KATALYST

Converge IoT
All things connected

MEET MINI-R 2x2

Mini-R-2x2

Product Name: Katalyst Mini-R Device Antenna (2x2)

Key Features:

- Frequency Band: 2400–2500 MHz, 5150–5850 MHz, 5925–7125 MHz
- Efficiency: Up to 64.9% (Straight)
- Dimensions: Φ10.22 mm × 69.5 mm
- RoHS Compliant

OVERVIEW

The Mini-R 2x2 is a compact, high-performance external Wi-Fi antenna designed for dual-band and tri-band applications across 2.4 GHz, 5 GHz, and 6 GHz spectrums (2400–2500 MHz, 5150–5850 MHz, and 5925–7125 MHz). Engineered for terminal mounting, this omnidirectional antenna delivers reliable coverage and signal stability across a wide range of deployments.

With a low-profile form factor (Φ10.22 mm × 69.5 mm) and RP-SMA male connector, the Mini-R 2x2 installs easily and discreetly on routers, access points, and other wireless devices. The antenna supports both straight and bent positioning, maintaining efficiency up to 64.9% and peak gain up to 4.2 dBi depending on configuration.

Constructed with a durable black POM enclosure, it offers long-term performance in rugged environments and extreme temperatures (–40 °C to +85 °C). Ideal for applications including remote monitoring, vehicle tracking, telematics, point-of-sale systems, and wireless routers, the Mini-R 2x2 ensures broad compatibility with industry-standard Wi-Fi modules.

Designed for flexibility and built for performance, the Mini-R 2x2 delivers dependable wireless connectivity wherever it's deployed.

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SPECIFICATION

Test Condition: On 130 mm × 130 mm EVB

1.1. Electrical

Electrical	
Frequency Range	2400–2500 MHz, 5150–5850 MHz, 5925–7125 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

Band / Specification	Band	Wi-Fi 2G	Wi-Fi 5G	Wi-Fi 6G
	Freq. (MHz)	2400–2500	5150–5850	5925–7125
Max. VSWR	Straight	2.8	2.8	3.0
	Bent	2.9	2.6	2.7
Max. Return Loss (dB)	Straight	-6.4	-6.4	-6.1
	Bent	-6.4	-7.1	-6.8
AVG Eff. (%)	Straight	53.8	59.5	44.7
	Bent	52.5	56.3	45.6
AVG AVG Gain (dB)	Straight	-2.7	-2.3	-3.5
	Bent	-2.8	-2.5	-3.4
Max. Peak Gain (dBi)	Straight	3.3 (2460)	3.7 (5340)	4.0 (6455)
	Bent	3.9 (2470)	4.2 (5330)	2.1 (5975)
VSWR	Straight	≤ 3.0		
	Bent	≤ 2.9		
Return Loss	Straight	≤ -6.1 dB		
	Bent	≤ -6.4 dB		
Peak Gain	Straight	≤ 4.0 dBi		
	Bent	≤ 4.2 dBi		

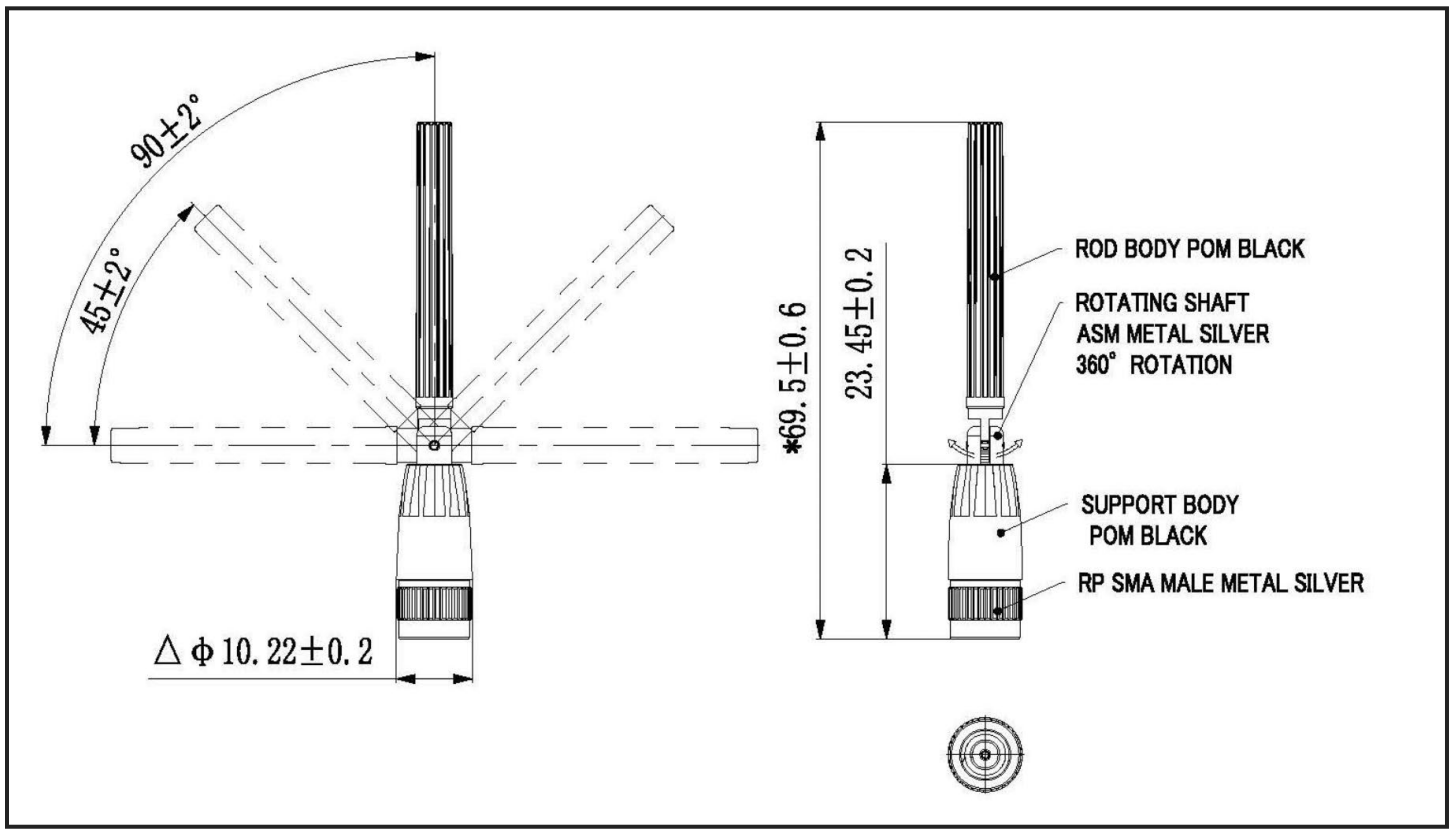
- Straight: The connector is vertical.
- Bent: The connector is bent.

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	Φ 10.22 mm × 69.5 mm
Casing Material & Color	POM & Black
Connector Type	RP SMA Male
Weight	Typ. 8.9 g
Mounting Type	Terminal (Connector)

Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS Compliant	Yes

DRAWING

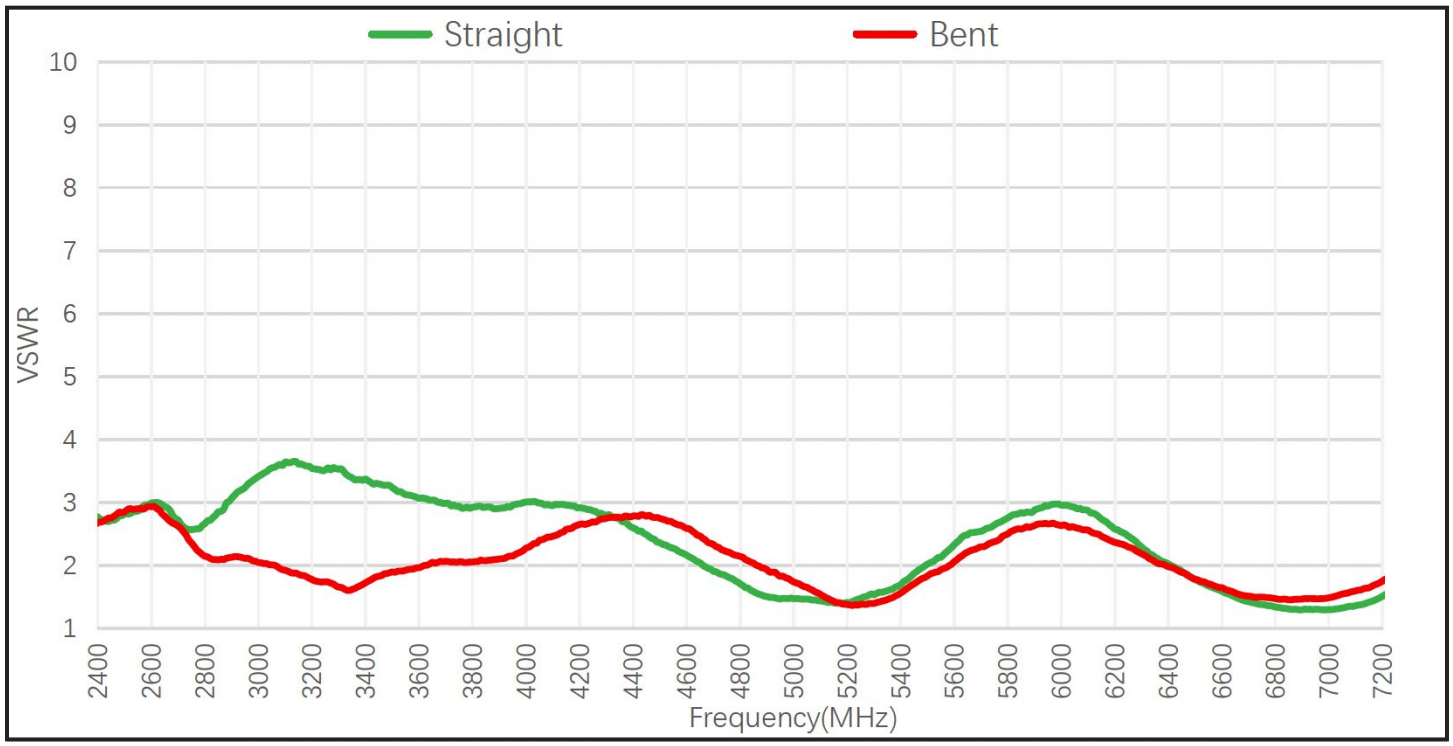

90±2°
45±2°
△ϕ10.22±0.2
*69.5±0.6
23.45±0.2
ROD BODY POM BLACK
ROTATING SHAFT
ASM METAL SILVER
360° ROTATION
SUPPORT BODY
POM BLACK
RP SMA MALE METAL SILVER

DETAILED PERFORMANCE

Test Condition: On 130 mm × 130 mm EVB

3.1. S-Parameter Test

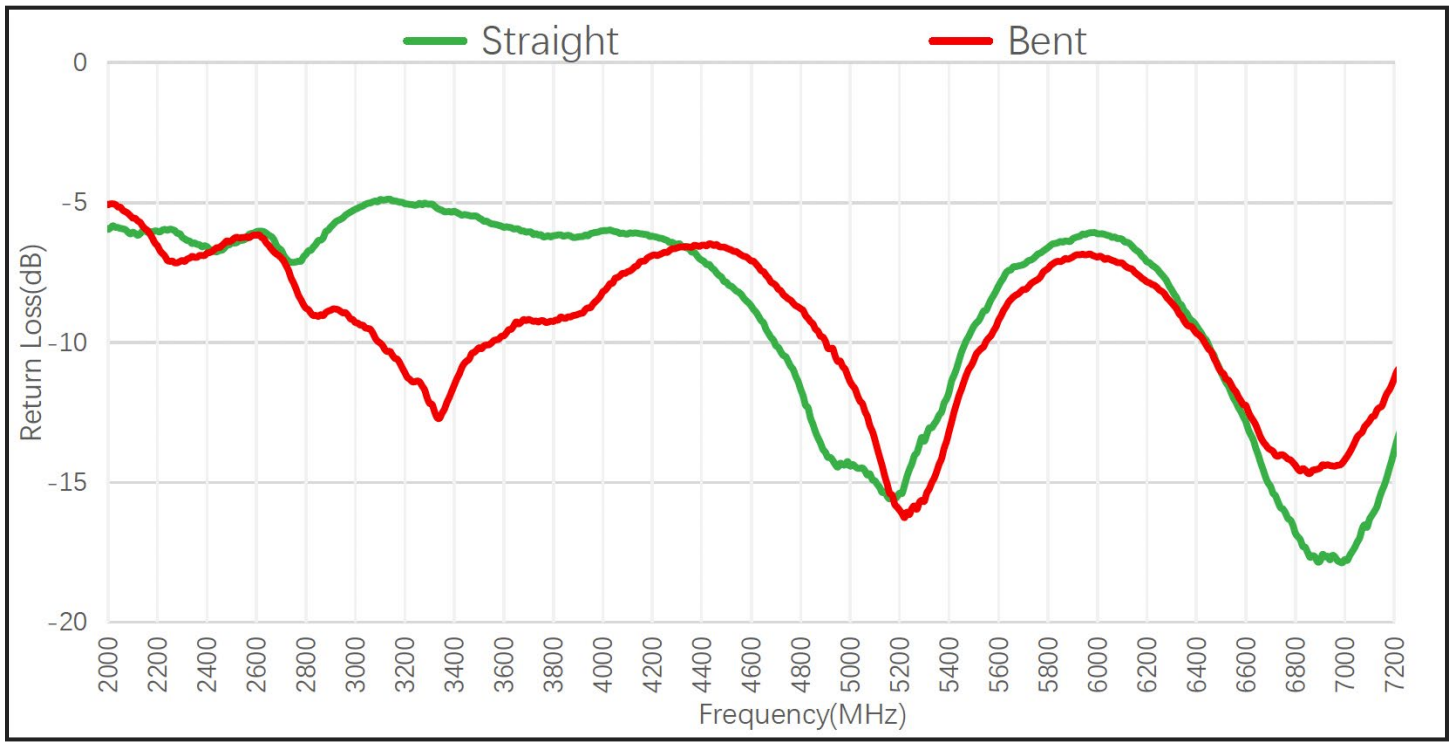
3.1.1. VSWR



Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6525	7125
Straight	2.8	2.7	2.8	1.4	2.0	2.8	2.9	1.7	1.4
Bent	2.7	2.8	2.9	1.4	1.8	2.6	2.7	1.7	1.6

3.1. S-Parameter Test

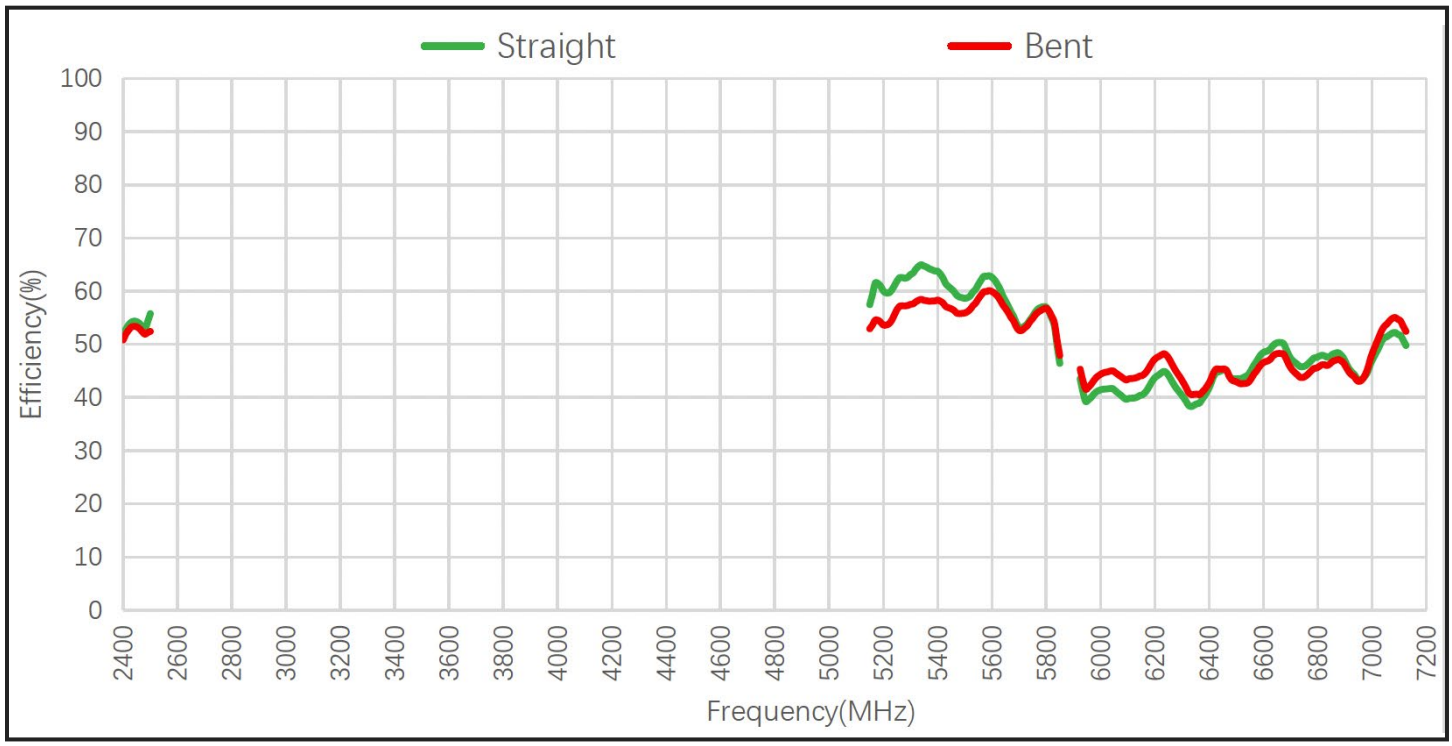
3.1.2. Return Loss



Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6525	7125
Straight	-6.6	-6.7	-6.4	-15.5	-9.4	-6.4	-6.2	-11.6	-16.0
Bent	-6.8	-6.6	-6.4	-15.1	-10.6	-7.1	-6.9	-11.3	-12.6

3.2. Radiation Performance Test

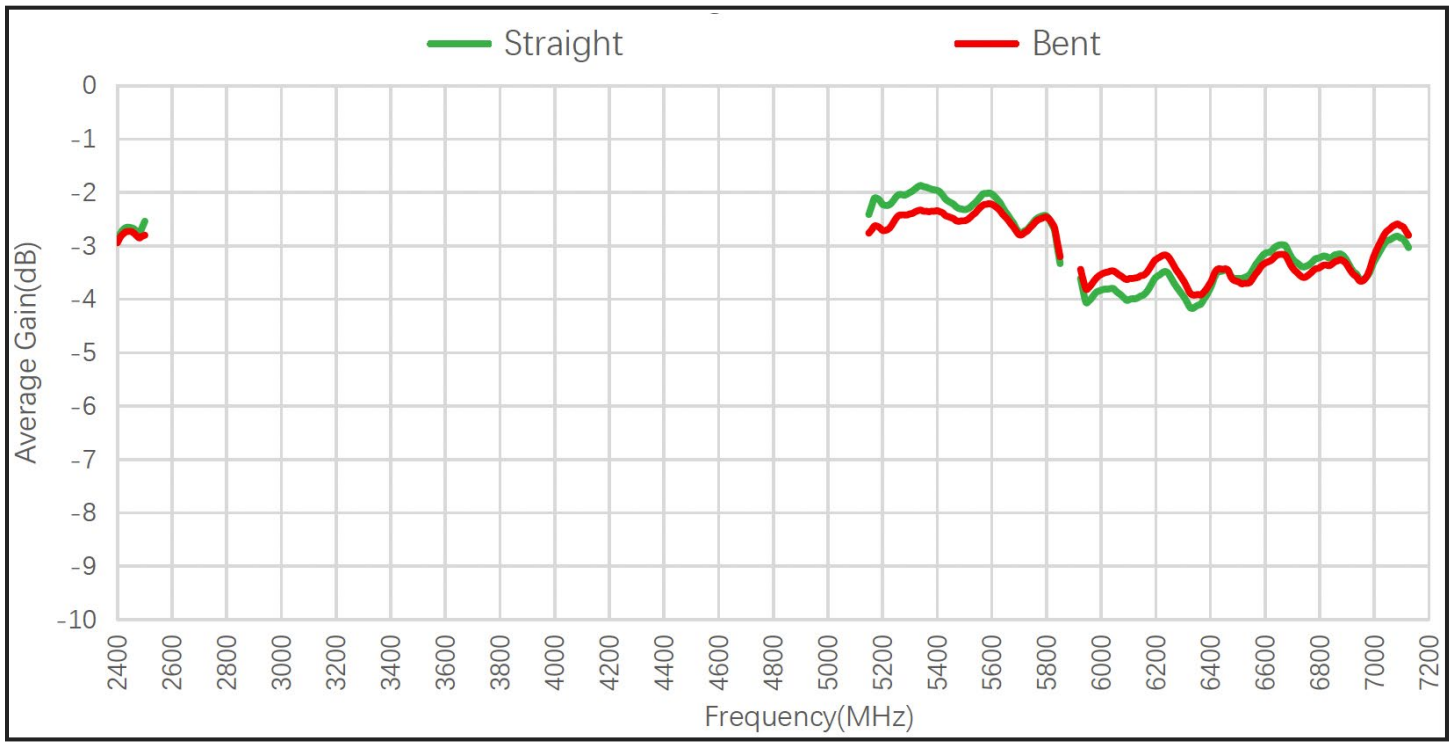
3.2.1. Efficiency



Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6525	7125
Straight	52.2	54.3	55.8	57.5	58.7	46.4	43.5	43.8	49.8
Bent	50.8	53.3	52.4	52.9	55.9	47.9	45.3	42.6	52.4

3.2. Radiation Performance Test

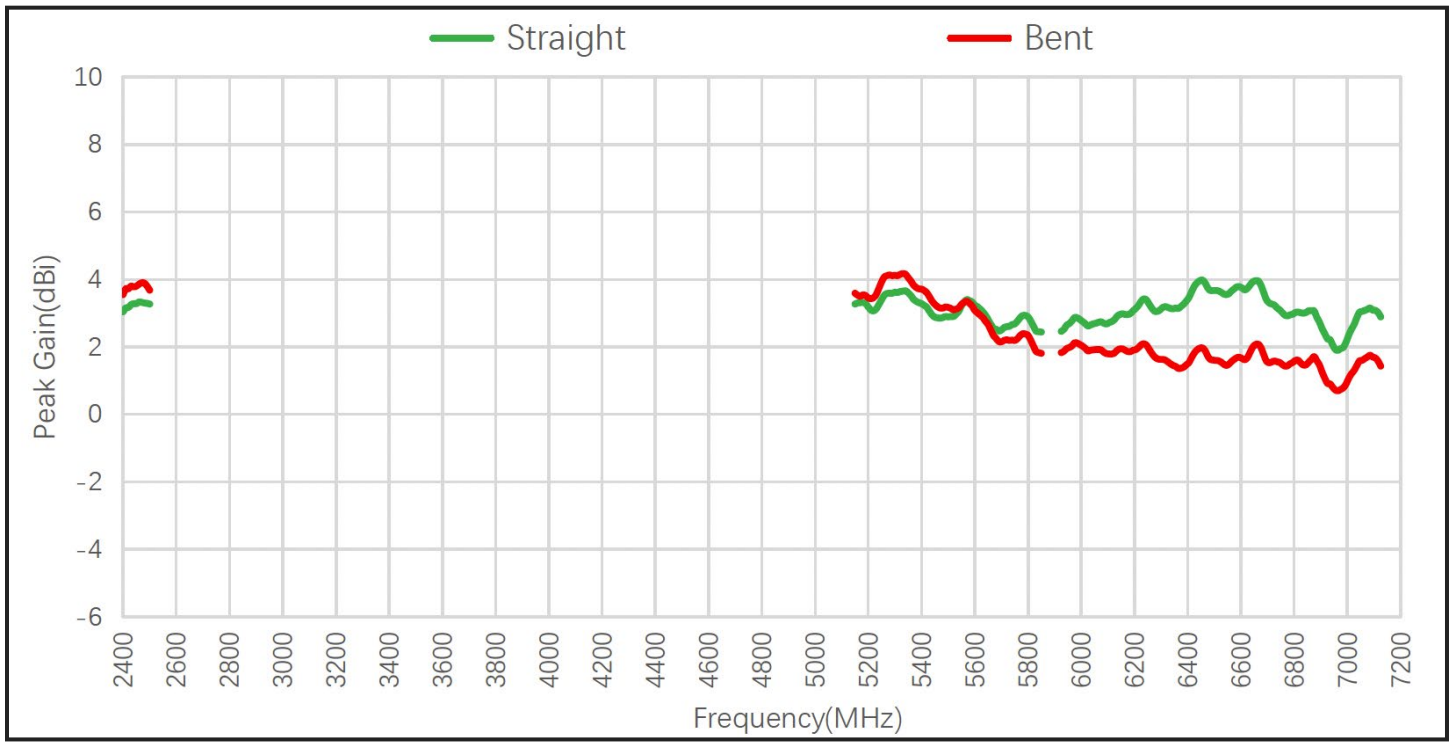
3.2.2. Average Gain



Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6525	7125
Straight	-2.8	-2.7	-2.5	-2.4	-2.3	-3.3	-3.6	-3.6	-3.0
Bent	-2.9	-2.7	-2.8	-2.8	-2.5	-3.2	-3.4	-3.7	-2.8

3.2. Radiation Performance Test

3.2.3. Peak Gain



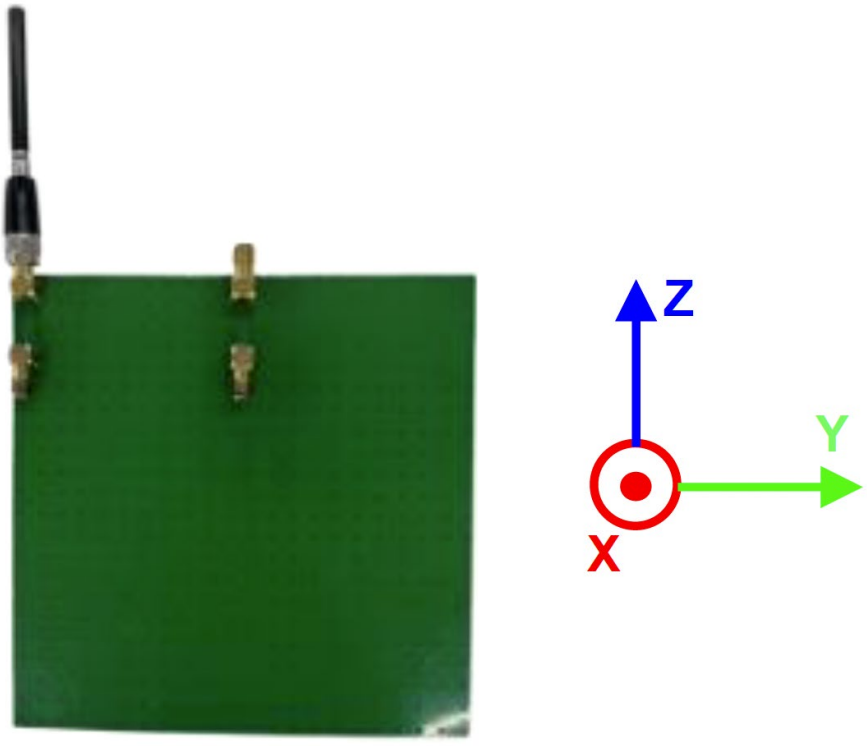
Frequency (MHz)	2400	2450	2500	5150	5500	5850	5925	6525	7125
Straight	3.0	3.3	3.3	3.3	2.9	2.4	2.5	3.6	2.9
Bent	3.6	3.8	3.7	3.6	3.2	1.8	1.8	1.6	1.4

3.2. Radiation Performance Test

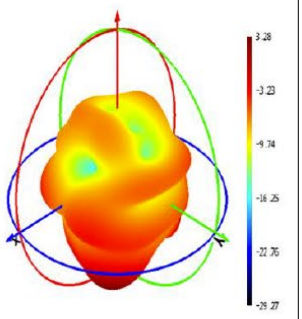
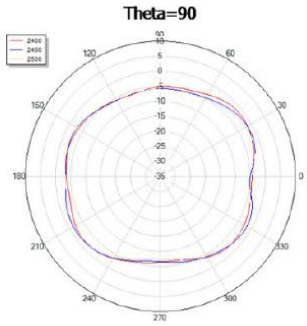
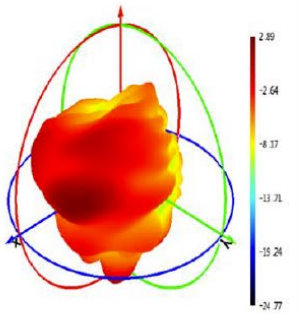
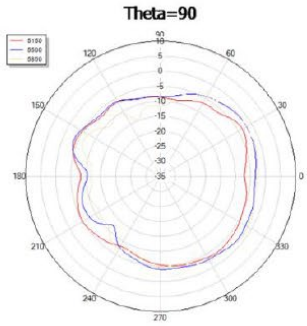
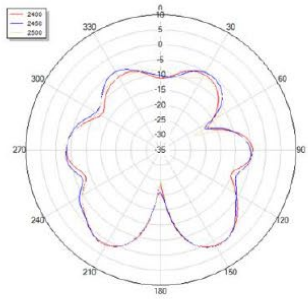
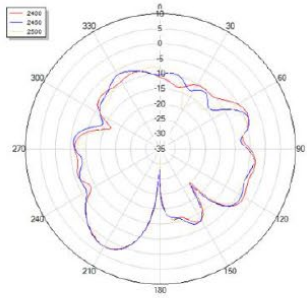
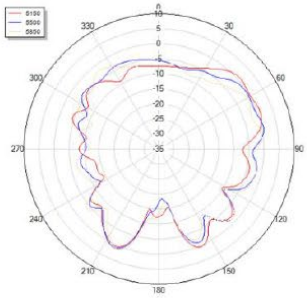
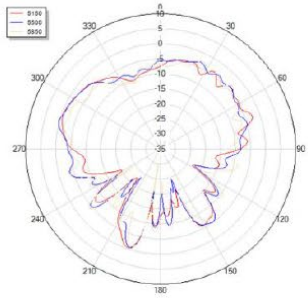
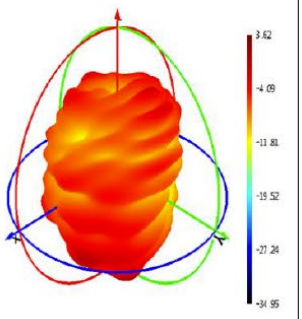
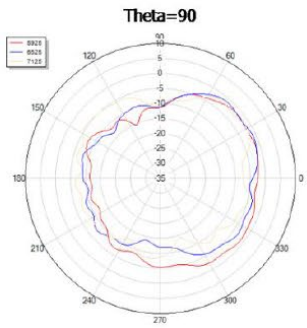
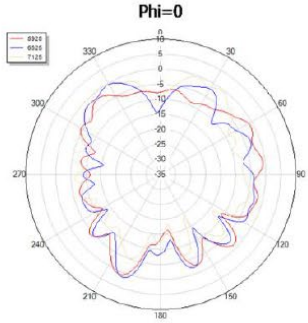
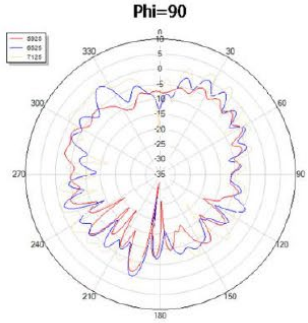
3.2.4. 3D & 2D Radiation Pattern

3.2.4.1. Test state: Straight

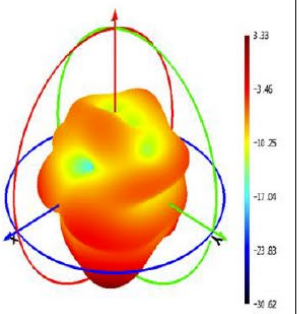
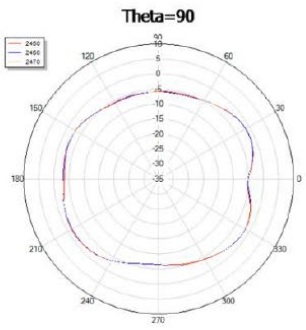
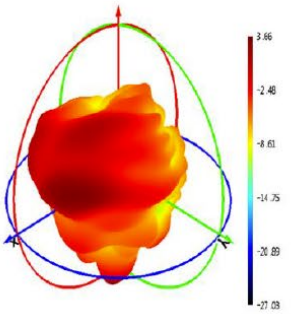
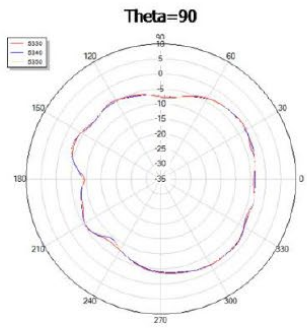
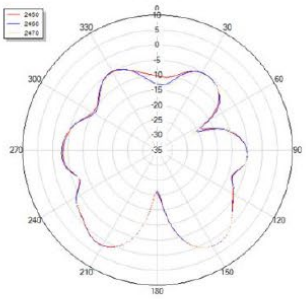
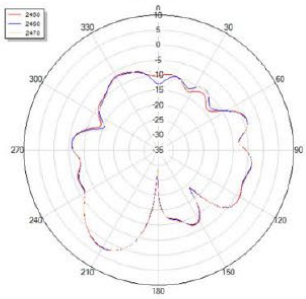
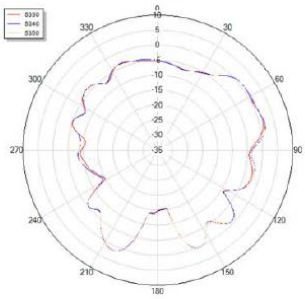
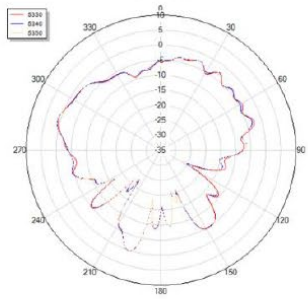
- Test Condition: On 130 mm × 130 mm EVB
- Test Chamber: HF-S-1



WiFi

2450 MHz		5500 MHz	
			
			
6525 MHz			
			
			

Max Peak Gain

2460 MHz		5340 MHz	
			
			
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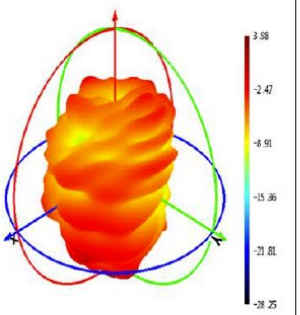
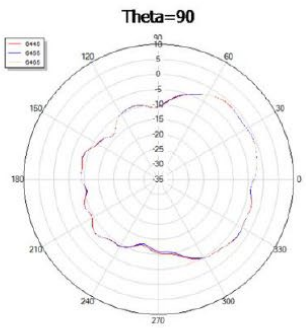
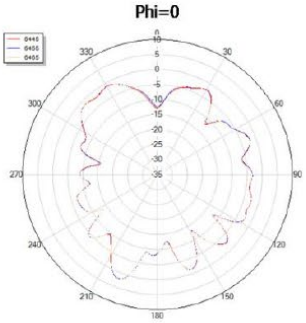
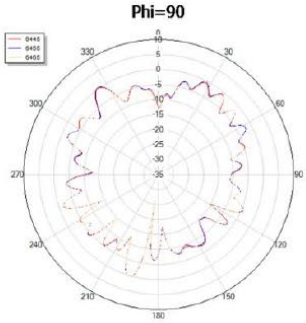
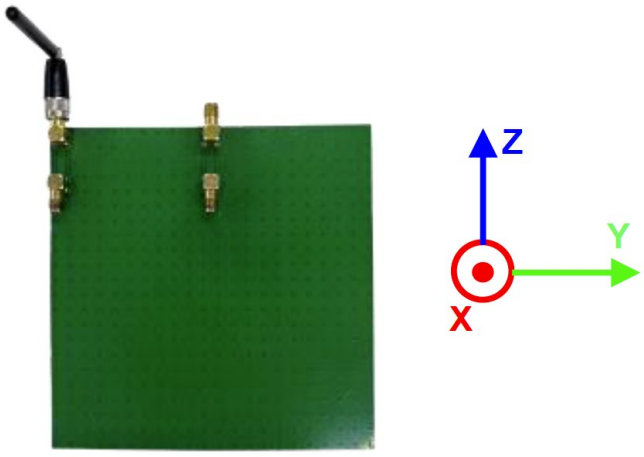
			
			

3.2. Radiation Performance Test

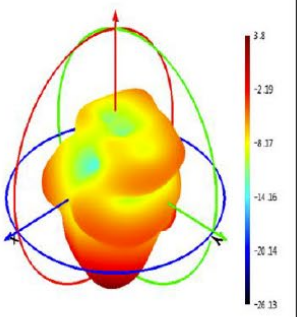
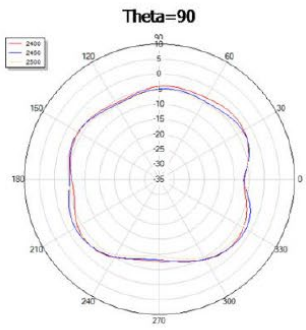
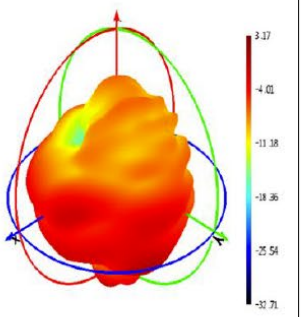
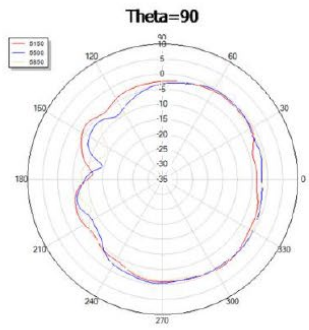
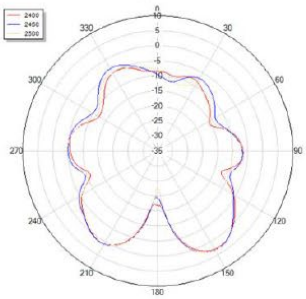
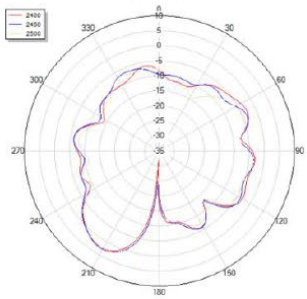
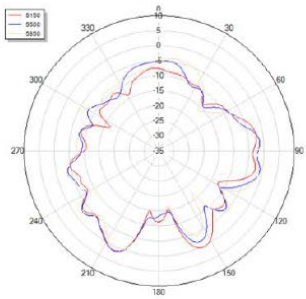
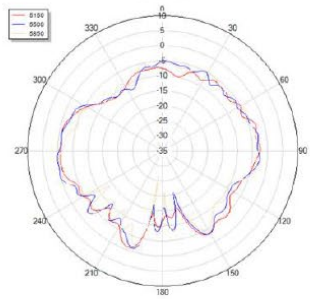
3.2.4. 3D & 2D Radiation Pattern

3.2.4.2. Test state: Bent

- Test Condition: On 130 mm × 130 mm EVB
- Test Chamber: HF-S-1



WiFi

2450 MHz		5500 MHz	
			
			
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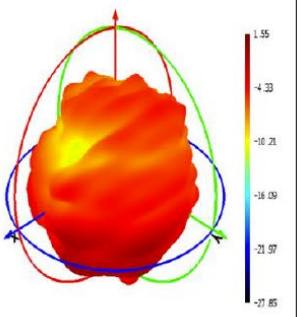
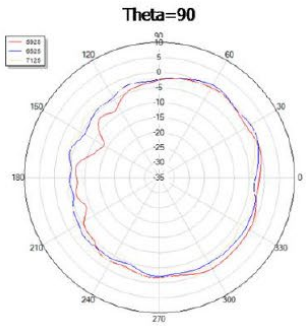
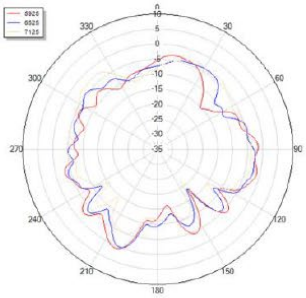
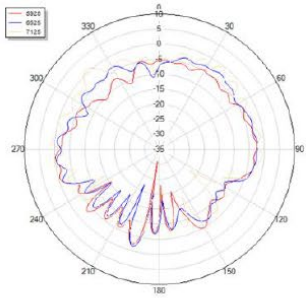
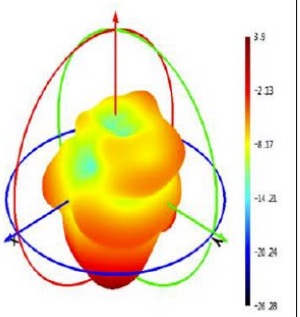
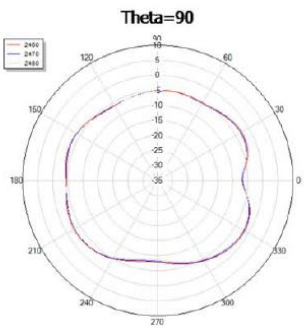
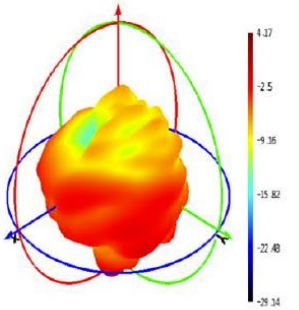
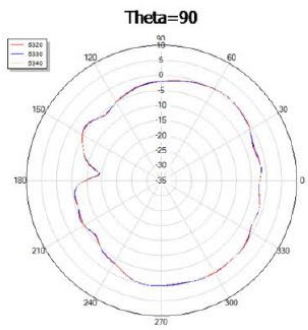
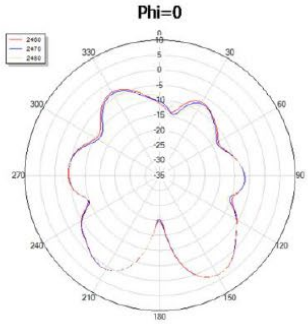
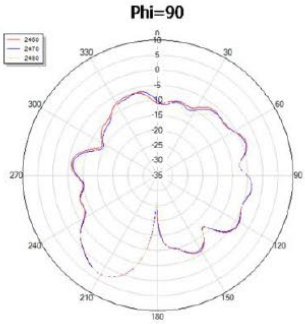
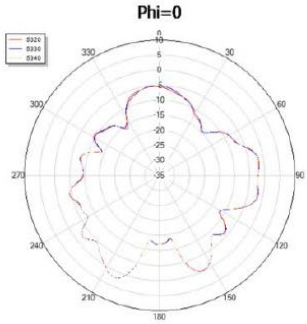
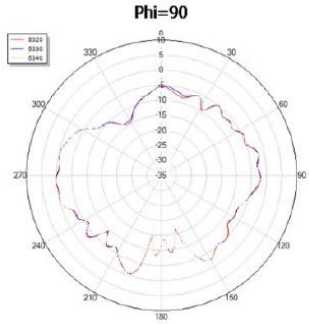
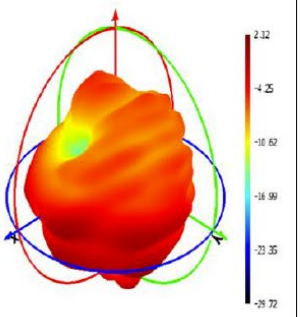
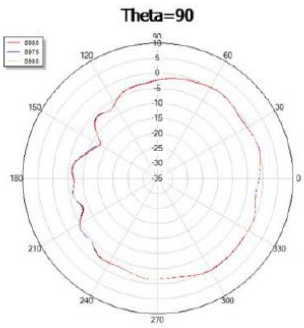
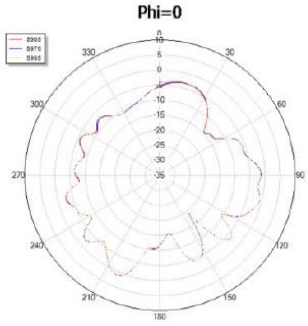
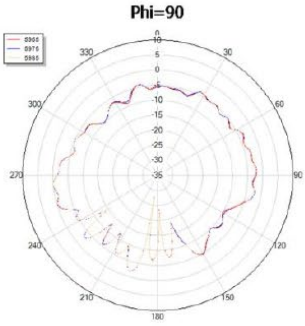
			
			

Max Peak Gain

2470 MHz		5330 MHz	
			
			
5975 MHz