



MRT Technology (Taiwan) Co., Ltd
Phone: +886-3-3288388
Fax: +886-3-3288918
Web: www.mrt-cert.com

Report No.: 2505TWA101-U2
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Issue Date: 2025-12-31

MEASUREMENT REPORT

C2PC

FCC ID: RN489896162-B0129

APPLICANT: SHUN HU Technology Co., Ltd.

Application Type: Certification

Product: 2.4G RF module

Model No.: B0129

FCC Classification: (DTS) Digital Transmission System

FCC Rule Part(s): Part 15.247

Test Procedure(s): ANSI C63.10-2020

Received Date: June 23, 2025

Test Date: July 16 ~ 23, 2025

Tested By : Eric Lin
(Eric Lin)

Reviewed By : Paddy Chen
(Paddy Chen)

Approved By : Chenz Ker
(Chenz Ker)



The test results only relate to the tested sample.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2505TWA101-U2	1.0	Original Report	2025-12-31	

Note:

1. This time, the Dipole(FPCB) / Helical Antenna is added, so the FCC C2PC is executed.
2. FCC Original Grant Date: 07/30/2021, FCC ID: RN489896162-B0129.

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General Information

Applicant	SHUN HU Technology Co., Ltd.
Applicant Address	No.21, Zhonggong Rd., Xihu Township, Changhua County 514, Taiwan
Manufacturer	SHUN HU Technology Co., Ltd.
Manufacturer Address	No.21, Zhonggong Rd., Xihu Township, Changhua County 514, Taiwan
Test Site	MRT Technology (Taiwan) Co., Ltd
Test Site Address	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
MRT FCC Registration No.	291082
FCC Rule Part(s)	Part 15.247
Test Device Serial No.	#1 ☐ Production ☒ Pre-Production ☐ Engineering

Test Facility / Accreditations

1. MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.
2. MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.
3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Canada, EU and TELEC Rules.

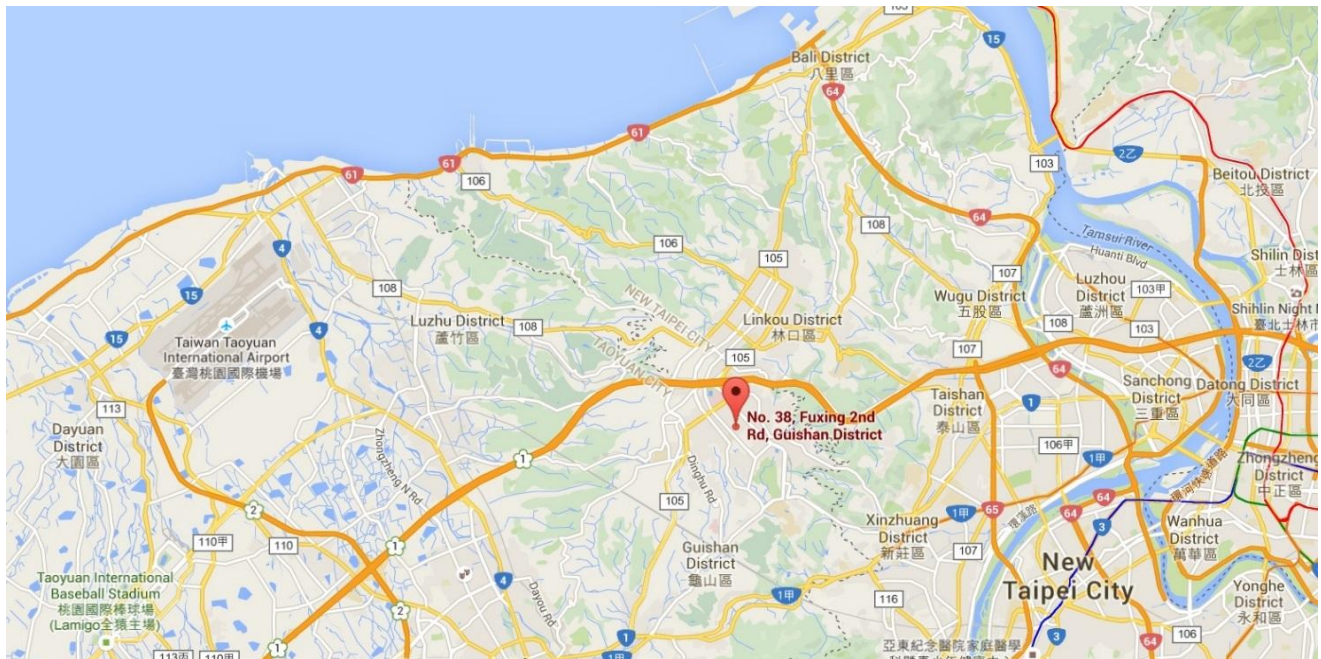
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	2.4G RF module
Model No.	B0129
Brand Name:	JUUKO
Supports Radios Spec.	2.4GHz

Note: This product has an external antenna version and a Internal antenna version. The difference is only in the Ipex connector, and other hardware is the same.

2.2. Product Specification Subjective to this Standard

Operating Frequency	2401~2478MHz
Type of modulation	CSS

2.3. Test Mode

Test Mode	Mode 1: Transmit - 2.4GHz with Dipole Antenna Mode 2: Transmit – 2.4GHz with Dipole(FPCB) Antenna Mode 3: Transmit – 2.4GHz with Helical Antenna
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Note: Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.

2.4. Operation Frequency / Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency
902	2401.0	931	2415.5	960	2430.0
903	2401.5	932	2416.0	961	2430.5
904	2402.0	933	2416.5	962	2431.0
905	2402.5	934	2417.0	963	2431.5
906	2403.0	935	2417.5	964	2432.0
907	2403.5	936	2418.0	965	2432.5
908	2404.0	937	2418.5	966	2433.0
909	2404.5	938	2419.0	967	2433.5
910	2405.0	939	2419.5	968	2434.0
911	2405.5	940	2420.0	969	2434.5
912	2406.0	941	2420.5	970	2435.0
913	2406.5	942	2421.0	971	2435.5
914	2407.0	943	2421.5	972	2436.0
915	2407.5	944	2422.0	973	2436.5
916	2408.0	945	2422.5	974	2437.0
917	2408.5	946	2423.0	975	2437.5
918	2409.0	947	2423.5	976	2438.0
919	2409.5	948	2424.0	977	2438.5
920	2410.0	949	2424.5	978	2439.0
921	2410.5	950	2425.0	979	2439.5
922	2411.0	951	2425.5	980	2440.0
923	2411.5	952	2426.0	981	2440.5
924	2412.0	953	2426.5	982	2441.0
925	2412.5	954	2427.0	983	2441.5
926	2413.0	955	2427.5	984	2442.0
927	2413.5	956	2428.0	985	2442.5
928	2414.0	957	2428.5	986	2443.0
929	2414.5	958	2429.0	987	2443.5
930	2415.0	959	2429.5	988	2444.0

Channel	Frequency	Channel	Frequency	Channel	Frequency
989	2444.5	1018	2459.0	1047	2473.5
990	2445.0	1019	2459.5	1048	2474.0
991	2445.5	1020	2460.0	1049	2474.5
992	2446.0	1021	2460.5	1050	2475.0
993	2446.5	1022	2461.0	1051	2475.5
994	2447.0	1023	2461.5	1052	2476.0
995	2447.5	1024	2462.0	1053	2476.5
996	2448.0	1025	2462.5	1054	2477.0
997	2448.5	1026	2463.0	1055	2477.5
998	2449.0	1027	2463.5	1056	2478.0
999	2449.5	1028	2464.0	--	--
1000	2450.0	1029	2464.5	--	--
1001	2450.5	1030	2465.0	--	--
1002	2451.0	1031	2465.5	--	--
1003	2451.5	1032	2466.0	--	--
1004	2452.0	1033	2466.5	--	--
1005	2452.5	1034	2467.0	--	--
1006	2453.0	1035	2467.5	--	--
1007	2453.5	1036	2468.0	--	--
1008	2454.0	1037	2468.5	--	--
1009	2454.5	1038	2469.0	--	--
1010	2455.0	1039	2469.5	--	--
1011	2455.5	1040	2470.0	--	--
1012	2456.0	1041	2470.5	--	--
1013	2456.5	1042	2471.0	--	--
1014	2457.0	1043	2471.5	--	--
1015	2457.5	1044	2472.0	--	--
1016	2458.0	1045	2472.5	--	--
1017	2458.5	1046	2473.0	--	--

2.5. Test Configuration

This device was tested per the guidance of ANSI C63.10-2020. ANSI C63.10-2020 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.6. Test Software

The test utility software used during testing was "Control Pro XI-H Install SX1280_Test.exe".

2.7. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.8. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION of TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2020), and the guidance provided in KDB 558074 D01v05r02 were used in the measurement of the **2.4G RF module**.

Deviation from measurement procedure.....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 9'x4'x3' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment which determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2020.

Line conducted emissions test results are shown in Section 7.8.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, which produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

Radiated emissions test results are shown in Section 7.6 & 7.7 .

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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.”

- The antenna of the **2.4G RF module**, is permanently attached.
- There are no provisions for connection to an external antenna.

Conclusion:

The EUT unit complies with the requirement of §15.203.

External Antenna List:

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Cortec	AN2400-57D38SM	Dipole	2.0dBi
2	Wellshow	AR001WSW0101A	Dipole	2.0dBi
3	Dongguan Yizong	MP.54.2400.228	Dipole	2.0dBi
4	Dongguan Yizong	PF.1002.173	Dipole(FPCB)	2.0dBi
5	BAT WIRELESS	BW2.4SNX14-3W5	Helical	2.0dBi

Note: Because antennas 1 and 2 have the same type and gain, the AN2400-57D38SM was chosen for testing. All other antennas were individually evaluated for radiation item.

Internal Antenna List:

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	JUUKO	B0129	PCB	2.0dBi

5. TEST EQUIPMENT CALIBRATION DATE

Radiated Emissions – AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2026/4/16
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00086	1 year	2026/11/13
Broadband Hornantenna	SCHWARZBECK	BBHA 9120D	MRTTWA00003	1 year	2026/2/11
Broadband Preamplifier	SCHWARZBECK	BBV 9718	MRTTWA00005	1 year	2026/2/11
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2026/3/27
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2026/3/20
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2026/3/4
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2026/5/20
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00010	1 year	2026/6/13
Cable	Rosnol	K1K50-UP0264- K1K50-4M	MRTTWE00012	1 year	2026/6/13
Temperature/Humidity Meter	TFA	35.1083	MRTTWA00032	1 year	2026/6/5

Conducted Test Equipment – SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2026/10/20
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTTWA00074	1 year	2026/7/14
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00015	1 year	2026/3/11

Test Software

Software	Version	Function
e3	9.160520a	EMI Test Software
EMI	V3	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Conducted Emission- Power Line
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.15MHz~30MHz: $\pm 2.53\text{dB}$
Conducted Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.3dB
Radiated Spurious Emission
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 9kHz~30MHz: $\pm 3.92\text{dB}$ 30MHz~1GHz: $\pm 4.25\text{dB}$ 1GHz~18GHz: $\pm 4.40\text{dB}$ 18GHz~40GHz: $\pm 4.45\text{dB}$

7. TEST RESULT

7.1. Summary

Product Name: 2.4G RF module

FCC Classification: (DTS) Digital Transmission System

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	6dB Bandwidth	$\geq 500\text{kHz}$	Conducted	Pass	Section 7.2
15.247(b)(3)	Output Power	$\leq 30.00\text{dBm}$		Pass	Section 7.3
15.247(e)	Power Spectral Density	$\leq 8.00\text{dBm}/3\text{kHz}$		Pass	Section 7.4
15.247(d)	Out-of-Band Emissions	Conducted $\geq 20\text{dBc}$		Pass	Section 7.5
15.205 15.209	Spurious Emission	< FCC 15.209 limits	Radiated	Pass	Section 7.6
15.205 15.209	Band Edge Measurement	$\leq 74\text{dBuV/m(Peak)}$ $\leq 54\text{dBuV/m(Average)}$		Pass	Section 7.7
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.8

Notes:

- Determining compliance is based on the test results met the regulation limits or requirements declared by clients, and the test results don't take into account the value of measurement uncertainty.
- All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
- The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

7.2. 6dB Bandwidth Measurement

7.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

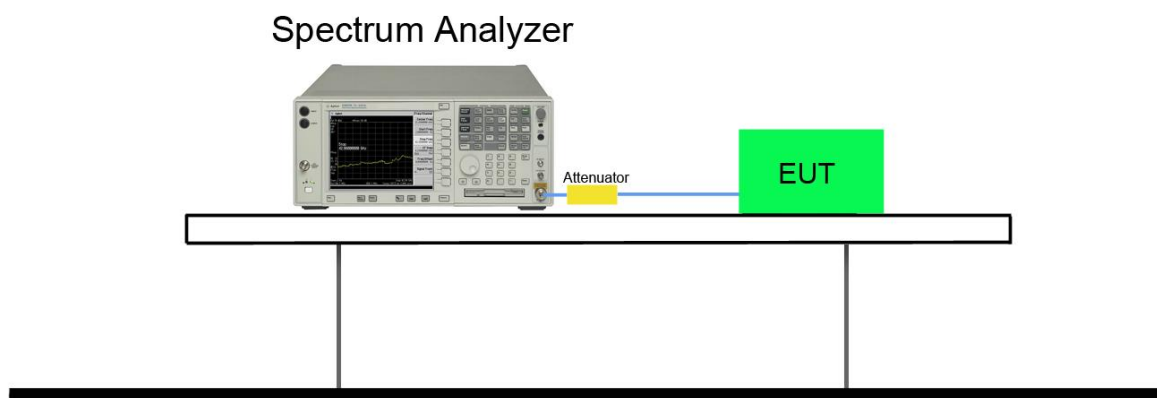
7.2.2. Test Procedure used

KDB 558074 D01v05r02- Section 8.2 Option 2

7.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 6$. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace was allowed to stabilize

7.2.4. Test Setup



7.2.5. Test Result

Note: Please refer to original report 2102TWA101-U1.

(FCC Original Grant Date: 07/30/2021, FCC ID: RN489896162-B0129)

7.3. Output Power Measurement

7.3.1. Test Limit

The maximum out power shall be less 1 Watt (30dBm).

7.3.2. Test Procedure Used

KDB 558074 D01v05r02 - Section 8.3

7.3.3. Test Setting

Peak Power Measurement

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

Average Power Measurement

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.3.4. Test Setup



7.3.5. Test Result of Output Power

Test Mode	Channel No.	Frequency (MHz)	Peak Power (dBm)	EIRP (dBm)	Peak Power Limit (dBm)	EIRP Limit (dBm)
TX	902	2401	9.307	11.307	< 30	< 36
	979	2439.5	9.480	11.480	< 30	< 36
	1056	2478	7.147	9.147	< 30	< 36

Note1: Output power =Reading value on power meter + cable loss.

Note2: Antenna Gain: 2.0dBi.

7.4. Power Spectral Density Measurement

7.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

7.4.2. Test Procedure Used

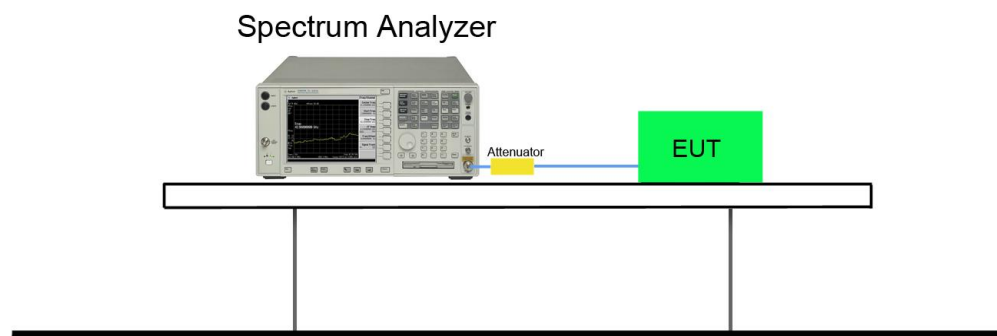
KDB 558074 D01v05r02 - Section 8.4 Method PKPSD

7.4.3. Test Setting

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to: 3 kHz.
- d) Set the VBW $\geq 3 \times$ RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.

7.4.4. Test Setup



7.4.5. Test Result

Note: Please refer to original report 2102TWA101-U1.

(FCC Original Grant Date: 07/30/2021, FCC ID: RN489896162-B0129)

7.5. Out-of-Band Spurious Emissions Emissions Measurement

7.5.1. Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on RF conducted measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

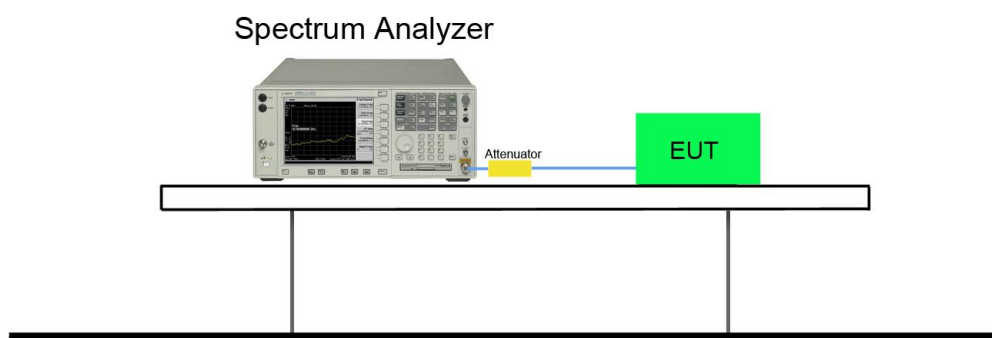
7.5.2. Test Procedure Used

ANSI C63.10- Section 11.11

7.5.3. Test Settling

- (a) Set instrument center frequency to DTS channel center frequency
- (b) Set the span to ≥ 1.5 times the DTS bandwidth
- (c) Set the RBW = 100 kHz
- (d) Set the VBW $\geq 3 \times$ RBW
- (e) Detector = peak
- (f) Sweep time = auto couple
- (g) Trace mode = max hold
- (h) Allow trace to fully stabilize

7.5.4. Test Setup



7.5.5. Test Result

Note: Please refer to original report 2102TWA101-U1.

(FCC Original Grant Date: 07/30/2021, FCC ID: RN489896162-B0129)

7.6. Radiated Spurious Emission Measurement

7.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.6.2. Test Procedure Used

ANSI C63.10- Section 11.12.2.3 (quasi-peak measurements)

ANSI C63.10- Section 11.12.2.4 (peak power measurements)

ANSI C63.10- Section 11.12.2.5 (average power measurements)

7.6.3. Test Setting

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple

6. Trace mode = max hold

7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. RBW = 1MHz

3. VBW $\geq 1/T$

4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode

5. Detector = Peak

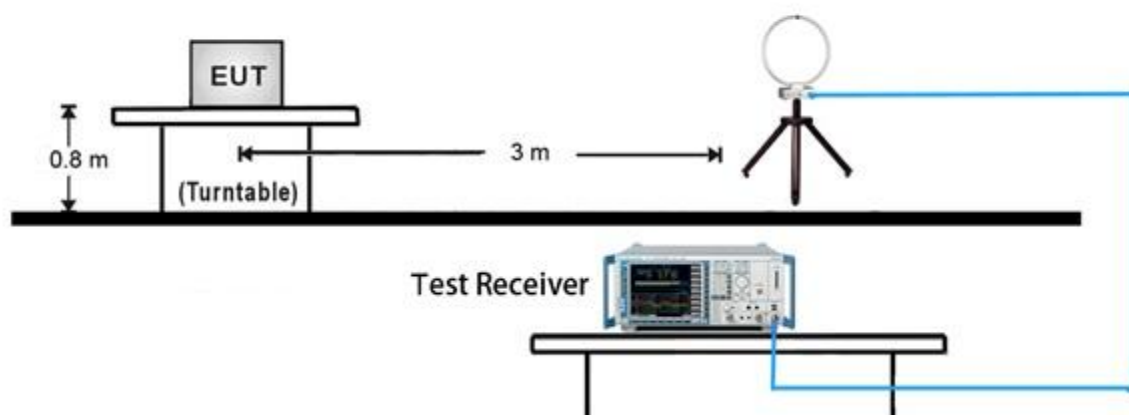
6. Sweep time = auto

7. Trace mode = max hold

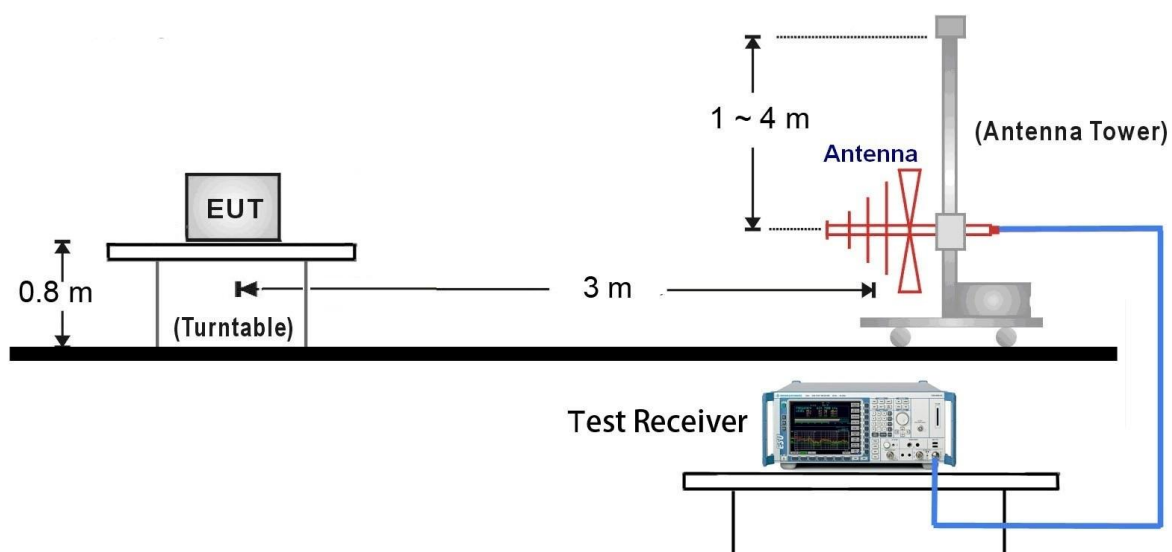
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.6.4. Test Setup

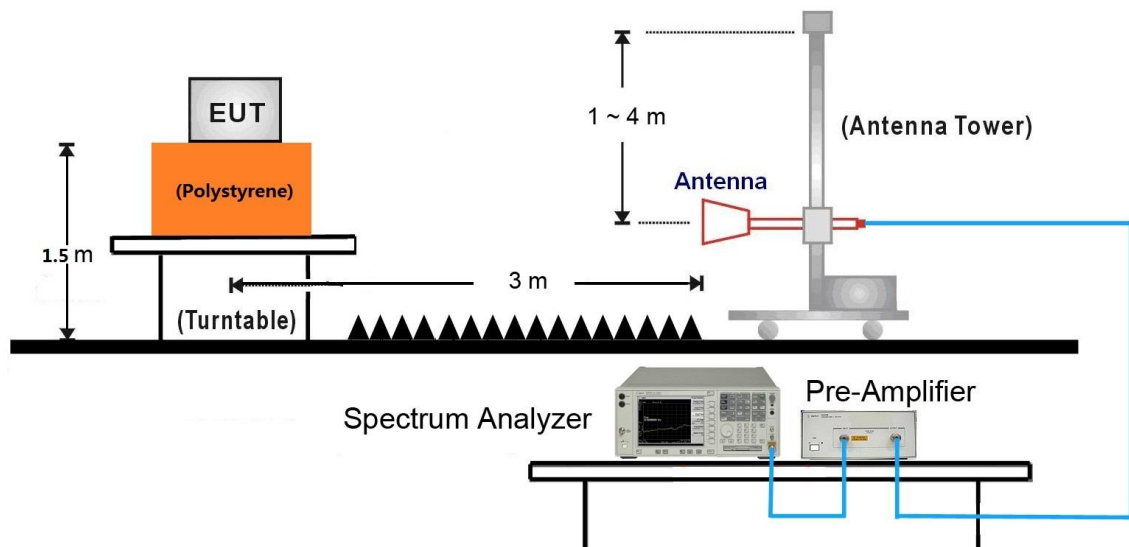
9kHz ~ 30MHz Test Setup:



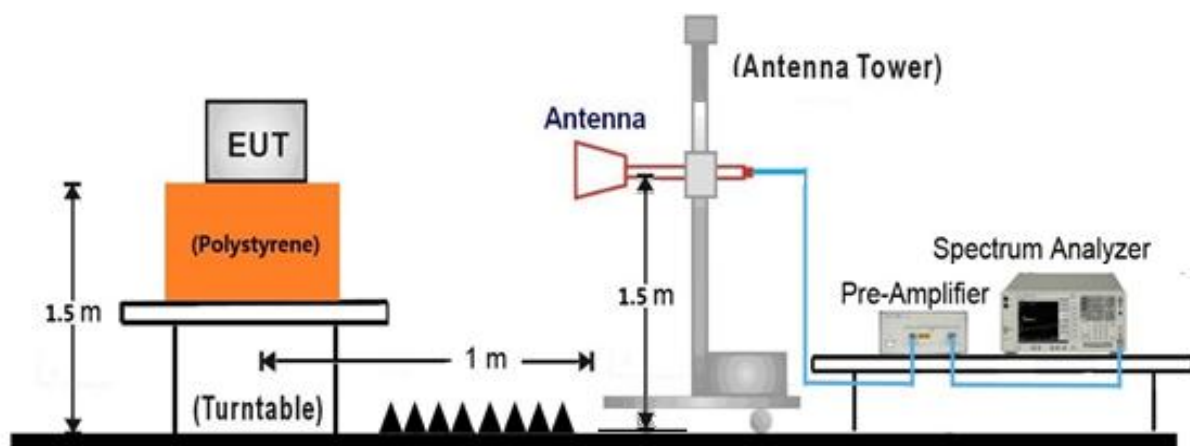
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:

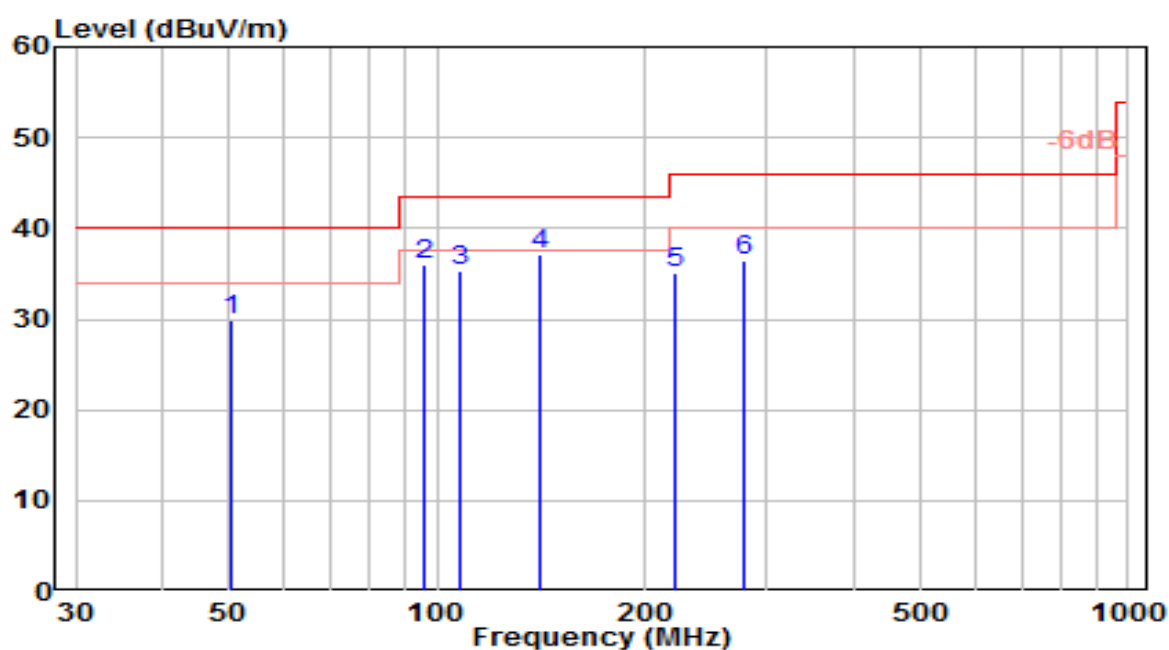


18GHz ~25GHz Test Setup:



7.6.5. Test Result

EUT	2.4G RF Module	Date of Test	2025-09-02
Factor	VULB 9162	Temp. / Humidity	23°C /61%
Polarity	Horizontal	Site / Test Engineer	AC1 / Todd
Test Mode	TX_2439.5MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

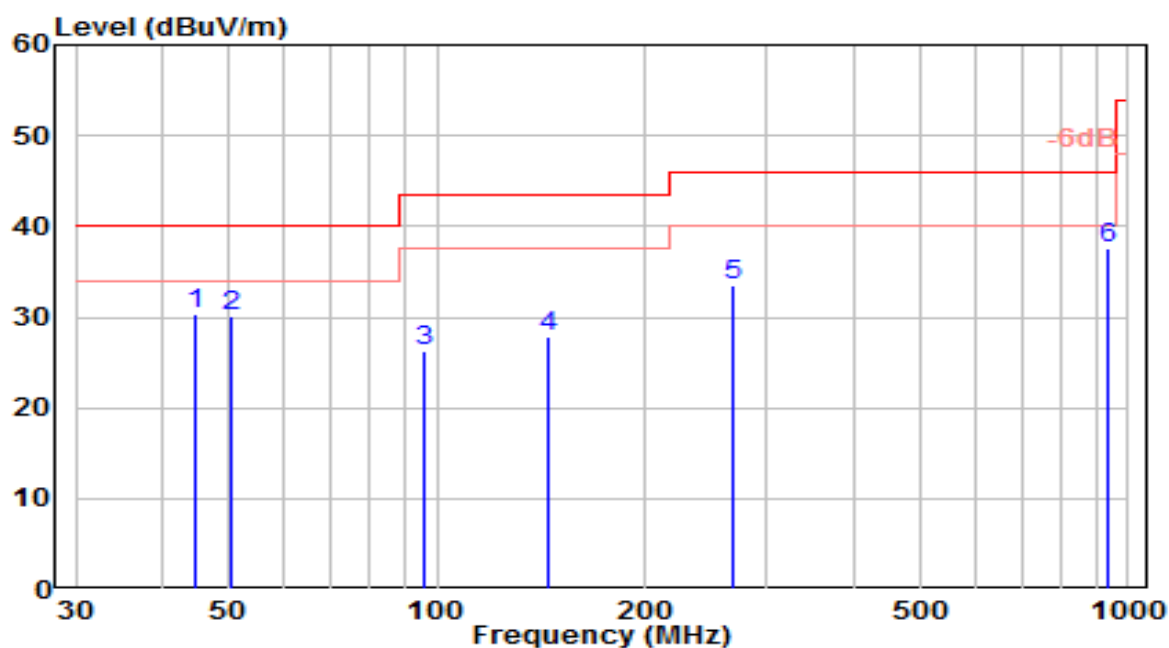


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	50.370	8.65	21.19	29.84	-10.16	40.00	150	325	QP
2	95.960	17.78	18.19	35.96	-7.54	43.50	150	295	QP
3	107.600	16.59	18.77	35.36	-8.14	43.50	150	275	QP
4	* 140.580	21.97	15.27	37.24	-6.26	43.50	150	225	QP
5	220.120	16.26	18.94	35.20	-10.80	46.00	150	200	QP
6	278.320	15.74	20.66	36.40	-9.60	46.00	100	190	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-09-02
Factor	VULB 9162	Temp. / Humidity	23°C /61%
Polarity	Vertical	Site / Test Engineer	AC1 / Todd
Test Mode	TX_2439.5MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

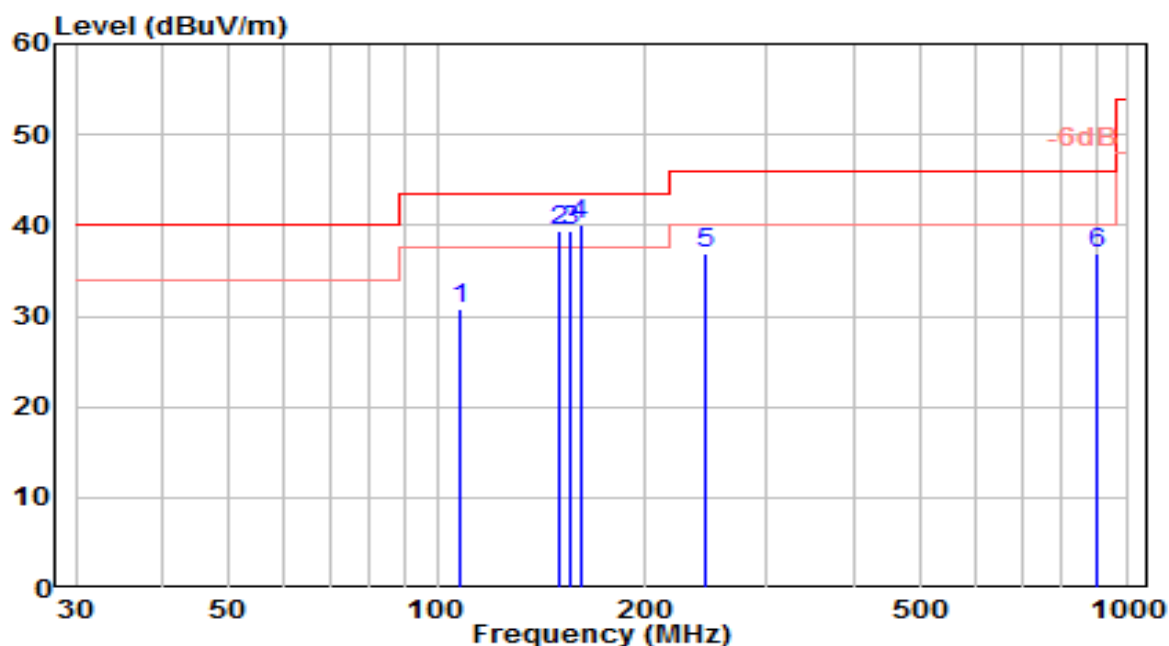


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	44.550	9.36	20.93	30.29	-9.71	40.00	100	245	QP
2	50.370	8.84	21.19	30.03	-9.97	40.00	100	275	QP
3	95.960	8.18	18.19	26.37	-17.13	43.50	150	20	QP
4	144.460	12.38	15.40	27.79	-15.71	43.50	150	55	QP
5	267.650	13.09	20.50	33.59	-12.41	46.00	120	360	QP
6	* 931.130	5.95	31.70	37.65	-8.35	46.00	100	210	QP

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-09-25
Factor	VULB 9162	Temp. / Humidity	22°C /59%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

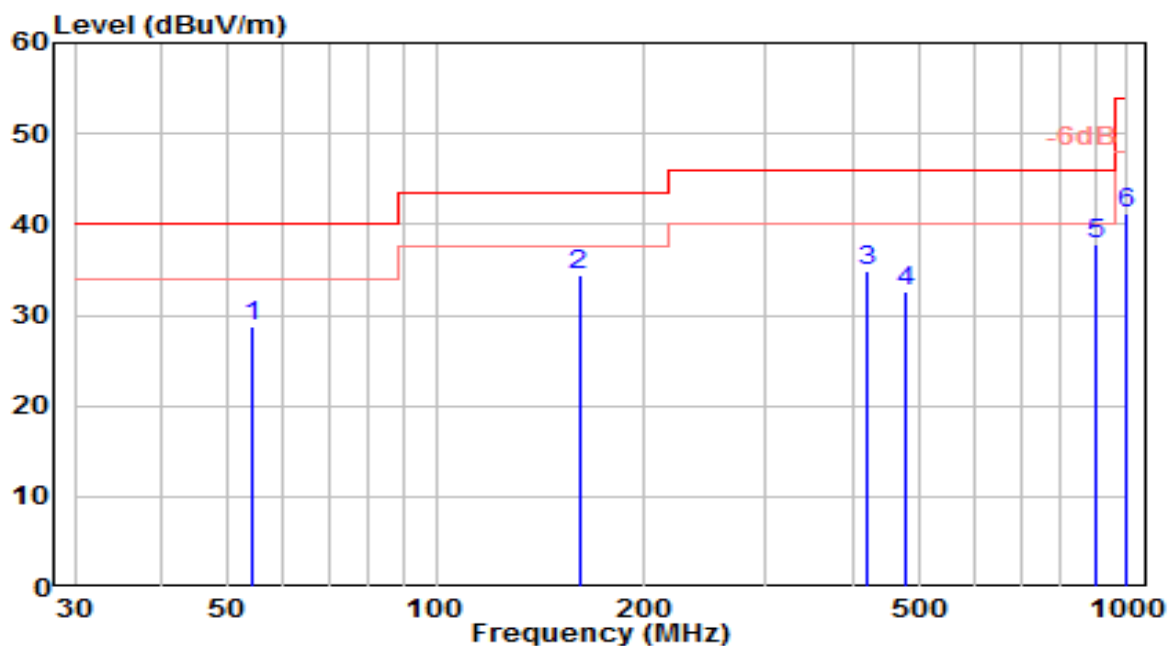


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	107.600	11.93	18.77	30.70	-12.80	43.50	150	280	QP
2	150.280	23.83	15.60	39.43	-4.07	43.50	150	255	QP
3	156.100	23.46	15.86	39.32	-4.18	43.50	150	250	QP
4 *	160.950	24.00	16.06	40.06	-3.44	43.50	150	260	QP
5	245.340	16.69	20.18	36.87	-9.13	46.00	100	250	QP
6	900.090	5.35	31.66	37.01	-8.99	46.00	150	220	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-09-25
Factor	VULB 9162	Temp. / Humidity	22°C /59%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

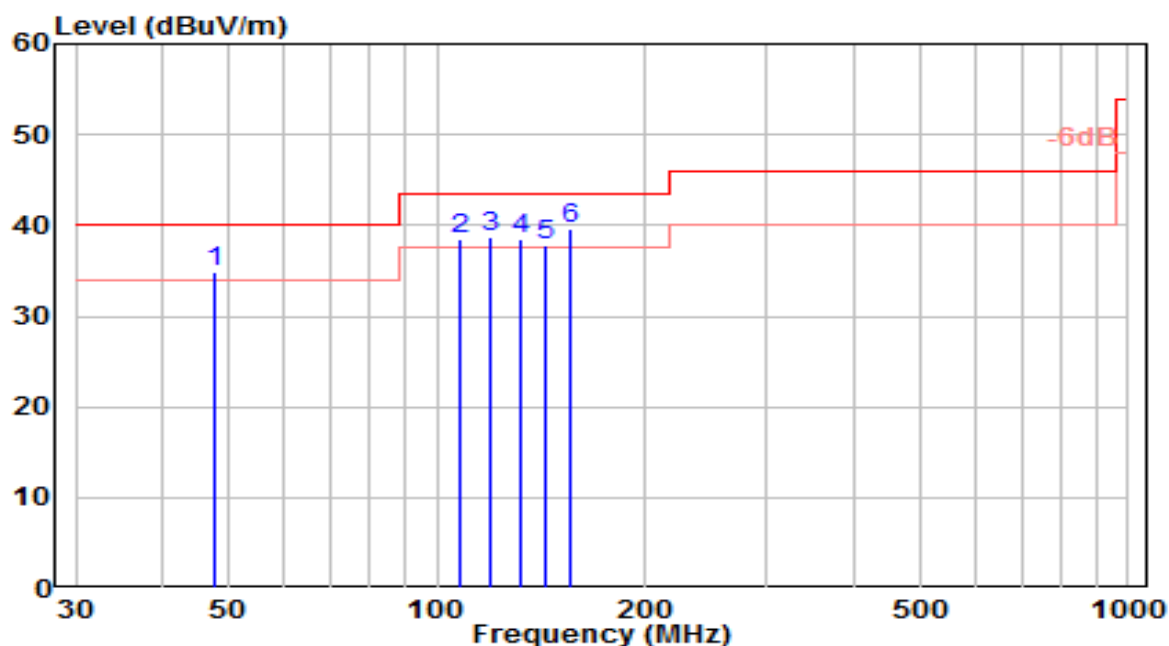


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	54.250	8.08	20.67	28.75	-11.25	40.00	100	240	QP
2	160.950	18.27	16.06	34.33	-9.17	43.50	100	165	QP
3	418.970	10.89	24.00	34.89	-11.11	46.00	100	195	QP
4	477.170	7.58	24.95	32.52	-13.48	46.00	100	325	QP
5	* 898.150	6.08	31.65	37.73	-8.27	46.00	100	210	QP
6	998.060	8.61	32.56	41.16	-12.84	54.00	100	180	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-09-25
Factor	VULB 9162	Temp. / Humidity	22°C /59%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

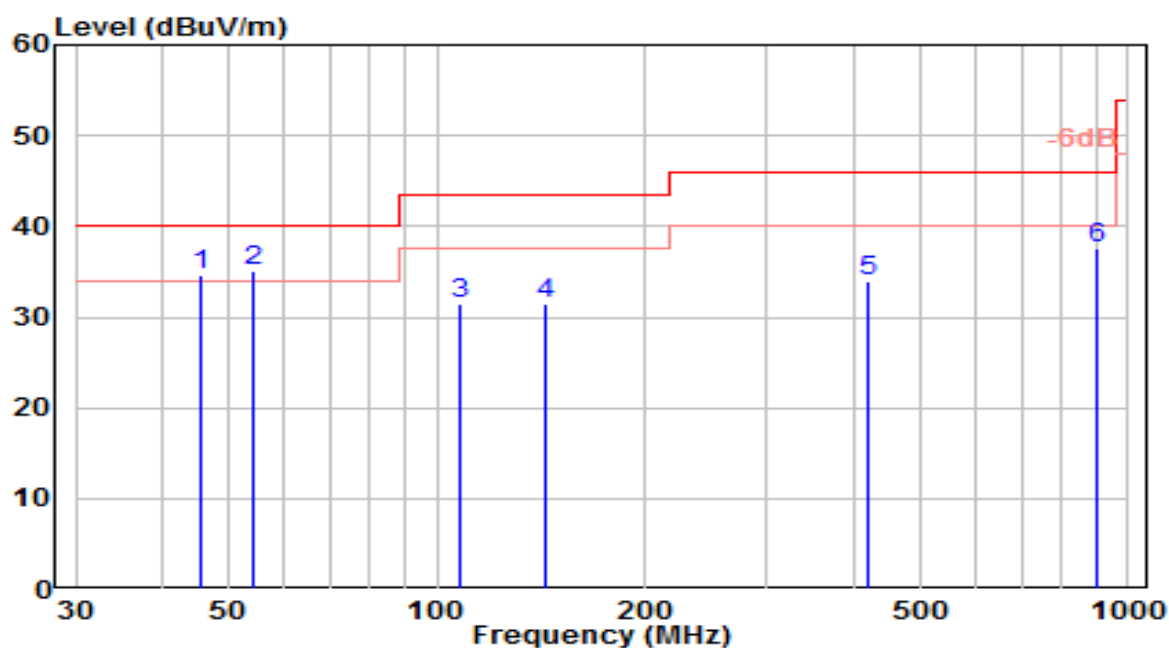


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	47.460	13.85	21.13	34.98	-5.02	40.00	150	295	QP
2	107.600	19.70	18.77	38.47	-5.03	43.50	150	300	QP
3	119.240	21.29	17.39	38.68	-4.82	43.50	150	290	QP
4	131.850	22.81	15.79	38.60	-4.90	43.50	150	280	QP
5	143.490	22.40	15.37	37.77	-5.73	43.50	150	270	QP
6	* 156.100	23.80	15.86	39.66	-3.84	43.50	150	260	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-09-25
Factor	VULB 9162	Temp. / Humidity	22°C /59%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

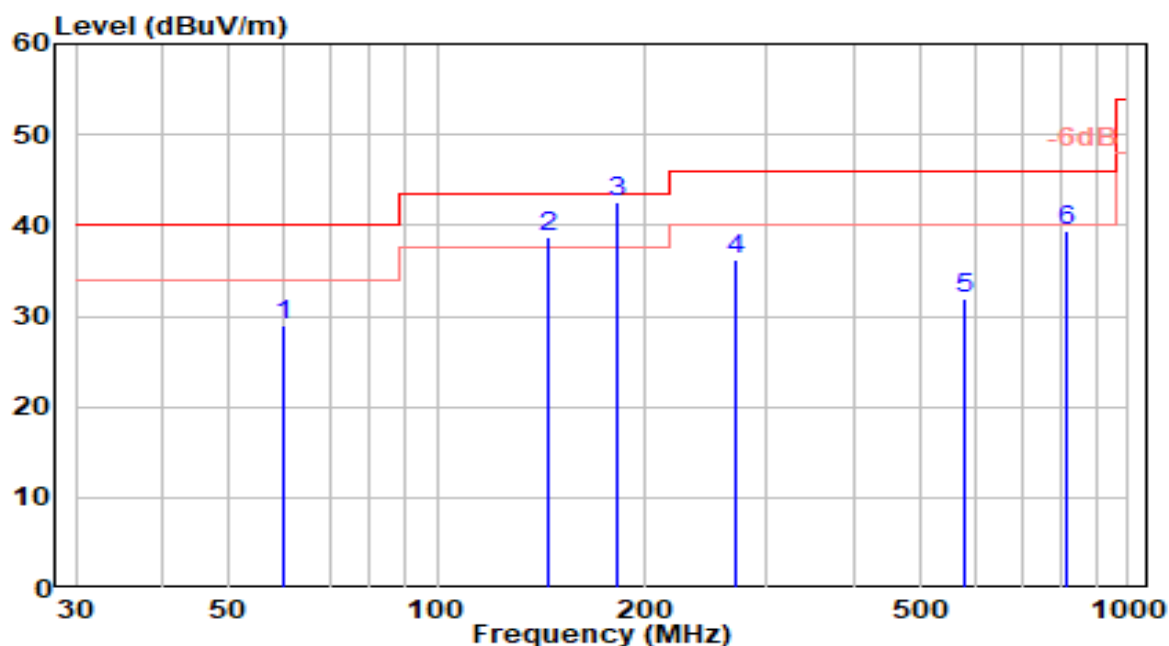


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	45.520	13.64	21.04	34.68	-5.32	40.00	100	240	QP
2	* 54.250	14.36	20.67	35.04	-4.96	40.00	100	250	QP
3	107.600	12.76	18.77	31.54	-11.96	43.50	100	245	QP
4	143.490	16.12	15.37	31.49	-12.01	43.50	150	360	QP
5	419.940	9.91	24.01	33.92	-12.08	46.00	100	200	QP
6	898.150	6.03	31.65	37.67	-8.33	46.00	100	200	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-29
Factor	VULB 9162	Temp. / Humidity	24°C /64%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2439.5MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

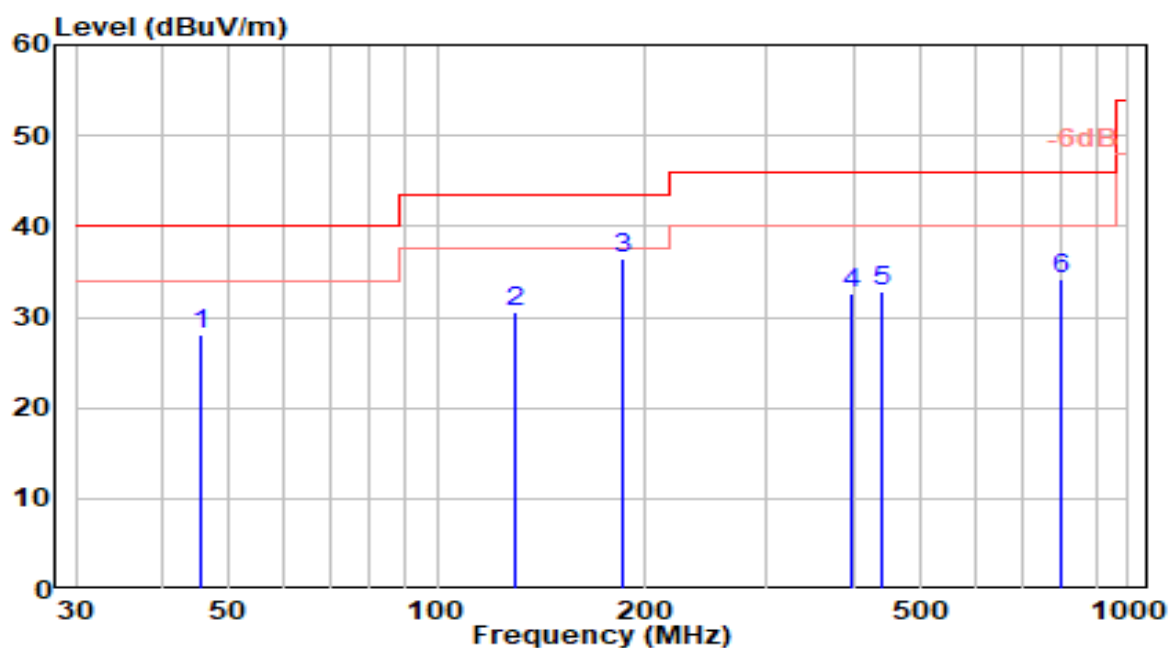


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	60.070	8.73	20.19	28.92	-11.08	40.00	100	80	QP
2	145.430	22.70	16.00	38.70	-4.80	43.50	150	120	QP
3	* 182.290	24.80	17.73	42.53	-0.97	43.50	150	120	QP
4	270.560	15.51	20.72	36.23	-9.77	46.00	100	25	QP
5	579.990	4.45	27.40	31.85	-14.15	46.00	100	190	QP
6	811.820	8.57	30.73	39.31	-6.69	46.00	100	280	QP

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-29
Factor	VULB 9162	Temp. / Humidity	24°C /64%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2439.5MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

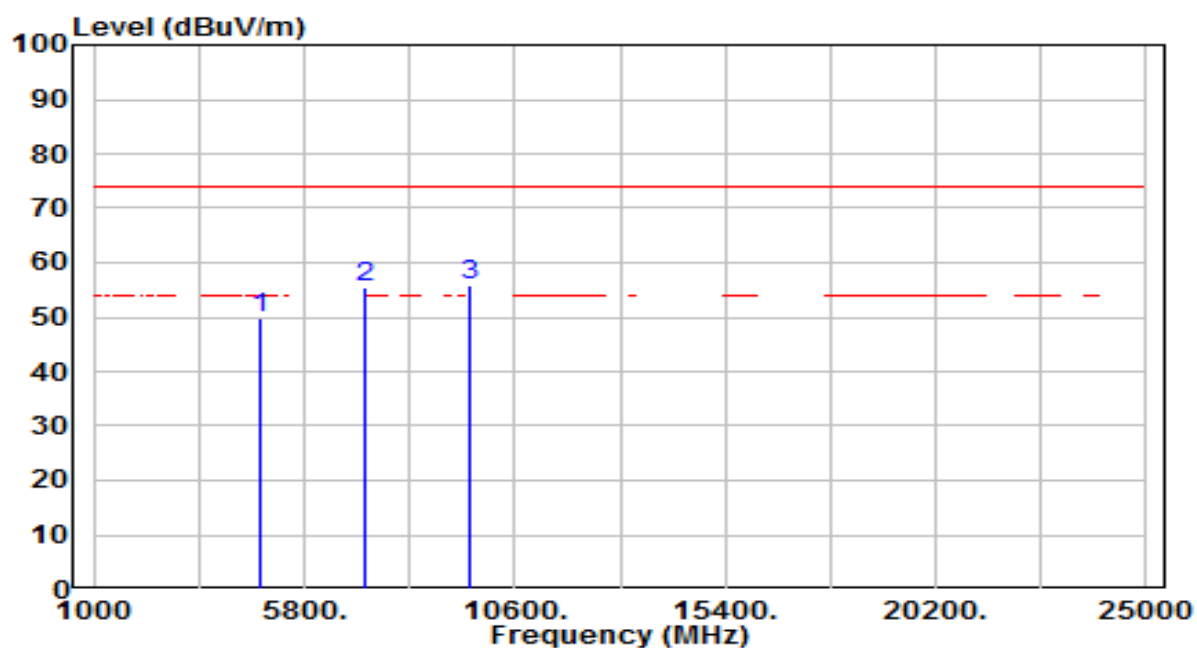


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	45.520	6.16	21.83	27.99	-12.01	40.00	100	250	QP
2	129.910	14.33	16.29	30.63	-12.87	43.50	100	115	QP
3	* 186.170	18.02	18.33	36.34	-7.16	43.50	100	190	QP
4	399.570	8.57	24.05	32.62	-13.38	46.00	100	350	QP
5	438.370	8.19	24.70	32.89	-13.11	46.00	100	225	QP
6	798.240	3.68	30.49	34.17	-11.83	46.00	100	170	QP

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

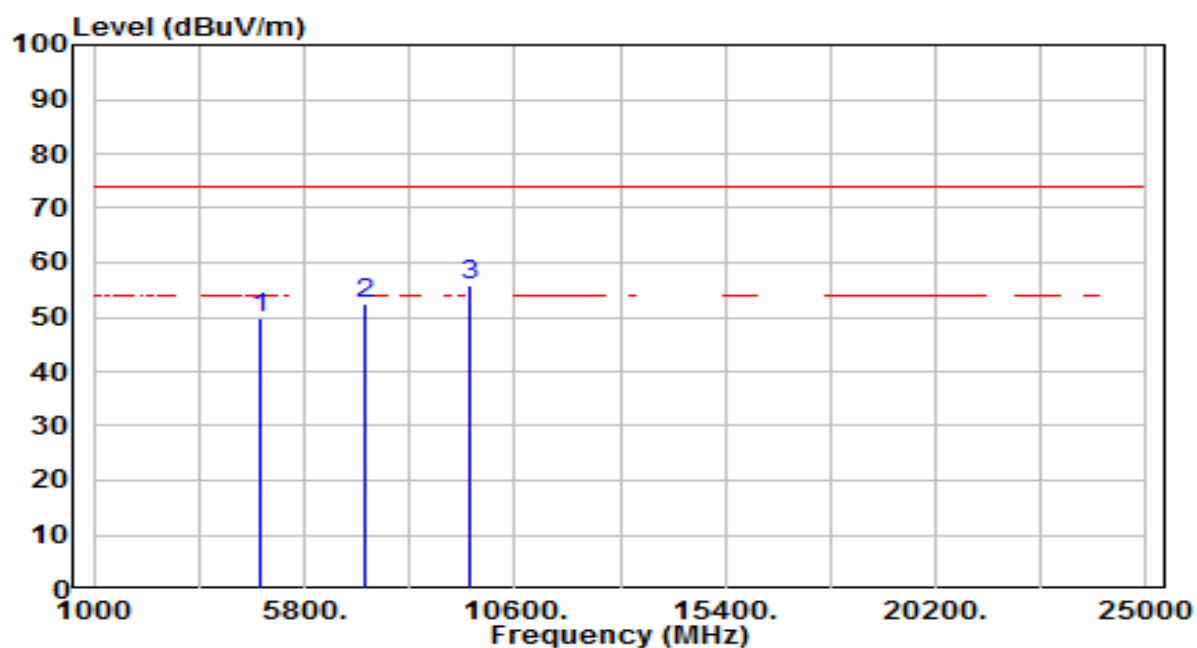


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4802.000	45.35	4.29	49.64	-24.36	74.00	300	112	Peak
2	7203.000	42.82	12.55	55.37	-18.63	74.00	300	107	Peak
3	* 9604.000	39.32	16.69	56.01	-17.99	74.00	300	141	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

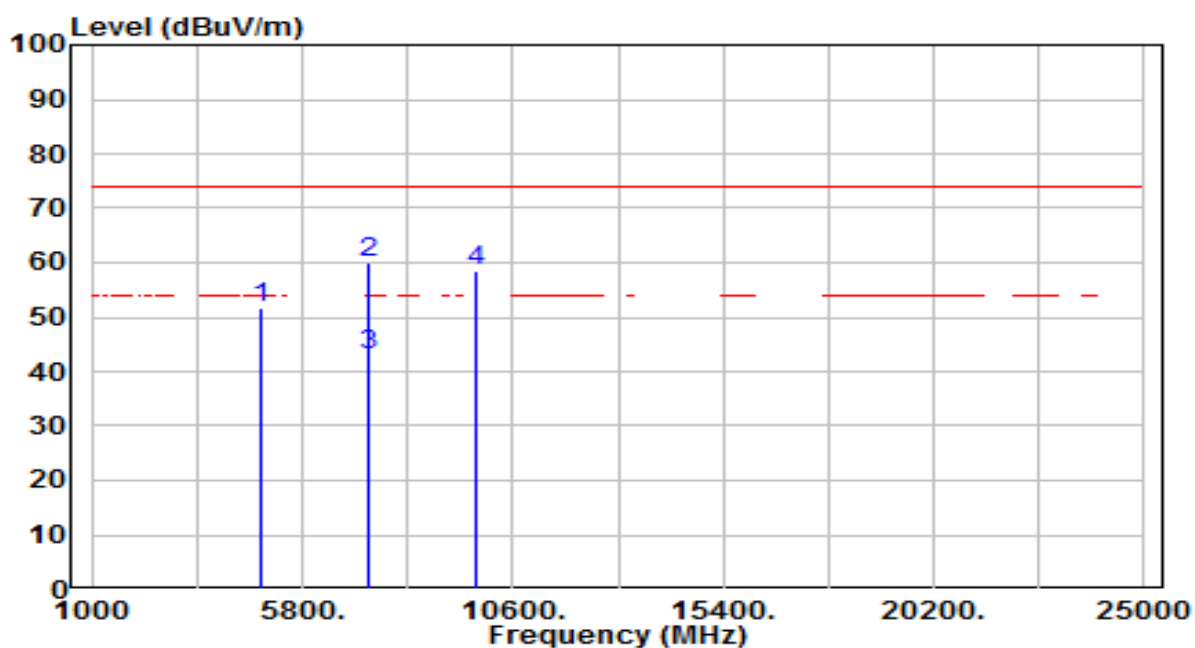


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4802.000	45.49	4.29	49.78	-24.22	74.00	300	357	Peak
2	7203.000	40.04	12.55	52.59	-21.41	74.00	300	136	Peak
3	* 9604.000	39.24	16.69	55.94	-18.06	74.00	300	274	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

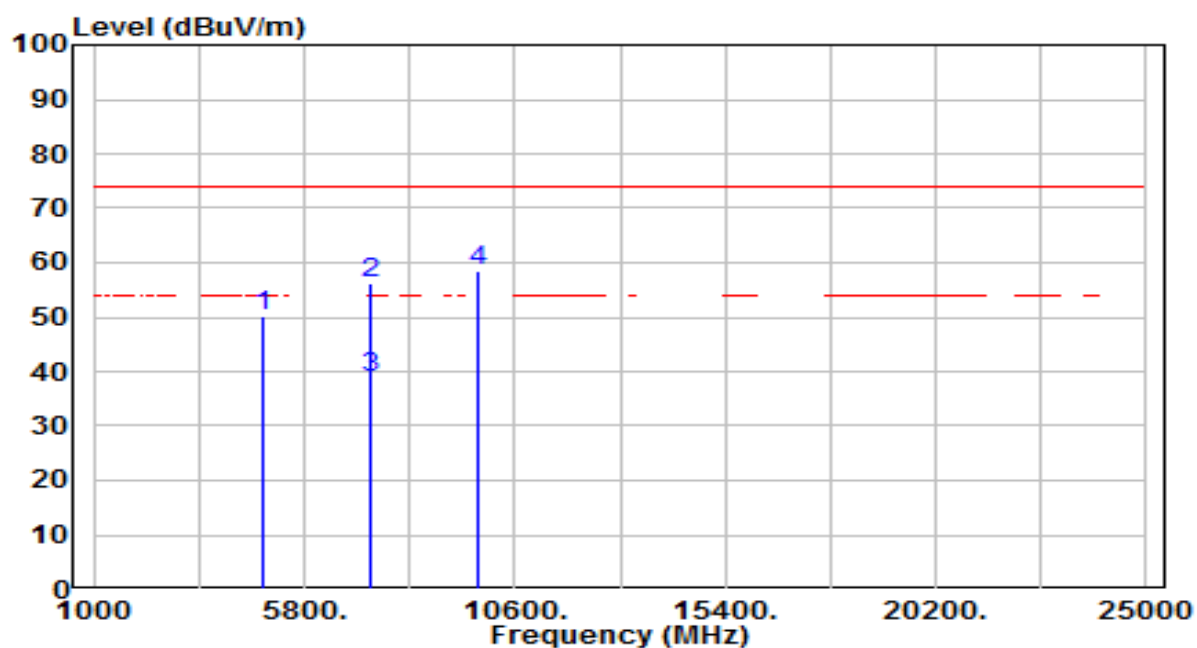


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	47.22	4.47	51.70	-22.30	74.00	300	118	Peak
2	* 7318.500	46.93	13.16	60.09	-13.91	74.00	300	106	Peak
3	* 7318.500	N/A	N/A	42.91	-11.09	54.00	300	106	Average
4	9758.000	41.44	16.94	58.38	-15.62	74.00	300	141	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor (20Log(1/Duty Cycle)) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

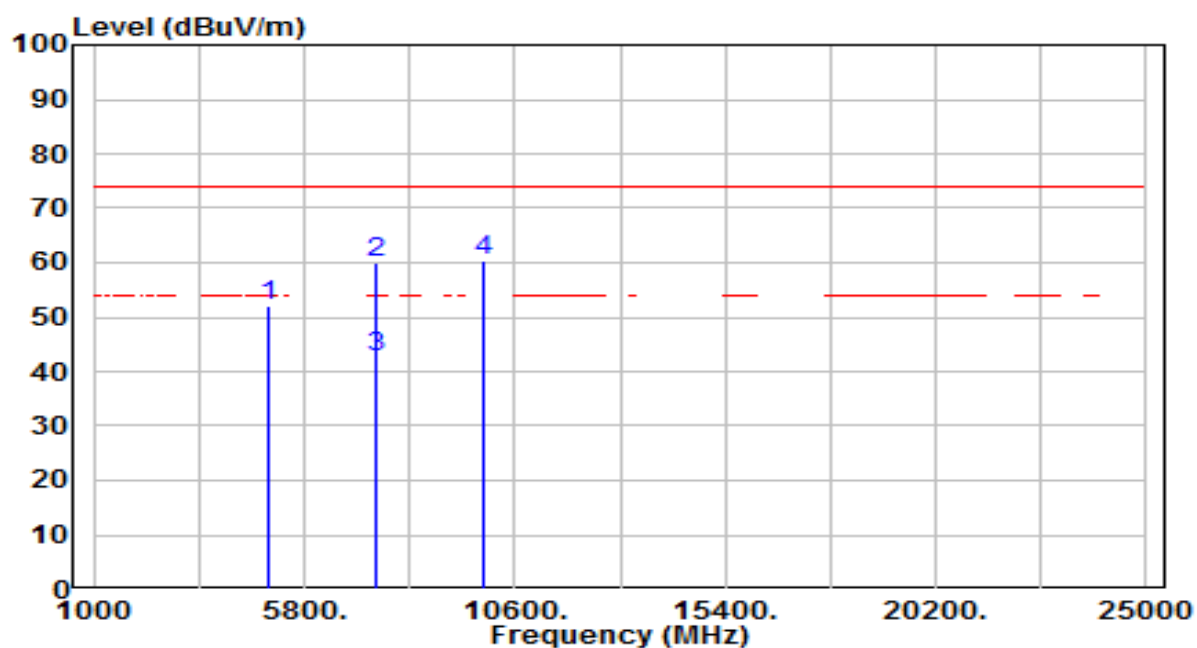


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	45.83	4.47	50.30	-23.70	74.00	300	121	Peak
2	7318.500	42.96	13.16	56.13	-17.87	74.00	300	23	Peak
3	* 7318.500	N/A	N/A	38.95	-15.05	54.00	300	23	Average
4	* 9758.000	41.36	16.94	58.30	-15.70	74.00	300	75	Peak

Note:

- " *", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

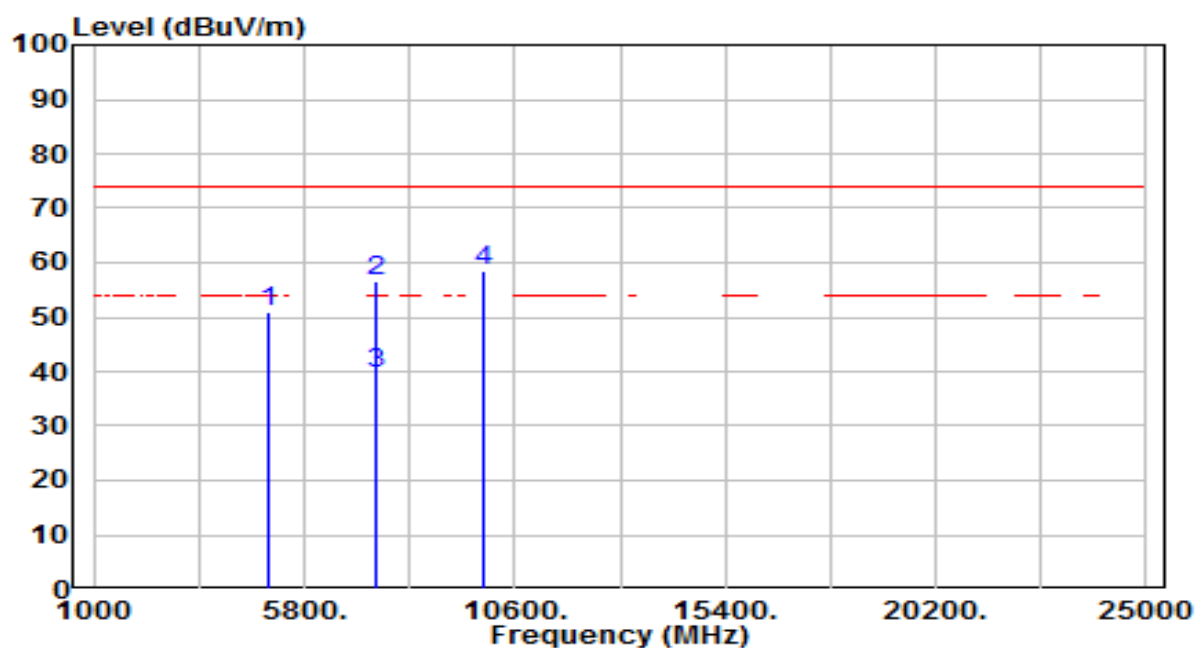


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4956.000	47.40	4.73	52.14	-21.86	74.00	300	118	Peak
2	7434.000	46.22	13.75	59.97	-14.03	74.00	300	126	Peak
3	* 7434.000	N/A	N/A	42.79	-11.21	54.00	300	126	Average
4	* 9912.000	43.23	17.26	60.49	-13.51	74.00	300	134	Peak

Note:

- "*" means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor (20Log(1/Duty Cycle)) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

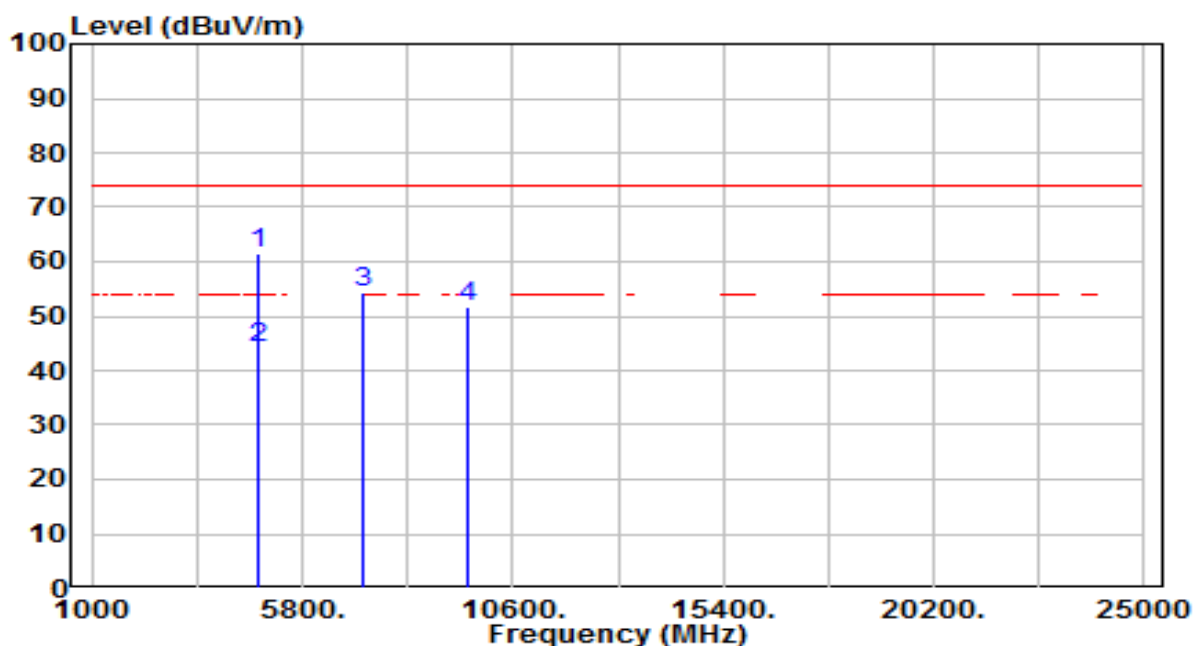


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4956.000	46.23	4.73	50.97	-23.03	74.00	300	360	Peak
2	7434.000	43.03	13.75	56.78	-17.22	74.00	300	8	Peak
3	* 7434.000	N/A	N/A	39.62	-14.38	54.00	300	8	Average
4	* 9912.000	41.39	17.26	58.65	-15.35	74.00	300	75	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor (20Log(1/Duty Cycle)) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

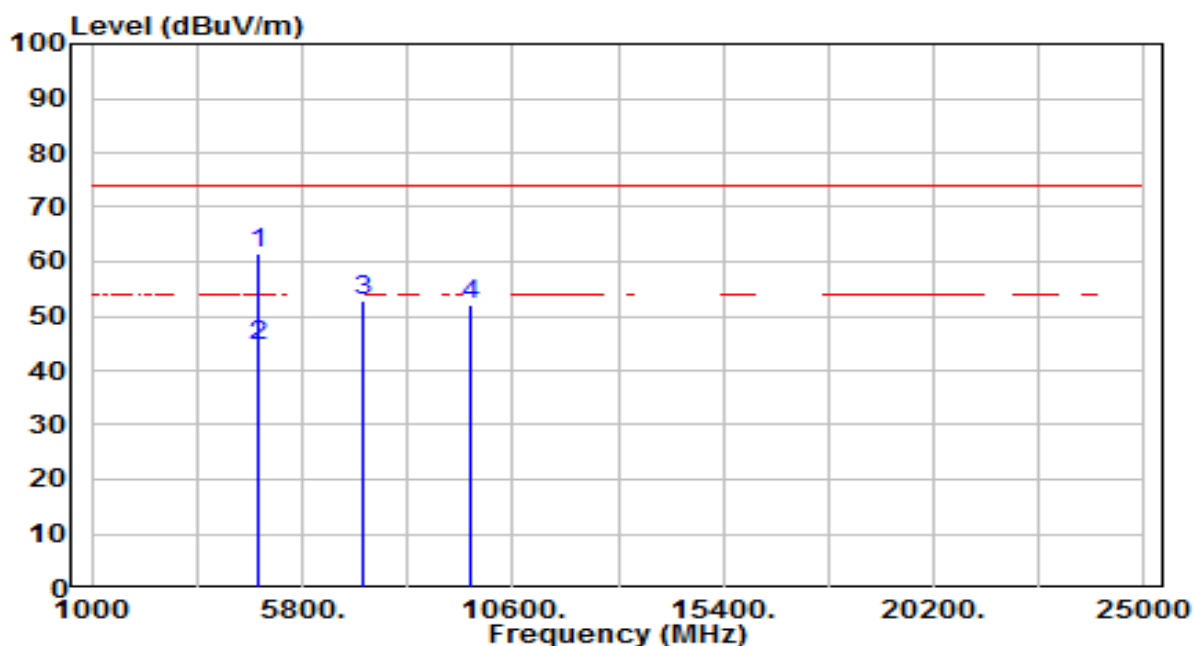


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4802.000	57.06	4.29	61.35	-12.65	74.00	300	14	Peak
2	*	4802.000	N/A	N/A	44.17	-9.83	54.00	300	14	Average
3		7203.000	41.86	12.55	54.41	-19.59	74.00	300	114	Peak
4		9604.000	35.12	16.66	51.78	-22.22	74.00	300	309	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

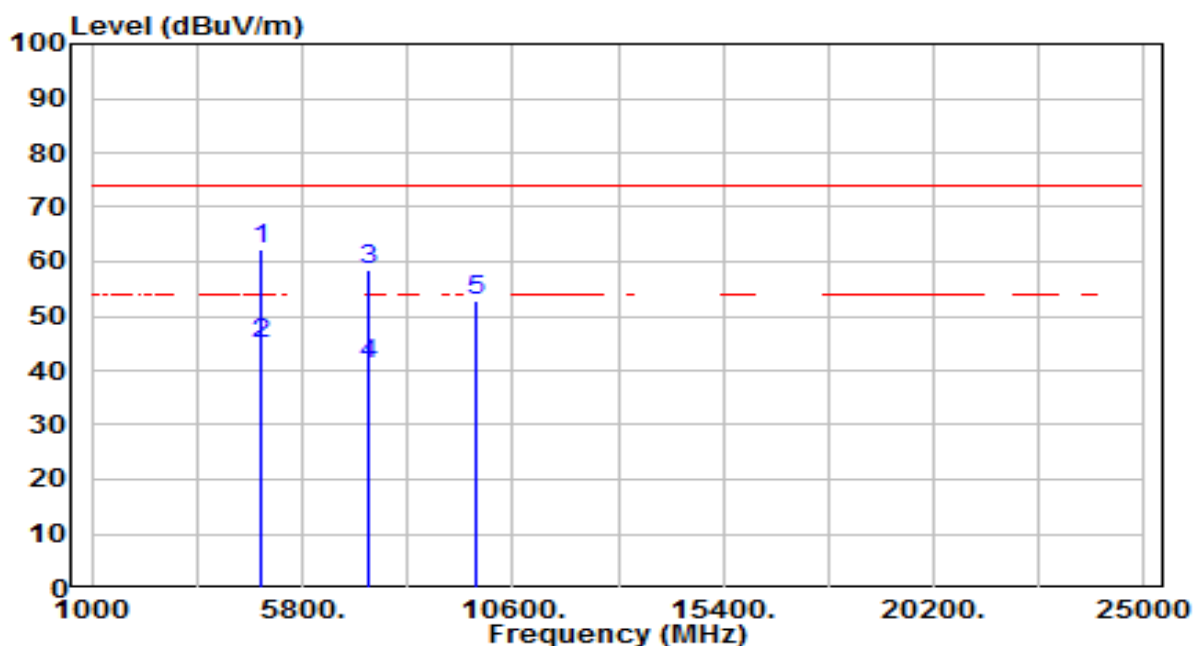


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4802.000	57.35	4.29	61.64	-12.36	74.00	300	339	Peak
2	*	4802.000	N/A	N/A	44.46	-9.54	54.00	300	339	Average
3		7203.000	40.14	12.55	52.69	-21.31	74.00	300	167	Peak
4		9604.000	35.27	16.70	51.98	-22.02	74.00	300	52	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

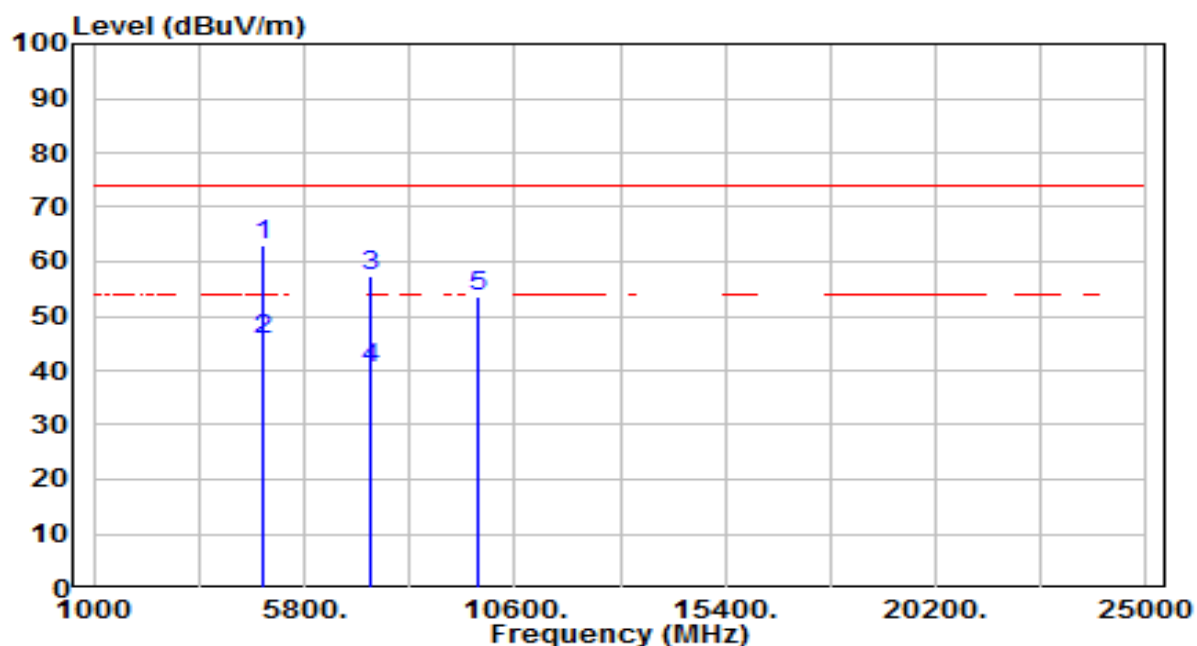


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	57.67	4.47	62.15	-11.85	74.00	300	6	Peak
2	* 4879.000	N/A	N/A	44.97	-9.03	54.00	300	6	Average
3	* 7318.500	45.32	13.16	58.48	-15.52	74.00	300	141	Peak
4	7318.500	N/A	N/A	41.30	-12.70	54.00	300	141	Average
5	9758.000	35.92	16.94	52.87	-21.13	74.00	300	118	Peak

Note:

- "*" means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

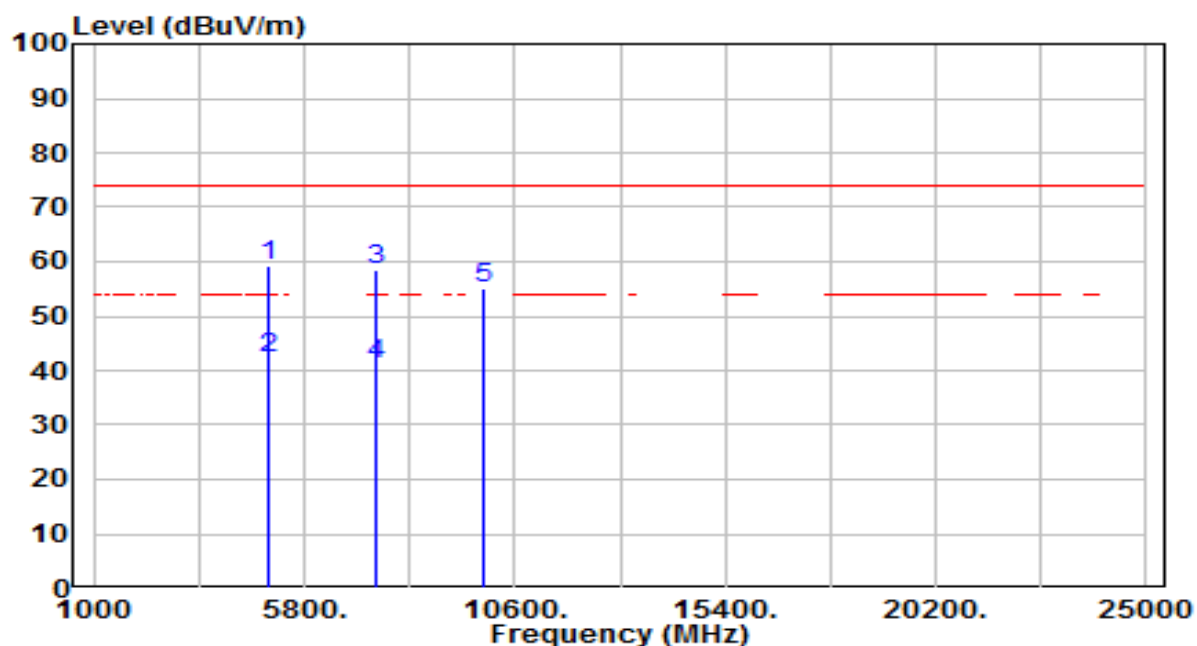


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	58.52	4.47	62.99	-11.01	74.00	300	5	Peak
2	* 4879.000	N/A	N/A	45.81	-8.19	54.00	300	5	Average
3	* 7318.500	44.27	13.16	57.43	-16.57	74.00	300	14	Peak
4	7318.500	N/A	N/A	40.25	-13.75	54.00	300	14	Average
5	9758.000	36.55	16.94	53.49	-20.51	74.00	300	234	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

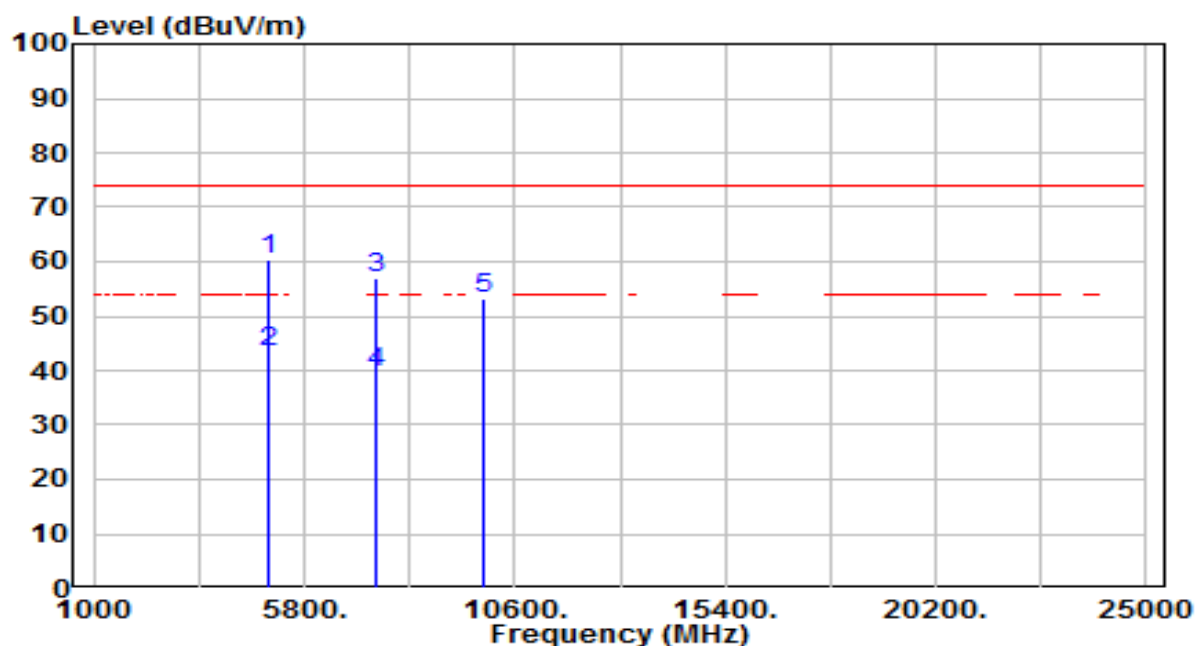


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4956.000	54.57	4.73	59.30	-14.70	74.00	300	12	Peak
2	*	4956.000	N/A	N/A	42.12	-11.88	54.00	300	12	Average
3		7434.000	44.58	13.75	58.33	-15.67	74.00	300	144	Peak
4		7434.000	N/A	N/A	41.15	-12.85	54.00	300	144	Average
5		9912.000	37.90	17.26	55.17	-18.83	74.00	300	127	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

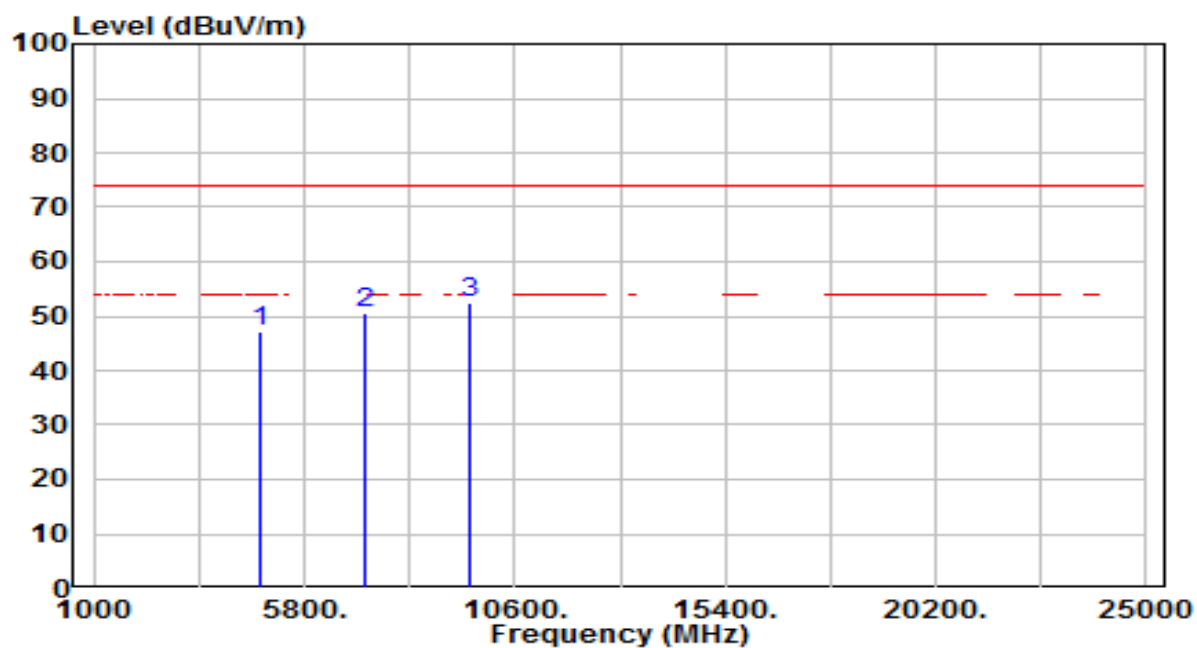


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	4956.000	55.75	4.73	60.48	-13.52	74.00	300	44	Peak
2	*	4956.000	N/A	N/A	43.30	-10.70	54.00	300	44	Average
3		7434.000	43.06	13.75	56.81	-17.19	74.00	300	56	Peak
4		7434.000	N/A	N/A	39.63	-14.37	54.00	300	56	Average
5		9912.000	35.83	17.26	53.09	-20.91	74.00	300	93	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

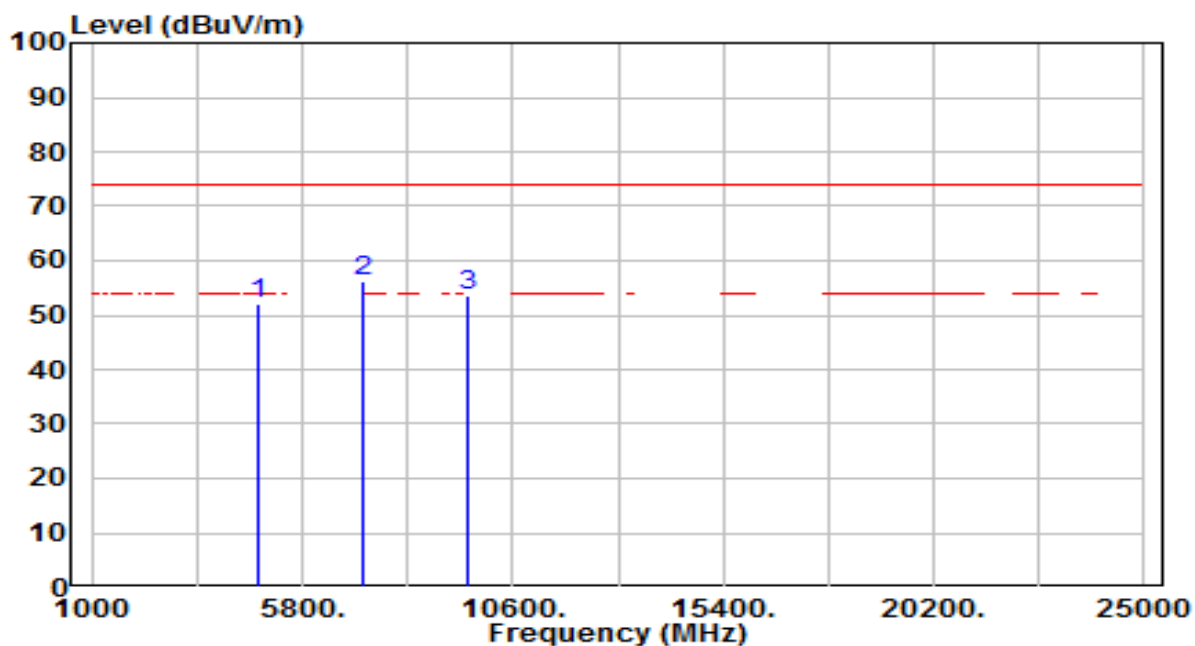


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4802.000	42.73	4.29	47.03	-26.97	74.00	300	295	Peak
2	7203.000	38.09	12.55	50.64	-23.36	74.00	300	172	Peak
3	* 9604.000	35.79	16.69	52.48	-21.52	74.00	300	128	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

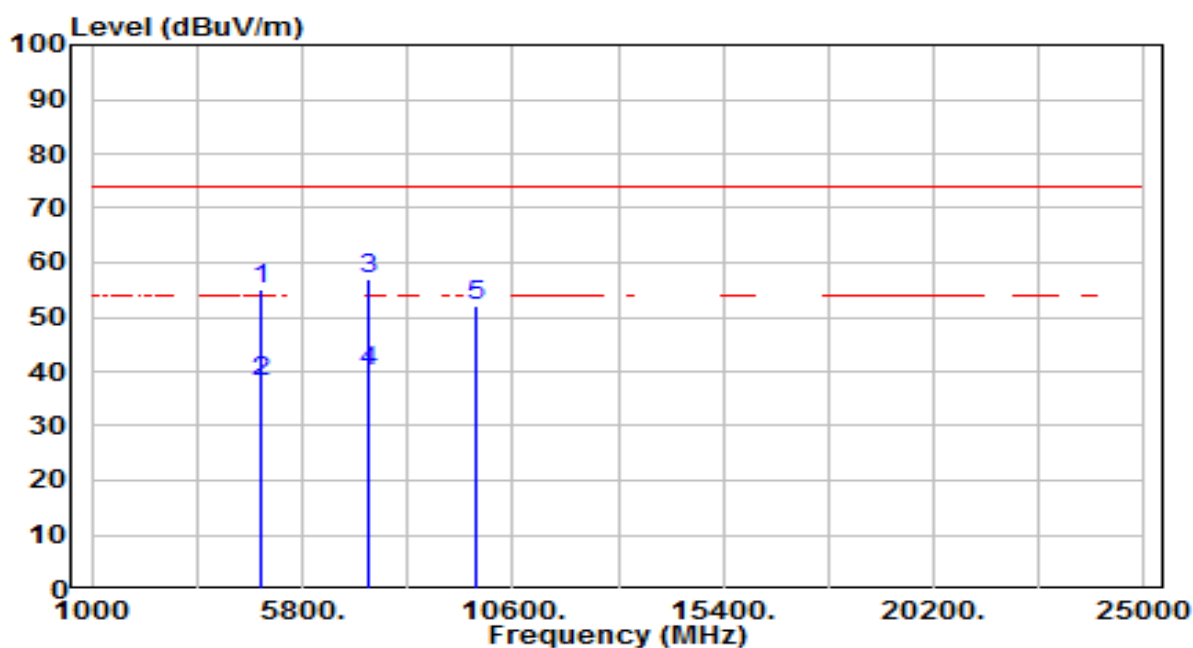


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4802.000	47.60	4.29	51.89	-22.11	74.00	300	153	Peak
2	* 7203.000	43.67	12.55	56.22	-17.78	74.00	300	206	Peak
3	9604.000	37.01	16.69	53.70	-20.30	74.00	300	201	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

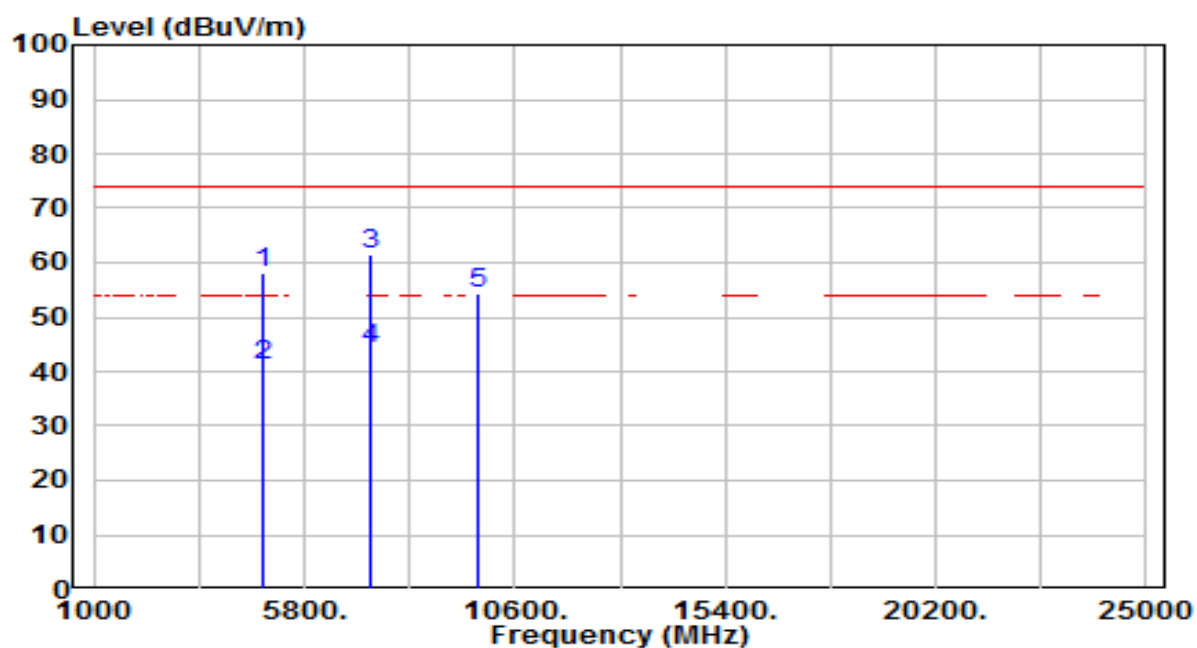


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	50.76	4.47	55.23	-18.77	74.00	300	279	Peak
2	4879.000	N/A	N/A	38.05	-15.95	54.00	300	279	Average
3	* 7318.500	43.90	13.16	57.07	-16.93	74.00	300	163	Peak
4	* 7318.500	N/A	N/A	39.89	-14.11	54.00	300	163	Average
5	9758.000	35.20	16.94	52.14	-21.86	74.00	300	235	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor (20Log(1/Duty Cycle)) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2439.5MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

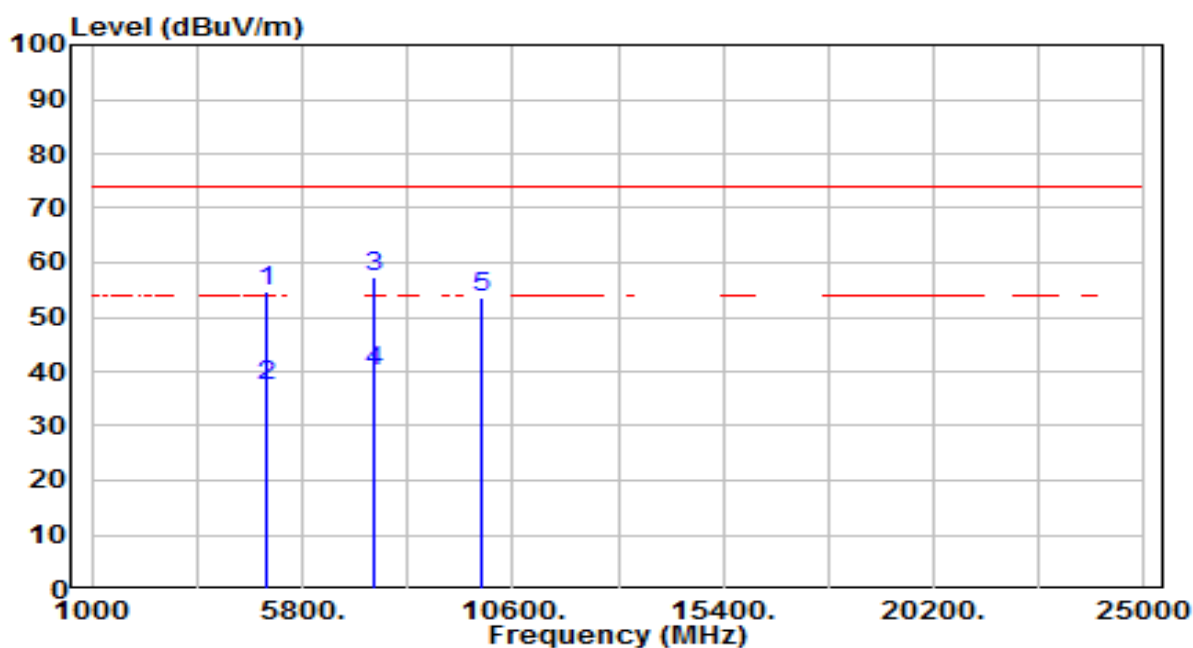


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	53.82	4.47	58.29	-15.71	74.00	300	201	Peak
2	4879.000	N/A	N/A	41.11	-12.89	54.00	300	201	Average
3	* 7318.500	48.30	13.16	61.46	-12.54	74.00	300	218	Peak
4	* 7318.500	N/A	N/A	44.28	-9.72	54.00	300	218	Average
5	9758.000	37.31	16.94	54.25	-19.75	74.00	300	170	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor (20Log(1/Duty Cycle)) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

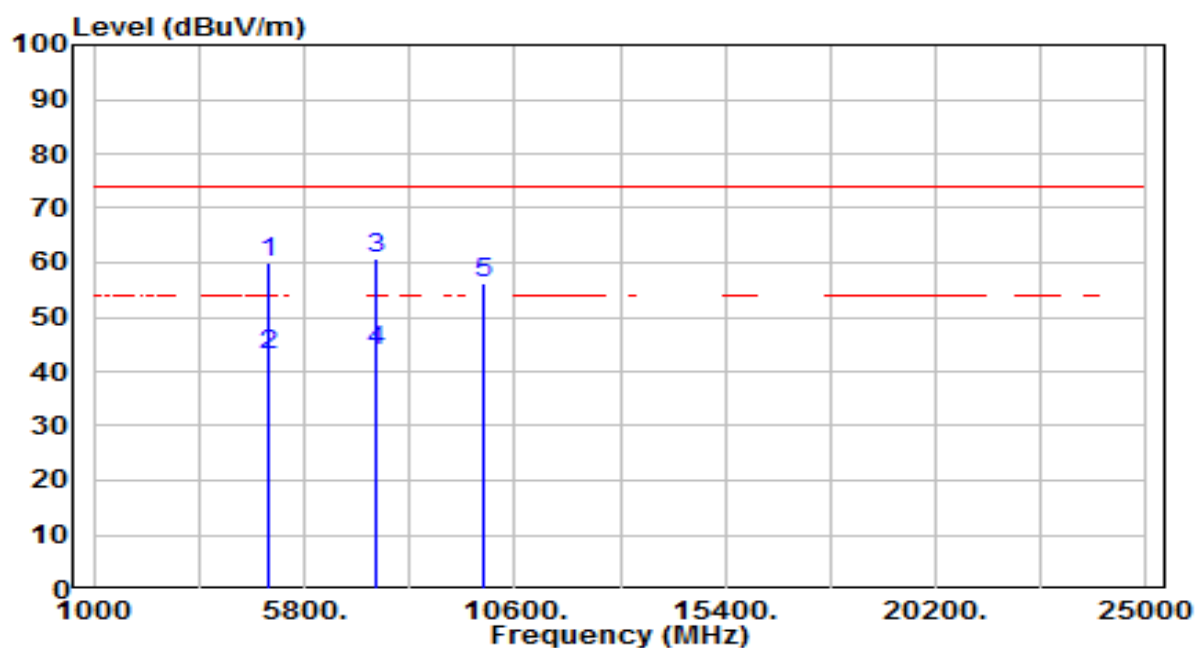


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4956.000	49.83	4.73	54.56	-19.44	74.00	300	284	Peak
2	4956.000	N/A	N/A	37.38	-16.62	54.00	300	284	Average
3	* 7434.000	43.54	13.75	57.29	-16.71	74.00	300	165	Peak
4	* 7434.000	N/A	N/A	40.11	-13.89	54.00	300	165	Average
5	9912.000	36.13	17.26	53.40	-20.60	74.00	300	259	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor (20Log(1/Duty Cycle)) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

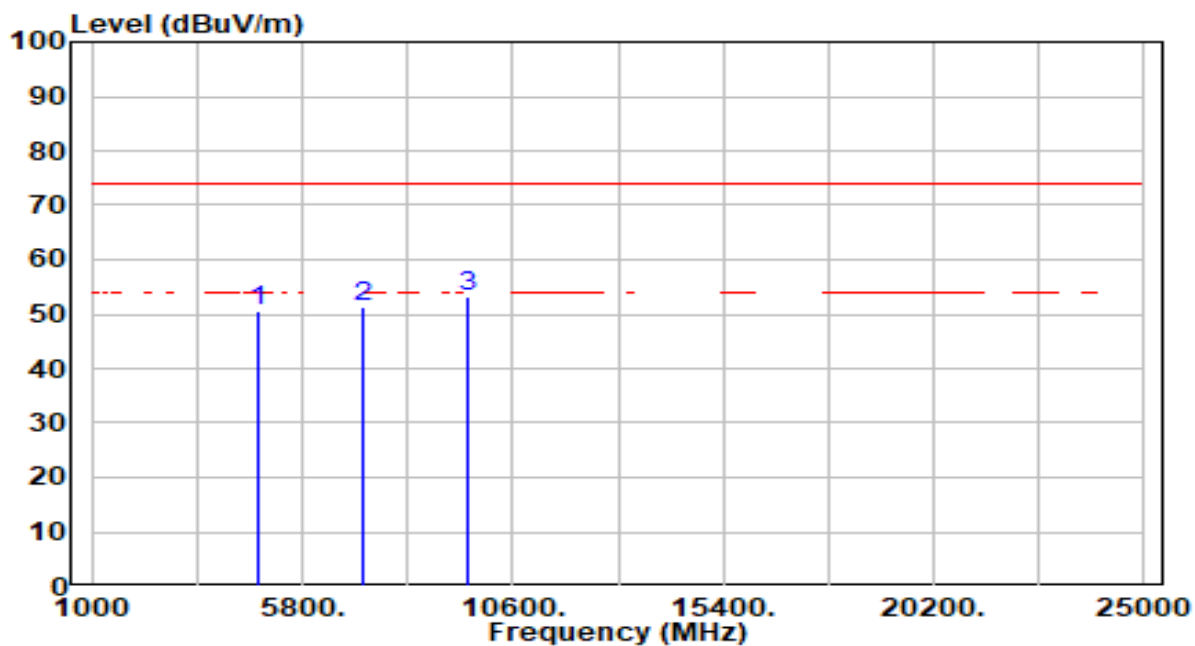


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4956.000	55.36	4.73	60.09	-13.91	74.00	300	209	Peak
2	4956.000	N/A	N/A	42.91	-11.09	54.00	300	209	Average
3	* 7434.000	47.16	13.75	60.91	-13.09	74.00	300	195	Peak
4	* 7434.000	N/A	N/A	43.73	-10.27	54.00	300	195	Average
5	9912.000	38.82	17.26	56.09	-17.91	74.00	300	159	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2401MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

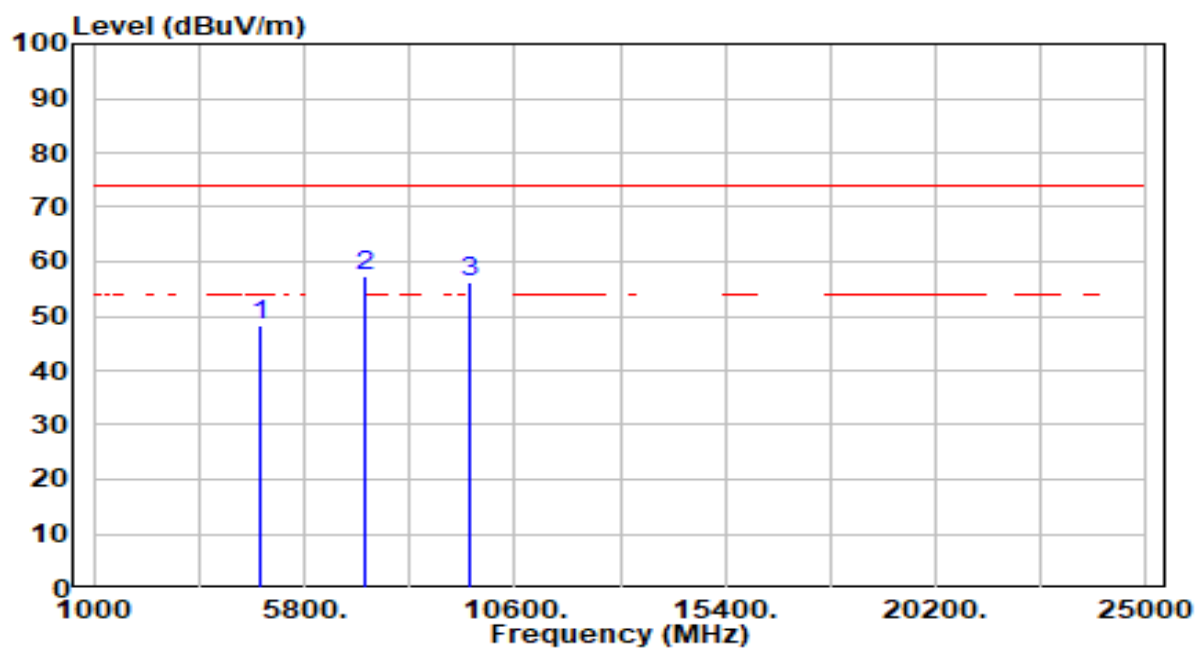


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4802.000	47.19	3.27	50.46	-23.54	74.00	100	360	Peak
2	7203.000	40.48	10.87	51.36	-22.64	74.00	100	360	Peak
3	* 9604.000	38.66	14.62	53.28	-20.72	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2401MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

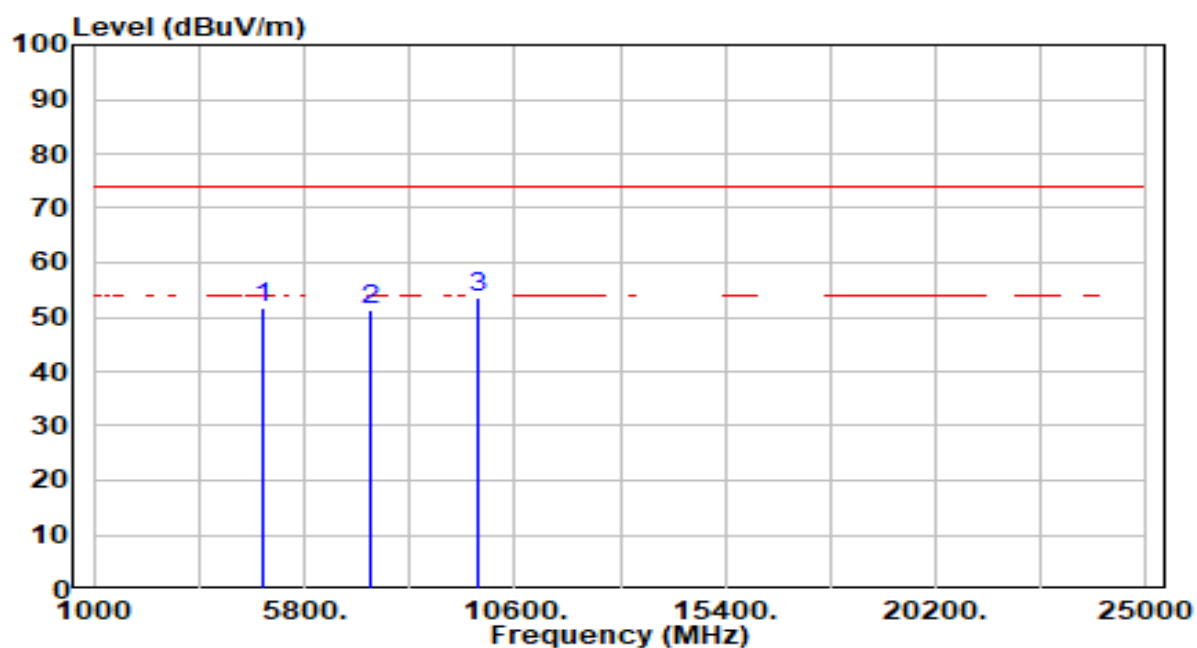


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4802.000	45.09	3.27	48.37	-25.63	74.00	100	360	Peak
2	* 7203.000	46.51	10.87	57.38	-16.62	74.00	100	360	Peak
3	9604.000	41.73	14.62	56.34	-17.66	74.00	100	360	Peak

Note:

- "*" means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2439.5MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

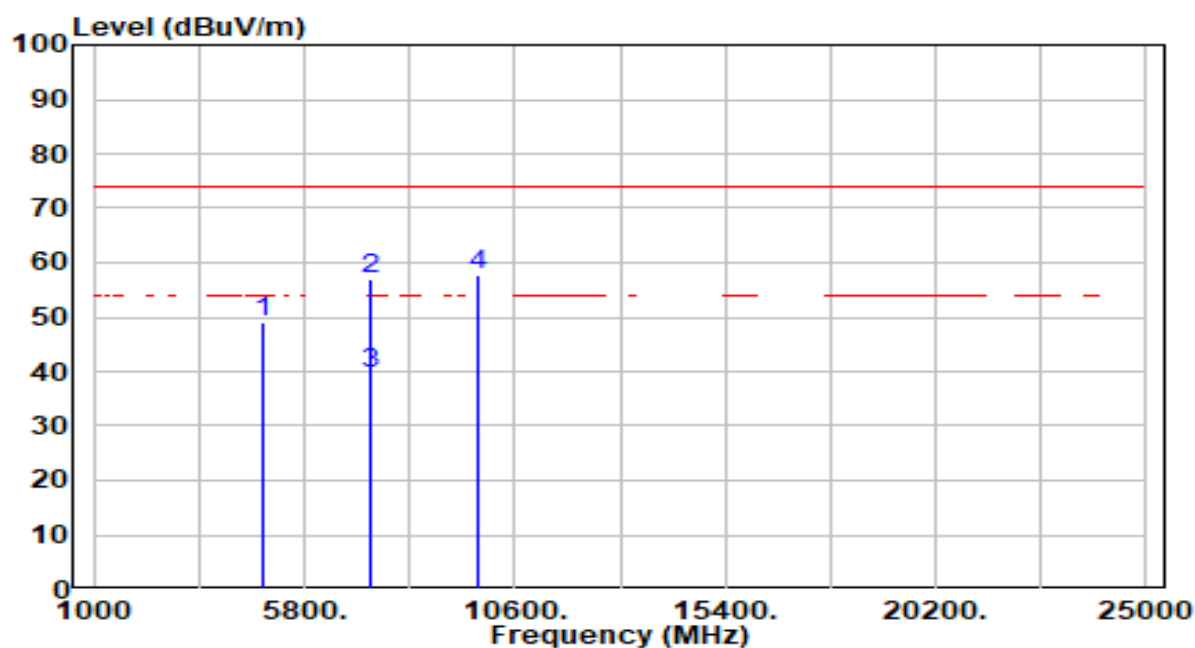


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	48.43	3.46	51.89	-22.11	74.00	100	360	Peak
2	7318.500	40.27	11.20	51.47	-22.53	74.00	100	360	Peak
3	* 9758.000	38.75	14.91	53.65	-20.35	74.00	100	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2439.5MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

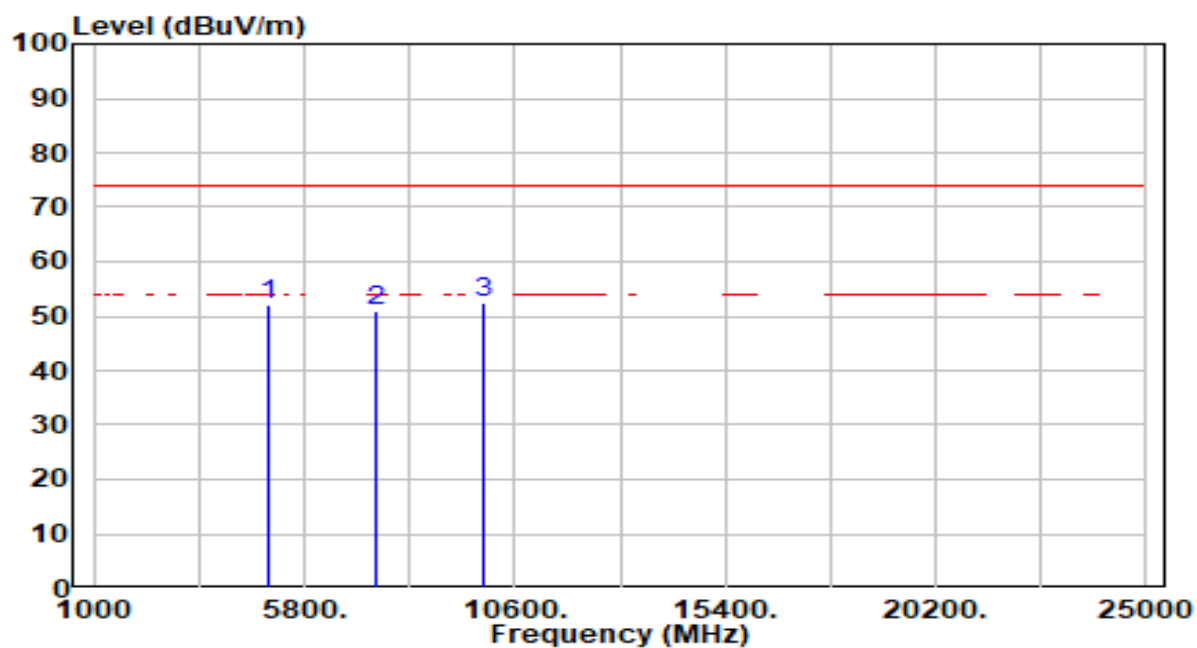


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4879.000	45.58	3.46	49.04	-24.96	74.00	100	360	Peak
2	7318.500	45.62	11.20	56.82	-17.18	74.00	100	140	Peak
3	* 7318.500	N/A	N/A	39.64	-14.36	54.00	100	140	Average
4	* 9758.000	42.90	14.91	57.81	-16.19	74.00	100	360	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor (20Log(1/Duty Cycle)) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2478MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

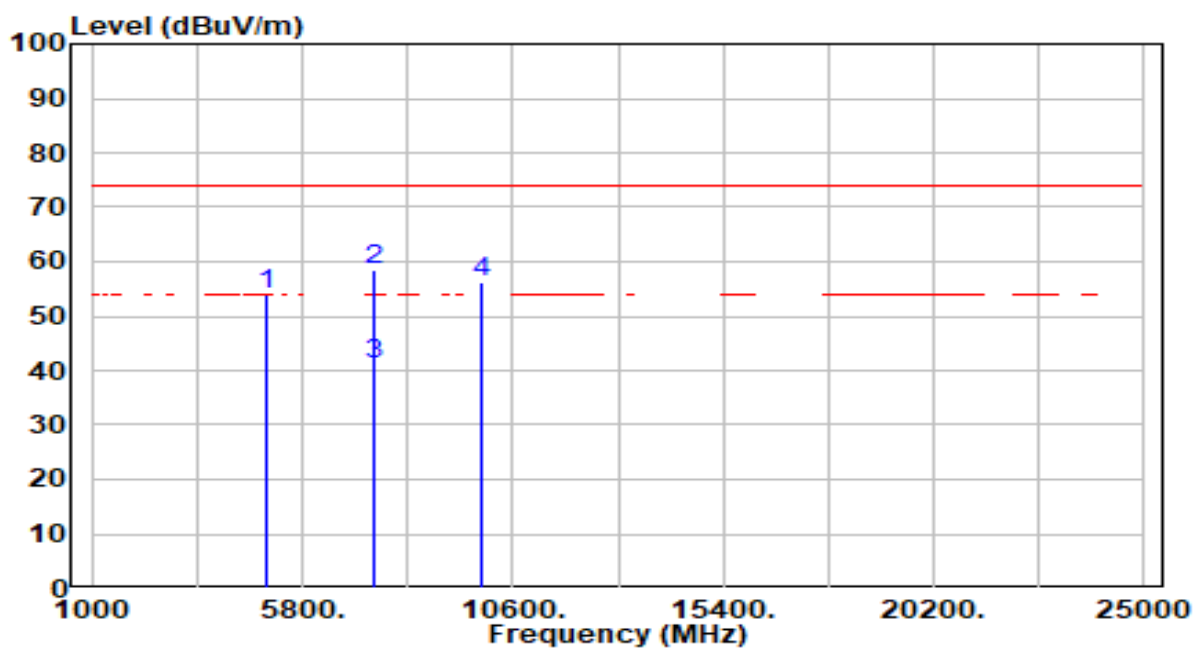


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4956.000	48.43	3.64	52.08	-21.92	74.00	100	360	Peak
2	7434.000	39.36	11.53	50.88	-23.12	74.00	100	360	Peak
3	* 9912.000	37.09	15.19	52.29	-21.71	74.00	100	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D & BBHA 9170	Temp. / Humidity	23°C /66%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2478MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC



No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	4956.000	50.27	3.64	53.91	-20.09	74.00	100	360	Peak
2	* 7434.000	46.78	11.53	58.31	-15.69	74.00	100	155	Peak
3	* 7434.000	N/A	N/A	41.13	-12.87	54.00	100	155	Average
4	9912.000	41.16	15.19	56.36	-17.64	74.00	100	360	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

7.7. Radiated Restricted Band Edge Measurement

7.7.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

7.7.2. Test Procedure Used

ANSI C63.10-2020 - Section 11.13

7.7.3. Test Setting

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3 * RBW
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

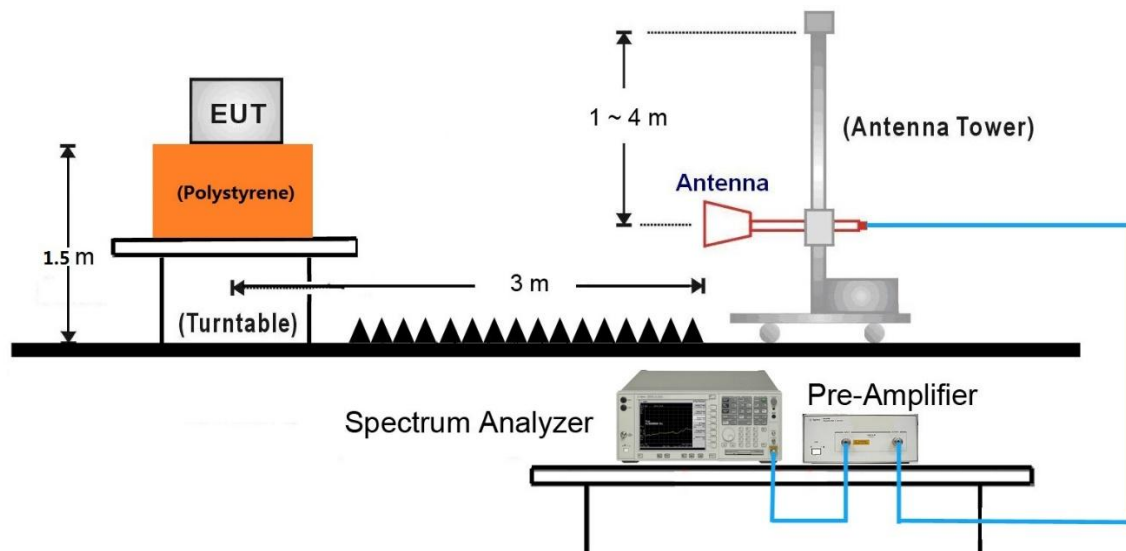
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

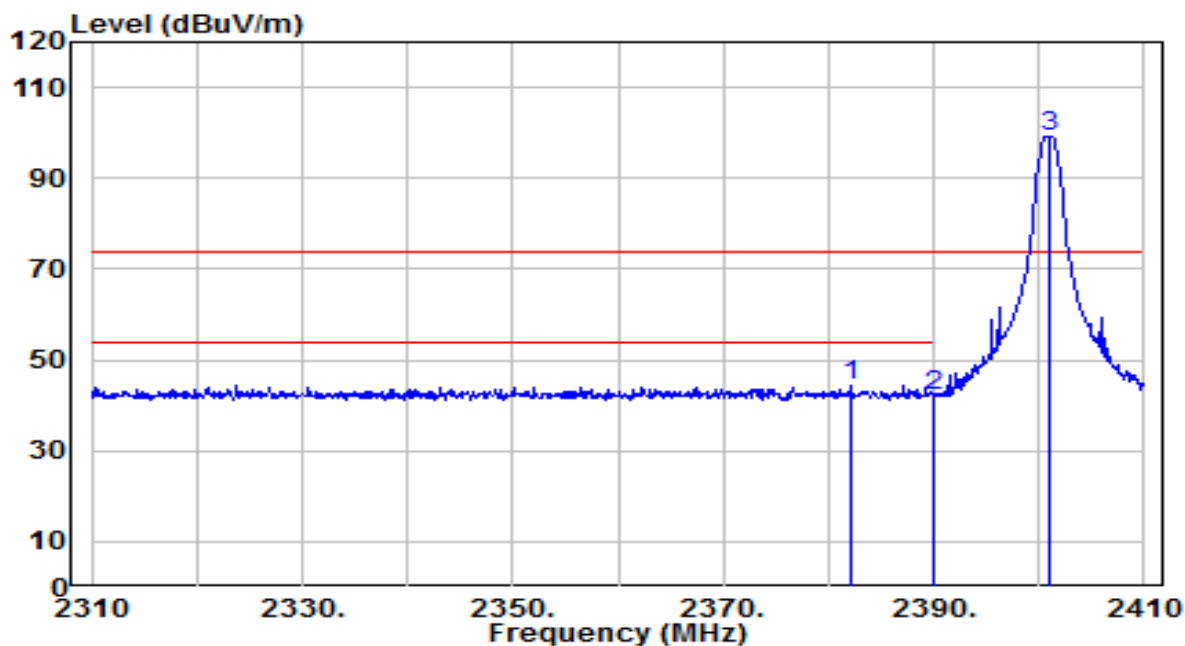
7.7.4. Test Setup

1GHz ~ 18GHz Test Setup:



7.7.5. Test Result

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

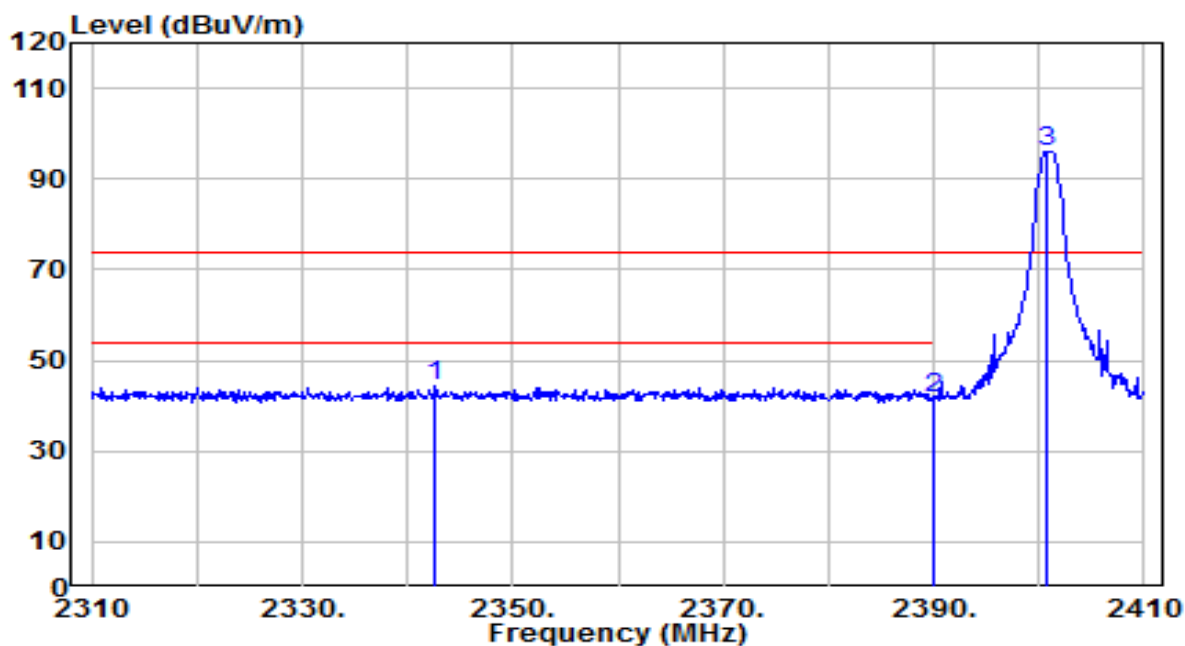


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	* 2382.100	45.81	-1.53	44.28	-29.72	74.00	110	190	Peak
2	2390.000	43.47	-1.50	41.97	-32.03	74.00	110	190	Peak
3	2401.100	100.69	-1.46	99.24	N/A	N/A	110	190	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

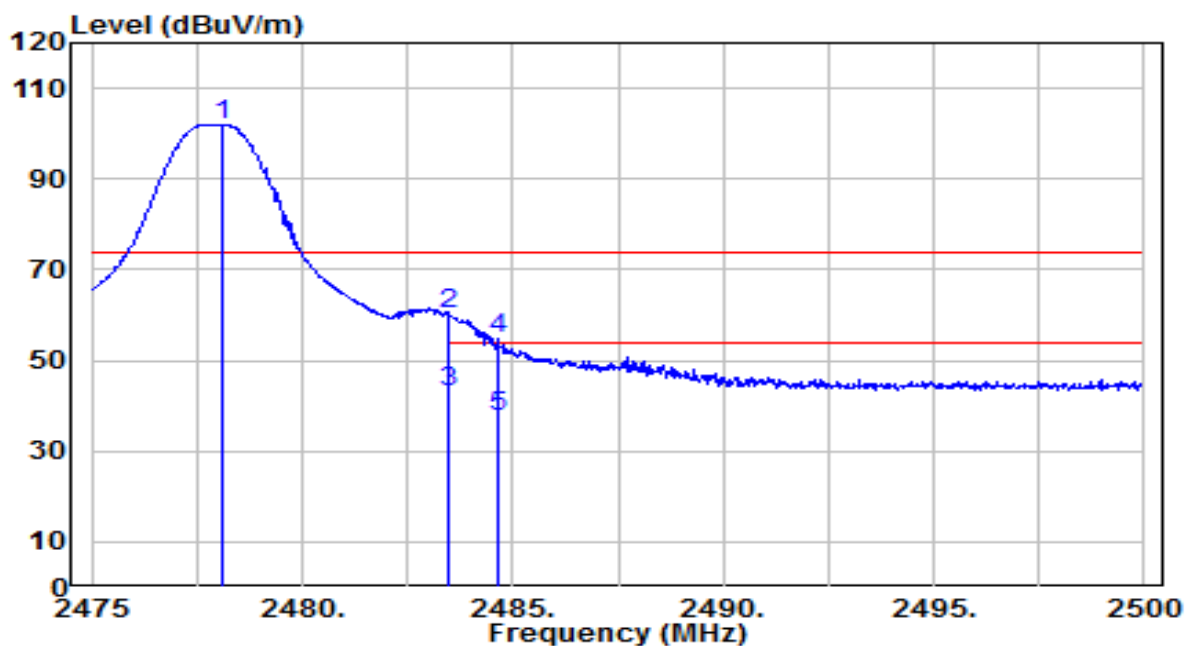


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	* 2342.700	45.89	-1.68	44.21	-29.79	74.00	100	230	Peak
2	2390.000	43.32	-1.50	41.82	-32.18	74.00	100	230	Peak
3	2400.800	97.55	-1.46	96.09	N/A	N/A	100	230	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

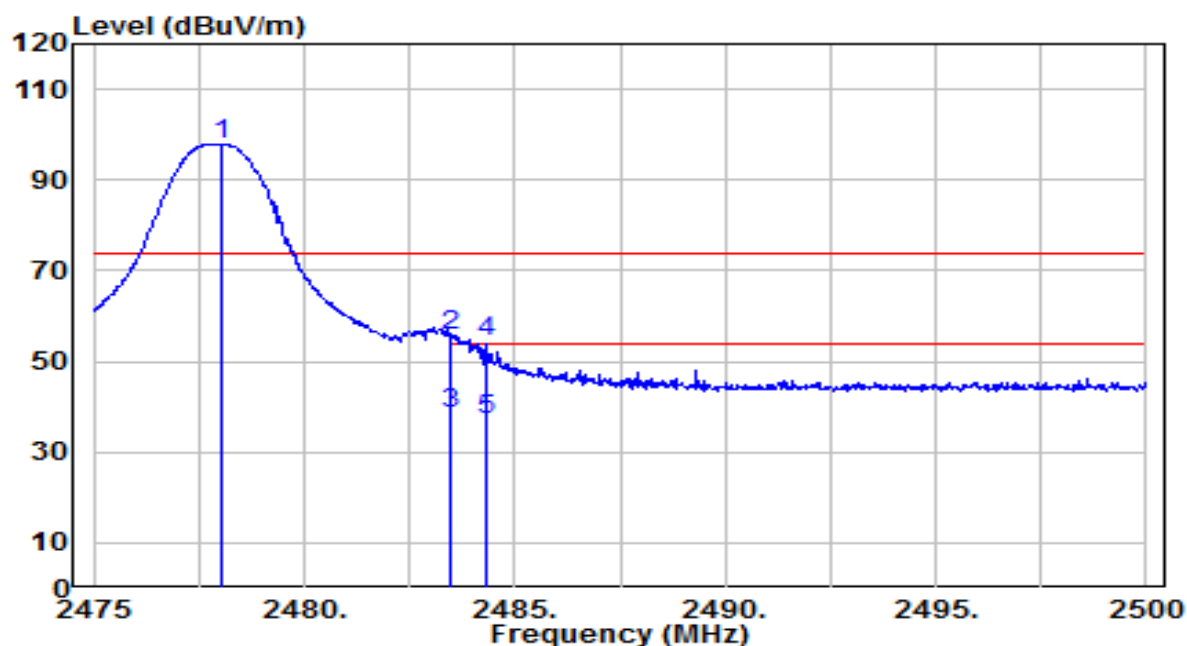


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2478.075	103.17	-1.17	102.00	N/A	N/A	130	180	Peak
2	* 2483.500	61.19	-1.15	60.04	-13.96	74.00	130	180	Peak
3	* 2483.500	N/A	N/A	42.86	-11.14	54.00	130	180	Average
4	2484.625	56.12	-1.15	54.97	-19.03	74.00	130	180	Peak
5	2484.625	N/A	N/A	37.79	-16.21	54.00	130	180	Average

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
- Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole(FPCB) Antenna_PF.1002.173	Test Voltage	By Notebook PC

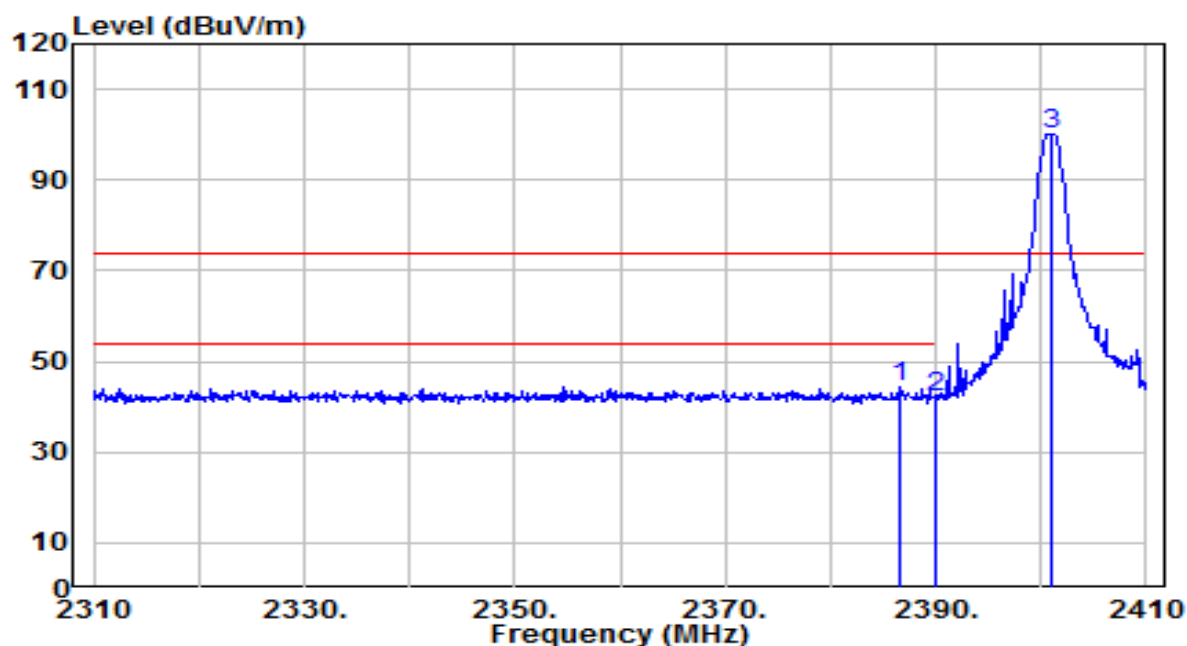


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2478.050	98.90	-1.17	97.73	N/A	N/A	125	215	Peak
2	* 2483.500	56.75	-1.15	55.59	-18.41	74.00	125	215	Peak
3	* 2483.500	N/A	N/A	38.41	-15.59	54.00	125	215	Average
4	2484.325	55.28	-1.15	54.13	-19.87	74.00	127	213	Peak
5	2484.325	N/A	N/A	36.95	-17.05	54.00	127	213	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor (20Log(1/Duty Cycle)) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

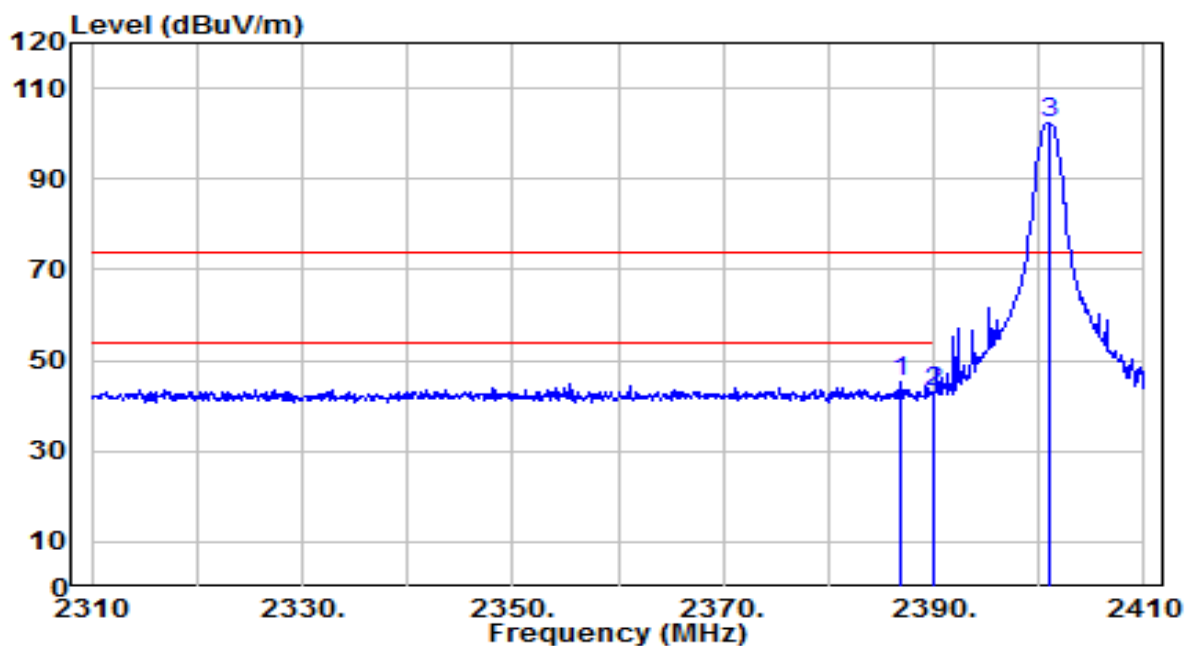


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2386.500	46.07	-1.51	44.56	-29.44	74.00	200	15	Peak
2		2390.000	43.72	-1.50	42.22	-31.78	74.00	200	15	Peak
3		2401.100	101.73	-1.46	100.27	N/A	N/A	200	15	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

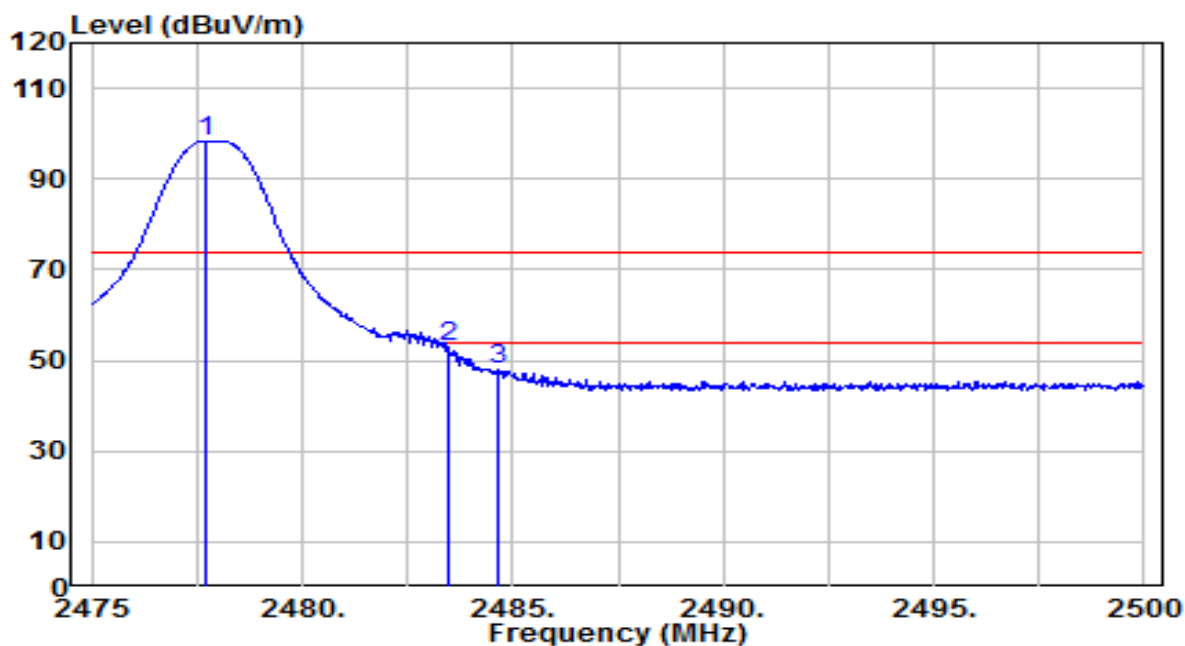


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2386.800	46.85	-1.51	45.34	-28.66	74.00	280	90	Peak
2		2390.000	44.49	-1.50	42.99	-31.01	74.00	280	90	Peak
3		2401.100	103.60	-1.46	102.14	N/A	N/A	280	90	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

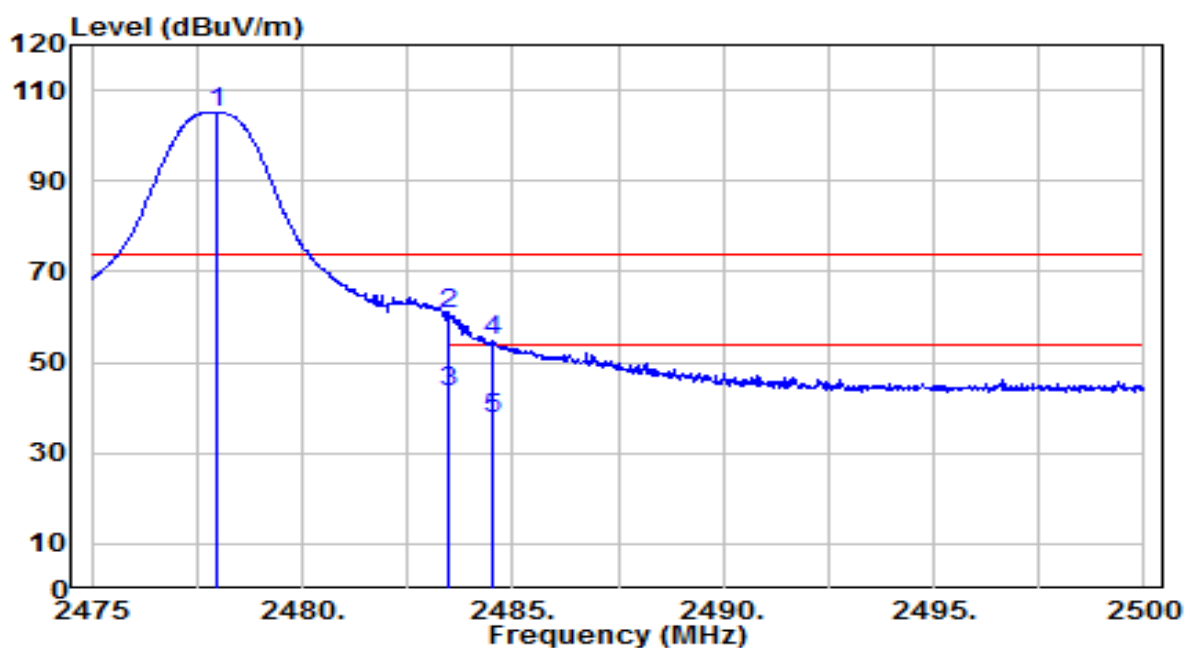


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2477.700	99.57	-1.17	98.39	N/A	N/A	160	340	Peak
2	* 2483.500	54.22	-1.15	53.07	-20.93	74.00	160	340	Peak
3	2484.625	49.05	-1.15	47.90	-26.10	74.00	160	340	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-10-24
Factor	BBHA 9120D	Temp. / Humidity	24°C /72%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_With Dipole Antenna_MP.54.2400.228	Test Voltage	By Notebook PC

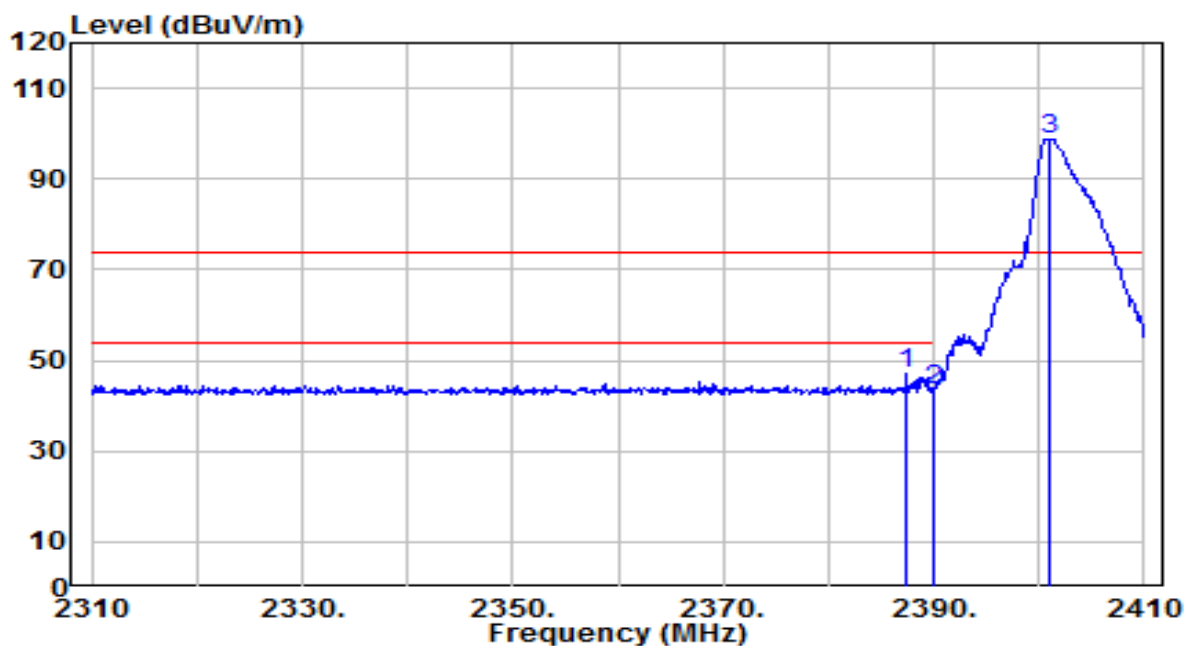


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2478.000	106.12	-1.17	104.95	N/A	N/A	165	40	Peak
2	* 2483.500	61.68	-1.15	60.53	-13.47	74.00	165	40	Peak
3	* 2483.500	N/A	N/A	43.35	-10.65	54.00	165	40	Average
4	2484.550	55.72	-1.15	54.57	-19.43	74.00	165	40	Peak
5	2484.550	N/A	N/A	37.39	-16.61	54.00	165	40	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor (20Log(1/Duty Cycle)) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D	Temp. / Humidity	24°C /55%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

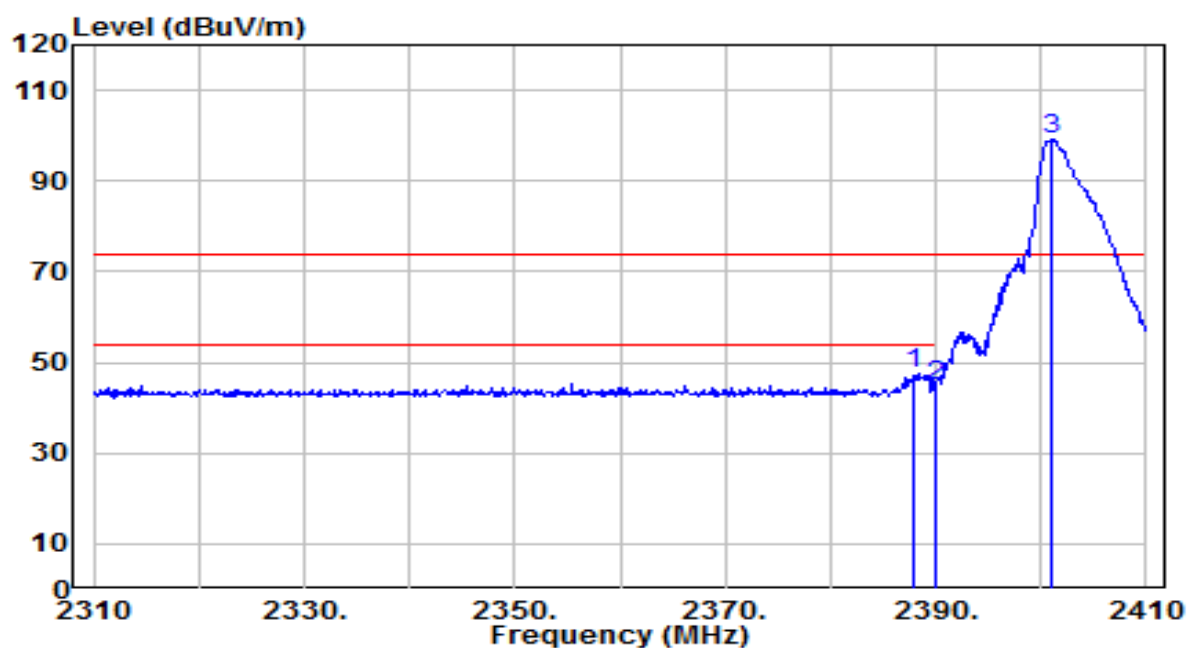


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2387.400	48.47	-1.51	46.96	-27.04	74.00	215	235	Peak
2		2390.000	44.96	-1.50	43.46	-30.54	74.00	215	235	Peak
3		2401.100	100.34	-1.46	98.88	N/A	N/A	215	235	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-11-26
Factor	BBHA 9120D	Temp. / Humidity	24°C /55%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2401MHz_ With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

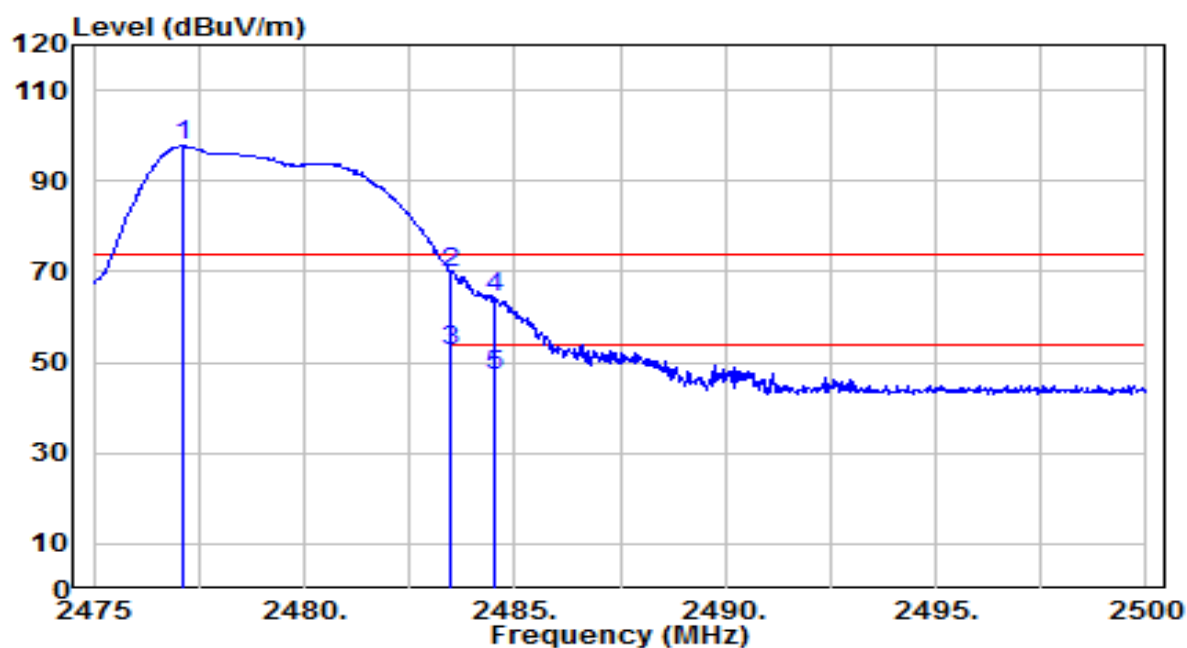


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2388.000	49.09	-1.51	47.59	-26.41	74.00	135	265	Peak
2		2390.000	46.54	-1.50	45.04	-28.96	74.00	135	265	Peak
3		2401.100	100.42	-1.46	98.96	N/A	N/A	135	265	Peak

Note:

- "*", means this data is the worst emission level.
- C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
- Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
- The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2025-11-05
Factor	BBHA 9120D	Temp. / Humidity	25°C /65%
Polarity	Horizontal	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_ With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

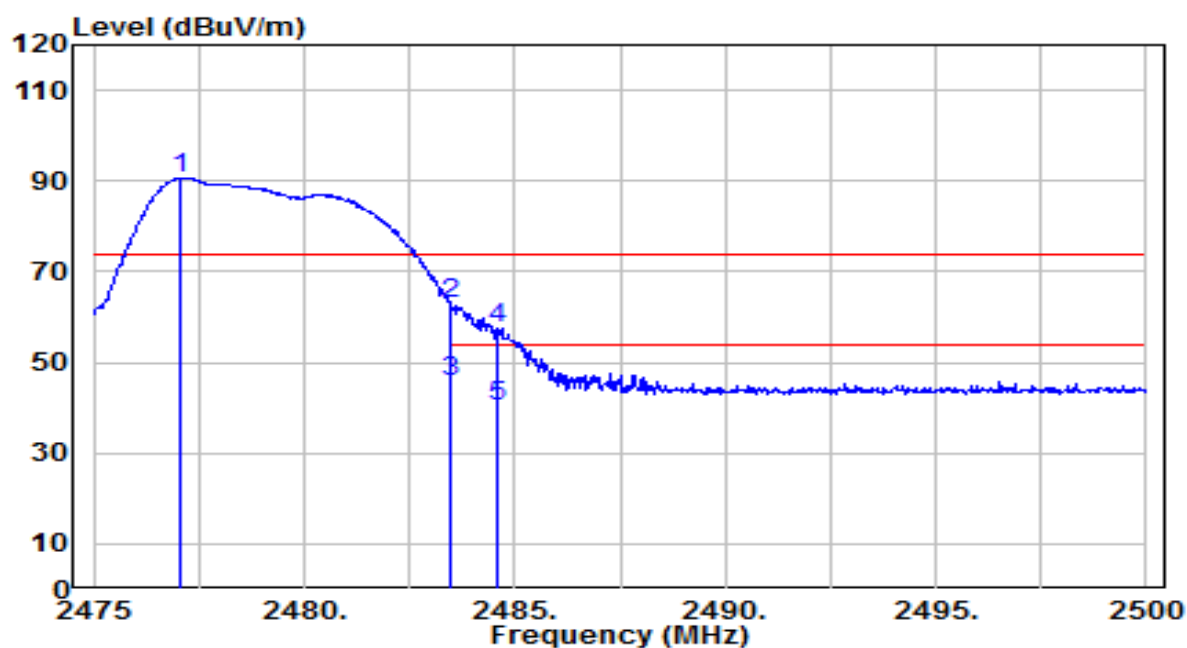


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2477.100	98.82	-1.18	97.65	N/A	N/A	175	25	Peak
2	* 2483.500	71.00	-1.15	69.85	-4.15	74.00	175	25	Peak
3	* 2483.500	N/A	N/A	52.67	-1.33	54.00	175	25	Average
4	2484.550	65.53	-1.15	64.39	-9.61	74.00	175	25	Peak
5	2484.550	N/A	N/A	47.21	-6.79	54.00	175	25	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2025-11-05
Factor	BBHA 9120D	Temp. / Humidity	25°C /65%
Polarity	Vertical	Site / Test Engineer	AC1 / James
Test Mode	TX_2478MHz_ With Helical Antenna_ BW2.4SNX14-3W5	Test Voltage	By Notebook PC

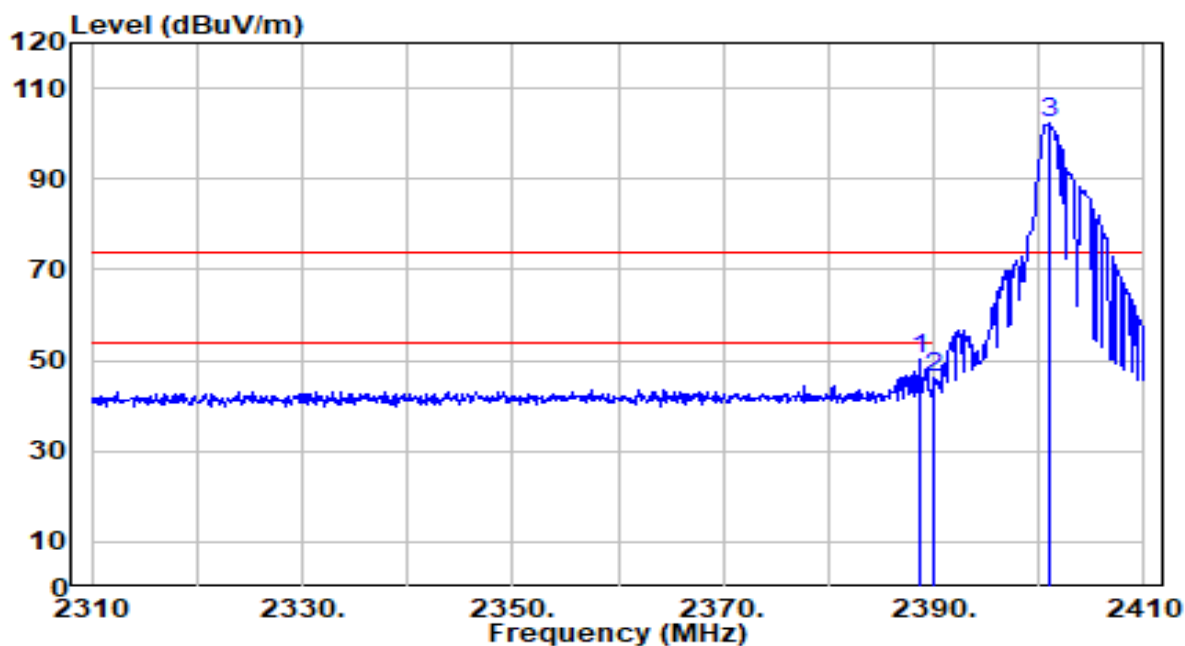


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2477.050	91.92	-1.18	90.74	N/A	N/A	215	170	Peak
2	* 2483.500	64.11	-1.15	62.96	-11.04	74.00	215	170	Peak
3	* 2483.500	N/A	N/A	45.78	-8.22	54.00	215	170	Average
4	2484.600	58.66	-1.15	57.51	-16.49	74.00	215	170	Peak
5	2484.600	N/A	N/A	40.33	-13.67	54.00	215	170	Average

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Average factor ($20\log(1/\text{Duty Cycle})$) is 17.18dB.
6. Average Measurement = Peak Measurement - Average factor.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D	Temp. / Humidity	24°C /67%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2401MHz_ With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

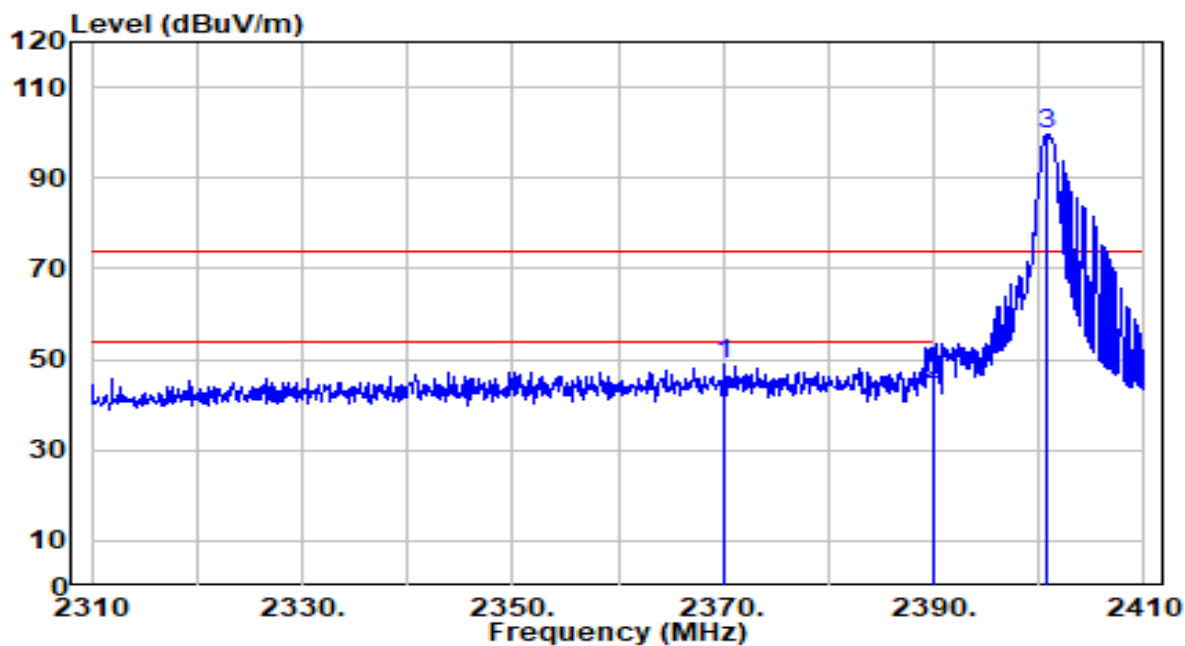


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2388.700	52.83	-2.71	50.12	-23.88	74.00	185	135	Peak
2		2390.000	48.70	-2.70	45.99	-28.01	74.00	185	135	Peak
3		2400.900	105.19	-2.66	102.54	N/A	N/A	185	135	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D	Temp. / Humidity	24°C /67%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2401MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

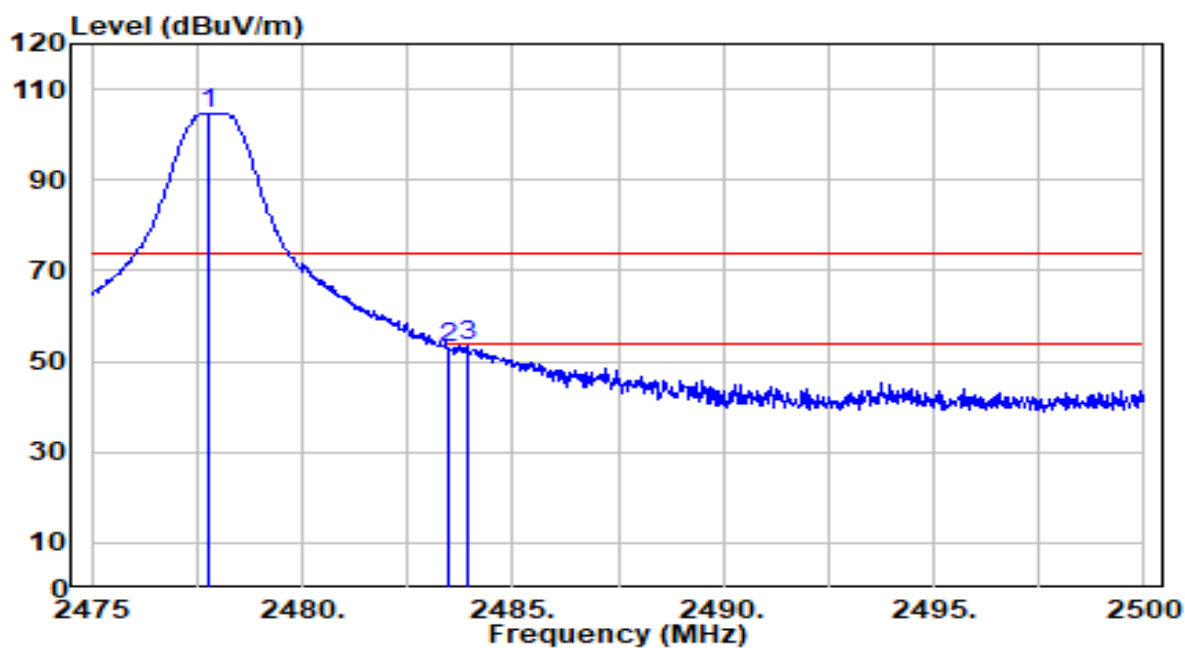


No		Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	2370.200	51.64	-2.79	48.84	-25.16	74.00	375	200	Peak
2		2390.000	46.99	-2.70	44.28	-29.72	74.00	375	200	Peak
3		2400.700	102.37	-2.66	99.72	N/A	N/A	375	200	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D	Temp. / Humidity	24°C /67%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2478MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC

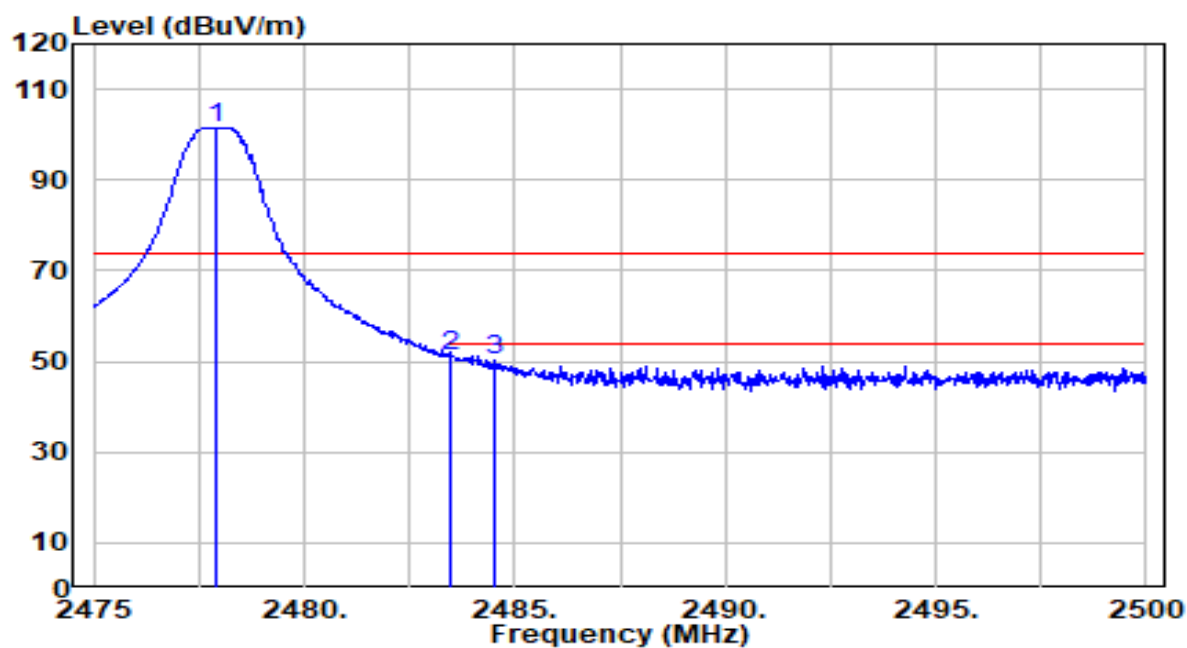


No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2477.775	107.11	-2.32	104.80	N/A	N/A	280	130	Peak
2	2483.500	55.23	-2.29	52.94	-21.06	74.00	280	130	Peak
3	* 2483.925	55.58	-2.29	53.29	-20.71	74.00	280	130	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

EUT	2.4G RF Module	Date of Test	2021-03-27
Factor	BBHA 9120D	Temp. / Humidity	24°C /67%
Polarity	Vertical	Site / Test Engineer	AC1 / Kaunaz
Test Mode	TX_2478MHz_With PCB Antenna_B0129A2	Test Voltage	By Notebook PC



No	Frequency (MHz)	Reading (dBuV)	C.F (dB/m)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	2477.900	103.96	-2.32	101.64	N/A	N/A	350	205	Peak
2	* 2483.500	53.29	-2.29	50.99	-23.01	74.00	350	205	Peak
3	2484.500	52.35	-2.29	50.06	-23.94	74.00	250	205	Peak

Note:

1. " *", means this data is the worst emission level.
2. C.F (Correction Factor) = Antenna Factor (dB/m) + Cable Loss (dB) – Preamplifier(dB).
3. Measurement (dBuV/m) = Reading(dBuV) + C.F (Correction Factor).
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

7.8. AC Conducted Emissions Measurement

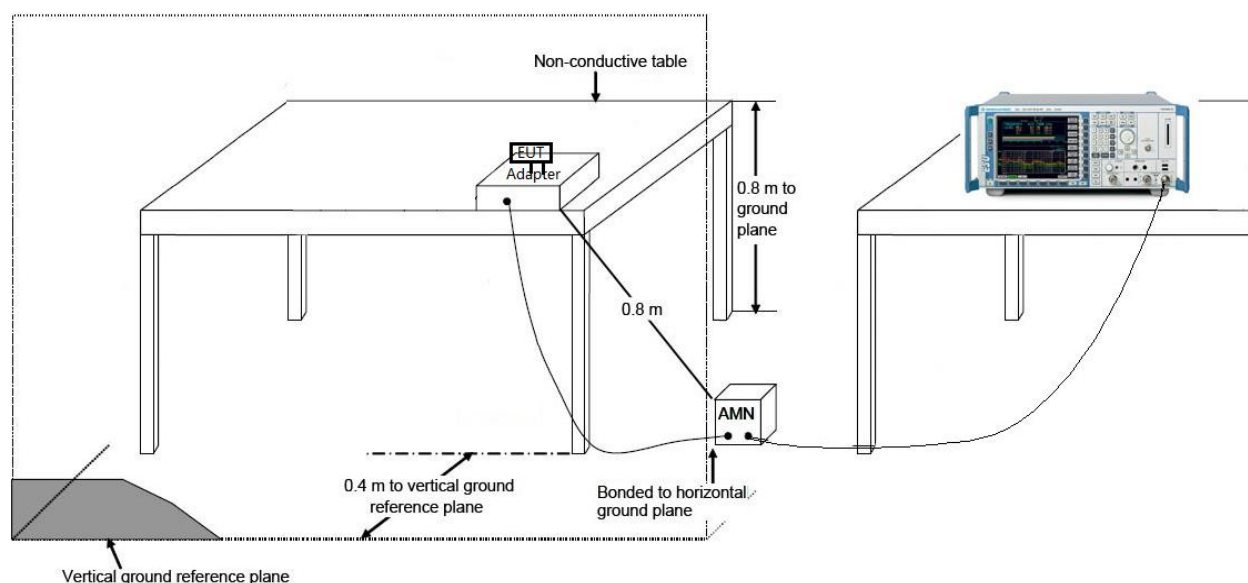
7.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 / RSS-Gen Limits		
Frequency (MHz)	QP (dB μ V)	Average (dB μ V)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

7.8.2. Test Setup



7.8.3. Test Result

Note: Please refer to original report 2102TWA101-U1.

(FCC Original Grant Date: 07/30/2021, FCC ID: RN489896162-B0129)

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **2.4G RF module** is in compliance with Part 15C of the FCC Rules.

Appendix A : Test Setup Photograph

Refer to “2505TWA101-UT” file.

Appendix B : External Photograph

Refer to “2505TWA101-UE” file.

Appendix C : Internal Photograph

Refer to “2505TWA101-UI” file.

_____ The End _____