramic chip antennas are made using Low Temperature Co-fired Ceramic (LTCC) technology which has the ability to embed low and high dielectric constants inside our antenna. This enables our components to have high detuning resilience and stability over extreme temperatures (~2ppm).



Recommended mounting locations for this antenna

PCB End

General Specifications[1]

Operational Frequency (MHz)	Tuning Version 1		Tuning Version 2	
	700 - 800	**1710 - 2100**	**824 - 960**	**1710 - 2690**
	Evaluation Board 1 (Large PCB) *See pages 5-6*		Evaluation Board 2 (Large PCB) *See pages 7-8*	
Return Loss (dB)	3.5 Min.	4.4 Min.	4.4 Min.	4.4 Min.
Peak Gain (dBi)	1.0 Typ.	2.0 Typ.	2.0 Typ.	2.0 Typ.
Average Gain (dBi)	-1.6 Typ.	-1.0 Typ.	0.0 Typ.	-1.0 Typ.
Radiated Efficiency (%) Frequency (MHz)	38 / 51 / 42 700 / 750 / 800	63 / 80 / 77 1700 / 1900 / 2100	47 / 59 / 53 824 / 900 / 960	54 / 81 / 60 1710 / 2200 / 2690
	Evaluation Board 3 (Small PCB) *See pages 10-11*		Evaluation Board 4 (Small PCB) *See pages 12-13*	
Return Loss (dB)	2.7 Min.	4.4 Min.	2.7 Min.	4.4 Min.
Peak Gain (dBi)	-2.0 Typ.	1.8 Typ.	-1.2 Typ.	1.7 Typ.
Average Gain (dBi)	-6.0 Typ.	-1.0 Typ.	-6.4 Typ.	-1.3 Typ.
Radiated Efficiency (%) Frequency (MHz)	13 / 23 / 19 700 / 750 / 800	71 / 79 / 70 1700 / 1900 / 2100	16 / 21 / 14 824 / 900 / 960	66 / 67 / 38 1710 / 2200 / 2690
	Antenna-Switch Solution[2] **700 - 960, GPS/GLONASS, 1710 - 2200, 2400 - 2480**			

[1] Typical value represents average measurement at 25°C. Min./Max. values represent measurements over specified operating temperature.

[2] All frequencies can be achieved in a combined antenna and switch solution. More information can be found in our Application Note 90 [Click].

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Maximum Ratings

Power Capacity (W)	3 Max. (CW)
Operating Temperature (°C)	-40 to +85
Recommended Storage Conditions post-installation (°C)	-40 to +85
Recommended Storage Conditions and Period for Unused T&R Product	45% - 75% RH +5 to +35 °C 18 Months Max.

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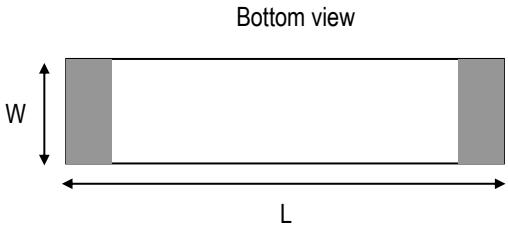
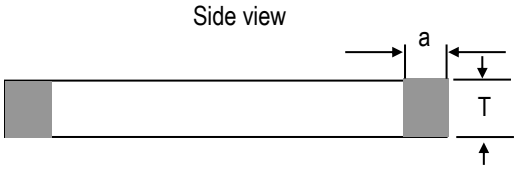
Mechanical Dimensions

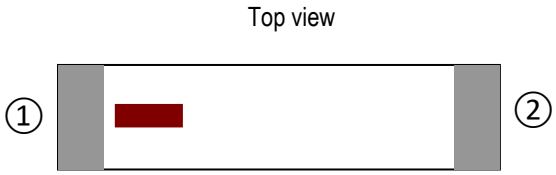
	Inches			Millimeters		
L	0.591	±	0.008	15.00	±	0.20
W	0.157	±	0.008	4.00	±	0.20
T	0.059	±	0.008	1.50	±	0.20
a	0.039	±	0.012	1.00	±	0.30





Terminal Configuration[3]

Pin Number	Function
1	Feed
2	NC*



[3] The termination type is Nickel Tin. Go to: https://www.johansontechnology.com/ipcsoldering-profile for Typical Soldering Profile.

* This terminal must be soldered for anchoring and mechanical stability.

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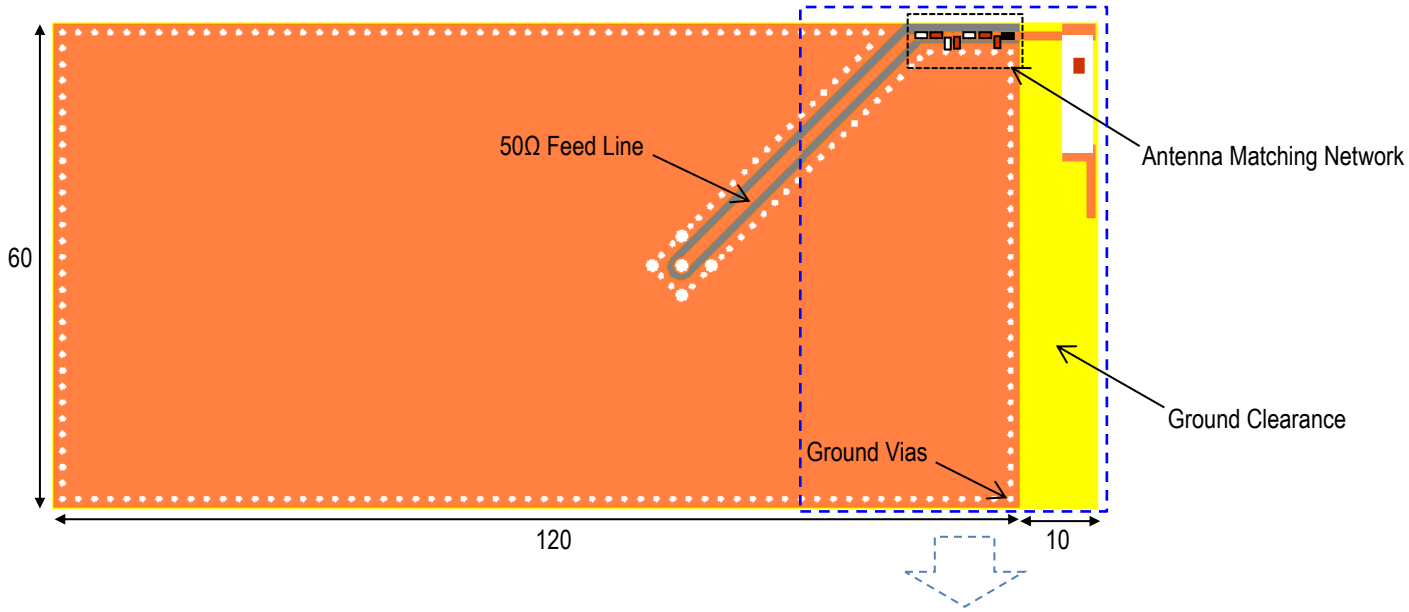
Evaluation Board and Recommended Mounting Configuration 1 (Large PCB): Tuning Version 1 and 2 (P/N 0830AT54A2200001CE1 and 0830AT54A2200001CE2)

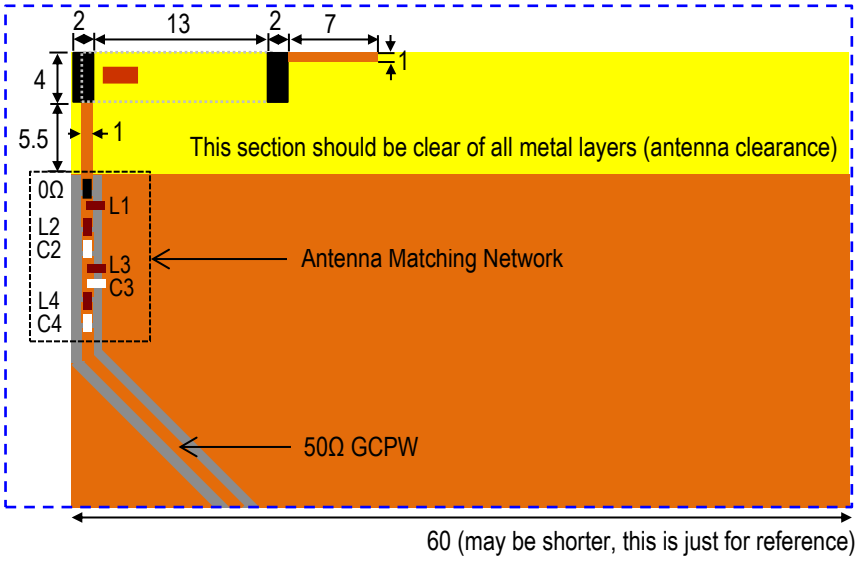
All units in mm



Antenna Matching Network Values[4]

Tuning Version 1 (P/N. 0830AT54A2200001CE1)
0Ω Resistor
L1(12nH): LRW0402WJ12NGG001T
L2 (2.4nH): LRW0402WS2N4GG001T
C2 (0.9pF): QSCF500Q0R9B1GV001T
L3 (6.8nH): LRW0402WJ6N8GG001T
C3 (0.8pF): QSCF500Q0R8B1GV001T
L4 (5.9nH): LQW15AN5N9C10D (Murata)
C4 (2.2pF): QSCF500Q2R2B1GV001T

Tuning Version 2 (P/N. 0830AT54A2200001CE2)
0Ω Resistor
L1(18nH): LRW0402WJ18NGG001T
L2 (5.6nH): LRW0402WJ5N6GG001T
C2 (0.8pF): QSCF500Q0R8B1GV001T
L3 (8.6nH): LQW15AN8N6G00D (Murata)
C3 (0.9pF): QSCF500Q0R9B1GV001T
L4 (6.2nH): LRW0402WJ6N2GG001T
C4 (2.7pF): QSCF500Q2R7B1GV001T



If you'd like the CAD PCB layout or have any questions,
contact our application engineers at https://www.johansontechnology.com/ask-a-question

[4] It is recommended that the designer leave available slots for the topology of the network. The antenna matching network values above are used when the antenna is mounted on Johanson's evaluation board. The optimal matching values will vary depending on the layout, thickness, material, etc. Go to: https://www.johansontechnology.com/tuning for more information.

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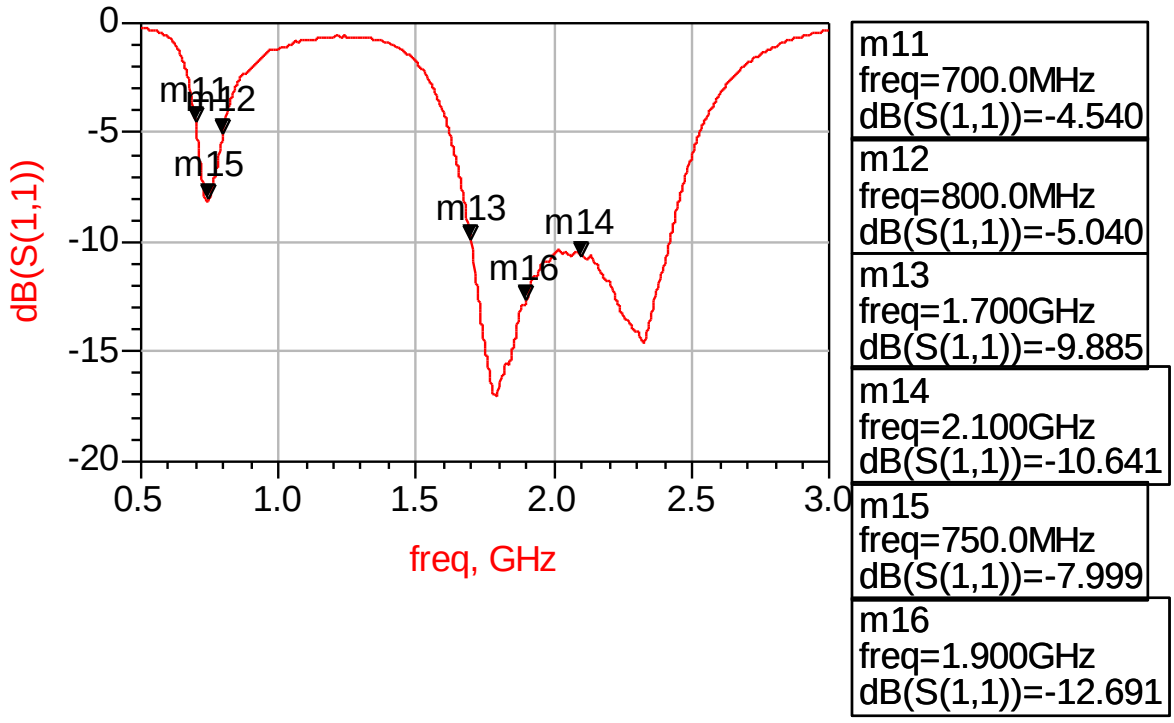
Tuning Version 1: Evaluation Board Typical Return Loss Measurement (P/N 0830AT54A2200001CE1)



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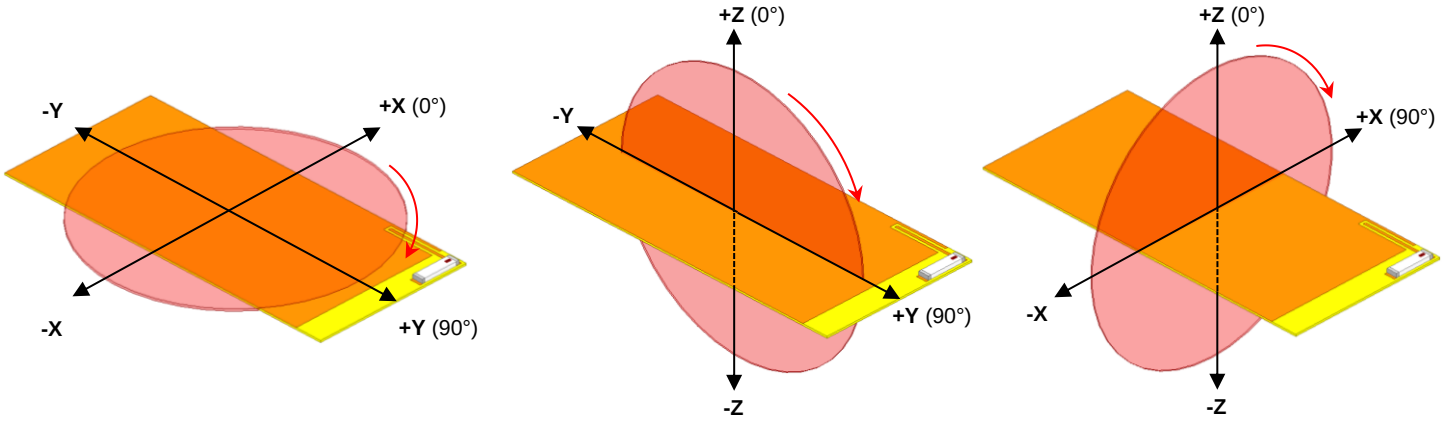
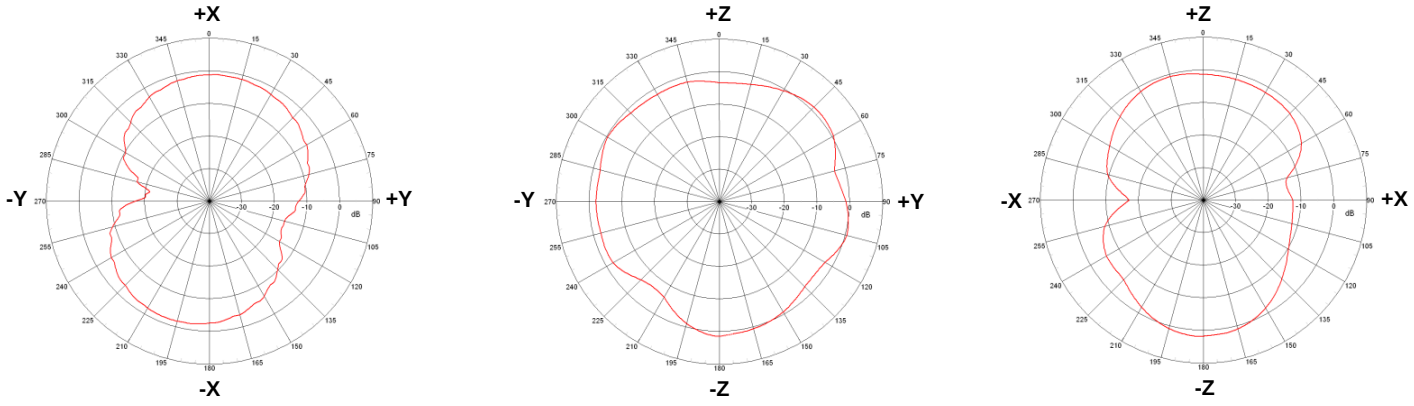
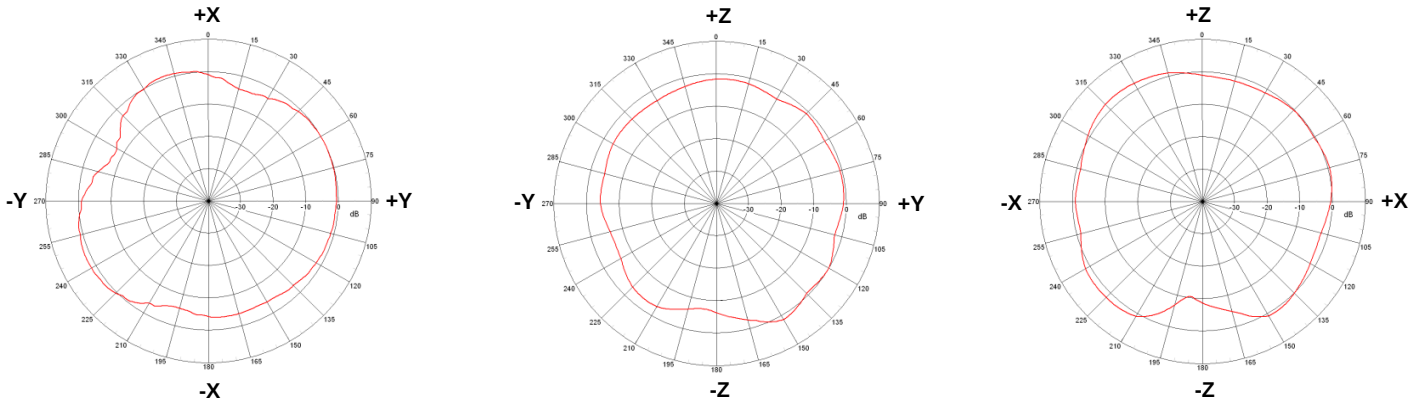
Tuning Version 1: Evaluation Board Typical 2D Radiation Patterns (P/N 0830AT54A2200001CE1)



@750 MHz Band



@1900 MHz Band



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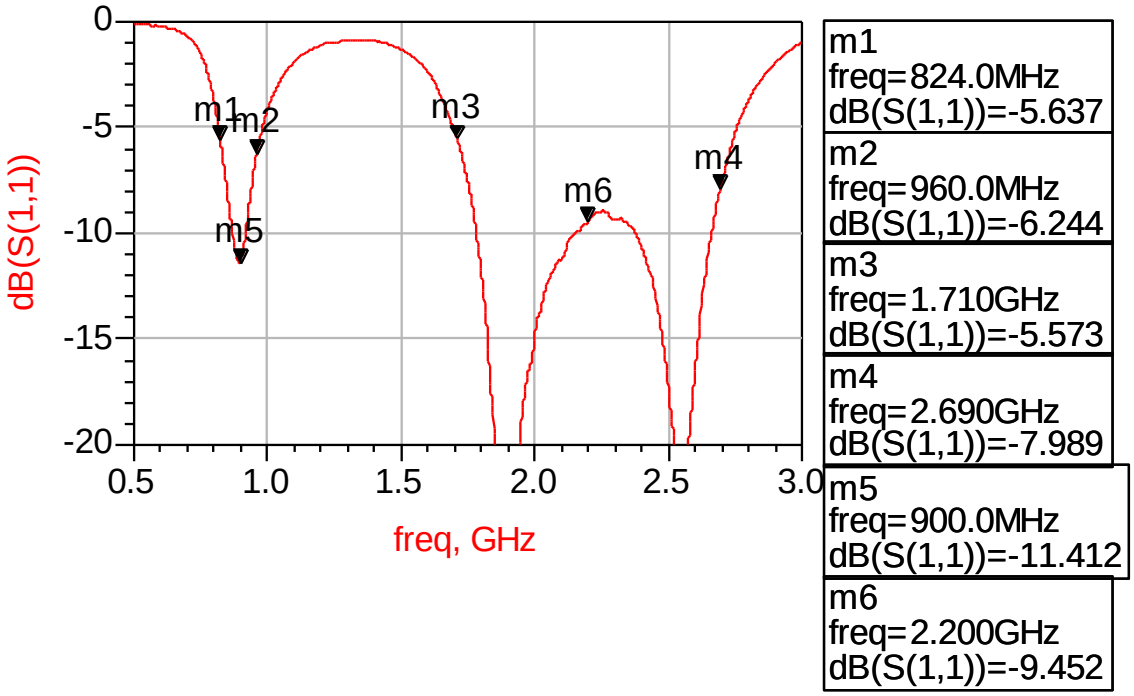
Tuning Version 2: Evaluation Board Typical Return Loss Measurement (P/N 0830AT54A2200001CE2)



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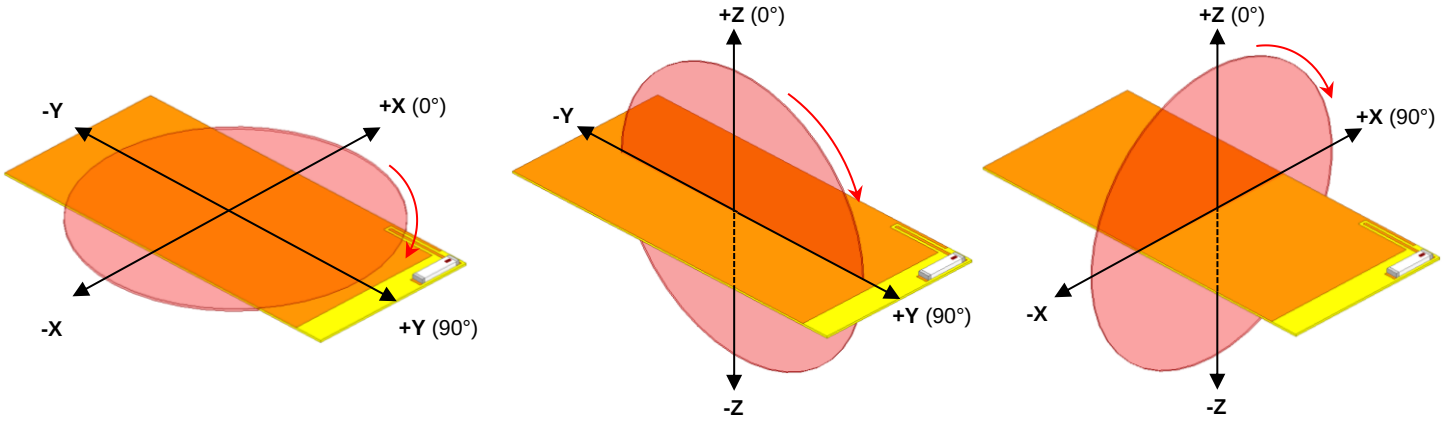
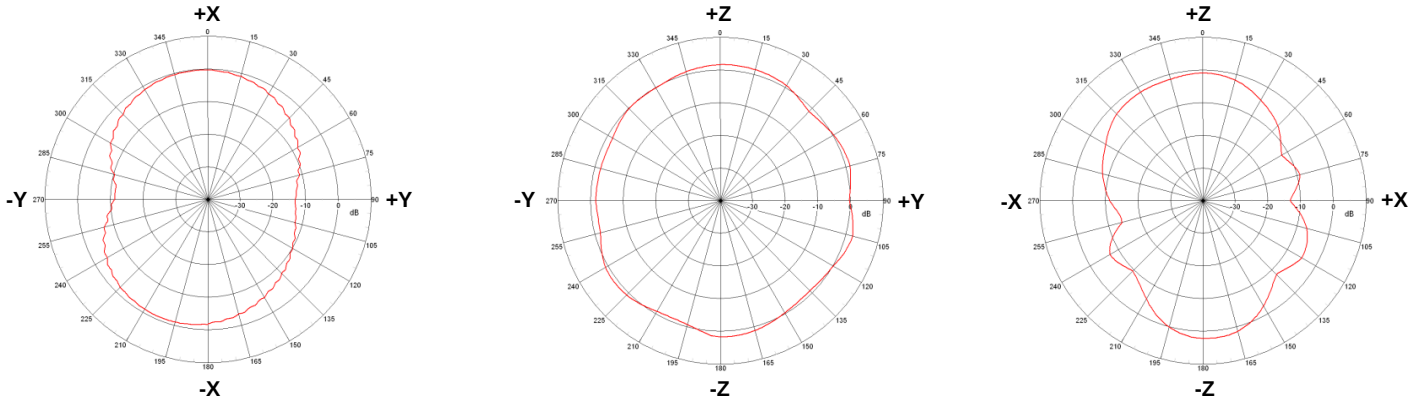
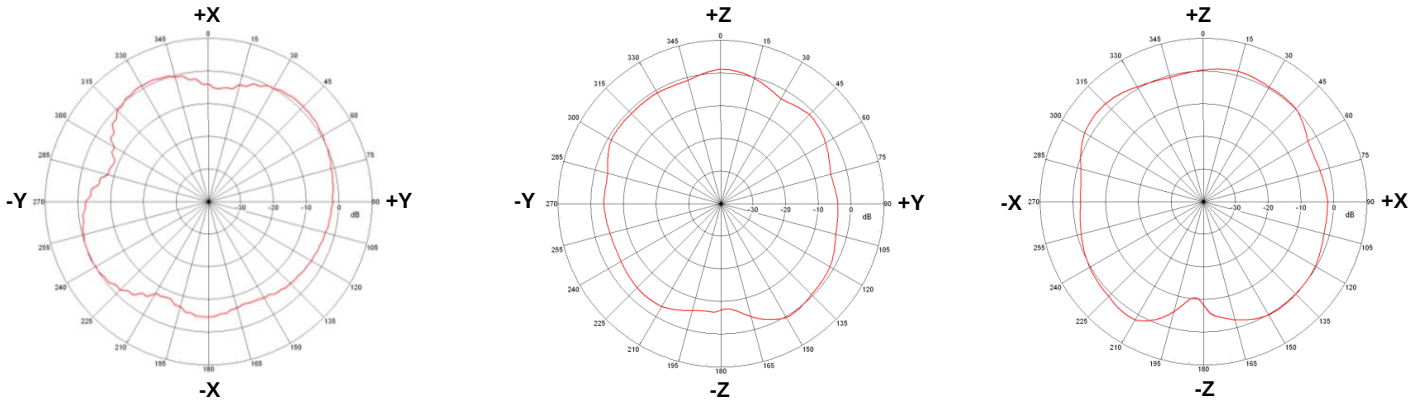
Tuning Version 2: Evaluation Board Typical 2D Radiation Patterns (P/N 0830AT54A2200001CE2)



@900 MHz Band



@2200 MHz Band



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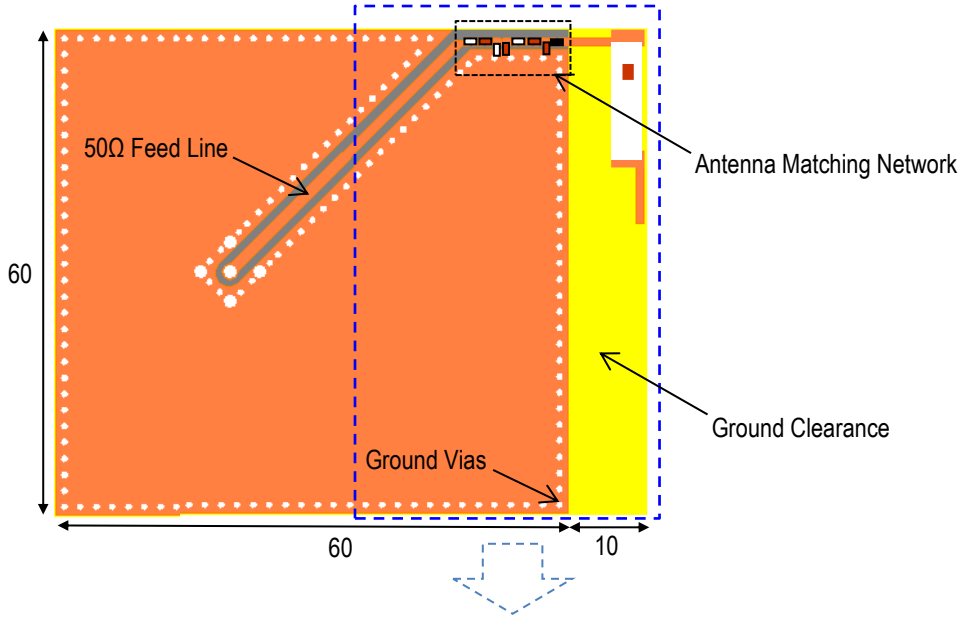
Evaluation Board and Recommended Mounting Configuration 2 (Small PCB): Tuning Version 1 and 2 (P/N 0830AT54A2200001CE3 and 0830AT54A2200001CE4)

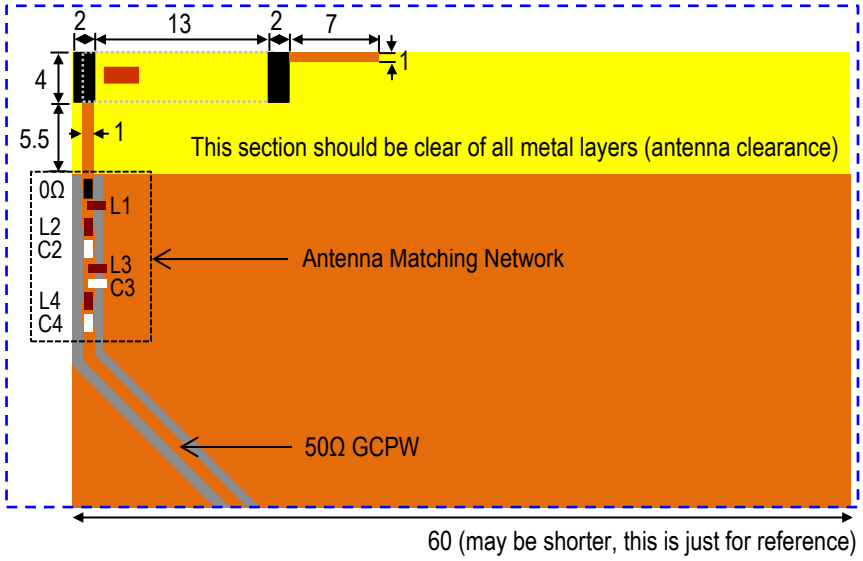
All units in mm



Antenna Matching Network Values[5]

Tuning Version 1 (P/N. 0830AT54A2200001CE3)
0Ω Resistor
L1(18nH): LRW0402WJ18NGG001T
L2 (6.2nH): LRW0402WJ6N2GG001T
C2 (0.7pF): QSCF500Q0R7B1GV001T
L3 (7.8nH): LQW15AN7N8G80D (Murata)
C3 (1.5pF): QSCF500Q1R5B1GV001T
L4 (5.8nH): LQW15AN5N8B00D (Murata)
C4 (2.2pF): QSCF500Q2R2B1GV001T

Tuning Version 2 (P/N. 0830AT54A2200001CE4)
0Ω Resistor
L1(13nH): LRW0402WJ13NGG001T
L2 (3.9nH): LRW0402WC3N9GG001T
C2 (0.7pF): QSCF500Q0R7B1GV001T
L3 (7.5nH): LRW0402WJ7N5GG001T
C3 (0.7pF): QSCF500Q0R7B1GV001T
L4 (5.8nH): LQW15AN5N8B00D (Murata)
C4 (2.0pF): QSCF500Q2R0B1GV001T



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[5] It is recommended that the designer leave available slots for the topology of the network. The antenna matching network values above are used when the antenna is mounted on Johanson's evaluation board. The optimal matching values will vary depending on the layout, thickness, material, etc. Go to: https://www.johansontechnology.com/tuning for more information.

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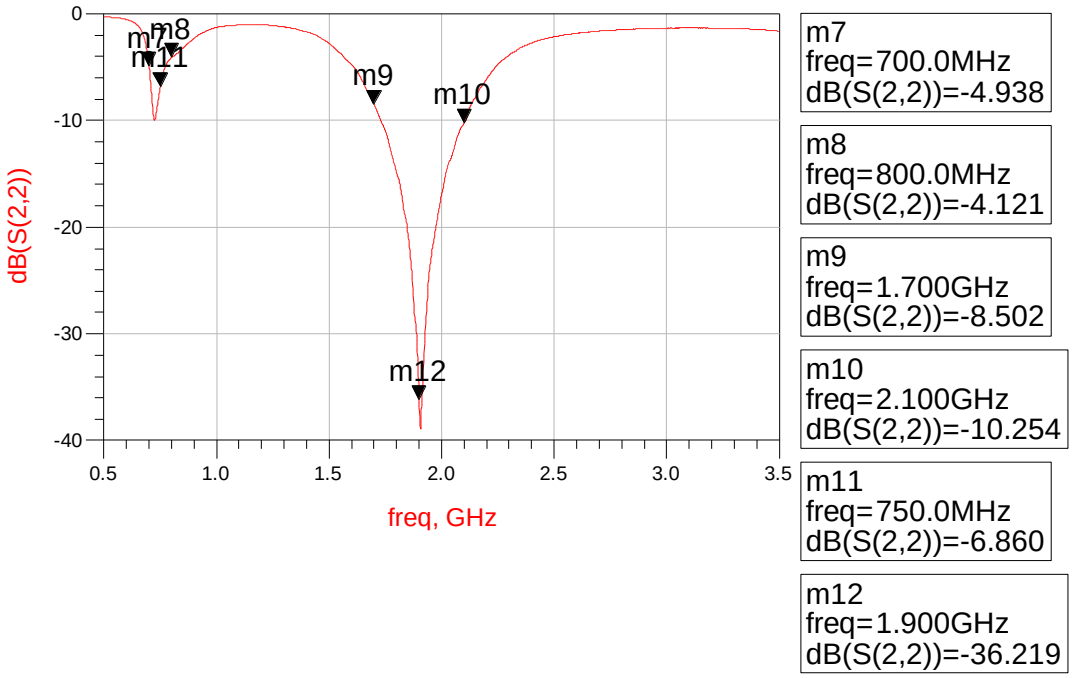
Tuning Version 1: Evaluation Board Typical Return Loss Measurement (P/N 0830AT54A2200001CE3)



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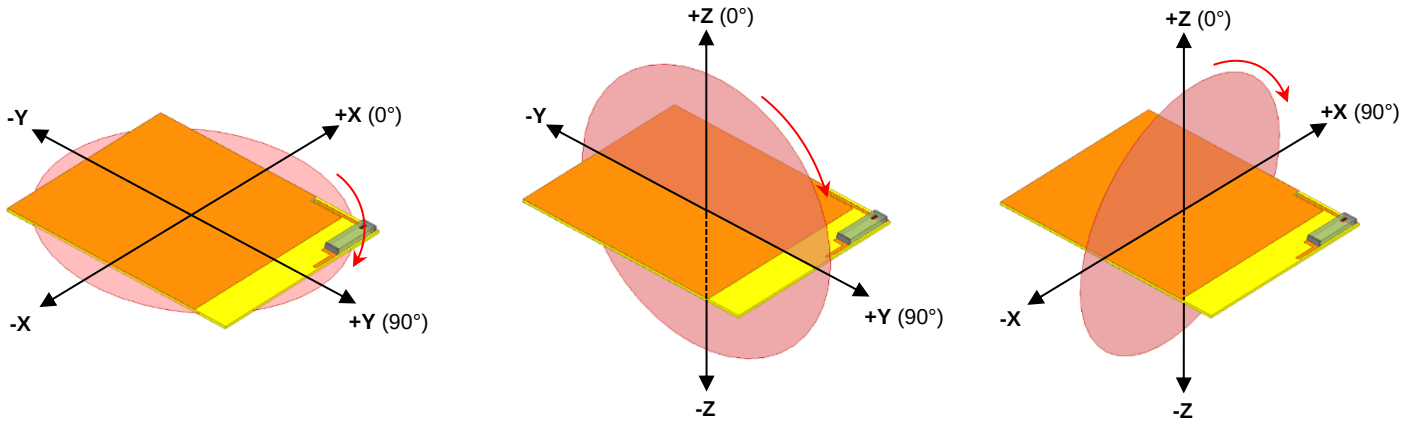
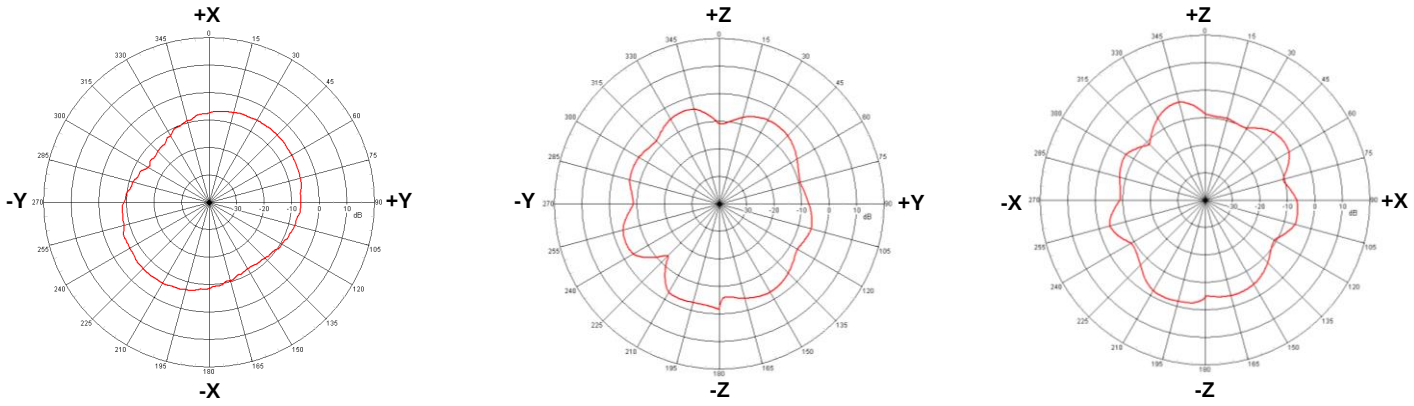
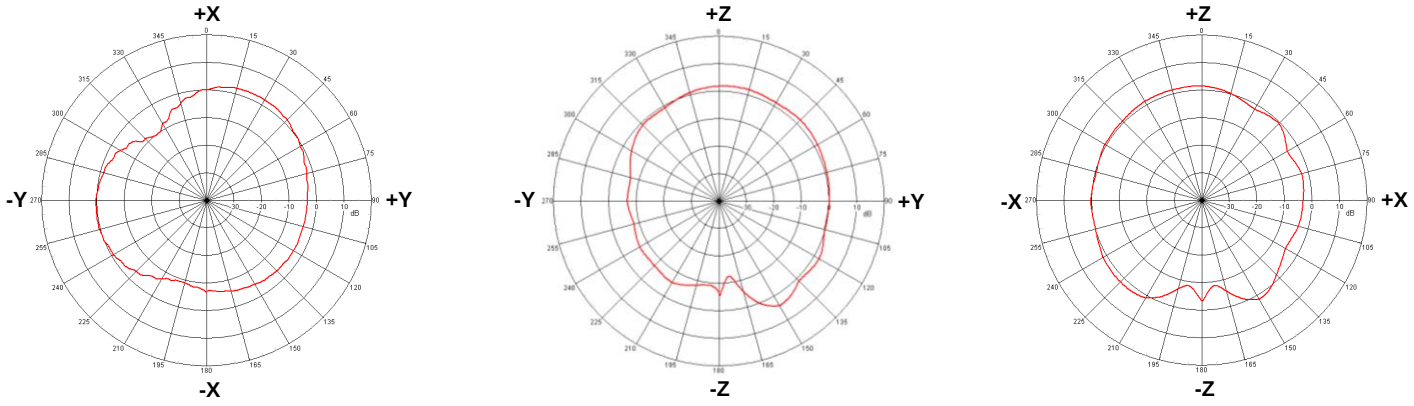
Tuning Version 1: Evaluation Board Typical 2D Radiation Patterns (P/N 0830AT54A2200001CE3)



@ 750MHz Band



@ 1900MHz Band



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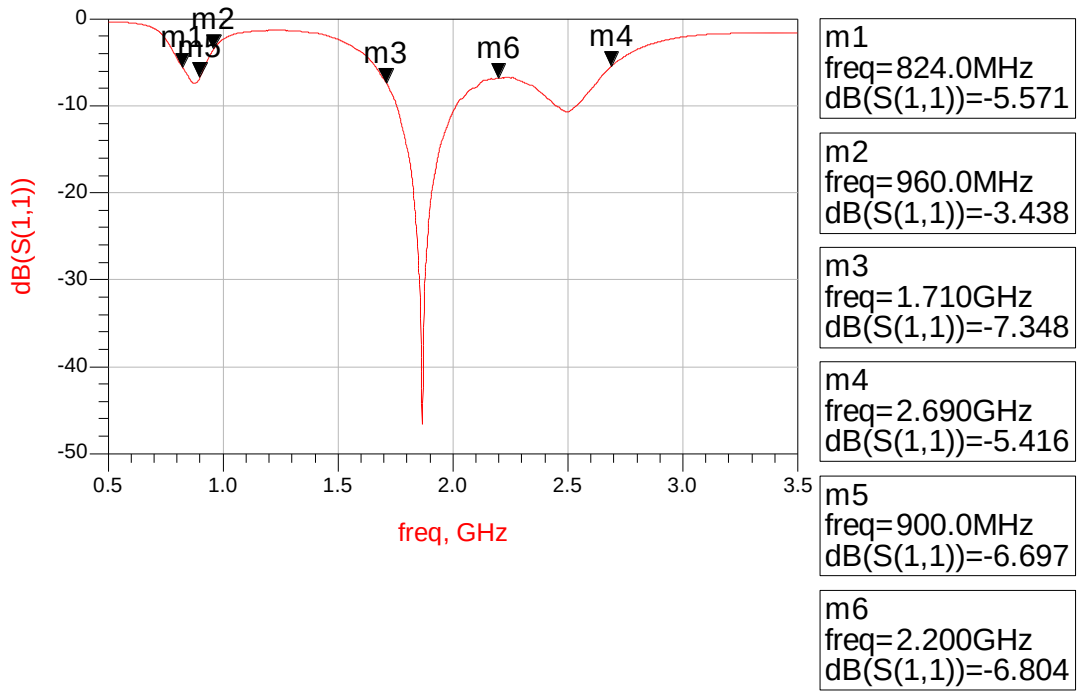
Tuning Version 2: Evaluation Board Typical Return Loss Measurement (P/N 0830AT54A2200001CE4)



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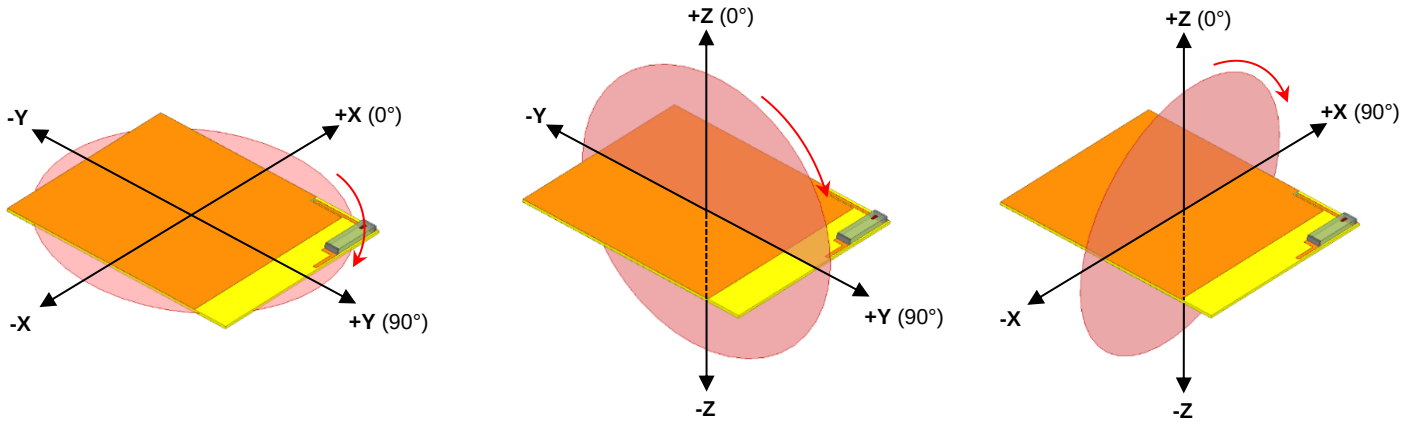
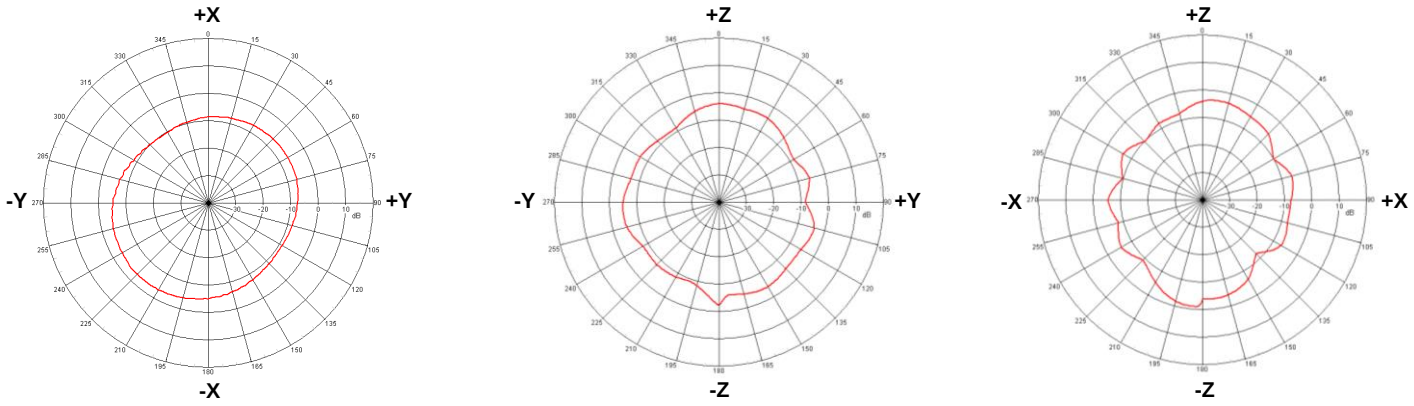
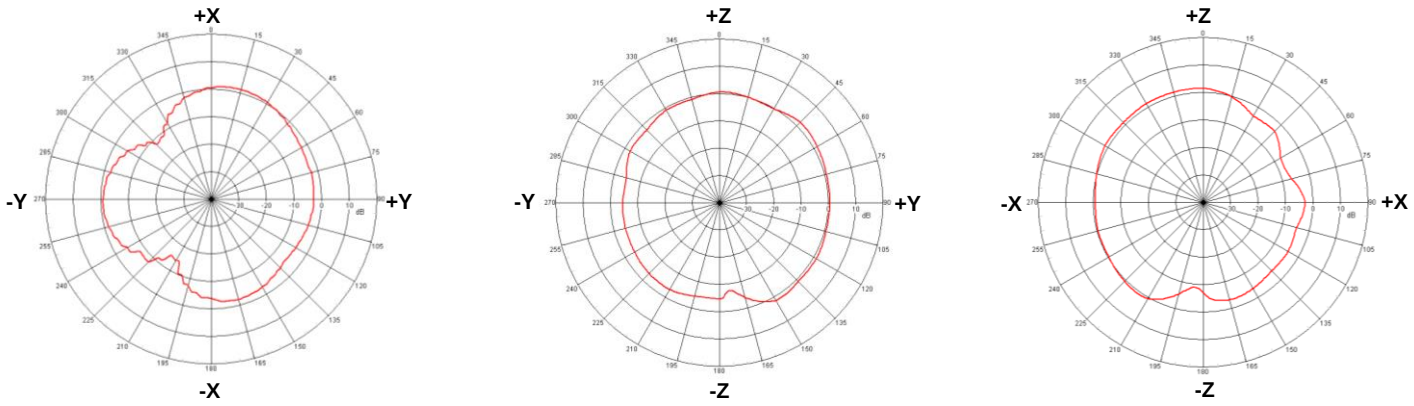
Tuning Version 2: Evaluation Board Typical 2D Radiation Patterns (P/N 0830AT54A2200001CE4)



@900 MHz Band



@2200 MHz Band



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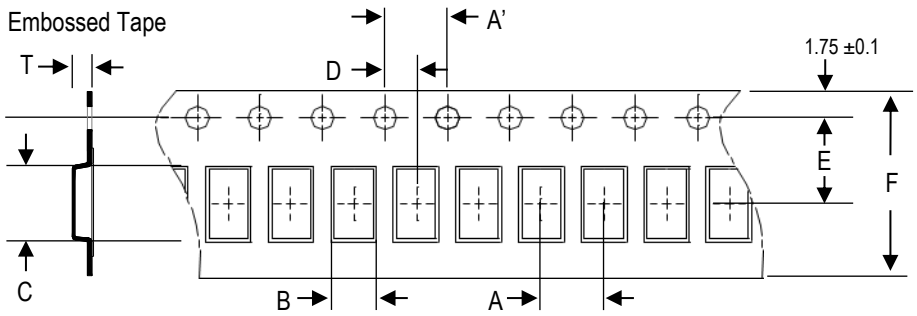
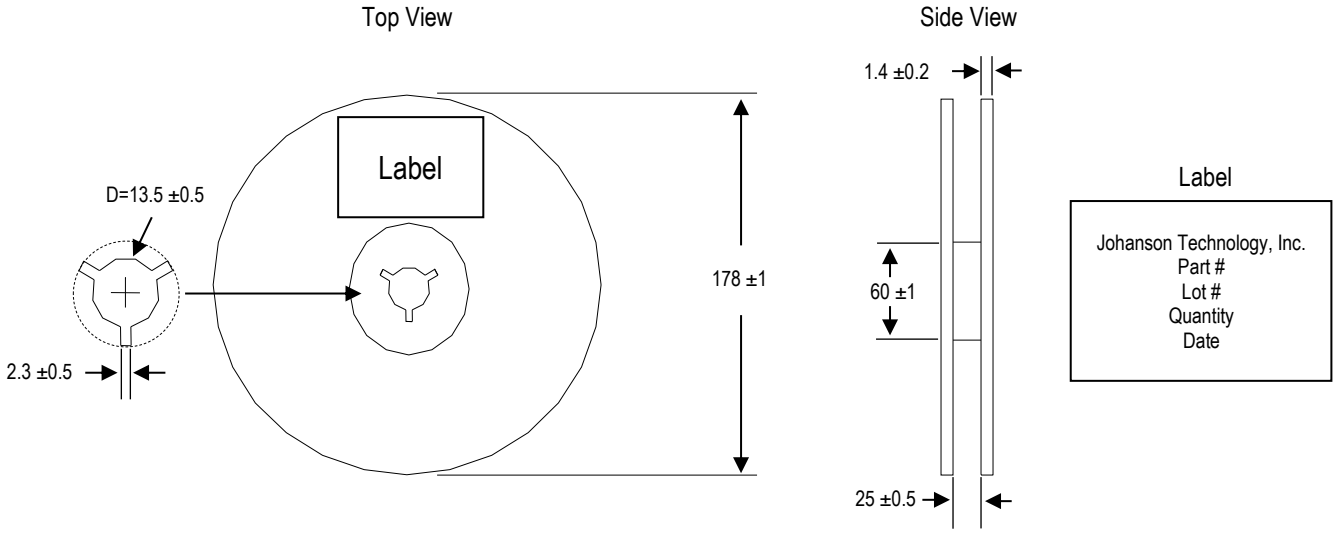
Tape and Reel Specification (Units in mm)

Tape Dimensions

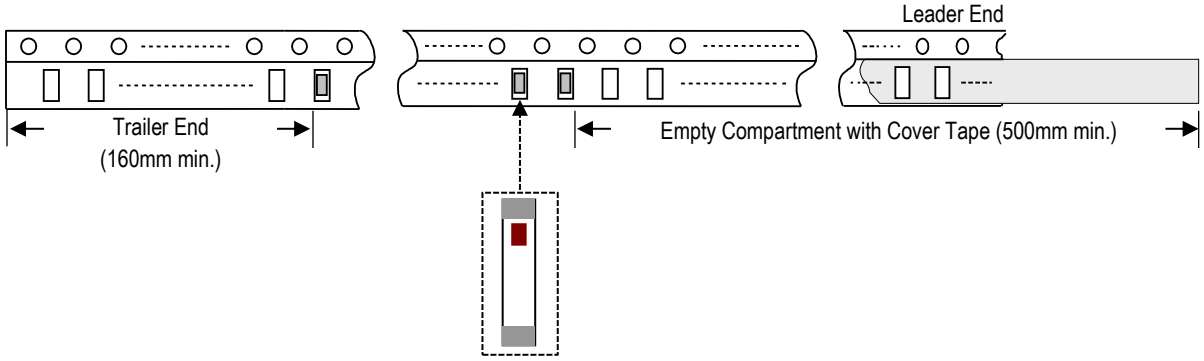


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
8.0 ±0.1	4.0 ±0.1	4.3 ±0.1	15.3 ±0.1	2.0 ±0.05	11.5 ±0.1	24.0 ±0.3	1.8 ±0.1	500pcs.	Plastic (Embossed)

Reel Dimensions



Leader and Trailer Dimensions



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Orderable Part Number

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	0830AT54A2200001B	Nickel Tin
T & R (7" Reel Embossed Tape)	0830AT54A2200001E (Qty: 500 pcs./reel)	
Evaluation Board with 1 SMA Connector	0830AT54A2200001CE1 (large PCB) – Tuning Version 1 (Page4)	
	0830AT54A2200001CE2 (large PCB) – Tuning Version 2 (Page4)	
	0830AT54A2200001CE3 (small PCB) – Tuning Version 1 (Page9)	
	0830AT54A2200001CE4 (small PCB) – Tuning Version 2 (Page9)	

Important Links

0830AT54A2200001E Product Page

IoT Multi-band Solution Application Note 90

More Chip Antennas

Antenna Tuning, Optimization, and Validation Services

Soldering Information

MSL Information

Packaging Information

Recommended Storage Condition and Max Shelf Life

RoHS Compliance

Contact our application engineers for a PCB layout review.

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