REPORT No.: SZ24040353W01

TEST REPORT

APPLICANT	:	Skeeter Enterprises
PRODUCT NAME	:	Stadia Neptune
MODEL NAME	:	1
BRAND NAME	:	N/A
FCC ID	:	2BFZ6-1
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2024-04-20
TEST DATE	:	2024-04-23 to 2024-04-30
ISSUE DATE	:	2024-05-10

Edited by: Peng Mi

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DIRECTORY

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Change History		
Version	Date	Reason for change
1.0	2023-05-10	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Skeeter Enterprises
Applicant Address:	8184 Compass pointe E Wynd NE, Leland, NC 28451
Manufacturer:	Anteral
Manufacturer Address:	Calle Tajonar 22. 31006, Pamplona Spain

1.2. Equipment Under Test (EUT) Description

Product Name:	Stadia Neptune
Sample No.:	#1
Frequency Range	24.005 – 24.245 GHz
Modulation Type	CW

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	15.215 2.1049	Occupied Bandwidth	April 23, 2024	Wang Dalong	PASS	No deviation
3	15.207(a)	Conducted Emission	April 23, 2024	Wang Dalong	PASS	No deviation

4	15.249(a)(c)(e)	Field Strength of Fundamental	April 25, 2024	Wang Dalong	PASS	No deviation
5	15.249(a)(c)(d)(e) 15.209(a)	Radiated Emission and Field Strength of Harmonic	April 25, 2024	Wang Dalong	PASS	No deviation
6	15.249(c)(d) (e) 15.205(a)(b)(d),	Restricted Bands	April 27, 2024	Wang Dalong	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2020.

Note 2: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 3: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.4. Environmental Conditions

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

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 15C Requirements

2.1. Antenna Requirement

2.1.1. Applicable Standard

According to FCC 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.

2.1.2. Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

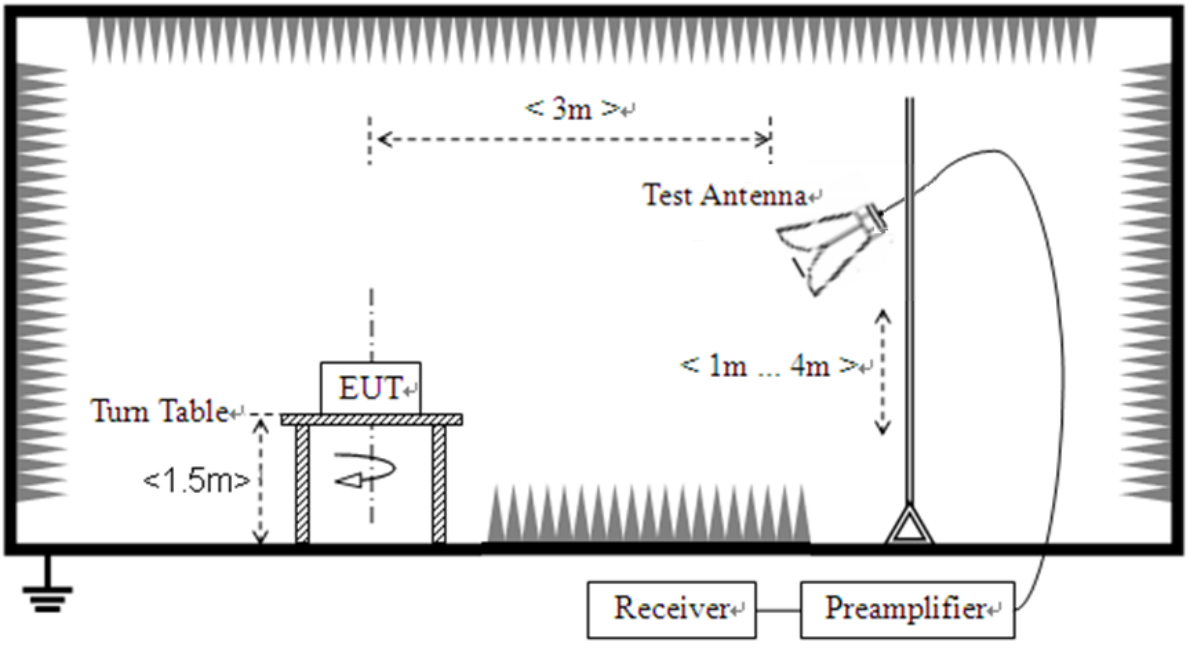
2.2. Occupied Bandwidth

2.2.1. Requirement

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

2.2.2. Test Description

Test Setup:



2.2.3. Test Procedure

The Equipment Under Test (EUT) was set up to perform the fundamental bandwidth measurements.
The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation.
The results recorded were measured with the modulation which produce the worst-case (smallest) emission bandwidth.

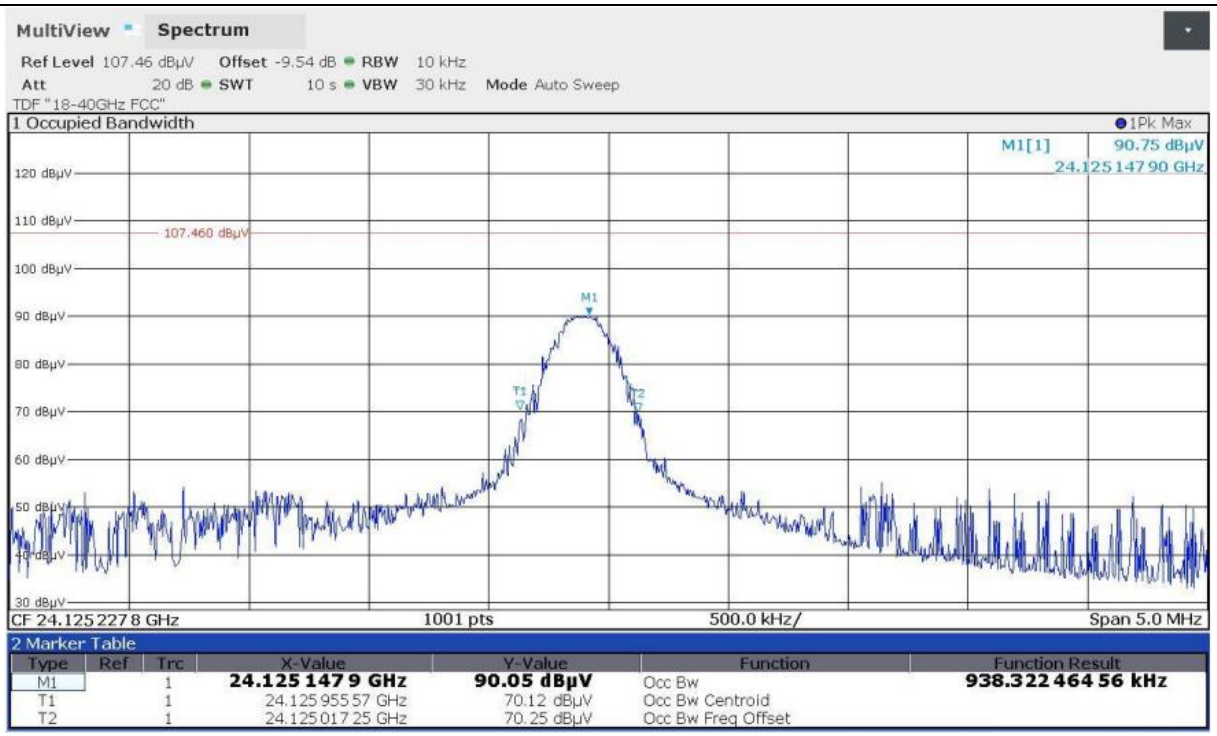
The Equipment Under Test (EUT) was set up on a non-conductive support (tilt device) at 1.5 m height in a fully-anechoic chamber. The EUT and the test antenna were adjusted for maximum main beam coupling.
Analyzer settings:
Resolution Bandwidth(RBW):1% to 5% of OBW
Video Bandwidth(VBW):Three times of RBW
Span: Three to five times of OBW
Trace: Maxhold
Sweeps: allow the trace to stabilize
Sweeptime:10 ms
Detector: Peak
Note :
We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

2.2.4. Test Result

A.Test Verdict:

Bandwidth(kHz)	Low Frequency (MHz)	High Frequency (MHz)	Result
938.322	24125.01725	24125.95557	Pass

B.Test Plot:



20dB Bandwidth

2.3. Conducted Emission

2.3.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

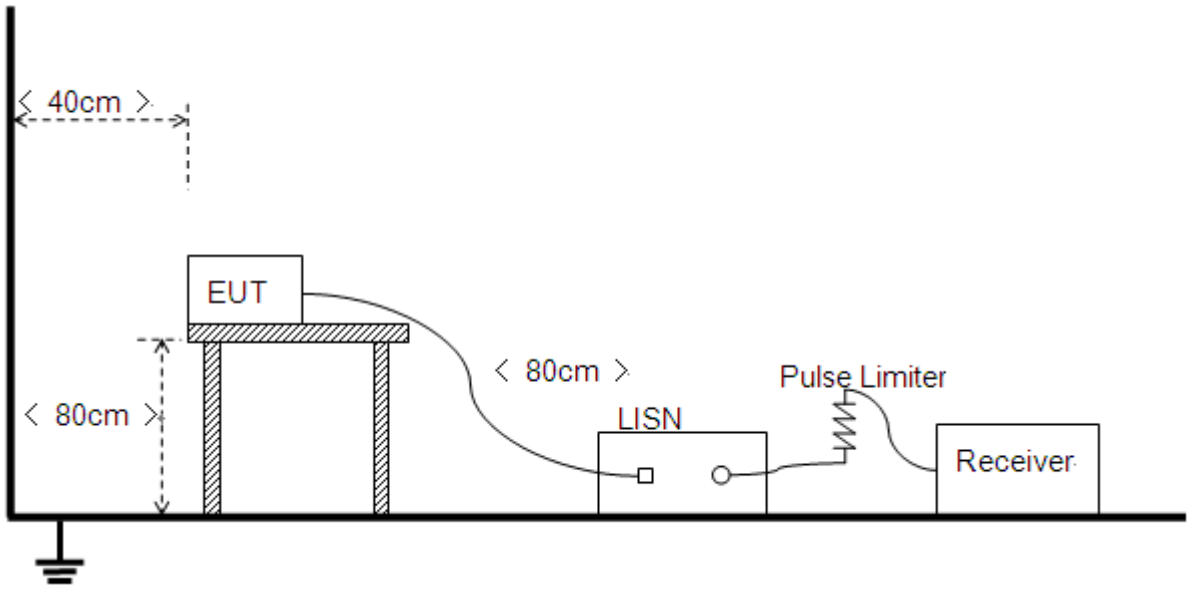
Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

1) The lower limit shall apply at the band edges.
2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.3.2. Test Description

Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

2.3.3. Test Procedure

Use the following reciver settings:

Span = wide enough to fully capture the emission being measured
RBW = 9 kHz
VBW = 30 kHz
Sweep = auto
Detector function = Quasi peak and Average
Trace = max hold

2.3.4. Test Result

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the Average and Quasi peak limits, and that have narrow margins from the Average and Quasi peak limits will be re-measured with Average and Quasi peak detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A.Test Setup:

Test Mode: EUT+24GHz TX

Test voltage: AC 120V/60Hz

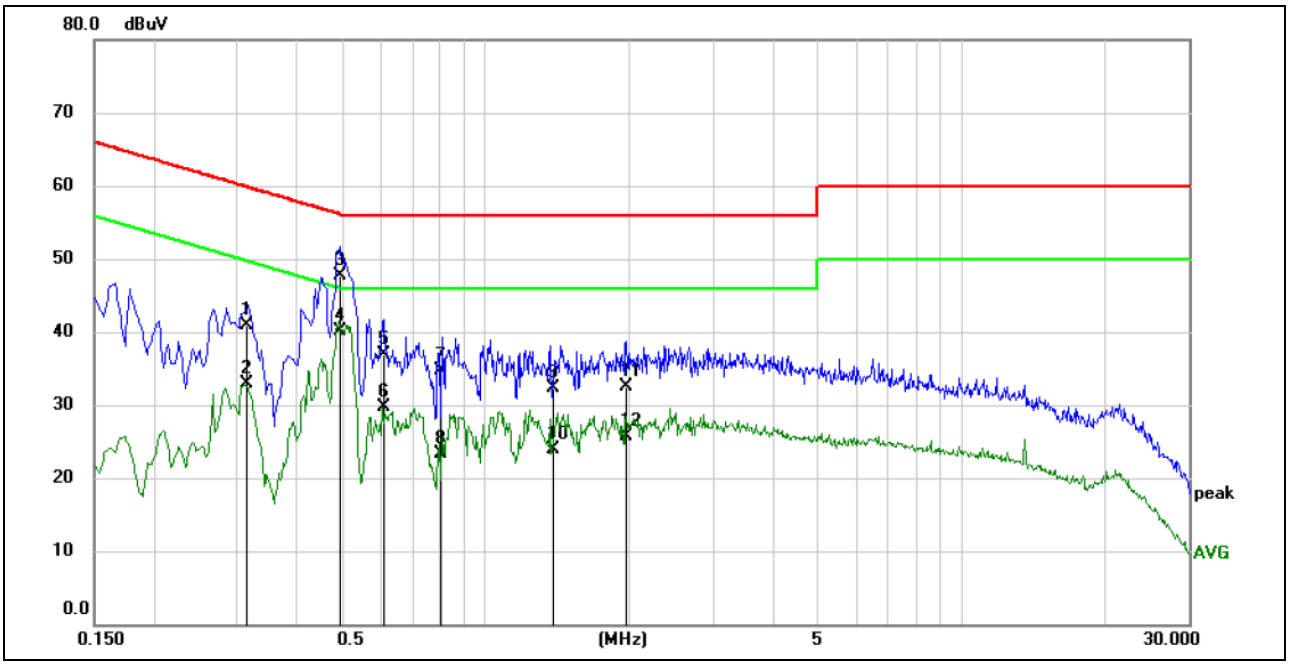
The measurement results are obtained as below:

E [dBμV] $= U_R$[dBμV] + $L_{Cable\ loss}$ [dB] + A_{Factor} [dB]

U_R: Receiver Reading

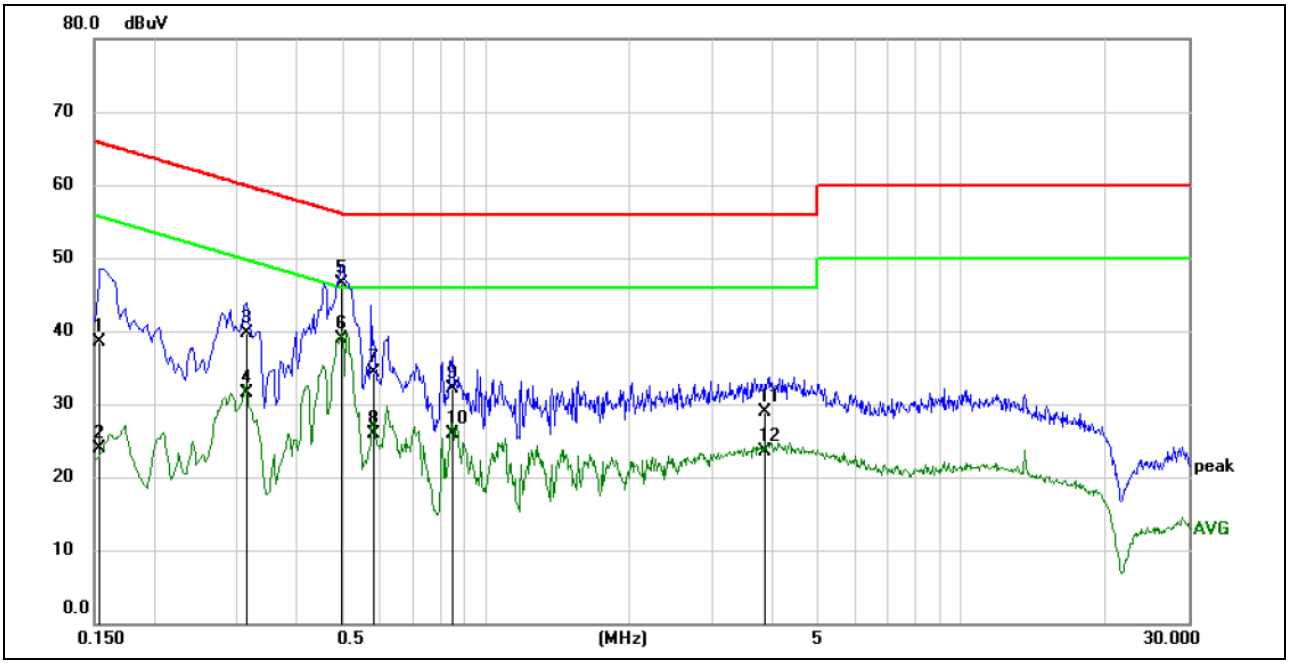
A_{Factor}: Voltage division factor of LISN

B.Test Plot:



(L Phase)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3134	31.35	9.59	40.94	59.88	-18.94	QP
2	0.3134	23.27	9.59	32.86	49.88	-17.02	AVG
3	0.4949	38.02	9.60	47.62	56.09	-8.47	QP
4	0.4949	30.55	9.60	40.15	46.09	-5.94	AVG
5	0.6120	27.34	9.60	36.94	56.00	-19.06	QP
6	0.6120	20.07	9.60	29.67	46.00	-16.33	AVG
7	0.8053	25.01	9.60	34.61	56.00	-21.39	QP
8	0.8053	13.73	9.60	23.33	46.00	-22.67	AVG
9	1.3853	22.78	9.61	32.39	56.00	-23.61	QP
10	1.3853	14.34	9.61	23.95	46.00	-22.05	AVG
11	1.9785	22.95	9.63	32.58	56.00	-23.42	QP
12	1.9785	16.08	9.63	25.71	46.00	-20.29	AVG



(N Phase)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1537	29.01	9.59	38.60	65.80	-27.20	QP
2	0.1537	14.25	9.59	23.84	55.80	-31.96	AVG
3	0.3140	30.19	9.59	39.78	59.86	-20.08	QP
4	0.3140	21.87	9.59	31.46	49.86	-18.40	AVG
5	0.4948	36.95	9.60	46.55	56.09	-9.54	QP
6	0.4948	29.21	9.60	38.81	46.09	-7.28	AVG
7	0.5805	24.64	9.60	34.24	56.00	-21.76	QP
8	0.5805	16.22	9.60	25.82	46.00	-20.18	AVG
9	0.8520	22.57	9.60	32.17	56.00	-23.83	QP
10	0.8520	16.39	9.60	25.99	46.00	-20.01	AVG
11	3.8645	19.29	9.69	28.98	56.00	-27.02	QP
12	3.8645	13.81	9.69	23.50	46.00	-22.50	AVG

2.4. Field Strength of Fundamental

2.4.1. Requirement

According to FCC section 15.245(b), the field strength of fundamental and harmonics from intentional radiators operated within these frequency bands shall comply with the following:

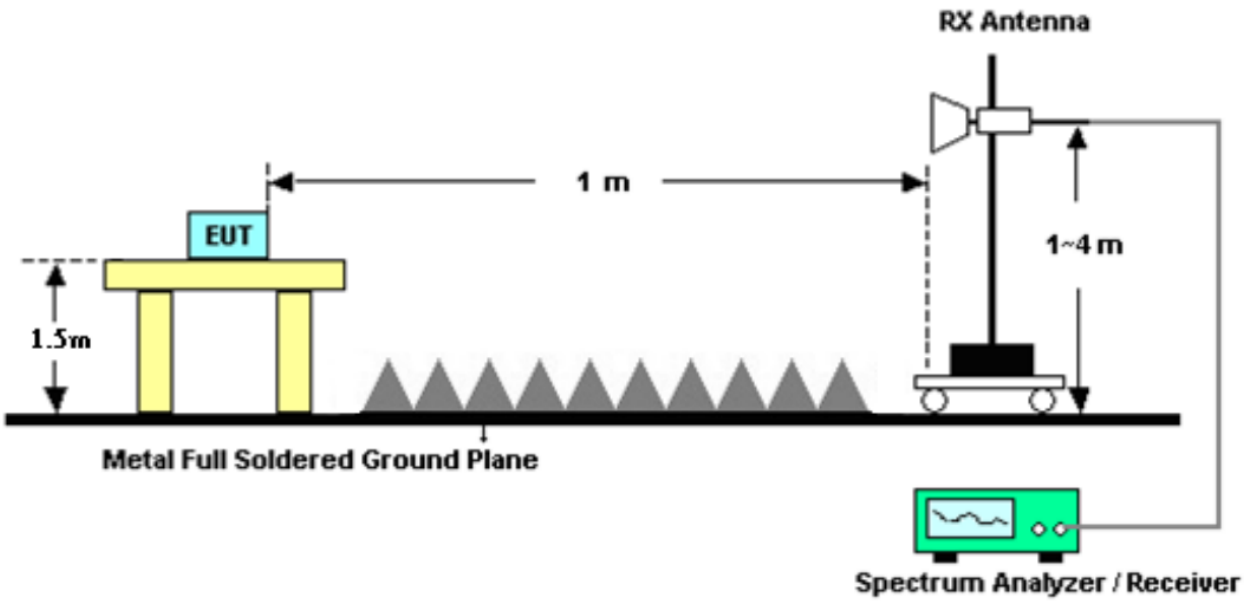
24.00-24.25	Field strength of fundamental (millivolts/meter)	Field strength of fundamental (dBuV/m)
Average limits	250	107.95
Peak limits	-	127.95

Note:

1) Limitation expressed in dBuV/m is calculated by 20log Emission Level(1000*mV/m).
2) Field strength limits are specified at a distance of 3 meters.
3) The emission limits shown above are based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

2.4.2. Test Description

Test Setup:



The EUT is placed on a non-conducting table 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT distance is 1 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

2.4.3. Test Procedure

Analyzer settings:
Resolution Bandwidth(RBW):1000 kHz
Video Bandwidth(VBW):3000 kHz
Span: 20 MHz
Trace: Maxhold
Sweeps: allow the trace to stabilize
Sweeptime:20 ms
Detector: Peak/ Average

2.4.4. Test Result

The measurement results are obtained as below:

E [dBμV/m] $= U_R$[dB μ V] + A_T[dB] + A_{Factor} [dB/m]; $A_T = L_{Cable\ loss}$ [dB]-G_{preamp} [dB]

A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

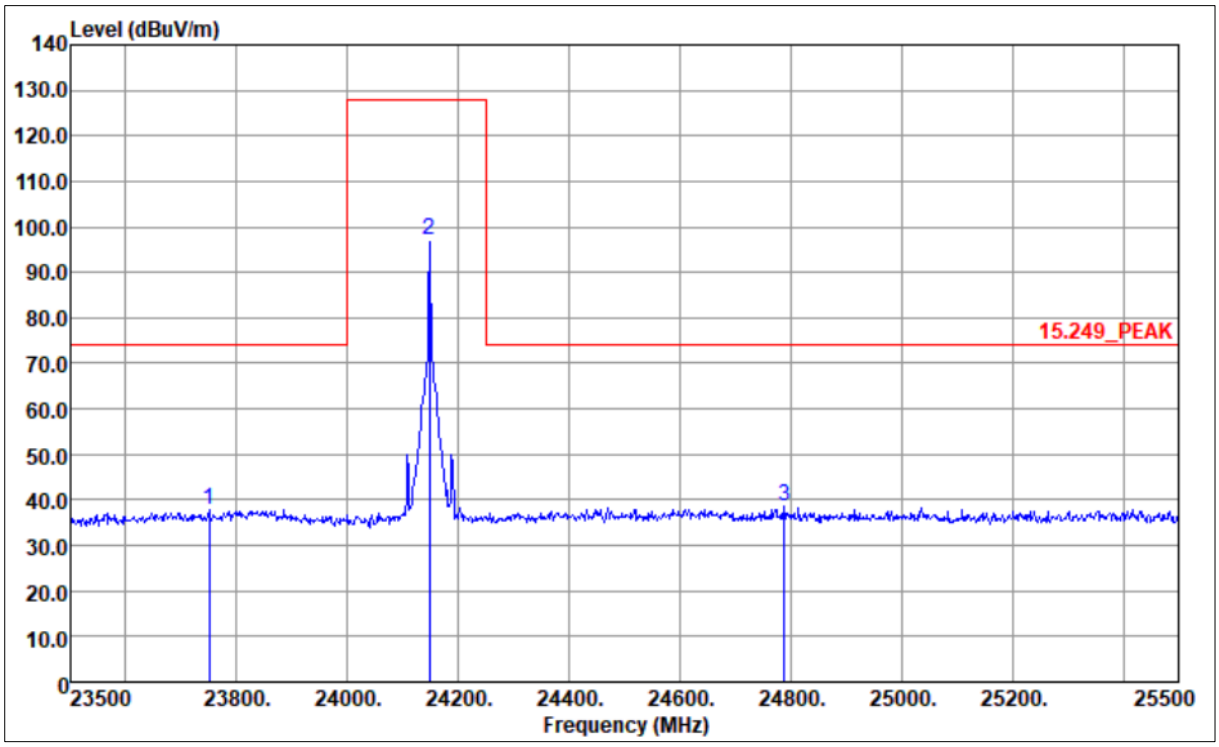
During the test, the total correction Factor AT and A_{Factor} were built in test software.

Note: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis(X and Y) test condition was recorded in this test report

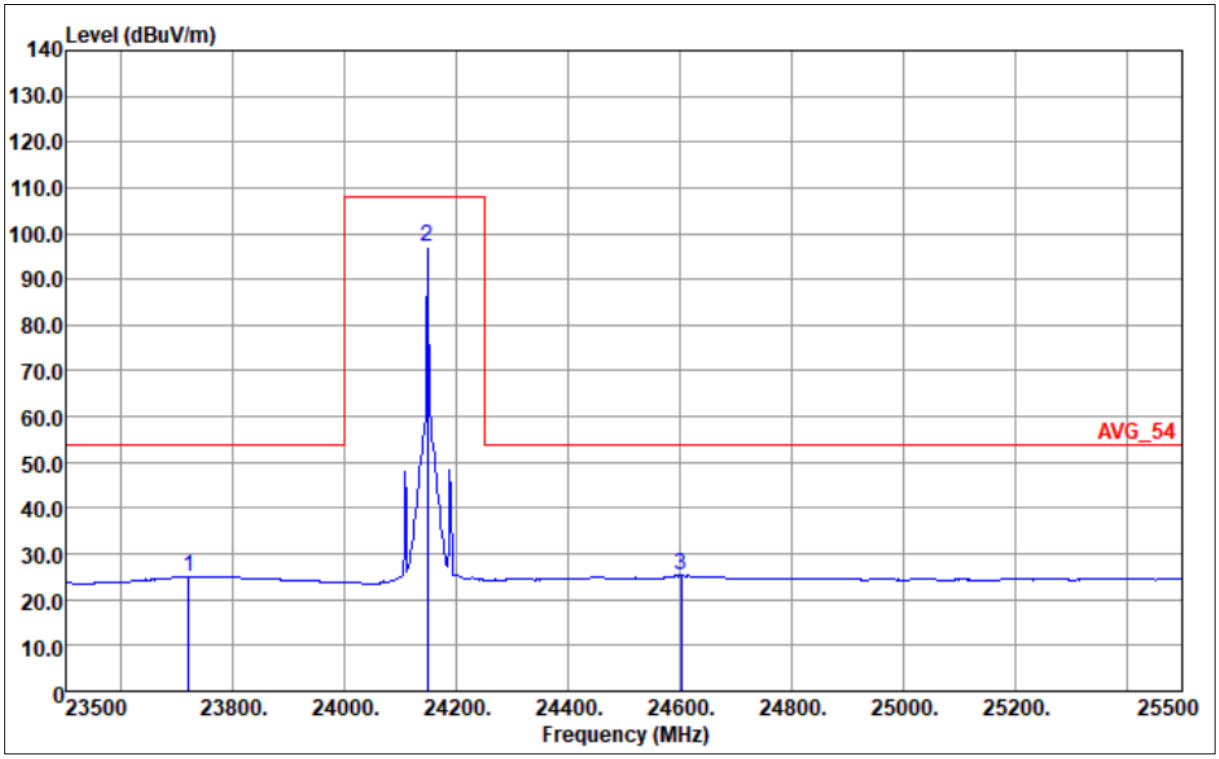
A.Test Verdict:

Field Strength of Fundamental

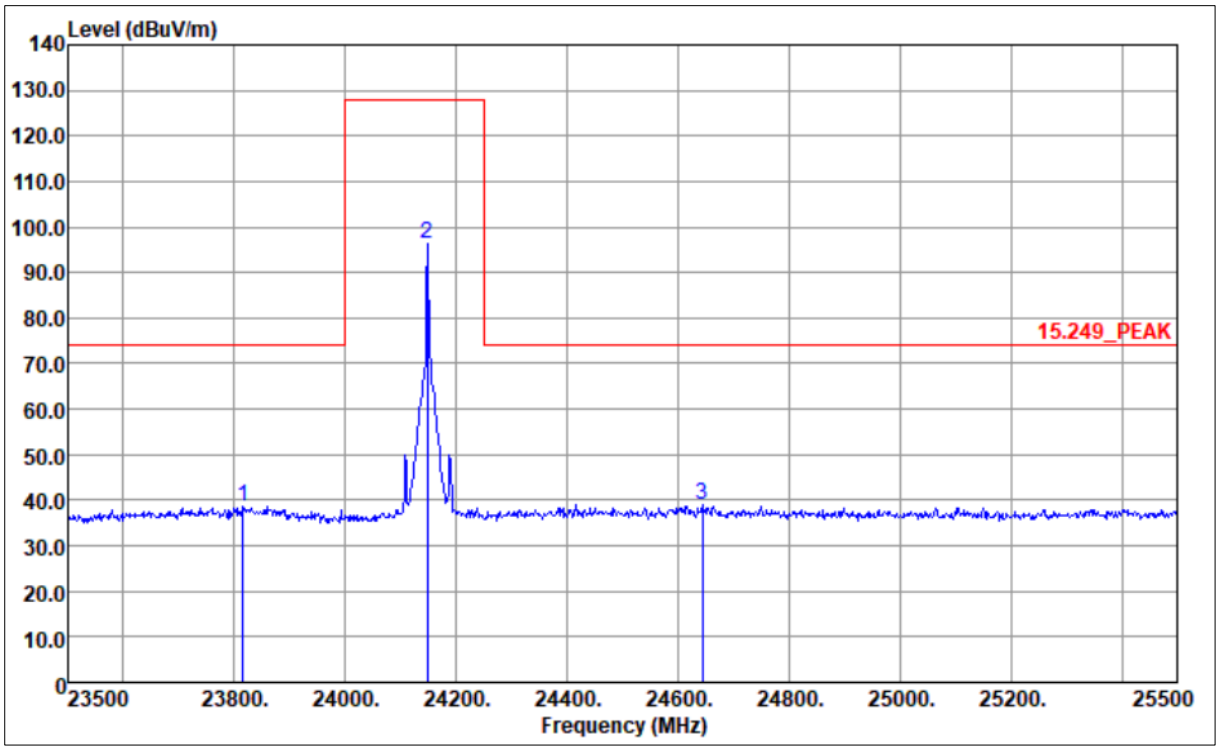
Ambient temperature:25℃
Air Pressure:1030 hPa
Humidity: 44 %



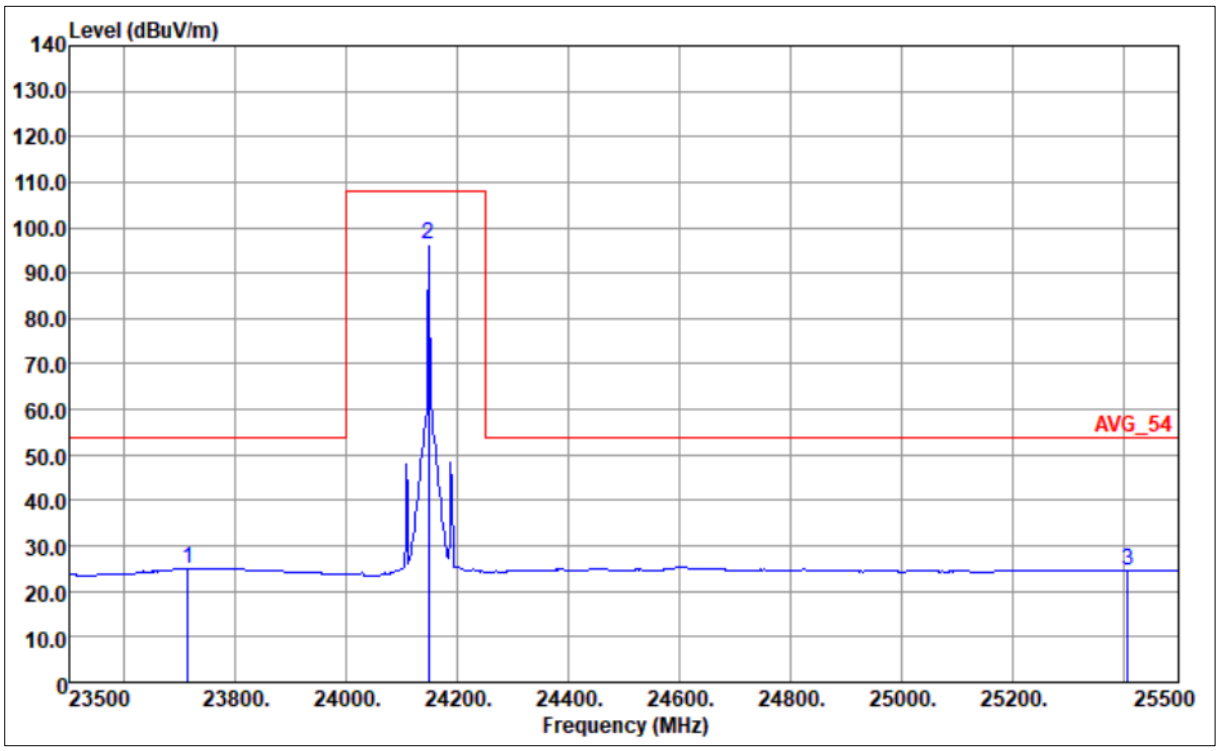
Peak, Horizontal



Average, Horizontal



Peak, Vertical



Average, Vertical

Frequency	Level	Distance extrapolation	Margin	Limit	Read	Antenna	Path	Peak	Pol.
(MHz)	(dBuV/m)	Factor （dB）	（dB)	Line (dBuV/m)	Level （dBuV)	Factor (dB/m）	Loss （dB）	Avg. (PIA)	（HV
23750	37.7	-9.54	-36.3	74	54.61	39.6	-46.97	P	H
24125.5	97.16	-9.54	-30.79	127.95	113.77	39.62	-46.69	P	H
24788	38.48	-9.54	-35.52	74	54.39	39.87	-46.24	P	H
23720	25.05	-9.54	-28.95	54	42	39.58	-46.99	A	H
24125.5	97.1	-9.54	-10.9	108	113.71	39.62	-46.69	A	H
24602	25.21	-9.54	-28.79	54	41.4	39.66	-46.31	A	H
23816	38.59	-9.54	-35.41	74	55.5	39.57	-46.94	P	V
24125.5	96.21	-9.54	-31.74	127.95	112.82	39.62	-46.69	P	V
24644	39.04	-9.54	-34.96	74	55.14	39.73	-46.29	P	V
23714	25.08	-9.54	-28.92	54	42.04	39.57	-46.99	A	V
24125.5	96.5	-9.54	-11.5	108	113.11	39.62	-46.69	A	V
25408	24.73	-9.54	-29.27	54	40.75	39.51	-45.99	A	V

2.5. Radiated Emission and Field Strength of Harmonic

2.5.1. Requirement

According to section 15.245(b), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

24.00-24.25	**Field strength of harmonic (microvolts/meter)**	**Field strength of harmonic (dBuV/m)**
Average limits	2500	67.95
Peak limits	-	87.95

Note:

1) Limitation expressed in dBuV/m is calculated by 20log Emission Level(1000*mV/m).
2) Field strength limits are specified at a distance of 3 meters.
3) The emission limits shown above are based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

According to section 15.245(b)(3), Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)	Field Strength Limitation at 3m Measurement Distance	
			(uV/m)	(dBuV/m)
0.009 - 0.490	2400/F(kHz)	300	10000* 2400/F(KHz)	20log 2400/F(KHz) + 80
0.490 - 1.705	24000/F(kHz)	30	100* 2400/F(KHz)	20log 2400/F(KHz) + 40
1.705 - 30.0	30	30	100*30	20log 30 + 40
30 - 88	100	3	100	20log 100
88 - 216	150	3	150	20log 150
216 - 960	200	3	200	20log 200
Above 960	500	3	500	20log 500

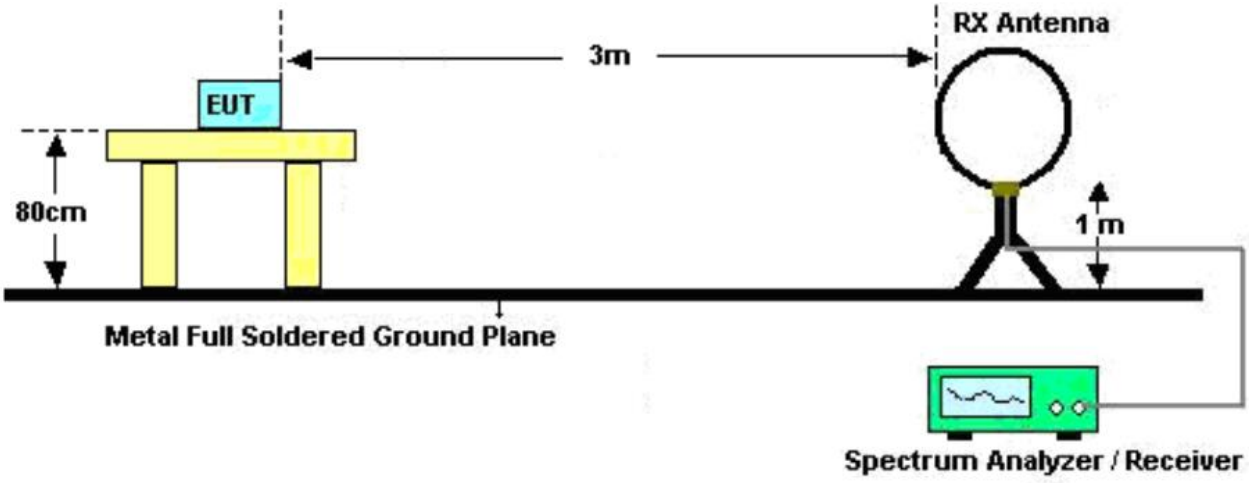
Note:

1) In the emission table above, the tighter limit applies at the band edges.
2) Limitation expressed in dBuV/m is calculated by 20log Emission Level(uV/m).
3) If measurement is made at other distance, then F.S Limitation is adjusted by using the formula of $L_{d1} = L_{d2} * (d2/d1)$.
4) Field strength limits are specified at a distance of 3 meters.
5) The provisions in Section 15.35 for limiting peak emissions apply.

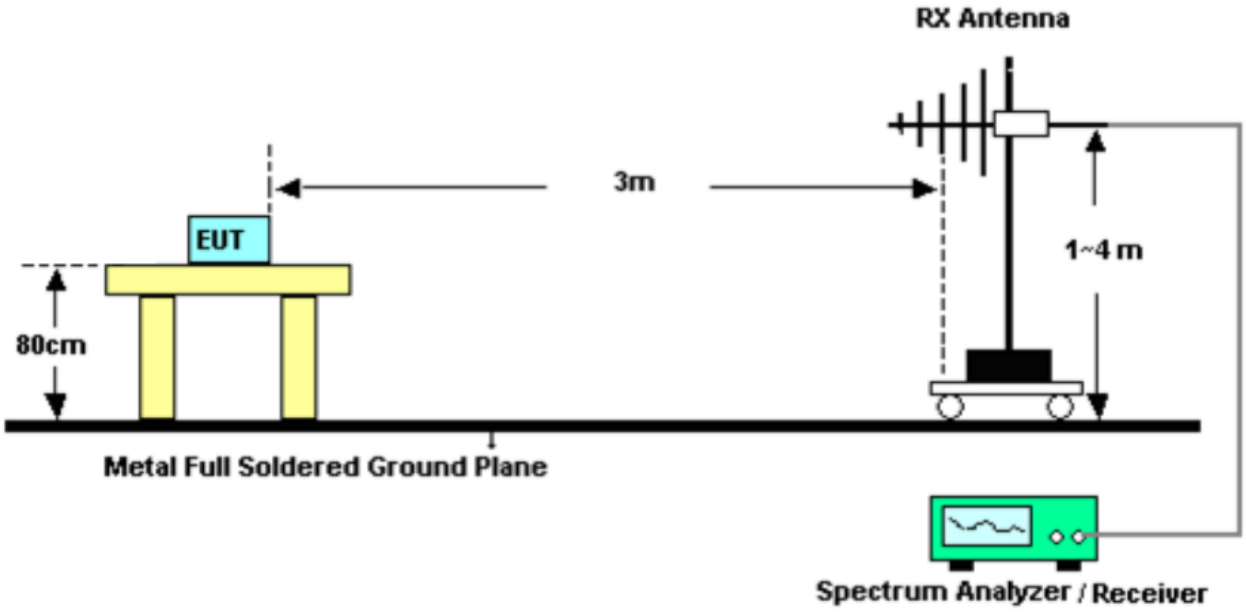
2.5.2. Test Description

A.Test Setup:

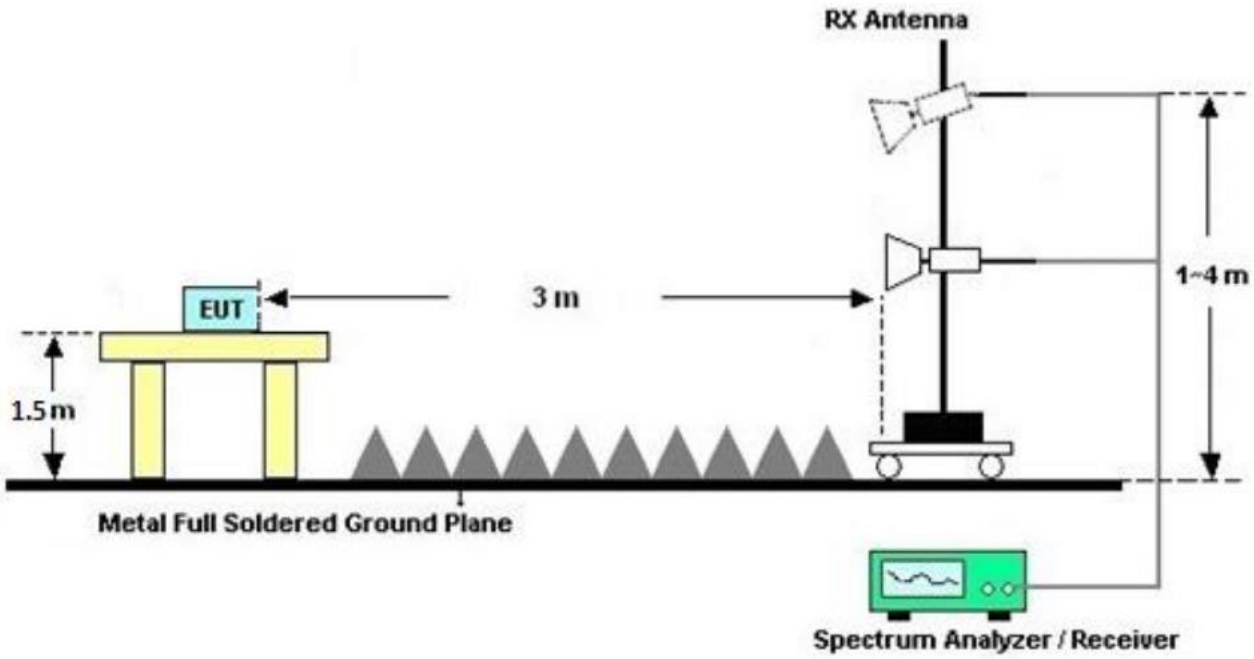
1) For radiated emissions from 9kHz to 30MHz



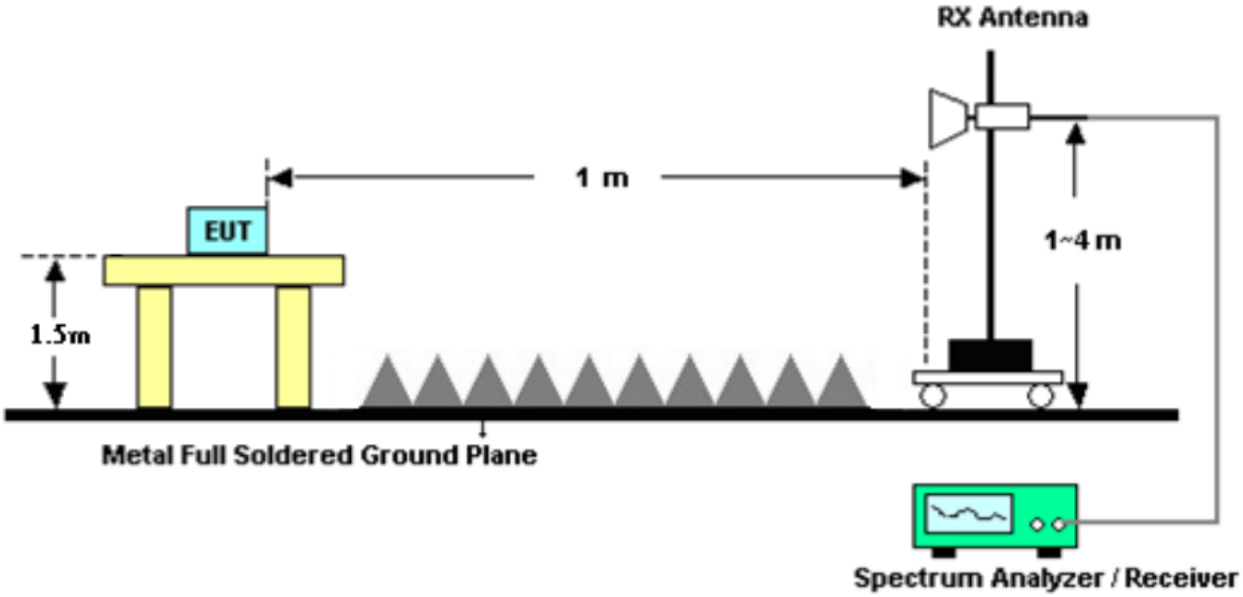
2) For radiated emissions from 30MHz to1GHz



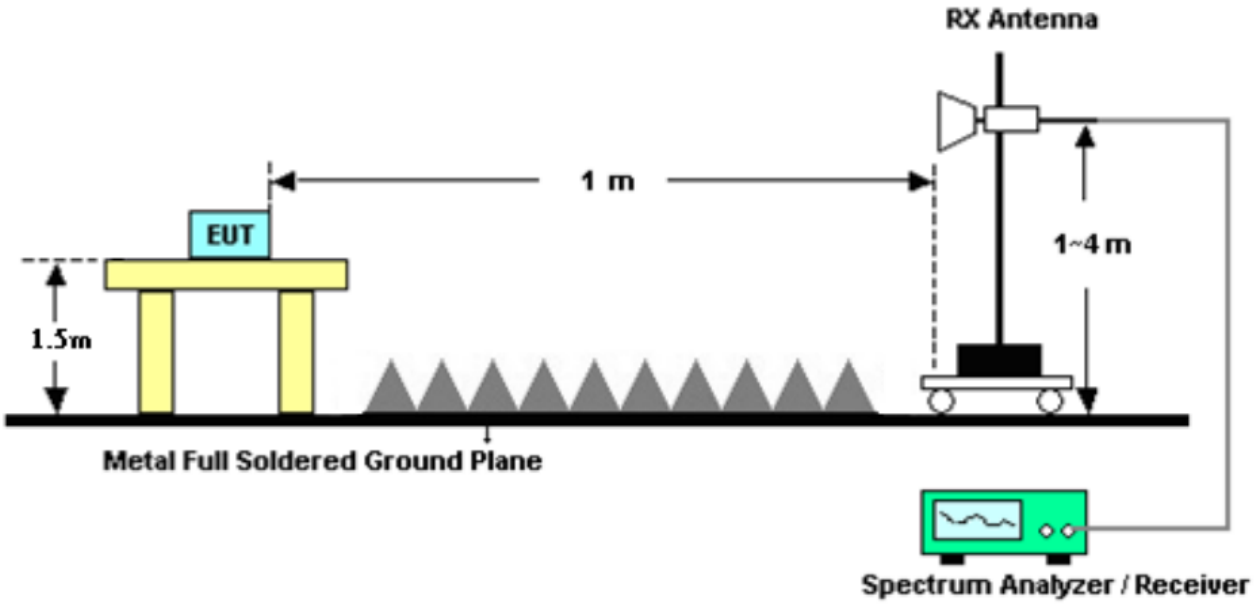
3) For radiated emissions from 1GHz to 18GHz



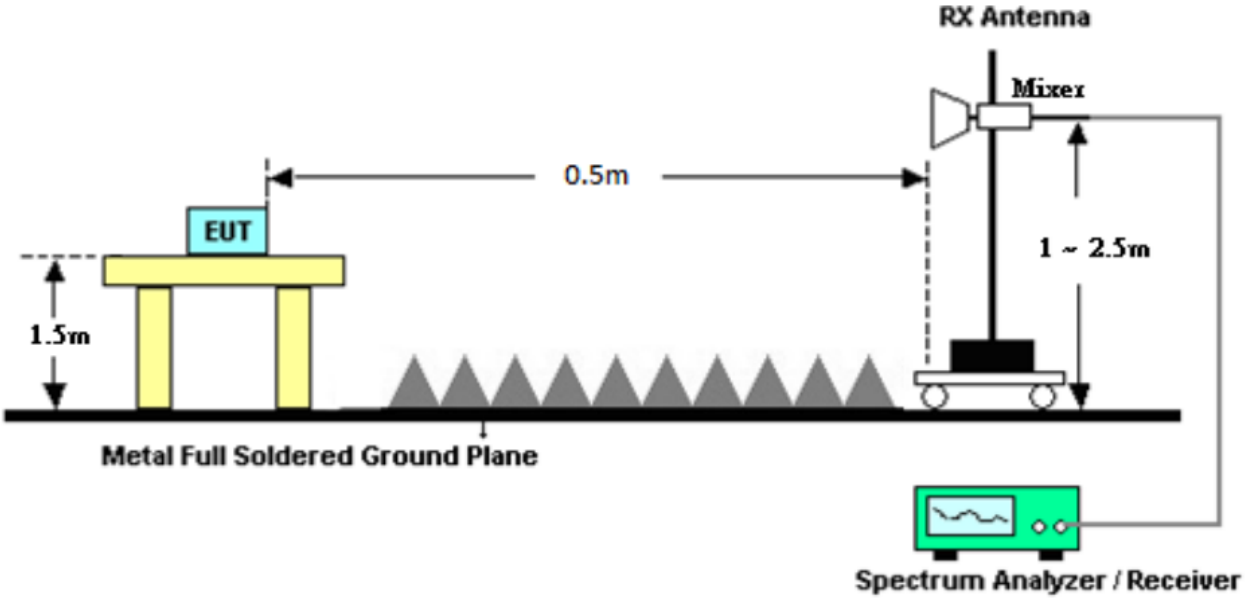
4) For radiated emissions from 18GHz to 40GHz



5) For radiated emissions from 40GHz to 90GHz



6) For radiated emissions above 90GHz



The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

2.5.3. Test Procedure

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.For measurements below 150kHz the resolution bandwidth is set to 200Hz for peak detection measurements or quasi-peak detection measurements. For measurements above 150kHz the resolution bandwidth is set to 9kHz for peak detection measurements or quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

2.5.4. Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

E [dBμV/m] $= U_R$[dB μ V] + A_T[dB] + A_{Factor} [dB/m]; $A_T = L_{Cable\ loss}$ [dB]-G_{preamp} [dB]

$L_{Cable\ loss}$ [dB]=L_{Mixer}[dB]+L_{IF}[dB]

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

When testing above 40GHz:

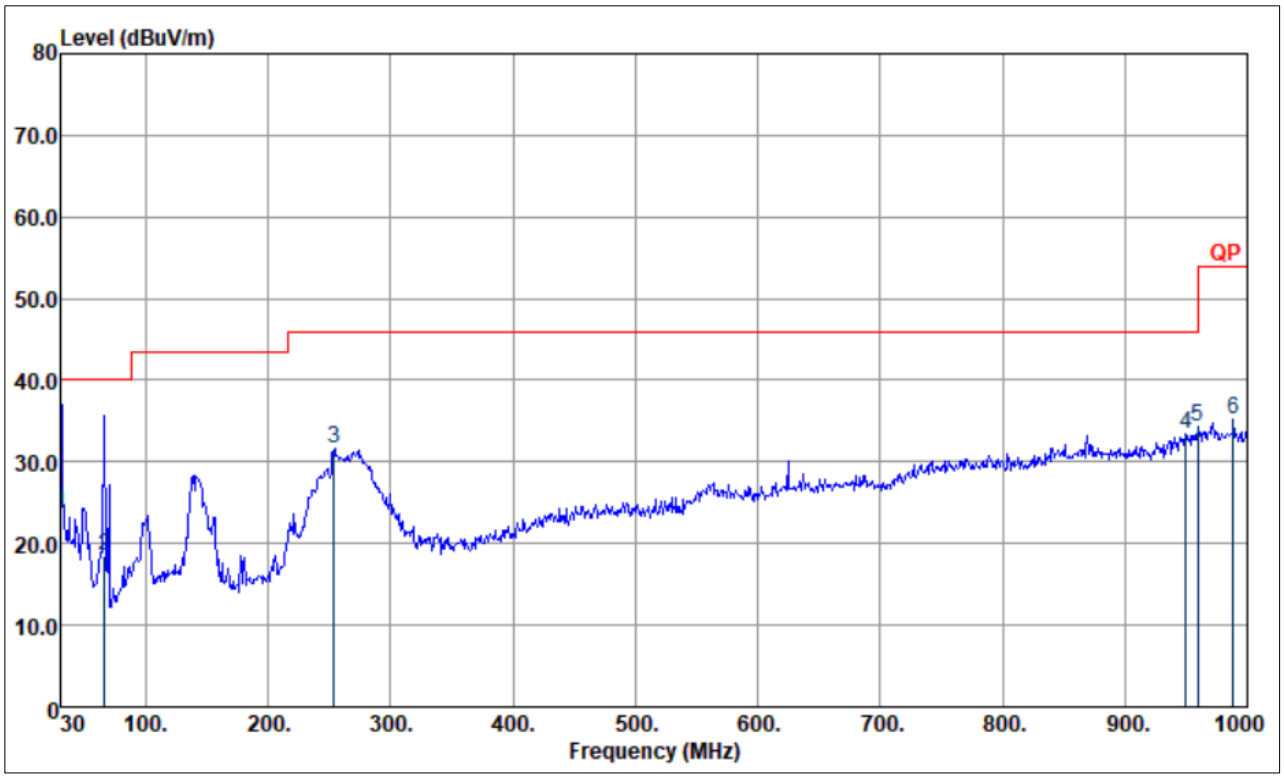
L_{mixer}[dB]: Conversion Loss of Mixer.

L_{IF}[dB]: Cable loss of the RF cable that connects the IF output of the mixer to the IF input of the spectrum.

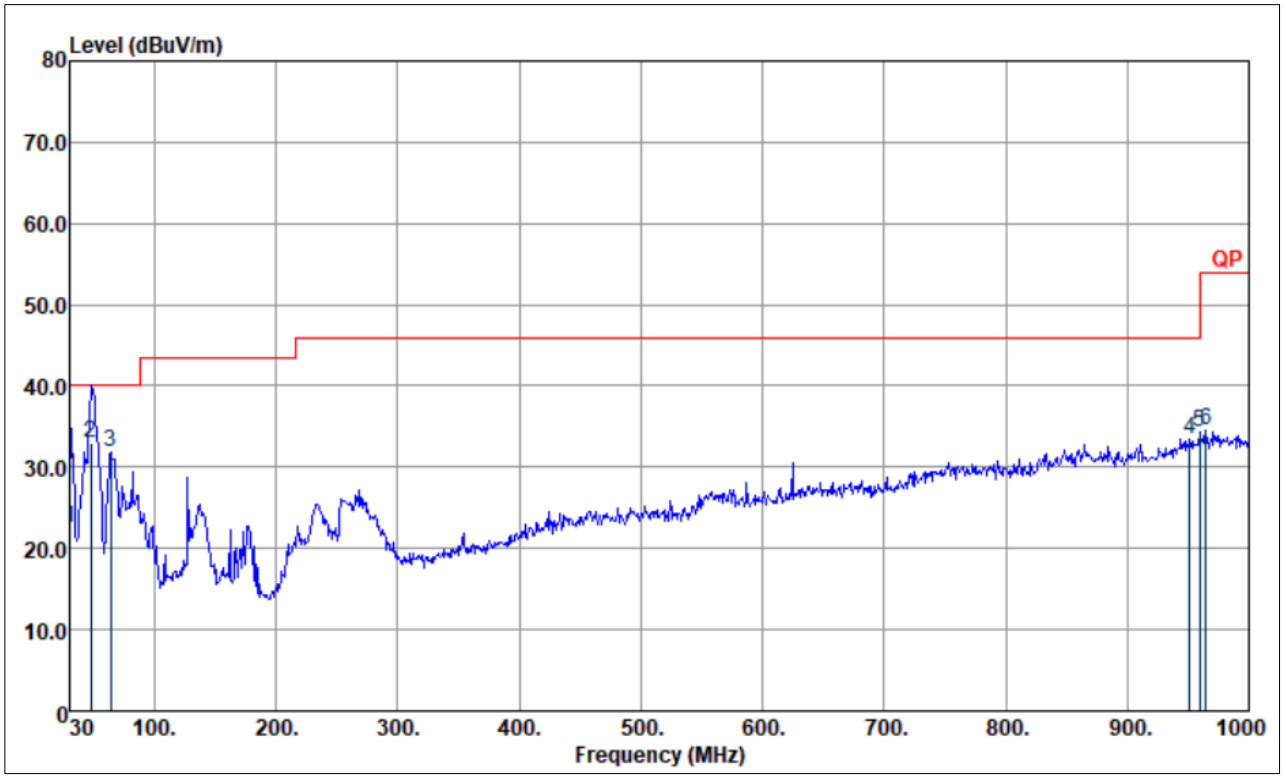
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note 1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note 2: 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.



30MHz to 1GHz, Horizontal



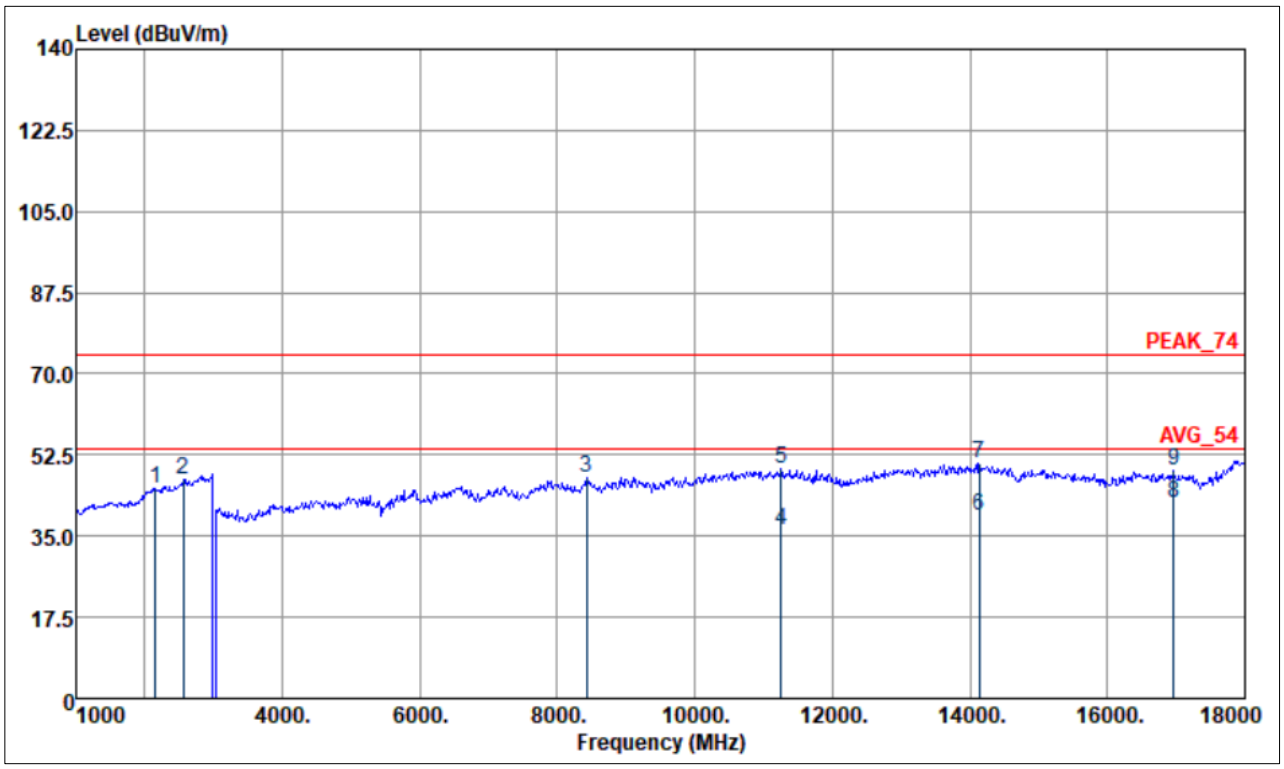
30MHz to 1GHz, Vertical

Frequency	Level	Margin	Limit	Read	Antenna	Path	Ant	Table	Peak	Pol.
			Line	Level	Factor	Loss	Pos	Pos	Avg.	
（MHz)	(dBuV/m)	（dB）	（dBuV/m)	（dBuV)	(dB/m）	（dB）	（cm)	（deg)	(P/Q)	(H/V)
30.00	23.65	-16.35	40	31.04	23.92	-31.31	100	353	QP	H
65.91	18.40	-21.60	40	37.72	11.65	-30.97	150	132	QP	H
253.56	31.56	-14.44	46	42.61	18.50	-29.55	-1	-	P	H
949.60	33.47	-12.53	46	29.46	30.15	-26.14	-	-	PI	H
959.40	34.35	-11.65	46	29.70	30.66	-26.01	-	-	P	H
988.10	35.29	-18.71	54	30.73	30.21	-25.65	-	-	P	H
30.00	22.49	-17.51	40	29.88	23.92	-31.31	100	2	QP	V
47.55	32.99	-7.01	40	48.89	15.20	-31.10	100	5	QP	V
63.48	31.88	-8.12	40	51.34	11.52	-30.98	-	-	PI	V
951.00	33.49	-12.51	46	29.39	30.23	-26.13	-	-	PI	V
959.40	34.39	-11.61	46	29.74	30.66	-26.01	-	-	P	V
964.30	34.50	-19.50	54	29.86	30.59	-25.95	-	-	P	V

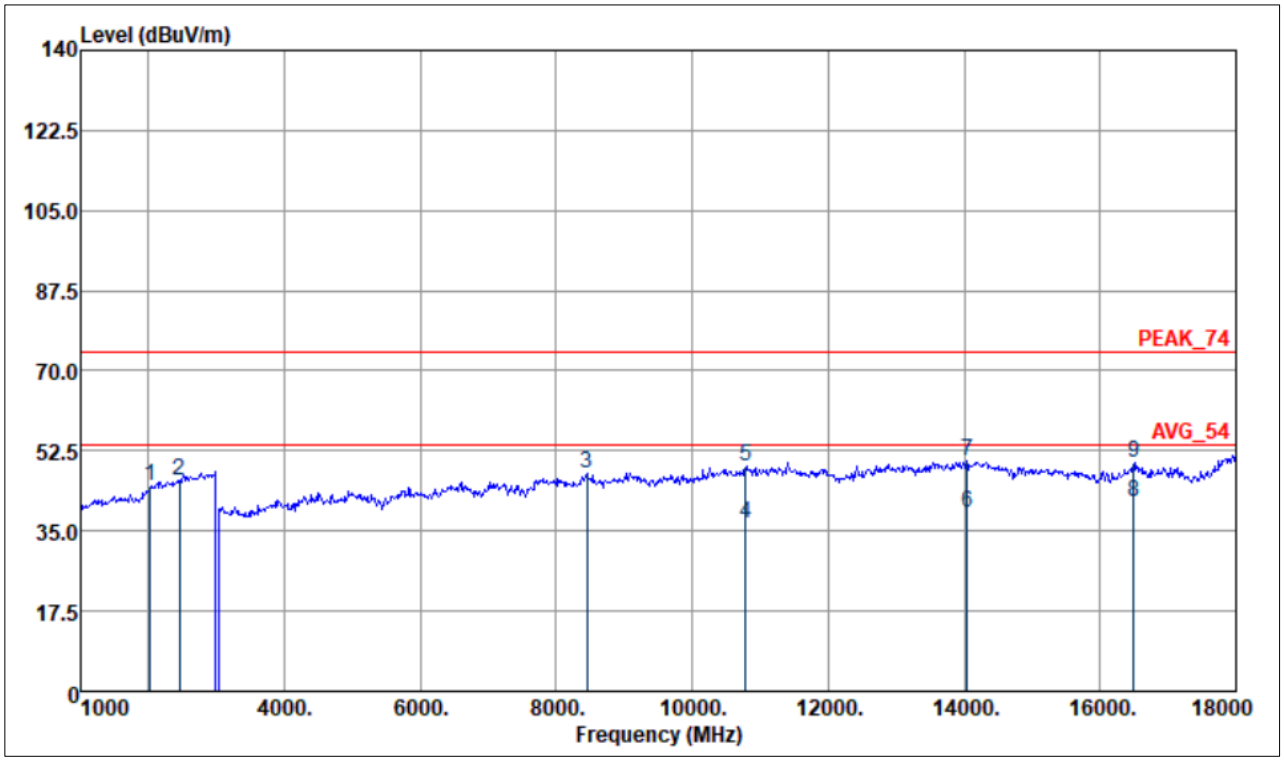
1.No other spurious found.

2.The maximized peak level complies with the average limit, unnecessary to perform an average measurement

3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only



1GHz to 18GHz, Horizontal



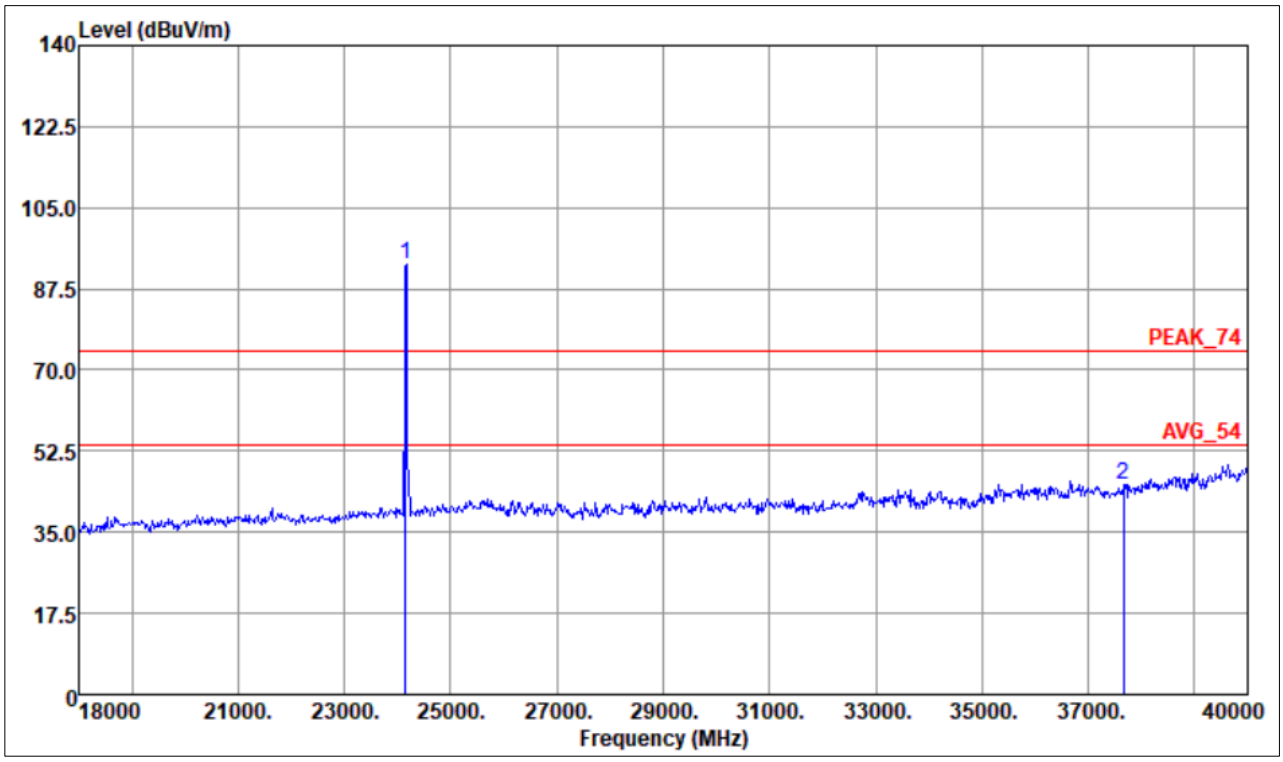
1GHz to 18GHz, Vertical

Frequency	Level	Margin	Limit Line	Read	Antenna	Path	Ant Pos	Table Pos	Peak Avg.	Pol.
（MHz)	(dBuV/m)	（dB）	(dBuV/m)	Level （dBuV)	Factor (dB/m）	Loss （dB）	(cm）	(deg)	(PIA)	(H/V)
2152	45.34	-28.66	74	45.29	27.50	-27.45	.	-	P	H
2564	47.16	-26.84	74	45.73	28.16	-26.73	-	-	P	H
8430	47.65	-26.35	74	53.08	37.22	-42.65	·	.	P	H
11250	36.07	-17.93	54	40.11	39.15	-43.19	100	25	A	H
11250	49.41	-24.59	74	53.45	39.15	-43.19	100	25	P	H
14130	39.31	-14.69	54	41.02	40.63	-42.34	100	71	A	H
14130	50.71	-23.29	74	52.42	40.63	-42.34	100	71	P	H
16965	42.09	-11.91	54	39.81	37.87	-35.59	100	36	A	H
16965	49.28	-24.72	74	47.00	37.87	-35.59	100	36	P	H
2028	44.97	-29.03	74	45.78	26.92	-27.73	-	-	P	V
2450	45.97	-28.03	74	45.10	27.80	-26.93	-	-	P	V
8445	47.51	-26.49	74	52.85	37.28	-42.62	-	-	P	V
10785	36.80	-17.20	54	40.53	39.30	-43.03	100	281	A	V
10785	49.09	-24.91	74	52.82	39.30	-43.03	100	281	P	V
14040	39.01	-14.99	54	41.05	40.54	-42.58	100	32	A	V
14040	50.17	-23.83	74	52.21	40.54	-42.58	100	32	P	V
16500	41.33	-12.67	54	40.03	38.50	-37.20	100	52	A	V
16500	49.80	-24.20	74	48.50	38.50	-37.20	100	52	P	V

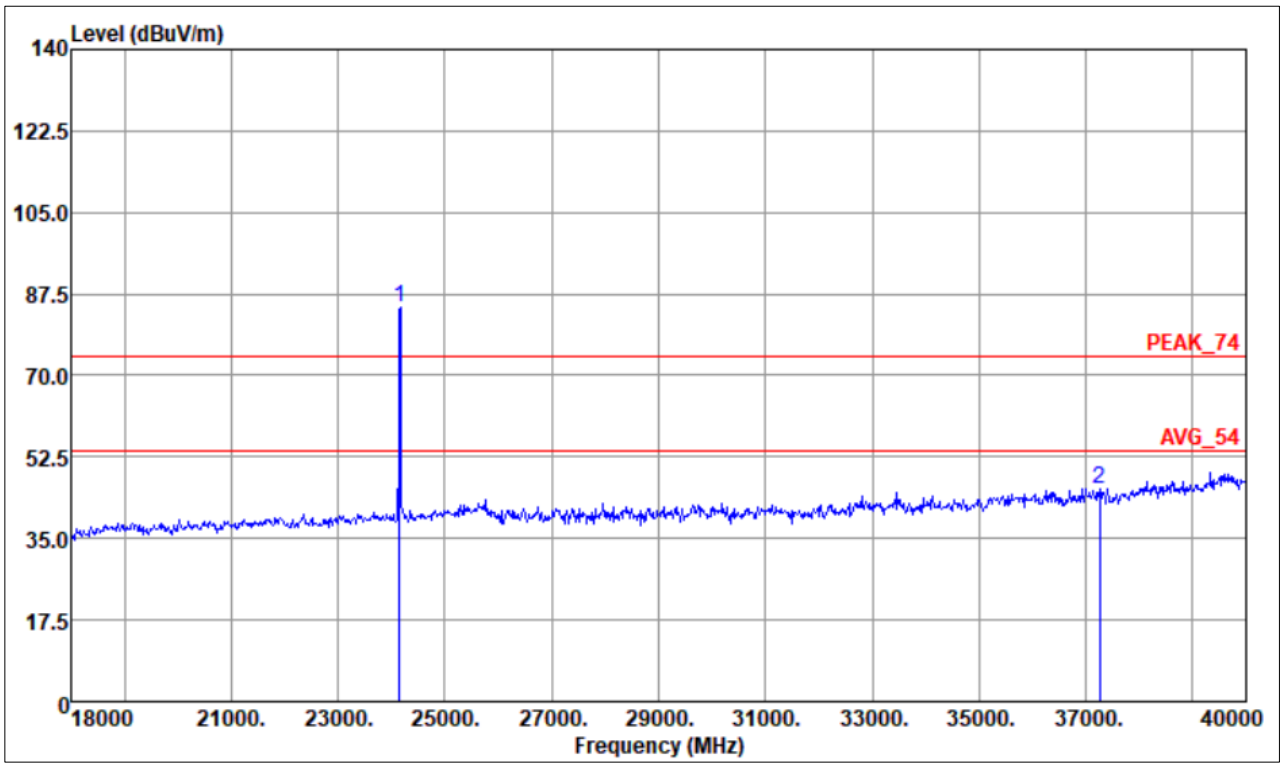
1.No other spurious found.

2.The maximized peak level complies with the average limit, unnecessary to perform an average measurement

3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only



18GHz to 40GHz, Horizontal



18GHz to 40GHz, Vertical

Frequency	Level	Distance extrapolation	Margin	Limit	Read	Antenna Factor	Path Loss	Ant Pos	Table Pos	Peak Avg.	Pol.
（MHz）	(dBuV/m)	Factor (dB)	(dB）	Line (dBuV/m)	Level （dBuV)	(dB/m)	（dB）	（cm）	(deg)	(PIA)	(H/V)
37659.13	45.34	-9.54	-28.66	74	61.28	42.73	-49.13	*	-	P	H
37256.56	45.62	-9.54	-28.38	74	62.12	42.41	-49.37	-	-	P	V

1.No other spurious found.

2.The maximized peak level complies with the average limit, unnecessary to perform an average measurement

3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only

Above 40GHz

Frequency	Level	Distance extrapolation	Margin	Limit	EIRP	Ant	Table	Peak	Pol.
（GHz)	(dBuV/m）	Factor （dB）	（dB）	Line (dBuV/m）	Level (dBm)	Pos（cm）	Pos（deg）	Avg. (PIA)	(H/V
45.80	56.80	-9.54	-17.22	74.00	-38.46	-	-	P	H
49.76	44.25	-9.54	-9.77	54.00	-51.01	-	-	A	H
48.30	54.61	-9.54	-33.36	87.95	-40.65	-	-	P	H
48.30	46.43	-9.54	-21.54	67.95	-48.83	.	.	A	H
60.02	60.26	-9.54	-13.76	74.00	-35.00	·	-	P	H
60.00	48.31	-9.54	-5.71	54.00	-46.95	.	.	A	H
72.45	47.05	-9.54	-40.92	87.95	-48.21	.	.	P	H
72.45	37.91	-9.54	-30.06	67.95	-57.35	-	-	A	H
92.51	62.81	-15.56	-11.19	74.00	-32.43	-	-	P	H
92.03	52.62	-15.56	-1.38	54.00	-42.62	-	-	A	H
96.60	56.66	-15.56	-31.29	87.95	-38.58	-	-	P	H
96.60	48.07	-15.56	-19.88	67.95	-47.17	-	-	A	H
48.68	56.99	-9.54	-17.03	74.00	-38.27	-	-	P	V
49.76	46.19	-9.54	-7.83	54.00	-49.07	-	-	A	V
48.30	57.09	-9.54	-30.88	87.95	-38.17	-	-	P	V
48.30	48.39	-9.54	-19.58	67.95	-46.87	-	-	A	V
60.02	59.07	-9.54	-14.95	74.00	-36.19	-	-	P	V
60.01	48.55	-9.54	-5.47	54.00	-46.71	-	-	A	V
72.45	46.22	-9.54	-41.75	87.95	-49.04	-	-	P	V
72.45	37.59	-9.54	-30.38	67.95	-57.67	·	-	A	V
91.94	62.66	-15.56	-11.34	74.00	-32.58	-	-	P	V
92.08	52.60	-15.56	-1.40	54.00	-42.64	-	-	A	V
96.60	56.32	-15.56	-31.63	87.95	-38.92	-	-	P	V
96.60	48.23	-15.56	-19.72	67.95	-47.01	.	.	A	V

1.No other spurious found.

2.The maximized peak level complies with the average limit, unnecessary to perform an average measurement

3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only

2.6. Restricted Bands

2.6.1. Requirement

According to section 15.245(d), Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)	Field Strength Limitation at 3m Measurement Distance	
			(uV/m)	(dBuV/m)
0.009 - 0.490	2400/F(kHz)	300	10000* 2400/F(KHz)	20log 2400/F(KHz) + 80
0.490 - 1.705	24000/F(kHz)	30	100* 2400/F(KHz)	20log 2400/F(KHz) + 40
1.705 - 30.0	30	30	100*30	20log 30 + 40
30 - 88	100	3	100	20log 100
88 - 216	150	3	150	20log 150
216 - 960	200	3	200	20log 200
Above 960	500	3	500	20log 500

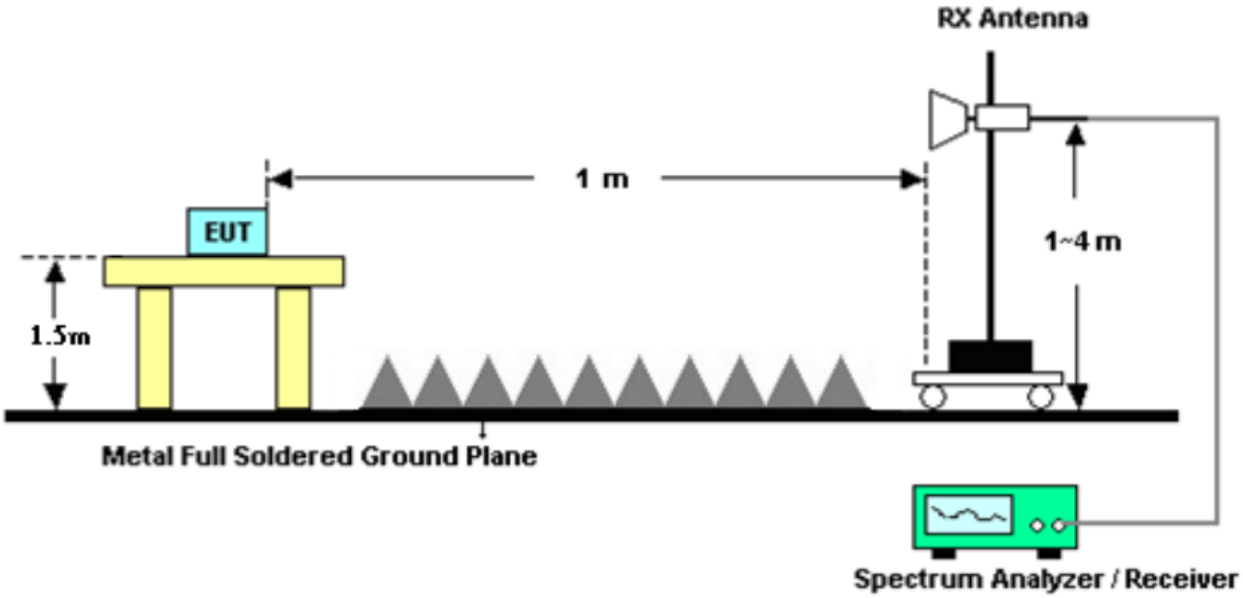
Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions.

Note:

1) In the emission table above, the tighter limit applies at the band edges.
2) Limitation expressed in dBuV/m is calculated by 20log Emission Level(uV/m).
1) If measurement is made at other distance, then F.S Limitation is adjusted by using the formula of $L_{d1} = L_{d2} * (d2/d1)$.
2) Field strength limits are specified at a distance of 3 meters.
3) The provisions in Section 15.35 for limiting peak emissions apply.

2.6.2. Test Description

A.Test Setup:



The EUT is placed on a non-conducting table 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT distance is 1 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

2.6.3. Test Procedure

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

2.6.4. Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the average detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement .

The measurement results are obtained as below:

E [dBμV/m] $= U_R$[dB μ V] + A_T[dB] + A_{Factor} [dB/m]; $A_T = L_{Cable\ loss}$ [dB]-G_{preamp} [dB]

A_T: Total correction Factor except Antenna

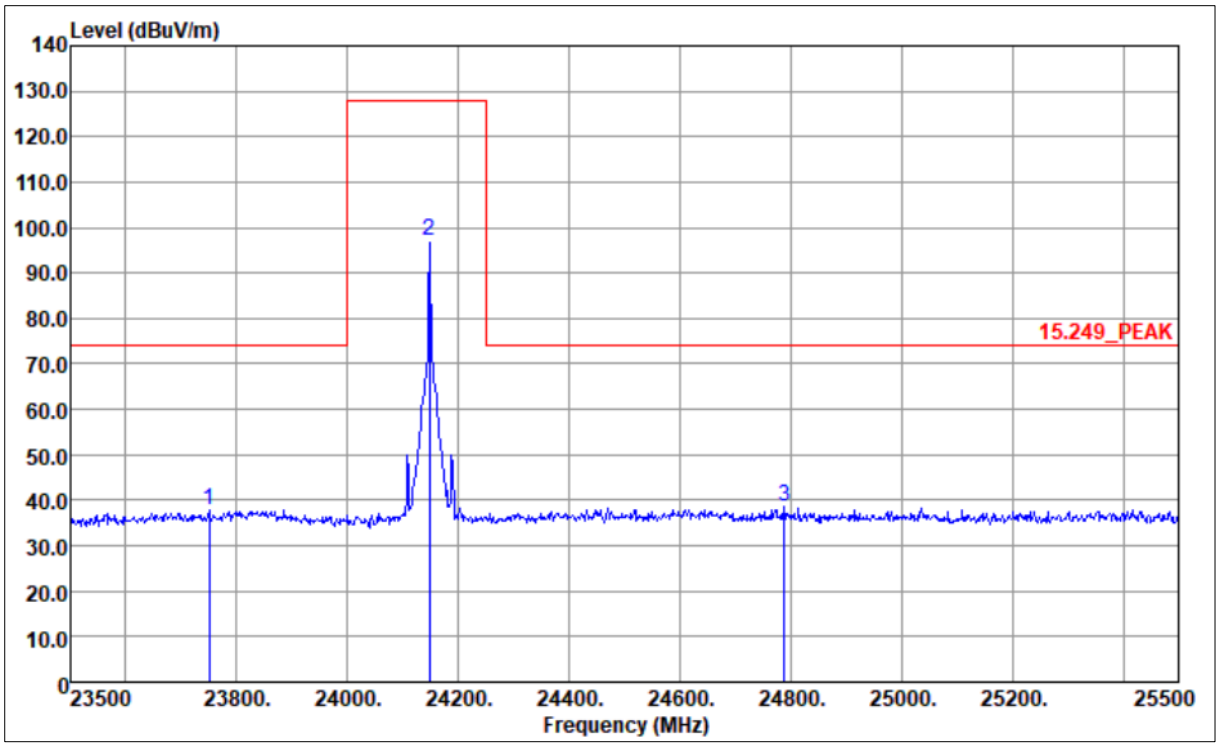
U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

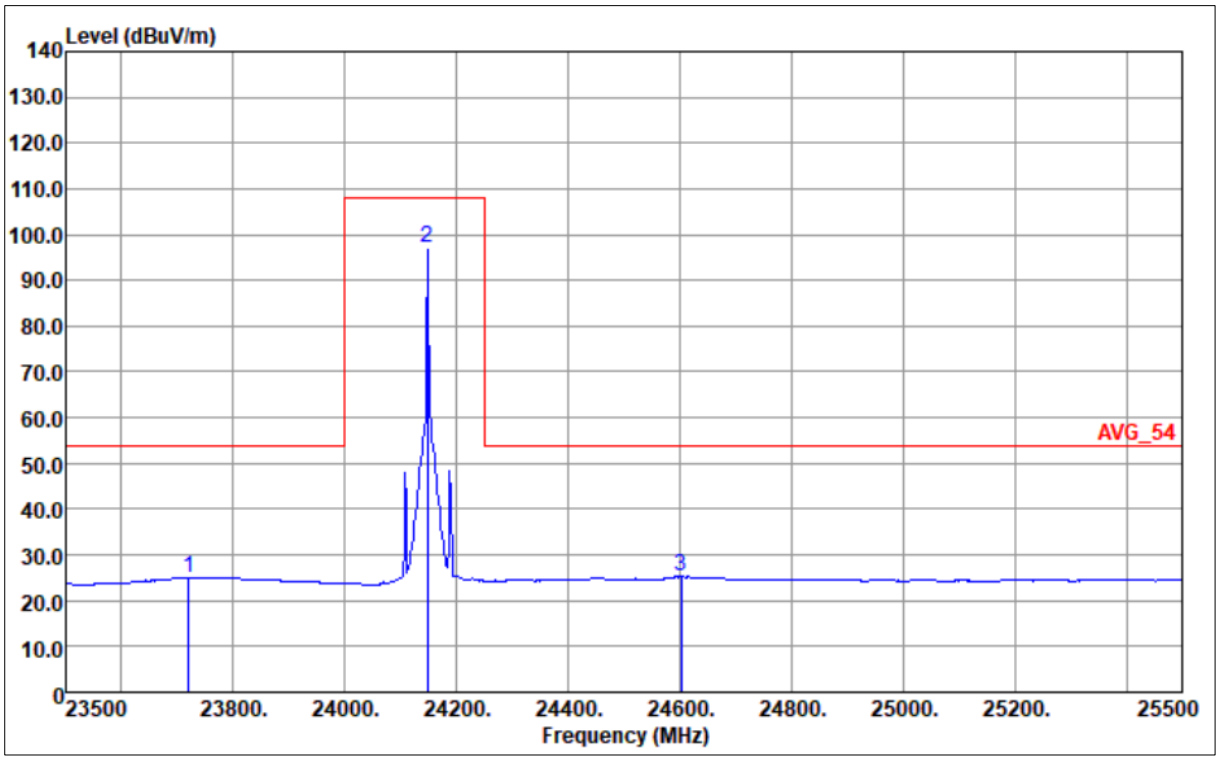
A_{Factor}: Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

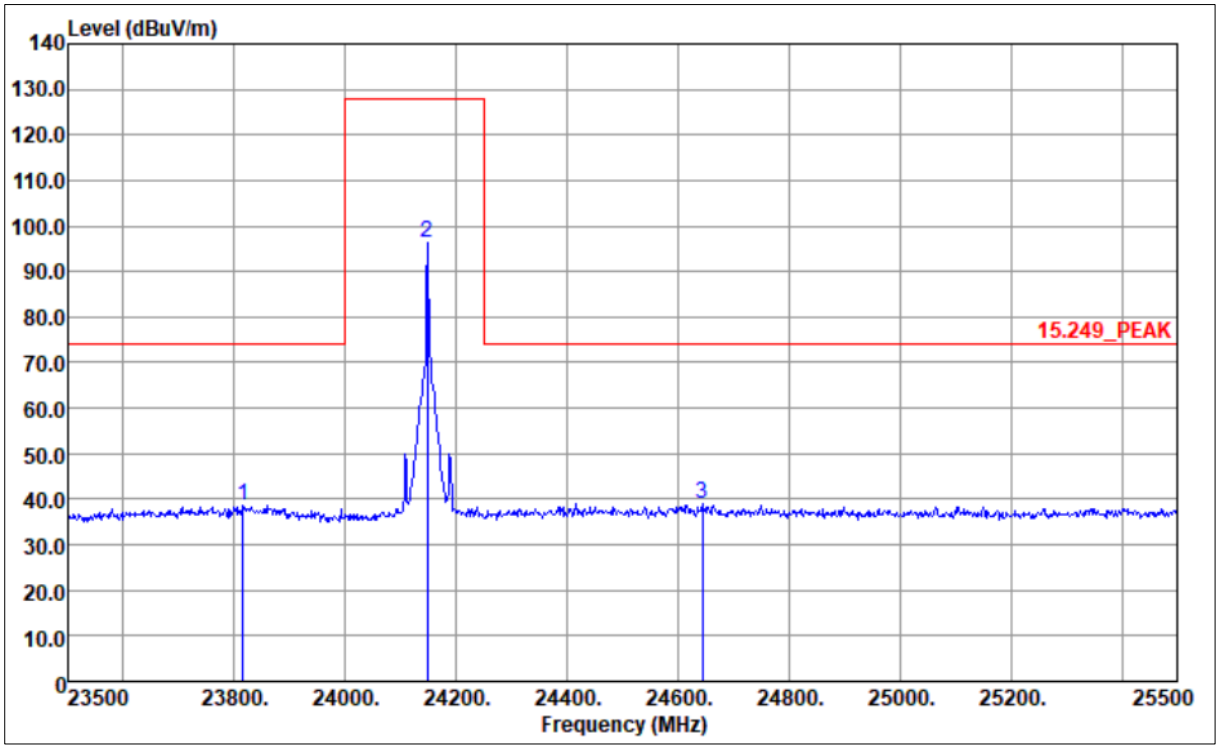
Note 1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.



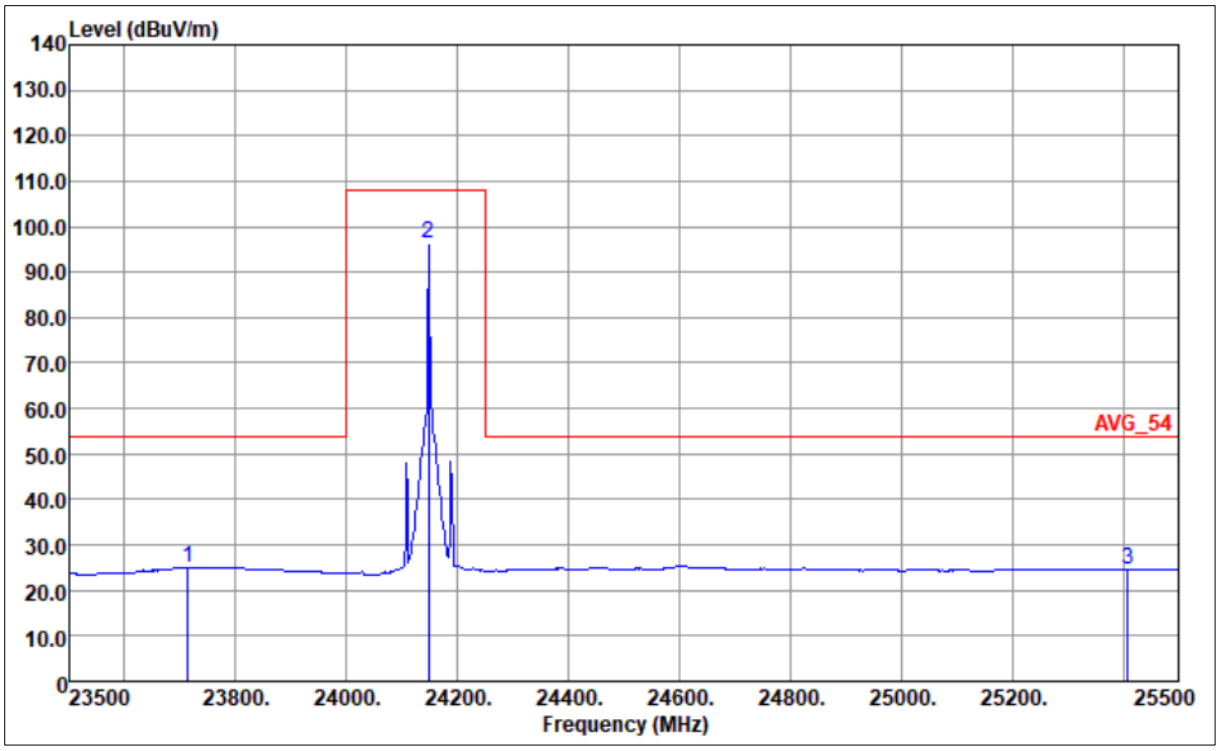
Peak, Horizontal



Average, Horizontal



Peak, Vertical



Average, Vertical

Frequency	Level	Distance extrapolation	Margin	Limit	Read	Antenna	Path	Peak	Pol.
(MHz)	(dBuV/m)	Factor （dB）	（dB)	Line (dBuV/m)	Level （dBuV)	Factor (dB/m）	Loss （dB）	Avg. (PIA)	（HV
23750	37.7	-9.54	-36.3	74	54.61	39.6	-46.97	P	H
24125.5	97.16	-9.54	-30.79	127.95	113.77	39.62	-46.69	P	H
24788	38.48	-9.54	-35.52	74	54.39	39.87	-46.24	P	H
23720	25.05	-9.54	-28.95	54	42	39.58	-46.99	A	H
24125.5	97.1	-9.54	-10.9	108	113.71	39.62	-46.69	A	H
24602	25.21	-9.54	-28.79	54	41.4	39.66	-46.31	A	H
23816	38.59	-9.54	-35.41	74	55.5	39.57	-46.94	P	V
24125.5	96.21	-9.54	-31.74	127.95	112.82	39.62	-46.69	P	V
24644	39.04	-9.54	-34.96	74	55.14	39.73	-46.29	P	V
23714	25.08	-9.54	-28.92	54	42.04	39.57	-46.99	A	V
24125.5	96.5	-9.54	-11.5	108	113.11	39.62	-46.69	A	V
25408	24.73	-9.54	-29.27	54	40.75	39.51	-45.99	A	V

Annex A Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.:

Test Case	Parameter	Uncertainty
Occupied Bandwidth	Power Frequency	5. dB 100.0 kHz
Conducted Emission	Power	3.4 dB
Field Strength of Fundamental	Power	2.2 dB
Radiated Emission and Field Strength of Harmonic	Power	5.5 dB
Restricted Bands	Power Frequency	2.2 dB 11.2 kHz

The measurement uncertainties for all parameters are calculated with an expansion factor (coverage factor) k = 1.96. This means, that the true value is in the corresponding interval with a probability of 95 %.

Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EMI Receiver / Spectrum Analyzer	101603	ESW44	Rohde & Schwarz GmbH & Co.KG	2023-07-01	2024-06-30
SAC/FAR, 10.58 mx 6.38 mx6.00 m	/	Anechoic Chamber 01	GmbH & Co.KG Frankonia	2023-07-01	2024-06-30
Harmonic Mixer 40 - 60 GHz	100178	FS-Z60	Rohde & Schwarz Messgerateba u GmbH	2023-06-01	2024-05-31
Biconical-log-per antenna (30MHz- 3 GHz) with HL 562E biconicals	830547/003	HL 562 ULTRALOG	Rohde & Schwarz GmbH & Co.KG	2023-09-01	2024-08-31
Broadband Amplifier 100 MHz- 18 GHz	/	AMF-7D00101800-30-10P-R	Miteq	2023-06-01	2024-05-31
High Pass Filter	9942012	5HC2700/12750 -1.5-KK	Trilithic	2023-06-01	2024-05-31
Antenna Mast	/	ASP 1.2/1.8-10 kg	Maturo GmbH	N/A	N/A
FAR,8.80m x 4.60m x 4.05m (lxwx h)	P26971-647-001-PRB	Anechoic Chamber 03	Albatross Projects	2023-07-01	2024-06-30
Tunable Band Reject Filter	11	WRD1920/1980-	Wainwright Instruments	2023-06-01	2024-05-31

		5/22-5EESD	GmbH		
Oscilloscope [SA2](Aux)	B021311	TDS 784C	Tektronix	2023-06-01	2024-05-31
Broadband Amplifier 18 GHz- 26 GHz	849785	JS4-18002600-32-5P	Miteq	2023-06-01	2024-05-31
Spectrum Analyzer	103779	FSW 43	Rohde & Schwarz	2023-06-01	2024-05-31
Standard Gain /Pyramidal Horn Antenna 26.5 GHz	00083069	3160-09	EMCO Elektronic GmbH	2023-06-01	2024-05-31
Standard Gain /Pyramidal Horn Antenna (40-60 GHz)	093	SGH-19	Millitech	2023-06-01	2024-05-31
High Pass Filter	09	WHKX 7.0/18G-8SS	Wainwright Instruments GmbH	2023-06-01	2024-05-31
Turn Table 2 m diameter	420/573/99	DS 420S	HD GmbH	N/A	N/A
High Pass Filter	9942011	4HC1600/12750-1.5-KK	Trilithic	2023-06-01	2024-05-31
Notch Filter Ultra Stable	16	WRCD1879.8-0.2/40-10EE	Wainwright Instruments GmbH	2023-06-01	2024-05-31
AC Source	64040001304	Chroma 6404	Chroma ATE INC.	N/A	N/A
Broadband Amplifier 30 MHz-26 GHz	619368	JS4-00102600-42-5A	Miteq	2023-06-01	2024-05-31
Turn Table	/	TT 1.5 WI	Maturo GmbH	N/A	N/A
Biconical-log-per Antenna (30 MHz-3 GHz)	100609	HL 562 ULTRALOG	Rohde & Schwarz GmbH & Co.KG	2023-06-01	2024-05-31
Standard Gain	00086675	3160-10	EMCO	2023-06-01	2024-05-31

/Pyramidal Horn Antenna 40 GHz			Elektronic GmbH		
Bore Sight Antenna Mast	/	MA4985-XP-ET	Innco systems GmbH	2023-07-01	2024-06-30
Air Compressor	612582	JUN-AIR Mod. 6-15	JUN-AIR Deutschland GmbH	N/A	N/A
High Pass Filter	200035008	5HC3500/18000 -1.2-KK	Trilithic	2023-07-01	2024-06-30
Fibre optic link USB 1.1	018	OLS-1 M	Ingenieurburo Scheiba	N/A	N/A
Broadband Amplifier 30 MHz-18 GHz	896037	JS4-00101800-35-5P	Miteq	2023-07-01	2024-06-30
Antenna Mast (pneumatic polarisation)	620/37	AS 620 P	HD GmbH	N/A	N/A
EUT Tilt Device (Rohacell)	TD1.5-10kg/024/3790709	TD1.5-10kg	Maturo GmbH	N/A	N/A
Controller for bore sight mast SAC	CO3000/967/39371016/L	Innco Systems	innco systems GmbH	N/A	N/A
Antenna Mast	/	CO3000	Maturo GmbH	N/A	N/A
Broadband Amplifier 25 MHz-18 GHz	2035324	PAS 2.5-10 kg	Miteq	2023-06-01	2024-05-31
Tuneable Notch Filter	20	AFS42-00101800-25-S-42	Wainwright Instruments GmbH	2023-06-01	2024-05-31
Antenna Mast 4m	AM4.0/180/11920513	WRCA800/960-0.2/40-6EEK	Maturo GmbH	N/A	N/A
Double-ridged horn	102444	AM 4.0	Rohde & Schwarz	2023-09-01	2024-08-31
Temperature	5856600215	HF 907	Votsch	2023-05-23	2024-05-22

Chamber Votsch 03	0010				
Antenna(60GHz to 90GHz)	Quinstar	QWH-EPRR 00	137200100	2023-05-23	2024-05-22
Antenna(90GHz to 140GHz)	Quinstar	QWH-EPRR 00	101150080	2023-05-23	2024-05-22
Harmonic Mixer(60GHz to 90GHz)	R&S	FSZ-90	101811	2023-06-01	2024-05-31
Harmonic Mixer(90GHz to 140GHz)	R&S	PRG FS-Z140	101128	2023-06-01	2024-05-31
Loop Antenna	R&S	HFH2-Z2	100315	2023-05-23	2024-05-22

4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2024-03-14	2025-03-13
LISN	812744	NSLK 8127	Schwarzbeck	2024-03-14	2025-03-13
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2023-07-25	2024-07-24
RF Coaxial Cable(DC-100MHz)	MRE04	BNC	Qualwave	N/A	N/A

5. Test Software Utilized

Model	Version Number
EMC32 Measurement Software	10.60.10
INNCO Mast Controller	1.02.62
MATURO Mast Controller	12.19
MATURO Turn-Table Controller	30.10
INNCO Mast Controller	1.02.62
Conducted Emissions: Software	10.60.20

END OF REPORT