UWB Multi-layer Chip Antenna

ACS0301U

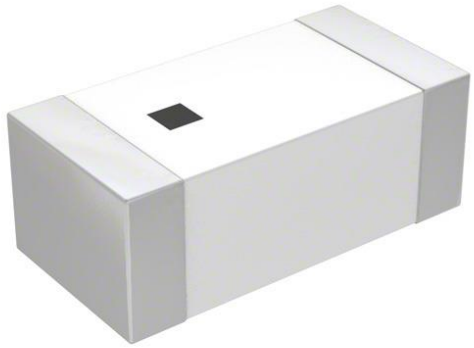
Features

- Supports 6 to 8.2 GHz(UWB Channels 5~9)
- Compact & Low-Profile
- VSWR: ≤ 2.0
- Peak Gain: 2.2 dBi
- Efficiency: up to 63%
- Surface Mount (SMD)
- High efficiency across UWB bands

Applications

- UWB (Ultra-Wide Band)
- Secure car access
- Item Tracking
- Indoor Navigation
- Hands-Free Payment
- Smart Access
- Object Detection

Product Image



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Electrical Specification

Parameter	Specification	Unit
Operating Frequency	6000-8200 (US UWB channels 5-9) EU UWB band	MHz
VSWR (Typ.)	< 2.0	
Peak Gain	2.2	dBi
Efficiency (Maximum)	63	%
Impedance	50	Ω
Polarization	Linear	
Radiation Pattern (Azimuth)	Omni-directional	

Note : All test measurements were conducted on 31 x 35 mm. Performance of the chip antenna will vary relative to the ground plane size in use.

Mechanical Specification

Parameter	Specification
Dimensions	3.2 x 1.6 x 1.1 mm
Antenna Clearance Space	11.6 x 6.5 mm
Evaluation Board size	31 x 35 mm
Solder Termination	Ag (Environmental-Friendly Pb-Free)

Environmental Specification

Parameter	Specification
Operating Temperature	-40℃ to +85℃
Storage Temperature	-10℃ to +40℃
Relative Humidity	70%
RoHS Complaint	Yes

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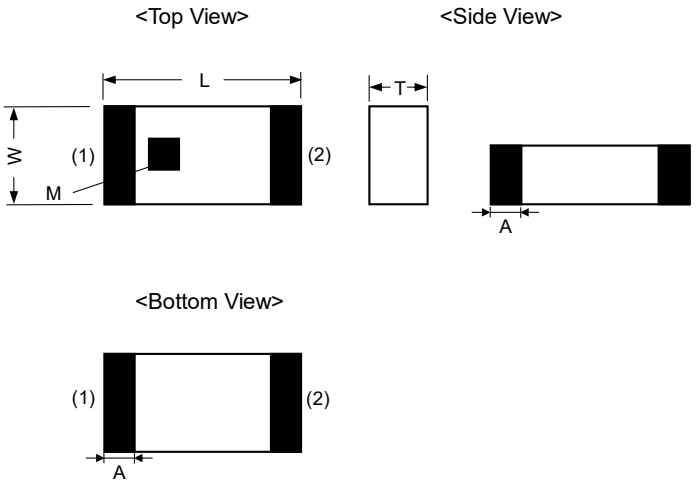
Product Dimensions



Unit: mm

(1)	Feeding Point
(2)	Not Connected (NC)
M	MARK

MARK	L	W	T	A
Dimensions (mm)	3.20 ±0.20	1.60 ±0.20	1.10 ±0.10	0.5 ±0.10

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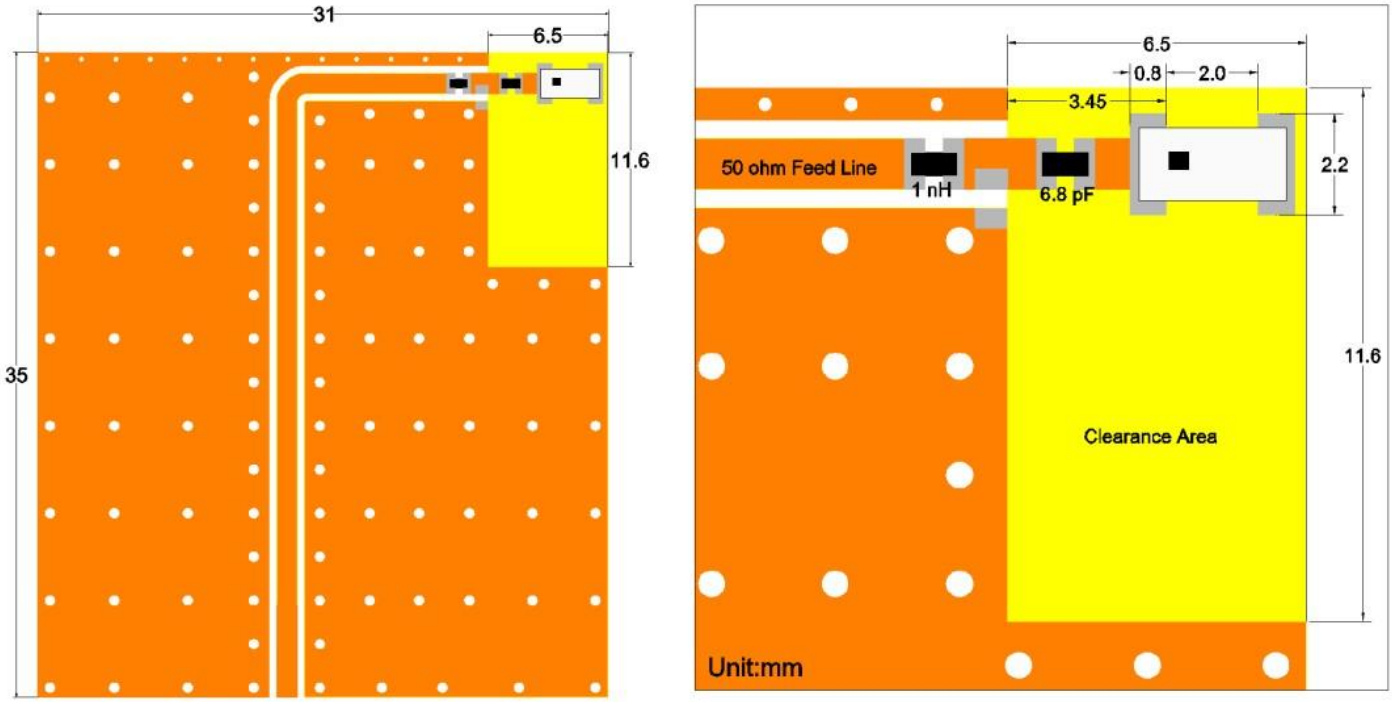
Evaluation Board Dimensions



Unit: mm

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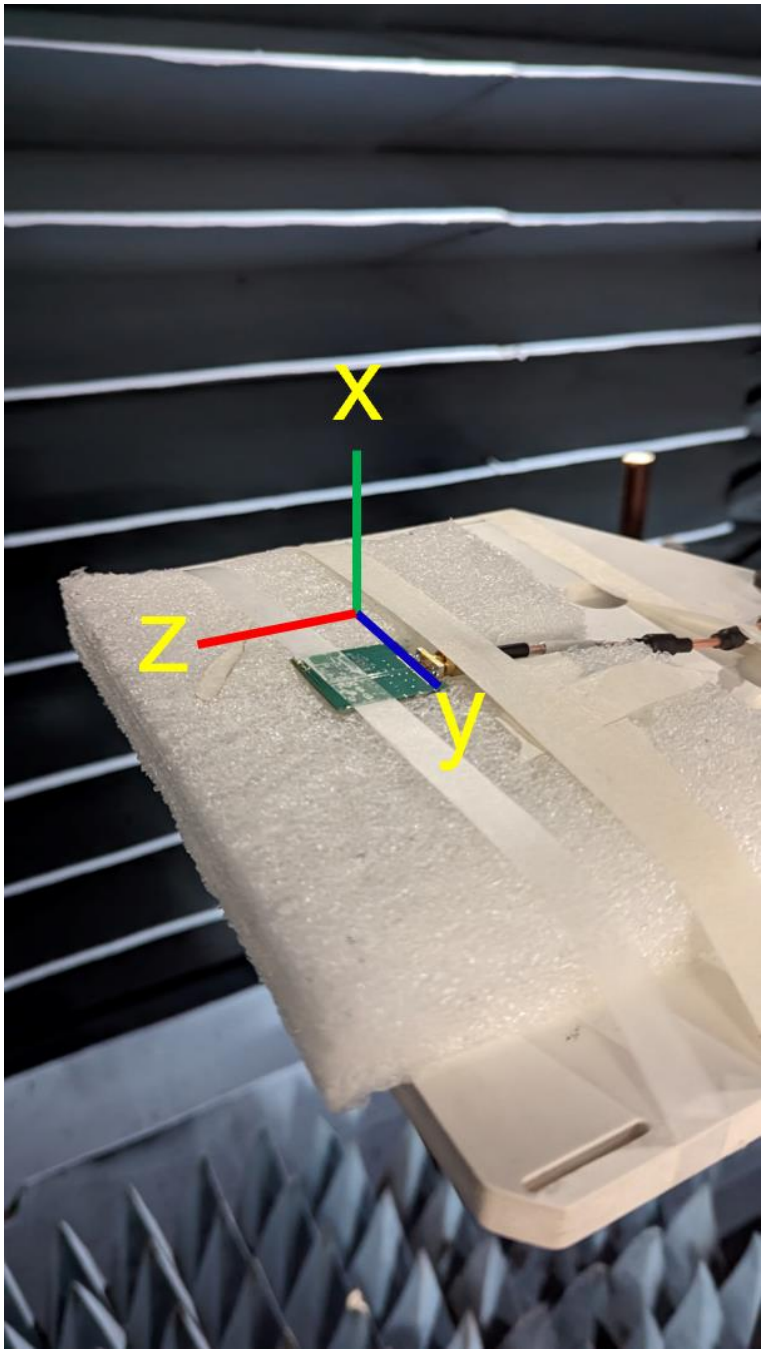
Measurement Setup photo



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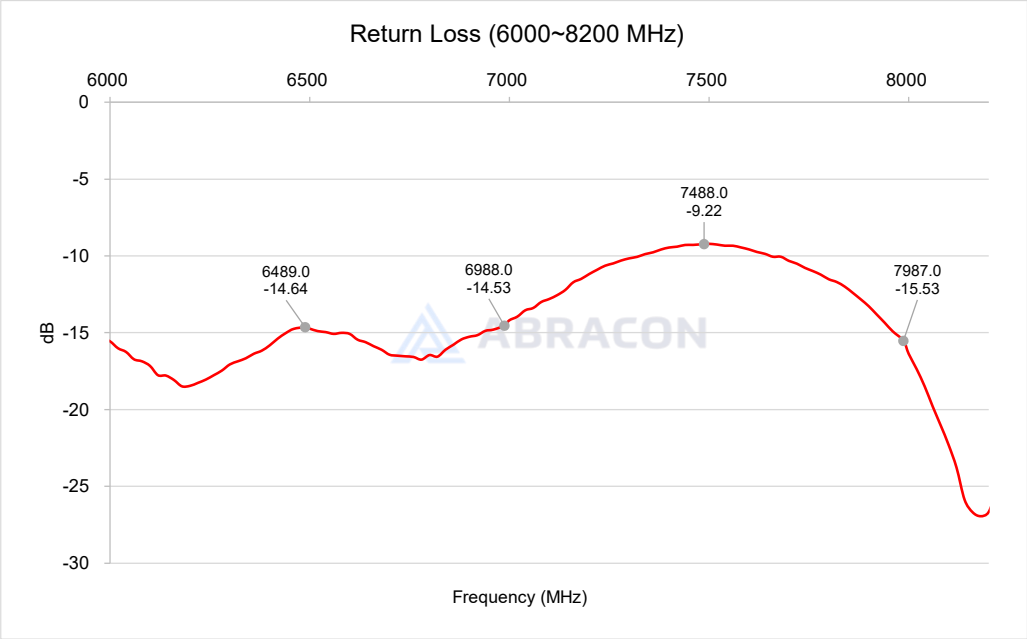
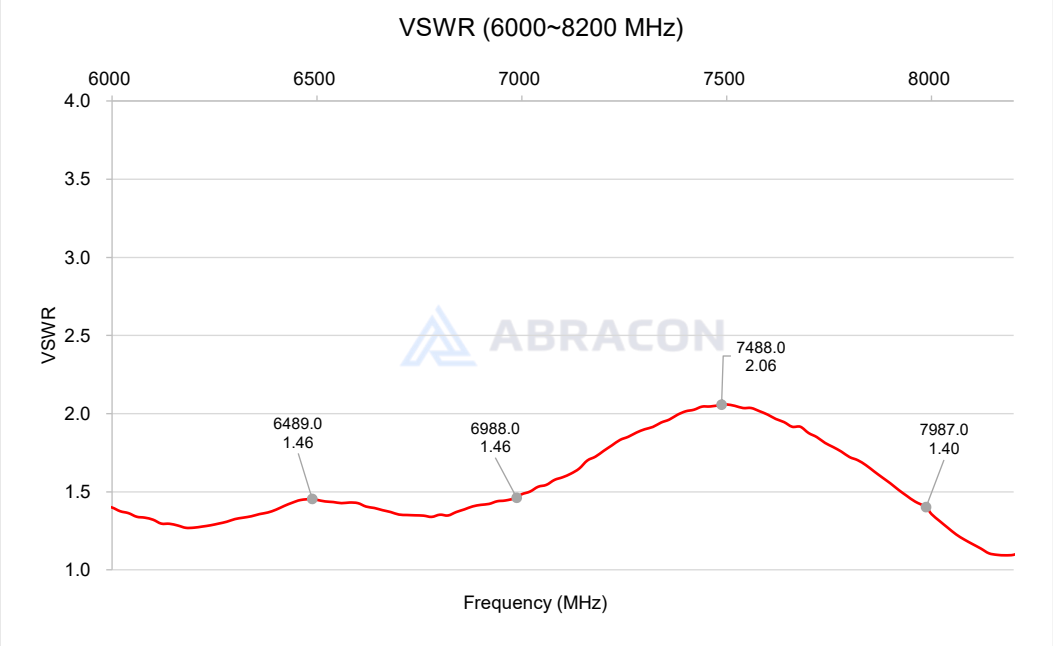
Reflection Characteristics –Return Loss & VSWR





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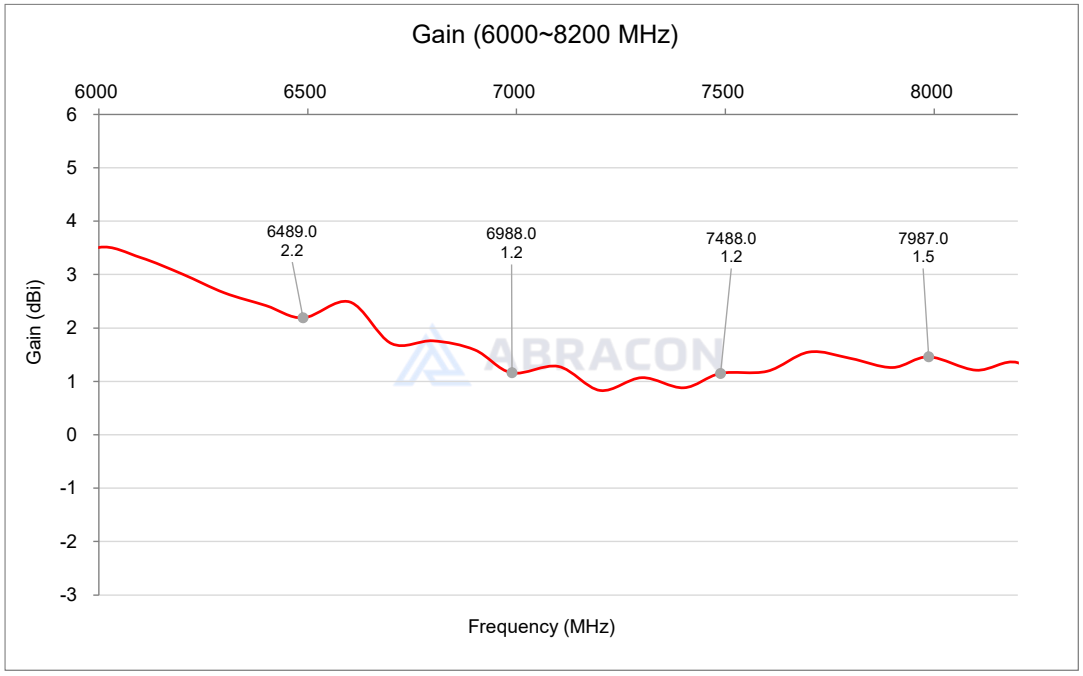
Radiation Characteristics – Peak Gain



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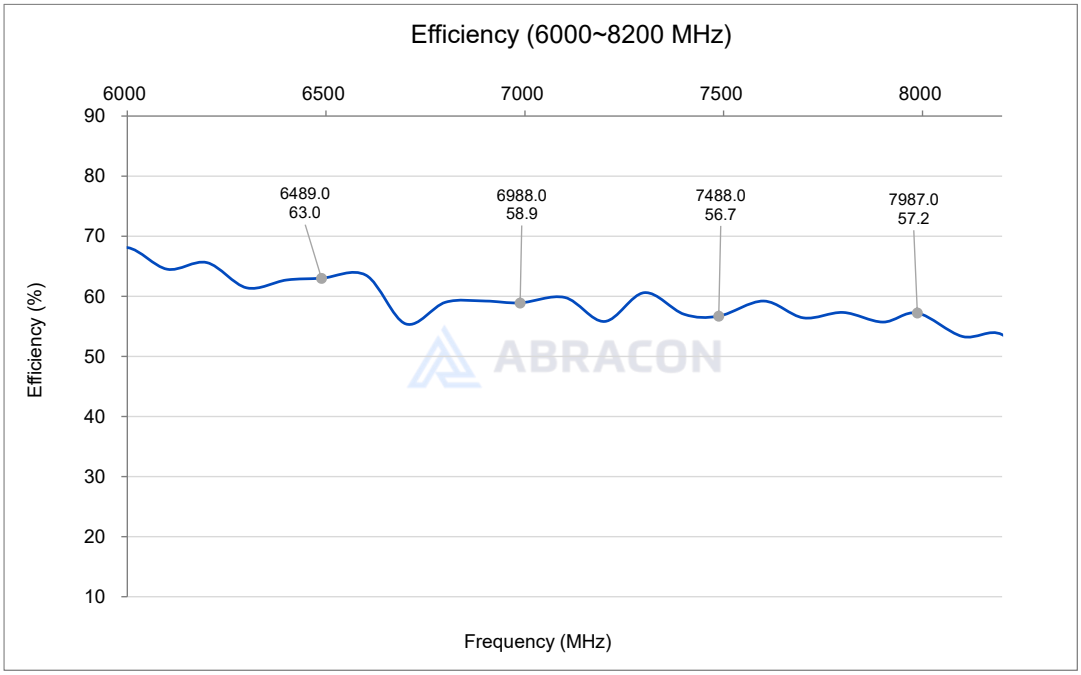
Radiation Characteristics – Total Efficiency (%)



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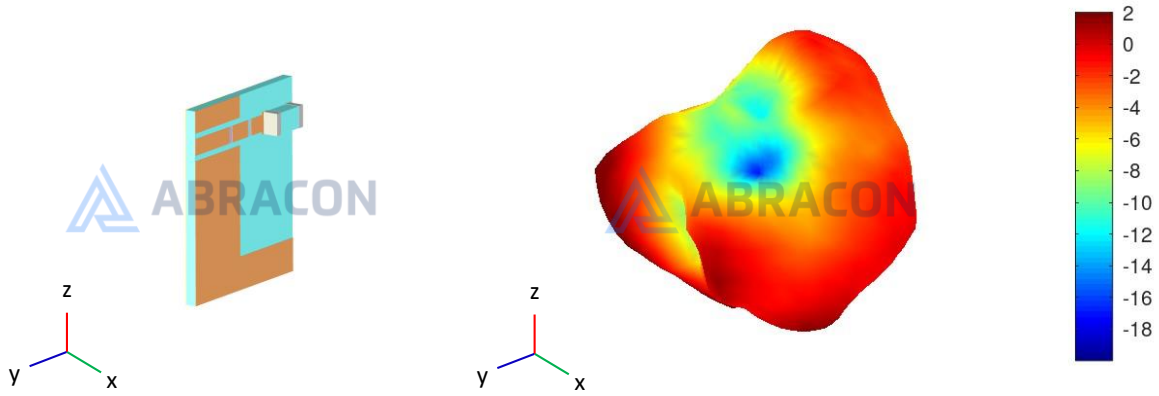
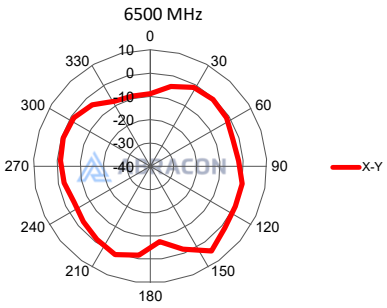
Radiation Characteristics – 3D & 2D Pattern

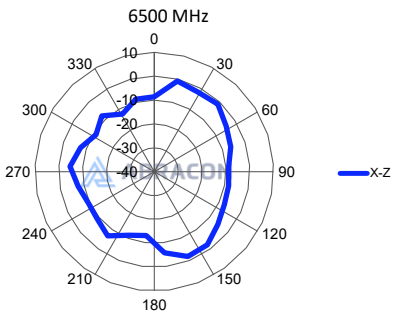
6500MHz



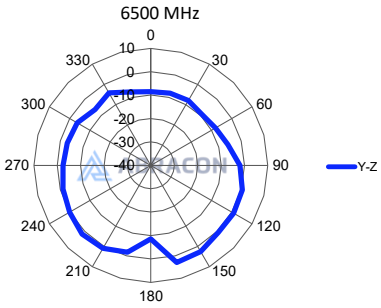
XY plane



XZ plane



YZ plane



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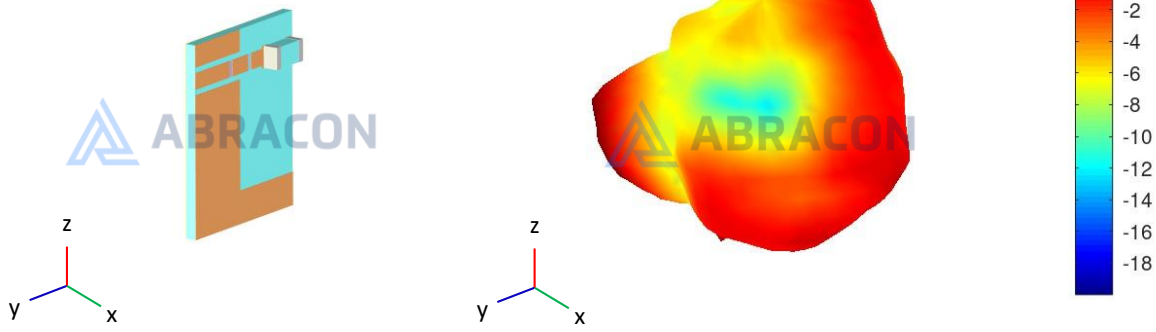
7000MHz



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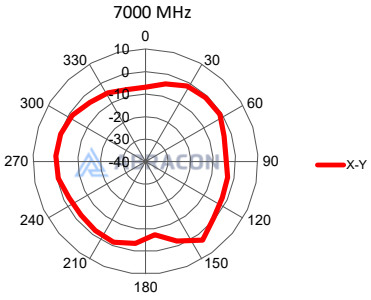
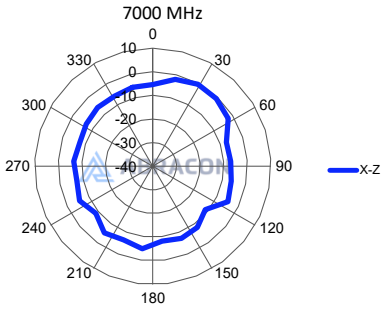
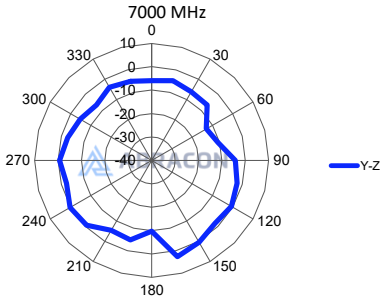


XZ plane



YZ plane



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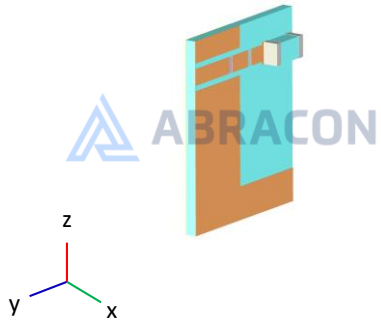
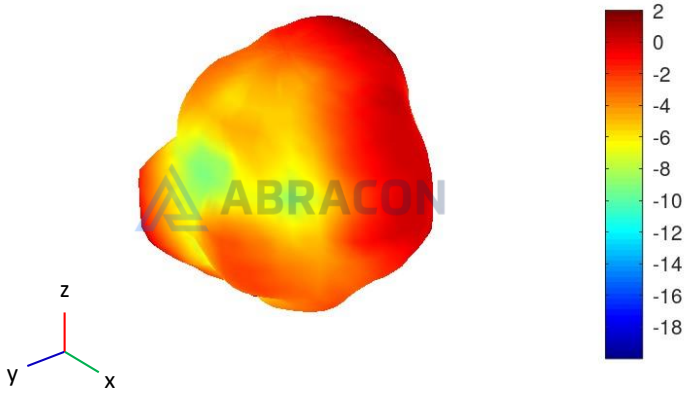
7500MHz





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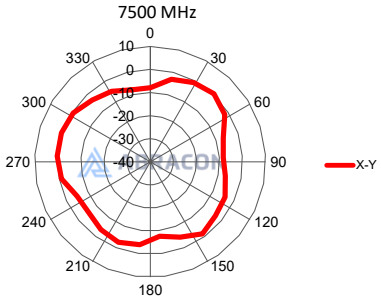
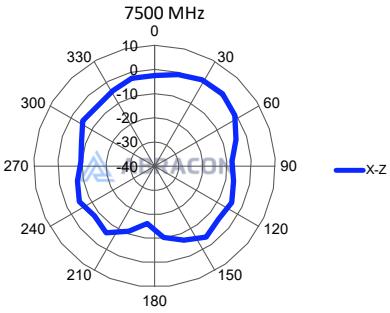


XZ plane



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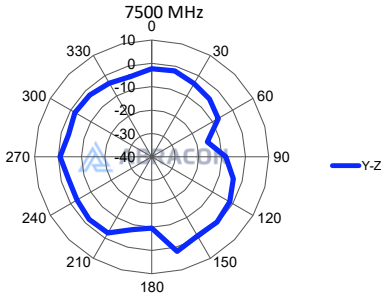

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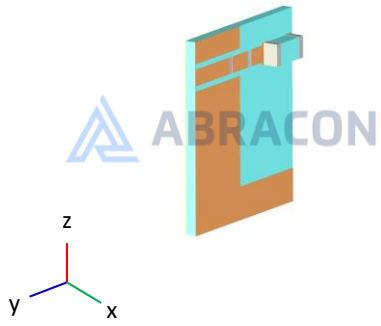
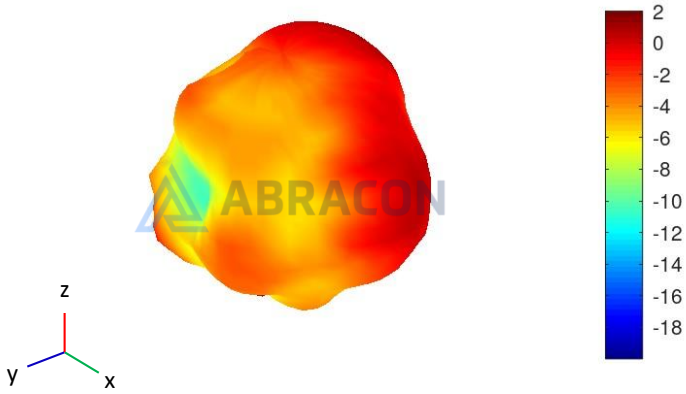
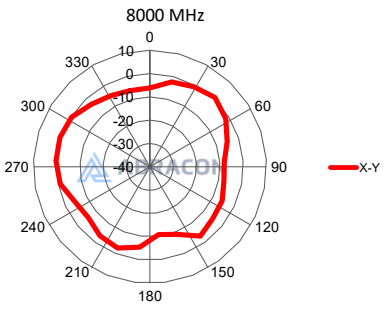
8000MHz

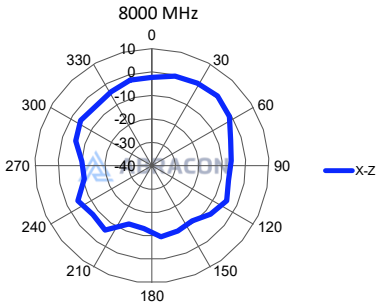




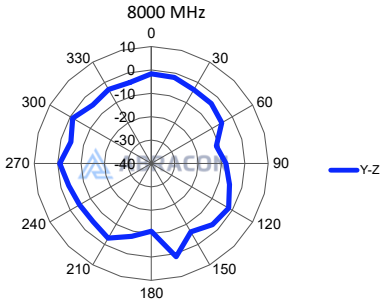
XY plane



XZ plane



YZ plane



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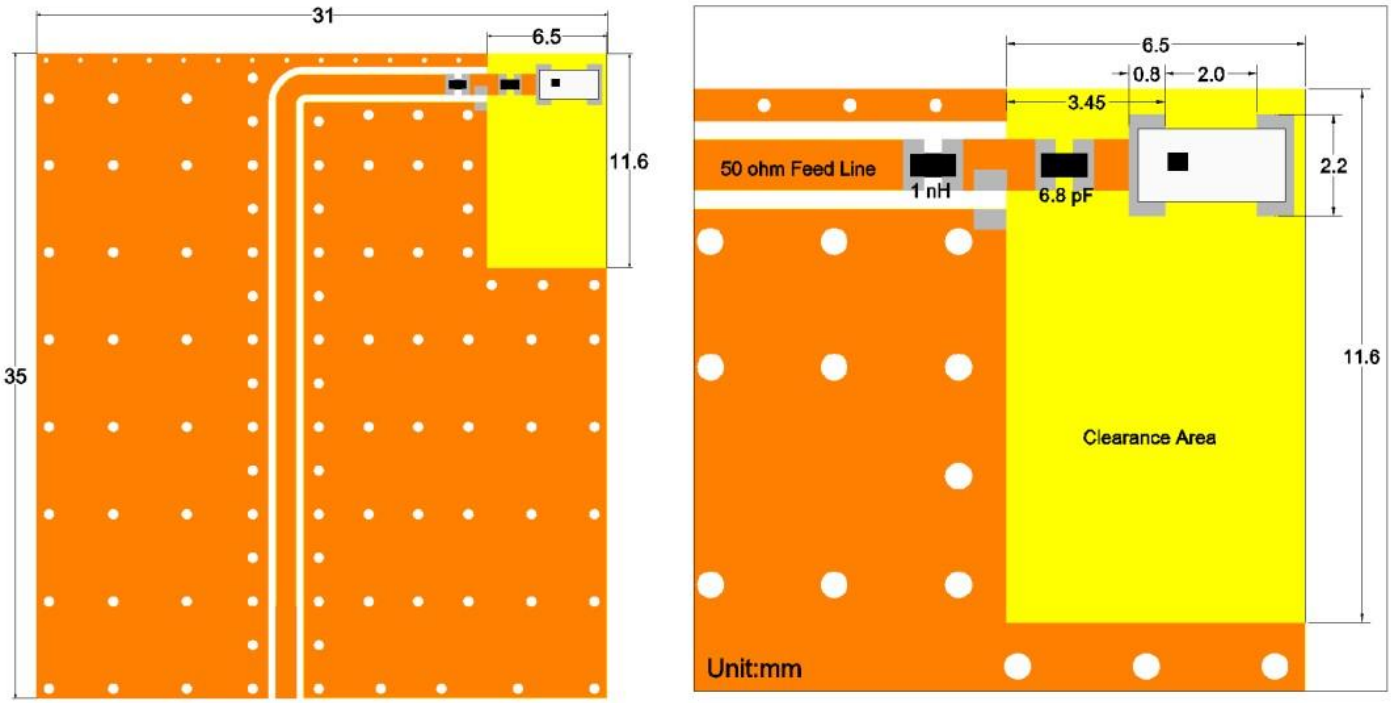
Evaluation Board Outline & Matching Circuit

The evaluation board is developed to showcase the performance of the Niche antenna on a typical PCB and to simplify antenna testing and evaluation. It has a size of 31 x 35 mm. The performance could vary with different PCB sizes and Abracon can offer support to optimize the antenna for your specific application.

The evaluation board has a matching circuit implemented next to the antenna. This is aimed to enable optimization possibilities for the user.

The standard tuning for the evaluation board is the following (can be replaced by equivalent):

However, it is common that the resonant frequency will shift during implementation in an arbitrary device. Therefore, this matching may be changed with other values/components/brands for compensation of such effects. This is further described in the General Implementation Guidelines section below.



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Reflow Profile [JEDEC J-STD-020]

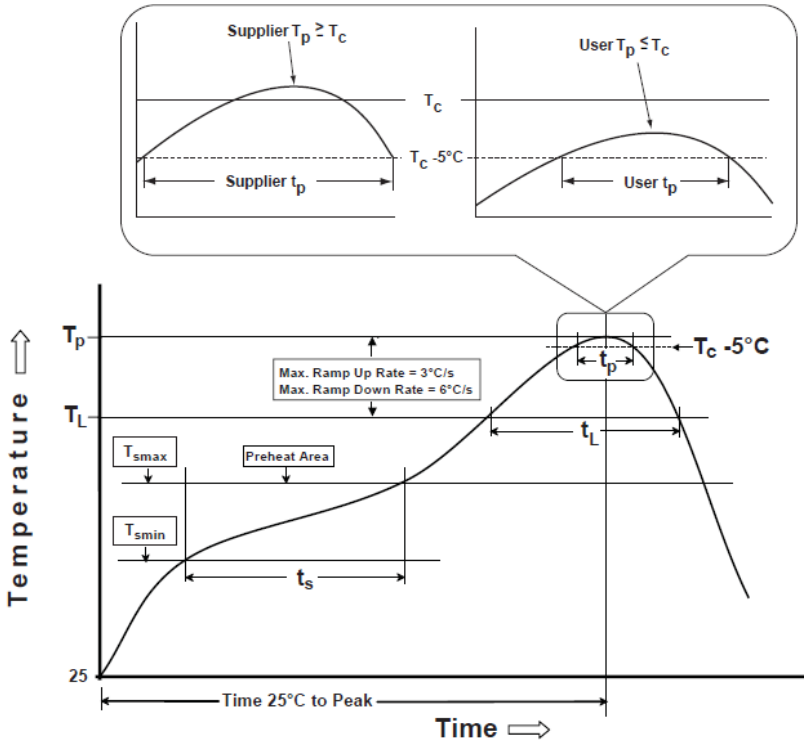

Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	Volume mm³ <350	Volume mm³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	Volume mm³ <350	Volume mm³ 350-2000	Volume mm³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_P)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T_P)*	**see Table 1**	**see Table 2**
Time (t_p)** within 5°C of the specified classification temperature (T_C)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

*Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.

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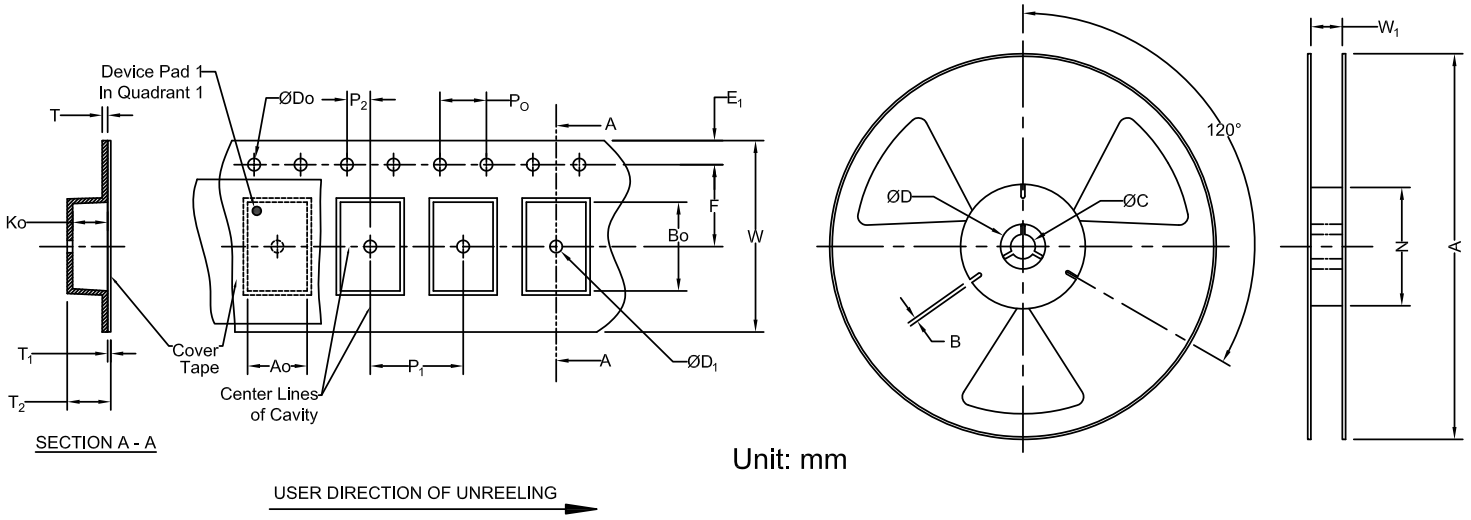
Packaging

Tape & Reel Dimension



Unit: mm

Carrier Tape Specifications (mm)										
Do	E_1	P_0	P_2	T	F	P_1	W	A_0	B_0	Reel Qty
1.50 ± 0.1	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.05	0.22 ± 0.05	3.5 ± 0.05	4.0 ± 0.1	8.0 ± 0.3	1.8± 0.1	3.5± 0.1	3,000

Reel Specifications (mm)				
A	W_1	N	B	C
178 ± 2.0	10.0 ± 1.5	58 ± 2.0	3.0 ± 0.1	13.5 ± 0.2

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