SPECIFICATION FOR APPROVAL

Customer Name: _____

Customer P/N: AX3000

Jing Feng P/N: JF8960-2

Specification Description:

OPEN-1.13 white-2.4G white rubber antenna -L225MM

Production Date: 2024.04.09

Factory Confirmation:

Department	CHECKED BY	APPROVED BY
RF Department	Tan Mu Chen	Wang Shuo
Structure Department	Liang Sen	Wang Shuo
Quality Department	Liu Xiao Jun	Wang Shuo

Customer Confirmation:

INSPECTION	CHECKED	APPROVED

△ Record Of Document Formulation, Modification And Abolishment

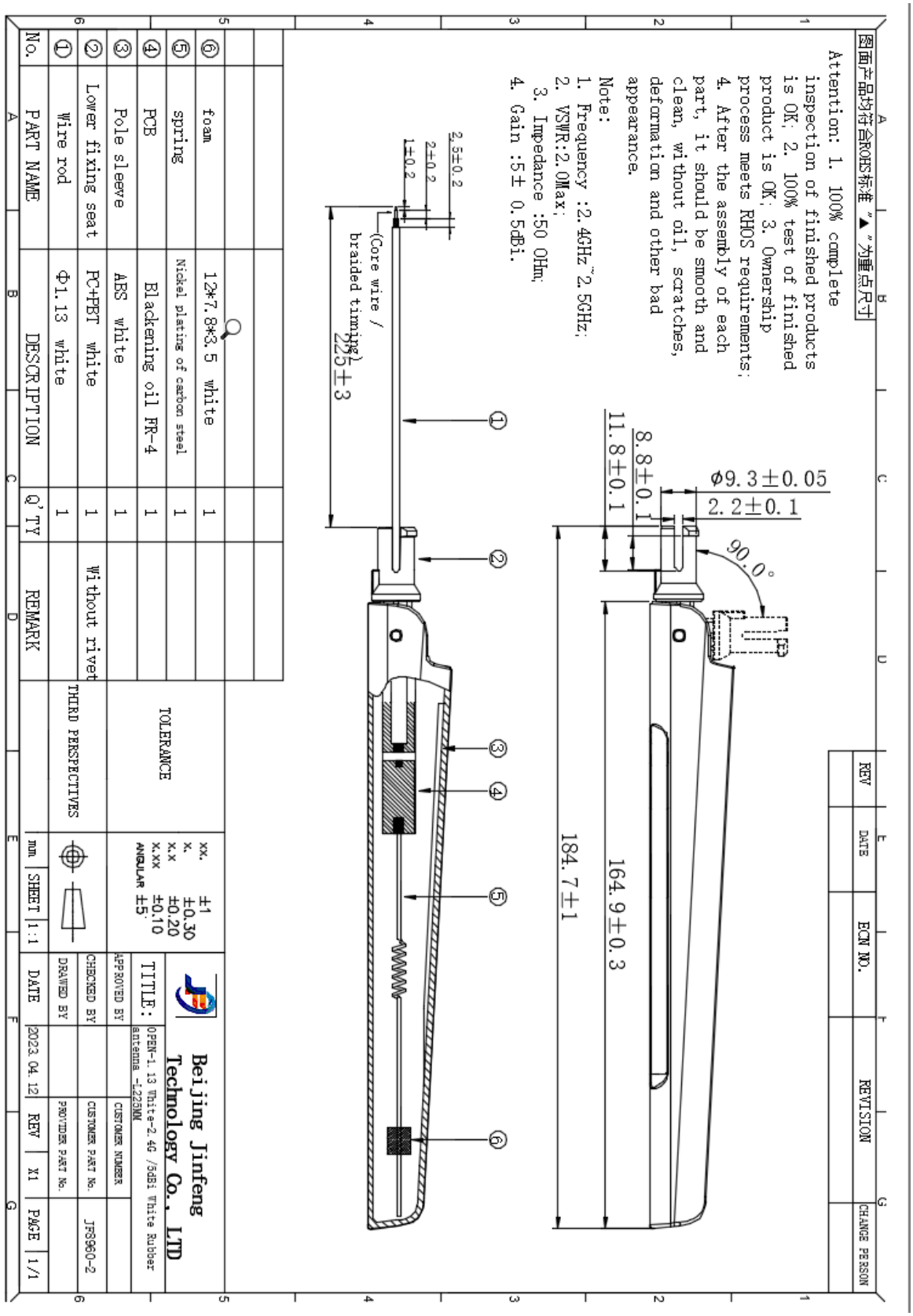
File name	Date	Control version	Related content	Formulate	Approved
Sample Approved	2024.04.09	V1	First	Tan Mu Chen	Wang Shuo

Contents

4、Main technical specifications

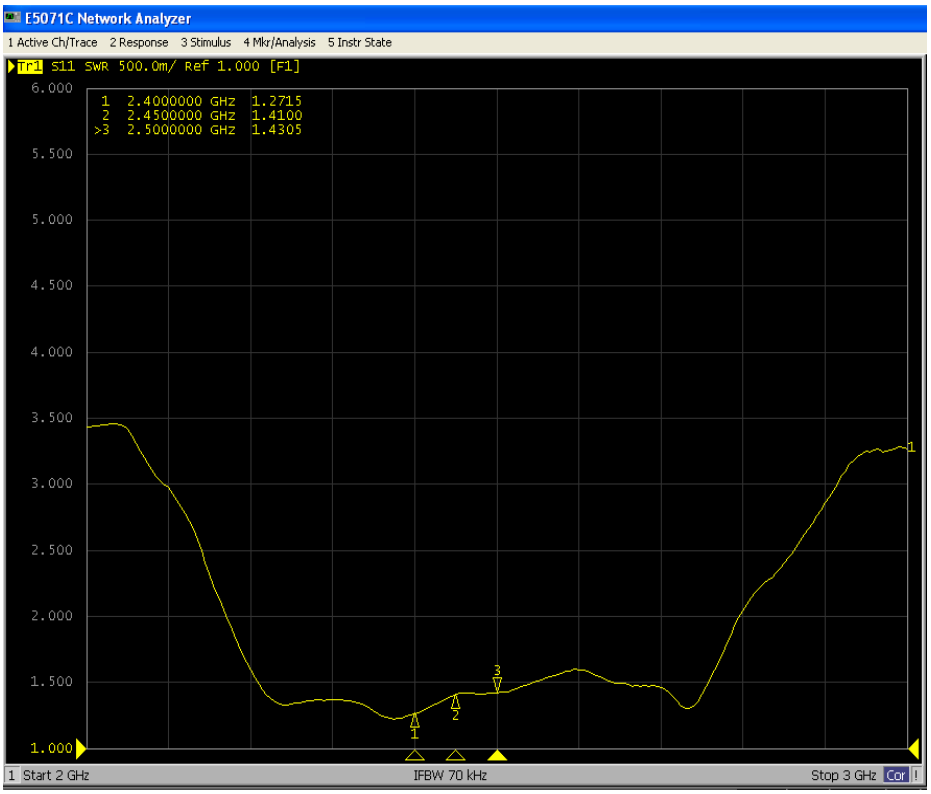
Electrical Parameters	
Frequency Range(MHZ)	2400~2500MHz
Impedance(Ω)	50Ω
VSWR	≤2.0
Peak Gain(dBi)	5±0.5dBi
Power Capacity	3W
Withstand Voltage Test	1KV
ON-Off Test	ON
Polarization	Linear, Vertical
Radiation	Omni-Directional
Connector Type	welded
Mechanical Parameters	
Length (mm)	225±3mm
Coaxial line	1.13 White Line
Drawing force	＞1KG
Salt Spray Test	24H
Environmental Parameters	
Operating Temp	-30℃~+75℃
Storage Temp	-30℃~+75℃

5、Product Structure Drawing

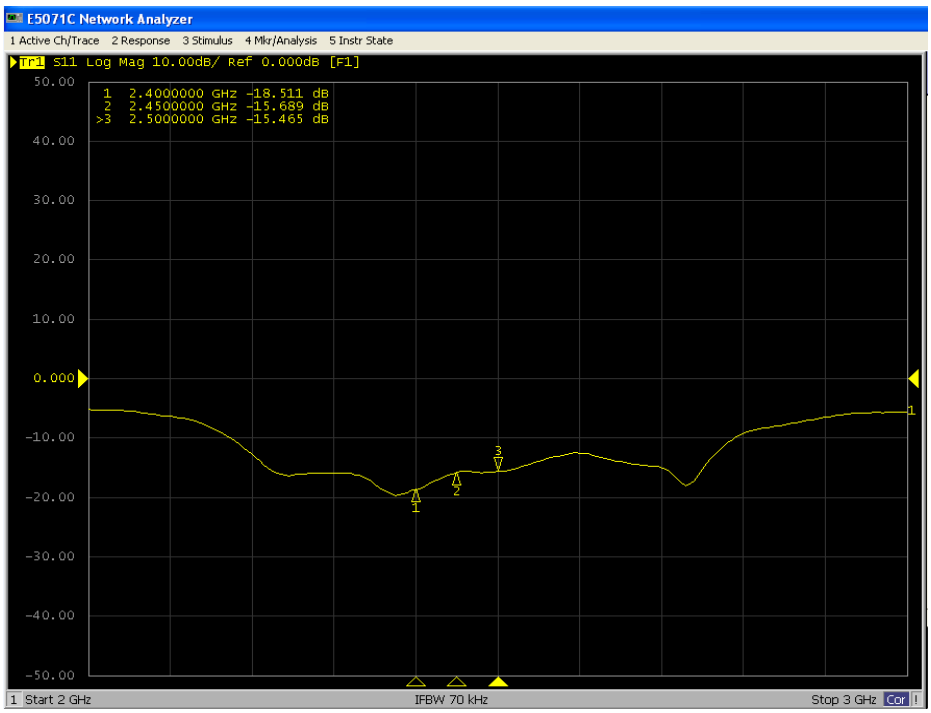


6、Electrical Performance Test report

VSWR:（2.4G）



Return Loss

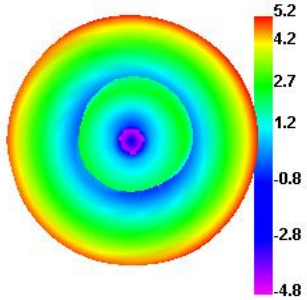


Efficiency & gain:

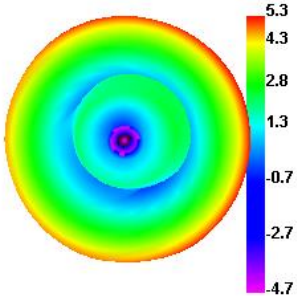
Freq (MHz)	Effi (%)	Gain (dBi)
2400	73.78	5.23
2410	73.39	5.32
2420	75.84	5.01
2430	74.8	5.12
2440	72.84	5.25
2450	74.08	5.34
2460	72.03	5.41
2470	75.13	5.37
2480	78.41	5.25
2490	83.44	5.23
2500	79.74	5.19

3D Radiation pattern:

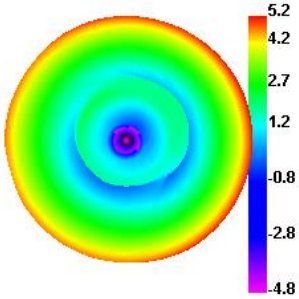
2400.000MHz



2450.000MHz

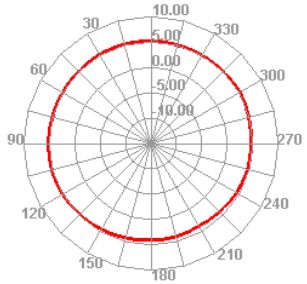


2500.000MHz

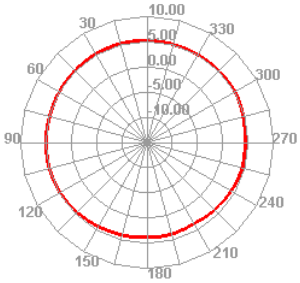


2D Radiation pattern

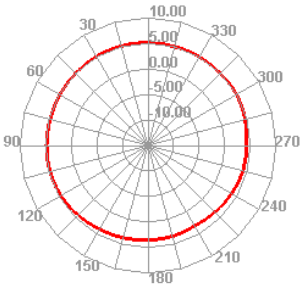
2400.000MHz H



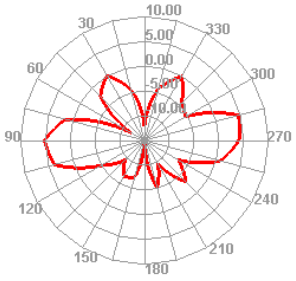
2450.000MHz H



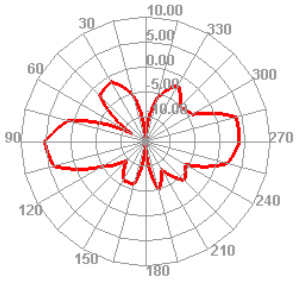
2500.000MHz H



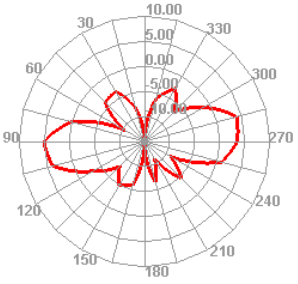
2400.000MHz E1



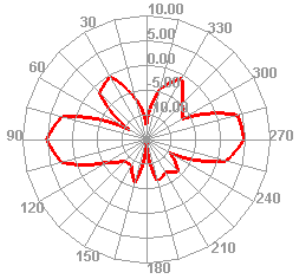
2450.000MHz E1



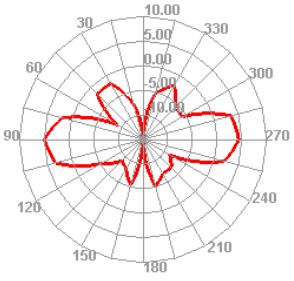
2500.000MHz E1



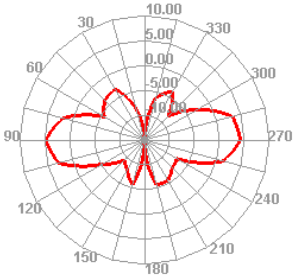
2400.000MHz E2



2450.000MHz E2



2500.000MHz E2



7、Reliability test requirements

	Test items	Specific instructions
1.	bending endurance test	Test purpose: To verify that the antenna elbow with bending function can meet the long-term durability; Prerequisites: 1) Test sample electrical properties meet the requirements, the appearance of the sample without cracking, wear and other defects; 2) Minimum sample quantity: 3pcs. Test process: 1. Check whether the mechanical and electrical functions of the antenna are normal before testing; Place the whole antenna horizontally and fix the antenna connector; 2, manually or mechanically rotate the antenna base to the position of 90 degrees with the connecting head, and then rotate to the original position, one reciprocating count, test frequency: 30~40 times per minute, a total of 500 bending, every 100 intermittent 5min; 3. After testing, check the appearance and mechanical properties of the antenna. Criteria: 1, after the test is completed, the antenna should not have obvious physical damage, and the antenna can not slide when it is folded into 30 degrees with the vertical direction. 2, no change in electrical performance before and after the test;
2.	Antenna side pressure test	Test purpose: To verify the side pressure resistance of the integrated external antenna, test the strength of the antenna itself, the strength of the contact part between the product and the equipment, such as the strength of the shell and the strength of the stop limit bar. Prerequisites: 1) Test sample electrical properties meet the requirements, the appearance of the sample without cracking, wear and other defects. 2) Install the antenna on the product according to the normal state, and fix the product. 3) Each test sample should be at least 3pcs; Test steps: 1. Before testing, check the appearance and function of the sample to be tested; 2. Conduct the following two tests, using two sets of materials respectively: Test 1: Keep the antenna open and straight, and apply 20N force in, out, up, and down 5mm at the end of the antenna, respectively, and hold for 5 seconds. Repeat this operation 10 times in each direction. Test 2: When the antenna is bent at 90 degrees and the antenna is twisted until the stop limit bar is in effect, apply 20N force to the 5mm position at the end of the antenna and hold it for 5S. Repeat this operation 10 times. Complete the

		test of both positive and negative limit positions. 3. In the above two groups of tests, if it is found that after the antenna is stressed, the antenna deformation Angle is greater than 30°, and the external force is still less than 20N, the deformation Angle is kept at 30°, the external force is withdrawn after 5s, and the above operations are repeated for 10 times; Completed the four directions of the test, a total of 40 times; 4, after the test is completed, check the mechanical and electrical properties of the sample. 5, if there are multiple antennas on the same product, each antenna installation position on the product should be tested. Criteria: 1. The mechanical and electrical functions of the antenna are normal after the test is completed; 2, the antenna can be manually recoverable bending phenomenon, the shell is not allowed to break, the core is not allowed to break. 3, the limit bar of the main equipment is cracked, and the shell buckle cannot be loosened or broken; 4, no change in antenna electrical performance before and after the test;
3.	Antenna rotation endurance test	Test purpose: To verify that the antenna with free rotation function between the antenna fixed head and the antenna body can meet the long-term durability requirements; Prerequisite: The electrical properties of the test sample meet the requirements, and the appearance of the sample is free from cracking, wear and other defects; Test process: 180 degree rotatable antenna: 1. Ensure that the mechanical and electrical functions of the antenna are normal before testing, and there is no physical damage; 2. Bend the antenna base in the direction perpendicular to the connecting head 3. Install the antenna on the fixed platform of the corresponding machine type, and bend the antenna base to make it perpendicular to the connecting head. 4, manually or mechanically rotate the antenna base to the left to the horizontal position (90 degrees), and then rotate to the original position, and then rotate the antenna base to the right to the horizontal position (90 degrees), and then rotate to the original position, the whole reciprocating count once. 5, test frequency 30~40 times per minute, a total of 1000 times of rotation; 6. After testing, check the mechanical and electrical performance of the antenna. 360 ° rotating antenna: 1. Ensure that the mechanical and electrical functions of the antenna are normal before testing, and there is no physical damage; 2. Bend the antenna base in the direction perpendicular to the connecting head

		2. Install the antenna on the fixed platform of the corresponding machine type, and bend the antenna base to form a vertical direction with the connecting head 3, manually or mechanically rotate 360 degrees to the left to return to the original position, and then rotate the antenna base 360 to the right to return to the original position, the whole reciprocating count twice. 4, the test frequency is 30 to 40 times per minute, a total of 1000 times of rotation; 5. After testing, check the mechanical and electrical performance of the antenna. Criteria: 1, after the test is completed, the antenna should not have obvious physical damage, and the antenna rotating head also has the function of fixing the rotating position of the antenna after the test, and the limit structure of the main equipment is not damaged; 2, no change in electrical performance before and after the test.
4.	Complete machine free drop test	Verify that the drop strength of desktop and handheld terminals meets the requirements during use or handling. Test procedure: Test conditions: (1) The open state of the antenna together with the whole machine drop height of 0.8m, 6 sides, 1 cycle, a total of 6 times, marble platform, controlled drop; (2) Minimum sample quantity: 3pcs 2. Procedure (1) Ensure that the mechanical and electrical functions of the sample are normal; (2) Controlled drop of each sample corresponding to the required height and number of drops; (3) During the test process, each test surface is required to check the appearance and function. When testing the next surface, if the fault is caused, it can be manually restored. After manual recovery, the test is carried out. Criteria: After the completion of 1 cycle test, the mechanical function of the sample is normal and the electrical function is normal, allowing manual recoverable mechanical failure to occur. Minor mechanical failures that do not affect the normal use and safety of the user are allowed.
5.	Antenna tensile test	Test purpose: to verify whether the strength of the antenna connection meets the requirements; Prerequisite: The electrical properties of the test sample meet the requirements, and the appearance of the sample is free from cracking, wear and other defects; Test process: 1, the test before the initial inspection, to ensure that the prototype parts in the test before the normal function; 2, fix the fixed head, apply 5kgf pulling force to the antenna axis, and keep

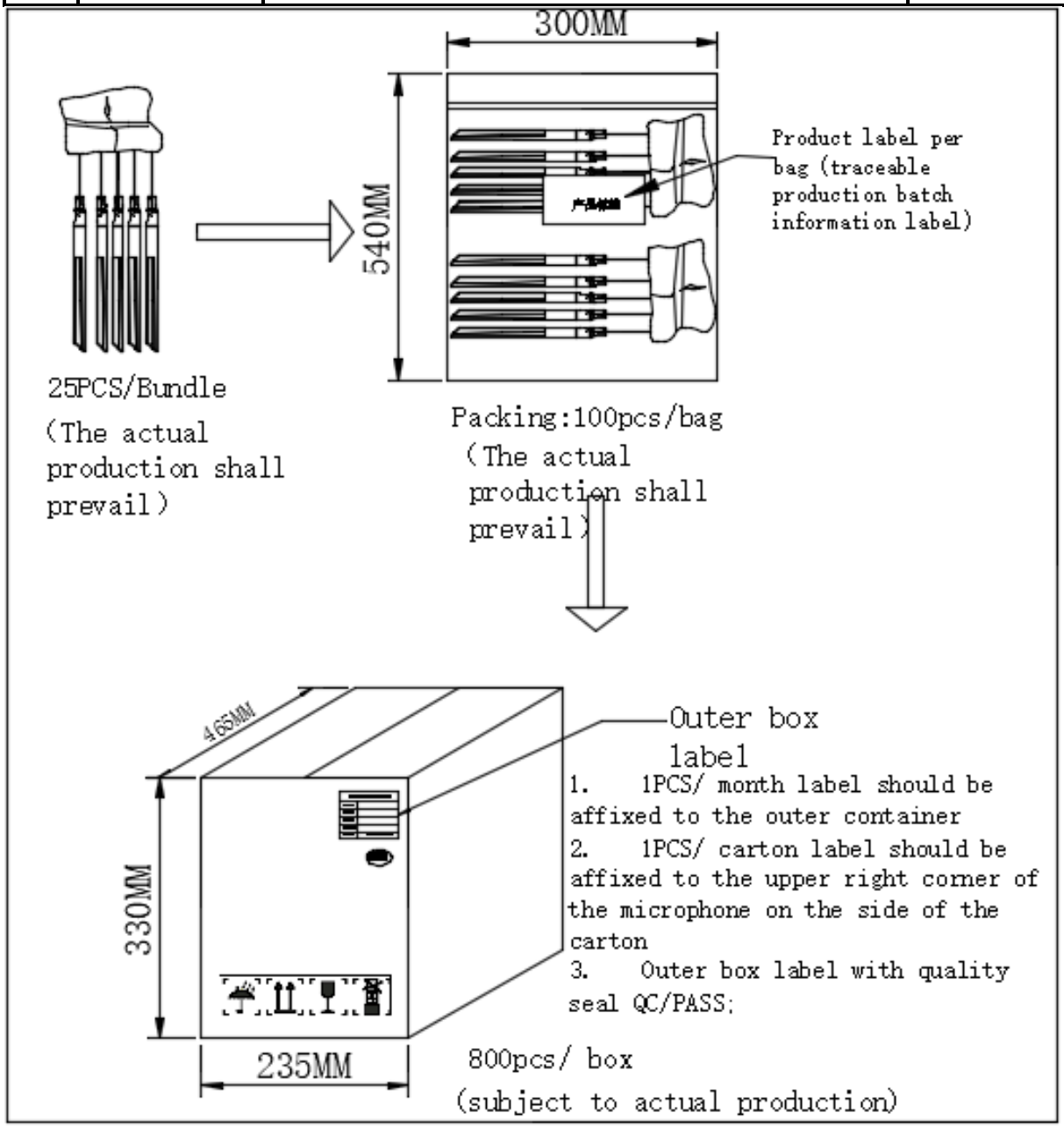
		2S when the force reaches 5kgf; 3. Repeat step (2)20 times; 4, fix the antenna axis, apply 5kgf pull on the antenna end, keep 2S when the force reaches 5kgf; 5. Repeat step (4)20 times. Criteria: 1, after the completion of the test antenna can not have obvious physical damage. 2, no change in electrical performance before and after the test.
6.	Antenna mounting force	Test objective: To verify whether the installation force of the antenna in production assembly meets the requirements of human comfort; Prerequisite: ONT and antenna must be new samples, installed for the first time; Due to structural wear, the installation force will be significantly reduced during the second installation, resulting in invalid test data. Test process: 1, the initial inspection before the test, to ensure that the ONT shell and antenna is a new prototype, no antenna installation; 2. Fix the ONT shell and press the antenna into the ONT shell antenna mounting hole; A press can be used to record the antenna installation force. 3. Number of prototypes: 13pcs Checkpoints, requirements to be met, indicators and expected results: 1, antenna installation force is less than 30N;
7.	Antenna abnormal noise test	Test objective: To verify that the antenna makes no noise during shaking; Test criteria: Shaking individual antenna manually makes no noise;

8.Environmental requirements

Meet the requirements of ROHS2.0 standard, meet the requirements of European ROHS\REACH, meet the requirements of China ROHS\REACH, lead-free requirements of electroplating.

9. Packaging requirements

	Incoming packing	1, the antenna monomer is packaged in PE plastic bag, and then put into the outer bag; 2. Paste the certificate and product label on the outer packaging bag; 3, traceable production batch information label	See the following figure



10. Environmental requirements

	Environmental parameter	index	Reference standard
	Storage temperature range (° C)	-30～+75	Reference standard: IEC 60068-2-1/2/6 / 14/30/31/78 ETSI EN 300 019-2-1/2/3 GR-63-CORE
	Operating temperature range (℃)	-20～+65	
	Storage humidity range	40℃, 95% humidity, 96 hours	
	Operating humidity range	5%～95%	
	Alternating humidity and heat	1) Keep the temperature at +25 ° C and raise the humidity to 95%RH within 1 hour 2) Keep the humidity at 95%RH; The temperature rises to +55 ° C within 3 hours. 3) Keep at +55℃, 95%RH for 9 hours 4) Keep the humidity at 95%RH; The temperature drops to +25℃ within 3 hours. 5) Keep at +25℃, 95%RH for 9 hours 6) Repeat steps 2) to 5) 5 times (a total of 6 cycles); 7) Keep the temperature at +25 ° C and reduce the humidity to 50% within 1 hour; 8) Keep at +25℃, 50%RH for 2 hours Required indicators and expected results to be achieved by checkpoints: 1, the antenna should not occur discoloration, cracking, degumming, warping deformation, loss of function, etc. 2, the damping force of the antenna and ONT does not change significantly, and the damping force of the antenna and the product can keep the antenna stable at any Angle;	
	Temperature cycle	1) High temperature limit: 1) 75℃; 2) Low temperature limit: -30℃; 3) Temperature change and holding time: maintain at least 4h at the high and low temperature extremes, and the time from high temperature to low temperature or from low temperature to high temperature should not exceed 4 hours; 4) Number of cycles: 9 cycles in total 5) Recovery time: 24h 6) Minimum sample quantity: 3pcs Required indicators and expected results to be achieved by checkpoints: 1, the antenna should not occur discoloration, cracking, degumming, warping deformation, loss of function, etc.	

		2, the damping force of the antenna and ONT does not change significantly, and the damping force of the antenna and the product can keep the antenna stable at any Angle;	
	High temperature storage	The temperature was raised to 75℃ at the rate of 1℃/min and kept at 75℃ for 24 hours; Cooling at 1℃/min to +25℃ for 2 hours. Minimum sample quantity: 3pcs Required indicators and expected results to be achieved by checkpoints: 1, the antenna should not occur discoloration, cracking, degumming, warping deformation, loss of function, etc. 2, the damping force of the antenna and ONT does not change significantly, and the damping force of the antenna and the product can keep the antenna stable at any Angle;	
	Low temperature storage	The temperature is cooled to -30℃ at a rate of 1℃/min and maintained at -30℃ for 24 hours; Heat up at 1℃/min to +25℃ for 2 hours. Required indicators and expected results to be achieved by checkpoints: 1, the antenna should not occur discoloration, cracking, degumming, warping deformation, loss of function, etc. 2, the damping force of the antenna and ONT does not change significantly, and the damping force of the antenna and the product can keep the antenna stable at any Angle;	
	Constant salt spray	72-hour salt spray test, after the test at room temperature, the product index, function and mechanical properties are normal.	
	illumination	/	
	Bare machine vibration	Require; 1, frequency: 10~30Hz, placing distance: 0.38mm,3 cycles, each cycle 5 minutes; 2, frequency: 30~60Hz, placement distance: 0.38mm,3 cycles, each cycle 5 minutes; 3, repeat once in the direction of 3 axes; After the test, the product index, function and mechanical properties are all normal.	
	Appearance and quality requirements of antenna injection parts	/	《DKBA040001 93 Plastic parts, rubber parts general quality requirements,

				section 1, 2, 3, 5, 6 requirements
	Environmental protection requirement	Meet European ROHS\REACH requirements	yes	
		Meet the requirements of China ROHS\REACH	yes	
		Lead-free requirements for electroplating	yes	