TEST REPORT

Product Name	:	Multifunction GPS altimeter
Brand Name	:	N/A
Model	:	GPS
Series Model	:	FR510; FR500; C3;C7;C8;C9;C10
FCC ID		2BO3A-GPS
Applicant	:	**SUNROAD INC.**
Address	:	6547 N Academy Blvd #2266 Colorado Springs CO 80918 US
Manufacturer	:	**SUNROAD TECHNOLOGY LIMITED**
Address	:	15F, 3C Building, Tianyungu, No.2018, Xuegang North Road, Longgang District, Shenzhen, Guangdong, China
Standard(s)	:	FCC CFR Title 47 Part 15 Subpart B
Date of Receipt	:	Mar.28, 2025
Date of Test	:	Mar.28, 2025~ Apr.10, 2025
Issued Date	:	Apr.11, 2025

Issued By: **Guangdong Asia Hongke Test Technology Limited**

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

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Leon.yi

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GUANGDONG ASIA TEST TECHNOLOGY LIMITED AiT TEST REPORT

Report Revise Record

Report Version	Issued Date	Notes
M1	Apr.11, 2025	Initial Release

Contents

1 TEST SUMMARY

1.1 Test Standards

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

ANSI C63.4: 2014 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz

1.2 Test Summary

Test Item	Section in 47 CFR	Test Result
AC Power Line Conducted Emission	FCC Part 15 B (Section15.107) ICES-003 Issue 7 (Section 3.1)	PASS
Electric Field Radiated Emissions	FCC Part 15 B (Section15.109) ICES-003 Issue 7 (Section3.2)	PASS

1.3 Test Facility

Test Laboratory:
Guangdong Asia Hongke Test Technology Limited
B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:
FCC-Registration No.: 251906 Designation Number: CN1376
Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 31737 CAB identifier: CN0165
The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01
Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Guangdong Asia Hongke Test Technology Limited’s quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.
Hereafter the best measurement capability for Asia Hongke laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	9KHz~30MHz ±1.20 dB	(1)
Radiated Emission	9KHz~30MHz ±3.10dB	(1)
Radiated Emission	30MHz~1GHz ±3.75dB	(1)
Radiated Emission	1GHz~18GHz ±3.88 dB	(1)
Radiated Emission	18GHz-40GHz ±3.88dB	(1)
RF power, conducted	30MHz~6GHz ±0.16dB	(1)
RF power density, conducted	±0.24dB	(1)
Spurious emissions, conducted	±0.21dB	(1)
Temperature	±1℃	(1)
Humidity	±3%	(1)
DC and low frequency voltages	±1.5%	(1)
Time	±2%	(1)
Duty cycle	±2%	(1)

The report uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of k=2 , providing a level of confidence of approximately 95%

2 GENERAL INFORMATION

2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	Multifunction GPS altimeter
Model/Type reference:	GPS
Serial Model:	FR510, FR500, C3, C7, C8, C9, C10
Different mode：	Only the names are different, everything else is the same.
Power Ratings:	Input: DC 5V DC 3.7V 320mAh 1.184Wh By battery
Hardware Version:	N/A
Software Version:	N/A

2.3 Description of Test Modes

The device, according to the function of the EUT, select the following operating modes for testing.

Test Modes:	
Mode 1	Charging+Working
Mode 2	Idle mode

Note:

1. Pre-testing on all test modes, only the worst case mode was recorded in this report.
2. After the pre-testing, the following test modes were found to be the worst mode for the corresponding test items and recorded in the report

Test item	Test mode (Worse case operation mode)
EMI	Test mode 1

2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Serial No.	Provided by	Other
Adapter	HNT	HNT-QC530	/	Test lab	/
/	/	/	/	/	/

2.5 Equipment List for the Test

☒ **Radiation Emission Test Equipment (AiT 966 chamber)**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Measuring Receiver	R&S	ESR	101160	2024.09.25	2025.09.24
2	Low Noise Pre Amplifier	SCHWARZBECK	BBV 9745	00282	2024.09.25	2025.09.24
3	Low Noise Pre Amplifier	CESHENG	CSKJLNA231016A	CSKJLNA231016A	2024.09.25	2025.09.24
4	Spectrum Analyzer	R&S	FSV40	101470	2024.09.23	2025.09.22
5	Passive Loop	ETS	6512	00165355	2024.08.29	2026.08.28
6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9168	01434	2024.08.29	2026.08.28
7	Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	452	2024.08.29	2026.08.28
8	6dB Attenuator	JFW	50FPE-006	4360846-949-1	2024.09.24	2025.09.23
9	Filter	MICRO-TRONICS	BRM50702-02	16	2024.09.23	2025.09.22
10	Filter	MICRO-TRONICS	BRC50703-02	17	2024.09.23	2025.09.22
11	Filter	MICRO-TRONICS	BRC50705-02	18	2024.09.23	2025.09.22

☒ **Conducted Emission Test Equipment (AiT shiled room)**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	R&S	ESPI	100771	2024.09.25	2025.09.24
2	LISN	R&S	NNLK 8129	8130179	2024.09.24	2025.09.23
3	ISN	TESEQ	T800	29429	2024.09.26	2025.09.25
4	Pulse Limiter	R&S	ESH3-Z2	102789	2024.09.24	2025.09.23

3 TEST CONDITIONS AND RESULTS

3.1 Conducted Emission

LIMIT

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following：

FREQUENCY (MHz)	☐Class A (dBuV)		☒Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

TEST PROCEDURE

a) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2014.

b) Support equipment, if needed, was placed as per ANSI C63.4-2014.

c) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2014.

d) The EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.

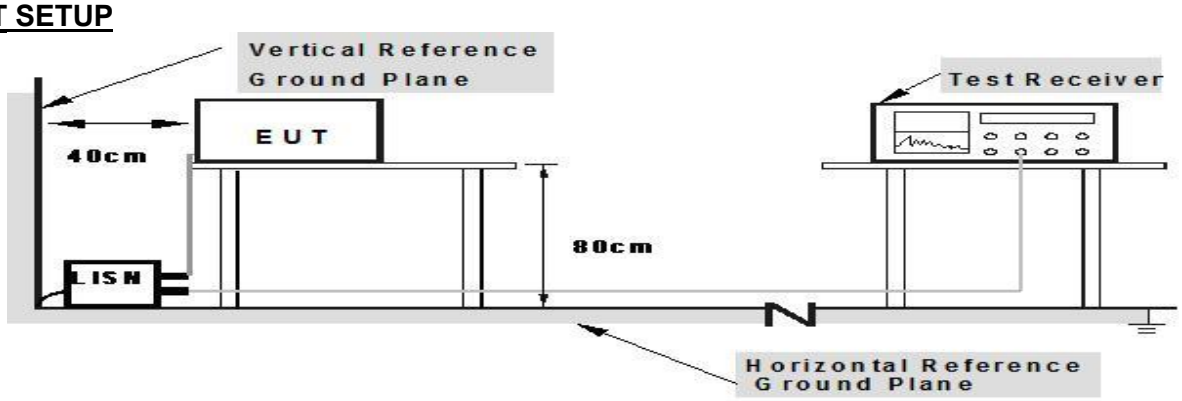
e) All support equipments received AC power from a second LISN, if any.

f) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.

g) Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

h) During the above scans, the emissions were maximized by cable manipulation.

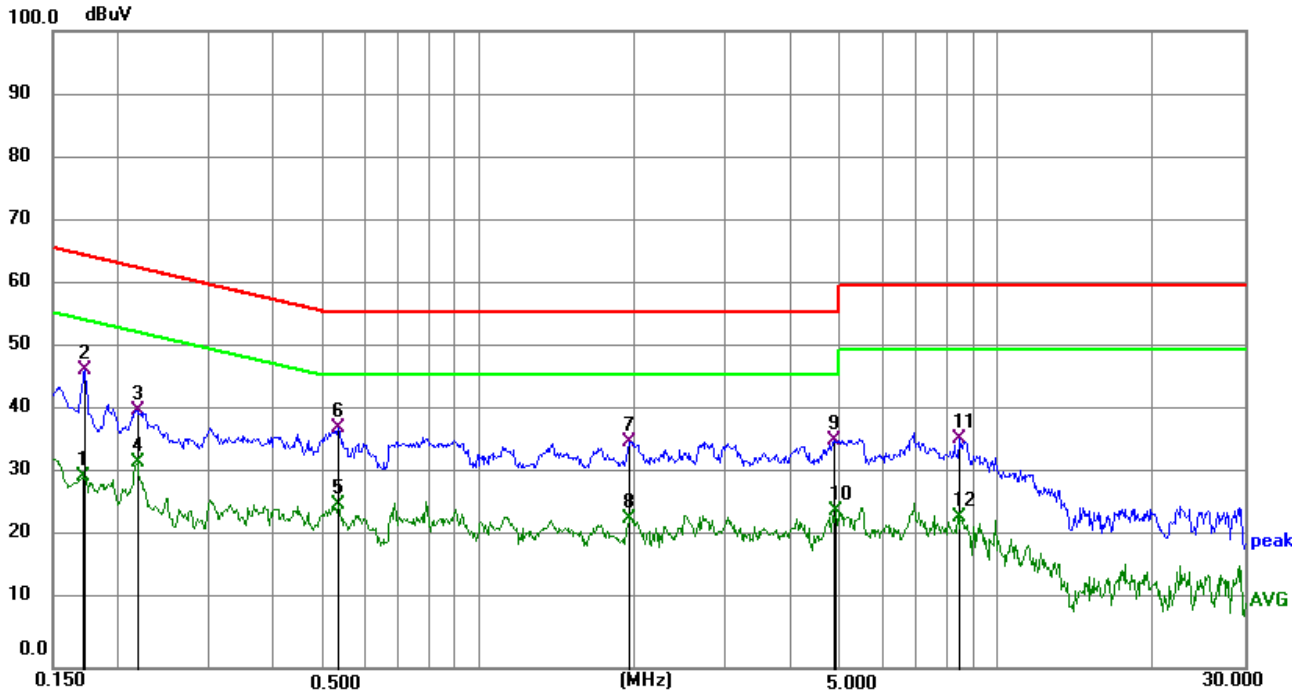
TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

TEST RESULTS

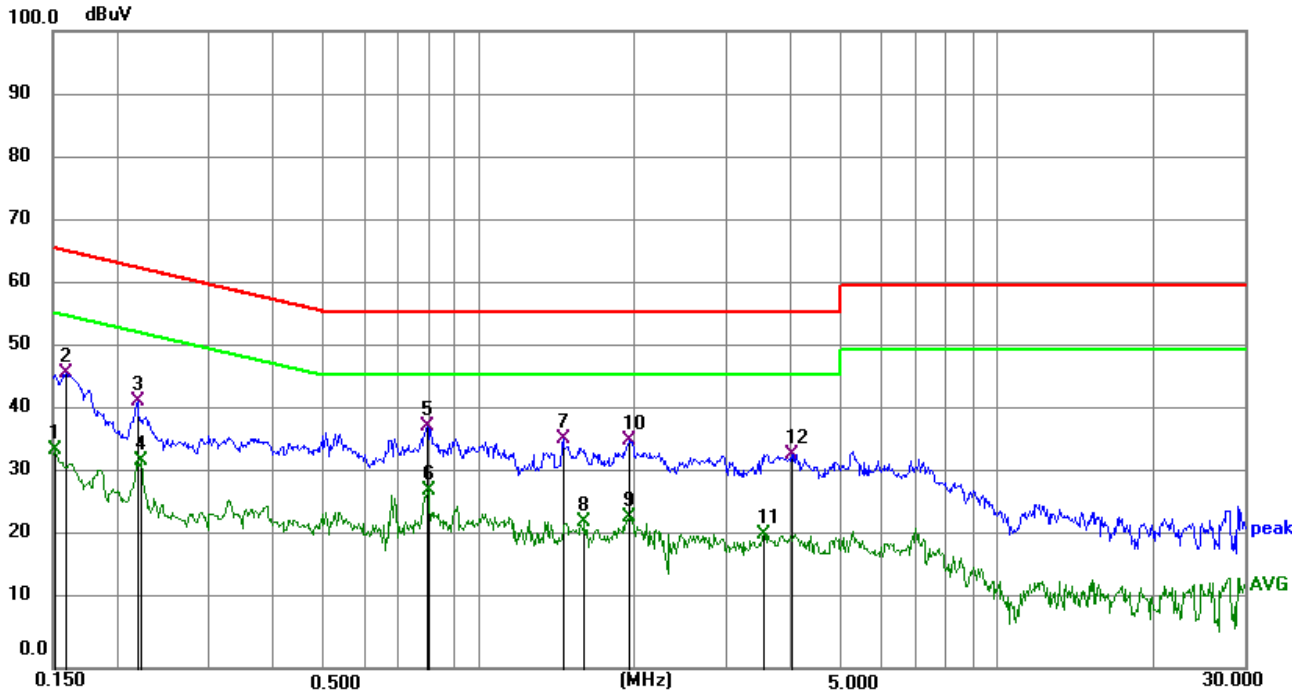
Test Mode	Mode 1	Line:	L



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level +Correct Factor;
Margin = Measurement Result- Limit

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1711	19.39	10.67	30.06	54.91	-24.85	AVG
2	0.1723	36.08	10.67	46.75	64.85	-18.10	QP
3	0.2174	29.78	10.69	40.47	62.92	-22.45	QP
4	0.2174	21.51	10.69	32.20	52.92	-20.72	AVG
5	0.5322	15.02	10.69	25.71	46.00	-20.29	AVG
6	0.5350	27.07	10.69	37.76	56.00	-18.24	QP
7	1.9455	24.81	10.76	35.57	56.00	-20.43	QP
8	1.9590	12.70	10.77	23.47	46.00	-22.53	AVG
9	4.8345	24.78	11.01	35.79	56.00	-20.21	QP
10	4.8795	13.57	11.01	24.58	46.00	-21.42	AVG
11	8.4930	24.93	11.04	35.97	60.00	-24.03	QP
12	8.4930	12.70	11.04	23.74	50.00	-26.26	AVG

Test Mode	Mode 1	Line:	N



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level +Correct Factor;
Margin = Measurement Result- Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1514	22.57	11.68	34.25	55.92	-21.67	AVG
2	0.1590	35.57	10.78	46.35	65.52	-19.17	QP
3	0.2174	31.26	10.69	41.95	62.92	-20.97	QP
4	0.2220	21.95	10.69	32.64	52.74	-20.10	AVG
5	0.7933	27.32	10.65	37.97	56.00	-18.03	QP
6	0.7980	17.21	10.65	27.86	46.00	-18.14	AVG
7	1.4500	25.23	10.69	35.92	56.00	-20.08	QP
8	1.5945	12.37	10.72	23.09	46.00	-22.91	AVG
9	1.9455	12.87	10.76	23.63	46.00	-22.37	AVG
10	1.9540	25.03	10.76	35.79	56.00	-20.21	QP
11	3.5384	10.10	10.97	21.07	46.00	-24.93	AVG
12	4.0243	22.66	10.99	33.65	56.00	-22.35	QP

3.2 Radiated Emission

LIMITS

LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	☐Class A (at 10m)	☒Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (at 3m) dBuV/m		Class B (at 3m) dBuV/m	
	Peak	Avg	Peak	Avg
Above 1000	80	60	74	54

Notes:

1) The limit for radiated test was performed according to as following: CISPR 22/ FCC PART 15B /ICES-003.
2) The tighter limit applies at the band edges.
3) Emission level (dBuV/m)=20log Emission level (uV/m).

TEST PROCEDURE

a) The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

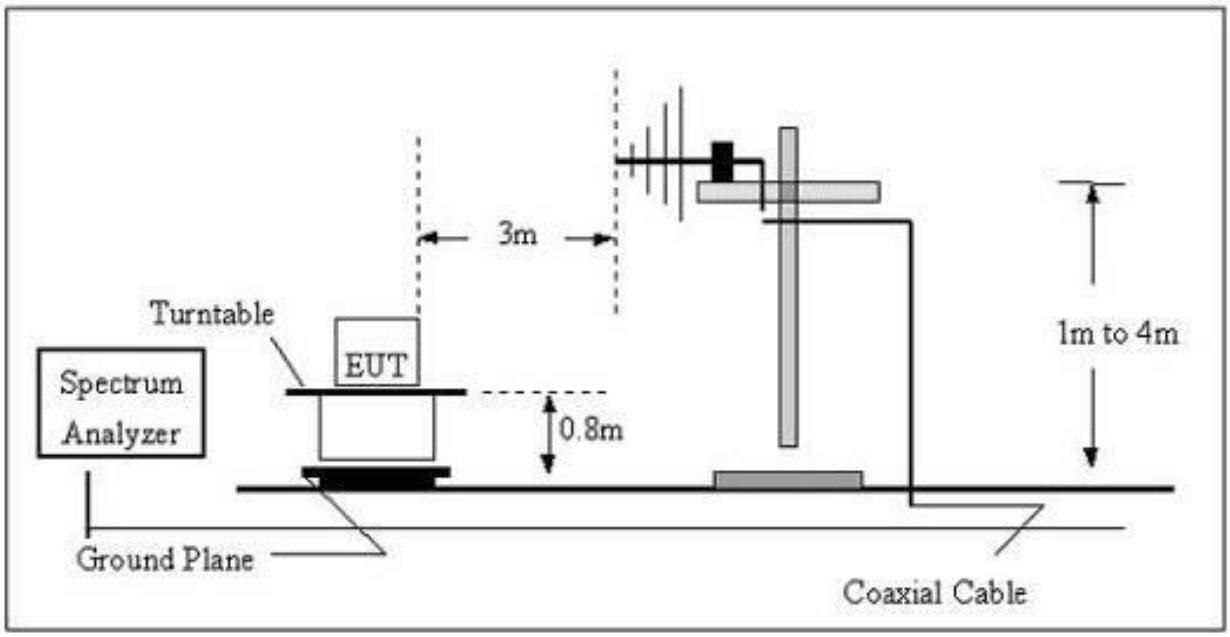
d) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP (AV) Limits and then no additional QP Mode measurement performed.

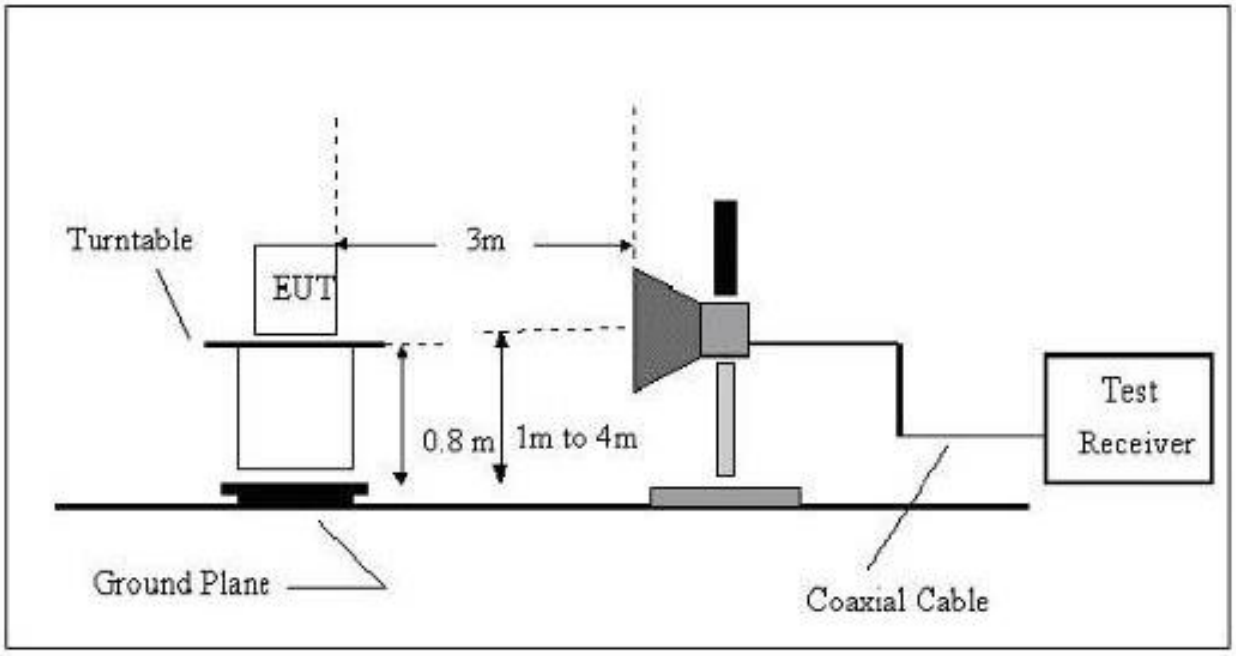
f) For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-UP Frequency Above 1GHz



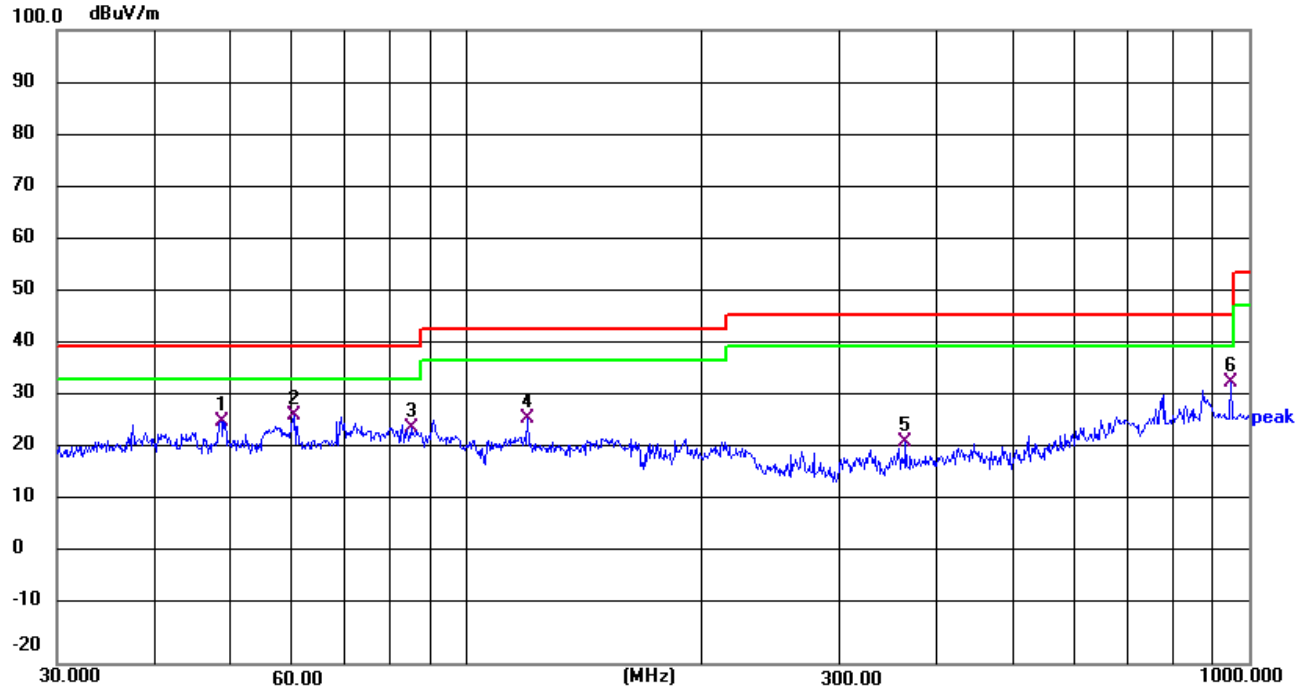
For 30MHz-1GHz

Test mode:	Mode 1	Polarization:	Horizontal

Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	37.5479	44.99	-16.82	28.17	40.00	-11.83	QP
2	49.1865	45.30	-16.60	28.70	40.00	-11.30	QP
3	60.9176	47.52	-17.41	30.11	40.00	-9.89	QP
4	119.8556	46.30	-18.40	27.90	43.50	-15.60	QP
5	779.6068	39.22	-6.34	32.88	46.00	-13.12	QP
6	948.7610	42.47	-3.55	38.92	46.00	-7.08	QP

Test mode:	Mode 1	Polarization:	Vertical

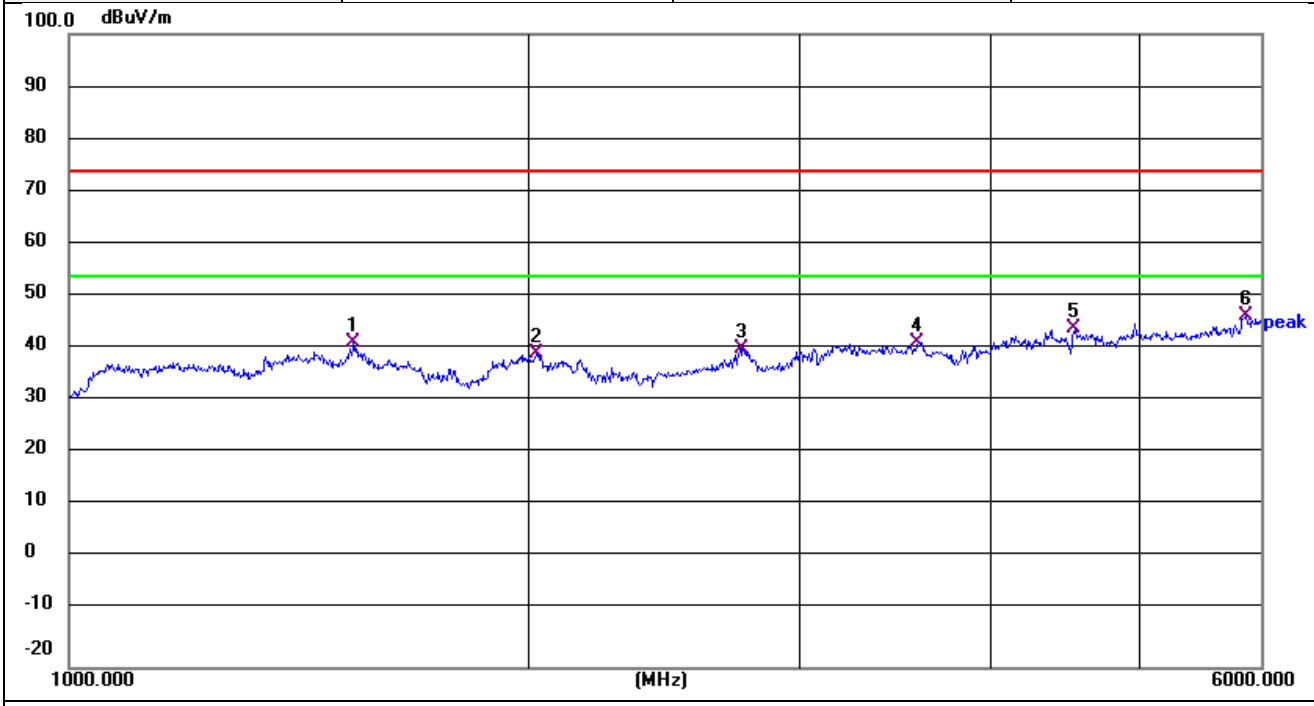


Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	48.6720	42.59	-16.62	25.97	40.00	-14.03	QP
2	60.2800	44.45	-17.29	27.16	40.00	-12.84	QP
3	84.9993	45.55	-20.97	24.58	40.00	-15.42	QP
4	119.8555	44.80	-18.40	26.40	43.50	-17.10	QP
5	364.2595	37.29	-15.38	21.91	46.00	-24.09	QP
6	948.7610	36.97	-3.55	33.42	46.00	-12.58	QP

For 1GHz-6 GHz

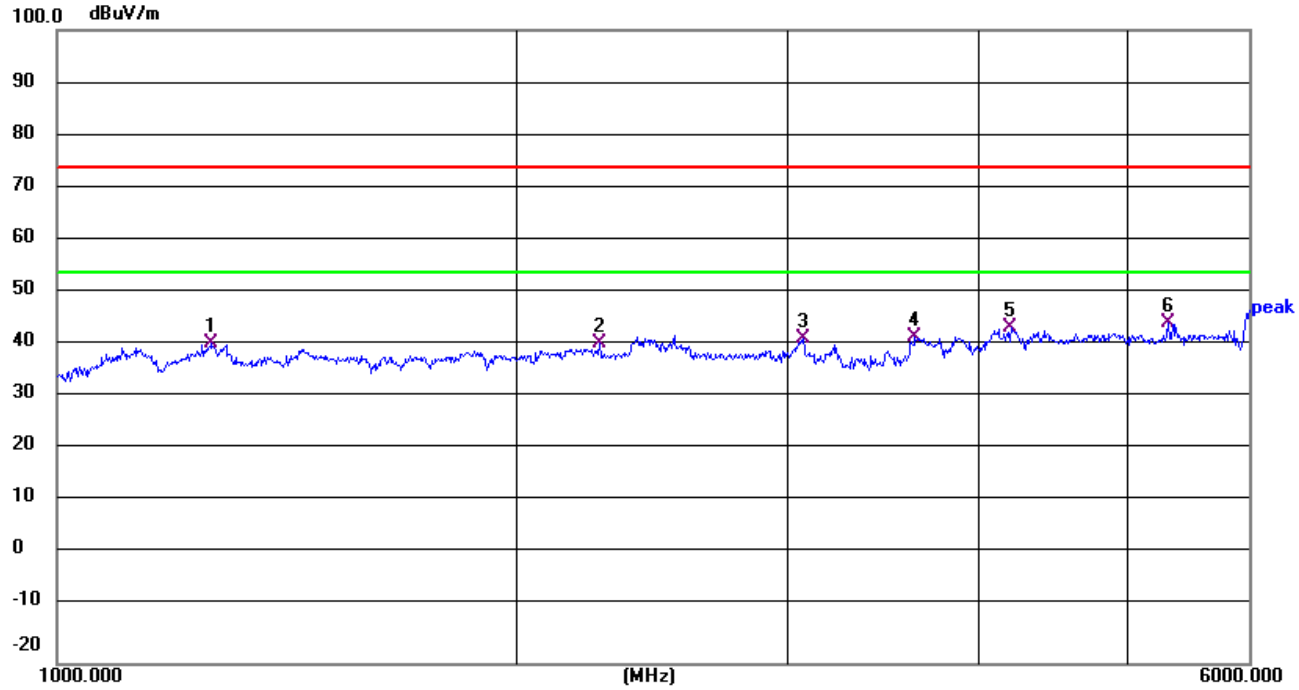
Test mode:	Mode 1	Polarization:	Horizontal



Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1534.540	51.43	-9.86	41.57	74.00	-32.43	QP
2	2018.530	48.53	-8.94	39.59	74.00	-34.41	QP
3	2752.044	43.74	-3.20	40.54	74.00	-33.46	QP
4	3587.747	41.26	0.36	41.62	74.00	-32.38	QP
5	4536.904	39.52	4.93	44.45	74.00	-29.55	QP
6	5872.370	42.69	3.97	46.66	74.00	-27.34	QP

Test mode:	Mode 1	Polarization:	Vertical



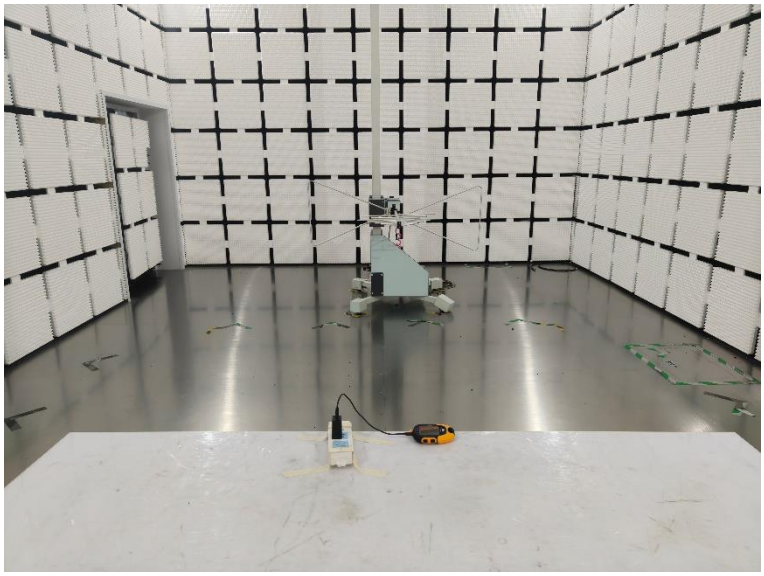
Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

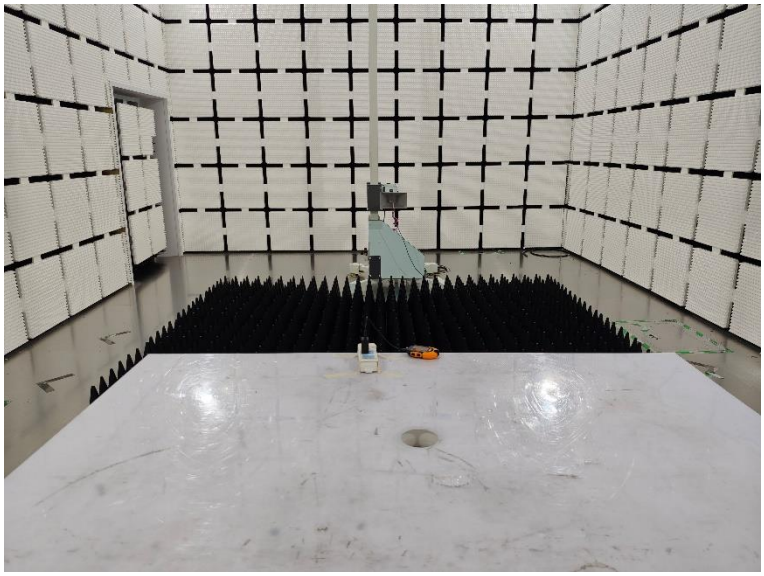
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1262.292	51.03	-10.42	40.61	74.00	-33.39	QP
2	2259.742	47.67	-6.87	40.80	74.00	-33.20	QP
3	3069.889	43.22	-1.51	41.71	74.00	-32.29	QP
4	3633.029	41.00	0.80	41.80	74.00	-32.20	QP
5	4200.482	39.44	4.14	43.58	74.00	-30.42	QP
6 *	5311.742	40.29	4.38	44.67	74.00	-29.33	QP

4 Test Setup Photographs of EUT

Conducted Emission

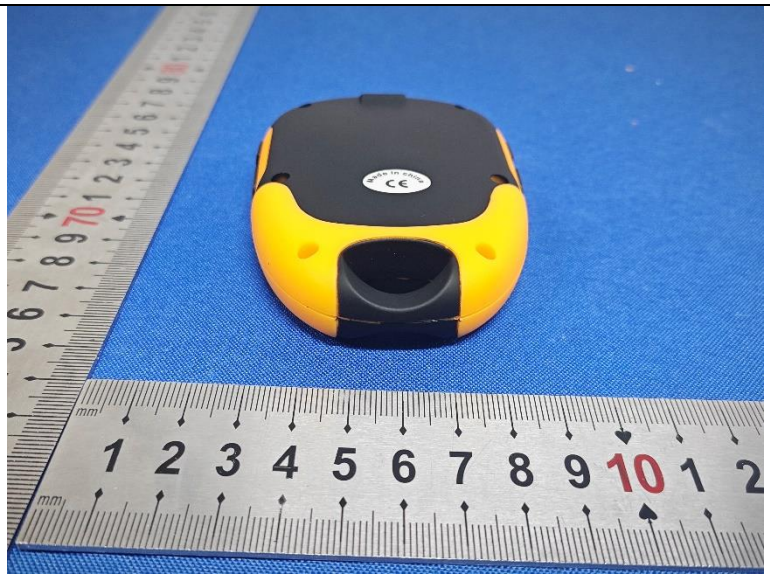
Radiated Emission

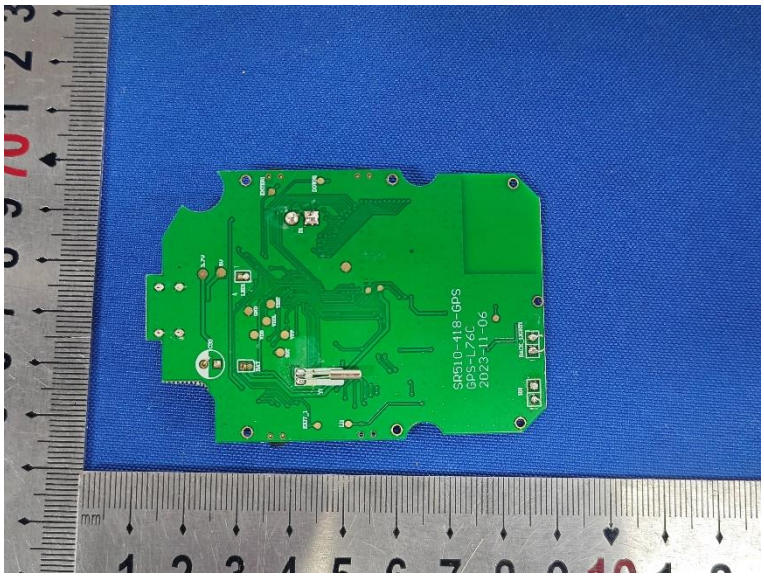




5 Photos of EUT

External photos

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GPS-L76C
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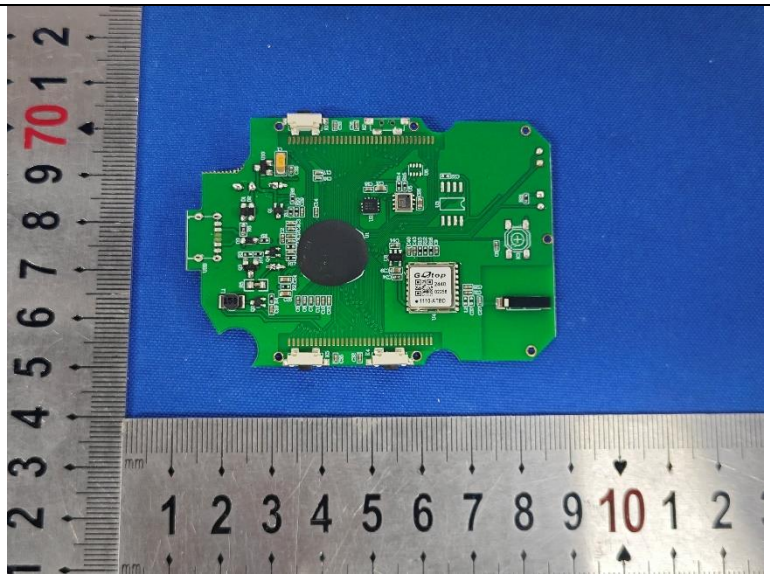

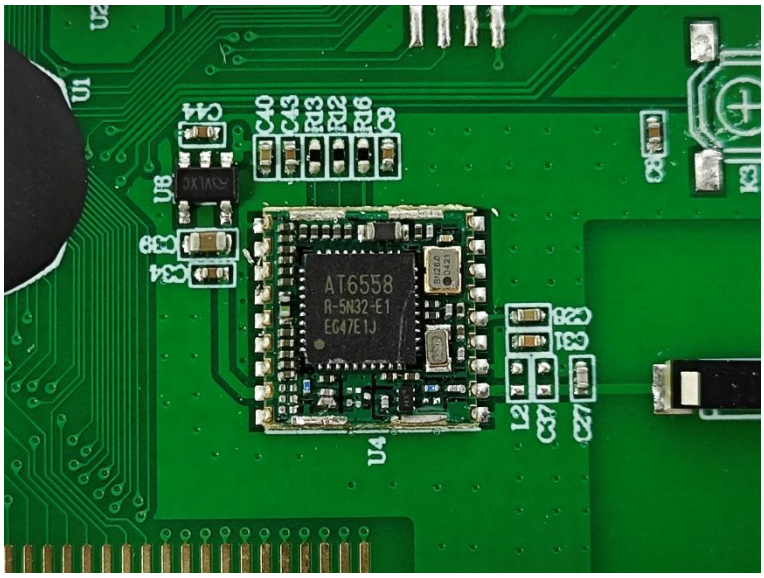

********** **End of Report** **********