

QW-FC07

Antenna Debugging Report

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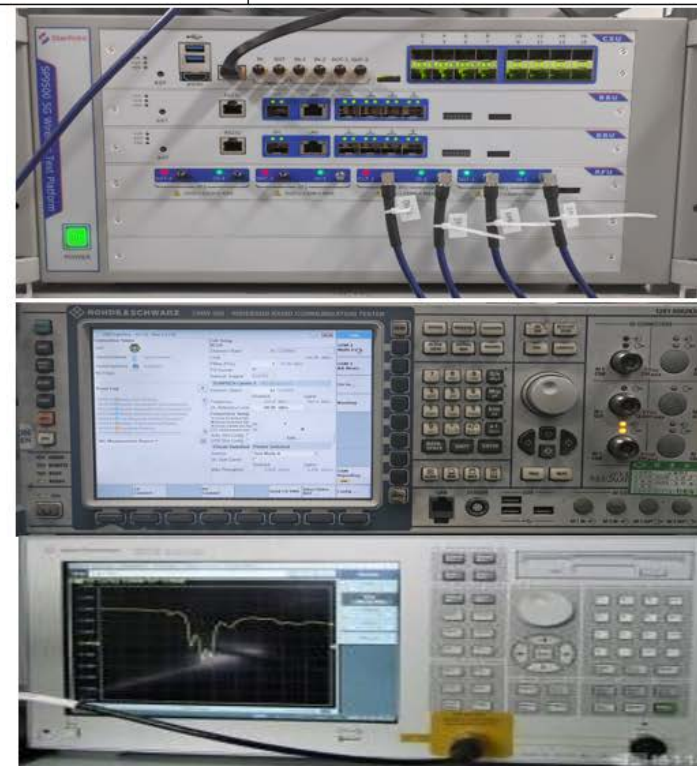
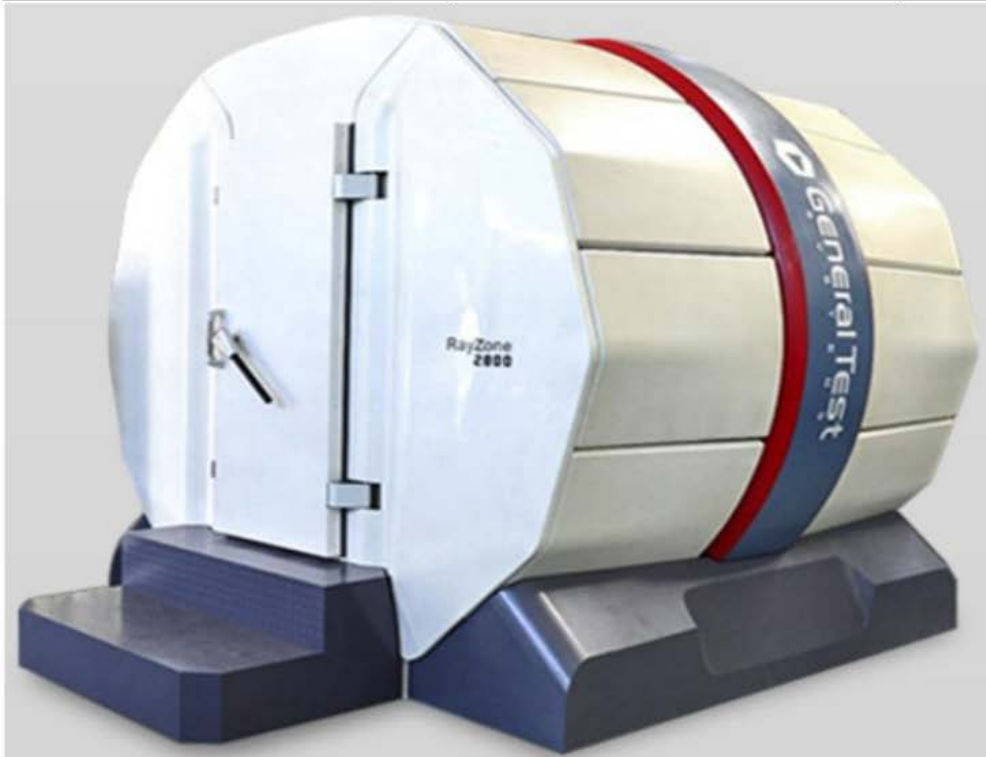


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- 05 | Passive S-parameters, Efficiency and Gain
- 06 | Complete Machine Environment Handling

>>> Test Equipment

无源及有源测试—5G微波暗室 Passive and Active Testing - 5G Microwave Chamber

◆ 测试系统	◆ 测试环境	◆ 有源测试	◆ 无源测试
GTS2800	温度：22°C±3°C 湿度：50%±15%	支持5G/4G/3G/2G 支持BT/WIFI/GPS	600MHZ——6G



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- [illegible]

>>> Version Record



Version	Date	Content summary
V1.0	2025/12/16	Prototype Debugging
V1.1	2025/01/08	T0 Debugging

Project Description



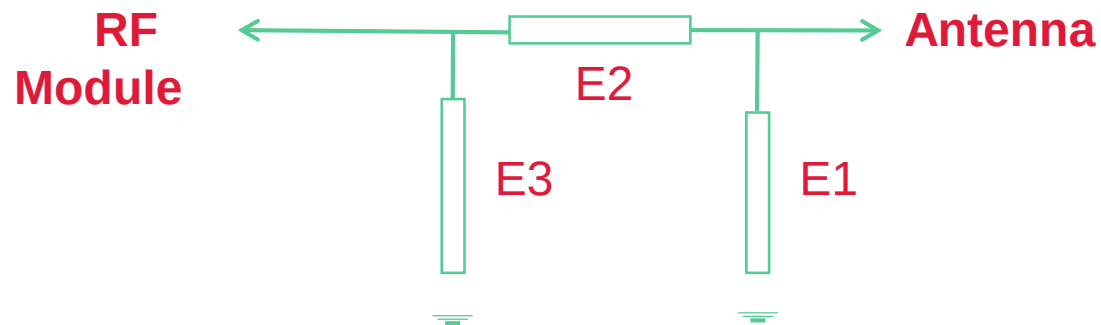
Machine type	Bicycle Computer	
Machine and Antenna Layout		
Antenna – Related Information	Antenna Type And Material	Built In FPC Antenna
	Debugging Frequency Band	GPS L1/BD B1C:1575.42MHz GPS L5/BD B2a:1176.45MHz BD B1I:1561.098MHz GLONASS:1602MHz BT&ANT+:2.4~2.5GHz
	Antenna Form	GPS L1&BT&ANT+:IFA

>>> Antenna Matching (GPS L1)

Has the matching circuit been modified? Yes

- Matching Circuit Schematic Diagram

Parallel: 12NH



- Match Value:

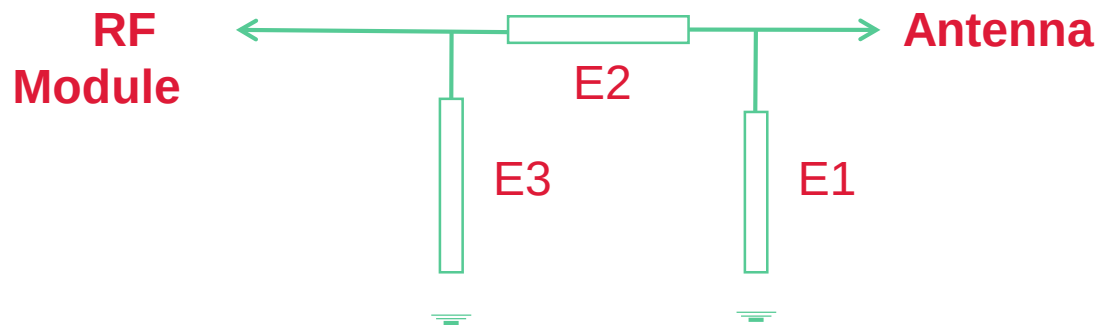
Element	Value
E1(0201)	12NH
E2(0201)	0Ω
E3(0201)	NC

>>> Antenna Matching (GPS L5)

Has the matching circuit been modified? Yes

- Matching Circuit Schematic Diagram

Parallel:2.4PF



- Match Value:

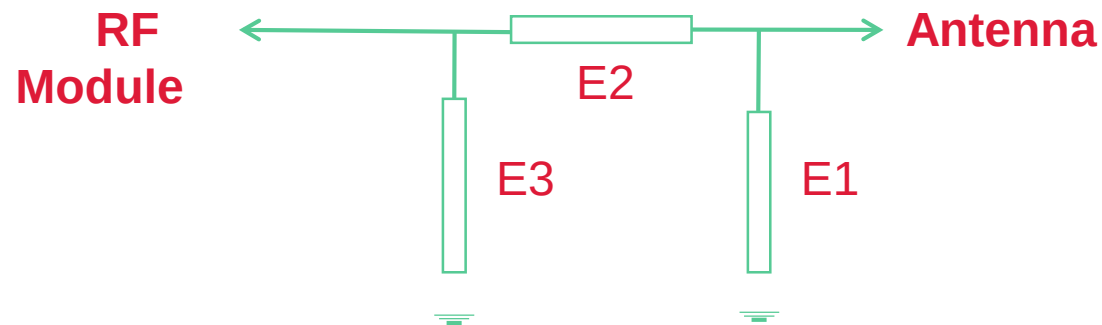
Element	Value
E1(0201)	2.4PF
E2(0201)	0Ω
E3(0201)	NC

>>> Antenna Matching (BT1)

Has the matching circuit been modified? Yes

- Matching Circuit Schematic Diagram

Parallel:1.5PF



- Match Value:

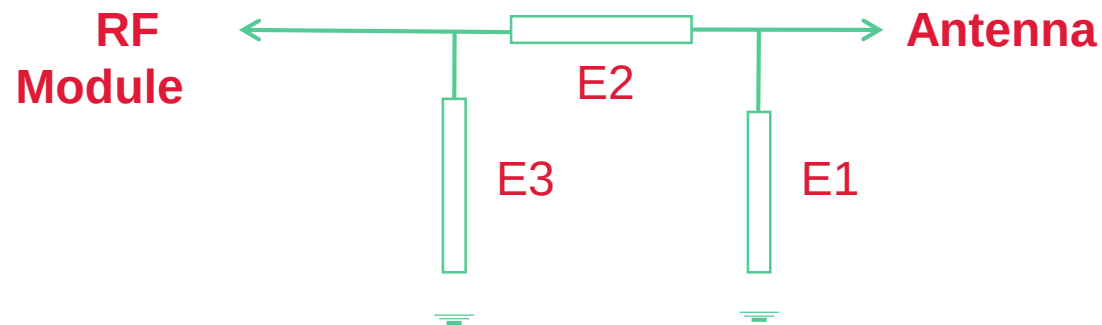
Element	Value
E1(0201)	1.5pF
E2(0201)	0Ω
E3(0201)	NC

>>> Antenna Matching (BT2)

Has the matching circuit been modified? Yes

- Matching Circuit Schematic Diagram

Parallel:1.8PF



- Match Value:

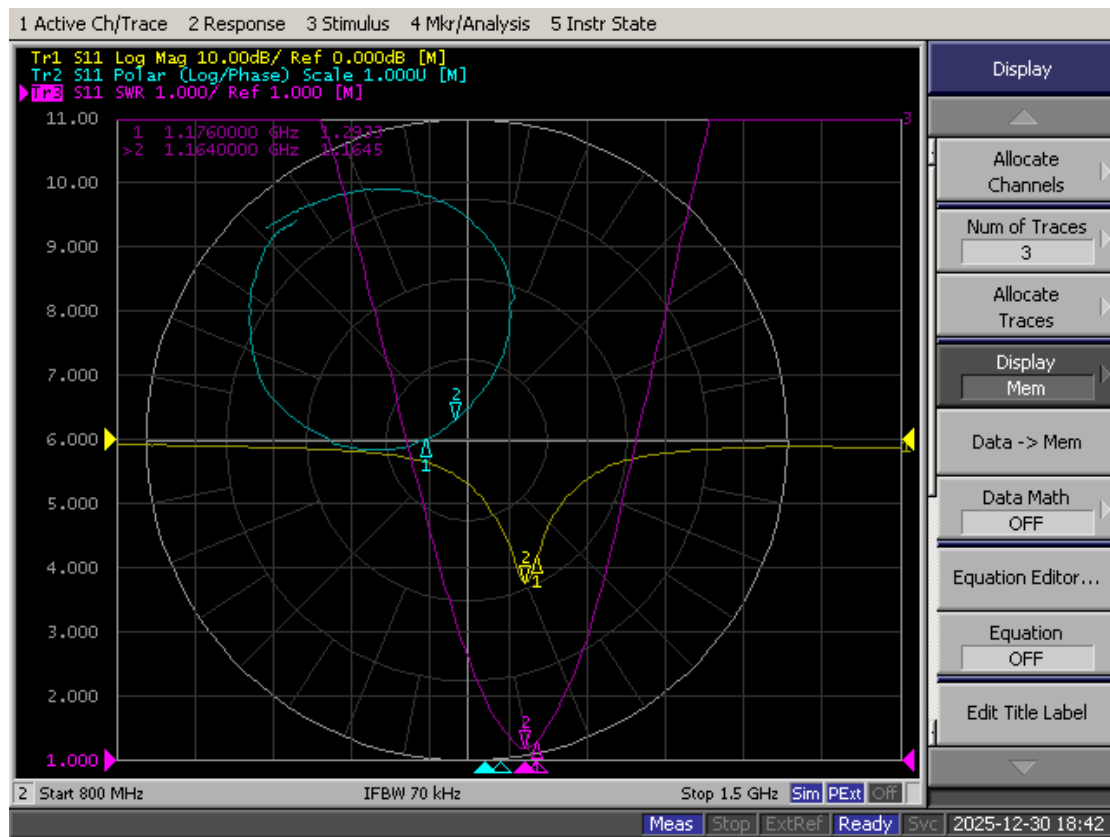
Element	Value
E1(0201)	1.8pF
E2(0201)	0Ω
E3(0201)	NC



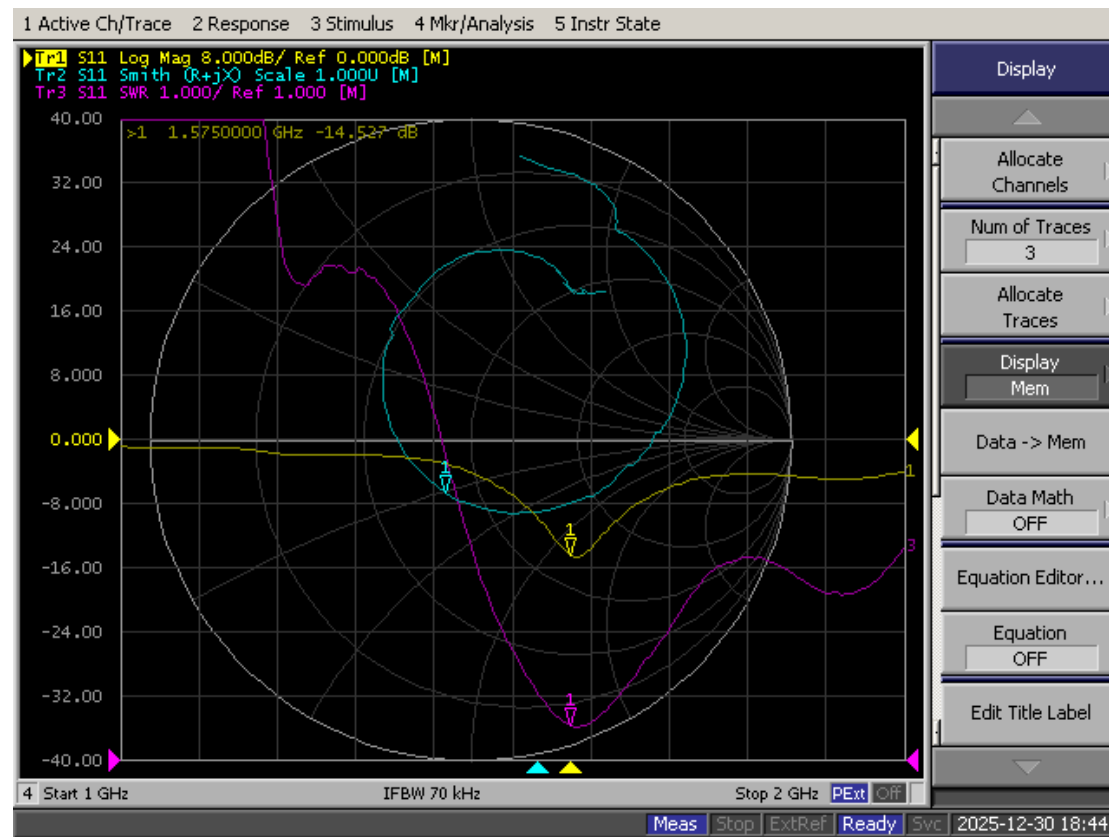
Passive S-parameters-GPS L1&L5



GPS L1+BD



GPS L5/BD B2a

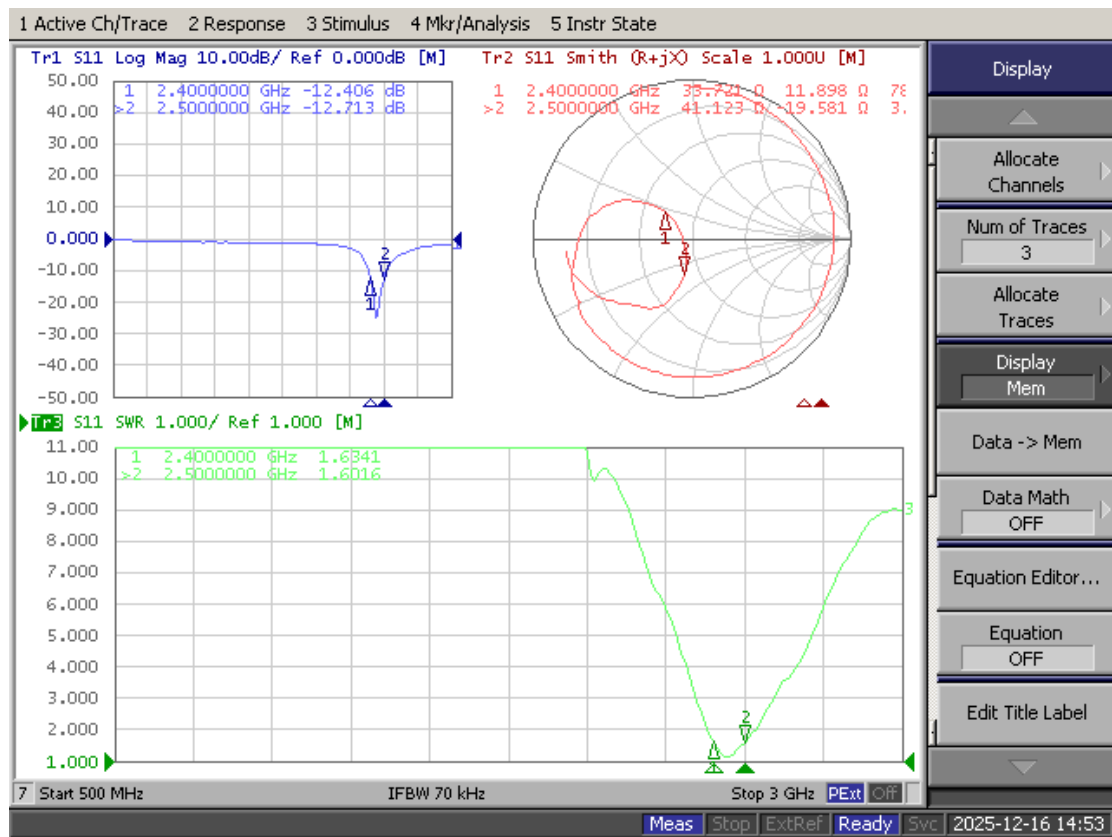




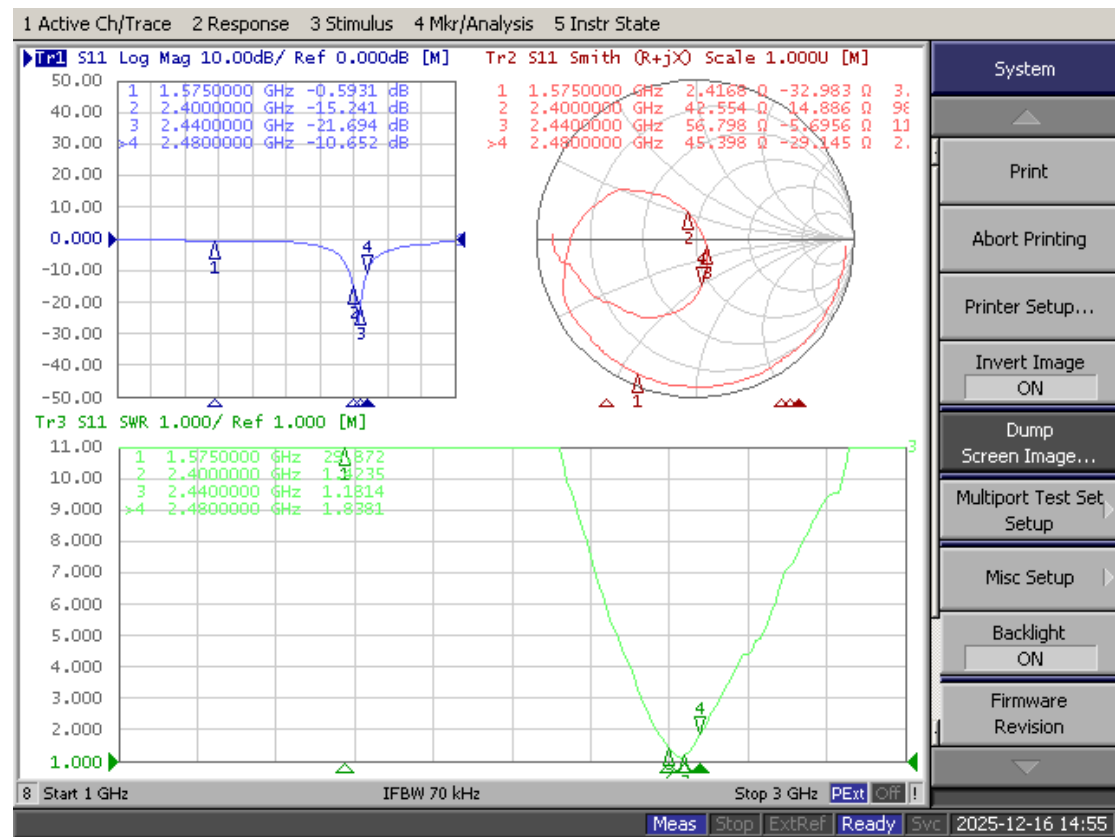
Passive S-parameters-BT1&BT2



BT1

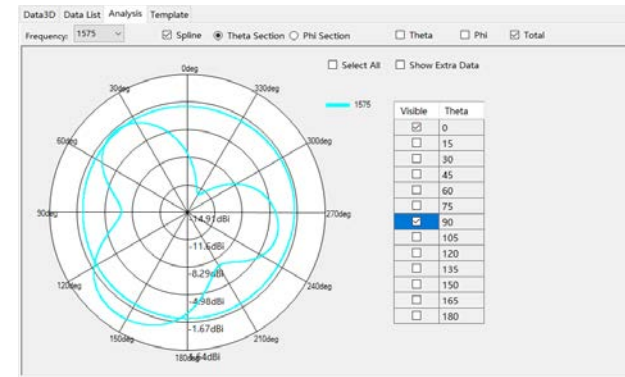
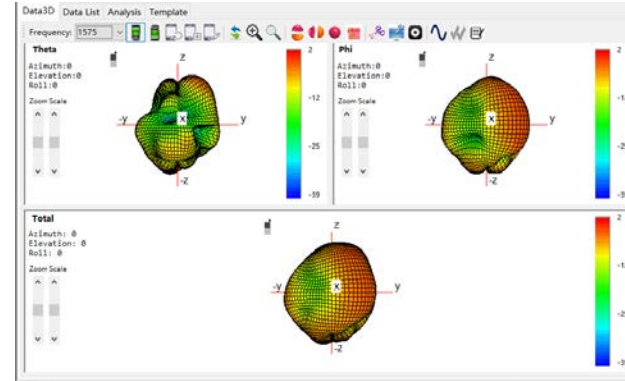


ANT+



Passive Gain, Efficiency and Radiation Pattern-GPS L1

Frequency(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
1500	-3.73	0.15	42.32
1505	-3.66	0.22	43.09
1510	-3.69	0.18	42.77
1515	-3.69	0.08	42.74
1520	-3.56	0.28	44.02
1525	-3.54	0.43	44.26
1530	-3.4	0.7	45.73
1535	-3.34	0.89	46.39
1540	-3.22	1.16	47.69
1545	-3.25	1.21	47.27
1550	-3.24	1.32	47.4
1555	-3.31	1.34	46.66
1560	-3.33	1.4	46.49
1565	-3.46	1.42	45.12
1570	-3.51	1.45	44.56
1575	-3.51	1.49	44.56
1580	-3.57	1.56	44
1585	-3.55	1.57	44.18
1590	-3.52	1.59	44.45
1595	-3.53	1.61	44.36
1600	-3.38	1.79	45.91

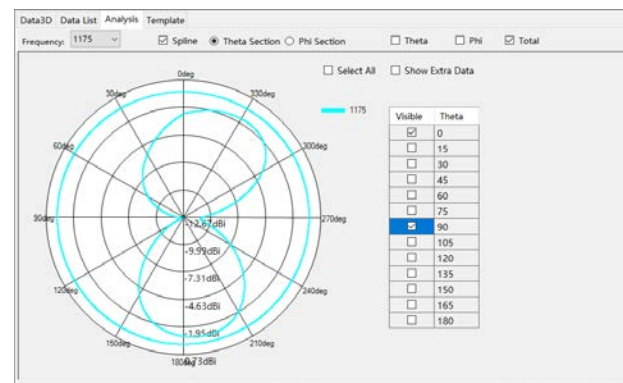
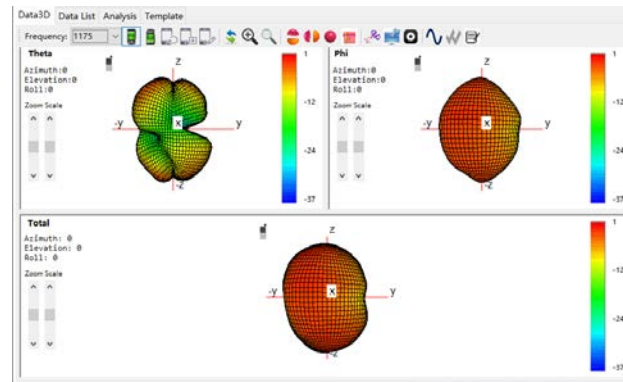




Passive Gain, Efficiency and Radiation Pattern-GPS L5



Frequency(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
1125	-4.32	-0.89	37.02
1130	-4.03	-0.61	39.55
1135	-3.77	-0.25	42
1140	-3.54	-0.05	44.29
1145	-3.27	0.14	47.11
1150	-3.07	0.35	49.35
1155	-2.88	0.57	51.52
1160	-2.7	0.7	53.64
1165	-2.58	0.86	55.27
1170	-2.56	0.85	55.41
1175	-2.58	0.71	55.23
1180	-2.6	0.65	54.92
1185	-2.68	0.48	53.98
1190	-2.82	0.4	52.29
1195	-2.96	0.27	50.56
1200	-3.12	0.14	48.72
1205	-3.3	-0.07	46.72
1210	-3.54	-0.26	44.27
1215	-3.79	-0.62	41.81
1220	-3.97	-0.78	40.06
1225	-4.25	-0.95	37.57

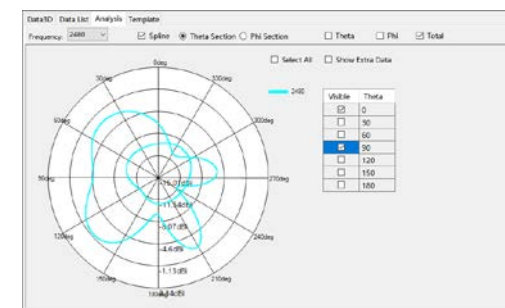
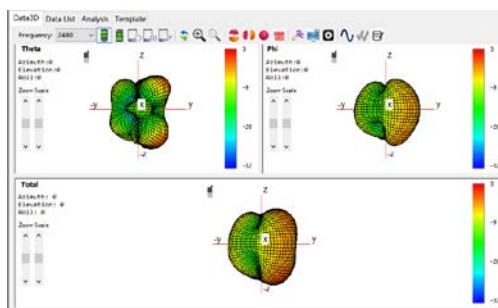
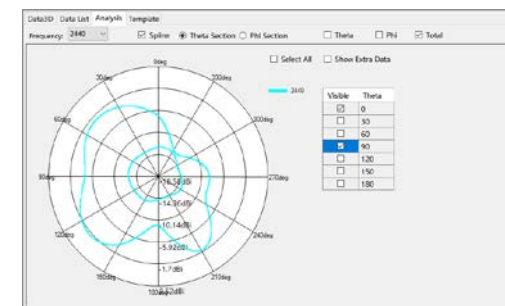
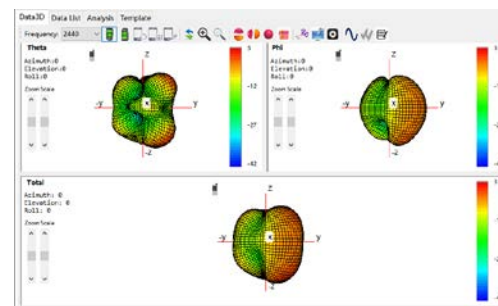
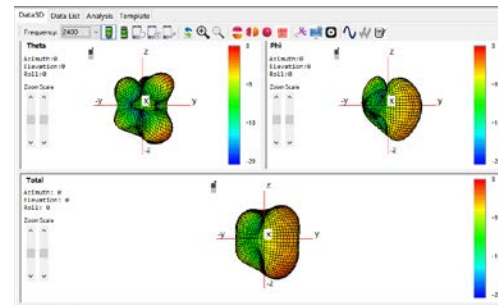




Passive Gain, Efficiency and Radiation Pattern-BT1



Frequency(MHz)	Efficiency(dB)	Gain(dBi)	Efficiency(%)
2400	-3.68	2.16	42.84
2410	-3.71	2.29	42.57
2420	-3.73	2.37	42.41
2430	-3.76	2.37	42.06
2440	-3.74	2.48	42.22
2450	-3.68	2.55	42.88
2460	-3.68	2.5	42.89
2470	-3.71	2.32	42.53
2480	-3.73	2.28	42.38
2490	-3.9	2.03	40.7
2500	-4.01	1.94	39.71

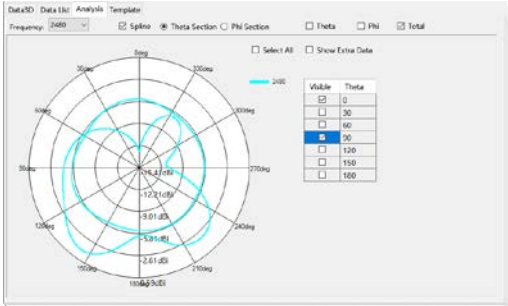
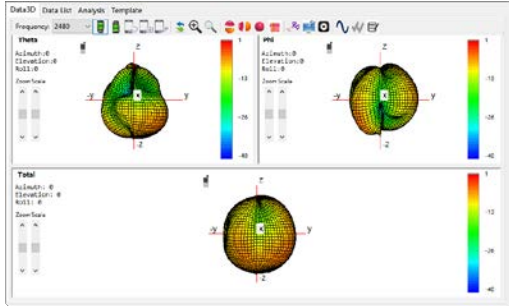
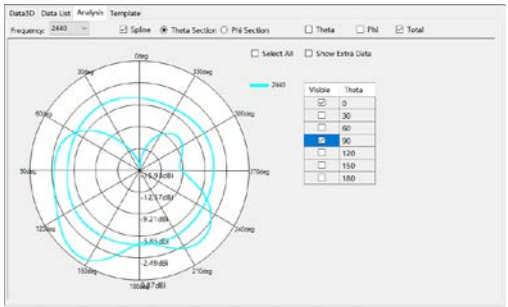
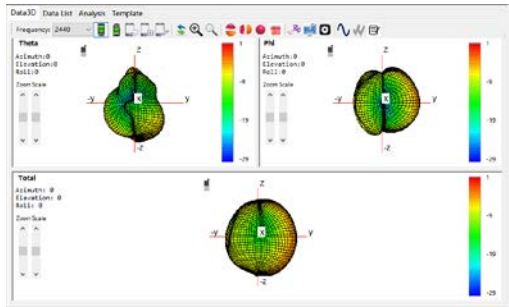
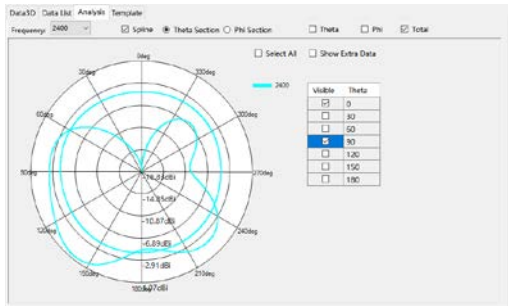
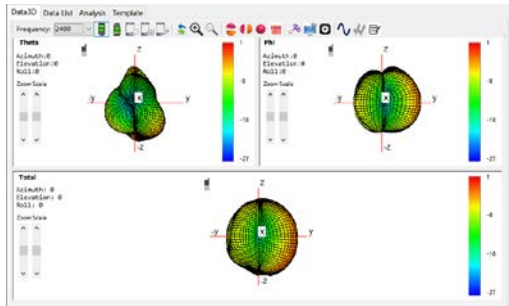




Passive Gain, Efficiency and Radiation Pattern-ANT+



Frequency(MHz)	Efficiency(dB)	Gain(dBi)	Efficiency(%)
2400	-3.59	0.86	43.72
2410	-3.72	0.73	42.48
2420	-3.81	0.65	41.63
2430	-3.91	0.68	40.62
2440	-4.01	0.64	39.74
2450	-4.04	0.66	39.41
2460	-4.17	0.62	38.28
2470	-4.28	0.59	37.28
2480	-4.43	0.41	36.06
2490	-4.66	0.08	34.23
2500	-4.78	-0.04	33.23



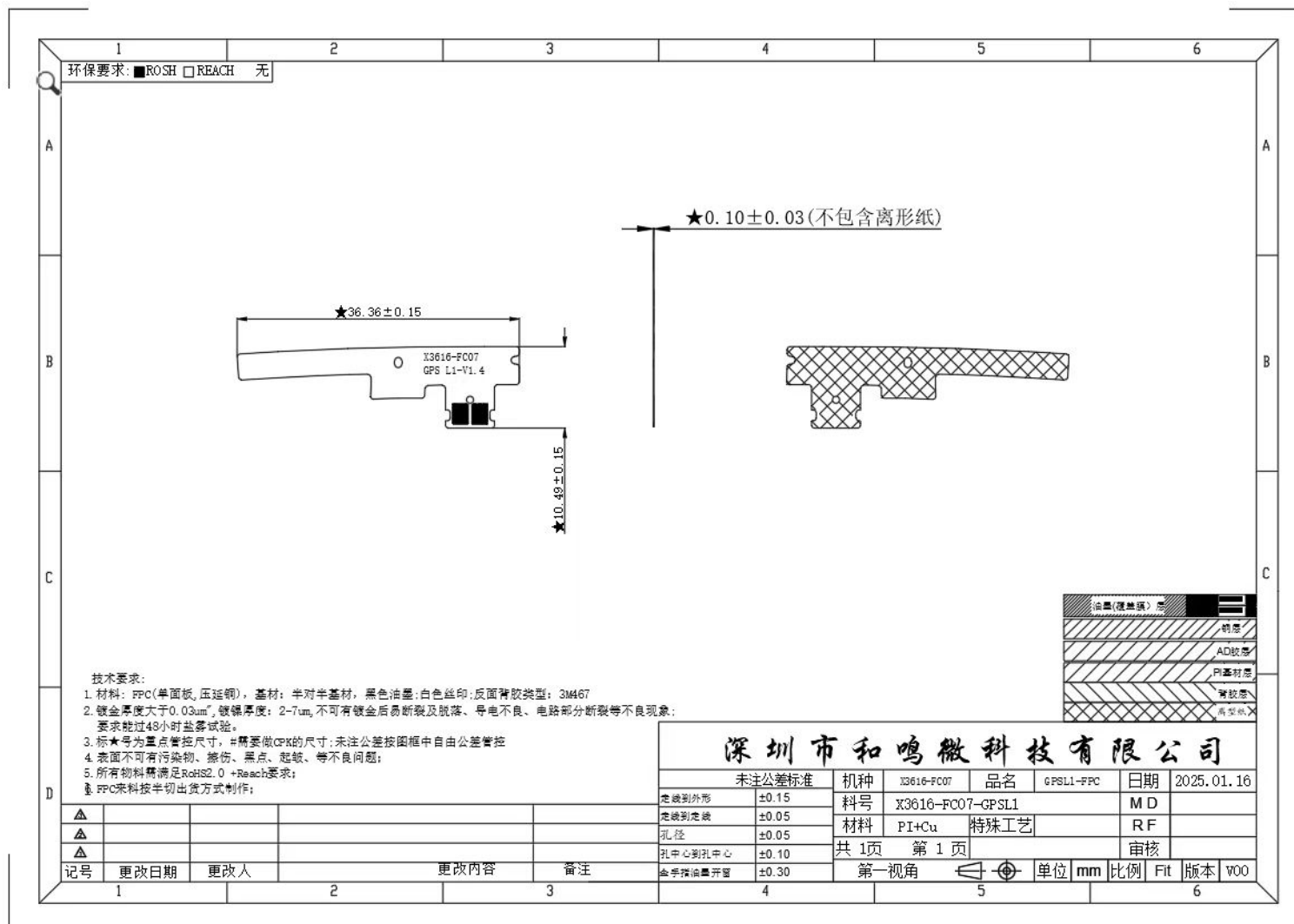
>>> Complete Machine Environment Handling



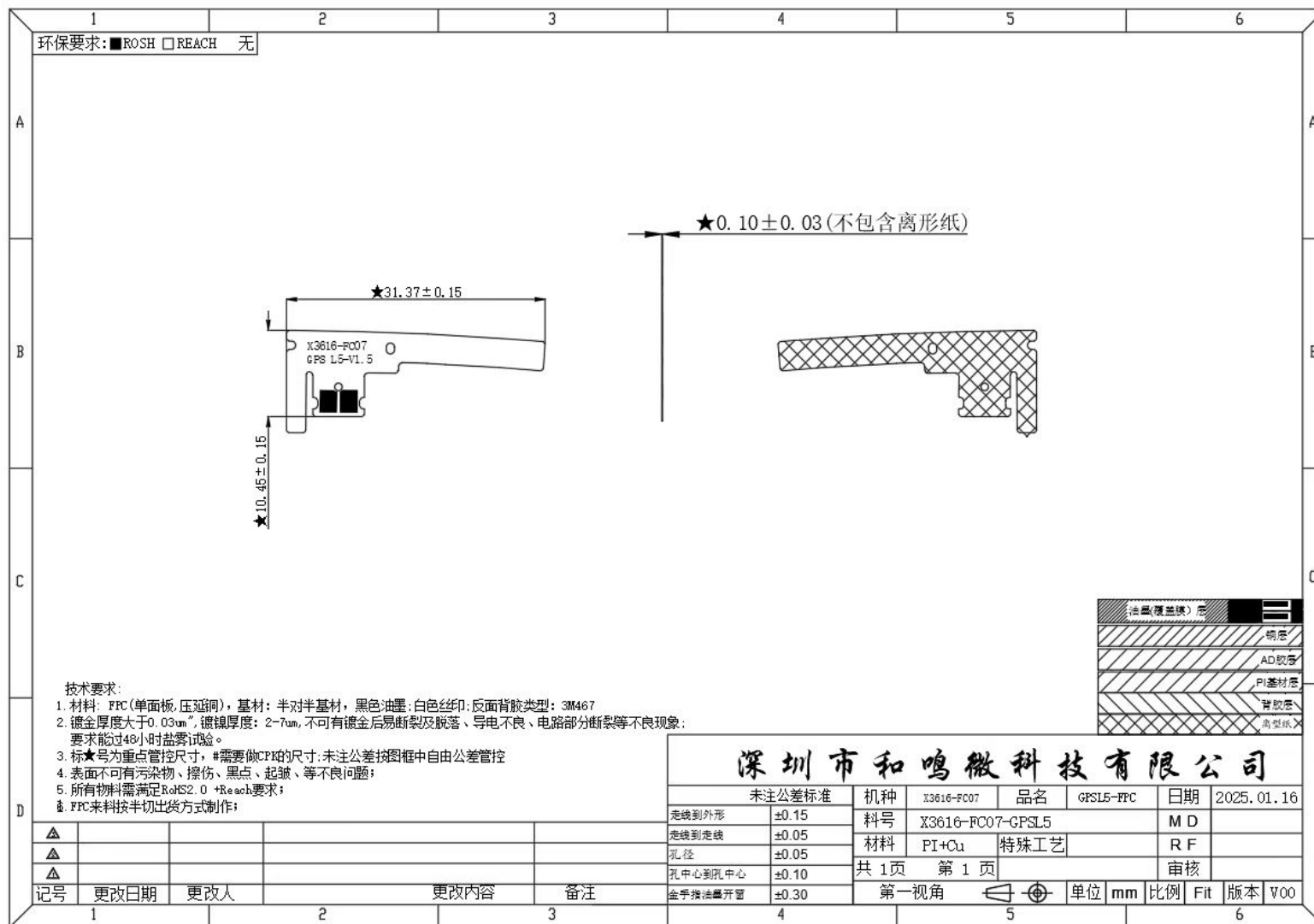
Stick conductive foam on the upper and lower areas of the shield to ensure good grounding between the steel sheet on the back of the LCD and the main board, as shown in the figure:

Foam Size: Length: 11.2mm; Width: 3.2mm; Height: 2.5mm

>>> L1 Antenna Appearance

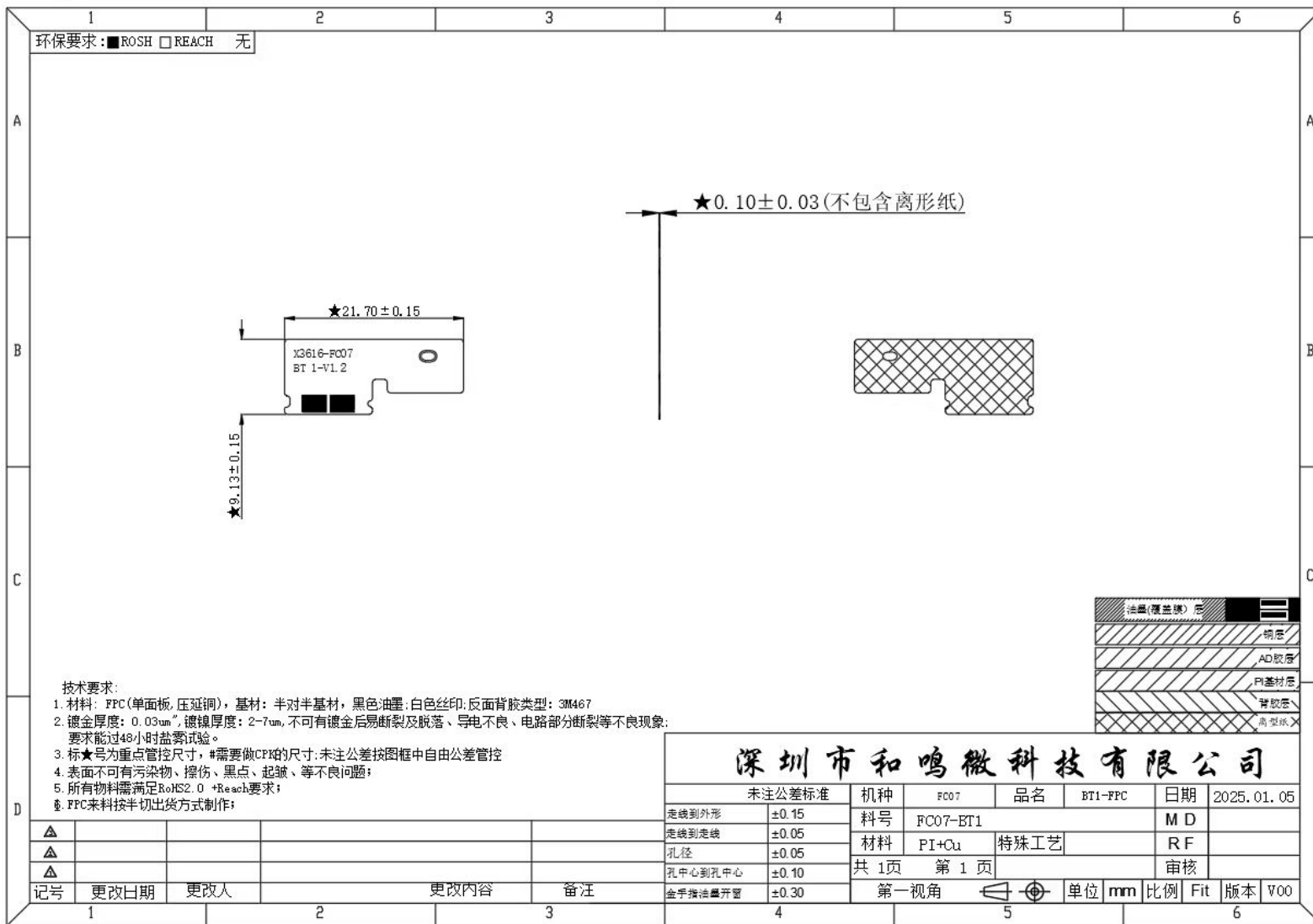


>>> L5 Antenna Appearance



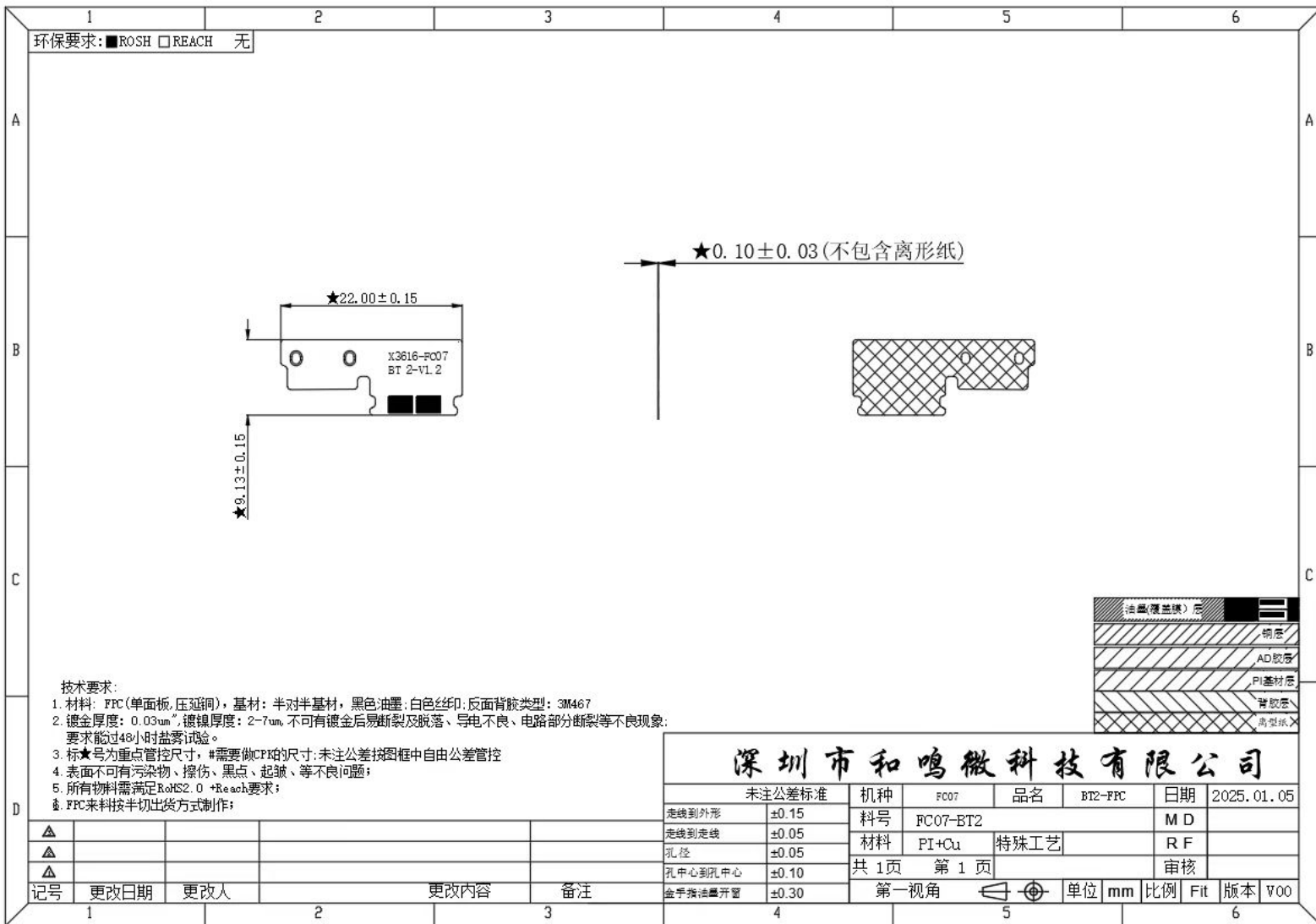


BT1 Antenna Appearance





BT2 Antenna Appearance





Thanks For Watching

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