FCC 47 CFR PART 15 Subpart B

TEST REPORT

Equipment	HF Radio Transceiver
Trademark	XIEGU
FCC ID	2ANLH-X6100
Model No.	X6100
Report No.	CTB211130007RFX
Applicant	Chongqing Xiegu Technology Co. , Ltd. 7-6, Incubator Building, No. 256, Fangzheng Avenue, Shuitu High-tech Park, Beibei District, Chongqing, China
Manufacturer	Chongqing Xiegu Technology Co. , Ltd. 7-6, Incubator Building, No. 256, Fangzheng Avenue, Shuitu High-tech Park, Beibei District, Chongqing, China
Prepared by	Shenzhen CTB Testing Technology Co., Ltd. Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China Tel: 086-4008-707-283 Fax: 086-0755-23208027
Date of Receipt	Nov. 20, 2021
Date of Test(s)	Nov. 20, 2021 ~ Nov. 24, 2021
Date of Issue	Nov. 24, 2021
Test Standard(s)	CFR47, FCC Part 15 Subpart B, ANSI C63.4: 2014

In the configuration tested, the EUT complied with the standards specified above.

Producer : Arron Liu , Date : Nov. 24, 2021

Arron Liu / Engineer

Signatory : Bin Mei , Date : Nov. 24, 2021

Bin Mei / Director

Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of CTB. This document may be altered or revised by CTB, personnel only, and shall be noted in the revision of the document.

Revision History

Edition No.	Date of Revision	Revision Summary	Report Number
0	Nov. 24, 2021	Original Report	CTB211130007RFX

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1. GENERAL INFORMATION

1.1. Description of EUT

Equipment	HF Radio Transceiver
Trade Mark	XIEGU
Model Name	X6100
Serial No.	N/A
Model Difference	N/A
Receive frequency	0.5-30MHz,50-53.99MHz
I/O Port	N/A
EUT Power Rating	DC 12V
Configuration	☒ Table-top ☐ Floor-standing
Cable Supplied	USB

Note:

1. Other Accessory Device List and Details

Description	Manufacturer	Model	Note
USB	N/A	N/A	N/A

External I/O Cable

Cable Description	Shielded Type	Ferrite Core	Length(m)	Note
-	☐Shielded ☐Non-shielded	☐Yes ☐No		

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. TEST SUMMARY

Test procedures according to the technical standards:

FCC Rules	Test Item	Test Result
§15.107	Conducted Emission	PASS
§15.109	Radiated Emission	PASS
§15.111	Conducted power of antenna port	PASS

Remark: N/A is abbreviation for Not Applicable.

The test was carried out in all the test modes, only the worst data are list in report.

3. FACILITIES

3.1. Test Facility

CTB-LAB

Floor 1&2, Building A, No. 26 of Xinhe Road, Xinqiao Street, Baoan District, Shenzhen China

3.2. Test Instruments

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

Table list of the test and measurement equipment

Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated date	Calibrated until
1	AMN	R&S	ESH3-Z5	831551852	2021.08.06	2022.08.05
2	Pulse limiter	R&S	ESH3Z2	357881052	2021.08.06	2022.08.05
3	EMI test Receiver	R&S	ESCI	834115/006	2021.08.06	2022.08.05
4	Coaxial cable	ZDECL	Z302S-BNCJ-BNCJ-1.5M	18091904	2021.08.06	2022.08.05
5	CE Test software	FALA	EZ-EMC	Ver. EMC-con3A1.1	N/A	N/A

Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated date	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	869	2021.08.06	2022.08.05
2	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	1911	2021.08.06	2022.08.05
3	Preamplifier	Agilent	8449B	3008A01838	2021.08.06	2022.08.05
4	Amplifier	HP	8447E	2945A02747	2021.08.06	2022.08.05
5	Coaxial cable	ETS	RFC-SNS-100-NMS-80 NI	/	2021.08.06	2022.08.05
6	Coaxial cable	ETS	RFC-SNS-100-NMS-20 NI	/	2021.08.06	2022.08.05
7	Coaxial cable	ETS	RFC-SNS-100-SMS-20 NI	/	2021.08.06	2022.08.05
8	Coaxial cable	ETS	RFC-NNS-100-NMS-300 NI	/	2021.08.06	2022.08.05
9	EMI test Receiver	R&S	ESPI	100362	2021.08.06	2022.08.05
10	MXA signal analyzer	Agilent	N9020A	MY52090073	2021.08.06	2022.08.05
11	RE Test software	FALA	EZ-EMC	Ver. FA-03A2 RE	N/A	N/A

4. Measurement uncertainty

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4 and ANSI C63.4.

Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Conducted Emission	Level Accuracy: 150kHz to 30MHz	±1.22 dB	±3.6 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±3.67 dB	±5.2 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.79 dB	N/A
Antenna power conduction	Above 1G	0.9dB	N/A
Antenna power conduction	below 1G	0.9dB	N/A

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.1. Operating condition of EUT

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively

Pretest Mode	Description
Mode 1	Working

For Conducted **Test**	
Final Test Mode	Description
Mode 1	Working

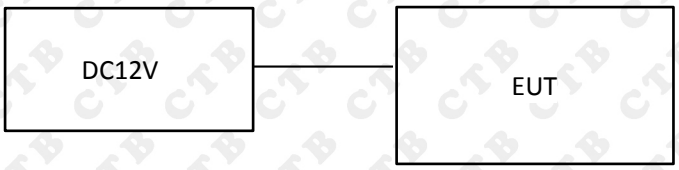
For Radiated Test	
Final Test Mode	Description
Mode 1	Working
Mode 2	Charge

4.2. Test conditions

Temperature: 15-35℃
Relative Humidity: 30-60 %
Atmospheric pressure: 800hPa-1060hPa

4.3. DESCRIPTION OF TEST SETUP

Working



5. AC Powerline Conducted Emission

5.1. Limit

☒ Except for Class B devices:

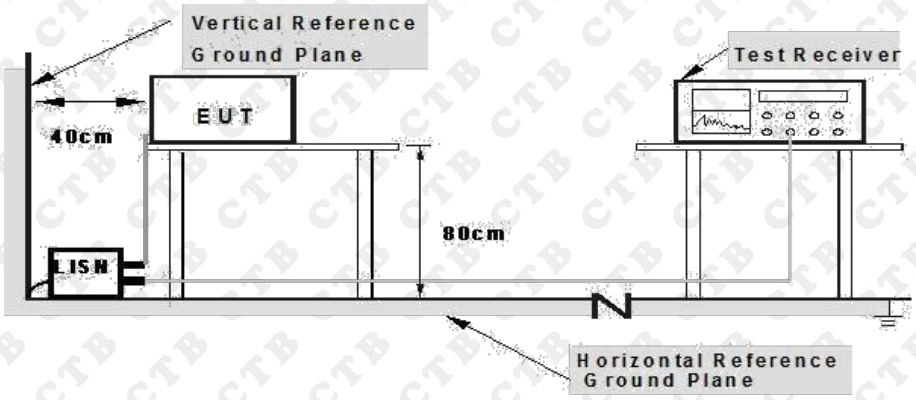
Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

☐ For Class A devices:

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	79	66
0.5-30	73	60

5.2. 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

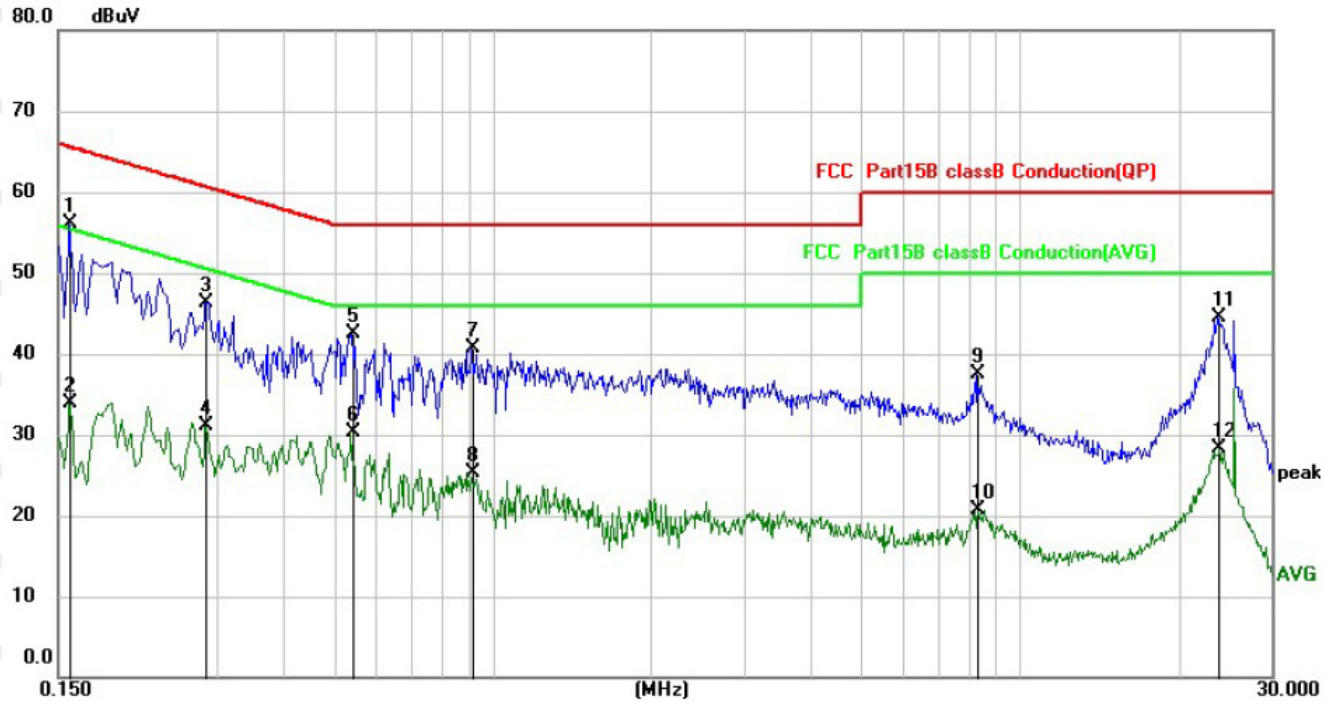
The setup of EUT is according with ANSI C63.4 measurement procedure. Specification used with FCC Part 15 limits.

5.3. Test procedure

Measurement was performed in shielded room, and instruments used were followed clause 4 of ANSI C63.4.
Detailed test procedure was following clause 7 of ANSI C63.4.
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

5.4. Test results

L:



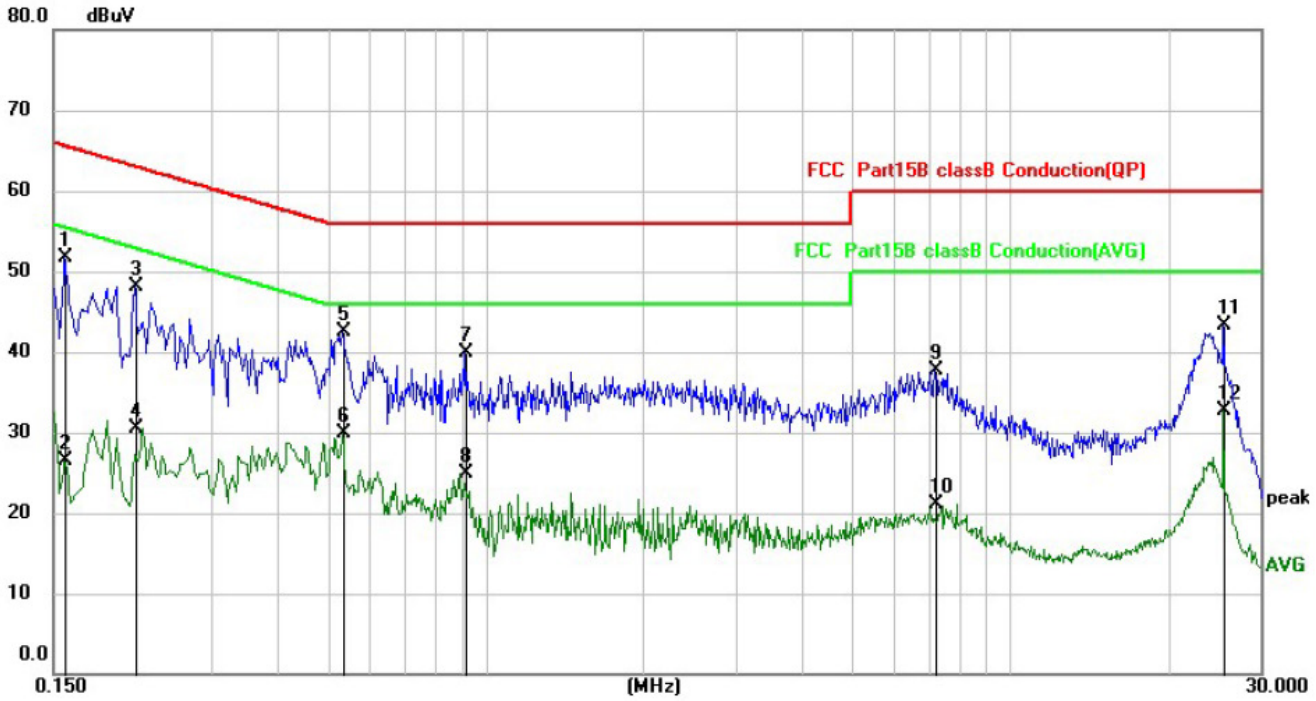
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1580	45.39	10.72	56.11	65.57	-9.46	QP
2		0.1580	23.15	10.72	33.87	55.57	-21.70	AVG
3		0.2860	35.63	10.64	46.27	60.64	-14.37	QP
4		0.2860	20.54	10.64	31.18	50.64	-19.46	AVG
5		0.5420	32.04	10.53	42.57	56.00	-13.43	QP
6		0.5420	19.81	10.53	30.34	46.00	-15.66	AVG
7		0.9140	30.09	10.60	40.69	56.00	-15.31	QP
8		0.9140	14.72	10.60	25.32	46.00	-20.68	AVG
9		8.3180	26.76	10.76	37.52	60.00	-22.48	QP
10		8.3180	10.02	10.76	20.78	50.00	-29.22	AVG
11		23.7460	33.55	11.00	44.55	60.00	-15.45	QP
12		23.7460	17.25	11.00	28.25	50.00	-21.75	AVG

6.

Remark:

7. Factor = Cable loss + LISN factor, Margin = Measurement – Limit

N:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1580	41.00	10.72	51.72	65.57	-13.85	QP
2		0.1580	15.87	10.72	26.59	55.57	-28.98	AVG
3		0.2140	37.45	10.68	48.13	63.05	-14.92	QP
4		0.2140	19.80	10.68	30.48	53.05	-22.57	AVG
5	*	0.5340	31.91	10.53	42.44	56.00	-13.56	QP
6		0.5340	19.30	10.53	29.83	46.00	-16.17	AVG
7		0.9140	29.28	10.60	39.88	56.00	-16.12	QP
8		0.9140	14.21	10.60	24.81	46.00	-21.19	AVG
9		7.1900	26.95	10.72	37.67	60.00	-22.33	QP
10		7.1900	10.30	10.72	21.02	50.00	-28.98	AVG
11		25.5820	32.29	11.01	43.30	60.00	-16.70	QP
12		25.5820	21.70	11.01	32.71	50.00	-17.29	AVG

Remark:

Factor = Cable loss + LISN factor, Margin = Measurement – Limit

6. Antenna power conduction for receivers

6.1 Test Procedure

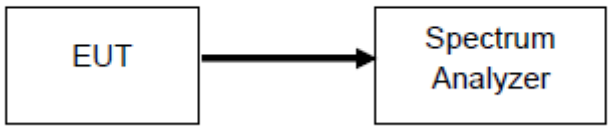
Per FCC section 15.109(f), For a receiver which employs terminals for the connection of an external receiving antenna, the receiver shall be tested to demonstrate compliance with the provisions of this section with an antenna connected to the antenna terminals unless the antenna conducted power is measured as specified in §15.111(a).

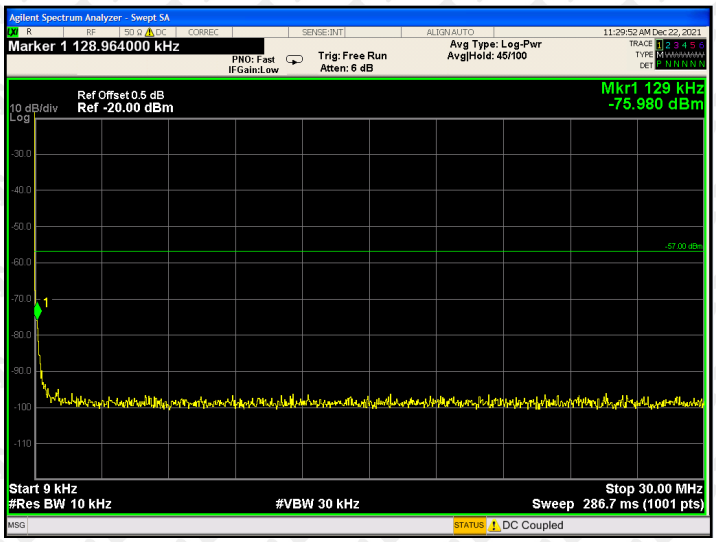
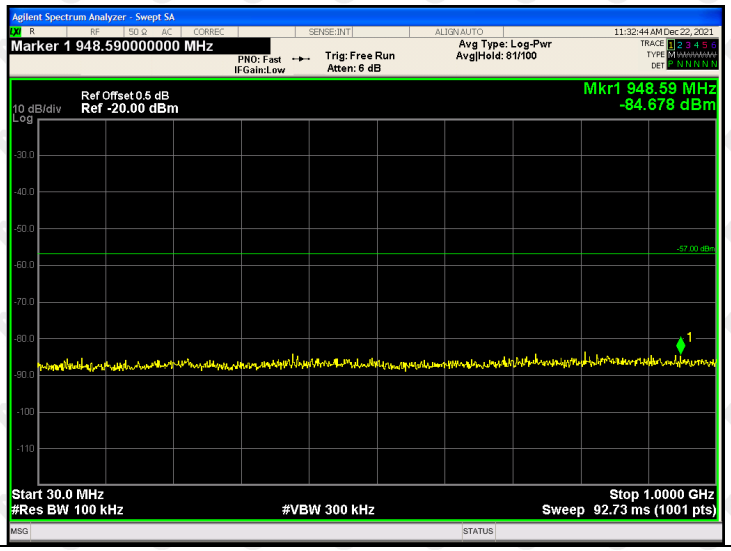
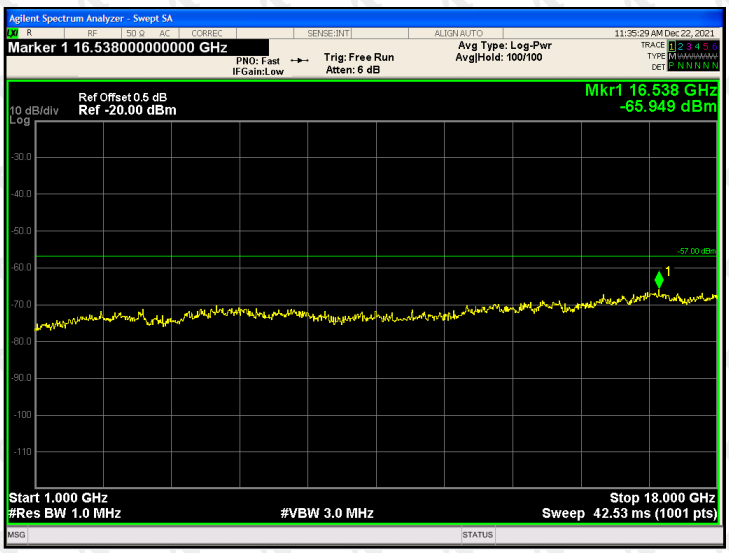
FCC section 15.111(a) states: In addition to the radiated emission limits, receivers that operate (tune) in the frequencyrange 30 to 960 MHz and CB receivers that provide terminals for the connection of an external receiving antenna may betested to demonstrate compliance with the provisions of §15.109 with the antenna terminals shielded and terminated witha resistive termination equal to the impedance specified for the antenna, provided these receivers also comply with the following: With the receiver antenna terminal connected to a resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at any frequency within the range of measurements specified in §15.33 shall not exceed 2.0 nanowatts.

All signals measured at the receiver antenna port were below 2 nanowatts (-57 dBm). Refer to Annex A for supporting test data.

The EUT was connected directly to the spectrum analyzer and conducted spurious emissions were recorded for each type of modulation in both scanning and non-scanning mode. Scanning mode was performed across the allowed frequency range of 30 – 3000 MHz.

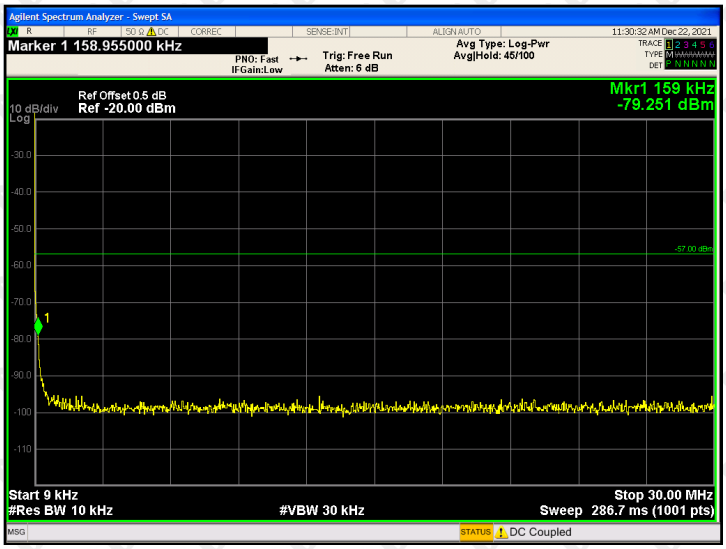
Test Setup



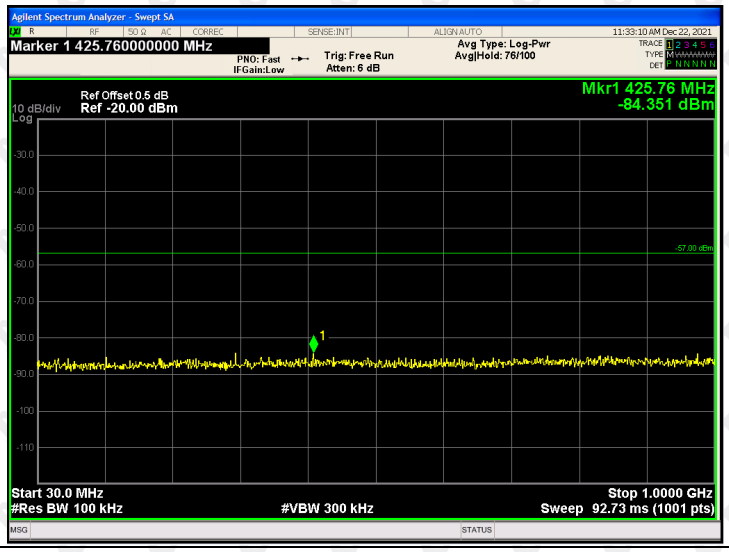
SSB	9KHz-30MHz  30MHz-1GHz  1-18GHz 

CW

9KHz-30MHz



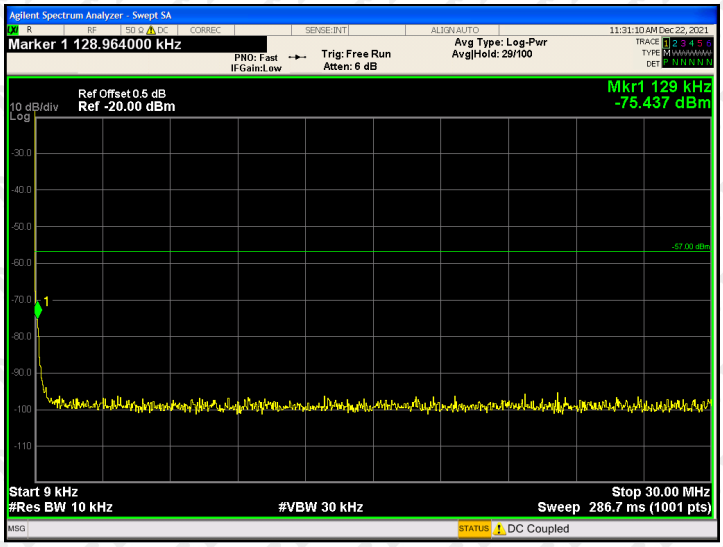
30MHz-1GHz



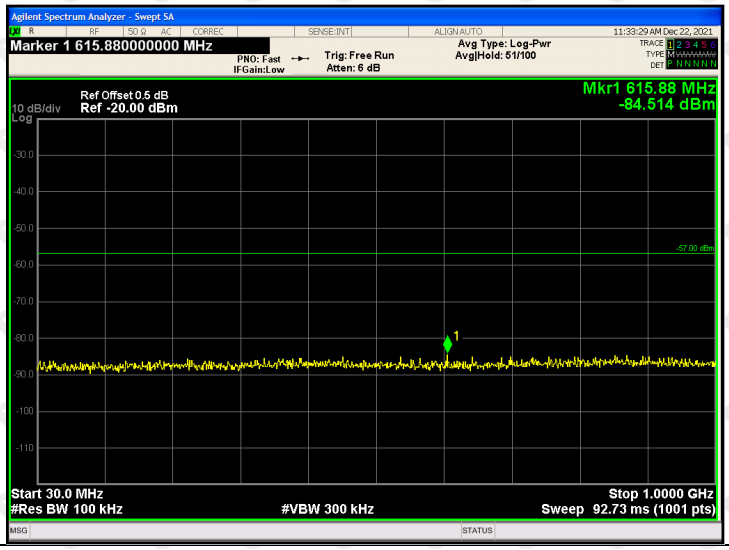
1-18GHz

AM

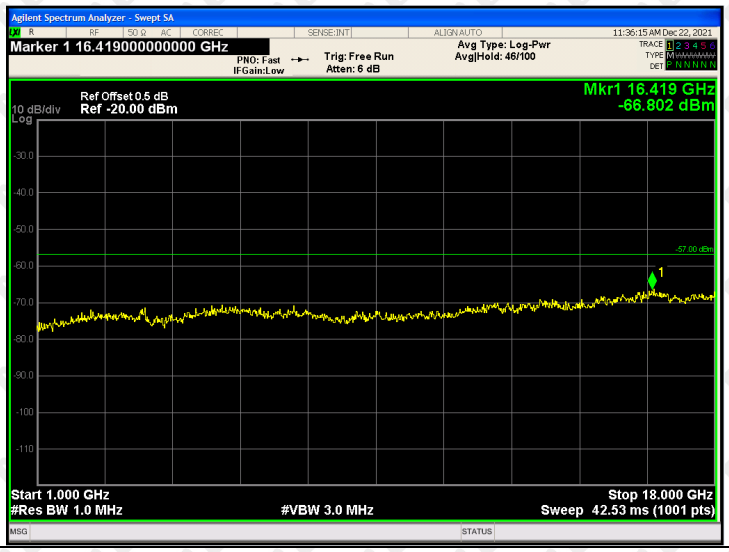
9KHz-30MHz

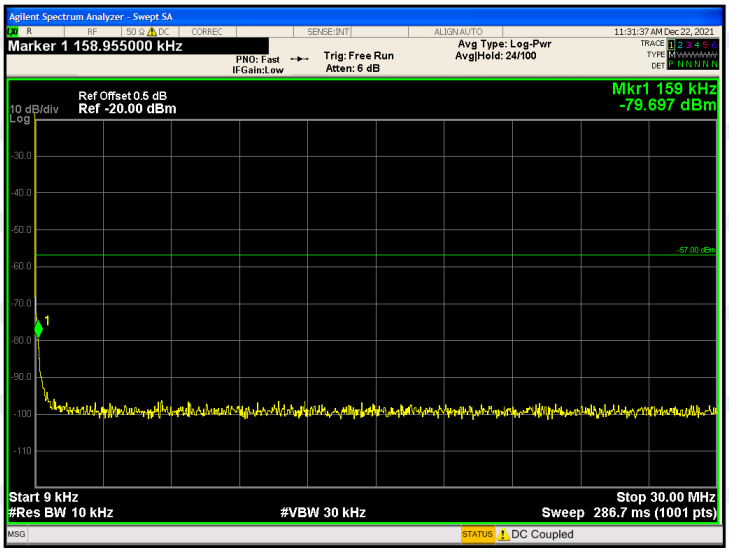
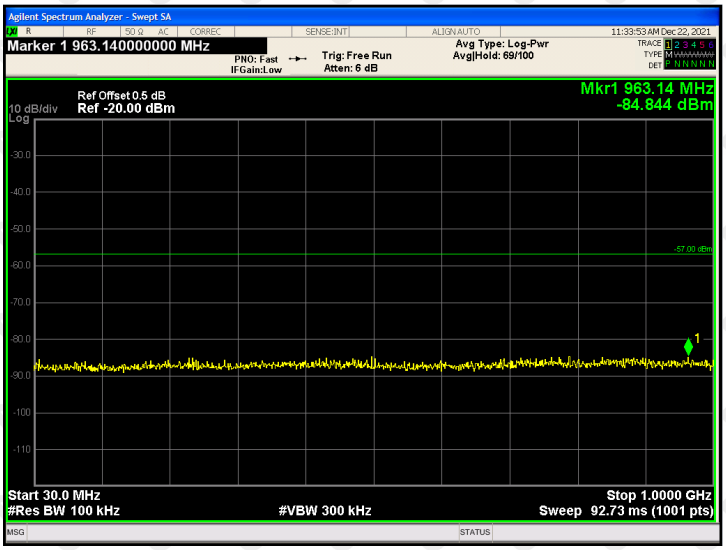
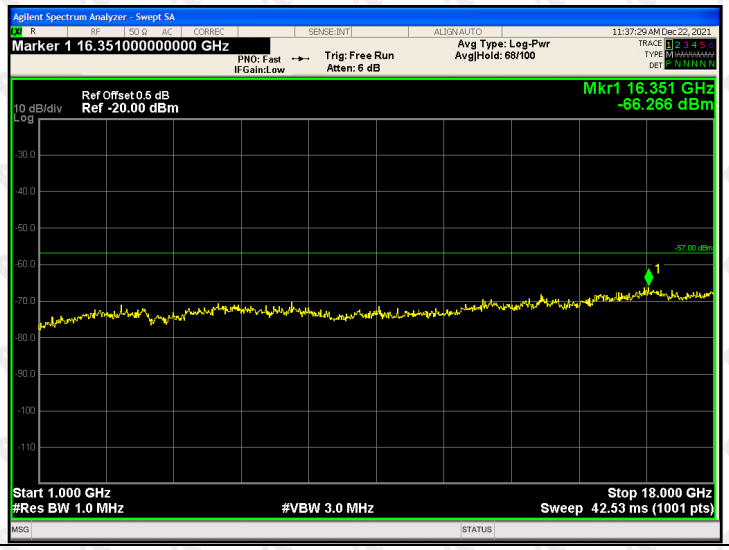


30MHz-1GHz



1-18GHz



FM	9KHz-30MHz
	
	30MHz-1GHz
	
	1-18GHz
	

7. Radiated emissions

7.1 Limit

☒ Except for Class B devices (at 3m):

Frequency of emission (MHz)	Field strength (microvolts/meter)	
	(microvolts/meter)	(dBμV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

☐ For Class A devices (at 10m):

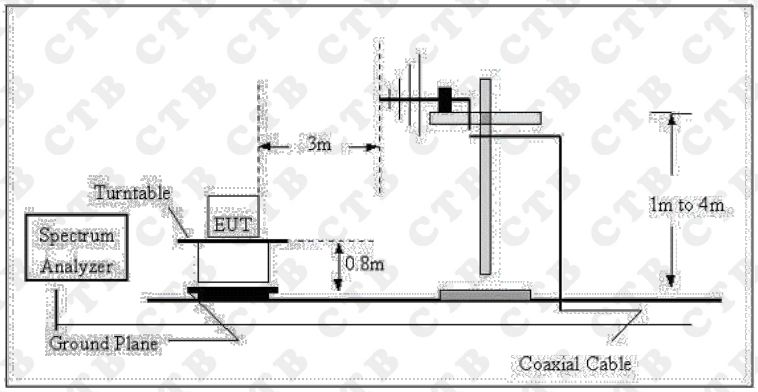
Frequency of emission (MHz)	Field strength (microvolts/meter)	
	(microvolts/meter)	(dBμV/m)
30-88	90	39
88-216	150	43.5
216-960	210	46.4
Above 960	300	49.5

LIMITS OF RADIATED EMISSION MEASUREMENT

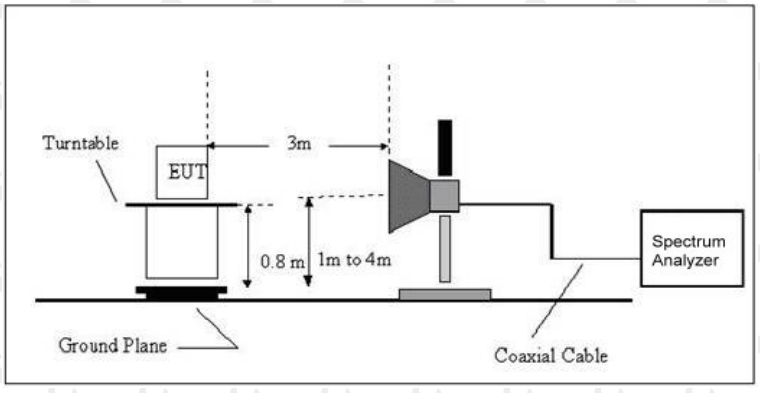
Frequency of emission (MHz)	Class A(dBμV/m)（at 3M）		Class B(dBμV/m)（at 3M）	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

7.2 Test setup

Radiated Emission Test Set-Up Frequency Below 1 GHz



Radiated Emission Test Set-Up Frequency Above 1GHz



The radiated tests were performed in semi-anechoic(3m) test site, using the setup accordance with the ANSI C63.4:2014.

EMI Test Receiver Setup and Spectrum Analyzer Setup

During the radiated emission test, the EMI test receiver and Spectrum Analyzer were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz-1000MHz	100kHz	300kHz	120kHz	QP
Above 1GHz	1MHz	3MHz	/	PK
	1MHz	10Hz	/	AVG

7.3 Test procedure

The measurement was performed in a semi-anechoic chamber, and instruments used were followed clause 4 of ANSI C63.4.

Detailed test procedure was following clause 8 of ANSI C63.4.

Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB /10 decades.

7.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

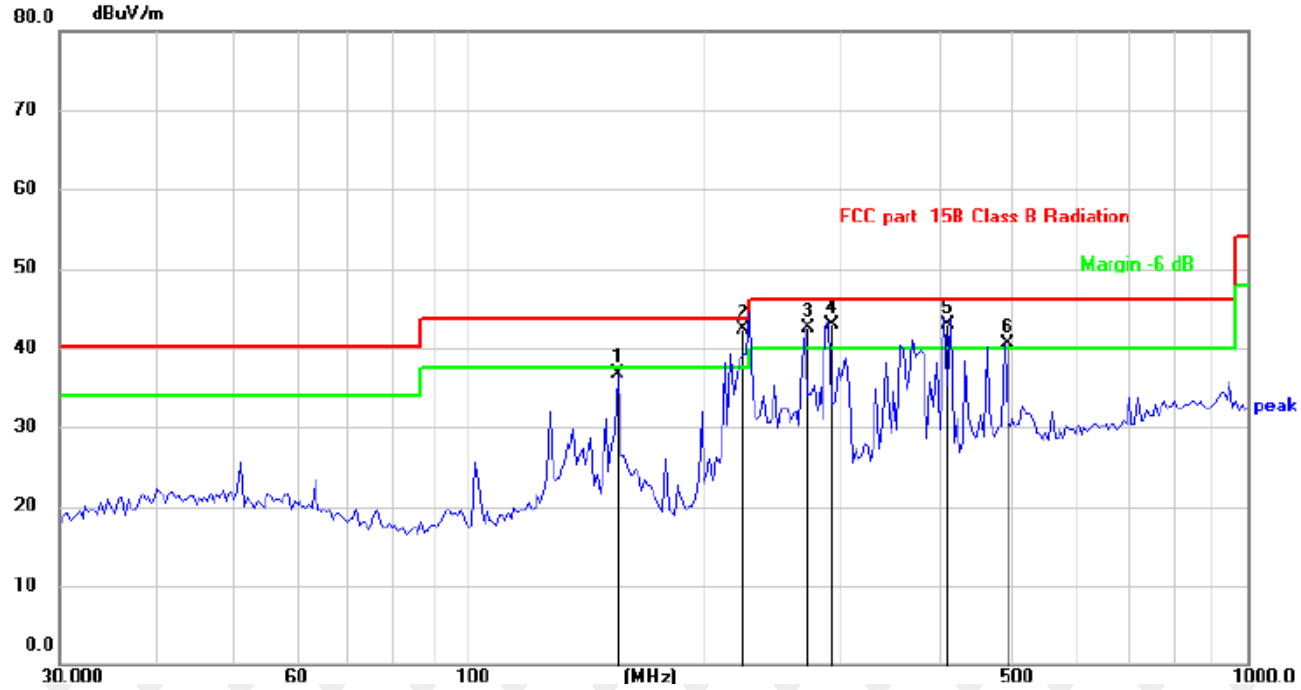
Margin = Limit – Corrected Amplitude

7.5 Test results

PASS

Please refer to the following page.

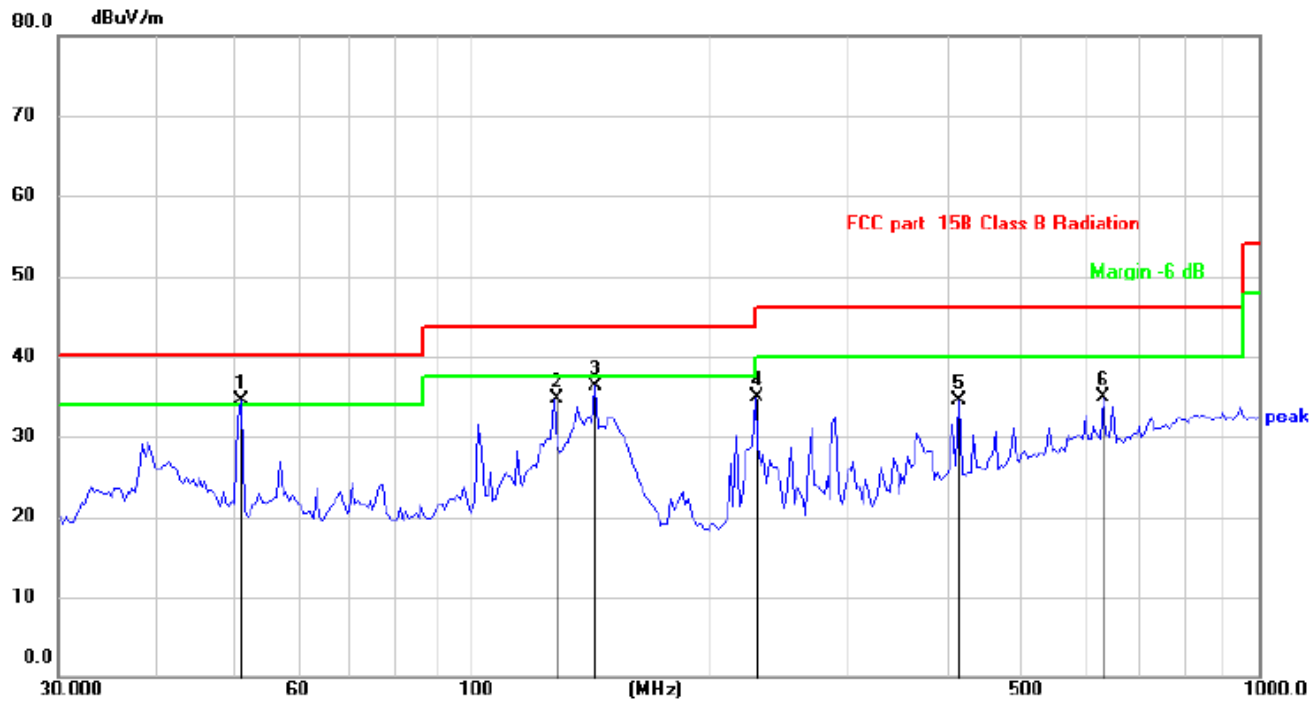
Polarization: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		155.9101	42.15	-5.54	36.61	43.50	-6.89	QP
2	*	224.1000	48.63	-6.36	42.27	43.50	-1.23	QP
3	!	270.8493	47.92	-5.50	42.42	46.00	-3.58	QP
4	!	290.5262	48.22	-5.31	42.91	46.00	-3.09	QP
5	!	408.9460	44.30	-1.47	42.83	46.00	-3.17	QP
6	!	487.3151	40.17	0.41	40.58	46.00	-5.42	QP

Note: Result=Reading+Factor
Over Limit=Result-Limit

Polarization: V

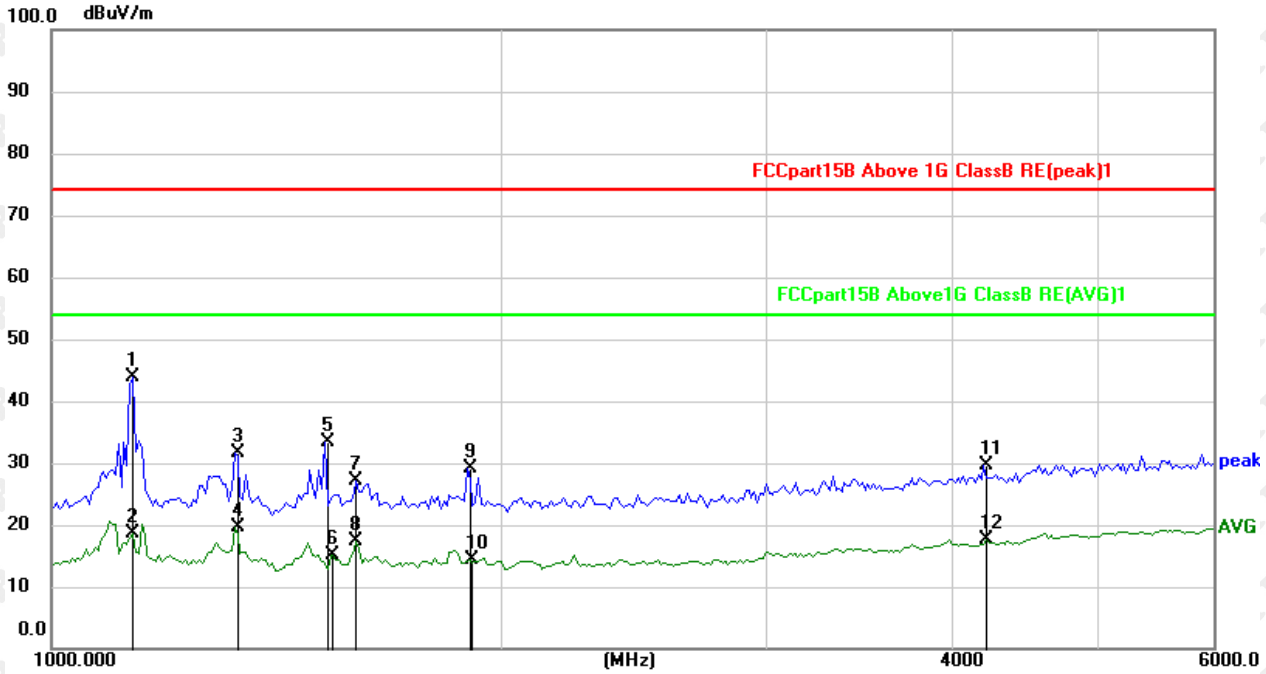


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	51.2106	40.26	-5.70	34.56	40.00	-5.44	QP
2		127.4409	41.14	-6.34	34.80	43.50	-8.70	QP
3		144.0819	41.78	-5.46	36.32	43.50	-7.18	QP
4		229.2931	40.85	-5.95	34.90	43.50	-8.60	QP
5		416.1791	35.78	-1.29	34.49	46.00	-11.51	QP
6		633.9073	31.83	3.04	34.87	46.00	-11.13	QP

Note: Result=Reading+Factor
Over Limit=Result-Limit

Above 1 G

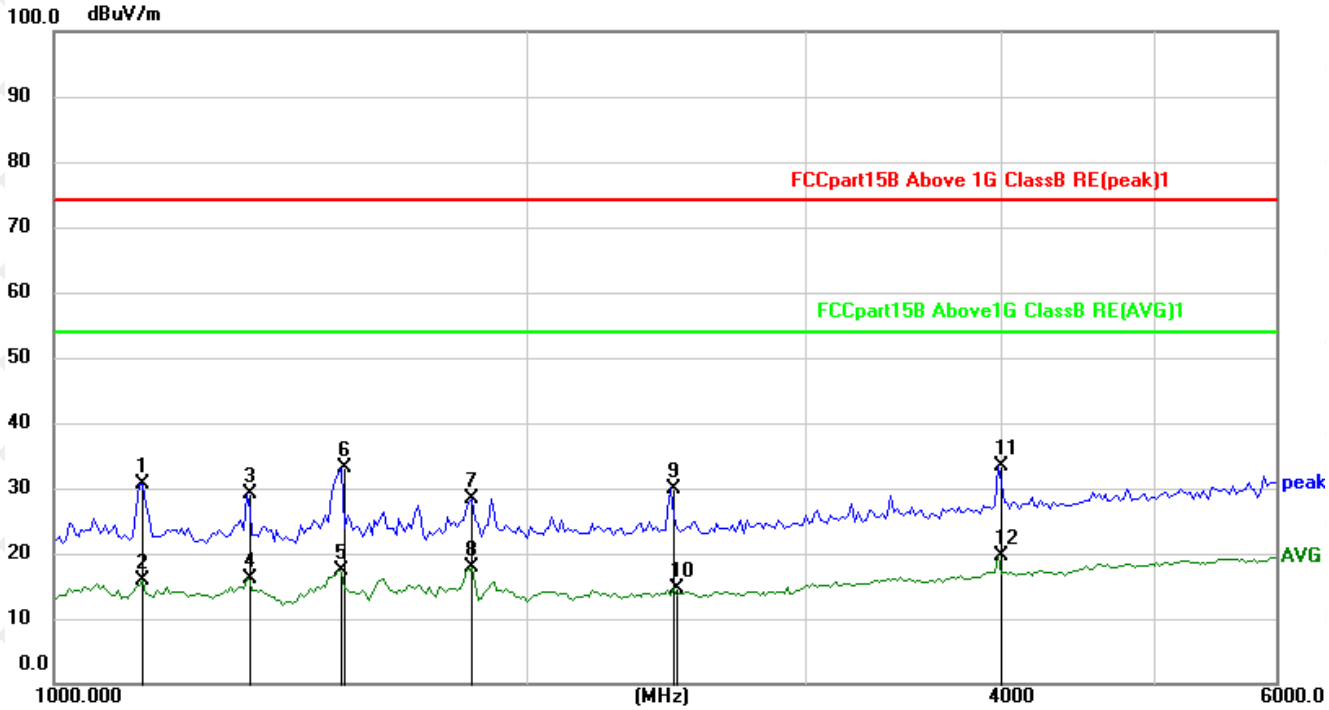
Polarization: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	1133.628	54.15	-10.18	43.97	74.00	-30.03	peak
2		1133.628	28.75	-10.18	18.57	54.00	-35.43	AVG
3		1326.047	41.20	-9.55	31.65	74.00	-42.35	peak
4		1326.047	29.16	-9.55	19.61	54.00	-34.39	AVG
5		1523.581	42.30	-8.93	33.37	74.00	-40.63	peak
6		1537.292	24.08	-8.88	15.20	54.00	-38.80	AVG
7		1600.533	35.80	-8.68	27.12	74.00	-46.88	peak
8		1600.533	26.09	-8.68	17.41	54.00	-36.59	AVG
9		1897.532	36.85	-7.73	29.12	74.00	-44.88	peak
10		1906.051	21.97	-7.70	14.27	54.00	-39.73	AVG
11		4211.787	31.63	-2.05	29.58	74.00	-44.42	peak
12		4230.695	19.57	-2.00	17.57	54.00	-36.43	AVG

Note: Result=Reading+Factor
Over Limit=Result-Limit

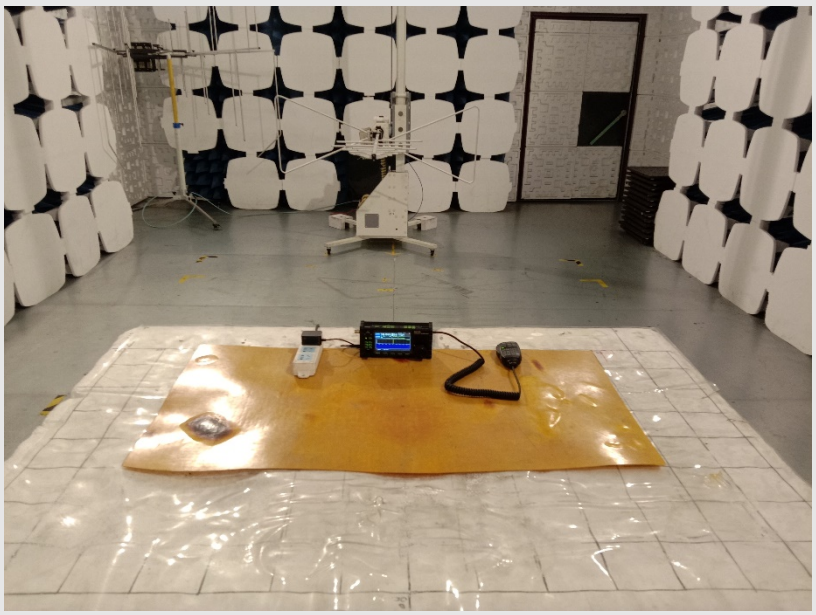
Polarization: V



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		1138.717	40.74	-10.15	30.59	74.00	-43.41	peak
2		1138.717	25.94	-10.15	15.79	54.00	-38.21	AVG
3		1326.047	38.67	-9.55	29.12	74.00	-44.88	peak
4		1326.047	25.69	-9.55	16.14	54.00	-37.86	AVG
5		1516.772	26.40	-8.94	17.46	54.00	-36.54	AVG
6		1523.581	42.05	-8.93	33.12	74.00	-40.88	peak
7		1847.212	36.34	-7.89	28.45	74.00	-45.55	peak
8		1847.212	25.79	-7.89	17.90	54.00	-36.10	AVG
9		2471.533	35.83	-5.94	29.89	74.00	-44.11	peak
10		2482.629	20.54	-5.90	14.64	54.00	-39.36	AVG
11		3991.369	35.91	-2.63	33.28	74.00	-40.72	peak
12	*	3991.369	22.32	-2.63	19.69	54.00	-34.31	AVG

Note: Result=Reading+Factor
Over Limit=Result-Limit

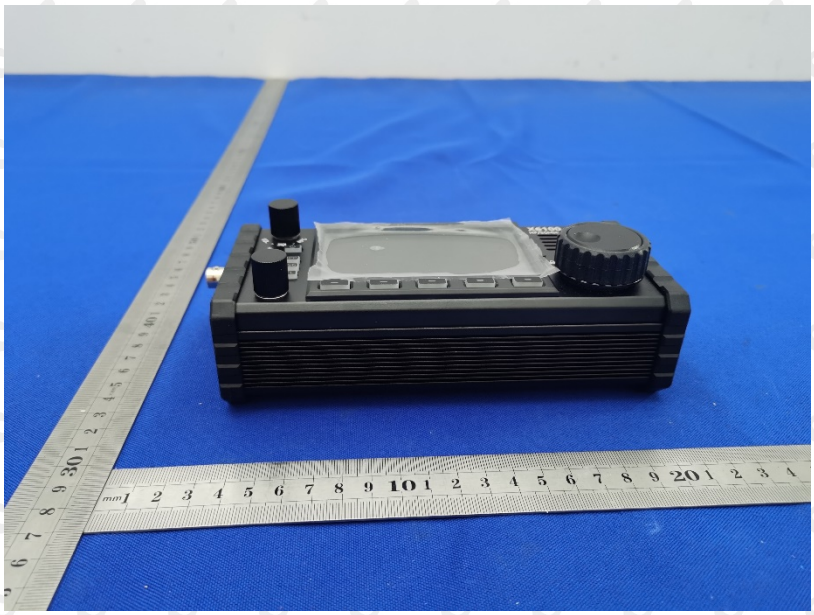
8. Photographs of test setup

Photograph of test setup for Radiated disturbance
below

Photograph of test setup for Radiated disturbance
Above


9. Photographs of EUT

Photographs of EUT

Photographs of EUT



Photographs of EUT

End of report