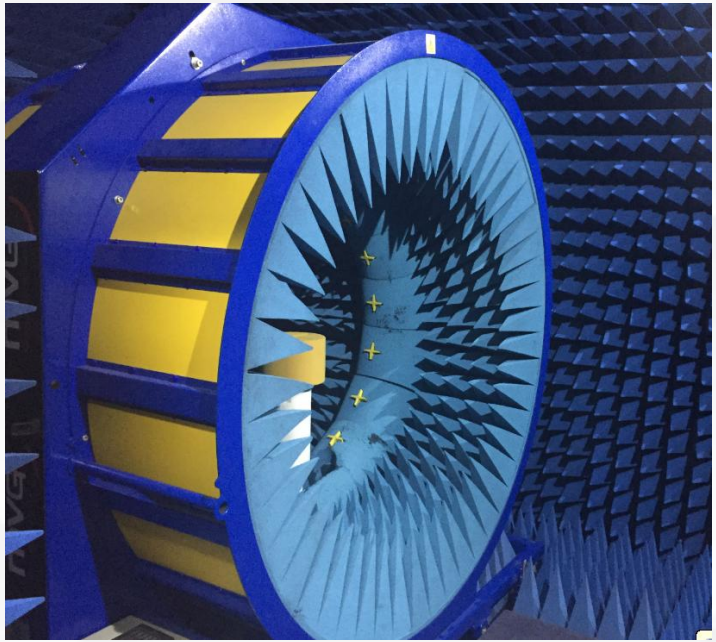
天线调试报告

Antenna debugging report

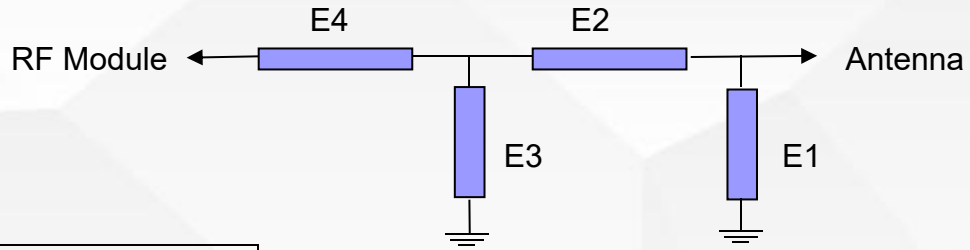
客　户customer：图高Tu Gon
项目名project：HW06
射　频RF：江工 Jiang Gong
日　期Date：　2024.5.14

实验室测试环境及设备
Laboratory testing environment and equipment

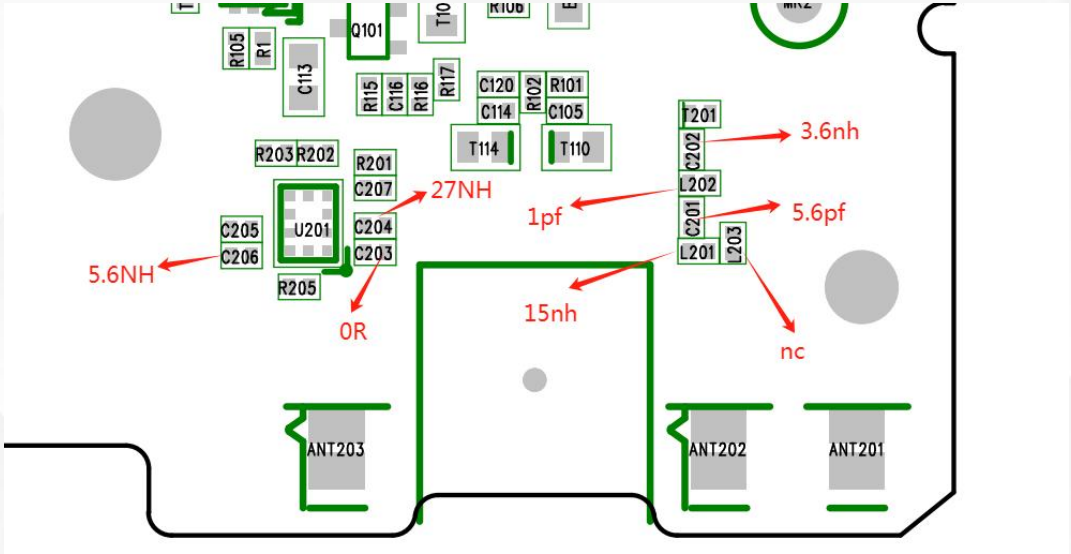


测试项目 Test items	测试设备 Test equipment
S11、S12 、VSWR 、LOSS	网络分析仪network analyzer E5071B、E5062A
Efficiency、Gain 3D Radiation Pattern	Satimo SG16暗室darkroom、GP7*4*3暗室darkroom、E5071B
TRP、TIS	Satimo SG16暗室darkroom、GP7*4*3暗室darkroom、8960 、CMW500、MT8820C、E4438C、

ANT0 匹配电路 ANT0matching circuit



Element	Value
E1(0201)	15NH
E2(0201)	5.6pf
E3(0201)	1PF
E4(0201)	3.6NH

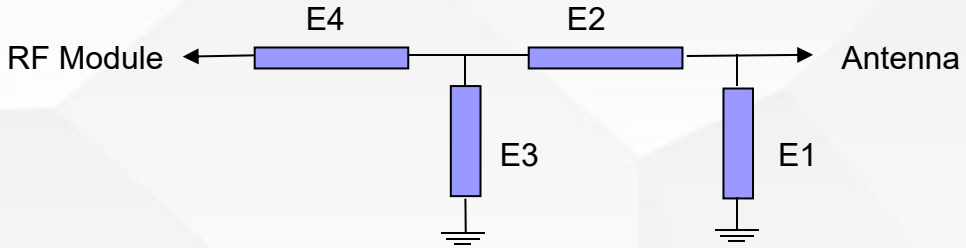


ANT0 开关逻辑 ANT0Switch logic

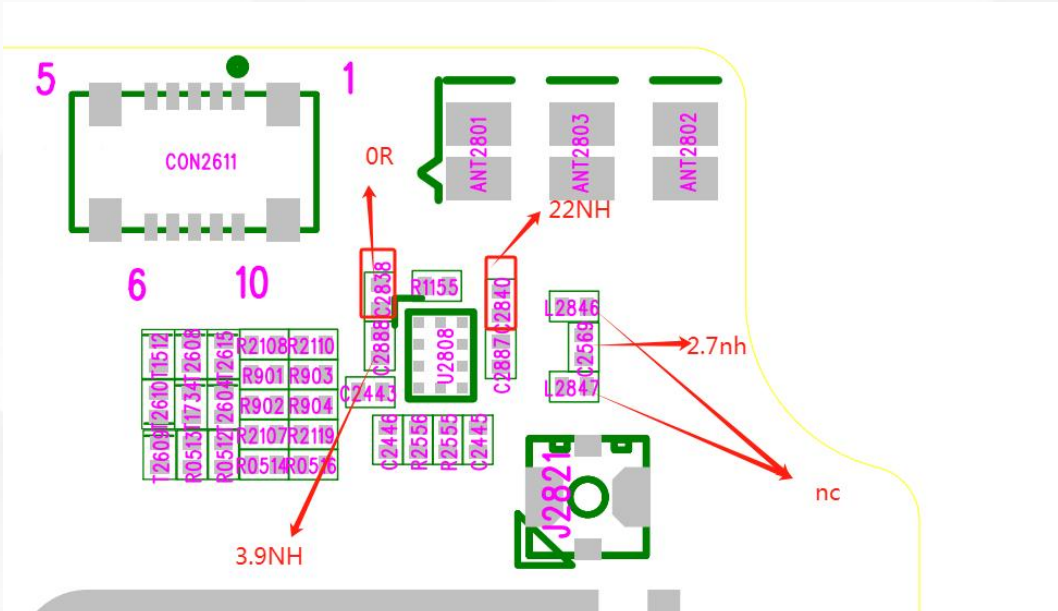
ANT0关

C547 (RF1)	GSM900+ DCS/PCS+W1/2/4/8+BC1+LTE B1/2/3/4/7/8/25/66/34/39/40/+ N1/2/3/7/8 (TX&RX)
C548(RF2)	GSM850+ W-B5/6/19+BC0/BC10+ LTE B5/18/19/20/26+ N5(TX&RX)
C549(RF3)	LTE-B12/17/28+N28(TX&RX)
C550(RF4)	

ANT1 匹配电路 ANT1Matching circuit



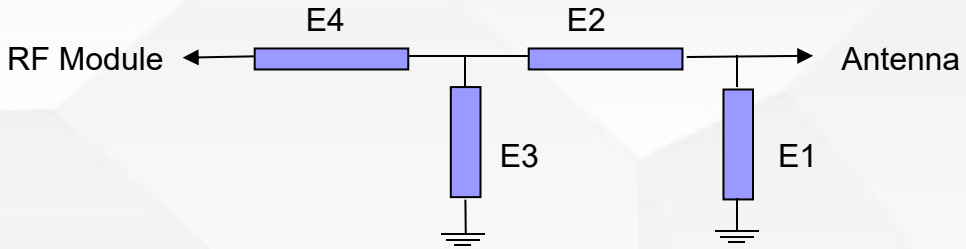
Element	Value
E1(0201)	NC
E2(0201)	2.7nh
E3(0201)	NC



ANT1 开关逻辑 ANT1Switch logic

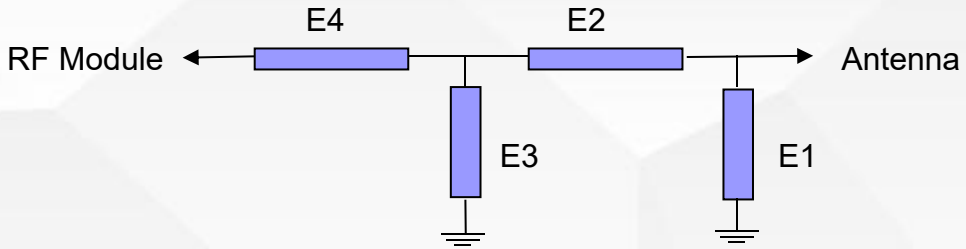
ANT1天	
RF1 (C2838)	GSM900+ DCS/PCS+W1/2/4/8+BC1+LTE B1/2/3/4/7/8/25/66/34/39/40/+ N1/2/3/7/8 (TX&RX)
RF2(C2888)	GSM850+ W-B5/6/19+BC0/BC10+ LTE B5/18/19/20/26+ N5(TX&RX)
RF3(C2840)	LTE-B12/17/28+N28(TX&RX)

ANT2 匹配电路 ANT2 Matching circuit



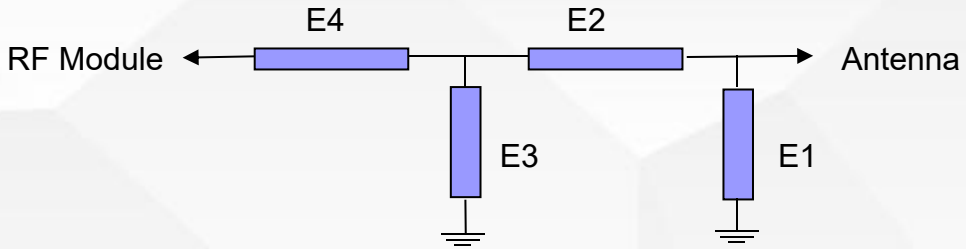
Element	Value
E1(0201)	
E2(0201)	主板原匹配
E3(0201)	
E4(0201)	

ANT3 匹配电路 ANT3 Matching circuit



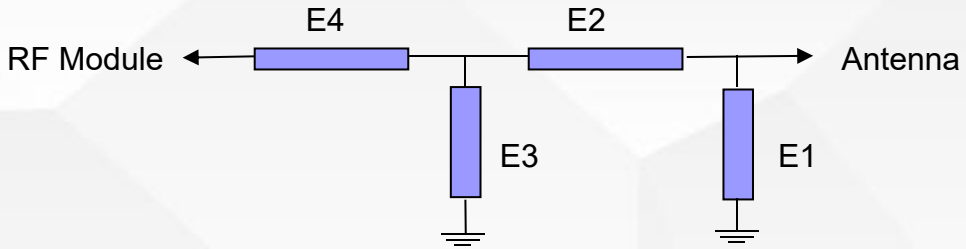
Element	Value
E1(0201)	
E2(0201)	主板原匹配
E3(0201)	
E4(0201)	

ANT4 匹配电路 ANT4Matching circuit



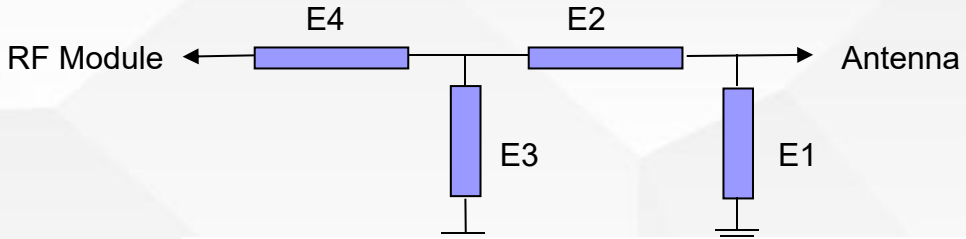
Element	Value
E1(0201)	
E2(0201)	主板原匹配
E3(0201)	
E4(0201)	

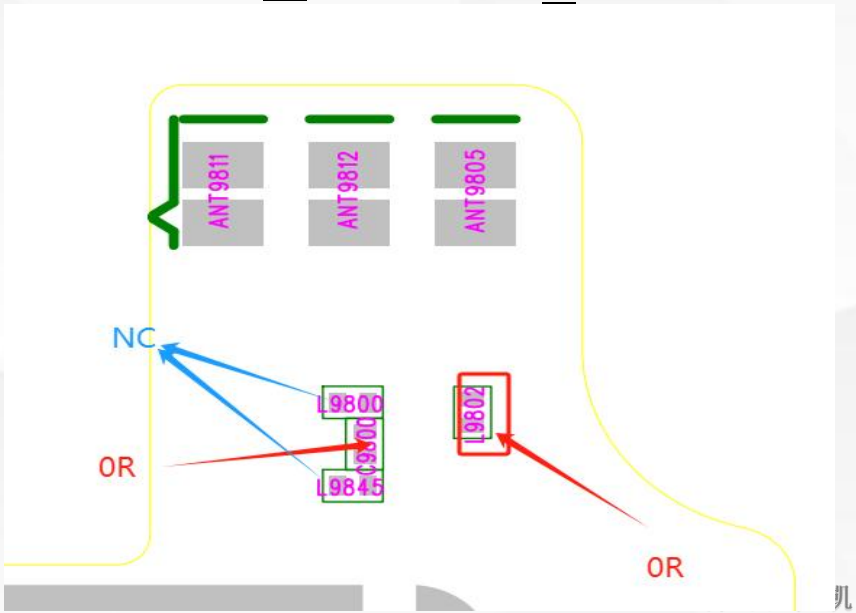
ANT5 匹配电路 ANT5Matching circuit



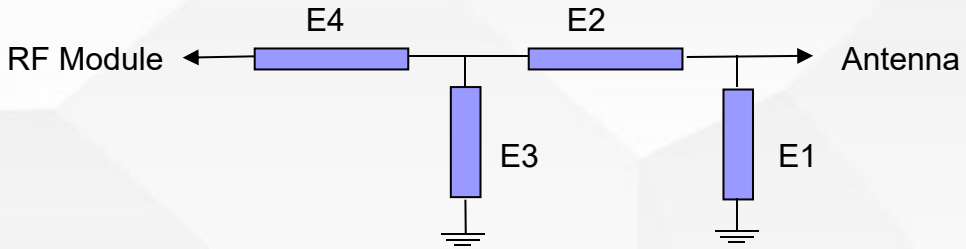
Element	Value
E1(0201)	
E2(0201)	主板原匹配
E3(0201)	
E4(0201)	

ANT6 匹配电路 ANT6Matching circuit



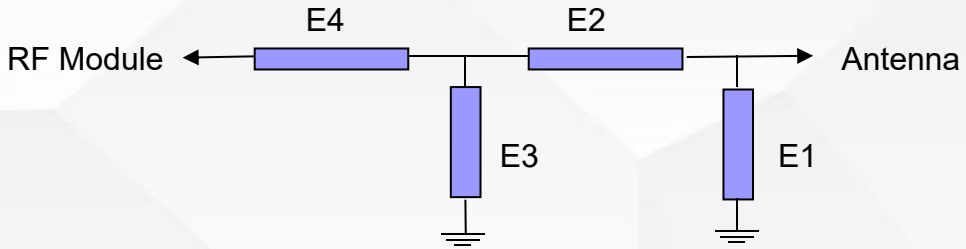


ANT7 匹配电路 ANT7Matching circuit



Element	Value
E1(0201)	
E2(0201)	主板原匹配
E3(0201)	
E4(0201)	

NFC匹配电路 NFC Matching circuit



Element	Value
E1(0201)	
E2(0201)	主板原匹配
E3(0201)	
E4(0201)	

天线测试 数据 Antenna test data

2G 3G

FS	Channel	TRP	TIS
GSM850	L	25.5	
	M	25.6	
	H	25.6	-101.3
EGSM900	L	25.8	
	M	26.2	
	H	26.1	-100.1
DCS1800	L	25.3	
	M	25.5	
	H	25.2	-103.6
PCS1900	L	25.8	
	M	25.6	
	H	25.4	-102.9

	Channel	TRP	TIS
W-1	L	18.5	
	M	18.2	
	H	18.7	-104.5
W-2	L	18.3	
	M	18.5	
	H	18.2	-104.6
W-4	L	17.7	
	M	18.2	
	H	18.5	-105.3
W-5	L	16.5	
	M	16.8	
	H	16.5	-103.6
W-8	L	16.7	
	M	16.5	
	H	16.3	-103.1

天线测试 数据 Antenna test data

4G

FS	Channel	TRP	TIS
LTE-1	L	18.2	
	M	18.3	
	H	17.5	-94.2
LTE-2	L	18.2	
	M	18.2	
	H	18.5	-95.2
LTE-3	L	17.5	
	M	17.8	
	H	18.3	-96.4
LTE-4	L	18.3	
	M	17.7	
	H	17.9	-94
LTE-5	L	16.8	
	M	16.5	
	H	16.5	-92.1

	Channel	TRP	TIS
LTE-7	L	17.4	
	M	17.5	
	H	17.1	-93.8
LTE-8	L	17.6	
	M	17.5	
	H	17.2	-88.3
LTE-12	L	16.5	
	M	16.8	
	H	17.1	-89.4
LTE-17	L	16.8	
	M	16.8	
	H	16.7	-90.1
LTE-18	L	16.8	
	M	17.1	
	H	17.1	-90.2

	Channel	TRP	TIS
LTE-19	L	17.6	
	M	17.5	
	H	17.0	-89.3
LTE-20	L	17.0	
	M	17.2	
	H	17.5	-90.4
LTE-25	L	18.2	
	M	18.2	
	H	18.4	-96.0
LTE26	L	17.7	
	M	17.5	
	H	16.9	-90.3
LTE-28	L	16.5	
	M	17.2	
	H	17.3	-90.7

天线测试 数据 Antenna test data

4G

FS	Channel	TRP	TIS
LTE-34	L	17.3	
	M	17.2	
	H	17.2	-94.9
LTE-38	L	18.9	
	M	18.5	
	H	17.2	-91.9
LTE-39	L	18.5	
	M	18.6	
	H	19.3	-94
LTE-40	L	18.1	
	M	17.6	
	H	17.3	-90.9
LTE-41	L	18.8	
	M	18.2	
	H	17.7	-94

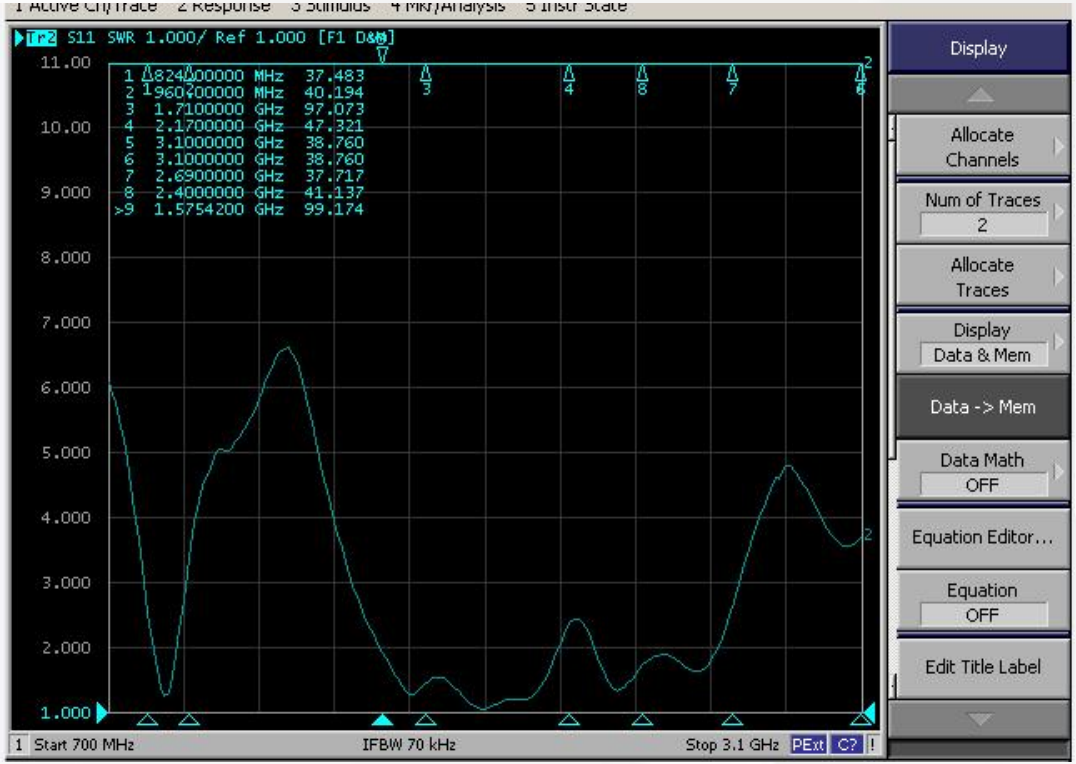
天线测试 数据 Antenna test data

5G

FS	Channel	TRP	TIS
N-1(20M)	L	19.1	
	M	18.6	
	H	18.8	-92
N-3(20M)	L	17.1	
	M	17.7	
	H	18.2	-94
N-5(20M)	L	17.2	
	M	16.8	
	H	16.8	-87
N-7(20M)	L	18.2	
	M	18.2	
	H	18.0	-91.8
N-8(20M)	L	16.8	
	M	16.5	
	H	16.4	-85.0

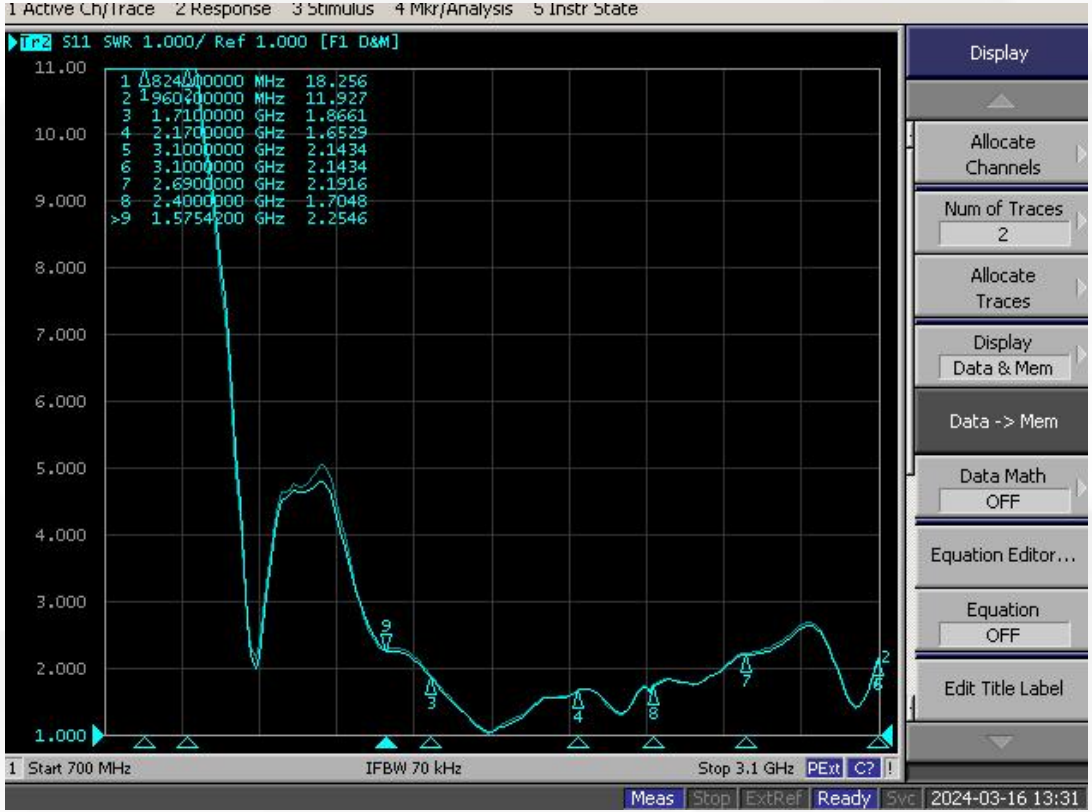
	Channel	TRP	TIS
N-28(20M)	L	17.3	
	M	17.5	
	H	17.2	-86.4
N-38(20M)	L	18.2	
	M	18.5	
	H	18.8	-92.6
N-41(100M)	L	18.6	
	M	19.5	
	H	19.5	-85.2
N-77(100M)	L	19.1	
	M	19.5	
	H	19.8	-89.2
N78(100M)	L	18.9	
	M	19.3	
	H	19.8	-88.4

S11图 Figure S11



ANT0

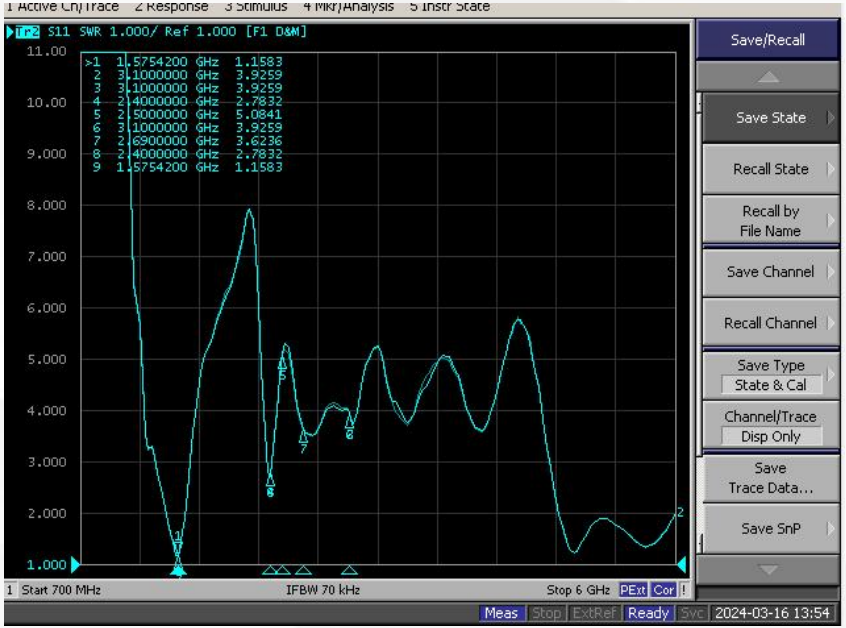
S11图 Figure S11



ANT4(中高频)

S11图 Figure S11

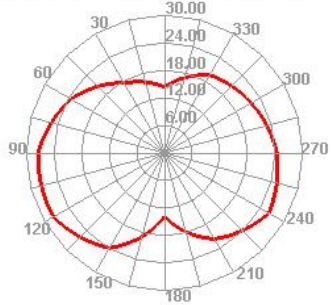
ANT7(1.2G/2.4G/5.8G)



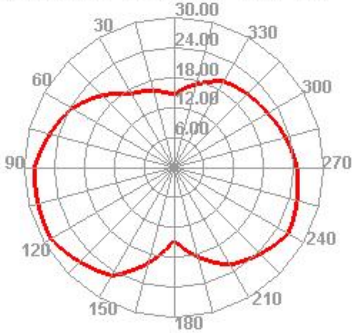
ANT6(1.5G/2.4G/5.8G)

方向图 Directions

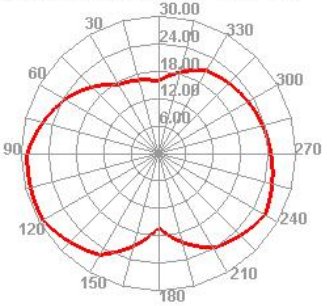
GSM850 128 TRP Phi=45



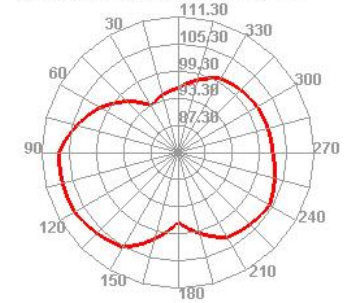
GSM850 190 TRP Phi=45



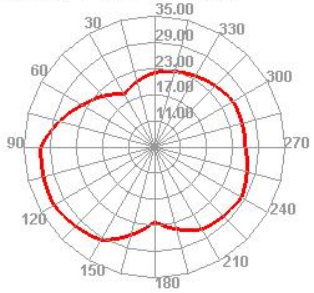
GSM850 251 TRP Phi=45



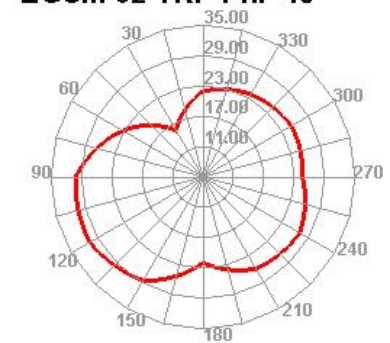
GSM850 251 TIS Phi=45



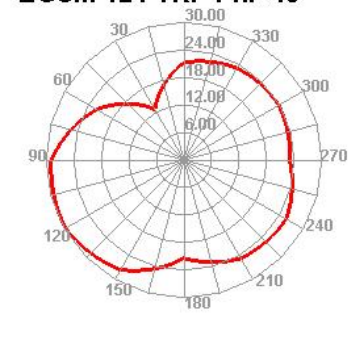
EGSM 1 TRP Phi=45



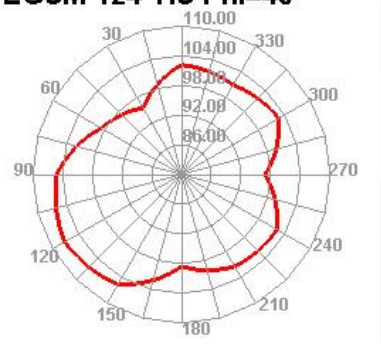
EGSM 62 TRP Phi=45



EGSM 124 TRP Phi=45

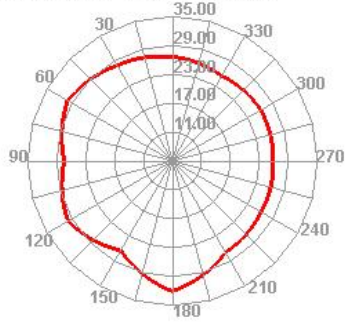


EGSM 124 TIS Phi=45

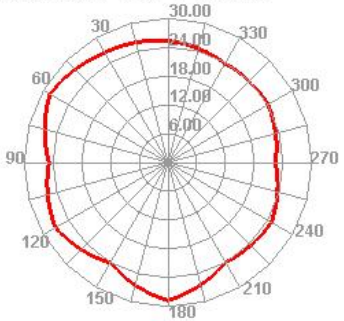


方向图 Directions

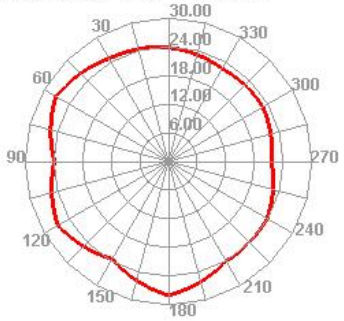
DCS 512 TRP Phi=45



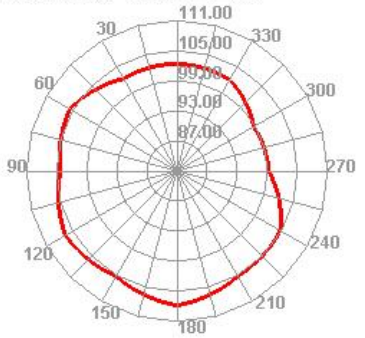
DCS 698 TRP Phi=45



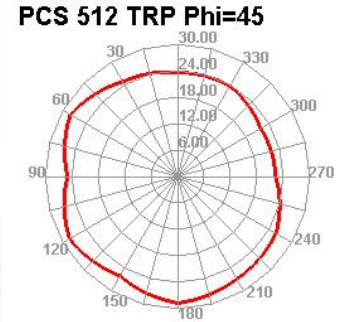
DCS 885 TRP Phi=45



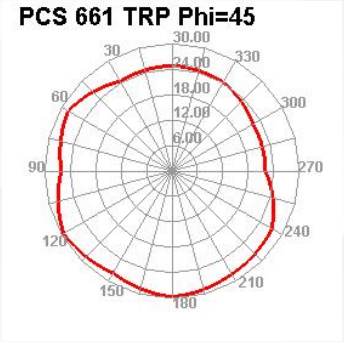
DCS 885 TIS Phi=45



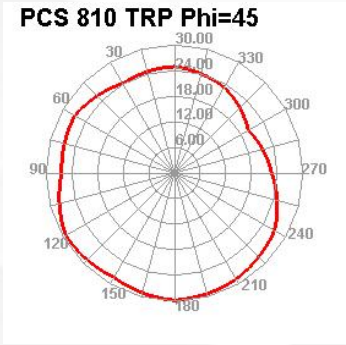
PCS 512 TRP Phi=45



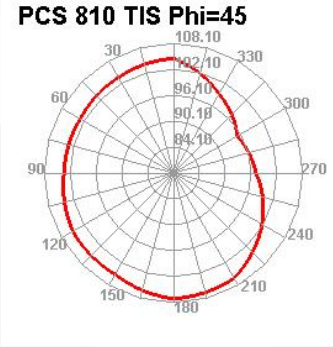
PCS 661 TRP Phi=45



PCS 810 TRP Phi=45

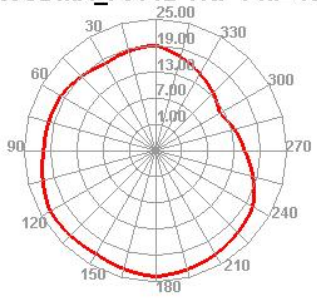


PCS 810 TIS Phi=45

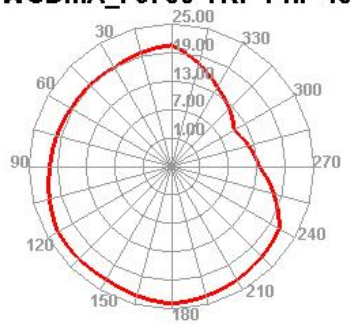


方向图 Directions

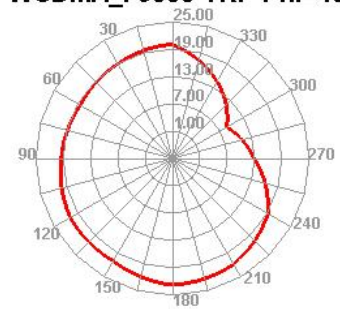
WCDMA_I 9612 TRP Phi=45



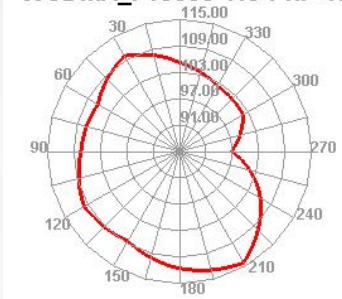
WCDMA_I 9750 TRP Phi=45



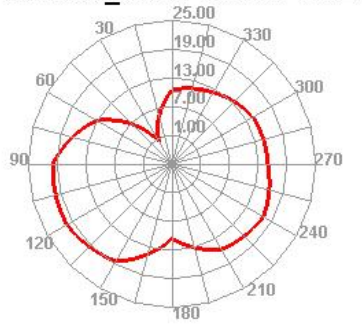
WCDMA_I 9888 TRP Phi=45



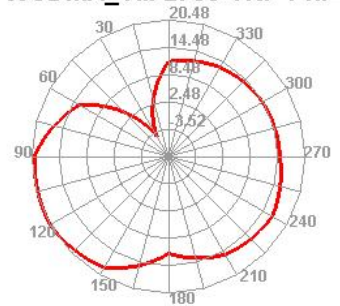
WCDMA_I 10838 TIS Phi=45



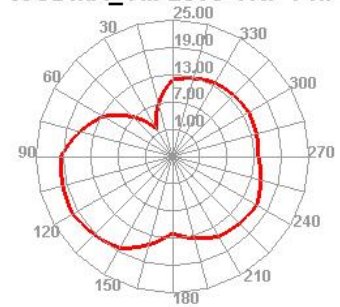
WCDMA_VIII 2712 TRP Phi=4



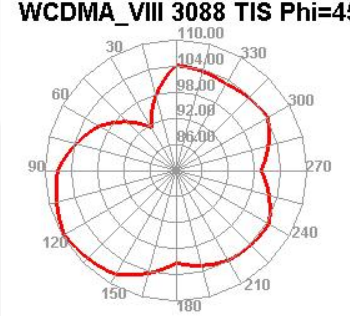
WCDMA_VIII 2788 TRP Phi=4



WCDMA_VIII 2863 TRP Phi=4



WCDMA_VIII 3088 TIS Phi=45



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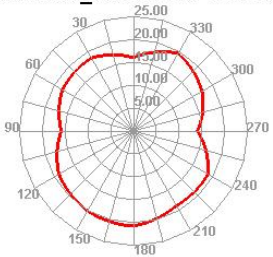
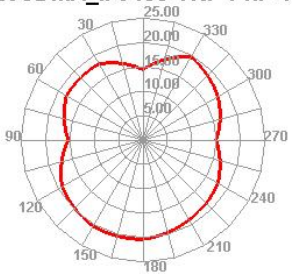
方向图 Directions

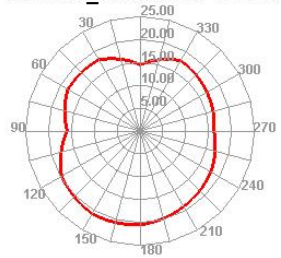
WCDMA_II 9262 TRP Phi=45



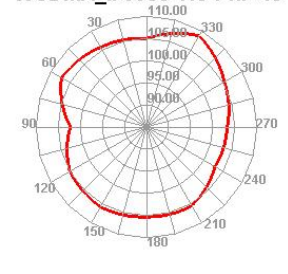
WCDMA_II 9400 TRP Phi=45



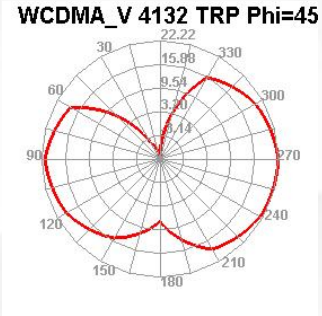
WCDMA_II 9538 TRP Phi=45



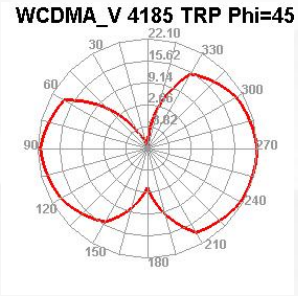
WCDMA_II 9938 TIS Phi=45



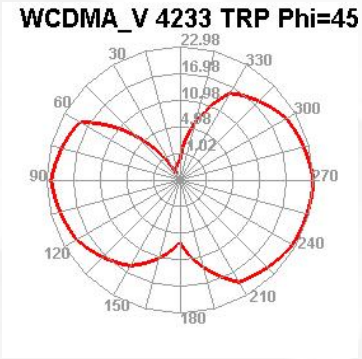
WCDMA_V 4132 TRP Phi=45



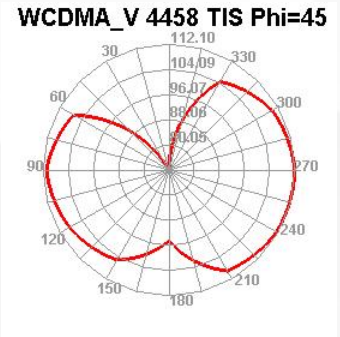
WCDMA_V 4185 TRP Phi=45



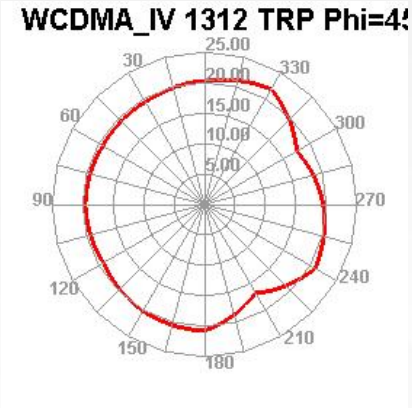
WCDMA_V 4233 TRP Phi=45

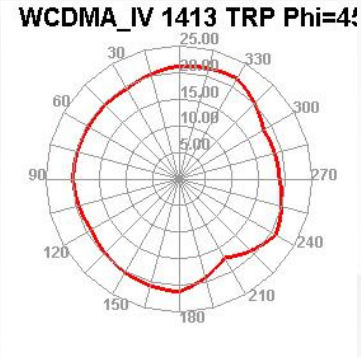


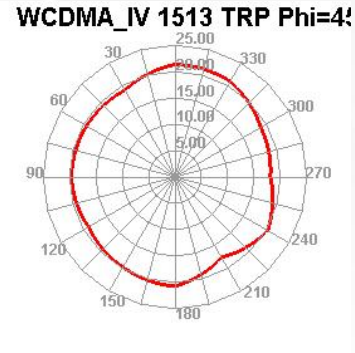
WCDMA_V 4458 TIS Phi=45

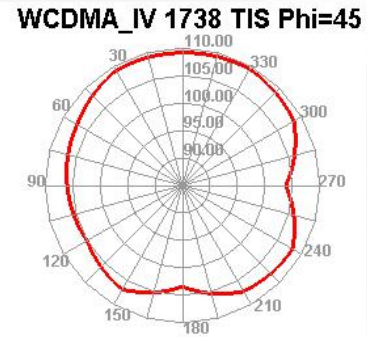


2D方向图 2D Directions









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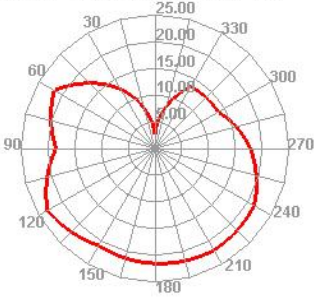
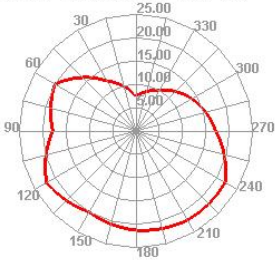
2D方向图 2D Directions

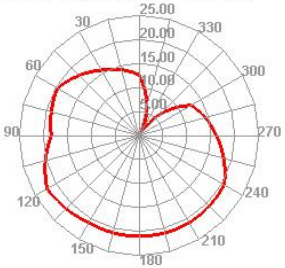
LTE1 18050 TRP Phi=45



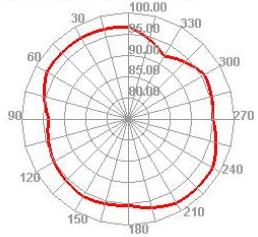
LTE1 18300 TRP Phi=45



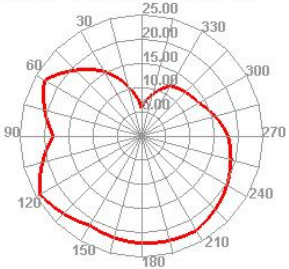
LTE1 18550 TRP Phi=45



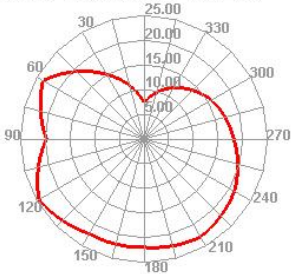
LTE1 550 TIS Phi=45



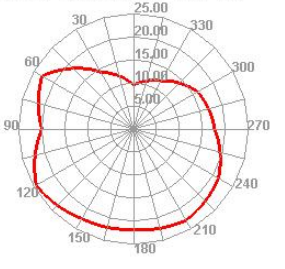
LTE2 18650 TRP Phi=45



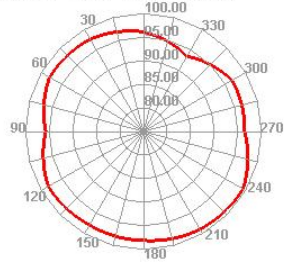
LTE2 18900 TRP Phi=45



LTE2 19150 TRP Phi=45

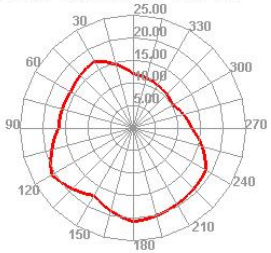


LTE2 1150 TIS Phi=45

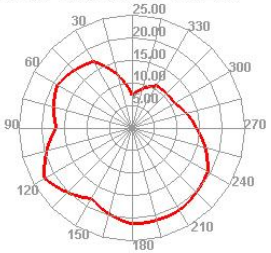


2D方向图 2D Directions

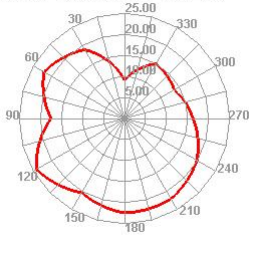
LTE3 19250 TRP Phi=45



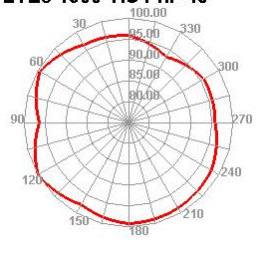
LTE3 19575 TRP Phi=45



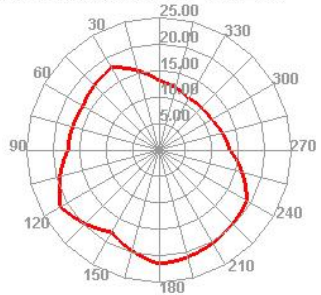
LTE3 19900 TRP Phi=45



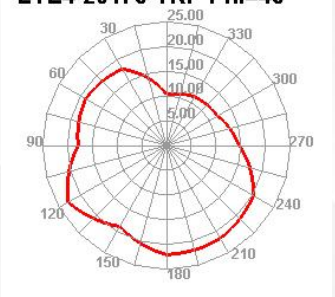
LTE3 1900 TIS Phi=45



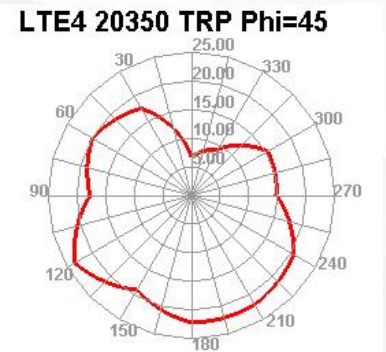
LTE4 20000 TRP Phi=45



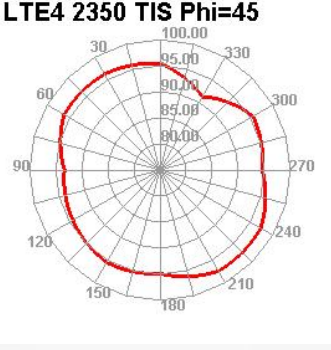
LTE4 20175 TRP Phi=45



LTE4 20350 TRP Phi=45



LTE4 2350 TIS Phi=45



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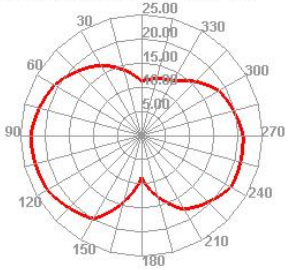
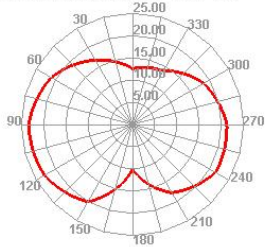
2D方向图 2D Directions

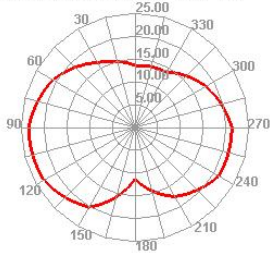
LTE5 20450 TRP Phi=45



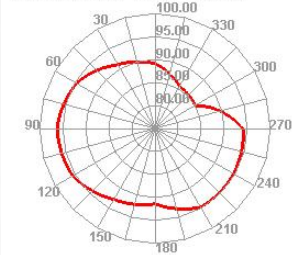
LTE5 20525 TRP Phi=45



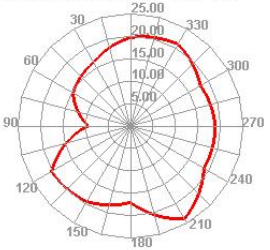
LTE5 20600 TRP Phi=45



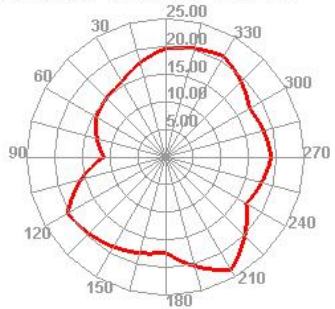
LTE5 2600 TIS Phi=45



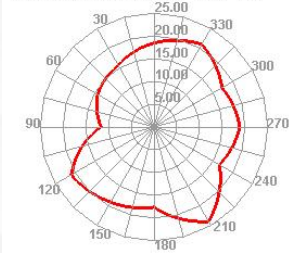
LTE7 20800 TRP Phi=45



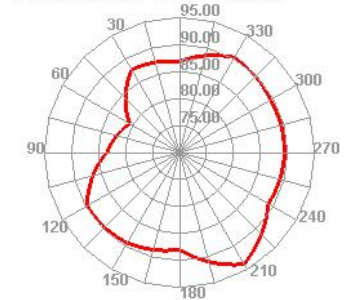
LTE7 21100 TRP Phi=45



LTE7 21400 TRP Phi=45



LTE7 3400 TIS Phi=45



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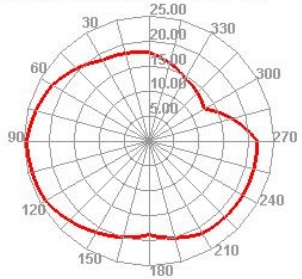
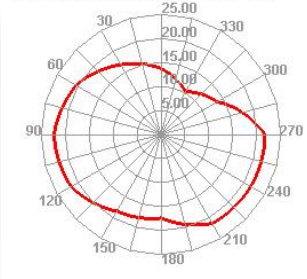
2D方向图 2D Directions

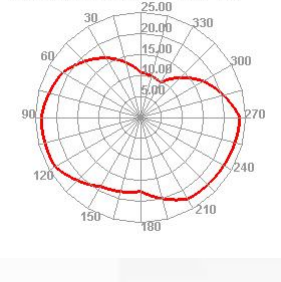
LTE8 21500 TRP Phi=45



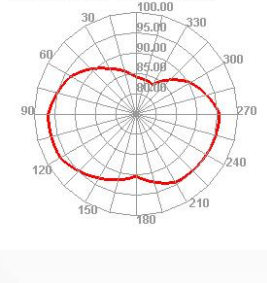
LTE8 21625 TRP Phi=45



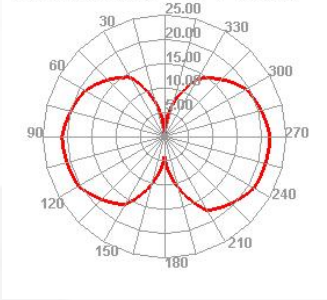
LTE8 21750 TRP Phi=45



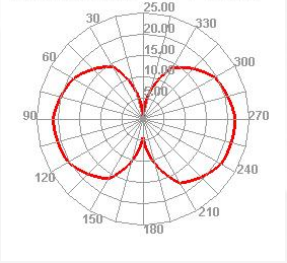
LTE8 3750 TIS Phi=45



LTE12 23060 TRP Phi=45



LTE12 23095 TRP Phi=45



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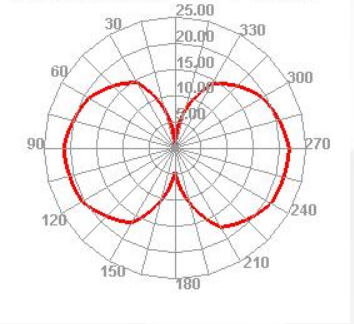
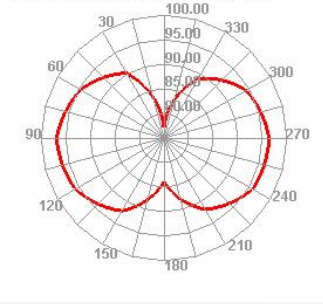


LTE12 5130 TIS Phi=45



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2D方向图 2D Directions

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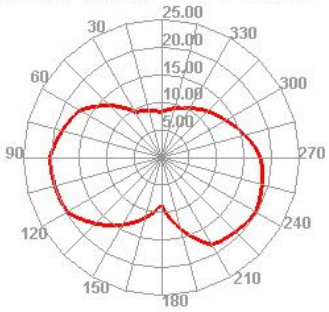
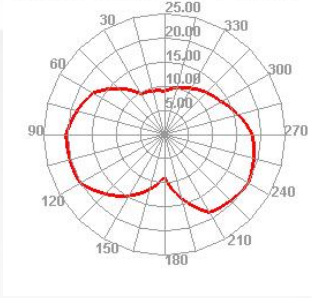
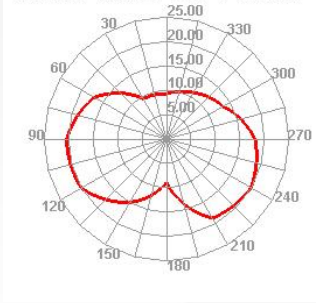


LTE17 23790 TRP Phi=45



LTE17 23800 TRP Phi=45



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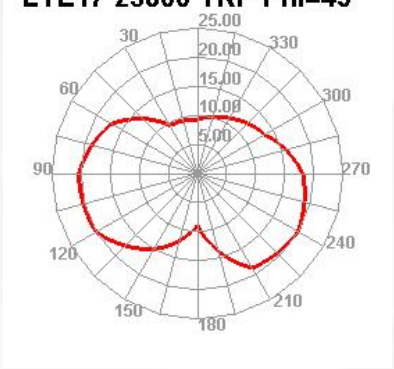

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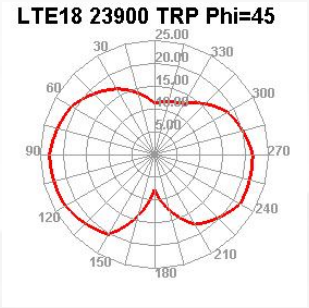
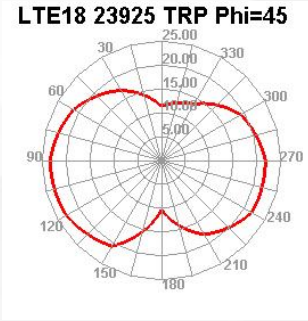
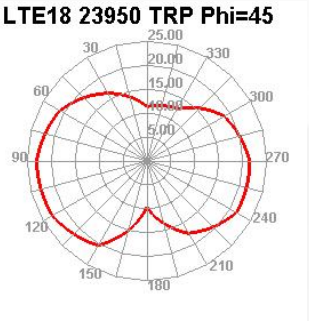


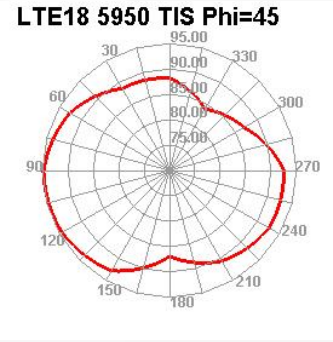
LTE18 23925 TRP Phi=45



LTE18 23950 TRP Phi=45



LTE18 5950 TIS Phi=45



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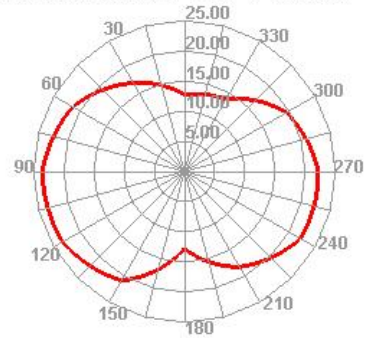
2D方向图 2D Directions

LTE19 24050 TRP Phi=45



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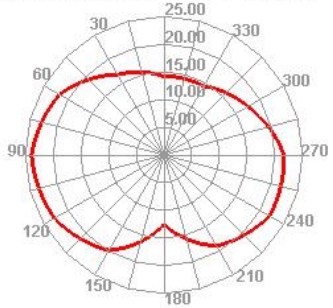
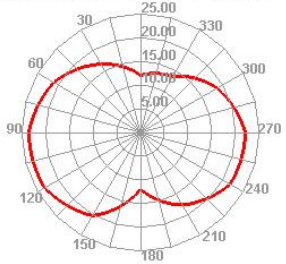
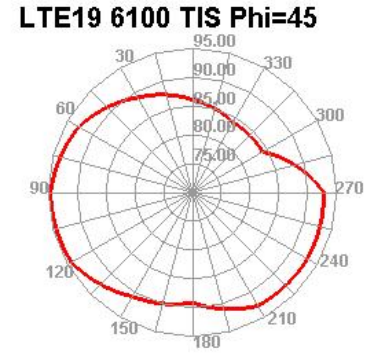


LTE19 24100 TRP Phi=45



LTE19 6100 TIS Phi=45



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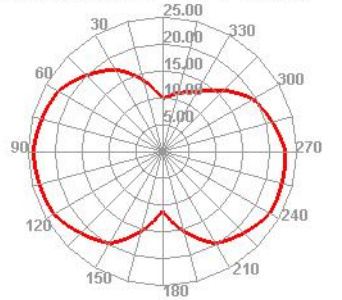

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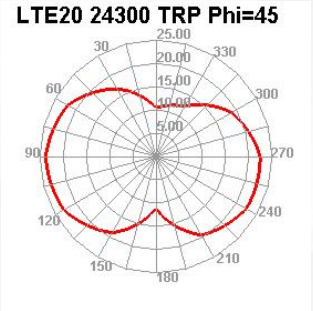

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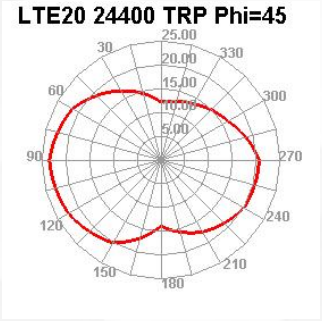

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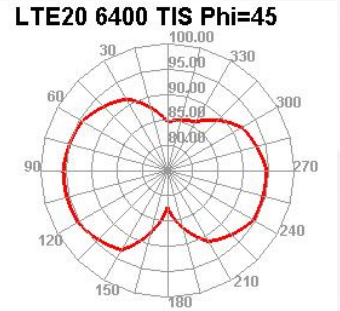

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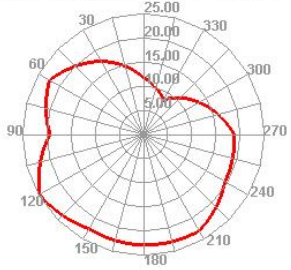
2D方向图 2D Directions

LTE25 26090 TRP Phi=45



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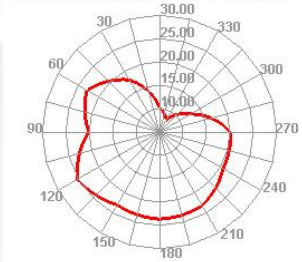

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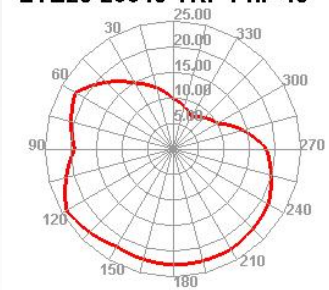

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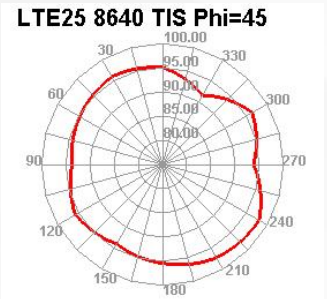

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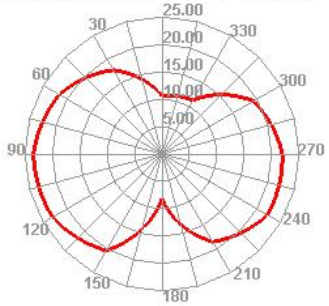

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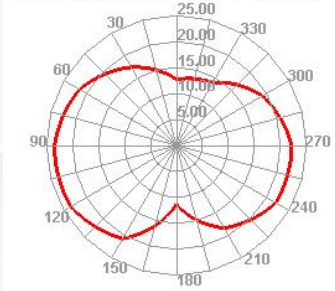

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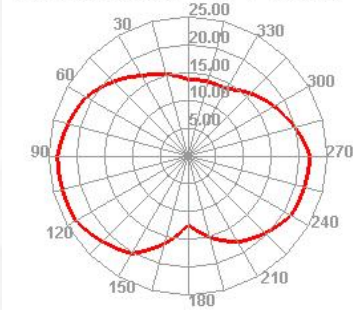
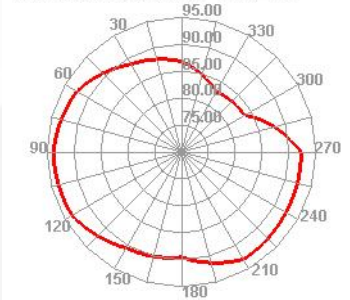
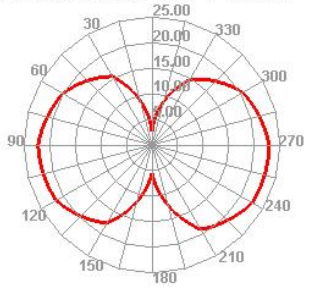


LTE26 8990 TIS Phi=45



2D方向图 2D Directions

LTE28 27260 TRP Phi=45



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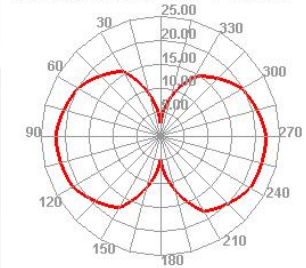
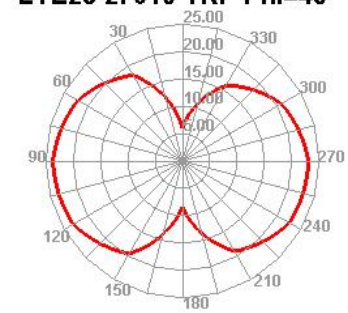
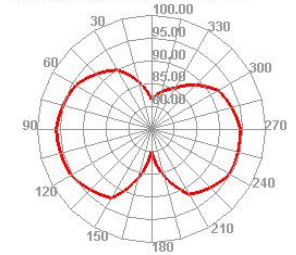


LTE28 27610 TRP Phi=45



LTE28 9610 TIS Phi=45



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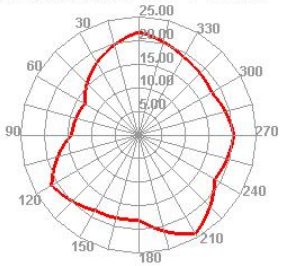

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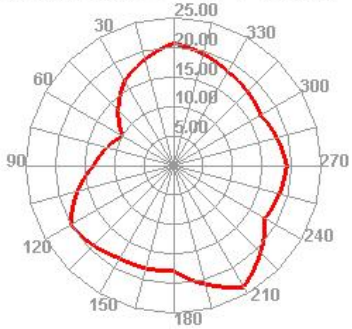

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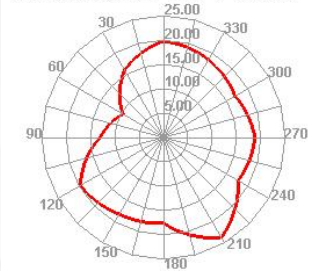

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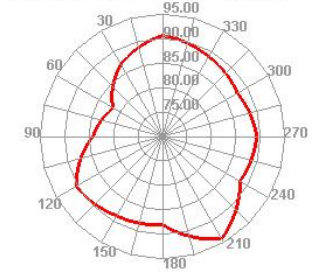
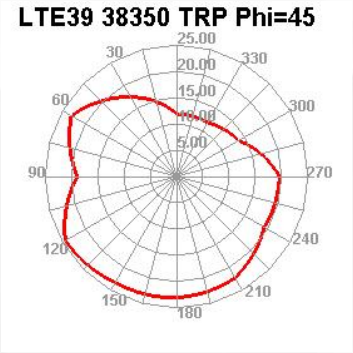
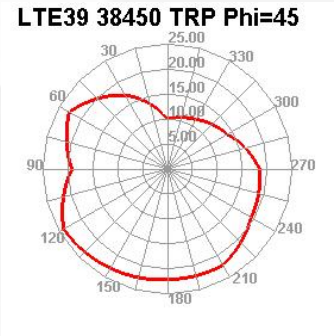
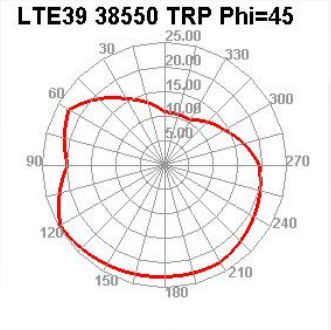
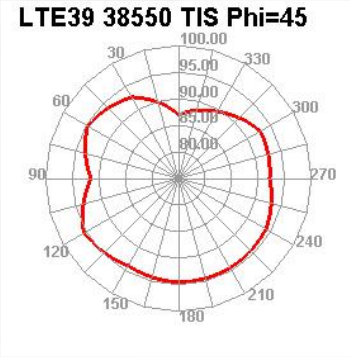


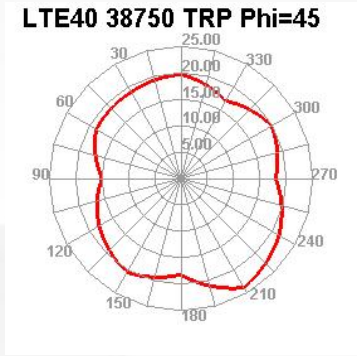
2D方向图 2D Directions

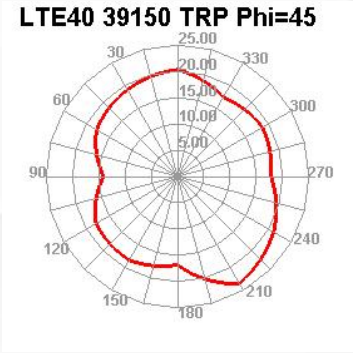


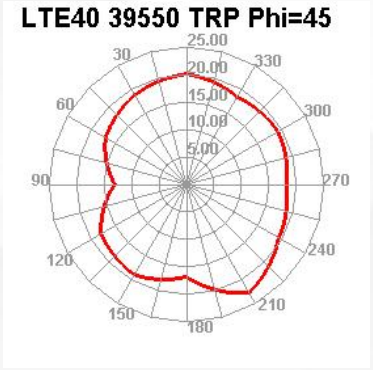


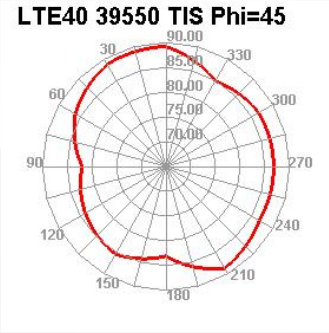






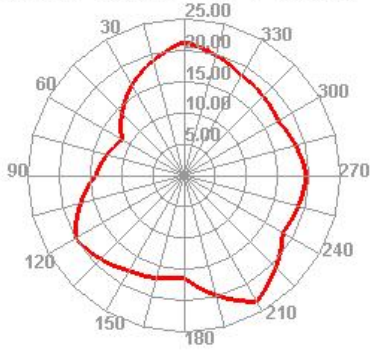






2D方向图 2D Directions

LTE41 40240 TRP Phi=45



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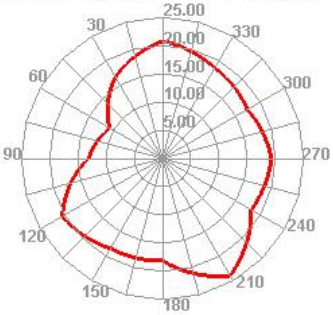

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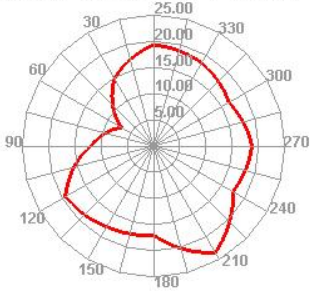

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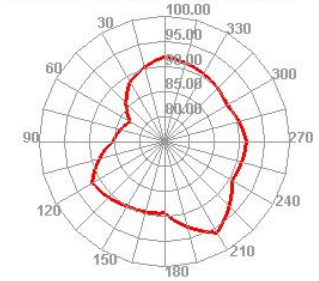

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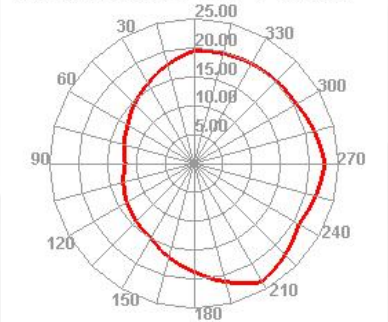

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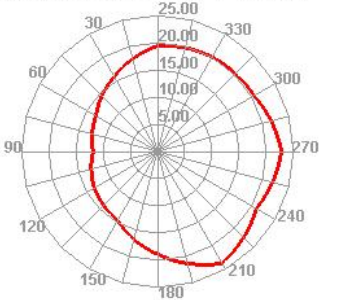

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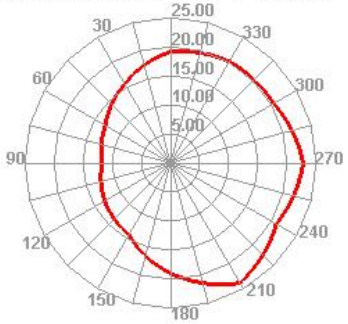

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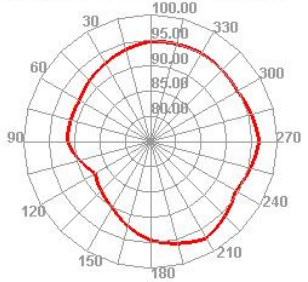

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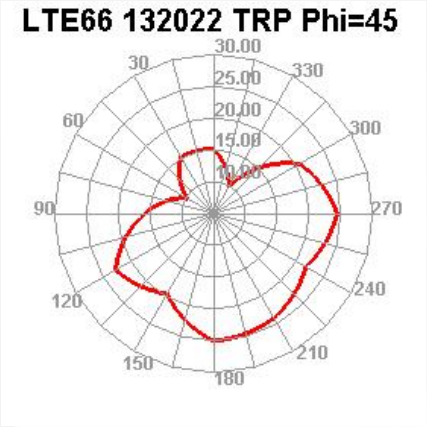
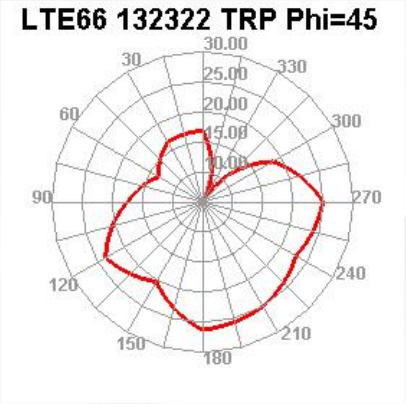
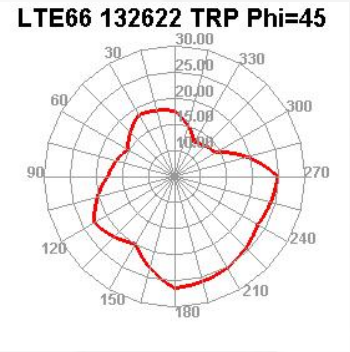
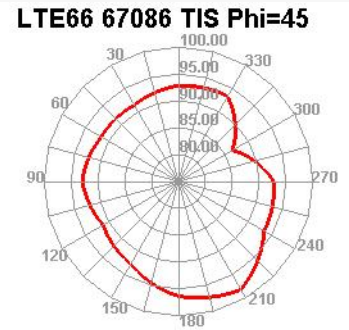
2D方向图 2D Directions



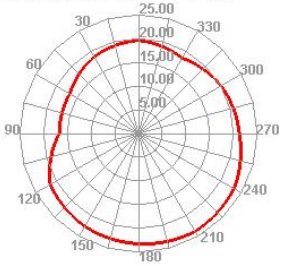






2D方向图 2D Directions

n1 386000 TRP Phi=45



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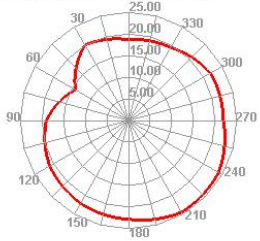

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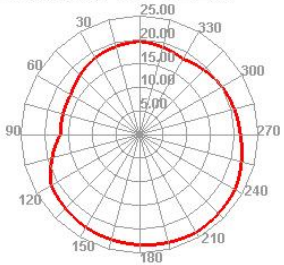
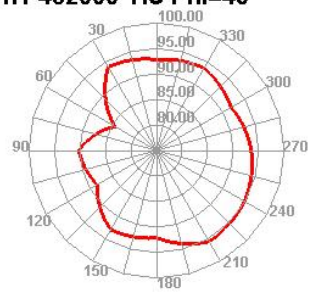
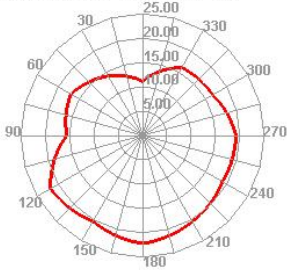


n1 432000 TIS Phi=45



n3 344000 TRP Phi=45



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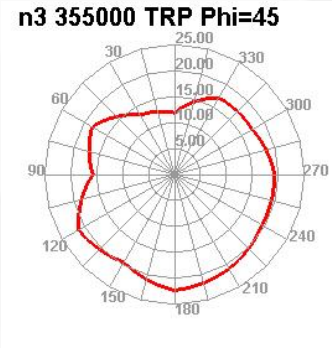

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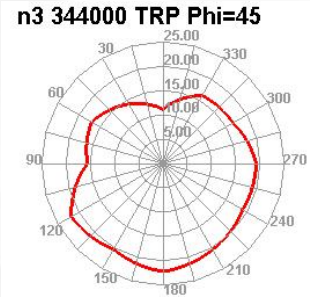
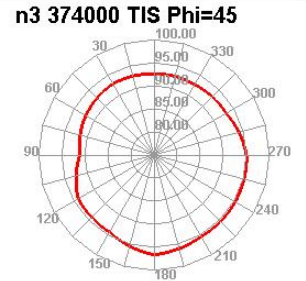
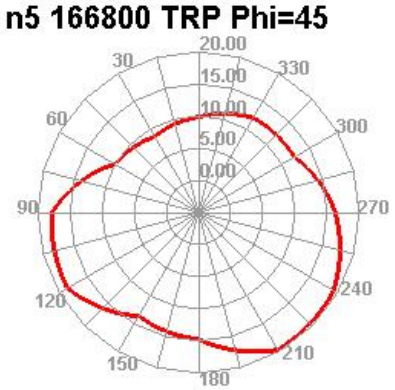
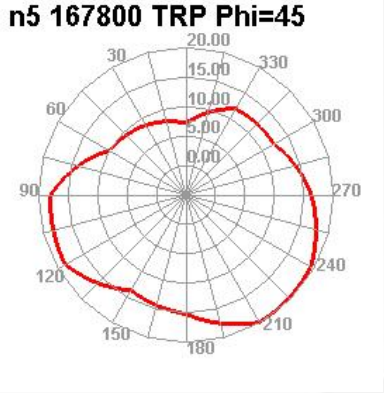


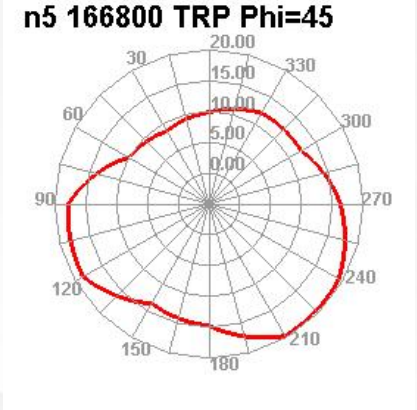
n3 374000 TIS Phi=45

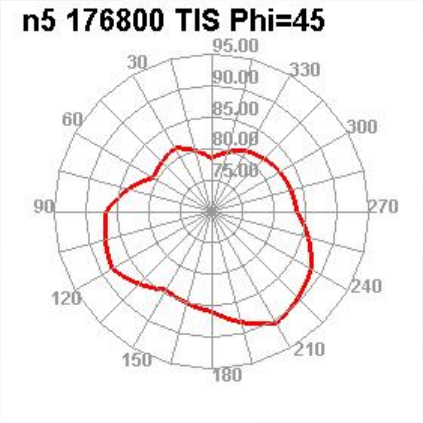


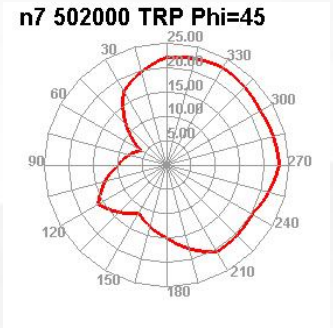
2D方向图 2D Directions

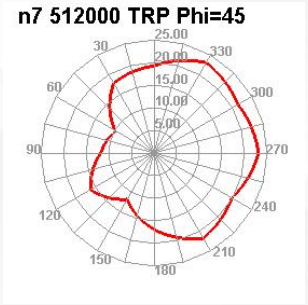


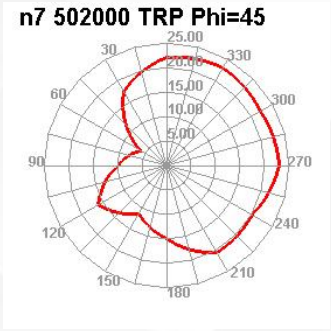


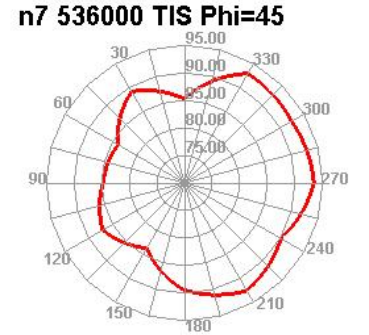






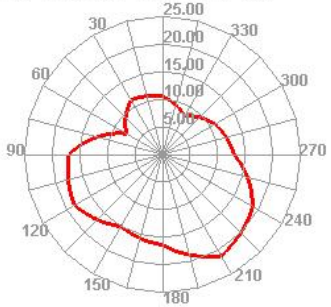




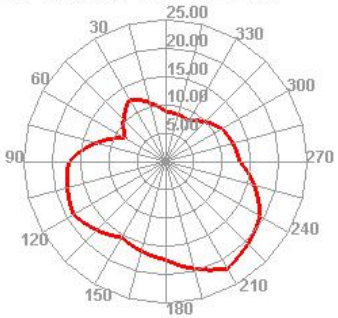


2D方向图 2D Directions

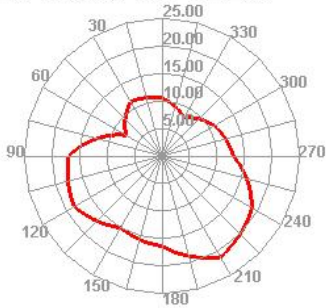
n8 178000 TRP Phi=45



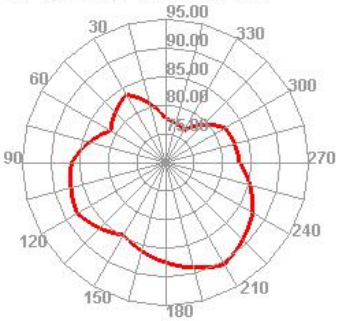
n8 181000 TRP Phi=45



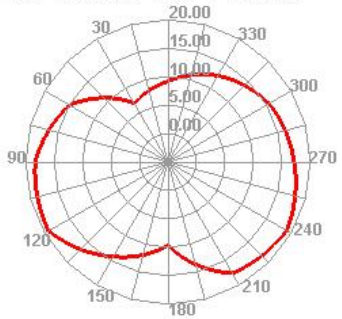
n8 178000 TRP Phi=45



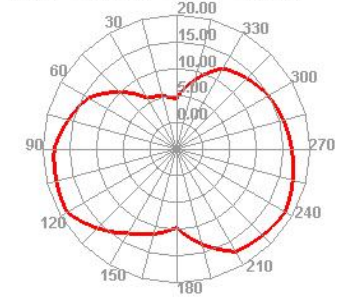
n8 190000 TIS Phi=45



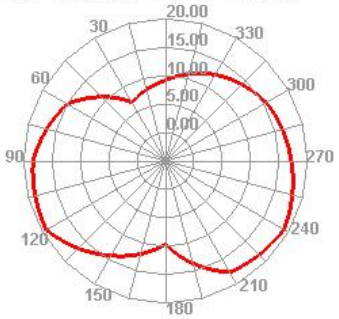
n28 142600 TRP Phi=45



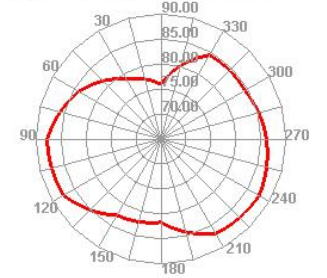
n28 144600 TRP Phi=45



n28 142600 TRP Phi=45

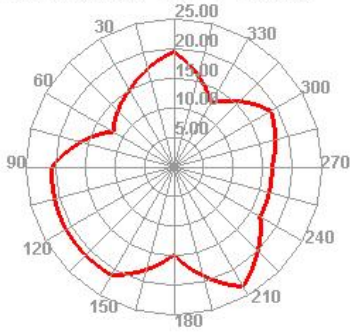


n28 155600 TIS Phi=45

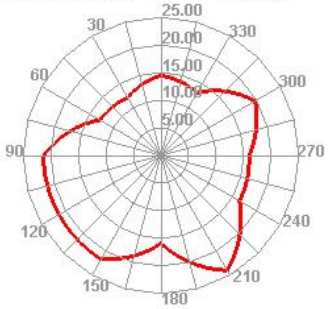


2D方向图 2D Directions

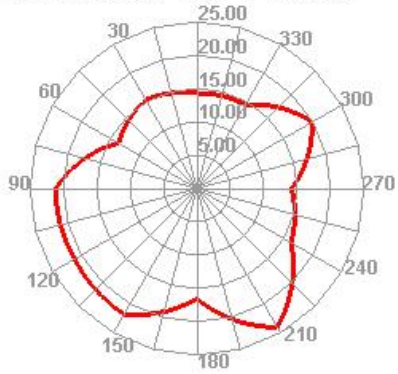
n38 516000 TRP Phi=45



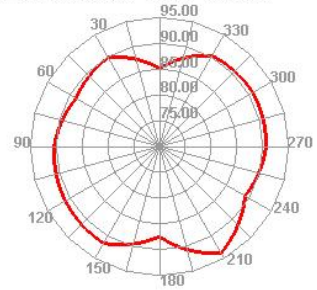
n38 519000 TRP Phi=45



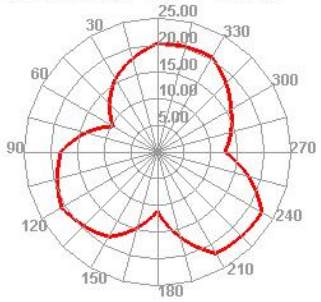
n38 522000 TRP Phi=45



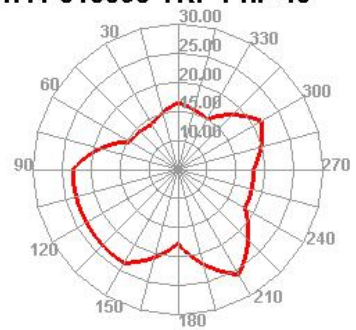
n38 522000 TIS Phi=45



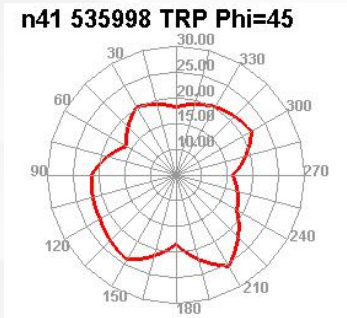
n41 501204 TRP Phi=45



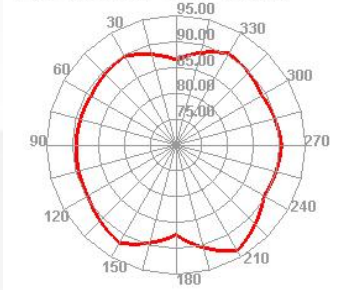
n41 518598 TRP Phi=45



n41 535998 TRP Phi=45



n41 535998 TIS Phi=45



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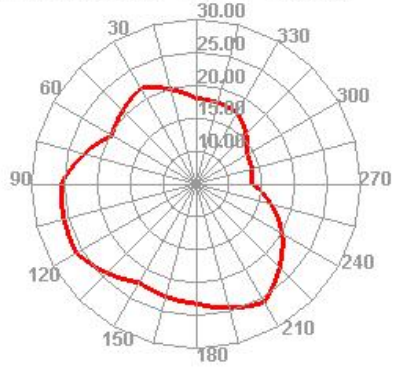
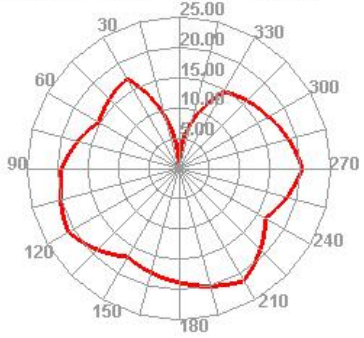
2D方向图 2D Directions

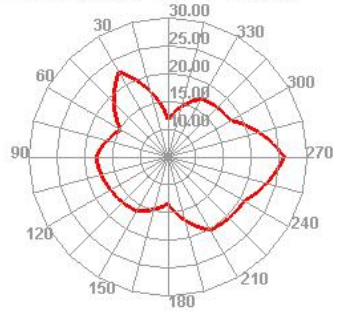
n77 623334 TRP Phi=45



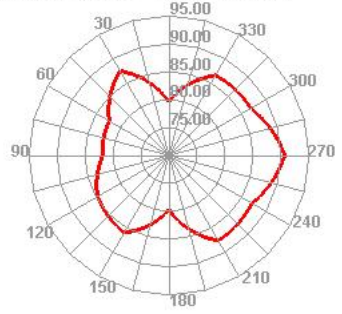
n77 650000 TRP Phi=45



n77 676666 TRP Phi=45



n77 676666 TIS Phi=45



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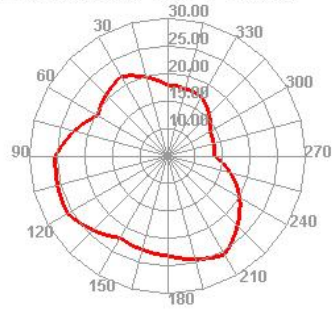

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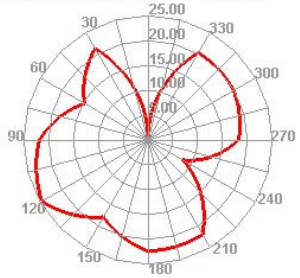
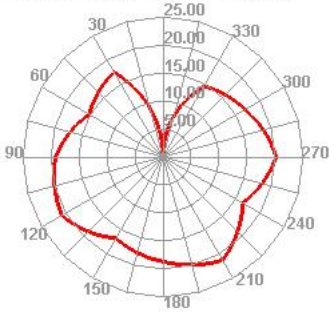
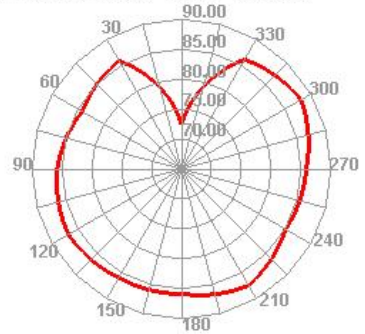


n78 650000 TRP Phi=45



n78 650000 TIS Phi=45



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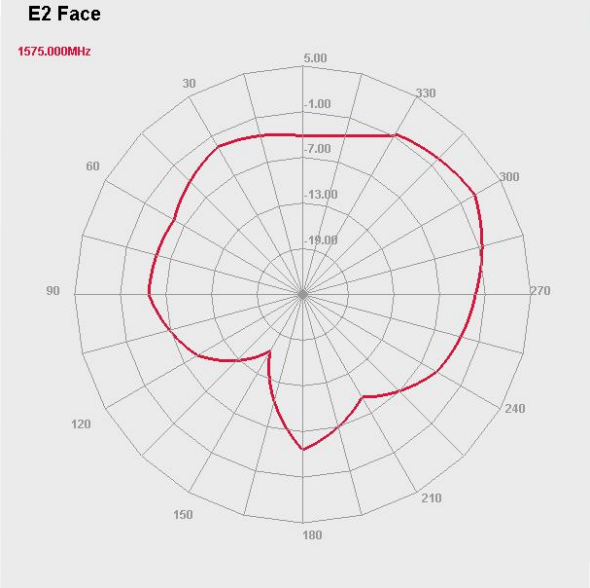
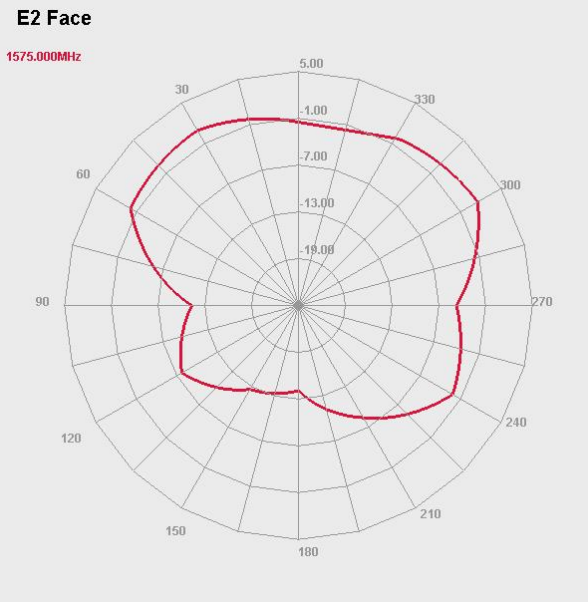
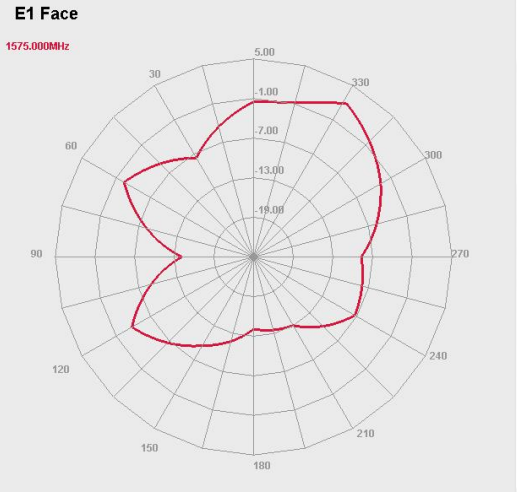
2D方向图 2D Directions







2D方向图 2D Directions

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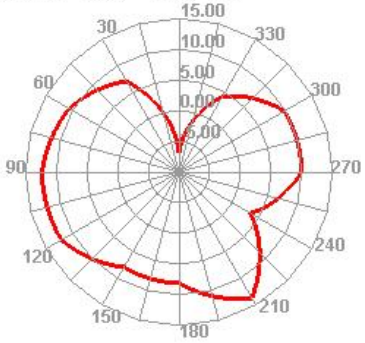
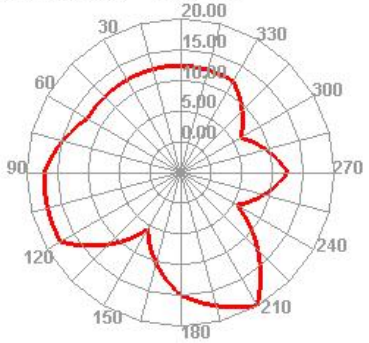
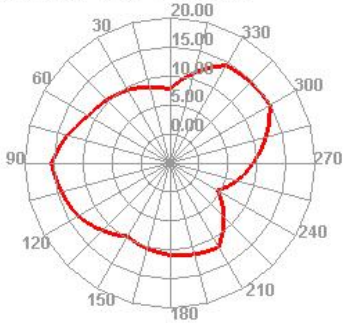
Wifi 1 TRP Phi=45



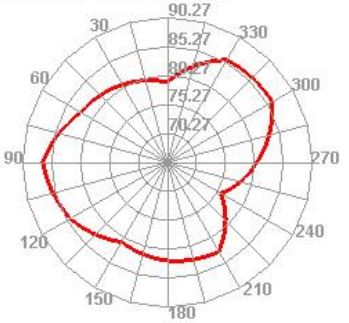
Wifi 6 TRP Phi=45



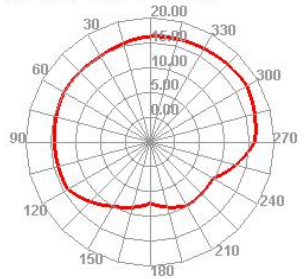
Wifi 12 TRP Phi=45



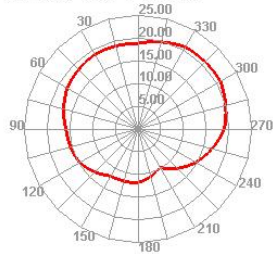
Wifi 12 TIS Phi=45



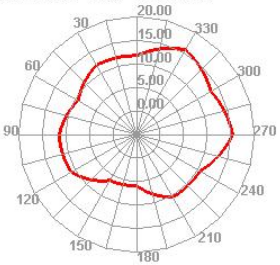
Wifi 36 TRP Phi=45



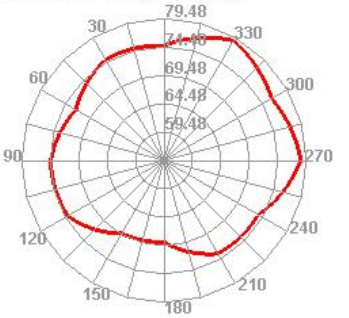
Wifi 60 TRP Phi=45



Wifi 161 TRP Phi=45



Wifi 161 TIS Phi=45



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效率增益 Efficiency gains

Freq (MHz)	Effi (%)	Gain (dBi)
700	17.88	-3.07
710	15.97	-3.88
720	20.35	-3.83
730	22.58	-3.21
740	23.2	-3.3
750	23.03	-3.13
760	23.4	-2.76
770	16.42	-4.09
780	15.53	-4.01
790	16.43	-3.65
800	33.25	-0.36
810	31.35	-0.66
820	30.82	-0.65
830	27.08	-1.4
840	27.23	-1.43
850	30.79	-1.14
860	36.44	-0.46
870	38.89	-0.22
880	37.83	-0.19
890	36.79	-0.21
900	33.18	-0.61
910	31.16	-0.89
920	28.06	-1.37
930	21.47	-2.61
940	18.02	-3.44
950	15.9	-4.06
960	12.18	-5.22

Freq (MHz)	Effi (%)	Gain (dBi)
1700	28.7	0.7
1710	31.88	1.25
1720	34.35	1.57
1730	35.24	1.59
1740	35.94	1.88
1750	36.78	1.8
1760	35.93	1.95
1770	33.96	1.36
1780	41.02	2.2
1790	41.99	2.05
1800	43.68	2.25
1810	43.82	2.16
1820	43.37	2.17
1830	43.17	2.2
1840	40.13	1.83
1850	38.37	1.65
1860	34.64	1.01
1870	32.64	0.35
1880	32.88	0.15
1890	30.67	-0.56
1900	27.94	-1.26
1910	30	-1.25
1920	32.49	-1.38
1930	33.52	-1.06
1940	33.06	-1.24
1950	34.64	-0.75
1960	33.39	-0.95
1970	32.07	-0.74
1980	30.89	-0.63
1990	31.06	-0.31

2000	26.22	0.16
2010	30.51	0.89
2020	33.49	1.35
2030	30.13	0.83
2040	31.82	1.03
2050	33	1.17
2060	37.83	1.81
2070	38.49	1.97
2080	45.84	2.86
2090	42.99	2.71
2100	38.66	2.3
2110	42.41	2.77
2120	44.62	3.05
2130	47.42	3.45
2140	48.7	3.66
2150	47.33	3.65
2160	44.17	3.25
2170	44.01	3.16
2180	45.89	3.12
2190	48.69	3.19
2200	46.93	2.82
2210	49.08	2.97
2220	48.37	2.86
2230	49.94	2.85
2240	50.89	2.65
2250	45.1	1.77
2260	44.4	1.31
2270	43.08	0.94
2280	46.46	1.21
2290	42.69	0.89
2300	41.37	0.91
2310	39.7	0.88
2320	41.46	1.13

2330	40.64	1.15
2340	42.57	1.51
2350	44.85	1.91
2360	45.2	2.19
2370	40.55	1.89
2380	45.16	2.49
2390	43.29	2.25
2400	43.23	2.15
2410	41.33	1.78
2420	44.61	2.04
2430	42.96	1.68
2440	46.8	1.88
2450	48.31	1.82
2460	46.7	1.55
2470	41.92	1.04
2480	49.01	1.65
2490	56	2.24
2500	55.68	2.19
2510	48.98	1.63
2520	50.52	1.66
2530	51.39	1.78
2540	43.23	1.1
2550	49.87	1.84
2560	53.14	2.36
2570	51.35	2.57
2580	49.52	2.63
2590	49.98	2.86
2600	52.89	3.3
2610	48.4	3.05
2620	46.44	2.97
2630	48.57	3.16
2640	54.58	3.79
2650	51.9	3.64

效率增益 Efficiency gains

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Freq (MHz)	Effi (%)	Gain (dBi)
1500	39.37	0.45
1505	36.73	0.24
1510	32.48	-0.22
1515	31.65	-0.36
1520	34.28	0
1525	35.43	0.22
1530	32.99	-0.1
1535	29.52	-0.62
1540	31.58	-0.4
1545	30.34	-0.52
1550	29.91	-0.61
1555	27.64	-1.03
1560	29.14	-0.86
1565	28.95	-0.83
1570	30.1	-0.7
1575	29.25	-0.9
1580	29.56	-0.86
1585	29.8	-0.76
1590	28.29	-1.07
1595	30.54	-0.79
1600	29.38	-0.94

Freq (MHz)	Effi (%)	Gain (dBi)
2300	25.49	-1.24
2310	25.6	-1.12
2320	27.02	-0.79
2330	29.73	-0.21
2340	35.5	0.61
2350	37.18	0.79
2360	37.45	0.78
2370	36.53	0.7
2380	40.97	1.32
2390	37.89	1.08
2400	38.97	1.32
2410	38.16	1.32
2420	40.21	1.55
2430	40.41	1.61
2440	42.23	1.78
2450	41.96	1.86
2460	41.9	1.87
2470	38.24	1.53
2480	41.64	1.9
2490	47.22	2.48
2500	46.64	2.35

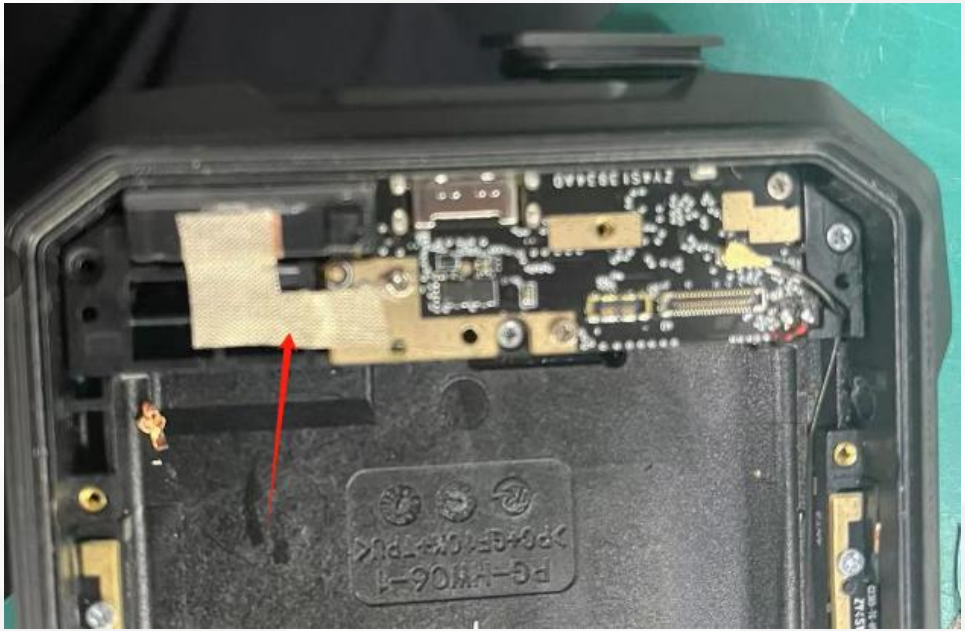
Freq (MHz)	Effi (%)	Gain (dBi)
5150	31.6	2.95
5200	34.05	2.97
5250	33.18	2.8
5300	32.01	2.46
5350	35.1	2.17
5400	38.82	2
5450	33.47	1.37
5500	37.42	1.85
5550	40.96	2.32
5600	36.53	1.8
5650	38.8	2.11
5700	40.06	2.37
5750	37.43	2.26
5800	42.16	2.2
5850	43.21	2.47

效率增益 Efficiency gains

3300	33.78	-0.84
3320	34.46	-0.67
3340	35.55	-0.35
3360	37.72	0.11
3380	35.04	-0.28
3400	32.15	-0.68
3420	31.92	-0.27
3440	33.03	0.14
3460	33.81	0.39
3480	34.4	0.61
3500	33.16	0.24
3520	30.34	-0.24
3540	28.59	-0.64
3560	28.3	-0.62
3580	28.19	-0.51
3600	28.18	-0.45
3620	30.61	-0.16
3640	30.73	-0.35
3660	28.13	-0.86
3680	28.09	-1
3700	27.73	-1.09
3720	25.7	-1.3
3740	24.4	-1.3
3760	25.67	-1.22
3780	26.66	-1.18
3800	24.81	-1.65

4000	13.67	-0.06
4020	14.74	0.32
4040	13.98	0.04
4060	14.81	0.21
4080	14.04	0.01
4100	15.82	0.45
4120	14.09	-0.2
4140	15.04	-0.06
4160	14.23	-0.34
4180	14.13	-0.47
4200	14.57	-0.32
4220	16.29	0.17
4240	16.21	0.22
4260	18	0.72
4280	17.85	0.77
4300	19.58	1.16
4320	19.44	1.08
4340	18.18	0.74
4360	18.01	0.63
4380	18.12	0.67
4400	17.66	0.34
4420	15.74	-0.6
4440	16.35	-0.65
4460	15.93	-1.11
4480	13.34	-2.49
4500	32.82	1.39
4520	34.36	1.63
4540	32.83	1.42
4560	33.87	1.46
4580	32.34	1.26
4600	35.29	1.5

环境处理 Environmental treatment



喇叭需要按如图所示贴导电布与小板接地

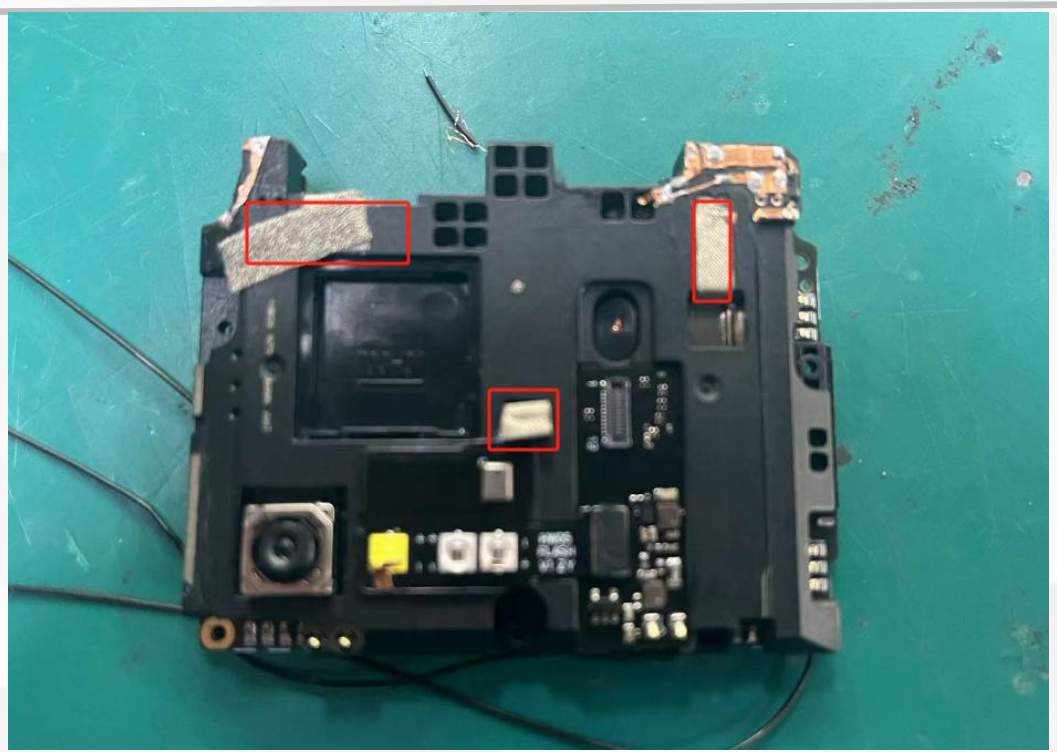
The horn should be grounded by sticking conductive cloth as shown

凯普深

环境处理 Environmental treatment

摄像头按上图所示贴双面导电布接地处理
The camera is grounded by sticking double-sided conductive cloth as shown above

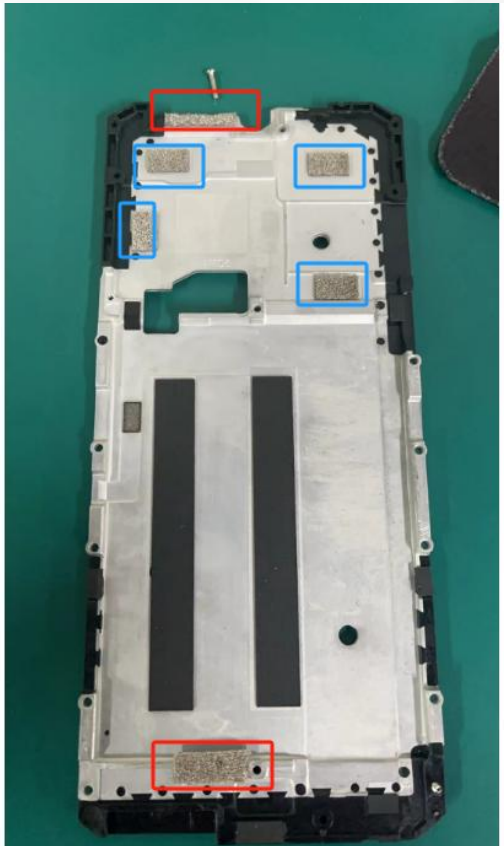
环境处理 Environmental treatment



图中三处位置与背面金属建做接地处理

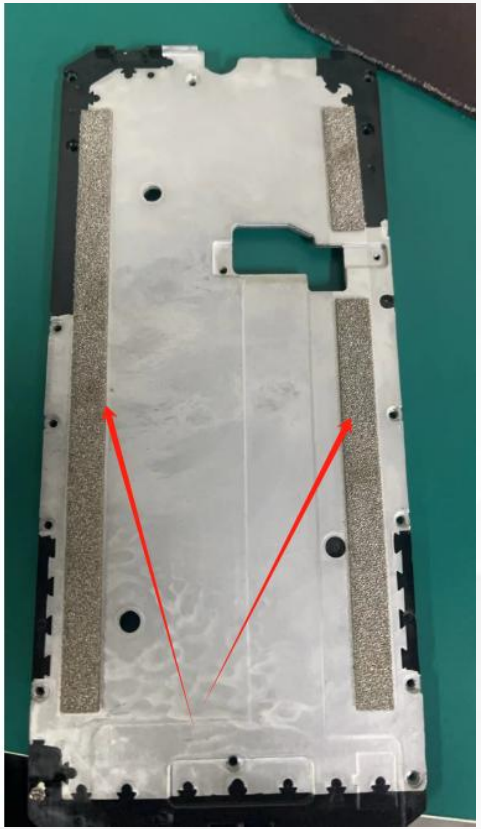
Three locations in the figure are grounded with the metal on the back

环境处理 Environmental treatment



红色框为新加的导电海绵，其他按照现有即可
Red Box for the new conductive sponge, the other can follow the existing

环境处理 Environmental treatment



如图所示两侧贴导电海绵与屏做接地处理
As shown on both sides of the conductive sponge and screen for grounding treatment

环境处理 Environmental treatment

其他按照T0装机提供的原环境处理即可
Other in accordance with the T 0 installed to provide the original environment can be treated

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