Product specification acknowledgment.

Shenzhen Maya antenna lab

R&D center in ShenZhen

The mobile communication terminal antenna

PRODUCT NAME **GQ3120**

CUSTOMER NAME 冠群

account party	Development party		
Customer acknowledges	Quality Department	R&D Department	approved by
		ME: RF:	
Date：	Date：		

Shenzhen Maya communication equipment Co., LTD
Site：A second floor, minqing road, minqing road, longhua street, baoan district, shenzhen city.
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1. aim

For the Production from shenzhen maya communication equipment co., LTD. That mobile communication terminal antenna product specifications and test methods for specification, avoid the test conditions, the error caused by different methods

Antenna debug design requirement frequency band.

Fre	BAND
2G	GSM900/850/1800/1900
3G	WCDMA1/2/4/5/8
4G	LTE-1-2-3-4-5-7-8-12-17-19-20-28-34-38-39-40-41-66
other	GPS/WIFI/BT NFC FM

3.Sky chart.

Mobile phone figure

MAIN The antenna

AUX The antenna

GPS/WIFI/BT The antenna

NFC The antenna

FM The antenna

4. Electrical

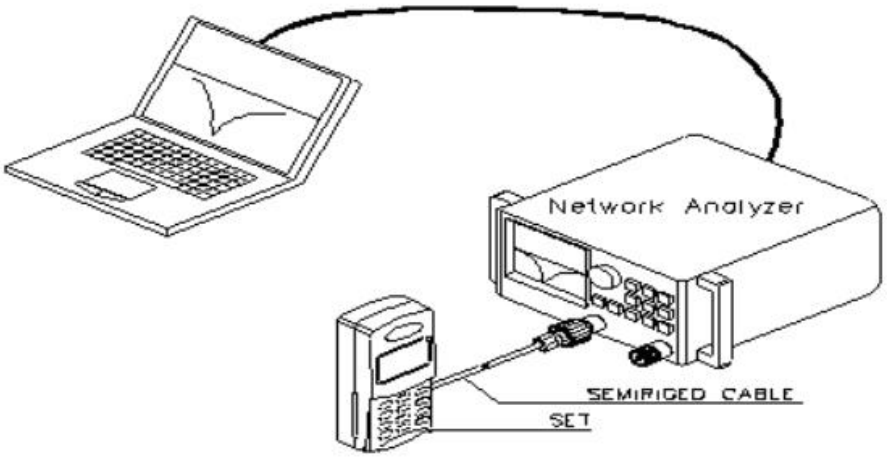
Test method description and data.

Device name	use
Vector Network Analyzer	S11/Impedance/ Passive Test
Agilent 8960 SP6010 R&S CMU200	**GSM, GPRS, EDGE, CDMA2000, 1xev-do, td-scdma, WCDMA, HSDPA mobile phone mobile communication equipment test.**
R&S CMW500 MT8820C	**Including td-scdma, WCDMA, HSDPA, LTE, WIFI, GPS mobile phone mobile communication equipment test.**
SP9500E	5G、SA、NSA
Agilent E4438C	**Test active GPS**
MVG Chamber	**Passive Test / OTA active Test / Efficiency/Gain**

4.2 Passive Test Report

Test equipment: network analyzer.

Test method: with a 50 ohm CABLE CABLE from the instrument test port is derived, using the calibration after a calibration mechanism of SMA connector, connecting hand records related to the frequency points corresponding return loss and standing wave ratio data.



测试示意图

4.3 Active Test Report

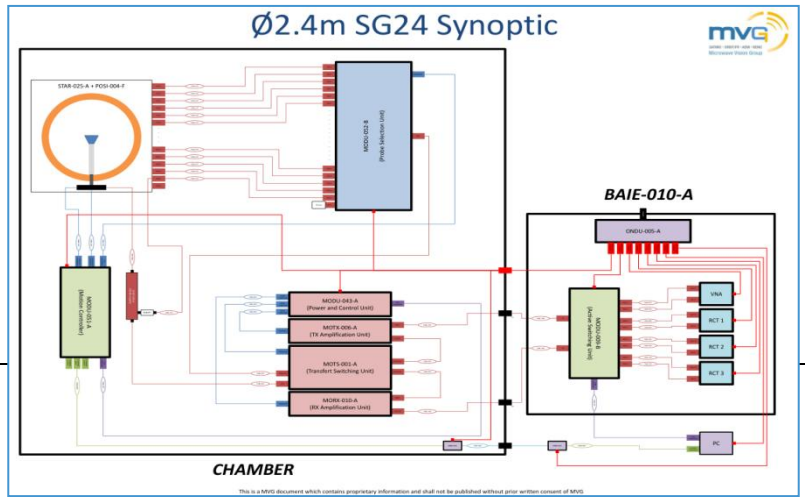
TRP/TIS

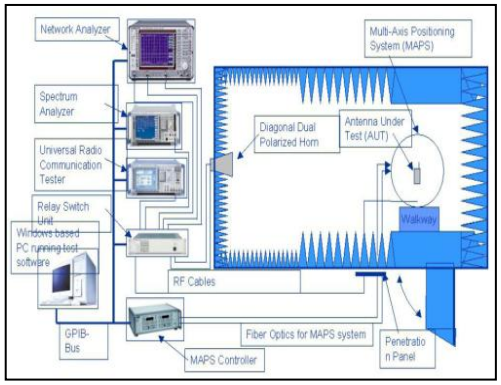
From testing tools, measuring, network analyzer, full waves far field ETS, French MVG SG24LT (Satmio) near field 3 d microwave dark room, the high precision positioning system and its controller and the computer with automatic test procedure test environment: the temperature of 22 ℃ + 3 ℃, humidity 60% plus or minus 60% test methods: Using EST or 24 lt Satimo system software Test method and calculation of TRP when tested TRP, DUT (Device Under Test) is in a state of maximum transmitted power, including three to choose channel Test, by positioning system control the location of the DUT, with 15 degrees for step length, measuring three dimensional space, the effective radiated power (EIRP) at various points through the average of the integral sphere, computation formula is as follows

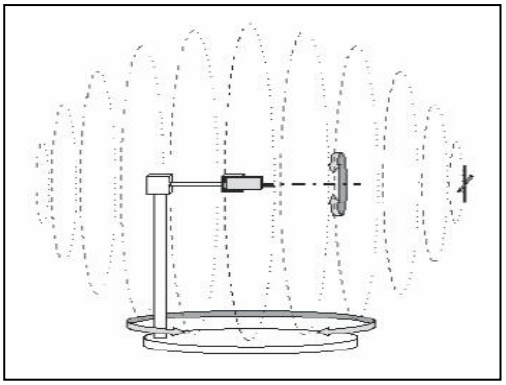
$$TRP \cong \frac{\pi}{2NM}\sum_{i=1}^{N-1}\sum_{j=0}^{M-1}\left[EiRP_{\theta}(\theta_i,\phi_j)+EiRP(\theta_i,\phi_j)\right]\sin(\theta_i)$$

In TIS test, the DUT at the maximum transmission power of the state, including three to choose channel test, by controlling the location of the DUT, at 30 degrees for the step length, measuring the three dimensional space each point receiving sensitivity, the average of the sphere by integral calculation, calculation formula is as follows:

$$TIS \cong \frac{}{\pi\sum_{i=}^{N\cdot}}$$




Network Analyzer
Multi-Axis Positioning System (MAPS)
Spectrum Analyzer
Diagonal Dual Polarized Horn
Antenna Under Test (AUT)
Universal Radio Communication Tester
Relay Switch Unit
Walkway
Windows based PC running test software
RF Cables
GPIB-Bus
Fiber Optics for MAPS system
Penetration Panel
MAPS Controller



4.4 Active Report.

标准	BAND	GSM900			DCS1800		
2G	CHANNEL	1	62	124	512	699	885
	TRP	28.43	28.51	28.47	25.57	25.69	25.74
	TIS			-101.15			-102.53
	BAND	GSM850			PCS1900		
	CHANNEL	128	192	251	512	661	810
	TRP	28.15	28.25	28.29	25.58	25.58	25.67
	TIS			-103.15			-102.57

标准	BAND	WCDMA-B1			WCDMA-B2		
3G	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	17.43	17.48	17.09	17.49	17.16	17.08
	TIS			-106.49			-106.46
	BAND	WCDMA-B4			WCDMA-B5		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	18.38	18.57	18.61	18.75	18.79	18.74
	TIS			-106.44			-106.08

标准	BAND	WCDMA-B8					
3G	CHANNEL	Low	Medium	High			
	TRP	18.38	18.58	18.42			
	TIS			-102.32			

标准	BAND	LTE-B1			LTE-B2		
4G	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	17.66	17.81	17.23	18.07	18.02	17.35
	TIS			-92.28			-94.04
	BAND	LTE-B3			LTE-B4		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	18.61	18.58	18.79	18.58	18.75	18.72
	TIS			-92.43			-93.34

标准	BAND	LTE-B5			LTE-B7		
4G	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	18.13	18.48	18.76	18.45	18.41	18.55
	TIS			-92.04			-90.24
	BAND	LTE-B8			LTE-B12		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	18.75	18.59	18.52	17.32	17.63	17.42
	TIS			-90.18			-91.45

标准	BAND	LTE-B17			LTE-B19		
4G	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	17.89	17.77	17.71	18.53	18.34	18.47
	TIS			-91.36			-90.02
	BAND	LTE-B20			LTE-B28		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	18.04	18.36	18.18	17.49	17.78	17.73
	TIS			-91.24			-91.38

标准	BAND	LTE-B34			LTE-B38		
4G	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	17.14	17.07	17.03	18.62	18.73	18.59
	TIS			-92.21			-90.9
	BAND	LTE-B39			LTE-B40		
	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	17.35	17.73	17.13	18.35	18.63	18.52
	TIS			-91.41			-92.09

标准	BAND	LTE-B41			LTE-B66		
4G	CHANNEL	Low	Medium	High	Low	Medium	High
	TRP	18.78	18.58	18.54	18.62	18.75	18.55
	TIS			-91.03			-94.48

标准	BAND	WiFi_B			WiFi_A		
WIFI	CHANNEL	L	M	H	L	M	H
	TRP	13.25	13.29	13.03	12.53	12.01	12.16
	TIS(亮屏)			-81.56			-71.52

GPS test

NFC test

Type1	4.5cm
Type2	4.0cm
Type3	3.5cm
Type4	2.2cm

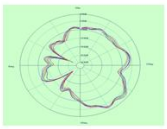
测试距离用的垫片

4.5 Passive Test Report.

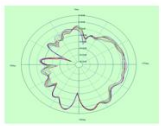
WIFI-2.4G Efficiency, Gain Passive pattern

Frequency(MHz)	Efficiency	Gain . dBi
2400	42.03%	4.098396
2410	42.49%	4.150819
2420	44.04%	4.401412
2430	46.50%	4.455896
2440	46.00%	4.127649
2450	46.28%	4.090329
2460	48.48%	4.072721
2470	49.55%	3.811522
2480	48.44%	3.566617
2490	48.63%	3.561086
2500	50.99%	3.766184

Azimuth 0°

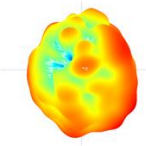


Azimuth 90°



H-Plane (Elevation 90°)

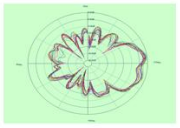
3D view Frequency
2450MHz



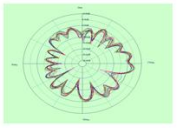
5.8G Efficiency, Gain Passive pattern

Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dBi
5.2E+09	31.12%	-5.06951	5.2E+09	5.136091
5.23E+09	29.79%	-5.25997	5.23E+09	4.999092
5.26E+09	30.52%	-5.15446	5.26E+09	5.17074
5.29E+09	30.80%	-5.11476	5.29E+09	5.114379
5.32E+09	30.00%	-5.22868	5.32E+09	4.663695
5.35E+09	28.81%	-5.40523	5.35E+09	4.271819
5.38E+09	30.05%	-5.22182	5.38E+09	4.437093
5.41E+09	32.12%	-4.93208	5.41E+09	5.125708
5.44E+09	34.31%	-4.64548	5.44E+09	5.851728
5.47E+09	33.64%	-4.73143	5.47E+09	6.00446
5.5E+09	33.94%	-4.69244	5.5E+09	6.345909
5.53E+09	34.40%	-4.63432	5.53E+09	6.723181
5.56E+09	34.32%	-4.64425	5.56E+09	6.519008
5.59E+09	30.09%	-5.21593	5.59E+09	5.841436
5.62E+09	28.28%	-5.48562	5.62E+09	5.520509
5.65E+09	27.38%	-5.62568	5.65E+09	5.173284
5.68E+09	28.57%	-5.44024	5.68E+09	5.096957
5.71E+09	27.39%	-5.62425	5.71E+09	4.958942
5.74E+09	28.25%	-5.48957	5.74E+09	5.198881
5.77E+09	30.55%	-5.15017	5.77E+09	5.584596
5.8E+09	31.31%	-5.04332	5.8E+09	5.916906

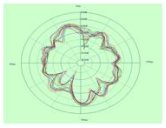
Azimuth 0°



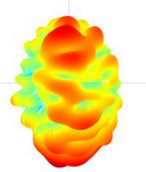
Azimuth 90°



H-Plane (Elevation 90°)



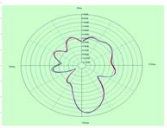
3D view Frequency
57200MHz



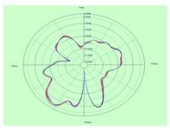
GPS Efficiency, Gain Passive pattern

Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB
1570000000	36.47%	-4.38026	1.57E+09	1.832582
1571000000	36.44%	-4.38442	1.57E+09	1.784087
1572000000	36.31%	-4.39947	1.57E+09	1.713411
1573000000	36.16%	-4.41799	1.57E+09	1.648478
1574000000	36.03%	-4.43347	1.57E+09	1.615132
1575000000	36.01%	-4.43534	1.58E+09	1.630306
1576000000	36.10%	-4.42551	1.58E+09	1.683617
1577000000	36.26%	-4.40546	1.58E+09	1.710203
1578000000	36.44%	-4.38452	1.58E+09	1.741191
1579000000	36.48%	-4.37893	1.58E+09	1.735676
1580000000	36.35%	-4.39483	1.58E+09	1.678513

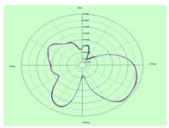
Azimuth 0°



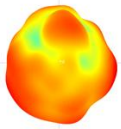
Azimuth 90°



H-Plane (Elevation 90°)



3D view Frequency
1575MHz

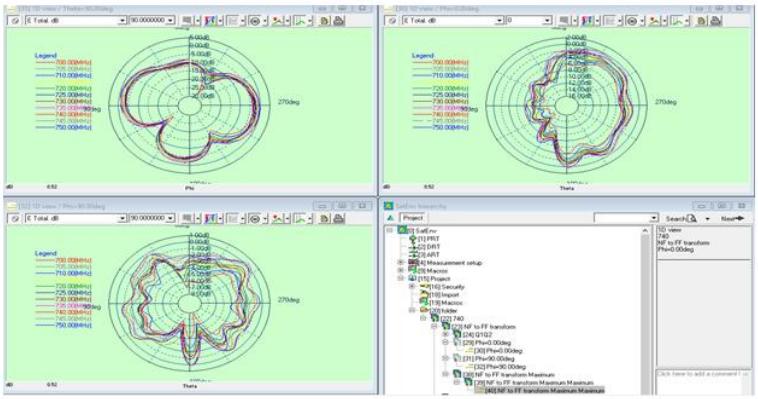


4G Efficiency, Gain Passive pattern

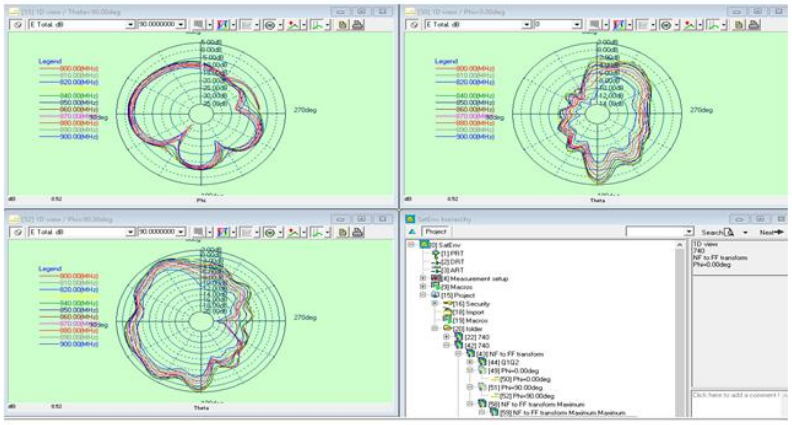
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB
700000000	25.68%	-5.90366	7E+08	-2.11248
705000000	34.59%	-4.61084	7.05E+08	-0.77926
710000000	29.72%	-5.26926	7.1E+08	-1.75193
715000000	40.07%	-3.97168	7.15E+08	-0.27125
720000000	32.36%	-4.90014	7.2E+08	-1.18399
725000000	44.78%	-3.48882	7.25E+08	0.130301
730000000	33.77%	-4.71464	7.3E+08	-0.51246
735000000	45.66%	-3.40441	7.35E+08	0.424271
740000000	33.85%	-4.70395	7.4E+08	-0.77146
745000000	43.85%	-3.58013	7.45E+08	0.016463
750000000	33.75%	-4.71711	7.5E+08	-0.73101

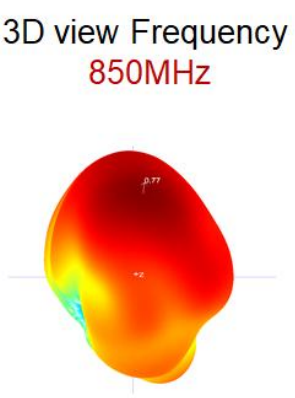
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB
800000000	26.32%	-5.79669	8E+08	0.874609
810000000	30.69%	-5.12942	8.1E+08	1.192965
820000000	34.91%	-4.57016	8.2E+08	1.675296
830000000	36.82%	-4.33922	8.3E+08	1.690285
840000000	36.19%	-4.41382	8.4E+08	1.518917
850000000	33.03%	-4.81152	8.5E+08	0.820184
860000000	29.19%	-5.34695	8.6E+08	0.267556
870000000	25.72%	-5.89724	8.7E+08	-0.36821
880000000	22.10%	-6.55627	8.8E+08	-1.05266
890000000	18.91%	-7.23272	8.9E+08	-1.69451
900000000	15.93%	-7.9767	9E+08	-2.40077

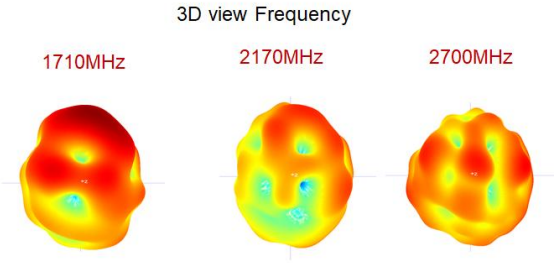
Frequency	Efficiency	Efficiency . dB	Frequency	Gain . dB
1710000000	35.42%	-4.50719	1.71E+09	0.705261
1759500000	34.64%	-4.60418	1.76E+09	0.486413
1809000000	28.78%	-5.40878	1.81E+09	-0.36986
1858500000	25.94%	-5.86005	1.86E+09	-0.56019
1908000000	20.51%	-6.87993	1.91E+09	-0.98161
1957500000	22.44%	-6.48901	1.96E+09	0.544992
2007000000	23.40%	-6.30754	2.01E+09	0.05658
2056500000	25.03%	-6.01598	2.06E+09	2.124663
2106000000	24.69%	-6.07405	2.11E+09	2.008329
2155500000	23.38%	-6.3118	2.16E+09	0.803333
2205000000	25.02%	-6.01735	2.21E+09	0.456327
2254500000	26.16%	-5.82414	2.25E+09	0.322838
2304000000	24.49%	-6.10964	2.3E+09	0.516292
2353500000	26.38%	-5.78803	2.35E+09	1.519998
2403000000	31.42%	-5.02845	2.4E+09	1.485548
2452500000	35.97%	-4.44084	2.45E+09	2.366774
2502000000	40.49%	-3.92684	2.5E+09	2.777491
2551500000	39.23%	-4.06364	2.55E+09	2.074438
2601000000	35.55%	-4.49217	2.6E+09	2.101123
2650500000	32.81%	-4.83972	2.65E+09	2.3216
2700000000	32.73%	-4.85076	2.7E+09	2.192779



3D view Frequency
725MHz

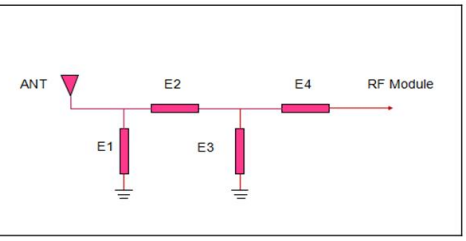



3D view Frequency
850MHz


3D view Frequency
1710MHz
2170MHz
2700MHz

5. Matching Circuit

主天线设计: main antenna design	
元件 Element	值 Value
C101(0201):	NC
R102(0201):	0欧
C102(0201):	9.1nH
R103(0201):	0欧



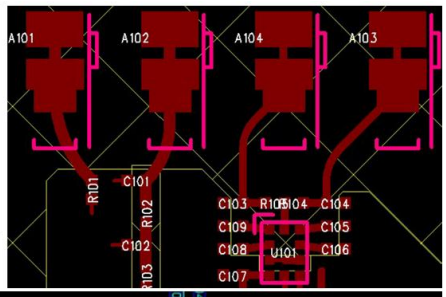
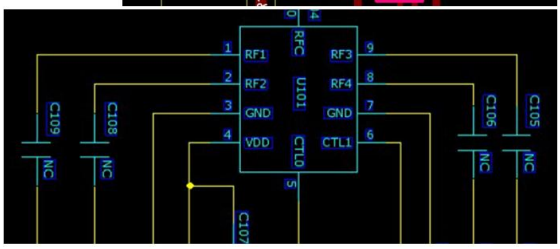
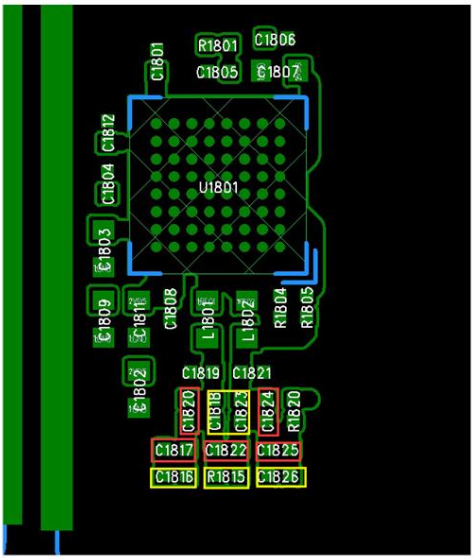


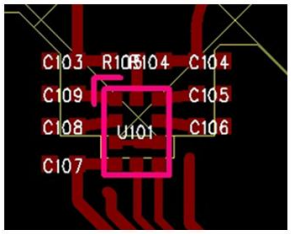
Figure:
C101/C106/C108-NC，R101/R102/R103/R105/C109-0欧姆，
C105-5.1nH，C103-27nH。
A103弹片去除。

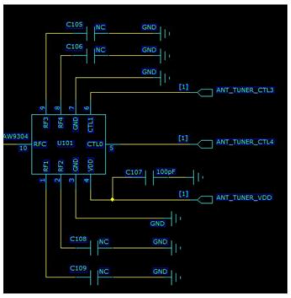


元件 Element	值 Value
C1820/C1824(0201):	180pF
C1817/C1825(0201):	220pF
C1822(0201):	NC
C1818/1823(0201):	NC
C1816/C1826(0201):	NC
R1815(0201):	NC



RF开关通路	匹配	控制频段
RF1(C109)	0欧姆	GSM:900/1800/1900 WCDMA:B1/2/4/8 LTE:B1/2/3/4/7/8/34/38/39/40/41/66
RF2(C108)	NC	LTE:B12/17/28
RF3(C105)	5.1nH	GSM:850 WCDMA:B5 LTE : B5/19/20
RF4(C106)	NC	/





6.Environmental treatment

Figure: The red box is grounded with conductive cloth.

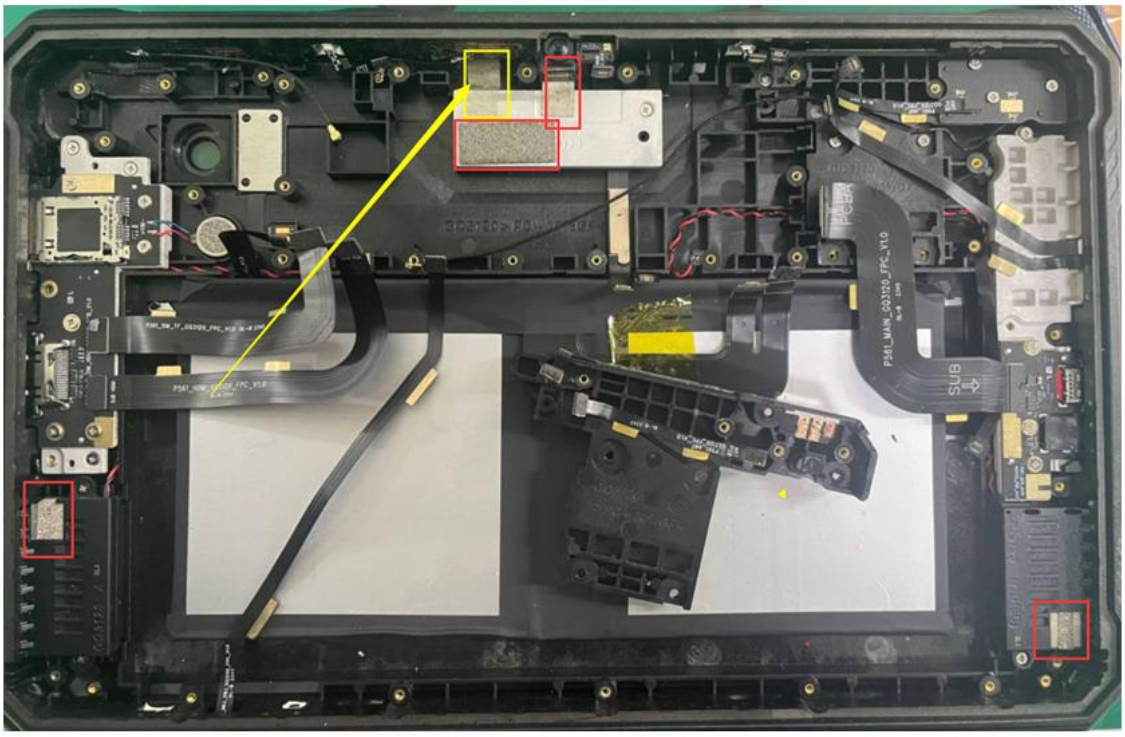
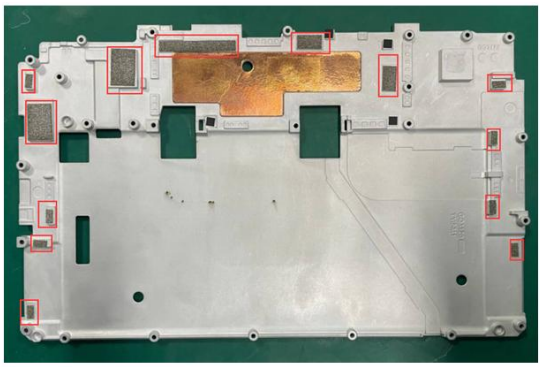
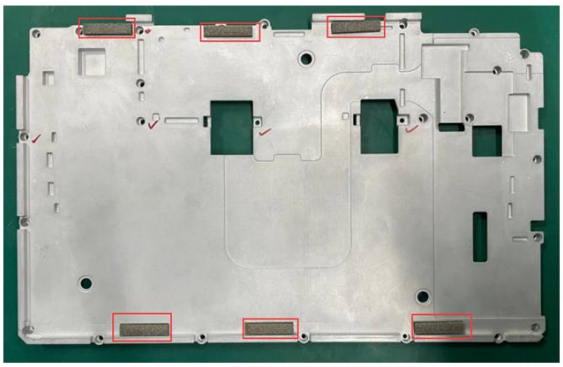


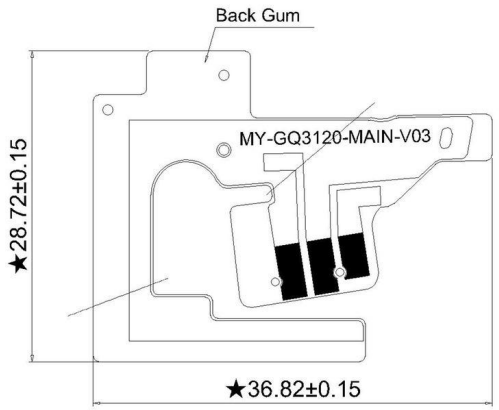
Figure: The motherboard is grounded with a conductive sponge.





7. Structural drawings

File number:QWRE-3023-429-IA-31-A



图档审核会签栏

电子	DQE	项目经理	高级结构经理	项目副总监	项目总监
日 期	日 期	日 期	日 期	日 期	日 期

NOTE:
. The welding position of the antenna is firm and the cable size is accurate. Compare with the engineering sample.
. Mark ★ as the key dimension. If the tolerance is not indicated. The general tolerance shall prevail
. The finished product must be 100% conduction test OK. The finished product must be 100% full inspection OK
. Joint tension SMA 3kg, IPEX:1.2KG , solder height ≤ 2.0
. The surface shall be free from oxidation, notch, dirty spot, oil stain, etc. The wire rod shall be clean and the outer skin shall be free from damage
. Adopt environmental protection process

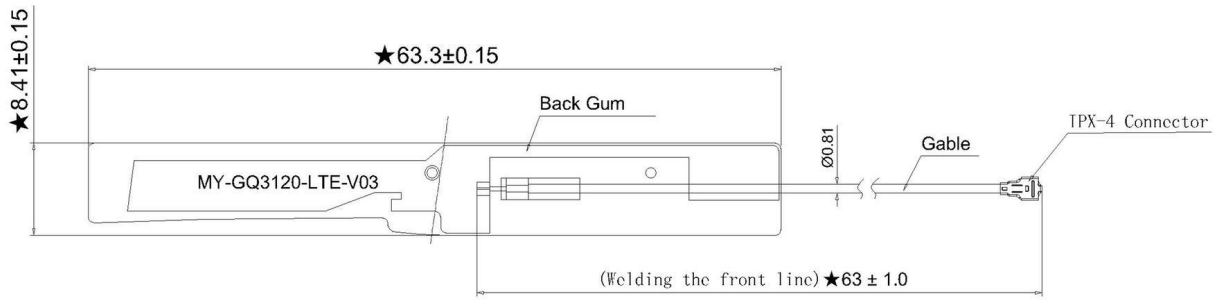
Date	Modify the content	Version	Revised

ShenZhen MaYa Communication Equipment Co.,Ltd.

0~10	±0.10	0.02
10~20	±0.12	Ø0.03
20~40	±0.15	0.02
40~50	±0.20	0.04
		0.02

Machine phone	GQ3120	Date	2024-01-26
Product name	FPC antenna (MAIN)	design	SimonLi
Material number		audit	ME
Material	FPC+Gable		RF
Mold surface treatment		Confirmation	
Appearance treatment		Department (mm) Proportion	FIT Version R:A

File number:QWRE-3023-429-IB-A



图档审核会签栏

电子	DQE	项目经理	高级结构经理	项目副总监	项目总监
日 期	日 期	日 期	日 期	日 期	日 期

NOTE:
. The welding position of the antenna is firm and the cable size is accurate. Compare with the engineering sample.
. Mark ★ as the key dimension. If the tolerance is not indicated. The general tolerance shall prevail
. The finished product must be 100% conduction test OK. The finished product must be 100% full inspection OK
. Joint tension SMA 3kg, IPEX:1.2KG , solder height ≤ 2.0
. The surface shall be free from oxidation, notch, dirty spot, oil stain, etc. The wire rod shall be clean and the outer skin shall be free from damage
. Adopt environmental protection process

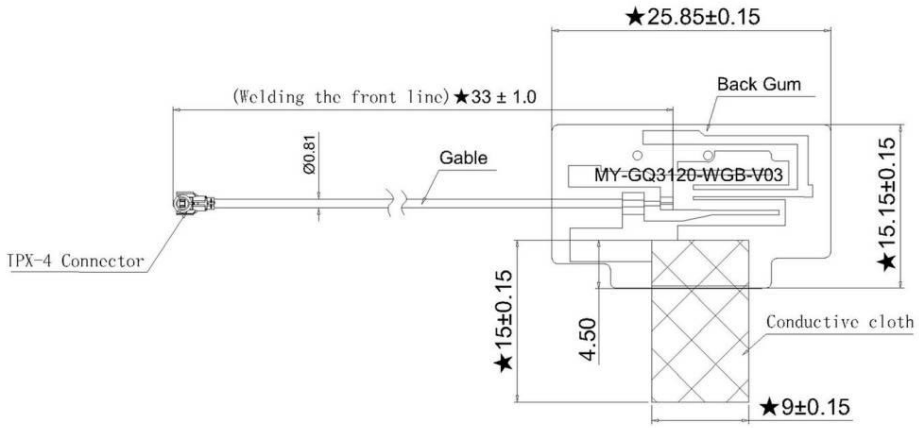
Date	Modify the content	Version	Revised

ShenZhen MaYa Communication Equipment Co.,Ltd.

位置 Position		
0~10	±0.10	0.02
10~20	±0.12	Ø0.03
20~40	±0.15	0.02
40~50	±0.20	0.04
		0.02

Machine phone	GQ3120	Date	2024-01-26
Product name	FPC antenna (LTE)	design	SimonLi
Material number		audit	ME
Material	FPC+Gable		RF
Mold surface treatment		Confirmation	
Appearance treatment		Department (mm)	Proportion FIT Version R:A

File number:QWRE-3023-429-IC-A



图档审核会签栏

电子	DQE	项目经理	高级结构经理	项目副总监	项目总监
日 期	日 期	日 期	日 期	日 期	日 期

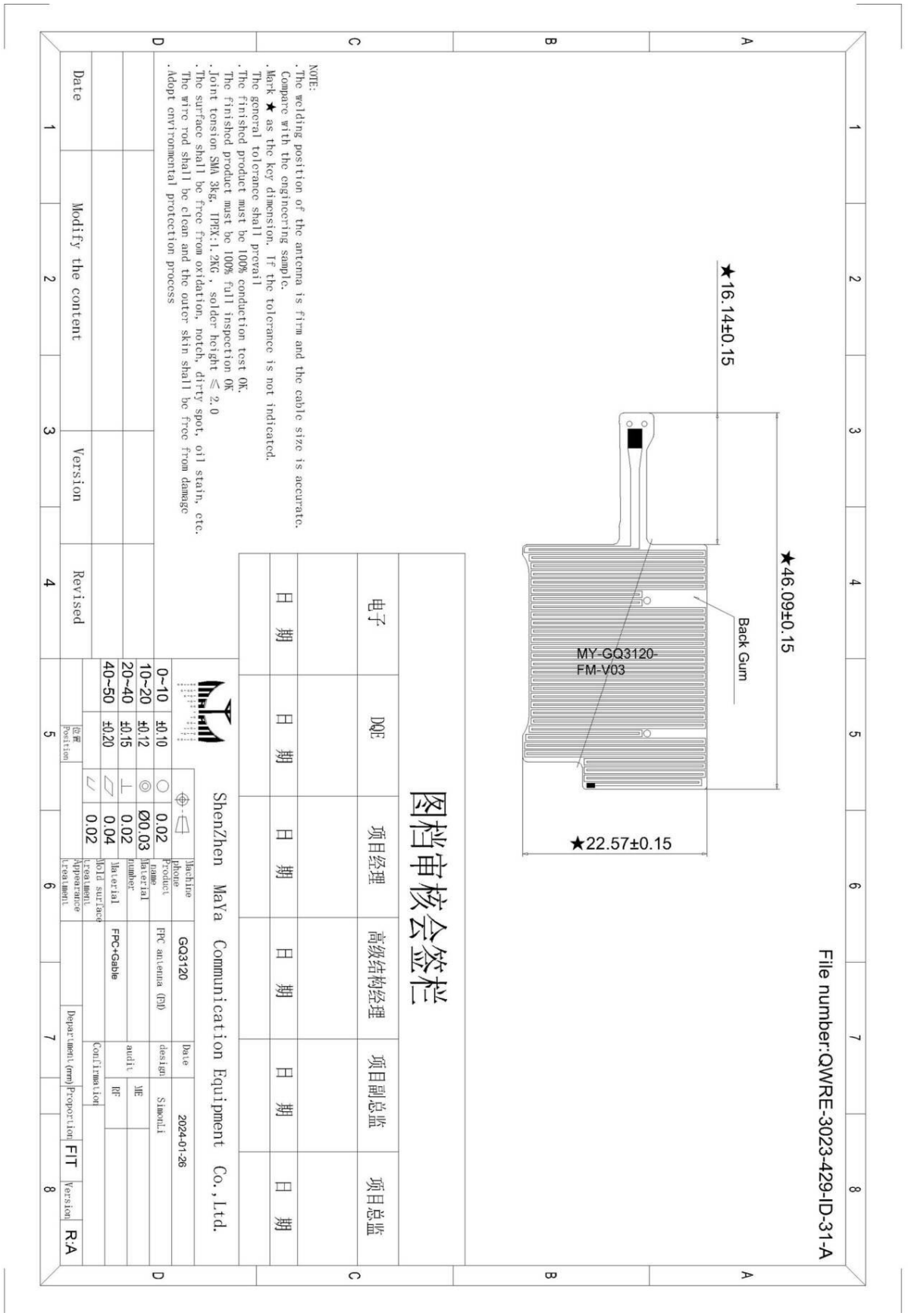
NOTE:
. The welding position of the antenna is firm and the cable size is accurate. Compare with the engineering sample.
. Mark ★ as the key dimension. If the tolerance is not indicated. The general tolerance shall prevail
. The finished product must be 100% conduction test OK. The finished product must be 100% full inspection OK
. Joint tension SMA 3kg, IPEX:1.2KG , solder height ≤ 2.0
. The surface shall be free from oxidation, notch, dirty spot, oil stain, etc. The wire rod shall be clean and the outer skin shall be free from damage
. Adopt environmental protection process

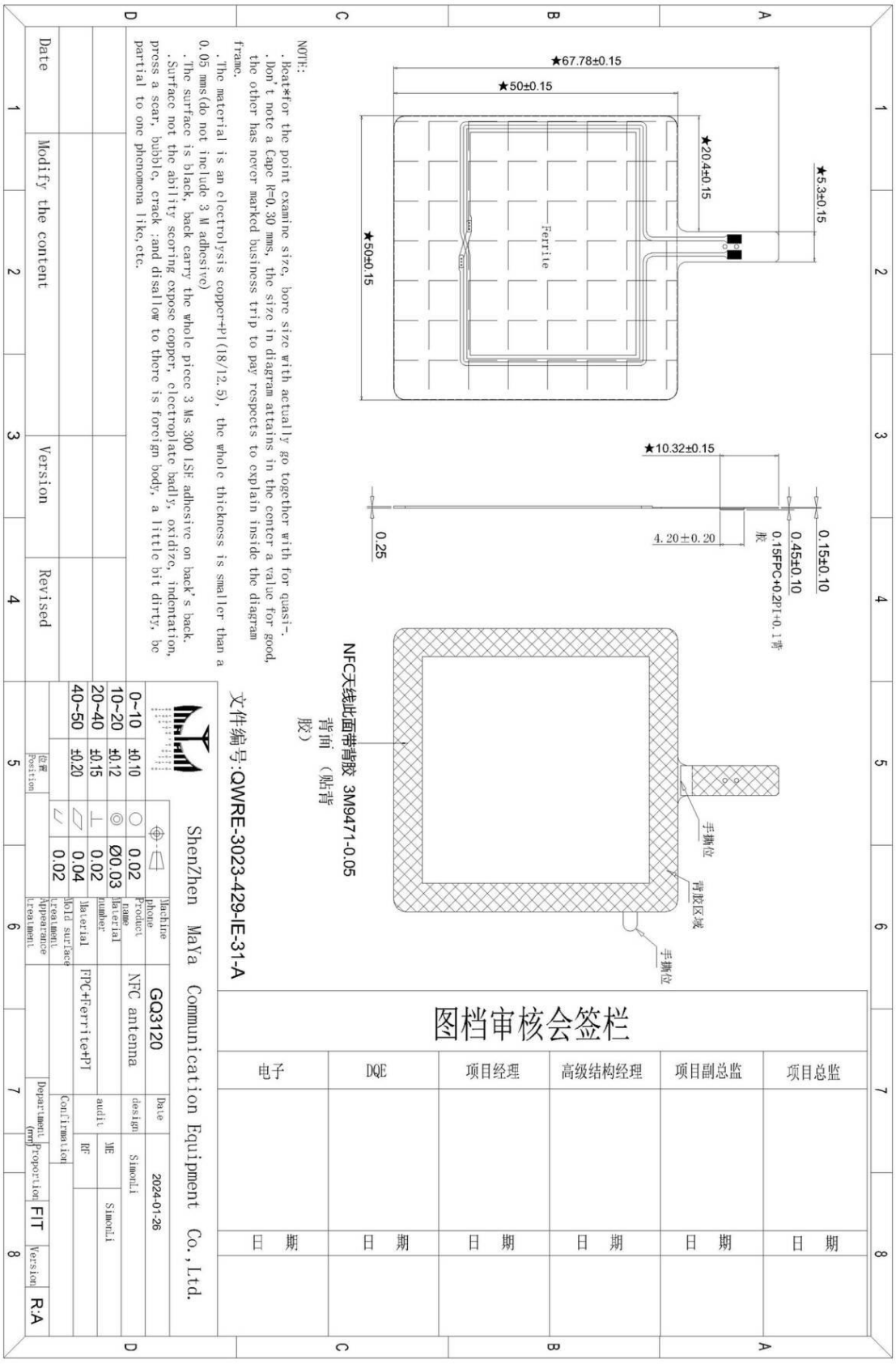
Date	Modify the content	Version	Revised

ShenZhen MaYa Communication Equipment Co.,Ltd.

位置 Position		
0~10	±0.10	0.02
10~20	±0.12	Ø0.03
20~40	±0.15	0.02
40~50	±0.20	0.04
		0.02

Machine phone	GQ3120	Date	2024-01-26
Product name	FPC antenna (WGB)	design	SimonLi
Material number		audit	ME
Material	FPC+Gable		RF
Mold surface treatment		Confirmation	
Appearance treatment		Department (mm)	Proportion FIT Version R:A


★16.14±0.15
★46.09±0.15
Back Gum
MY-GQ3120-
FM-V03
★22.57±0.15
File number:QWRE-3023-429-ID-31-A
NOTE:
. The welding position of the antenna is firm and the cable size is accurate. Compare with the engineering sample.
. Mark ★ as the key dimension. If the tolerance is not indicated.
. The general tolerance shall prevail
. The finished product must be 100% conduction test OK.
. The finished product must be 100% full inspection OK
. Joint tension SHA 3kg, TPEX:1.2KG , solder height ≤ 2.0
. The surface shall be free from oxidation, notch, dirty spot, oil stain, etc.
. The wire rod shall be clean and the outer skin shall be free from damage
. Adopt environmental protection process
Modify the content
Version
Revised
Date
图档审校会签栏
电子
DQE
项目经理
高级结构经理
项目副总监
项目总监
日 期
ShenZhen MaYa Communication Equipment Co.,Ltd.
Machine phone
GQ3120
Date
2024-01-26
Product name
FPC antenna (FU)
design
Simonli
Material number
audit
ME
RF
FPC+Gable
Mold surface treatment
Appearance treatment
Confirmation
Department
Proportion
FIT
Version
R:A
Position
0~10 ±0.10
10~20 ±0.12
20~40 ±0.15
40~50 ±0.20
0.02
Ø0.03
0.02
0.04
0.02



NOTE:
. Beat*for the point examine size, bore size with actually go together with for quasi-.
. Don't note a Cape R=0.30 mms, the size in diagram attains in the conter a value for good, the other has never marked business trip to pay respects to explain inside the diagram frame.
. The material is an electrolysis copper+PI(18/12.5), the whole thickness is smaller than a 0.05 mms(do not include 3 M adhesive)
. The surface is black, back carry the whole piece 3 Ms 300 LSF adhesive on back's back.
. Surface not the ability scoring expose copper, electroplate badly, oxidize, indentation, pross a scar, bubble, crack ;and disallow to there is foreign body, a little bit dirty, be partial to one phenomena like,etc.

Date	Modify the content	Version	Revised

文件编号:QWRE-3023-429-IE-31-A

ShenZhen MaYa Communication Equipment Co.,Ltd.

Machine phone		Date	2024-01-26		
Product name	NFC antenna	design	Simon.Li		
Material number	GQ3120	audit	ME	Simon.Li	
Material	FPC+Ferrite+PI		RF		
Mold surface treatment		Confirmation			
Appearance treatment		Department (mm)	Proportion	FIT	Version R:A

位置 Position		
0~10	±0.10	0.02
10~20	±0.12	Ø0.03
20~40	±0.15	0.02
40~50	±0.20	0.04
		0.02

图档审核会签栏

电子	DQE	项目经理	高级结构经理	项目副总监	项目总监
日 期	日 期	日 期	日 期	日 期	日 期