

EMC TEST REPORT

Radio Frequency Devices - Unintentional Radiators

FCC ID.....:	2ACOE-SKM55	
Test Report No.:	TCT230303E011	
Date of issue	Mar. 03, 2023	
Testing laboratory.....:	SHENZHEN TONGCE TESTING LAB	
Testing location/ address.....:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name	Skylab M&C Technology Co., Ltd.	
Address.....:	6/F, Building 9, Lijincheng park, Gongye East Rd, Longhua St, Longhua District, Shenzhen, 518109 China	
Manufacturer's name	Skylab M&C Technology Co., Ltd.	
Address.....:	6/F, Building 9, Lijincheng park, Gongye East Rd, Longhua St, Longhua District, Shenzhen, 518109 China	
Standard(s)	FCC 47 CFR Part 15 Subpart B	
Test item description.....:	GPS Module	
Trade Mark.....:	N/A	
Model/Type reference	SKM55	
Rating(s)	DC 5 V, 50 mA	
Date of receipt of test item.....:	Mar. 03, 2023	
Date (s) of performance of test:	Nov. 18, 2022 - Mar. 03, 2023	
Tested by (+signature).....:	Kyle ZHOU	
Check by (+signature)	Howie LYU	
Approved by (+signature)	Tomsin	



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1. General Product Information

1.1.EUT description

Test item description..... :	GPS Module
Model/Type reference :	SKM55
Rating(s):	DC 5 V, 50 mA
Highest internal frequency F_x :	☐ $F_x \leq 108$ MHz ☐ $108 \text{ MHz} < F_x \leq 500 \text{ MHz}$ ☐ $500 \text{ MHz} < F_x \leq 1 \text{ GHz}$ ☒ $F_x > 1 \text{ GHz}$
USB Line..... :	☒ Shielded ☐ Unshielded, ☐ Detachable ☒ Un-detachable ☐ No applicable ☒ Length: 3 m

1.2.Model(s) list

None.

2. Test Information

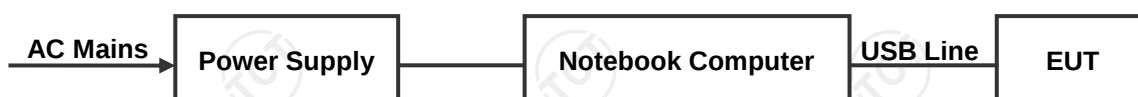
2.1.EUT operation mode(s)

Mode #	Operating mode description	Test voltage
1	Normal Operation	DC 5 V (Notebook Computer Input AC 120 V/ 60 Hz)

2.2.Special accessories and auxiliary equipment

Product Type	Manufacturer	Model No.	Serial No.
Notebook Computer	DELL	G3 3500	00342-36088-99832-AAOEM
Power Supply	DELL	HA130PM190	CN-0CY0JM-CH200-0B6-7405-A01

2.3.Configuration of system under test



(EUT: GPS Module)

2.4.General test conditions

Environmental reference conditions

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.

The climatic conditions during the tests were within the following limits:

Temperature	Humidity	Atmospheric pressure
15 °C – 35 °C	30 % - 60 %	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.

Measurement uncertainties

Test Item	Uncertainty
Uncertainty for Disturbance voltage at the mains terminals	3.10 dB
Uncertainty for Radiated emission (30 MHz to 1 GHz)	4.56 dB
Uncertainty for Radiated emission (above 1 GHz)	4.22 dB

The overall measurement uncertainty of a measurement is defined as the range of which can be supposed that it contains the true value with a specified probability.

This probability is 95 % for the generally specified measurement uncertainty (so-called expanded measurement uncertainty).

The limits for emission measurements and the Test levels for immunity tests in the applied standards were defined taking into consideration the accuracy limits for measurement and testing equipment required by the Basic standards.

All measurement and test results of the EMC laboratory of SHENZHEN TONGCE TESTING LAB fulfil the requirements for measurement uncertainties according to the standards applied.

Decision rule for statement(s) of conformity is based on accuracy method specified in Clause 4.4.3 in IEC Guide 115:2021.

3. Test Result Summary

FCC 47 CFR Part 15 Subpart B	
Requirement – Test case	Verdict
Classification Class (☐ A ☒ B)	—
Disturbance voltage at the mains terminals	Pass
Radiated emission	Pass
Remark:---	

Test case verdicts	
- Test case does not apply to the test object	N/A
- Test object does meet the requirement.....	P (Pass)
- Test object does not meet the requirement	F (Fail)

4. List of Test Equipment

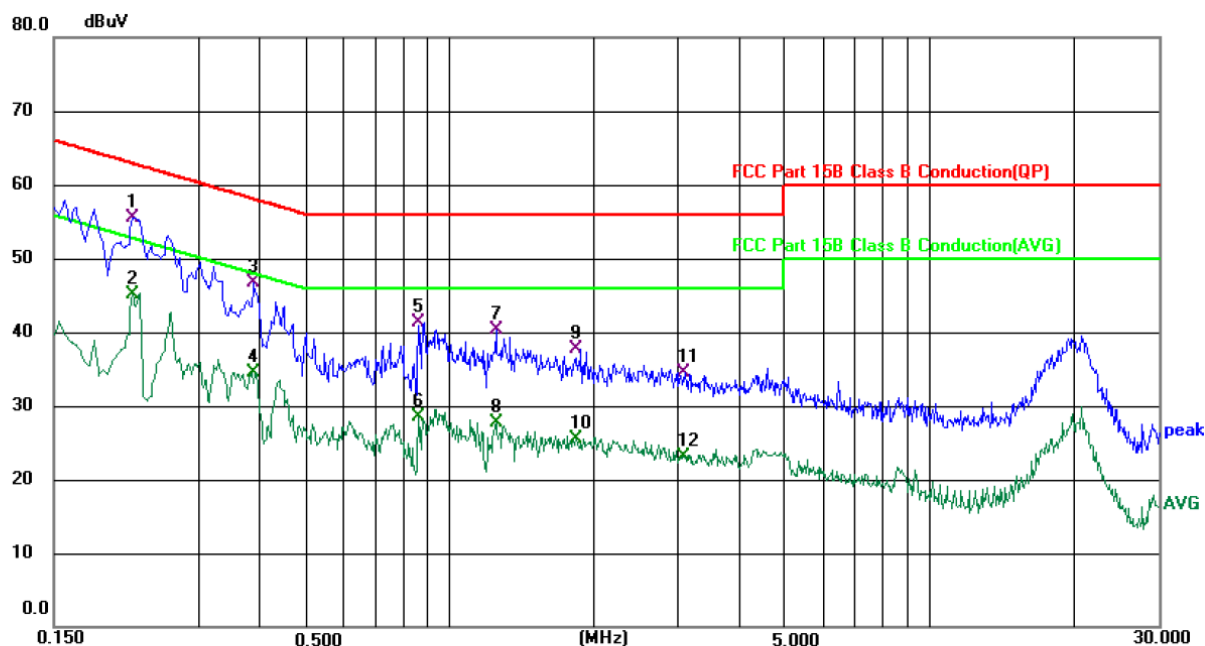
Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Disturbance voltage at mains terminals				
EMI Test Receiver	R&S	ESCI3	100898	2023/07/03
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	2024/02/20
Attenuator	N/A	10dB	164080	2023/07/03
844 Shielded room	SKET	8m*4m*4m	CR4	2024/03/02
Test software	EZ EMC	EMEC-3A1	/	/
Radiated emission (30 MHz to 1 GHz)				
Broadband Antenna	Schwarzbeck	VULB 9168	01197	2024/02/24
EMI Test Receiver	R&S	ESCI7	100529	2024/02/20
Test software	EZ EMC	FA-03A2 RE+	/	/
3m Anechoic Chamber	SKET	9m*6m*6m	SA01	2024/01/25
Radiated emission (above 1 GHz)				
Horn Antenna	Schwarzbeck	BBHA 9120 D	02372	2024/02/24
Horn Antenna	Schwarzbeck	BBHA 9170	00956	2024/02/24
Signal Analyzer	R&S	FSQ40	200061	2023/07/03
Pre-amplifier	SKET	LNPA_0118G-45	SK2021012102	2024/02/20
Pre-amplifier	SKET	LNPA_1840G-50	SK202109203500	2024/02/20
3m Anechoic Chamber	SKET	9m*6m*6m	SA03	2024/01/25
Test software	EZ EMC	FA-03A2 RE+	/	/

5. Test Conditions and Results

5.1. Disturbance voltage at mains terminals

Test requirement	FCC 47 CFR Part 15 Subpart B		
Basic standard	ANSI C63.4: 2014+A1:2017		
Test frequency range..	150 kHz to 30 MHz		
Limits.....	Limits for Class A		
	Frequency (MHz)	dB μ V Quasi-peak	dB μ V Average
	0.15 to 0.5	79	66
	0.5 to 30	73	60
	Limits for Class B		
	Frequency (MHz)	dB μ V Quasi-peak	dB μ V Average
	0.15 to 0.5	66 to 56	56 to 46
	0.5 to 5	56	46
	5 to 30	60	50
Test method	The AMN placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN).		
Ambient temperature..	25.3 °C		
Relative humidity	56 %		
Test location	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China		
Test model(s)	SKM55		
EUT operation mode..	Mode 1		
Test results	Pass		
Remark.....	/		

Measurement data and Graphical presentation of the result



Site 844 Shielding Room

Phase: **L1**

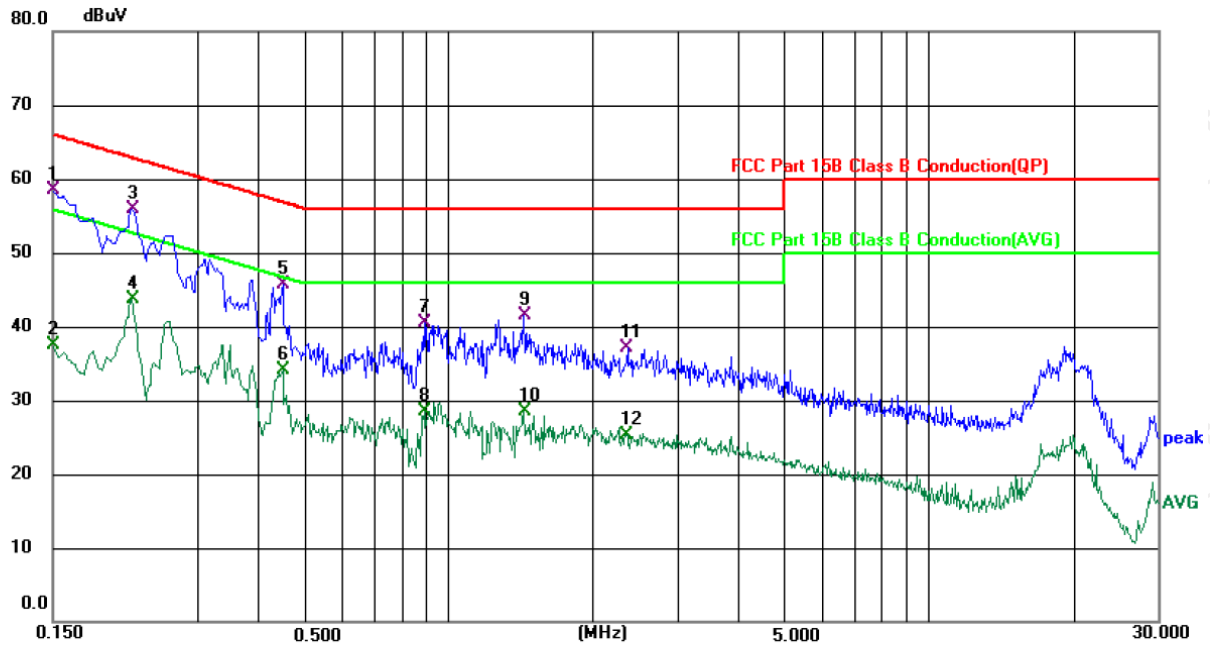
Temperature: 25.3 (°C)

Humidity: 56 %

Limit: FCC Part 15B Class B Conduction(QP)

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.2179	45.17	10.28	55.45	62.90	-7.45	QP	
2		0.2179	34.84	10.28	45.12	52.90	-7.78	AVG	
3		0.3899	36.53	10.20	46.73	58.07	-11.34	QP	
4		0.3899	24.21	10.20	34.41	48.07	-13.66	AVG	
5		0.8659	31.13	10.11	41.24	56.00	-14.76	QP	
6		0.8659	18.30	10.11	28.41	46.00	-17.59	AVG	
7		1.2540	30.27	10.08	40.35	56.00	-15.65	QP	
8		1.2540	17.53	10.08	27.61	46.00	-18.39	AVG	
9		1.8300	27.61	10.04	37.65	56.00	-18.35	QP	
10		1.8300	15.56	10.04	25.60	46.00	-20.40	AVG	
11		3.0900	24.53	10.03	34.56	56.00	-21.44	QP	
12		3.0900	13.13	10.03	23.16	46.00	-22.84	AVG	



Site 844 Shielding Room

Phase: **N**

Temperature: 25.3 (°C)

Humidity: 56 %

Limit: FCC Part 15B Class B Conduction(QP)

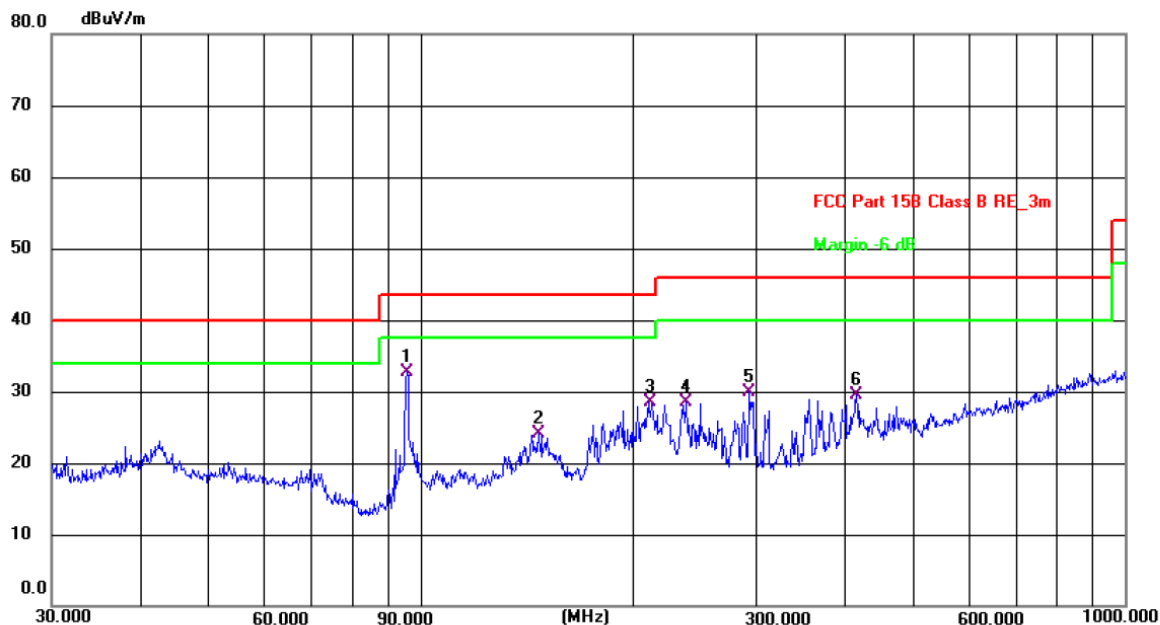
Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	48.15	10.44	58.59	66.00	-7.41	QP	
2		0.1500	27.12	10.44	37.56	56.00	-18.44	AVG	
3	*	0.2180	45.69	10.28	55.97	62.89	-6.92	QP	
4		0.2180	33.40	10.28	43.68	52.89	-9.21	AVG	
5		0.4500	35.59	10.17	45.76	56.88	-11.12	QP	
6		0.4500	23.87	10.17	34.04	46.88	-12.84	AVG	
7		0.8900	30.45	10.11	40.56	56.00	-15.44	QP	
8		0.8900	18.41	10.11	28.52	46.00	-17.48	AVG	
9		1.4340	31.35	10.12	41.47	56.00	-14.53	QP	
10		1.4340	18.34	10.12	28.46	46.00	-17.54	AVG	
11		2.3540	26.92	10.13	37.05	56.00	-18.95	QP	
12		2.3540	15.23	10.13	25.36	46.00	-20.64	AVG	

5.2. Radiated emission

Test requirement	FCC 47 CFR Part 15 Subpart B			
Basic standard	ANSI C63.4: 2014+A1:2017			
Test frequency range..	30 MHz to 40 GHz			
Limits.....	Frequency (MHz)	3 m measurement distance		
		Quasi-peak (dB μ V/m)		
		Class A		Class B
	30 to 88	49		40
	88 to 216	53.5		43.5
	216 to 960	56.4		46
	960 to 1000	59.5		54
	Frequency (MHz)	3 m measurement distance		
		Class A		Class B
		Peak (dB μ V/m)	Average (dB μ V/m)	Peak (dB μ V/m)
				Average (dB μ V/m)
	Above 1000	79.5	59.5	74
Test method.....	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meters with the receive antenna located at 1 to 4-meter height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.			
Ambient temperature..	24 °C - 25.3 °C			
Relative humidity	50 % - 52 %			
Test location	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China			
Test model(s)	SKM55			
EUT operation mode..	Mode 1			
Test results	Pass			
Remark.....	/			

Measurement data and Graphical presentation of the result



Site: #1 3m Anechoic Chamber

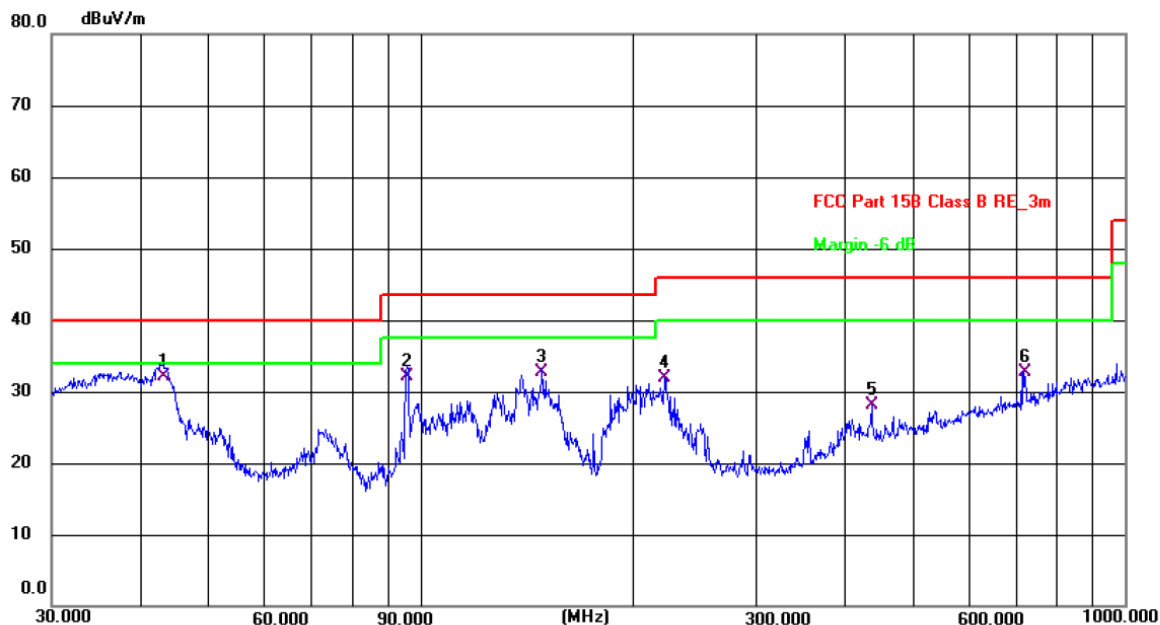
Polarization: **Horizontal**

Temperature: 25.3(C) Humidity: 50 %

Limit: FCC Part 15B Class B RE_3m

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	95.7622	23.38	9.31	32.69	43.50	-10.81	QP	P	
2	147.4036	11.10	12.92	24.02	43.50	-19.48	QP	P	
3	211.5264	17.94	10.58	28.52	43.50	-14.98	QP	P	
4	238.3101	16.36	12.11	28.47	46.00	-17.53	QP	P	
5	293.0842	16.49	13.36	29.85	46.00	-16.15	QP	P	
6	416.1791	13.08	16.45	29.53	46.00	-16.47	QP	P	



Site: #1 3m Anechoic Chamber

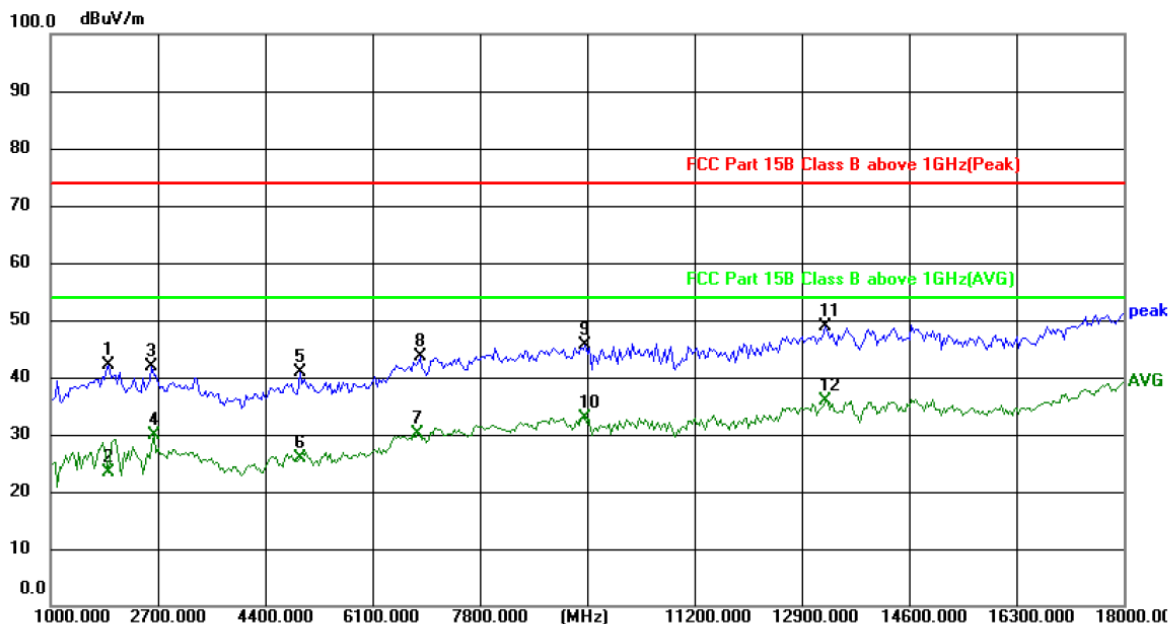
Polarization: **Vertical**

Temperature: 25.3(C) Humidity: 50 %

Limit: FCC Part 15B Class B RE_3m

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	43.2016	18.52	13.64	32.16	40.00	-7.84	QP	P	
2	95.7622	22.78	9.31	32.09	43.50	-11.41	QP	P	
3	148.9624	19.71	12.97	32.68	43.50	-10.82	QP	P	
4	222.1697	20.79	11.03	31.82	46.00	-14.18	QP	P	
5	437.1200	11.11	16.96	28.07	46.00	-17.93	QP	P	
6	719.1995	10.50	22.15	32.65	46.00	-13.35	QP	P	



Site: #1 3m Anechoic Chamber

Polarization: **Horizontal**

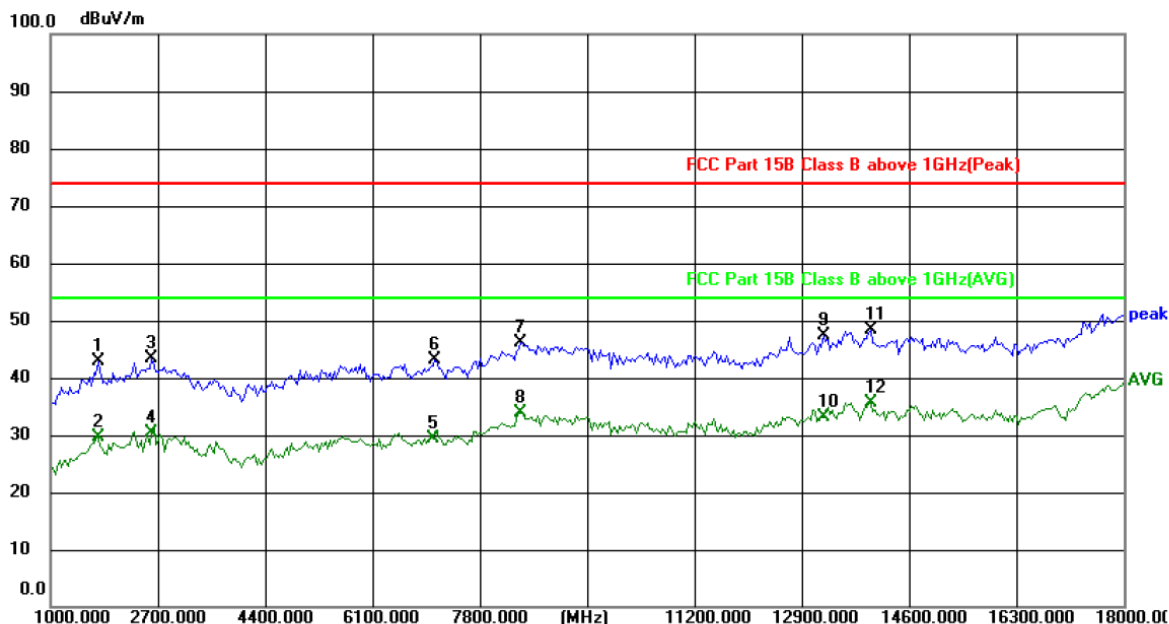
Temperature: 24(C)

Humidity: 52 %

Limit: FCC Part 15B Class B above 1GHz(Peak)

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1918.000	59.57	-17.39	42.18	74.00	-31.82	peak	P	
2	1918.000	40.87	-17.39	23.48	54.00	-30.52	AVG	P	
3	2598.000	56.92	-14.99	41.93	74.00	-32.07	peak	P	
4	2632.000	44.71	-14.86	29.85	54.00	-24.15	AVG	P	
5	4944.000	49.96	-8.96	41.00	74.00	-33.00	peak	P	
6	4944.000	34.79	-8.96	25.83	54.00	-28.17	AVG	P	
7	6814.000	34.54	-4.40	30.14	54.00	-23.86	AVG	P	
8	6848.000	47.93	-4.32	43.61	74.00	-30.39	peak	P	
9	9466.000	46.99	-1.48	45.51	74.00	-28.49	peak	P	
10	9466.000	34.24	-1.48	32.76	54.00	-21.24	AVG	P	
11	13274.000	46.24	2.58	48.82	74.00	-25.18	peak	P	
12 *	13274.000	33.27	2.58	35.85	54.00	-18.15	AVG	P	



Site: #1 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 24(C)

Humidity: 52 %

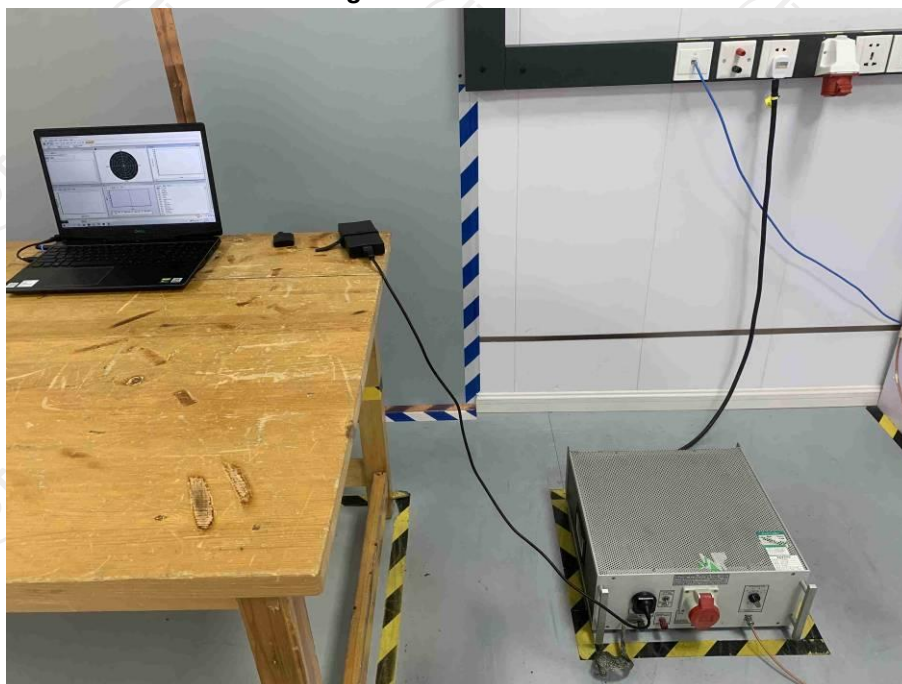
Limit: FCC Part 15B Class B above 1GHz(Peak)

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

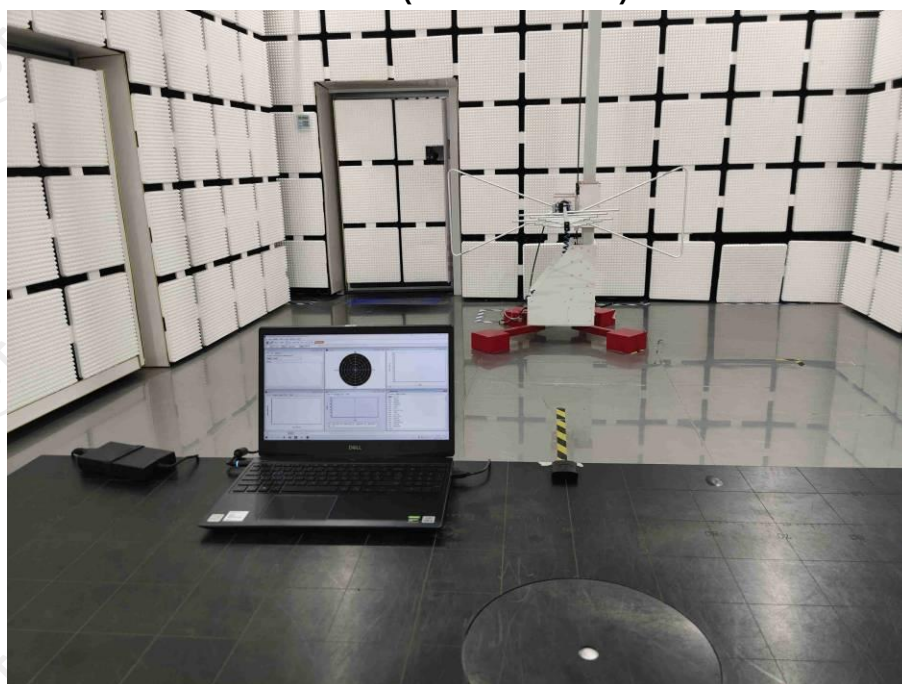
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1748.000	60.68	-17.71	42.97	74.00	-31.03	peak	P	
2	1748.000	47.30	-17.71	29.59	54.00	-24.41	AVG	P	
3	2598.000	58.31	-14.99	43.32	74.00	-30.68	peak	P	
4	2598.000	45.41	-14.99	30.42	54.00	-23.58	AVG	P	
5	7052.000	33.36	-3.92	29.44	54.00	-24.56	AVG	P	
6	7086.000	47.06	-3.89	43.17	74.00	-30.83	peak	P	
7	8446.000	48.38	-2.25	46.13	74.00	-27.87	peak	P	
8	8446.000	36.16	-2.25	33.91	54.00	-20.09	AVG	P	
9	13240.000	44.84	2.55	47.39	74.00	-26.61	peak	P	
10	13240.000	30.68	2.55	33.23	54.00	-20.77	AVG	P	
11	13988.000	45.16	3.33	48.49	74.00	-25.51	peak	P	
12 *	13988.000	32.27	3.33	35.60	54.00	-18.40	AVG	P	

6. Test set-up photo

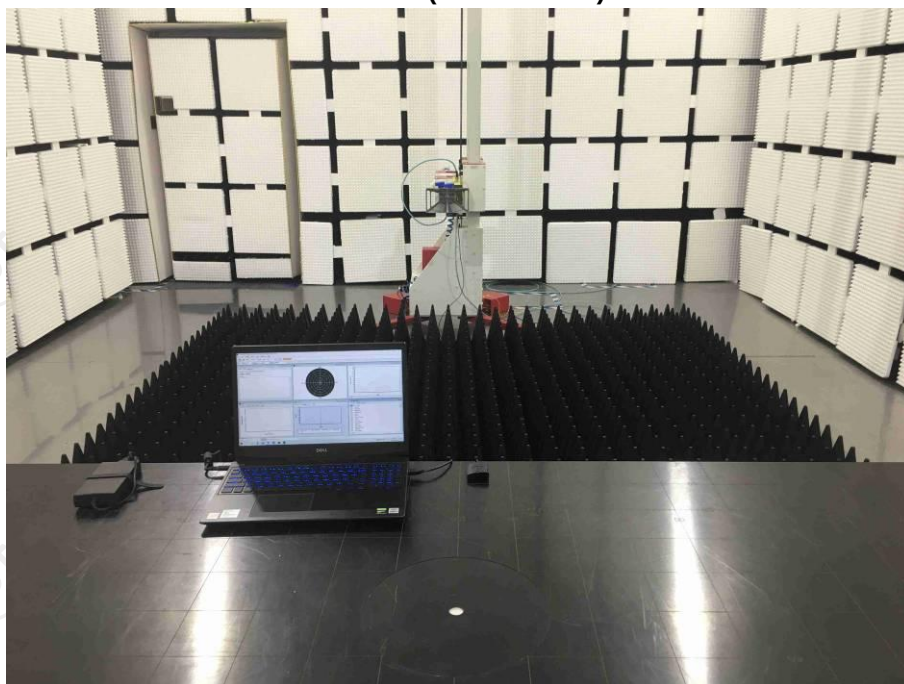
Disturbance voltage at the mains terminals Test View



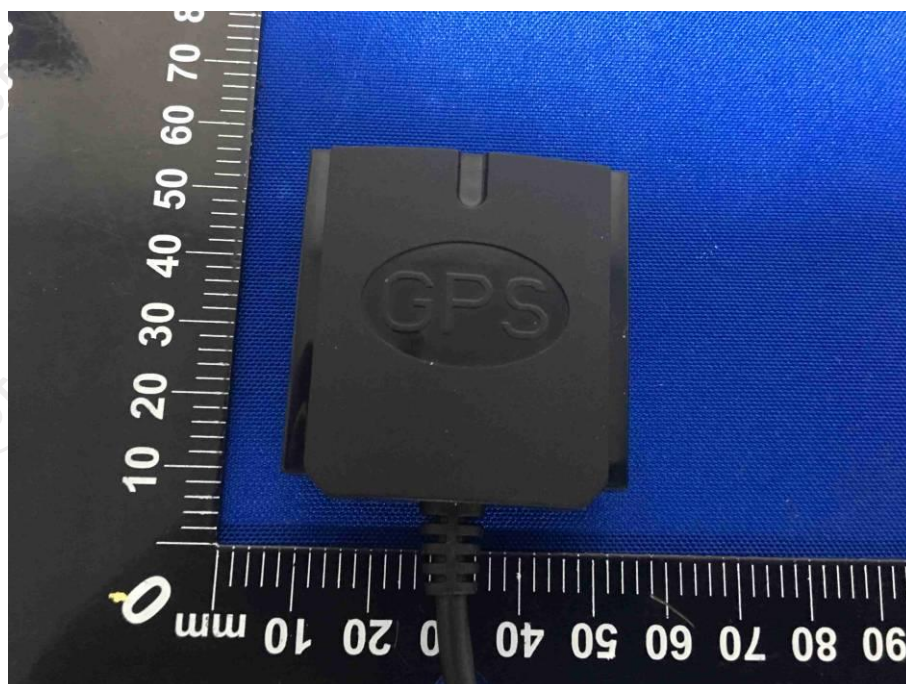
Radiated emission (30 MHz to 1 GHz) Test View



Radiated emission (above 1 GHz) Test View

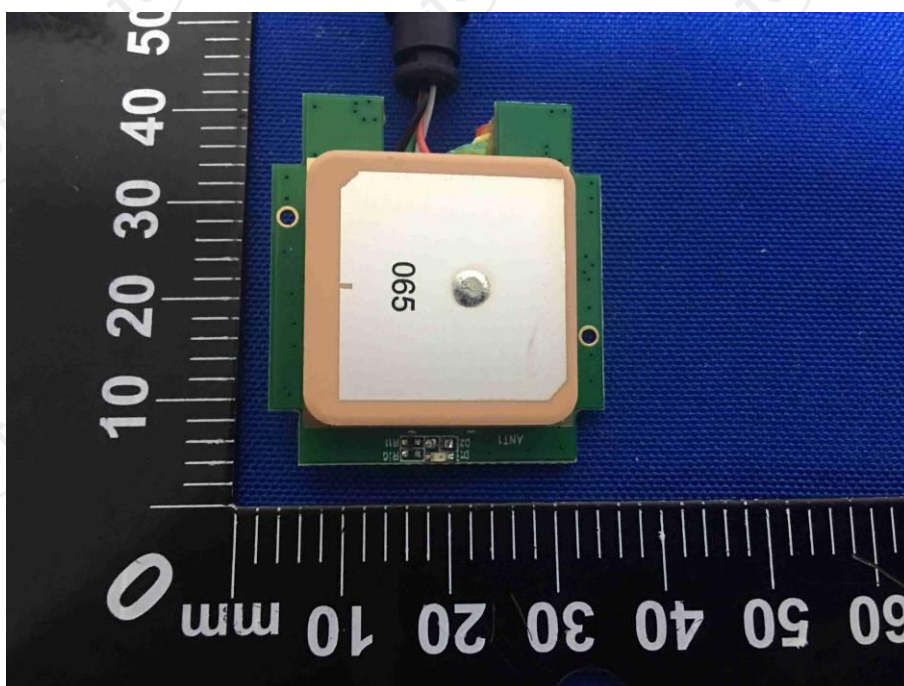
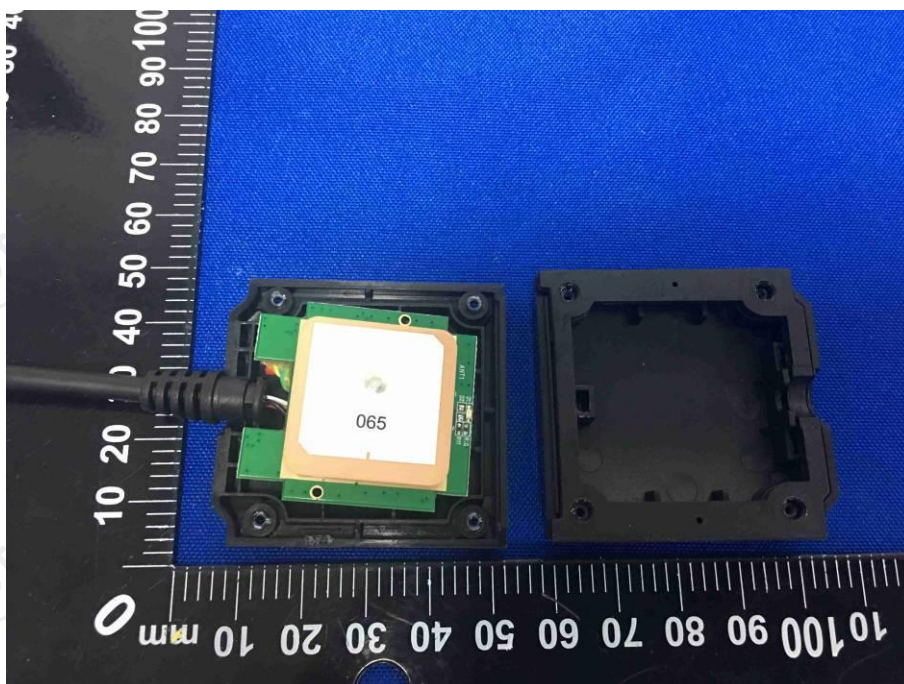


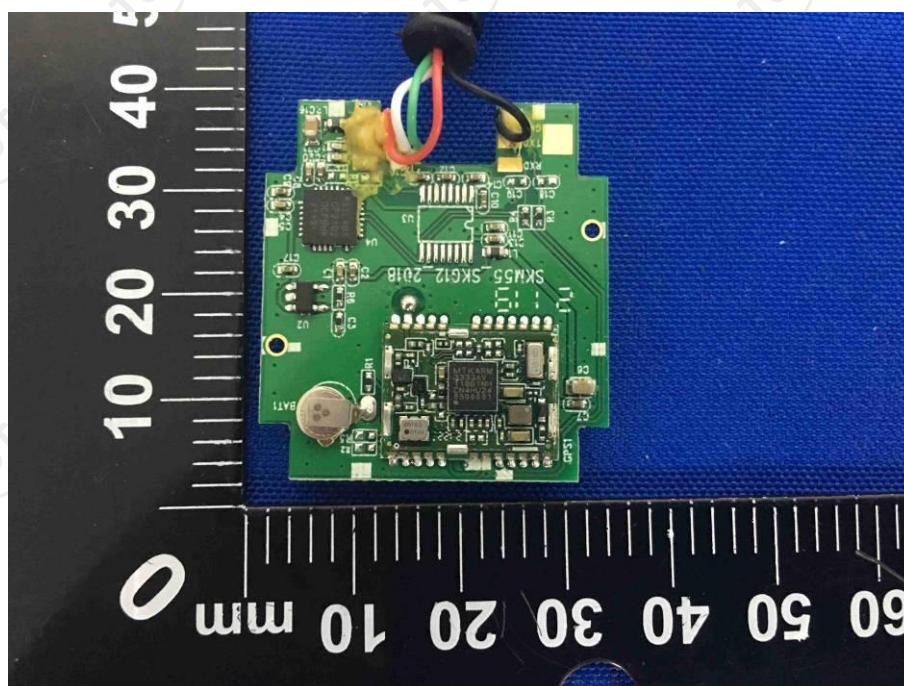
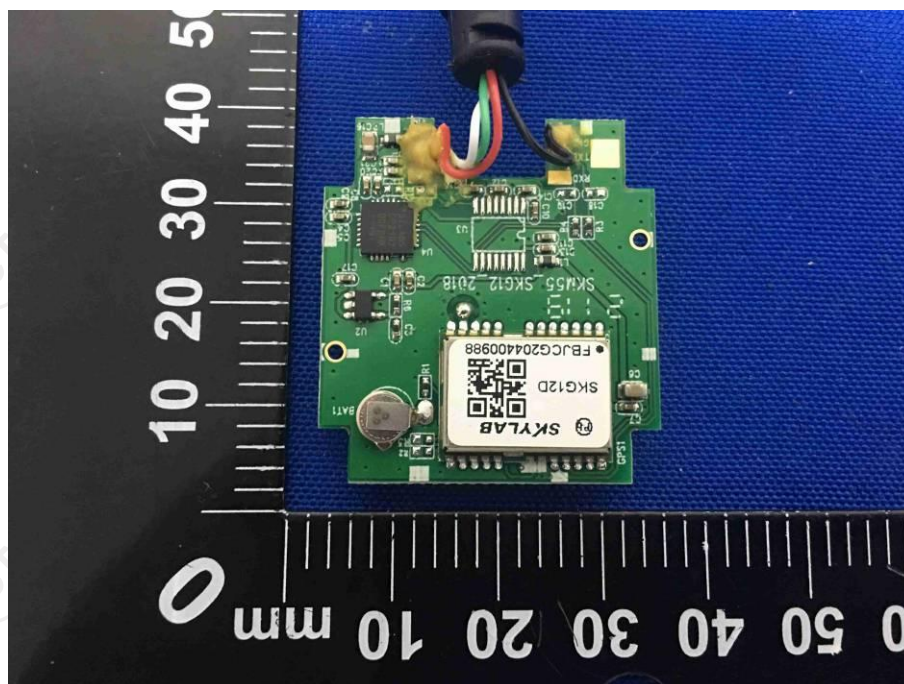
7. Photo of the EUT











*******End of report*******