

# acknowledgement

product description: Manufacturer: Shenzhen Yusheng Communication Equipment Co., LTD  
 Project model: GTX 15  
 Specification / color: Bluetooth GPS antenna / LDS injection molding / chemical plating / radium carving  
 Material: Bluetooth antenna  
 Name: 3. 01.GTX15LG000  
 Sample signing date: 2024 / 2 / 29  
 Material R:a  
 Note: (This cover requires supplier seal)  
 appendix: Code: p QC engineering drawing p sample  
 version number: p Reliability test report p Packaging mode  
 p Electrical and mechanical performance description (specifications)  manufacturing flow chart  
 p CPK Report the p full-size measurement report  
 p List of raw materials / RoHS Report / HF / REACH ratify: (Everything that needs to be provided needs a filling color)

Supplier signature and approval: Review:  
 (All of the above require manual signature, and printing is not allowed)

**The above should be filled in by the supplier, and the following is by Aidu**

	department	Confirm content				Confirm the results	Valfirm person / date
Technical confirmation column	Supplier quality	<input type="checkbox"/> RoHS material <input type="checkbox"/> Non-RoHS materials	<input type="checkbox"/> Compliance with the REACH requirements	<input type="checkbox"/> Meet the halogen-free requirements	<input type="checkbox"/> Other environmental protection requirements		
	Design department ID:	<input type="checkbox"/> Customer request ID	<input type="checkbox"/> color confirmation	<input type="checkbox"/> Surface process validation	<input type="checkbox"/> Shell, hardware, key material		
	construction engineer	<input type="checkbox"/> 2D drawing file dimensional confirmation <input type="checkbox"/> Specification and technical requirements	<input type="checkbox"/> Focus on controlling the dimension labeling <input type="checkbox"/> electrical performance parameters	<input type="checkbox"/> adaptation validation <input type="checkbox"/> function	<input type="checkbox"/> Shell, hardware, key material <input type="checkbox"/> effect		
	hardware engineer	<input type="checkbox"/> 2D drawing file dimensional confirmation <input type="checkbox"/> Specification and technical requirements	<input type="checkbox"/> Focus on controlling the dimension labeling <input type="checkbox"/> electrical performance parameters	<input type="checkbox"/> adaptation validation <input type="checkbox"/> function	<input type="checkbox"/> Shell, hardware, key material <input type="checkbox"/> effect		
	Research and development quality:	<input type="checkbox"/> Test criteria confirm the appearance <input type="checkbox"/> appearance	<input type="checkbox"/> Normative dimension labeling (key ruler cun)	<input type="checkbox"/> reliability verification <input type="checkbox"/> adaptation validation	<input type="checkbox"/> Function <input type="checkbox"/> effect		

Final Confirmation of the Project Manager:

- Acknowledge the integrity of the documents
- Normalization of dimensions (key dimensions)
- Specification and technical requirements
- appearance
- Electrical performance parameters
- function
- effect

Conditions of recognition:  formal recognition

limited recognition

disallow

Distribution department:  IQC  supplier  customer  after-sales  SQE / text control

other\_\_\_\_\_

QF -QMP -QA 01-01

# catalogue

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# 1. Overview

## 1.1 Scope of application

This requirement specifies the antenna technical requirements and material requirements specifications for GTX15 products.

This requirement applies to the selection, testing and acceptance of GTX 15 antenna.

# 2. Technical index requirements

## 2.1 Introduction of test items and equipment

inventory	test item	equipment
S11 parameter	Standing wave ratio, echo loss	network analyzer
Active test	TRP,TIS	Integrated tester, microwave darkroom
Passive test	Gain, efficiency	network analyzer

## 2.2 Active Reporting

### 2.2.1 Test instructions

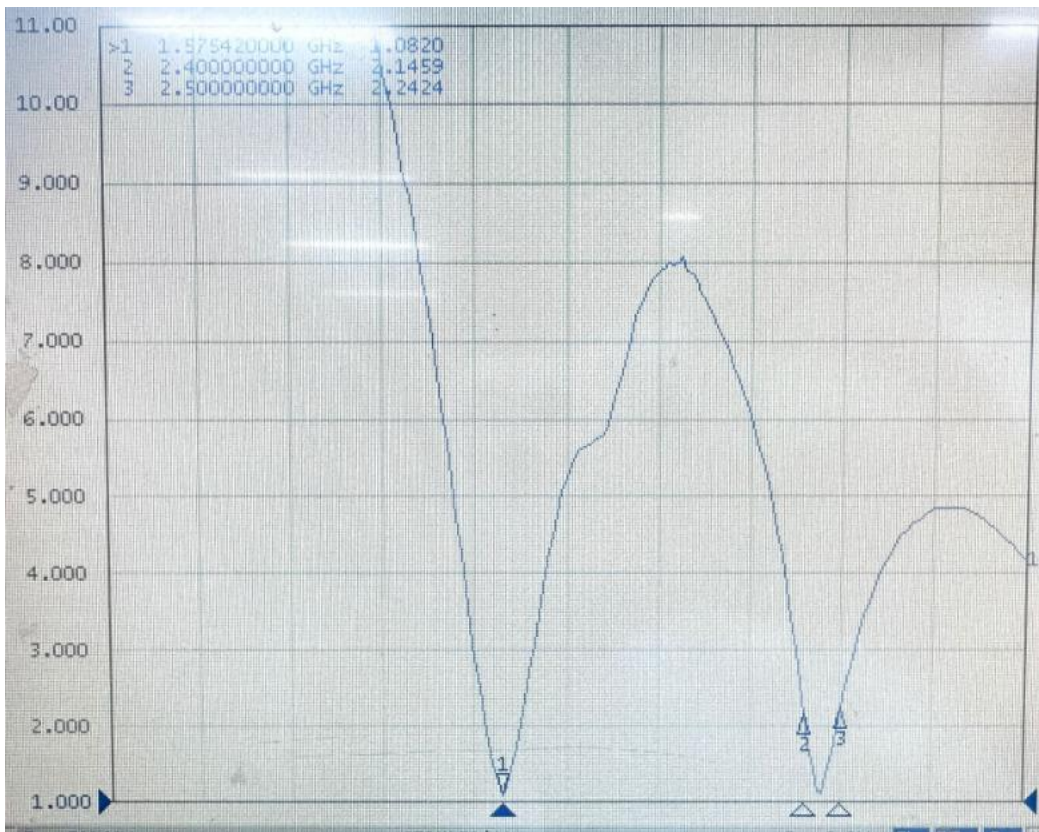
Test tools: Agilent8960 instrument, R & SCMW500, full wave far field ETS dark room, high precision positioning system and its controller and computer with automatic test program

Test environment: temperature  $22^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , humidity  $50\% \pm 15\%$

Test method: DUT is fixed in the center of the turntable with H plane, on the same horizontal line as the center of the horn antenna.

The positioning system enables the DUT to rotate in the whole sphere to satisfy the high-precision 3 D positioning. Each RF instrument and turntable controller communicate with PC with automatic test software through GPIB interface.

### 2.2.2 The antenna is passive



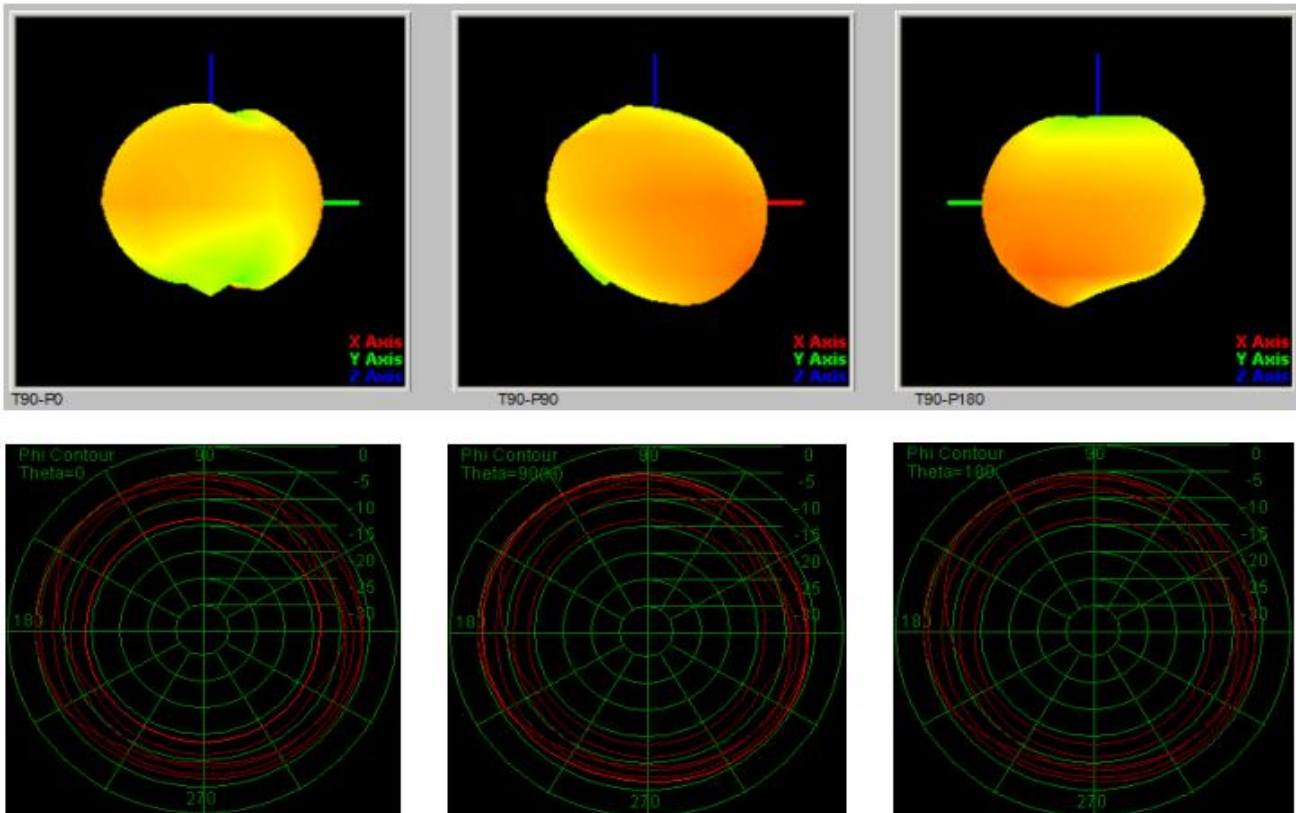
### 2.2.3 Antenna efficiency- -FS

Freq (MHz)	Effi (%)	Gain (dBi)	Freq (MHz)	Effi (%)	Gain (dBi)
1550	19.1	-2.3	2400	17.4	-3.1
1560	19.5	-2.0	2410	18.0	-2.9
1570	20.3	-1.7	2420	18.6	-2.6
1575	20.7	-1.5	2430	19.1	-2.4
1580	19.8	-1.9	2440	19.5	-2.1
1590	19.4	-2.1	2450	18.7	-2.5
			2460	18.0	-2.8
			2470	17.2	-3.0
			2480	16.8	-3.3

2.2.4 Antenna efficiency- -ARM

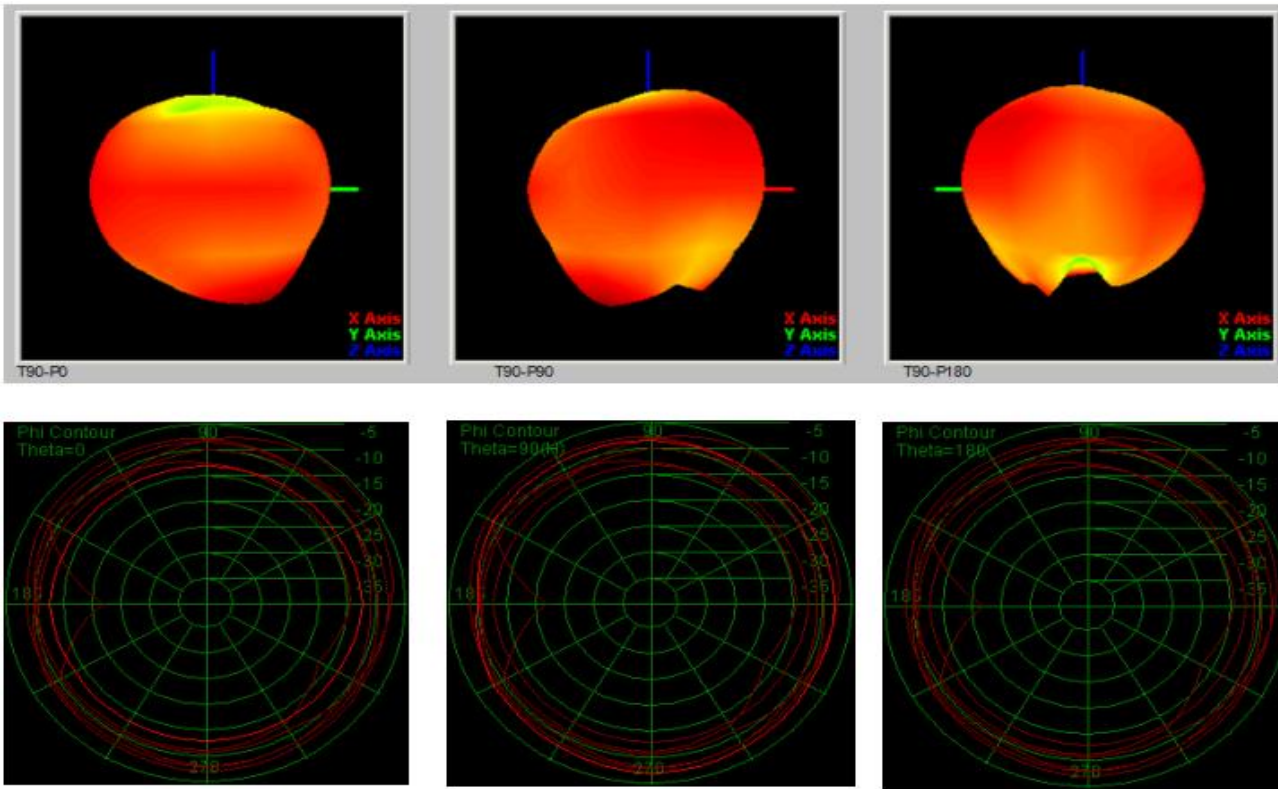
Freq (MHz)	Effi (%)	Gain (dBi)	Freq (MHz)	Effi (%)	Gain (dBi)
1550	9.6	-4.9	2400	6.5	-6.5
1560	10.2	-4.5	2410	6.9	-6.3
1570	10.7	-4.2	2420	7.3	-5.8
1575	11.3	-3.7	2430	7.8	-5.7
1580	10.8	-4.0	2440	8.2	-5.4
1590	10.1	-4.6	2450	7.6	-5.6
			2460	7.0	-5.9
			2470	6.8	-6.2
			2480	6.3	-6.8

2.2.5 GPS direction diagram- -ARM





### 2.2.6 GPS direction diagram- -ARM



### 2.2.7 Measured Search-ARM



Pilot production machine antenna status



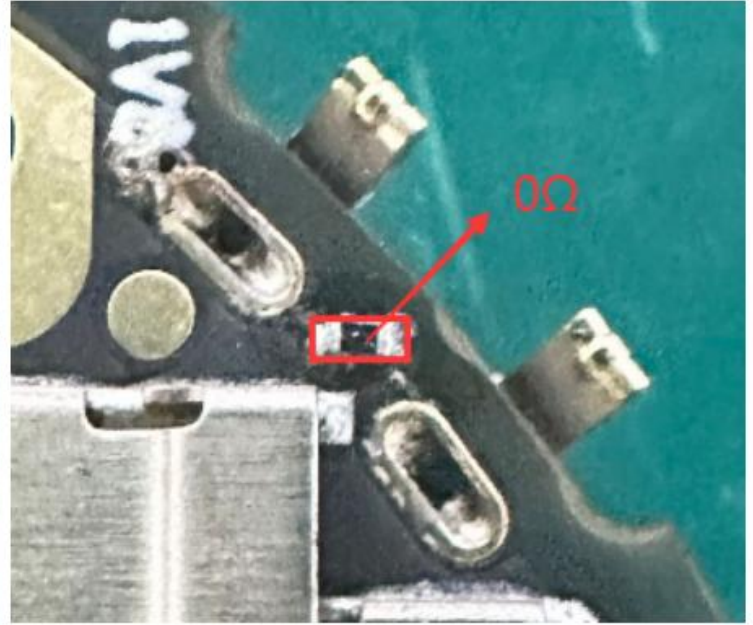
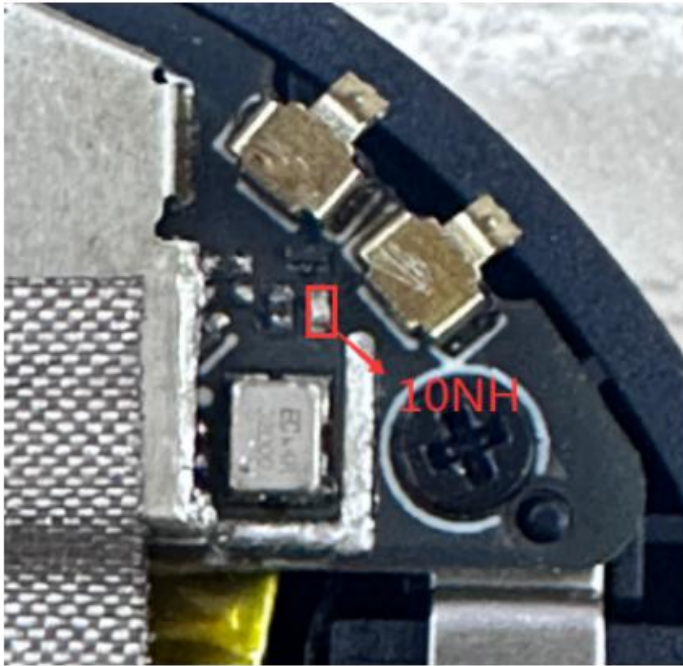
Optimal state of antenna adjustment

2.2.8 plug-in measured search star-ARM

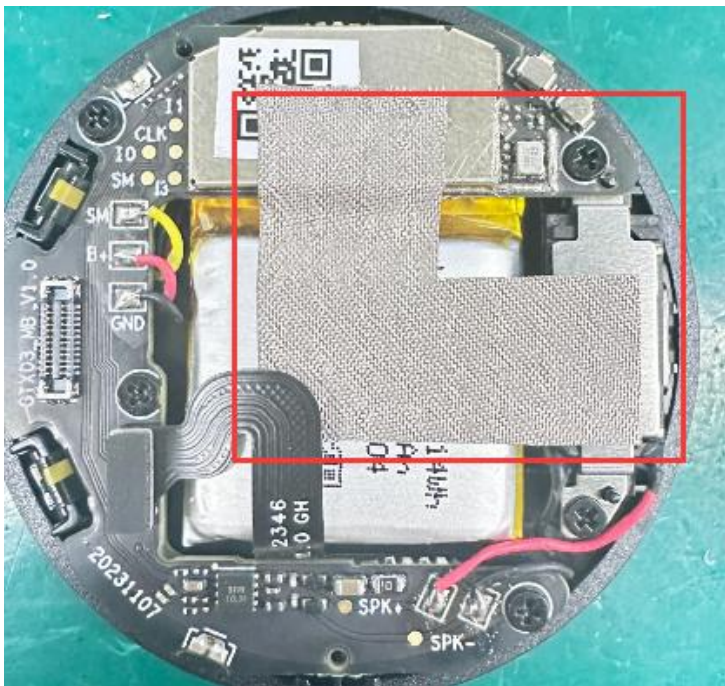




## 2.2.9 The antenna matching



## 2.2.10 Environmental treatment



### 3.Engineering drawing file

1	2	3	4	5	6	7	8																																
由 Autodesk 教育版产品制作																																							
<p>Skills requirement:</p> <p>1.The dimensions marked with numbers are regarded as important dimensions, and the others refer to 2D drawings</p> <p>2 MATERIAL: Black: LDS PC-BKNAT (BLACK 100% pure ingredients)</p> <p>3 Parameter requirement: CU:8-12 UM NI:2-4UM</p> <p>4. Flatness of the finished product is less than or equal to 0.50;</p> <p>5.Ds Antenna can not crack and fall off after electroless plating. Obvious scratch, overflow plating, such as lack of plating, bad phenomenon.</p> <p>6. LDS antenna products require 100% test conduction.</p> <p>7. Parts meet ROHS2.0/HF/Reach/GP environmental protection requirements</p>				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:20%;">DATE</td> <td style="width:40%;">Modify the content</td> <td style="width:20%;">Version</td> <td style="width:20%;">Revise</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>				DATE	Modify the content	Version	Revise																												
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<p>Back Glue T=0.1</p>																																							
<p>Shenzhen Yu Sheng Communication Equipment Co., Ltd.</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">Model</td> <td style="width:15%;">GTY15</td> <td style="width:15%;">DATE</td> <td style="width:15%;">20240304</td> </tr> <tr> <td>Name</td> <td>Antenna</td> <td>Design</td> <td>JFB</td> </tr> <tr> <td>Part NO</td> <td>063026-1A</td> <td>Revise</td> <td>JFB</td> </tr> <tr> <td>Material quality</td> <td>CU 8-12 um NI 2-4um</td> <td>RF</td> <td>CKH</td> </tr> <tr> <td>Weld surface treatment</td> <td></td> <td>confirm</td> <td></td> </tr> <tr> <td>Appearance treatment</td> <td></td> <td>UNIT</td> <td>mm</td> </tr> <tr> <td></td> <td></td> <td>Inspection</td> <td>FTT</td> </tr> <tr> <td></td> <td></td> <td>Revise</td> <td>R.A</td> </tr> </table>				Model	GTY15	DATE	20240304	Name	Antenna	Design	JFB	Part NO	063026-1A	Revise	JFB	Material quality	CU 8-12 um NI 2-4um	RF	CKH	Weld surface treatment		confirm		Appearance treatment		UNIT	mm			Inspection	FTT			Revise	R.A				
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		Revise	R.A																																				
<p>由 Autodesk 教育版产品制作</p>																																							

### 4. Bill Of Material

#### YUSHENG COMMUNICATION TECHNOLOGY CO.,LTD.

#### 063026 (GTX15)-BOM

Edition: R:A

client:063

Model: 063026

date: 20240304

Item	Part No	Name	Types of	version	specification	Material quality	colour	unit	Quantity	Craft
1	063026-IA-RA	Antenna	Z	R:A	33.90*3.55MM				PCS	1
1.1	063026-IA-01-RA	Trestle	W	R:A	33.90*3.55MM	LDS -PC	black	V#18	PCS	1
1.2	063026-IA-02-RA	Pattern	W	R:A	CU 8-12um NI 2-4um	CU NI		Chemistry NI	PCS	1

Type: W. Outsourcing B. Semi-finished products Z. Finished products C. Customer supply

Confirmation:

Review:

Production: FJW



### 5.Full test size report

THOT



Shenzhen Yusheng  
Communication Equipment

supplier	Renesola		Name of a part	GTX15		P / N	063026			
Mold point number	5		The first test	batch		date	2024/2/29			
Visual inspection / dimensions										
order number	standard figures		measured value					judge		remarks
			1	2	3	4	5	OK	NG	
1	7.50	Soil 0.1	7.52	7.49	7.50	7.51	7.49	✓		
2	7.01	Soil 0.1	7.01	7.02	7.00	7.01	7.01	✓		
3	4.33	±0.1	4.33	4.34	4.32	4.35	4.33	✓		1
4	3.55	±0.05	3.55	3.56	3.54	3.57	3.54	✓		
5	1.10	±0.1	1.11	1.09	1.10	1.12	1.10	✓		
6	1.50	±0.1	1.48	1.51	1.49	1.50	1.52	✓		
7	3.00	±0.05	3.00	3.02	3.01	3.00	2.99	✓		
8	33.90	±0.1	33.91	33.92	33.89	33.90	33.91	✓		
9	22.40	±0.1	22.43	22.39	22.40	22.38	22.41	✓		
10	20.73	±0.1	20.74	20.74	20.75	20.73	20.72	✓		
11	1.90	Soil 0.1	1.88	1.91	1.92	1.89	1.90	✓		
12	11.74	±0.1	11.75	<del>11.73</del>	11.75	11.76	11.74	✓		
13	7.98	±0.1	7.99	7.98	7.96	7.98	7.97	✓		
14	5.92	±0.1	5.94	5.90	5.93	5.91	5.90	✓		
15										

in

First part:

Second part :

Conclusion:

合格

Examine and verify:

*(Handwritten signature)*

inspector: Su Guanfeng



## 6.FPC-CPK

### Process Capability Calculation Worksheet

PartNumber: 天线  
 Part Description: GTX15  
 Part Revision: LDS

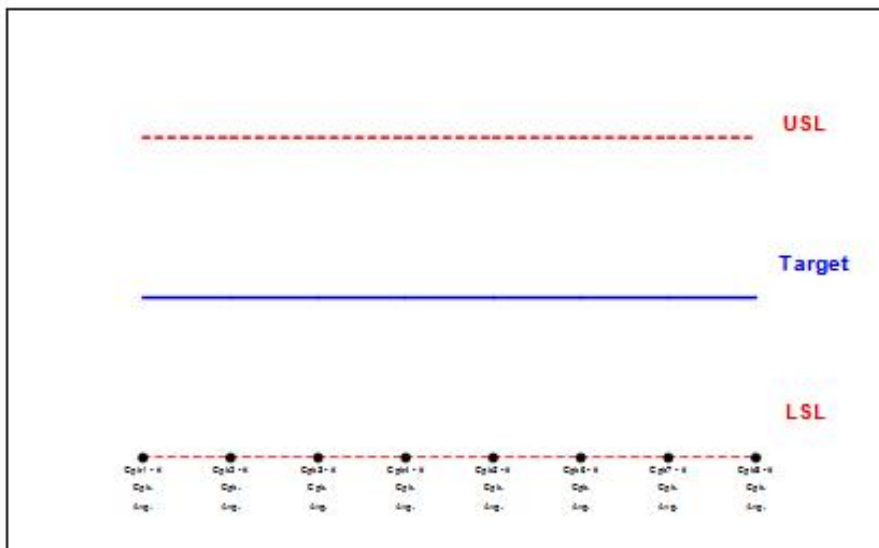
Supplier :  
 Submission Date: 29/Feb/24

Cavity/Tool # : #REF!  
 Inspector:

### Cpk Data

	DRAWING SPECIFICATIONS							
	Cpk1 - #	Cpk2 - #	Cpk3 - #	Cpk4 - #	Cpk5 - #	Cpk6+ #	Cpk7 - #	Cpk8 - #
Nominal	3.550	33.900	3.000					
Upper Tol.	0.050	0.100	0.050					
Lower Tol.	0.050	0.100	0.050					
USL	3.600	34.000	3.050	0.000	0.000	0.000	0.000	0.000
LSL	3.500	33.800	2.950	0.000	0.000	0.000	0.000	0.000

Total Tol	0.100	0.200	0.100	0.000	0.000	0.000	0.000	0.000
Xbar	3.550	33.901	3.000					
Stdv	0.012	0.023	0.010					
Zu	1.432	1.424	1.678					
Zl	1.432	1.451	1.657					
Cp	1.432	1.437	1.668					
Cpk	1.432	1.424	1.657					
Max	3.570	33.950	3.030	0.000	0.000	0.000	0.000	0.000
Min	3.530	33.860	2.980	0.000	0.000	0.000	0.000	0.000





DIMENSIONAL DATA								
Sample	Cpk1 - #	Cpk2 - #	Cpk3 - #	Cpk4 - #	Cpk5 - #	Cpk6+ #	Cpk7 - #	Cpk8 - #
1	3.54	33.92	3.00					
2	3.56	33.91	3.00					
3	3.55	33.92	2.99					
4	3.53	33.90	2.99					
5	3.55	33.89	3.00					
6	3.55	33.90	3.00					
7	3.54	33.91	3.01					
8	3.53	33.88	3.00					
9	3.56	33.89	3.00					
10	3.55	33.91	2.99					
11	3.54	33.92	2.98					
12	3.55	33.90	2.99					
13	3.54	33.91	3.01					
14	3.56	33.89	3.00					
15	3.57	33.90	3.01					
16	3.53	33.88	3.00					
17	3.56	33.87	3.01					
18	3.55	33.93	3.02					
19	3.54	33.94	3.03					
20	3.56	33.89	3.00					
21	3.57	33.87	3.00					
22	3.56	33.90	2.99					
23	3.55	33.90	2.99					
24	3.53	33.91	3.00					
25	3.56	33.86	3.01					
26	3.55	33.87	2.99					
27	3.54	33.94	3.00					
28	3.56	33.95	3.00					
29	3.57	33.86	2.99					
30	3.55	33.88	3.00					
31	3.55	33.93	3.00					
32	3.55	33.90	2.99					

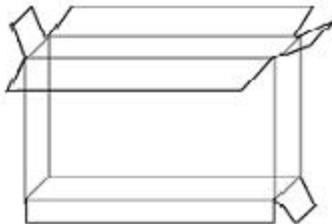
#REF!  
#REF!

## 7. Reliability test report

The LDS antenna test report							
client	Love is	project name	GTX15	testing time	2024/2/16	product type	LDS
number	test item	test condition	requirement	test result	Judgment conclusion		
1	Appearance test	Distance: 30cm distance from the object Time: confirm defects within 10 seconds Angle: the measured surface is 45 degrees; the measured object rotates up and down within 15 degrees Lighting: equivalent to a 40W fluorescent lamp	Cracking, stripping, oxidative corrosion, bubbles, bumps, heterocolor, deviation are not allowed	No abnormality seen	OK		
2	cold test	Temperature-20°C, placed for 48h, no intermediate detection, recovery: under normal temperature state for 2h, bent antenna, Angle: 120 degrees, times: 3 times	Structure contrast, appearance contrast Key points: after low temperature test, the antenna has no peeling, cracks, wrinkles, severe allochromatic or chloror green; after bending, the antenna has no block peeling	No abnormality seen	OK		
3	steady temperature damp test	Temperature + 60°C, RH 95%, placed at 96H, with no intermediate detection Recovery: recover for 2h at normal temperature	Structure contrast, appearance contrast Key: antenna no peel, cracks, wrinkles, severe hetereuchromatic or brass	No abnormality seen	OK		
4	salt spray test	① NaCl and distilled water configuration, concentration $5 \pm 0.1\%$ , PH value $6.5 \sim 7.2$ ; ② temperature: $35 \pm 2^\circ\text{C}$ ; ③ spray water pressure: 80 KPa, ④ water flow: collecting	Structure contrast, appearance contrast Key points: the antenna has no stripping, cracks, wrinkles, and corrosive substances	No abnormality seen	OK		

		<p>container can collect 1.0~2.0ml saline solution per hour, ⑤ time: 48h, no intermediate detection</p> <p>Recovery: After removing the prototype, remove the surface saline with cotton cloth and toilet paper, and place it for 1H at room temperature</p>				
5	Bige test	<p>Draw 1001mm 1mm grids on the test antenna surface (1mmX1mm grids can be drawn in a small area), deep and paint the bottom; brush the test area with a brush; stick the test area with 3M600 tape and wipe the tape to increase the contact area and strength of the test area. After placing for 1 minute, grab one end of the tape by hand, tear off the tape at 90 degrees, and conduct the same test in the same position</p>	<p>1, more than 1 / 2 of the top paint or coating fall off as unqualified;</p> <p>2. After the 1X1mm grid is cut, if there is more than 1 / 4 of the area falling in the small grid, it is unqualified. (Or there are obvious debris in the process of cutting, which is unqualified)</p>	No abnormality seen	OK	
experiment conclusion:		qualified	test controler:	Zhong Qihong	examine and verify:	Feng Jiwu

## 8. Packaging information

Packaging method diagram																
product name	LDS antenna															
P / N	063026															
Project model	GTX15															
File details	Carton Size 1: 270*260*200MM Carton Size 2: 260*200*200MM Carton Size 3: Depending on the order quantity / volume															
	Boating method	Packaging by order quantity														
	Total number of binning	Packaging by order quantity														
labeling requirement	Tag Size 1: Universal use 100 * 100mm Tag Size 2: According to customer requirements	深圳市昱晟通讯设备有限公司 <table border="1"> <tr> <td>客户名称</td> <td>*****</td> </tr> <tr> <td>订单编号</td> <td>*****</td> </tr> <tr> <td>项目名称</td> <td>*****</td> </tr> <tr> <td>物料编码</td> <td>*****</td> </tr> <tr> <td>数量</td> <td>***pcs</td> </tr> <tr> <td>出货日期</td> <td>***年**月**日</td> </tr> <tr> <td colspan="2">地址：深圳市光明新区光明大道南太云创客园区2栋4楼4A</td> </tr> </table>	客户名称	*****	订单编号	*****	项目名称	*****	物料编码	*****	数量	***pcs	出货日期	***年**月**日	地址：深圳市光明新区光明大道南太云创客园区2栋4楼4A	
客户名称	*****															
订单编号	*****															
项目名称	*****															
物料编码	*****															
数量	***pcs															
出货日期	***年**月**日															
地址：深圳市光明新区光明大道南太云创客园区2栋4楼4A																
matters need attention																
1. Due to the limitation of order quantity, the packing method of each material is the size of the box according to the total quantity of the order or the physical volume																
2. Storage temperature: room temperature																
3. Preservation conditions: store them in a cool and dry place																