

# "High Frequency Ceramic Solutions"

BT/WiFi and GPS/BDS/GLNSS Quad band, Dual Feed Chip Antenna:  
2.4/1.561/1.575/1.602GHz, SMD, AEC-Q200 Qualified

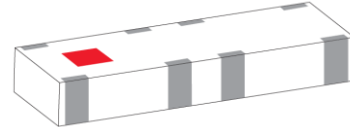
P/N 2450AD47A1590E-AEC

Detail Specification: 1/10/2018

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## General Specifications

Part Number	2450AD47A1590E-AEC					
Frequency (MHz)	2400~2500	1561	1575	1602		
Peak Gain (dBi typ.)	1.0 (YZ-Total)	0.5 (YZ-Total)	1.5 (YZ-Total)	1.5 (YZ-Total)		
Average Gain (dBi typ.)	-1.0 (YZ-Total)	-2.5 (YZ-Total)	-2.0 (YZ-Total)	-2.0 (YZ-Total)		
Return Loss (dB)	8 min.	7.5 min.	9.0 min.	8 min.	Reel Quantity	1,000
Ave Radiation Efficiency % <sup>1</sup> (on JTI EVB)	83	45	51	51	Operating Temperature	-40 to +105°C
Isolation	20 dB	15 dB	15 dB	15 dB	Storage Temperature	-40 to +105°C
					Storage Period	18 months max.
					Power Capacity	2W max. (CW)



<sup>1</sup>On Johanson test board p/n: 2450AD47A1590-EB1SMA. EVB details on pages 2/3

## Part Number Explanation

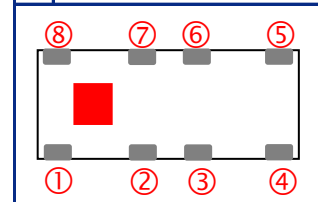
P/N Suffix	Packing Style	Bulk (loose)	Suffix = S	e.g., 2450AD47A1590S-AEC
		T & R	Suffix = E	e.g., 2450AD47A1590E-AEC
		100% Tin	Suffix = E or S	e.g., 2450AD47A1590(E or S)-AEC
	Evaluation Board	2450AD47A1590-EB1SMA (Pre-tuned with SMA connectors)		

## Mechanical Dimensions

	In	mm
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
a1	0.031 ± 0.008	0.80 ± 0.20
a2	0.106 ± 0.008	2.70 ± 0.20
a3	0.039 ± 0.008	1.00 ± 0.20
b	0.012 ± 0.004/-0.008	0.30 ± 0.1/-0.2

## Terminal Configuration

No.	Function
1	2.4GHz Feed Point
2	GND
3	GND
4	1.5-1.6GHz Feed Point
5	GND
6	GND
7	GND
8	GND



Find out more about our antenna design assistance services at:  
<http://www.johansontechnology.com/ipc-antenna-services>

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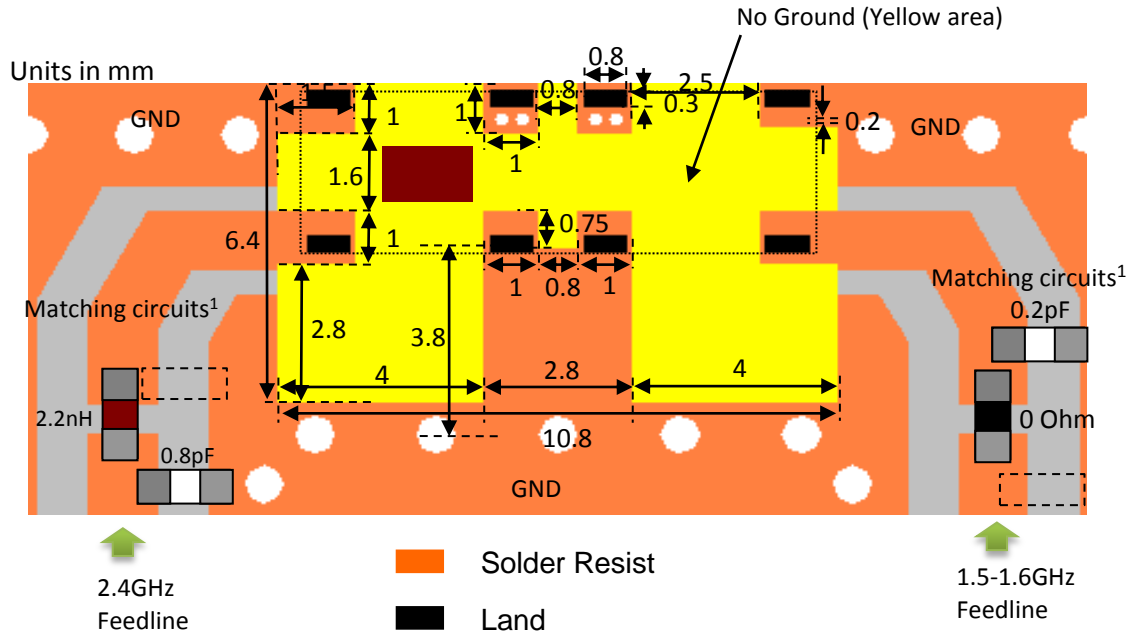
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P/N 2450AD47A1590E-AEC

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## Layout Recommendations



Would you like the layout file of the above? Contact our applications engineers at: [www.johansontechnology.com/ask-a-question](http://www.johansontechnology.com/ask-a-question)

<sup>1</sup>Attention: Matching circuits and component values will be different on the client's design, depending on PCB layout, geometry, etc. It is recommended that the designer leave available slots for a "pi" (or shunt-series-shunt) network. The antenna matching network values you see here are used when antenna is mounted on Johanson's evaluation board.

Need help laying out the antenna, want us to review your antenna design (free!), require the Gerber files for this EVB, or would like us to validate the new tuning values of your PCB (fee may apply) go to: [www.johansontechnology.com/ask-a-question](http://www.johansontechnology.com/ask-a-question)

Orderable EVB for evaluation, it comes with a female SMA connector. Go to: [www.johansontechnology.com/component/samplerequest](http://www.johansontechnology.com/component/samplerequest) and ask for p/n 2450AD47A1590-EB1SMA

\* Line width should be designed to match 50Ω characteristic impedance, depending on PCB material, thickness, and preferably CPWG (co-planar wave guide) type.

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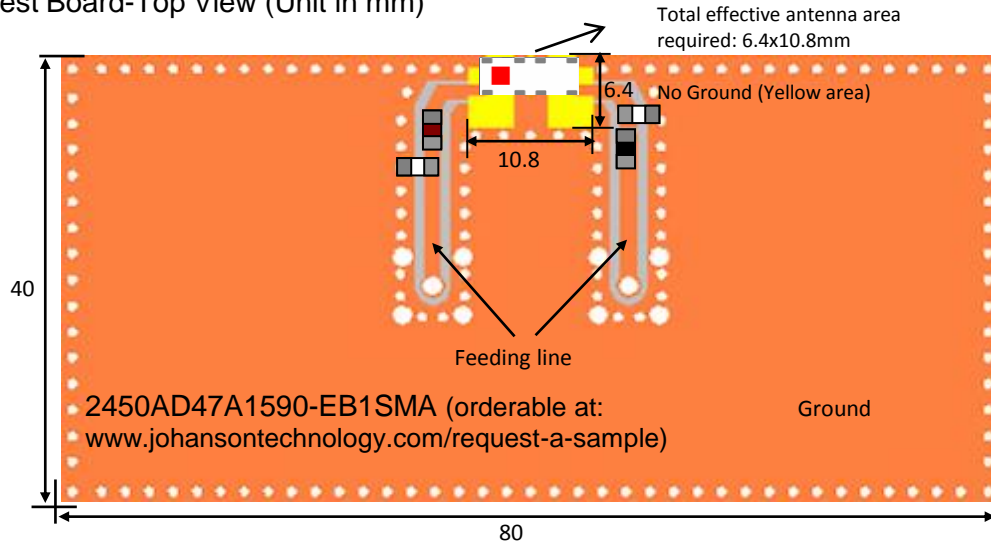
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Detail Specification: 1/10/2018

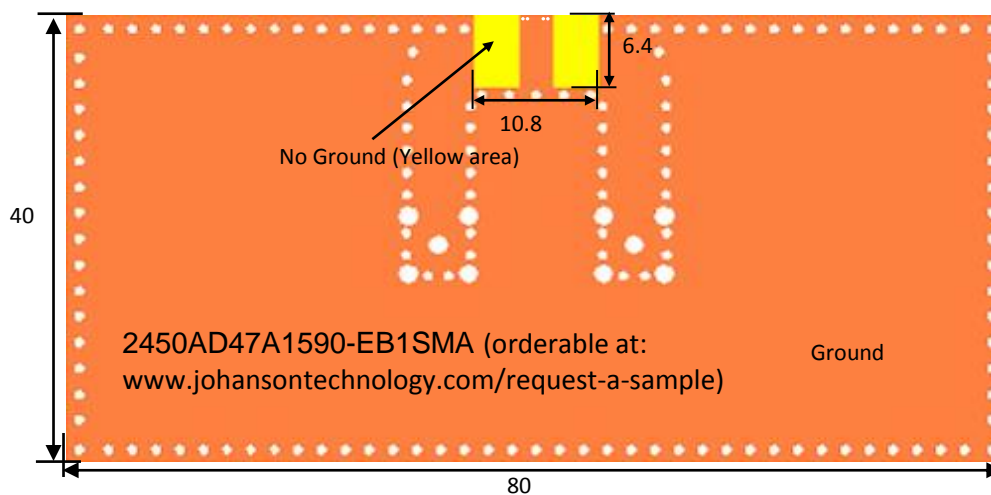
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## Typical Electrical Characteristics (T=25°C)

### ❖ Test Board-Top View (Unit in mm)



### ❖ Test Board-Bottom View (Unit in mm)



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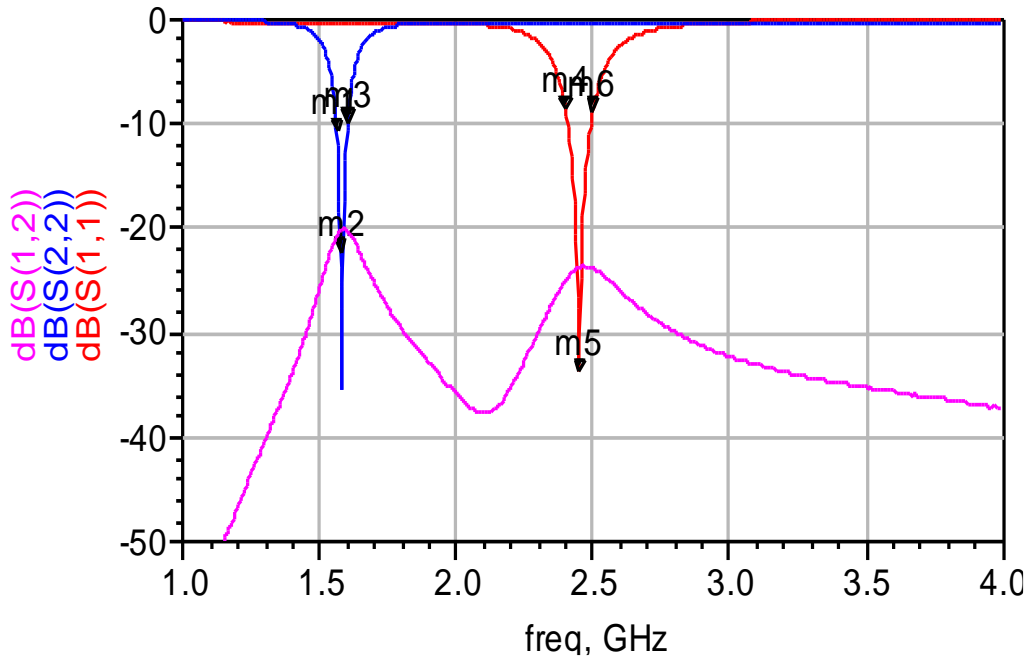
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## Typical Electrical Characteristics (T=25°C)

Return Loss and Isolation With Matching Circuits On Johanson EVB



m1	m4
Freq=1.561GHz	Freq=2.400GHz
dB(S(2,2))=-10.697	dB(S(1,1))=-8.678
m2	m5
Freq=1.575GHz	Freq=2.450GHz
dB(S(2,2))=-22.294	dB(S(1,1))=-33.793
m3	m6
Freq=1.602GHz	Freq=2.500GHz
dB(S(2,2))=-9.842	dB(S(1,1))=-8.901

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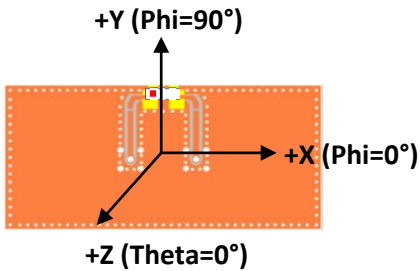
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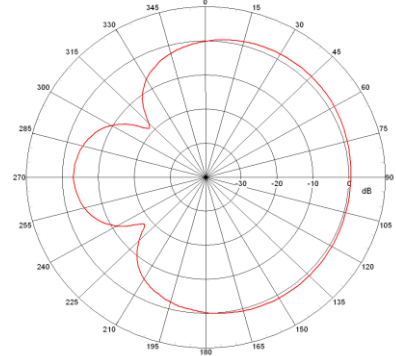
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## Typical Radiation Patterns

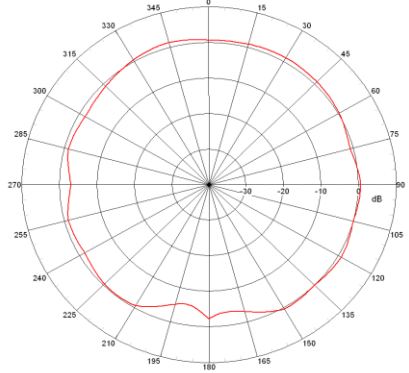
❖ Radiation Patterns @ 2.44GHz



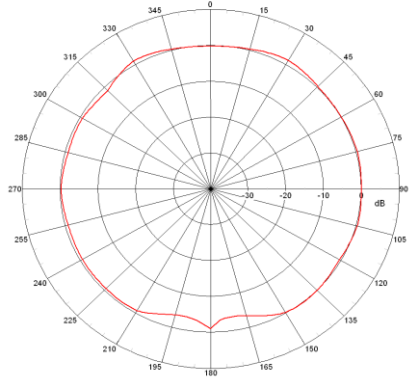
XY-Plane



YZ-Plane



XZ-Plane



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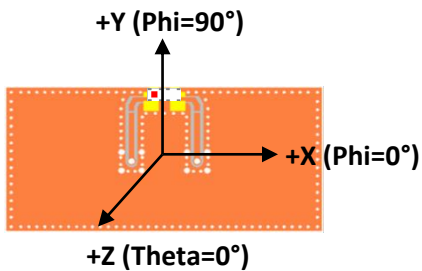
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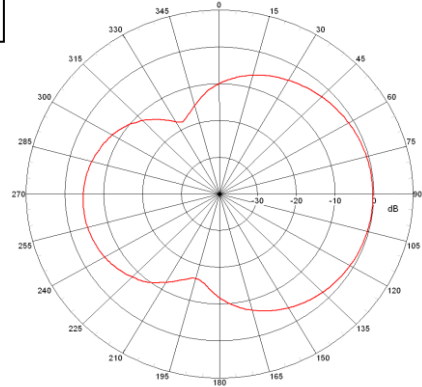
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## Typical Radiation Patterns

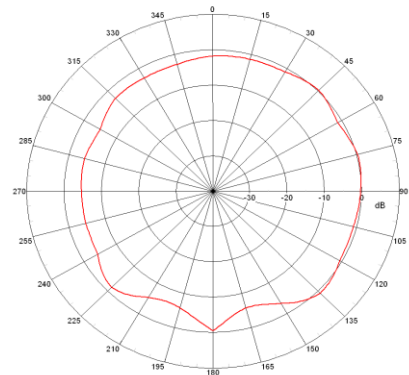
❖ Radiation Patterns @ 1.561GHz



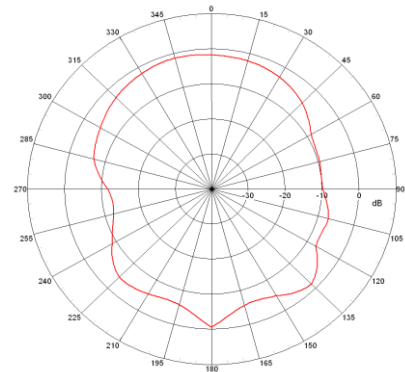
XY-Plane



YZ-Plane



XZ-Plane



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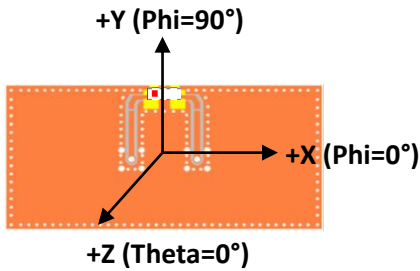
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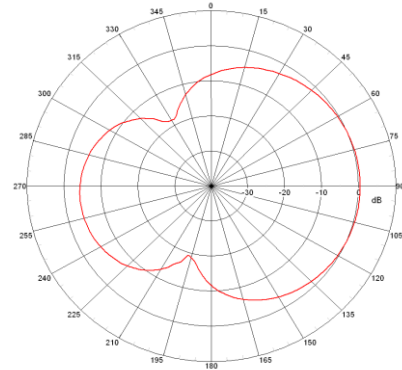
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## Typical Radiation Patterns

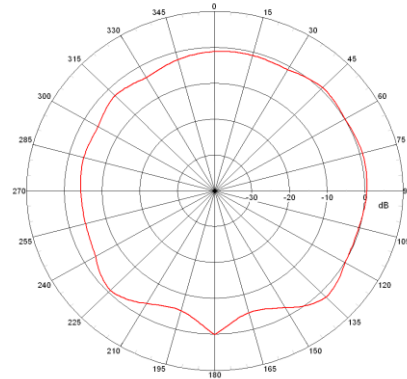
❖ Radiation Patterns @ 1.575GHz



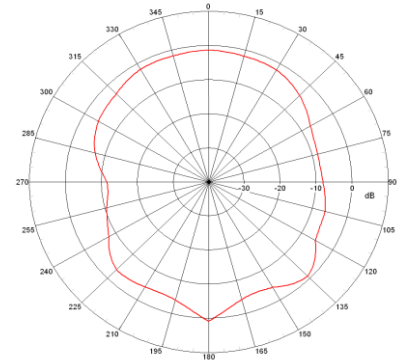
XY-Plane



YZ-Plane



XZ-Plane



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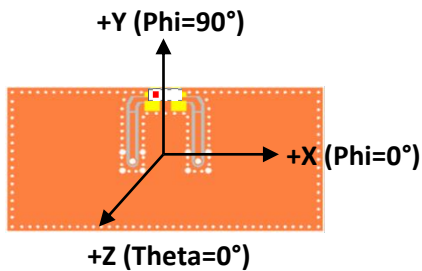
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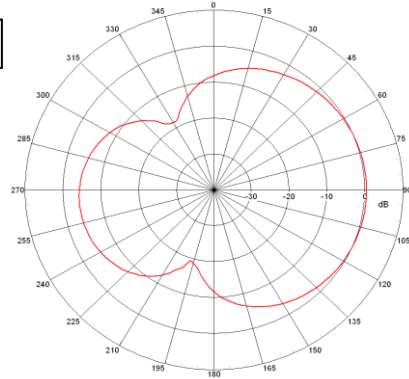
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## Typical Radiation Patterns

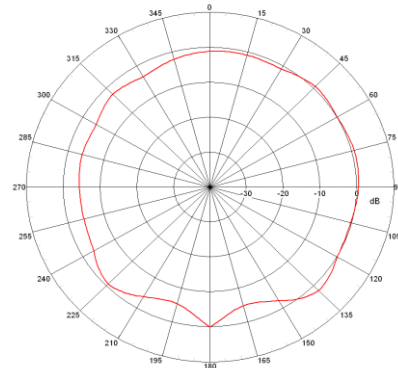
❖ Radiation Patterns @ 1.602GHz



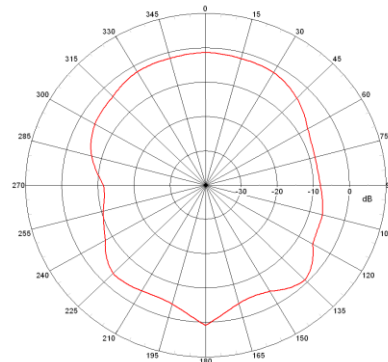
XY-Plane



YZ-Plane



XZ-Plane



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## Antenna tuning, optimization, and validation services:

[www.johansontechnology.com/ipcantennaservices](http://www.johansontechnology.com/ipcantennaservices)

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

[www.johansontechnology.com/antennas](http://www.johansontechnology.com/antennas)

## Soldering Information

[www.johansontechnology.com/ipcsoldering-profile](http://www.johansontechnology.com/ipcsoldering-profile)

## MSL Info

[www.johansontechnology.com/technical-notes/msl-rating.html](http://www.johansontechnology.com/technical-notes/msl-rating.html)

## Packaging information

[www.johansontechnology.com/ipcpackaging.html](http://www.johansontechnology.com/ipcpackaging.html)

## For layout review contact our Applications Team at:

[www.johansontechnology.com/component/techquestion](http://www.johansontechnology.com/component/techquestion)

## RoHS Compliance

[www.johansontechnology.com/technical-notes/rohs-compliance.html](http://www.johansontechnology.com/technical-notes/rohs-compliance.html)

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