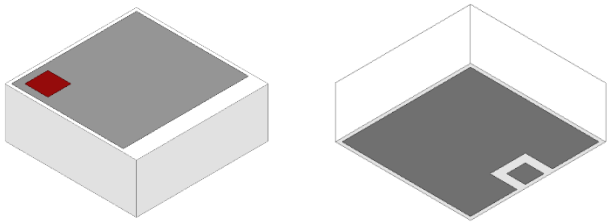
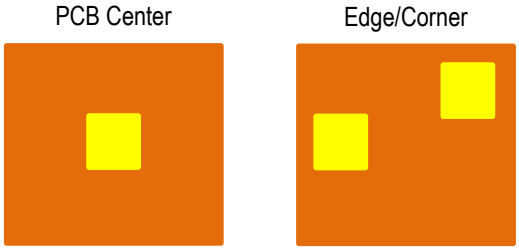
8 GHz Mini Ceramic Patch Antenna (Directional), AEC-Q200 Qualified

- 7987 MHz ±100 MHz operational frequency
- Focused on UWB Channel 9 and tunable to adjacent frequencies.
- Smart access (keyless entry), AoA sensing, ranging, radar, home/industrial autonomous robots (beacon) applications.
- Mini SMD, patch, 4x4 x1.5mm (LxWxT).
- Can be mounted in the center, corner or edge of PCB
- Broadly linear polarization
- For automotive applications
- HFSS and CST Model available[1]
- RoHS compliant



Johanson Technology, Inc. (JTI) 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 the antenna. This enables our components to have high detuning resilience and stability over extreme temperatures (~2ppm).

Recommended mounting locations for this antenna



General Specifications[2] [3]

Operational Frequency (MHz)	**7887 - 8087**
Impedance (Ω)	50
Return Loss (dB)	6 Min.
Gain (dBi) in +Z direction[4]	3.5 Typ.

Maximum Ratings

Power Capacity (W)	1 Max. (CW)
Operating Temperature (°C)	-40 to +105
Recommended Storage Conditions post-installation (°C)	-40 to +105
Recommended Storage Conditions and Period for Unused T&R Product	45% - 75% RH +5 to +35 °C 18 Months Max.

[1] To request Ansys HFSS or CST 3D EM file, got to: https://www.johansontechnology.com/contact/request-a-3d-simulation-model/
[2] Typical value represents average measurement at 25°C. Min./Max. values represent measurements over specified operating temperature.
[3] General specifications measured on Johanson's evaluation board P/N 7987AT45A0200001CE1.
[4] +Z direction points toward the top of the antenna where the E-Field is focused for optimal range and operation.

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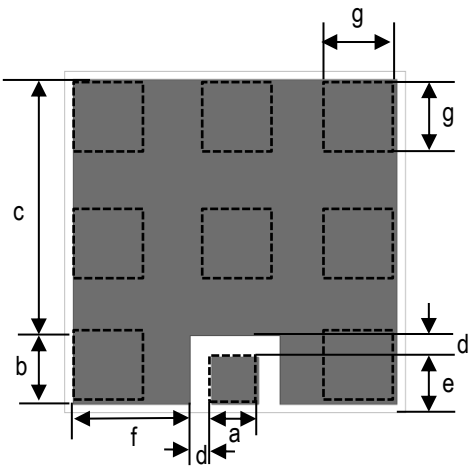
Mechanical Dimensions

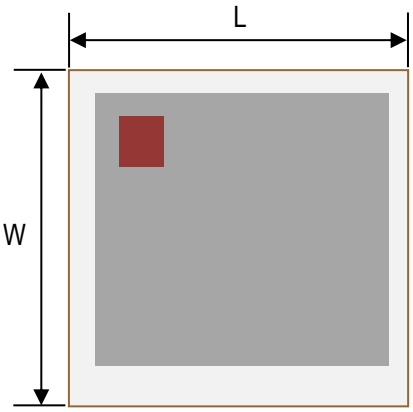
	Inches			Millimeters		
L	0.157	±	0.008	4.00	±	0.20
W	0.157	±	0.008	4.00	±	0.20
T	0.059	±	0.004	1.50	±	0.10
a	0.022	±	0.008	0.55	±	0.20
b	0.031	±	0.002	0.80	±	0.05
c	0.118	±	0.008	3.00	±	0.20
d	0.010	±	0.008	0.25	±	0.20
e	0.026	±	0.008	0.65	±	0.20
f	0.054	±	0.008	1.375	±	0.20
g	0.035	±	0.008	0.89	±	0.20

Bottom View



Recommended Solder Pads

Top view

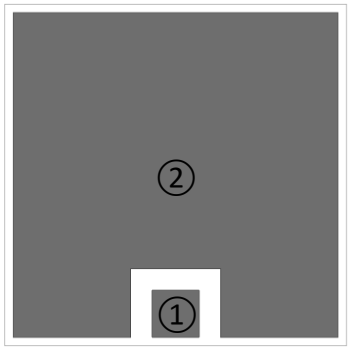


Side view

Terminal Configuration[5]

Pin Number	Function
1	Feed
2	GND

Bottom View



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

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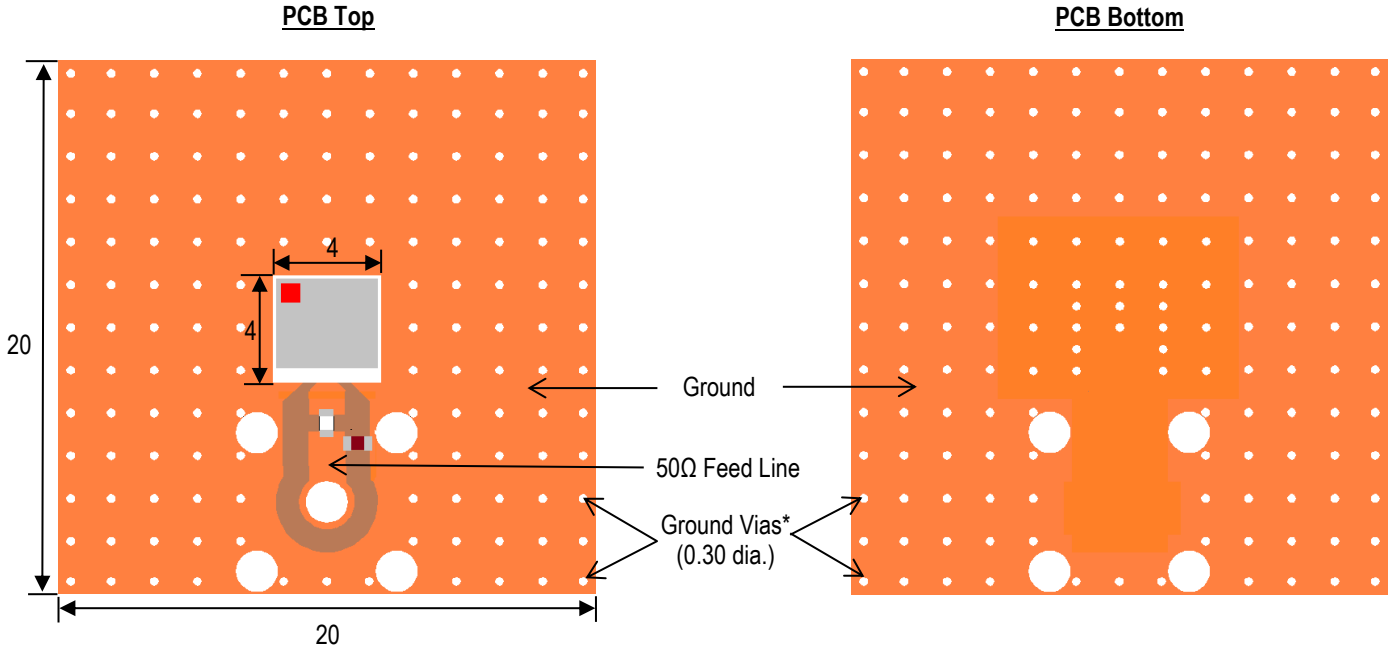
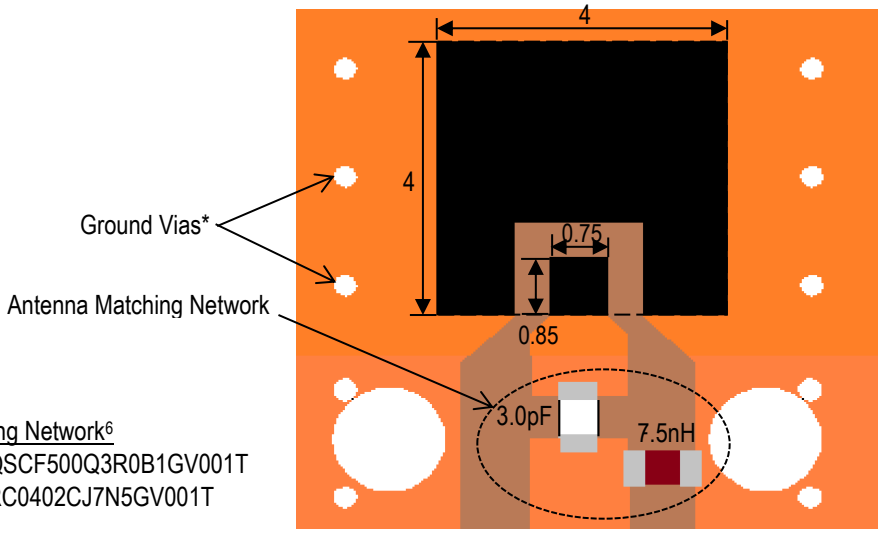
Evaluation Board and Recommended Mounting Configuration (Orderable P/N: 7987AT45A0200001CE1)

All units in mm





JTI P/N's for Matching Network[6]
Capacitor (3.0pF): QSCF500Q3R0B1GV001T
Inductor (7.5nH): LRC0402CJ7N5GV001T

*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
If you'd like to order this pre-tuned EVB (with SMA connector), click on this link:
Website EVB Request

[6] It is recommended that the designer leave available slots for a "pi" (or shunt-series-shunt) network. The antenna matching network values above are used when antenna is mounted on Johanson's evaluation board. The matching values on client's PCB will be different, depending on the layout, thickness, material, etc. Go to: https://www.johansontechnology.com/tuning and see how to obtain the new values, we can perform the tuning as well.

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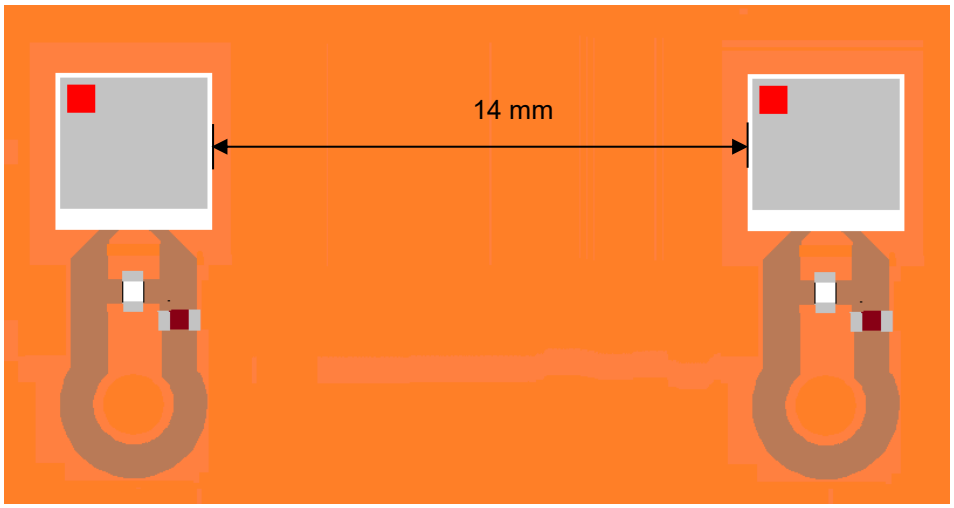
Recommended distance between antennas (for antenna array)



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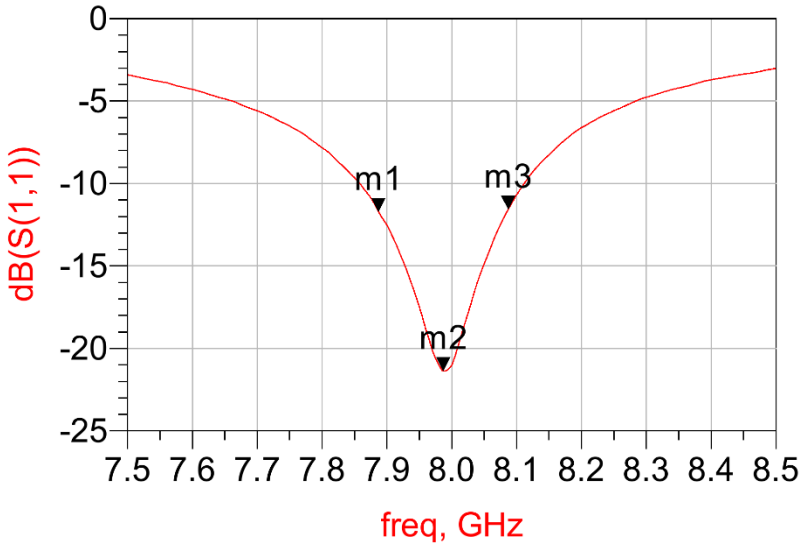
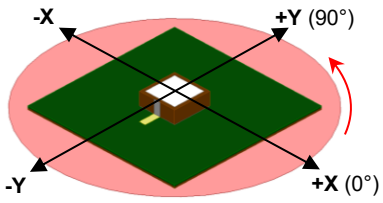
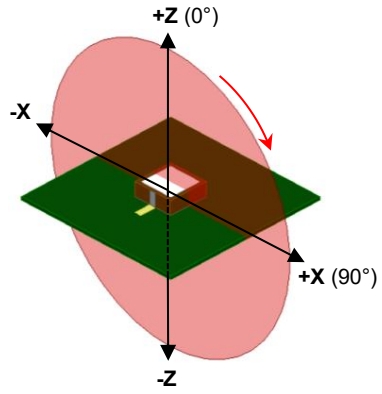
Evaluation Board Typical Return Loss Measurement (measured on EVB P/N 7987AT45A0200001CE1)

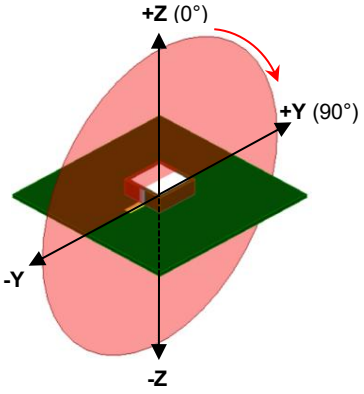


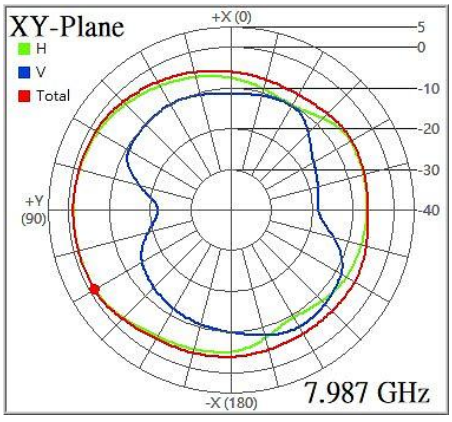
m1	m2	m3
freq=7.887GHz dB(S(1,1))=-11.705	freq=7.987GHz dB(S(1,1))=-21.357	freq=8.087GHz dB(S(1,1))=-11.566

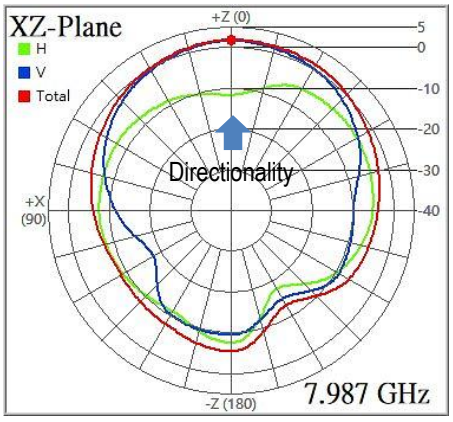
Evaluation Board Typical 2D Radiation Patterns @7987 MHz (P/N 7987AT45A0200001CE1)

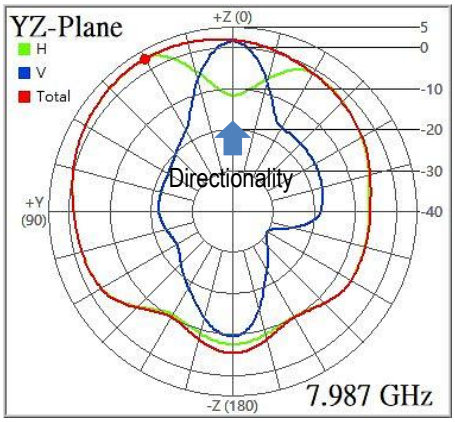












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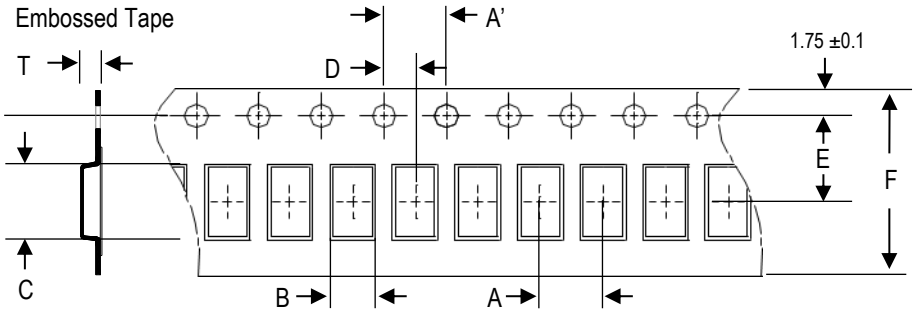
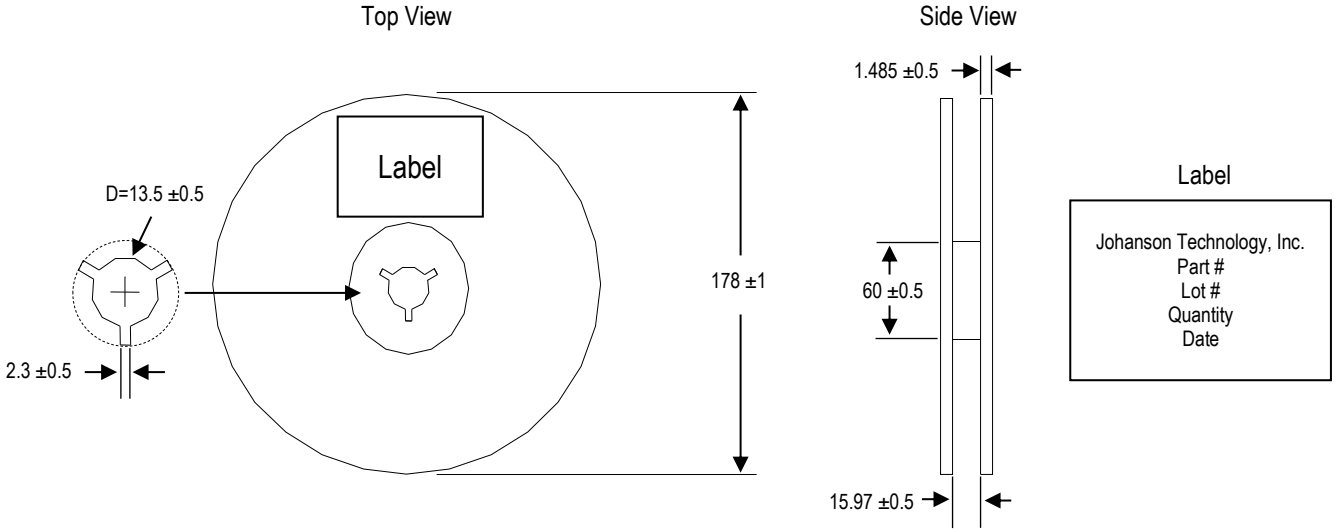
Tape and Reel Specification (Units in mm)

Tape Dimensions

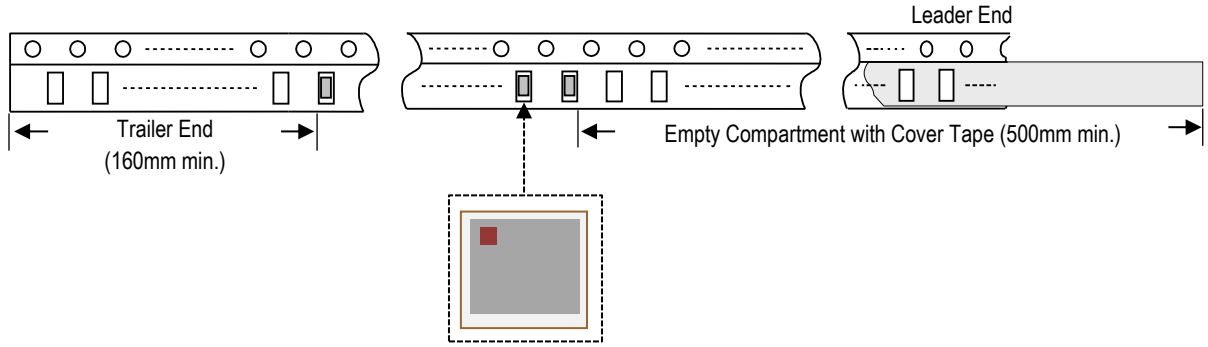


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
8.0 ±0.1	4.0 ±0.1	4.3 ±0.1	4.3 ±0.1	2.0 ±0.1	5.5 ±0.1	12.0 ±0.15	1.65 ±0.1	1,000pcs.	Plastic (Embossed)

Reel Dimensions



Leader and Trailer Dimensions



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Orderable Part Number

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	7987AT45A0200002B	Nickel Tin
T & R (7" Reel Embossed Tape)	7987AT45A0200002E (Qty: 1,000 pcs./reel)	
Evaluation Board with SMA Connector	7987AT45A0200001CE1	

Important Links

7987AT45A0200002E Product Page

More RF 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 or simulations inquiries.

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