承　　认　　书

SPECIFICATION FOR APPROVAL

客户名称 Customer Name	熵基		
客户项目名 Customer Project Name	V3L	盛邦尔项目名 Surbaner Project Name	V3L
客户编码 Customer P/N	A86020062	盛邦尔料号 Surbaner P/N	3160-170-00409-V01
频段 Band	2400-2500MHz&5150-5850MHz		
版本号 Version	A0		
设计人信息/Designer Information			
射频工程师 RF Engineer	林德长	研发主管 R&D Diretor	朱浩彦
结构工程师 ME Engineer	邓荣山		

盛邦尔审批/Surbaner Approval				客户批准/Customer Approval	
	制作 Prepared By	审核 Checked By	批准 Approval By	审核 Checked By	批准 Approval By
签章 Signature	刘胜荣	朱浩彦 2023-04-24	曾湘彪		
日期 Date	2023.04.23	2023.4.24			

深圳市盛邦尔科技有限公司 受控技术文件

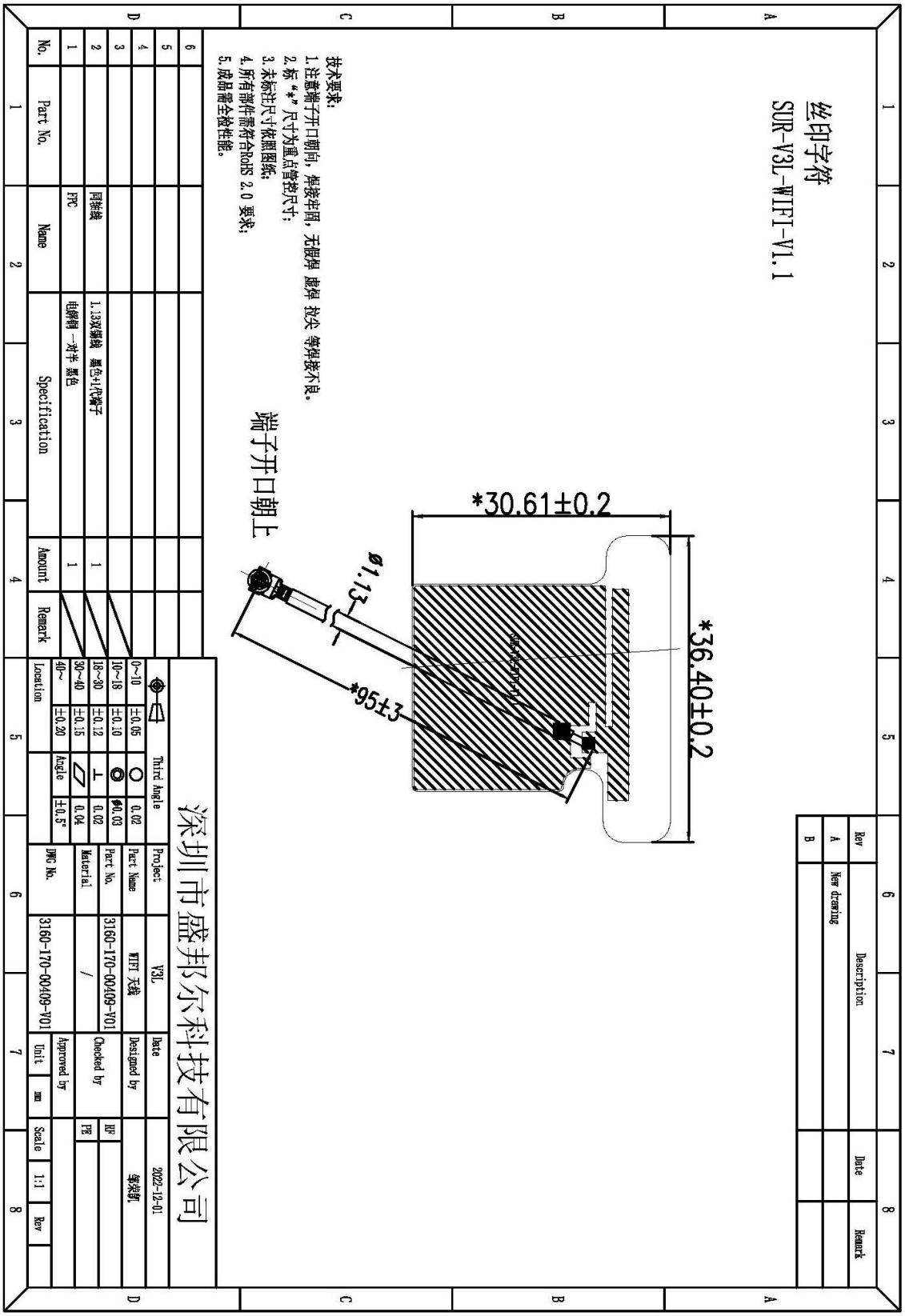
修订履历/Change Log				
版本 Version	修订内容 Change Description	责任人 Person in Charge	核准 Approval By	日期 Date

Address: 2/F, Building B25, Hengfeng industrial city, Hezhou community, Xixiang Street, Baoan District, Shenzhen City, TEL：0755-82790675 FAX：0755-82809726

目录/Catalogue

产品图纸或实物图片

Drawing or Product Image



二. Technical Parameter /技术参数

1. Antenna/天线

No/序号	Part Name/项目	SPEC/规格
1	Frequency Range/ 频率范围	2400-2500MHz & 5150-5850MHz
2	Impendence/阻抗	50 ohm nominal
3	Maximum peak gain/最大峰值增益	2400MHz-2483.5MHz: 3.2 dBi 5150MHz-5250MHz: 3.7 dBi 5250MHz-5350MHz: 3.7 dBi 5470MHz-5725MHz: 4.6 dBi 5725MHz-5850MHz: 4.2 dBi
4	Polarization/极化	Vertical / horizontal
5	VSWR/驻波比	≤2.5
6	Efficiency/效率	≥35%
7	RF Cable/射频连接线	1.13 black line 95mm
8	RF Connector/连接器	CCT Generation 1 terminal

2. Environmental Characteristics/环境特性

No/序号	Part Name/项目	SPEC/规格
1	Operation Humidity /工作湿度	5~95%
2	Operating Temperature/ 工作温度	-20~+60℃
3	Store Temperatuer/ 储存温度	-30~+70℃

射频性能测量报告

RF Performance Test Report

客户名称 Customer Name	熵基	项目名称 Project Name	V3L	盛邦尔料号 Surbaner P/N	3160-170-00409-V01
频段 Band	2400-2500MHz& 5150-5850MHz	测试日期 Test Date	2023/04/23	测试人 Inspector	林德友

天线测试设备简介

Antenna Test Equipment Introduction

测试天线输入特性使用 **Agilent E5071C and Agilent 5062A** 矢量网络分析仪；辐射特性利用 Satimo 三维近场暗室进行测试，并分别使用 8960 E5515 和 Agilent E4438C 进行了分析。暗房的测试坐标如下:

Test of antenna input characteristics using **Agilent E5071C and Agilent 5062A** vector network analyzer; The radiation pattern of the antenna are tested using the Satimo starlab 3D near field Anechoic Chamber, and the instrument is used to agilent8960 E5515 and Agilent E4438C. The test coordinates of the darkroom are as follows:

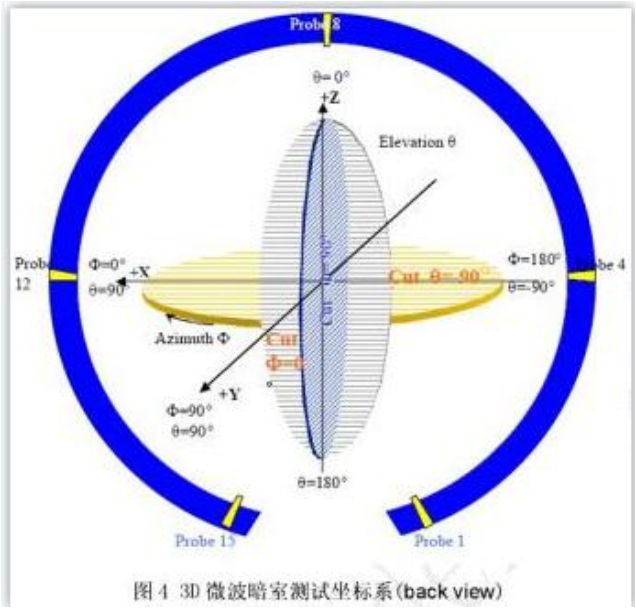


图 4 3D 微波暗室测试坐标系(back view)

1. S11 参数测量/*S11 Parameter-VSWR*

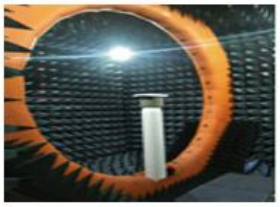
使用一根 50Ω同轴电缆连接到天线，然后该电缆连接到网络分析仪测量 S11 参数，被测量产品远离金属至少 20 厘米。

Measuring Method is a 50Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the S11 parameter, Keeping this fixture away from metal at least 20cm.

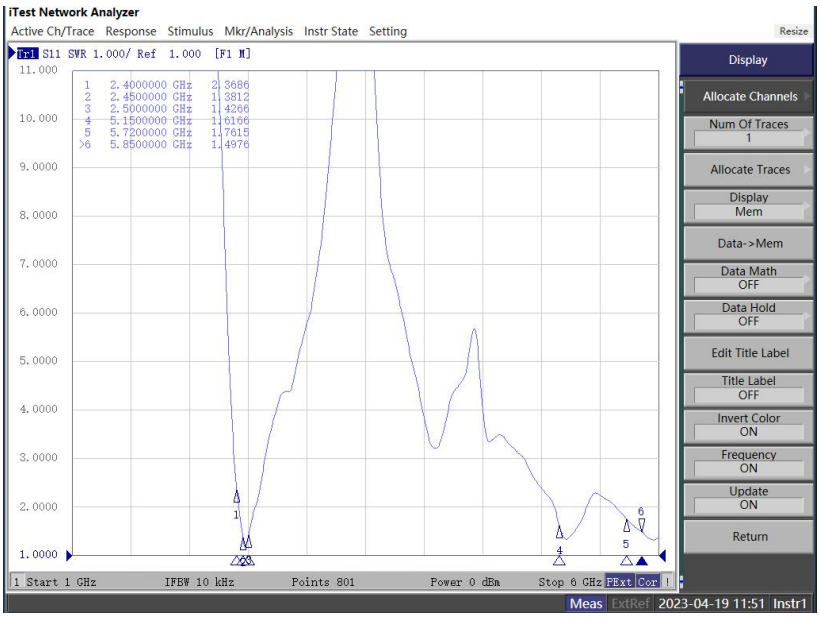
Test System

Sequence Number	Test Item	equipment
S parameter	VSWR	Agilent 5071C & Agilent 5062A
OTA Test	TRP&TIS	Agilent 8960 E5515C& Agilent 4438C&CMW500 &CMW270 ETS&SATIMO
Gain & Efficiency	Gain & Efficiency	ETS&SATIMO Agilent 5071C



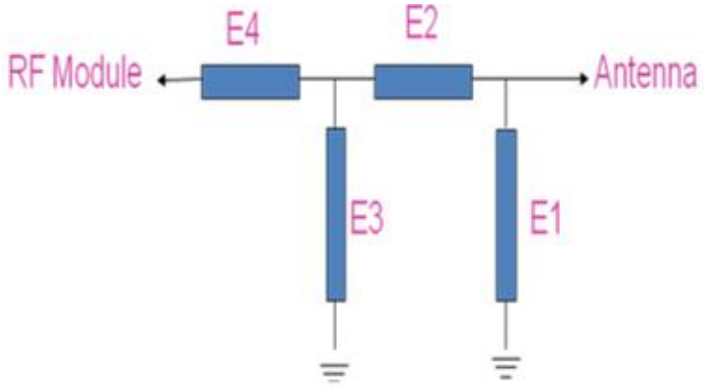



S11 Parameter-VSWR



Frequency(MHz)	2400	2450	2500	5150	5720	5850
VSWR	2.36	1.38	1.42	1.61	1.76	1.49

2.天线匹配网络/Antenna Matching Network



Element	Capacitor	Inductor
E1	N/A	N/A
E2	N/A	N/A
E3	N/A	N/A
E4	N/A	N/A

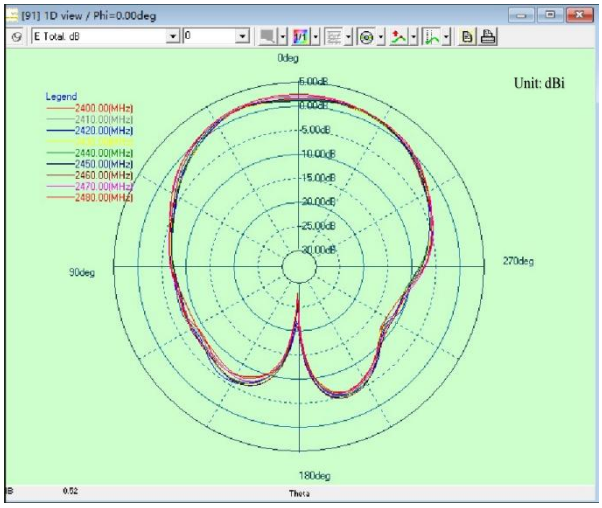
PCB板端匹配电路未改动

3. Gain & Efficiency

Frequency (MHz)	Efficiency (%)	Peak GAIN (dBi)
2400	44.9%	3.1
2410	45.5%	3.2
2420	45.8%	3.2
2430	45.3%	3.1
2440	44.3%	2.9
2450	45.6%	2.9
2460	48.0%	2.9
2470	48.4%	3.0
2480	47.4%	3.2

Frequency (MHz)	Efficiency (%)	Peak GAIN (dBi)
5150	38.0%	2.7
5240	39.5%	3.3
5320	41.6%	3.7
5500	42.8%	4.6
5600	39.3%	4.5
5720	42.2%	3.9
5745	44.3%	3.6
5795	44.2%	3.9
5850	46.1%	4.2

2D Pattern-2.4 GHz Band



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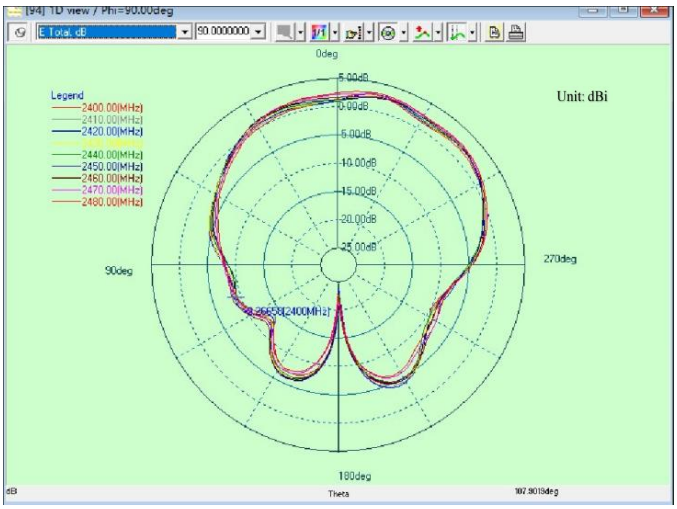

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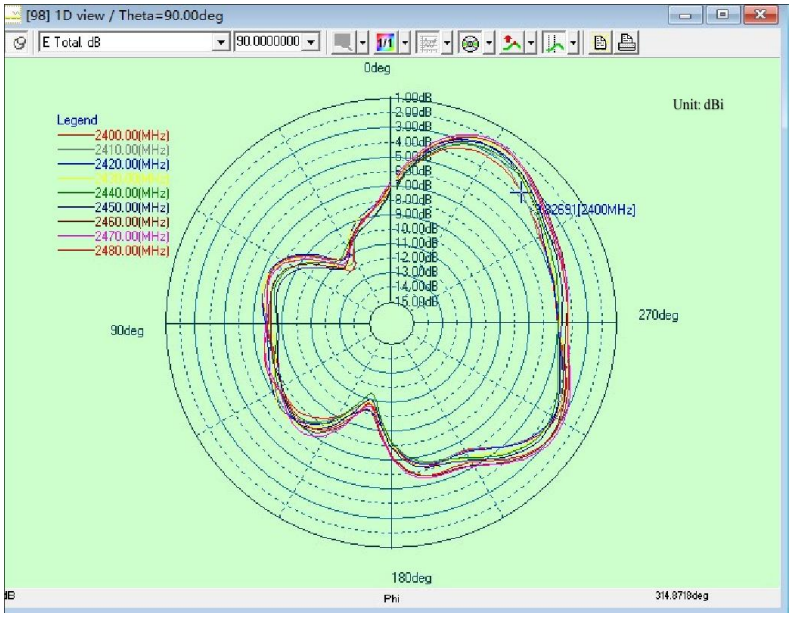

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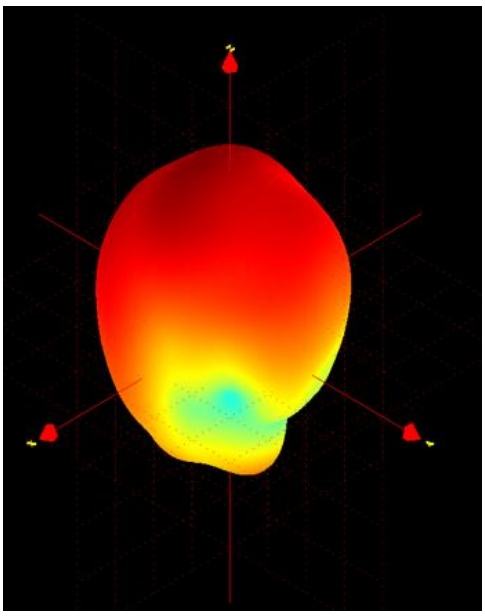
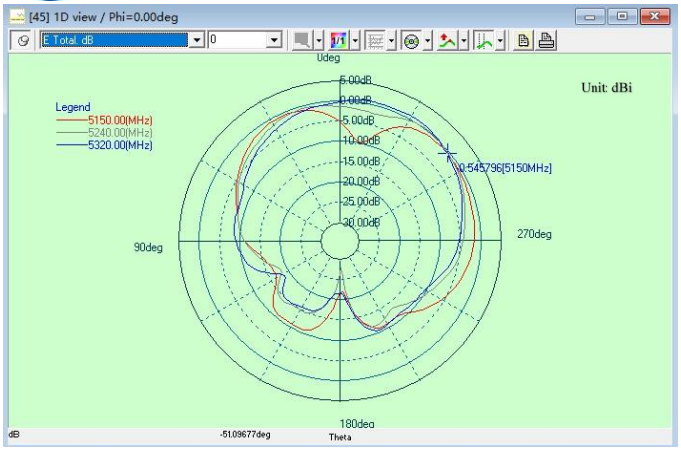


3D

2D Pattern-5 GHz (5150-5350MHz)



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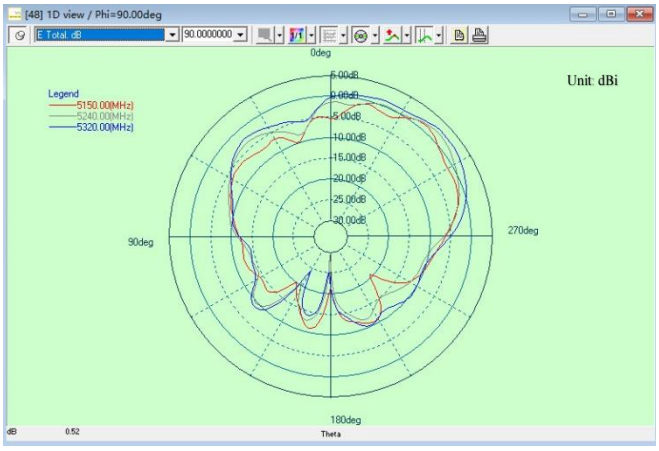

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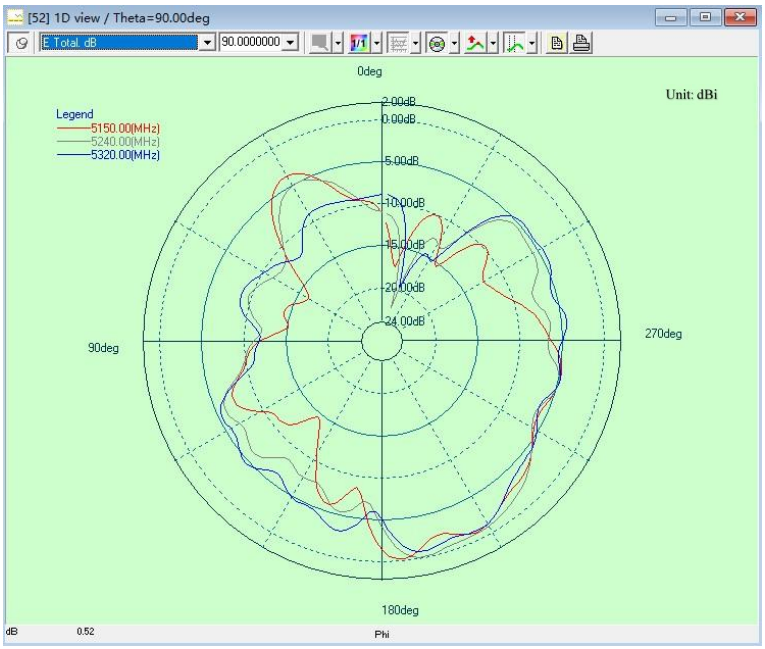

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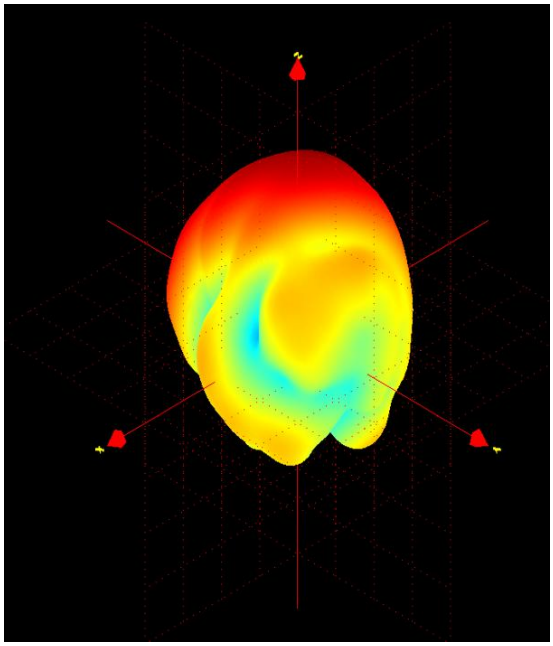
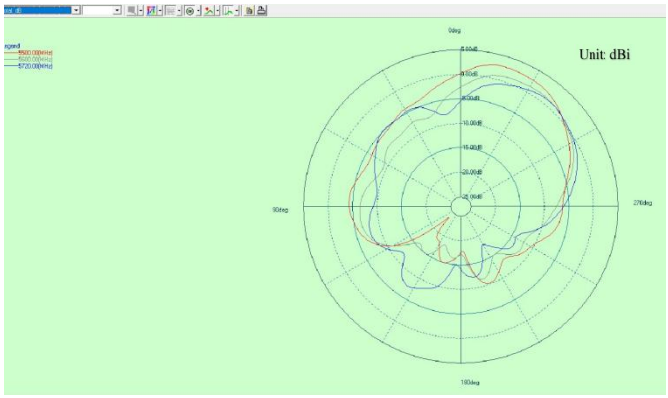


3D

2D Pattern-5 GHz (5470-5725Mhz)



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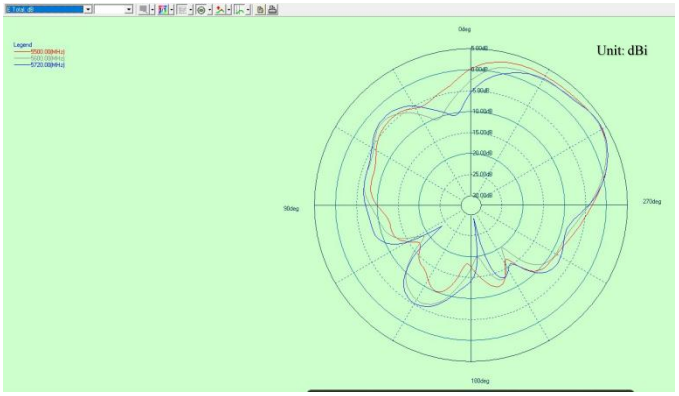

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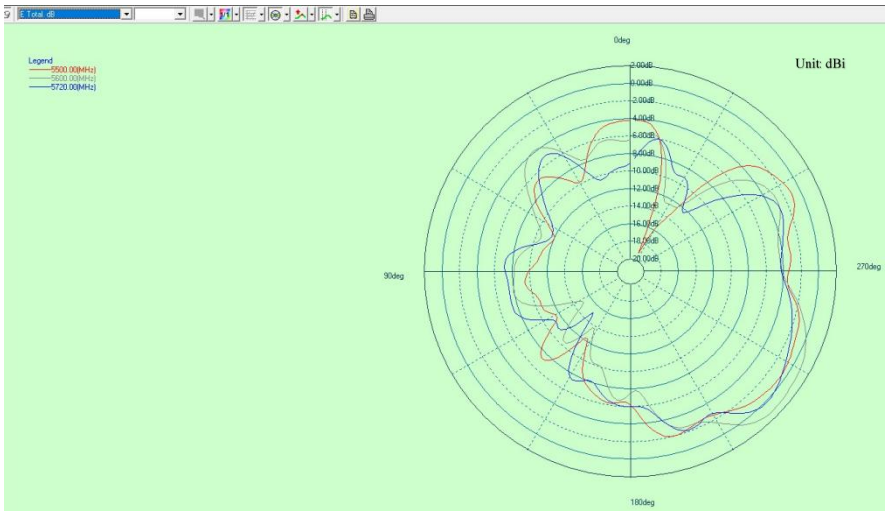

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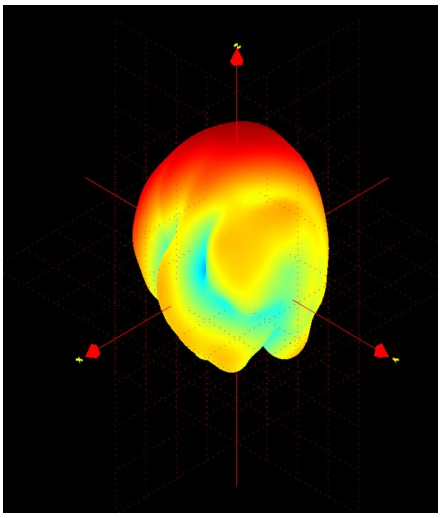
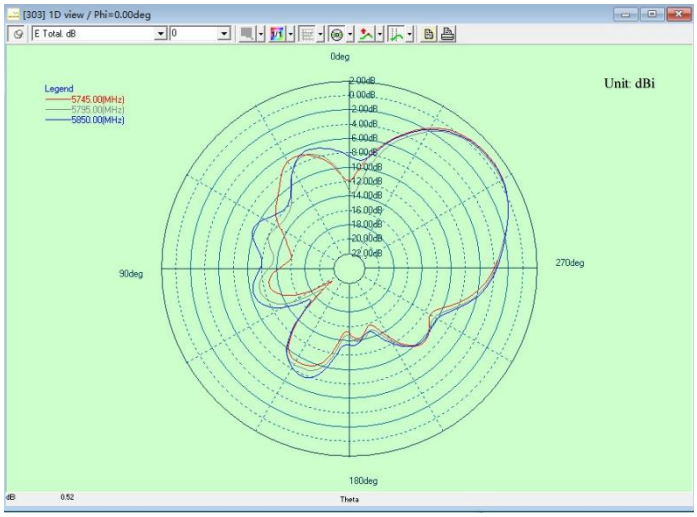


3D

2D Pattern-5.8 GHz (5745-5850MHz)



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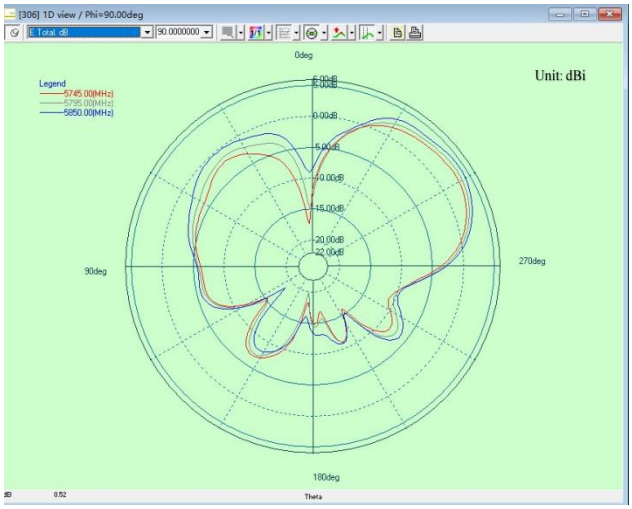

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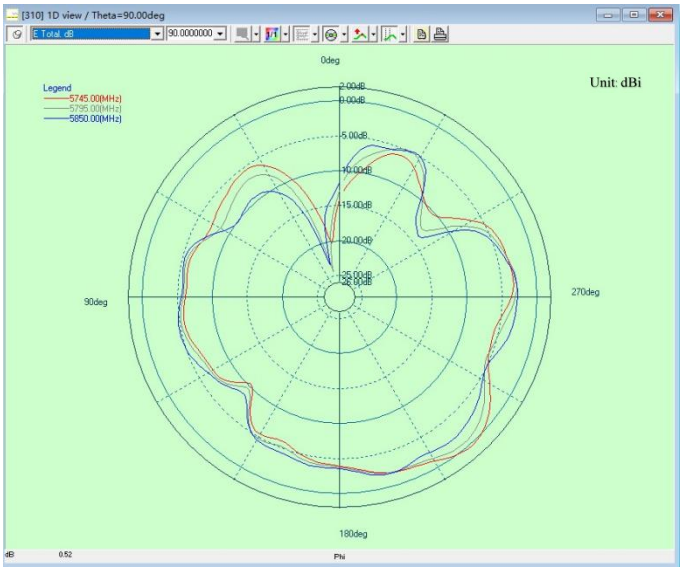

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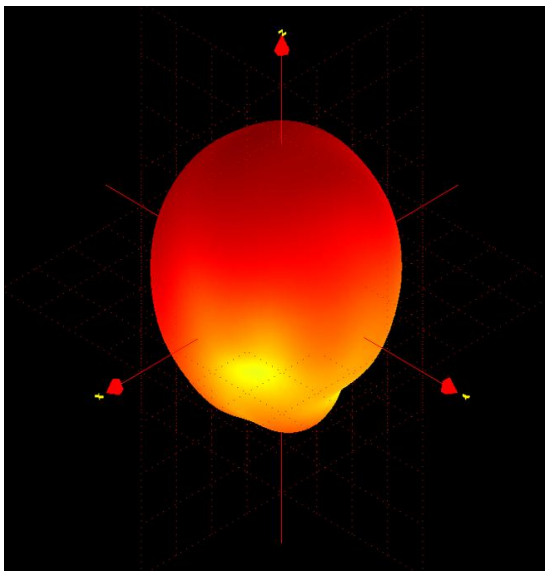


3D

4.OTA

Test Equipment:	R&S CMW270			
Test Condition:	3D chamber			
Band	Wireless Protocol	Channel	TRP(dBm)	TIS(dBm)
WIFI	802.11 b/11Mbs	1	13.27	-75.83
		6	13.29	-73.55
		11	13.70	-75.02
WIFI	802.11 g/54Mbs	1	11.08	-61.76
		6	10.95	-60.94
		11	11.28	-61.5
WIFI	802.11 n/65Mbs	1	10.02	-60.07
		6	9.54	-60.16
		11	10.29	-60.76
WIFI	802.11 a/54Mbs	36	12.06	-68.04
		100	12.43	-68.5
		165	12.36	-67.21

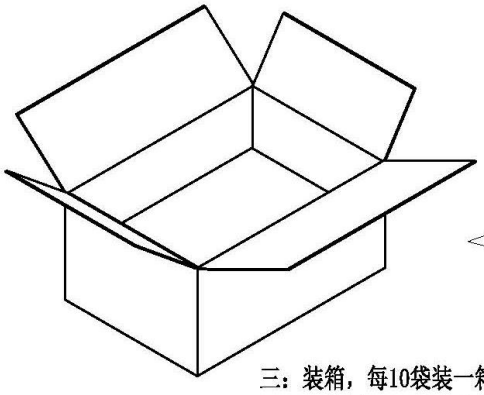
5.Product Overview & Dimension

WIFI

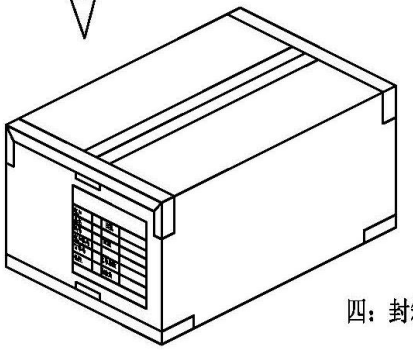
产品包装规范

项目名：V3L	版本：A
客户：熵基	成品名称：WIFI 天线

一：成品天线 ⟹ 二：每PE袋装50PCS产品(以实际包装为准)。



三：装箱，每10袋装一箱，
一箱共500PCS产品(以实际包装为准)。



四：封箱，外箱贴我司生产标签和ROHS标签。

批准：_____ 确认：_____ 拟制：邹荣凯

深圳市盛邦尔科技有限公司
Shenzhen Surbaner Technology CO. LTD

样品尺寸测量报告

Sample Dimensions Test Report

客户名称 Customer Name	熵基	客户料号 Customer P/N	A86020062	盛邦尔料号 Surbaner P/N	3160-170-00409-V01
测试日期 Test Date	2023/04/23	样品数量 Sample Qty.	3	测试人 Inspector	曾心荣
尺寸编号 Dimension No.	标准 Standard	样品 1 Sample 1	样品 2 Sample 2	样品 3 Sample 3	Pass/NG
①长度	36.40±0.2mm	36.42	36.40	36.39	Pass
②宽度	30.61±0.2mm	30.63	30.61	30.60	Pass
③厚度	0.12±0.05mm	0.12	0.12	0.12	Pass
④线长	95±3mm	95	95.1	95	Pass
⑤					
⑥					
⑦					
最终结论 Conclusion					PASS
测试人&日期 Inspector & Date	曾心荣 2023/04/23		批准&日期 Approval &D ate		

Address: 2/F, Building B25, Hengfeng industrial city, Hezhou community, Xixiang Street, Baoan District, Shenzhen City. TEL：0755-82790675 FAX：0755-82809726

可靠性测试报告

Reliability Test Report

客户名称 Customer Name	熵基	客户料号 Customer P/N	A86020062	盛邦尔料号 Surbaner P/N	3160-170-00409-V01	
测试日期 Test Date	2023/04/22	样品数量 Sample Qty.	3	测试人 Inspector	何春辉	
测试项目 Test Item	要求 Requirement	试验设备 testing equipment	样品 1 Sample 1	样品 2 Sample 2	样品 3 Sample 3	判定 PASS/NG
高温存储	在+70°C条件下暴露 24H，恢复 2H 后进行测试电气性能正常	恒温恒湿箱	OK	OK	OK	Pass
低温存储	在-30°C条件下暴露 24H，恢复 2H 后进行测试电气性能正常	恒温恒湿箱	OK	OK	OK	Pass
高温工作	在+60°C条件下通电工作 24H 电气性能正常	恒温恒湿箱	OK	OK	OK	Pass
低温工作	在-20°C条件下通电工作 24H 电气性能正常	恒温恒湿箱	OK	OK	OK	Pass
连接器盐雾试验	（5 士 0．5)%氯化钠、pH 值为 6.5～7.2，实验箱温度(35±2)°C ☑24H　　☐48H	盐雾试验机	OK	OK	OK	Pass
连接器铆压拉拔力	0.81 线径 ≥8N 1.13 线径 ≥10N RG174 ≥60N RG178 ≥40N	推拉力计	≥10N	≥10N	≥10N	Pass
最终结论 Conclusion						Pass
测试人&日期 Inspector & Date	何春辉　2023/04/23		批准&日期 Approval &Date			

Address: 2/F, Building B25, Hengfeng industrial city, Hezhou community, Xixiang Street, Baoan District, Shenzhen City.　TEL：0755-82790675　FAX：0755-82809726

产品 ROHS 成分宣告表

产品名称	均匀物质材料		有害物质含量(PPM)										HS 测试报告编号	HS 测试报告日期
			Pb	Cd	Hg	Cr6+	PBBs	PBDEs	DEHP	BBP	DBP	DIBP		
WIFI 天线	FPC	文字油墨	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ETR22A01347M01	22/10/17
		3M 胶	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SHAEC2217569205	23/1/4
		基材	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SHAEC23001049106	23/2/15
		防焊油墨	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ETR22705905	22/8/5
		抗氧剂	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SZXEC23000119402	23/2/27
	线材	氟化物	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NGBMR23000169901	23/2/6
		镀锡铜线	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SHAEE22000472905	22/8/10
		黑色色母	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	HKTEC2202547207	22/6/10
	端子	C5210	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	CANEC2301145810	23/2/8
		塑胶	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ETR22800771	22/8/10
		镀金	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	A2220404860101001C	22/9/17

Address: 2/F, Building B25, Hengfeng industrial city, Hezhou community, Xixiang Street, Baoan District, Shenzhen City. TEL：0755-82790675 FAX：0755-82809726