



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: 福诺格 Fu nuoge

项目名Project Name: S61

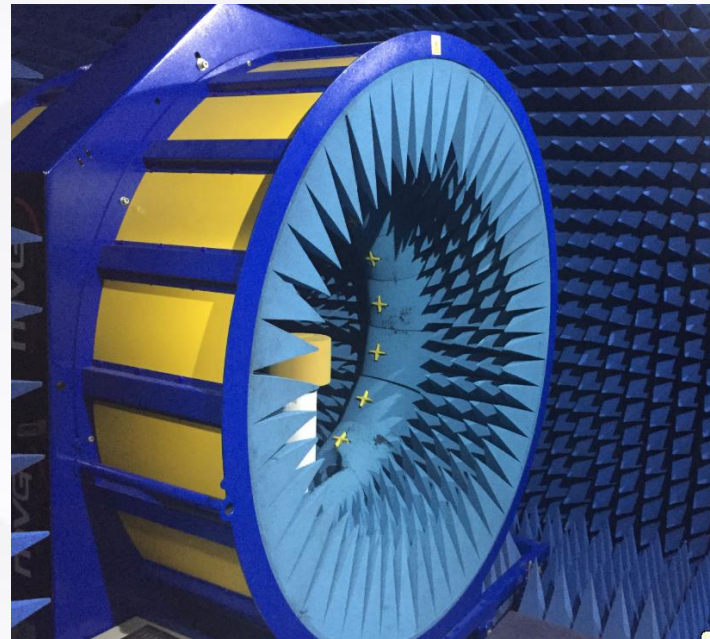
测试工程师: Test Engineer江长兴Jiangchangxing

日 期Date: 2024.8.27



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

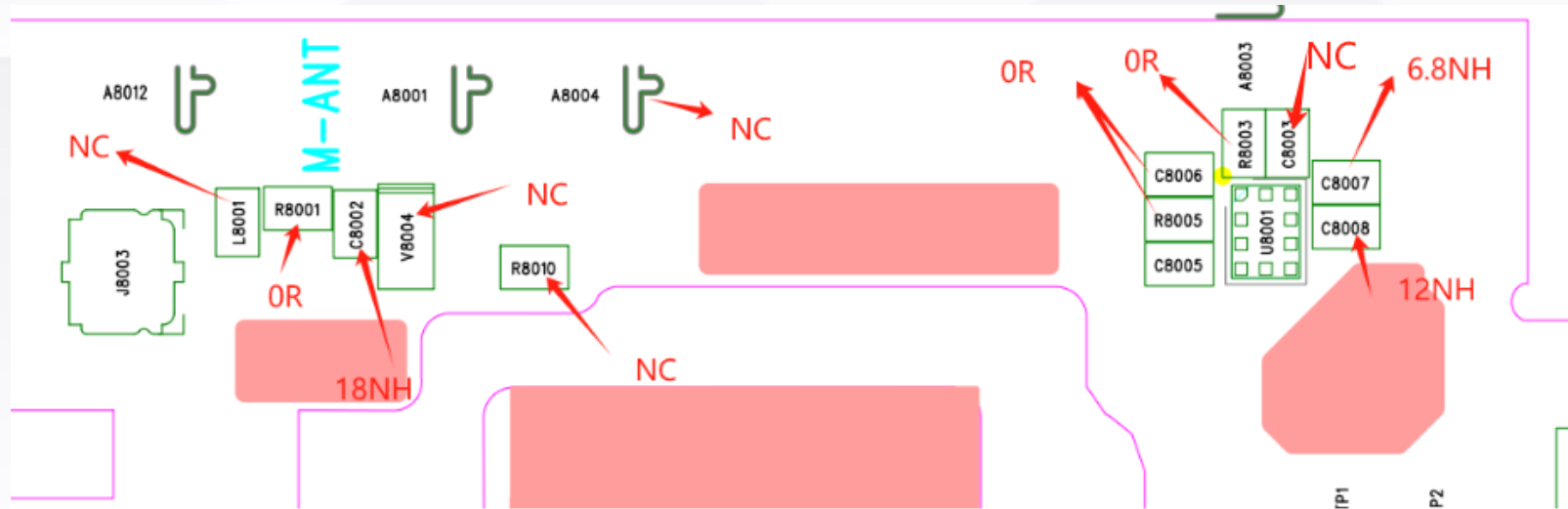
整机类型 Machine type	手机mobile phone			
		频段信息 Frequency band information	天线形式 Antenna form	匹配改动 Match changes
天线种类及频段信息 Antenna type and frequency band information	主天线Main antenna	GSM850/900/1800/1900 WCDMA/2/4/5 LTE-B2/4/5/7/12/25/26 66/71/41	PIFA	是YES
	副天线 Secondary antenna	WIFI,BT,GPS (三合一Three in one)	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



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主天线开关匹配电路

Main antenna switch matching circuit





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主天线开关匹配电路

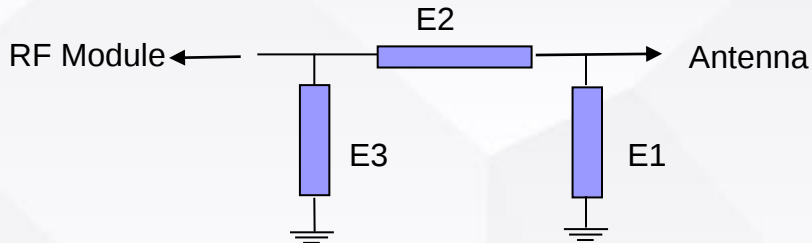
Main antenna switch matching circuit

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	OR	2G: 850/GSM900 3G:W5 4G:5/26
	RF2	OR	2G:DCS1800/PCS1900 3G:W2/4 4G:LTE2/4/7/25/66/41
	RF3	6.8NH	4G:12
	RF4	12NH	4G:71



三合一天线匹配电路

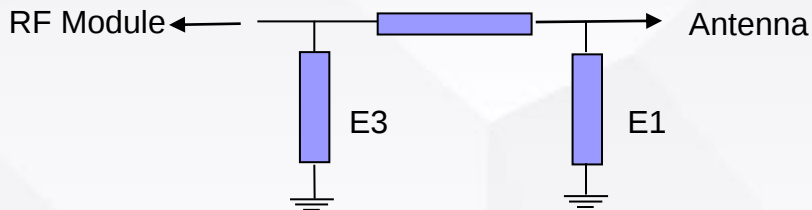
Three in one antenna matching circuit



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



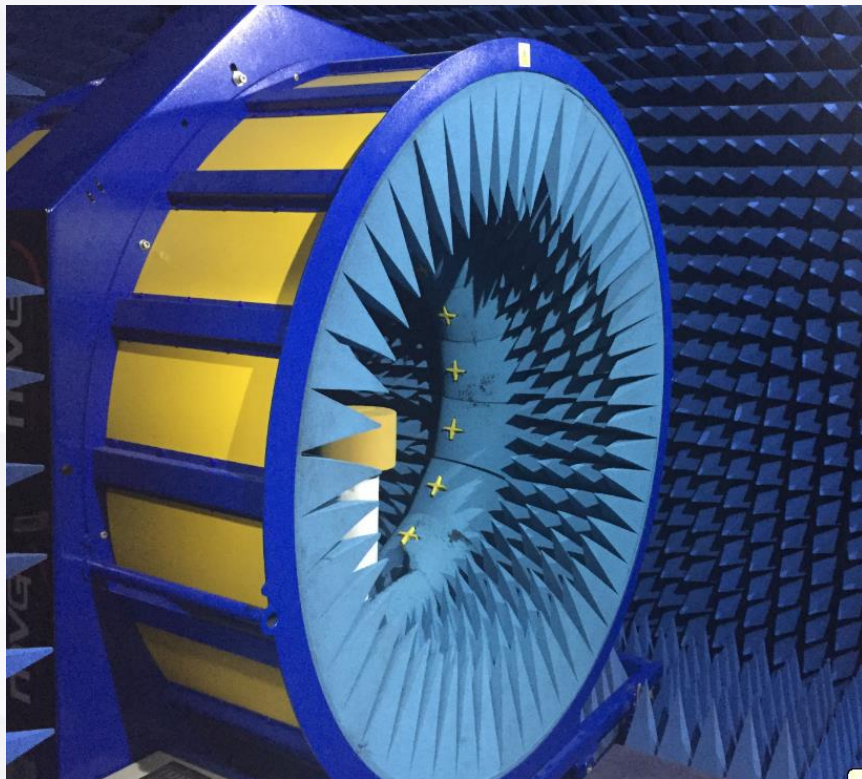
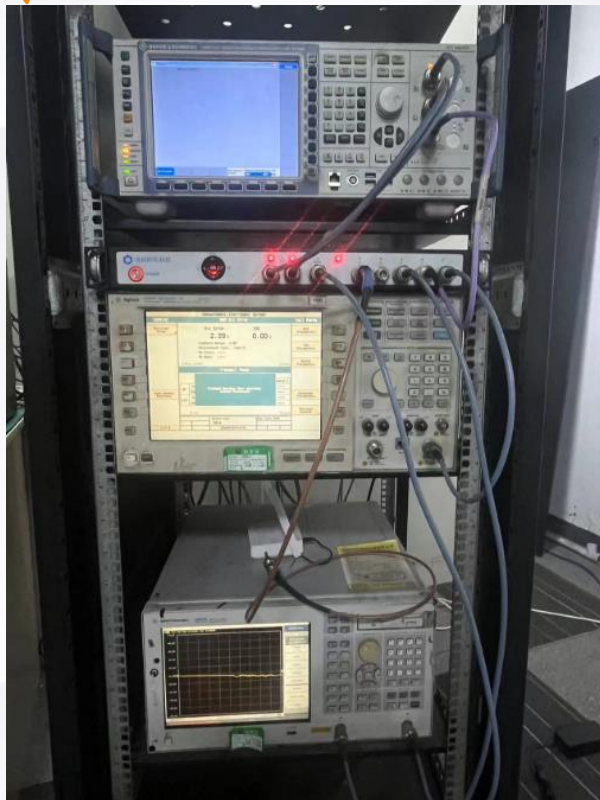
分集天线 Diversity antenna	Element	Value	附图说明Attached image description
	E1(0402)		主板原有匹配 Original motherboard matching
	E2(0402)		
	E3(0402)		



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测试设备配置

Test equipment configuration





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 Comprehen sive Tester	ROHDE SCHWARZ	CMW-500		2024.4.25	2025.4.24
综合测试仪 Comprehensiv e Tester	安捷伦 Agilent	8960		2024.4.25	2025.4.24

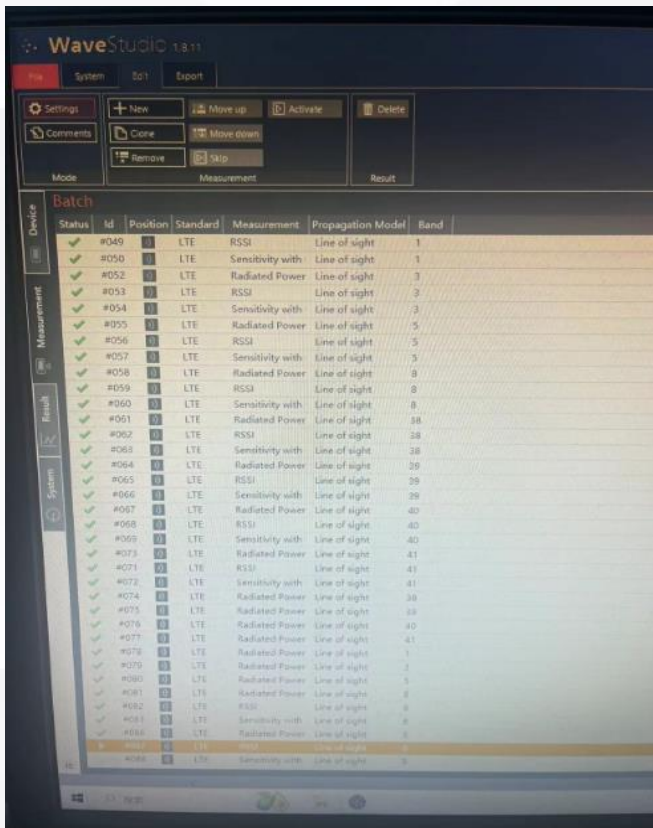


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测试软件 Test the software

Test the software is

软件为 Wave Studio 1.8.11





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



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天线测试数据

Antenna test data

FS	Channel	TRP	TIS		Channel	TRP	TIS
LTE-2	L	18.7		LTE-26	L	15.5	
	M	18.5			M	15.6	
	H	18.5	-94.6		H	16.0	-90.3
LTE-4	L	17.8		LTE-66	L	17.8	
	M	17.6			M	18.2	
	H	17.6	-91.9		H	18.2	-91.5
LTE-5	L	15.1		LTE-71	L	16.2	
	M	15.7			M	17.4	
	H	16.0	-92.6		H	17.7	-91
LTE-12	L	17.3		LTE-41	L	15.2	
	M	17.5			M	14.8	
	H	17.7	-92.5		H	14.2	-88.1
LTE-25	L	18.9					
	M	18.6					
	H	18.4	-94.8				



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天线测试数据

Antenna test data

FS	Channel	TRP	TIS		Channel	TRP	TIS
W-2	L	18.6		GSM850	L	25.8	
	M	18.5			M	25.4	
	H	18.5	-105.3		H	25.6	-99.4
W-4	L	17.8		EGSM900	L	26.3	
	M	17.8			M	25.5	
	H	18.2	-104.1		H	23.3	-98.6
W-5	L	15.5		DCS1800	L	24.5	
	M	15.8			M	25.3	
	H	15.5	-103.6		H	25.3	-103.7
				PCS1900	L	26.2	
					M	26.2	
					H	25.8	-104.6



WiFi有源测试数据

WiFi active test data

WIFI2.4

Channel	TRP(dBm)	TIS(dBm)
Low	10.2	
Mid	11.1	
Hig	12.4	-79.3

WIFI5.8 54M

Channel	TRP(dBm)	TIS(dBm)
Low	5.2	
Mid	6.8	
Hig	6.0	-68.7

BT

Channel	TRP(dBm)	TIS(dBm)
Low	4.6	
Mid	5.1	
Hig	5.4	-86.3

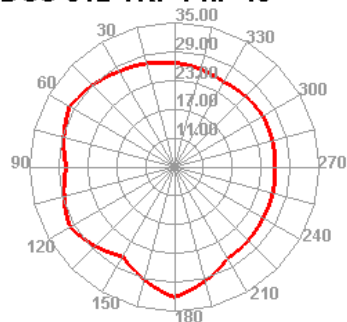




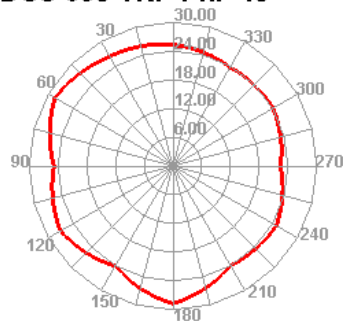
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方向图Directions

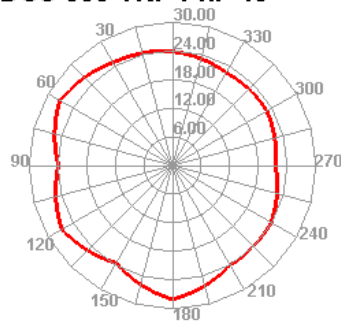
DCS 512 TRP Phi=45



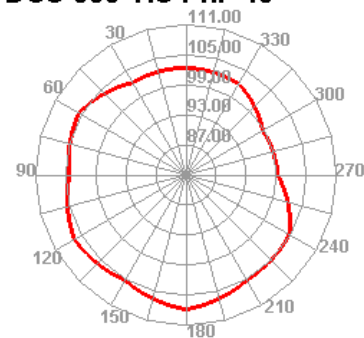
DCS 698 TRP Phi=45



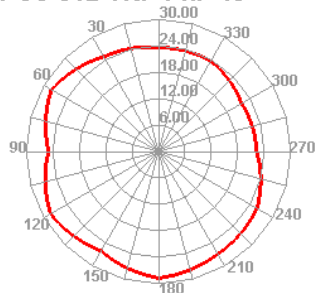
DCS 885 TRP Phi=45



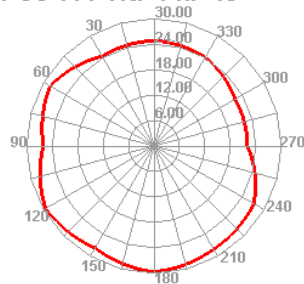
DCS 885 TIS Phi=45



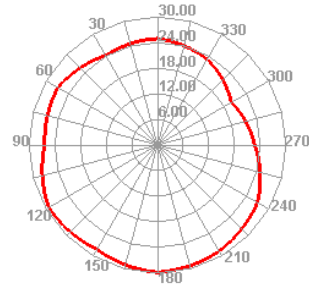
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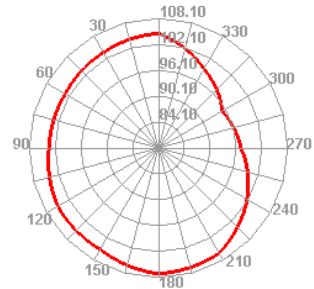
PCS 661 TRP Phi=45



PCS 810 TRP Phi=45



PCS 810 TIS Phi=45

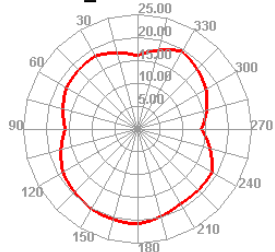




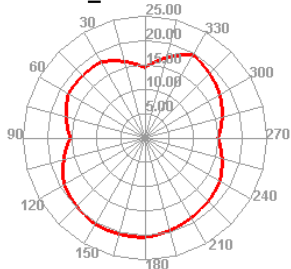
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方向图Directions

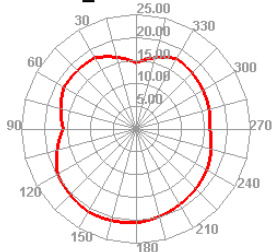
WCDMA_II 9262 TRP Phi=45



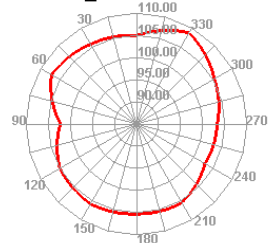
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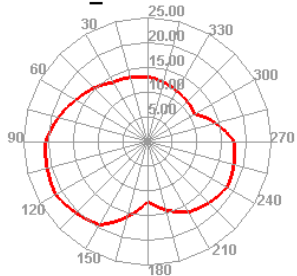
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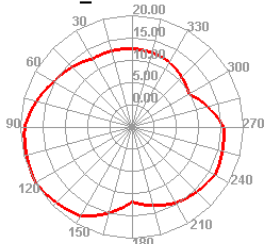
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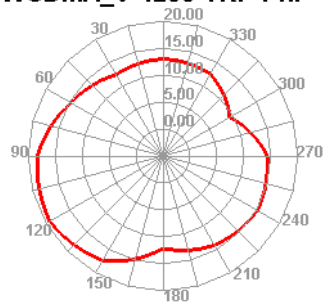
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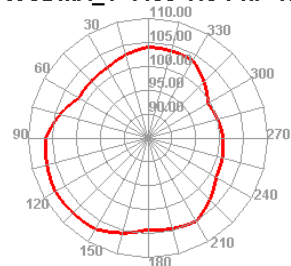
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WCDMA_V 4233 TRP Phi=45



WCDMA_V 4458 TIS Phi=45

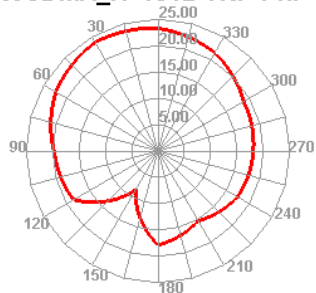




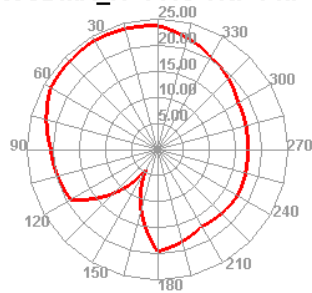
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方向图Directions

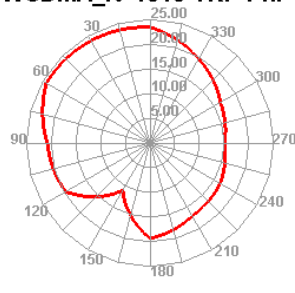
WCDMA_IV 1312 TRP Phi=4!



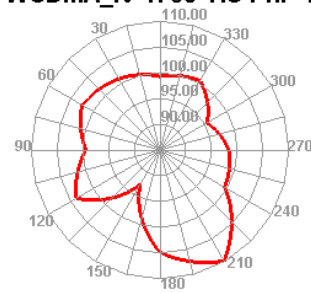
WCDMA_IV 1413 TRP Phi=4!



WCDMA_IV 1513 TRP Phi=4!



WCDMA_IV 1738 TIS Phi=45

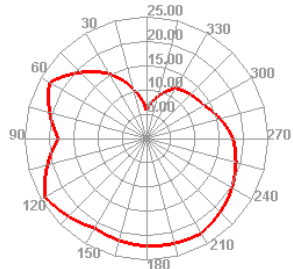




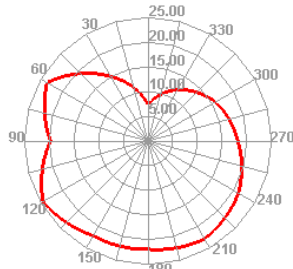
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2D方向图 2DDirections

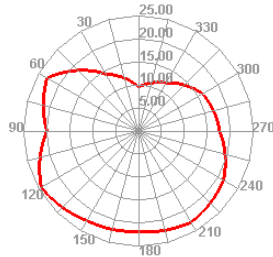
LTE2 18650 TRP Phi=45



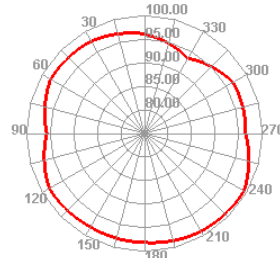
LTE2 18900 TRP Phi=45



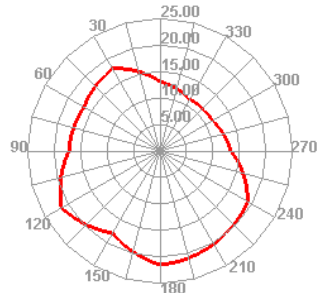
LTE2 19150 TRP Phi=45



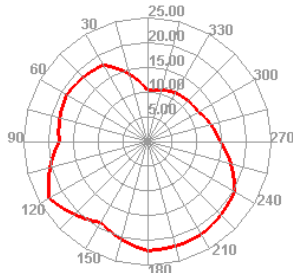
LTE2 1150 TIS Phi=45



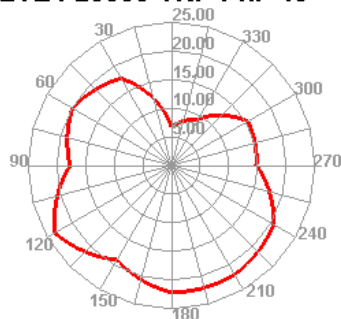
LTE4 20000 TRP Phi=45



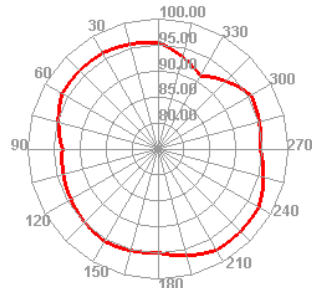
LTE4 20175 TRP Phi=45



LTE4 20350 TRP Phi=45



LTE4 2350 TIS Phi=45

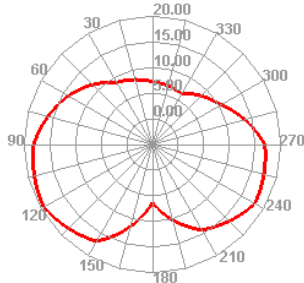




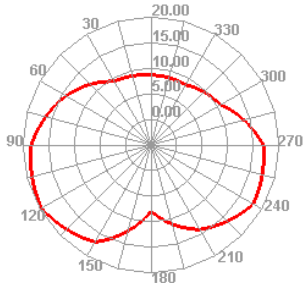
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2D方向图 2DDirections

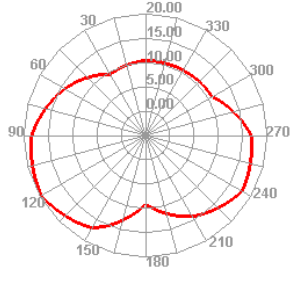
LTE5 20450 TRP Phi=45



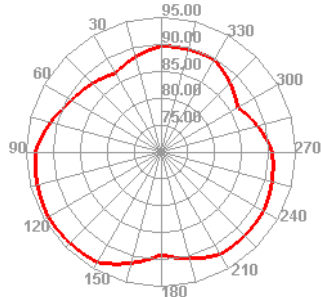
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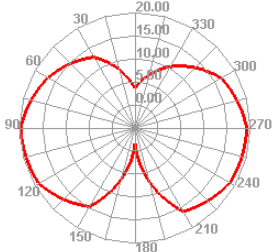
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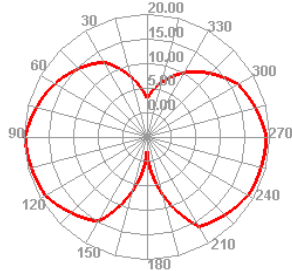
LTE5 2600 TIS Phi=45



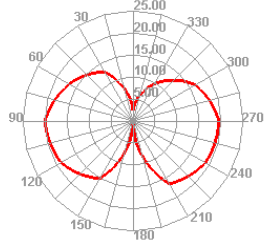
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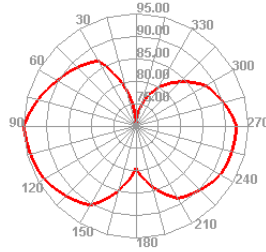
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LTE12 23130 TRP Phi=45



LTE12 5130 TIS Phi=45

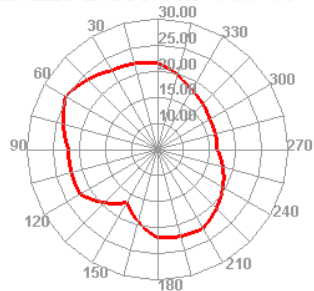




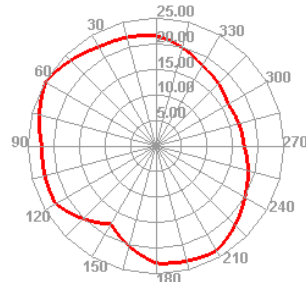
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2D方向图 2D Directions

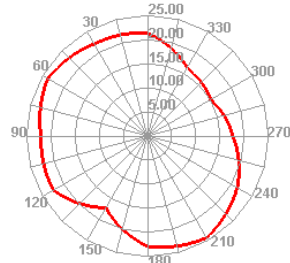
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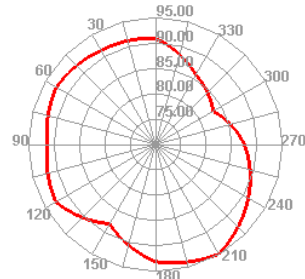
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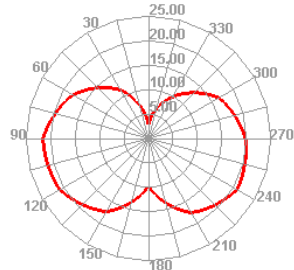
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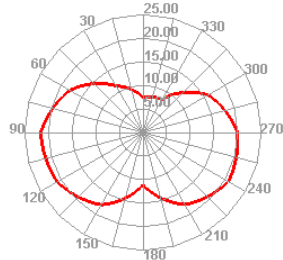
LTE25 8640 TIS Phi=45



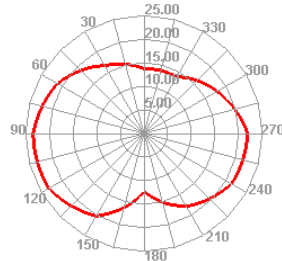
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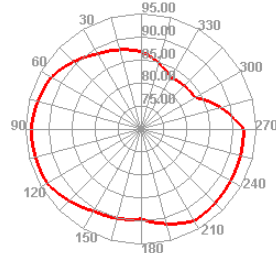
LTE26 26865 TRP Phi=45



LTE26 26990 TRP Phi=45



LTE26 8990 TIS Phi=45

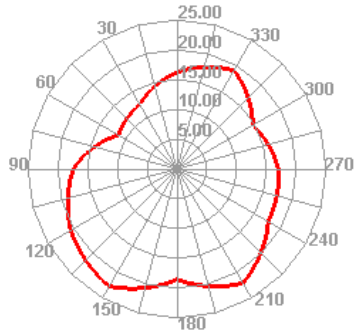




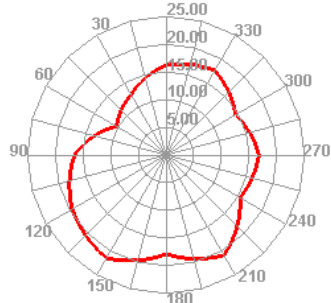
凯普深

2D方向图 2D Directions

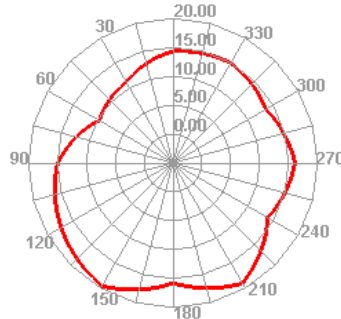
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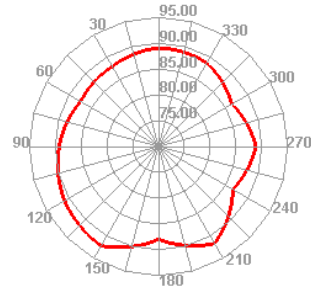
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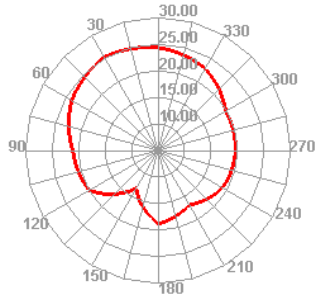
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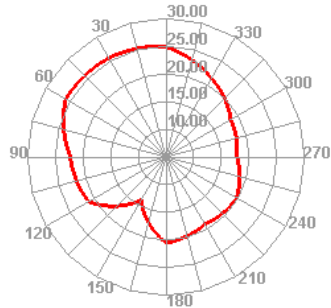
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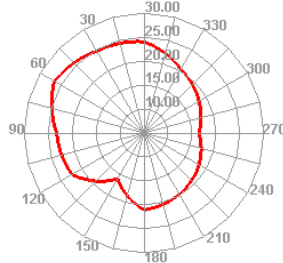
LTE66 132022 TRP Phi=45



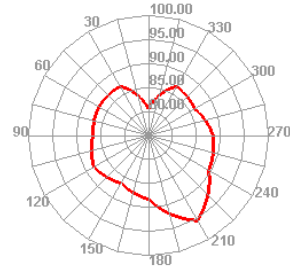
LTE66 132322 TRP Phi=45



LTE66 132622 TRP Phi=45



LTE66 67086 TIS Phi=45

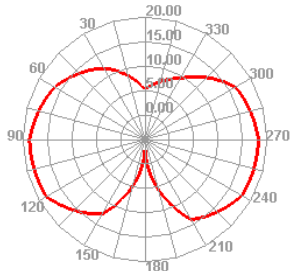




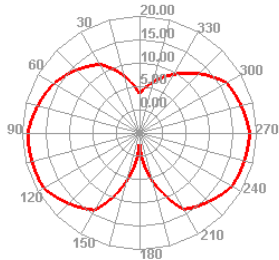
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2D方向图 2D Directions

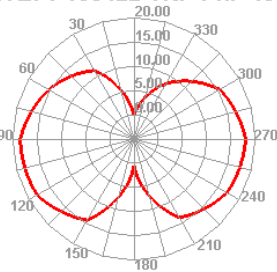
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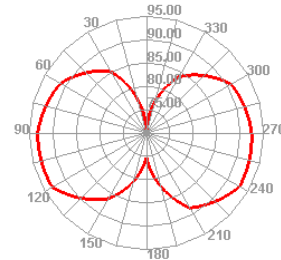
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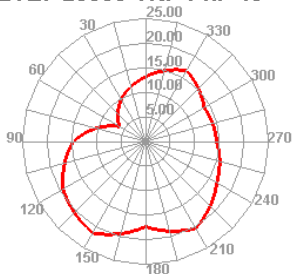
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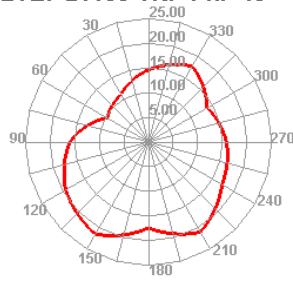
LTE71 68886 TIS Phi=45



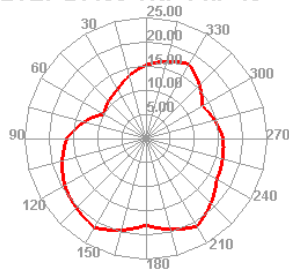
LTE7 20800 TRP Phi=45



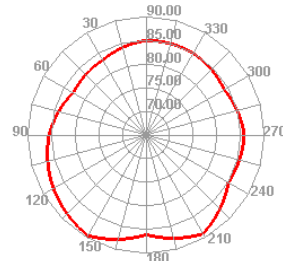
LTE7 21100 TRP Phi=45



LTE7 21400 TRP Phi=45



LTE7 3400 TIS Phi=45

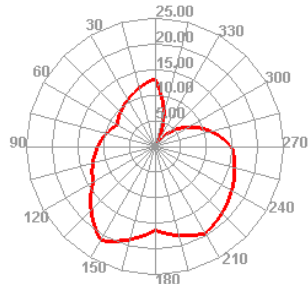




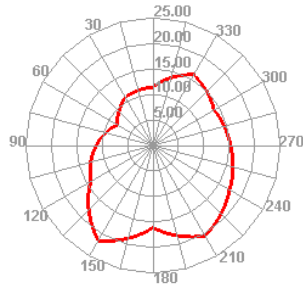
凯普深

2D方向图 2D Directions

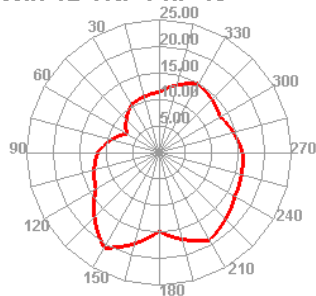
Wifi 1 TRP Phi=45



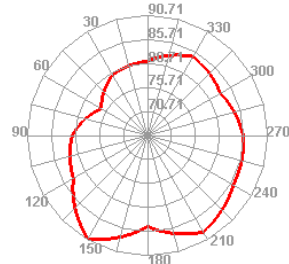
Wifi 6 TRP Phi=45



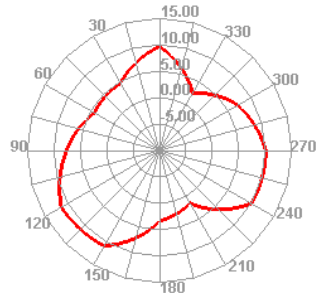
Wifi 12 TRP Phi=45



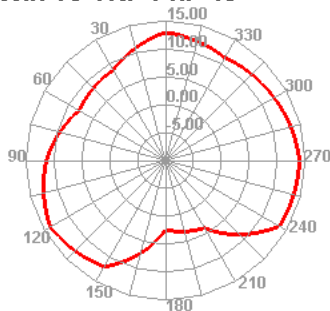
Wifi 12 TIS Phi=45



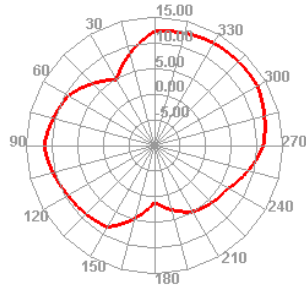
Wifi 36 TRP Phi=45



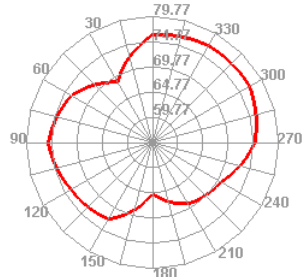
Wifi 60 TRP Phi=45



Wifi 161 TRP Phi=45



Wifi 161 TIS Phi=45





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Gain test data

	GSM850	EGSM900	DCS1800	PCS1900		
peak Gain(dBi)	-4.54	-5.32	-2.39	-2.56		

	W2	W4	W5			
peak Gain(dBi)	-2.56	-2.39	-4.54			



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Gain test data

	LTE2	LTE4	LTE5	LTE12	LTE25	LTE26
peak Gain(dBi)	-2.56	-2.39	-4.54	-3.78	-2.49	-4.07

	LTE66	LTE71	LTE41			
peak Gain(dBi)	-2.39	-4.41	-3.65			



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Gain test data

	GPS	2.4GWIFI	BT	5G WIFI		
peak Gain(dBi)	-3.32	-3.18	-3.18	-4.07		



联系方式contact information

联系方式: contact information

射频radio frequency : 江工Jiang Gong

电话 elephone: 15014104367

邮箱mailbox : kpsyanfa1@szkpstx.com

地址address : 龙华区龙观大道440号龙城工业区御龙办公楼二楼

2nd Floor, Yulong Office Building, Longcheng Industrial Zone, No. 440

Longguan Avenue, Longhua District



THE END

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