

M42449TM Antenna Debugging Report

1、Introduction to project debugging

Type of machine	Mobile or cellular phone			
Type of plate	Motherboard			
Frequency band and antenna materials	Main antenna	Frequency band		Material: .
		2G	GSM850/900/1800/1900	FPC
		3rd generation	WCDMA B1/2/4/5	
		4th generation	LTE: FDD:2/4/7/28AB/38/42	
	Other antennas	GWB	1575.42MHz/2.450G	FPC
		DRX	1.7GHz-2.7GHz	FPC
Performance requirements	Perform as required by the customer			

2、Active parameters of the main antenna

Test	GSM 850			EGSM 900		
Channel	128	190	251	1	62	124
TRP (dBm)	28.44	28.36	28.51	28.25	28.48	28.52
TIS (dBm)	-104.14	-103.89	-103.78	-104.28	-104.05	-103.61

Test	DCS 1800			PCS 1900		
Channel	512	698	885	512	661	810
TRP (dBm)	24.57	24.88	25.06	25.09	24.87	24.74
TIS (dBm)	-103.17	-102.75	-102.49	-103.06	-102.28	-102.52

Active parameters of the main antenna

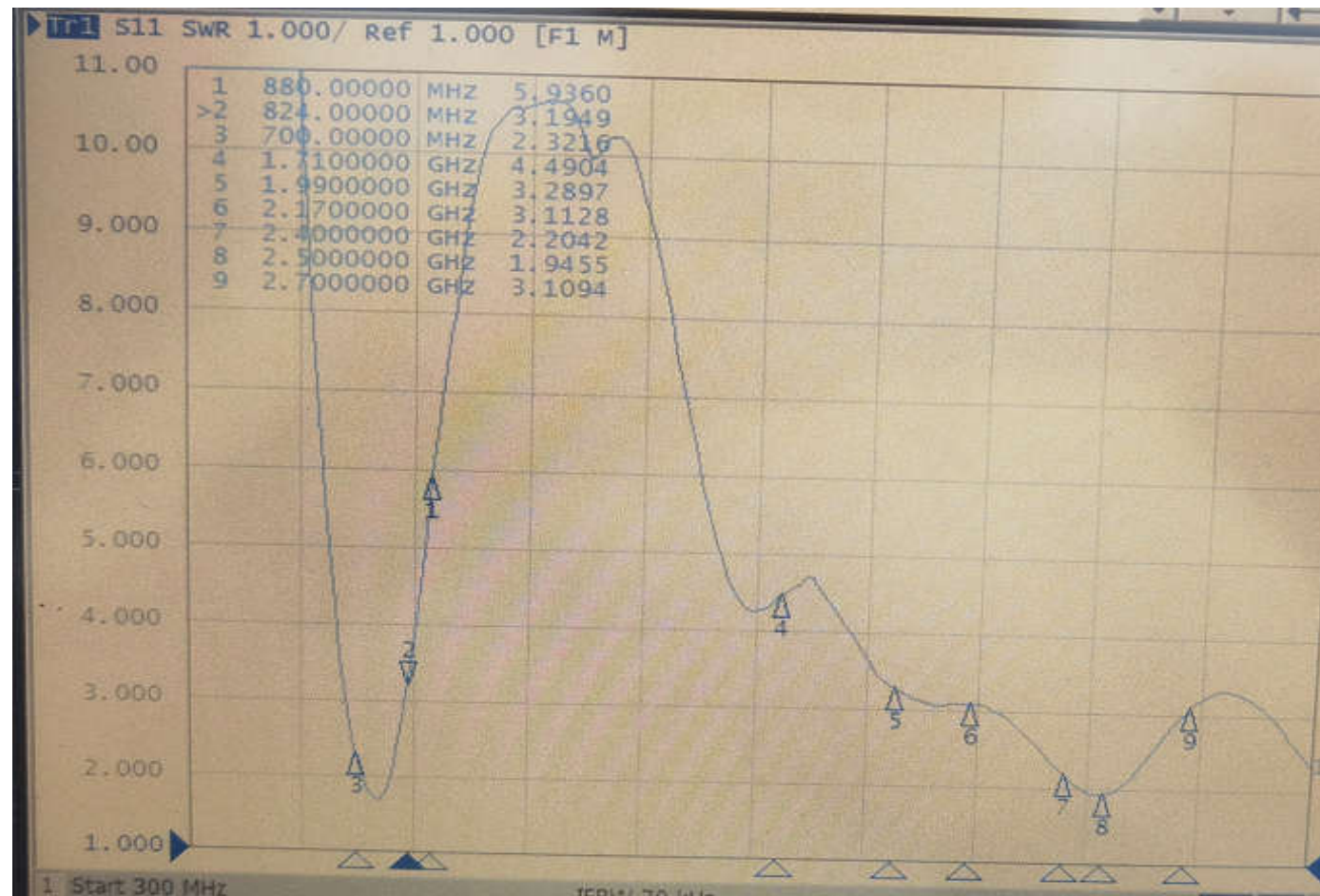
Test	WCDMA_I			WCDMA_II		
Channel	10562	10700	10838	9662	9800	9938
TRP (dBm)	18.34	18.66	17.89	18.25	18.33	18.51
TIS (dBm)	-104.14	-104.48	-104.67	-104.72	-104.53	-104.29

Test	WCDMA_VI			WCDMA_V		
Channel	1537	1638	1738	4357	4408	4458
TRP (dBm)	18.32	18.74	18.68	18.36	18.57	18.69
TIS (dBm)	-105.09	-104.62	-104.16	-104.18	-103.65	-103.48

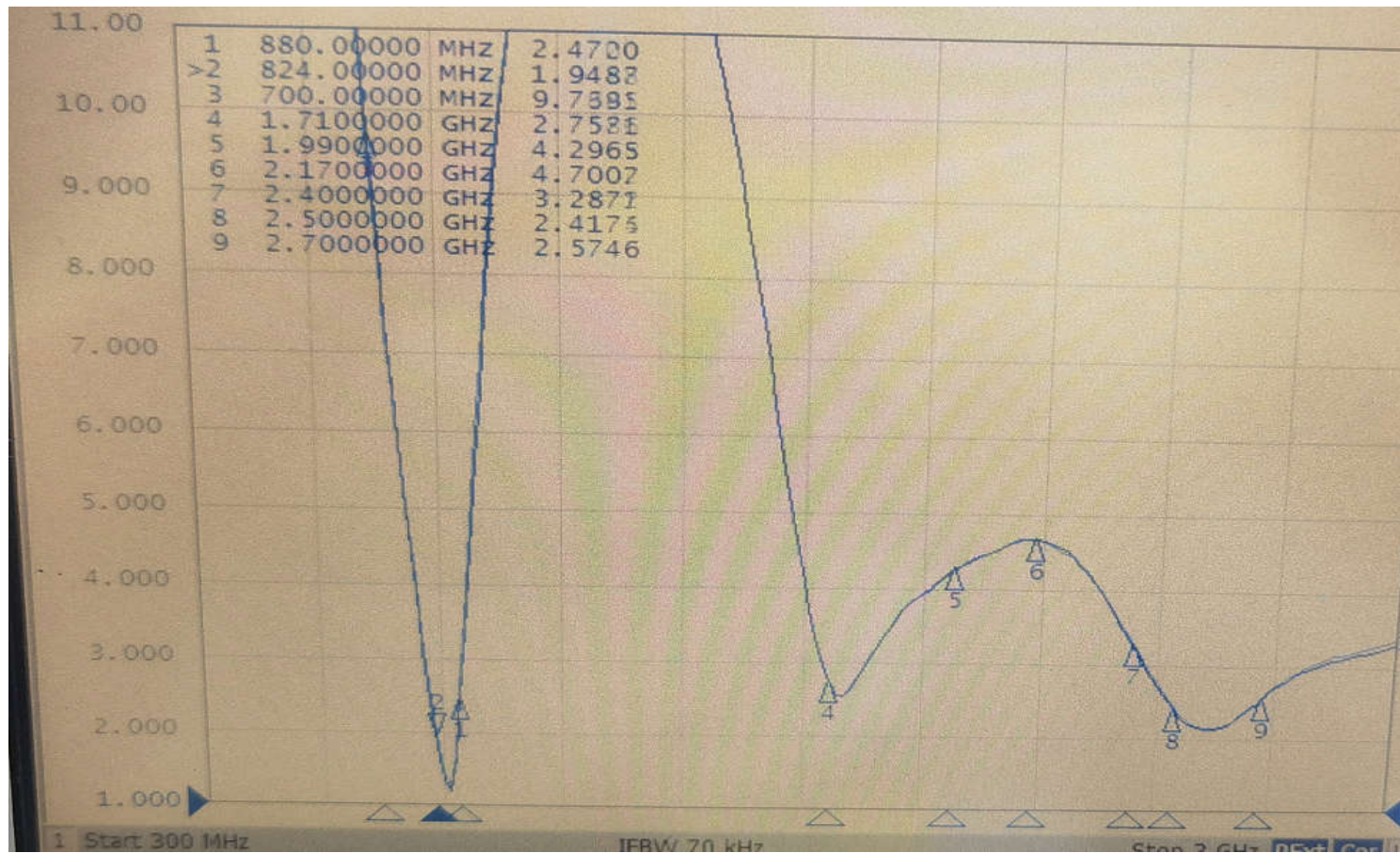
Active parameters of the main antenna

Test	FDD B2			FDD B4		
Channel	18650	18900	19150	20050	20175	20350
TRP (dBm)	19.21	18.75	18.67	18.23	18.69	19.14
TIS (dBm)	-95.22	-94.17	-94.36	-94.88	-94.52	-94.55
Test	FDD B7			FDD B28A		
Channel	20800	21100	21400	27260	27360	27460
TRP (dBm)	17.22	17.18	17.49	18.67	18.52	18.44
TIS (dBm)	-95.14	-94.08	-94.56	-93.19	-92.66	-92.28
Test	FDD B28B			TDD B38		
Channel	27410	27510	27610	37850	38000	38150
TRP (dBm)	18.43	18.57	18.69	17.24	17.53	17.49
TIS (dBm)	-93.89	-93.54	-93.38	-94.12	-93.69	-93.31
Test	TDD B42					
Channel	38750	39150	39550			
TRP (dBm)	19.23	18.85	18.77			
TIS (dBm)	-93.37	-93.45	-93.16			

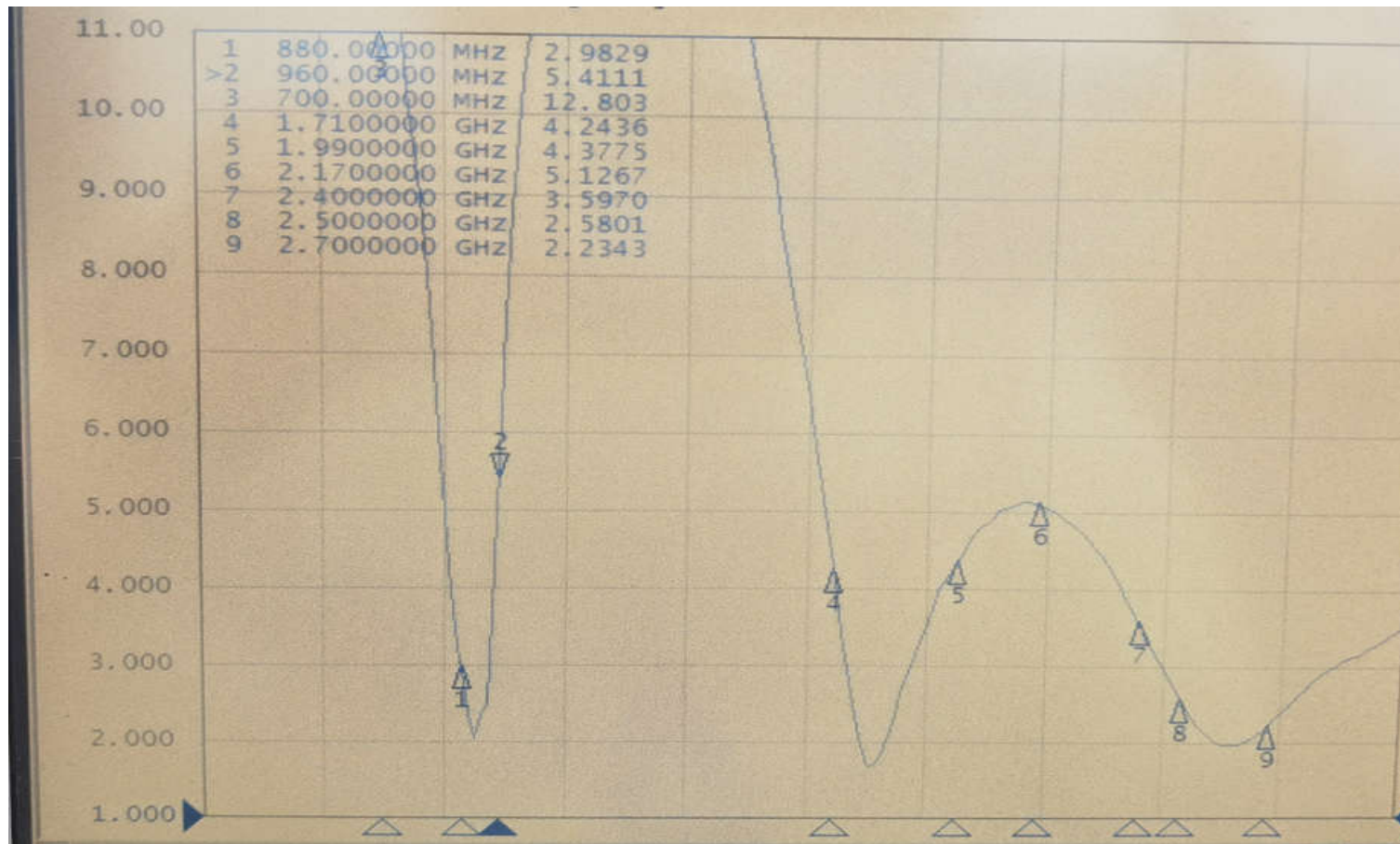
3、Antenna passive standing wave-GSM (700Mhz)



Antenna passive standing wave-GSM (850Mhz)



Antenna passive standing wave-GSM (900Mhz/1800-3400Mhz)



4、Antenna passive parameters – GSM

Freq (Main antenna efficiency)	Effi (%)
700MHZ	35
750MHZ	37
800MHZ	39
850MHZ	45
900MHZ	41
950MHZ	38
1700MHZ	35
1750MHZ	36
1800MHZ	38
1850MHZ	41
1900MHZ	43
1950MHZ	45

Freq (Main antenna efficiency)	Effi (%)
2000MHZ	45
2050MHZ	44
2100MHZ	40
2150MHZ	39
2200MHZ	38
2250MHZ	35
2300MHZ	38
2350MHZ	36
2400MHZ	37
2450MHZ	35
2500MHZ	35
2550MHZ	37
2690MHZ	34
3390MHZ	32
3490MHZ	31
3590MHZ	33

Antenna passive parameters - Episodes

Freq(Diversity antenna efficiency)	Effi (%)
1800MHZ	34
1850MHZ	36
1900MHZ	38
1950MHZ	41
2000MHZ	43
2050MHZ	46
2100MHZ	45
2150MHZ	42
2200MHZ	40
2250MHZ	38
2300MHZ	36
2350MHZ	34
2400MHZ	35

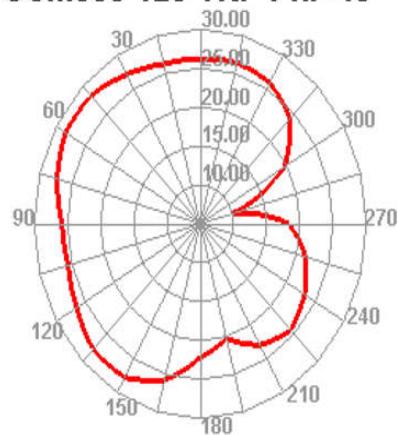
Freq(Diversity antenna efficiency)	Effi (%)
2450MHZ	37
2500MHZ	39
2550MHZ	40
2690MHZ	41

Antenna passive parameters – GWB

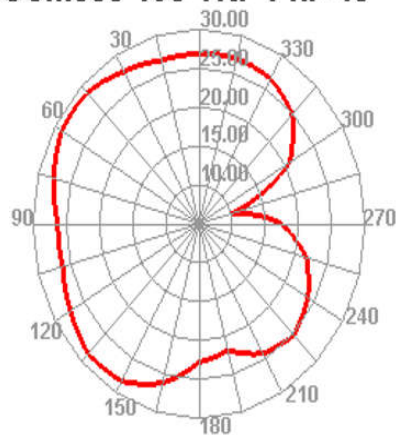
Freq(GPS antenna efficiency)	Effi (%)	Freq(WIFI antenna efficiency)	Effi (%)
1565MHZ	38	2400MHZ	35
1575MHZ	40	2410MHZ	37
1585MHZ	37	2420MHZ	40
1595MHZ	36	2430MHZ	42
1605MHZ	34	2440MHZ	44
		2450MHZ	45
		2460MHZ	43
		2470MHZ	40
		2480MHZ	39
		2490MHZ	37
		2500MHZ	36

6、Apple chart

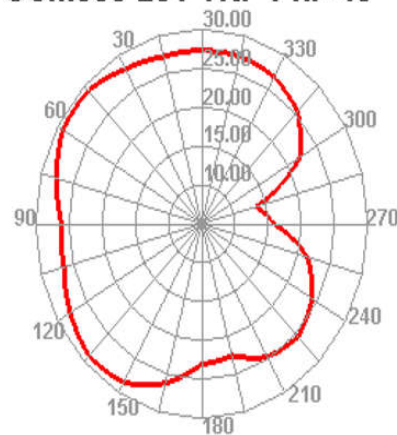
GSM850 128 TRP Phi=45



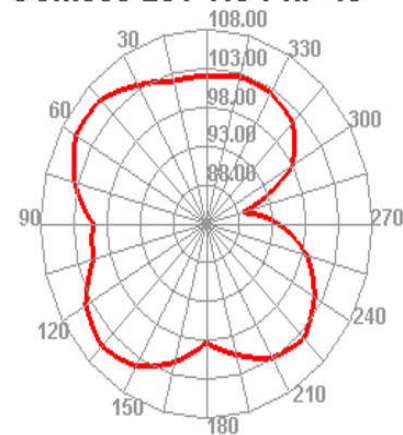
GSM850 190 TRP Phi=45



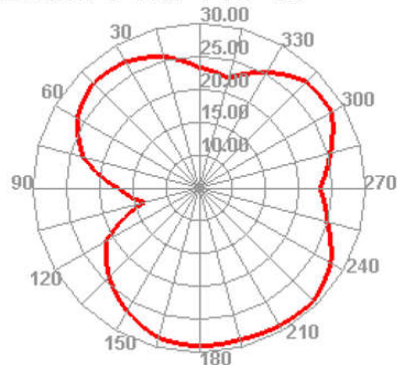
GSM850 251 TRP Phi=45



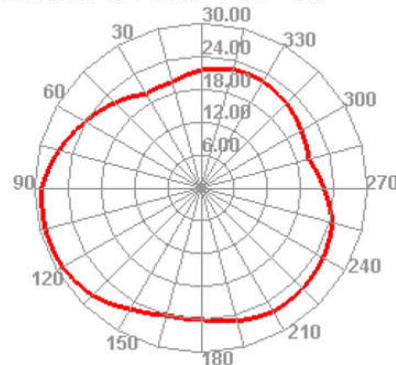
GSM850 251 TIS Phi=45



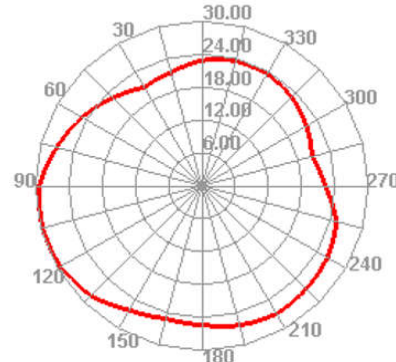
EGSM 1 TRP Phi=45



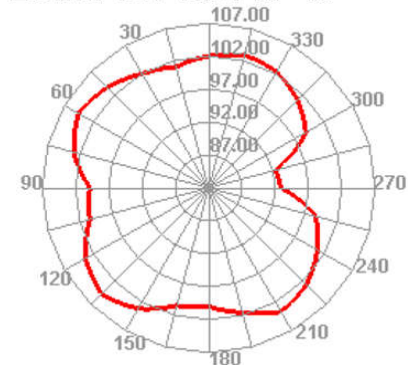
EGSM 62 TRP Phi=45



EGSM 124 TRP Phi=45

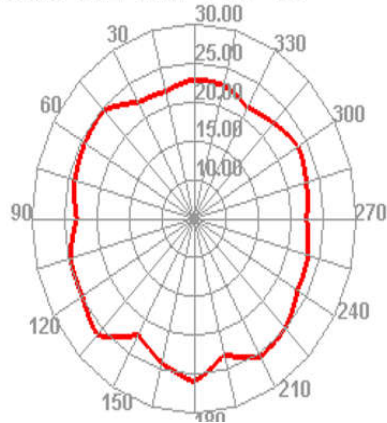


EGSM 124 TIS Phi=45

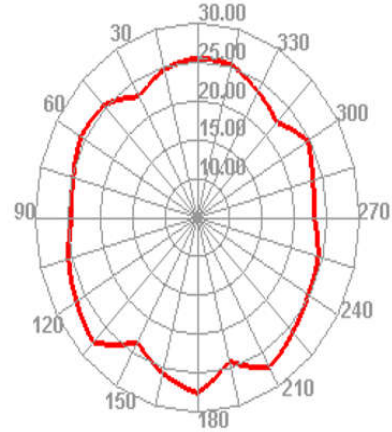


Apple chart

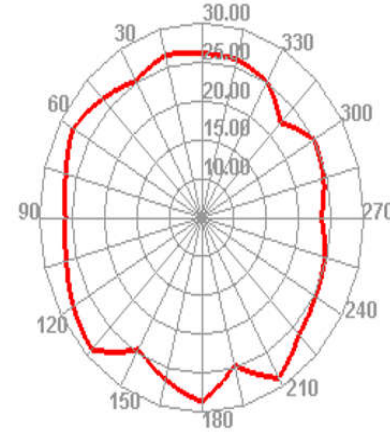
DCS 512 TRP Phi=45



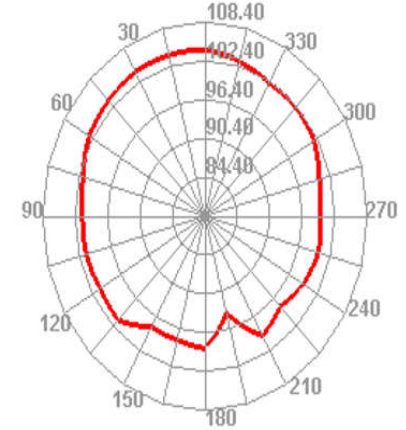
DCS 698 TRP Phi=45



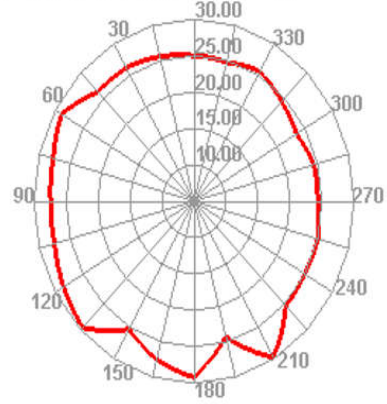
DCS 885 TRP Phi=45



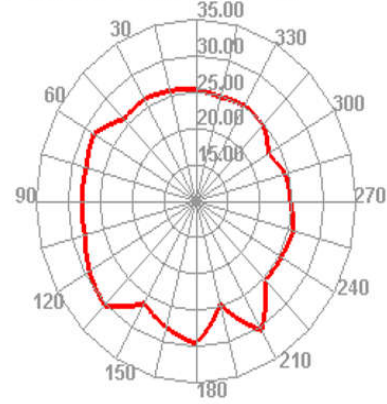
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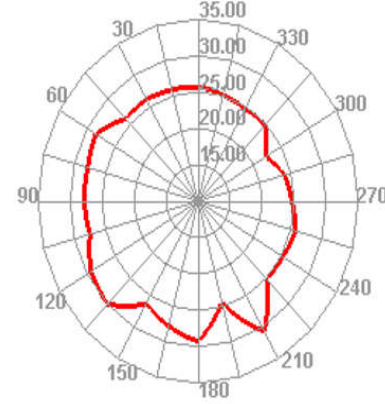
PCS 512 TRP Phi=45



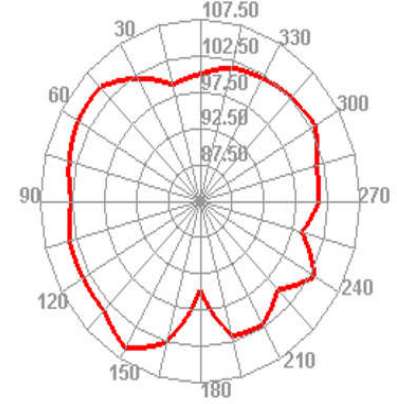
PCS 661 TRP Phi=45



PCS 810 TRP Phi=45

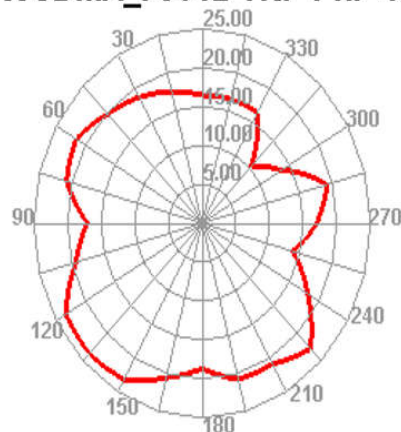


PCS 810 TIS Phi=45

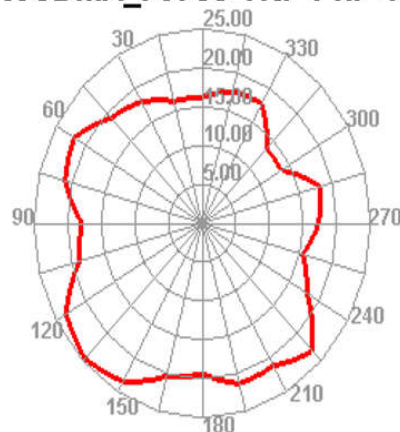


Apple chart

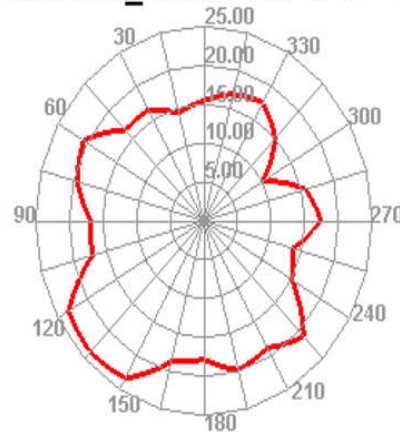
WCDMA_I 9612 TRP Phi=45



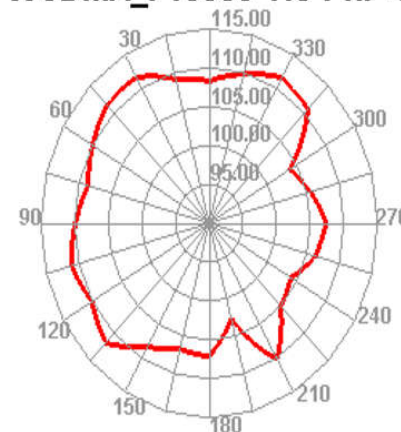
WCDMA_I 9750 TRP Phi=45



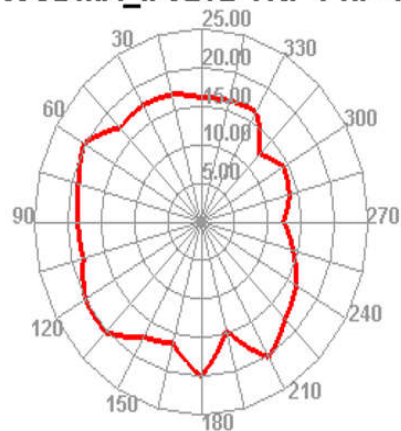
WCDMA_I 9888 TRP Phi=45



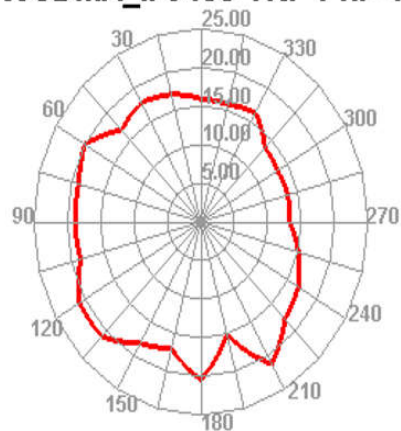
WCDMA_I 10838 TIS Phi=45



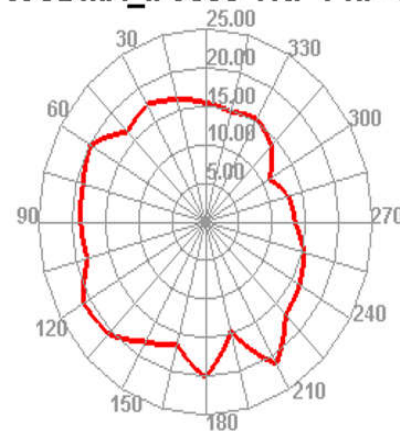
WCDMA_II 9262 TRP Phi=45



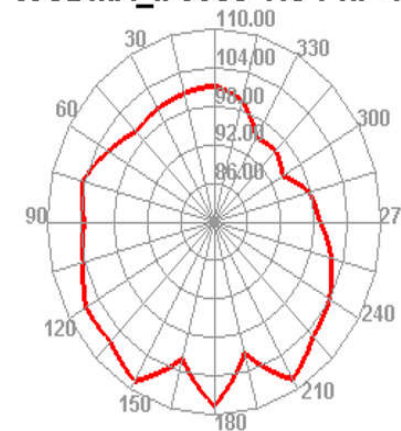
WCDMA_II 9400 TRP Phi=45



WCDMA_II 9538 TRP Phi=45

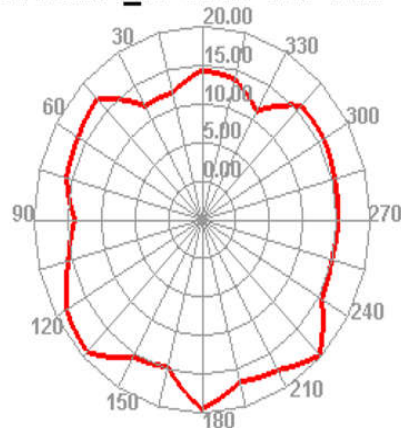


WCDMA_II 9938 TIS Phi=45

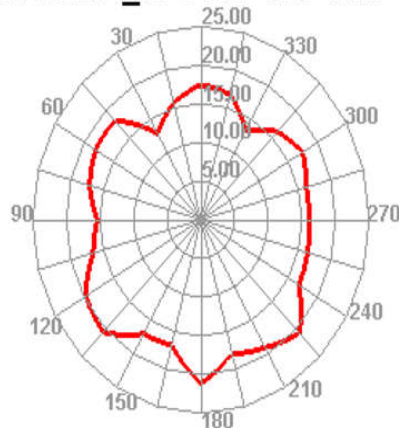


Apple chart

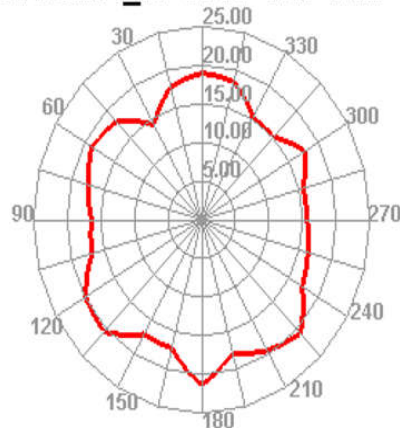
WCDMA_IV 1312 TRP Phi=45°



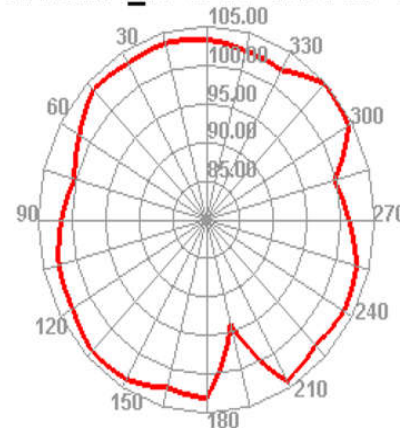
WCDMA_IV 1413 TRP Phi=45°



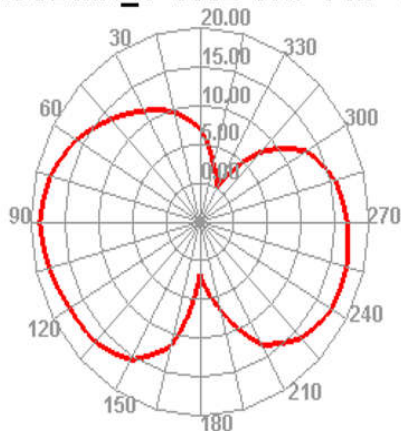
WCDMA_IV 1513 TRP Phi=45°



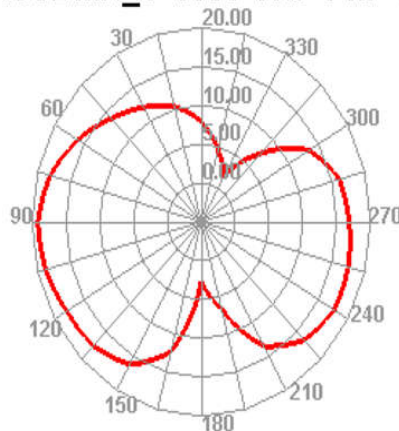
WCDMA_IV 1738 TIS Phi=45°



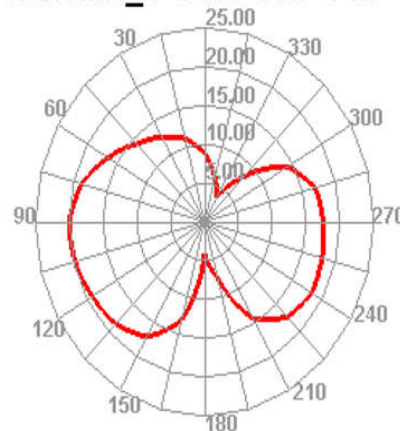
WCDMA_V 4132 TRP Phi=45°



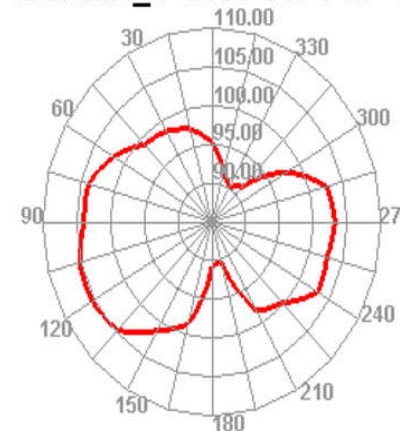
WCDMA_V 4185 TRP Phi=45°



WCDMA_V 4233 TRP Phi=45°

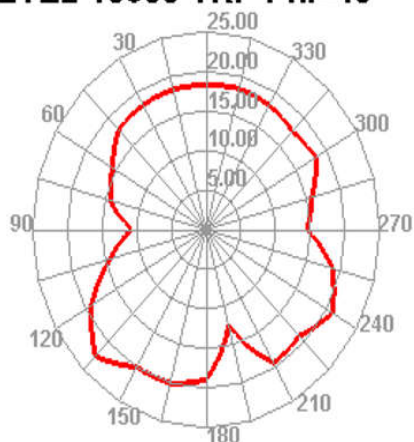


WCDMA_V 4458 TIS Phi=45°

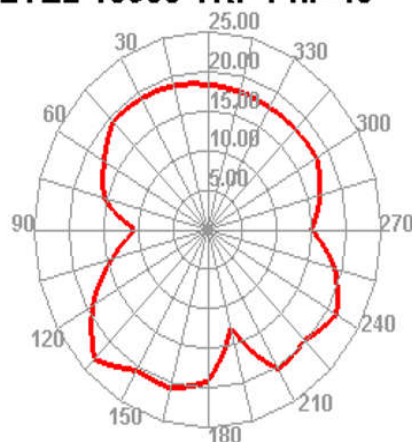


Apple chart

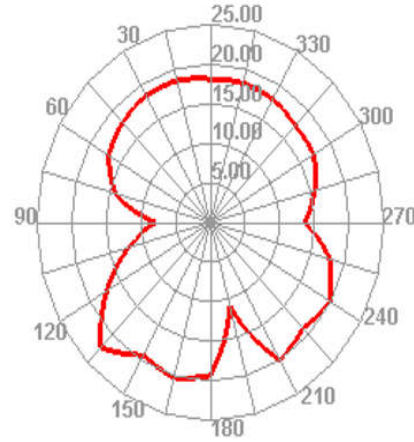
LTE2 18650 TRP Phi=45



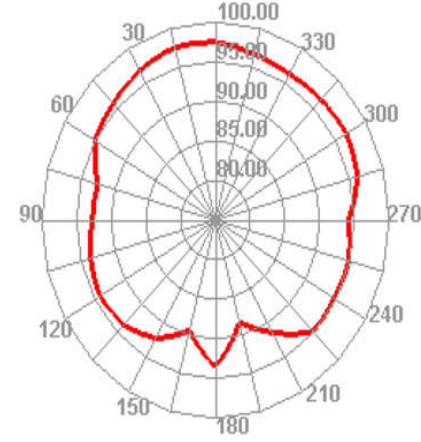
LTE2 18900 TRP Phi=45



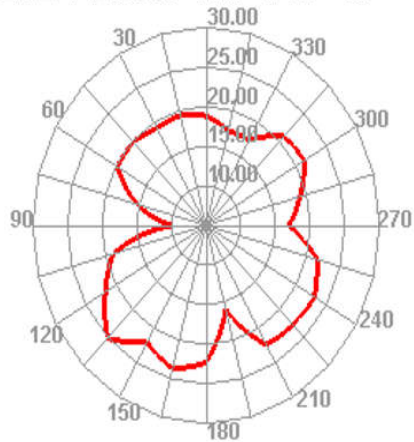
LTE2 19150 TRP Phi=45



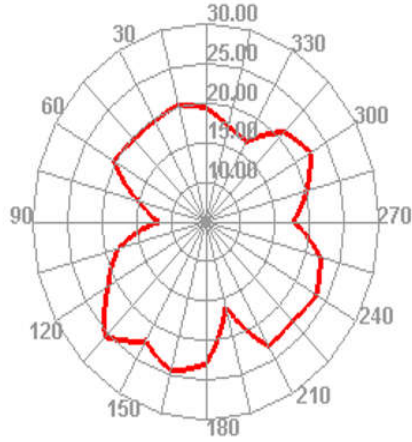
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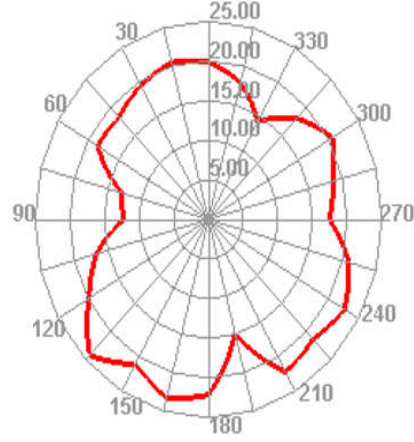
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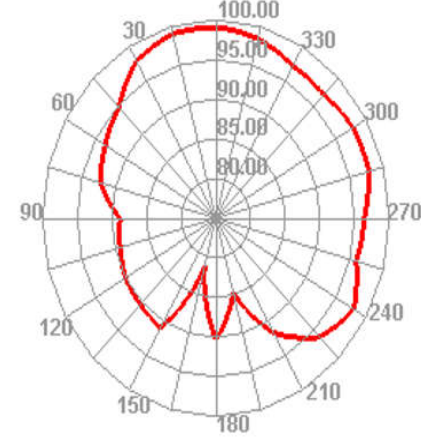
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LTE4 20350 TRP Phi=45

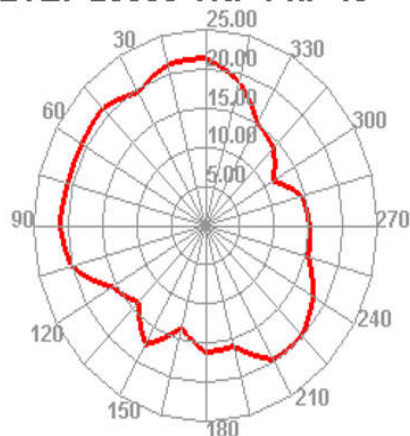


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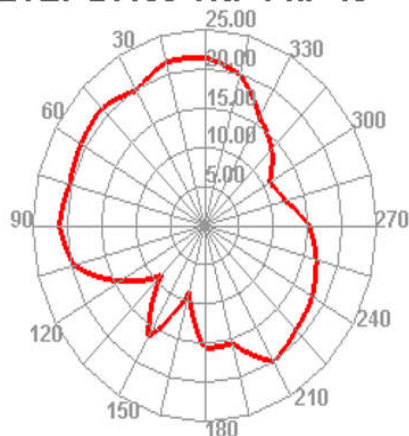


Apple chart

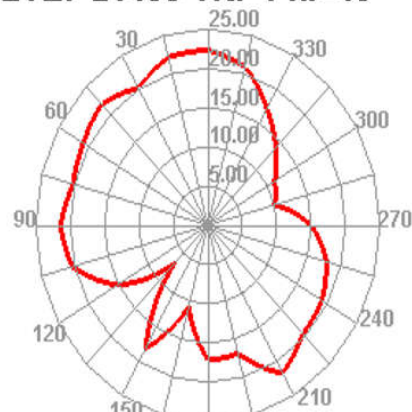
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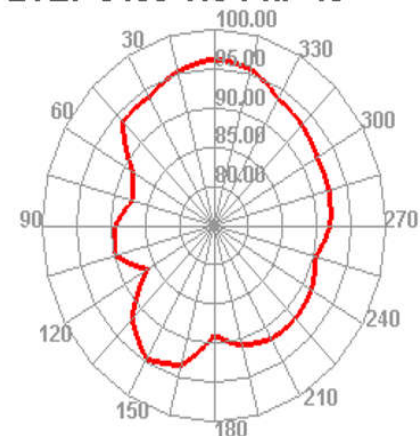
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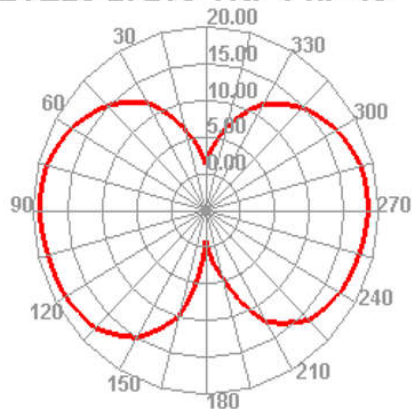
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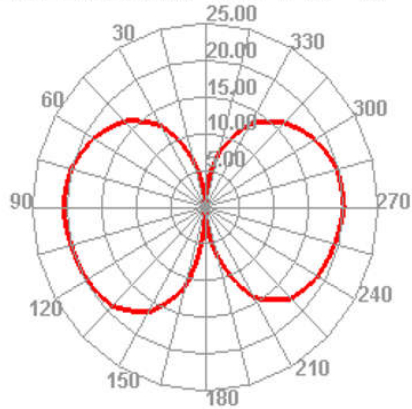
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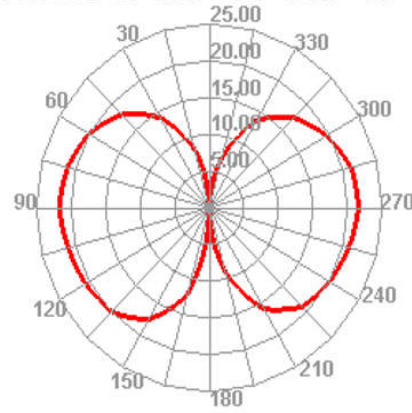
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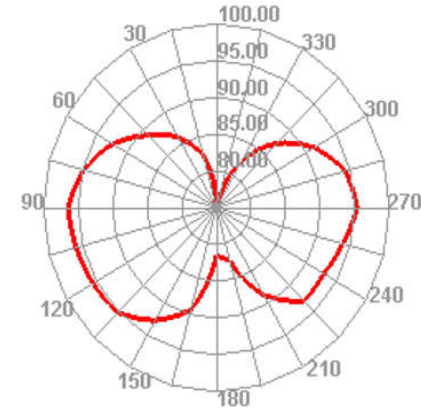
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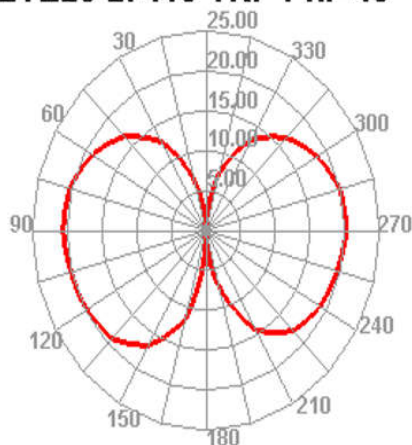


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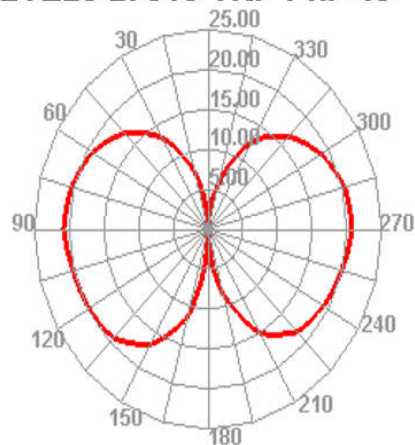


Apple chart

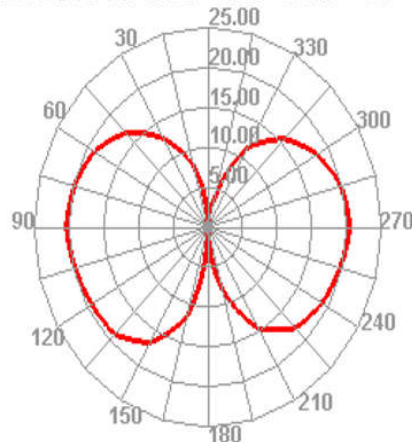
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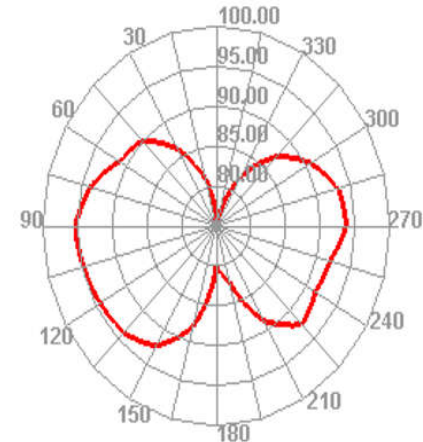
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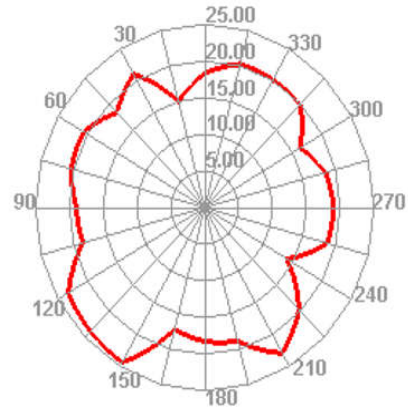
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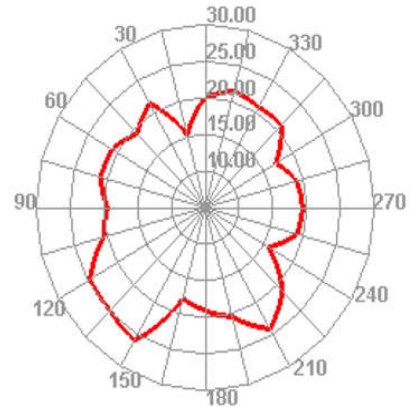
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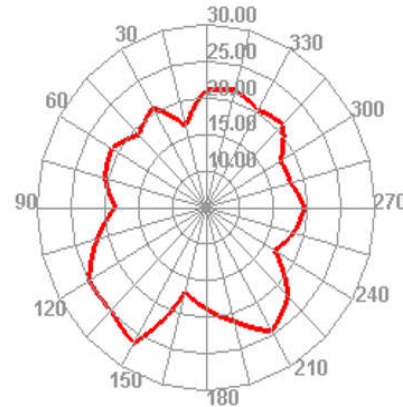
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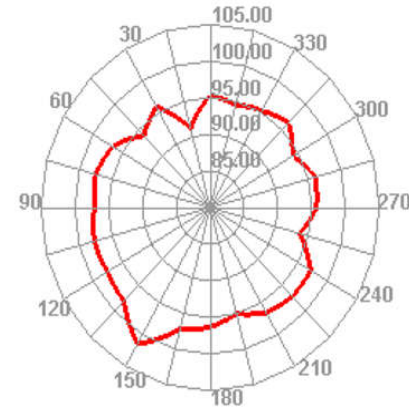
LTE38 38000 TRP Phi=45



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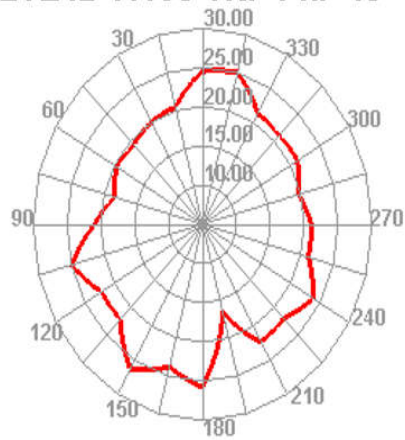


LTE38 38150 TIS Phi=45

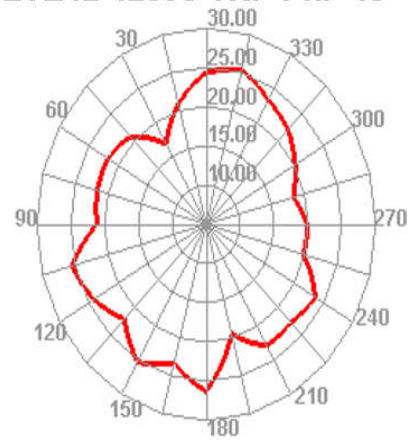


Apple chart

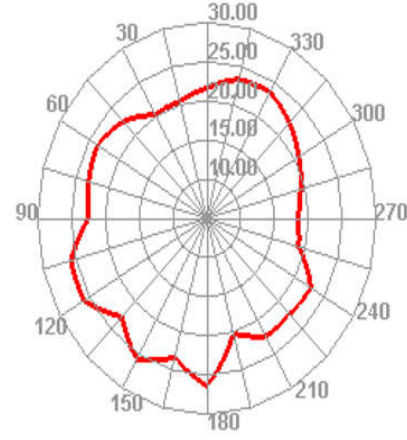
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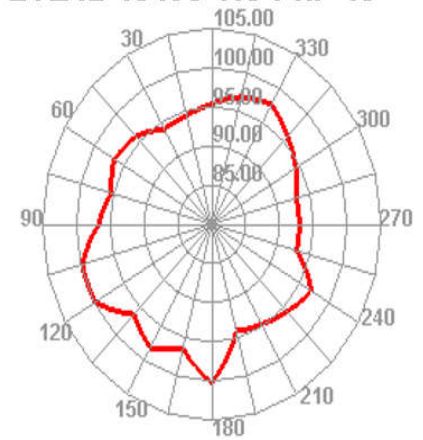
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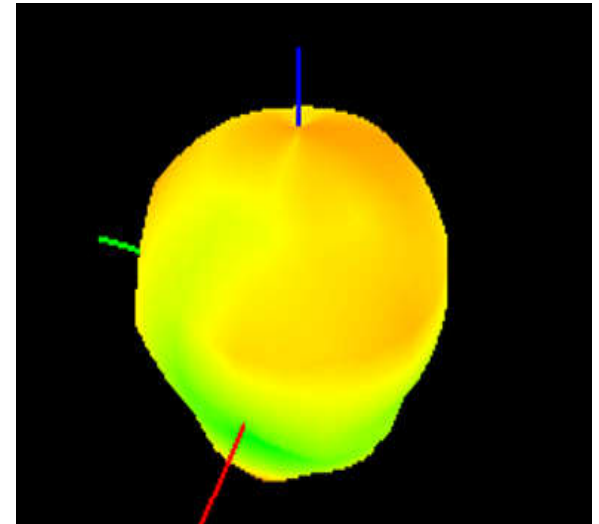
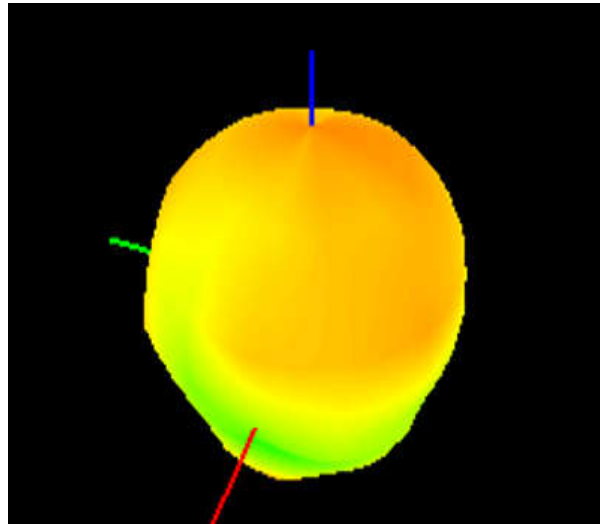
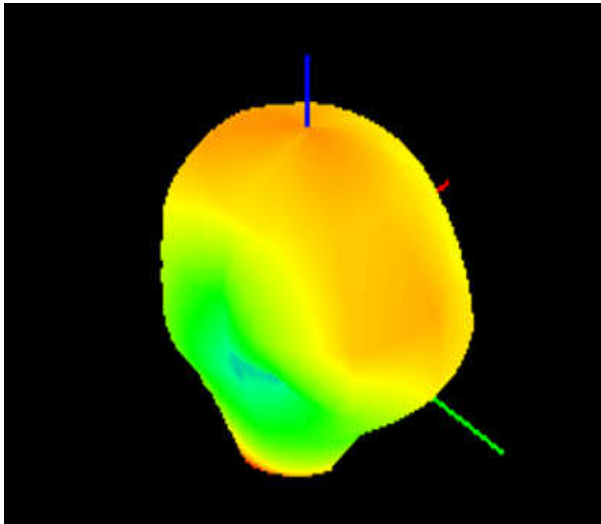
LTE42 43490 TRP Phi=45



LTE42 43490 TIS Phi=45



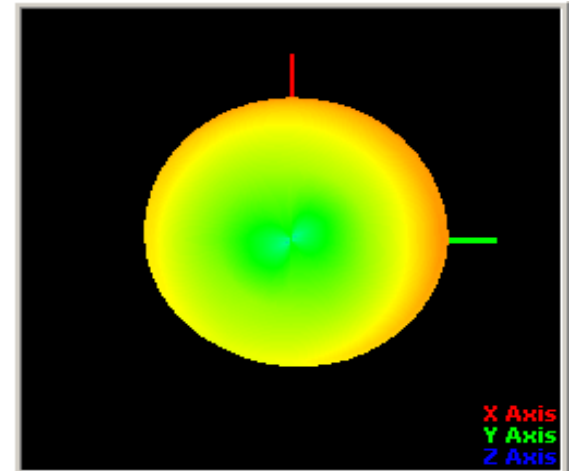
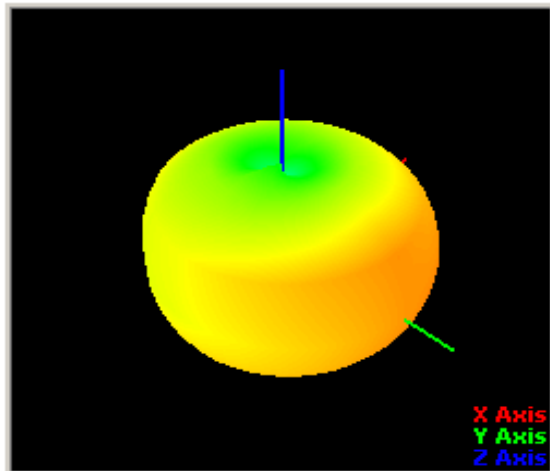
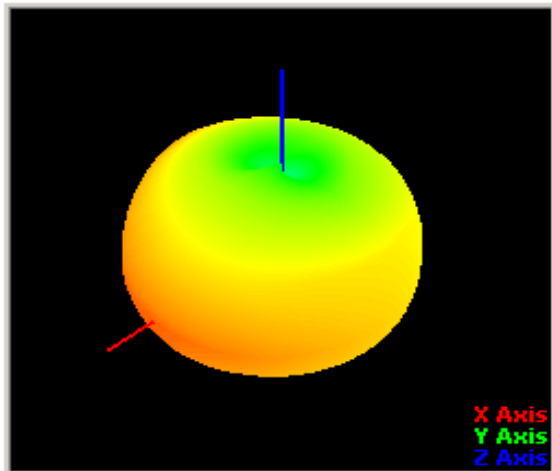
WIFI/BT



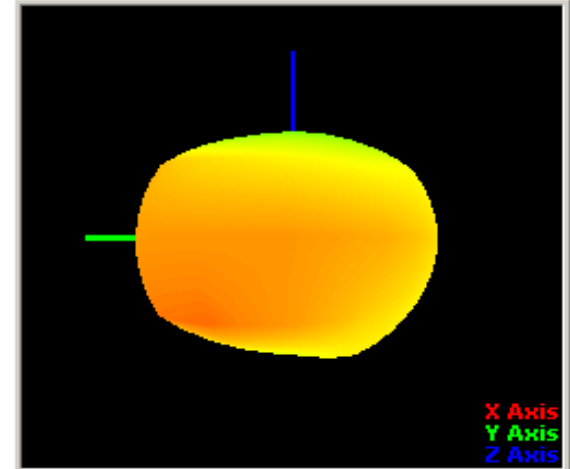
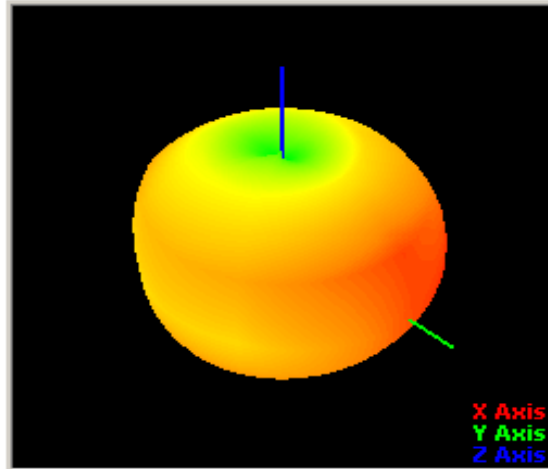
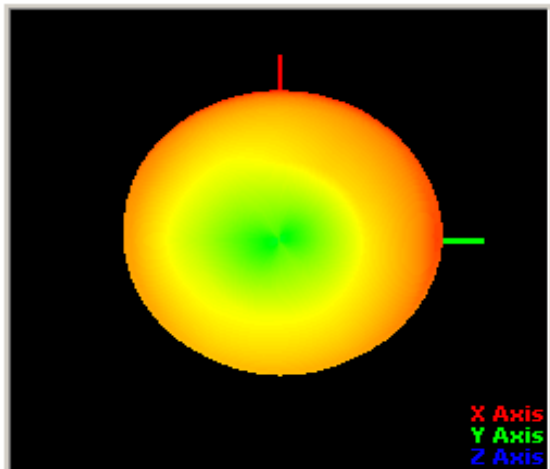
5、Antenna gain

Band	Gain (MAX)		
GSM850	0.73	Global Positioning System	1.24
EGSM900	0.69		
DCS1800	0.58		
PCS1900	0.52	WiFi	1.15
WCDMA B1	0.64	BT	1.15
WCDMA B2	0.52		
WCDMA B4	0.61		
WCDMA B5	0.73		
LTE B2	0.52		
LTE B4	0.61		
LTE B7	0.54		
LTE B28	0.66		
LTE B38	0.54		
LTE B42	0.65		

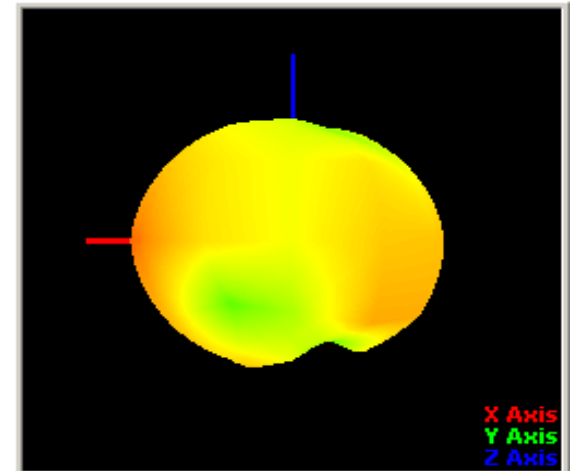
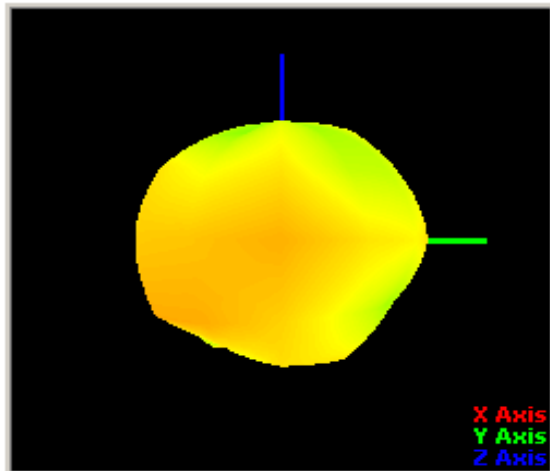
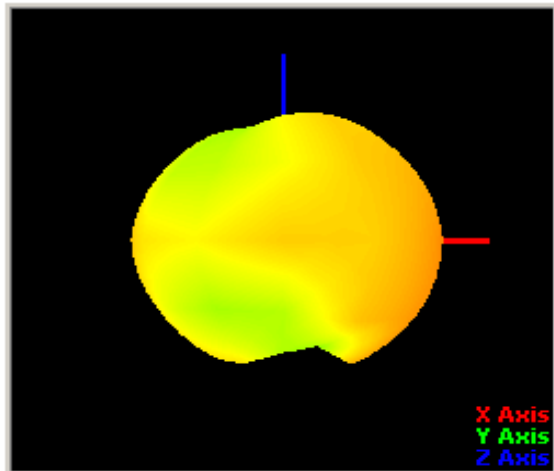
GSM850/WCDMA B5



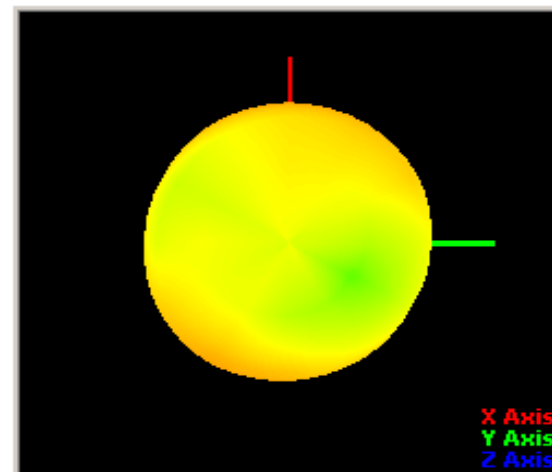
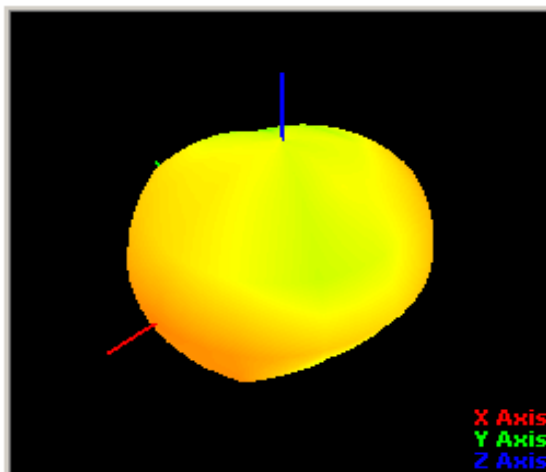
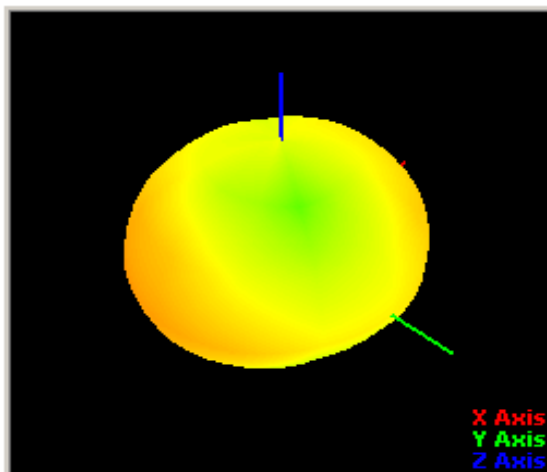
GSM900



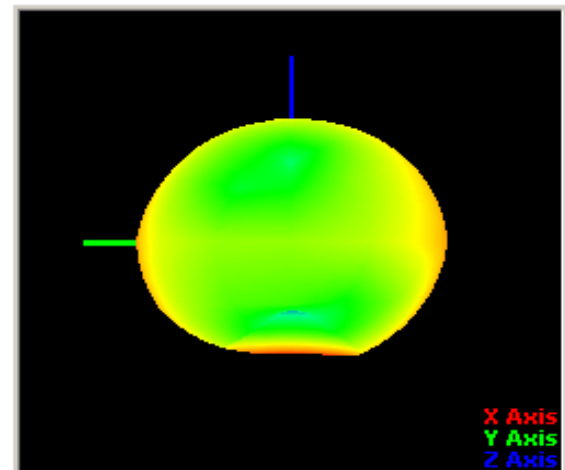
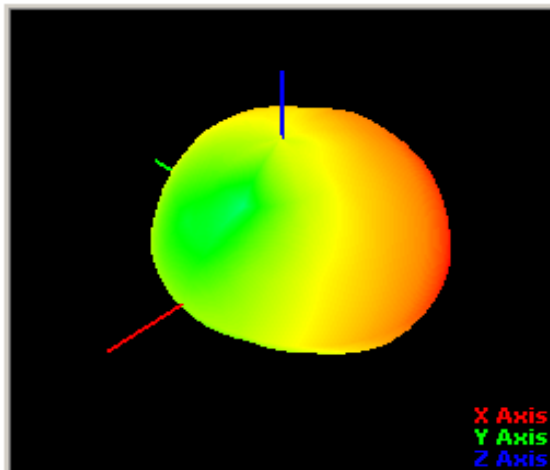
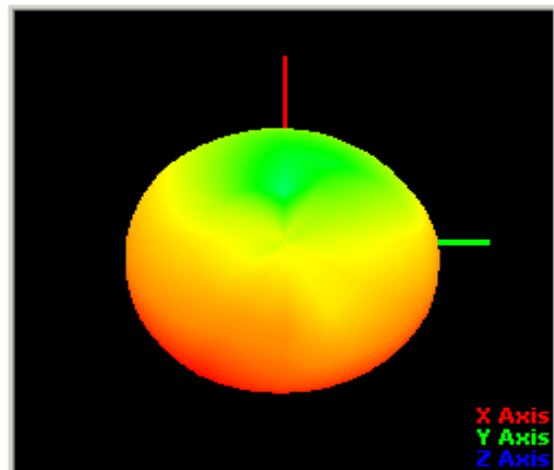
GSM1800



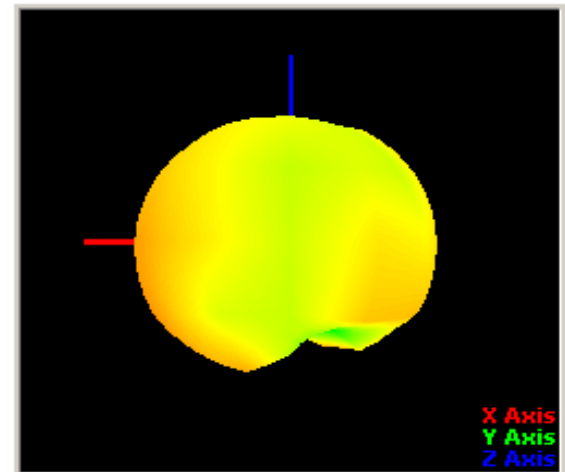
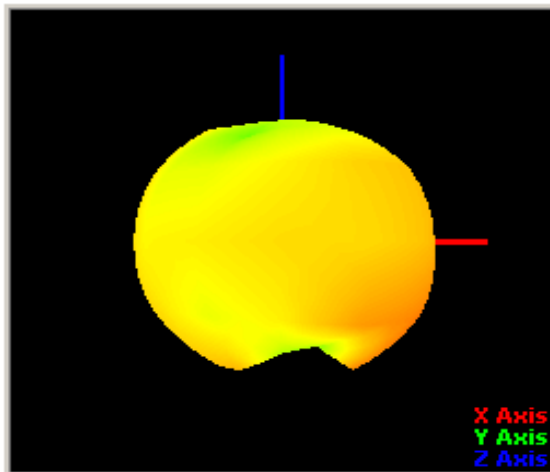
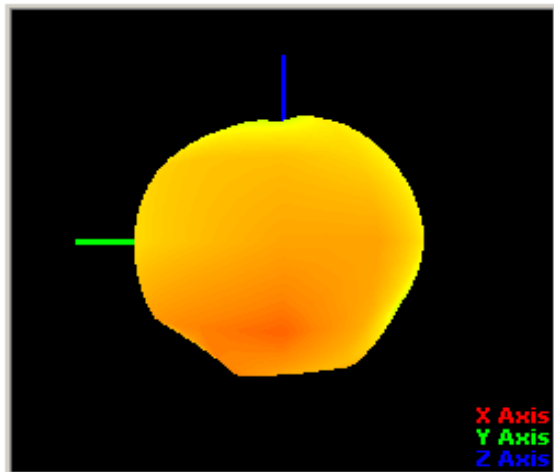
GSM1900/WCDMA B2/LTE B2



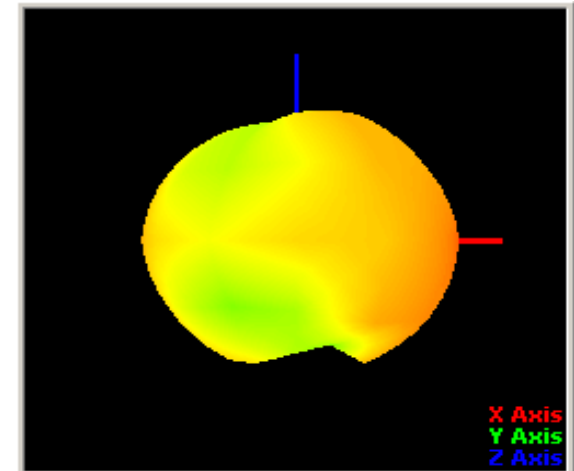
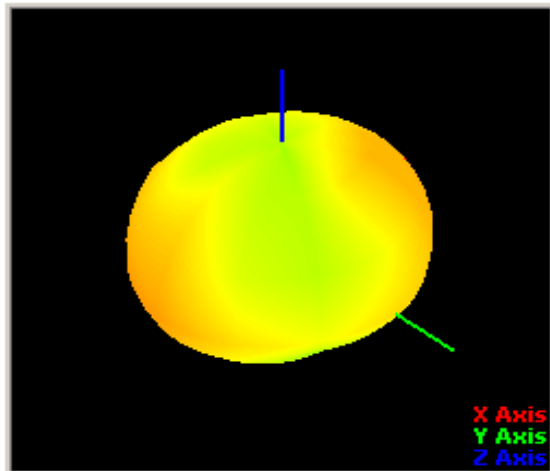
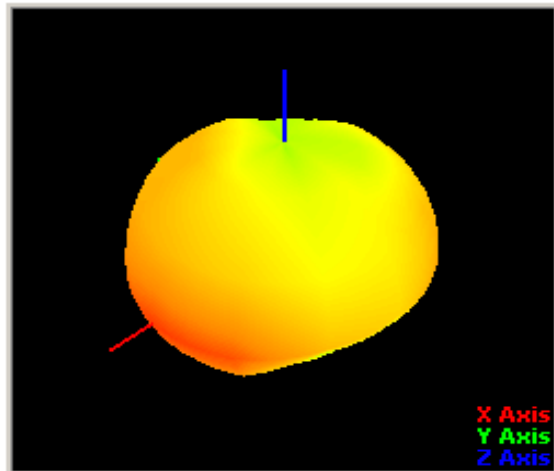
WCDMA B1



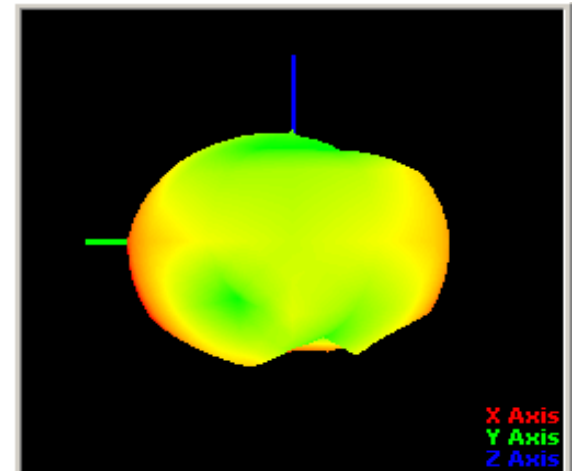
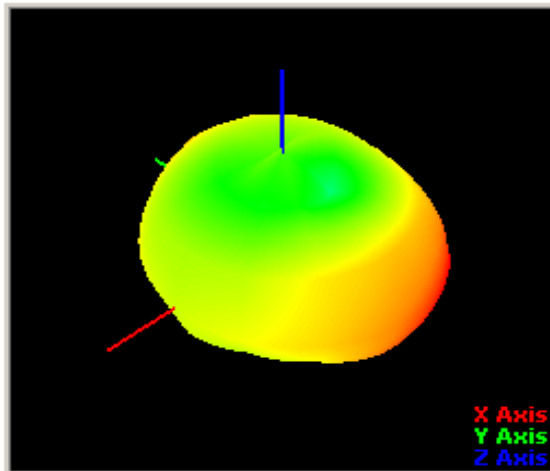
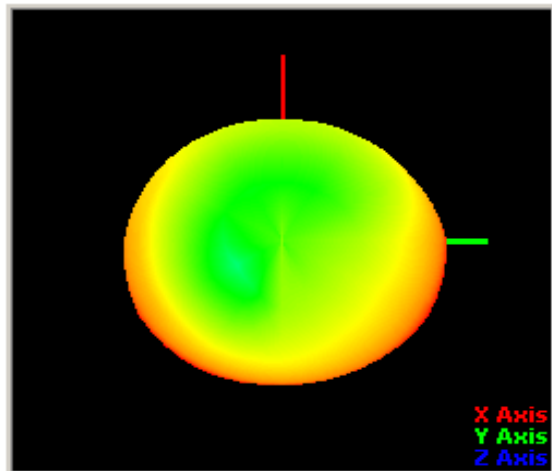
WCDMA B4/LTE B4



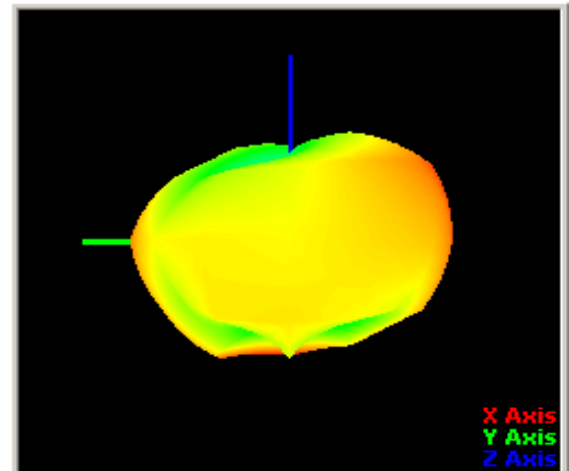
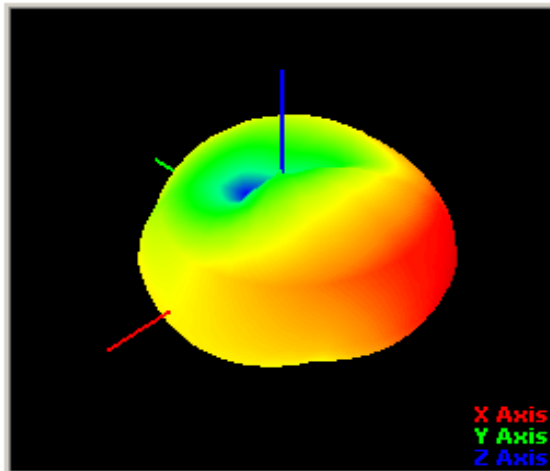
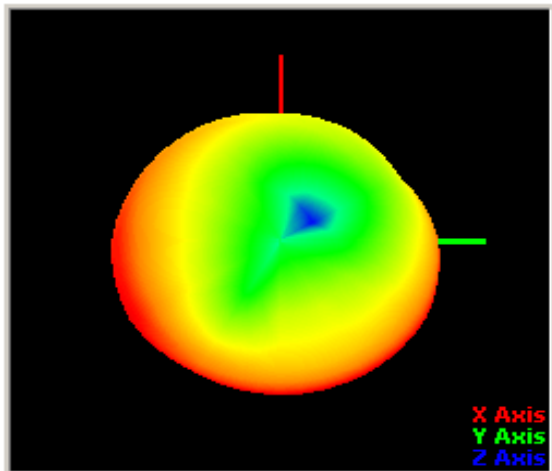
LTE B28



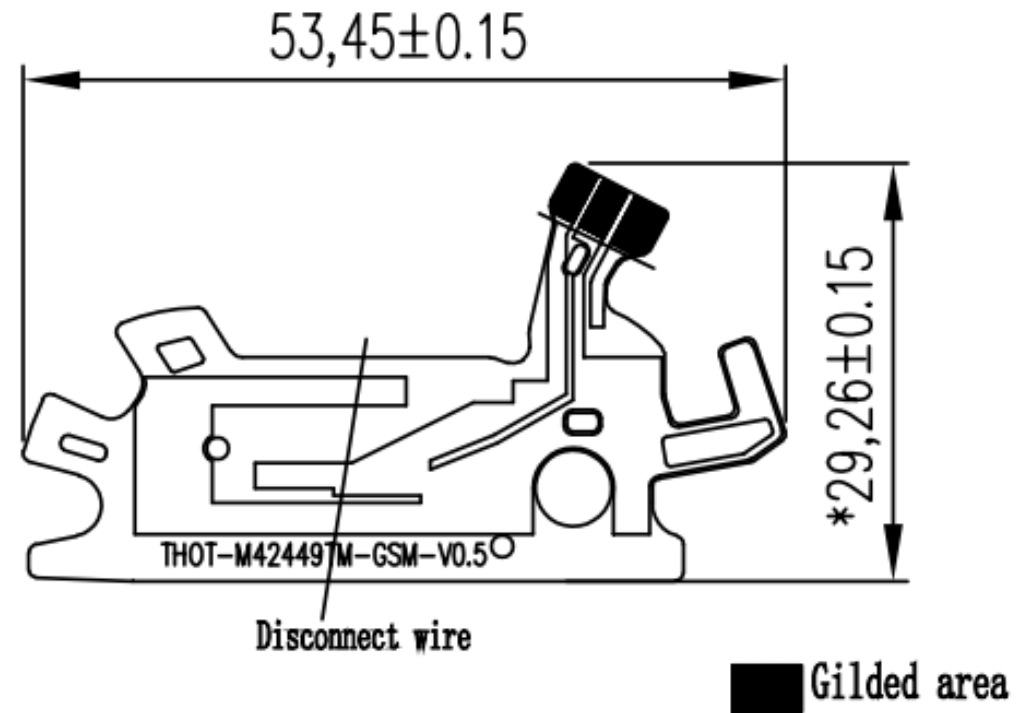
LTE B7/B38



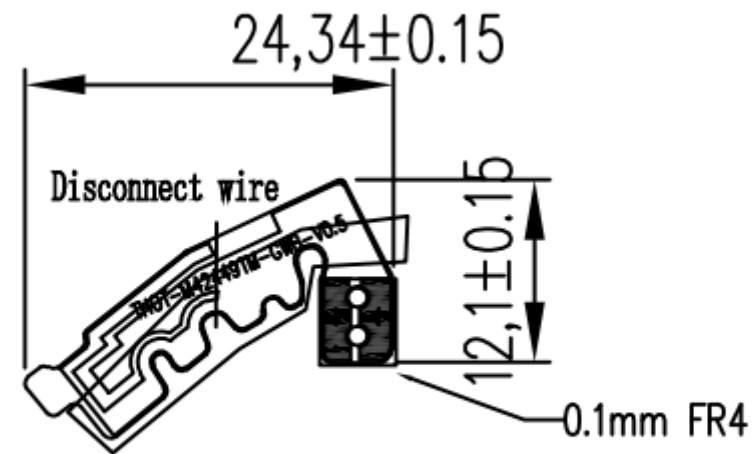
B42



6、Antenna Drawing

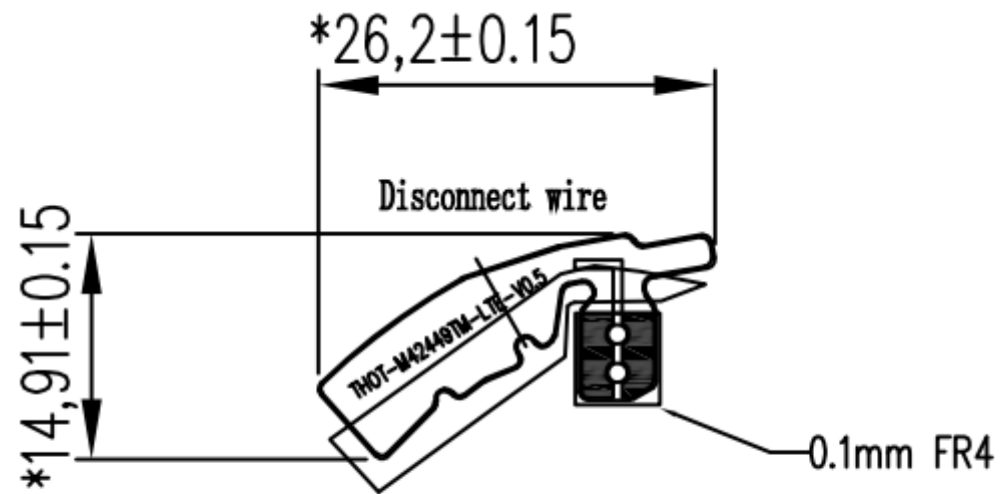


Technical requirement		
FPC substrate specification	PI base material	0.5mil
	Electrolytic copper (single panel)	0.5oz (ED)
	Single-sided adhesive	3M-9471LE
Surface ink requirements	Ink color	black
	Font color	black
	Font height	Drawing requirements
RoHS requirement	Materials involved must comply with ROHS requirements	



■ Gilded area

Technical requirement		
FPC substrate specification	PI base material	0.5mil
	Electrolytic copper (single panel)	0.5oz (ED)
	Single-sided adhesive	3M-9471LE
Surface ink requirements	Ink color	black
	Font color	black
	Font height	Drawing requirements
RoHS requirement	Materials involved must comply with ROHS requirements	



■ Gilded area

Technical requirement		
FPC substrate specification	PI base material	0.5mil
	Electrolytic copper (single panel)	0.5oz (ED)
	Single-sided adhesive	3M-9471LE
Surface ink requirements	Ink color	black
	Font color	black
	Font height	Drawing requirements
RoHS requirement	Materials involved must comply with ROHS requirements	

7、Main antenna standard

BAND	CARRIER	
2G	TRP	TIS
GSM850	26	-102
EGSM900	26	-102
DCS1800	24	-102
PCS1900	24	-102

BAND	CARRIER	
3G	TRP	TIS
B1	17	-103
B2	17	-103
B3	17	-103
B4	17	-103
B5	16	-102
B6	16	-102
B8	16	-102
B19	16	-102

BAND	CARRIER	
FDD LTE	TRP	TIS
B1	16	-93
B2	16	-93
B3	16	-93
B4	16	-93
B5	16	-91
B7	16	-93
B8	16	-91
B12	16	-91
B13	16	-91
B17	16	-91
B19	16	-91
B20	16	-91
B25	16	-91
B26	16	-91
B28	16	-91

BAND	CARRIER	
TDD LTE	TRP	TIS
TD-A (34 : 2100)	17	-104
TD-F (39 : 1900)	16	-90
B34	16	-90
B38	16	-90
B39	16	-90
B40	16	-90
B41	16	-90

Thank you!

