

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



**Applicant:** Quanta Computer Inc.  
No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City  
33377, Taiwan

**Product Name:** Clover Flex

**Brand Name:** clover

**Model No.:** C403

**HVIN:** C403W

**Model Difference:** N/A

**Report Number:** ER/2021/50018

**FCC ID** HFS-C403W

**IC:** 1787B-C403W

**Issue Date:** July 9, 2021

**Date of Test:** June 11, 2021 ~ June 30, 2021

**Date of EUT Received:** May 21, 2021

*Blue Yang*  
**Approved By** \_\_\_\_\_  
**Blue Yang**

## 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.

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## Revision History

Report Number	Revision	Description	Issue Date	Revised By
ER/2021/50018	00	Original	July 9, 2021	Yuri Tsai

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# 1 GENERAL INFORMATION

## 1.1 Product Description

Product Name:	Clover Flex
Brand Name:	clover
Model No.:	C403
HVIN:	C403W
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	C043UT11750016
Power Supply:	7.6V from Li-ion Polymer rechargeable battery or 12V from Adapter

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (dBm)	Modulation Technology
b	2412-2462	11	19.58	DSSS, OFDM
g			20.90	
n_HT20			21.59	
n_HT40	2422-2452	7	22	
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM			
Transission 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_HT20MHz: 6.5 – 72.2 Mbps 802.11 n_HT40MHz: 13.5 - 150.0 Mbps			

## 1.2 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
PIFA	SAA	DQ60AYF0002	2.4GHz	-1.47	-
Note: Antenna information is provided by the applicant.					

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### 1.3 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, Amendment 2, February 2021  
 ANSI C63.10:2013

### 1.4 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		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conducted 4	TW0028	
		Conducted 5		
		Conducted 6		
		Conduction A		
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
Conducted G				
<p><b>Note:</b> 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.</p>				

### 1.5 Special Accessories

There are no special accessories used while test was conducted.

### 1.6 Equipment Modifications

There was no modification incorporated into the EUT.

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## 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 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 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.

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## 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.

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## 2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission configuration

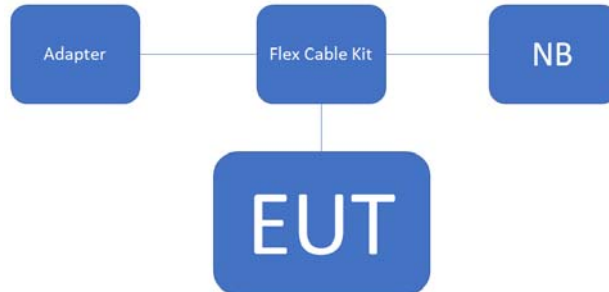


Fig. 2-2 Conducted (Antenna Port) Configuration Emission



Fig 2-3 Conduction (AC Power Line) Radiated Emission

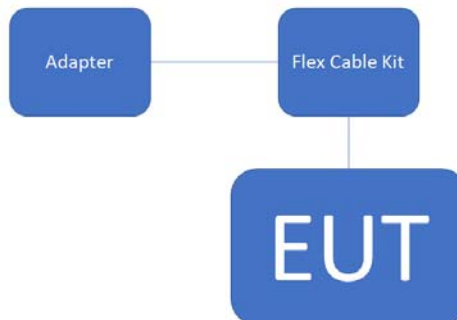


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
1	WLAN Test Software	N/A	N/A	N/A
2	Notebook	Lenovo	T440P	PC-014TAK
3	Flex Cable Kit	Clover	N/A	H041UQ63940213

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### 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

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## 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

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#### 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 given UE is pre-scanned among below modes.

Modulation	Transmission Chain				Single Transmission Spatial	Multiple Transmission Spatial
<input checked="" type="checkbox"/> 802.11 b	<input checked="" type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input checked="" type="checkbox"/> 1TX	<input type="checkbox"/> 2TX
<input checked="" type="checkbox"/> 802.11 g	<input checked="" type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input checked="" type="checkbox"/> 1TX	<input type="checkbox"/> 2TX
<input checked="" type="checkbox"/> 802.11 n	<input checked="" type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input checked="" type="checkbox"/> SISO	<input type="checkbox"/> MIMO
<input type="checkbox"/> 802.11 ax	<input type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> SISO	<input type="checkbox"/> 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.

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**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	1,6,11	OFDM	6	ch0

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 11	1,6,10,11	OFDM	MCS0	ch0
802.11n (HT40)	3 to 9	3,4,5,6,9	OFDM	MCS0	ch0

**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 Measurement:**

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 11	1,6,10,11	OFDM	MCS0	ch0
802.11n (HT40)	3 to 9	3,4,5,6,9	OFDM	MCS0	ch0

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## 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.

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## 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

- The lower limit shall apply at the transition frequencies
- 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 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
LISN	SCHWARZ-BECK	NSLK 8127	8127-465	04/09/2021	04/08/2022
Coaxial Cables	N/A	Coaxial Cable	161207	12/07/2020	12/06/2021
Test Software	audix	e3	Ver. 6.11-20180413	01/01/2021	12/31/2021
EMI Test Receiver	R&S	ESCI 7	100759	07/13/2020	07/12/2021

### 6.3 EUT Setup

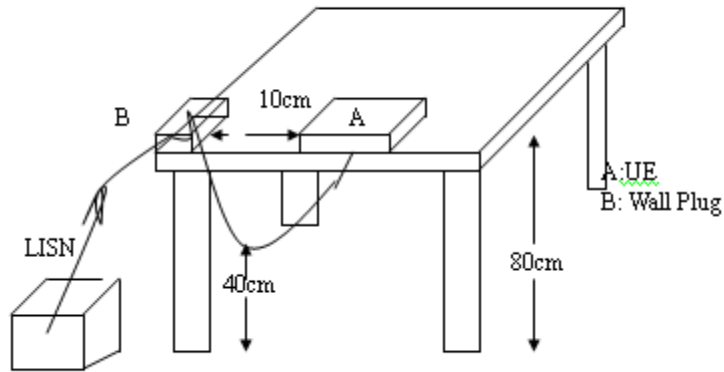
- The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- The LISN was connected with 120Vac/60Hz power source.

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### 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.

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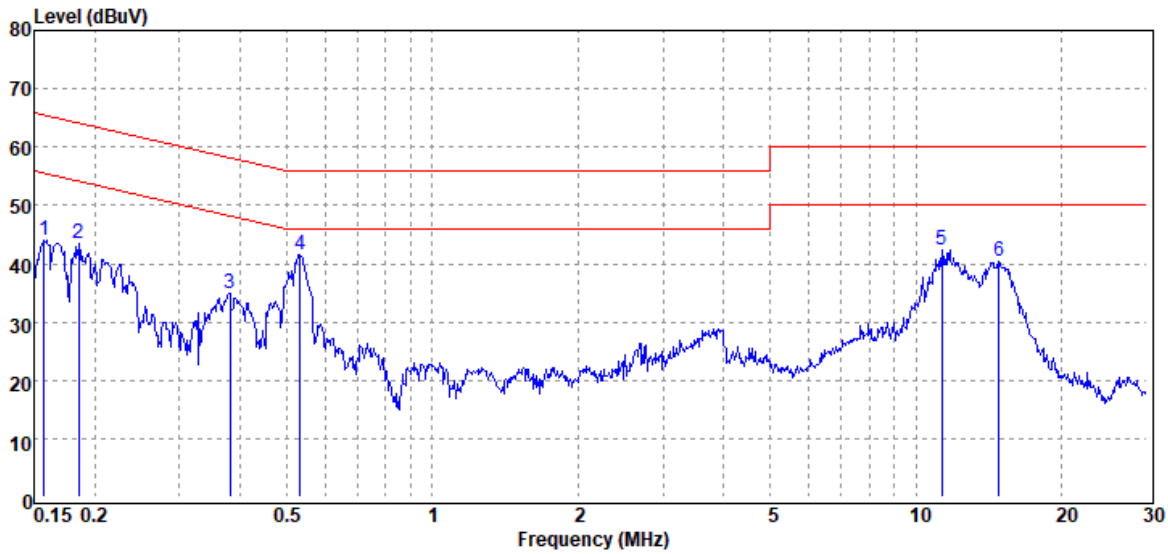
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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :ER/2021/50018  
 Test Mode :WLAN 2.4G  
 Power :AC 120V/60Hz  
 Probe :L  
 Note: :

Test Site :Conduction 6F  
 Test Date :2021-06-16  
 Temp./Humi. :25.3/58  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.16	Peak	43.92	0.04	43.96	65.60	-21.64
0.19	Peak	43.47	0.04	43.51	64.24	-20.73
0.38	Peak	34.75	0.10	34.85	58.25	-23.40
0.53	Peak	41.24	0.15	41.39	56.00	-14.61
11.32	Peak	41.42	0.89	42.31	60.00	-17.69
14.83	Peak	39.38	1.03	40.41	60.00	-19.59

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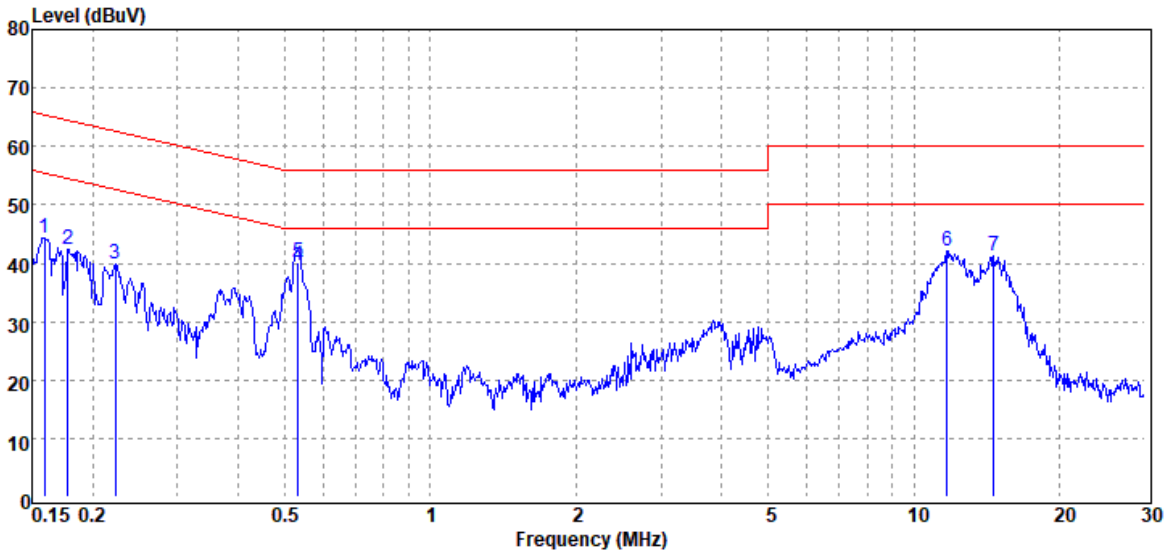
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Report Number :ER/2021/50018  
 Test Mode :WLAN 2.4G  
 Power :AC 120V/60Hz  
 Probe :N  
 Note: :

Test Site :Conduction 6F  
 Test Date :2021-06-16  
 Temp./Humi. :25.3/58  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.16	Peak	44.31	0.11	44.42	65.52	-21.10
0.18	Peak	42.35	0.11	42.46	64.59	-22.13
0.22	Peak	39.63	0.11	39.74	62.70	-22.96
0.53	Average	39.40	0.21	39.61	46.00	-6.39
0.53	QP	39.80	0.21	40.01	56.00	-15.99
11.68	Peak	41.34	0.80	42.14	60.00	-17.86
14.59	Peak	40.31	0.95	41.26	60.00	-18.74

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## 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	99.14	0.04	0.08	0.01
802.11g	98.24	0.08	0.48	0.01
802.11n_20	98.11	0.08	0.52	0.01
802.11n_40	94.89	0.23	1.05	2.00

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### 7.3 Duty Cycle test plots

802.11b\_20MHz\_Chain0\_2412MHz



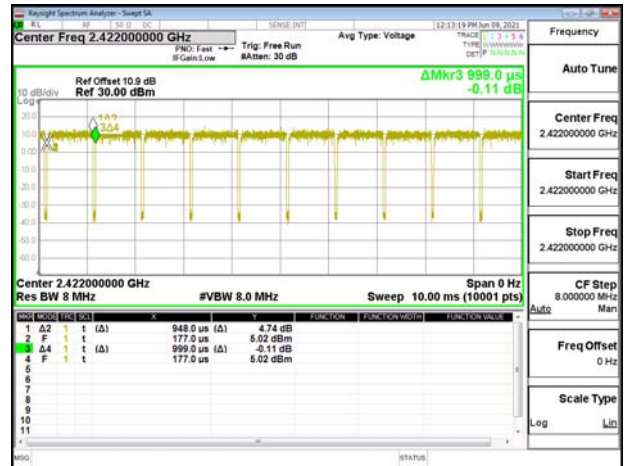
802.11n\_20MHz\_Chain0\_2412MHz



802.11g\_20MHz\_Chain0\_2412MHz



802.11n\_40MHz\_Chain0\_2422MHz



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## 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 from 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.

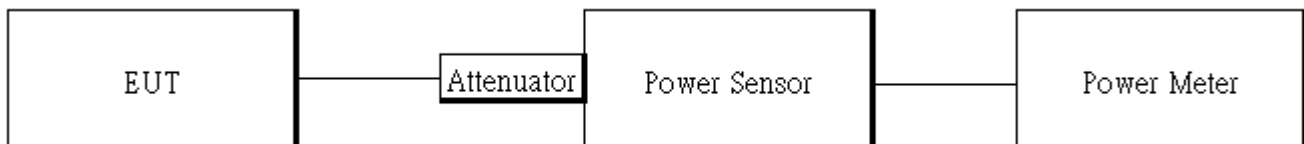
The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

### 8.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
PXA Spectrum Analyzer	Agilent	N9030A	MY53120760	04/27/2021	04/26/2022
Power Meter	Anritsu	ML2496A	1804001	03/02/2021	03/01/2022
Power Sensor	Anritsu	MA2411B	1726104	03/02/2021	03/01/2022
Power Sensor	Anritsu	MA2411B	1726107	03/02/2021	03/01/2022
Attenuator	Mini-Circuit	BW-S10W2+	4	12/16/2020	12/15/2021
DC Block	Mini-Circuits	BLK-18-S+	1	12/16/2020	12/15/2021

### 8.3 Test Set-up

Power Meter:



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### 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	16.5	19.58	30.00	PASS
6	2437	1	16.5	19.44	30.00	PASS
11	2462	1	16.5	19.39	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	16.5	17.26	30.00	PASS
6	2437	1	16.5	17.24	30.00	PASS
11	2462	1	16.5	17.19	30.00	PASS

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802.11g Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	16	20.90	30.00	PASS
6	2437	6	16	20.88	30.00	PASS
11	2462	6	16	20.68	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	16	16.26	30.00	PASS
6	2437	6	16	16.25	30.00	PASS
11	2462	6	16	16.28	30.00	PASS

802.11n_HT20M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	16.5	21.37	30.00	PASS
6	2437	MCS0	16.5	21.47	30.00	PASS
10	2457	MCS0	16.5	21.59	30.00	PASS
11	2462	MCS0	16	20.18	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	16.5	16.68	30.00	PASS
6	2437	MCS0	16.5	16.66	30.00	PASS
10	2457	MCS0	16.5	16.70	30.00	PASS
11	2462	MCS0	16	16.64	30.00	PASS

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802.11n_HT40M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	13.5	20.30	30.00	PASS
4	2427	MCS0	13.5	20.13	30.00	PASS
5	2432	MCS0	14	20.76	30.00	PASS
6	2437	MCS0	15	22.00	30.00	PASS
9	2452	MCS0	15	21.68	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	13.5	14.19	30.00	PASS
4	2427	MCS0	13.5	14.24	30.00	PASS
5	2432	MCS0	14	14.60	30.00	PASS
6	2437	MCS0	15	15.85	30.00	PASS
9	2452	MCS0	15	15.88	30.00	PASS

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EIRP

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	17.26	-1.47	15.79	36	PASS
6	2437	1	17.24	-1.47	15.77	36	PASS
11	2462	1	17.19	-1.47	15.72	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	16.26	-1.47	14.79	36	PASS
6	2437	6	16.25	-1.47	14.78	36	PASS
11	2462	6	16.28	-1.47	14.81	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	16.68	-1.47	15.21	36	PASS
6	2437	MCS0	16.66	-1.47	15.19	36	PASS
10	2457	MCS0	16.70	-1.47	15.23	36	PASS
11	2462	MCS0	16.64	-1.47	15.17	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	14.19	-1.47	12.72	36	PASS
4	2427	MCS0	14.24	-1.47	12.77	36	PASS
5	2432	MCS0	14.60	-1.47	13.13	36	PASS
6	2437	MCS0	15.85	-1.47	14.38	36	PASS
9	2452	MCS0	15.88	-1.47	14.41	36	PASS

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

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## 9 EMISSION BANDWIDTH MEASUREMENT

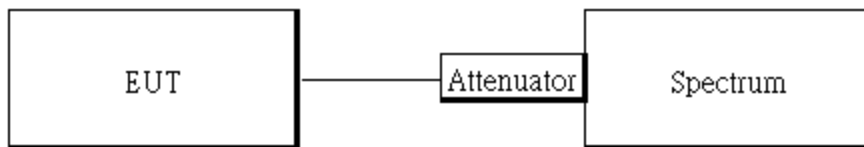
### 9.1 Standard Applicable

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

### 9.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
PXA Spectrum Analyzer	Agilent	N9030A	MY53120760	04/27/2021	04/26/2022
Attenuator	Mini-Circuit	BW-S10W2+	4	12/16/2020	12/15/2021
DC Block	Mini-Circuits	BLK-18-S+	1	12/16/2020	12/15/2021

### 9.3 Test Set-up



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## 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  $\geq$  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

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### 9.5 6dB Bandwidth

#### 802.11b Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	8110.00	≥ 500	PASS
2437	8110.00	≥ 500	PASS
2462	<b>8113.00</b>	≥ 500	PASS

#### 802.11g Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15180.00	≥ 500	PASS
2437	15150.00	≥ 500	PASS
2462	<b>15720.00</b>	≥ 500	PASS

#### 802.11\_n\_HT20 Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15180.00	≥ 500	PASS
2437	16020.00	≥ 500	PASS
2462	<b>16360.00</b>	≥ 500	PASS

#### 802.11\_n\_HT40 Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	<b>35740.00</b>	≥ 500	PASS
2437	35190.00	≥ 500	PASS
2452	35140.00	≥ 500	PASS

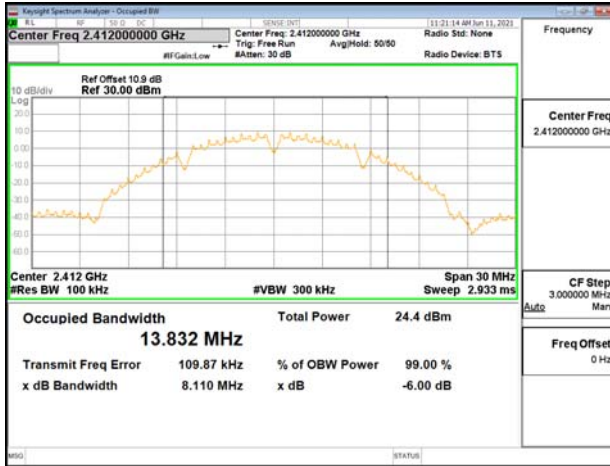
*\*Refer to next page for plots*

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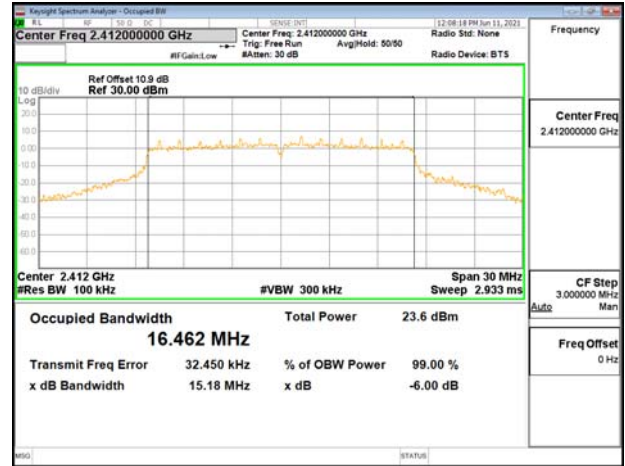
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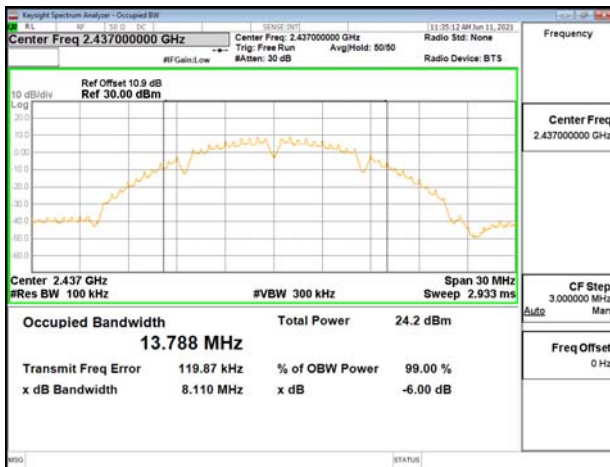
802.11b\_20MHz\_Chain0\_2412MHz



802.11g\_20MHz\_Chain0\_2412MHz



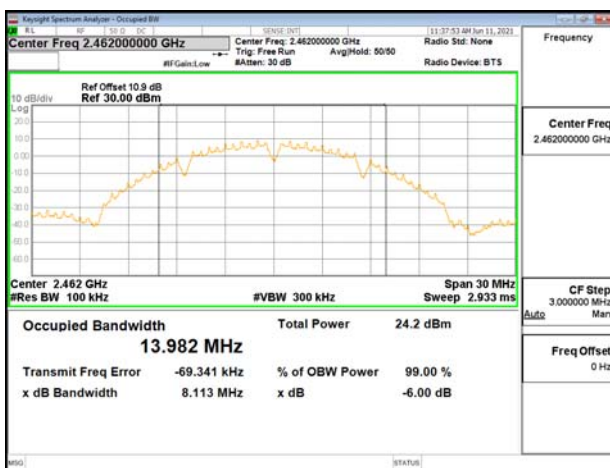
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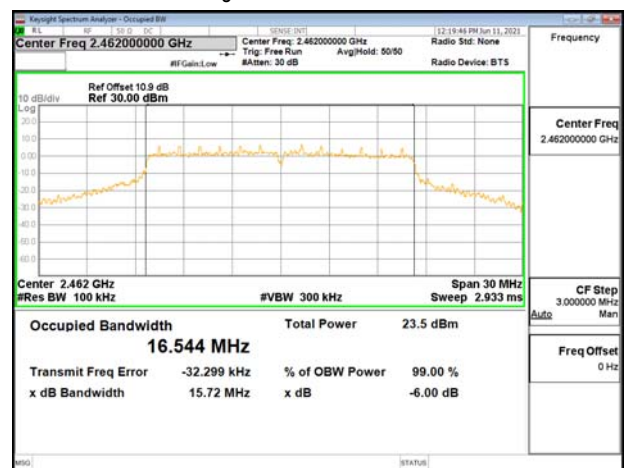
802.11g\_20MHz\_Chain0\_2437MHz



802.11b\_20MHz\_Chain0\_2462MHz



802.11g\_20MHz\_Chain0\_2462MHz

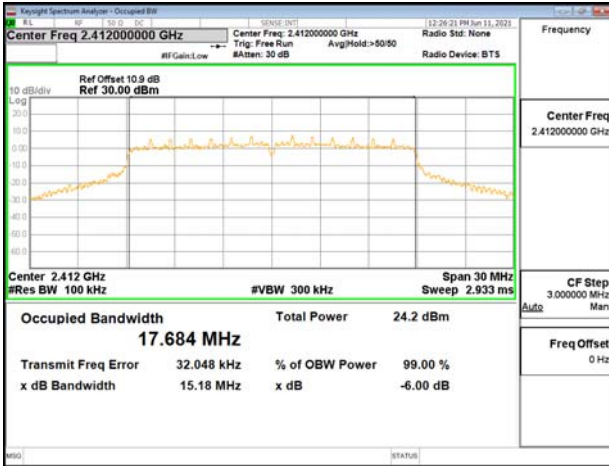


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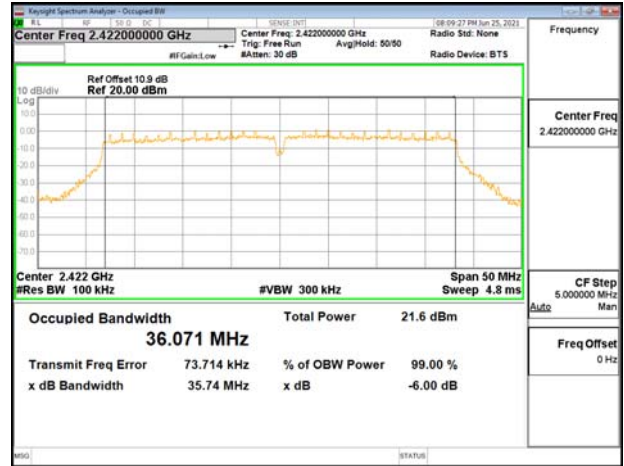
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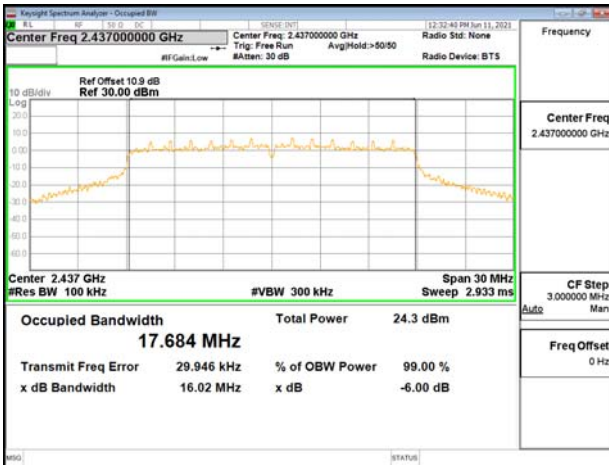
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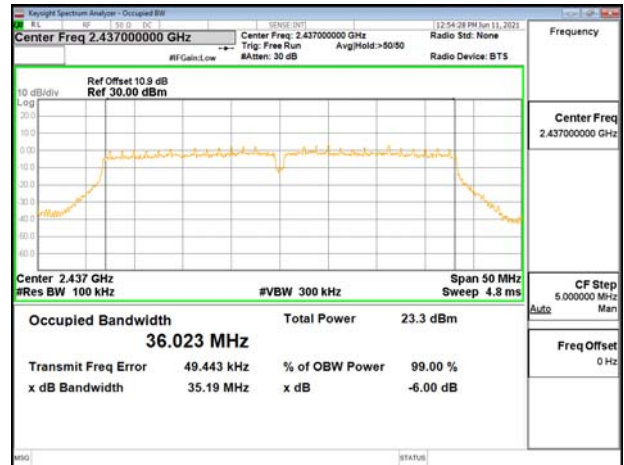
802.11n\_40MHz\_Chain0\_2422MHz



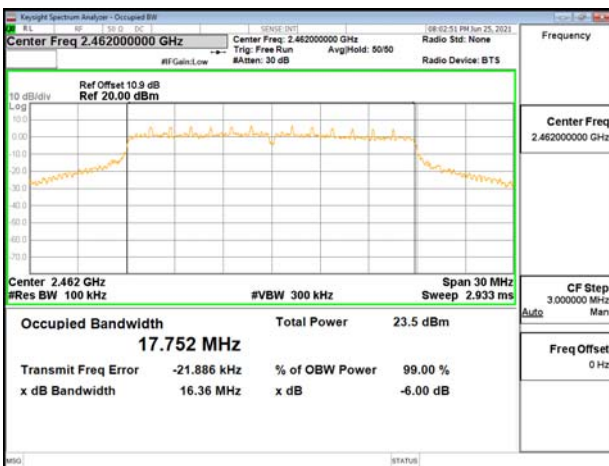
802.11n\_20MHz\_Chain0\_2437MHz



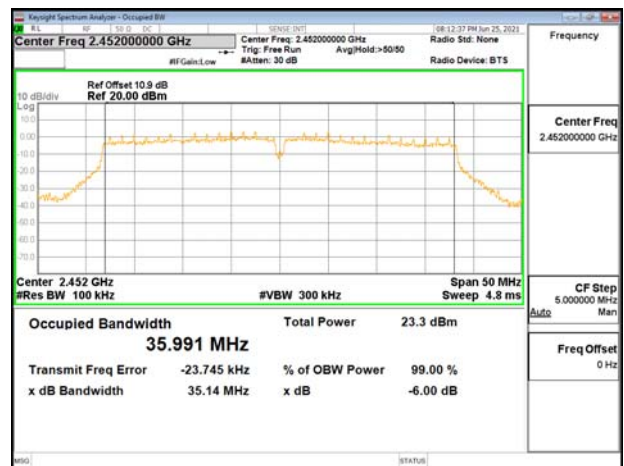
802.11n\_40MHz\_Chain0\_2437MHz



802.11n\_20MHz\_Chain0\_2462MHz



802.11n\_40MHz\_Chain0\_2452MHz



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9.6 99% Bandwidth

802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	13.803
2437	13.769
2462	13.981

802.11g Ch0

Freq. (MHz)	99% BW (MHz)
2412	16.707
2437	16.692
2462	16.856

802.11n\_HT20M Ch0

Freq. (MHz)	99% BW (MHz)
2412	17.913
2437	17.907
2462	18.029

802.11n\_HT40M Ch0

Freq. (MHz)	99% BW (MHz)
2422	36.264
2437	36.204
2452	36.131

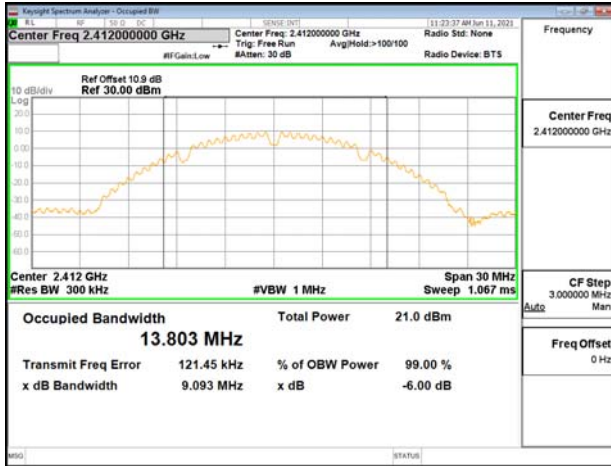
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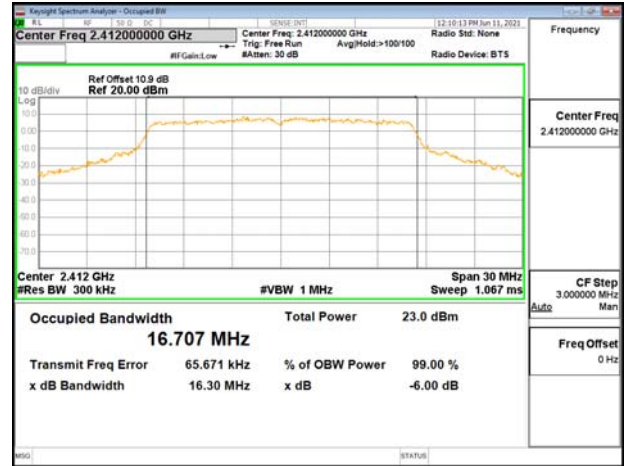
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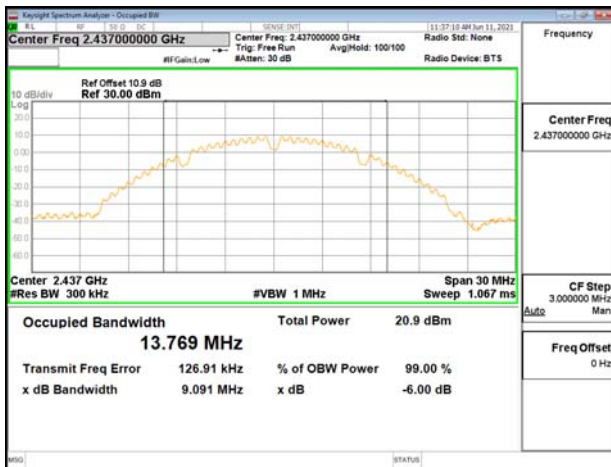
802.11b\_20MHz\_Chain0\_2412MHz



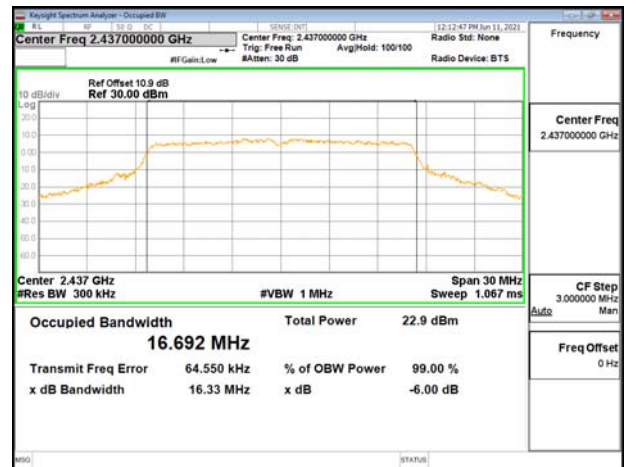
802.11g\_20MHz\_Chain0\_2412MHz



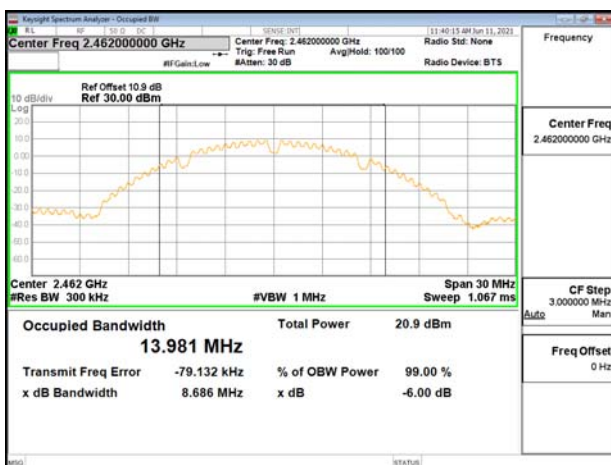
802.11b\_20MHz\_Chain0\_2437MHz



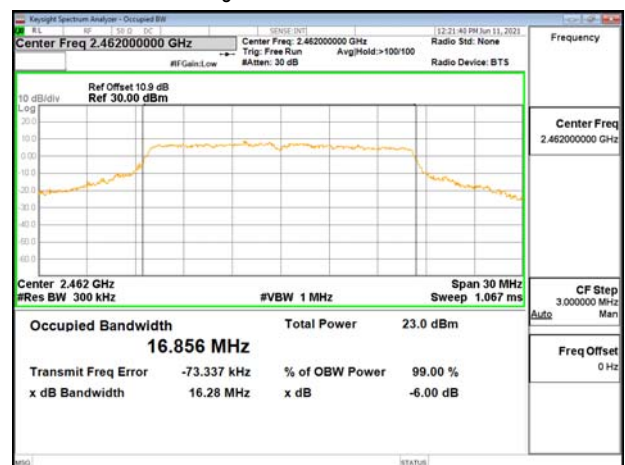
802.11g\_20MHz\_Chain0\_2437MHz



802.11b\_20MHz\_Chain0\_2462MHz



802.11g\_20MHz\_Chain0\_2462MHz

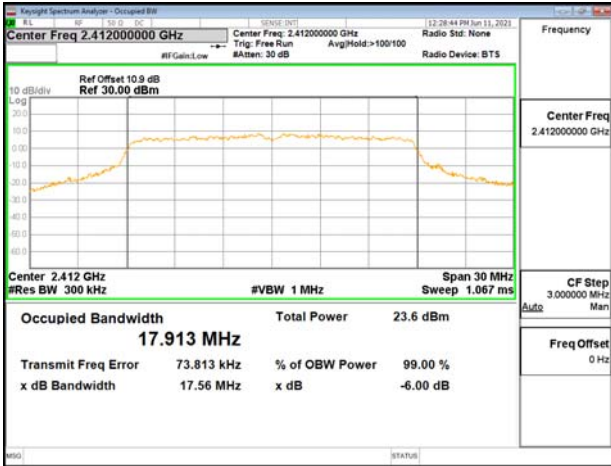


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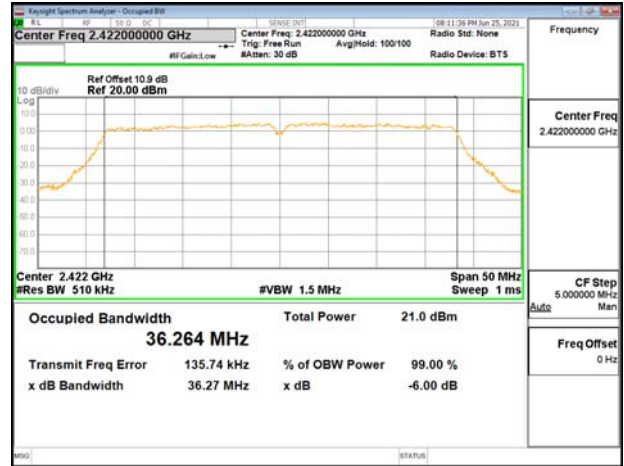
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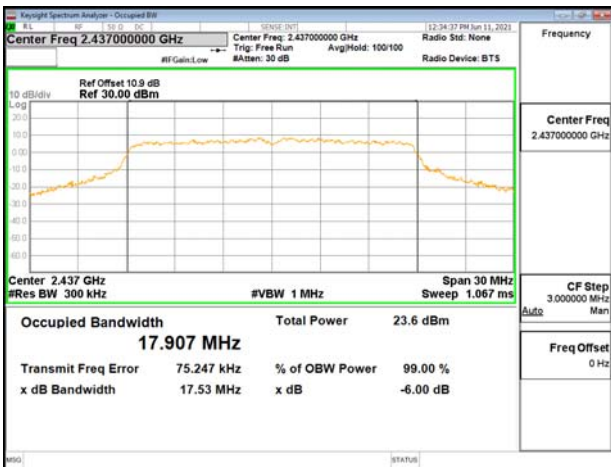
802.11n\_20MHz\_Chain0\_2412MHz



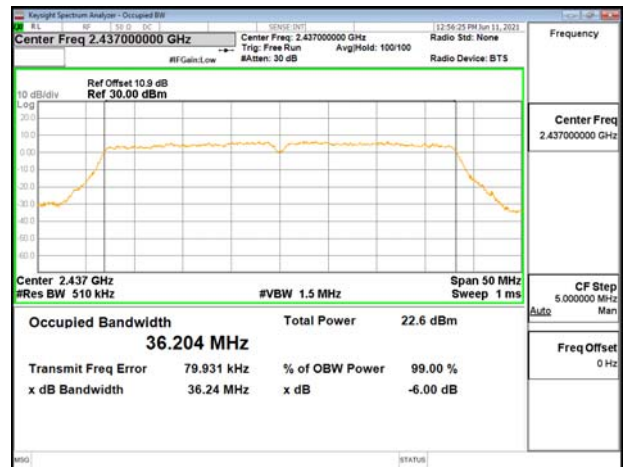
802.11n\_40MHz\_Chain0\_2422MHz



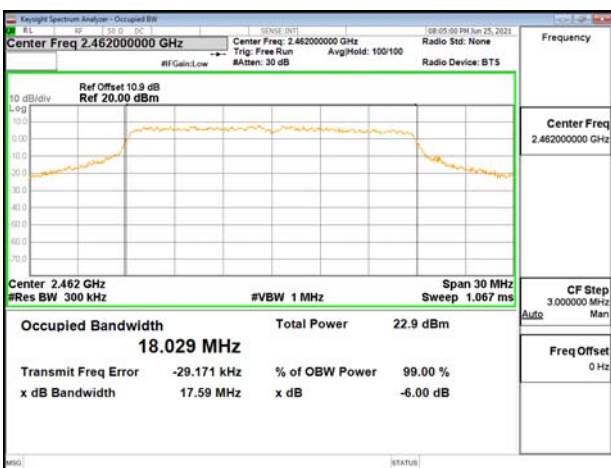
802.11n\_20MHz\_Chain0\_2437MHz



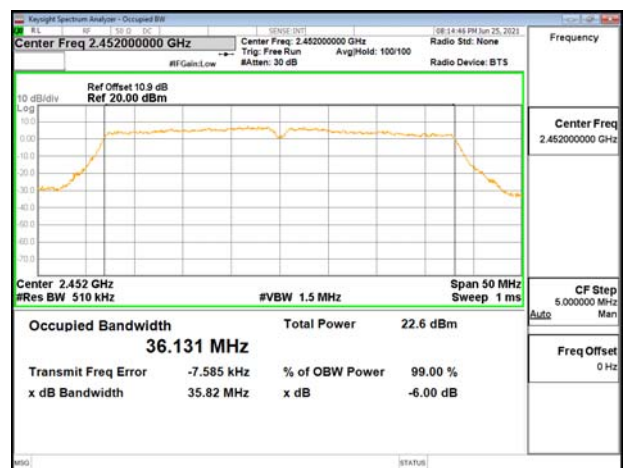
802.11n\_40MHz\_Chain0\_2437MHz



802.11n\_20MHz\_Chain0\_2462MHz



802.11n\_40MHz\_Chain0\_2452MHz



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## 10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

### 10.1 Standard Applicable

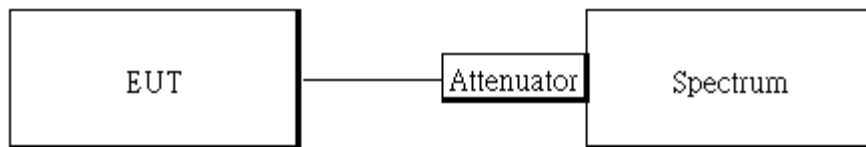
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
PXA Spectrum Analyzer	Agilent	N9030A	MY53120760	04/27/2021	04/26/2022
Attenuator	Mini-Circuit	BW-S10W2+	4	12/16/2020	12/15/2021
DC Block	Mini-Circuits	BLK-18-S+	1	12/16/2020	12/15/2021

### 10.3 Test SET-UP



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## 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.

### 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.

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**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.

**10.5 Measurement Result**

Reference Level of Limit 802.11b mode			
Freq. (MHz)	PSD (dBm)	Offset	Reference Level of Limit (dBm)
2412	9.24	10.90	-10.76
2437	8.98	10.90	-11.02
2462	9.04	10.90	-10.96

Reference Level of Limit 802.11g mode			
Freq. (MHz)	PSD (dBm)	Offset	Reference Level of Limit (dBm)
2412	6.39	10.90	-13.61
2437	6.42	10.90	-13.58
2462	6.07	10.90	-13.93

Reference Level of Limit 802.11n20 mode			
Freq. (MHz)	PSD (dBm)	Offset	Reference Level of Limit (dBm)
2412	7.12	10.90	-12.88
2437	7.16	10.90	-12.84
2462	6.42	10.90	-13.58

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Reference Level of Limit 802.11n40 MODE			
Freq. (MHz)	PSD (dBm)	Offset	Reference Level of Limit (dBm)
2422	1.061	10.90	-18.94
2437	2.75	10.90	-17.25
2452	3.296	10.90	-16.70

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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

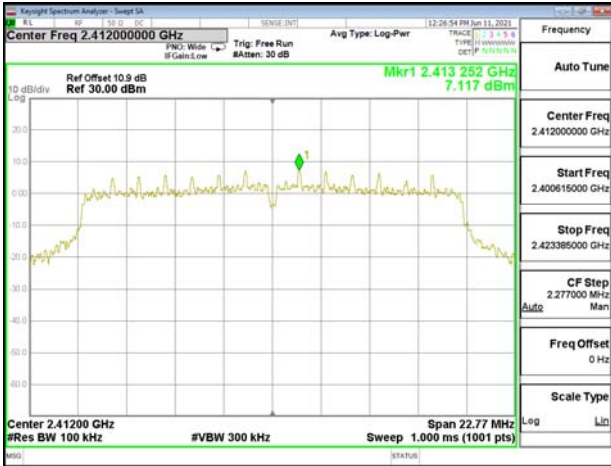


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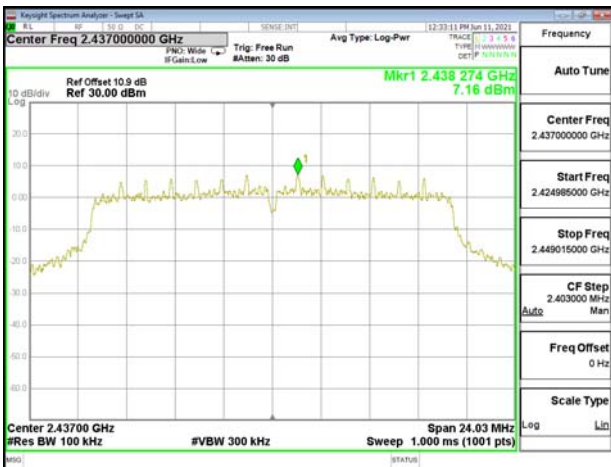
802.11n\_20MHz\_Chain0\_2412MHz



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



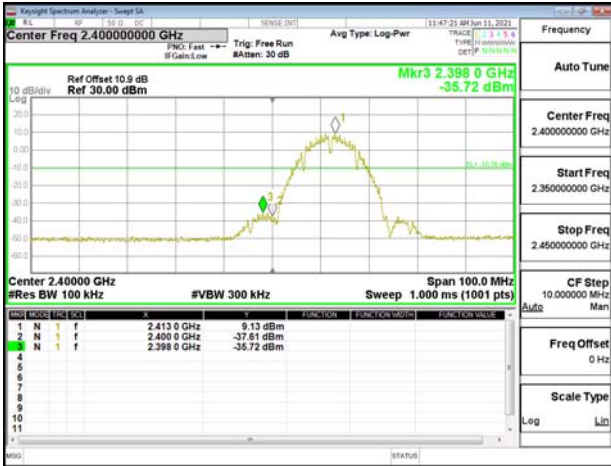
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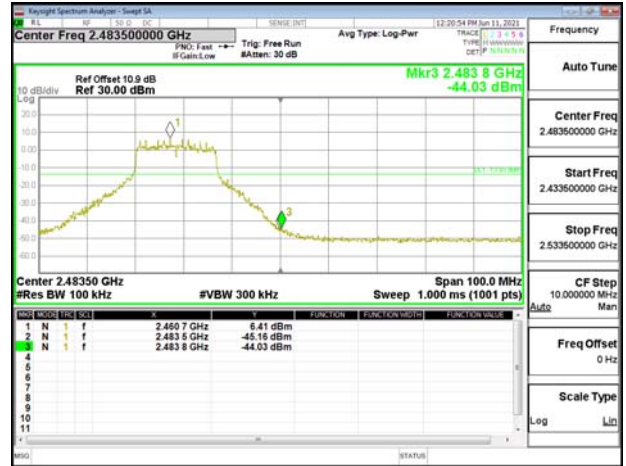
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802.11b\_20MHz\_Chain0\_2412MHz



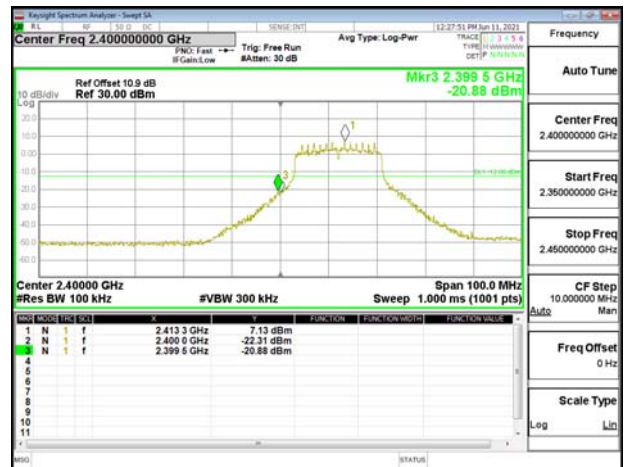
802.11g\_20MHz\_Chain0\_2462MHz



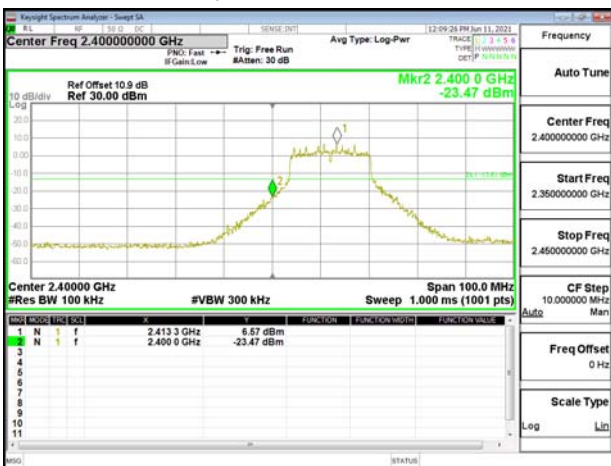
802.11b\_20MHz\_Chain0\_2462MHz



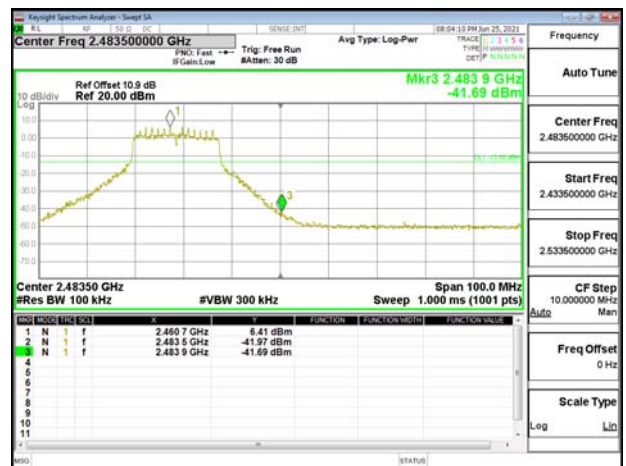
802.11n\_20MHz\_Chain0\_2412MHz



802.11g\_20MHz\_Chain0\_2412MHz



802.11n\_20MHz\_Chain0\_2462MHz



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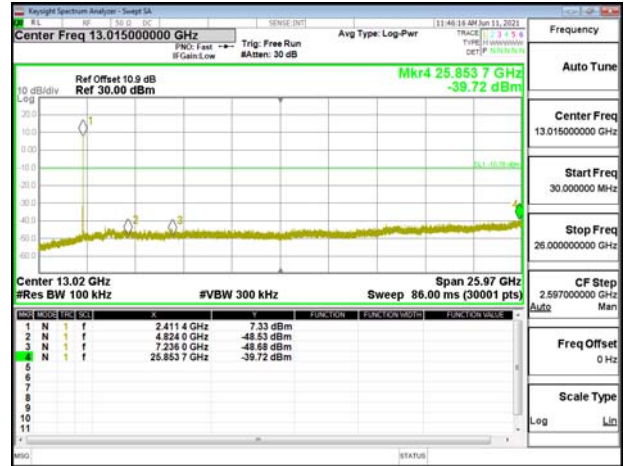
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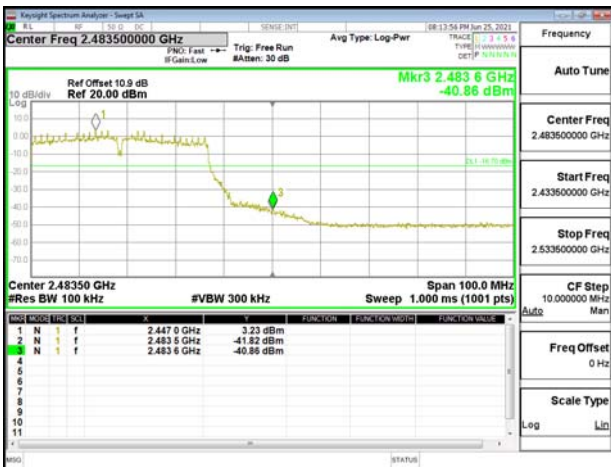
802.11n\_40MHz\_Chain0\_2422MHz



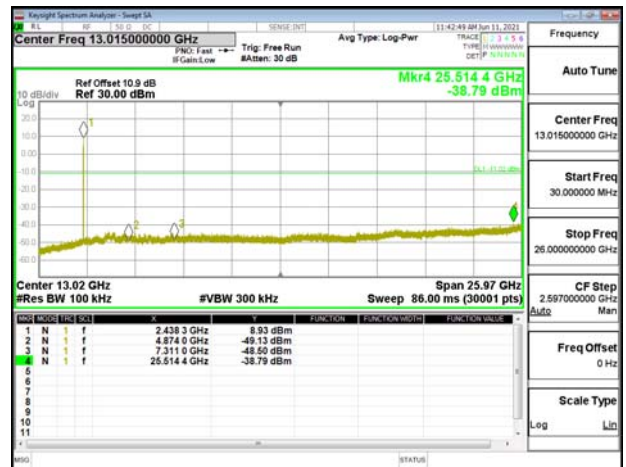
802.11b\_20MHz\_Chain0\_2412MHz



802.11n\_40MHz\_Chain0\_2452MHz



802.11b\_20MHz\_Chain0\_2437MHz



802.11b\_20MHz\_Chain0\_2462MHz



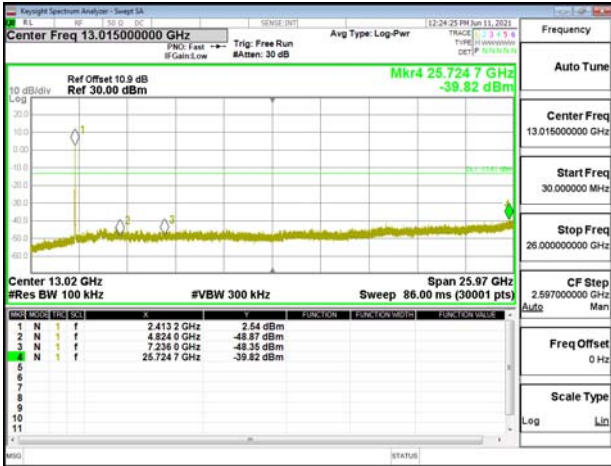
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802.11g\_20MHz\_Chain0\_2412MHz



802.11n\_20MHz\_Chain0\_2412MHz



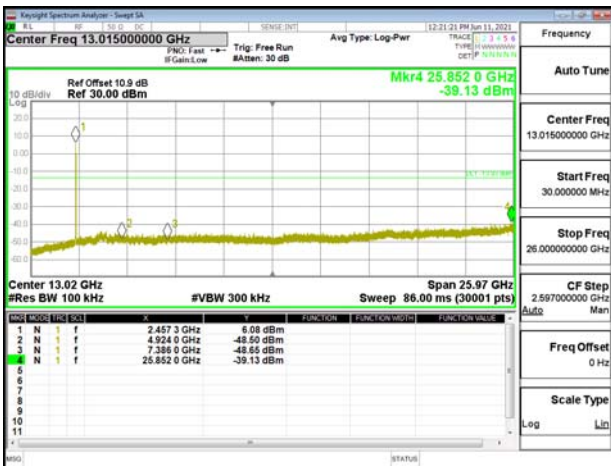
802.11g\_20MHz\_Chain0\_2437MHz



802.11n\_20MHz\_Chain0\_2437MHz



802.11g\_20MHz\_Chain0\_2462MHz



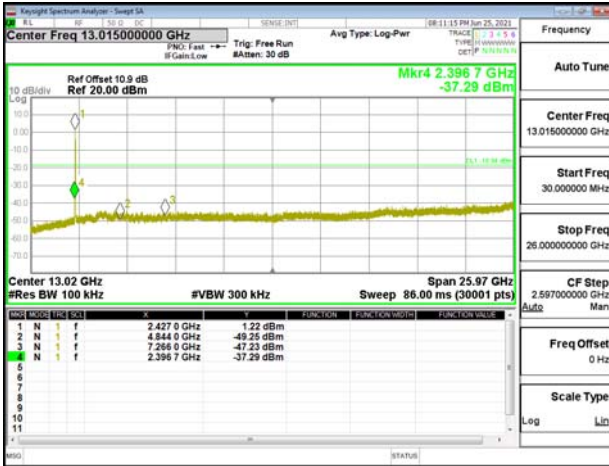
802.11n\_20MHz\_Chain0\_2462MHz



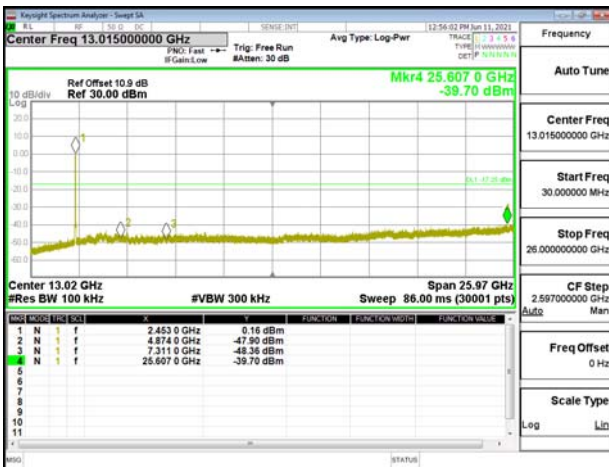
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802.11n\_40MHz\_Chain0\_2422MHz



802.11n\_40MHz\_Chain0\_2437MHz



802.11n\_40MHz\_Chain0\_2452MHz



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## 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.
2. Emission level (dBµV/m) = 20 log Emission level (µV/m)

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**11.2 Measurement Equipment Used:**

Radiated Emission Test Site: SAC 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Horn Antenna	SCHWARZ-BECK	BBHA9170	184	12/11/2020	12/10/2021
Site Cal	SGS	SAC I chamber	N/A	01/01/2021	12/31/2021
Horn Antenna	SCHWARZ-BECK	BBHA9120D	D803	12/17/2020	12/16/2021
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT-N0555	01/13/2021	01/12/2022
Loop Antenna	ETS.LIND-GREN	6502	148045	10/19/2020	10/18/2021
Spectrum Analyzer	Agilent	E4446A	MY51100003	10/29/2020	10/28/2021
Test Software	audix	e3	Ver. 6.11-20180413	01/01/2021	12/31/2021
EMI Test Receiver	R&S	ESCI 7	100759	07/13/2020	07/12/2021
Pre-Amplifier	EMC Instruments	EMC184045B	980135	12/16/2020	12/15/2021
Pre-Amplifier	HP	8449B	3008A01973	12/16/2020	12/15/2021
Pre-Amplifier	HP	8447D	2944A09469	12/16/2020	12/15/2021
Attenuator	Mini-Circuit	BW-S10W2+	4	12/16/2020	12/15/2021
Bandreject Filter 2400-2483.5	EWT	EWT-14-0166	M1	12/16/2020	12/15/2021
3.2GHz High Pass Filter	WI	WHKX10-2624-80SS	3	04/20/2021	12/15/2021
Coaxial Cable	Huber Suhner	succoflex 102	MY2622/2	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	succoflex 104A	800086/4a	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	EMC 104-SM-SM-2000	160123	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 106	76096/6	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 102	MY2630/2	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 102	MY22962/2	12/16/2020	12/15/2021

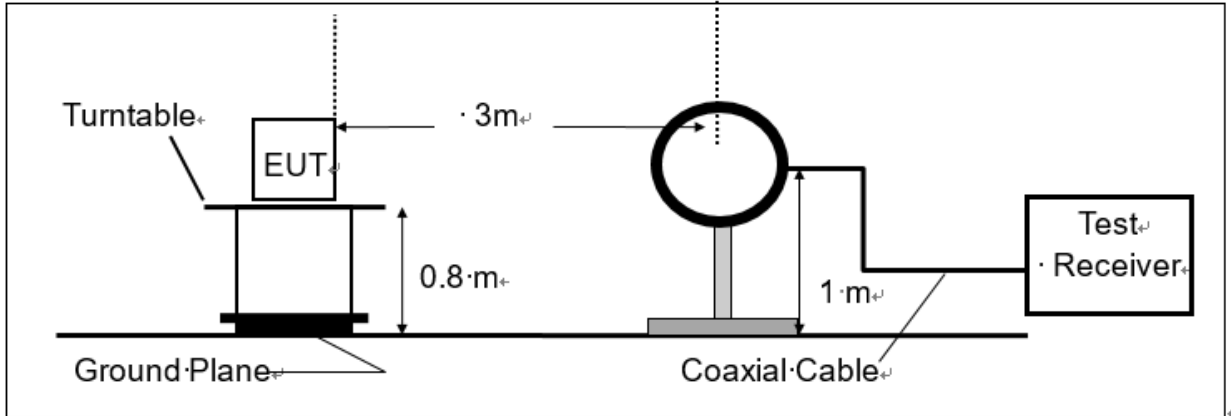
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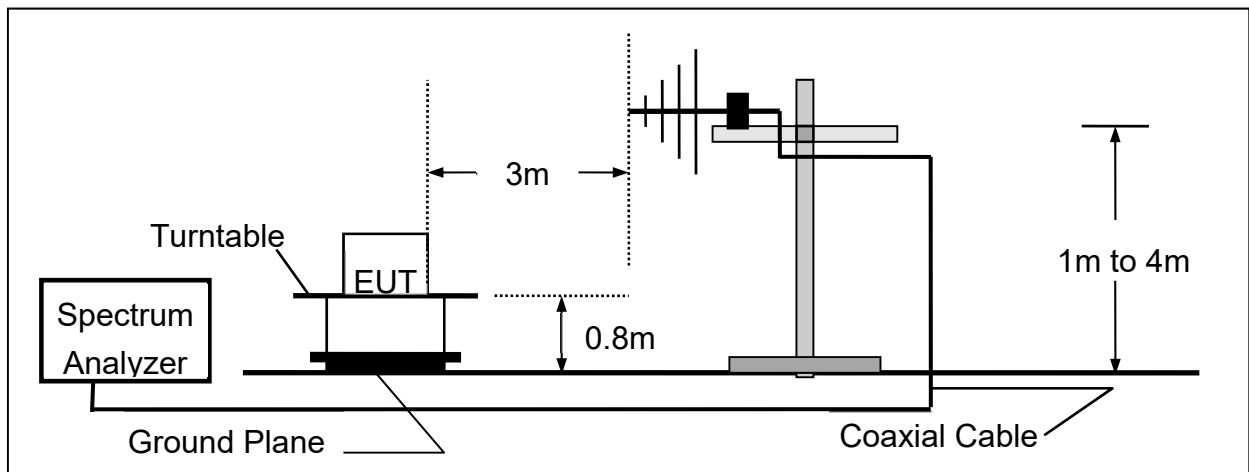
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### 11.3 Test SET-UP

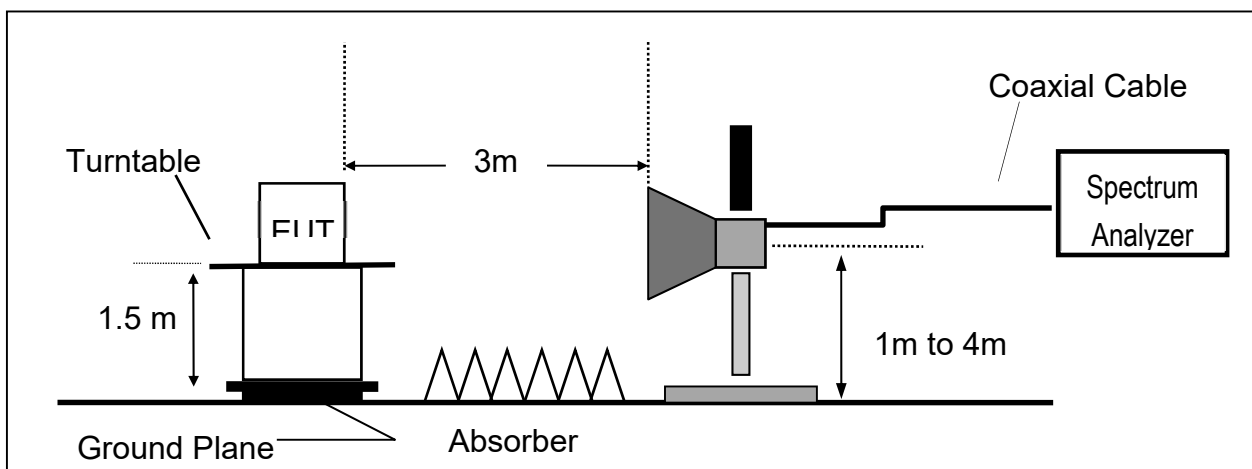
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



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



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



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## 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. 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.
6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector 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 Detector at frequency above 1 GHz.
9. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
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. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
12. Repeat above procedures until all default test channel measured were complete.

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### 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  $20 \cdot \log(uV/m)$*

*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*

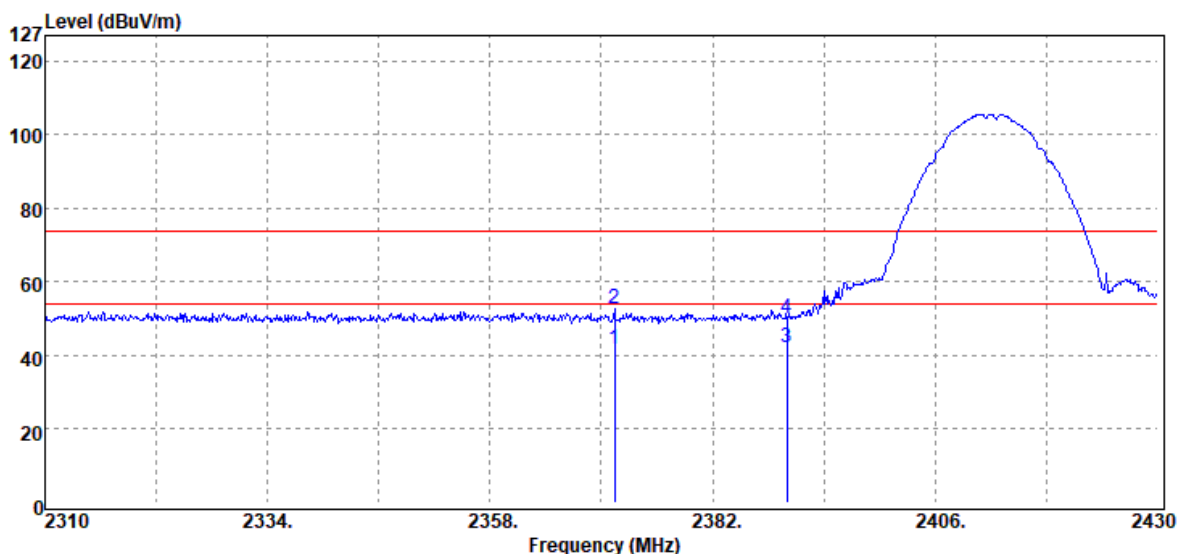
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### 11.7.1 Radiated Band Edge Measurement Result

Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11b	Test Date	:2021-06-15
Test Frequency	:2412 MHz	Temp./Humi.	:28.6/67
Test Mode	:Bandedge CH Low	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2371.44	Average	41.61	-0.05	41.56	54.00	-12.44
2371.44	Peak	52.69	-0.05	52.64	74.00	-21.36
2390.00	Average	42.27	-0.12	42.15	54.00	-11.85
2390.00	Peak	50.38	-0.12	50.26	74.00	-23.74

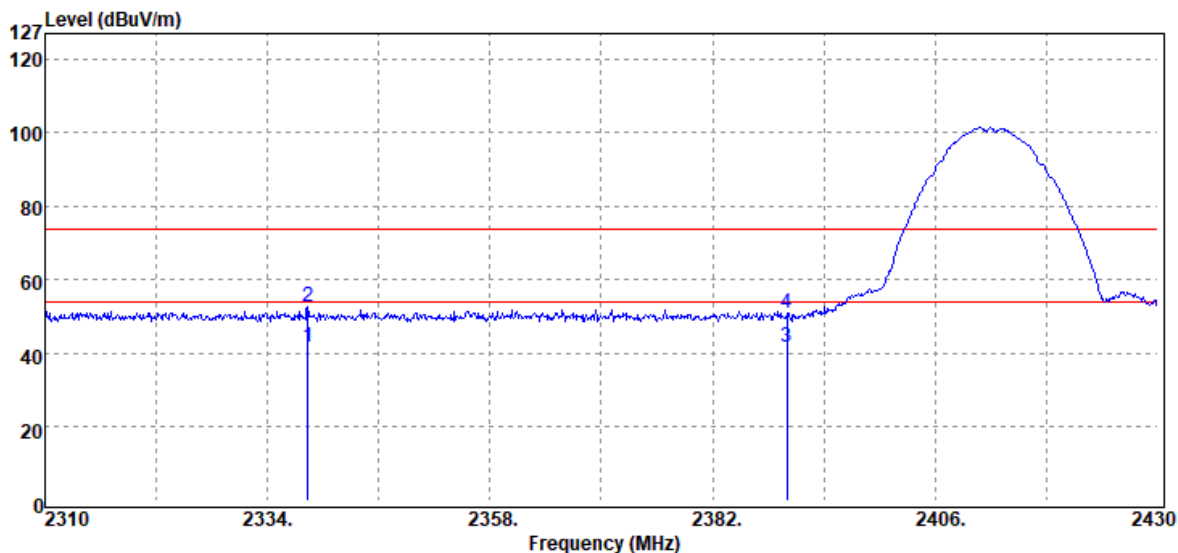
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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11b	Test Date	:2021-06-15
Test Frequency	:2412 MHz	Temp./Humi.	:28.6/67
Test Mode	:Bandedge CH Low	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



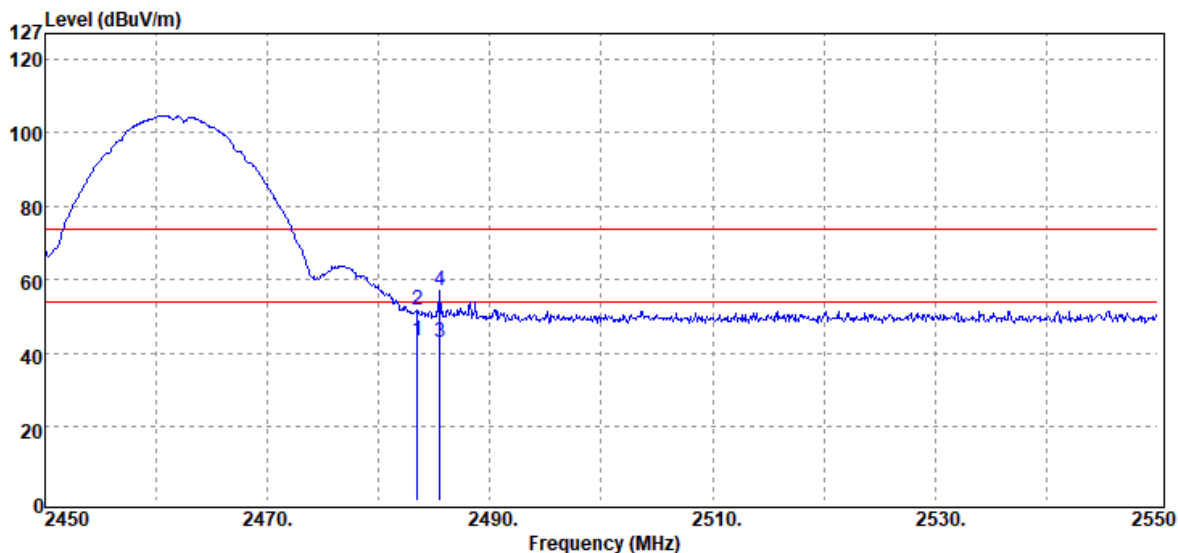
Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2338.32	Average	41.62	0.01	41.63	54.00	-12.37
2338.32	Peak	52.56	0.01	52.57	74.00	-21.43
2390.00	Average	41.73	-0.12	41.61	54.00	-12.39
2390.00	Peak	51.27	-0.12	51.15	74.00	-22.85

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11b	Test Date	:2021-06-15
Test Frequency	:2462 MHz	Temp./Humi.	:28.6/67
Test Mode	:Bandedge CH High	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	43.76	-0.16	43.60	54.00	-10.40
2483.50	Peak	52.09	-0.16	51.93	74.00	-22.07
2485.50	Average	43.33	-0.16	43.17	54.00	-10.83
2485.50	Peak	57.12	-0.16	56.96	74.00	-17.04

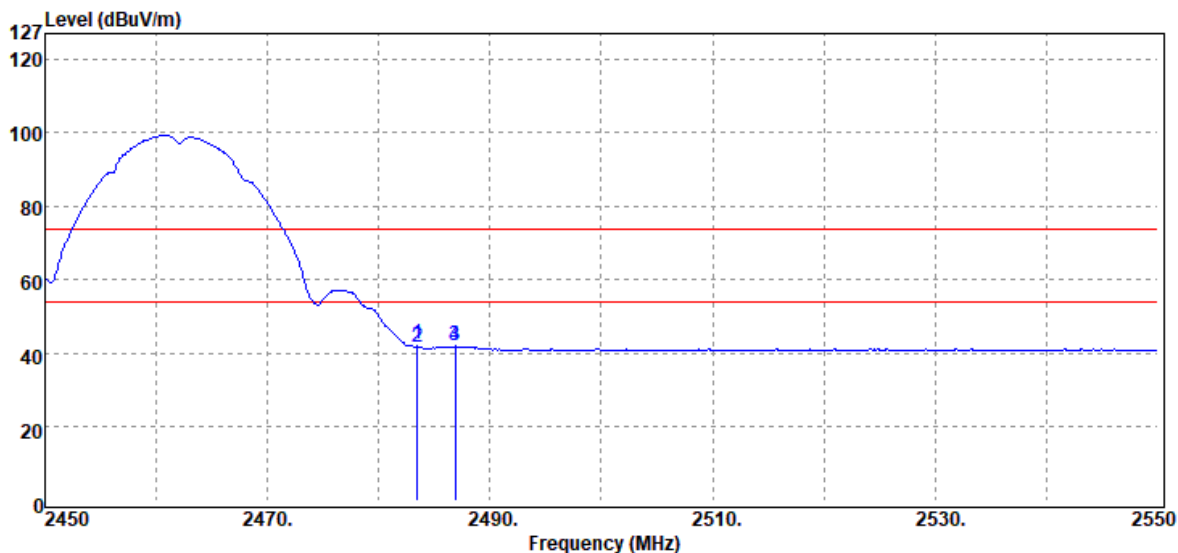
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Report Number :ER/2021/50018  
 Operation Mode :802.11b  
 Test Frequency :2462 MHz  
 Test Mode :Bandedge CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-15  
 Temp./Humi. :28.6/67  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



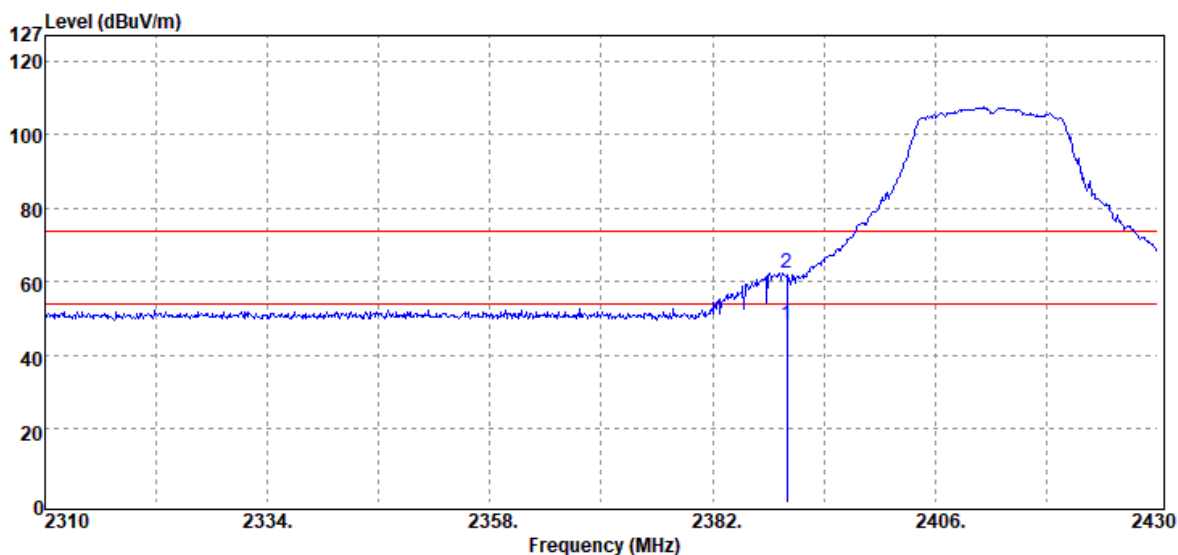
Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBUV/m	Limit @3m dBUV/m	Margin dB
2483.50	Average	42.70	-0.16	42.54	54.00	-11.46
2483.50	Peak	42.00	-0.16	41.84	74.00	-32.16
2486.90	Average	42.40	-0.16	42.24	54.00	-11.76
2486.90	Peak	42.14	-0.16	41.98	74.00	-32.02

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11g	Test Date	:2021-06-15
Test Frequency	:2412 MHz	Temp./Humi.	:28.6/67
Test Mode	:Bandedge CH Low	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



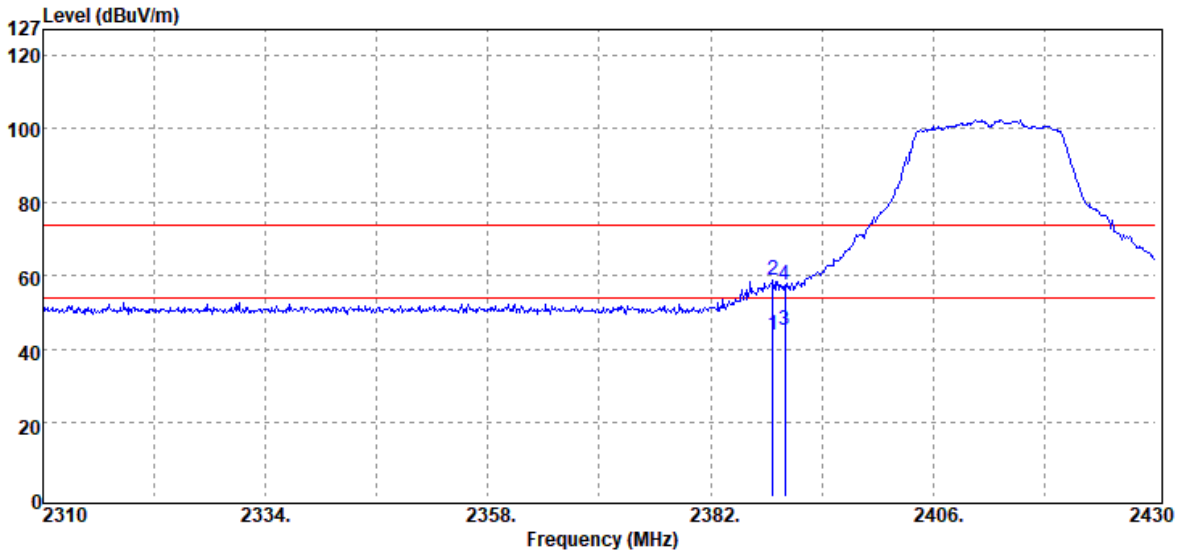
Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	48.44	-0.12	48.32	54.00	-5.68
2390.00	Peak	62.74	-0.12	62.62	74.00	-11.38

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11g	Test Date	:2021-06-15
Test Frequency	:2412 MHz	Temp./Humi.	:28.6/67
Test Mode	:Bandedge CH Low	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



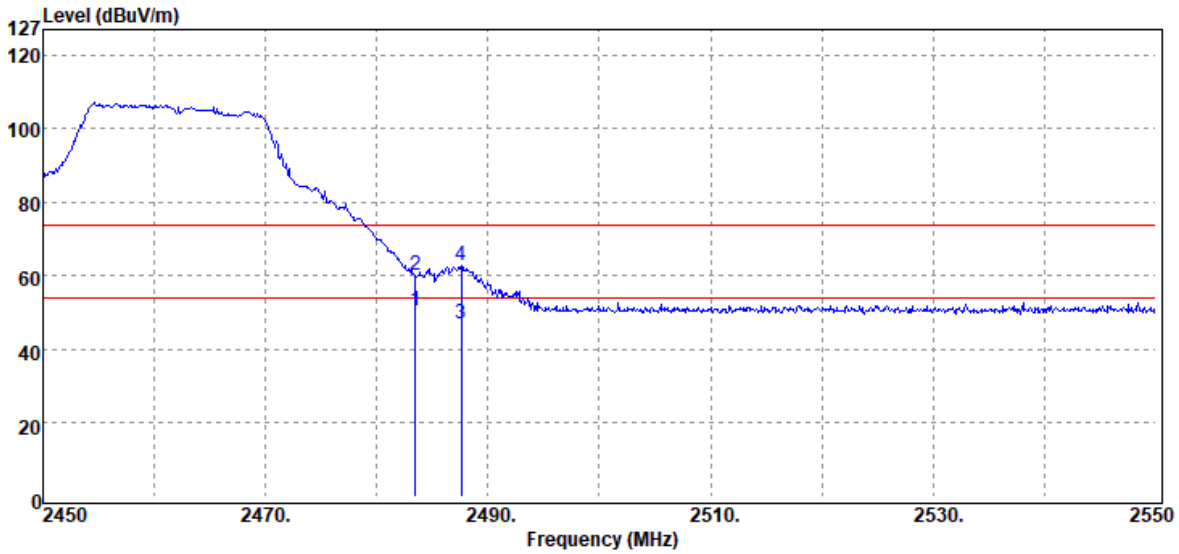
Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2388.72	Average	43.95	-0.11	43.84	54.00	-10.16
2388.72	Peak	59.20	-0.11	59.09	74.00	-14.91
2390.00	Average	45.25	-0.12	45.13	54.00	-8.87
2390.00	Peak	57.65	-0.12	57.53	74.00	-16.47

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11g	Test Date	:2021-06-15
Test Frequency	:2462 MHz	Temp./Humi.	:28.6/67
Test Mode	:Bandedge CH High	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	50.54	-0.16	50.38	54.00	-3.62
2483.50	Peak	60.53	-0.16	60.37	74.00	-13.63
2487.60	Average	46.98	-0.16	46.82	54.00	-7.18
2487.60	Peak	63.03	-0.16	62.87	74.00	-11.13

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Report Number :ER/2021/50018

Operation Mode :802.11g

Test Frequency :2462 MHz

Test Mode :Bandedge CH High

EUT Pol :E2 Plane

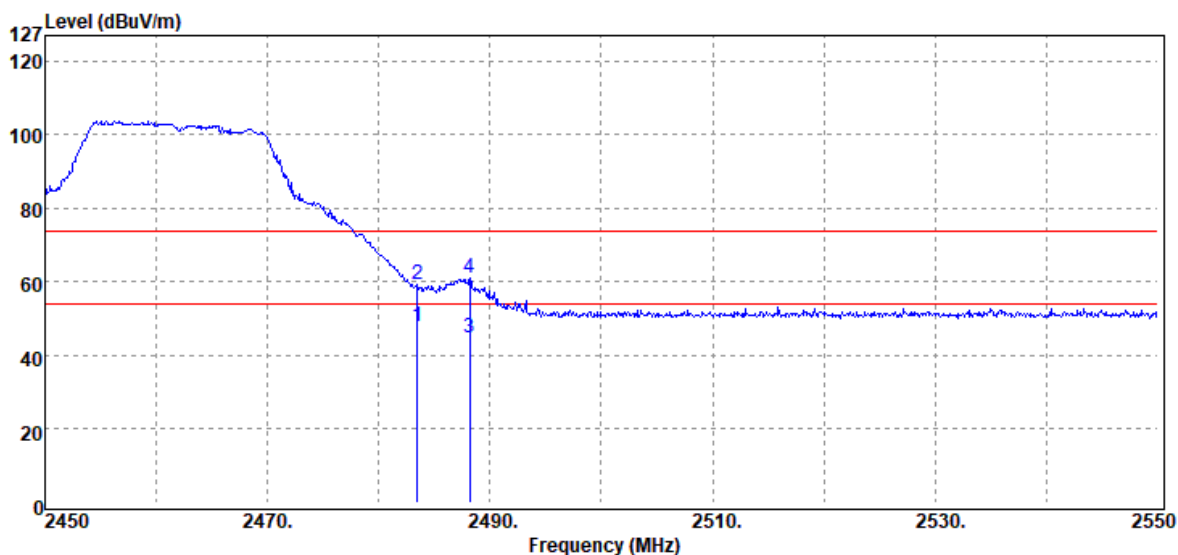
Test Site :SAC I Chamber

Test Date :2021-06-15

Temp./Humi. :28.6/67

Antenna Pol. :HORIZONTAL

Engineer :Neo Tsai



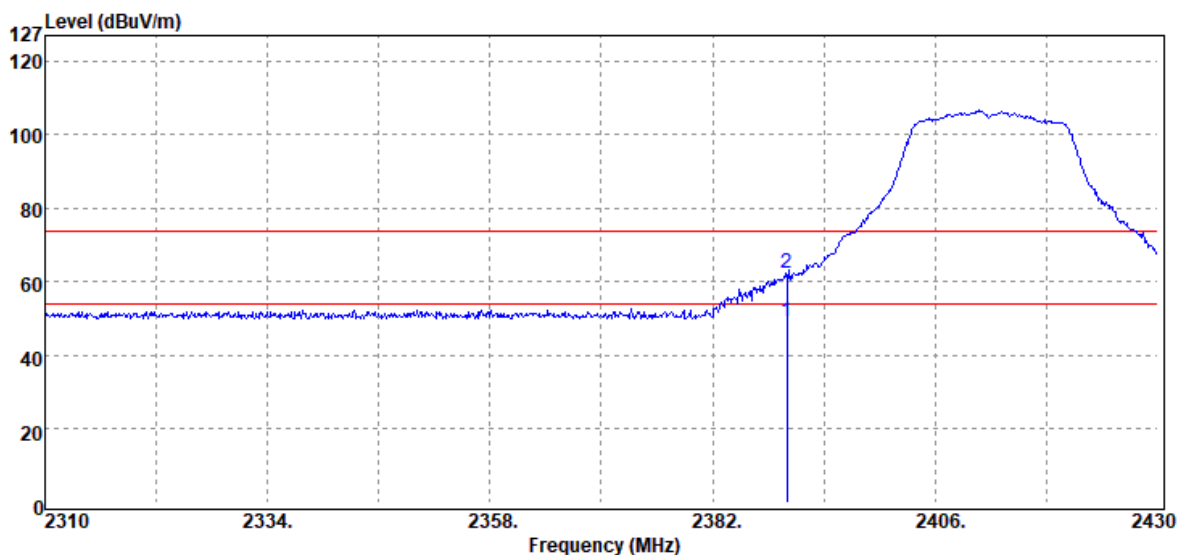
Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	48.09	-0.16	47.93	54.00	-6.07
2483.50	Peak	59.59	-0.16	59.43	74.00	-14.57
2488.20	Average	44.95	-0.16	44.79	54.00	-9.21
2488.20	Peak	61.30	-0.16	61.14	74.00	-12.86

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n20	Test Date	:2021-06-17
Test Frequency	:2412 MHz	Temp./Humi.	:26.2/62
Test Mode	:Bandedge CH Low	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	49.34	-0.12	49.22	54.00	-4.78
2390.00	Peak	62.36	-0.12	62.24	74.00	-11.76

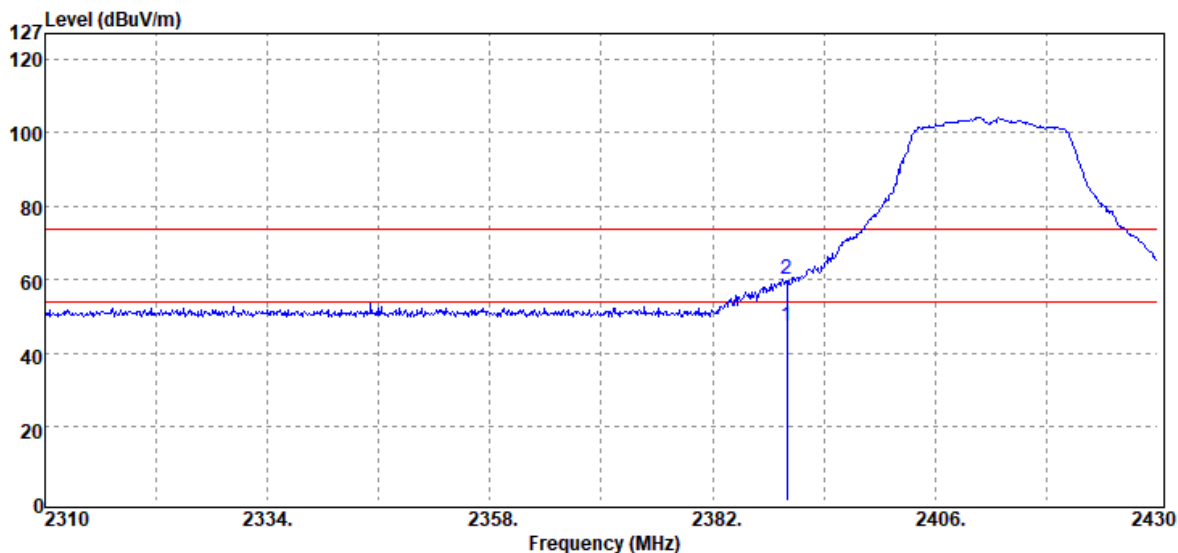
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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n20	Test Date	:2021-06-17
Test Frequency	:2412 MHz	Temp./Humi.	:26.2/62
Test Mode	:Bandedge CH Low	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



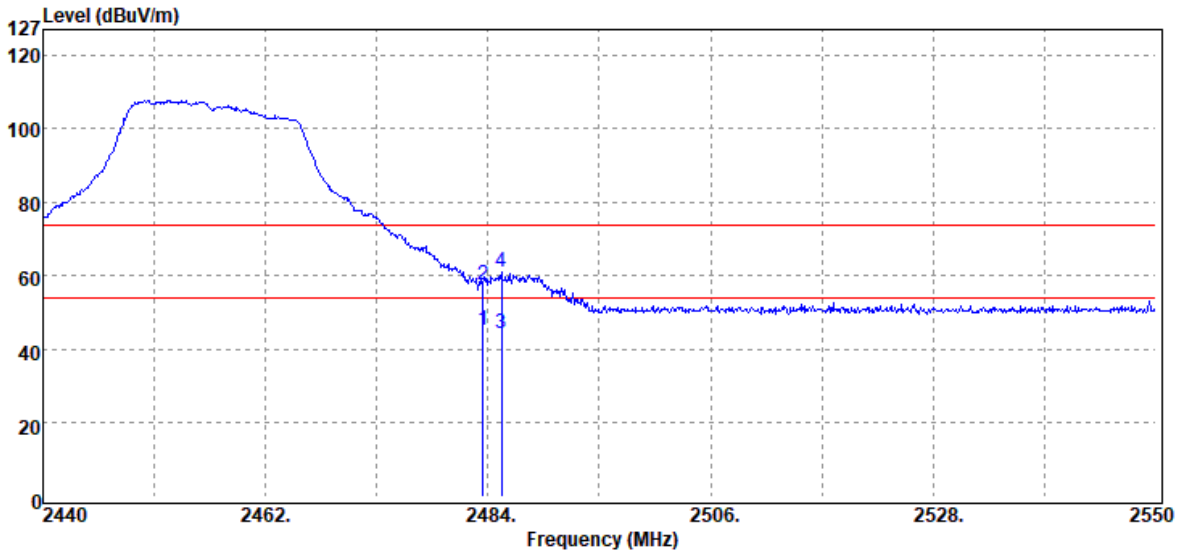
Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2390.00	Average	47.62	-0.12	47.50	54.00	-6.50
2390.00	Peak	60.12	-0.12	60.00	74.00	-14.00

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n20	Test Date	:2021-06-22
Test Frequency	:2457 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH High	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



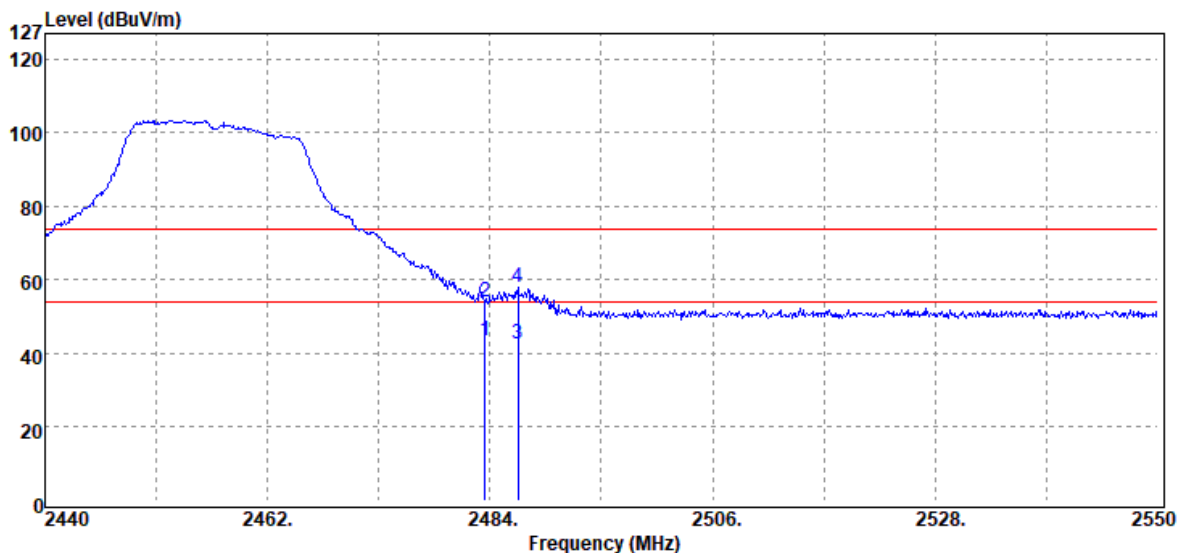
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level d $\mu$ V	Factor dB	Actual FS d $\mu$ V/m	Limit @3m d $\mu$ V/m	Margin dB
2483.50	Average	45.55	-0.16	45.39	54.00	-8.61
2483.50	Peak	57.59	-0.16	57.43	74.00	-16.57
2485.32	Average	44.62	-0.17	44.45	54.00	-9.55
2485.32	Peak	61.13	-0.17	60.96	74.00	-13.04

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n20	Test Date	:2021-06-22
Test Frequency	:2457 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH High	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



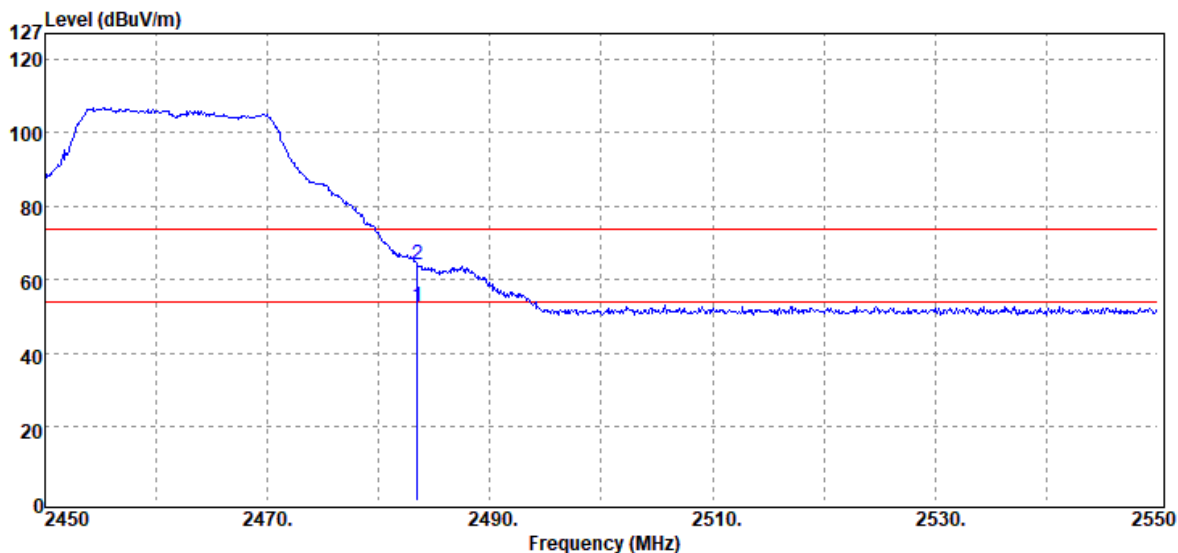
Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2483.50	Average	43.53	-0.16	43.37	54.00	-10.63
2483.50	Peak	54.04	-0.16	53.88	74.00	-20.12
2486.75	Average	42.96	-0.16	42.80	54.00	-11.20
2486.75	Peak	58.00	-0.16	57.84	74.00	-16.16

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n20	Test Date	:2021-06-24
Test Frequency	:2462 MHz	Temp./Humi.	:26.1/59
Test Mode	:Bandedge CH High	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:GN Lin



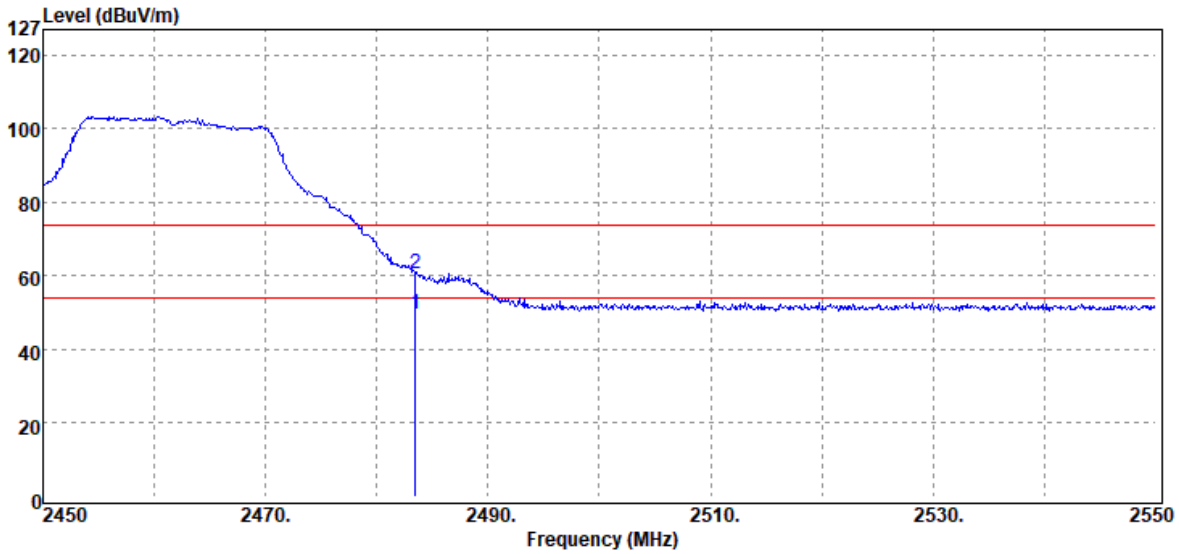
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level	dB	FS	@3m	dB
	PK/QP/AV	dBμV		dBμV/m	dBμV/m	
2483.50	Average	53.02	-0.16	52.86	54.00	-1.14
2483.50	Peak	64.54	-0.16	64.38	74.00	-9.62

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n20	Test Date	:2021-06-24
Test Frequency	:2462 MHz	Temp./Humi.	:26.1/59
Test Mode	:Bandedge CH High	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:GN Lin

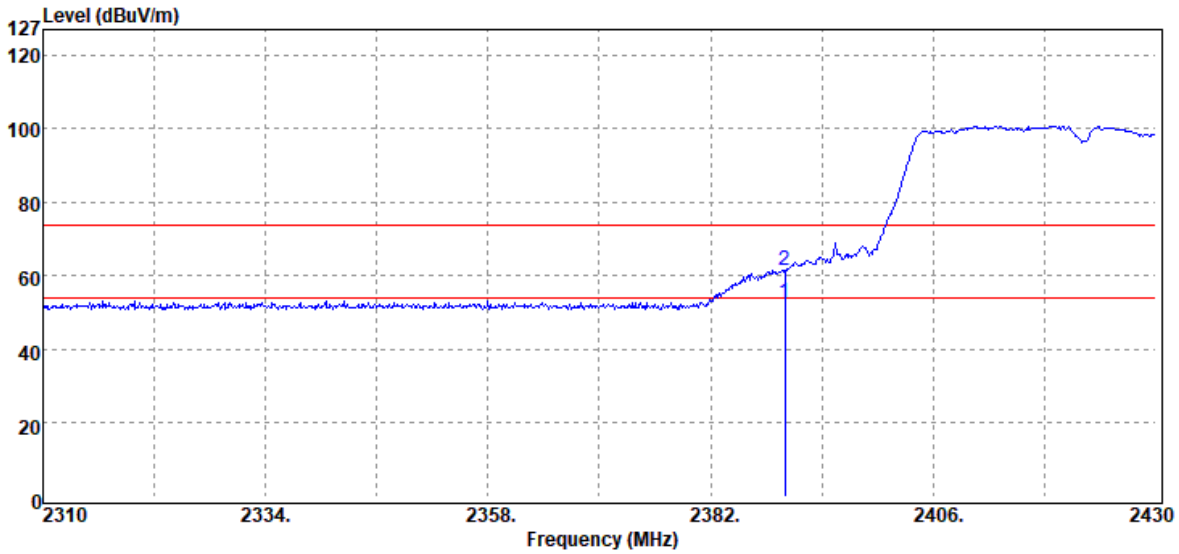


Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2483.50	Average	49.72	-0.16	49.56	54.00	-4.44
2483.50	Peak	60.60	-0.16	60.44	74.00	-13.56

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-24
Test Frequency	:2422 MHz	Temp./Humi.	:26.1/59
Test Mode	:Bandedge CH Low	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:GN Lin



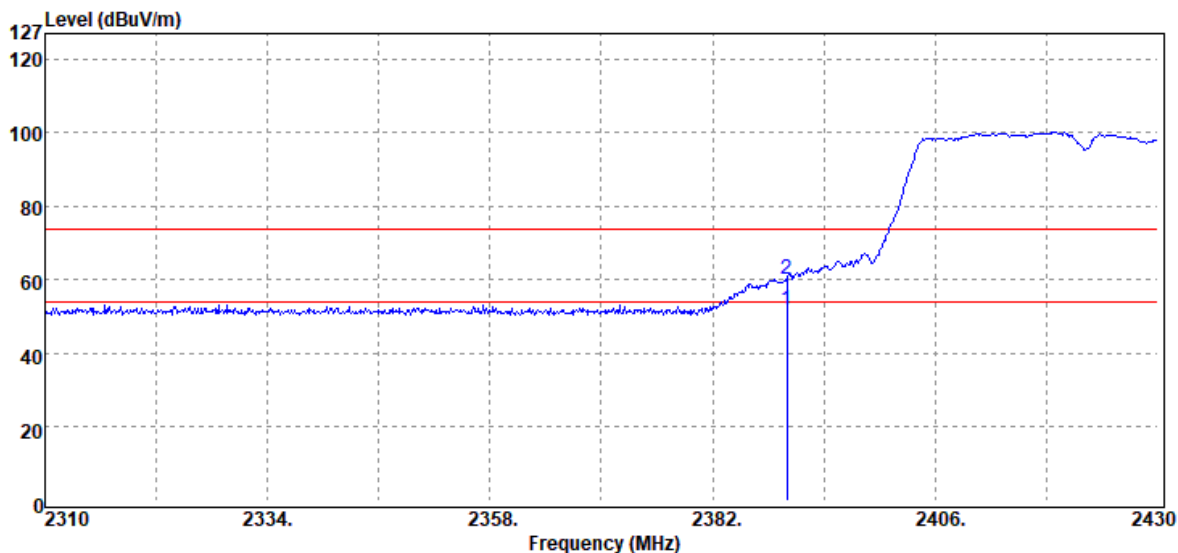
Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2390.00	Average	52.81	-0.12	52.69	54.00	-1.31
2390.00	Peak	61.85	-0.12	61.73	74.00	-12.27

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-24
Test Frequency	:2422 MHz	Temp./Humi.	:26.1/59
Test Mode	:Bandedge CH Low	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:GN Lin



Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	51.78	-0.12	51.66	54.00	-2.34
2390.00	Peak	60.53	-0.12	60.41	74.00	-13.59

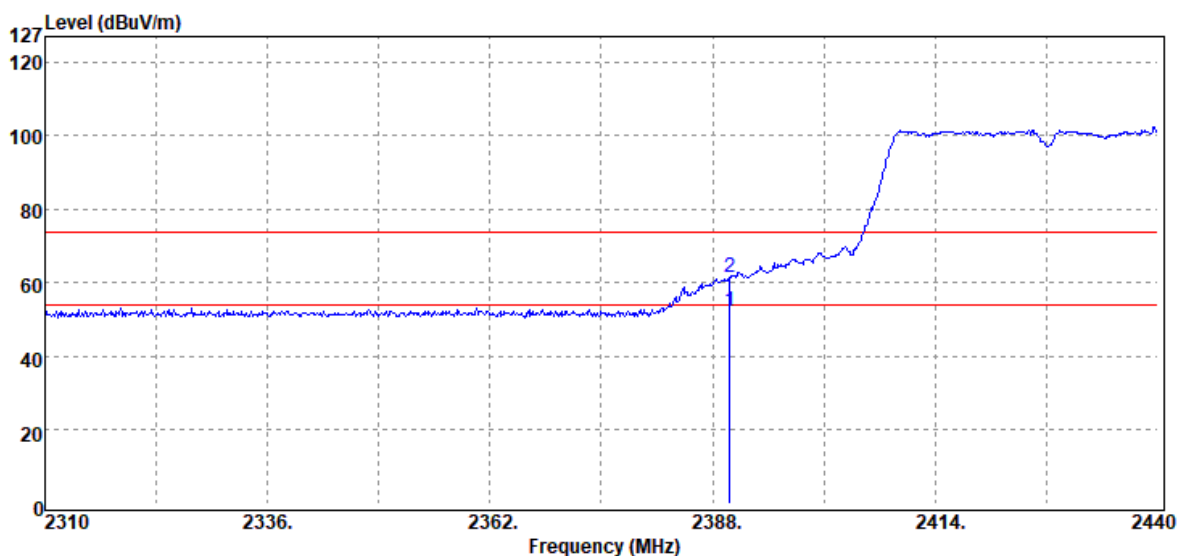
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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-25
Test Frequency	:2427 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH Low	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



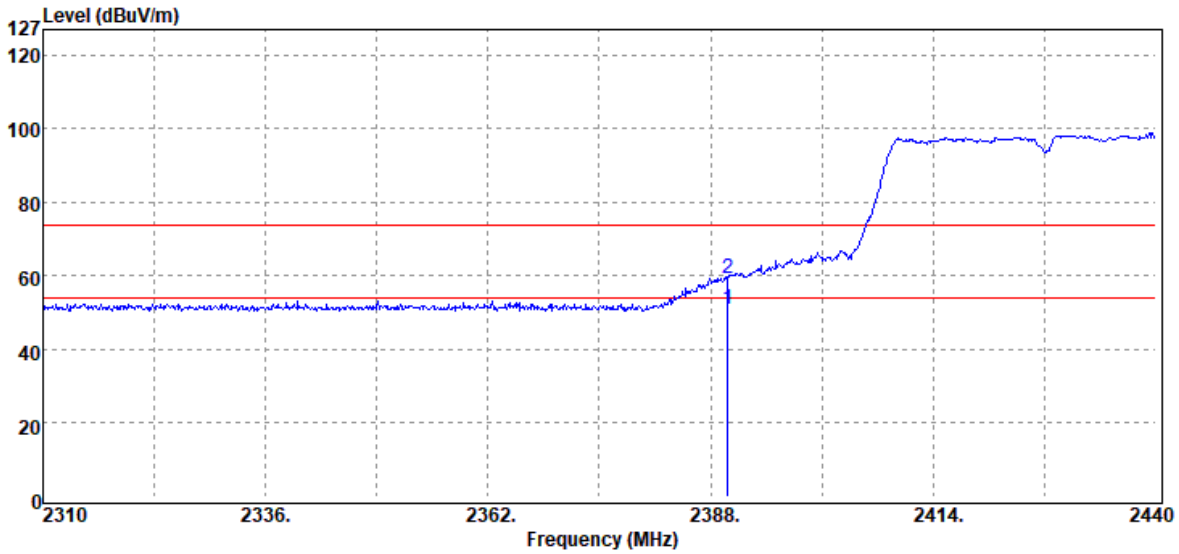
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2390.00	Average	52.63	-0.12	52.51	54.00	-1.49
2390.00	Peak	61.58	-0.12	61.46	74.00	-12.54

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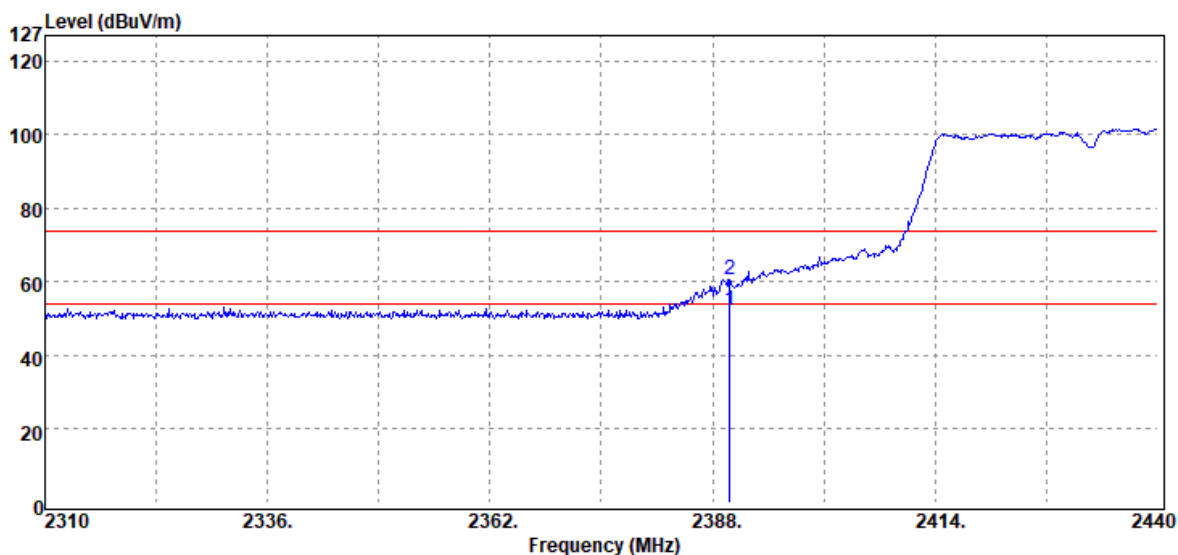
Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-25
Test Frequency	:2427 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH Low	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2390.00	Average	51.02	-0.12	50.90	54.00	-3.10
2390.00	Peak	59.38	-0.12	59.26	74.00	-14.74

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-25
Test Frequency	:2432 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH Low	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



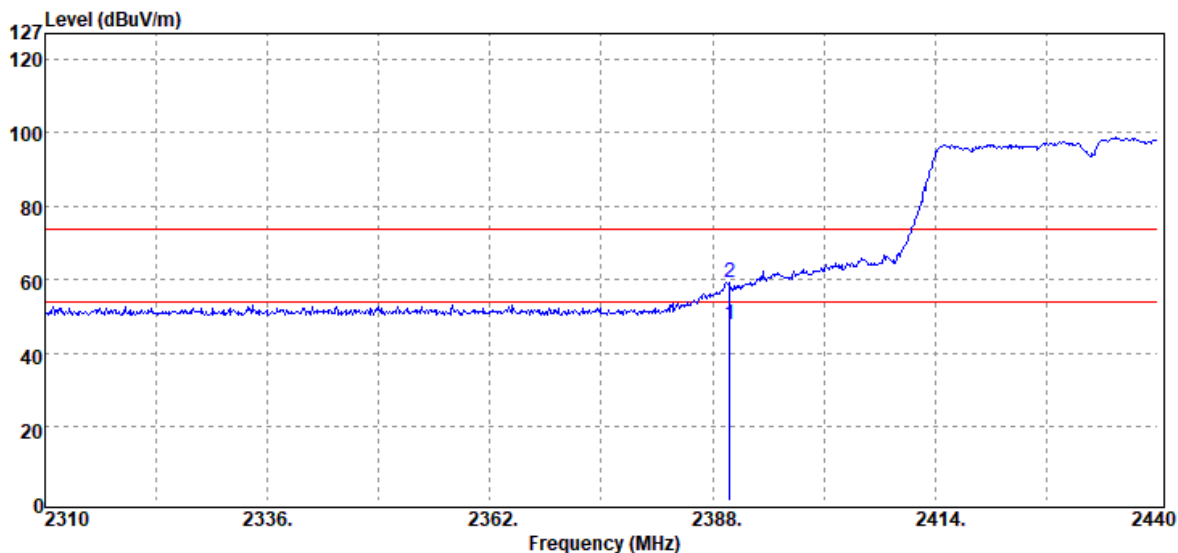
Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2390.00	Average	52.47	-0.12	52.35	54.00	-1.65
2390.00	Peak	60.59	-0.12	60.47	74.00	-13.53

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-25
Test Frequency	:2432 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH Low	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



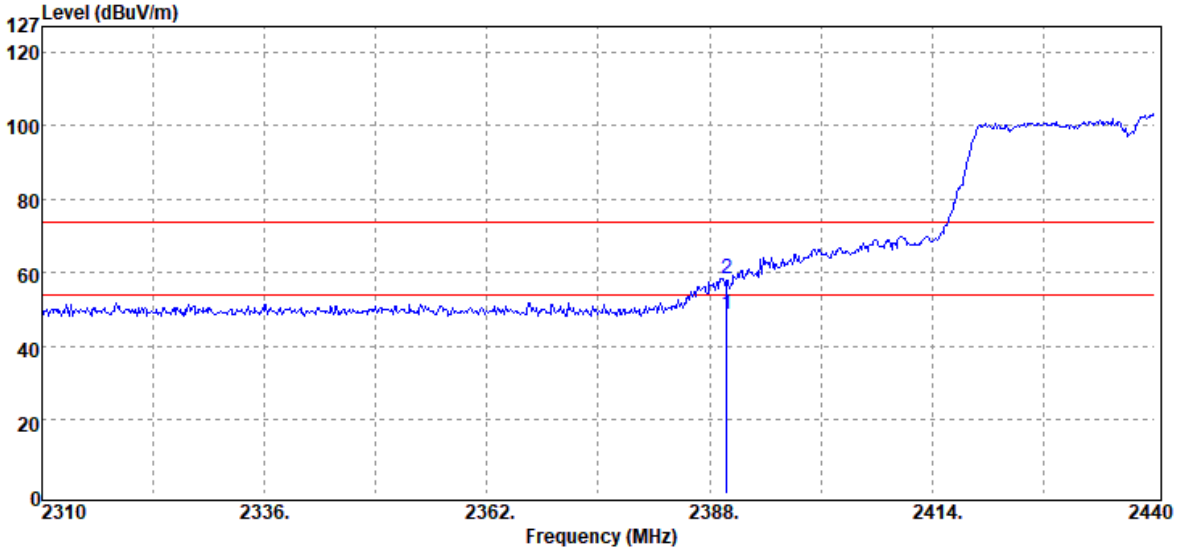
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level	dB	FS	@3m	dB
	PK/QP/AV	dB $\mu$ V		dB $\mu$ V/m	dB $\mu$ V/m	
2390.00	Average	48.16	-0.12	48.04	54.00	-5.96
2390.00	Peak	59.25	-0.12	59.13	74.00	-14.87

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-22
Test Frequency	:2437 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH Mid	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



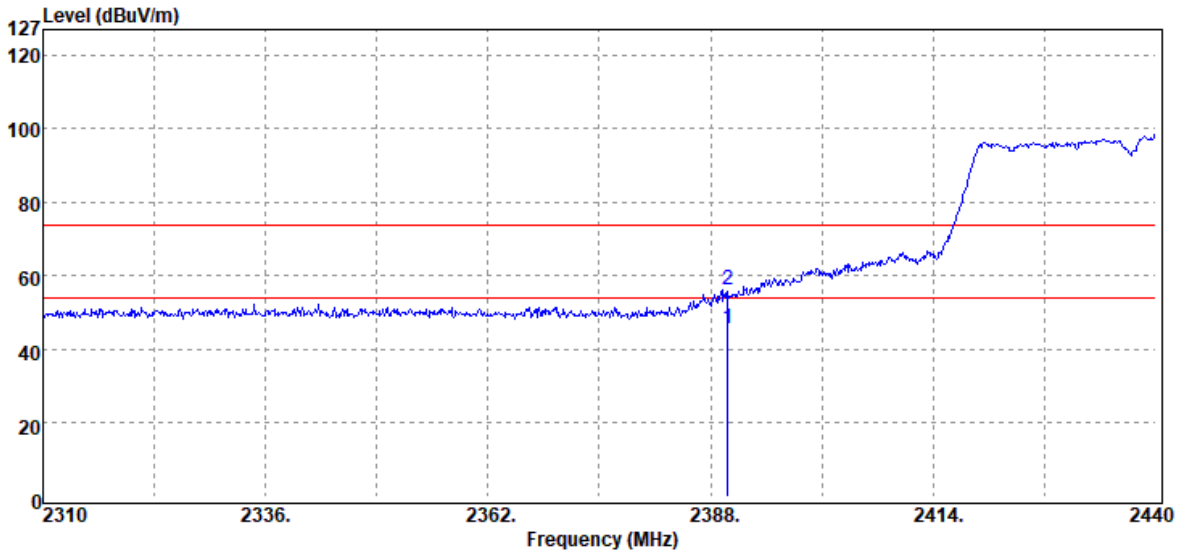
Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2390.00	Average	48.99	-0.12	48.87	54.00	-5.13
2390.00	Peak	58.77	-0.12	58.65	74.00	-15.35

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-22
Test Frequency	:2437 MHz	Temp./Humi.	:26.8/64
Test Mode	:Bandedge CH Mid	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2390.00	Average	45.76	-0.12	45.64	54.00	-8.36
2390.00	Peak	56.20	-0.12	56.08	74.00	-17.92

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Report Number :ER/2021/50018

Operation Mode :802.11n40

Test Frequency :2452 MHz

Test Mode :Bandedge CH High

EUT Pol :E2 Plane

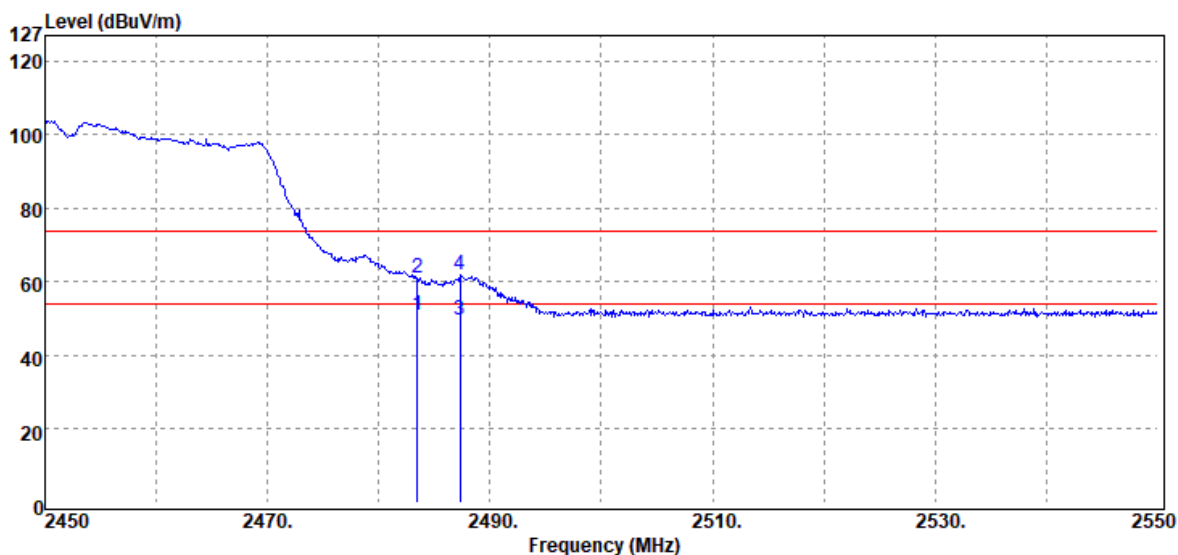
Test Site :SAC I Chamber

Test Date :2021-06-24

Temp./Humi. :26.1/59

Antenna Pol. :VERTICAL

Engineer :GN Lin



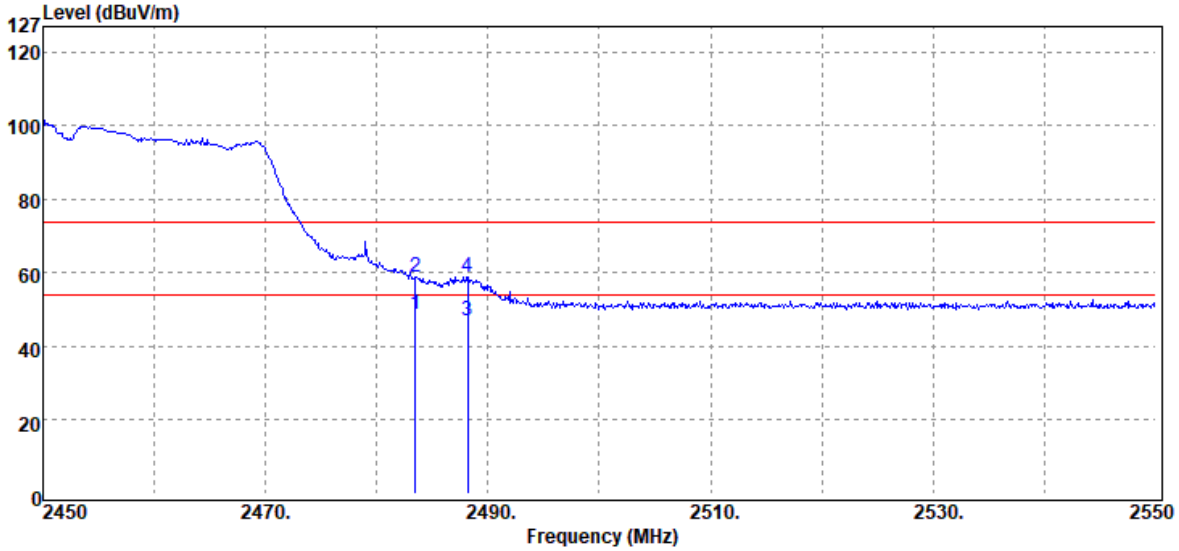
Freq. MHz	Detector Mode	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	51.18	-0.16	51.02	54.00	-2.98
2483.50	Peak	61.16	-0.16	61.00	74.00	-13.00
2487.30	Average	49.98	-0.16	49.82	54.00	-4.18
2487.30	Peak	61.96	-0.16	61.80	74.00	-12.20

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Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11n40	Test Date	:2021-06-24
Test Frequency	:2452 MHz	Temp./Humi.	:26.1/59
Test Mode	:Bandedge CH High	Antenna Pol.	:HORIZONTAL
EUT Pol	:E2 Plane	Engineer	:GN Lin



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
2483.50	Average	48.84	-0.16	48.68	54.00	-5.32
2483.50	Peak	58.89	-0.16	58.73	74.00	-15.27
2488.20	Average	47.01	-0.16	46.85	54.00	-7.15
2488.20	Peak	59.24	-0.16	59.08	74.00	-14.92

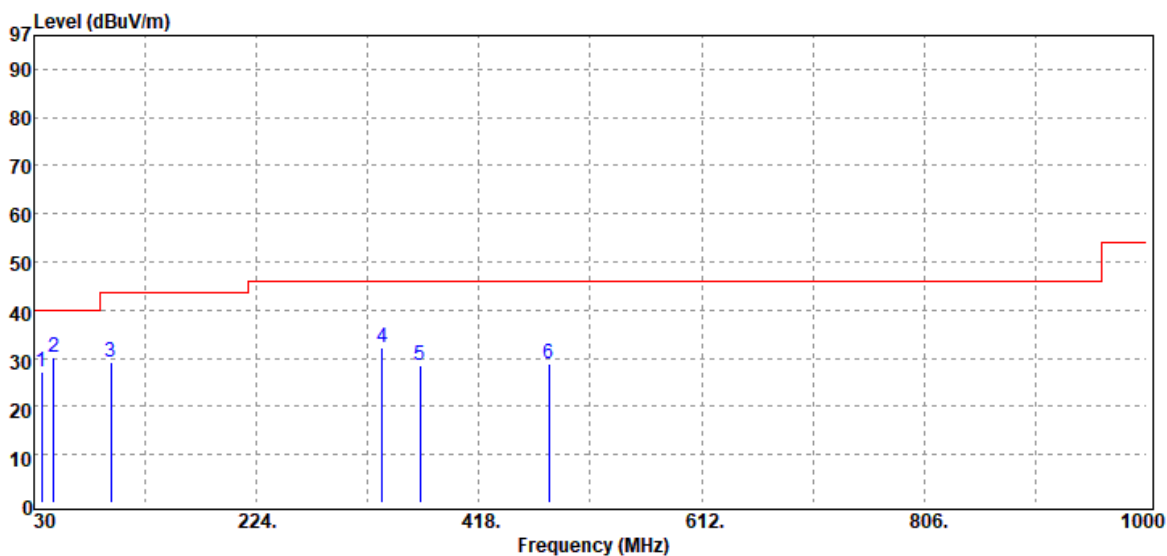
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11.7.2 Below 1GHz Worst-Case Emission:

Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11g	Test Date	:2021-06-30
Test Frequency	:2437 MHz	Temp./Humi.	:26.8/62
Test Mode	:Tx CH Mid	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
36.79	Peak	35.70	-8.40	27.30	40.00	-12.70
47.46	Peak	44.41	-14.37	30.04	40.00	-9.96
96.93	Peak	43.12	-13.82	29.30	43.50	-14.20
333.61	Peak	40.75	-8.54	32.21	46.00	-13.79
366.59	Peak	36.57	-8.04	28.53	46.00	-17.47
479.11	Peak	34.96	-5.96	29.00	46.00	-17.00

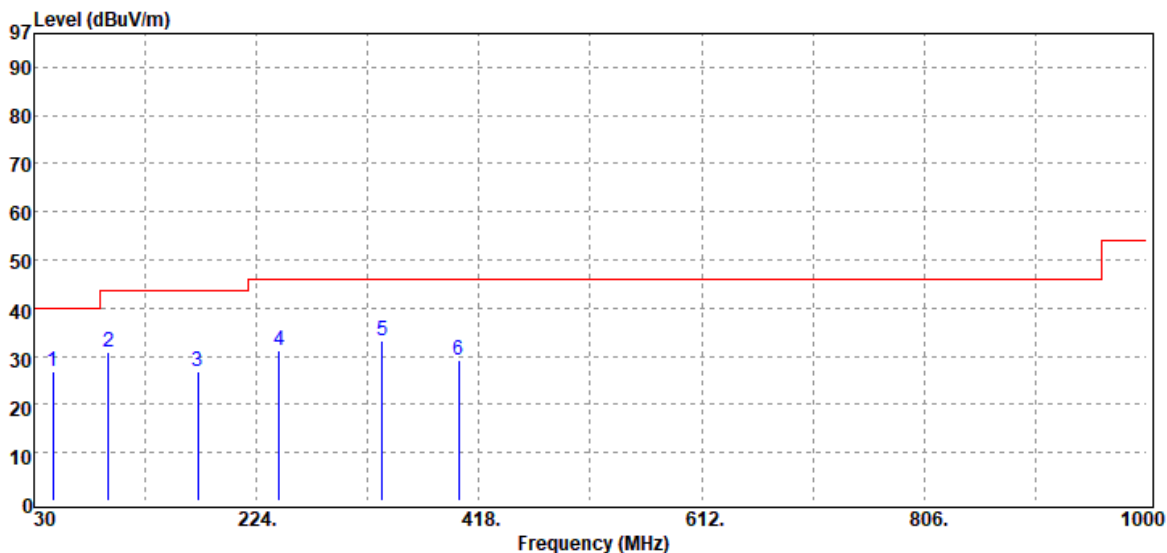
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Report Number :ER/2021/50018  
 Operation Mode :802.11g  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-30  
 Temp./Humi. :26.8/62  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
46.49	Peak	40.63	-13.90	26.73	40.00	-13.27
94.99	Peak	45.04	-14.30	30.74	43.50	-12.76
172.59	Peak	40.54	-13.85	26.69	43.50	-16.81
243.40	Peak	42.12	-10.87	31.25	46.00	-14.75
333.61	Peak	41.91	-8.54	33.37	46.00	-12.63
400.54	Peak	36.00	-6.89	29.11	46.00	-16.89

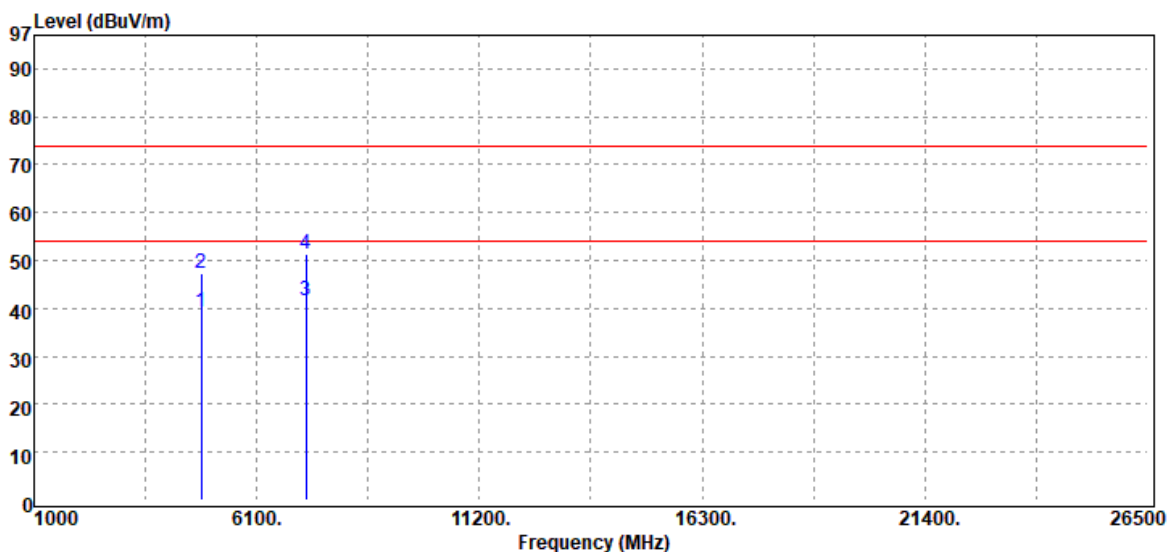
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**11.7.3 Above 1GHz Emission:**

Report Number	:ER/2021/50018	Test Site	:SAC I Chamber
Operation Mode	:802.11b	Test Date	:2021-06-17
Test Frequency	:2412 MHz	Temp./Humi.	:26.8/61
Test Mode	:Tx CH Low	Antenna Pol.	:VERTICAL
EUT Pol	:E2 Plane	Engineer	:Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4824.00	Average	32.05	7.10	39.15	54.00	-14.85
4824.00	Peak	40.14	7.10	47.24	74.00	-26.76
7236.00	Average	26.19	15.57	41.76	54.00	-12.24
7236.00	Peak	35.78	15.57	51.35	74.00	-22.65

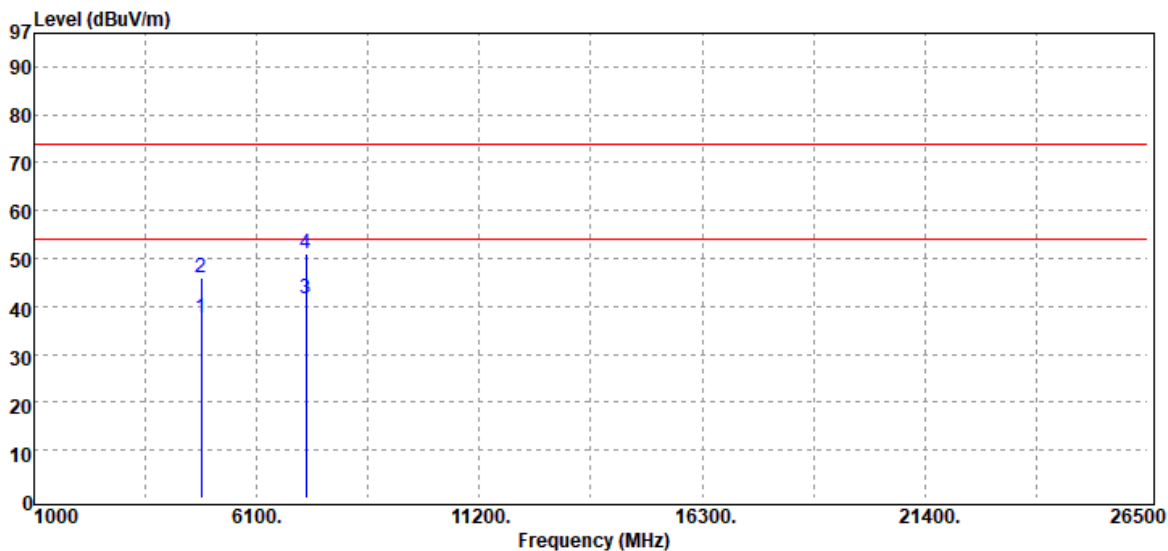
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Report Number :ER/2021/50018  
 Operation Mode :802.11b  
 Test Frequency :2412 MHz  
 Test Mode :Tx CH Low  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-17  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4824.00	Average	30.48	7.10	37.58	54.00	-16.42
4824.00	Peak	38.88	7.10	45.98	74.00	-28.02
7236.00	Average	26.16	15.57	41.73	54.00	-12.27
7236.00	Peak	35.51	15.57	51.08	74.00	-22.92

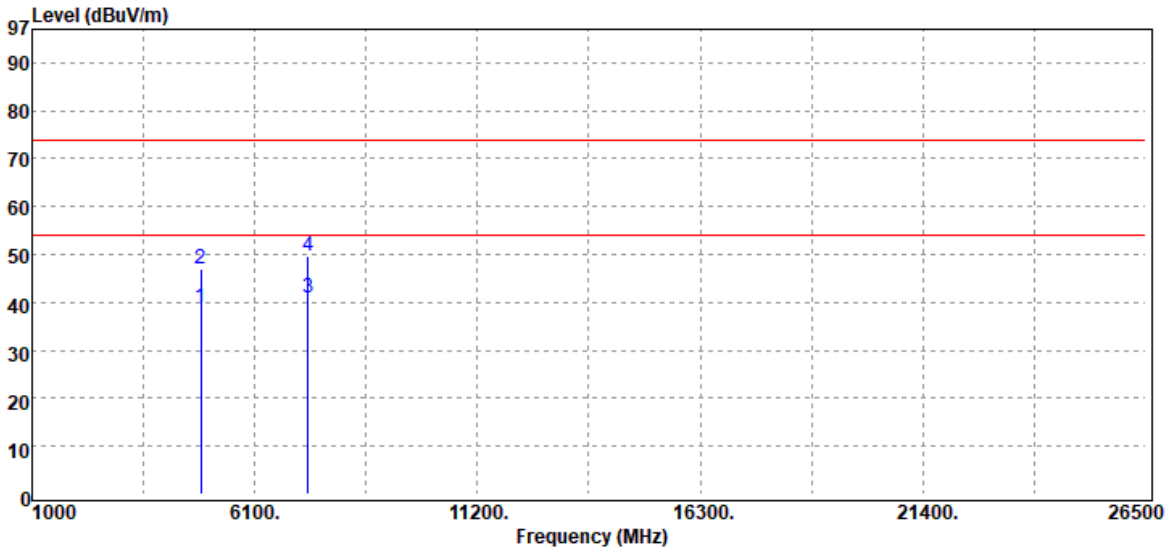
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Report Number :ER/2021/50018  
 Operation Mode :802.11b  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-17  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4874.00	Average	31.84	7.05	38.89	54.00	-15.11
4874.00	Peak	39.83	7.05	46.88	74.00	-27.12
7311.00	Average	25.85	14.99	40.84	54.00	-13.16
7311.00	Peak	34.82	14.99	49.81	74.00	-24.19

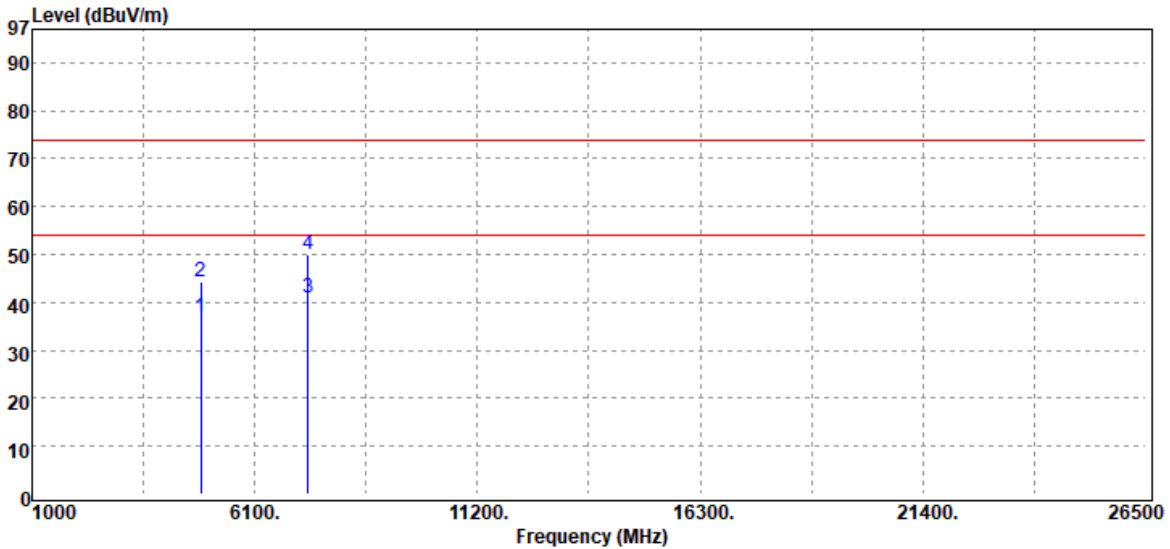
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Report Number :ER/2021/50018  
 Operation Mode :802.11b  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-17  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4874.00	Average	29.94	7.05	36.99	54.00	-17.01
4874.00	Peak	37.18	7.05	44.23	74.00	-29.77
7311.00	Average	25.87	14.99	40.86	54.00	-13.14
7311.00	Peak	34.89	14.99	49.88	74.00	-24.12

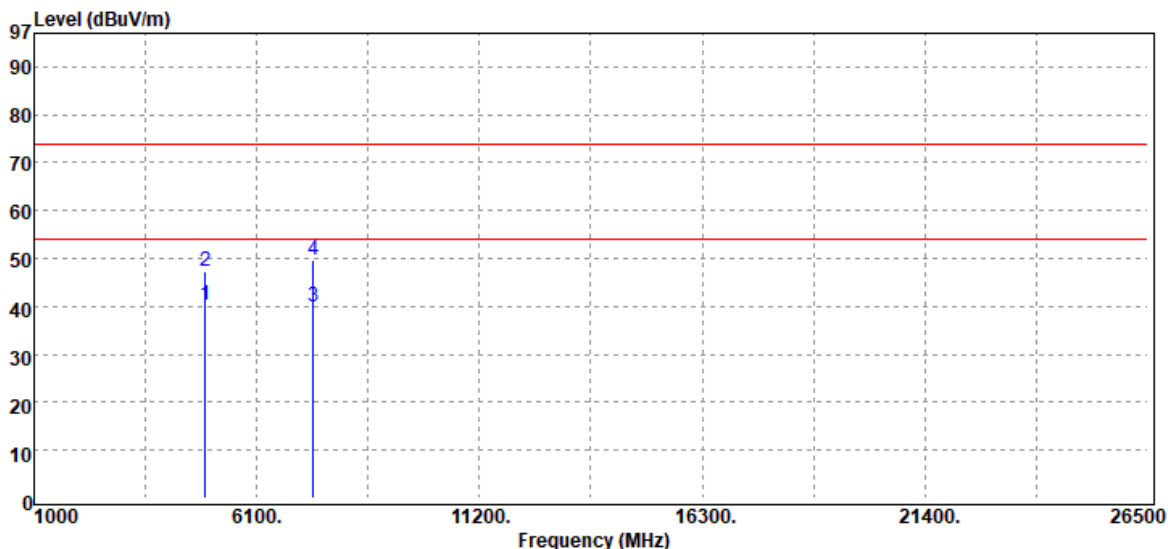
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Report Number :ER/2021/50018  
 Operation Mode :802.11b  
 Test Frequency :2462 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-17  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4924.00	Average	32.96	7.30	40.26	54.00	-13.74
4924.00	Peak	40.10	7.30	47.40	74.00	-26.60
7386.00	Average	25.47	14.55	40.02	54.00	-13.98
7386.00	Peak	35.00	14.55	49.55	74.00	-24.45

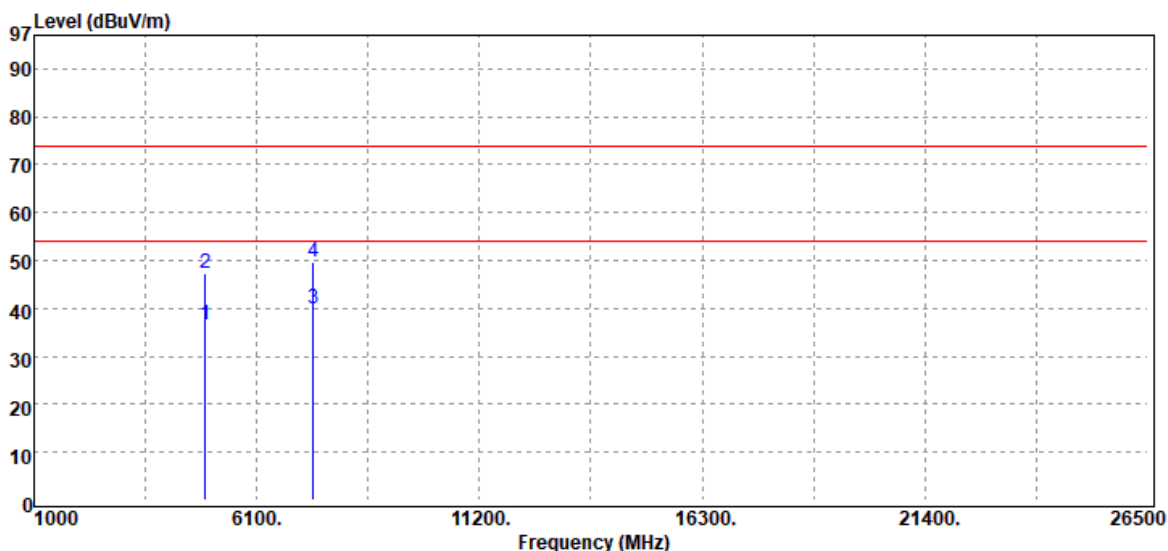
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Report Number :ER/2021/50018  
 Operation Mode :802.11b  
 Test Frequency :2462 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-17  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4924.00	Average	29.44	7.30	36.74	54.00	-17.26
4924.00	Peak	39.94	7.30	47.24	74.00	-26.76
7386.00	Average	25.46	14.55	40.01	54.00	-13.99
7386.00	Peak	35.12	14.55	49.67	74.00	-24.33

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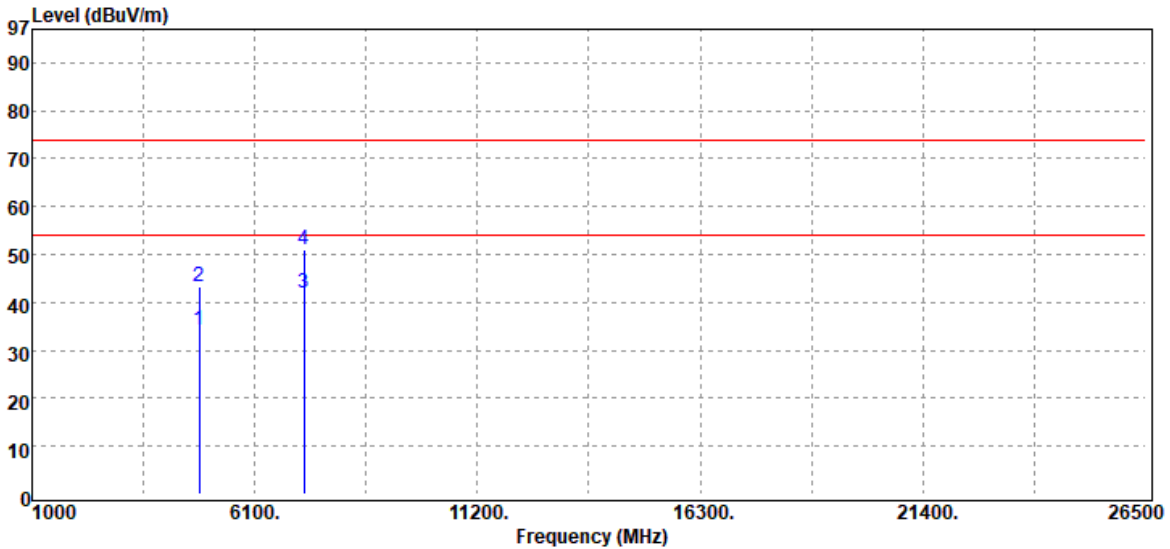
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Report Number :ER/2021/50018  
 Operation Mode :802.11g  
 Test Frequency :2412 MHz  
 Test Mode :Tx CH Low  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4824.00	Average	27.01	7.10	34.11	54.00	-19.89
4824.00	Peak	36.11	7.10	43.21	74.00	-30.79
7236.00	Average	26.26	15.57	41.83	54.00	-12.17
7236.00	Peak	35.43	15.57	51.00	74.00	-23.00

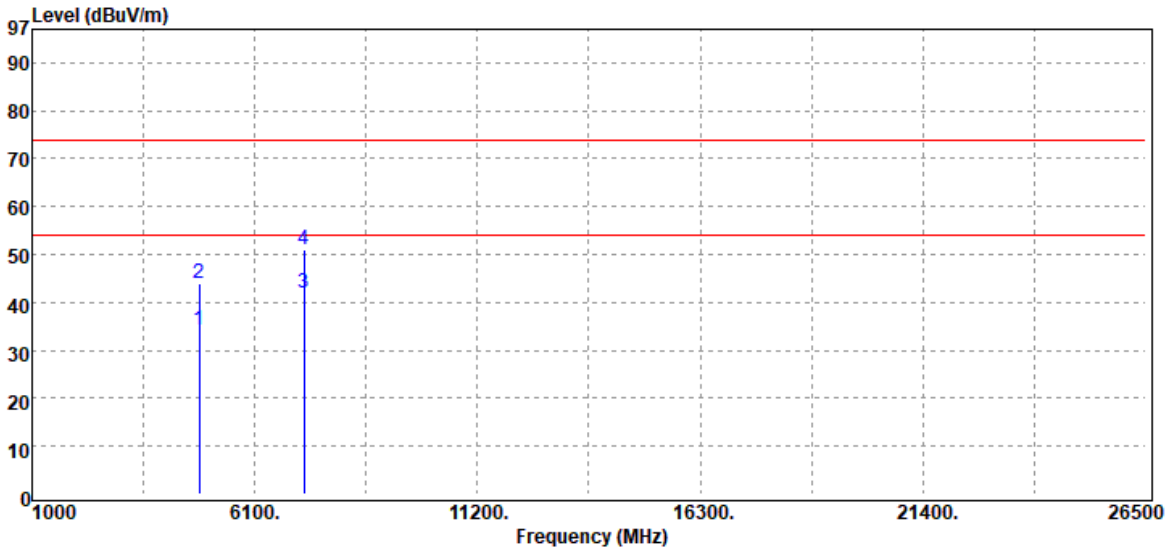
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Report Number :ER/2021/50018  
 Operation Mode :802.11g  
 Test Frequency :2412 MHz  
 Test Mode :Tx CH Low  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4824.00	Average	27.04	7.10	34.14	54.00	-19.86
4824.00	Peak	36.73	7.10	43.83	74.00	-30.17
7236.00	Average	26.25	15.57	41.82	54.00	-12.18
7236.00	Peak	35.55	15.57	51.12	74.00	-22.88

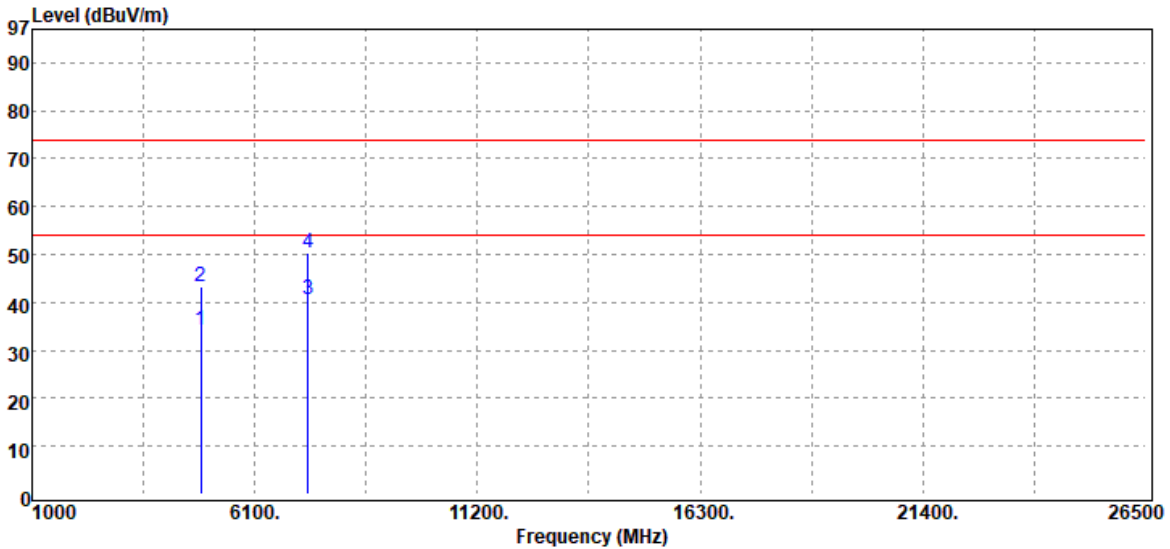
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Report Number :ER/2021/50018  
 Operation Mode :802.11g  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4874.00	Average	27.03	7.05	34.08	54.00	-19.92
4874.00	Peak	36.11	7.05	43.16	74.00	-30.84
7311.00	Average	25.79	14.99	40.78	54.00	-13.22
7311.00	Peak	35.47	14.99	50.46	74.00	-23.54

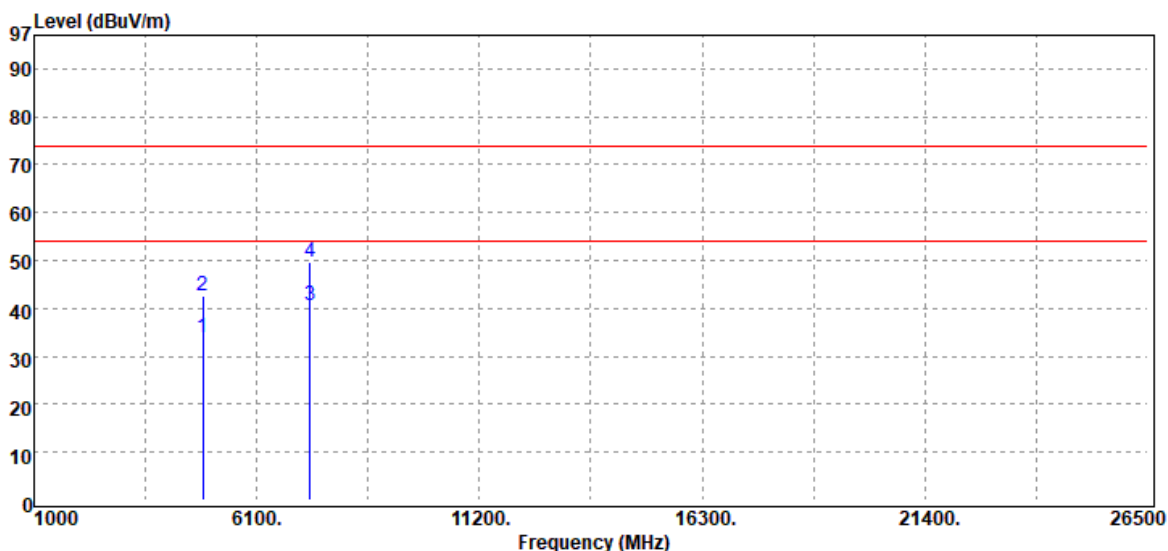
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Report Number :ER/2021/50018  
 Operation Mode :802.11g  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4874.00	Average	26.95	7.05	34.00	54.00	-20.00
4874.00	Peak	35.59	7.05	42.64	74.00	-31.36
7311.00	Average	25.56	14.99	40.55	54.00	-13.45
7311.00	Peak	34.75	14.99	49.74	74.00	-24.26

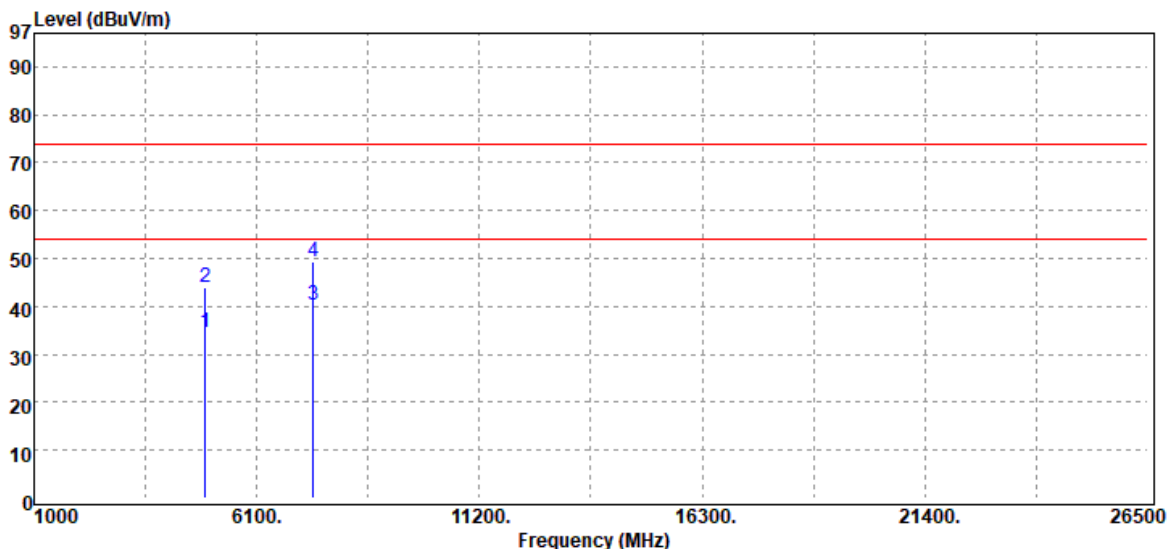
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Report Number :ER/2021/50018  
 Operation Mode :802.11g  
 Test Frequency :2462 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4924.00	Average	27.18	7.30	34.48	54.00	-19.52
4924.00	Peak	36.59	7.30	43.89	74.00	-30.11
7386.00	Average	25.82	14.55	40.37	54.00	-13.63
7386.00	Peak	34.89	14.55	49.44	74.00	-24.56

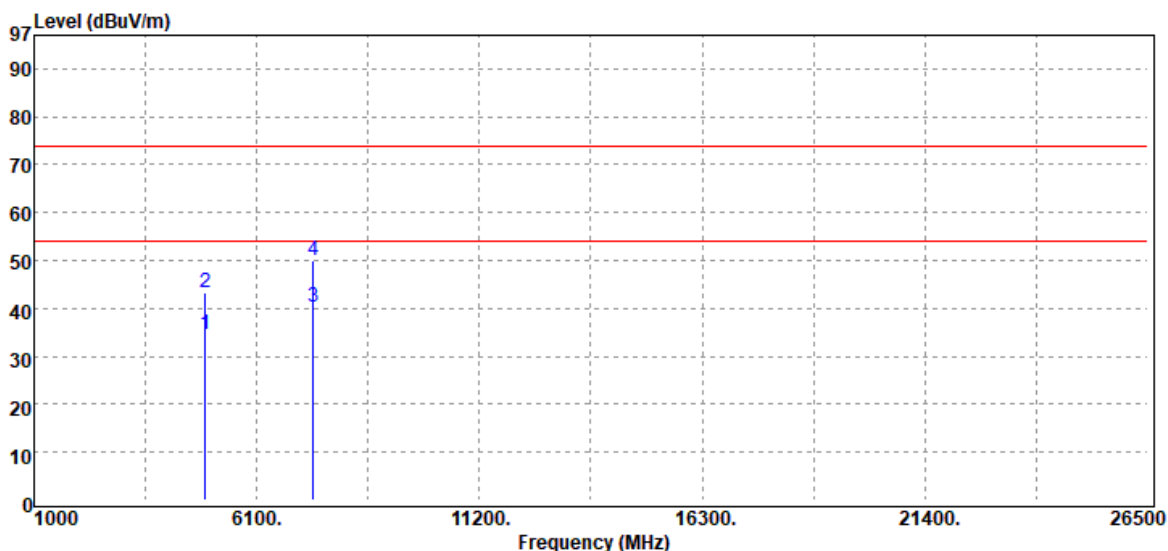
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Report Number :ER/2021/50018  
 Operation Mode :802.11g  
 Test Frequency :2462 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4924.00	Average	27.21	7.30	34.51	54.00	-19.49
4924.00	Peak	36.01	7.30	43.31	74.00	-30.69
7386.00	Average	25.77	14.55	40.32	54.00	-13.68
7386.00	Peak	35.37	14.55	49.92	74.00	-24.08

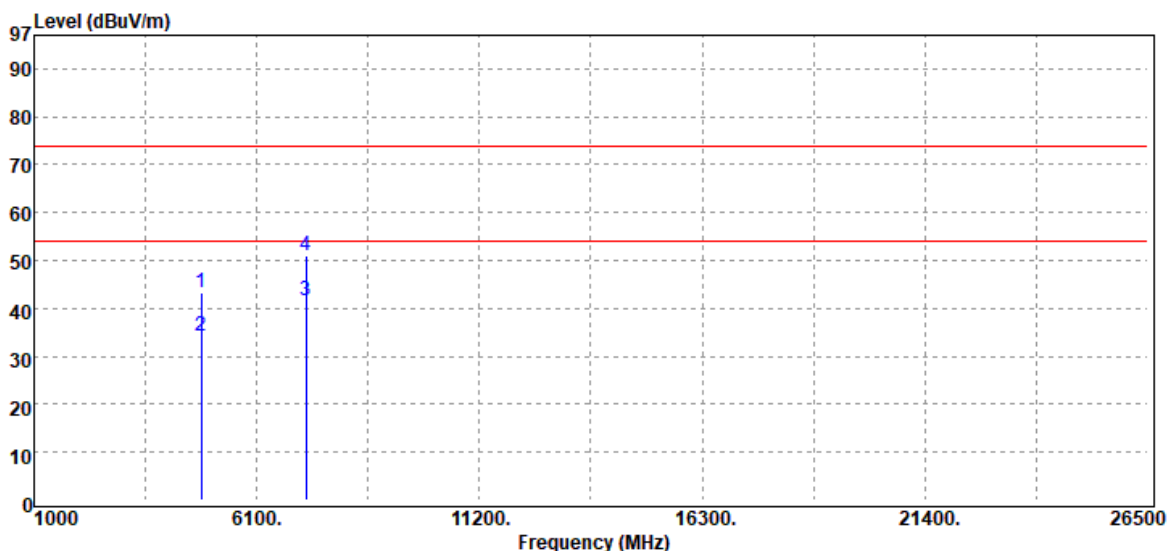
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Report Number :ER/2021/50018  
 Operation Mode :802.11n20  
 Test Frequency :2412 MHz  
 Test Mode :Tx CH Low  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4824.00	Average	36.15	7.10	43.25	54.00	-10.75
4824.00	Peak	27.18	7.10	34.28	74.00	-39.72
7236.00	Average	26.12	15.57	41.69	54.00	-12.31
7236.00	Peak	35.38	15.57	50.95	74.00	-23.05

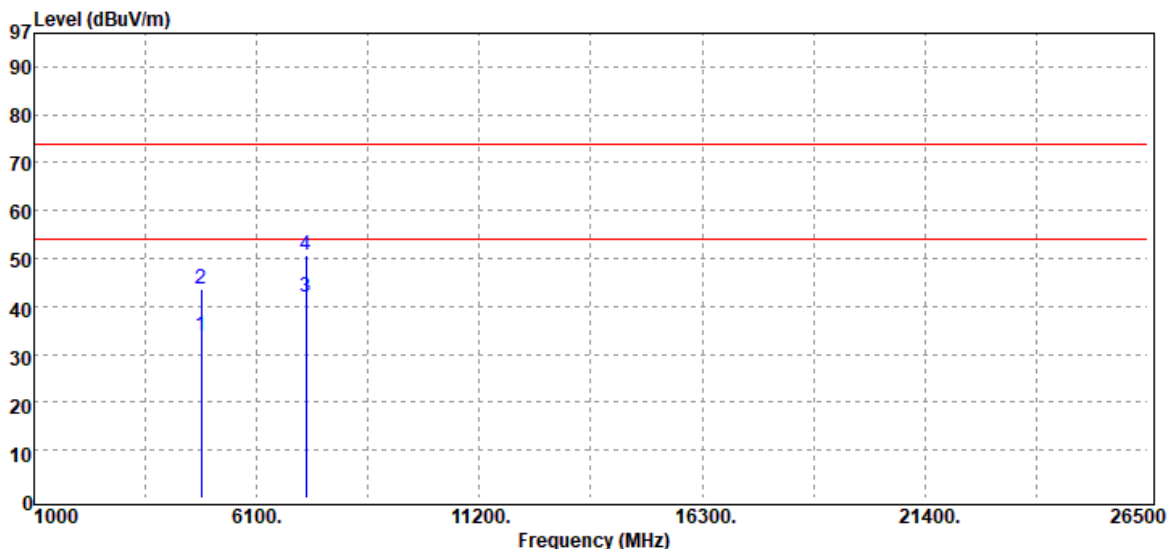
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Report Number :ER/2021/50018  
 Operation Mode :802.11n20  
 Test Frequency :2412 MHz  
 Test Mode :Tx CH Low  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4824.00	Average	26.85	7.10	33.95	54.00	-20.05
4824.00	Peak	36.64	7.10	43.74	74.00	-30.26
7236.00	Average	26.29	15.57	41.86	54.00	-12.14
7236.00	Peak	35.11	15.57	50.68	74.00	-23.32

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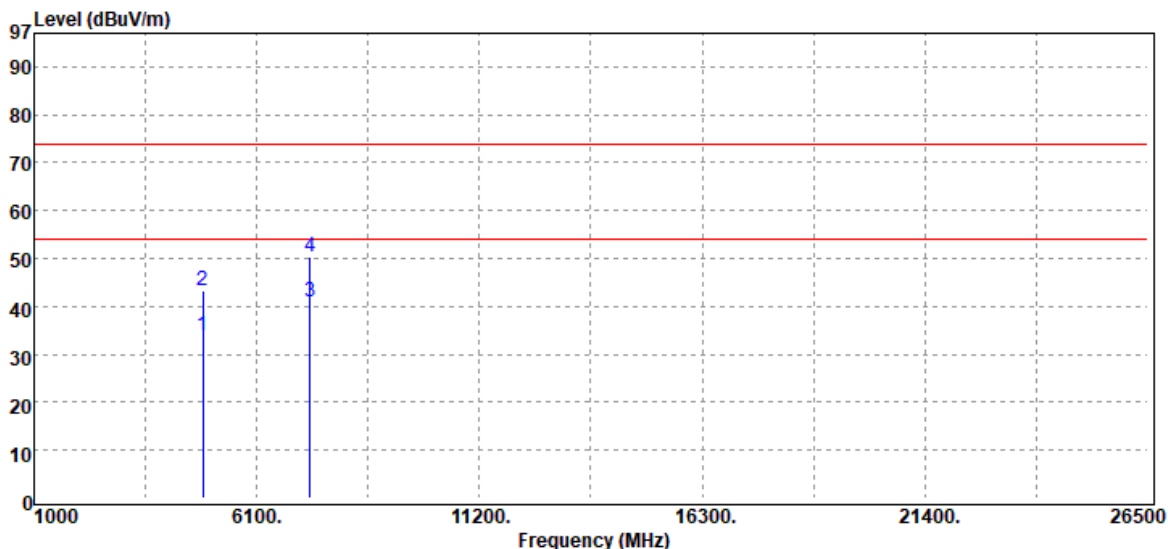
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Report Number :ER/2021/50018  
 Operation Mode :802.11n20  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4874.00	Average	26.89	7.05	33.94	54.00	-20.06
4874.00	Peak	36.37	7.05	43.42	74.00	-30.58
7311.00	Average	25.84	14.99	40.83	54.00	-13.17
7311.00	Peak	35.32	14.99	50.31	74.00	-23.69

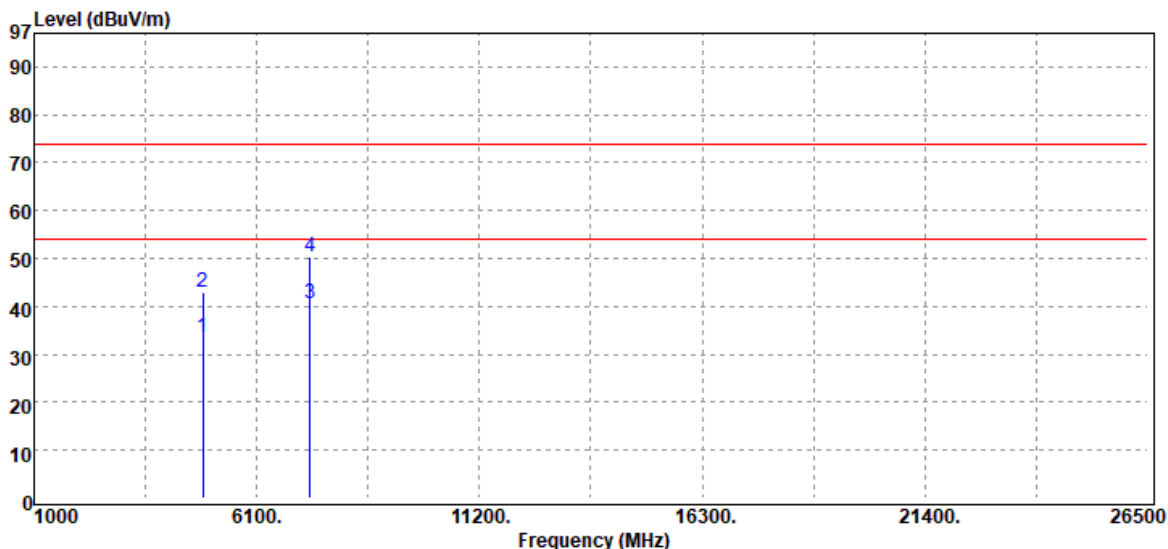
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Report Number :ER/2021/50018  
Operation Mode :802.11n20  
Test Frequency :2437 MHz  
Test Mode :Tx CH Mid  
EUT Pol :E2 Plane

Test Site :SAC I Chamber  
Test Date :2021-06-18  
Temp./Humi. :26.8/61  
Antenna Pol. :HORIZONTAL  
Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4874.00	Average	26.58	7.05	33.63	54.00	-20.37
4874.00	Peak	35.83	7.05	42.88	74.00	-31.12
7311.00	Average	25.53	14.99	40.52	54.00	-13.48
7311.00	Peak	35.32	14.99	50.31	74.00	-23.69

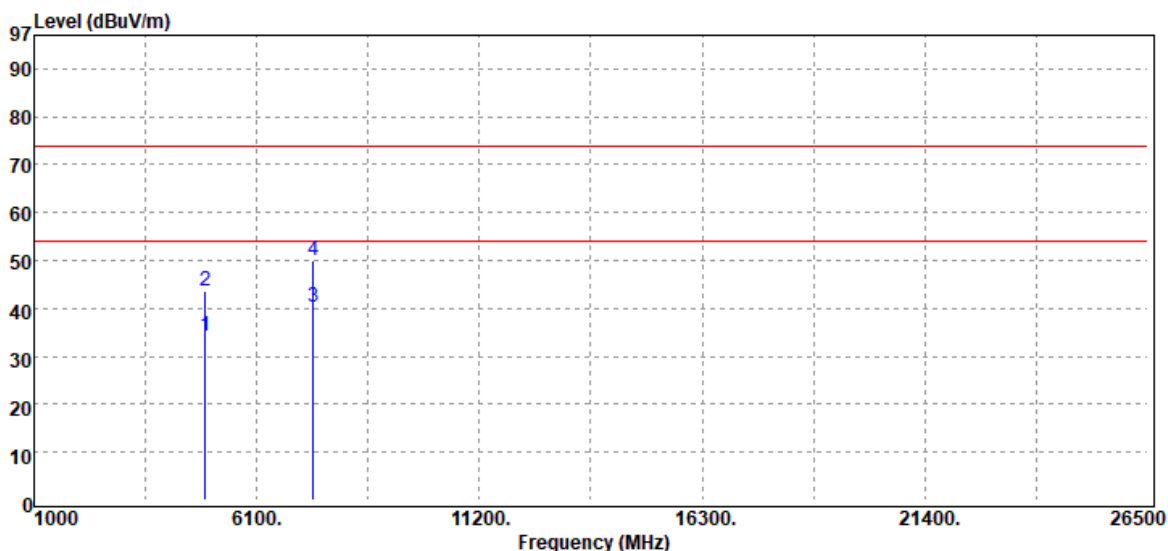
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Report Number :ER/2021/50018  
 Operation Mode :802.11n20  
 Test Frequency :2462 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4924.00	Average	26.80	7.30	34.10	54.00	-19.90
4924.00	Peak	36.47	7.30	43.77	74.00	-30.23
7386.00	Average	25.78	14.55	40.33	54.00	-13.67
7386.00	Peak	35.63	14.55	50.18	74.00	-23.82

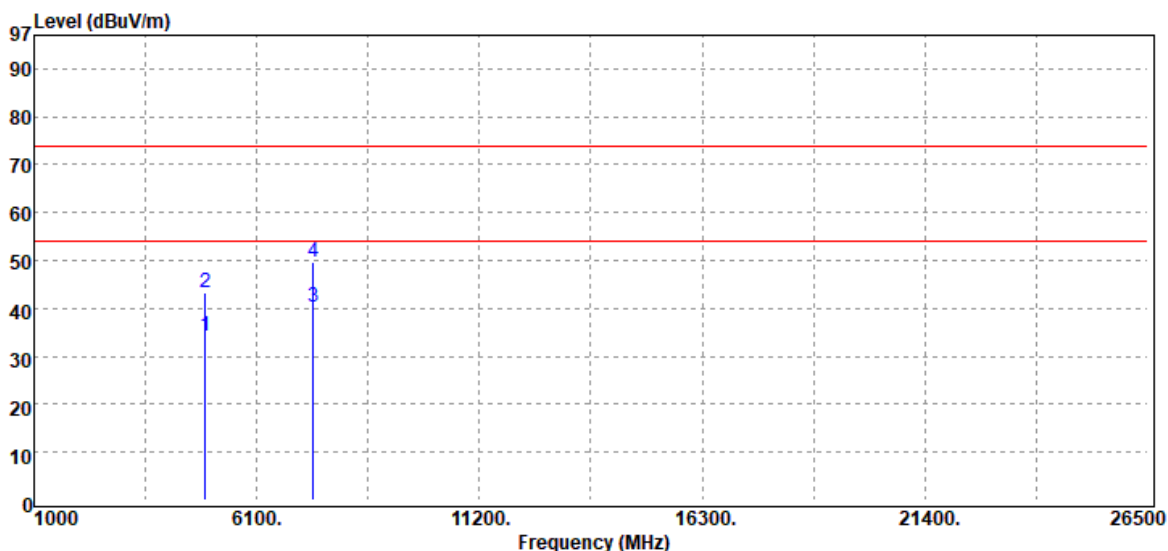
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Report Number :ER/2021/50018  
 Operation Mode :802.11n20  
 Test Frequency :2462 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4924.00	Average	26.87	7.30	34.17	54.00	-19.83
4924.00	Peak	36.12	7.30	43.42	74.00	-30.58
7386.00	Average	25.83	14.55	40.38	54.00	-13.62
7386.00	Peak	35.27	14.55	49.82	74.00	-24.18

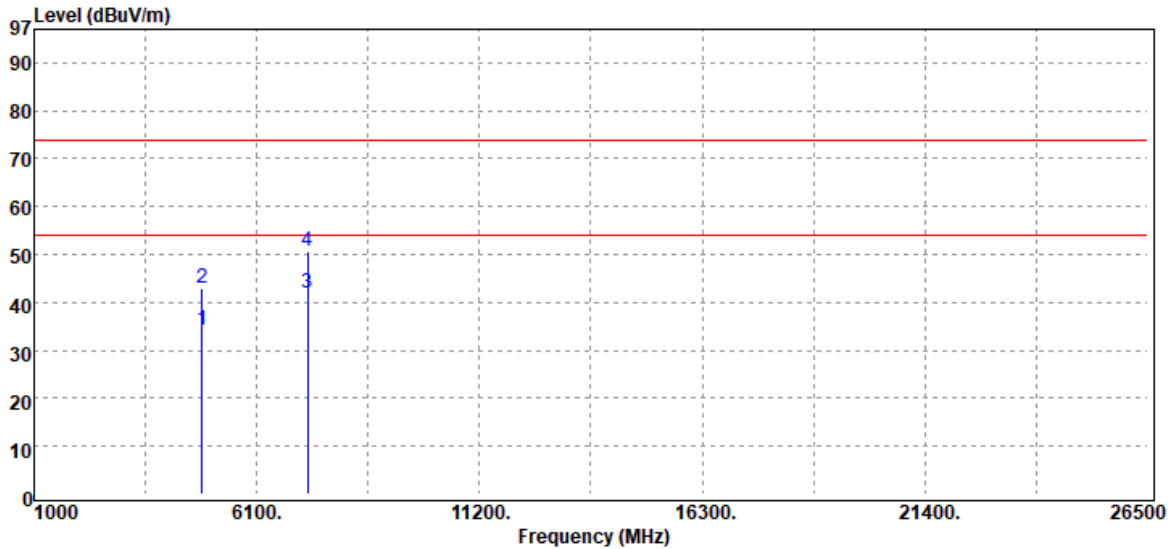
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Report Number :ER/2021/50018  
 Operation Mode :802.11n40  
 Test Frequency :2422 MHz  
 Test Mode :Tx CH Low  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4844.00	Average	27.37	7.03	34.40	54.00	-19.60
4844.00	Peak	35.80	7.03	42.83	74.00	-31.17
7266.00	Average	26.51	15.35	41.86	54.00	-12.14
7266.00	Peak	35.24	15.35	50.59	74.00	-23.41

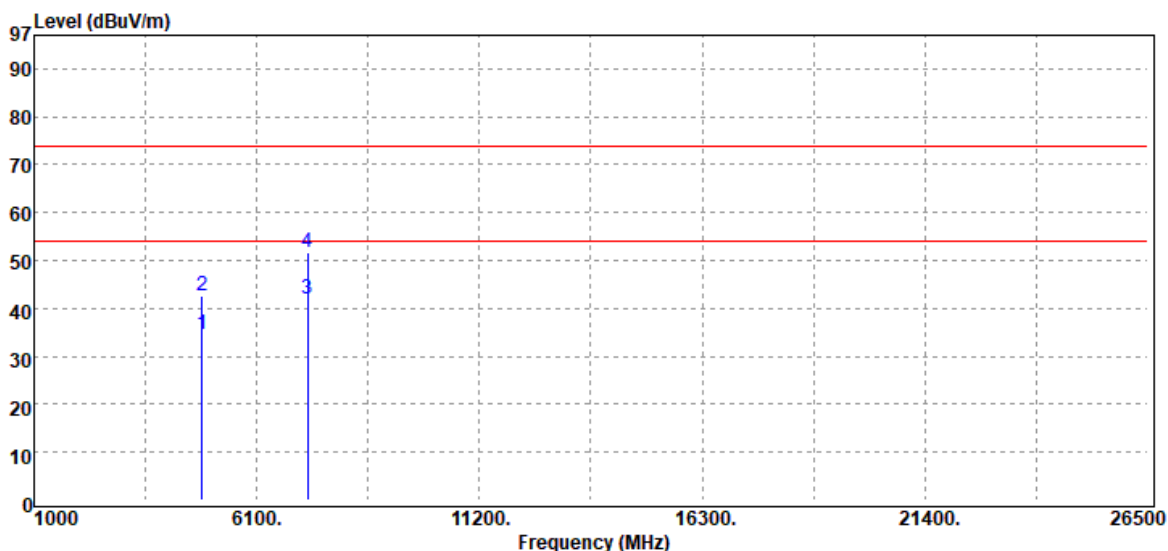
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Report Number :ER/2021/50018  
 Operation Mode :802.11n40  
 Test Frequency :2422 MHz  
 Test Mode :Tx CH Low  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4844.00	Average	27.67	7.03	34.70	54.00	-19.30
4844.00	Peak	35.48	7.03	42.51	74.00	-31.49
7266.00	Average	26.73	15.35	42.08	54.00	-11.92
7266.00	Peak	36.19	15.35	51.54	74.00	-22.46

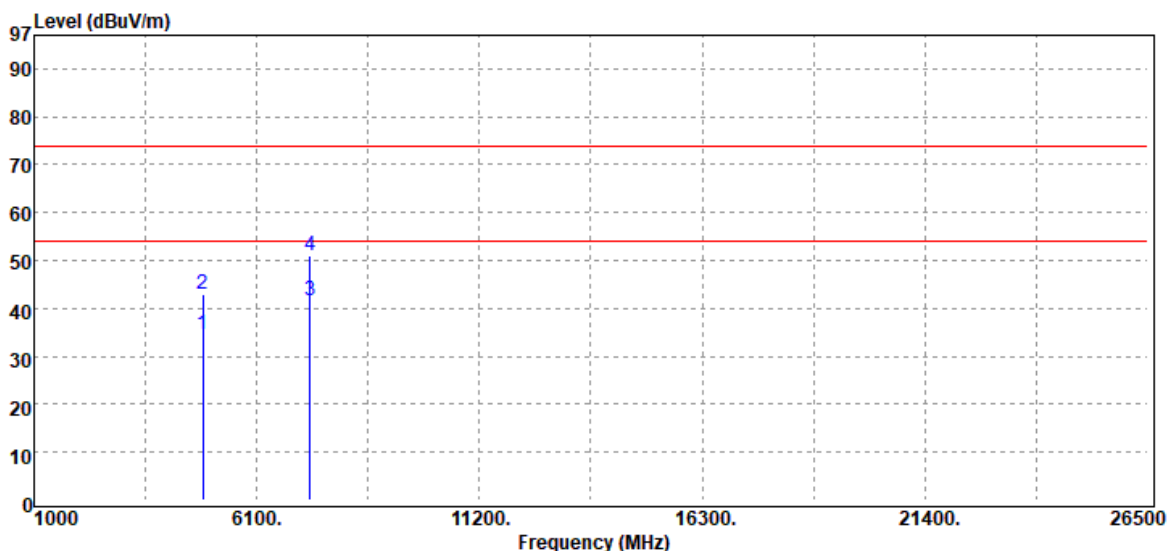
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Report Number :ER/2021/50018  
 Operation Mode :802.11n40  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4874.00	Average	27.45	7.05	34.50	54.00	-19.50
4874.00	Peak	35.82	7.05	42.87	74.00	-31.13
7311.00	Average	26.51	14.99	41.50	54.00	-12.50
7311.00	Peak	35.93	14.99	50.92	74.00	-23.08

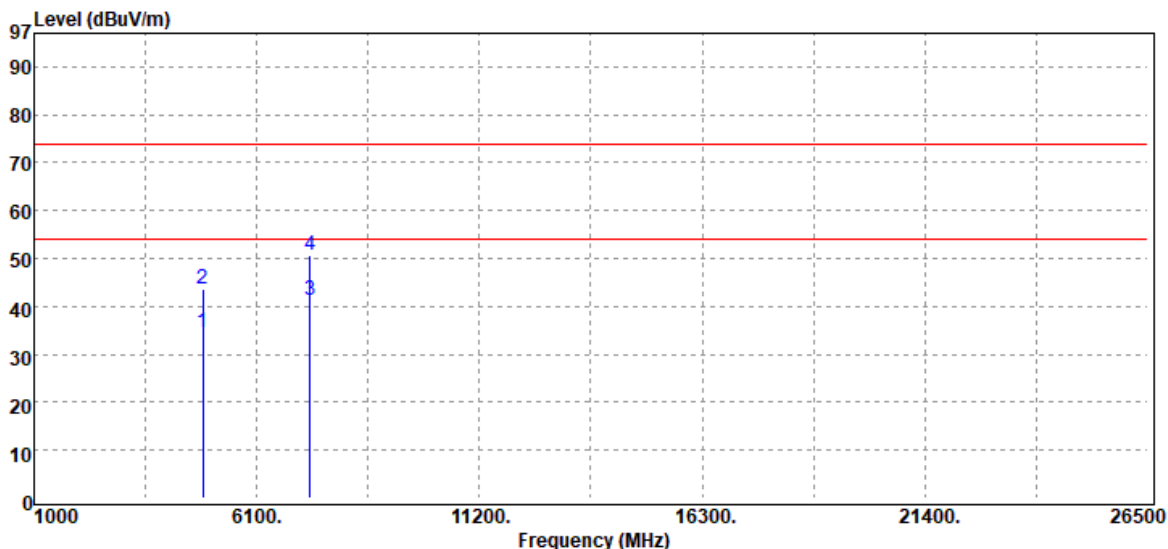
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Report Number :ER/2021/50018  
 Operation Mode :802.11n40  
 Test Frequency :2437 MHz  
 Test Mode :Tx CH Mid  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4874.00	Average	27.59	7.05	34.64	54.00	-19.36
4874.00	Peak	36.47	7.05	43.52	74.00	-30.48
7311.00	Average	26.46	14.99	41.45	54.00	-12.55
7311.00	Peak	35.84	14.99	50.83	74.00	-23.17

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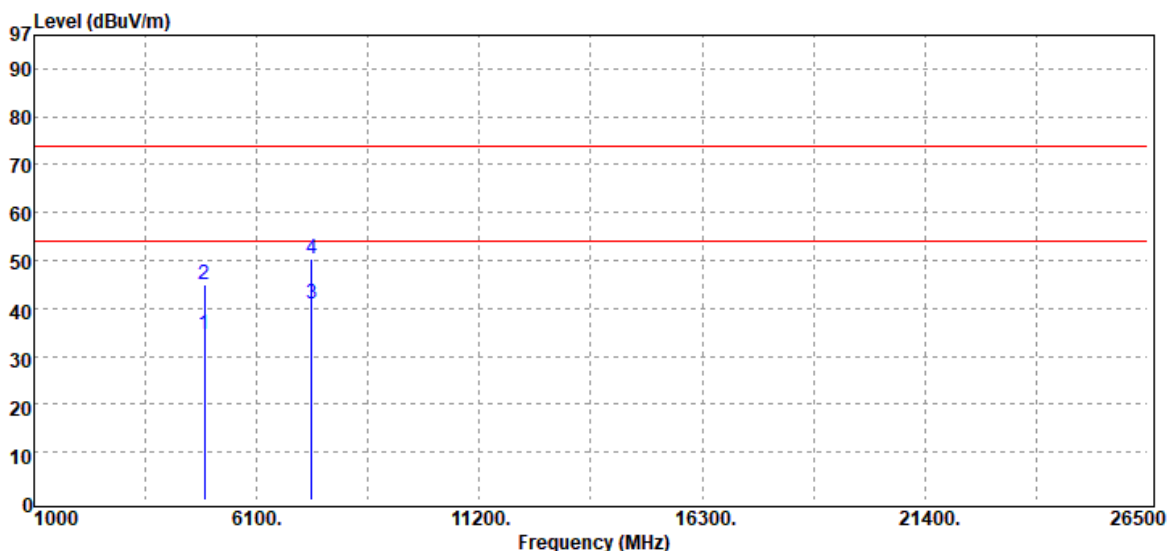
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Report Number :ER/2021/50018  
 Operation Mode :802.11n40  
 Test Frequency :2452 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :VERTICAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4904.00	Average	27.59	7.11	34.70	54.00	-19.30
4904.00	Peak	38.00	7.11	45.11	74.00	-28.89
7356.00	Average	26.29	14.68	40.97	54.00	-13.03
7356.00	Peak	35.74	14.68	50.42	74.00	-23.58

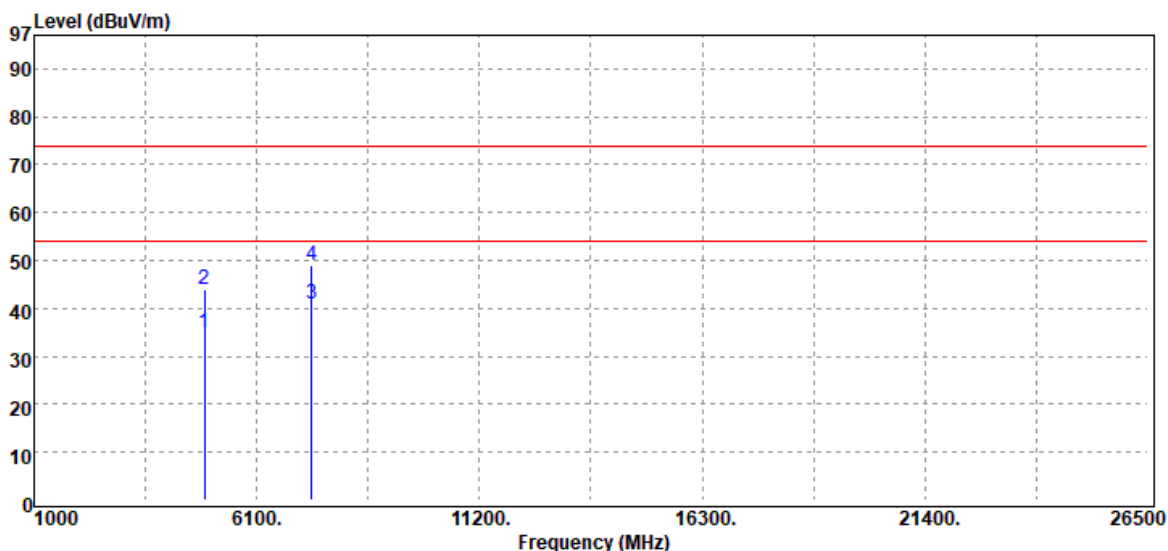
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Report Number :ER/2021/50018  
 Operation Mode :802.11n40  
 Test Frequency :2452 MHz  
 Test Mode :Tx CH High  
 EUT Pol :E2 Plane

Test Site :SAC I Chamber  
 Test Date :2021-06-18  
 Temp./Humi. :26.8/61  
 Antenna Pol. :HORIZONTAL  
 Engineer :Neo Tsai



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
4904.00	Average	27.66	7.11	34.77	54.00	-19.23
4904.00	Peak	36.79	7.11	43.90	74.00	-30.10
7356.00	Average	26.20	14.68	40.88	54.00	-13.12
7356.00	Peak	34.43	14.68	49.11	74.00	-24.89

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## 12 POWER SPECTRAL DENSITY

### 12.1 Standard Applicable

Per Part 15.247 (e)

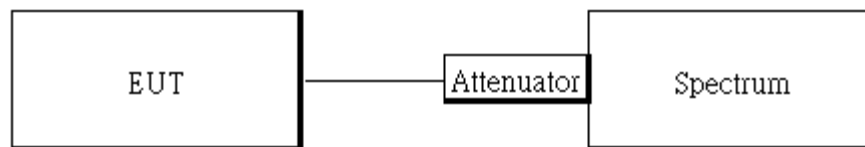
The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

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 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
PXA Spectrum Analyzer	Agilent	N9030A	MY53120760	04/27/2021	04/26/2022
Attenuator	Mini-Circuit	BW-S10W2+	4	12/16/2020	12/15/2021
DC Block	Mini-Circuits	BLK-18-S+	1	12/16/2020	12/15/2021

### 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.

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

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**12.5 Power spectral density**

POWER DENSITY 802.11b				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-5.92	-5.92	8.00	PASS
2437	-7.76	-7.76	8.00	PASS
2462	-4.13	-4.13	8.00	PASS

POWER DENSITY 802.11g				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-9.88	-9.88	8.00	PASS
2437	-11.8	-11.80	8.00	PASS
2462	-11.82	-11.82	8.00	PASS

POWER DENSITY 802.11n HT20				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-9.07	-9.07	8.00	PASS
2437	-10.75	-10.75	8.00	PASS
2462	-9.697	-9.70	8.00	PASS

POWER DENSITY 802.11n HT40				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2422	-15.74	-15.74	8.00	PASS
2437	-12.76	-12.76	8.00	PASS
2452	-13.54	-13.54	8.00	PASS

*\*Refer to next page for plots*

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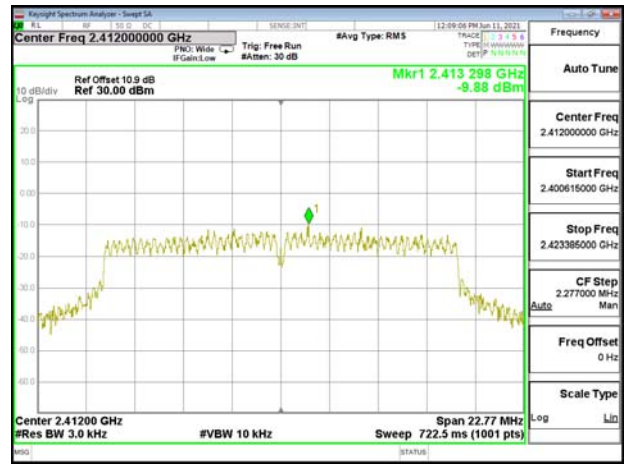
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802.11b\_20MHz\_Chain0\_2412MHz



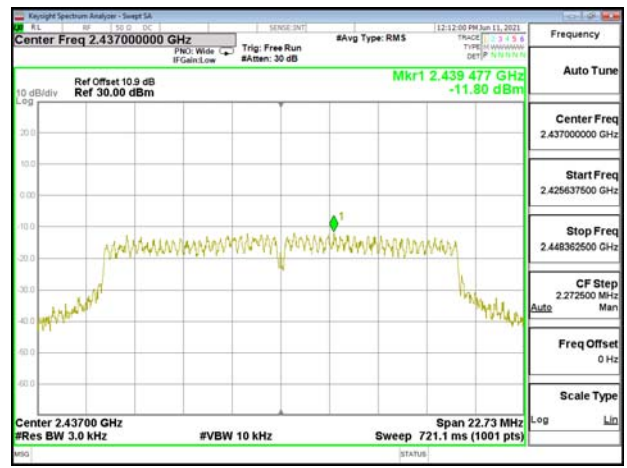
802.11g\_20MHz\_Chain0\_2412MHz



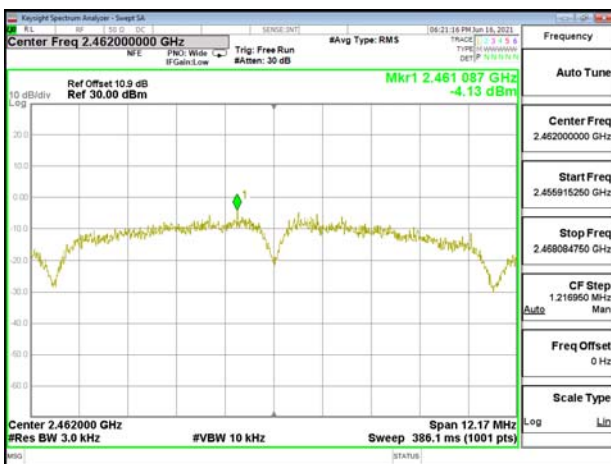
802.11b\_20MHz\_Chain0\_2437MHz



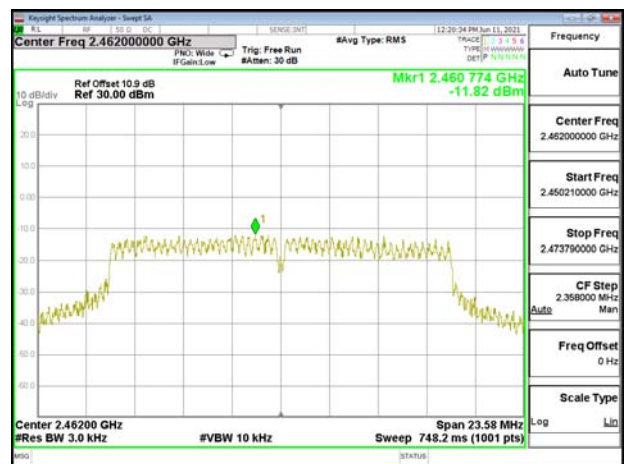
802.11g\_20MHz\_Chain0\_2437MHz



802.11b\_20MHz\_Chain0\_2462MHz



802.11g\_20MHz\_Chain0\_2462MHz

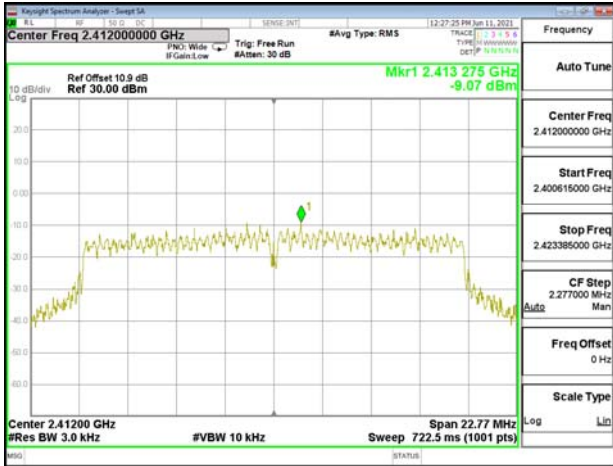


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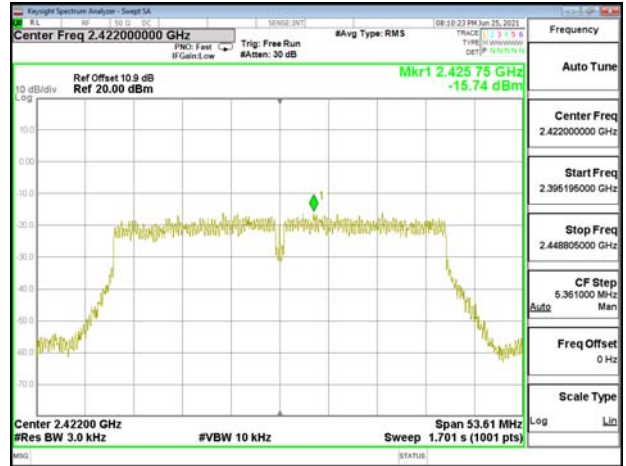
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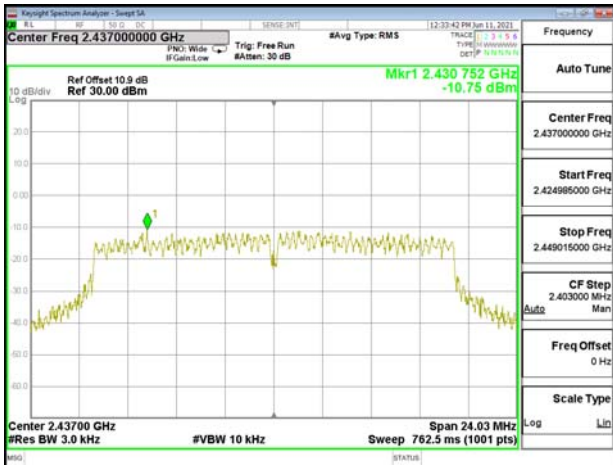
802.11n\_20MHz\_Chain0\_2412MHz



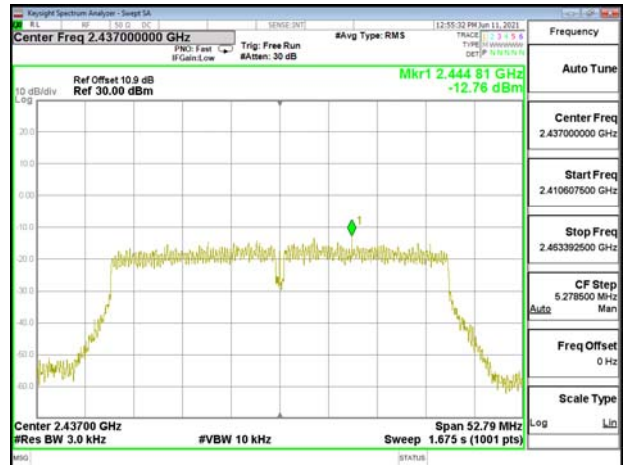
802.11n\_40MHz\_Chain0\_2422MHz



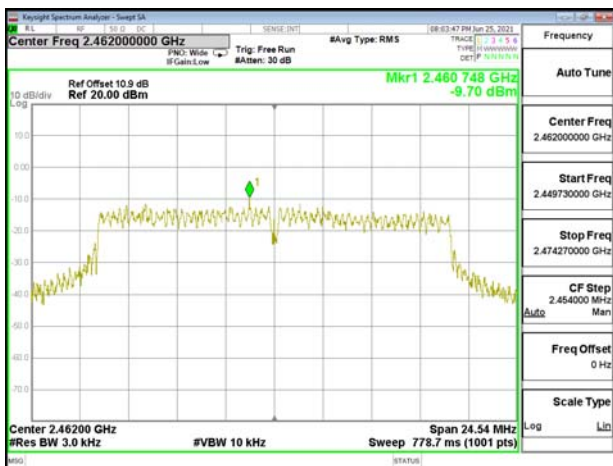
802.11n\_20MHz\_Chain0\_2437MHz



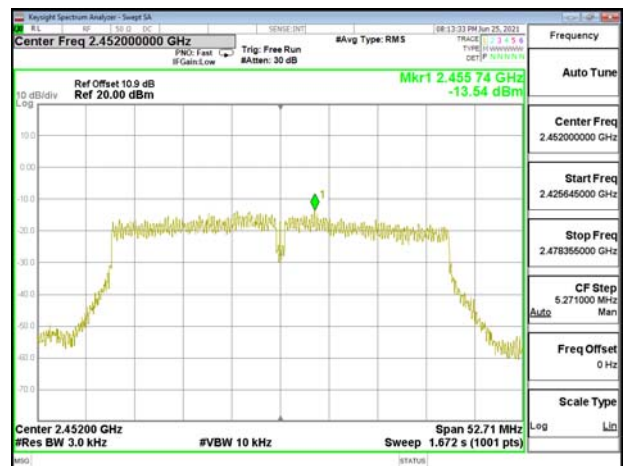
802.11n\_40MHz\_Chain0\_2437MHz



802.11n\_20MHz\_Chain0\_2462MHz



802.11n\_40MHz\_Chain0\_2452MHz



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## 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 as permanently attached and no consideration of replacement. Please see EUT photo for details.

*~ End of Report ~*

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