

Testing Report

Customer Name: vivo

Product Name: V2419

Sample Model: PD2420F_EX_A_13.0.4.3.W30.V000L1

Reference Standard: *GB/T 9410-2008; ANSI/IEEE Std 149-2021*

Issue Date: 2024.08.15

Version

Version No.	Date	Description	Formulate	Approval
A0	2024.08.15	For the first time, formulate	Dengyihao	Hufangben

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1.3 Test equipment

Equipment	Model No.	Serial No.	Manufacturer	Calibration date	Next calibration date
OTA Test System	RayZone-5000	Sunway-LAB-RF-D00	GTS	2024.3.14	2025.3.13
Network Analyzer	E5071C	Sunway-LAB-R-D01	KEYSIGHT	2024.5.13	2025.5.12

1.4 Test environment

Temperature	22.8°C
Humidity	58%RH
Pressure	100.23kPa

1.5 Statement

- (1) The test results in the report are only applicable to the tested samples and the tested samples work under the environment described in the report.
- (2) Only Sunway Communication have the right to modify the report, and the modification information shall be annotated in the revision form.
- (3) Any objection to this report shall be raised within 30 days after formal confirmation of the report.
- (4) This report is invalid if there is any evidence that the sample information provided is falsified.

2. Sample Information

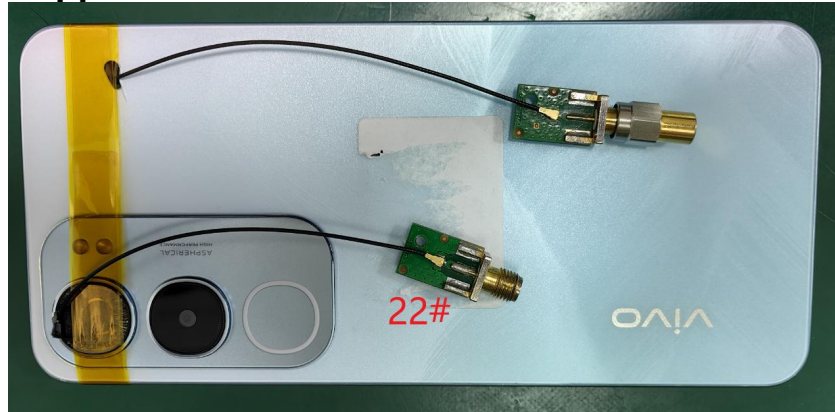
2.1 Client information

Name	vivo
Address	No.1, vivo Road, Chang'an, Dongguan, Guangdong, China
Contacts	/
Tel	/
E-mail	/
Manufacturer	/

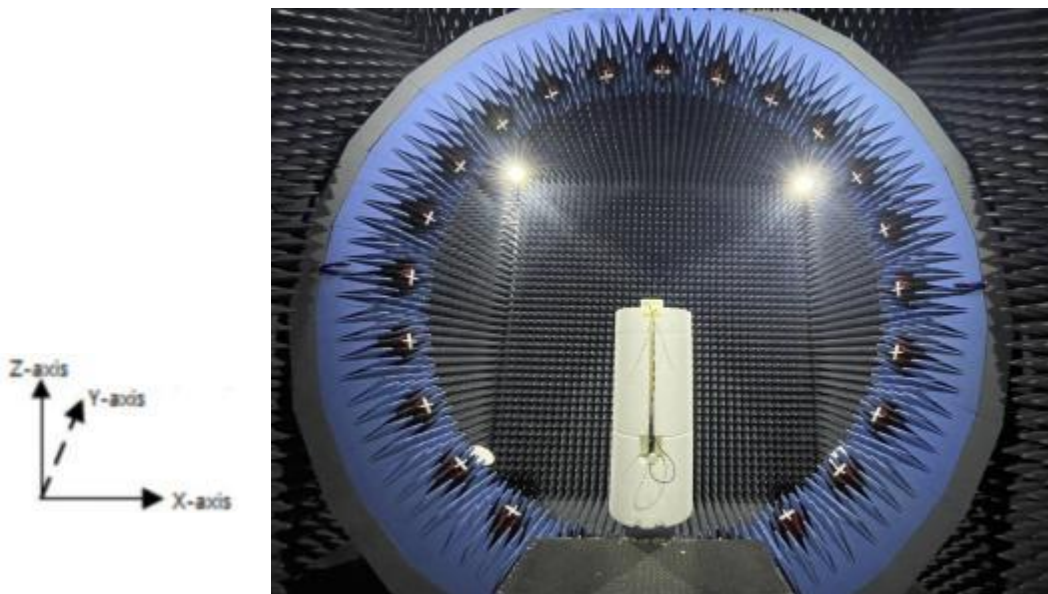
2.2 Description of EUT(S)

Product Name	V2419
Sample Model	PD2420F_EX_A_13.0.4.3.W30.V000L1
Antenna Size	/
Serial No.	/
Antenna Type	PIFA
Test Item	Antenna gain; Efficiency; Radiation pattern
Frequency Range	2400-2500MHz&5150-5850MHz
Received Date	2024.08.15
Test Date	2024.08.15
Remark	/

2.3 EUT appearance



2.4 EUT setup photo of free space OTAtesting



3. Test Results

3.1 Test standard

Name	Parameter	Method	Standard no.
Mobile communication antenna	Antenna gain	Generic specification for antennas used in the mobile communications	GB/T 9410-2008
	Radiation pattern		
Antenna	Radiation efficiency	IEEE Standard Test Procedures for Antennas	ANSI/IEEE Std 149-2021
	Gain and directivity		

3.2 Test uncertainty

The uncertainty was calculated on the basis of the GUM published by ISO, using the inclusion factor of K=2 and the 95% confidence level to express the extended uncertainty.

Item	Uncertainty
Antenna gain	$\pm 1\text{dB}$
Radiation efficiency	$\pm 10\%$

3.3 Test data

3.3.1 Typical free space efficiency and gain

Frequency/MHz	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600
Peak Gain/dBi	-1.2	-2.4	-1.9	-1.5	-0.8	-0.8	-0.6	-0.5	-0.5	-0.7	-1
Efficiency/%	-4.6	-4.1	-3.6	-3.4	-3.4	-3.3	-3.3	-3.3	-3.4	-3.5	-3.9

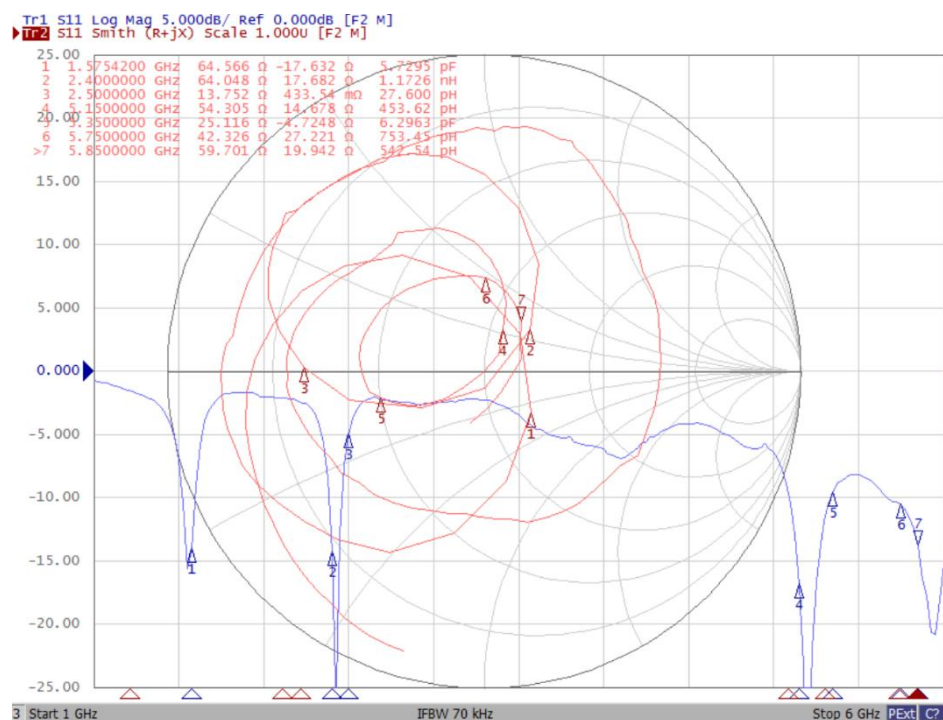
Frequency/MHz	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain/dBi	-1.2	-1.2	-1.4	-1.4	-1.6	-2	-2.4	-2.8	-3.3	-3.9	-4.4
Efficiency/%	-5.9	-5.6	-5.15	-4.9	-4.8	-4.7	-4.8	-4.8	-5.2	-5.5	-6.1

Frequency/MHz	5150	5170	5190	5210	5230	5250	5270	5290	5310	5330	5350
Peak Gain/dBi	0.43	0.52	0.55	0.69	0.40	0.02	0.01	-0.29	-0.41	-0.37	-0.47
Efficiency/%	-3.9	-3.8	-3.7	-3.4	-3.4	-3.6	-3.7	-3.8	-3.9	-4.0	-3.9

Frequency/MHz	5370	5390	5410	5430	5450	5470	5490	5510	5530	5550	5570
Peak Gain/dBi	-0.54	-0.52	-0.42	-0.32	-0.41	-0.60	-0.35	-0.71	-0.71	-0.27	-0.27
Efficiency/%	-4.1	-4.4	-4.5	-4.6	-4.7	-4.7	-4.8	-4.9	-5.1	-5.2	-5.2

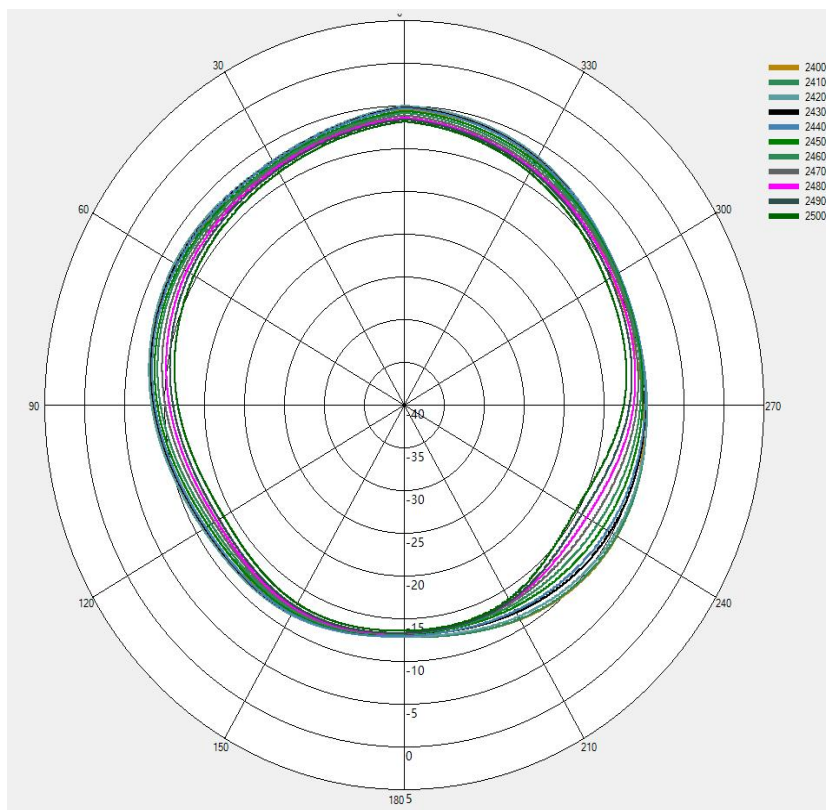
Frequency/MHz	5590	5610	5630	5650	5670	5690	5710	5730	5750	5770	5790
Peak Gain/dBi	0.22	0.19	0.60	0.88	0.89	1.48	1.41	1.88	2.37	2.4	2.47
Efficiency/%	-5.1	-4.9	-4.9	-4.8	-4.9	-5.0	-4.9	-4.7	-4.7	-4.5	-4.2

Frequency/MHz	5810	5830	5850
Peak Gain/dBi	2.29	2.47	2.5
Efficiency/%	-4.1	-3.8	-3.5

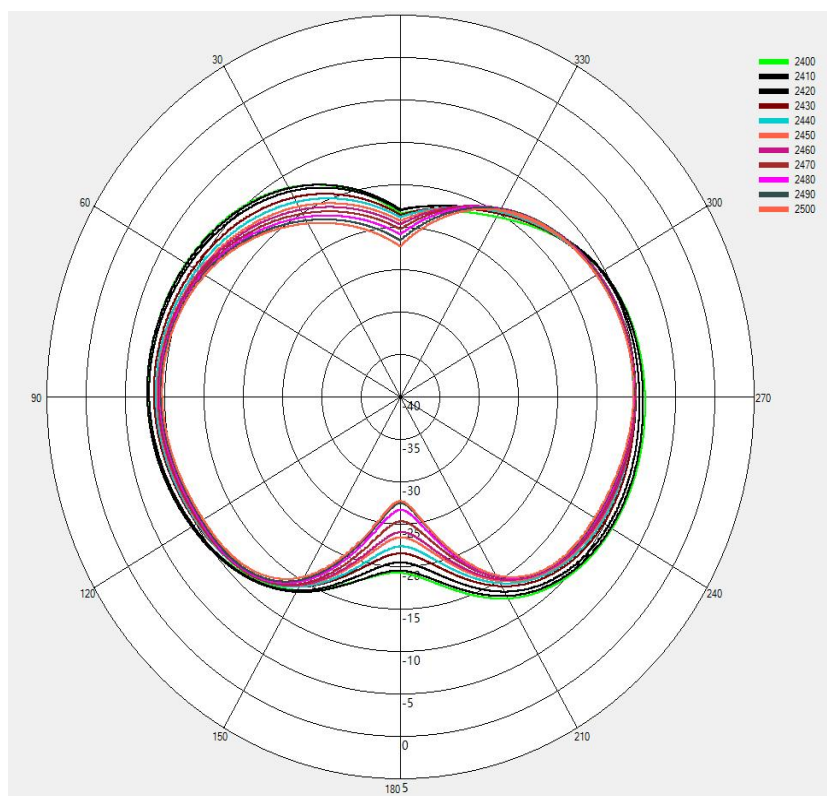


3.3.2 Typical free space radiation pattern

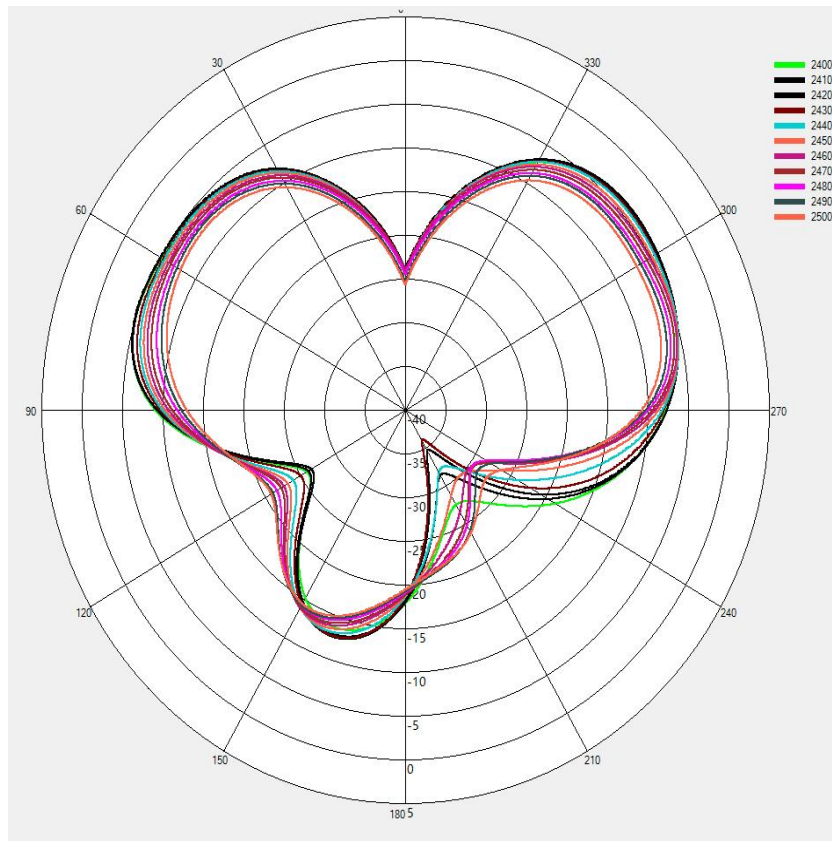
(1) X-Y Plane(unit:dBi):



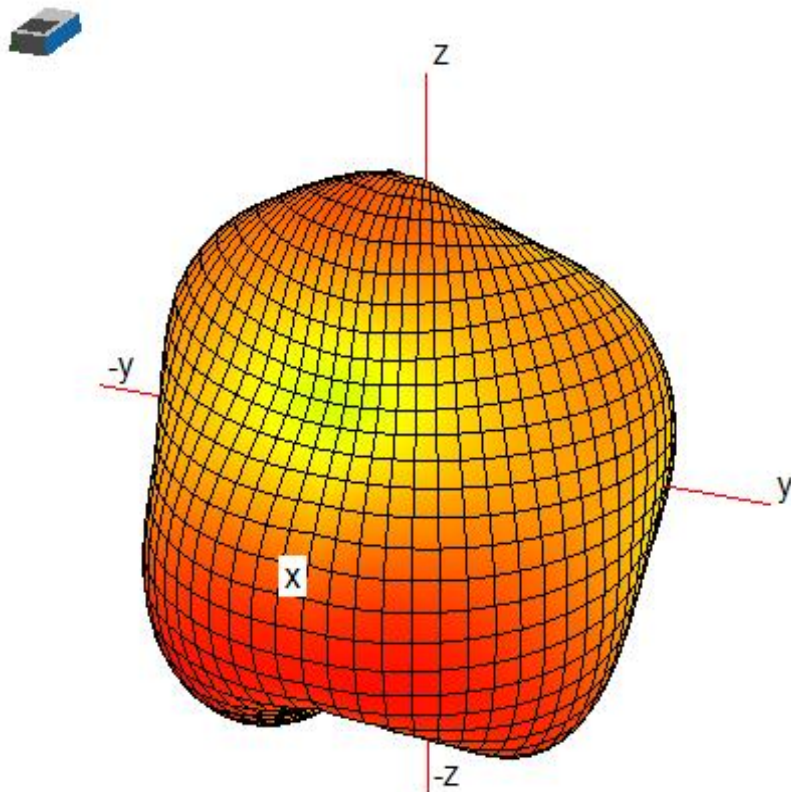
(2) X-Z Plane(unit:dBi):



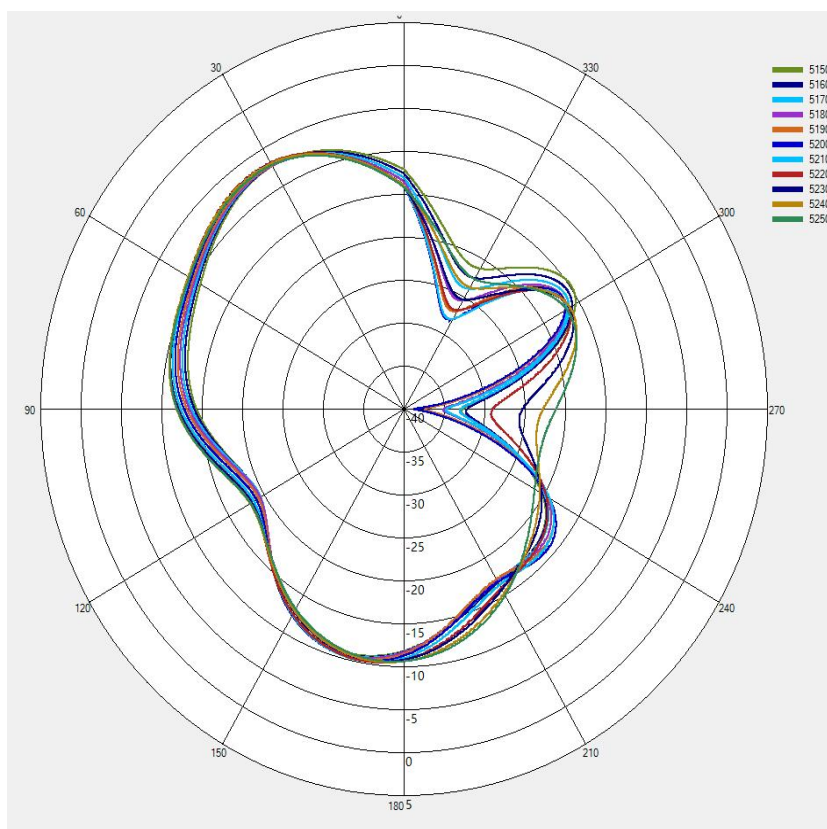
(3) Y-Z Plane(unit:dBi):



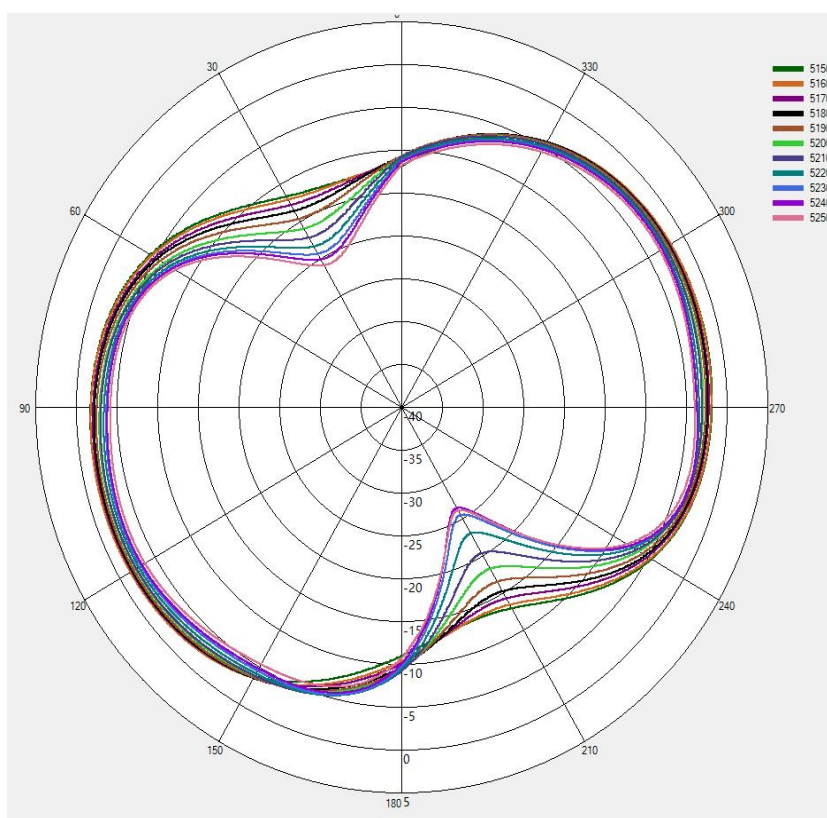
(4) Typical Free Space 3D Radiation Pattern at 2.5GHz(unit:dBi):



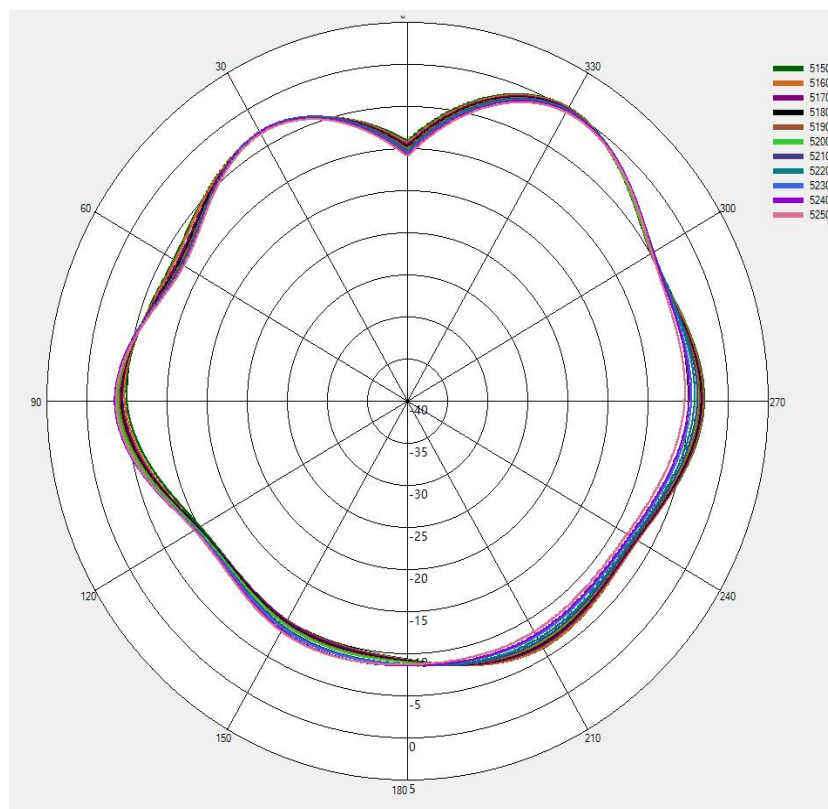
(5) X-Y Plane(unit:dBi)



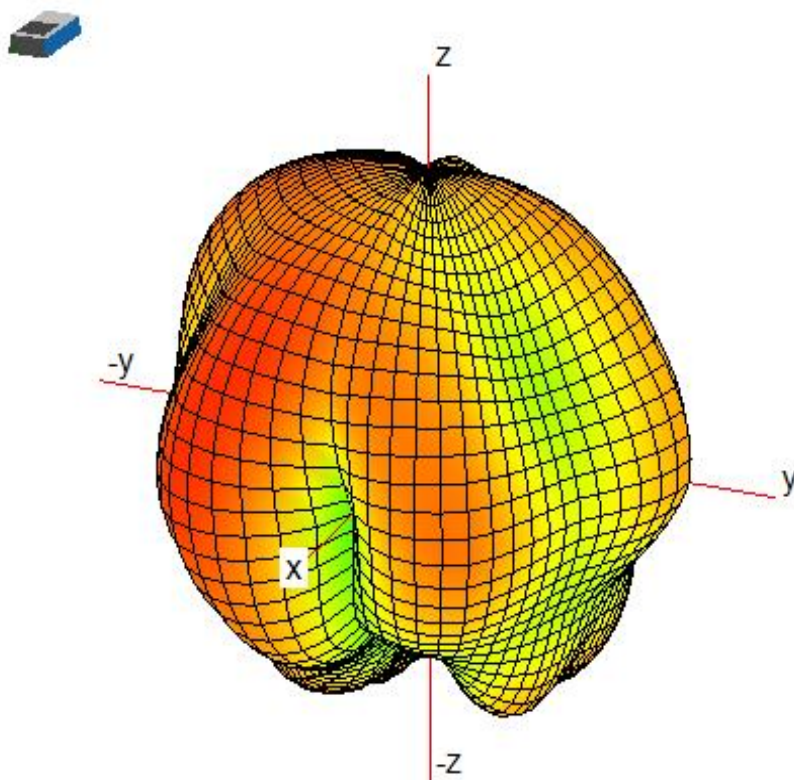
(6) X-Z Plane(unit:dBi):



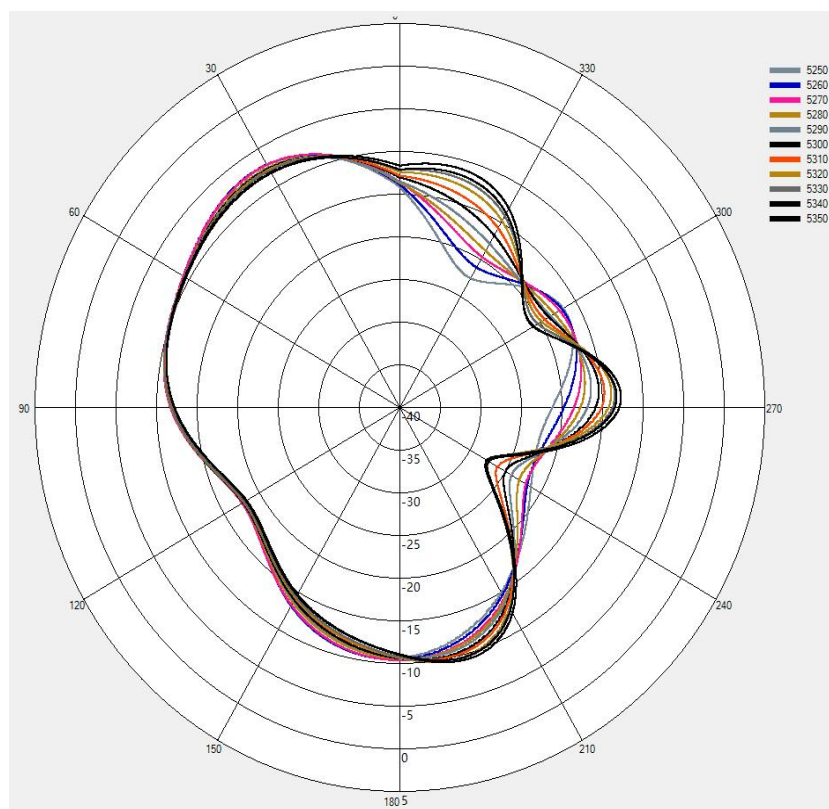
(7) Y-Z Plane(unit:dBi):



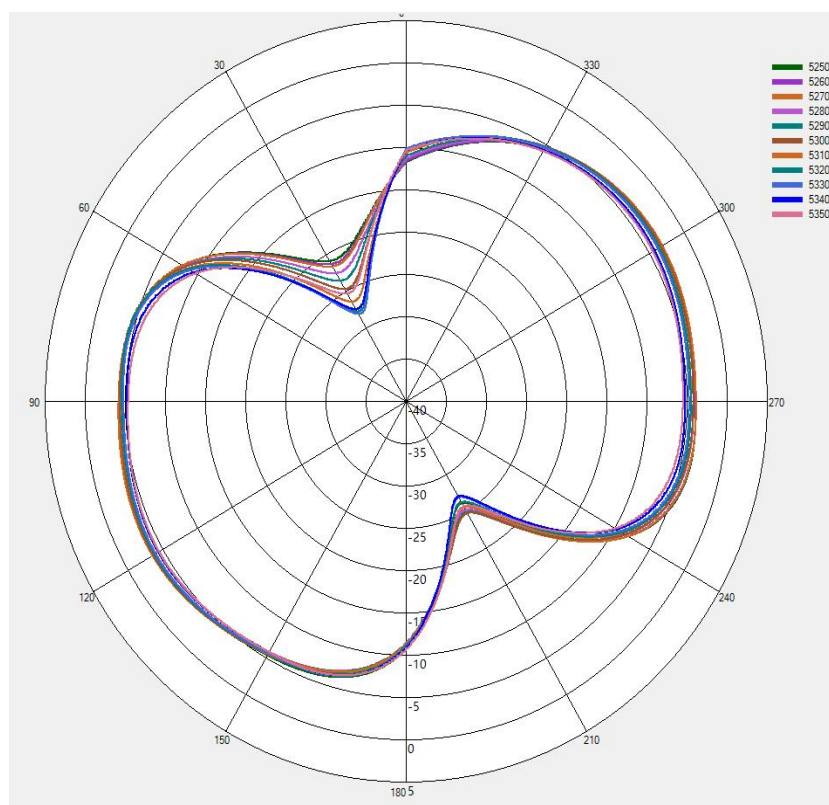
(8) Typical Free Space 3D Radiation Pattern at 5.15GHz(unit:dBi):



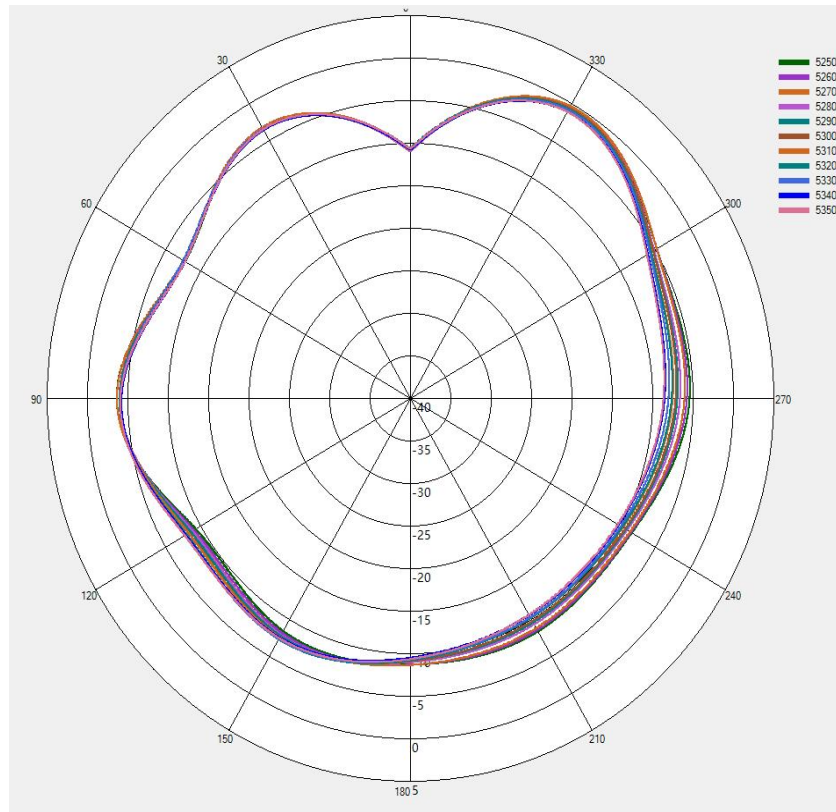
(9) X-Y Plane(unit:dBi):



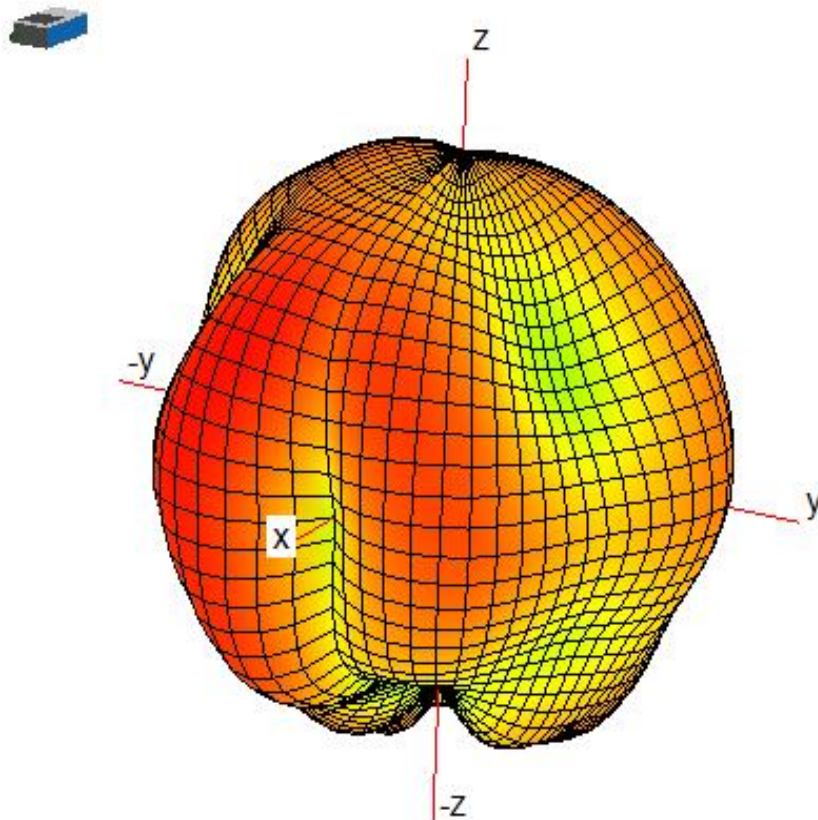
(10) X-Z Plane(unit:dBi):



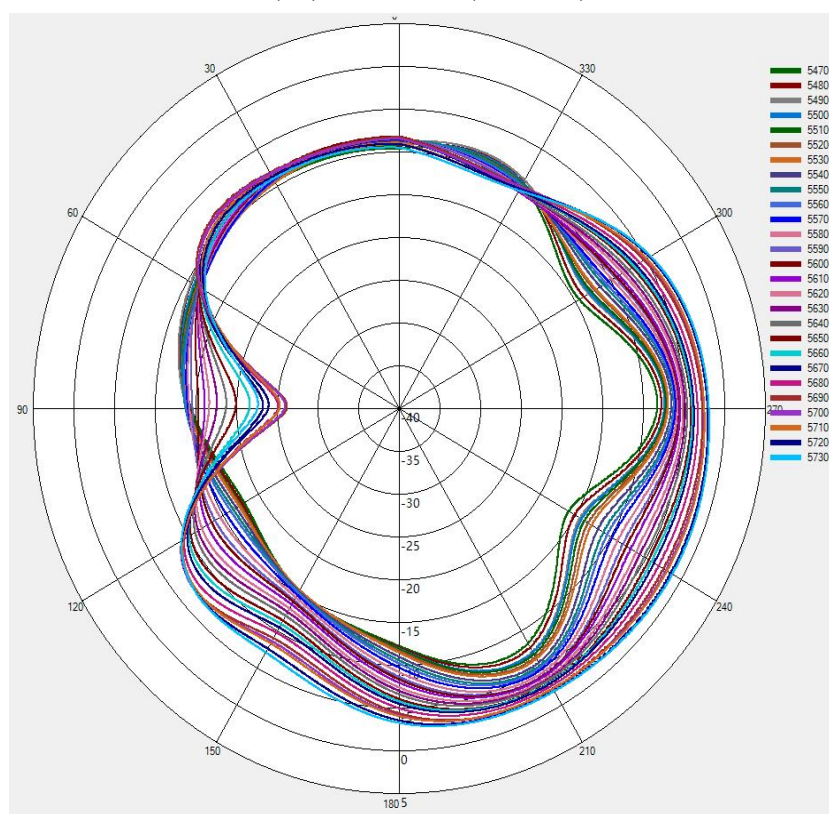
(11) Y-Z Plane(unit:dBi):



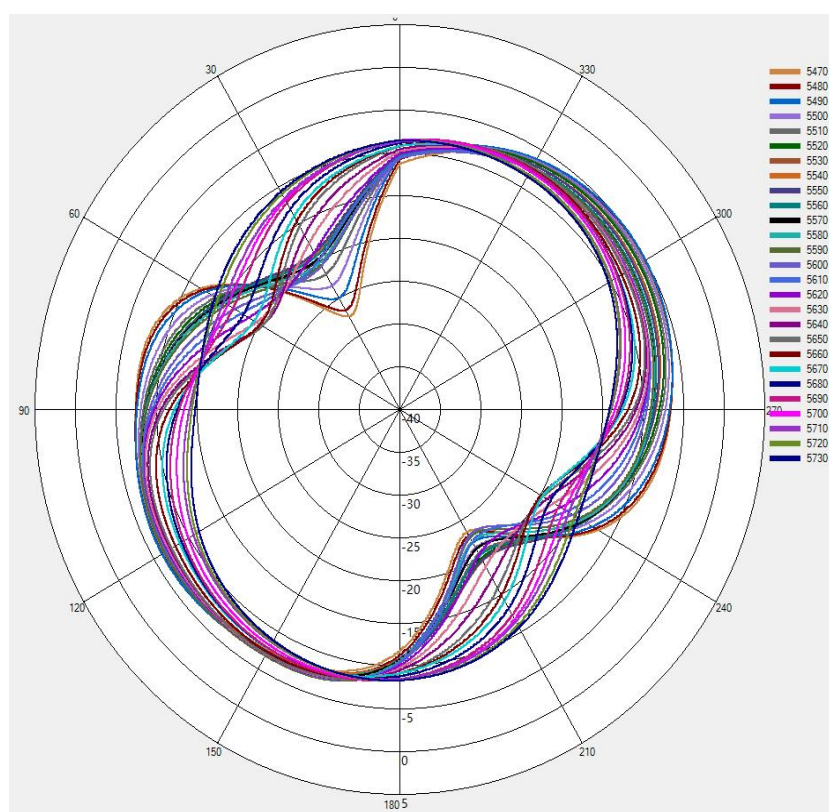
Typical Free Space 3D Radiation Pattern at 5.25GHz(unit:dBi): (12)



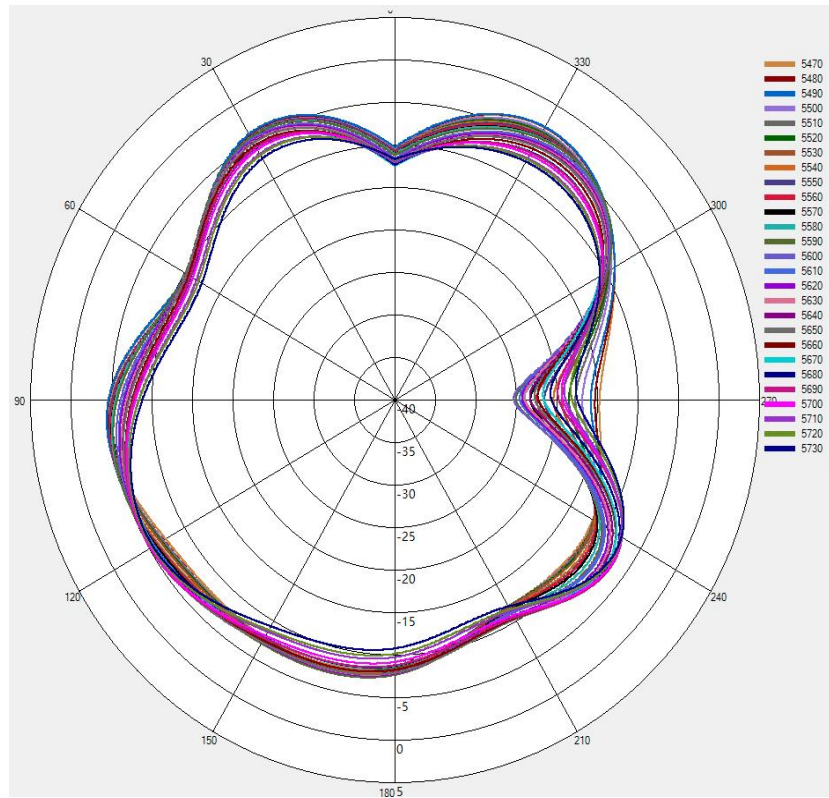
(13) X-Y Plane(unit:dBi)



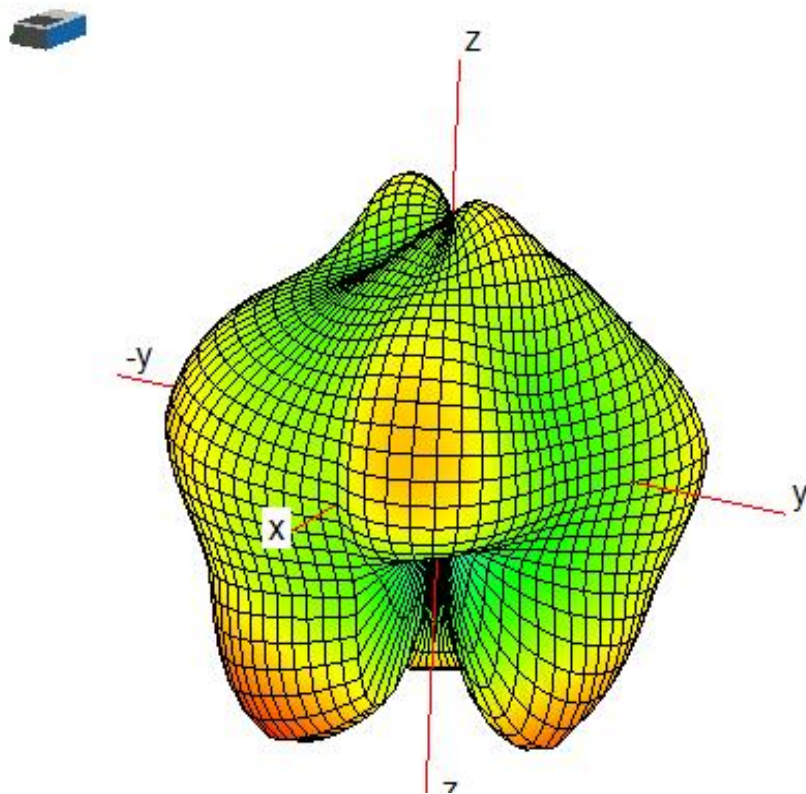
(14) X-Z Plane(unit:dBi):



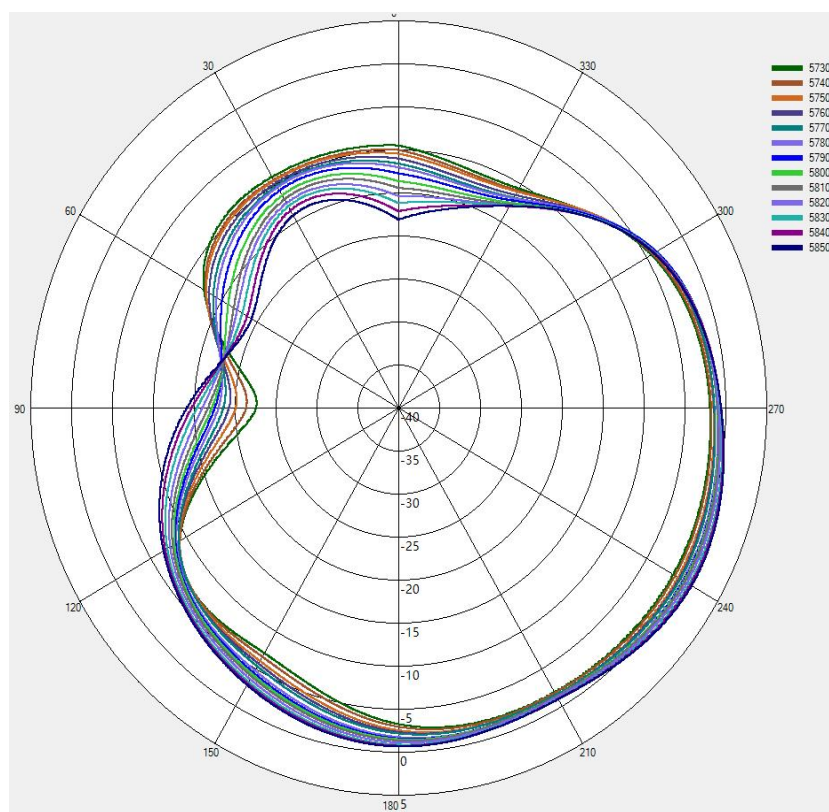
(15) Y-Z Plane(unit:dBi):



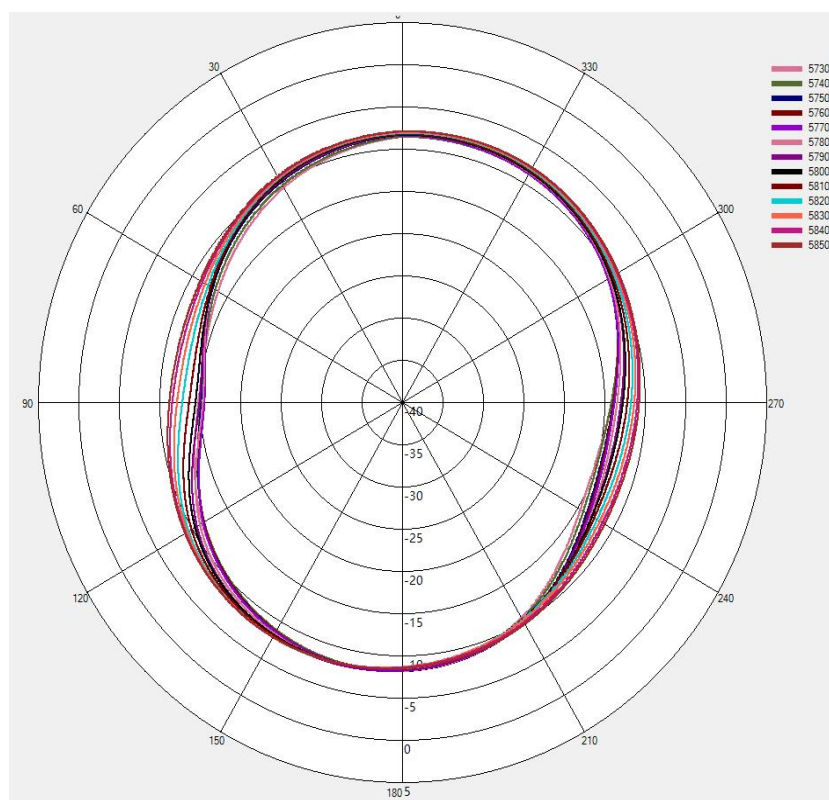
(16) Typical Free Space 3D Radiation Pattern at 5.47GHz(unit:dBi):



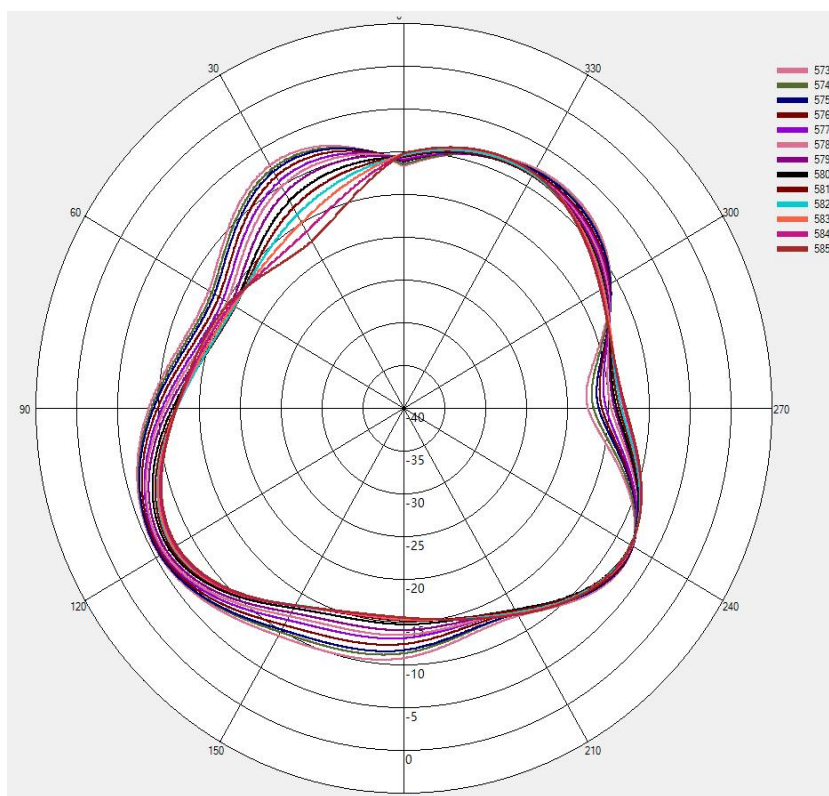
(17) X-Y Plane(unit:dBi)



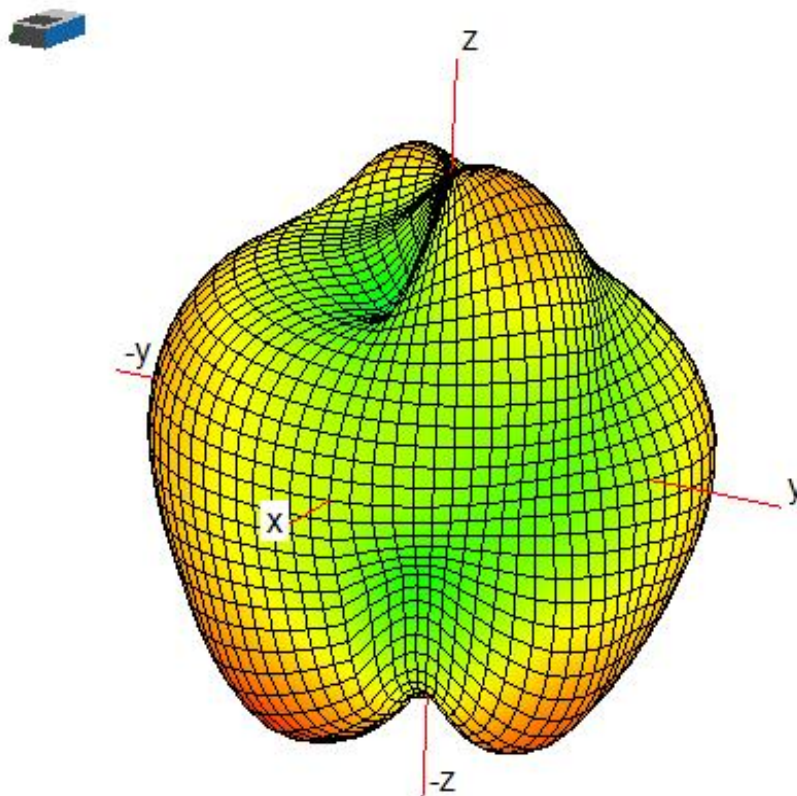
(18) X-Z Plane(unit:dBi):



(19) Y-Z Plane(unit:dBi):



(20) Typical Free Space 3D Radiation Pattern at 5.85GHz(unit:dBi):



End

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