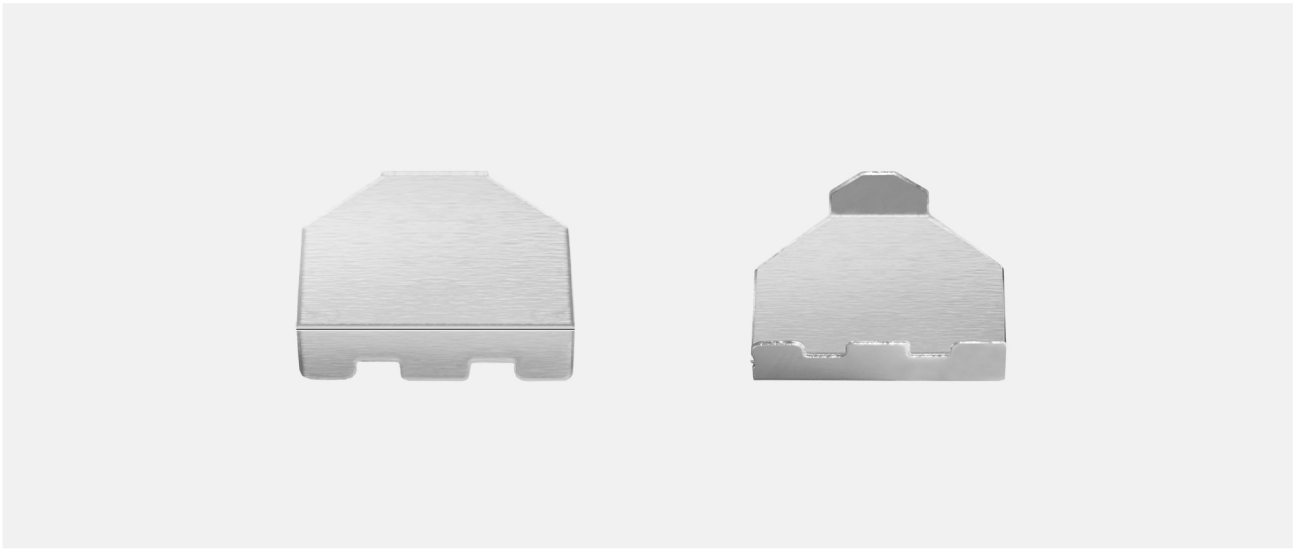
2.2-8.5GHZ WIFI

UWB MIMO ONBOARD SMD ANTENNA

2.4-2.5 | 5.1-5.8 | 5.925-7.125 | 6.1-6.9 | 7.1-8.5 GHz

Dimensions: 12.0 x 10.46 x 3.0 mm

Clearance Area: 45.0 x 15.7 mm



PN: M01-X01210U230

RoHS COMPLIANT

Reach COMPLIANT

Table of Contents

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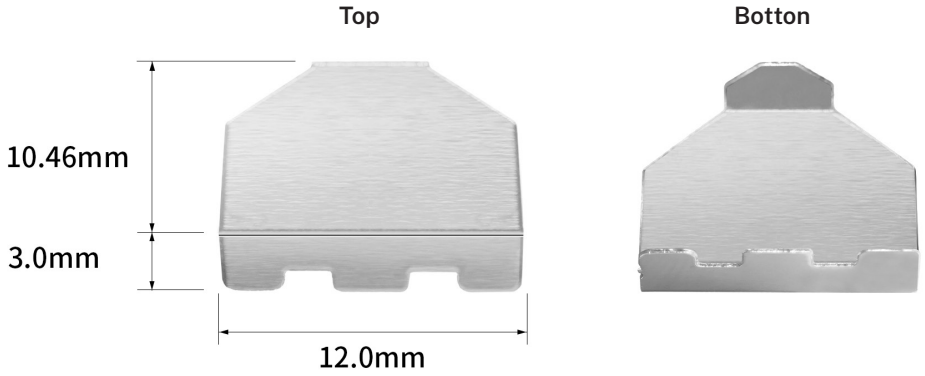
1 FEATURES & BENEFITS

- Low Profile
- Light Weight
- Easy to Integrate
- Intended for SMD Mounting
- Reduced Cost and Time-to-Market

2 APPLICATIONS

- WIFI 6E UWB MIMO Antenna
- Wireless Routers and Modems
- Internet of Things (IoT) Devices, M2M
- Indoor Location Tracking and Positioning
- Consumer Tracking
- Smart Metering
- Virtual Reality (VR) and Augmented Reality (AR)



Items	Dimensions (mm)
Length	12.0±0.1
Width	10.46±0.1
Thickness	3.0±0.1

3 ORDER INFORMATION

Product Name	2.2-8.5GHz WIFI UWB MIMO ONBOARD SMD ANTENNA
Part Number	M01-X01210U230
Dimensions	12.0 x 10.46 x 3.0 mm
Weight	0.35 g
Mounting	SMT
Packaging	Tape & Reel
MOQ	1000 pcs/reel

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4 REFERENCE GUIDE

Antenna	Antenna-Left			Antenna-Right		
Technical Features（GHz）	2. 2-2.5	3.0-5.0	5.0-8.5	2. 2-2.5	3.0-5.0	5.0-8.5
Max VSWR	3.74:1	1.8:1	2.29:1	3.71:1	1.71:1	2.53:1
Max Efficiency	88.43%			92.17%		
Max Return Loss	-6.13 dB			-4.96 dB		
Peak Gain	Up to 5.43 dBi (Typ)			Up to 5.64 dBi (Typ)		
Max Input Power	2 Watts CW					
Polarization	Linear					
Input Impedance	50 Ω					
Operating Temperature	-40°C to +80°C					
Relative Humidity	10 to 70%					
Dimensions (L x W x H)	12.0 x 10.46 x 3.0 mm					
All data were measured in free space and on a reference wground plane of 45 mm length, 35 mm width, and 1.0 mm thickness. Application data might vary.						

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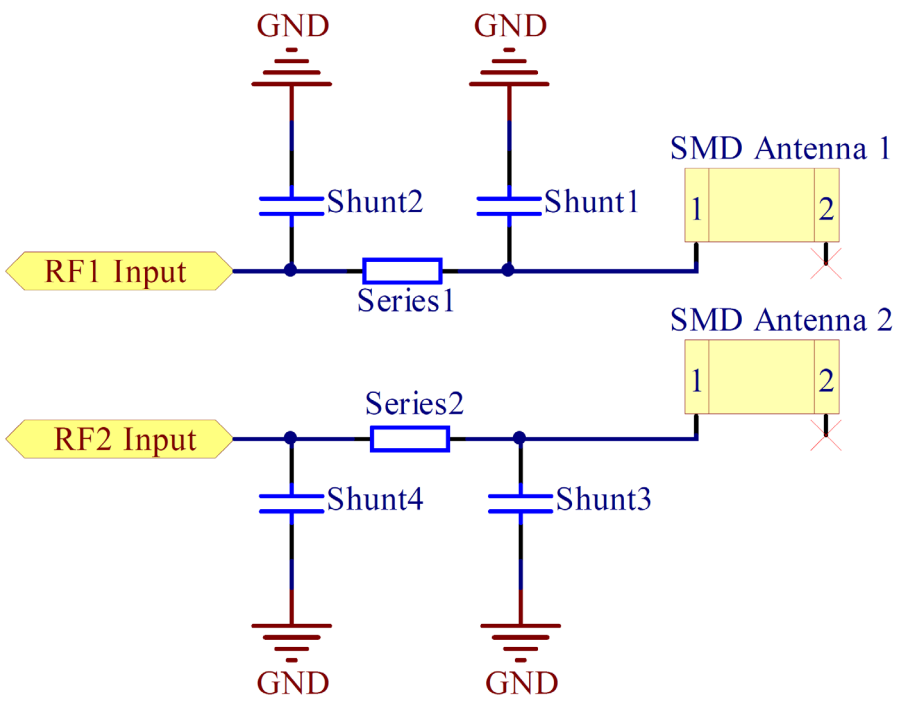
6 MATCHING NETWORK



Tag Number	Value	Brand	PN
Series1	RES SMD 0603 package OR ± 1%	YAGEO	D03-0100450000
Series2	RES SMD 0603 package OR ± 1%	YAGEO	D03-0100450000
Shunt1	NC		
Shunt2	NC		
Shunt3	NC		
Shunt4	NC		

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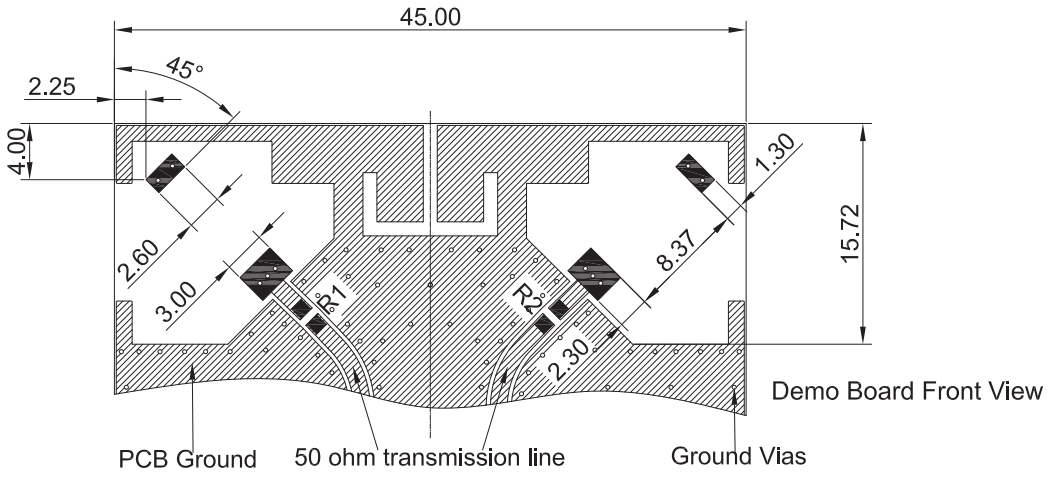
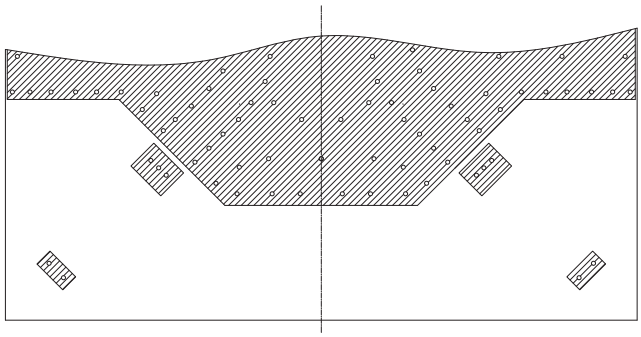
7 RECOMMENDED FOOTPRINT AND LAYOUT



Demo Board Front View



Demo Board Back View

Tag Number	Value	Brand	PN
R1	RES SMD 0603 package 0R ±1%	YAGEO	D03-0100450000
R2	RES SMD 0603 package 0R ±1%	YAGEO	D03-0100450000

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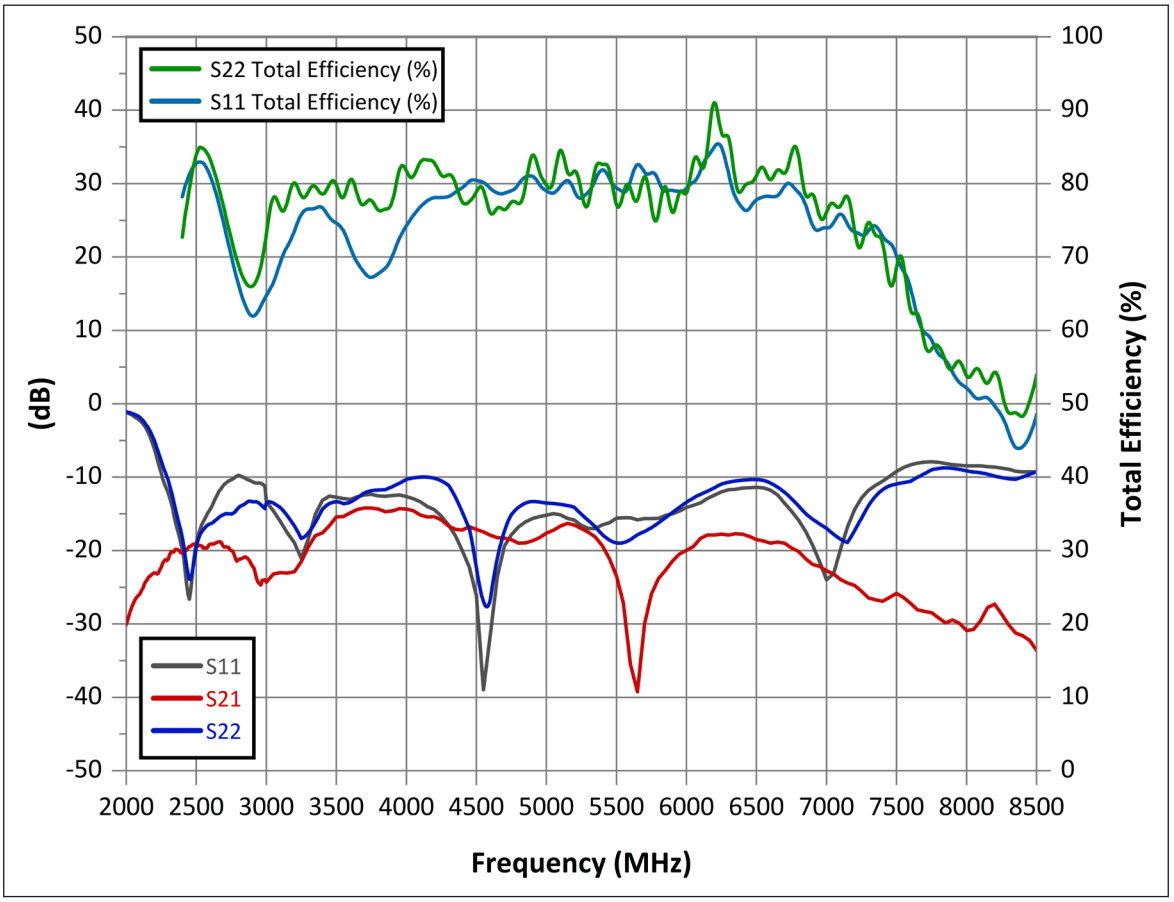
8 ELECTRICAL PERFORMANCE

◎ **Note**

All data displayed in Chapter 8 were measured in free space and on a reference ground plane of 45 mm length, 35 mm width, and 1.0 mm thickness.

8.1 Return Loss(S11, S22), Isolation(S21) and Total Efficiency



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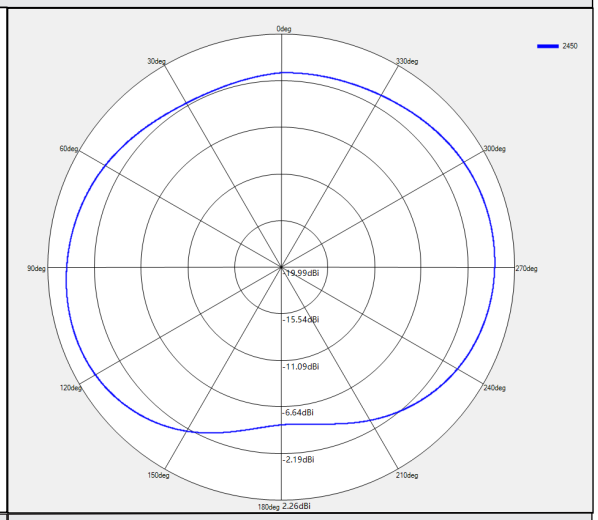
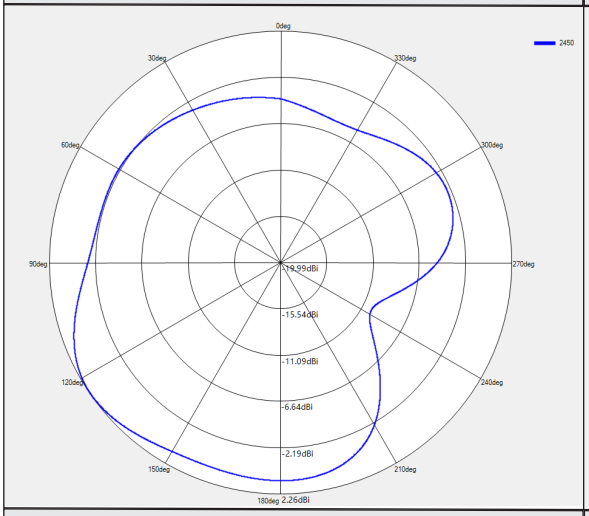
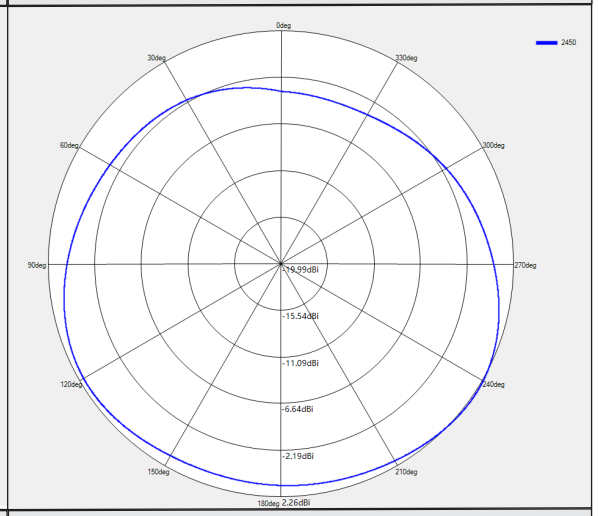
8.2 Antenna for WIFI

8.2.1 Radiation Patterns (2.4-2.5 GHz), Efficiency (%) and Gain (dBi)

Antenna-Left	
	
PCB board size: 45 mm x 35 mm x 1.0 mm	θ = 90° Plane XY at 2450MHz
	
Φ = 0° Plane XZ at 2450MHz	Φ = 90° Plane YZ at 2450MHz

Gain	Peak Gain	2.48 dBi
	Average Gain across the band	2.25 dBi
	Gain Range across the band (min, max)	2.04 to 2.48dBi
Efficiency	Peak Efficiency	82.77%
	Average Efficiency across the band	80.97%
	Efficiency Range across the band (min, max)	78.27 to 82.77%

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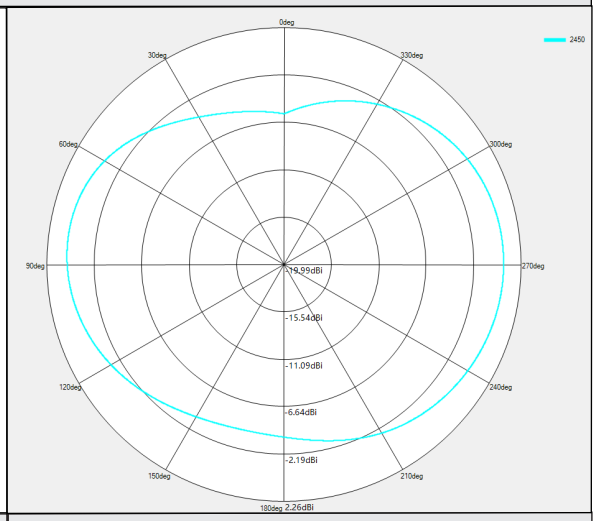
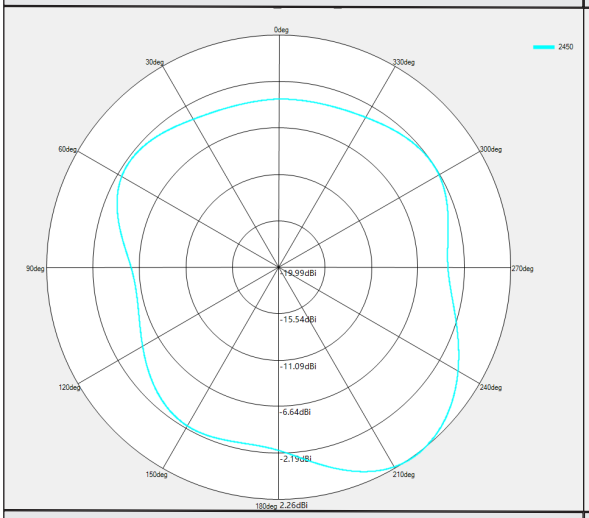
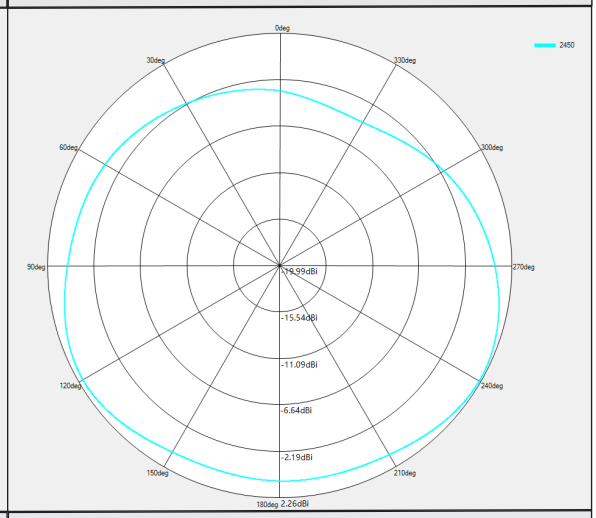
Antenna-Right	
	
PCB board size: 45 mm x 35 mm x 1.0 mm	θ = 90° Plane XY at 2450MHz
	
Φ = 0° Plane XZ at 2450MHz	Φ = 90° Plane YZ at 2450MHz

Gain	Peak Gain	2.13 dBi
	Average Gain across the band	2.05 dBi
	Gain Range across the band (min, max)	1.96 to 2.05 dBi
Efficiency	Peak Efficiency	84.18%
	Average Efficiency across the band	78.90%
	Efficiency Range across the band (min, max)	73.36 to 84.18%

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8.2.2 Radiation Patterns (5.1-5.8 GHz), Efficiency (%) and Gain (dBi)

<table>
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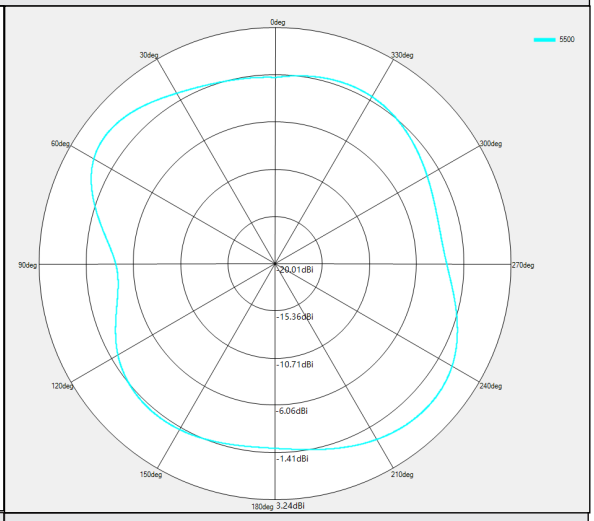
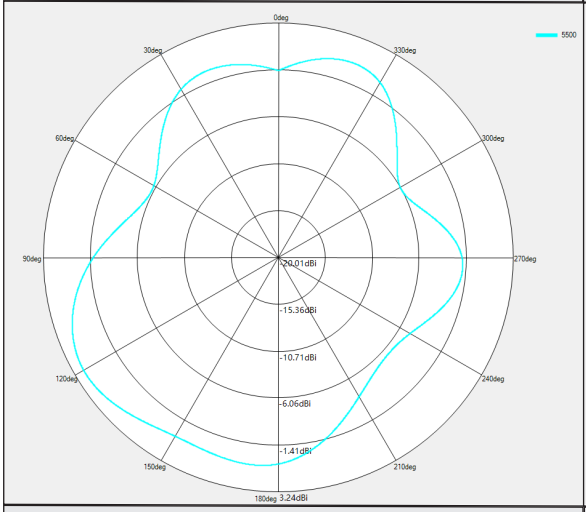
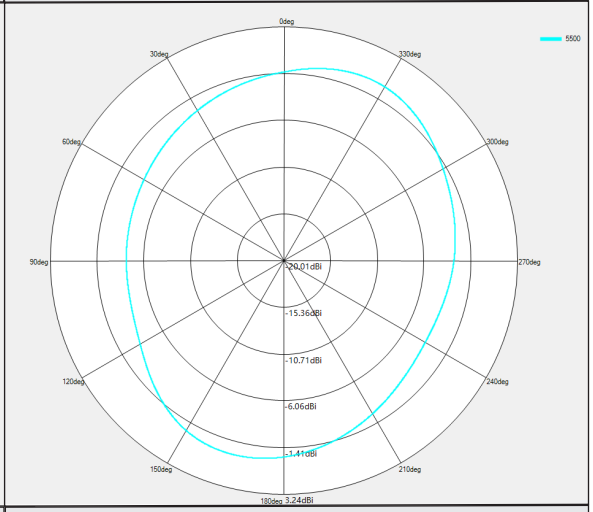
<tr><td></td><td> 
</td></tr>
<tr><td>PCB board size: 45 mm x 35 mm x 1.0 mm</td><td>θ = 90° Plane XY at 5500MHz</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Φ = 0° Plane XZ at 5500MHz</td><td>Φ = 90° Plane YZ at 5500MHz</td></tr>
</table>

Gain	Peak Gain	4.37 dBi
	Average Gain across the band	3.93 dBi
	Gain Range across the band (min, max)	2.89 to 4.37 dBi
Efficiency	Peak Efficiency	85.81%
	Average Efficiency across the band	82.77%
	Efficiency Range across the band (min, max)	75.65 to 85.81%

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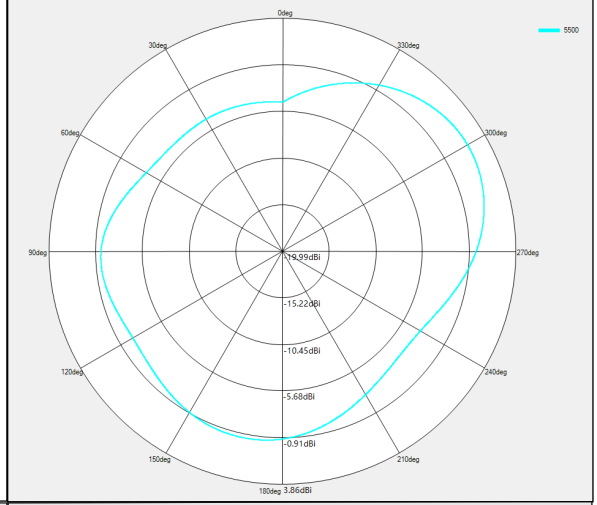
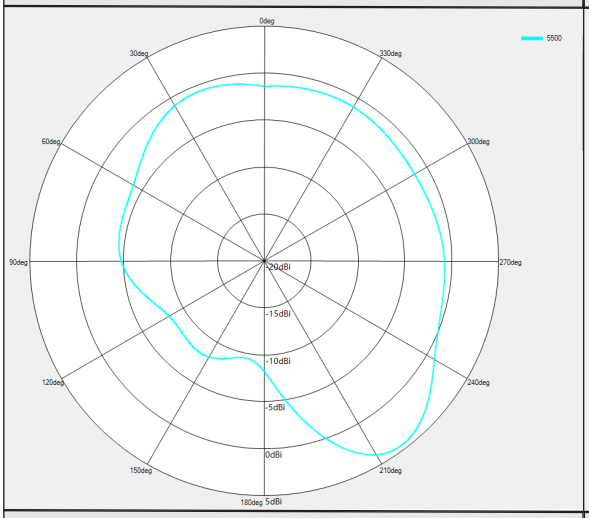
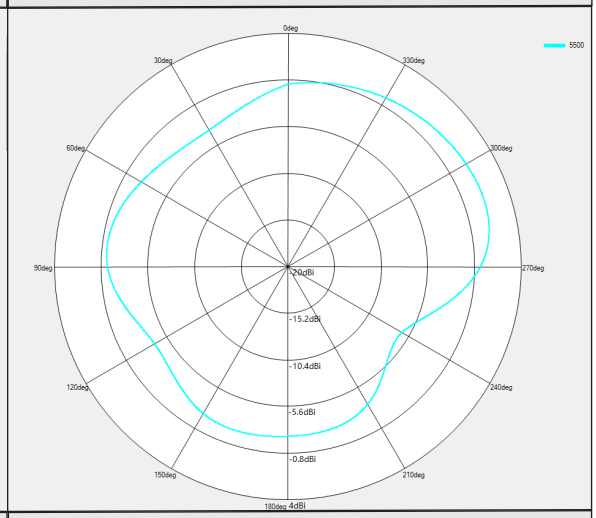
Antenna-Right	
	
PCB board size: 45 mm x 35 mm x 1.0 mm	θ = 90° Plane XY at 5500MHz
	
Φ = 0° Plane XZ at 5500MHz	Φ = 90° Plane YZ at 5500MHz

Gain	Peak Gain	4.19 dBi
	Average Gain across the band	3.70 dBi
	Gain Range across the band (min, max)	3.34 to 4.19 dBi
Efficiency	Peak Efficiency	82.77%
	Average Efficiency across the band	79.82%
	Efficiency Range across the band (min, max)	75.39 to 85.42%

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8.2.3 Radiation Patterns (5.925-7.125 GHz), Efficiency (%) and Gain (dBi)

<table>
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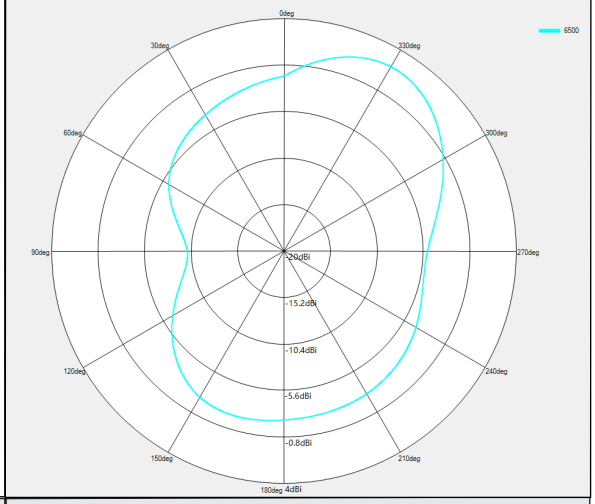
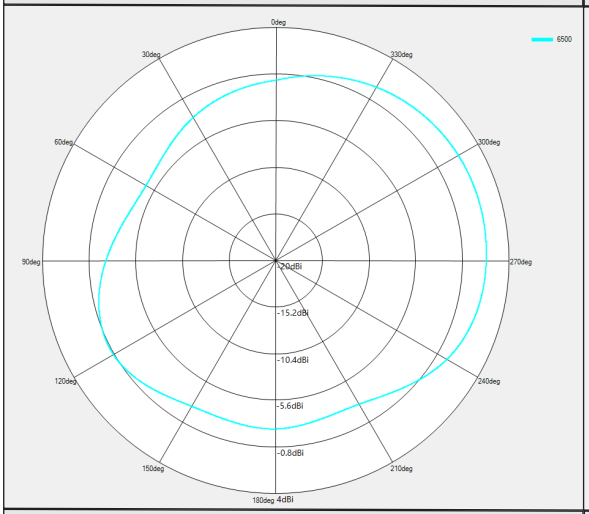
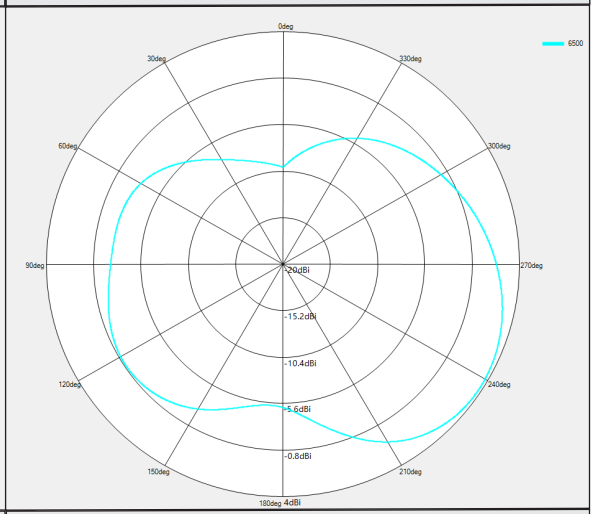
<tr><td></td><td> 
</td></tr>
<tr><td>PCB board size: 45 mm x 35 mm x 1.0 mm</td><td>θ = 90° Plane XY at 6500MHz</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Φ = 0° Plane XZ at 6500MHz</td><td>Φ = 90° Plane YZ at 6500MHz</td></tr>
</table>

Gain	Peak Gain	4.49 dBi
	Average Gain across the band	3.73 dBi
	Gain Range across the band (min, max)	2.72 to 4.49 dBi
Efficiency	Peak Efficiency	88.43%
	Average Efficiency across the band	78.46%
	Efficiency Range across the band (min, max)	72.82 to 88.43%

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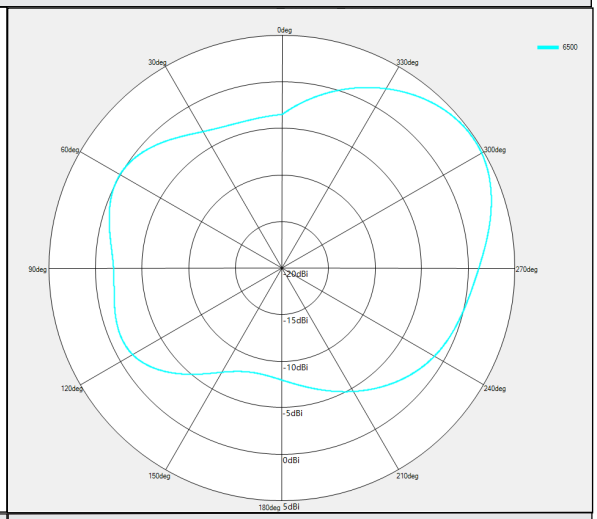
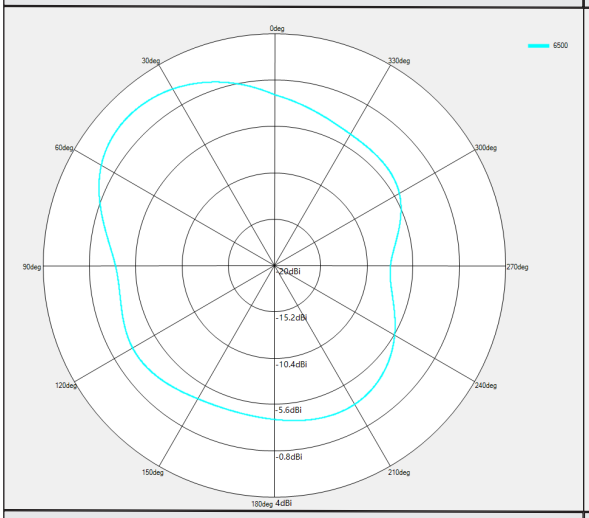
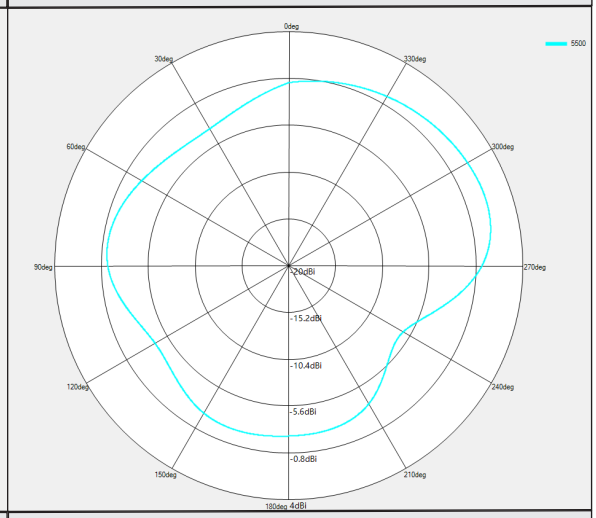
Antenna-Right	
	
PCB board size: 45 mm x 35 mm x 1.0 mm	θ = 90° Plane XY at 6500MHz
	
Φ = 0° Plane XZ at 6500MHz	Φ = 90° Plane YZ at 6500MHz

Gain	Peak Gain	5.64 dBi
	Average Gain across the band	5.24 dBi
	Gain Range across the band (min, max)	2.44 to 5.64 dBi
Efficiency	Peak Efficiency	92.17%
	Average Efficiency across the band	80.97%
	Efficiency Range across the band (min, max)	74.95 to 92.17%

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8.3 Antenna for UWB

8.3.1 Radiation Patterns (6.1-6.9 GHz), Efficiency (%) and Gain (dBi)

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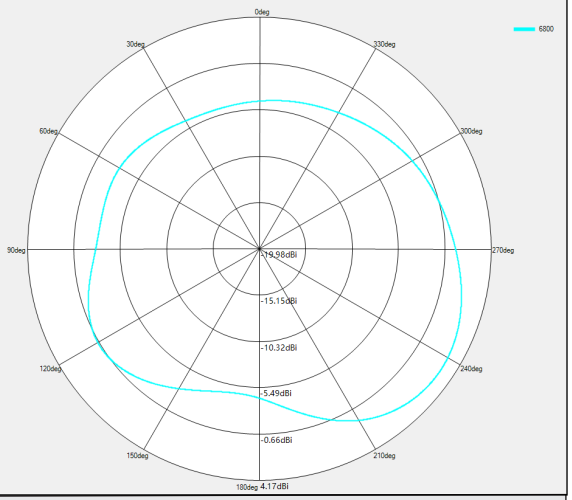
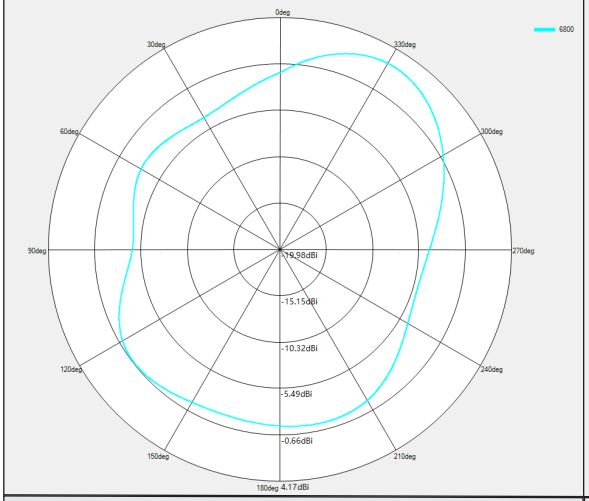
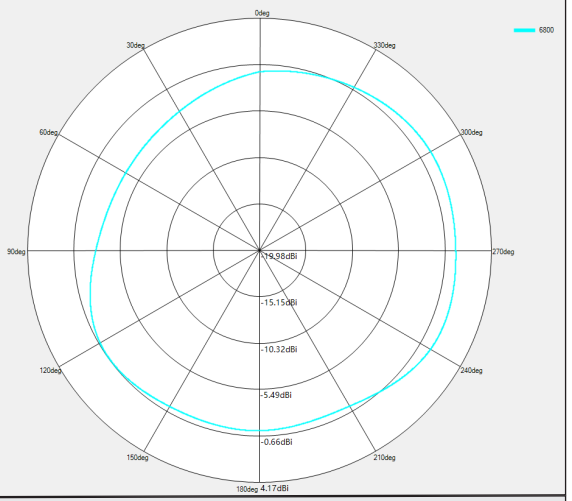
<tr><td></td><td> 
</td></tr>
<tr><td>PCB board size: 45 mm x 35 mm x 1.0 mm</td><td>θ = 90° Plane XY at 6800MHz</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Φ = 0° Plane XZ at 6800MHz</td><td>Φ = 90° Plane YZ at 6800MHz</td></tr>
</table>

Gain	Peak Gain	5.64 dBi
	Average Gain across the band	4.02 dBi
	Gain Range across the band (min, max)	3.23 to 5.64 dBi
Efficiency	Peak Efficiency	88.43%
	Average Efficiency across the band	79.04%
	Efficiency Range across the band (min, max)	74.31 to 88.43%

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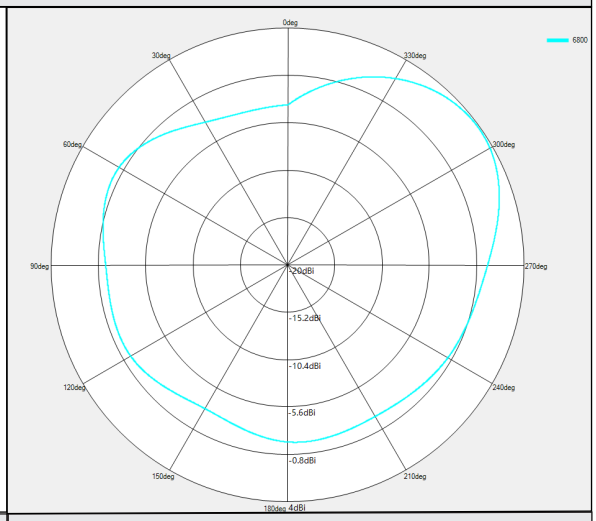
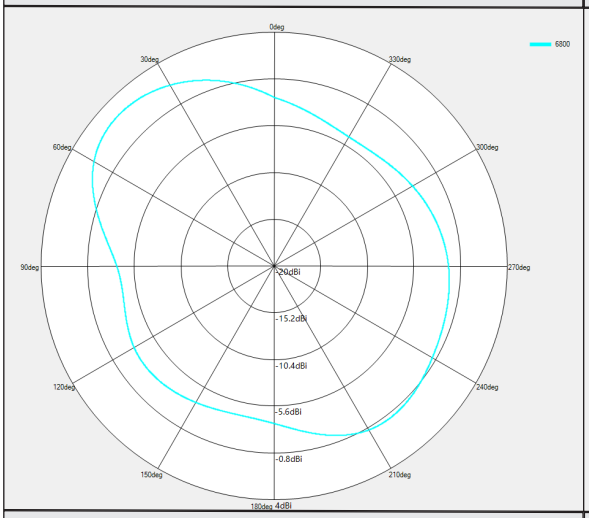
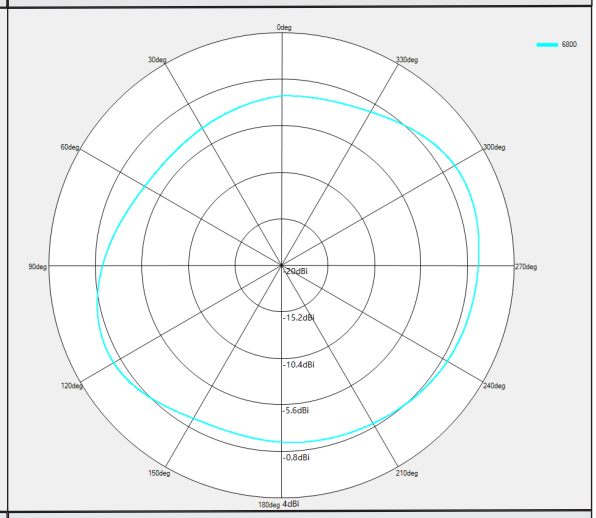
Antenna-Right	
	
PCB board size: 45 mm x 35 mm x 1.0 mm	θ = 90° Plane XY at 6800MHz
	
Φ = 0° Plane XZ at 6800MHz	Φ = 90° Plane YZ at 6800MHz

Gain	Peak Gain	5.64 dBi
	Average Gain across the band	4.58 dBi
	Gain Range across the band (min, max)	3.23 to 5.64 dBi
Efficiency	Peak Efficiency	92.17%
	Average Efficiency across the band	82.45%
	Efficiency Range across the band (min, max)	77.74 to 92.17%

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8.3.2 Radiation Patterns (7.1-8.5 GHz), Efficiency (%) and Gain (dBi)

<table>
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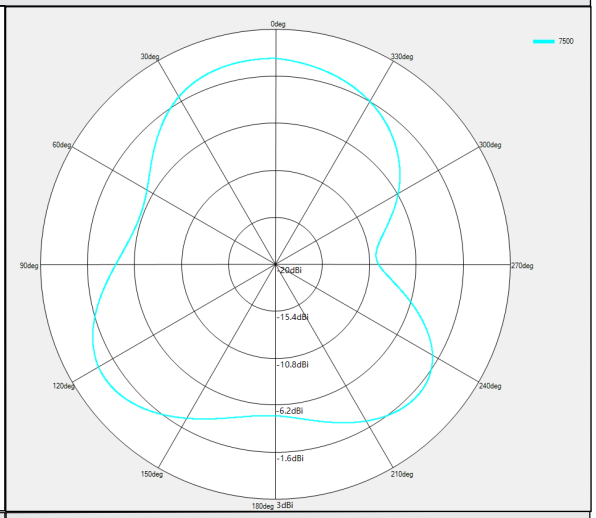
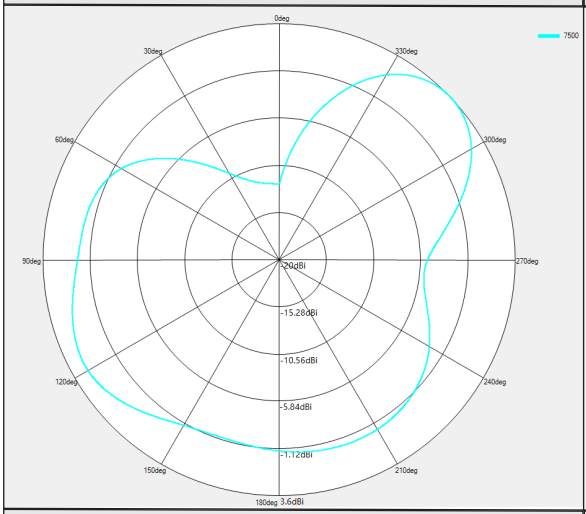
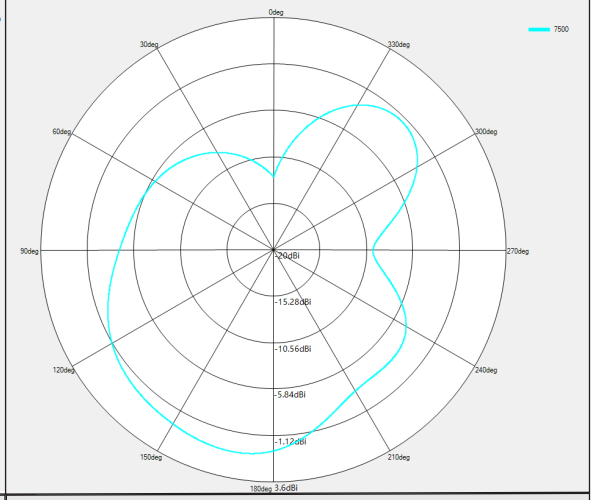
<tr><td></td><td> 
</td></tr>
<tr><td>PCB board size: 45 mm x 35 mm x 1.0 mm</td><td>θ = 90° Plane XY at 7500MHz</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Φ = 0° Plane XZ at 7500MHz</td><td>Φ =90° Plane YZ at 7500MHz</td></tr>
</table>

Gain	Peak Gain	3.94 dBi
	Average Gain across the band	3.19 dBi
	Gain Range across the band (min, max)	2.16 to 3.94 dBi
Efficiency	Peak Efficiency	77.33%
	Average Efficiency across the band	59.12%
	Efficiency Range across the band (min, max)	43.09 to 73.33%

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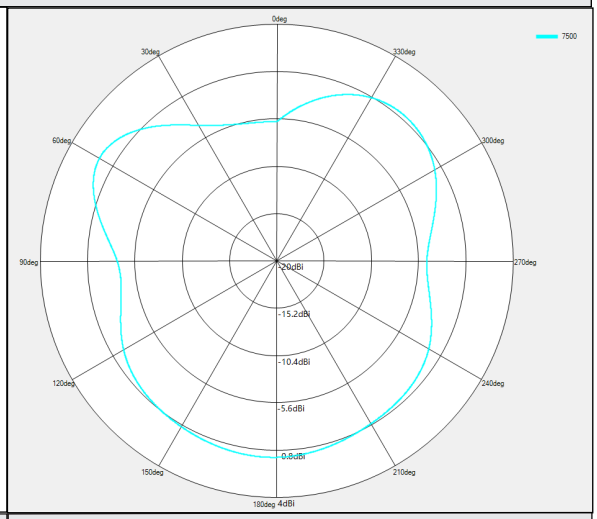
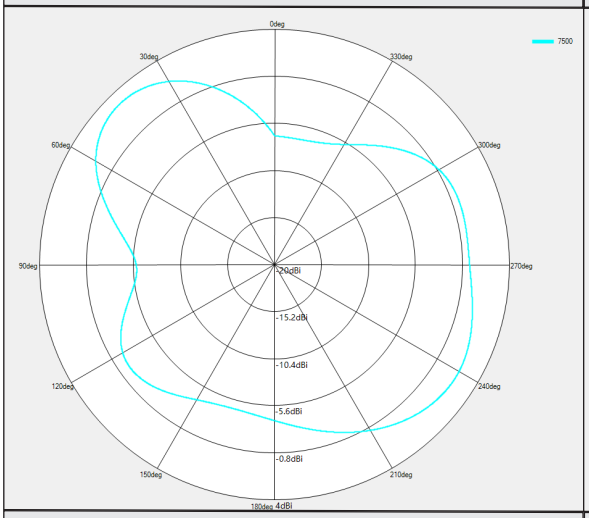
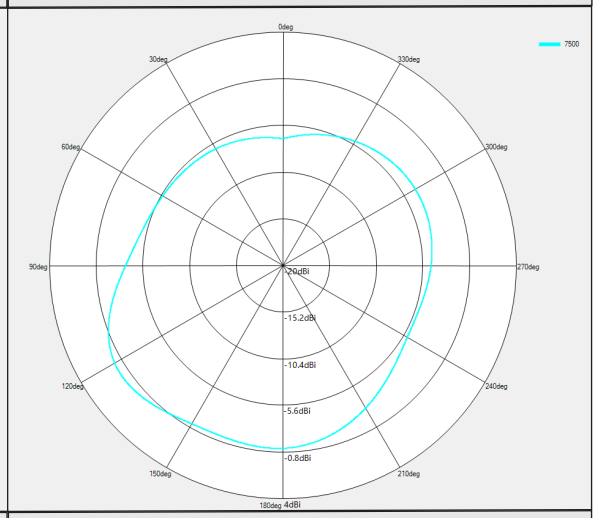
Antenna-Right	
	
PCB board size: 45 mm x 35 mm x 1.0 mm	θ = 90° Plane XY at 7500MHz
	
Φ = 0° Plane XZ at 7500MHz	Φ = 90° Plane YZ at 7500MHz

Gain	Peak Gain	3.2 dBi
	Average Gain across the band	2.52 dBi
	Gain Range across the band (min, max)	2.15 to 3.2 dBi
Efficiency	Peak Efficiency	78.69%
	Average Efficiency across the band	61.34%
	Efficiency Range across the band (min, max)	48.09 to 78.69%

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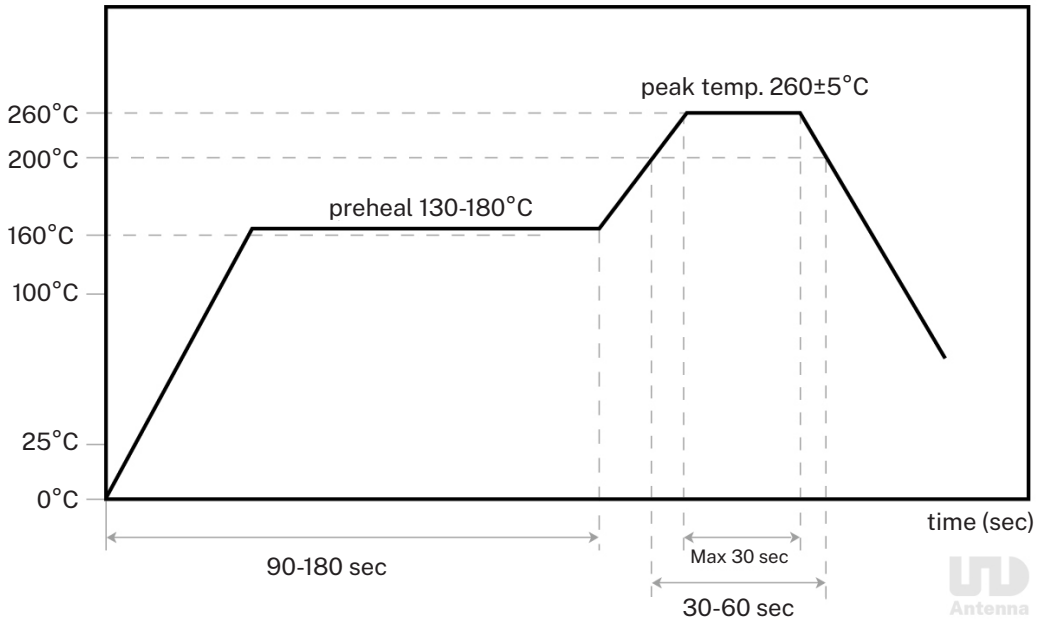
9 SOLDERING CONDITIONS

This antenna is suitable for lead free soldering.
The reflow duration should be adjusted to create good solder joints without raising the antenna temperature beyond the allowed maximum of 260°C.
The figure below shows the temperature profile for soldering.



10 PACKAGING

10.1 Optimal Storage Conditions for Packaged Reels

Temperature	-5°C to 40°C
Humidity	Less than 70% RH
Shelf life	18 months
Storage place	Away from corrosive gas and direct sunlight
Packaging	Reels should be stored in unopened sealed manufacturer's plastic packaging.

◎ **Note**
Storage of open reels of antennas is not recommended due to possible oxidization of pads on antennas. If short-term storage is necessary, then it is highly recommended that the bag containing the antenna reel is re-sealed and stored in like storage conditions as in the above table.

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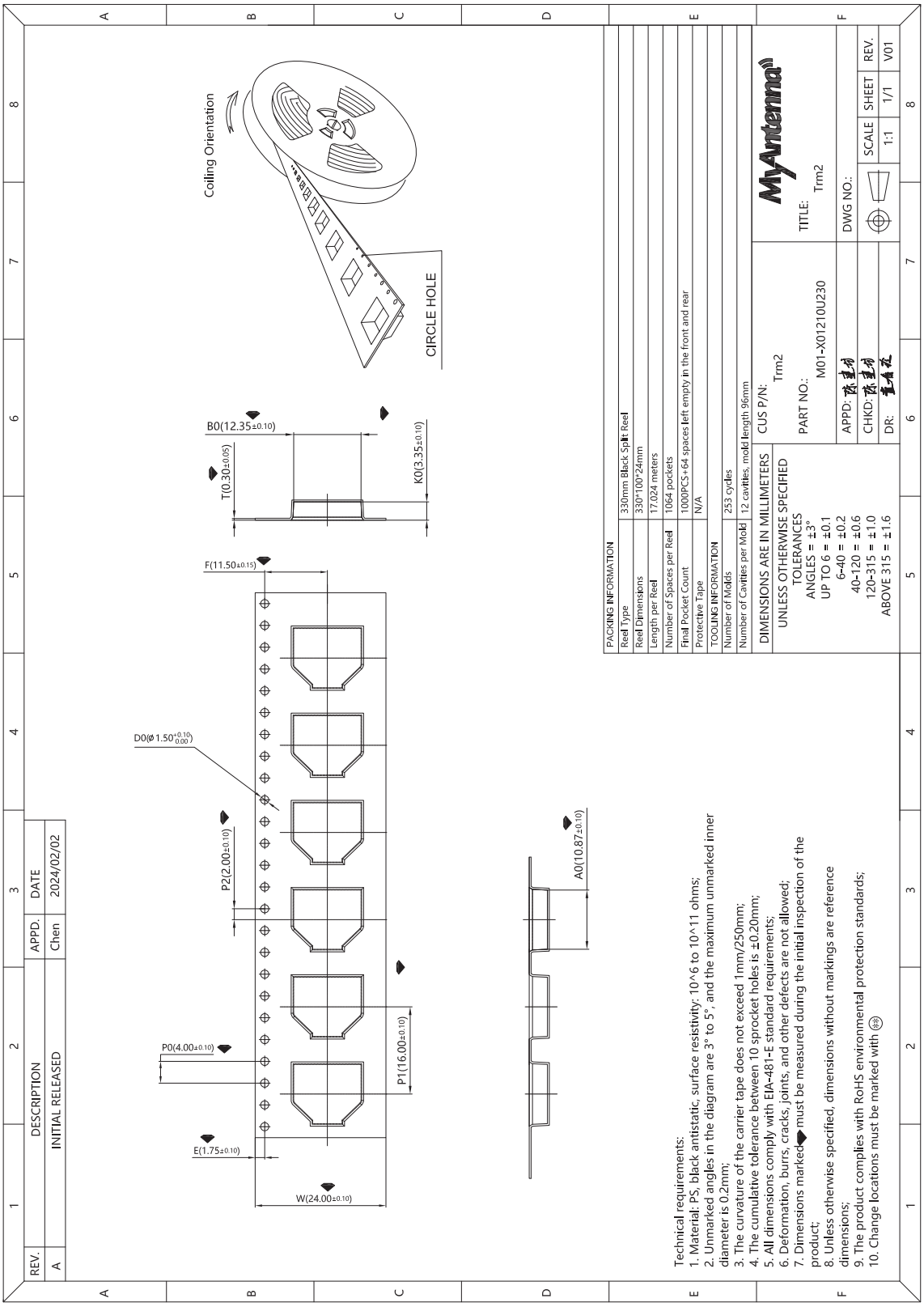
10.2 Packagings and Dimensions (Unit: mm)



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11 ANTENNA CERTIFICATION

RoHS Approval	Compliant [2011/65/EU&2015/863]
REACH Approval	Conform or declared [(EC)1907/2006]
Hazardous material regulation conformance: A certificate of conformance is available upon request. Feel free to consult us for details.	

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The materials provided herein, which are intended for illustration purposes only, are believed to be reliable and correct. However, no responsibility is further assumed for inaccuracies or incompleteness, and all such information shall be entirely at the user's risk. All information is subject to change without prior notice.
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12 WELCOME ALL ANTENNA OEM/ODM PROJECTS

About ABOOSTY

- 10+ years in antenna R&D, production, and OEM/ODM
- House of Aboosty: 450,000 units annual output capacity
- Factory directly competitive price
- Industry-leading quality levels
- Professional team-work & support
- Quick price and lead time estimation

Why Choose ABOOSTY

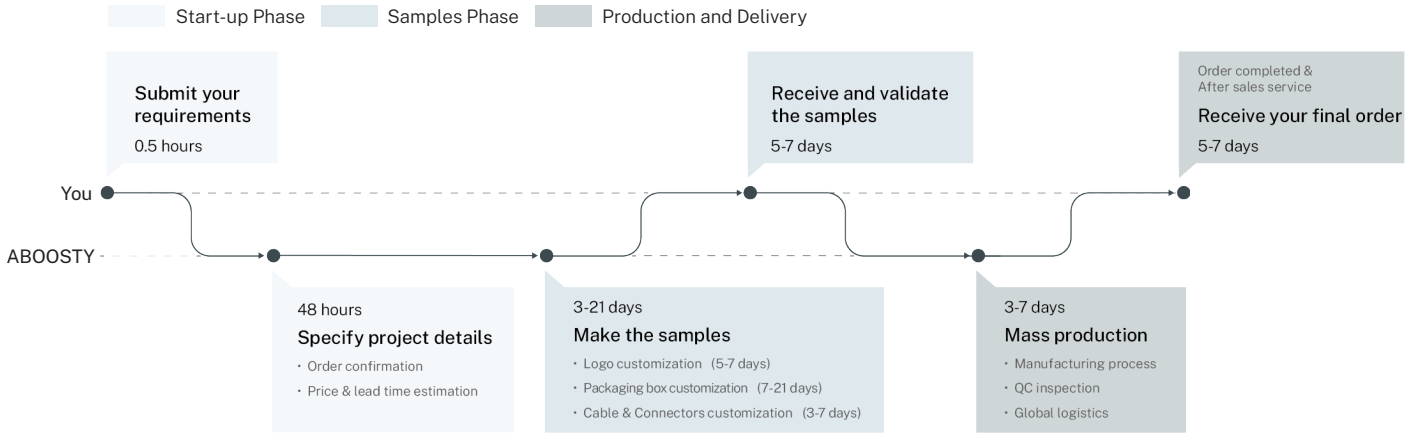
- Innovative and patented design solutions
- Full terminal devices anechoic chamber test
- Co-location with its custom
- Competitive price
- Strict inspection
- Prompt reply within 24h

What We Provide

OEM/ODM Services	
Light Customization	Deep Customization
· Logo · Packaging · Cables&Connectors	· In-depth tailoring for specific applications · Functional enhancements · Environmental adaptations · Vertical certifications · ...

Custom Process

Light Customization Process



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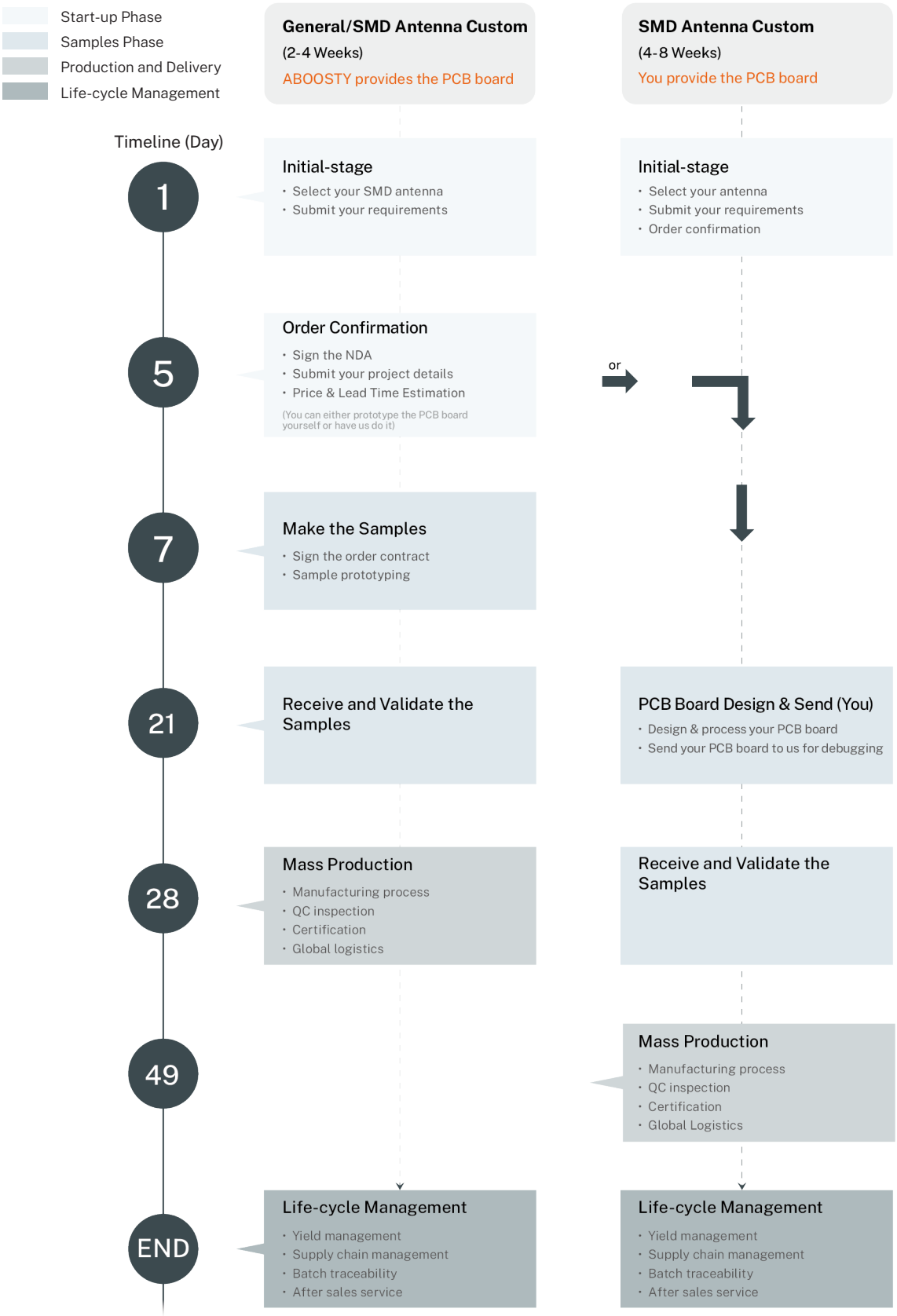
Deep Customization Process



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