

TEST REPORT

For FCC Part15B

Report No.: CHTW24080038 Report verification: 

Project No.: SHT2406041801W

FCC ID.....: 2BGNSDM660U

Applicant's name: SATELRADIO TELECOMUNICACAO LTDA

Address.....: AV.FRANCISCO MATARAZZO, 1752, SALAS 516, AGUA BRANCA, SAO PAULO/SP, BRAZIL

Product Name: Digital Mobile Radio

Trade Mark: -

Model No.: DM660 U(1)

Listed Model(s): -

Standard: FCC CFR Title 47 Part 15 Subpart B

Date of receipt of test sample.....: Jun.13, 2024

Date of testing.....: Aug.06, 2024- Aug.09, 2024

Date of issue.....: Aug.09, 2024

Result.....: Pass

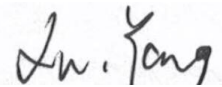
Compiled by
(position+printed name+signature)....: File administrators Caspar Chen



Supervised by
(position+printed name+signature)....: Project Engineer Caspar Chen



Approved by
(position+printed name+signature)....: RF Manager Xu Yang



Testing Laboratory Name: Shenzhen Huatongwei International Inspection Co., Ltd.
Address.....: Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China

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The test report merely corresponds to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

[FCC CFR Title 47 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. Report version information

Revision No.	Date of issue	Description
N/A	2024-08-09	Original

2. TEST DESCRIPTION

Section	Test Item	Section in CFR 47	Result ^{#1}	Test Engineer
5.1	Conducted Emissions	15.107(a)	N/A	-
5.2	Radiated Emissions	15.109(a)	PASS	Yifan Wang

Note:

#1: The test result does not include measurement uncertainty value

3. SUMMARY

3.1. Client Information

Applicant:	SATELRADIO TELECOMUNICACAO LTDA
Address:	AV.FRANCISCO MATARAZZO, 1752, SALAS 516, AGUA BRANCA, SAO PAULO/SP, BRAZIL
Manufacturer:	SATELRADIO TELECOMUNICACAO LTDA
Address:	AV.FRANCISCO MATARAZZO, 1752, SALAS 516, AGUA BRANCA, SAO PAULO/SP, BRAZIL

3.2. Product Description

Main unit information:	
Product Name:	Digital Mobile Radio
Trade Mark:	-
Model No.:	DM660 U(1)
Listed Model(s):	-
Power supply:	DC 13.6V
Hardware version:	V2.00.10
Software version:	DM660UHFMB_A

3.3. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China	
Connect information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC Registration Number	762235
	FCC Designation Number	CN1181

4. TEST CONFIGURATION

4.1. Descriptions of test mode

Test mode	Description
Test mode O1	Power on EUT and keep it turned on

4.2. Support unit used in test configuration

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?				
✓ No				
Item	Equipment	Trade Name	Model No.	Other specification
1				
2				

4.3. Environmental conditions

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

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.4. Statement of the measurement uncertainty

No.	Test Items	Measurement Uncertainty
1	Radiated Emission	4.54dB for 30MHz-1GHz 5.10dB for above 1GHz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4.5. Equipments Used during the Test

● Radiated Emission - 30MHz~1GHz							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2023/04/06	2026/04/05
●	EMI Test Receiver	R&S	HTWE0099	ESCI 7	100900	2023/8/30	2024/8/29
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0119	VULB9163	546	2023/2/22	2026/2/21
●	Pre-Amplifier	SCHWARZBECK	HTWE0295	BBV 9742	/	2024/5/24	2025/5/23
●	Test Software	R&S	N/A	EMC32	N/A	N/A	N/A

● Radiated emission-Above 1GHz							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	C11121	2023/04/17	2026/04/16
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2023/08/22	2024/08/21
●	Horn Antenna	SCHWARZBECK	HTWE0126	BBHA 9120D	1011	2023/02/14	2026/02/13
●	Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2023/02/20	2026/02/19
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0551	SCU18F	100855	2024/6/6	2025/6/5
●	Test Software	R&S	N/A	EMC32	N/A	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Conducted Emissions

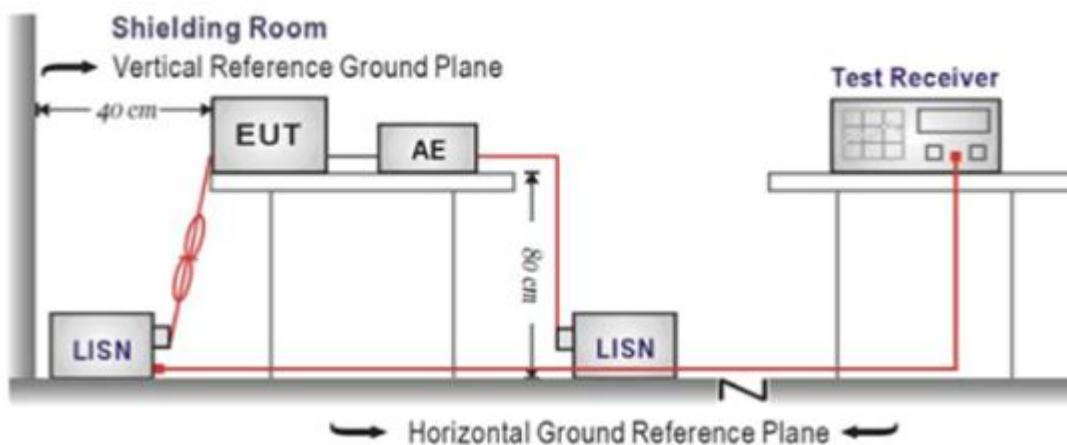
LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.107:

Frequency range (MHz)	Limit (dBuV)	
	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.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.4:2014
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☐ Passed ☒ Not Applicable

5.2. Radiated Emissions

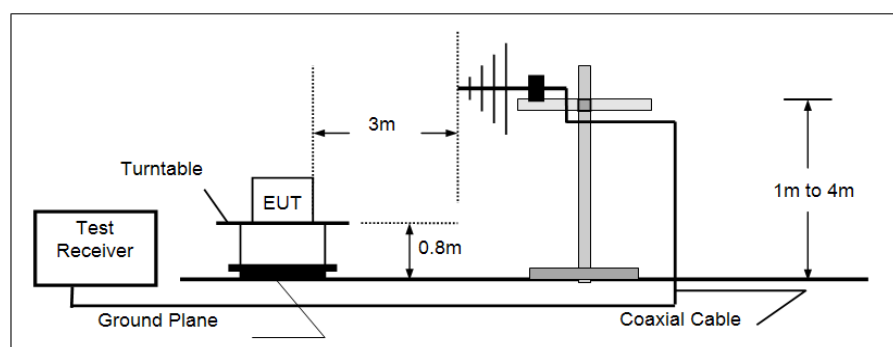
LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.109

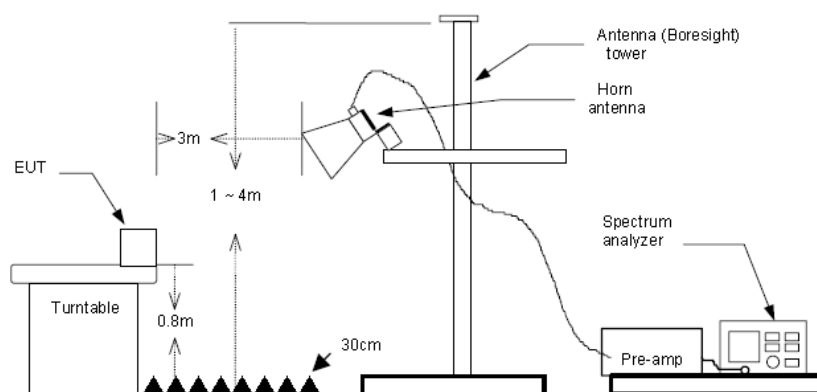
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

➤ 30MHz ~ 1GHz



➤ Above 1GHz



TEST PROCEDURE

1. The EUT was tested according to ANSI C63.4:2014.
2. The EUT is placed on a turn table which is 0.8 meter above ground.
3. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
4. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
5. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Below 1GHz,
RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold;
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
 - (3) From 1GHz to 5th harmonic, RBW=1MHz, VBW=3MHz

TEST MODE:

Please refer to the clause 3.3

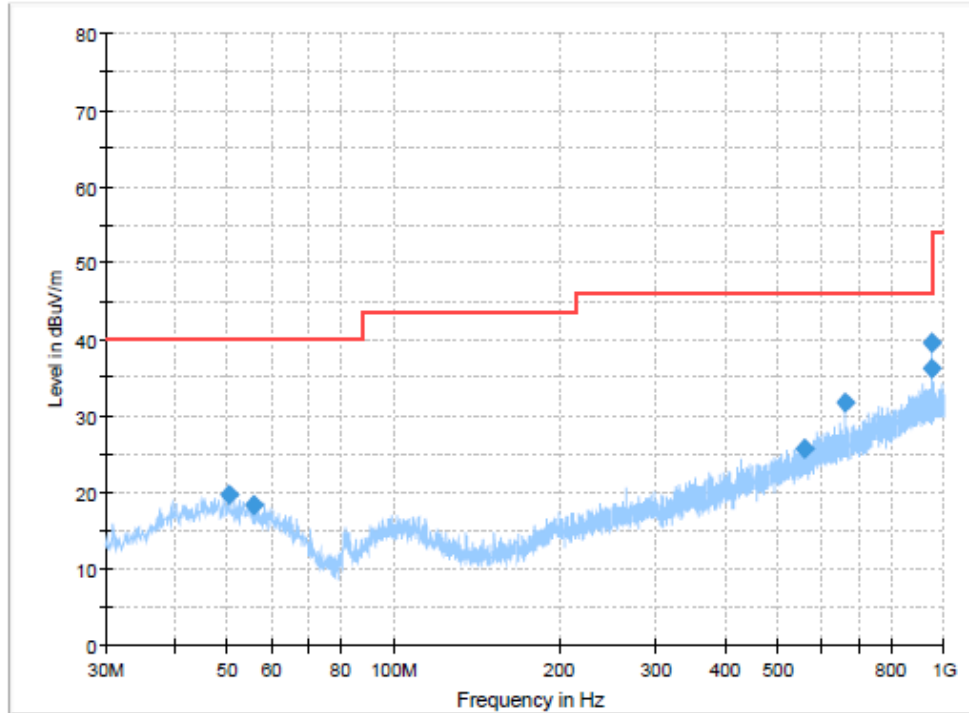
TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Note: Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
The emission levels of frequency above 6GHz are very lower than limit and not show in test report.

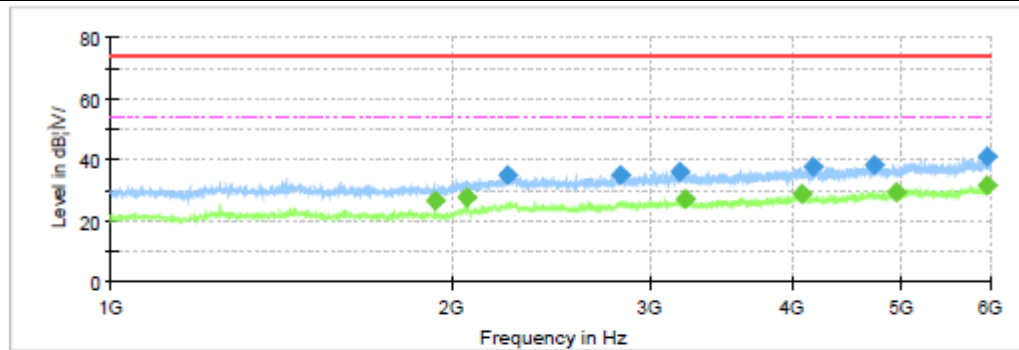
Polarization:

Horizontal



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.1275	19.59	40.00	20.41	300.0	H	12.0	-8.4
55.9475	18.23	40.00	21.77	100.0	H	299.0	-8.7
556.2250	25.72	46.00	20.28	100.0	H	331.0	-0.2
660.0150	31.76	46.00	14.24	300.0	H	349.0	2.2
946.6500	36.24	46.00	9.76	100.0	H	51.0	7.5
948.3475	39.65	46.00	6.35	100.0	H	123.0	7.5

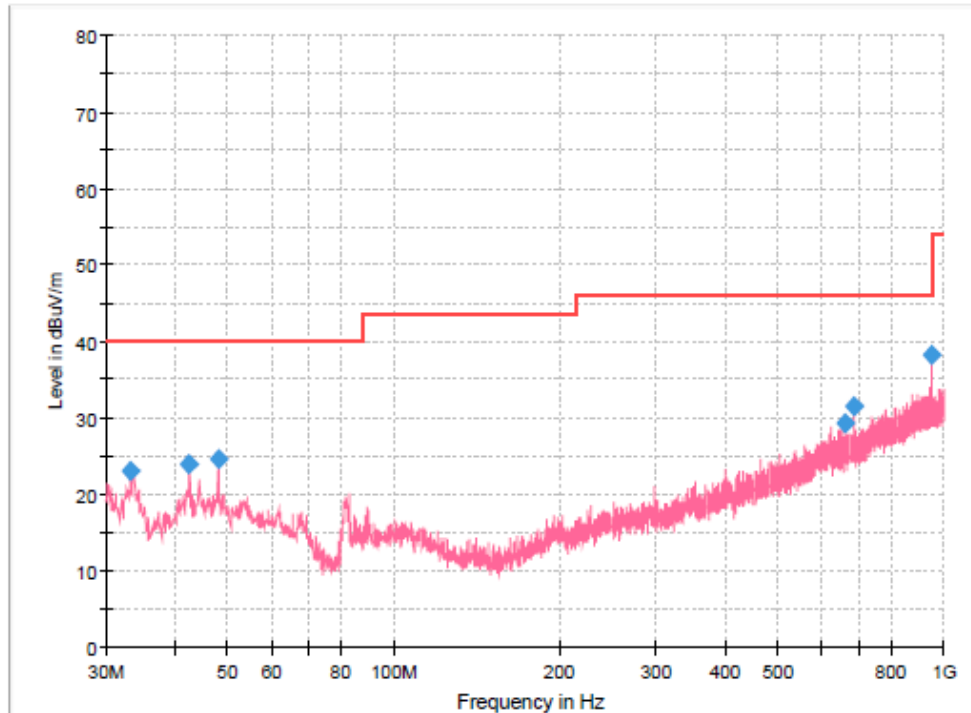


Final Result

Frequency (MHz)	MaxPeak (dB; μ V/m)	Average (dB; μ V/m)	Limit (dB; μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1937.500000	---	26.68	54.00	27.32	150.0	H	125.0	-12.0
2062.500000	---	27.96	54.00	26.04	150.0	H	214.0	-10.7
2244.375000	35.00	---	74.00	39.00	150.0	H	181.0	-9.1
2817.500000	34.89	---	74.00	39.11	150.0	H	0.0	-8.4
3178.750000	36.28	---	74.00	37.72	150.0	H	11.0	-7.2
3214.375000	---	26.98	54.00	27.02	150.0	H	203.0	-7.2
4088.125000	---	28.77	54.00	25.23	150.0	H	225.0	-4.8
4180.625000	38.00	---	74.00	36.00	150.0	H	236.0	-4.7
4726.250000	38.39	---	74.00	35.61	150.0	H	11.0	-3.3
4958.125000	---	29.55	54.00	24.45	150.0	H	33.0	-2.9
5946.875000	41.16	---	74.00	32.84	150.0	H	56.0	-0.2
5946.875000	---	31.70	54.00	22.30	150.0	H	56.0	-0.2

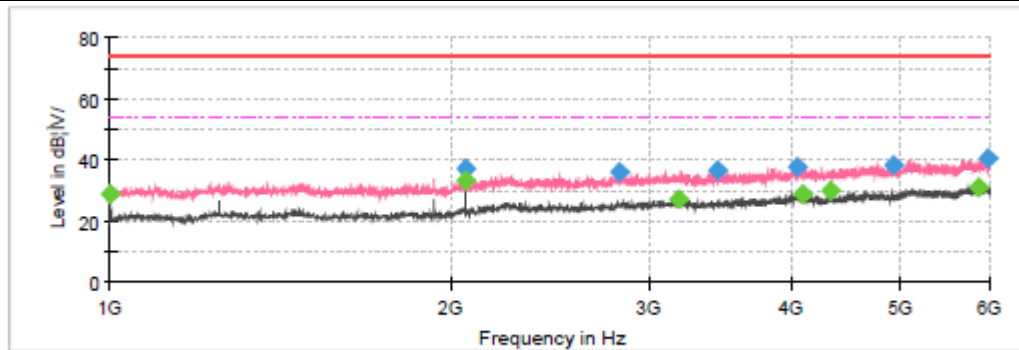
Polarization:

Vertical



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.2738	23.07	40.00	16.93	100.0	V	40.0	-12.0
42.4888	23.82	40.00	16.18	100.0	V	0.0	-8.8
47.9450	24.48	40.00	15.52	100.0	V	354.0	-8.4
660.0150	29.17	46.00	16.83	100.0	V	0.0	2.2
687.5388	31.60	46.00	14.40	100.0	V	335.0	2.5
948.3475	38.11	46.00	7.89	100.0	V	5.0	7.5

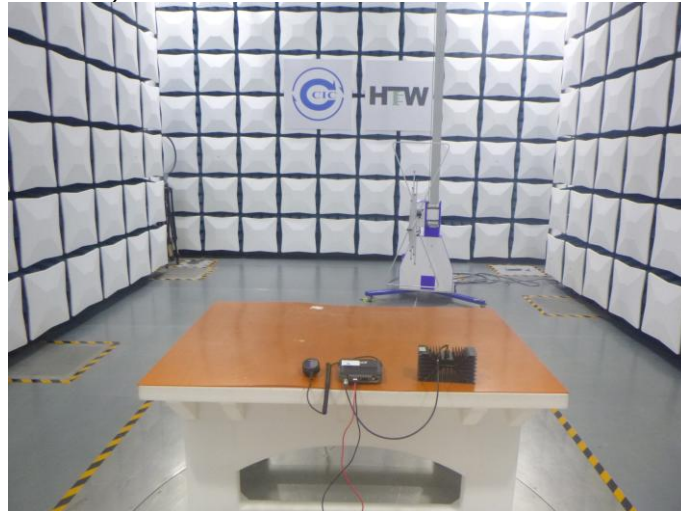


Final Result

Frequency (MHz)	MaxPeak (dB; i V/m)	Average (dB; i V/m)	Limit (dB; i V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1000.000000	---	28.67	54.00	25.33	150.0	V	145.0	-14.3
2062.500000	---	33.08	54.00	20.92	150.0	V	212.0	-10.7
2062.500000	37.28	---	74.00	36.72	150.0	V	212.0	-10.7
2817.500000	36.26	---	74.00	37.74	150.0	V	259.0	-8.4
3186.250000	---	27.21	54.00	26.79	150.0	V	201.0	-7.2
3440.625000	36.82	---	74.00	37.18	150.0	V	348.0	-7.3
4054.375000	37.81	---	74.00	36.19	150.0	V	348.0	-4.9
4101.250000	---	29.05	54.00	24.95	150.0	V	281.0	-4.7
4341.250000	---	29.74	54.00	24.26	150.0	V	270.0	-4.3
4930.000000	38.46	---	74.00	35.54	150.0	V	281.0	-3.0
5870.625000	---	31.34	54.00	22.66	150.0	V	111.0	-0.3
5981.250000	40.43	---	74.00	33.57	150.0	V	66.0	-0.2

6. TEST SETUP PHOTOS OF THE EUT

Radiated Emissions (30MHz-1GHz)



Radiated Emissions (Above 1GHz)



7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Refer to the test report No.: CHTW24070054

-----End of Report-----