

XS4 Mini+

E1517

E10M, E30M

Antennas

Version	Date	Changes	Author
1.0	28/06/2022	First edition	M.U.

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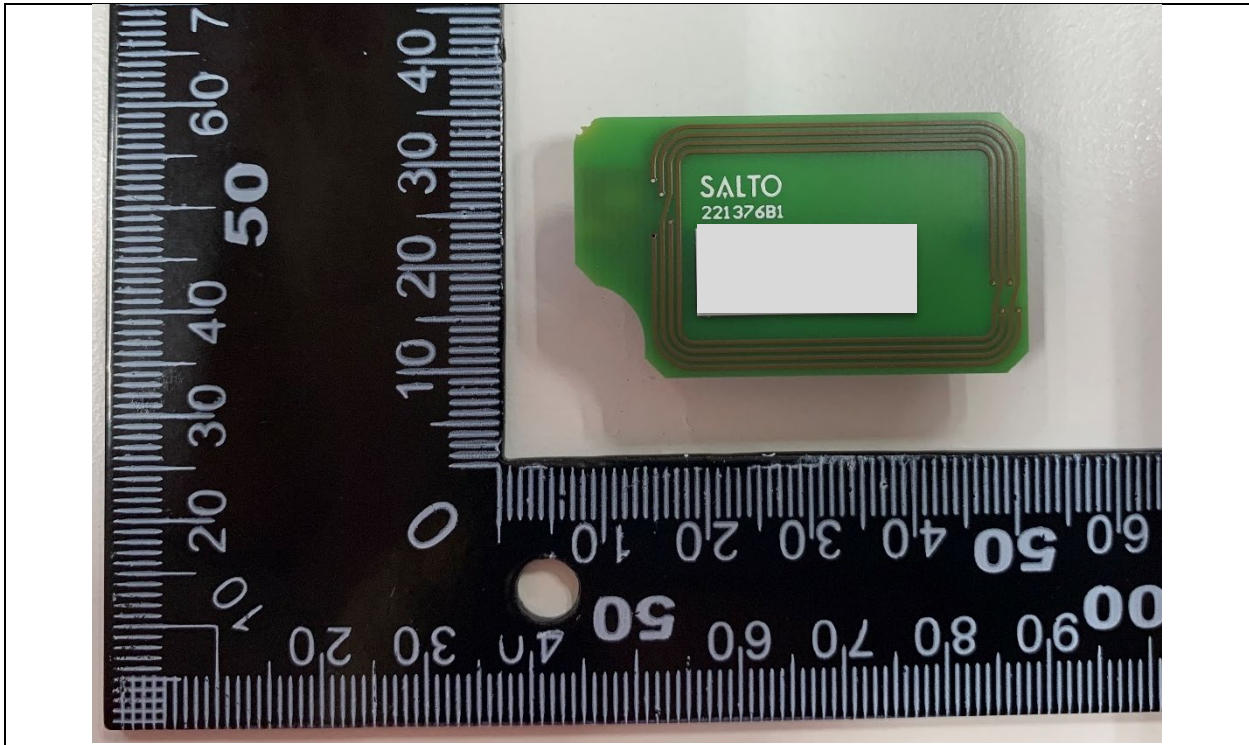
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1 E10M and E30M

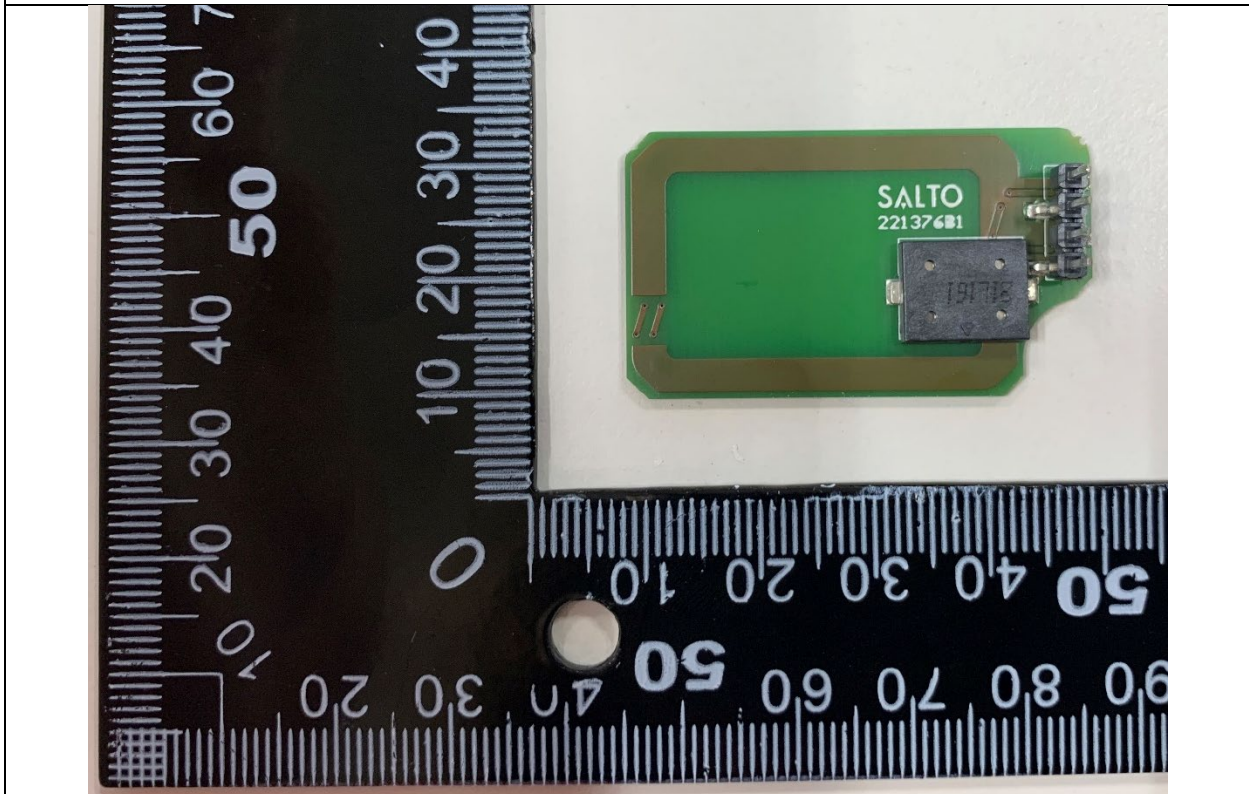
XS4 Mini+ E1517		E10M and E30M
		MIFARE (1) + BLE (2)
Antennas	Number of antennas	2
	Manufacturer	1- SALTO Systems, S.L. 2- N/A
	Model number	1- E10M 2- N/A
	Type	1- Integral, PCB 2- Integral, Chip
	Gain	1- N/A 2- 1.5 dBi
	Frequency of Operation	1- 13.553 - 13.567 MHz 2- 2400 - 2483.5 MHz
Channels	Number of channels	1- N/A 2- 40
	Spacing	1- N/A 2- 2 MHz
	Bandwith	1- N/A 2- 2 MHz
Type of Modulation		1- ASK 100%, OOK (subcarrier $f_c/16$) 2- GFSK
Declared Nominal Output Power (Max.)		1- 23 dBm 2- 6 dBm
ITU Emission Designator		1- K1D 2- F1D
Equipment Configuration for frequency Stability: Data Rate		1- 106 Kbit/s, 26.48 Kbit/s 2- 1 Mbit/s
Equipment Configuration for Field Strenght Measurement: Data Rate		1- 106 Kbit/s, 26.48 Kbit/s 2- 1 Mbit/s

RFID Antenna

The RFID antenna was designed by Salto Systems, S.L. at Arkotz 9, Pol. Lanbarren 20180 Oiartzun (Gipuzkoa), Spain. The antenna model is E10M and it is located on the antenna circuit, 221376B1. The dimensions of the circuit and the antenna are shown in the following pictures.



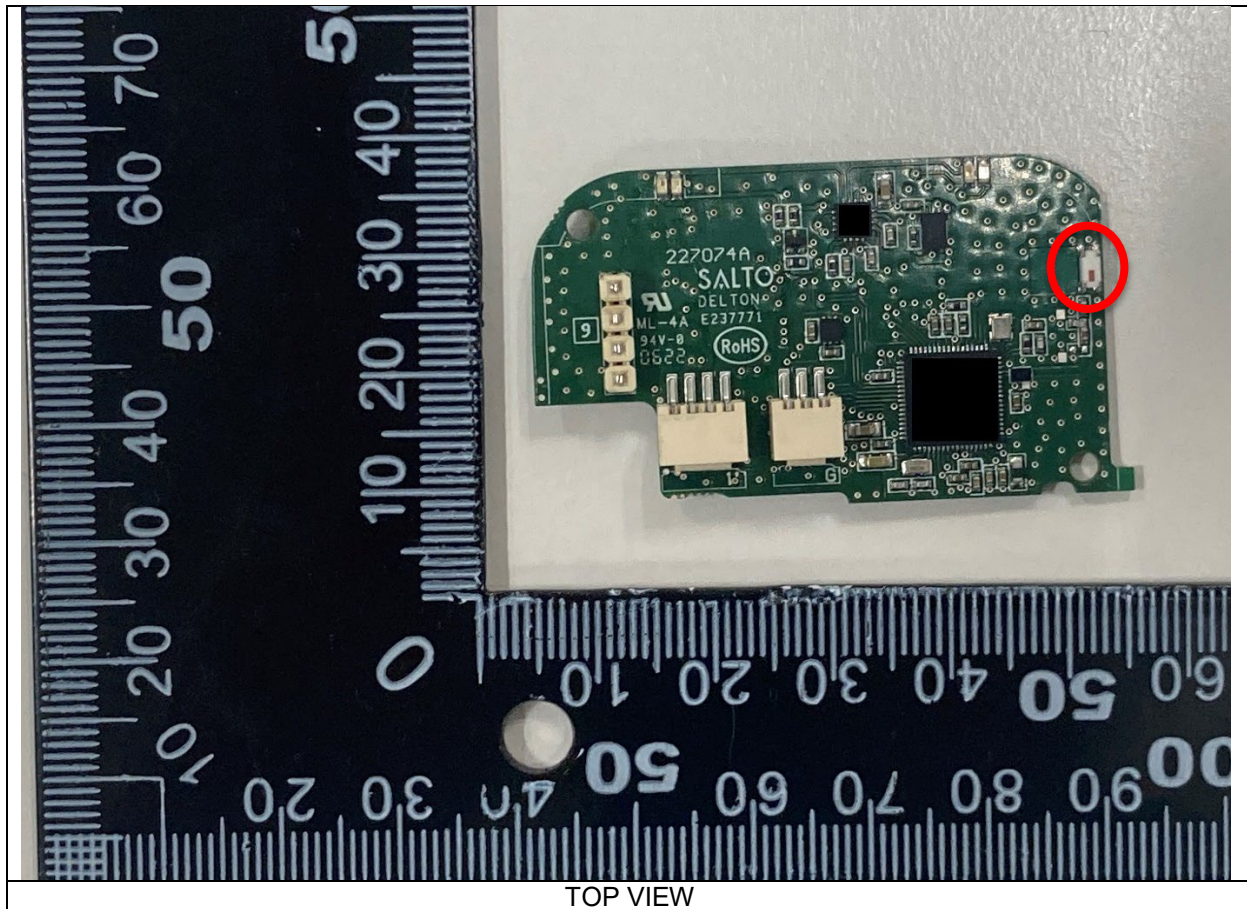
TOP VIEW



BOTTOM VIEW

Bluetooth LE Antenna

The Bluetooth LE antenna is the 2450AT18D0100 model from Johanson Technology. The antenna is located on the top side of the control circuit, 227074A. The following image shows the location of the antenna on the control circuit.



The remaining technical information of the antenna is described in the data sheet attached in Annex I.

Annex I

High Frequency Ceramic Solutions

AEC-Q200 Qualification Available

**2.45 GHz SMD Antenna, EIA 1206, Detuning resilient,
Edge Mount Design**

New Global P/N 2450AT18D0100001

Legacy P/N 2450AT18D0100

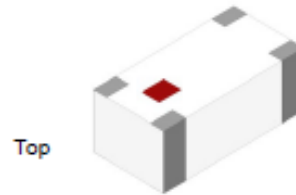
Detail Specification: 8/24/2022

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

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

General Specifications	
New Global Part Number	2450AT18D0100001
Frequency (GHz)	2.4 - 2.5
Peak Gain (dBi)	1.5 typ. (XZ-total)
Average Gain (dBi)	-1.0 typ. (XZ-total)
Radiated Efficiency*	72%
Return Loss (dB)	10 min.
Impedance (Ω)	50
Input Power (W)	3 max. (CW)
Operating Temperature	-40 to +125°C
Recommended Storage Conditions and Period for unused Product on T&R	+5 to +35°C Humidity 45 - 75% RH 18 months max.
Reel Quantity (pcs./reel)	3,000



Top



Bottom

*Efficiency measured on Johanson's evaluation board PN 2450AT18D0100001CE1

Part Number Explanation (See last page for more info on new and legacy part numbers)			
P/N Suffix	Packing Style	Bulk (loose pcs.)	Suffix = B e.g. 2450AT18D0100001B
		T & R	Suffix = E e.g. 2450AT18D0100001E
		100% Tin	Suffix = None e.g. 2450AT18D0100001(B or S)
	Evaluation Board	2450AT18D0100001CE1	

Mechanical Dimensions		
	In	mm
L	0.128 ± 0.008	3.20 ± 0.2
W	0.063 ± 0.008	1.60 ± 0.2
T	0.047 ± 0.004	1.20 ± 0.1
a	0.012 +0.004 / -0.008	0.30 +0.1 / -0.2
b	0.020 ± 0.008	0.50 ± 0.2

Terminal Configuration		
No.	Function 1	Function 2
1	FEED	GND
2	GND	GND
3	GND	GND
4	GND	FEED

Function 1: Antenna fed from left

Function 2: Antenna fed from right

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High Frequency Ceramic Solutions

2.45 GHz SMD Antenna, EIA 1206, Detuning resilient, Edge Mount Design New Global P/N 2450AT18D0100001
Legacy P/N 2450AT18D0100
 Detail Specification: 8/24/2022 Page 2 of 7

Mounting Considerations 1: Evaluation Board (Standard Layout)

40mm

20mm

Matching Circuits

Ground clearance

Feeding Line

Ground Vias

Measured radiated efficiency of 2450AT18D0100 on this evaluation board is 72%

Units in mm

1.0 2.0 1.0 0.6 0.7 0.6 4.1 6.0 4.0

Ground

50 Ohm

50Ω Trace (Grounded CPWG type is preferred)

GND Vias

Ground

Matching Circuits

No ground, metal PCB layers, or other metallic components like batteries directly underneath antenna!

To order a pre-tuned 50Ω EVB with a female SMA connector click here:
<https://www.johansontechnology.com/request-a-sample>
 Reference p/n: 2450AT18D0100001CE1

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High Frequency Ceramic Solutions

2.45 GHz SMD Antenna, EIA 1206, Detuning resilient,
Edge Mount Design

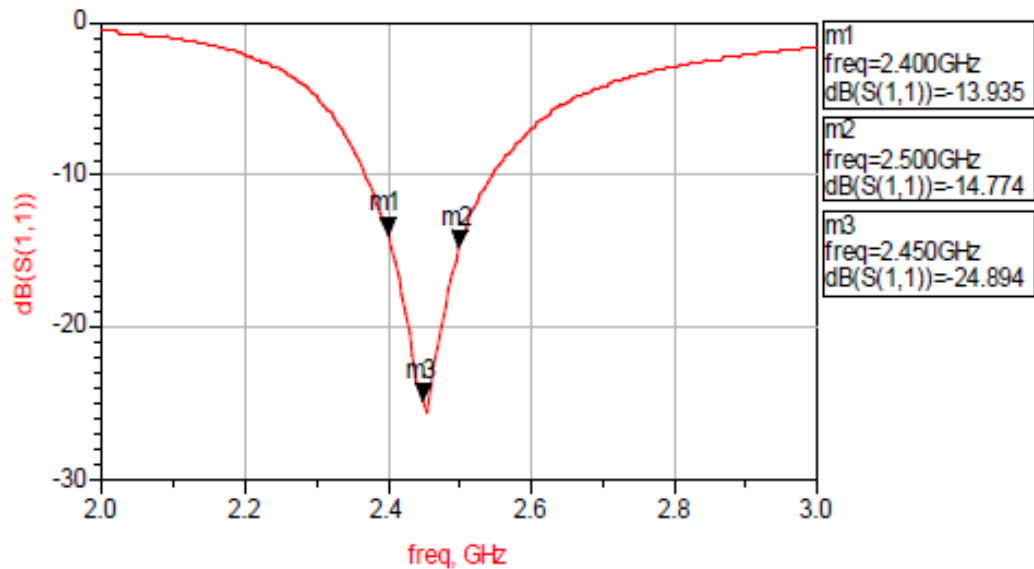
New Global P/N 2450AT18D0100001
Legacy P/N 2450AT18D0100

Detail Specification: 8/24/2022

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Mounting Considerations 1: Electrical Performance @25°C

Measured Return Loss



Would you like the antenna layout? 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.

Contact our applications engineers at:

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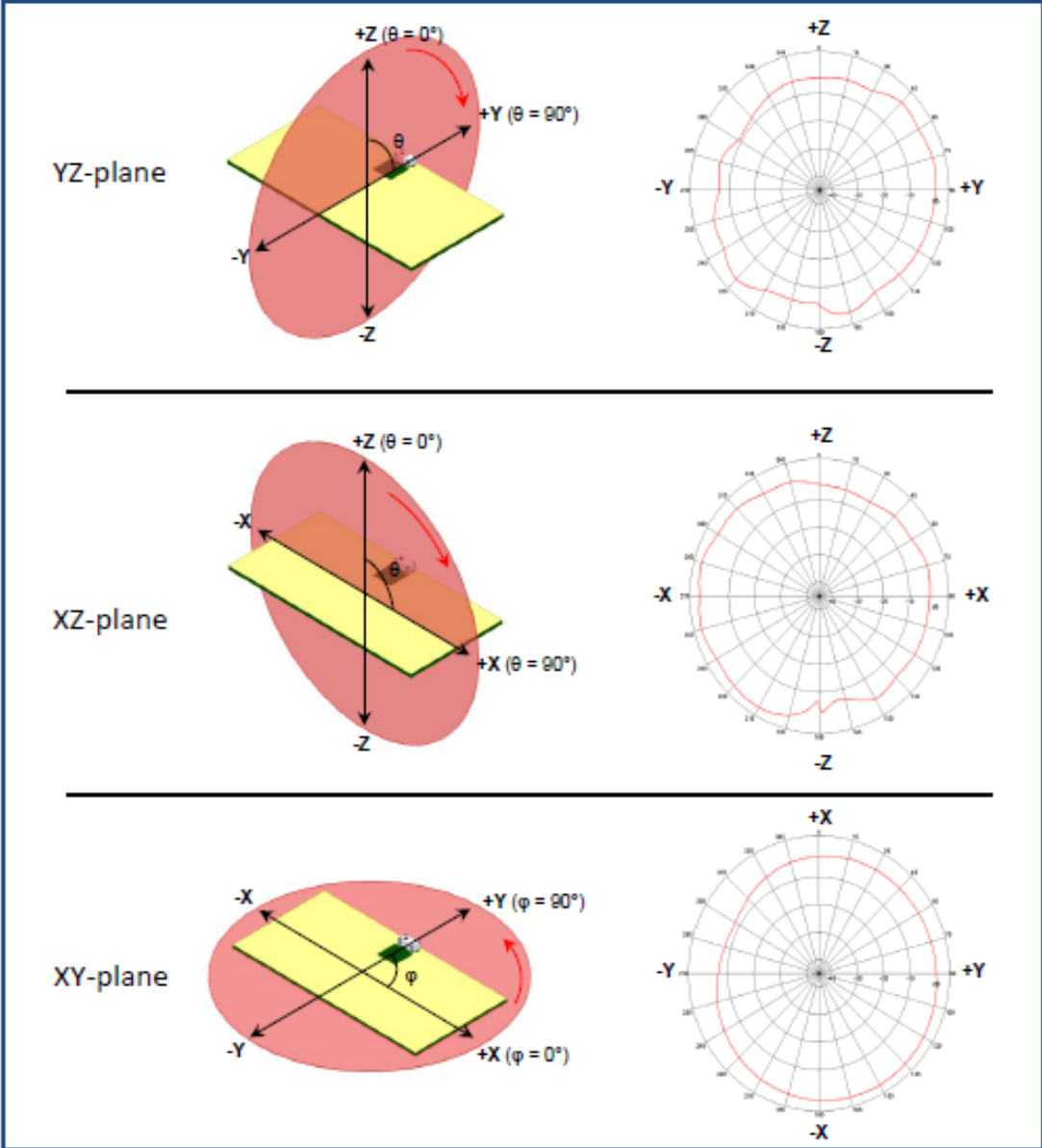
New Global P/N 2450AT18D0100001

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Mounting Considerations 1: Typical 2D radiation patterns @ 2.44GHz



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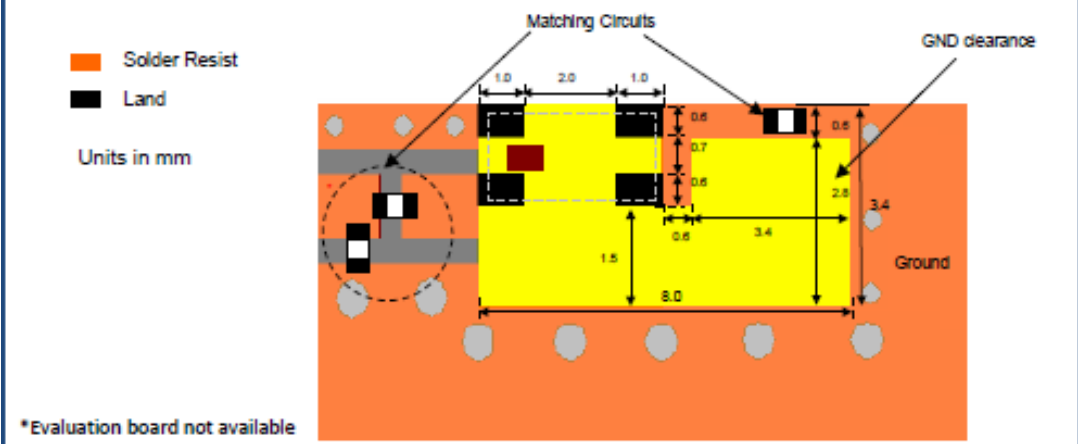
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Legacy P/N 2450AT18D0100
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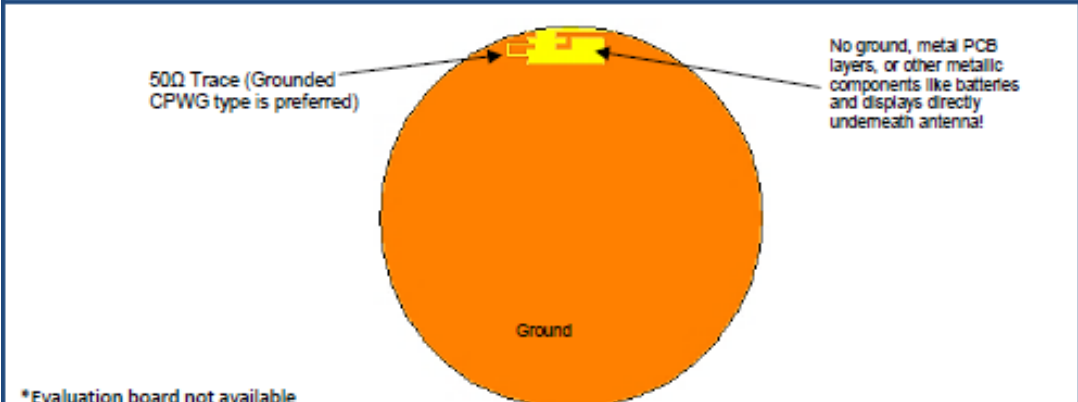
Mounting Considerations 2: Small Clearance or "Thin edge" Applications*

Frequency (GHz)	Peak Gain (dBi)	Average Gain (dBi)	Radiated Efficiency (%)
2.45	0.3 (XZ-plane)	-3.6 (XZ-plane)	66



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Mounting Considerations 3: "Thin edge" application on circular PCB



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High Frequency Ceramic Solutions

2.45 GHz SMD Antenna, EIA 1206, Detuning resilient, Edge Mount Design	New Global P/N 2450AT18D0100001 Legacy P/N 2450AT18D0100
Detail Specification: 8/24/2022	Page 6 of 7

Mounting Considerations 4: Fed from Right Side*

(Feeding the antenna from the right will have no impact on antenna performance)

Legend:
■ Solder Resist
■ Land

Units in mm

No ground, metal PCB layers, or other metallic components like batteries directly

*Evaluation board not available

Would you like the layout file of the above? Have antenna tuning issues?
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Antenna tuning, optimization, and validation services:

<https://www.johansontechnology.com/inc-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:

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RoHS Compliance

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

Recommended Storage Condition and Max Shelf Life

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

Johanson's New Global Part Number Schema

Johanson has instituted a new Global Part Numbering (GPN) system. Only the part number is changing. The parts are produced with the exact same materials, manufacturing processes, manufacturing controls, dimensions, physical attributes and testing as the parts supplied with the legacy part numbers.

A database for part number crosses can be accessed at:

<https://www.johansontechnology.com/pn-search>

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