

**ELECTROMAGNETIC EMISSIONS  
COMPLIANCE REPORT**

**Applicant:** Laipac Technology Inc  
25 Valleywood Drive Unit11, Markham, Ontario, Canada,  
L3R 5L9

**Manufacturer:** Laipac Technology Inc  
25 Valleywood Drive Unit11, Markham, Ontario, Canada,  
L3R 5L9

**Product Name:** LooK SPOT 2

**Brand Name:** LooK SPOT

**Model No.:** LooK SPOT 2

**Model Difference:** N/A

**Report Number:** E2/2021/80082

**FCC ID** TET-LOOKSPOT2

**IC:** 11280A-LOOKSPOT2

**Issue Date:** Dec.03,2021

**Date of Test:** Aug.30,2021~Sep.27,2021

**Date of EUT Received:** Jun.15,2021

Approved By

Arno Hsieh

**Arno Hsieh**

**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	Remark
E2/2021/80082	Rev.00	Original.	Dec.03,2021	Viola Su	-

**Note:**

- 1、The remark "" indicates modification of the report upon requests from certification body.
- 2、Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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# 1 GENERAL INFORMATION

## 1.1 Product Description

Product Name:	LooK SPOT 2
Brand Name:	LooK SPOT
Model No.:	LooK SPOT 2
Model Difference:	N/A
Hardware Version:	V2.0
Firmware Version:	V1.0
EUT Series No.:	PJ216050001
Power Supply:	12V DC

## 1.2 RF Specification

WLAN 2.4GHz				
Wi-Fi	Frequency Range	Channels	Rated Power in dBm (Peak)	Modulation Technology
802.11b	2412~2462	11	16.00	DSSS
802.11g	2412~2462	11	22.56	OFDM
802.11n20	2412~2462	11	22.29	OFDM
802.11n40	2422~2452	7	22.45	OFDM
Modulation type:		CCK, DQPSK, DBPSK for DSSS		
		64QAM, 16QAM, QPSK, BPSK for OFDM		
Data Rate:		802.11 b: 1/2/5.5/11 Mbps		
		802.11 g: 6/9/12/18/24/36/48/54 Mbps		
		802.11 n_20MHz:6.5 - 72.2Mbps		
		802.11 n_40MHz:13.5 - 150Mbps		

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**WLAN 2.4GHz for IC**

Wi-Fi	Frequency Range	Channels	Rated Power in dBm (Peak)	Rated Power in dBm (EIRP)	Modulation Technology
802.11b	2412~2462	11	16.00	19.50	DSSS
802.11g	2412~2462	11	22.56	26.06	OFDM
802.11n20	2412~2462	11	22.29	25.79	OFDM
802.11n40	2422~2452	7	22.45	25.95	OFDM
Modulation type:		CCK, DQPSK, DBPSK for DSSS			
		64QAM, 16QAM, QPSK, BPSK for OFDM			
Data Rate:		802.11 b: 1/2/5.5/11 Mbps			
		802.11 g: 6/9/12/18/24/36/48/54 Mbps			
		802.11 n_20MHz:6.5 - 72.2Mbps			
		802.11 n_40MHz:13.5 - 150Mbps			

**1.3 Antenna Designation**

Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)
resonant cavity	2.4GHz	3.5

**Note:**

1. Antenna information is provided by the applicant.

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### 1.4 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247  
 FCC KDB 558074 D01 15.247 Meas Guidance v05r02  
 RSS-247 issue 2 Feb. 2017  
 RSS-Gen, Issue 5 (Amendment 2, February 2021)  
 ANSI C63.10:2013

### 1.5 Test Facility

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

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

### 1.6 Special Accessories

There are no special accessories used while test was conducted.

### 1.7 Equipment Modifications

There was no modification incorporated into the EUT.

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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\*6m\*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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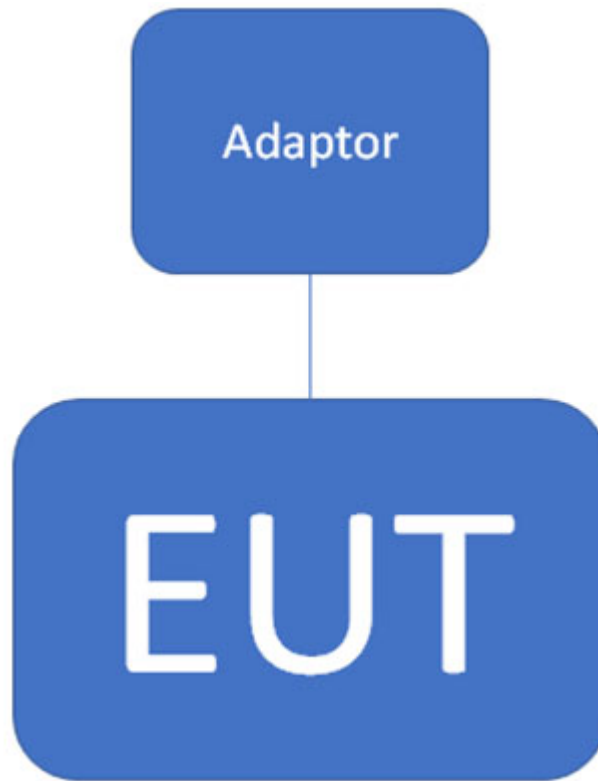
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## 2.5 Test Configuration

### Conducted Setup & Radiated Setup & Conduction



## 2.6 Control Unit(s)

Item	Equipment	MRF/BRAND	Model/Type No.	Version
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N/A
Test Software	audix	e3	210322 sgs Ver.9	N/A
Test Software	audix	e3	E3 20923 SGS Ver.9 ( C )	N/A
Cmd	N/A	N/A	N/A	N/A
Adapter	CUI INC	SDM36-12-U	2038000662	N/A

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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	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 gevin UE is pre-scanned among below modes.

Modulation		Transmission Chain		Single Transmission Spatial	
v	802.11 b	v	Ch0	v	1TX
v	802.11 g	v	Ch0	v	1TX
v	802.11 n	v	Ch0	v	SISO

Modulation	Transmission Chain					Single Transmission Spatial	Multiple Transmission Spatial
	Ch0	Ch1	Ch2	Ch3	Ch4		
<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 type="checkbox"/> Ch4	<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 type="checkbox"/> Ch4	<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 type="checkbox"/> Ch4	<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"/> Ch4	<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.

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

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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	1,6,11	OFDM	MCS0	ch0
802.11n (HT40)	3 to 9	3,6,9	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 **E2 Plane** is tested and recorded.

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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

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR/BRAND	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Software	audix	e3	210322 sgs Ver.9	N.C.R	N.C.R
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	974	04/19/2021	04/18/2022
EMI Test Receiver	R&S	ESCI	101342	04/28/2021	04/27/2022
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2021	03/26/2022
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2021	03/26/2022
Adapter	CUI INC	SDM36-12-U	2038000662	N.C.R	N.C.R

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

### 6.3 EUT Setup

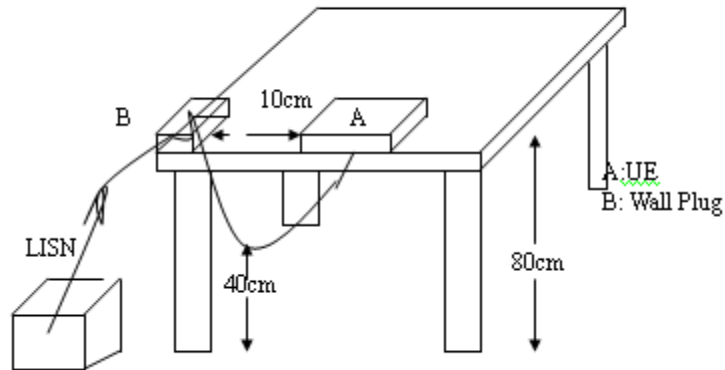
- The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- The LISN was connected with 120Vac/60Hz power source.

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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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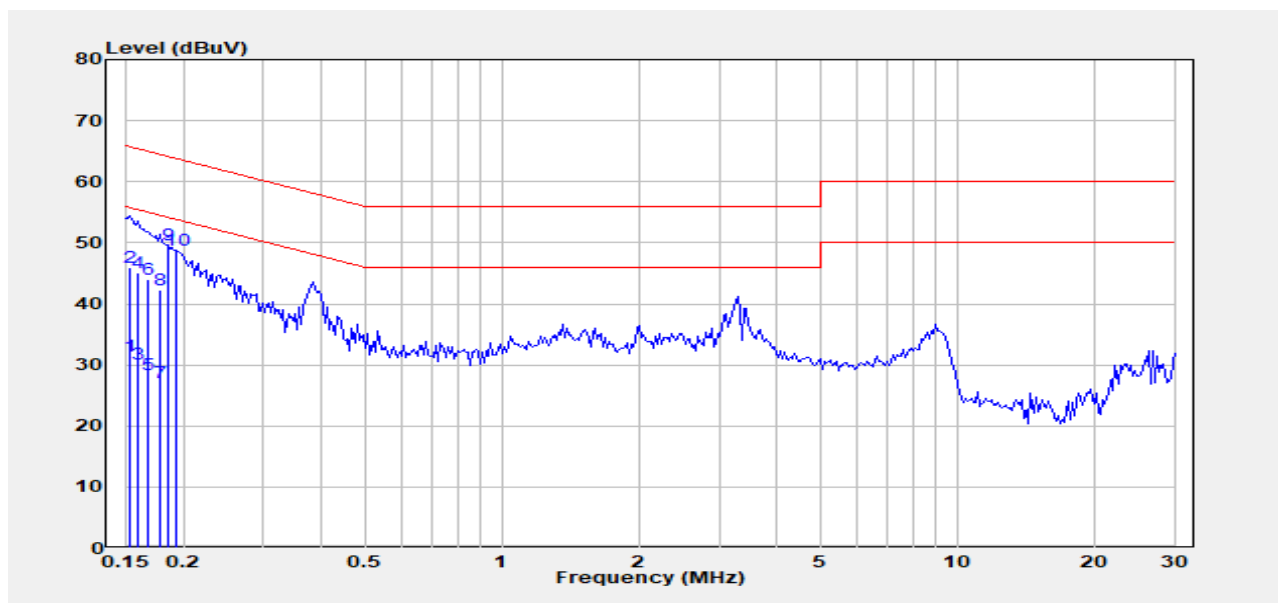
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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number	:E2/2021/80082	Test Site	:Conduction C
Test Mode	:2.4G	Test Date	:2021-09-02
Power	:120V/60Hz	Temp./Humi.	:23.5/60
Probe	:L1	Engineer	:Jack Tseng
Note:	: Adpater:SDM36-12-U		



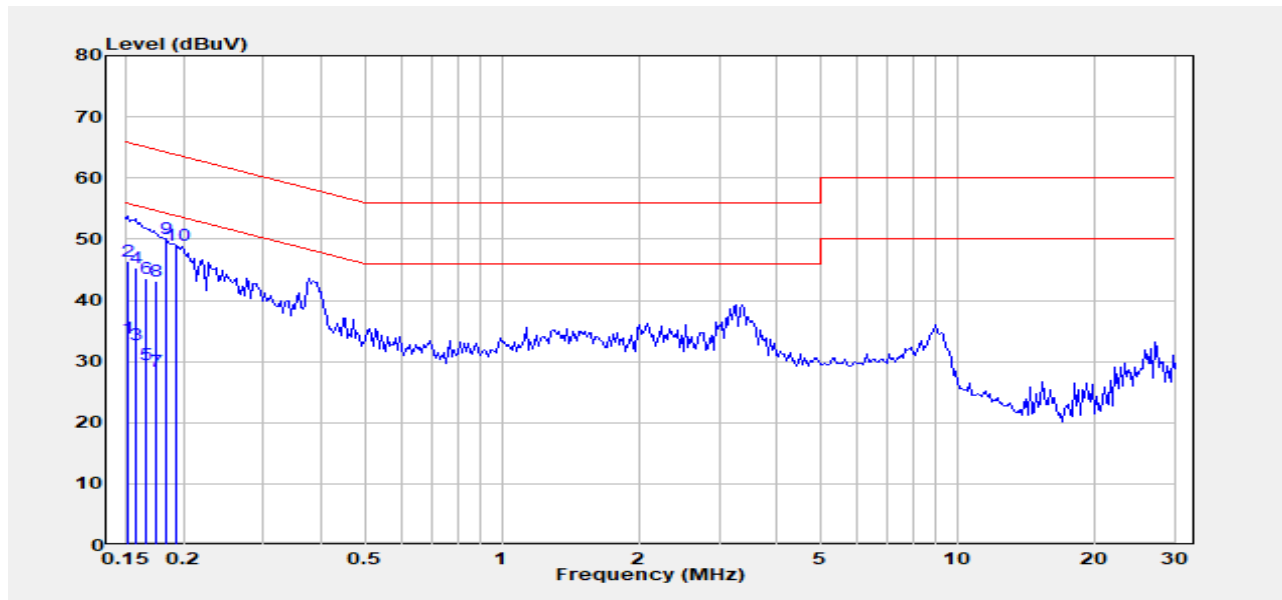
Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V	Limit dB $\mu$ V	Margin dB
0.153	Average	21.10	10.30	31.40	55.82	-24.42
0.153	QP	35.60	10.30	45.90	65.82	-19.92
0.158	Average	19.90	10.30	30.20	55.56	-25.36
0.158	QP	34.70	10.30	45.00	65.56	-20.56
0.167	Average	18.00	10.30	28.30	55.12	-26.82
0.167	QP	33.80	10.30	44.10	65.12	-21.02
0.178	Average	16.70	10.30	27.00	54.59	-27.59
0.178	QP	32.00	10.30	42.30	64.59	-22.29
0.185	Peak	39.36	10.30	49.66	64.24	-14.58
0.193	Peak	38.41	10.30	48.71	63.89	-15.18

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Report Number	:E2/2021/80082	Test Site	:Conduction C
Test Mode	:2.4G	Test Date	:2021-09-02
Power	:120V/60Hz	Temp./Humi.	:23.5/60
Probe	:N	Engineer	:Jack Tseng
Note:	: Adpater:SDM36-12-U		



Freq. MHz	Detector Mode	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V	Limit dB $\mu$ V	Margin dB
0.152	Average	23.50	10.31	33.81	55.91	-22.10
0.152	QP	36.00	10.31	46.31	65.91	-19.60
0.156	Average	22.40	10.31	32.71	55.65	-22.94
0.156	QP	35.00	10.31	45.31	65.65	-20.34
0.165	Average	19.10	10.31	29.41	55.21	-25.80
0.165	QP	33.30	10.31	43.61	65.21	-21.60
0.174	Average	18.20	10.30	28.50	54.77	-26.26
0.174	QP	32.80	10.30	43.10	64.77	-21.66
0.183	Peak	39.73	10.30	50.03	64.33	-14.30
0.193	Peak	38.70	10.30	49.00	63.89	-14.89

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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.

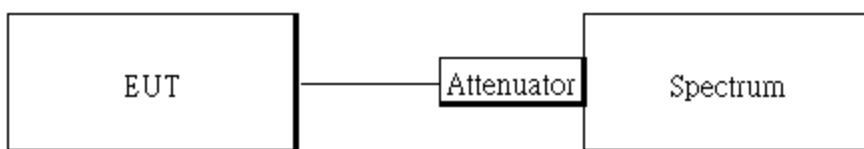
All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

### 7.1 Measurement Equipment Used

Conducted Emission Test Site: Conducted B					
EQUIPMENT TYPE	MFR/BRAND	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/13/2021	07/12/2022
Attenuator	Marvelous	MVE2213-10	RF05	11/19/2020	11/18/2021
DC Block	PASTERNAK	PE8210	RF157	11/19/2020	11/18/2021
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

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

### 7.2 Test Set-up



### 7.3 Measurement Procedure:

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

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7.4 Duty Cycle:

	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log ( 1/Duty Cycle )	1/T (kHz)	VBW setting (kHz)
802.11b	99.99	0.00	0.08	0.01
802.11g	98.95	0.05	0.48	0.01
802.11n_20	98.88	0.05	0.52	0.01
802.11n_40	97.62	0.10	1.06	2.00

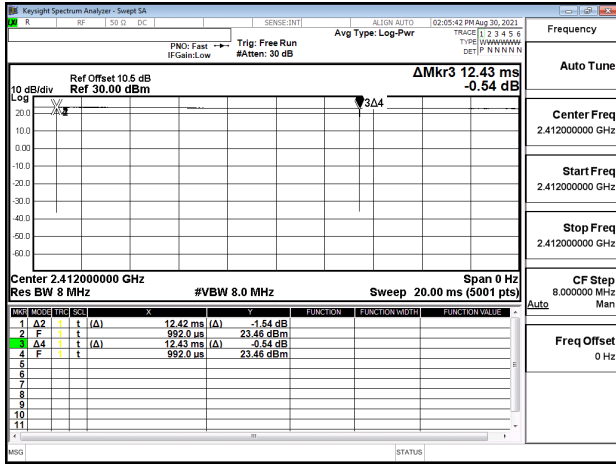
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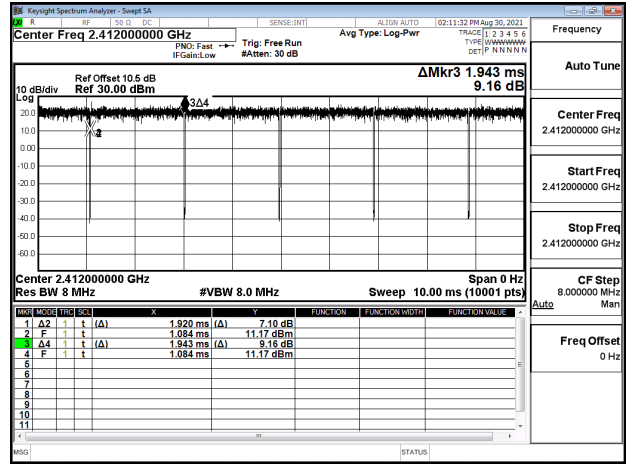
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### 7.5 Duty Cycle test plots

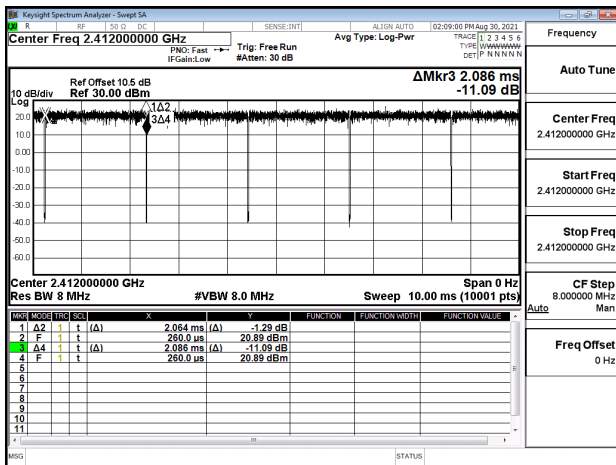
802.11b\_20MHz\_Chain0\_2412MHz



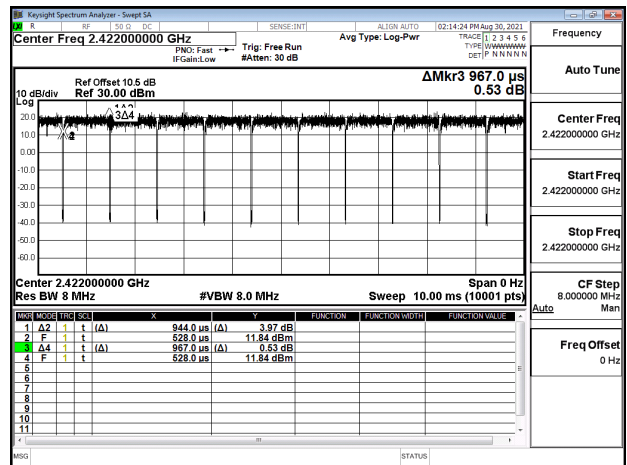
802.11n\_20MHz\_Chain0\_2412MHz



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.

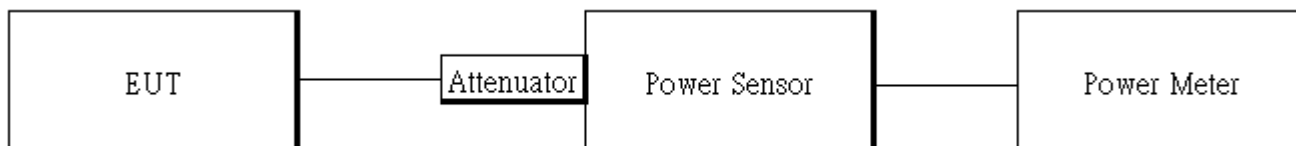
### 8.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted B					
EQUIPMENT TYPE	MFR/BRAND	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Attenuator	Marvelous	MVE2213-10	RF05	11/19/2020	11/18/2021
Power Meter	Anritsu	ML2496A	1804002	04/14/2021	04/13/2022
Power Sensor	Anritsu	MA2411B	1726105	04/14/2021	04/13/2022
Power Sensor	Anritsu	MA2411B	1726106	04/14/2021	04/13/2022
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/13/2021	07/12/2022
Attenuator	Marvelous	MVE2213-10	RF05	11/19/2020	11/18/2021
DC Block	PASTERNAK	PE8210	RF157	11/19/2020	11/18/2021
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

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

### 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 and below is compensated to obtain the maximum value of measurement in average.**

### 8.5 Measurement Result

#### 8.5.1 Peak Output Power

802.11b Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	48	16.00	30.00	PASS
6	2437	1	47	15.84	30.00	PASS
11	2462	1	47	15.77	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	48	12.95	30.00	PASS
6	2437	1	47	12.88	30.00	PASS
11	2462	1	47	12.78	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	46	22.49	30.00	PASS
6	2437	6	46	22.43	30.00	PASS
11	2462	6	46	<b>22.56</b>	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	46	12.87	30.00	PASS
6	2437	6	46	12.97	30.00	PASS
11	2462	6	46	<b>13.21</b>	30.00	PASS

802.11n_HT20M Ch0						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	46	21.92	30.00	PASS
6	2437	MCS0	46	22.27	30.00	PASS
11	2462	MCS0	46	<b>22.29</b>	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	46	12.43	30.00	PASS
6	2437	MCS0	46	12.48	30.00	PASS
11	2462	MCS0	46	<b>12.65</b>	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	48	22.45	30.00	PASS
6	2437	MCS0	47	22.34	30.00	PASS
9	2452	MCS0	44	21.18	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	48	13.25	30.00	PASS
6	2437	MCS0	47	13.27	30.00	PASS
9	2452	MCS0	44	11.47	30.00	PASS

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8.5.2 EIRP

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	12.95	3.50	16.45	36	PASS
6	2437	1	12.88	3.50	16.38	36	PASS
11	2462	1	12.78	3.50	16.28	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	12.87	3.50	16.37	36	PASS
6	2437	6	12.97	3.50	16.47	36	PASS
11	2462	6	13.21	3.50	16.71	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	12.43	3.50	15.93	36	PASS
6	2437	MCS0	12.48	3.50	15.98	36	PASS
11	2462	MCS0	12.65	3.50	16.15	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	13.25	3.50	16.75	36	PASS
6	2437	MCS0	13.27	3.50	16.77	36	PASS
9	2452	MCS0	11.47	3.50	14.97	36	PASS

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## 9 EMISSION BANDWIDTH MEASUREMENT

### 9.1 Standard Applicable

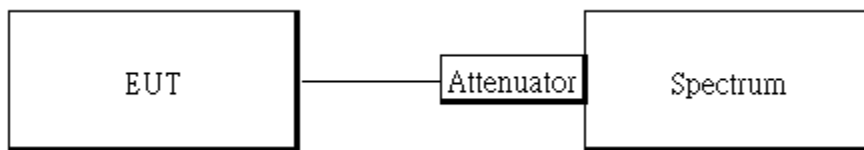
The minimum 6 dB bandwidth shall be at least 500 kHz.

### 9.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted B					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/13/2021	07/12/2022
Attenuator	Marvelous	MVE2213-10	RF05	11/19/2020	11/18/2021
DC Block	PASTER-NACK	PE8210	RF157	11/19/2020	11/18/2021
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

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

### 9.3 Test Set-up



### 9.4 Measurement Procedure

- Place the EUT on the table and set it in transmitting mode.
- The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 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.
- Set the spectrum analyzer as  
 RBW= 1 % to 5% of 99% Bandwidth ,  
 VBW ≥ 3 X RBW,  
 Span= large enough to capture all products of the modulation process,  
 Sweep=auto,  
 Detector = Peak, and Max hold for 99% Bandwidth test.

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6. Turn on the 99% bandwidth function, max reading.
7. Repeat above procedures until all test default channel is completed

### 9.5 6dB Bandwidth

802.11b Ch0			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	8120.00	≥ 500	PASS
2437	8119.00	≥ 500	PASS
2462	<b>8121.00</b>	≥ 500	PASS

802.11g Ch0			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	<b>16340.00</b>	≥ 500	PASS
2437	<b>16340.00</b>	≥ 500	PASS
2462	15210.00	≥ 500	PASS

802.11_n_HT20 Ch0			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	<b>17320.00</b>	≥ 500	PASS
2437	17310.00	≥ 500	PASS
2462	15210.00	≥ 500	PASS

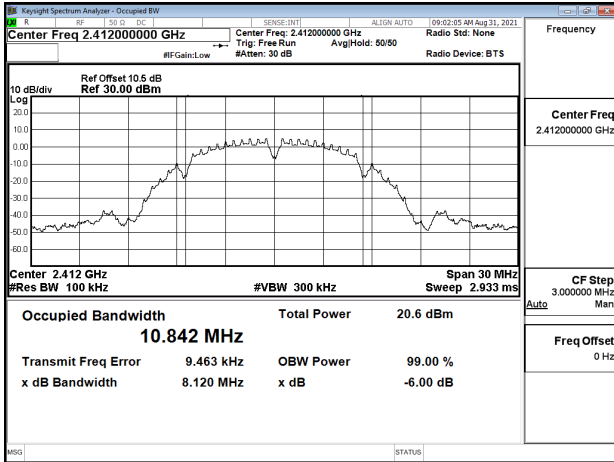
802.11_n_HT40 Ch0			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35700.00	≥ 500	PASS
2437	<b>35920.00</b>	≥ 500	PASS
2452	35780.00	≥ 500	PASS

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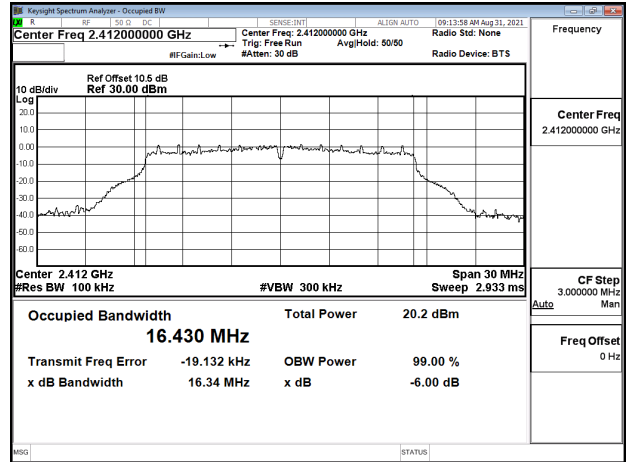
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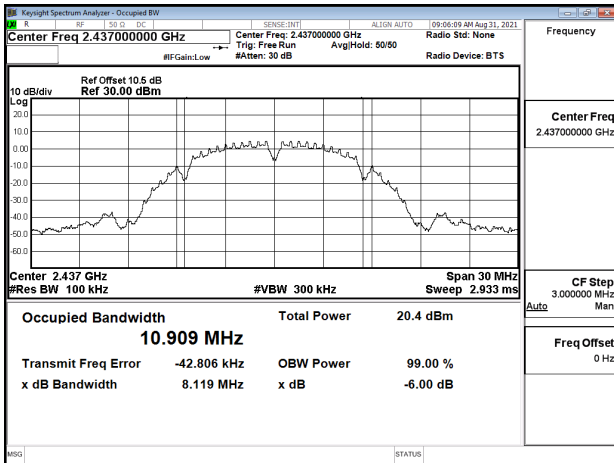
802.11b\_20MHz\_Chain0\_2412MHz



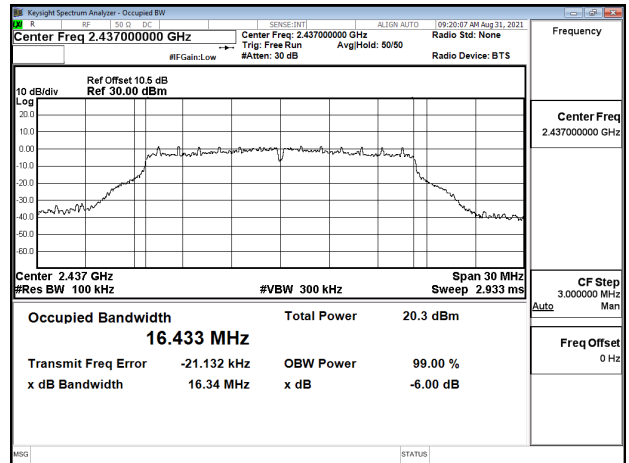
802.11g\_20MHz\_Chain0\_2412MHz



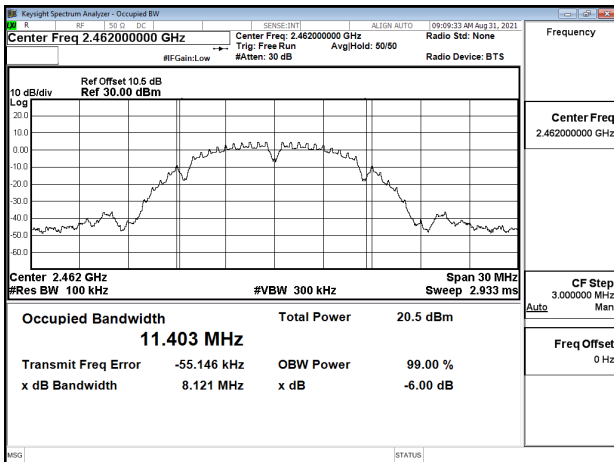
802.11b\_20MHz\_Chain0\_2437MHz



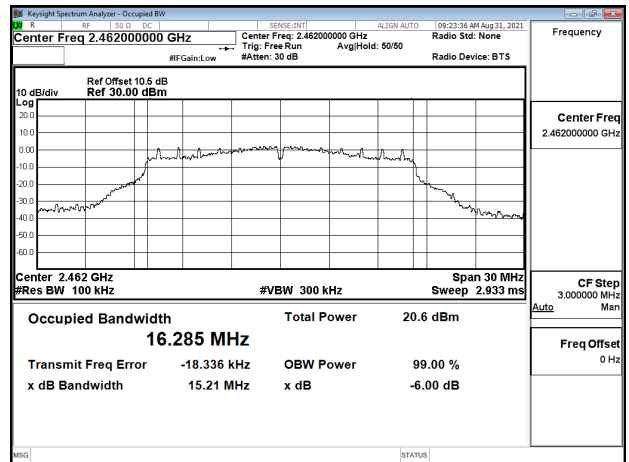
802.11g\_20MHz\_Chain0\_2437MHz



802.11b\_20MHz\_Chain0\_2462MHz



802.11g\_20MHz\_Chain0\_2462MHz

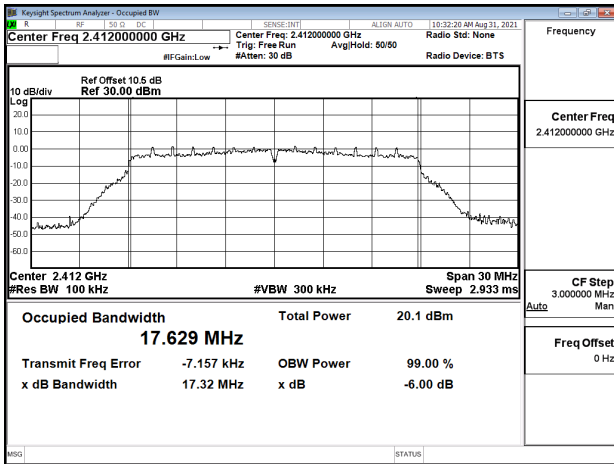


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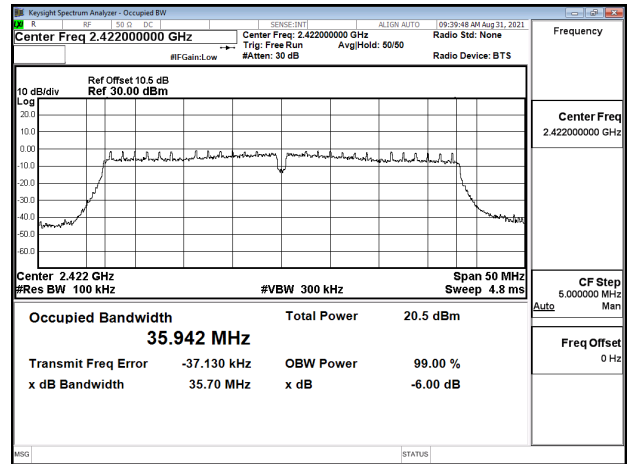
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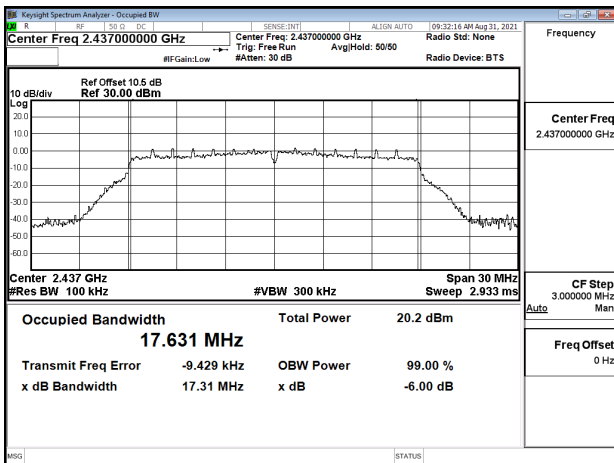
802.11n\_20MHz\_Chain0\_2412MHz



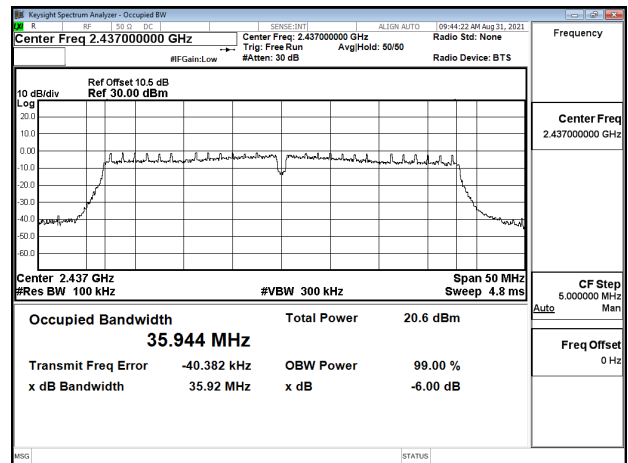
802.11n\_40MHz\_Chain0\_2422MHz



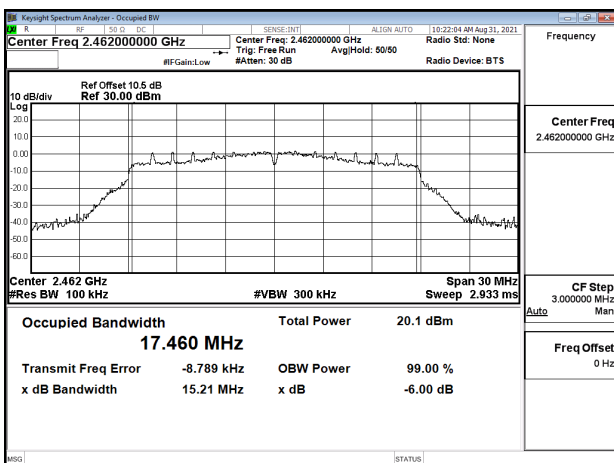
802.11n\_20MHz\_Chain0\_2437MHz



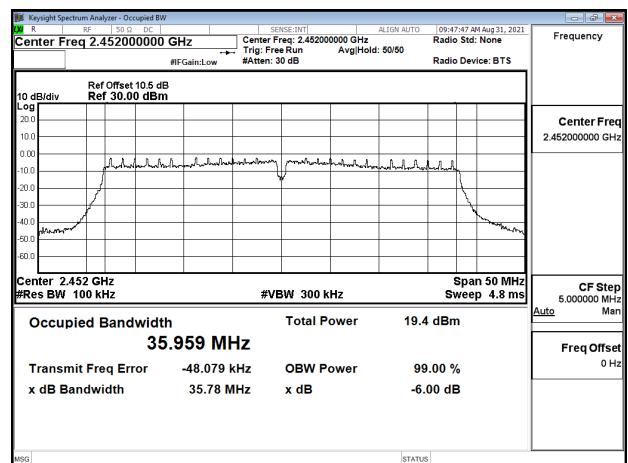
802.11n\_40MHz\_Chain0\_2437MHz



802.11n\_20MHz\_Chain0\_2462MHz



802.11n\_40MHz\_Chain0\_2452MHz



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9.6 99% Bandwidth

802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	11.266
2437	11.211
2462	<b>11.537</b>

802.11g Ch0

Freq. (MHz)	99% BW (MHz)
2412	<b>16.882</b>
2437	16.869
2462	16.553

802.11n\_HT20M Ch0

Freq. (MHz)	99% BW (MHz)
2412	17.963
2437	<b>17.992</b>
2462	17.605

802.11n\_HT40M Ch0

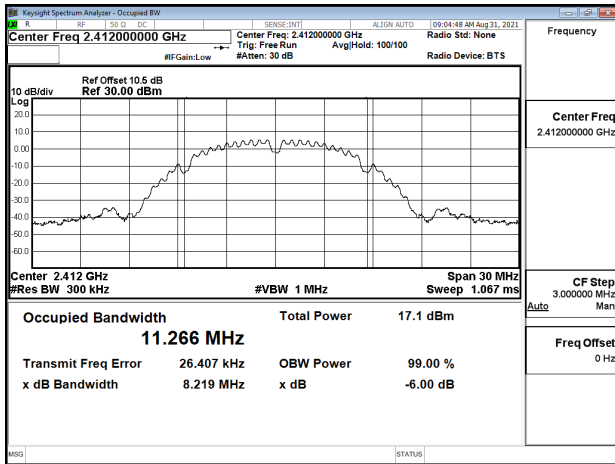
Freq. (MHz)	99% BW (MHz)
2422	36.215
2437	36.226
2452	<b>36.258</b>

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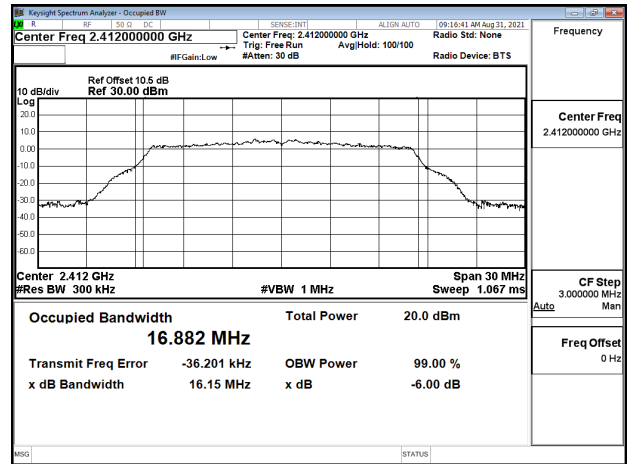
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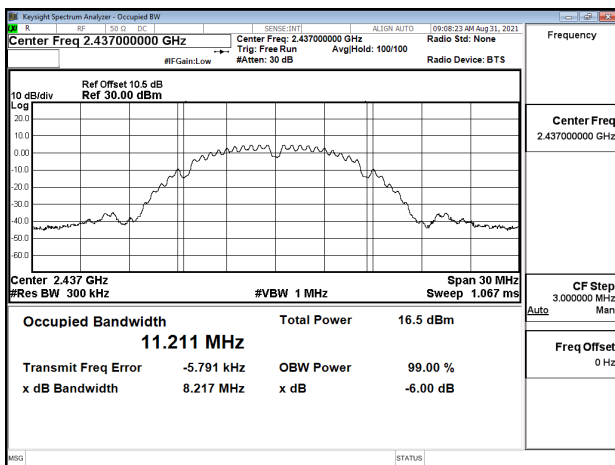
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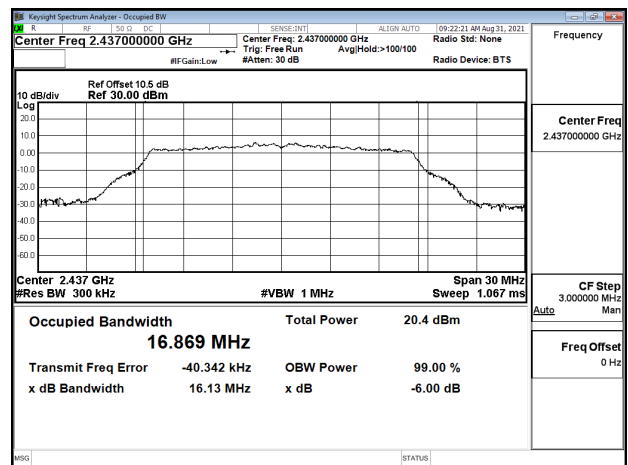
802.11g\_20MHz\_Chain0\_2412MHz



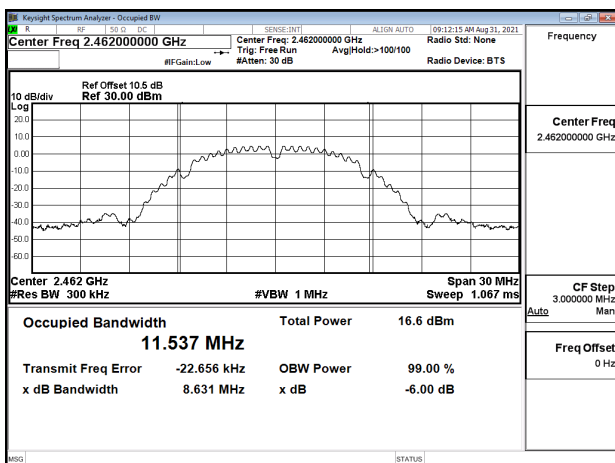
802.11b\_20MHz\_Chain0\_2437MHz



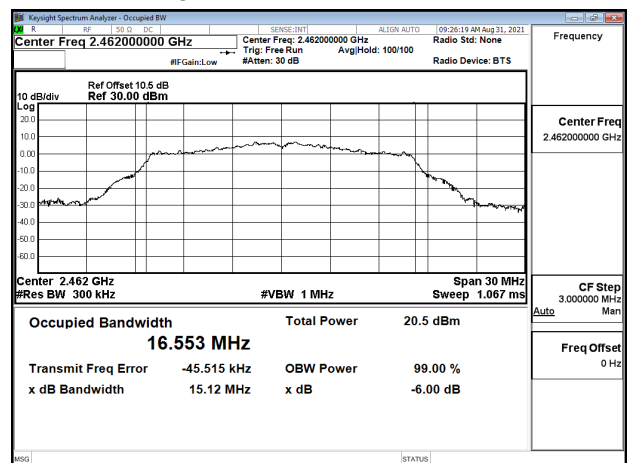
802.11g\_20MHz\_Chain0\_2437MHz



802.11b\_20MHz\_Chain0\_2462MHz



802.11g\_20MHz\_Chain0\_2462MHz



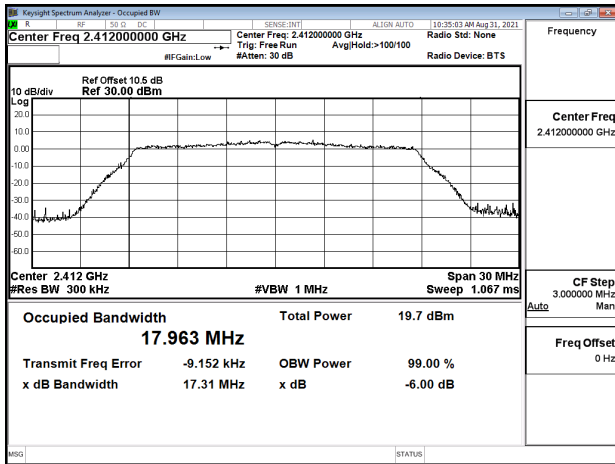
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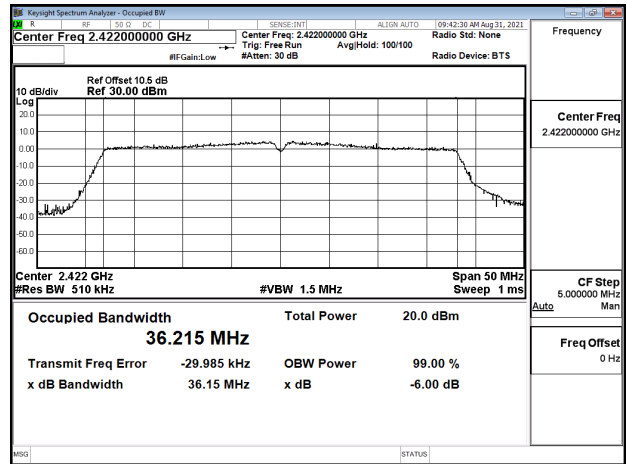
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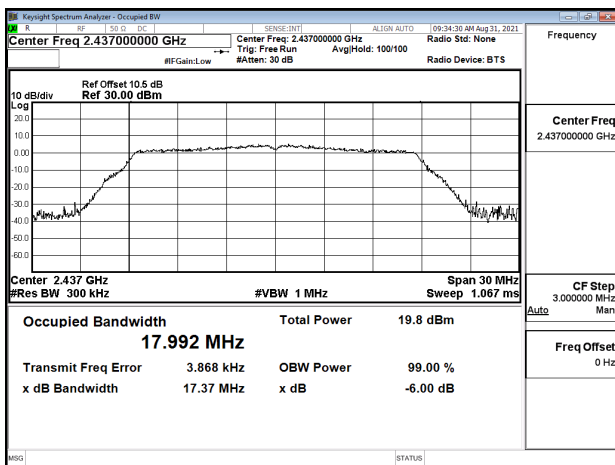
802.11n\_20MHz\_Chain0\_2412MHz



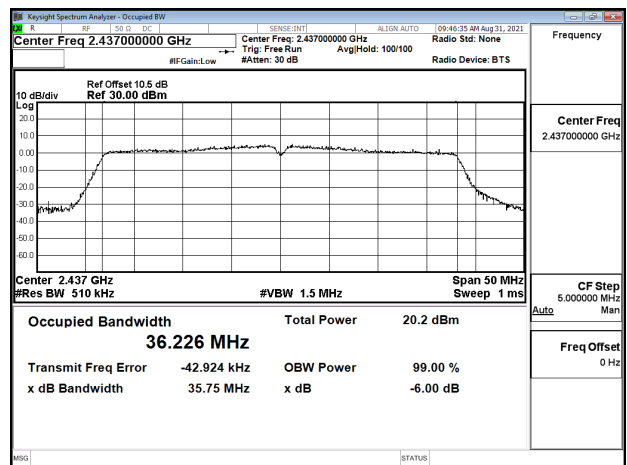
802.11n\_40MHz\_Chain0\_2422MHz



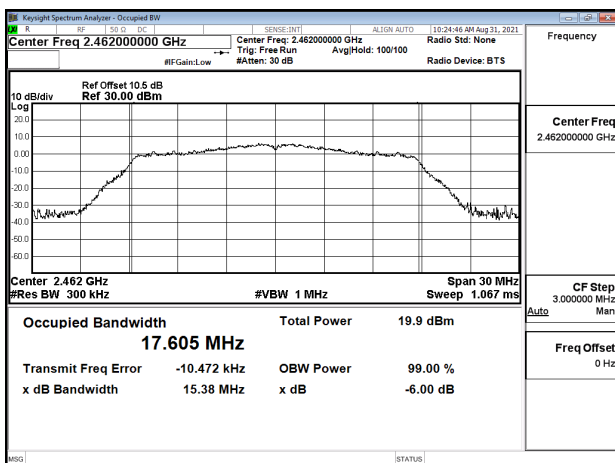
802.11n\_20MHz\_Chain0\_2437MHz



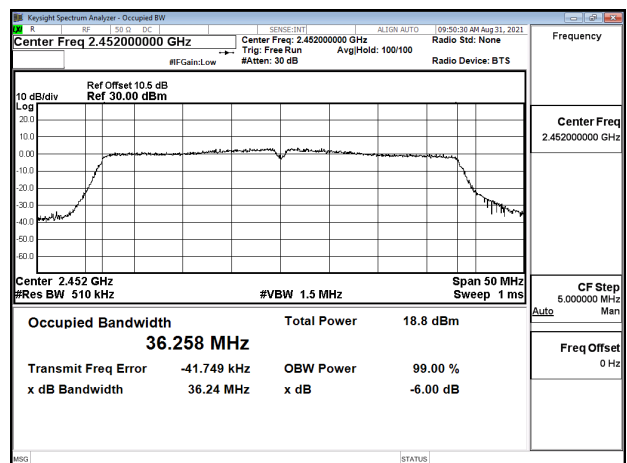
802.11n\_40MHz\_Chain0\_2437MHz



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

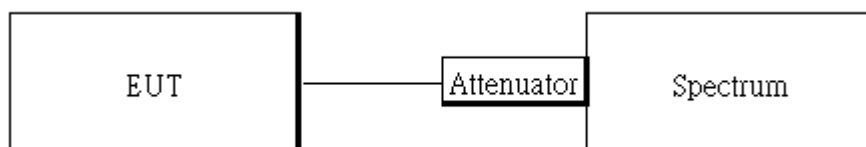
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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 B					
EQUIPMENT TYPE	MFR/BRAND	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Attenuator	Marvelous	MVE2213-10	RF05	11/19/2020	11/18/2021
Power Meter	Anritsu	ML2496A	1804002	04/14/2021	04/13/2022
Power Sensor	Anritsu	MA2411B	1726105	04/14/2021	04/13/2022
Power Sensor	Anritsu	MA2411B	1726106	04/14/2021	04/13/2022

### 10.3 Test SET-UP



### 10.4 Measurement Procedure

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**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.

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## 10.5 Measurement Result

Reference Level of Limit 802.11b mode		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	4.80	-15.20
2437	4.66	-15.34
2462	4.65	-15.35

Reference Level of Limit 802.11g mode		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	1.34	-18.66
2437	1.65	-18.35
2462	2.16	-17.84

Reference Level of Limit 802.11n20 MODE		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	1.58	-18.42
2437	1.66	-18.34
2462	1.83	-18.17

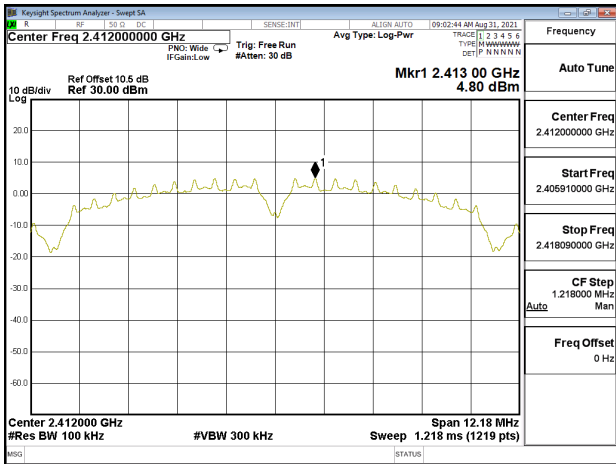
Reference Level of Limit 802.11n40 MODE		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2422	-1.12	-21.12
2437	-0.97	-20.97
2452	-2.15	-22.15

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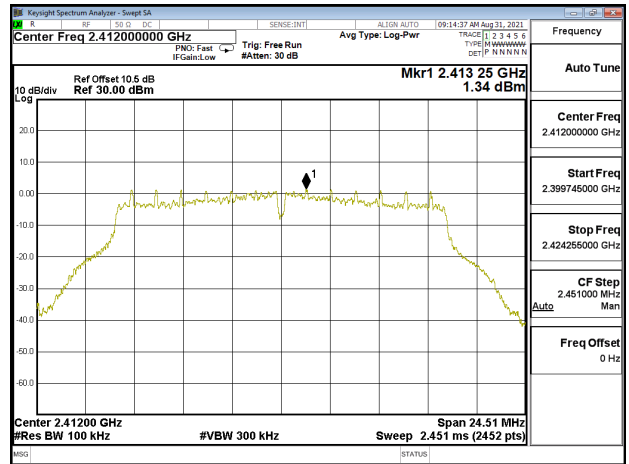
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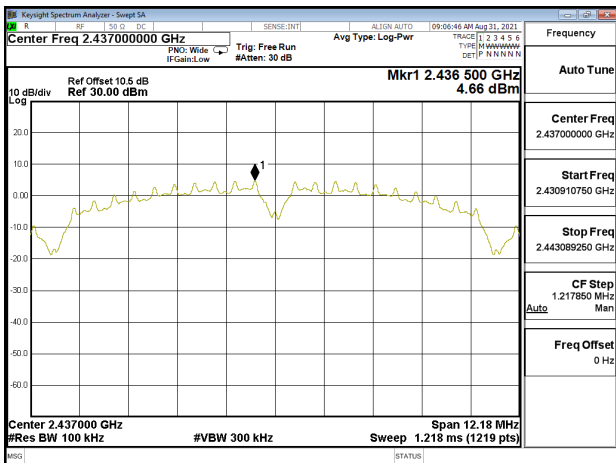
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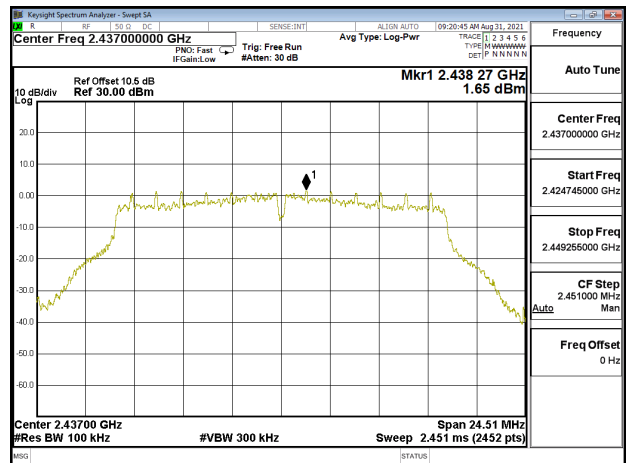
802.11g\_20MHz\_Chain0\_2412MHz



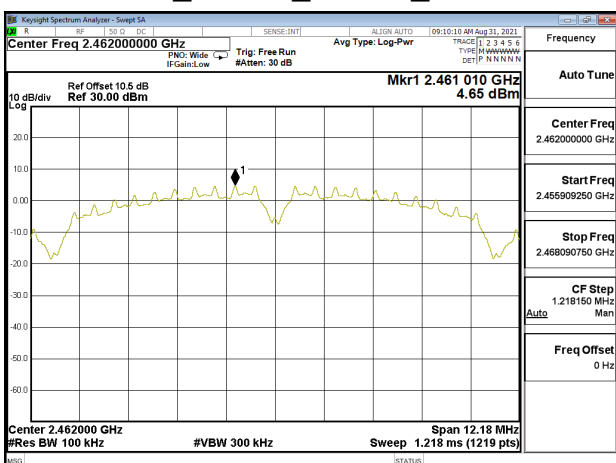
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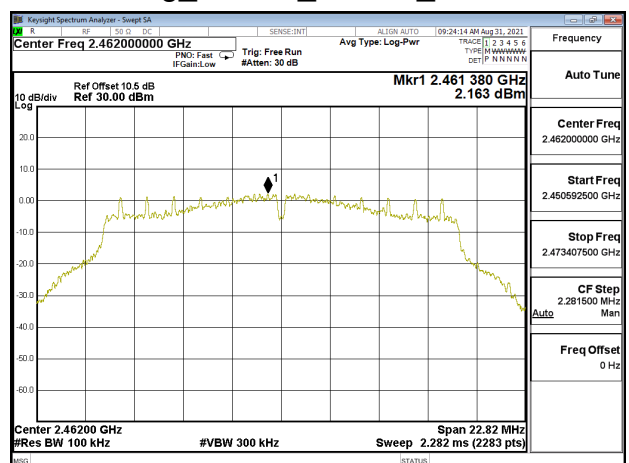
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802.11b\_20MHz\_Chain0\_2462MHz



802.11g\_20MHz\_Chain0\_2462MHz

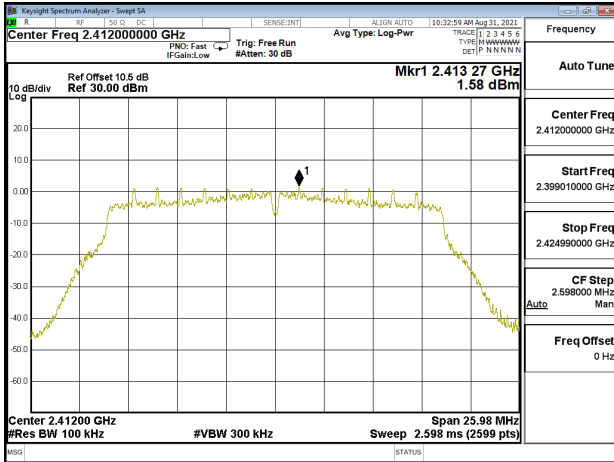


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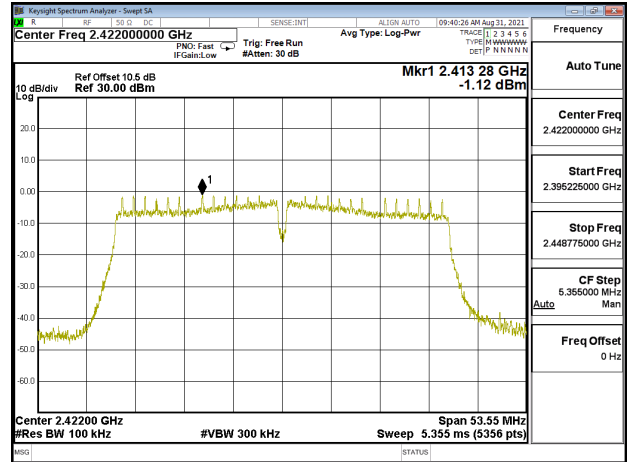
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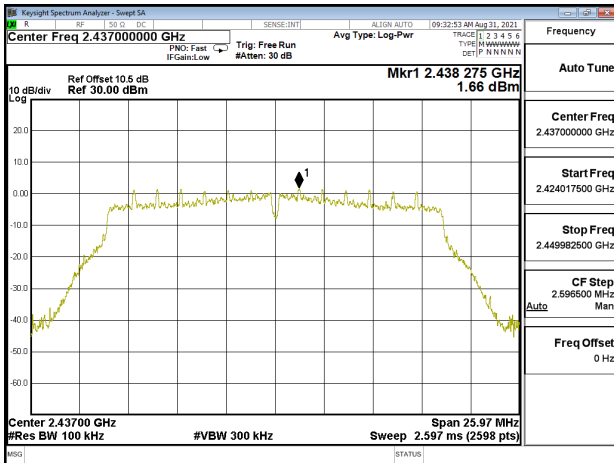
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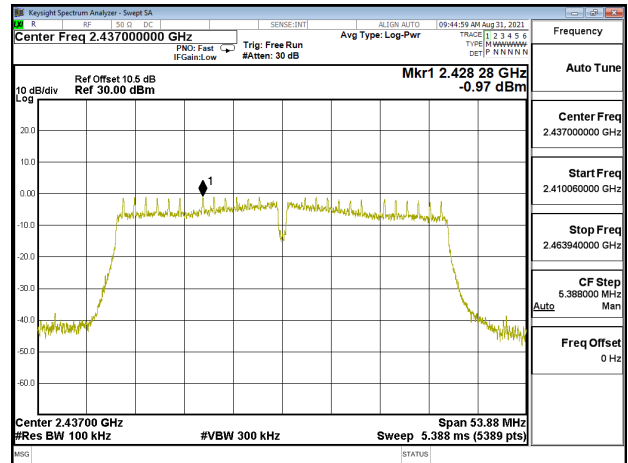
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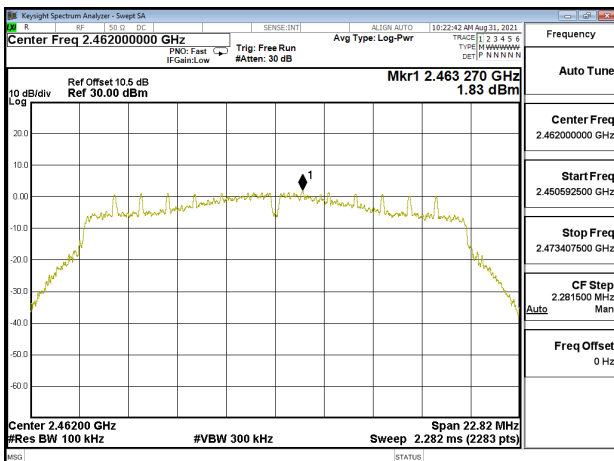
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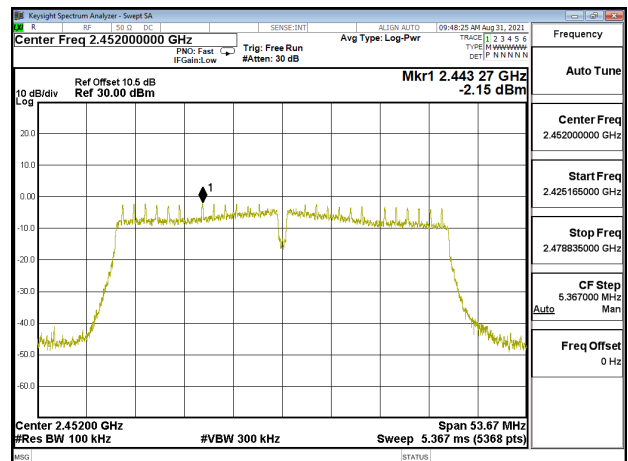
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802.11n\_20MHz\_Chain0\_2462MHz



802.11n\_40MHz\_Chain0\_2452MHz

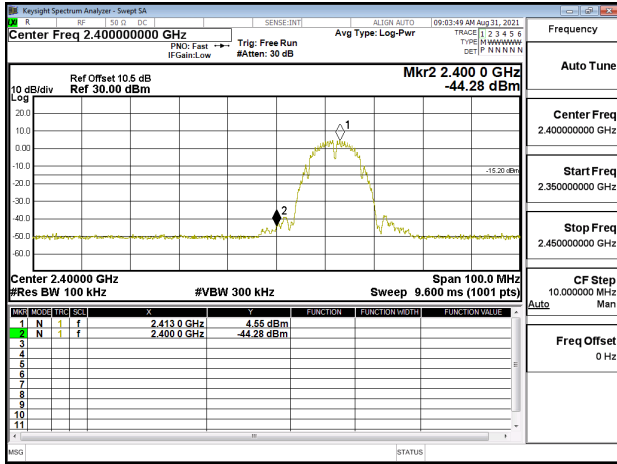


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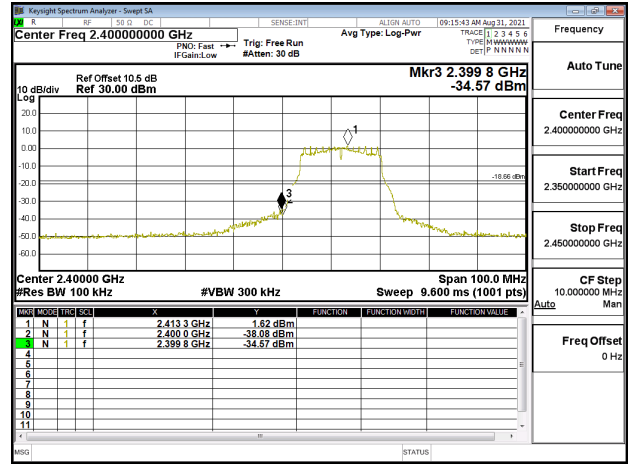
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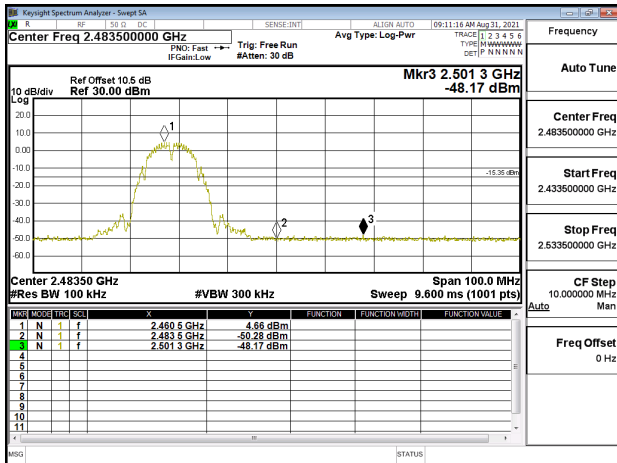
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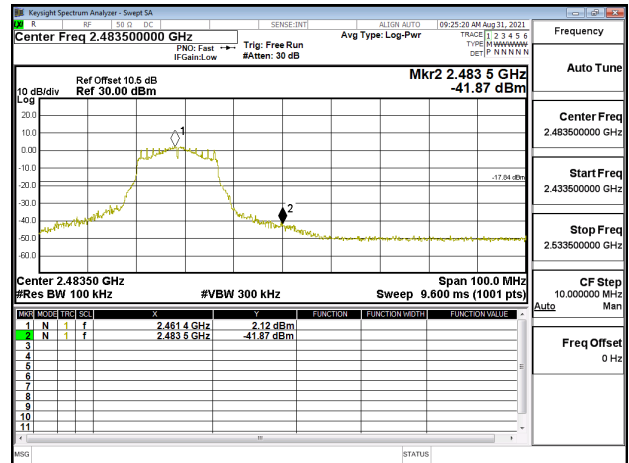
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802.11b\_20MHz\_Chain0\_2462MHz



802.11g\_20MHz\_Chain0\_2462MHz



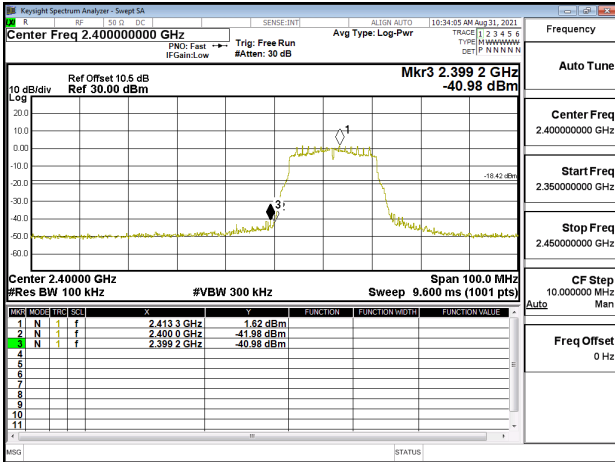
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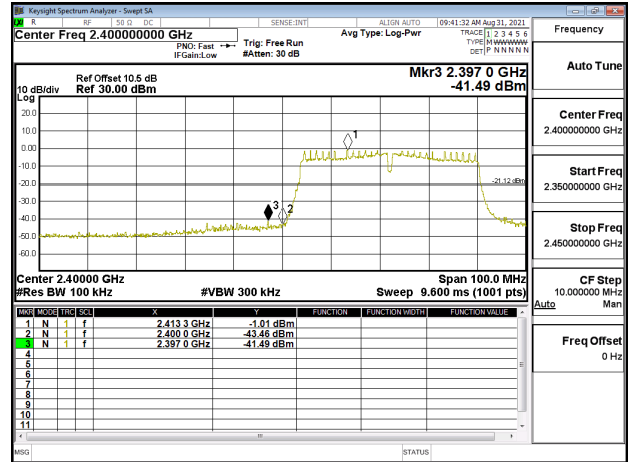
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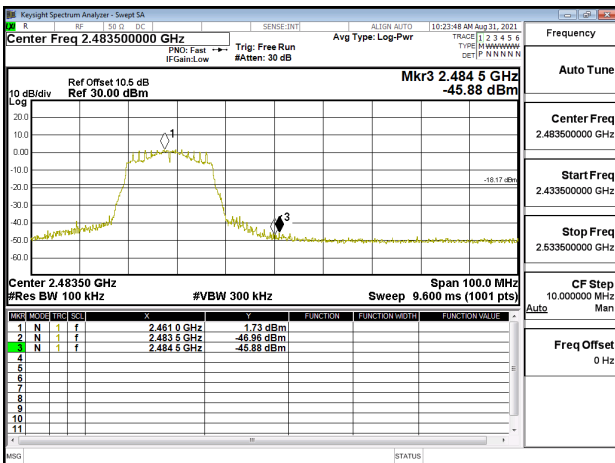
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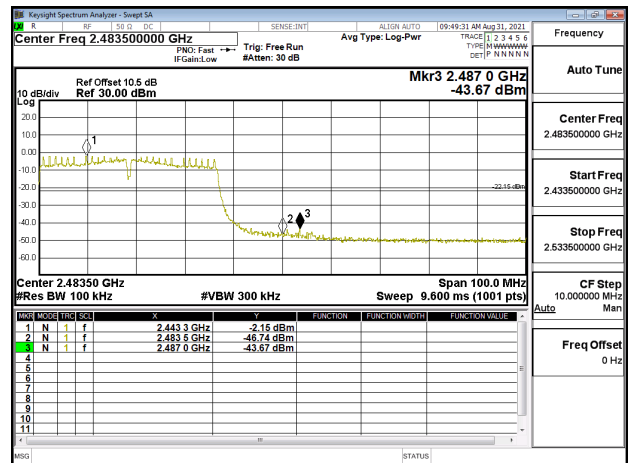
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802.11n\_20MHz\_Chain0\_2462MHz



802.11n\_40MHz\_Chain0\_2452MHz

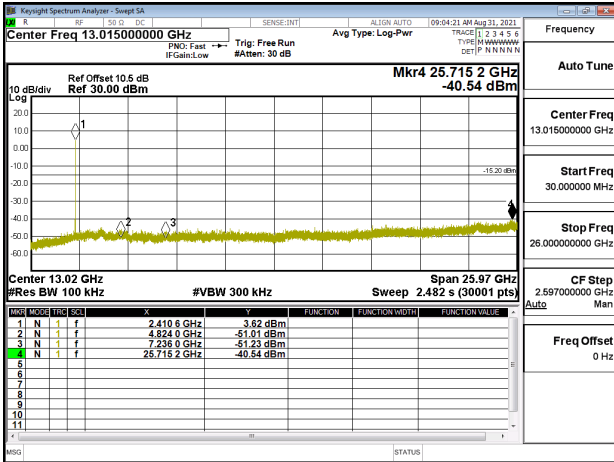


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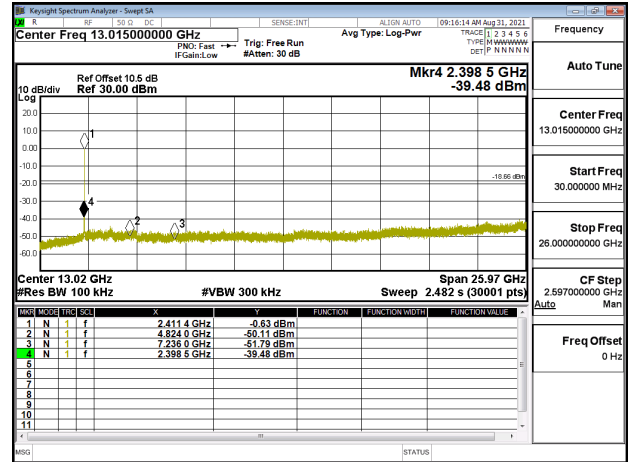
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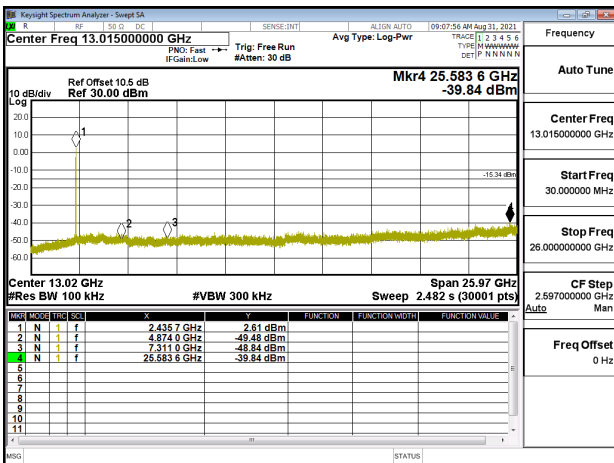
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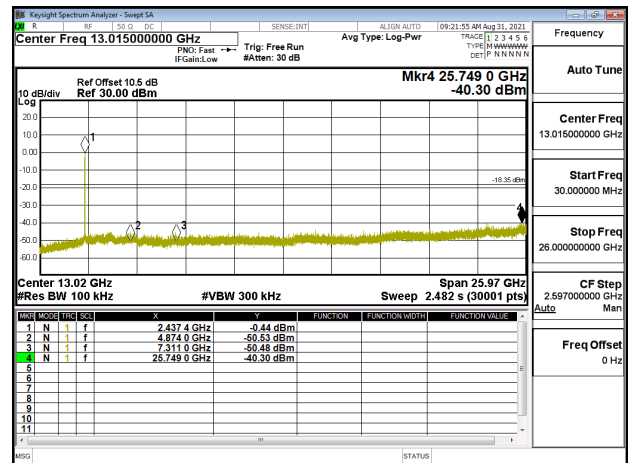
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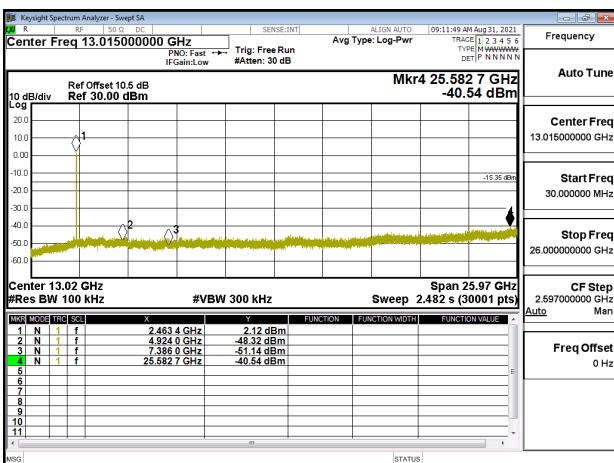
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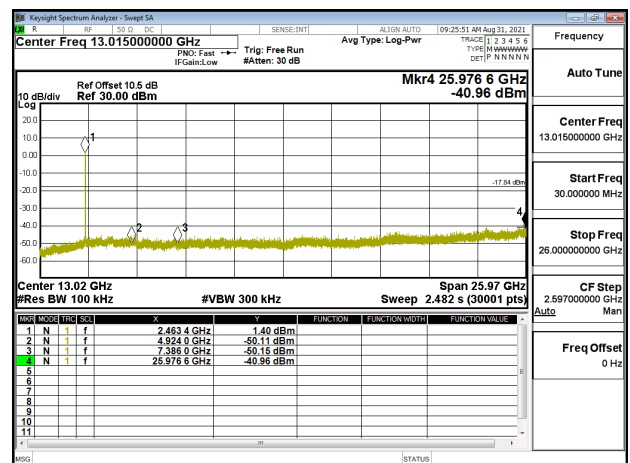
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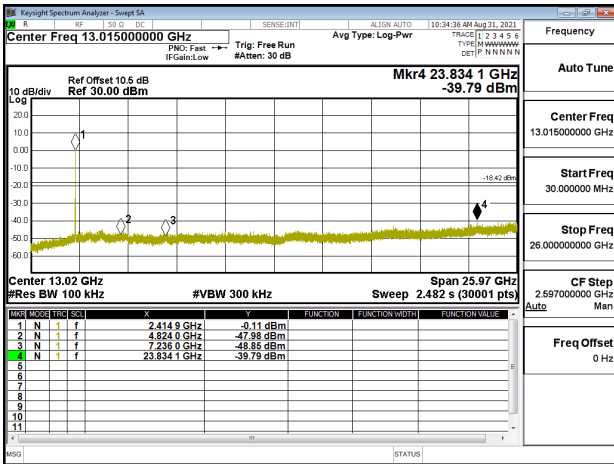


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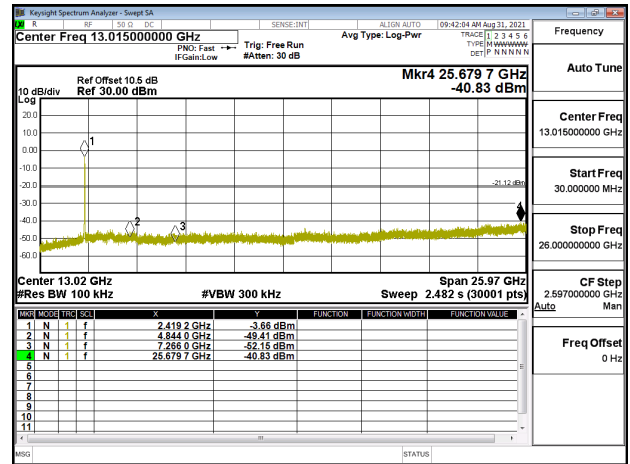
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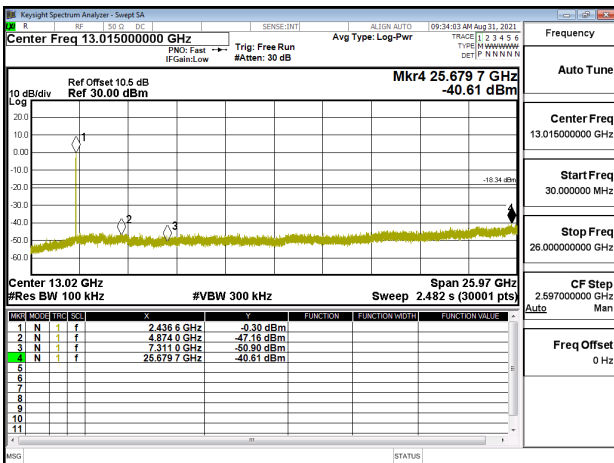
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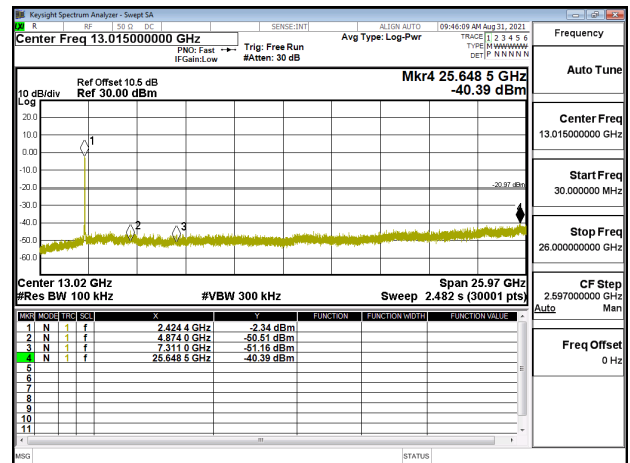
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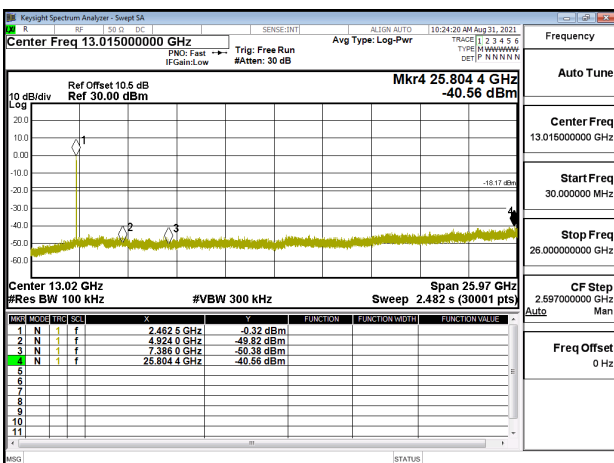
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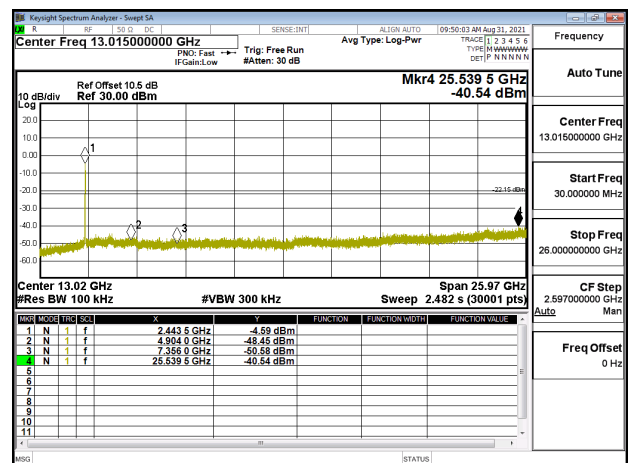
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802.11n\_20MHz\_Chain0\_2462MHz



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.

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**11.2 Measurement Equipment Used:**

Radiated Emission Test Site: SAC D					
EQUIPMENT TYPE	MFR/BRAND	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	SCHWAZBECK	VULB 9168	9168-617	11/11/2020	11/10/2021
Horn Antenna	Schwarzbeck	BBHA9170	184	12/11/2020	12/10/2021
Horn Antenna	Schwarzbeck	BBHA9120D	1341	06/04/2021	06/03/2022
Loop Antenna	ETS.LINDGREN	6502	143303	05/07/2021	05/06/2022
3m Site NSA	SGS	966 chamber D	N/A	07/12/2021	07/11/2022
Test Software	audix	e3	E3 20923 SGS Ver.9 ( C )	N.C.R	N.C.R
Spectrum Analyzer	KEYSIGHT	N9010A	MY57120200	03/22/2021	03/21/2022
Pre-Amplifier	EMC Instruments	EMC184045B	980135	10/27/2020	10/26/2021
Pre-Amplifier	EMC Instruments	EMC9135	980234	11/19/2020	11/18/2021
Pre-Amplifier	EMC Instruments	EMC12630SE	980273	11/19/2020	11/18/2021
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	EMC106-SM-SM- 7200	150703	11/19/2020	11/18/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17413/4	11/19/2020	11/18/2021
Attenuator	Marvelous	WATT-218FS-10	RF17	11/19/2020	11/18/2021
Lowpass Filter	Woken	EWT-56-0019	RF173	11/19/2020	11/18/2021
High Pass Filter	R&S	F13 HPF 3GHz	RF175	11/19/2020	11/18/2021
Band Rejection Filter	Micro-Tronics	BRM50701-01	RF201	11/19/2020	11/18/2021

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

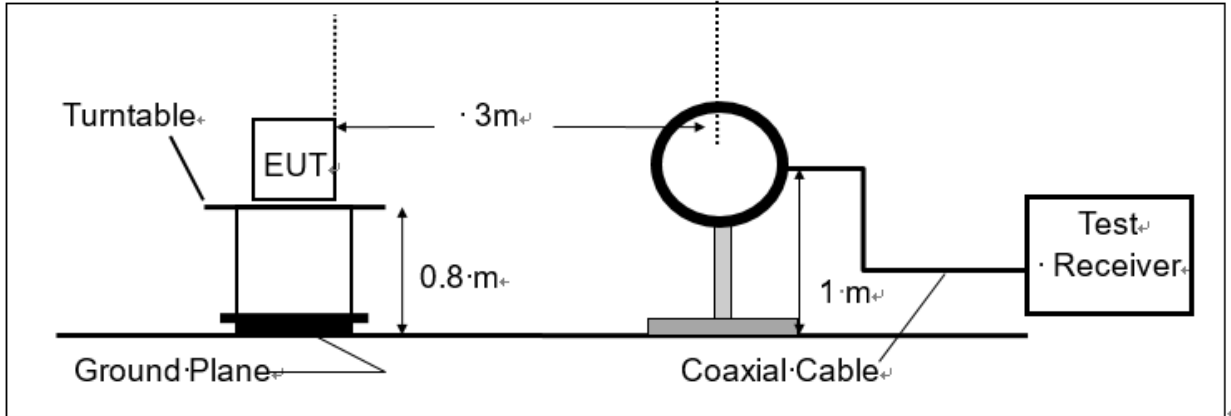
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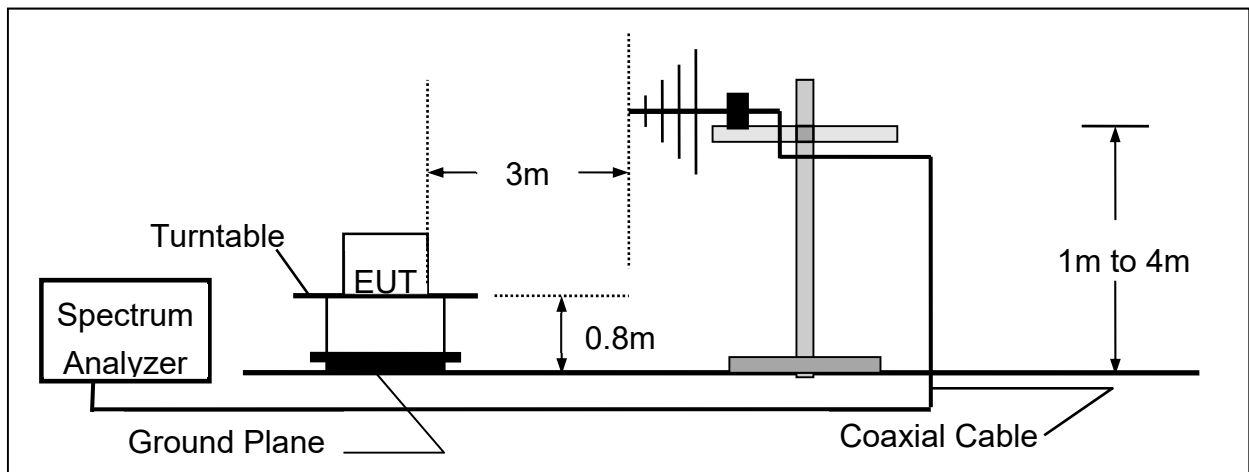
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### 11.3 Test SET-UP

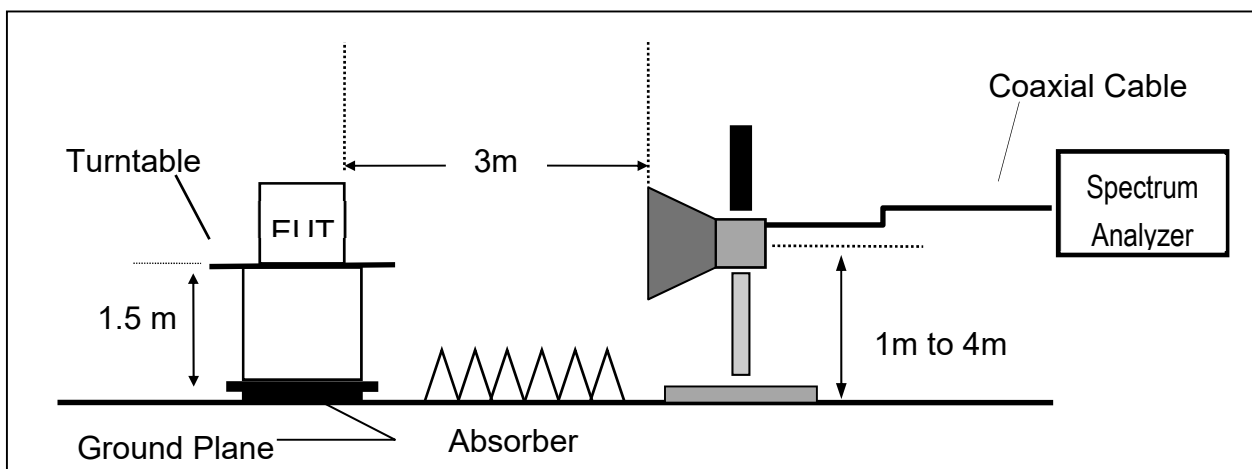
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



(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. Set the spectrum analyzer as RBW=100 kHz and VBW=300 kHz for Peak Detector (PK) at frequency between 30MHz and 1 GHz.
6. Use receiver mode as RBW=120 kHz for Quasi-peak (QP) at frequency between 30MHz and 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Maximum Emission Measurements at frequency above 1 GHz.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Emission Measurements at frequency above 1 GHz.
9. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.
10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
12. Repeat above procedures until all default test channel measured were complete.

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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\*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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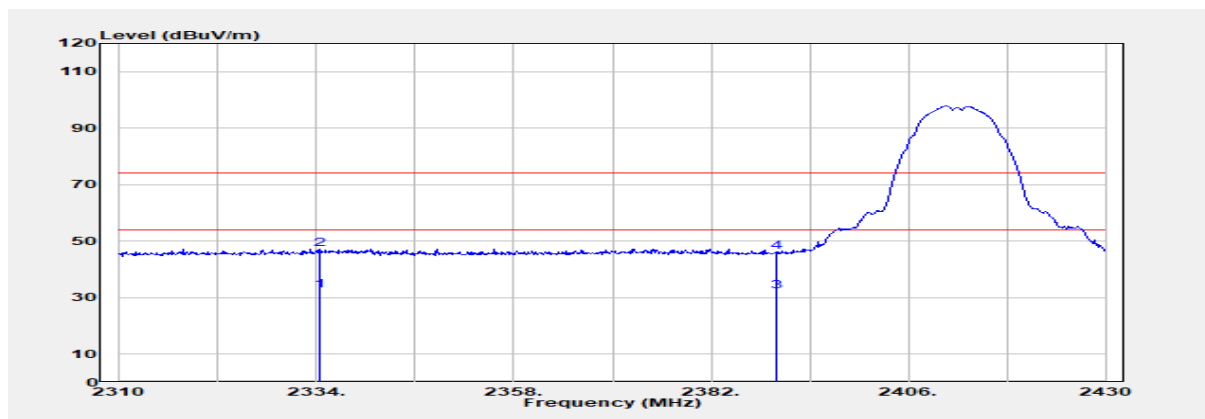
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### 11.7.1 Radiated Band Edge Measurement Result

Report Number	:E2/2021/80082	Test Site	:SAC D
Operation Mode	:802.11b	Test Date	:2021-08-30
Test Frequency	:2412 MHz	Temp./Humi.	:22.2/64
Test Mode	:BE CH LOW	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Andy Wang



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
2334.360	Average	40.07	-7.63	32.45	54.00	-21.55
2334.360	Peak	54.92	-7.63	47.29	74.00	-26.71
2390.000	Average	40.18	-7.89	32.29	54.00	-21.71
2390.000	Peak	54.07	-7.89	46.18	74.00	-27.82

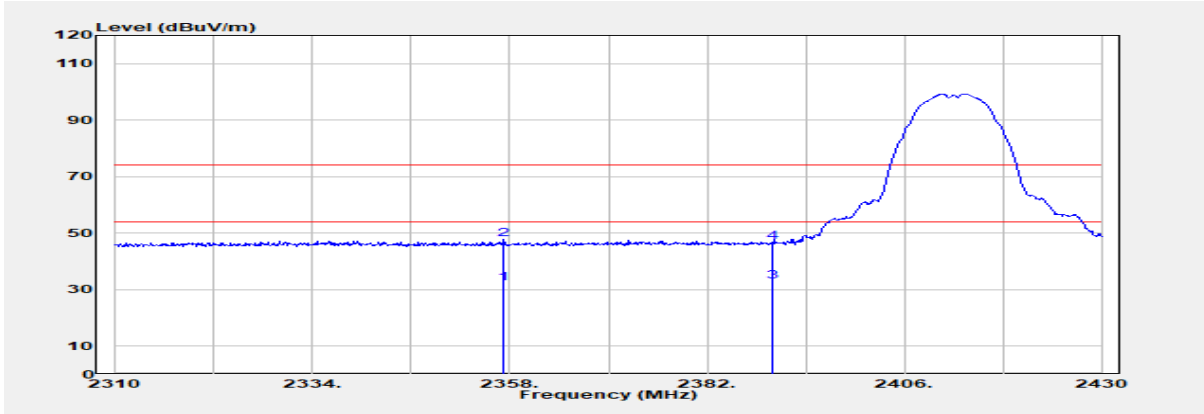
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Report Number :E2/2021/80082  
Operation Mode :802.11b  
Test Frequency :2412 MHz  
Test Mode :BE CH LOW  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-30  
Temp./Humi. :22.2/64  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2357.280	Average	39.92	-7.83	32.09	54.00	-21.91
2357.280	Peak	55.55	-7.83	47.73	74.00	-26.27
2390.000	Average	40.67	-7.89	32.78	54.00	-21.22
2390.000	Peak	54.80	-7.89	46.92	74.00	-27.08

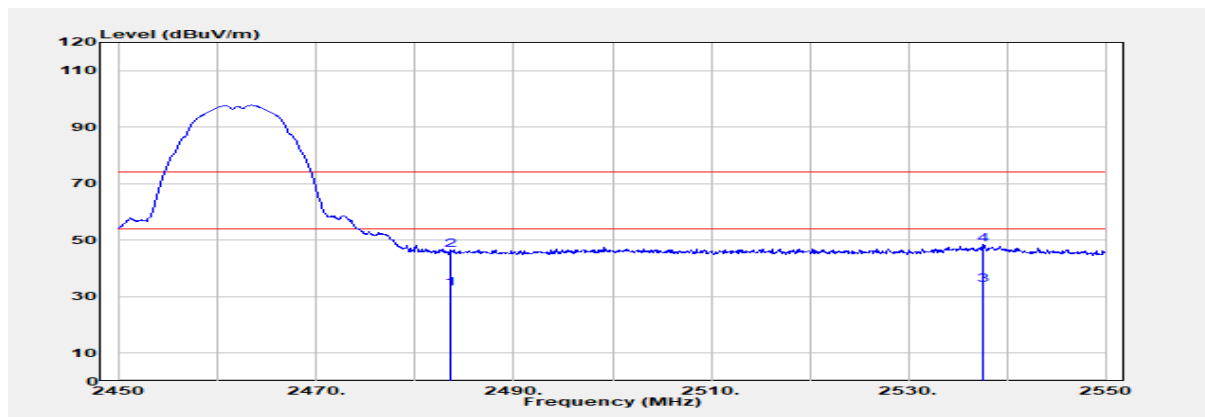
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Report Number :E2/2021/80082  
Operation Mode :802.11b  
Test Frequency :2462 MHz  
Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
2483.500	Average	41.11	-8.15	32.96	54.00	-21.04
2483.500	Peak	54.70	-8.15	46.55	74.00	-27.45
2537.600	Average	41.91	-7.91	33.99	54.00	-20.01
2537.600	Peak	56.29	-7.91	48.38	74.00	-25.62

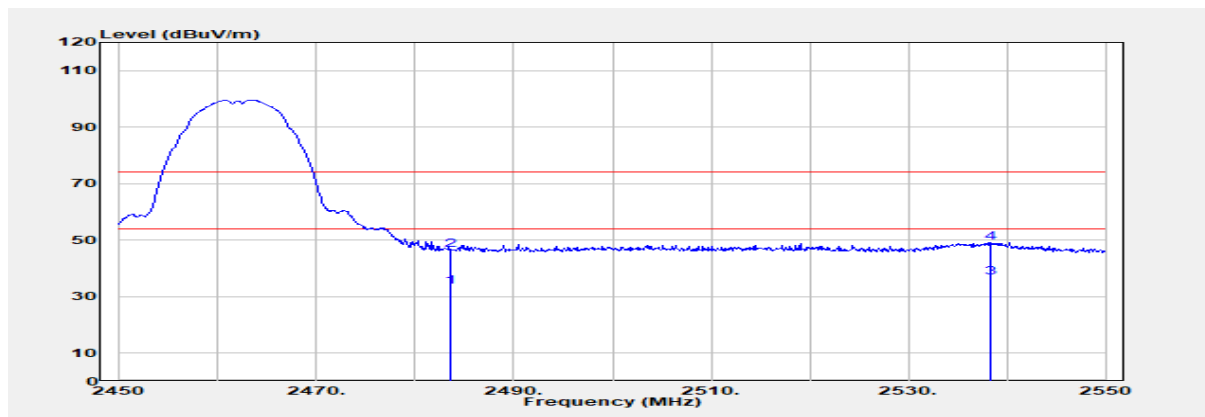
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Report Number :E2/2021/80082  
Operation Mode :802.11b  
Test Frequency :2462 MHz  
Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2483.500	Average	41.79	-8.15	33.64	54.00	-20.36
2483.500	Peak	54.73	-8.15	46.57	74.00	-27.43
2538.400	Average	44.64	-7.90	36.74	54.00	-17.26
2538.400	Peak	56.96	-7.90	49.05	74.00	-24.95

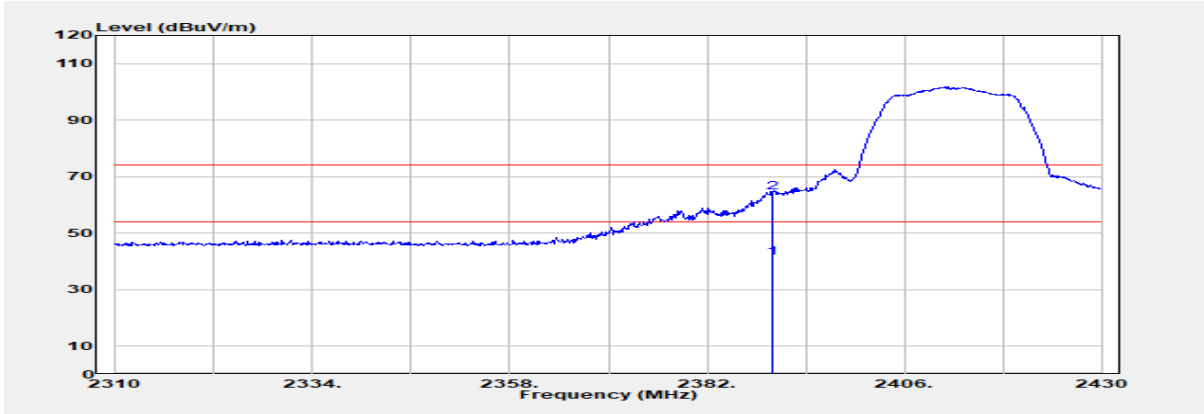
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Report Number :E2/2021/80082  
Operation Mode :802.11g  
Test Frequency :2412 MHz  
Test Mode :BE CH LOW  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
2390.000	Average	49.13	-7.89	41.24	54.00	-12.76
2390.000	Peak	72.25	-7.89	64.36	74.00	-9.64

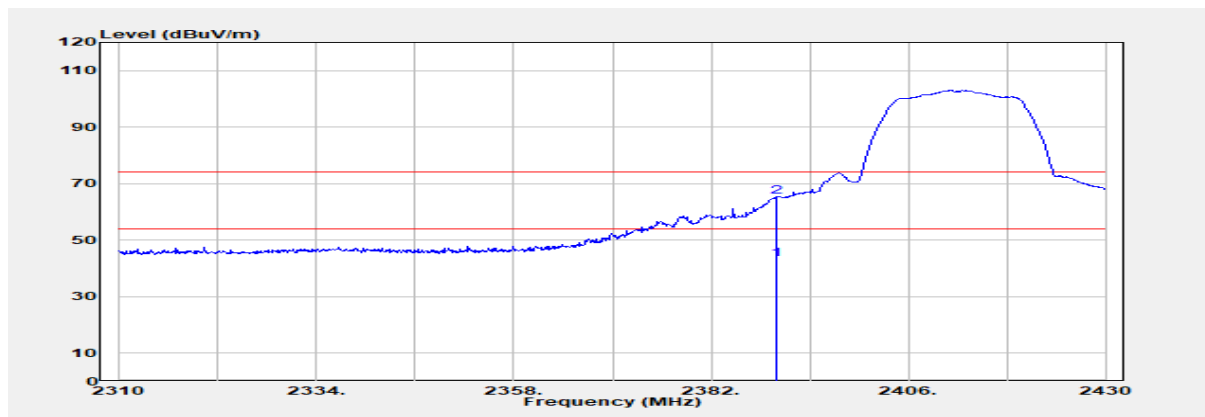
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EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2390.000	Average	51.18	-7.89	43.29	54.00	-10.71
2390.000	Peak	73.35	-7.89	65.46	74.00	-8.54

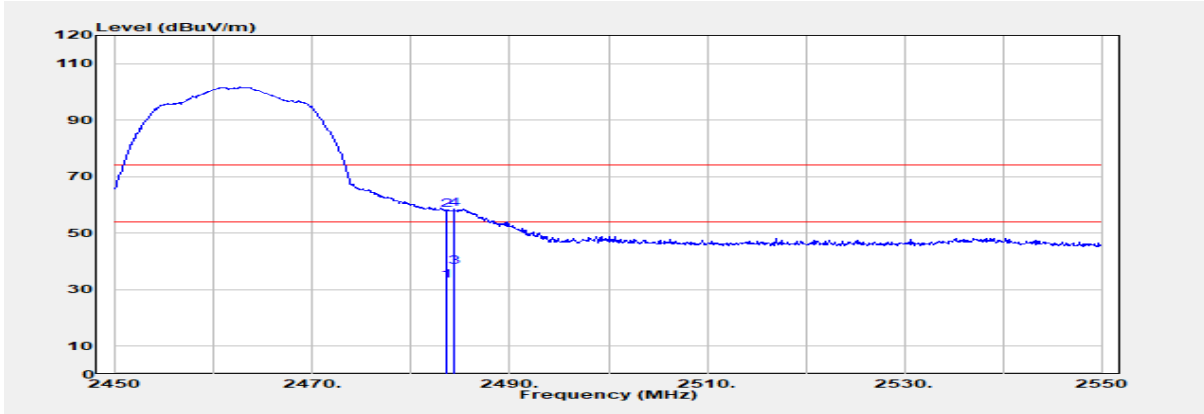
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Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
2483.500	Average	41.40	-8.15	33.25	54.00	-20.75
2483.500	Peak	66.34	-8.15	58.18	74.00	-15.82
2484.400	Average	46.19	-8.15	38.04	54.00	-15.96
2484.400	Peak	66.80	-8.15	58.64	74.00	-15.36

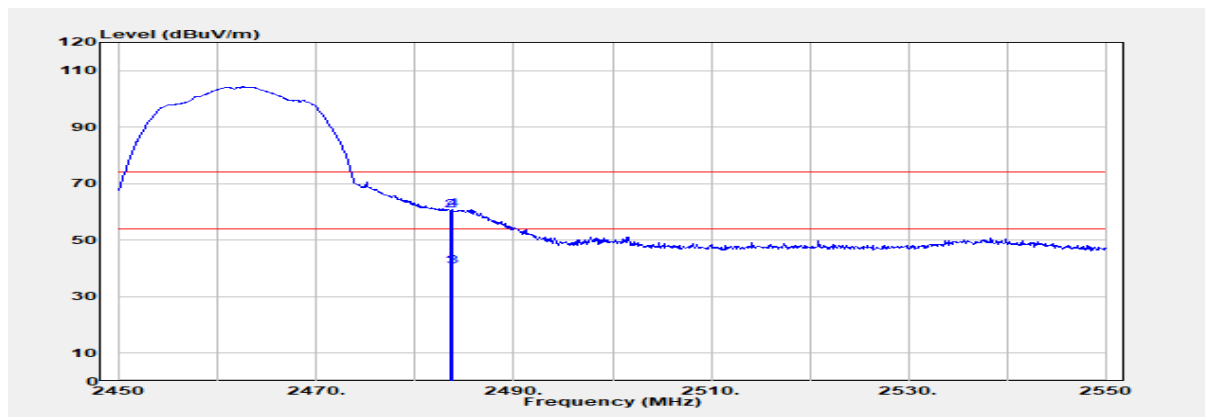
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Operation Mode :802.11g  
Test Frequency :2462 MHz  
Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2483.500	Average	48.77	-8.15	40.62	54.00	-13.38
2483.500	Peak	68.54	-8.15	60.39	74.00	-13.61
2483.800	Average	48.69	-8.15	40.54	54.00	-13.46
2483.800	Peak	69.12	-8.15	60.97	74.00	-13.03

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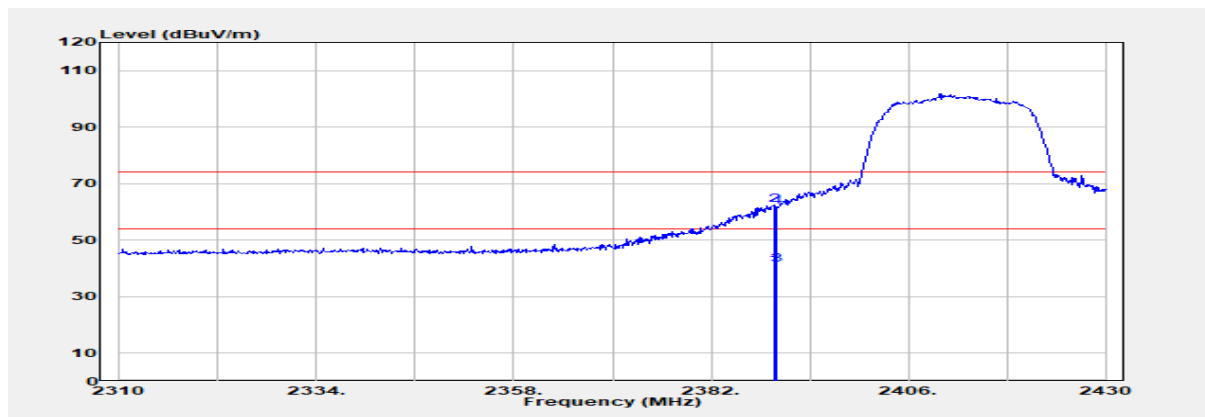
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Report Number :E2/2021/80082  
Operation Mode :802.11n20  
Test Frequency :2412 MHz  
Test Mode :BE CH LOW  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
2389.800	Average	48.91	-7.88	41.03	54.00	-12.97
2389.800	Peak	70.17	-7.88	62.29	74.00	-11.71
2390.000	Average	49.03	-7.89	41.14	54.00	-12.86
2390.000	Peak	69.79	-7.89	61.90	74.00	-12.10

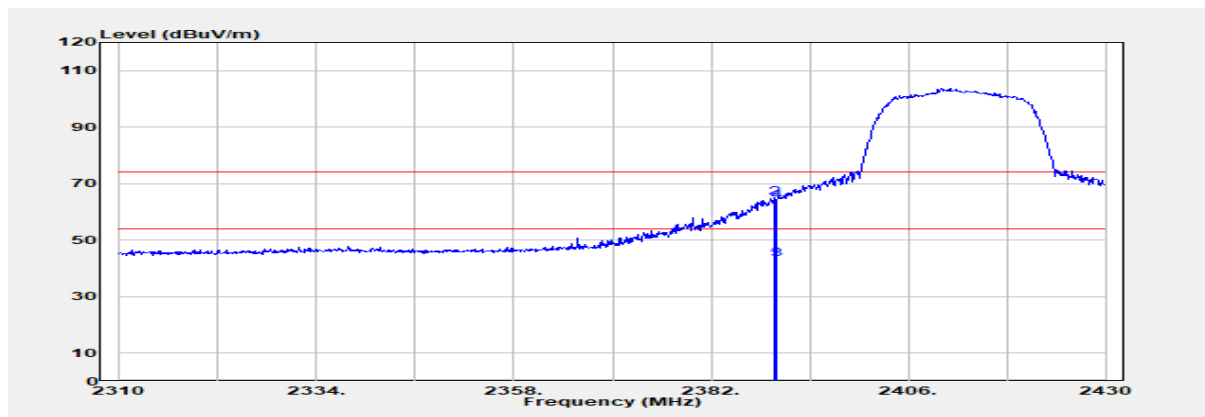
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Report Number :E2/2021/80082  
Operation Mode :802.11n20  
Test Frequency :2412 MHz  
Test Mode :BE CH LOW  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2389.680	Average	50.82	-7.88	42.94	54.00	-11.06
2389.680	Peak	72.94	-7.88	65.06	74.00	-8.94
2390.000	Average	51.29	-7.89	43.40	54.00	-10.60
2390.000	Peak	71.60	-7.89	63.71	74.00	-10.29

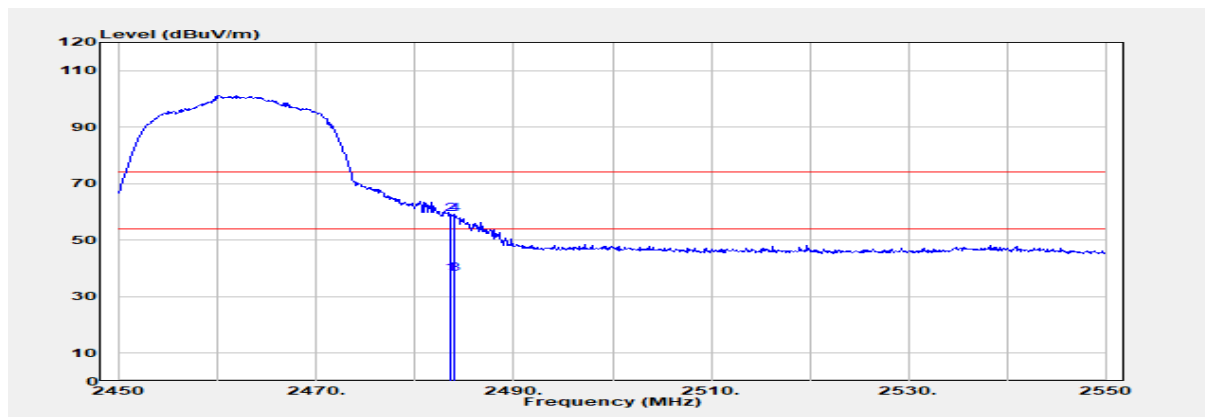
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Report Number :E2/2021/80082  
Operation Mode :802.11n20  
Test Frequency :2462 MHz  
Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
2483.500	Average	46.31	-8.15	38.15	54.00	-15.85
2483.500	Peak	67.26	-8.15	59.11	74.00	-14.89
2484.000	Average	46.11	-8.15	37.96	54.00	-16.04
2484.000	Peak	67.21	-8.15	59.05	74.00	-14.95

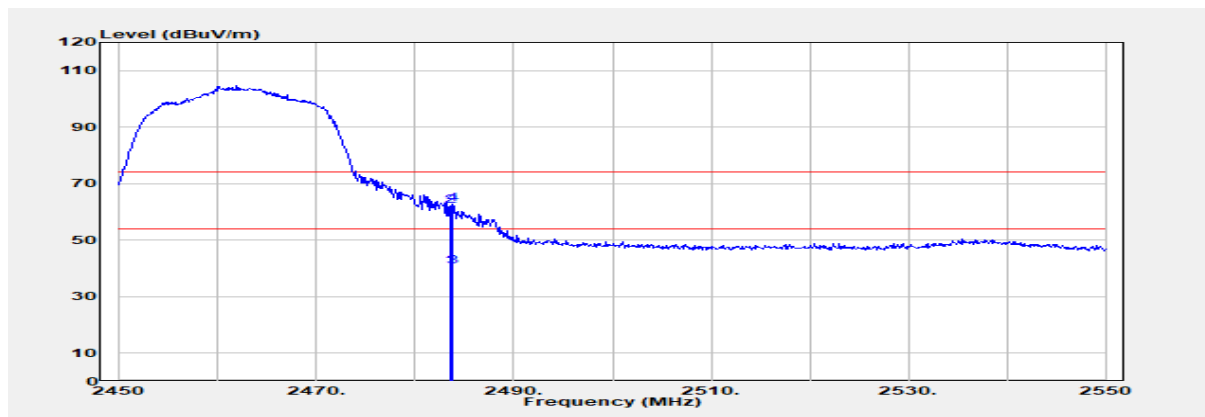
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Report Number :E2/2021/80082  
Operation Mode :802.11n20  
Test Frequency :2462 MHz  
Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2483.500	Average	48.81	-8.15	40.66	54.00	-13.34
2483.500	Peak	70.31	-8.15	62.16	74.00	-11.84
2483.700	Average	48.75	-8.15	40.60	54.00	-13.40
2483.700	Peak	70.88	-8.15	62.73	74.00	-11.27

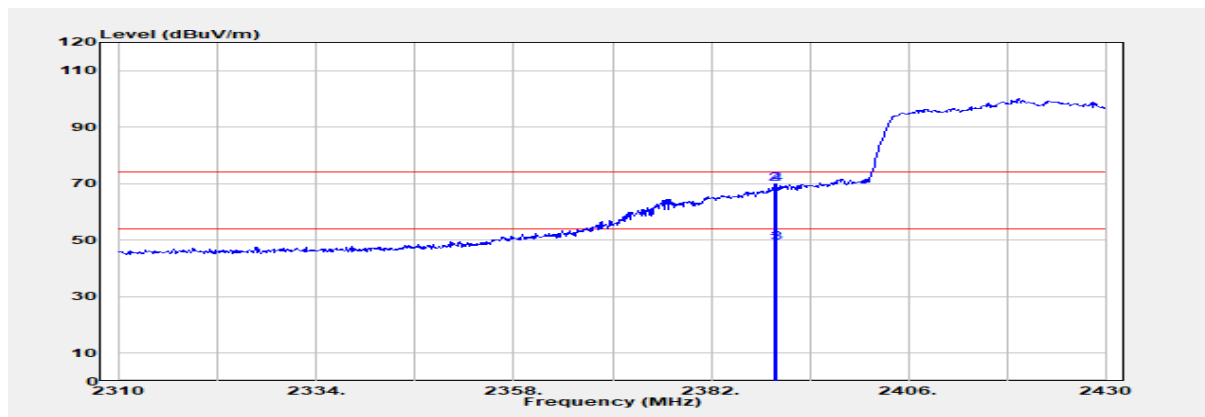
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Report Number :E2/2021/80082  
Operation Mode :802.11n40  
Test Frequency :2422 MHz  
Test Mode :BE CH LOW  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
2389.680	Average	56.75	-7.88	48.88	54.00	-5.12
2389.680	Peak	77.79	-7.88	69.92	74.00	-4.08
2390.000	Average	56.88	-7.89	48.99	54.00	-5.01
2390.000	Peak	77.86	-7.89	69.97	74.00	-4.03

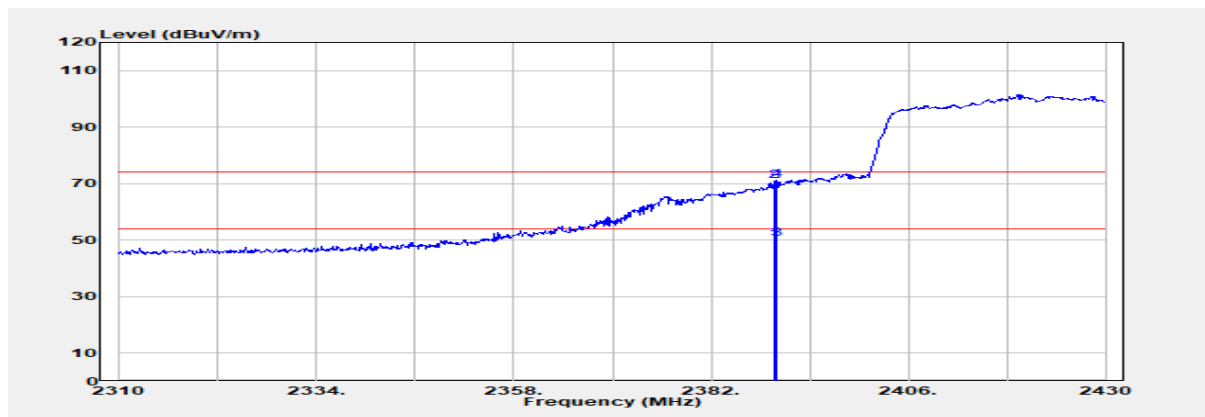
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Report Number :E2/2021/80082  
Operation Mode :802.11n40  
Test Frequency :2422 MHz  
Test Mode :BE CH LOW  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2389.680	Average	58.11	-7.88	50.24	54.00	-3.76
2389.680	Peak	78.82	-7.88	70.94	74.00	-3.06
2390.000	Average	58.27	-7.89	50.38	54.00	-3.62
2390.000	Peak	78.97	-7.89	71.08	74.00	-2.92

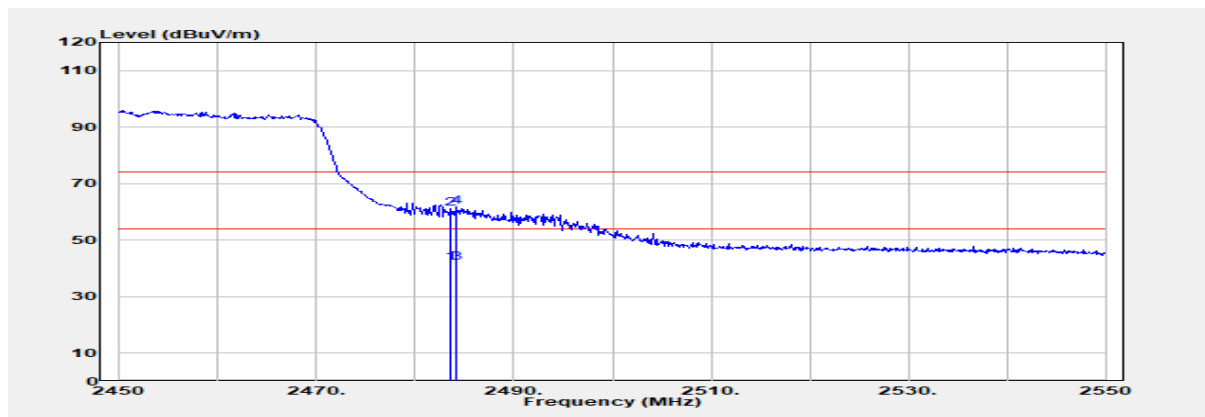
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Report Number :E2/2021/80082  
Operation Mode :802.11n40  
Test Frequency :2452 MHz  
Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
2483.500	Average	50.21	-8.15	42.06	54.00	-11.94
2483.500	Peak	69.40	-8.15	61.25	74.00	-12.75
2484.200	Average	49.98	-8.15	41.83	54.00	-12.17
2484.200	Peak	69.79	-8.15	61.64	74.00	-12.36

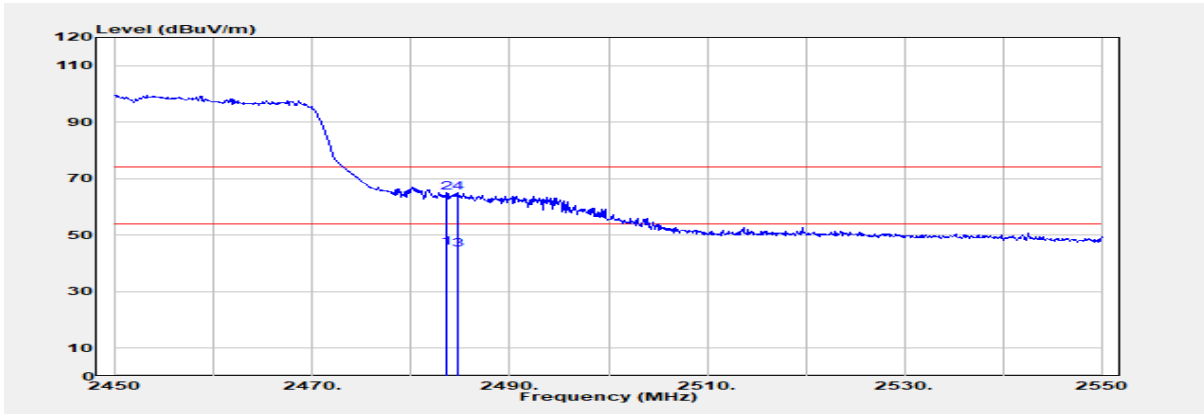
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Report Number :E2/2021/80082  
Operation Mode :802.11n40  
Test Frequency :2452 MHz  
Test Mode :BE CH HIGH  
EUT Pol :E2 Plane

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :21.8/63  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
2483.500	Average	53.53	-8.15	45.37	54.00	-8.63
2483.500	Peak	73.08	-8.15	64.92	74.00	-9.08
2484.700	Average	53.08	-8.16	44.92	54.00	-9.08
2484.700	Peak	73.15	-8.16	65.00	74.00	-9.00

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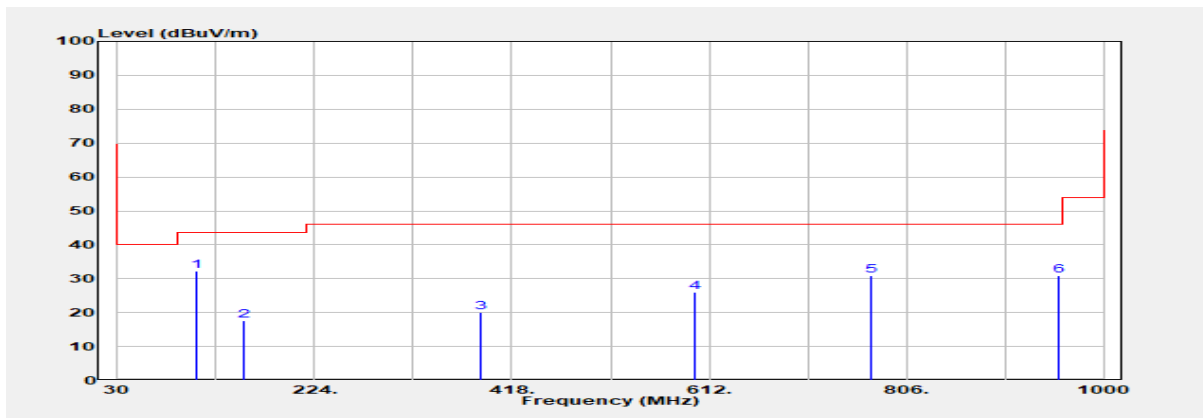
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11.7.2 Spurious Emission:

Report Number	:E2/2021/80082	Test Site	:SAC D
Operation Mode	:802.11g	Test Date	:2021-08-31
Test Frequency	:2437 MHz	Temp./Humi.	:22.2/64
Test Mode	:TX CH MID	Antenna Pol.	:Vertical
EUT Pol	:E2 Plane	Engineer	:Andy Wang
Ant	:		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
107.600	Peak	52.83	-20.65	32.17	43.50	-11.33
154.160	Peak	34.36	-16.84	17.53	43.50	-25.97
386.960	Peak	34.25	-14.08	20.17	46.00	-25.83
598.420	Peak	35.06	-8.93	26.13	46.00	-19.87
772.050	Peak	37.39	-6.57	30.82	46.00	-15.18
956.350	Peak	35.93	-4.91	31.02	46.00	-14.98

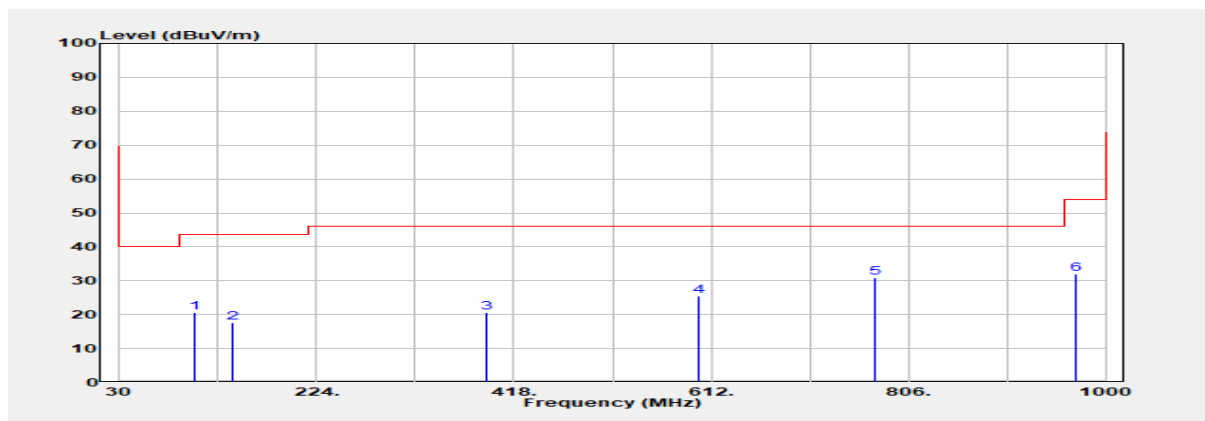
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Report Number :E2/2021/80082  
 Operation Mode :802.11g  
 Test Frequency :2437 MHz  
 Test Mode :TX CH MID  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
104.690	Peak	41.67	-21.08	20.59	43.50	-22.91
141.550	Peak	34.65	-16.98	17.67	43.50	-25.83
391.810	Peak	34.58	-13.88	20.69	46.00	-25.31
599.390	Peak	34.34	-8.89	25.45	46.00	-20.55
773.020	Peak	37.57	-6.58	30.99	46.00	-15.01
970.900	Peak	36.01	-3.94	32.07	54.00	-21.93

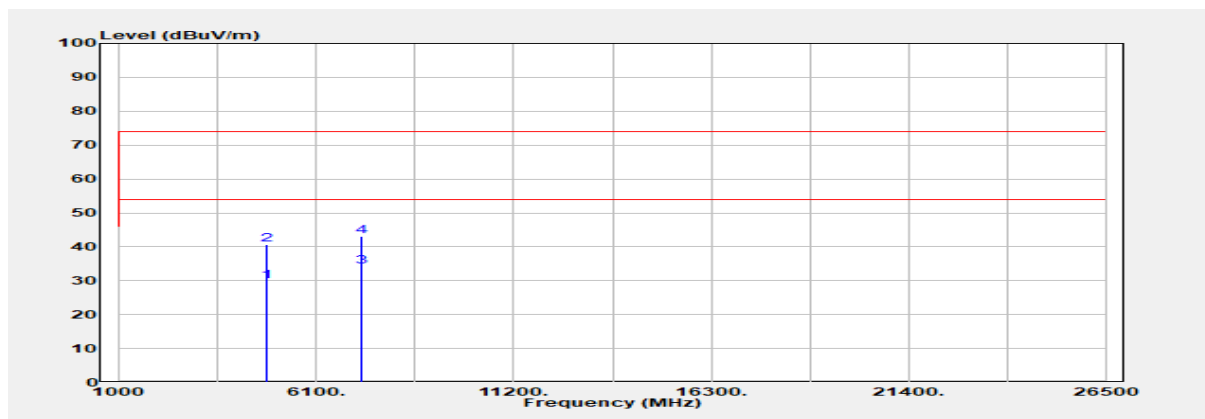
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Report Number :E2/2021/80082  
 Operation Mode :802.11b  
 Test Frequency :2412 MHz  
 Test Mode :TX CH LOW  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Vertical  
 Engineer :Andy Wang



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
4824.000	Average	33.09	-3.18	29.92	54.00	-24.08
4824.000	Peak	43.81	-3.18	40.63	74.00	-33.37
7236.000	Average	31.67	2.41	34.08	54.00	-19.92
7236.000	Peak	40.64	2.41	43.05	74.00	-30.95

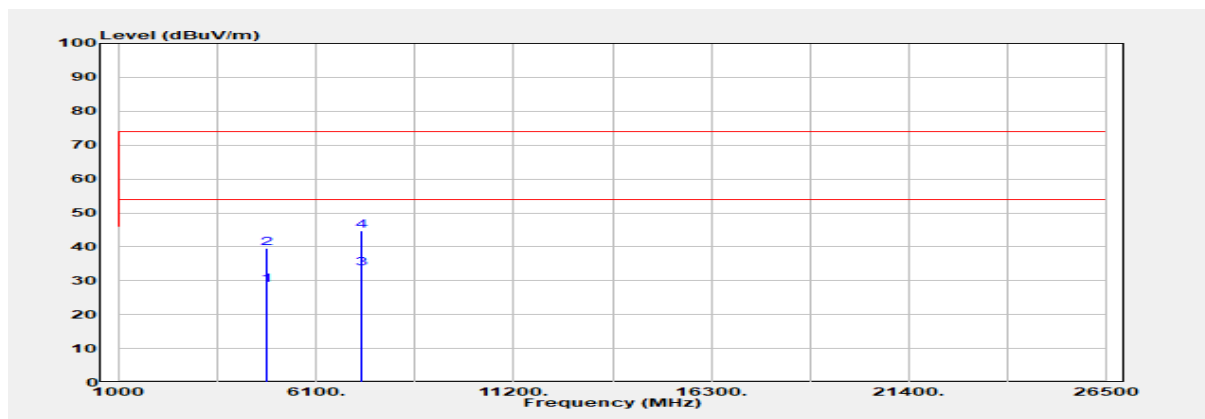
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Report Number :E2/2021/80082  
Operation Mode :802.11b  
Test Frequency :2412 MHz  
Test Mode :TX CH LOW  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
4824.000	Average	31.81	-3.18	28.63	54.00	-25.37
4824.000	Peak	42.83	-3.18	39.66	74.00	-34.34
7236.000	Average	31.27	2.41	33.68	54.00	-20.32
7236.000	Peak	42.21	2.41	44.62	74.00	-29.38

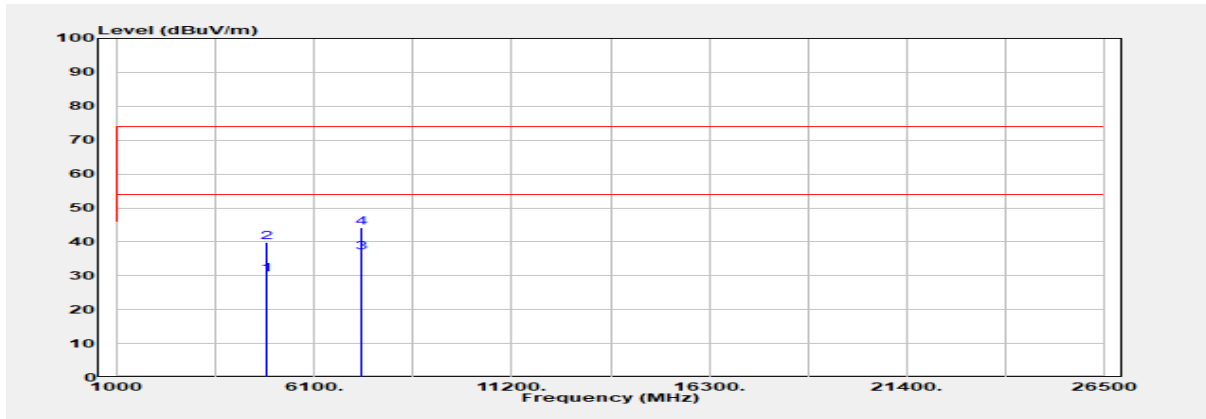
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Report Number :E2/2021/80082  
 Operation Mode :802.11b  
 Test Frequency :2437 MHz  
 Test Mode :TX CH MID  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Vertical  
 Engineer :Andy Wang



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
4874.000	Average	33.49	-3.05	30.43	54.00	-23.57
4874.000	Peak	42.81	-3.05	39.76	74.00	-34.24
7311.000	Average	32.97	3.91	36.88	54.00	-17.12
7311.000	Peak	40.36	3.91	44.27	74.00	-29.73

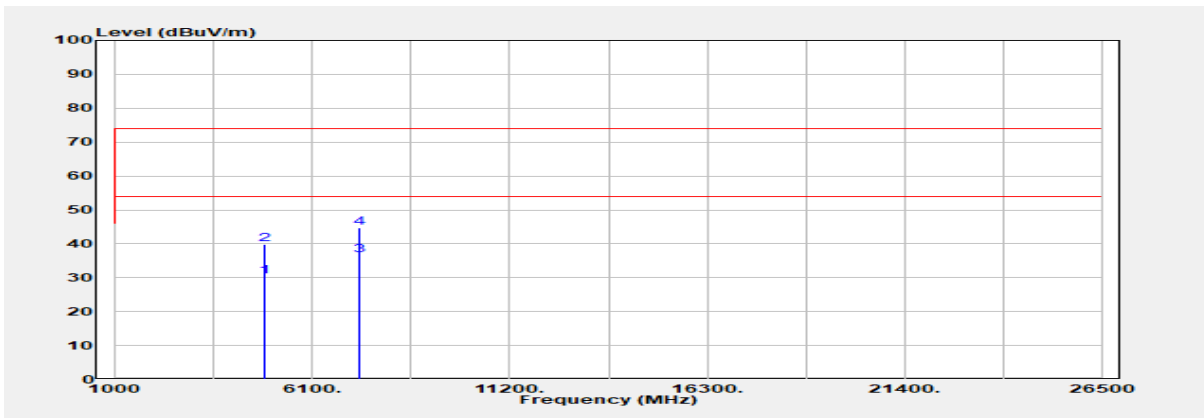
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Report Number :E2/2021/80082  
 Operation Mode :802.11b  
 Test Frequency :2437 MHz  
 Test Mode :TX CH MID  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4874.000	Average	33.38	-3.05	30.33	54.00	-23.67
4874.000	Peak	42.95	-3.05	39.90	74.00	-34.10
7311.000	Average	32.77	3.91	36.68	54.00	-17.32
7311.000	Peak	40.83	3.91	44.74	74.00	-29.26

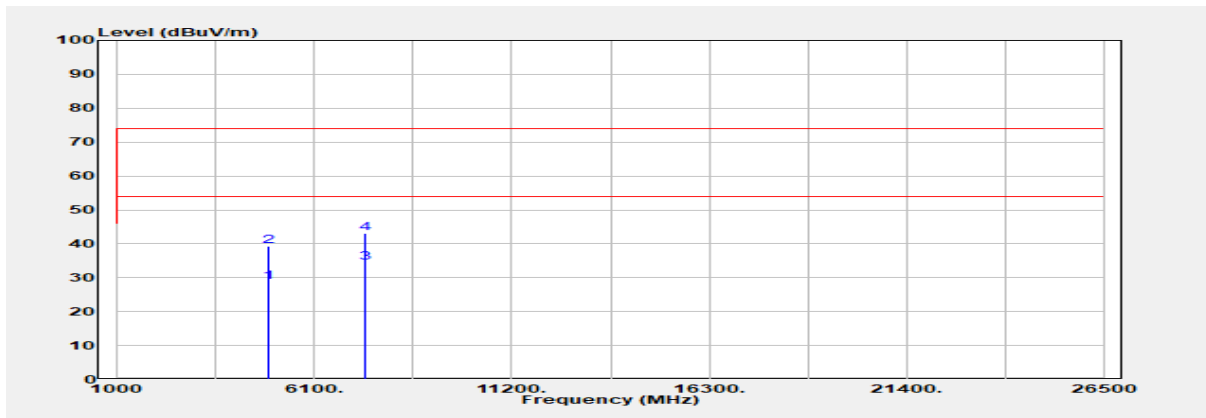
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Report Number :E2/2021/80082  
Operation Mode :802.11b  
Test Frequency :2462 MHz  
Test Mode :TX CH HIGH  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
4924.000	Average	31.84	-3.21	28.63	54.00	-25.37
4924.000	Peak	42.52	-3.21	39.31	74.00	-34.69
7386.000	Average	31.21	3.24	34.45	54.00	-19.55
7386.000	Peak	39.92	3.24	43.16	74.00	-30.84

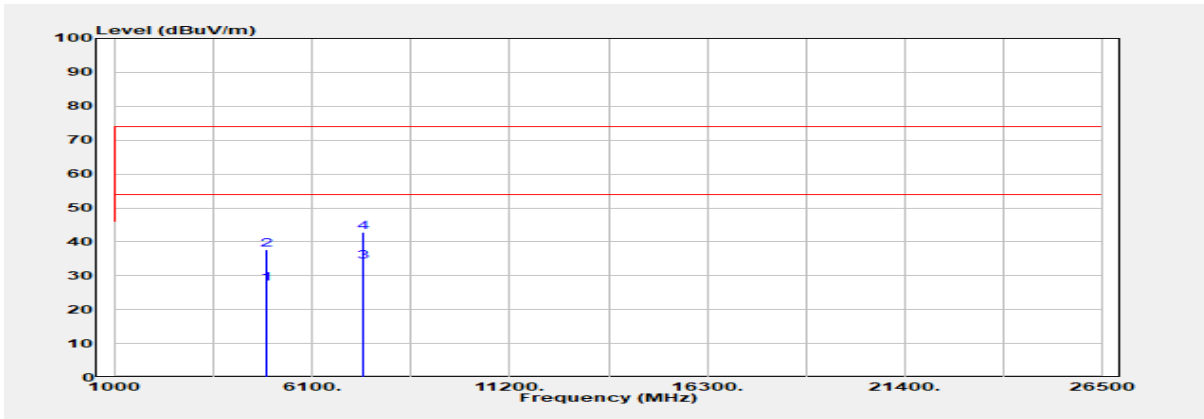
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Report Number :E2/2021/80082  
Operation Mode :802.11b  
Test Frequency :2462 MHz  
Test Mode :TX CH HIGH  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
4924.000	Average	30.96	-3.21	27.75	54.00	-26.25
4924.000	Peak	40.99	-3.21	37.78	74.00	-36.22
7386.000	Average	30.86	3.24	34.10	54.00	-19.90
7386.000	Peak	39.66	3.24	42.89	74.00	-31.11

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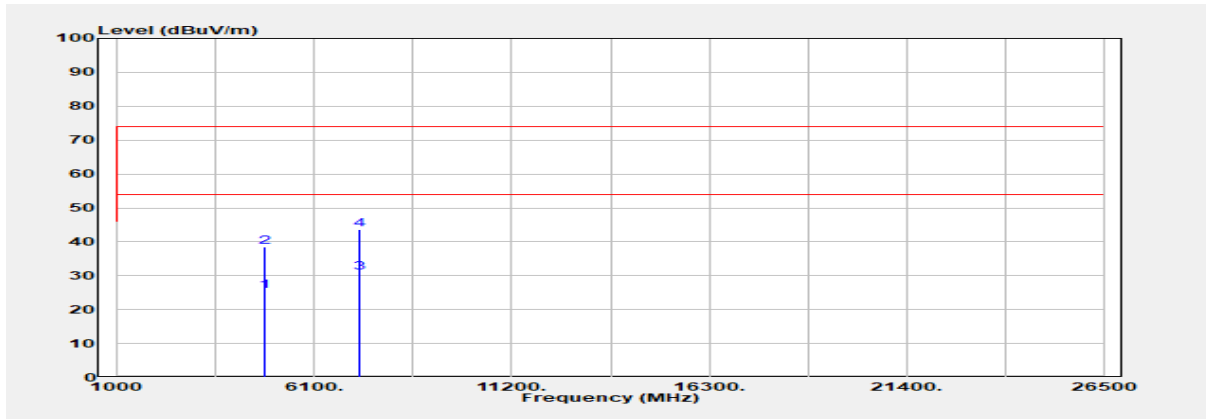
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Report Number :E2/2021/80082  
Operation Mode :802.11g  
Test Frequency :2412 MHz  
Test Mode :TX CH LOW  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
4824.000	Average	28.65	-3.18	25.47	54.00	-28.53
4824.000	Peak	41.68	-3.18	38.50	74.00	-35.50
7236.000	Average	28.52	2.41	30.93	54.00	-23.07
7236.000	Peak	41.15	2.41	43.56	74.00	-30.44

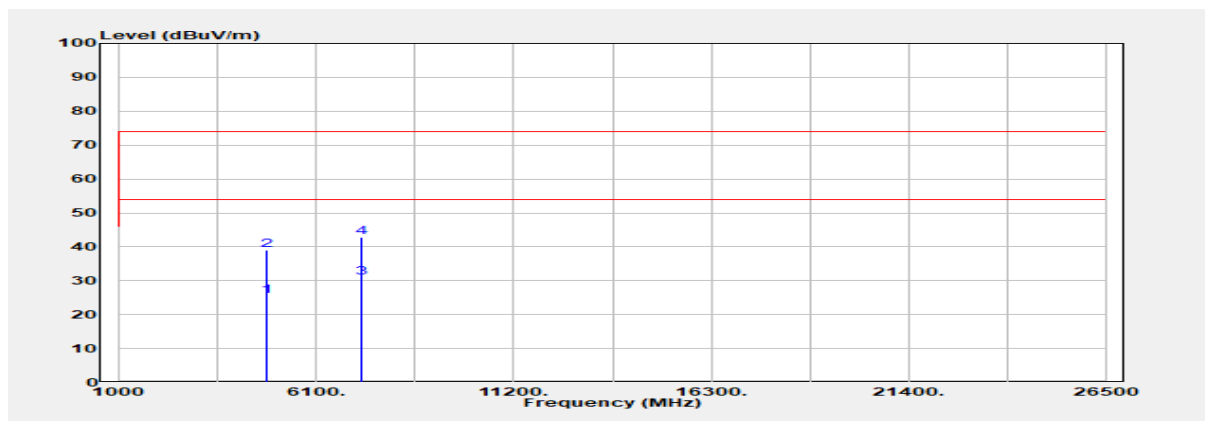
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Report Number :E2/2021/80082  
 Operation Mode :802.11g  
 Test Frequency :2412 MHz  
 Test Mode :TX CH LOW  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4824.000	Average	28.77	-3.18	25.59	54.00	-28.41
4824.000	Peak	42.18	-3.18	39.01	74.00	-34.99
7236.000	Average	28.43	2.41	30.84	54.00	-23.16
7236.000	Peak	40.39	2.41	42.80	74.00	-31.20

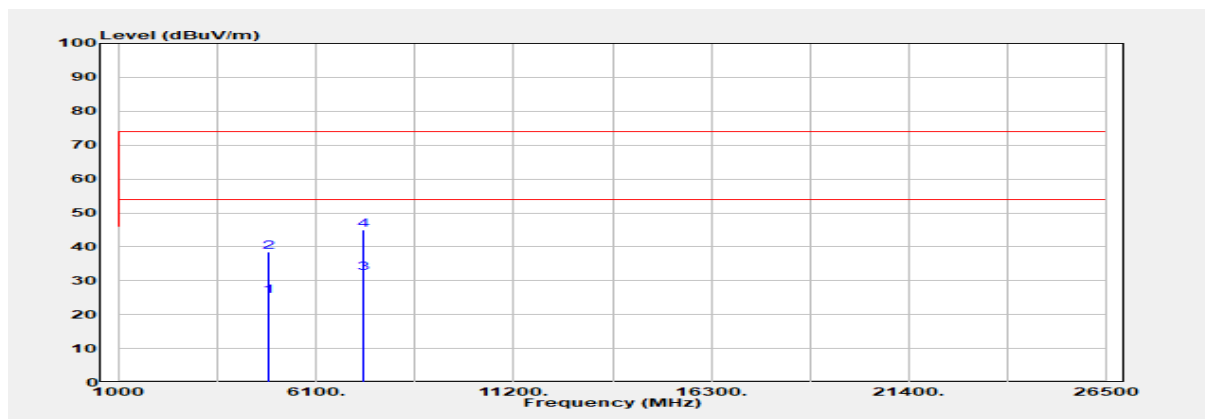
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Report Number :E2/2021/80082  
Operation Mode :802.11g  
Test Frequency :2437 MHz  
Test Mode :TX CH MID  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
4874.000	Average	28.44	-3.05	25.39	54.00	-28.61
4874.000	Peak	41.62	-3.05	38.57	74.00	-35.43
7311.000	Average	28.26	3.91	32.17	54.00	-21.83
7311.000	Peak	41.21	3.91	45.12	74.00	-28.88

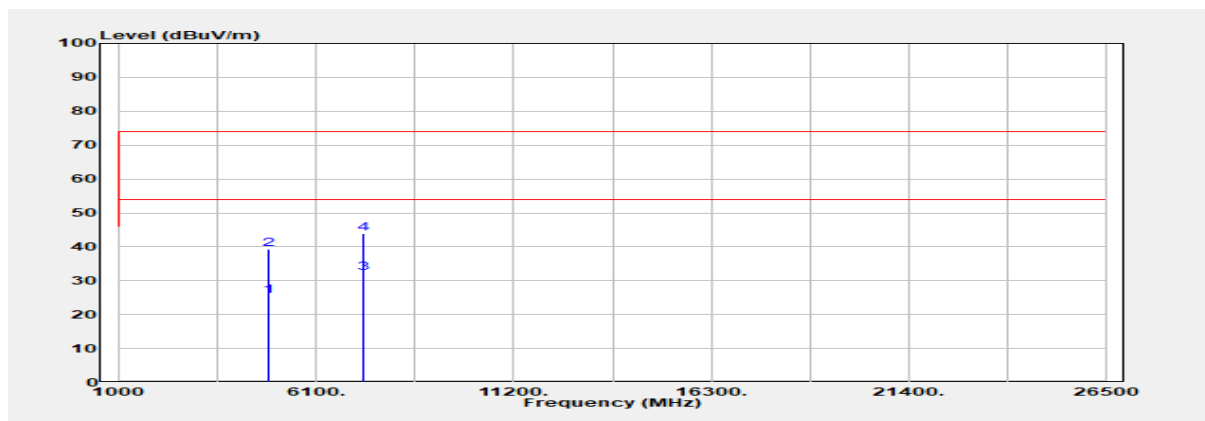
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Report Number :E2/2021/80082  
 Operation Mode :802.11g  
 Test Frequency :2437 MHz  
 Test Mode :TX CH MID  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4874.000	Average	28.56	-3.05	25.51	54.00	-28.49
4874.000	Peak	42.30	-3.05	39.25	74.00	-34.75
7311.000	Average	28.39	3.91	32.30	54.00	-21.70
7311.000	Peak	39.92	3.91	43.83	74.00	-30.17

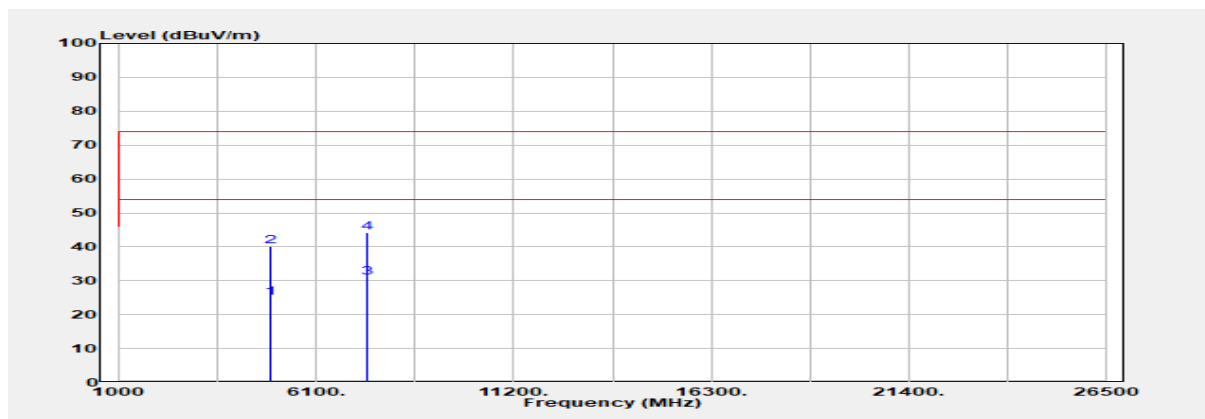
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Report Number :E2/2021/80082  
 Operation Mode :802.11g  
 Test Frequency :2462 MHz  
 Test Mode :TX CH HIGH  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Vertical  
 Engineer :Andy Wang



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
4924.000	Average	28.10	-3.21	24.90	54.00	-29.10
4924.000	Peak	43.30	-3.21	40.09	74.00	-33.91
7386.000	Average	27.67	3.24	30.91	54.00	-23.09
7386.000	Peak	40.83	3.24	44.07	74.00	-29.93

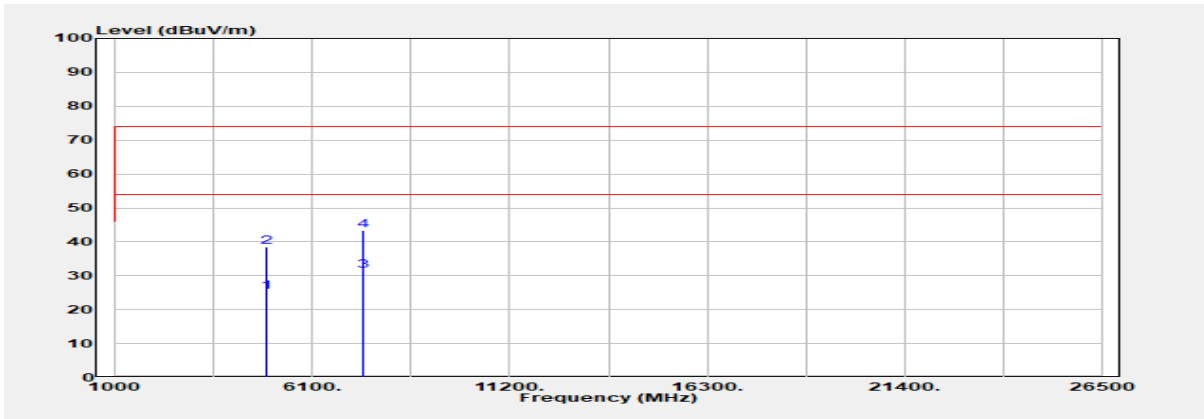
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Report Number :E2/2021/80082  
 Operation Mode :802.11g  
 Test Frequency :2462 MHz  
 Test Mode :TX CH HIGH  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4924.000	Average	28.28	-3.21	25.07	54.00	-28.93
4924.000	Peak	41.78	-3.21	38.57	74.00	-35.43
7386.000	Average	28.13	3.24	31.37	54.00	-22.63
7386.000	Peak	40.10	3.24	43.34	74.00	-30.66

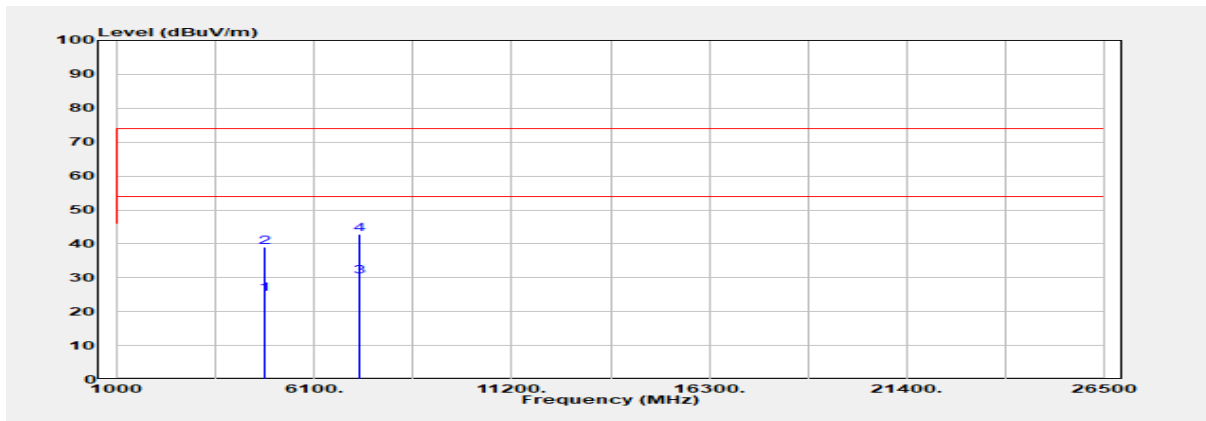
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Report Number :E2/2021/80082  
 Operation Mode :802.11n20  
 Test Frequency :2412 MHz  
 Test Mode :TX CH LOW  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Vertical  
 Engineer :Andy Wang



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
4824.000	Average	28.31	-3.18	25.13	54.00	-28.87
4824.000	Peak	42.29	-3.18	39.12	74.00	-34.88
7236.000	Average	28.07	2.41	30.48	54.00	-23.52
7236.000	Peak	40.43	2.41	42.84	74.00	-31.16

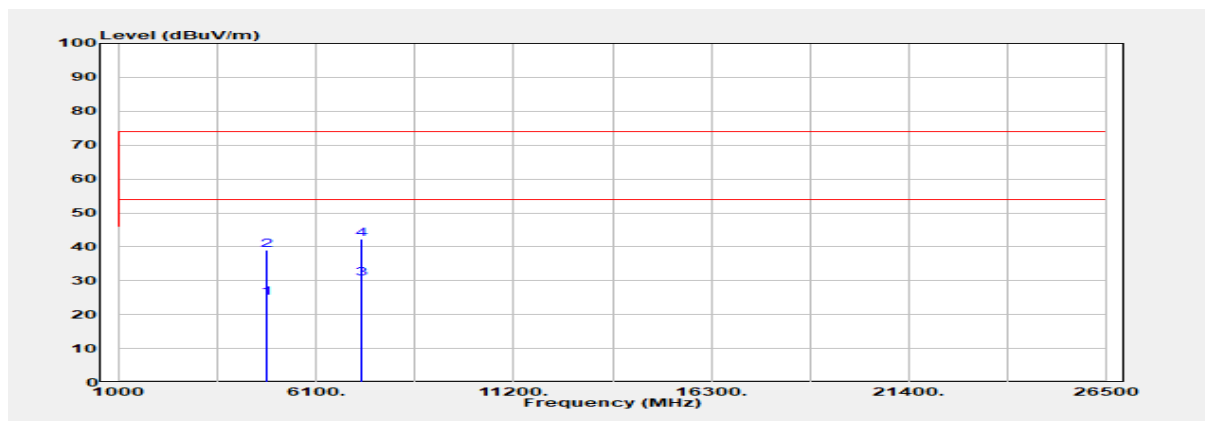
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Report Number :E2/2021/80082  
 Operation Mode :802.11n20  
 Test Frequency :2412 MHz  
 Test Mode :TX CH LOW  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4824.000	Average	28.24	-3.18	25.07	54.00	-28.93
4824.000	Peak	42.21	-3.18	39.04	74.00	-34.96
7236.000	Average	28.14	2.41	30.55	54.00	-23.45
7236.000	Peak	39.74	2.41	42.15	74.00	-31.85

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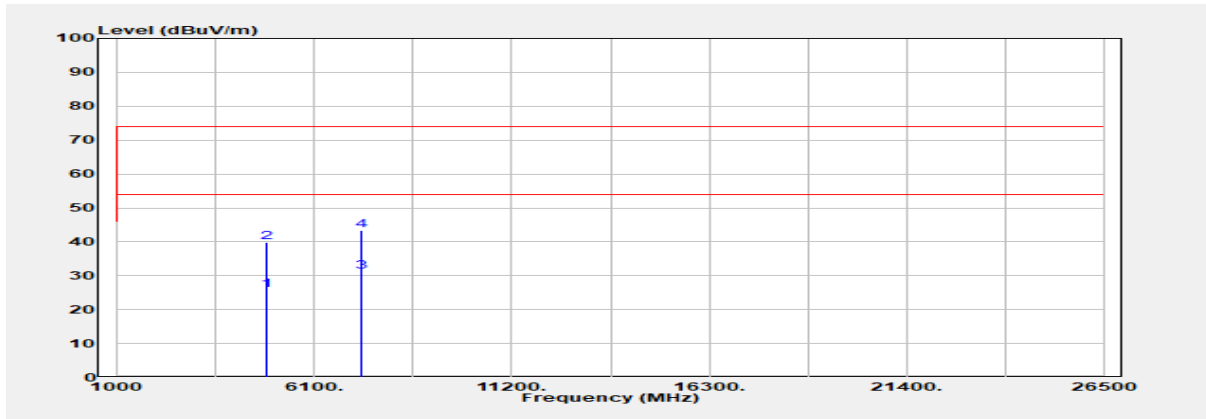
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Report Number :E2/2021/80082  
 Operation Mode :802.11n20  
 Test Frequency :2437 MHz  
 Test Mode :TX CH MID  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Vertical  
 Engineer :Andy Wang



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
4874.000	Average	28.85	-3.05	25.79	54.00	-28.21
4874.000	Peak	43.01	-3.05	39.96	74.00	-34.04
7311.000	Average	27.34	3.91	31.25	54.00	-22.75
7311.000	Peak	39.47	3.91	43.38	74.00	-30.62

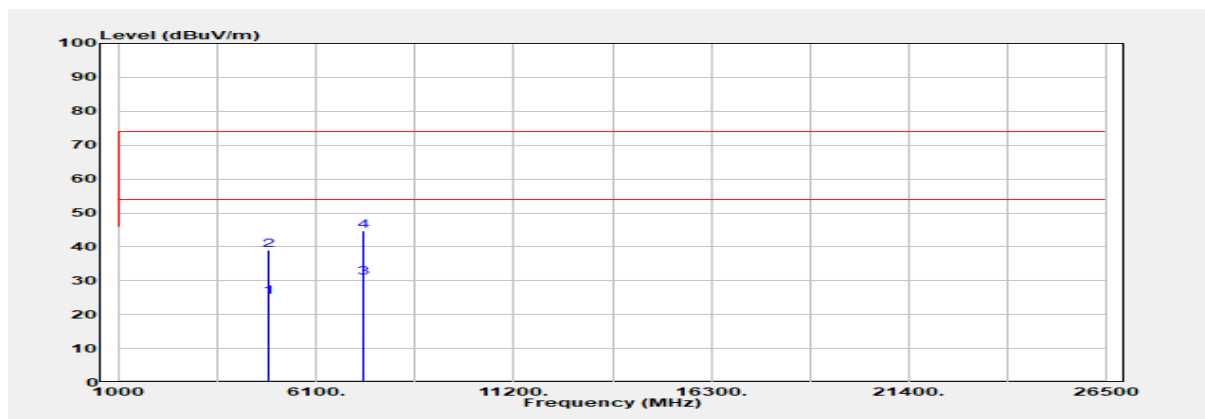
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Report Number :E2/2021/80082  
 Operation Mode :802.11n20  
 Test Frequency :2437 MHz  
 Test Mode :TX CH MID  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4874.000	Average	28.19	-3.05	25.14	54.00	-28.86
4874.000	Peak	42.06	-3.05	39.01	74.00	-34.99
7311.000	Average	27.06	3.91	30.97	54.00	-23.03
7311.000	Peak	40.89	3.91	44.80	74.00	-29.20

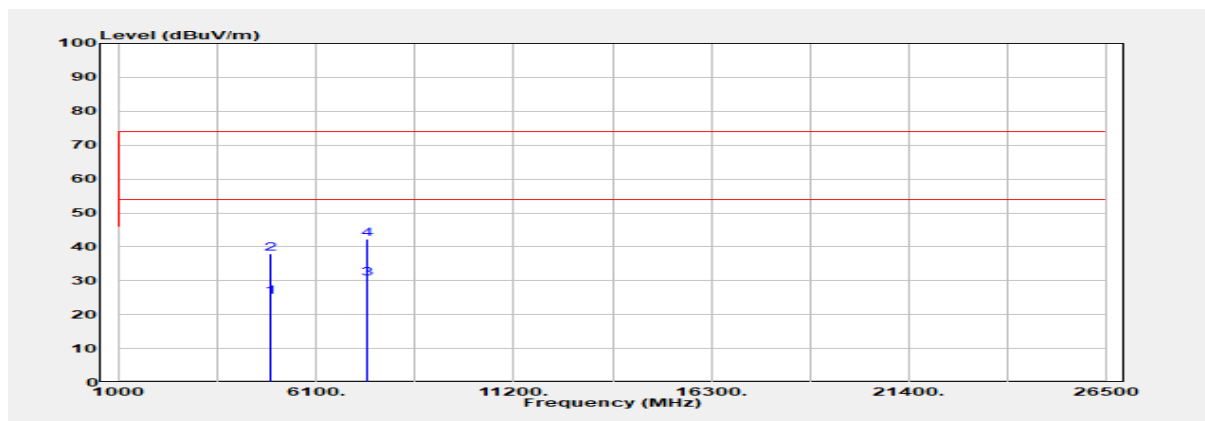
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Report Number :E2/2021/80082  
 Operation Mode :802.11n20  
 Test Frequency :2462 MHz  
 Test Mode :TX CH HIGH  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Vertical  
 Engineer :Andy Wang



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
4924.000	Average	28.41	-3.21	25.21	54.00	-28.79
4924.000	Peak	41.03	-3.21	37.82	74.00	-36.18
7386.000	Average	27.33	3.24	30.57	54.00	-23.43
7386.000	Peak	39.04	3.24	42.27	74.00	-31.73

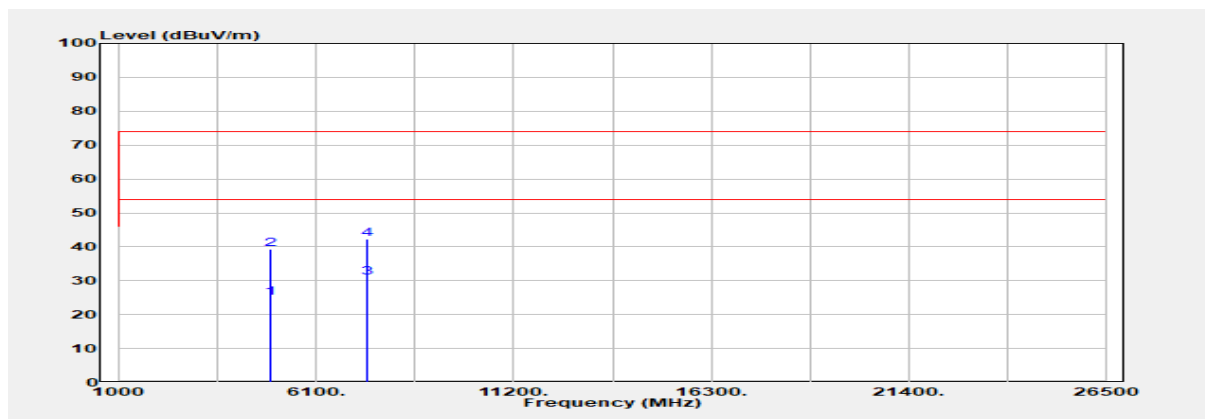
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Report Number :E2/2021/80082  
Operation Mode :802.11n20  
Test Frequency :2462 MHz  
Test Mode :TX CH HIGH  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
4924.000	Average	28.11	-3.21	24.90	54.00	-29.10
4924.000	Peak	42.51	-3.21	39.30	74.00	-34.70
7386.000	Average	27.66	3.24	30.90	54.00	-23.10
7386.000	Peak	39.01	3.24	42.24	74.00	-31.76

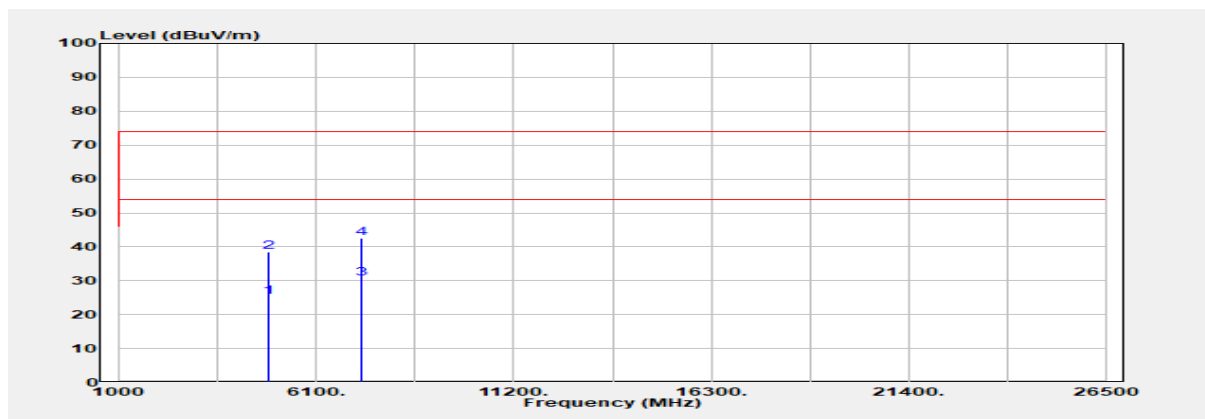
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Report Number :E2/2021/80082  
Operation Mode :802.11n40  
Test Frequency :2422 MHz  
Test Mode :TX CH LOW  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
4844.000	Average	28.28	-3.07	25.21	54.00	-28.79
4844.000	Peak	41.56	-3.07	38.49	74.00	-35.51
7266.000	Average	27.44	3.10	30.54	54.00	-23.46
7266.000	Peak	39.35	3.10	42.45	74.00	-31.55

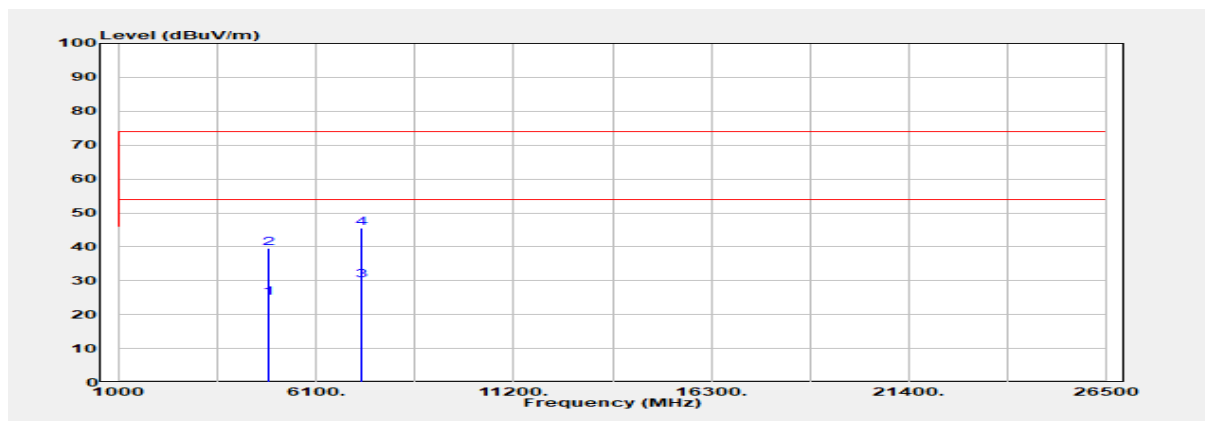
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Report Number :E2/2021/80082  
 Operation Mode :802.11n40  
 Test Frequency :2422 MHz  
 Test Mode :TX CH LOW  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4844.000	Average	28.10	-3.07	25.03	54.00	-28.97
4844.000	Peak	42.72	-3.07	39.65	74.00	-34.35
7266.000	Average	27.04	3.10	30.14	54.00	-23.86
7266.000	Peak	42.37	3.10	45.46	74.00	-28.54

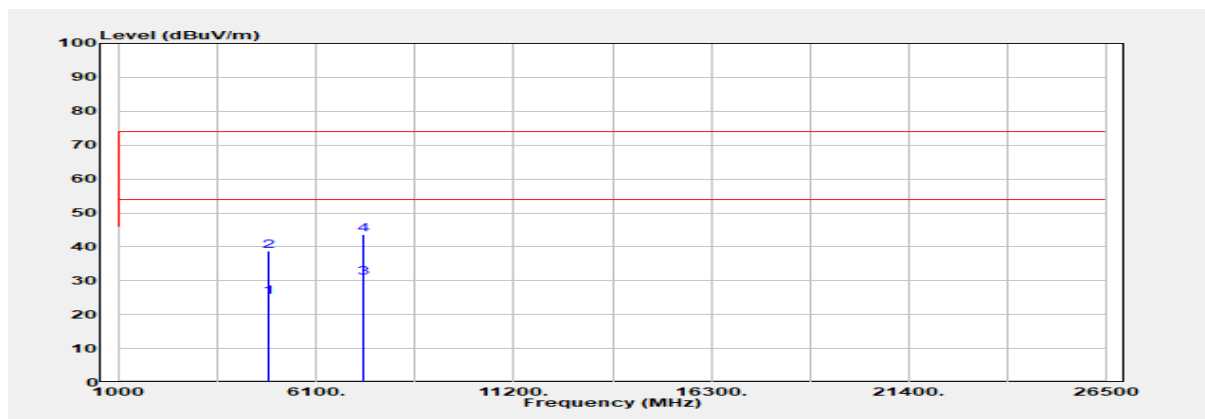
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Report Number :E2/2021/80082  
Operation Mode :802.11n40  
Test Frequency :2437 MHz  
Test Mode :TX CH MID  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Vertical  
Engineer :Andy Wang



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
4874.000	Average	28.39	-3.05	25.33	54.00	-28.67
4874.000	Peak	41.82	-3.05	38.77	74.00	-35.23
7311.000	Average	26.97	3.91	30.88	54.00	-23.12
7311.000	Peak	39.62	3.91	43.53	74.00	-30.47

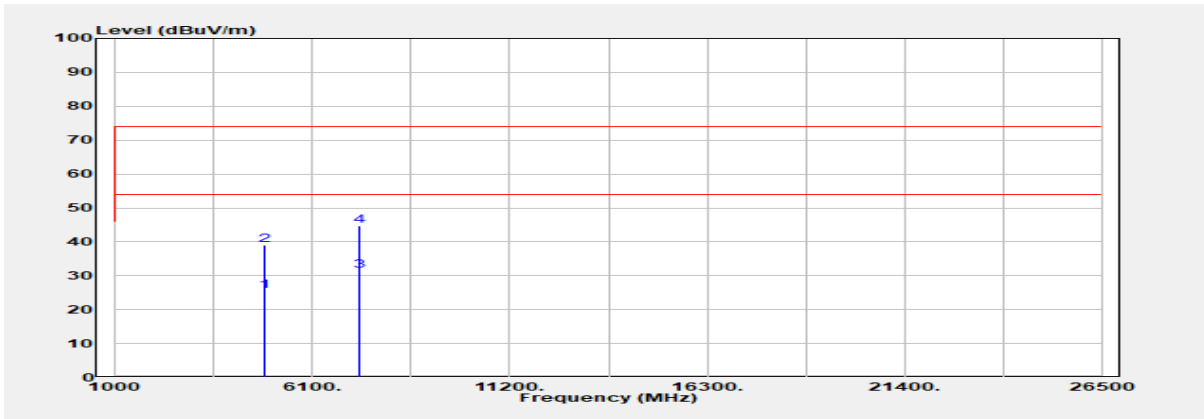
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Report Number :E2/2021/80082  
 Operation Mode :802.11n40  
 Test Frequency :2437 MHz  
 Test Mode :TX CH MID  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Horizontal  
 Engineer :Andy Wang



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
4874.000	Average	28.53	-3.05	25.48	54.00	-28.52
4874.000	Peak	42.03	-3.05	38.98	74.00	-35.02
7311.000	Average	27.42	3.91	31.33	54.00	-22.67
7311.000	Peak	40.93	3.91	44.84	74.00	-29.16

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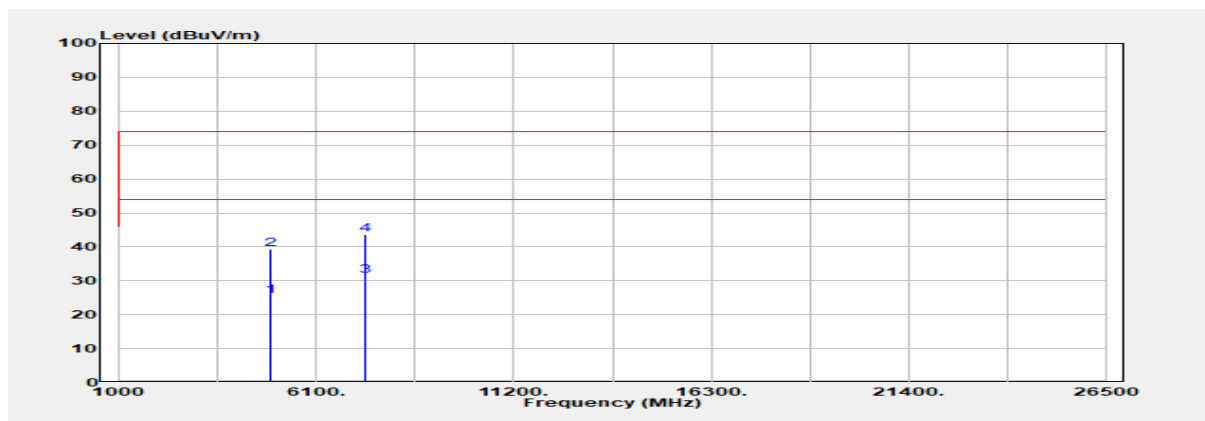
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Report Number :E2/2021/80082  
 Operation Mode :802.11n40  
 Test Frequency :2452 MHz  
 Test Mode :TX CH HIGH  
 EUT Pol :E2 Plane  
 Ant :

Test Site :SAC D  
 Test Date :2021-08-31  
 Temp./Humi. :22.2/64  
 Antenna Pol. :Vertical  
 Engineer :Andy Wang



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
4904.000	Average	28.48	-3.03	25.45	54.00	-28.55
4904.000	Peak	42.43	-3.03	39.40	74.00	-34.60
7356.000	Average	27.63	3.74	31.37	54.00	-22.63
7356.000	Peak	39.84	3.74	43.58	74.00	-30.42

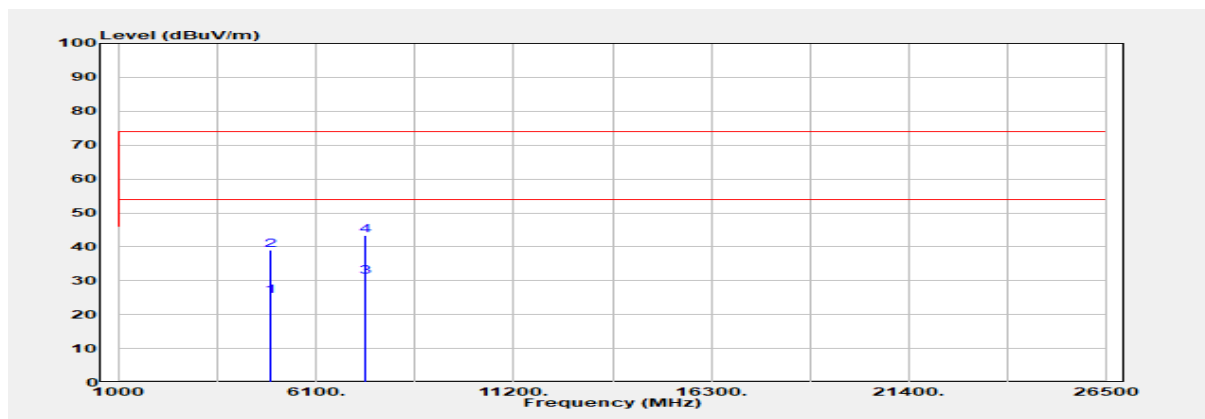
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Report Number :E2/2021/80082  
Operation Mode :802.11n40  
Test Frequency :2452 MHz  
Test Mode :TX CH HIGH  
EUT Pol :E2 Plane  
Ant :

Test Site :SAC D  
Test Date :2021-08-31  
Temp./Humi. :22.2/64  
Antenna Pol. :Horizontal  
Engineer :Andy Wang



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
4904.000	Average	28.47	-3.03	25.44	54.00	-28.56
4904.000	Peak	41.96	-3.03	38.93	74.00	-35.07
7356.000	Average	27.37	3.74	31.11	54.00	-22.89
7356.000	Peak	39.75	3.74	43.49	74.00	-30.51

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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.

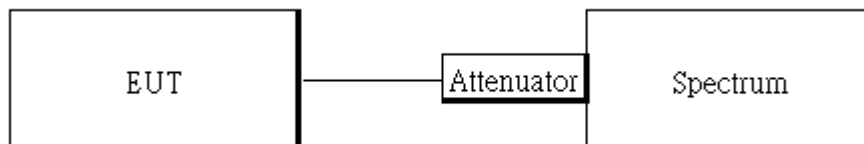
This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### 12.2 Measurement Equipment Used

Conducted Emission Test Site: Conducted B					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/13/2021	07/12/2022
Attenuator	Marvelous	MVE2213-10	RF05	11/19/2020	11/18/2021
DC Block	PASTER-NACK	PE8210	RF157	11/19/2020	11/18/2021
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

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

### 12.3 Test Set-up



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## 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.

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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	-9.67	-9.67	8.00	PASS
2437	-9.91	-9.91	8.00	PASS
2462	-8.1	-8.10	8.00	PASS

POWER DENSITY 802.11g				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-10.67	-10.67	8.00	PASS
2437	-10.29	-10.29	8.00	PASS
2462	-9.4	-9.40	8.00	PASS

POWER DENSITY 802.11n HT20				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412	-11.34	-11.34	8.00	PASS
2437	-11.87	-11.87	8.00	PASS
2462	-10.2	-10.20	8.00	PASS

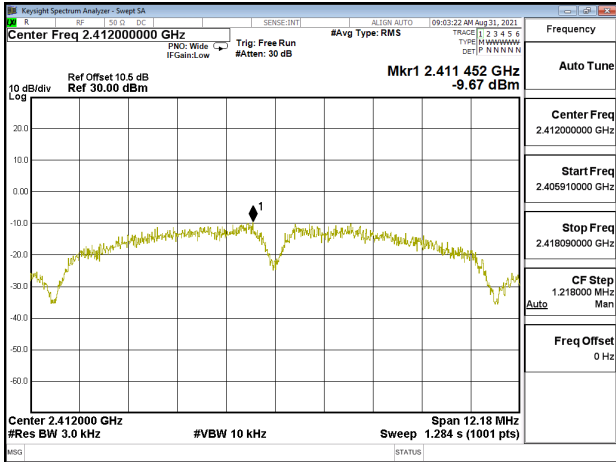
POWER DENSITY 802.11n HT40				
Freq. (MHz)	Ch0 PSD	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
2422	-14.75	-14.75	8.00	PASS
2437	-14.72	-14.72	8.00	PASS
2452	-15.82	-15.82	8.00	PASS

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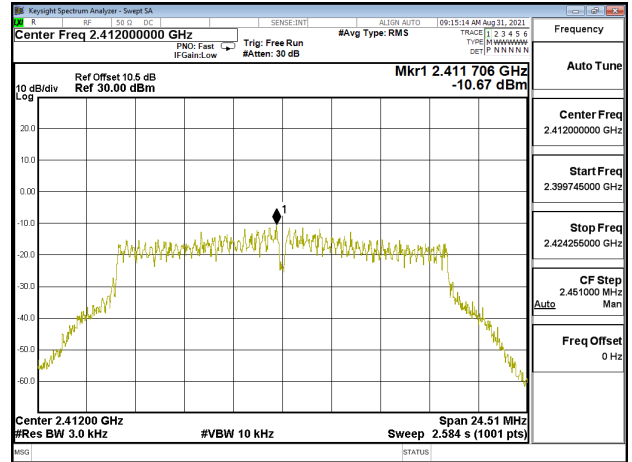
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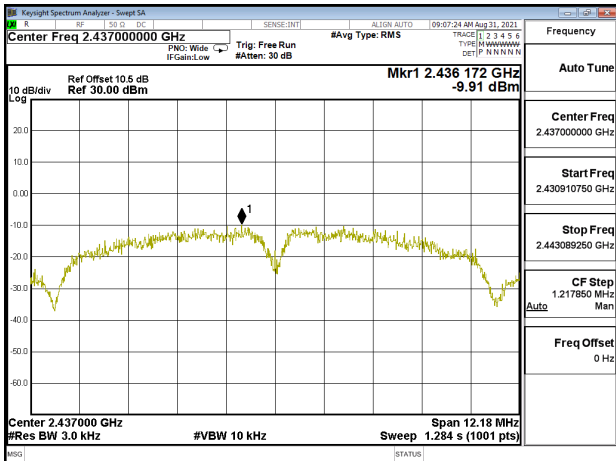
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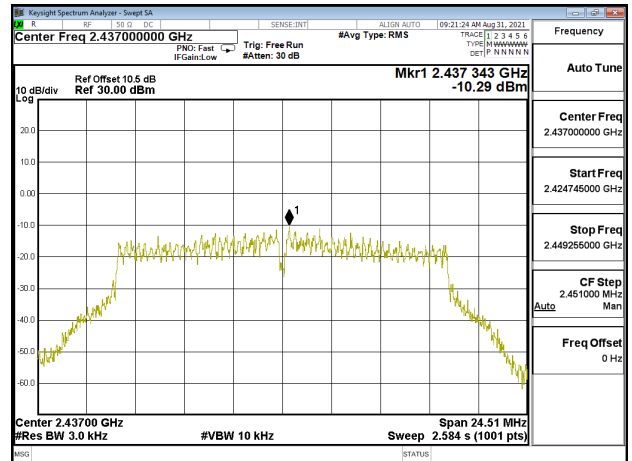
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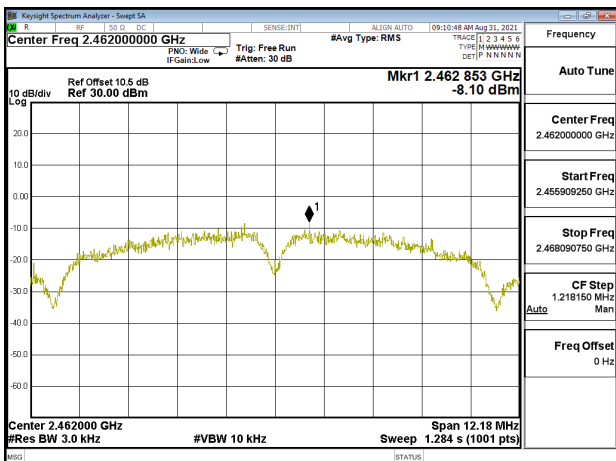
802.11b\_20MHz\_Chain0\_2437MHz



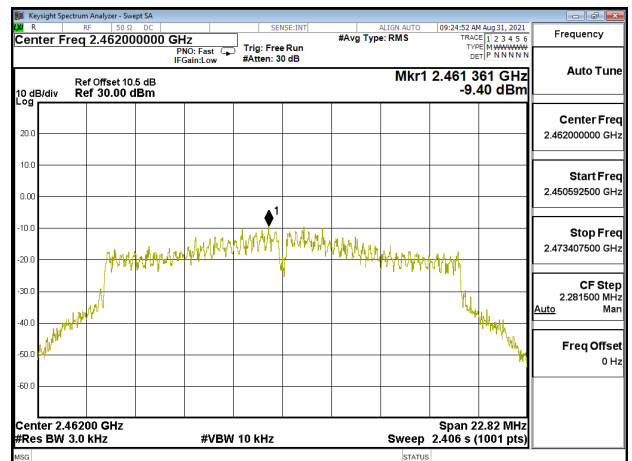
802.11g\_20MHz\_Chain0\_2437MHz



802.11b\_20MHz\_Chain0\_2462MHz



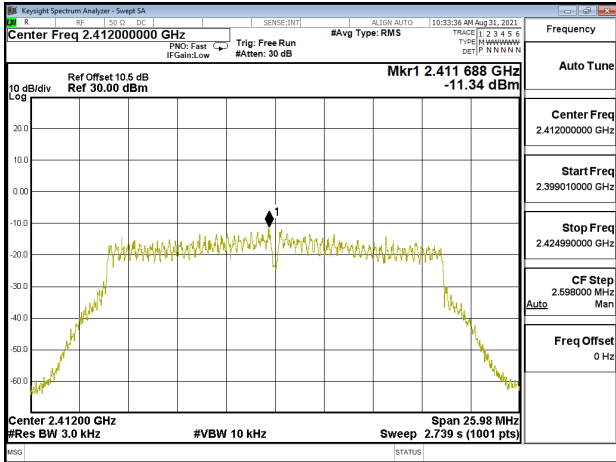
802.11g\_20MHz\_Chain0\_2462MHz



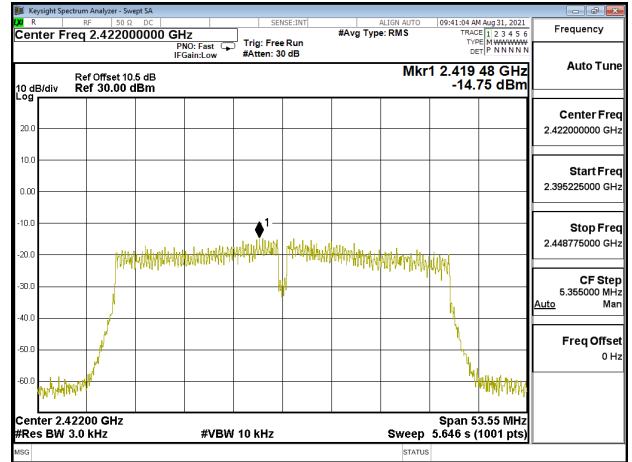
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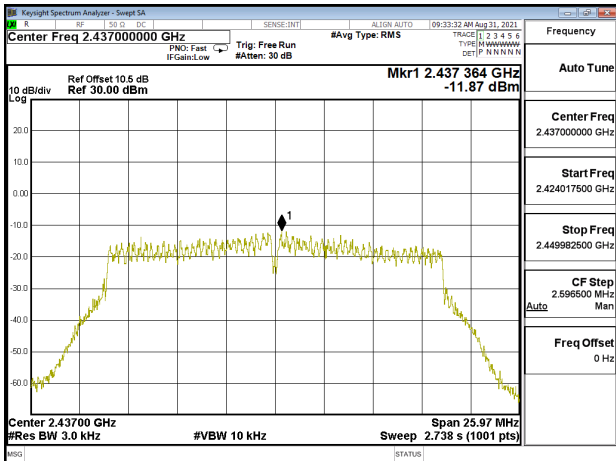
802.11n\_20MHz\_Chain0\_2412MHz



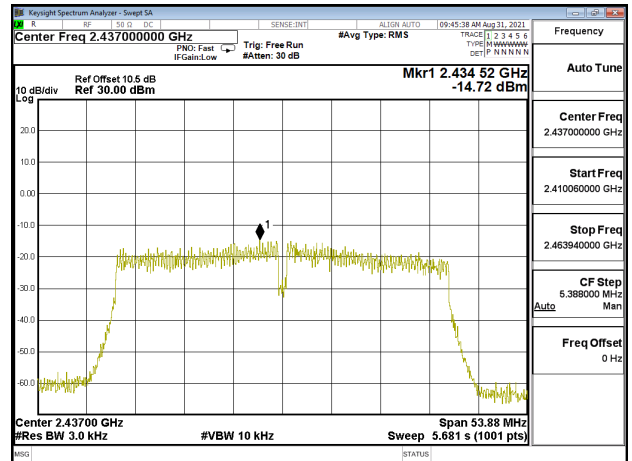
802.11n\_40MHz\_Chain0\_2422MHz



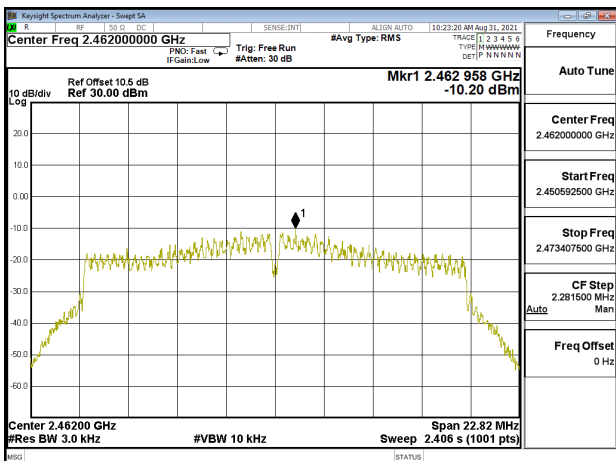
802.11n\_20MHz\_Chain0\_2437MHz



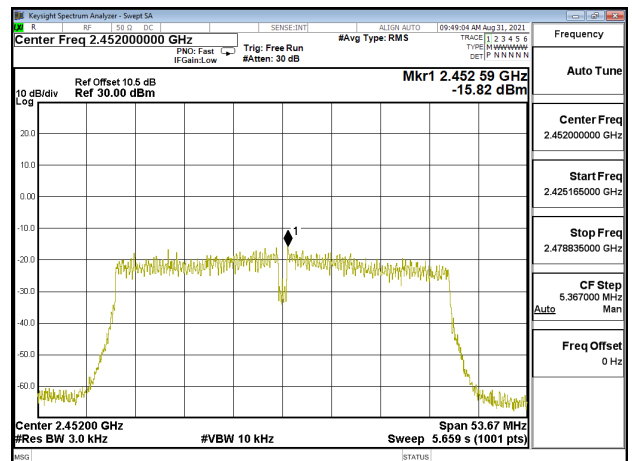
802.11n\_40MHz\_Chain0\_2437MHz



802.11n\_20MHz\_Chain0\_2462MHz



802.11n\_40MHz\_Chain0\_2452MHz



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## 13 ANTENNA REQUIREMENT

### 13.1 Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 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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