This antenna must have metal directly underneath on bottom layer in order to function properly. The antenna was designed in mind for small coin cell, wearable, IoT, 2.4 BLE, 802.11, ISM, Zigbee, etc. applications in close-range networks where metal or a battery/display covers the entire length or side of the PCB or encaissement must be present directly under the antenna and there's no room for usual/typical antenna metal clearance.

This antenna is specifically designed for PCBs that have 0.5-1mm of total thickness.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Frequency (MHz)</th>
<th>Peak Gain</th>
<th>Impedance</th>
<th>Power Capacity</th>
<th>Q'ty/Reel (pcs)</th>
<th>Operating Temp</th>
<th>Storage Temp</th>
<th>Storage Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>2450AT42E0100</td>
<td>2400 - 2480</td>
<td>-2.0 dBi typ. (Y-Z-V)</td>
<td>50Ω</td>
<td>2W max. (CW)</td>
<td>2,000 pcs</td>
<td>-40 to +85°C</td>
<td>-40 to +85°C</td>
<td>18 months max.</td>
</tr>
</tbody>
</table>

Total average radiated efficiency on PCB feature on "Mounting Considerations 1" (orderable EVB p/n: 2450AT42E0100-EB1SMA) is ~30%

If you’d like the complete datasheet which includes detailed layout specs, tuning techniques, and application notes for IoT/wearables, send us as message at: www.johansontechnology.com/ask-a-question

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2.4 GHz Surface Mount, Above Metal, Low Profile Mini Chip Antenna

This antenna must have metal directly underneath on bottom layer in order to function properly.

Detail Specification: 10/17/2016

Typical Electrical Characteristics (T=25 °C) Radiation Patterns@2.44GHz

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How To Choose The Correct Antenna Variant

Refer to the table below for substrate thickness and the corresponding antenna variation.

<table>
<thead>
<tr>
<th>PCB Substrate Thickness (H)</th>
<th>Recommended JTI PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 1.0mm</td>
<td>2450AT42E0100</td>
</tr>
<tr>
<td>1.0mm - 2.0mm</td>
<td>2450AT42E010B</td>
</tr>
<tr>
<td>≥ 2.0mm</td>
<td>2450AT42E010C</td>
</tr>
</tbody>
</table>

Typical Efficiency Values @ 2.44GHz for various scenarios for a 30x50mm PCB

The following efficiency values represent performance on a 30x50mm EVB like on page 2. Please note that antenna efficiency varies widely with board layout, size and surroundings.

<table>
<thead>
<tr>
<th>PCB Substrate Thickness (H)</th>
<th>Simulated Antenna Efficiency(%) @ 2.44GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>H = 0.12 mm</td>
<td>1.95%</td>
</tr>
<tr>
<td>H = 0.7 mm</td>
<td>29.20%</td>
</tr>
<tr>
<td>H = 1.5 mm</td>
<td>23.30%</td>
</tr>
<tr>
<td>H = 2.5 mm</td>
<td>31.60%</td>
</tr>
</tbody>
</table>

We encourage you to use a relatively thick dielectric layer below antenna, as we have seen a direct correlation between substrate thickness and antenna performance.

Note: "H" substrate thickness of <0.25mm (10mil) is not recommended. The component will still work and radiate, just not optimally.

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2.4 GHz Surface Mount, Above Metal, Low Profile Mini Chip Antenna

This antenna must have metal directly underneath on bottom layer in order to function properly.

Detail Specification: 10/17/2016

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

Antenna layout review, tuning, and characterization services
www.johansontechnology.com/ipc-antenna-services

More SMD Chip Antennas at:
www.johansontechnology.com/antennas

Soldering Information
www.johansontechnology.com/ipcsoldering-profile

Antenna layout and tuning techniques (How to obtain the new antenna matching values)
www.johansontechnology.com/tuning

Packaging information
http://www.johansontechnology.com/tape-reel-packaging

RoHS Compliance
www.johansontechnology.com/rohs-compliance

MSL Info
www.johansontechnology.com/msl-rating

P/N Explanation and Breakdown
www.johansontechnology.com/ipc-pn-explained

Recommended Storage Conditions of uninstalled product still on T&R
-40 ~ +85 °C, Humidity 45~75%RH, 18 mos. Max

If you’d like the complete datasheet which includes detailed layout specs, tuning techniques, and application notes for IoT/wearables, send us a message at:
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