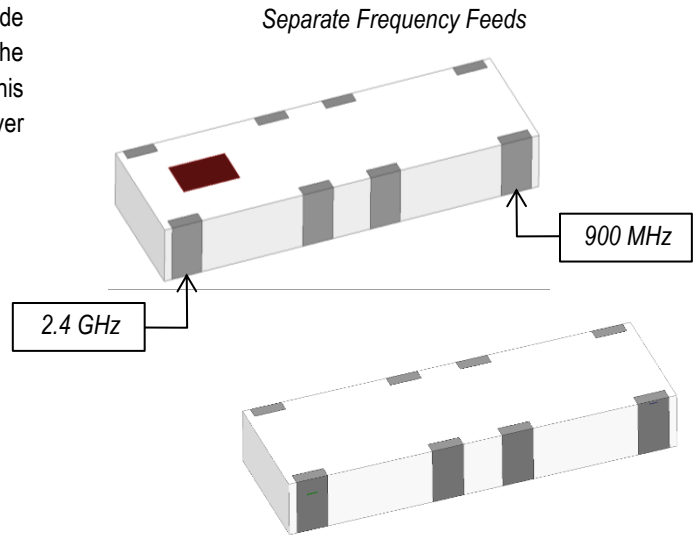


Dual Band 900 MHz and 2.4 GHz Chip Antenna

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 2}

Passband Frequency (MHz)	865 - 928	2400 - 2480
Impedance (Ω)	50	50
Return Loss (dB)	3 Min.	6 Min.
Peak Gain (dBi)	-3.0 Typ.	1.5 Typ.
Average Gain (dBi)	-8.0 Typ.	-3.5 Typ.
Average Radiated Efficiency (%)	27	56
Average Radiated Efficiency (%) – Larger Evaluation Board ³	52	82

Maximum Ratings

Power Capacity (W)	2 Max. (CW)
Operating Temperature ($^{\circ}\text{C}$)	-40 to +85
Recommended Storage Conditions post-installation ($^{\circ}\text{C}$)	-40 to +85
Recommended Storage Conditions and Period for Unused T&R Product	45% - 75% RH +5 to +35 $^{\circ}\text{C}$ 18 Months Max.

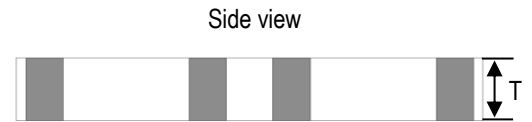
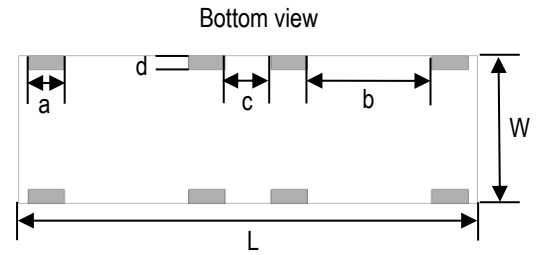
¹ Typical value represents average measurement at 25 $^{\circ}\text{C}$. Min./Max. values represent measurements over specified operating temperature.

² General specifications measured on Johanson's evaluation board P/N 0900AD47A2450001CE1. See pages 3-5.

³ Measured Average Radiated Efficiency on pre-tuned larger evaluation board for reference only. See Pages 6-8.

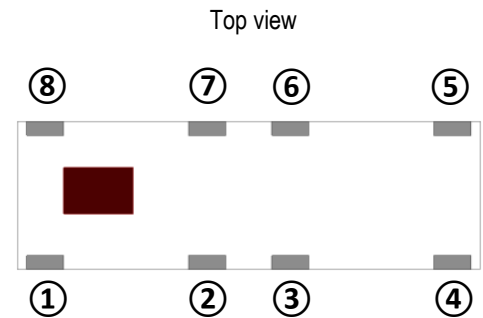
Mechanical Dimensions

	Inches			Millimeters		
L	0.394	±	0.008	10.00	±	0.20
W	0.126	±	0.008	3.20	±	0.20
T	0.059	±	0.008	1.50	±	0.20
a	0.031	±	0.008	0.80	±	0.20
b	0.106	±	0.008	2.70	±	0.20
c	0.039	±	0.008	1.00	±	0.20
d	0.012	+0.004/-0.008		0.30	+0.10/-0.20	



Terminal Configuration^{4 5}

Pin Number	Function
1	2.4 GHz Feed
2	NC
3	NC
4	900 MHz Feed
5	NC
6	NC
7	NC
8	NC

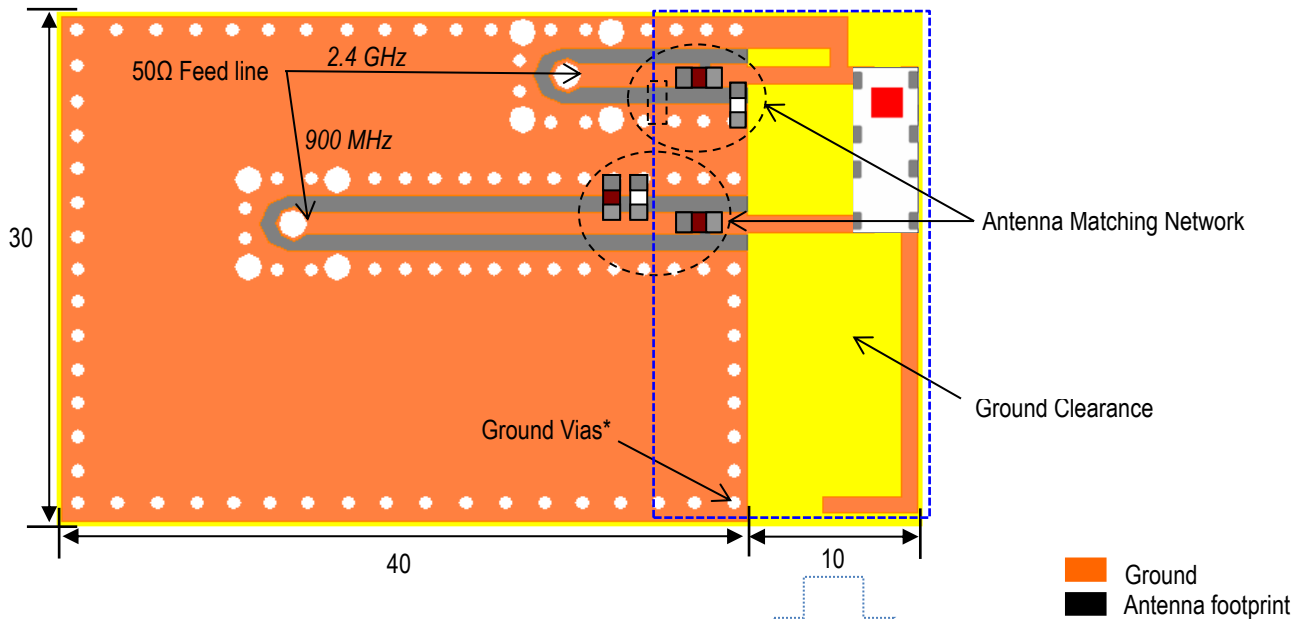


⁴ Even though terminals 2, 3, 5, 6, 7, and 8 are NC ("No Connect"), they must be soldered down to the landing pad for proper operation.

⁵ The termination type is Nickel Tin. Go to: <https://www.johansontechnology.com/ipcsoldering-profile> for Typical Soldering Profile.

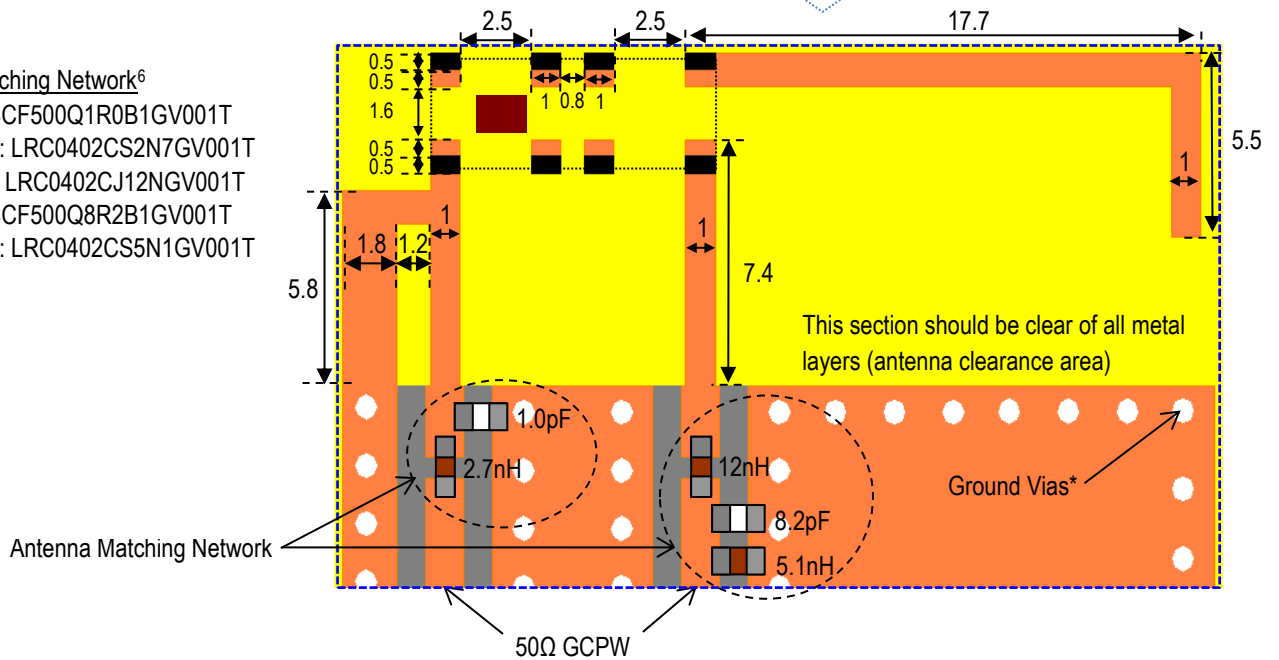
Evaluation Board and Recommended Mounting Configuration 1 (P/N 0900AD47A2450001CE1)

All units in mm



JTI P/Ns for Matching Network⁶

- Cap (1.0pF): QSCF500Q1R0B1GV001T
- Inductor (2.7nH): LRC0402CS2N7GV001T
- Inductor (12nH): LRC0402CJ12NGV001T
- Cap (8.2pF): QSCF500Q8R2B1GV001T
- Inductor (5.1nH): LRC0402CS5N1GV001T

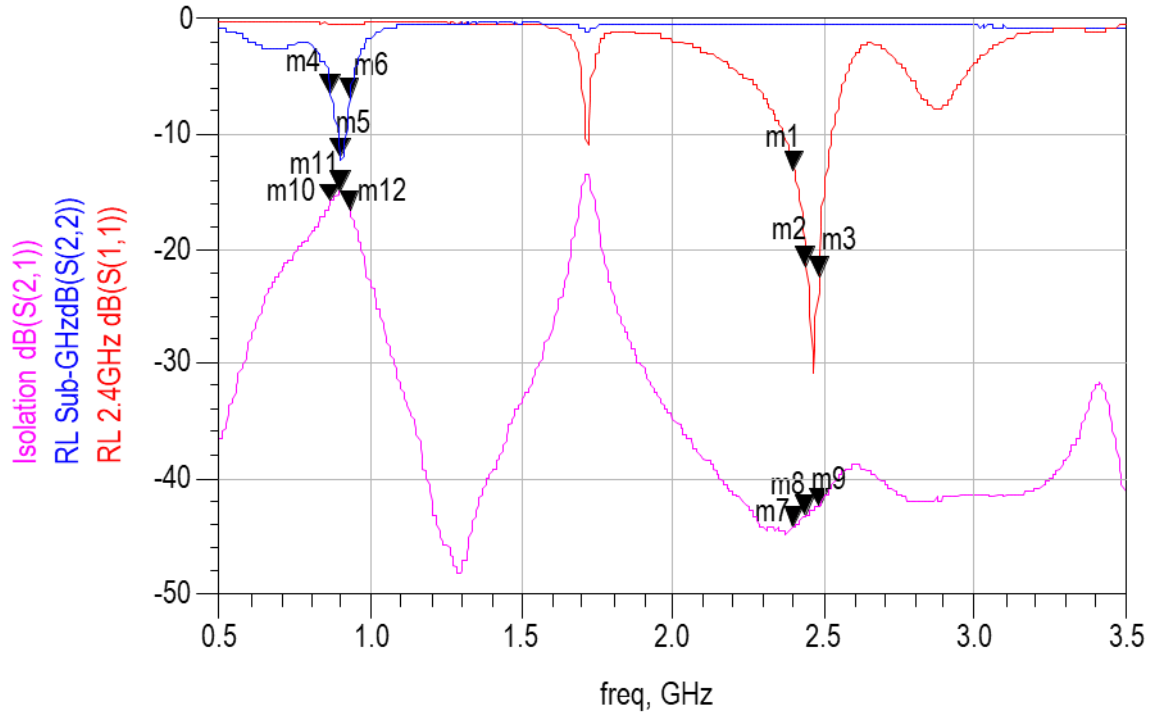


*Note: Ground Vias are highly recommended to have better antenna efficiency.

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

⁶ 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.

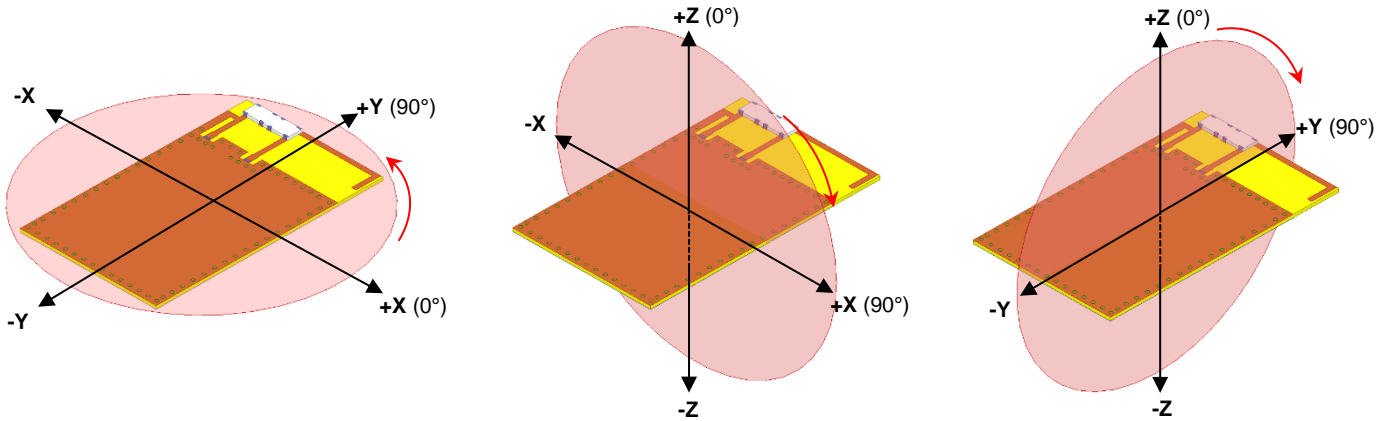
Evaluation Board Typical Return Loss Measurement (P/N 0900AD47A2450001CE1)



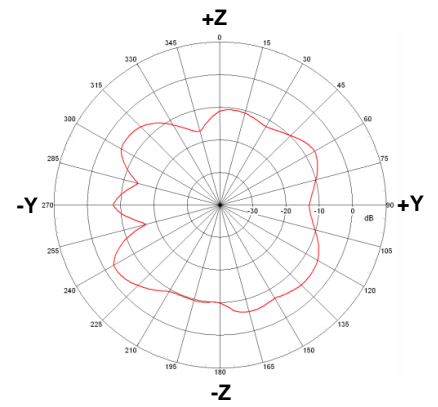
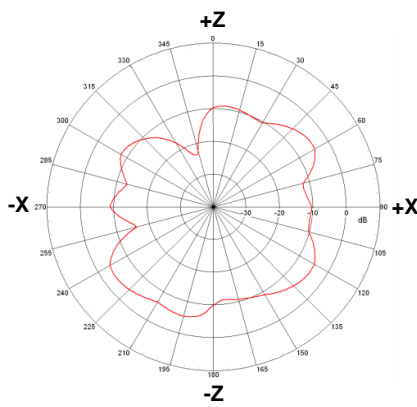
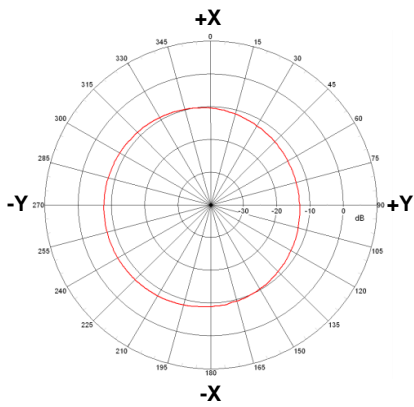
m1 freq=2.400GHz dB(S(1,1))=-13.210	m5 freq=896.0MHz dB(S(2,2))=-12.022	m9 freq=2.480GHz dB(S(2,1))=-42.394
m2 freq=2.440GHz dB(S(1,1))=-21.451	m6 freq=928.0MHz dB(S(2,2))=-6.789	m10 freq=868.0MHz dB(S(2,1))=-15.927
m3 freq=2.480GHz dB(S(1,1))=-22.425	m7 freq=2.400GHz dB(S(2,1))=-44.254	m11 freq=896.0MHz dB(S(2,1))=-14.992
m4 freq=868.0MHz dB(S(2,2))=-6.534	m8 freq=2.440GHz dB(S(2,1))=-43.149	m12 freq=928.0MHz dB(S(2,1))=-16.553



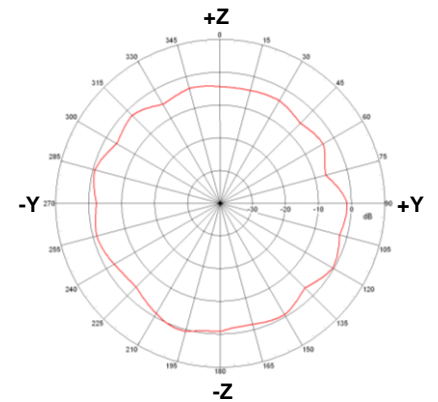
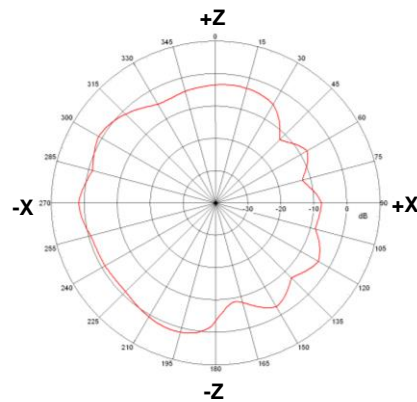
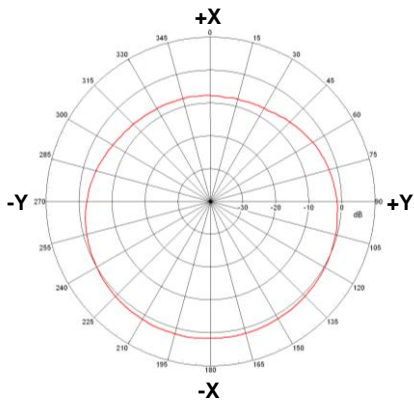
Evaluation Board Typical 2D Radiation Patterns (P/N 0900AD47A2450001CE1)



@896MHz Band

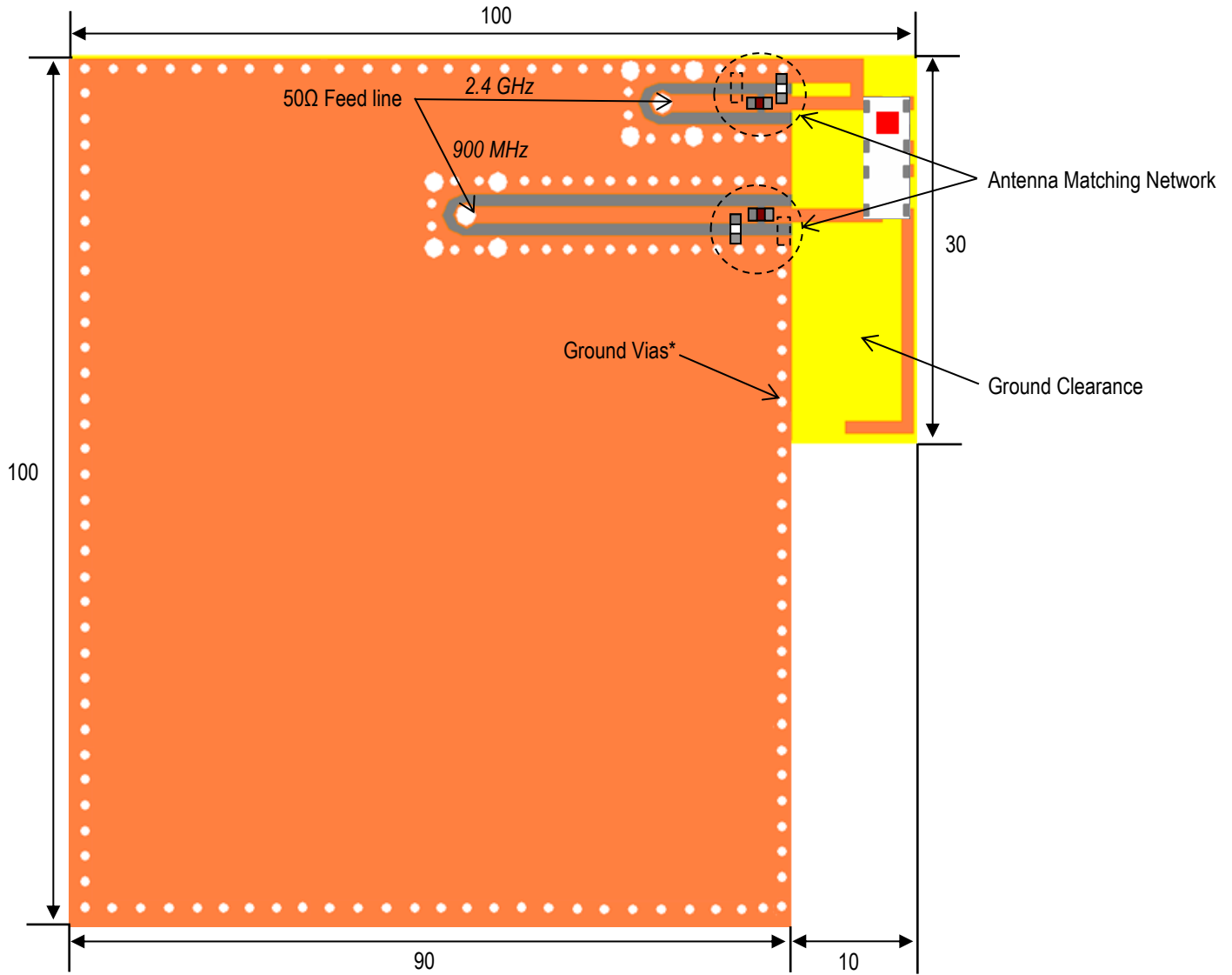


@2440MHz Band



Larger Evaluation Board and Recommended Mounting Configuration 2 (Reference only, evaluation board unavailable)

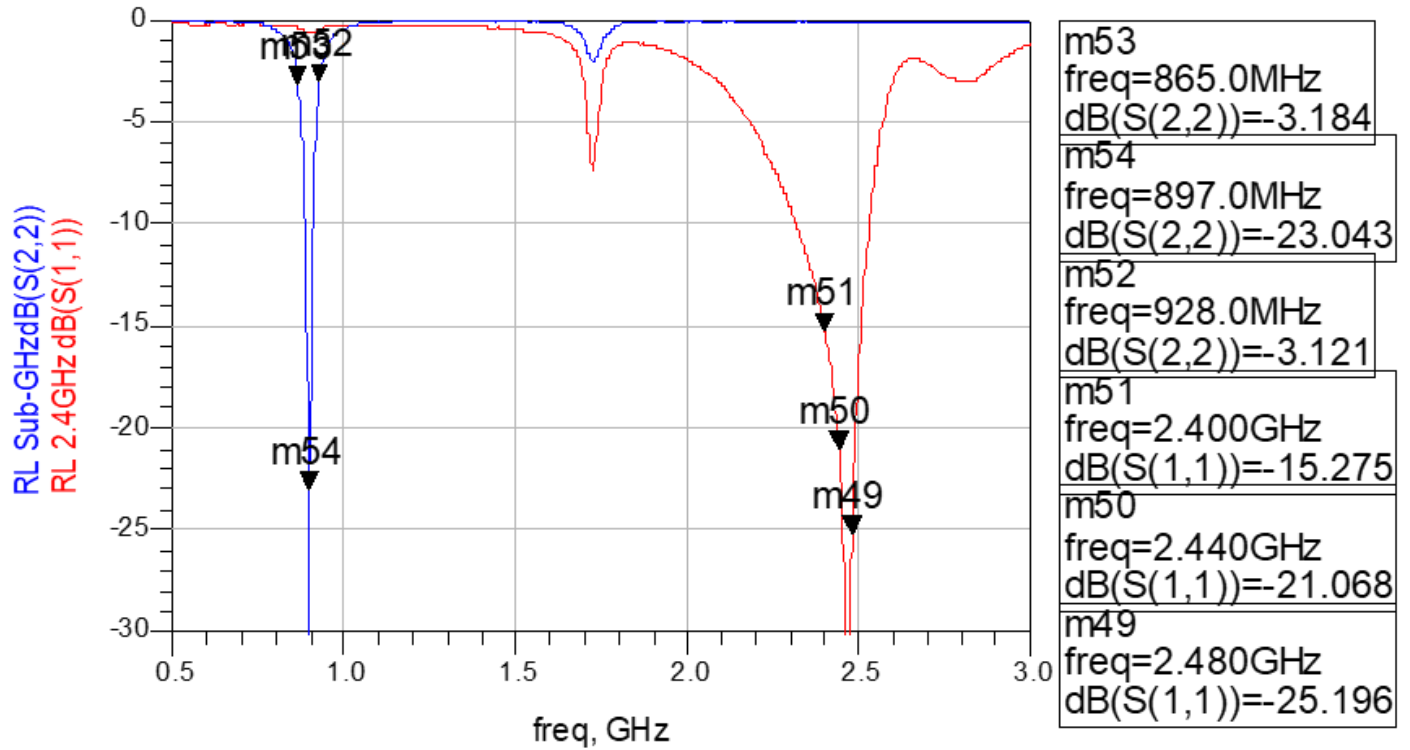
All units in mm



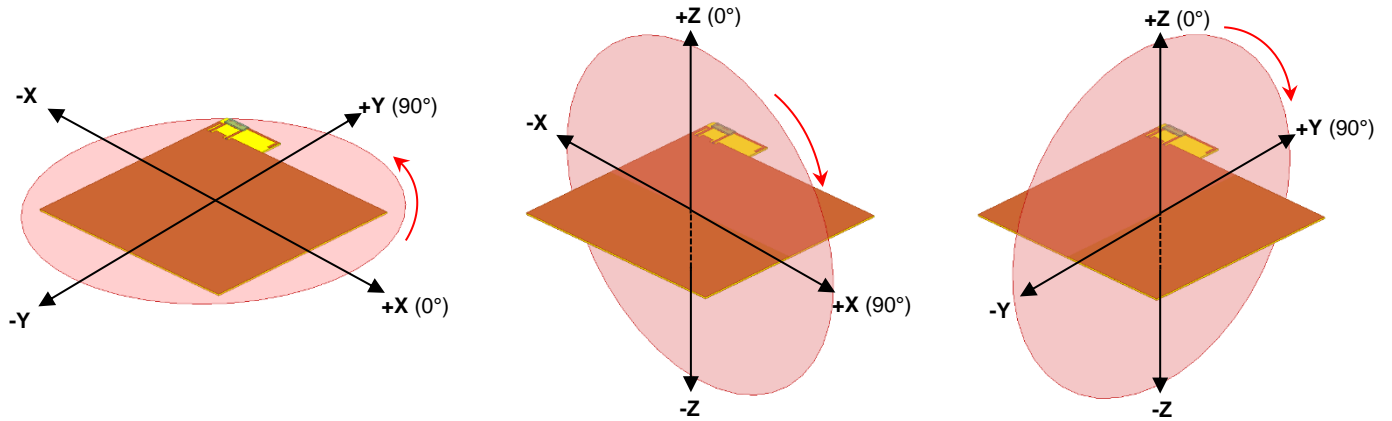
*Note: Ground Vias are highly recommended to have better antenna efficiency.

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contact our application engineers at <https://www.johansontechnology.com/ask-a-question>

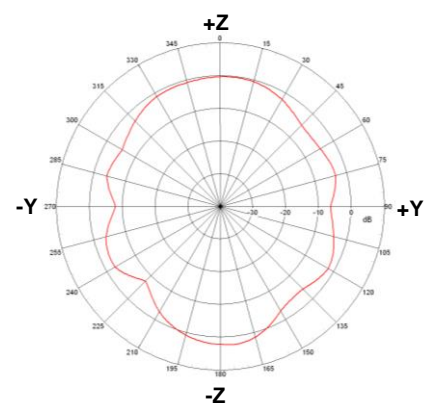
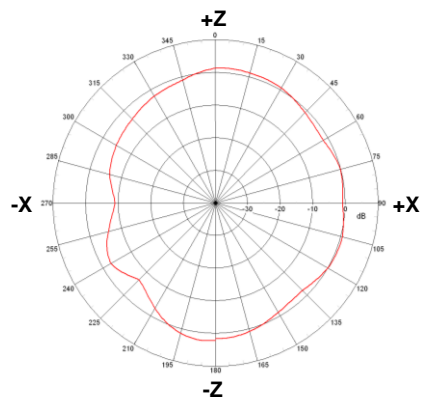
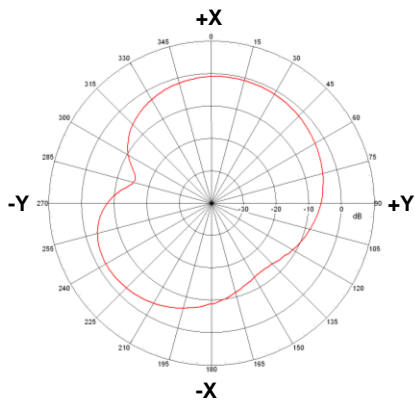
Larger Evaluation Board Typical Return Loss Measurement (For reference only, eval board non-orderable)



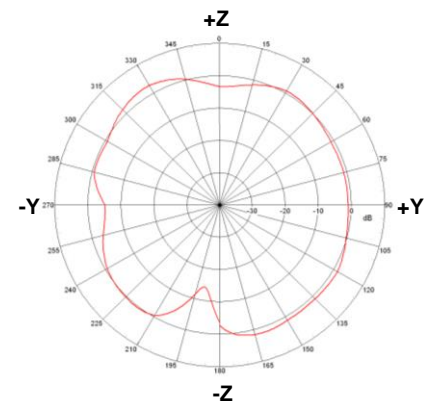
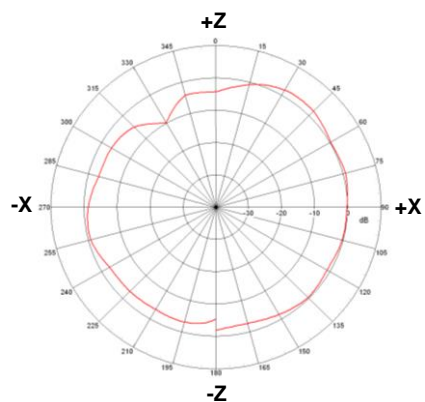
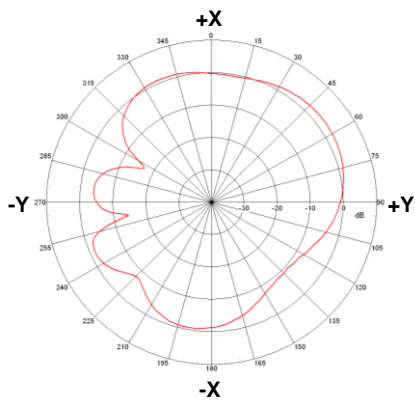
Larger Evaluation Board Typical 2D Radiation Patterns (For reference only, eval board non-orderable)



@896MHz Band



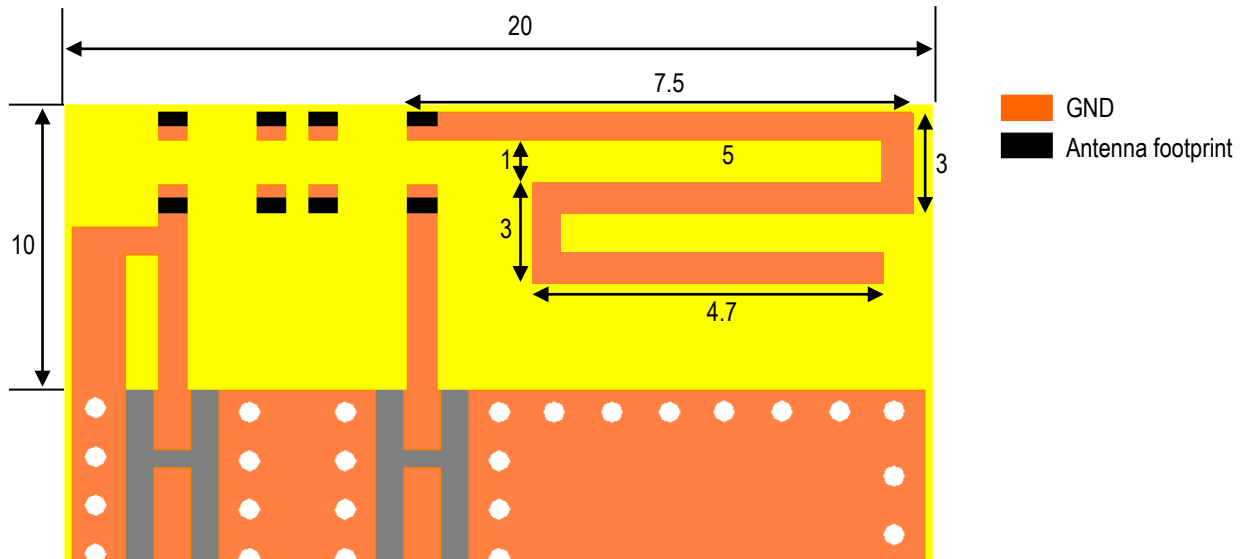
@2440MHz Band



Recommended Mounting Configuration for Narrow PCB (For reference only, eval board non-orderable)

The following layout can be followed for PCB designs that are narrower and cannot accommodate the recommended Mounting Configurations 1 and 2.

Units in mm

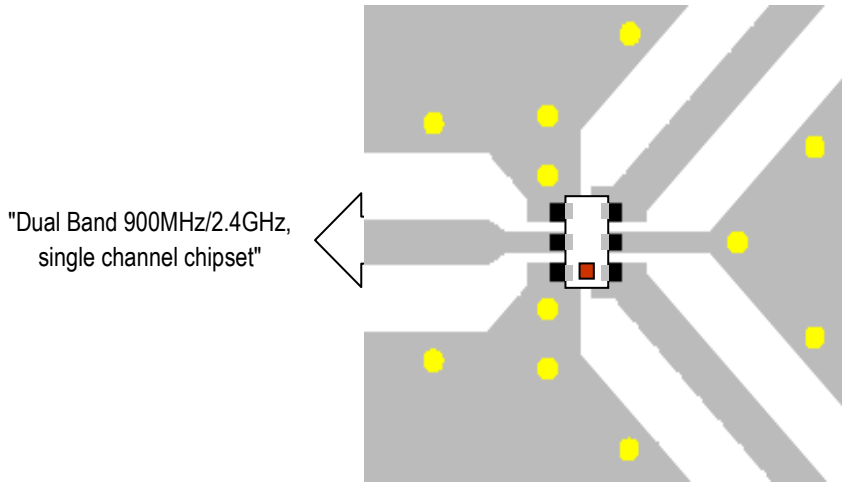


If you have any questions, contact our application engineers at <https://www.johansontechnology.com/ask-a-question>

Recommended Single Feed Configuration with Diplexer Option

If there's a single 900MHz/2.4GHz combined feed coming from the chipset, Johanson Technology offers a diplexer option to separate and filter the 900MHz and 2.4GHz signals. The recommended p/n. is: [0900DP15A2450001E](#).

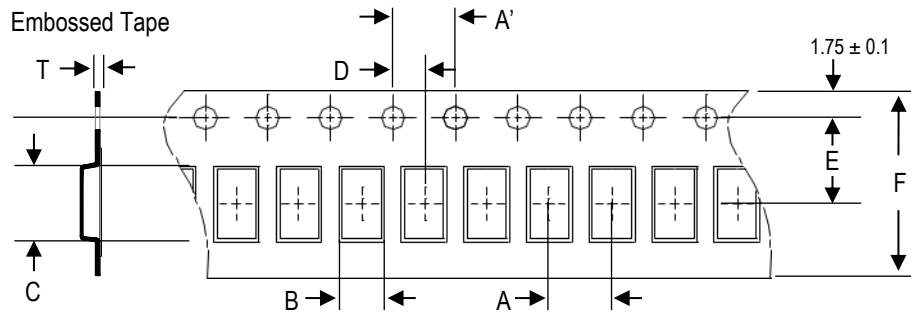
Pairing a 900MHz low pass filter with a 2.4GHz high pass filter not only separates the two signals but provides harmonic attenuation to fulfill regulation qualification for industry standards.



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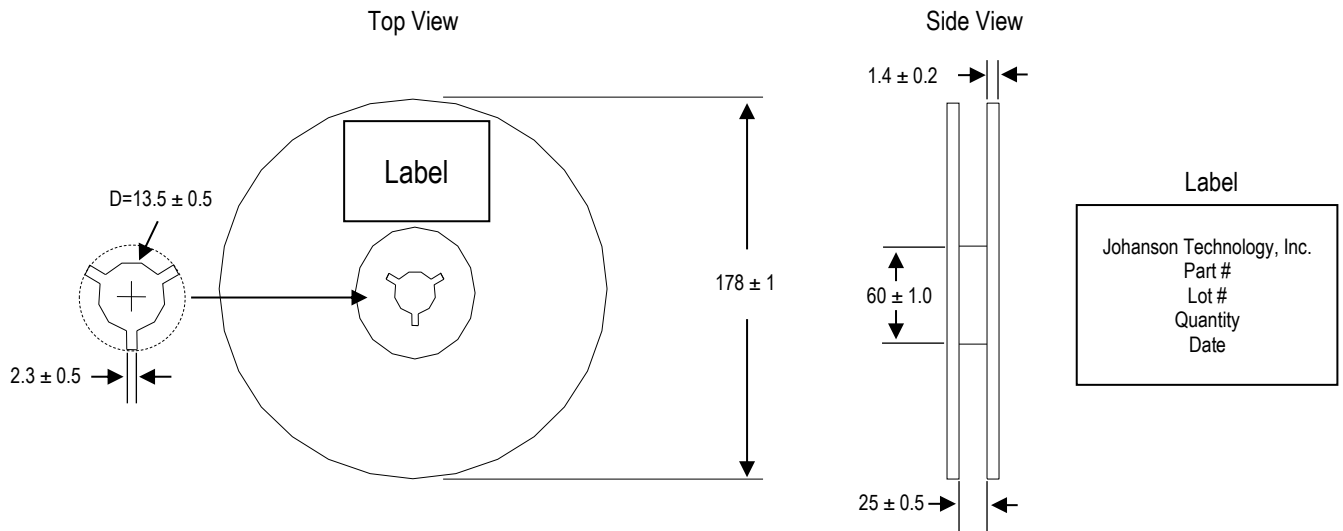
Tape and Reel Specification (Units in mm)

Tape Dimensions

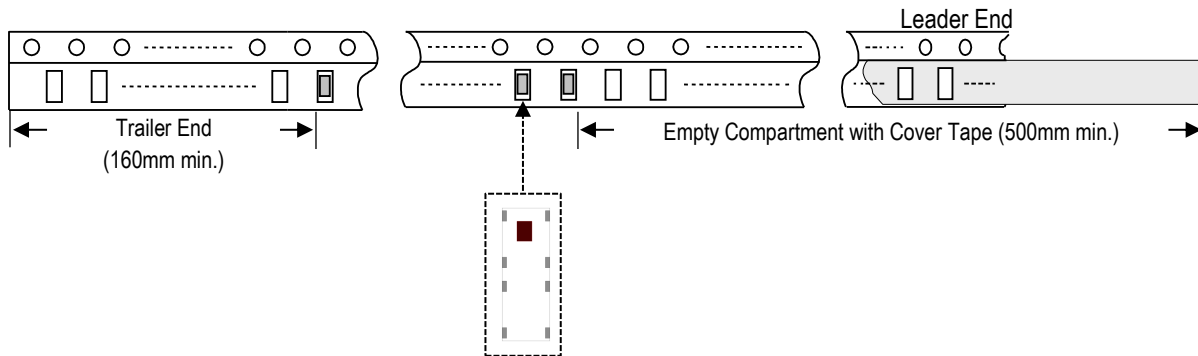


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
8.0±0.1	4.0±0.1	3.45±0.1	10.3±0.1	2.0±0.05	7.5±0.1	16.0±0.2	1.7±0.1	1,000pcs	Plastic (Embossed)

Reel Dimensions



Leader and Trailer Dimensions



Orderable Part Number

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	0900AD47A2450001B	Nickel Tin
T & R (7" Reel Embossed Tape)	0900AD47A2450001E (Qty: 1,000 pcs/reel)	
Evaluation Board with 2 SMA Connector	0900AD47A2450001CE1 (Optimized for 868 - 928MHz and 2.4GHz)	
	0900AD47A2450001CE2 (Optimized for US/Americas/Japan 902-930MHz and 2.4GHz)	
	0900AD47A2450001CE3 (Optimized for EU 868MHz and 2.4GHz)	

Important Links

[0900AD47A2450001E Product Page](#)

[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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