



M3 Project Antenna Material Requirement Specification

Customer Name: Tongli

Product Name: M3 Antenna Finished Product; M3 WiFi

Antenna Assembly Product Specification: For details,
please refer to BOM

Material code: antenna finished product: 21860035;WIFI antenna assembly:
14050119

Change Content Resume:

Serial Number	Version	Status	Effective Date	Responsible Person	Page	Remarks
1	R:a	R:a	2025.10.30	Li Jieyi	18	

The Supplier acknowledges the signature:

Responsible Person/Date		IQC/Date	Review/Date	Approval/Date
MD	Feng Jiwu	Su Guanfeng	He Lei	
RF	Chen Kehong			

The buyer acknowledges the signature (please send it back after signing):

Demander judgment result: ☐ Qualified ☐ Unqualified			
Development Design Engineer/Date	SQE Engineer/Date	Purchaser/Date	Development Manager Approval/Date

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1. Overview

1.1 Scope of application

This requirement specifies the antenna technical requirements and material requirements specifications for

M3 products. This requirement applies to the selection, testing and acceptance of **M3** antennas.

1.2 Project basic information

Antenna Name:	<u>M3</u>
Antenna Band:	WIFI:2400-2500 5.1-5.8G
Antenna material:	FPC + Ferrite
Antenna version:	V1

2. Technical Index Requirements

2.1 Test items and equipment introduction

List	Test Item	Equipment
Active Test	TRP,TIS	Comprehensive tester, microwave anechoic chamber

2.2 Active Reports

2.2.1 Test Description

Test tools: Agilent8960 comprehensive tester, R & SCMW500, all-electric wave far-field ETS darkroom, high-precision positioning system and its controller and computer with automatic test program.

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

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

The positioning system enables the DUT to rotate on the entire spherical surface to meet the high-precision three-dimensional positioning. Each RF instrument, turntable controller and PC with automatic test software communicate through GPIB interface.

2.3.1 MTK-US Version-Antenna Active Parameters

Test	FDD B2			FDD B4		
Channel	18650	18900	19150	20000	20175	20350
TRP (dBm)	17.36	17.33	17.16	17.01	17.22	17.09
TIS (dBm)			-91.05			-91.57

Test	FDD B5			FDD B7		
Channel	20450	20525	20600	20800	21100	21400
TRP (dBm)	17.18	17.45	17.61	16.88	16.94	16.98
TIS (dBm)			-91.51			-90.64

Test	FDD B12			FDD B13		
Channel	23050	23090	23130		23230	
TRP (dBm)	17.01	17.18	17.20		17.17	
TIS (dBm)			-91.52		-90.27	

Test	FDD B14			FDD B17		
Channel		23330		23780	23790	23800
TRP (dBm)		17.05		17.15	17.32	17.41
TIS (dBm)		-91.01				-90.27

Test	FDD B25			FDD B26		
Channel	26090	26365	26640	26740	26865	26990
TRP (dBm)	17.11	16.92	16.86	17.26	17.47	17.51
TIS (dBm)			-90.37			-91.12

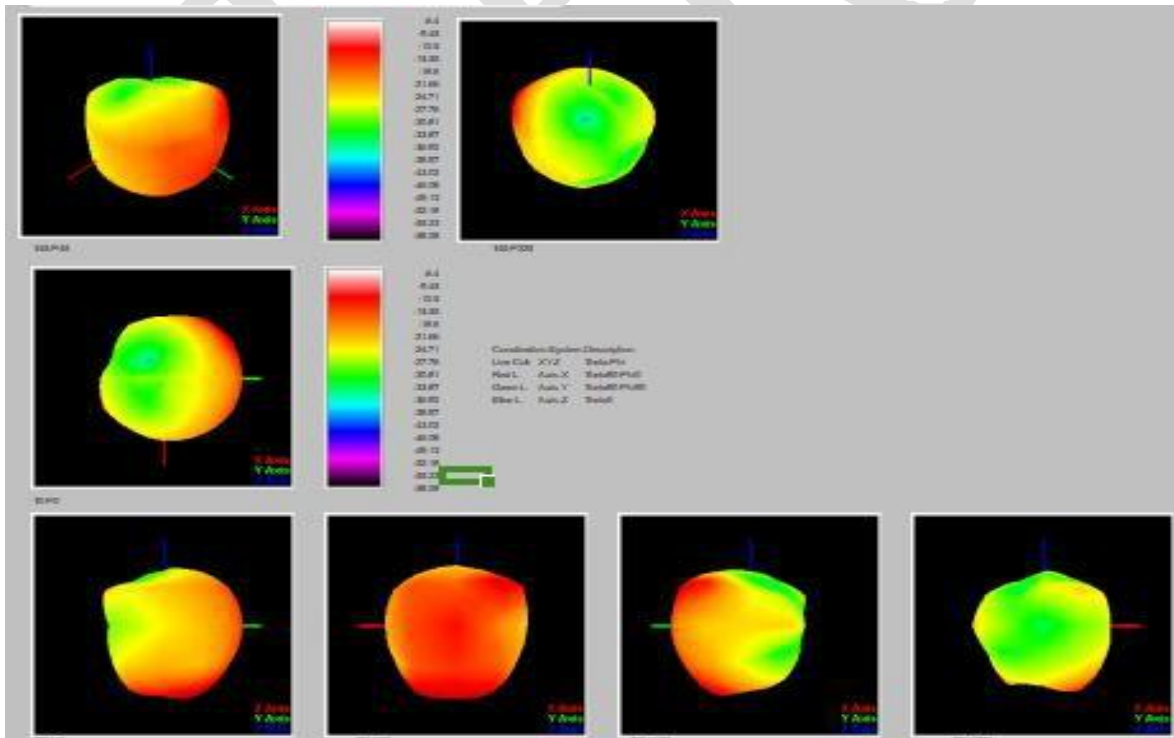
Test	FDD B41			FDD B66		
Channel		40620		132022	132322	132622
TRP (dBm)		17.19		16.97	17.07	17.24
TIS (dBm)		-91.02				-91.33

Test	FDD B71		
Channel	133172	133297	133422
TRP (dBm)	17.23	17.31	17.29
TIS (dBm)			-90.78

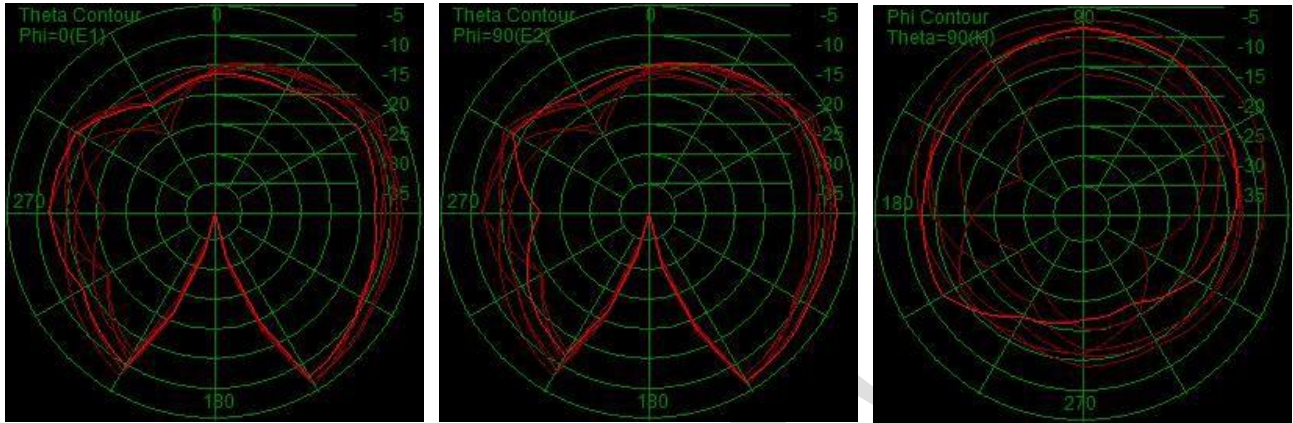
2.3.2 MTK-US Edition-GPS Search Star



2.3.3 -MTK-US Edition-Apple Chart



2.3.4 MTK-US Edition-Directional Chart



2.4.1 MTK-European version-Antenna active parameters

Test	FDD B1			FDD B2		
Channel	18050	18300	18550	18650	18900	19150
TRP (dBm)	16.28	16.86	17.37	17.05	17.31	17.39
TIS (dBm)			-92.48			-91.28

Test	FDD B3			FDD B4		
Channel	19250	19575	19900	20000	20175	20350
TRP (dBm)	17.18	17.43	17.55	17.22	17.29	17.61
TIS (dBm)			-92.51			-92.34

Test	FDD B5			FDD B7		
Channel	20450	20525	20600	20800	21100	21400
TRP (dBm)	17.55	17.61	17.76	16.50	16.77	16.94
TIS (dBm)			-91.28			-90.61

Test	FDD B8			FDD B20		
Channel	21500	21625	21750	24200	24300	24400
TRP (dBm)	17.31	16.47	16.89	16.41	16.59	16.70
TIS (dBm)			-90.60			-90.28

Test	FDD B28A			FDD B28B		
Channel	27260	27360	27460	27410	27510	27610
TRP (dBm)	17.58	17.61	17.78	17.23	17.37	17.48
TIS (dBm)			-91.20			-91.36

Test	FDD B38			FDD B39		
Channel	37850	38000	38150	38350	38450	38550
TRP (dBm)	17.15	17.25	17.46	16.25	16.34	16.42
TIS (dBm)			-92.28			-90.39

Test	FDD B40			FDD B41		
Channel	38750	39150	39550		40620	
TRP (dBm)	17.58	17.75	17.89		17.49	
TIS (dBm)			-92.42		-92.57	

Test	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
TRP (dBm)	25.2	25.3	26.3	26.2	26.5	26.8
TIS (dBm)			-102.49			-103.43

Test	EGSM 900			DCS 1800		
Channel	1	62	124	512	698	885
TRP (dBm)	26.1	26.0	25.8	26.6	26.2	26.0
TIS (dBm)			-102.34			-103.20

Test	WCDMA_I			WCDMA_II		
Result	10562	10700	10838	9662	9800	9938
TRP (dBm)	17.2	16.3	16.7	16.3	16.7	17.2
TIS (dBm)			-102.7			-102.1

Test	WCDMA_V			WCDMA_III		
Result	4357	4408	4458	2937	3013	3088
TRP (dBm)	16.6	16.2	16.1	16.5	16.7	16.9
TIS (dBm)			-101.3			-101.3

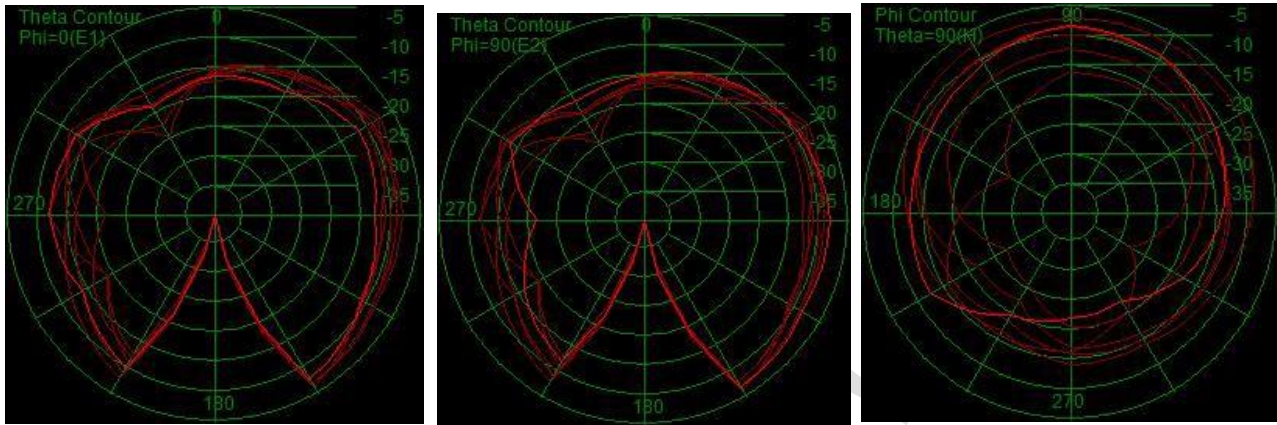
The image shows a handheld GPS device with a monochrome screen. The screen displays the following information:

- Top Status Bar:** Shows the time 7:24 and a battery level indicator.
- Main Display Area:**
 - GNSS Status:** A box labeled "GNSS STATUS" shows "No Fix" with a red location pin icon.
 - Receiver ID:** A box labeled "Receiver ID" shows the number "0".
 - In View:** A box labeled "In View" shows the number "14".
 - In Use:** A box labeled "In Use" shows the number "0".
 - Bar Chart:** A bar chart showing signal strength for 14 satellites. The bars are green, indicating good signal strength. The values above the bars are: 46, 45, 30, 39, 83, 24, 31, 42, 44, 43, 40, 41, 01, 02, 03, 19, 66, 75, 76, 82, 144, 105, 201, 220.
 - Vertical Scale:** A vertical scale on the right side of the screen, ranging from 0 to 100, with a green bar indicating the current signal strength.
- Physical Buttons:** The device has several physical buttons around the screen, including a power button, a directional pad, and a trackball.

Figure 1 displays eight heatmaps showing the spatial distribution of the first four principal components (PC1-PC4) for the shape of the fruit. Each plot includes a color scale on the left and a 3D model of the fruit with axes. The color scale ranges from -0.25 (blue) to 0.25 (red). The 3D models show the fruit shape with axes labeled X, Y, and Z. The plots are labeled PC1, PC2, PC3, and PC4. A legend for the Coordinate System Description is provided in the center-right.

Coordinate System Description:
 Line Color: XYZ, Shapefile
 Red L: Axis X, Shapefile
 Green L: Axis Y, Shapefile
 Blue L: Axis Z, Shapefile

2.4.4 MTK-European version-GPS plan



2.5.1 Qualcomm-US Edition-Antenna Active Parameters

Test	FDD B2			FDD B4		
Channel	18650	18900	19150	20000	20175	20350
TRP (dBm)	17.21	17.16	16.94	16.98	16.91	16.83
TIS (dBm)			-91.36			-92.10

Test	FDD B5			FDD B7		
Channel	20450	20525	20600	20800	21100	21400
TRP (dBm)	17.22	17.35	17.38	16.97	16.80	16.72
TIS (dBm)			-91.45			-90.61

Test	FDD B12			FDD B13		
Channel	23050	23090	23130		23230	
TRP (dBm)	17.05	17.11	17.29		17.32	
TIS (dBm)			-91.33		-91.05	

Test	FDD B14			FDD B17		
Channel		23330		23780	23790	23800
TRP (dBm)		16.97		17.02	17.14	17.27
TIS (dBm)		-90.64				-91.51

Test	FDD B25			FDD B26		
Channel	26090	26365	26640	26740	26865	26990
TRP (dBm)	16.79	16.92	17.34	17.11	17.26	17.43
TIS (dBm)			-90.88			-92.07

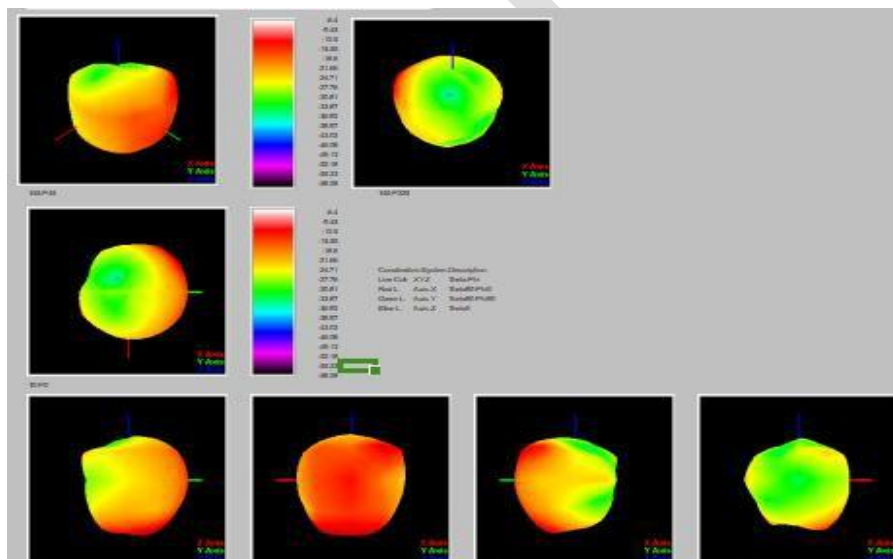
Test	FDD B41			FDD B66		
Channel		40620		132022	132322	132622
TRP (dBm)		16.93		17.23	17.37	17.44
TIS (dBm)		-90.48				-91.29

Test	FDD B71		
Channel	133172	133297	133422
TRP (dBm)	17.38	17.13	16.97
TIS (dBm)			-90.35

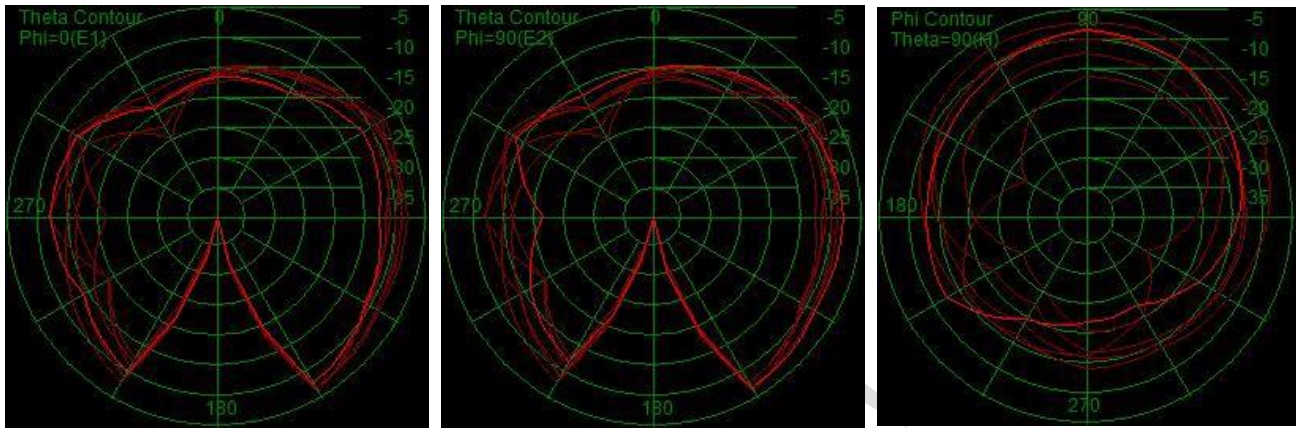
2.5.2 -Qualcomm-US Edition-GPS Search Star



2.5.3 Qualcomm-US Edition-GPS Apple Chart



2.5.4 Qualcomm-US Edition-GPS Directional Chart



2.6.1 Qualcomm-European version-antenna active parameters

Test	FDD B1			FDD B2		
Channel	18050	18300	18550	18650	18900	19150
TRP (dBm)	17.25	17.14	16.97	17.05	17.21	17.36
TIS (dBm)			-91.35			-91.05

Test	FDD B3			FDD B4		
Channel	19250	19575	19900	20000	20175	20350
TRP (dBm)	17.45	17.68	17.72	17.61	17.49	17.37
TIS (dBm)			-92.29			-91.28

Test	FDD B5			FDD B7		
Channel	20450	20525	20600	20800	21100	21400
TRP (dBm)	17.23	17.16	16.91	17.01	16.82	16.76
TIS (dBm)			-91.38			-90.16

Test	FDD B8			FDD B20		
Channel	21500	21625	21750	24200	24300	24400
TRP (dBm)	16.89	17.11	17.35	17.16	17.24	17.05
TIS (dBm)			-91.27			-91.10

Test	FDD B28A			FDD B28B		
Channel	27260	27360	27460	27410	27510	27610
TRP (dBm)	17.28	17.31	17.20	17.19	17.34	17.29
TIS (dBm)			-91.17			-91.34

Test	FDD B38			FDD B39		
Channel	37850	38000	38150	38350	38450	38550
TRP (dBm)	16.67	16.78	16.98	17.15	17.51	17.69
TIS (dBm)			-91.26			-91.79

Test	FDD B40			FDD B41		
Channel	38750	39150	39550		40620	
TRP (dBm)	17.34	17.30	17.21		17.50	
TIS (dBm)			-92.22		-91.83	

Test	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
TRP (dBm)	25.4	25.6	25.9	26.1	26.2	26.5
TIS (dBm)			-102.37			-103.27

Test	EGSM 900			DCS 1800		
Channel	1	62	124	512	698	885
TRP (dBm)	26.3	26.2	25.7	26.4	26.3	26.5
TIS (dBm)			-102.05			-103.44

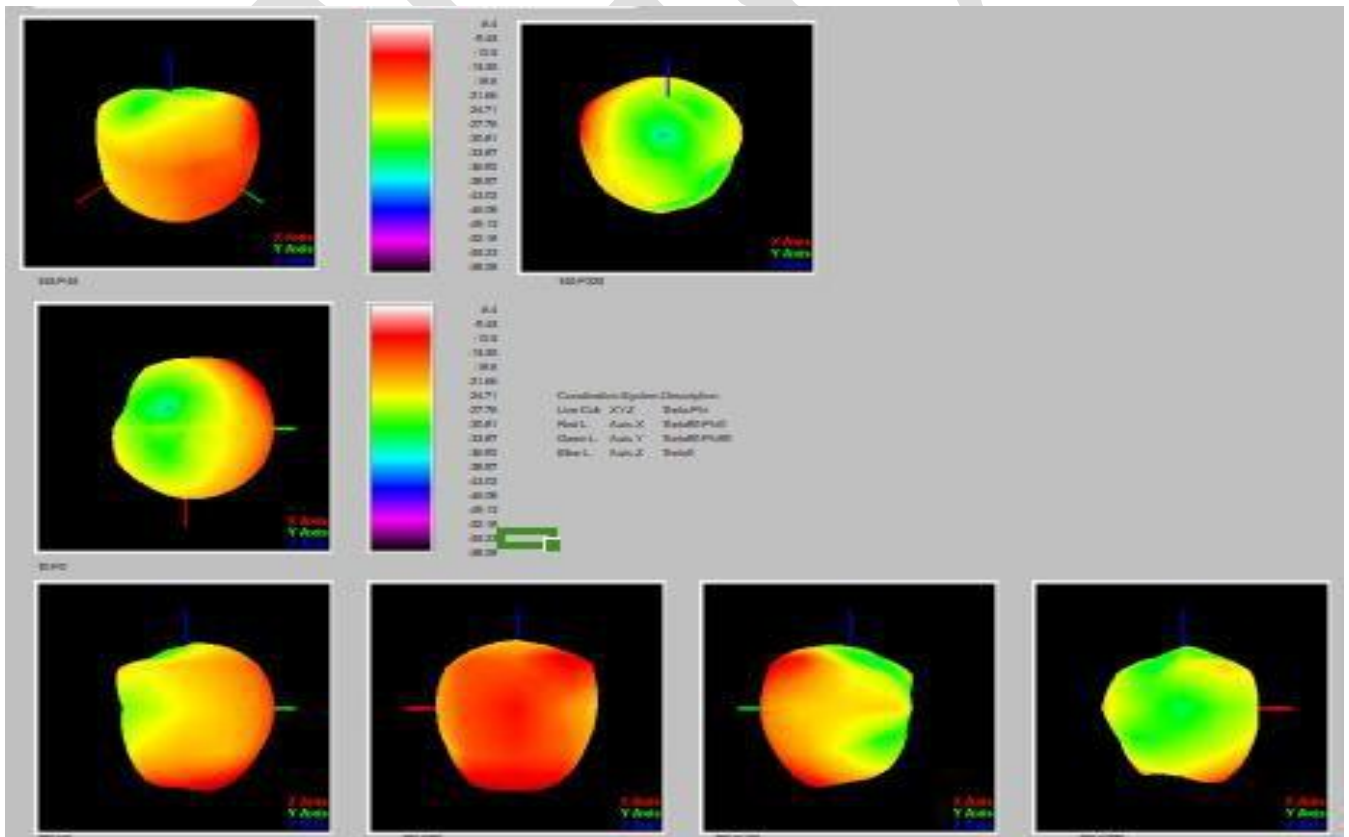
Test	WCDMA_I			WCDMA_II		
Result	10562	10700	10838	9662	9800	9938
TRP (dBm)	17.1	17.0	16.9	16.1	16.8	17.0
TIS (dBm)			-102.13			-102.38

Test	WCDMA_V			WCDMA_III		
Result	4357	4408	4458	2937	3013	3088
TRP (dBm)	16.6	16.3	16.4	16.8	16.9	17.2
TIS (dBm)			-101.50			-102.53

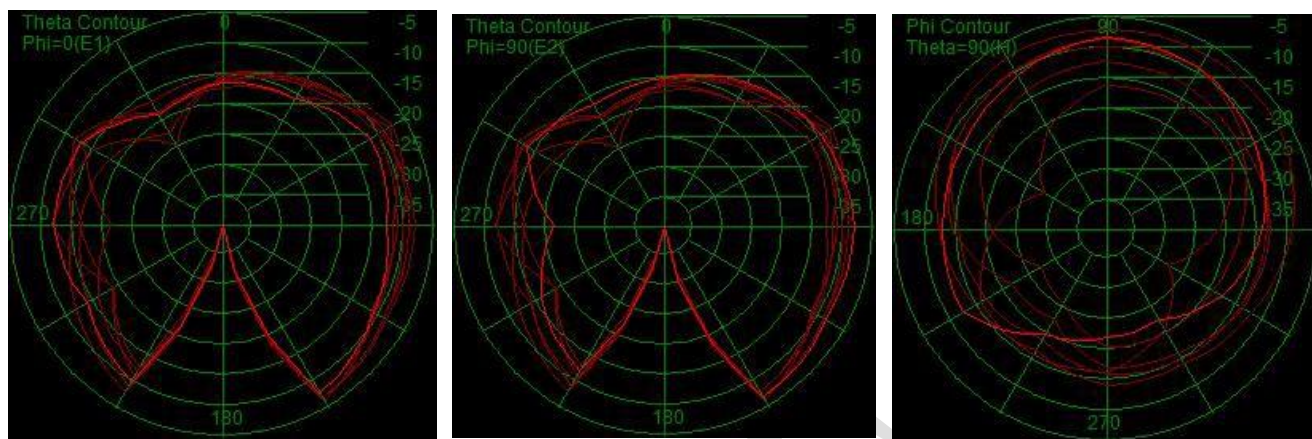
2.6.2 Qualcomm-European Edition-GPS Search Star



2.6.3 Qualcomm-European Edition-GPS Apple Chart



2.6.4 Qualcomm-European Edition-GPS Directional Chart



Finished Antenna

致力于为客户提供专业级天线解决方案

WIFI Antenna Assembly

1	2	3	4	5	6																											
				<table border="1"> <tr> <th>标记</th> <th>签名</th> <th>修改内容</th> <th>日期</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	标记	签名	修改内容	日期																								
标记	签名	修改内容	日期																													
A	B	C	D																													
技术要求: <table border="1"> <tr> <td>1. PFC基材规格:</td> <td>P1基材:</td> <td>电解铜 一对半</td> </tr> <tr> <td>2. 电镀规格:</td> <td>电镀铜(单面脱):</td> <td>0.5oz (10)</td> </tr> <tr> <td>3. 表面油膜要求:</td> <td>双面脱:</td> <td>3M-9471LE</td> </tr> <tr> <td>4. 可靠性要求:</td> <td>镀镍: 3~8um</td> <td>镀金:</td> </tr> <tr> <td>5. 公差要求:</td> <td>表面油膜颜色:</td> <td>亚光黑色</td> </tr> <tr> <td>6. 重点管控尺寸:</td> <td>印刷字体颜色:</td> <td>白色</td> </tr> <tr> <td>7. RoHS要求:</td> <td>印刷字体高度:</td> <td>按图纸要求</td> </tr> <tr> <td>8. 包装要求:</td> <td>1. 可靠性测试: 金壳老化测试(温度: 40℃, 湿度: 85%, 时间: 168h)</td> <td></td> </tr> <tr> <td></td> <td>2. 正面油膜: 油膜表面要求对折不开裂, 不可划伤等。</td> <td></td> </tr> </table>	1. PFC基材规格:	P1基材:	电解铜 一对半	2. 电镀规格:	电镀铜(单面脱):	0.5oz (10)	3. 表面油膜要求:	双面脱:	3M-9471LE	4. 可靠性要求:	镀镍: 3~8um	镀金:	5. 公差要求:	表面油膜颜色:	亚光黑色	6. 重点管控尺寸:	印刷字体颜色:	白色	7. RoHS要求:	印刷字体高度:	按图纸要求	8. 包装要求:	1. 可靠性测试: 金壳老化测试(温度: 40℃, 湿度: 85%, 时间: 168h)			2. 正面油膜: 油膜表面要求对折不开裂, 不可划伤等。		1. 外形公差 ±0.15; 2. 铜箔到外形的位置 ±0.15; 3. 铜箔到外形的位置 ±0.10; 4. 孔到外形的位置公差 ±0.15; 5. 金手指尺寸公差 ±0.20; 6. 其它未标注尺寸参照图纸。	1. 外形公差 ±0.15; 2. 铜箔到外形的位置 ±0.15; 3. 铜箔到外形的位置 ±0.10; 4. 孔到外形的位置公差 ±0.15; 5. 金手指尺寸公差 ±0.20; 6. 其它未标注尺寸参照图纸。	1. 外形公差 ±0.15; 2. 铜箔到外形的位置 ±0.15; 3. 铜箔到外形的位置 ±0.10; 4. 孔到外形的位置公差 ±0.15; 5. 金手指尺寸公差 ±0.20; 6. 其它未标注尺寸参照图纸。	1. 外形公差 ±0.15; 2. 铜箔到外形的位置 ±0.15; 3. 铜箔到外形的位置 ±0.10; 4. 孔到外形的位置公差 ±0.15; 5. 金手指尺寸公差 ±0.20; 6. 其它未标注尺寸参照图纸。	1. 外形公差 ±0.15; 2. 铜箔到外形的位置 ±0.15; 3. 铜箔到外形的位置 ±0.10; 4. 孔到外形的位置公差 ±0.15; 5. 金手指尺寸公差 ±0.20; 6. 其它未标注尺寸参照图纸。
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7. RoHS要求:	印刷字体高度:	按图纸要求																														
8. 包装要求:	1. 可靠性测试: 金壳老化测试(温度: 40℃, 湿度: 85%, 时间: 168h)																															
	2. 正面油膜: 油膜表面要求对折不开裂, 不可划伤等。																															
1	2	3	4	5	6																											
THOT-M3-WIFI0-V0.1	端子开口朝下																															
A	B	C	D																													
深圳市昱晟通讯设备有限公司	项目名称	410006	日期	20250928																												
材料	WIFI 组件	审核	MD	BYZ	RF																											
产品料号	410006-1B	批准	tdl	比例	1:1																											
单位	mm	版本	R:A	比例	1:1																											
比例	1:1	版本	R:A	比例	1:1																											

4.Material BOM

410006 (M3)-BOM表

版次: R:A

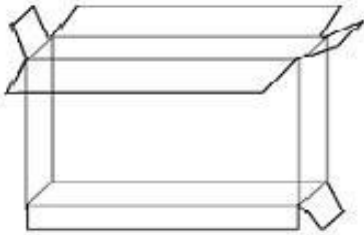
客户: 410

机种: 410006

制订日期: 2025/06/24

项次	*物料编码	*物料名称	物料类别.名称	*机型	规格型号	颜色	*计量单位.	用量	备注
1	410006-IA	成品		M3	贴合+焊接+组装+贴片	黑色	PCS	1	
1.1	410001-IA-01	上壳		M3	ABS黑色	黑色	PCS	1	
1.2	410001-IA-02	下壳		M3	ABS黑色	黑色	PCS	1	
1.3	410001-IA-03	PCB板		M3	绿色 电解铜 FR4 T=1.5MM	绿色	PCS	1	
1.4	410006-IA-04	顶针		M3		黑色	PCS	3	
1.5	410001-IA-05	FPC-GSM		M3	黑色 GSM-FPC 电解铜 半对半 镀镍	黑色	PCS	1	
1.7	410001-IA-07	FPC-DIV		M3	黑色 WIFI-FPC 电解铜 半对半 镀镍	黑色	PCS	1	
1.8	410001-IA-08	线材		M3	线材	黑色	PCS	3	
1.9	410001-IA-09	3M背胶		M3	3M 背胶	黑色	PCS	1	
1.1	410006-IA-10	组装		M3	贴合+焊接+组装		PCS	1	
2	410006-IB-RA	WIFI天线组件		M3	WIFI-FPC焊接同轴线+导通测试	黑色	PCS	1	
2.1	410006-IB-01-RA	FPC-WIFI		M3	黑色 WIFI-FPC 电解铜 半对半 OSP工艺 39.95*18.50*0.12MM	黑色	PCS	1	
2.1	410006-IB-02-RA	WIFI同轴线		M3	1代单头 直径1.13 黑色 1.13*90MM	黑色	PCS	1	
2.2	410006-IB-03-RA	焊接+导通测试		M3	焊接+导通测试		PCS	1	
确认:			审核:			制作: 郭前钱			

5.Packing Drawing

Packing mode diagram																
Product Name	Antenna															
Project Model	M3															
Packing Details	Carton size 1: 270*260*200MM Carton size 2: 260*200*200MM Carton Size 3: Depending on order quantity/volume															
	Packing method	Minimum package of 50 1 bags, waterproof bag in turn														
	Total Packing	Packing by order quantity														
Labeling Requirements	Label size 1: Universal 100*100mm label 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谷园区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谷园区2栋4楼4A	
	客户名称	*****														
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地址：深圳市光明新区光明大道南太云创谷园区2栋4楼4A																
Precautions 1. Due to the order quantity limit, the packing method of each item selects the box size according to the total order quantity or physical volume. 2. Storage temperature: normal temperature 3. Preservation conditions: stored in a cool and dry place																

(This figure is only a schematic diagram of packaging, which is subject to actual mass production.)

Shenzhen Address: 4 /F, Building 2, Taiyun Chuanggu, South Guangming Avenue, Guangming New District, Shenzhen