


TEST REPORT

For FCC Part15B

Report No.: **CHTEW22080269** Report verification: 

Project No.: **SHT2206030501EW**

FCC ID.....: **2ATDI-C2000**

Applicant's name: **NRadio Technologies, Co., Ltd.**

Address.....: Room 408, Ziyun Building, No.211, Xin'an 2nd Rd., Bao'an District, Shenzhen, P.R.C.

Product Name: **Dual-Band 4G LTE Router**

Trade Mark: NRadio

Model No.: C2000

Listed Model(s): N5,N6,C6,N8,C8,N9,C9,B5,B8,C4800,C5800

Standard: **47 CFR FCC Part 15 Subpart B**

Date of receipt of test sample.....: Jun. 15, 2022

Date of testing.....: Jun. 16, 2022- Aug. 16, 2022

Date of issue.....: Aug. 17, 2022

Result.....: **Pass**

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Testing Laboratory Name: **Shenzhen Huatongwei International Inspection Co., Ltd.**

Address.....: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, 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:

[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. Report version information

Revision No.	Date of issue	Description
N/A	2022-08-17	Original

2. TEST DESCRIPTION

Section	Test Item	Section in CFR 47	Result ^{#1}	Test Engineer
5.1	Conducted Emissions	15.107(a)	PASS	Pan Xie
5.2	Radiated Emissions	15.109(a)	PASS	Pan Xie

Note:

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

3. SUMMARY

3.1. Client Information

Applicant:	NRadio Technologies, Co., Ltd.
Address:	Room 408, Ziyun Building, No.211, Xin'an 2nd Rd., Bao'an District, Shenzhen, P.R.C.
Manufacturer:	NRadio Technologies, Co., Ltd.
Address:	Room 408, Ziyun Building, No.211, Xin'an 2nd Rd., Bao'an District, Shenzhen, P.R.C.

3.2. Product Description

Main unit information:	
Product Name:	Dual-Band 4G LTE Router
Trade Mark:	NRadio
Model No.:	C2000
Listed Model(s):	N5,N6,C6,N8,C8,N9,C9,B5,B8,C4800,C5800
Power supply:	DC 5V from adapter
Hardware version:	V1
Software version:	1.9
Accessory unit information:	
Adapter information:	Model:JZB310-050200UU Input: AC100-240V, 50/60Hz, 0.35A Output: 5.0Vdc, 2000mA

3.3. Testing Laboratory Information

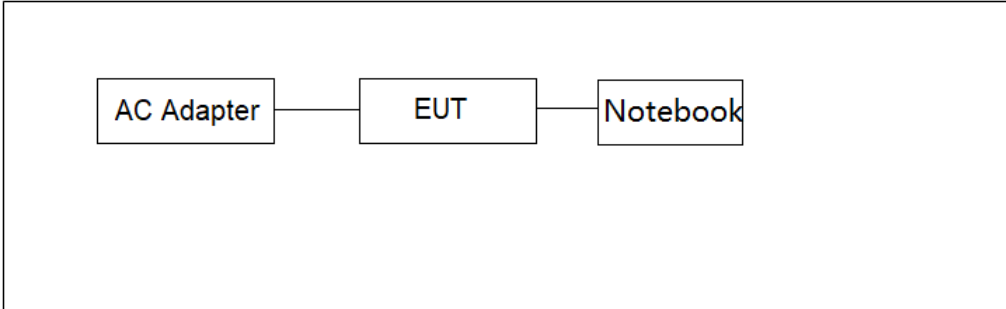
Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Connect information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC	762235

4. TEST CONFIGURATION

4.1. Descriptions of test mode

Test mode	Description
Data exchange	Keep the EUT in Data exchange with notebook.

4.2. Configuration of Tested System

Test mode	Configuration
Data exchange	 <pre>graph LR; ACAdapter[AC Adapter] --- EUT[EUT]; EUT --- Notebook[Notebook]</pre>

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

Test Items	MeasurementUncertainty
Conducted emission	3.25dB
Radiated emission	<1GHz: 4.22dB >1GHz:5.06ppm

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

● Conducted Emission

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	HTWE0114	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2021/09/14	2022/09/13
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2021/09/17	2022/09/16
●	Pulse Limiter	R&S	HTWE0193	ESH3-Z2	101447	2021/09/16	2022/09/15
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLEX 142	EF-NM-BNCM-2M	2021/09/17	2022/09/16
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated Emission-6th test site

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	2018/09/30	2022/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2021/09/14	2022/09/13
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0119	VULB9163	546	2020/04/28	2023/04/27
●	Pre-Amplifier	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2021/11/05	2022/11/04
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2022/02/25	2023/02/24
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX104	501184/4	2022/02/25	2023/02/24
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-7th test site

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	2018/09/27	2022/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2021/09/13	2022/09/12
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2020/04/01	2023/03/31
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2022/02/28	2023/02/27
●	RF Connection Cable	HUBER+SUHNER	HTWE0126-01	RE-7-FH	N/A	2022/03/04	2023/03/03
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Conducted Emissions

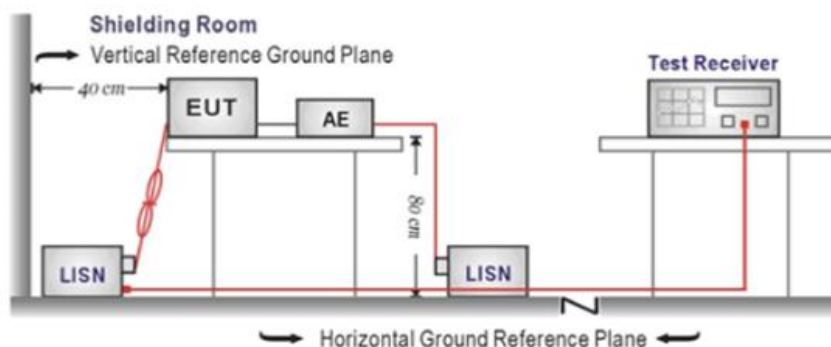
LIMIT

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:

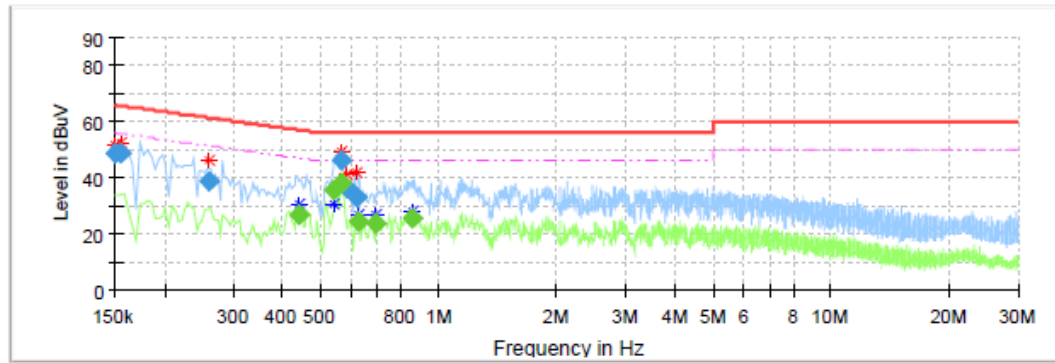
Please refer to the clause 3.3

TEST RESULTS

☒ Passed ☐ Not Applicable

Test Line:

L

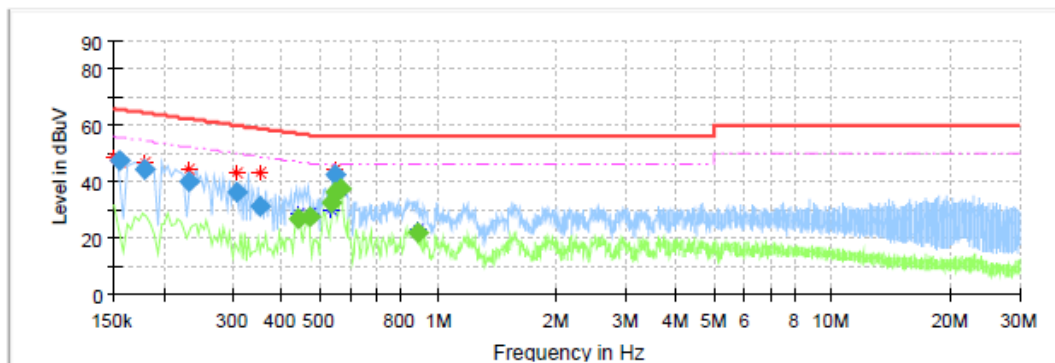


Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.150000	48.53	---	66.00	17.47	L1	10.1
0.155500	49.04	---	65.70	16.66	L1	10.1
0.259500	38.62	---	61.45	22.83	L1	10.1
0.439500	---	27.12	47.07	19.95	L1	10.1
0.540500	---	35.92	46.00	10.08	L1	10.1
0.563500	46.38	---	56.00	9.62	L1	10.1
0.567500	---	38.10	46.00	7.90	L1	10.1
0.587500	36.26	---	56.00	19.74	L1	10.1
0.619500	33.00	---	56.00	23.00	L1	10.1
0.623500	---	24.69	46.00	21.31	L1	10.1
0.695500	---	23.66	46.00	22.34	L1	10.2
0.859500	---	25.46	46.00	20.54	L1	10.1

Test Line:

N



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.155500	47.42	---	65.70	18.28	N	10.1
0.179500	44.56	---	64.51	19.95	N	10.1
0.231500	40.21	---	62.40	22.18	N	10.1
0.307500	36.49	---	60.04	23.55	N	10.1
0.352500	31.54	---	58.90	27.36	N	10.1
0.443500	---	26.63	47.00	20.37	N	10.1
0.471500	---	27.23	46.49	19.26	N	10.1
0.536500	---	32.80	46.00	13.20	N	10.1
0.547500	42.37	---	56.00	13.63	N	10.1
0.547500	---	36.05	46.00	9.95	N	10.1
0.567500	---	37.32	46.00	8.68	N	10.1
0.891500	---	21.93	46.00	24.07	N	10.1

5.2. Radiated Emissions

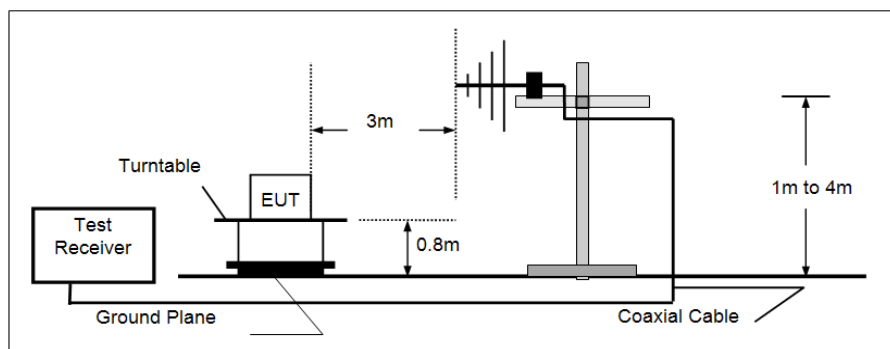
LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.109

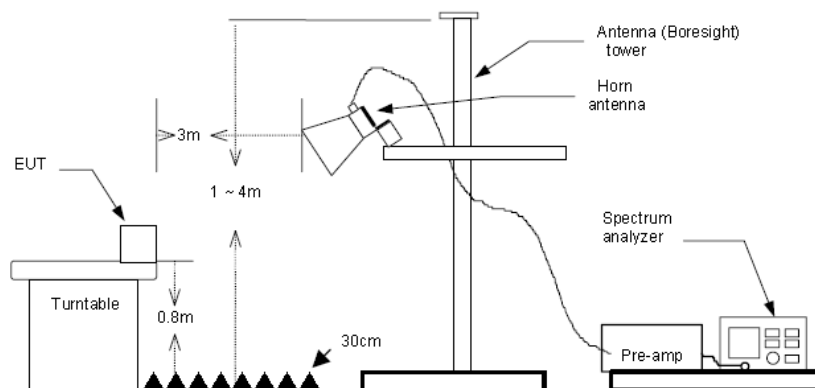
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

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

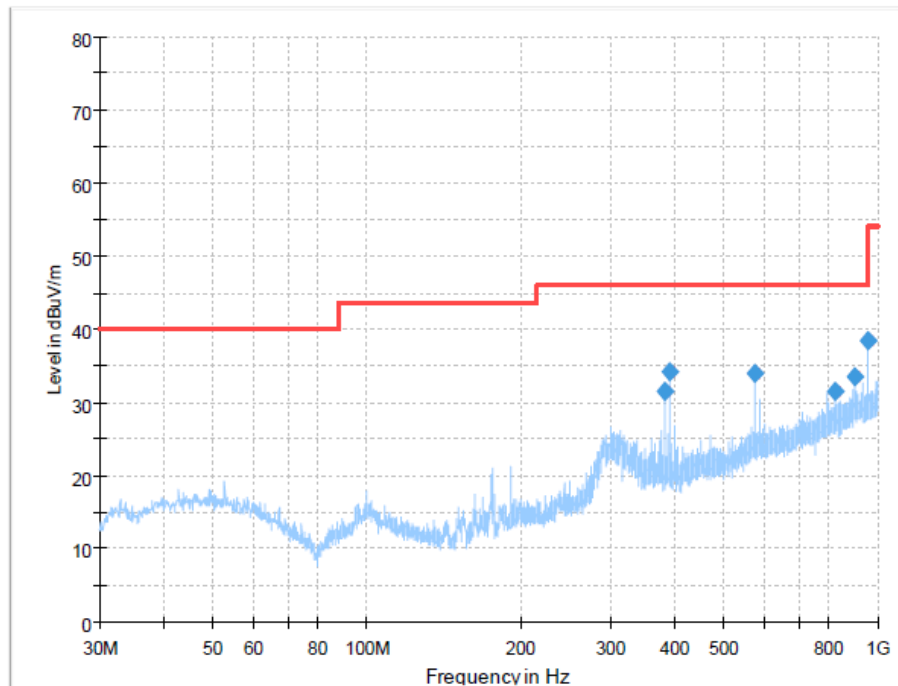
TEST RESULTS

☒ **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:

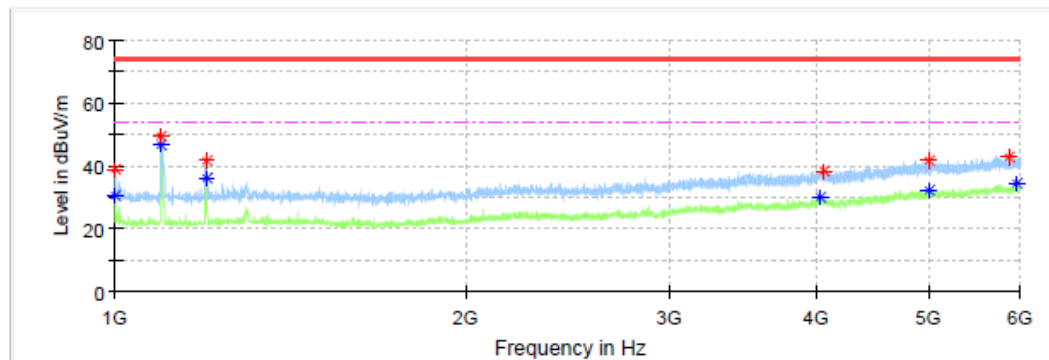
Horizontal



Serif,

Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
384.050000	31.56	46.00	14.44	100.0	H	0.0	-4.9
391.688750	34.15	46.00	11.85	100.0	H	0.0	-4.6
575.018750	33.86	46.00	12.14	100.0	H	321.0	0.2
826.855000	31.60	46.00	14.40	300.0	H	139.0	4.9
899.362500	33.44	46.00	12.56	100.0	H	104.0	6.5
958.411250	38.33	46.00	7.67	100.0	H	299.0	7.4

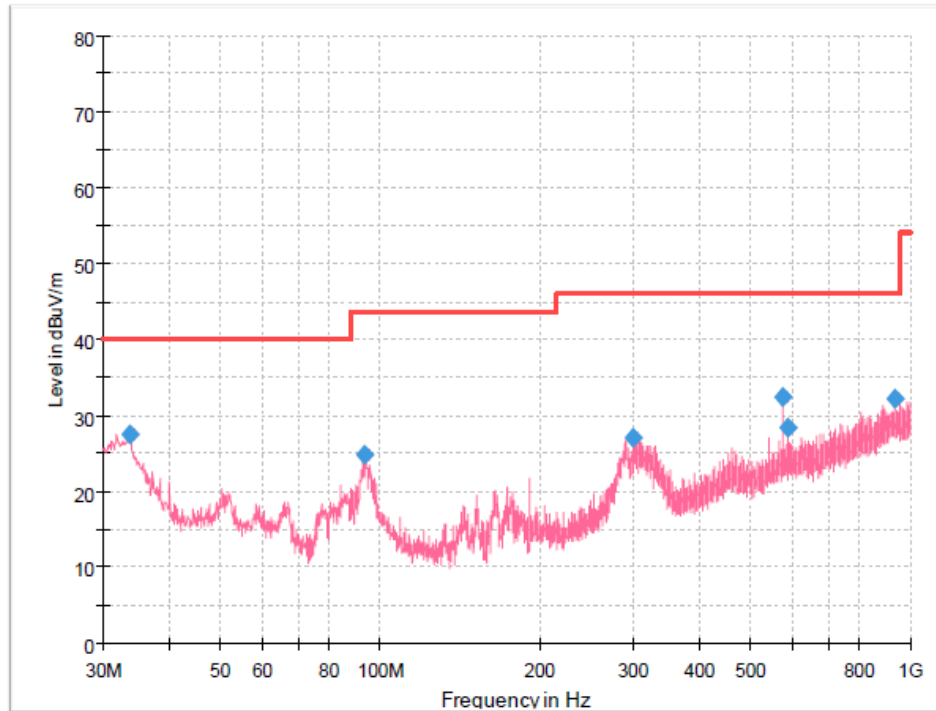


Critical Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4061.875000	38.55	---	74.00	35.45	150.0	H	0.0	0.8
5007.500000	---	32.27	54.00	21.73	150.0	H	11.0	5.9
4031.875000	---	30.12	54.00	23.88	150.0	H	108.0	0.7
5945.625000	---	34.36	54.00	19.64	150.0	H	108.0	8.5
5015.625000	41.74	---	74.00	32.26	150.0	H	136.0	6.0
1198.125000	---	36.14	54.00	17.86	150.0	H	205.0	-7.8
5876.250000	42.85	---	74.00	31.15	150.0	H	205.0	8.1
1095.625000	49.22	---	74.00	24.78	150.0	H	261.0	-8.3
1095.625000	---	46.60	54.00	7.40	150.0	H	261.0	-8.3
1000.000000	38.83	---	74.00	35.17	150.0	H	275.0	-7.7
1000.000000	---	30.29	54.00	23.71	150.0	H	275.0	-7.7
1196.250000	41.41	---	74.00	32.59	150.0	H	275.0	-7.8

Polarization:

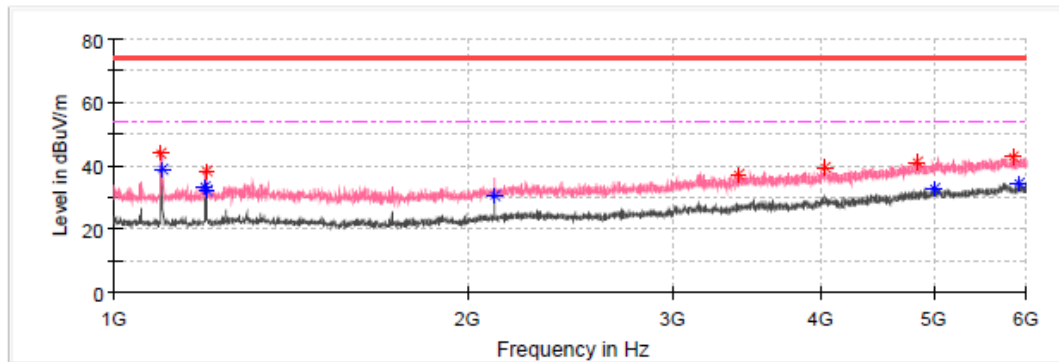
Vertical



Serif;

Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.758750	27.48	40.00	12.52	100.0	V	356.0	-11.5
93.656250	24.91	43.50	18.59	100.0	V	223.0	-12.3
301.115000	27.06	46.00	18.94	100.0	V	311.0	-7.4
575.018750	32.30	46.00	13.70	100.0	V	223.0	0.2
588.477500	28.48	46.00	17.52	100.0	V	50.0	0.5
937.071250	32.14	46.00	13.86	100.0	V	50.0	7.1



Critical Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1199.375000	---	32.05	54.00	21.95	150.0	V	0.0	-7.8
4846.875000	40.84	---	74.00	33.16	150.0	V	0.0	5.1
2108.125000	---	30.56	54.00	23.44	150.0	V	7.0	-5.8
5909.375000	---	34.58	54.00	19.42	150.0	V	78.0	8.2
4044.375000	39.22	---	74.00	34.78	150.0	V	147.0	0.7
5853.750000	42.72	---	74.00	31.28	150.0	V	147.0	8.1
1096.250000	44.11	---	74.00	29.89	150.0	V	161.0	-8.3
1098.125000	---	38.90	54.00	15.10	150.0	V	161.0	-8.3
1196.875000	38.25	---	74.00	35.75	150.0	V	175.0	-7.8
1195.625000	---	33.48	54.00	20.52	150.0	V	189.0	-7.8
5010.625000	---	32.52	54.00	21.48	150.0	V	230.0	5.9
3413.750000	37.33	---	74.00	36.67	150.0	V	328.0	-2.2

6. TEST SETUP PHOTOS

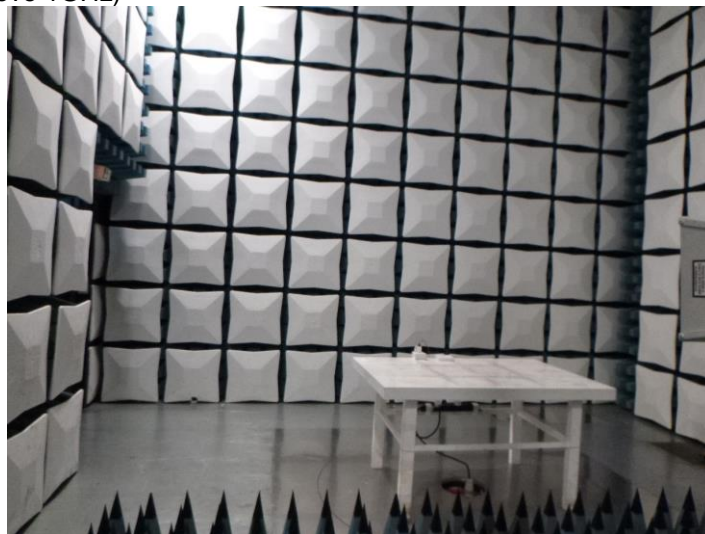
Conducted Emissions (AC Mains)



Radiated Emissions (30MHz-1GHz)



Radiated Emissions (Above 1GHz)



7. **EXTERNAL AND INTERNAL PHOTOS**

Refer to the test report No.: CHTEW22080267

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