



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	
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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

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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

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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

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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.



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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

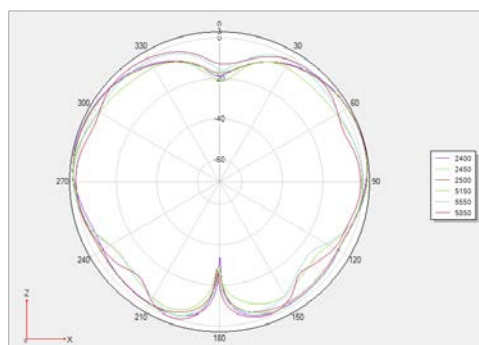
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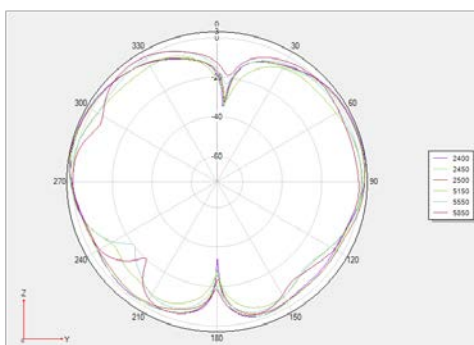
Confidential Information

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

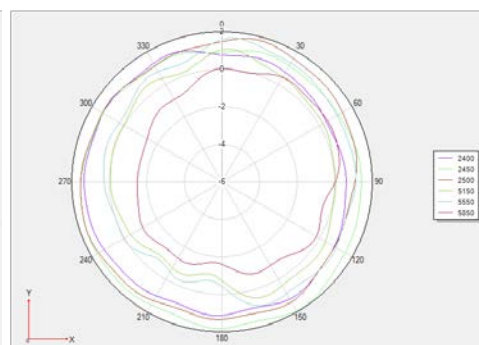
Phi 0 2D:



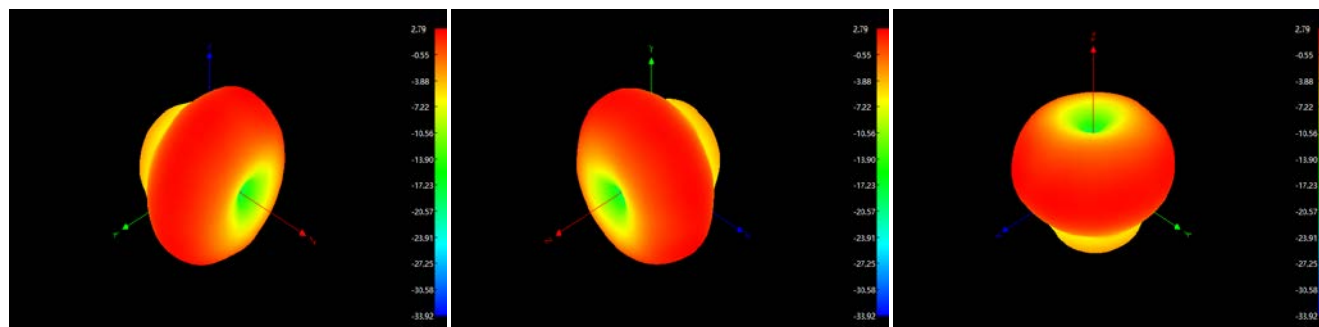
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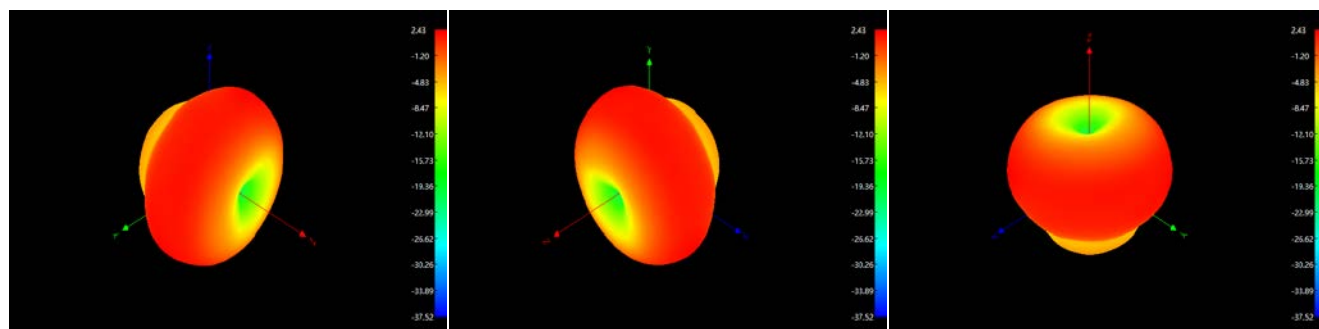
Theta 90 2D:



3D 2400:



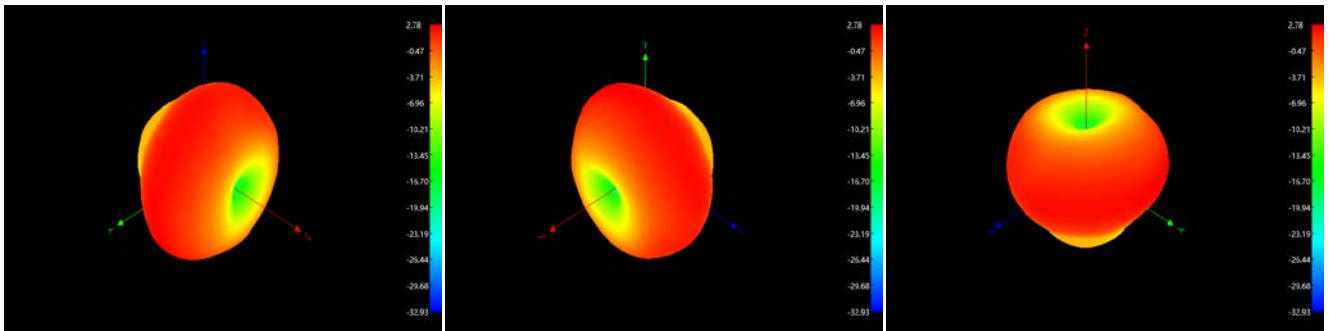
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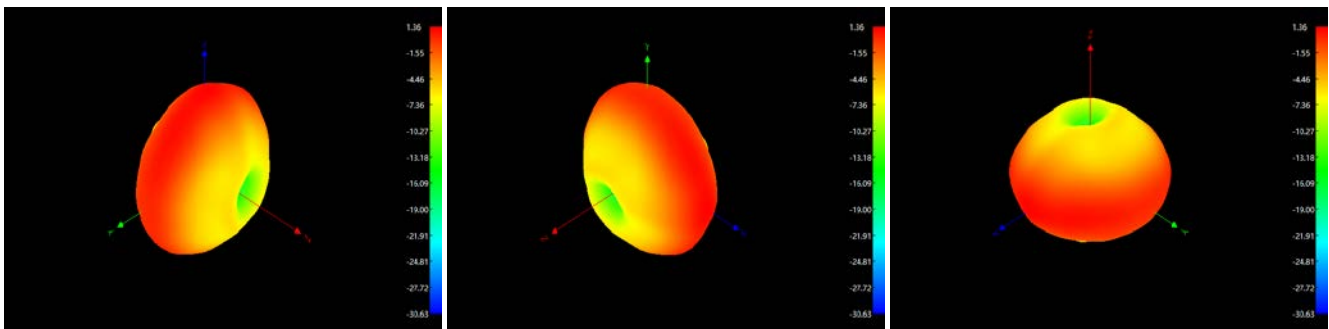
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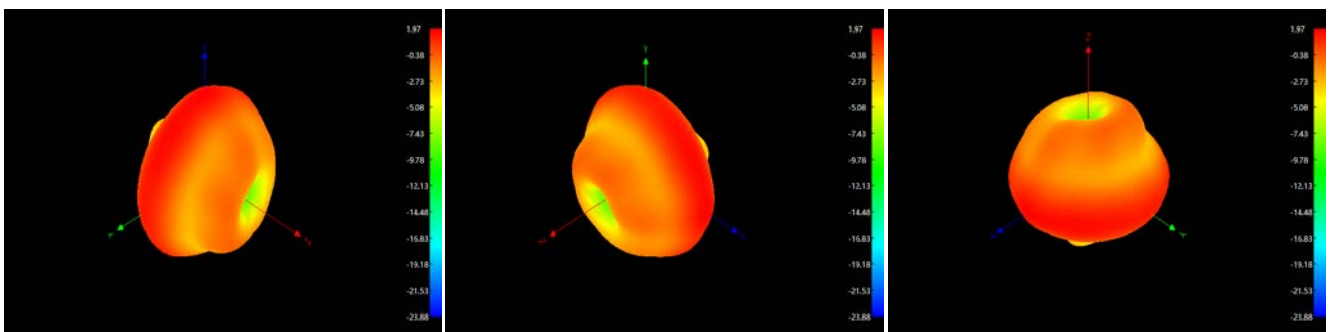
3D 2500:



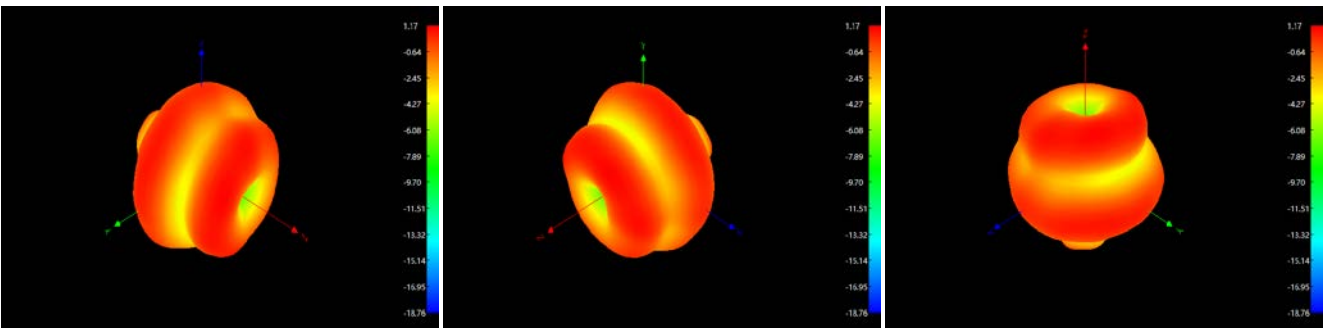
3D 5150:



3D5550:



3D5850:



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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

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<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>	<p>REV</p> <p>DATE</p> <p>DESCRIPTION</p> <p>NAME</p>
<p>技术要求:</p> <p>1. 成品须100%测试导通OK;</p> <p>2. “*”为重点标注尺寸, 未注公差满足公差表。</p> <p>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。</p> <p>4. 产品需满足IP65要求: 防火等级需达到UL 94V-0</p> <p>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。</p>	<p>6</p> <p>5</p> <p>4</p> <p>3</p> <p>2</p> <p>1</p>

频率范围 (FREQUENCY RANGE)	2400-2500/150-5850MHz
增益 (GAIN)	2.0dBi
电压驻波比 (VSWR)	<1.52
极化 (POLARIZATION)	Linear/Vertical
最大功率 (Max Power Rating)	50W
特性阻抗 (Impedance)	50欧姆

公差表									
公差	M	S	F	C	H	K	M	N	P
0-0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.05-0.1	0.1	0.15	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.1-0.2	0.15	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.2-0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.3-0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.4-0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0.5-0.6	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
0.6-0.7	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
0.7-0.8	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
0.8-0.9	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
0.9-1.0	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1.0-1.1	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1.1-1.2	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3
1.2-1.3	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
1.3-1.4	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1.4-1.5	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6
1.5-1.6	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
1.6-1.7	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
1.7-1.8	1.7	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1.8-1.9	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
1.9-2.0	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.0-2.1	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2
2.1-2.2	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3
2.2-2.3	2.2	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4
2.3-2.4	2.3	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5
2.4-2.5	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6
2.5-2.6	2.5	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7
2.6-2.7	2.6	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8
2.7-2.8	2.7	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9
2.8-2.9	2.8	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2.9-3.0	2.9	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3.0-3.1	3.0	3.1	3.2	3.2	3.2	3.2	3.2	3.2	3.2
3.1-3.2	3.1	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3
3.2-3.3	3.2	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4
3.3-3.4	3.3	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5
3.4-3.5	3.4	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6
3.5-3.6	3.5	3.6	3.7	3.7	3.7	3.7	3.7	3.7	3.7
3.6-3.7	3.6	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8
3.7-3.8	3.7	3.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9
3.8-3.9	3.8	3.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
3.9-4.0	3.9	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1
4.0-4.1	4.0	4.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2
4.1-4.2	4.1	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3
4.2-4.3	4.2	4.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4
4.3-4.4	4.3	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.4-4.5	4.4	4.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6
4.5-4.6	4.5	4.6	4.7	4.7	4.7	4.7	4.7	4.7	4.7
4.6-4.7	4.6	4.7	4.8	4.8	4.8	4.8	4.8	4.8	4.8
4.7-4.8	4.7	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.9
4.8-4.9	4.8	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4.9-5.0	4.9	5.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1
5.0-5.1	5.0	5.1	5.2	5.2	5.2	5.2	5.2	5.2	5.2
5.1-5.2	5.1	5.2	5.3	5.3	5.3	5.3	5.3	5.3	5.3
5.2-5.3	5.2	5.3	5.4	5.4	5.4	5.4	5.4	5.4	5.4
5.3-5.4	5.3	5.4	5.5	5.5	5.5	5.5	5.5	5.5	5.5
5.4-5.5	5.4	5.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6
5.5-5.6	5.5	5.6	5.7	5.7	5.7	5.7	5.7	5.7	5.7
5.6-5.7	5.6	5.7	5.8	5.8	5.8	5.8	5.8	5.8	5.8
5.7-5.8	5.7	5.8	5.9	5.9	5.9	5.9	5.9	5.9	5.9
5.8-5.9	5.8	5.9	6.0	6.0	6.0	6.0	6.0	6.0	6.0
5.9-6.0	5.9	6.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1
6.0-6.1	6.0	6.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2
6.1-6.2	6.1	6.2	6.3	6.3	6.3	6.3	6.3	6.3	6.3
6.2-6.3	6.2	6.3	6.4	6.4	6.4	6.4	6.4	6.4	6.4
6.3-6.4	6.3	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5
6.4-6.5	6.4	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6
6.5-6.6	6.5	6.6	6.7	6.7	6.7	6.7	6.7	6.7	6.7
6.6-6.7	6.6	6.7	6.8	6.8	6.8	6.8	6.8	6.8	6.8
6.7-6.8	6.7	6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.9
6.8-6.9	6.8	6.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0
6.9-7.0	6.9	7.0	7.1	7.1	7.1	7.1	7.1	7.1	7.1
7.0-7.1	7.0	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.2
7.1-7.2	7.1	7.2	7.3	7.3	7.3	7.3	7.3	7.3	7.3
7.2-7.3	7.2	7.3	7.4	7.4	7.4	7.4	7.4	7.4	7.4
7.3-7.4	7.3	7.4	7.5	7.5	7.5	7.5	7.5	7.5	7.5
7.4-7.5	7.4	7.5	7.6	7.6	7.6	7.6	7.6	7.6	7.6
7.5-7.6	7.5	7.6	7.7	7.7	7.7	7.7	7.7	7.7	7.7
7.6-7.7	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.8
7.7-7.8	7.7	7.8	7.9	7.9	7.9	7.9	7.9	7.9	7.9
7.8-7.9	7.8	7.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0
7.9-8.0	7.9	8.0	8.1	8.1	8.1	8.1	8.1	8.1	8.1
8.0-8.1	8.0	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.2
8.1-8.2	8.1	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3
8.2-8.3	8.2	8.3	8.4	8.4	8.4	8.4	8.4	8.4	8.4
8.3-8.4	8.3	8.4	8.5	8.5	8.5	8.5	8.5	8.5	8.5
8.4-8.5	8.4	8.5	8.6	8.6	8.6	8.6	8.6	8.6	8.6
8.5-8.6	8.5	8.6	8.7	8.7	8.7	8.7	8.7	8.7	8.7
8.6-8.7	8.6	8.7	8.8	8.8	8.8	8.8	8.8	8.8	8.8
8.7-8.8	8.7	8.8	8.9	8.9	8.9	8.9	8.9	8.9	8.9
8.8-8.9	8.8	8.9	9.0	9.0	9.0	9.0	9.0	9.0	9.0
8.9-9.0	8.9	9.0	9.1	9.1	9.1	9.1	9.1	9.1	9.1
9.0-9.1	9.0	9.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2
9.1-9.2	9.1	9.2	9.3	9.3	9.3	9.3	9.3	9.3	9.3
9.2-9.3	9.2	9.3	9.4	9.4	9.4	9.4	9.4	9.4	9.4
9.3-9.4	9.3	9.4	9.5	9.5	9.5	9.5	9.5	9.5	9.5
9.4-9.5	9.4	9.5	9.6	9.6	9.6	9.6	9.6	9.6	9.6
9.5-9.6	9.5	9.6	9.7	9.7	9.7	9.7	9.7	9.7	9.7
9.6-9.7	9.6	9.7	9.8	9.8	9.8	9.8	9.8	9.8	9.8
9.7-9.8	9.7	9.8	9.9	9.9	9.9	9.9	9.9	9.9	9.9
9.8-9.9	9.8	9.9	10.0	10.0	10.0	10.0	10.0	10.0	10.0
9.9-10.0	9.9	10.0	10.1	10.1	10.1	10.1	10.1	10.1	10.1
10.0-10.1	10.0	10.1	10.2	10.2	10.2	10.2	10.2	10.2	10.2
10.1-10.2	10.1	10.2	10.3	10.3	10.3	10.3	10.3	10.3	10.3
10.2-10.3	10.2	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.4
10.3-10.4	10.3	10.4	10.5	10.5	10.5	10.5	10.5	10.5	10.5
10.4-10.5	10.4	10.5	10.6	10.6	10.6	10.6	10.6	10.6	10.6
10.5-10.6	10.5	10.6	10.7	10.7	10.7	10.7	10.7	10.7	10.7
10.6-10.7	10.6	10.7	10.8	10.8	10.8	10.8	10.8	10.8	10.8
10.7-10.8	10.7	10.8	10.9	10.9	10.9	10.9	10.9	10.9	10.9
10.8-10.9	10.8	10.9	11.0	11.0	11.0	11.0	11.0	11.0	11.0
10.9-11.0	10.9	11.0	11.1	11.1	11.1	11.1	11.1	11.1	11.1
11.0-11.1	11.0	11.1	11.2	11.2	11.2	11.2	11.2	11.2	11.2
11.1-11.2	11.1	11.2	11.3	11.3	11.3				

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:											
组 件 材 料 名称 + /Part Name	组成材料 Material Composition	ICP 报告编 号 ICP report #	测试机构 Test Org.	测试时间 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	SZHEC2102 641803	SGS	2021/8/23	ND	ND	ND	ND	ND	ND	PASS
plastic	TPE	TSNEC2101 417101	SGS	2021/7/20	ND	ND	ND	ND	ND	ND	PASS
	Aldary	CANEC2200 189312	SGS	2022/1/12	ND	27364	ND	ND	ND	ND	PASS
SMA- connect	plastic	SHAEC2118 528402	SGS	2021/8/30	ND	ND	ND	ND	ND	ND	PASS
	Alloy plating	SZHEC2103 405301	SGS	2021/11/12	ND	24	ND	ND	ND	ND	PASS
copper pipe	brass strip	SHAEC2127 949504	SGS	2021/12/30	ND	35	ND	ND	ND	ND	PASS

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