

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Applicant: AMPED WIRELESS
13089 Peyton Dr. #C307, Chino Hills California, 91709, United States

Product Name: High Power AC1200 Pro Wi-Fi Access Point

Brand Name: AMPED WIRELESS

Model No.: AP1200EX

Model Difference: N/A

Report Number: E2/2018/60056

FCC ID: ZTT-AP1200EX

FCC Rule Part: §15.247, Cat: DTS

Issue Date: Jul. 20, 2018

Date of Test: Apr.19, 2018~ Jun. 20, 2018

Date of EUT Re-ceived: Apr.19, 2018

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory 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 tested as described in this report is in compliance with conducted and radiated emission limits.

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

Tested By:



Vito Pei / Engineer

Approved By:



Jim Chang / Manager



Testing Laboratory

0513

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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
E2/2018/60056	Rev.00	Initial creation of document	All	Jul. 20, 2018	Stefanie Yu / Clerk

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1 GENERAL INFORMATION

1.1 Product description

General:

Product Name:	High Power AC1200 Pro Wi-Fi Access Point	
Brand Name:	AMPED WIRELESS	
Model No.:	AP1200EX	
Model Difference:	N/A	
Hardware Version:	N/A	
Software Version:	N/A	
Power Supply:	48V from PoE Adapter	
	Adapter:	Model Name: PSE301G, Supplier: N/A

WLAN 2.4GHz:

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (dBm)	Modulation Technology
b	2412-2462	11	19.63	DSSS,
g			24.96	OFDM
n_HT20			25.06 (MIMO)	
n_HT40	2422-2452	9	25.00 (MIMO)	
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM			
Antenna Designation:	Patch Antenna, 1. Part No.: N/A, Supplier: Master WANSHIH Electronic Co., Ltd. 2.4GHz Gain: 7.52 dBi 2. Part No.: N/A, Supplier: Master WANSHIH Electronic Co., Ltd. 2.4GHz Gain: 7.72 dBi			
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM			
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 144.4Mbps 802.11 n_40MHz: 13.5 – 300.0Mbps			

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 DTS Meas. Guidance v04

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd.,
Guishan District, Taoyuan City, Taiwan 333

(TAF code 0513)

FCC Registration Numbers are: 735305 / TW0002

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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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 turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH 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 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.

2.4 Measurement Results Explanation Example

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.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

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2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration



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



Fig. 2-3 Conducted (AC powerline) Emission Configuration

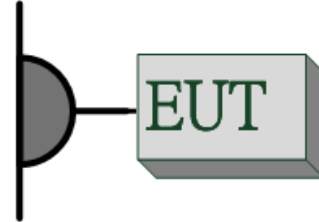


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2	Notebook	Lenovo	T420	S0012599	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	6dB & 99% Emission Bandwidth	Compliant
§15.247(d)	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.203 §15.247(b)	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operated in 2400 ~ 2483.5MHz Band

11 channels are provided for 802.11b, 802.11g and 802.11n_HT20

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

7 channels are provided for 802.11n_HT40

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

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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.

RADIATED EMISSION TEST:

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
RADIATED EMISSION TEST (BELOW 1 GHz)					
802.11g	1 to 11	1,6,11	OFDM	6	2TX
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 8	MIMO
RADIATED EMISSION TEST (ABOVE 1 GHz)					
802.11b	1 to 11	1, 6, 11	DSSS	1	2TX
802.11g	1 to 11	1, 6, 11	OFDM	6	2TX
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 8	MIMO
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 8	MIMO
Note:					
The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.					

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ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1, 6, 11	DSSS	1	2TX
802.11g	1 to 11	1, 6, 11	OFDM	6	2TX
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	MCS 8	MIMO
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	MCS 8	MIMO

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
6dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Peak Power Density	+/- 1.3 dB
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz-30MHz: +/-2.87dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	9kHz-30MHz: +/-2.87dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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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 dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI 7	100950	12/24/2017	12/23/2018
Coaxial Cables	N/A	N30N30-1042-150cm	N/A	08/30/2017	08/29/2018
LISN	Schwarzbeck	NSLK 8127	8127-648	06/18/2018	06/17/2019
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

6.3 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

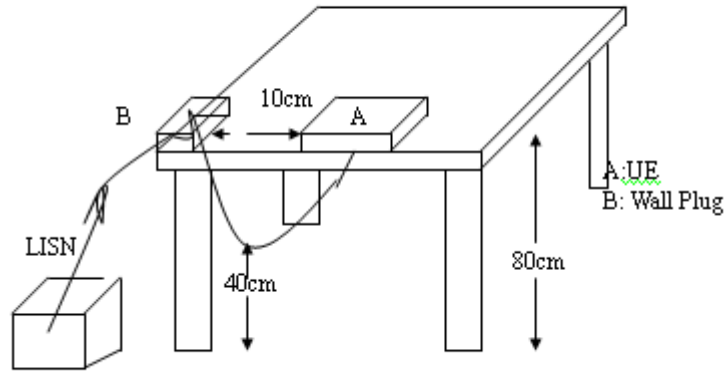
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6.4 Test SET-UP (Block Diagram of Configuration)



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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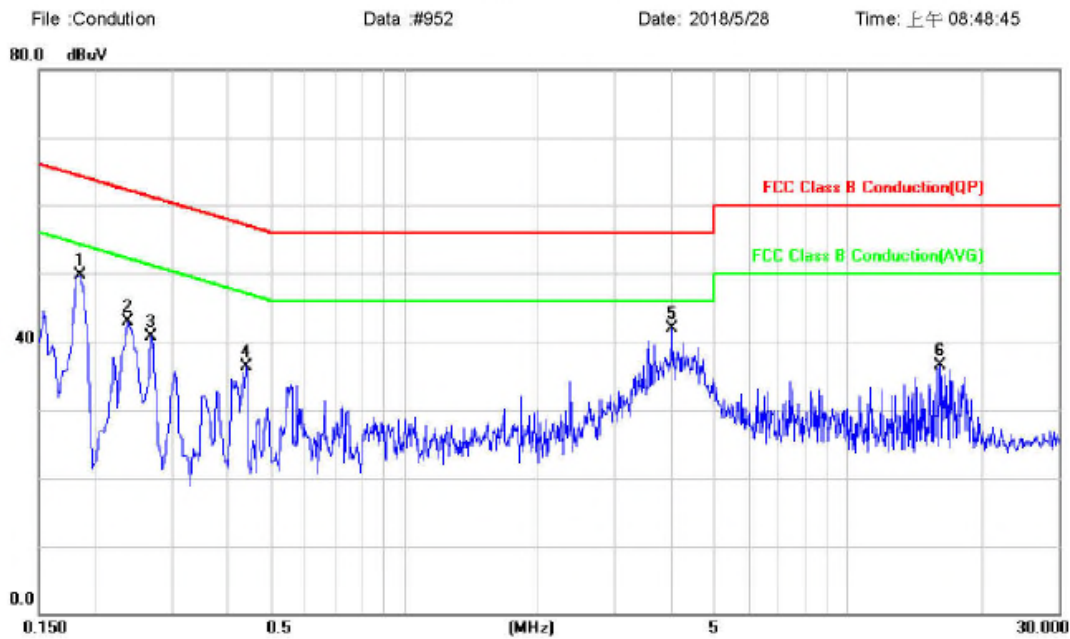
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Site : Conduction Room	Phase: L1	Temperature: 25 °C
Limit: FCC Class B Conduction(QP)	Power: AC 120V/60Hz	Humidity: 85 %
Mode:		
Note:		

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1860	29.97	19.64	49.61	64.21	-14.60	peak	
2		0.2380	23.08	19.73	42.81	62.17	-19.36	peak	
3		0.2700	20.92	19.81	40.73	61.12	-20.39	peak	
4		0.4420	16.15	20.11	36.26	57.02	-20.76	peak	
5	*	4.0180	21.86	19.98	41.84	56.00	-14.16	peak	
6		16.1660	16.60	19.99	36.59	60.00	-23.41	peak	

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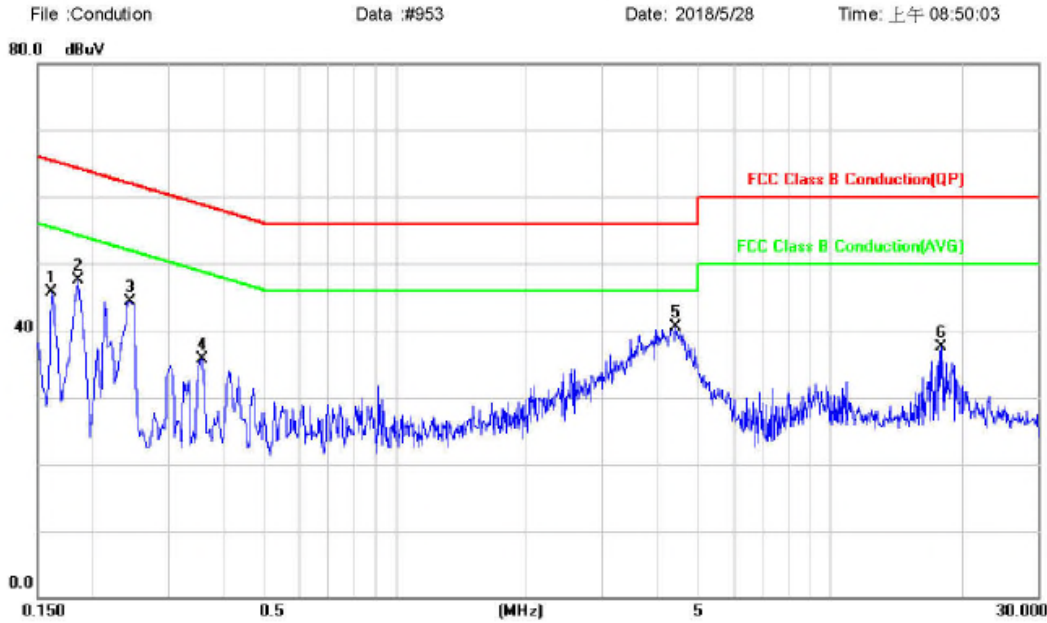
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Site : Conduction Room Phase: **N** Temperature: 25 °C
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 85 %
 Mode:
 Note:

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1620	26.08	19.64	45.72	65.36	-19.64	peak	
2		0.1860	27.80	19.63	47.43	64.21	-16.78	peak	
3		0.2430	24.54	19.73	44.27	61.99	-17.72	peak	
4		0.3580	15.78	20.01	35.79	58.77	-22.98	peak	
5 *		4.4260	20.52	19.96	40.48	56.00	-15.52	peak	
6		18.0260	17.45	20.04	37.49	60.00	-22.51	peak	

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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.

Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

Measurement Procedure:

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

Duty Cycle:

	Duty Cycle (%)	Duty Factor (dB)	1/T (kHz)	VBW setting (kHz)
802.11b	98.50	0.07	0.12	1.00
802.11g	91.37	0.39	0.72	1.00
802.11n_20	78.42	1.06	1.48	2.00
802.11n_40	69.81	1.56	2.88	3.00

$$b = 98.5\%, g = 91.37\%, n_{ht_20} = 78.42\%$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.985) = 0.07$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.9137) = 0.39$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.7842) = 1.06$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.6981) = 1.56$$

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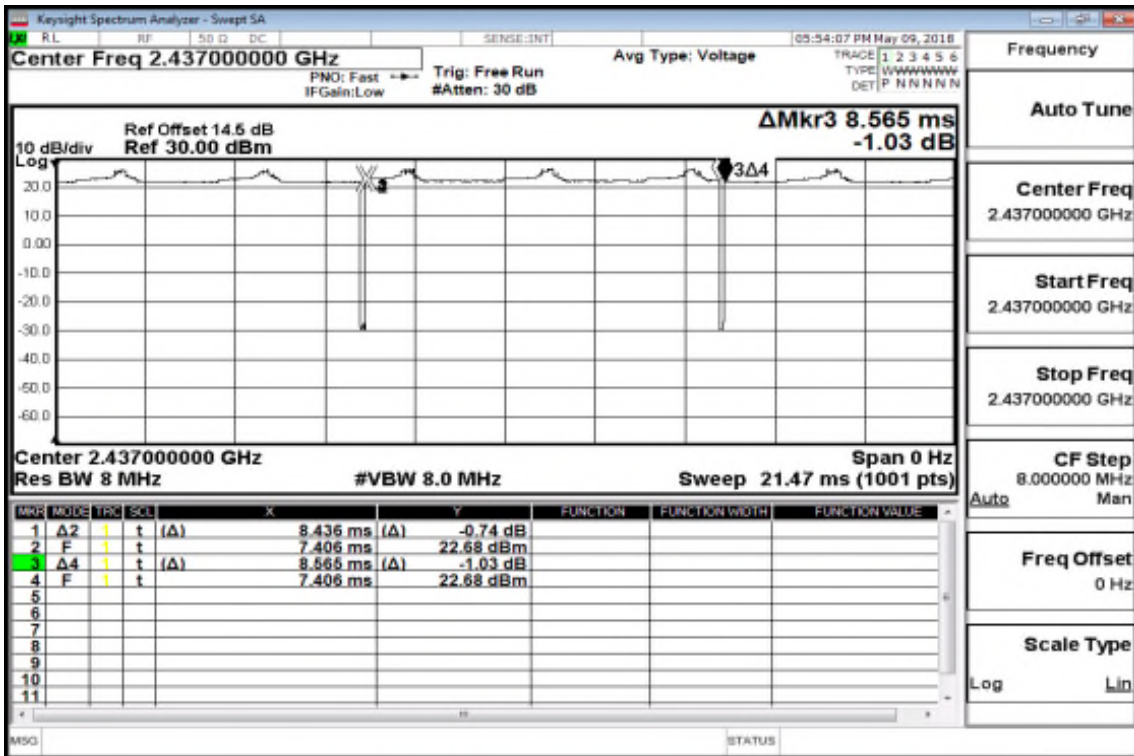
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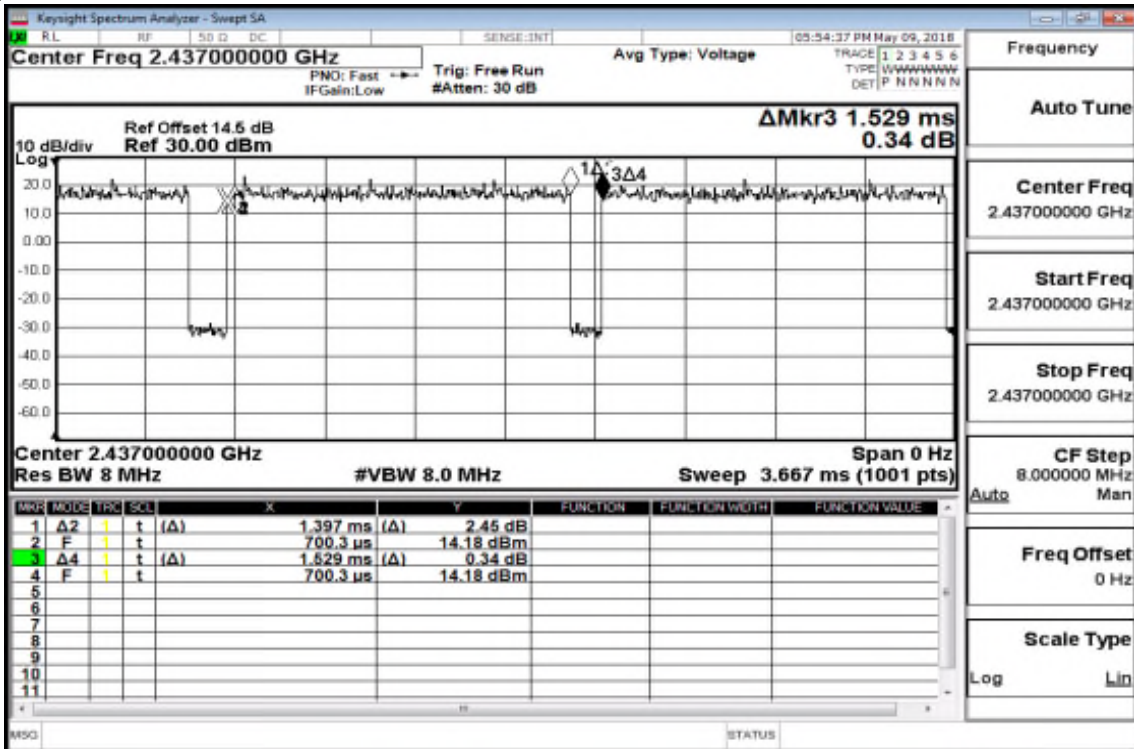
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7.1 DUTY CYCLE TEST SIGNAL Measurement Result

802.11 b



802.11 g



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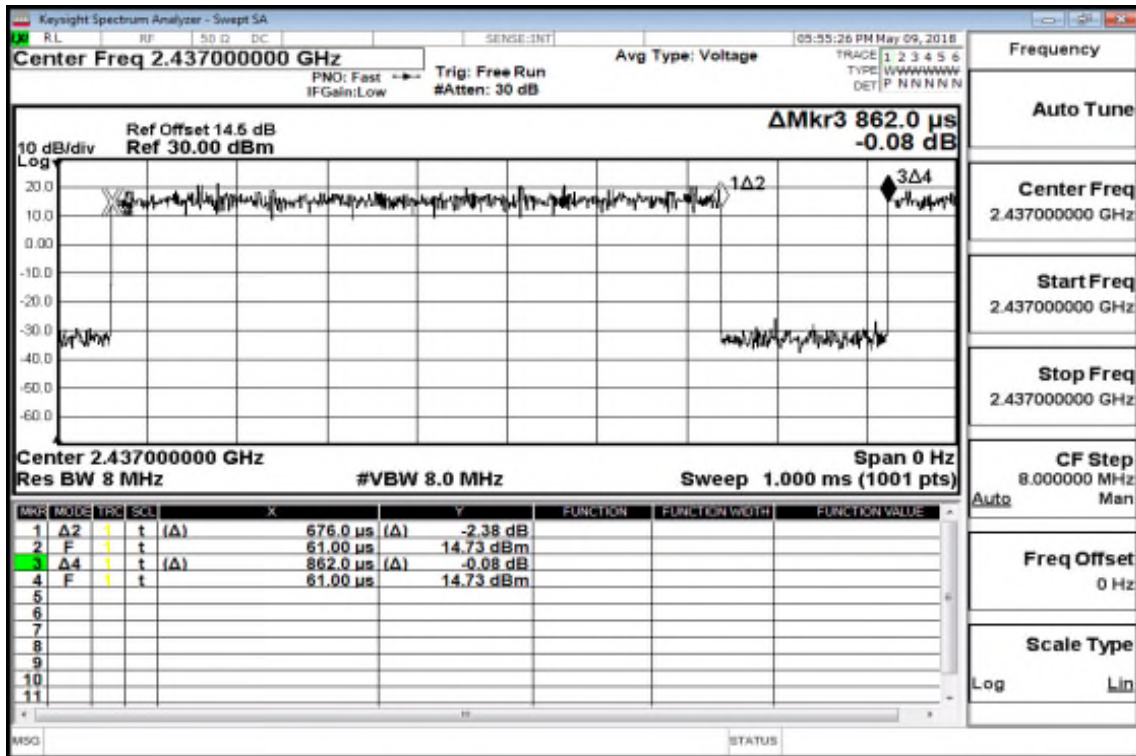
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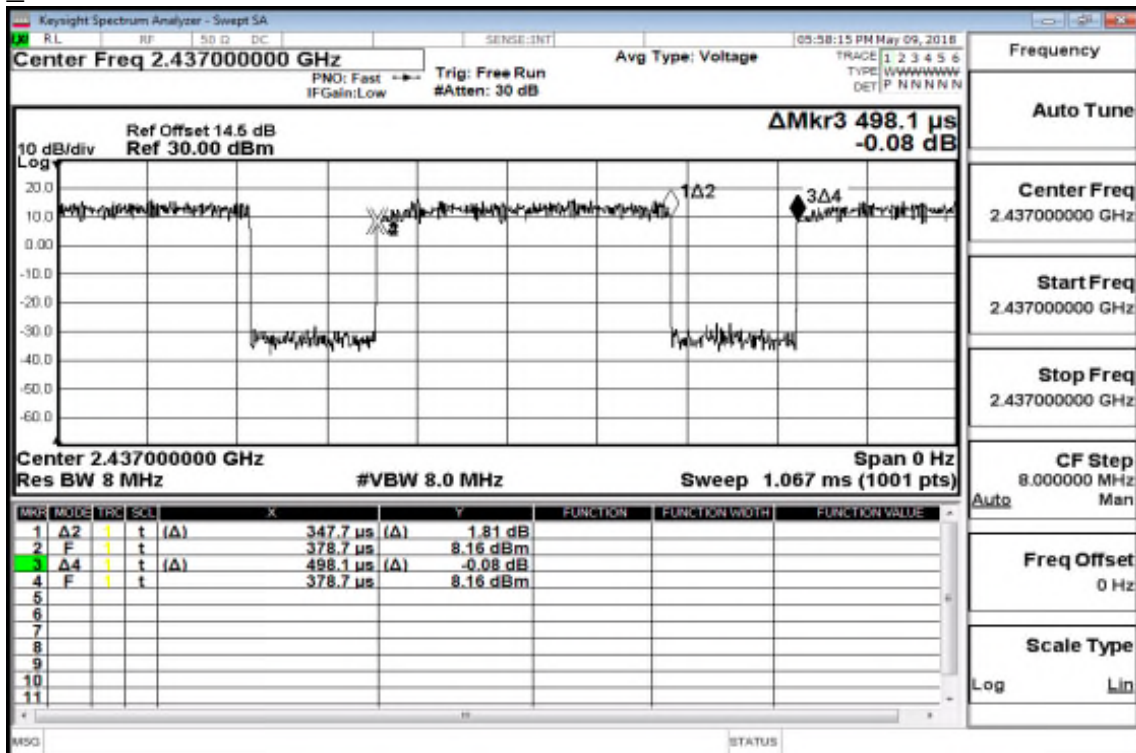
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802.11 n 20 MHz



802.11 n 40 MHz



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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.

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.

Note:

As per FCC KDB 662911 D01

Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, ..., GN dBi.

(i) If transmit signals are correlated, then Directional gain = $10 \log[(10G1 / 20 + 10G2 / 20 + \dots + 10GN / 20) ^2 / NANT]$ dBi

[Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

Frequency (MHz)	Effective Legacy Gain (dBi)	Conducted Power Limit (dBm)
2412~2462	10.63	25.36854885

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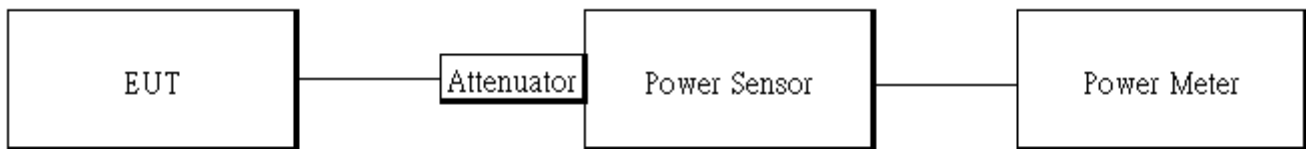
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8.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018
Power Meter	Anritsu	ML2496A	1326001	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315048	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315049	06/23/2017	06/22/2018
Coaxial Cable 30cm	WOKEN	00100A1F1A1 95C	RF01	12/24/2017	12/23/2018
DC Block	PASTERNAK	PE8210	RF29	12/24/2017	12/23/2018
Splitter	RF-LAMBAD	RFLT2W1G18 G	RF35	12/24/2017	12/23/2018
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018

8.3 Test Set-up

Power Meter:



8.4 Measurement Procedure

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

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.

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8.5 Measurement Result

802.11b Main						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit		RESULT
1	2412	1	19.15	28.28	dBm	PASS
6	2437	1	18.78	28.28	dBm	PASS
11	2462	1	18.61	28.28	dBm	PASS
802.11b Main						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit		RESULT
1	2412	1	16.95	28.28	dBm	PASS
6	2437	1	16.91	28.28	dBm	PASS
11	2462	1	16.95	28.28	dBm	PASS
802.11b Aux1						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit		RESULT
1	2412	1	19.01	28.28	dBm	PASS
6	2437	1	18.64	28.28	dBm	PASS
11	2462	1	18.34	28.28	dBm	PASS
802.11b Aux1						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit		RESULT
1	2412	1	16.90	28.28	dBm	PASS
6	2437	1	16.87	28.28	dBm	PASS
11	2462	1	16.92	28.28	dBm	PASS

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802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	1	17.37	15.39	19.50	89.17	25.37 dBm	PASS
6	2437	1	17.47	15.55	19.63	91.74	25.37 dBm	PASS
11	2462	1	17.25	15.46	19.46	88.24	25.37 dBm	PASS

802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Max. Avg. Output include tune up tolerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	1	14.83	12.70	16.97	49.72	25.37 dBm	PASS
6	2437	1	14.78	12.81	16.98	49.85	25.37 dBm	PASS
11	2462	1	14.71	12.93	16.98	49.91	25.37 dBm	PASS

802.11g Main						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit	RESULT	
1	2412	6	22.19	28.28 dBm	PASS	
6	2437	6	22.21	28.28 dBm	PASS	
11	2462	6	22.25	28.28 dBm	PASS	

802.11g Main						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit	RESULT	
1	2412	6	17.92	28.28 dBm	PASS	
6	2437	6	17.93	28.28 dBm	PASS	
11	2462	6	17.90	28.28 dBm	PASS	

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802.11g Aux1						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit		RESULT
1	2412	6	22.10	28.28	dBm	PASS
6	2437	6	22.03	28.28	dBm	PASS
11	2462	6	22.12	28.28	dBm	PASS
802.11g Aux1						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit		RESULT
1	2412	6	17.84	28.28	dBm	PASS
6	2437	6	17.88	28.28	dBm	PASS
11	2462	6	17.86	28.28	dBm	PASS

802.11g_2TX								
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	6	22.01	21.89	24.96	313.38	25.37 dBm	PASS
6	2437	6	21.87	20.91	24.43	277.13	25.37 dBm	PASS
11	2462	6	21.84	20.96	24.43	277.49	25.37 dBm	PASS
802.11g_2TX								
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Max. Avg. Output include tune up tolerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	6	15.52	13.38	17.98	62.85	25.37 dBm	PASS
6	2437	6	15.43	13.51	17.98	62.77	25.37 dBm	PASS
11	2462	6	15.35	13.56	17.95	62.36	25.37 dBm	PASS

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802.11n_HT20M Main						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit		RESULT
1	2412	MCS0	22.22	28.28	dBm	PASS
6	2437	MCS0	22.18	28.28	dBm	PASS
11	2462	MCS0	19.70	28.28	dBm	PASS
10	2457	MCS0	22.21	28.28	dBm	PASS
802.11n_HT20M Main						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit		RESULT
1	2412	MCS0	19.92	28.28	dBm	PASS
6	2437	MCS0	19.94	28.28	dBm	PASS
11	2462	MCS0	13.34	28.28	dBm	PASS
802.11n_HT20M Aux1						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit		RESULT
1	2412	MCS0	22.00	28.28	dBm	PASS
6	2437	MCS0	22.07	28.28	dBm	PASS
11	2462	MCS0	19.53	28.28	dBm	PASS
10	2457	MCS0	21.97	28.28	dBm	PASS
802.11n_HT20M Aux1						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit		RESULT
1	2412	MCS0	19.82	28.28	dBm	PASS
6	2437	MCS0	19.85	28.28	dBm	PASS
11	2462	MCS0	13.11	28.28	dBm	PASS
10	2457	MCS0	19.63	28.28	dBm	PASS

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802.11n_HT20M MIMO								
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	MCS8	22.84	20.43	24.81	302.72	1 Watt = 25.37 dBm	PASS
6	2437	MCS8	22.61	21.41	25.06	320.75	1 Watt = 25.37 dBm	PASS
11	2462	MCS8	18.87	20.31	22.66	184.50	1 Watt = 25.37 dBm	PASS
10	2457	MCS8	13.14	17.46	18.83	76.38	1 Watt = 25.37 dBm	PASS

802.11n_HT20M MIMO								
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Max. Avg. Output include tune up tolerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit	RESULT
			CH 0	CH 1				
1	2412	MCS8	16.84	14.77	19.99	99.84	25.37 dBm	PASS
6	2437	MCS8	16.67	15.01	19.98	99.65	25.37 dBm	PASS
11	2462	MCS8	7.21	10.74	13.39	21.83	25.37 dBm	PASS

802.11n_HT40M Main						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit	RESULT	
3	2422	MCS0	18.84	28.28 dBm	PASS	
6	2437	MCS0	22.25	28.28 dBm	PASS	
9	2452	MCS0	17.76	28.28 dBm	PASS	
4	2427	MCS0	22.11	28.28 dBm	PASS	
8	2447	MCS0	22.19	28.28 dBm	PASS	

802.11n_HT40M Main						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit	RESULT	
3	2422	MCS0	12.93	28.28 dBm	PASS	
6	2437	MCS0	19.88	28.28 dBm	PASS	
9	2452	MCS0	10.63	28.28 dBm	PASS	

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802.11n_HT40M Aux1						
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)	Limit		RESULT
3	2422	MCS0	18.70	28.28	dBm	PASS
6	2437	MCS0	22.14	28.28	dBm	PASS
9	2452	MCS0	17.72	28.28	dBm	PASS
4	2427	MCS0	21.93	28.28	dBm	PASS
8	2447	MCS0	21.99	28.28	dBm	PASS
802.11n_HT40M Aux1						
CH	Freq. (MHz)	Data Rate	Max. Avg. Output include tune up tolerance Power (dBm)	Limit		RESULT
3	2422	MCS0	12.91	28.28	dBm	PASS
6	2437	MCS0	19.77	28.28	dBm	PASS
9	2452	MCS0	10.52	28.28	dBm	PASS

802.11n_HT40M MIMO									
CH	Freq. (MHz)	Data Rate	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Total Peak Output Power (mW)	Limit		RESULT
			CH 0	CH 1			dBm	dBm	
3	2422	MCS8	15.18	18.25	19.99	99.80	25.37	dBm	PASS
6	2437	MCS8	22.36	21.58	25.00	316.23	25.37	dBm	PASS
9	2452	MCS8	12.01	16.71	17.98	62.77	25.37	dBm	PASS
4	2427	MCS8	20.09	21.73	24.00	251.03	25.37	dBm	PASS
8	2447	MCS8	20.68	22.01	24.41	275.80	25.37	dBm	PASS
802.11n_HT40M MIMO									
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Max. Avg. Output include tune up tolerance Power (dBm)	Max. Avg. Output include tune up tolerance Power (mW)	Limit		RESULT
			CH 0	CH 1			dBm	dBm	
3	2422	MCS8	7.59	9.65	13.31	21.44	25.37	dBm	PASS
6	2437	MCS8	16.27	14.37	19.99	99.87	25.37	dBm	PASS
9	2452	MCS8	3.96	7.57	10.70	11.75	25.37	dBm	PASS

offset 11.10 dB for SISO mode

offset 11.10 dB for MIMO mode

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

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9 6DB & 99% BANDWIDTH MEASUREMENT

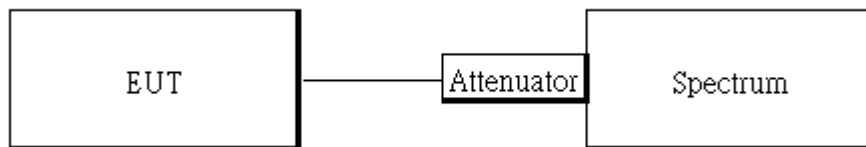
9.1 Standard Applicable

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

9.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/19	2019/06/18
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25
DC Block	PASTERNAK	PE8210	RF29	2017/12/26	2018/12/25
Notebook	Lenovo	L412	S0011357	N/A	N/A

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.
- For 6dB Bandwidth:
Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=peak, Sweep=auto.
- Mark the peak frequency and -6dB (upper and lower) frequency.
- For 99% Bandwidth:
Set the spectrum analyzer as RBW=1%, VBW = 3*RBW, Span = 30M/50MHz, Detector=Sample, Sweep=auto.
- Turn on the 99% bandwidth function, max reading.
- Repeat above procedures until all frequency of interest measured was complete.

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9.5 Measurement Result

802.11b Main				802.11b Aux1			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result	Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	10084	> 500	PASS	2412	10087	> 500	PASS
2437	10085	> 500	PASS	2437	10090	> 500	PASS
2462	10082	> 500	PASS	2462	10093	> 500	PASS

802.11g Main				802.11g Aux1			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result	Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16474	> 500	PASS	2412	16500	> 500	PASS
2437	16445	> 500	PASS	2437	16500	> 500	PASS
2462	16429	> 500	PASS	2462	16506	> 500	PASS

802.11_n_HT20 Main				802.11_n_HT20 Aux1			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result	Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	17579	> 500	PASS	2412	17604	> 500	PASS
2437	17576	> 500	PASS	2437	17609	> 500	PASS
2462	17331	> 500	PASS	2462	17607	> 500	PASS
2457	17600	> 500	PASS	2457	17610	> 500	PASS

802.11_n_HT40 Main				802.11_n_HT40 Aux1			
Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result	Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35756	> 500	PASS	2422	36334	> 500	PASS
2437	35750	> 500	PASS	2437	36329	> 500	PASS
2452	35746	> 500	PASS	2452	36337	> 500	PASS
2427	35760	> 500	PASS	2427	36330	> 500	PASS
2447	36330	> 500	PASS	2447	35750	> 500	PASS

*Refer to next page for plots

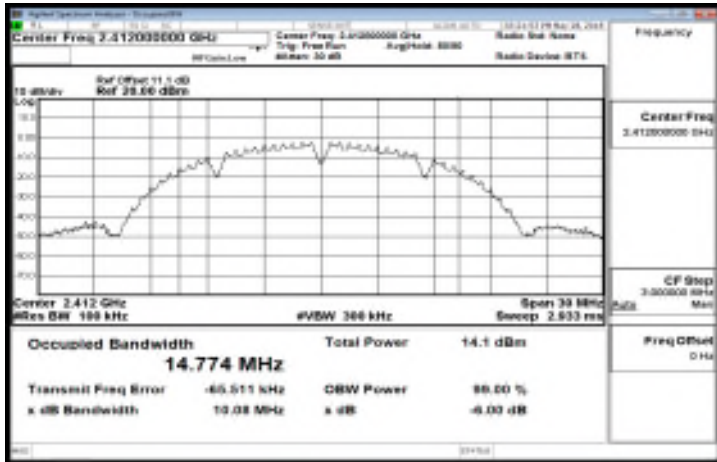
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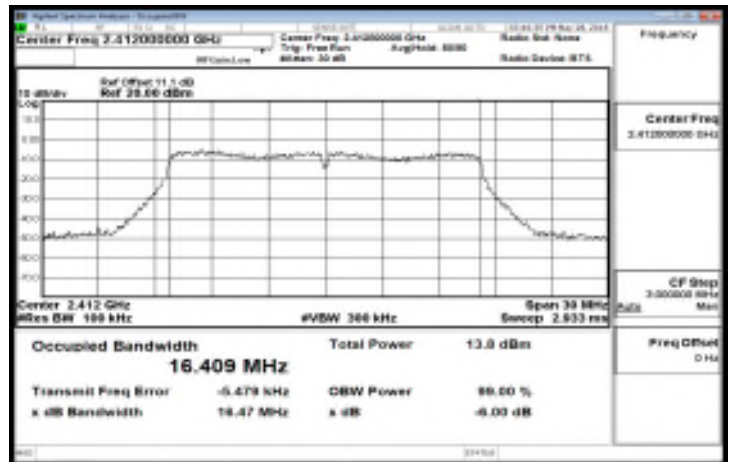
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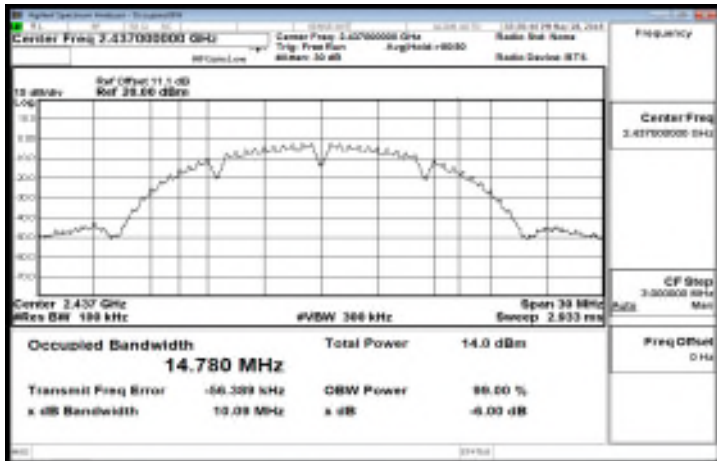
802.11b (Main)
6dB Band Width Test Data CH-Low



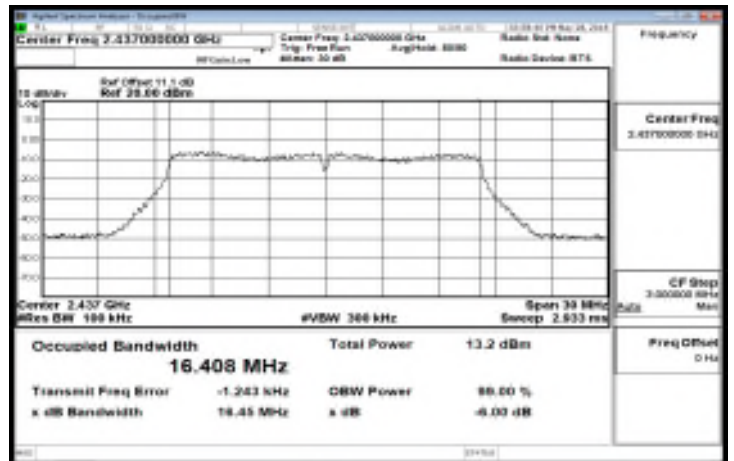
802.11g (Main)
6dB Band Width Test Data CH-Low



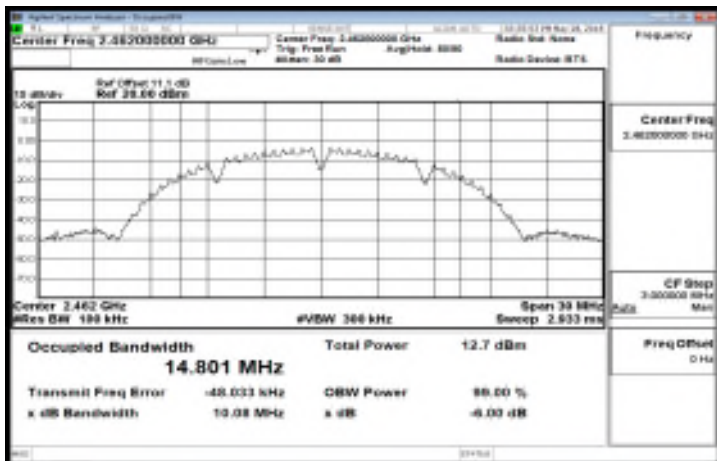
6dB Band Width Test Data CH-Mid



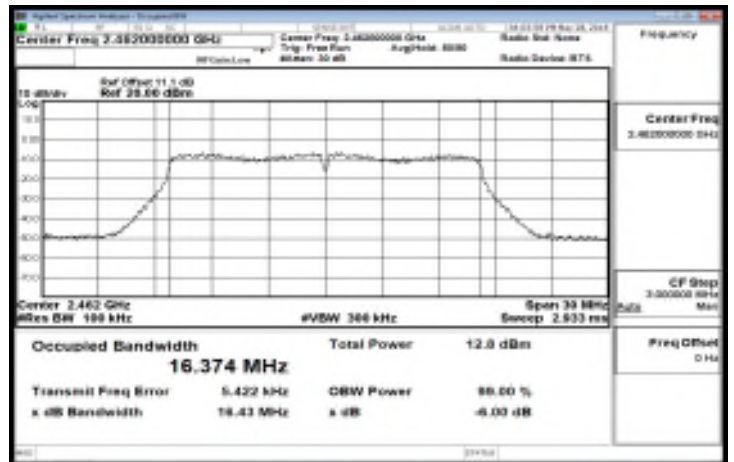
6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



6dB Band Width Test Data CH-High



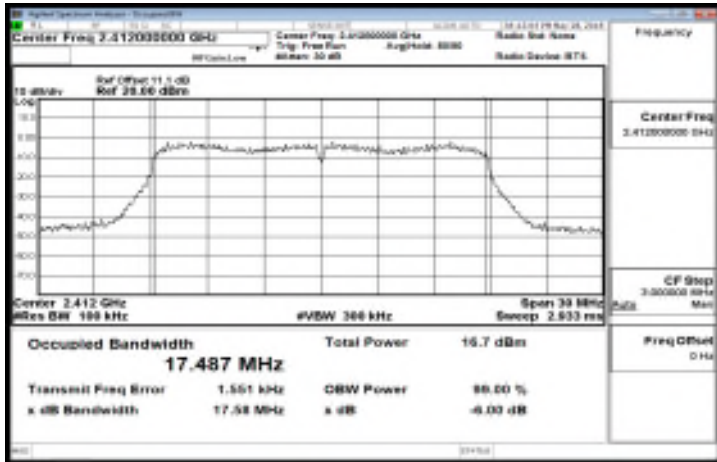
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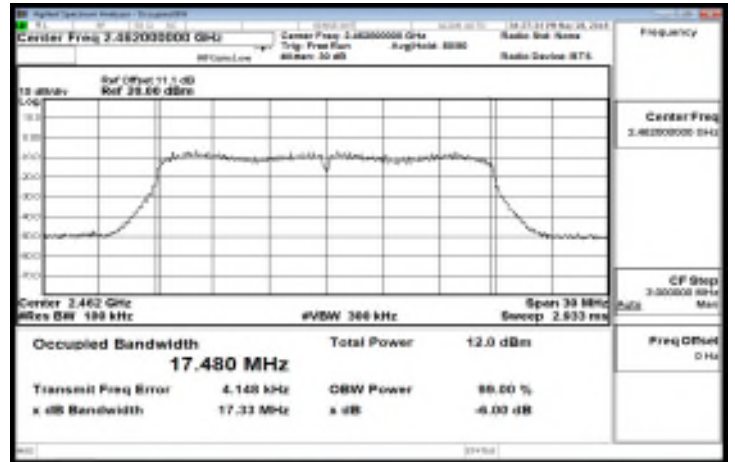
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802.11n_20M (Main)

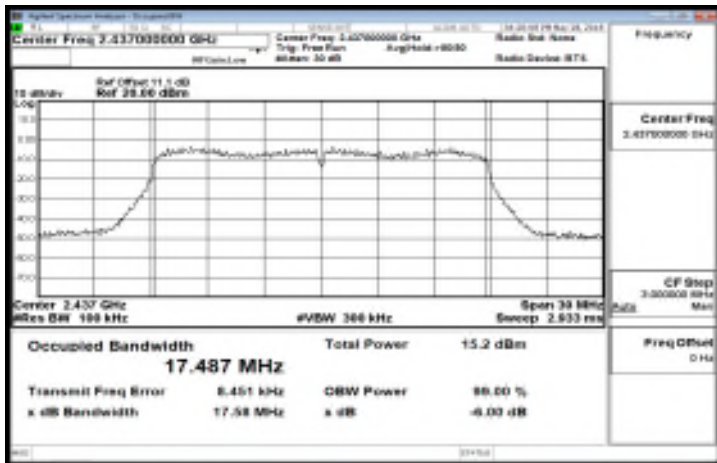
6dB Band Width Test Data CH-Low



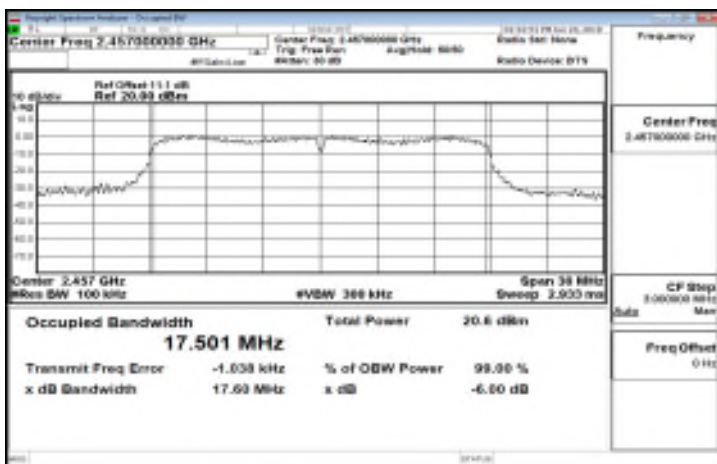
6dB Band Width Test Data CH-High (2462MHz)



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High (2457MHz)



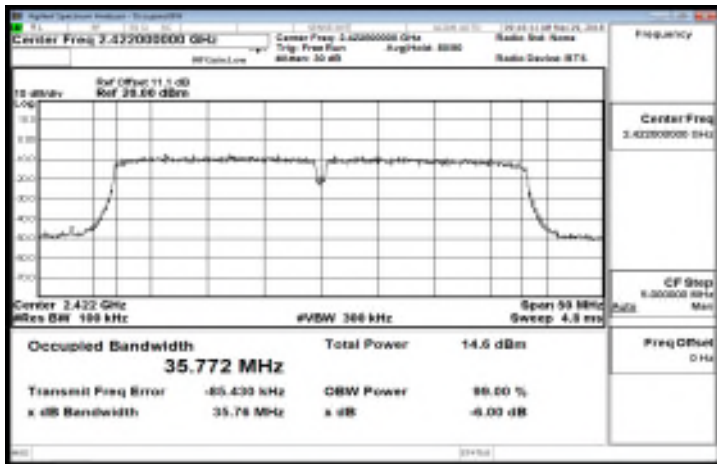
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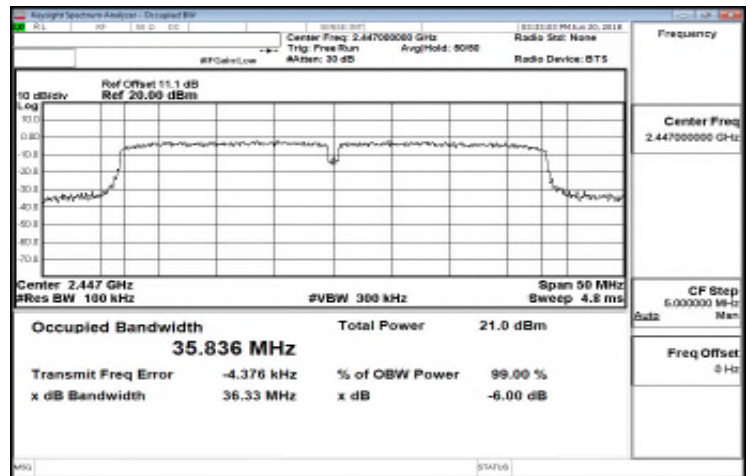
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802.11n_40M (Main)

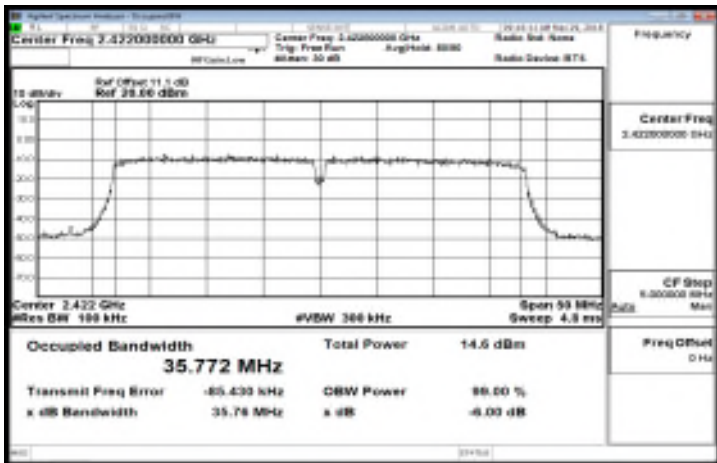
6dB Band Width Test Data CH-Low (2422MHz)



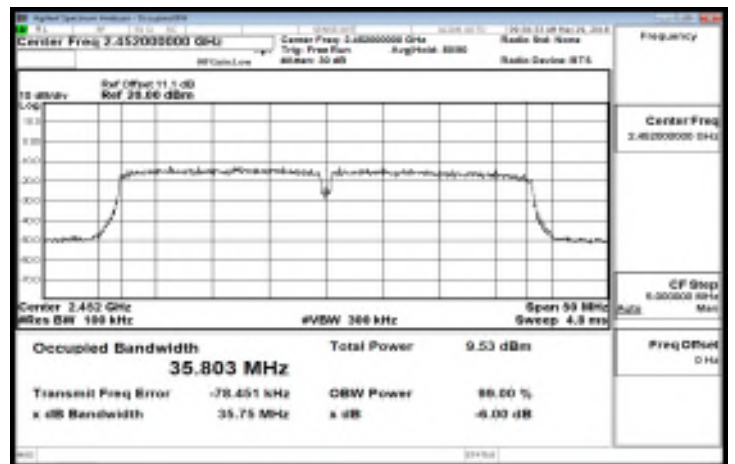
6dB Band Width Test Data CH-High (2447MHz)



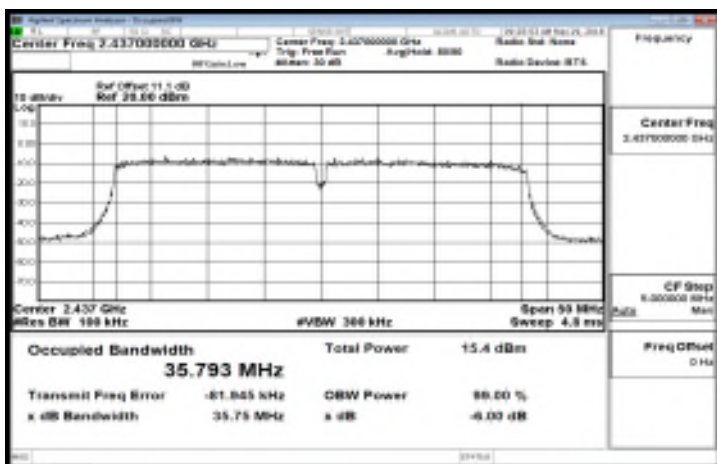
6dB Band Width Test Data CH-Low (2427MHz)



6dB Band Width Test Data CH-High (2452MHz)



6dB Band Width Test Data CH-Mid

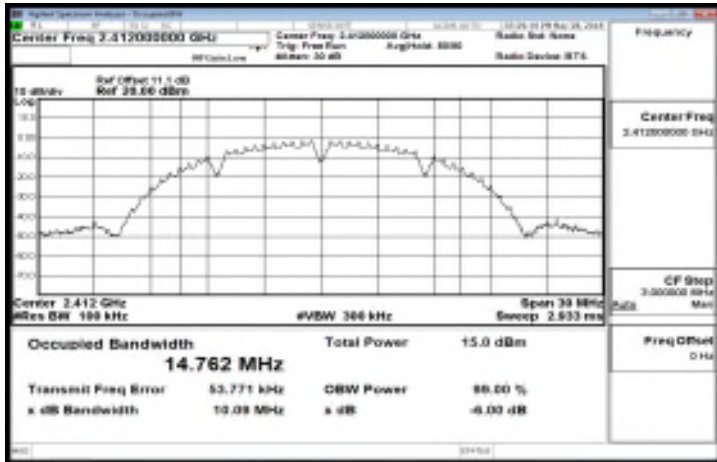


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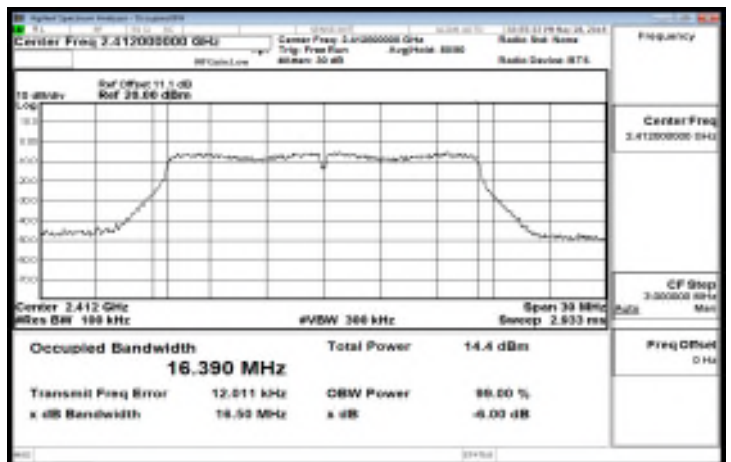
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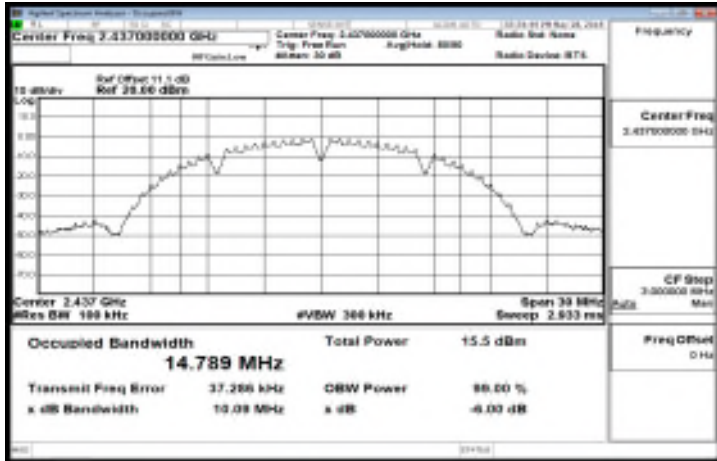
802.11b (Aux)
6dB Band Width Test Data CH-Low



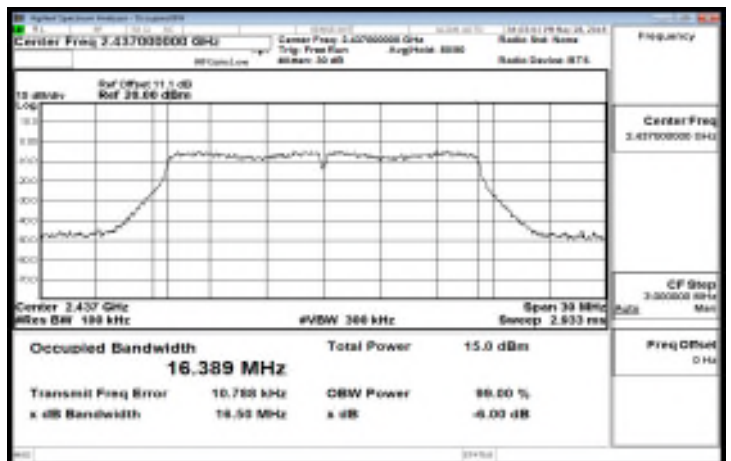
802.11g (Aux)
6dB Band Width Test Data CH-Low



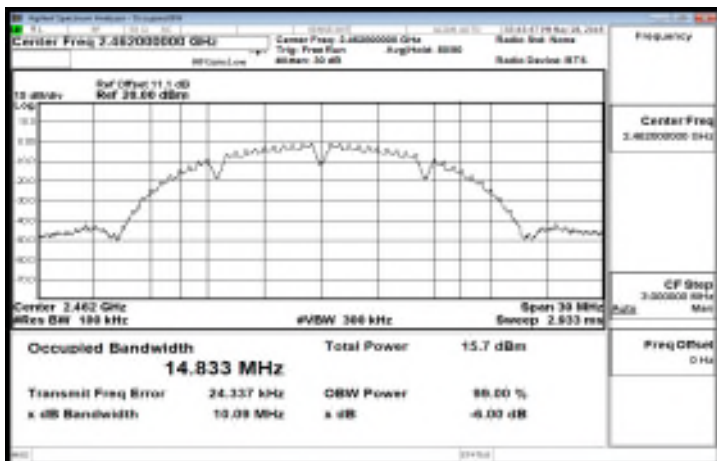
6dB Band Width Test Data CH-Mid



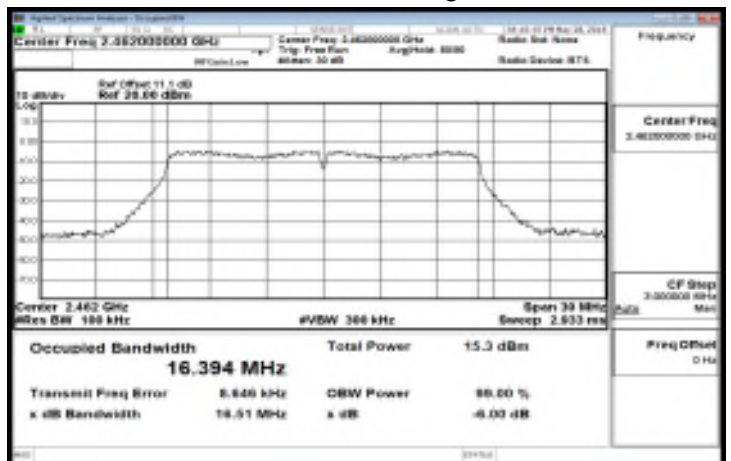
6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High



6dB Band Width Test Data CH-High



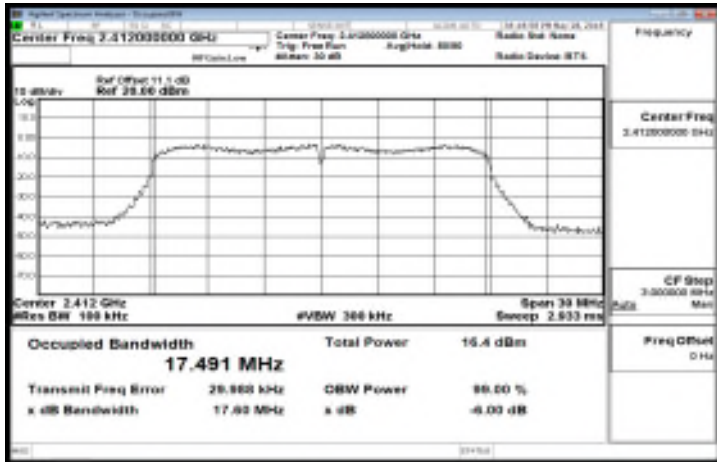
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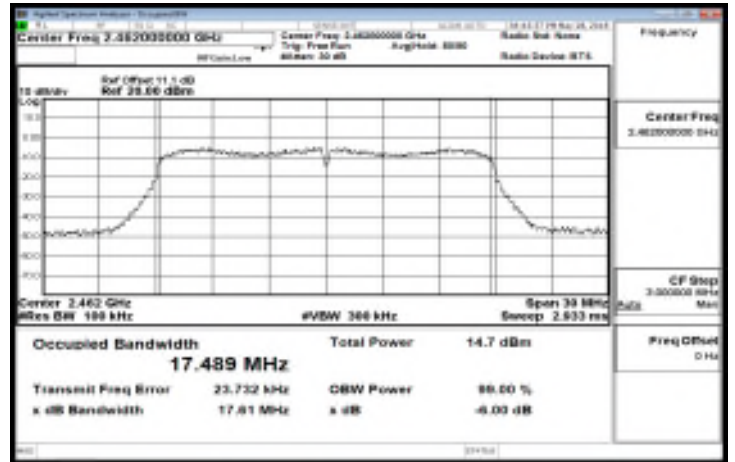
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802.11n_20M (Aux)

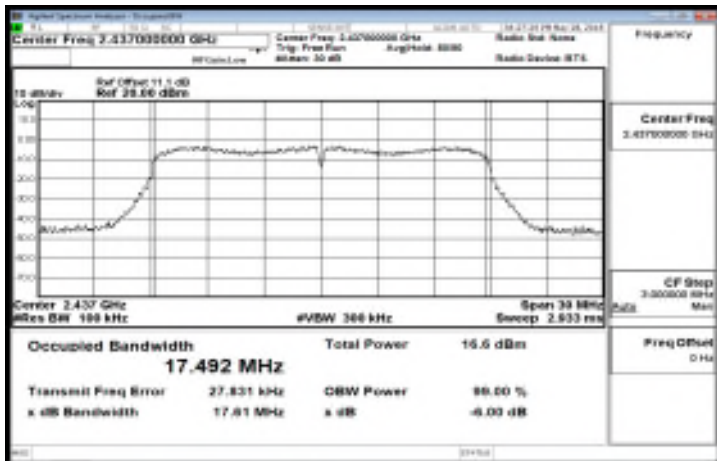
6dB Band Width Test Data CH-Low



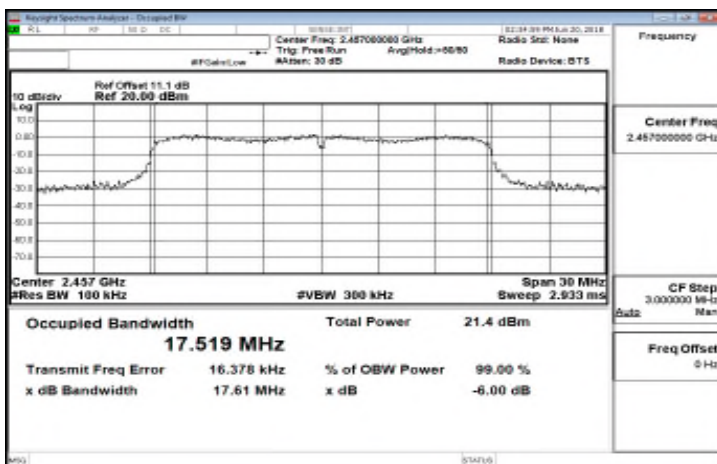
6dB Band Width Test Data CH-High (262MHz)



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High (2457MHz)



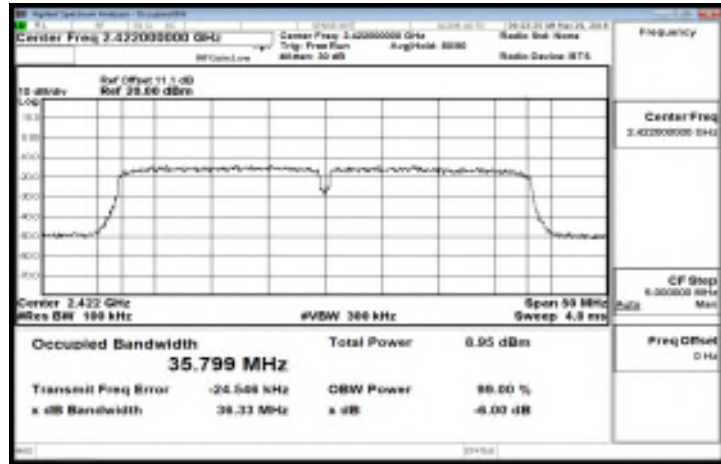
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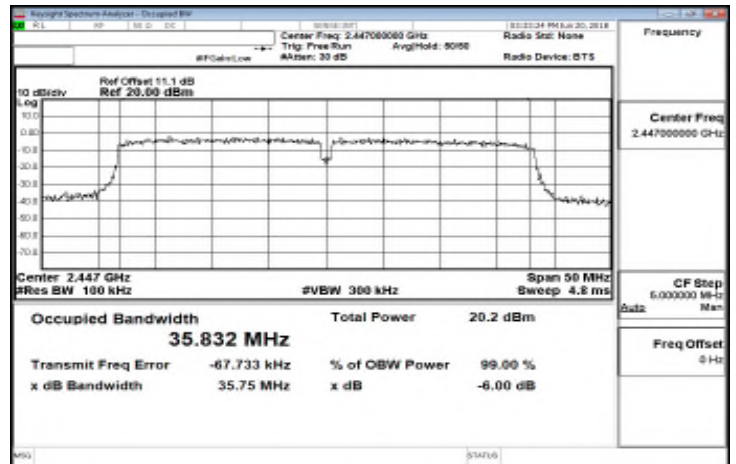
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802.11n_40M (Aux)

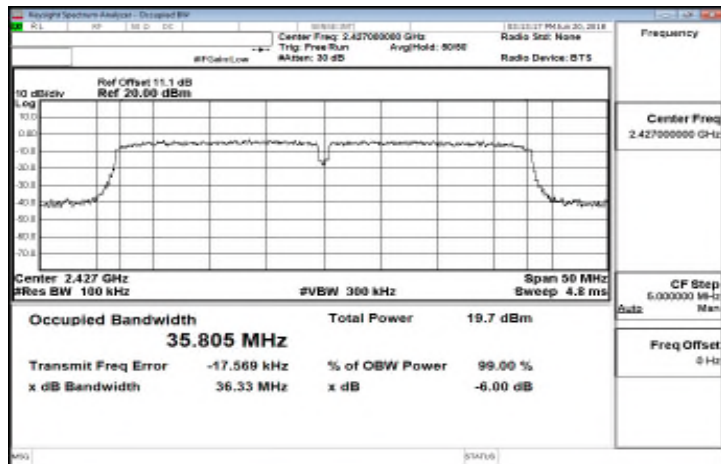
6dB Band Width Test Data CH-Low (2422MHz)



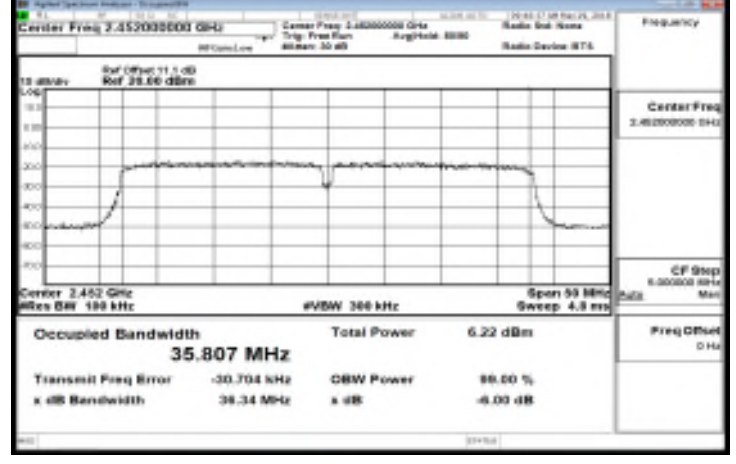
6dB Band Width Test Data CH-High (2447MHz)



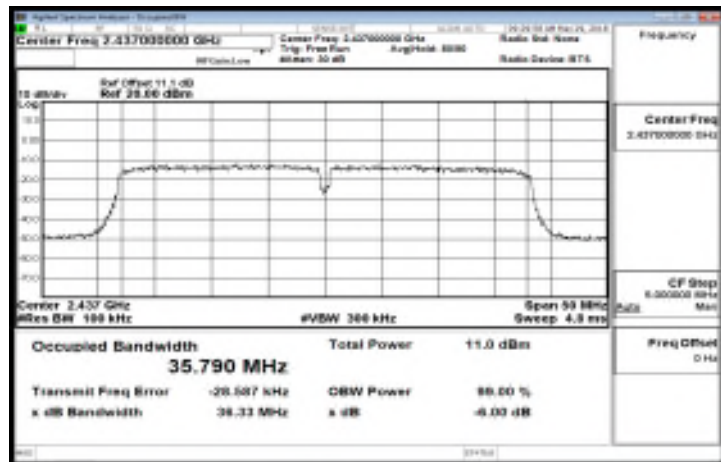
6dB Band Width Test Data CH-Low (2427MHz)



6dB Band Width Test Data CH-High (2452MHz)



6dB Band Width Test Data CH-Mid



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10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

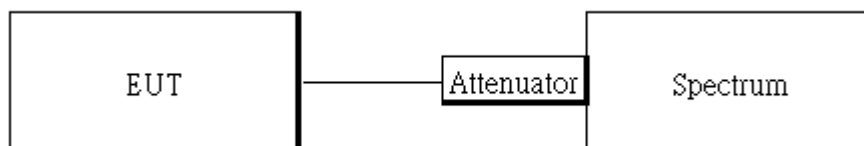
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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), must also comply with the radiated emission limits specified in §15.209(a).

10.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018
Power Meter	Anritsu	ML2496A	1326001	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315048	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315049	06/23/2017	06/22/2018
Coaxial Cable 30cm	WOKEN	00100A1F1A1 95C	RF01	12/24/2017	12/23/2018
DC Block	PASTERNAK	PE8210	RF29	12/24/2017	12/23/2018
Splitter	RF-LAMBAD	RFLT2W1G18 G	RF35	12/24/2017	12/23/2018
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2018	05/01/2019

10.3 Test SET-UP



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10.4 Measurement Procedure

Reference Level of Emission Calculation:

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.
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 1 – 20dBm
8. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 kHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
9. Repeat above procedures until all default test channel (low, middle, and high) was complete.

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Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Repeat above procedures until all default test channel measured were complete.

10.5 Measurement Result

Reference Level of Limit 802.11b mode		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	-1.28	-21.28
2462	-0.74	-20.74
Reference Level of Limit 802.11g mode		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	-5.18	-25.18
2462	-4.38	-24.38
Reference Level of Limit 802.11n20 mode		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	-3.06	-23.06
2462	-4.91	-24.91
2457	0.85	-19.16
Reference Level of Limit 802.11n40 MODE		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2422	-7.8	-27.80
2452	-12.63	-32.63
2427	-3.706	-23.71
2447	-1.699	-21.70

offset 11.10 dB for SISO mode
 offset 11.10 dB for MIMO mode

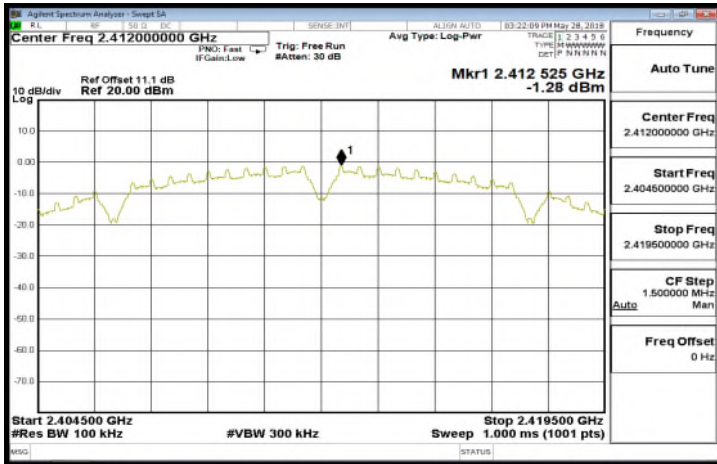
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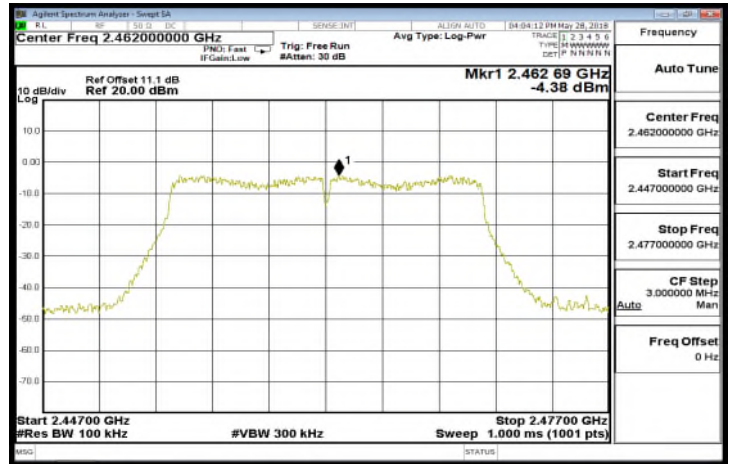
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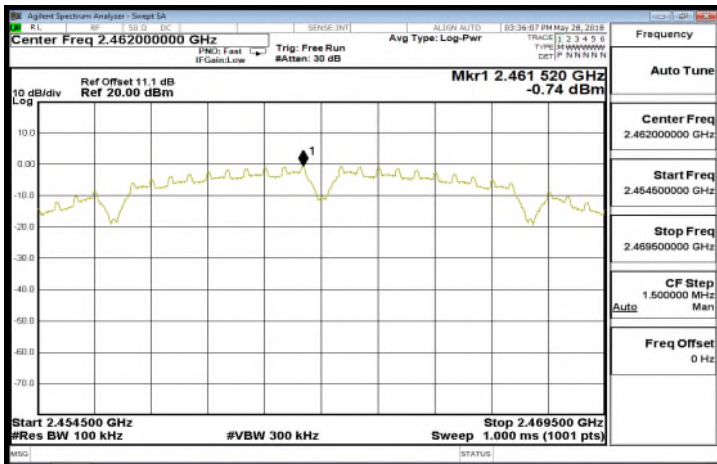
802.11b Band Edge Limit Test Data CH-Low



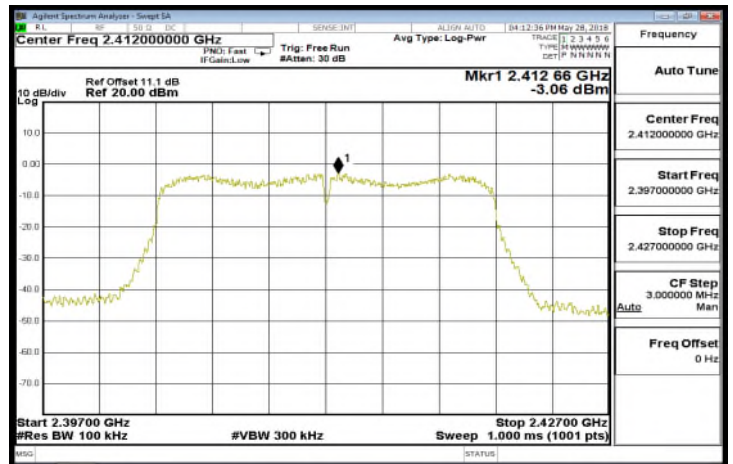
802.11g Band Edge Limit Test Data CH-High



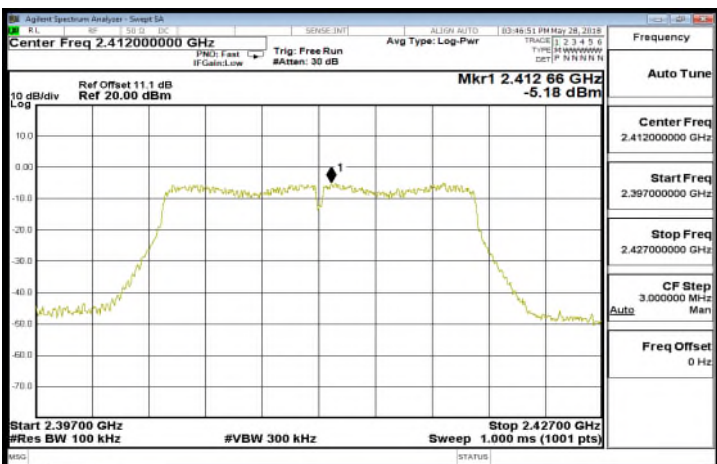
802.11b Band Edge Limit Test Data CH-High



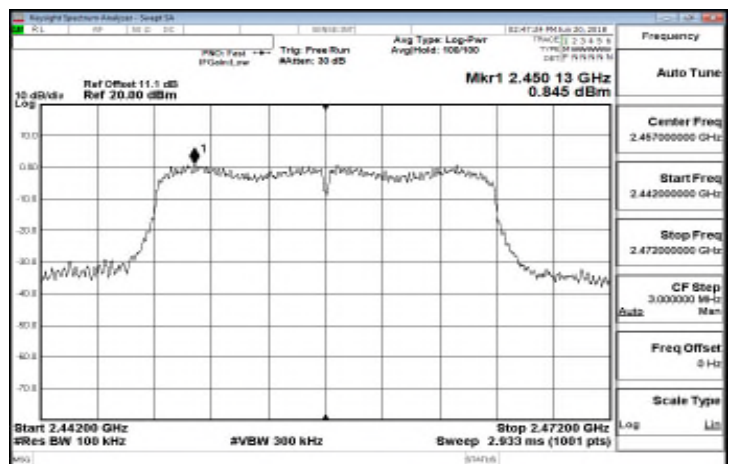
802.11n_HT20 Band Edge Limit Test Data CH-Low



802.11g Band Edge Limit Test Data CH-Low



802.11n_HT20 Band Edge Limit Test Data CH-High (2457HMz)

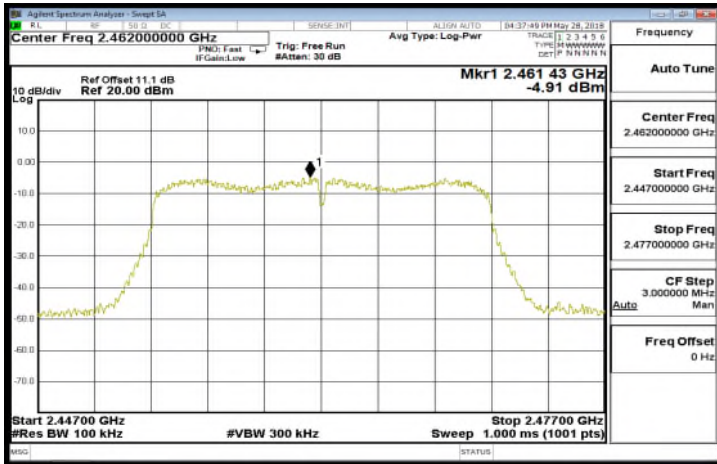


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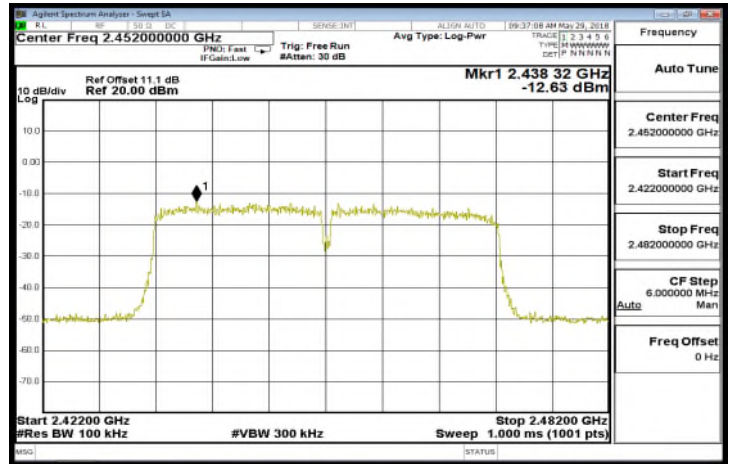
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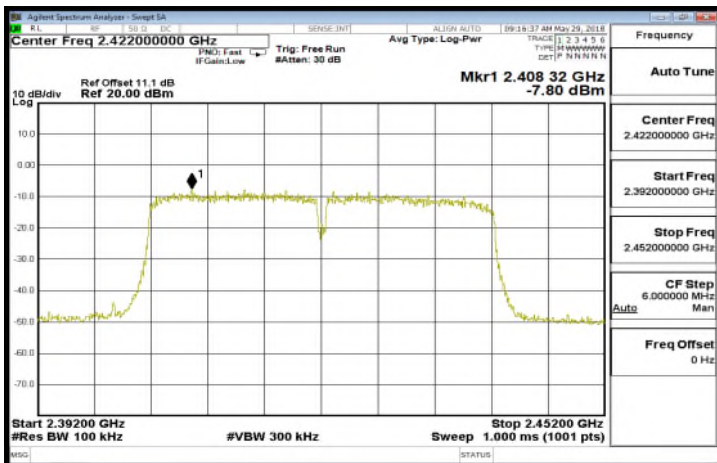
802.11n_HT20 Band Edge Limit Test Data CH-High (2462MHz)



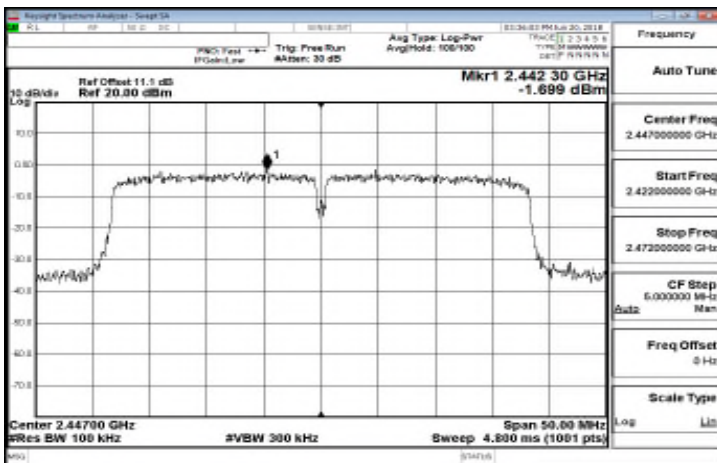
802.11n_HT40 Band Edge Limit Test Data CH-High (2452MHz)



802.11n_HT40 Band Edge Limit Test Data CH-Low (2422MHz)



802.11n_HT40 Band Edge Limit Test Data CH-High (2447MHz)

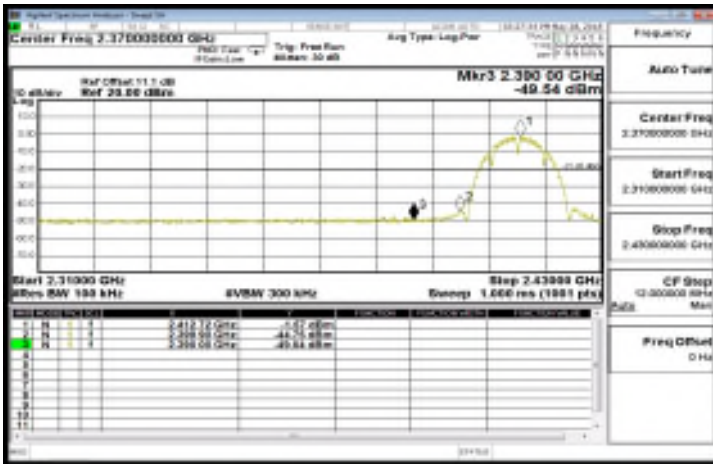


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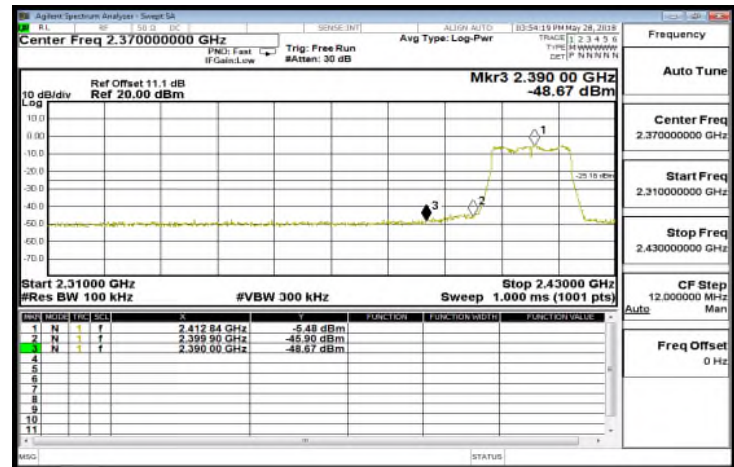
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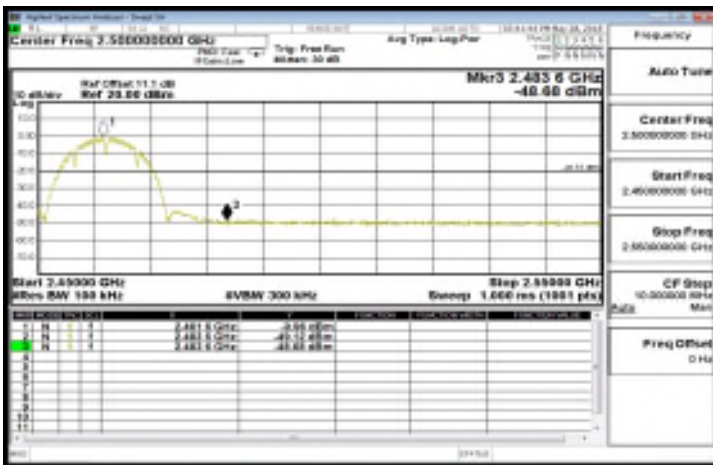
802.11b
Band Edge Test Data CH-Low



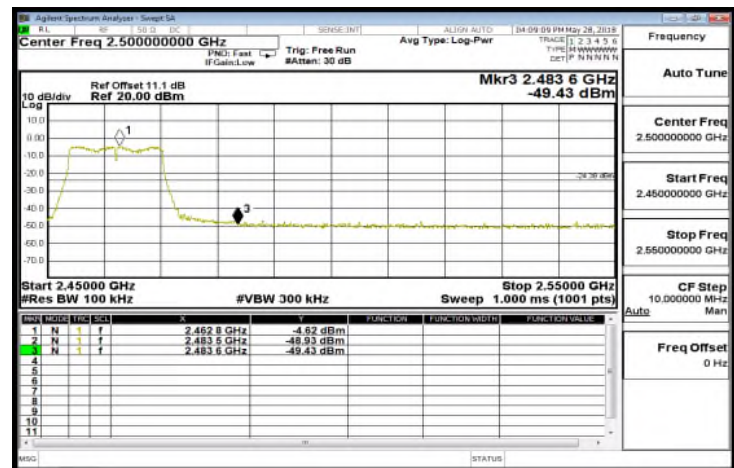
802.11g
Band Edge Test Data CH-Low



Band Edge Test Data CH-High



Band Edge Test Data CH-High

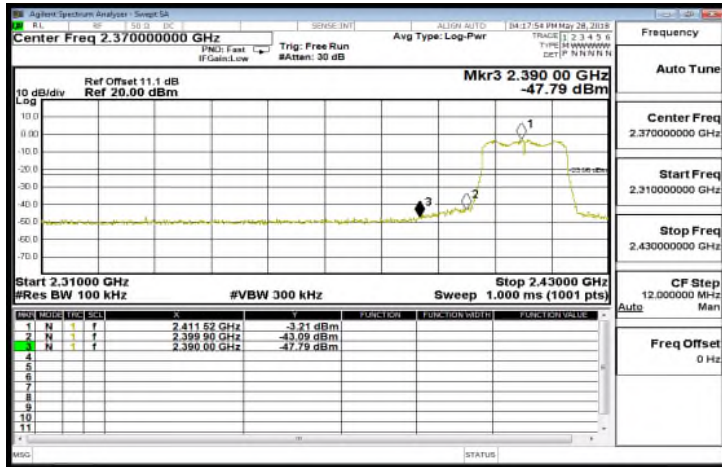


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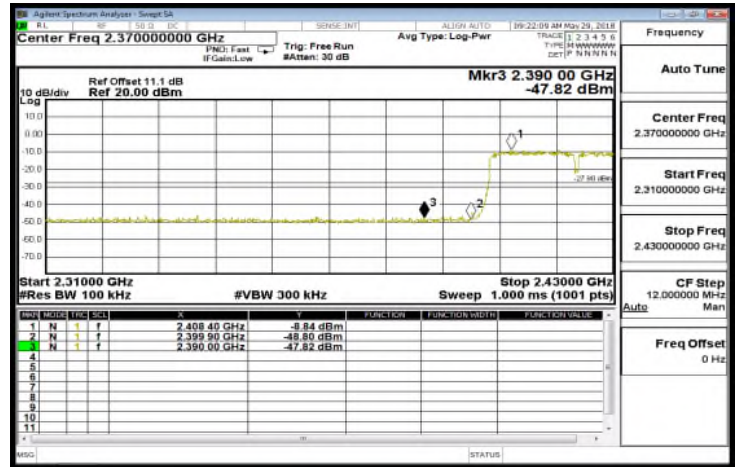
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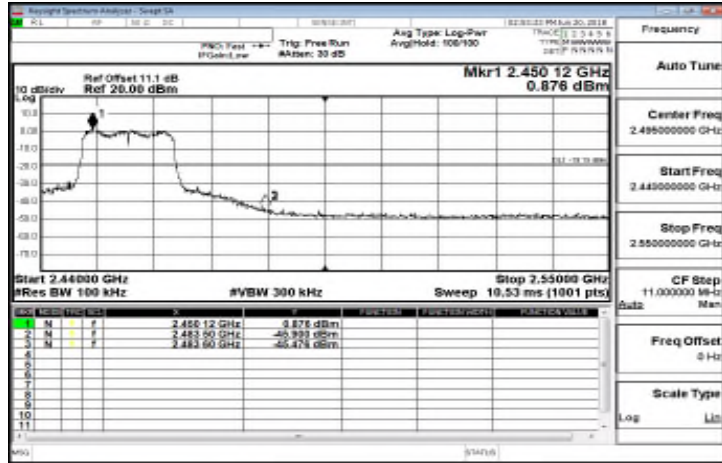
802.11n_HT20
Band Edge Test Data CH-Low



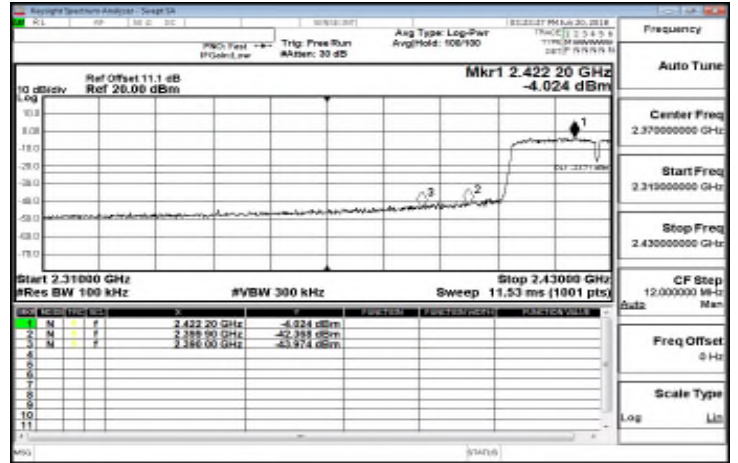
802.11n_HT40
Band Edge Test Data CH-Low (2422HMz)



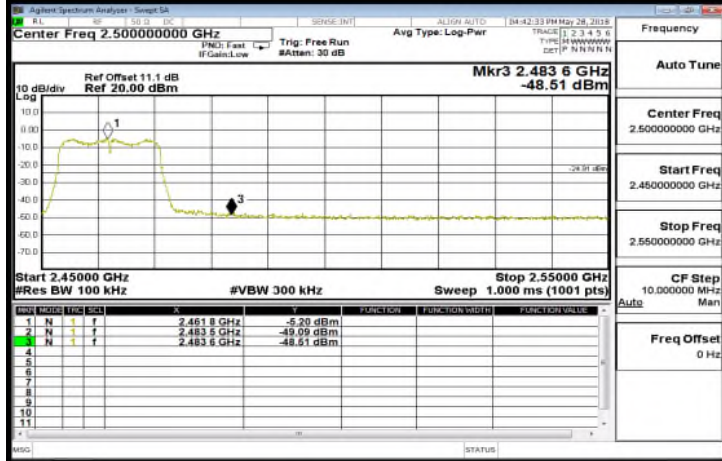
Band Edge Test Data CH-High (2457HMz)



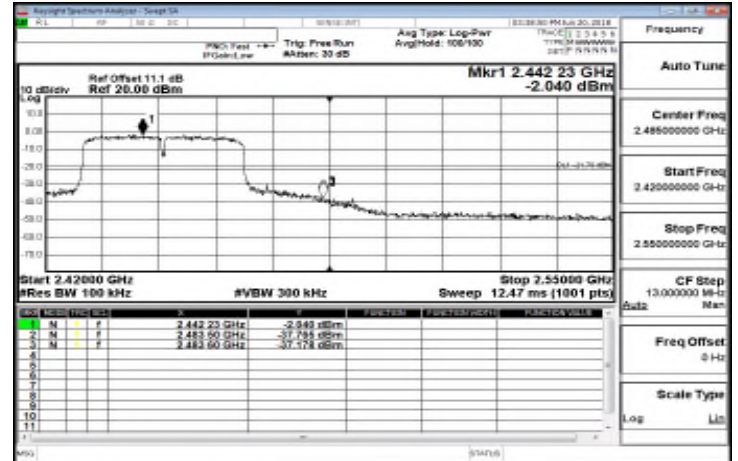
Band Edge Test Data CH-Low (2427HMz)



Band Edge Test Data CH-High (2462HMz)



Band Edge Test Data CH-High (2447HMz)

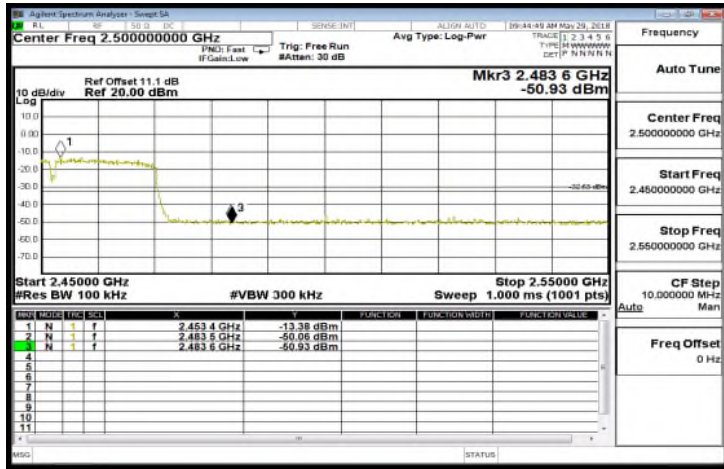


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Band Edge Test Data CH-High (2452HMz)



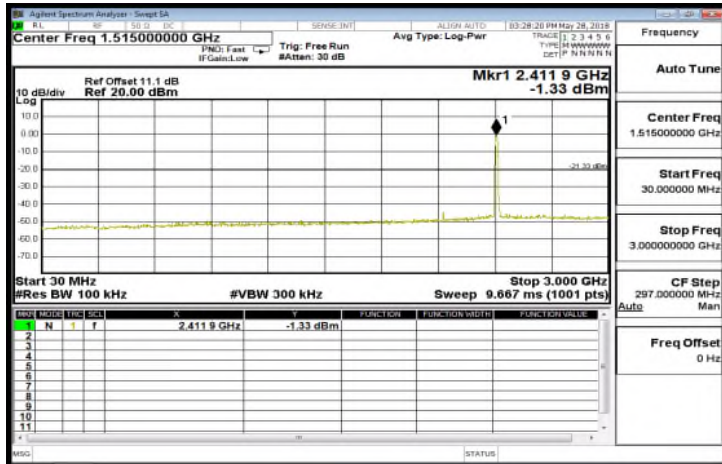
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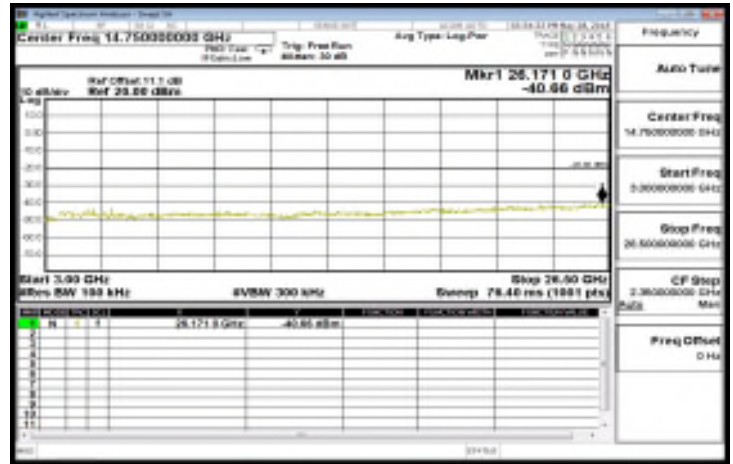
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802.11b

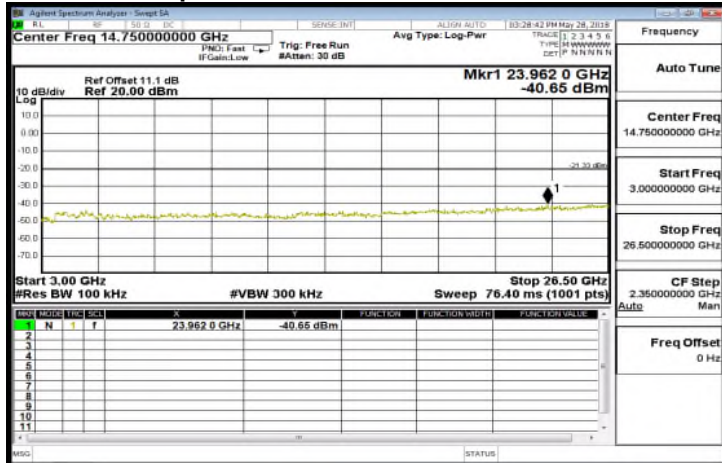
30M-3GHz Spurious Emission Test Data CH-Low



3G-26.5GHz Spurious Emission Test Data CH-Mid



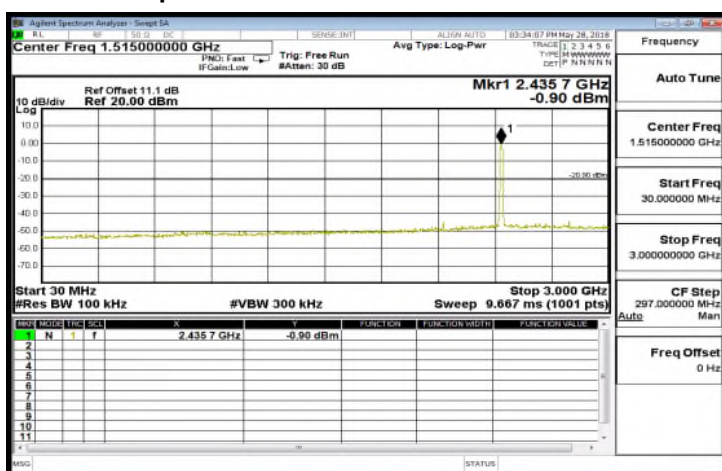
3G-26.5GHz Spurious Emission Test Data CH-Low



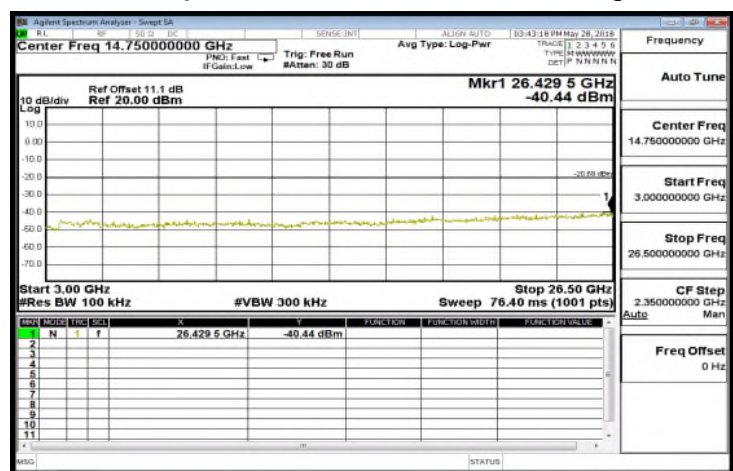
30M-3GHz Spurious Emission Test Data CH-High



30M-3GHz Spurious Emission Test Data CH-Mid



3G-26.5GHz Spurious Emission Test Data CH-High

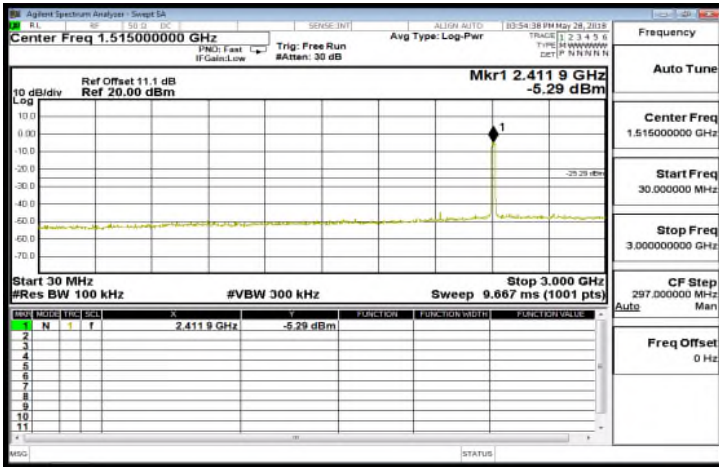


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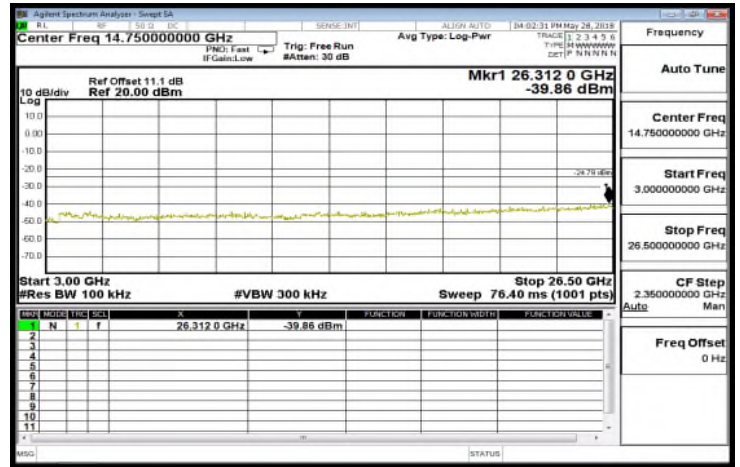
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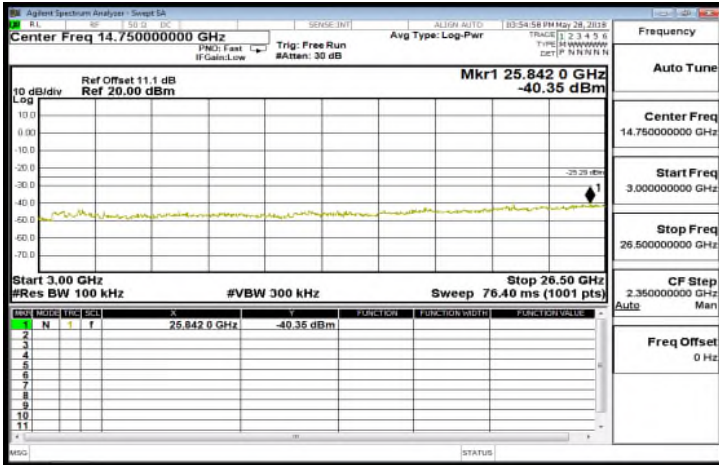
802.11g
30M-3GHz Spurious Emission Test Data CH-Low



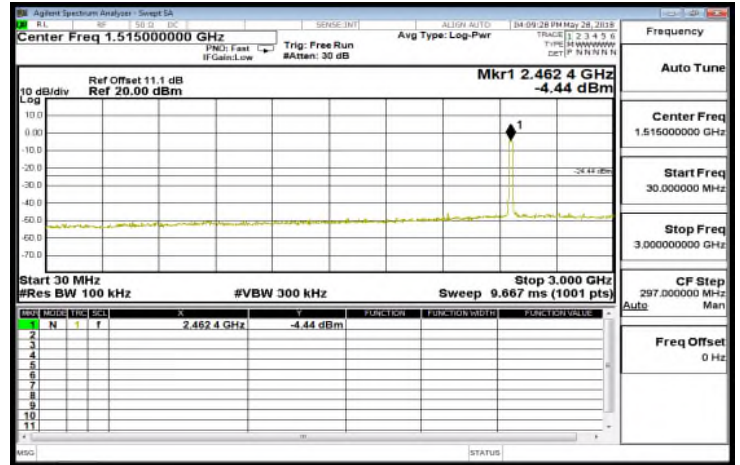
3G-26.5GHz Spurious Emission Test Data CH-Mid



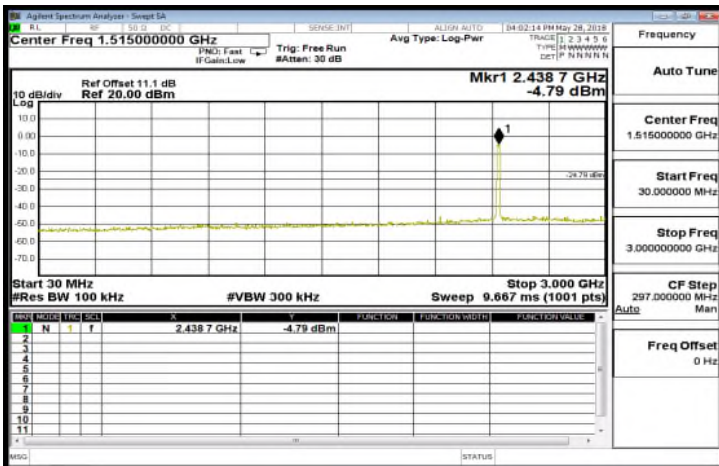
3G-26.5GHz Spurious Emission Test Data CH-Low



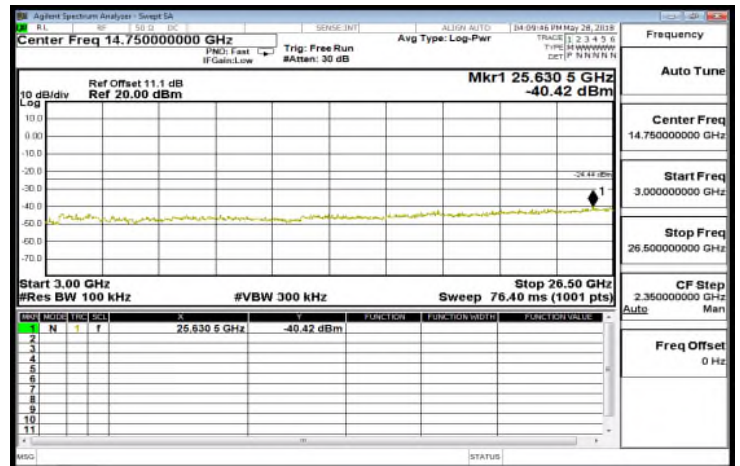
30M-3GHz Spurious Emission Test Data CH-High



30M-3GHz Spurious Emission Test Data CH-Mid



3G-26.5GHz Spurious Emission Test Data CH-High



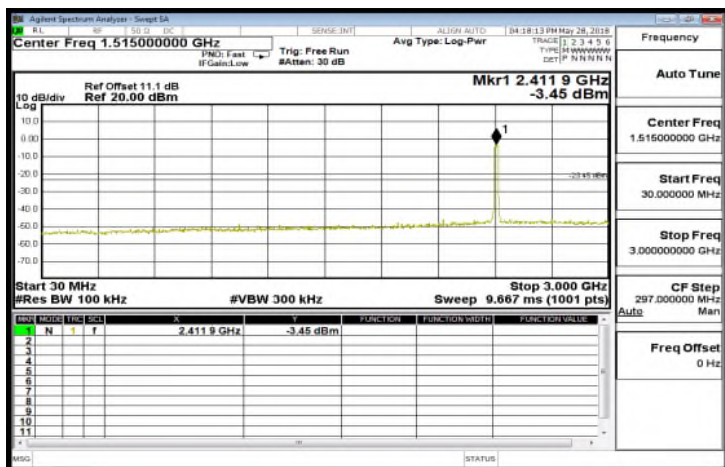
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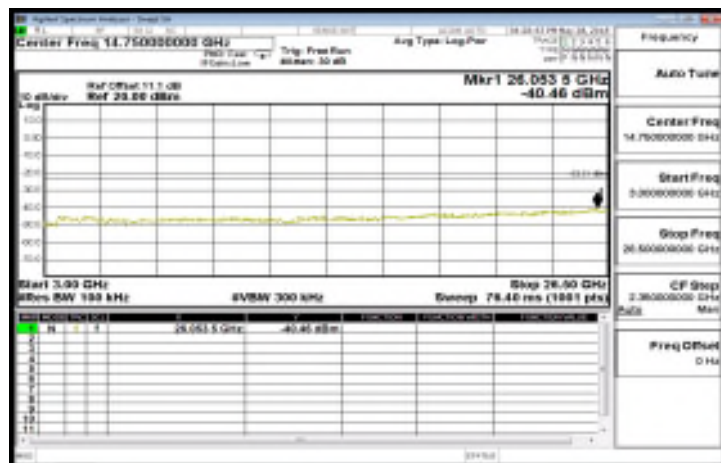
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802.11n_HT20

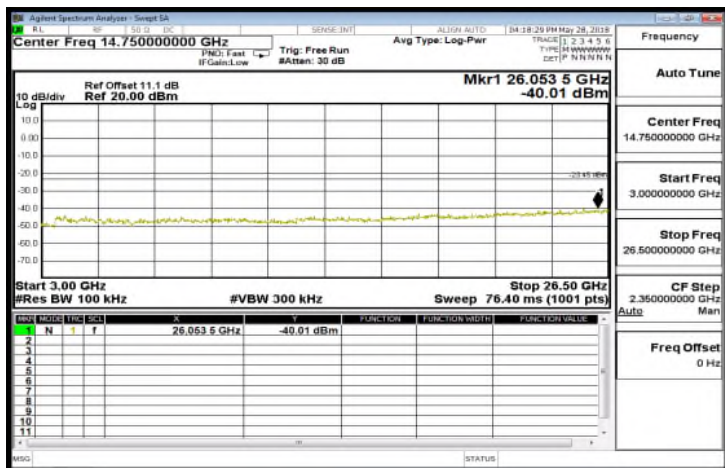
30M-3GHz Spurious Emission Test Data CH-Low



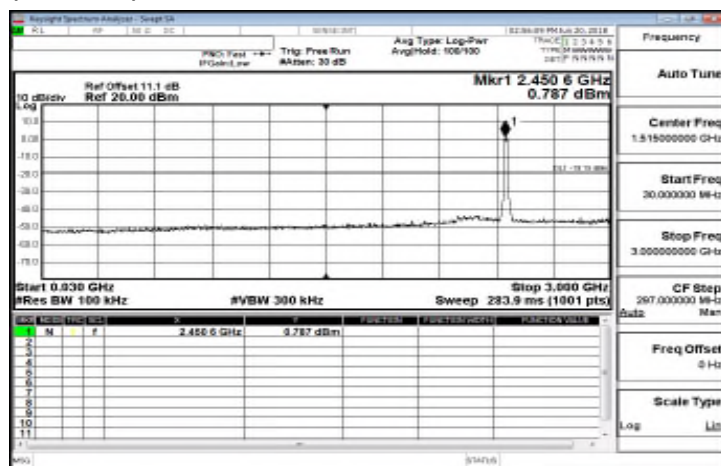
3G-26.5GHz Spurious Emission Test Data CH-Mid



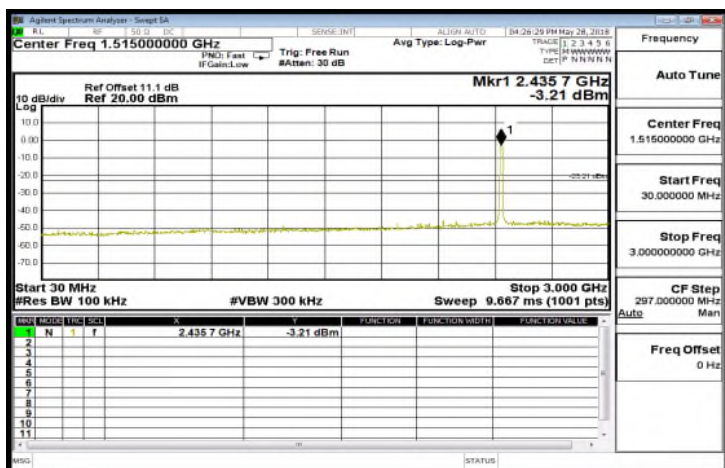
3G-26.5GHz Spurious Emission Test Data CH-Low



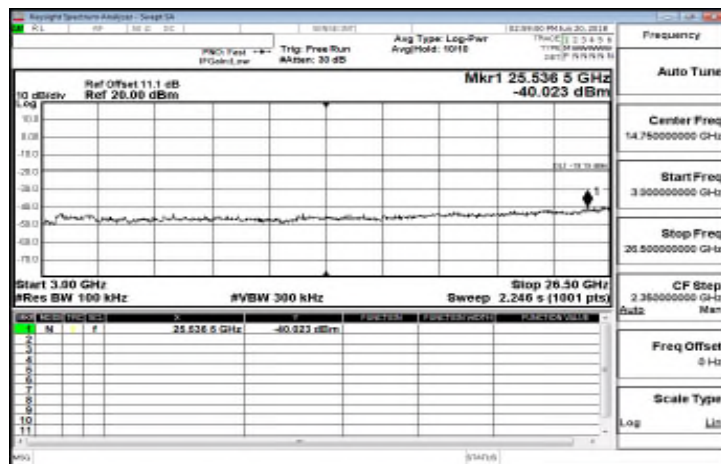
30M-3GHz Spurious Emission Test Data CH-High (2457MHz)



30M-3GHz Spurious Emission Test Data CH-Mid



3G-26.5GHz Spurious Emission Test Data CH-High (2457MHz)

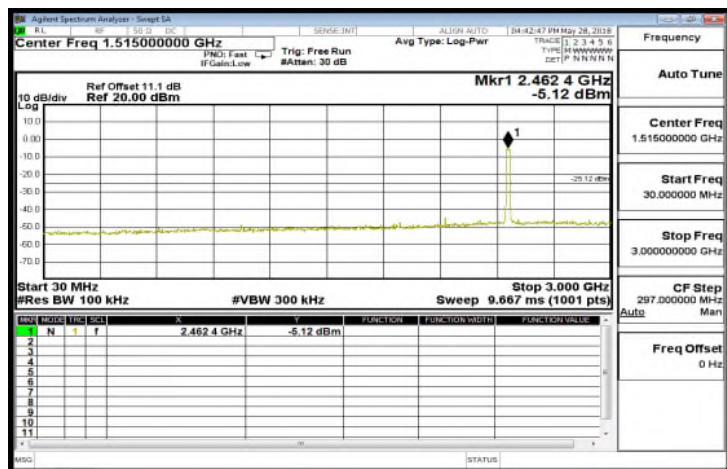


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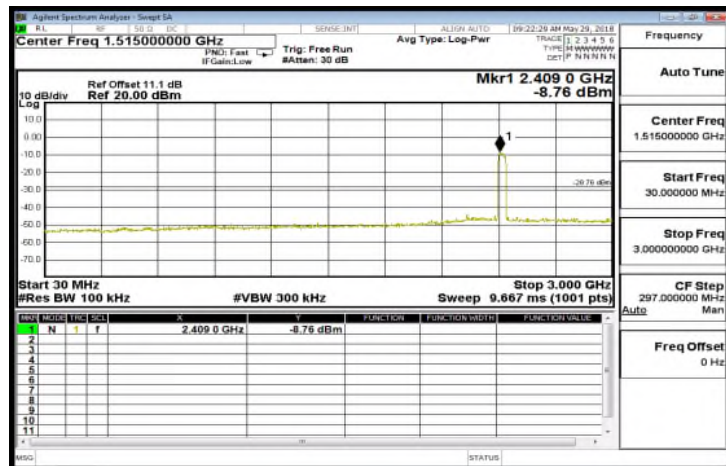
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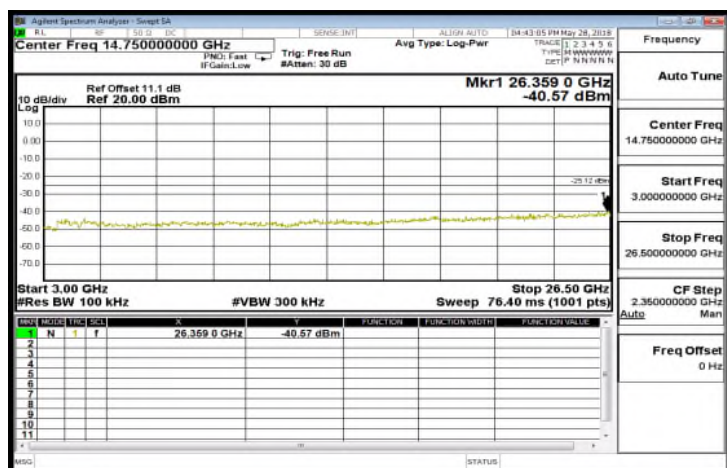
30M-3GHz Spurious Emission Test Data CH-High (2462MHz)



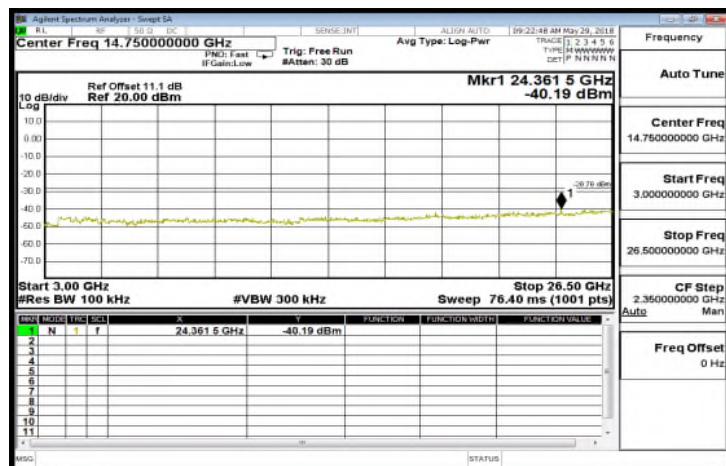
**802.11n_HT40
30M-3GHz Spurious Emission Test Data CH-Low (2422MHz)**



3G-26.5GHz Spurious Emission Test Data CH-High (2462MHz)



3G-26.5GHz Spurious Emission Test Data CH-Low (2422MHz)

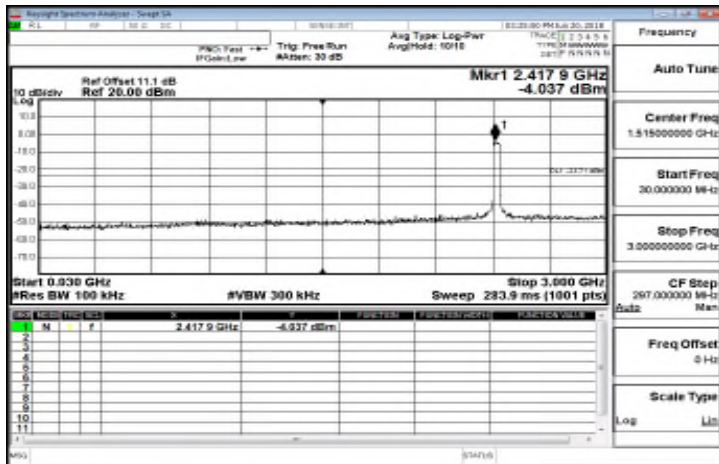


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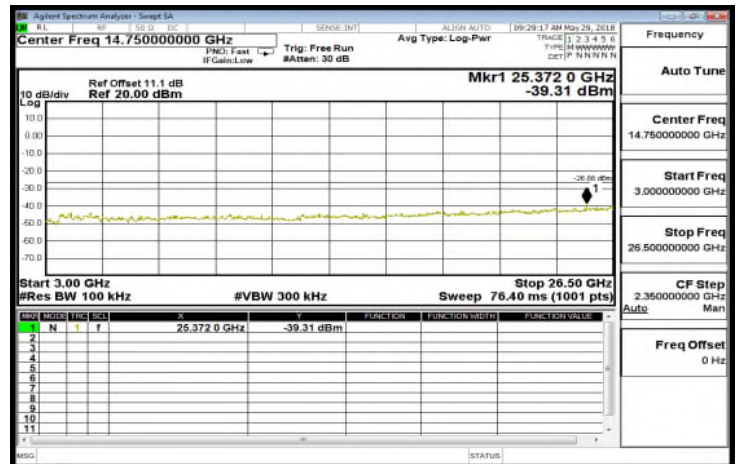
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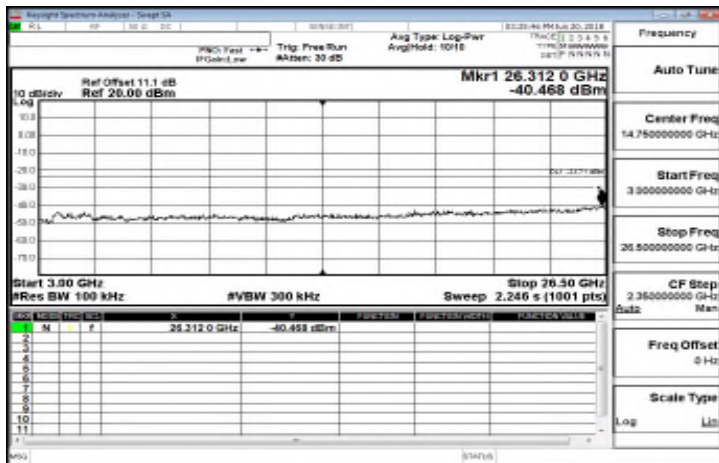
30M-3GHz Spurious Emission Test Data CH-Low (2427MHz)



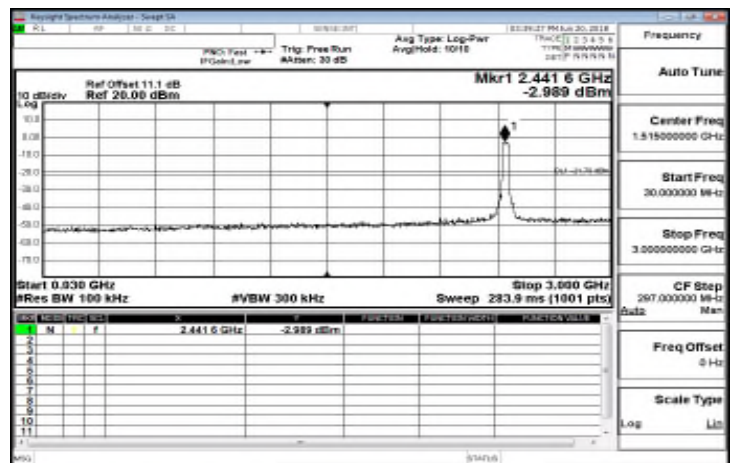
3G-26.5GHz Spurious Emission Test Data CH-Mid



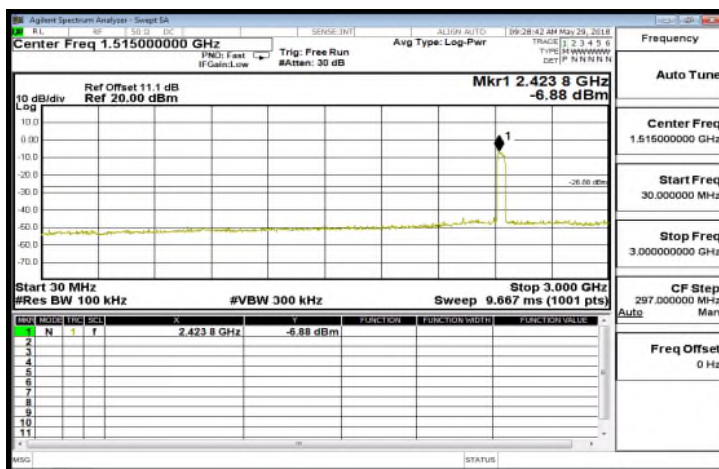
3G-26.5GHz Spurious Emission Test Data CH-Low (2427MHz)



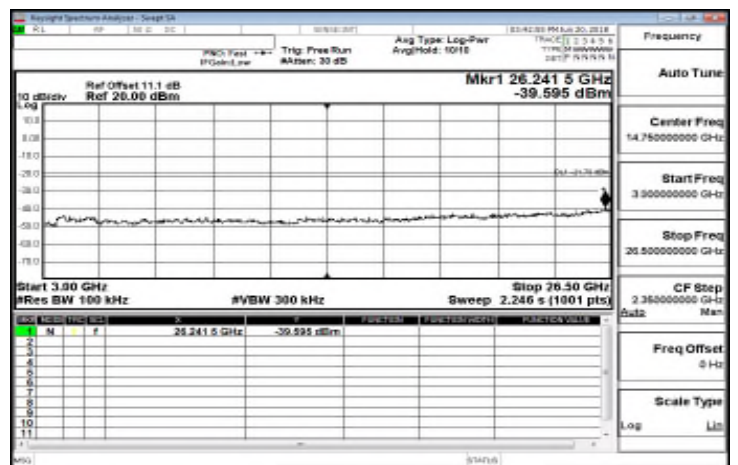
30M-3GHz Spurious Emission Test Data CH-High (2447MHz)



30M-3GHz Spurious Emission Test Data CH-Mid



3G-26.5GHz Spurious Emission Test Data CH-High (2447MHz)

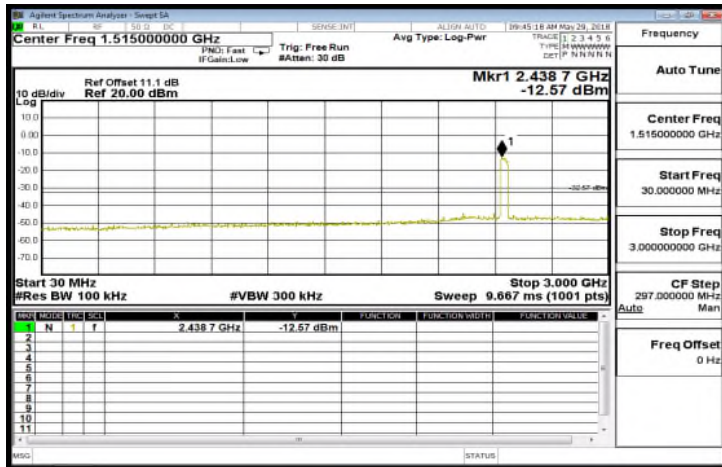


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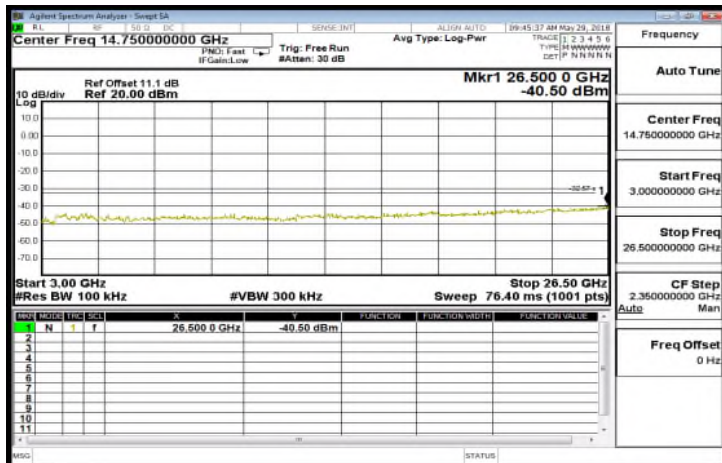
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30M-3GHz Spurious Emission Test Data CH-High (2452MHz)



3G-26.5GHz Spurious Emission Test Data CH-High (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 limit as below.

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

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

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

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11.2 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	SCHWAZBECK	VULB 9168	9168-617	10/27/2017	10/26/2018
Horn Antenna	Schwarzbeck	BBHA9120D	1341	05/31/2017	05/30/2018
Loop Antenna	ETS.LINDGREN	6502	148045	09/26/2017	09/25/2018
3m Site NSA	SGS	966 chamber D	N/A	07/06/2018	07/05/2019
EMI Test Receiver	R&S	ESU 40	100363	04/11/2018	04/10/2019
Pre-Amplifier	EMC Instruments	EMC184045B	980135	10/27/2017	10/26/2018
Pre-Amplifier	EMC Instruments	EMC9135	980234	12/26/2017	12/25/2018
Pre-Amplifier	EMC Instruments	EMC12630SE	980271	12/26/2017	12/25/2018
Attenuator	Marvelous	WATT-218FS-10	RF246	12/26/2017	12/25/2018
Highpass Filter	Micro Tronics	BRM50701-01	G008	12/26/2017	12/25/2018
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	12/26/2017	12/25/2018
Coaxial Cable	Huber Suhner	EMC106-SM-SM-7200	150703	12/26/2017	12/25/2018
Notebook	Lenovo	L420	S0012467	N/A	N/A

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

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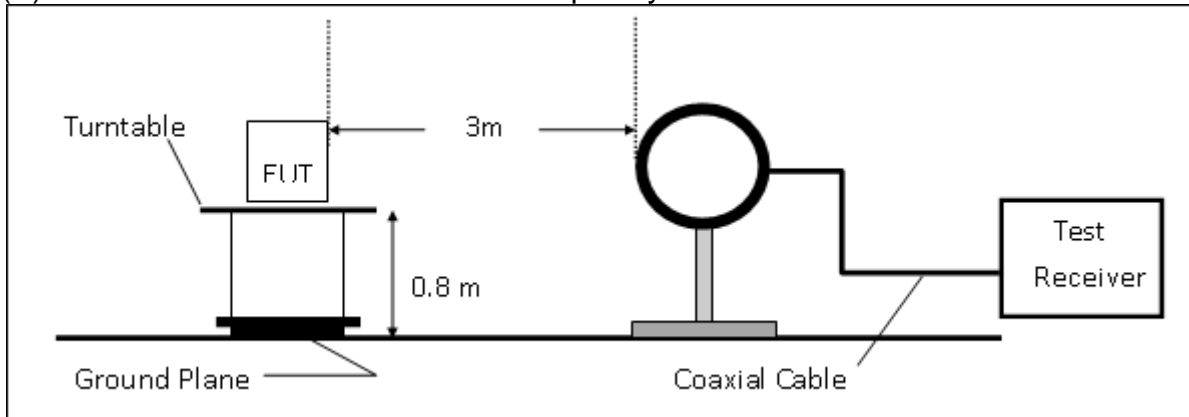
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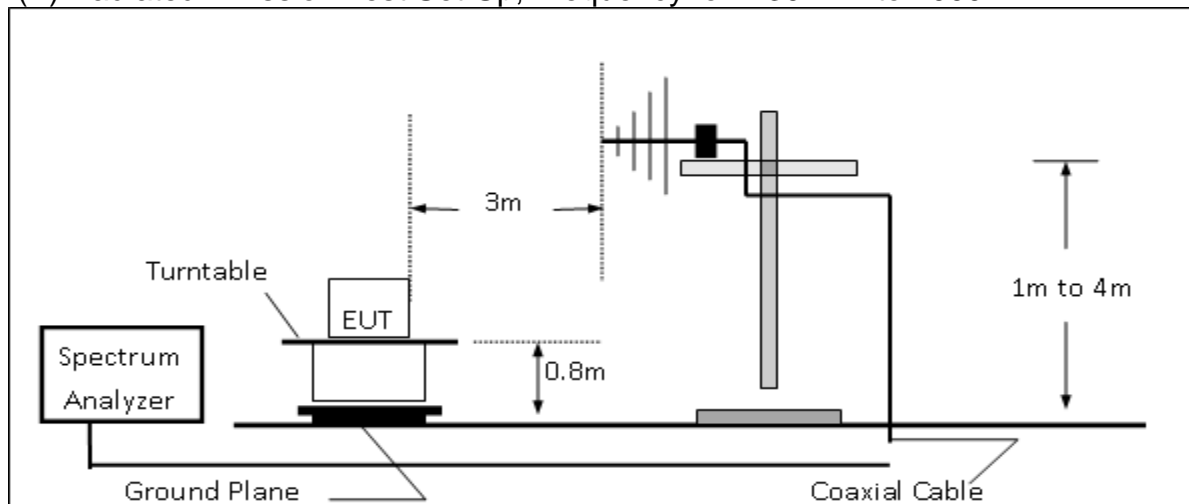
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11.3 Test SET-UP

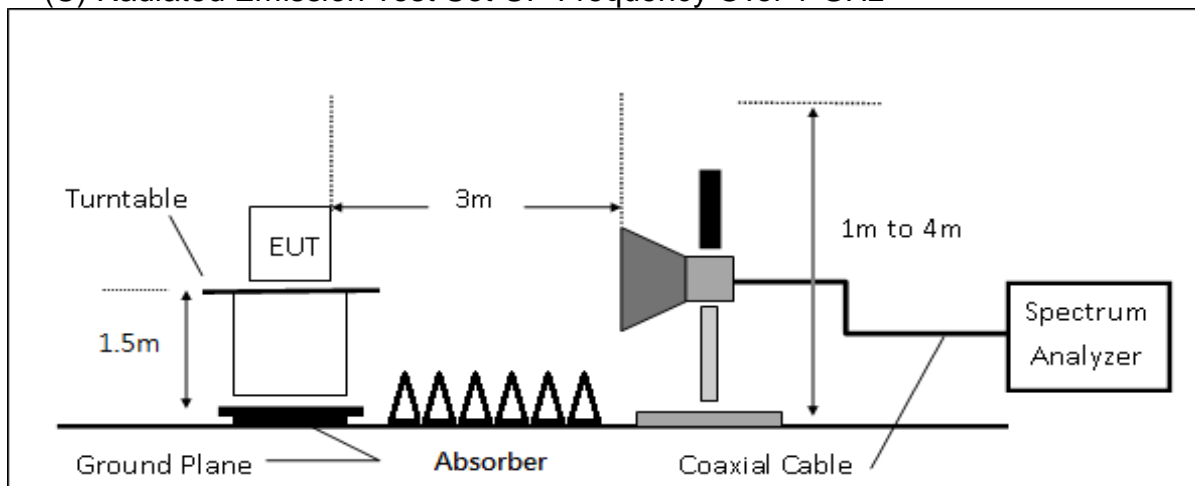
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



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



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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11.4 Measurement Procedure

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

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11.5 Field Strength Calculation

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

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

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

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 form 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) was not reported.

11.7 Measurement Result

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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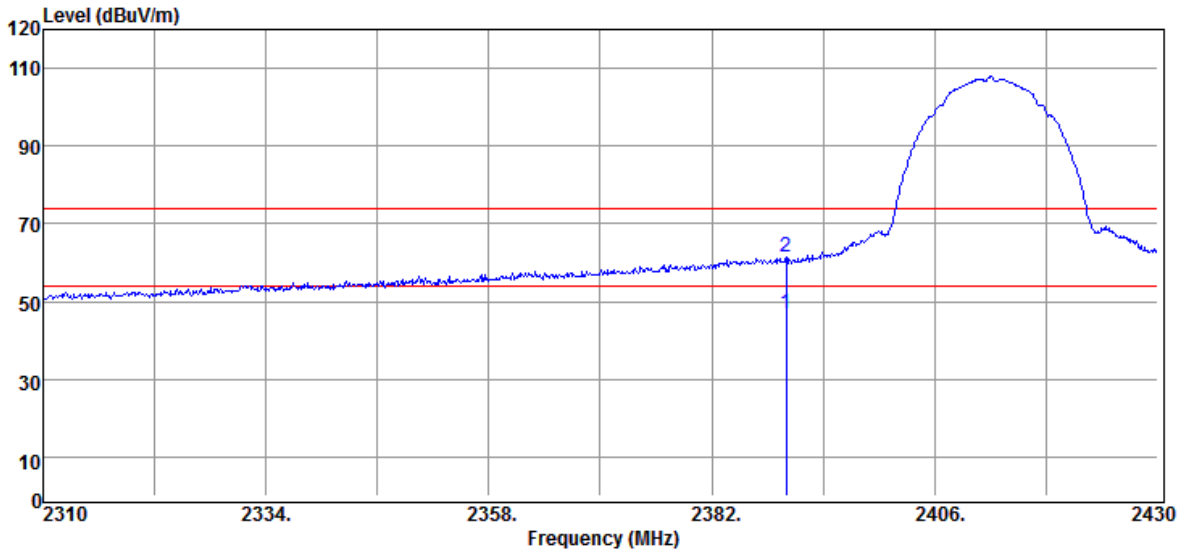
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Radiated Band Edge Measurement Result (802.11b)

Operation Mode	:802.11b	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2390.00	Average	52.46	-5.57	46.89	54.00	-7.11
2390.00	Peak	67.00	-5.57	61.43	74.00	-12.57

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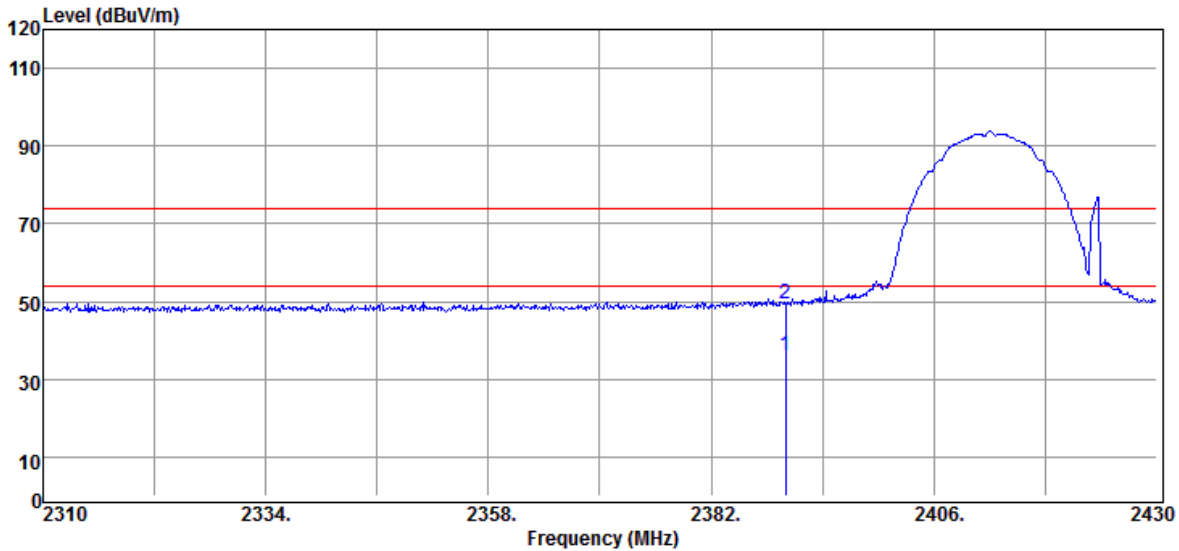
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Operation Mode	:802.11b	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Average	41.80	-5.57	36.23	54.00	-17.77
2390.00	Peak	55.06	-5.57	49.49	74.00	-24.51

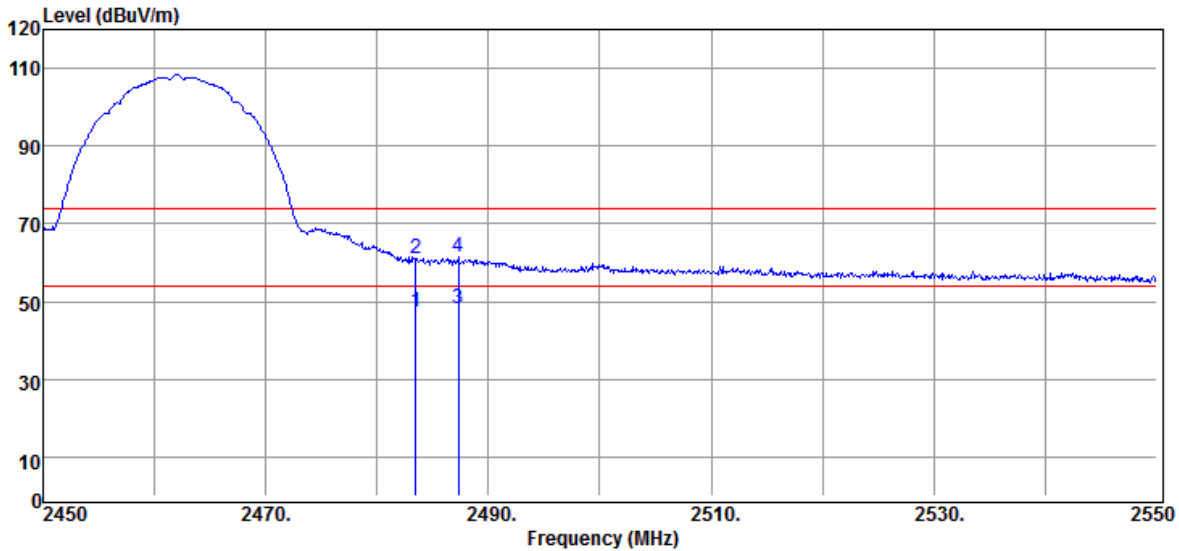
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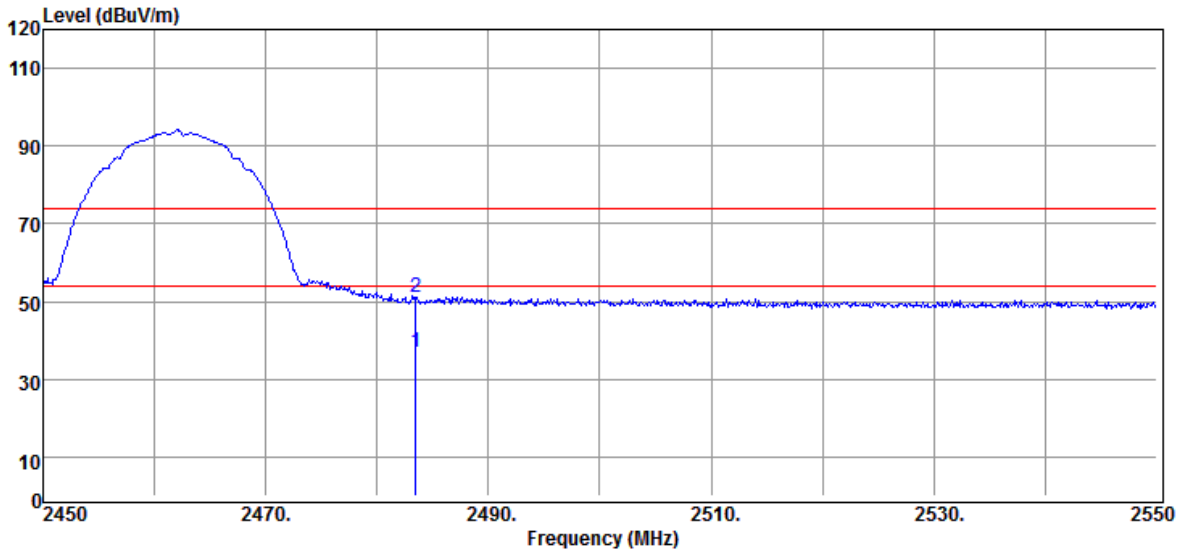
Operation Mode	:802.11b	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	52.26	-4.90	47.36	54.00	-6.64
2483.50	Peak	65.98	-4.90	61.08	74.00	-12.92
2487.30	Average	52.94	-4.87	48.07	54.00	-5.93
2487.30	Peak	66.27	-4.87	61.40	74.00	-12.60

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Operation Mode	:802.11b	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	42.00	-4.90	37.10	54.00	-16.90
2483.50	Peak	55.86	-4.90	50.96	74.00	-23.04

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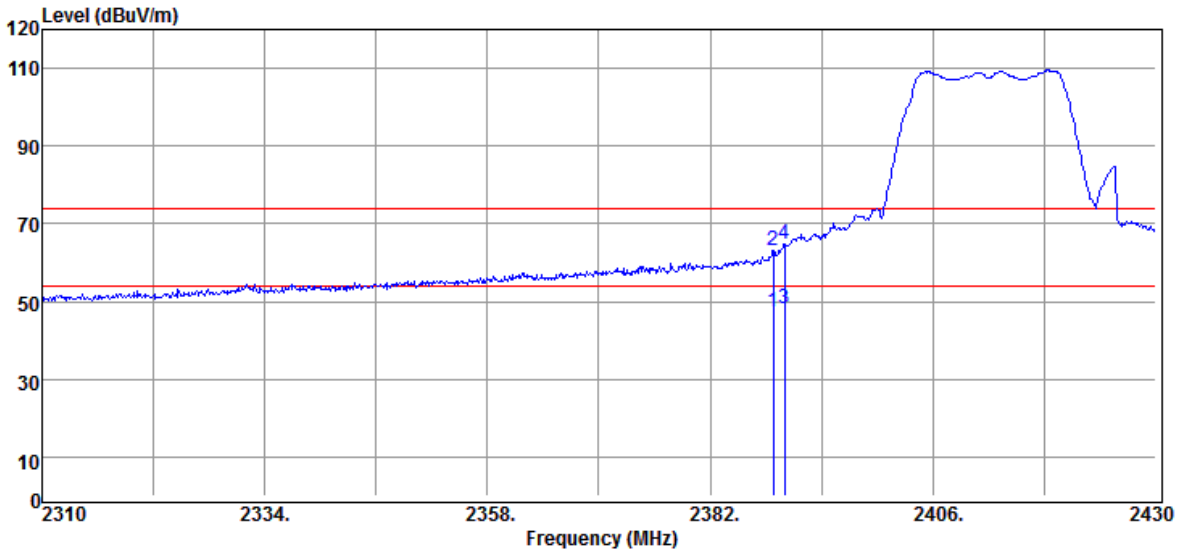
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Radiated Band Edge Measurement Result (802.11g)

Operation Mode	:802.11g	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2388.84	Average	52.72	-5.57	47.15	54.00	-6.85
2388.84	Peak	68.63	-5.57	63.06	74.00	-10.94
2390.00	Average	53.65	-5.57	48.08	54.00	-5.92
2390.00	Peak	70.20	-5.57	64.63	74.00	-9.37

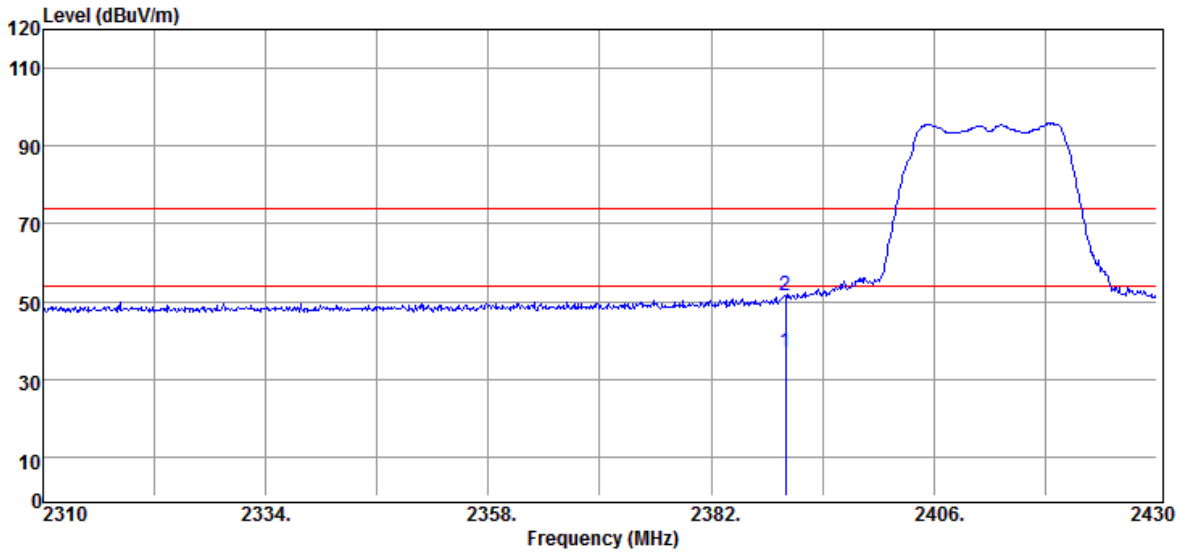
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Operation Mode	:802.11g	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2390.00	Average	42.42	-5.57	36.85	54.00	-17.15
2390.00	Peak	57.06	-5.57	51.49	74.00	-22.51

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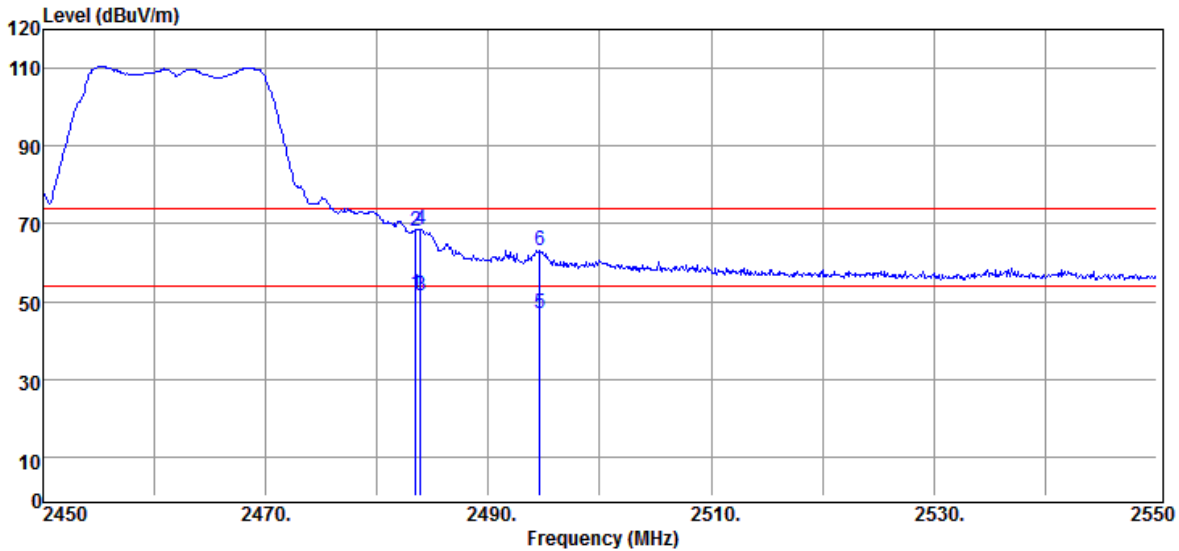
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Operation Mode	:802.11g	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	56.96	-4.90	52.06	54.00	-1.94
2483.50	Peak	73.02	-4.90	68.12	74.00	-5.88
2483.90	Average	56.38	-4.90	51.48	54.00	-2.52
2483.90	Peak	73.40	-4.90	68.50	74.00	-5.50
2494.60	Average	51.76	-4.81	46.95	54.00	-7.05
2494.60	Peak	68.12	-4.81	63.31	74.00	-10.69

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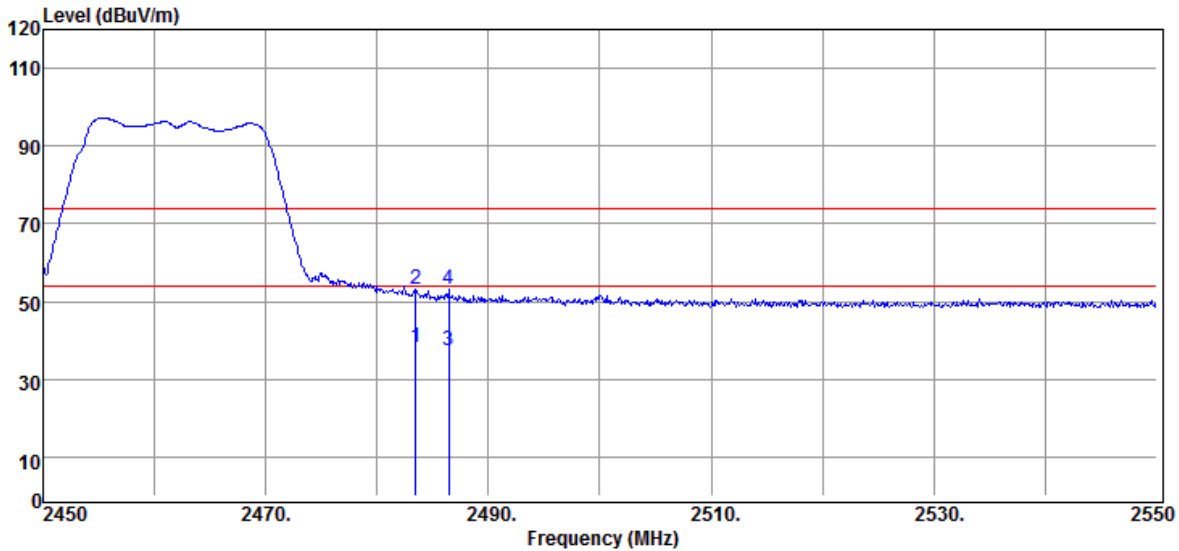
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Operation Mode	:802.11g	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	42.93	-4.90	38.03	54.00	-15.97
2483.50	Peak	58.08	-4.90	53.18	74.00	-20.82
2486.40	Average	42.16	-4.87	37.29	54.00	-16.71
2486.40	Peak	57.82	-4.87	52.95	74.00	-21.05

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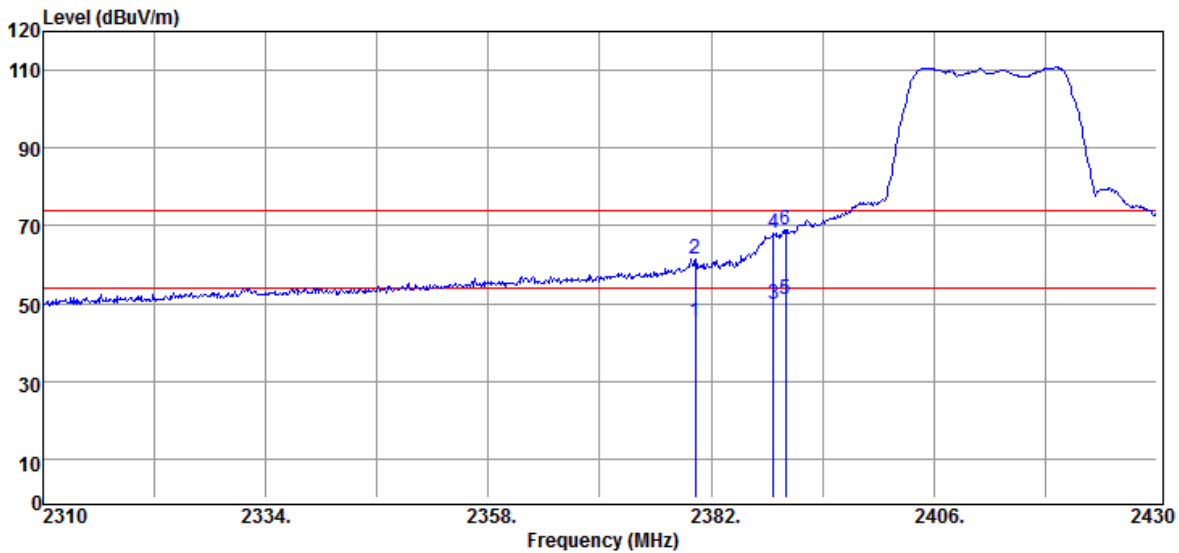
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Radiated Band Edge Measurement Result (802.11_HT20)

Operation Mode	:802.11n20	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2380.32	Average	50.86	-5.57	45.29	54.00	-8.71
2380.32	Peak	66.95	-5.57	61.38	74.00	-12.62
2388.72	Average	55.28	-5.57	49.71	54.00	-4.29
2388.72	Peak	73.68	-5.57	68.11	74.00	-5.89
2390.00	Average	56.76	-5.57	51.19	54.00	-2.81
2390.00	Peak	74.42	-5.57	68.85	74.00	-5.15

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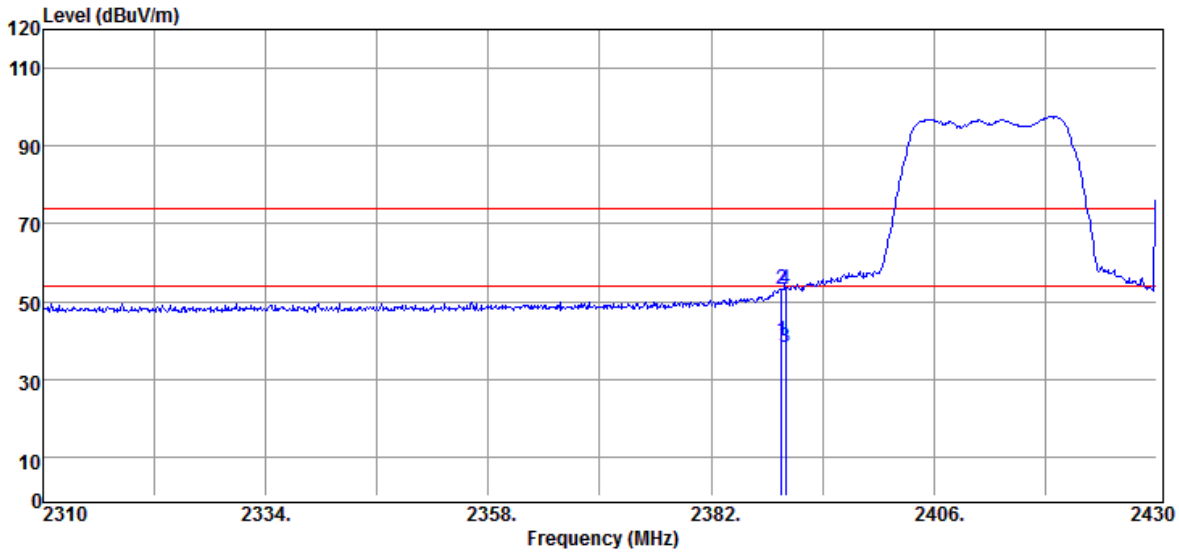
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Operation Mode	:802.11n20	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2389.56	Average	45.50	-5.57	39.93	54.00	-14.07
2389.56	Peak	58.85	-5.57	53.28	74.00	-20.72
2390.00	Average	43.75	-5.57	38.18	54.00	-15.82
2390.00	Peak	58.90	-5.57	53.33	74.00	-20.67

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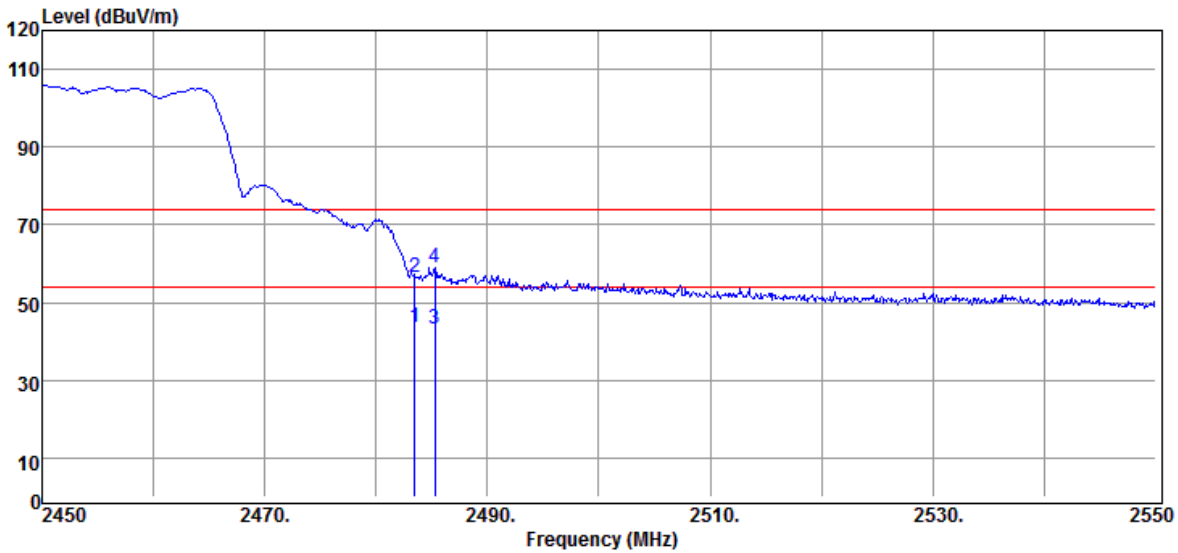
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Operation Mode	:802.11n20	Test Date	:2018-06-12
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2457 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	48.66	-4.90	43.76	54.00	-10.24
2483.50	Peak	61.18	-4.90	56.28	74.00	-17.72
2485.30	Average	47.96	-4.89	43.07	54.00	-10.93
2485.30	Peak	63.67	-4.89	58.78	74.00	-15.22

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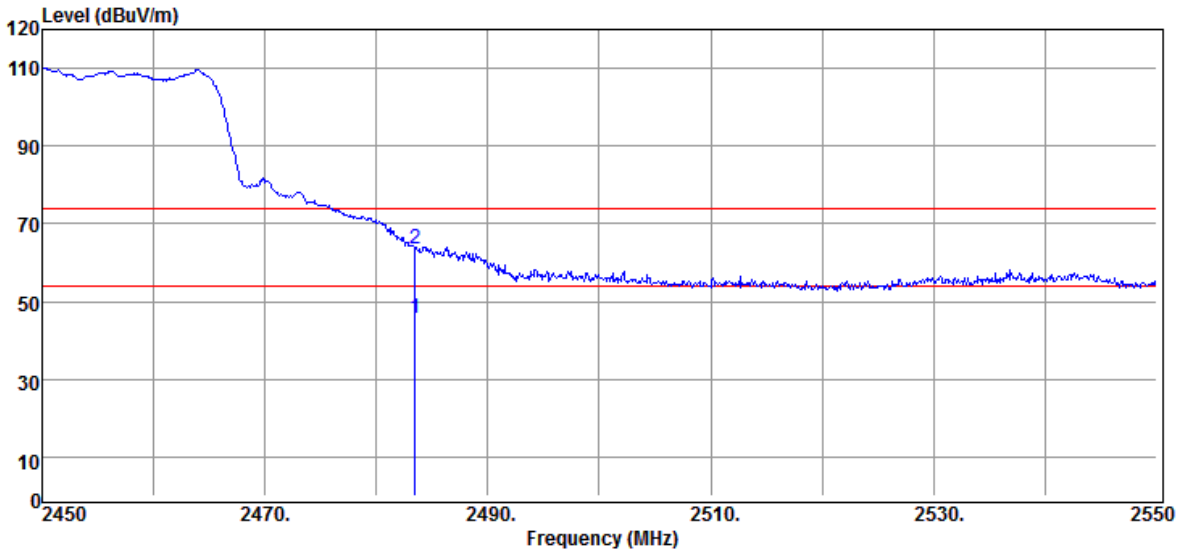
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Operation Mode	:802.11n20	Test Date	:2018-06-12
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2457 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	50.45	-4.90	45.55	54.00	-8.45
2483.50	Peak	68.25	-4.90	63.35	74.00	-10.65

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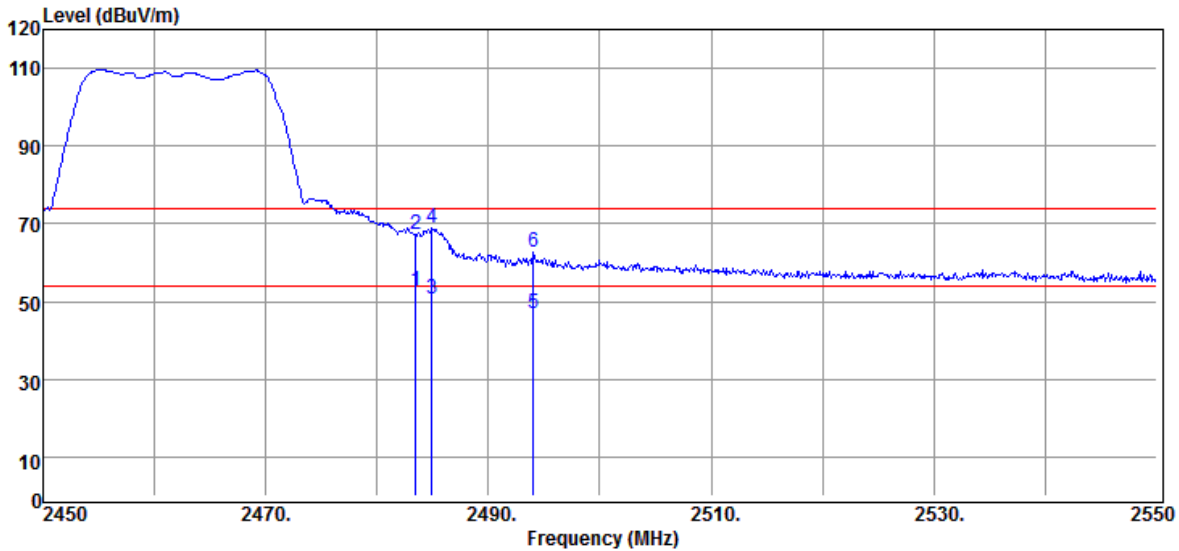
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Operation Mode	:802.11n20	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	57.70	-4.90	52.80	54.00	-1.20
2483.50	Peak	72.19	-4.90	67.29	74.00	-6.71
2484.90	Average	55.59	-4.90	50.69	54.00	-3.31
2484.90	Peak	73.97	-4.90	69.07	74.00	-4.93
2494.00	Average	51.81	-4.82	46.99	54.00	-7.01
2494.00	Peak	67.50	-4.82	62.68	74.00	-11.32

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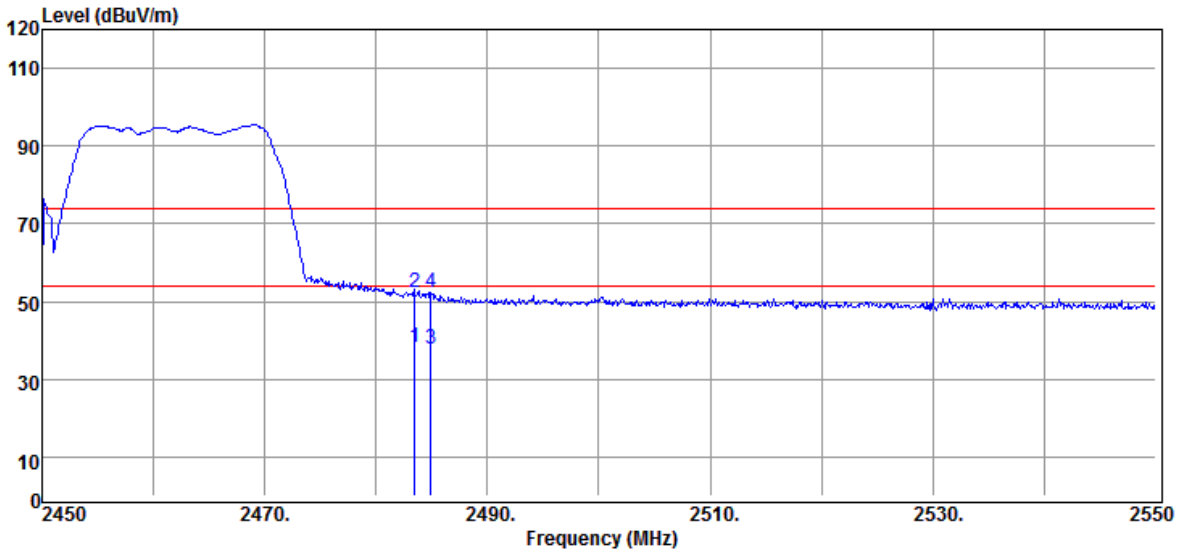
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Operation Mode	:802.11n20	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	43.04	-4.90	38.14	54.00	-15.86
2483.50	Peak	57.16	-4.90	52.26	74.00	-21.74
2484.90	Average	42.51	-4.90	37.61	54.00	-16.39
2484.90	Peak	57.37	-4.90	52.47	74.00	-21.53

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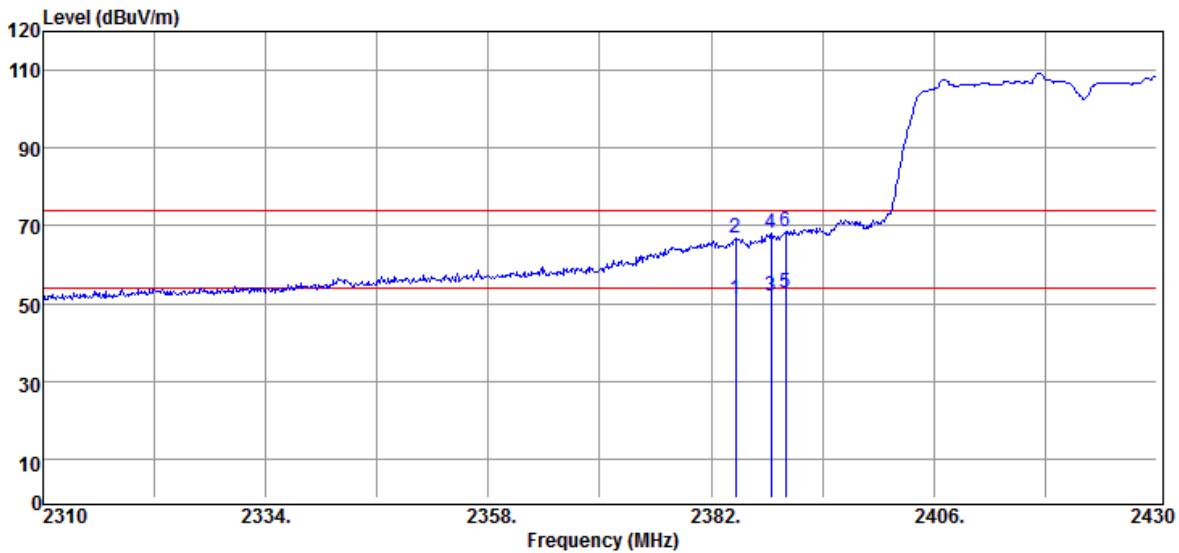
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Radiated Band Edge Measurement Result (802.11_HT40)

Operation Mode	:802.11n40	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2422 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2384.64	Average	56.82	-5.57	51.25	54.00	-2.75
2384.64	Peak	72.29	-5.57	66.72	74.00	-7.28
2388.48	Average	57.43	-5.57	51.86	54.00	-2.14
2388.48	Peak	73.58	-5.57	68.01	74.00	-5.99
2390.00	Average	58.37	-5.57	52.80	54.00	-1.20
2390.00	Peak	73.93	-5.57	68.36	74.00	-5.64

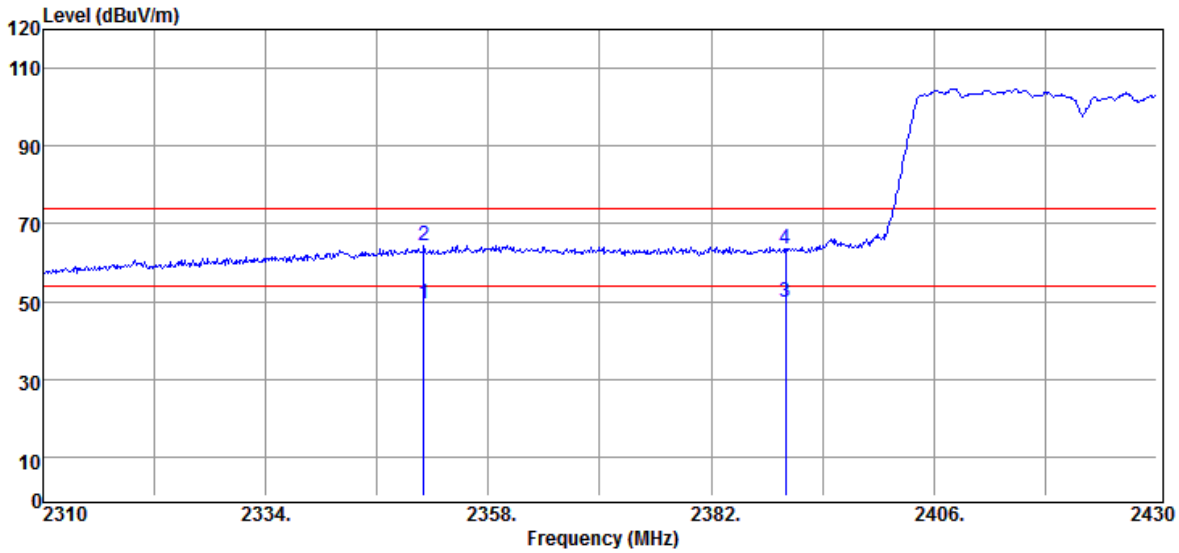
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Operation Mode	:802.11n40	Test Date	:2018-05-24
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2422 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2351.04	Average	54.82	-5.55	49.27	54.00	-4.73
2351.04	Peak	70.04	-5.55	64.49	74.00	-9.51
2390.00	Average	55.24	-5.57	49.67	54.00	-4.33
2390.00	Peak	69.07	-5.57	63.50	74.00	-10.50

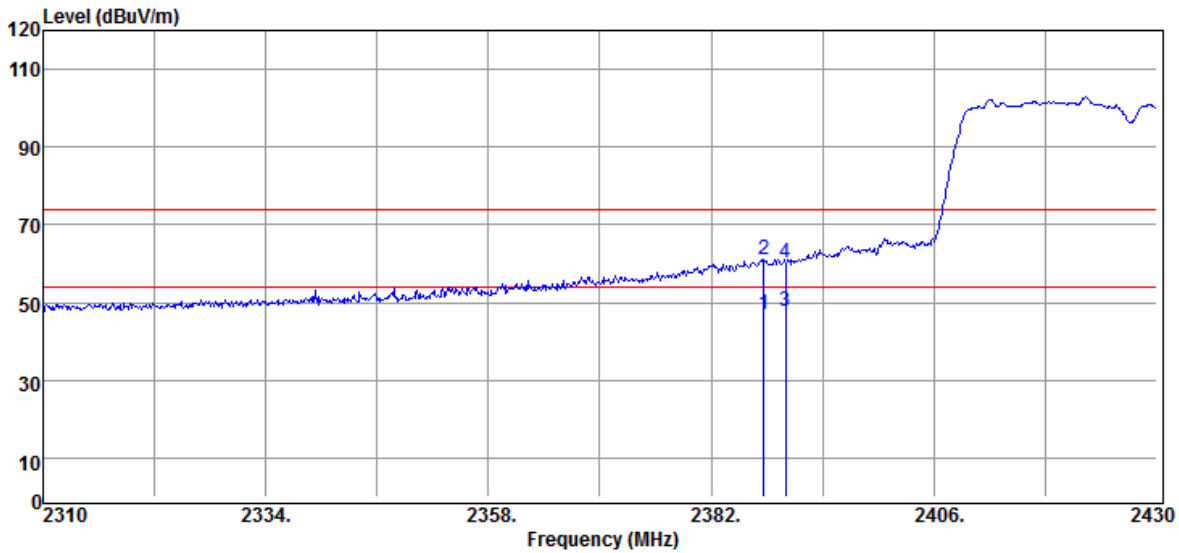
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Operation Mode	:802.11n40	Test Date	:2018-06-12
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2427 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2387.64	Average	52.69	-5.58	47.11	54.00	-6.89
2387.64	Peak	66.68	-5.58	61.10	74.00	-12.90
2390.00	Average	53.34	-5.57	47.77	54.00	-6.23
2390.00	Peak	65.75	-5.57	60.18	74.00	-13.82

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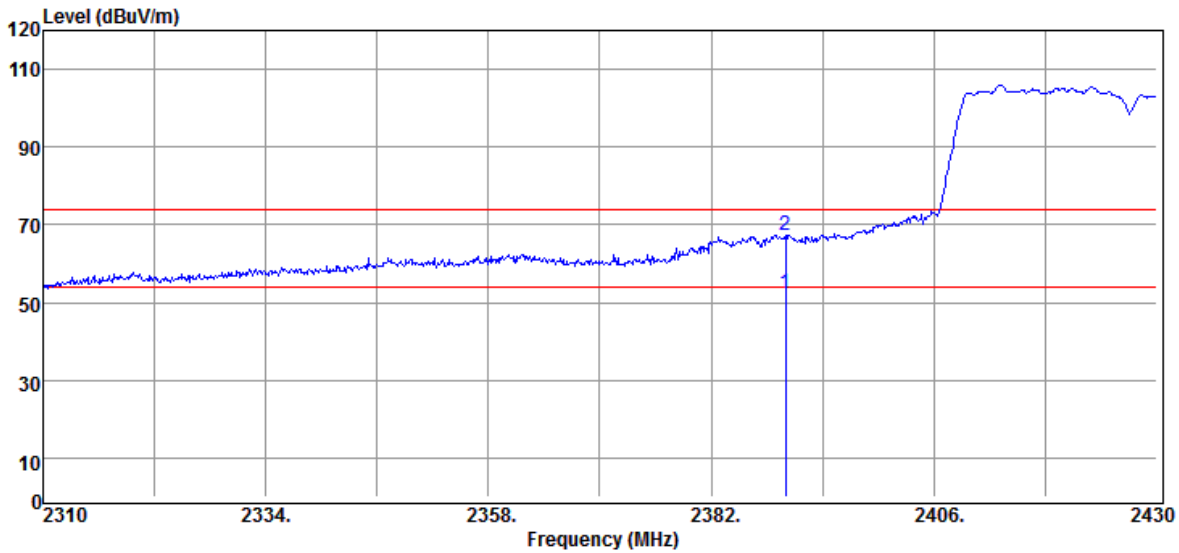
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Operation Mode	:802.11n40	Test Date	:2018-06-12
Test Mode	:Bandedge CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2427 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2390.00	Average	58.04	-5.57	52.47	54.00	-1.53
2390.00	Peak	72.92	-5.57	67.35	74.00	-6.65

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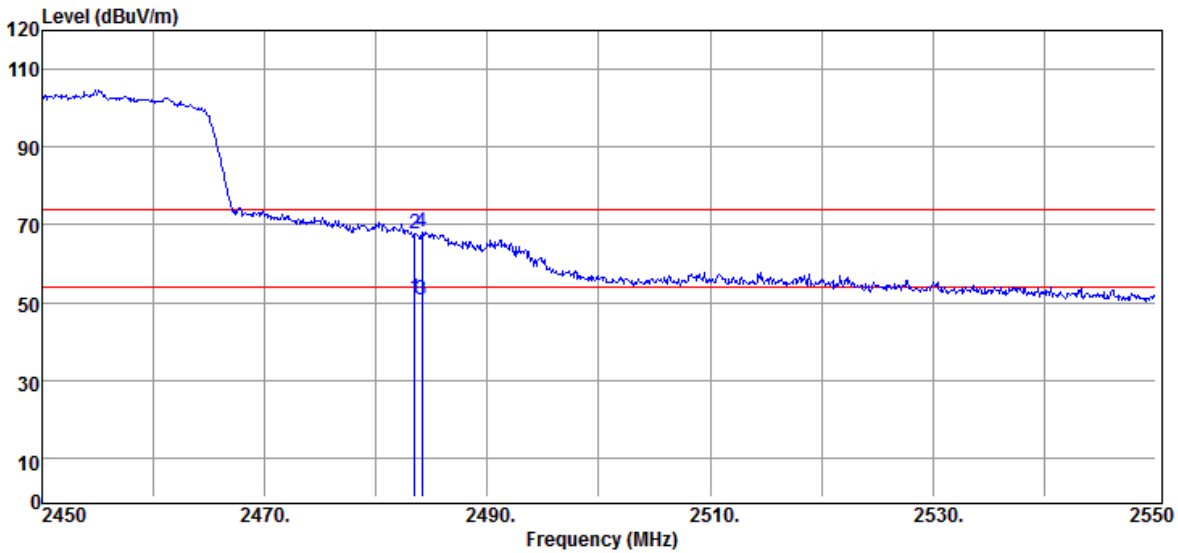
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Operation Mode	:802.11n40	Test Date	:2018-06-12
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2447 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	56.14	-4.90	51.24	54.00	-2.76
2483.50	Peak	72.47	-4.90	67.57	74.00	-6.43
2484.10	Average	55.70	-4.90	50.80	54.00	-3.20
2484.10	Peak	72.82	-4.90	67.92	74.00	-6.08

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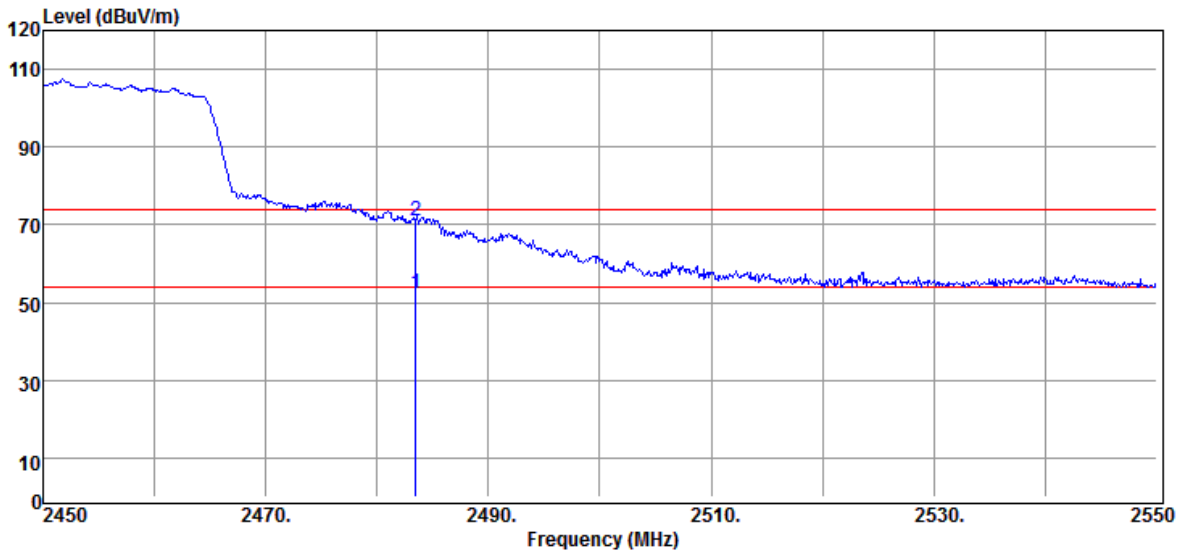
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Operation Mode	:802.11n40	Test Date	:2018-06-12
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2447 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	57.26	-4.90	52.36	54.00	-1.64
2483.50	Peak	75.95	-4.90	71.05	74.00	-2.95

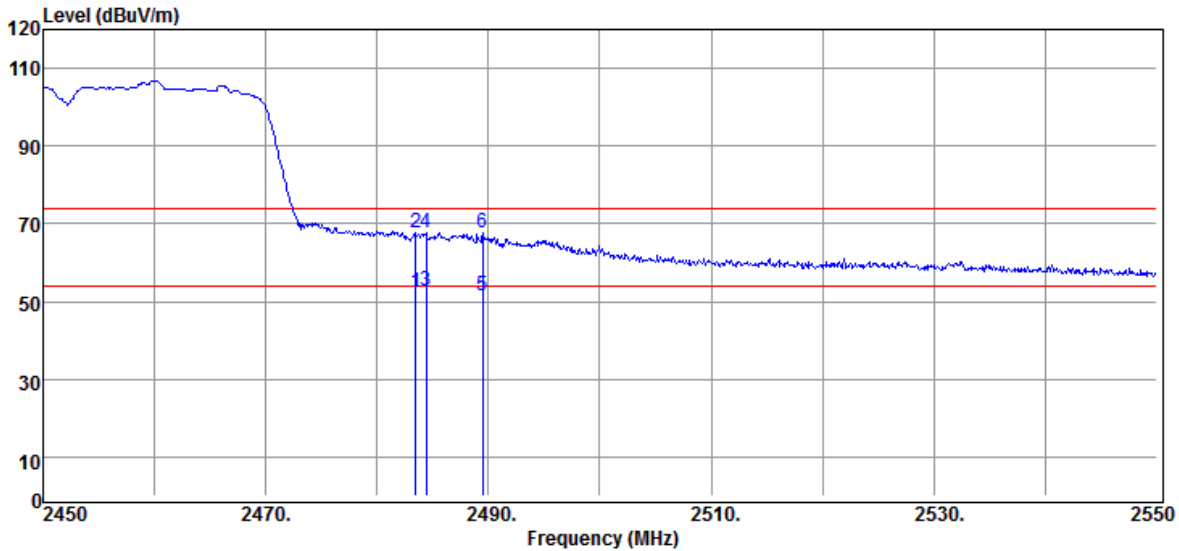
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Operation Mode	:802.11n40	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2452 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Average	57.35	-4.90	52.45	54.00	-1.55
2483.50	Peak	72.48	-4.90	67.58	74.00	-6.42
2484.40	Average	57.80	-4.90	52.90	54.00	-1.10
2484.40	Peak	72.64	-4.90	67.74	74.00	-6.26
2489.50	Average	56.35	-4.85	51.50	54.00	-2.50
2489.50	Peak	72.41	-4.85	67.56	74.00	-6.44

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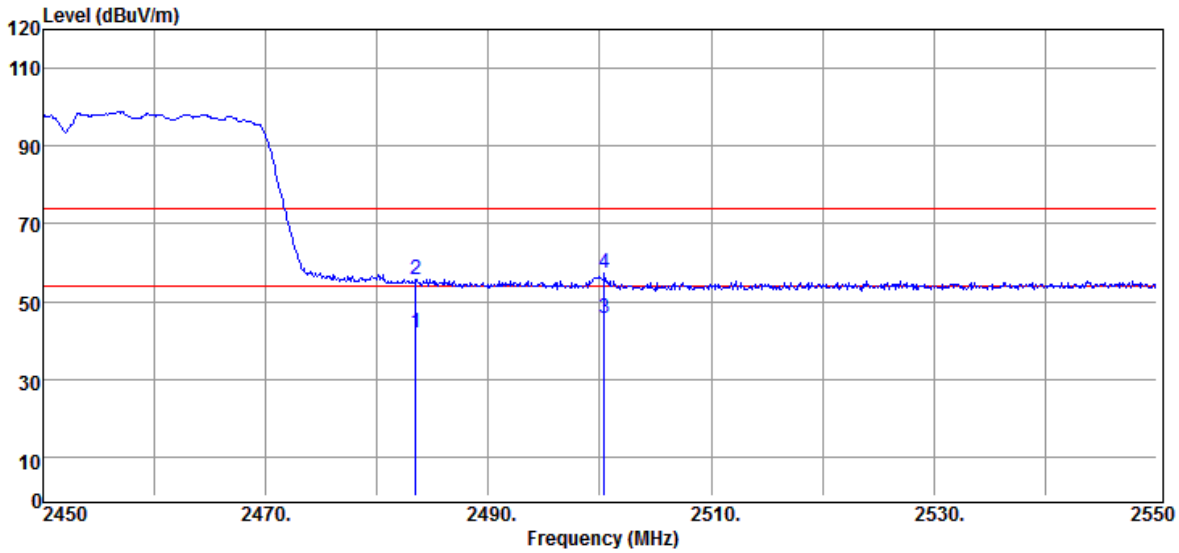
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Operation Mode	:802.11n40	Test Date	:2018-05-24
Test Mode	:Bandedge CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2452 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
2483.50	Average	46.71	-4.90	41.81	54.00	-12.19
2483.50	Peak	60.68	-4.90	55.78	74.00	-18.22
2500.40	Average	50.38	-4.77	45.61	54.00	-8.39
2500.40	Peak	62.14	-4.77	57.37	74.00	-16.63

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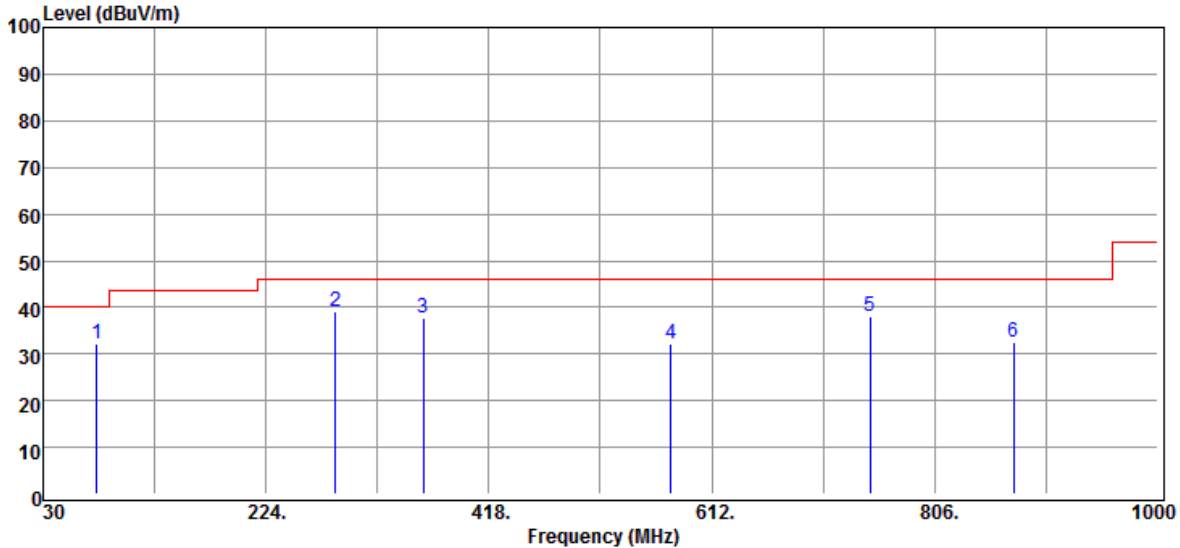
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Below 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result (802.11 g)

Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
76.56	Peak	53.15	-20.83	32.32	40.00	-7.68
284.14	Peak	54.67	-15.63	39.04	46.00	-6.96
360.77	Peak	51.39	-13.72	37.67	46.00	-8.33
576.11	Peak	41.34	-9.21	32.13	46.00	-13.87
749.74	Peak	44.76	-6.78	37.98	46.00	-8.02
874.87	Peak	37.53	-5.14	32.39	46.00	-13.61

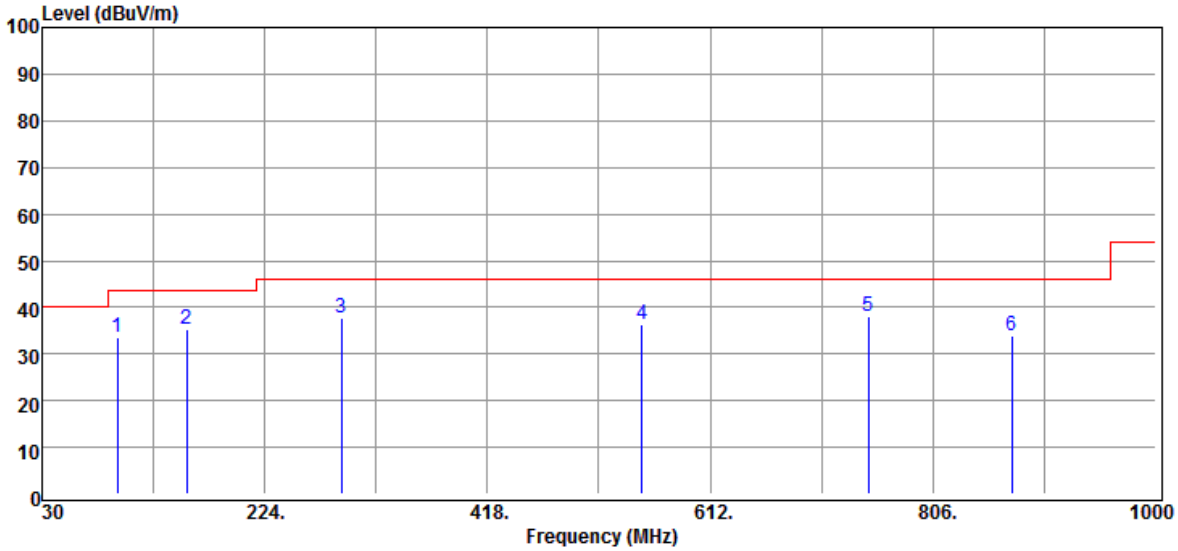
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Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
95.96	Peak	55.48	-22.08	33.40	43.50	-10.10
156.10	Peak	51.46	-16.18	35.28	43.50	-8.22
290.93	Peak	53.71	-15.99	37.72	46.00	-8.28
552.83	Peak	46.74	-10.34	36.40	46.00	-9.60
749.74	Peak	44.78	-6.78	38.00	46.00	-8.00
874.87	Peak	38.93	-5.14	33.79	46.00	-12.21

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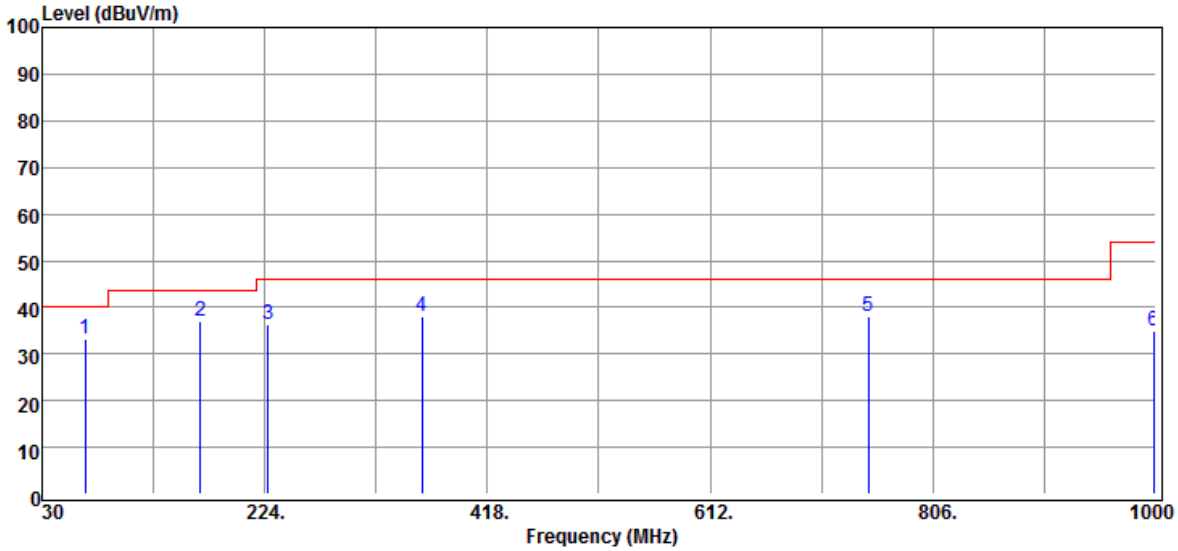
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Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
67.83	Peak	52.30	-19.07	33.23	40.00	-6.77
167.74	Peak	53.44	-16.42	37.02	43.50	-6.48
226.91	Peak	54.52	-18.20	36.32	46.00	-9.68
360.77	Peak	51.63	-13.72	37.91	46.00	-8.09
749.74	Peak	44.78	-6.78	38.00	46.00	-8.00
998.06	Peak	38.88	-3.79	35.09	54.00	-18.91

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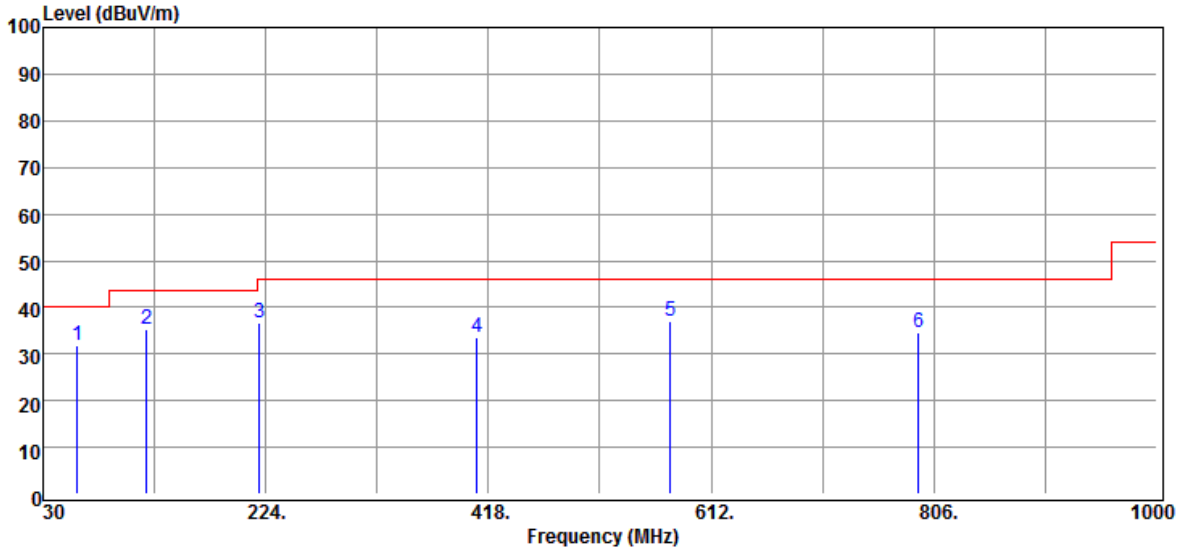
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Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
60.07	Peak	49.56	-17.68	31.88	40.00	-8.12
120.21	Peak	54.32	-19.05	35.27	43.50	-8.23
218.18	Peak	56.25	-19.68	36.57	46.00	-9.43
408.30	Peak	46.00	-12.45	33.55	46.00	-12.45
576.11	Peak	46.19	-9.21	36.98	46.00	-9.02
792.42	Peak	41.41	-6.81	34.60	46.00	-11.40

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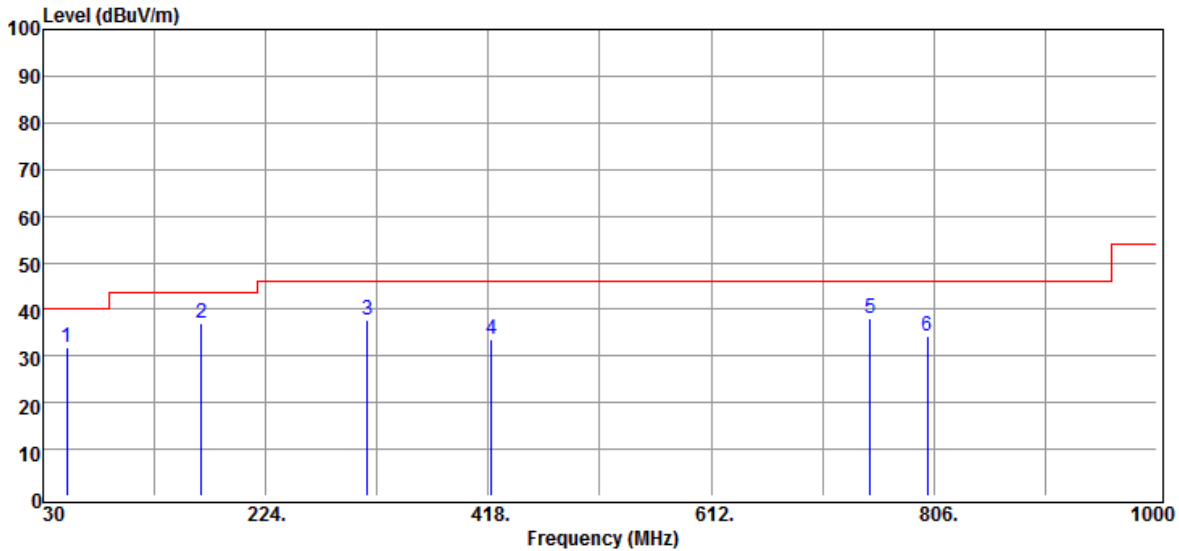
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Operation Mode :802.11g
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :2462 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
50.37	Peak	48.85	-16.91	31.94	40.00	-8.06
167.74	Peak	53.41	-16.42	36.99	43.50	-6.51
312.27	Peak	52.57	-14.91	37.66	46.00	-8.34
420.91	Peak	45.74	-12.22	33.52	46.00	-12.48
750.71	Peak	44.82	-6.78	38.04	46.00	-7.96
800.18	Peak	40.61	-6.44	34.17	46.00	-11.83

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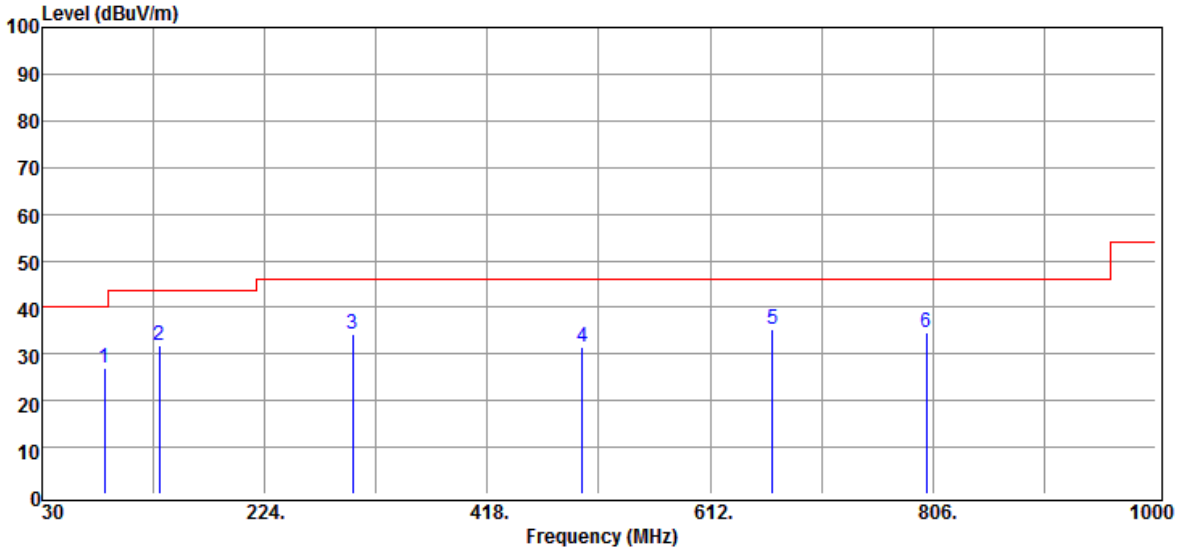
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Operation Mode :802.11g
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :2462 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
84.32	Peak	50.76	-23.69	27.07	40.00	-12.93
131.85	Peak	50.59	-18.84	31.75	43.50	-11.75
300.63	Peak	49.68	-15.43	34.25	46.00	-11.75
500.45	Peak	42.54	-11.13	31.41	46.00	-14.59
666.32	Peak	44.02	-8.72	35.30	46.00	-10.70
800.18	Peak	40.89	-6.44	34.45	46.00	-11.55

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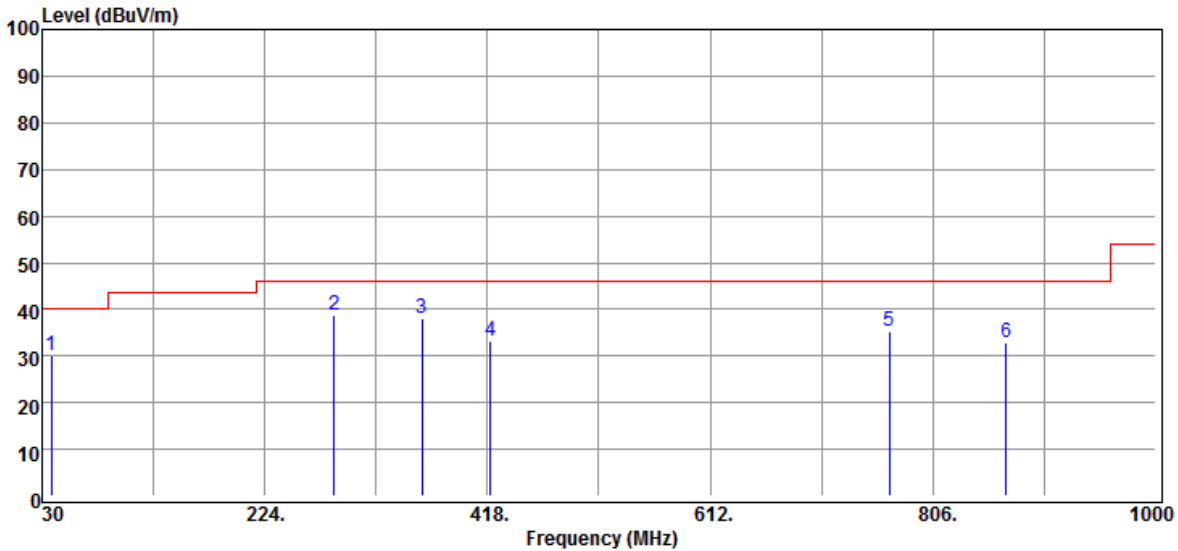
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Radiated Spurious Emission Measurement Result (802.11n 40)

Operation Mode	:802.11n40	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2422 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
37.76	Peak	48.03	-17.80	30.23	40.00	-9.77
284.14	Peak	54.37	-15.63	38.74	46.00	-7.26
360.77	Peak	51.62	-13.72	37.90	46.00	-8.10
420.91	Peak	45.60	-12.22	33.38	46.00	-12.62
768.17	Peak	42.13	-6.87	35.26	46.00	-10.74
870.02	Peak	37.65	-4.84	32.81	46.00	-13.19

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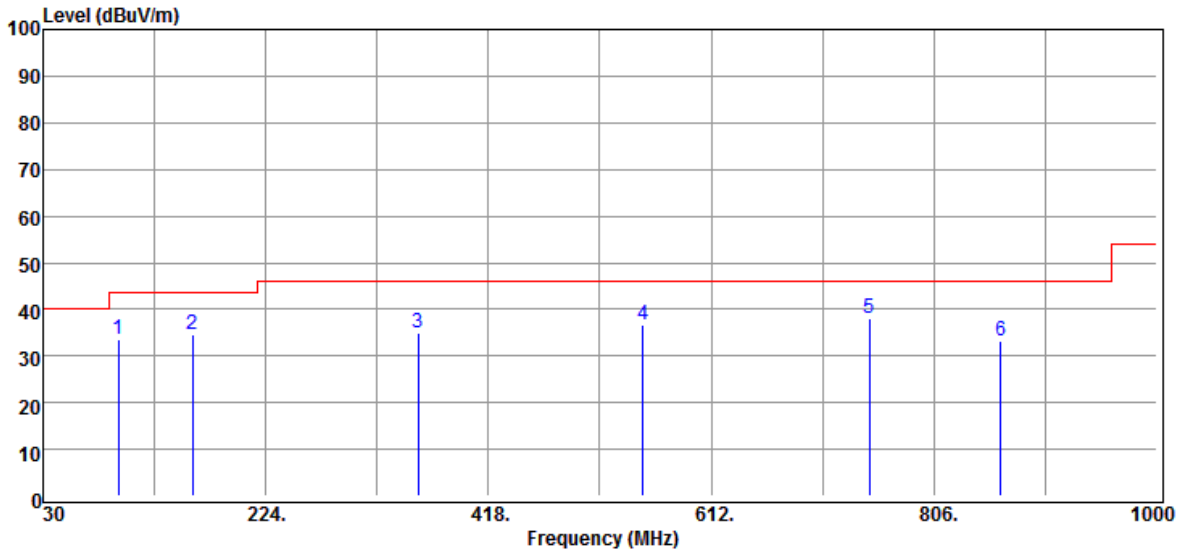
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Operation Mode :802.11n40
Test Mode :Tx CH Low
EUT Pol :H Plan
Test Channel :2422 MHz

Test Date :2018-05-25
Temp./Humi. :25/60
Antenna Pol. :HORIZONTAL
Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
95.96	Peak	55.54	-22.08	33.46	43.50	-10.04
159.98	Peak	50.74	-16.19	34.55	43.50	-8.95
356.89	Peak	48.72	-13.81	34.91	46.00	-11.09
552.83	Peak	47.19	-10.34	36.85	46.00	-9.15
749.74	Peak	44.78	-6.78	38.00	46.00	-8.00
864.20	Peak	38.30	-5.18	33.12	46.00	-12.88

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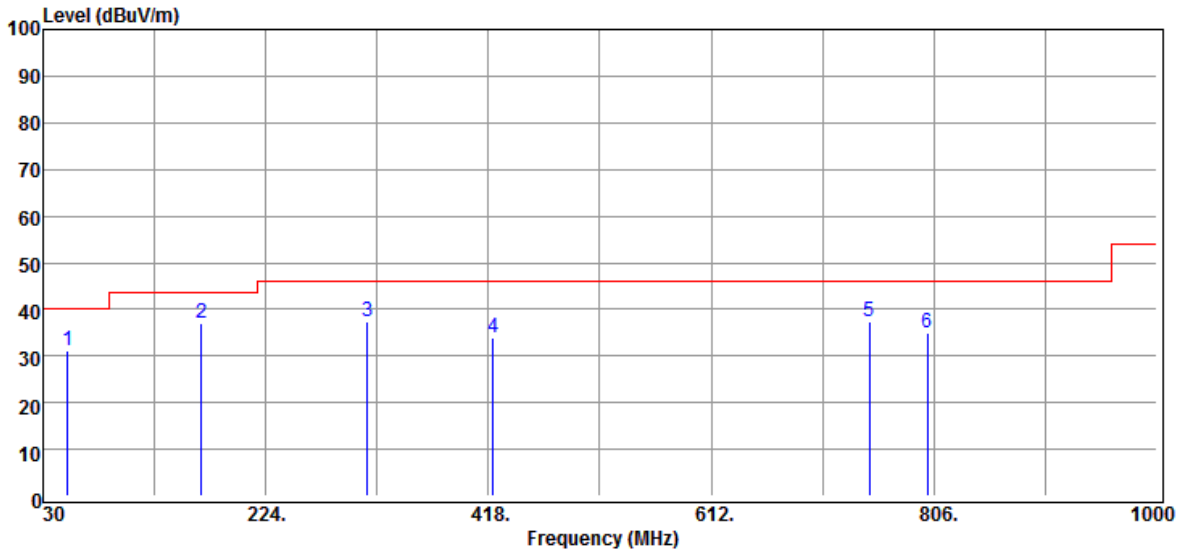
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Operation Mode :802.11n40
Test Mode :Tx CH Mid
EUT Pol :H Plan
Test Channel :2437 MHz

Test Date :2018-05-25
Temp./Humi. :25/60
Antenna Pol. :VERTICAL
Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
51.34	Peak	48.03	-16.98	31.05	40.00	-8.95
167.74	Peak	53.59	-16.42	37.17	43.50	-6.33
312.27	Peak	52.40	-14.91	37.49	46.00	-8.51
421.88	Peak	45.94	-12.19	33.75	46.00	-12.25
749.74	Peak	44.23	-6.78	37.45	46.00	-8.55
800.18	Peak	41.46	-6.44	35.02	46.00	-10.98

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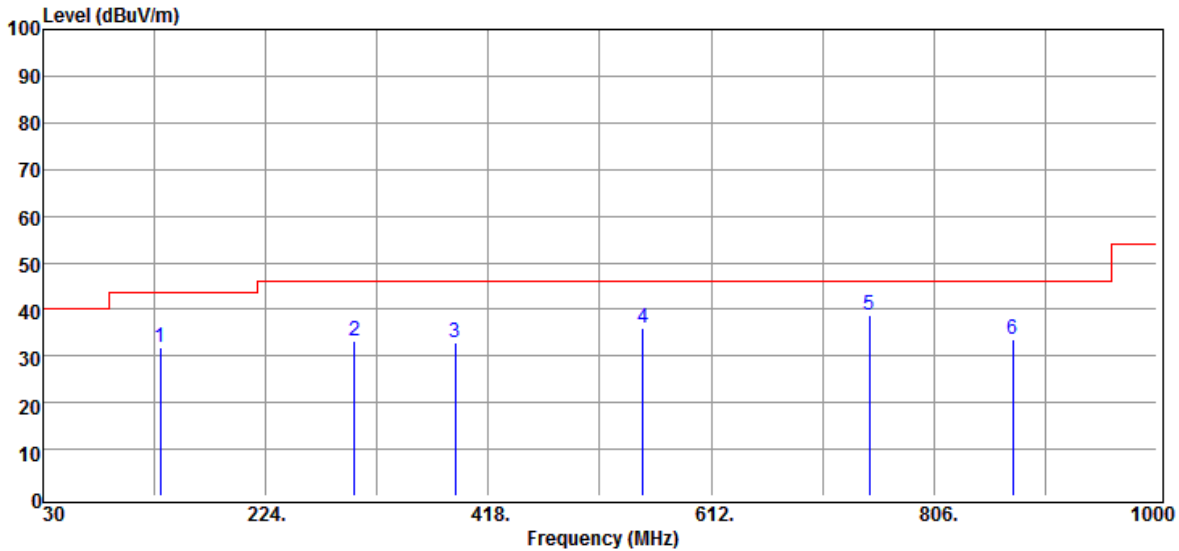
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Operation Mode :802.11n40
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :2437 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
131.85	Peak	50.57	-18.84	31.73	43.50	-11.77
301.60	Peak	48.56	-15.48	33.08	46.00	-12.92
388.90	Peak	46.10	-13.07	33.03	46.00	-12.97
552.83	Peak	46.25	-10.34	35.91	46.00	-10.09
749.74	Peak	45.40	-6.78	38.62	46.00	-7.38
874.87	Peak	38.65	-5.14	33.51	46.00	-12.49

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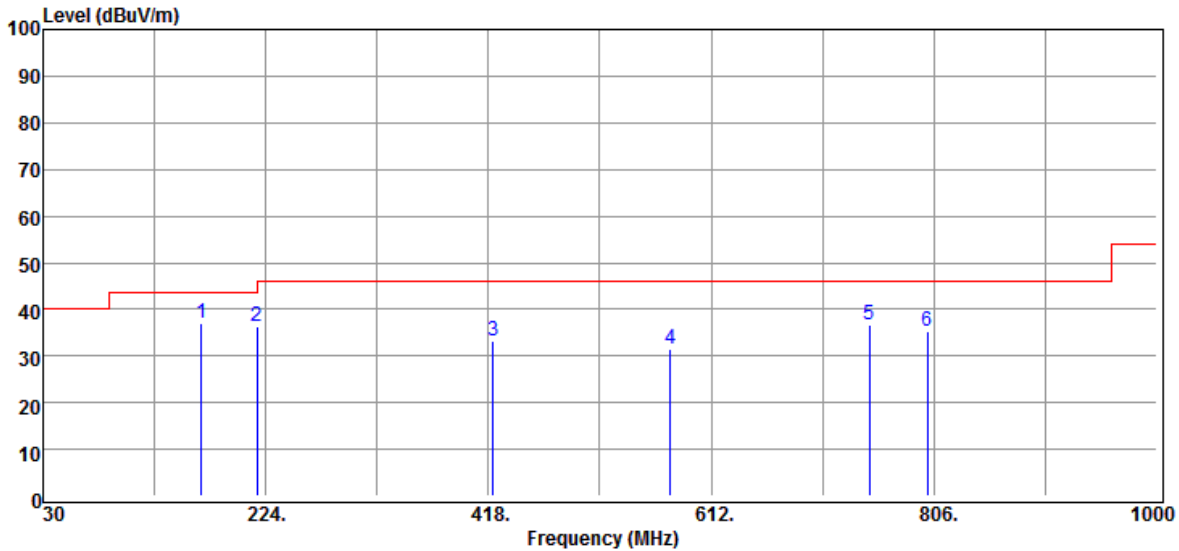
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Operation Mode :802.11n40
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :2452 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
167.74	Peak	53.53	-16.42	37.11	43.50	-6.39
216.24	Peak	55.14	-18.68	36.46	46.00	-9.54
421.88	Peak	45.48	-12.19	33.29	46.00	-12.71
576.11	Peak	40.59	-9.21	31.38	46.00	-14.62
749.74	Peak	43.44	-6.78	36.66	46.00	-9.34
800.18	Peak	41.65	-6.44	35.21	46.00	-10.79

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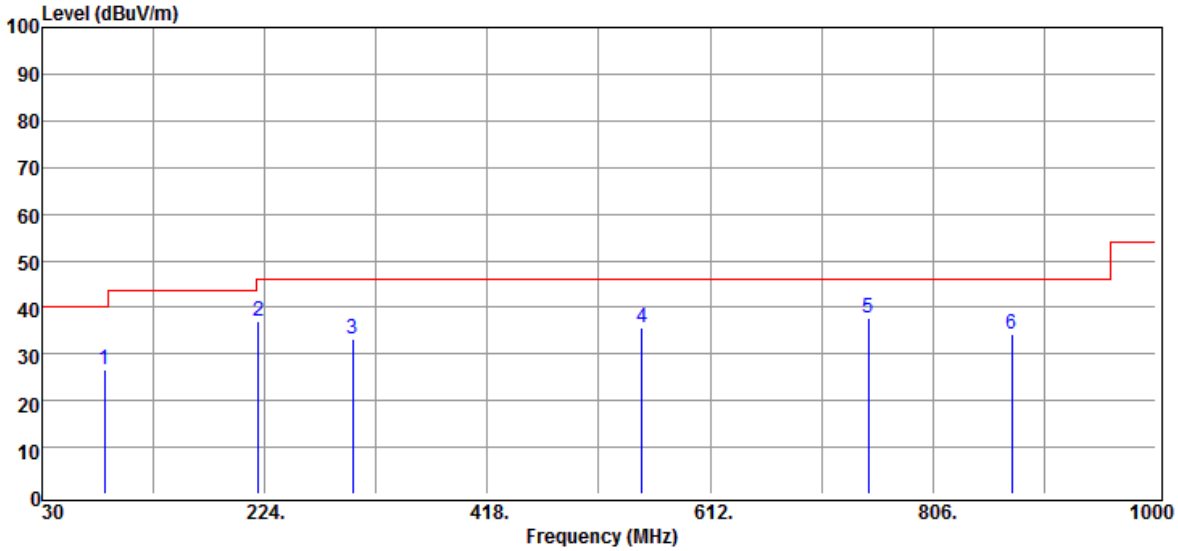
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Operation Mode	:802.11n40	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2452 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
84.32	Peak	50.21	-23.69	26.52	40.00	-13.48
218.18	Peak	56.65	-19.68	36.97	46.00	-9.03
300.63	Peak	48.53	-15.43	33.10	46.00	-12.90
552.83	Peak	46.13	-10.34	35.79	46.00	-10.21
749.74	Peak	44.59	-6.78	37.81	46.00	-8.19
874.87	Peak	39.32	-5.14	34.18	46.00	-11.82

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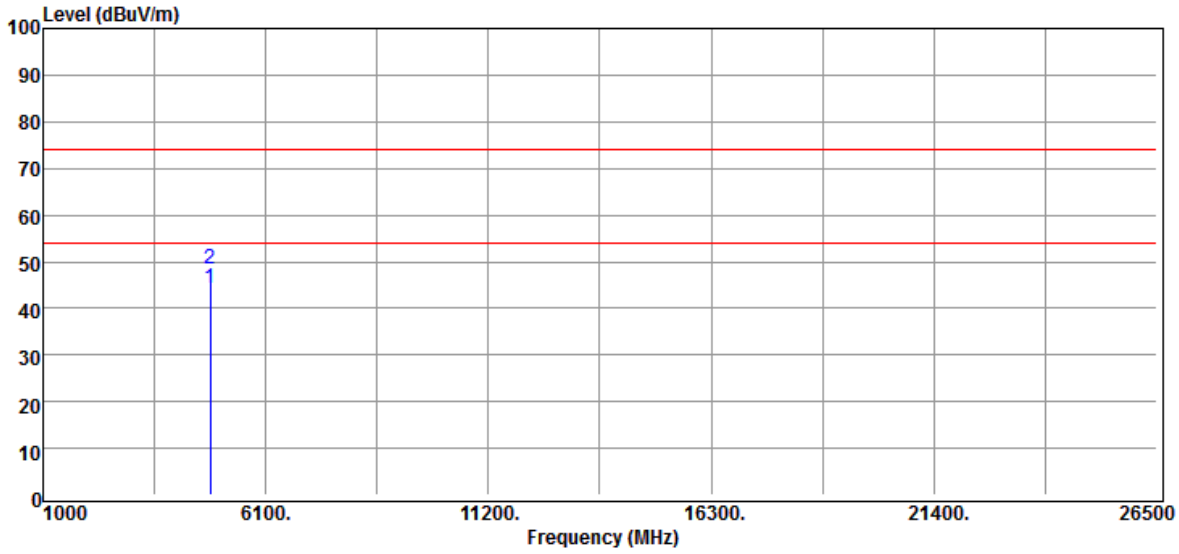
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Above 1GHz Data:

Radiated Spurious Emission Measurement Result (802.11 b)

Operation Mode	:802.11b	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4824.00	Average	43.92	0.38	44.30	54.00	-9.70
4824.00	Peak	48.13	0.38	48.51	74.00	-25.49

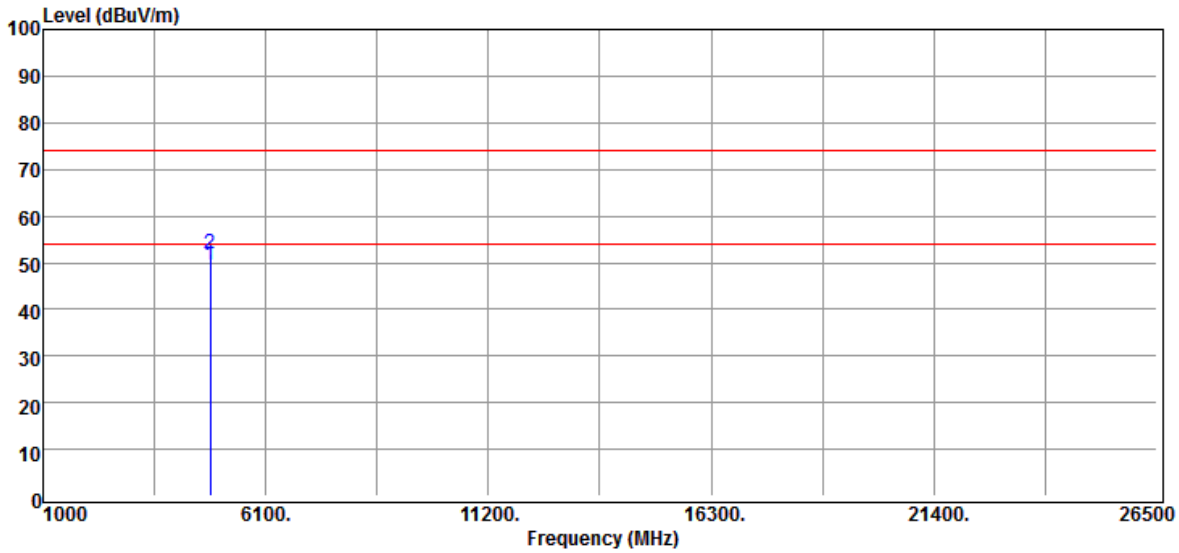
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Operation Mode	:802.11b	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4824.00	Average	48.95	0.38	49.33	54.00	-4.67
4824.00	Peak	51.66	0.38	52.04	74.00	-21.96

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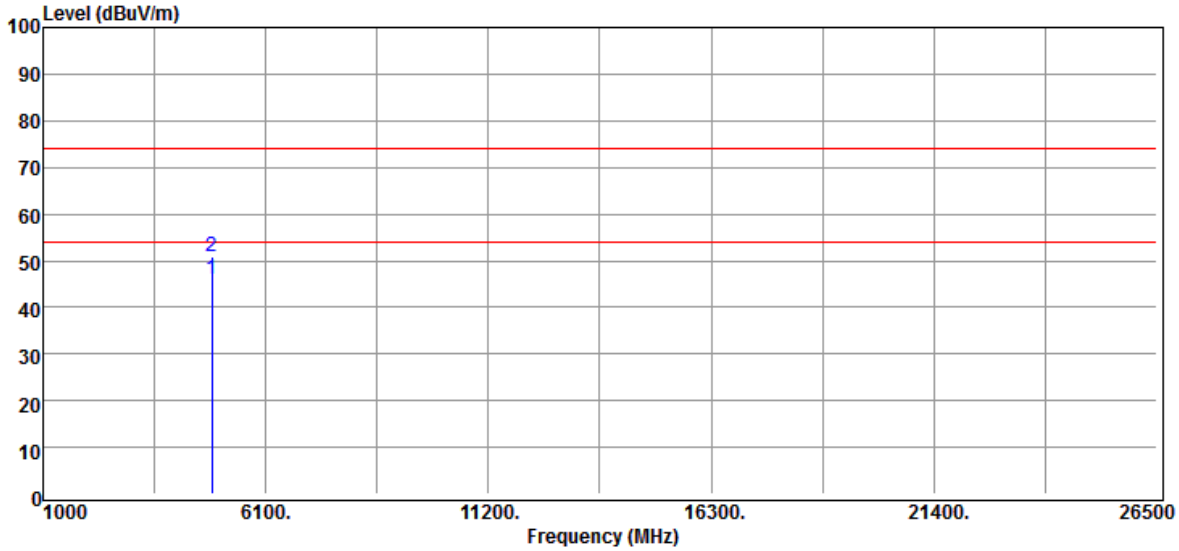
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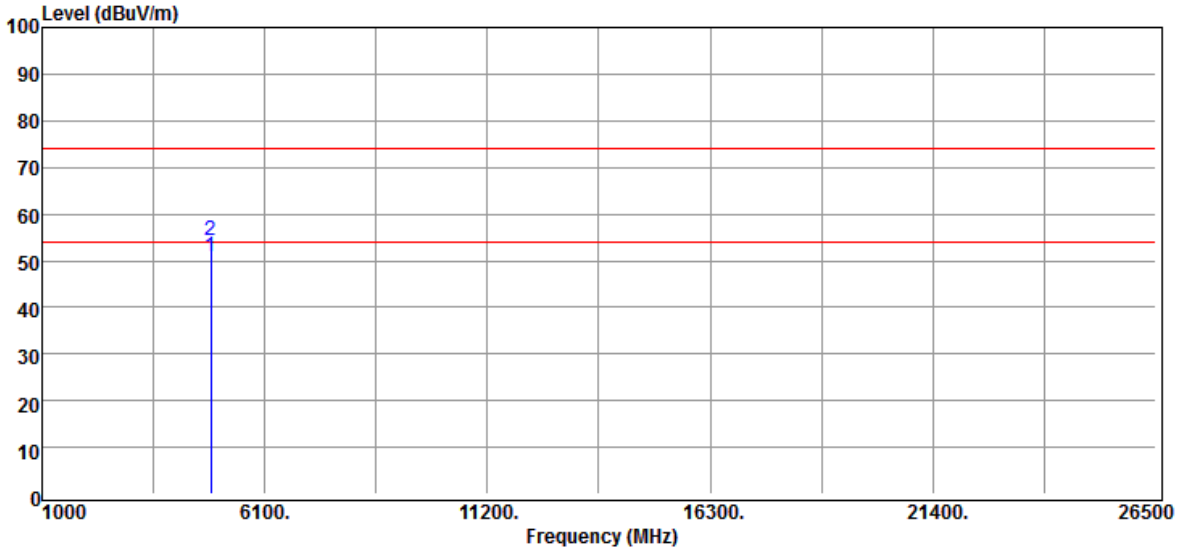
Operation Mode	:802.11b	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4874.00	Average	45.32	0.66	45.98	54.00	-8.02
4874.00	Peak	50.12	0.66	50.78	74.00	-23.22

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Operation Mode	:802.11b	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4874.00	Average	50.22	0.66	50.88	54.00	-3.12
4874.00	Peak	53.79	0.66	54.45	74.00	-19.55

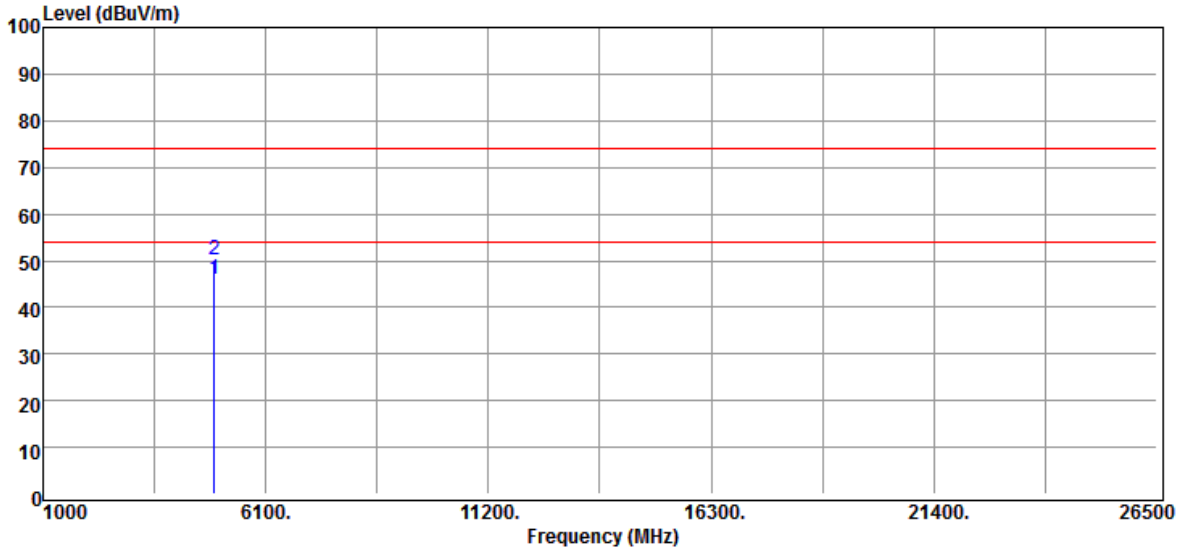
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Operation Mode	:802.11b	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4927.00	Average	44.85	1.00	45.85	54.00	-8.15
4927.00	Peak	49.23	1.00	50.23	74.00	-23.77

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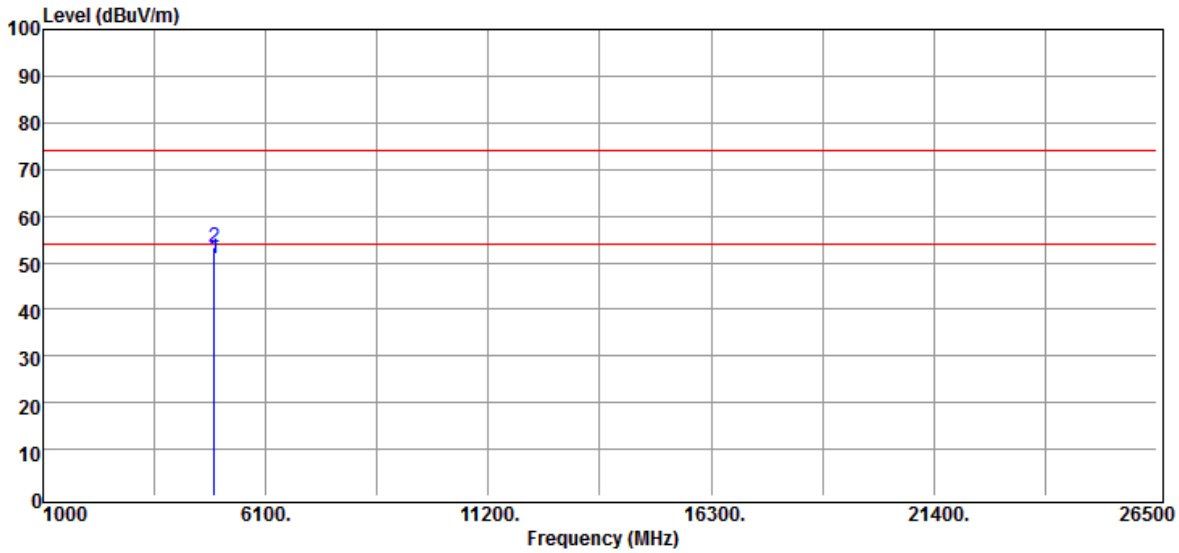
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Operation Mode	:802.11b	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4924.00	Average	49.89	0.97	50.86	54.00	-3.14
4924.00	Peak	52.39	0.97	53.36	74.00	-20.64

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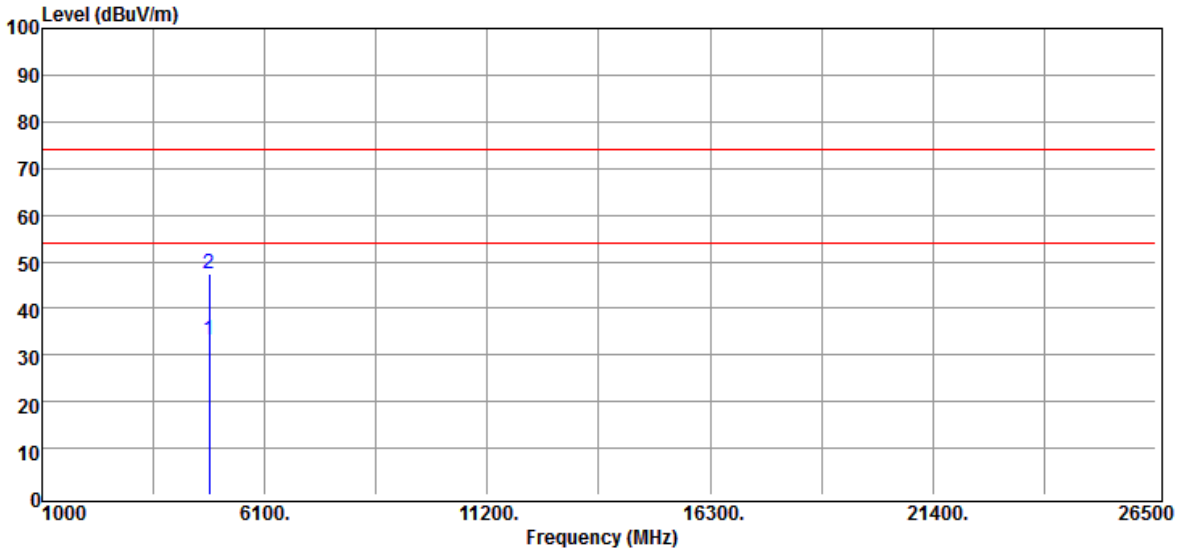
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Radiated Spurious Emission Measurement Result (802.11 g)

Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4824.00	Average	32.96	0.38	33.34	54.00	-20.66
4824.00	Peak	46.87	0.38	47.25	74.00	-26.75

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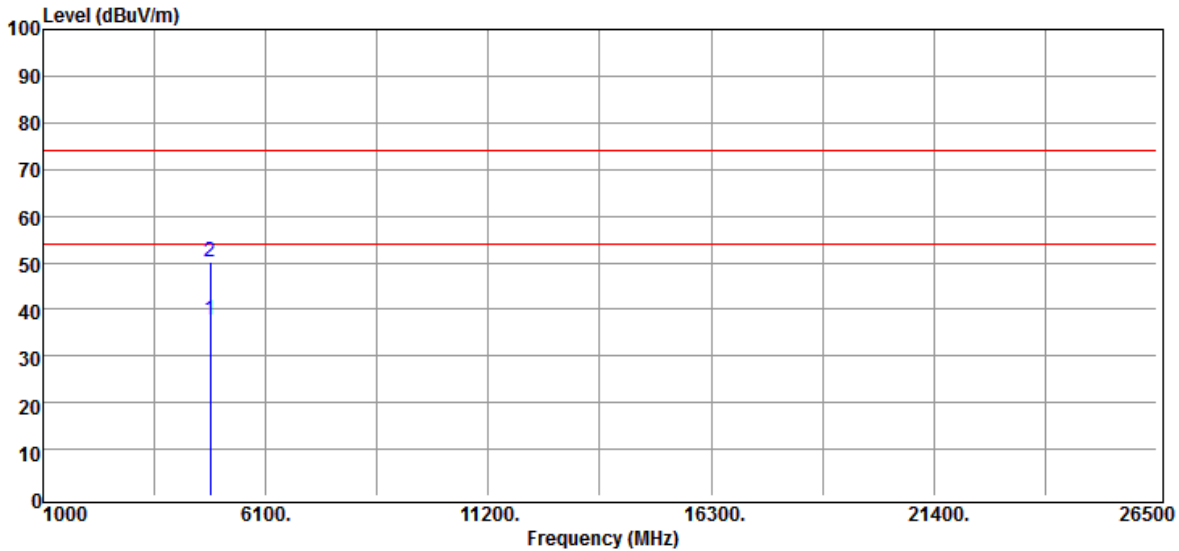
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Operation Mode :802.11g
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :2412 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4824.00	Average	37.23	0.38	37.61	54.00	-16.39
4824.00	Peak	49.70	0.38	50.08	74.00	-23.92

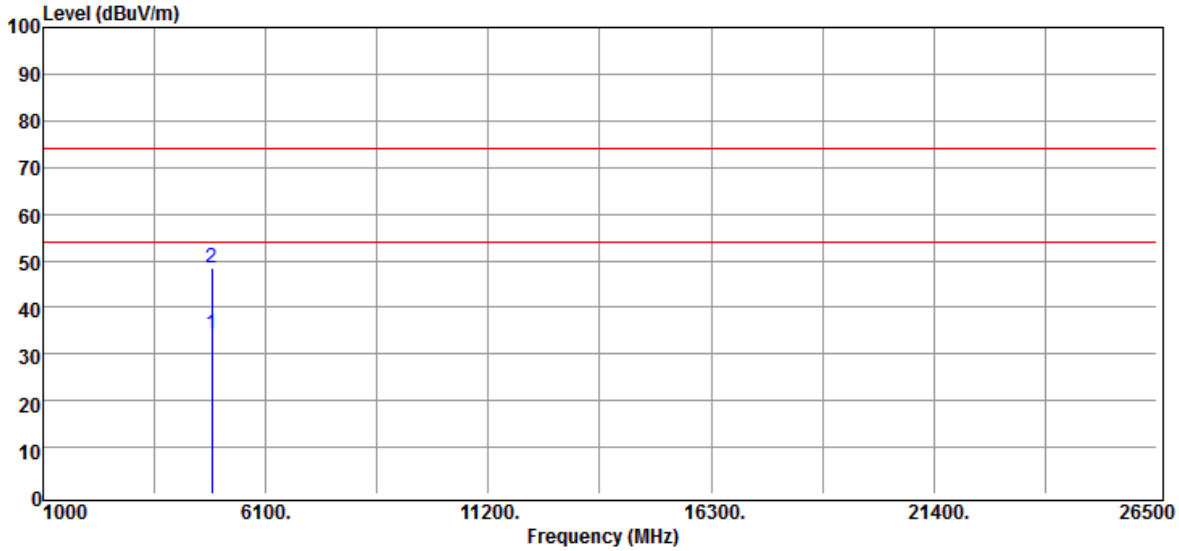
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Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4874.00	Average	33.68	0.66	34.34	54.00	-19.66
4874.00	Peak	47.69	0.66	48.35	74.00	-25.65

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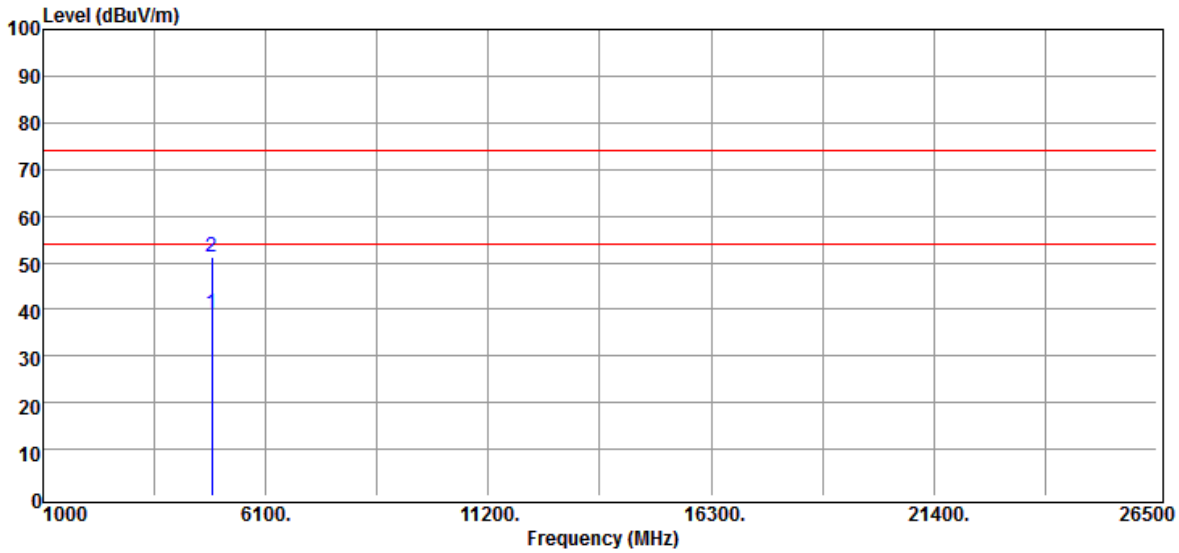
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Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4874.00	Average	38.40	0.66	39.06	54.00	-14.94
4874.00	Peak	50.53	0.66	51.19	74.00	-22.81

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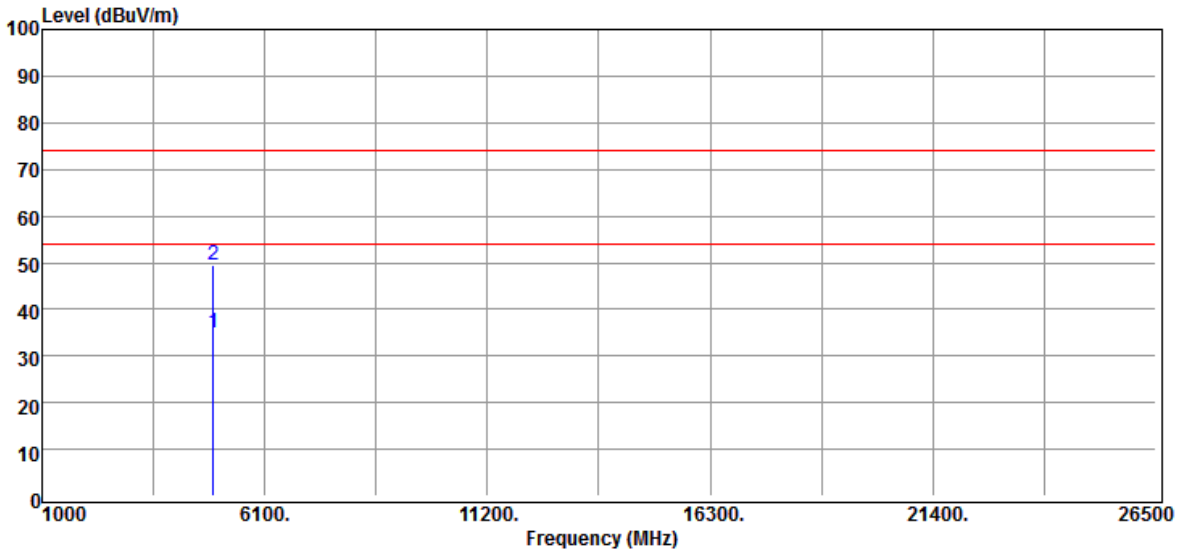
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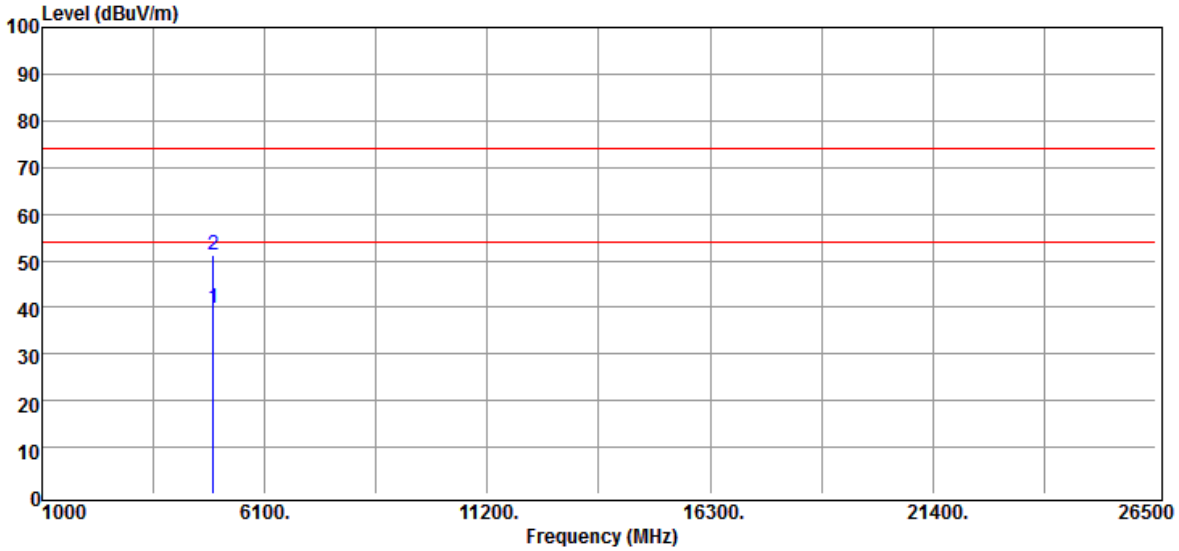
Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4924.00	Average	33.91	0.97	34.88	54.00	-19.12
4924.00	Peak	48.38	0.97	49.35	74.00	-24.65

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Operation Mode	:802.11g	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2462 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4924.00	Average	38.75	0.97	39.72	54.00	-14.28
4924.00	Peak	50.24	0.97	51.21	74.00	-22.79

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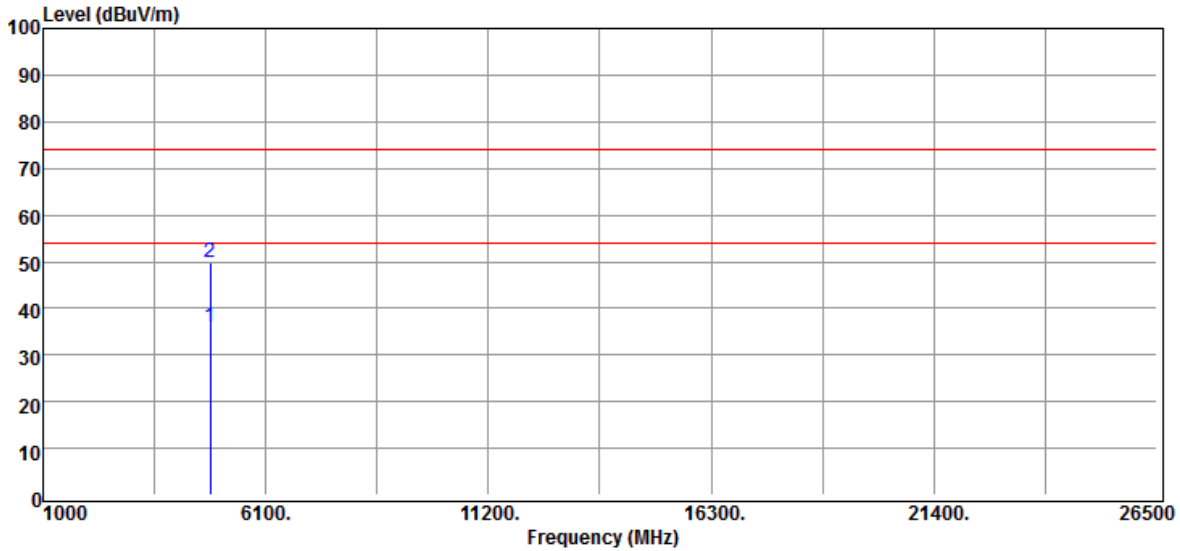
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Radiated Spurious Emission Measurement Result (802.11_HT20)

Operation Mode	:802.11n20	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2412 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4824.00	Average	35.69	0.38	36.07	54.00	-17.93
4824.00	Peak	49.57	0.38	49.95	74.00	-24.05

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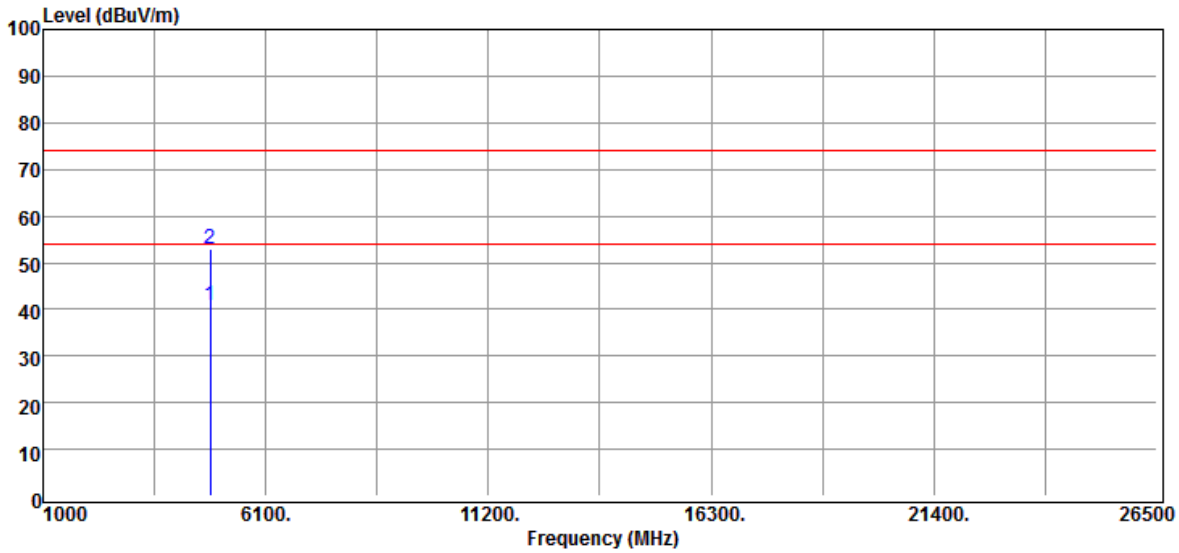
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Operation Mode :802.11n20
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :2412 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4824.00	Average	40.54	0.38	40.92	54.00	-13.08
4824.00	Peak	52.72	0.38	53.10	74.00	-20.90

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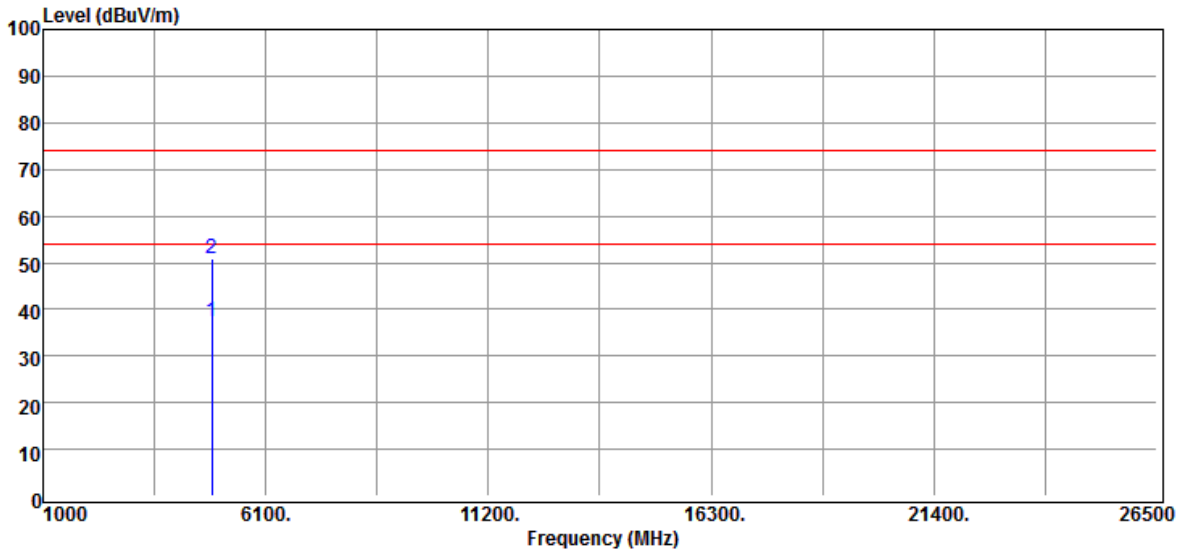
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Operation Mode :802.11n20
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :2437 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4871.00	Average	36.83	0.64	37.47	54.00	-16.53
4871.00	Peak	50.33	0.64	50.97	74.00	-23.03

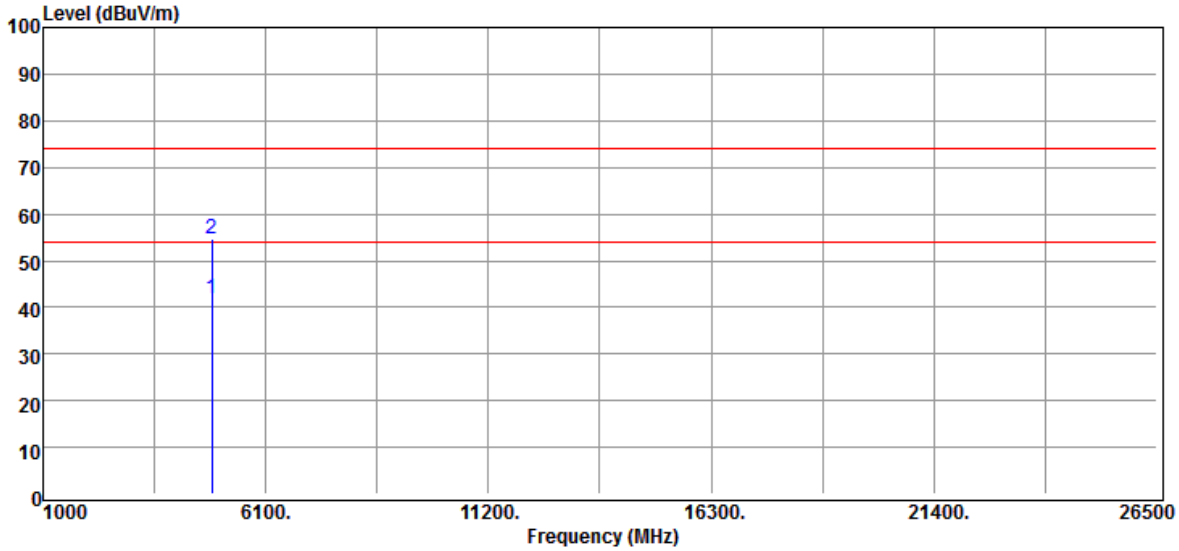
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Operation Mode	:802.11n20	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4874.00	Average	41.38	0.66	42.04	54.00	-11.96
4874.00	Peak	53.93	0.66	54.59	74.00	-19.41

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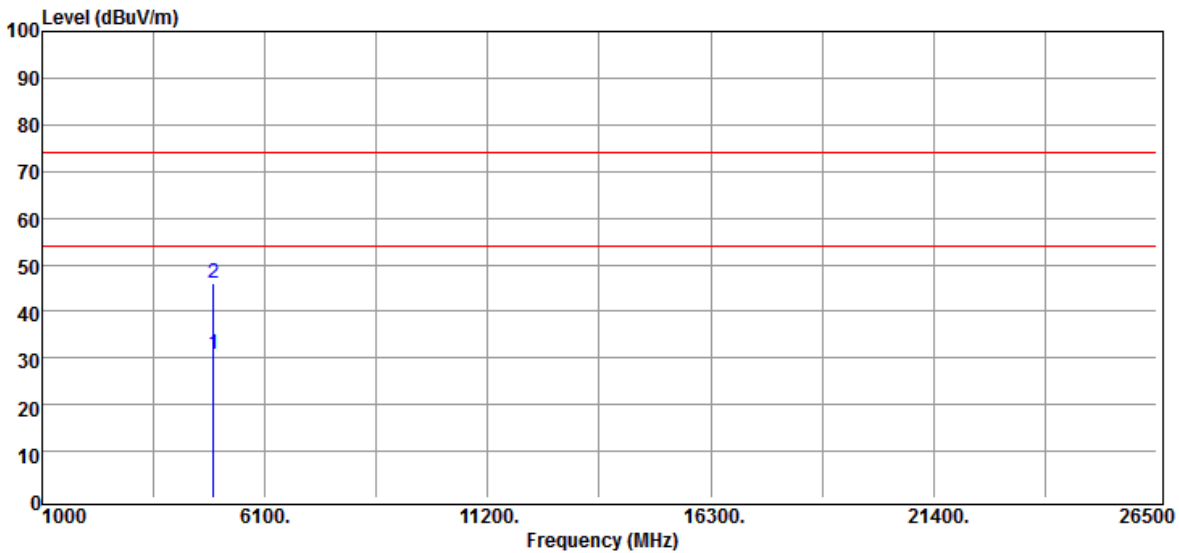
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Operation Mode	:802.11n20	Test Date	:2018-06-12
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2457 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4914.00	Average	29.90	0.91	30.81	54.00	-23.19
4914.00	Peak	45.22	0.91	46.13	74.00	-27.87

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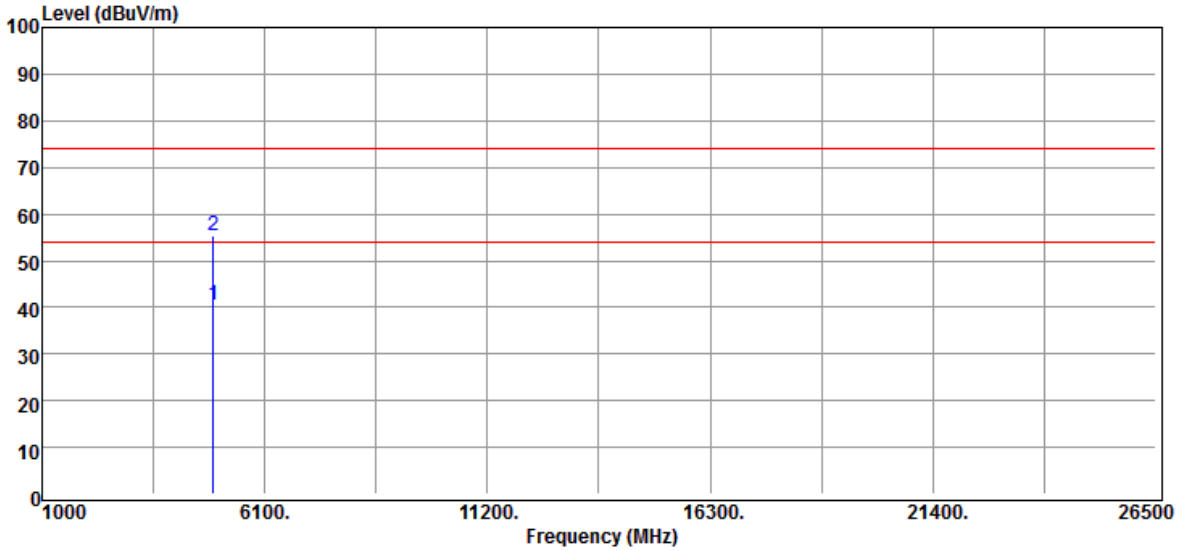
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Operation Mode	:802.11n20	Test Date	:2018-06-12
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2457 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4914.00	Average	39.40	0.91	40.31	54.00	-13.69
4914.00	Peak	54.40	0.91	55.31	74.00	-18.69

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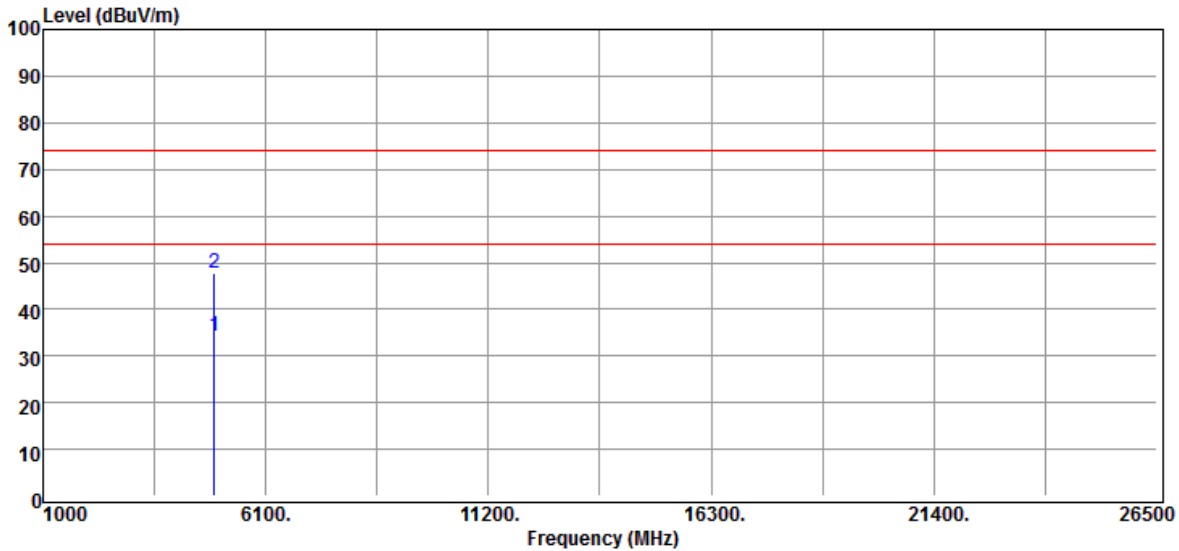
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Operation Mode :802.11n20
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :2462 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4924.00	Average	33.29	0.97	34.26	54.00	-19.74
4924.00	Peak	46.63	0.97	47.60	74.00	-26.40

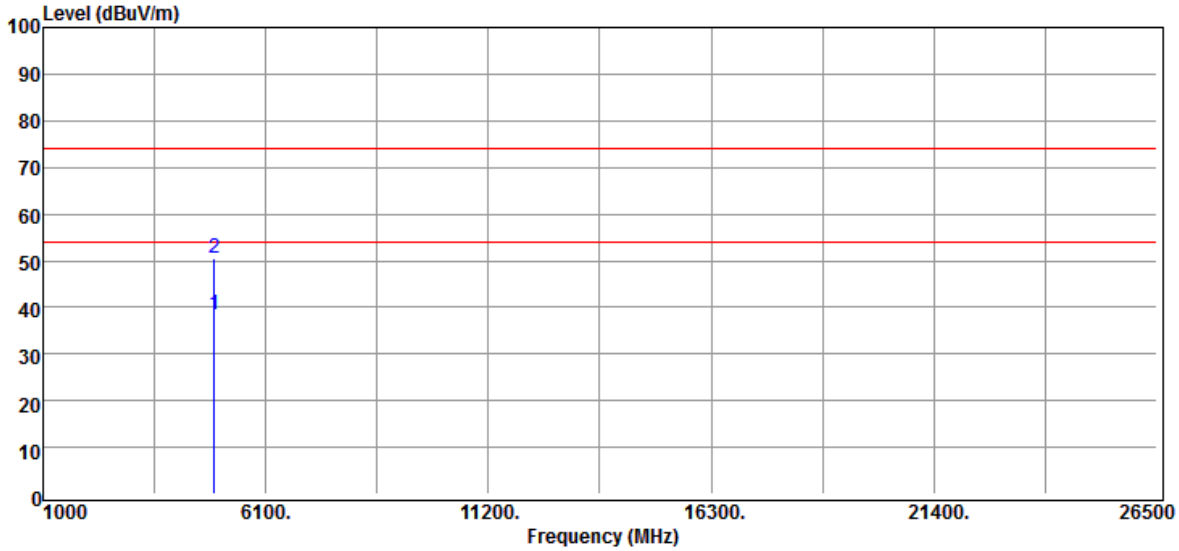
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Operation Mode	:802.11n20	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2462 MHz	Engineer	:Jerry

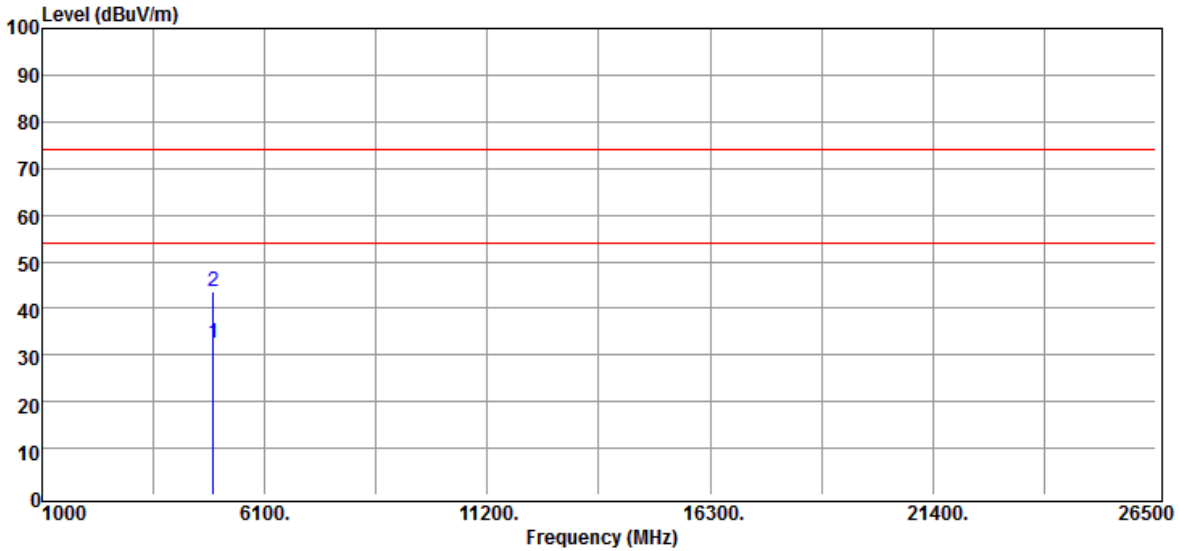


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4924.00	Average	37.56	0.97	38.53	54.00	-15.47
4924.00	Peak	49.64	0.97	50.61	74.00	-23.39

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Radiated Spurious Emission Measurement Result (802.11_HT40)

Operation Mode	:802.11n40	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2422 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4924.00	Average	31.54	0.97	32.51	54.00	-21.49
4924.00	Peak	42.70	0.97	43.67	74.00	-30.33

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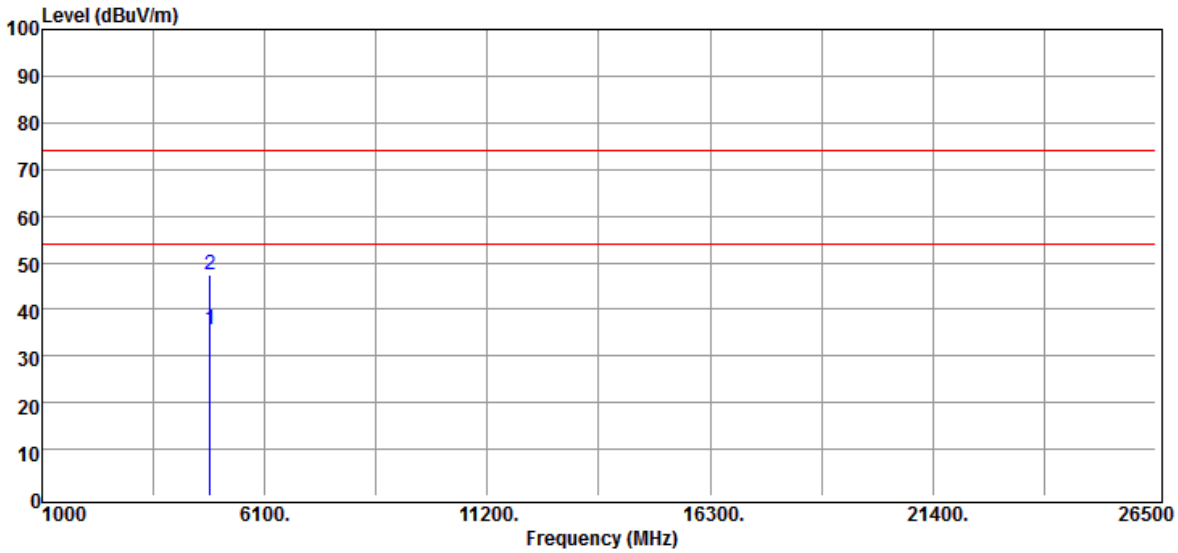
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Operation Mode :802.11n40
Test Mode :Tx CH Low
EUT Pol :H Plan
Test Channel :2422 MHz

Test Date :2018-05-25
Temp./Humi. :25/60
Antenna Pol. :HORIZONTAL
Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4844.00	Average	35.29	0.49	35.78	54.00	-18.22
4844.00	Peak	46.88	0.49	47.37	74.00	-26.63

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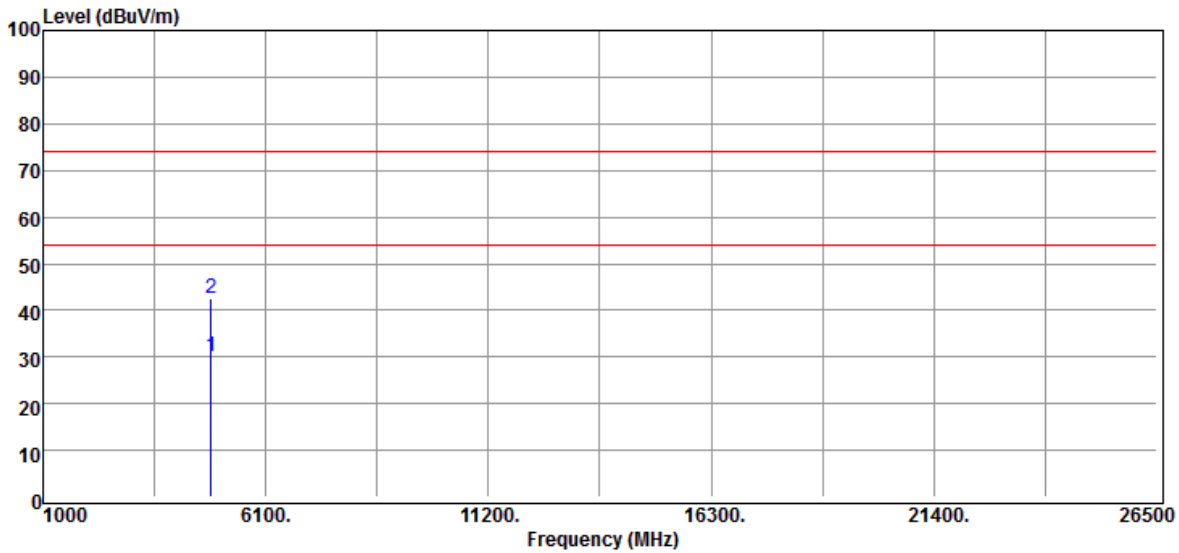
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Operation Mode :802.11n40
Test Mode :Tx CH Low
EUT Pol :H Plan
Test Channel :2427 MHz

Test Date :2018-06-12
Temp./Humi. :25/60
Antenna Pol. :VERTICAL
Engineer :Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4854.00	Average	29.55	0.55	30.10	54.00	-23.90
4854.00	Peak	42.00	0.55	42.55	74.00	-31.45

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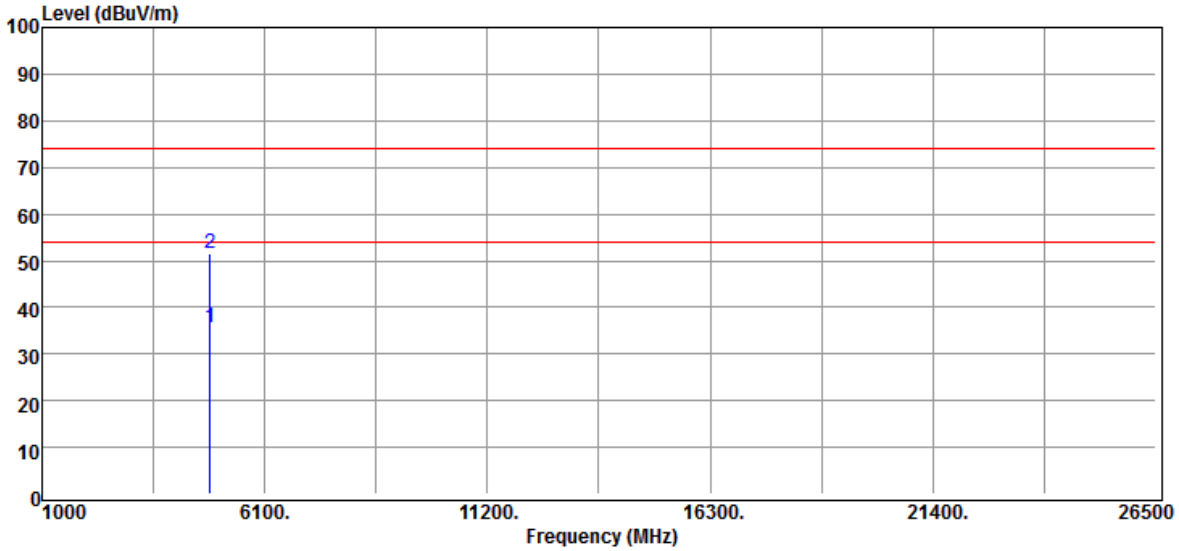
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Operation Mode :802.11n40
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :2427 MHz

Test Date :2018-06-12
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4854.00	Average	35.15	0.55	35.70	54.00	-18.30
4854.00	Peak	51.09	0.55	51.64	74.00	-22.36

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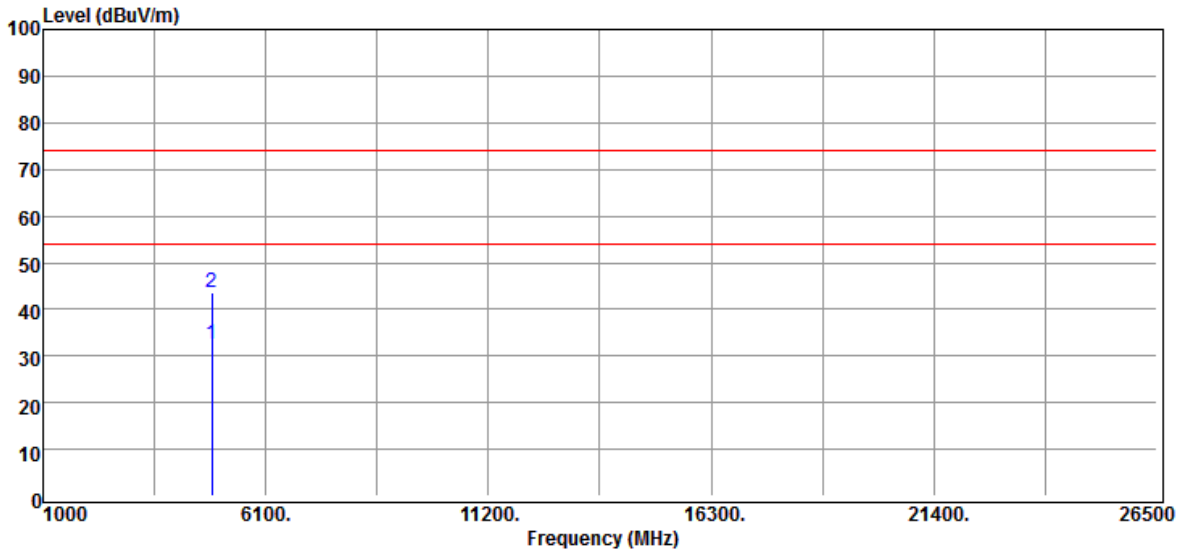
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Operation Mode	:802.11n40	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2437 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4874.00	Average	31.70	0.66	32.36	54.00	-21.64
4874.00	Peak	42.83	0.66	43.49	74.00	-30.51

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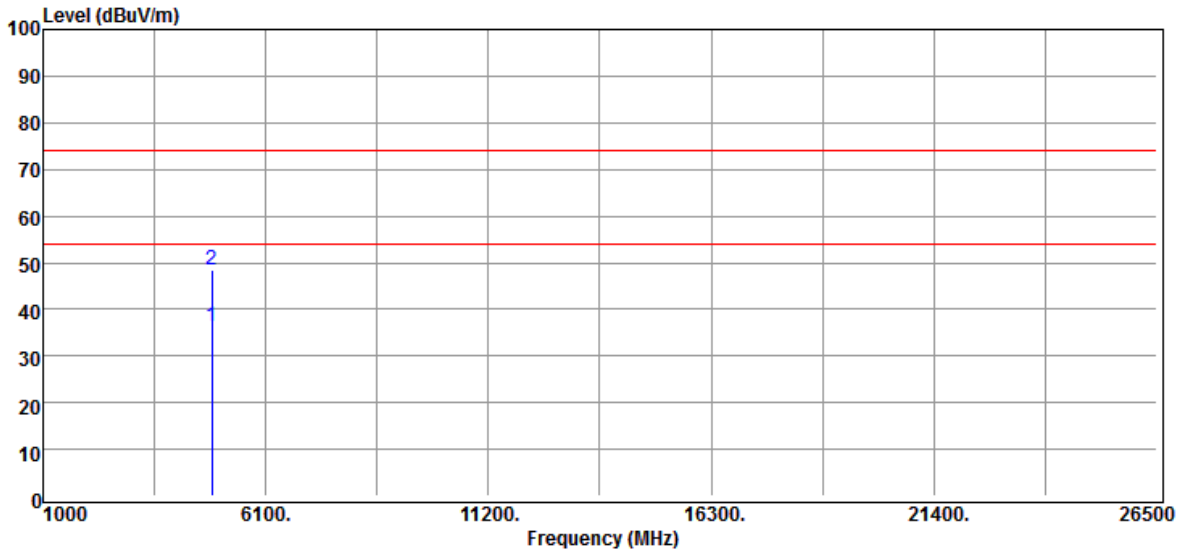
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Operation Mode :802.11n40
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :2437 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4871.00	Average	35.53	0.64	36.17	54.00	-17.83
4871.00	Peak	47.65	0.64	48.29	74.00	-25.71

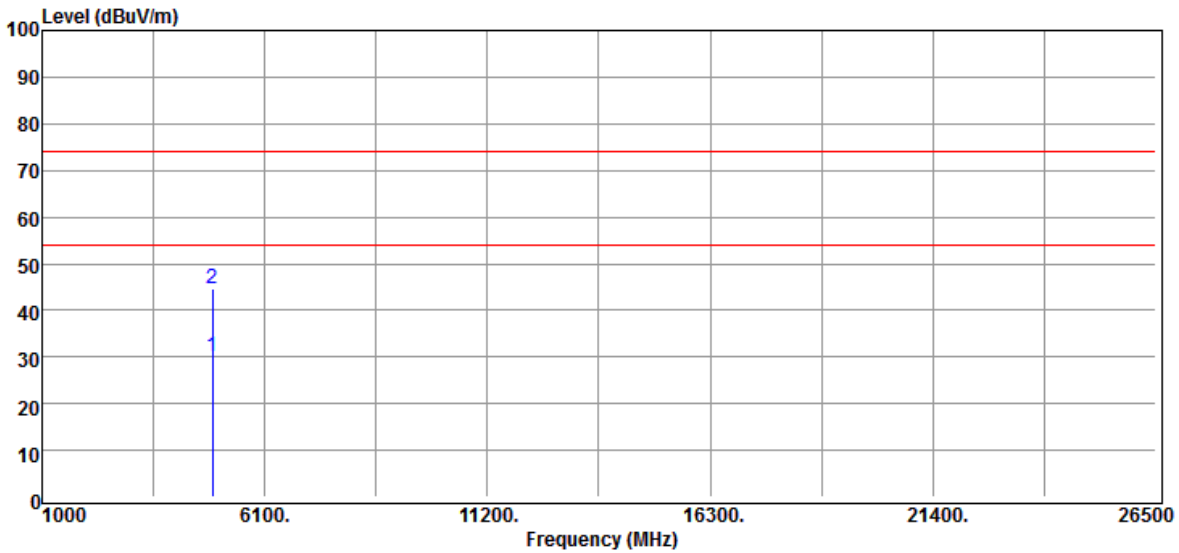
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Operation Mode	:802.11n40	Test Date	:2018-06-12
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:2447 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4894.00	Average	29.40	0.78	30.18	54.00	-23.82
4894.00	Peak	43.82	0.78	44.60	74.00	-29.40

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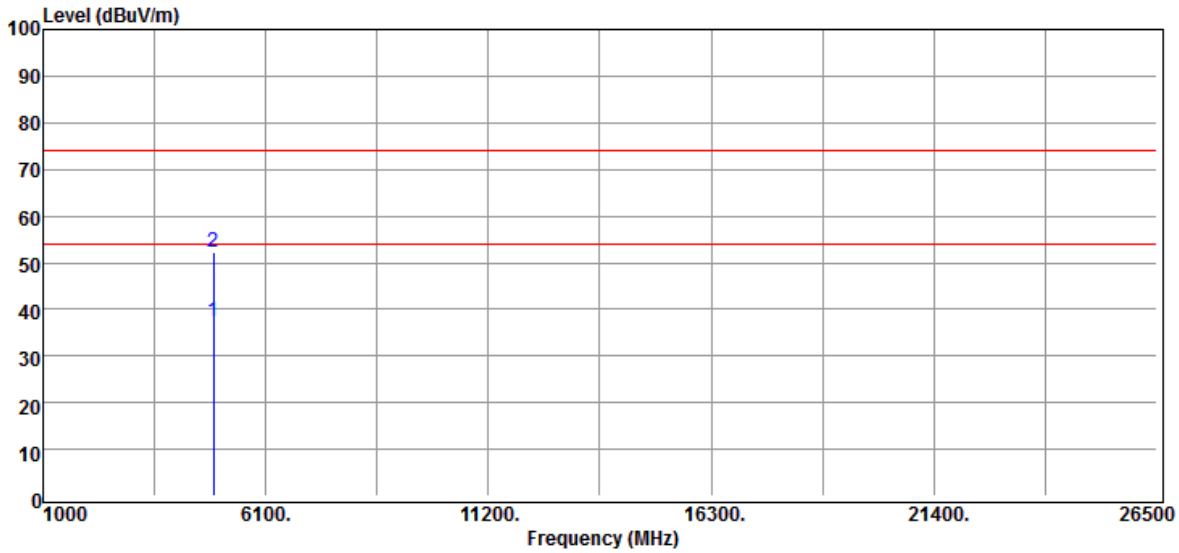
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Operation Mode	:802.11n40	Test Date	:2018-06-12
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2447 MHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4894.00	Average	36.55	0.78	37.33	54.00	-16.67
4894.00	Peak	51.37	0.78	52.15	74.00	-21.85

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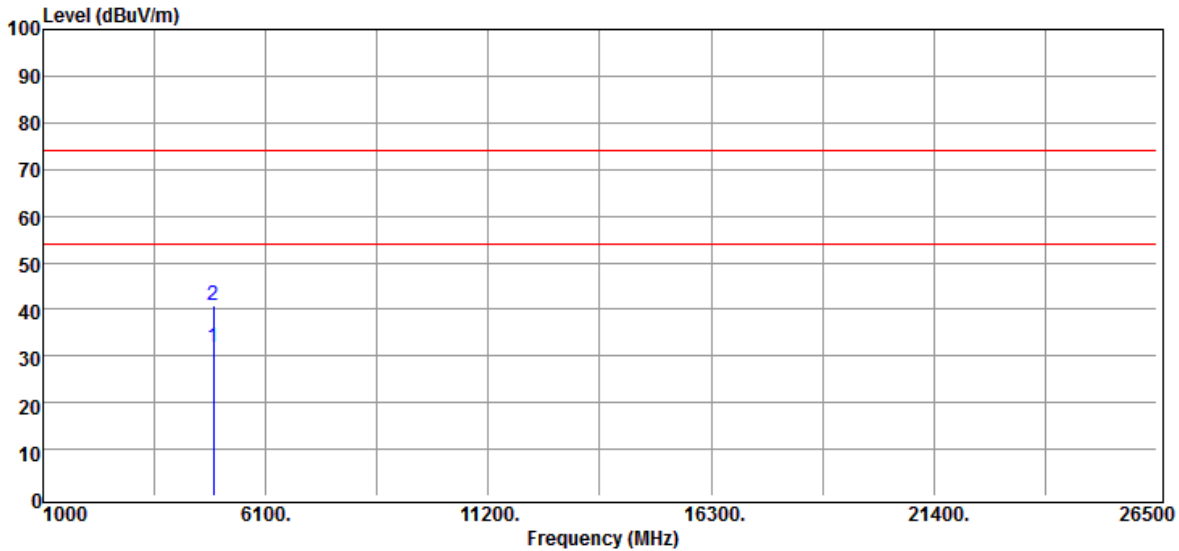
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Operation Mode :802.11n40
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :2452 MHz

Test Date :2018-05-25
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4904.00	Average	31.08	0.84	31.92	54.00	-22.08
4904.00	Peak	40.03	0.84	40.87	74.00	-33.13

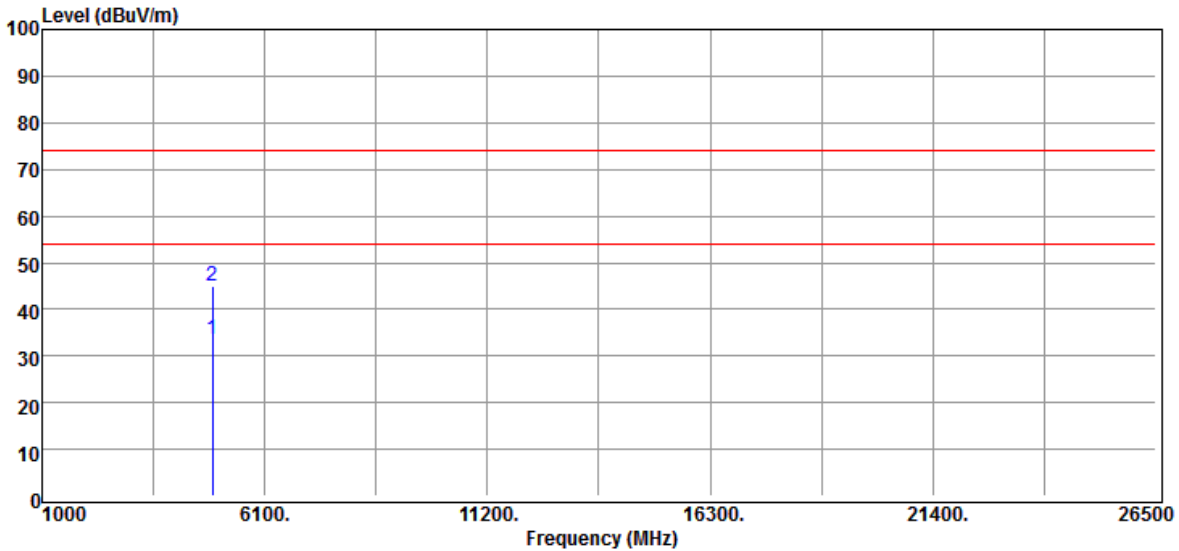
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Operation Mode	:802.11n40	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:2452 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
4904.00	Average	32.83	0.84	33.67	54.00	-20.33
4904.00	Peak	44.31	0.84	45.15	74.00	-28.85

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12 PEAK POWER SPECTRAL DENSITY

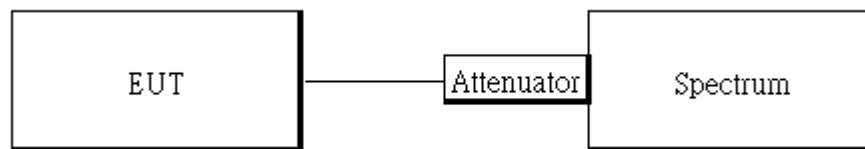
12.1 Standard Applicable

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.

12.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	06/20/2017	06/19/2018
Power Meter	Anritsu	ML2496A	1326001	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315048	06/23/2017	06/22/2018
Power Sensor	Anritsu	MA2411B	1315049	06/23/2017	06/22/2018
Coaxial Cable 30cm	WOKEN	00100A1F1A 195C	RF01	12/24/2017	12/23/2018
DC Block	PASTERNAK	PE8210	RF29	12/24/2017	12/23/2018
Splitter	RF-LAMBAD	RFLT2W1G1 8G	RF35	12/24/2017	12/23/2018
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018
DC Power Supply	Agilent	E3640A	MY53140006	05/02/2018	05/01/2019

12.3 Test Set-up



12.4 Measurement Procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 3 kHz & VBW = 10 kHz.
5. For defining Restricted Band Edge Limit:
Set the RBW = 100kHz & VBW = 300 kHz
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level.

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11. 802.11n MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application.

As per FCC KDB 662911 D01

Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, ..., GN dBi.

(i) If transmit signals are correlated, then Directional gain
 $= 10 \log[(10G1 / 20 + 10G2 / 20 + \dots + 10GN / 20) 2 / NANT]$ dBi

[Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

12.5 Measurement Result

POWER DENSITY 802.11b				POWER DENSITY 802.11g			
Freq. (MHz)	PPSD (dBm)	Limit (dBm)	Result	Freq. (MHz)	PPSD (dBm)	Limit (dBm)	Result
2412	-21.28	3.37	PASS	2412	-19.40	3.37	PASS
2437	-21.01	3.37	PASS	2437	-18.88	3.37	PASS
2462	-20.70	3.37	PASS	2462	-18.36	3.37	PASS

POWER DENSITY 802.11n HT20				POWER DENSITY 802.11n HT40			
Freq. (MHz)	PPSD (dBm)	Limit (dBm)	Result	Freq. (MHz)	PPSD (dBm)	Limit (dBm)	Result
2412	-16.13	3.37	PASS	2422	-22.75	3.37	PASS
2437	-16.10	3.37	PASS	2437	-21.5	3.37	PASS
2462	-18.07	3.37	PASS	2452	-27.4	3.37	PASS

offset 11.10 dB for SISO mode

offset 11.10 dB for MIMO mode

*Refer to next page for plots

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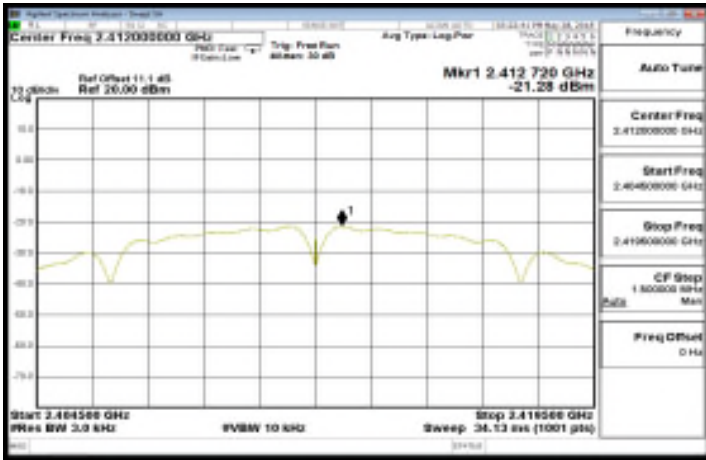
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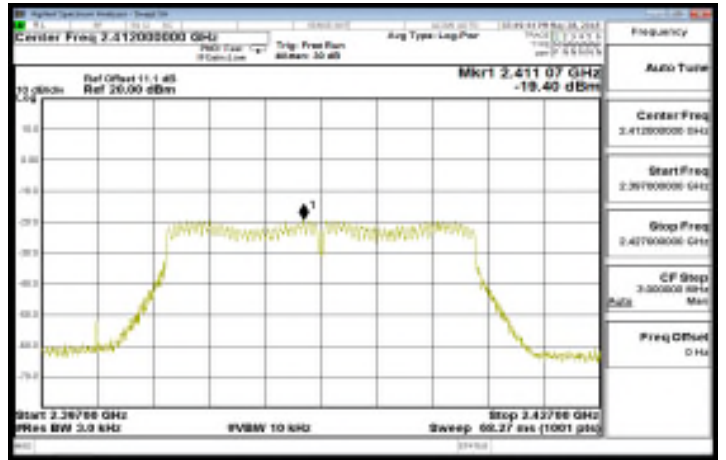
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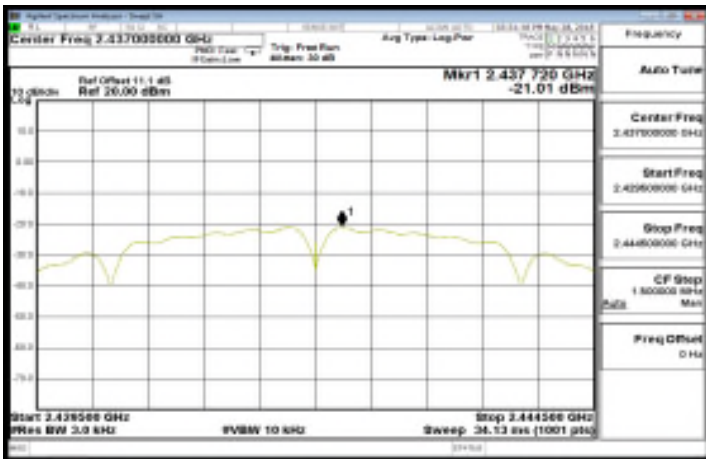
802.11b PSD(CH-Low)



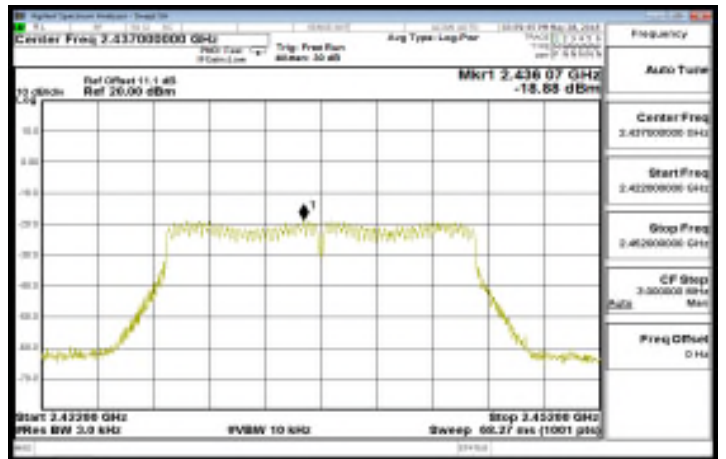
802.11g PSD(CH-Low)



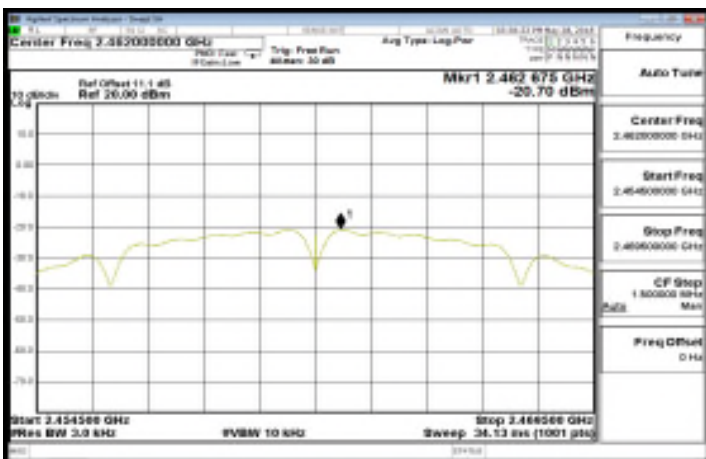
802.11b PSD (CH-Mid)



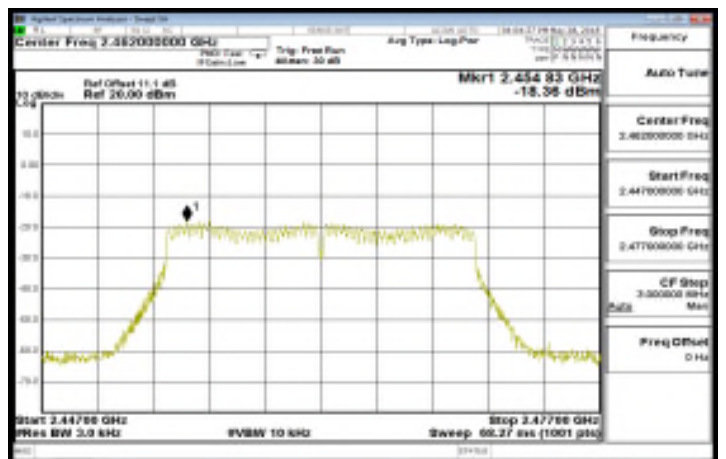
802.11g PSD (CH-Mid)



802.11b PSD (CH-High)



P802.11g PSD (CH-High)



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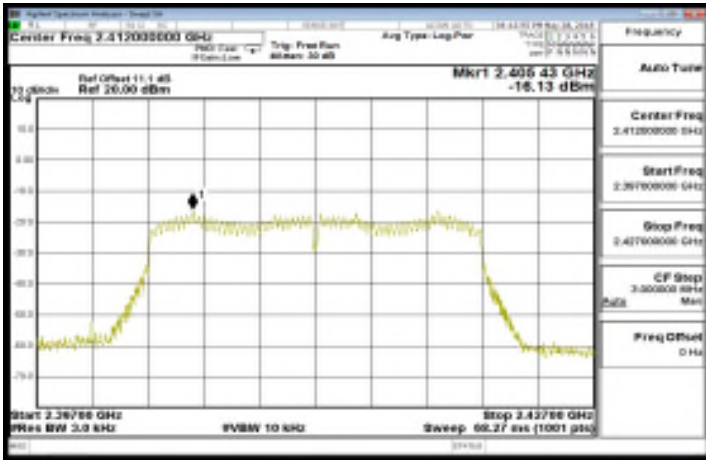
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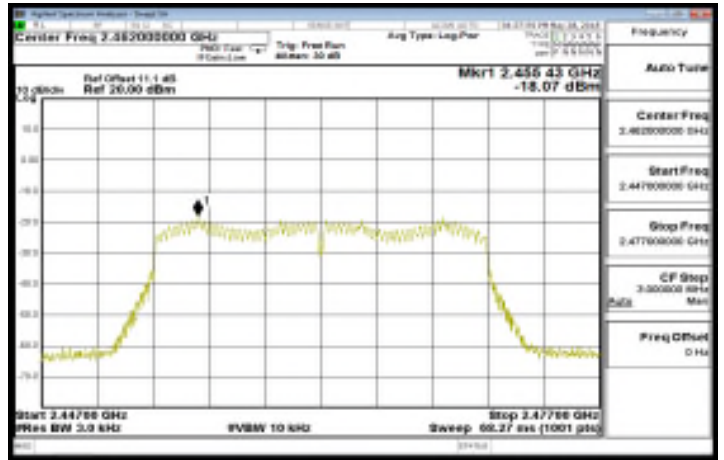
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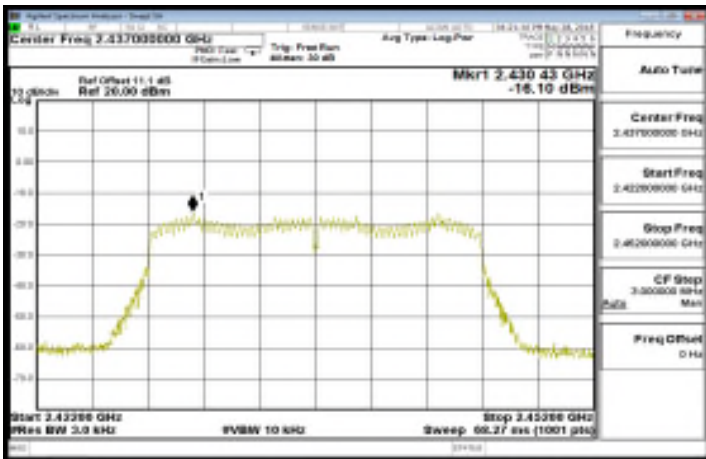
802.11n_HT20 PSD (CH-Low)



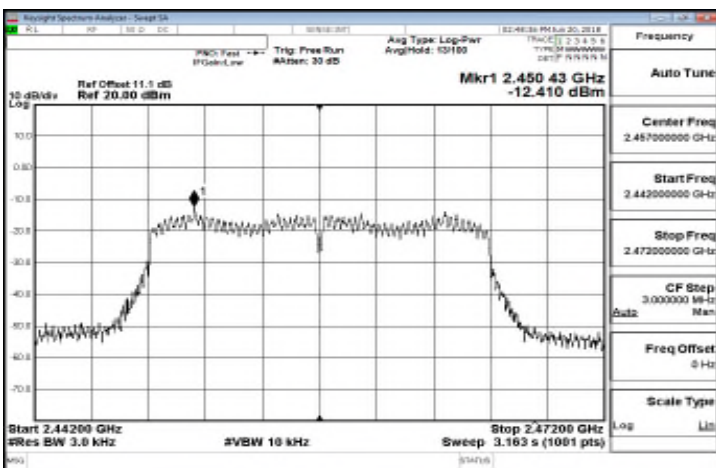
802.11n_HT20 PSD (CH-High) (2462MHz)



802.11n_HT20 PSD (CH-Mid)



802.11n_HT20 PSD (CH-High) (2457MHz)



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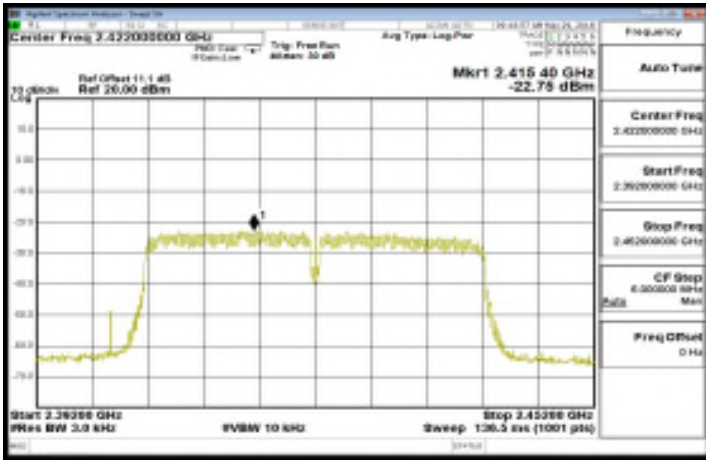
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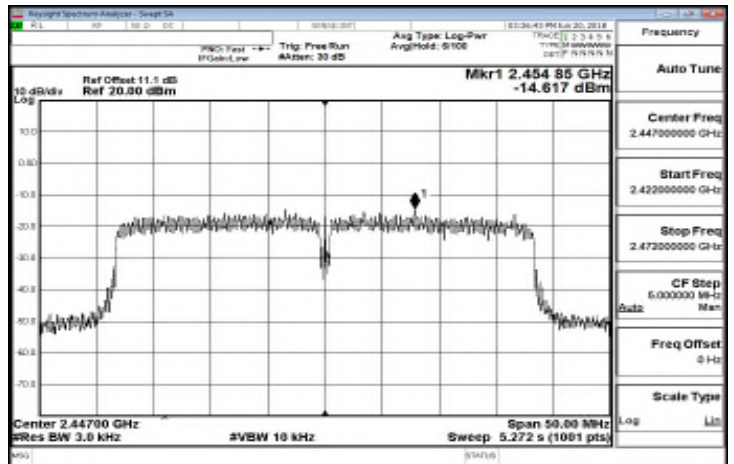
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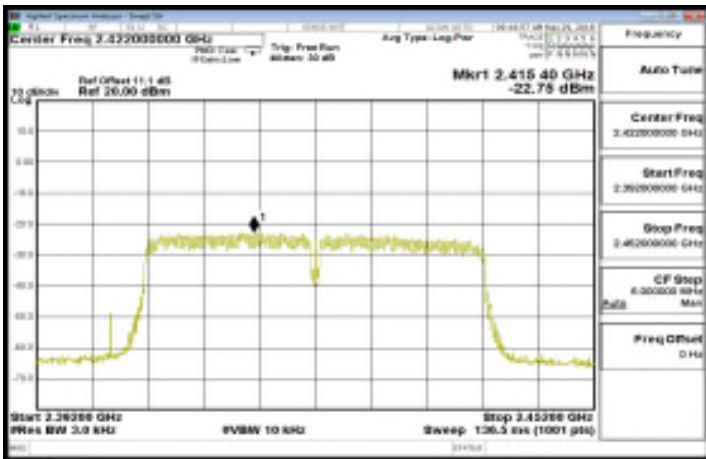
802.11n_HT40 PSD (CH-Low) (2422MHz)



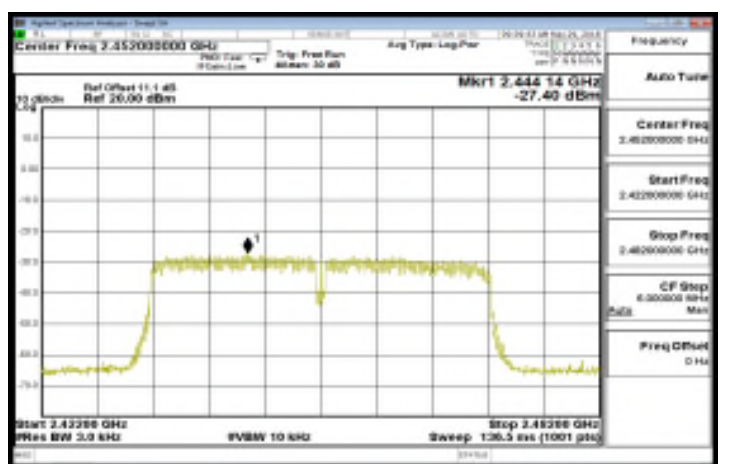
802.11n_HT40 PSD (CH-High) (2447MHz)



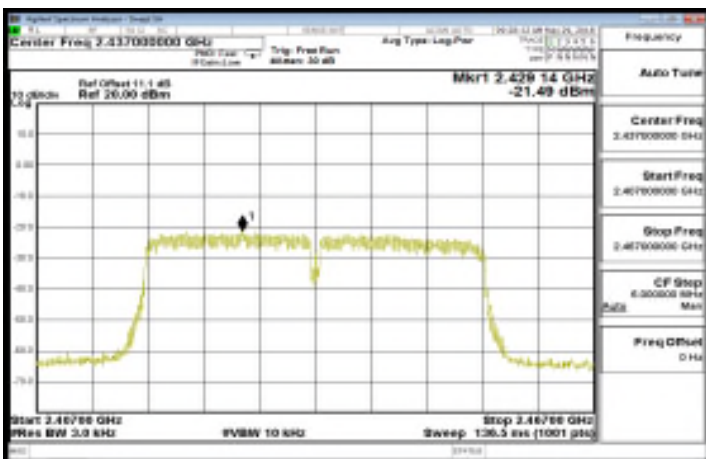
802.11n_HT40 PSD (CH-Low) (2427MHz)



802.11n_HT40 PSD (CH-High) (2452MHz)



802.11n_HT40 PSD (CH-Mid)



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13 ANTENNA REQUIREMENT

13.1 Standard Applicable

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

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

13.2 Antenna Connected Construction

The antenna is designed as permanently attached and no consideration of replacement. Please see EUT photo for details..

~ End of Report ~

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