

## Unlicensed Transmitters: Approved Antennas List

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### WiFi

| <i><b>Manufacturer</b></i> | <i><b>Antenna</b></i> | <i><b>Description</b></i>                                                                                                                                             | <i><b>Type</b></i> | <i><b>Length<br/>(mm)</b></i> | <i><b>Width<br/>(mm)</b></i> | <i><b>Other<br/>Info</b></i> | <i><b>Connector<br/>Type</b></i> | <i><b>Notes</b></i> |
|----------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------|------------------------------|------------------------------|----------------------------------|---------------------|
| Johanson Technology        | 2450AD14A5500         | Dual Band 2.45/5 GHz Mini Chip Antenna<br>Peak gain of<br>1.0dBi (xz plane) at 2.4GHz<br>4.0dBi (xz plane) at 5GHz<br>(refer to datasheet)                            | Chip Antenna       | 1.6                           | 0.8                          | On board                     | n/a                              | Ant1                |
| Johanson Technology        | 2450AD18A6050         | 2.4, 5, and 6GHz Mini Chip Antenna<br>Peak gain of<br>2.0dBi (yz plane) at 2.4GHz,<br>1.5dBi (yz plane) at 5GHz,<br>2.7dBi (yz plane) at 6GHz<br>(refer to datasheet) | Chip Antenna       | 3.2                           | 1.6                          | On board                     | n/a                              | Ant2                |

### Radar

| <i><b>Manufacturer</b></i> | <i><b>Antenna</b></i>           | <i><b>Description</b></i>    | <i><b>Type</b></i> | <i><b>Length<br/>(mm)</b></i> | <i><b>Width<br/>(mm)</b></i> | <i><b>Other<br/>Info</b></i> | <i><b>Connector<br/>Type</b></i> | <i><b>Notes</b></i> |
|----------------------------|---------------------------------|------------------------------|--------------------|-------------------------------|------------------------------|------------------------------|----------------------------------|---------------------|
| Socionext Inc              | SC1233AR3<br>Integrated Antenna | SC1233AR3 Integrated Antenna | Patch Antenna      | n/a                           | n/a                          | Integral Antenna             | n/a                              |                     |

# "High Frequency Ceramic Solutions"

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

**P/N 2450AD14A5500**

Detail Specification: 11/6/2018

Page 1 of 6

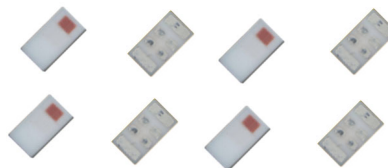
This is the Web version of this datasheet, for the full datasheet, please contact us at: <https://www.johansontechnology.com/ask-a-question>

## General Specifications

|                         |                          |                          |
|-------------------------|--------------------------|--------------------------|
| Part Number             | 2450AD14A5500            |                          |
| Frequency (MHz)         | 2400 - 2480              | 5150 - 5850              |
| Ave. Rad Efficiency     | 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 $\Omega$              |                          |
| Input Power             | 2 Watts max. (CW)        |                          |

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

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



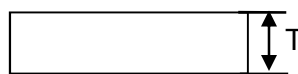
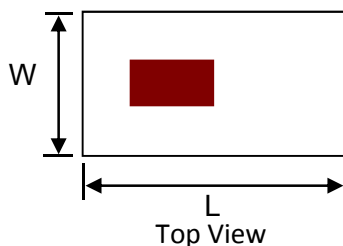
|                       |                |
|-----------------------|----------------|
| Storage Period        | 18 months max. |
| Storage Temperature   | -40 to +85°C   |
| Operating Temperature | -40 to +85°C   |
| Reel Quantity         | 4000pcs        |

## 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 |                 |                            |

## Mechanical Dimensions

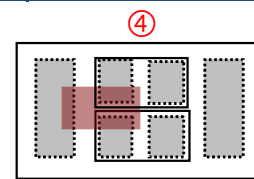
|   | In                | mm              |
|---|-------------------|-----------------|
| L | 0.063 $\pm$ 0.004 | 1.60 $\pm$ 0.10 |
| W | 0.031 $\pm$ 0.004 | 0.80 $\pm$ 0.10 |
| T | 0.016 max.        | 0.40 max.       |



Side View

## Terminal Configuration

| No. | Function |
|-----|----------|
| 1   | GND      |
| 2   | FEED     |
| 3   | NC       |
| 4   | NC       |



Top View looking "through" the component

If you'd like the complete datasheet which includes detailed gain performance, layout guidelines, application notes, small WiFi application layout, send us as message at:

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

As a bonus, you'll be assigned an RF Engineer to assist you in the design for free!

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

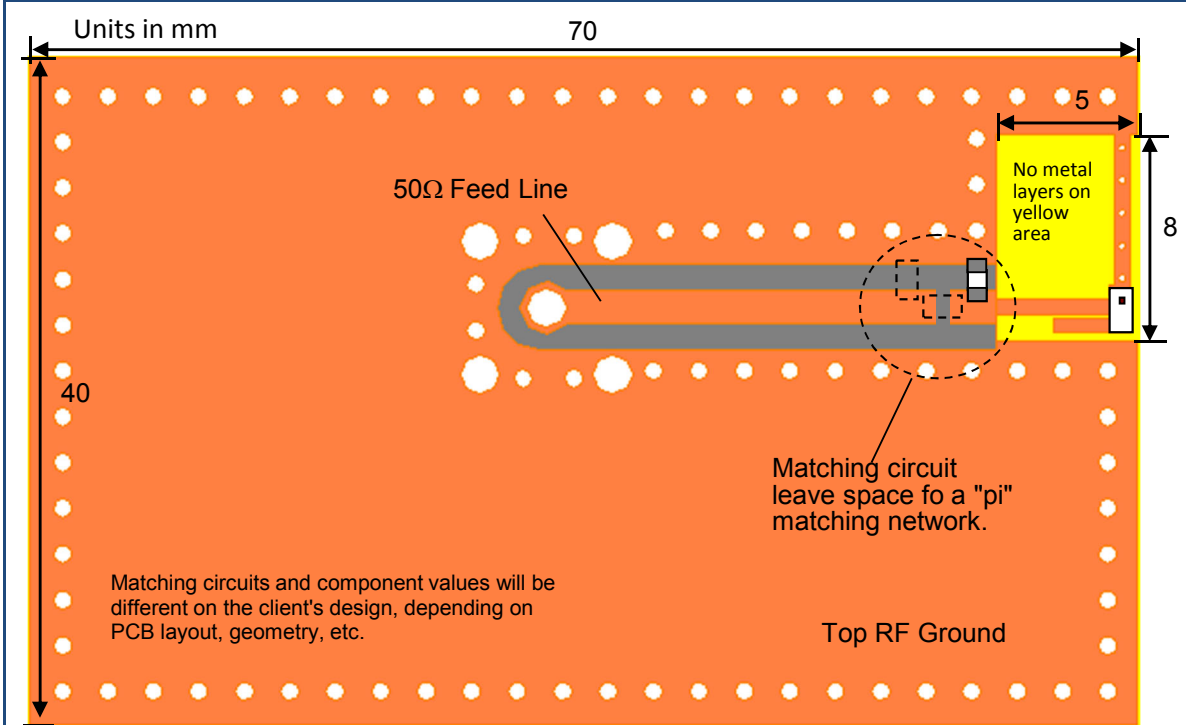
**P/N 2450AD14A5500**

Detail Specification: 11/6/2018

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## Mounting Considerations 1: Evaluation Board, 65x70mm (Scenario 1 Terminal Configuration)



To order the ABOVE pre-tuned 50Ω EVB with a female SMA connector click here: <https://www.johansontechnology.com/request-a-sample>

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.

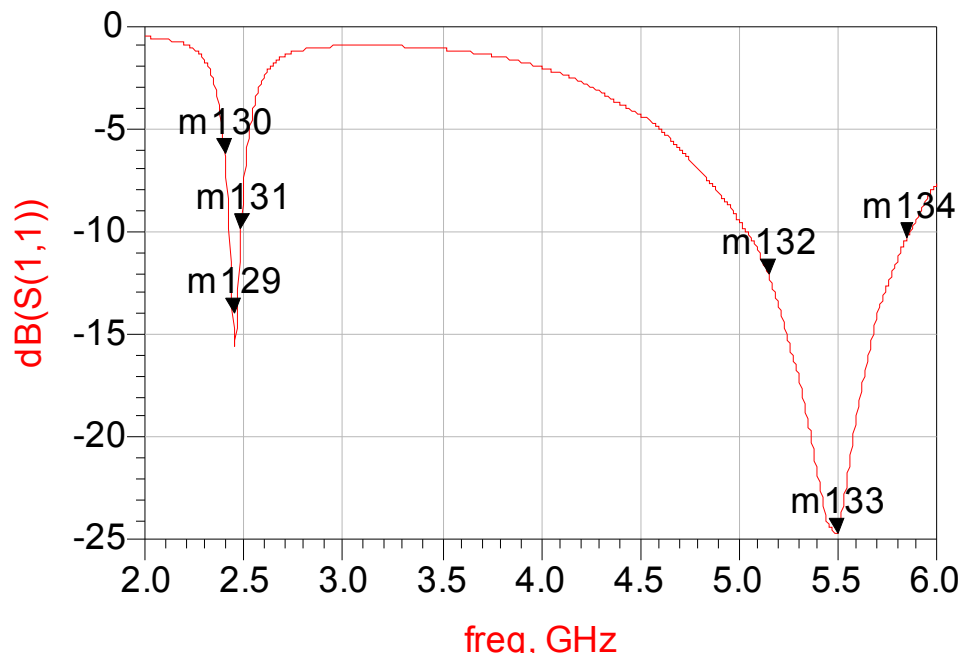
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## Mounting Considerations 2: Typical Electrical Performance (T=25°C)



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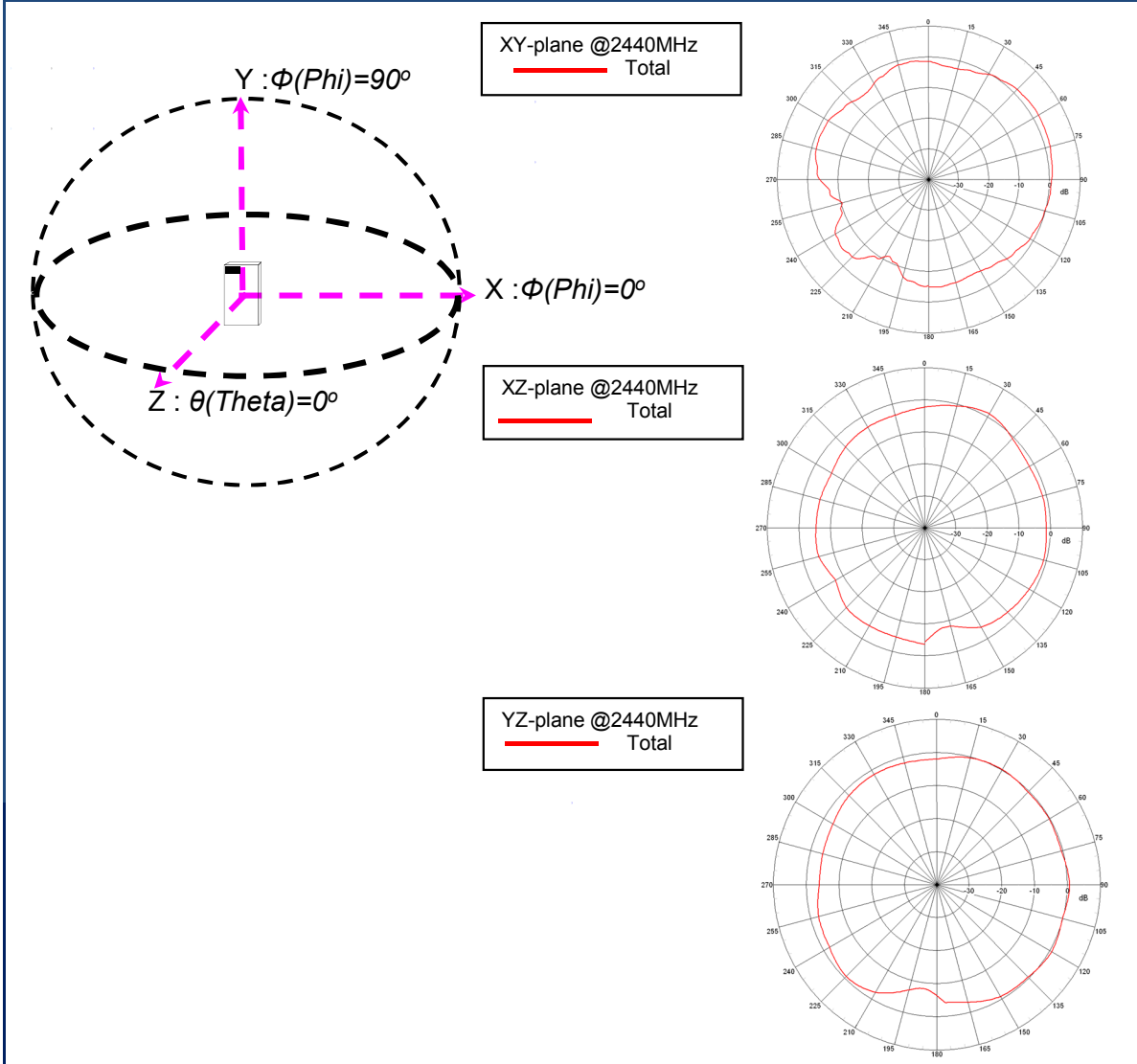
**P/N 2450AD14A5500**

Detail Specification: 11/6/2018

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## Typical EM Radiation Performance @ 2.44GHz (T=25°C)



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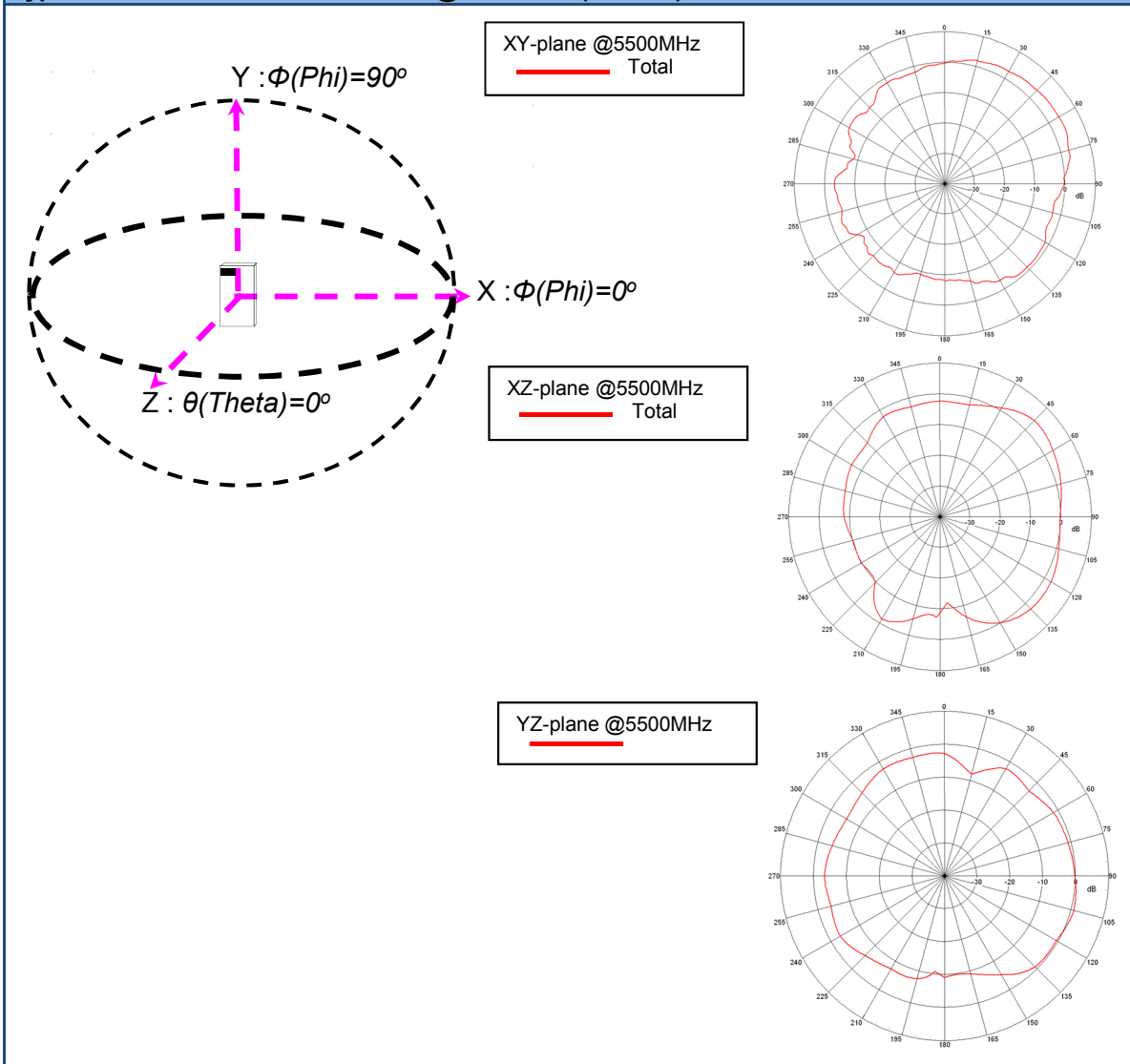
**P/N 2450AD14A5500**

Detail Specification: 11/6/2018

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## Typical EM Radiation Performance @ 5.50 GHz (T=25°C)



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P/N 2450AD14A5500

Detail Specification: 11/6/2018

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<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.

If you'd like the complete datasheet which includes detailed gain performance, layout guidelines, application notes, small WiFi application layout, send us as message at:

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# High Frequency Ceramic Solutions

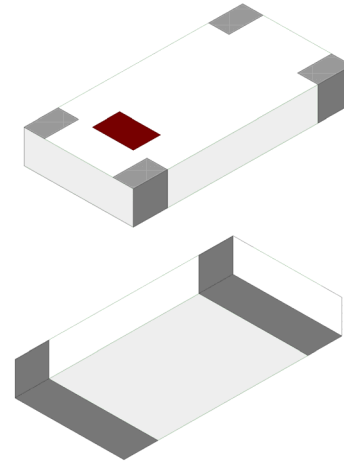
2.4, 5, and 6GHz BT/WiFi6E Mini Antenna, Single-feed, Tri-band, Corner Mount P/N 2450AD18A6050

Detail Specification: 10/20/2021

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## General Specifications

|                                                                     |                                                         |                 |                 |
|---------------------------------------------------------------------|---------------------------------------------------------|-----------------|-----------------|
| Part Number                                                         | 2450AD18A6050                                           |                 |                 |
| Frequency (MHz)                                                     | 2400 - 2500                                             | 4900 - 5850     | 5850 - 7200     |
| Peak Gain (dBi typ.)                                                | +2.0 (YZ-plane)                                         | +1.5 (YZ-plane) | +2.7 (YZ-plane) |
| Average Gain (dBi typ.)                                             | -1.5 (YZ-plane)                                         | -2.0 (YZ-plane) | -2.0 (YZ-plane) |
| Return Loss (dB)                                                    | 6 min.                                                  | 5 min.          | 5 min.          |
| Radiation Efficiency % <sup>1</sup>                                 | 79                                                      | 74              | 85              |
| Impedance (Ω)                                                       | 50                                                      |                 |                 |
| Power Capacity (W)                                                  | 3 max. (CW)                                             |                 |                 |
| Operating Temp.                                                     | -40°C to +85°C                                          |                 |                 |
| Reel Quantity (pcs./reel)                                           | 3,000                                                   |                 |                 |
| Recommended Storage Conditions and Period for unused Product on T&R | +5°C to +35°C<br>Humidity 45 - 75% RH<br>18 months max. |                 |                 |



Use this antenna with our diplexers and filters to split the signal into the corresponding RF path. Go to page 7 for the links.

<sup>1</sup>Efficiency measured on Johanson's evaluation board PN 2450AD18A6050-EB1SMA

## Part Number Explanation

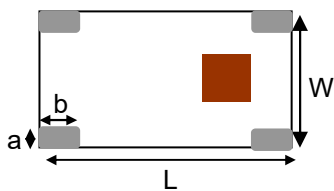
|            |                  |                                                      |                 |                            |
|------------|------------------|------------------------------------------------------|-----------------|----------------------------|
| P/N Suffix | Packing Style    | Bulk (loose pcs.)                                    | Suffix = S      | E.g. 2450AD18A6050S        |
|            |                  | T & R                                                | Suffix = E      | E.g. 2450AD18A6050E        |
|            |                  | 100% Tin                                             | Suffix = E or S | E.g. 2450AD18A6050(E or S) |
|            | Evaluation Board | 2450AD18A6050-EB1SMA (Pre-tuned with SMA connectors) |                 |                            |

## Mechanical Dimensions

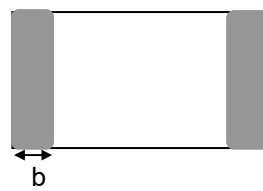
|   | In                  | mm             |
|---|---------------------|----------------|
| L | 0.126 ± 0.008       | 3.20 ± 0.20    |
| W | 0.063 ± 0.008       | 1.60 ± 0.20    |
| T | 0.020 ± 0.004       | 0.50 ± 0.10    |
| a | 0.012 +0.004/+0.008 | 0.30 +0.1/-0.2 |
| b | 0.020 ± 0.004       | 0.50 ± 0.10    |



<Side view>



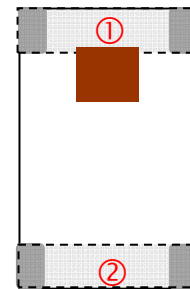
<Top view>



<Bottom view>

## Terminal Configuration

| No. | Function   |
|-----|------------|
| 1   | Feed Point |
| 2   | NC         |



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# High Frequency Ceramic Solutions

2.4, 5, and 6GHz BT/WiFi6E Mini Antenna, Single-feed, Tri-band, Corner Mount

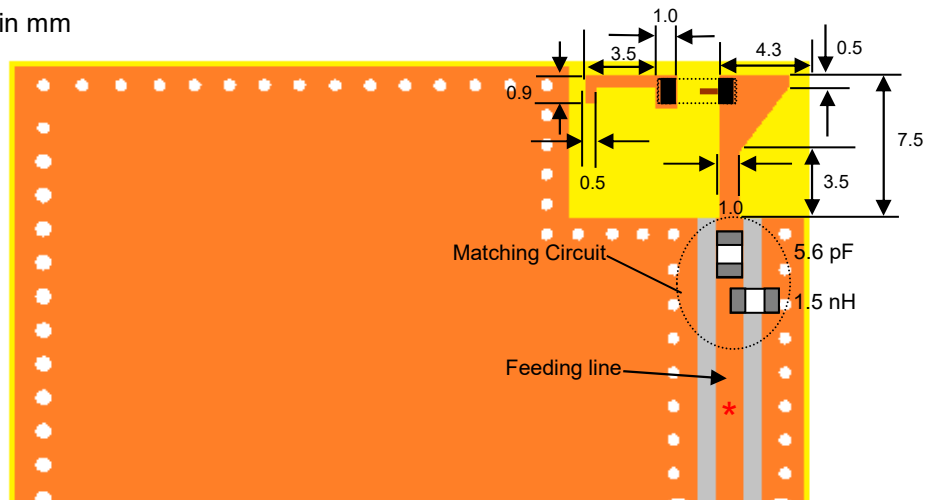
P/N 2450AD18A6050

Detail Specification: 10/20/2021

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## Layout Recommendations

Unit in mm



Ask for the layout/gerber files at: <https://www.johansontechnology.com/ask-a-question>

-  Solder Resist
-  Land

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!), or would like us to measure and derive the new tuning values of your PCB (fee may apply) go to: <https://www.johansontechnology.com/ask-a-question>

Orderable EVB for evaluation, it comes with a female SMA connector. Go to: <https://www.johansontechnology.com/component/request-a-sample> and ask for p/n 2450AD18A6050-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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2.4, 5, and 6GHz BT/WiFi6E Mini Antenna, Single-feed, Tri-band, Corner Mount

P/N 2450AD18A6050

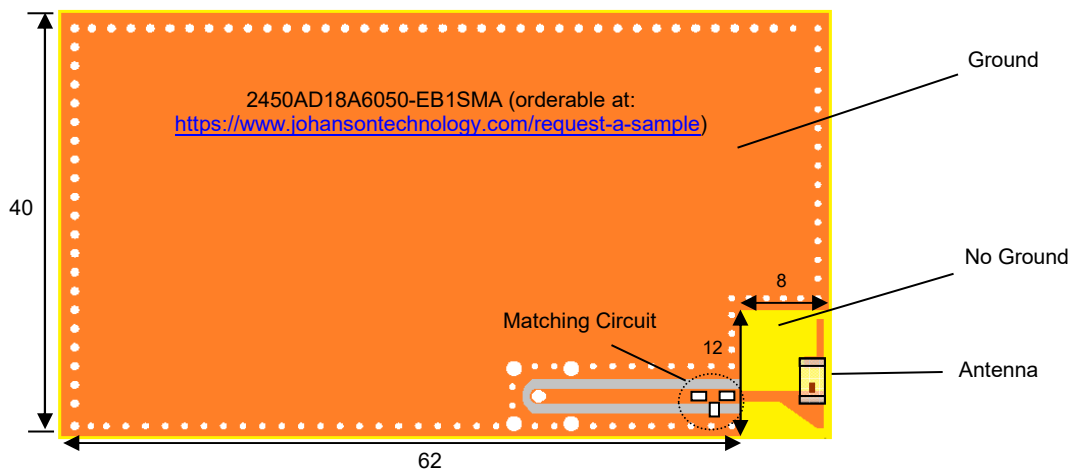
Detail Specification: 10/20/2021

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## Johanson Technology Evaluation Board Mounting Configuration

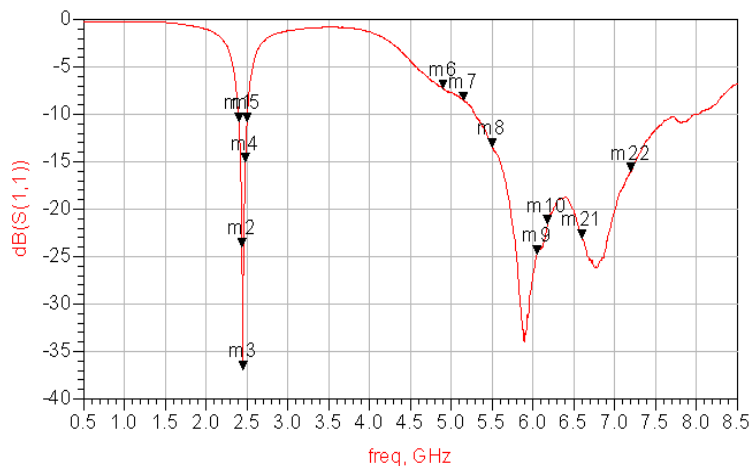
### ❖ Test Board-Top View

Unit in mm



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

### Antenna Return Loss with Matching Circuits On Johanson EVB



|     |               |                    |
|-----|---------------|--------------------|
| m1  | freq=2.400GHz | dB(S(1,1))=-10.756 |
| m2  | freq=2.440GHz | dB(S(1,1))=-23.983 |
| m3  | freq=2.450GHz | dB(S(1,1))=-36.886 |
| m4  | freq=2.480GHz | dB(S(1,1))=-15.047 |
| m5  | freq=2.500GHz | dB(S(1,1))=-10.778 |
| m21 | freq=6.600GHz | dB(S(1,1))=-23.053 |
| m22 | freq=7.200GHz | dB(S(1,1))=-16.091 |

|     |               |                    |
|-----|---------------|--------------------|
| m6  | freq=4.900GHz | dB(S(1,1))=-7.277  |
| m7  | freq=5.150GHz | dB(S(1,1))=-8.522  |
| m8  | freq=5.500GHz | dB(S(1,1))=-13.415 |
| m9  | freq=6.050GHz | dB(S(1,1))=-24.728 |
| m10 | freq=6.175GHz | dB(S(1,1))=-21.581 |

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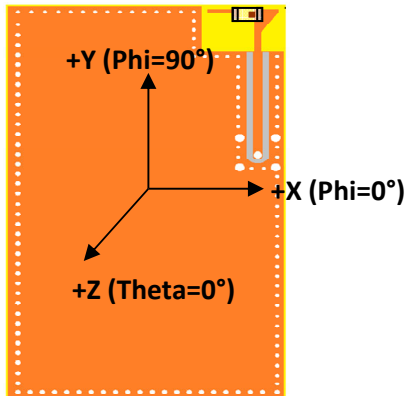
P/N 2450AD18A6050

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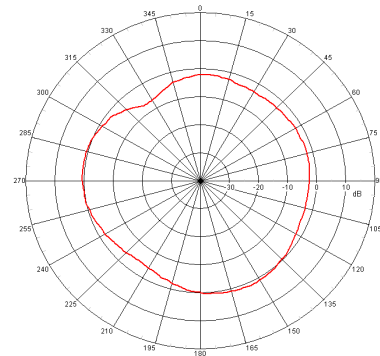
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## Typical Radiation Patterns

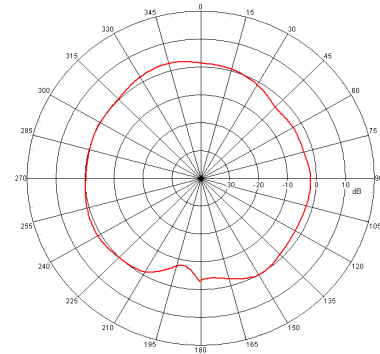
❖ Radiation Patterns @ 2.45GHz



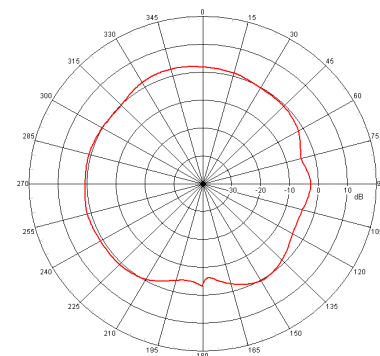
XY-Plane



YZ-Plane



XZ-Plane



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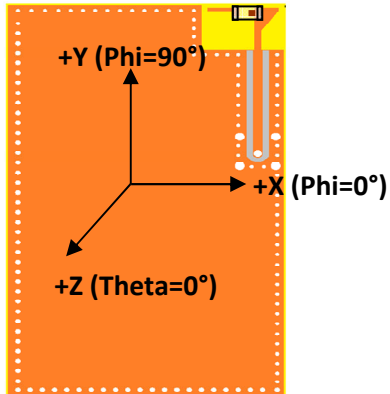
P/N 2450AD18A6050

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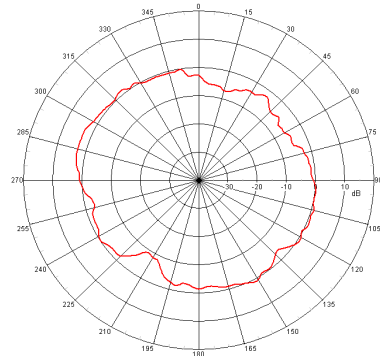
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## Typical Radiation Patterns

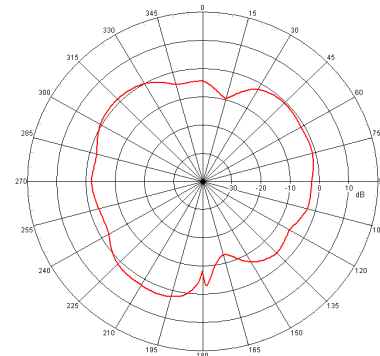
❖ Radiation Patterns @ 5.375GHz



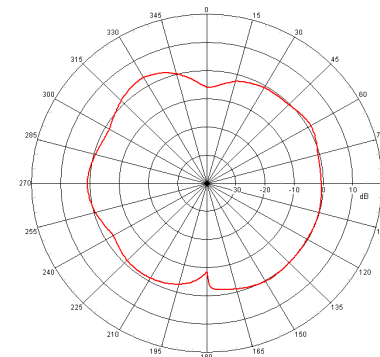
XY-Plane



YZ-Plane



XZ-Plane



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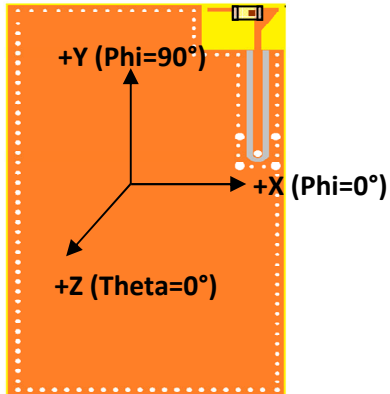
P/N 2450AD18A6050

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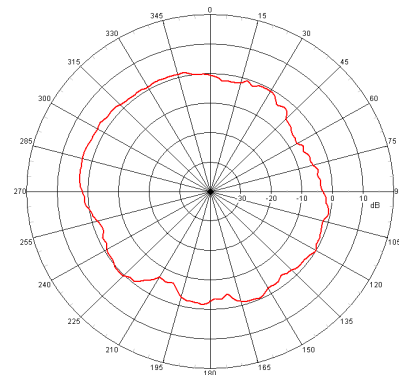
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## Typical Radiation Patterns

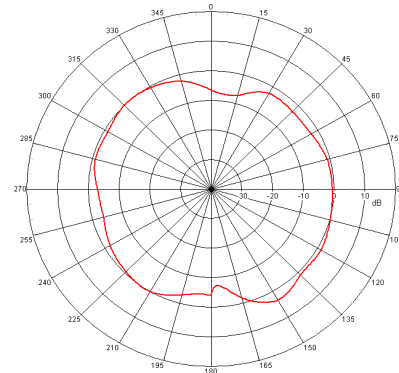
❖ Radiation Patterns @ 6.525GHz



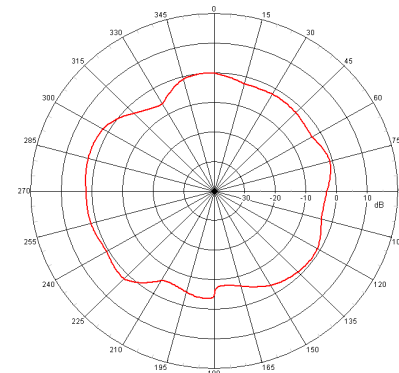
XY-Plane



YZ-Plane



XZ-Plane



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# High Frequency Ceramic Solutions

2.4, 5, and 6GHz BT/WiFi6E Mini Antenna, Single-feed, Tri-band, Corner Mount

P/N 2450AD18A6050

Detail Specification: 10/20/2021

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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>

## 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>

## Recommended Storage Condition and Max Shelf Life

<https://www.johansontechnology.com/recommended-storage-conditions>

## Diplexers Page

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

## Band Pass Filters Page

<https://www.johansontechnology.com/band-pass-filters>

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