



深圳市凯普深通讯科技有限公司
Shenzhen cape deep communication technology co., LTD

天线测试报告

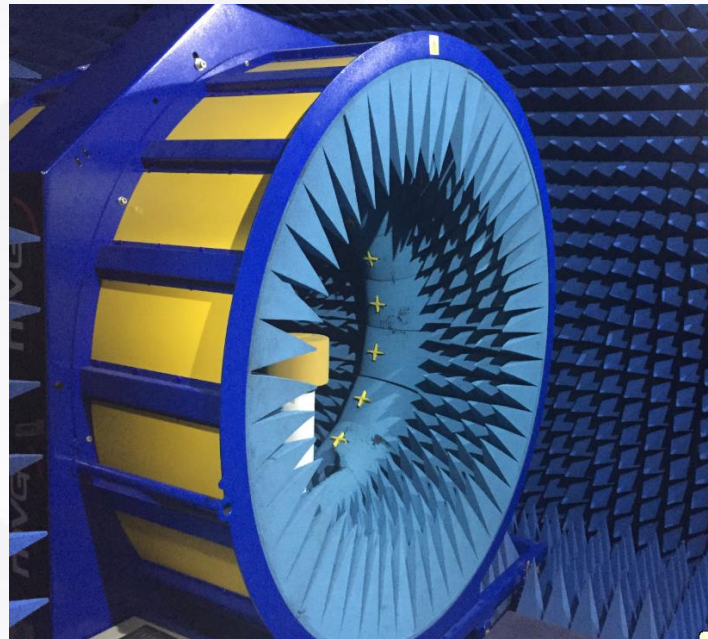
Antenna test report

客 户Customer: 鼎维尔Dingweier
项目名Project Name: P5501
工程师 Test Engineer: 江长兴Jiangchangxing
日 期Date: 2024.7.30



实验室测试环境及设备

Laboratory testing environment and equipment



测试项目Test project	测试设备Testing 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、



项目调试简介

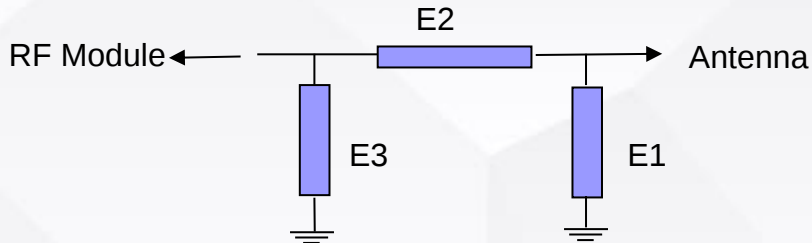
Introduction to Project Debugging

整机类型 Machine type	手机mobile phone			
		频段信息 Frequency band information	天线形式 Antenna form	匹配改动 Match changes
天线种类及频段信息 Antenna type and frequency band information	主天线Main antenna	GSM850/900/1800/1900 WCDMA/2/4/5 LTE-B2/4/5/12/13/17/25/26 66/71/41	LOOP	是YES
	副天线 Secondary antenna	WIFI,BT,GPS (三合一Three in one)	PIFA	否NO
	分集diversity	2000MHZ-2690MHZ	PIFA	否NO
天线材质 Antenna material	主天线Main antenna , 副天线Secondary antenna , 分集FPCdiversity			深圳市凯普深通讯科技有限公司 Shenzhen cape deep communication technology co., LTD



主天线匹配电路

Main antenna matching circuit



主天线 Main antenna	Element	Value	附图说明
	E1(0402)	15nh	
	E2(0402)	2.4nh	
	E3(0402)	nc	



主天线开关匹配电路

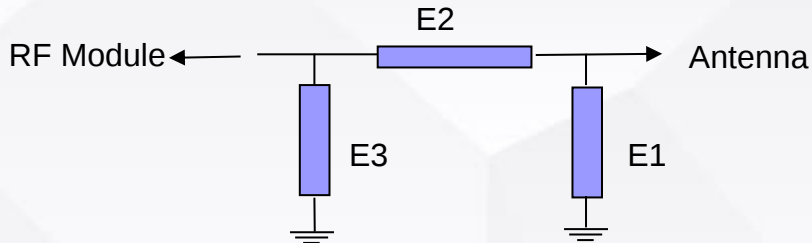
Main antenna switch matching circuit

单刀四掷开关 Single pole four throw switch		匹配matching	逻辑对应频段 Logical corresponding frequency band
	RF1	0欧姆Ω	G900/1800/1900 W2/4/ LTE2/4/25/66
	RF2	现有匹配Existing matches	B12/17/13
	RF3	10NH	B71
	RF4	1.8NH	GSM850/ W5/ LTE5/26



三合一天线匹配电路

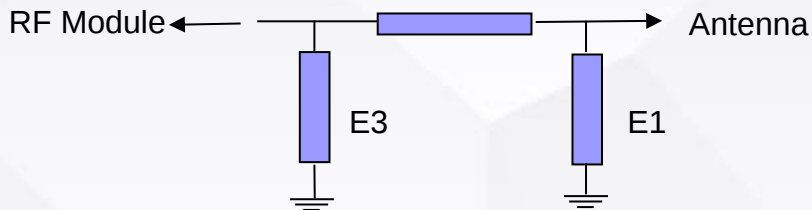
Three in one antenna matching circuit



三合一天线 Three in one antenna	Element	Value	附图说明Attached image description
	E1(0402)		主板原有匹配 Original motherboard matching
	E2(0402)		
	E3(0402)		

分集天线匹配电路

iversity antenna matching circuit

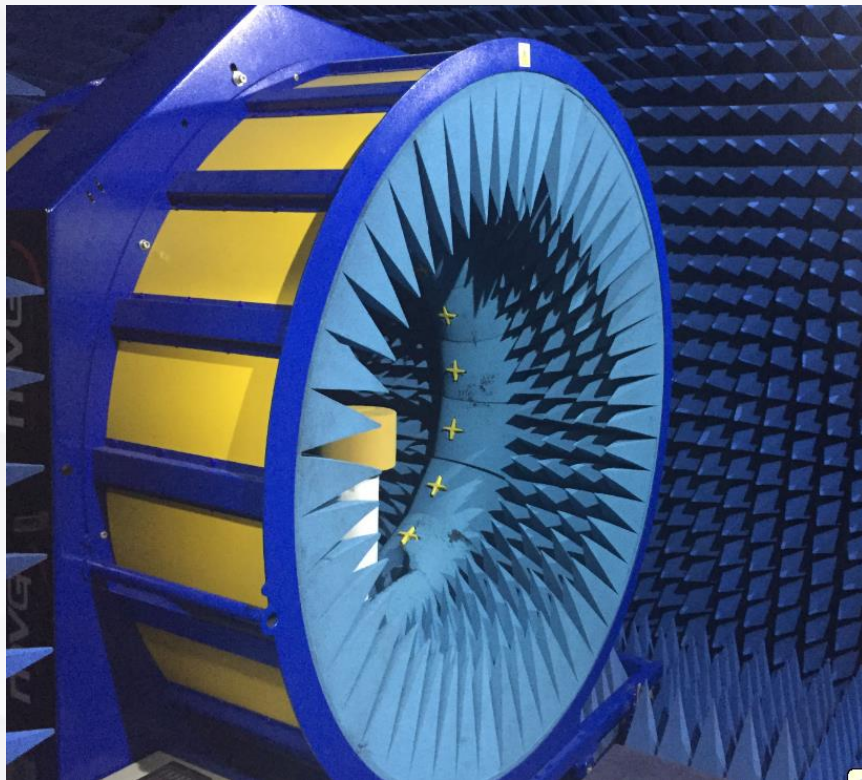
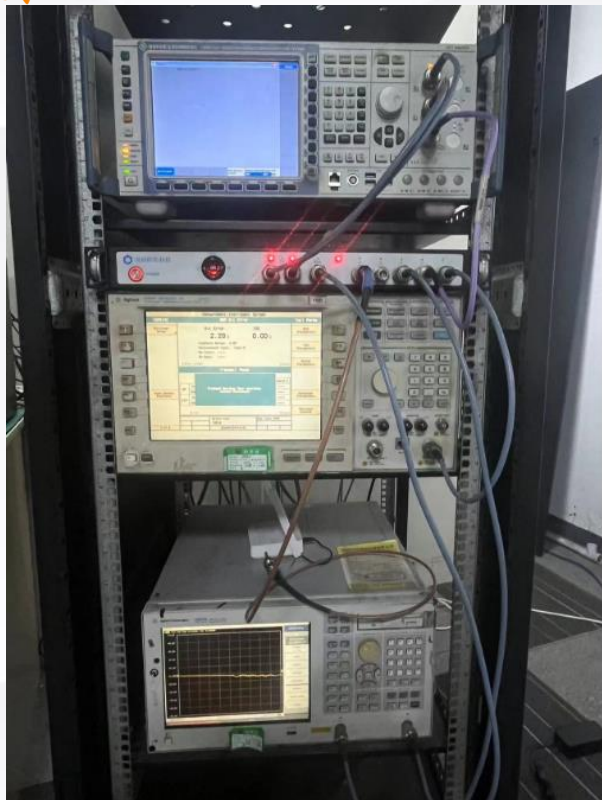


分集天线 Diversity antenna	Element	Value	附图说明Attached image description
	E1(0402)		主板原有匹配 Original motherboard matching
	E2(0402)		
	E3(0402)		



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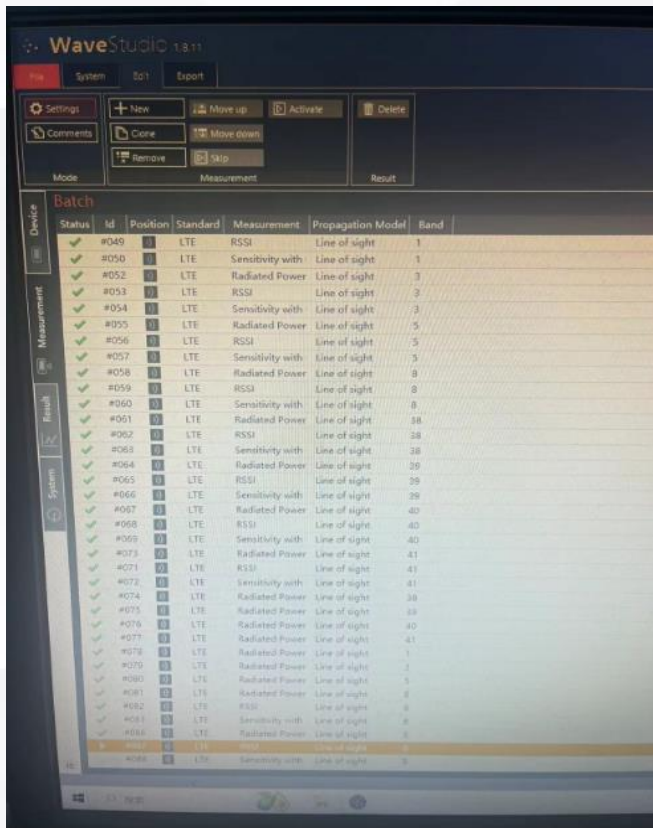
测试设备





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测试软件 testing software



软件为 Wave Studio 1.8.11



仪器 instrument

Equipment	Manufacturer	Model NO	Serial NO .	Last CAL	Due Date
网络分析仪 Network analyzers	安捷伦 Agilent	E5071B		2024.4.25	2025.4.24
综合测试仪 Comprehensive Tester	ROHDE SCHWARZ	CMW-500		2024.4.25	2025.4.24
综合测试仪 Comprehensive Tester	安捷伦 Agilent	8960		2024.4.25	2025.4.24



测试方法及步骤 Testing methods and steps

1: 手机插上测试卡，开机通电之后，将手机放入微波暗室中。

Insert the test card into the phone, power it on, and place it in a microwave darkroom

2: 打开暗室测试软件，选择手机支持的频段，按照暗室的操作指南进行下一步

Open the darkroom testing software, select the frequency band supported by your phone, and follow the darkroom operation guide to proceed to the next step

3: 待被测物连上CMW500后，关上屏蔽门即可测试

After connecting the test object to CMW500, close the shielding door to proceed with the test

test standard :

Name	Parameter	Method	Standard no.
Antenna performance	Radiation efficiency	IEEE Standard Test Procedures for Antennas	ANSI/IEEE Std 149- 2021



天线测试数据

Antenna test data

Frequency band	Channel	TRP	TIS 灭	Frequency band	Channel	TRP	TIS 灭
GSM 850	Low	28.1		WCDMA 2	Low	19.6	
	Mid	27.2			Mid	19.5	
	Hig	27.4	-102.1		Hig	19.6	-104.6
EGSM 900	Low	27.8		WCDMA 4	Low	19.6	
	Mid	27.7			Mid	19.9	
	Hig	26	-101		Hig	19.8	-103.1
DCS 1800	Low	26.4		WCDMA 5	Low	18.7	
	Mid	25.4			Mid	18.4	
	Hig	24.6	-105.4		Hig	18.3	-104.5
PCS 1900	Low	25.9					
	Mid	26					
	Hig	25.4	-104.6				



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天线测试数据

Antenna test data

Frequency band2B4	Channel	TRP	TIS灭	Frequency band	Channel	TRP	TIS灭
LTE B2	Low	19.3		LTE B25	Low	19.1	
	Mid	19.7			Mid	19.2	
	Hig	19.2	-91.5		Hig	19.3	-90.7
LTE B4	Low	18.5		LTE B26	Low	18.2	
	Mid	18.6			Mid	18.2	
	Hig	18.7	-91.6		Hig	18.1	-90.4
LTE B5	Low	16.0		LTE B66	Low	18.6	
	Mid	16.8			Mid	18.6	
	Hig	17.1	-90.5		Hig	18.9	-91.7
LTE B12	Low	17.6		LTE B71	Low	16.7	
	Mid	17.6			Mid	16.9	
	Hig	17.8	-91.5		Hig	16.3	-91.3
LTE B41	Low	18.8					
	Mid	18.3					
	Hig	17.0	-91.8				



WiFi有源测试数据

WiFi active test data

WIFI2.4

Channel	TRP(dBm)	TIS(dBm)
Low	15.2	-86.8
Mid	15.6	-87.5
Hig	14.5	-86

WIFI5.8 6M

Channel	TRP(dBm)	TIS(dBm)
Low	8.6	
Mid	9.1	
Hig	8.3	-88.4



BT有源测试数据 BT active test data

BT

Channel	TRP(dBm)	TIS(dBm)
Low	5.3	
Mid	5.3	
Hig	5.5	-84.6



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Gain test data

	GSM850	EGSM900	DCS1800	PCS1900		
peak Gain(dBi)	-3.14	-2.09	-2.09	-2.16		

	W2	W4	W5			
peak Gain(dBi)	-2.16	-2.09	-3.14			



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Gain test data

	LTE2	LTE4	LTE5	LTE12	LTE25	LTE26
peak Gain(dBi)	-2.16	-2.09	-3.14	-3.23	-2.27	-3.37

	LTE66	LTE71	LTE41			
peak Gain(dBi)	-2.09	-3.41	-2.65			



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Gain test data

	GPS	2.4GWIFI	BT	5G WIFI		
peak Gain(dBi)	-2.32	-2.18	-2.18	-2.97		



三合一天线实测效果

Actual measurement effect of three in one antenna



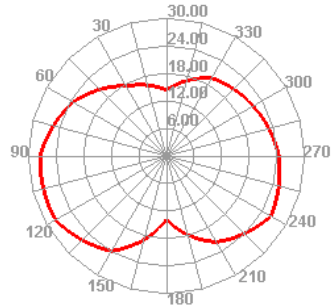
我司楼下测试Our company's downstairs testing



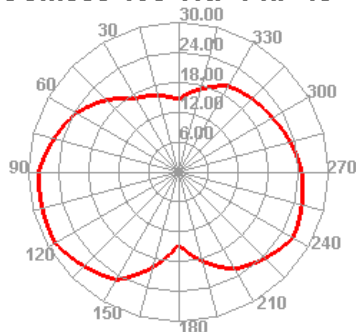
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方向图 Directions

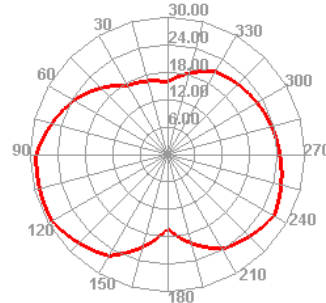
GSM850 128 TRP Phi=45



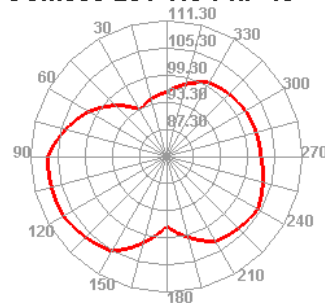
GSM850 190 TRP Phi=45



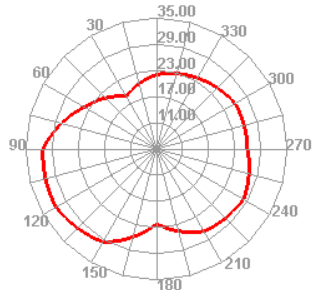
GSM850 251 TRP Phi=45



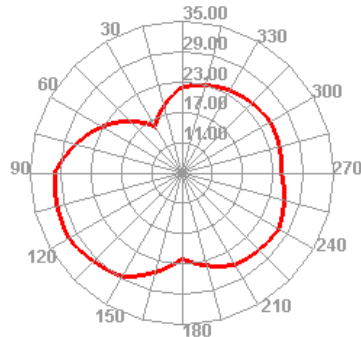
GSM850 251 TIS Phi=45



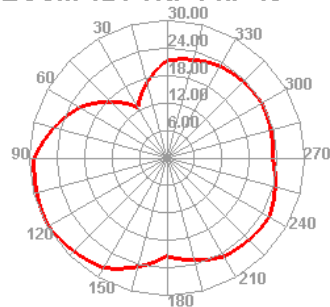
EGSM 1 TRP Phi=45



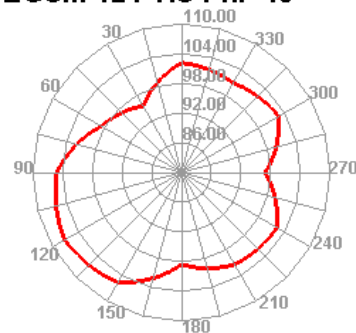
EGSM 62 TRP Phi=45



EGSM 124 TRP Phi=45



EGSM 124 TIS Phi=45

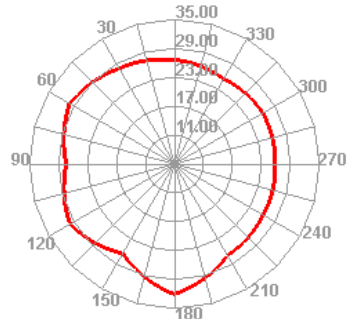




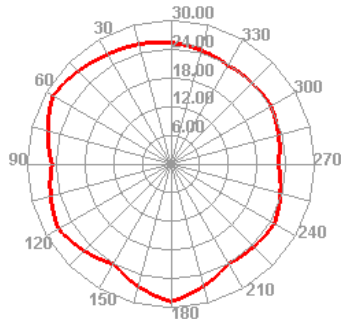
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方向图Directions

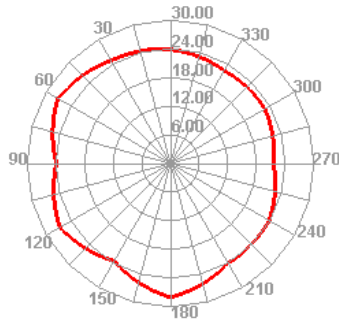
DCS 512 TRP Phi=45



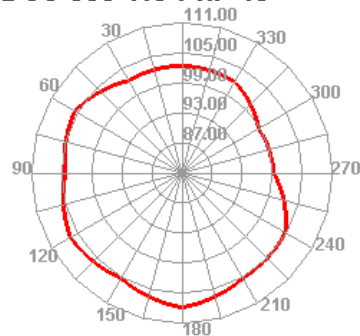
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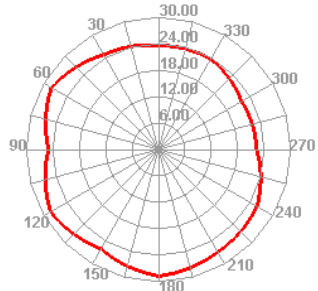
DCS 885 TRP Phi=45



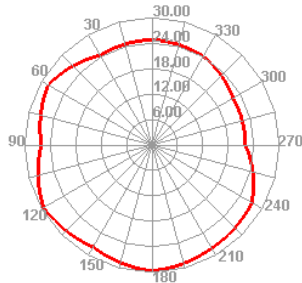
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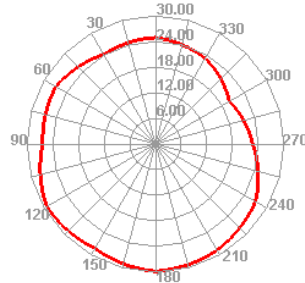
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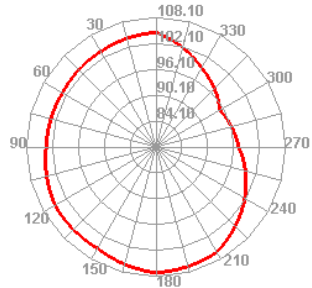
PCS 661 TRP Phi=45



PCS 810 TRP Phi=45



PCS 810 TIS Phi=45

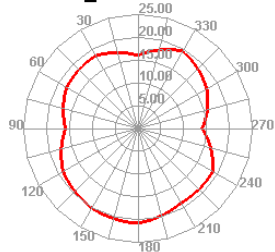




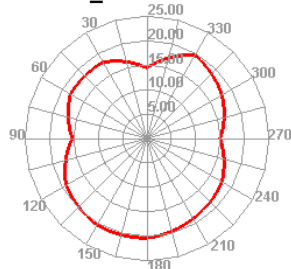
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方向图Directions

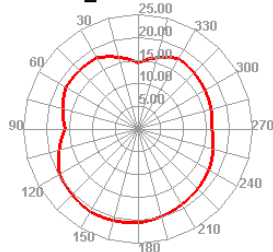
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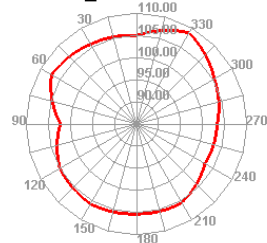
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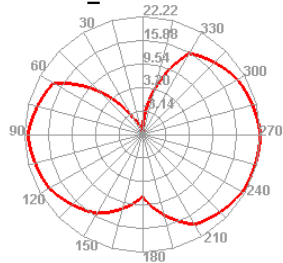
WCDMA_II 9538 TRP Phi=45



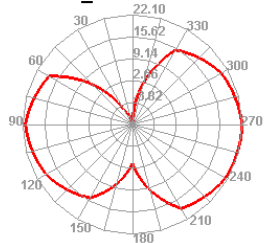
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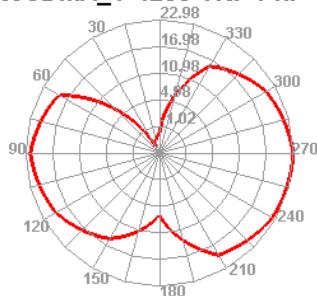
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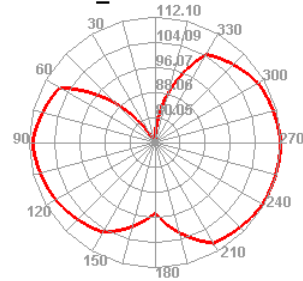
WCDMA_V 4185 TRP Phi=45



WCDMA_V 4233 TRP Phi=45



WCDMA_V 4458 TIS Phi=45

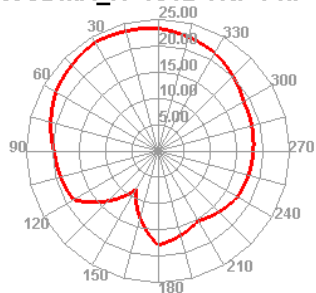




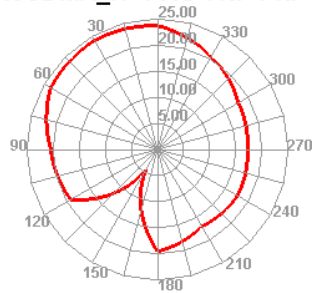
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方向图Directions

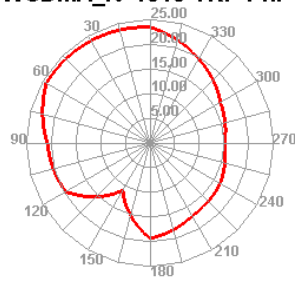
WCDMA_IV 1312 TRP Phi=4!



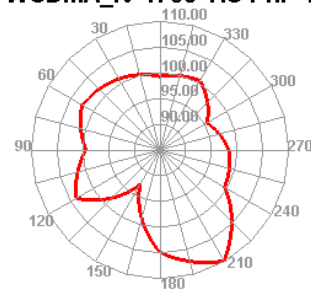
WCDMA_IV 1413 TRP Phi=4!



WCDMA_IV 1513 TRP Phi=4!



WCDMA_IV 1738 TIS Phi=45

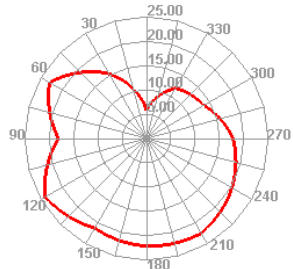




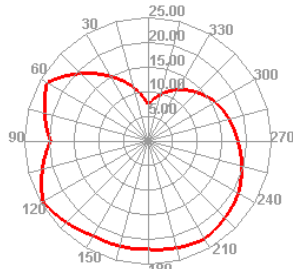
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2D方向图 2DDirections

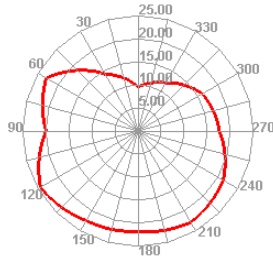
LTE2 18650 TRP Phi=45



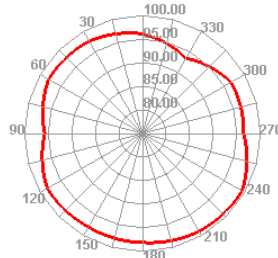
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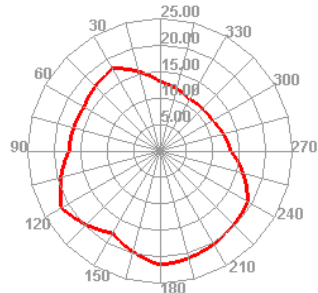
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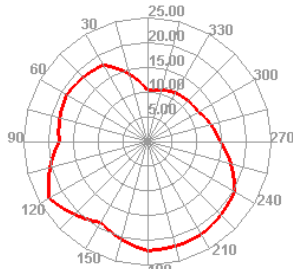
LTE2 1150 TIS Phi=45



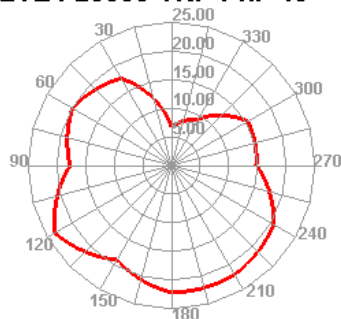
LTE4 20000 TRP Phi=45



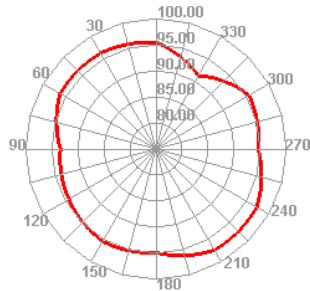
LTE4 20175 TRP Phi=45



LTE4 20350 TRP Phi=45



LTE4 2350 TIS Phi=45

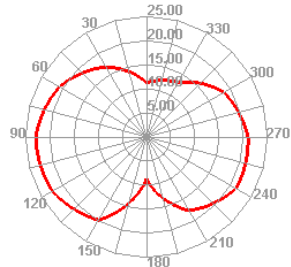




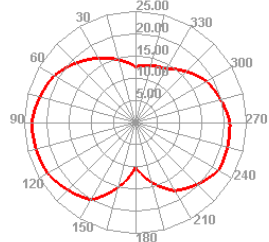
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2D方向图 2D Directions

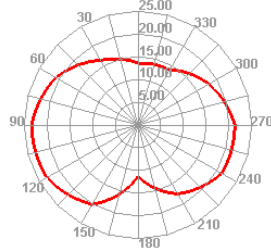
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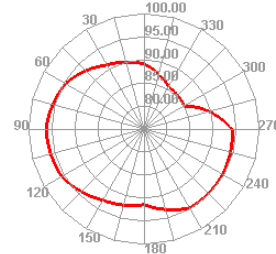
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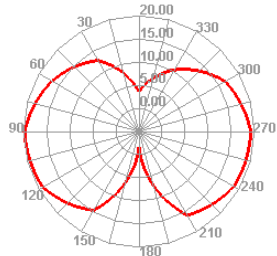
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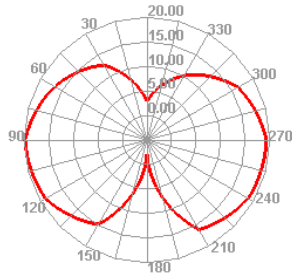
LTE5 2600 TIS Phi=45



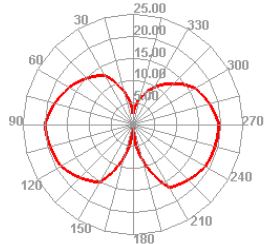
LTE12 23060 TRP Phi=45



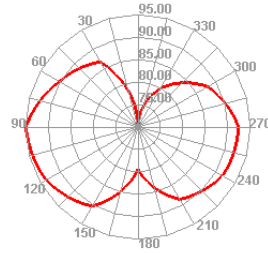
LTE12 23095 TRP Phi=45



LTE12 23130 TRP Phi=45



LTE12 5130 TIS Phi=45

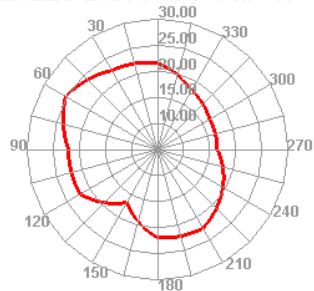




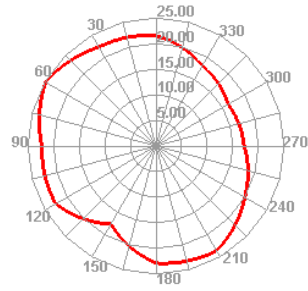
凯普深

2D方向图 2D Directions

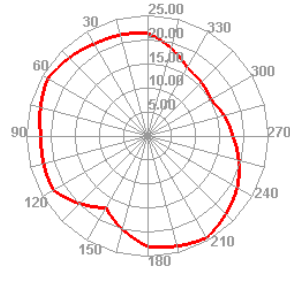
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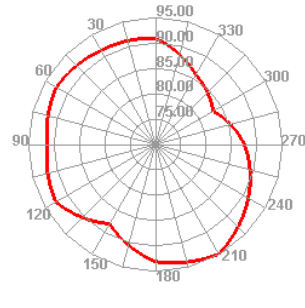
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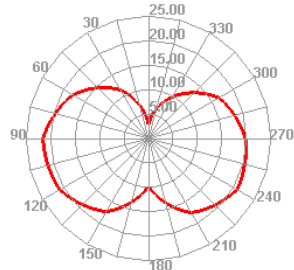
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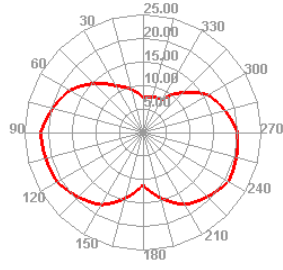
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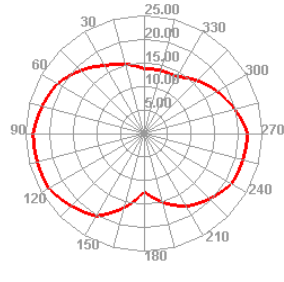
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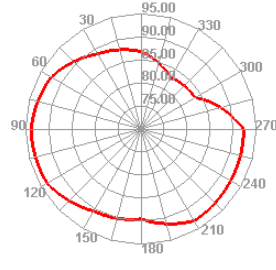
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LTE26 26990 TRP Phi=45



LTE26 8990 TIS Phi=45

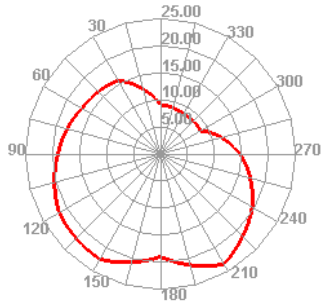




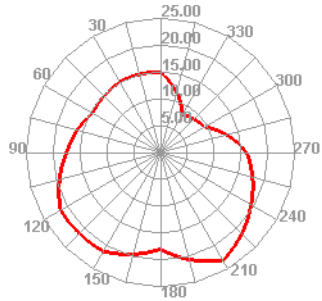
凯普深

2D方向图 2D Directions

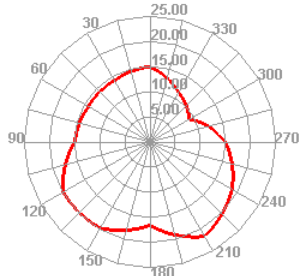
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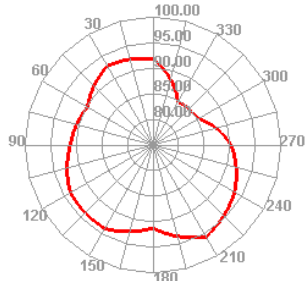
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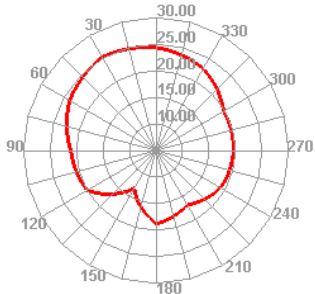
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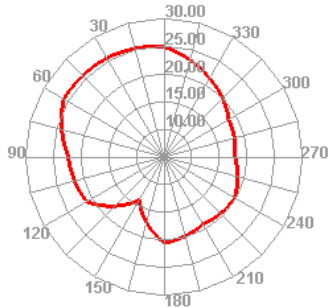
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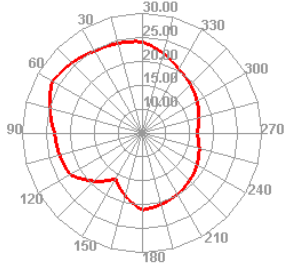
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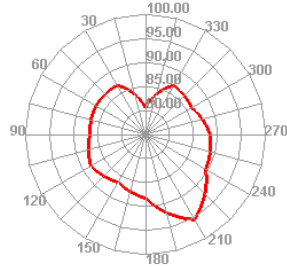
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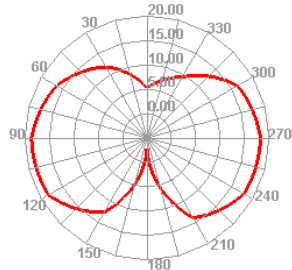




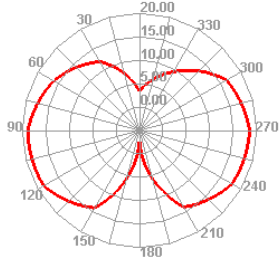
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2D方向图 2DDirections

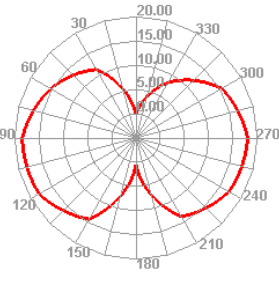
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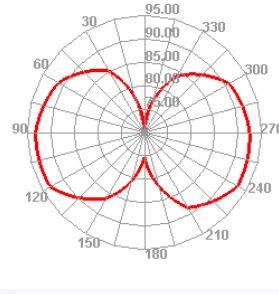
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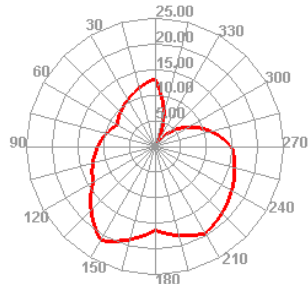




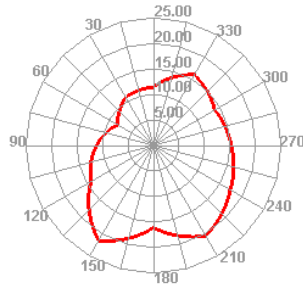
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2D方向图 2DDirections

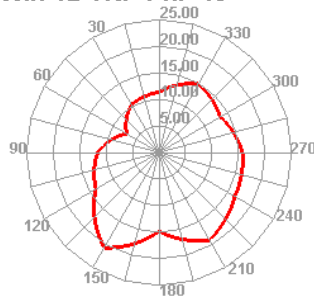
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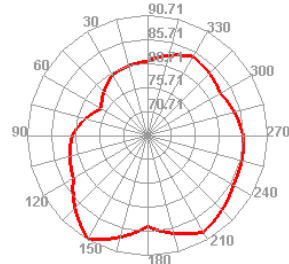
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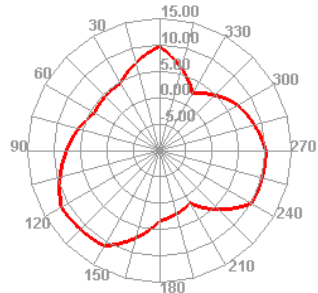
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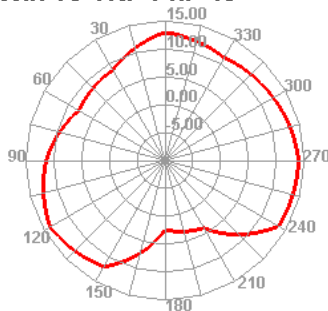
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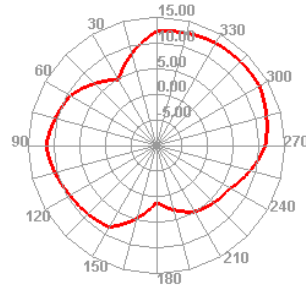
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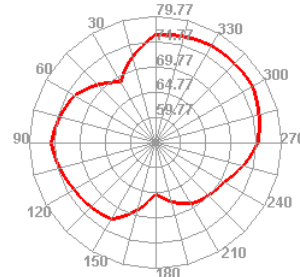
Wifi 60 TRP Phi=45



Wifi 161 TRP Phi=45



Wifi 161 TIS Phi=45





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THE END

**感谢您的宝贵意见！
Thank you for your
valuable feedback**