



FCC SDoC Test Report

For

Applicant Name: GUANGZHOU STAR INFORMATION TECHNOLOGY CO.,LTD
Address: C-201 YUNSHENG SCIENCE PARK, NO.11, MIDDLE GUANGPU ROAD, HUANGPU DISTRICT, GUANGZHOU, 510663
EUT Name: GNSS Receiver
Brand Name: STEC, Think2, Navtron
Model Number: SE Lite
Series Model Number: SDi, SDi 1, SDi 2, SDi 3, SDi Pro, SDi plus, SLi, SLi 1, SLi 2, SLi 3, SLi plus, SLi Pro, T2, T2 Lite, T2 pro, N1, N2, N3, TERA A, TERA B, TERA C, TERA D, TERA E, TERA S

Issued By

Company Name: BTF Testing Lab (Shenzhen) Co., Ltd.
Address: F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Report Number: BTF240416E00401
Test Standards: 47 CFR Part 15, Subpart B
Test Conclusion: Pass
Test Date: 2024-04-16 to 2024-05-17
Date of Issue: 2024-05-20

Prepared By:

Gavin Cui

Gavin Cui / Project Engineer

2024-05-20

Date:

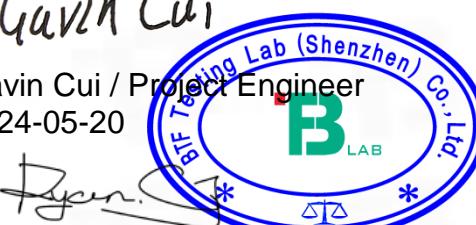
Approved By:

Ryan.CJ

Ryan.CJ / EMC Manager

Date:

2024-05-20



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Test Report Number: BTF240416E00401

Revision History		
Version	Issue Date	Revisions Content
R_V0	2024-05-20	Original

Note: Once the revision has been made, then previous versions reports are invalid.

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1 Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 Product Information

2.1 Application Information

Company Name:	GUANGZHOU STAR INFORMATION TECHNOLOGY CO.,LTD
Address:	C-201 YUNSHENG SCIENCE PARK, NO.11, MIDDLE GUANGPU ROAD, HUANGPU DISTRICT, GUANGZHOU, 510663

2.2 Manufacturer Information

Company Name:	GUANGZHOU STAR INFORMATION TECHNOLOGY CO.,LTD
Address:	C-201 YUNSHENG SCIENCE PARK, NO.11, MIDDLE GUANGPU ROAD, HUANGPU DISTRICT, GUANGZHOU, 510663

2.3 Factory Information

Company Name:	GUANGZHOU STAR INFORMATION TECHNOLOGY CO.,LTD
Address:	C-201 YUNSHENG SCIENCE PARK, NO.11, MIDDLE GUANGPU ROAD, HUANGPU DISTRICT, GUANGZHOU, 510663

2.4 General Description of Equipment under Test (EUT)

EUT Name:	GNSS Receiver
Test Model Number:	SE Lite
Series Model Number:	SDi, SDi 1, SDi 2, SDi 3, SDi Pro, SDi plus, SLi, SLi 1, SLi 2, SLi 3, SLi plus, SLi Pro, T2, T2 Lite, T2 pro, N1, N2, N3, TERA A, TERA B, TERA C, TERA D, TERA E, TERA S
Description of Model name differentiation:	Only the exterior color is different and the rest is exactly the same

2.5 Technical Information

Power Supply:	Model: TYPE-C451C Input : 100-240V~50/60Hz 1.3A Output: 5V=3A/9V=3A/12.0V=3.0A/15.0V=3.0A/20.0V=2.25A MAX: 45.0W
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3 Summary of Test Results

3.1 Test Standards

The tests were performed according to following standards:
47 CFR Part 15, Subpart B: Unintentional Radiators

3.2 Uncertainty of Test

Item	Measurement Uncertainty
Conducted Emission (150 kHz-30 MHz)	±2.64dB
Radiated Emissions (30M - 1GHz)	±4.12dB
Radiated Emissions (above 1GHz)	1-6GHz: ±3.94dB 6-18GHz: ±4.16dB

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.3 Summary of Test Result

Item	Standard	Requirement	Result
Conducted emissions on AC mains	47 CFR Part 15, Subpart B	15.107, Class B	Pass
Radiated emissions (Below 1GHz)	47 CFR Part 15, Subpart B	15.109, Class B	Pass
Radiated emissions (Above 1GHz)	47 CFR Part 15, Subpart B	15.109, Class B	Pass

4 Test Configuration

4.1 Test Equipment List

Conducted emissions on AC mains					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00953	/	/
Coaxial Switcher	SCHWARZBECK	CX210	CX210	/	/
V-LISN	SCHWARZBECK	NSLK 8127	01073	2023-11-16	2024-11-15
LISN	AFJ	LS16/110VAC	16010020076	2023-11-26	2024-11-15
EMI Receiver	ROHDE&SCHWABE RZ	ESCI3	101422	2023-11-15	2024-11-14

Radiated emissions (Below 1GHz) Radiated emissions (Above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	/	/
Preamplifier	SCHWARZBECK	BBV9744	00246	/	/
RE Cable	REBES Talent	UF1-SMASMAM-1 0m	21101566	/	/
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	/	/
RE Cable	REBES Talent	UF1-SMASMAM-1 m	21101568	/	/
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	/	/
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2023-11-13	2024-11-12
EMI TEST RECEIVER	ROHDE&SCHWABE RZ	ESCI7	101032	2023-11-16	2024-11-15
SIGNAL ANALYZER	ROHDE&SCHWABE RZ	FSQ40	100010	2023-11-16	2024-11-15
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplifier	SCHWARZBECK	BBV9718D	00008	/	/
Horn Antenna	SCHWARZBECK	BBHA9120D	2597	2023-11-13	2024-11-12
EZ_EMC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2023-11-13	2024-11-12

4.2 Test Auxiliary Equipment

Title	Manufacturer	Model No.	Serial No.
/	/	/	/

4.3 Test Modes

Test Modes	Description
TM1	Charging Mode + Normal Operation

5 Emission Test Results (EMI)

5.1 Conducted emissions on AC mains

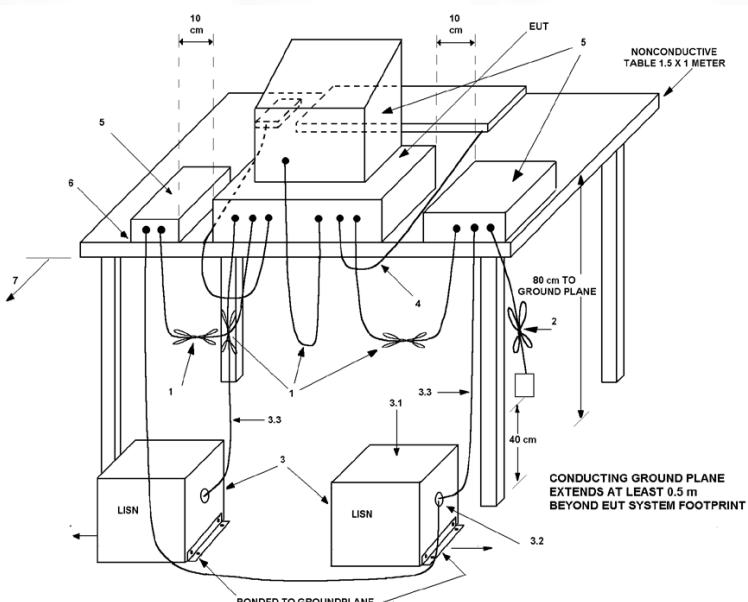
Test Requirement:	15.107, Class B		
Test Method:	ANSI C63.4-2014 ANSI C63.4a-2017		
Test Limit:	Frequency of emission (MHz)		Conducted limit (dB μ V)
			Quasi-peak
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
5-30		60	50
*Decreases with the logarithm of the frequency.			
Procedure:	<p>An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.</p> <p>Remark: Level= Read Level+ Cable Loss+ LISN Factor</p>		

5.1.1 E.U.T. Operation:

Operating Environment:

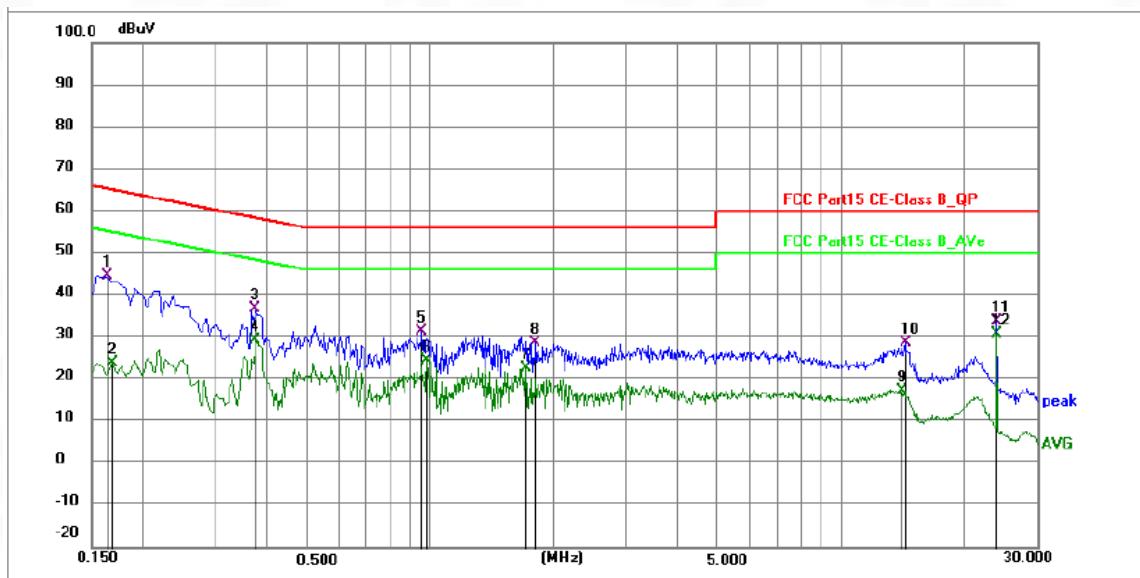
Temperature:	24.7 °C
Humidity:	52 %
Atmospheric Pressure:	1010 mbar

5.1.2 Test Setup Diagram:

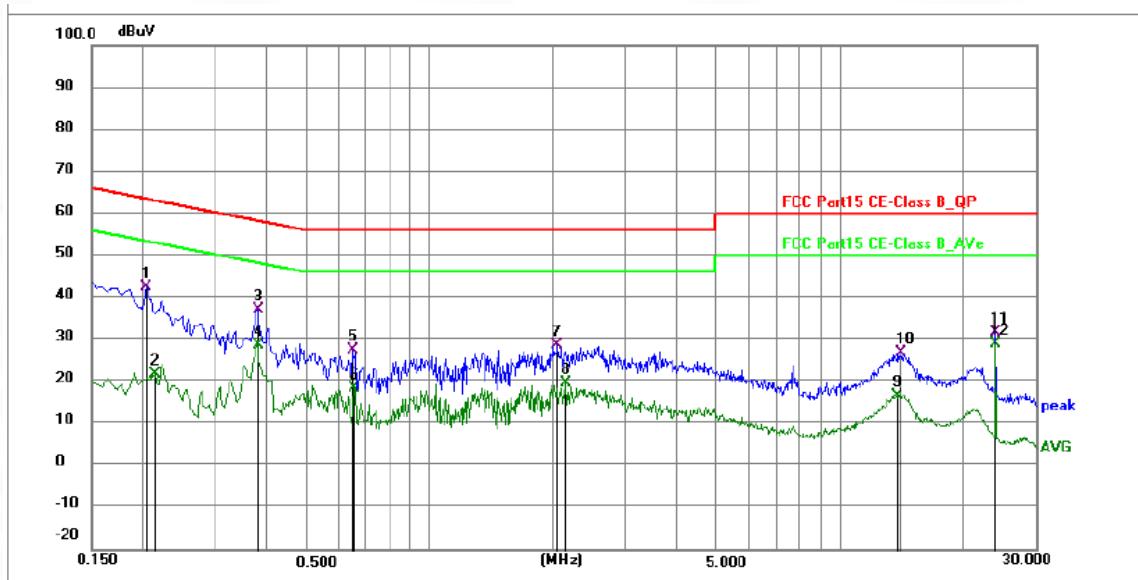


5.1.3 Test Data:

TM1 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1635	34.04	10.48	44.52	65.28	-20.76	QP	P	
2	0.1680	13.32	10.49	23.81	55.06	-31.25	AVG	P	
3	0.3750	26.32	10.57	36.89	58.39	-21.50	QP	P	
4 *	0.3750	18.93	10.57	29.50	48.39	-18.89	AVG	P	
5	0.9555	20.76	10.67	31.43	56.00	-24.57	QP	P	
6	0.9825	13.78	10.66	24.44	46.00	-21.56	AVG	P	
7	1.7160	12.04	10.67	22.71	46.00	-23.29	AVG	P	
8	1.8015	18.05	10.67	28.72	56.00	-27.28	QP	P	
9	14.0145	6.58	10.92	17.50	50.00	-32.50	AVG	P	
10	14.2935	17.81	10.90	28.71	60.00	-31.29	QP	P	
11	23.9775	22.66	11.17	33.83	60.00	-26.17	QP	P	
12	23.9775	19.72	11.17	30.89	50.00	-19.11	AVG	P	

TM1 / Line: Neutral


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2040	31.92	10.56	42.48	63.45	-20.97	QP	P	
2	0.2130	11.17	10.56	21.73	53.09	-31.36	AVG	P	
3	0.3795	26.69	10.57	37.26	58.29	-21.03	QP	P	
4 *	0.3795	18.26	10.57	28.83	48.29	-19.46	AVG	P	
5	0.6495	17.02	10.65	27.67	56.00	-28.33	QP	P	
6	0.6540	7.77	10.66	18.43	46.00	-27.57	AVG	P	
7	2.0445	18.06	10.68	28.74	56.00	-27.26	QP	P	
8	2.1525	9.21	10.68	19.89	46.00	-26.11	AVG	P	
9	13.8300	5.98	10.84	16.82	50.00	-33.18	AVG	P	
10	14.1360	16.16	10.83	26.99	60.00	-33.01	QP	P	
11	23.9730	20.48	11.17	31.65	60.00	-28.35	QP	P	
12	23.9730	17.83	11.17	29.00	50.00	-21.00	AVG	P	

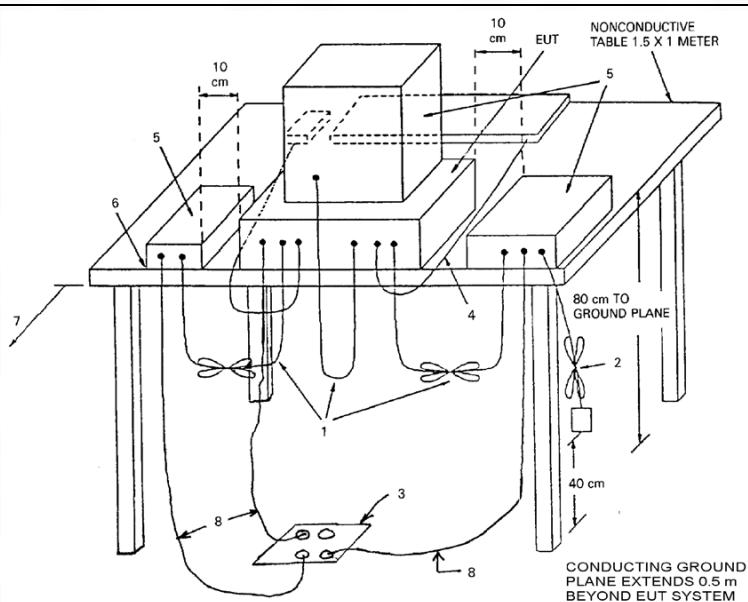
5.2 Radiated emissions (Below 1GHz)

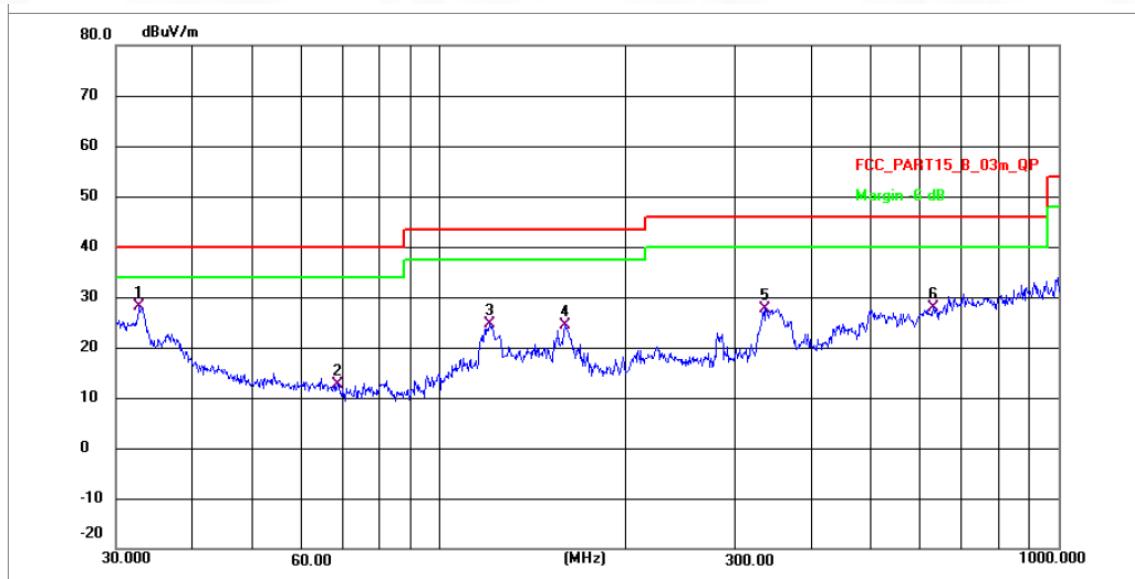
Test Requirement:	15.109, Class B																												
Test Method:	ANSI C63.4-2014 ANSI C63.4a-2017																												
Test Limit:	Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:																												
	<table border="1"> <thead> <tr> <th>Frequency of emission (MHz)</th> <th>Field strength @3m (μV/m)</th> <th>Field strength @10m (dBμV/m)</th> <th>Field strength @10m (μV/m)</th> <th>Field strength @10m (dBμV/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td><td>100</td><td>40</td><td>30</td><td>29.5</td></tr> <tr> <td>88 – 216</td><td>150</td><td>43.5</td><td>45</td><td>33.1</td></tr> <tr> <td>216 – 960</td><td>200</td><td>46</td><td>60</td><td>35.6</td></tr> <tr> <td>Above 960</td><td>500</td><td>54</td><td>150</td><td>43.5</td></tr> </tbody> </table>				Frequency of emission (MHz)	Field strength @3m (μ V/m)	Field strength @10m (dB μ V/m)	Field strength @10m (μ V/m)	Field strength @10m (dB μ V/m)	30 – 88	100	40	30	29.5	88 – 216	150	43.5	45	33.1	216 – 960	200	46	60	35.6	Above 960	500	54	150	43.5
Frequency of emission (MHz)	Field strength @3m (μ V/m)	Field strength @10m (dB μ V/m)	Field strength @10m (μ V/m)	Field strength @10m (dB μ V/m)																									
30 – 88	100	40	30	29.5																									
88 – 216	150	43.5	45	33.1																									
216 – 960	200	46	60	35.6																									
Above 960	500	54	150	43.5																									
Procedure:	<p>An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.</p> <p>Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</p>																												

5.2.1 E.U.T. Operation:

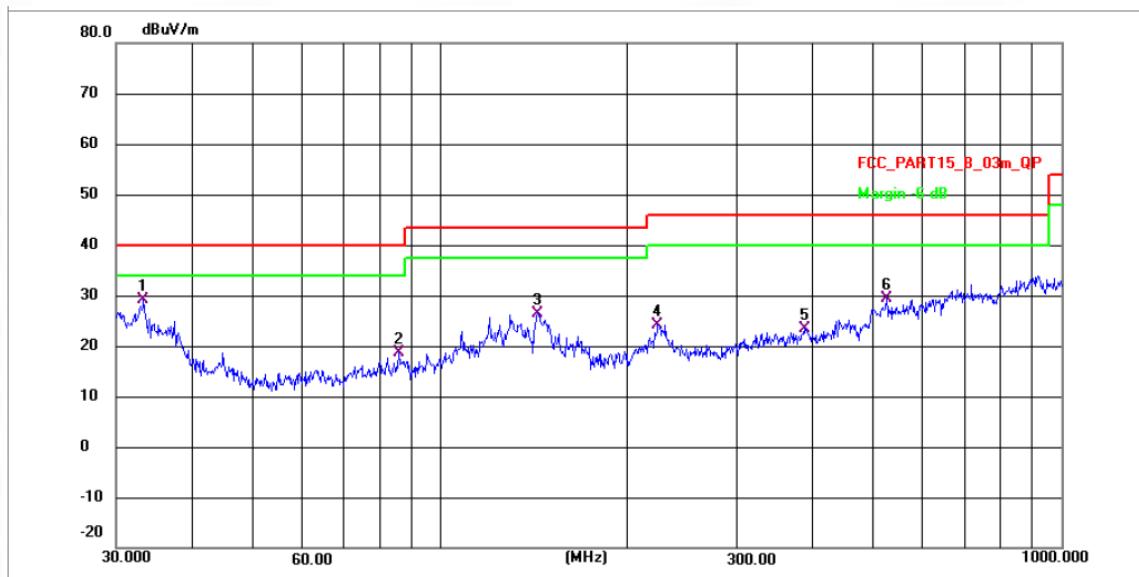
Operating Environment:			
Temperature:	24.3 °C		
Humidity:	54 %		
Atmospheric Pressure:	1010 mbar		

5.2.2 Test Setup Diagram:



5.2.3 Test Data:
TM1 / Polarization: Horizontal


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	32.7486	32.32	-4.30	28.02	40.00	-11.98	QP	P
2	68.3906	16.99	-4.27	12.72	40.00	-27.28	QP	P
3	120.9110	46.79	-22.27	24.52	43.50	-18.98	QP	P
4	160.0646	46.42	-21.92	24.50	43.50	-19.00	QP	P
5	336.6247	48.06	-20.32	27.74	46.00	-18.26	QP	P
6	629.4772	46.11	-18.12	27.99	46.00	-18.01	QP	P

TM1 / Polarization: Vertical


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	33.2111	33.42	-4.30	29.12	40.00	-10.88	QP	P
2	85.7476	41.43	-22.69	18.74	40.00	-21.26	QP	P
3	143.5774	48.41	-22.07	26.34	43.50	-17.16	QP	P
4	224.1260	45.38	-21.29	24.09	46.00	-21.91	QP	P
5	385.9565	43.42	-19.94	23.48	46.00	-22.52	QP	P
6	522.7180	48.16	-18.84	29.32	46.00	-16.68	QP	P

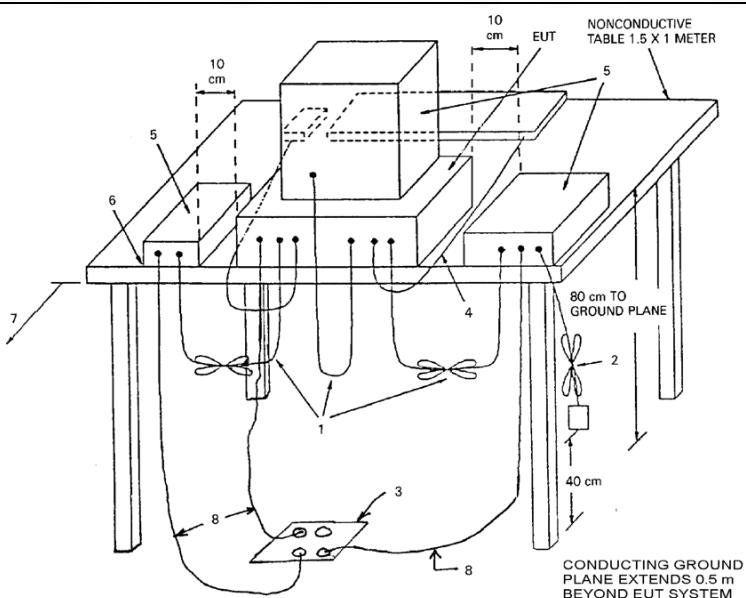
5.3 Radiated emissions (Above 1GHz)

Test Requirement:	15.109, Class B			
Test Method:	ANSI C63.4-2014 ANSI C63.4a-2017			
Test Limit:	Frequency of emission (MHz)		Field strength @3m	
	Average (uV/m)	Average(d BuV/m)	Peak (dBuV/m)	
	Above 1GHz	500	54	74
Procedure:	<p>An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. For below 1GHz test, Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. For above 1GHz test, Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.</p> <p>Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</p>			

5.3.1 E.U.T. Operation:

Operating Environment:			
Temperature:	24.3 °C		
Humidity:	54 %		
Atmospheric Pressure:	1010 mbar		

5.3.2 Test Setup Diagram:



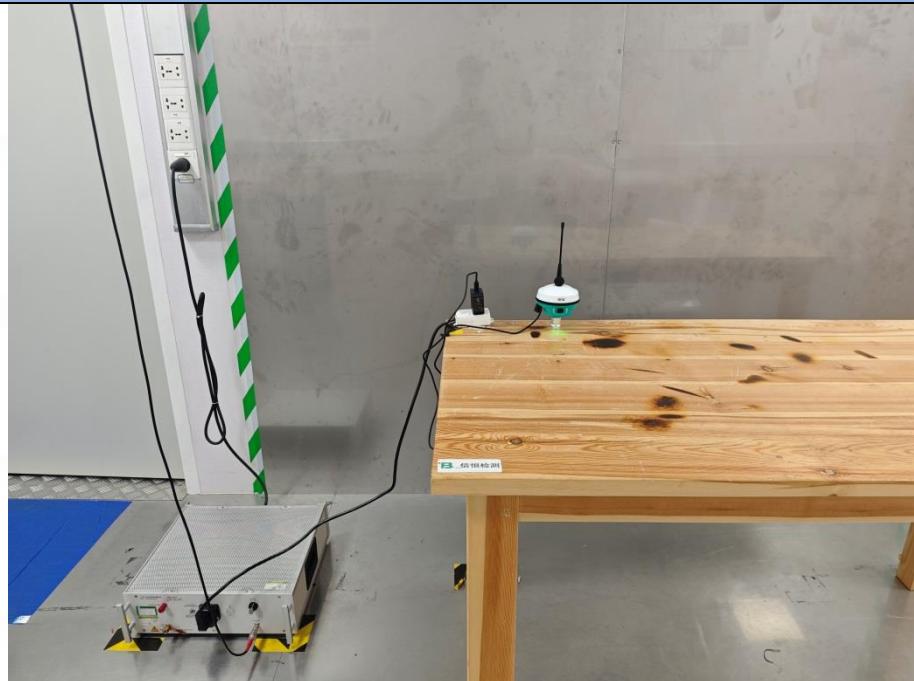
5.3.3 Test Data:
TM1 / Polarization: Horizontal

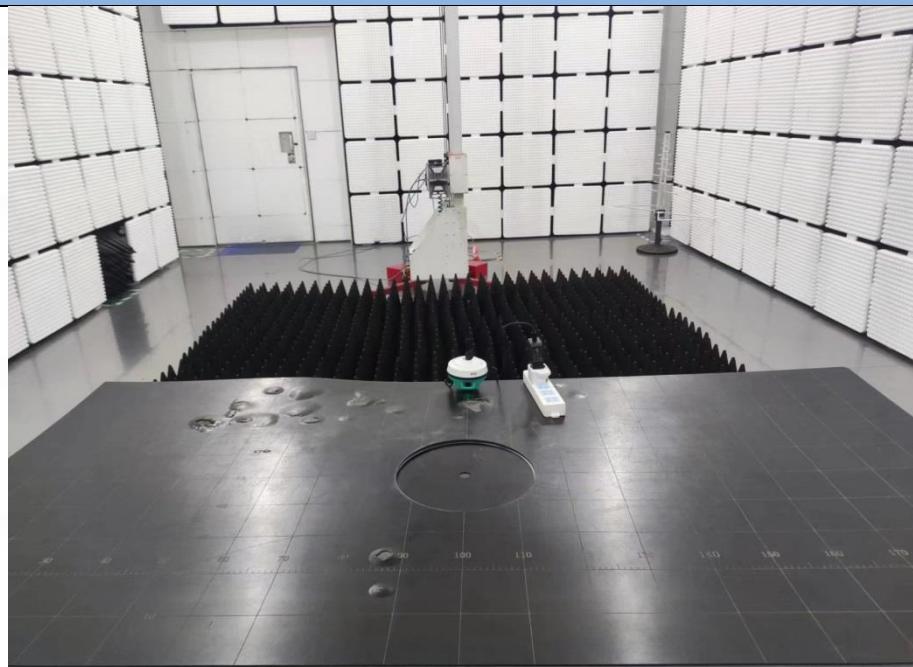
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	5161.626	70.73	-48.70	22.03	74.00	-51.97	peak	P
2	3600.627	65.12	-49.32	15.80	74.00	-58.20	peak	P
3	2737.291	63.30	-49.35	13.95	74.00	-60.05	peak	P
4	1954.468	60.71	-49.80	10.91	74.00	-63.09	peak	P
5	1590.527	60.89	-49.90	10.99	74.00	-63.01	peak	P
6	1308.346	60.70	-49.99	10.71	74.00	-63.29	peak	P

TM1 / Polarization: Vertical

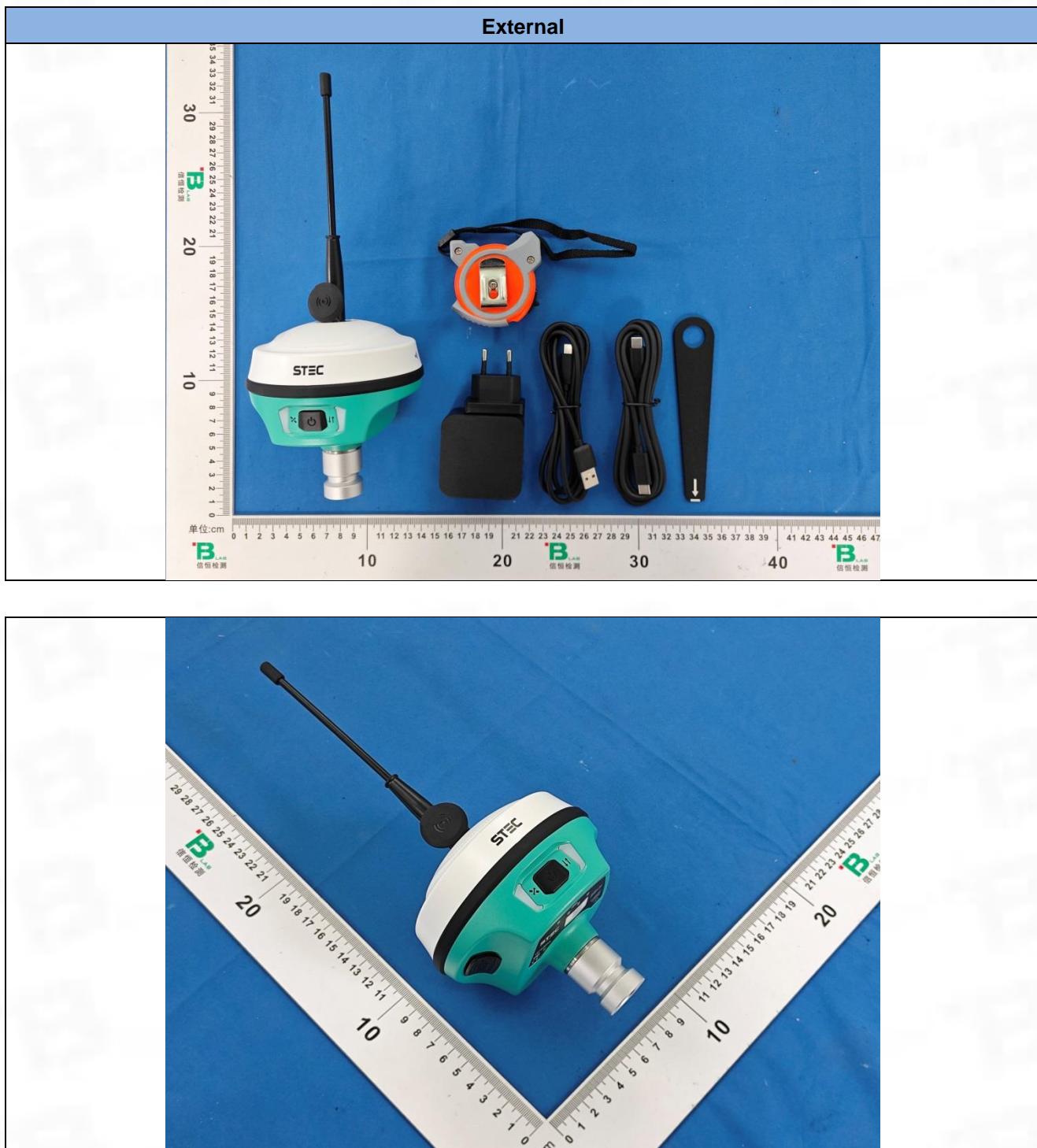
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	4681.417	70.75	-48.97	21.78	74.00	-52.22	peak	P
2	3309.825	66.30	-49.25	17.05	74.00	-56.95	peak	P
3	2156.884	61.36	-49.70	11.66	74.00	-62.34	peak	P
4	1669.365	61.32	-49.89	11.43	74.00	-62.57	peak	P
5	1332.000	37.19	-25.35	11.84	74.00	-62.16	peak	P
6	1108.520	35.81	-25.24	10.57	74.00	-63.43	peak	P

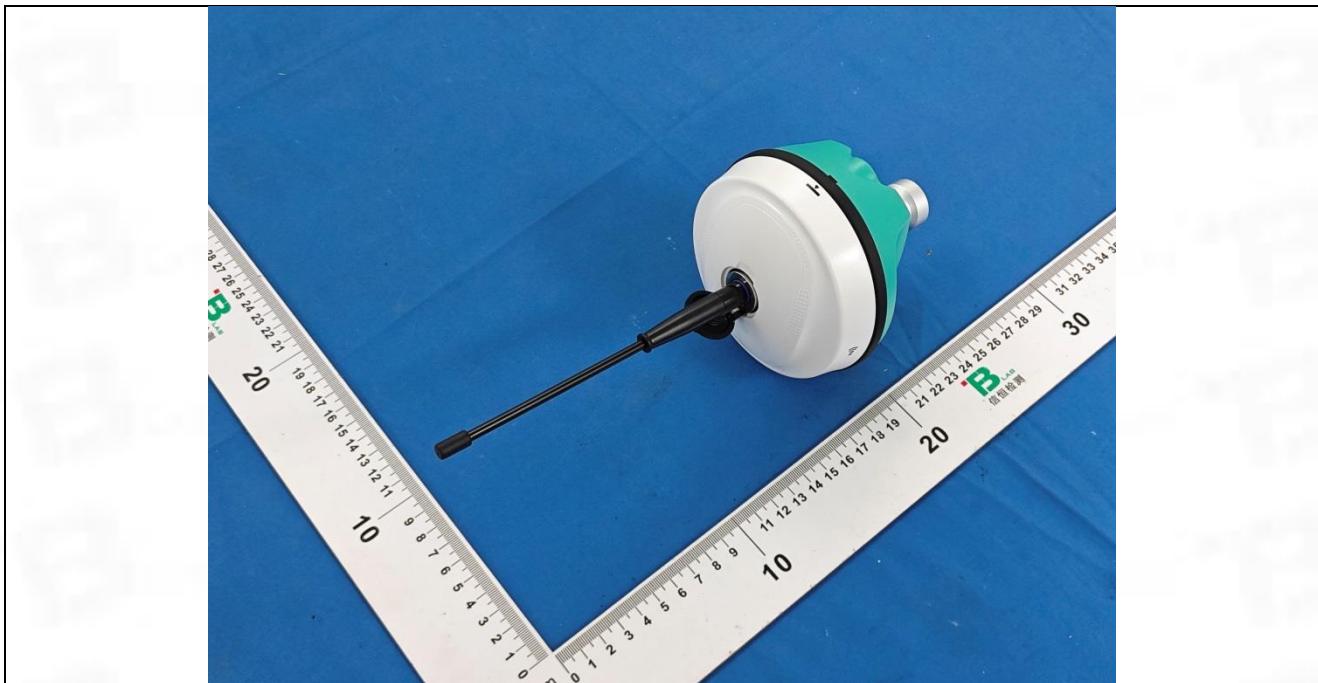
6 Test Setup Photos

Conducted emissions on AC mains**Radiated emissions (Below 1GHz)**

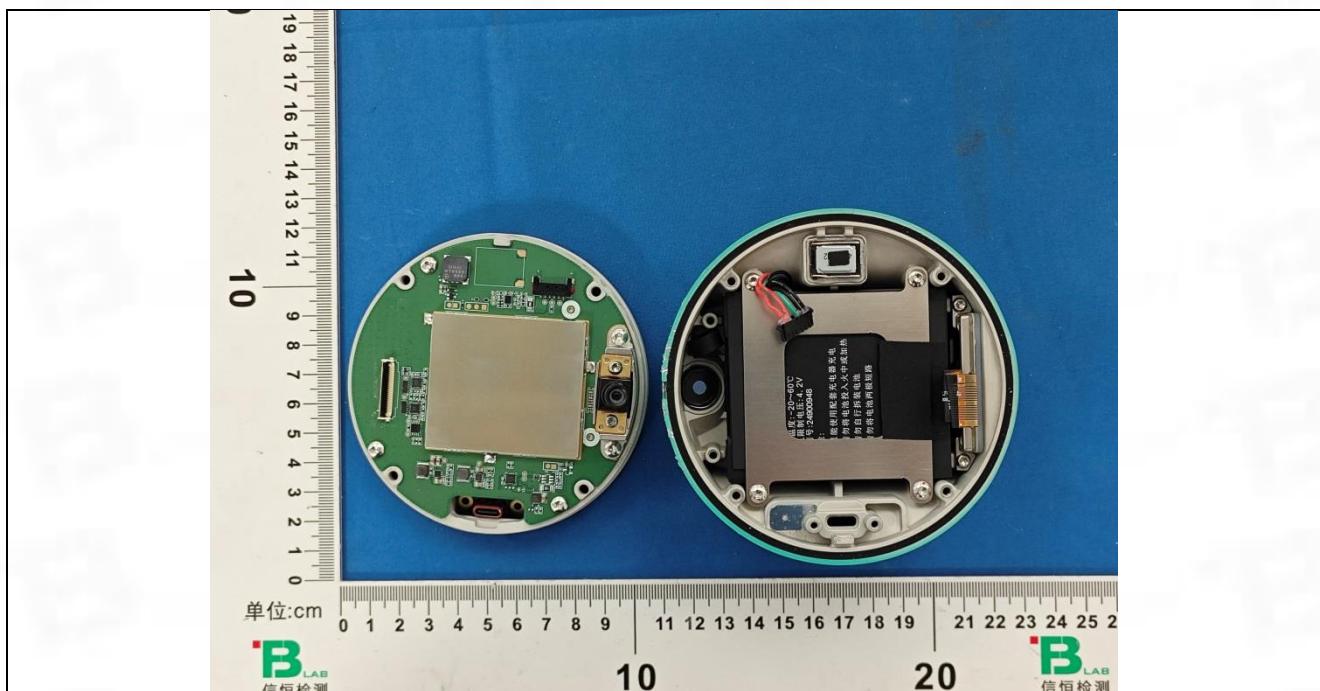
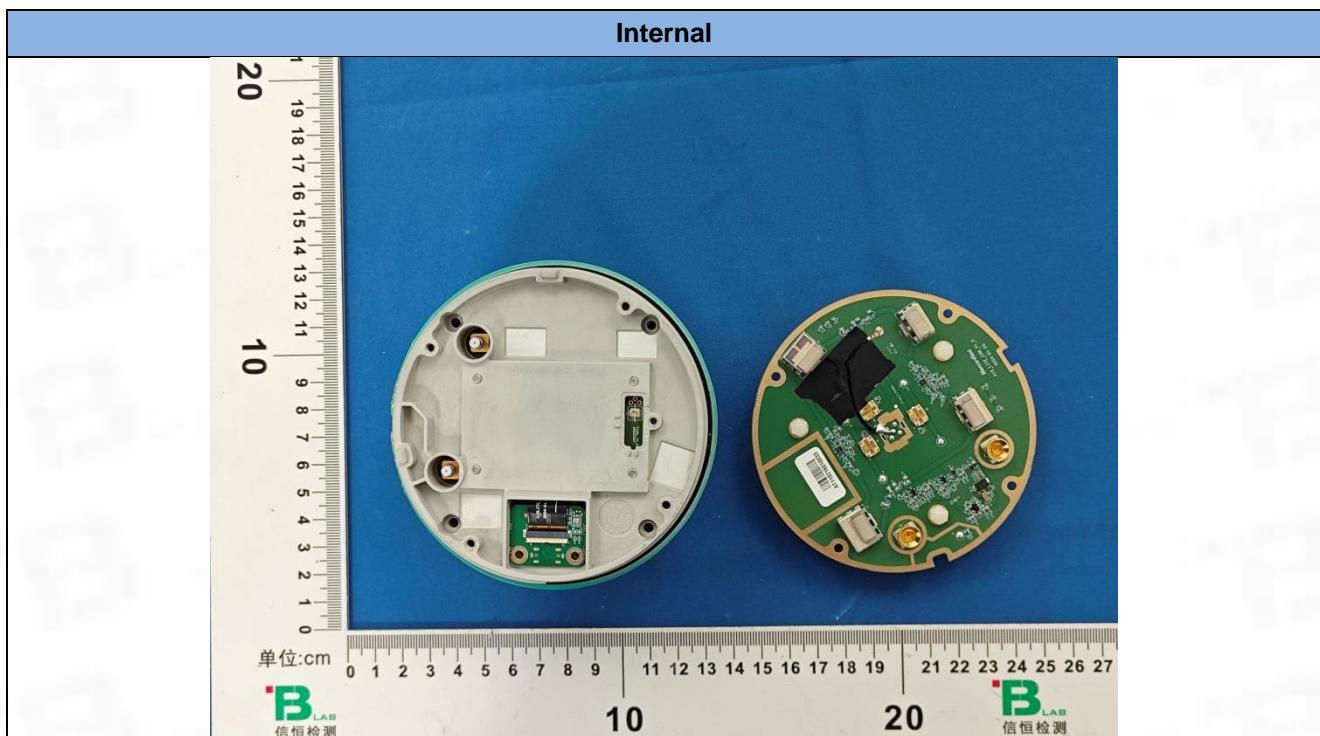
Radiated emissions (Above 1GHz)

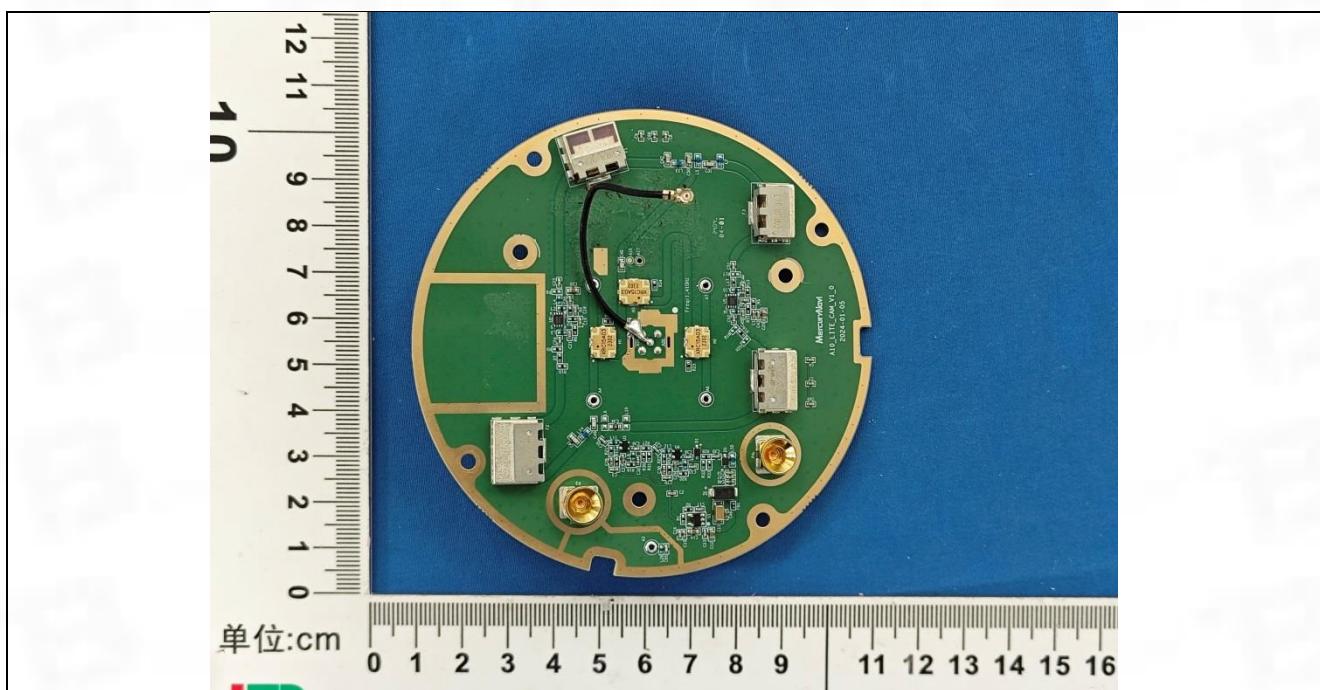
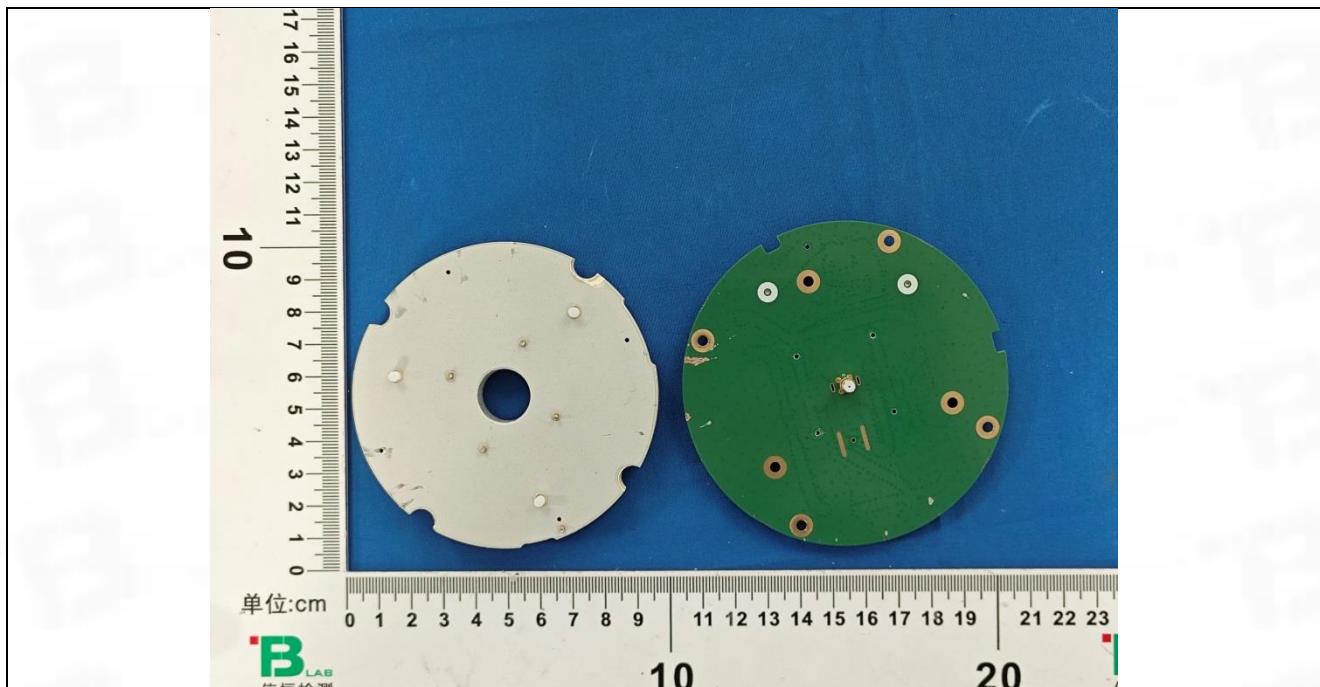
7 EUT Constructional Details (EUT Photos)

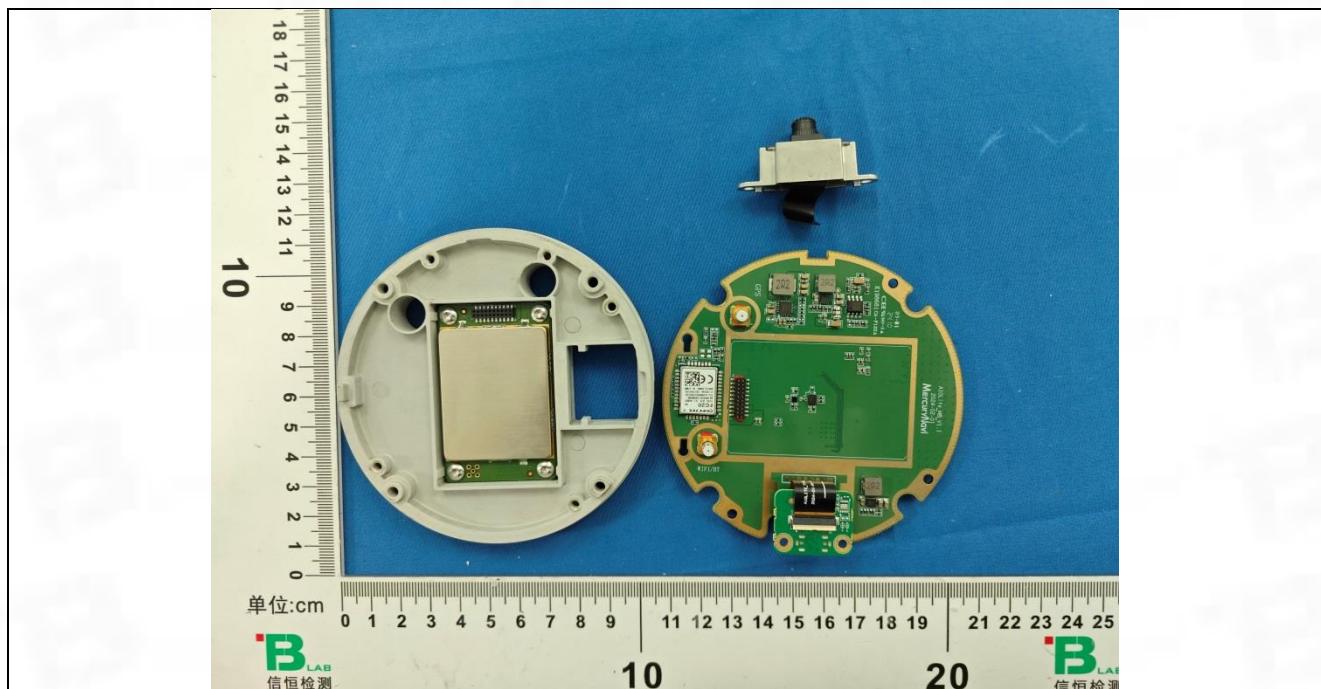
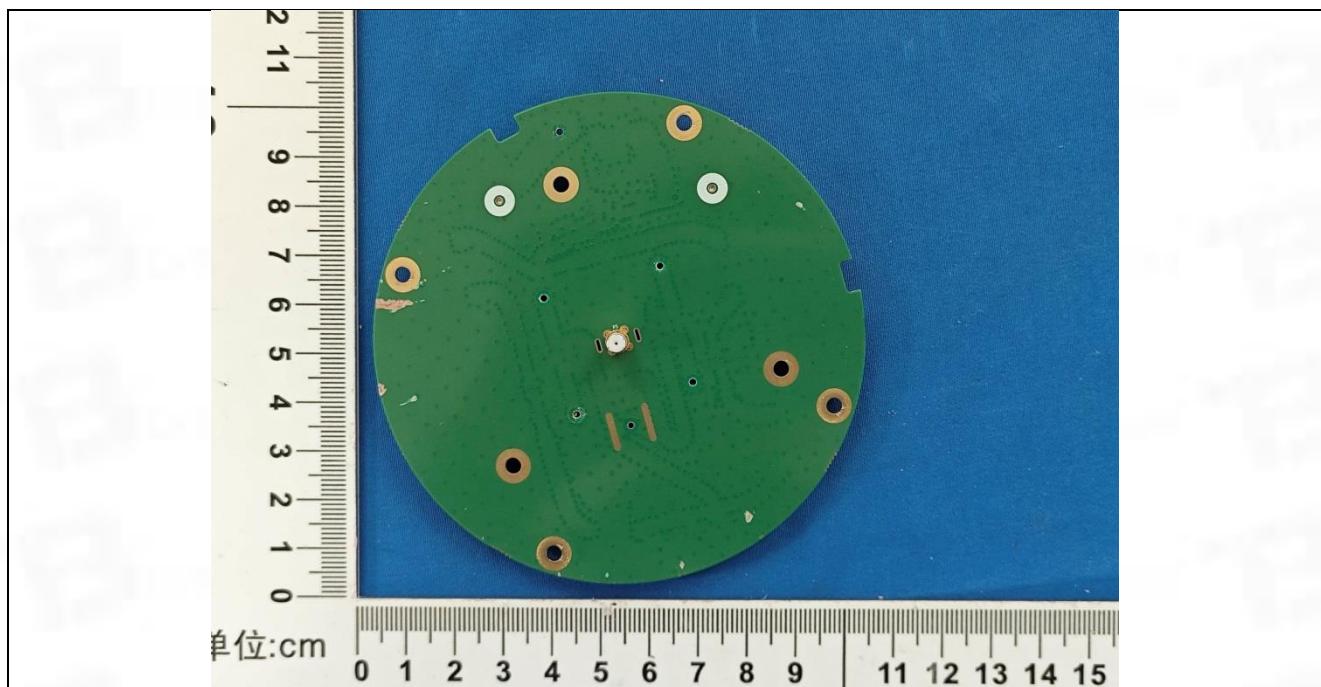


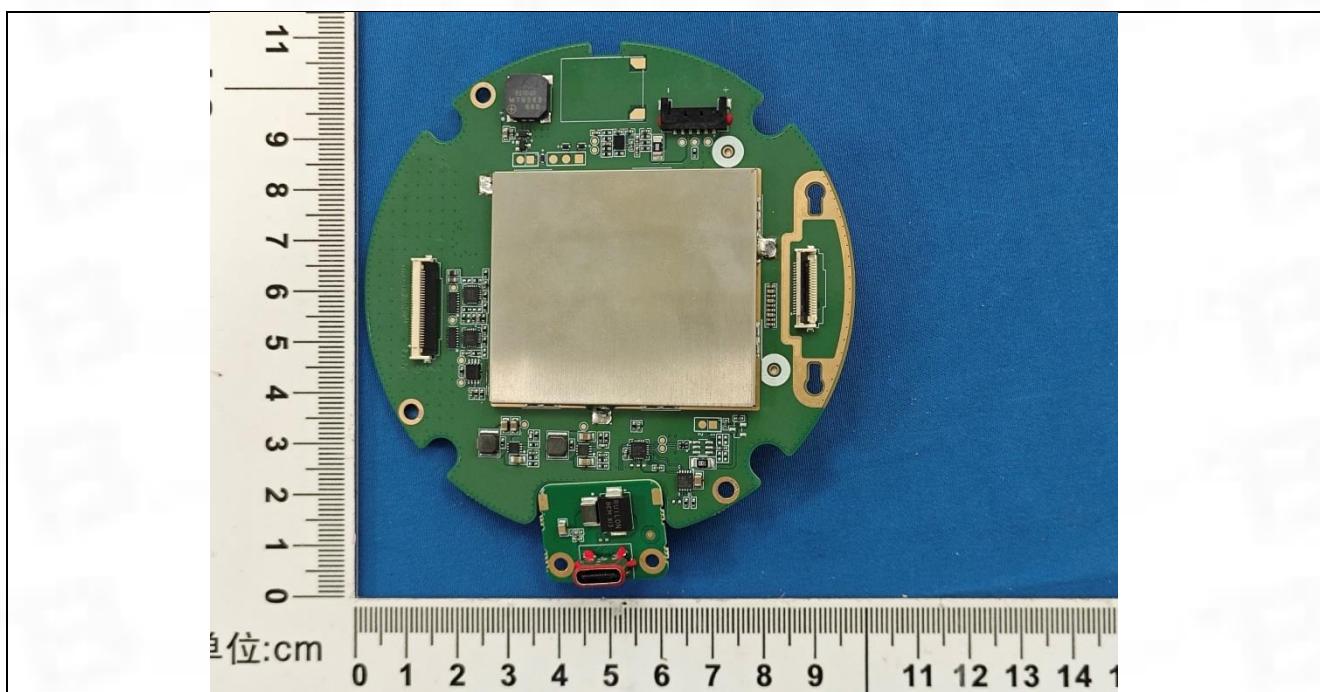
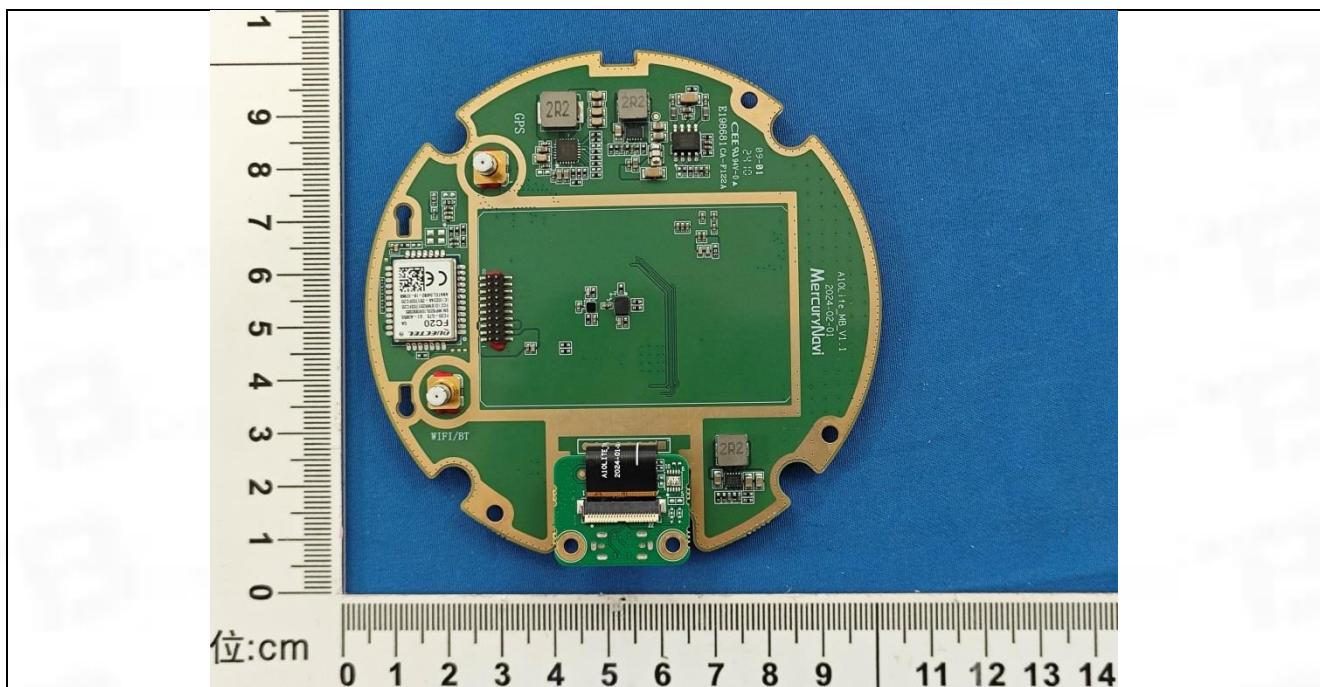


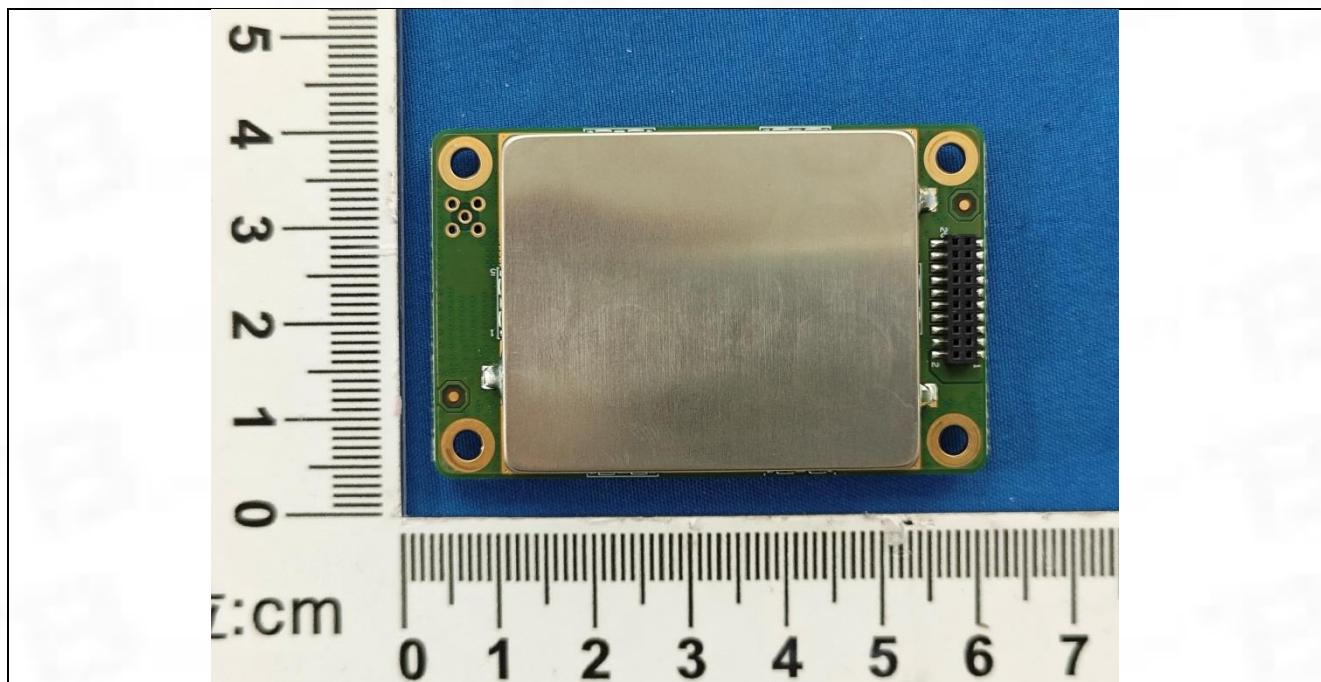
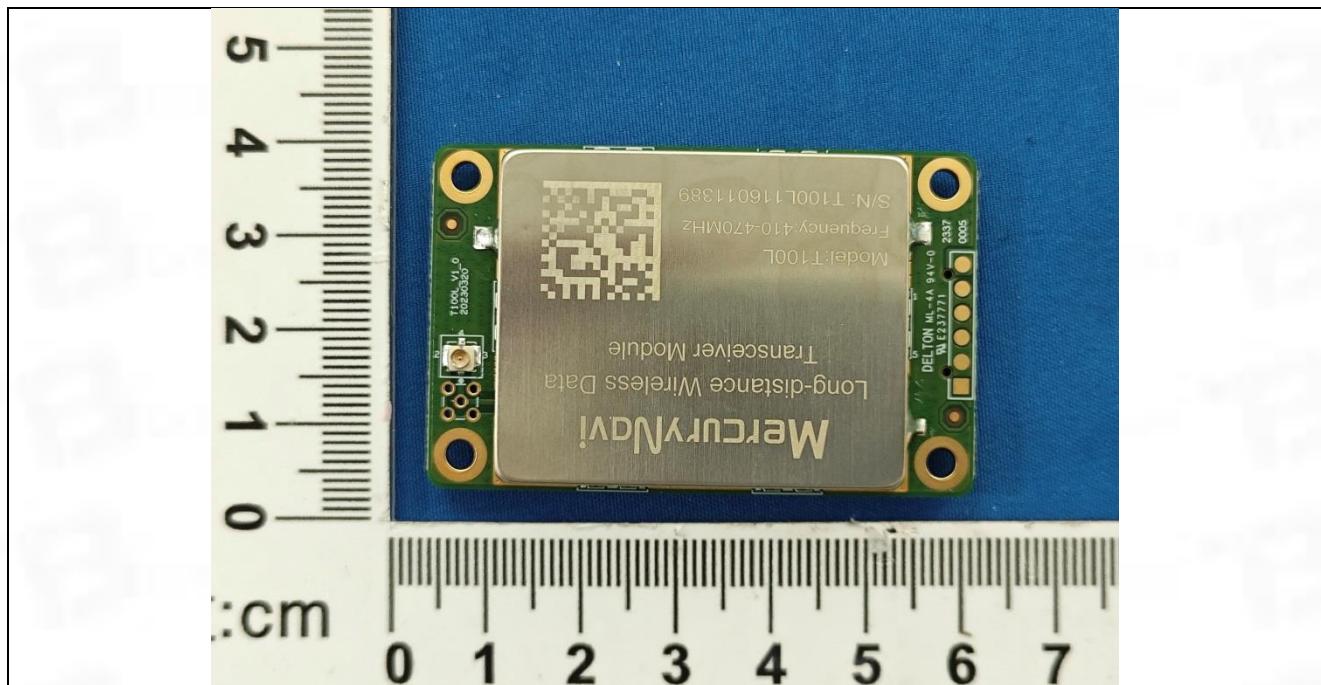


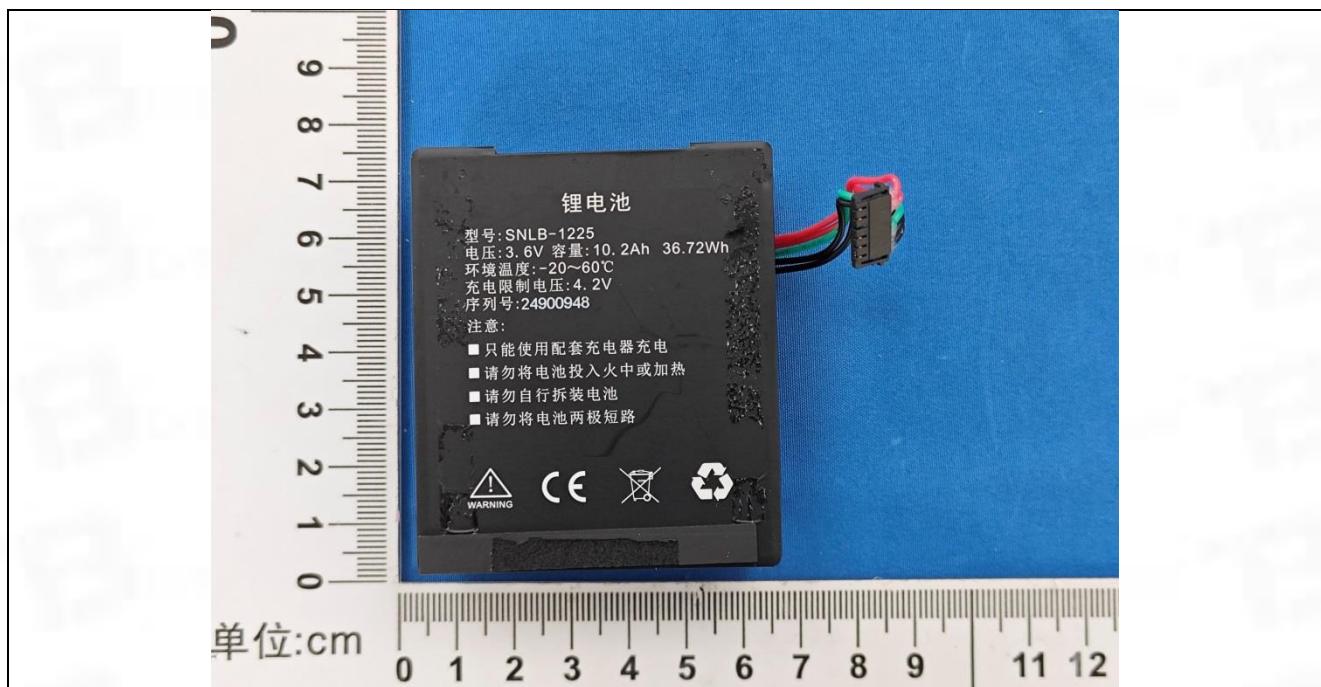














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