

# High Frequency Ceramic Solutions

## 802.11 Dual Band 2.45/5 GHz Mini Chip Antenna. WiFi, WLAN, IoT P/N 2450AD14A5500T-AEC

Detail Specification: 3/10/2021

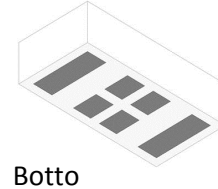
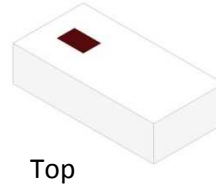
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AEC-Q200 Qualified

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

<https://www.johansontechnology.com/ipc-antenna-services>

General Specifications		
Part Number	2450AD14A5500T-AEC	
Frequency (MHz)	2400 - 2480	5150 - 5850
Avg. Rad Efficiency <sup>1</sup>	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)	7.2 typ. (2.7 min.)	9.5 typ. (3.95 min.)
Impedance (Ω)	50	
Input Power (W)	2 max. (CW)	
Quantity/Reel (pcs)	4,000	



Operating Temperature	-40 to +105°C
Recommended Storage Conditions and Period for unused Product on T&R	+5 to +35°C Humidity 45~75% RH 18 months max.

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

Part Number Explanation				
P/N Suffix	Packing Style	Bulk (loose pcs.)	Suffix = S	e.g. 2450AD14A5500T-AEC
		T & R	Suffix = T	e.g. 2450AD14A5500T-AEC
		100% Tin	Suffix = None	e.g. 2450AD14A5500(T or S)-AEC
	Evaluation Board	2450AD14A5500-EB1SMA & 2450AD14A5500-EB2SMA see pages 2&7 for details		

Mechanical Dimensions			
	In	mm	
L	0.063 ± 0.004	1.60	± 0.10
W	0.031 ± 0.004	0.80	± 0.10
T	0.016 max.	0.40	max.
a	0.003 ± 0.004	0.086	± 0.10
b	0.008 min.	0.208	min.
c	0.008 ± 0.001	0.20	± 0.03
d	0.003 ± 0.001	0.085	± 0.03
e	0.008 ± 0.002	0.215	± 0.05
f	0.010 ± 0.002	0.25	± 0.05
g	0.006 min.	0.15	min.
h	0.008 ± 0.001	0.20	± 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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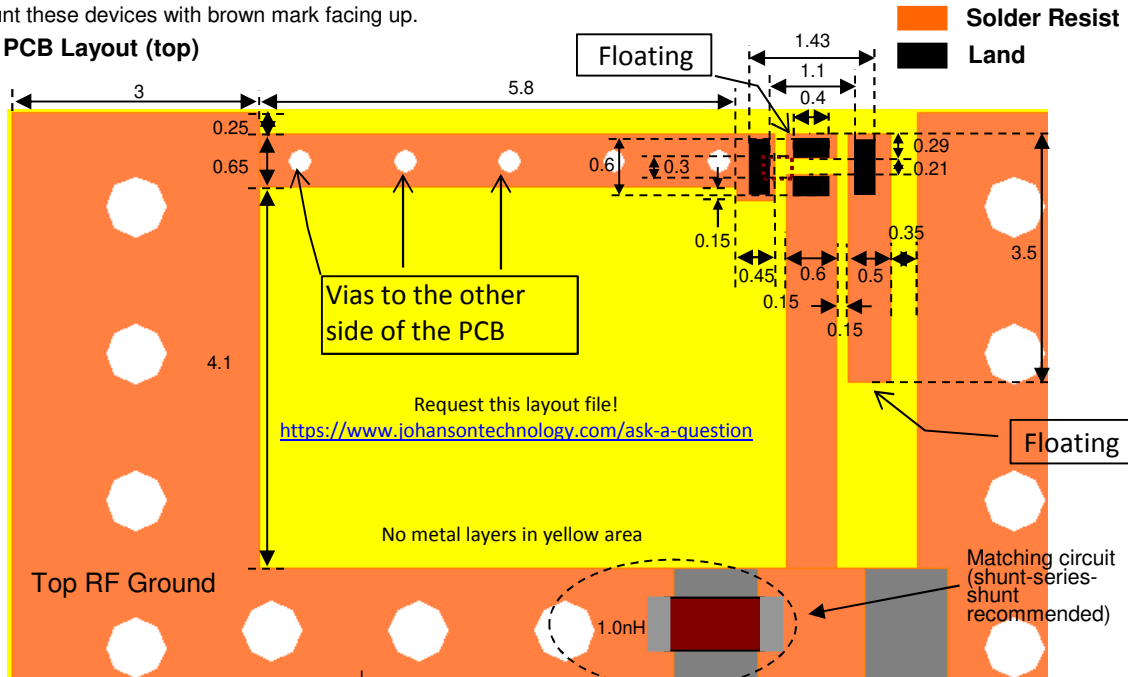
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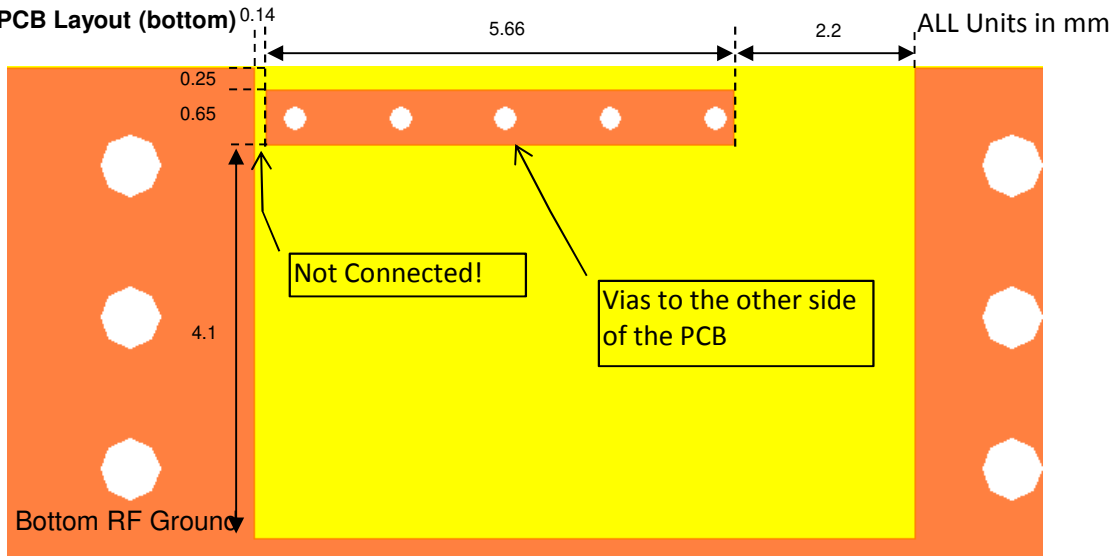
## Mounting Considerations 1: Antenna PCB Layout (Scenario 1 Terminal Configuration)

Mount these devices with brown mark facing up.

### PCB Layout (top)



### PCB Layout (bottom)



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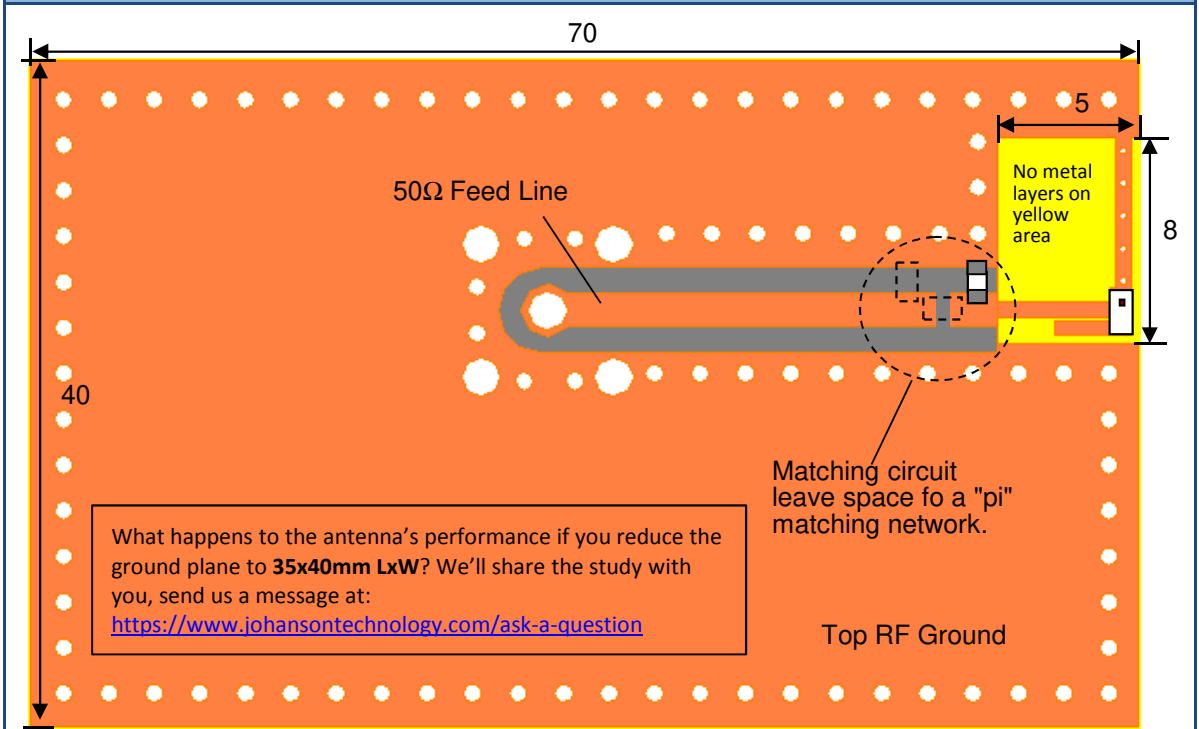
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## Mounting Consideration 1: Evaluation Board, 40x70mm (Scenario 1 Terminal Configuration)



What happens to the antenna's performance if you reduce the ground plane to **35x40mm LxW**? We'll share the study with you, send us a message at: <https://www.johansontechnology.com/ask-a-question>

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: <https://www.johansontechnology.com/request-a-sample>

Reference p/n: 2450AD14A5500-EB1SMA

Would you like the layout file of the above? Have antenna tuning issues?

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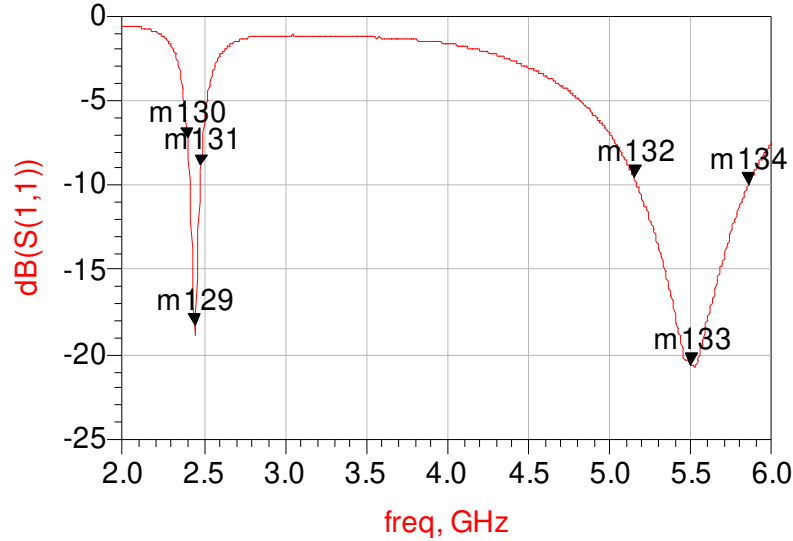
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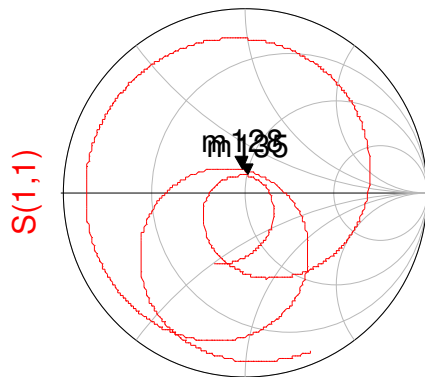
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## Mounting Consideration 1: Evaluation Board, 40x70mm Typical Electrical Performance (T=25°C)



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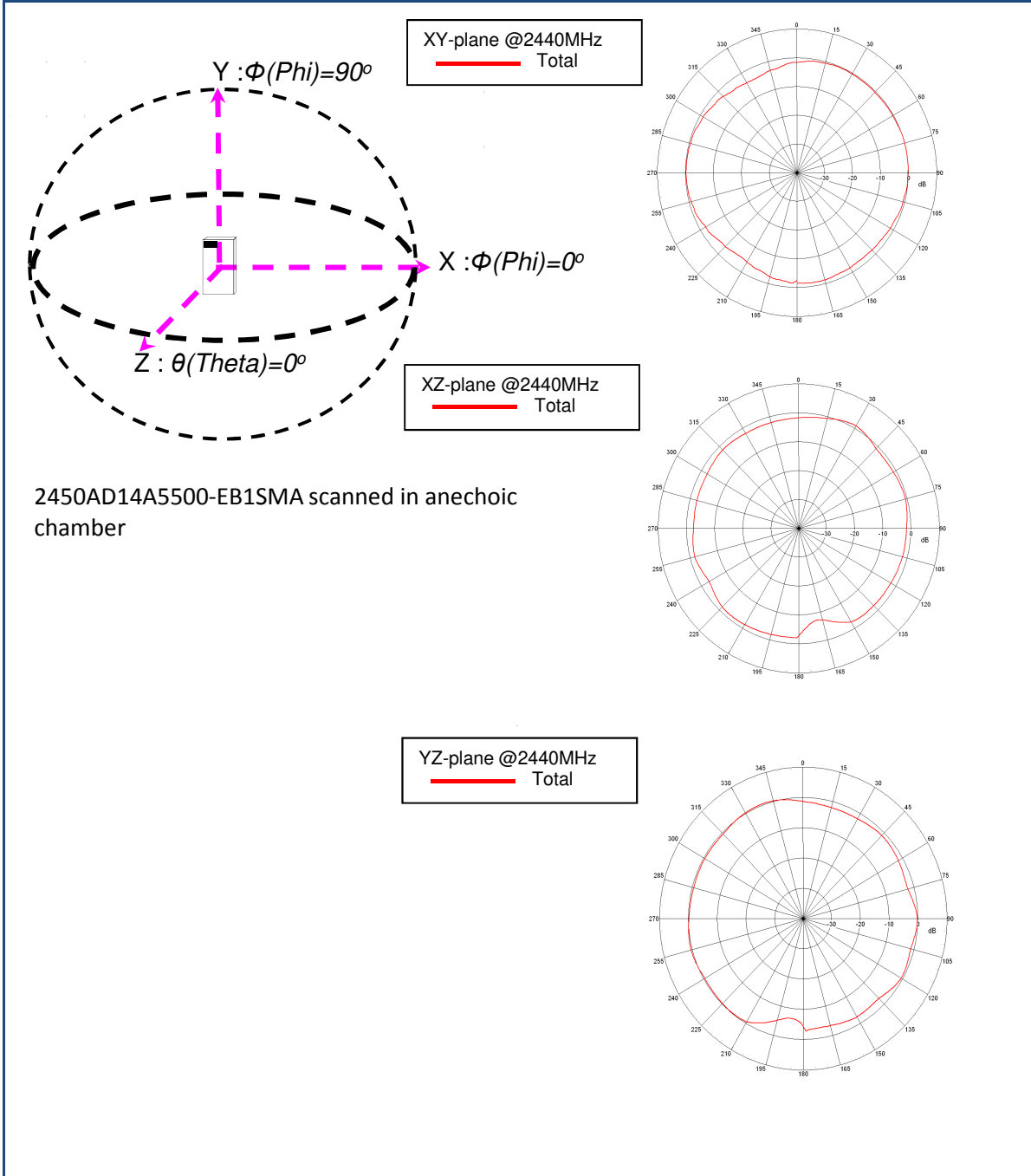
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## Mounting Consideration 1: Evaluation Board, 40x70mm Typical EM Radiation Performance @2.44GHz (T=25°C)



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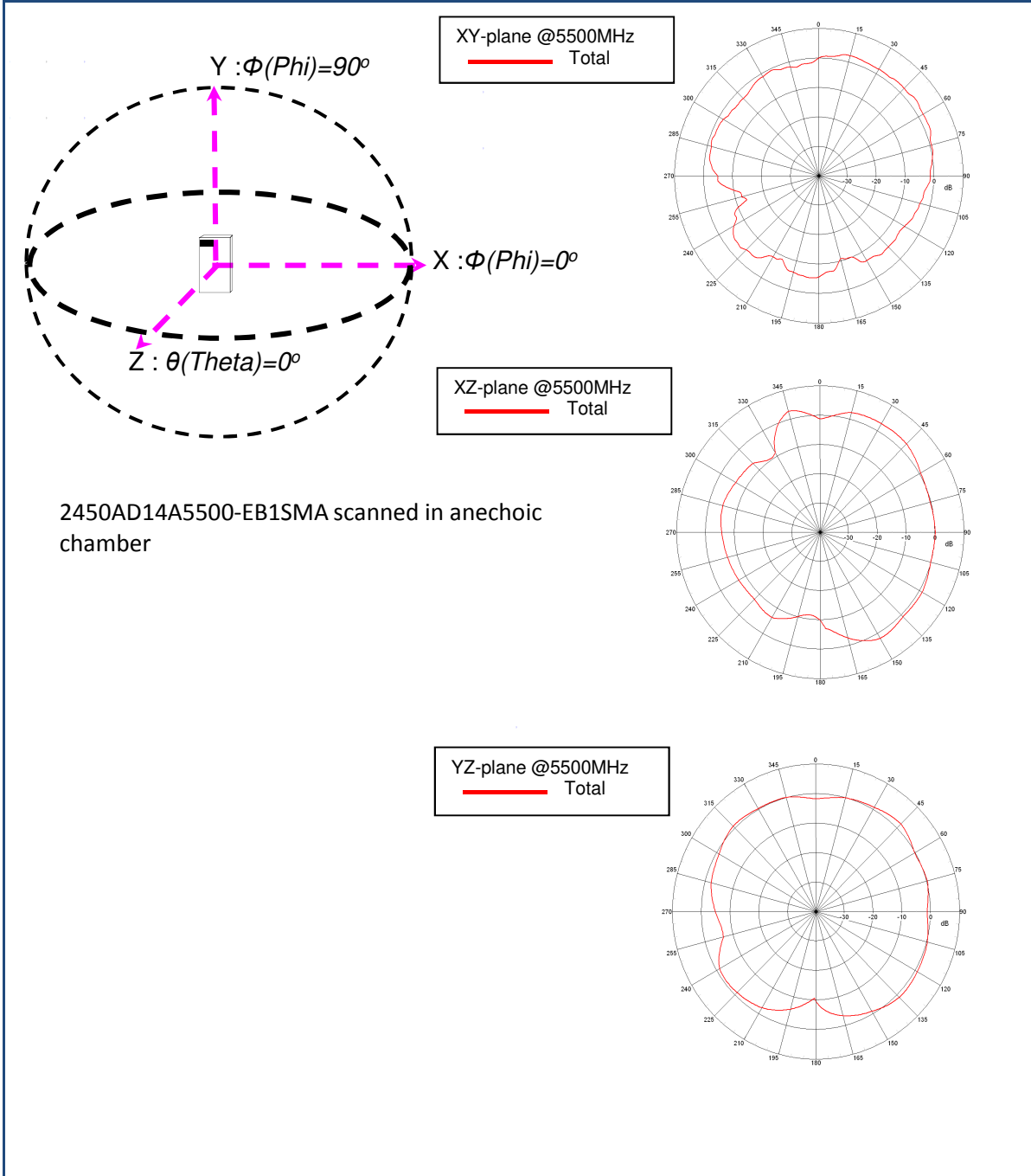
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## Mounting Consideration 1: Evaluation Board, 40x70mm Typical EM Radiation Performance @5.50GHz (T=25°C)



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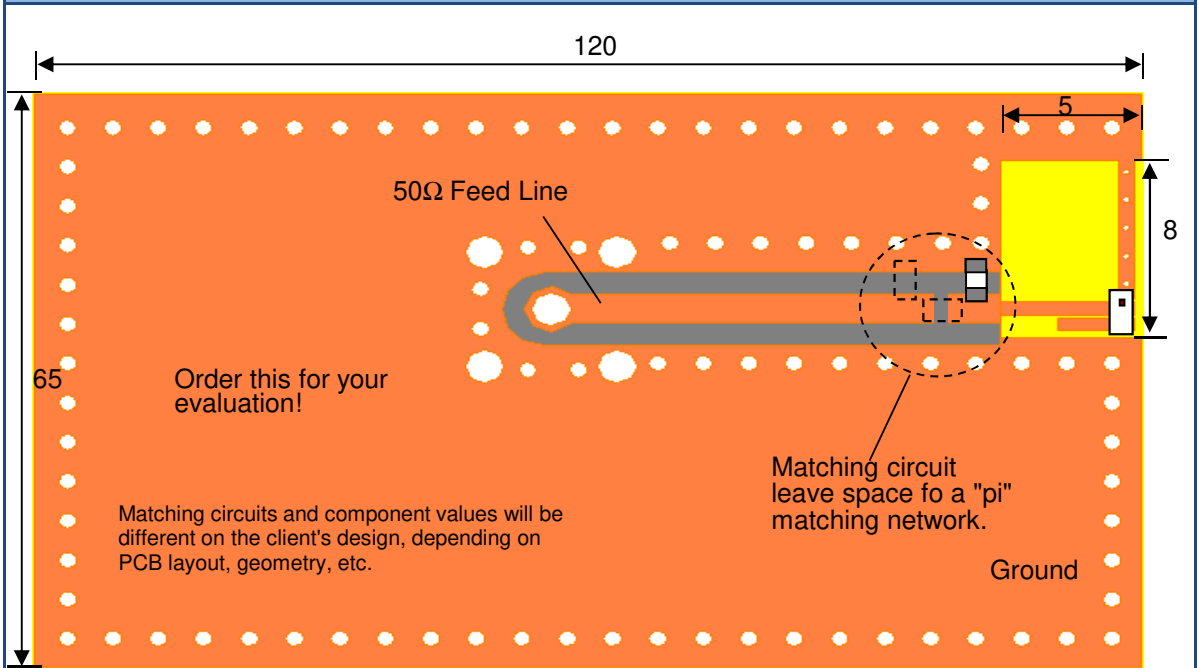
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## Mounting Consideration 2: Evaluation Board, 65x120mm (Scenario 1 Terminal Configuration)



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

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Reference p/n: 2450AD14A5500-EB2SMA

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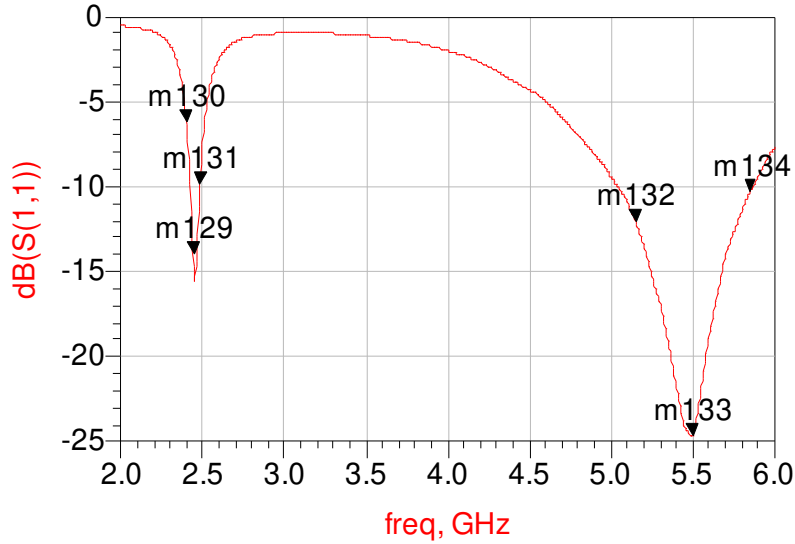
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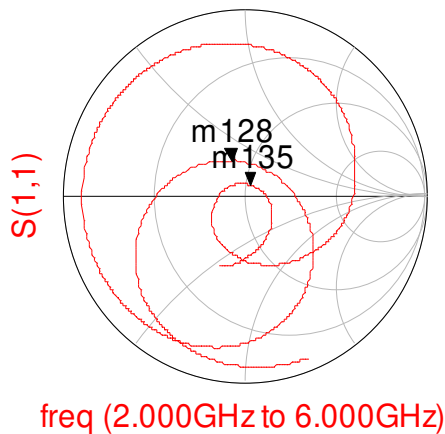
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## Mounting Consideration 2: Evaluation Board, 65x120mm Typical Electrical Performance (T=25°C)



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))=-12.060	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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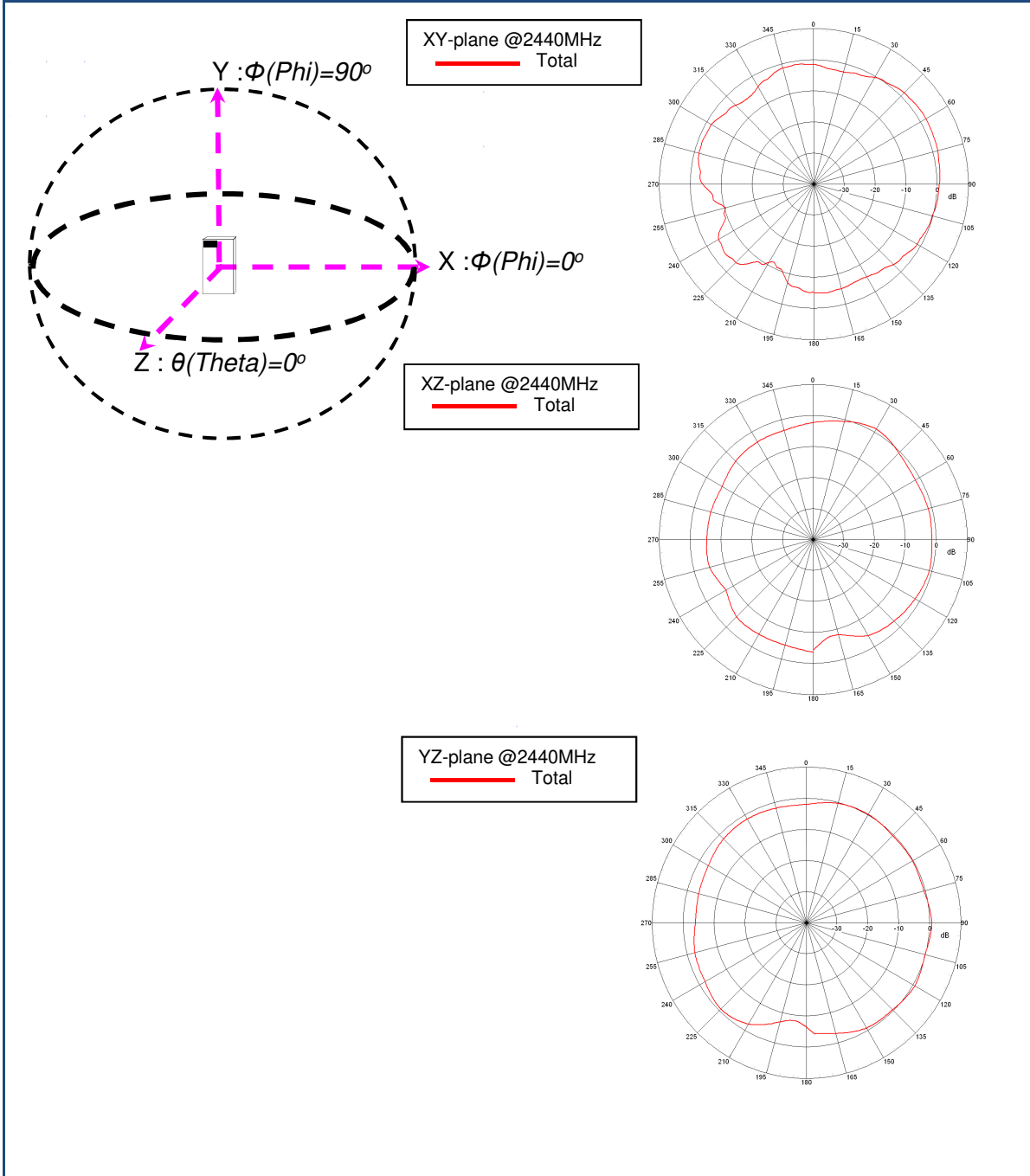
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## Mounting Consideration 2: Evaluation Board, 65x120mm Typical EM Radiation Performance @2.44GHz (T=25°C)



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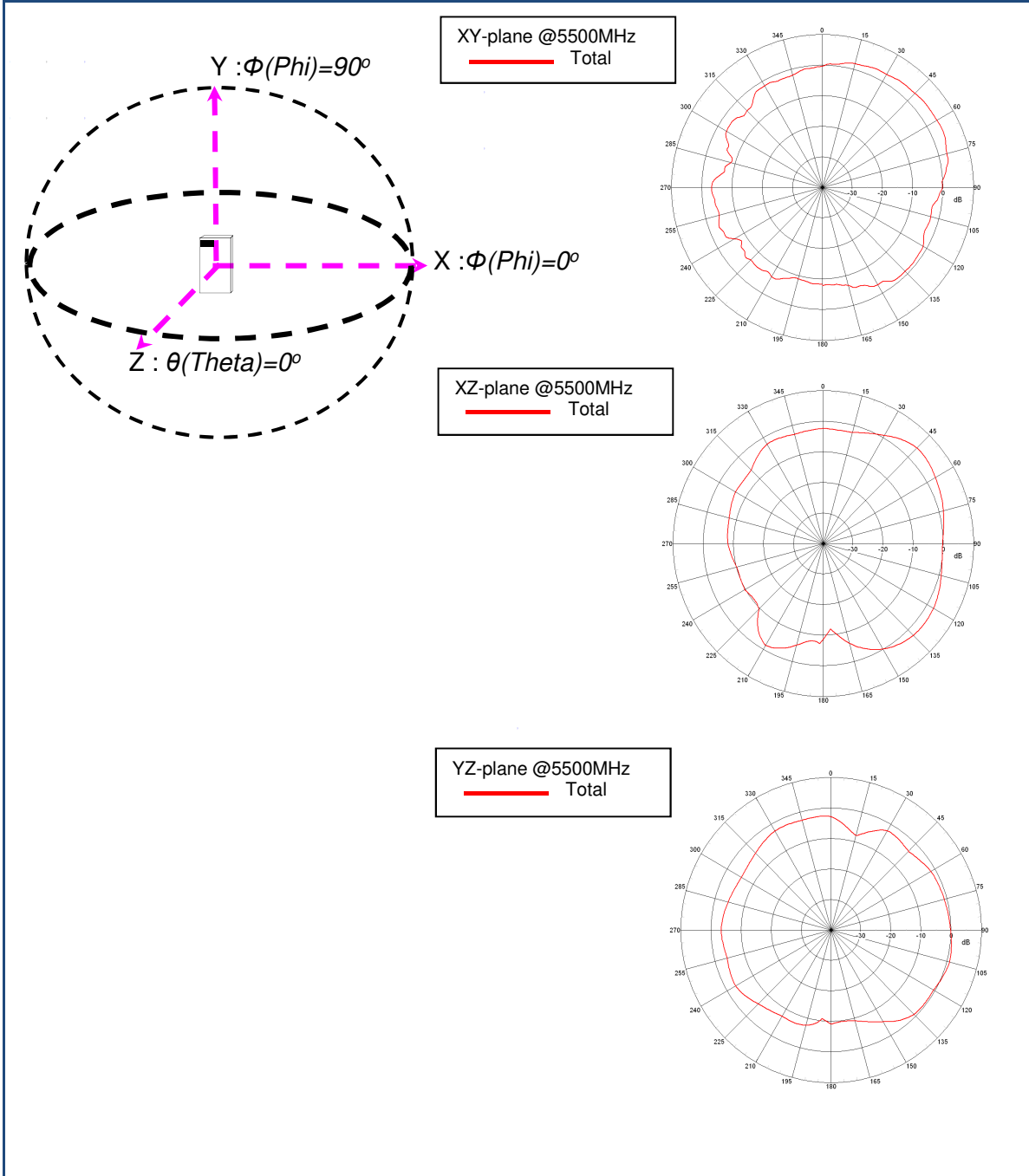
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## Mounting Consideration 2: Evaluation Board, 65x120mm Typical EM Radiation Performance @5.50GHz (T=25°C)



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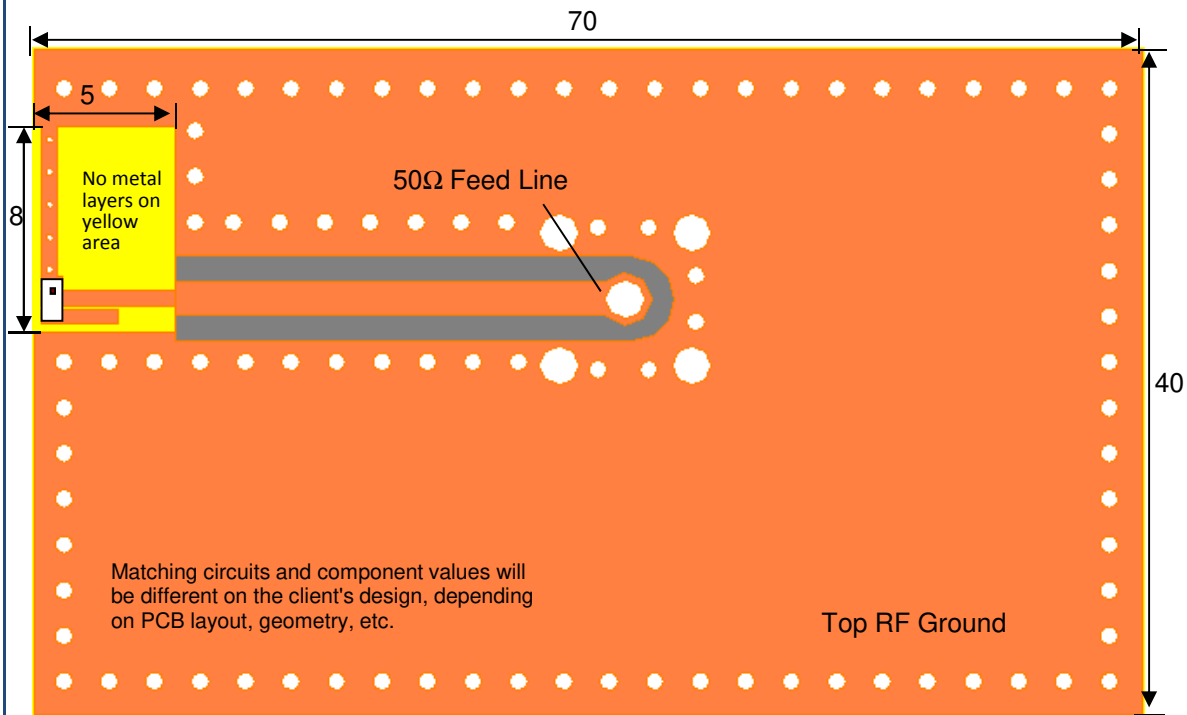
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## Mounting Consideration 3: Scenario 2 Terminal Configuration



Units in mm

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Contact our applications engineers at:

<https://www.johansontechnology.com/ask-a-question>

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: <https://www.johansontechnology.com/ask-a-question>

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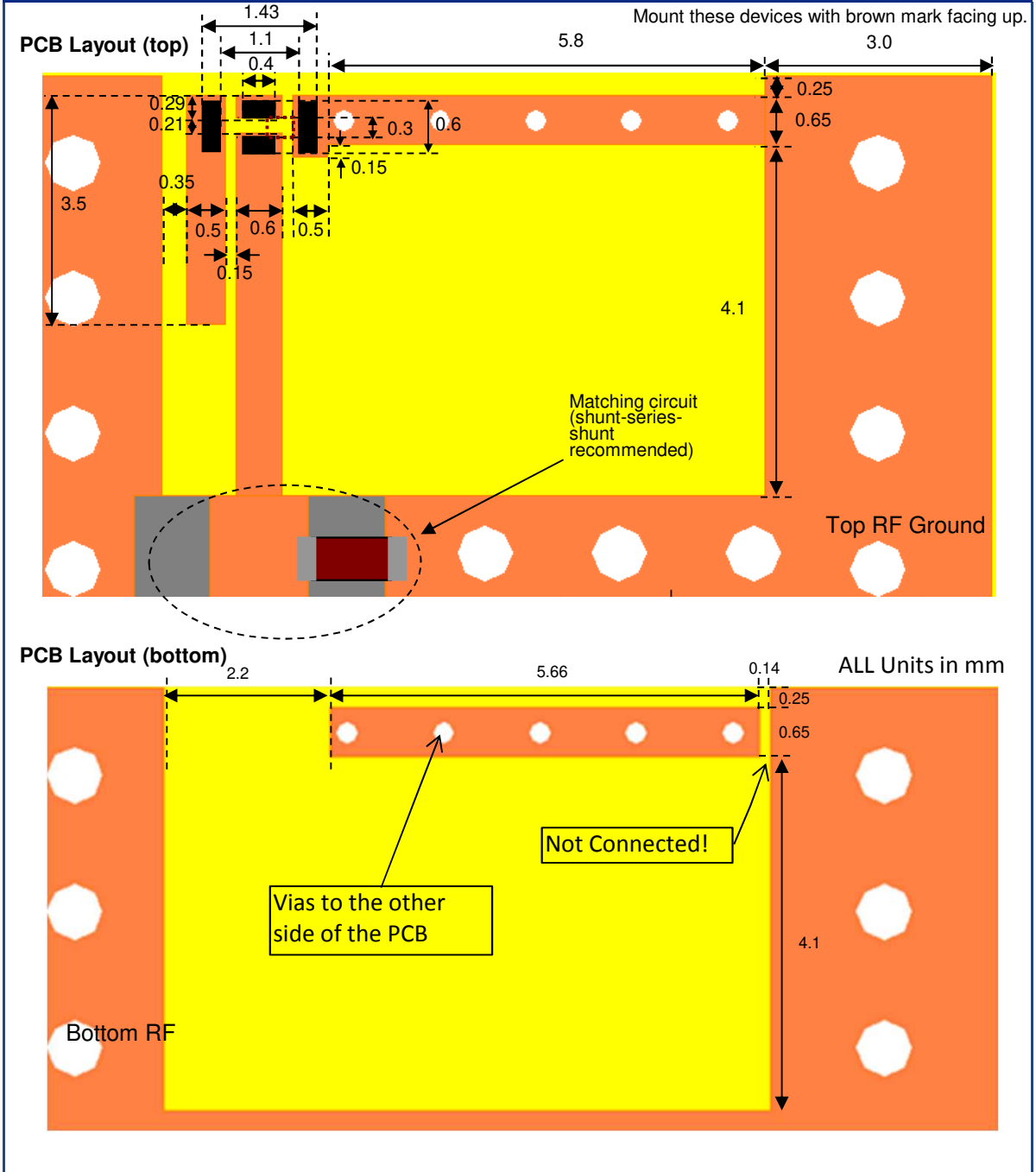
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## Mounting Consideration 3: Scenario 2 Terminal Configuration



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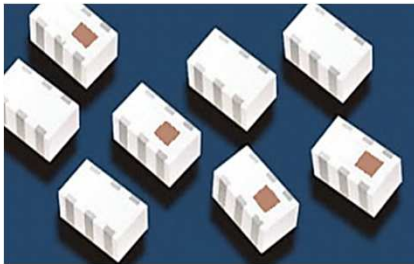
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## Single Feed Configuration with Diplexer Option

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.



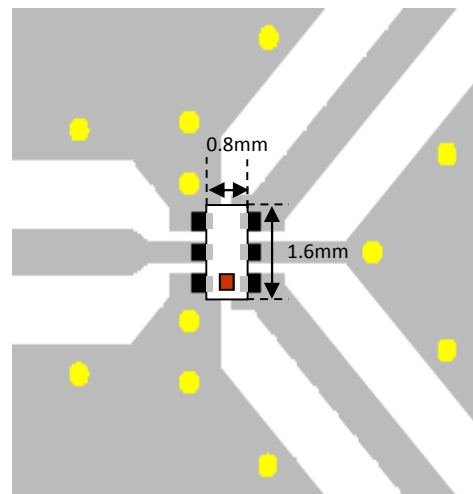
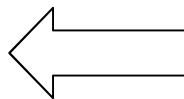
For more information about our diplexers go to:  
<https://www.johansontechnology.com/diplexers>

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

Example part numbers include 2450DP14C5400, 2450DP14D5400

Mini chip diplexer footprint and example layout

2450AD14A5500T-AEC  
Dual Band Antenna



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## Antenna tuning, optimization, and validation services:

<https://www.johansontechnology.com/ipc-antenna-services>

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

<https://www.johansontechnology.com/antennas>

## For more information about our diplexers:

<https://www.johansontechnology.com/diplexers>

## Soldering Information

<https://www.johansontechnology.com/ipcsoldering-profile>

## MSL Info

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

## Packaging information

<https://www.johansontechnology.com/tape-reel-packaging>

## For layout review contact our Applications Team at:

<https://www.johansontechnology.com/ask-a-question>

## RoHS Compliance

<https://www.johansontechnology.com/rohs-compliance>

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

<https://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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