


TEST REPORT

For FCC Part15B

Report No.: **CHEW22120021** Report verification: 

Project No.: **SHT2112010901EW**

FCC ID : **2ALV5-SE-200PB**

Applicant's name : **Origins Technology Limited**
 Address.....: 603 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road,
 Hong Kong

Product Name : **Kaiterra Sensedge Mini Air Quality Monitor**

Trade Mark: Kaiterra

Model No.: SE-200PB

Listed Model(s): SE-200B

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

Date of receipt of test sample.....: Dec.17, 2021

Date of testing.....: Dec.17, 2021- Dec.02, 2022

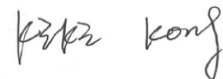
Date of issue.....: Dec.05, 2022

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

Compiled by
 (position+printed name+signature)...: File administrators Fanghui Zhu



Supervised by
 (position+printed name+signature)...: Project Engineer Kiki Kong



Approved by
 (position+printed name+signature)...: RF Manager Hans Hu



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	2022-12-05	Original

2. TEST DESCRIPTION

Section	Test Item	Section in CFR 47	Result #1	Test Engineer
5.1	Conducted Emissions	15.107(a)	PASS	Quanhai Deng
5.2	Radiated Emissions	15.109(a)	PASS	Junman Wang

Note:

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

3. SUMMARY

3.1. Client Information

Applicant:	Origins Technology Limited
Address:	603 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Hong Kong
Manufacturer:	Origins Technology Limited
Address:	603 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Hong Kong

3.2. Product Description

Main unit information:	
Product Name:	Kaiterra Sensedge Mini Air Quality Monitor
Trade Mark:	Kaiterra
Model No.:	SE-200PB
Listed Model(s):	SE-200B
Power supply:	DC 10-30V AC10-30V AC100-240V from adapter 42-57V from POE
Hardware version:	v1.2
Software version:	v3.0.2
Accessory unit information:	
Adapter information:	Model: SOY-0500200-090 IUPUT:100-240Va.c., 50/60Hz 0.5A Max OUTPUT: 5.0Vd.c., 2.0A 10.0W

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 O1	Working, AC 30V from AC power
Test mode O2	Working, DC 30V from DC power
Test mode O3	Working, AC 120V from adapter
Test mode O4	Working, AC 120V from POE

Pre-scan above all test mode, found below test mode which it was worse case mode, so only show the test data for worse case mode on the test report

Test Item	Test mode for worse case
Conducted Emissions	Test mode O3
Radiated Emissions	Test mode O4

4.2. 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

4.3. Statement of the measurement uncertainty

No.	Test Items	Measurement Uncertainty
1	AC Conducted Emission	3.21dB
2	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.

4.4. 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	2022/08/30	2023/08/29
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2022/08/29	2023/08/28
●	Pulse Limiter	R&S	HTWE0193	ESH3-Z2	101447	2022/08/29	2023/08/28
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLEX_142	EF-NM-BNCM-2M	2022/09/17	2023/09/16
●	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	2023/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2022/08/30	2023/08/29
●	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	2023/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2022/08/25	2023/08/24
●	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

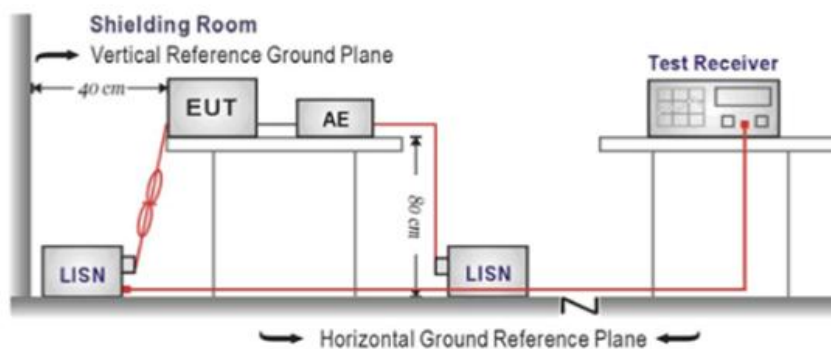
LIMIT

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:

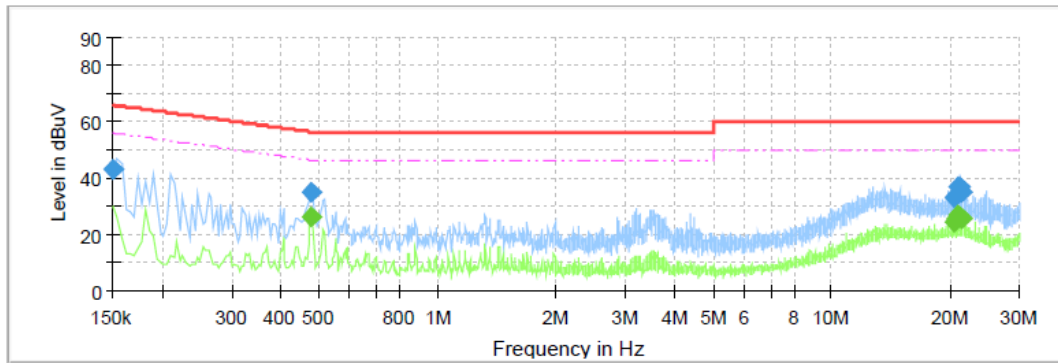
Please refer to the clause 3.3

TEST RESULTS

Passed Not Applicable

Test Line:

L

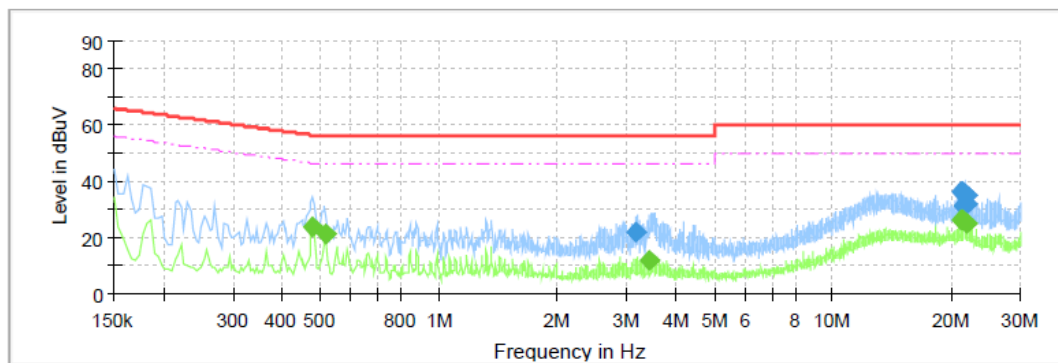


Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.150000	42.99	---	66.00	23.01	L1	10.0
0.475500	---	26.03	46.42	20.39	L1	10.0
0.475500	34.75	---	56.42	21.67	L1	10.0
20.367500	---	24.61	50.00	25.39	L1	10.5
20.395500	33.09	---	60.00	26.91	L1	10.5
20.659500	---	25.82	50.00	24.18	L1	10.5
20.927500	36.62	---	60.00	23.38	L1	10.5
20.935500	---	26.58	50.00	23.42	L1	10.5
21.195500	36.65	---	60.00	23.35	L1	10.5
21.195500	---	26.55	50.00	23.45	L1	10.5
21.467500	35.31	---	60.00	24.69	L1	10.5
21.475500	---	25.50	50.00	24.50	L1	10.5

Test Line:

N



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.475500	---	24.02	46.42	22.39	N	10.0
0.515500	---	21.39	46.00	24.61	N	10.0
3.159500	21.87	---	56.00	34.13	N	10.0
3.411500	---	12.17	46.00	33.83	N	10.0
21.207500	---	26.37	50.00	23.63	N	10.6
21.215500	36.35	---	60.00	23.65	N	10.6
21.311500	31.37	---	60.00	28.63	N	10.6
21.467500	36.15	---	60.00	23.85	N	10.6
21.483500	---	26.20	50.00	23.80	N	10.6
21.775500	34.71	---	60.00	25.29	N	10.6
21.775500	---	24.84	50.00	25.16	N	10.6
22.011500	32.11	---	60.00	27.89	N	10.6

5.2. Radiated Emissions

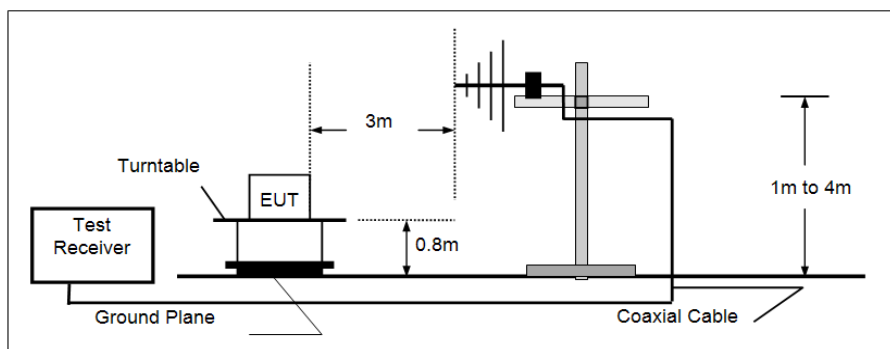
LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.109

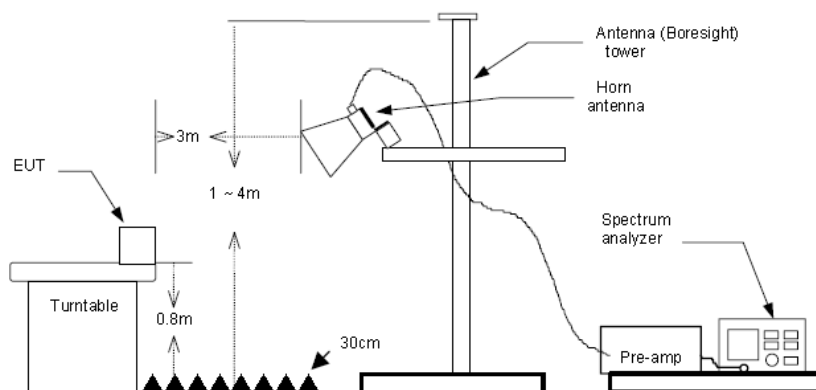
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

➤ 30MHz ~ 1GHz



➤ Above 1GHz



TEST PROCEDURE

- The EUT was tested according to ANSI C63.4:2014.
- The EUT is placed on a turn table which is 0.8 meter above ground.
- The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 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.
- Use the following spectrum analyzer settings
 - Span shall wide enough to fully capture the emission being measured;
 - 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.
 - From 1GHz to 5th harmonic, RBW=1MHz, VBW=3MHz

TEST MODE:

Please refer to the clause 3.3

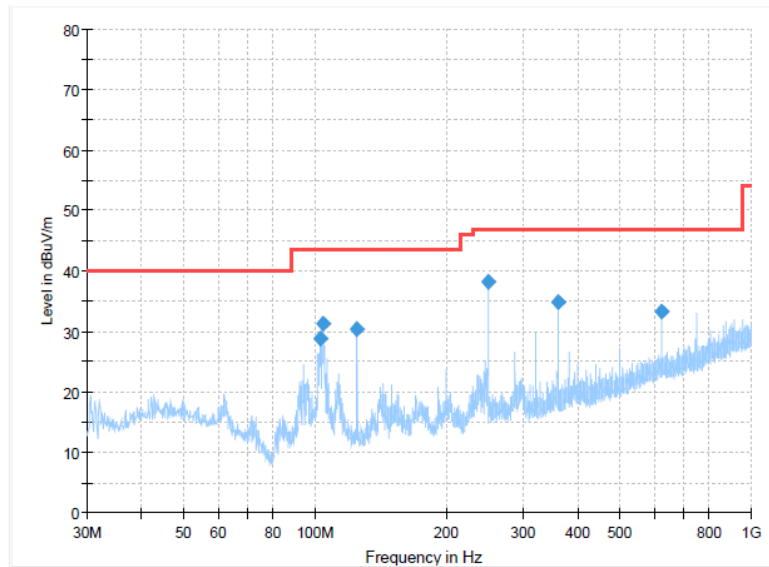
TEST RESULTS

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.

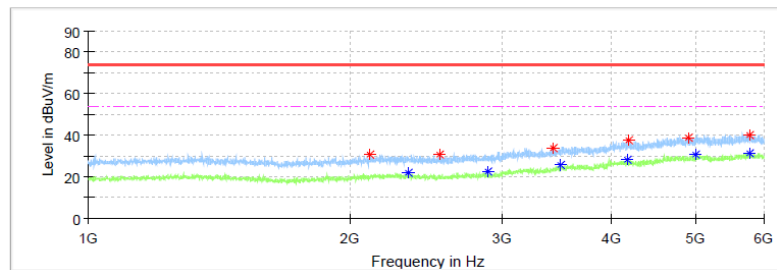
Polarization:

Horizontal



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
103.235000	28.75	43.50	14.75	300.0	H	158.0	-11.2
104.690000	31.19	43.50	12.31	300.0	H	354.0	-11.4
124.938750	30.29	43.50	13.21	300.0	H	169.0	-13.4
249.947500	38.16	47.00	8.84	100.0	H	0.0	-9.2
360.042500	34.80	47.00	12.20	100.0	H	118.0	-5.7
624.973750	33.23	47.00	13.77	100.0	H	291.0	0.9

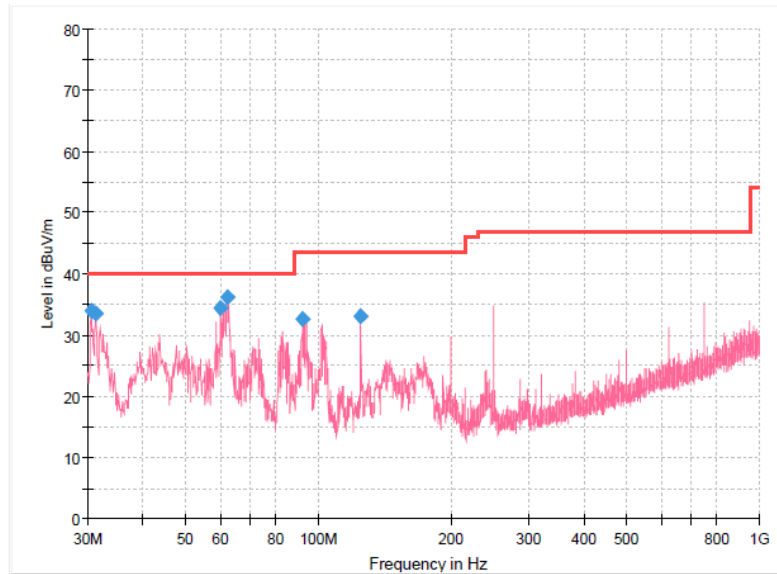


Critical Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2885.625000	---	22.61	54.00	31.39	160.0	H	0.0	-5.7
5773.125000	40.21	---	74.00	33.79	160.0	H	0.0	5.0
2535.000000	30.88	---	74.00	43.12	160.0	H	83.0	-6.7
4173.750000	---	28.17	54.00	25.83	160.0	H	110.0	-1.0
2110.625000	30.93	---	74.00	43.07	160.0	H	166.0	-7.4
5771.875000	---	31.48	54.00	22.52	160.0	H	166.0	5.0
4188.125000	37.43	---	74.00	36.57	160.0	H	235.0	-0.9
3502.500000	---	25.33	54.00	28.67	160.0	H	249.0	-3.5
3436.250000	33.56	---	74.00	40.44	160.0	H	263.0	-4.0
4997.500000	---	30.52	54.00	23.48	160.0	H	304.0	2.9
2333.750000	---	21.90	54.00	32.10	160.0	H	332.0	-6.6
4914.375000	39.03	---	74.00	34.97	160.0	H	358.0	2.6

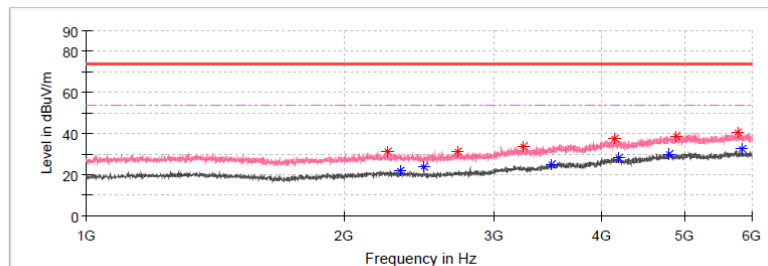
Polarization:

Vertical



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.606250	34.05	40.00	5.95	100.0	V	324.0	-12.6
31.333750	33.43	40.00	6.57	100.0	V	217.0	-12.3
60.191250	34.39	40.00	5.61	100.0	V	80.0	-10.1
62.252500	36.19	40.00	3.81	100.0	V	80.0	-10.7
92.443750	32.71	43.50	10.79	100.0	V	229.0	-12.5
124.938750	33.15	43.50	10.35	100.0	V	359.0	-13.4



Critical Freqs

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3493.125000	---	24.75	54.00	29.25	160.0	V	0.0	-3.6
2713.125000	30.95	---	74.00	43.05	160.0	V	3.0	-5.9
2248.125000	31.33	---	74.00	42.67	160.0	V	15.0	-6.6
4150.000000	37.31	---	74.00	36.69	160.0	V	29.0	-1.2
4890.000000	38.68	---	74.00	35.32	160.0	V	29.0	2.6
2480.000000	---	23.54	54.00	30.46	160.0	V	57.0	-6.9
3241.875000	33.94	---	74.00	40.06	160.0	V	98.0	-4.4
5837.500000	---	32.31	54.00	21.69	160.0	V	126.0	5.2
4191.875000	---	28.13	54.00	25.87	160.0	V	140.0	-0.8
4810.000000	---	30.31	54.00	23.69	160.0	V	153.0	2.2
2327.500000	---	21.84	54.00	32.16	160.0	V	264.0	-6.6
5768.750000	40.67	---	74.00	33.33	160.0	V	278.0	5.0

6. TEST SETUP PHOTOS

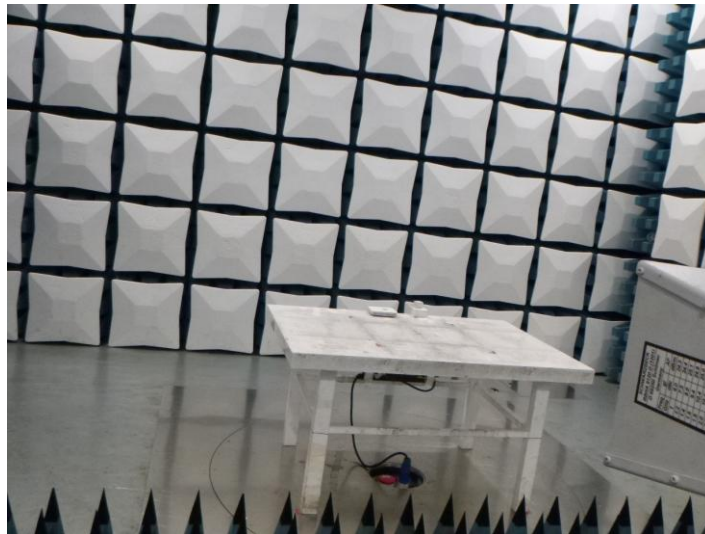
Conducted Emissions (AC Mains)



Radiated Emissions (30MHz-1GHz)



Radiated Emissions (Above 1GHz)



7. EXTERNAL AND INTERNAL PHOTOS

Refer to the test report No.: CHTEW22120019

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