



# FCC TEST REPORT

## FCC ID: 2ASXF-GSK1R

Applicant: ZhuoYe ChuangYi Co., Ltd.

Address: Room 602-1, Building 6, Shenzhen Bay Eco-Tech Park, Nanshan District, Shenzhen, China

Manufacturer: ZhuoYe ChuangYi Co., Ltd.

Address: Room 602-1, Building 6, Shenzhen Bay Eco-Tech Park, Nanshan District, Shenzhen, China

EUT: Wireless Mechanical Gaming Keyboard Receiver

Trade Mark: GravaStar

Model Number: GS K1R

Date of Receipt: Jul. 22, 2024

Test Date: Jul. 22, 2024 - Aug. 08, 2024

Date of Report: Aug. 08, 2024

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

Applicable Standards: FCC Part 15 Subpart B  
ANSI C63.4:2014

Test Result: Pass

Report Number: DL-240722026ER

Prepared (Test Engineer): Alisa Song

Reviewer (Supervisor): Jack Bu

Approved (Manager): Jade Yang



*This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.*



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**1. VERSION**

Version No.	Date	Description
00	Aug. 08, 2024	Original

**2. TEST SUMMARY**

EMC Emission				
Standard	Test Item	Limit	Result	Remark
FCC PART 15.107	Conducted Emission at power ports	Class B	N/A	
FCC PART 15.109	Radiated Emission below 1GHz	Class B	PASS	
FCC PART 15.109	Radiated Emission above 1GHz	Class B	PASS	

**NOTE:**

(1)" N/A" denotes test is not applicable in this Test Report

(2) Test Facility: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No. 8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China



### 3. GENERAL INFORMATION

#### 3.1 Description of Device (EUT)

EUT: Wireless Mechanical Gaming Keyboard Receiver

Trade Mark: GravaStar

Model Number: GS K1R

Test Model: GS K1R

Model Difference: N/A

Power Supply: DC 5V

Working Frequency: Above 108MHz

NOTE:

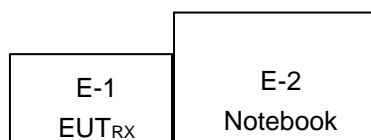
(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) The EUT's all information provided by client.

#### 3.2 Tested System Details

None.

#### 3.3 Block Diagram of Test Set-up



#### 3.4 Test Mode Description

Mode1. On Mode

#### 3.5 Test Auxiliary Equipment

Notebook (Provide by test lab):

Manufacturer: LENOVO

Model: 310S-14AST

I/P: AC 100-240V 50/60Hz

#### 3.6 Test Uncertainty

Conducted Emission Uncertainty :  $\pm 2.56\text{dB}$

Radiated Emission Uncertainty :  $\pm 3.24\text{dB}$



#### 4. TEST INSTRUMENT USED

##### For Conducted Emission Test (843 Shielded Room)

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
843 Shielded Room	YIHENG	843 Room	843	Nov. 06, 2023	Nov. 05, 2026
EMI Receiver	R&S	ESR	101421	Nov. 04, 2023	Nov. 03, 2024
LISN	R&S	ENV216	102417	Nov. 04, 2023	Nov. 03, 2024
Clamp	COM-POWER	CLA-050	431072	Nov. 04, 2023	Nov. 03, 2024
3-Loop Antenna	DAZE	ZN30401	13021	Nov. 04, 2023	Nov. 03, 2024
ISN T8	Schwarzbeck	NTFM 8158	101135	Nov. 04, 2023	Nov. 03, 2024
ISN T5	Schwarzbeck	NTFM 8158	101136	Nov. 04, 2023	Nov. 03, 2024
843 Cable 1#	ChengYu	CE Cable	001	Nov. 04, 2023	Nov. 03, 2024
843 Cable 1#	ChengYu	CE Cable	002	Nov. 04, 2023	Nov. 03, 2024

##### For Radiated Emission Test (966 chamber)

Equipment	Manufacturer	Model	Serial	Last Cal.	Next Cal.
966 chamber	YIHENG	966 Room	966	Nov. 05, 2023	Nov. 04, 2026
Spectrum Analyzer	Agilent	E4408B	MY50140780	Nov. 04, 2023	Nov. 03, 2024
EMI Receiver	R&S	ESRP7	101393	Nov. 04, 2023	Nov. 03, 2024
Amplifier	Schwarzbeck	BBV9743B	00153	Nov. 04, 2023	Nov. 03, 2024
Amplifier	EMEC	EM01G8GA	00270	Nov. 04, 2023	Nov. 03, 2024
Broadband Trilog Antenna	Schwarzbeck	VULB9162	00306	Nov. 04, 2023	Nov. 03, 2024
Horn Antenna	Schwarzbeck	BBHA9120D	02139	Nov. 04, 2023	Nov. 03, 2024
966 Cable 1#	ChengYu	966	004	Nov. 04, 2023	Nov. 03, 2024
966 Cable 2#	ChengYu	966	003	Nov. 04, 2023	Nov. 03, 2024

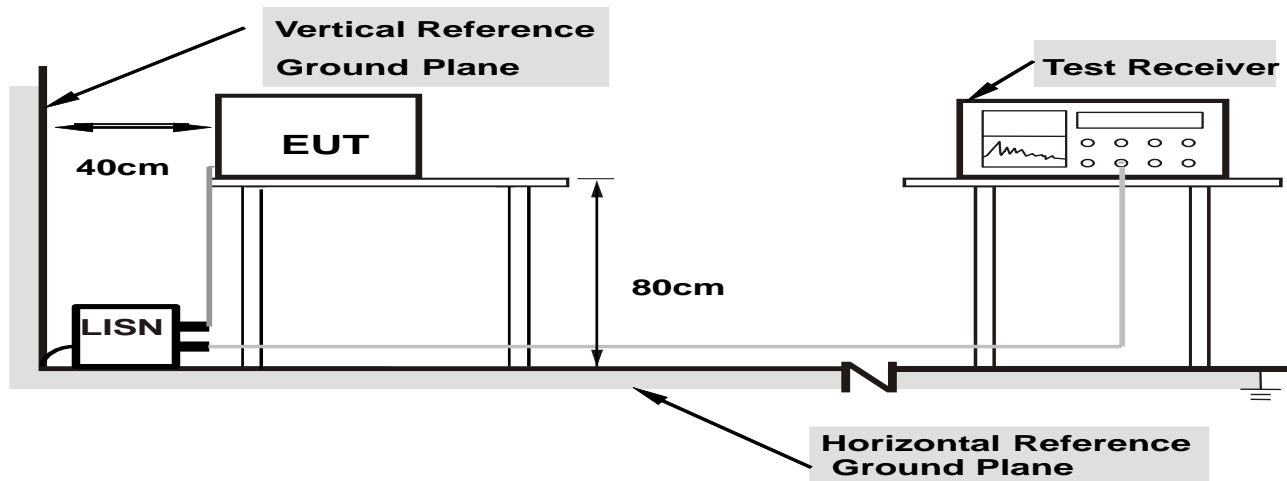
##### Other

Name	Manufacturer	Model	Software version
EMC Conduction Test System	FALA	EZ_EMCC	EMC-CON 3A1.1
EMC radiation test system	FALA	EZ_EMCC	FA-03A2

## 5. CONDUCTED EMISSION TEST

### 5.1 Block Diagram of Test Setup

### For Mains Terminals Test



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

## 5.2 Test Standard and Limit

## FCC PART 15 B

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15~0.50	66 ~ 56*	55 ~ 46*
0.50~5.00	56	46
5.00~30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

### 5.3 EUT Configuration on Test

The following equipment's are installed on conducted emission test to meet FCC PART 15 B requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

#### 5.4 Operating Condition of EUT

#### 5.4.1 Setup the EUT and simulators as shown in Section 5.1.

#### 5.4.2 Turn on the power of all equipments.

#### 5.4.3 Let the EUT work in test modes and test it.



#### 5.5 Test Procedure

The EUT is put on the table and connected to the AC mains through a Artificial Mains Network (AMN) or ISN. This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the **ANSI C63.4** regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESR) is set at 10KHz.

The frequency range from 150 KHz to 30 MHz is investigated.

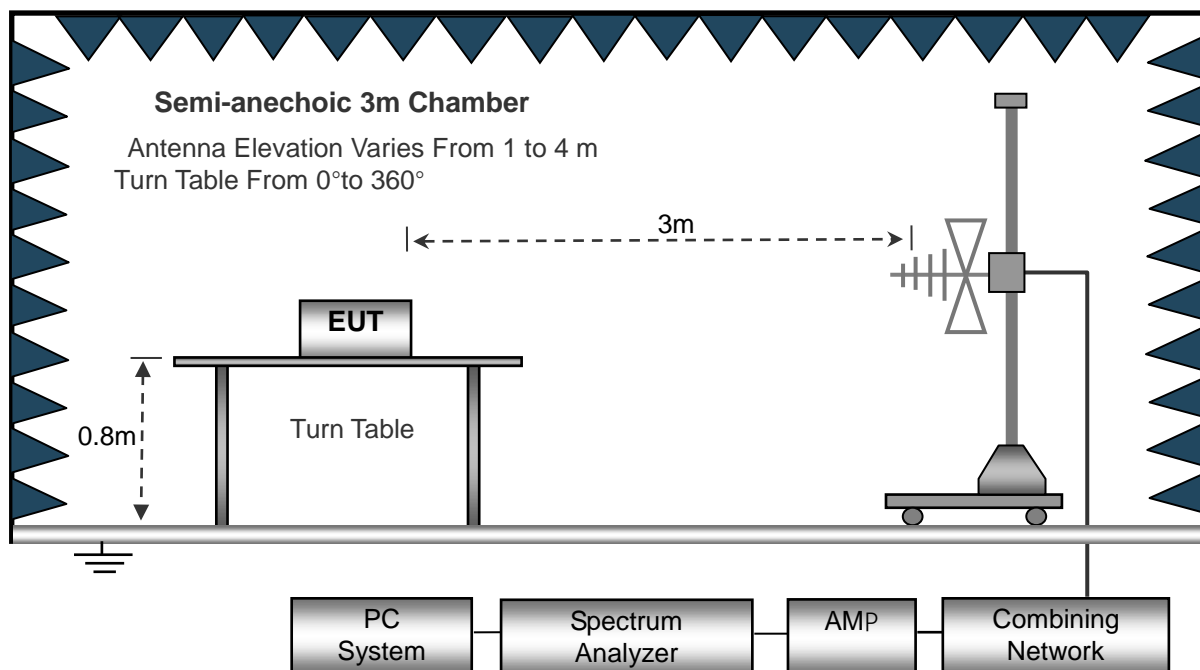
#### 5.6 Test Result

The EUT is powered by DC, no requirements for this item.

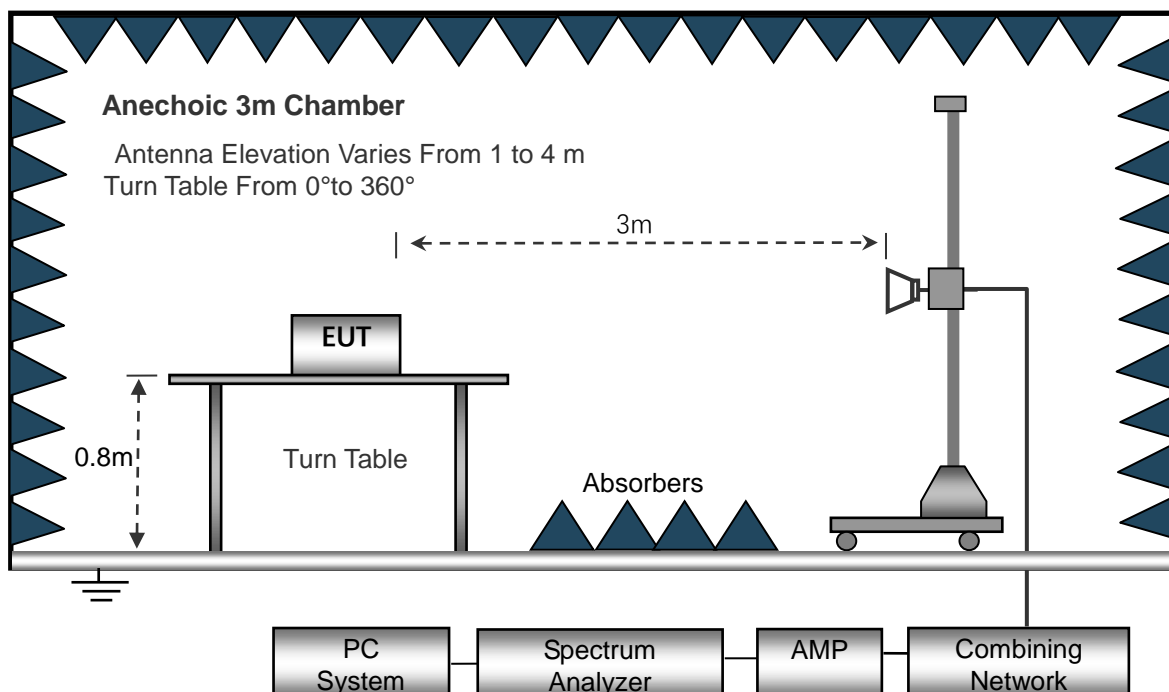
## 6. RADIATION EMISSION TEST

### 6.1 Block Diagram of Test Setup

Below 1GHz



Above 1GHz



## 6.2 Test Standard and Limit

FCC PART 15 B

Below 1GHz





Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB $\mu$ V/m)
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
960 ~ 1000	3	54.0

Above 1GHz

Frequency MHz	Distance (Meters)	Field Strengths Limits dB( $\mu$ V)/m	Detector
1000~6000	3	74.0	PEAK
1000~6000	3	54.0	AVERAGE

Remark:

(1) The smaller limit shall apply at the cross point between two frequency bands.

(2) Distance refers to the distance in meters between the measuring instrument, antenna and the closed point of any part of the device or system.

#### 6.3 EUT Configuration on Test

The FCC PART 15 B regulations test method must be used to find the maximum emission during radiated emission test.

The configuration of EUT is the same as used in conducted emission test.

Please refer to Section 5.3.

#### 6.4 Operating Condition of EUT

Same as conducted emission test, which is listed in Section 5.4 except the test set up replaced as Section 6.2.

#### 6.5 Test Procedure

1) The radiated emissions test was conducted in a semi-anechoic chamber.

2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.8m of insulation.

3) Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.

4) The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

5) The bandwidth setting on the field strength meter (R&S Test Receiver ESCI) is set at 120KHz.

6) The frequency range from 30MHz to 1000MHz is checked.

#### 6.6 Test Result

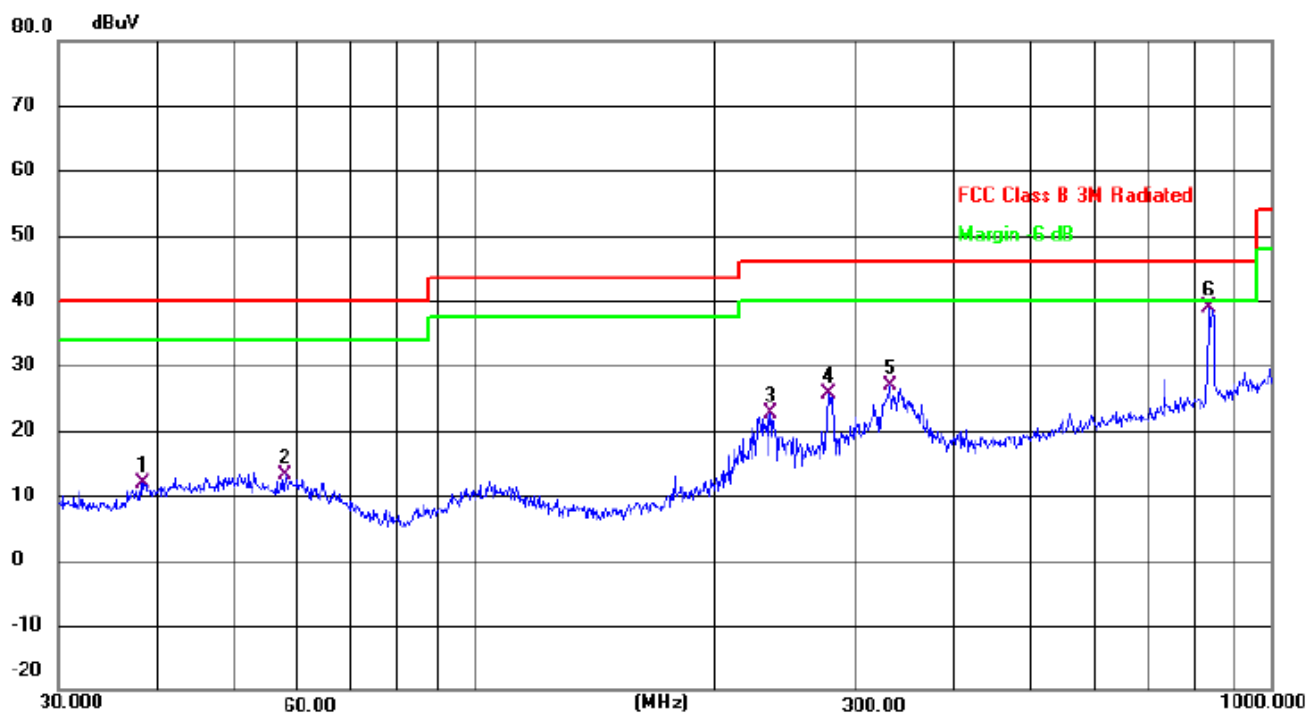
PASS

Please refer to the following page.



## Radiation Emission Test Data(Below 1GHz)

Temperature:	24.5℃	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Horizontal
Test Voltage:	DC 5V	Test Mode:	Mode 1



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
	MHz	dBuV	dB	dBuV	dB	dB	Detector
1	38.3462	26.38	-14.53	11.85	40.00	-28.15	QP
2	57.7962	26.62	-13.53	13.09	40.00	-26.91	QP
3	234.9909	36.08	-13.49	22.59	46.00	-23.41	QP
4	278.0668	38.01	-12.40	25.61	46.00	-20.39	QP
5	332.5187	38.11	-11.16	26.95	46.00	-19.05	QP
6 *	836.2443	40.88	-1.98	38.90	46.00	-7.10	QP

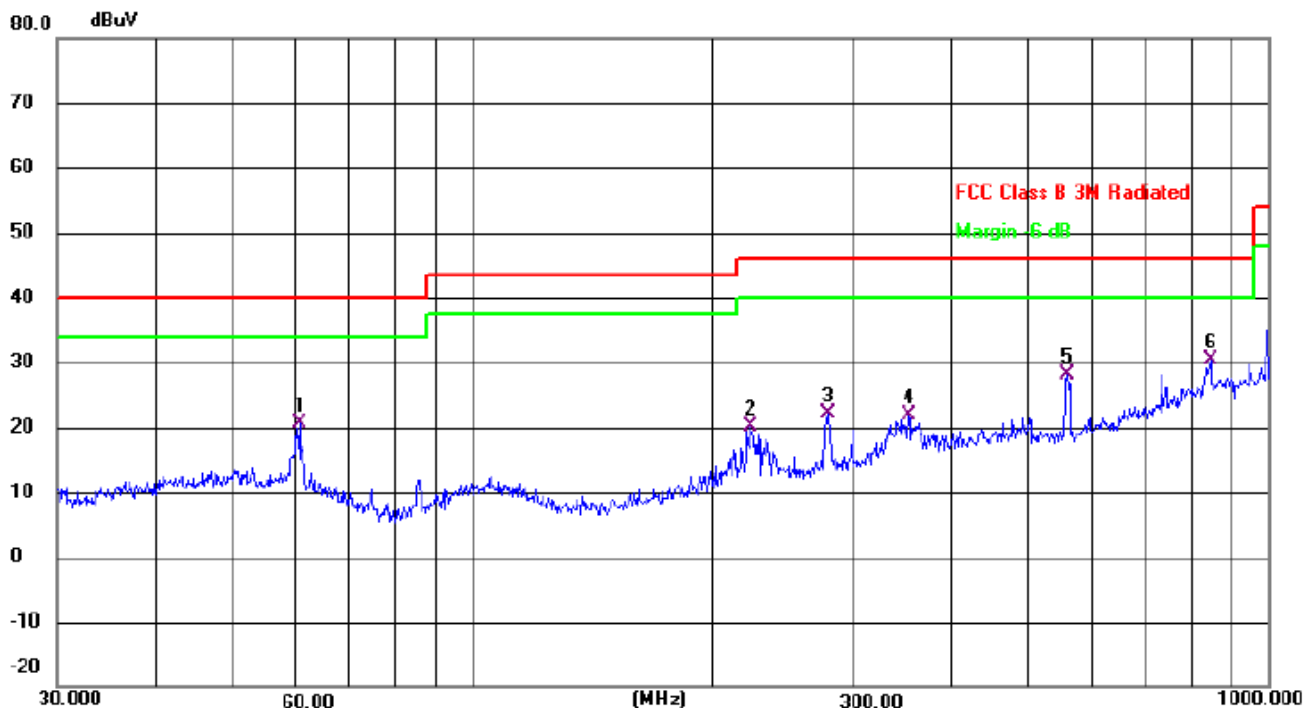
Remark:

Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;



Radiation Emission Test Data(Below 1GHz)			
Temperature:	24.5℃	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Vertical
Test Voltage:	DC 5V	Test Mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV	dB	dB	Detector
1		60.4917	34.52	-13.81	20.71	40.00	-19.29	QP
2		223.7333	34.13	-14.07	20.06	46.00	-25.94	QP
3		279.0436	34.50	-12.32	22.18	46.00	-23.82	QP
4		352.9433	32.55	-10.67	21.88	46.00	-24.12	QP
5		558.7300	34.18	-5.93	28.25	46.00	-17.75	QP
6	*	845.0877	31.91	-1.58	30.33	46.00	-15.67	QP

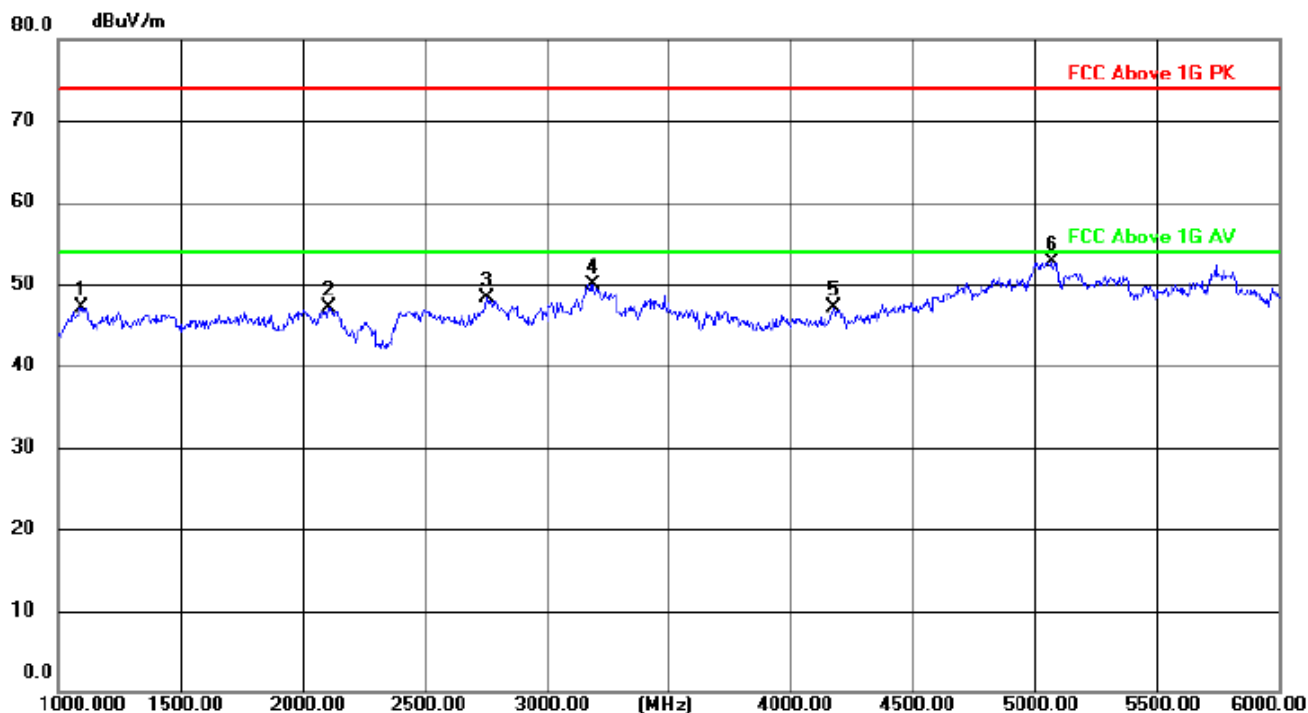
Remark:

Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;

**Radiation Emission Test Data(Above 1GHz)**

Temperature:	24.5℃	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Horizontal
Test Voltage:	DC 5V	Test Mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		1095.000	60.05	-12.88	47.17	74.00	-26.83	peak
2		2110.000	55.44	-8.28	47.16	74.00	-26.84	peak
3		2755.000	55.50	-7.24	48.26	74.00	-25.74	peak
4		3190.000	56.48	-6.55	49.93	74.00	-24.07	peak
5		4175.000	54.09	-6.97	47.12	74.00	-26.88	peak
6	*	5070.000	58.15	-5.48	52.67	74.00	-21.33	peak

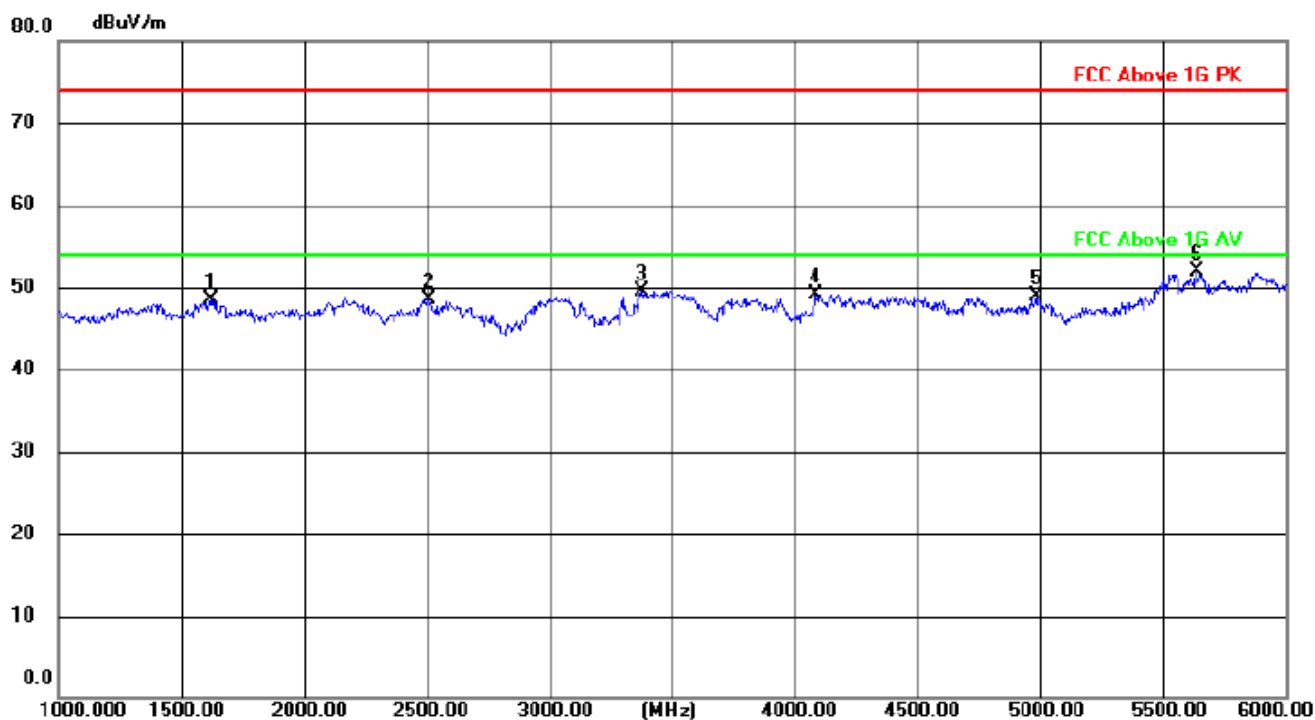
Remark:

Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;

**Radiation Emission Test Data(Above 1GHz)**

Temperature:	24.5℃	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Vertical
Test Voltage:	DC 5V	Test Mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		1625.000	58.09	-9.59	48.50	74.00	-25.50	peak
2		2510.000	56.33	-7.84	48.49	74.00	-25.51	peak
3		3375.000	56.03	-6.48	49.55	74.00	-24.45	peak
4		4085.000	56.32	-7.13	49.19	74.00	-24.81	peak
5		4980.000	54.44	-5.57	48.87	74.00	-25.13	peak
6	*	5635.000	57.16	-5.23	51.93	74.00	-22.07	peak

Remark:

Correct Factor=Cable loss+Antenna factor-Preamplifier

Measurement Level = Reading Level + Correct Factor; Margin = Measurement Level- Limit;

Other emissions above 6GHz are attenuated 20dB below the limit, so it does not record.



**7. TEST SEUUP PHOTO**

Reference to the appendix I for details.

**8. EUT PHOTOGRAPHS**

Reference to the appendix II for details.

\*\*\*\*\* END OF REPORT \*\*\*\*\*