

"High Frequency Ceramic Solutions"

915 MHz ISM Antenna for small form factor applications

P/N 0915AT43A0026

Detail Specification: 9/7/2016

Page 1 of 5

Recommended Application ISM

General Specifications

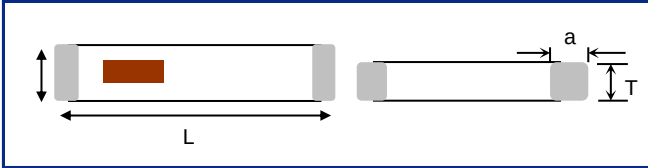
Part Number	0915AT43A0026	Input Power	2W max. (CW)
Frequency (MHz)	902 - 928 Mhz	Operating Temperature	-40 to +85°C
Peak Gain (XZ-total)	-1.0 dBi typ.	Recommended Storage Conditions	+5 to +35°C, Humidity 45~75%RH
Average Gain (XZ-total)	-4.0 dBi typ.	Reel Quantity	1,000
Return Loss	8.5 dB min.		

Part Number Explanation

P/N Suffix	Packing Style	Bulk (loose)	Suffix = S	eg. 0915AT43A0026S
		T & R	Suffix = E	eg. 0915AT43A0026E
		100% Tin	Suffix = E or S	eg. 0915AT43A0026(E or S)
	Evaluation Board	0915AT43A0026-EB1SMA		

Mechanical Dimensions

	In	mm
L	0.276 ± 0.008	7.00 ± 0.20
W	0.079 ± 0.008	2.00 ± 0.20
T	0.031 ± +.004/-0.008	0.80 ± +0.1/-0.2
a	0.020 ± 0.012	0.50 ± 0.30



Terminal Configuration

No.	Function
1	Feeding Point
2	NC*



*This terminal must be soldered for anchoring and functionality purposes

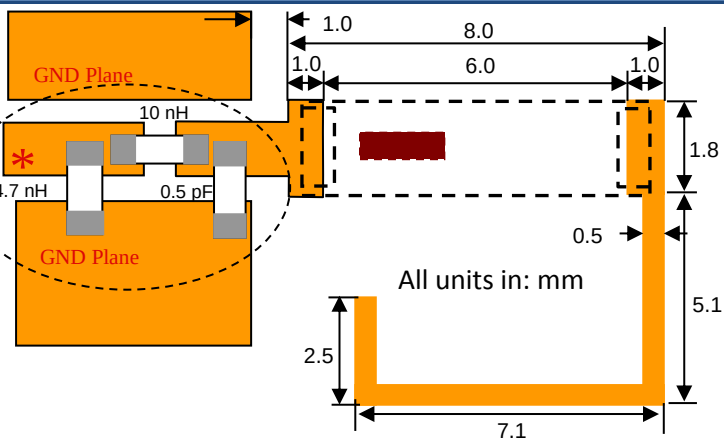
Mounting Considerations I

Mount these devices with maroon mark facing up. *Line width should be designed to provide 50 Ω impedance matching characteristics.

Matching circuit**:
See Note 2 on next page!

Want the layout file of this? Send us a message at:
www.johansontechnology.com/component/techquestion

JTI P/N for Matching Circuit:**
Inductor (4.7nH): L-07C4N7SV6T
Inductor (10nH): L-07C10NJV6T
Cap (0.5pF): 500R07S0R5BV4T



**matching circuit and component values will depend on PCB layout, thickness, material, etc.



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P/N 0915AT43A0026

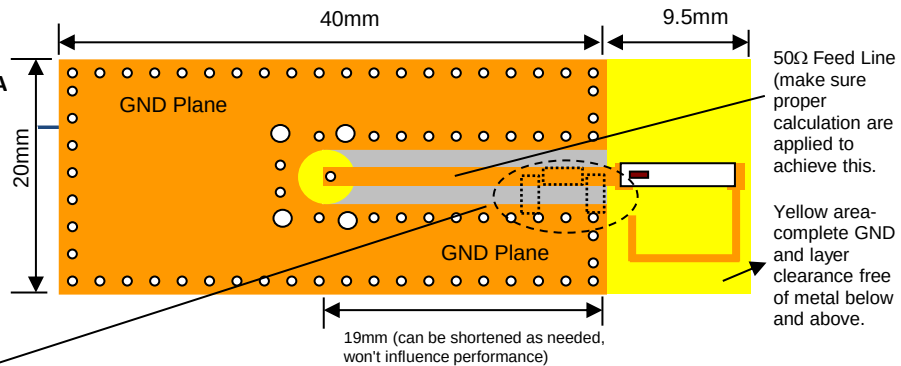
Detail Specification: 9/7/2016

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Recommended Application ISM

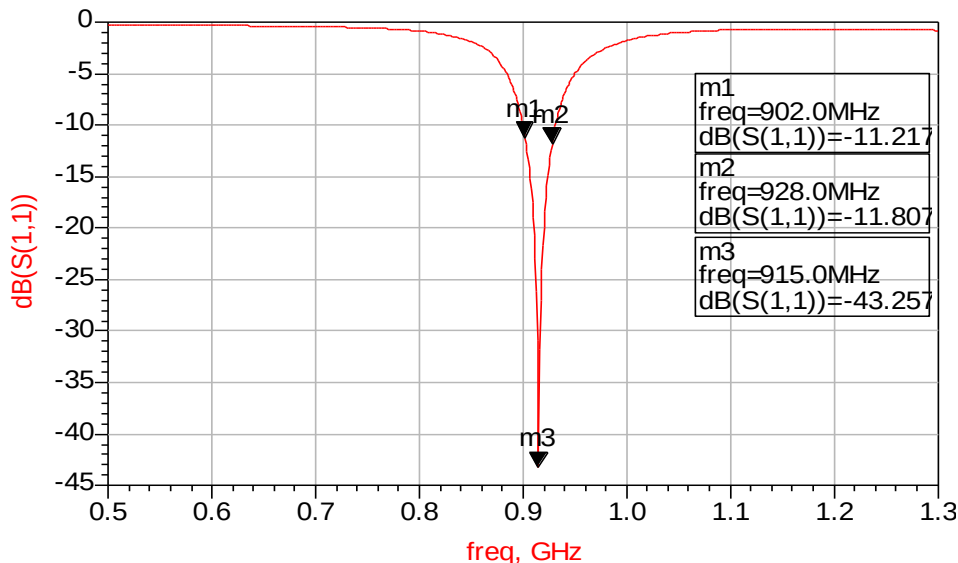
Mounting Considerations II

Johanson Test Board
(orderable) p/n:
0915AT43A0026-EB1SMA



****Note 2:** 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. Go to: www.johansontechnology.com/tuning and see how to obtain the new values. If you need further help, such as needing the layout file of the above, contact our RF Applications Eng. Team at: www.johansontechnology.com/ask-a-question

Return Loss (with matching)



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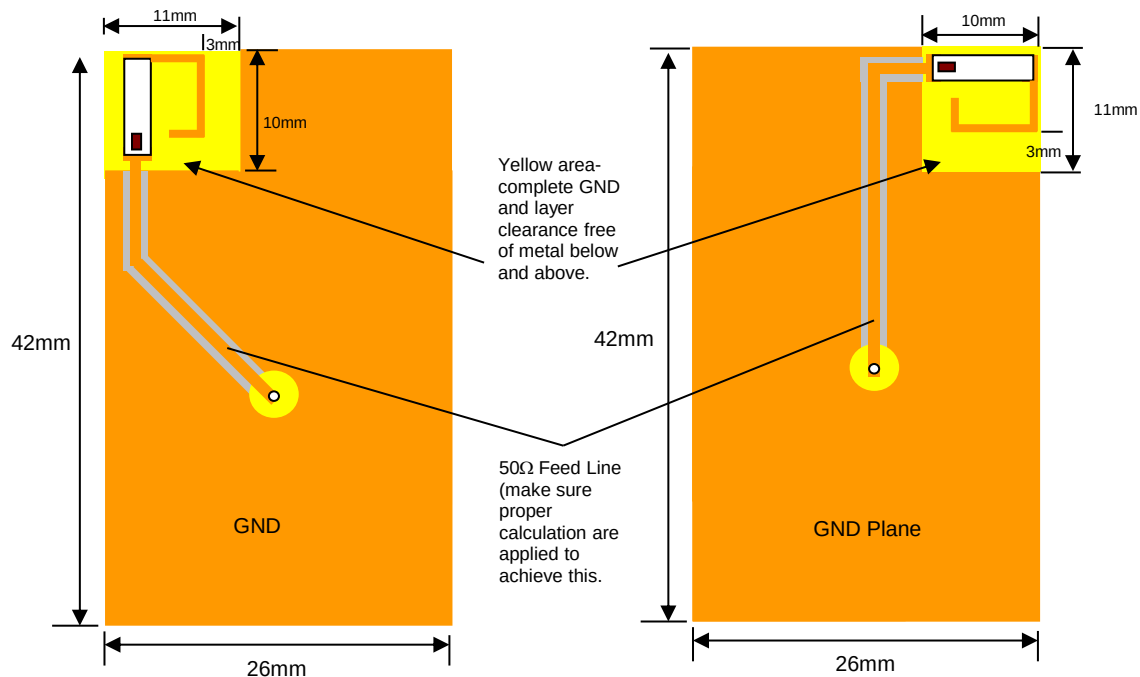
Detail Specification: 9/7/2016

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Recommended Application ISM

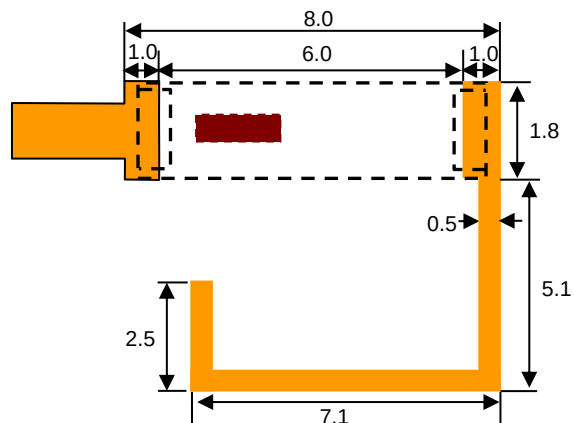
Mounting Considerations III

We have conducted internal studies to show that the following corner placements provide antenna efficiency results with minimal detrimental effects.



Note: 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. Go to: www.johansontechnology.com/tuning and see how to obtain the new values. If you need further help, such as needing the layout file of the above, contact our RF Applications Eng. Team at:

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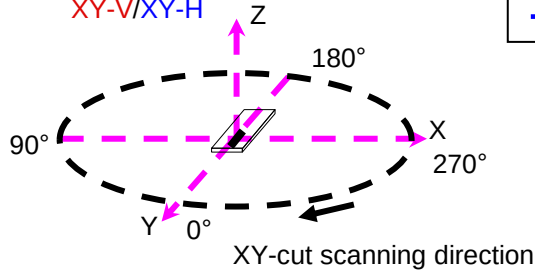
Page 4 of 5

Recommended Application ISM

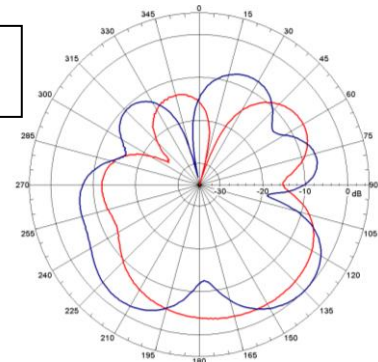
Typical Radiation Performance @ 25° C using 0915AT43A0026-EB1SMA

Typical Radiation Patterns

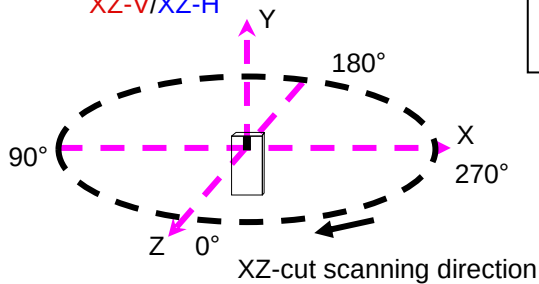
XY-V/XY-H



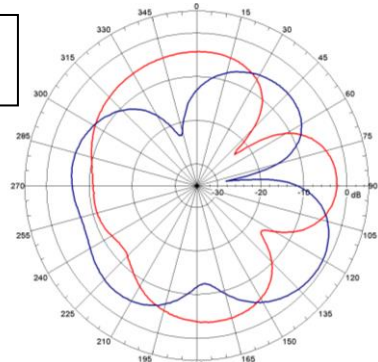
XY cut @915MHz
 — Vertical
 Horizontal



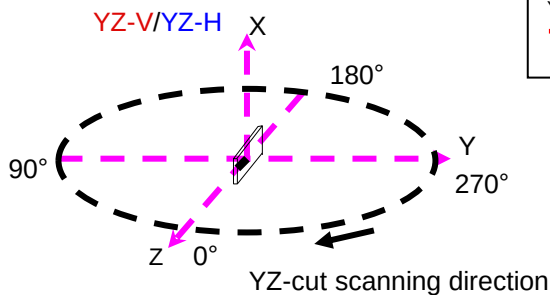
XZ-V/XZ-H



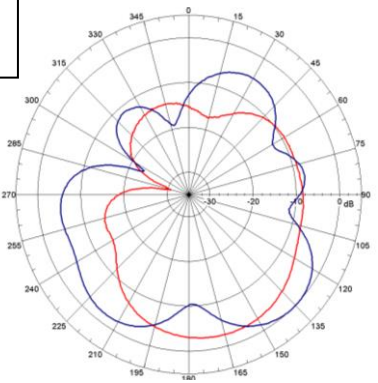
XZ cut @915MHz
 — Vertical
 Horizontal



YZ-V/YZ-H



YZ cut @915MHz
 — Vertical
 Horizontal



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Packaging information

www.johansontechnology.com/tape-reel-packaging

Soldering Information

www.johansontechnology.com/typical-soldering-profile

Antenna layout and tuning techniques (How to obtain the new antenna matching values)

www.johansontechnology.com/tuning

Antenna layout review, tuning, and characterization services

www.johansontechnology.com/ipc-antenna-services

RoHS Compliance

www.johansontechnology.com/rohs-compliance

MSL Info

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802.11 Dual Band 2.45/5 GHz Mini Chip Antenna. WiFi, WLAN, IoT

P/N 2450AD14A5500

Detail Specification: 10/26/2017

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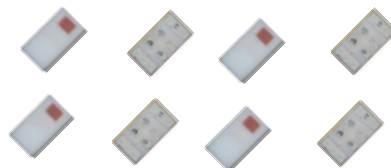
AEC-Q200 qualification available.

Let us help you with the antenna design, optimization, and tuning!

www.johansontechnology.com/ipc-antenna-services

General Specifications

Part Number	2450AD14A5500	
Frequency (MHz)	2400 - 2480	5150 - 5850
Avg. Rad Efficiency¹	60%	80%
Peak Gain (dBi typ.)	1.0 dBi typ. (XZ-Total)	4.0 dBi typ. (XZ-Total)
Average Gain (dBi typ.)	-3.5 dBi typ. (XZ-Total)	-2.5 dBi typ. (XZ-Total)
Return Loss (dB)	6 min.	6 min.
Impedance	50 Ω	
Input Power	2 Watts max. (CW)	
Storage Period	18 months max.	
Storage Temperature	-40 to +85°C	
Operating Temperature	-40 to +85°C	
Reel Quantity	4000	



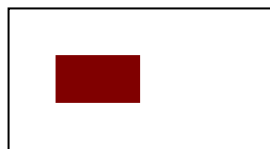
¹Measured on 2450AD14A5500-EB2SMA eval-board (See pages 7-11 for details)

Part Number Explanation

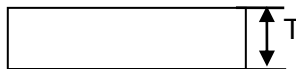
P/N Suffix	Packing Style	Bulk (loose)	Suffix = S	e.g. 2450AD14A5500S
		T & R	Suffix = T	e.g. 2450AD14A5500T
		100% Tin	Suffix = T or S	e.g. 2450AD14A5500(T or S)
	Evaluation Board	2450AD14A5500-EB1SMA & 2450AD14A5500-EB2SMA see pages 2&7 for details		

Mechanical Dimensions

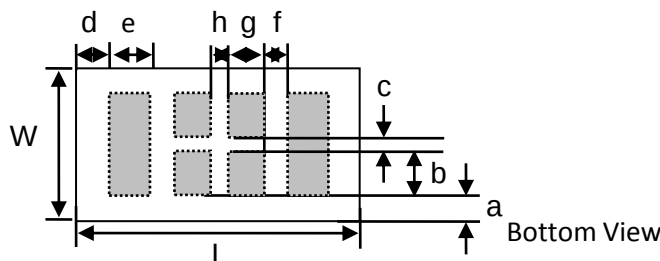
	In	mm
L	0.063 $\pm$ 0.004	1.60 $\pm$ 0.10
W	0.031 $\pm$ 0.004	0.80 $\pm$ 0.10
T	0.016 max.	0.40 max.
a	0.003 $\pm$ 0.004	0.086 $\pm$ 0.10
b	0.010 0.002	0.264 0.05
c	0.004 $\pm$ 0.001	0.10 $\pm$ 0.03
d	0.003 $\pm$ 0.001	0.085 $\pm$ 0.03
e	0.008 $\pm$ 0.002	0.215 $\pm$ 0.05
f	0.010 $\pm$ 0.002	0.25 $\pm$ 0.05
g	0.008 0.002	0.20 0.05
h	0.004 $\pm$ 0.001	0.10 $\pm$ 0.03



Top View



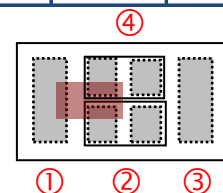
Side View



Bottom View

Terminal Configuration

No.	Function	
	Scenario 1	Scenario 2
1	GND	GND
2	FEED	NC
3	NC	NC
4	NC	FEED



Top View, looking "through" the component

-Terminals 2 and 4 have two pads each

-Make sure to have Pin 3 soldered to its PCB land pad but not connected to GND or input, they must be NC (or floating). If unsoldered, it may affect improper antenna resonance and drop-shock resistance.

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P/N 2450AD14A5500

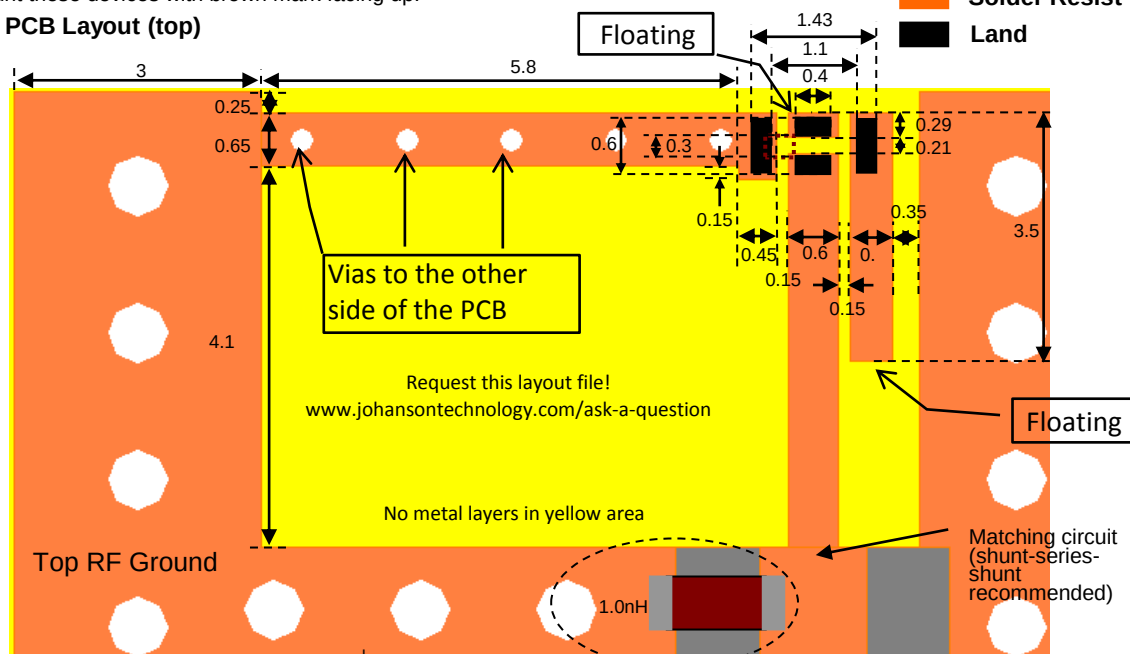
Detail Specification: 10/26/2017

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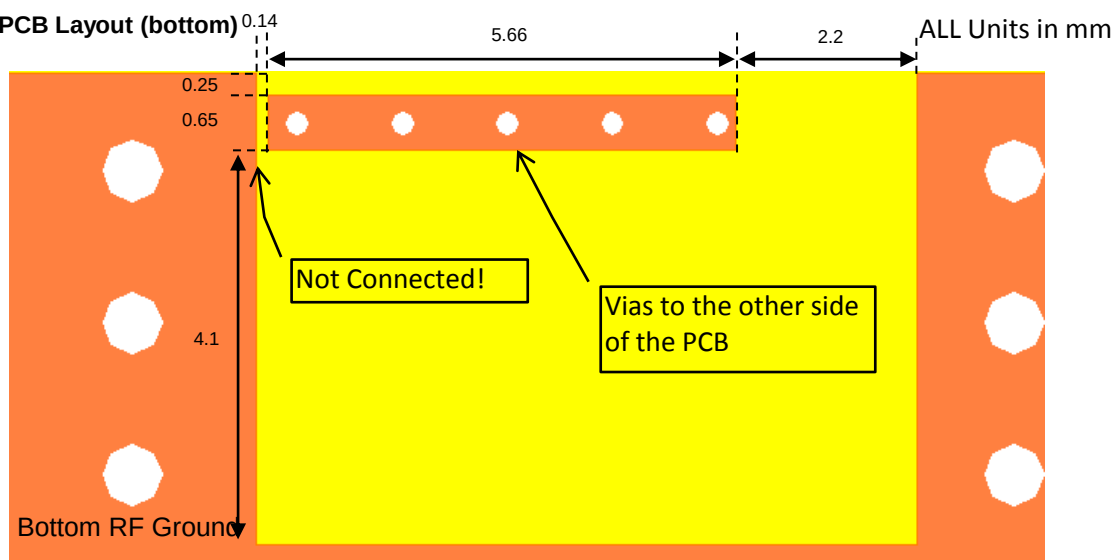
Mounting Considerations 1: Antenna PCB Layout (Scenario 1 Terminal Configuration) aka "righ feeding"

Mount these devices with brown mark facing up.

PCB Layout (top)



PCB Layout (bottom)



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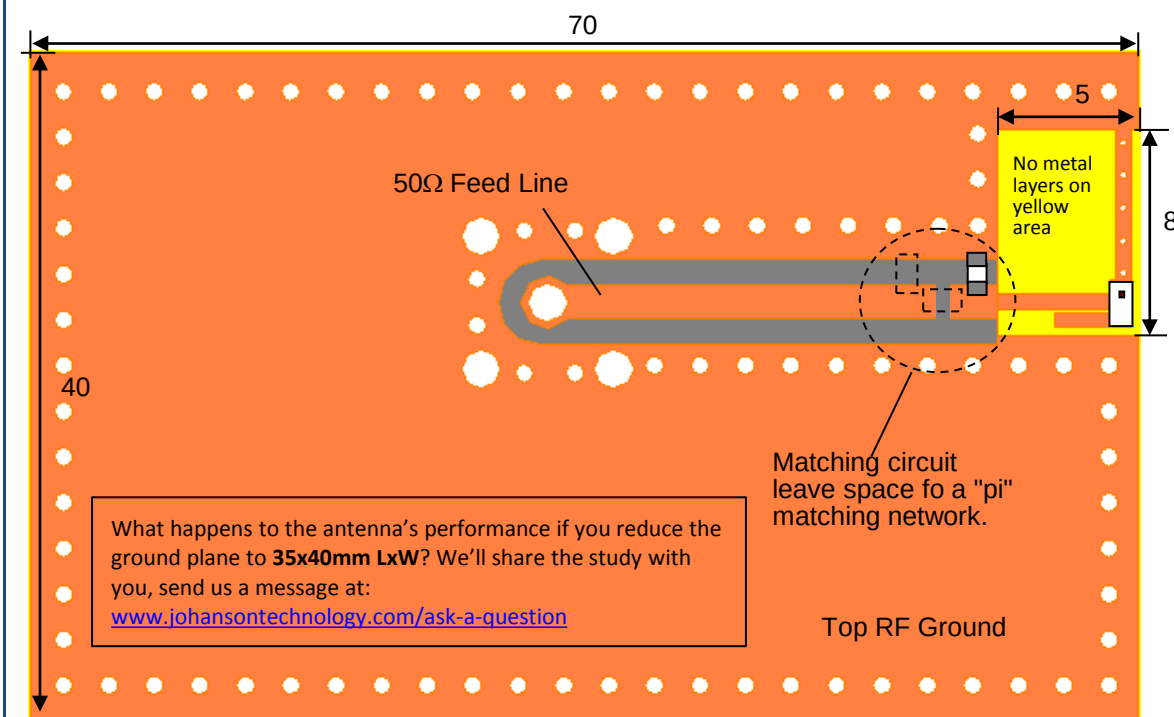
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P/N 2450AD14A5500

Detail Specification: 10/26/2017

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Mounting Considerations 1: Evaluation Board, 40x70mm (Scenario 1 Terminal Configuration)



Frequency (GHz)	Radiated Efficiency (%)
2.44	66
5.5	79

Units in mm

To order the ABOVE pre-tuned 50Ω EVB with a female SMA connector click here: www.johansontechnology.com/request-a-sample
Reference p/n: 2450AD14A5500-EB1SMA

Would you like the layout file of the above? Have antenna tuning issues? Please contact us if you have any questions regarding the implementation of this antenna in your PCB's layout. We'll be happy to guide you to maximize the antenna's performance. Contact our applications engineers at: www.johansontechnology.com/ask-a-question

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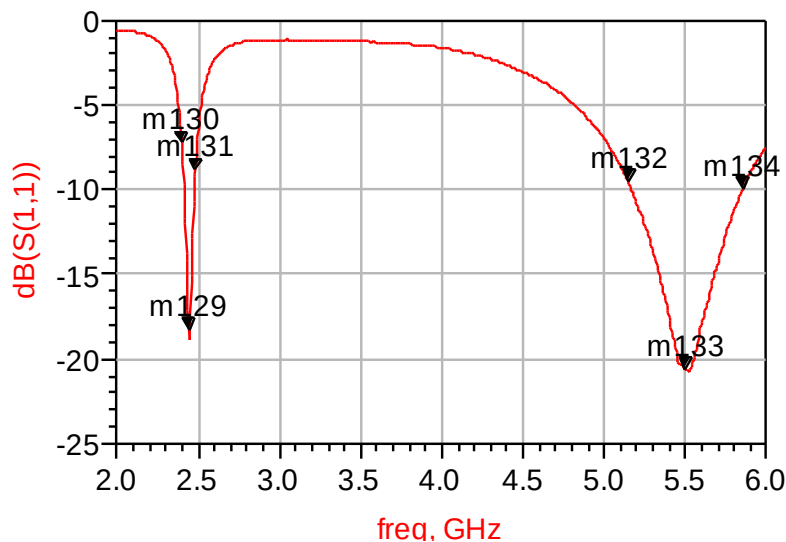
802.11 Dual Band 2.45/5 GHz Mini Chip Antenna. WiFi, WLAN, IoT

P/N 2450AD14A5500

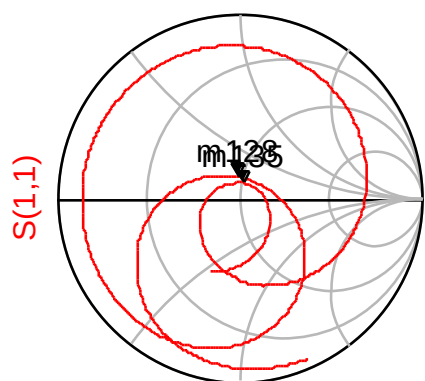
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Mounting Considerations 1 in Evaluation Board, 40x70mm: Typical Electrical Performance (T=25°C)



m130 freq=2.400GHz dB(S(1,1))=-7.250	m129 freq=2.442GHz dB(S(1,1))=-18.254	m131 freq=2.484GHz dB(S(1,1))=-8.854
m132 freq=5.150GHz dB(S(1,1))=-9.557	m133 freq=5.500GHz dB(S(1,1))=-20.673	m134 freq=5.850GHz dB(S(1,1))=-10.013



freq (2.000GHz to 6.000GHz)

m128 freq=2.442GHz S(1,1)=0.122 / 95.014 impedance = 47.527 + j11.753
m135 freq=5.500GHz S(1,1)=0.093 / 81.368 impedance = 50.543 + j9.329

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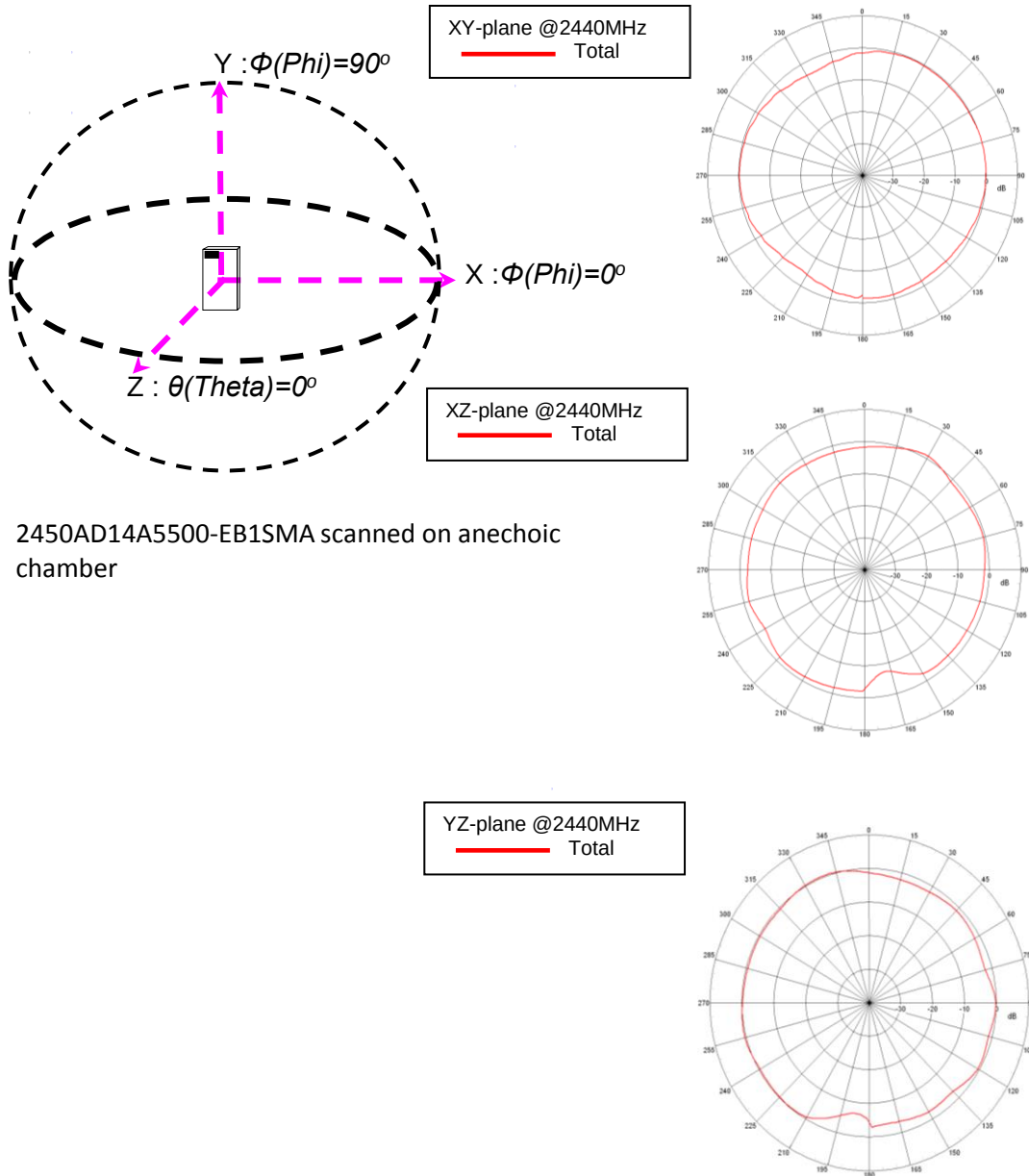
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Mounting Considerations 1 in Evaluation Board, 40x70mm: Typical EM Radiation Performance @2.44GHz (T=25°C)



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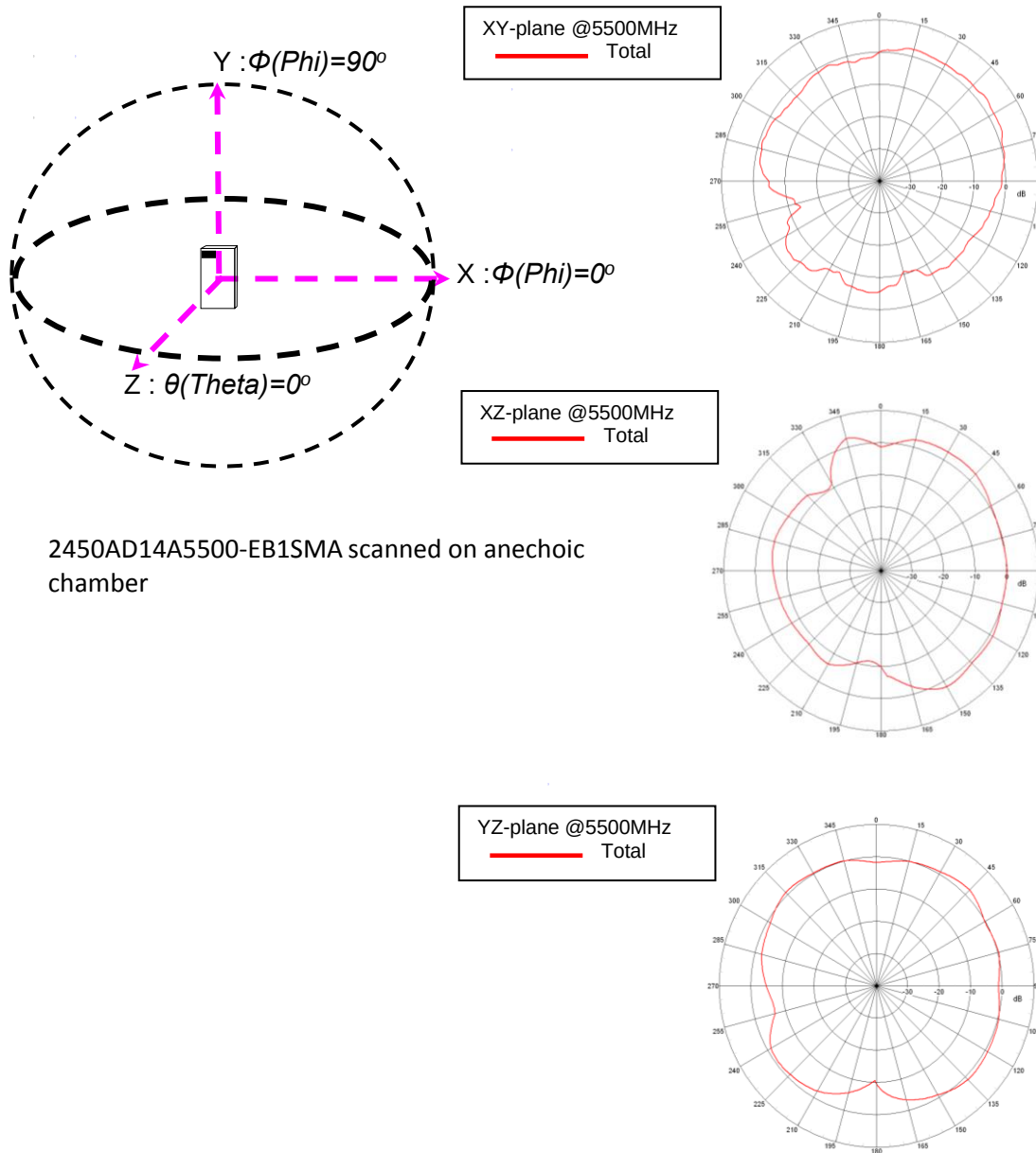
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P/N 2450AD14A5500

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Mounting Considerations 1 in Evaluation Board, 40x70mm: Typical EM Radiation Performance @5.50GHz (T=25°C)



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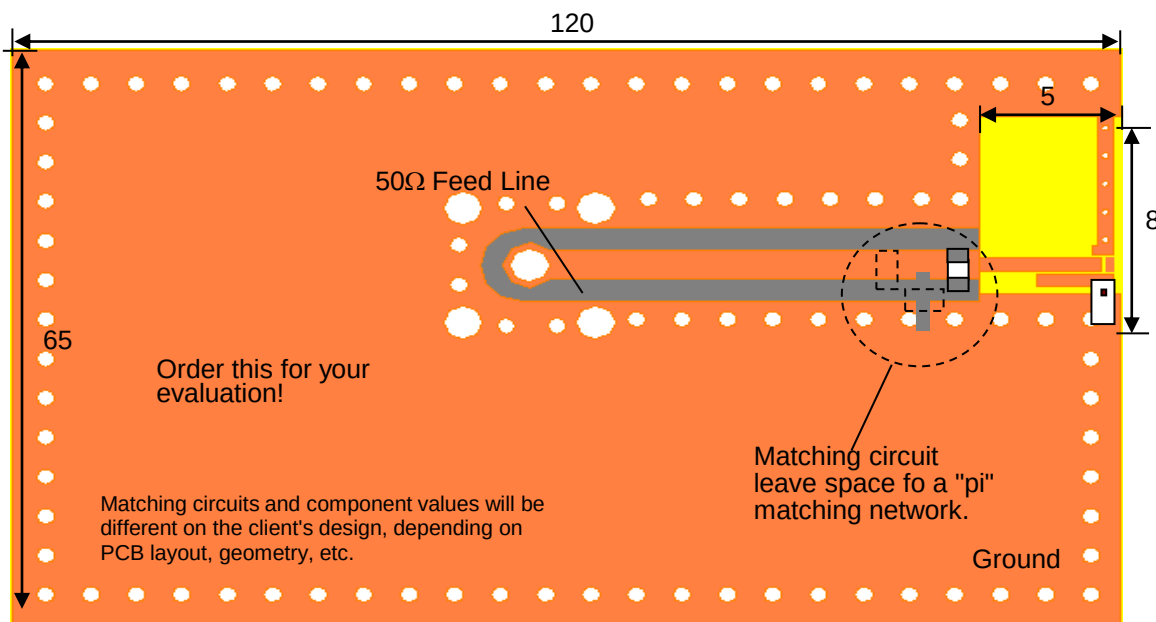
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P/N 2450AD14A5500

Detail Specification: 10/26/2017

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Mounting Considerations 1: Evaluation Board, 65x120mm (Scenario 1 Terminal



Units in mm

Frequency (GHz)	Radiated Efficiency (%)
2.44	60
5.5	86

To order the ABOVE pre-tuned 50Ω EVB with a female SMA connector click here: www.johansontechnology.com/request-a-sample
Reference p/n: 2450AD14A5500-EB2SMA

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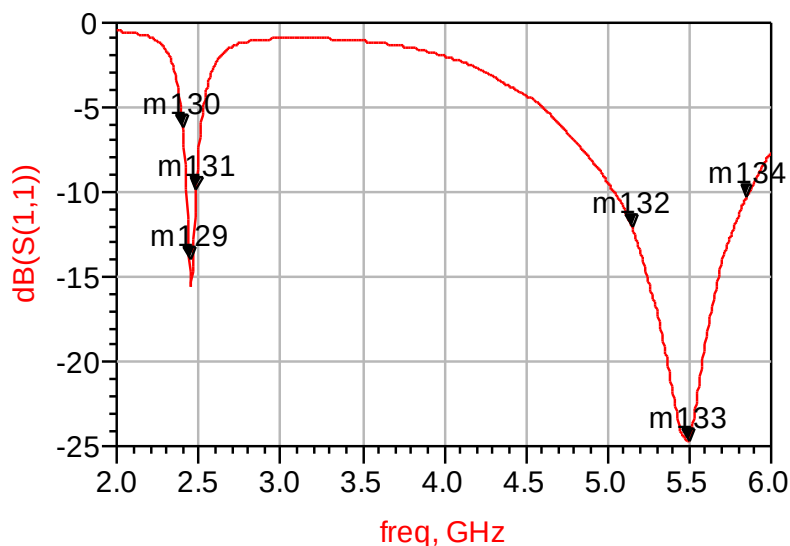
802.11 Dual Band 2.45/5 GHz Mini Chip Antenna. WiFi, WLAN, IoT

P/N 2450AD14A5500

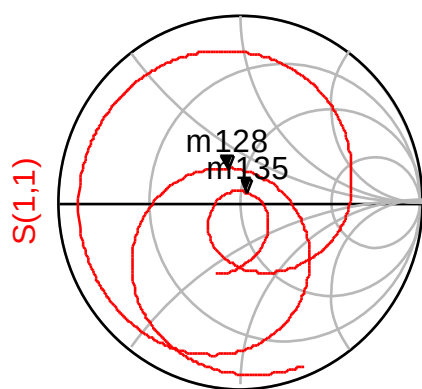
Detail Specification: 10/26/2017

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Mounting Considerations 1 in Evaluation Board, 65x120mm: Typical Electrical Performance (T=25°C)



m130 freq=2.400GHz dB(S(1,1))=-6.202	m129 freq=2.442GHz dB(S(1,1))=-14.010	m131 freq=2.484GHz dB(S(1,1))=-9.880
m132 freq=5.150GHz dB(S(1,1))=-12.066	m133 freq=5.500GHz dB(S(1,1))=-24.657	m134 freq=5.850GHz dB(S(1,1))=-10.323



m128
freq=2.442GHz
S(1,1)=0.199 / 110.889
impedance = 40.626 + j15.755

m135
freq=5.500GHz
S(1,1)=0.059 / 59.150
impedance = 52.817 + j5.324

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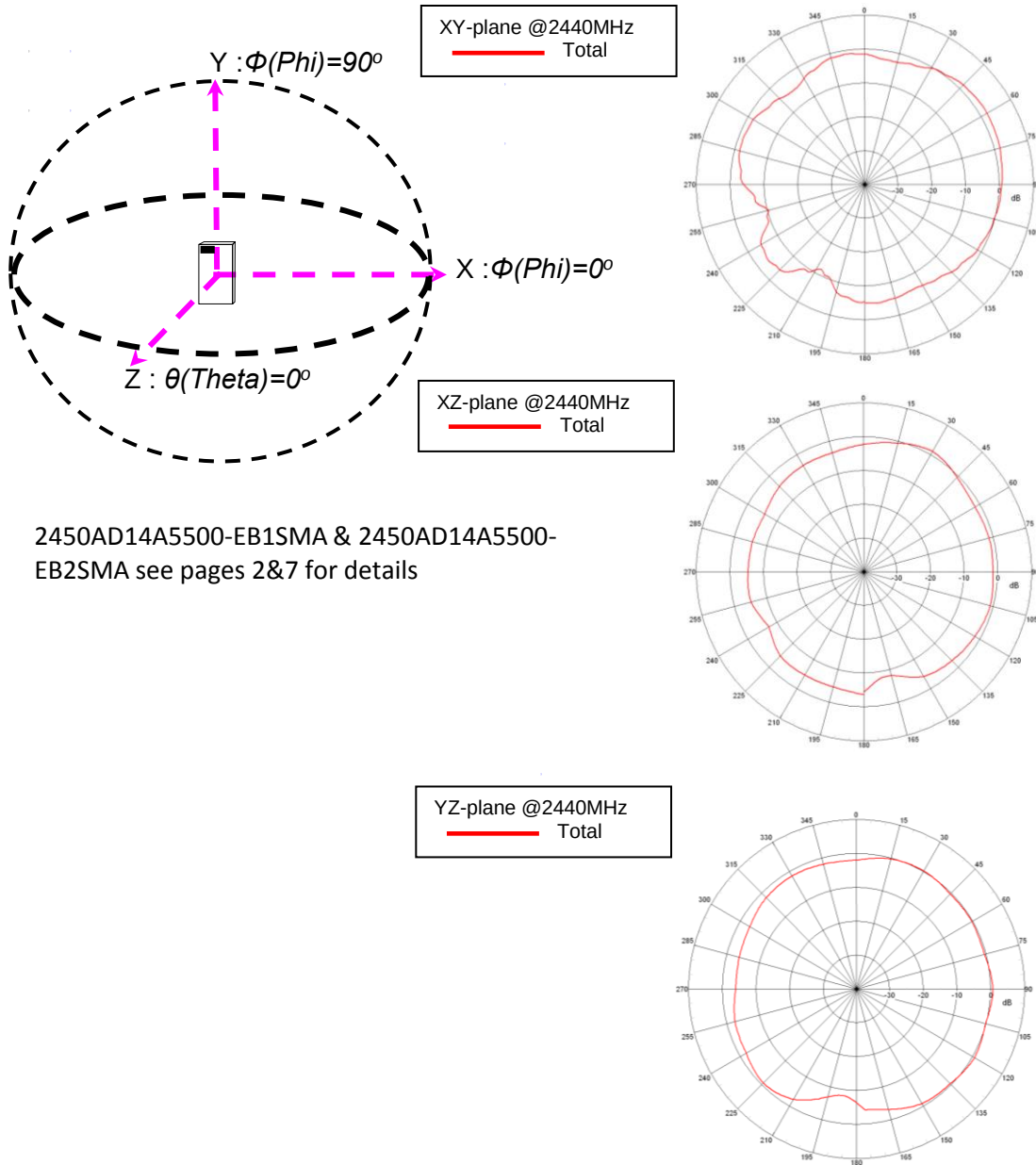
802.11 Dual Band 2.45/5 GHz Mini Chip Antenna. WiFi, WLAN, IoT

P/N 2450AD14A5500

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Mounting Considerations 1 in Evaluation Board, 65x120mm: Typical EM Radiation Performance @2.44GHz (T=25°C)



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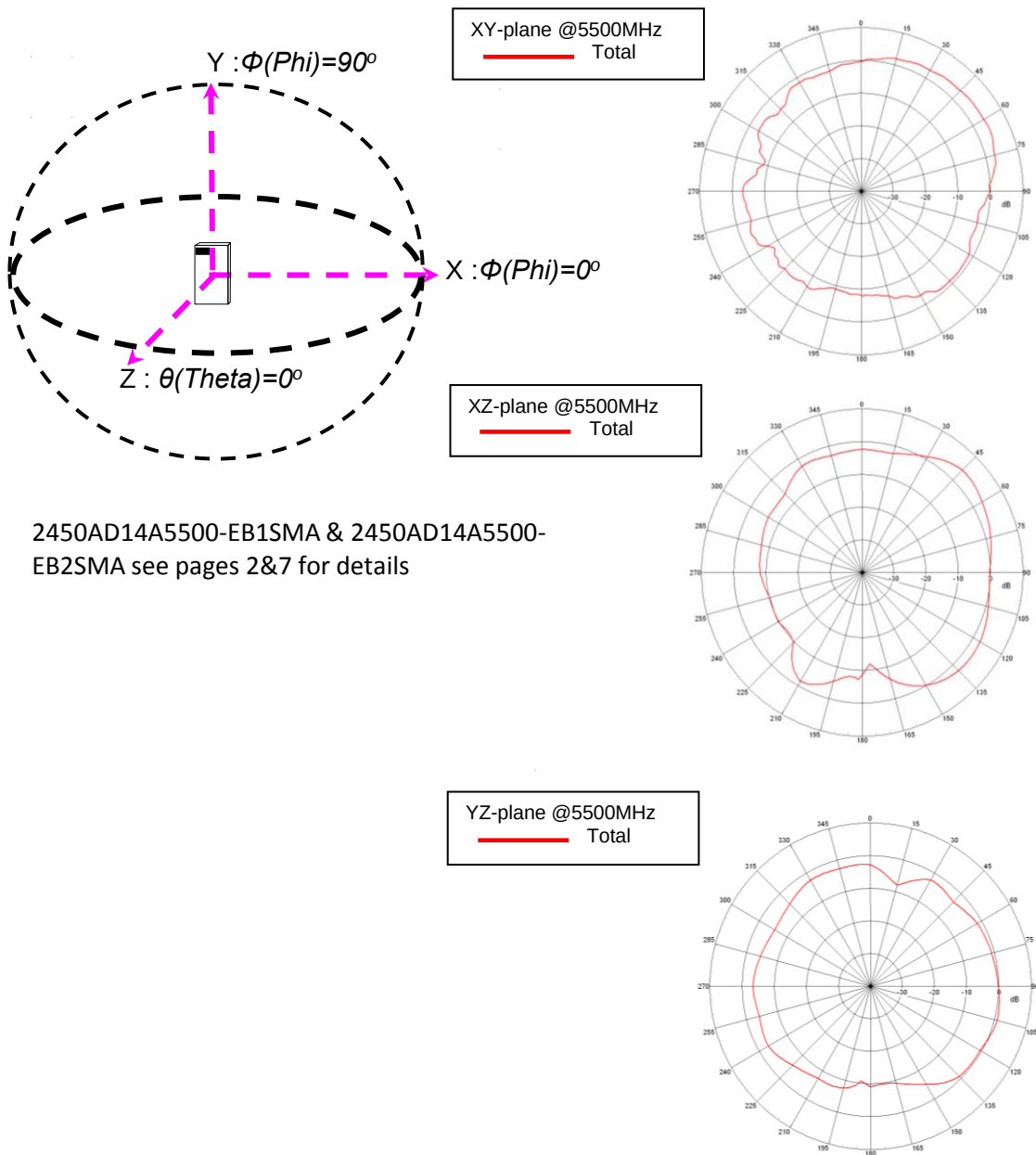
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P/N 2450AD14A5500

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Mounting Considerations 1 in Evaluation Board, 65x70mm: Typical EM Radiation Performance @5.50GHz (T=25°C)



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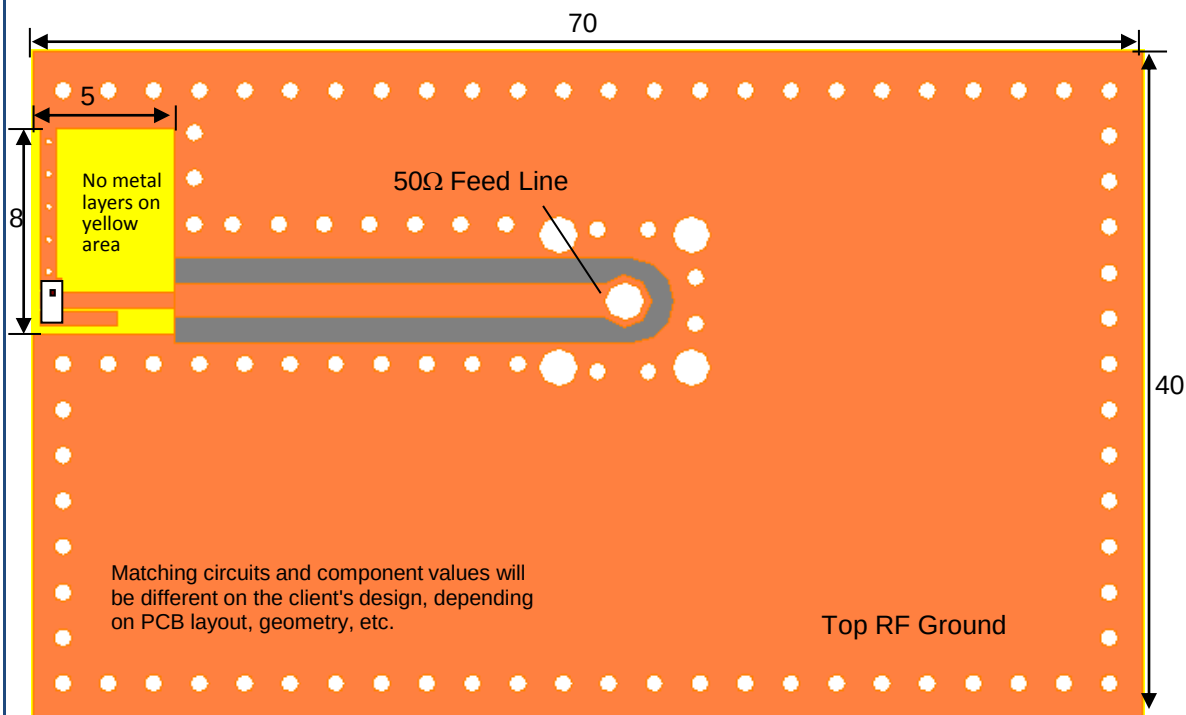
802.11 Dual Band 2.45/5 GHz Mini Chip Antenna. WiFi, WLAN, IoT

P/N 2450AD14A5500

Detail Specification: 10/26/2017

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Mounting Considerations 2: Scenario 2 Terminal Configuration, aka "left feeding"



Units in mm

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Contact our applications engineers at:
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Would you like to know what happens to the antenna's performance if you reduce the ground plane to half (**35x40mm LxW**)? We'll share the study with you, send us a message at: www.johansontechnology.com/ask-a-question

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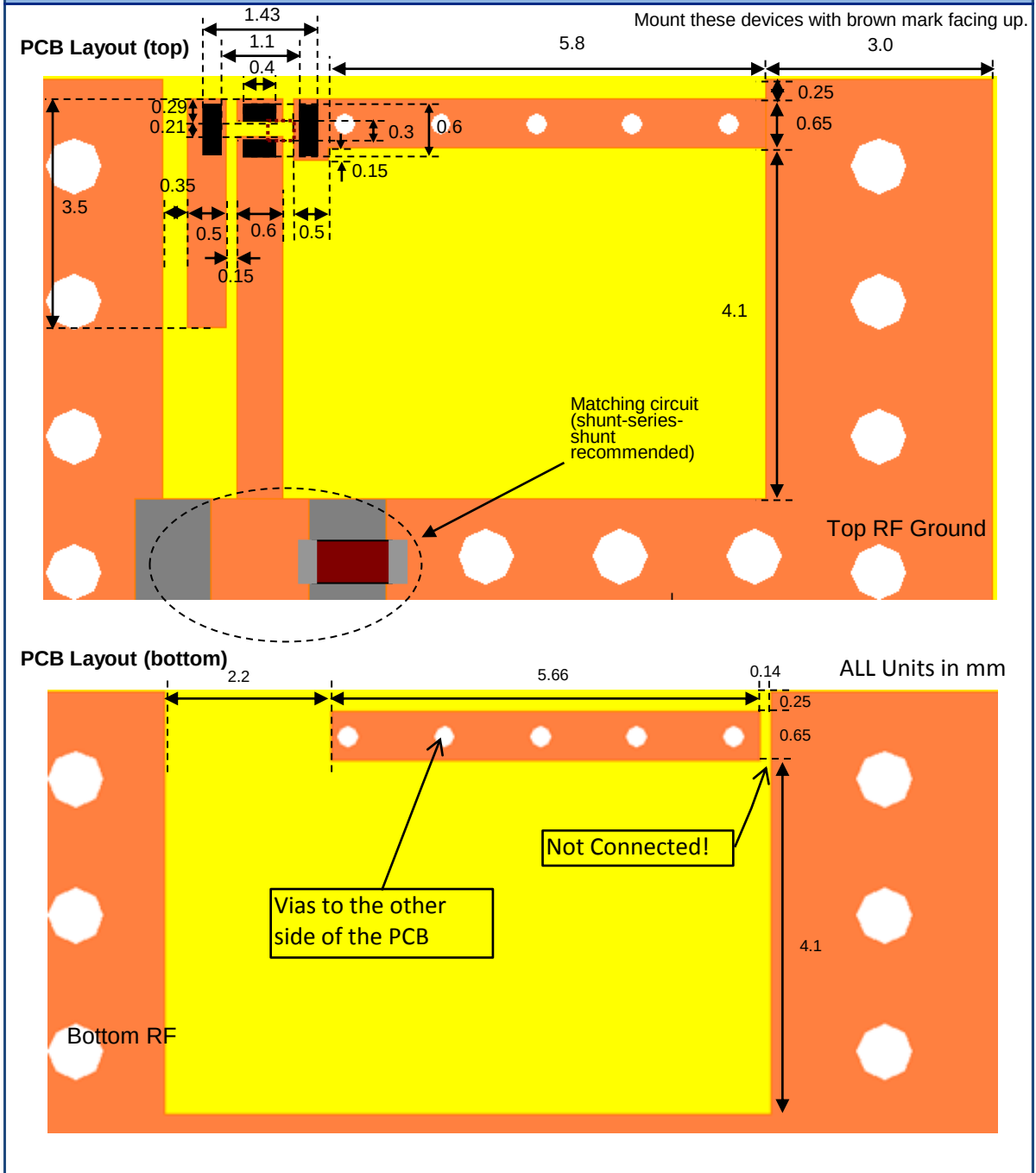
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Mounting Considerations 2: Antenna PCB Layout (Scenario 2 Terminal Configuration) aka "left feeding"



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802.11 Dual Band 2.45/5 GHz Mini Chip Antenna. WiFi, WLAN, IoT

P/N 2450AD14A5500

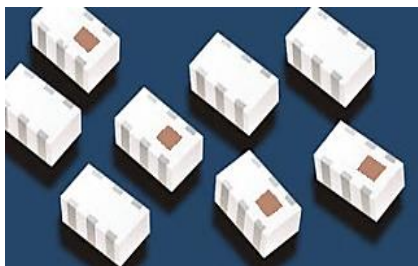
Detail Specification: 10/26/2017

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Single Feed Configuration with Diplexer Option

If the single feed option is preferred, Johanson Technology has several chip diplexer options to both separate and filter the 2G and 5G signals. These diplexers are identical in size as the antenna itself and can be mounted just prior to the matching network of the antenna.

Pairing a 2.4GHz low pass filter with a 5.4GHz band pass filter not only separates the two signals but provides harmonic attenuation to fulfill regulation qualification for industry standards.



For more information about our diplexers go to:
www.johansontechnology.com/diplexers

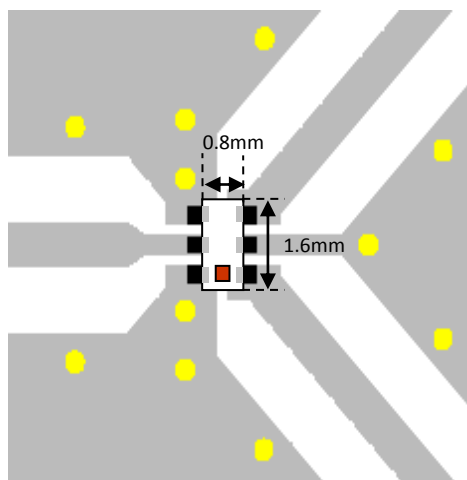
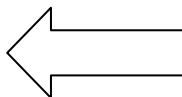
For assistance with PCB layout or general component inquiries, please go to:
www.johansontechnology.com/ask-a-question

2450AD14A5500-EB1SMA & 2450AD14A5500-EB2SMA see pages 2&7 for details

Example part numbers include 2450DP14C5400, 2450DP14D5400

Mini chip diplexer footprint and example layout

2450AD14A5500
Dual Band Antenna



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"High Frequency Ceramic Solutions"

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Antenna tuning, optimization, and validation services:

www.johansontechnology.com/ipc-antenna-services

For more antennas and to download measured S-parameters, go to:

www.johansontechnology.com/antennas

For more information about our diplexers:

www.johansontechnology.com/diplexers

Soldering Information

www.johansontechnology.com/ipcsoldering-profile

MSL Info

<http://www.johansontechnology.com/msl-rating>

Packaging information

www.johansontechnology.com/tape-reel-packaging

For layout review contact our Applications Team at:

www.johansontechnology.com/ask-a-question

RoHS Compliance

www.johansontechnology.com/rohs-compliance

Need help designing the antenna in? Use our antenna design services!

www.johansontechnology.com/ipc-antenna-services

2 free layout reviews and if you need us to tune and characterize the antenna on your product (inside anechoic chamber) we can do that too. Small lab fee may apply for the latter.

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4001 Calle Tecate • Camarillo, CA 93012 • TEL 805.389.1166 FAX 805.389.1821
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