TEST REPORT

Report No.	CISRR25010703103
Project No.	CISR250107031
FCC ID	2BNEY-M500
Applicant	Mahdi Premium (Shenzhen) Technology CO.,Ltd
Address	3/F, Building 63, Baotian Industrial Zone, Chentian Community, Xixiang Street, Bao'an District, Shenzhen, China
Manufacturer	Mahdi Premium (Shenzhen) Technology CO.,Ltd
Address	3/F, Building 63, Baotian Industrial Zone, Chentian Community, Xixiang Street, Bao'an District, Shenzhen, China
Product Name	Digital player recording pen
Trade Mark	N/A
Model/Type reference	M500
Listed Model(s)	P10, P20, P30, P40, P50, P60, P70, P80, P90, P100, P200, P300, M400, M390, M20, M420, M450, M240, M366, M10, M200, P88, P66, P8, P6, M9, M6, M8, Z21
Standard	47 CFR Part 15E
Test date	January 8, 2025 to January 20, 2025
Issue date	January 21, 2025
Test result	**Complied**

Rory Huang

Prepared by: Rory Huang

Genry Long

Approved by: Genry Long

The test results relate only to the tested samples.

The test report should not be reproduced except in full without the written approval of Shenzhen Bangce Testing Technology Co., Ltd.

Contents

1. REPORT VERSION 3

2. TEST DESCRIPTION 4

3. SUMMARY 5

3.1. Product Description * 5
3.2. Radio Specification Description * 5
3.3. Modification of EUT 6
3.4. Deviation from standards 6
3.5. Testing Site 6

4. TEST CONFIGURATION 7

4.1. Test frequency list 7
4.2. Descriptions of test mode 7
4.3. Support unit used in test configuration 8
4.4. Test sample information 8
4.5. Environmental conditions 8
4.6. Equipment Used during the Test 9

5. TEST RESULTS 11

5.1. Evaluation Results (Evaluation) 11
5.1.1. Antenna requirement 11
5.2. Radio Spectrum Matter Test Results (RF) 12
5.2.1. Conducted Emission at AC power line 12
5.2.2. Duty Cycle 21
5.2.3. Emission bandwidth and occupied bandwidth 22
5.2.4. Maximum conducted output power 24
5.2.5. Power spectral density 26
5.2.6. Band edge emissions (Conducted) 28
5.2.7. Band edge emissions (Radiated) 31
5.2.8. Undesirable emission limits (below 1GHz) 37
5.2.9. Undesirable emission limits (above 1GHz) 48

6. TEST SETUP PHOTOS 55

7. EXTERNAL AND INTERNAL PHOTOS 57

7.1. External Photos 57
7.2. Internal Photos 57

8. APPENDIX REPORT 57

1. REPORT VERSION

Version No.	Issue date	Description
00	January 21, 2025	Original

2. TEST DESCRIPTION

No.	Test Item	Standard Requirement	Result
1	Antenna requirement	Part 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15.207(a)	Pass
3	Duty Cycle		Pass
4	Emission bandwidth and occupied bandwidth	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. 47 CFR Part 15.407(e)	Pass
5	Maximum conducted output power	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(2) 47 CFR Part 15.407(a)(3)(i)	Pass
6	Power spectral density	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(2) 47 CFR Part 15.407(a)(3)(i)	Pass
7	Band edge emissions (Conducted)	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(3) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)	Pass
8	Band edge emissions (Radiated)	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(3) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)	Pass
9	Undesirable emission limits (below 1GHz)	47 CFR Part 15.407(b)(9)	Pass
10	Undesirable emission limits (above 1GHz)	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(3) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)	Pass

Note:

– The measurement uncertainty is not included in the test result.

– A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW;

3. SUMMARY

3.1. Product Description *

Main unit information:	
Product Name:	Digital player recording pen
Trade Mark:	N/A
Model No.:	M500
Listed Model(s):	P10, P20, P30, P40, P50, P60, P70, P80, P90, P100, P200, P300, M400, M390, M20, M420, M450, M240, M366, M10, M200, P88, P66, P8, P6, M9, M6, M8, Z21
Model difference:	The difference between different models is that in this application, due to different sales channels and different model names.
Power supply:	DC 5V
Hardware version:	V1.1
Software version:	8.1
Accessory unit (AU) information:	
Battery:	DC 3.7V

3.2. Radio Specification Description *

Modulation type:	802.11a/n: OFDM(BPSK, QPSK, 16QAM, 64QAM);
Operation frequency:	802.11a/n(HT20): U-NII Band 1: 5180MHz to 5240MHz; U-NII Band 2A: 5260MHz to 5320MHz; U-NII Band 2C: 5500MHz to 5700MHz; U-NII Band 3: 5745MHz to 5825MHz; 802.11n(HT40): U-NII Band 1: 5190MHz to 5230MHz; U-NII Band 2A: 5270MHz to 5310MHz; U-NII Band 2C: 5510MHz to 5670MHz; U-NII Band 3: 5755MHz to 5795MHz;
Channel number:	802.11a/n(HT20): U-NII Band 1: 4; U-NII Band 2A: 4; U-NII Band 2C: 11; U-NII Band 3: 5; 802.11n(HT40): U-NII Band 1: 2; U-NII Band 2A: 2; U-NII Band 2C: 5; U-NII Band 3: 2;
Channel separation:	802.11a/n(HT20): 20MHz 802.11n(HT40): 40MHz
Antenna type:	FPC

Antenna gain:	-0.45dBi
Device Type:	Client Devices

Note:
*: Since the above information is provided by the applicant relevant results or conclusions of this report are only made for these information , Bangce is not responsible for the authenticity, integrity and results of the information and/or the validity of the conclusion.

3.3. Modification of EUT

No modifications are made to the EUT during all test items.

3.4. Deviation from standards

None

3.5. Testing Site

Laboratory Name	Shenzhen Bangce Testing Technology Co., Ltd.
Laboratory Location	101, building 10, Yunli Intelligent Park, Shutianpu community, Matian Street, Guangming District, Shenzhen，Guangdong, China
Contact information	Tel: 86-755-2319 6848, email: service@cis-cn.net Website: http://www.cis-cn.net/
FCC registration number	736346
FCC designation number	CN1372

4. TEST CONFIGURATION

4.1. Test frequency list

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	5180	5200	5240
40	5190	/	5230

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	5260	5300	5320
40	5270	/	5310

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	5500	5600	5700
40	5510	5590	5670

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	5745	5785	5825
40	5755	/	5795

4.2. Descriptions of test mode

No	Test mode	Description
TM1	802.11a mode	Keep the EUT connect to AC power line and works in continuously transmitting mode with 802.11a modulation type at lowest, middle and highest channel. All data rates has been tested and found the data rate @ 6Mbps is the worst case. Only the data of worst case is recorded in the report.
TM2	802.11n mode	Keep the EUT connect to AC power line and works in continuously transmitting mode with 802.11n modulation type at lowest, middle and highest channel. All bandwidth and data rates has been tested and found the data rate @ MCS0 is the worst case. Only the data of worst case is recorded in the report.
TM3	Normal Operating	Keep the EUT works in normal operating mode and connect to companion device
TM4	Charging mode	Keep the EUT in charging status

4.3. 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:

Item	Equipment name	Trade Name	Model No.
1	Phone	Huawei	NZONE S7
2	Adapter	Guangdong Sangu Technology Co. ltd	SG-0501000AU

4.4. Test sample information

Type	Sample No.
Engineer sample	CISR250107031-S01
Normal sample	CISR250107031-S02

4.5. Environmental conditions

Type	Requirement
Temperature:	15~35°C
Relative Humidity:	25~75%
Air Pressure:	860~1060mbar

4.6. Equipment Used during the Test

Conducted Emission at AC power line

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100853	2025-01-08	2026-01-07
2	Artificial power network	Schwarzbeck	NSLK8127	8127-01096	2025-01-08	2026-01-07
3	8-wire Impedance Stabilization Network	Schwarzbeck	NTFM 8158	8158-00337	2025-01-08	2026-01-07
4	Artificial power network	Schwarzbeck	ENV216	/	2025-01-08	2026-01-07

Band edge emissions (Radiated)
Undesirable emission limits (below 1GHz)
Undesirable emission limits (above 1GHz)
Emission bandwidth and occupied bandwidth
Band edge emissions (Conducted)
Duty Cycle
Power spectral density
Maximum conducted output power

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI7	100853	2025-01-08	2026-01-07
2	Amplifier	Tonscend	TAP9K3G40	AP23A8060270	2025-01-08	2026-01-07
3	Prime amplifier	Tonscend	TAP01018050	AP23A8060280	2025-01-08	2026-01-07
4	9*6*6 anechoic chamber	SKET	9.3*6.3*6	N/A	2024-09-02	2027-09-01
5	Spectrum analyzer	Agilent	N9020A	MY50530263	2025-01-08	2026-01-07
6	Spectrum analyzer	R&S	FSV-40N	102130	2025-01-08	2026-01-07
7	Bilog Antenna	Schwarzbeck	VULB 9163	1463	2023-01-09	2026-01-08
8	Horn Antenna	SCHWARZBECK	BBHA 9120 D	2487	2023-01-09	2026-01-08
9	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	2023-01-09	2026-01-08
10	RF Cable	Tonscend	Cable 1	/	2025-01-08	2026-01-07
11	RF Cable	Tonscend	Cable 2	/	2025-01-08	2026-01-07
12	RF Cable	SKET	Cable 3	/	2025-01-08	2026-01-07
13	L.I.S.N.#1	Schwarzbeck	NSLK8127	/	2025-01-08	2026-01-07
14	L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	2025-01-08	2026-01-07

15	Horn Antenna	SCHWARZBECK	BBHA9170	1130	2023-01-09	2026-01-08
16	Preamplifier	Tonscend	TAP18040048	AP21C806126	2025-01-08	2026-01-07
17	Variable-frequency power source	Pinhong	PH1110	/	2025-01-08	2026-01-07
18	6dB Attenuator	SKET	DC-6G	/	2025-01-08	2026-01-07
19	Antenna tower	SKT	Bk-4AT-BS	AT2021040101-V1	2025-01-08	2026-01-07

5. TEST RESULTS

5.1. Evaluation Results (Evaluation)

5.1.1. Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

5.1.1.1. Test Result

Pass

5.1.1.2. Conclusion:

The EUT antenna is FPC(-0.45dBi), the directional gain of the antenna less than 6dBi. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.Antenna structure please refer to the EUT internal photographs antenna photo.

5.2. Radio Spectrum Matter Test Results (RF)

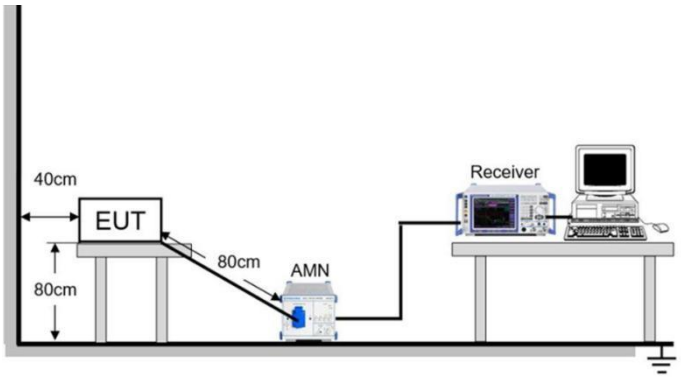
5.2.1. Conducted Emission at AC power line

Test Requirement:	47 CFR Part 15.207(a)		
Test Limit:	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.		
Test Method:	ANSI C63.10-2020 section 6.2		

5.2.1.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.2 °C	Humidity:	55.3 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.1.2. Test Setup Diagram



5.2.1.3. Test Result

Pass

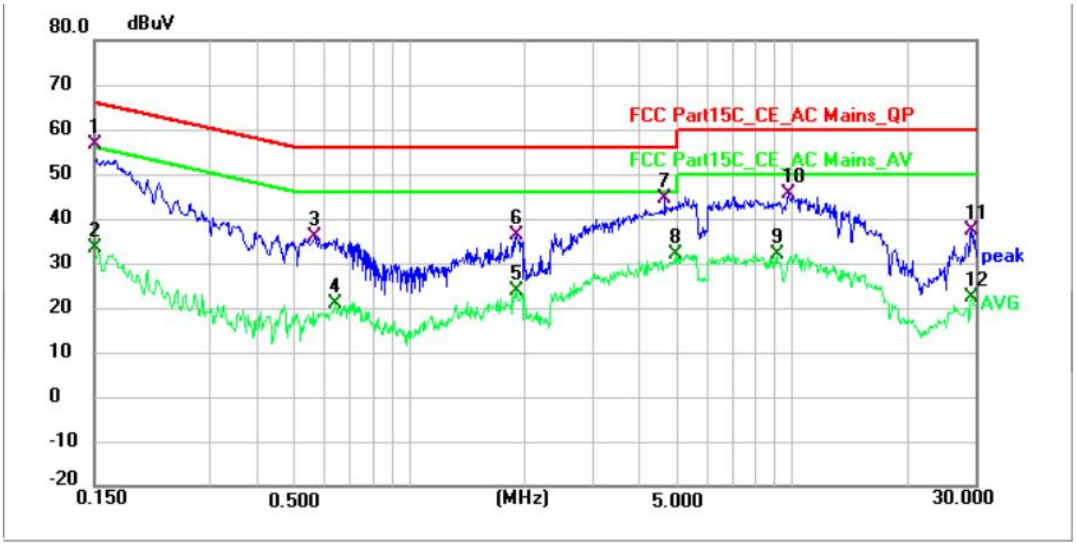
5.2.1.4. Test Data

Note:

Have pre-scan all test mode, found TM6 mode which it was worst case, so only show the worst case's data on this report.

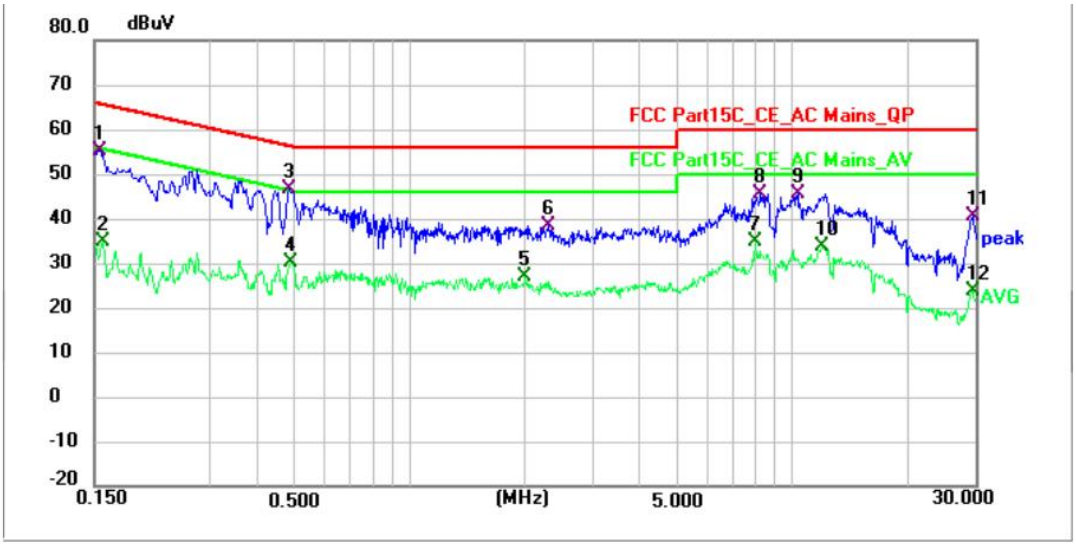
5180MHz to 5240MH:

Mode6 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.150	46.31	10.32	56.63	66.00	-9.37	QP
2	0.150	23.00	10.32	33.32	56.00	-22.68	AVG
3	0.566	25.60	10.39	35.99	56.00	-20.01	QP
4	0.642	10.51	10.40	20.91	46.00	-25.09	AVG
5	1.906	13.10	10.68	23.78	46.00	-22.22	AVG
6	1.918	25.44	10.68	36.12	56.00	-19.88	QP
7	4.662	32.66	11.63	44.29	56.00	-11.71	QP
8	4.926	20.15	11.74	31.89	46.00	-14.11	AVG
9	9.150	18.74	13.36	32.10	50.00	-17.90	AVG
10	9.762	32.03	13.54	45.57	60.00	-14.43	QP
11	29.278	22.72	14.78	37.50	60.00	-22.50	QP
12	29.278	7.70	14.78	22.48	50.00	-27.52	AVG

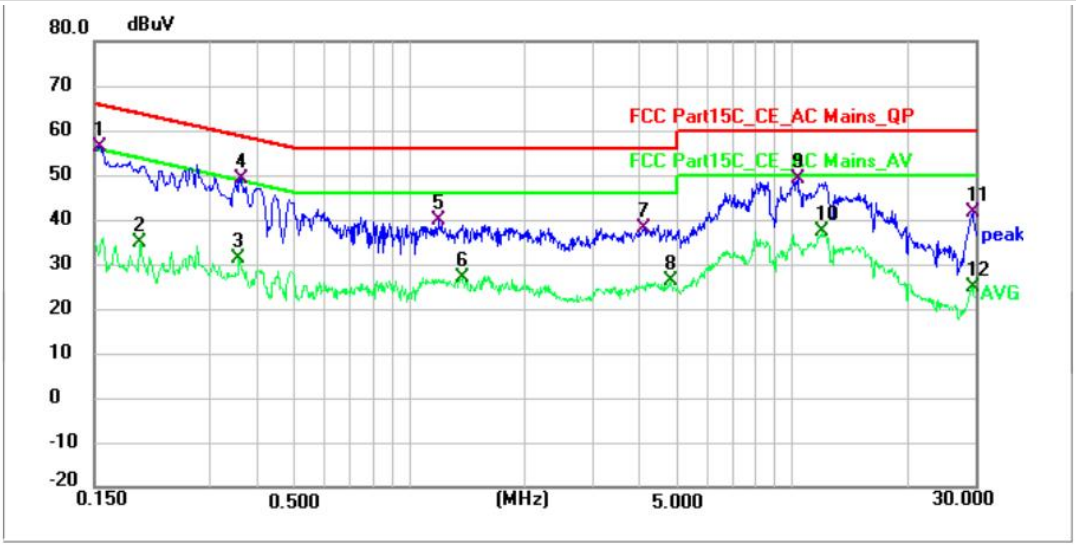
Mode6 / Line: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.156	44.93	10.32	55.25	65.67	-10.42	QP
2	0.158	24.62	10.32	34.94	55.57	-20.63	AVG
3 *	0.484	36.09	10.36	46.45	56.27	-9.82	QP
4	0.490	19.99	10.36	30.35	46.17	-15.82	AVG
5	2.002	16.35	10.71	27.06	46.00	-18.94	AVG
6	2.310	27.73	10.79	38.52	56.00	-17.48	QP
7	8.002	21.83	13.04	34.87	50.00	-15.13	AVG
8	8.278	32.38	13.12	45.50	60.00	-14.50	QP
9	10.310	31.70	13.77	45.47	60.00	-14.53	QP
10	11.874	19.30	14.58	33.88	50.00	-16.12	AVG
11	29.626	25.81	14.74	40.55	60.00	-19.45	QP
12	29.626	9.10	14.74	23.84	50.00	-26.16	AVG

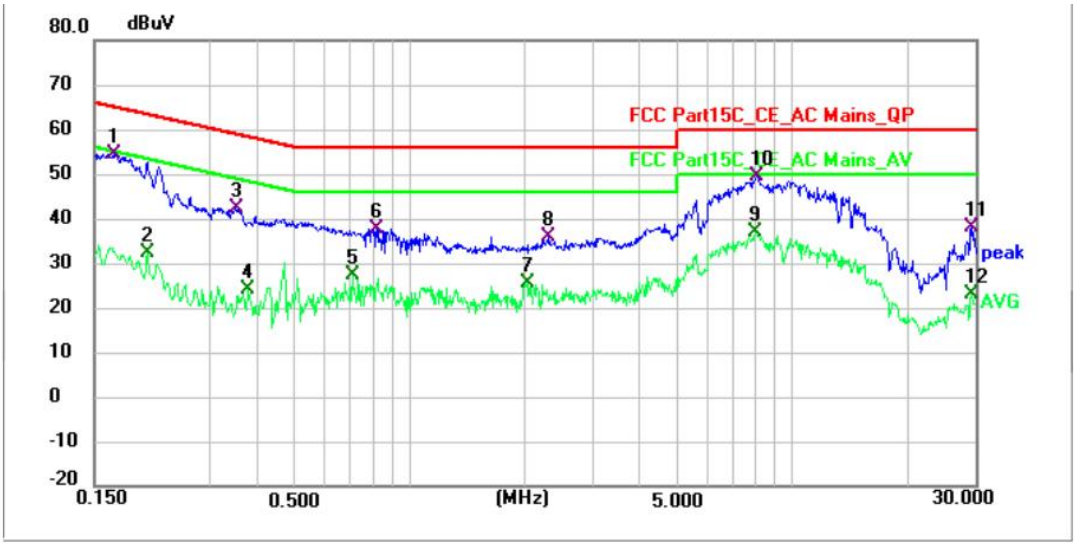
5260MHz to 5320MHz:

Mode6 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.156	45.93	10.32	56.25	65.67	-9.42	QP
2	0.198	24.50	10.31	34.81	53.69	-18.88	AVG
3	0.357	20.83	10.32	31.15	48.80	-17.65	AVG
4	0.362	38.73	10.32	49.05	58.68	-9.63	QP
5	1.190	29.25	10.48	39.73	56.00	-16.27	QP
6	1.370	16.41	10.54	26.95	46.00	-19.05	AVG
7	4.094	26.66	11.42	38.08	56.00	-17.92	QP
8	4.834	14.47	11.71	26.18	46.00	-19.82	AVG
9	10.310	35.20	13.77	48.97	60.00	-11.03	QP
10	11.874	22.80	14.58	37.38	50.00	-12.62	AVG
11	29.626	26.81	14.74	41.55	60.00	-18.45	QP
12	29.626	10.10	14.74	24.84	50.00	-25.16	AVG

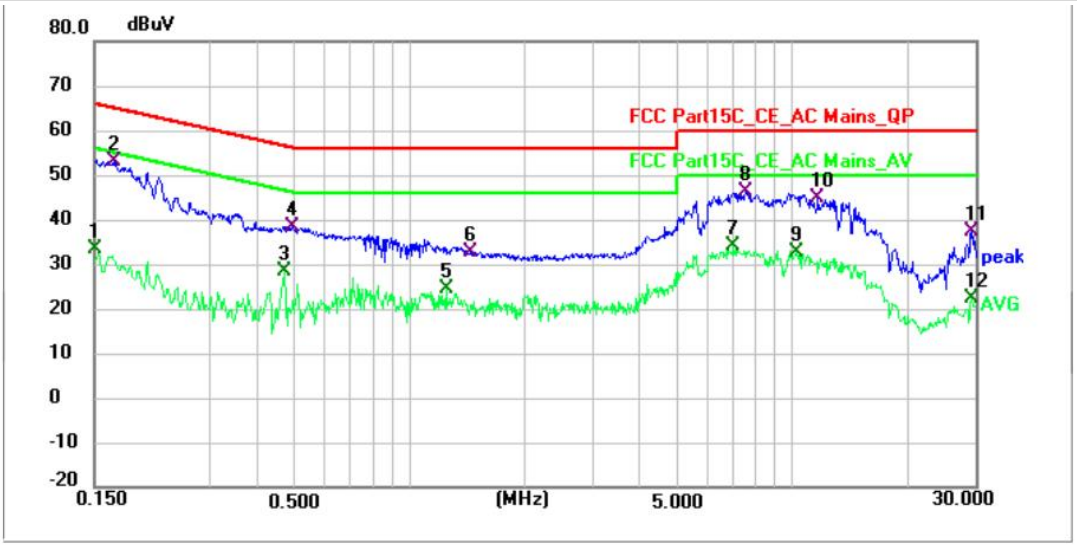
Mode6 / Line: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.169	44.21	10.32	54.53	65.01	-10.48	QP
2	0.206	22.17	10.32	32.49	53.37	-20.88	AVG
3	0.354	31.83	10.32	42.15	58.87	-16.72	QP
4	0.378	13.96	10.32	24.28	48.32	-24.04	AVG
5	0.710	17.04	10.41	27.45	46.00	-18.55	AVG
6	0.826	27.37	10.42	37.79	56.00	-18.21	QP
7	2.030	14.77	10.72	25.49	46.00	-20.51	AVG
8	2.318	25.26	10.79	36.05	56.00	-19.95	QP
9	8.002	23.94	13.04	36.98	50.00	-13.02	AVG
10 *	8.090	36.46	13.07	49.53	60.00	-10.47	QP
11	29.278	23.22	14.78	38.00	60.00	-22.00	QP
12	29.278	8.20	14.78	22.98	50.00	-27.02	AVG

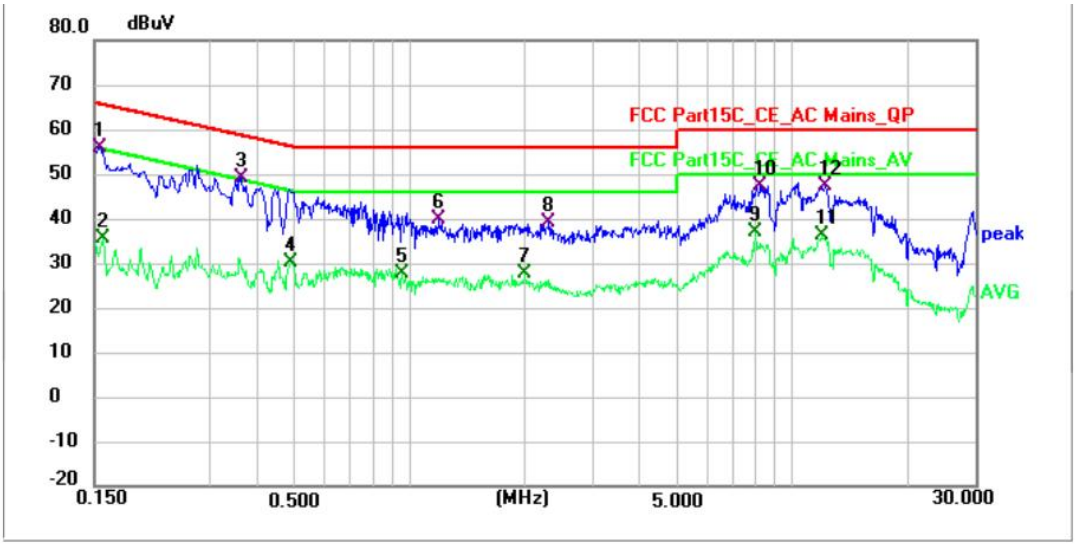
5510MHz to 5670MHz:

Mode6 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.150	23.00	10.32	33.32	56.00	-22.68	AVG
2 *	0.169	42.71	10.32	53.03	65.01	-11.98	QP
3	0.470	18.21	10.35	28.56	46.51	-17.95	AVG
4	0.491	27.92	10.37	38.29	56.15	-17.86	QP
5	1.246	14.05	10.49	24.54	46.00	-21.46	AVG
6	1.442	22.26	10.55	32.81	56.00	-23.19	QP
7	6.990	21.18	12.75	33.93	50.00	-16.07	AVG
8	7.586	33.17	12.91	46.08	60.00	-13.92	QP
9	10.238	18.78	13.73	32.51	50.00	-17.49	AVG
10	11.670	30.31	14.48	44.79	60.00	-15.21	QP
11	29.278	22.72	14.78	37.50	60.00	-22.50	QP
12	29.278	7.70	14.78	22.48	50.00	-27.52	AVG

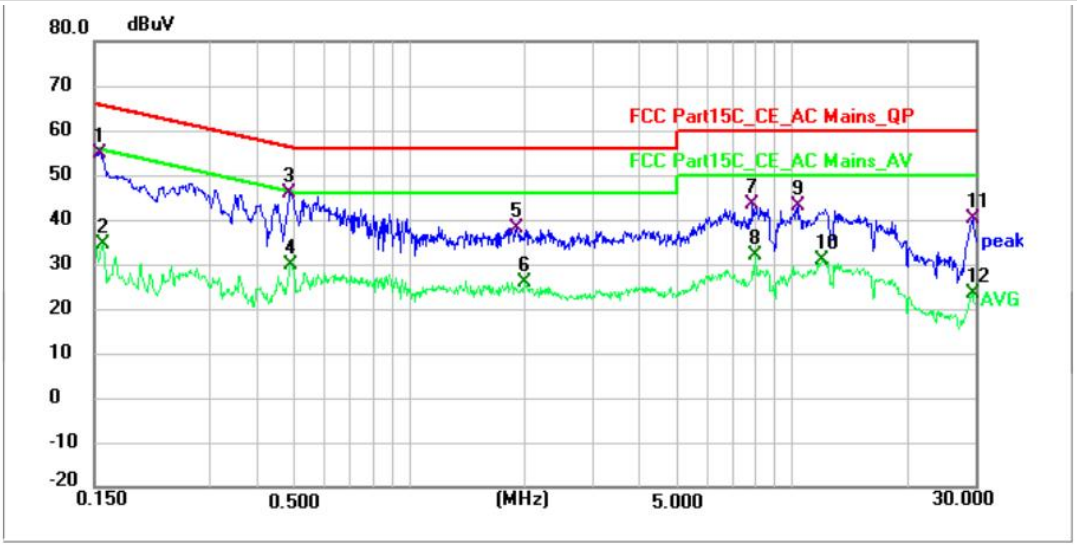
Mode6 / Line: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.156	45.43	10.32	55.75	65.67	-9.92	QP
2	0.158	25.12	10.32	35.44	55.57	-20.13	AVG
3 *	0.362	38.73	10.32	49.05	58.68	-9.63	QP
4	0.490	19.99	10.36	30.35	46.17	-15.82	AVG
5	0.962	17.32	10.43	27.75	46.00	-18.25	AVG
6	1.190	29.25	10.48	39.73	56.00	-16.27	QP
7	2.002	16.85	10.71	27.56	46.00	-18.44	AVG
8	2.310	28.23	10.79	39.02	56.00	-16.98	QP
9	8.002	23.83	13.04	36.87	50.00	-13.13	AVG
10	8.278	34.38	13.12	47.50	60.00	-12.50	QP
11	11.874	21.80	14.58	36.38	50.00	-13.62	AVG
12	12.218	32.69	14.76	47.45	60.00	-12.55	QP

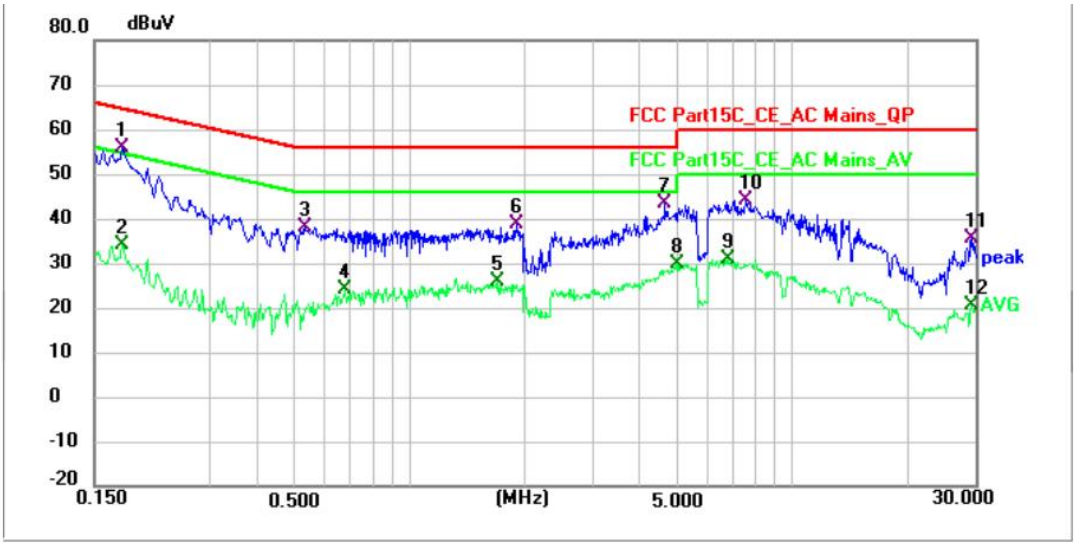
5755MHz to 5795MHz:

Mode6 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.156	44.43	10.32	54.75	65.67	-10.92	QP
2	0.158	24.12	10.32	34.44	55.57	-21.13	AVG
3 *	0.486	35.48	10.36	45.84	56.24	-10.40	QP
4	0.490	19.49	10.36	29.85	46.17	-16.32	AVG
5	1.910	27.43	10.68	38.11	56.00	-17.89	QP
6	2.002	15.35	10.71	26.06	46.00	-19.94	AVG
7	7.874	30.37	13.00	43.37	60.00	-16.63	QP
8	8.002	18.83	13.04	31.87	50.00	-18.13	AVG
9	10.310	29.20	13.77	42.97	60.00	-17.03	QP
10	11.874	16.30	14.58	30.88	50.00	-19.12	AVG
11	29.626	25.31	14.74	40.05	60.00	-19.95	QP
12	29.626	8.60	14.74	23.34	50.00	-26.66	AVG

Mode6 / Line: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.178	45.43	10.31	55.74	64.58	-8.84	QP
2	0.178	23.78	10.31	34.09	54.58	-20.49	AVG
3	0.532	27.66	10.38	38.04	56.00	-17.96	QP
4	0.678	13.64	10.40	24.04	46.00	-21.96	AVG
5	1.694	15.36	10.62	25.98	46.00	-20.02	AVG
6	1.918	27.94	10.68	38.62	56.00	-17.38	QP
7	4.662	31.66	11.63	43.29	56.00	-12.71	QP
8	4.990	17.92	11.77	29.69	46.00	-16.31	AVG
9	6.802	18.33	12.65	30.98	50.00	-19.02	AVG
10	7.586	31.17	12.91	44.08	60.00	-15.92	QP
11	29.278	20.72	14.78	35.50	60.00	-24.50	QP
12	29.278	5.70	14.78	20.48	50.00	-29.52	AVG

5.2.2. Duty Cycle

Test Requirement:	All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.
Test Limit:	No limits, only for report use.
Test Method:	ANSI C63.10-2020 section 12.2 (b)
Procedure:	i) Set the center frequency of the instrument to the center frequency of the transmission. ii) Set RBW >= EBW if possible; otherwise, set RBW to the largest available value. iii) Set VBW >= RBW. iv) Set detector = peak. v) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in item a1) of 12.2, and the number of sweep points across duration T exceeds 100.

5.2.2.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.1 °C	Humidity:	55.8 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

5.2.2.2. Test Setup Diagram

5.2.2.3. Test Result

Pass

5.2.2.4. Test Data

Please Refer to Appendix for Details.

5.2.3. Emission bandwidth and occupied bandwidth

Test Requirement:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. U-NII 3, U-NII 4: 47 CFR Part 15.407(e)
Test Limit:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. U-NII 3, U-NII 4: Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Test Method:	ANSI C63.10-2020, section 6.9 & 12.5 KDB 789033 D02, Clause C.2
Procedure:	Emission bandwidth: a) Set RBW = approximately 1% of the emission bandwidth. b) Set the VBW > RBW. c) Detector = peak. d) Trace mode = max hold. e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%. Occupied bandwidth: a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Step a) through step c) might require iteration to adjust within the specified range. e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used. f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth. g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies. h) The occupied bandwidth shall be reported by providing plot(s) of the measuring

	instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s). 6 dB emission bandwidth: a) Set RBW = 100 kHz. b) Set the video bandwidth (VBW) ≥ 3 >= RBW. c) Detector = Peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.2.3.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.1 °C	Humidity:	55.8 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

5.2.3.2. Test Setup Diagram

5.2.3.3. Test Result

Pass

5.2.3.4. Test Data

Please Refer to Appendix for Details.

5.2.4. Maximum conducted output power

Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(2) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm). For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point

	operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
Test Method:	ANSI C63.10-2020, section 12.4
Procedure:	Refer to ANSI C63.10-2020 section 12.4

5.2.4.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.1 °C	Humidity:	55.8 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

5.2.4.2. Test Setup Diagram

5.2.4.3. Test Result

Pass

5.2.4.4. Test Data

Please Refer to Appendix for Details.

5.2.5. Power spectral density

Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(2) 47 CFR Part 15.407(a)(3)(i)
Test Limit:	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725-5.850 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Method:	ANSI C63.10-2020, section 12.6
Procedure:	Refer to ANSI C63.10-2020, section 12.6

5.2.5.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.1 °C	Humidity:	55.8 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

5.2.5.2. Test Setup Diagram

5.2.5.3. Test Result

Pass

5.2.5.4. Test Data

Please Refer to Appendix for Details.

5.2.6. Band edge emissions (Conducted)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(3) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in §

15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method: ANSI C63.10-2020, section 12.7.4, 12.7.6, 12.7.7

Procedure:

Above 1GHz:
a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not

	exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

5.2.6.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.1 °C	Humidity:	55.8 %	Atmospheric Pressure:	103 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

5.2.6.2. Test Setup Diagram

5.2.6.3. Test Result

Pass

5.2.6.4. Test Data

Please Refer to Appendix for Details.

5.2.7. Band edge emissions (Radiated)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(3) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in §

15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method: ANSI C63.10-2020, section 12.7.4, 12.7.6, 12.7.7

Procedure:

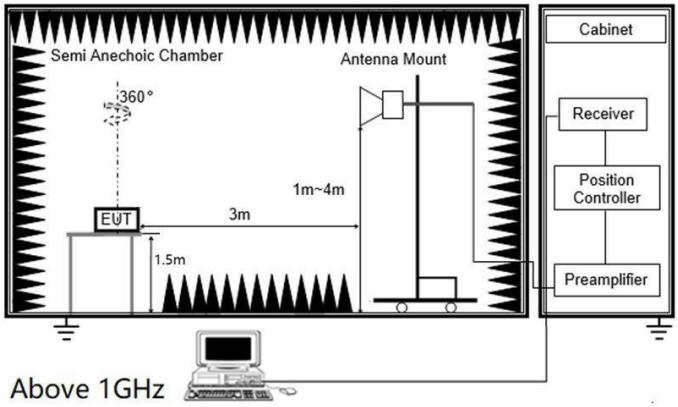
Above 1GHz:
a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not

	exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

5.2.7.1. E.U.T. Operation

Operating Environment:					
Temperature:	23 °C	Humidity:	55.2 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.7.2. Test Setup Diagram



5.2.7.3. Test Result

Pass

5.2.7.4. Test Data

Note:

1) Level= Reading + Factor; Factor =Antenna Factor+ Cable Loss- Preamp Factor
2) Margin = Limit - Level
3) Average measurement was not performed if peak level is lower than average limit
4) The other emission levels were very low against the limit.
5) Have pre-scan all test channel, found 11a mode which it was worst case, so only show the worst case’s data on this report.

Test channel:CH36										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5150.00	70.18	28.62	4.08	38.62	-5.92	64.26	74	9.74	Peak	Horizontal
5150.00	51.29	28.62	4.08	38.62	-5.92	45.37	54	8.63	Average	Horizontal
5150.00	69.23	28.62	4.08	38.62	-5.92	63.31	74	10.69	Peak	Vertical
5150.00	50.43	28.62	4.08	38.62	-5.92	44.51	54	9.49	Average	Vertical

Test channel:CH48										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5250.00	70.12	29.45	3.91	40.17	-6.81	63.31	74	10.69	Peak	Horizontal
5250.00	49.41	29.45	3.91	40.17	-6.81	42.60	54	11.40	Average	Horizontal
5250.00	68.28	29.45	3.91	40.17	-6.81	61.47	74	12.53	Peak	Vertical
5250.00	50.42	29.45	3.91	40.17	-6.81	43.61	54	10.39	Average	Vertical

Test channel:CH52										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5260.00	69.95	28.62	4.08	38.62	-5.92	64.03	74	9.97	Peak	Horizontal
5260.00	51.32	28.62	4.08	38.62	-5.92	45.40	54	8.60	Average	Horizontal
5260.00	68.83	28.62	4.08	38.62	-5.92	62.91	74	11.09	Peak	Vertical
5260.00	50.60	28.62	4.08	38.62	-5.92	44.68	54	9.32	Average	Vertical

Test channel:CH64										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5320.00	69.31	29.45	3.91	40.17	-6.81	62.50	74	11.50	Peak	Horizontal
5320.00	49.72	29.45	3.91	40.17	-6.81	42.91	54	11.09	Average	Horizontal
5320.00	67.85	29.45	3.91	40.17	-6.81	61.04	74	12.96	Peak	Vertical
5320.00	50.66	29.45	3.91	40.17	-6.81	43.85	54	10.15	Average	Vertical

Test channel:CH100										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5500.00	69.82	28.62	4.08	38.62	-5.92	63.90	74	10.10	Peak	Horizontal
5500.00	51.53	28.62	4.08	38.62	-5.92	45.61	54	8.39	Average	Horizontal
5500.00	69.50	28.62	4.08	38.62	-5.92	63.58	74	10.42	Peak	Vertical
5500.00	49.69	28.62	4.08	38.62	-5.92	43.77	54	10.23	Average	Vertical

Test channel:CH140										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5700.00	69.70	29.45	3.91	40.17	-6.81	62.89	74	11.11	Peak	Horizontal
5700.00	49.90	29.45	3.91	40.17	-6.81	43.09	54	10.91	Average	Horizontal
5700.00	68.40	29.45	3.91	40.17	-6.81	61.59	74	12.41	Peak	Vertical
5700.00	50.81	29.45	3.91	40.17	-6.81	44.00	54	10.00	Average	Vertical

Test channel:CH149										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5725.00	70.40	28.62	4.08	38.62	-5.92	64.48	74	9.52	Peak	Horizontal
5725.00	51.49	28.62	4.08	38.62	-5.92	45.57	54	8.43	Average	Horizontal
5725.00	68.55	28.62	4.08	38.62	-5.92	62.63	74	11.37	Peak	Vertical
5725.00	50.19	28.62	4.08	38.62	-5.92	44.27	54	9.73	Average	Vertical

Test channel:CH163										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
5850.00	69.43	29.45	3.91	40.17	-6.81	62.62	74	11.38	Peak	Horizontal
5850.00	49.76	29.45	3.91	40.17	-6.81	42.95	54	11.05	Average	Horizontal
5850.00	68.33	29.45	3.91	40.17	-6.81	61.52	74	12.48	Peak	Vertical
5850.00	50.90	29.45	3.91	40.17	-6.81	44.09	54	9.91	Average	Vertical

5.2.8. Undesirable emission limits (below 1GHz)

<table>
<tr><td>Test Requirement:</td><td>47 CFR Part 15.407(b)(9)</td></tr>
<tr><td>Test Limit:</td><td>Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.

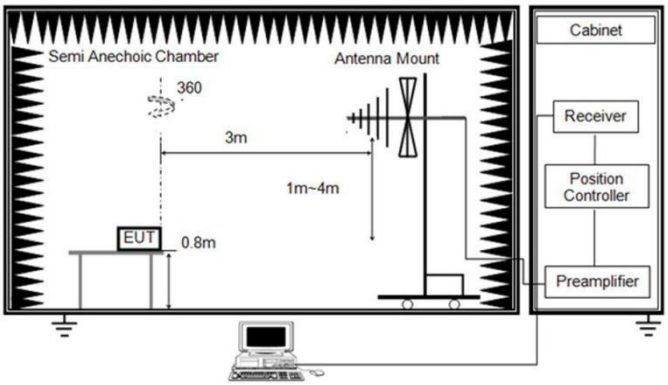
Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:
<table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2020, section 12.7.4, 12.7.5</td></tr>
<tr><td>Procedure:</td><td>Below 1GHz:
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when</td></tr>
</table>

	testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

5.2.8.1. E.U.T. Operation

Operating Environment:					
Temperature:	23 °C	Humidity:	55.2 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.8.2. Test Setup Diagram



Below 1 GHz and above 30 MHz

5.2.8.3. Test Result

Pass

5.2.8.4. Test Data

Note:

1) Level= Reading + Factor/Transd; Factor/Transd =Antenna Factor+ Cable Loss- Preamp Factor
2) Margin = Limit – Level
3) Average measurement was not performed if peak level is lower than average limit(54 dBuV/m) for above 1GHz.
4) The other emission levels were very low against the limit.
5) This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.

For 9 kHz ~ 30 MHz

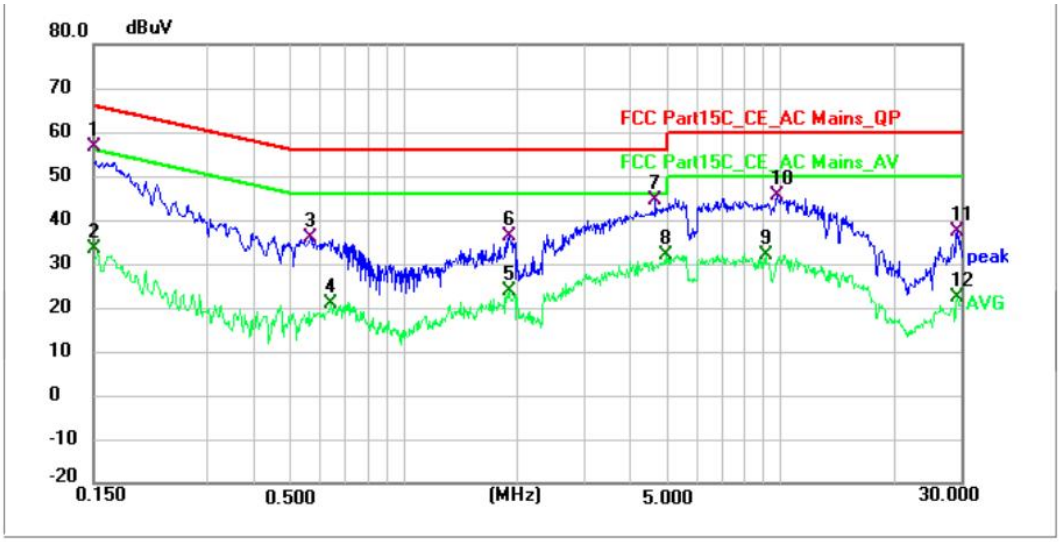
The EUT was pre-scanned this frequency band, found the radiated level 20dB lower than the limit, so don't show data on this report.

For 30 MHz ~ 1000 MHz

Have pre-scan all test channel, found 11a mode which it was worst case, so only show the worst case's data on this report.

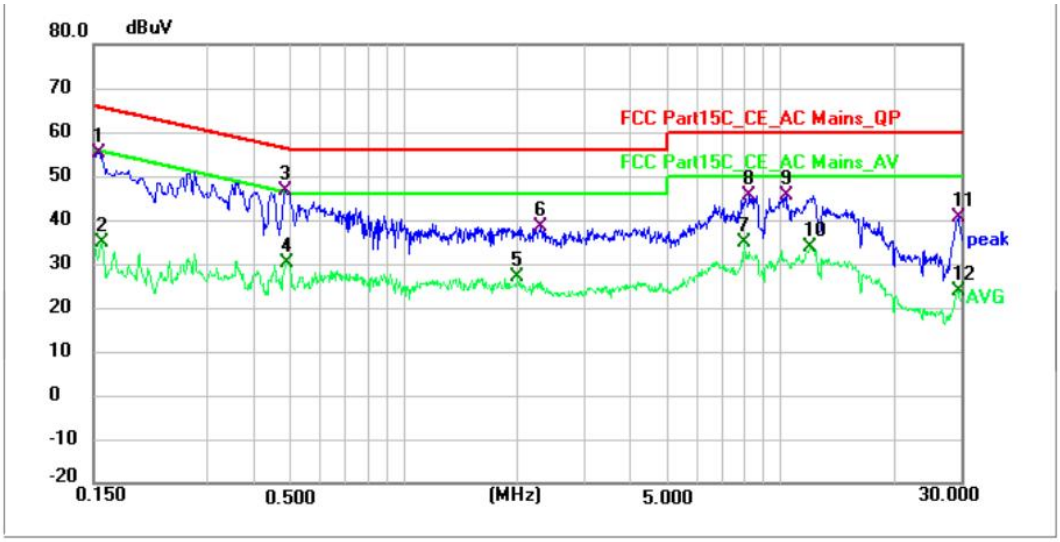
5180MHz to 5240MH:

Mode1 / Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.150	46.31	10.32	56.63	66.00	-9.37	QP
2	0.150	23.00	10.32	33.32	56.00	-22.68	AVG
3	0.566	25.60	10.39	35.99	56.00	-20.01	QP
4	0.642	10.51	10.40	20.91	46.00	-25.09	AVG
5	1.906	13.10	10.68	23.78	46.00	-22.22	AVG
6	1.918	25.44	10.68	36.12	56.00	-19.88	QP
7	4.662	32.66	11.63	44.29	56.00	-11.71	QP
8	4.926	20.15	11.74	31.89	46.00	-14.11	AVG

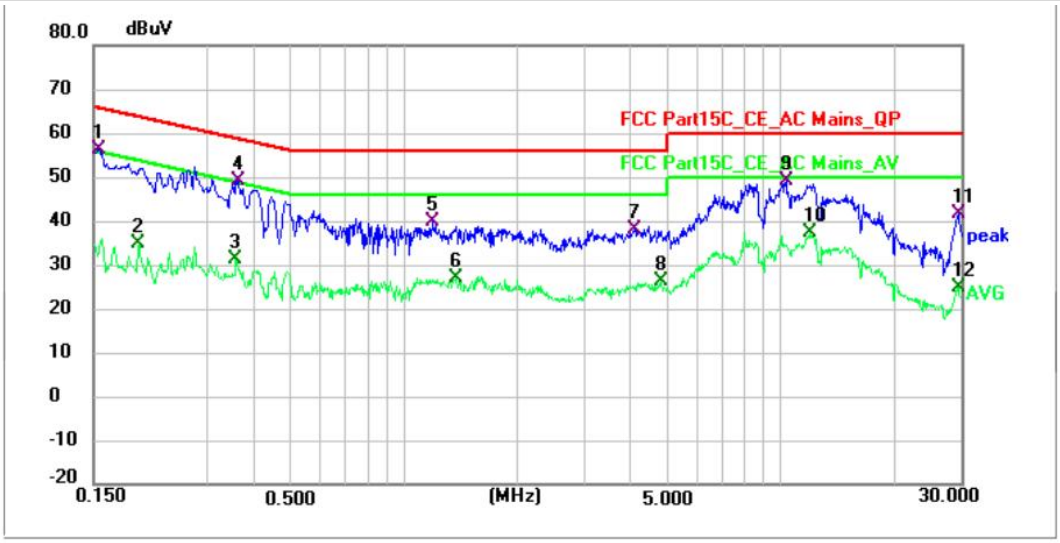
Mode1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.156	44.93	10.32	55.25	65.67	-10.42	QP
2	0.158	24.62	10.32	34.94	55.57	-20.63	AVG
3 *	0.484	36.09	10.36	46.45	56.27	-9.82	QP
4	0.490	19.99	10.36	30.35	46.17	-15.82	AVG
5	2.002	16.35	10.71	27.06	46.00	-18.94	AVG
6	2.310	27.73	10.79	38.52	56.00	-17.48	QP
7	8.002	21.83	13.04	34.87	50.00	-15.13	AVG
8	8.278	32.38	13.12	45.50	60.00	-14.50	QP

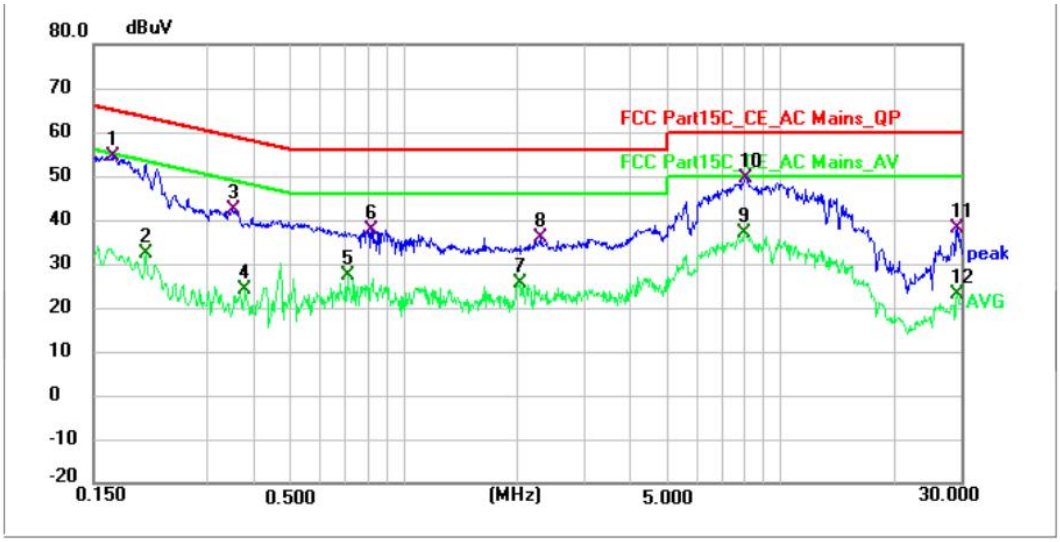
5260MHz to 5320MHz:

Mode1 / Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.156	45.93	10.32	56.25	65.67	-9.42	QP
2	0.198	24.50	10.31	34.81	53.69	-18.88	AVG
3	0.357	20.83	10.32	31.15	48.80	-17.65	AVG
4	0.362	38.73	10.32	49.05	58.68	-9.63	QP
5	1.190	29.25	10.48	39.73	56.00	-16.27	QP
6	1.370	16.41	10.54	26.95	46.00	-19.05	AVG
7	4.094	26.66	11.42	38.08	56.00	-17.92	QP
8	4.834	14.47	11.71	26.18	46.00	-19.82	AVG

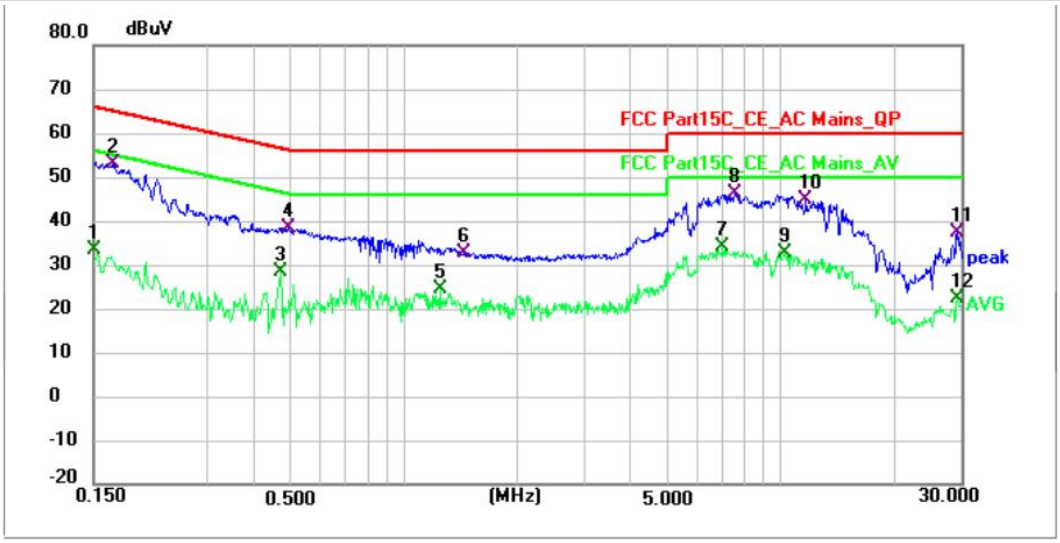
Mode1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.169	44.21	10.32	54.53	65.01	-10.48	QP
2	0.206	22.17	10.32	32.49	53.37	-20.88	AVG
3	0.354	31.83	10.32	42.15	58.87	-16.72	QP
4	0.378	13.96	10.32	24.28	48.32	-24.04	AVG
5	0.710	17.04	10.41	27.45	46.00	-18.55	AVG
6	0.826	27.37	10.42	37.79	56.00	-18.21	QP
7	2.030	14.77	10.72	25.49	46.00	-20.51	AVG
8	2.318	25.26	10.79	36.05	56.00	-19.95	QP

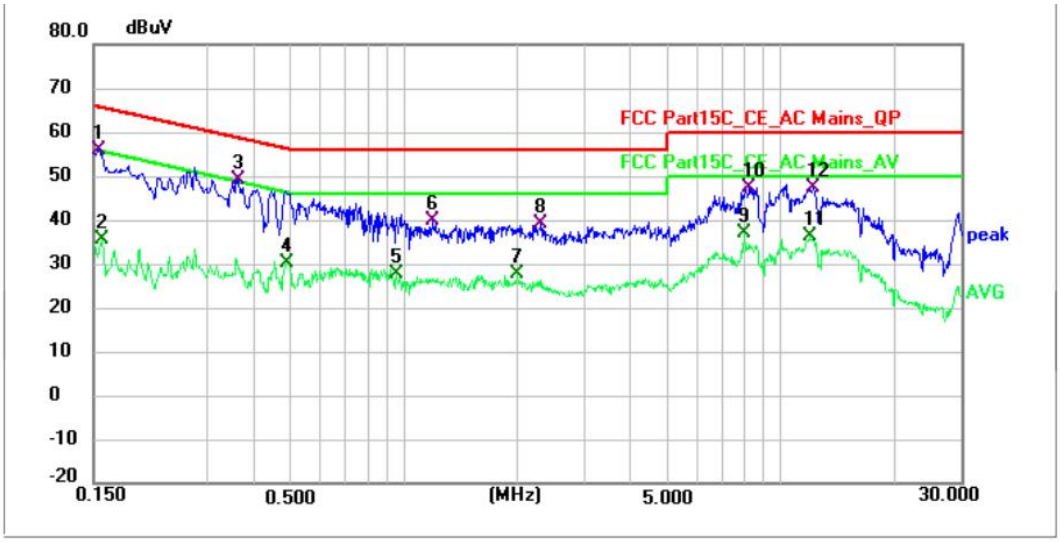
5510MHz to 5670MHz:

Mode1 / Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.150	23.00	10.32	33.32	56.00	-22.68	AVG
2 *	0.169	42.71	10.32	53.03	65.01	-11.98	QP
3	0.470	18.21	10.35	28.56	46.51	-17.95	AVG
4	0.491	27.92	10.37	38.29	56.15	-17.86	QP
5	1.246	14.05	10.49	24.54	46.00	-21.46	AVG
6	1.442	22.26	10.55	32.81	56.00	-23.19	QP
7	6.990	21.18	12.75	33.93	50.00	-16.07	AVG
8	7.586	33.17	12.91	46.08	60.00	-13.92	QP

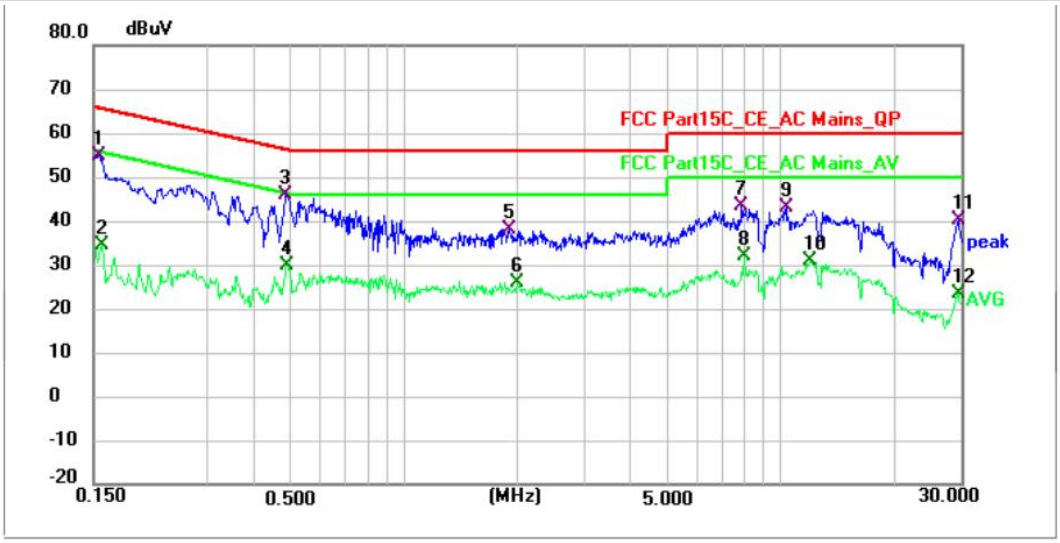
Mode1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.156	45.43	10.32	55.75	65.67	-9.92	QP
2	0.158	25.12	10.32	35.44	55.57	-20.13	AVG
3 *	0.362	38.73	10.32	49.05	58.68	-9.63	QP
4	0.490	19.99	10.36	30.35	46.17	-15.82	AVG
5	0.962	17.32	10.43	27.75	46.00	-18.25	AVG
6	1.190	29.25	10.48	39.73	56.00	-16.27	QP
7	2.002	16.85	10.71	27.56	46.00	-18.44	AVG
8	2.310	28.23	10.79	39.02	56.00	-16.98	QP

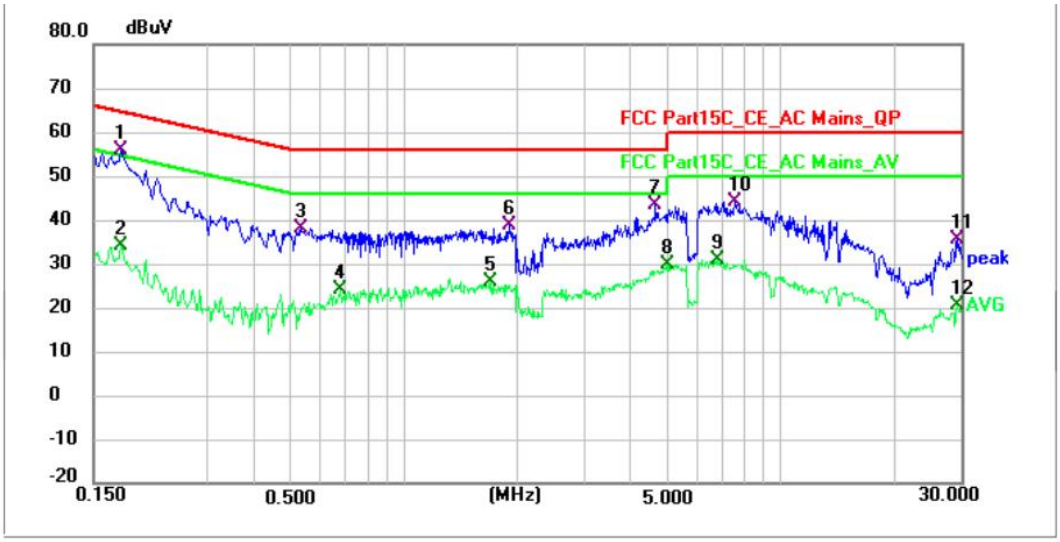
5755MHz to 5795MHz:

Mode1 / Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.156	44.43	10.32	54.75	65.67	-10.92	QP
2	0.158	24.12	10.32	34.44	55.57	-21.13	AVG
3 *	0.486	35.48	10.36	45.84	56.24	-10.40	QP
4	0.490	19.49	10.36	29.85	46.17	-16.32	AVG
5	1.910	27.43	10.68	38.11	56.00	-17.89	QP
6	2.002	15.35	10.71	26.06	46.00	-19.94	AVG
7	7.874	30.37	13.00	43.37	60.00	-16.63	QP
8	8.002	18.83	13.04	31.87	50.00	-18.13	AVG

Mode1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.178	45.43	10.31	55.74	64.58	-8.84	QP
2	0.178	23.78	10.31	34.09	54.58	-20.49	AVG
3	0.532	27.66	10.38	38.04	56.00	-17.96	QP
4	0.678	13.64	10.40	24.04	46.00	-21.96	AVG
5	1.694	15.36	10.62	25.98	46.00	-20.02	AVG
6	1.918	27.94	10.68	38.62	56.00	-17.38	QP
7	4.662	31.66	11.63	43.29	56.00	-12.71	QP
8	4.990	17.92	11.77	29.69	46.00	-16.31	AVG

5.2.9. Undesirable emission limits (above 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(3) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above

1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method: ANSI C63.10-2020, section 12.7.4, 12.7.6, 12.7.7

Procedure:

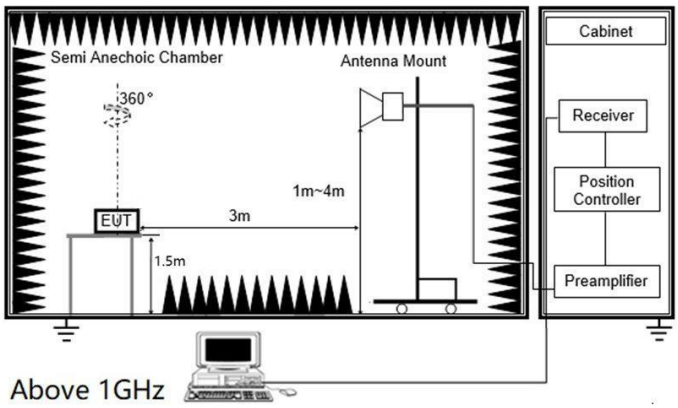
Above 1GHz:
a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

	3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

5.2.9.1. E.U.T. Operation

Operating Environment:					
Temperature:	23 °C	Humidity:	55.2 %	Atmospheric Pressure:	102 kPa
Pre test mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

5.2.9.2. Test Setup Diagram



5.2.9.3. Test Result

Pass

5.2.9.4. Test Data

For 1 GHz ~ 40 GHz

Have pre-scan all test channel, found 11a mode which it was worst case, so only show the worst case's data on this report.

Test channel:CH36										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
15.54	69.04	31.33	4.23	38.62	-3.06	65.98	74	8.02	Peak	Horizontal
15.54	49.71	31.33	4.23	38.62	-3.06	46.65	54	7.35	Average	Horizontal
15.54	65.22	31.33	4.23	38.62	-3.06	62.16	74	11.84	Peak	Vertical
15.54	51.24	31.33	4.23	38.62	-3.06	48.18	54	5.82	Average	Vertical

Test channel:CH40										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
15.60	70.08	30.26	4.09	38.29	-3.94	66.14	74	7.86	Peak	Horizontal
15.60	50.78	30.26	4.09	38.29	-3.94	46.84	54	7.16	Average	Horizontal
15.60	67.07	30.26	4.09	38.29	-3.94	63.13	74	10.87	Peak	Vertical
15.60	50.71	30.26	4.09	38.29	-3.94	46.77	54	7.23	Average	Vertical

Test channel:CH48										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
15.72	64.78	31.97	4.11	38.47	-2.39	62.39	74	11.61	Peak	Horizontal
15.72	50.55	31.97	4.11	38.47	-2.39	48.16	54	5.84	Average	Horizontal
15.72	67.16	31.97	4.11	38.47	-2.39	64.77	74	9.23	Peak	Vertical
15.72	51.29	31.97	4.11	38.47	-2.39	48.90	54	5.10	Average	Vertical

Test channel:CH52										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
10.52	69.06	31.33	4.23	38.62	-3.06	66.00	74	8.00	Peak	Horizontal
10.52	49.39	31.33	4.23	38.62	-3.06	46.33	54	7.67	Average	Horizontal
10.52	64.63	31.33	4.23	38.62	-3.06	61.57	74	12.43	Peak	Vertical
10.52	50.79	31.33	4.23	38.62	-3.06	47.73	54	6.27	Average	Vertical

Test channel:CH60										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
10.60	70.19	30.26	4.09	38.29	-3.94	66.25	74	7.75	Peak	Horizontal
10.60	51.02	30.26	4.09	38.29	-3.94	47.08	54	6.92	Average	Horizontal
10.60	67.66	30.26	4.09	38.29	-3.94	63.72	74	10.28	Peak	Vertical
10.60	50.65	30.26	4.09	38.29	-3.94	46.71	54	7.29	Average	Vertical

Test channel:CH64										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
10.64	64.74	31.97	4.11	38.47	-2.39	62.35	74	11.65	Peak	Horizontal
10.64	49.99	31.97	4.11	38.47	-2.39	47.60	54	6.40	Average	Horizontal
10.64	67.85	31.97	4.11	38.47	-2.39	65.46	74	8.54	Peak	Vertical
10.64	51.50	31.97	4.11	38.47	-2.39	49.11	54	4.89	Average	Vertical

Test channel:CH100										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
11.00	68.99	31.33	4.23	38.62	-3.06	65.93	74	8.07	Peak	Horizontal
11.00	49.68	31.33	4.23	38.62	-3.06	46.62	54	7.38	Average	Horizontal
11.00	64.76	31.33	4.23	38.62	-3.06	61.70	74	12.30	Peak	Vertical
11.00	51.24	31.33	4.23	38.62	-3.06	48.18	54	5.82	Average	Vertical

Test channel:CH116										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
11.16	70.89	30.26	4.09	38.29	-3.94	66.95	74	7.05	Peak	Horizontal
11.16	50.41	30.26	4.09	38.29	-3.94	46.47	54	7.53	Average	Horizontal
11.16	66.91	30.26	4.09	38.29	-3.94	62.97	74	11.03	Peak	Vertical
11.16	50.63	30.26	4.09	38.29	-3.94	46.69	54	7.31	Average	Vertical

Test channel:CH140										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
11.40	64.30	31.97	4.11	38.47	-2.39	61.91	74	12.09	Peak	Horizontal
11.40	50.26	31.97	4.11	38.47	-2.39	47.87	54	6.13	Average	Horizontal
11.40	67.69	31.97	4.11	38.47	-2.39	65.30	74	8.70	Peak	Vertical
11.40	51.14	31.97	4.11	38.47	-2.39	48.75	54	5.25	Average	Vertical

Test channel:CH149										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
11.49	68.87	31.33	4.23	38.62	-3.06	65.81	74	8.19	Peak	Horizontal
11.49	49.56	31.33	4.23	38.62	-3.06	46.50	54	7.50	Average	Horizontal
11.49	65.15	31.33	4.23	38.62	-3.06	62.09	74	11.91	Peak	Vertical
11.49	50.73	31.33	4.23	38.62	-3.06	47.67	54	6.33	Average	Vertical

Test channel:CH157										
Freq. (GHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
11.57	70.47	30.26	4.09	38.29	-3.94	66.53	74	7.47	Peak	Horizontal
11.57	50.33	30.26	4.09	38.29	-3.94	46.39	54	7.61	Average	Horizontal
11.57	66.84	30.26	4.09	38.29	-3.94	62.90	74	11.10	Peak	Vertical
11.57	50.68	30.26	4.09	38.29	-3.94	46.74	54	7.26	Average	Vertical

Test channel:CH163										
Freq. (MHz)	Reading (dBuv)	Ant. Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)	Level (dBuv)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
11.65	64.46	31.97	4.11	38.47	-2.39	62.07	74	11.93	Peak	Horizontal
11.65	49.83	31.97	4.11	38.47	-2.39	47.44	54	6.56	Average	Horizontal
11.65	67.89	31.97	4.11	38.47	-2.39	65.50	74	8.50	Peak	Vertical
11.65	51.59	31.97	4.11	38.47	-2.39	49.20	54	4.80	Average	Vertical

Notes:

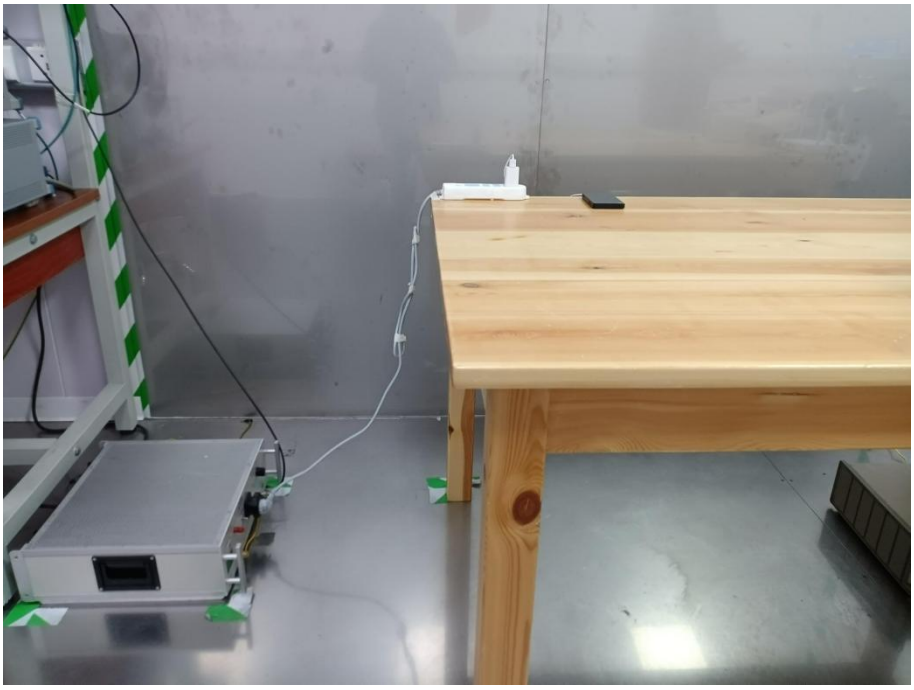
1). Measuring frequencies from 9 KHz ~ 40GHz, emissions are attenuated more than 20dB below the permissible limits generated frequency to 30MHz.

2). Radiated emissions measured in frequency range from 9 KHz ~ 40GHz were made with an instrument using Peak detector mode.

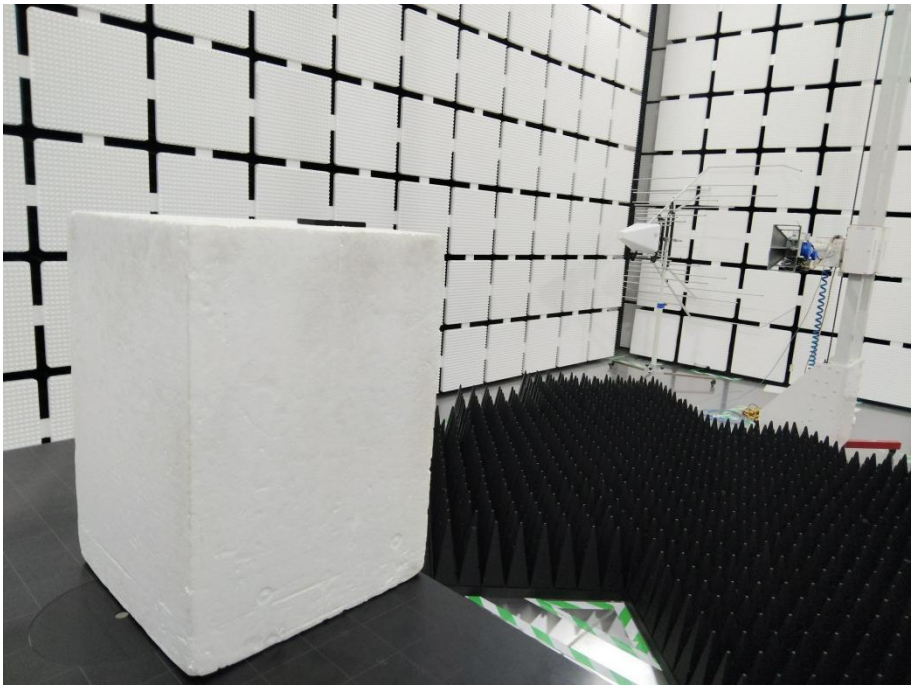
3). 18~40GHz at least have 20dB margin. No recording in the test report.

6. TEST SETUP PHOTOS

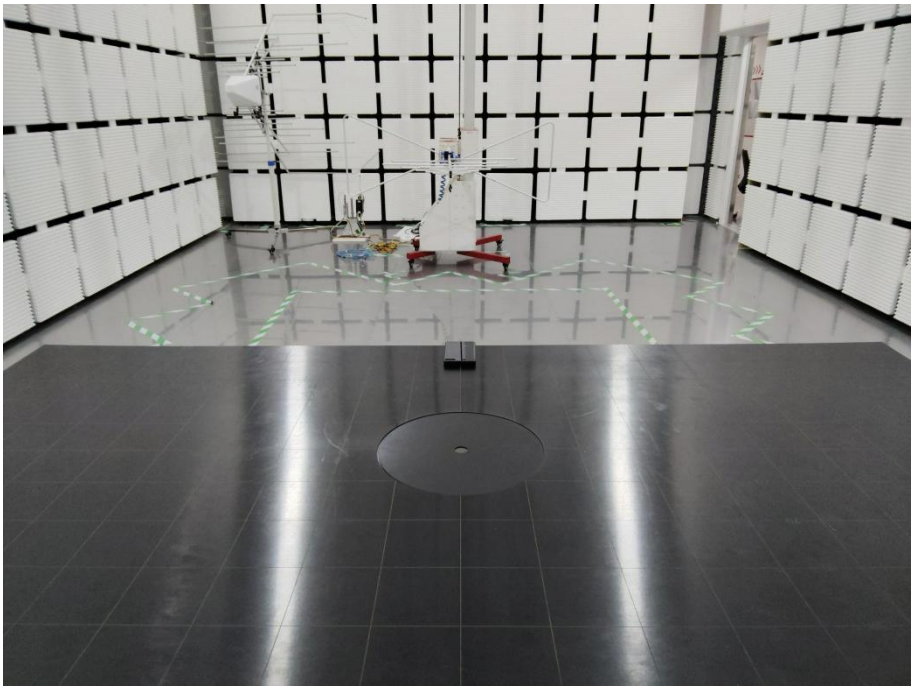
Conducted Emission at AC power line



Band edge emissions (Radiated)
Undesirable emission limits (above 1GHz)



Undesirable emission limits (below 1GHz)



7. EXTERNAL AND INTERNAL PHOTOS

7.1. External Photos

refer to the report CISRR25010703101.

7.2. Internal Photos

refer to the report CISRR25010703101.

8. Appendix Report