



ShenZhen Huaxinwei communication technology
Co.,Ltd.

Antenna test report

Customer Name: FreeYond

Project Name: M5A

Designer: Zhang Jun

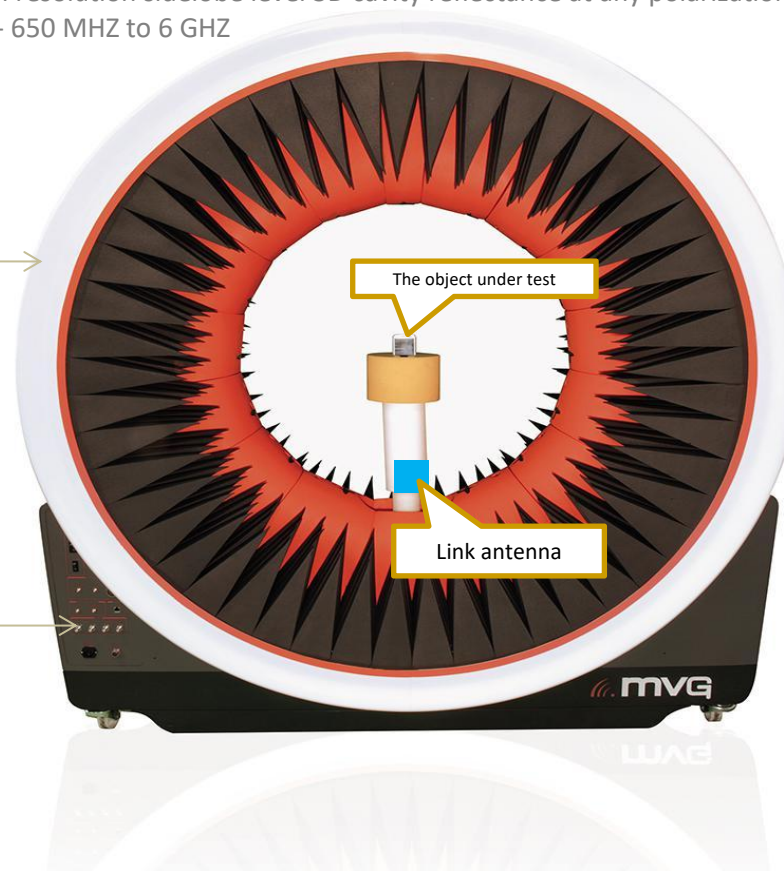
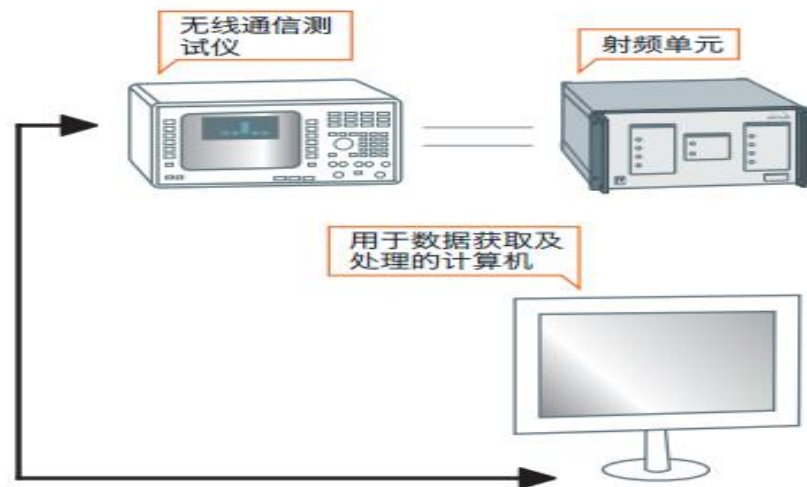
Date: 2023/04/19



The customer name		FreeYond	Project Name	M5A
NO.	project	Detailed above		
1	spectrum	GSM850/900/1800/1900+WCDMA-B1/2/4/5/8+LTE-B1/2/3/4/5/7/8/12/17/20/28/66/40/41+GPS/WIFI/BT		
2	Project type	The mobile phone		
3	Antenna space area			
4	Feed point type			
5	The sensitivity			
6	Type of antenna			
7	The length of the PCB board			
8	note	Debugging prototype		
RF		Zhang Jun	13430515055	hxw_xiaozhang@126.com

1、Test system and test equipment

System Brand: MVG(SATIMO) measurement features: gain • pattern beamwidth cross polarization resolution sidelobe level 3D cavity reflectance at any polarization cavity reflectance (line or arc) antenna efficiency TRP, TIS, EIRP and EIS. Frequency band: StarLab 6 GHZ - 650 MHZ to 6 GHZ



TIS预计测量时间 (一个信道每隔30° 取样)

灵敏度算法 \ 标准	GSM GPRS EDGE	CDMA 1 x RTT 1 x EvDO	WCDMA HSDPA LTE FDD/TDD	Wi-Fi 802.11 a/b/g/n	CTIA 批准方法
RSSI模式+线性化+TIS补偿	8 min		10 min		是
EIS模式+TIS补偿		5 min		5 min	是 ²
快速CDMA		8 min			No
EIRP模式+TIS补偿				10 min	No

1、根据RTC
2、根据协议



TIS 3D方位切割强度图



TRP 3D方位切割强度图

Test Equipment

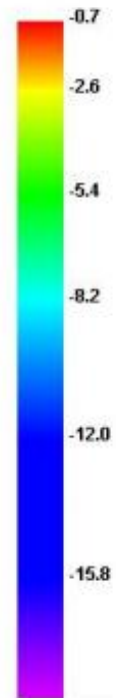
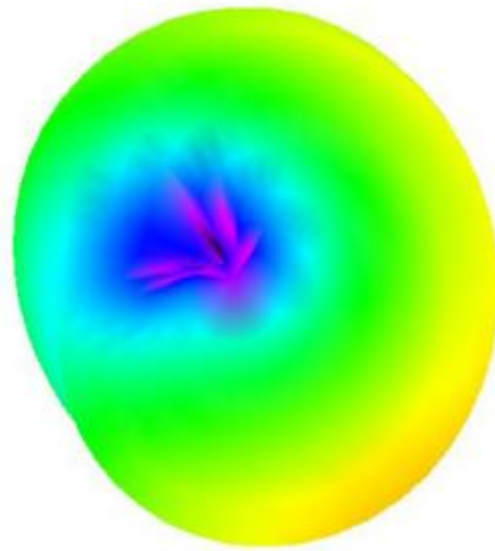


Efficient (2G+3G+4G+2. 4G-WiFi /BT)

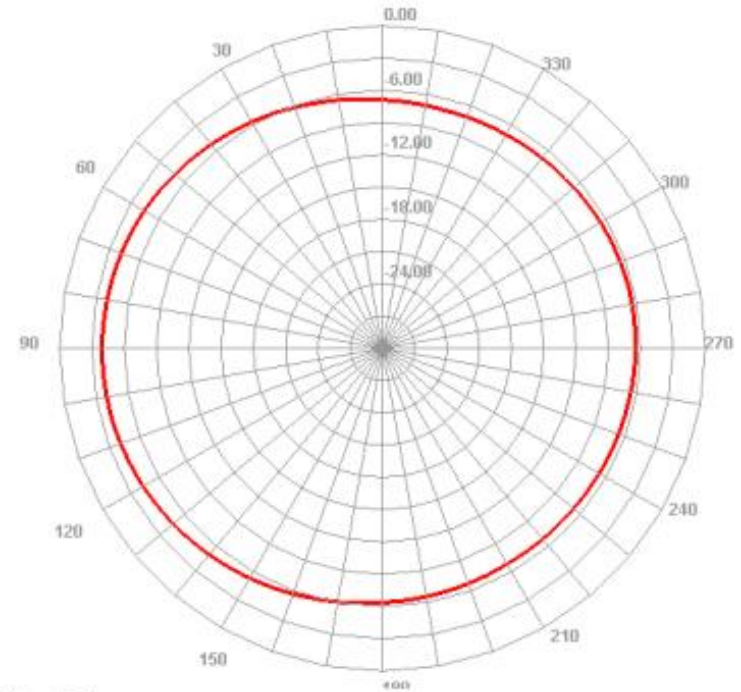
PEAK GAIN			
2G:	Frequency range	Effi %	Gaim dBi
GSM850	824~894Mhz	21. 80	-0. 71
GSM900	880~960Mhz	20. 84	-1. 05
DCS1800	1710~1880Mhz	28. 62	0. 63
PCS1900	1850~1990Mhz	30. 81	0. 81
3G:			
W1	1920~2170Mhz	37. 45	0. 91
W2	1850~1990Mhz	30. 81	0. 81
W4	1710~2155Mhz	31. 07	0. 92
W5	824~894Mhz	21. 80	-0. 71
W8	880~960Mhz	20. 84	-1. 05
4G:			
LTE-B1	1920~2170Mhz	37. 45	0. 91
LTE-B2	1850~1990Mhz	30. 81	0. 81
LTE-B3	1710~1880Mhz	28. 62	0. 63
LTE-B4	1710~2155Mhz	31. 07	0. 92
LTE-B5	824~894Mhz	21. 80	-0. 71
LTE-B7	2500~2690Mhz	28. 01	1. 12
LTE-B8	880~960Mhz	20. 84	-1. 05
LTE-B12	698~746Mhz	19. 03	-1. 42
LTE-B17	704~746Mhz	19. 04	-1. 42
LTE-B20	791~862Mhz	20. 84	-0. 71
LTE-B28	708~798Mhz	19. 05	-1. 42
LTE-B66	1710~2170Mhz	31. 08	0. 92
LTE-B40	2300~2400Mhz	29. 21	1. 14
LTE-B41	2500~2690Mhz	28. 03	1. 12
5G-WIFI	5150~5250Mhz	37. 81	1. 81
	5725~5850Mhz	37. 16	1. 91
2. 4G-WIFI	2400~2500Mhz	42. 52	1. 37
BT	2400~2500Mhz	42. 51	1. 37
GPS	1575Mhz	38. 73	0. 43

Efficient (791–894MHz)

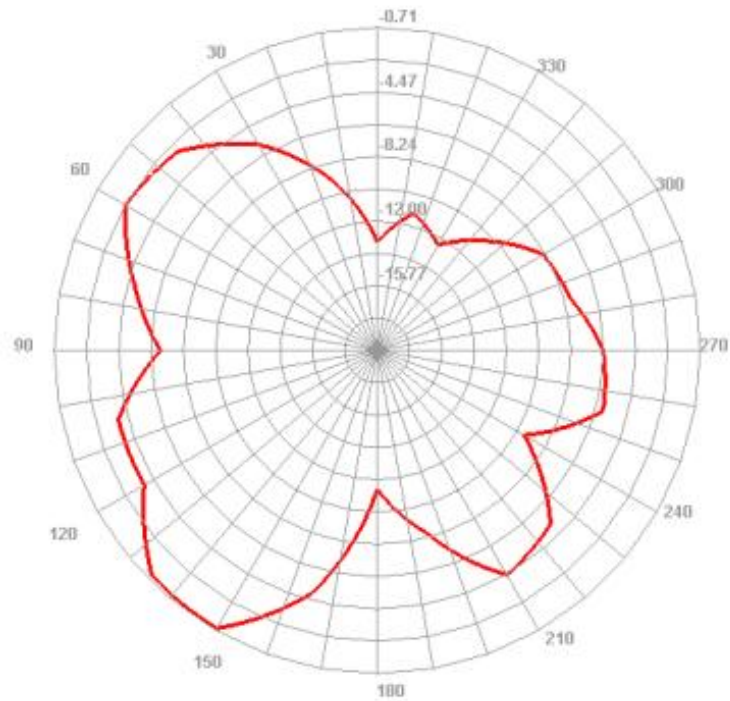
830.000MHz



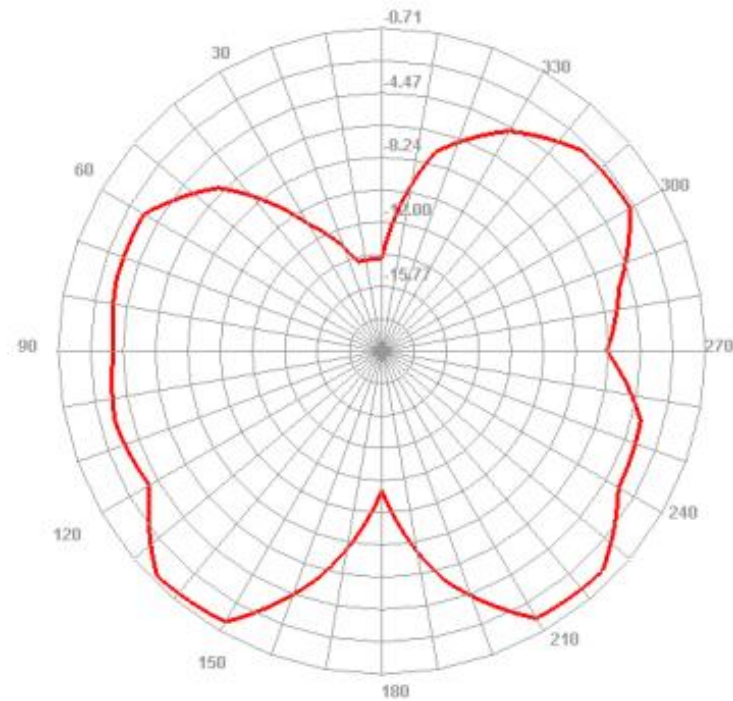
830.000MHz H



830.000MHz E1

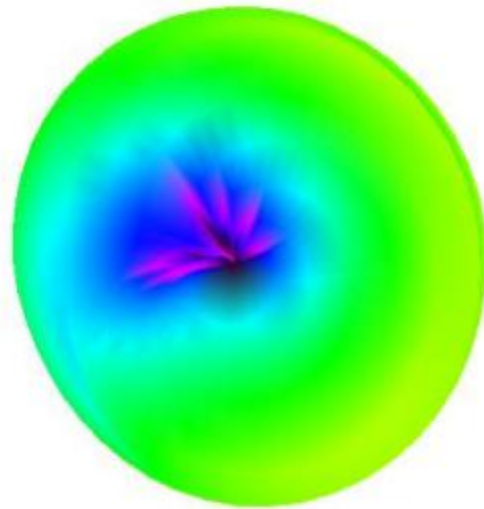


830.000MHz E2

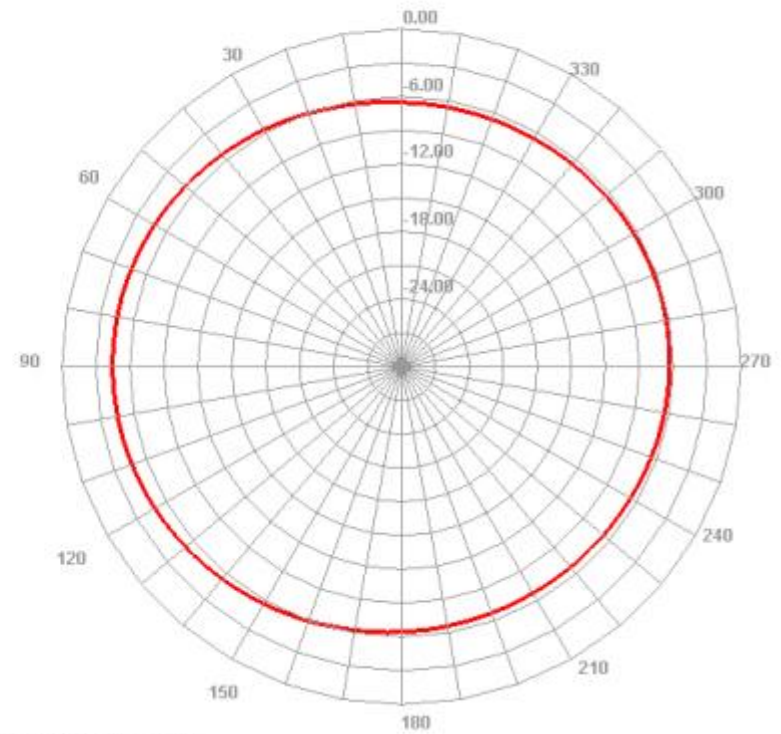


Efficient (880–960MHz)

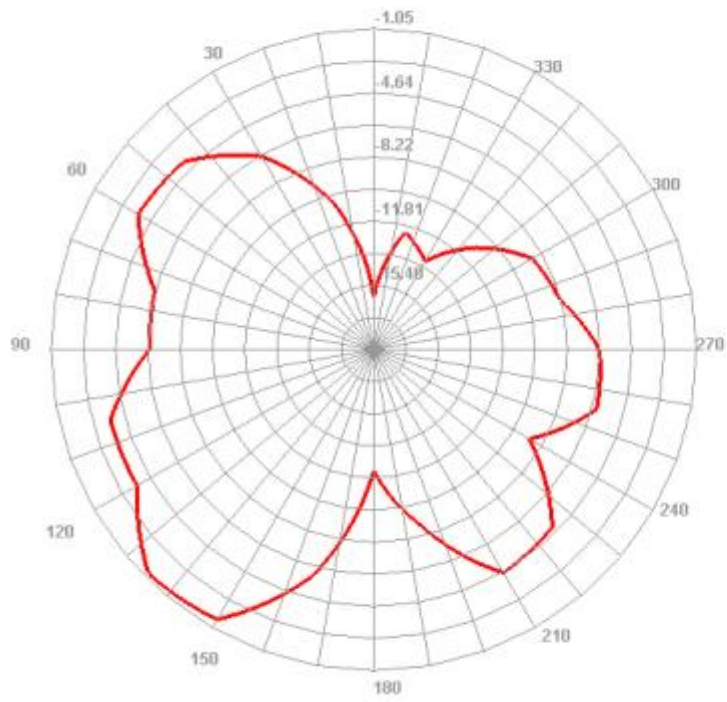
900.000MHz



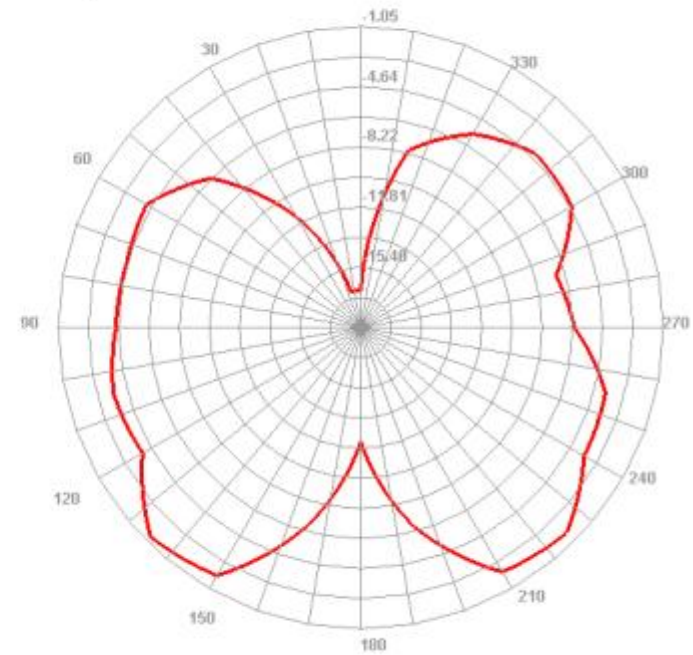
900.000MHz H



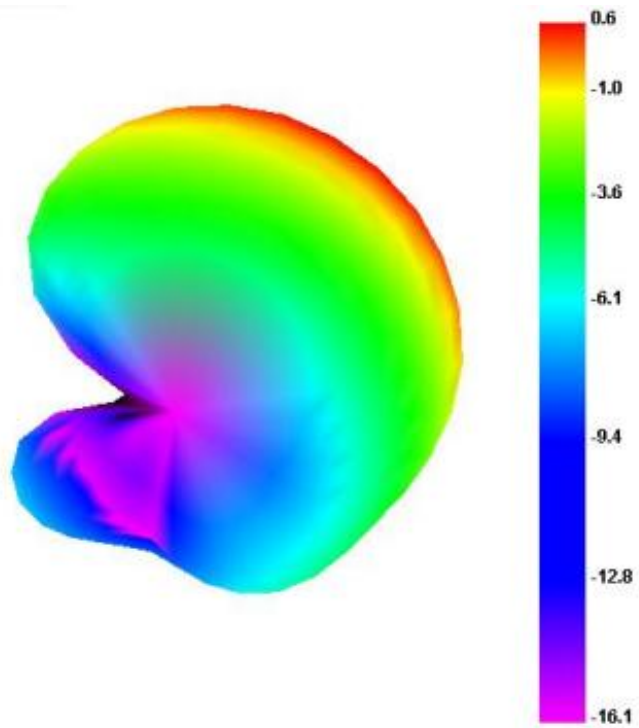
900.000MHz E1



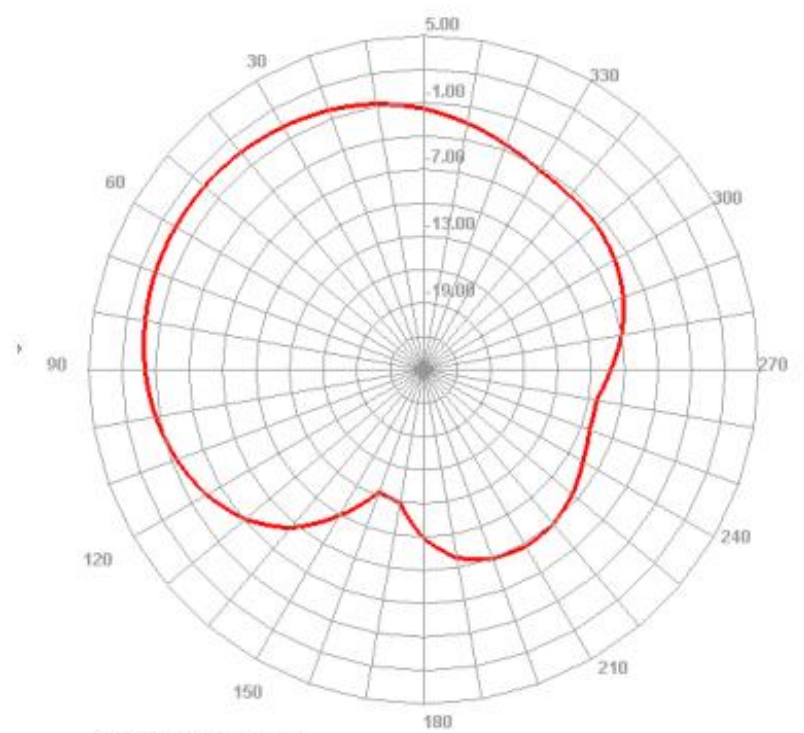
900.000MHz E2



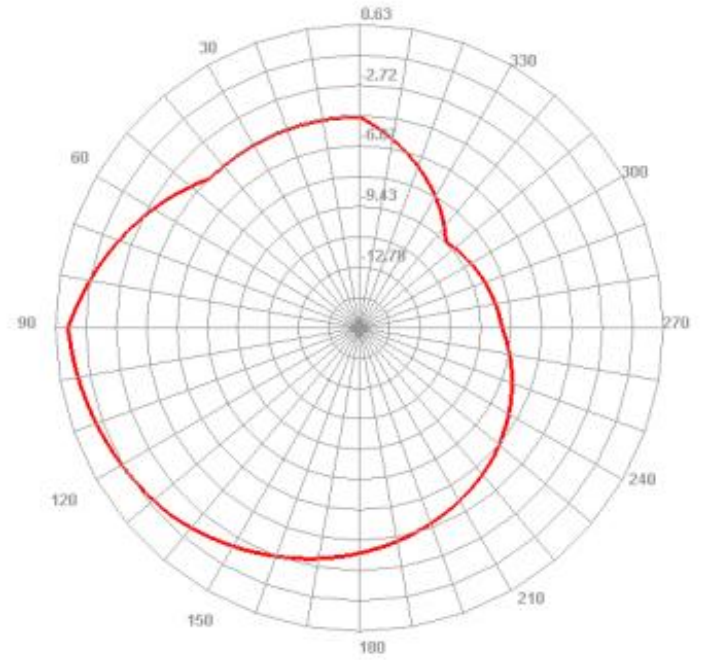
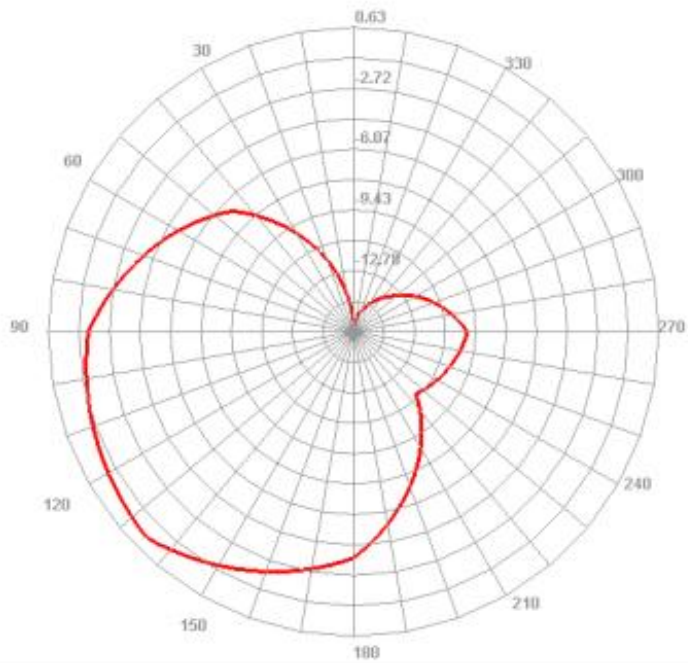
Efficient (1710–1880MHz)



1820.000MHz E1

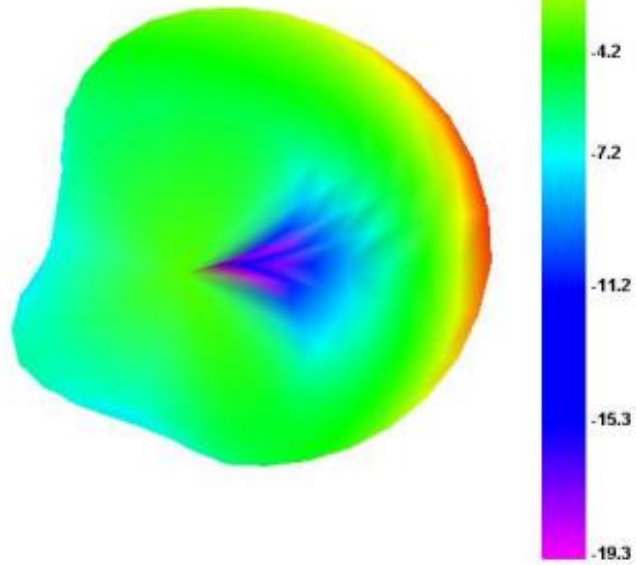


1820.000MHz E2

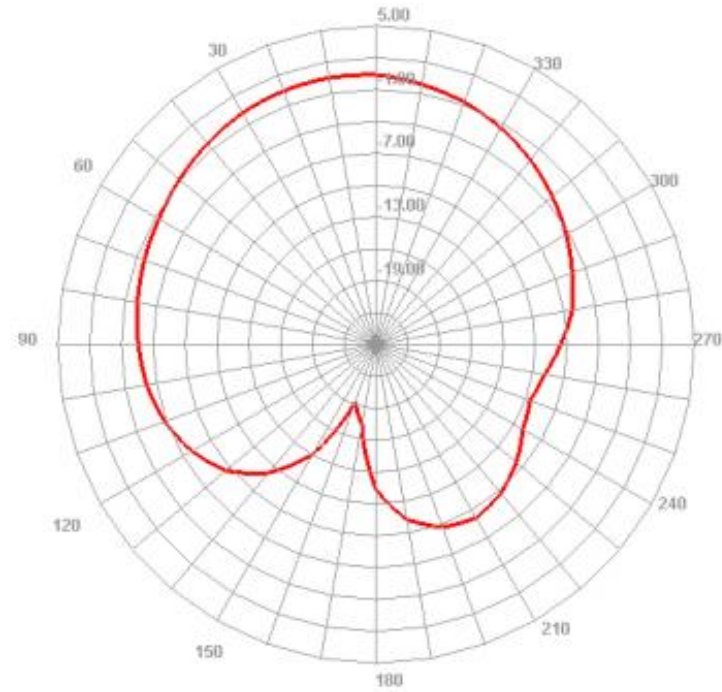


Efficient (1710–1990MHz)

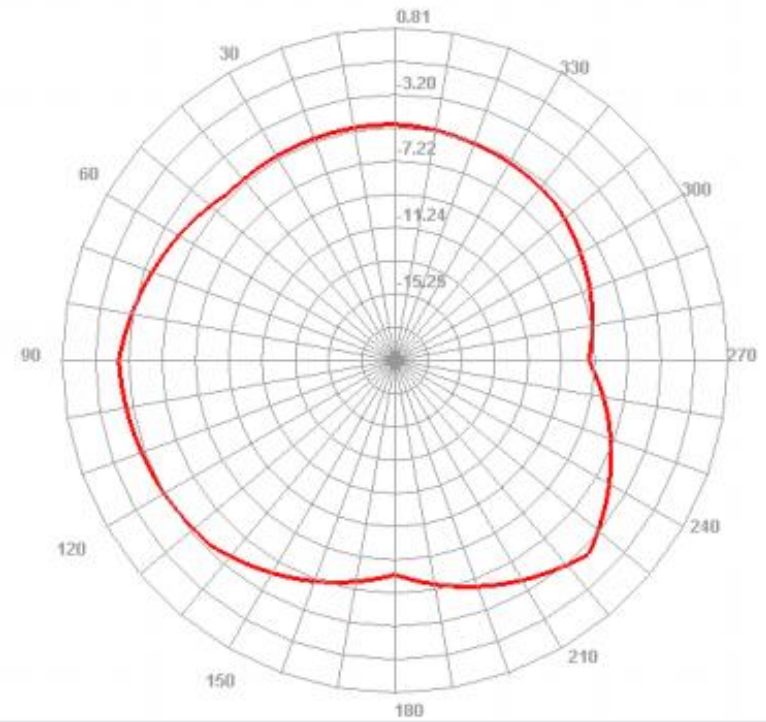
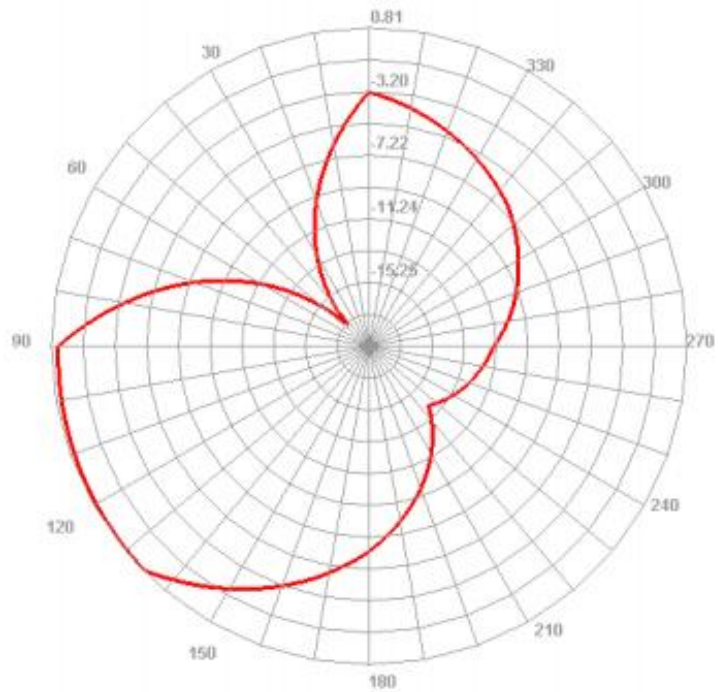
1920.000MHz



1920.000MHz H

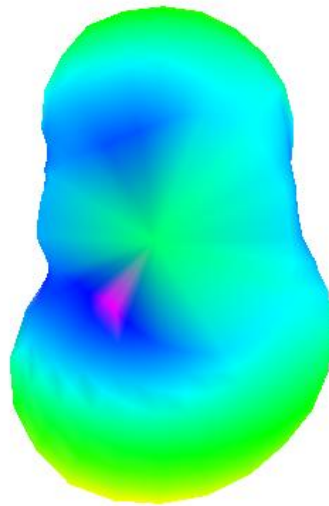


1920.000MHz E1

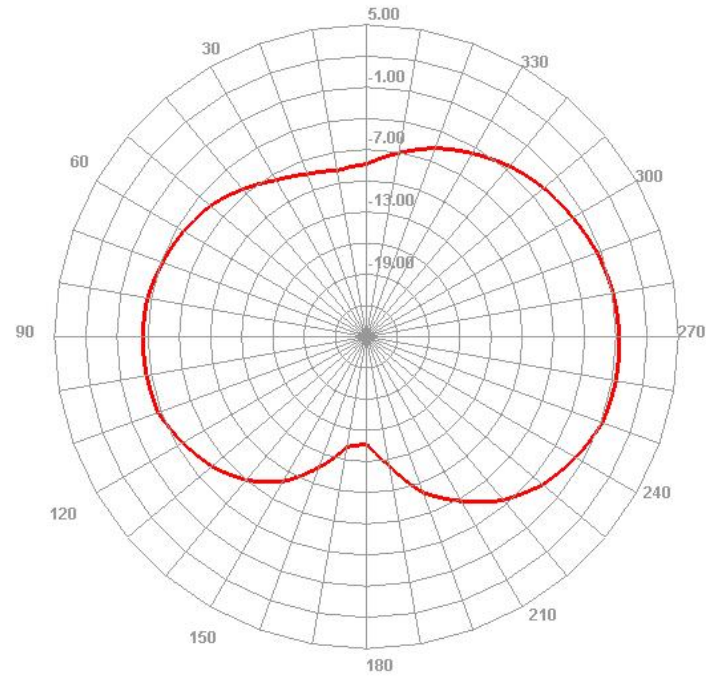


Efficient (1920-2170MHz)

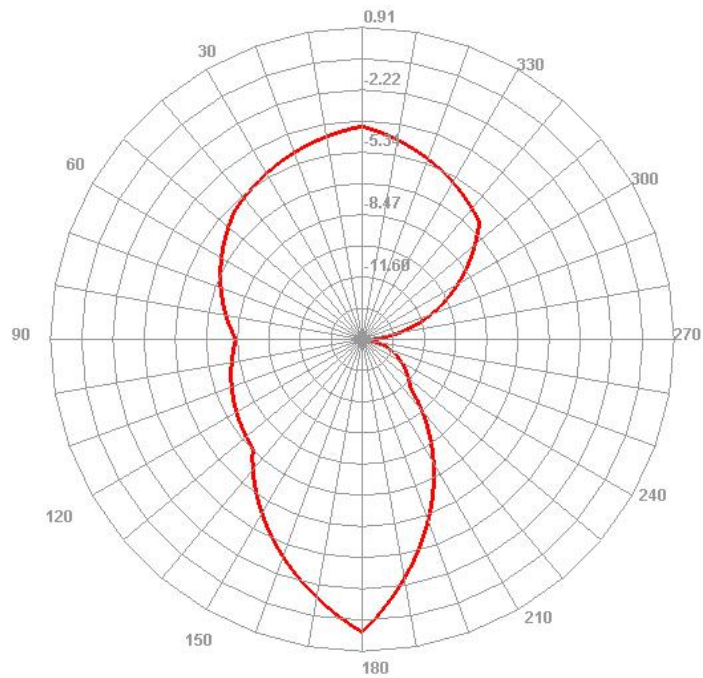
2010.000MHz



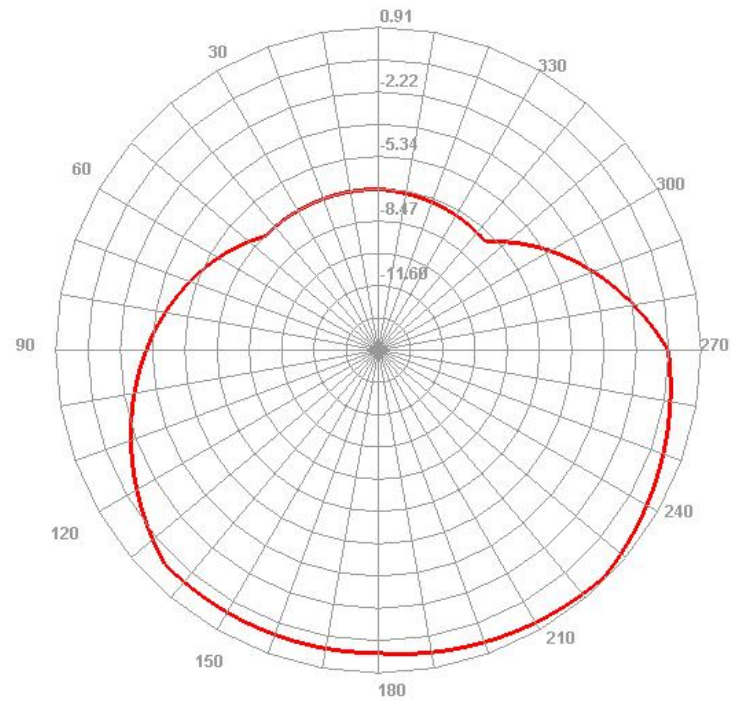
2010.000MHz H



2010.000MHz E1

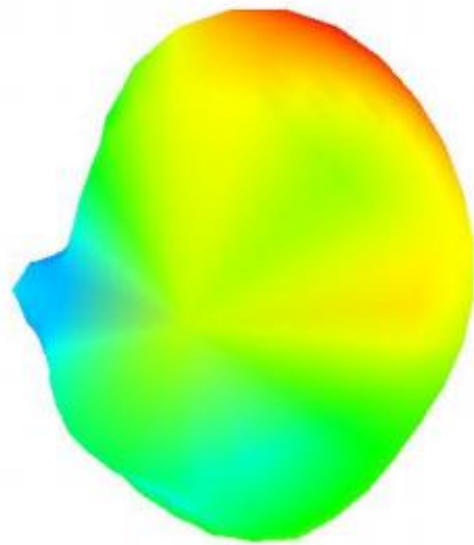


2010.000MHz E2

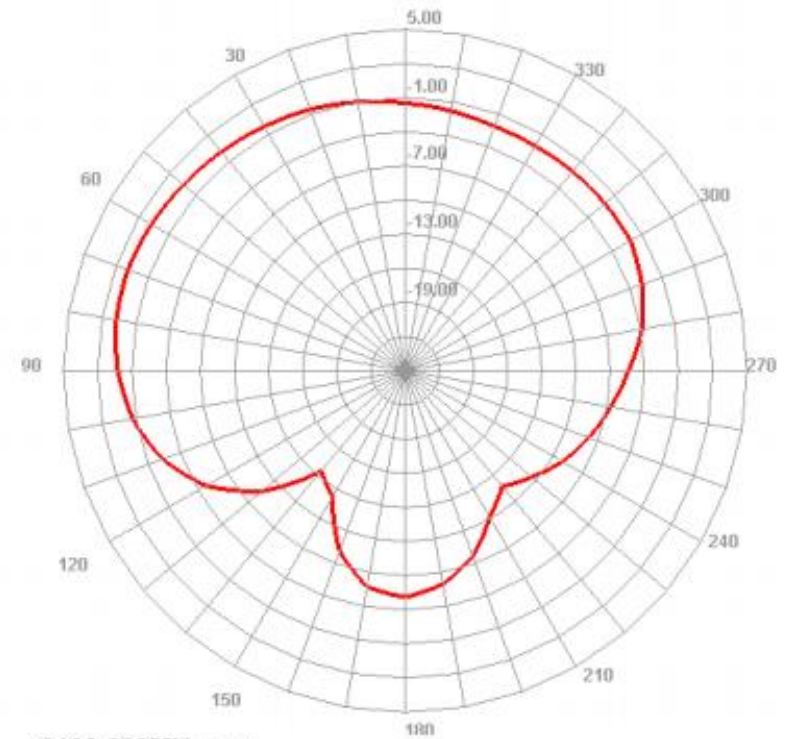


Efficient (1710-2170MHz)

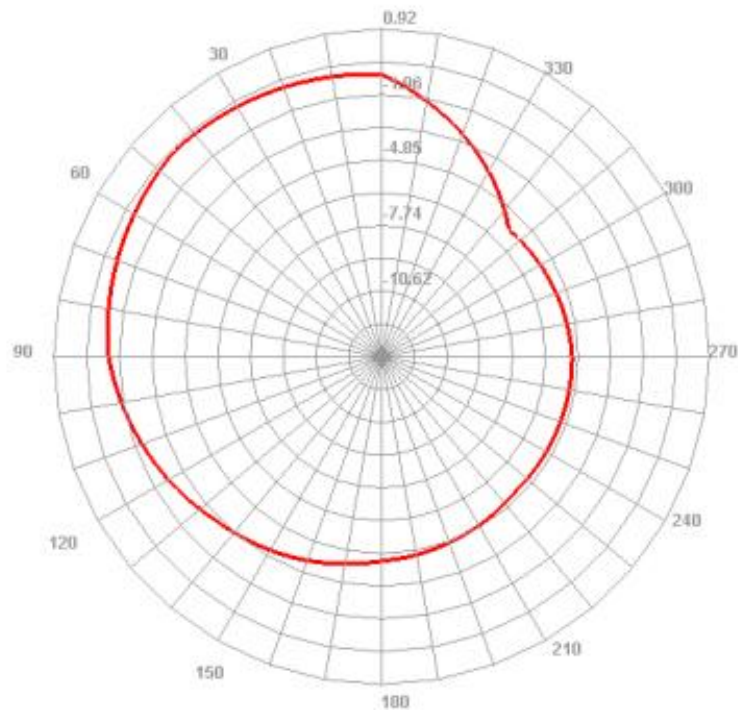
2160.000MHz



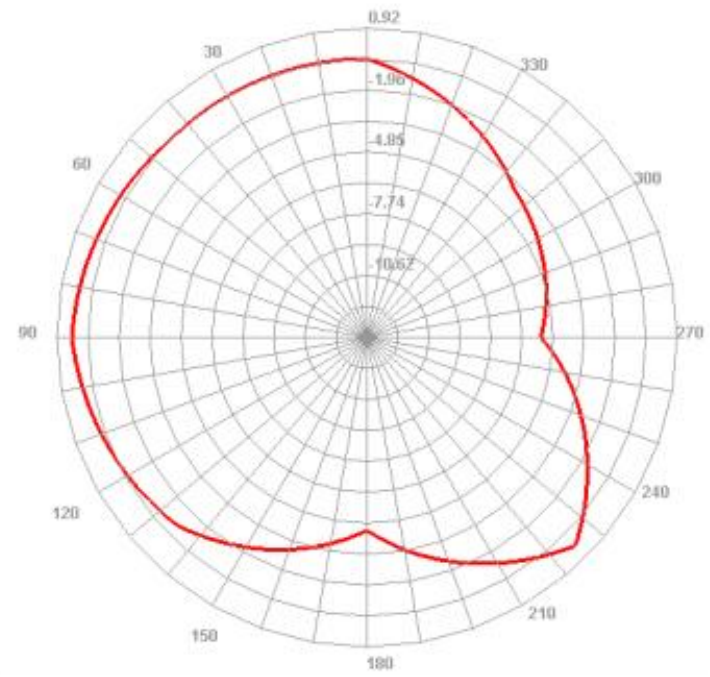
2160.000MHz H



2160.000MHz E1

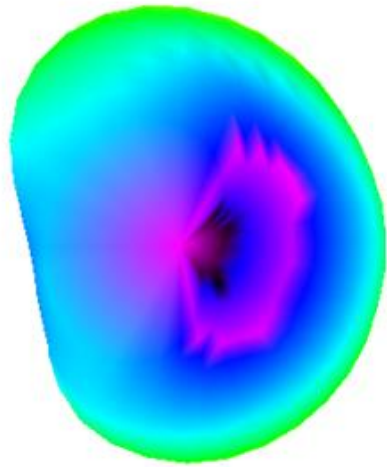


2160.000MHz E2

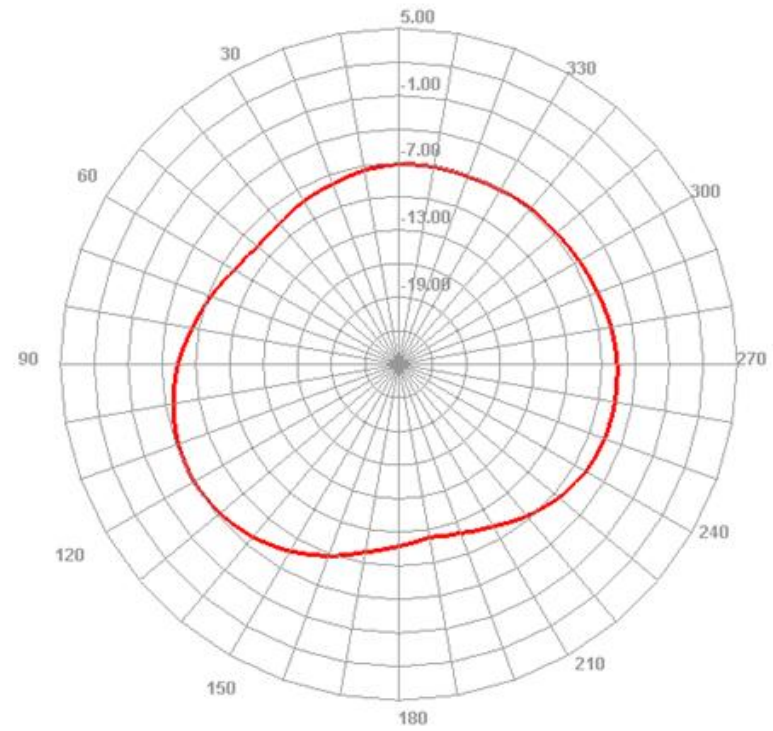


Efficient (2500–2690MHz)

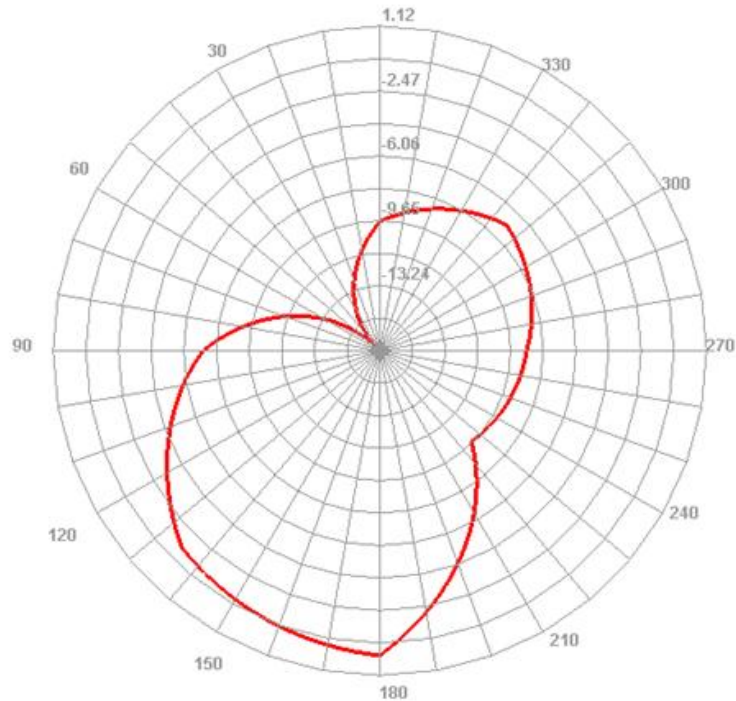
2660.000MHz



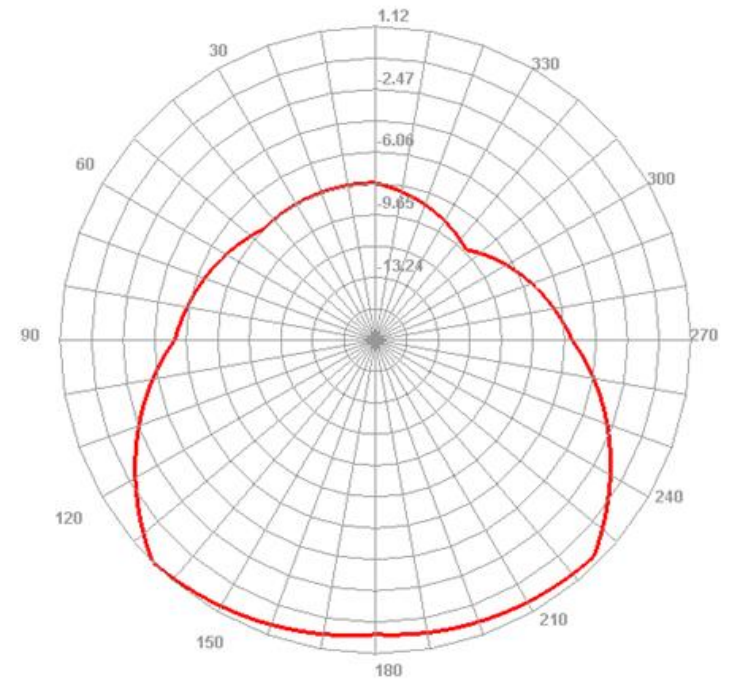
2660.000MHz H



2660.000MHz E1

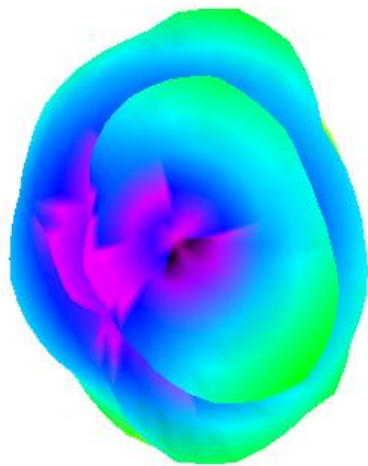


2660.000MHz E2

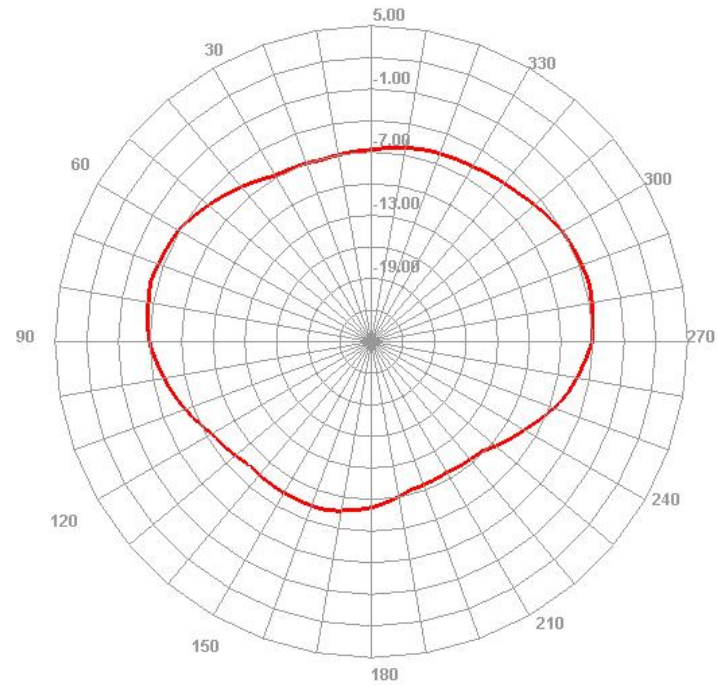


Efficient (2300–2400MHz)

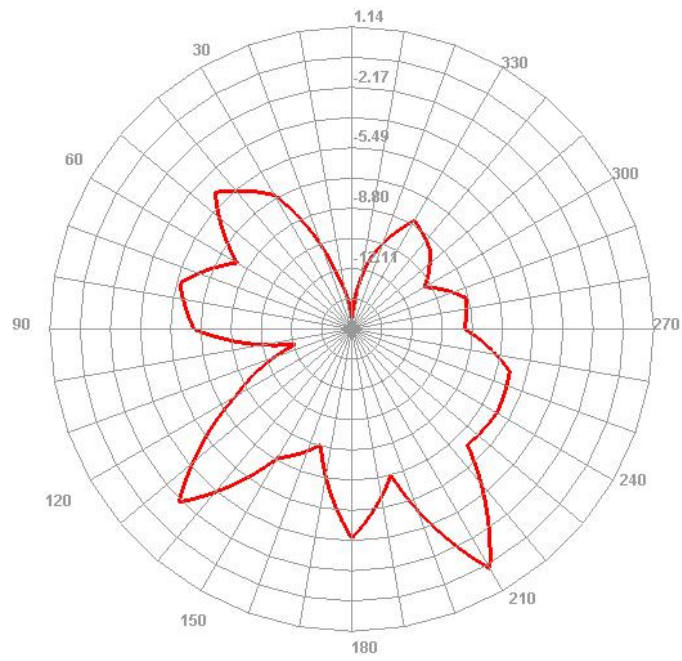
2370.000MHz



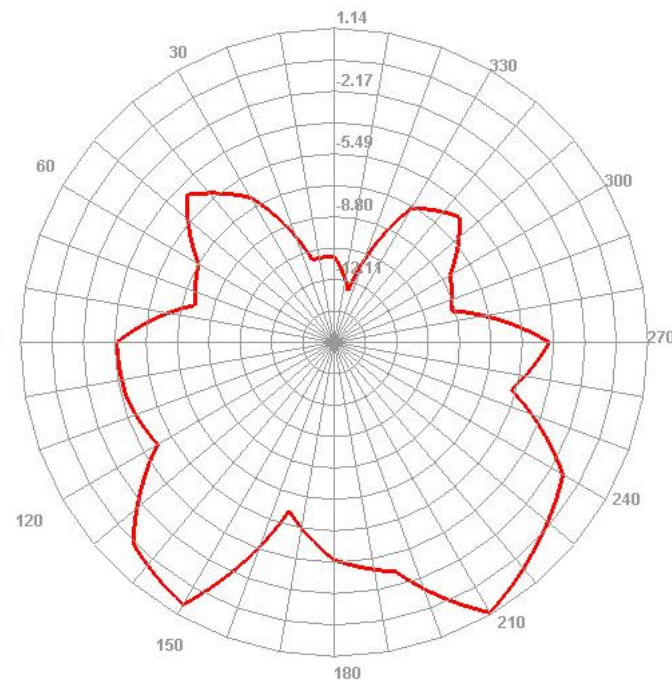
2370.000MHz H



2370.000MHz E1

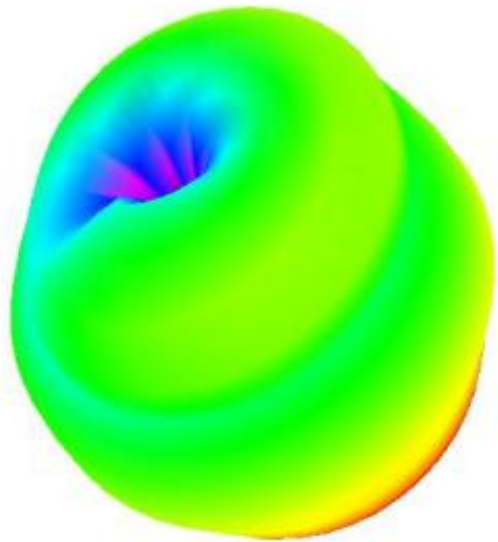


2370.000MHz E2

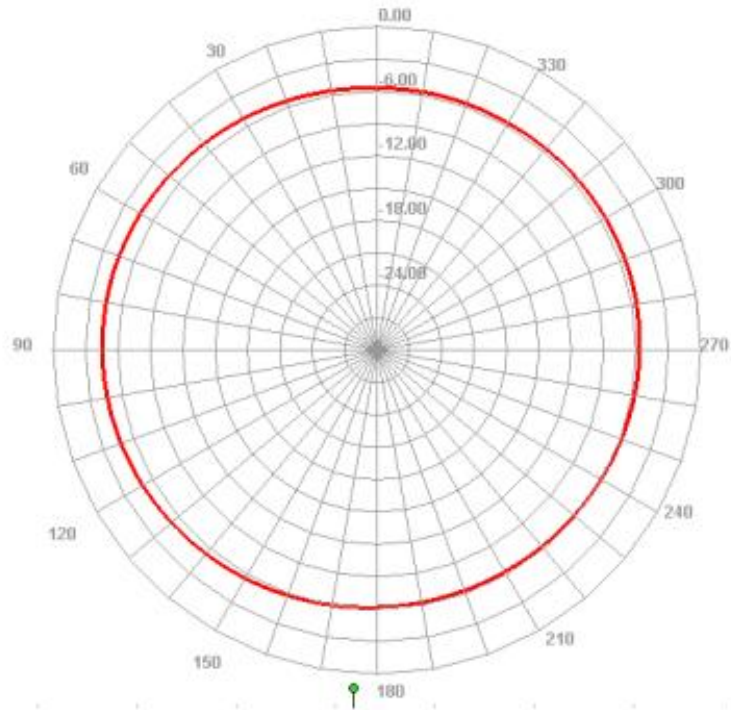


Efficient (698-798MHz)

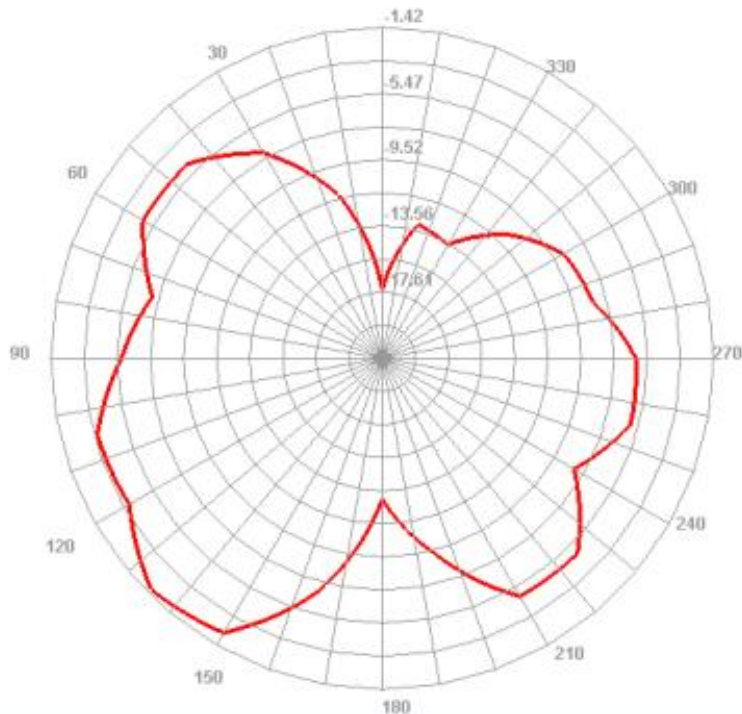
710.000MHz



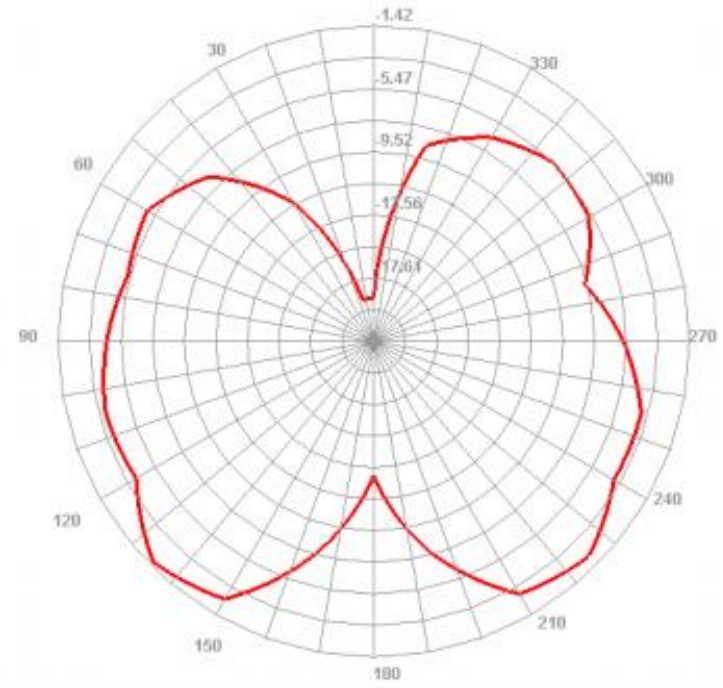
710.000MHz H



710.000MHz E1

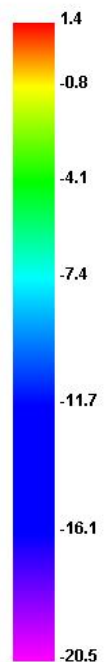
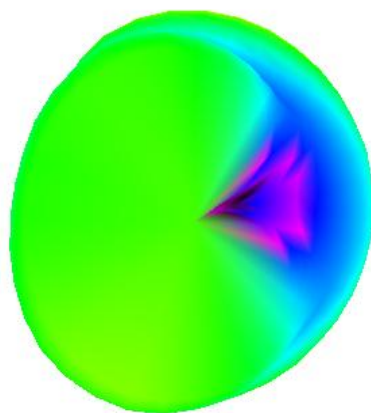


710.000MHz E2

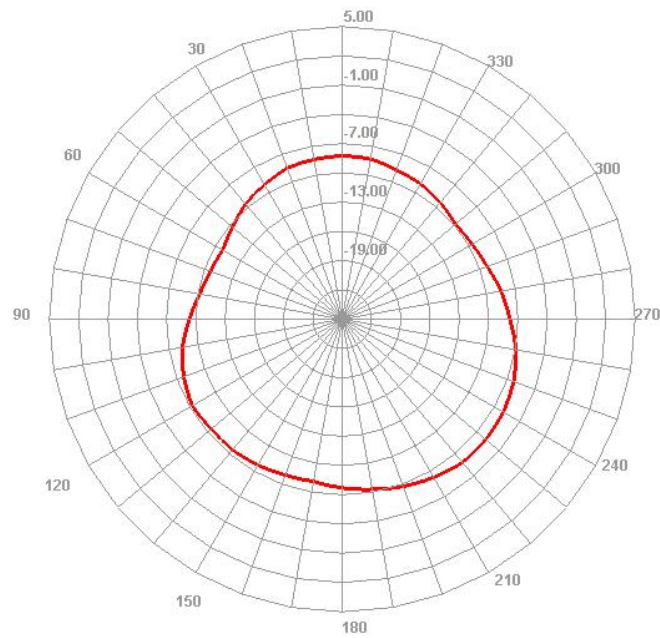


Efficient (2. 4G-WIFI/BT 2400-2500MHz)

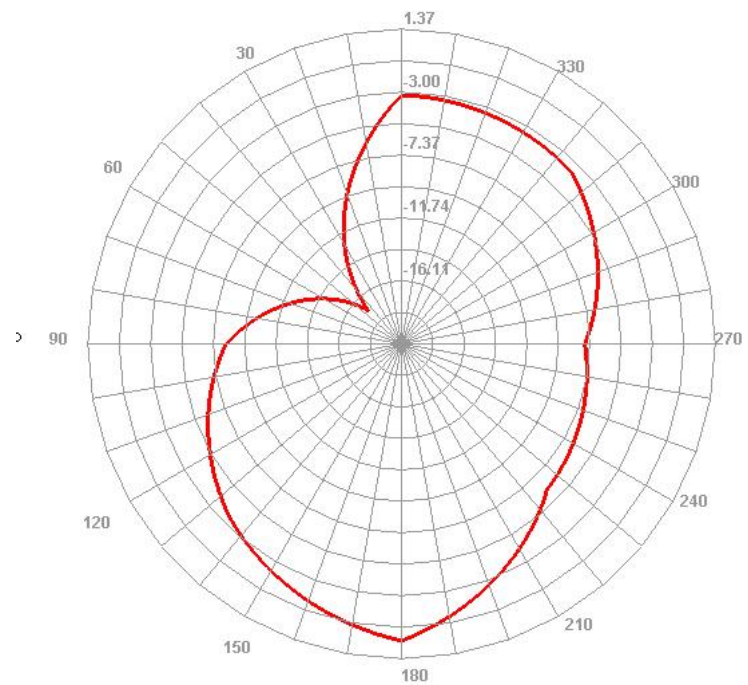
2450.000MHz



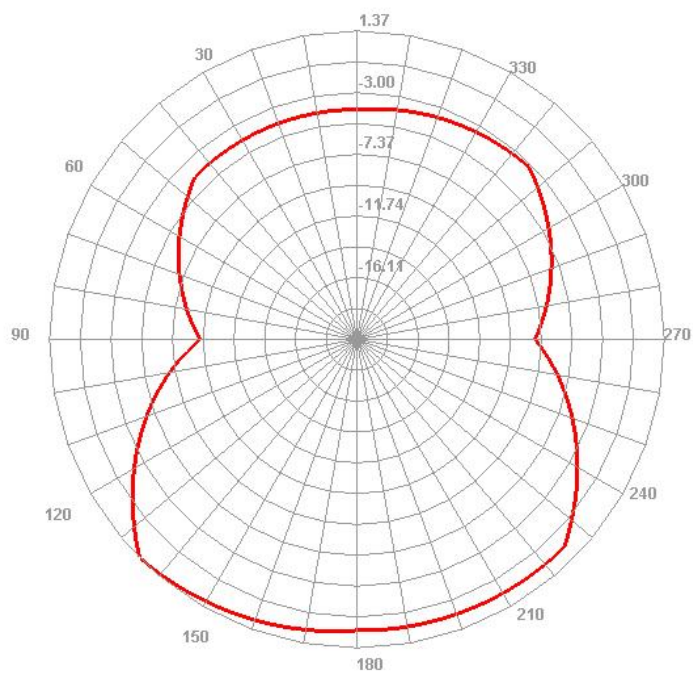
2450.000MHz H



2450.000MHz E1

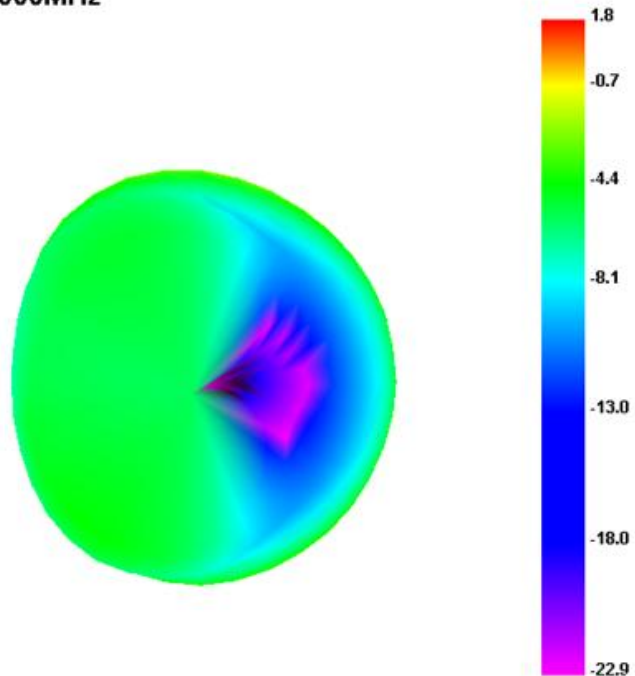


2450.000MHz E2

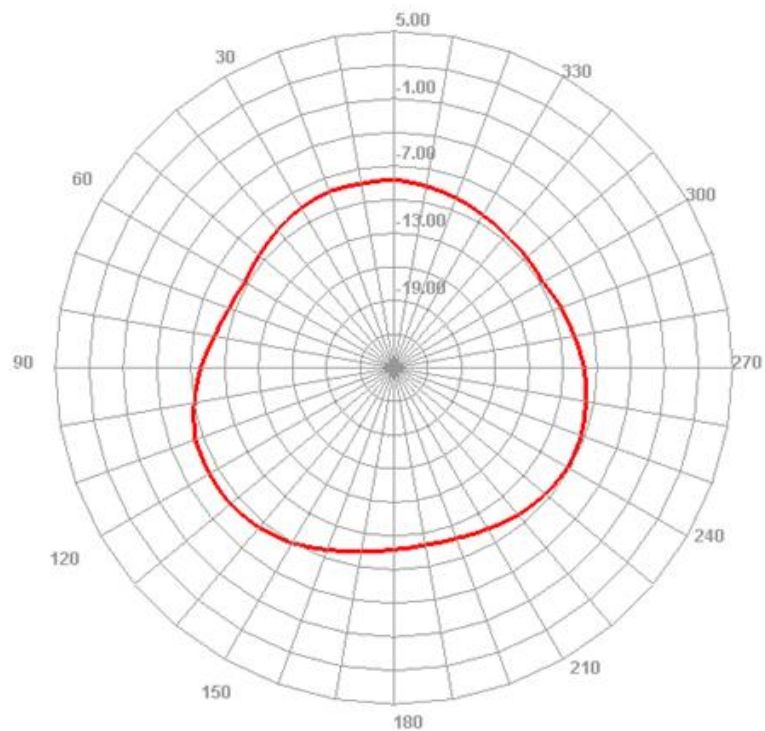


Efficient (5G-WIFI 5000-5250MHz)

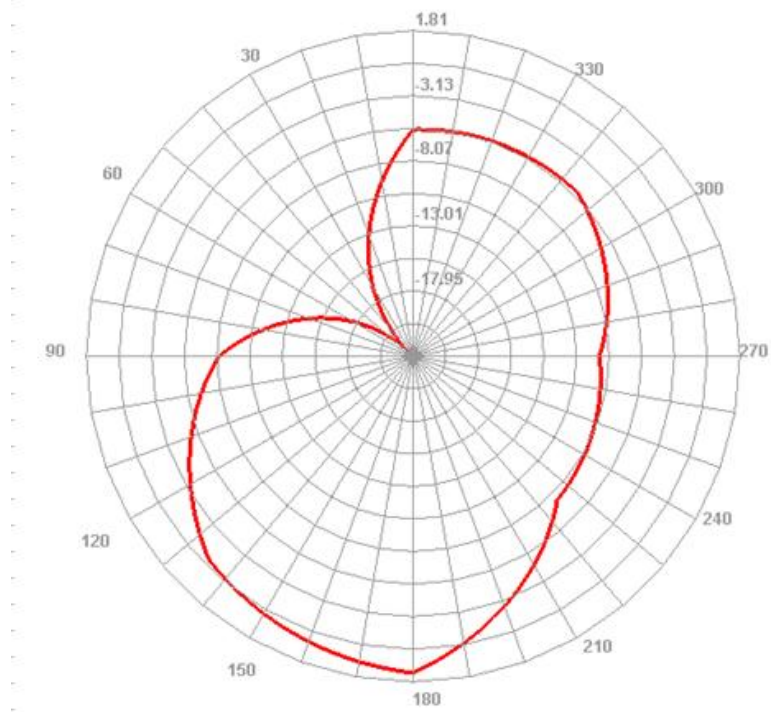
5150.000MHz



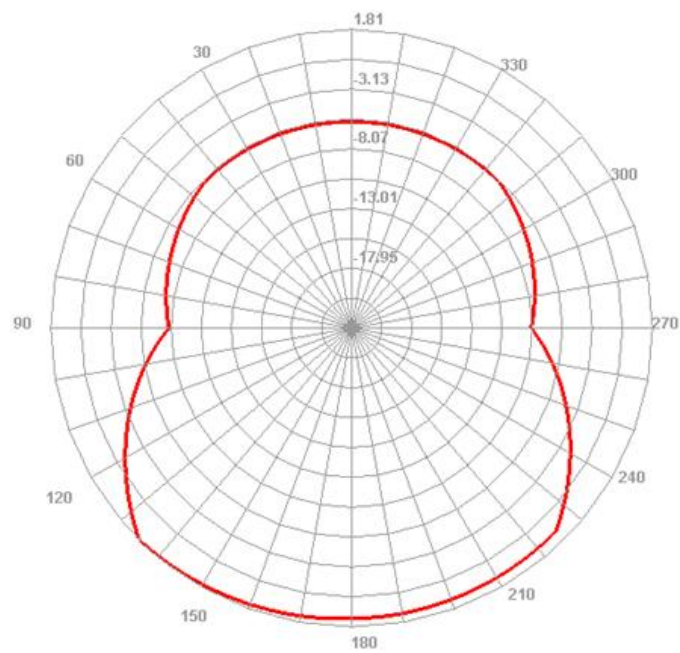
5150.000MHz H



5150.000MHz E1

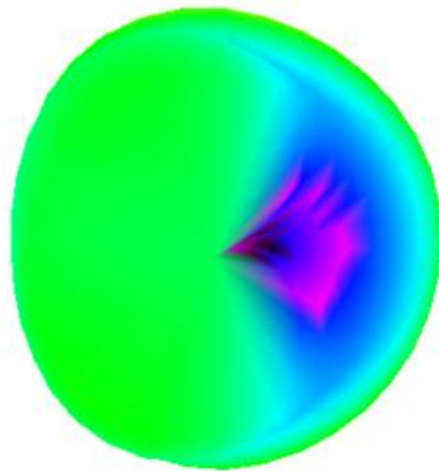


5150.000MHz E2

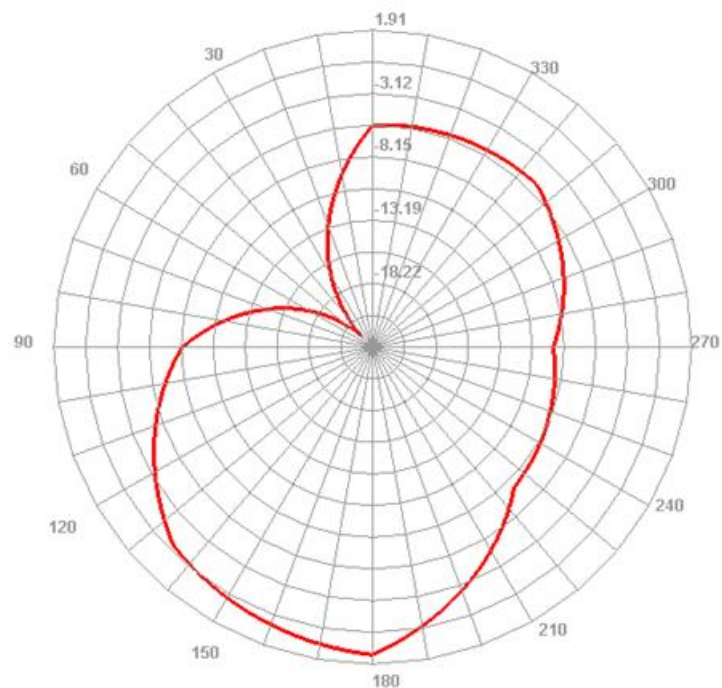


Efficient (5G-WIFI 5725-5850MHz)

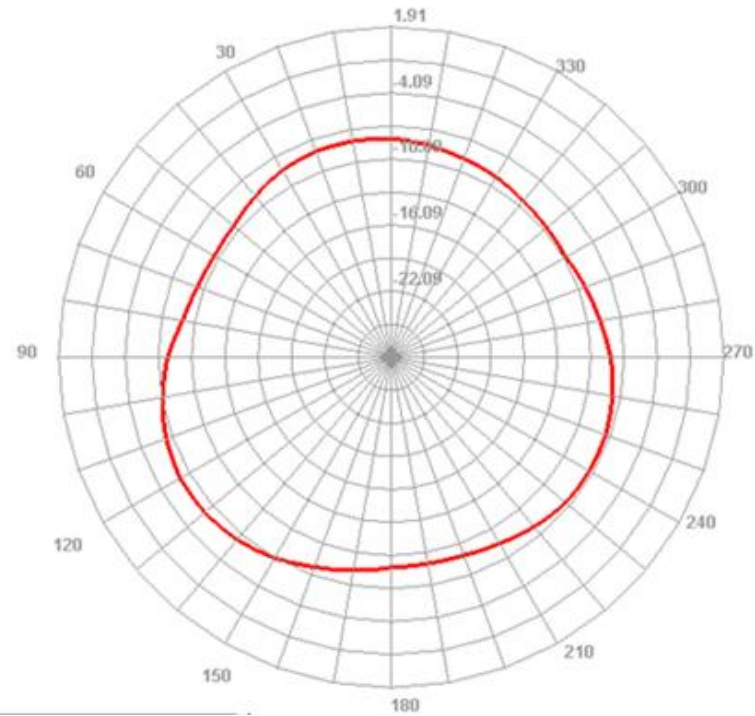
5740.000MHz



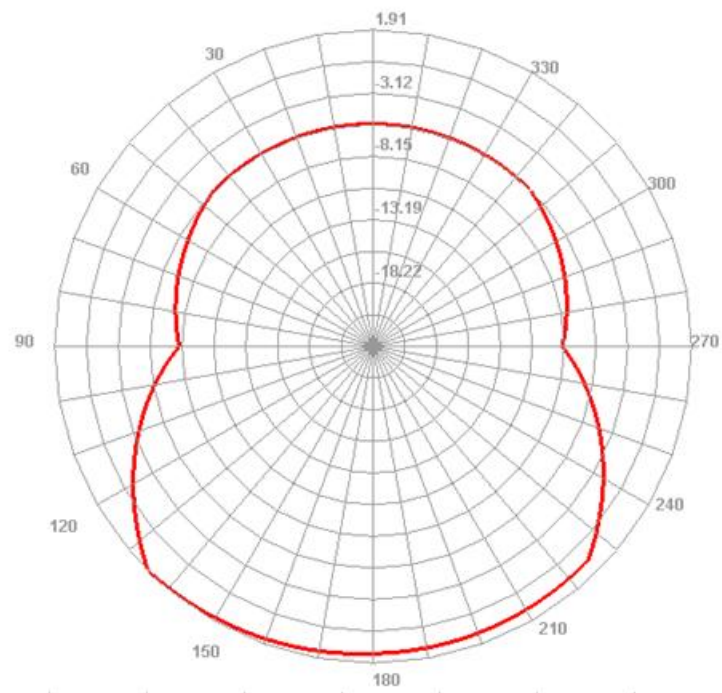
5740.000MHz E1



5740.000MHz H

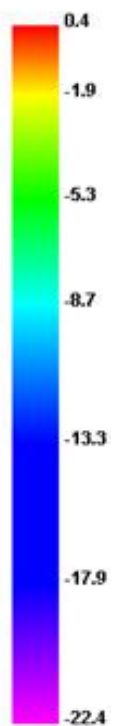
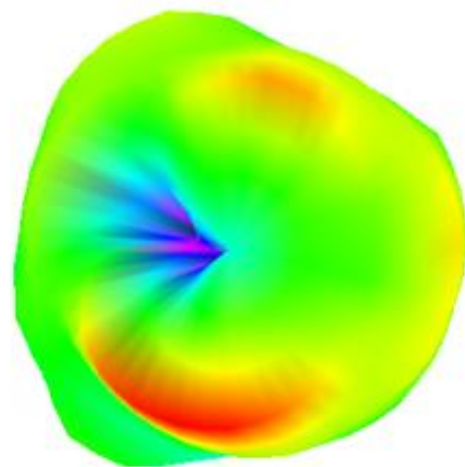


5740.000MHz E2

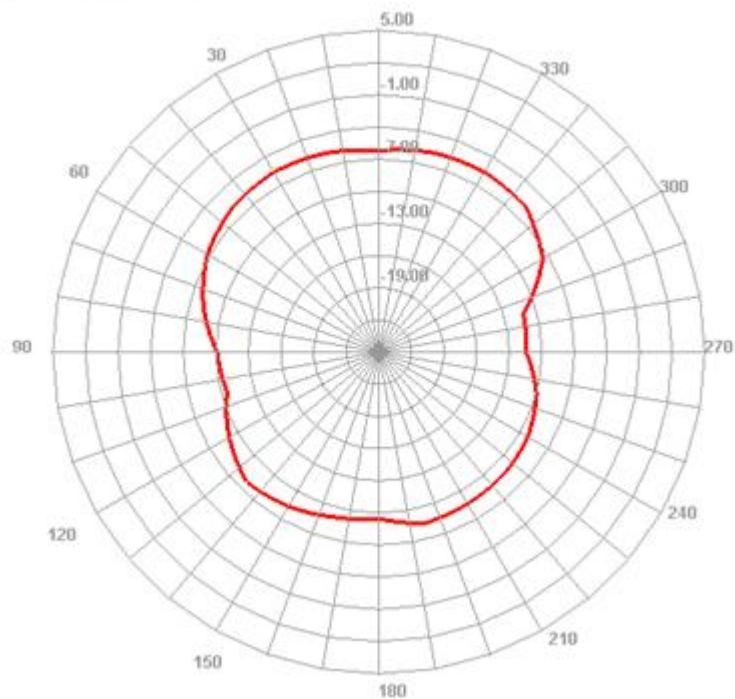


Efficient (GPS 1575.42MHz)

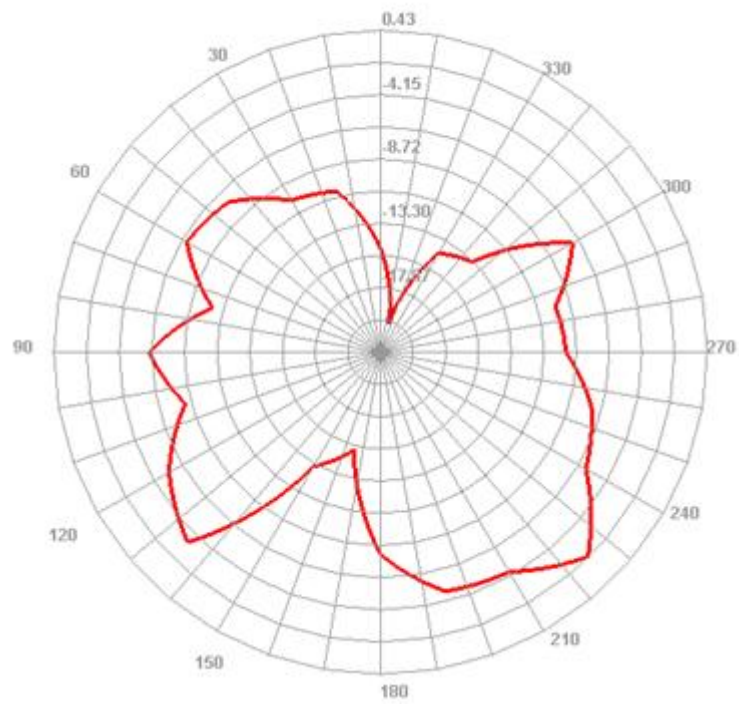
1575.491MHz



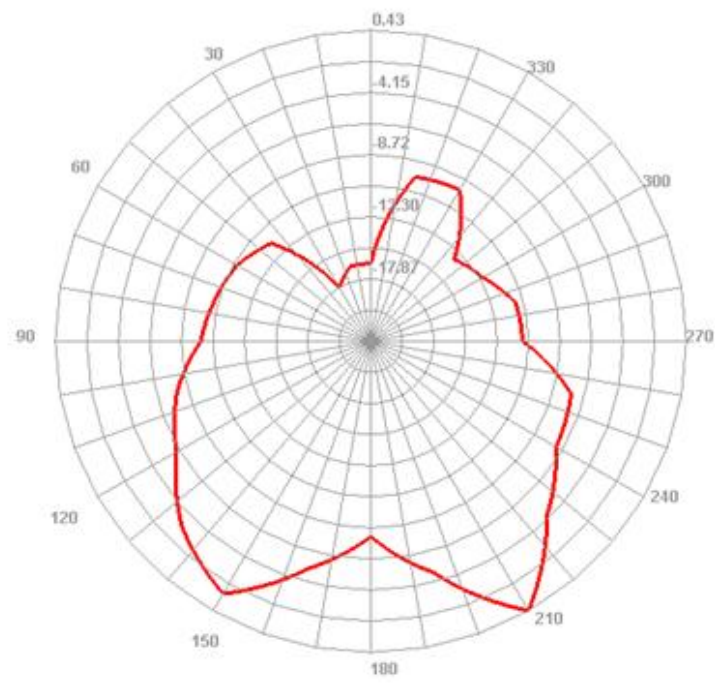
1575.491MHz H



1575.491MHz E1



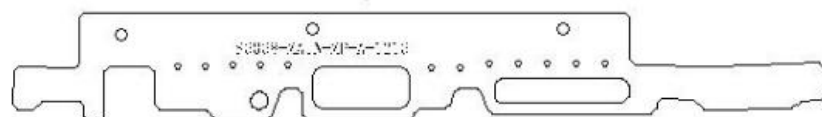
1575.491MHz E2



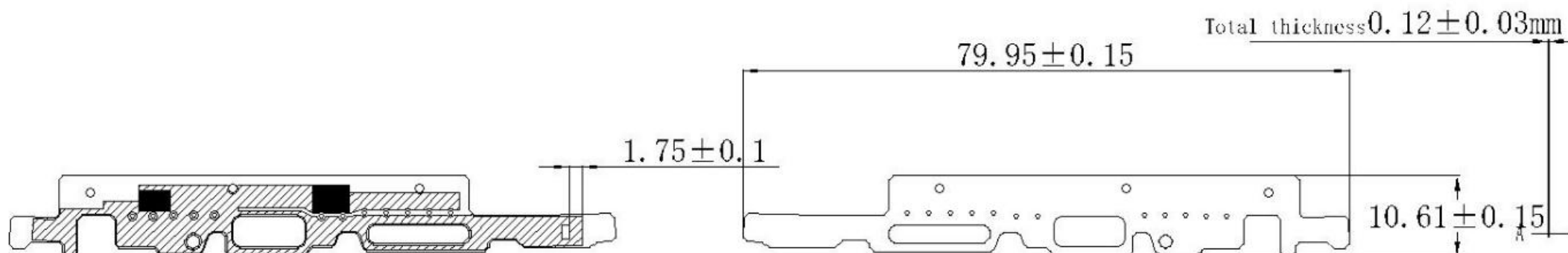
Master antenna specifications

version	Modify the content	modifier	Date of revision

Shape - screen printing → Half and half black covering film
silkscreen white characters



substrate	half to 1/3	
	half and half	✓
	3 pair and a half	
	one-to-one	



Finished product drawing-front

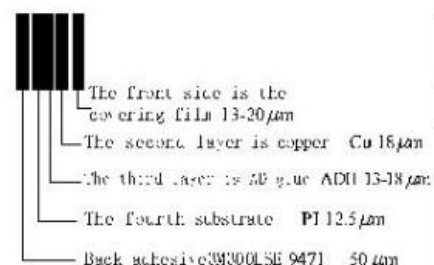
Hand tear line back glue map-back

✓ V0.1
✓ V0.2
✓ V0.3
✓ V0.4
✓ V0.5
✓ V0.6
✓ V0.7
✓ V0.8
✓ V0.9
✓ V0.10

NOTES:

1. Gunned paper: 3M300LSE;
2. The gold finger has a gilded surface $0.5 \sim 3 \mu$; Attention to materials, No oxidation is allowed in this position.
3. The overall thickness should be less than or equal to 0.12mm ;
4. Precise tolerance range: $\pm 0.03 \text{mm}$;
5. Only the product diagram is allowed to conduct electricity;

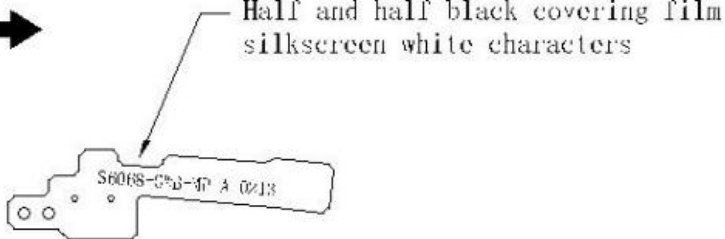
Amplification at A



Huaxin Micro Communication Technology Co. LTD					
 unit: mm	name: FPC		date: 2023-04-19		
	Material number: S6008E GSM		design: zhushunshen		
	material: FPC+3M9471		R F:		
	Surface treatment: clean		confirm:		
color:		proportion: 1:1		version: A	

GPS/WIFI/BT Specifications

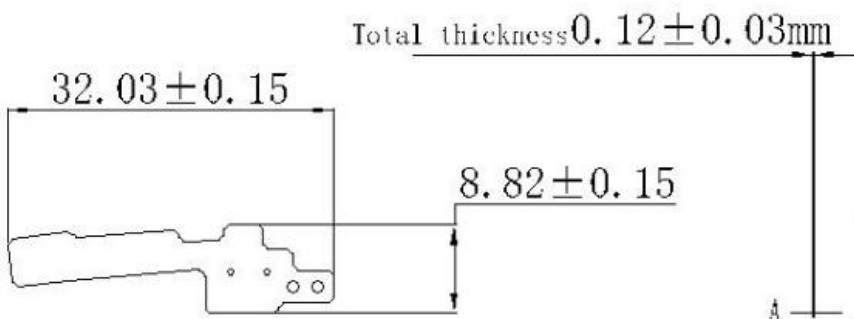
Shape - screen printing



Finished product drawing-front

version	Modify the content	modifier	Date of revision

substrate	Half to 1/3	
	Half and half	✓
	A pair and a half	
	one-to-one	

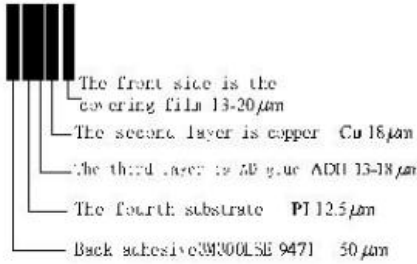


Hand tear line back glue map-back

NOTES:

1. Gunned paper: 3M300LSE;
2. The gold finger has a gilded surface 0.5~3u";Attention to materials, No oxidation is allowed in this position.
3. The overall thickness should be less than or equal to 0.12mm;
4. Precise tolerance range: ±0.03mm;
5. Only the product diagram is allowed to conduct electricity;

Amplification at A



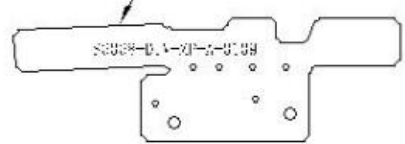
Huaxin Micro Communication Technology Co. LTD				
	unit: mm	name: FPC	date: 2023-04-19	
General tolerance:		Material number: S6068E GWB	design: zhoushunshen	
L	±0.5	material: FPC+3M9471	R F:	
.X	±0.25	Surface treatment: clean	confirm:	
.XX	±0.05	color:	proportion: 1:1	version: A
.XXX	±0.05			
ANGULAR	≤ 0.5°			

- ✓ V0.1
- ✓ V0.2
- ✓ V0.3
- ✓ V0.4
- ✓ V0.5
- ✓ V0.6
- ✓ V0.7
- ✓ V0.8
- ✓ V0.9
- ✓ V0.10

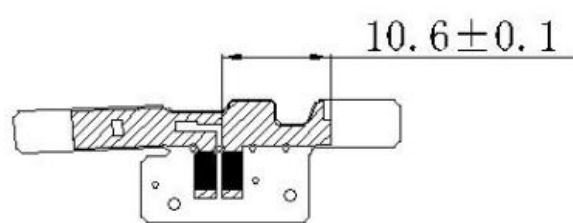
Diversity antenna specifications

	version	Modify the content	modifier	Date of revision

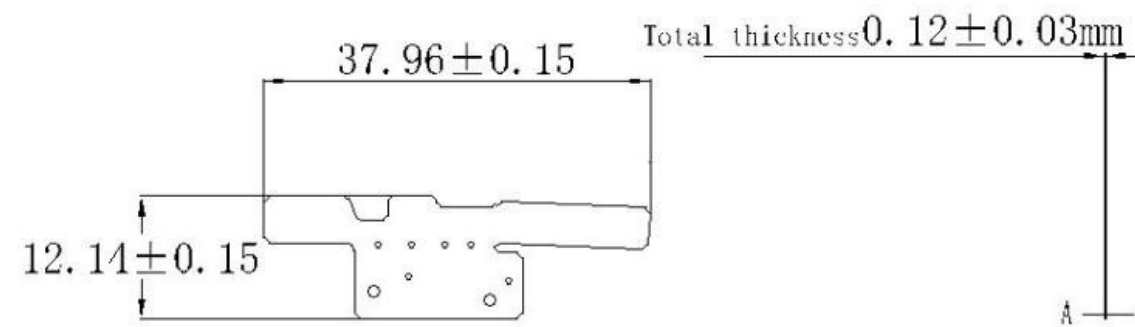
Shape - screen printing → Half and half black covering film
silkscreen white characters



substrate	half to 1/3	
	half and half	✓
	3 pair and a half	
	one-to-one	



Finished product drawing-front

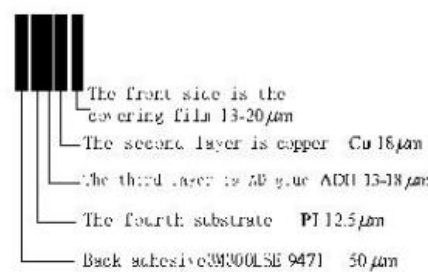


Hand tear line back glue map-back

NOTES:

- 1. Gunned paper: 3M300LSE;
- 2. The gold finger has a gilded surface0.5~3u";Attention to materials, No oxidation is allowed in this position.
- 3. The overall thickness should be less than or equal to0.12mm;
- 4. Precise tolerance range:±0.03mm;
- 5. Only the product diagram is allowed to conduct electricity;

Amplification at A



Huaxin Micro Communication Technology Co. LTD				
	unit: mm	name: FPC	date: 2023-04-19	
General tolerance:		Material number: S6068E DIV	design: zhoushunshen	
L	±0.5	material: FPC+3M9471	R F:	
.X	±0.25	Surface treatment: clean	confirm:	
.XX	±0.05	color:	proportion: 1:1	version: A
.XXX	±0.05			
ANGULAR	∠ = 0.5°			

- ✓ V0.1
- ✓ V0.2
- ✓ V0.3
- ✓ V0.4
- ✓ V0.5
- ✓ V0.6
- ✓ V0.7
- ✓ V0.8
- ✓ V0.9
- ✓ V0.10