FCC Test Report

Product Name	Wireless module
Model No.	P5740-162
FCC ID.	2AJE7SMC-WEX07

Applicant	SMC Corporation
Address	4-2-2, Kinunodai, Tsukubamirai-shi, Ibaraki-ken, 300-2493 Japan

Date of Receipt	Apr. 29, 2021
Issued Date	Jun. 11, 2021
Report No.	2140998R-E3032110109
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
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The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: Jun. 11, 2021
Report No.: 2140998R-E3032110109

Product Name	Wireless module
Applicant	SMC Corporation
Address	4-2-2, Kinunodai, Tsukubamirai-shi, Ibaraki-ken, 300-2493 Japan
Manufacturer	SMC Corporation
Model No.	P5740-162
FCC ID.	2AJE7SMC-WEX07
EUT Rated Voltage	DC 3.3V by Test Fixture
EUT Test Voltage	DC 24V by DC Power Supply
Trade Name	SMC
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Jinn Chen

(Senior Adm. Specialist / Jinn Chen)

Tested By : Ivan Chuang

(Senior Engineer / Ivan Chuang)

Approved By : Jack Hsu

(Senior Engineer / Jack Hsu)

TABLE OF CONTENTS

Revision History

Report No.	Version	Description	Issued Date
2140998R-E3032110109	V1.0	Initial issue of report.	Jun. 11, 2021

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless module
Trade Name	SMC
Model No.	P5740-162
FCC ID.	2AJE7SMC-WEX07
Frequency Range	2403MHz – 2481MHz
Channel Number	79
Type of Modulation	GFSK
Antenna Type	PCB Antenna / whip Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	SMC	P5740-162	PCB Antenna	1.83 dBi for 2.4 GHz
2	SMC	P5740-164	whip Antenna	1.49 dBi for 2.4 GHz

Note: The antenna of EUT conforms to FCC 15.203.

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 79:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz	Channel 79:	2481 MHz
Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz		

Note:

1. The EUT is a Wireless module with built-in 2.4G transceiver.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit - 250kbps Mode 2: Transmit - 1Mbps

1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

PCB Antenna:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	DC Power Supply	KEYSIGHT	E36234A	MY59001234	Non-shielded, 1.8m
2	Test Fixture	SMC	P5741-155-3	N/A	N/A

Signal Cable Type		Signal cable Description
A	Power Cable	Non-shielded, 0.4m
B	Power Cable	Non-shielded, 2m

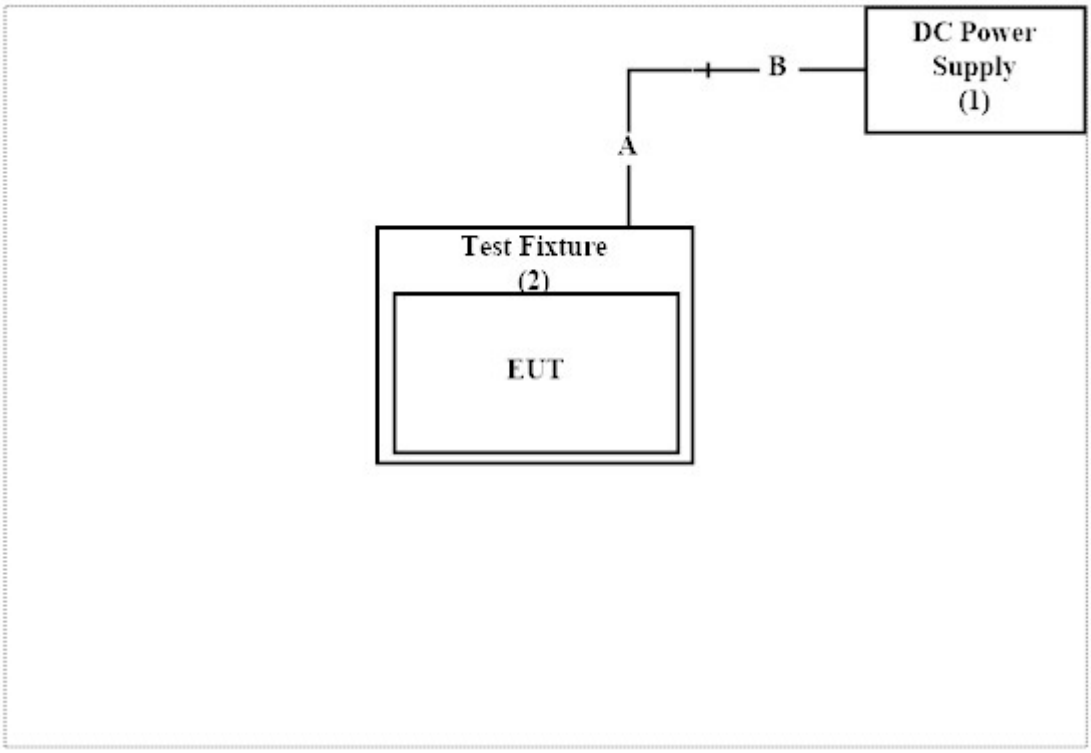
Whip Antenna:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	DC Power Supply	KEYSIGHT	E36234A	MY59001234	Non-shielded, 1.8m
2	Test Fixture	SMC	P5741-155-3	N/A	N/A

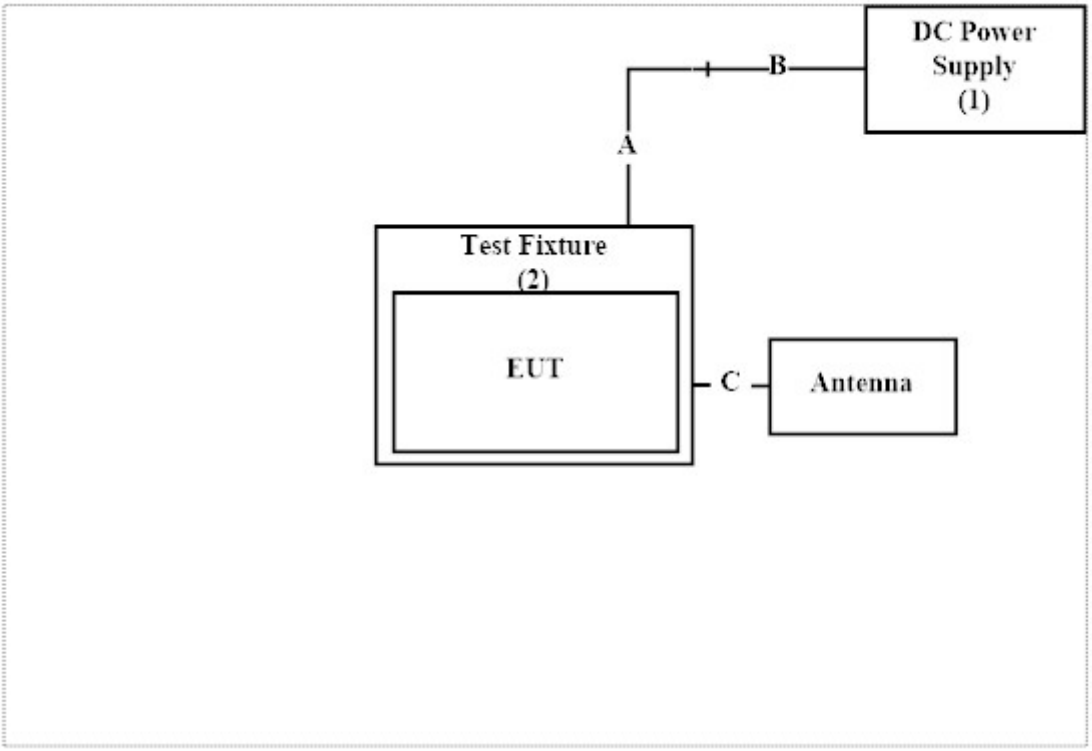
Signal Cable Type		Signal cable Description
A	Power Cable	Non-shielded, 0.4m
B	Power Cable	Non-shielded, 2m
C	Antenna Cable	Shielded, 1.56m

1.3. Configuration of Tested System

PCB Antenna:



Whip Antenna:



1.4. EUT Exercise Software

1. Setup the EUT as shown in Section 1.3.
2. Execute software “Wireless tool Ver 1.2a” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	29.7 °C
	Humidity (%RH)	10~90 %	83 %
Radiated Emission	Temperature (°C)	10~40 °C	24.6 °C
	Humidity (%RH)	10~90 %	52.6 %
Conductive	Temperature (°C)	10~40 °C	35 °C
	Humidity (%RH)	10~90 %	59 %

USA : FCC Registration Number: TW0033
Canada : IC Registration Number: 26930

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City
Phone number : 886-2-2602-7968
Fax number : 866-2-2602-3286
Email address : info.tw@dekra.com
Website : http://www.dekra.com.tw

1.6. List of Test Equipment

For Conduction measurements /SH1

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	EMI Test Receiver	R&S	ESR7	101601	2021.01.04	2022.01.03
X	Two-Line V-Network	R&S	ENV216	101306	2021.04.08	2022.04.07
X	Two-Line V-Network	R&S	ENV216	101307	2020.04.17	2021.04.16
X	Coaxial Cable	DEKRA	RG400_BNC	RF001	2021.05.24	2022.05.23

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0.

For Conducted measurements /SH2

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Spectrum Analyzer	R&S	FSV30	103465	2021.03.16	2022.03.15
X	Power Meter	Anritsu	ML2496A	1548002	2021.02.24	2022.02.23
X	Power Sensor	Anritsu	MA2411B	1531022	2021.02.24	2022.02.23
X	Power Sensor	Anritsu	MA2411B	1531023	2021.02.24	2022.02.23

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test System V9.0.5.

For Radiated measurements /966-3

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Loop Antenna	AMETEK	HLA6121	56736	2021.04.14	2022.04.13
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-678	2020.09.04	2021.09.03
X	Horn Antenna	ETS-Lindgren	3117	00201259	2020.10.23	2021.10.22
X	Horn Antenna	Com-Power	AH-840	101087	2020.06.08	2021.06.07
X	Pre-Amplifier	EMCI	EMC001330	980302	2020.07.08	2021.07.07
X	Pre-Amplifier	EMCI	EMC051835SE	980312	2020.06.10	2021.06.09
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2020.06.24	2021.06.23
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2020.06.10	2021.06.09
X	Filter	MICRO TRONICS	BRM50702	G251	2020.09.17	2021.09.16
	Filter	MICRO TRONICS	BRM50716	G188	2020.09.17	2021.09.16
X	EMI Test Receiver	R&S	ESR	102793	2020.12.17	2021.12.16
X	Spectrum Analyzer	R&S	FSV3044	101113	2021.02.03	2022.02.02
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2021.03.03	2022.03.02
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2020.06.10	2021.06.09

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Testing System V2.0.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

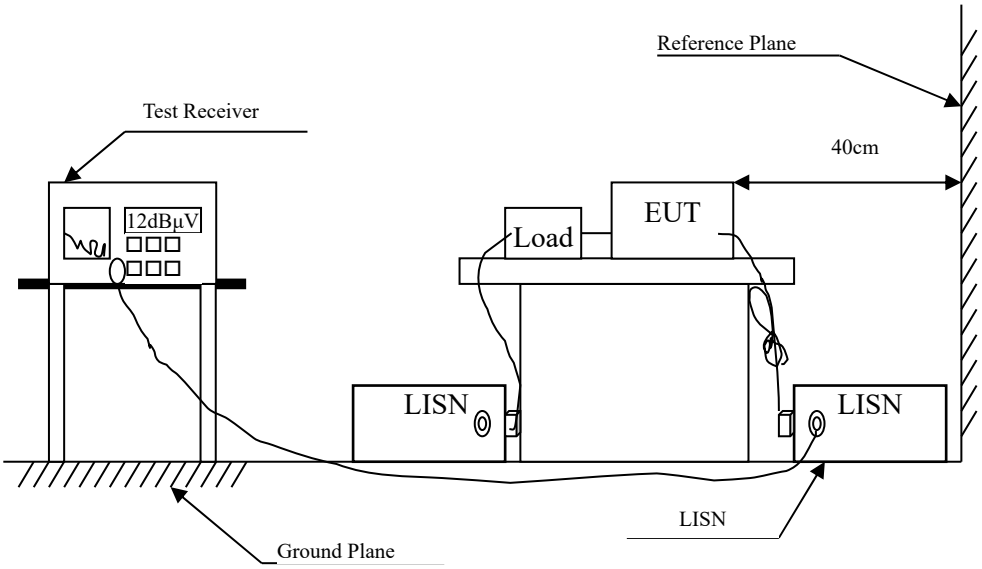
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	±3.42 dB	
Peak Power Output	±0.91 dB	
Radiated Emission	Under 1GHz ±4.06 dB	Above 1GHz ±3.73 dB
RF Antenna Conducted Test	±2.53 dB	
Band Edge	Under 1GHz ±4.06 dB	Above 1GHz ±3.73 dB
Channel Number	N/A	
Channel Separation	±682.83 Hz	
Dwell Time	±2.31 ms	
Occupied Bandwidth	±682.83 Hz	
Duty Cycle	±2.31 ms	

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

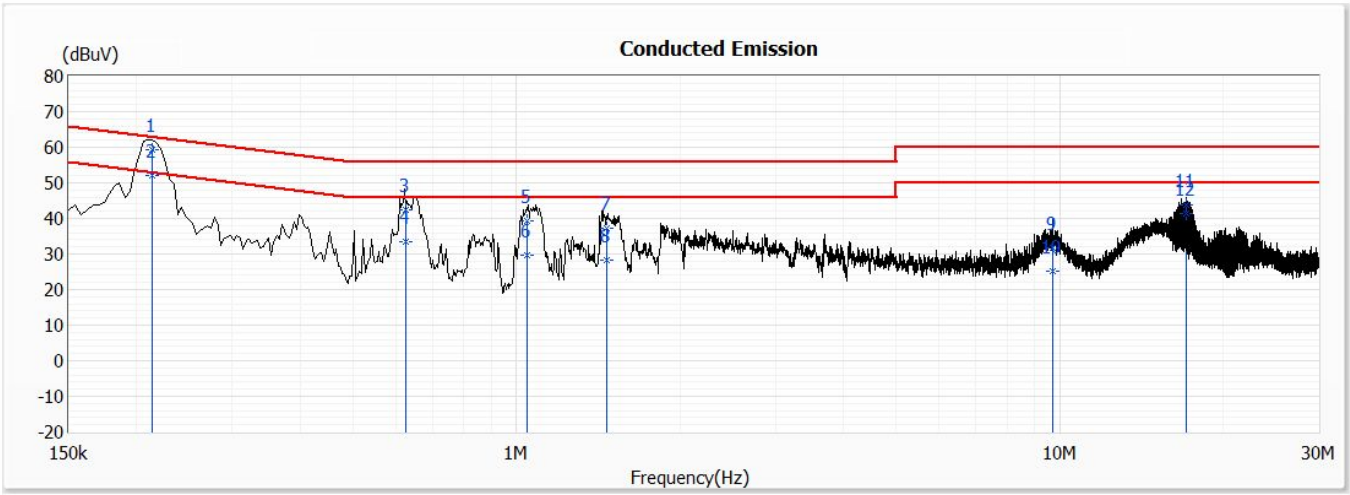
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT setup and the test procedure are according to ANSI C63.4, 2014 to comply with the requirements of FCC 47CFR Subpart C.

2.4. Test Result of Conducted Emission

Product : Wireless module
Test Item : Conducted Emission Test
Power Line : L
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_PCB Antenna
Test Date : 2021/06/04

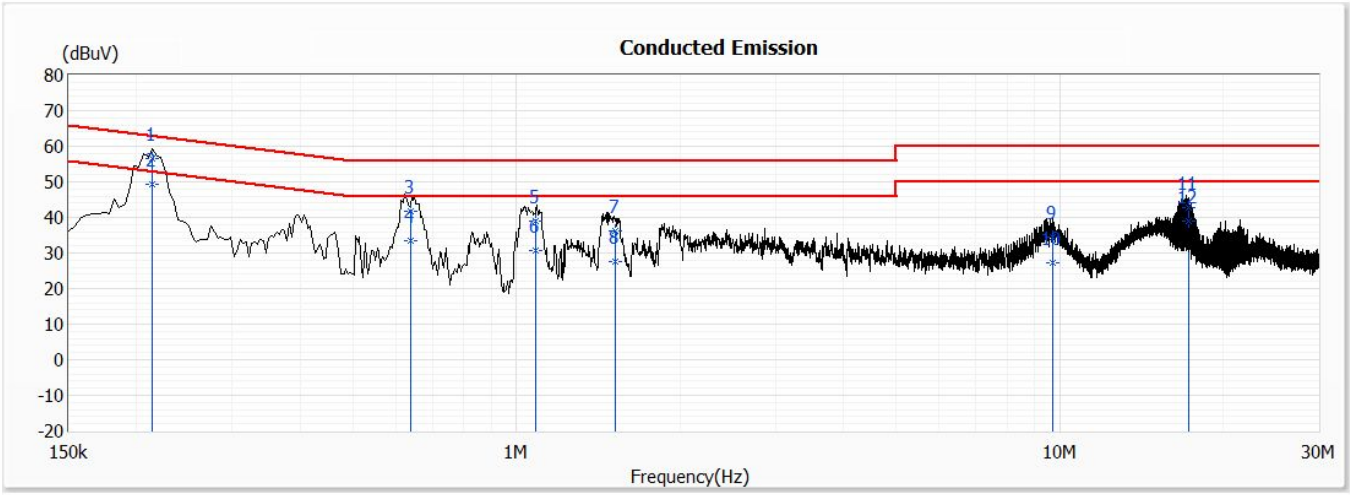


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.213	59.14	63.07	-3.93	49.49	9.65	QP
*2	0.213	51.96	53.07	-1.11	42.31	9.65	AV
3	0.626	42.37	56.00	-13.63	32.70	9.67	QP
4	0.626	33.57	46.00	-12.43	23.90	9.67	AV
5	1.046	39.38	56.00	-16.62	29.69	9.69	QP
6	1.046	29.75	46.00	-16.25	20.06	9.69	AV
7	1.468	37.14	56.00	-18.86	27.44	9.70	QP
8	1.468	28.22	46.00	-17.78	18.52	9.70	AV
9	9.723	31.77	60.00	-28.23	21.88	9.89	QP
10	9.723	25.03	50.00	-24.97	15.14	9.89	AV
11	17.087	43.86	60.00	-16.14	33.91	9.95	QP
12	17.087	41.25	50.00	-8.75	31.30	9.95	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless module
Test Item : Conducted Emission Test
Power Line : N
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_PCB Antenna
Test Date : 2021/06/04

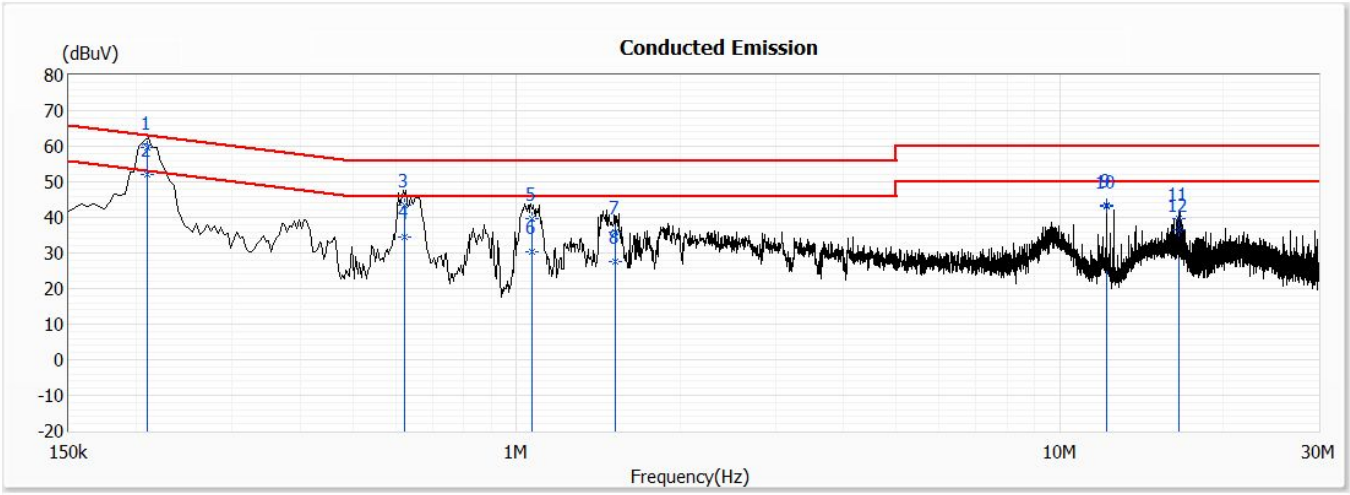


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.214	56.58	63.07	-6.49	46.91	9.67	QP
*2	0.214	49.36	53.07	-3.71	39.69	9.67	AV
3	0.640	41.83	56.00	-14.17	32.15	9.68	QP
4	0.640	33.33	46.00	-12.67	23.65	9.68	AV
5	1.088	38.82	56.00	-17.18	29.13	9.69	QP
6	1.088	30.80	46.00	-15.20	21.11	9.69	AV
7	1.521	36.22	56.00	-19.78	26.50	9.72	QP
8	1.521	27.70	46.00	-18.30	17.98	9.72	AV
9	9.708	34.45	60.00	-25.55	24.54	9.91	QP
10	9.708	27.13	50.00	-22.87	17.22	9.91	AV
11	17.277	42.90	60.00	-17.10	32.88	10.02	QP
12	17.277	38.94	50.00	-11.06	28.92	10.02	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless module
Test Item : Conducted Emission Test
Power Line : L
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_Whip Antenna
Test Date : 2021/06/04

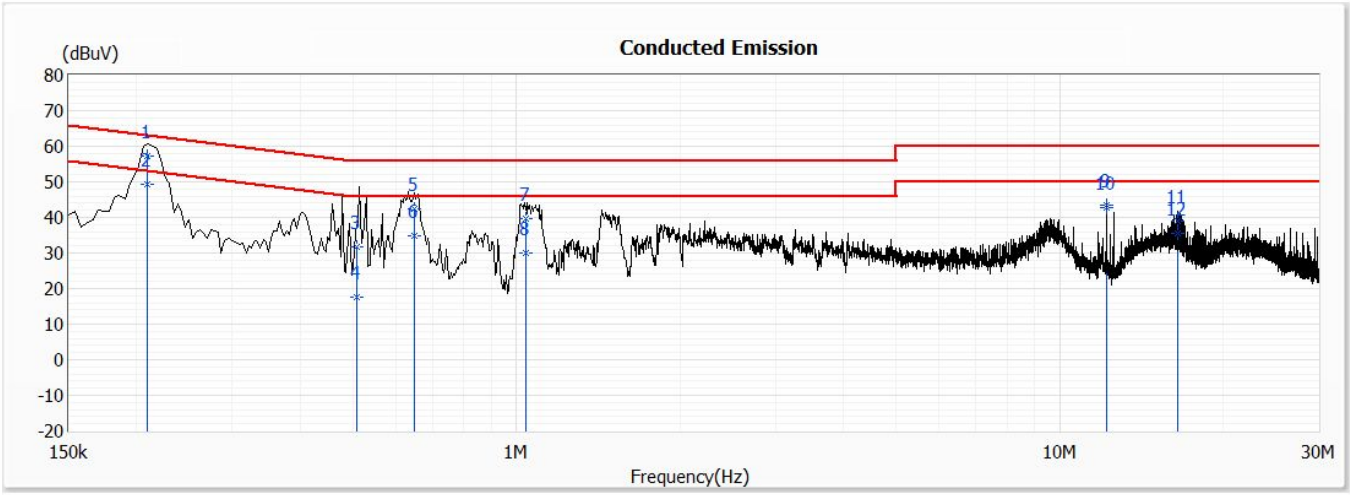


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.209	59.71	63.24	-3.53	50.06	9.65	QP
*2	0.209	52.00	53.24	-1.24	42.35	9.65	AV
3	0.621	43.47	56.00	-12.53	33.81	9.66	QP
4	0.621	34.37	46.00	-11.63	24.71	9.66	AV
5	1.067	39.82	56.00	-16.18	30.13	9.69	QP
6	1.067	30.25	46.00	-15.75	20.56	9.69	AV
7	1.520	36.02	56.00	-19.98	26.31	9.71	QP
8	1.520	27.47	46.00	-18.53	17.76	9.71	AV
9	12.200	43.48	60.00	-16.52	33.56	9.92	QP
10	12.200	43.06	50.00	-6.94	33.14	9.92	AV
11	16.578	39.58	60.00	-20.42	29.63	9.95	QP
12	16.578	36.67	50.00	-13.33	26.72	9.95	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless module
Test Item : Conducted Emission Test
Power Line : N
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_Whip Antenna
Test Date : 2021/06/04



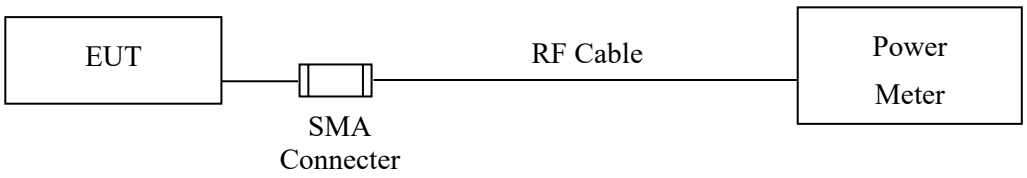
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.210	57.15	63.22	-6.07	47.48	9.67	QP
*2	0.210	49.44	53.22	-3.78	39.77	9.67	AV
3	0.510	31.73	56.00	-24.27	22.06	9.67	QP
4	0.510	17.72	46.00	-28.28	8.05	9.67	AV
5	0.649	42.56	56.00	-13.44	32.88	9.68	QP
6	0.649	34.71	46.00	-11.29	25.03	9.68	AV
7	1.039	39.82	56.00	-16.18	30.13	9.69	QP
8	1.039	30.05	46.00	-15.95	20.36	9.69	AV
9	12.200	43.32	60.00	-16.68	33.37	9.95	QP
10	12.200	42.83	50.00	-7.17	32.88	9.95	AV
11	16.483	38.87	60.00	-21.13	28.86	10.01	QP
12	16.483	35.61	50.00	-14.39	25.60	10.01	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ * “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt.

3.3. Test Procedure

Tested according to FHSS test procedure of KDB 558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

3.4. Test Result of Peak Power Output

Product : Wireless module
Test Item : Peak Power Output
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2021/05/10

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
01	2403	13.58	125mWatt= 20.96 dBm	Pass
40	2442	13.56	125mWatt= 20.96 dBm	Pass
79	2481	0.56	125mWatt= 20.96 dBm	Pass

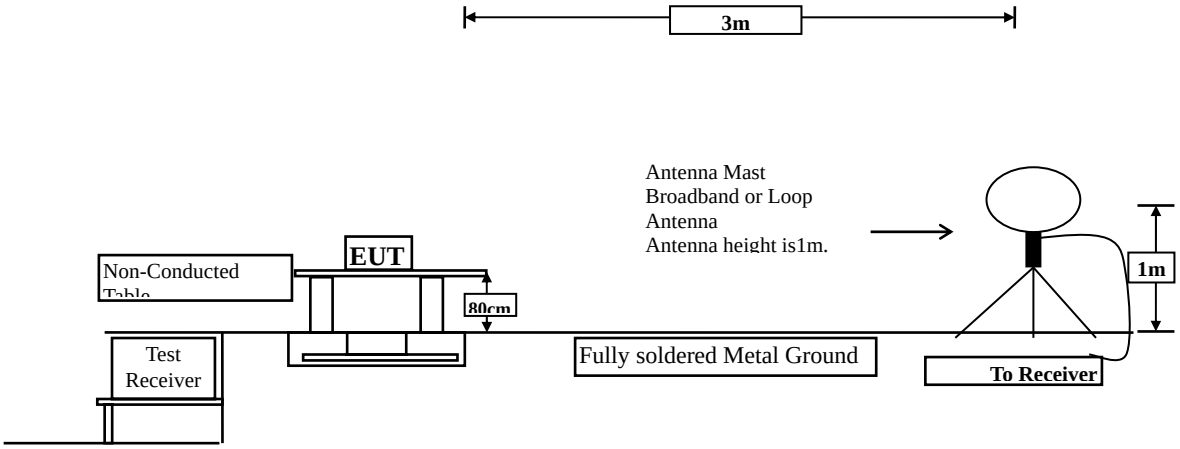
Product : Wireless module
Test Item : Peak Power Output
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2021/05/10

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
01	2403	13.51	125mWatt= 20.96 dBm	Pass
40	2442	13.55	125mWatt= 20.96 dBm	Pass
79	2481	0.57	125mWatt= 20.96 dBm	Pass

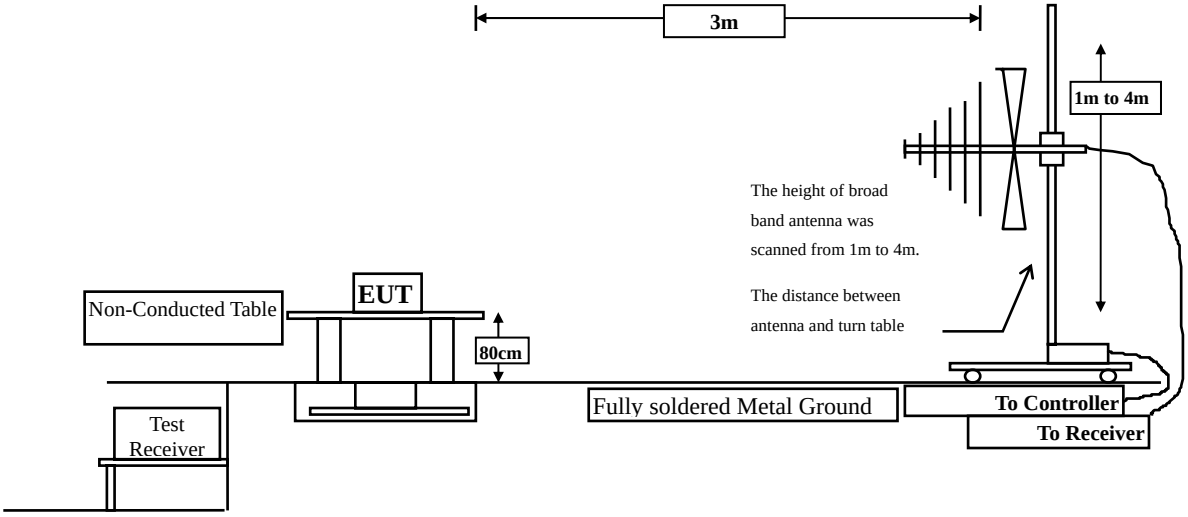
4. Radiated Emission

4.1. Test Setup

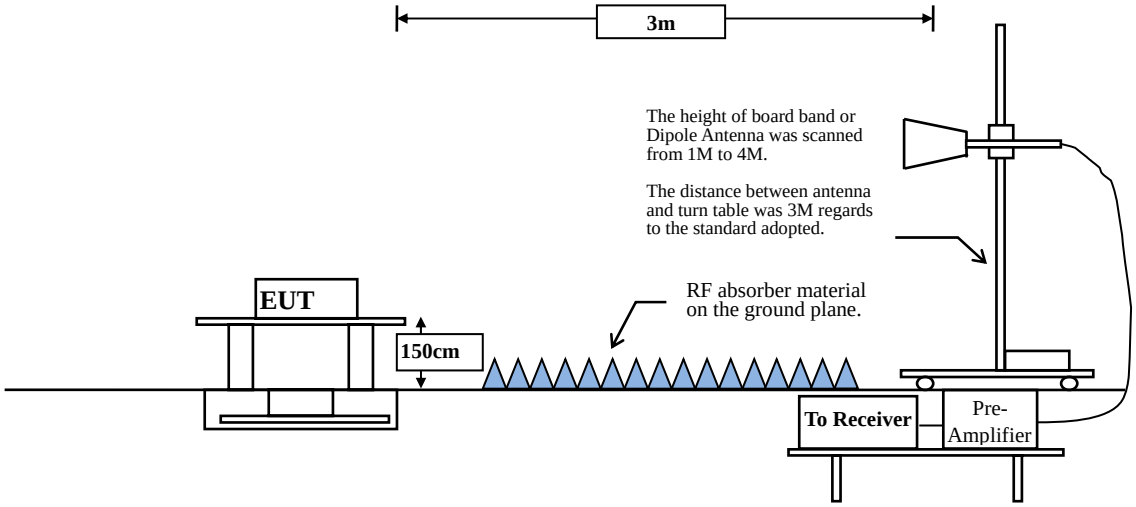
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

➢ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
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

Remarks: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

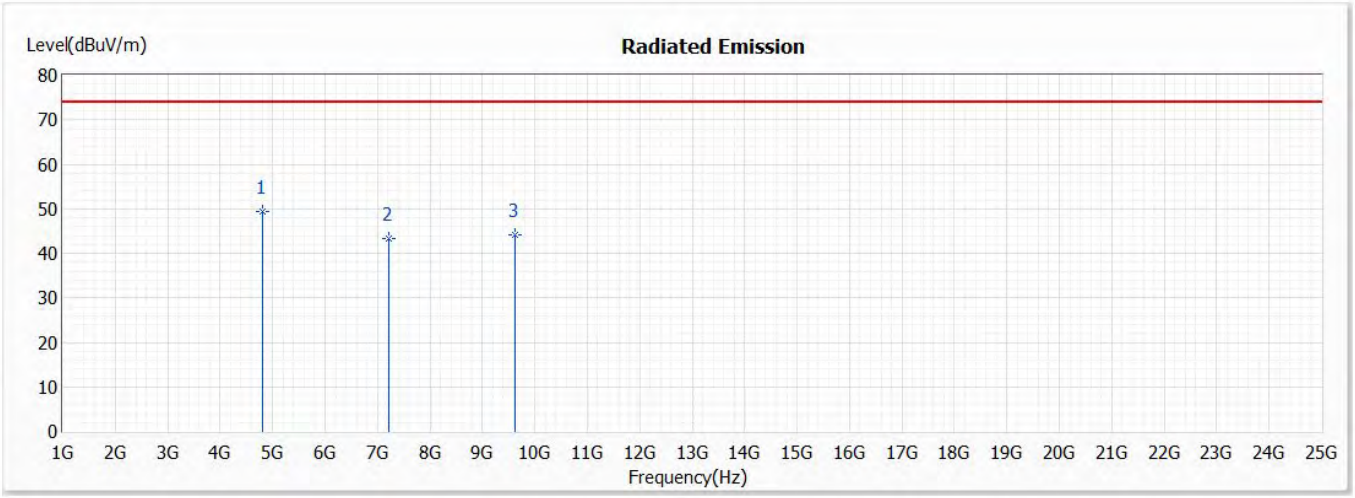
The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Test Result of Radiated Emission

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2403MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4806.000	49.34	74.00	-24.66	48.85	0.49	PK
2	7209.000	43.20	74.00	-30.80	38.49	4.71	PK
3	9612.000	44.10	74.00	-29.90	37.25	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

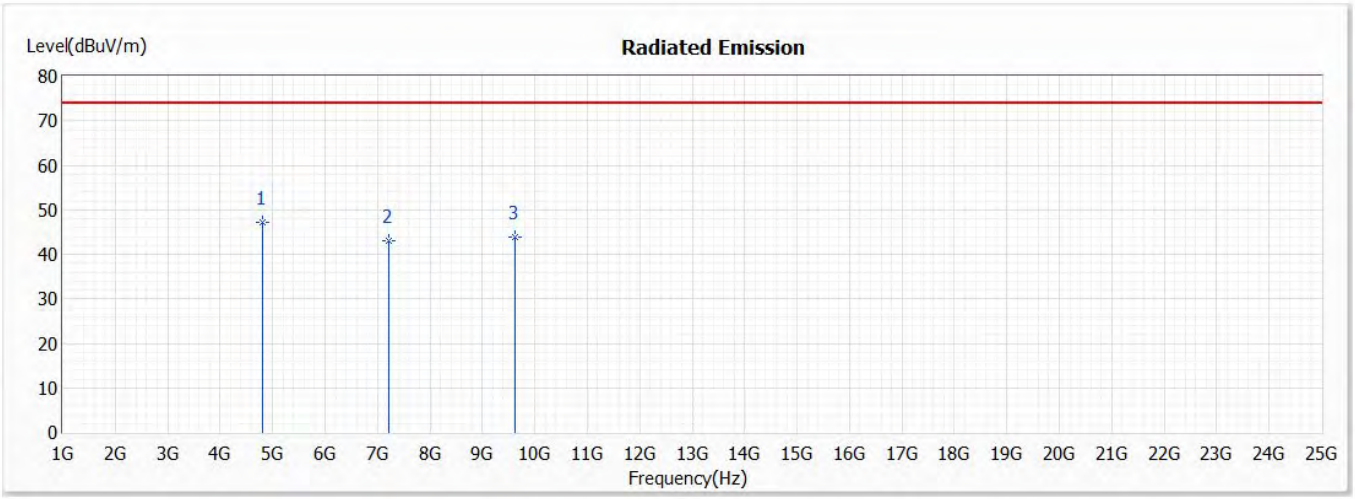
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2403MHz)_PCB Antenna
Test Date : 2021/06/07

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4806.000	47.18	74.00	-26.82	46.69	0.49	PK
2	7209.000	43.13	74.00	-30.87	38.42	4.71	PK
3	9612.000	43.98	74.00	-30.02	37.13	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

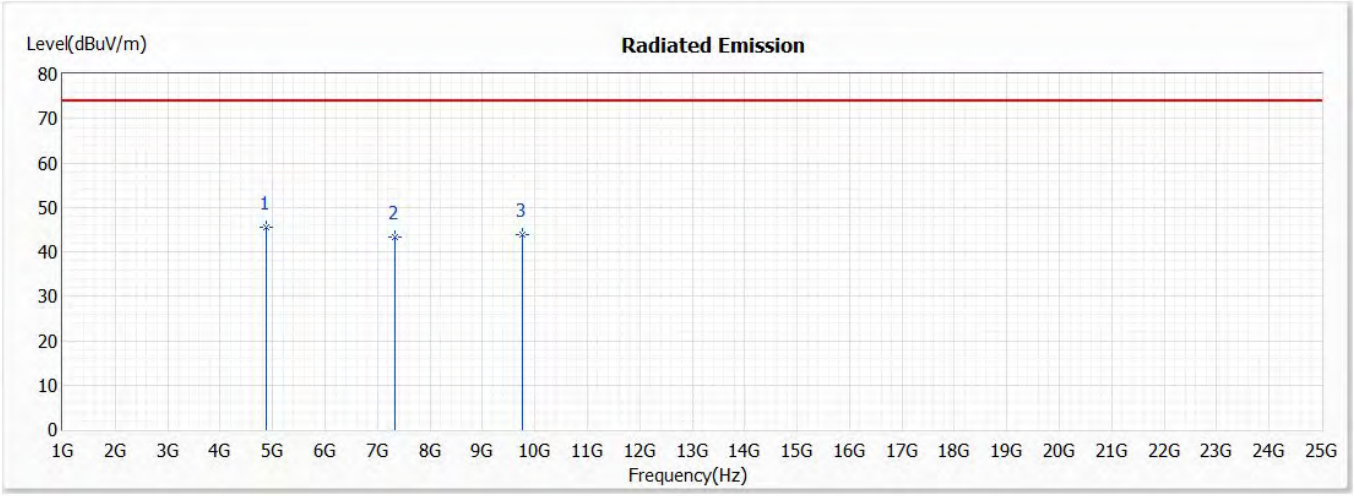
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2442MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	45.40	74.00	-28.60	44.81	0.59	PK
2	7326.000	43.22	74.00	-30.78	38.37	4.85	PK
3	9768.000	43.76	74.00	-30.24	36.52	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

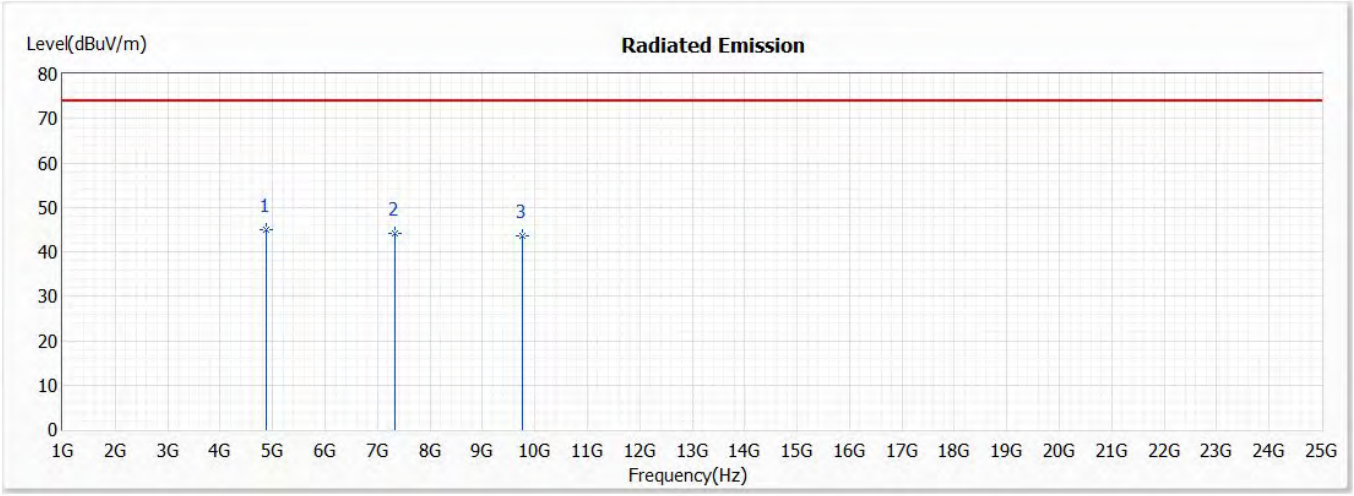
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2442MHz)_PCB Antenna
Test Date : 2021/06/07

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	44.97	74.00	-29.03	44.38	0.59	PK
2	7326.000	44.06	74.00	-29.94	39.21	4.85	PK
3	9768.000	43.71	74.00	-30.29	36.47	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

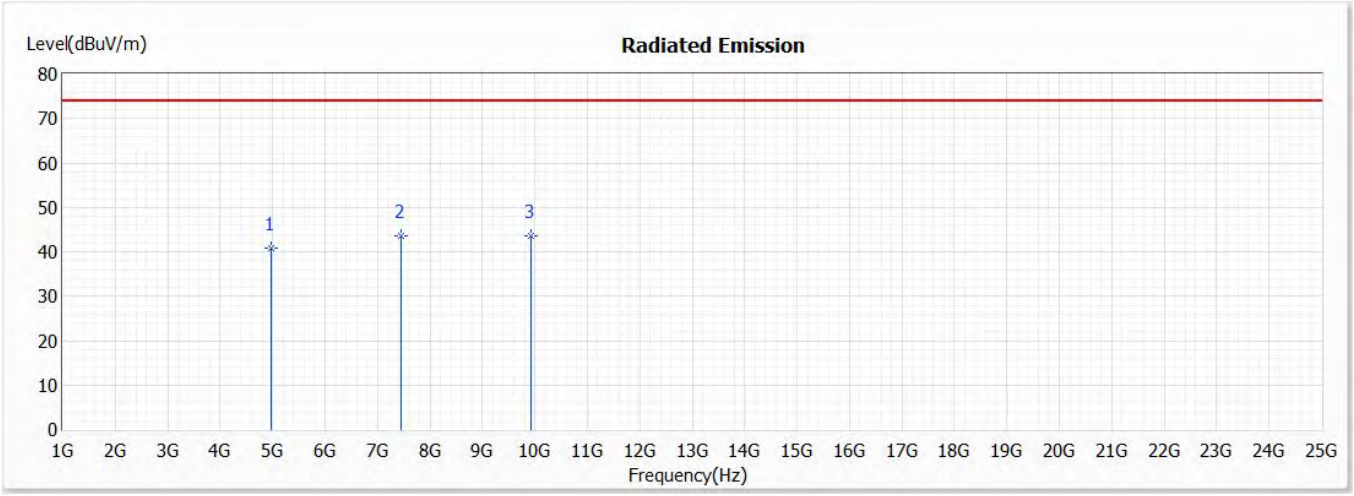
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2481MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	40.95	74.00	-33.05	40.25	0.70	PK
2	7443.000	43.66	74.00	-30.34	38.71	4.95	PK
* 3	9924.000	43.69	74.00	-30.31	36.28	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

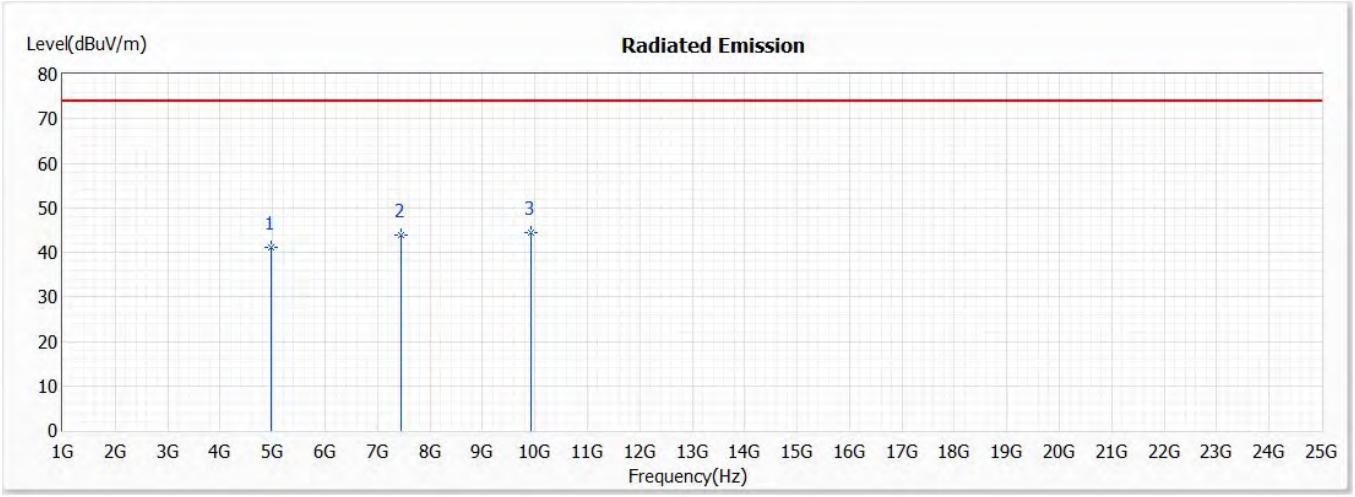
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product	:	Wireless module
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 1: Transmit - 250kbps(2481MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	41.08	74.00	-32.92	40.38	0.70	PK
2	7443.000	43.97	74.00	-30.03	39.02	4.95	PK
* 3	9924.000	44.39	74.00	-29.61	36.98	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

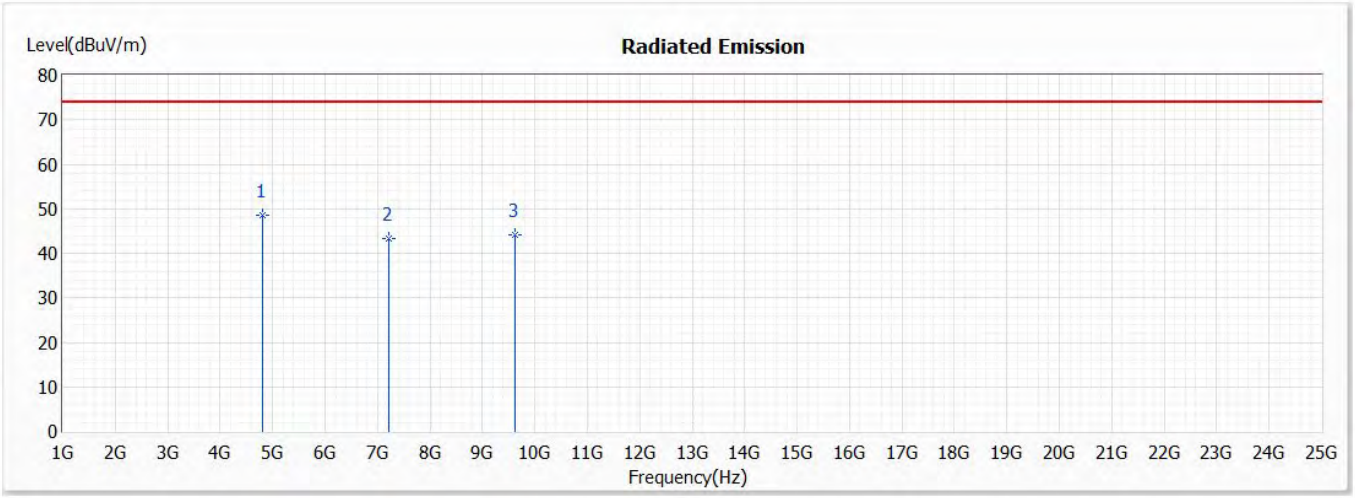
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps(2403MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4806.000	48.45	74.00	-25.55	47.96	0.49	PK
2	7209.000	43.25	74.00	-30.75	38.54	4.71	PK
3	9612.000	44.17	74.00	-29.83	37.32	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

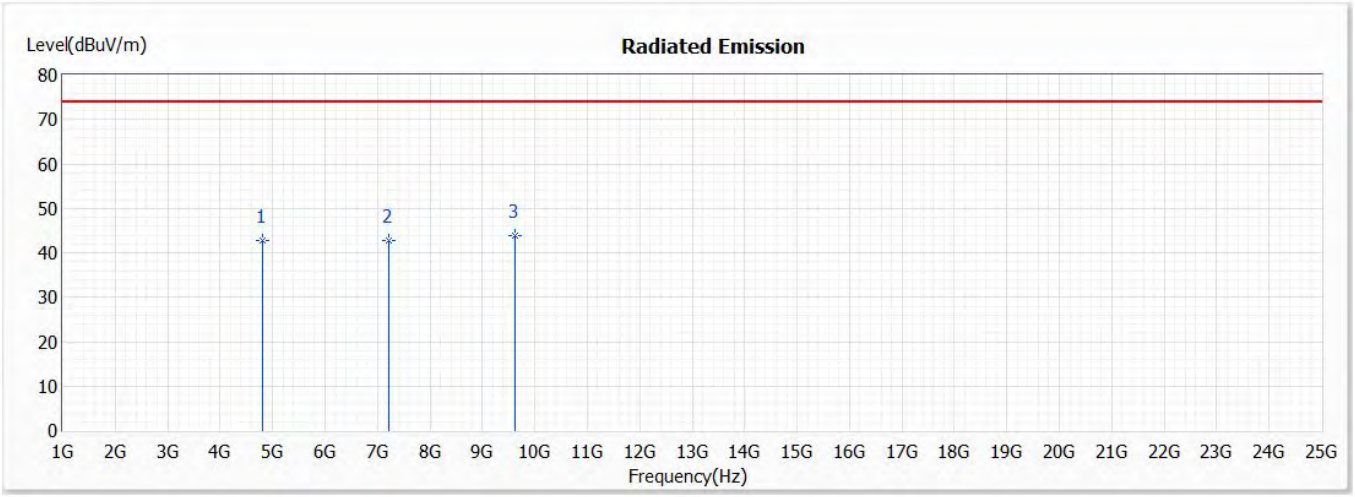
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product	:	Wireless module
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 2: Transmit - 1Mbps(2403MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4806.000	42.75	74.00	-31.25	42.26	0.49	PK
2	7209.000	42.70	74.00	-31.30	37.99	4.71	PK
* 3	9612.000	43.93	74.00	-30.07	37.08	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

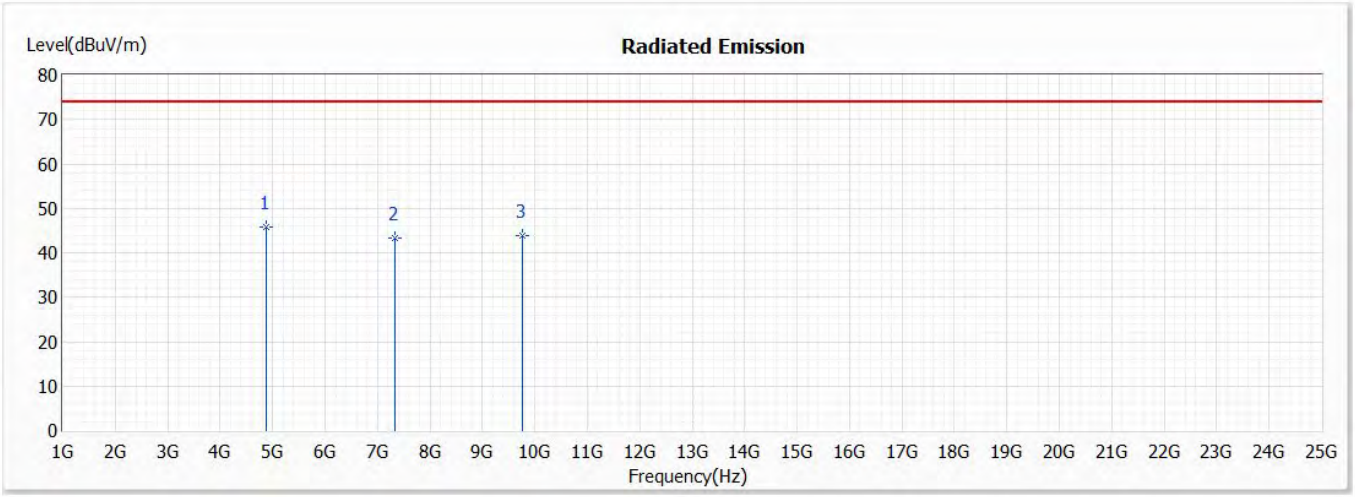
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	45.90	74.00	-28.10	45.31	0.59	PK
2	7326.000	43.21	74.00	-30.79	38.36	4.85	PK
3	9768.000	43.78	74.00	-30.22	36.54	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

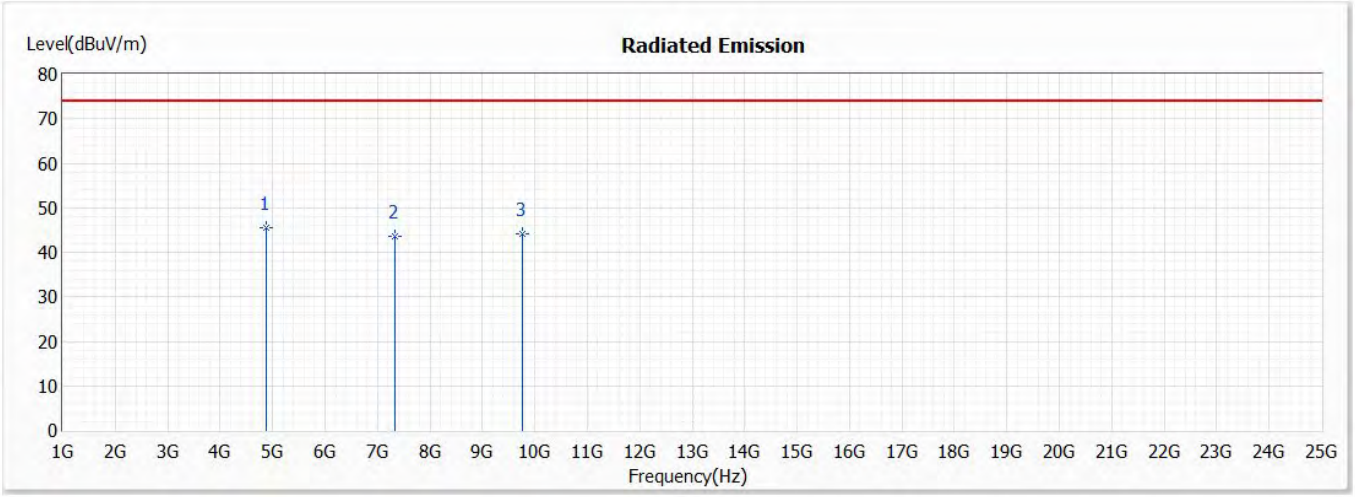
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_PCB Antenna
Test Date : 2021/06/07

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	45.48	74.00	-28.52	44.89	0.59	PK
2	7326.000	43.53	74.00	-30.47	38.68	4.85	PK
3	9768.000	44.25	74.00	-29.75	37.01	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

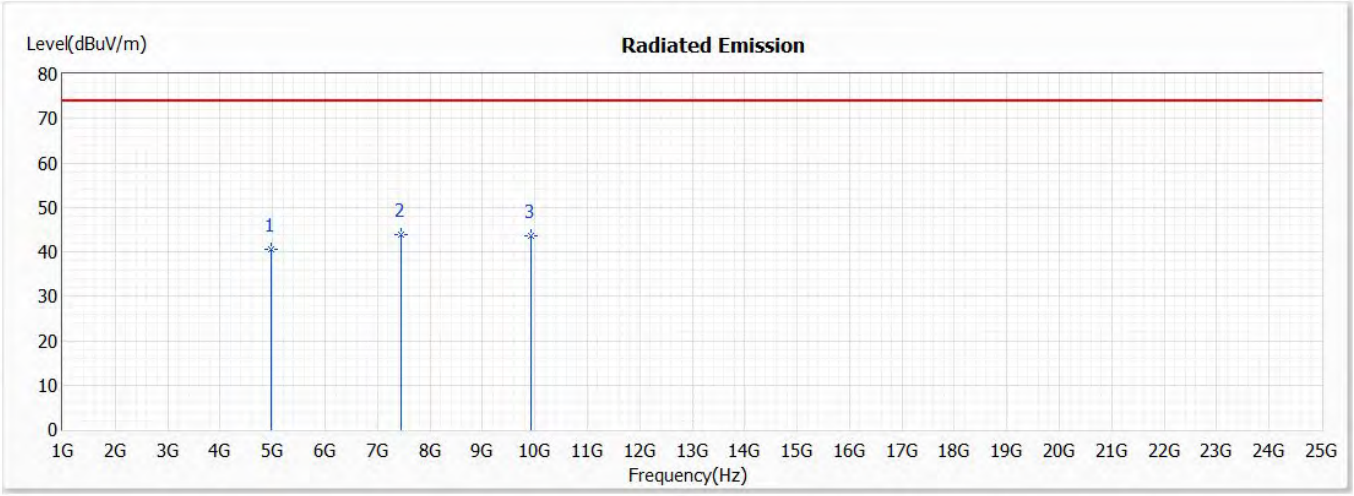
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	40.54	74.00	-33.46	39.84	0.70	PK
* 2	7443.000	43.73	74.00	-30.27	38.78	4.95	PK
3	9924.000	43.59	74.00	-30.41	36.18	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

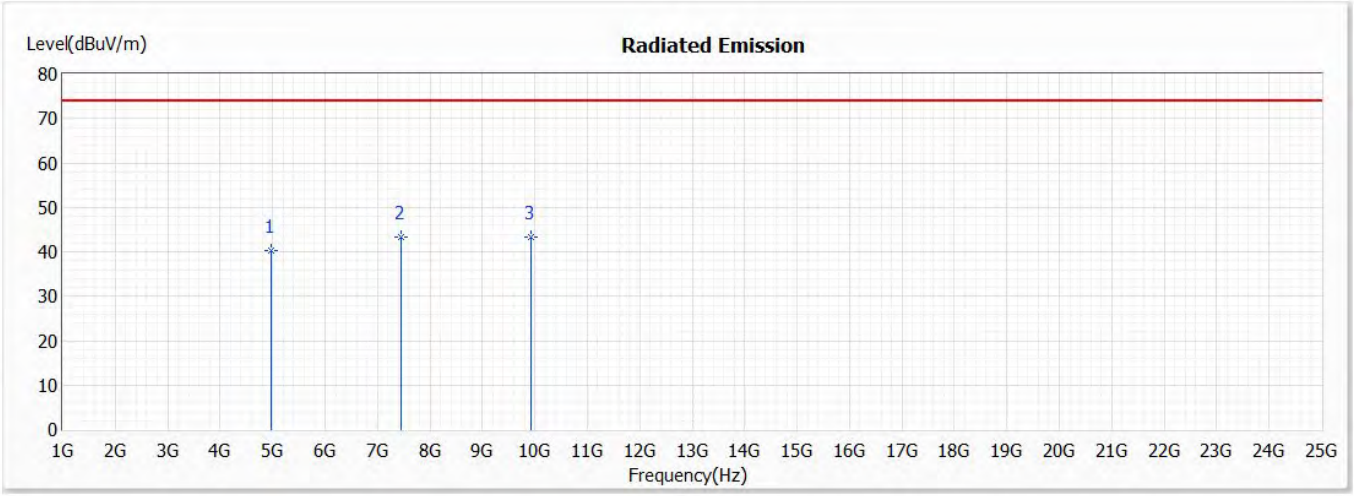
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_PCB Antenna
Test Date : 2021/06/07

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	40.33	74.00	-33.67	39.63	0.70	PK
* 2	7443.000	43.29	74.00	-30.71	38.34	4.95	PK
3	9924.000	43.26	74.00	-30.74	35.85	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

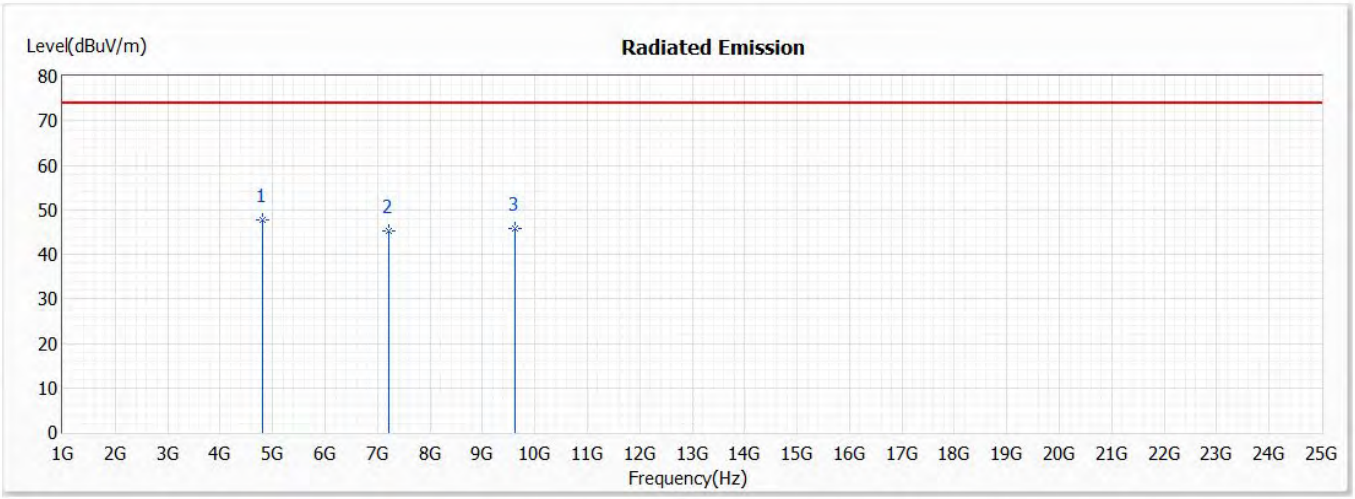
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product	:	Wireless module
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 1: Transmit - 250kbps(2403MHz)_Whip Antenna
Test Date	:	2021/05/29

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4806.000	47.62	74.00	-26.38	47.13	0.49	PK
2	7209.000	45.16	74.00	-28.84	40.45	4.71	PK
3	9612.000	45.77	74.00	-28.23	38.92	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

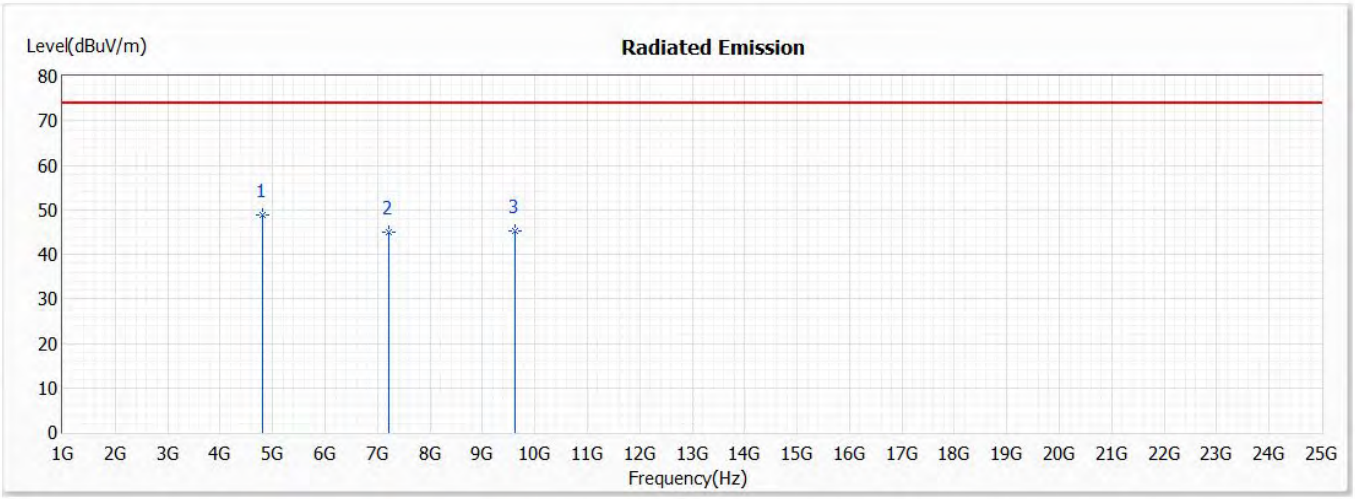
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2403MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4806.000	48.71	74.00	-25.29	48.22	0.49	PK
2	7209.000	44.86	74.00	-29.14	40.15	4.71	PK
3	9612.000	45.16	74.00	-28.84	38.31	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

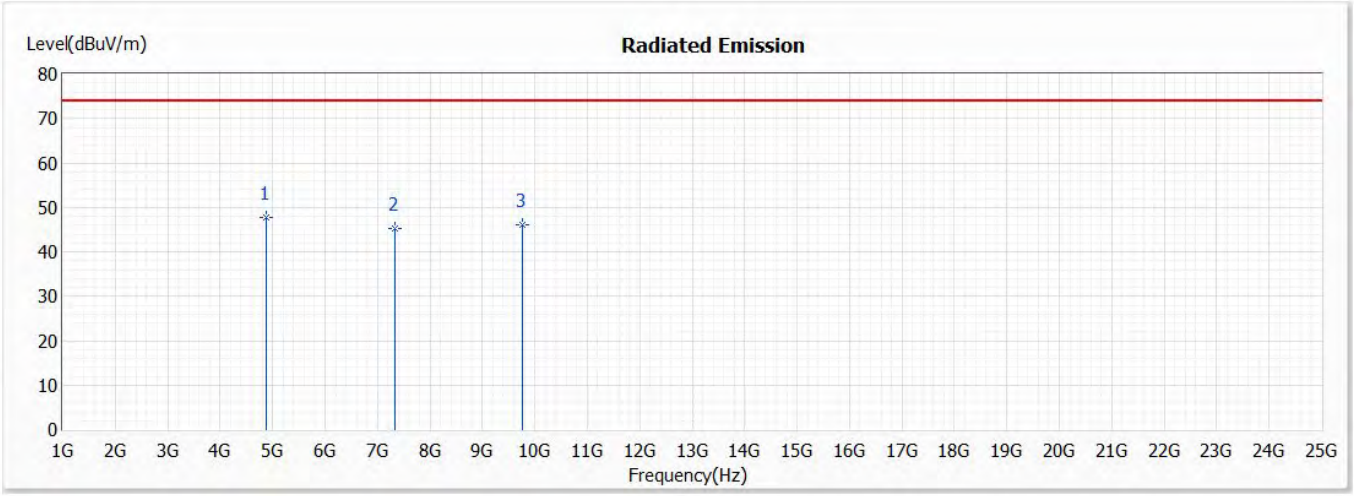
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2442MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	47.79	74.00	-26.21	47.20	0.59	PK
2	7326.000	45.36	74.00	-28.64	40.51	4.85	PK
3	9768.000	46.08	74.00	-27.92	38.84	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

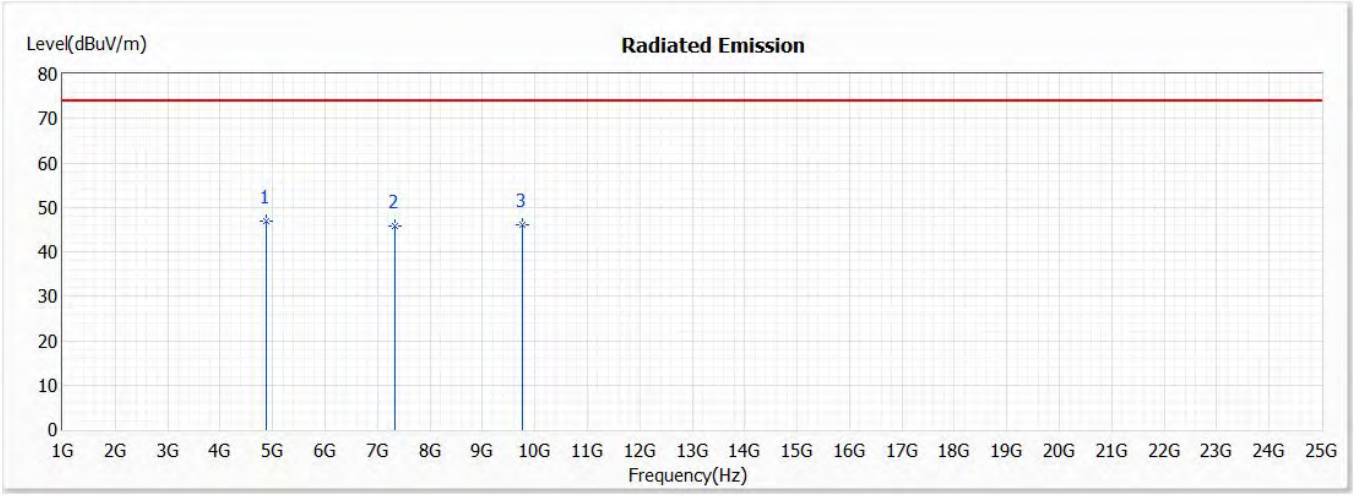
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2442MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	46.82	74.00	-27.18	46.23	0.59	PK
2	7326.000	45.82	74.00	-28.18	40.97	4.85	PK
3	9768.000	45.99	74.00	-28.01	38.75	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

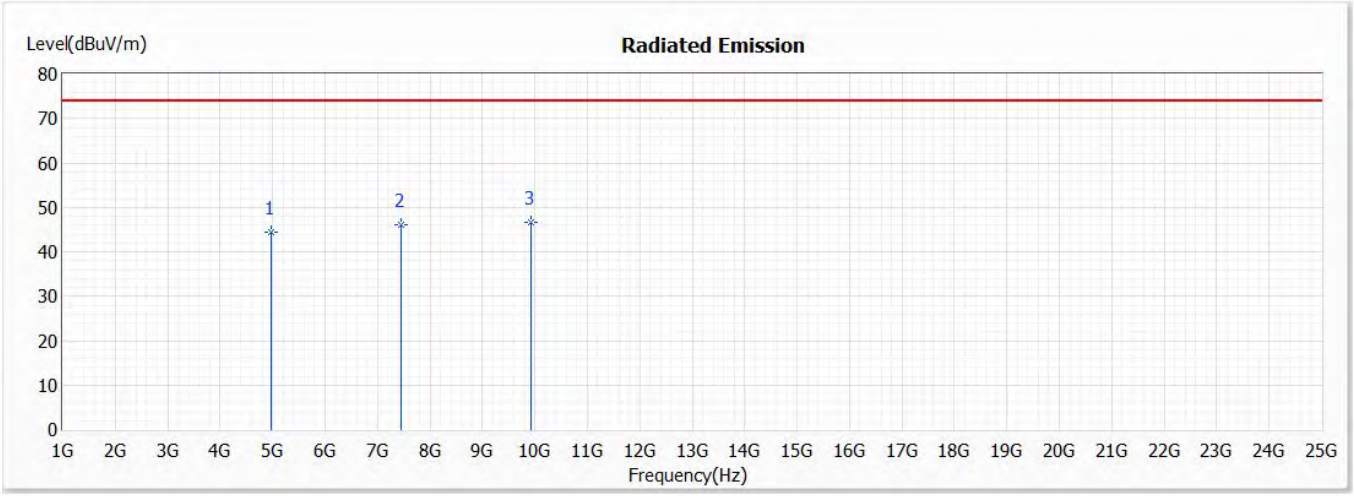
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2481MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	44.51	74.00	-29.49	43.81	0.70	PK
2	7443.000	46.19	74.00	-27.81	41.24	4.95	PK
* 3	9924.000	46.55	74.00	-27.45	39.14	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

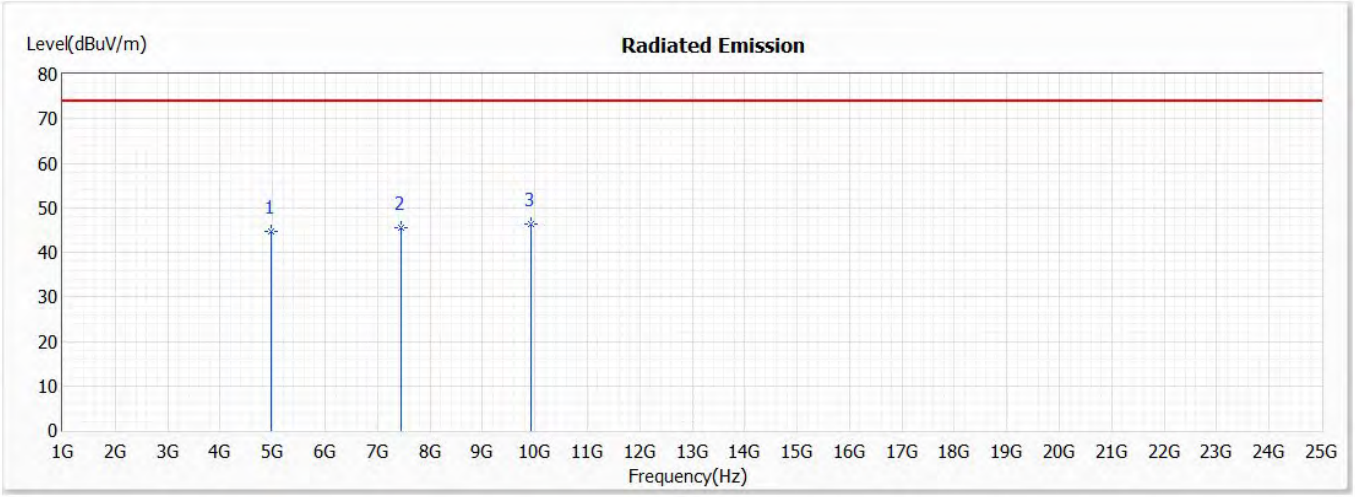
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 250kbps(2481MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	44.67	74.00	-29.33	43.97	0.70	PK
2	7443.000	45.55	74.00	-28.45	40.60	4.95	PK
* 3	9924.000	46.21	74.00	-27.79	38.80	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

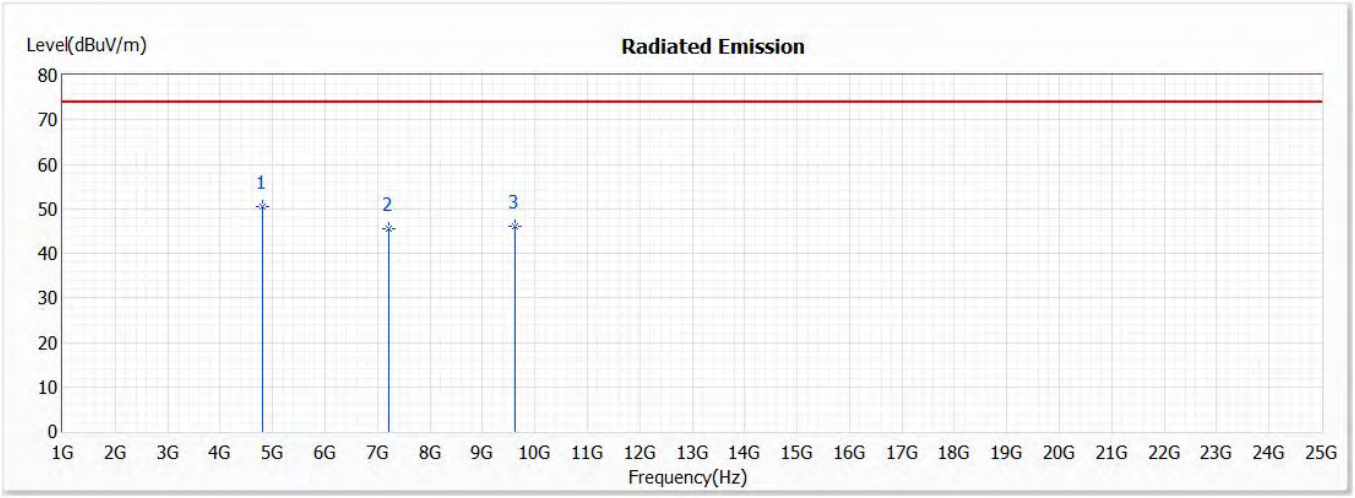
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps(2403MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4806.000	50.53	74.00	-23.47	50.04	0.49	PK
2	7209.000	45.65	74.00	-28.35	40.94	4.71	PK
3	9612.000	46.01	74.00	-27.99	39.16	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

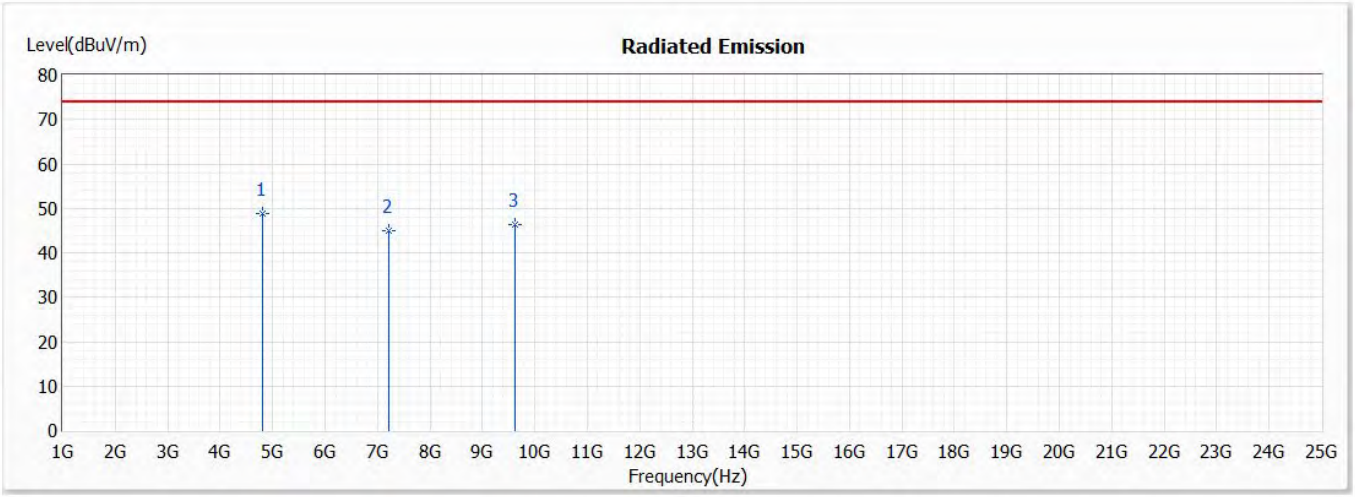
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product	:	Wireless module
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 2: Transmit - 1Mbps(2403MHz)_Whip Antenna
Test Date	:	2021/05/29

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4806.000	48.71	74.00	-25.29	48.22	0.49	PK
2	7209.000	44.98	74.00	-29.02	40.27	4.71	PK
3	9612.000	46.37	74.00	-27.63	39.52	6.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

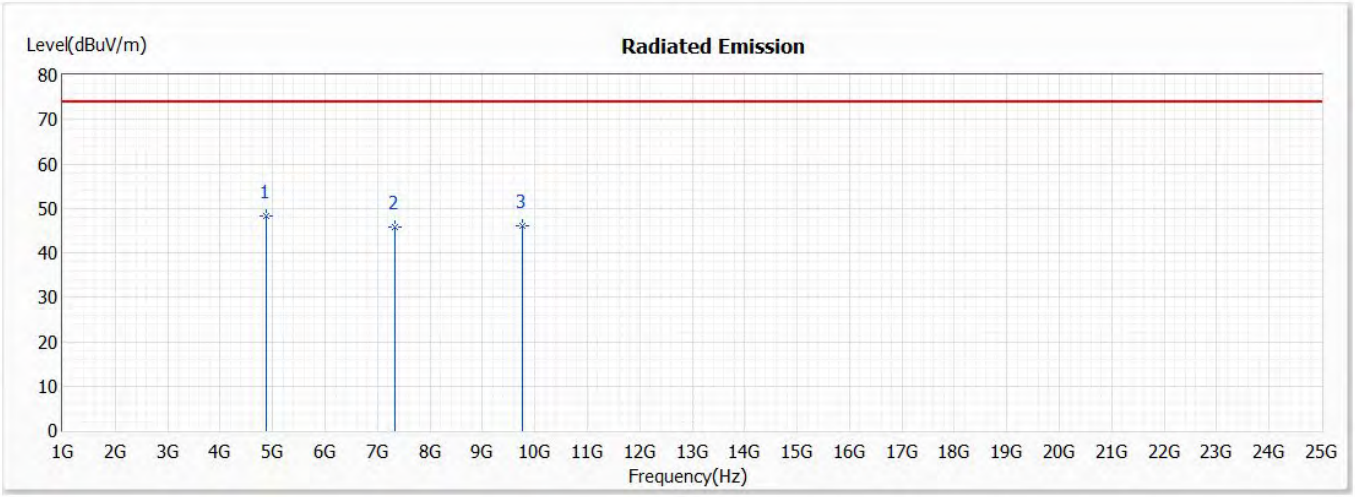
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	48.41	74.00	-25.59	47.82	0.59	PK
2	7326.000	45.93	74.00	-28.07	41.08	4.85	PK
3	9768.000	46.09	74.00	-27.91	38.85	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

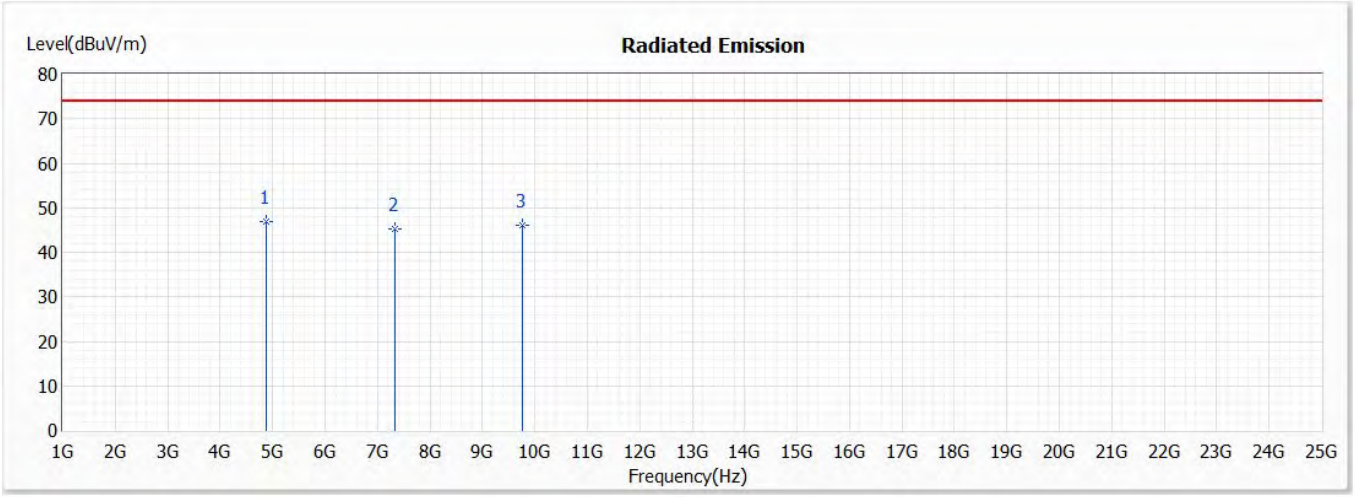
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2442MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	4884.000	46.92	74.00	-27.08	46.33	0.59	PK
2	7326.000	45.18	74.00	-28.82	40.33	4.85	PK
3	9768.000	46.19	74.00	-27.81	38.95	7.24	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

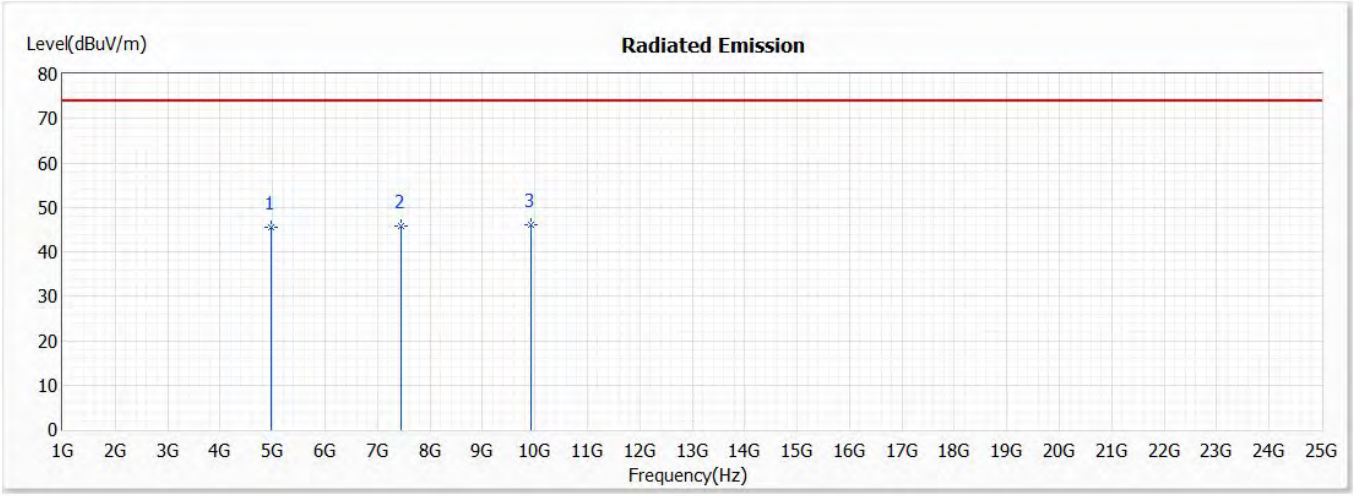
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	45.49	74.00	-28.51	44.79	0.70	PK
2	7443.000	45.81	74.00	-28.19	40.86	4.95	PK
* 3	9924.000	46.14	74.00	-27.86	38.73	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

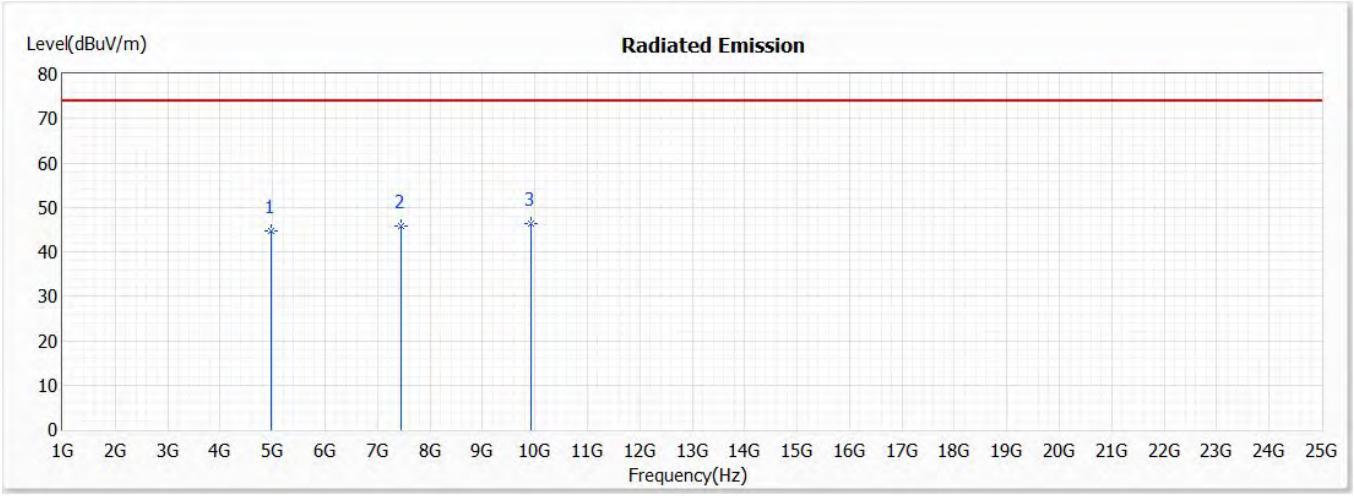
Frequency MHz	Peak Measurement dBµV/m	Duty Cycle Factor dB	Average Measurement dBµV/m	Margin dB	Peak Limit dBµV/m	Average Limit dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 11.

Product : Wireless module
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	4962.000	44.81	74.00	-29.19	44.11	0.70	PK
2	7443.000	45.70	74.00	-28.30	40.75	4.95	PK
* 3	9924.000	46.22	74.00	-27.78	38.81	7.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

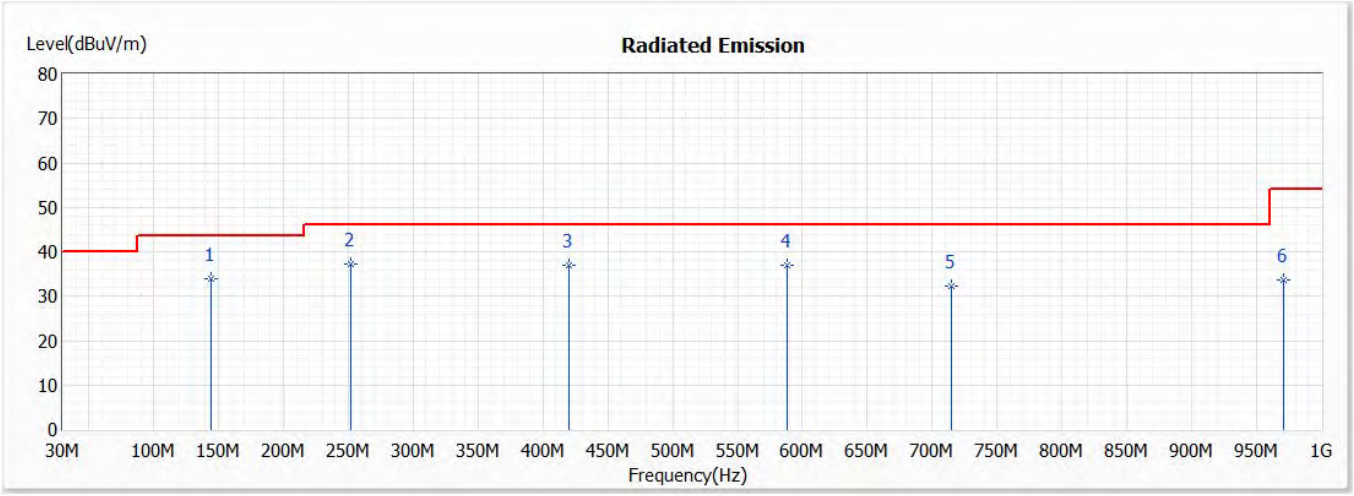
Frequency	Peak Measurement	Duty Cycle Factor	Average Measurement	Margin	Peak Limit	Average Limit
MHz	dBµV/m	dB	dBµV/m	dB	dBµV/m	dBµV/m
Average Detector:						
--	--	--	--	--	74.000	54.000

Note:

3. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
4. The Duty Cycle is refer to section 11.

Product	:	Wireless module
Test Item	:	General Radiated Emission
Test Mode	:	Mode 2: Transmit - 1Mbps (2442MHz)_PCB Antenna
Test Date	:	2021/06/07

Horizontal



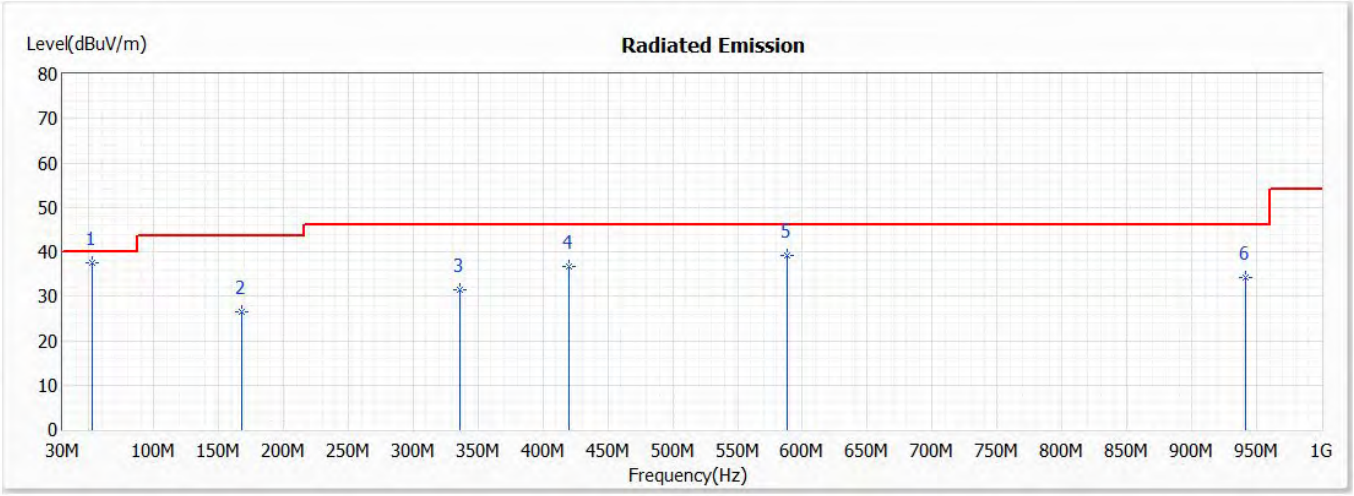
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	144.460	34.02	43.50	-9.48	44.54	-10.52	QP
* 2	252.130	37.13	46.00	-8.87	48.29	-11.16	QP
3	419.940	36.83	46.00	-9.17	43.47	-6.64	QP
4	587.750	36.84	46.00	-9.16	40.04	-3.20	QP
5	714.820	32.24	46.00	-13.76	33.49	-1.25	QP
6	970.900	33.62	54.00	-20.38	31.54	2.08	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	Wireless module
Test Item	:	General Radiated Emission
Test Mode	:	Mode 2: Transmit - 1Mbps (2442MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



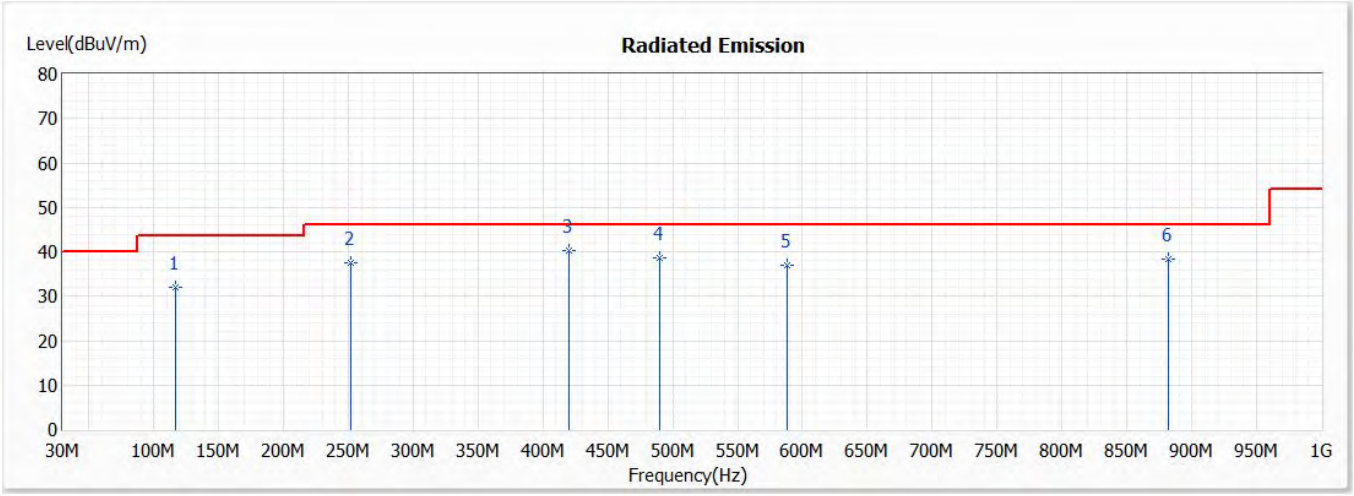
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	52.310	37.60	40.00	-2.40	48.14	-10.54	QP
2	167.740	26.45	43.50	-17.05	36.71	-10.26	QP
3	335.550	31.52	46.00	-14.48	40.22	-8.70	QP
4	419.940	36.75	46.00	-9.25	43.39	-6.64	QP
5	587.750	39.14	46.00	-6.86	42.34	-3.20	QP
6	941.800	34.29	46.00	-11.71	32.50	1.79	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	Wireless module
Test Item	:	General Radiated Emission
Test Mode	:	Mode 2: Transmit - 1Mbps (2442MHz)_Whip Antenna
Test Date	:	2021/05/29

Horizontal



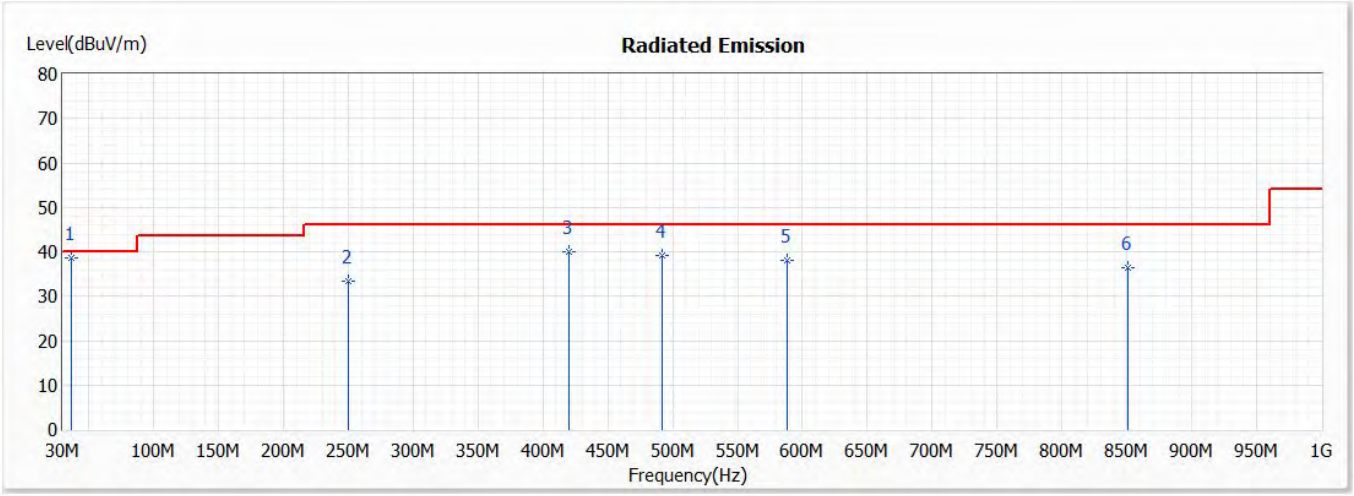
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	117.300	32.01	43.50	-11.49	45.28	-13.27	QP
2	252.130	37.58	46.00	-8.42	48.74	-11.16	QP
* 3	419.940	40.33	46.00	-5.67	46.97	-6.64	QP
4	489.780	38.70	46.00	-7.30	44.09	-5.39	QP
5	587.750	37.05	46.00	-8.95	40.25	-3.20	QP
6	881.660	38.22	46.00	-7.78	37.44	0.78	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	Wireless module
Test Item	:	General Radiated Emission
Test Mode	:	Mode 2: Transmit - 1Mbps (2442MHz)_ Whip Antenna
Test Date	:	2021/05/29

Vertical



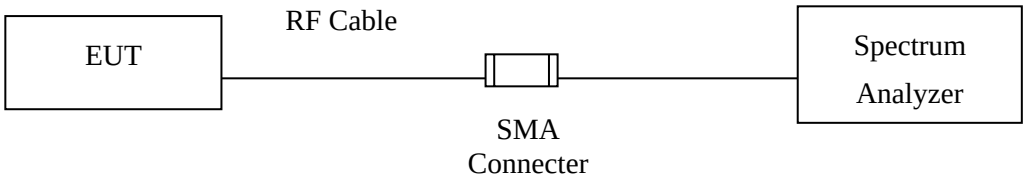
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	36.790	38.69	40.00	-1.31	50.06	-11.37	QP
2	250.190	33.35	46.00	-12.65	44.56	-11.21	QP
3	419.940	40.09	46.00	-5.91	46.73	-6.64	QP
4	491.720	39.19	46.00	-6.81	44.56	-5.37	QP
5	587.750	38.03	46.00	-7.97	41.23	-3.20	QP
6	850.620	36.28	46.00	-9.72	35.79	0.49	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF Antenna Conducted Test

5.1. Test Setup



5.2. Limits

According to FCC Section 15.247(d). 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 either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 b) for compliance to FCC 47CFR 15.247 requirements.

5.4. Test Result of RF Antenna Conducted Test

Product	:	Wireless module
Test Item	:	RF Antenna Conducted Test
Test Mode	:	Mode 1: Transmit - 250kbps
Test Date	:	2021/05/10

Figure Channel 01:

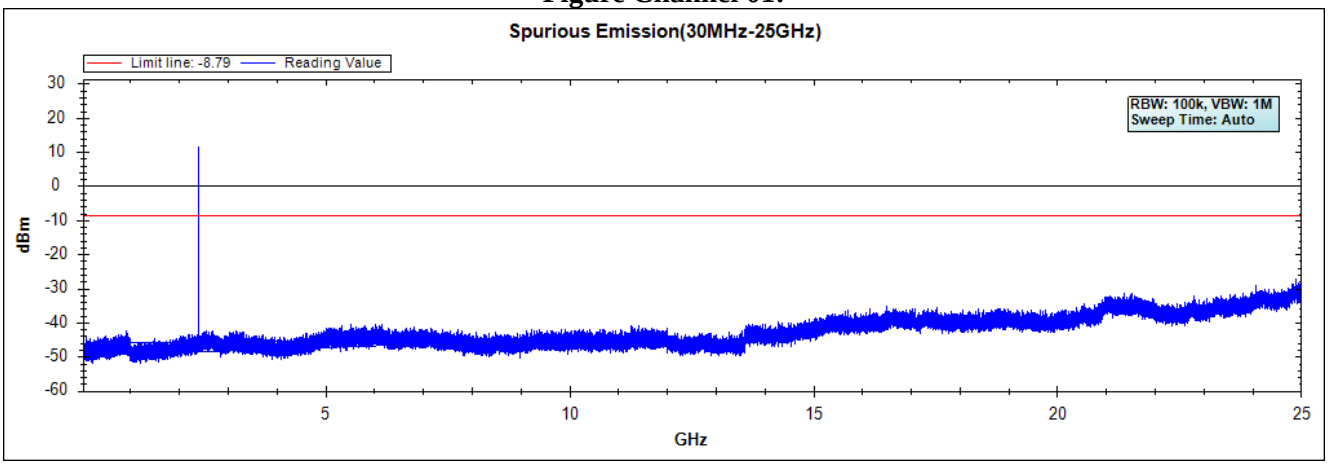


Figure Channel 40:

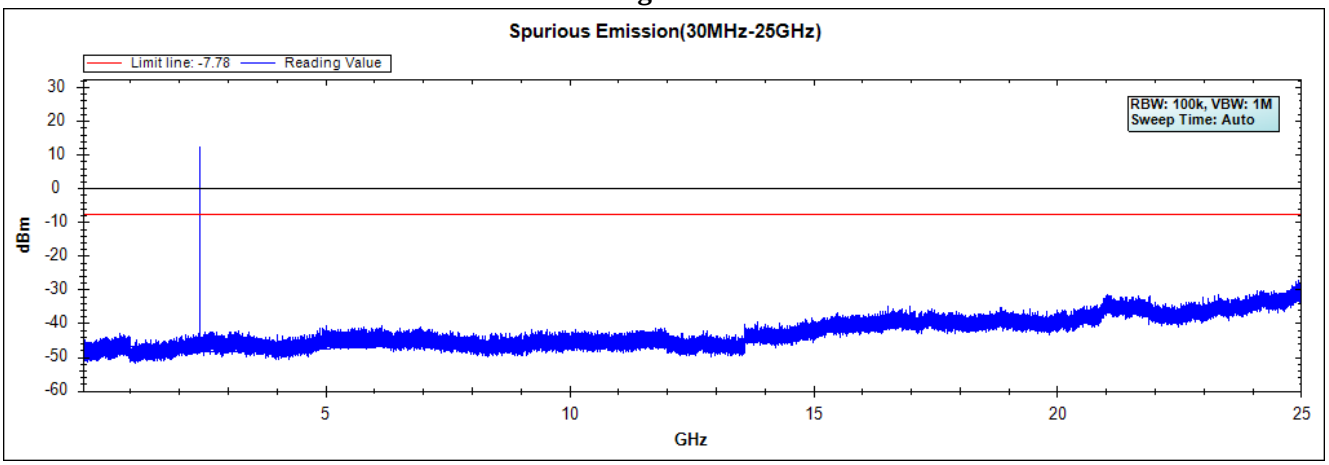
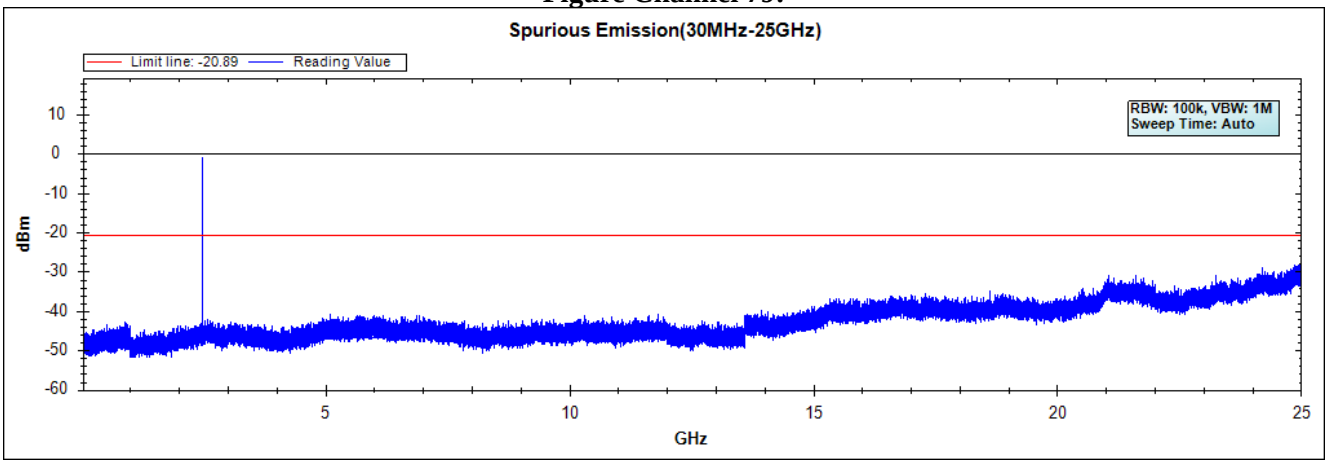


Figure Channel 79:



Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Wireless module
Test Item	:	RF Antenna Conducted Test
Test Mode	:	Mode 2: Transmit - 1Mbps
Test Date	:	2021/05/10

Figure Channel 01:

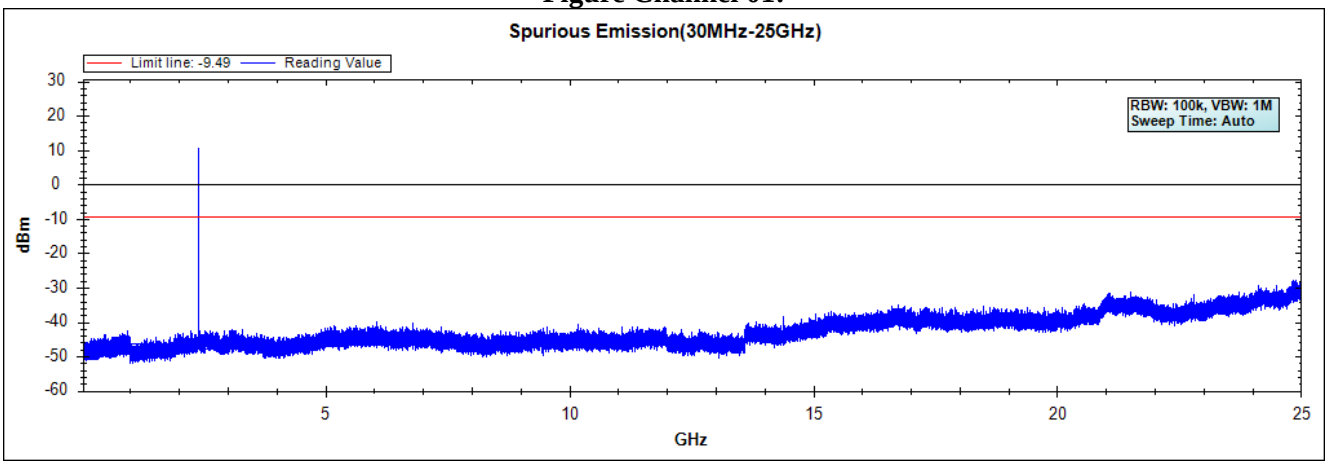


Figure Channel 40:

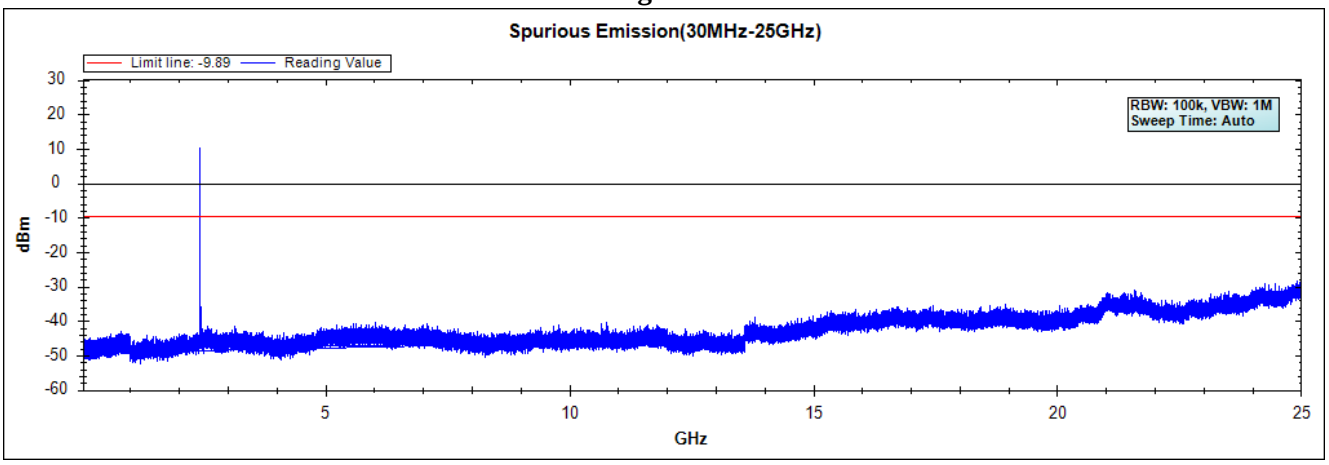
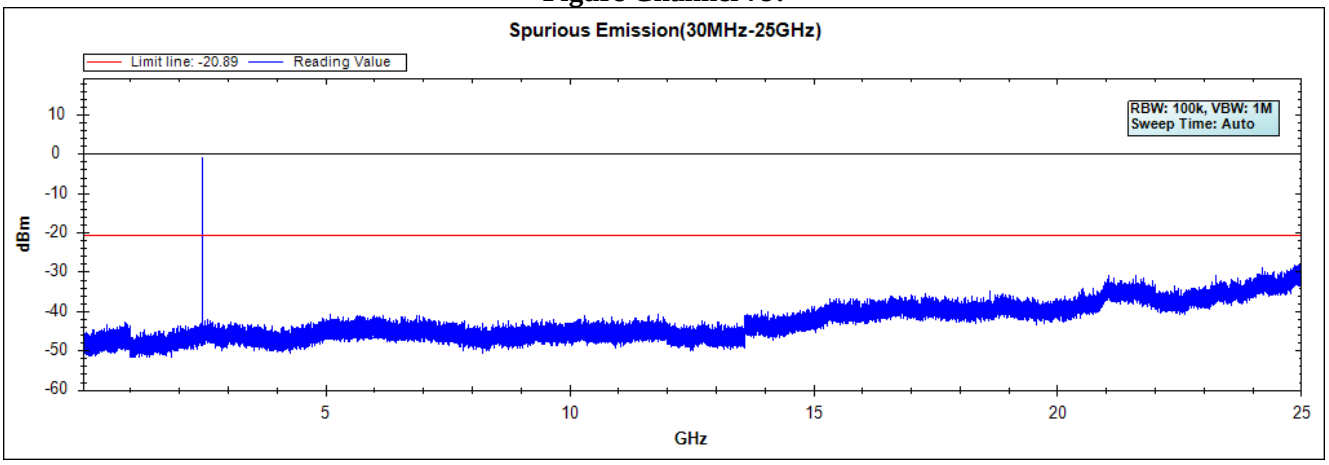


Figure Channel 79:

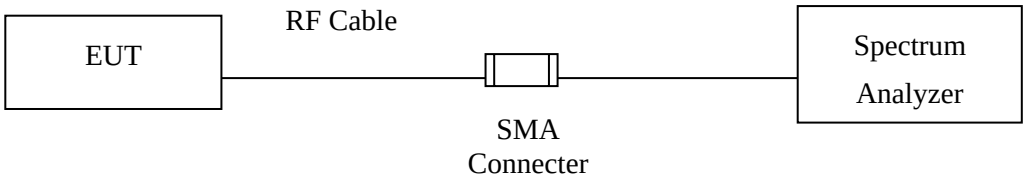


Note: The above test pattern is synthesized by multiple of the frequency range.

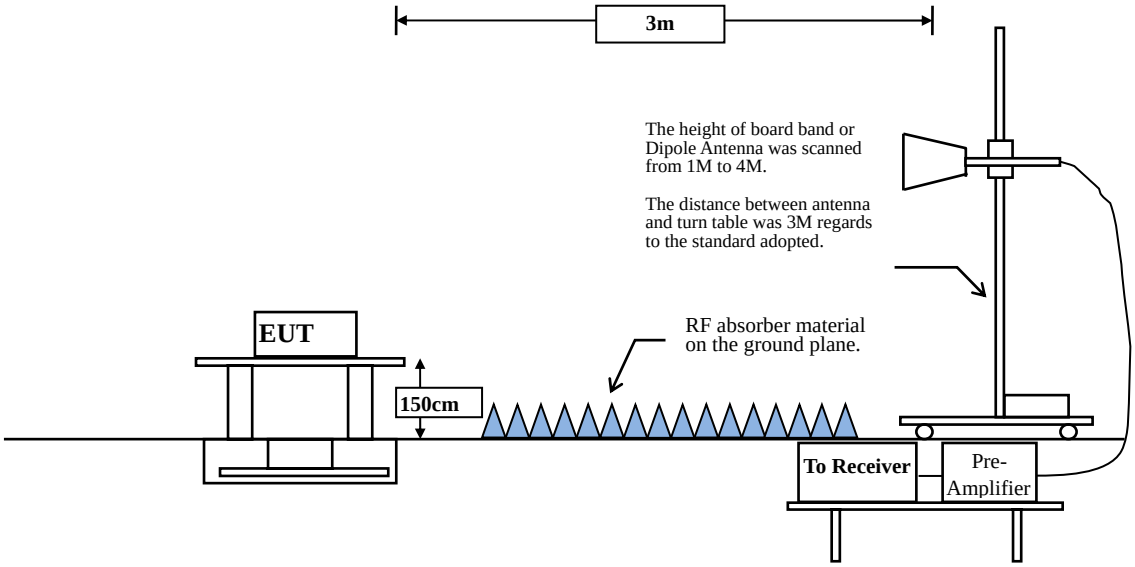
6. Band Edge

6.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



6.2. Limit

According to FCC Section 15.247(d). 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 either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

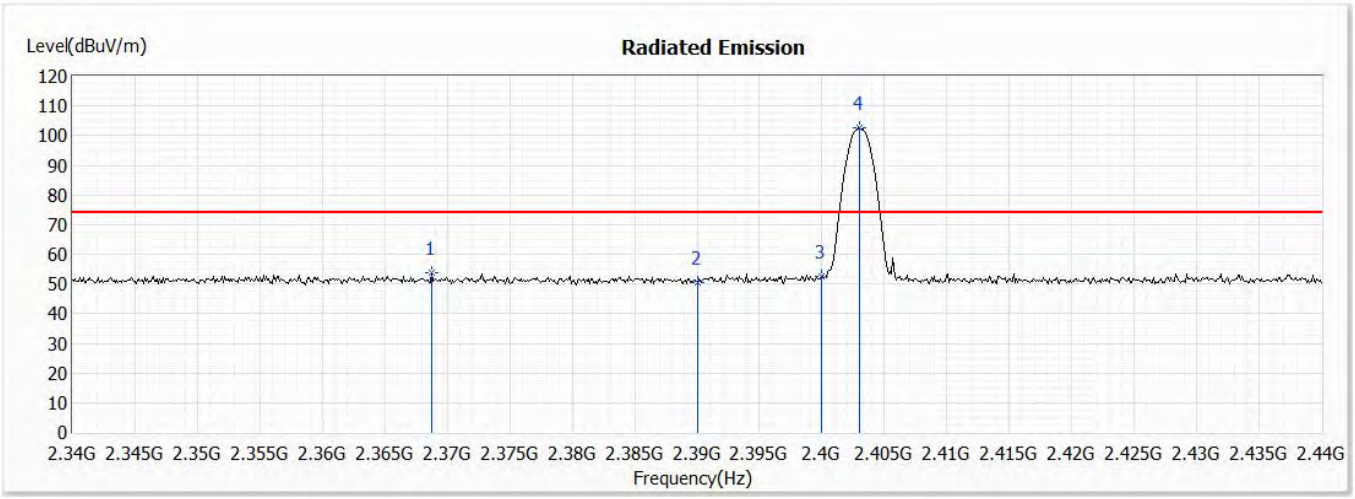
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

6.4. Test Result of Band Edge

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps (2403MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



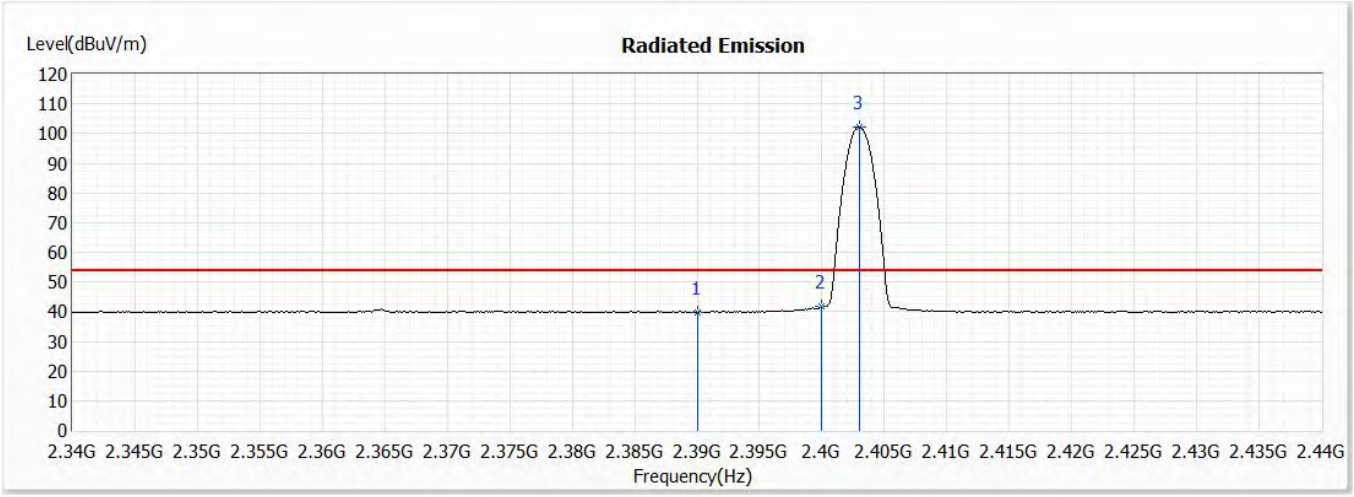
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2368.800	53.92	74.00	-20.08	40.78	13.14	PK
2	2390.000	50.46	74.00	-23.54	37.30	13.16	PK
3	2400.000	52.39	--	--	39.21	13.18	PK
4	2403.000	102.44	--	--	89.26	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2403MHz)_PCB Antenna
Test Date	:	2021/06/07

Horizontal



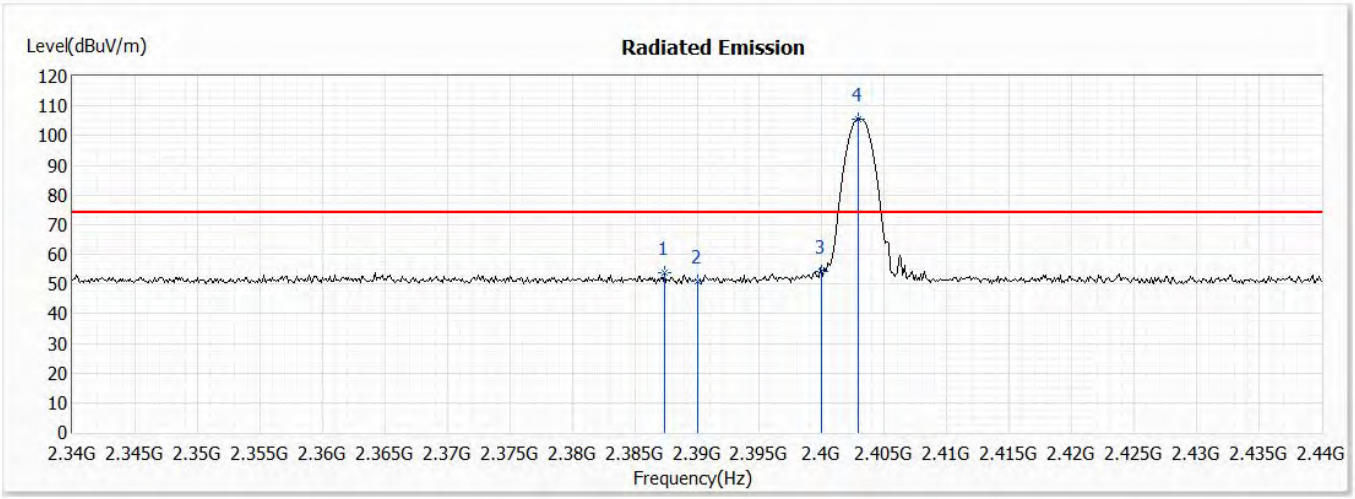
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2390.000	39.82	54.00	-14.18	26.66	13.16	AV
2	2400.000	41.60	--	--	28.42	13.18	AV
3	2403.000	102.27	--	--	89.09	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2403MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



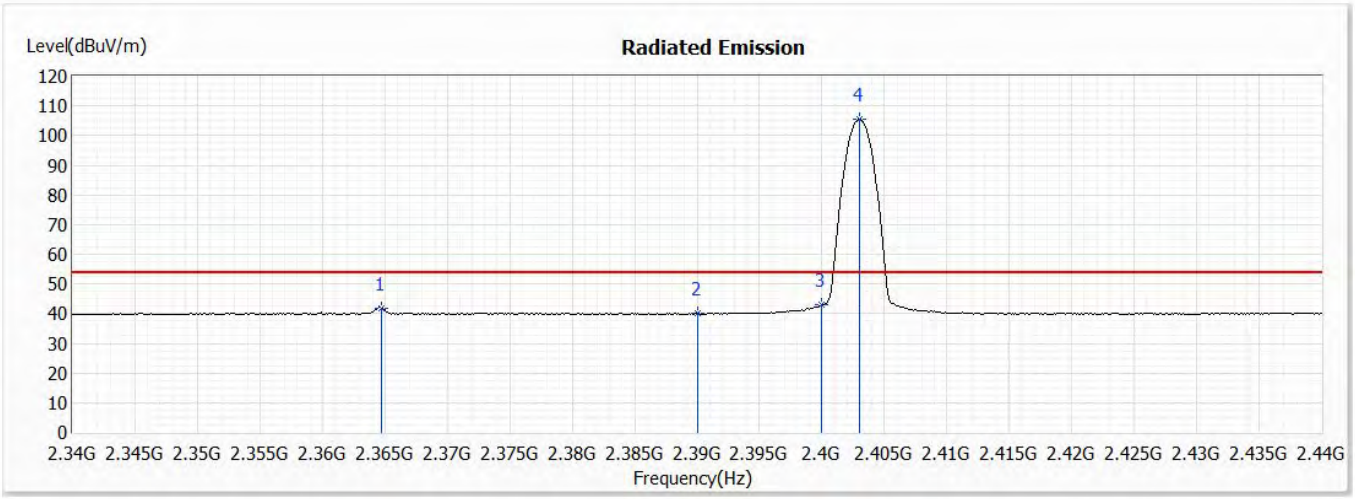
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2387.400	53.70	74.00	-20.30	40.54	13.16	PK
2	2390.000	50.85	74.00	-23.15	37.69	13.16	PK
3	2400.000	54.14	--	--	40.96	13.18	PK
4	2402.900	105.72	--	--	92.54	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2403MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



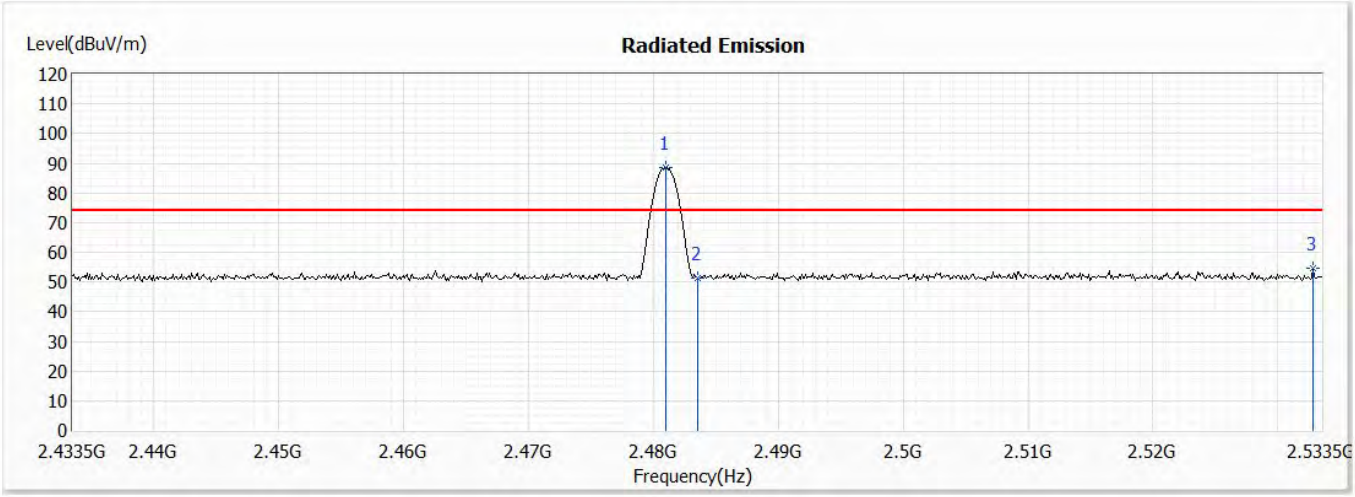
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2364.700	41.76	54.00	-12.24	28.63	13.13	AV
2	2390.000	40.17	54.00	-13.83	27.01	13.16	AV
3	2400.000	43.01	--	--	29.83	13.18	AV
4	2403.000	105.59	--	--	92.41	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps (2481MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



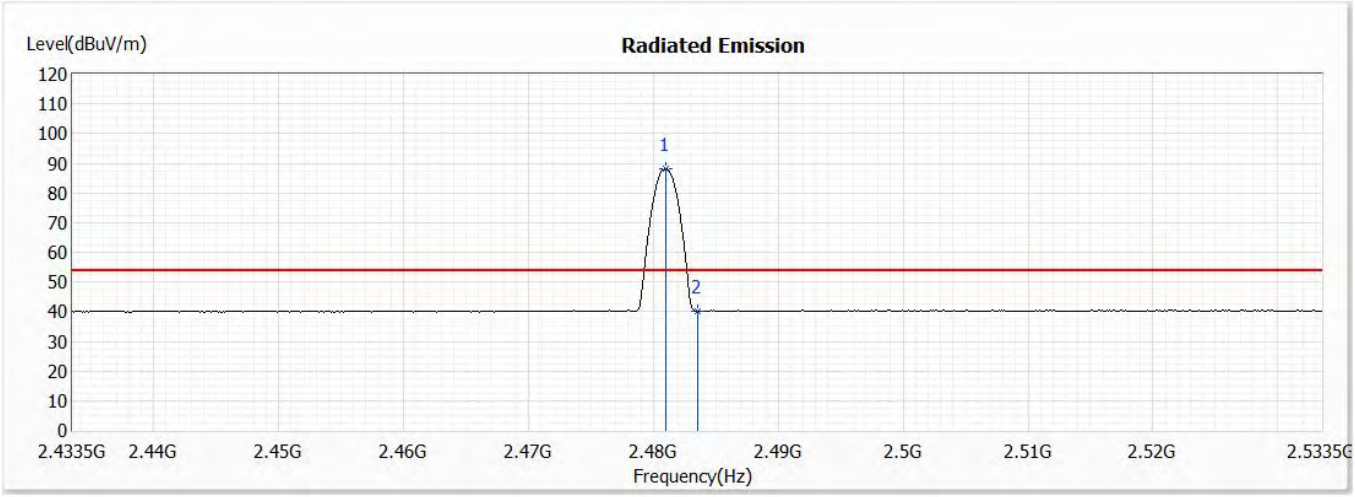
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	88.40	--	--	75.21	13.19	PK
2	2483.500	51.35	74.00	-22.65	38.16	13.19	PK
3	2532.800	54.48	74.00	-19.52	41.30	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2481MHz)_PCB Antenna
Test Date	:	2021/06/07

Horizontal



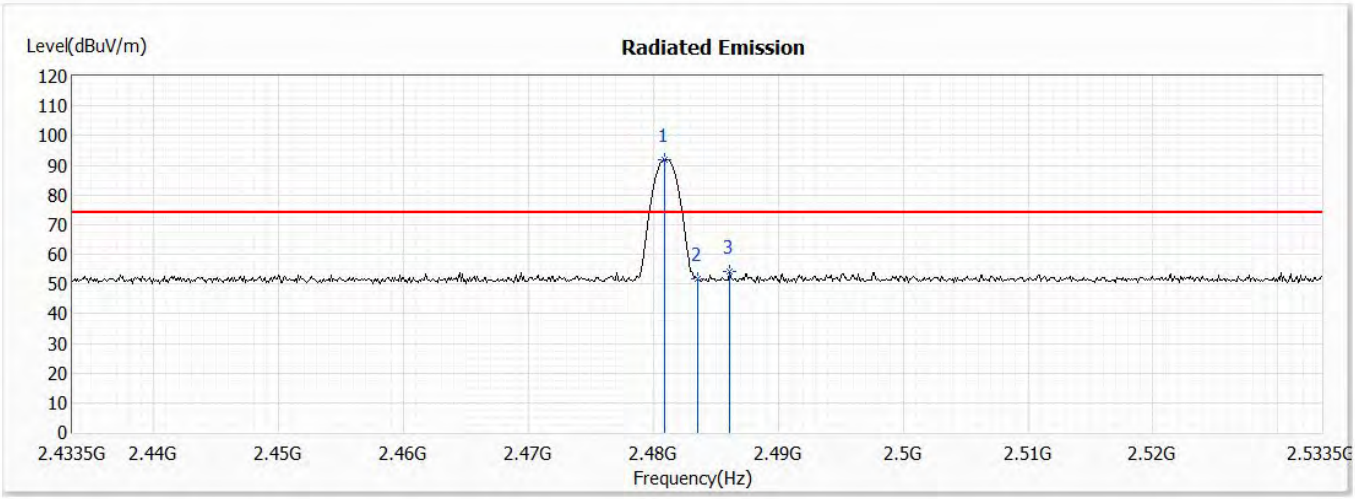
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	88.10	--	--	74.91	13.19	AV
2	2483.500	40.13	54.00	-13.87	26.94	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2481MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



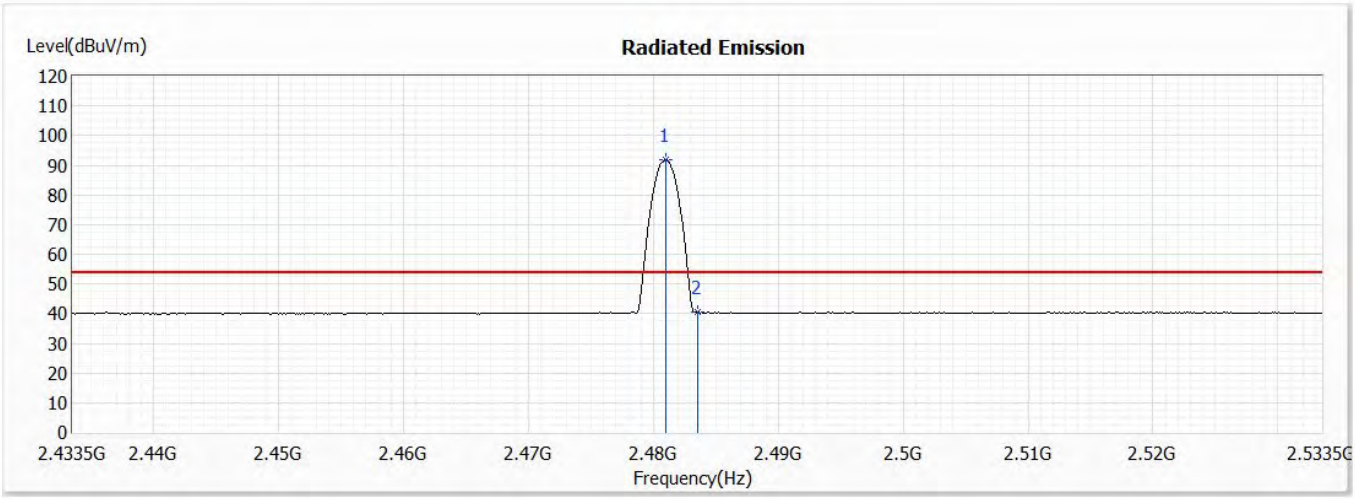
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2480.900	91.95	--	--	78.76	13.19	PK
2	2483.500	51.61	74.00	-22.39	38.42	13.19	PK
3	2486.100	54.35	74.00	-19.65	41.16	13.19	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2481MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



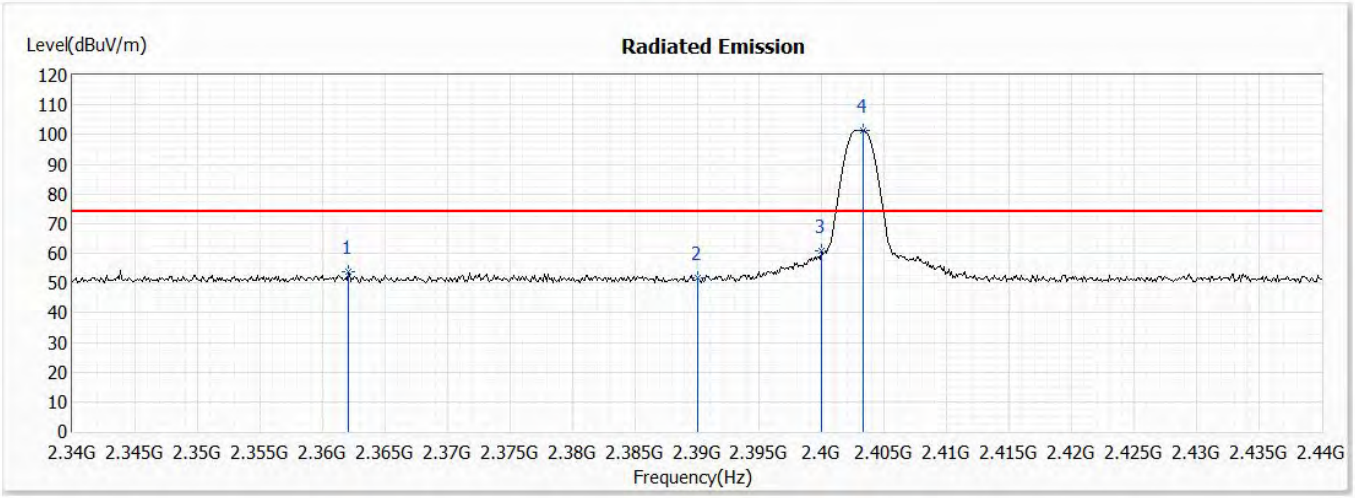
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	91.76	--	--	78.57	13.19	AV
2	2483.500	40.58	54.00	-13.42	27.39	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 2: Transmit - 1Mbps (2403MHz)_PCB Antenna
Test Date	:	2021/06/07

Horizontal



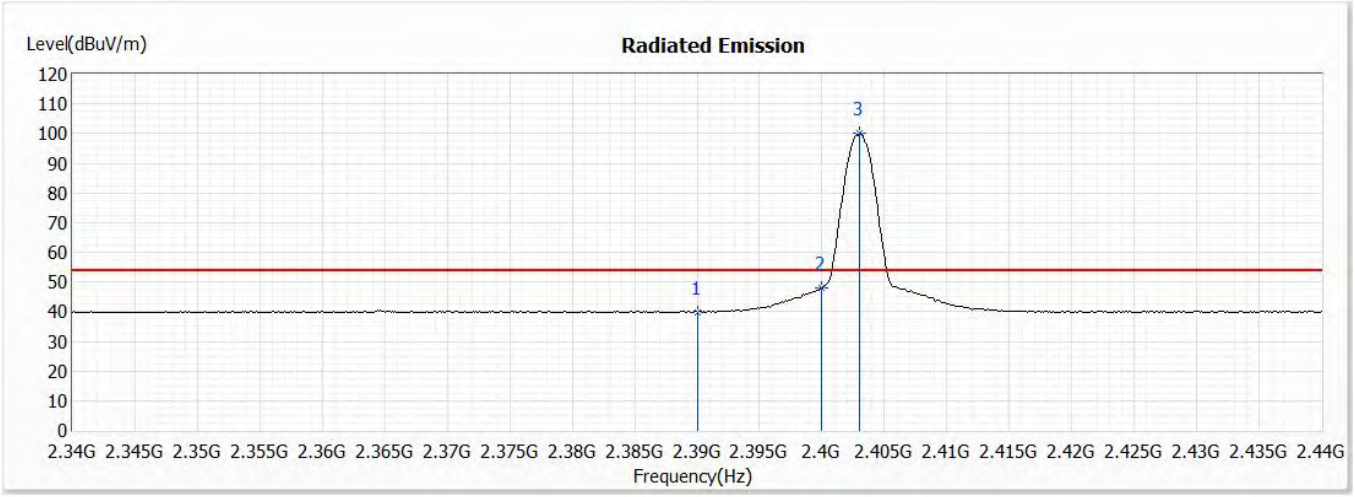
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2362.100	53.71	74.00	-20.29	40.58	13.13	PK
2	2390.000	51.59	74.00	-22.41	38.43	13.16	PK
3	2400.000	60.85	--	--	47.67	13.18	PK
4	2403.300	101.43	--	--	88.25	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2403MHz)_PCB Antenna
Test Date : 2021/06/07

Horizontal



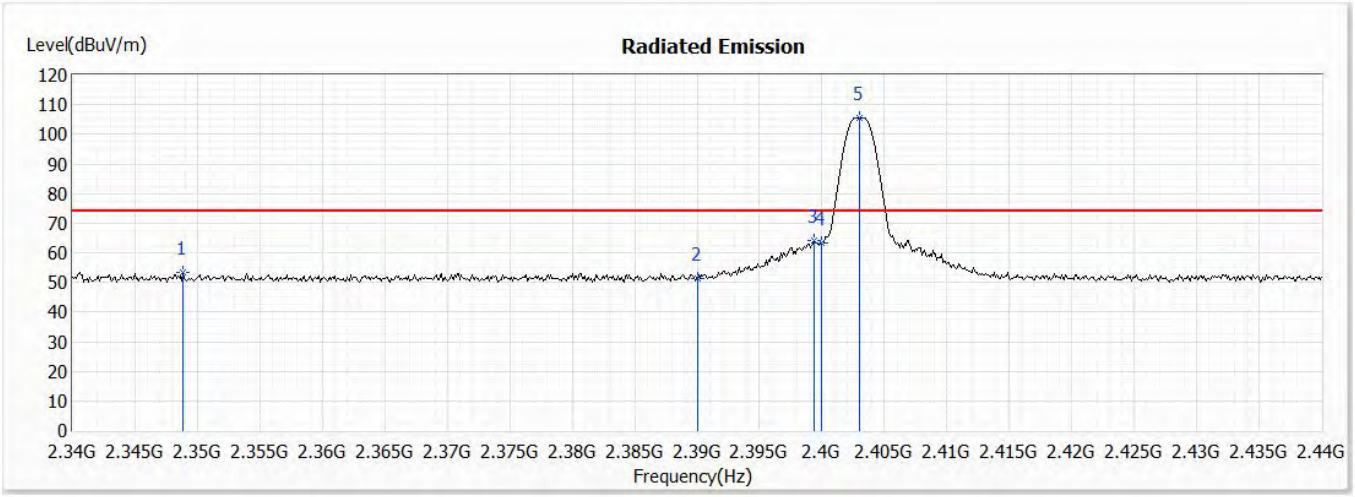
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2390.000	39.88	54.00	-14.12	26.72	13.16	AV
2	2400.000	47.86	--	--	34.68	13.18	AV
3	2403.000	100.05	--	--	86.87	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2403MHz)_PCB Antenna
Test Date : 2021/06/07

Vertical



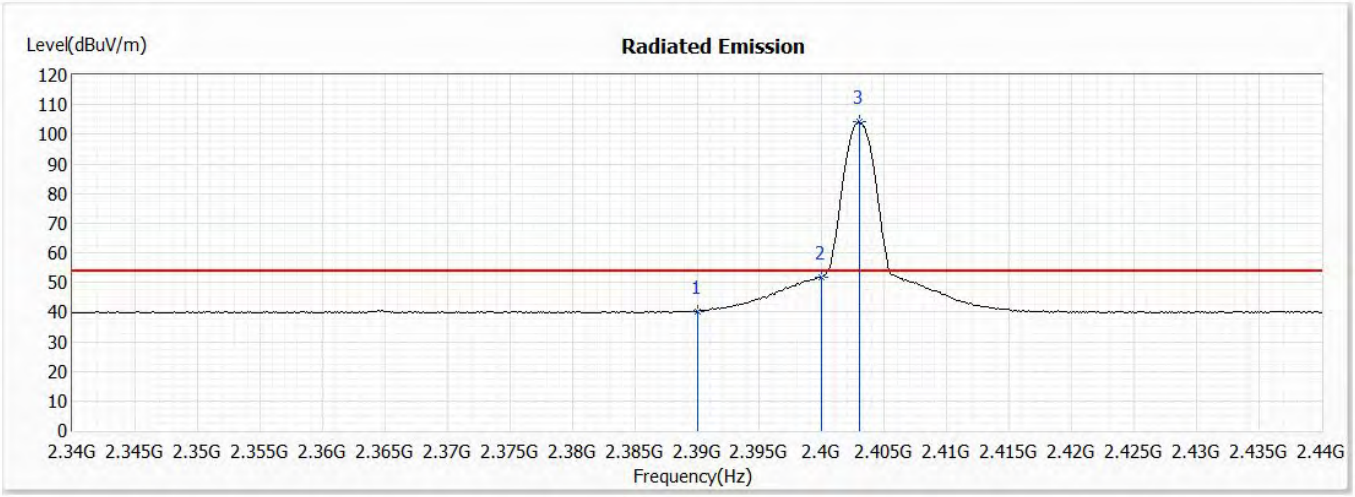
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2348.800	53.34	74.00	-20.66	40.24	13.10	PK
2	2390.000	51.40	74.00	-22.60	38.24	13.16	PK
3	2399.400	64.03	--	--	50.85	13.18	PK
4	2400.000	63.22	--	--	50.04	13.18	PK
5	2403.000	105.67	--	--	92.49	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 2: Transmit - 1Mbps (2403MHz)_PCB Antenna
Test Date	:	2021/06/07

Vertical



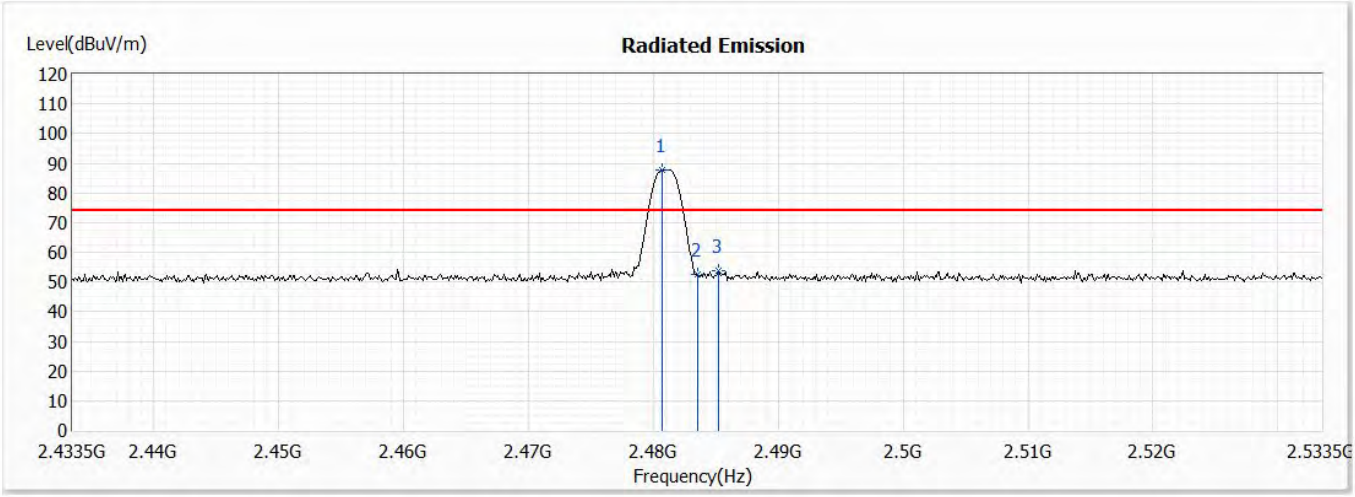
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2390.000	40.26	54.00	-13.74	27.10	13.16	AV
2	2400.000	51.90	--	--	38.72	13.18	AV
3	2403.000	104.30	--	--	91.12	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 2: Transmit - 1Mbps (2481MHz)_PCB Antenna
Test Date	:	2021/06/07

Horizontal



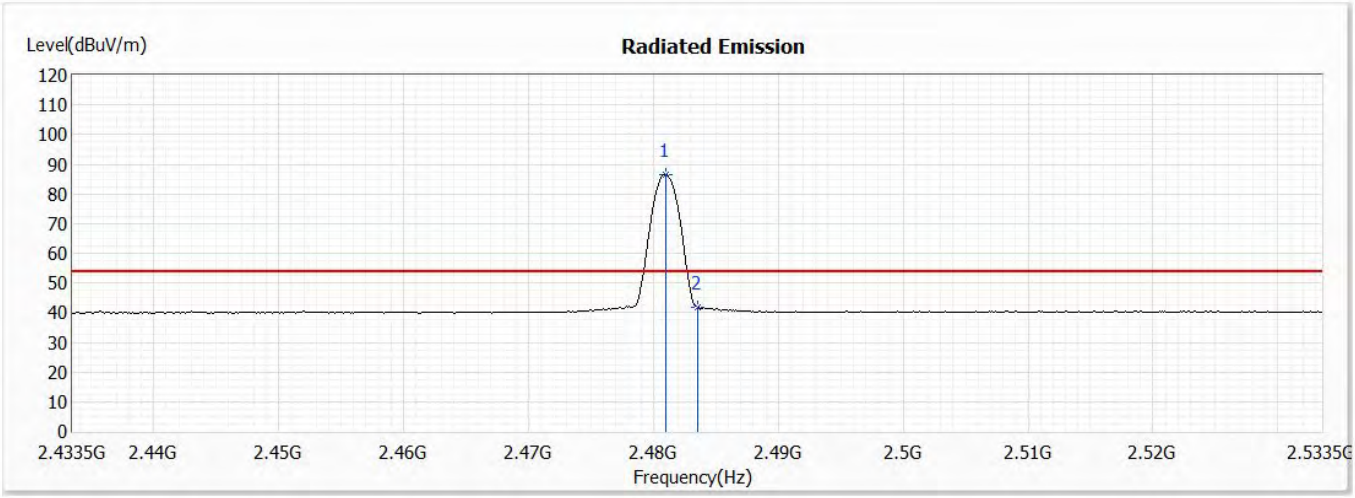
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2480.700	87.86	--	--	74.67	13.19	PK
2	2483.500	52.70	74.00	-21.30	39.51	13.19	PK
3	2485.200	53.92	74.00	-20.08	40.73	13.19	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 2: Transmit - 1Mbps (2481MHz)_PCB Antenna
Test Date	:	2021/06/07

Horizontal



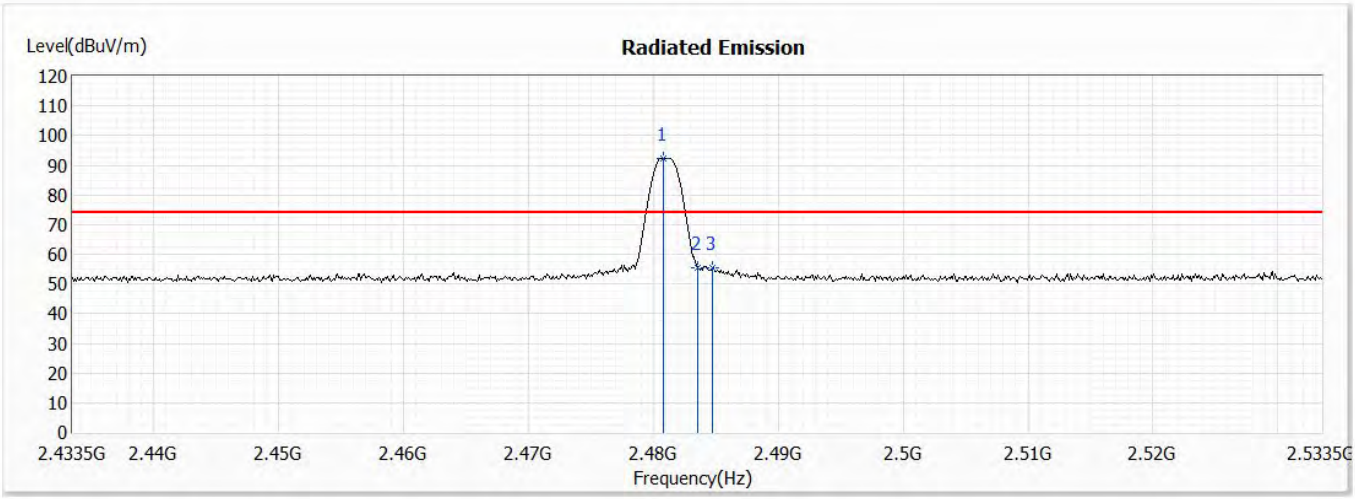
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	86.64	--	--	73.45	13.19	AV
2	2483.500	41.83	54.00	-12.17	28.64	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_PCB Antenna
Test Date : 2021/06/07

Vertical



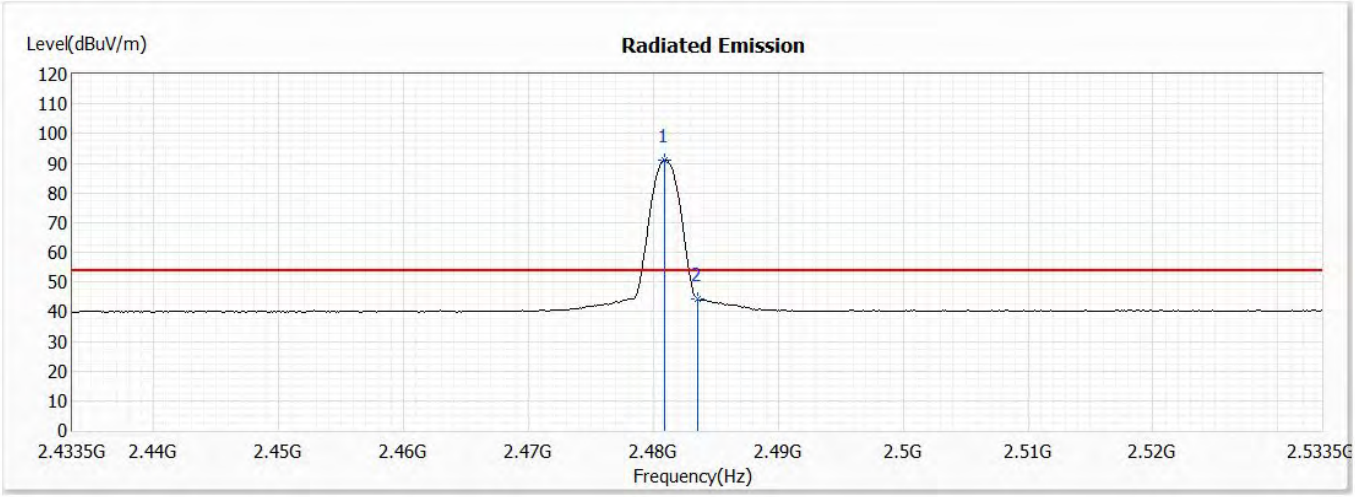
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2480.800	92.45	--	--	79.26	13.19	PK
2	2483.500	55.28	74.00	-18.72	42.09	13.19	PK
3	2484.700	55.52	74.00	-18.48	42.33	13.19	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_PCB Antenna
Test Date : 2021/06/07

Vertical



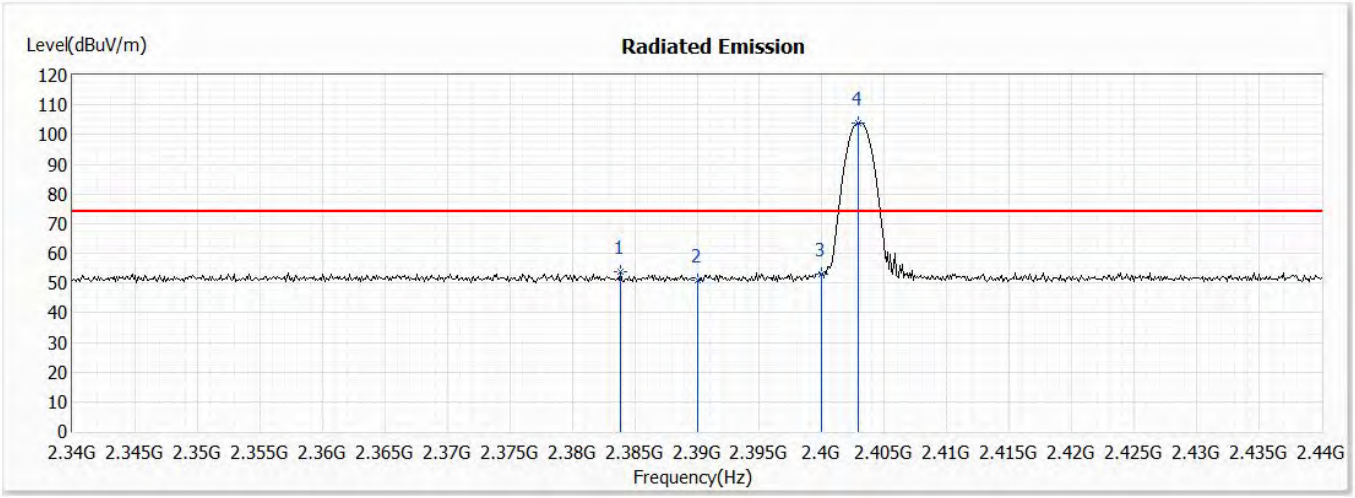
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2480.900	91.15	--	--	77.96	13.19	AV
2	2483.500	44.22	54.00	-9.78	31.03	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2403MHz)_Whip Antenna
Test Date	:	2021/05/29

Horizontal



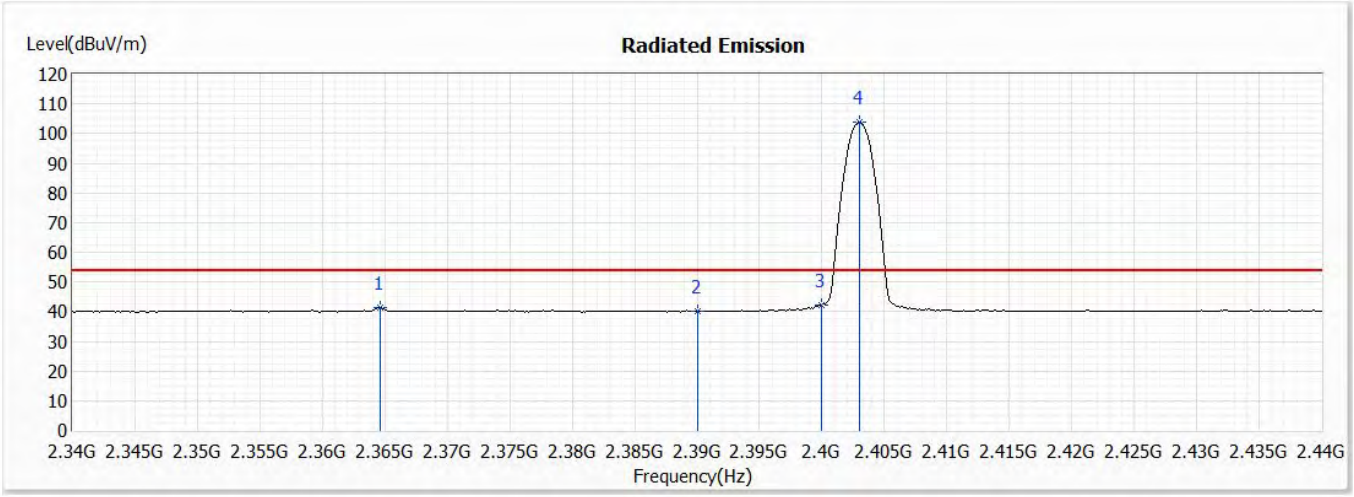
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2383.900	53.93	74.00	-20.07	40.77	13.16	PK
2	2390.000	51.03	74.00	-22.97	37.87	13.16	PK
3	2400.000	53.16	--	--	39.98	13.18	PK
4	2402.900	103.99	--	--	90.81	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2403MHz)_Whip Antenna
Test Date	:	2021/05/29

Horizontal



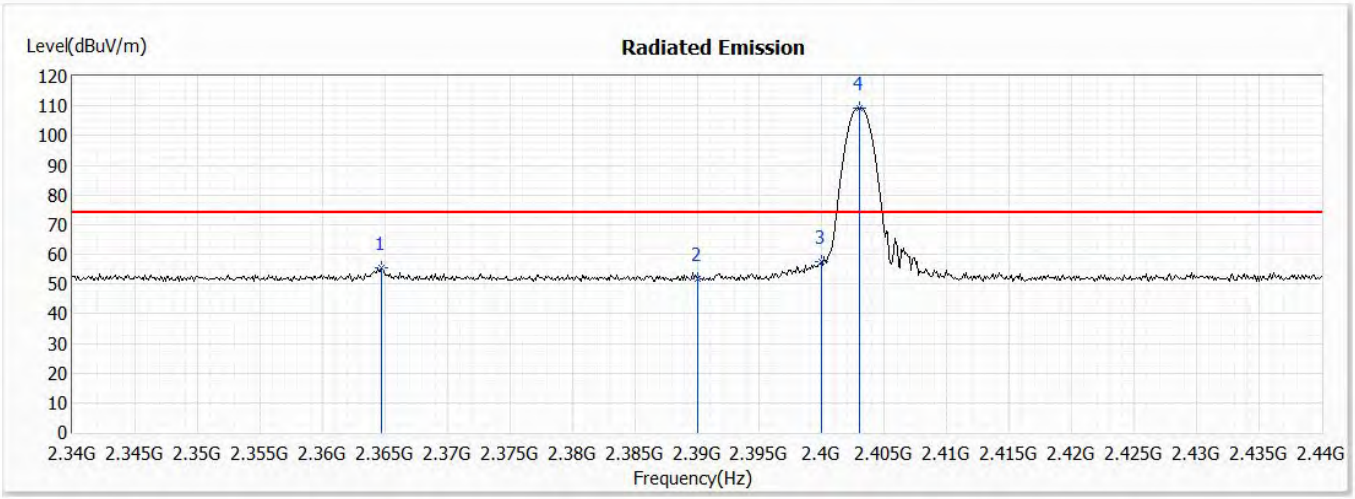
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2364.600	41.31	54.00	-12.69	28.18	13.13	AV
2	2390.000	40.12	54.00	-13.88	26.96	13.16	AV
3	2400.000	42.26	--	--	29.08	13.18	AV
4	2403.000	103.86	--	--	90.68	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2403MHz)_Whip Antenna
Test Date	:	2021/05/29

Vertical



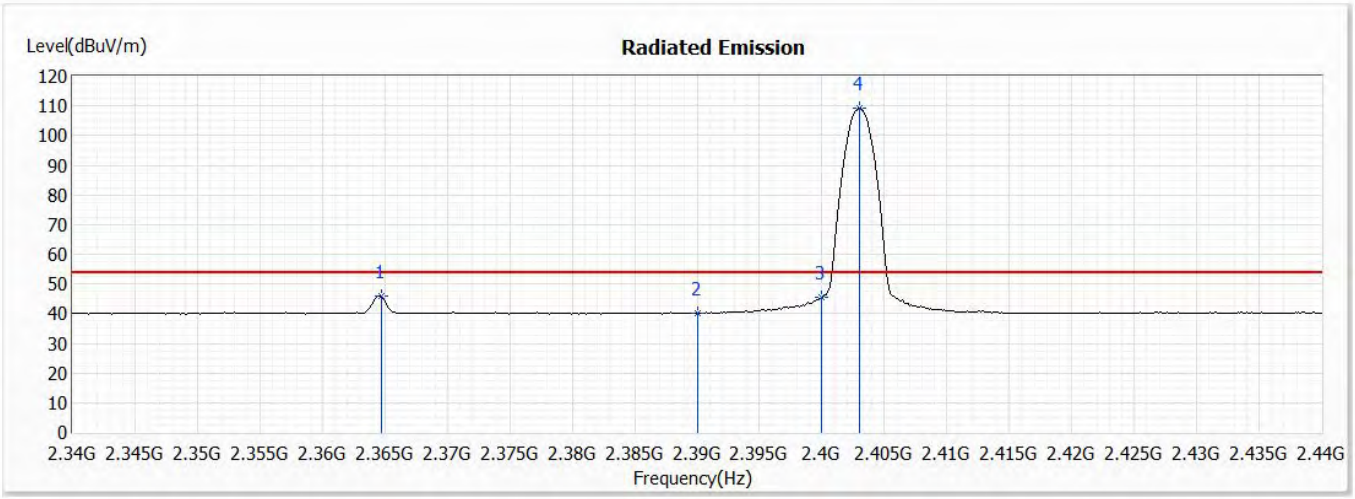
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2364.700	55.42	74.00	-18.58	42.29	13.13	PK
2	2390.000	51.77	74.00	-22.23	38.61	13.16	PK
3	2400.000	57.49	--	--	44.31	13.18	PK
4	2403.000	109.35	--	--	96.17	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps (2403MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



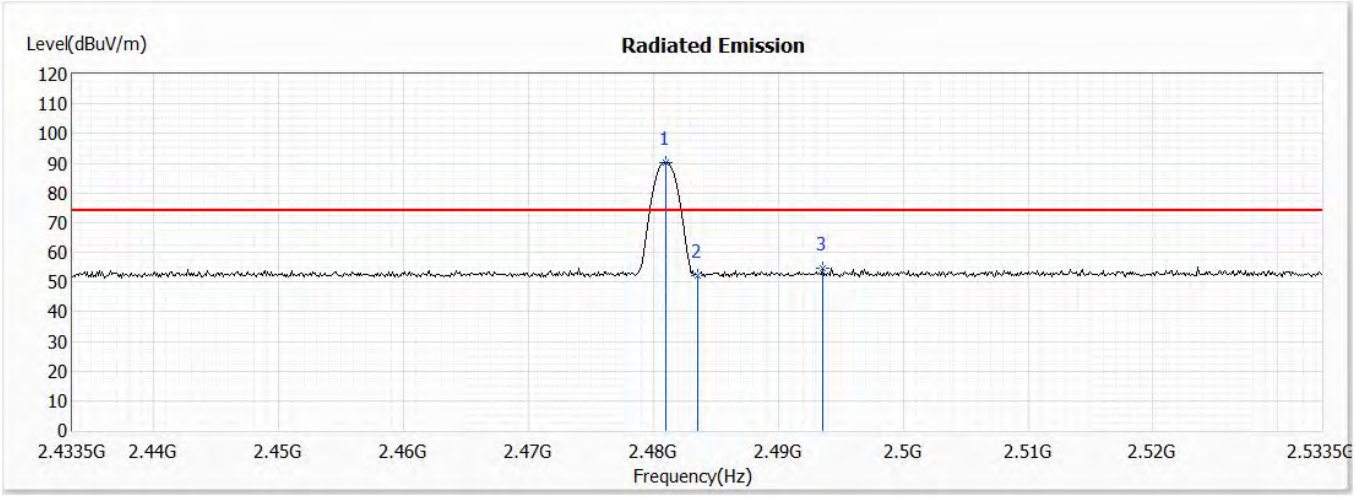
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2364.700	45.91	54.00	-8.09	32.78	13.13	AV
2	2390.000	40.24	54.00	-13.76	27.08	13.16	AV
3	2400.000	45.35	--	--	32.17	13.18	AV
4	2403.000	109.19	--	--	96.01	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps (2481MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



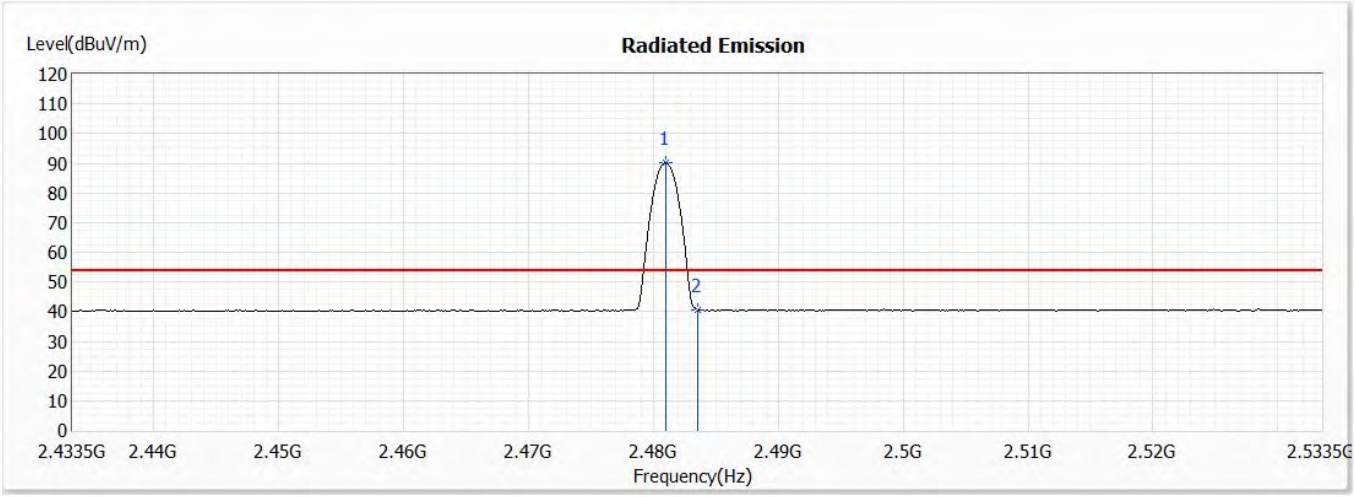
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	90.27	--	--	77.08	13.19	PK
2	2483.500	52.32	74.00	-21.68	39.13	13.19	PK
3	2493.600	54.82	74.00	-19.18	41.62	13.20	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2481MHz)_Whip Antenna
Test Date	:	2021/05/29

Horizontal



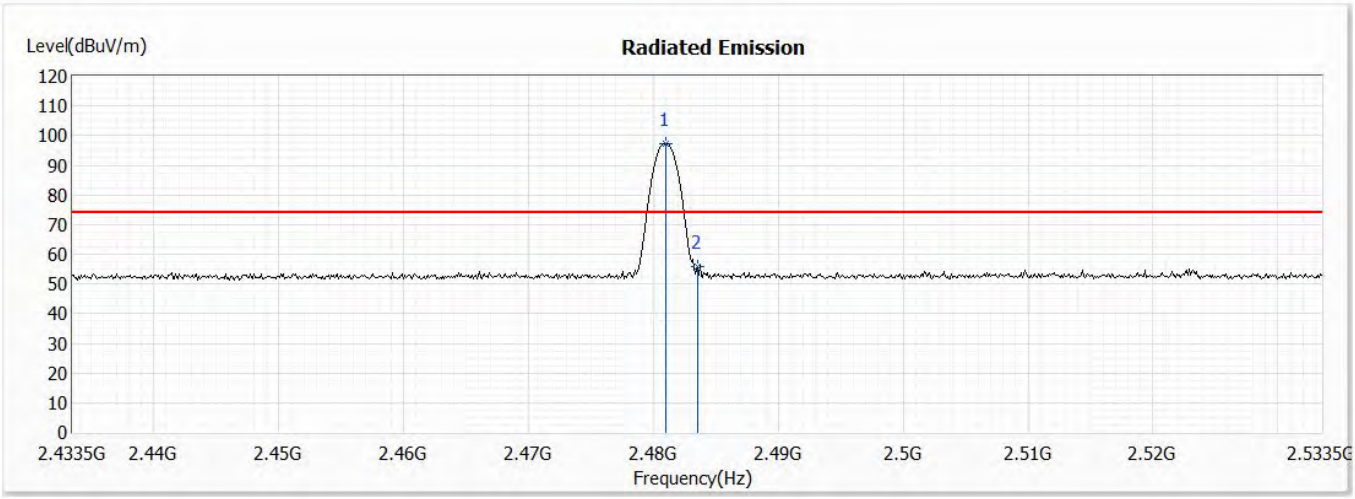
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	90.08	--	--	76.89	13.19	AV
2	2483.500	40.56	54.00	-13.44	27.37	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2481MHz)_Whip Antenna
Test Date	:	2021/05/29

Vertical



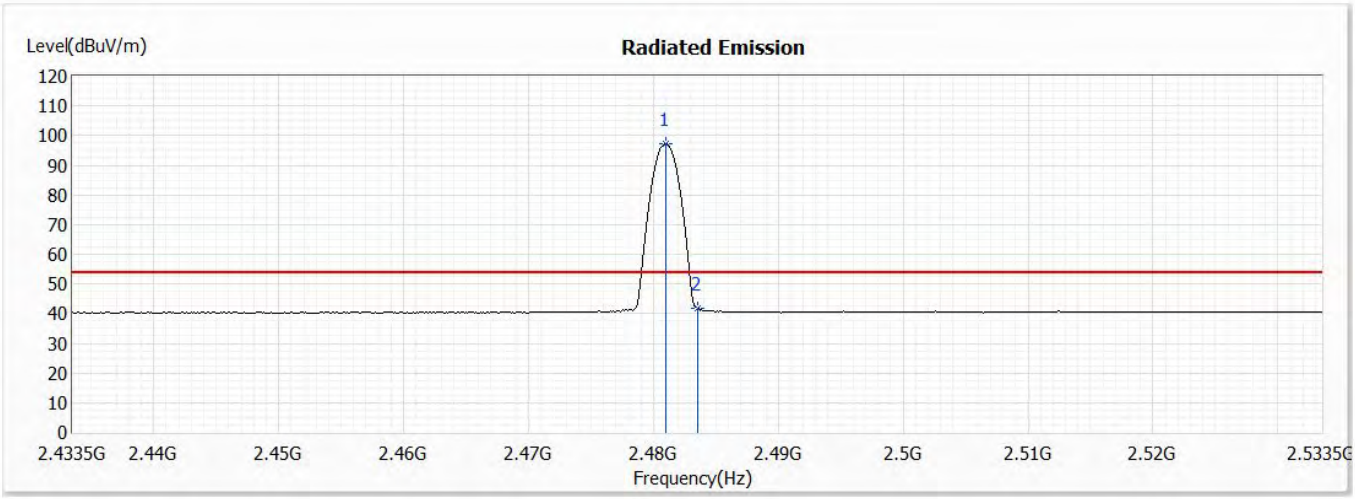
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	97.30	--	--	84.11	13.19	PK
2	2483.500	55.73	74.00	-18.27	42.54	13.19	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 1: Transmit - 250kbps (2481MHz)_Whip Antenna
Test Date	:	2021/05/29

Vertical



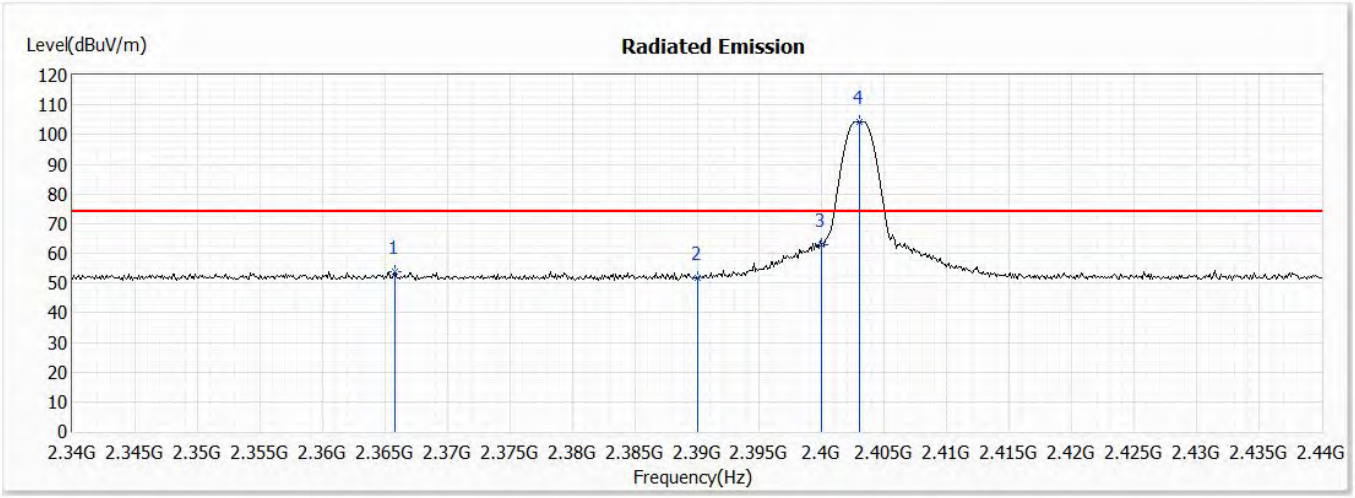
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	97.16	--	--	83.97	13.19	AV
2	2483.500	41.98	54.00	-12.02	28.79	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 2: Transmit - 1Mbps (2403MHz)_Whip Antenna
Test Date	:	2021/05/29

Horizontal



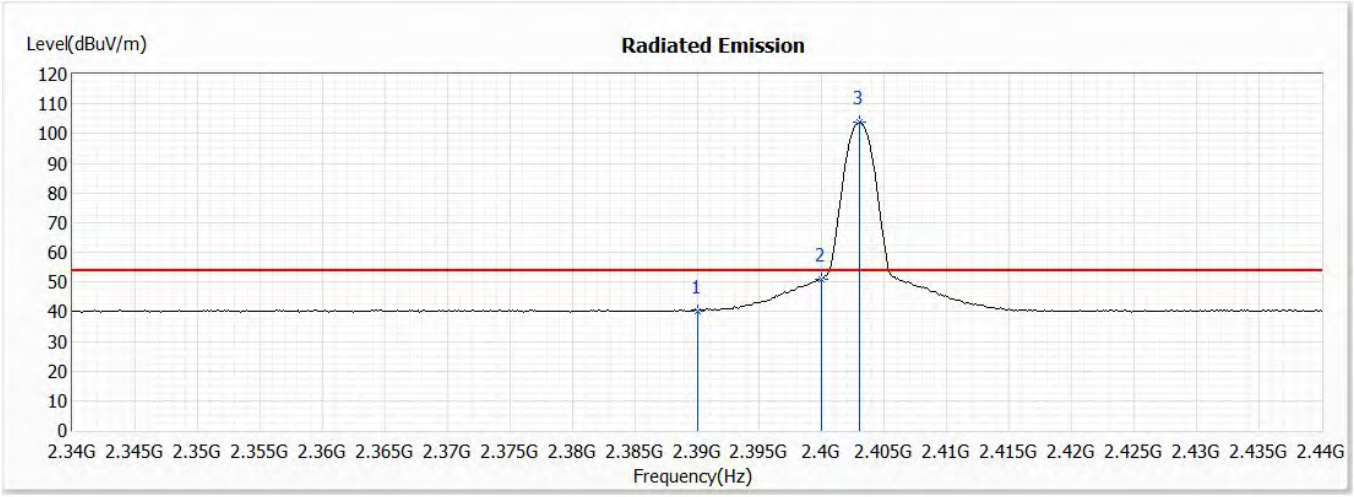
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2365.800	53.96	74.00	-20.04	40.82	13.14	PK
2	2390.000	51.54	74.00	-22.46	38.38	13.16	PK
3	2400.000	62.93	--	--	49.75	13.18	PK
4	2403.000	104.32	--	--	91.14	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2403MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



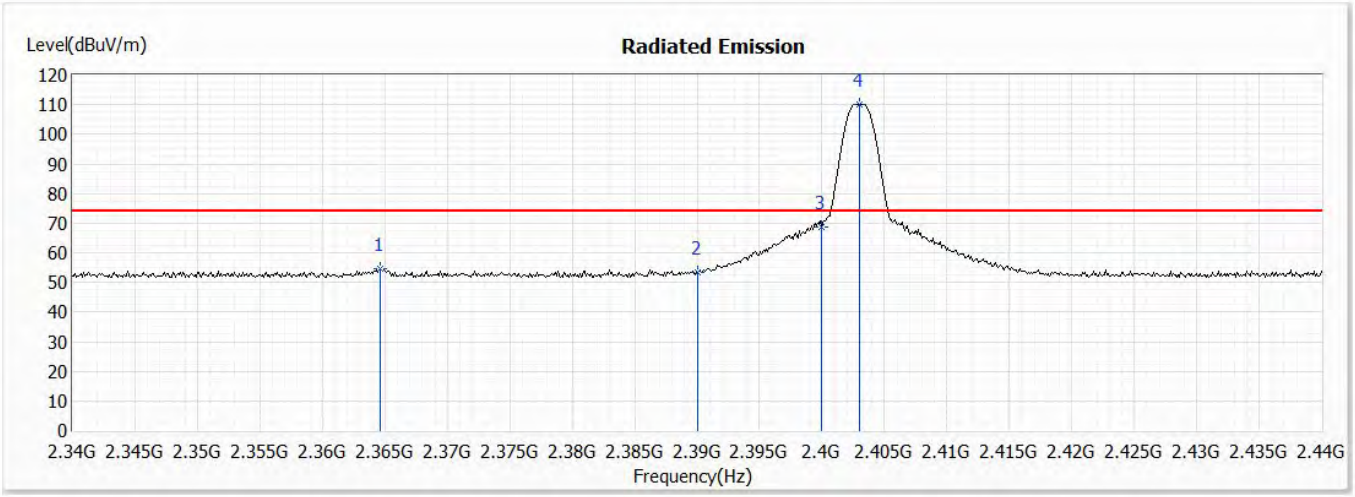
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2390.000	40.25	54.00	-13.75	27.09	13.16	AV
2	2400.000	50.87	--	--	37.69	13.18	AV
3	2403.000	103.68	--	--	90.50	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2403MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



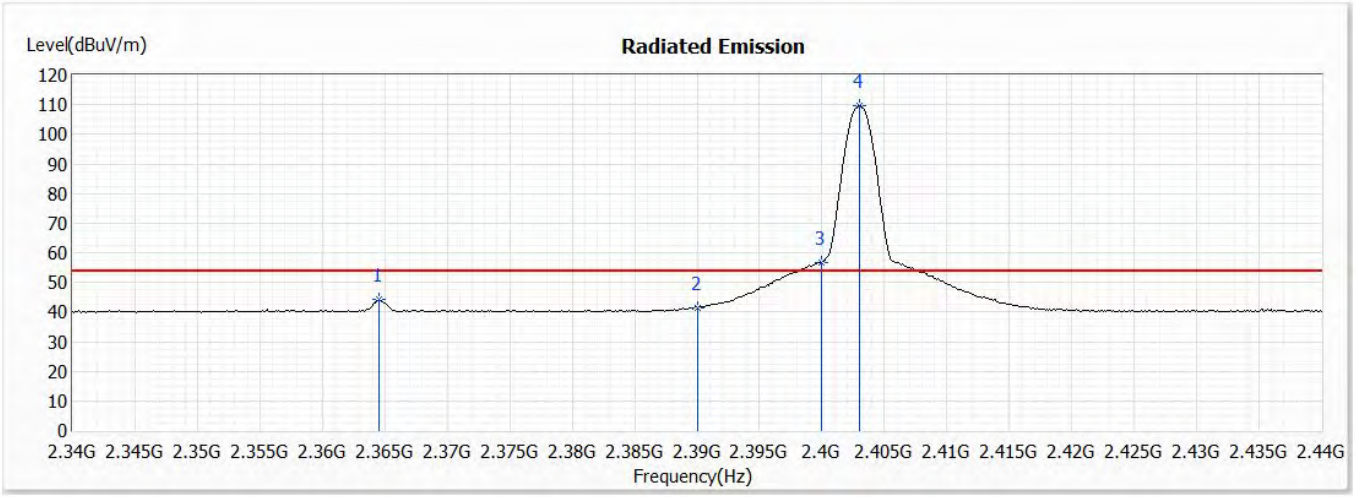
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2364.600	54.70	74.00	-19.30	41.57	13.13	PK
2	2390.000	53.48	74.00	-20.52	40.32	13.16	PK
3	2400.000	68.76	--	--	55.58	13.18	PK
4	2403.000	110.20	--	--	97.02	13.18	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2403MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



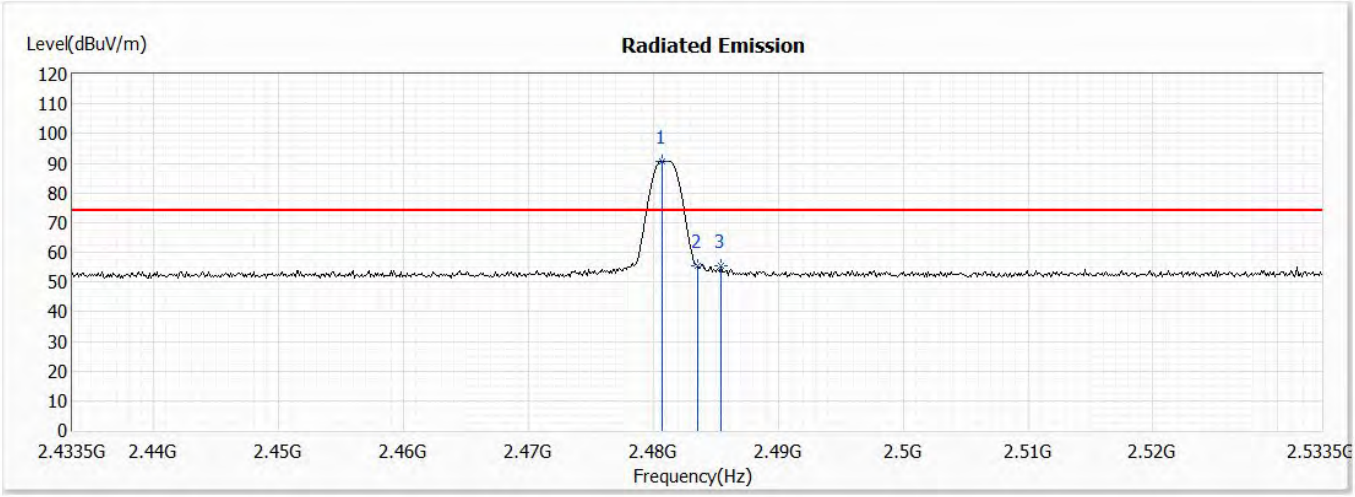
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2364.500	44.16	54.00	-9.84	31.03	13.13	AV
2	2390.000	41.37	54.00	-12.63	28.21	13.16	AV
3	2400.000	56.62	--	--	43.44	13.18	AV
4	2403.000	109.58	--	--	96.40	13.18	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_Whip Antenna
Test Date : 2021/05/29

Horizontal



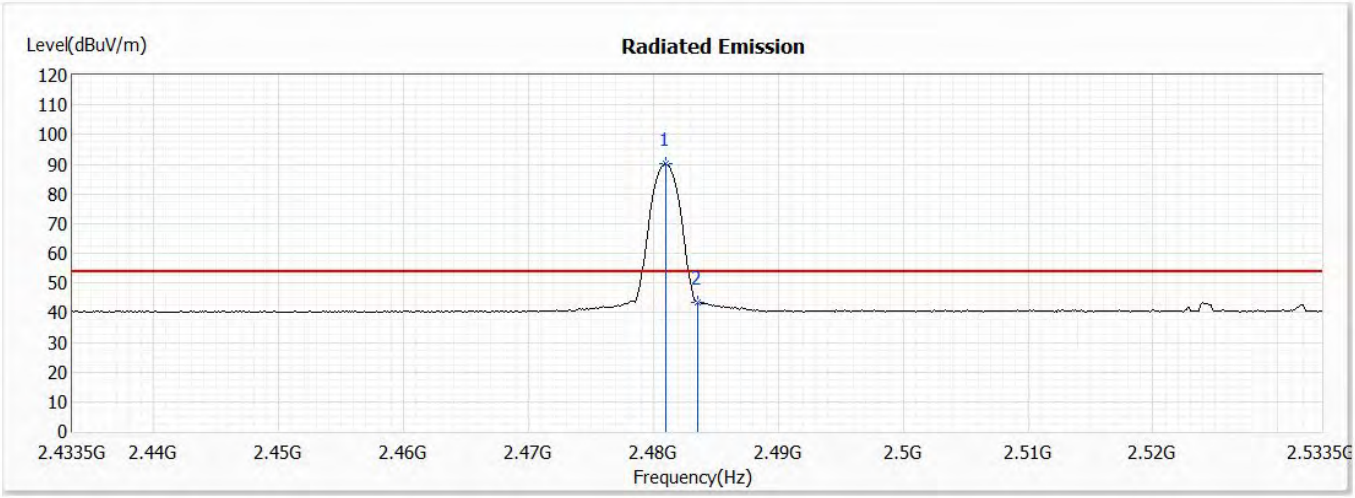
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2480.700	90.72	--	--	77.53	13.19	PK
2	2483.500	55.26	74.00	-18.74	42.07	13.19	PK
3	2485.400	55.55	74.00	-18.45	42.36	13.19	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	Wireless module
Test Item	:	Band Edge
Test Mode	:	Mode 2: Transmit - 1Mbps (2481MHz)_Whip Antenna
Test Date	:	2021/05/29

Horizontal



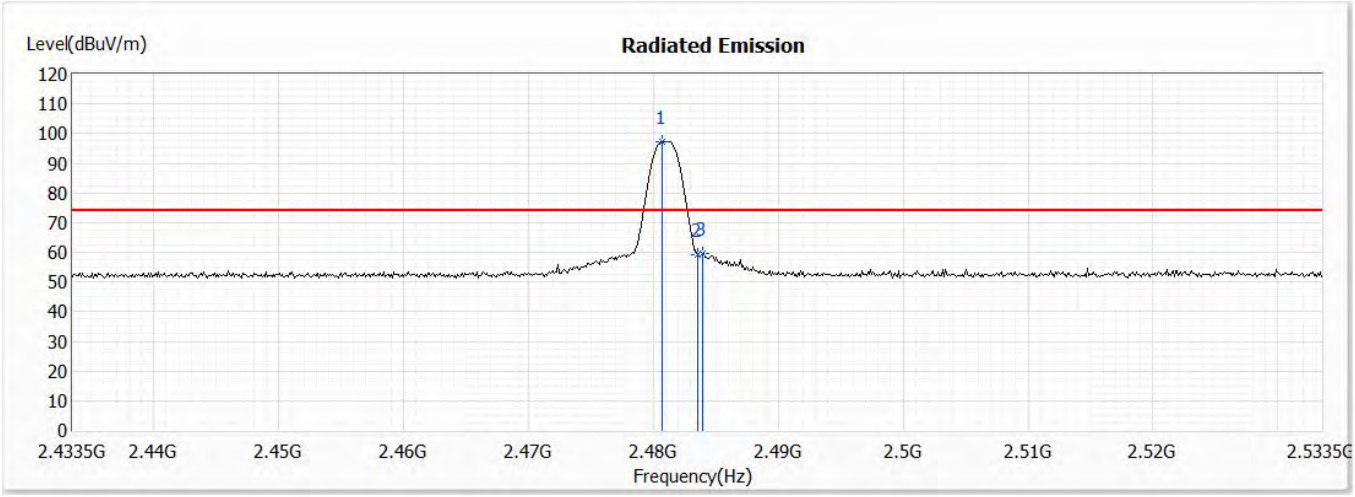
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	90.06	--	--	76.87	13.19	AV
2	2483.500	43.32	54.00	-10.68	30.13	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



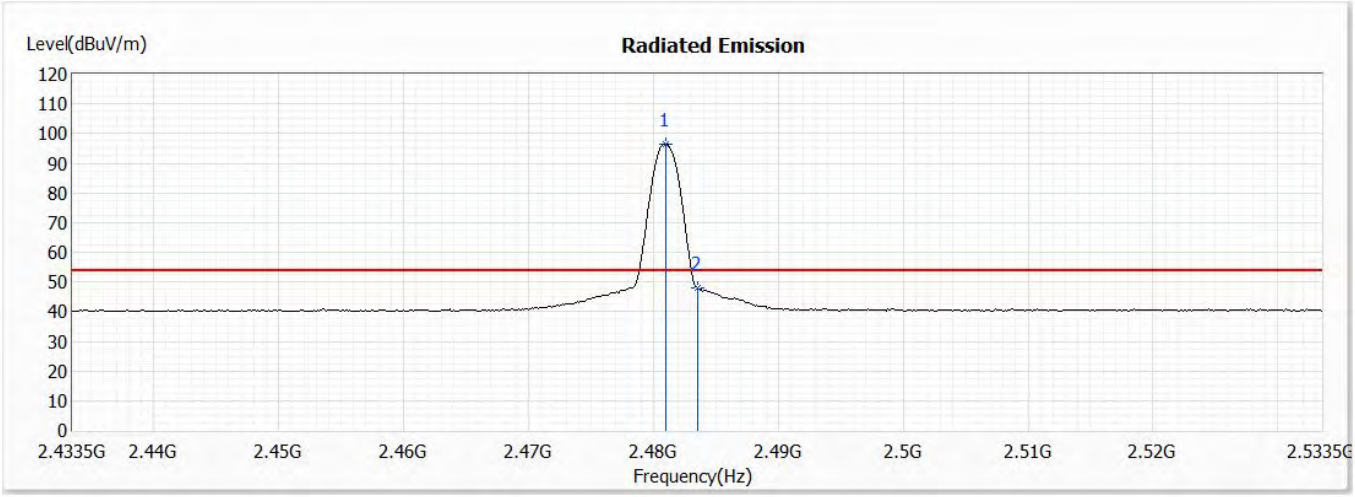
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2480.700	97.26	--	--	84.07	13.19	PK
2	2483.500	59.07	74.00	-14.93	45.88	13.19	PK
3	2483.900	59.54	74.00	-14.46	46.35	13.19	PK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (2481MHz)_Whip Antenna
Test Date : 2021/05/29

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	2481.000	96.60	--	--	83.41	13.19	AV
2	2483.500	48.06	54.00	-5.94	34.87	13.19	AV

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps(Hopping off)
Test Date : 2021/06/03

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 01:

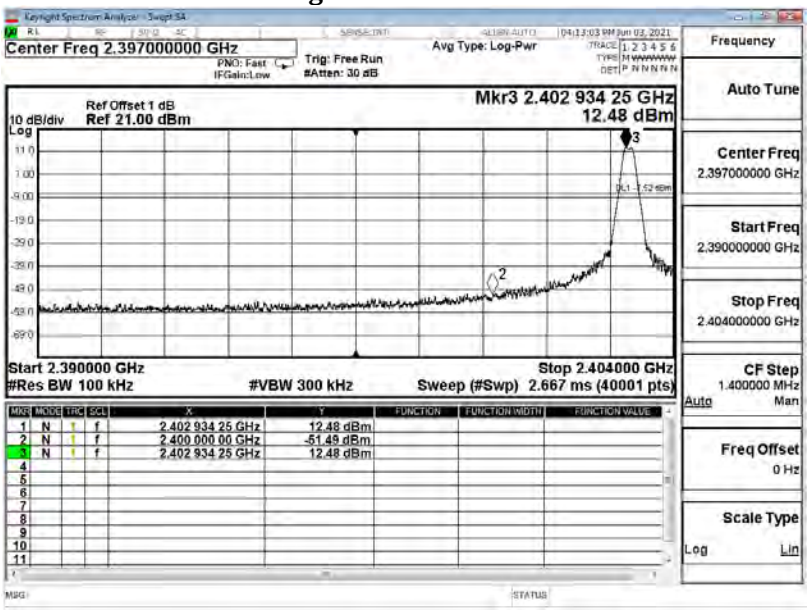
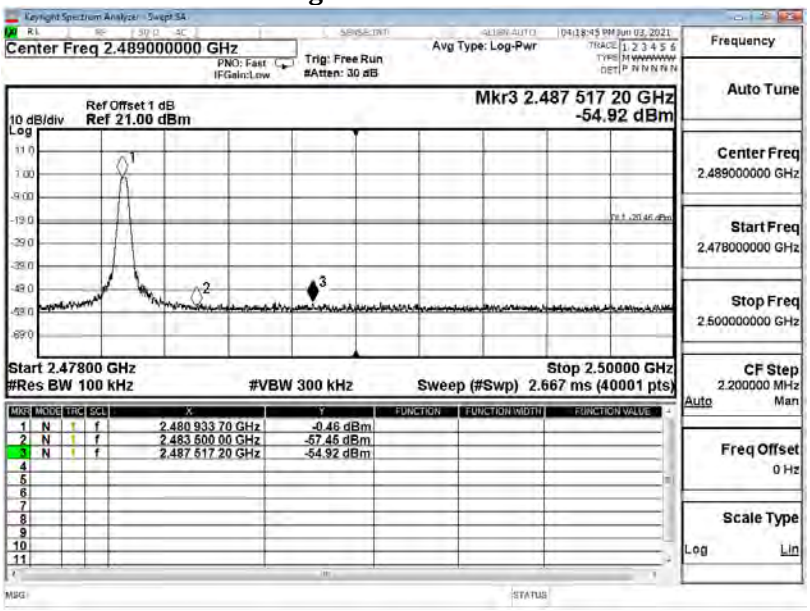


Figure Channel 79:



Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (Hopping off)
Test Date : 2021/06/03

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 01:

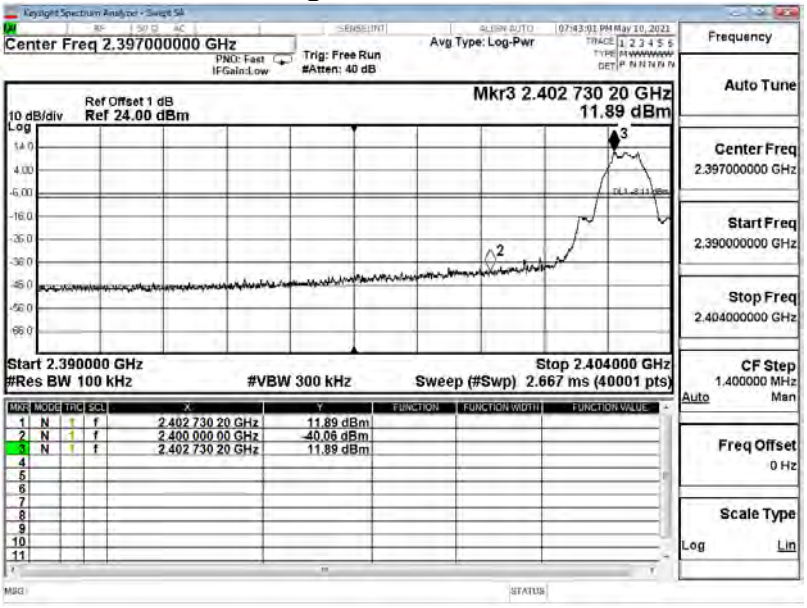
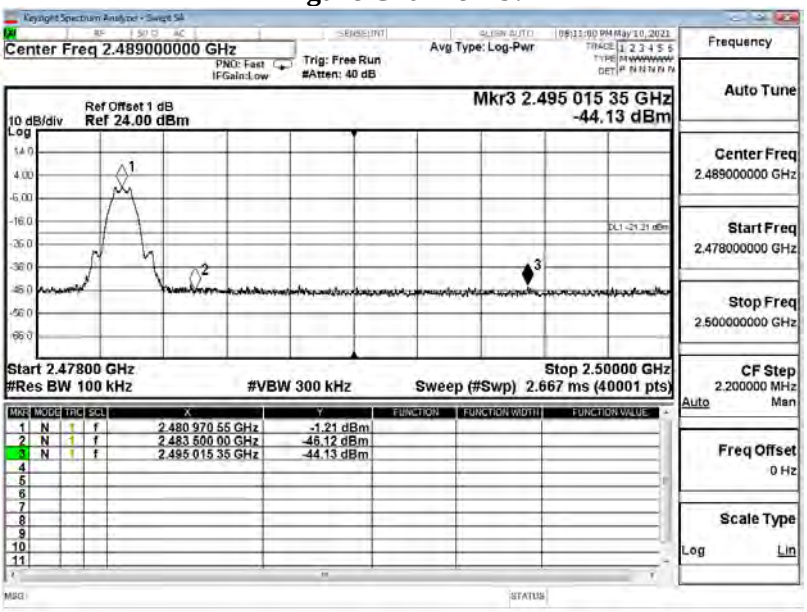


Figure Channel 79:



Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 250kbps(Hopping on)
Test Date : 2021/05/10

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel Hopping:

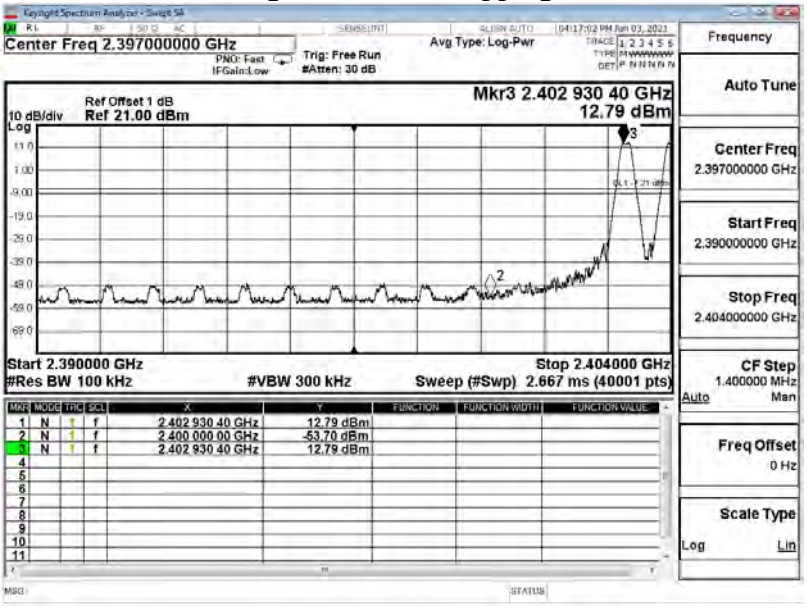
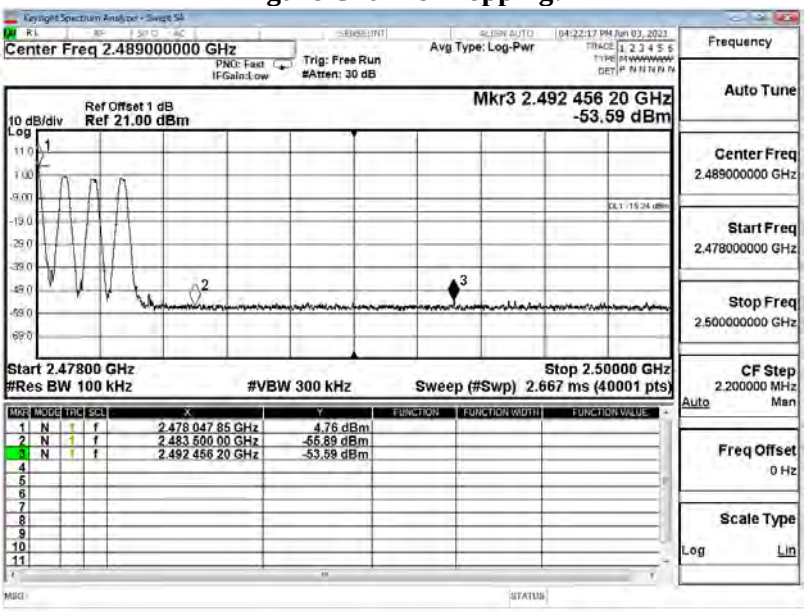


Figure Channel Hopping:



Product : Wireless module
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 1Mbps (Hopping on)
Test Date : 2021/05/10

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel Hopping:

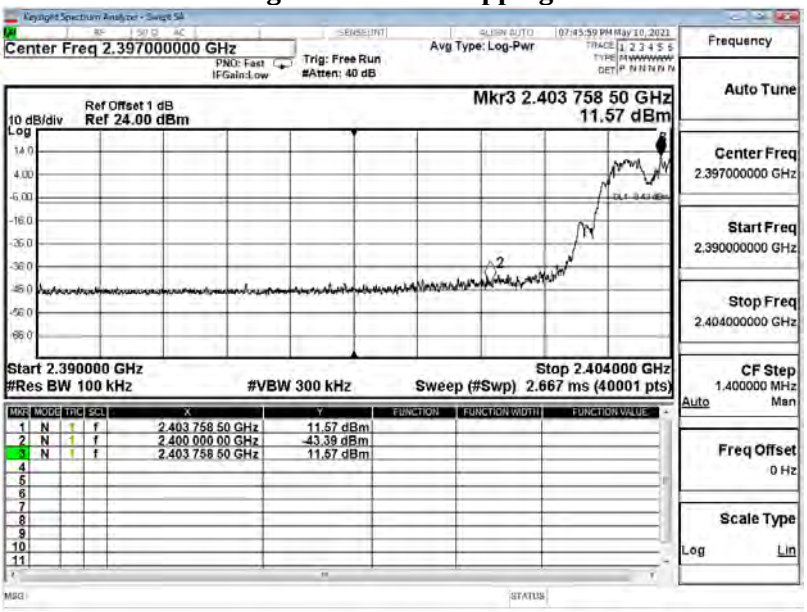
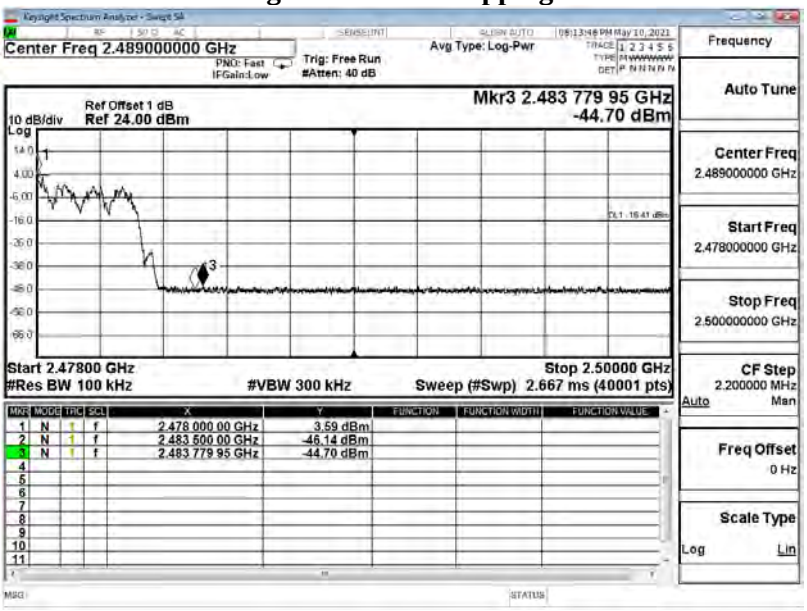
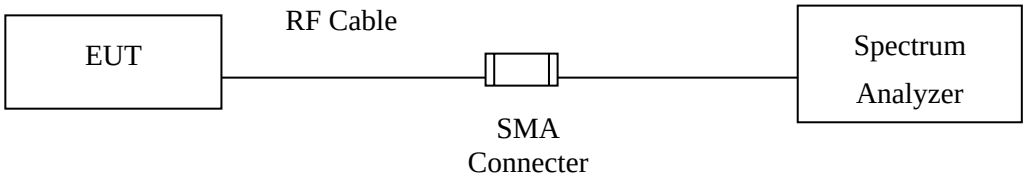


Figure Channel Hopping:



7. Channel Number

7.1. Test Setup



7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

7.3. Test Procedure

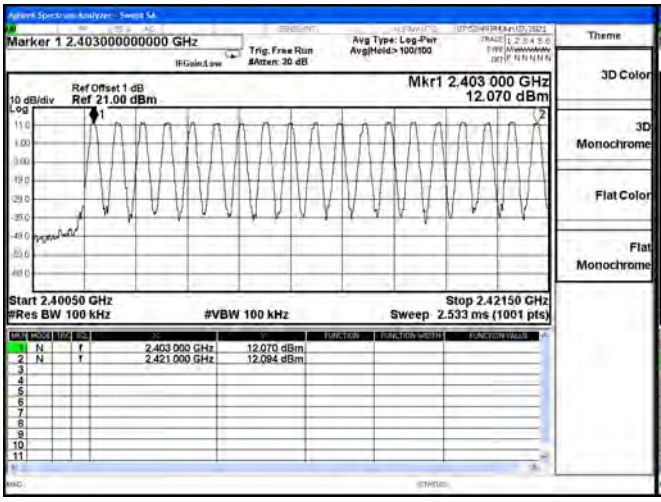
Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

7.4. Test Result of Channel Number

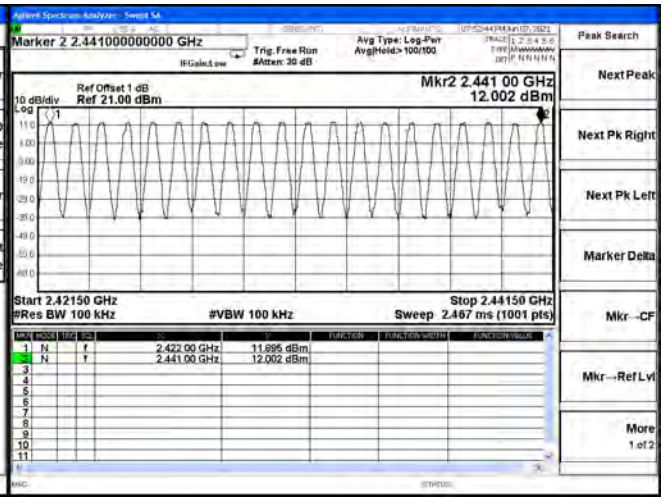
Product : Wireless module
Test Item : Channel Number
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2021/06/07

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2403 ~ 2481	79	>75	Pass

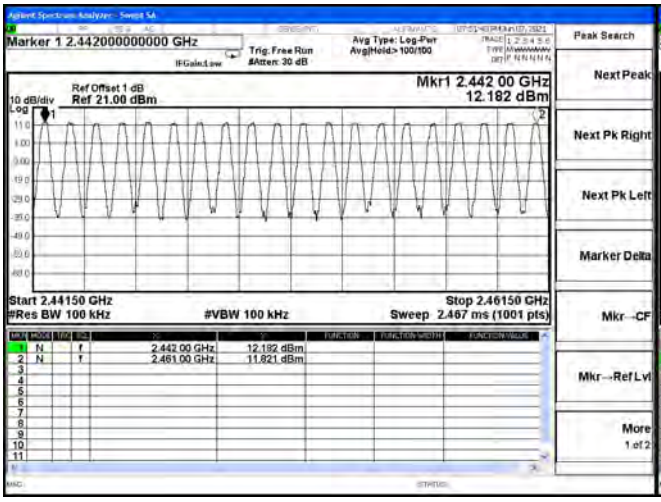
2403-2421MHz



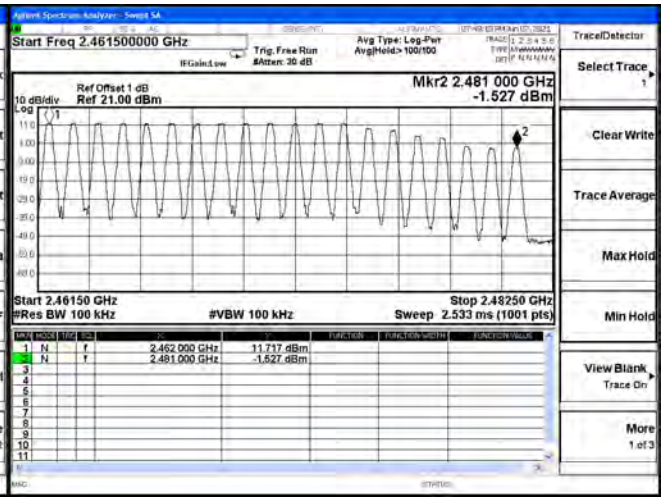
2422-2441MHz



2442-2461MHz



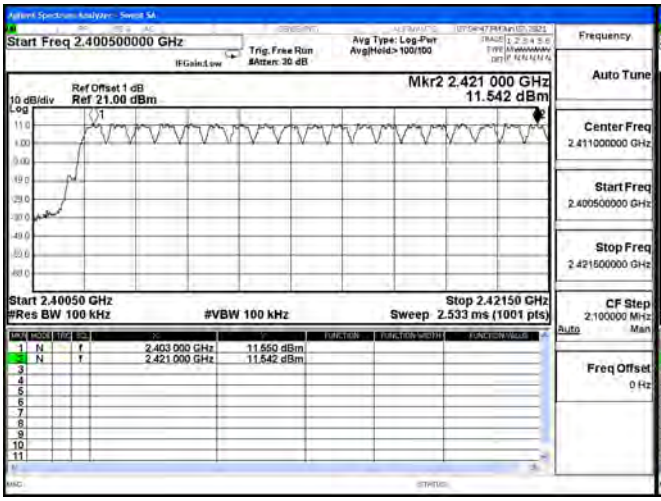
2462-2481MHz



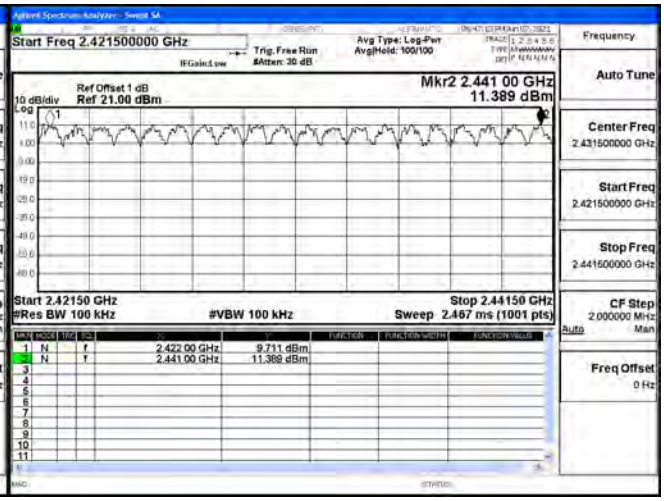
Product : Wireless module
Test Item : Channel Number
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2021/06/07

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2403 ~ 2481	79	>75	Pass

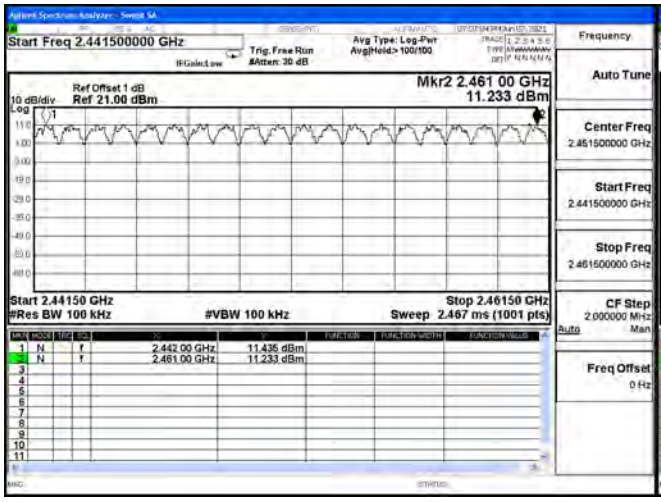
2403-2421MHz



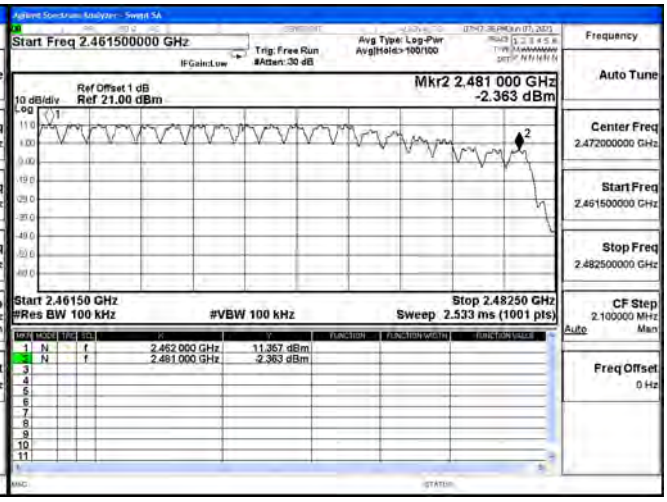
2422-2441MHz



2442-2461MHz

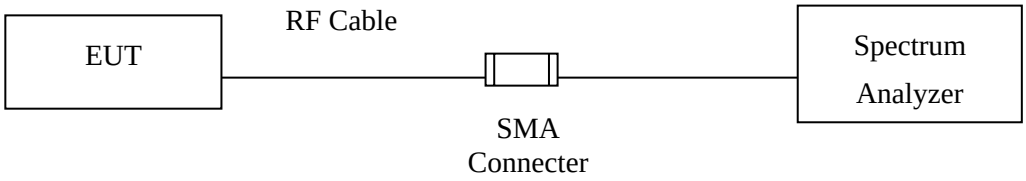


2462-2481MHz



8. Channel Separation

8.1. Test Setup



8.2. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

8.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

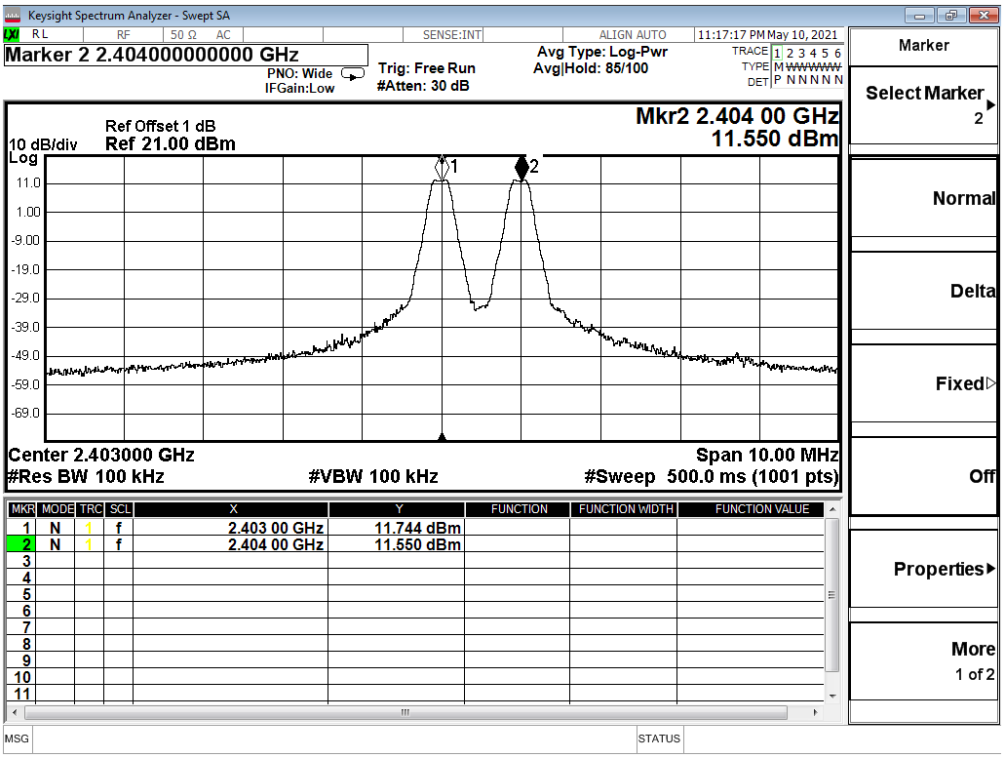
8.4. Test Result of Channel Separation

Product : Wireless module
Test Item : Channel Separation
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2021/05/10

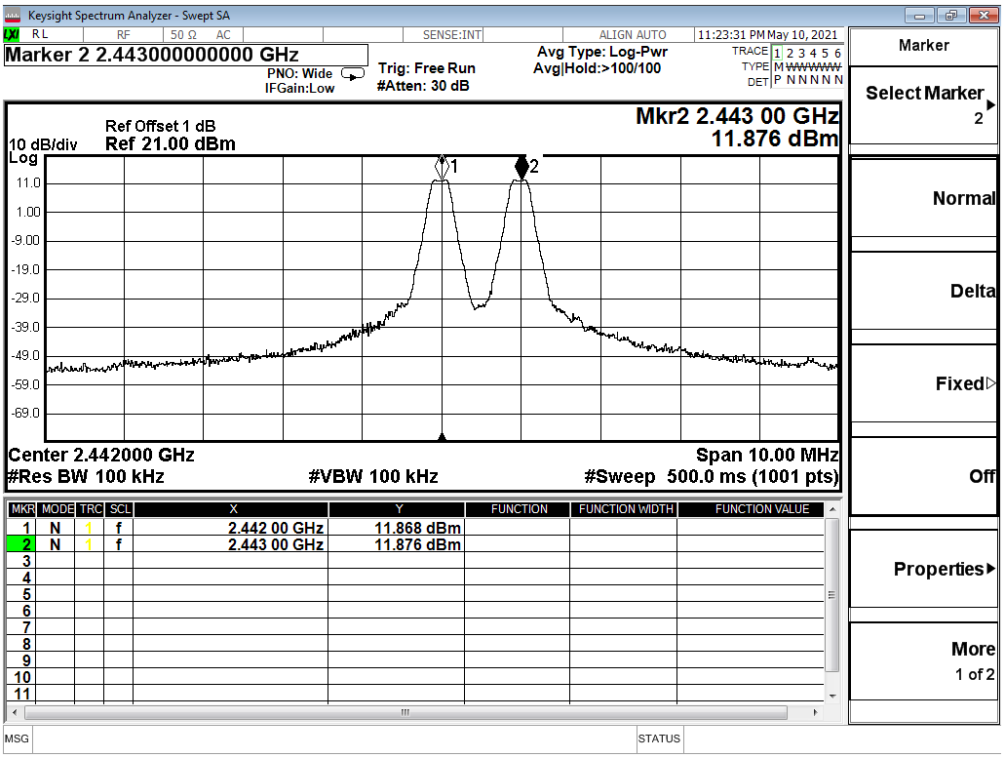
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
01	2403	1000	>25 kHz	218.0	Pass
40	2442	1000	>25 kHz	218.0	Pass
79	2481	1000	>25 kHz	220.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

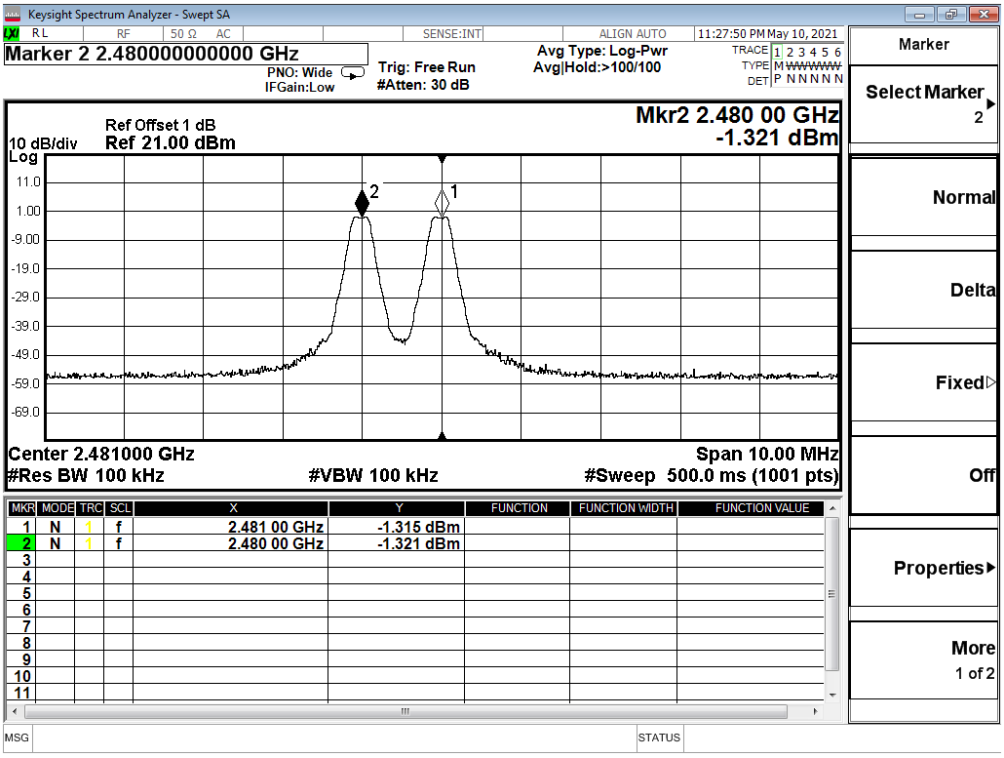
Channel 01 (2403MHz)



Channel 40 (2442MHz)



Channel 79 (2481MHz)



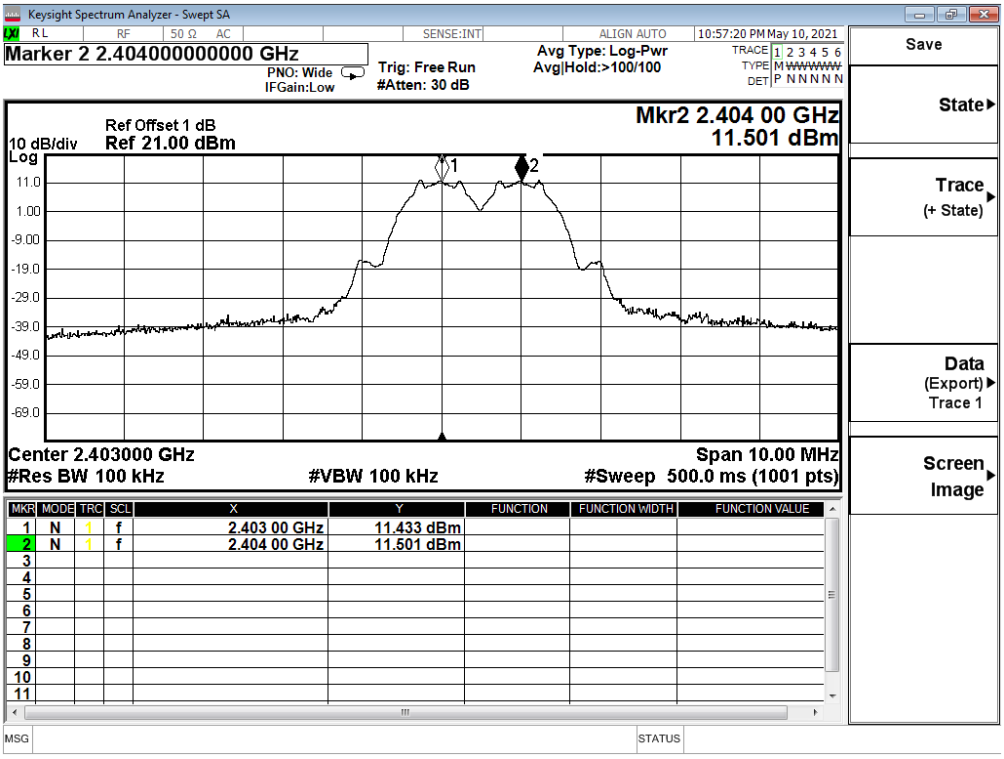
2

Product : Wireless module
Test Item : Channel Separation
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2021/05/10

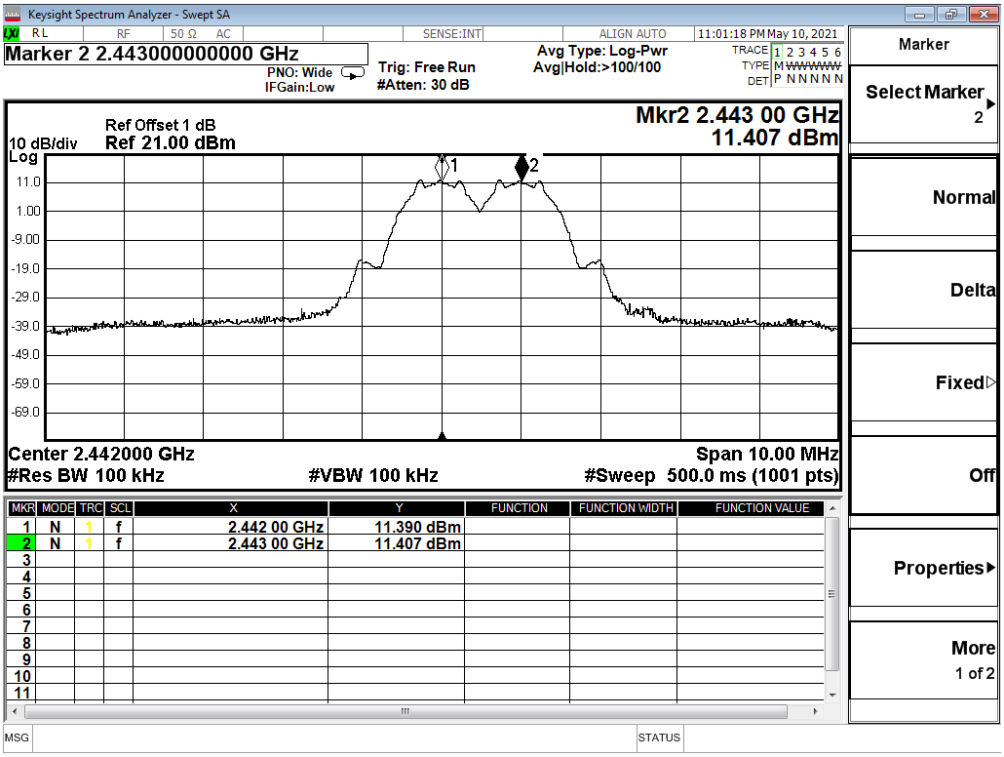
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
01	2403	1000	>25 kHz	790.0	Pass
40	2442	1000	>25 kHz	790.0	Pass
79	2481	1000	>25 kHz	798.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

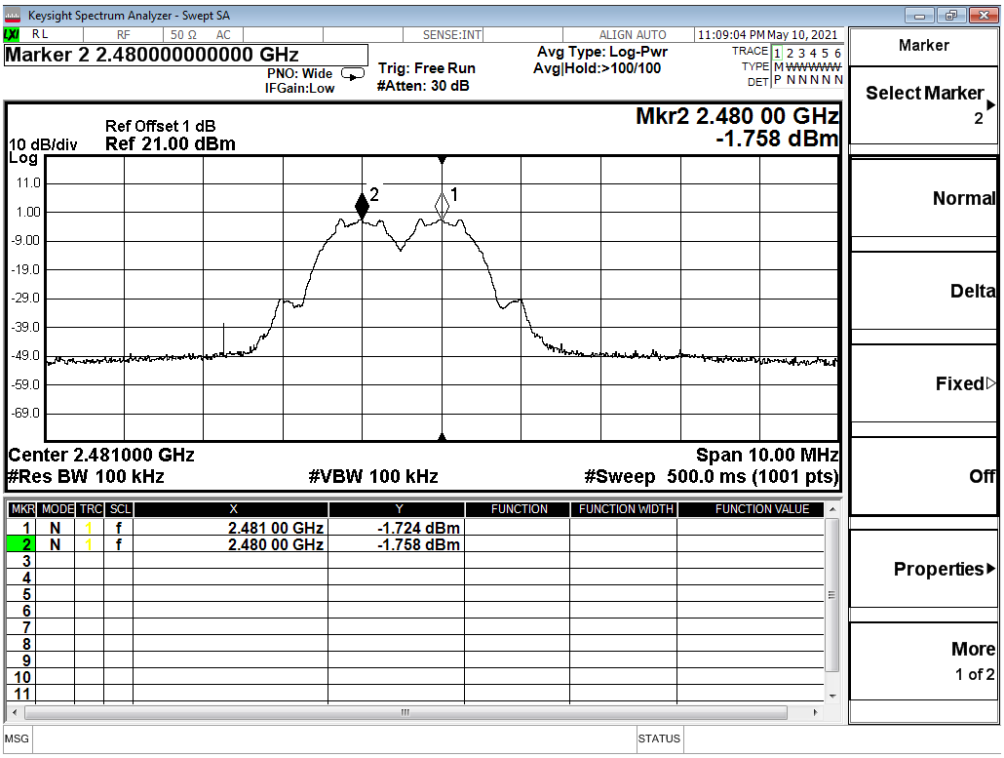
Channel 01 (2403MHz)



Channel 40 (2442MHz)

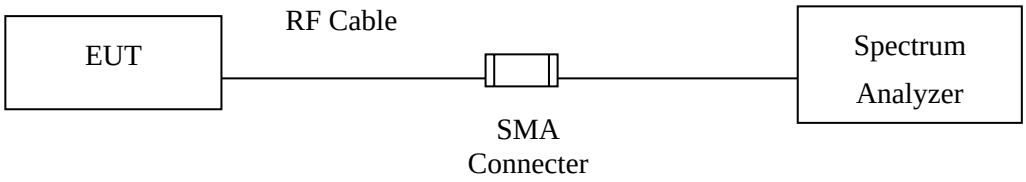


Channel 79 (2481MHz)



9. Dwell Time

9.1. Test Setup



9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

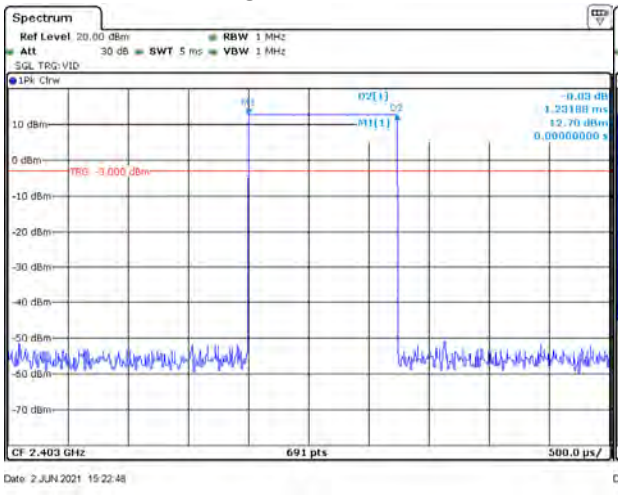
9.4. Test Result of Dwell Time

Product : Wireless module
Test Item : Dwell Time
Test Mode : Mode 1: Transmit - 250kbps (Channel 01,40,79)
Test Date : 2021/06/02

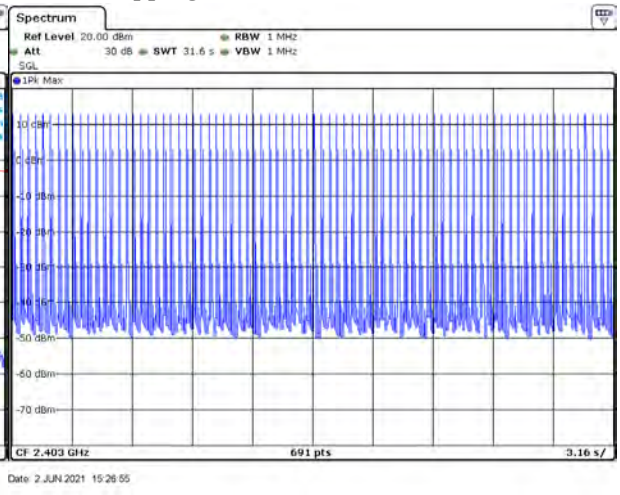
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (ms)	Limit (ms)	Result
2403	1.232	82	31600	101.014	400	Pass
2442	1.232	82	31600	101.014	400	Pass
2481	1.239	82	31600	101.609	400	Pass

Dwell time = Time slot length(ms)*Hopping of Number

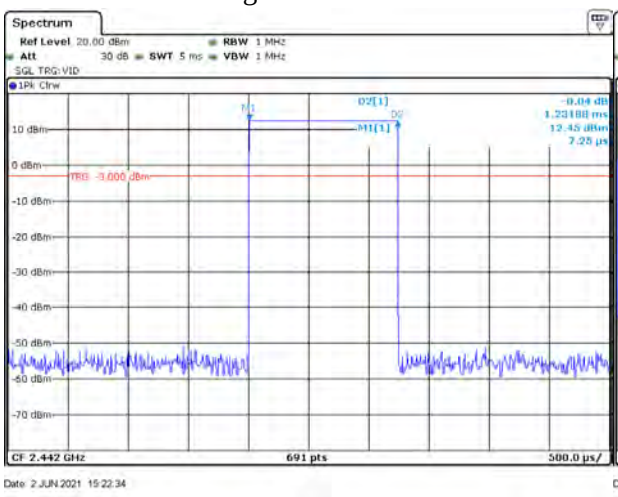
CH 01 Time slot length



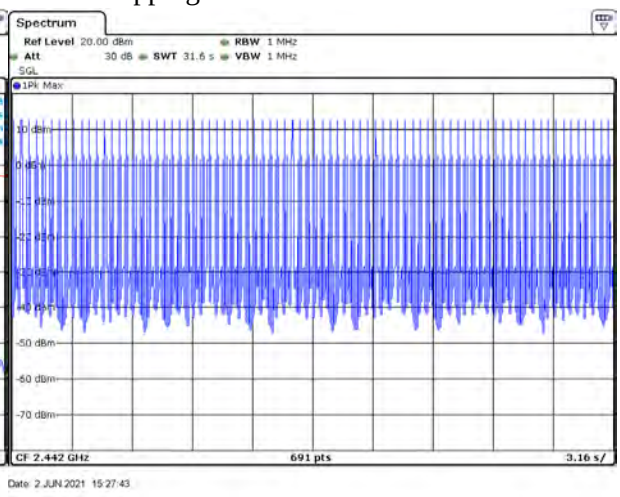
CH 01 Hopping of Number



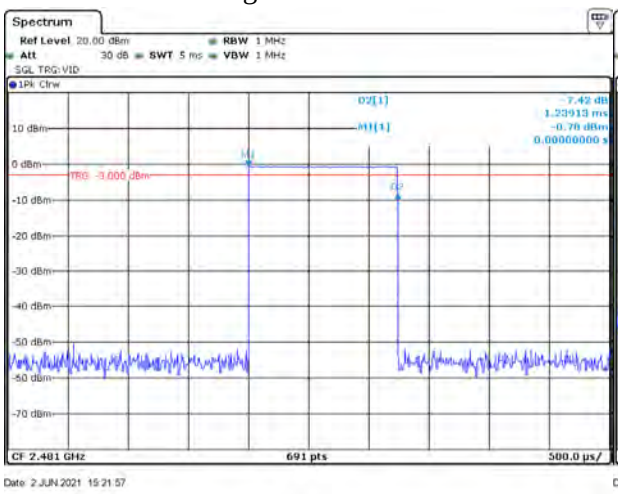
CH 40 Time slot length



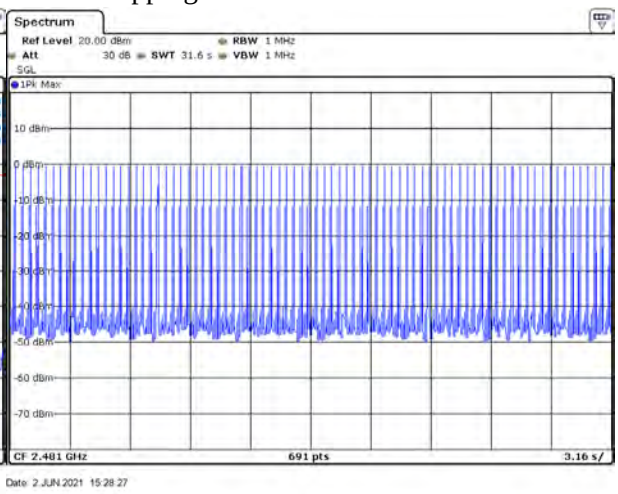
CH 40 Hopping of Number



CH 79 Time slot length



CH 79 Hopping of Number



Note:

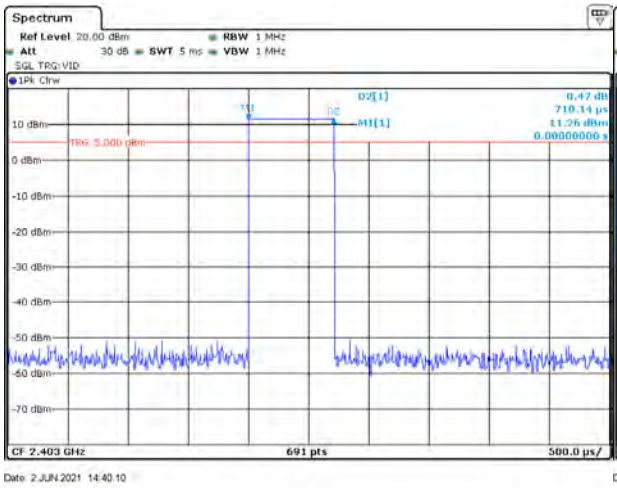
The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product : Wireless module
Test Item : Dwell Time
Test Mode : Mode 2: Transmit - 1Mbps (Channel 01,40,79)
Test Date : 2021/06/02

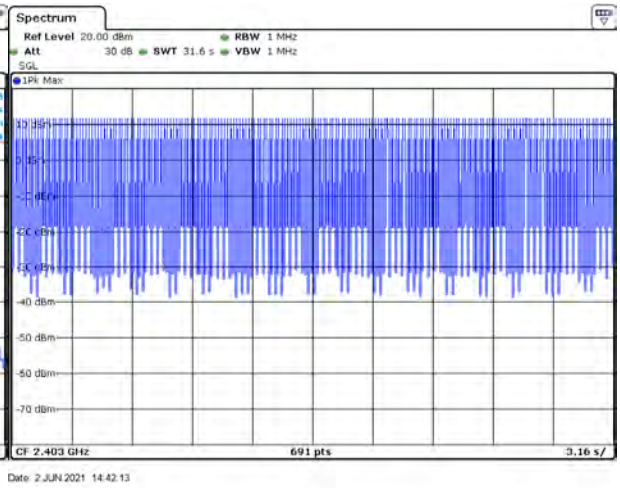
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (ms)	Limit (ms)	Result
2403	0.710	203	31600	144.158	400	Pass
2442	0.717	202	31600	144.913	400	Pass
2481	0.710	203	31600	144.158	400	Pass

Dwell time = Time slot length(ms)*Hopping of Number

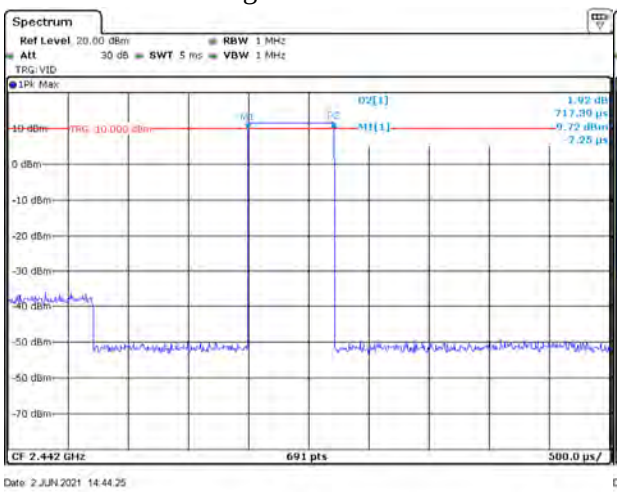
CH 00 Time slot length



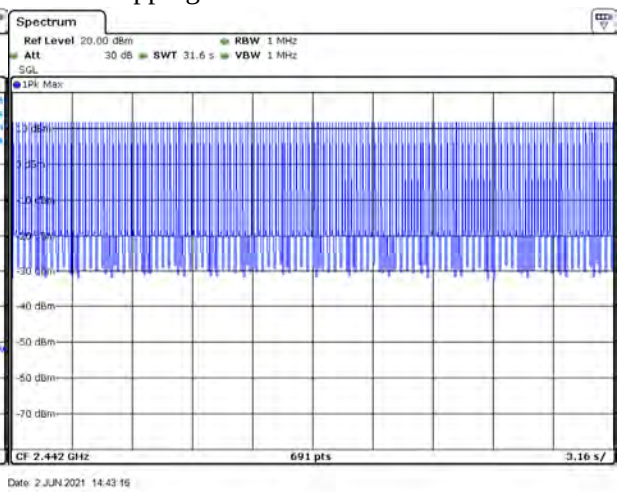
CH 00 Hopping of Number



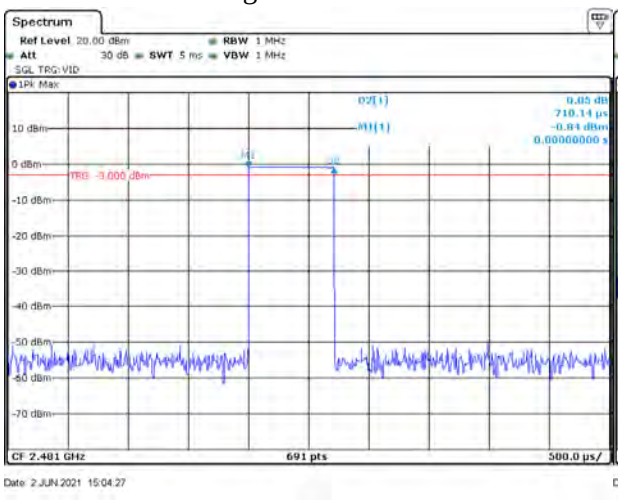
CH 40 Time slot length



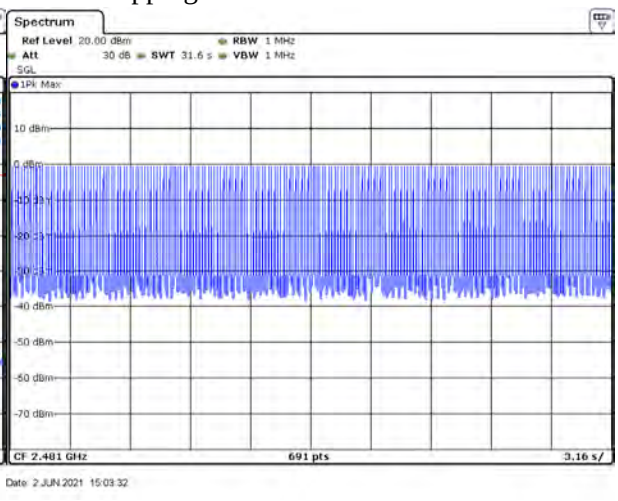
CH 40 Hopping of Number



CH 79 Time slot length



CH 79 Hopping of Number

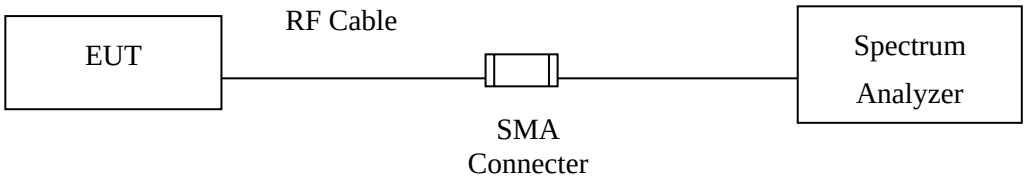


Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

10. Occupied Bandwidth

10.1. Test Setup



10.2. Limits

N/A

10.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

10.4. Test Result of Occupied Bandwidth

Product : Wireless module
Test Item : Occupied Bandwidth Data
Test Mode : Mode 1: Transmit - 250kbps
Test Date : 2021/05/10

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2403	327	--	NA
40	2442	327	--	NA
79	2481	330	--	NA

Figure Channel 01:

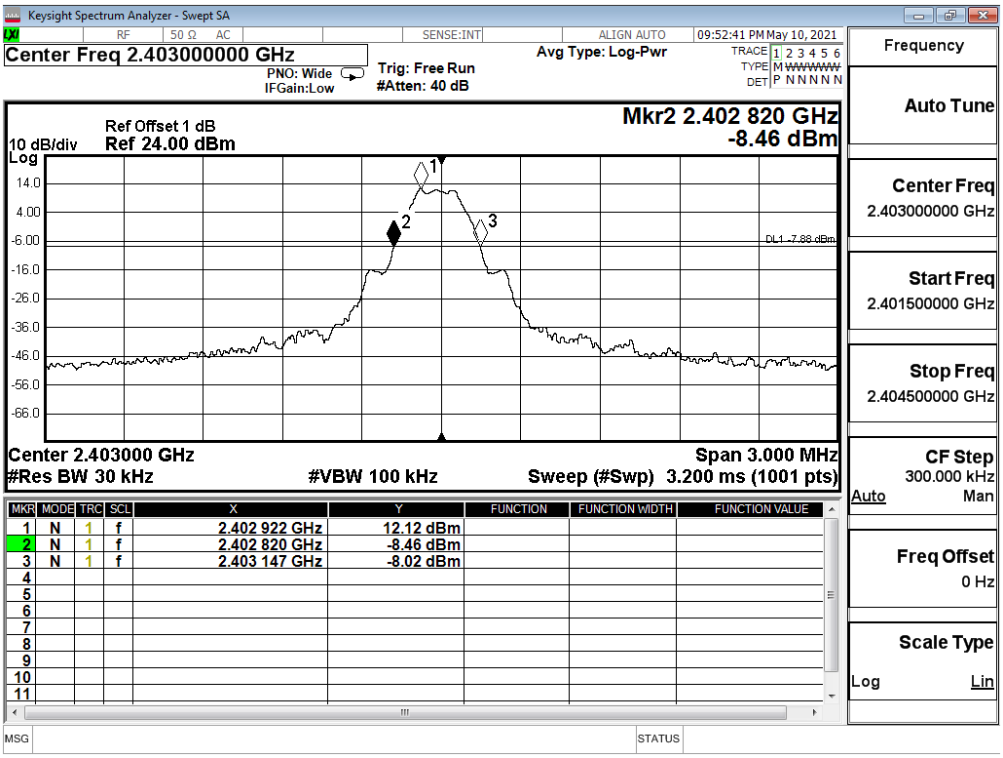


Figure Channel 40:

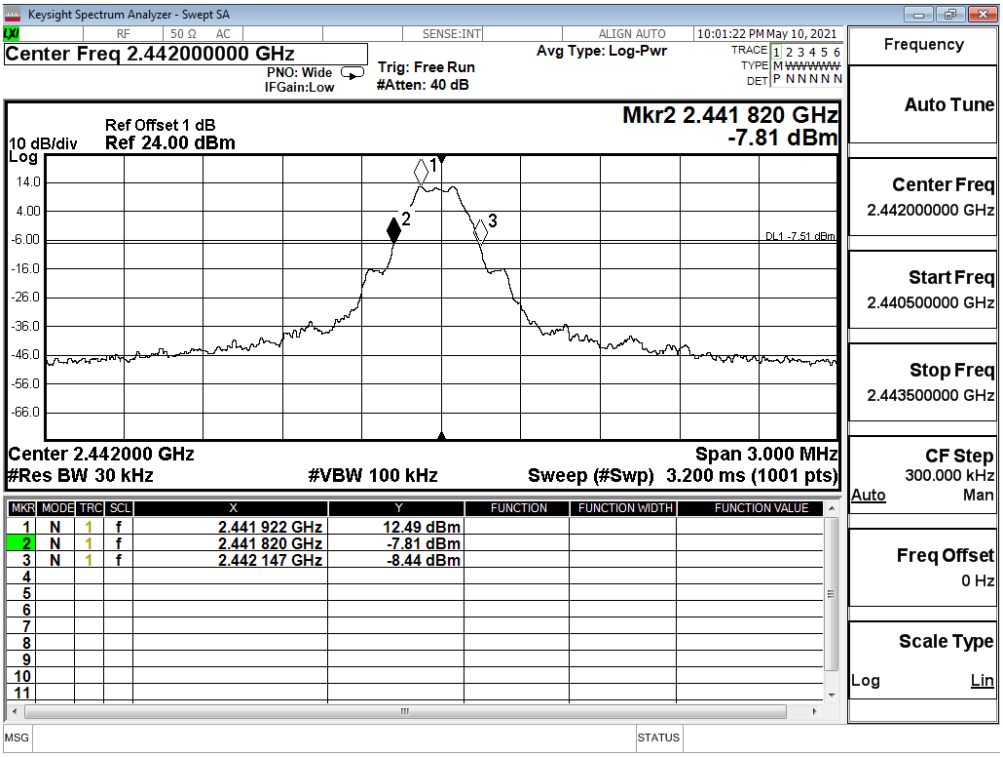
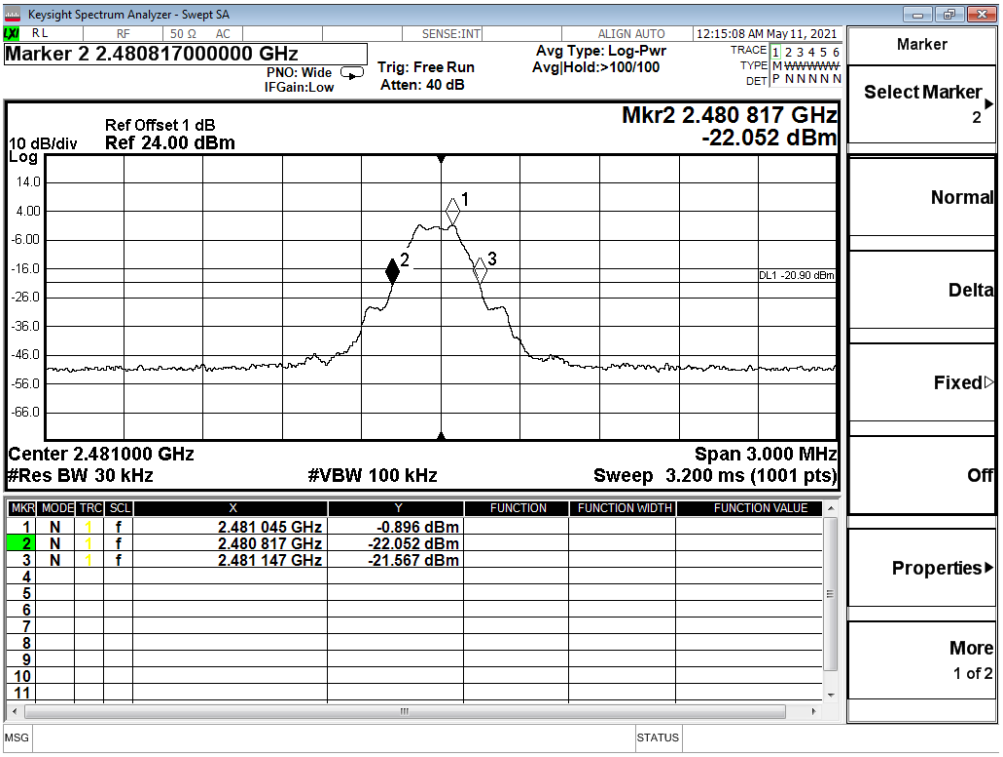


Figure Channel 79:



Product : Wireless module
Test Item : Occupied Bandwidth Data
Test Mode : Mode 2: Transmit - 1Mbps
Test Date : 2021/05/10

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2403	1185	--	NA
40	2442	1185	--	NA
79	2481	1197	--	NA

Figure Channel 01:

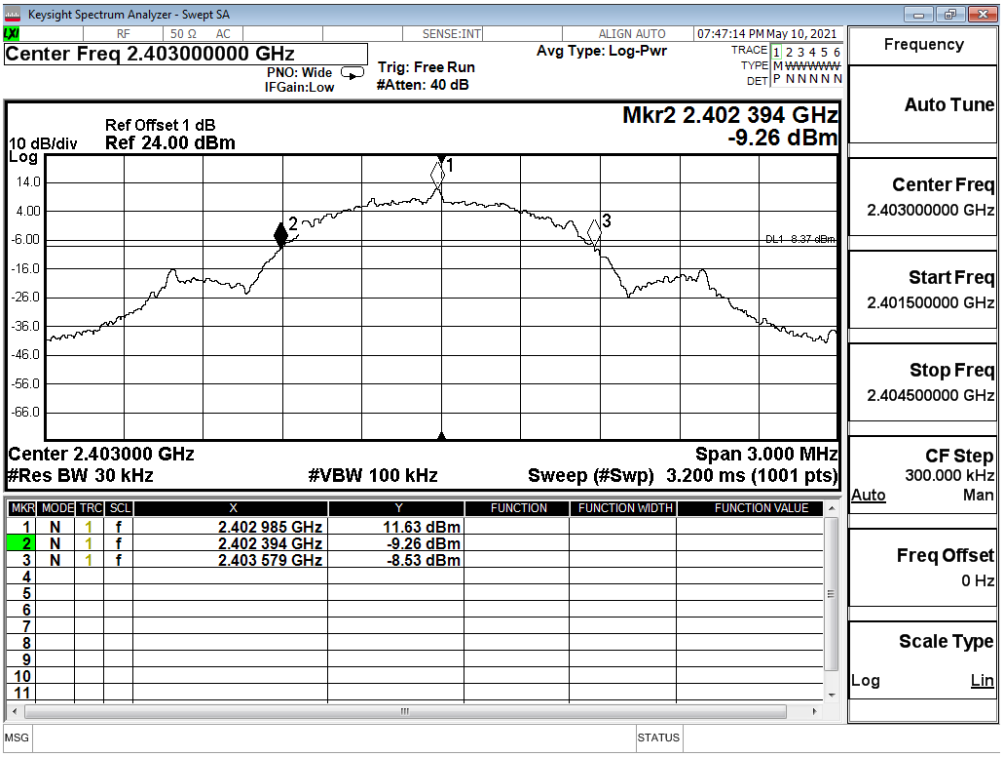


Figure Channel 40:

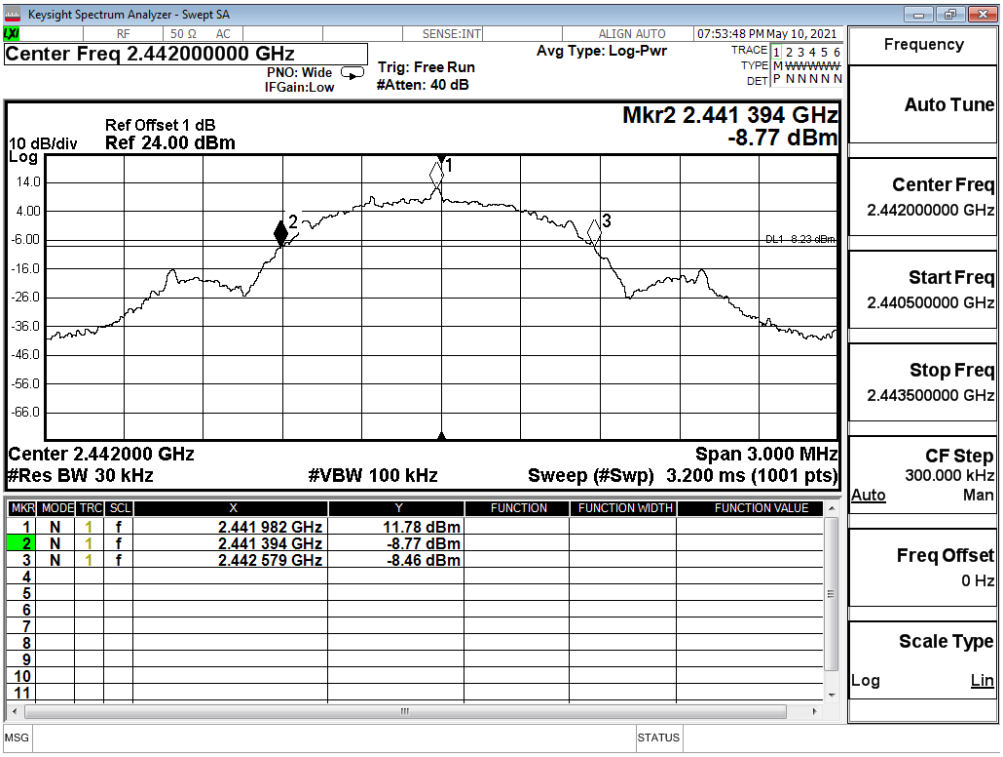
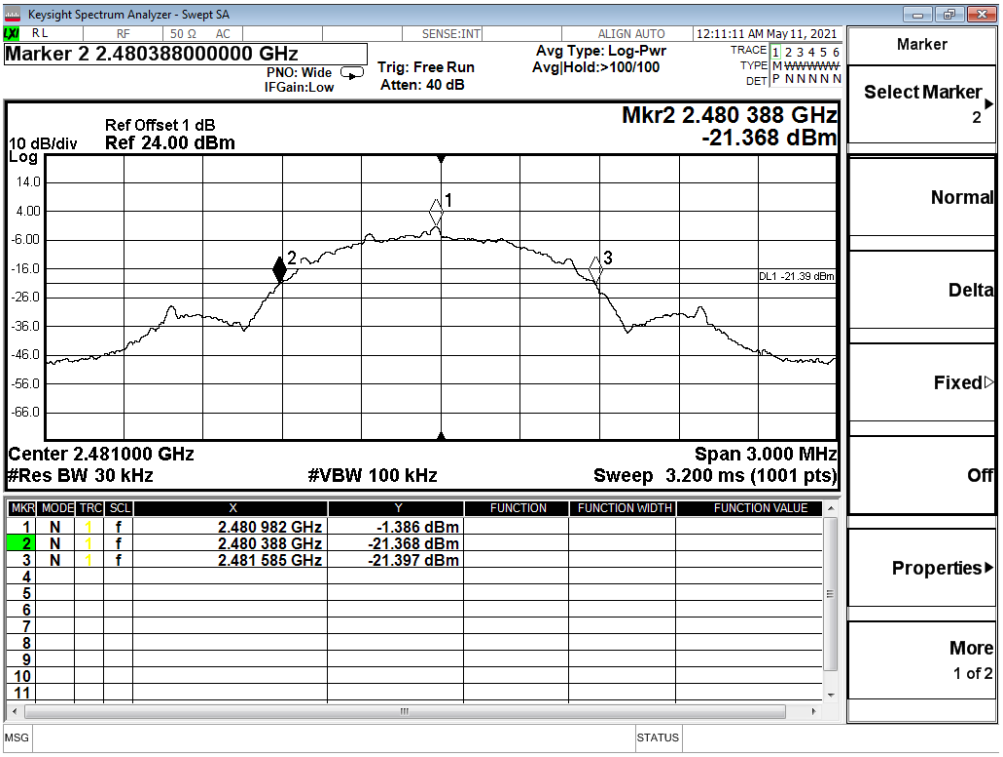
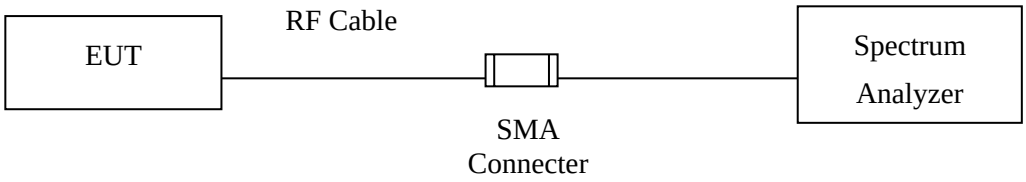


Figure Channel 79:



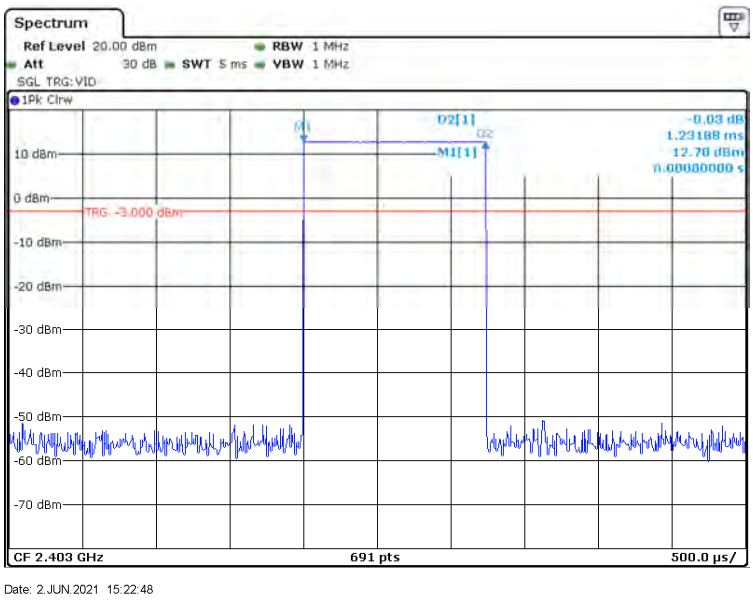
11. Duty Cycle

11.1. Test Setup

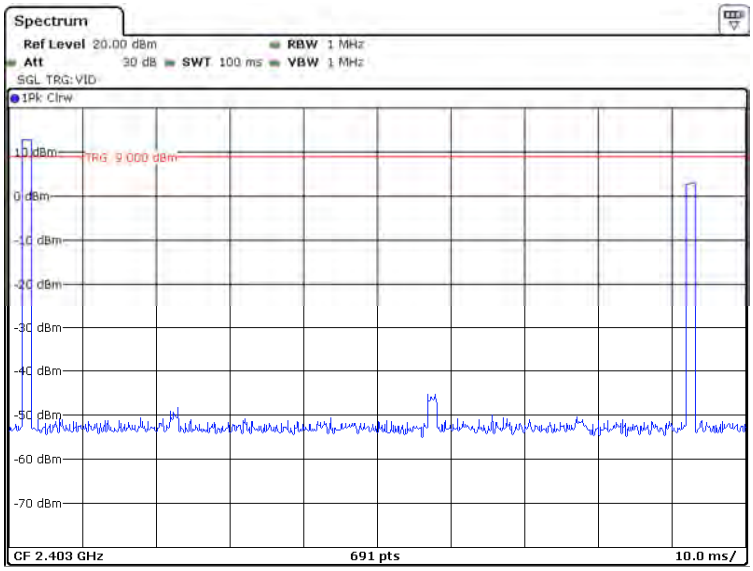


11.2. Test Result of Duty Cycle

Product : Wireless module
Test Item : Duty Cycle Data
Test Mode : Mode 1: Transmit - 250kbps



Date: 2.JUN.2021 15:22:48



Date: 2.JUN.2021 15:23:13

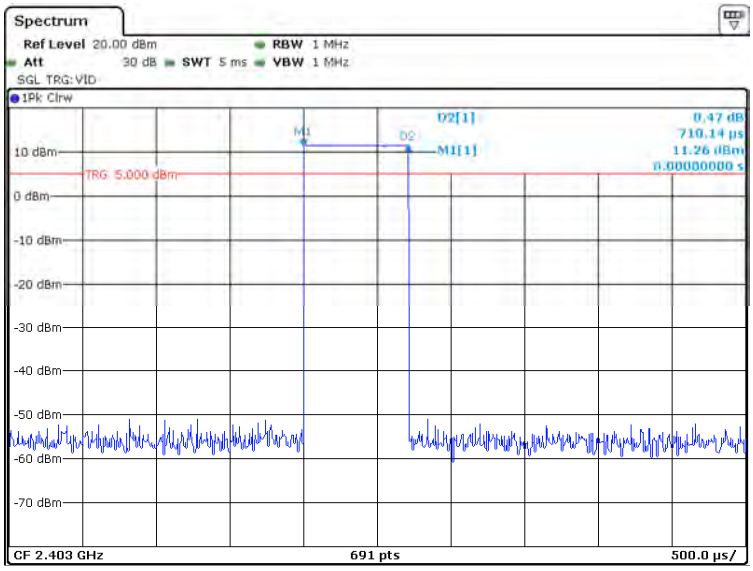
Time on of 100ms= 0.71ms*2= 1.42ms

Duty Cycle=1.42ms / 100ms= 0.0142

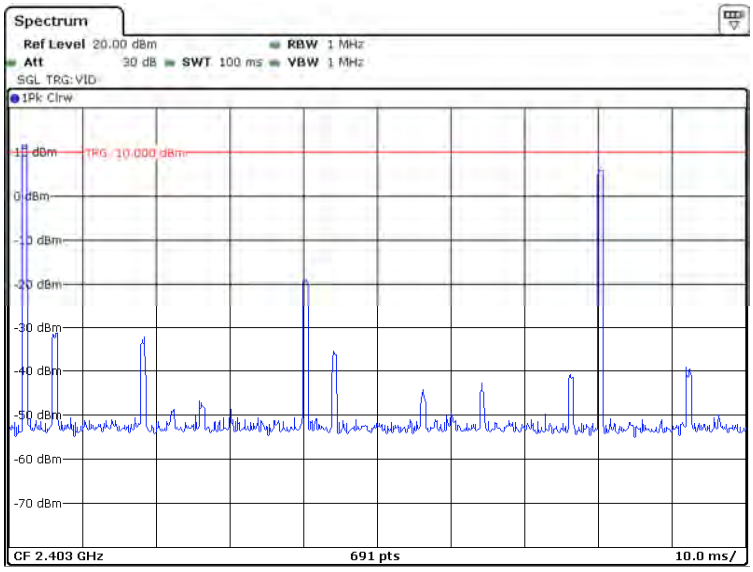
Duty Cycle correction factor= 20 LOG 0.0142= -36.954 dB

Duty Cycle correction factor	**-36.954**	**dB**

Product : Wireless module
Test Item : Duty Cycle Data
Test Mode : Mode 2: Transmit - 1Mbps



Date: 2.JUN.2021 14:40:10



Date: 2.JUN.2021 14:40:48

Time on of 100ms= 1.23ms*2= 2.46ms

Duty Cycle=2.46ms / 100ms= 0.0246

Duty Cycle correction factor= 20 LOG 0.0246= -32.181 dB

Duty Cycle correction factor	**-32.181**	**dB**

12. EMI Reduction Method During Compliance Testing

No modification was made during testing.