



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

承 认 书

SPECIFICATION FOR APPROVAL

客户名称 Customer Name	熵基 ZKTECO		
客户项目名 Customer Project Name	BK500	盛邦尔料号 Surbaner P/N	160180-01965
客户编码 Customer P/N	/	工作频段 Working Band	2400-2500MHz
产品描述 Product description	WIFI 天线/FPC/24.00*22.80*0.12MM/一代端子/1.13 黑色线 L=72MM		
版本号 Version	V01		
设计人信息/Designer Information			
射频工程师 RF Engineer		研发主管 R&D Director	
结构工程师 ME Engineer			

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	王海华林				
日期 Date	2026.03.27	2026-03-17 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

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1 / 11

FM: SBR-QR-RD-37 REV: A2

目录/Catalogue

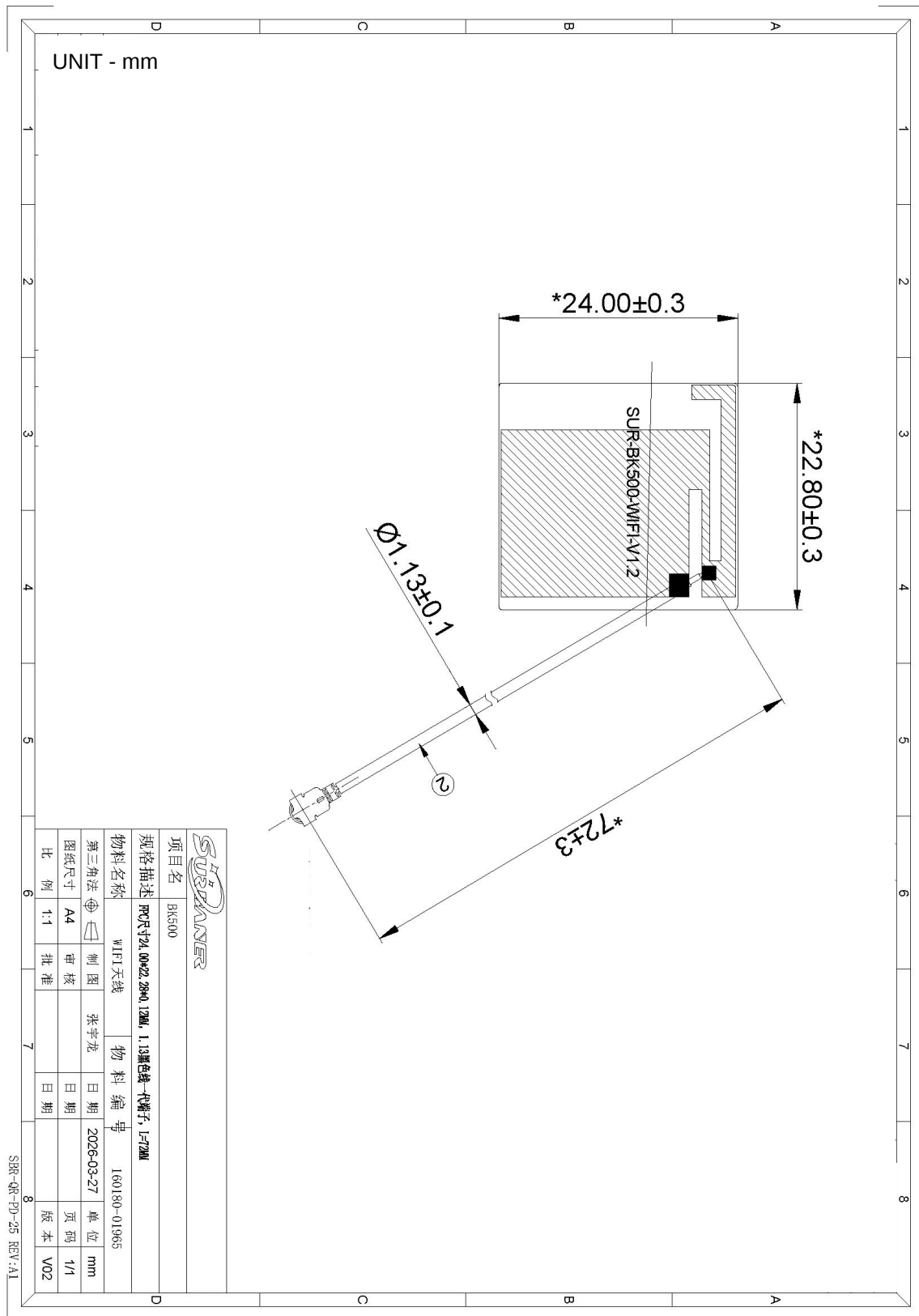
序号 No.	项目 Item	页码 Page No.
1	图纸或实物图片 Drawing or Product Image	3-4
2	技术参数 Technical Parameter	5
3	射频性能测试报告 RF Performance Test Report	6
4	包装文件 Package Document	7-10
5	尺寸测量报告 Dimensions Test Report	11

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一. 产品图纸或实物图片/Drawing or Product Image



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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
2	Impedence/阻抗	50 ohm nominal
3	Gain/增益	3.89 dBi
4	Polarization/极化	LINE
5	VSWR/驻波比	<2.5
6	Efficiency/效率	≥60% AVG
7	RF Cable/射频连接线	1.13 黑色线 72MM
8	RF Connector/连接器	一代端子
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°C
3	Store Temperatuer /工作储存温度	-30~+70°C
4	Salt Spray Test /盐雾试验	24H

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4 / 12

FM: SBR-QR-RD-37 REV: A2

射频性能测量报告

RF Performance Test Report

客户名称 Customer Name		项目名称 Project Name	BK500	盛邦尔料号 Surbaner P/N	160180-01965
频段 Band	2400-2500MHz	测试日期 Test Date	2026/03/27	测试人 Inspector	

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:

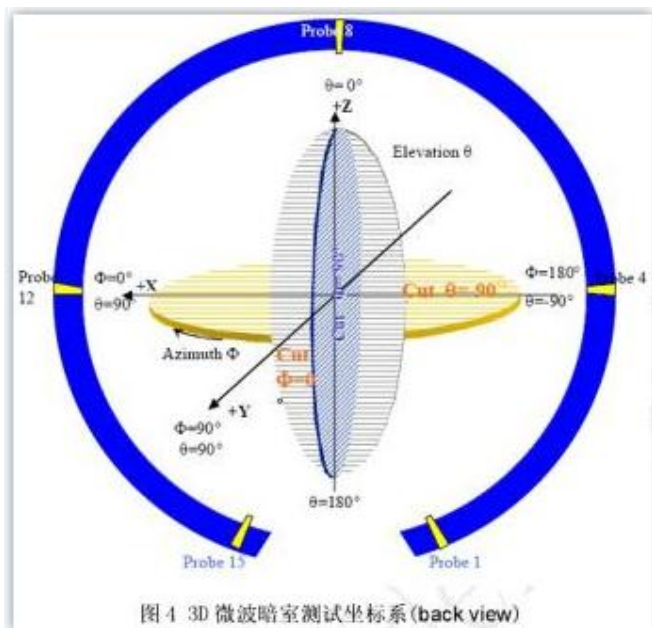


图 4 3D 微波暗室测试坐标系 (back view)

1. S11 参数测量 / S11 Parameter-VSWR

使用一根 50 Ω 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 50 Ω 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.

2. Product Overview & Environmental Treatment



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6 / 12

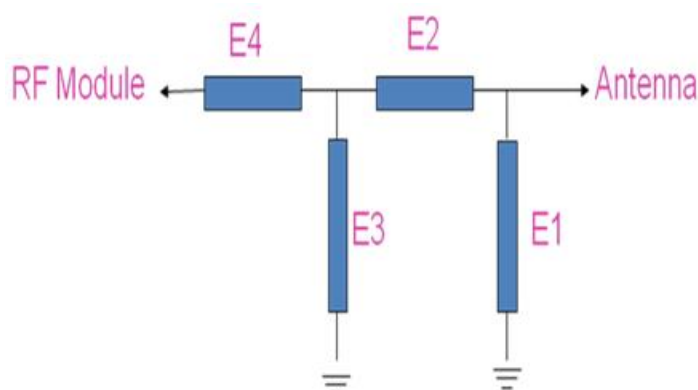
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Test System

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



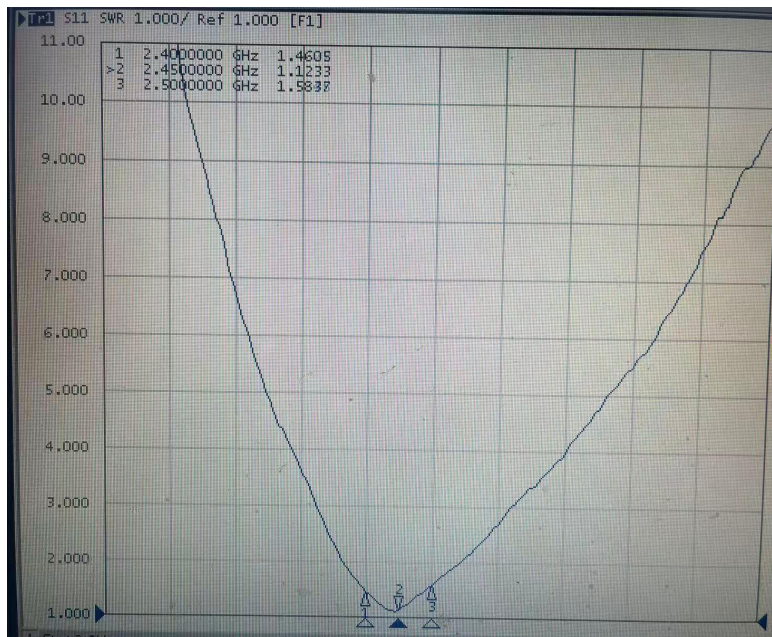
Antenna MatchingNetwork



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

PCB 板端原始匹配未改动

S11 Parameter-S11



Frequency	2400	2450	2500
VSWR	1.46	1.12	1.58

Gain & Efficiency

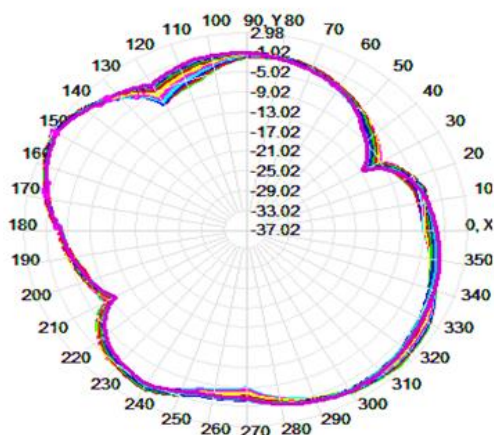
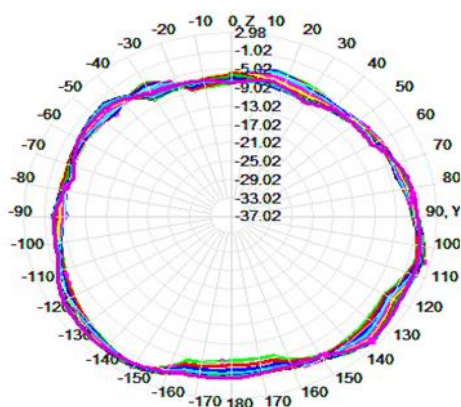
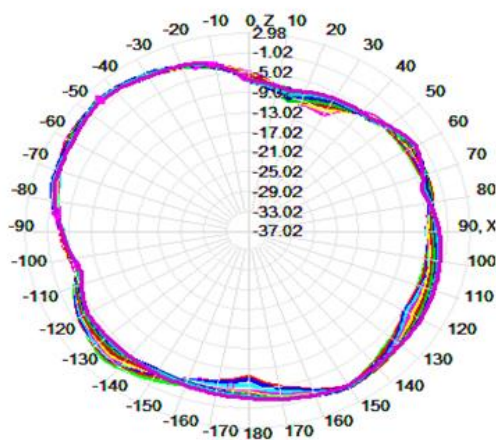
Frequency (MHz)	Efficiency (%)	Peak GAIN (dBi)
2400	67.03	3.22
2410	65.24	3.32
2420	66.38	3.52
2430	67.62	3.64
2440	69.25	3.80
2450	69.24	3.89
2460	69.83	3.89
2470	68.37	3.70
2480	67.84	3.59
2490	66.38	3.49
2500	65.64	3.41

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2D Pattern

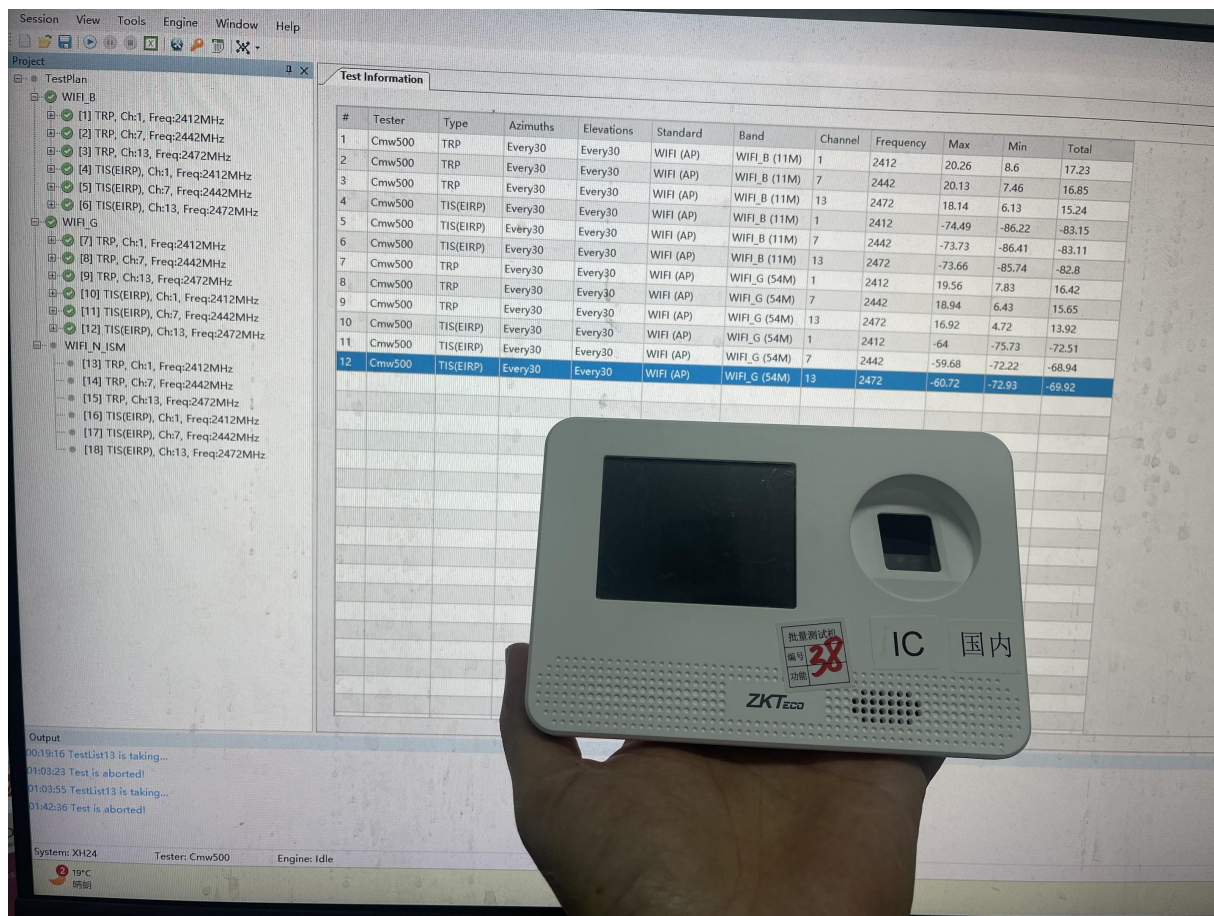


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OTA



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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	/	盛邦尔料号 Surbaner P/N	160180-01965
测试日期 Test Date	2026/03/27	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尺寸 1	24.00±0.3mm	24.06	24.03	23.95	Pass
②尺寸 2	22.80±0.3mm	22.85	22.82	22.76	Pass
③尺寸 3	72.00±3mm	71.00	70.50	69.50	Pass
④					
⑤					
⑥					
⑦					
最终结论 Conclusion					PASS
测试人&日期 Inspector & Date	曾心荣 2026/03/27		批准&日期 Approval & Date		

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11 / 12
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