SWARD

Sward Antenna Report

Customer：Estone Technology

Project：MS100-10 inch plastic shell-meg SLM900A0-64Q8 module

Report Date：2023.04.21

Building B, Hexi Hangcheng Industrial Zone, No. 135 Qianjin No. 2 Road, Baoan District, Shenzhen

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Project Introduction

1.Resume

Antennas	Type
5	4G tablet
Shell Material：10-inch plastic shell	

2.Description

Num.	Function	Frequency Band / MHz	Material / Structure
1	4G MAIN	GSM 850/1900 WCDMA 2100/1900/1700/850 B 2/4/5/7/12/13/14/25/26/41	FPC
2	4G AUX	LTE-B 2/4/5/7/12/13/14/25/26/41	FPC
3	WIFI&BT	2400MHz/2500MHz	FPC
4	5Gwifi	5GHz/5.8GHz	FPC
5	GPS	1560MHz/1580MHz	Ceramics

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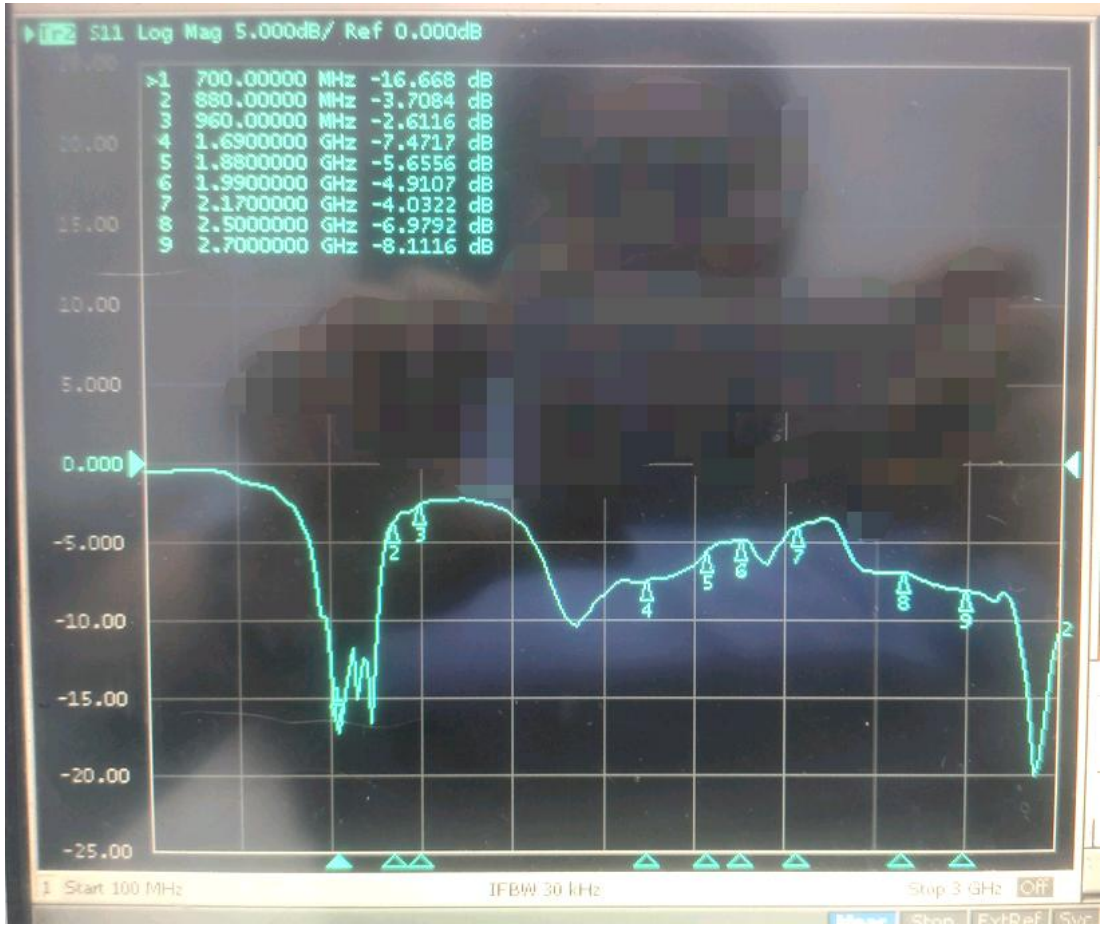
2G&3G&4G Antenna S11



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3G & 4G antenna active data

频段	3G CH	TRP	TIS	频段	4G CH	TRP	TIS	频段	4G CH	TRP	TIS
WCDMA -2100				LTE-B2	18650	18.34		LTE-B13			
					18900	18.59			23230	17.74	-88.58
					19150	18.35	-92.13				
	Avg				Avg				Avg		
WCDMA -1900	9662	18.4		LTE-B4	20000	16.84		LTE-B14			
	9800	18.13			20175	17.12					
	9938	18.32	-103.82		20350	17.48	-87.25				
	Avg				Avg				Avg		
WCDMA -850	4357	17.9		LTE-B5	20450	18.62		LTE-B25	26090	18.23	
	4410	17.59			20525	18.28			26365	18.45	
	4458	16.73	-102.46		20600	18.35	-92.28		26640	18.57	-91.19
	Avg				Avg				Avg		
WCDMA -1700	1312	15.88		LTE-B7	20800	18.17		LTE-B26	26740	18.31	
	1413	16.11			21100	17.26			26865	18.24	
	1513	16.03	-94.85		21400	16.78	-92.51		26990	18.17	-88.71
	Avg				Avg				Avg		
GSM 850	1312	28.73		LTE-B12	20800	18.12		LTE-B41			
	1413	28.73			21100	18.37					
	1513	28.32	-		21400	18.33	-88.66				
	Avg				Avg				Avg		

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2G & 3G & 4G efficiency test

Passive Test For 680-960						
Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
680	39.51	-4.03	-0.44	-2.59	-0.44	-14.89
700	40.94	-3.88	-0.48	-2.63	-0.48	-16.57
720	46.87	-3.29	0.18	-1.97	0.18	-17.48
740	39.3	-4.06	-0.66	-2.81	-0.66	-13.03
760	37.85	-4.22	0.28	-1.87	0.28	-15.16
780	41.05	-3.87	1.63	-0.52	1.63	-17.04
800	30.71	-5.13	1.03	-1.12	1.03	-19.78
820	36.47	-4.38	1.81	-0.34	1.81	-18.04
840	29.4	-5.32	0.67	-1.48	0.67	-20.62
860	23.37	-6.31	-0.62	-2.77	-0.62	-25.22
880	18.27	-7.38	-2.09	-4.24	-2.09	-23.42
900	16.26	-7.89	-2.71	-4.86	-2.71	-25.37
920	14.89	-8.27	-3.5	-5.65	-3.5	-23.49
940	10.81	-9.66	-5.26	-7.41	-5.26	-17.98
960	8.43	-10.74	-6.3	-8.45	-6.3	-20.54

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2G & 3G & 4G efficiency test

Passive Test For 1710-2690						
Freq (MHz)	Effi (%%)	Effi (dB)	Gain (dBi)	Gain (dBd)	Max (dB)	Min (dB)
1700	47.02	-3.28	0.65	-1.5	0.65	-12.52
1720	42.05	-3.76	-0.1	-2.25	-0.1	-13.04
1740	56.52	-2.48	1.4	-0.75	1.4	-17.54
1760	51.56	-2.88	1.59	-0.56	1.59	-21.09
1780	40.83	-3.89	0.44	-1.71	0.44	-18.05
1800	40.49	-3.93	-0.15	-2.3	-0.15	-13.98
1820	53.46	-2.72	1.21	-0.94	1.21	-11.54
1840	53.14	-2.75	1.36	-0.79	1.36	-12.5
1860	50.58	-2.96	0.89	-1.26	0.89	-16.97
1880	57.34	-2.42	1.67	-0.48	1.67	-24.19
1900	52.36	-2.81	1.54	-0.61	1.54	-18.85
1920	48.4	-3.15	1.08	-1.07	1.08	-19.56
1940	57.48	-2.4	1.56	-0.59	1.56	-18.12
2040	49.33	-3.07	0.27	-1.88	0.27	-14.84
2060	37.68	-4.24	-1.06	-3.21	-1.06	-15.36
2080	35.56	-4.49	-0.77	-2.92	-0.77	-16.54
2100	32.14	-4.93	-0.83	-2.98	-0.83	-16.23
2120	21.79	-6.62	-2.64	-4.79	-2.64	-18.05
2140	23.3	-6.33	-2.06	-4.21	-2.06	-15.51
2160	26.08	-5.84	-1.18	-3.33	-1.18	-13.39
2200	18.82	-7.25	-3.05	-5.2	-3.05	-22.01
2220	22.72	-6.44	-2.22	-4.37	-2.22	-17.07
2240	24.35	-6.14	-1.9	-4.05	-1.9	-18.15
2260	20.32	-6.92	-1.15	-3.3	-1.15	-14.14
2280	23.35	-6.32	-0.03	-2.18	-0.03	-18.39
2300	32.4	-4.89	1.03	-1.12	1.03	-17.79
2320	29.01	-5.37	0.05	-2.1	0.05	-15.59
2340	29.19	-5.35	-0.04	-2.19	-0.04	-14.84
2360	37.4	-4.27	1.23	-0.92	1.23	-13.34
2380	31.72	-4.99	0.32	-1.83	0.32	-13.59
2400	29.57	-5.29	0.12	-2.03	0.12	-16.56
2420	31.24	-5.05	0.36	-1.79	0.36	-18
2440	33.29	-4.78	0.89	-1.26	0.89	-17.96
2460	31.11	-5.07	0.72	-1.43	0.72	-16.33
2480	26.65	-5.74	0.08	-2.07	0.08	-16.63
2500	35.7	-4.47	1.44	-0.71	1.44	-16.69
2520	37.07	-4.31	1.75	-0.4	1.75	-18.72
2540	31.4	-5.03	0.78	-1.37	0.78	-18.34
2560	36.92	-4.33	0.96	-1.19	0.96	-17.86
2580	35.59	-4.49	0.38	-1.77	0.38	-17.5
2600	29.55	-5.29	-0.74	-2.89	-0.74	-18.36
2620	31.71	-4.99	-0.63	-2.78	-0.63	-15.95
2640	34.69	-4.6	0.4	-1.75	0.4	-13.48
2660	30.29	-5.19	0.46	-1.69	0.46	-13.33
2680	29.23	-5.34	0.25	-1.9	0.25	-14.75
2700	34.49	-4.62	0.99	-1.16	0.99	-15.54

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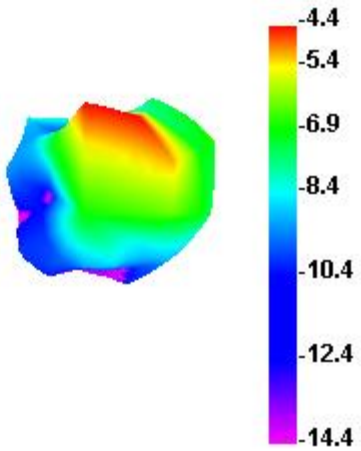
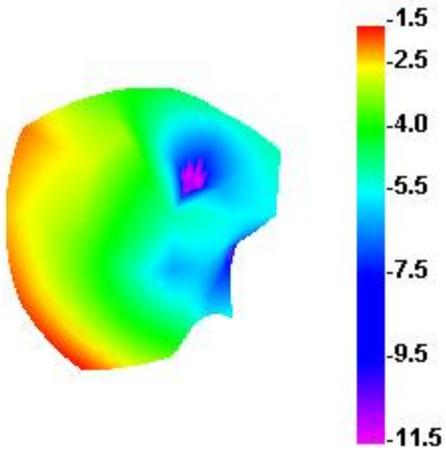
2G & 3G & 4G efficiency test

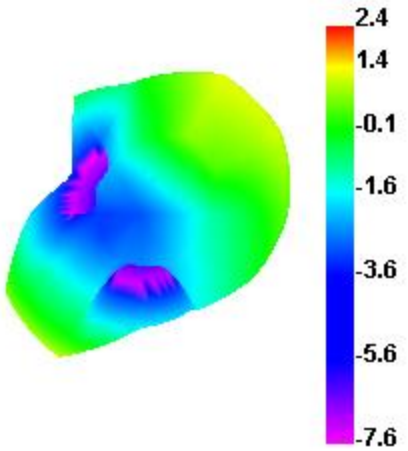
700.000MHz



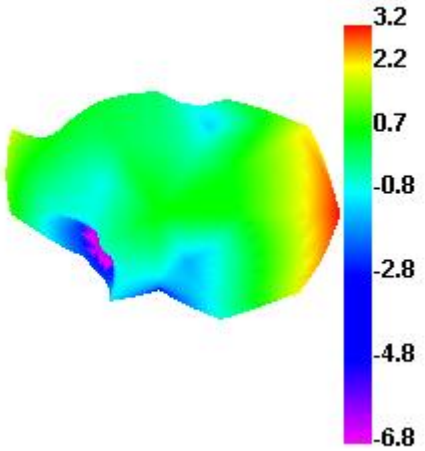
830.000MHz



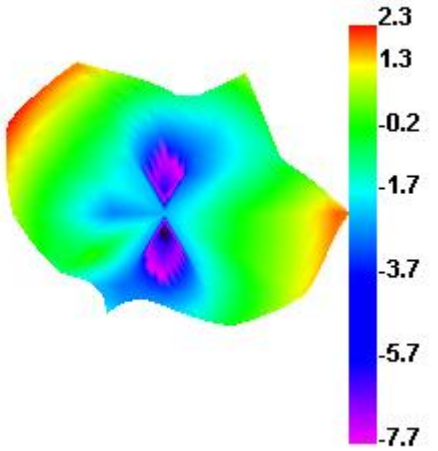
960.000MHz



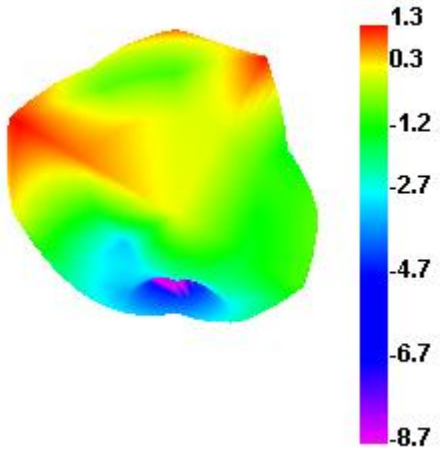
1700.000MHz



1865.000MHz



2100.000MHz



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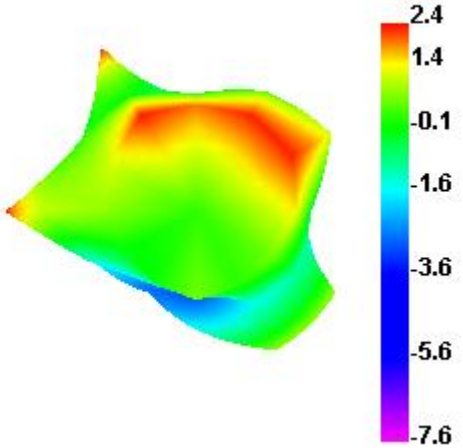
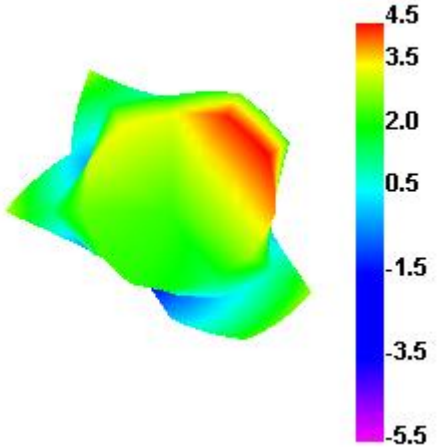
2G & 3G & 4G efficiency test

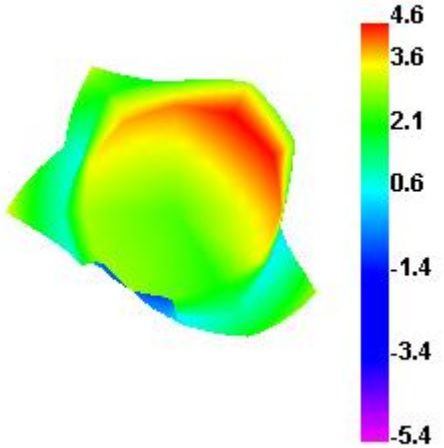
2500.000MHz



2570.000MHz



2620.000MHz



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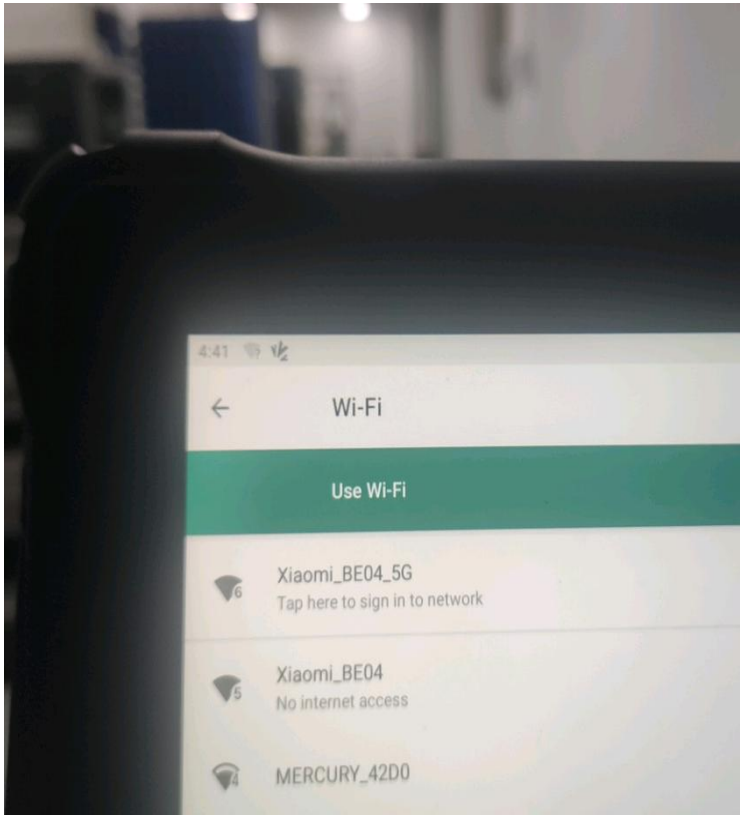
WIFI antenna signal strength measured picture



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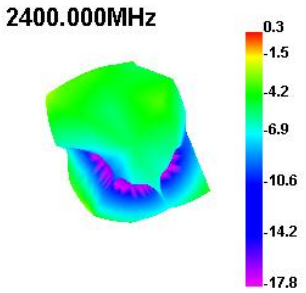
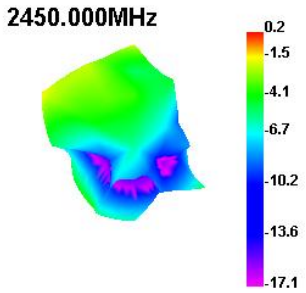
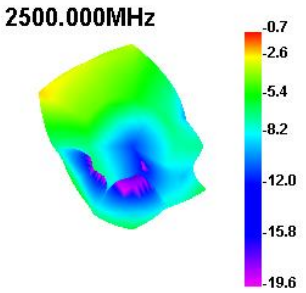
Antenna 2.4G Efficiency

Passive Test For 2.4Gwifi								
Freq	Effi	Effi	Gain	Gain	UHIS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
2400	26.63	-5.75	0.31	-1.84	11.441	15.186	0.31	-17.82
2410	26.18	-5.82	-0.24	-2.39	11.272	14.907	-0.24	-19.76
2420	26.38	-5.79	-0.38	-2.53	11.421	14.962	-0.38	-21
2430	26.26	-5.81	-0.31	-2.46	11.589	14.675	-0.31	-19.45
2440	25.8	-5.88	-0.17	-2.32	11.67	14.131	-0.17	-17.23
2450	26.39	-5.79	0.18	-1.97	12.071	14.319	0.18	-17.07
2460	25.59	-5.92	0.08	-2.07	11.854	13.732	0.08	-19.23
2470	23.97	-6.2	-0.29	-2.44	11.203	12.765	-0.29	-22.76
2480	23.73	-6.25	-0.41	-2.56	11.217	12.515	-0.41	-23.44
2490	24.75	-6.06	-0.34	-2.49	11.71	13.045	-0.34	-20.13
2500	23.16	-6.35	-0.66	-2.81	10.984	12.171	-0.66	-19.56







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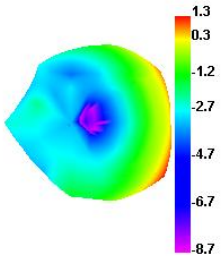
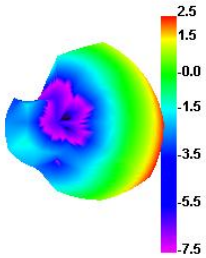
Antenna 5G Efficiency

Passive Test For 5Gwifi								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHIS (%)	DHIS (%)	Max (dB)	Min (dB)
5000	32.61	-4.87	1.34	-0.81	14.62	17.988	1.34	-20.27
5100	34.51	-4.62	1.53	-0.62	15.551	18.961	1.53	-17.67
5200	36.95	-4.32	1.47	-0.68	16.923	20.022	1.47	-16.54
5300	34.95	-4.57	1.1	-1.05	15.568	19.386	1.1	-20.24
5400	45.56	-3.41	2.26	0.11	20.15	25.405	2.26	-14.15
5500	42.73	-3.69	2.46	0.31	18.887	23.839	2.46	-15.03
5600	46.18	-3.36	2.38	0.23	20.05	26.133	2.38	-17.86
5700	46.5	-3.33	2.63	0.48	18.848	27.649	2.63	-14.84
5800	45.86	-3.39	2.78	0.63	18.598	27.262	2.78	-16.6
5900	37.39	-4.27	1.94	-0.21	15.635	21.759	1.94	-15.83
6000	41.12	-3.86	1.87	-0.28	17.819	23.301	1.87	-17.7

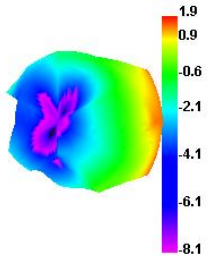
5000.000MHz



5500.000MHz



6000.000MHz



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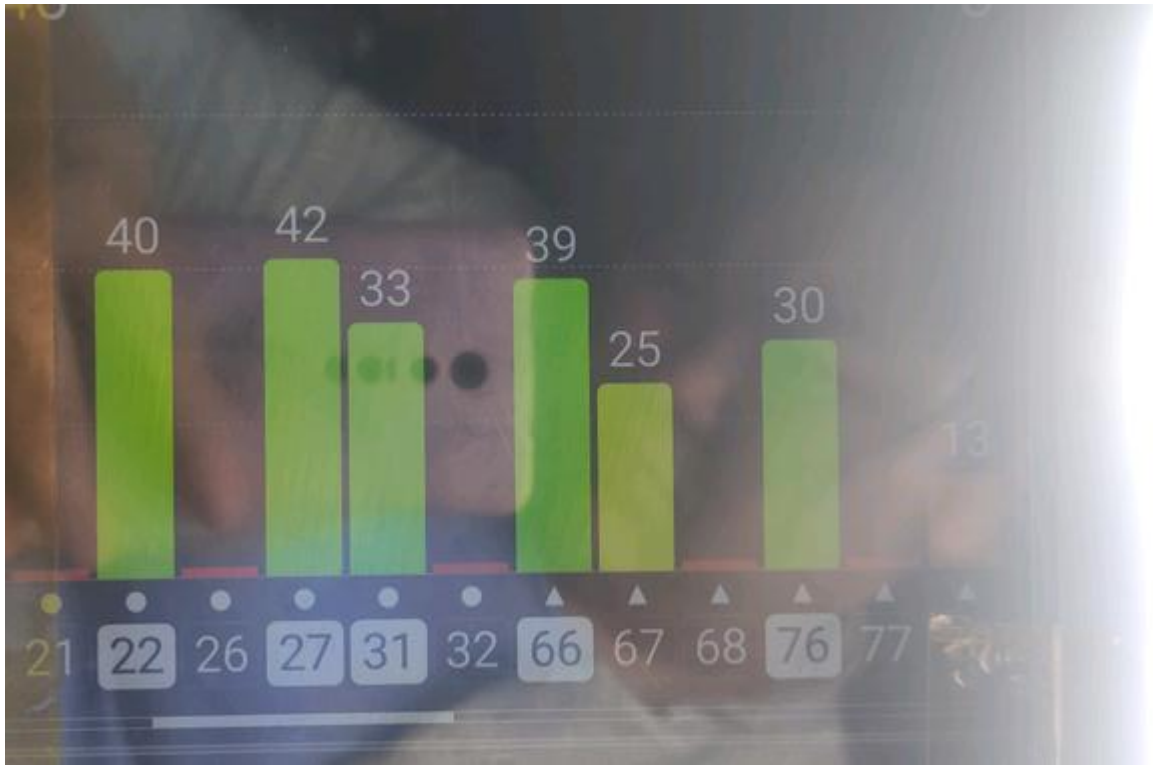
Measured Data of GPS



Test Location : Roof of Sward
Test Time : 9:30-10:00
Test Direction : 10-15 meters
Cold start Positioning : < 60s

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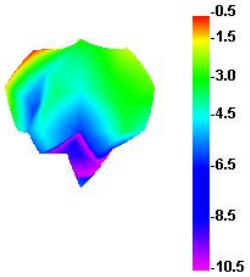
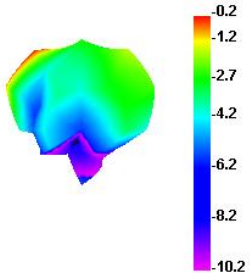
Antenna GPS Efficiency

Passive Test For GPS2								
Freq	Effi	Effi	Gain	Gain	UHIS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
1570	21.21	-6.74	-0.5	-2.65	8.302	12.905	-0.5	-17.37
1571	21.86	-6.6	-0.36	-2.51	8.548	13.315	-0.36	-16.8
1572	22.31	-6.51	-0.3	-2.45	8.728	13.585	-0.3	-16.57
1573	22.62	-6.45	-0.25	-2.4	8.868	13.754	-0.25	-16.74
1574	22.74	-6.43	-0.23	-2.38	8.933	13.808	-0.23	-16.95
1575	22.77	-6.43	-0.22	-2.37	8.94	13.827	-0.22	-17
1576	22.7	-6.44	-0.25	-2.4	8.958	13.746	-0.25	-17.5
1577	22.6	-6.46	-0.27	-2.42	8.925	13.671	-0.27	-17.77
1578	22.49	-6.48	-0.29	-2.44	8.893	13.593	-0.29	-17.94
1579	22.26	-6.52	-0.37	-2.52	8.833	13.43	-0.37	-18.38
1580	21.99	-6.58	-0.46	-2.61	8.755	13.235	-0.46	-18.36

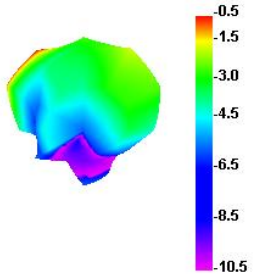
1570.000MHz



1575.000MHz



1580.000MHz



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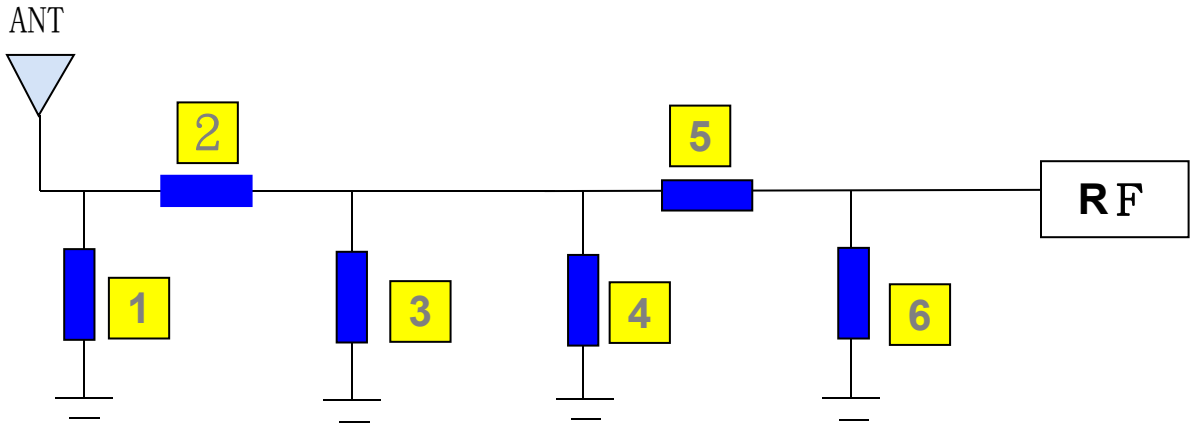
Antenna Matching Network



Antenna matching has not been changed.

Main Ant	1	2	3	4	5	6	Remarks
Original Match	-	-	-	-	-	-	-
Changed Match	-	-	-	-	-	-	-

Notes:

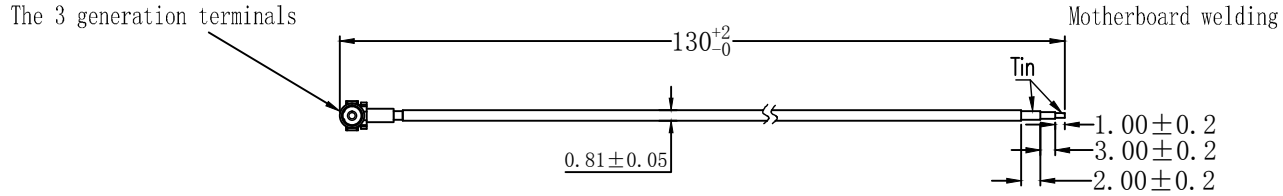
1. This report is based on the actual commissioning and testing of the commissioning prototype, including the assembly instructions, antenna position and assembly position of each device. **It cannot be changed at will;**

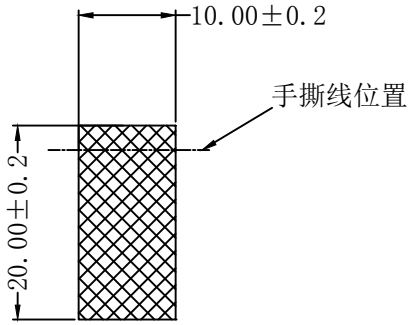
2. If there is **any change** in the materials used in the prototype, it is necessary to timely feed back to our company for **re-verification**;

3. List of sensitive devices:

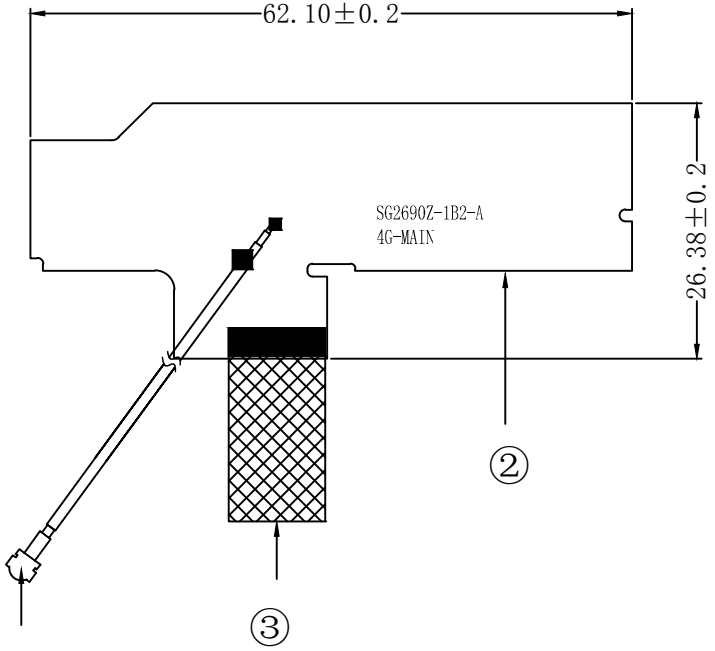
TP (material, coating, wiring, etc.)
Screen (amplification circuit, led, cable layout design, etc.)
Shell material (antenna assembly method, structural interference, shell material, antenna position height and area, etc.)
Mainboard (mainboard conduction, RF circuit matching, PA, duplex, filter, LNA, power circuit, etc.)
Camera, battery, motor, MIC, fingerprint identification module, etc.

4. Due to the small number or only one sample adjusting machine, some probabilistic problems cannot be completely found. **It is recommended to Check the problem points in small batch trial production before mass production**(screen flashes , horn noise, TP jump point, black screen OR crash, signal diving, etc.).





conductive fabric



①Terminal facing inward

technical requirements:
1.* for critical dimensions;
2.Size conform to the requirements of the drawings;
3.No virtual welding welding point, false welding。Require full welding points。
4.Network test pass。
5.No marked tolerance according toSJ/T 10628 1995 6classes;

5											
4											
3	conductive fabric	grey	1	10*20mm		signatures	date	mass	signatures	date	
2	FPC	black	1	SG2690Z-1B2-A	RD	YWD	2022.12.26	Q C			
1	coaxial line	black	1	ϕ=0.81mm	RF						
	name	color	quantity	specifications	audits			approval			

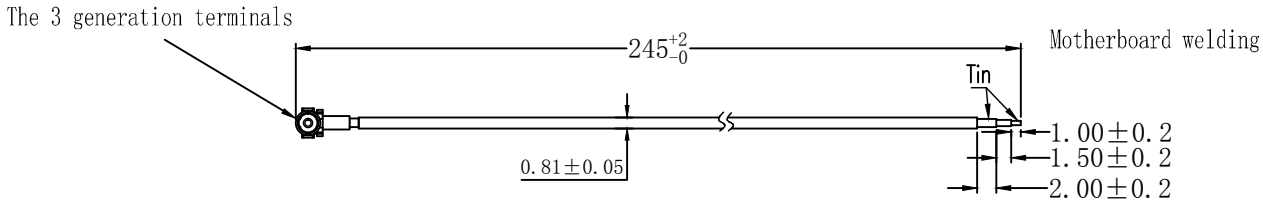
SWARD

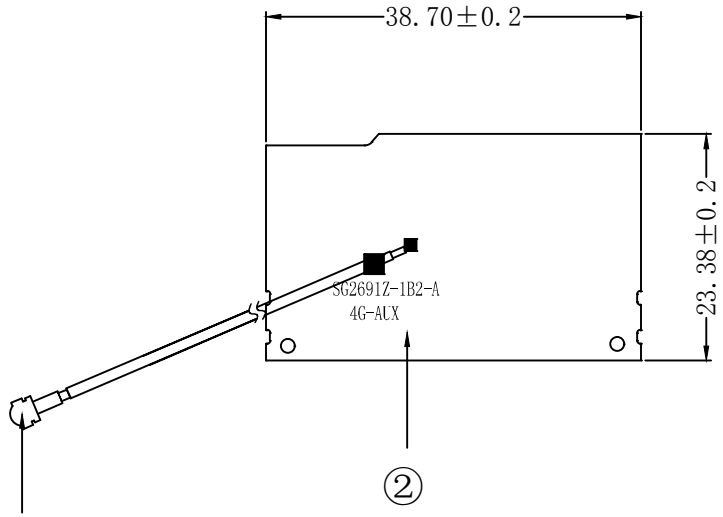
ShenZhen SWARD Communication Technology Co.Ltd

SG2690Z-1L23B-130-A

time markup					percentage
1			A		1 : 1

ROHS





①Terminals facing outward

technical requirements:
1.* for critical dimensions;
2.Size conform to the requirements of the drawings;
3.No virtual welding welding point, false welding。Require full welding points。
4.Network test pass。
5.No marked tolerance according toSJ/T 10628 1995 6classes;

5											
4											
3						signatures	date	mass	signatures	date	
2	FPC	black	1	SG2691Z-1B2-A	RD	YWD	2023.04.20	Q C			
1	coaxial line	black	1	ϕ=0.81MM	RF						
	name	color	quantity	specifications	audits			approval			

SWARD

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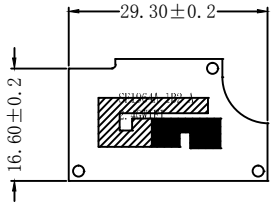
SG2691Z-1L23B-245-A

time markup					percentage
1			A		1 : 1

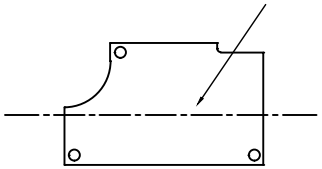
ROHS

Gum-3M300



positive

Hand tear line position



opposite

technical requirements:
1, Please use the half-pair PI substrates, Electrolytic copper。
2, The yellow part is the line part, Surface spray matte black, Text is bright and black。
3, The yellow shadow part is the exposed contact, Process Requirements Electric Gold Processing。
4, All materials comply with environmental ROHS standards。
5, Focus size with "*" tolerance: ± 0.03。

Test criteria:
1, Shape dimensions and line dimensions consistent with drawings, within controllable tolerances。
2,Antenna line, broken line, FPC bend to do 180 ° bending experiment, no fracture, more than 5 times PASS。
3, Clear, no misprints.。

Packaging requirements:
1. PE sealed pocket packaging。
2.100 pcs/bag。

	signatures	date	mass	signatures	date
RD	YWD	2023.04.20	QC		
RF					
audits			approval		

time markup				percentage
1			A	1:1
共1张		第1张		

SWARD

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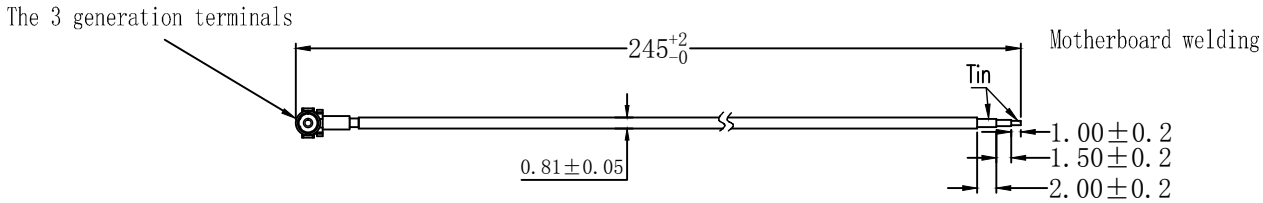
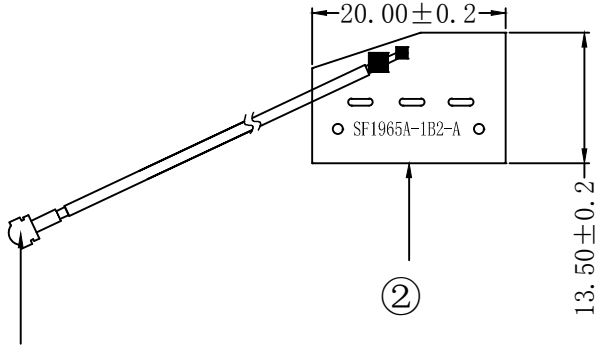
SF1964A-1B2-A

ROHS





technical requirements:
1.* for critical dimensions;
2.Size conform to the requirements of the drawings;
3.No virtual welding welding point, false welding。Require full welding points。
4.Network test pass。
5.No marked tolerance according toSJ/T 10628 1995 6classes;

5										
4										
3						signatures	date	mass	signatures	date
2	FPC	black	1	SF1965A-1B2-A	RD	YWD	2023.04.20	Q C		
1	coaxial line	black	1	ϕ=0.81MM	RF					
	name	color	quantity	specifications	audits			approval		

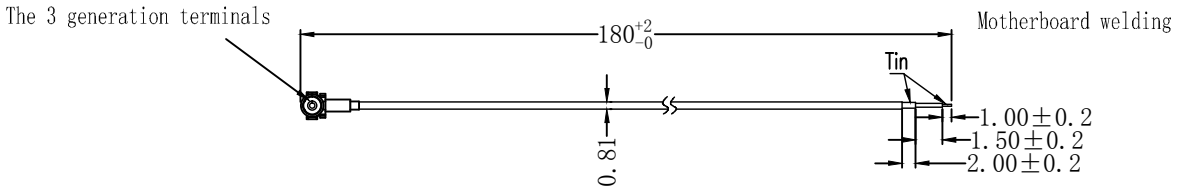
SWARD

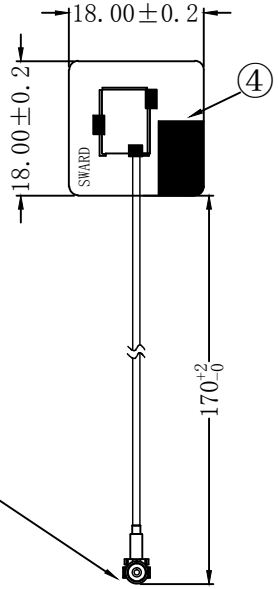
ShenZhen SWARD Communication Technology Co.Ltd

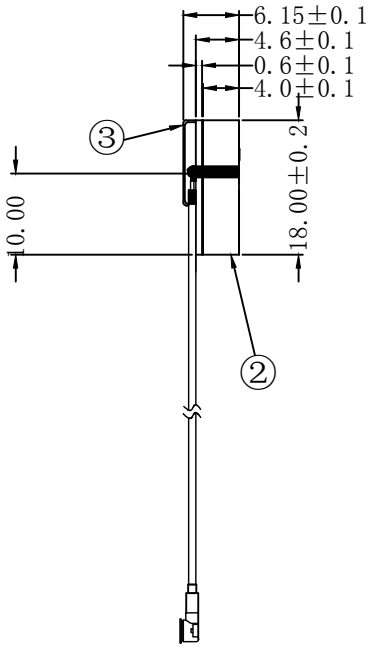
SF1965A-1L23B-245-A

time markup					percentage
1			A		1 : 1

ROHS







①Terminal facing outward

Technical requirements:
1. Mark * as the key size;
2. The dimensions meet the requirements of the drawings;
3. There shall be no false or false soldering at the welding points. Require roundness and fullness.
4. The network division test passed (with the specified waveform appearing).
5. Linear dimensions without tolerance indications shall be in accordance with SJ/T 10628, 1995 Grade 6, and the tolerance values shall be evenly divided from upper to lower deviations;

5											
4	PCB small board	green	1	PCB-002-2B3-A							
3	shield cover	silvery	1	PBG-002-3B6-A		signatures	date	mass	signatures	date	
2	Ceramic chip	silvery	1	917-001-6B2-A	RD	YWD	2023.04.20	Q C			
1	coaxial line	grey	1	P1-0F32-180-A	RF						
	name	color	quantity	specifications	audits		approval				

SWARD

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SS917K-6D23G-170-A

time markup				percentage
1			A	1 : 1

ROHS