



惠州硕贝德无线科技股份有限公司

Huizhou Speed Wireless Technology Co.,Ltd

APPROVAL SHEET

CUSTOMER NAME	Nokia	
CUSTOMER P/N	P624789	
PART NAME	Dual-band WiFi Antenna	
P/ N	F-0Y-55-0013-000-00	
APPROVAL REV.	A0	
DELIVERY DATE	8 th , July, 2022	
PREPARED BY	Zhao Ma	
CHECKED BY	Lei Xu	
APPROVED BY		
Customer Approved		
Approved By	Checked By	Prepared By

Address: No.138 Huize Avenue, Dongjiang High-tech Industrial Park, Zhongkai High-tech Zone, Huizhou city, Guangdong

www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

Contents

1. Project Overview.....	3
2. Antenna Specification.....	3
3. Test Environment.....	4
4. Test Results.....	6
5. Reliability Test Standard.....	9
6. Structure Diagram.....	10
7. ROHS Material Control Report.....	11

www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

1 Project Overview

This document is the specifications of the dual-band WiFi antenna. The antenna is suitable for outdoor use, product photo is shown as below.



2 Antenna Specification

Electrical Specifications	
Frequency Range	2400-2500/5150-5850MHz
VSWR	< 1.92
Input Impedance	50 Ω
Direction	All
Gain	2dBi
Mechanical Specifications	
Antenna Color	Black
Input connector	RP-SMA
Length of antenna	68 mm
Working Temperature	-40°C~+85°C
Working Humidity	20%~80%
UL Rating	UL 94V-0

3 Test Environment

www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

The measuring equipment for antenna return loss, voltage standing wave ratio and isolation is Keysight E5071C vector network analyzer, shown as below:



Keysight E5071C vector network analyzer

www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

The efficiency, gain, and pattern of the antenna are all tested in Chamber Satimo. 64 probes are used to electronically scan the antenna's radiation performance, collect data, and then analyze data through computer, which can provide antenna testing from 400MHz to 6.0GHz frequency.



www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

4 Test Results



2D、3D(2.4G/5G)test data:

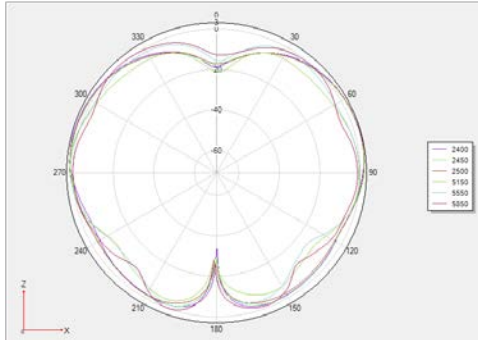
Frequency(MHz)	Efficiency (%)	Gain.(dBi)
2400MHz	72.28	2.79
2410MHz	78.34	2.72
2420MHz	71.61	2.91
2430MHz	73.45	2.28
2440MHz	72.61	2.58
2450MHz	79.62	2.43
2460MHz	74.82	3.03
2470MHz	70.79	2.07
2480MHz	71.45	2.49
2490MHz	76.38	2.09
2500MHz	74.13	2.78
5150MHz	73.58	1.76
5250MHz	70.53	1.97
5350MHz	71.61	2.07

www.speed-hz.com

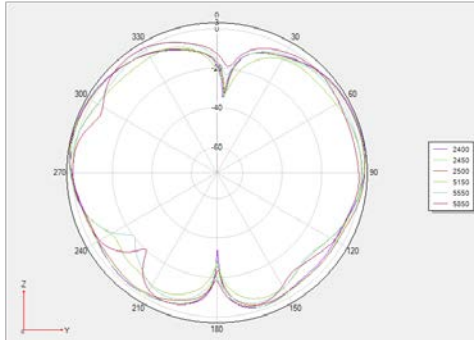
SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

5450MHz	72.6	2.15
5550MHz	70.81	1.97
5650MHz	77.16	2.03
5750MHz	75.88	1.96
5850MHz	72.95	1.77

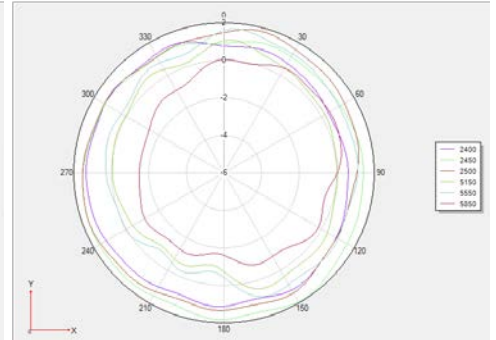
Phi 0 2D:



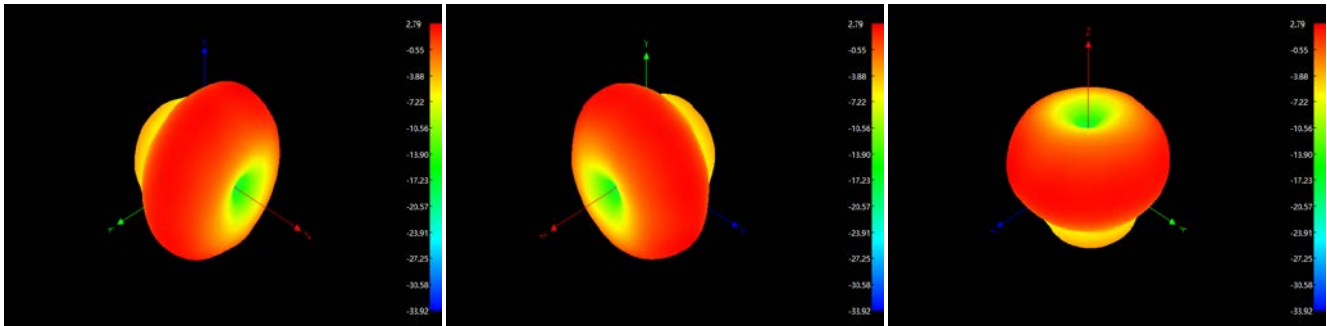
Phi 90 2D:



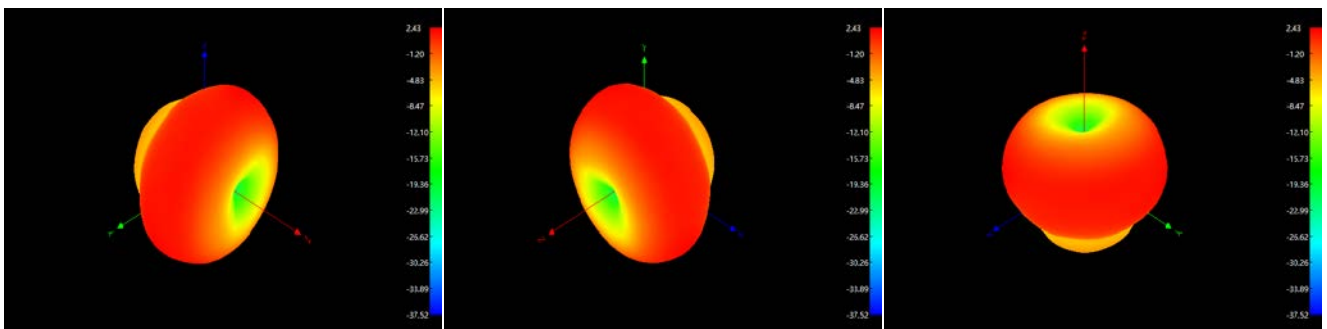
Theta 90 2D:



3D 2400:



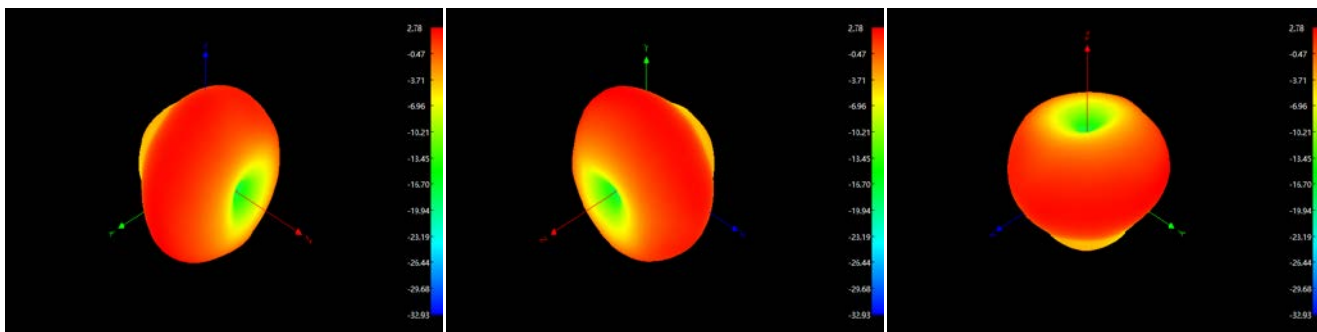
3D 2450:



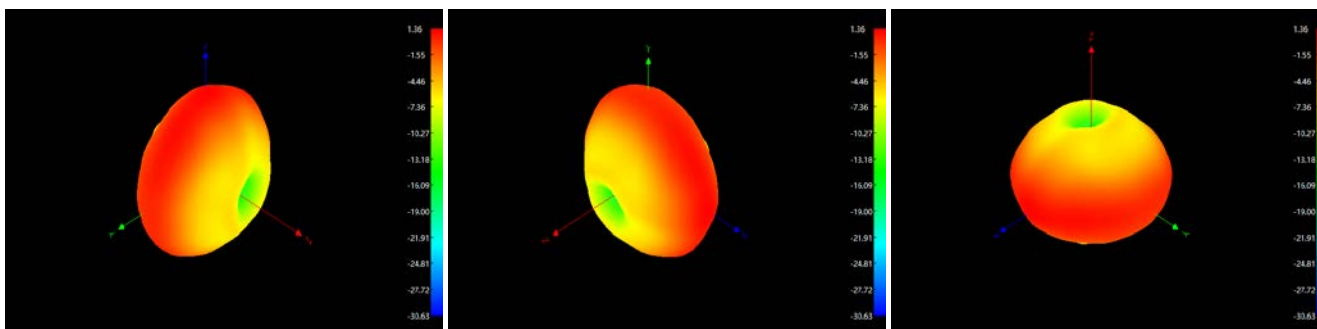
www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

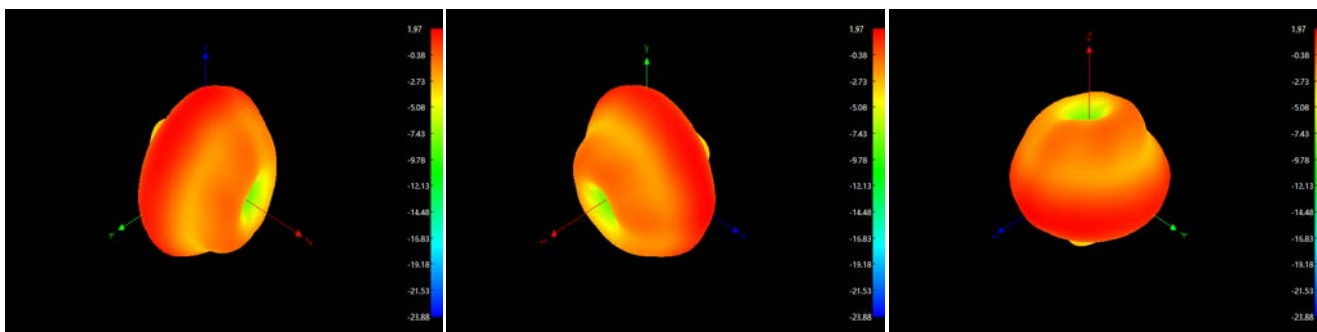
3D 2500:



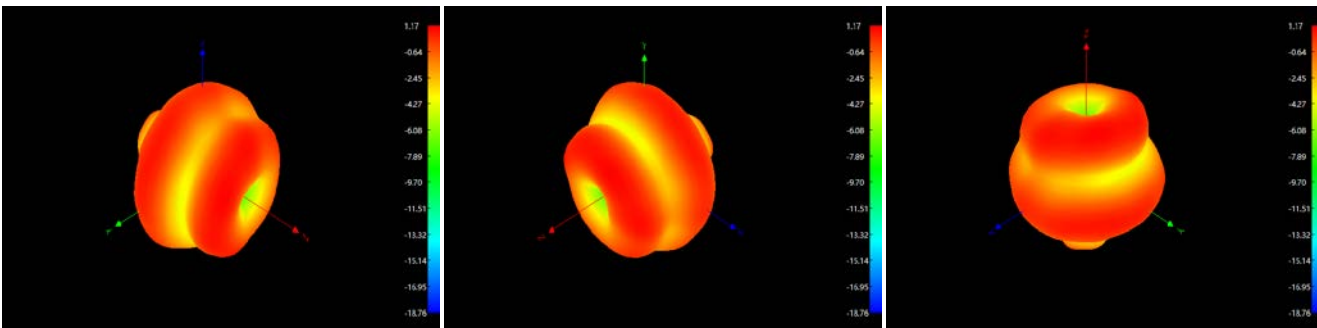
3D 5150:



3D5550:



3D5850:



www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

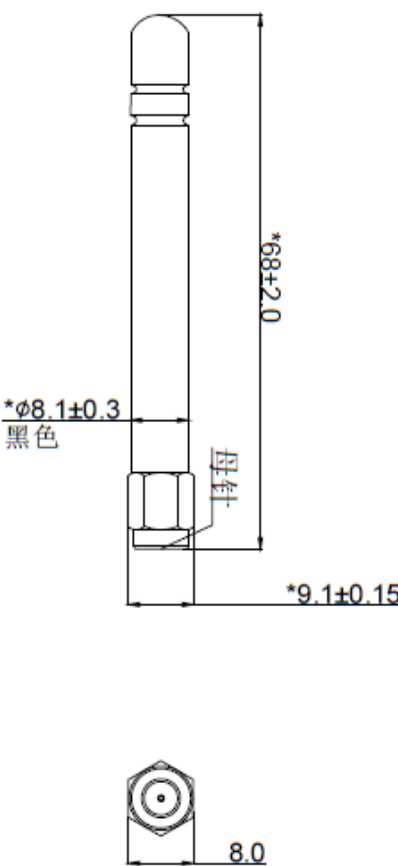
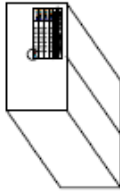

5 Reliability Test Standard

item	test condition	standard
storage environment	1. temperature ranges from -20°C to $+70^{\circ}\text{C}$ 2. relative humidity is 45%-85% 3. air pressure is 86kpa-106kpa	The electrical and mechanical properties are OK
thermocycling	Five cycles were carried out between 70°C and -20°C , and then 1-2H under normal conditions to check the appearance quality.	The dimensions shall meet the requirements and shall meet the mechanical and electrical properties
Temperature / Humidity test	The relative humidity was $95\pm 3\%$, and the test temperature was 40°C . After 2H of action, the electrical performance was measured within 5min after the sample was taken out, and the appearance quality of the sample was checked for 1-2h under normal conditions	The dimensions shall meet the requirements and shall meet the mechanical and electrical properties
vibration test	Vibration frequency range 10-55Hz, displacement amplitude: 0.35mm, acceleration amplitude: 50.0M/S, frequency sweep cycle number: 30	The electrical and mechanical properties are OK
drop test	1M high in the air and fall three times in the direction of mutually perpendicular axes	The electrical and mechanical properties are OK
waterproof test	Meet the IP65 test requirements	The electrical and mechanical properties are OK

6 Structure Diagram

www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

1	A	B	C	D	E	F	G																																										
<table border="1" style="float: right; margin-right: 10px;"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>NAME</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>							REV	DATE	DESCRIPTION	NAME					1																																		
REV	DATE	DESCRIPTION	NAME																																														
							4																																										
							5																																										
<p>技术要求:</p> <ol style="list-style-type: none"> 1. 成品须100%测试合格OK; 2. “*”为重点标注尺寸, 未注公差满足公差表。 3. 产品表面要求无流痕、缺胶、缩水、油污、气纹等外观不良现象。 4. 产品需满足IP65要求; 防火等级需达到UL 94V-0 5. 符合我司《产品中有毒有害物质管理标准》包括但不限于欧盟RoHS2.0。 							5																																										
<table border="1" style="width: 100%;"> <tr> <td>频率范围 (FREQUENCY RANGE)</td> <td>2400-2500/150-5550MHz</td> </tr> <tr> <td>增益 (GAIN)</td> <td>2.0dB</td> </tr> <tr> <td>电压驻波比 (VSWR)</td> <td><1.92</td> </tr> <tr> <td>极化 (POLARIZATION)</td> <td>Linear/Vertical</td> </tr> <tr> <td>最大功率 (Max Power rating)</td> <td>50W</td> </tr> <tr> <td>特性阻抗 (Impedance)</td> <td>50欧姆</td> </tr> </table>							频率范围 (FREQUENCY RANGE)	2400-2500/150-5550MHz	增益 (GAIN)	2.0dB	电压驻波比 (VSWR)	<1.92	极化 (POLARIZATION)	Linear/Vertical	最大功率 (Max Power rating)	50W	特性阻抗 (Impedance)	50欧姆	6																														
频率范围 (FREQUENCY RANGE)	2400-2500/150-5550MHz																																																
增益 (GAIN)	2.0dB																																																
电压驻波比 (VSWR)	<1.92																																																
极化 (POLARIZATION)	Linear/Vertical																																																
最大功率 (Max Power rating)	50W																																																
特性阻抗 (Impedance)	50欧姆																																																
<table border="1"> <tr> <th colspan="6">公差表</th> </tr> <tr> <th>公差</th> <th>M</th> <th>S</th> <th>P</th> <th>C</th> <th>F</th> </tr> <tr> <td>±0.05</td> <td>0.05</td> <td>0.1</td> <td>0.1</td> <td>0.2</td> <td>0.3</td> </tr> <tr> <td>±0.1</td> <td>0.1</td> <td>0.15</td> <td>0.2</td> <td>0.3</td> <td>0.4</td> </tr> <tr> <td>±0.15</td> <td>0.15</td> <td>0.2</td> <td>0.3</td> <td>0.4</td> <td>0.5</td> </tr> <tr> <td>±0.2</td> <td>0.2</td> <td>0.25</td> <td>0.3</td> <td>0.4</td> <td>0.5</td> </tr> <tr> <td>±0.3</td> <td>0.3</td> <td>0.35</td> <td>0.4</td> <td>0.5</td> <td>0.6</td> </tr> </table>							公差表						公差	M	S	P	C	F	±0.05	0.05	0.1	0.1	0.2	0.3	±0.1	0.1	0.15	0.2	0.3	0.4	±0.15	0.15	0.2	0.3	0.4	0.5	±0.2	0.2	0.25	0.3	0.4	0.5	±0.3	0.3	0.35	0.4	0.5	0.6	6
公差表																																																	
公差	M	S	P	C	F																																												
±0.05	0.05	0.1	0.1	0.2	0.3																																												
±0.1	0.1	0.15	0.2	0.3	0.4																																												
±0.15	0.15	0.2	0.3	0.4	0.5																																												
±0.2	0.2	0.25	0.3	0.4	0.5																																												
±0.3	0.3	0.35	0.4	0.5	0.6																																												
<table border="1" style="width: 100%;"> <tr> <td>零件名称 (PART NAME)</td> <td>单位 (UNIT)</td> <td>比例 (SCALE)</td> <td>版本 (REV)</td> <td>幅面 (SIZE)</td> </tr> <tr> <td>双频室外VWF天线</td> <td>mm</td> <td>1:1</td> <td>A0</td> <td>A4</td> </tr> <tr> <td>产品名称 (product name)</td> <td>产品规格 (specification)</td> <td>产品料号 (product no.)</td> <td>设计 (DESIGN)</td> <td>审核 (CHECK)</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>							零件名称 (PART NAME)	单位 (UNIT)	比例 (SCALE)	版本 (REV)	幅面 (SIZE)	双频室外VWF天线	mm	1:1	A0	A4	产品名称 (product name)	产品规格 (specification)	产品料号 (product no.)	设计 (DESIGN)	审核 (CHECK)											6																	
零件名称 (PART NAME)	单位 (UNIT)	比例 (SCALE)	版本 (REV)	幅面 (SIZE)																																													
双频室外VWF天线	mm	1:1	A0	A4																																													
产品名称 (product name)	产品规格 (specification)	产品料号 (product no.)	设计 (DESIGN)	审核 (CHECK)																																													
 <p>苏州捷创无线技术有限公司 Suzhou Speed Wireless Technology Co., Ltd.</p>							6																																										

www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology

7 ROHS Material Control Report

ROHS material control report													
This is to certify that the components delivered to your company, the raw materials used in the auxiliary materials, and the additives used in the production engineering comply with the environmental protection requirements of the RoHS Directive on Limiting the Use of Hazardous Substances (RoHS Directive 2011/65/EC).													
The components of components, raw materials used for auxiliary materials, packaging materials and additives used in the production process are reported as follows:													
Component 名称 /Part Name	Material 组成材料 Composition	ICP 报告 编号 ICP report #	Test 机构 Test Org.	Test 时间 Test Date	有害物质含量(ppm)							是否合格 PASS or NOT PASS	
					Cd	Pb	Hg	Cr ⁶⁺	PBB	PBDE			
cable	Teflon coaxial cable	SZXEC2102 641803	SGS	2021/8/23	ND	ND	ND	ND	ND	ND	PASS		
					plastic	TPB	TSNEC2101 417101	SGS	2021/7/20	ND	ND	ND	ND
SMA- connect	plastic	Aldary	CANEC2200 189312	SGS	2022/1/12	ND	27364	ND	ND	ND	PASS		
						SHAECC2118 528402	SGS	2021/8/30	ND	ND	ND	ND	PASS
						Alloy plating	SZXEC2103 405301	SGS	2021/11/12	ND	24	ND	ND
copper pipe	brass strip	SHAECC2127 949504	SGS	2021/12/30	ND	35	ND	ND	ND	ND	PASS		

www.speed-hz.com

SPEED has possession of proprietary information provided in this presentation and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of SPEED Wireless Technology