ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

Applicant:	Quanta Computer Inc. No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377, Taiwan
Product Name:	Clover Station Pro Terminal
Brand Name:	clover
Model No.:	C503
HVIN:	C503W
Model Difference:	N/A
Report Number:	E2/2021/60096
FCC ID	HFS-CX03W
IC:	1787B-CX03W
Issue Date:	Aug. 03, 2021
Date of Test:	Jul. 01, 2021～Jul. 12, 2021
Date of EUT Received:	Jul. 01, 2021

Approved By Jay. Lin

Jay Lin

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.247, ISED RSS-247.

The results of this report relate only to the sample identified in this report.

Revision History

Report Number	Revision	Description	Issue Date	Revised By
E2/2021/60096	Rev.00	Original.	Aug. 03, 2021	Yi-Shan Tsai

Table of Contents

1 GENERAL INFORMATION

1.1 Product Description

Product Name:	Clover Station Pro Terminal
Brand Name:	clover
Model No.:	C503
HVIN:	C503W
Model Difference:	N/A
Hardware Version:	C503W
Firmware Version:	N/A
EUT Series No.:	PJ216216001 (Radiated) C053UQ11620145 (Conducted) C153UQ11620149 (Conduction)
Power Supply:	12V from AC/DC Adapter

1.2 RF Specification

WLAN 2.4GHz

Wi-Fi	Frequency Range	Channels	Rated Power in dBm (Peak)	Modulation Technology
802.11b	2412~2462	11	18.21	DSSS
802.11g	2412~2462	11	19.58	OFDM
802.11n20	2412~2462	11	23.12	OFDM
802.11n40	2422~2452	7	24.06	OFDM
Modulation type:		CCK, DQPSK, DBPSK for DSSS		
		64QAM, 16QAM, QPSK, BPSK for OFDM		
Data Rate:		802.11 b: 1/2/5.5/11 Mbps		
		802.11 g: 6/9/12/18/24/36/48/54 Mbps		
		802.11 n_20MHz:6.5 - 144.4Mbps		
		802.11 n_40MHz:13.5 - 300Mbps		

WLAN 2.4GHz for IC

Wi-Fi	Frequency Range	Channels	Rated Power in dBm (Peak)	Rated Power in dBm (EIRP)	Modulation Technology
802.11b	2412~2462	11	18.21	17.56	DSSS
802.11g	2412~2462	11	19.58	16.95	OFDM
802.11n20	2412~2462	11	23.12	20.39	OFDM
802.11n40	2422~2452	7	24.06	21.88	OFDM
Modulation type:		CCK, DQPSK, DBPSK for DSSS			
		64QAM, 16QAM, QPSK, BPSK for OFDM			
Data Rate:		802.11 b: 1/2/5.5/11 Mbps			
		802.11 g: 6/9/12/18/24/36/48/54 Mbps			
		802.11 n_20MHz:6.5 - 144.4Mbps			
		802.11 n_40MHz:13.5 - 300Mbps			

1.3 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
PIFA	SAA	GD9320-15-001-R	2402~2480	1.15	
	SAA	GD9321-15-001-R	2402~2480	-0.2	
	Luxshare-ICT	LA81FP017-1H	2402~2480	2.1	V
	Luxshare-ICT	LA81FP018-1H	2402~2480	0.9	

Note:
1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. Antenna information is provided by the applicant.

1.4 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247
FCC KDB 558074 D01 15.247 Meas Guidance v05r02
FCC KDB 662911 D01 Multiple Transmitter Output v02r01
RSS-247 issue 2 Feb. 2017
RSS-Gen. issue 5
ANSI C63.10:2013

1.5 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction A	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

1.6 Special Accessories

There are no special accessories used while test was conducted.

1.7 Equipment Modifications

There was no modification incorporated into the EUT.

2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.
There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

2.5 Configuration of Tested System

Fig. 2-1 Conduction (AC Power Line)

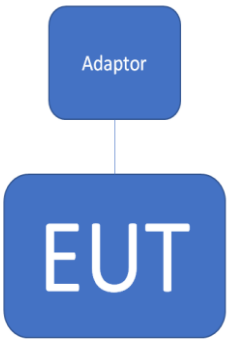


Fig. 2-2 Conducted (Antenna Port) Configuration & Radiated Emission

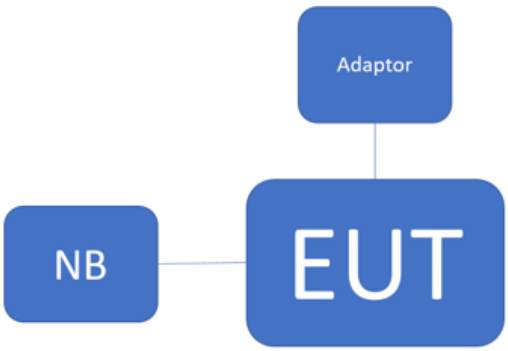


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	Adapter	clover	FSP040-RHBN3	N/A	N/A	N/A
3.	Notebook	Lenovo	L440	P0000367	N/A	N/A

3 SUMMARY OF TEST RESULTS

FCC Rules	IC Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	RSS-247 §5.4 d	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §5.2 a RSS-Gen §6.7	Emission Bandwidth	Compliant
§15.205 §15.209 §15.247(d)	RSS-247 §5.5 RSS-Gen §8.9 RSS-Gen §8.10 RSS-Gen §6.13	Radiated & Conducted Band Edge and Spurious Emission	Compliant
§15.247(e)	RSS-247 §5.2 b	Power Spectral Density	Compliant
§15.203 §15.247(b)	N/A	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

4.1 Operatin Frequencies

Modulation of 20MHz nominal bandwidth

CHANNEL	FREQUENCY (MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

Modulation of 40MHz nominal bandwidth

CHANNEL	FREQUENCY (MHz)
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452

4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.

   The gevin UE is pre-scanned among below modes.

Modulation	Transmission Chain				Single Transmission Spatial	Multiple Transmission Spatial
☒ 802.11 b	☒ Ch0	☒ Ch1	☐ Ch2	☐ Ch3	☒ 1TX	☐ 2TX
☒ 802.11 g	☒ Ch0	☒ Ch1	☐ Ch2	☐ Ch3	☒ 1TX	☐ 2TX
☒ 802.11 n	☒ Ch0	☒ Ch1	☐ Ch2	☐ Ch3	☐ SISO	☒ MIMO

4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

4.3 Radiated Emission Test:

RADIATED EMISSION TEST (BELOW 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11g	1 to 11	6	OFDM	6	ch0
802.11n (HT40)	3 to 9	6	OFDM	MCS8	MIMO

RADIATED EMISSION TEST (ABOVE 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,6,11	DSSS	1	ch0
802.11g	1 to 11	1,6,11	OFDM	6	ch0
802.11n (HT20)	1 to 13	1,6,11	OFDM	MCS8	MIMO
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS8	MIMO

Note:

The field strength of radiation emission was measured as EUT three orthogonal planes, E1 / E2 / H, are positioned to pre-scan the emission generating the highest one. The worst position is tested and recorded.

4.4 Antenna Port Conducted Mesurement:

Conducted					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,6,11	DSSS	1	ch0
802.11g	1 to 11	1,6,11	OFDM	6	ch0
802.11n (HT20)	1 to 13	1,6,11	OFDM	MCS8	MIMO
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS8	MIMO

5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty		
AC Power Line Conducted Emission	+/-	2.34	dB
Emission Bandwidth	+/-	1.53	Hz
The Maximum Output Power Measurement	+/-	1	dB
Peak Power Spectral Density Measurement	+/-	1.53	dB
Frequency Stability	+/-	1.53	Hz
Temperature	+/-	0.4	°C
Humidity	+/-	3.5	%
DC / AC Power Source	+/-	1	%

Radiated Spurious Emission Measurement Uncertainty				
Polarization: Vertical	**+/-**	**2.64**	**dB**	9kHz~30MHz
	+/-	**4.93**	**dB**	30MHz - 1000MHz
	+/-	**4.81**	**dB**	1GHz - 18GHz
	+/-	**4.52**	**dB**	18GHz - 40GHz
Polarization: Horizontal	**+/-**	**2.64**	**dB**	9kHz~30MHz
	+/-	**4.45**	**dB**	30MHz - 1000MHz
	+/-	**4.81**	**dB**	1GHz - 18GHz
	+/-	**4.52**	**dB**	18GHz - 40GHz

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (dBuV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

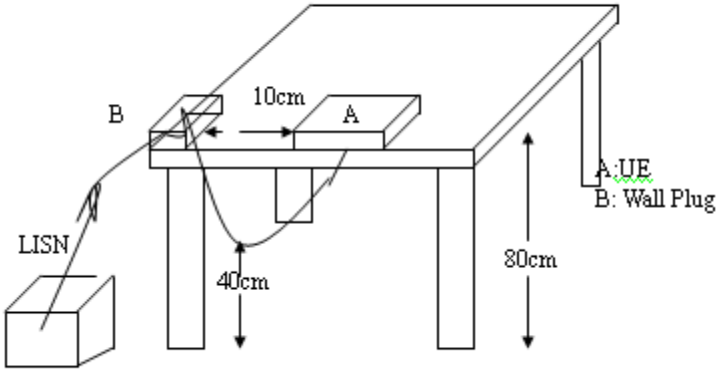
6.2 Measurement Equipment Used

Radiated Emission Test Site: Conduction A					
EQUIPMENT TYPE	**MFR**	**MODEL NUM-BER**	**SERIAL NUM-BER**	**LAST CAL.**	**CAL DUE.**
Test Software	audix	e3	Ver. 6.11-20180419c	N.C.R	N.C.R
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	03/25/2021	03/24/2022
EMI Test Receiver	R&S	ESCI	101342	04/27/2021	04/26/2022
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2021	03/26/2022
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2021	03/26/2022

6.3 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

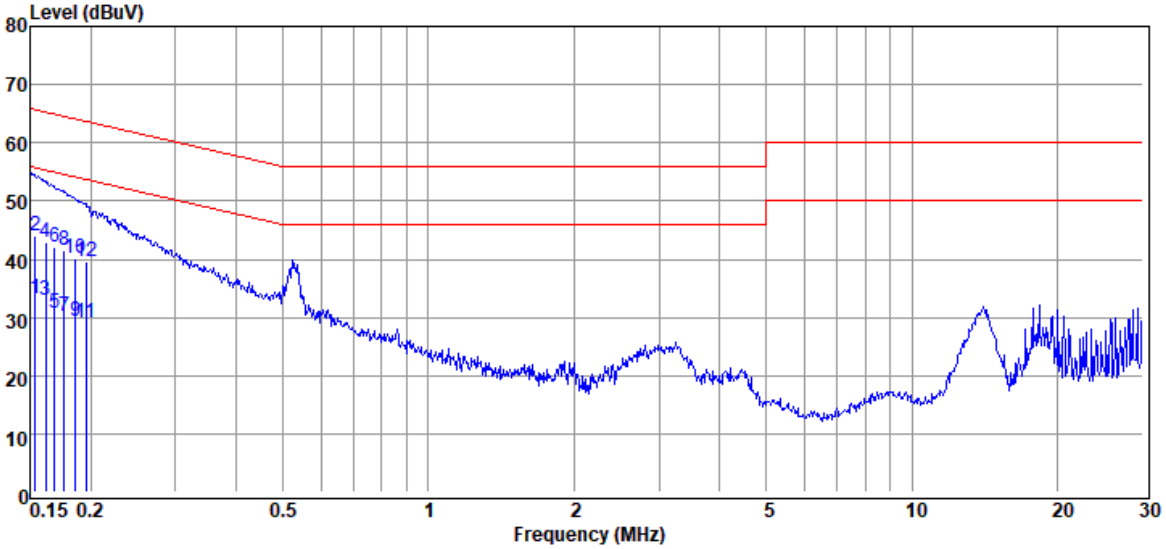
6.6 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit.

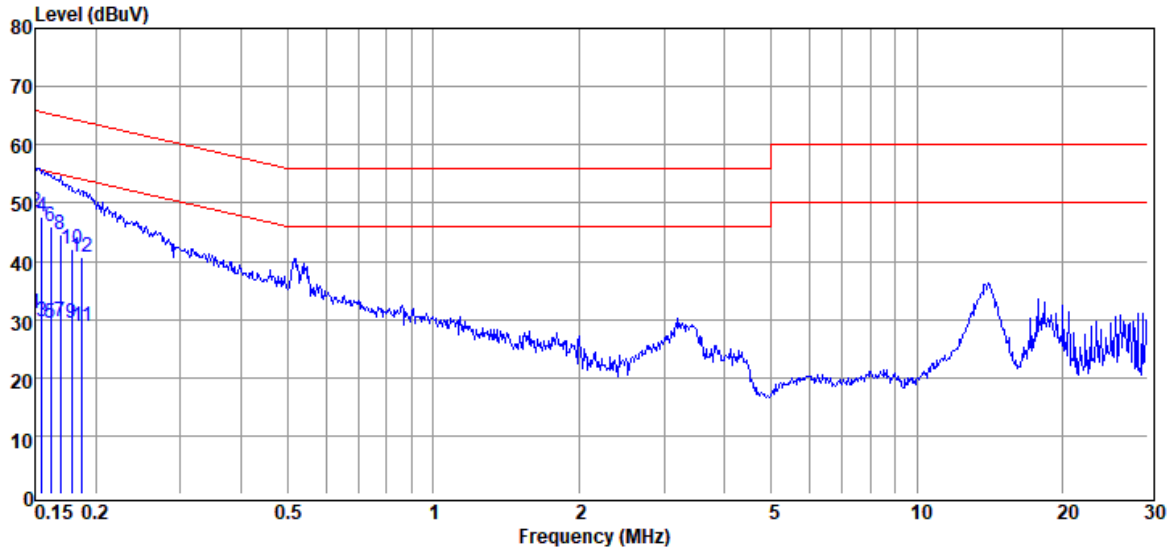
AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number	:E2/2021/60096	Test Site	:Conduction Room C
Test Mode	:WLAN 2.4G	Test Date	:2021-07-09
Power	:120V/60Hz	Temp./Humi.	:25.5/52
Probe	:L1	Engineer	:Ashton Chiu
Note:	: Adapter:FSP040-RHBN3		



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.15	Average	23.13	10.22	33.35	55.78	-22.43
0.15	QP	33.79	10.22	44.01	65.78	-21.77
0.16	Average	22.62	10.22	32.84	55.38	-22.54
0.16	QP	32.73	10.22	42.95	65.38	-22.43
0.17	Average	20.51	10.22	30.73	55.03	-24.30
0.17	QP	31.97	10.22	42.19	65.03	-22.84
0.18	Average	19.92	10.22	30.14	54.64	-24.50
0.18	QP	31.23	10.22	41.45	64.64	-23.19
0.19	Average	19.25	10.22	29.47	54.20	-24.73
0.19	QP	29.96	10.22	40.18	64.20	-24.02
0.20	Average	18.74	10.22	28.96	53.80	-24.84
0.20	QP	29.42	10.22	39.64	63.80	-24.16

Report Number	:E2/2021/60096	Test Site	:Conduction Room C
Test Mode	:WLAN 2.4G	Test Date	:2021-07-09
Power	:120V/60Hz	Temp./Humi.	:25.5/52
Probe	:N	Engineer	:Ashton Chiu
Note:	: Adapter:FSP040-RHBN3		



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.15	Average	20.69	10.31	31.00	55.99	-24.99
0.15	QP	38.00	10.31	48.31	65.99	-17.68
0.15	Average	19.46	10.21	29.67	55.74	-26.07
0.15	QP	37.39	10.31	47.70	65.74	-18.04
0.16	Average	19.26	10.21	29.47	55.38	-25.91
0.16	QP	35.65	10.21	45.86	65.38	-19.52
0.17	Average	19.36	10.21	29.57	54.99	-25.42
0.17	QP	34.48	10.21	44.69	64.99	-20.30
0.18	Average	19.22	10.21	29.43	54.55	-25.12
0.18	QP	31.92	10.21	42.13	64.55	-22.42
0.19	Average	18.62	10.21	28.83	54.15	-25.32
0.19	QP	30.51	10.21	40.72	64.15	-23.43

7 DUTY CYCLE OF TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

7.1 Measurement Procedure:

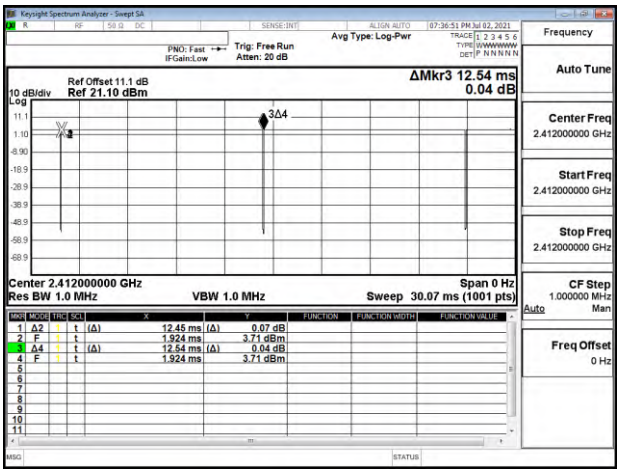
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

7.2 Duty Cycle:

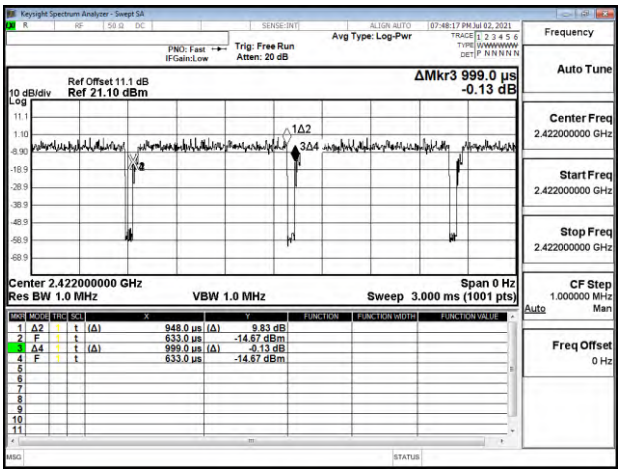
	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b	99.28	0.03	0.08	0.01
802.11g	97.86	0.09	0.49	1.00
802.11n_20	97.44	0.11	0.52	1.00
802.11n_40	94.89	0.23	1.05	2.00

7.3 Duty Cycle test plots

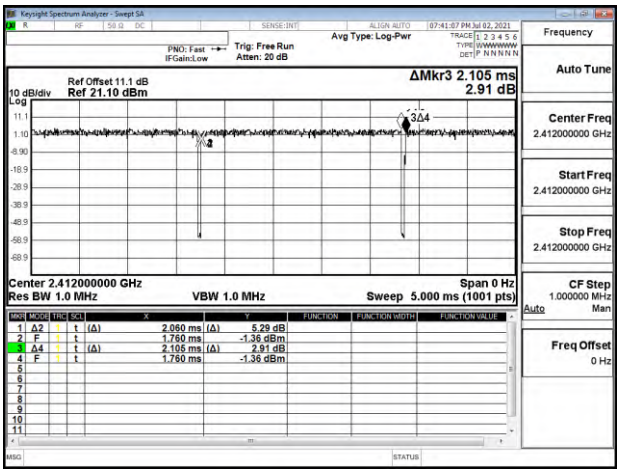
802.11b_20MHz_Chain0_2412MHz



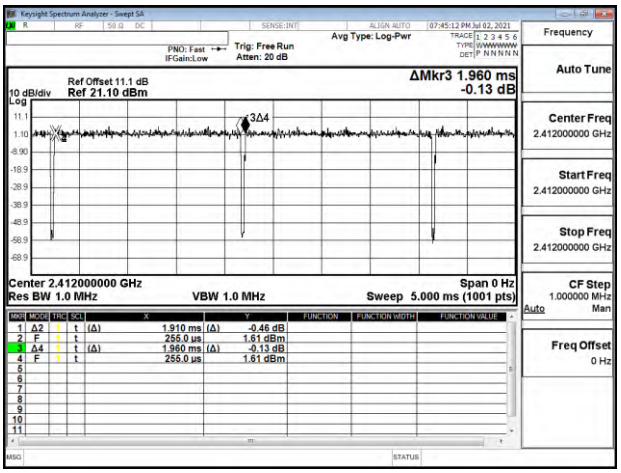
802.11n_40MHz_Chain0_2422MHz



802.11g_20MHz_Chain0_2412MHz



802.11n_20MHz_Chain0_2412MHz



8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt and the e.i.r.p. shall not exceed 4 W.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power form the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

Note:

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

- $$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

NSS = the number of independent spatial streams of data;

NANT = the total number of antennas

$g_{j,k} = 10^{Gk/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

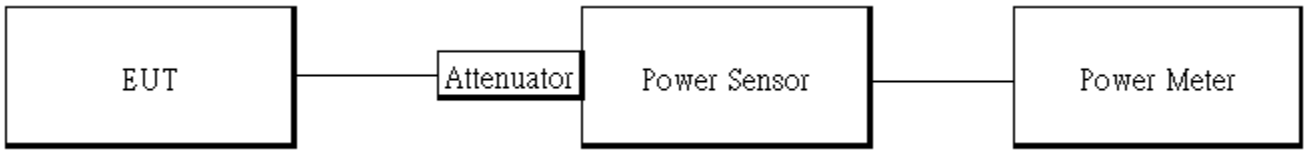
The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

8.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021
DC Block	PASTER-NACK	PE8210	RF152	11/19/2020	11/18/2021
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

8.3 Test Set-up

Power Meter:



8.4 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

   Power Meter:

   It is used as the auxiliary test equipment to conduct the output power measurement.
4. Record the max. Reading as observed from Spectrum or Power Meter.

**** Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.***

8.5 Measurement Result

802.11b Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	15.5	**18.21**	30.00	PASS
6	2437	1	15.5	18.05	30.00	PASS
11	2462	1	15.5	18.01	30.00	PASS
802.11b Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	1	15.5	**15.95**	30.00	PASS
6	2437	1	15.5	15.74	30.00	PASS
11	2462	1	15.5	15.87	30.00	PASS

802.11g Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	13	19.29	30.00	PASS
6	2437	6	14	19.25	30.00	PASS
11	2462	6	14	19.14	30.00	PASS
802.11g Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	6	13	13.91	30.00	PASS
6	2437	6	14	14.91	30.00	PASS
11	2462	6	14	**14.94**	30.00	PASS

802.11n_HT20M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	13.5	20.35	30.00	PASS
2	2417	MCS0	15	20.24	30.00	PASS
6	2437	MCS0	15	20.28	30.00	PASS
11	2462	MCS0	14	20.24	30.00	PASS
802.11n_HT20M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	13.5	13.93	30.00	PASS
2	2417	MCS0	15	15.27	30.00	PASS
6	2437	MCS0	15	15.46	30.00	PASS
11	2462	MCS0	14	14.40	30.00	PASS

802.11n_HT20M Ch1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	13.5	20.03	30.00	PASS
2	2417	MCS0	15	20.02	30.00	PASS
6	2437	MCS0	15	20.01	30.00	PASS
11	2462	MCS0	14	19.97	30.00	PASS
802.11n_HT20M Ch1						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	13.5	13.76	30.00	PASS
2	2417	MCS0	15	15.22	30.00	PASS
6	2437	MCS0	15	15.08	30.00	PASS
11	2462	MCS0	14	14.25	30.00	PASS

802.11n_HT20M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
1	2412	MCS8	15	20.27	19.94	**23.12**	30.00	PASS
2	2417	MCS8	15	20.03	19.86	22.96	30.00	PASS
6	2437	MCS8	15	20.21	18.92	22.62	30.00	PASS
11	2462	MCS8	14	20.19	19.87	23.04	30.00	PASS
802.11n_HT20M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
1	2412	MCS8	15	15.41	14.90	**18.29**	30.00	PASS
2	2417	MCS8	15	15.14	14.94	18.16	30.00	PASS
6	2437	MCS8	15	15.21	14.93	18.20	30.00	PASS
11	2462	MCS8	14	14.52	14.17	17.47	30.00	PASS

802.11n_HT40M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12	20.72	30.00	PASS
4	2427	MCS0	13	20.60	30.00	PASS
5	2432	MCS0	14	20.41	30.00	PASS
6	2437	MCS0	14	20.37	30.00	PASS
7	2442	MCS0	14	20.24	30.00	PASS
8	2447	MCS0	13	20.34	30.00	PASS
9	2452	MCS0	12	20.58	30.00	PASS
802.11n_HT40M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12	12.35	30.00	PASS
4	2427	MCS0	13	13.04	30.00	PASS
5	2432	MCS0	14	14.05	30.00	PASS
6	2437	MCS0	14	14.16	30.00	PASS
7	2442	MCS0	14	14.10	30.00	PASS
8	2447	MCS0	13	13.01	30.00	PASS
9	2452	MCS0	12	12.25	30.00	PASS

802.11n_HT40M Ch1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12	20.51	30.00	PASS
4	2427	MCS0	13	20.48	30.00	PASS
5	2432	MCS0	14	20.47	30.00	PASS
6	2437	MCS0	14	20.28	30.00	PASS
7	2442	MCS0	14	20.55	30.00	PASS
8	2447	MCS0	13	20.47	30.00	PASS
9	2452	MCS0	12	20.31	30.00	PASS
802.11n_HT40M Ch1						
CH	Freq. (MHz)	Data Rate	Power set	Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12	12.26	30.00	PASS
4	2427	MCS0	13	12.88	30.00	PASS
5	2432	MCS0	14	14.00	30.00	PASS
6	2437	MCS0	14	14.01	30.00	PASS
7	2442	MCS0	14	14.02	30.00	PASS
8	2447	MCS0	13	12.89	30.00	PASS
9	2452	MCS0	12	12.10	30.00	PASS

802.11n_HT40M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
3	2422	MCS8	12	21.08	20.78	23.94	30.00	PASS
4	2427	MCS8	14.5	20.57	20.72	23.66	30.00	PASS
5	2432	MCS8	14.5	20.74	20.78	23.77	30.00	PASS
6	2437	MCS8	14.5	21.06	21.04	**24.06**	30.00	PASS
7	2442	MCS8	14.5	20.92	20.79	23.87	30.00	PASS
8	2447	MCS8	14.5	20.79	20.72	23.77	30.00	PASS
9	2452	MCS8	12	21.02	20.43	23.75	30.00	PASS
802.11n_HT40M MIMO								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Max. Avg. Output include tune up tolerance Power (dBm)	Limit (dBm)	RESULT
				CH 0	CH 1			
3	2422	MCS8	12	12.31	12.05	15.42	30.00	PASS
4	2427	MCS8	14.5	14.13	14.04	17.32	30.00	PASS
5	2432	MCS8	14.5	14.05	14.10	17.31	30.00	PASS
6	2437	MCS8	14.5	14.14	14.08	**17.35**	30.00	PASS
7	2442	MCS8	14.5	14.03	14.12	17.31	30.00	PASS
8	2447	MCS8	14.5	14.12	14.05	17.32	30.00	PASS
9	2452	MCS8	12	12.28	11.92	15.34	30.00	PASS

**** Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.***

EIRP

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	15.95	0.90	16.85	36	PASS
6	2437	1	15.74	0.90	16.64	36	PASS
11	2462	1	15.87	0.90	16.77	36	PASS

802.11g Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	6	13.91	0.90	14.81	36	PASS
6	2437	6	14.91	0.90	15.81	36	PASS
11	2462	6	14.94	0.90	15.84	36	PASS

802.11n_HT20M Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	13.93	0.90	14.83	36	PASS
6	2437	MCS0	15.46	0.90	16.36	36	PASS
11	2462	MCS0	14.40	0.90	15.30	36	PASS

802.11n_HT20M Ch1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	13.76	2.10	15.86	36	PASS
6	2437	MCS0	15.08	2.10	17.18	36	PASS
11	2462	MCS0	14.25	2.10	16.35	36	PASS

802.11n_HT20M MIMO									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			CH 0	CH 1					
1	2412	MCS8	20.27	19.94	18.29	4.53	**22.82**	36	PASS
2	2417	MCS8	20.03	19.86	18.16	4.53	22.69	36	PASS
6	2437	MCS8	20.21	18.92	18.20	4.53	22.73	36	PASS
11	2462	MCS8	20.19	19.87	17.47	4.53	22.00	36	PASS

802.11n_HT40M Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12.35	0.90	13.25	36	PASS
6	2437	MCS0	14.16	0.90	15.06	36	PASS
9	2452	MCS0	12.25	0.90	13.15	36	PASS

802.11n_HT40M Ch1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12.26	2.10	14.36	36	PASS
6	2437	MCS0	14.01	2.10	16.11	36	PASS
9	2452	MCS0	12.10	2.10	14.20	36	PASS

802.11n_HT40M MIMO									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			CH 0	CH 1					
3	2422	MCS8	12.31	12.05	15.42	4.53	19.95	36	PASS
4	2427	MCS8	14.13	14.04	17.32	4.53	21.85	36	PASS
5	2432	MCS8	14.05	14.10	17.31	4.53	21.84	36	PASS
6	2437	MCS8	14.14	14.08	17.35	4.53	**21.88**	36	PASS
7	2442	MCS8	14.03	14.12	17.31	4.53	21.84	36	PASS
8	2447	MCS8	14.12	14.05	17.32	4.53	21.85	36	PASS
9	2452	MCS8	12.28	11.92	15.34	4.53	19.87	36	PASS

9 EMISSION BANDWIDTH MEASUREMENT

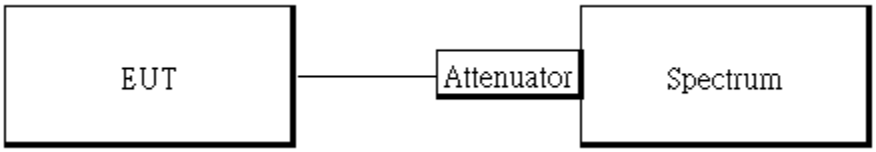
9.1 Standard Applicable

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

9.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	**MFR**	**MODEL NUM-BER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021
DC Block	PASTER-NACK	PE8210	RF152	11/19/2020	11/18/2021
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R
Test Software	SGS Taiwan	Radio Test Soft-ware	Ver.21	N.C.R	N.C.R

9.3 Test Set-up



9.4 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set the spectrum analyzer as
   RBW= 100kHz ,
   VBW = 3 X RBW,
   Span= 2 to 5 times of the OBW,
   Sweep=auto,
   Detector = Peak, and Max hold for -6dB Bandwidth test.
5. Set the spectrum analyzer as
   RBW= 1 % to 5% of 99% Bandwidth ,
   VBW ≥ 3 X RBW,
   Span= large enough to capture all products of the modulation process,
   Sweep=auto,
   Detector = Peak, and Max hold for 99% Bandwidth test.
6. Turn on the 99% bandwidth function, max reading.
7. Repeat above procedures until all test default channel is completed

9.5 6dB Bandwidth

802.11b Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	9047.00	≧ 500	PASS
2437	**9057.00**	≧ 500	PASS
2462	8597.00	≧ 500	PASS

802.11g Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15820.00	≧ 500	PASS
2437	15460.00	≧ 500	PASS
2462	**15970.00**	≧ 500	PASS

802.11_n_HT20 Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16560.00	≧ 500	PASS
2437	15520.00	≧ 500	PASS
2462	**16670.00**	≧ 500	PASS

802.11_n_HT20 Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16280.00	≧ 500	PASS
2437	15430.00	≧ 500	PASS
2462	**16360.00**	≧ 500	PASS

802.11_n_HT40 Ch0

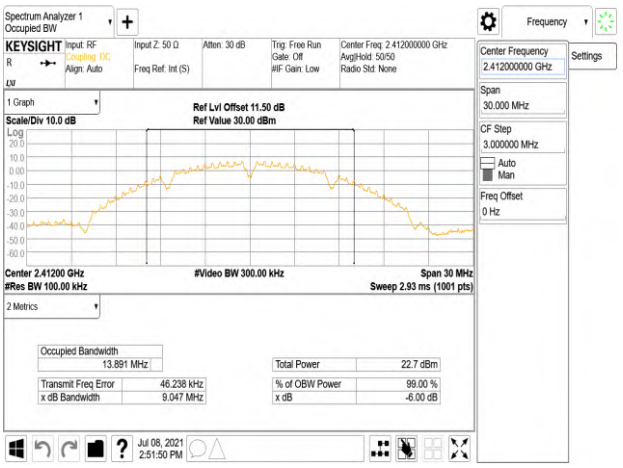
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35350.00	≧ 500	PASS
2437	35180.00	≧ 500	PASS
2452	**35750.00**	≧ 500	PASS

802.11_n_HT40 Ch1

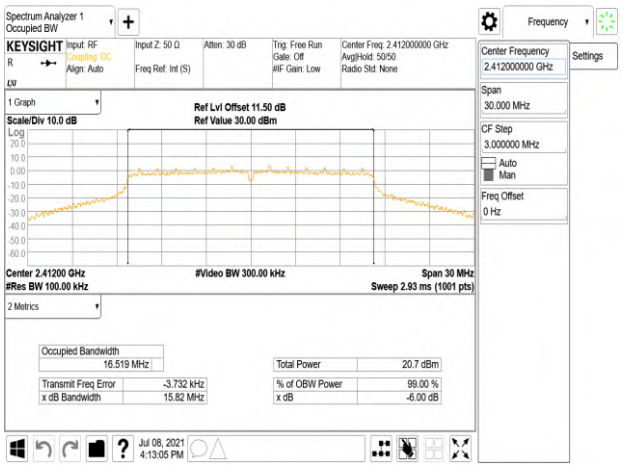
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35180.00	≧ 500	PASS
2437	**35530.00**	≧ 500	PASS
2452	35460.00	≧ 500	PASS

**Refer to next page for plots*

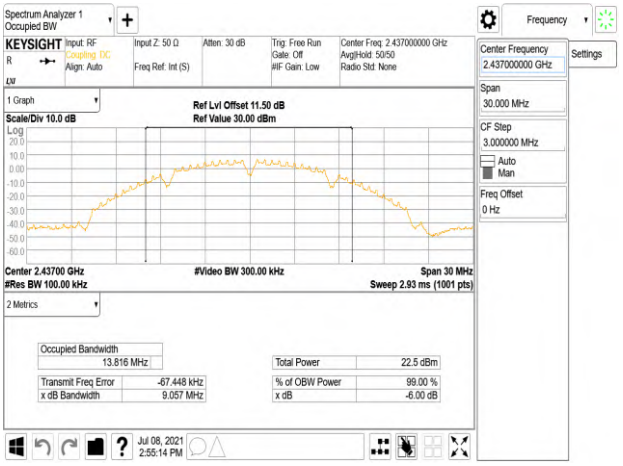
802.11b_20MHz_Chain0_2412MHz



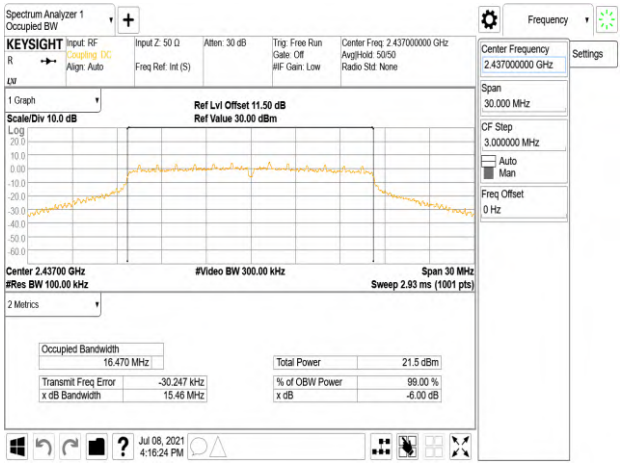
802.11g_20MHz_Chain0_2412MHz



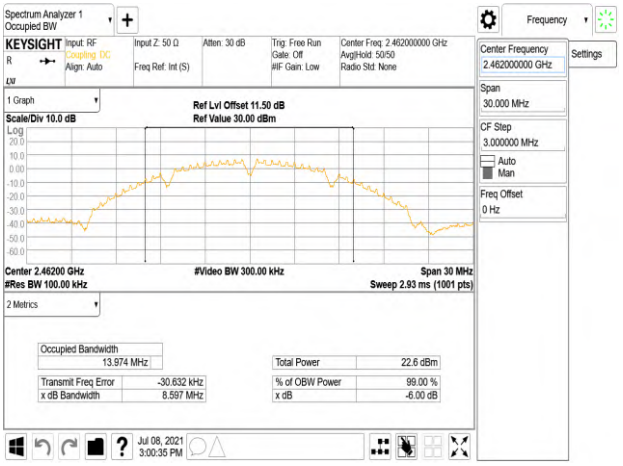
802.11b_20MHz_Chain0_2437MHz



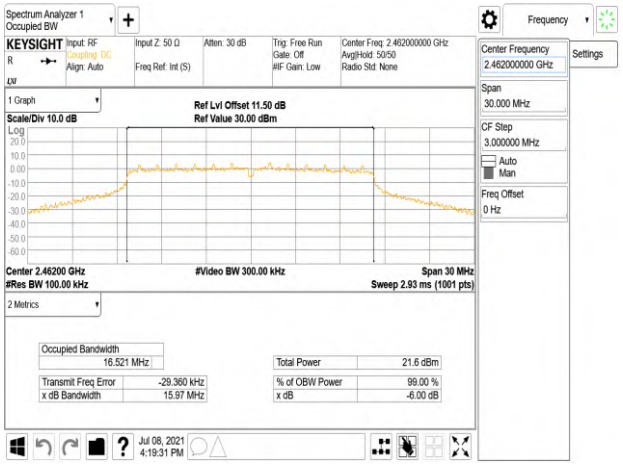
802.11g_20MHz_Chain0_2437MHz



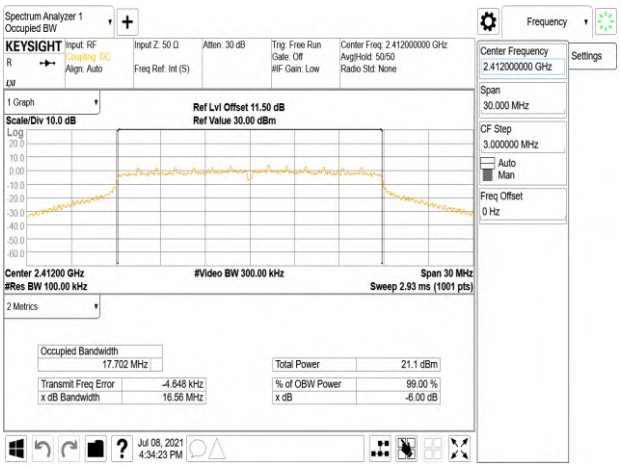
802.11b_20MHz_Chain0_2462MHz



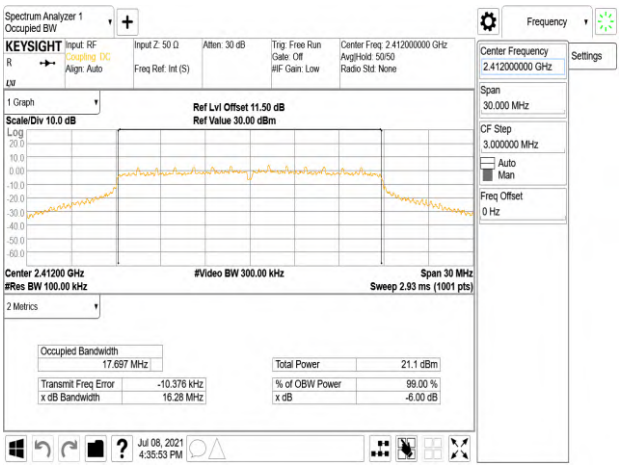
802.11g_20MHz_Chain0_2462MHz



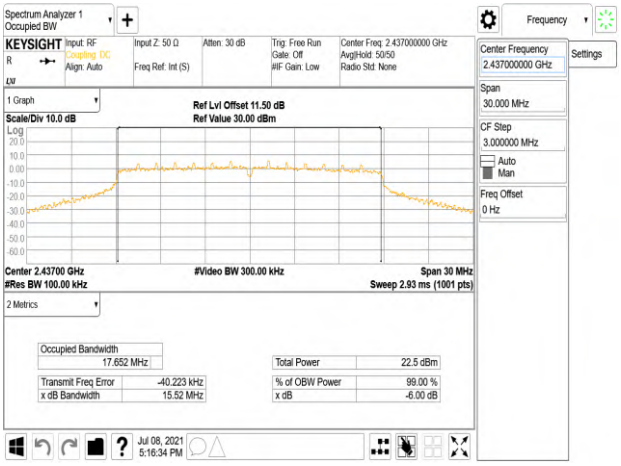
802.11n_20MHz_Chain0_2412MHz



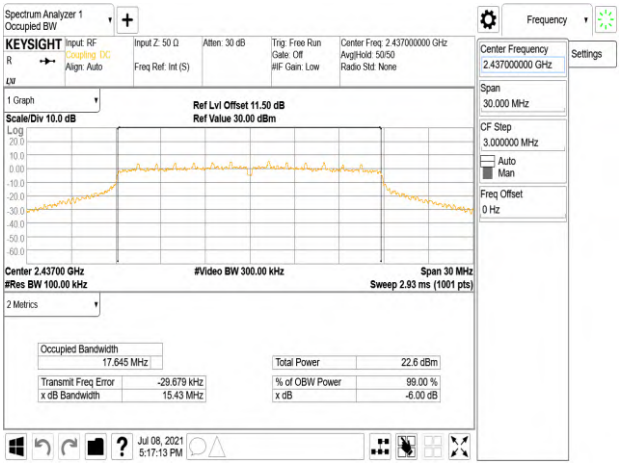
802.11n_20MHz_Chain1_2412MHz



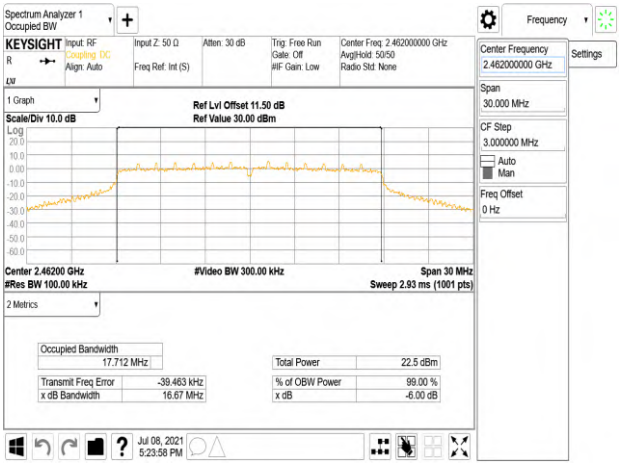
802.11n_20MHz_Chain0_2437MHz



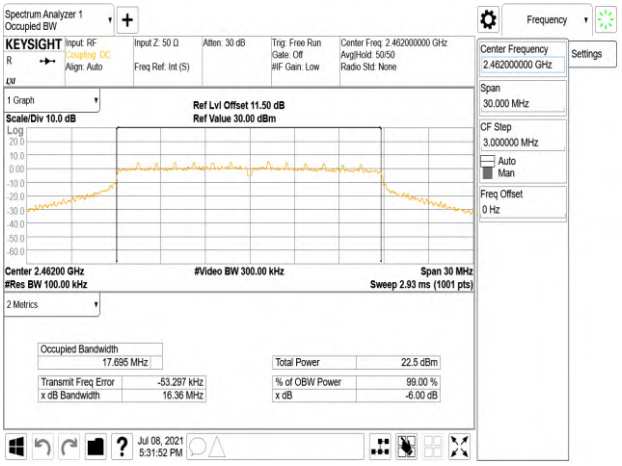
802.11n_20MHz_Chain1_2437MHz



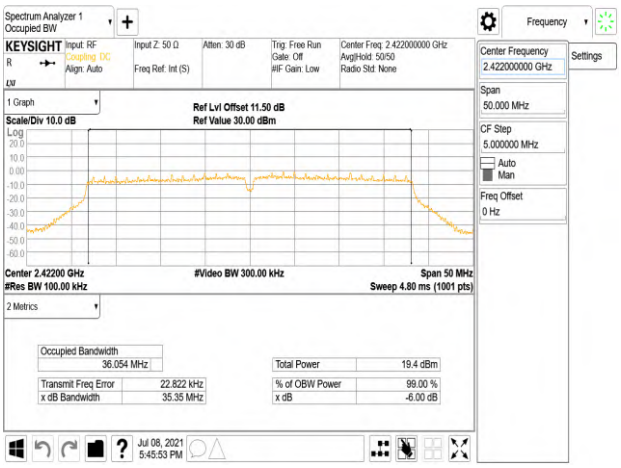
802.11n_20MHz_Chain0_2462MHz



802.11n_20MHz_Chain1_2462MHz

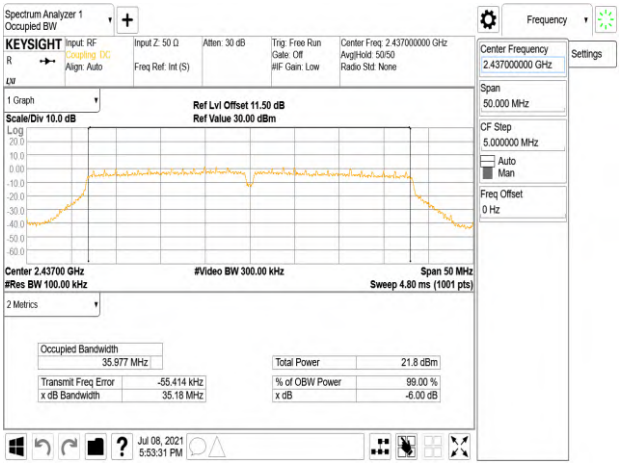


802.11n_40MHz_Chain0_2422MHz

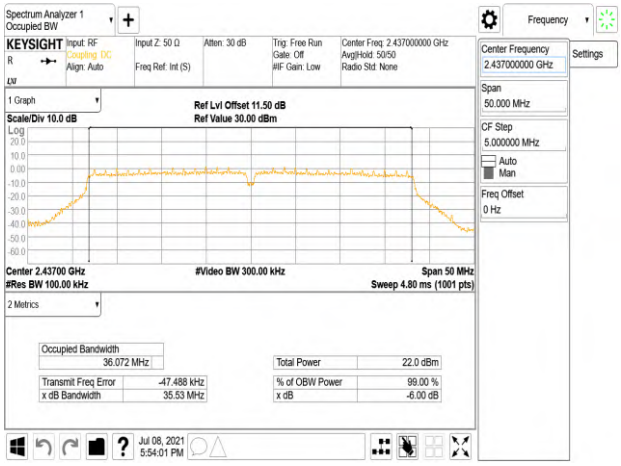


802.11n_40MHz_Chain1_2422MHz

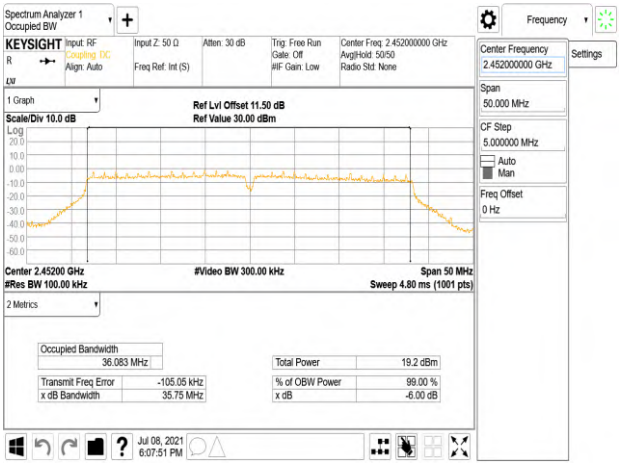
802.11n_40MHz_Chain0_2437MHz



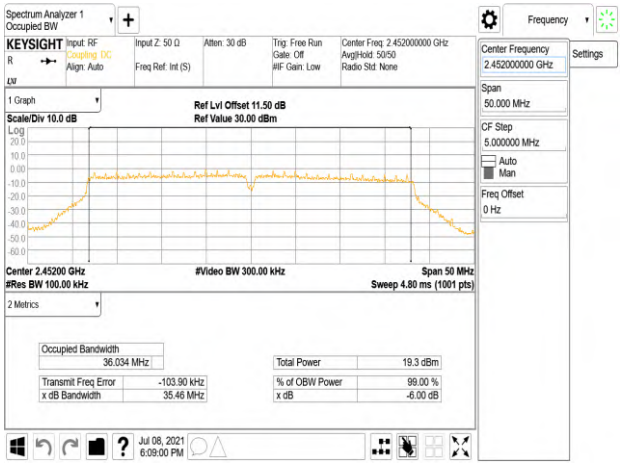
802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz



9.6 99% Bandwidth

802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	13.911
2437	13.83
2462	**14**

802.11g Ch0

Freq. (MHz)	99% BW (MHz)
2412	16.85
2437	16.745
2462	**16.881**

802.11n_HT20M Ch0

Freq. (MHz)	99% BW (MHz)
2412	18.032
2437	17.907
2462	**18.054**

802.11n_HT20M Ch1

Freq. (MHz)	99% BW (MHz)
2412	17.941
2437	17.877
2462	**17.963**

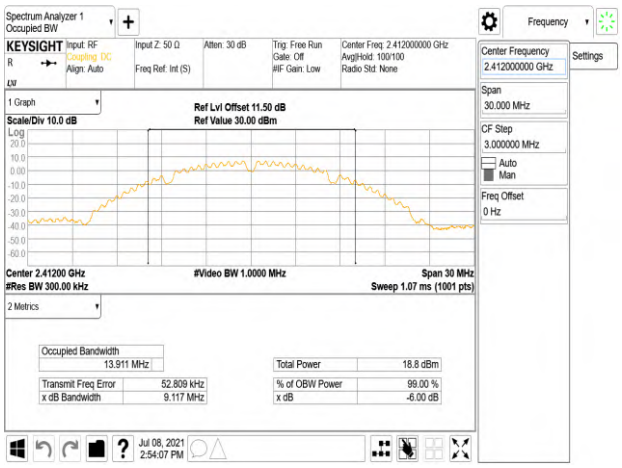
802.11n_HT40M Ch0

Freq. (MHz)	99% BW (MHz)
2422	36.258
2437	36.155
2452	**36.298**

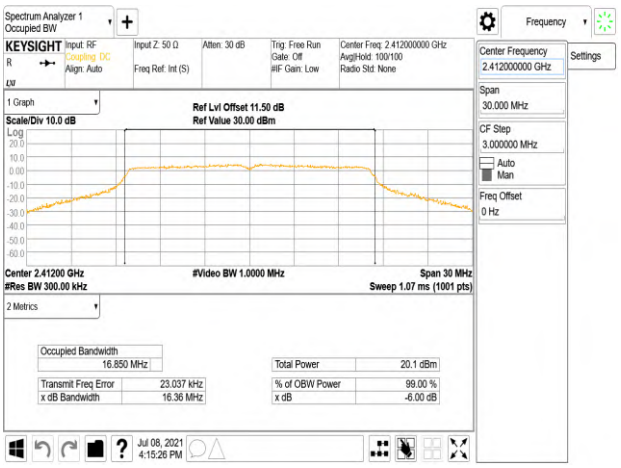
802.11n_HT40M Ch1

Freq. (MHz)	99% BW (MHz)
2422	**36.237**
2437	36.221
2452	36.196

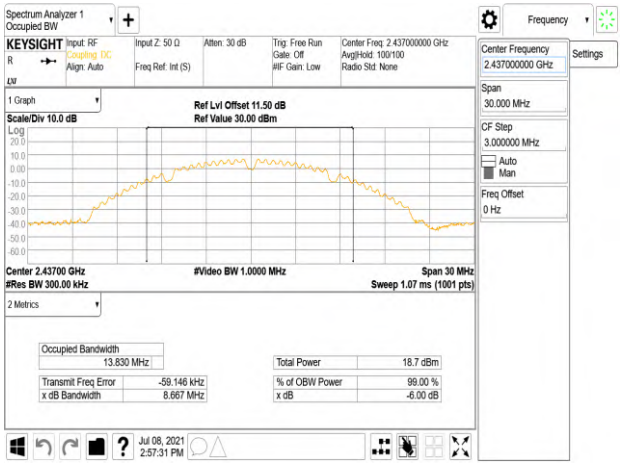
802.11b_20MHz_Chain0_2412MHz



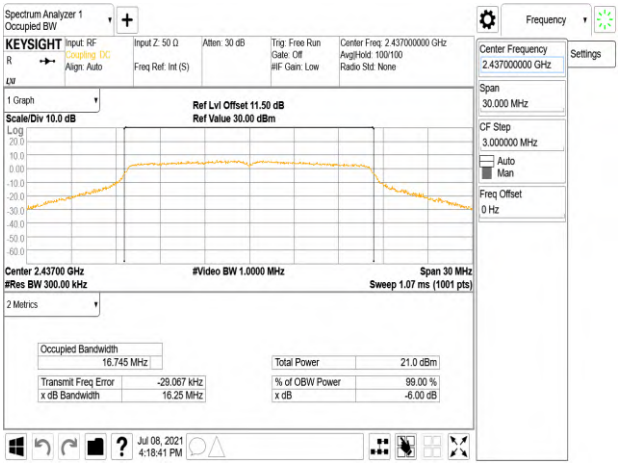
802.11g_20MHz_Chain0_2412MHz



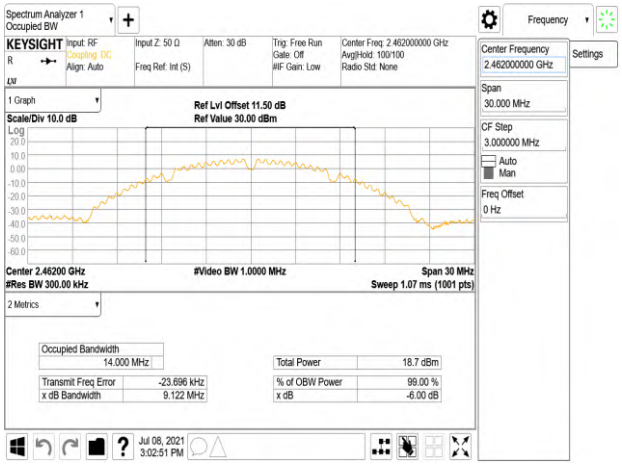
802.11b_20MHz_Chain0_2437MHz



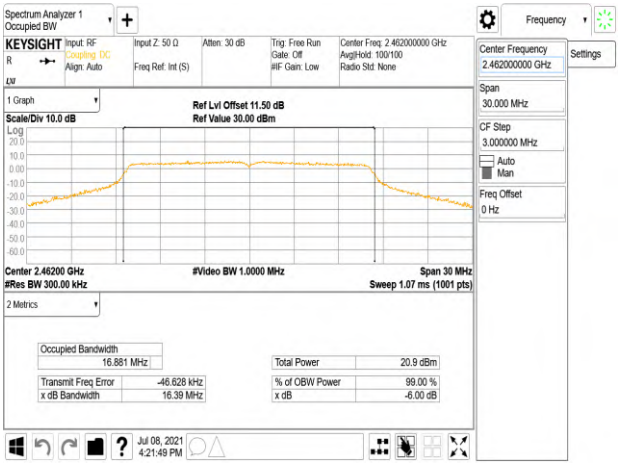
802.11g_20MHz_Chain0_2437MHz



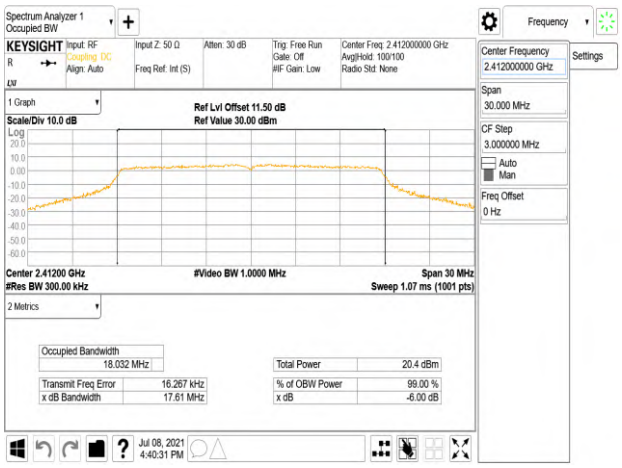
802.11b_20MHz_Chain0_2462MHz



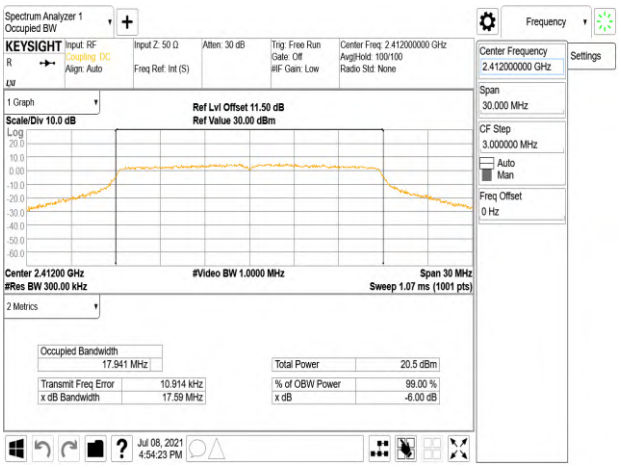
802.11g_20MHz_Chain0_2462MHz



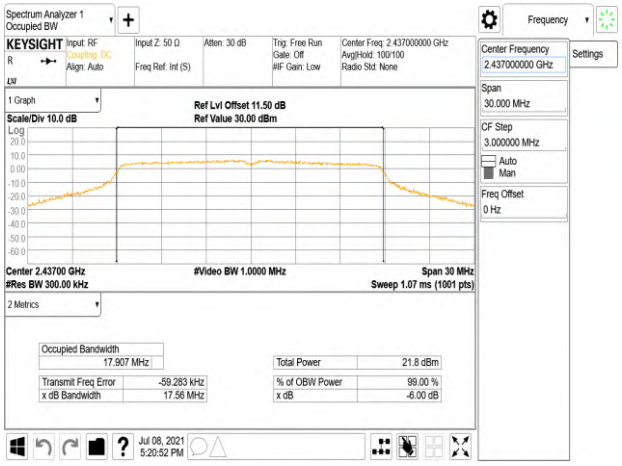
802.11n_20MHz_Chain0_2412MHz



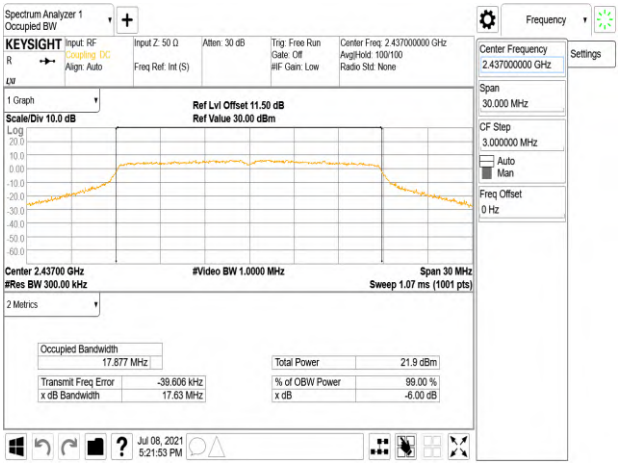
802.11n_20MHz_Chain1_2412MHz



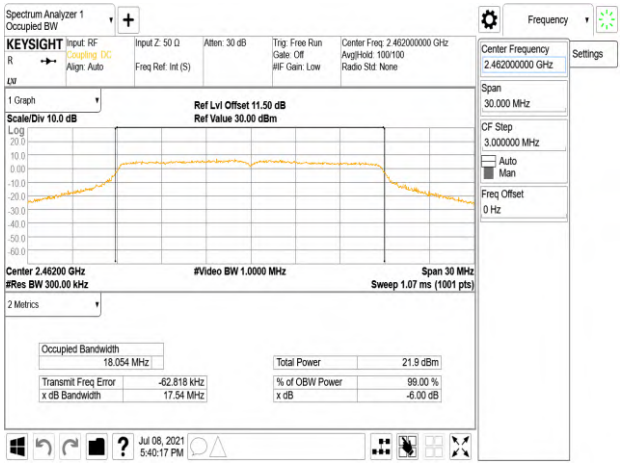
802.11n_20MHz_Chain0_2437MHz



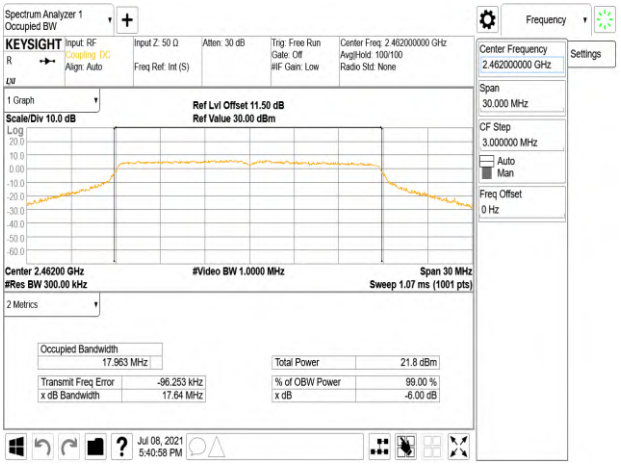
802.11n_20MHz_Chain1_2437MHz



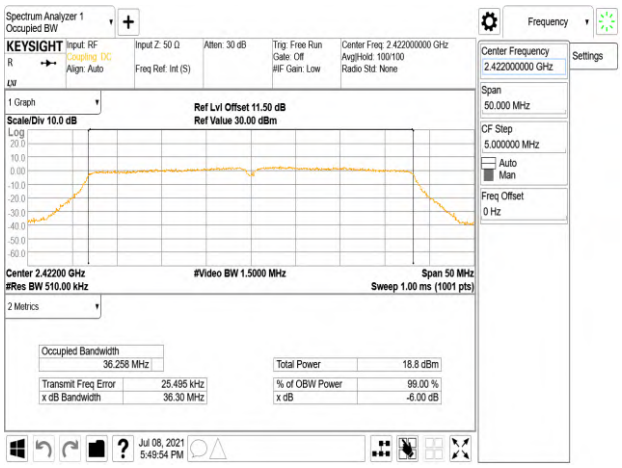
802.11n_20MHz_Chain0_2462MHz



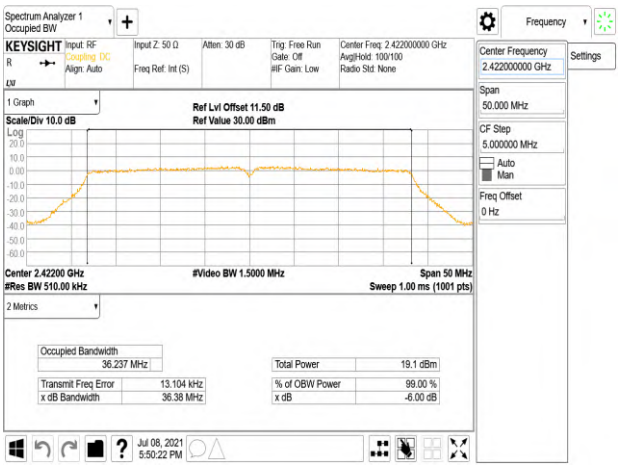
802.11n_20MHz_Chain1_2462MHz



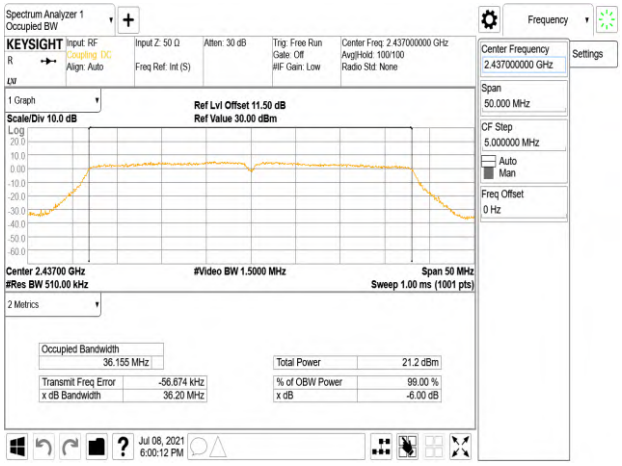
802.11n_40MHz_Chain0_2422MHz



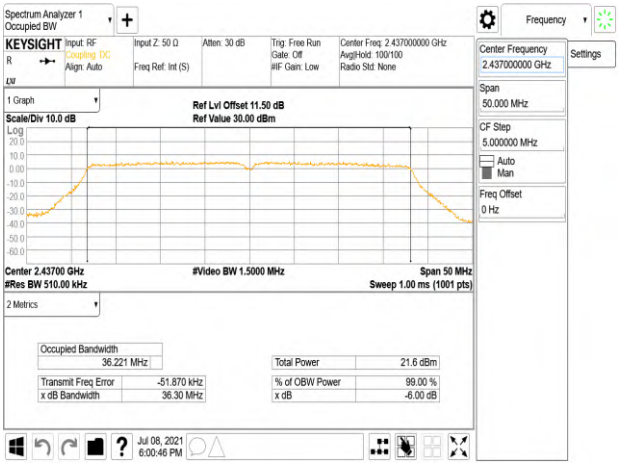
802.11n_40MHz_Chain1_2422MHz



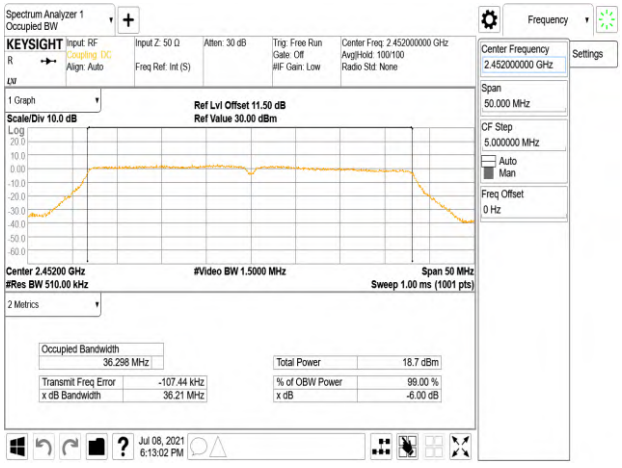
802.11n_40MHz_Chain0_2437MHz



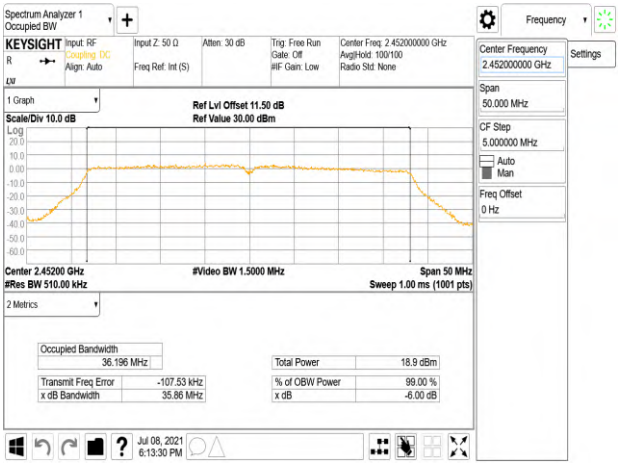
802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz



10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

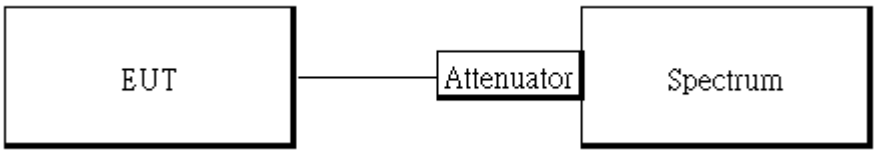
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the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

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.9.

10.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021
DC Block	PASTER-NACK	PE8210	RF152	11/19/2020	11/18/2021
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

10.3 Test SET-UP



10.4 Measurement Procedure

Reference Level of Emission Limit:

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 100kHz & VBW = 300 kHz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Conducted Band Edge:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
6. Mark the highest reading of the emission as the reference level measurement.
7. Set DL as the limit = reading on marker of reference level measurement – 20dBm
8. Mark the highest readings of the emissions outside of 2400MHz~2483.5MHz.
9. Repeat above procedures until all default test channel (low, middle, and high) was complete.
10. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Repeat above procedures until all default test channel measured were complete.
7. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Note:

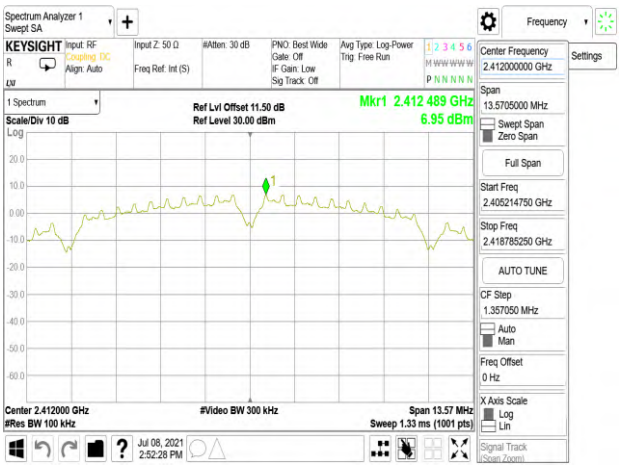
For test of MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome.

10.5 Measurement Result

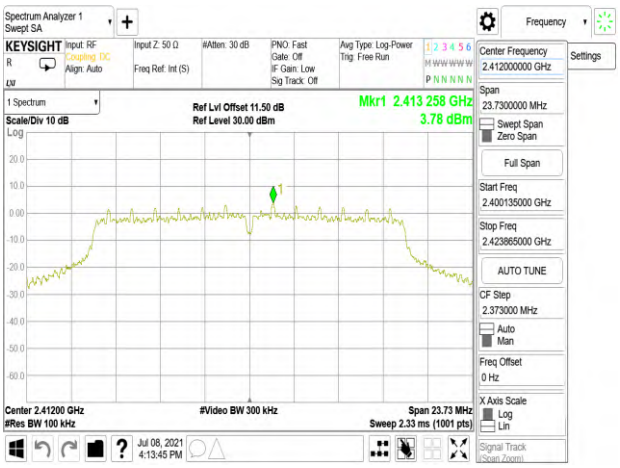
Reference Level of Limit 802.11b mode			Reference Level of Limit 802.11g mode		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	6.95	-13.05	2412	3.78	-16.22
2437	6.75	-13.25	2437	4.37	-15.63
2462	6.91	-13.09	2462	4.50	-15.50

Reference Level of Limit 802.11n20 mode			Reference Level of Limit 802.11n40 MODE		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	7.00	-13.00	2422	2.133	-17.87
2437	8.81	-11.19	2437	4.24	-15.76
2462	8.73	-11.27	2452	1.759	-18.24

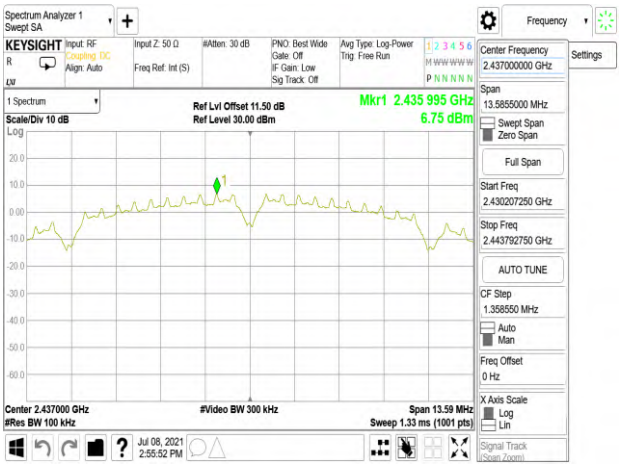
Reference_Level 802.11b_20MHz_Chain0_2412MHz



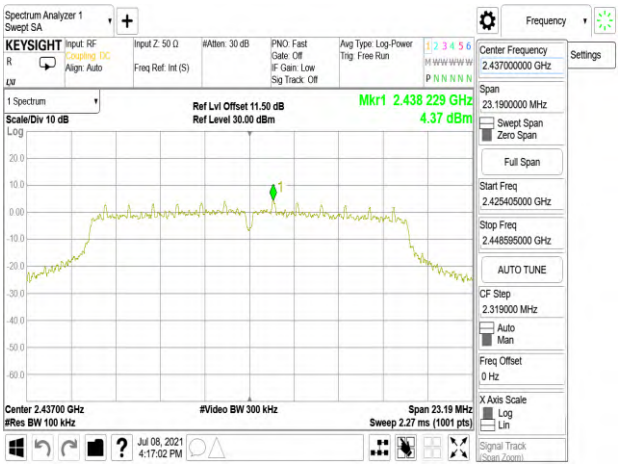
802.11g_20MHz_Chain0_2412MHz



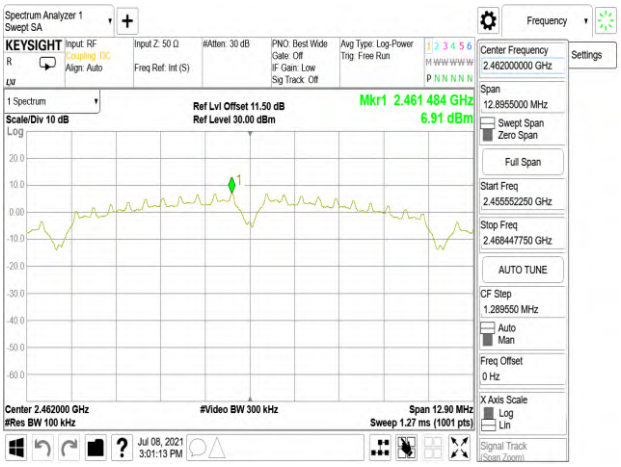
802.11b_20MHz_Chain0_2437MHz



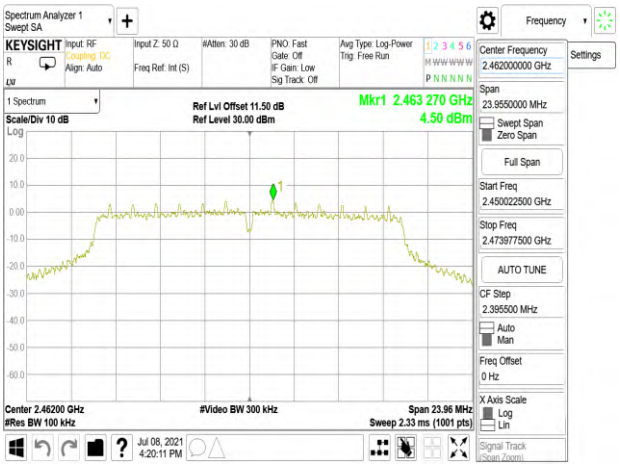
802.11g_20MHz_Chain0_2437MHz



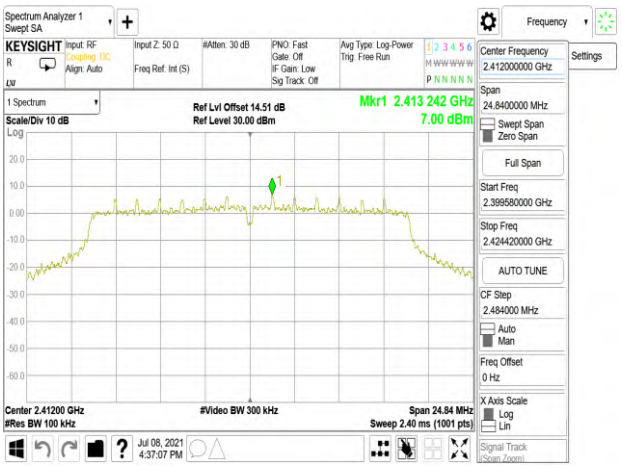
802.11b_20MHz_Chain0_2462MHz



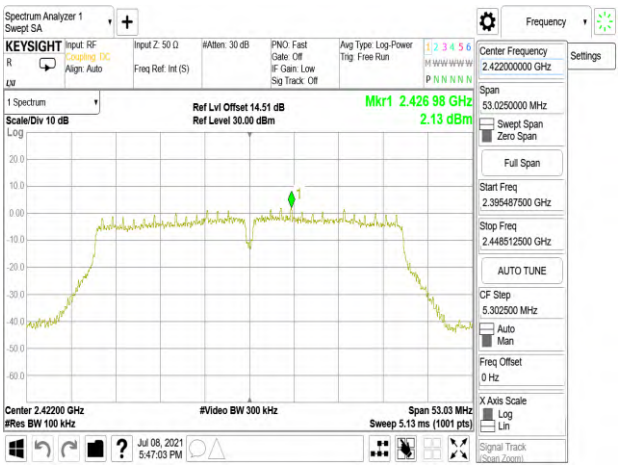
802.11g_20MHz_Chain0_2462MHz



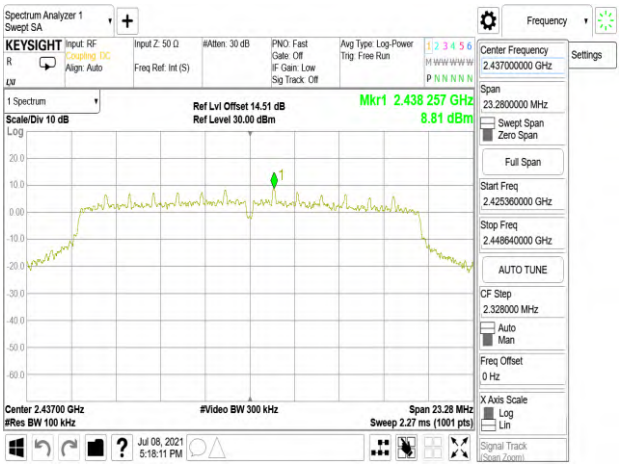
802.11n_20MHz_Chain0_2412MHz



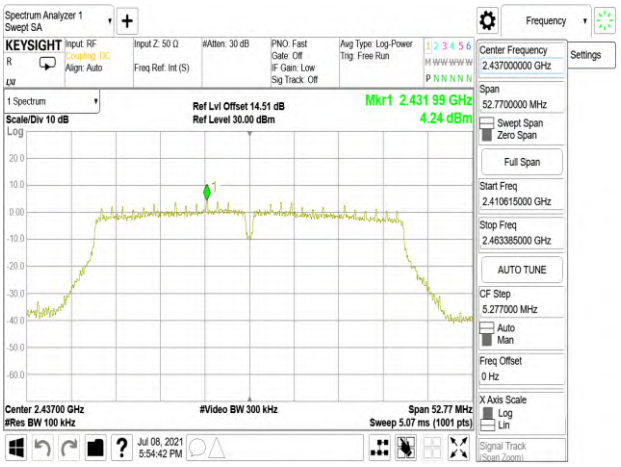
802.11n_40MHz_Chain0_2422MHz



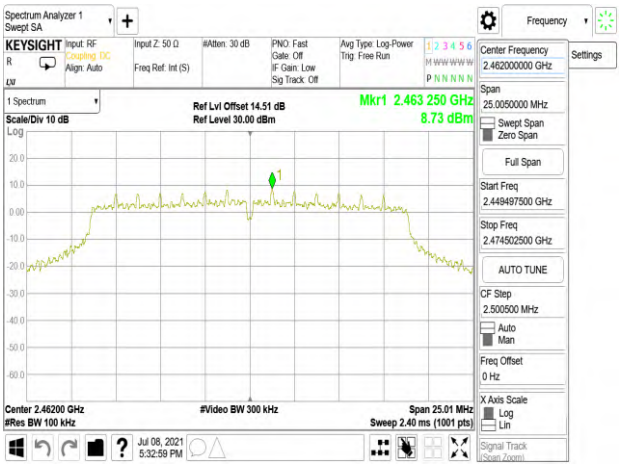
802.11n_20MHz_Chain0_2437MHz



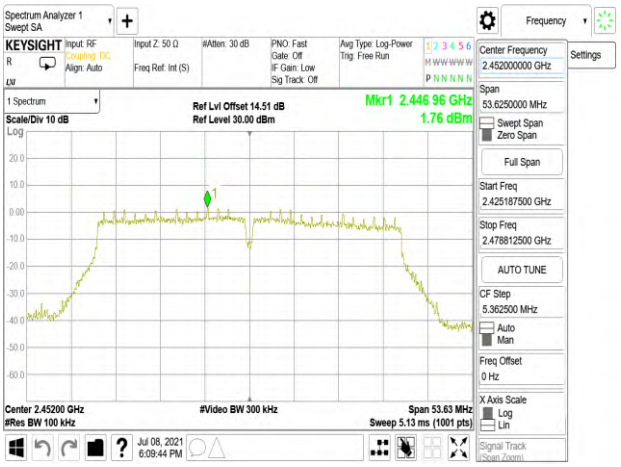
802.11n_40MHz_Chain0_2437MHz



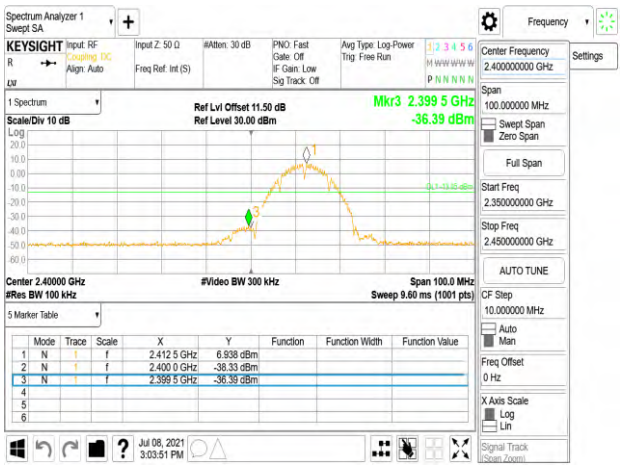
802.11n_20MHz_Chain0_2462MHz



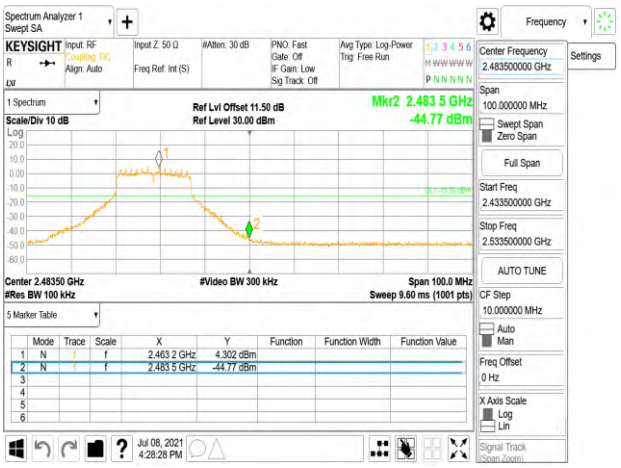
802.11n_40MHz_Chain0_2452MHz



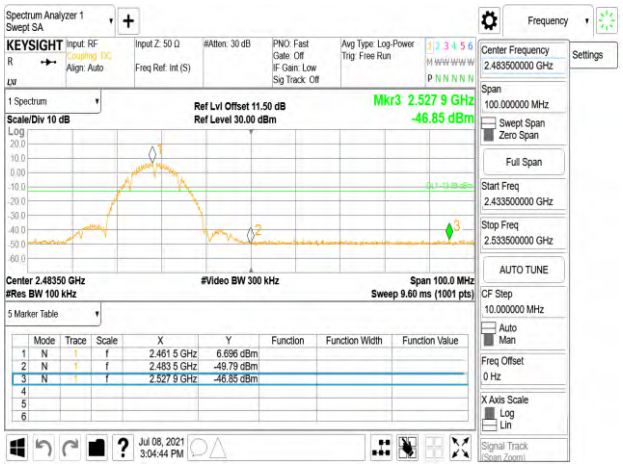
Band_Edge 802.11b_20MHz_Chain0_2412MHz



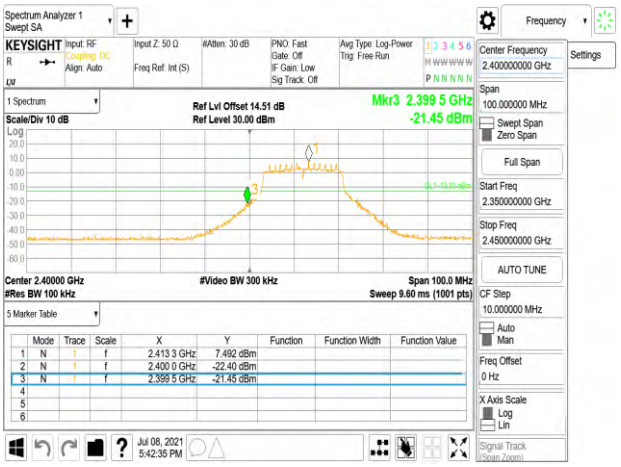
802.11g_20MHz_Chain0_2462MHz



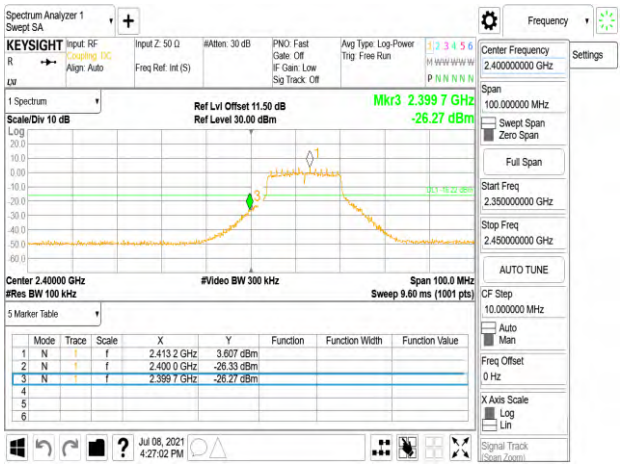
802.11b_20MHz_Chain0_2462MHz



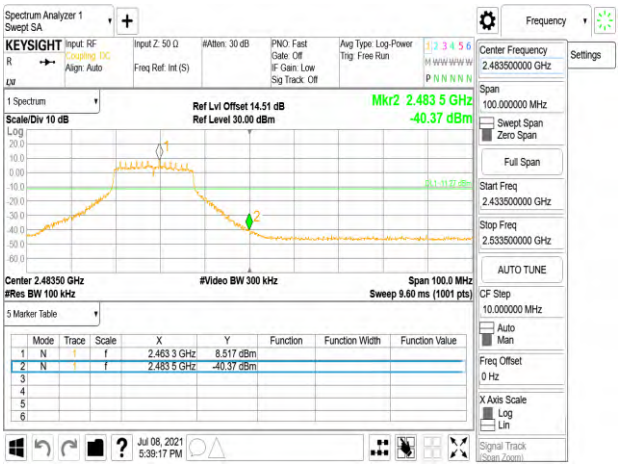
802.11n_20MHz_Chain0_2412MHz



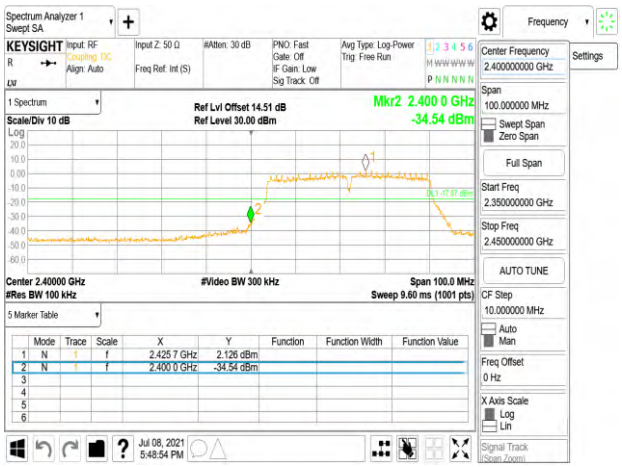
802.11g_20MHz_Chain0_2412MHz



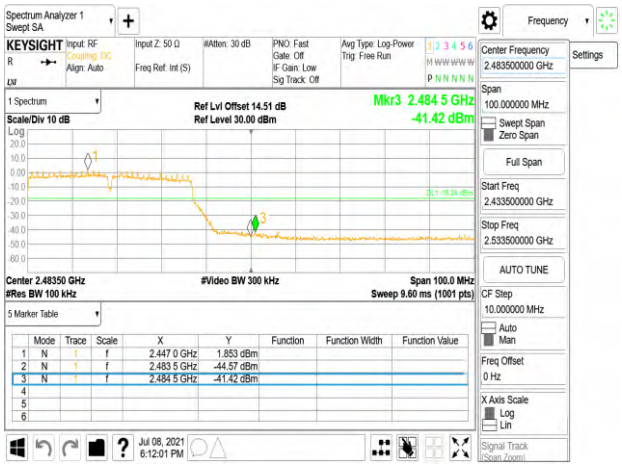
802.11n_20MHz_Chain0_2462MHz



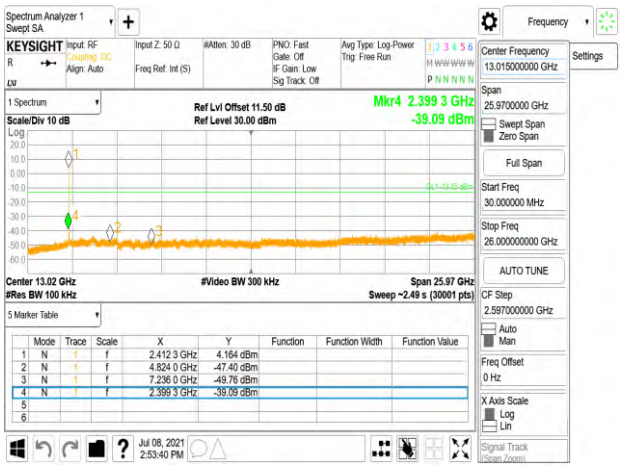
802.11n_40MHz_Chain0_2422MHz



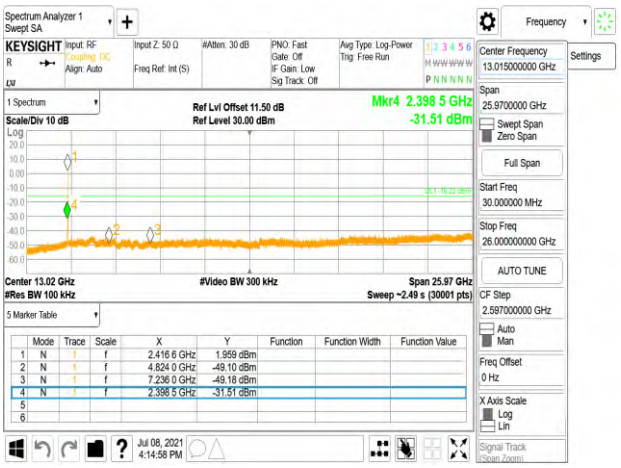
802.11n_40MHz_Chain0_2452MHz



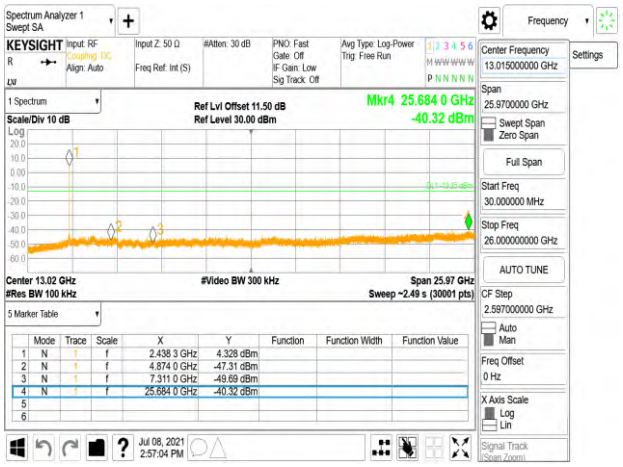
Spurious_Emission 802.11b_20MHz_Chain0_2412MHz



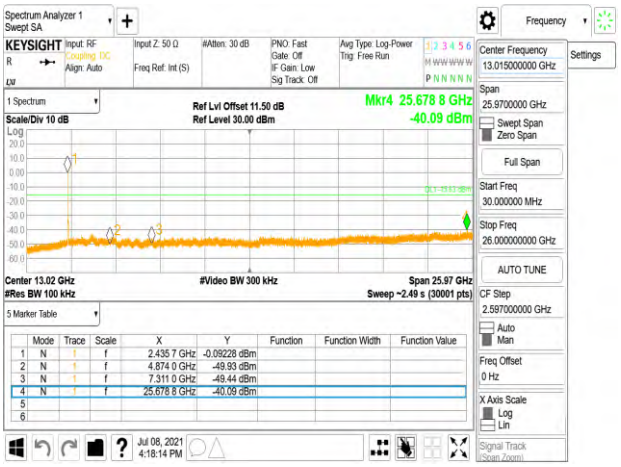
802.11g_20MHz_Chain0_2412MHz



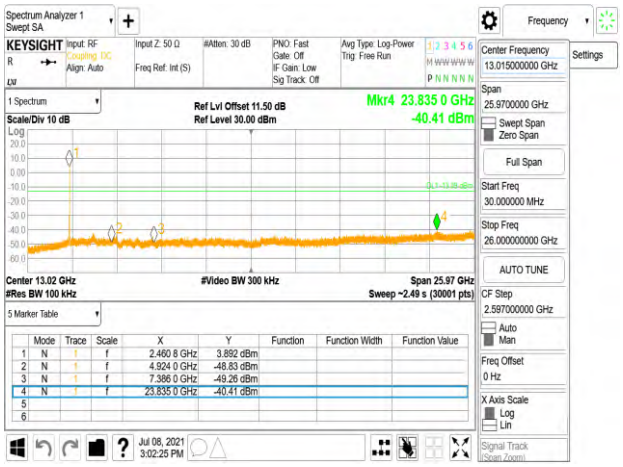
802.11b_20MHz_Chain0_2437MHz



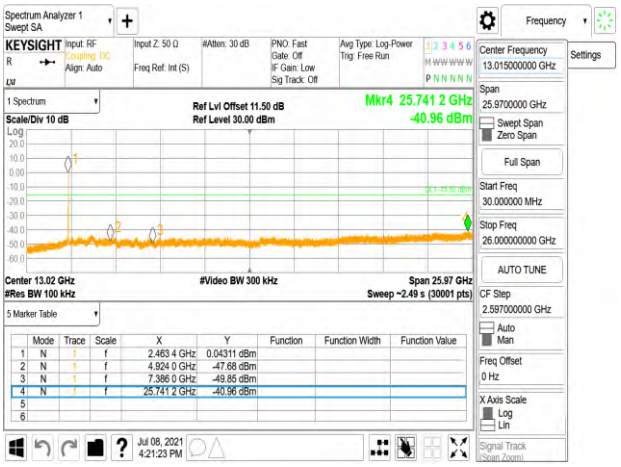
802.11g_20MHz_Chain0_2437MHz



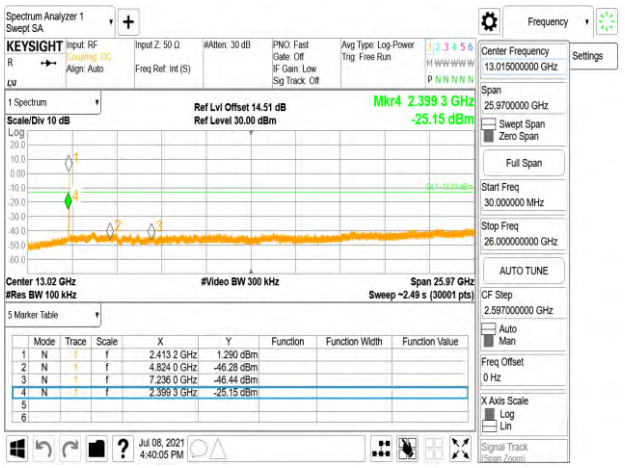
802.11b_20MHz_Chain0_2462MHz



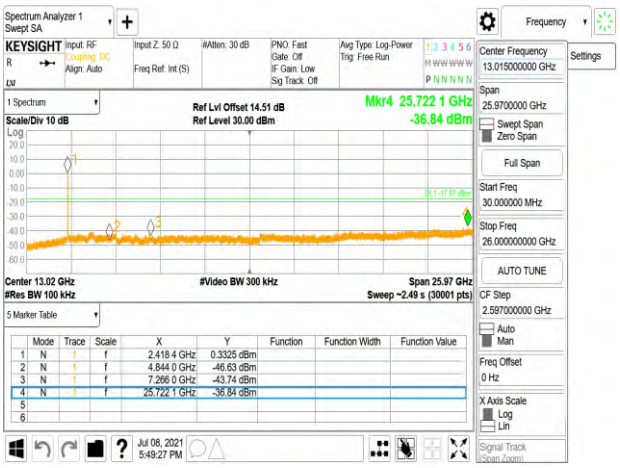
802.11g_20MHz_Chain0_2462MHz



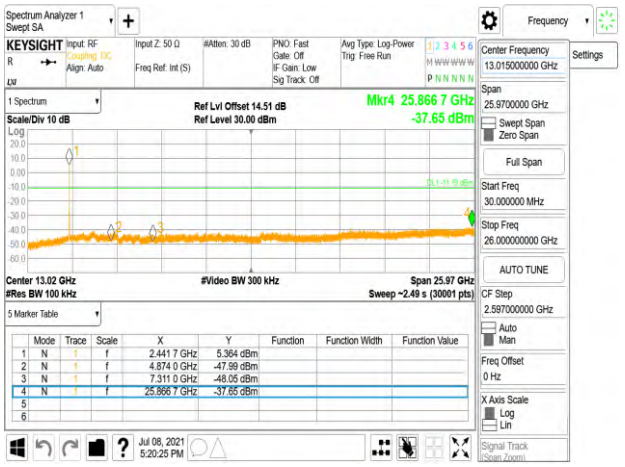
802.11n_20MHz_Chain0_2412MHz



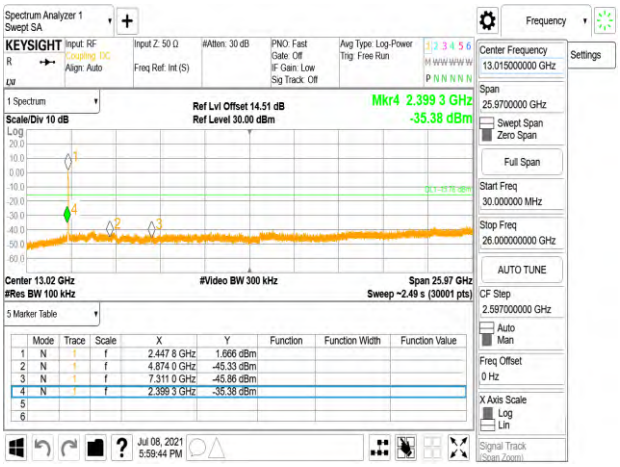
802.11n_40MHz_Chain0_2422MHz



802.11n_20MHz_Chain0_2437MHz



802.11n_40MHz_Chain0_2437MHz



802.11n_20MHz_Chain0_2462MHz

802.11n_40MHz_Chain0_2452MHz

11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

11.1 Standard Applicable

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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 and RSS-Gen §8.9 Table 5 and 6 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13.2.a, for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

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

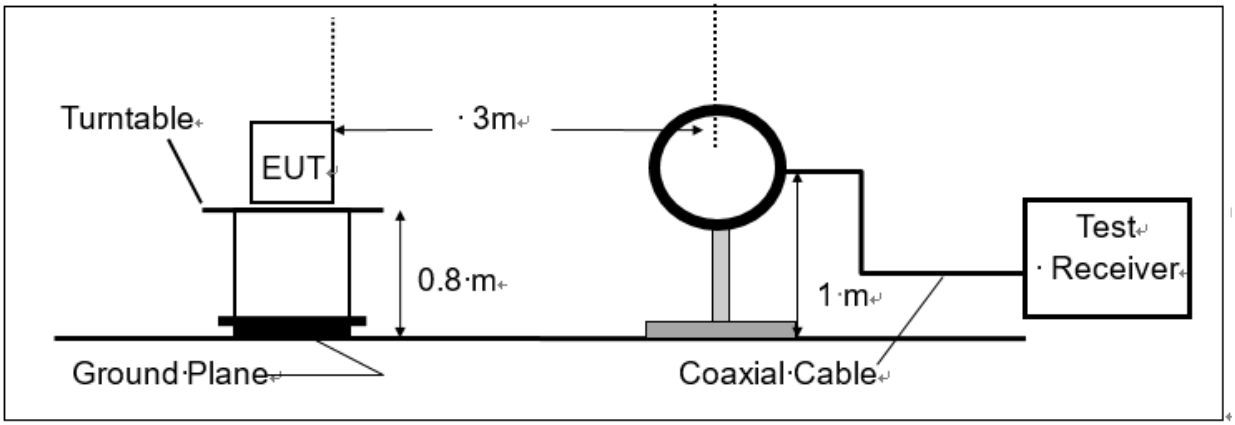
11.2 Measurement Equipment Used:

Radiated Emission Test Site: SAC C					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Broadband Antenna	TESEQ	CBL 6112D	35240	09/08/2020	09/07/2021
Horn Antenna	Schwarzbeck	BBHA9170	185	07/30/2020	07/29/2021
Horn Antenna	Schwarzbeck	BBHA9120D	1187	01/11/2021	01/10/2022
Loop Antenna	ETS.LINDGREN	6502	143303	05/07/2021	05/06/2022
EMI Test Receiver	R&S	ESU 40	100363	04/28/2021	04/27/2022
Pre-Amplifier	EMC Instruments	EMC330	980096	11/19/2020	11/18/2021
Pre-Amplifier	EMC Instruments	EMC0011830	980199	11/19/2020	11/18/2021
Pre-Amplifier	EMC Instruments	EMC184045B	980135	10/27/2020	10/26/2021
Attenuator	Marvelous	WATT-218FS-10	RF20	11/19/2020	11/18/2021
Band Rejection Filter	Micro-Tronics	BRM50701-01	RF201	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	11/19/2020	11/18/2021
Test Software	audix	e3	20923 sgs Ver.9	N.C.R	N.C.R

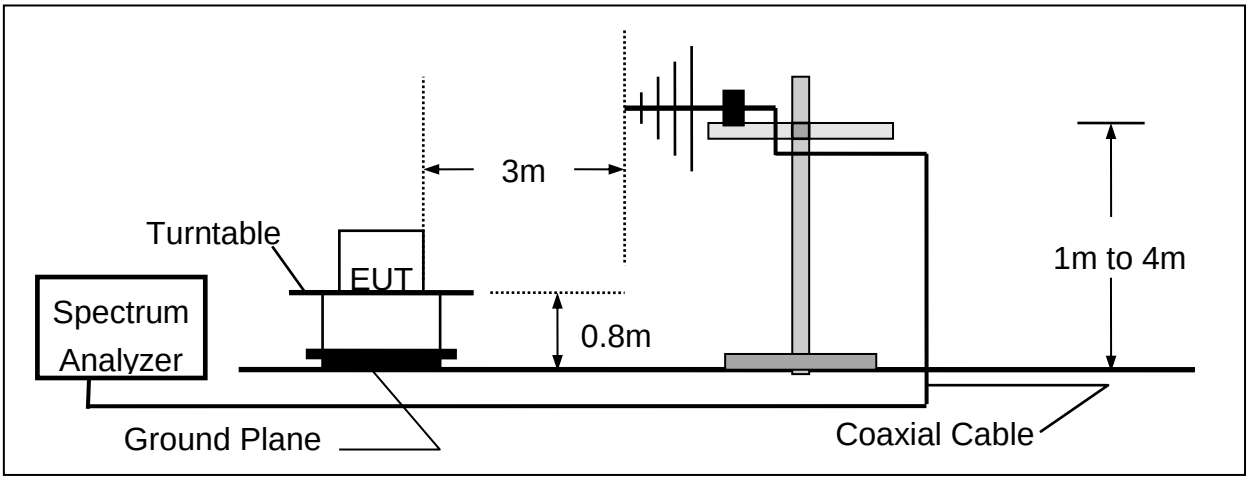
NOTE: N.C.R refers to Not Calibrated Required.

11.3 Test SET-UP

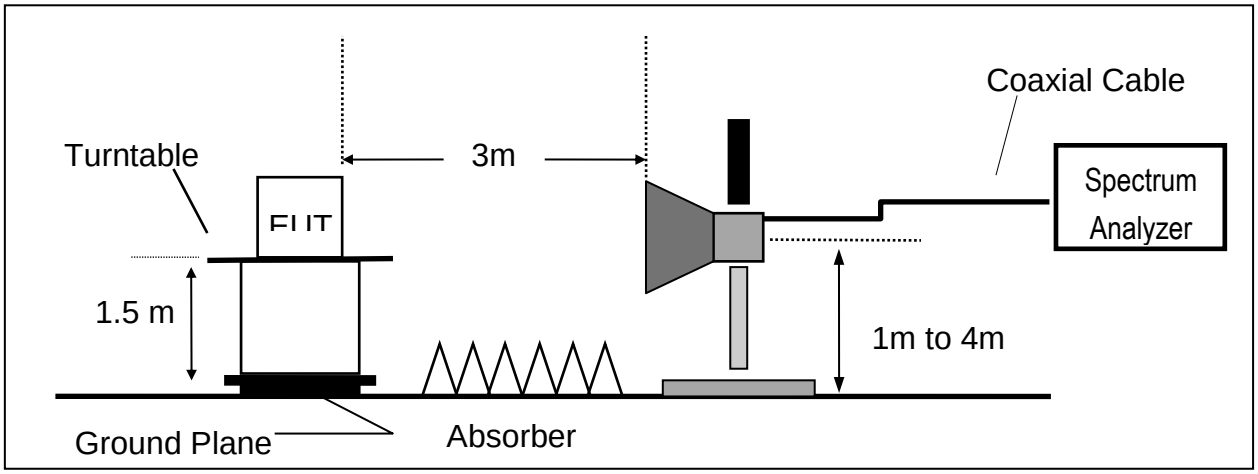
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz



(C) Radiated Emission Test Set-Up, Frequency Above 1GHz



11.4 Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
5. Set the spectrum analyzer as RBW=100 kHz and VBW=300 kHz for Peak Detector (PK) at frequency between 30MHz and 1 GHz.
6. Use receiver mode as RBW=120 kHz for Quasi-peak (QP) at frequency between 30MHz and 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Maximum Emission Measurements at frequency above 1 GHz.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Emission Measurements at frequency above 1 GHz.
9. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.
10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
12. Repeat above procedures until all default test channel measured were complete.

11.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where *FS = Field Strength* *CL = Cable Attenuation Factor (Cable Loss)*

RA = Reading Amplitude *AG = Amplifier Gain*

AF = Antenna Factor

*The limit of the emission level is expressed in dBuV/m, which converts 20*log(uV/m)*

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

11.6 Test Results of Radiated Spurious Emissions from 9 kHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) & RSS-GEN §6.13.2 was not reported.

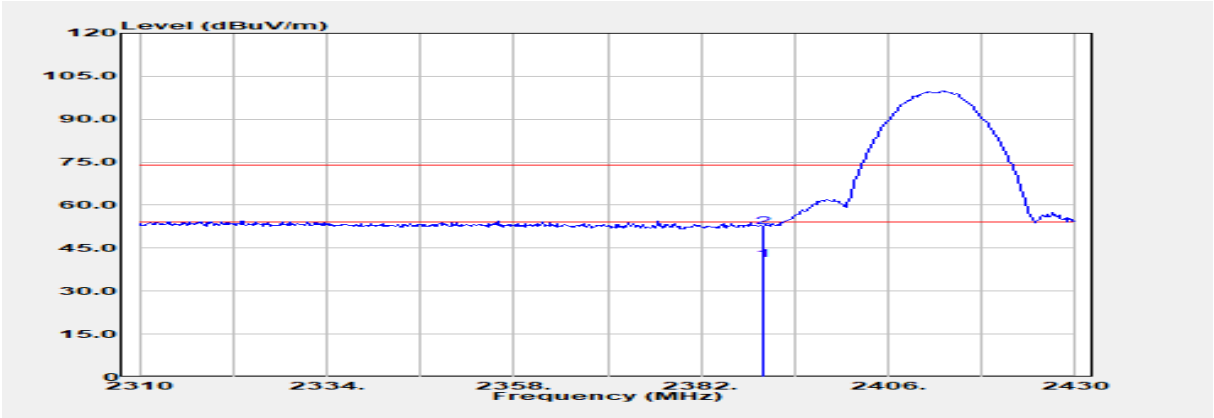
11.7 Measurement Result

Note:

1. *Refer to next page spectrum analyzer data chart and tabular data sheets.*
2. *Measurements are completed at peak and average level, the mark of average is the highest emission in restricted bands*

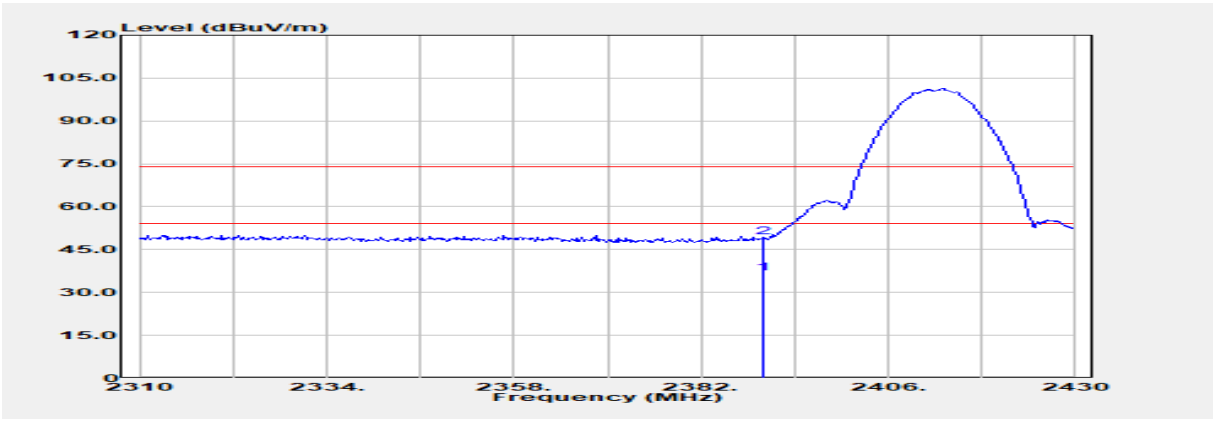
11.7.1 Radiated Band Edge Measurement Result

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-05
Test Frequency	:2412 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 01	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



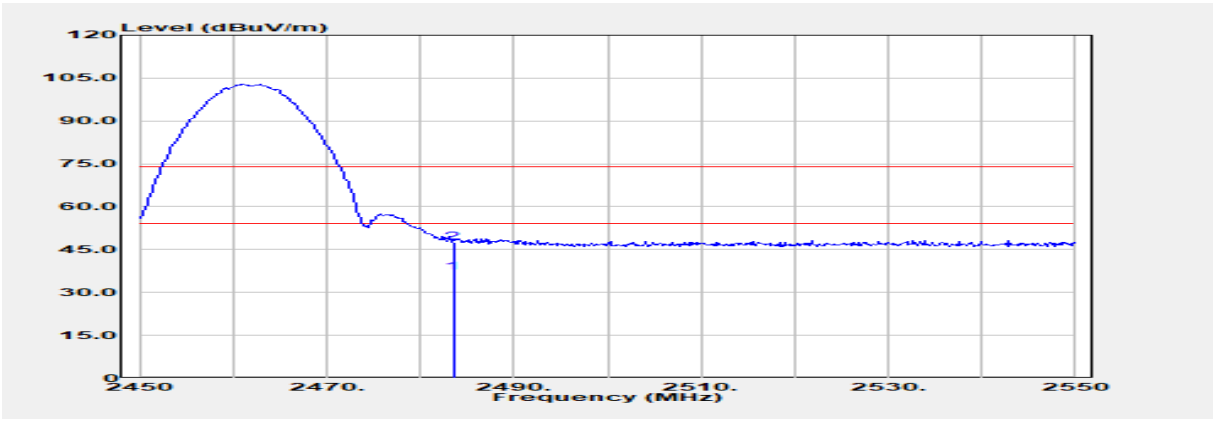
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	35.65	5.18	40.83	54.00	-13.17
2390.000	Peak	47.18	5.18	52.36	74.00	-21.64

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-05
Test Frequency	:2412 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 01	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



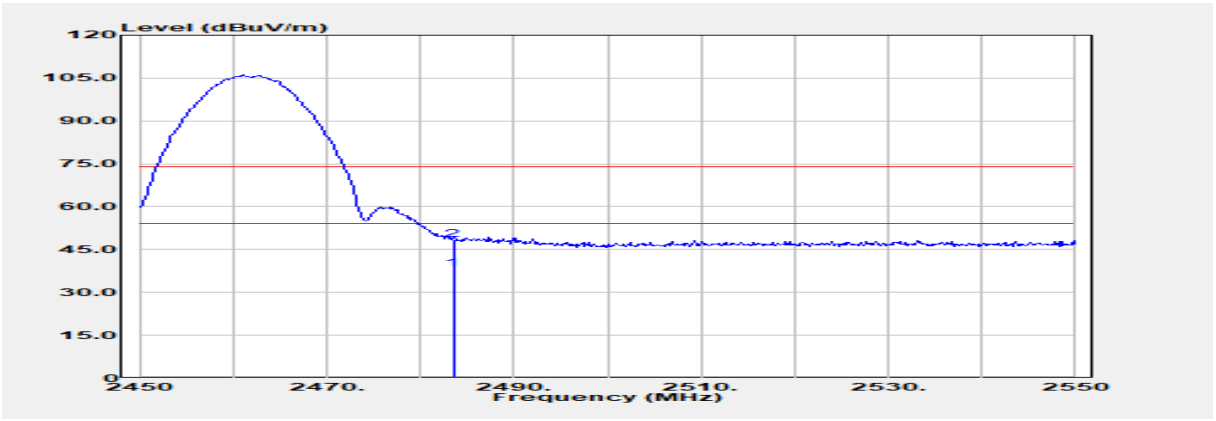
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	31.41	5.18	36.59	54.00	-17.41
2390.000	Peak	44.18	5.18	49.36	74.00	-24.64

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-05
Test Frequency	:2462 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 11	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



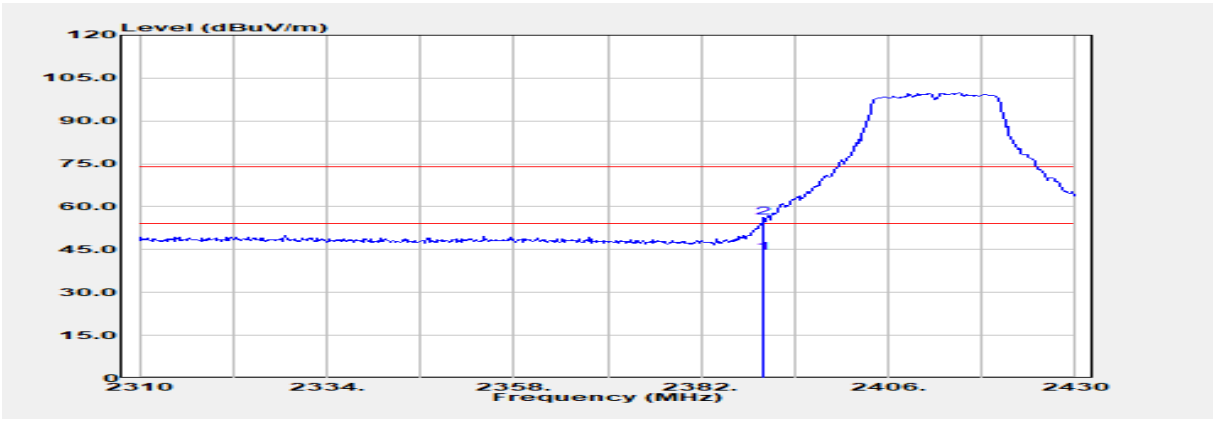
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	33.07	4.04	37.11	54.00	-16.89
2483.500	Peak	43.38	4.04	47.42	74.00	-26.58

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-05
Test Frequency	:2462 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 11	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



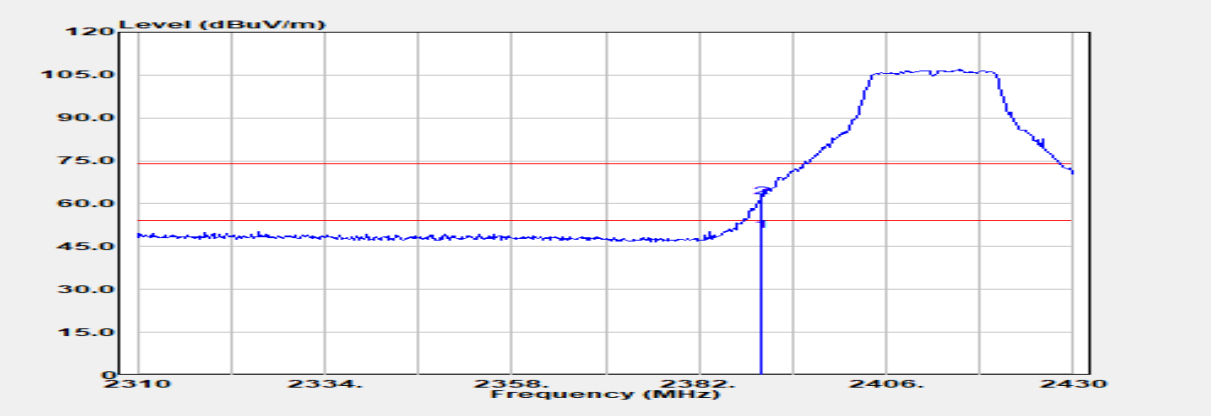
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	34.25	4.04	38.29	54.00	-15.71
2483.500	Peak	44.53	4.04	48.56	74.00	-25.44

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-05
Test Frequency	:2412 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 01	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



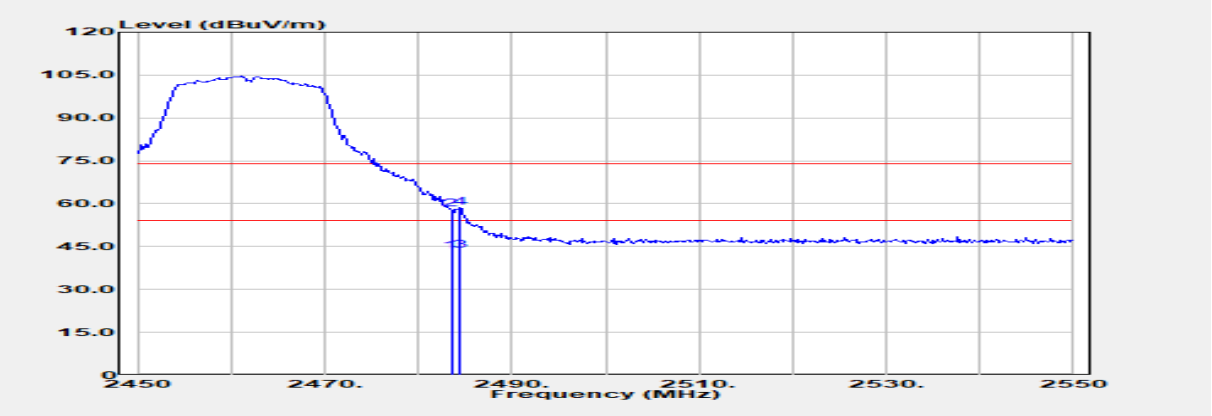
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	38.59	5.18	43.77	54.00	-10.23
2390.000	Peak	51.02	5.18	56.20	74.00	-17.80

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-05
Test Frequency	:2412 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 01	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



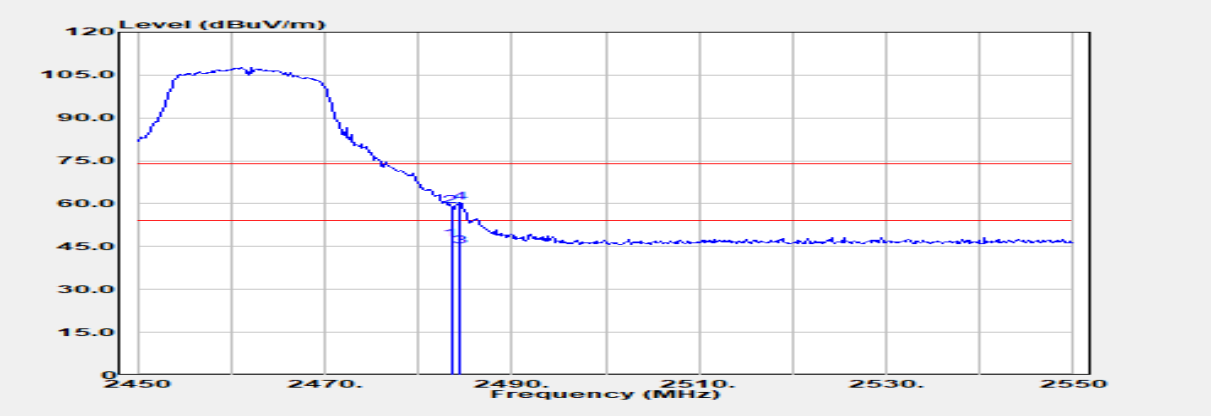
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	45.34	5.18	50.52	54.00	-3.48
2390.000	Peak	57.15	5.18	62.33	74.00	-11.67

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-05
Test Frequency	:2462 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 11	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



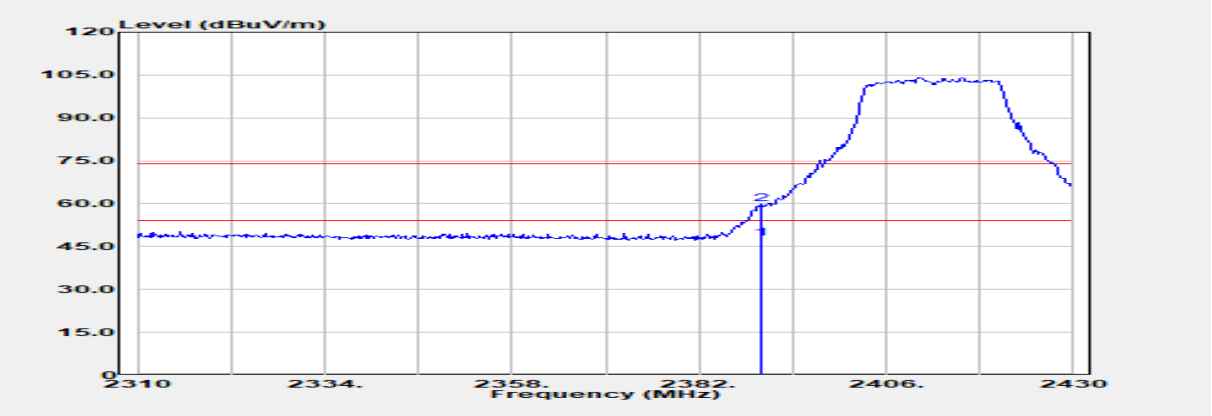
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	39.24	4.04	43.28	54.00	-10.72
2483.500	Peak	53.94	4.04	57.98	74.00	-16.02
2484.455	Average	39.59	4.03	43.62	54.00	-10.38
2484.455	Peak	54.53	4.03	58.56	74.00	-15.44

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-05
Test Frequency	:2462 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 11	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



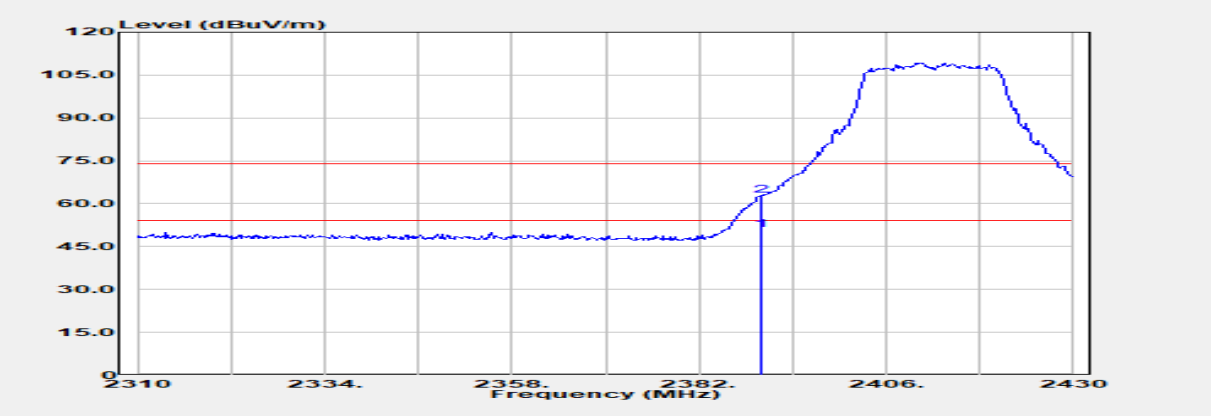
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	43.58	4.04	47.62	54.00	-6.38
2483.500	Peak	55.19	4.04	59.22	74.00	-14.78
2484.455	Average	41.22	4.03	45.25	54.00	-8.75
2484.455	Peak	56.44	4.03	60.47	74.00	-13.53

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-05
Test Frequency	:2412 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 01	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



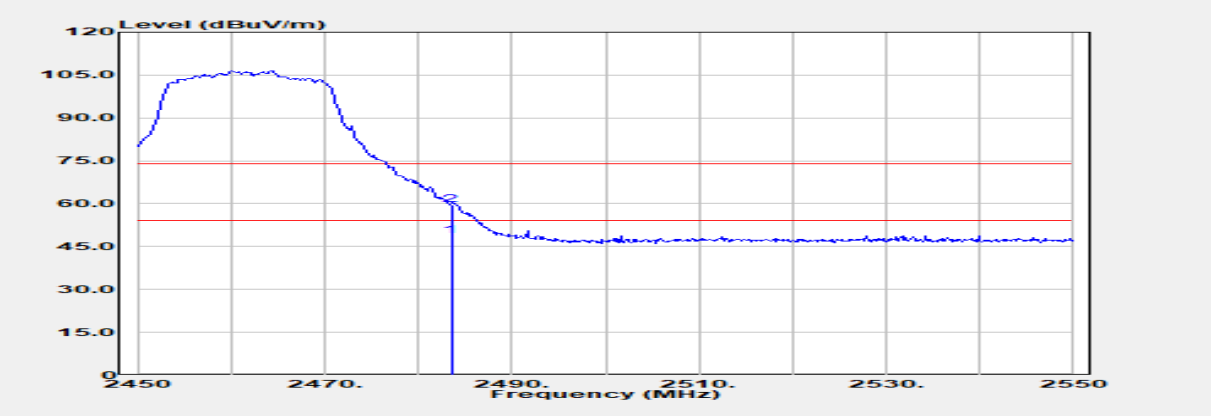
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	42.74	5.18	47.92	54.00	-6.08
2390.000	Peak	54.62	5.18	59.80	74.00	-14.20

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-05
Test Frequency	:2412 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 01	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



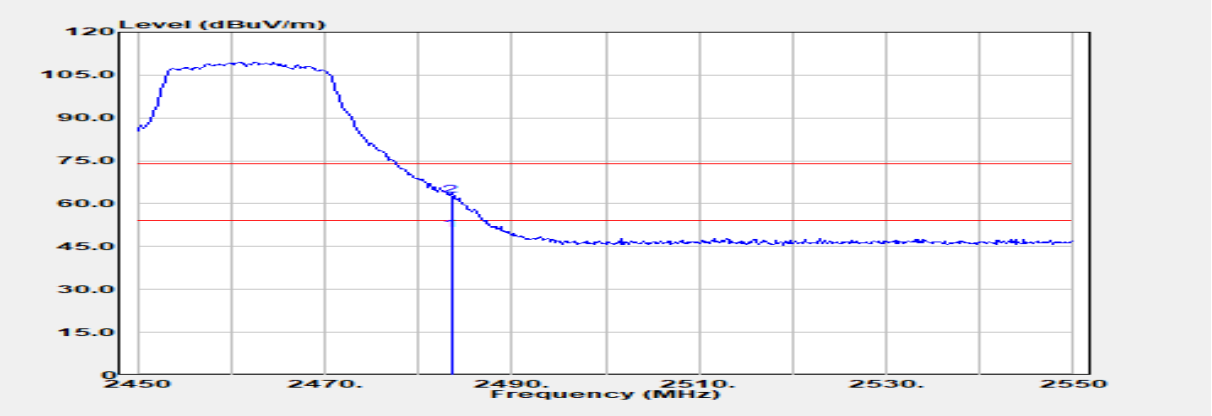
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	45.78	5.18	50.96	54.00	-3.04
2390.000	Peak	57.71	5.18	62.89	74.00	-11.11

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-05
Test Frequency	:2462 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 11	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



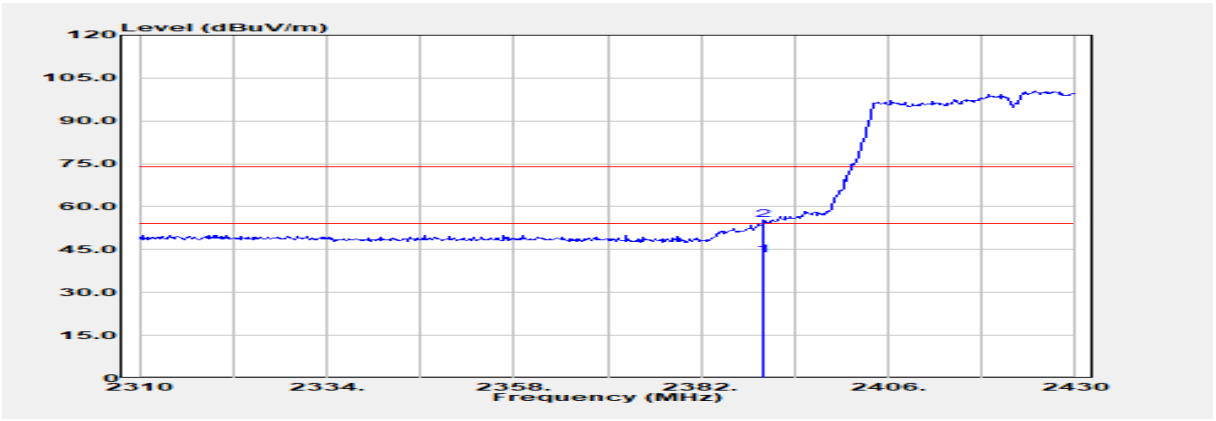
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	44.80	4.04	48.84	54.00	-5.16
2483.500	Peak	55.52	4.04	59.56	74.00	-14.44

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-05
Test Frequency	:2462 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 11	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



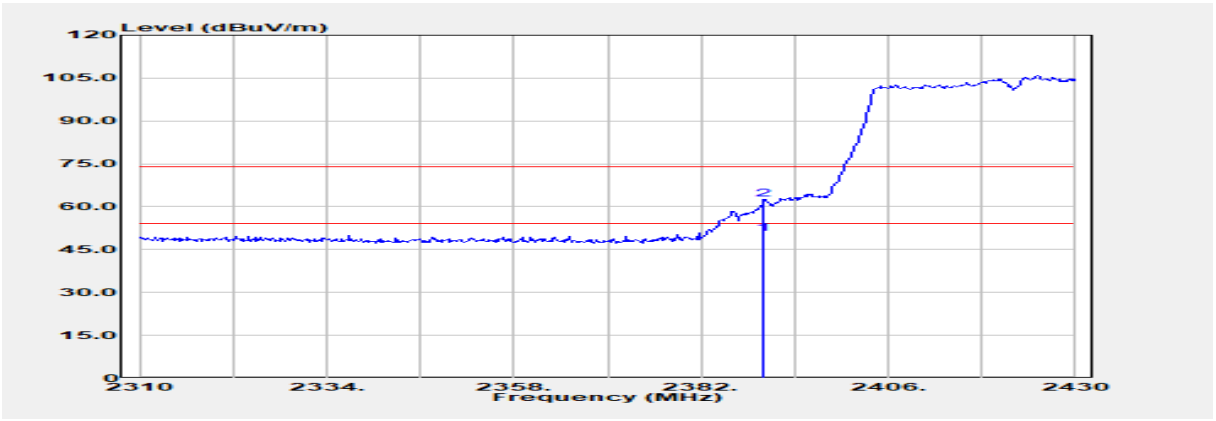
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	46.80	4.04	50.84	54.00	-3.16
2483.500	Peak	58.96	4.04	63.00	74.00	-11.00

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2422 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 03	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



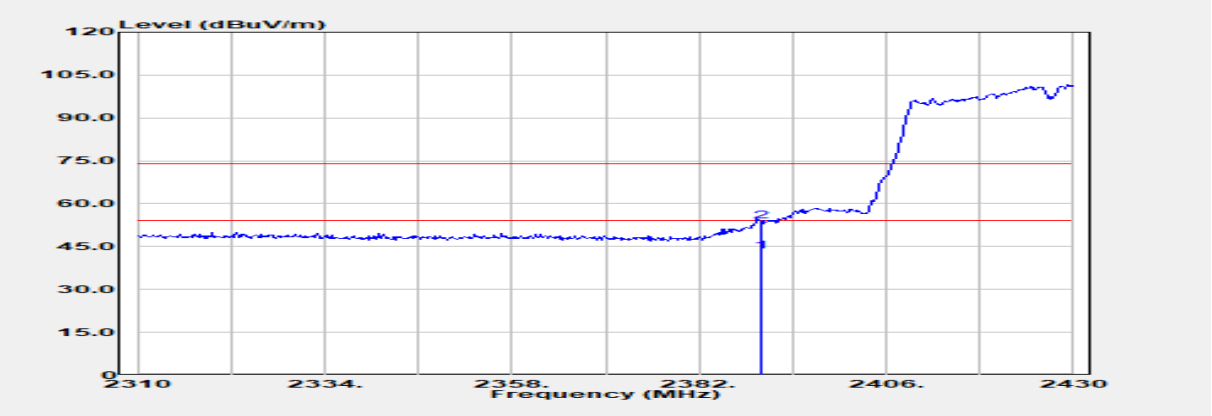
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	37.85	5.18	43.03	54.00	-10.97
2390.000	Peak	50.20	5.18	55.38	74.00	-18.62

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2422 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 03	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



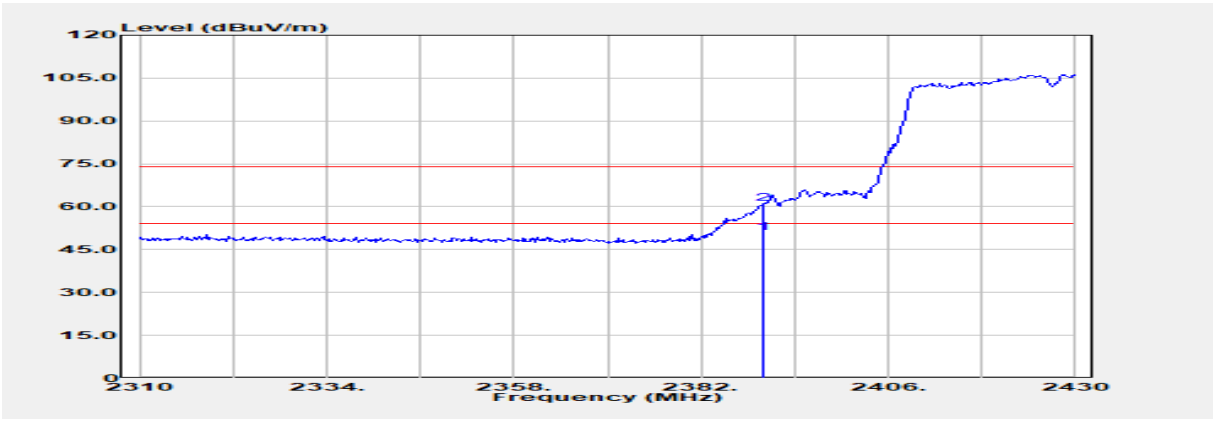
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	45.37	5.18	50.55	54.00	-3.45
2390.000	Peak	57.32	5.18	62.50	74.00	-11.50

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2427 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 04	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



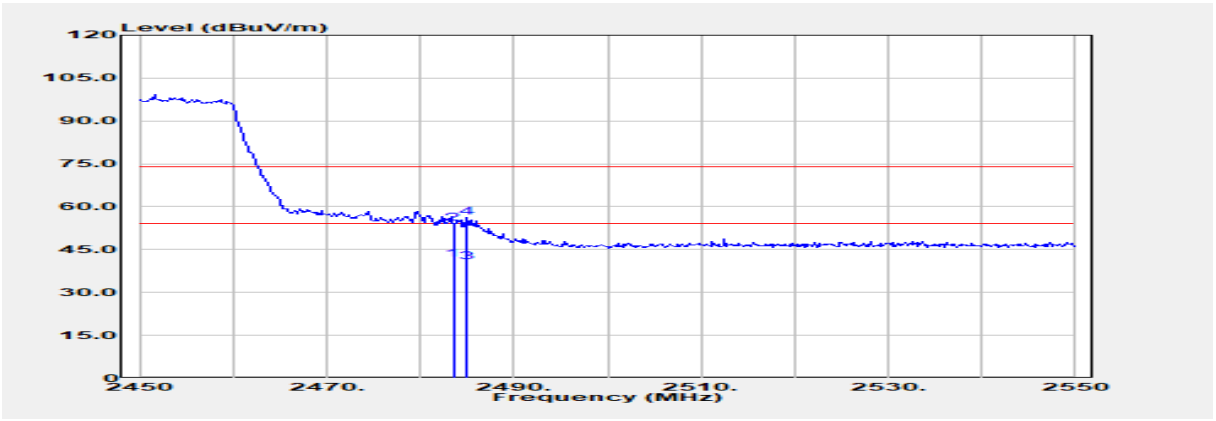
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	38.19	5.18	43.37	54.00	-10.63
2390.000	Peak	48.75	5.18	53.93	74.00	-20.07

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2427 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 04	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



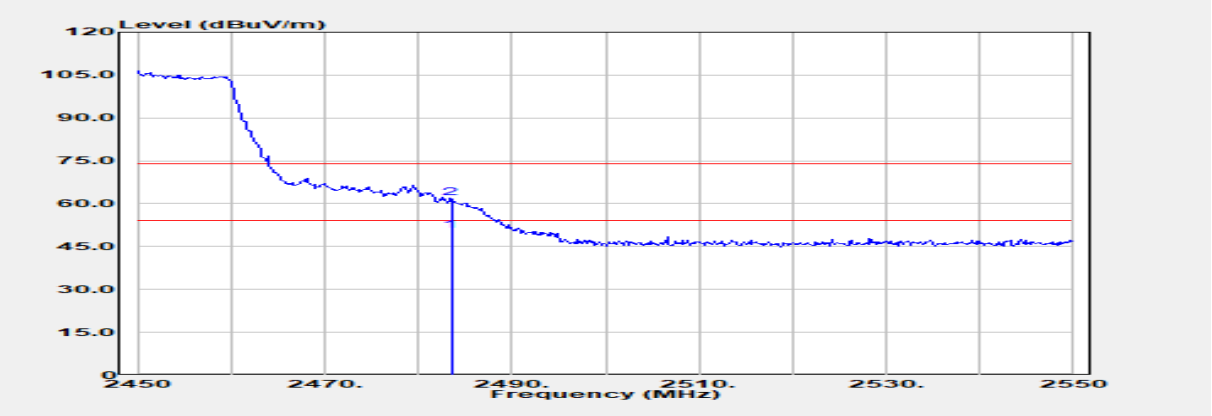
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.000	Average	45.60	5.18	50.78	54.00	-3.22
2390.000	Peak	55.85	5.18	61.03	74.00	-12.97

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2442 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 07	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



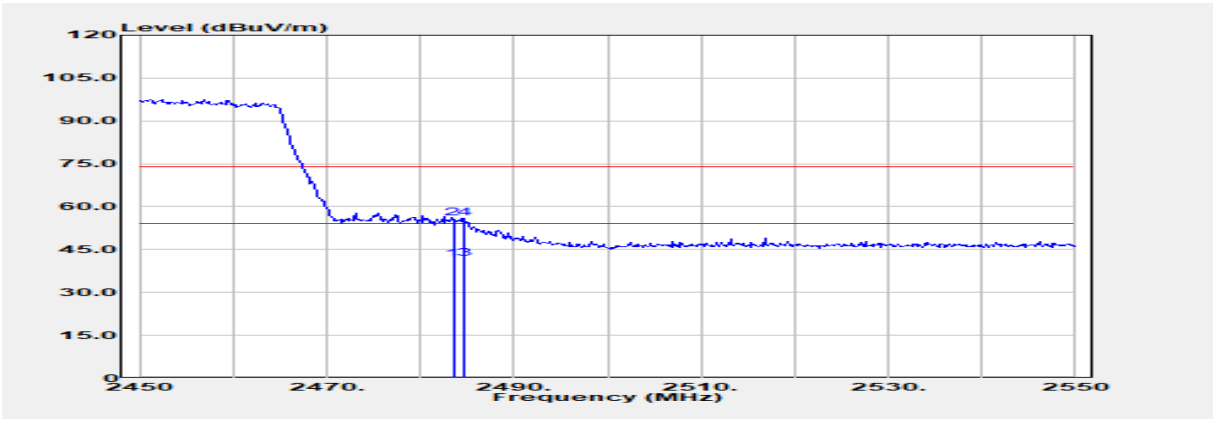
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	37.50	4.04	41.54	54.00	-12.46
2483.500	Peak	50.16	4.04	54.20	74.00	-19.80
2484.936	Average	36.66	4.02	40.68	54.00	-13.32
2484.936	Peak	52.12	4.02	56.15	74.00	-17.85

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2442 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 07	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



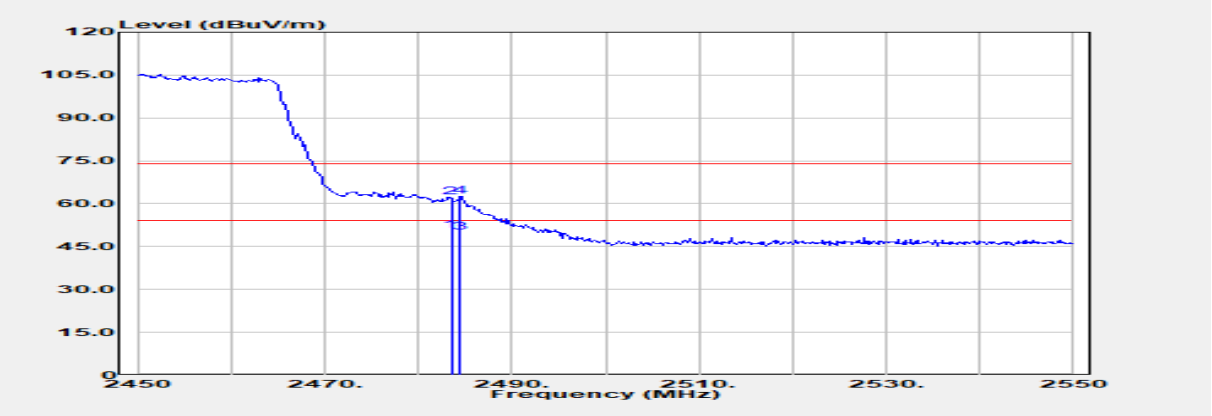
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	46.43	4.04	50.47	54.00	-3.53
2483.500	Peak	57.96	4.04	62.00	74.00	-12.00

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2447 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 08	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



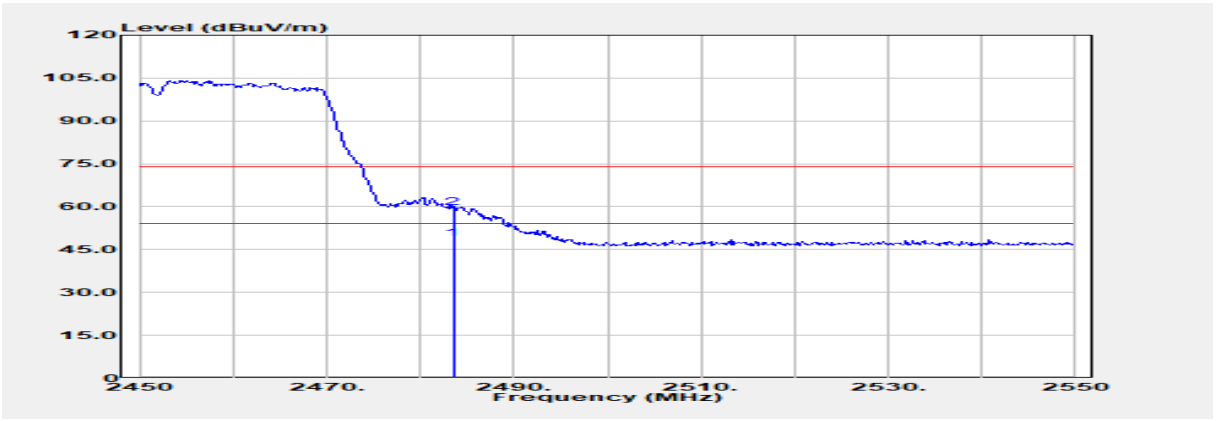
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	37.46	4.04	41.50	54.00	-12.50
2483.500	Peak	51.94	4.04	55.98	74.00	-18.02
2484.615	Average	37.78	4.03	41.81	54.00	-12.19
2484.615	Peak	52.05	4.03	56.07	74.00	-17.93

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2447 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 08	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



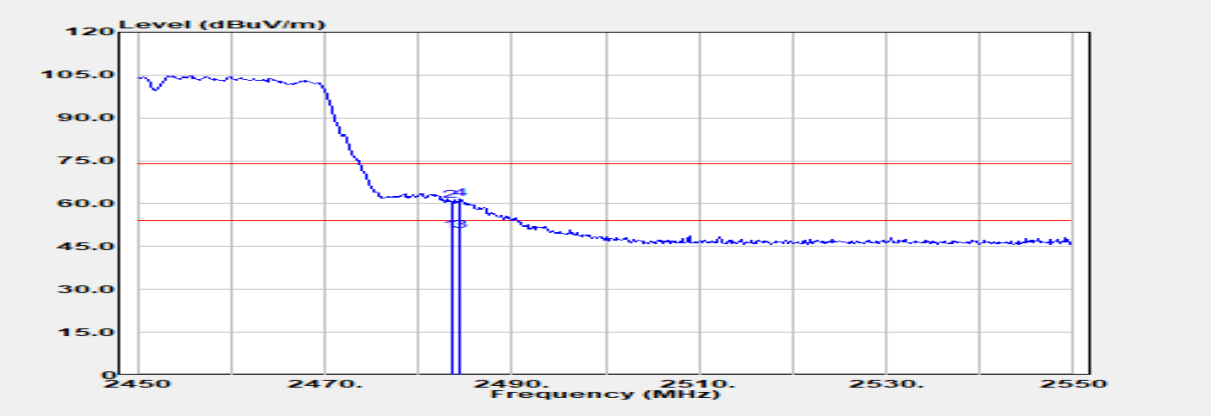
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	46.61	4.04	50.65	54.00	-3.35
2483.500	Peak	58.17	4.04	62.20	74.00	-11.80
2484.455	Average	45.93	4.03	49.96	54.00	-4.04
2484.455	Peak	58.51	4.03	62.53	74.00	-11.47

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2452 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 09	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Andy Wang



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	44.76	4.04	48.80	54.00	-5.20
2483.500	Peak	55.40	4.04	59.43	74.00	-14.57

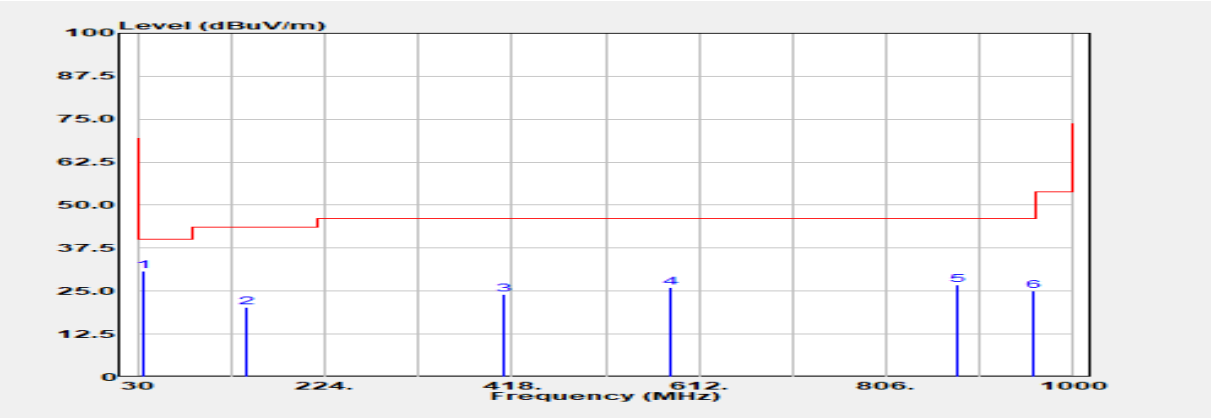
Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2452 MHz	Temp./Humi.	:24.2/52
Test Mode	:BE CH 09	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Andy Wang



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.500	Average	46.37	4.04	50.41	54.00	-3.59
2483.500	Peak	57.10	4.04	61.14	74.00	-12.86
2484.455	Average	46.56	4.03	50.59	54.00	-3.41
2484.455	Peak	57.56	4.03	61.59	74.00	-12.41

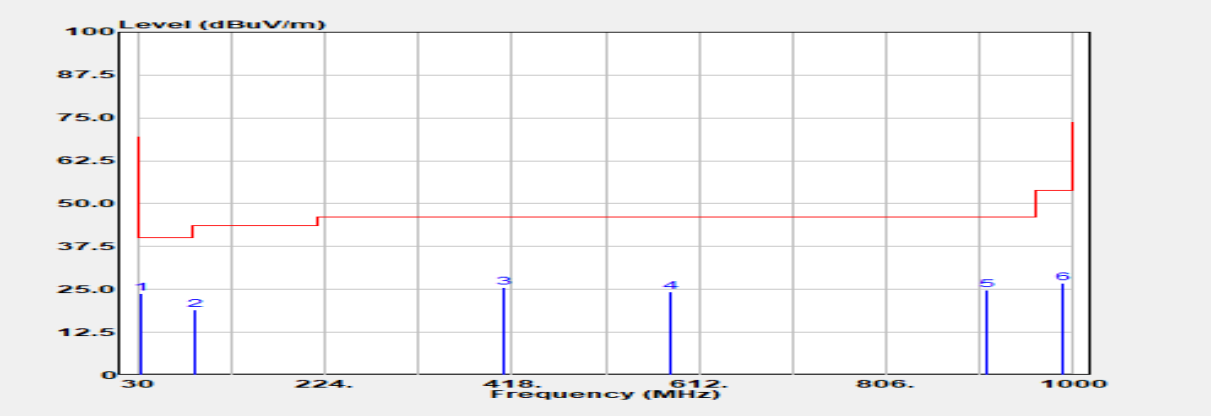
11.7.2 Below 1GHz Worst-Case Emission:

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-05
Test Frequency	:2437 MHz	Temp./Humi.	:24.9/50
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:H Plane	Engineer	:Ashton Chiu



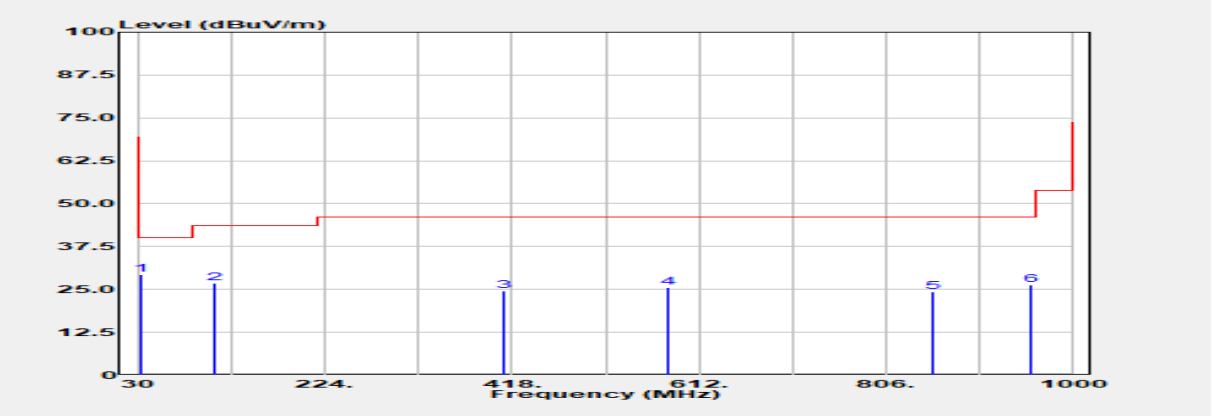
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
36.218	Peak	40.79	-10.03	30.76	40.00	-9.24
141.923	Peak	37.70	-17.41	20.28	43.50	-23.22
409.295	Peak	36.23	-12.06	24.17	46.00	-21.83
581.843	Peak	34.72	-8.75	25.97	46.00	-20.03
878.750	Peak	33.29	-6.46	26.84	46.00	-19.16
958.029	Peak	30.73	-5.74	25.00	46.00	-21.00

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-05
Test Frequency	:2437 MHz	Temp./Humi.	:24.9/50
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plane	Engineer	:Ashton Chiu



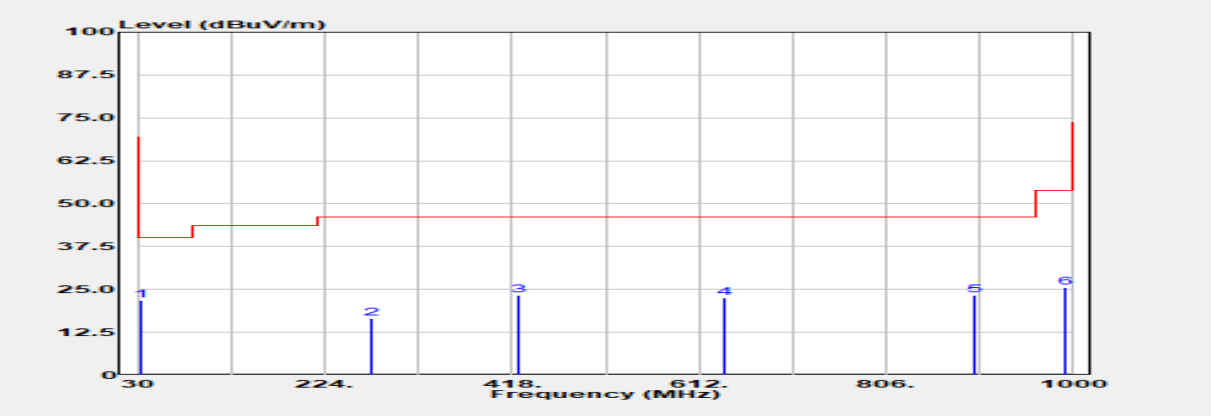
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
33.109	Peak	32.14	-8.39	23.75	40.00	-16.25
89.071	Peak	40.28	-21.33	18.95	43.50	-24.55
409.295	Peak	37.73	-12.06	25.67	46.00	-20.33
581.843	Peak	32.95	-8.75	24.20	46.00	-21.80
909.840	Peak	30.79	-5.97	24.82	46.00	-21.18
989.119	Peak	31.73	-4.85	26.88	54.00	-27.12

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2437 MHz	Temp./Humi.	:24.9/50
Test Mode	:TX CH MID	Antenna Pol.	:VERTICAL
EUT Pol	:H Plane	Engineer	:Ashton Chiu



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
34.663	Peak	38.19	-8.86	29.33	40.00	-10.67
109.279	Peak	44.94	-18.13	26.80	43.50	-16.70
409.295	Peak	36.70	-12.06	24.64	46.00	-21.36
580.289	Peak	34.24	-8.62	25.62	46.00	-20.38
853.878	Peak	30.47	-6.13	24.34	46.00	-21.66
956.474	Peak	31.82	-5.47	26.35	46.00	-19.65

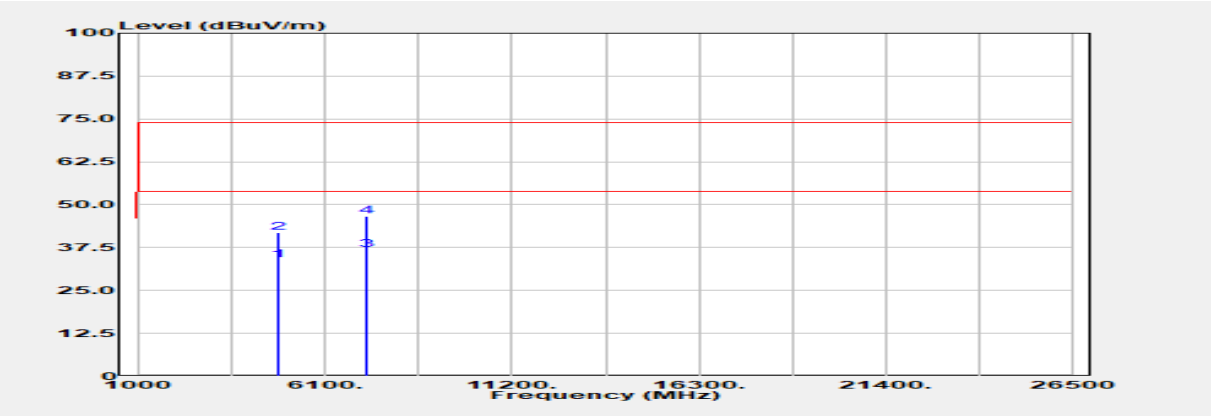
Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-05
Test Frequency	:2437 MHz	Temp./Humi.	:24.9/50
Test Mode	:TX CH MID	Antenna Pol.	:HORIZONTAL
EUT Pol	:H Plane	Engineer	:Ashton Chiu



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
34.663	Peak	30.79	-8.86	21.93	40.00	-18.07
272.500	Peak	32.25	-15.83	16.42	46.00	-29.58
424.840	Peak	34.81	-11.48	23.33	46.00	-22.67
637.805	Peak	30.79	-8.12	22.67	46.00	-23.33
897.404	Peak	29.13	-5.70	23.43	46.00	-22.57
990.673	Peak	30.32	-4.79	25.53	54.00	-28.47

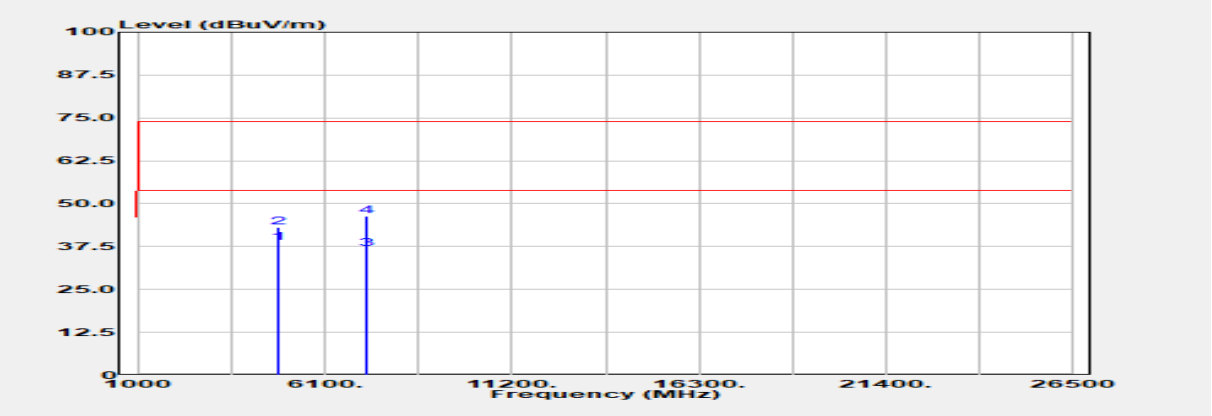
11.7.3 Above 1GHz Emission:

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-06
Test Frequency	:2412 MHz	Temp./Humi.	:23.2/56
Test Mode	:TX CH LOW	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



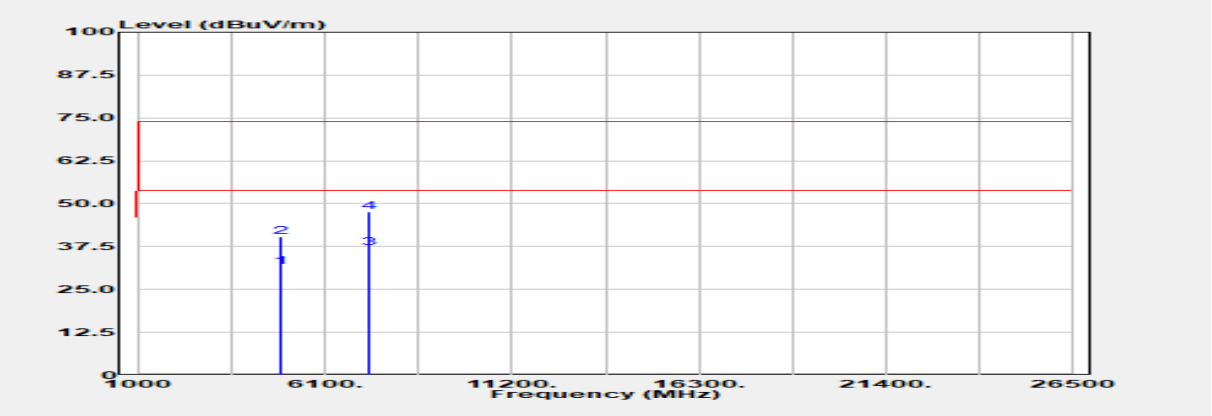
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000	Average	23.21	10.61	33.82	54.00	-20.18
4824.000	Peak	31.25	10.61	41.86	74.00	-32.14
7236.000	Average	19.11	17.62	36.73	54.00	-17.27
7236.000	Peak	28.99	17.62	46.61	74.00	-27.39

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-06
Test Frequency	:2412 MHz	Temp./Humi.	:23.2/56
Test Mode	:TX CH LOW	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



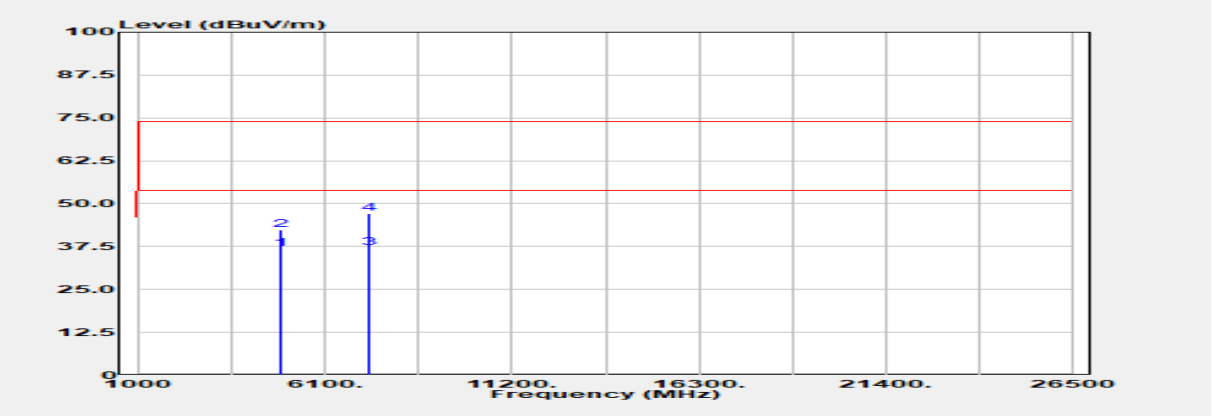
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000	Average	27.94	10.61	38.55	54.00	-15.45
4824.000	Peak	32.38	10.61	42.98	74.00	-31.02
7236.000	Average	19.11	17.62	36.73	54.00	-17.27
7236.000	Peak	28.80	17.62	46.42	74.00	-27.58

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.2/56
Test Mode	:TX CH MID	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



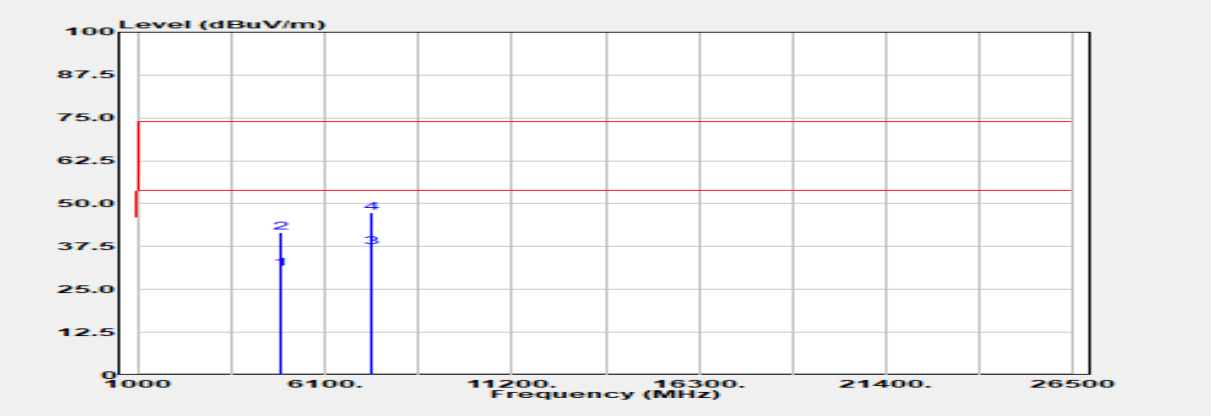
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	21.19	10.38	31.57	54.00	-22.43
4874.000	Peak	30.00	10.38	40.37	74.00	-33.63
7311.000	Average	19.02	17.97	36.99	54.00	-17.01
7311.000	Peak	29.64	17.97	47.61	74.00	-26.39

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.2/56
Test Mode	:TX CH MID	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



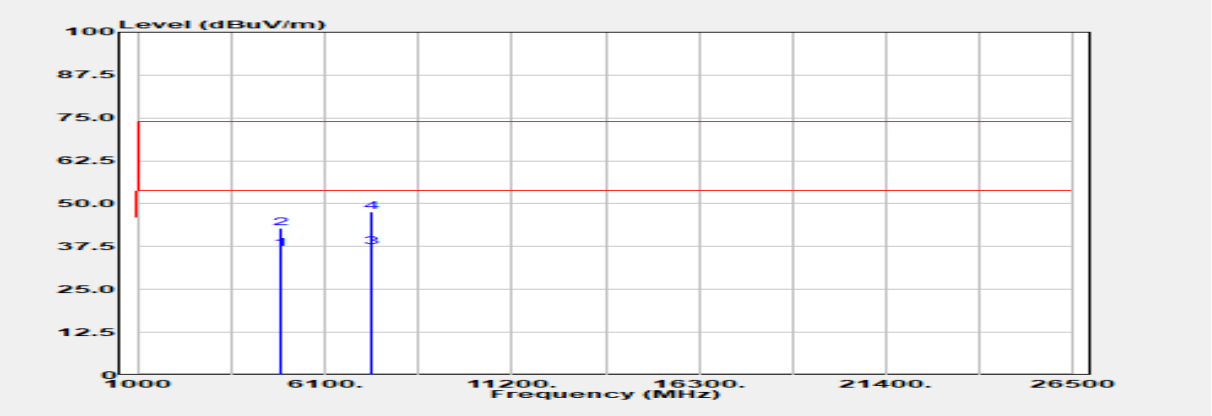
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	26.42	10.38	36.80	54.00	-17.20
4874.000	Peak	32.04	10.38	42.41	74.00	-31.59
7311.000	Average	19.01	17.97	36.98	54.00	-17.02
7311.000	Peak	29.20	17.97	47.18	74.00	-26.82

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-06
Test Frequency	:2462 MHz	Temp./Humi.	:23.2/56
Test Mode	:TX CH HIGH	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



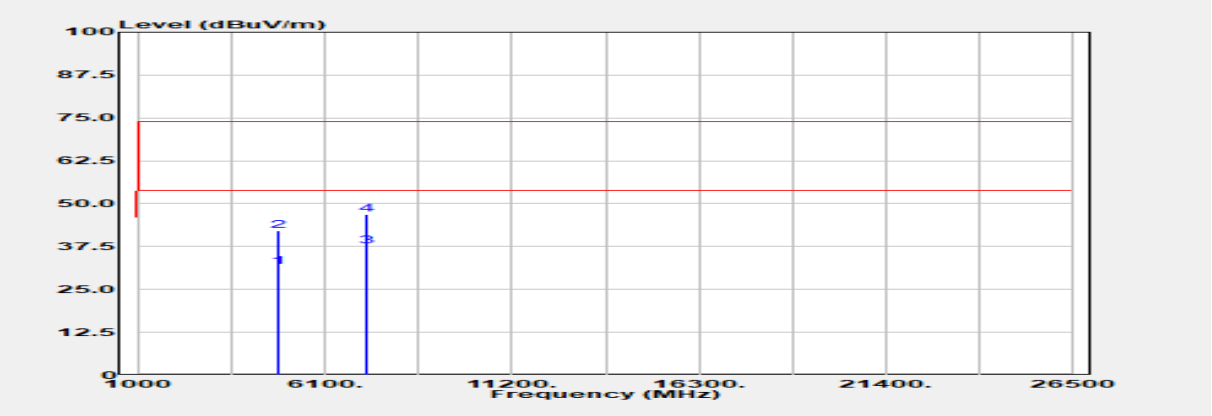
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000	Average	20.86	10.12	30.98	54.00	-23.02
4924.000	Peak	31.53	10.12	41.65	74.00	-32.35
7386.000	Average	19.02	18.22	37.24	54.00	-16.76
7386.000	Peak	29.18	18.22	47.40	74.00	-26.60

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11b	Test Date	:2021-07-06
Test Frequency	:2462 MHz	Temp./Humi.	:23.2/56
Test Mode	:TX CH HIGH	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



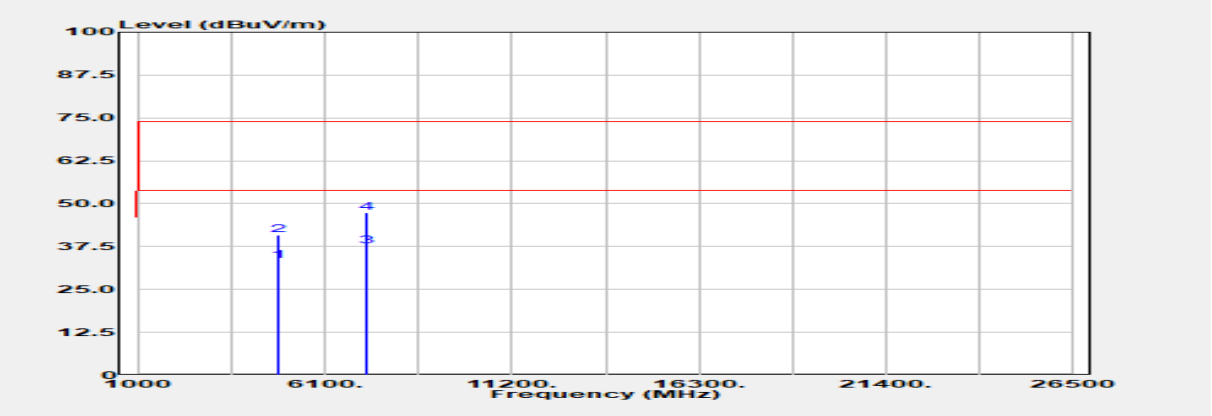
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000	Average	26.77	10.12	36.89	54.00	-17.11
4924.000	Peak	32.63	10.12	42.75	74.00	-31.25
7386.000	Average	19.06	18.22	37.28	54.00	-16.72
7386.000	Peak	29.38	18.22	47.60	74.00	-26.40

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-06
Test Frequency	:2412 MHz	Temp./Humi.	:23.5/59
Test Mode	:TX CH LOW	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



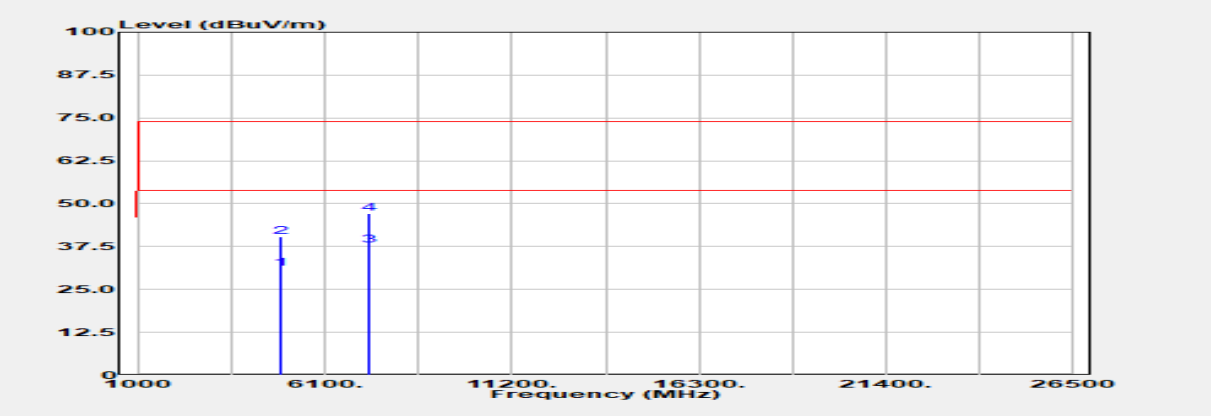
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000	Average	20.98	10.61	31.59	54.00	-22.41
4824.000	Peak	31.54	10.61	42.15	74.00	-31.85
7236.000	Average	20.01	17.62	37.63	54.00	-16.37
7236.000	Peak	29.27	17.62	46.89	74.00	-27.11

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-06
Test Frequency	:2412 MHz	Temp./Humi.	:23.5/59
Test Mode	:TX CH LOW	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



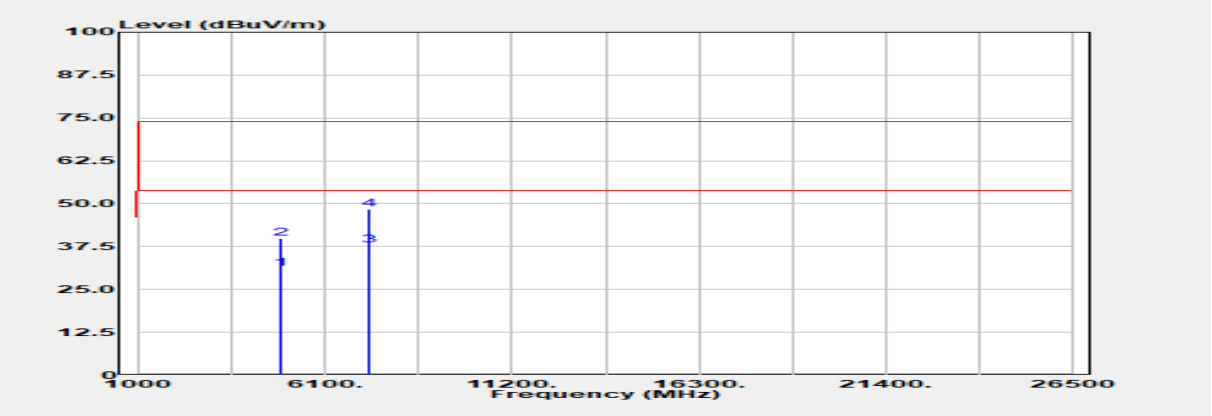
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000	Average	22.62	10.61	33.23	54.00	-20.77
4824.000	Peak	30.31	10.61	40.92	74.00	-33.08
7236.000	Average	20.01	17.62	37.63	54.00	-16.37
7236.000	Peak	29.69	17.62	47.31	74.00	-26.69

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.5/59
Test Mode	:TX CH MID	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



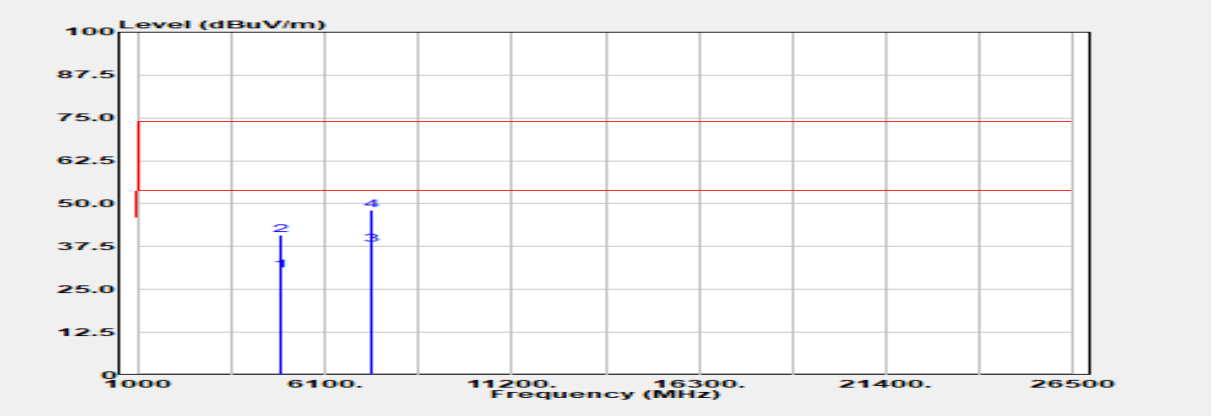
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	20.68	10.38	31.06	54.00	-22.94
4874.000	Peak	29.94	10.38	40.31	74.00	-33.69
7311.000	Average	19.94	17.97	37.91	54.00	-16.09
7311.000	Peak	29.27	17.97	47.24	74.00	-26.76

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.5/59
Test Mode	:TX CH MID	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



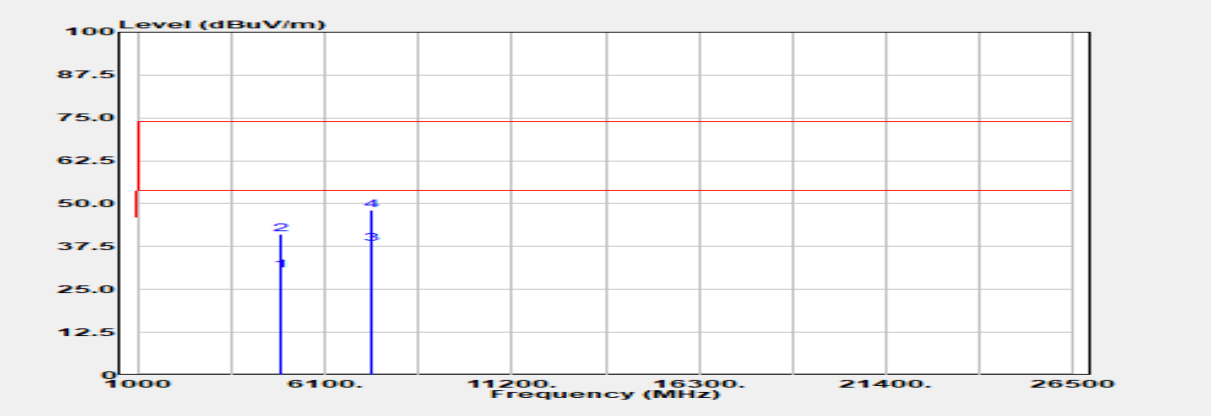
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	20.71	10.38	31.09	54.00	-22.91
4874.000	Peak	29.45	10.38	39.83	74.00	-34.17
7311.000	Average	19.93	17.97	37.90	54.00	-16.10
7311.000	Peak	30.45	17.97	48.42	74.00	-25.58

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-06
Test Frequency	:2462 MHz	Temp./Humi.	:23.5/59
Test Mode	:TX CH HIGH	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



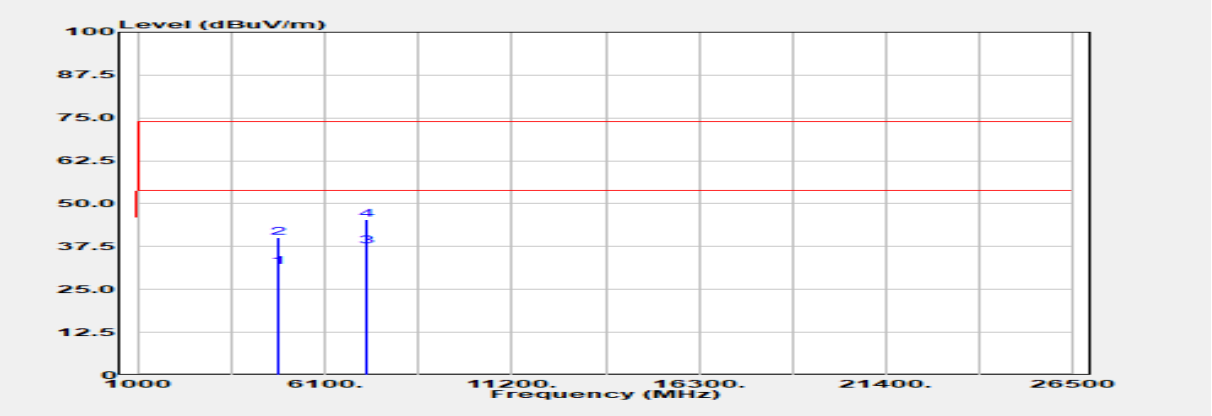
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000	Average	20.55	10.12	30.67	54.00	-23.33
4924.000	Peak	30.65	10.12	40.76	74.00	-33.24
7386.000	Average	19.91	18.22	38.13	54.00	-15.87
7386.000	Peak	29.83	18.22	48.05	74.00	-25.95

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11g	Test Date	:2021-07-06
Test Frequency	:2462 MHz	Temp./Humi.	:23.5/59
Test Mode	:TX CH HIGH	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



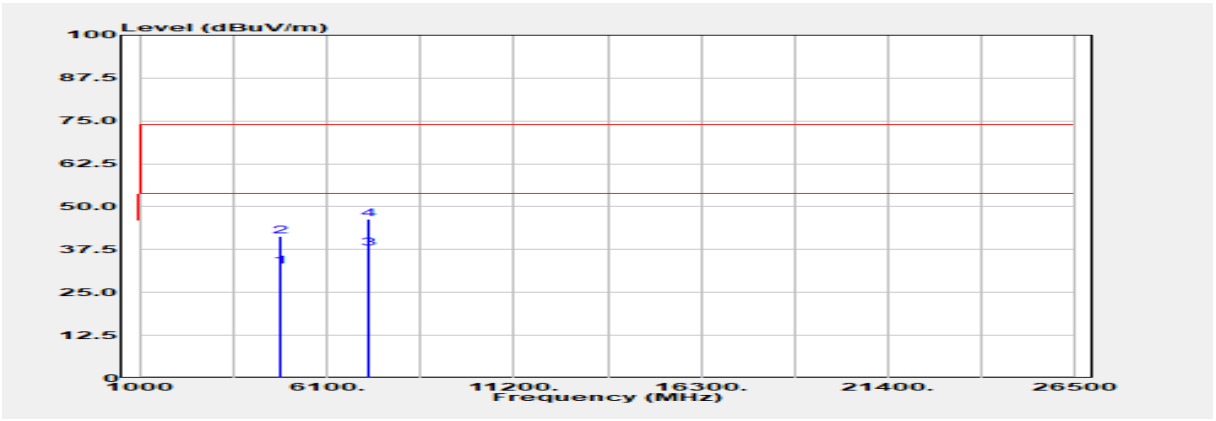
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000	Average	20.51	10.12	30.63	54.00	-23.37
4924.000	Peak	30.88	10.12	41.00	74.00	-33.00
7386.000	Average	20.14	18.22	38.36	54.00	-15.64
7386.000	Peak	29.78	18.22	48.00	74.00	-26.00

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-06
Test Frequency	:2412 MHz	Temp./Humi.	:23.8/58
Test Mode	:TX CH LOW	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



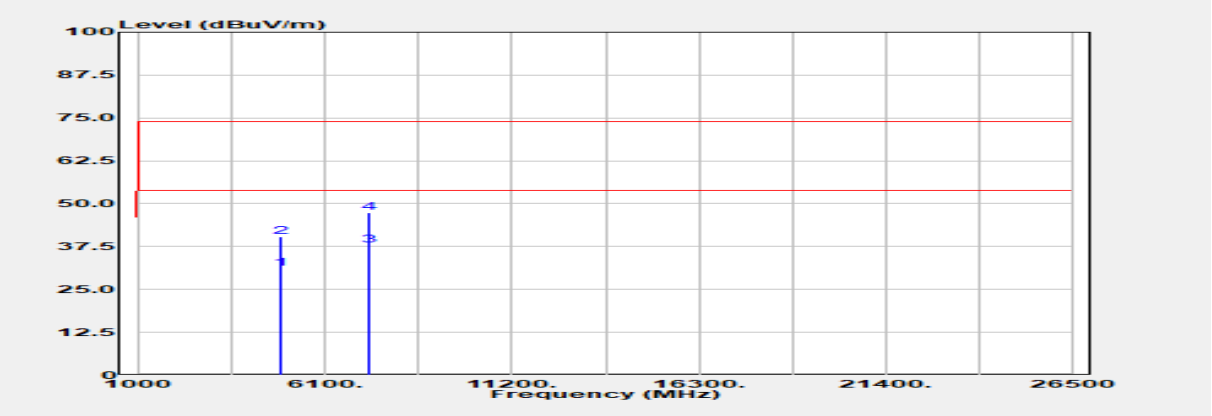
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000	Average	20.99	10.61	31.60	54.00	-22.40
4824.000	Peak	29.54	10.61	40.14	74.00	-33.86
7236.000	Average	20.02	17.62	37.64	54.00	-16.36
7236.000	Peak	27.81	17.62	45.43	74.00	-28.57

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-06
Test Frequency	:2412 MHz	Temp./Humi.	:23.8/58
Test Mode	:TX CH LOW	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



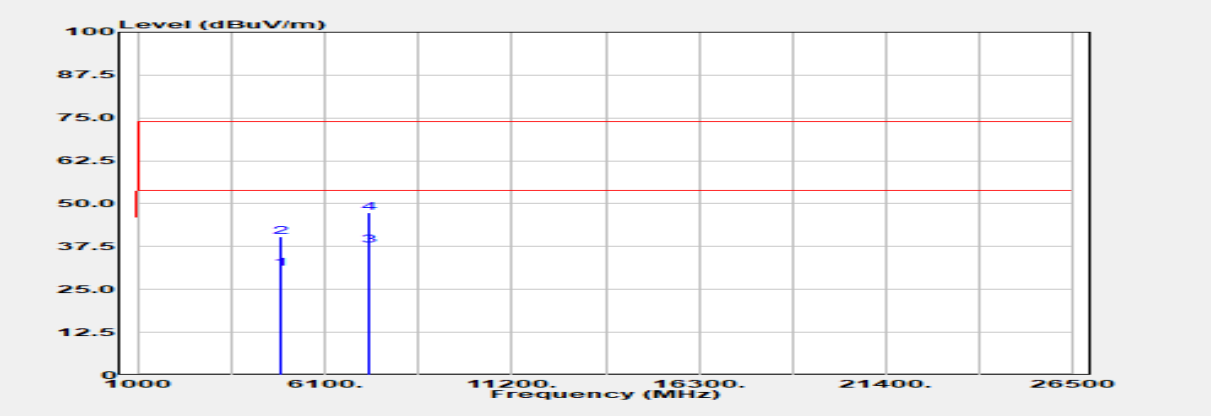
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4824.000	Average	22.02	10.61	32.63	54.00	-21.37
4824.000	Peak	30.73	10.61	41.34	74.00	-32.66
7236.000	Average	20.12	17.62	37.74	54.00	-16.26
7236.000	Peak	28.67	17.62	46.29	74.00	-27.71

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.8/58
Test Mode	:TX CH MID	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



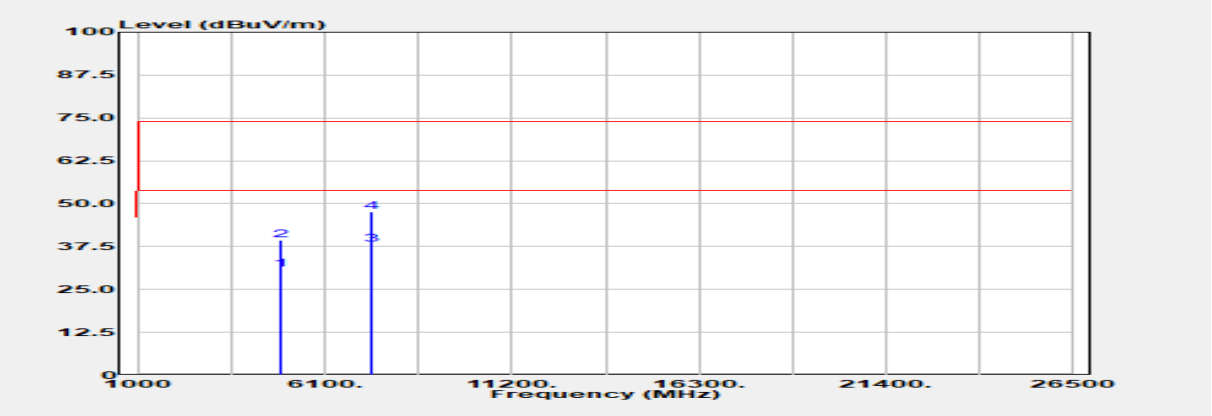
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	20.67	10.38	31.05	54.00	-22.95
4874.000	Peak	29.89	10.38	40.27	74.00	-33.73
7311.000	Average	19.89	17.97	37.86	54.00	-16.14
7311.000	Peak	29.38	17.97	47.36	74.00	-26.64

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.8/58
Test Mode	:TX CH MID	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



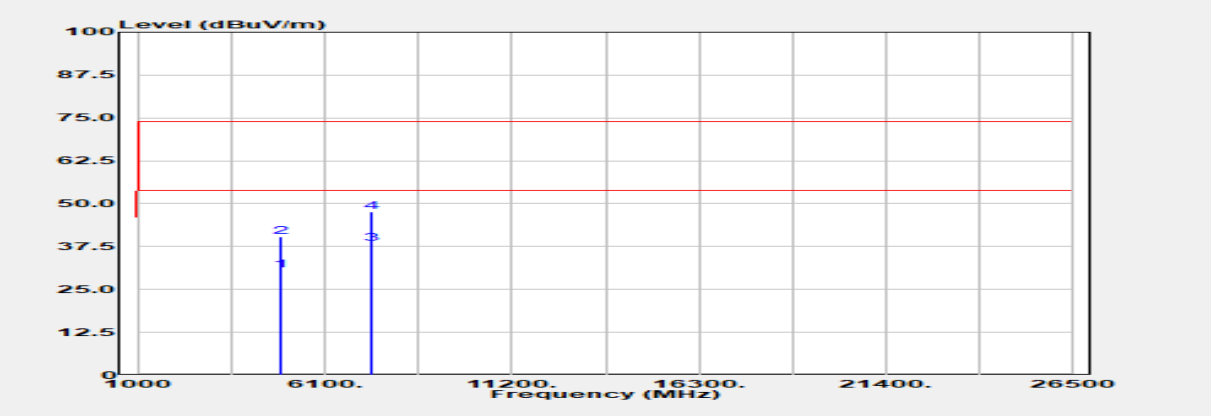
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	20.67	10.38	31.05	54.00	-22.95
4874.000	Peak	30.04	10.38	40.42	74.00	-33.58
7311.000	Average	19.99	17.97	37.96	54.00	-16.04
7311.000	Peak	29.38	17.97	47.36	74.00	-26.64

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-06
Test Frequency	:2462 MHz	Temp./Humi.	:23.8/58
Test Mode	:TX CH HIGH	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



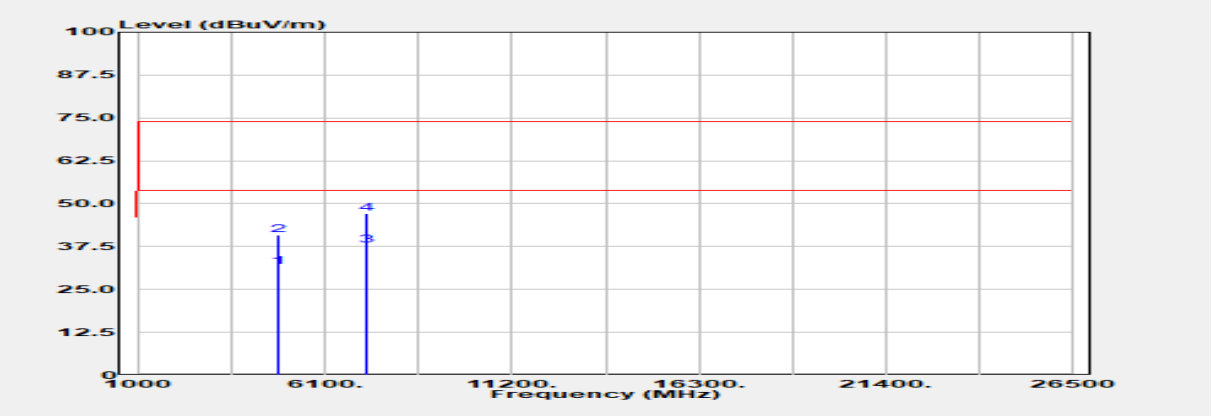
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000	Average	20.68	10.12	30.80	54.00	-23.20
4924.000	Peak	29.34	10.12	39.46	74.00	-34.54
7386.000	Average	19.93	18.22	38.15	54.00	-15.85
7386.000	Peak	29.51	18.22	47.73	74.00	-26.27

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n20	Test Date	:2021-07-06
Test Frequency	:2462 MHz	Temp./Humi.	:23.8/58
Test Mode	:TX CH HIGH	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



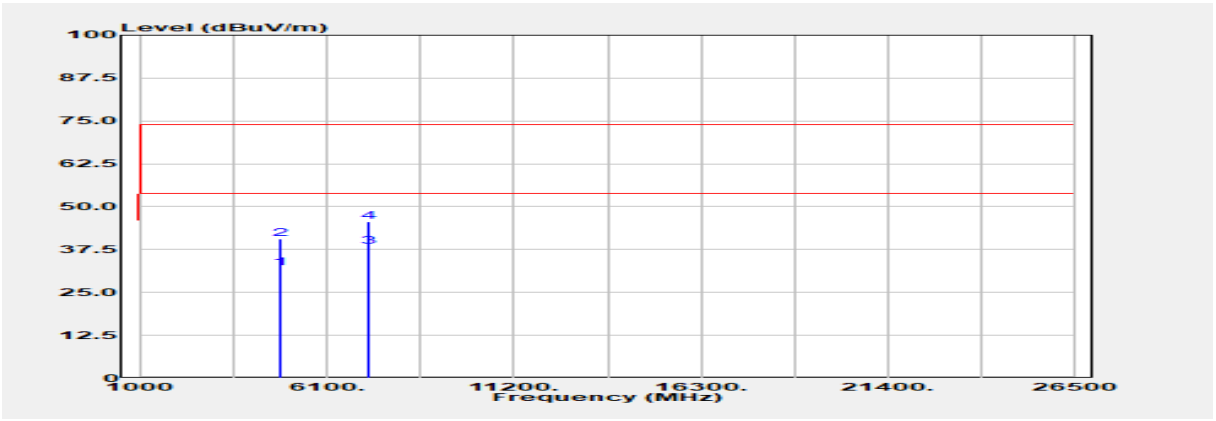
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4924.000	Average	20.53	10.12	30.65	54.00	-23.35
4924.000	Peak	30.22	10.12	40.34	74.00	-33.66
7386.000	Average	20.09	18.22	38.31	54.00	-15.69
7386.000	Peak	29.43	18.22	47.65	74.00	-26.35

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-06
Test Frequency	:2422 MHz	Temp./Humi.	:23.6/54
Test Mode	:TX CH LOW	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



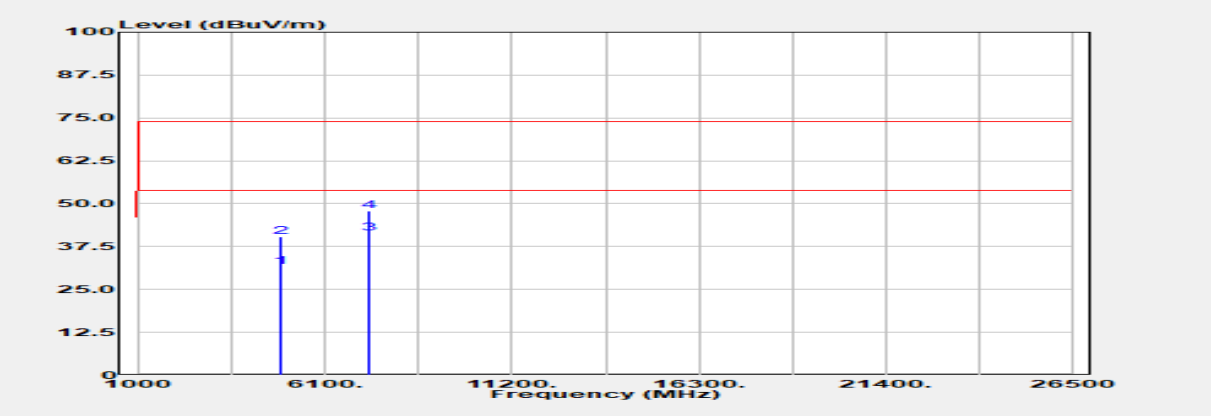
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4844.000	Average	20.89	10.77	31.66	54.00	-22.34
4844.000	Peak	30.17	10.77	40.94	74.00	-33.06
7266.000	Average	20.00	17.79	37.79	54.00	-16.21
7266.000	Peak	29.35	17.79	47.14	74.00	-26.86

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-06
Test Frequency	:2422 MHz	Temp./Humi.	:23.6/54
Test Mode	:TX CH LOW	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



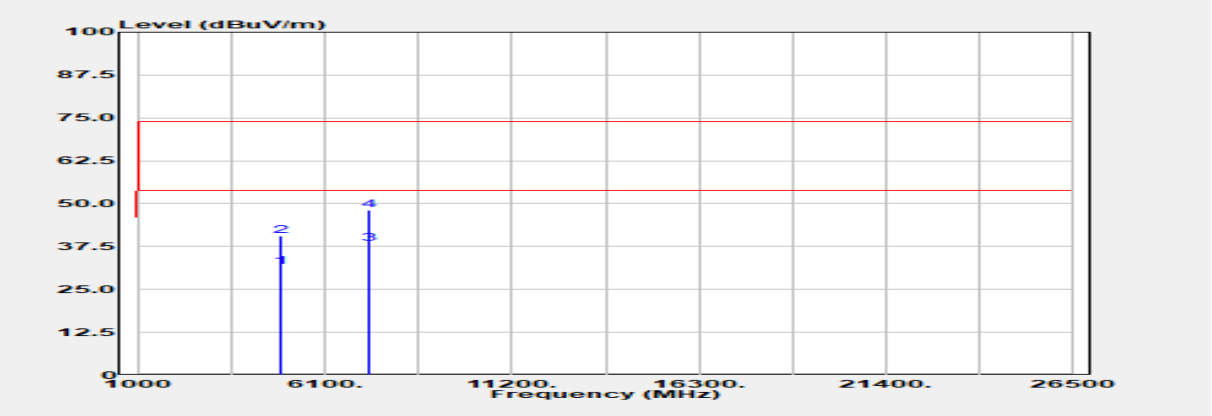
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4844.000	Average	21.40	10.77	32.17	54.00	-21.83
4844.000	Peak	29.82	10.77	40.59	74.00	-33.41
7266.000	Average	20.58	17.79	38.37	54.00	-15.63
7266.000	Peak	27.93	17.79	45.71	74.00	-28.29

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.6/54
Test Mode	:TX CH MID	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



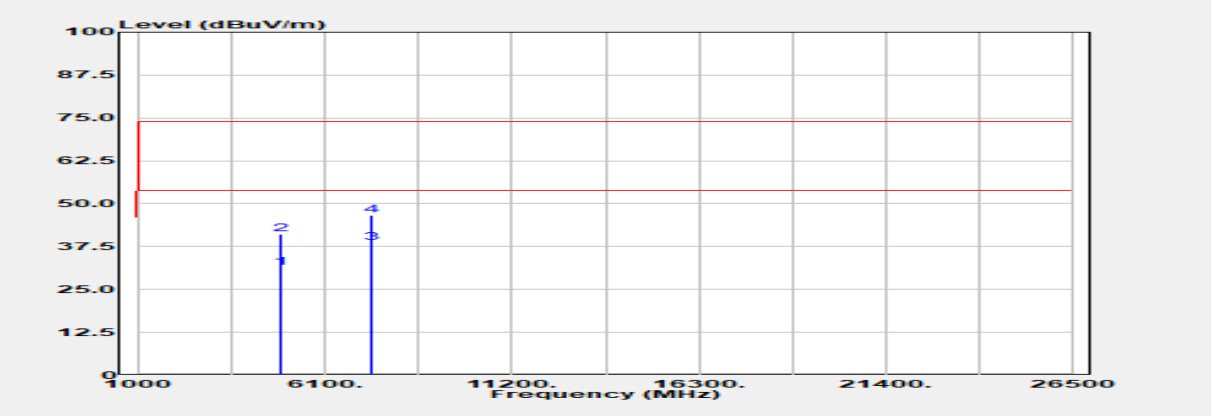
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	21.29	10.38	31.67	54.00	-22.33
4874.000	Peak	30.08	10.38	40.46	74.00	-33.54
7311.000	Average	23.45	17.97	41.42	54.00	-12.58
7311.000	Peak	30.00	17.97	47.97	74.00	-26.03

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-06
Test Frequency	:2437 MHz	Temp./Humi.	:23.6/54
Test Mode	:TX CH MID	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



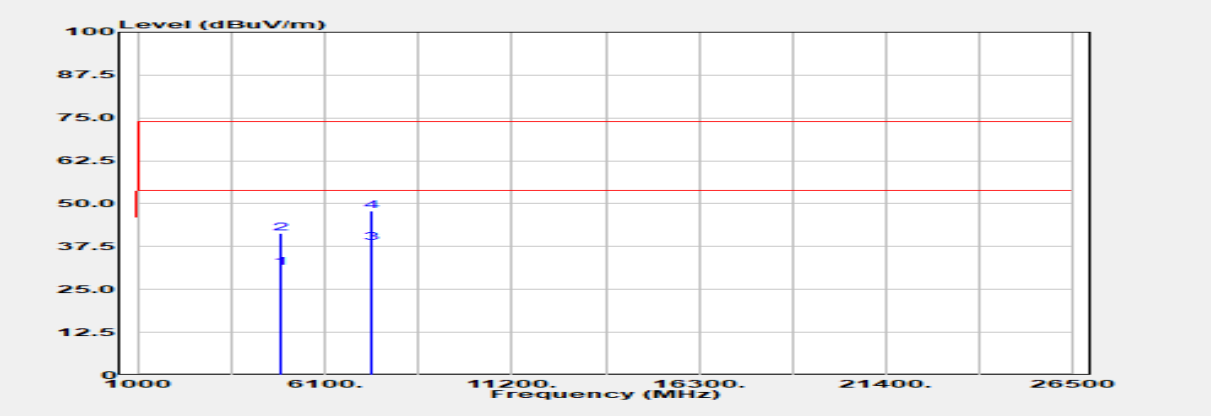
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4874.000	Average	21.26	10.38	31.64	54.00	-22.36
4874.000	Peak	30.13	10.38	40.50	74.00	-33.50
7311.000	Average	20.49	17.97	38.46	54.00	-15.54
7311.000	Peak	30.15	17.97	48.12	74.00	-25.88

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-06
Test Frequency	:2452 MHz	Temp./Humi.	:23.6/54
Test Mode	:TX CH HIGH	Antenna Pol.	:Vertical
EUT Pol	:H Plane	Engineer	:Enzo Chang



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4904.000	Average	21.11	10.20	31.31	54.00	-22.69
4904.000	Peak	30.81	10.20	41.01	74.00	-32.99
7356.000	Average	20.68	17.95	38.63	54.00	-15.37
7356.000	Peak	28.75	17.95	46.70	74.00	-27.30

Report Number	:E2/2021/60096	Test Site	:966 Chamber C
Operation Mode	:802.11n40	Test Date	:2021-07-06
Test Frequency	:2452 MHz	Temp./Humi.	:23.6/54
Test Mode	:TX CH HIGH	Antenna Pol.	:Horizontal
EUT Pol	:H Plane	Engineer	:Enzo Chang



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
4904.000	Average	21.24	10.20	31.44	54.00	-22.56
4904.000	Peak	31.20	10.20	41.40	74.00	-32.60
7356.000	Average	20.56	17.95	38.51	54.00	-15.49
7356.000	Peak	29.91	17.95	47.86	74.00	-26.14

12 POWER SPECTRAL DENSITY

12.1 Standard Applicable

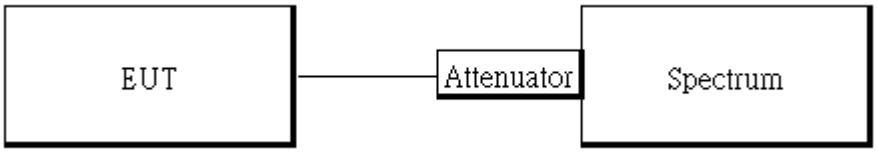
Per Part 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

12.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/18/2021	06/17/2022
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021
Attenuator	Marvelous	MVE2213-10	RF12	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF16	11/19/2020	11/18/2021
DC Block	PASTER-NACK	PE8210	RF152	11/19/2020	11/18/2021
Coaxial Cables	Woken	00100A1F2A196C	RF62	11/19/2020	11/18/2021
Test Software	Qualcomm	QRCT	V4.0.00161.0	N.C.R	N.C.R
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

12.3 Test Set-up



12.4 Measurement Procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 3 kHz & VBW = 10 kHz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Note:

For the test of MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome.

12.5 As per FCC KDB 662911 D01

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

- $$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

NSS = the number of independent spatial streams of data;

NANT = the total number of antennas

$g_{j,k}$ = / 20 10Gk if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

The antenna gain is not grater than 6 dBi. Therefore, reduction of power is not required.

12.6 Power spectral density

POWER DENSITY 802.11b					
Freq. (MHz)	Ch0 PSD	Ch1 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-7.67	-	-7.67	8.00	PASS
2437	-7.409	-	-7.41	8.00	PASS
2462	-6.902	-	-6.90	8.00	PASS

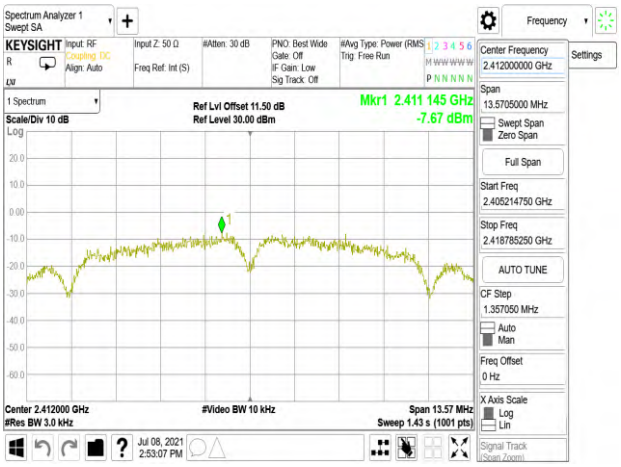
POWER DENSITY 802.11g					
Freq. (MHz)	Ch0 PSD	Ch1 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-11.78	-	-11.78	8.00	PASS
2437	-11.21	-	-11.21	8.00	PASS
2462	-10.87	-	-10.87	8.00	PASS

POWER DENSITY 802.11n HT20					
Freq. (MHz)	Ch0 PSD	Ch1 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-12.84	-12.01	-9.39	8.00	PASS
2437	-10.14	-11.16	-7.61	8.00	PASS
2462	-9.896	-11	-7.40	8.00	PASS

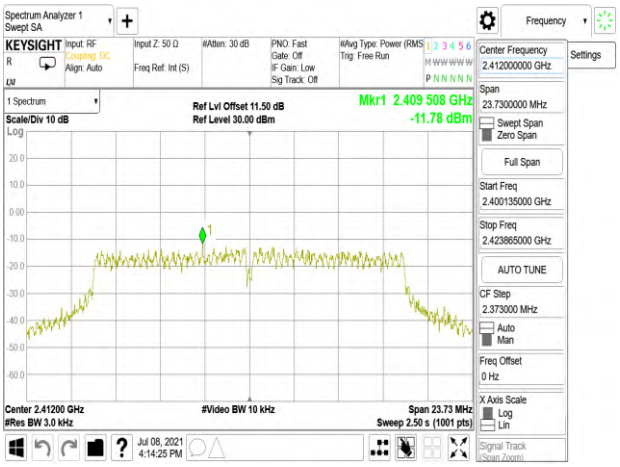
POWER DENSITY 802.11n HT40					
Freq. (MHz)	Ch0 PSD	Ch1 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2422	-16.5	-15.54	-12.98	8.00	PASS
2437	-13.79	-13.4	-10.58	8.00	PASS
2452	-16.52	-15.54	-12.99	8.00	PASS

*Refer to next page for plots

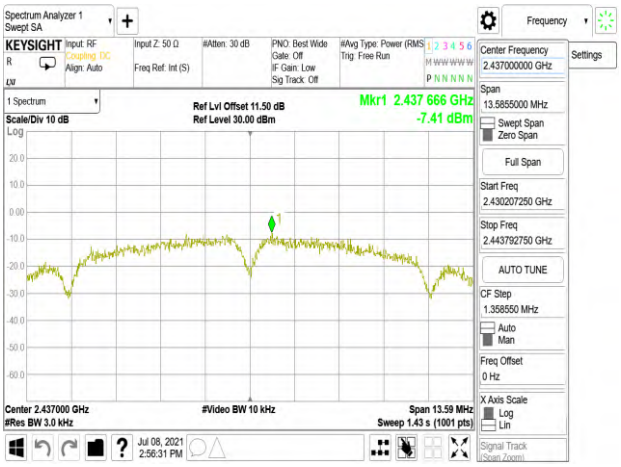
802.11b_20MHz_Chain0_2412MHz



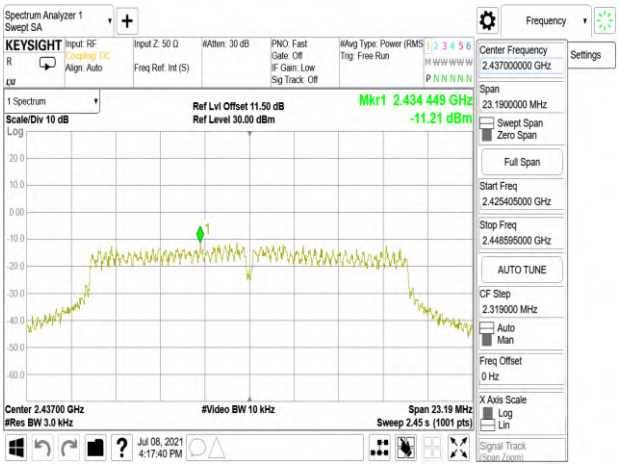
802.11g_20MHz_Chain0_2412MHz



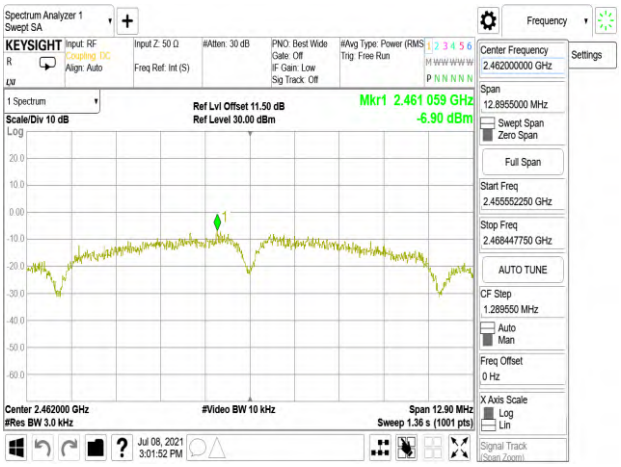
802.11b_20MHz_Chain0_2437MHz



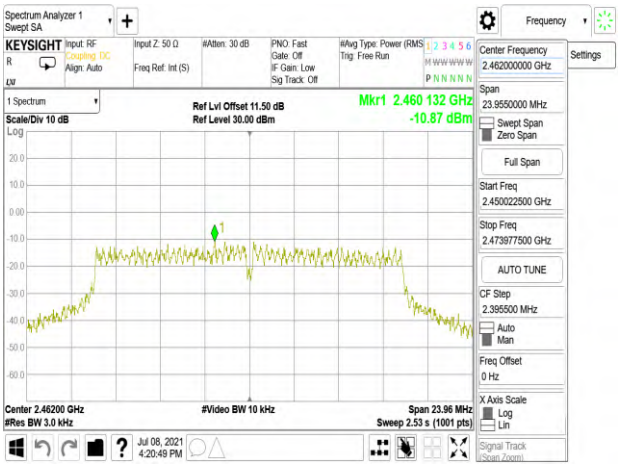
802.11g_20MHz_Chain0_2437MHz



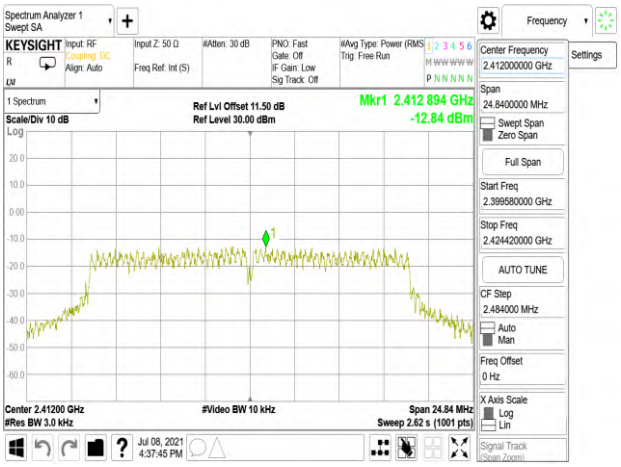
802.11b_20MHz_Chain0_2462MHz



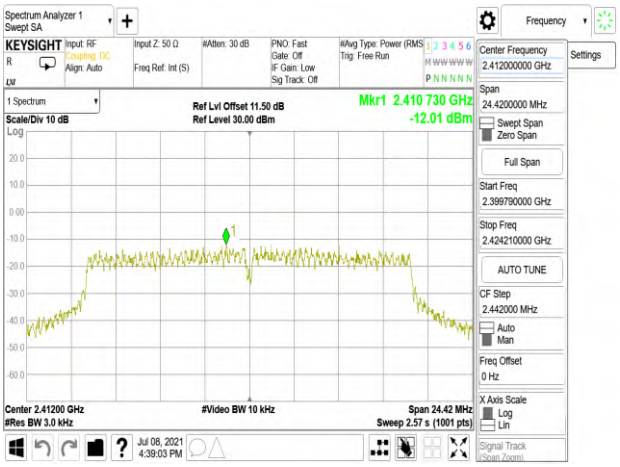
802.11g_20MHz_Chain0_2462MHz



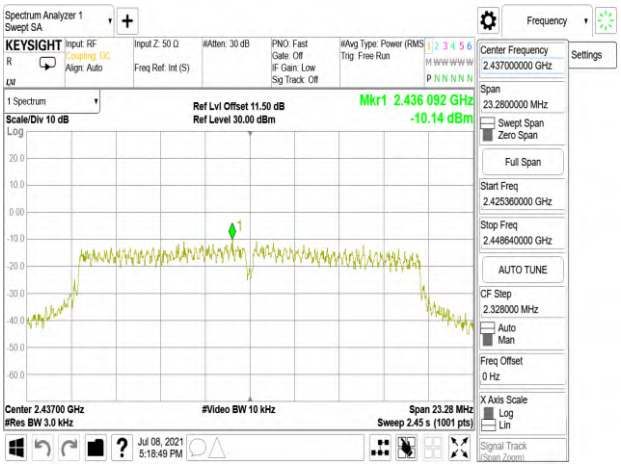
802.11n_20MHz_Chain0_2412MHz



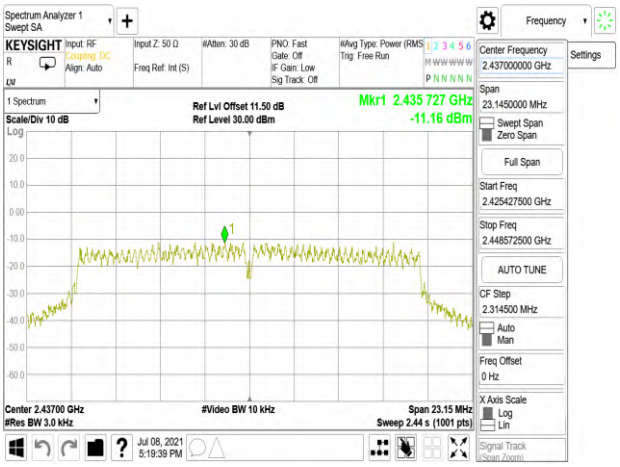
802.11n_20MHz_Chain1_2412MHz



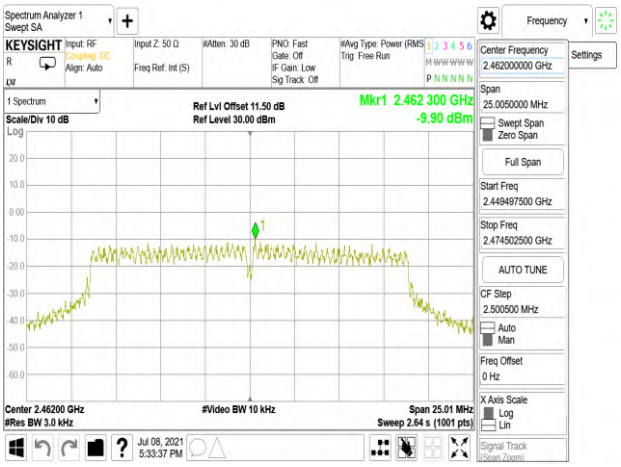
802.11n_20MHz_Chain0_2437MHz



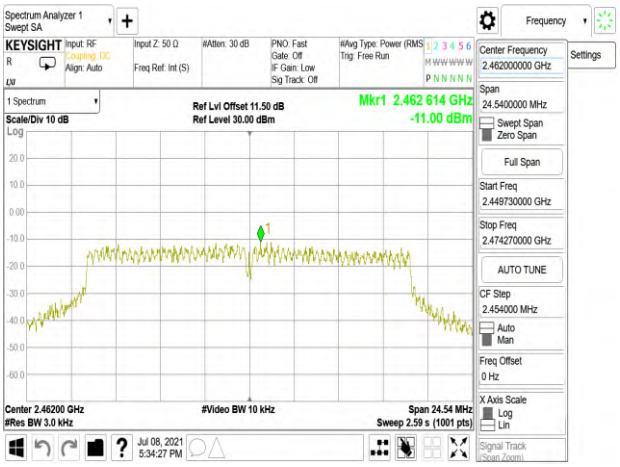
802.11n_20MHz_Chain1_2437MHz



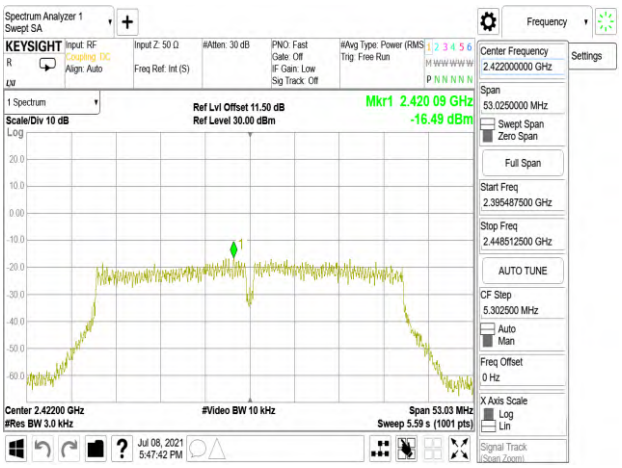
802.11n_20MHz_Chain0_2462MHz



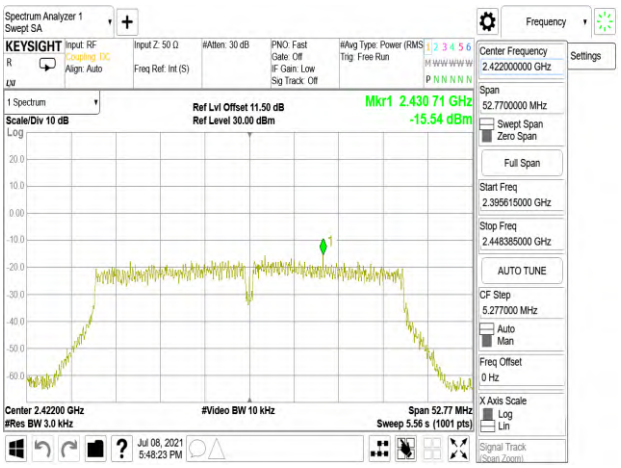
802.11n_20MHz_Chain1_2462MHz



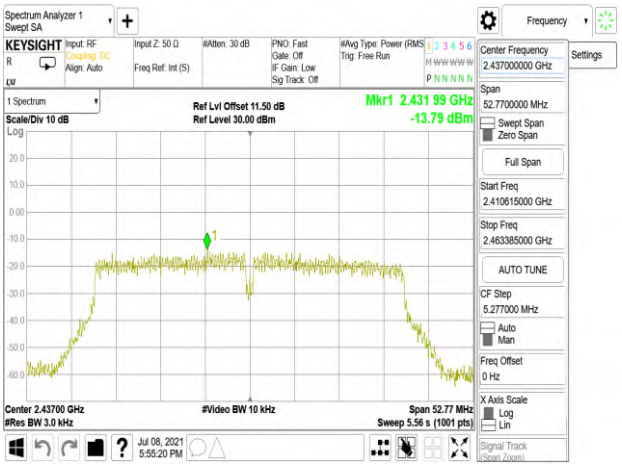
802.11n_40MHz_Chain0_2422MHz



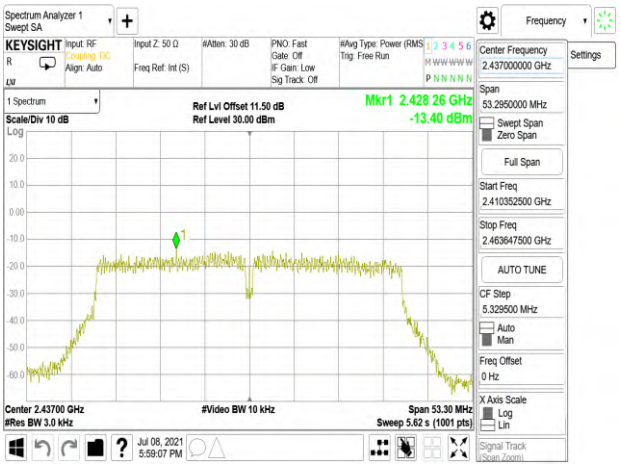
802.11n_40MHz_Chain1_2422MHz



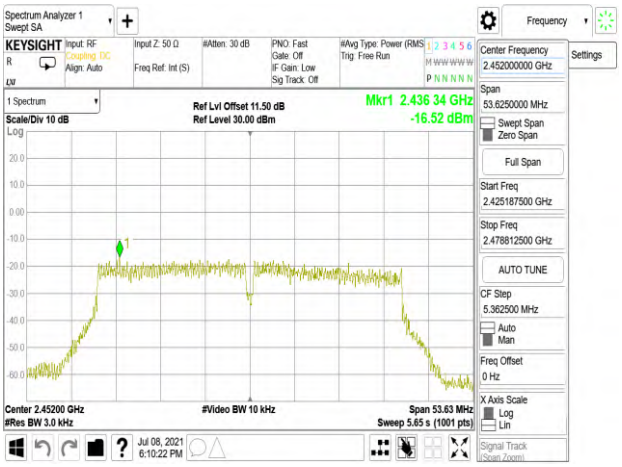
802.11n_40MHz_Chain0_2437MHz



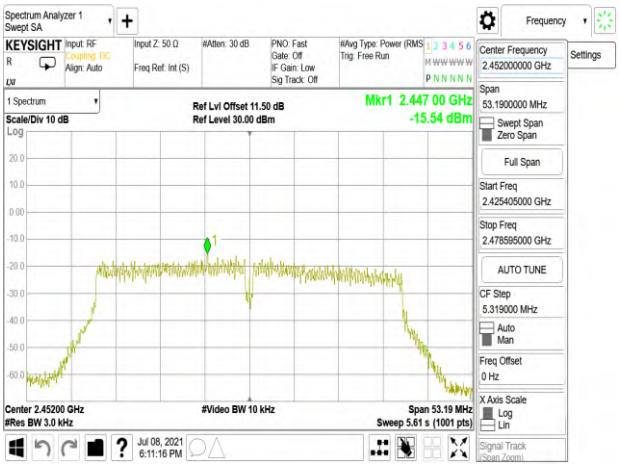
802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz



13 ANTENNA REQUIREMENT

13.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

13.2 Antenna Connected Construction

The antenna is designed with unique RF connector and no consideration of replacement. Please see EUT photo for details.

~ End of Report ~