FCC Test Report

(Class II Permissive Change)

Product Name	LTE SOM Module
Model No	MS-01 PRO
FCC ID.	2ABTU-MS01PRO

Applicant	RuggON Corporation
Address	4F, No. 298, Yang Guang St., Neihu Dist., Taipei City, Taiwan

Date of Receipt	Mar. 30, 2020
Issue Date	Apr. 29, 2020
Report No.	2030820R-RFUSP69V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

Issue Date: Apr. 29, 2020
Report No.: 2030820R-RFUSP69V00

Product Name	LTE SOM Module
Applicant	RuggON Corporation
Address	4F, No. 298, Yang Guang St., Neihu Dist., Taipei City, Taiwan
Manufacturer	RuggON Corporation
Model No.	MS-01 PRO
FCC ID.	2ABTU-MS01PRO
EUT Rated Voltage	DC 3.3V
EUT Test Voltage	DC 3.3V
Trade Name	RuggON
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Anny Chou

(Senior Adm. Specialist / Anny Chou)

Tested By : Anson Kuo

(Engineer / Anson Kuo)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	LTE SOM Module
Trade Name	RuggON
Model No.	MS-01 PRO
FCC ID.	2ABTU-MS01PRO
Frequency Range	2412-2472MHz for 802.11b/g/n-20BW, 2422-2462MHz for 802.11n-40BW
Number of Channels	802.11b/g/n-20MHz: 11, 802.11n-40MHz: 7
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 300Mbps
Channel separation	802.11b/g/n: 5 MHz
Type of Modulation	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PIFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List:

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	AnJie	AJDP1J-B0006	PIFA	3.46dBi for 2.4 GHz

Note: The antenna of EUT is conforming to FCC 15.203

802.11b/g/n-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

802.11n-40MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 03:	2422 MHz	Channel 04:	2427 MHz	Channel 05:	2432 MHz	Channel 06:	2437 MHz
Channel 07:	2442 MHz	Channel 08:	2447 MHz	Channel 09:	2452 MHz		

Note:

1. The EUT is an LTE SOM Module,Contains functions on NFC, 2.4G and 5G band WIFI and WWAN with Bluetooth (V5.0 and V3.0+HS, V2.1+EDR) combo card module transceiver,this report for 2.4GHz WLAN.
2. These tests are conducted on a sample for the purpose of demonstrating compliance of transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report.

1. This is to request a Class II permissive change for FCC ID: 2ABTU-MS01PRO, originally granted on 06/26/2019.

   The major change filed under this application is:

   Change #1: Addition an new antenna, antenna type is different with the original application.

   (Antenna type: PIFA antenna)

Test Mode	Mode 1:802.11b
	Mode 2:802.11g
	Mode 3:802.11n-20
	Mode 4:802.11n-40

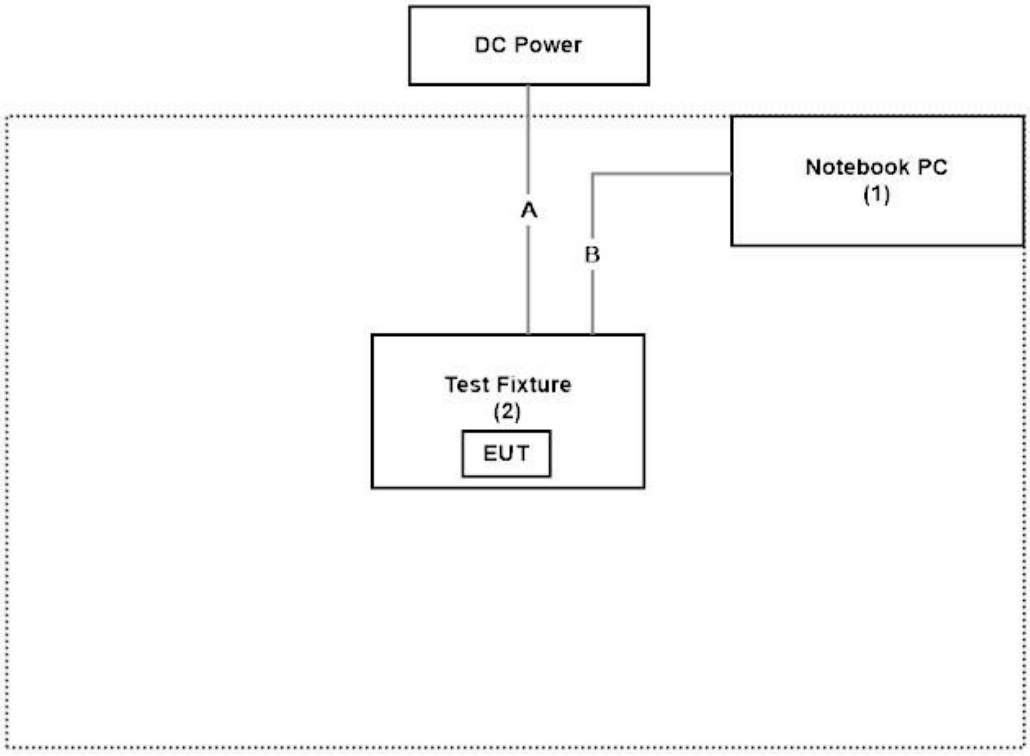
1.3. Tested System Details

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

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5580	2HRD7H2	Non-shielded, 0.8m
2	Test Fixture	RuggON	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 1m
B	Power Cable	Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

(1) Setup the EUT as shown on 1.4

(2) Execute software “QRCT3 V3.0.2680.0” on the EUT.

(3) Configure the test mode, the test channel, and the data rate.

(4) Start the continuous transmission.

(5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Radiated Emission	Temperature (°C)	10~40 °C	24.7 °C
	Humidity (%RH)	10~90 %	63.7 %
Conductive	Temperature (°C)	10~40 °C	20.5 ℃
	Humidity (%RH)	10~90 %	59.6 %

USA : FCC Registration Number: TW3023
Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
Phone number: 886-2-8601-3788
Fax number: 886-2-8601-3789
Email address: info.tw@dekra.com
Website: http://www.dekra.com.tw

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2020/04/06	2021/04/05
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2019/09/25	2020/09/24
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/30	2020/07/29
X	EMI Test Receiver	R&S	ESCS 30	100369	2019/11/19	2020/11/18
X	LISN	R&S	ENV216	101105	2020/04/09	2021/04/08
X	LISN	R&S	ESH3-Z5	836679/014	2020/04/09	2021/04/08
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2019/06/20	2020/06/19

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 SystemV9.0.5.

For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Test Receiver	R&S	ESR7	101602	2019/12/16	2020/12/15
X	Signal Analyzer	R&S	FSV40	101869	2019/07/04	2020/07/03
X	Loop Antenna	Teseq	HLA6121	37133	2020/10/15	2021/10/14
X	Bilog Antenna	Schaffner Chase	CBL6112B	2916	2020/01/20	2021/01/19
X	Coaxial Cable	DEKRA	L1907-001C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC001330	980254	2019/08/22	2020/08/21
X	Horn Antenna	ETS-LINDGREN	3117	00228113	2019/05/02	2020/05/01
X	Coaxial Cable	DEKRA	L1907-002C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC05820SE	980362	2019/06/26	2020/06/25
X	Amplifier	EMCI	EMC051845SE	980632	2019/08/08	2020/08/07
X	Horn Antenna	Com-Power	AH-1840	101101	2019/10/31	2020/10/30
X	Amplifier + Cable	EMCI	EMC184045SE	980369	2020/04/24	2021/04/23
	Bilog Antenna	Schaffner Chase	CBL6112B	2925	2020/02/20	2021/02/19
	Coaxial Cable	DEKRA	L1907-003C	00100A1B3A120M	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC001330	980255	2019/06/28	2020/06/27
X	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/08	2020/08/07
X	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/08	2020/08/07

Note:

1. Loop Antenna is calibrated every two years, the other 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 Test SystemV1.1.

2. Peak Power Output

2.1. Test Setup

2.2. Limits

The maximum peak power shall be less 1 Watt.

2.3. Test Procedure

The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 D01 DTS Meas Guidance v04 section 9.1.3 PKPM1 Peak power meter method.

2.4. Uncertainty

± 1.27 dB

2.5. Test Result of Peak Power Output

Product : LTE SOM Module
Test Item : Peak Power Output Data
Test date : 2020/04/14
Test Mode : Transmit 802.11b

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Required Limit	Result
		1	2	5.5	11		
		Measurement Level (dBm)					
01	2412	17.37	--	--	--	<30dBm	Pass
06	2437	17.61	17.53	17.47	17.40	<30dBm	Pass
11	2462	17.82	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Required Limit	Result
		1	2	5.5	11		
		Measurement Level (dBm)					
01	2412	18.41	--	--	--	<30dBm	Pass
06	2437	18.21	18.13	18.06	17.99	<30dBm	Pass
11	2462	18.02	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	1	17.37	18.41	20.93	<30dBm	Pass
6	2437	1	17.61	18.21	20.93	<30dBm	Pass
11	2462	1	17.82	18.02	20.93	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Product : LTE SOM Module
Test Item : Peak Power Output Data
Test date : 2020/04/14
Test Mode : Transmit 802.11g

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Required Limit	Result
		6	9	12	18	24	36	48	54		
		Measurement Level (dBm)									
01	2412	17.68	--	--	--	--	--	--	--	<30dBm	Pass
06	2437	17.79	17.72	17.66	17.58	17.51	17.45	17.37	17.31	<30dBm	Pass
11	2462	17.74	--	--	--	--	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Required Limit	Result
		6	9	12	18	24	36	48	54		
		Measurement Level (dBm)									
01	2412	18.37	--	--	--	--	--	--	--	<30dBm	Pass
06	2437	18.22	18.15	18.07	18.01	17.95	17.88	17.82	17.75	<30dBm	Pass
11	2462	18.01	--	--	--	--	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	6	17.68	18.37	21.05	<30dBm	Pass
6	2437	6	17.79	18.22	21.02	<30dBm	Pass
11	2462	6	17.74	18.01	20.89	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Product : LTE SOM Module
Test Item : Peak Power Output Data
Test date : 2020/04/14
Test Mode : Transmit 802.11n20

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Required Limit	Result
		HT8	HT9	HT10	HT11	HT12	HT13	HT14	HT15		
		Measurement Level (dBm)									
01	2412	15.78	--	--	--	--	--	--	--	<30dBm	Pass
06	2437	16.69	16.61	16.55	16.47	16.41	16.33	16.26	16.19	<30dBm	Pass
11	2462	16.69	--	--	--	--	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Required Limit	Result
		HT8	HT9	HT10	HT11	HT12	HT13	HT14	HT15		
		Measurement Level (dBm)									
01	2412	16.43	--	--	--	--	--	--	--	<30dBm	Pass
06	2437	17.16	17.08	17.01	16.95	16.88	16.82	16.75	16.68	<30dBm	Pass
11	2462	16.94	--	--	--	--	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
01	2412	HT8	15.78	16.43	19.13	<30dBm	Pass
06	2437	HT8	16.69	17.16	19.94	<30dBm	Pass
11	2462	HT8	16.69	16.94	19.83	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Product : LTE SOM Module
Test Item : Peak Power Output Data
Test date : 2020/04/14
Test Mode : Transmit 802.11n40

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Required Limit	Result
		HT8	HT9	HT10	HT11	HT12	HT13	HT14	HT15		
		Measurement Level (dBm)									
03	2422	15.23	--	--	--	--	--	--	--	<30dBm	Pass
06	2437	16.61	16.53	16.45	16.38	16.32	16.25	16.17	16.09	<30dBm	Pass
09	2452	15.89	--	--	--	--	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Required Limit	Result
		HT8	HT9	HT10	HT11	HT12	HT13	HT14	HT15		
		Measurement Level (dBm)									
03	2422	15.81	--	--	--	--	--	--	--	<30dBm	Pass
06	2437	17.12	17.05	16.97	16.91	16.83	16.77	16.69	16.62	<30dBm	Pass
09	2452	16.09	--	--	--	--	--	--	--	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

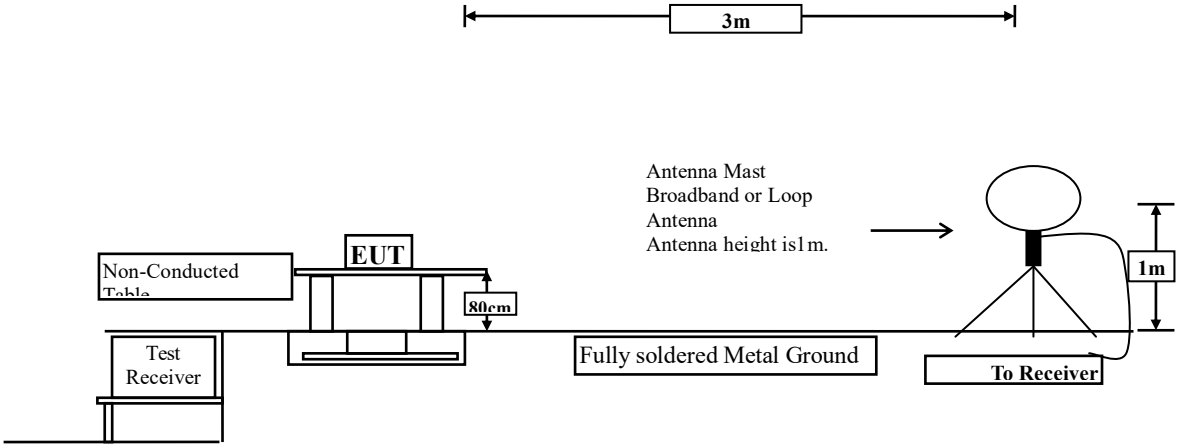
Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
03	2422	HT8	15.23	15.81	18.54	<30dBm	Pass
06	2437	HT8	16.61	17.12	19.88	<30dBm	Pass
09	2452	HT8	15.89	16.09	19.00	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

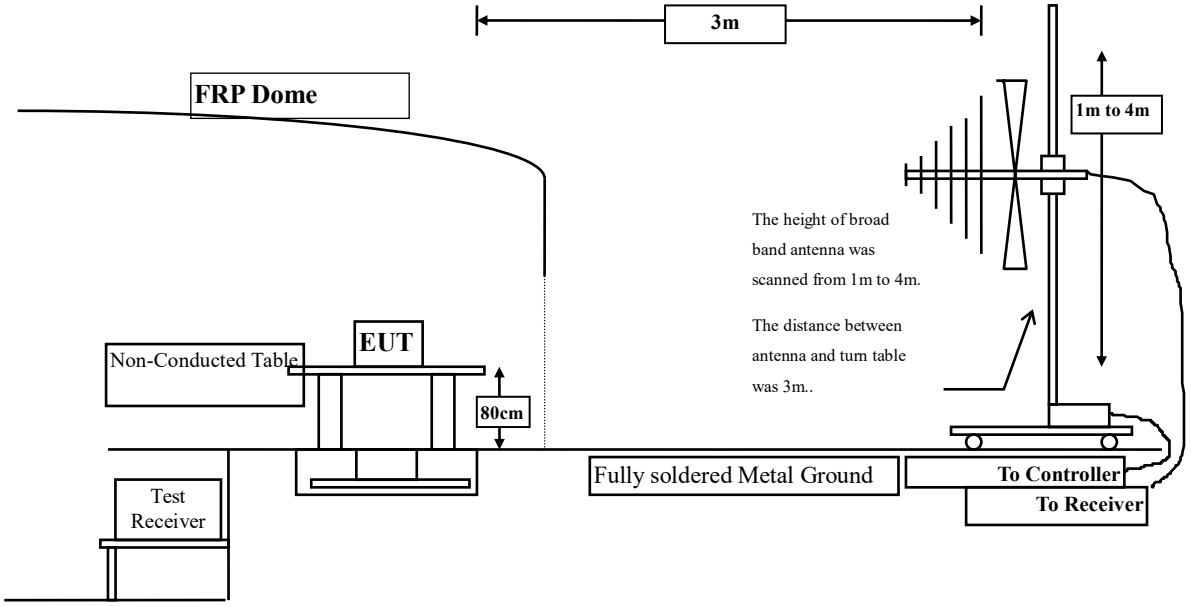
3. Radiated Emission

3.1. Test Setup

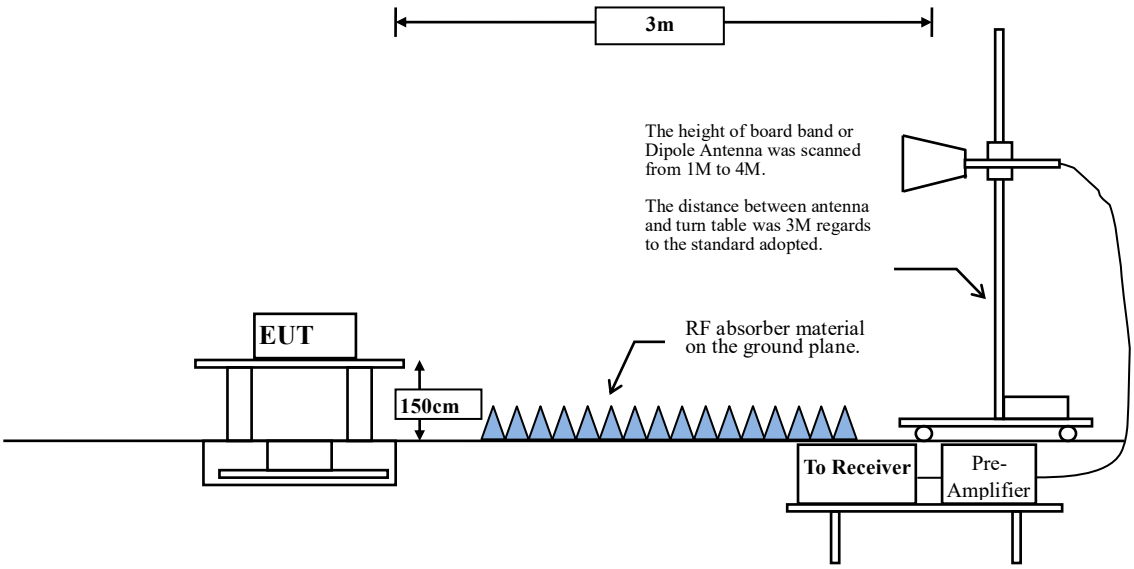
Under 30MHz



Below 1GHz



Above 1GHz



3.2. 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(a) 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: E field strength (dBuV/m) = 20 log E field strength (uV/m)

3.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for 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 worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

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

RBW and VBW Parameter setting:

According to KDB 558074 Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

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

According to KDB 558074 Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	97.67	12.1740	82	100
802.11g	94.63	2.0435	489	500
802.11 n20	93.57	1.8986	527	1000
802.11 n40	87.41	0.9058	1104	2000

Note: Duty Cycle Refer to Section 5

3.4. Uncertainty

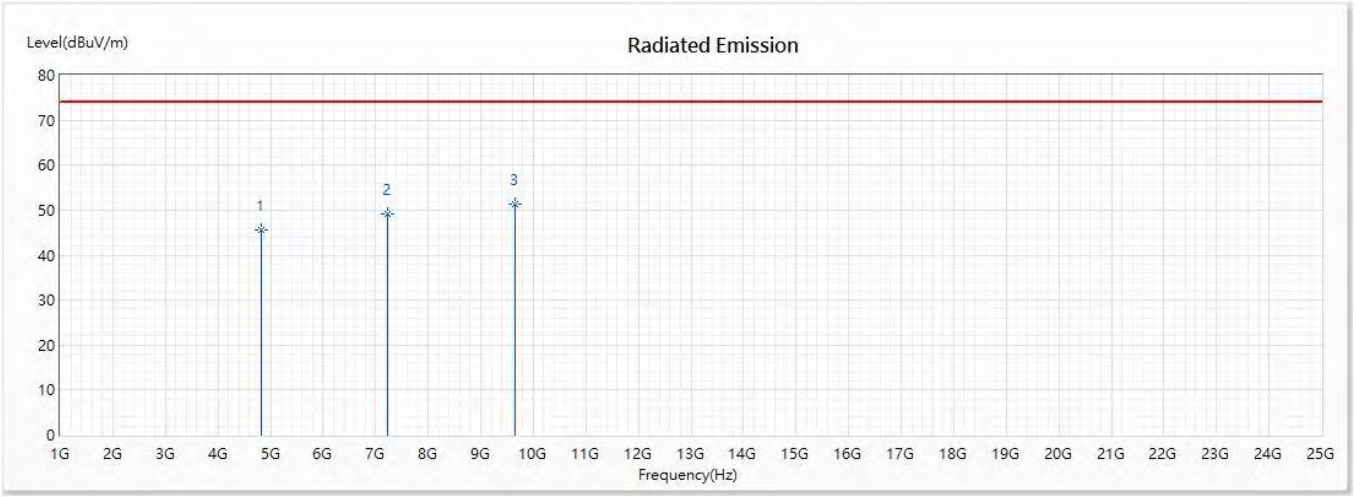
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

3.5. Test Result of Radiated Emission

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 1:802.11b (2412MHz)

Horizontal



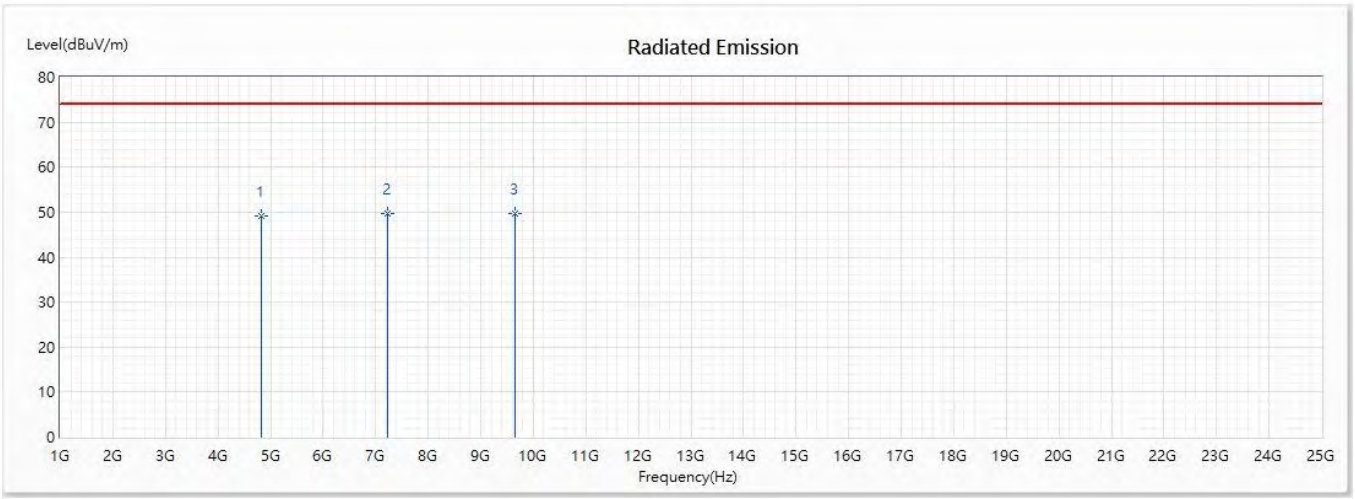
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	45.72	74.00	-28.28	40.94	4.78	PK
2	7236	49.25	74.00	-24.75	37.18	12.07	PK
* 3	9648	51.34	74.00	-22.66	39.44	11.90	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 1:802.11b (2412MHz)

Vertical



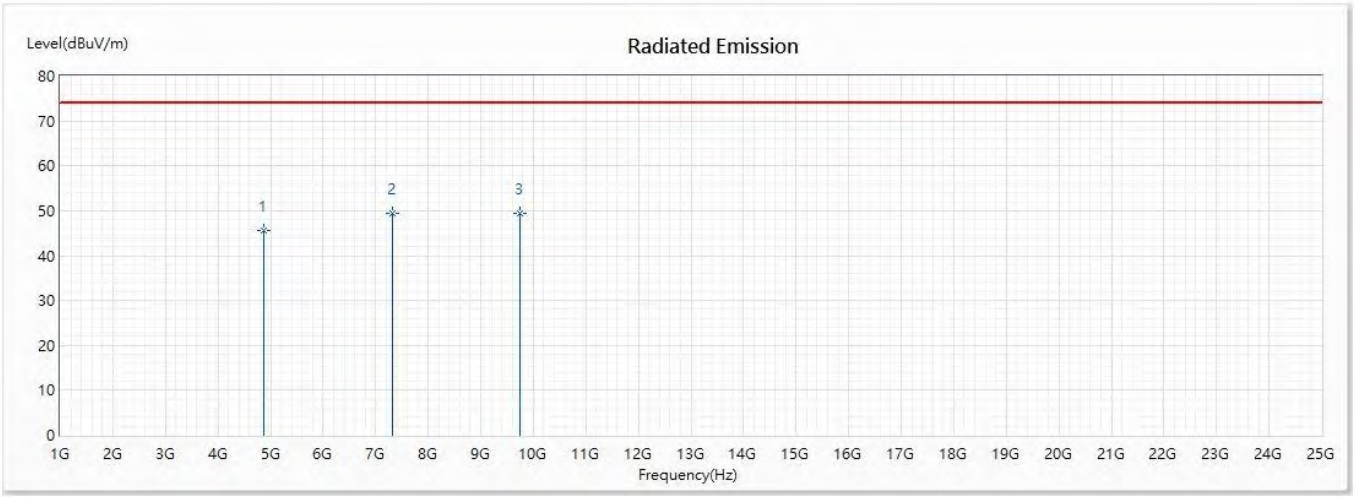
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	49.13	74.00	-24.87	44.35	4.78	PK
2	7236	49.72	74.00	-24.28	37.65	12.07	PK
* 3	9648	49.79	74.00	-24.21	37.89	11.90	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 1:802.11b (2437 MHz)

Horizontal



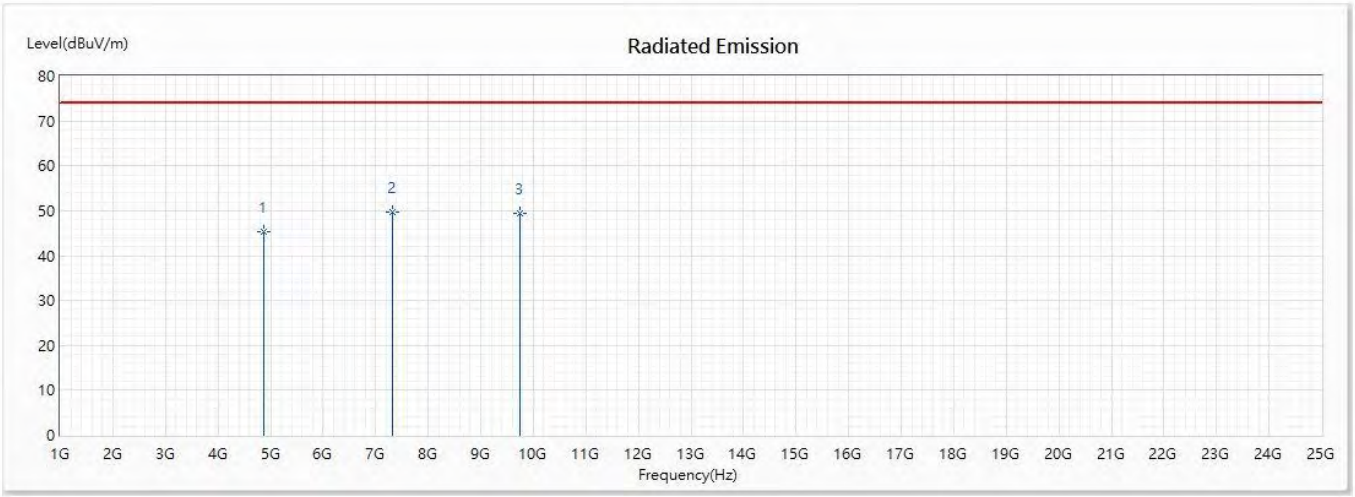
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.58	74.00	-28.42	40.34	5.24	PK
* 2	7311	49.42	74.00	-24.58	37.58	11.84	PK
3	9748	49.41	74.00	-24.59	37.54	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 1:802.11b (2437 MHz)

Vertical



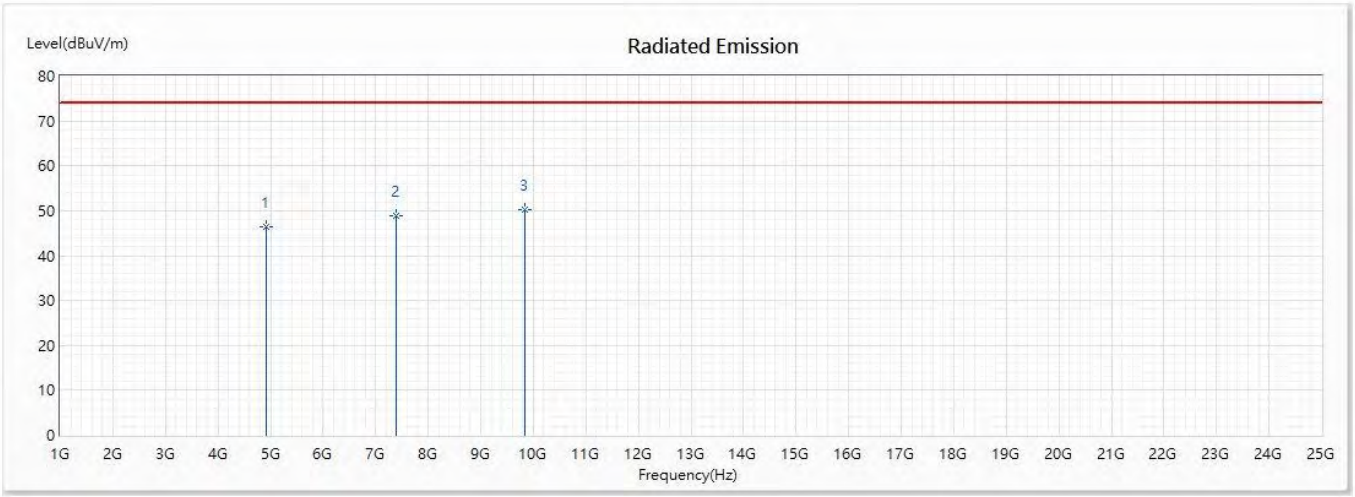
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.43	74.00	-28.57	40.19	5.24	PK
* 2	7311	49.68	74.00	-24.32	37.84	11.84	PK
3	9748	49.37	74.00	-24.63	37.50	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	LTE SOM Module
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2020/04/20
Test Mode	:	Mode 1:802.11b (2462 MHz)

Horizontal



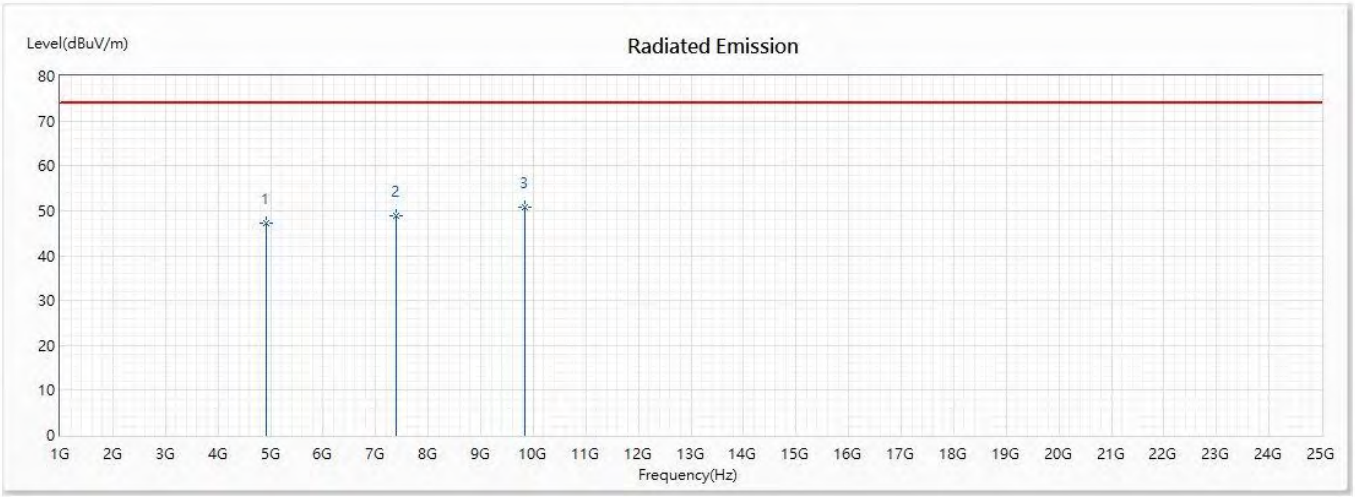
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4924	46.29	74.00	-27.71	40.59	5.70	PK
2	7386	48.92	74.00	-25.08	37.58	11.34	PK
* 3	9848	50.26	74.00	-23.74	37.88	12.38	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	LTE SOM Module
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2020/04/20
Test Mode	:	Mode 1:802.11b (2462 MHz)

Vertical



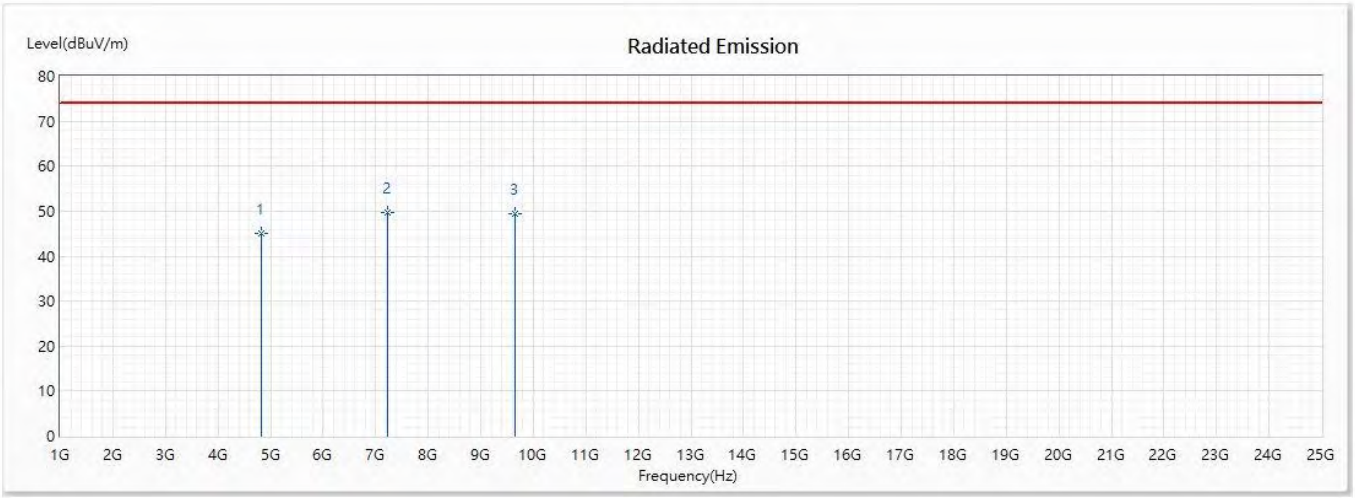
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4924	47.13	74.00	-26.87	41.43	5.70	PK
2	7386	48.95	74.00	-25.05	37.61	11.34	PK
* 3	9848	50.75	74.00	-23.25	38.37	12.38	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 2:802.11g (2412 MHz)

Horizontal



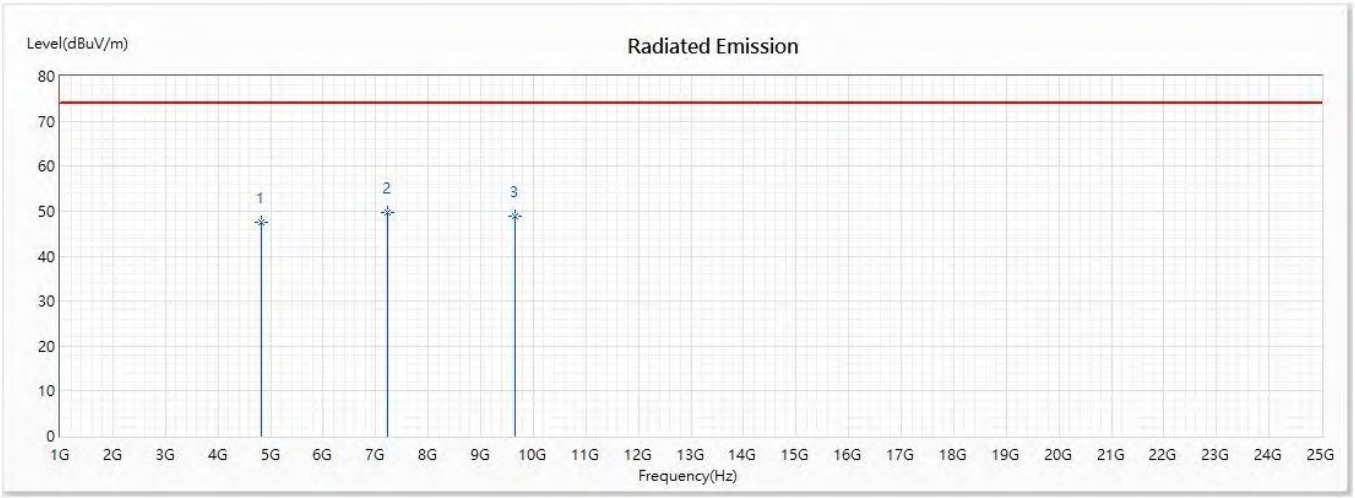
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	45.09	74.00	-28.91	40.31	4.78	PK
* 2	7236	49.72	74.00	-24.28	37.65	12.07	PK
3	9648	49.51	74.00	-24.49	37.61	11.90	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 2:802.11g (2412 MHz)

Vertical



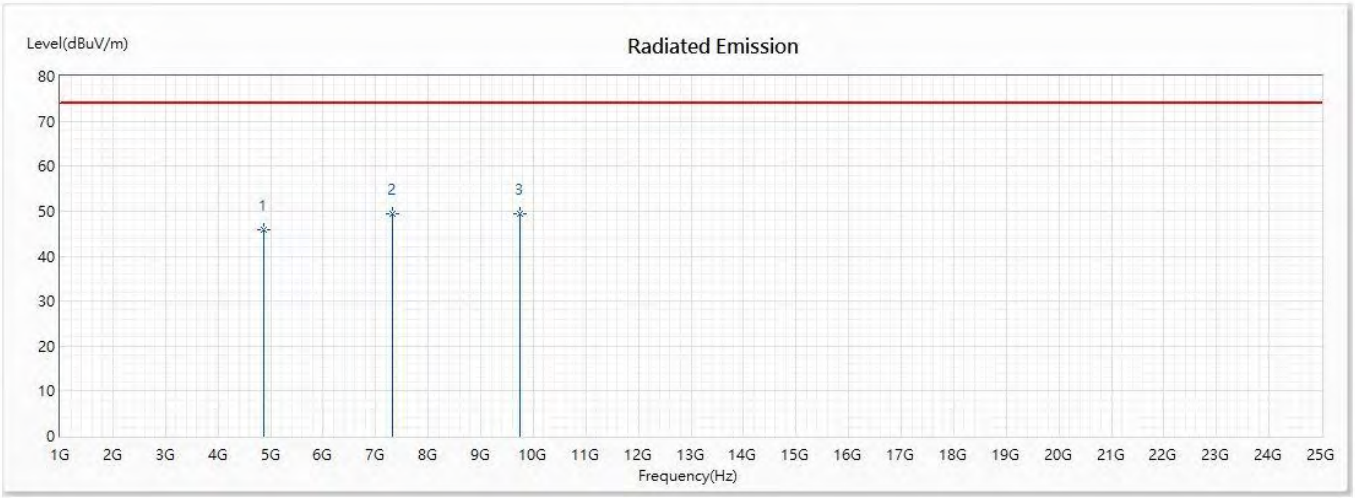
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	47.59	74.00	-26.41	42.81	4.78	PK
* 2	7236	49.56	74.00	-24.44	37.49	12.07	PK
3	9648	48.92	74.00	-25.08	37.02	11.90	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 2:802.11g (2437 MHz)

Horizontal



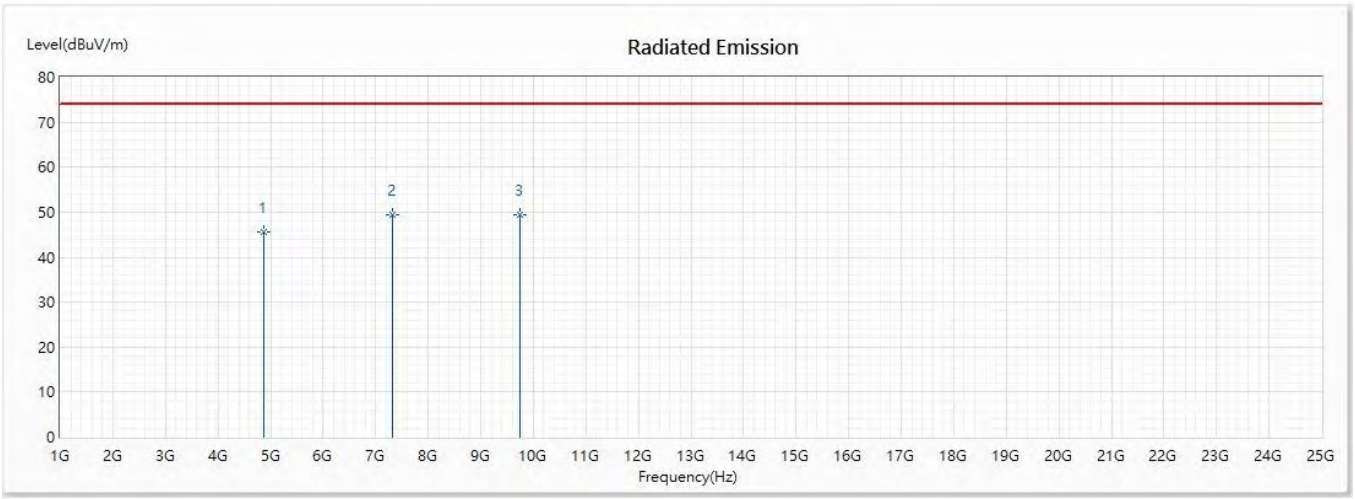
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.95	74.00	-28.05	40.71	5.24	PK
* 2	7311	49.51	74.00	-24.49	37.67	11.84	PK
3	9748	49.41	74.00	-24.59	37.54	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 2:802.11g (2437 MHz)

Vertical



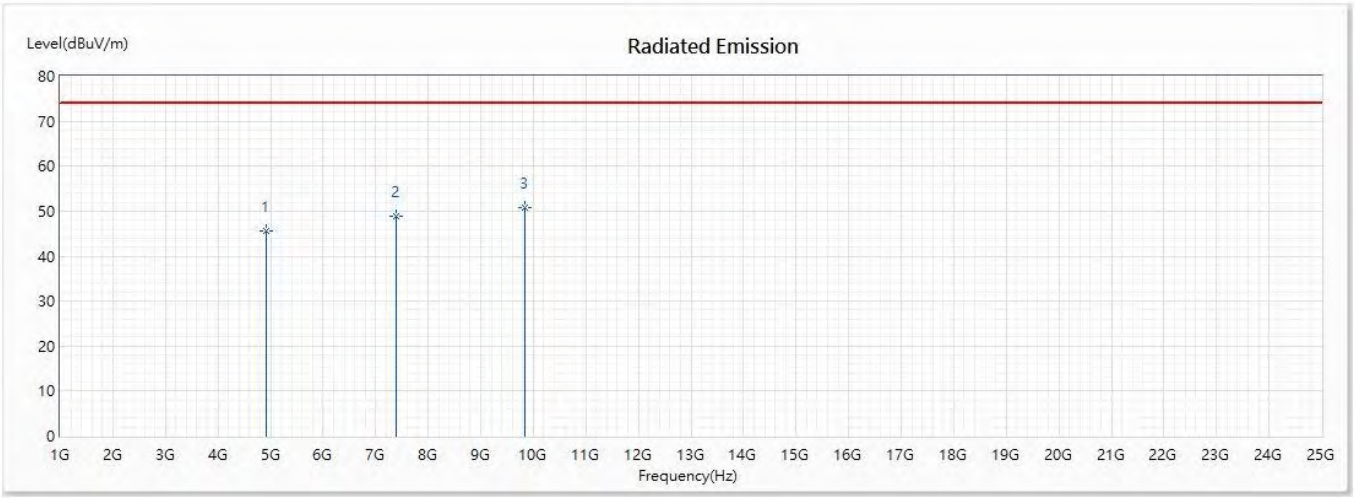
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.63	74.00	-28.37	40.39	5.24	PK
2	7311	49.32	74.00	-24.68	37.48	11.84	PK
* 3	9748	49.45	74.00	-24.55	37.58	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 2:802.11g (2462MHz)

Horizontal



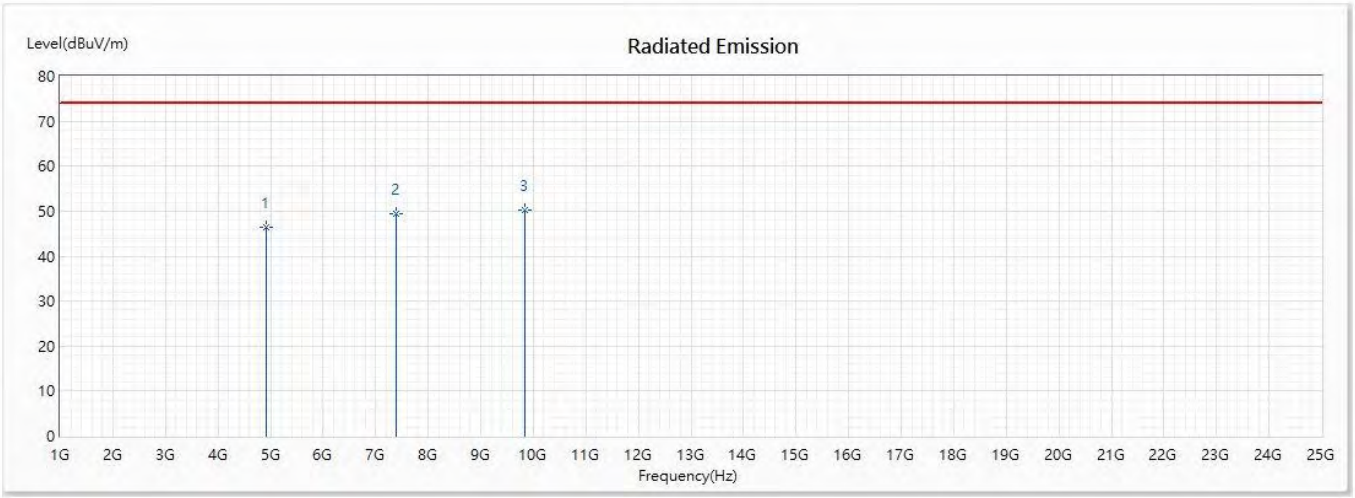
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4924	45.62	74.00	-28.38	39.92	5.70	PK
2	7386	48.75	74.00	-25.25	37.41	11.34	PK
* 3	9848	50.67	74.00	-23.33	38.29	12.38	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 2:802.11g (2462MHz)

Vertical



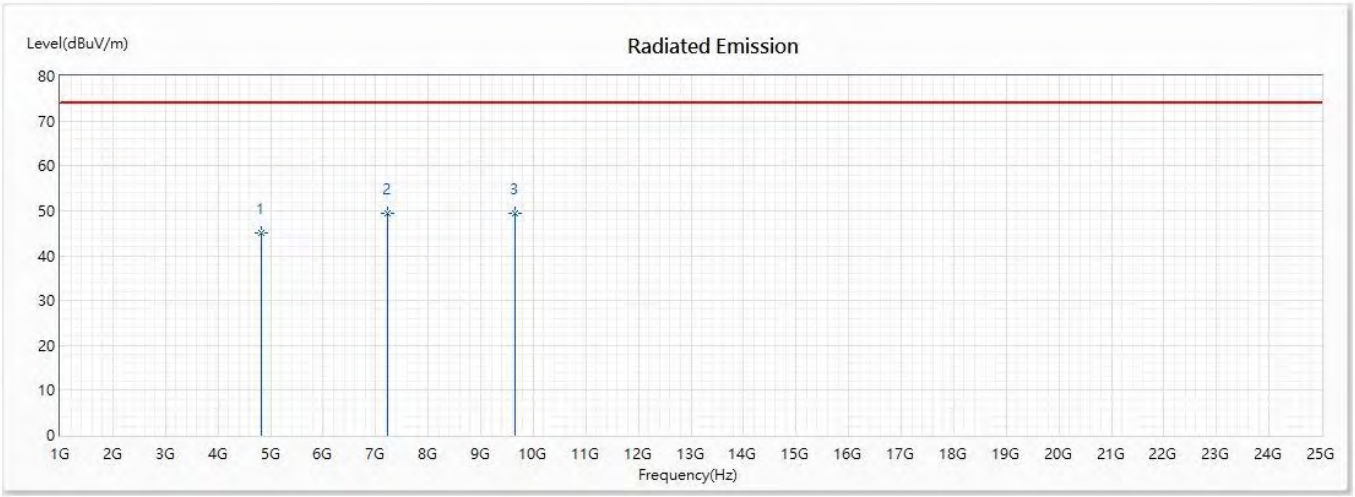
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4924	46.51	74.00	-27.49	40.81	5.70	PK
2	7386	49.46	74.00	-24.54	38.12	11.34	PK
* 3	9848	50.32	74.00	-23.68	37.94	12.38	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 3:802.11n-20 (2412 MHz)

Horizontal



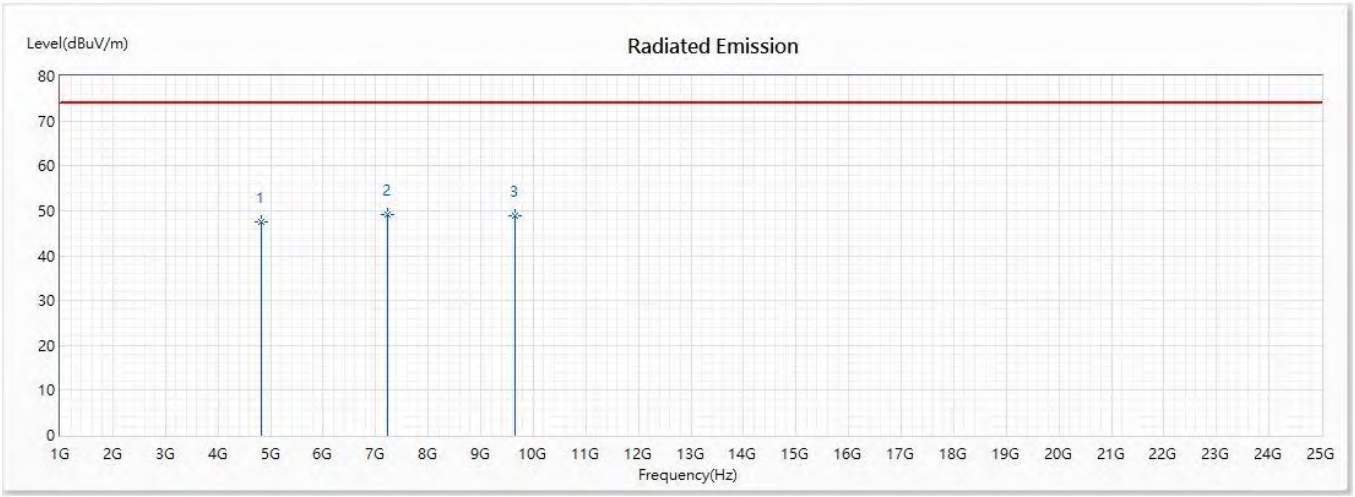
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	45.12	74.00	-28.88	40.34	4.78	PK
* 2	7236	49.51	74.00	-24.49	37.44	12.07	PK
3	9648	49.33	74.00	-24.67	37.43	11.90	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	LTE SOM Module
Test Item	:	Harmonic Radiated Emission Data
Test Date	:	2020/04/20
Test Mode	:	Mode 3:802.11n-20 (2412 MHz)

Vertical



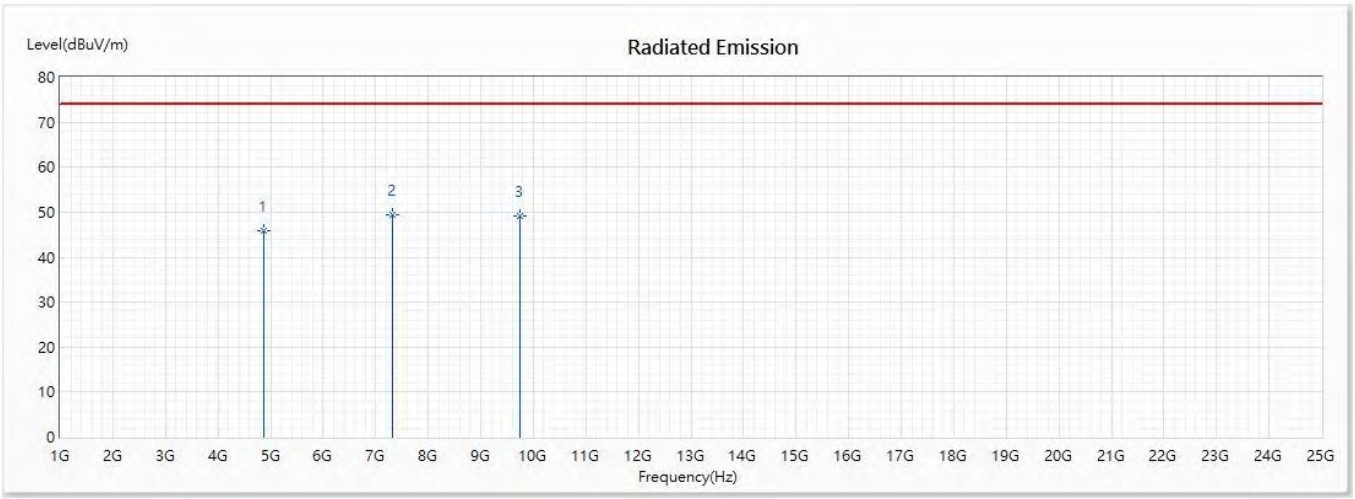
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4824	47.41	74.00	-26.59	42.63	4.78	PK
* 2	7236	49.28	74.00	-24.72	37.21	12.07	PK
3	9648	48.87	74.00	-25.13	36.97	11.90	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 3:802.11n-20 (2437 MHz)

Horizontal



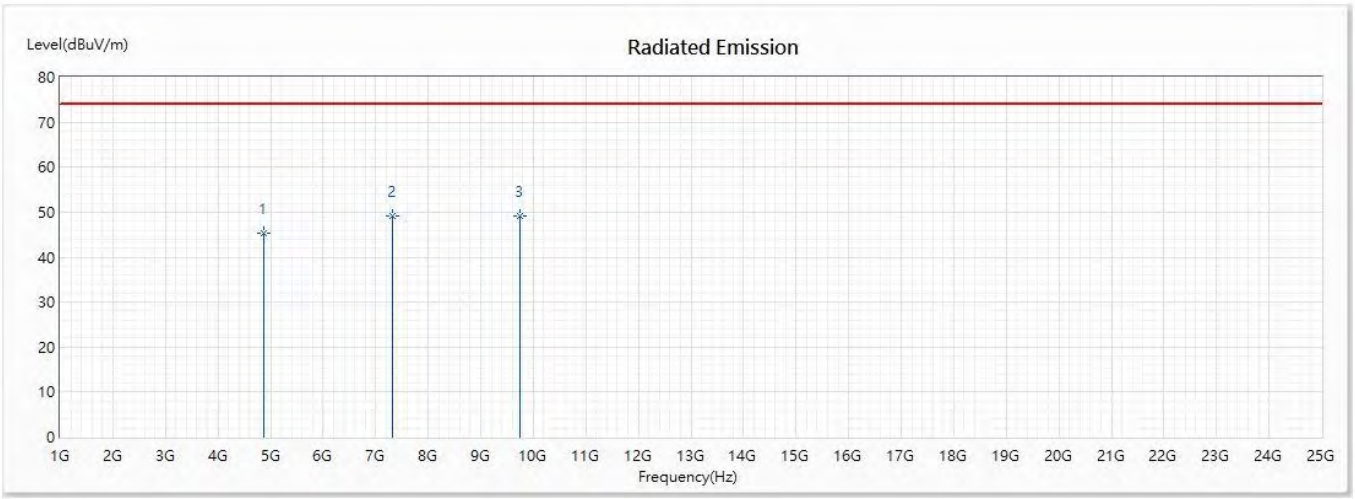
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.78	74.00	-28.22	40.54	5.24	PK
* 2	7311	49.35	74.00	-24.65	37.51	11.84	PK
3	9748	49.22	74.00	-24.78	37.35	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 3:802.11n-20 (2437 MHz)

Vertical



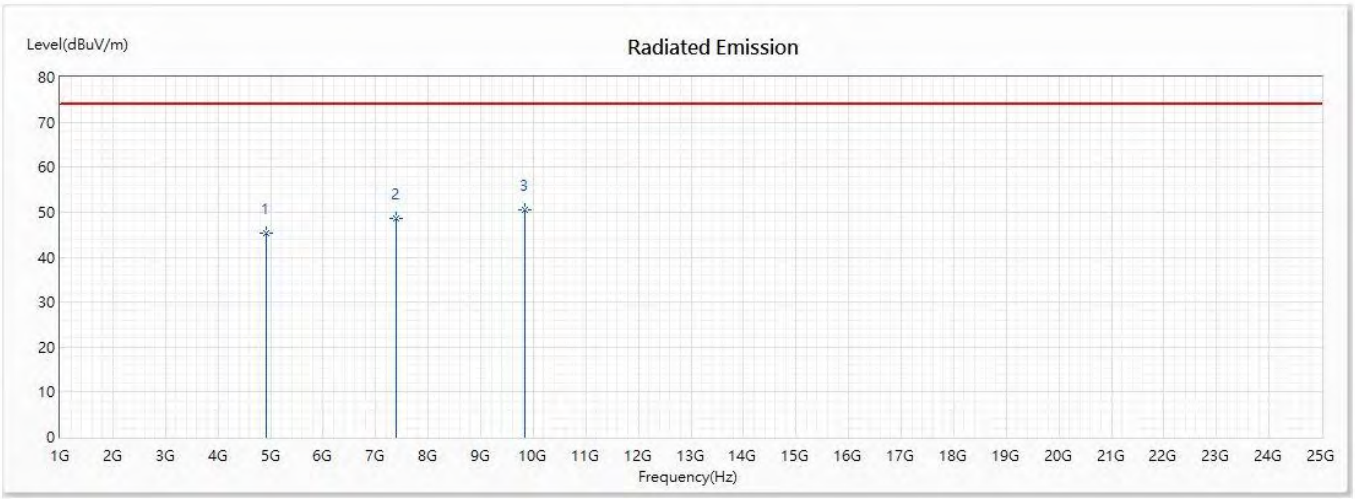
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.43	74.00	-28.57	40.19	5.24	PK
2	7311	49.21	74.00	-24.79	37.37	11.84	PK
* 3	9748	49.27	74.00	-24.73	37.40	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 3:802.11n-20 (2462 MHz)

Horizontal



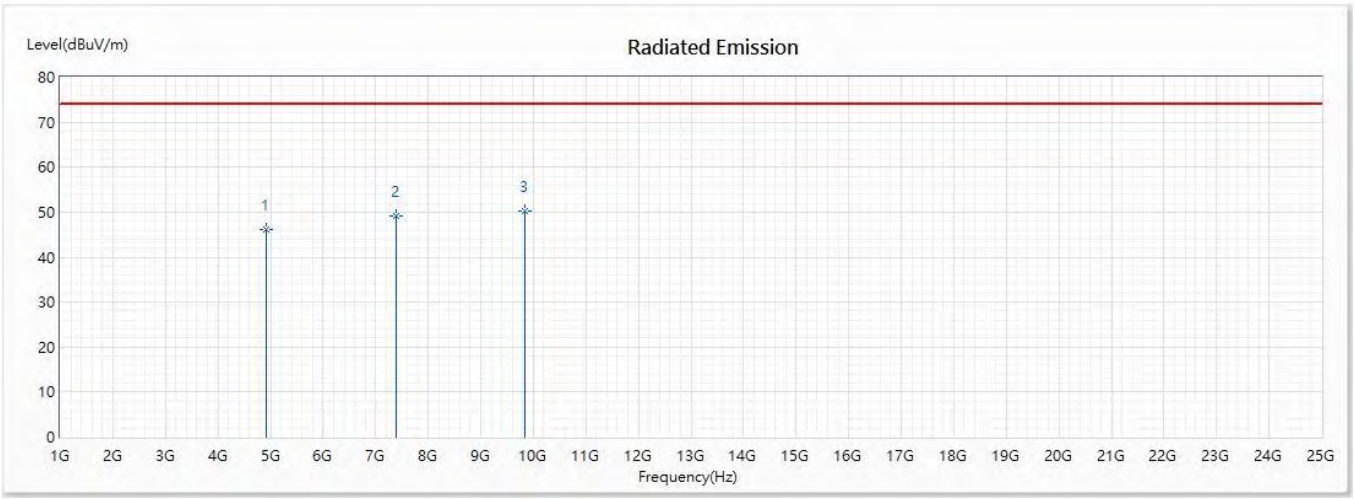
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4924	45.38	74.00	-28.62	39.68	5.70	PK
2	7386	48.52	74.00	-25.48	37.18	11.34	PK
* 3	9848	50.38	74.00	-23.62	38.00	12.38	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2018/08/30
Test Mode : Mode 3:802.11n-20 (2462 MHz)

Vertical



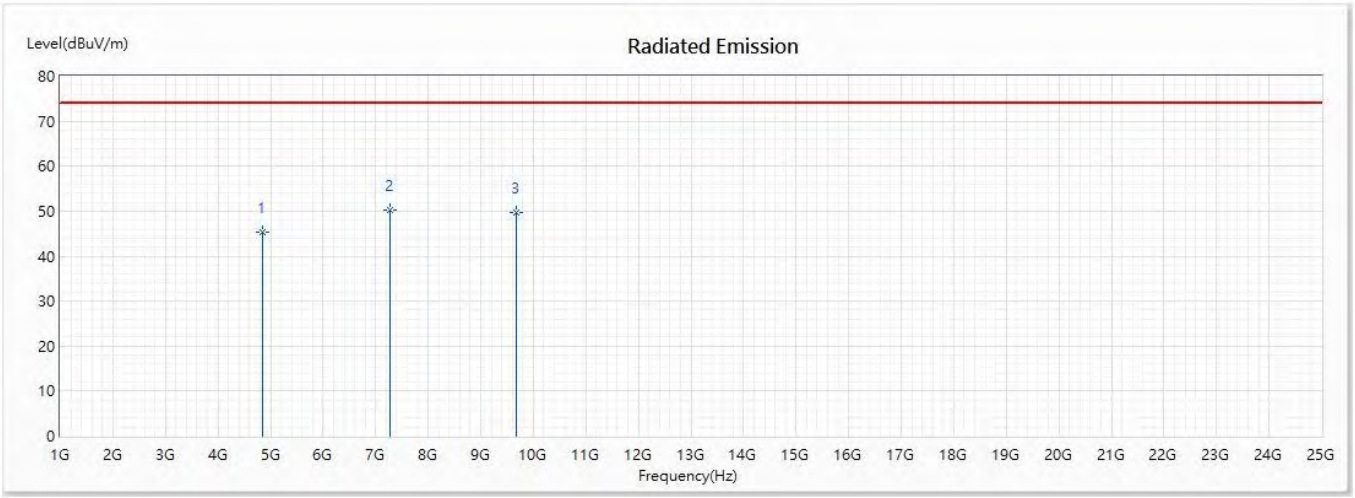
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4924	46.23	74.00	-27.77	40.53	5.70	PK
2	7386	49.25	74.00	-24.75	37.91	11.34	PK
* 3	9848	50.15	74.00	-23.85	37.77	12.38	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 4:802.11n-40 (2422 MHz)

Horizontal



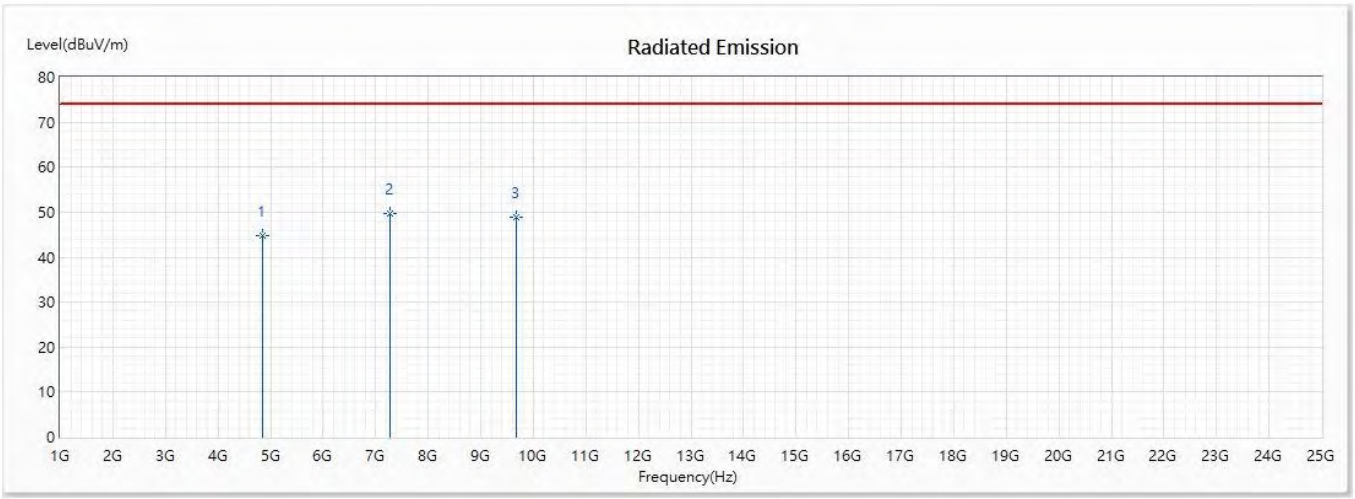
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4844	45.19	74.00	-28.81	40.22	4.97	PK
* 2	7266	50.19	74.00	-23.81	38.04	12.15	PK
3	9688	49.58	74.00	-24.42	37.69	11.89	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 4:802.11n-40 (2422 MHz)

Vertical



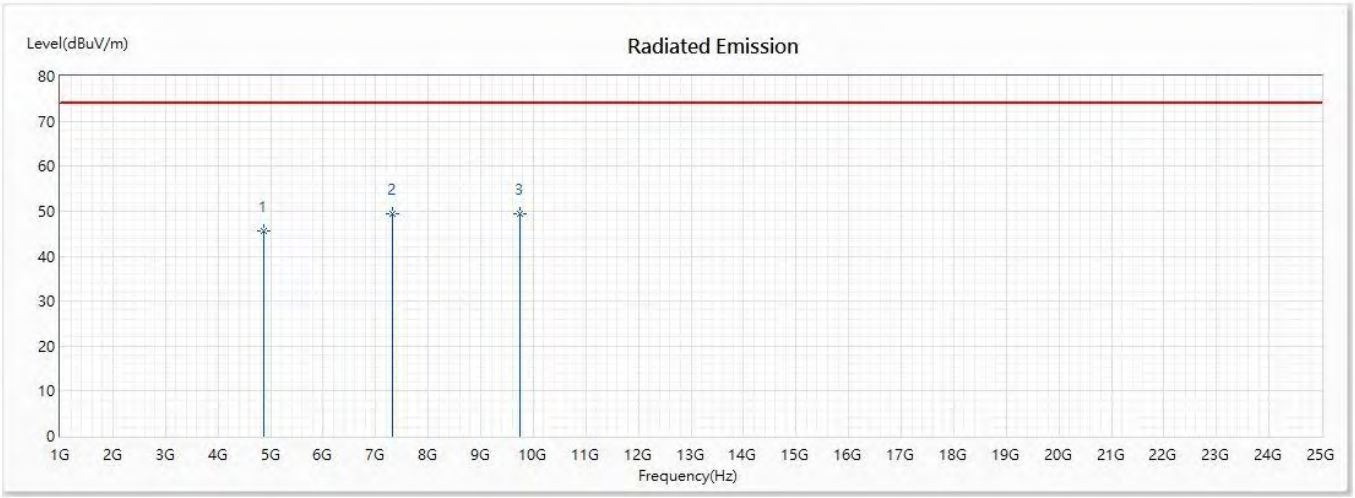
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4844	44.75	74.00	-29.25	39.78	4.97	PK
* 2	7266	49.67	74.00	-24.33	37.52	12.15	PK
3	9688	48.93	74.00	-25.07	37.04	11.89	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 4:802.11n-40 (2437MHz)

Horizontal



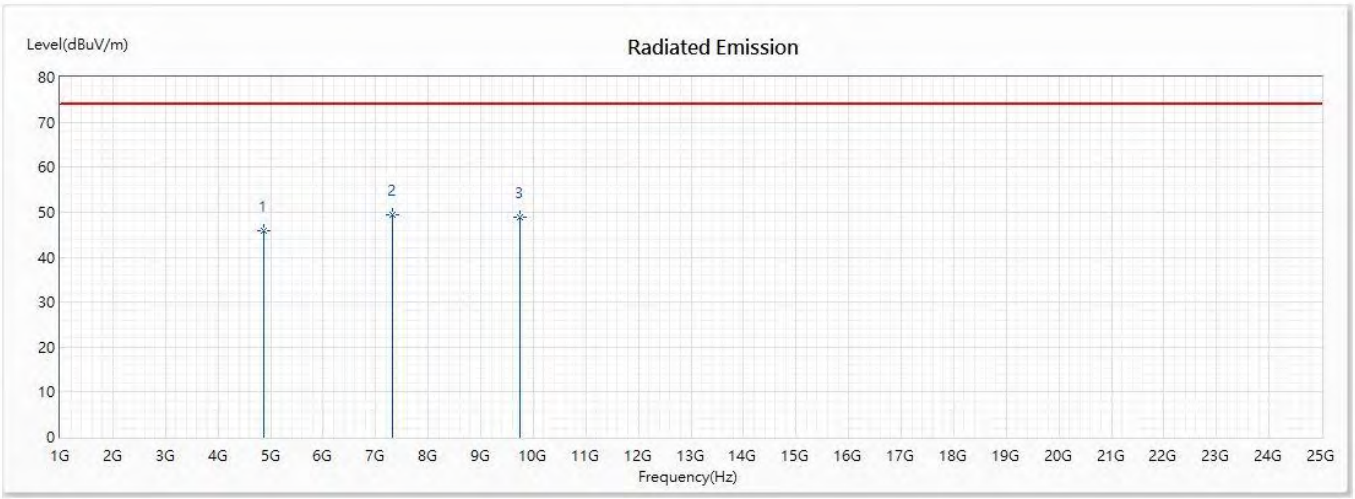
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.69	74.00	-28.31	40.45	5.24	PK
2	7311	49.32	74.00	-24.68	37.48	11.84	PK
* 3	9748	49.39	74.00	-24.61	37.52	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 4:802.11n-40 (2437MHz)

Vertical



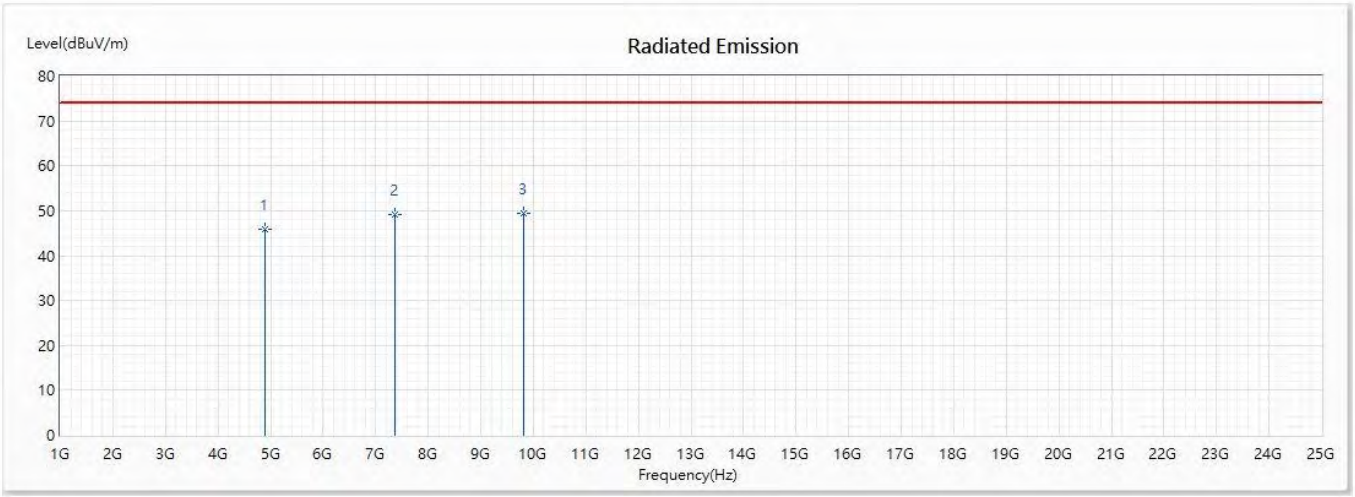
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4874	45.88	74.00	-28.12	40.64	5.24	PK
* 2	7311	49.31	74.00	-24.69	37.47	11.84	PK
3	9748	48.95	74.00	-25.05	37.08	11.87	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 4:802.11n-40 (2452 MHz)

Horizontal



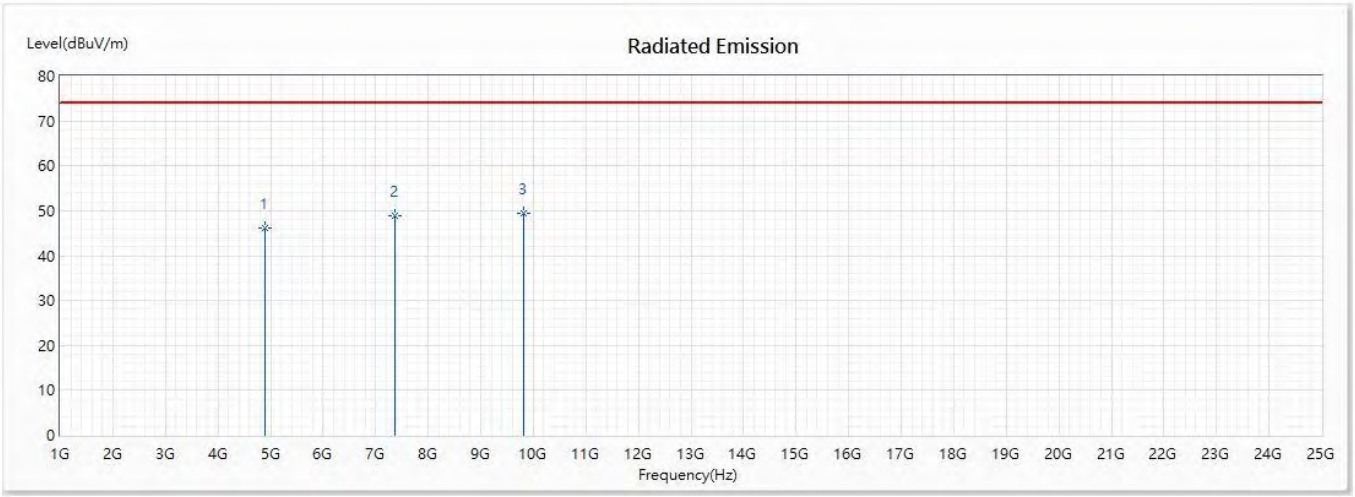
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4904	45.86	74.00	-28.14	40.34	5.52	PK
2	7356	49.21	74.00	-24.79	37.67	11.54	PK
* 3	9808	49.45	74.00	-24.55	37.29	12.16	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : Harmonic Radiated Emission Data
Test Date : 2020/04/20
Test Mode : Mode 4:802.11n-40 (2452 MHz)

Vertical



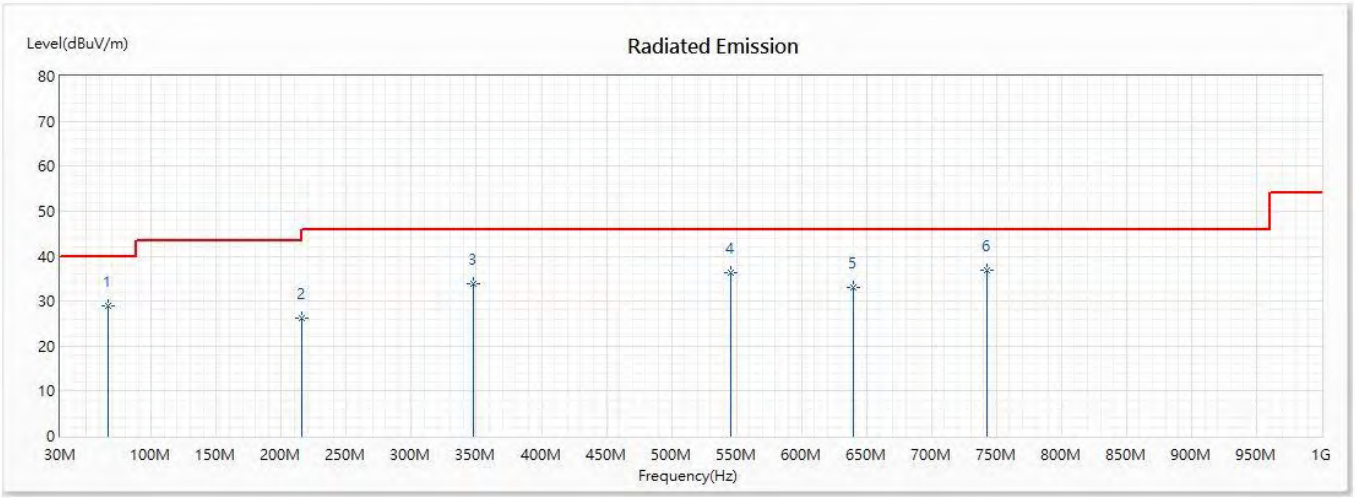
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	4904	46.12	74.00	-27.88	40.60	5.52	PK
2	7356	48.92	74.00	-25.08	37.38	11.54	PK
* 3	9808	49.35	74.00	-24.65	37.19	12.16	PK

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 average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 1:802.11b (2437 MHz)

Horizontal



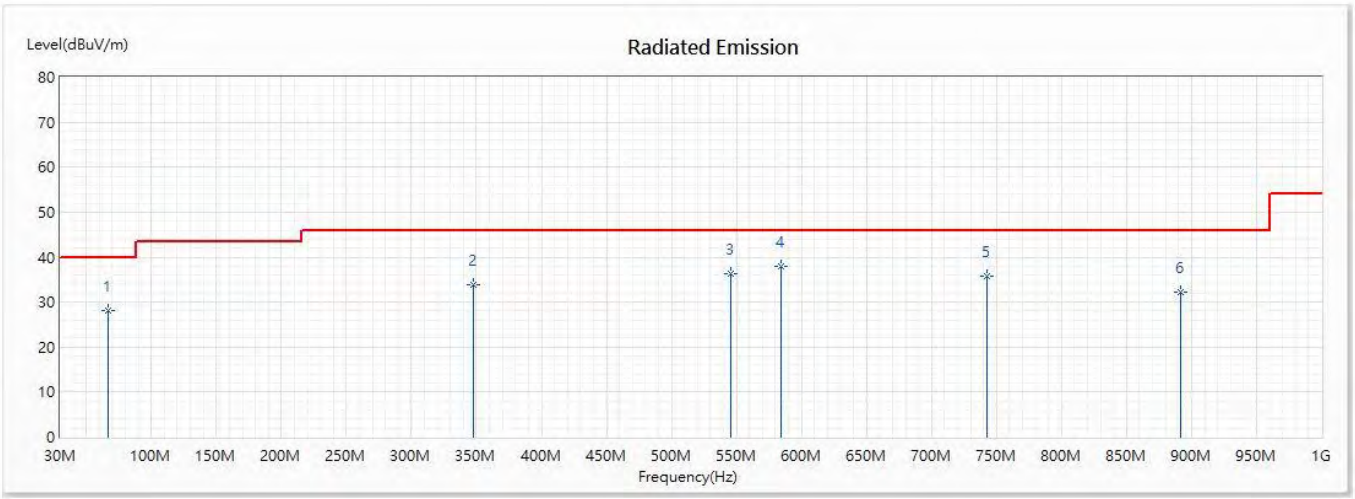
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	66.551	28.81	40.00	-11.19	42.10	-13.29	QP
2	215.565	26.26	43.50	-17.24	37.27	-11.01	QP
3	347.71	33.87	46.00	-12.13	38.97	-5.10	QP
4	545.928	36.19	46.00	-9.81	39.22	-3.03	QP
5	640.116	33.10	46.00	-12.90	34.61	-1.51	QP
* 6	742.739	36.91	46.00	-9.09	37.61	-0.70	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 : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 1:802.11b (2437 MHz)

Vertical



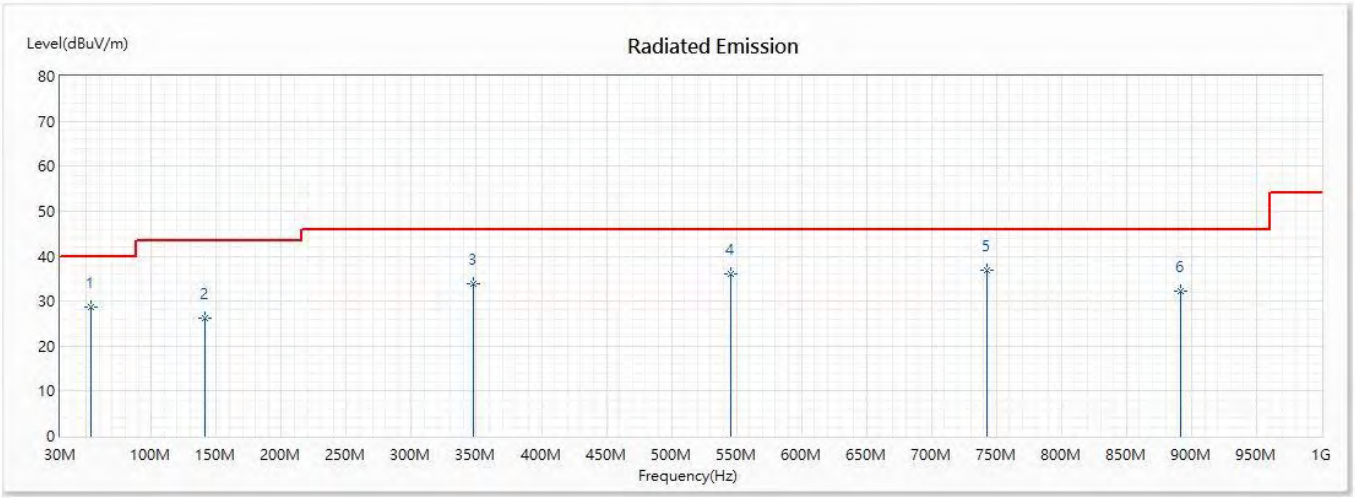
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	66.551	28.12	40.00	-11.88	41.41	-13.29	QP
2	347.71	33.83	46.00	-12.17	38.93	-5.10	QP
3	545.928	36.41	46.00	-9.59	39.44	-3.03	QP
* 4	583.884	37.97	46.00	-8.03	38.72	-0.75	QP
5	742.739	35.77	46.00	-10.23	36.47	-0.70	QP
6	891.754	32.24	46.00	-13.76	33.37	-1.13	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 : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 2:802.11g (2437 MHz)

Horizontal



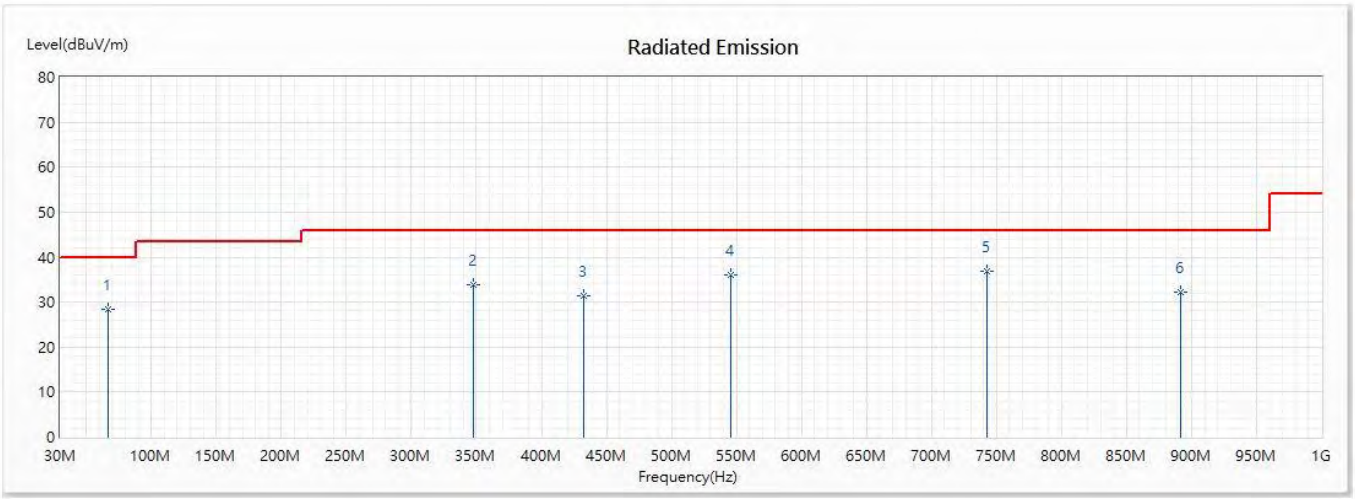
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	53.899	28.63	40.00	-11.37	39.93	-11.30	QP
2	141.058	26.22	43.50	-17.28	35.57	-9.35	QP
3	347.71	33.94	46.00	-12.06	39.04	-5.10	QP
4	545.928	35.98	46.00	-10.02	39.01	-3.03	QP
* 5	742.739	36.77	46.00	-9.23	37.47	-0.70	QP
6	891.754	32.28	46.00	-13.72	33.41	-1.13	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 : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 2:802.11g (2437 MHz)

Vertical



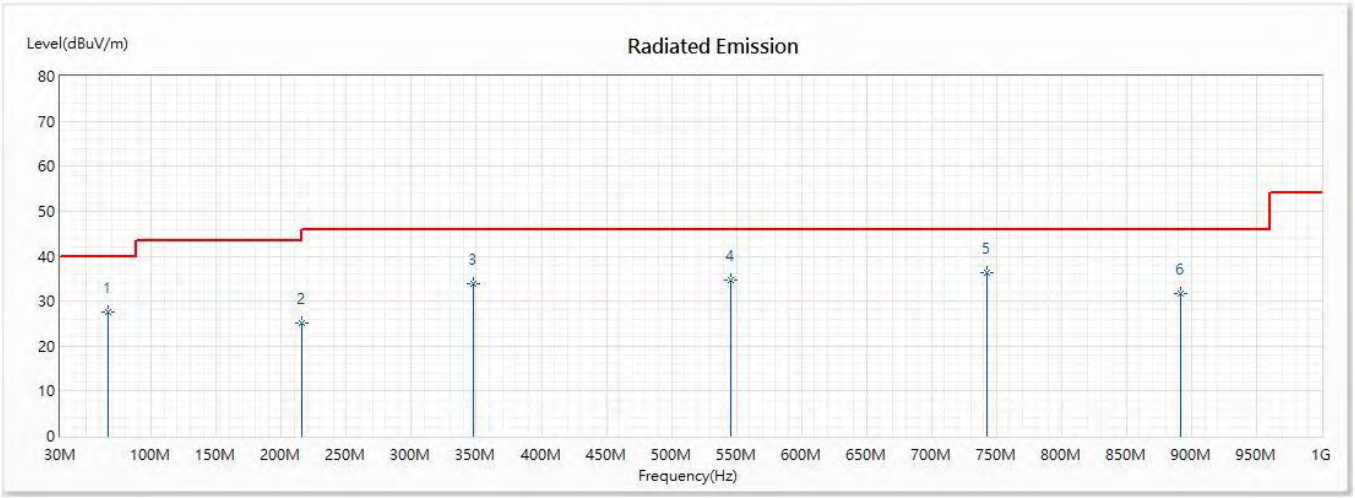
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	66.551	28.42	40.00	-11.58	41.71	-13.29	QP
2	347.71	33.94	46.00	-12.06	39.04	-5.10	QP
3	432.058	31.28	46.00	-14.72	33.89	-2.61	QP
4	545.928	35.98	46.00	-10.02	39.01	-3.03	QP
* 5	742.739	36.77	46.00	-9.23	37.47	-0.70	QP
6	891.754	32.28	46.00	-13.72	33.41	-1.13	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 : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 3:802.11n-20 (2437 MHz)

Horizontal



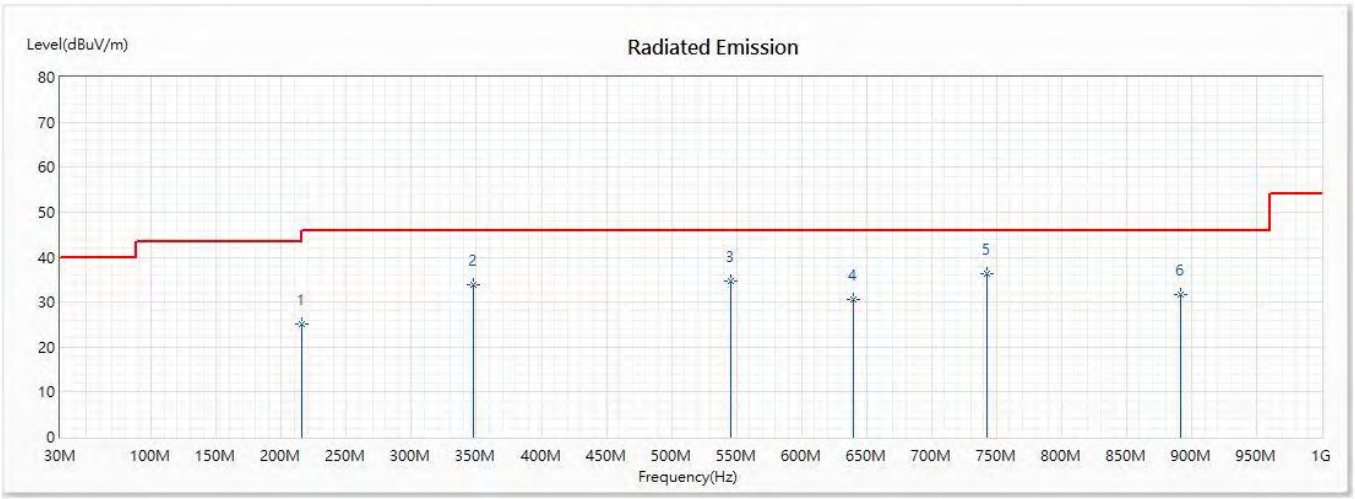
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	66.551	27.68	40.00	-12.32	40.97	-13.29	QP
2	215.565	25.11	43.50	-18.39	36.12	-11.01	QP
3	347.71	33.86	46.00	-12.14	38.96	-5.10	QP
4	545.928	34.69	46.00	-11.31	37.72	-3.03	QP
* 5	742.739	36.30	46.00	-9.70	37.00	-0.70	QP
6	891.754	31.56	46.00	-14.44	32.69	-1.13	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 : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 3:802.11n-20 (2437 MHz)

Vertical



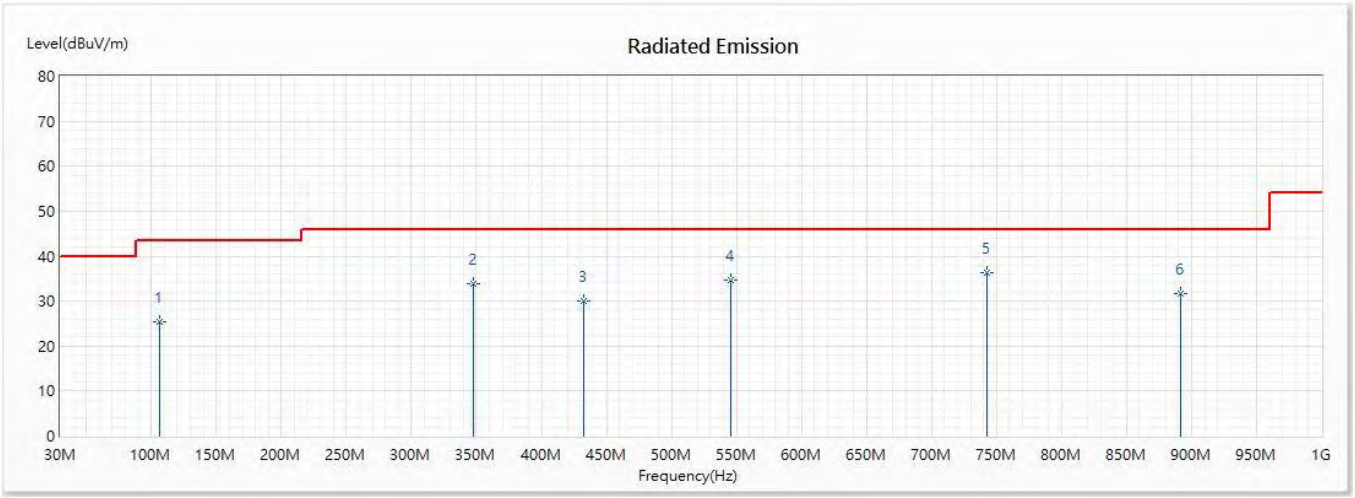
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	215.565	25.11	43.50	-18.39	36.12	-11.01	QP
2	347.71	33.86	46.00	-12.14	38.96	-5.10	QP
3	545.928	34.69	46.00	-11.31	37.72	-3.03	QP
4	640.116	30.53	46.00	-15.47	32.04	-1.51	QP
* 5	742.739	36.30	46.00	-9.70	37.00	-0.70	QP
6	891.754	31.56	46.00	-14.44	32.69	-1.13	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 : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 4:802.11n-40 (2437Hz)

Horizontal



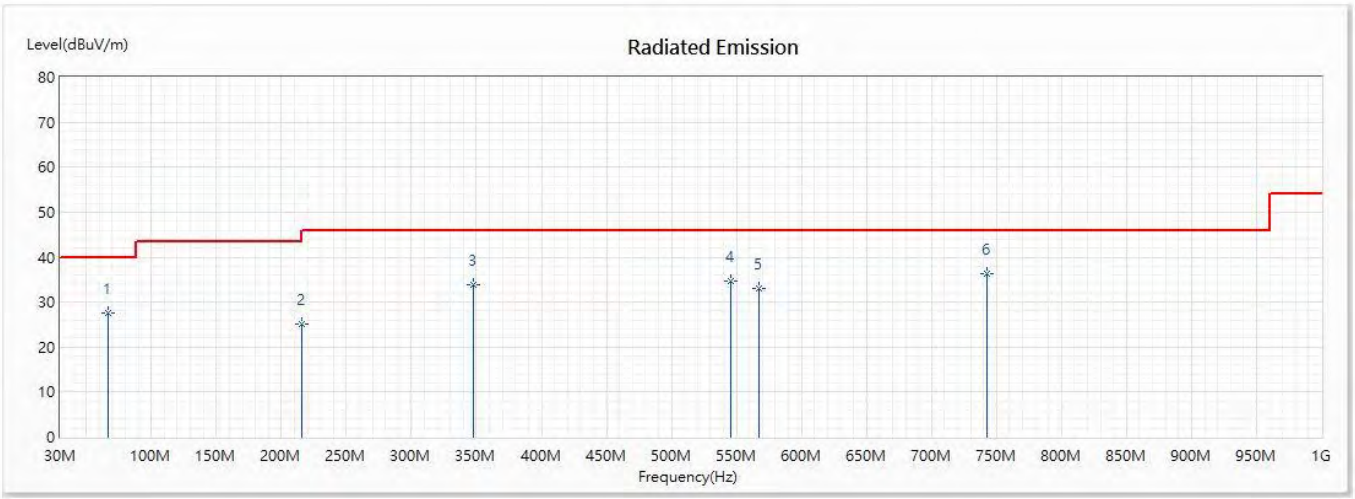
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	105.913	25.29	43.50	-18.21	35.18	-9.89	QP
2	347.71	33.86	46.00	-12.14	38.96	-5.10	QP
3	432.058	29.94	46.00	-16.06	32.55	-2.61	QP
4	545.928	34.69	46.00	-11.31	37.72	-3.03	QP
* 5	742.739	36.30	46.00	-9.70	37.00	-0.70	QP
6	891.754	31.56	46.00	-14.44	32.69	-1.13	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 : LTE SOM Module
Test Item : General Radiated Emission Data
Test Date : 2020/01/02
Test Mode : Mode 4:802.11n-40 (2437 MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	66.551	27.68	40.00	-12.32	40.97	-13.29	QP
2	215.565	25.11	43.50	-18.39	36.12	-11.01	QP
3	347.71	33.86	46.00	-12.14	38.96	-5.10	QP
4	545.928	34.69	46.00	-11.31	37.72	-3.03	QP
5	567.014	32.95	46.00	-13.05	34.89	-1.94	QP
* 6	742.739	36.30	46.00	-9.70	37.00	-0.70	QP

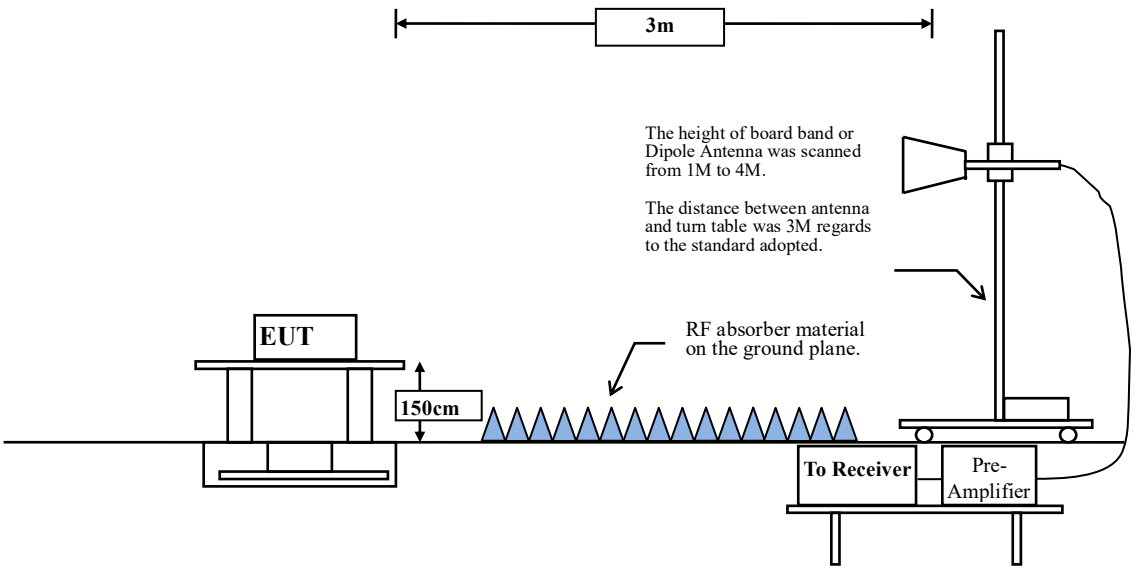
Note:

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.

4. Band Edge

4.1. Test Setup

RF Radiated Measurement:



4.2. 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.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
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 from 1 meter to 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.

RBW and VBW Parameter setting:

According to KDB 558074 Peak power measurement procedure
RBW = as specified in Table 1.
VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

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

According to KDB 558074 Average power measurement procedure
RBW = 1MHz.
VBW = 10Hz, when duty cycle ≥ 98 %
VBW ≥ 1/T, when duty cycle < 98 %
(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11b	97.67	12.1740	82	100
802.11g	94.63	2.0435	489	500
802.11n20	93.57	1.8986	527	1000
802.11n40	87.41	0.9058	1104	2000

Note: Duty Cycle Refer to Section 5

4.4. Uncertainty

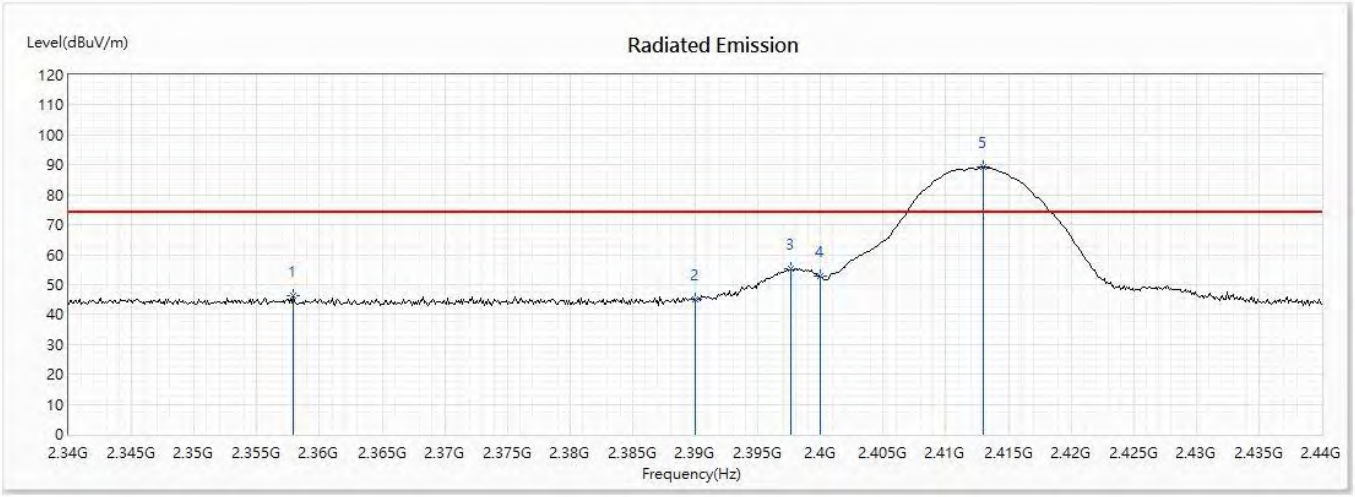
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Band Edge

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2412MHz)

Horizontal



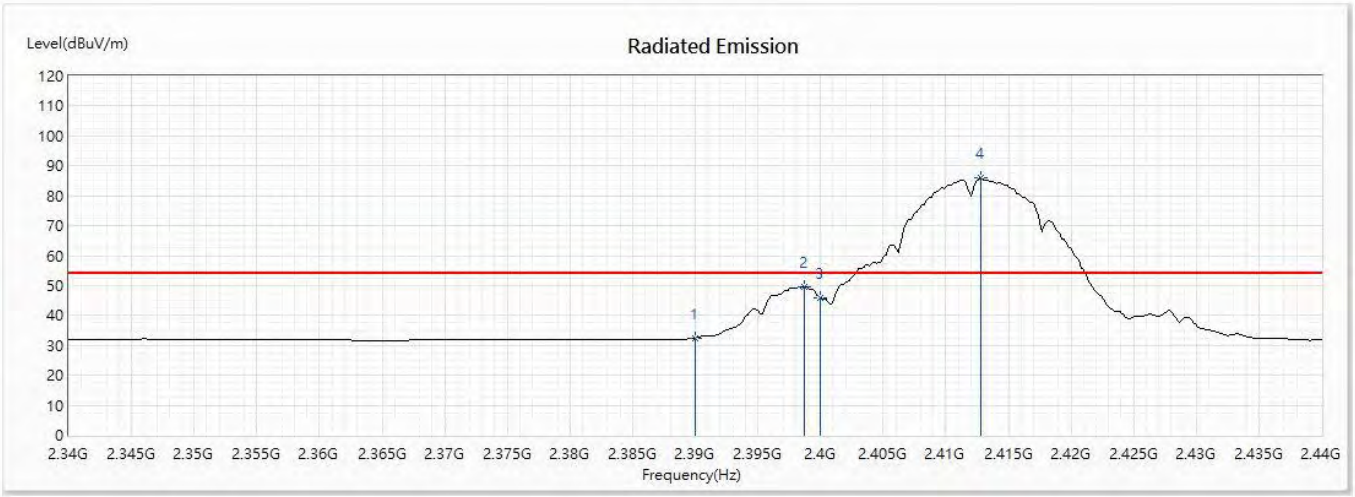
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2357.9	46.16	74.00	-27.84	47.51	-1.35	PK
2	2390	44.99	74.00	-29.01	46.54	-1.55	PK
3	2397.6	55.16	74.00	-18.84	56.76	-1.60	PK
4	2400	52.74	74.00	-21.26	54.35	-1.61	PK
! 5	2413	89.38	74.00	15.38	91.07	-1.69	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2412MHz)

Horizontal



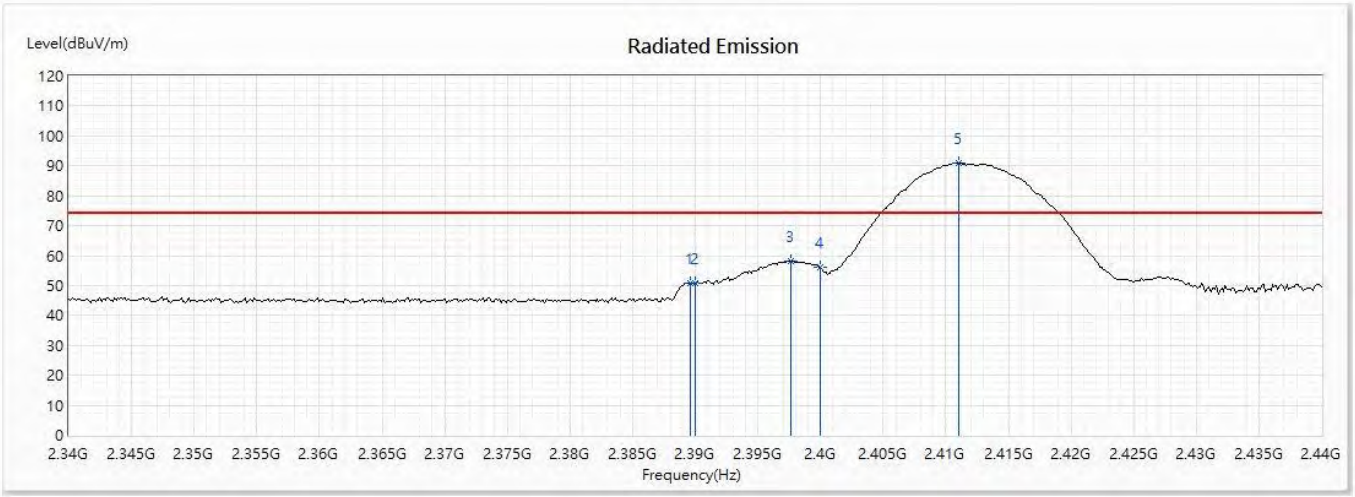
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	32.42	54.00	-21.58	33.97	-1.55	AV
2	2398.696	49.69	54.00	-4.31	51.29	-1.60	AV
3	2400	45.83	54.00	-8.17	47.44	-1.61	AV
! 4	2412.754	85.87	54.00	31.87	87.56	-1.69	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2412MHz)

VERTICAL



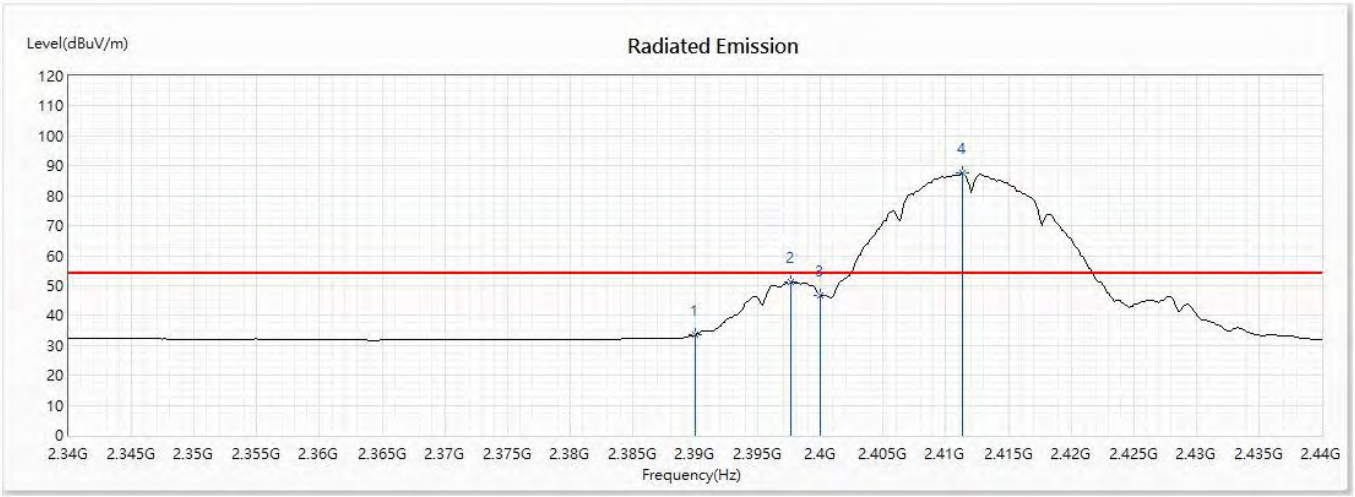
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2389.565	50.84	74.00	-23.16	52.38	-1.54	PK
2	2390	50.81	74.00	-23.19	52.36	-1.55	PK
3	2397.681	58.22	74.00	-15.78	59.82	-1.60	PK
4	2400	56.18	74.00	-17.82	57.79	-1.61	PK
! 5	2411.014	91.00	74.00	17.00	92.68	-1.68	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2412MHz)

Vertical



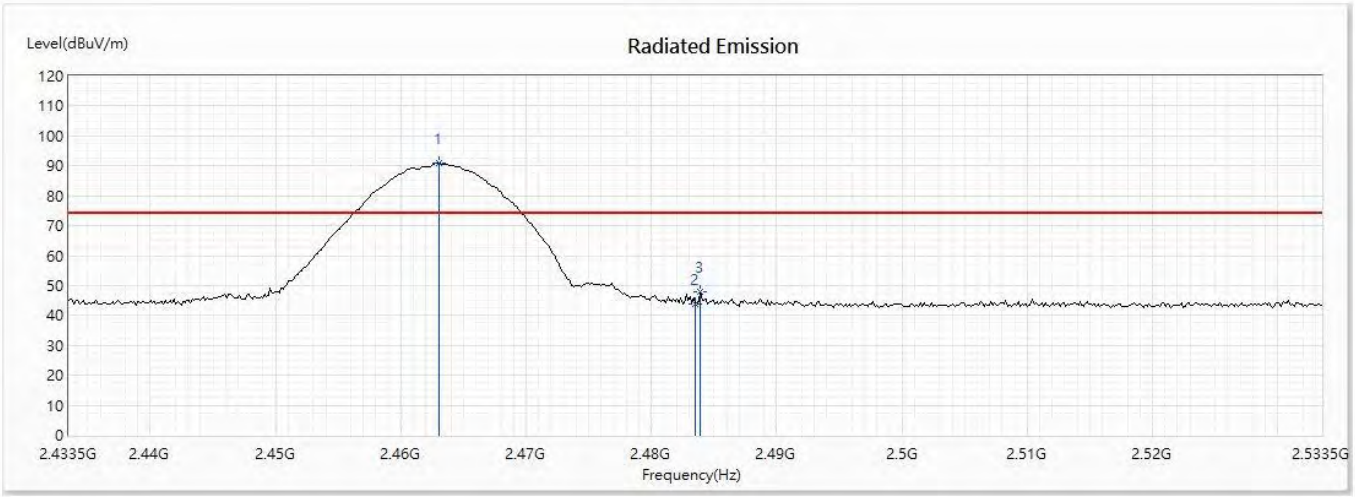
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	33.53	54.00	-20.47	35.08	-1.55	AV
2	2397.681	51.21	54.00	-2.79	52.81	-1.60	AV
3	2400	46.68	54.00	-7.32	48.29	-1.61	AV
! 4	2411.304	87.46	54.00	33.46	89.14	-1.68	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2462MHz)

Horizontal



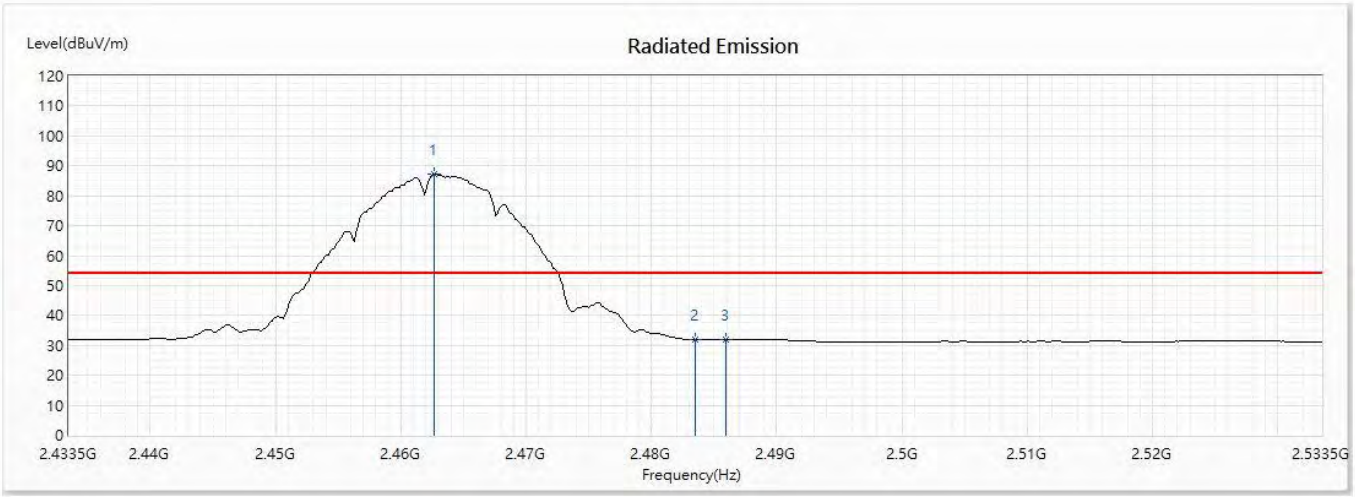
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.065	90.81	74.00	16.81	92.81	-2.00	PK
2	2483.5	43.83	74.00	-30.17	45.95	-2.12	PK
3	2483.935	48.03	74.00	-25.97	50.16	-2.13	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2462MHz)

Horizontal



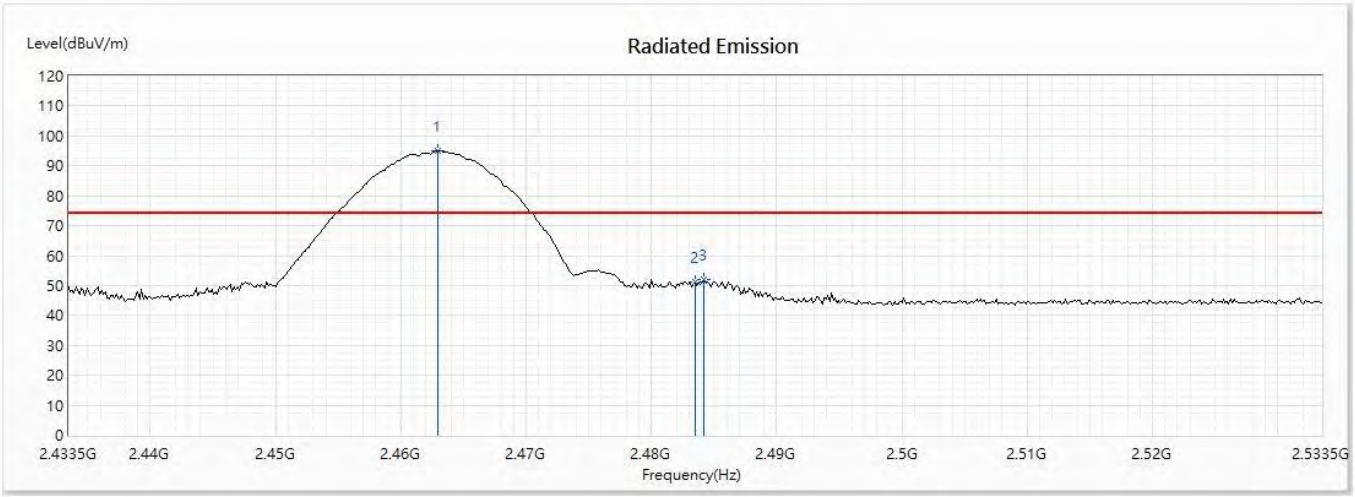
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2462.63	87.22	54.00	33.22	89.21	-1.99	AV
2	2483.5	31.88	54.00	-22.12	34.00	-2.12	AV
3	2485.964	32.04	54.00	-21.96	34.17	-2.13	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2462MHz)

Vertical



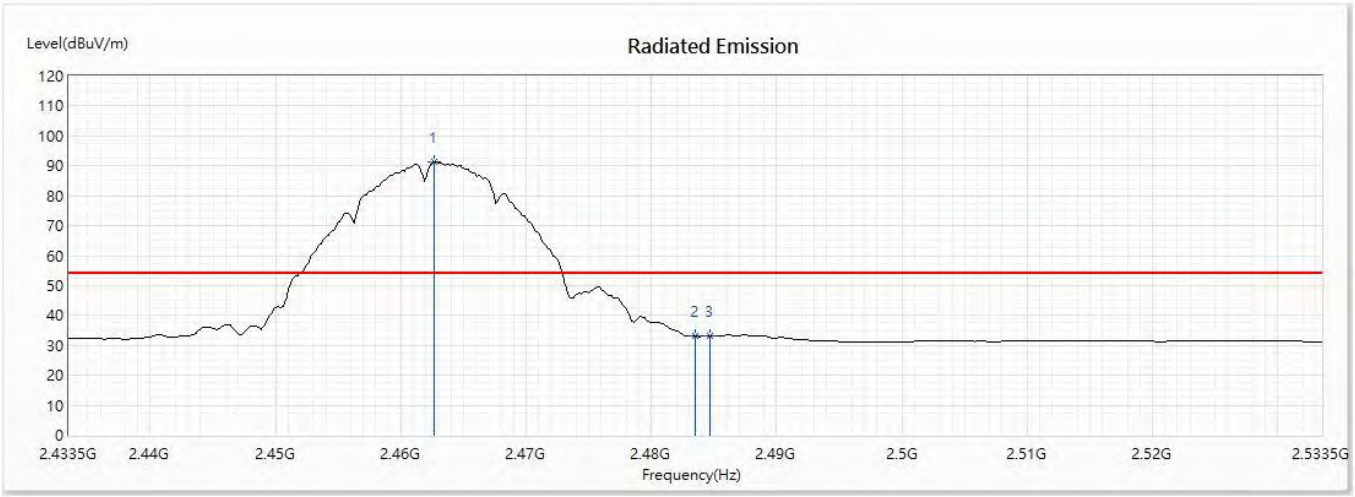
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2462.92	94.99	74.00	20.99	96.98	-1.99	PK
2	2483.5	51.02	74.00	-22.98	53.14	-2.12	PK
3	2484.225	52.20	74.00	-21.80	54.33	-2.13	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 1:802.11b (2462MHz)

Vertical



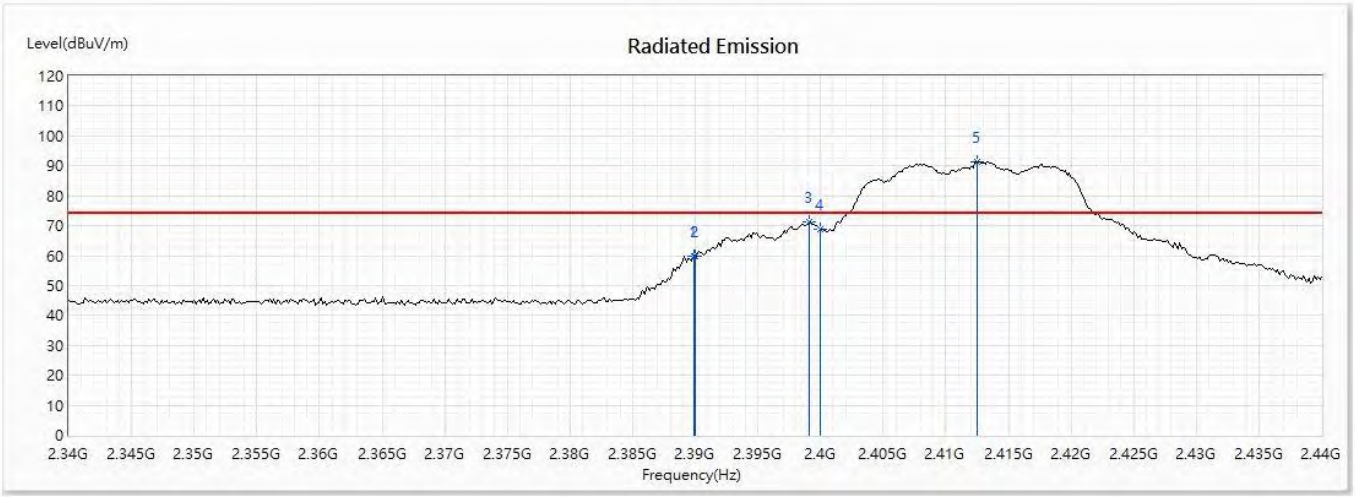
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2462.63	91.43	54.00	37.43	93.42	-1.99	AV
2	2483.5	33.11	54.00	-20.89	35.23	-2.12	AV
3	2484.659	33.29	54.00	-20.71	35.42	-2.13	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 2:802.11g (2412MHz)

Horizontal



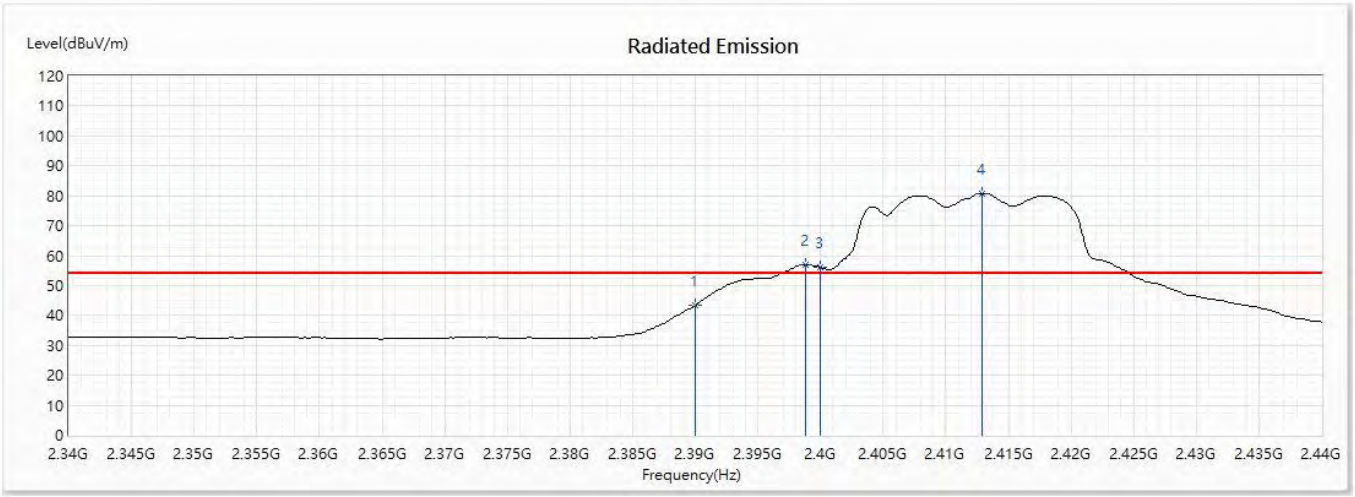
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2389.855	59.92	74.00	-14.08	61.47	-1.55	PK
2	2390	59.61	74.00	-14.39	61.16	-1.55	PK
3	2399.13	71.07	74.00	-2.93	72.67	-1.60	PK
4	2400	68.84	74.00	-5.16	70.45	-1.61	PK
! 5	2412.464	91.30	74.00	17.30	92.98	-1.68	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 2:802.11g (2412MHz)

Horizontal



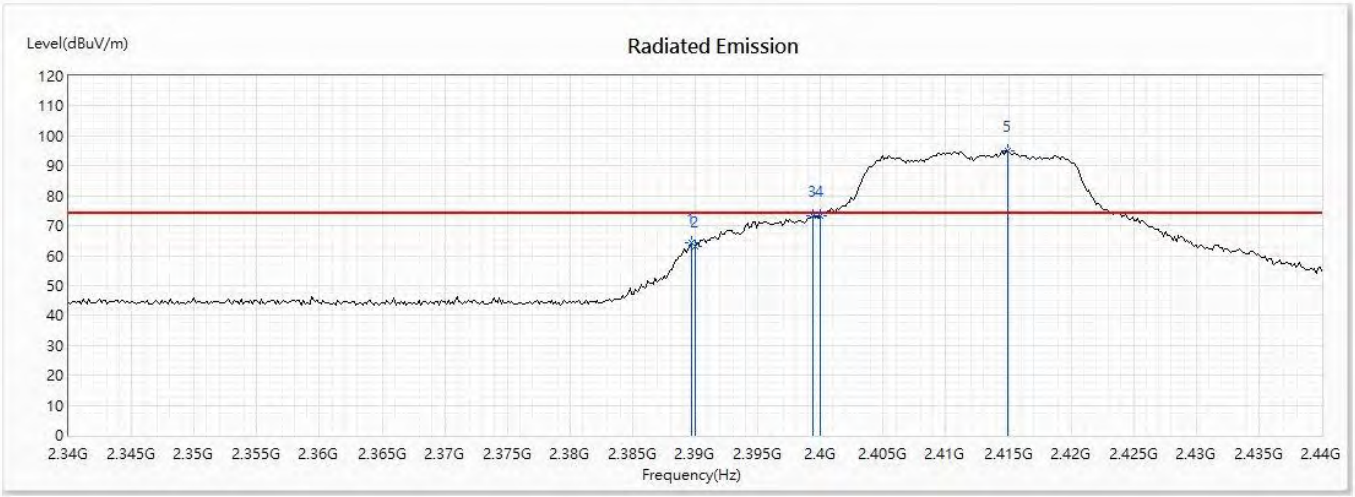
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	43.27	54.00	-10.73	44.82	-1.55	AV
! 2	2398.841	56.93	54.00	2.93	58.53	-1.60	AV
! 3	2400	56.15	54.00	2.15	57.76	-1.61	AV
! 4	2412.899	80.88	54.00	26.88	82.57	-1.69	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 2:802.11g (2412MHz)

Vertical



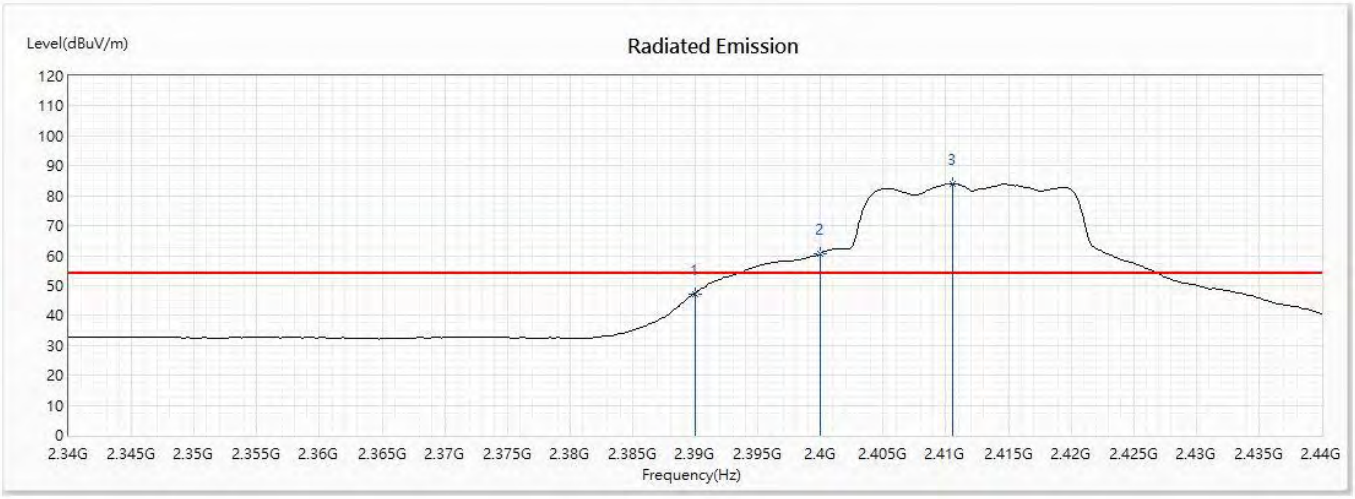
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2389.71	64.16	74.00	-9.84	65.71	-1.55	PK
2	2390	62.91	74.00	-11.09	64.46	-1.55	PK
3	2399.42	73.50	74.00	-0.50	75.10	-1.60	PK
4	2400	73.40	74.00	-0.60	75.01	-1.61	PK
! 5	2414.928	95.20	74.00	21.20	96.91	-1.71	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 2:802.11g (2412MHz)

Vertical



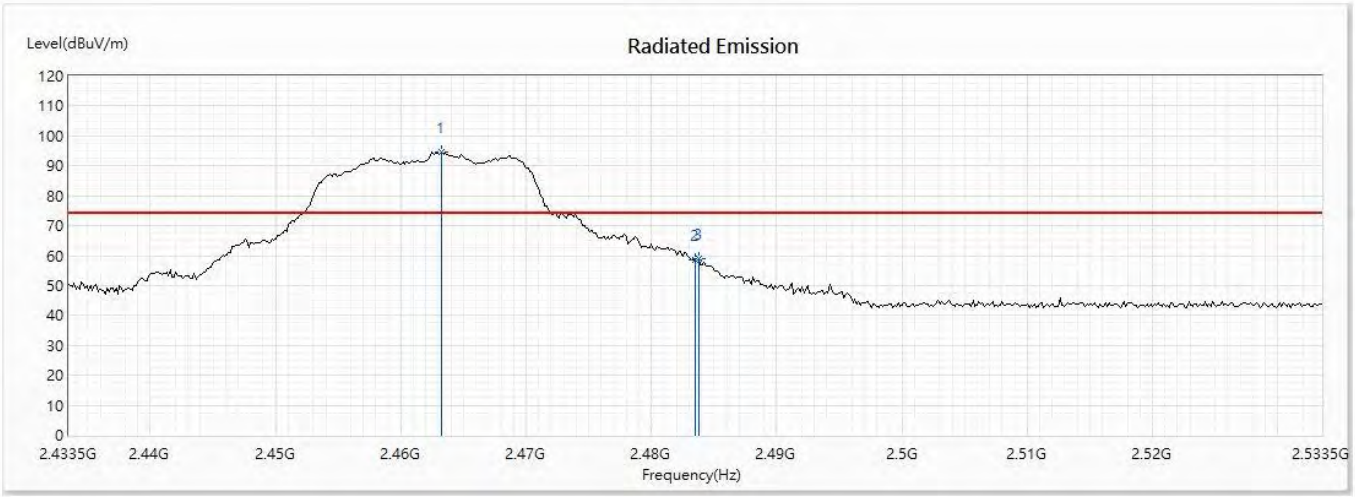
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	47.26	54.00	-6.74	48.81	-1.55	AV
! 2	2400	60.70	54.00	6.70	62.31	-1.61	AV
! 3	2410.58	84.02	54.00	30.02	85.70	-1.68	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 2:802.11g (2462MHz)

Horizontal



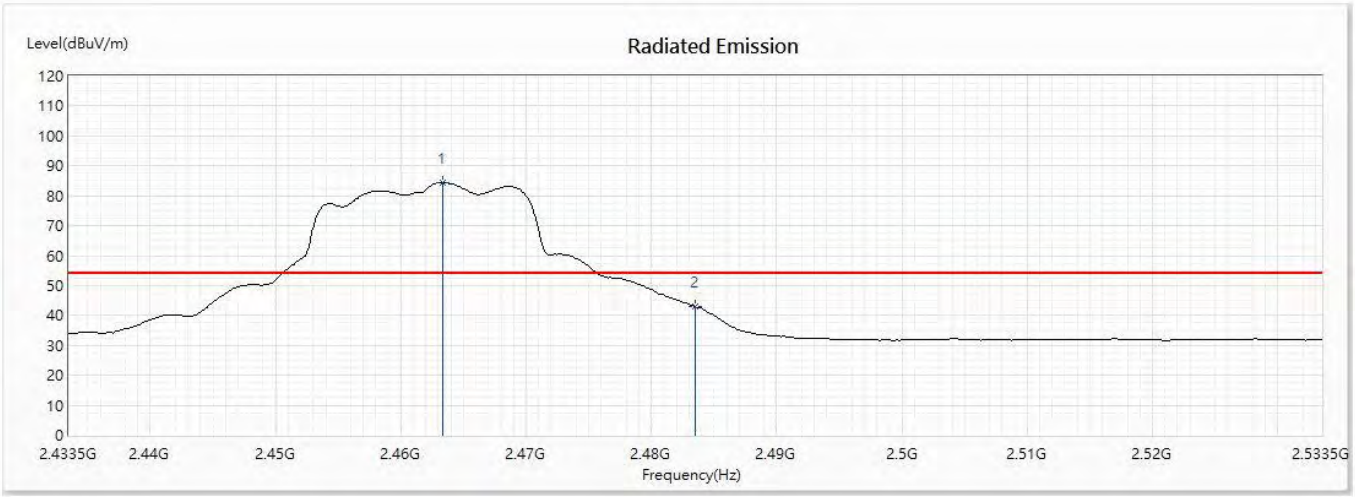
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.21	94.69	74.00	20.69	96.69	-2.00	PK
2	2483.5	58.40	74.00	-15.60	60.52	-2.12	PK
3	2483.79	58.79	74.00	-15.21	60.91	-2.12	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 2:802.11g (2462MHz)

Horizontal



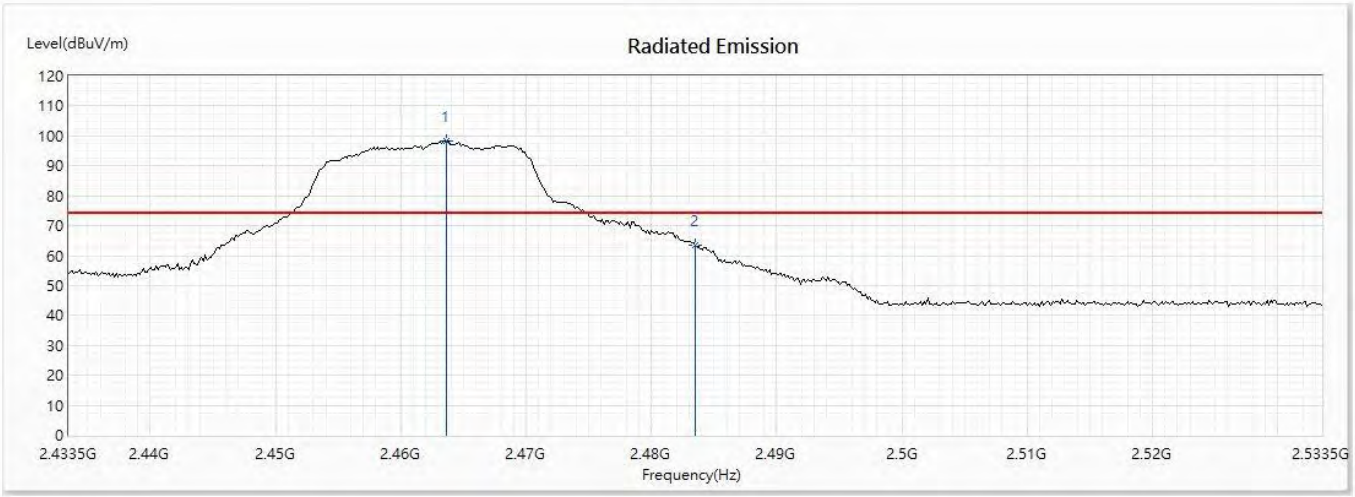
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.355	84.40	54.00	30.40	86.40	-2.00	AV
2	2483.5	42.83	54.00	-11.17	44.95	-2.12	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 2:802.11g (2462MHz)

Vertical



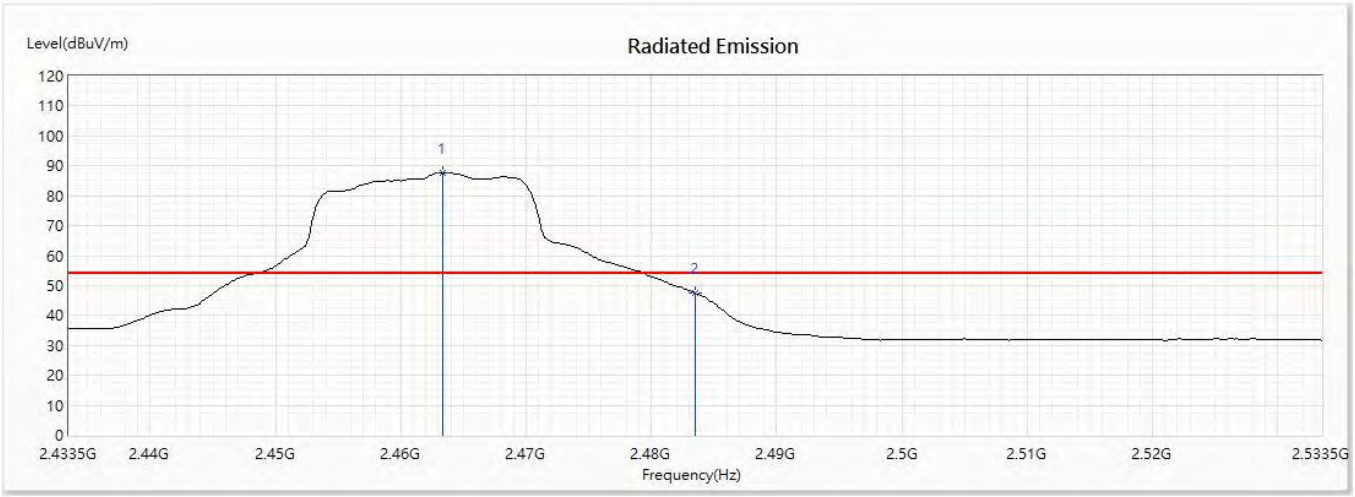
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.645	98.44	74.00	24.44	100.44	-2.00	PK
2	2483.5	63.63	74.00	-10.37	65.75	-2.12	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 2:802.11g (2462MHz)

Vertical



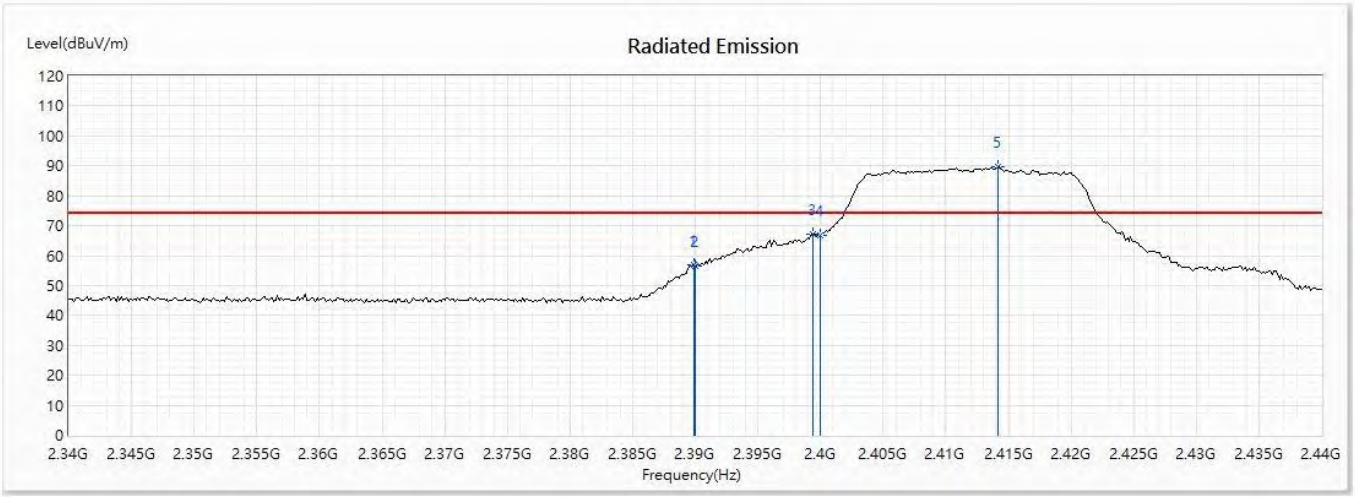
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.355	87.75	54.00	33.75	89.75	-2.00	AV
2	2483.5	47.34	54.00	-6.66	49.46	-2.12	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 3:802.11n-20 (2412MHz)

Horizontal



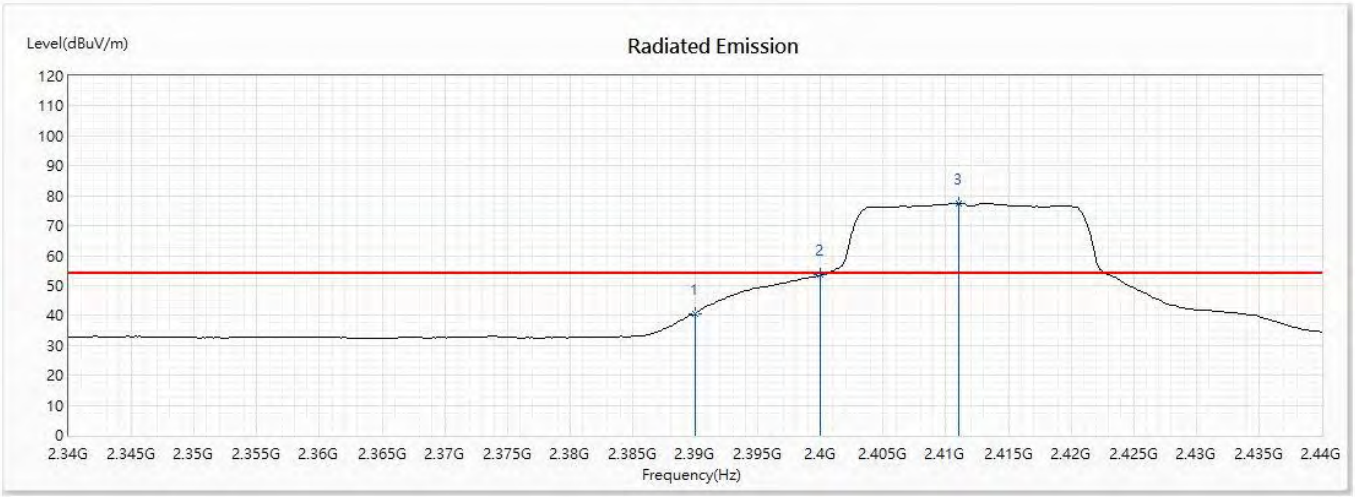
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2389.855	56.79	74.00	-17.21	58.34	-1.55	PK
2	2390	56.66	74.00	-17.34	58.21	-1.55	PK
3	2399.42	67.34	74.00	-6.66	68.94	-1.60	PK
4	2400	66.94	74.00	-7.06	68.55	-1.61	PK
! 5	2414.203	89.50	74.00	15.50	91.20	-1.70	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 3:802.11n-20 (2412MHz)

Horizontal



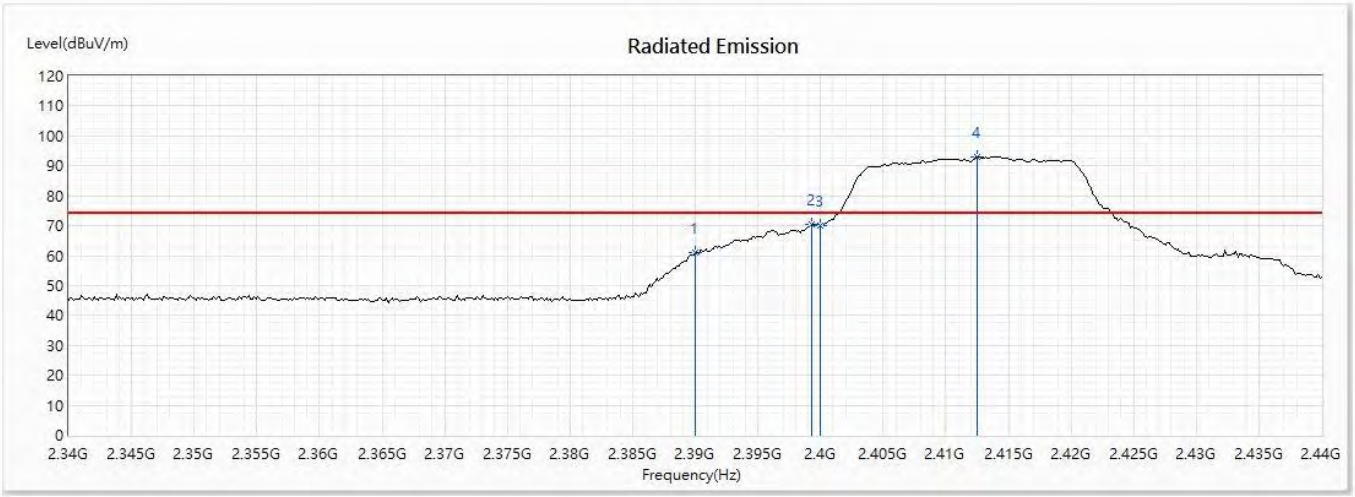
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	40.55	54.00	-13.45	42.10	-1.55	AV
2	2400	53.60	54.00	-0.40	55.21	-1.61	AV
! 3	2411.014	77.58	54.00	23.58	79.26	-1.68	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 3:802.11n-20 (2412MHz)

Vertical



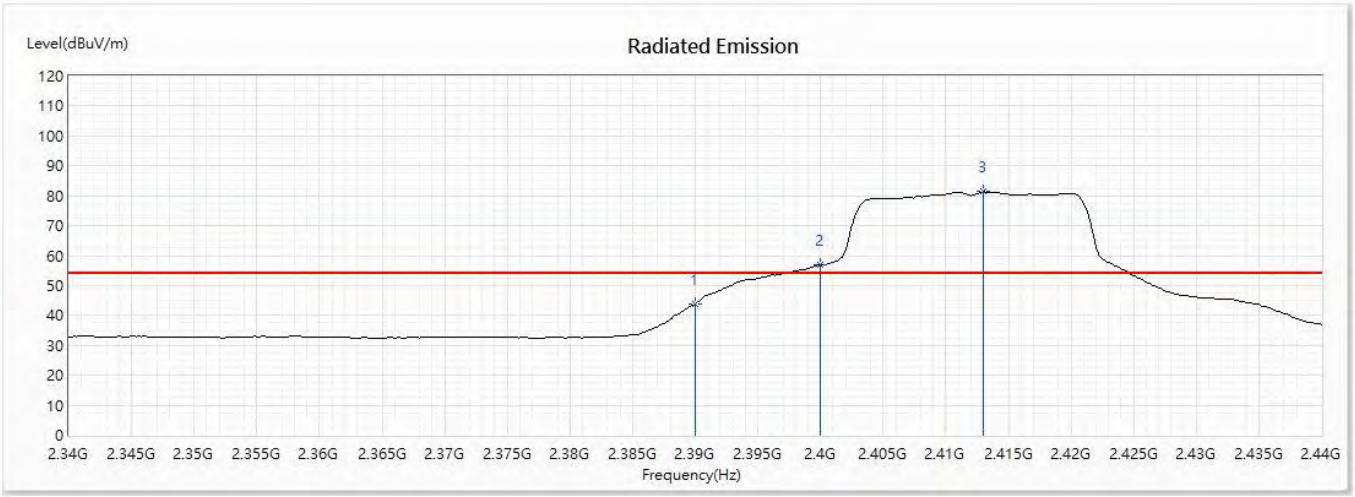
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	60.93	74.00	-13.07	62.48	-1.55	PK
2	2399.275	70.43	74.00	-3.57	72.03	-1.60	PK
3	2400	70.05	74.00	-3.95	71.66	-1.61	PK
! 4	2412.464	92.93	74.00	18.93	94.61	-1.68	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/01/06
Test Mode : Mode 3:802.11n-20 (2412MHz)

Vertical



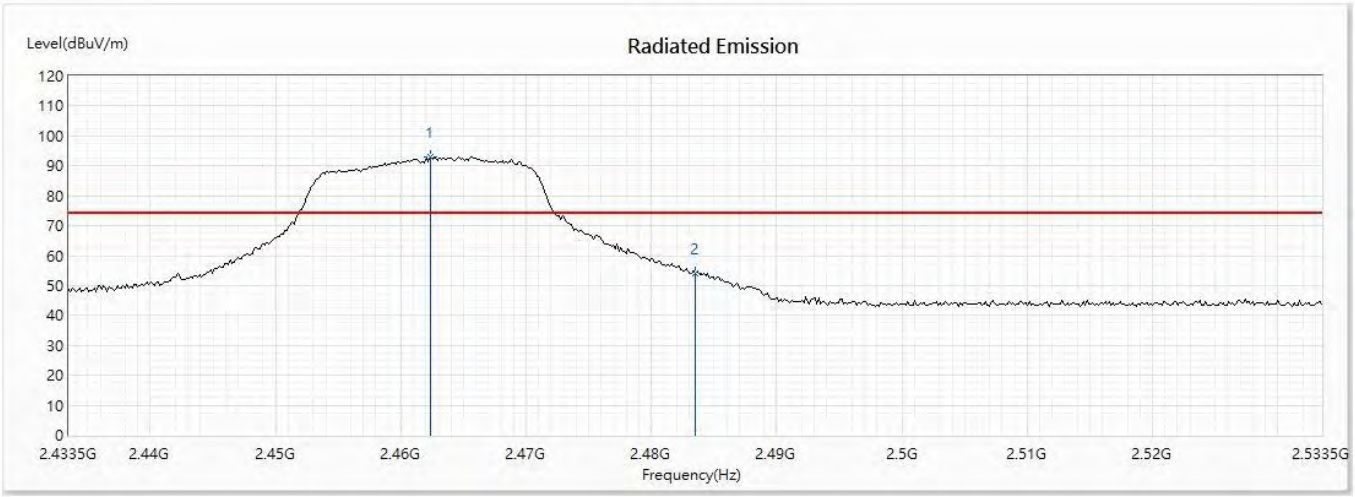
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	43.95	54.00	-10.05	45.50	-1.55	AV
! 2	2400	56.77	54.00	2.77	58.38	-1.61	AV
! 3	2413.043	81.31	54.00	27.31	83.00	-1.69	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 3:802.11n-20 (2462MHz)

Horizontal



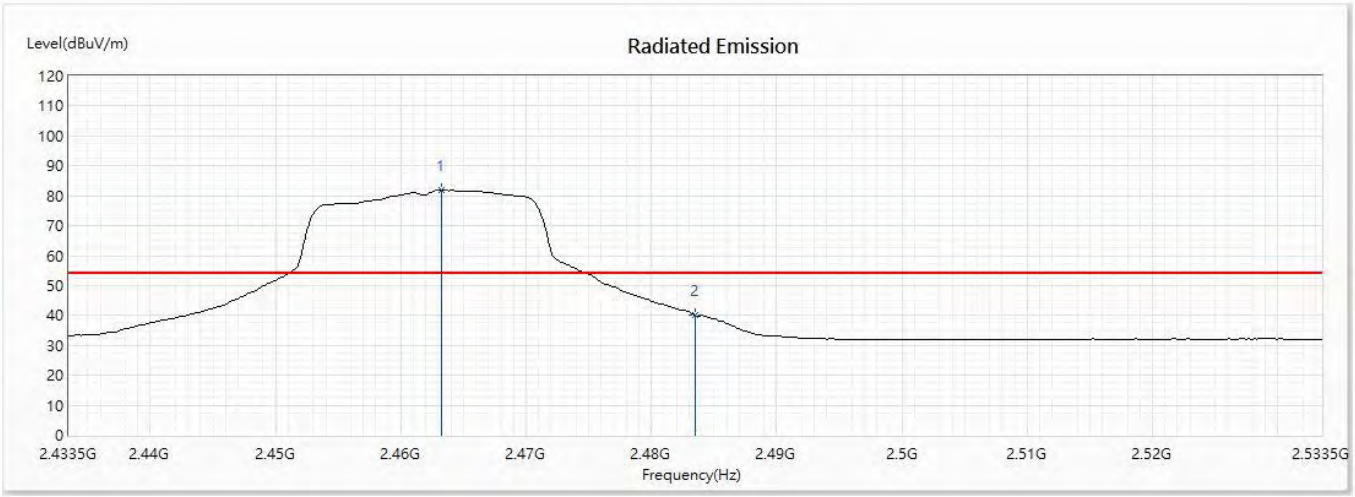
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2462.341	92.91	74.00	18.91	94.90	-1.99	PK
2	2483.5	54.03	74.00	-19.97	56.15	-2.12	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 3:802.11n-20 (2462MHz)

Horizontal



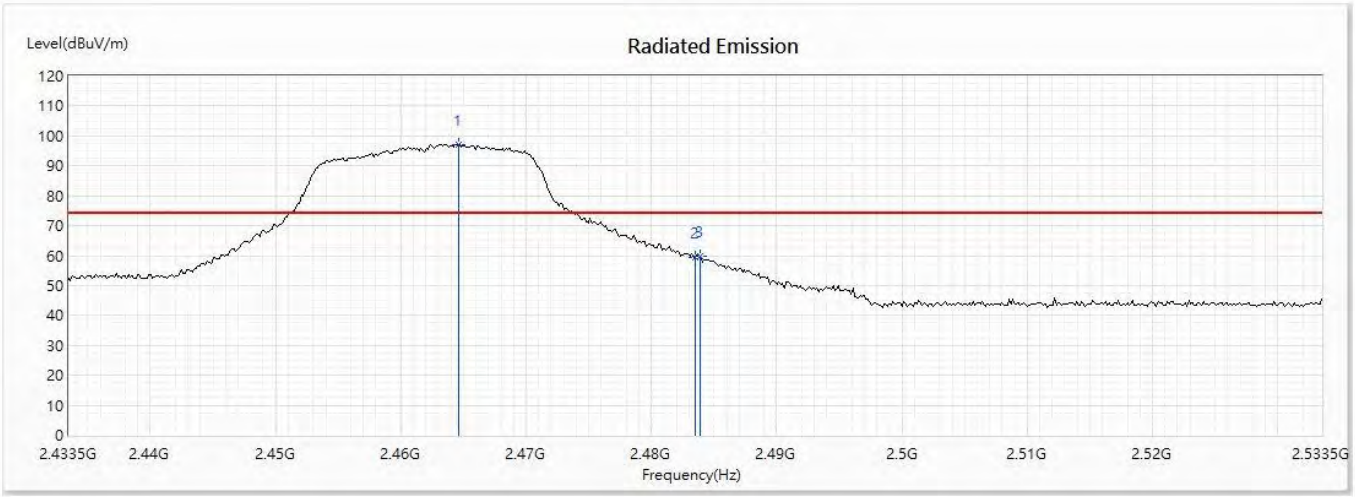
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.21	81.96	54.00	27.96	83.96	-2.00	AV
2	2483.5	39.99	54.00	-14.01	42.11	-2.12	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 3:802.11n-20 (2462MHz)

Vertical



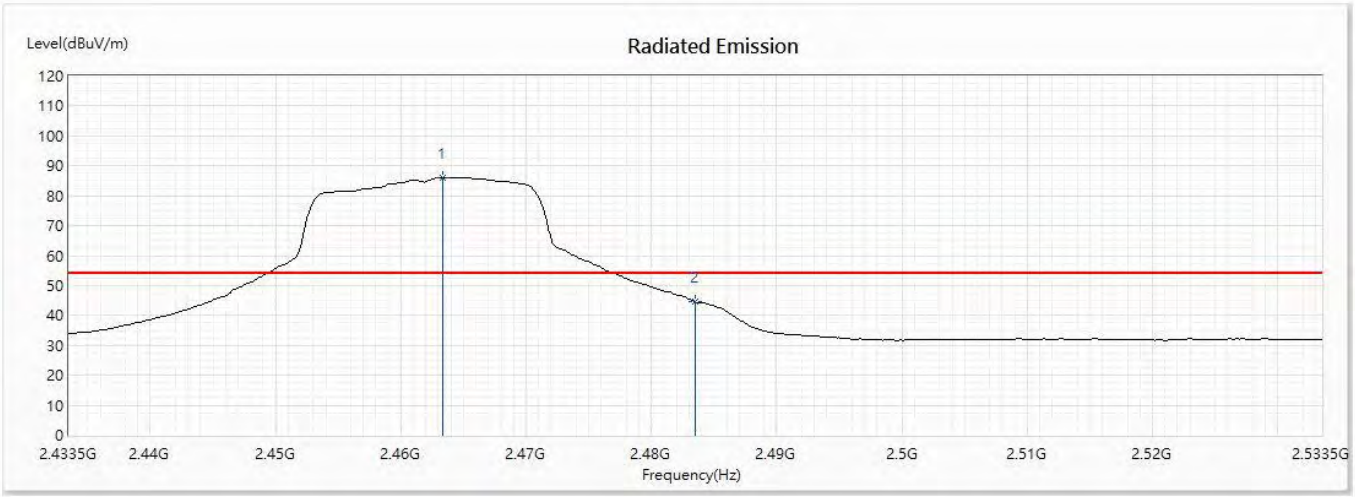
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2464.659	97.19	74.00	23.19	99.20	-2.01	PK
2	2483.5	59.34	74.00	-14.66	61.46	-2.12	PK
3	2483.935	59.71	74.00	-14.29	61.84	-2.13	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 3:802.11n-20 (2462MHz)

Vertical



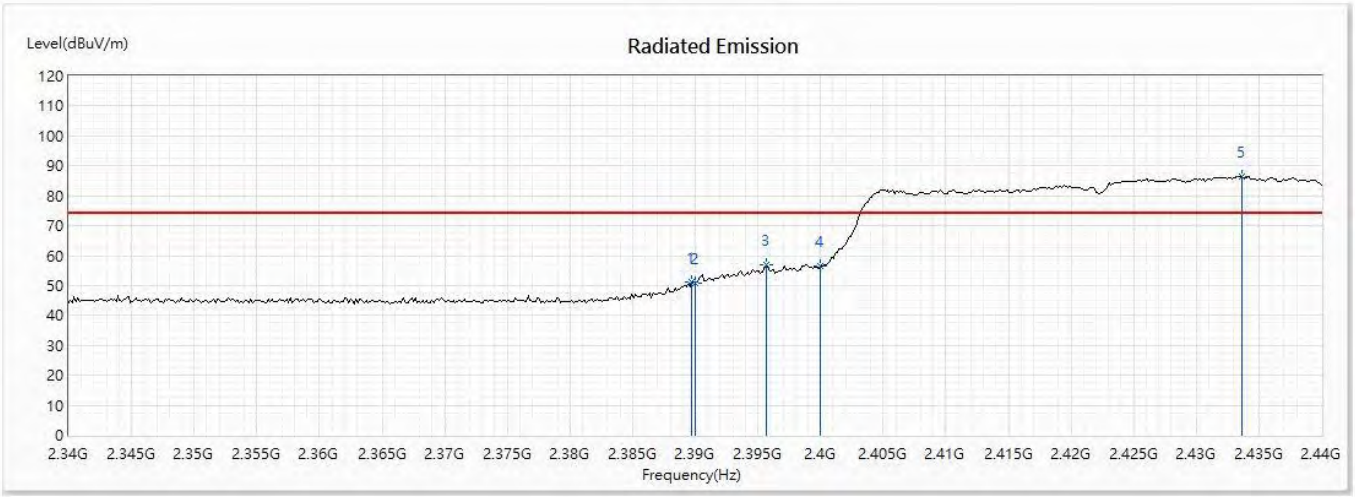
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.355	86.12	54.00	32.12	88.12	-2.00	AV
2	2483.5	44.44	54.00	-9.56	46.56	-2.12	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2422MHz)

Horizontal



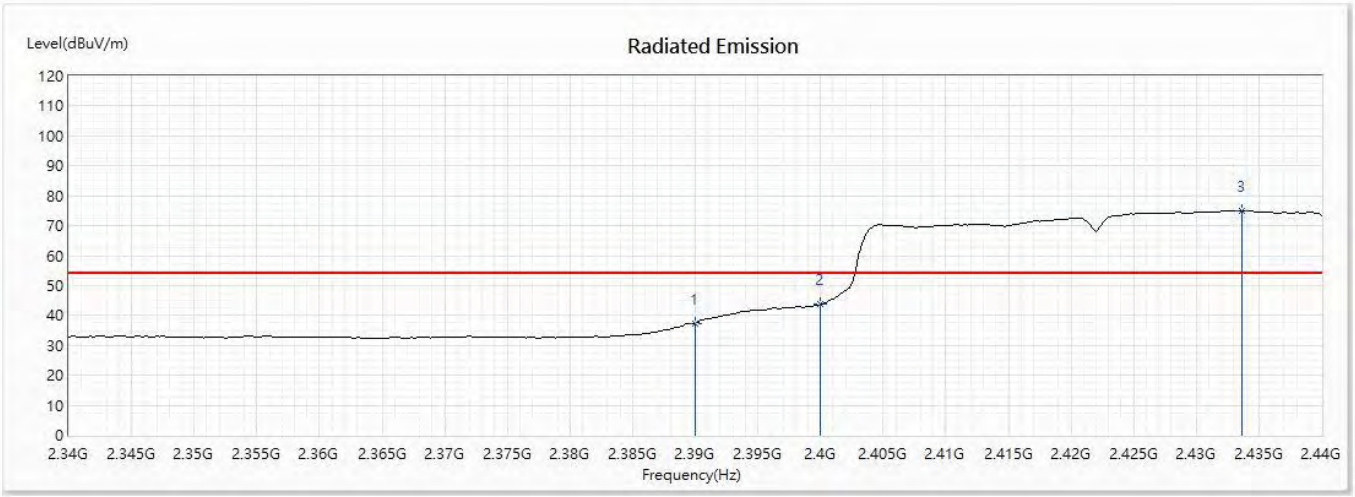
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2389.71	51.36	74.00	-22.64	52.91	-1.55	PK
2	2390	50.70	74.00	-23.30	52.25	-1.55	PK
3	2395.652	56.75	74.00	-17.25	58.33	-1.58	PK
4	2400	56.60	74.00	-17.40	58.21	-1.61	PK
! 5	2433.623	86.47	74.00	12.47	88.29	-1.82	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2422MHz)

Horizontal



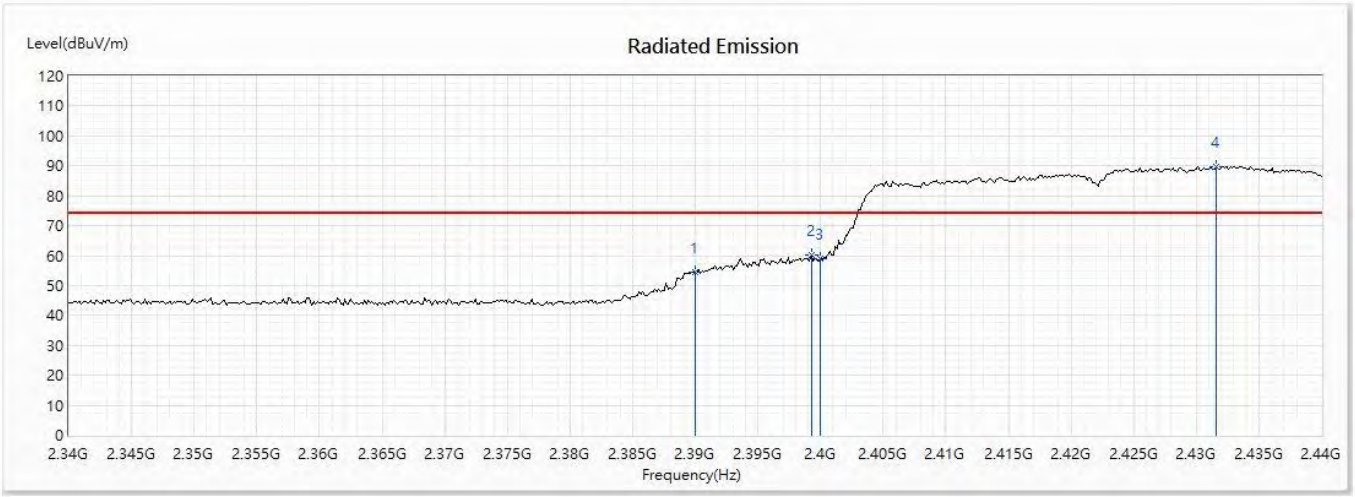
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	37.30	54.00	-16.70	38.85	-1.55	AV
2	2400	43.79	54.00	-10.21	45.40	-1.61	AV
! 3	2433.623	75.13	54.00	21.13	76.95	-1.82	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2422MHz)

Vertical



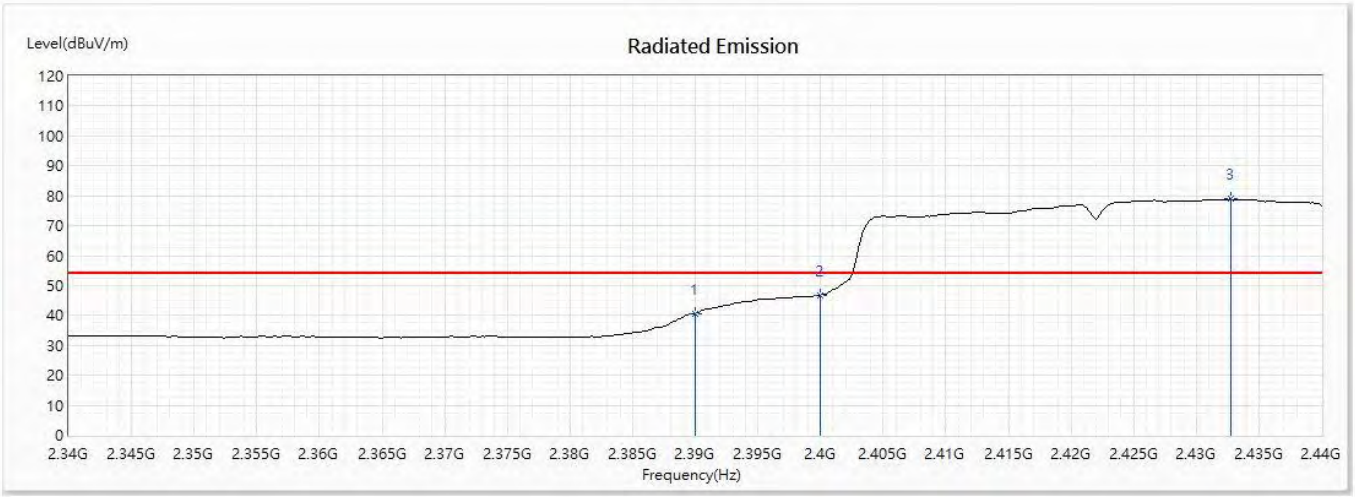
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	54.58	74.00	-19.42	56.13	-1.55	PK
2	2399.275	60.07	74.00	-13.93	61.67	-1.60	PK
3	2400	58.83	74.00	-15.17	60.44	-1.61	PK
! 4	2431.594	89.76	74.00	15.76	91.57	-1.81	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2422MHz)

Vertical



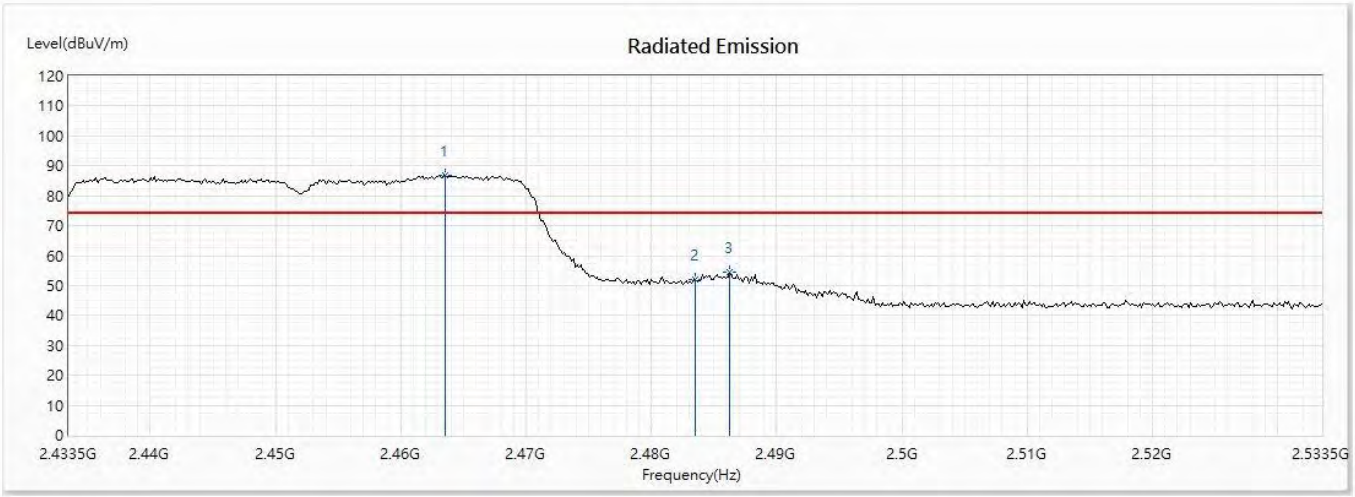
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	40.67	54.00	-13.33	42.22	-1.55	AV
2	2400	46.89	54.00	-7.11	48.50	-1.61	AV
! 3	2432.754	78.86	54.00	24.86	80.67	-1.81	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2452MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2463.5	86.94	74.00	12.94	88.94	-2.00	PK
2	2483.5	51.83	74.00	-22.17	53.95	-2.12	PK
3	2486.254	54.60	74.00	-19.40	56.74	-2.14	PK

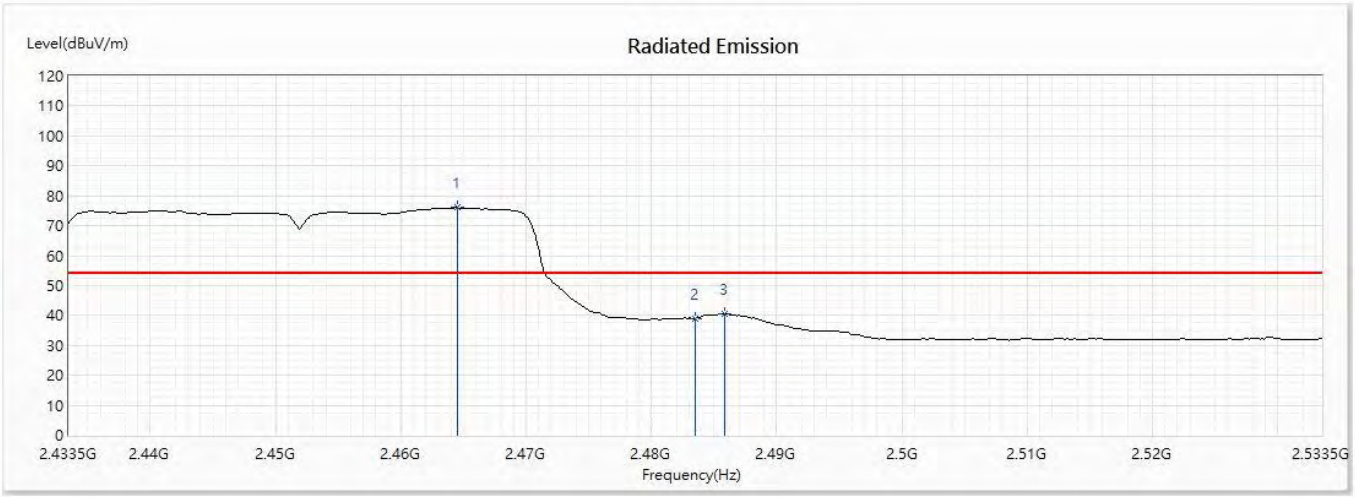
Remark:

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2452MHz)

Horizontal



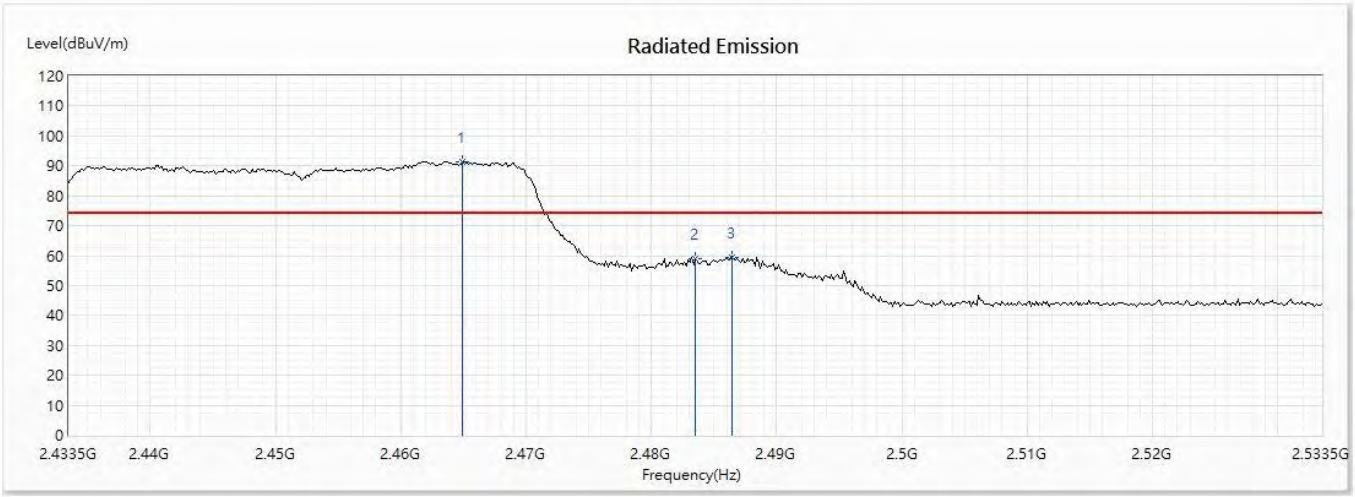
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2464.514	76.06	54.00	22.06	78.07	-2.01	AV
2	2483.5	39.10	54.00	-14.90	41.22	-2.12	AV
3	2485.819	40.49	54.00	-13.51	42.62	-2.13	AV

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2452MHz)

Vertical



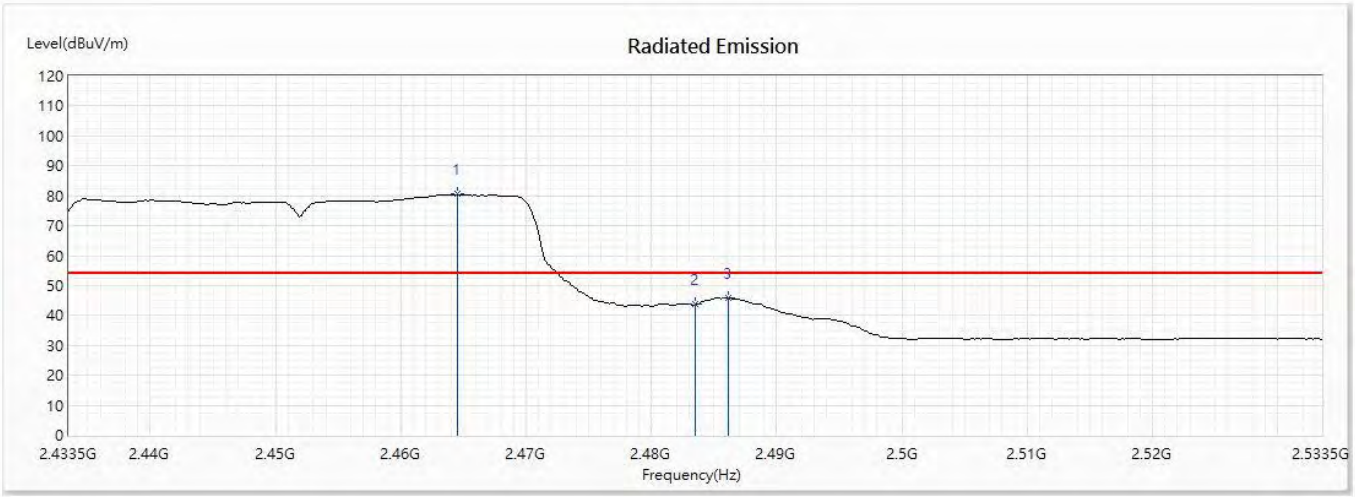
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2464.949	91.45	74.00	17.45	93.46	-2.01	PK
2	2483.5	58.88	74.00	-15.12	61.00	-2.12	PK
3	2486.399	59.59	74.00	-14.41	61.73	-2.14	PK

Note:

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

Product : LTE SOM Module
Test Item : Band Edge
Test Date : 2020/04/16
Test Mode : Mode 4:802.11n-40 (2452MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2464.514	80.48	54.00	26.48	82.49	-2.01	AV
2	2483.5	43.66	54.00	-10.34	45.78	-2.12	AV
3	2486.109	46.02	54.00	-7.98	48.16	-2.14	AV

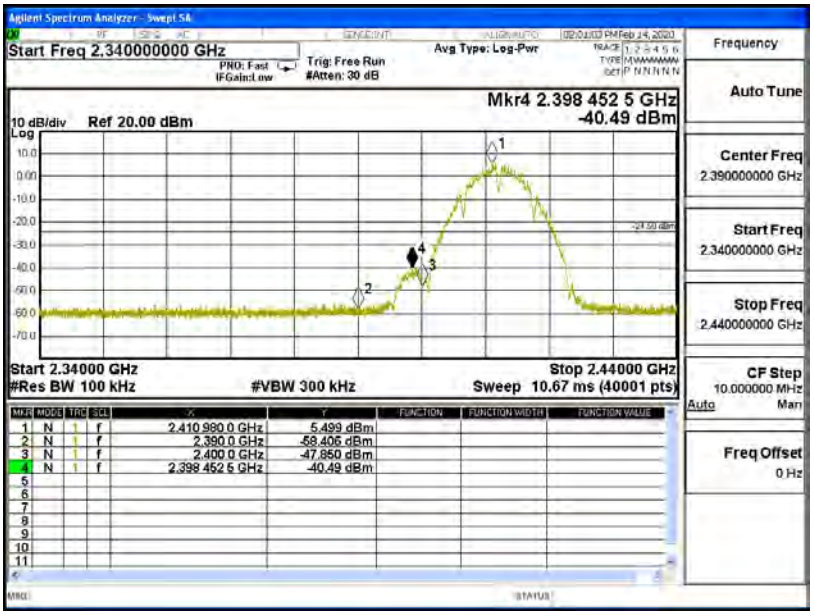
Note:

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

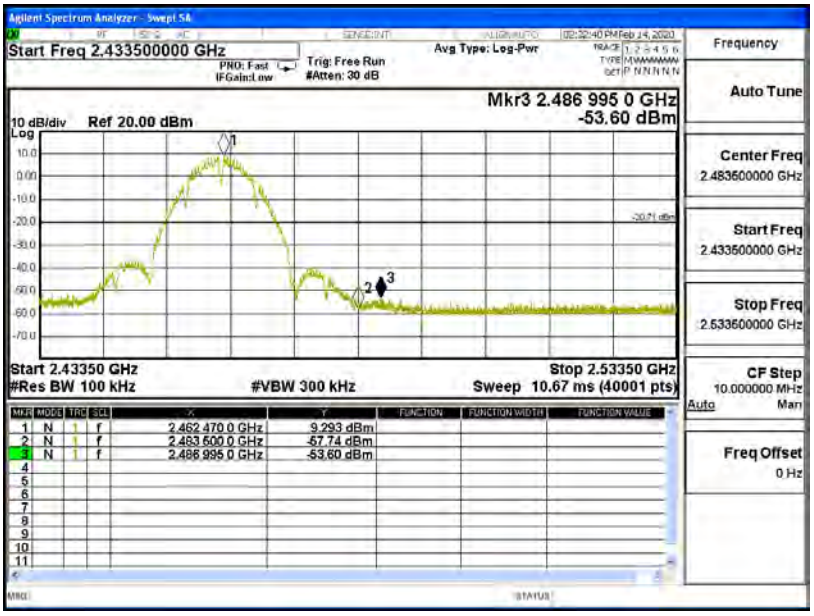
Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 1:802.11b Chain A

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2412	53.349	>30	PASS
2462	62.893	>30	PASS

2412MHz



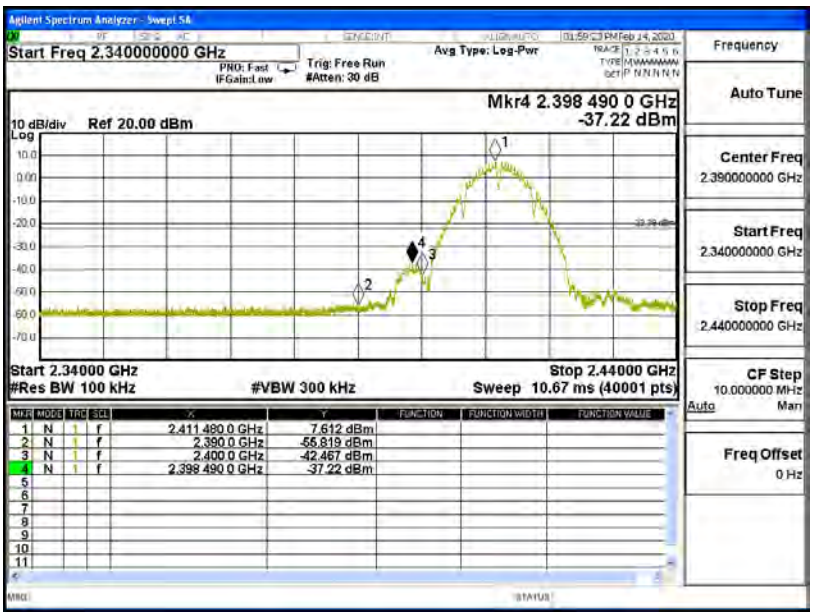
2462MHz



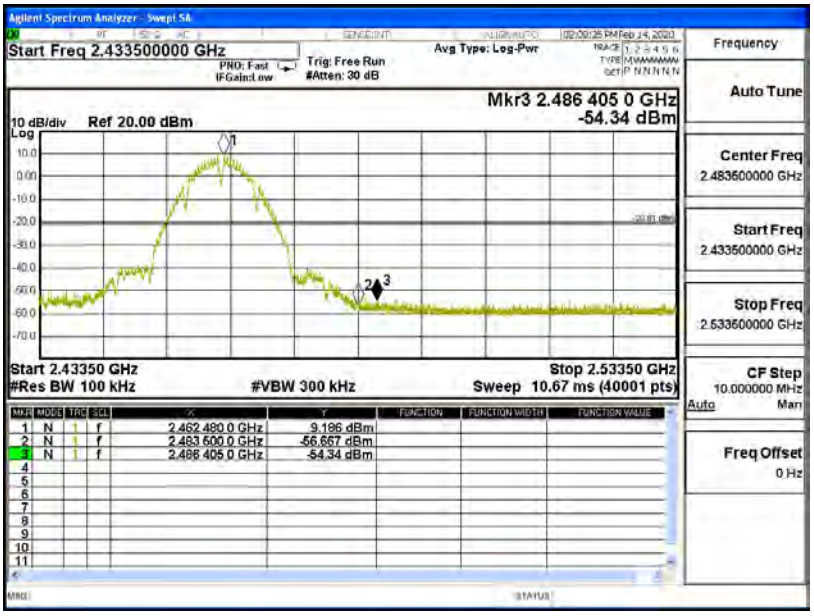
Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 1:802.11b Chain B

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2412	50.079	>30	PASS
2462	63.526	>30	PASS

2412MHz



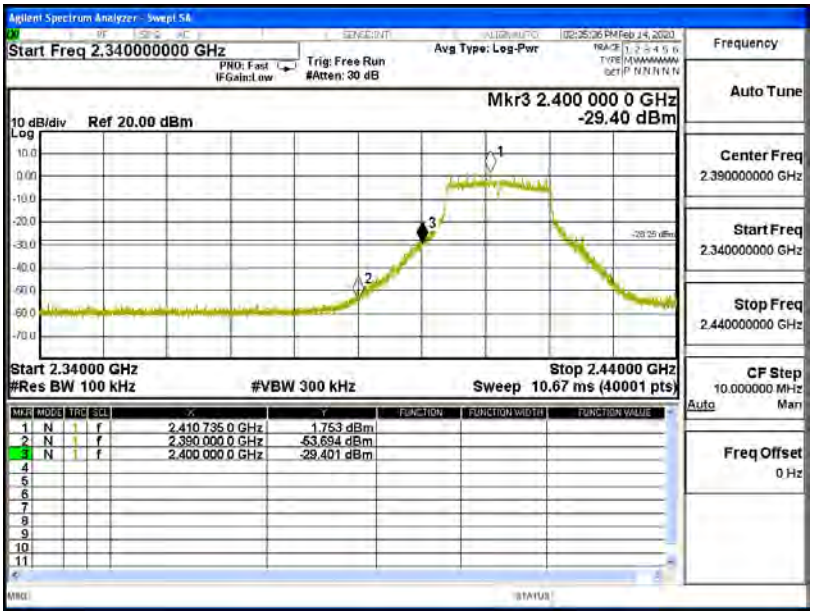
2462MHz



Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 2:802.11g Chain A

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2412	31.154	>30	PASS
2462	51.468	>30	PASS

2412MHz



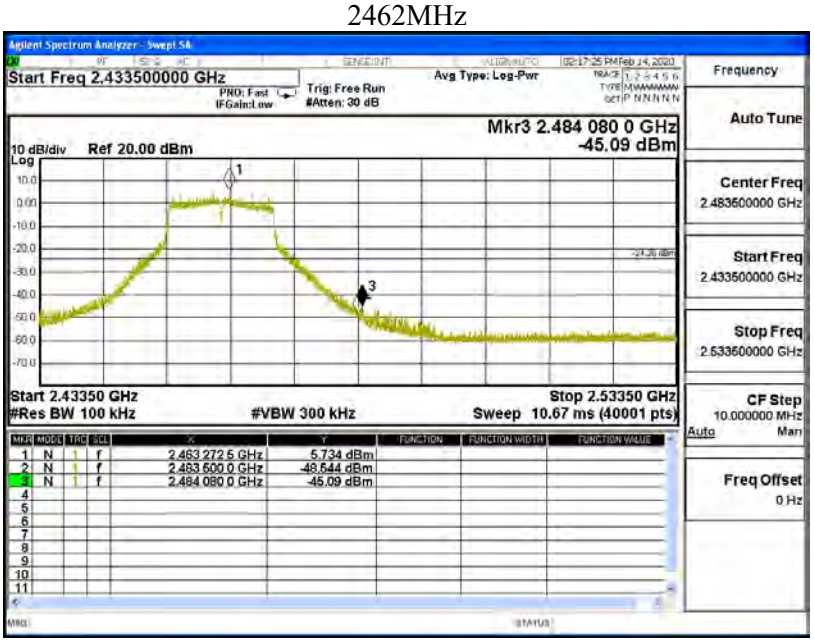
2462MHz

Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 2:802.11g Chain B

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2412	31.760	>30	PASS
2462	50.824	>30	PASS

2412MHz

2462MHz



Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 3:802.11n-20 Chain A

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2412	31.036	>30	PASS
2462	50.812	>30	PASS

2412MHz

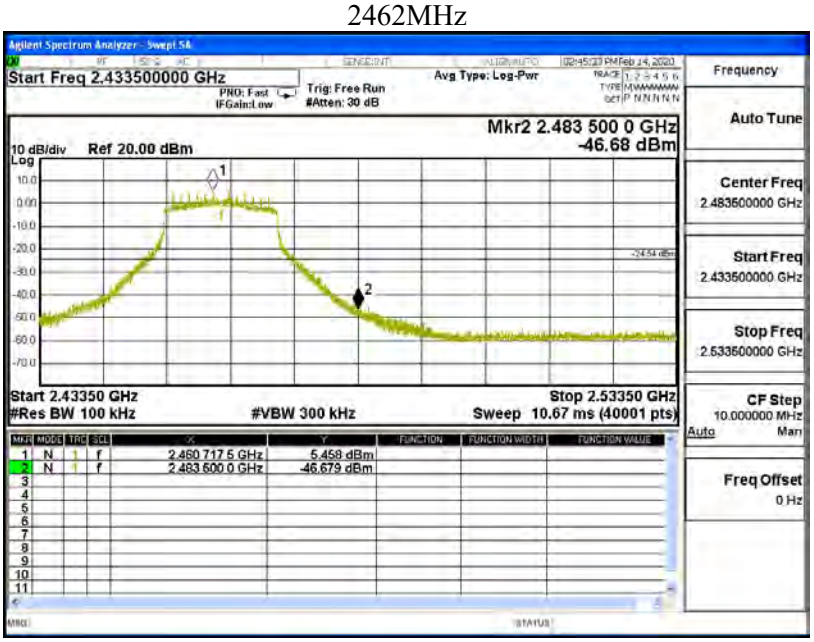
2462MHz

Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 3:802.11n-20 Chain B

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2412	31.943	>30	PASS
2462	52.137	>30	PASS

2412MHz

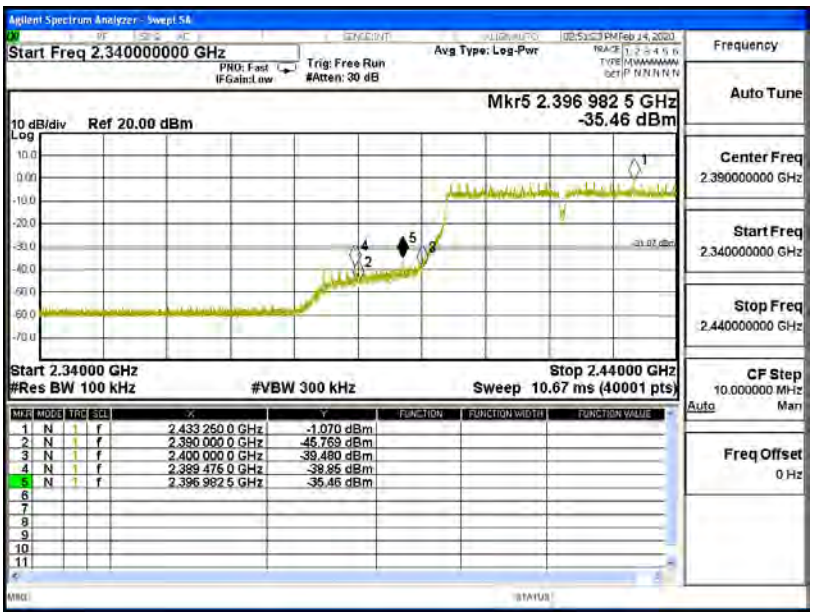
2462MHz



Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 4:802.11n-40 Chain A

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2422	38.410	>30	PASS
2452	46.911	>30	PASS

2422MHz

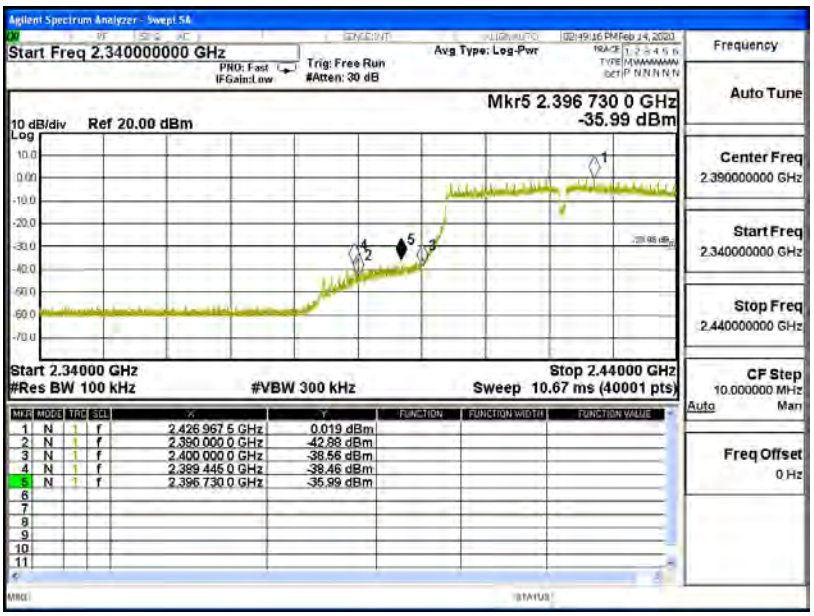


2452MHz

Product : LTE SOM Module
Test Item : Band Edge
Test Mode : Mode 4:802.11n-40 Chain B

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
2422	38.579	>30	PASS
2452	48.810	>30	PASS

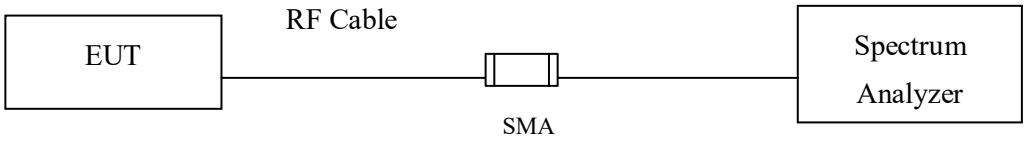
2422MHz



2452MHz

5. Duty Cycle

5.1. Test Setup



5.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

5.3. Uncertainty

± 2.31msec

5.4. Test Result of Duty Cycle

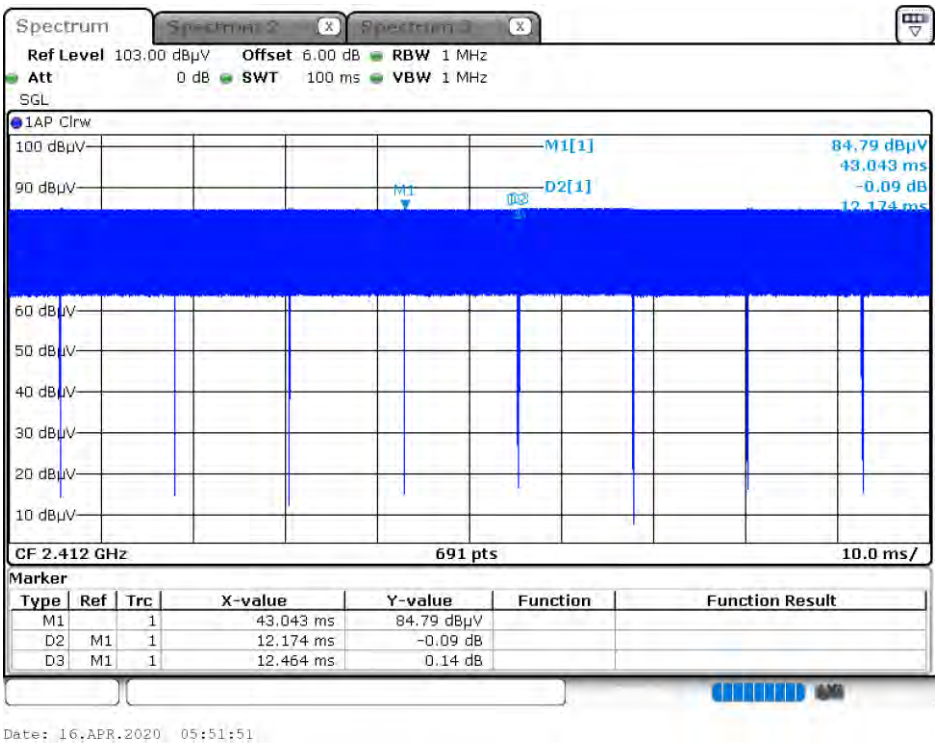
Product : LTE SOM Module
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

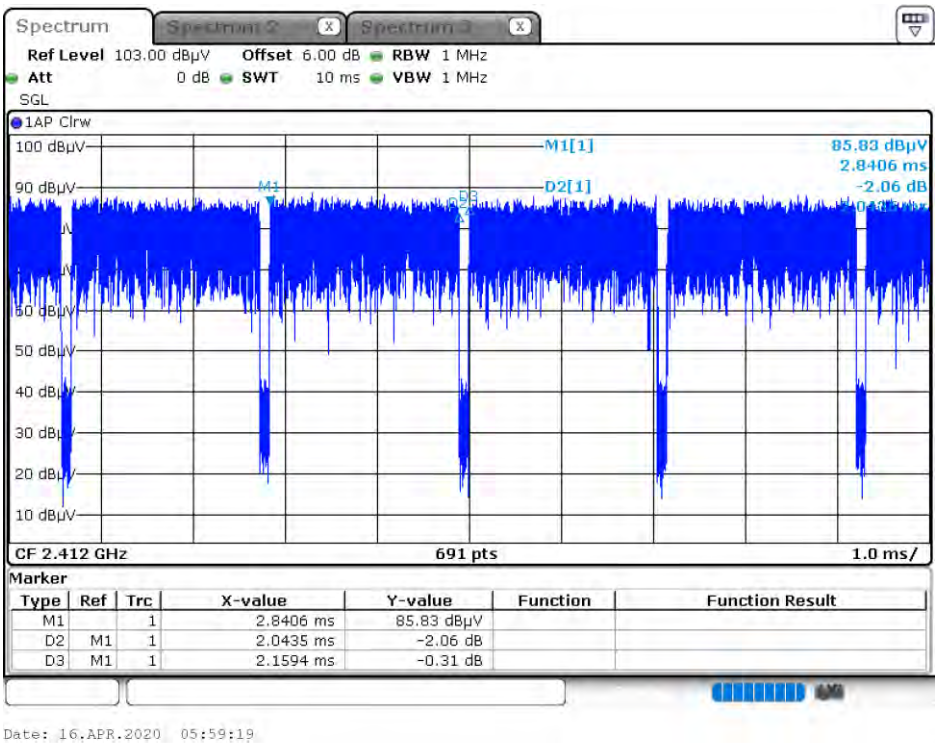
Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	12.1740	12.4640	97.67	0.10
802.11g	2.0435	2.1594	94.63	0.24
802.11n20	1.8986	2.0290	93.57	0.29
802.11n40	0.9058	1.0362	87.41	0.58

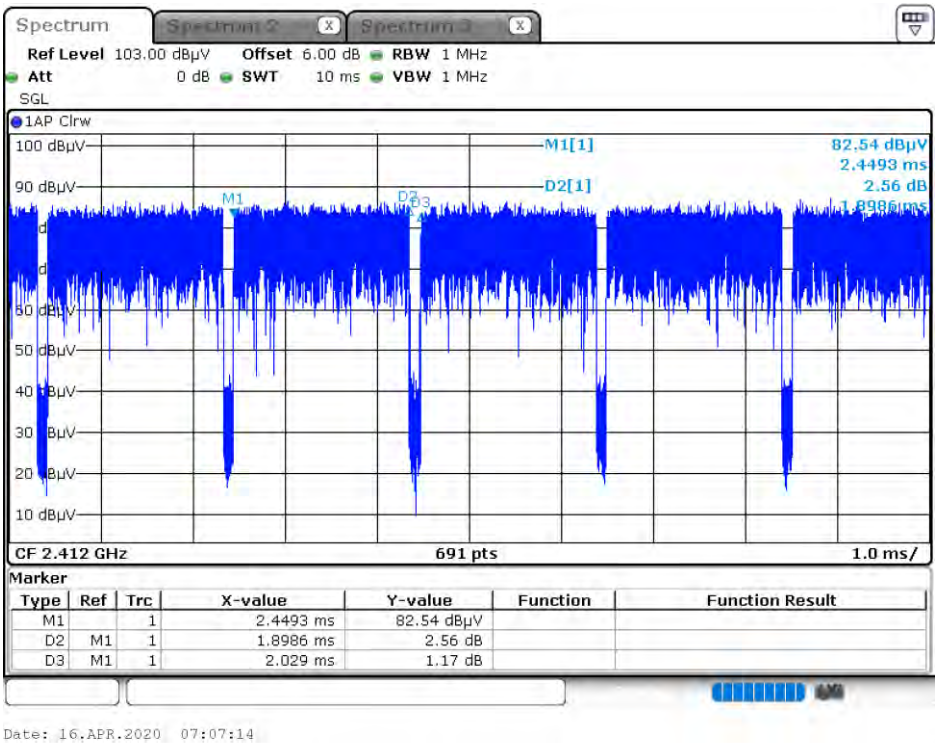
802.11b



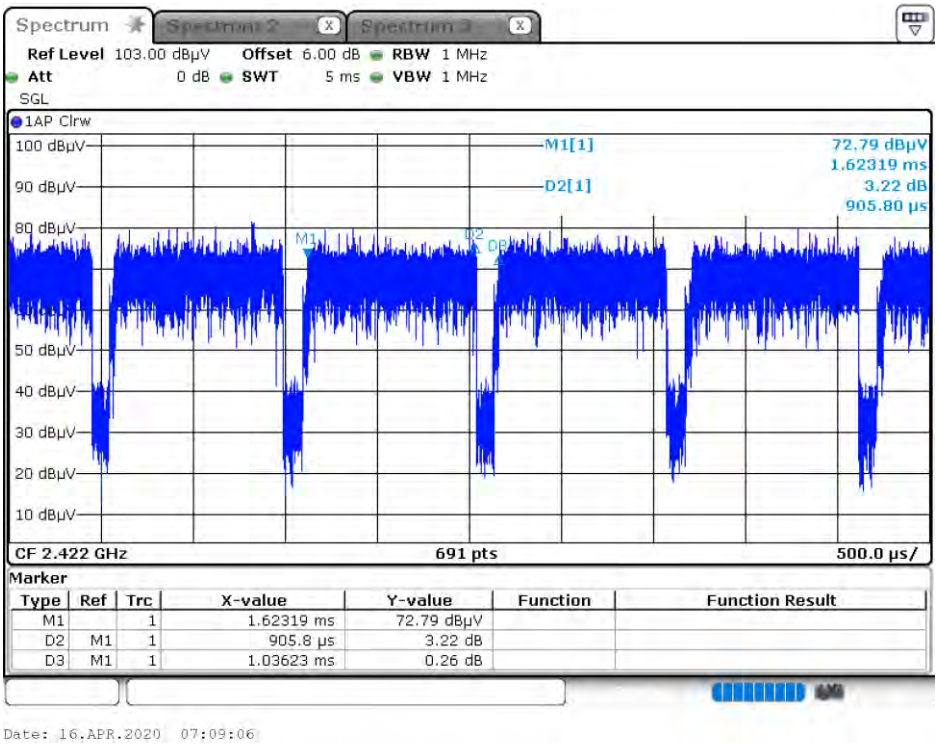
802.11g



802.11n20



802.11n40


Spectrum
Spectrum 2
Spectrum 3
Ref Level 103.00 dBµV Offset 6.00 dB RBW 1 MHz
Att 0 dB SWT 5 ms VBW 1 MHz
SGL
1AP Clrw
100 dBµV
90 dBµV
80 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
M1[1] 72.79 dBµV
1.62319 ms
D2[1] 3.22 dB
905.80 µs
CF 2.422 GHz
691 pts
500.0 µs/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 1.62319 ms 72.79 dBµV
D2 M1 1 905.8 µs 3.22 dB
D3 M1 1 1.03623 ms 0.26 dB
Date: 16.APR.2020 07:09:06

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.