

# "High Frequency Ceramic Solutions"

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

P/N 2450AT42E0100

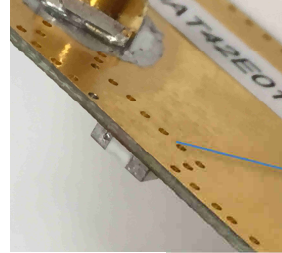
This antenna must have metal directly underneath on bottom layer in order to function properly

Detail Specification: 10/17/2016

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

General Specifications	
Part Number	2450AT42E0100
Frequency (MHz)	2400 - 2480
Peak Gain	-2.0 dBi typ. (YZ-V)
Impedance	50Ω
Power Capacity	2W max. (CW)
Q'ty/Reel (pcs)	2,000 pcs
Operating Temp	-40 to +85°C
Storage Temp	-40 to +85°C
Storage Period	18 months max.



**Zero Clearance!**

Antenna mounts directly above or below the metal layer of PCB. No antenna clearance required

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

This 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 encasement 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**

Part Number Explanation				
P/N Suffix	Packing Style	Bulk	Suffix = S	e.g.. 2450AT42E0100S
		T & R	Suffix = E	e.g.. 2450AT42E0100E
	EVB p/n	2450AT42E0100-EB1SMA (comes with 1 female SMA connector)		

Mechanical Specifications <sup>1</sup>		
	In	mm
L	0.197 ± 0.008	5.00 ± 0.20
W	0.079 ± 0.008	2.00 ± 0.20
T	0.059 ± 0.008	1.50 ± 0.20

Terminal Configuration	
1	Feeding Point
2	NC <sup>2</sup>
3	GND
4	GND

<sup>1</sup>Total Top layer area occupied by antenna is 6.3x3.0mm

<sup>2</sup>Make sure to have Pin 2 soldered to its PCB land pad but **not** connected to GND or input, it must be NC (or floating).

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](http://www.johansontechnology.com/ask-a-question)

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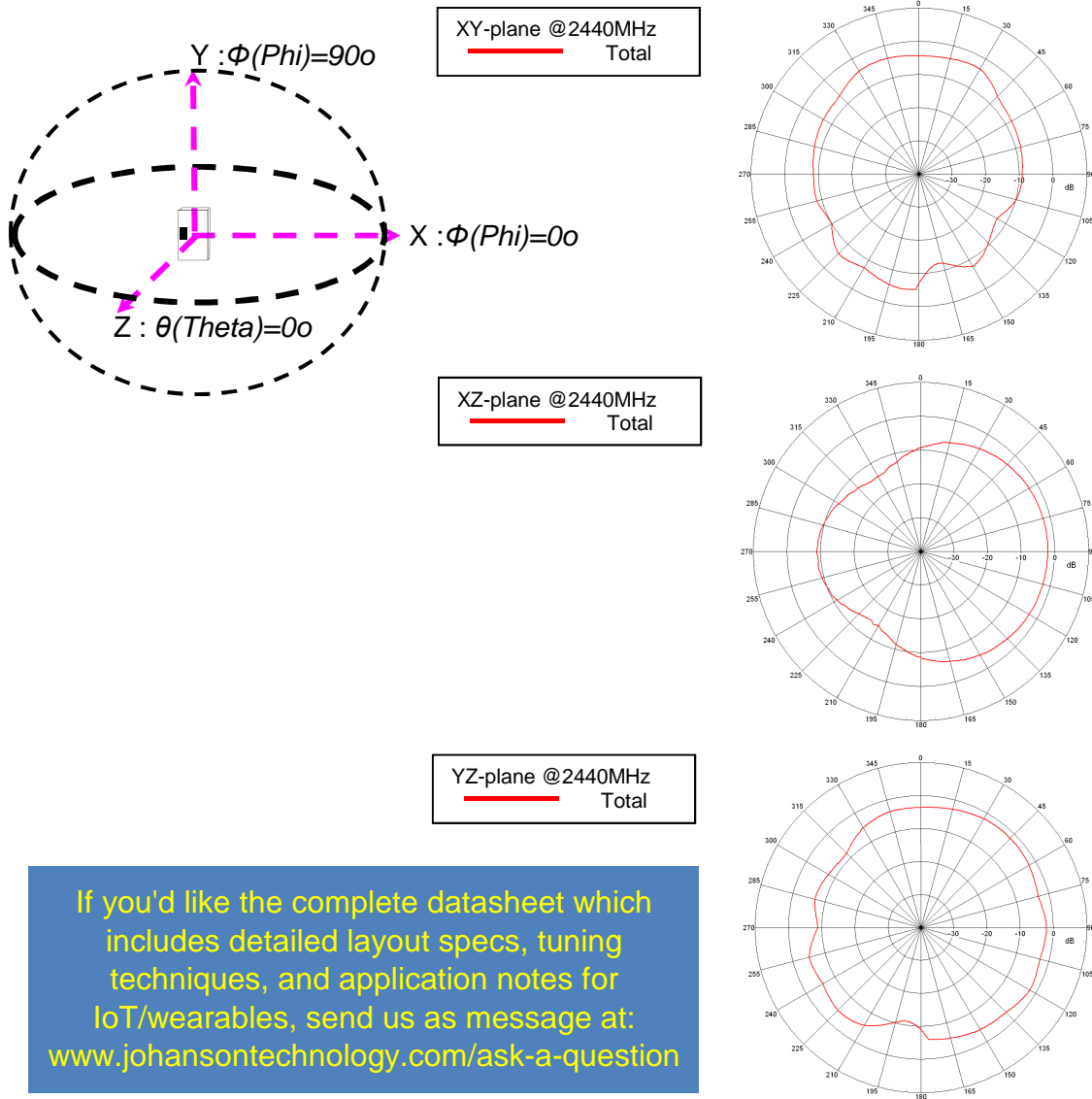
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## Typical Electrical Characteristics (T=25 °C) Radiation Patterns@2.44GHz



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## How To Choose The Correct Antenna Variant

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

PCB Substrate Thickness	Recommended JTI PN
≤ 1.0mm	2450AT42E0100
1.0mm - 2.0mm	2450AT42E010B
≥ 2.0mm	2450AT42E010C

## 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.

PCB Substrate Thickness (H)	Simulated Antenna Efficiency(%) @ 2.44GHz		
	2450AT42E0100	2450AT42E010B	2450AT42E010C
H = 0.12 mm	1.95%	1.02%	0.93%
H = 0.7 mm	29.20%	9.30%	2.30%
H = 1.5 mm	23.30%	41.90%	13.80%
H = 2.5 mm	21.60%	34.20%	38.40%

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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## Antenna layout review, tuning, and characterization services

[www.johansontechnology.com/ipc-antenna-services](http://www.johansontechnology.com/ipc-antenna-services)

## More SMD Chip Antennas at:

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

## Soldering Information

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

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

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

## Packaging information

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

## RoHS Compliance

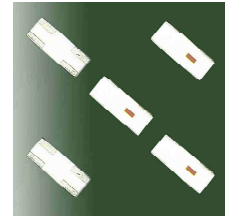
[www.johansontechnology.com/rohs-compliance](http://www.johansontechnology.com/rohs-compliance)

## MSL Info

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

## P/N Explanation and Breakdown

[www.johansontechnology.com/ipc-pn-explained](http://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

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Technical Author: Manuel Carmona



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