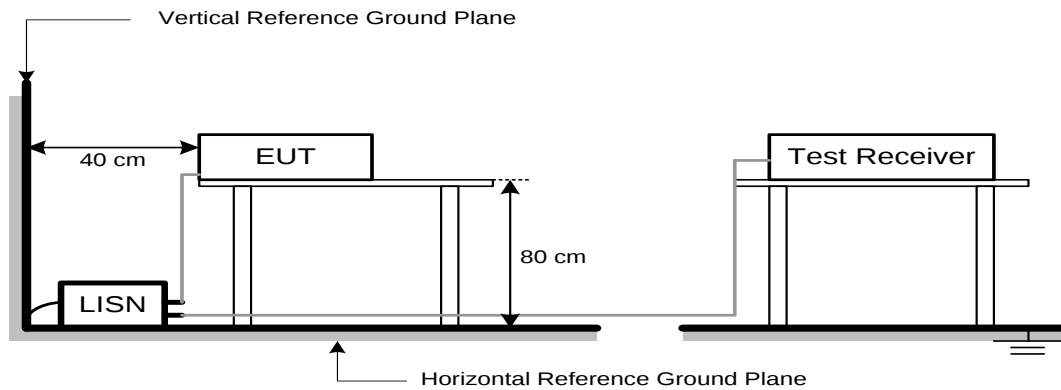


3.4 TEST SETUP



The LISN edge is arranged parallel to the edge of the test table
The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT

3.5 EUT OPERATION CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting/TX mode.

3.6 TEST RESULTS

Please refer to the APPENDIX A.

4. RADIATED EMISSIONS

4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000MHz)

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS (Above 1000 MHz)

Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength at 3m (dBμV/m)
5150-5250	-27	68.2
5250-5350	-27	68.2
5470-5725	-27	68.2
5725-5850 NOTE (2)	-27	68.2
	10	105.2
	15.6	110.8
	27	122.2

NOTE:

(1) The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

(2) According to 15.407(b)(4)(i), 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.

4.2 TEST PROCEDURE

- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

The following table is the setting of the receiver:

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz

Spectrum Parameters	Setting
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic or 40 GHz, whichever is lower
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for PK value 1MHz / 1/THz for AVG value

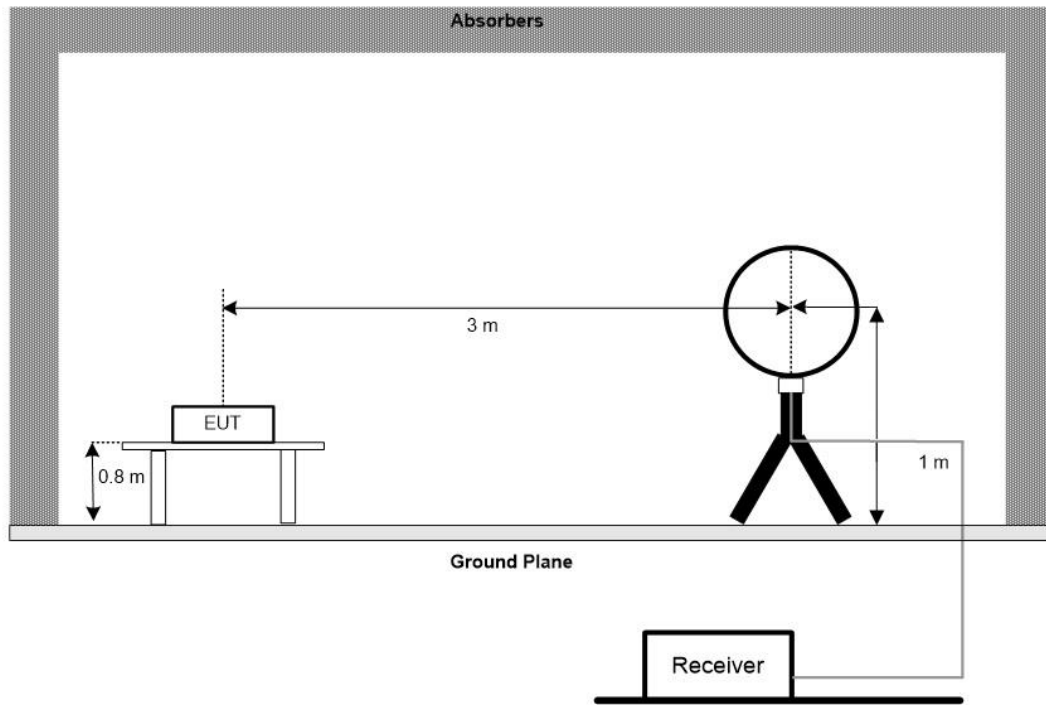
Receiver Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector
Start ~ Stop Frequency	1 GHz~40GHz for PK/AVG detector

4.3 DEVIATION FROM TEST STANDARD

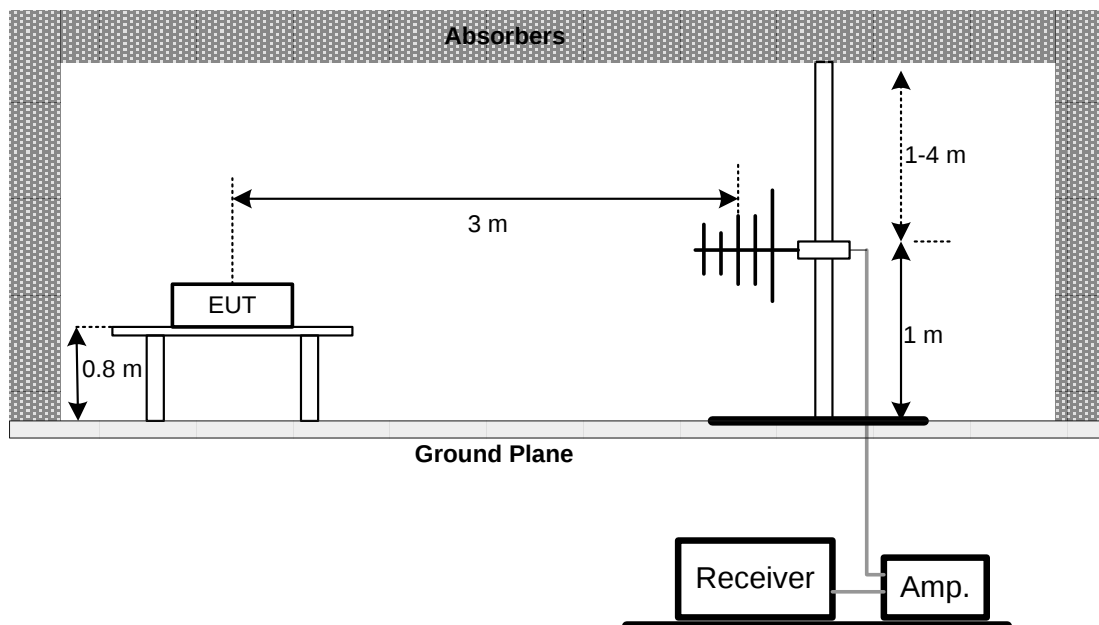
No deviation.

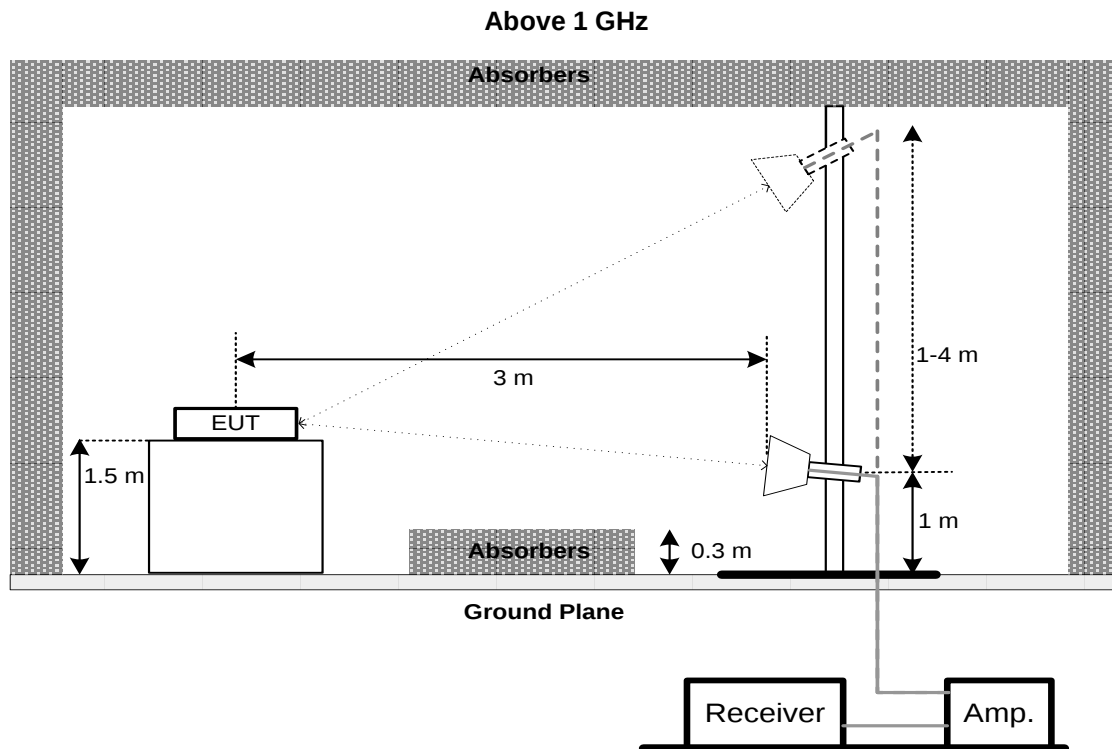
4.4 TEST SETUP

9 kHz to 30 MHz



30 MHz to 1 GHz





4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS - 9 KHZ TO 30 MHZ

Please refer to the APPENDIX B.

Remark:

- (1) Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

4.8 TEST RESULTS - ABOVE 1000 MHZ

Please refer to the APPENDIX D.

Remark:

- (1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

5.BANDWIDTH

5.1LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(a) FCC 15.407(e)	26 dB Bandwidth	-	5150-5250
	26 dB Bandwidth	-	5250-5350
	26 dB Bandwidth	-	5470-5725
	6dB Bandwidth	Minimum 500 kHz	5725-5850

5.2TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below
- b. Spectrum Setting:
For UNII-1, UNII-2A,

Spectrum Parameter	Setting
Span Frequency	> 26dB Bandwidth
RBW	Appromiximately 1% of the emission bandwidth
VBW	> RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

For UNII-3:

Spectrum Parameter	Setting
Span Frequency	> 6dB Bandwidth
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

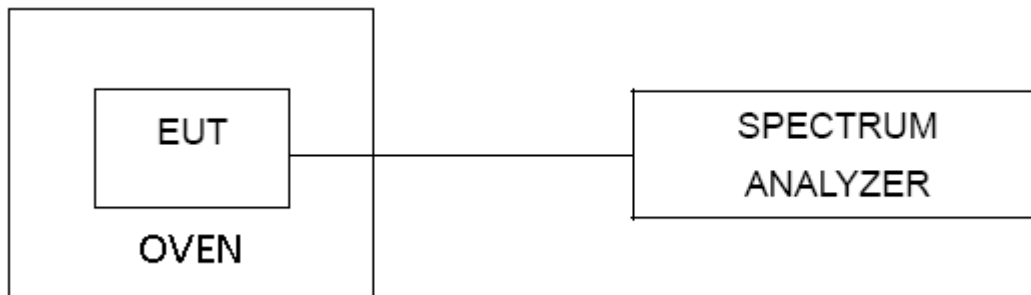
For 99% Occupied Bandwidth:

Spectrum Parameter	Setting
Span Frequency	1.5 times to 5 times the OBW
RBW	1% to 5% of the OBW
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- c. Measured the spectrum width with power higher than 26dB / 6dB below carrier.

5.3DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP**5.5 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS

Please refer to the APPENDIX E.

6.MAXIMUM OUTPUT POWER

6.1LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(a)	MaximumOutput Power	AP device:1 Watt (30dBm) Client device: 250mW (23.98dBm)	5150-5250
		250mW (23.98dBm)	5250-5350
		250mW (23.98dBm)	5470-5725
		1 Watt (30dBm)	5725-5850

Note:

- 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. In addition, 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, both the maximum conducted output power and 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 conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26dB Bandwidth in megahertz.

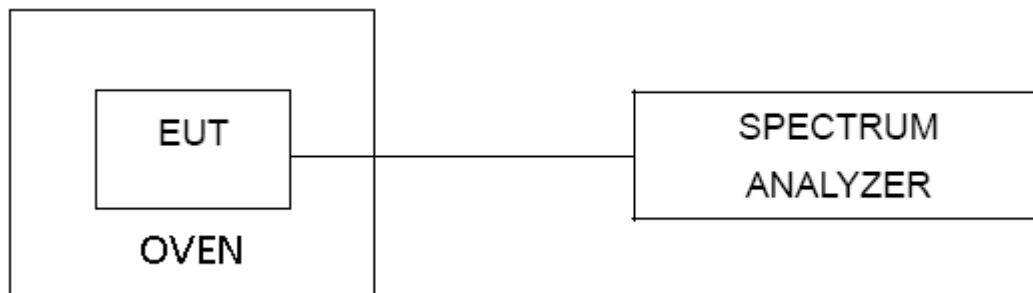
6.2TEST PROCEDURE

- The EUT was directly connected to the peak power analyzer and antenna output port as show in the block diagram below.
- The test was performed in accordance with method of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

6.3DEVIATION FROM STANDARD

No deviation.

6.4TEST SETUP



6.5EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULTS

Please refer to the APPENDIX F.

7.POWER SPECTRAL DENSITY

7.1LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(a)	Power Spectral Density	AP device:17dBm/MHz Client device:11dBm/MHz	5150-5250
		11dBm/MHz	5250-5350
		11dBm/MHz	5470-5725
		30dBm/500kHz	5725-5850

7.2TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting:
For UNII-1

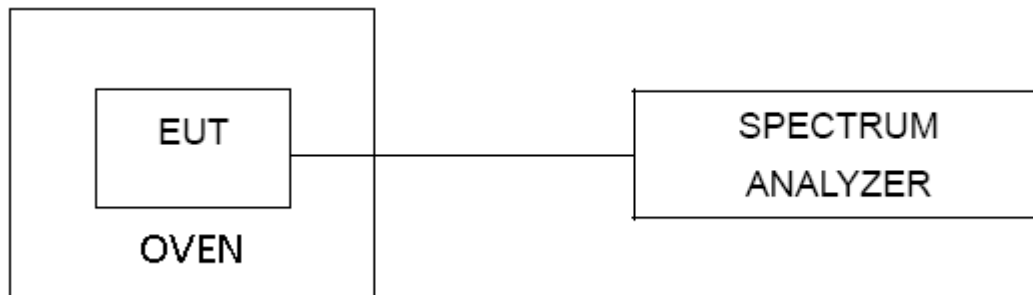
Spectrum Parameter	Setting
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1MHz.
VBW	3MHz.
Detector	RMS
Trace average	100 trace
Sweep Time	Auto

For UNII-3:

Spectrum Parameter	Setting
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1MHz.
VBW	3MHz.
Detector	RMS
Trace average	100 trace
Sweep Time	Auto

7.3DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP**7.5 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULTS

Please refer to the APPENDIXG.

8.FREQUENCY STABILITY

8.1LIMIT

Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.407(g)	Frequency Stability	An emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.	5150-5250
			5250-5350
			5470-5725
			5725-5850

8.2TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting:

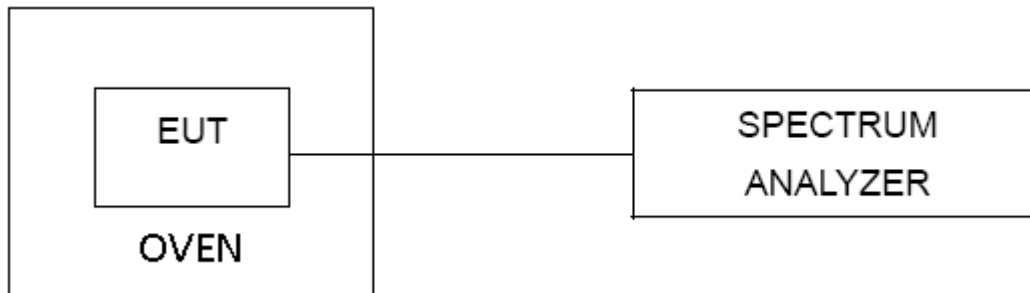
Spectrum Parameter	Setting
Span Frequency	Entire absence of modulation emissionsbandwidth
RBW	10 kHz
VBW	10kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
- User manual temperature is -30°C~75°C.

8.3DEVIATION FROM STANDARD

No deviation.

8.4TEST SETUP



8.5EUT OPERATION CONDITIONS

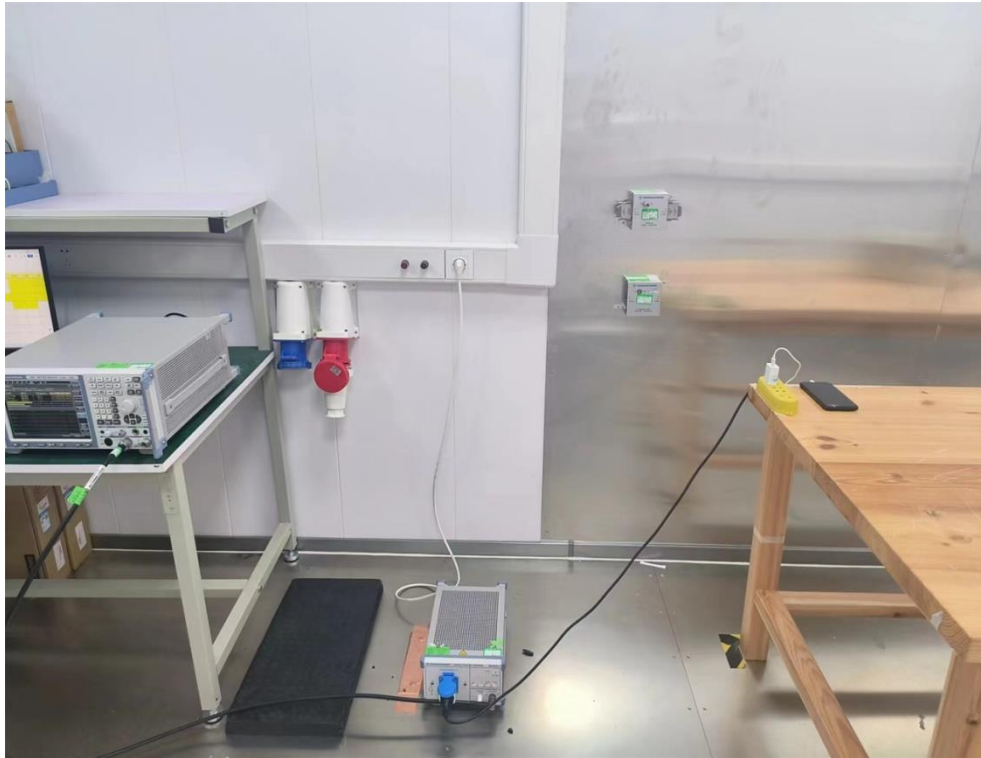
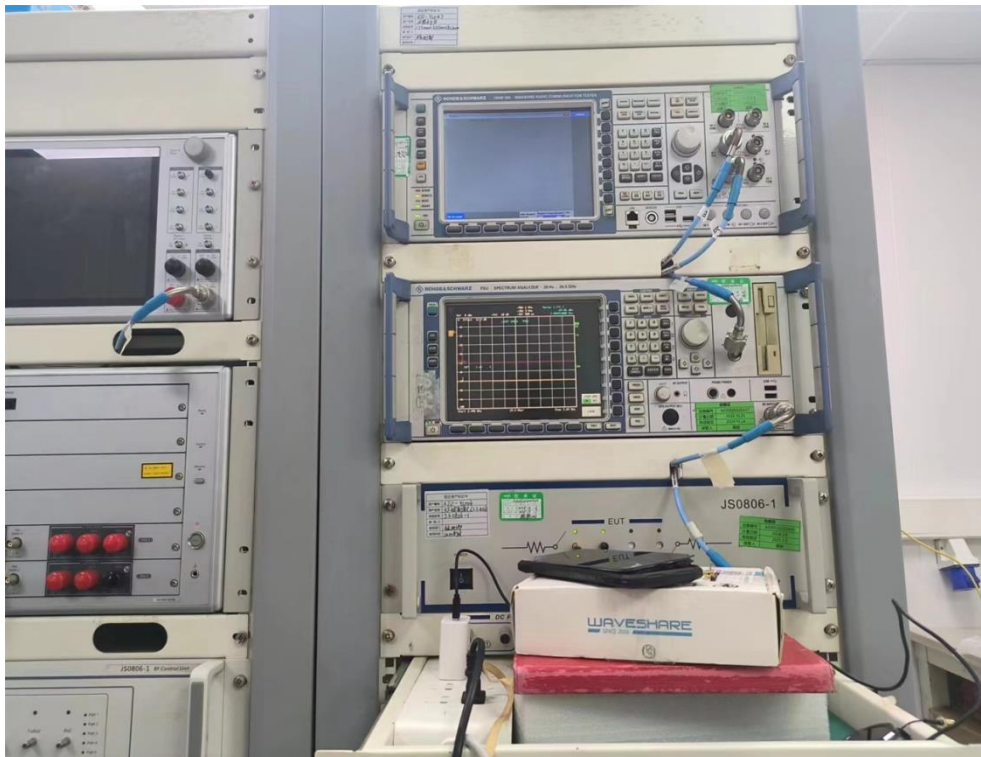
The EUT was programmed to be in continuously transmitting mode.

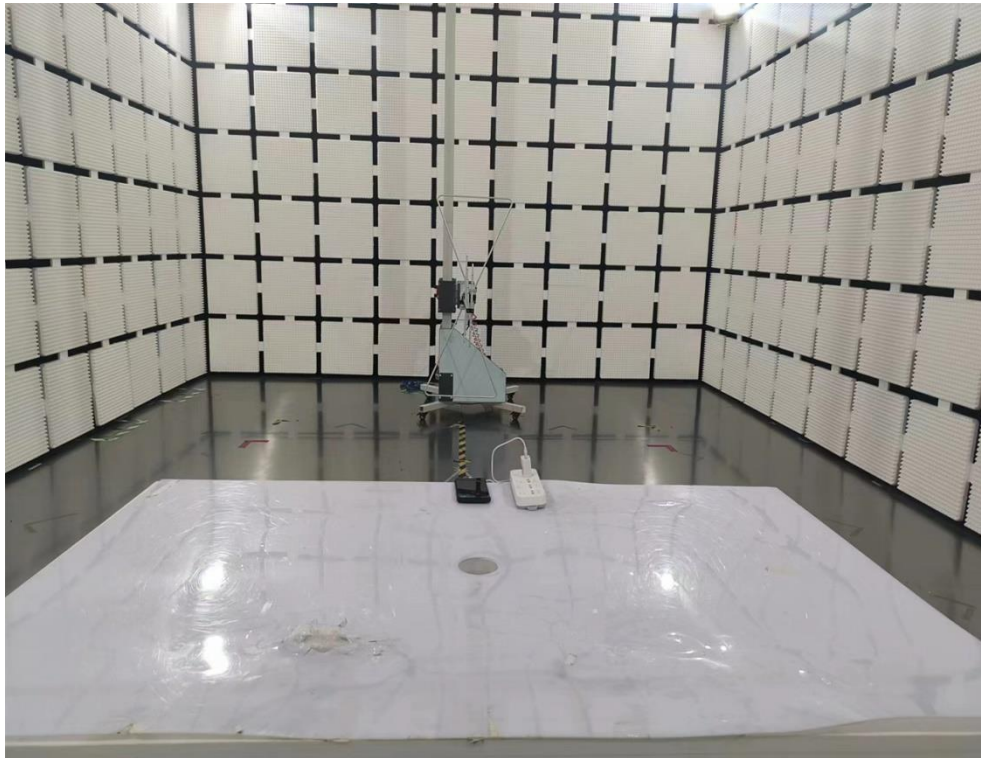
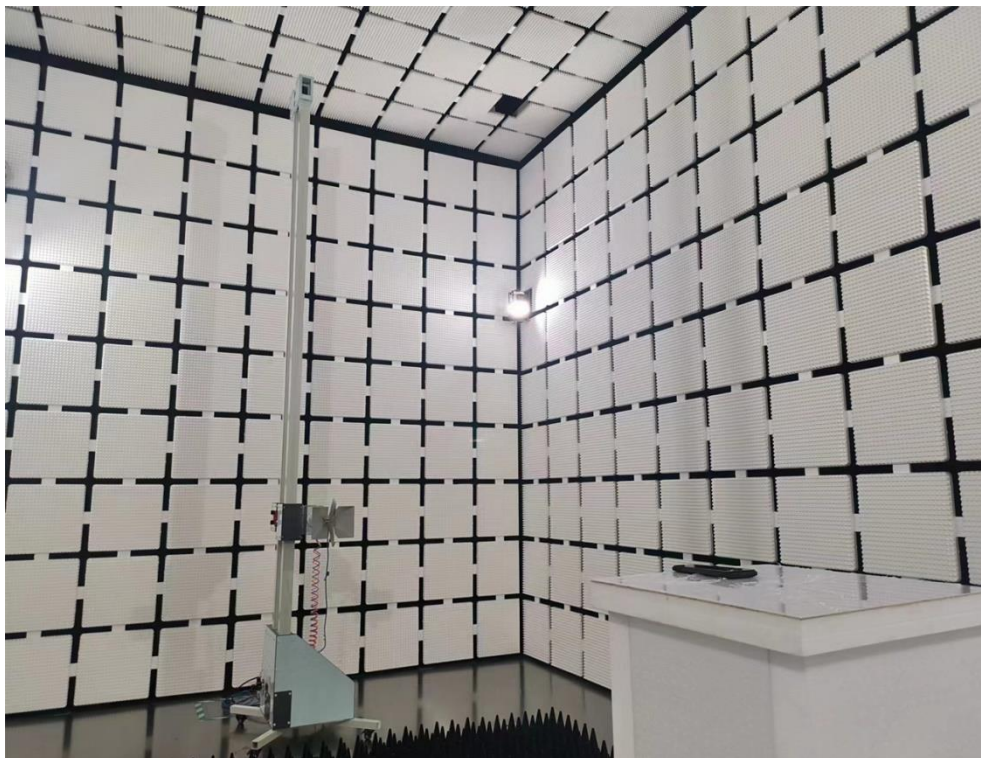
8.6 TEST RESULTS

N/A.

9. MEASUREMENT INSTRUMENTS LIST

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Receiver	Rohde&Schwarz	ESIB 40	YH-TIRT-SAC-966-20220911	2024/01/05	2025/01/04
Integral Antenna	Schwarzbeck	VULB 9163	01314	2022.12.11	2024.12.10
Integral Antenna	Rohde&Schwarz	HF907	RSM2991424	2022.12.11	2024.12.10
Preamplifier	Emtrace	RP01A	'02017	2024/01/05	2025/01/04
Preamplifier	Schwarzbeck	BBV9744	00143	2024/01/05	2025/01/04
Loop Antenna	ZHINAN	ZN30900A	12024	2024/01/05	2025/01/04
Horn Antenna	Schwarzbeck	BBHA9170	00956	2024/01/05	2025/01/04
RF Cable	/	LMR400UF-NMNM-7.0M	/	2024/01/05	2025/01/04
RF Cable	/	SFT2050PUR-NMNM-7.0M	/	2024/01/05	2025/01/04
EMI Receiver	Rohde&Schwarz	ESR7	1316.3003K07-102611-mk	2023/11/02	2024/11/01
LISN	Rohde&Schwarz	ENV216	3560.655.12-102915-Bp	2023/11/02	2024/11/01
RF Cable	\	SFT2050PUR-NMNM-2.0M	\	2024/01/05	2025/01/04
Spectrum analyzer	ROHDE&SCHWARZ	FSU26	200732	2024/01/05	2025/01/04
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	101722	2024/01/05	2025/01/04
Filter	HEWLETT PACKARD	JS0806-F	19K8060209	2024/01/05	2025/01/04

10.EUT TEST PHOTOS**AC Power Line Conducted Emissions Test Photos****Conducted RF Test Photos**

Radiated Emissions Test Photos**30 MHz to 1 GHz****Radiated Emissions Test Photos****Above 1 GHz**

11.EUT PHOTOS

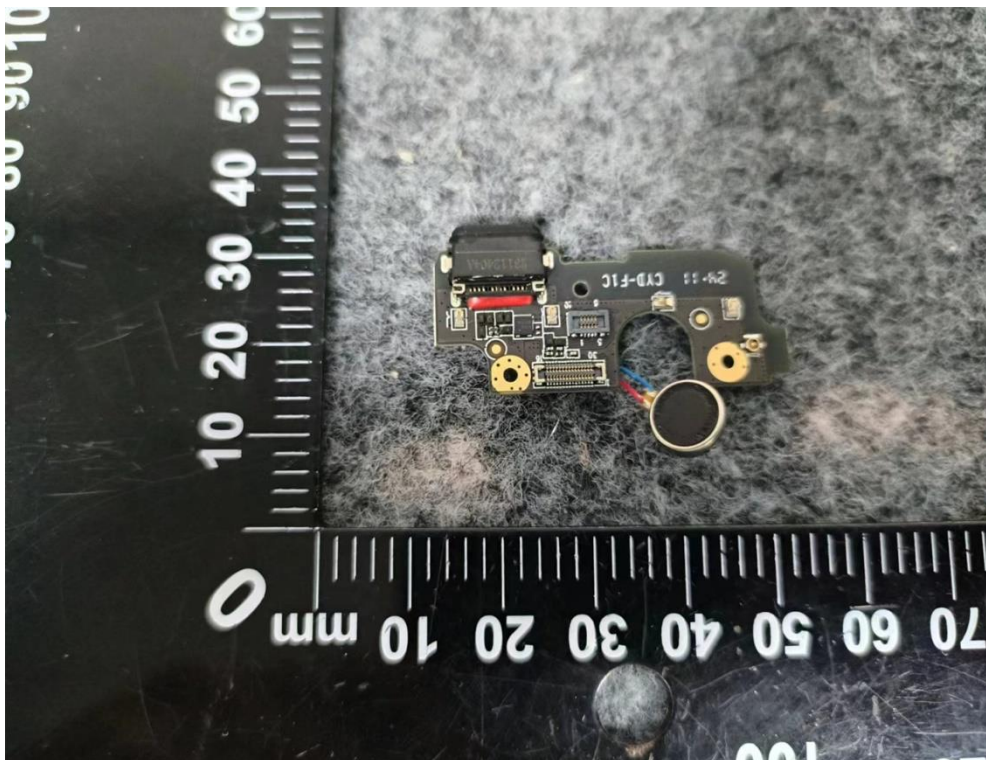
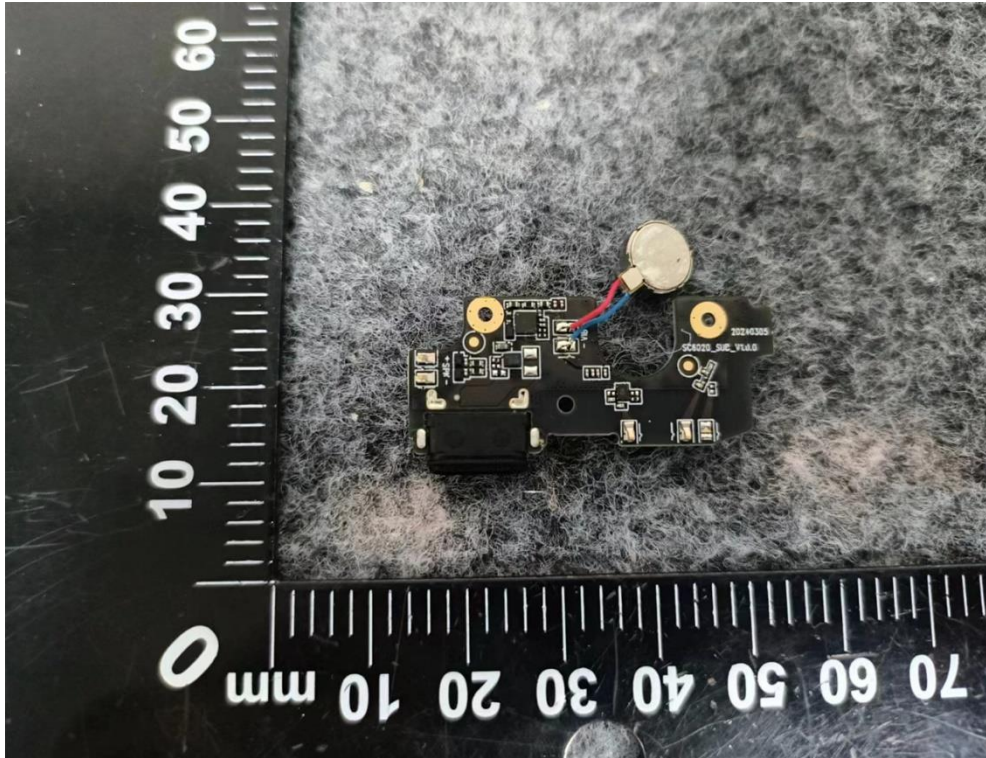








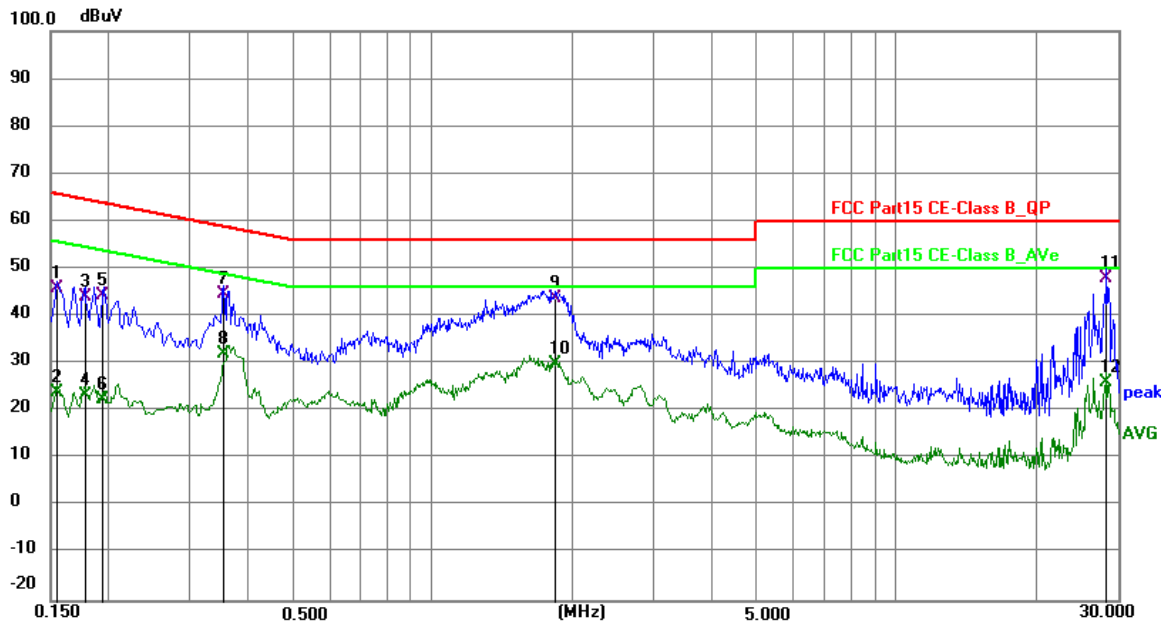






APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

Test Mode	TX AC(VHT80) Mode Channel 155 (UNII-3)	Phase	Line
-----------	--	-------	------

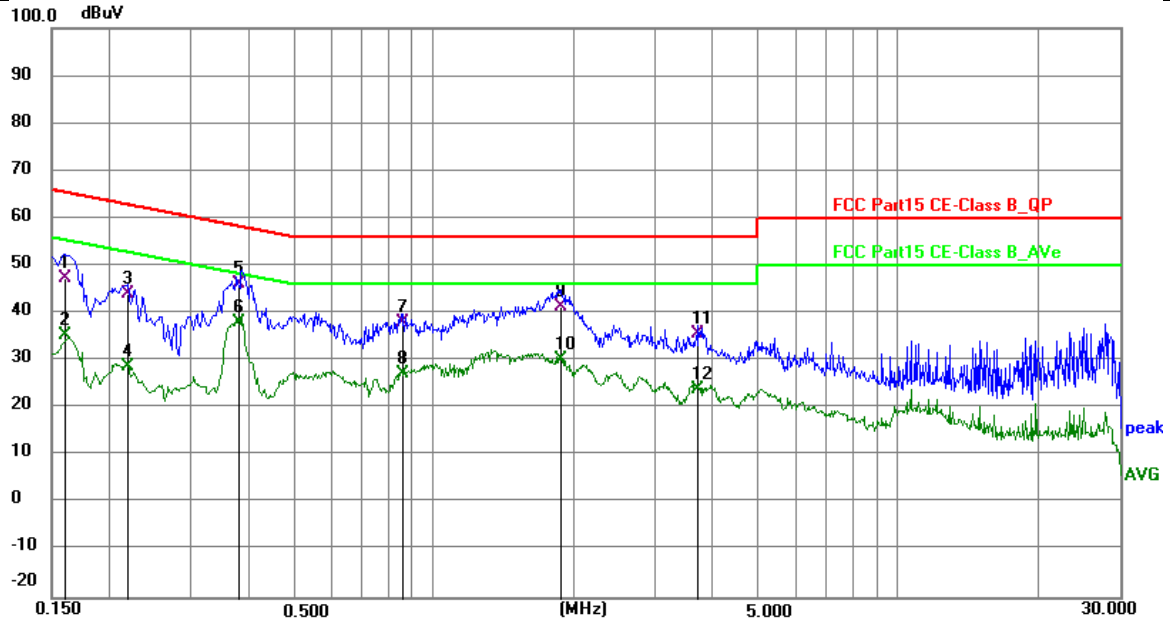


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1544	36.08	9.63	45.71	65.76	-20.05	QP	P	
2	0.1544	14.38	9.63	24.01	55.76	-31.75	AVG	P	
3	0.1770	34.49	9.63	44.12	64.63	-20.51	QP	P	
4	0.1770	13.62	9.63	23.25	54.63	-31.38	AVG	P	
5	0.1949	34.63	9.63	44.26	63.83	-19.57	QP	P	
6	0.1949	12.93	9.63	22.56	53.83	-31.27	AVG	P	
7	0.3523	35.09	9.63	44.72	58.91	-14.19	QP	P	
8	0.3523	22.52	9.63	32.15	48.91	-16.76	AVG	P	
9	1.8420	34.00	9.65	43.65	56.00	-12.35	QP	P	
10	1.8420	20.27	9.65	29.92	46.00	-16.08	AVG	P	
11 *	28.3290	38.28	9.74	48.02	60.00	-11.98	QP	P	
12	28.3290	16.38	9.74	26.12	50.00	-23.88	AVG	P	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.
- (3) The test result has included the cable loss.

Test Mode	TX AC(VHT80) Mode Channel 155 (UNII-3)	Phase	Neutral
-----------	--	-------	---------



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1611	37.80	9.62	47.42	65.41	-17.99	QP	P	
2	0.1611	25.58	9.62	35.20	55.41	-20.21	AVG	P	
3	0.2174	34.53	9.63	44.16	62.92	-18.76	QP	P	
4	0.2174	19.03	9.63	28.66	52.92	-24.26	AVG	P	
5	0.3790	36.50	9.62	46.12	58.30	-12.18	QP	P	
6 *	0.3790	28.52	9.62	38.14	48.30	-10.16	AVG	P	
7	0.8565	28.42	9.63	38.05	56.00	-17.95	QP	P	
8	0.8565	17.49	9.63	27.12	46.00	-18.88	AVG	P	
9	1.8751	31.55	9.65	41.20	56.00	-14.80	QP	P	
10	1.8751	20.63	9.65	30.28	46.00	-15.72	AVG	P	
11	3.7140	25.95	9.67	35.62	56.00	-20.38	QP	P	
12	3.7140	14.38	9.67	24.05	46.00	-21.95	AVG	P	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.
- (3) The test result has included the cable loss.

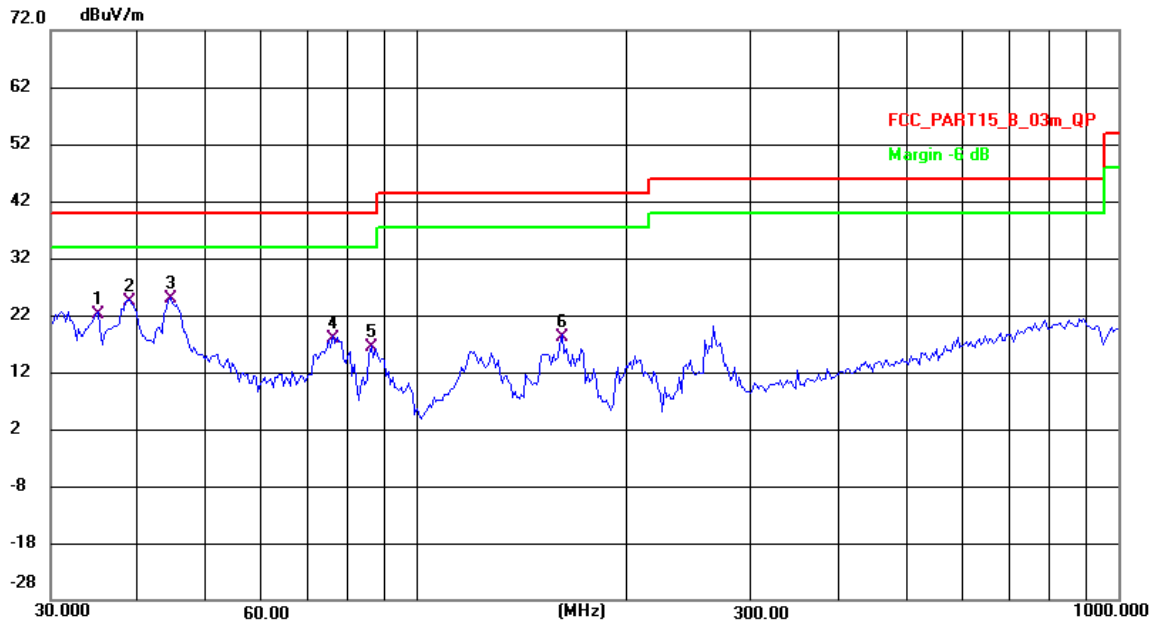
APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

Test Mode	TX AC(VHT80) Mode Channel 155 (UNII-3)	Polarization	Vertical
-----------	--	--------------	----------

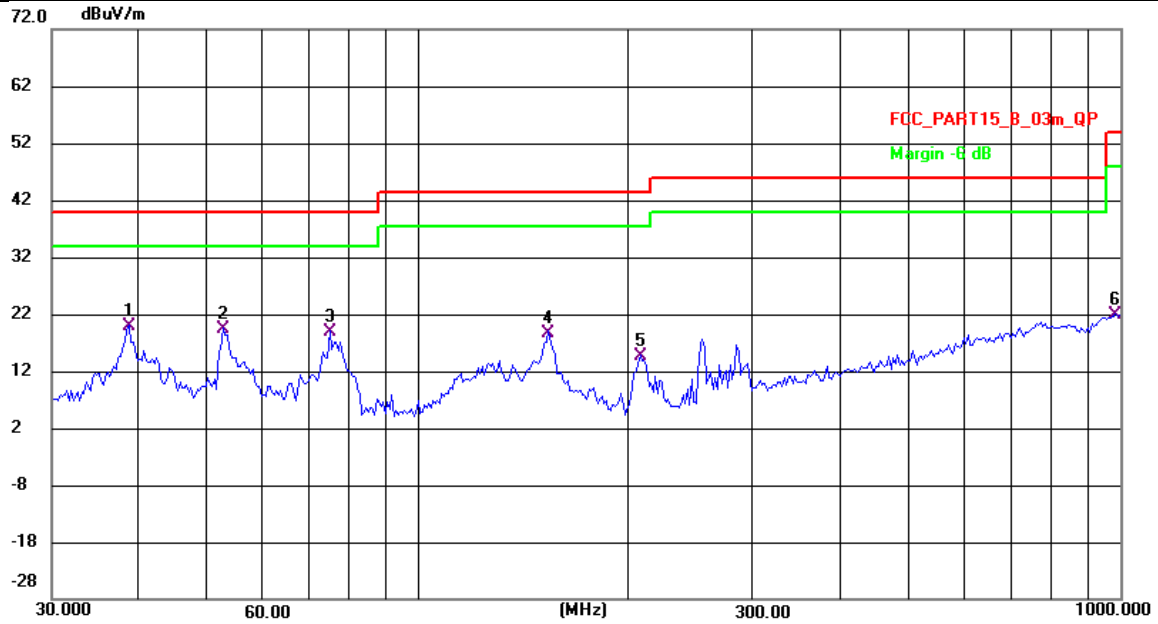


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	35.0157	45.07	-22.95	22.12	40.00	-17.88	QP	213	90	P	
2	38.9081	46.68	-22.26	24.42	40.00	-15.58	QP	200	120	P	
3 *	44.4657	47.00	-22.22	24.78	40.00	-15.22	QP	100	201	P	
4	75.8520	42.94	-25.11	17.83	40.00	-22.17	QP	200	216	P	
5	86.0795	42.21	-25.80	16.41	40.00	-23.59	QP	164	62	P	
6	160.8852	38.89	-20.77	18.12	43.50	-25.38	QP	100	245	P	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX AC(VHT80) Mode Channel 155 (UNII-3)	Polarization	Horizontal
-----------	--	--------------	------------



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	38.6357	42.28	-22.31	19.97	40.00	-20.03	QP	100	141	P	
2	52.6345	41.53	-22.22	19.31	40.00	-20.69	QP	184	105	P	
3	74.7934	43.72	-24.92	18.80	40.00	-21.20	QP	200	321	P	
4	153.1627	39.51	-20.76	18.75	43.50	-24.75	QP	209	91	P	
5	207.1968	39.51	-24.98	14.53	43.50	-28.97	QP	100	277	P	
6	986.0440	29.23	-7.36	21.87	54.00	-32.13	QP	108	42	P	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ

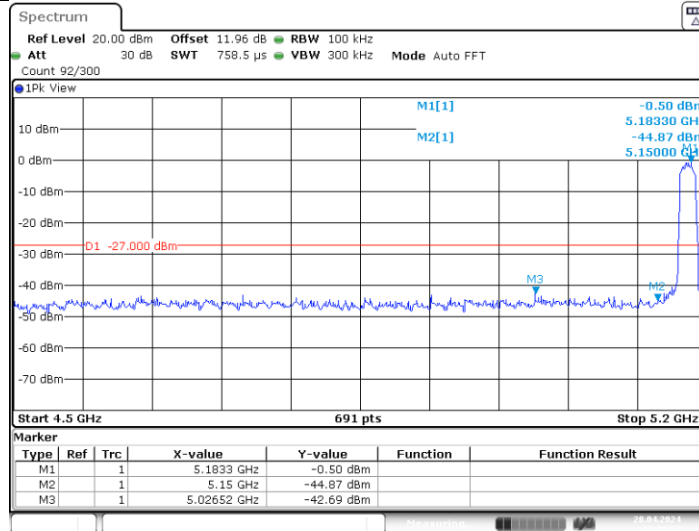
Test Result of Band edges.

TestMode	Antenna	ChName	Freq(MHz)	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	Low	5180	-42.69	≤-27	PASS
		High	5320	-42.27	≤-27	PASS
11N20SISO	Ant1	Low	5180	-43.03	≤-27	PASS
		High	5320	-41.96	≤-27	PASS
11N40SISO	Ant1	Low	5190	-42.05	≤-27	PASS
		High	5310	-41.17	≤-27	PASS
11AC20SISO	Ant1	Low	5180	-43.15	≤-27	PASS
		High	5320	-42.13	≤-27	PASS
11AC40SISO	Ant1	Low	5190	-40.43	≤-27	PASS
		High	5310	-38.31	≤-27	PASS
11AC80SISO	Ant1	Low	5210	-35.12	≤-27	PASS
		High	5290	-39.05	≤-27	PASS

TestMode	Antenna	ChName	Freq(MHz)	FreqRange [MHz]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	Low	5745	5650~5700	-41.68	≤8.15	PASS
				5700~5720	-37.79	≤15.60	PASS
				5720~5725	-35.12	≤25.10	PASS
				5760~5650	-42.99	≤-27	PASS
		High	5825	5850~5855	-39.73	≤18.92	PASS
				5855~5875	-40.87	≤14.21	PASS
				5875~5925	-41.76	≤-18.36	PASS
				5925~5935	-44.03	≤-27	PASS
11N20SISO	Ant1	Low	5745	5650~5700	-42.23	≤9.26	PASS
				5700~5720	-42.77	≤14.43	PASS
				5720~5725	-40.99	≤25.48	PASS
				5760~5650	-43.97	≤-27	PASS
		High	5825	5850~5855	-40.83	≤15.80	PASS
				5855~5875	-41.13	≤14.92	PASS
				5875~5925	-42.05	≤7.56	PASS
				5925~5935	-43.81	≤-27	PASS
11N40SISO	Ant1	Low	5755	5650~5700	-41.89	≤7.96	PASS
				5700~5720	-34.17	≤15.58	PASS
				5720~5725	-31.3	≤26.16	PASS
				5780~5650	-43.23	≤-27	PASS
		High	5795	5850~5855	-42.95	≤26.75	PASS
				5855~5875	-42.26	≤10.51	PASS
				5875~5925	-42.71	≤8.91	PASS
				5925~5935	-43.96	≤-27	PASS
11AC20SISO	Ant1	Low	5745	5650~5700	-42.88	≤9.01	PASS
				5700~5720	-40.16	≤14.01	PASS
				5720~5725	-36.67	≤25.10	PASS
				5760~5650	-43.59	≤-27	PASS
		High	5825	5850~5855	-36.5	≤19.81	PASS
				5855~5875	-38.29	≤10.05	PASS
				5875~5925	-42.03	≤-17.20	PASS
				5925~5935	-43.23	≤-27	PASS
11AC40SISO	Ant1	Low	5755	5650~5700	-40.93	≤8.83	PASS
				5700~5720	-31.15	≤15.53	PASS
				5720~5725	-31.36	≤26.16	PASS
				5780~5650	-42.78	≤-27	PASS
		High	5795	5850~5855	-39.71	≤26.21	PASS
				5855~5875	-41.03	≤11.58	PASS
				5875~5925	-41.48	≤-17.11	PASS
				5925~5935	-43.57	≤-27	PASS
11AC80SISO	Ant1	Low	5775	5650~5700	-36.69	≤1.71	PASS
				5700~5720	-33.81	≤15.48	PASS
				5720~5725	-33.25	≤25.40	PASS
				5800~5650	-42.12	≤-27	PASS

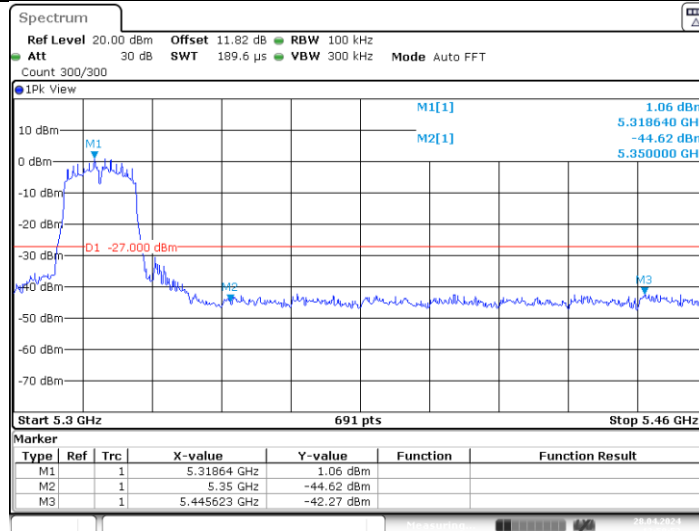
		High	5775	5850~5855	-35.08	≤21.73	PASS
				5855~5875	-34.64	≤11.83	PASS
				5875~5925	-38.36	≤-24.86	PASS
				5925~5935	-43.26	≤-27	PASS

11A_Ant1_Low_5180



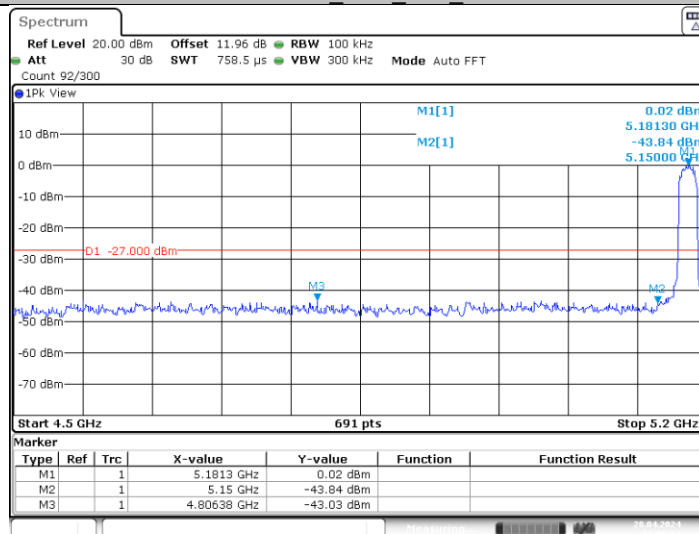
Date: 28.APR.2024 12:31:51

11A_Ant1_High_5320



Date: 28.APR.2024 12:59:52

11N20SISO_Ant1_Low_5180



Date: 28.APR.2024 13:06:53

11N20SISO_Ant1_High_5320