

Specifications

SPECIFICATION FOR APPROVAL

Customer name Customer Name	Shenzhen Minrray Industry Co., Ltd		
Customer Project Name	A460	He Li Xun Project Name He l ixun Project Name	A460
Customer code Customer P/N	3060400000013	He l ixun P/N	HLX0094-A460-V4
freq uenc y rang e Ban d	2400-2500MHZ,		
Version number			
Designer Information			
RF Eng ineer	Huang Yafei	Electrical Engineer EE Eng ineer	
Structural Engineer ME Eng ineer	Huang Yafei		

Helixun Approval				Customer Approval	
	fabrication Prepared By	examine and verify Checked By	ratify Approval By	examine and verify Checked By	ratify Approval By
signature Signature	Zhuo Ziji				
date Date	2025-07-31				

Edit History/Change Log				
edition Version	Revision Change Description	person liable Person in Charge	approval Approval By	date Date

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Catalog

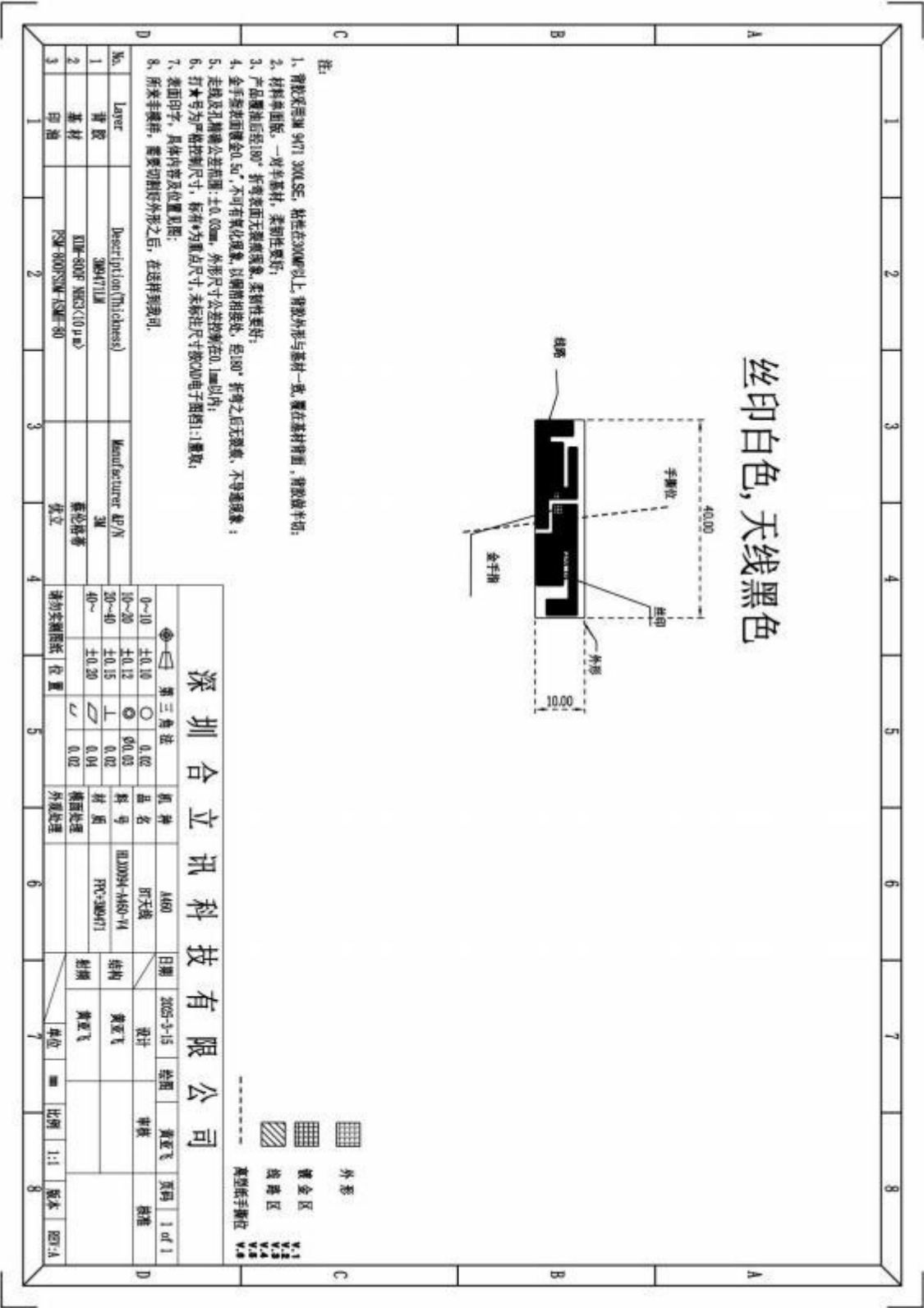
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Product drawings or photos
Drawing or Product Image



A		B		C		D																																																			
一、技术参数 1. 额定电压: 60VAC (R.M.S) 2. 频率测试范围: 0~65Hz 3. 特性阻抗: 50±2 ohms 4. 工作温度范围: -40℃~+85℃ 5. 工作湿度: 95%RH Max.		二、电气性能 1. 绝缘阻抗: 500M ohms 2. 接触阻抗: 中心PIN针 25a ohms Max. 外部铁壳 15a ohms Max. 3. 耐电压: 200V AC 2 Min 4. 线损: 900M Hz 0.5dB Max 1800M Hz 0.7dB Max 5. VSWR (电压驻波比): 0.1~3GHz 1.3 Max. 3~6GHz 1.5 Max.		三、机械性能 1. 拔出力: 初期 4N Min. 30回后 2N Min. 2. 拉力: 10N Min		深圳合立讯科技有限公司 <table border="1"> <tr> <th>图例</th> <th>第三角法</th> <th>机种</th> <th>品名</th> <th>料号</th> <th>日期</th> <th>设计</th> <th>审核</th> <th>页码</th> <th>标准</th> </tr> <tr> <td>0~10</td> <td>±0.10</td> <td>○</td> <td>0.02</td> <td>EL1004-A40-T</td> <td>2024-12-17</td> <td></td> <td></td> <td>黄重飞</td> <td>1 of 1</td> </tr> <tr> <td>10~20</td> <td>±0.12</td> <td>◎</td> <td>0.03</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>20~40</td> <td>±0.15</td> <td>⊥</td> <td>0.02</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>40~</td> <td>±0.20</td> <td>⌒</td> <td>0.04</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> 请见安装图及位置		图例	第三角法	机种	品名	料号	日期	设计	审核	页码	标准	0~10	±0.10	○	0.02	EL1004-A40-T	2024-12-17			黄重飞	1 of 1	10~20	±0.12	◎	0.03							20~40	±0.15	⊥	0.02							40~	±0.20	⌒	0.04						
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1. 线材 2. 端子		1. 描述 (Thickness) 2. 材料		1. 描述 2. 材料		1. 描述 2. 材料		1. 描述 2. 材料																																																	
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一、技术参数

1. 额定电压: 60VAC (R.M.S)

2. 频率测试范围: 0~65Hz

3. 特性阻抗: 50±2 ohms

4. 工作温度范围: -40℃~+85℃

5. 工作湿度: 95%RH Max.

二、电气性能

1. 绝缘阻抗: 500M ohms

2. 接触阻抗: 中心PIN针 25a ohms Max.
外部铁壳 15a ohms Max.

3. 耐电压: 200V AC 2 Min

4. 线损: 900M Hz 0.5dB Max
1800M Hz 0.7dB Max

5. VSWR (电压驻波比): 0.1~3GHz 1.3 Max.
3~6GHz 1.5 Max.

三、机械性能

1. 拔出力: 初期 4N Min. 30回后 2N Min.

2. 拉力: 10N Min

深圳合立讯科技有限公司

图例	第三角法	机种	品名	料号	日期	设计	审核	页码	标准
0~10	±0.10	○	0.02	EL1004-A40-T	2024-12-17			黄重飞	1 of 1
10~20	±0.12	◎	0.03						
20~40	±0.15	⊥	0.02						
40~	±0.20	⌒	0.04						

请见安装图及位置

1. 线材

2. 端子

1. 描述 (Thickness)

2. 材料

1

2

1

2

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Sample size measurement report

Sample Dimensions Test Report

customer name Customer Name	Shenzhen Mingri Industrial limited company	Customer Material Number Customer P/N	3060400000013	Helixun P/N	HLX0094-A460-V4
Test Date	2025-07-31	sample size Sample Qty.	3	Tester Inspector	Zhuo Ziji
Size Number Dimension No.	standard Standard	Sample 1 Sample 1	Sample 2 Sample 2	Sample 3 Sample 3	Pass/NG
① length	40.00±0.2mm	40.10mm	40.20mm	40.00mm	Pass
② width	10.00±0.2mm	10.20mm	10.10mm	10.00mm	Pass
③ thickness	0.2±0.05mm	0.2mm	0.21mm	0.22mm	Pass
④ Terminal wire length	80mm±3mm	80mm	81mm	82mm	Pass
Final Conclusions					PASS
Tester & Date Inspector & Date	Zhuo Ziji 2025-07-31		Approved & Date Approval & Date		

RF Performance Measurement Report

RF Performance Test Report

customer name Customer Name	Shenzhen Mingri Industrial Co., LTD	project name Project Name	A460	Helixun P/N	HLX0094-A460-V4
frequency range Band	2400-2500MHZ,	Test Date	2025-07-31	Tester Inspector	Zhuo Ziji

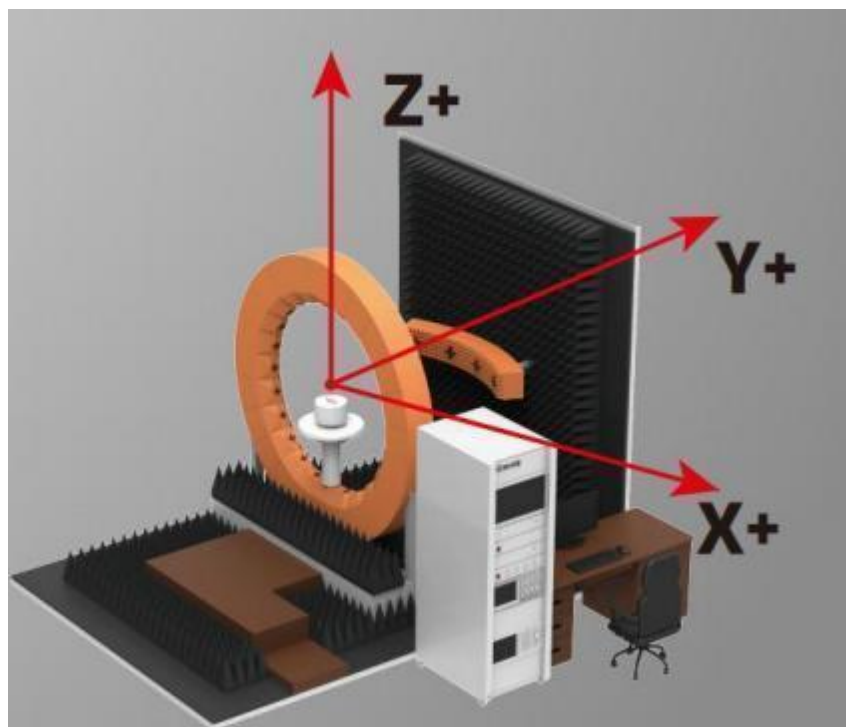
Antenna Test Equipment Overview

Antenna Test Equipment Introduction

The antenna's input characteristics were evaluated using Agilent E5071C and Agilent 5071B vector network analyzers. The radiation characteristics were measured in an ETS 3D near-field anechoic chamber, with CMW500 and Agilent5071C analyzers respectively employed for analysis. The anechoic chamber test coordinates are as follows:

Below :

Test of antenna input characteristics using Agilent E5071C and Agilent 5071B vector network analyzer ; The radiation pattern of the antenna are tested using the ETS star lab 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 :



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Tst S y stem

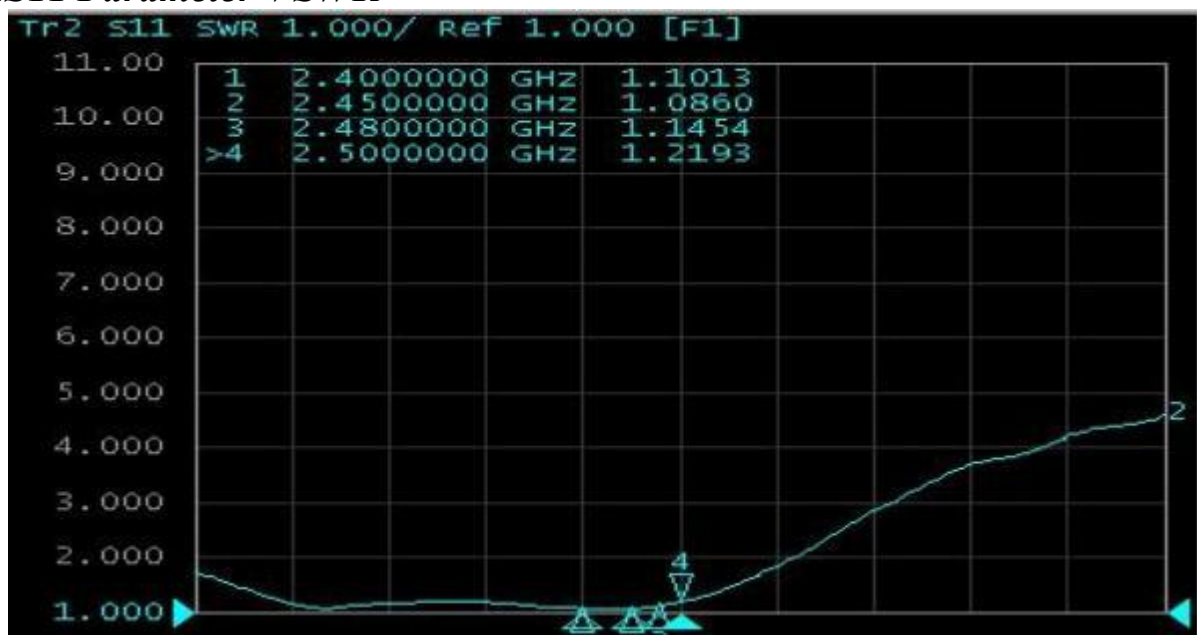
Sequence Number	Test Item	equipment
S parameter	VSWR	Agilent 5071C & Agilent 5071B
OTA Test	TRP&TIS	Agilent 8960 & CMW500 STIMO
Gain & Efficiency	Gain & Efficiency	SATIMO Agilent 5071C



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3. 1Test Result

1. S11 Parameter-VSWR



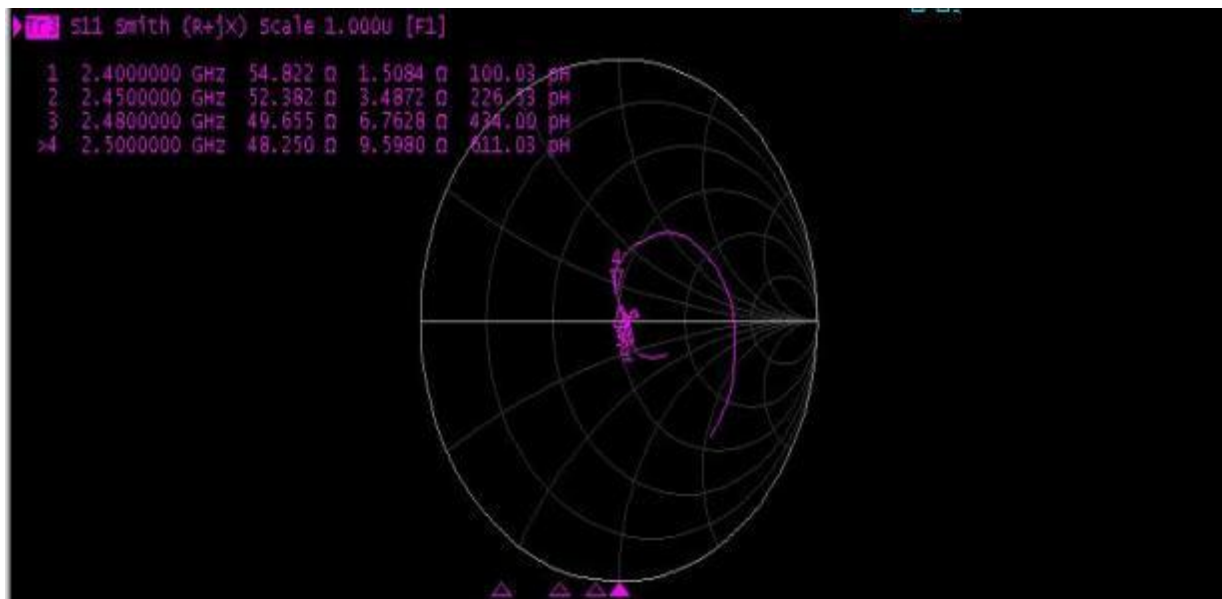
Frequency (MHz)	2400	2450	2480	2500
VSWR	1.10	1.08	1.14	1.21

2. S11 Parameter-Log Mag



Frequency (MHz)	2400	2450	2480	2500
Log Mag	-26.34	-27.69	-23.37	-20.10

3 .S11 Parameter-Sm i th



Frequency (MHz)	2400	2450	2480	2500
Sm i th(Ω)	54.82	52.38	49.65	48.25

3. 2 Test Result

1 Gain & Efficiency——ANT

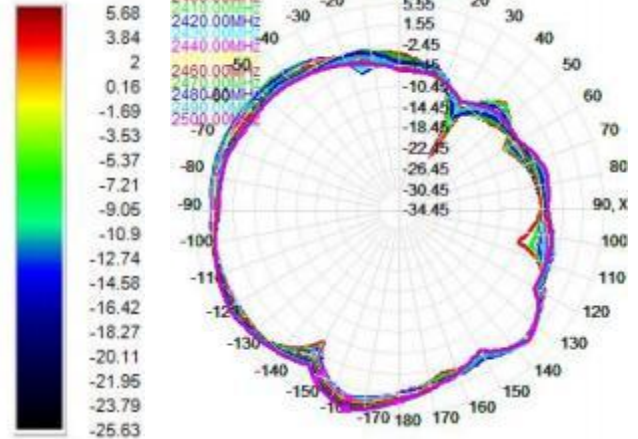
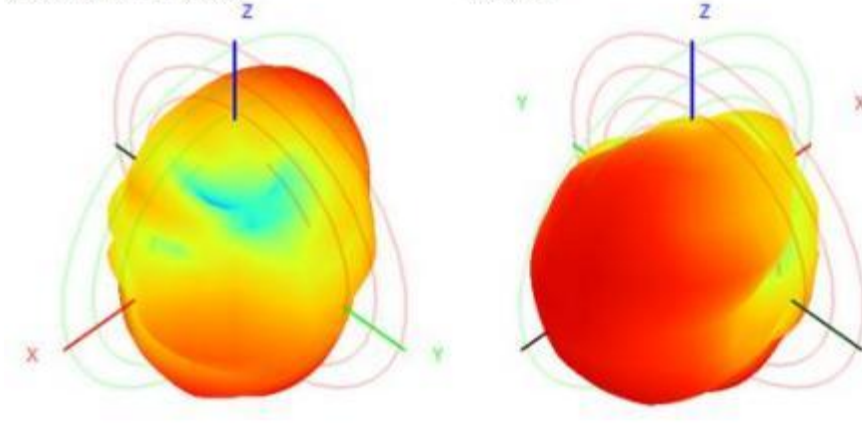
Frequency (MHz)	Efficiency (%)	Peak GAIN (dBi)
2400	62.50	5.68
2410	62.50	5.40
2420	61.92	5.02
2430	60.94	4.97
2440	60.53	5.42
2450	61.05	5.87
2460	61.18	6.30
2470	61.44	6.71
2480	62.35	7.05

3.3 Test Result

1 2D Pattern——BTANT

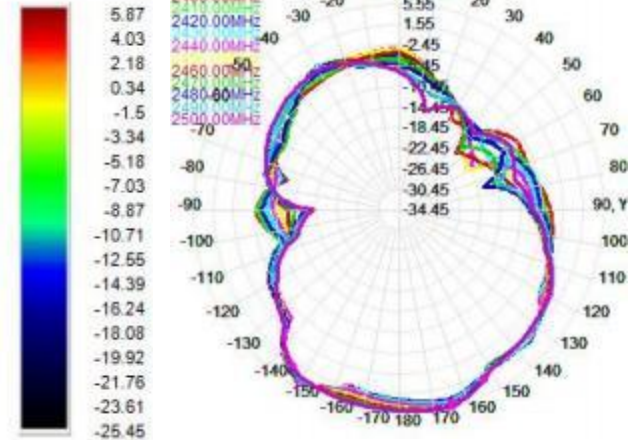
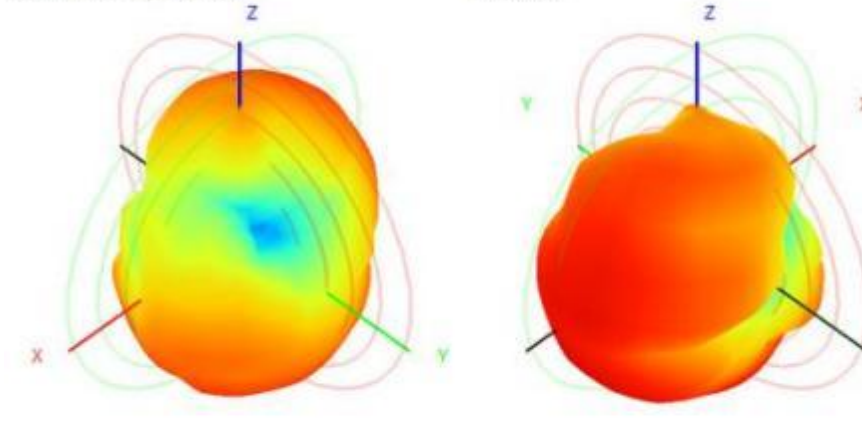
2400.0MHz Total, Eff: 62.5%

Back View



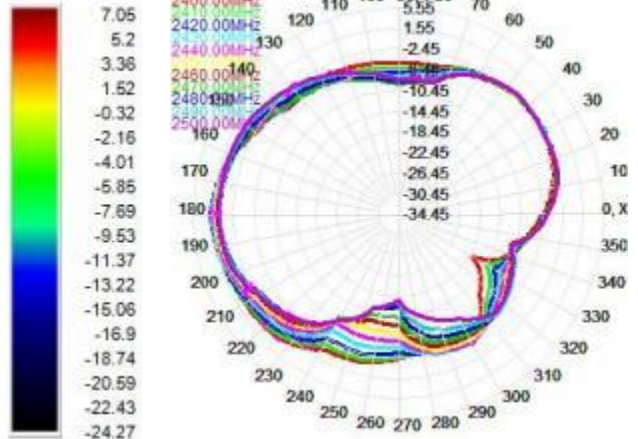
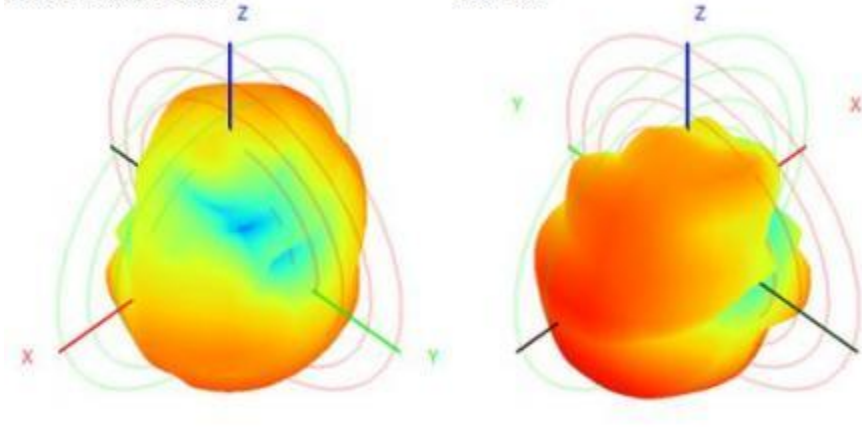
2450.0MHz Total, Eff: 61.0%

Back View



2480.0MHz Total, Eff: 62.3%

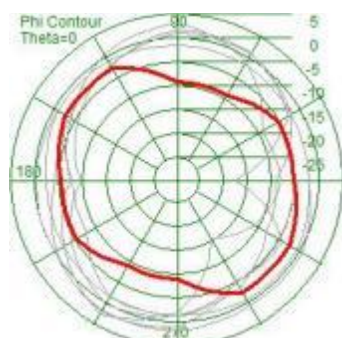
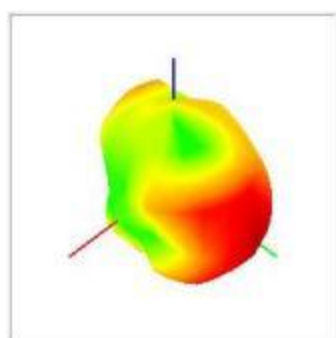
Back View



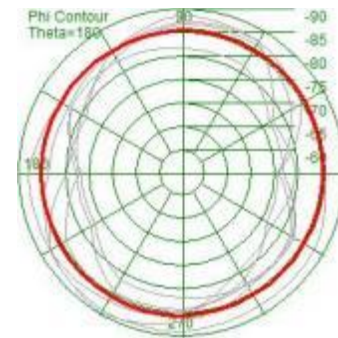
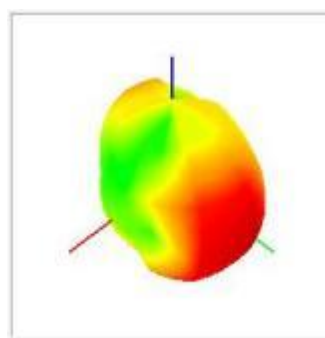
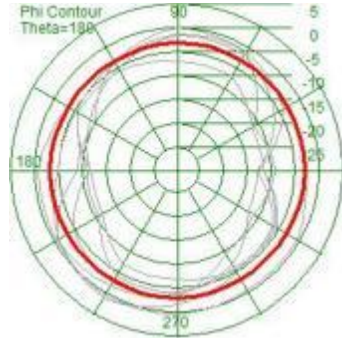
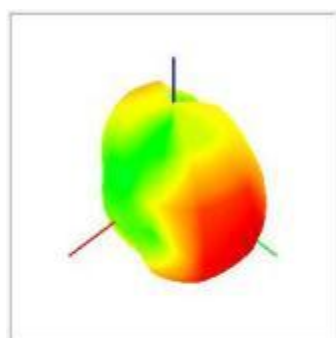
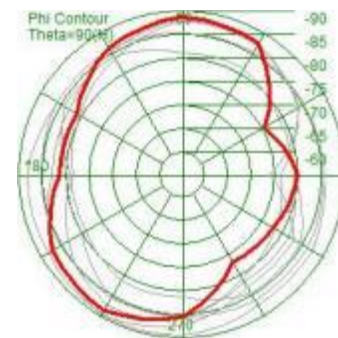
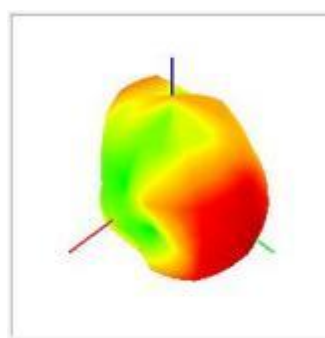
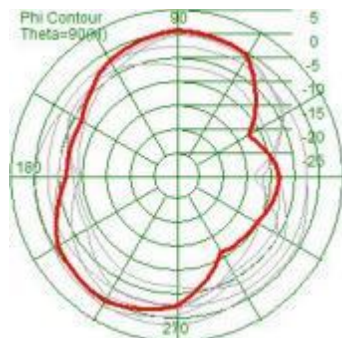
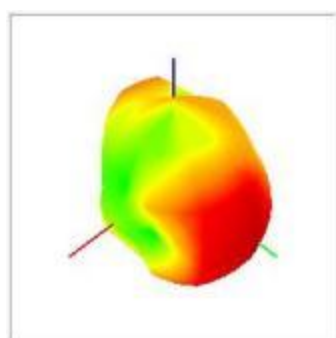
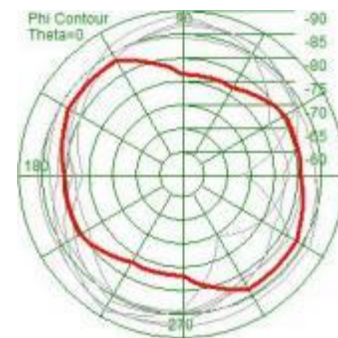
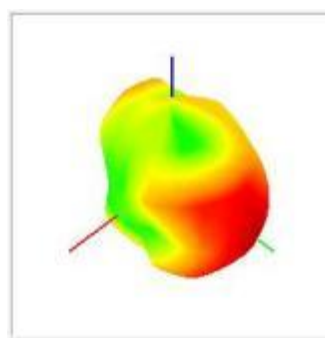
OTA Data

Test Equipment:	R&S CMW500		
Test Condition:	2 D chamber		
Band	Channel	TRP(dBm)	TIS(dBm)
BT	0	-1.00	-85.92
	39	-2.05	-86.93
	78	-2.34	-84.65

TRP



TIS



assembl

FPC placement



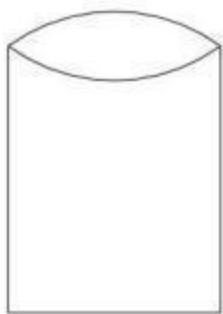
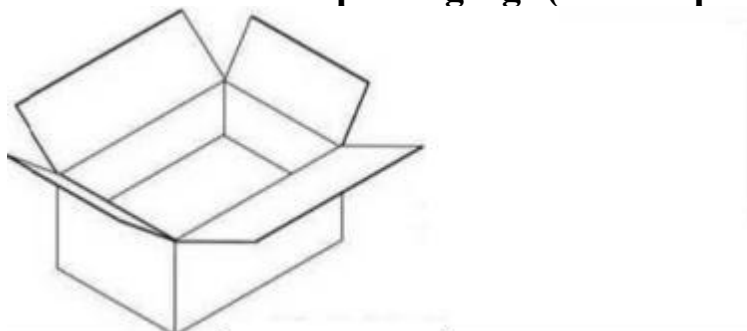
Reliability Test Report

Reliability Test Report

Customer name Name	Shenzhen Mingri Industrial limited company	Customer Material Number P/N	3060400000013	Helixun P/N	HLX0094-A460-V4	
Test Date	2025-07-31	Sample quantity Qty.	3	Tester Inspector	Zhuo Ziji	
Test Item	ask Requirement	Testing equipment equ ipment	Sample 1 Samp le 1	Sample 2 Samp le 2	Sample 3 Samp le 3	Review PASS/NG
High-temperature storage	Exposure to +85°C for 24 hours, followed by 2 hours of recovery before testing	Constant temperature and humidity chamber	OK	OK	OK	Pass
Low-temperature storage	Exposure to -40°C for 24 hours, followed by 2 hours of recovery before testing	Constant temperature and humidity chamber	OK	OK	OK	Pass
High temperature operation	Operate at +60°C for 24 hours	Constant temperature and humidity chamber	OK	OK	OK	Pass
Low temperature operation	Operate at -20°C for 24 hours	Constant temperature and humidity chamber	OK	OK	OK	Pass
salt spray test	(5.05)% sodium chloride solution with pH 6.5-7.2, and the experimental chamber temperature maintained at 35±2°C ☒ 24H ☐ 48H	Salt spray test machine	OK	OK	OK	Pass
Riveting connector pull-out force	1.13 Wire diameter ≥10N 0.81 Wire diameter ≥8N RG174 ≥60N RG178 ≥50N	pull and push dynamometer	10N	10N	10N	Pass
Final Conclusions						Pass

Tester & Date Inspector & Date	Zuo Ziji 2025-07-31	& Approva l &D ate	
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Product packaging specifications**PACKING CRITERION****1. Single product (subject to actual packaging)****2. Large PE bag packaging (100pcs per unit/100 pcs per sheet) (Actual packaging quantity applies)****3. Box sealing: Apply our company's production label and ROHS certification label to the outer packaging. (Actual packaging specifications shall prevail)**

Environmental requirements

MSDS (Material Safety Data Sheet)	☒ Provide ☐ Not provide ☐ N/A ☒ Provide ☐ Not provide ☐ N/A	☒ Provide ☐ Not provide ☐ N/A ☒ Provide ☐ Not provide ☐ N/A
COC (Environmental Protection Agreement)	☒ Provide ☐ Not provide ☐ N/A ☒ Provide ☐ Not provide ☐ N/A	☒ Provide ☐ Not provide ☐ N/A ☒ Provide ☐ Not provide ☐ N/A
Environmental hazardous substances Yunshi technical standards	☒ Provide ☐ Not provide ☐ N/A ☒ Provide ☐ Not provide ☐ N/A	☒ Provide ☐ Not provide ☐ N/A ☒ Provide ☐ Not provide ☐ N/A
Specific environmental requirements	☒ Complies with ROHS2.0 ☒ Complies with REACH ☒ Halogen-free ☒ Complies with ROHS2.0 ☒ Complies with REACH ☒ Halogen-free ☒ 65 in California	

Installation or other

Install Wizard or Other

Installation process:

For 1PCS product, manually remove the release paper from the back of the FPC. Align the FPC's positioning holes with the housing's positioning holes (or positioning ribs/lines), then press it flat onto the housing. Refer to the figure below for specific positioning.

Installation Notes:

- ☒ After attaching the antenna, ensure the FPC is fully adhered to the housing.
- ☒ Align the positioning hole with the housing positioning post;
- ☒ Align FPC edges with housing edges
- ☒ For terminal-equipped antennas, first align the terminals with the PCBA on the motherboard, then secure them vertically.
- ☒ When removing antenna terminals, use tools (e.g., a specialized crowbar) to lift them vertically. Never pull wires directly.



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