

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E 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: E2/2018/60057

FCC Rule Part: §15.407, Cat: NII

FCC ID: ZTT-AP1200EX

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



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	
Product SW/HW version:	N/A/ N/A	
Radio SW/HW version:	N/A/ N/A	
Test SW Version:	N/A	
RF power setting in TEST SW:	N/A	
Power Supply:	48V from PoE Adapter	
	Adapter:	Model Name: PSE301G, Supplier: N/A

WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology
11a	5150~5250	4	22.49 dBm	OFDM
	5725-5850	5	22.48 dBm	
11n / ac_20M	HT20 / VHT20 5150~5250	4	HT: 22.48 dBm (Worst Case)	OFDM
	HT20 / VHT20 5725-5850	5	HT: 22.49 dBm (Worst Case)	
11n / ac_40M	HT40 / VHT40 5150~5250	2	HT: 22.47 dBm (Worst Case)	OFDM
	HT40 / VHT40 5725-5850	2	HT: 22.48 dBm (Worst Case)	
11ac_80M	VHT80 5150~5250	1	17.04 dBm	OFDM
	VHT80 5725-5850	1	21.99 dBm	
Antenna Designation		Patch Antenna, Supplier: Master WANSHIH Electronic Co., Ltd. 1. Main: Partl No.: N/A, Gain: 8.96dBi (5150~5250MHz) 8.56dBi (5725~5850MHz) 2. Aux 1: Partl No.: N/A, Gain: 8.96dBi (5150~5250MHz) 8.56dBi (5725~5850MHz)		
Modulation type		64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only		
Transition Rate:		802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 216.7Mbps 802.11 n_40MHz: 13.5 – 450.0Mbps 802.11 ac_20MHz: 6.5 –288.9Mbps 802.11 ac_40MHz: 13.5 –600.0Mbps 802.11 ac_80MHz: 29.3 – 1300.0Mbps		

1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10:2013

Note:

1. 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 Number and Designation 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.

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 are 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/ 50 uH 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. Following shows an offset computation example.

SISO mode offset

= RF cable loss (dB)+ attenuation factor(dB)+ $10 \log(N_{\text{ANT}})$ dB =12.0(dB)

MIMO mode offset

= RF cable loss (dB)+ attenuation factor(dB)+ $10 \log(N_{\text{ANT}})$ dB =15.0dB

2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission



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



Fig. 2-3 Conduction Emission

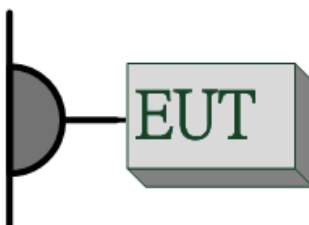


Table 2-1 Equipment Used in Tested System

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

3 SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.403(i) §15.407(e)	26 dB & 6dB & 99% Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

4.1 Operated in U-NII Bands

Operated band in 5150 MHz ~5250 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode	
Channel	Frequency
36	5180
44	5220
48	5240

802.11 n HT40 Mode, 802.11ac VHT40 Mode	
channel	Frequency
38	5190
42	5210
46	5230

802.11ac VHT80 Mode	
channel	Frequency
42	5210

Operated band in 5725 MHz ~5850 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode	
Channel	Frequency
149	5745
157	5785
165	5825

802.11 n HT40 Mode, 802.11ac VHT40 Mode	
channel	Frequency
151	5755
159	5795

802.11ac VHT80 Mode	
channel	Frequency
155	5775

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 mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	2TX
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MIMO
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	2TX
802.11ac_VHT80	5775	155	155	OFDM	MCS0	MIMO
RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	2TX
802.11n_HT20				OFDM	MCS16	MIMO
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS16	MIMO
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MIMO
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	2TX
802.11n_HT20				OFDM	MCS16	MIMO
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS16	MIMO
802.11ac_VHT80	5775	155	155	OFDM	MCS0	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 802.11a/n/ac WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	2TX
802.11n_HT20 802.11ac_VHT20				OFDM	MCS16	MIMO
802.11n_HT40 802.11ac_VHT40	5190~5230	38 to 46	38,46	OFDM	MCS16	MIMO
802.11ac_VHT80	5210	42	42	OFDM	MCS0	MIMO
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	2TX
802.11n_HT20 802.11ac_VHT20				OFDM	MCS16	MIMO
802.11n_HT40 802.11ac_VHT40	5755~5795	151 to 159	151,159	OFDM	MCS16	MIMO
802.11ac_VHT80	5775	155	155	OFDM	MCS0	MIMO

5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Measurement	+/- 0.96 dB
Peak Power Spectral Density Measurement	+/- 1.67 dB
Frequency Stability	+/- 123.36 Hz
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.

6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

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

Frequency range MHz	Limits dB(μV)	
	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.

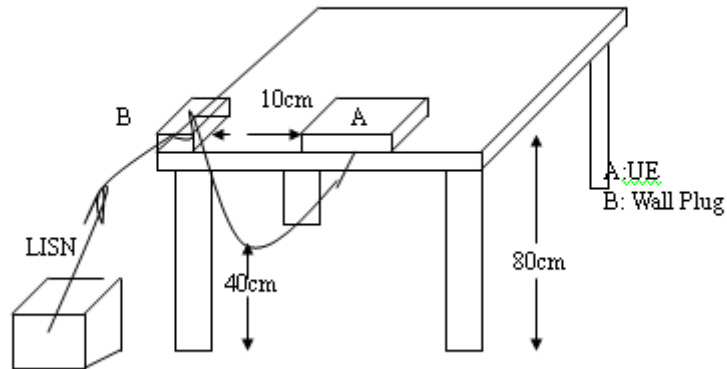
6.2 Measurement Equipment Used

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	N30N30-1042-1 50cm	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 C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The LISN was connected with 120Vac/60Hz power source.

6.4 Test SET-UP



6.5 Measurement Procedure

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

6.6 Measurement Result

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

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

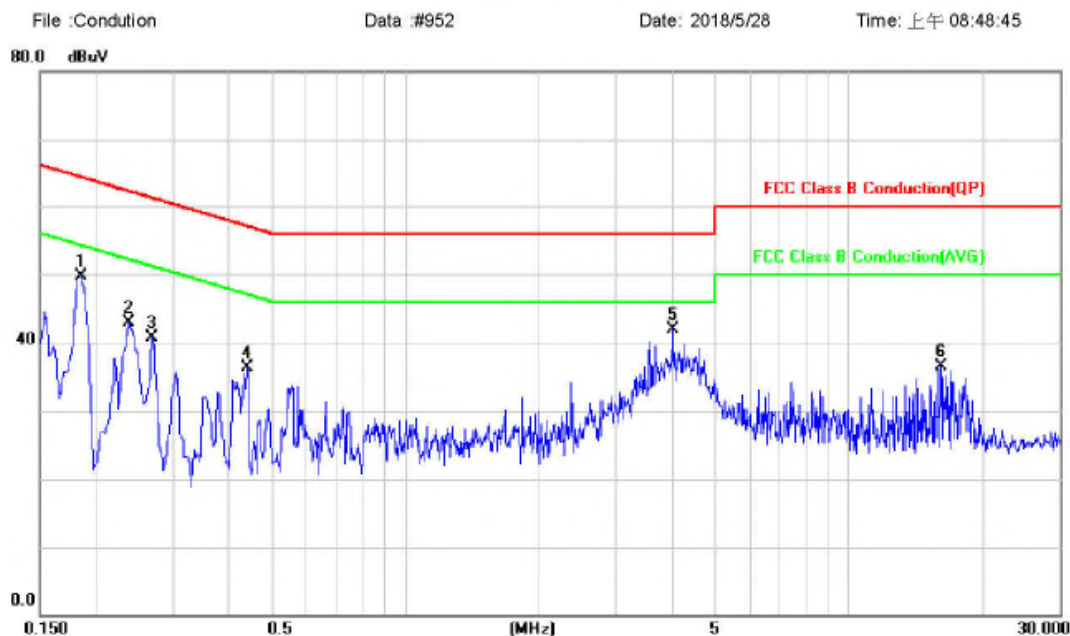
AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	operation mode	Test By:	Aken Huang
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Site : Conduction Room
 Limit: FCC Class B Conduction(QP)
 Mode:
 Note:

Phase: **L1**
 Power: AC 120V/60Hz
 Temperature: 25 °C
 Humidity: 85 %

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	

Site : Conduction Room

Phase: **N**

Temperature: 25 °C

Limit: FCC Class B Conduction(QP)

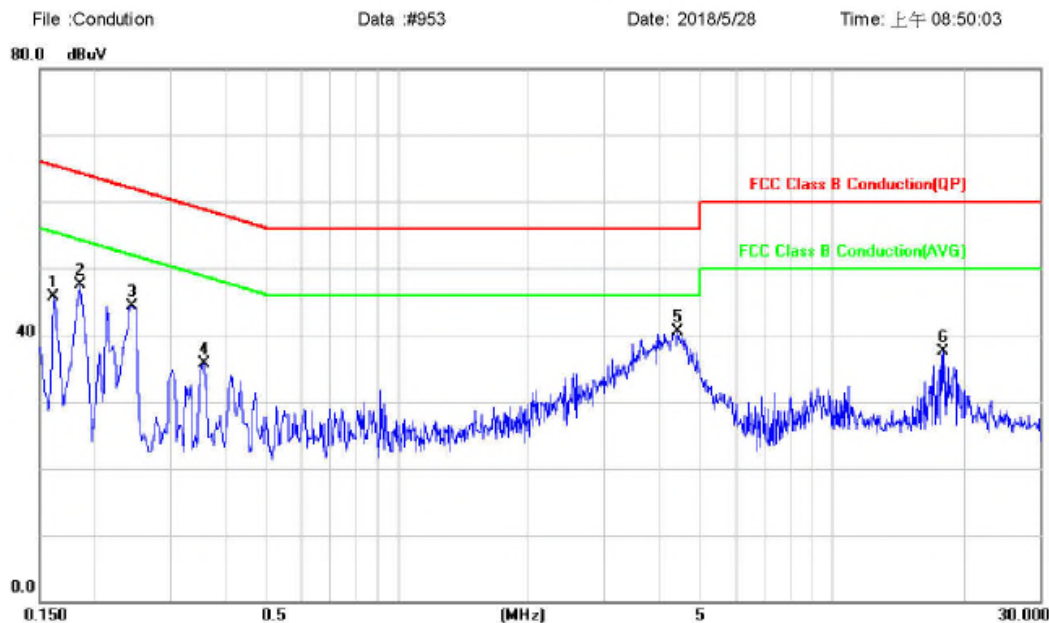
Power: AC 120V/60Hz

Humidity: 85 %

Mode:

Note:

Conducted Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
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	

7 DUTY CYCLE 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:

Mode	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11a	95.16	0.22	0.72	1.00
802.11n_20	88.48	0.53	1.48	2.00
802.11n_40	81.87	0.87	2.87	3.00
802.11ac_80	76.19	1.18	3.08	4.00

$$\text{Duty Cycle Factor: } 10 * \log(1/0.9516) = 0.22$$

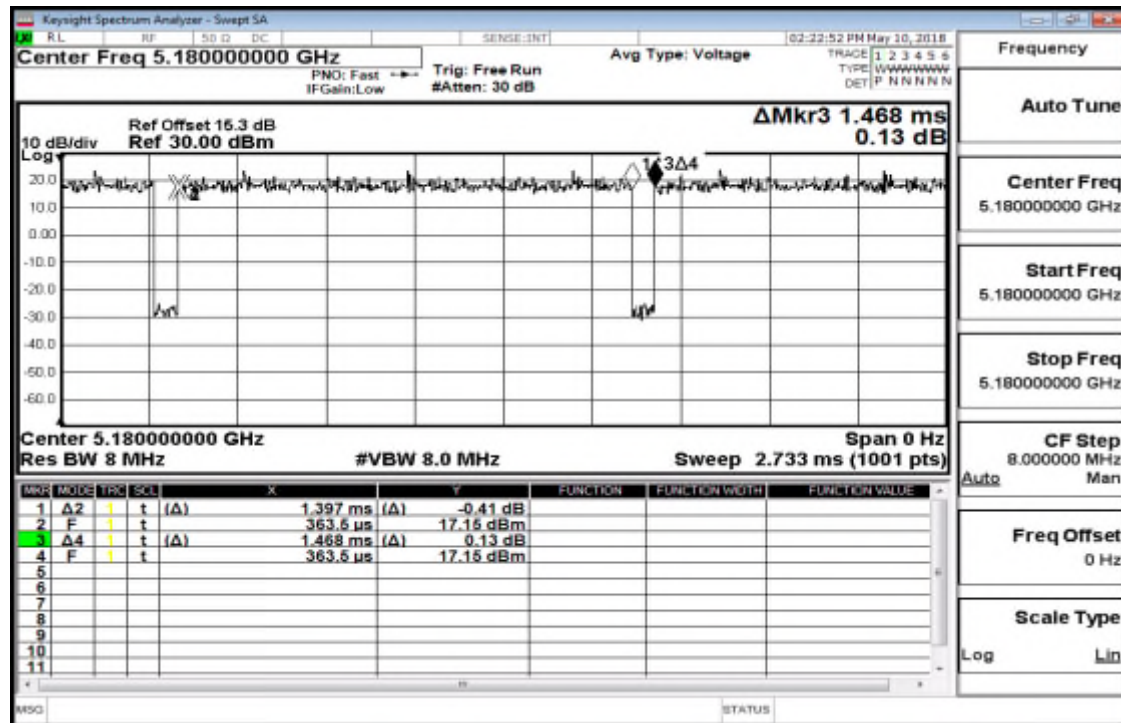
$$\text{Duty Cycle Factor: } 10 * \log(1/0.8708) = 0.6$$

$$\text{Duty Cycle Factor: } 10 * \log(1/0.7822) = 1.07$$

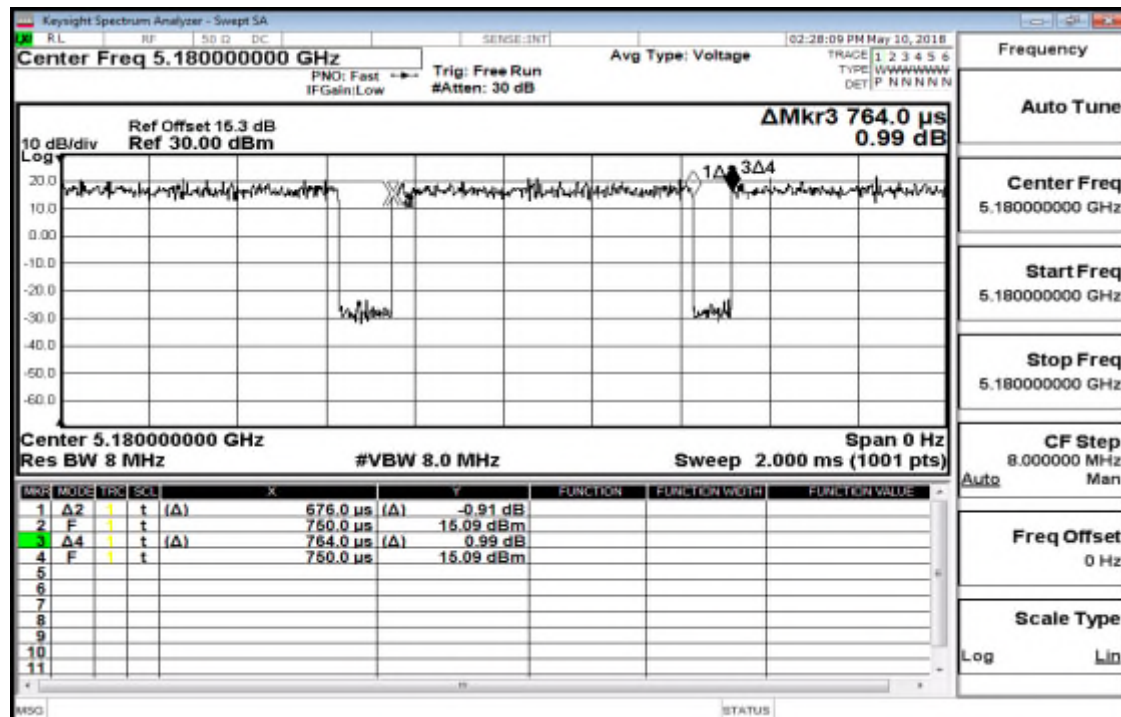
$$\text{Duty Cycle Factor: } 10 * \log(1/0.9245) = 0.34$$

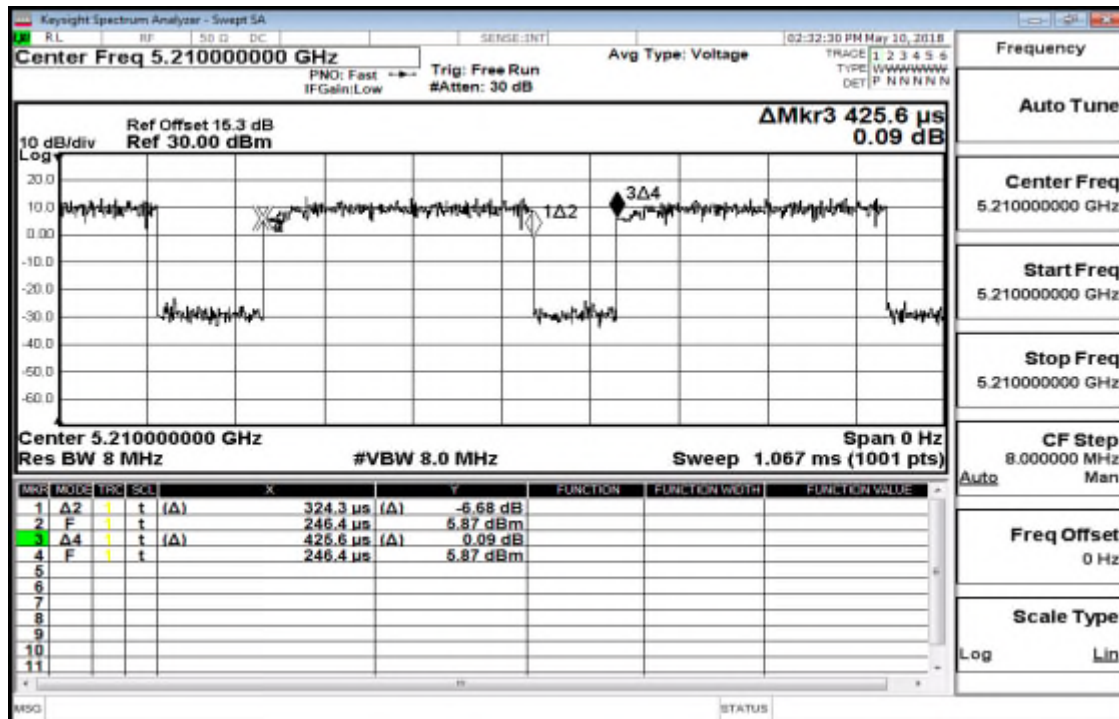
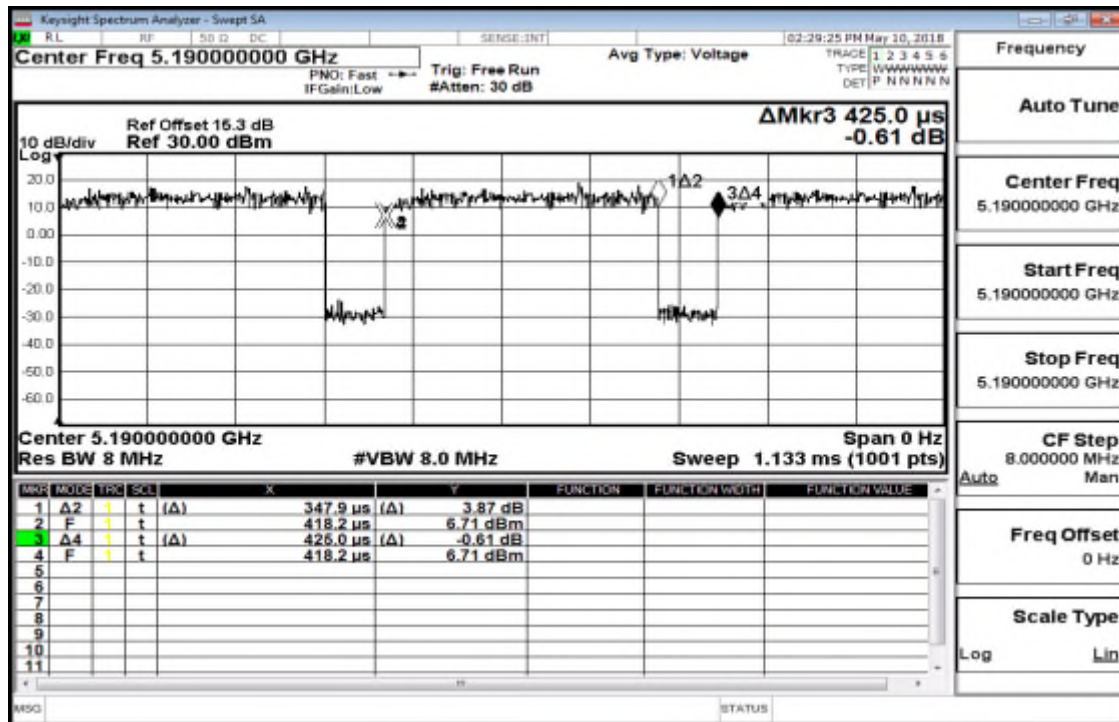
DUTY CYCLE TEST SIGNAL Measurement Result

802.11a



802.11n HT20





8 26DB & 6DB & 99% EMISSION BANDWIDTH MEASUREMENT

8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

8.2 Measurement Procedure

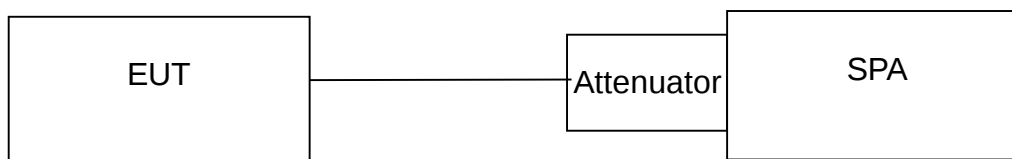
1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
 - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
 - b. Mark the peak frequency and –26dB (upper and lower) frequency.
4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
 - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=Peak, Sweep=auto
 - b. Mark the peak frequency and –6dB (upper and lower) frequency.
6. For 99% Bandwidth:

Set the spectrum analyzer as RBW=1%, VBW = 3*RBW, Span = 30M/50MHz, Detector=Sample, Sweep=auto.
7. Turn on the 99% bandwidth function, max reading.
8. Repeat above procedures until all frequency of interest measured was complete.

8.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration 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	00100A1F1A195C	RF01	12/24/2017	12/23/2018
DC Block	PASTERNAK	PE8210	RF29	12/24/2017	12/23/2018
Splitter	RF-LAMBAD	RFLT2W1G18G	RF35	12/24/2017	12/23/2018
Attenuator	WOKEN	218FS-10	RF23	12/24/2017	12/23/2018

8.4 Test Set-up



8.5 Measurement Result

26dB and 6dB Bandwidth

802.11a_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5180	19.00	12.787	5745	16.51	12.178
5220	18.99	12.785	5785	16.50	12.174
5240	19.00	12.788	5825	16.42	12.153

802.11a_Main

802.11a_Main

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.19	< 5250
5745	5736.78	> 5725

802.11a_Aux1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5180	20.38	13.092	5745	16.27	12.115
5220	20.43	13.102	5785	16.26	12.112
5240	19.87	12.981	5825	16.03	12.050

802.11a_Aux1

802.11a_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.28	< 5250
5745	5736.78	> 5725

802.11n_HT20_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5180	19.82	12.971	5745	16.31	12.125
5220	20.57	13.133	5785	16.31	12.125
5240	20.53	13.123	5825	16.32	12.127

802.11n_HT20_Main

802.11n_HT20_Main

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.85	< 5250
5745	5736.18	> 5725

802.11n_HT20_Aux1

802.11n_HT20_Aux1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5180	20.41	13.099	5745	16.93	12.286
5220	20.14	13.041	5785	16.35	12.134
5240	20.14	13.041	5825	17.15	12.344

802.11n_HT20_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5240	5248.82	< 5250
5745	5736.18	> 5725

802.11n_HT40_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5190	40.41	16.065	5755	35.36	15.485
5230	40.66	16.092	5795	35.14	15.458
5210	40.52	16.077			

802.11n_HT40_Main

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5230	5248.10	< 5250
5755	5736.95	> 5725

802.11n_HT40_Aux1

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5190	40.46	16.070	5755	35.36	15.485
5230	40.62	16.087	5795	35.41	15.492
5210	39.56	15.973			

802.11n_HT40_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5230	5248.20	< 5250
5755	5736.90	> 5725

802.11ac_VHT80_Main

802.11ac_VHT80_Main

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5210	81.00	19.085	5775	75.16	18.760

802.11ac_VHT80_Main

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5210	5247.80	< 5250

802.11ac_VHT80_Aux1

802.11ac_VHT80_Aux1

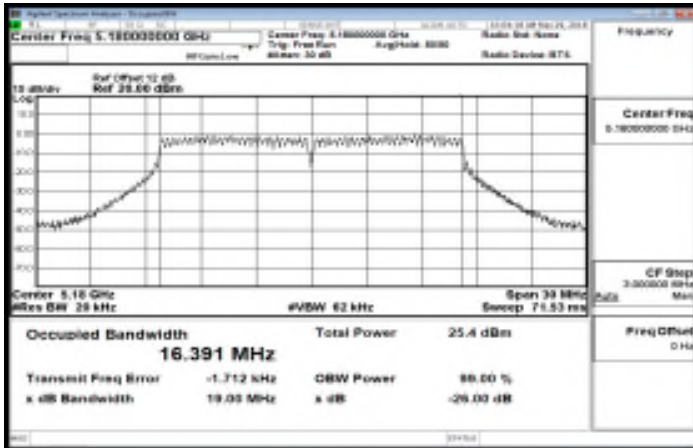
Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5210	81.18	19.094	5775	75.25	18.765

802.11n_HT80_Aux1

Frequency (MHz)	Measured Frequency (MHz)	Limit (MHz)
5210	5247.60	< 5250

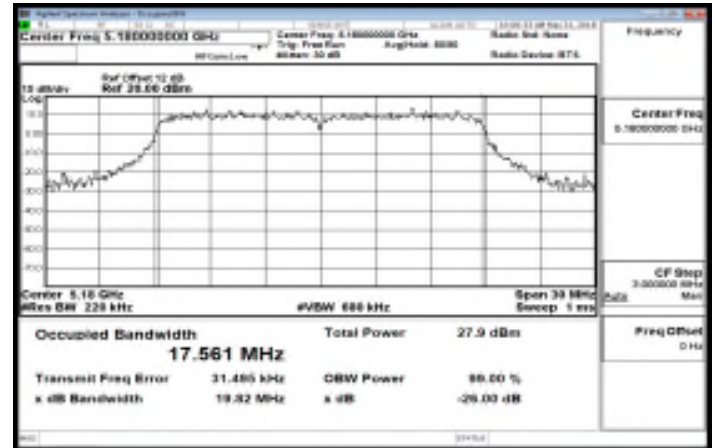
802.11a, 5150~5250 MHz (Main)

26dB Band Width Test Data CH-Low (5180MHz)

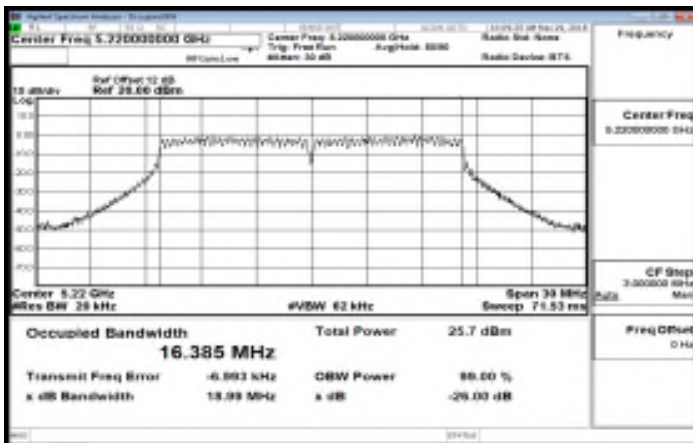


802.11n HT20, 5150~5250 MHz (Main)

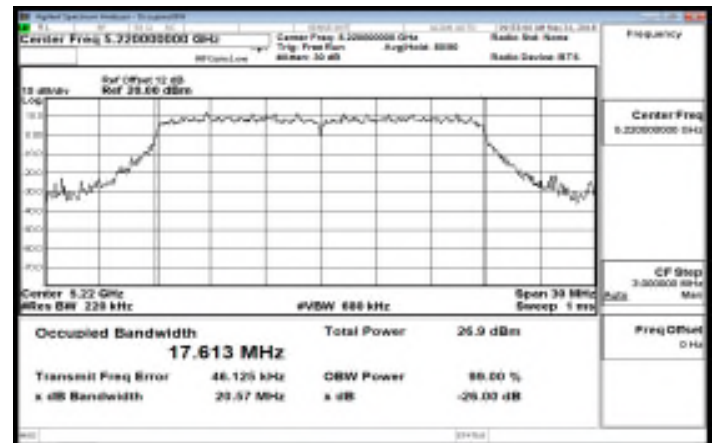
26dB Band Width Test Data CH-Low (5180 MHz)



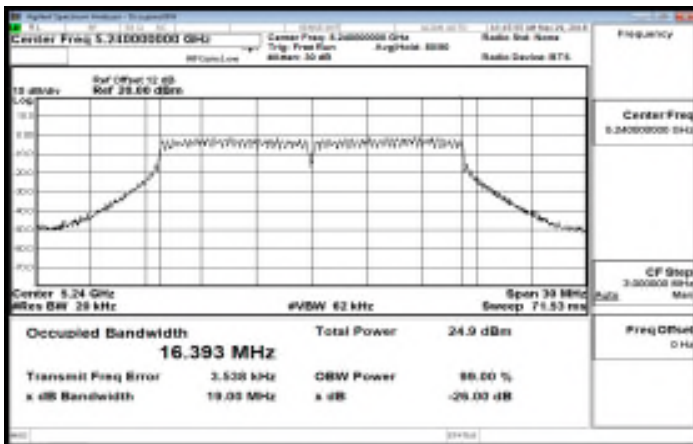
26dB Band Width Test Data CH-Mid (5220MHz)



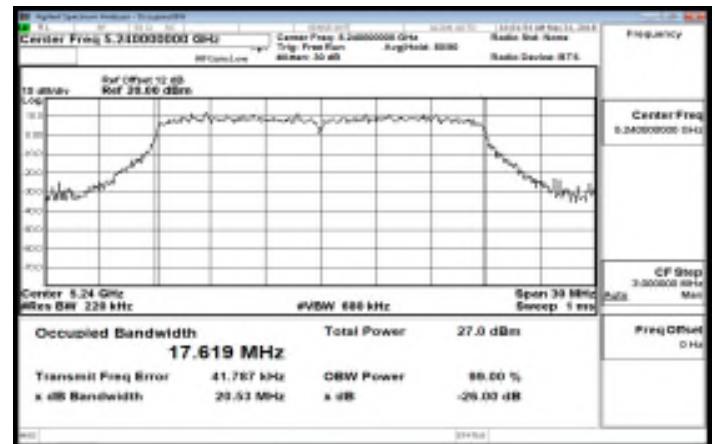
26dB Band Width Test Data CH-Mid (5220 MHz)



26dB Band Width Test Data CH-High (5240MHz)



26dB Band Width Test Data CH-High (5240 MHz)



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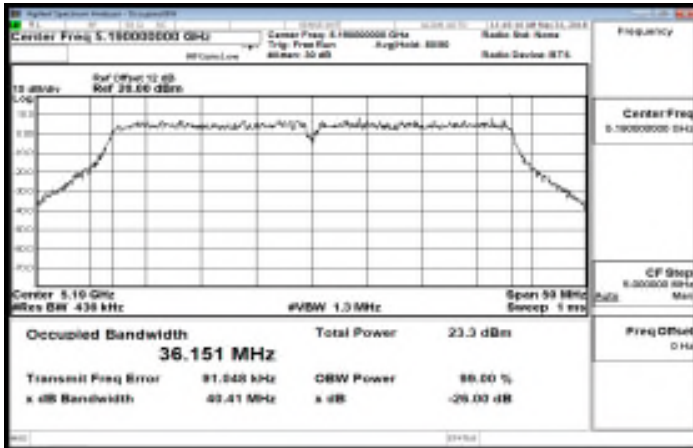
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f (886-2) 2298-0488

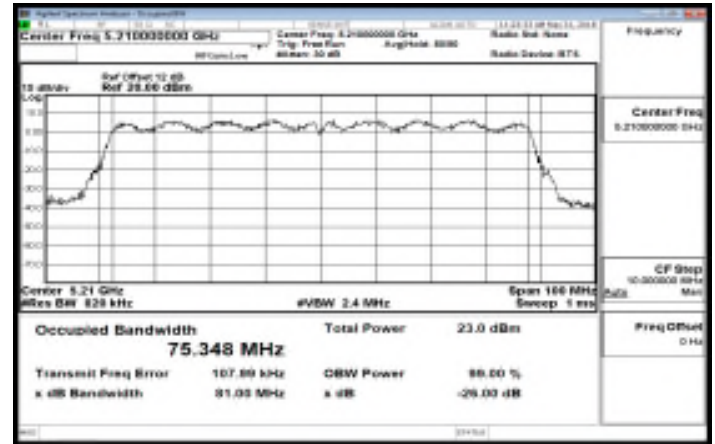
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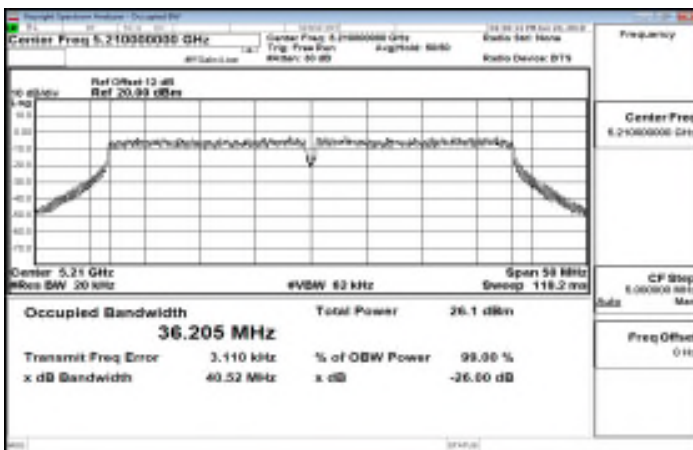
802.11n HT40, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Low (5190 MHz)



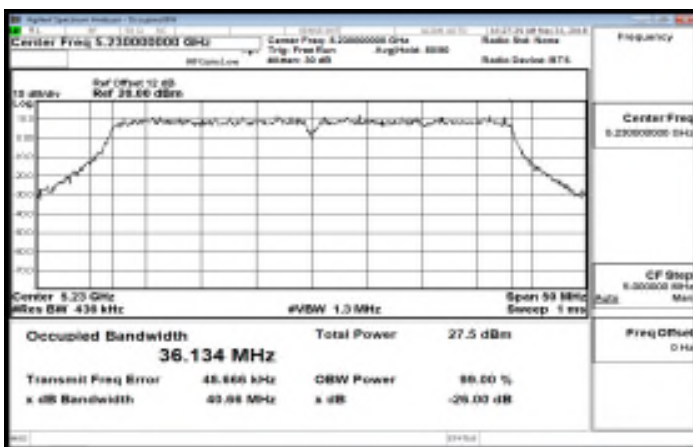
802.11ac VHT80, 5150~5250 MHz (Main) 26dB Band Width Test Data CH-Mid (5210 MHz)



26dB Band Width Test Data CH-High (5210MHz)



26dB Band Width Test Data CH-High (5230 MHz)



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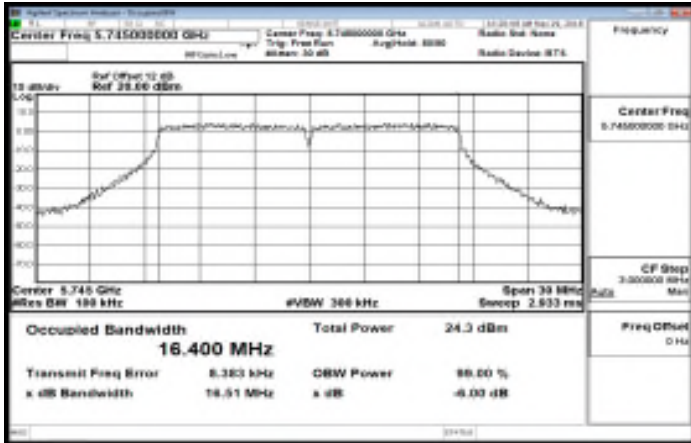
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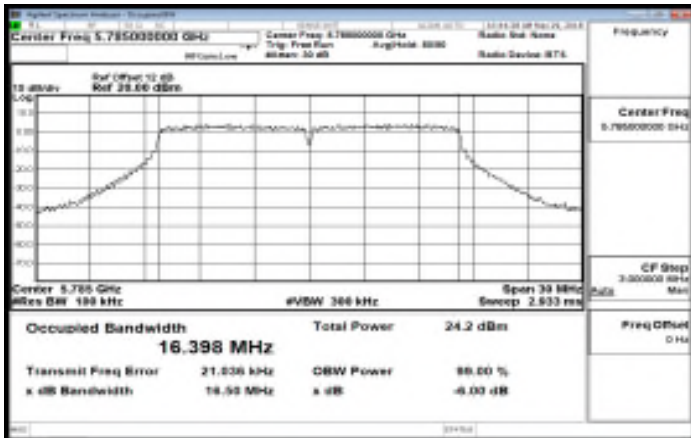
6dB Band Width measure with Peak detector for FCC

802.11a, 5725~5850 MHz (Main)

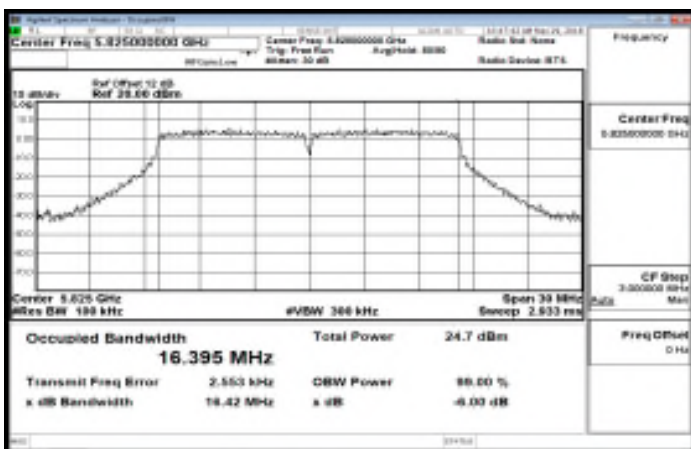
6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)

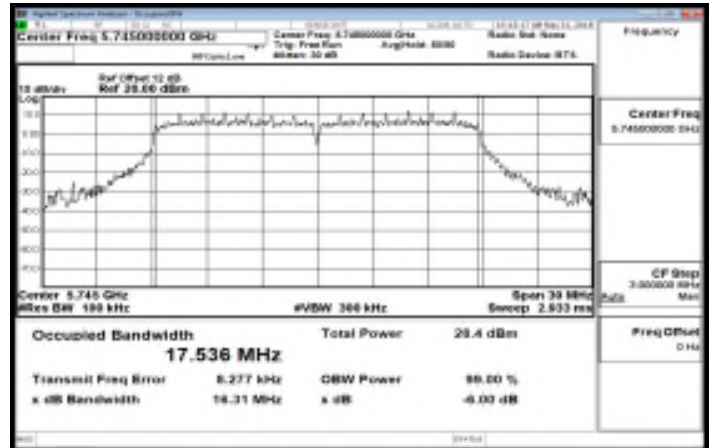


6dB Band Width Test Data CH-High (5825 MHz)

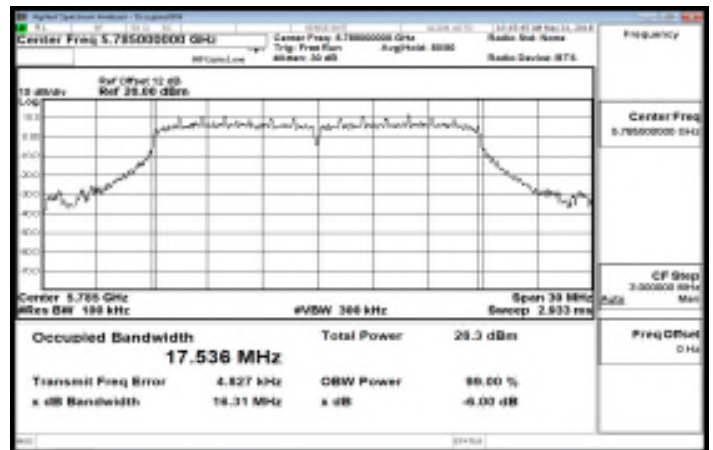


802.11n_HT20, 5725~5850 MHz (Main)

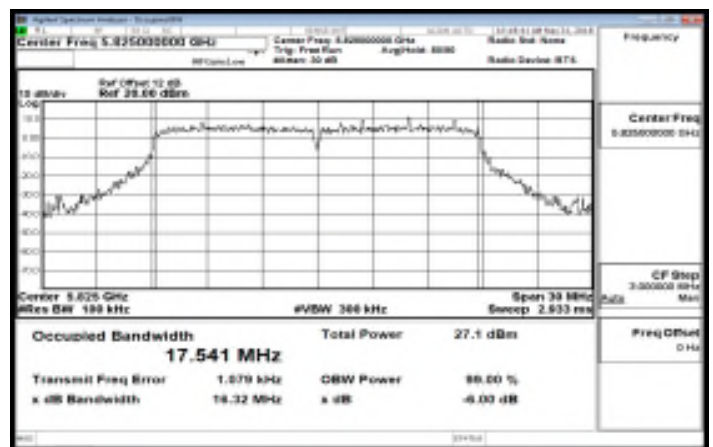
6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



6dB Band Width Test Data CH-High (5825 MHz)



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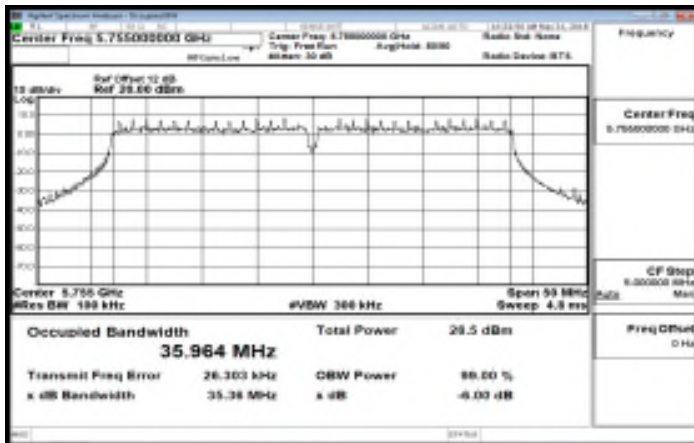
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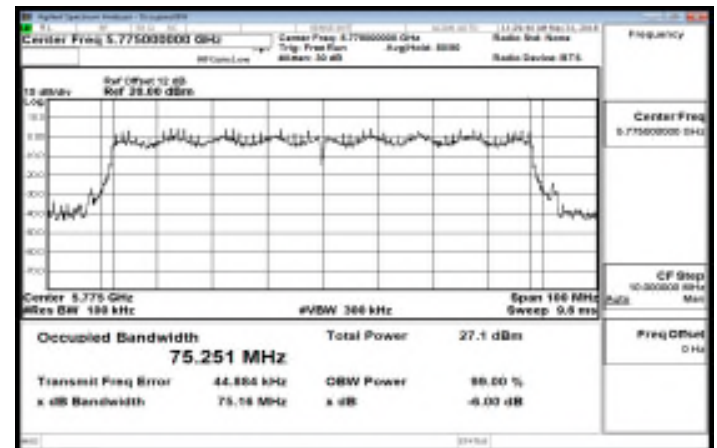
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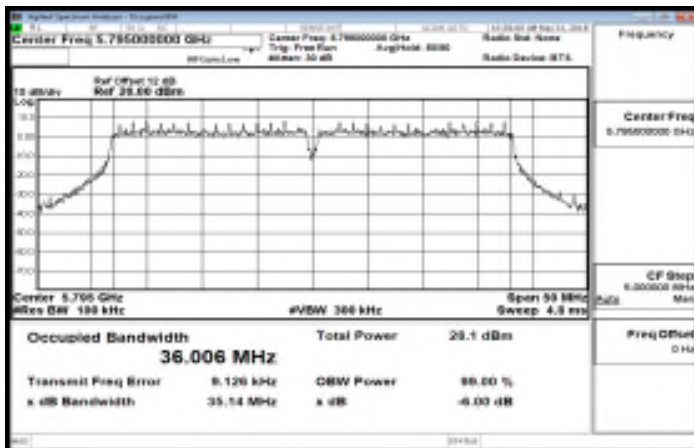
802.11n_HT40, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5755 MHz)



802.11ac VHT80, 5725~5850 MHz (Main) 6dB Band Width Test Data CH-Low (5775 MHz)



6dB Band Width Test Data CH-Mid (5795 MHz)



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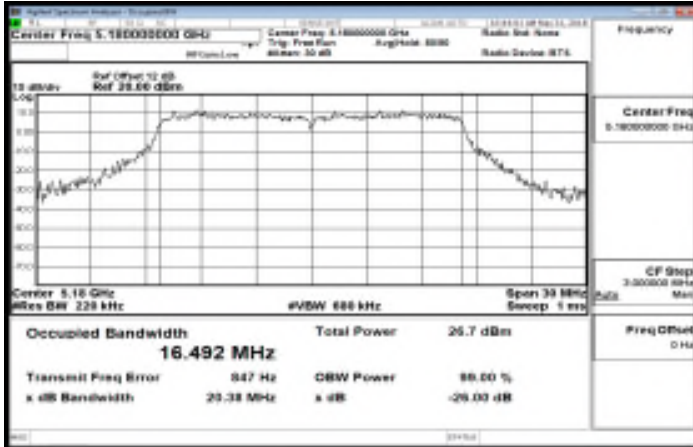
f (886-2) 2298-0488

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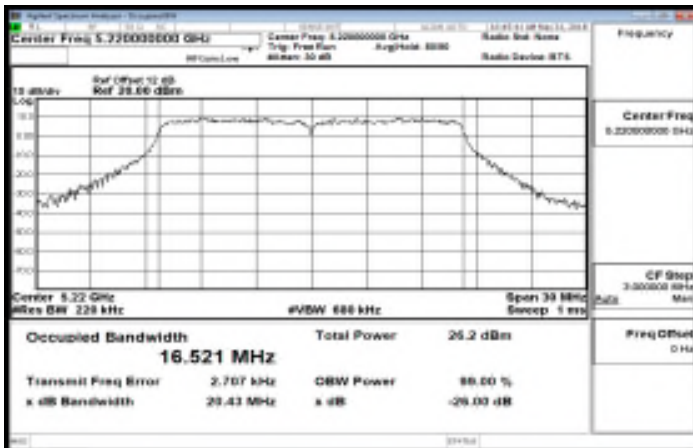
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802.11a, 5150~5250 MHz (Aux)

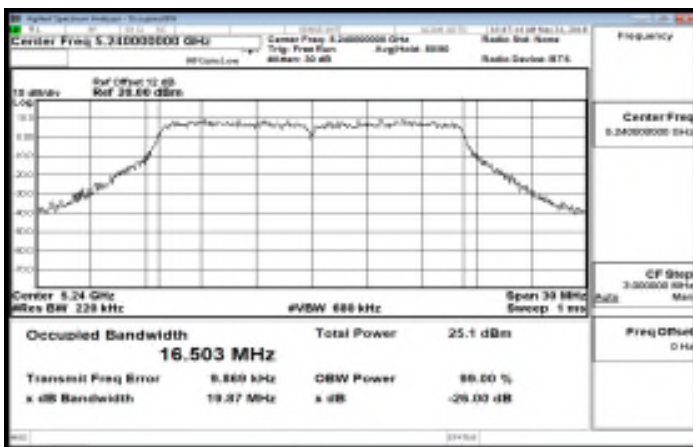
26dB Band Width Test Data CH-Low (5180MHz)



26dB Band Width Test Data CH-Mid (5220MHz)

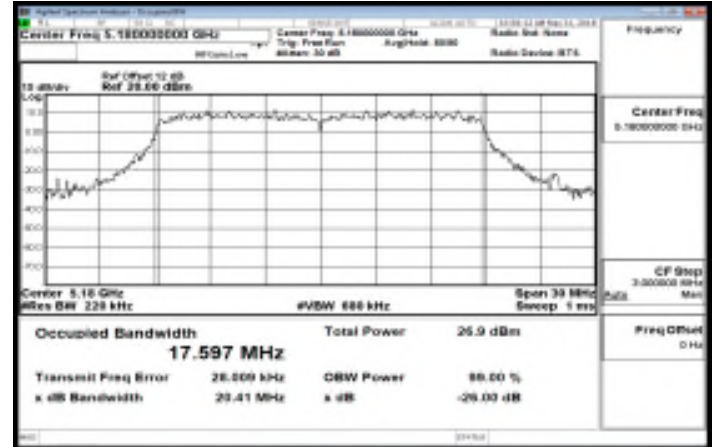


26dB Band Width Test Data CH-High (5240MHz)

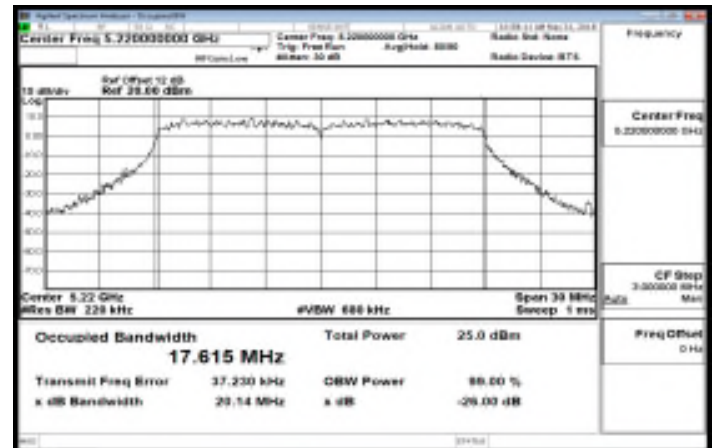


802.11n HT20, 5150~5250 MHz (Aux)

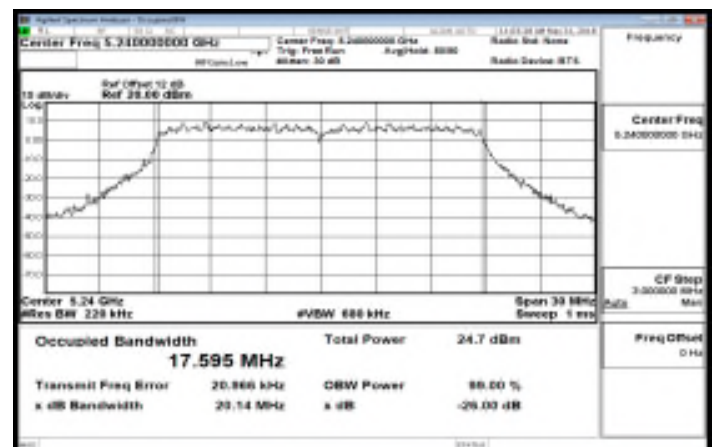
26dB Band Width Test Data CH-Low (5180 MHz)



26dB Band Width Test Data CH-Mid (5220 MHz)



26dB Band Width Test Data CH-High (5240 MHz)



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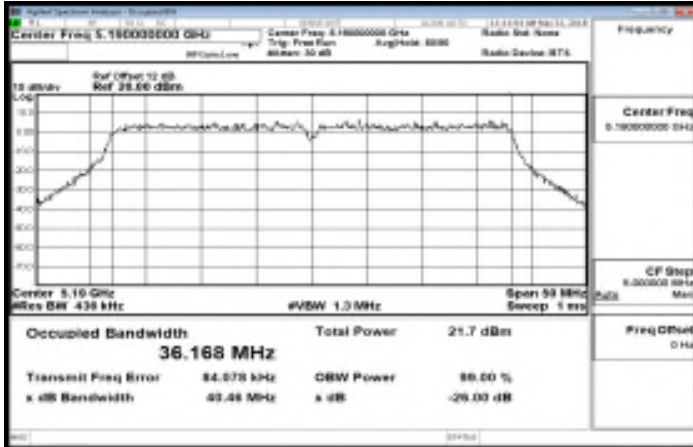
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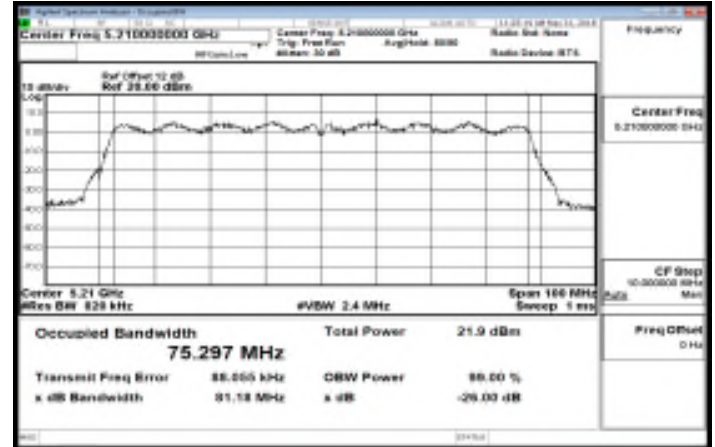
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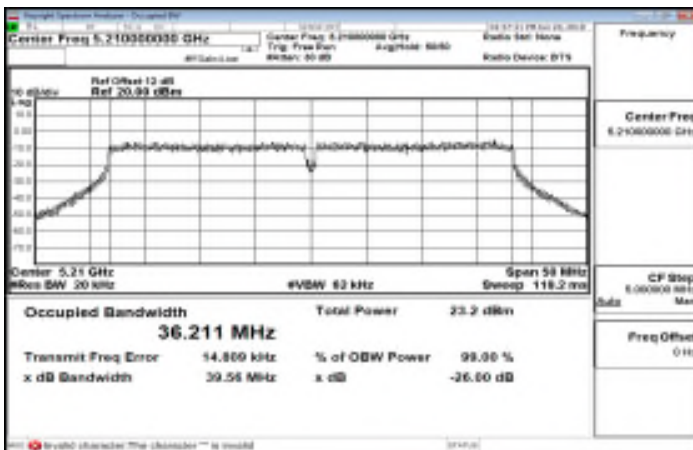
802.11n HT40, 5150~5250 MHz (Aux) 26dB Band Width Test Data CH-Low (5190 MHz)



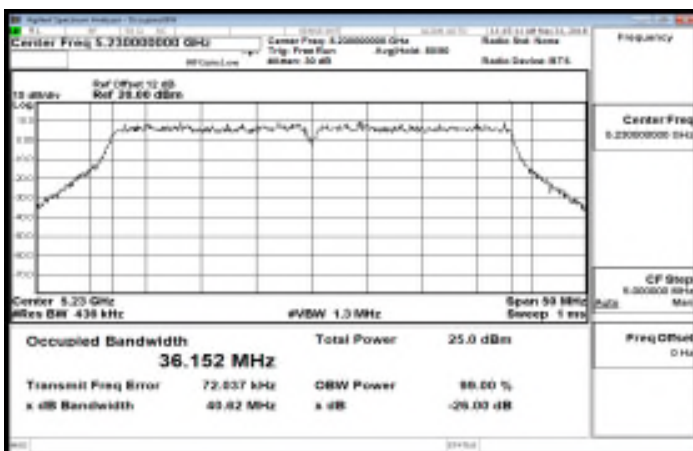
802.11ac VHT80, 5150~5250 MHz (Aux) 26dB Band Width Test Data CH-Mid (5210 MHz)



26dB Band Width Test Data CH-High (5210MHz)



26dB Band Width Test Data CH-High (5230 MHz)



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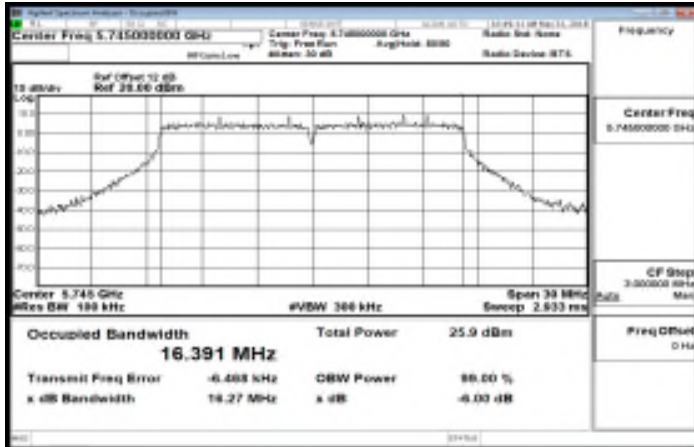
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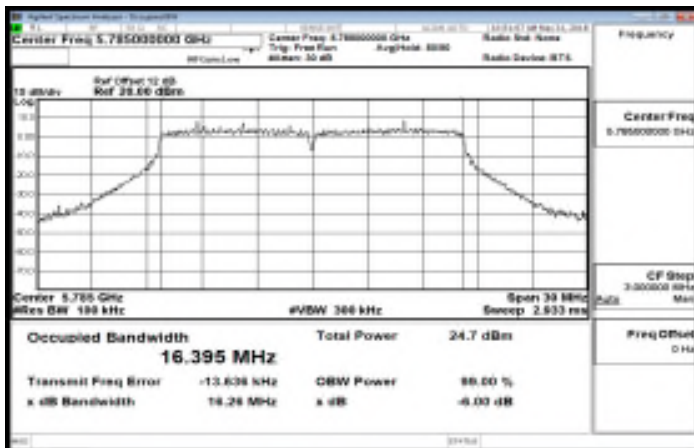
6dB Band Width measure with Peak detector for FCC

802.11a, 5725~5850 MHz (Aux)

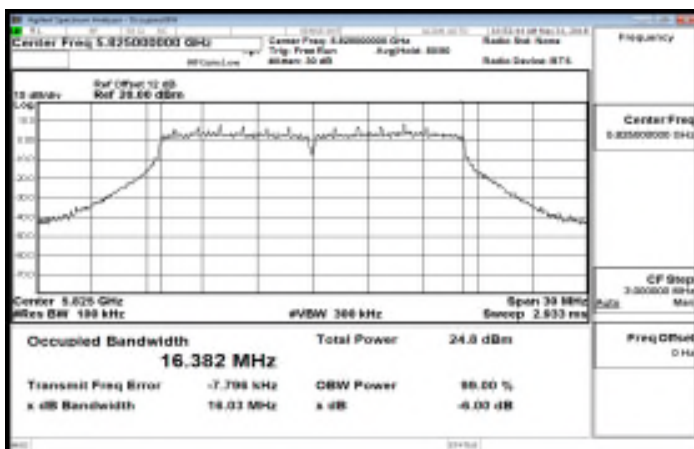
6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)

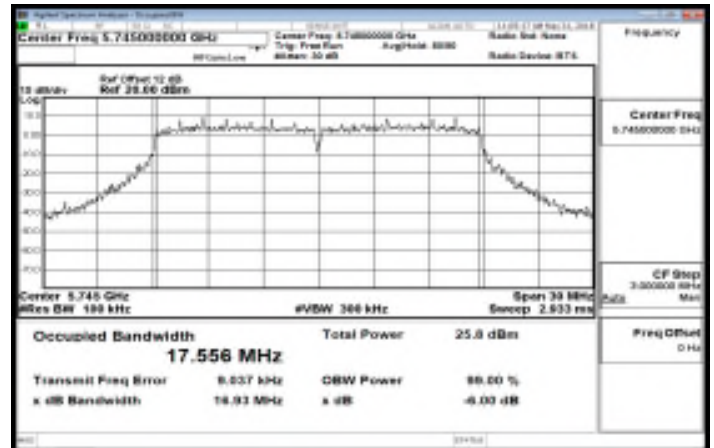


6dB Band Width Test Data CH-High (5825 MHz)

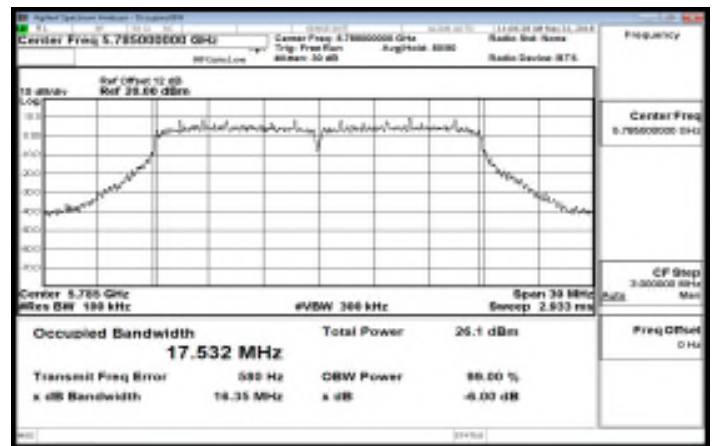


802.11n_HT20, 5725~5850 MHz (Aux)

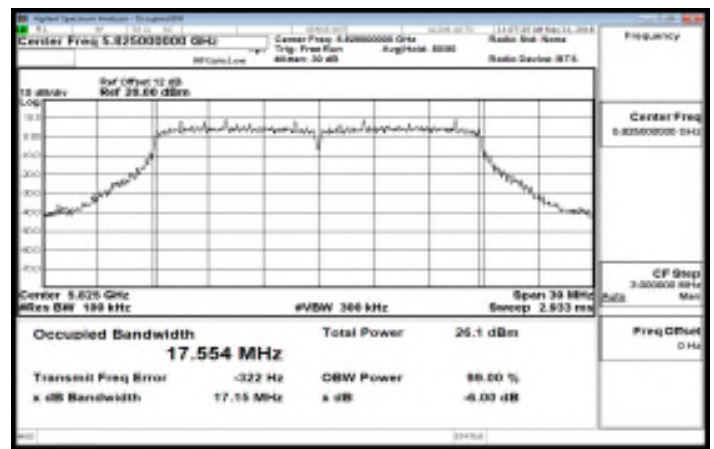
6dB Band Width Test Data CH-Low (5745 MHz)



6dB Band Width Test Data CH-Mid (5785 MHz)



6dB Band Width Test Data CH-High (5825 MHz)



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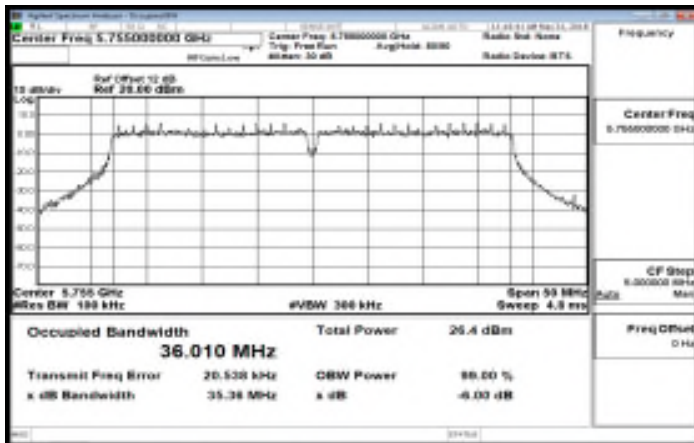
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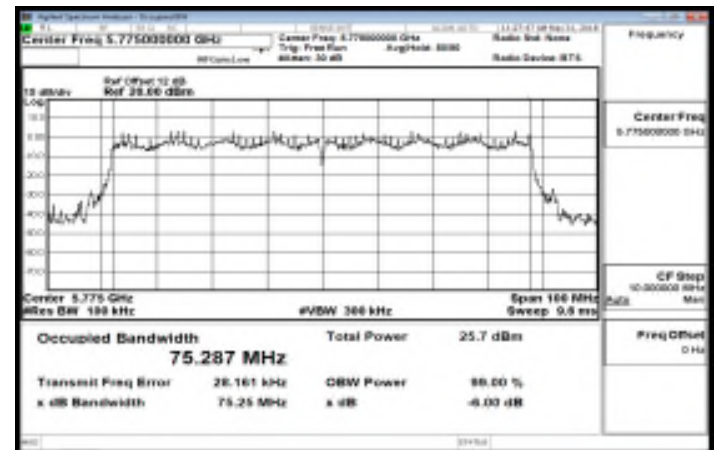
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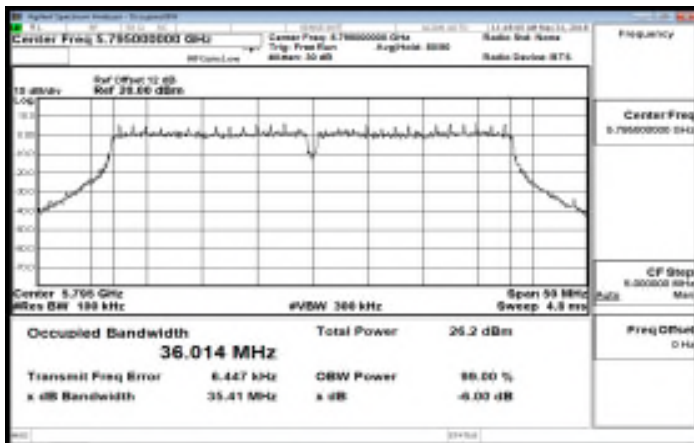
802.11n_HT40, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5755 MHz)



802.11ac VHT80, 5725~5850 MHz (Aux) 6dB Band Width Test Data CH-Low (5775 MHz)



6dB Band Width Test Data CH-Mid (5795 MHz)



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9 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

9.1 Standard Applicable

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1	√	Access Point (Master device)	1 Watt(30dBm)
		Fixed point-to-point Acess Ponit	1 Watt(30dBm)
		Mobile and portable clinet device	250mW(23.98dBm)
U-NII-2A			250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C			250mW(23.98dBm) or 11dBm+10 log B
U-NII-3	√		1 Watt(30dBm)

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note:

- (i) 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

$$= 10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] \text{ dBi}$$

 [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.]

	Effective Legacy Gain (dBi)	Limit
UNII-1	8.96+3.01=11.97	30dBm
U-NII-3	8.56+3.01=11.57	30dBm

Therefore the limit needs to reduce for the UNII-1 and U-NII-3 band.

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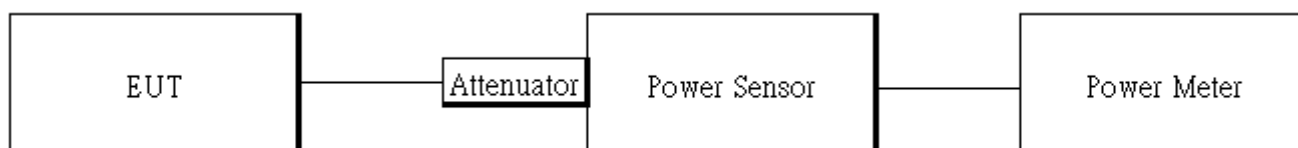
9.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
5. Record the max. reading and add $10 \log(1/\text{duty cycle})$.
6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

9.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Meter	Anritsu	ML2496A	1326001	2017/07/26	2018/07/25
Power Sensor	Anritsu	MA2411B	1315048	2017/07/26	2018/07/25
Power Sensor	Anritsu	MA2411B	1315049	2017/07/26	2018/07/25
Attenuator	Marvelous	WATT-218FS-10	RF246	2017/12/26	2018/12/25
Notebook	Lenovo	T420	S0012599	N/A	N/A

9.4 Test Set-up



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9.5 Measurement Result

Conducted output power

802.11a_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	22.42	174.400	27.04	PASS
44	5220	6	22.43	174.802	27.04	PASS
48	5240	6	22.44	175.205	27.04	PASS
149	5745	6	22.37	172.403	27.44	PASS
157	5785	6	22.40	173.598	27.44	PASS
165	5825	6	22.43	174.802	27.44	PASS

802.11a_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	22.39	173.199	27.08	PASS
44	5220	6	22.37	172.403	27.08	PASS
48	5240	6	22.42	174.400	27.08	PASS
149	5745	6	22.33	170.823	27.44	PASS
157	5785	6	22.35	171.611	27.44	PASS
165	5825	6	22.34	171.216	27.44	PASS

802.11a_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CH 0	CH 1				
36	5180	6	20.18	18.1	22.49	168.797	24.05	PASS
44	5220	6	20.17	18.09	22.48	168.409	24.05	PASS
48	5240	6	20.09	18.2	22.47	168.163	24.05	PASS
149	5745	6	19.63	18.82	22.47	168.041	24.43	PASS
157	5785	6	19.89	18.51	22.48	168.457	24.43	PASS
165	5825	6	20.12	18.18	22.48	168.567	24.43	PASS

802.11n_HT20_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	22.40	173.842	27.04	PASS
44	5220	MCS0	22.38	173.043	27.04	PASS
48	5240	MCS0	22.42	174.644	27.04	PASS
149	5745	MCS0	22.43	175.047	27.44	PASS
157	5785	MCS0	22.41	174.243	27.44	PASS
165	5825	MCS0	22.45	175.855	27.44	PASS

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802.11n_HT20_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	22.32	170.669	27.08	PASS
44	5220	MCS0	22.34	171.457	27.08	PASS
48	5240	MCS0	22.36	172.248	27.08	PASS
149	5745	MCS0	22.39	173.442	27.44	PASS
157	5785	MCS0	22.33	171.063	27.44	PASS
165	5825	MCS0	22.36	172.248	27.44	PASS

802.11n_HT20_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CH 0	CH 1				
36	5180	MCS8	19.88	17.73	22.48	156.567	24.05	PASS
44	5220	MCS8	19.81	17.82	22.47	156.253	24.05	PASS
48	5240	MCS8	19.78	17.9	22.48	156.720	24.05	PASS
149	5745	MCS8	19.31	18.56	22.49	157.089	24.43	PASS
157	5785	MCS8	19.56	18.22	22.48	156.739	24.43	PASS
165	5825	MCS8	19.79	17.91	22.49	157.081	24.43	PASS

802.11n_HT40_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	18.85	76.723	27.04	PASS
46	5230	MCS0	22.40	173.751	27.04	PASS
42	5210	MCS0	22.18	165.169	27.04	PASS
151	5755	MCS0	22.39	173.352	27.44	PASS
159	5795	MCS0	22.43	174.956	27.44	PASS

802.11n_HT40_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	18.79	75.671	27.08	PASS
46	5230	MCS0	22.34	171.367	27.08	PASS
42	5210	MCS0	22.11	162.528	27.08	PASS
151	5755	MCS0	22.32	170.580	27.44	PASS
159	5795	MCS0	22.37	172.555	27.44	PASS

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802.11n_HT40_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CH 0	CH 1				
38	5190	MCS8	16.63	12.61	18.95	64.265	24.05	PASS
46	5230	MCS8	19.62	17.24	22.47	144.588	24.05	PASS
42	5210	MCS8	19.6	16.63	22.24	137.227	24.05	PASS
151	5755	MCS8	19.22	17.87	22.48	144.795	24.43	PASS
159	5795	MCS8	19.53	17.42	22.48	144.951	24.43	PASS

802.11ac_VHT80_Main

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	MCS0	16.97	49.785	27.04	PASS
155	5775	MCS0	21.91	155.275	27.44	PASS

802.11ac_VHT80_Aux1

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	MCS0	16.79	47.764	27.08	PASS
155	5775	MCS0	21.85	153.145	27.44	PASS

802.11ac_VHT80_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)		TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
			CH 0	CH 1				
42	5210	MCS0	13.96	11.34	17.04	38.503	24.05	PASS
155	5775	MCS0	18.25	17.29	21.99	120.414	27.44	PASS

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10 PEAK POWER SPECTRAL DENSITY

10.1 Standard Applicable

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1	√	Access Point (Master device)	17dBm/ MHz
		Fixed point-to-point Acess Ponit	
		Mobile and portable clinet device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

$$= 10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] \text{ dBi}$$

[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.]

	Effective Legacy Gain (dBi)	Limit
UNII-1	8.56+3.01=11.57	17dBm
U-NII-3	8.56+3.01=11.57	30dBm

Therefore the limit needs to reduce for the UNII-1 and U-NII-3 band.

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10.2 Measurement Procedure

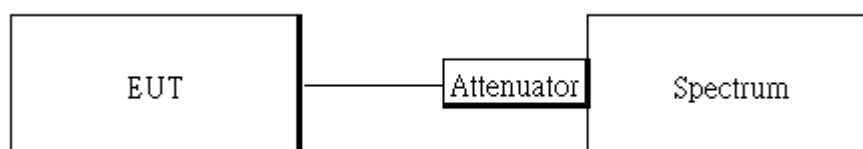
1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. **For U-NII1, U-NII-2A, U-NII-2C Band:**
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=500 kHz, VBW $\geq$ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. User the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

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

10.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration 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

10.4 Test Set-up



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10.5 Measurement Result

POWER DENSITY 802.11a MODE						
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	10.75	12.00	0.22	10.97	11.03	-0.06
5220	10.35	12.00	0.22	10.57	11.07	-0.50
5240	10.31	12.00	0.22	10.53	11.86	-1.33
5745	14.89	12.00	0.22	14.89	24.43	-9.54
5785	14.91	12.00	0.22	14.91	24.43	-9.52
5825	14.88	12.00	0.22	14.88	24.43	-9.55
POWER DENSITY 802.11n HT20 MODE						
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	8.61	12.00	0.53	9.14	11.03	-1.89
5220	8.60	12.00	0.53	9.13	11.03	-1.90
5240	8.12	12.00	0.53	8.65	11.03	-2.38
5745	16.99	12.00	0.53	16.99	24.43	-7.44
5785	16.48	12.00	0.53	16.48	24.43	-7.95
5825	15.59	12.00	0.53	15.59	24.43	-8.84
POWER DENSITY 802.11n HT40 MODE						
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5190	0.42	12.00	0.87	1.29	11.03	-9.74
5210	3.96	12.00	0.87	4.83	11.03	-6.20
5230	4.99	12.00	0.87	5.86	11.03	-5.17
5755	13.52	12.00	0.87	13.52	24.43	-10.91
5795	13.38	12.00	0.87	13.38	24.43	-11.05
POWER DENSITY 802.11ac VHT80 MODE						
Frequency (MHz)	PPSD W/O Duty Factor (dBm)	Offset	Duty Factor	PPSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5210	-3.46	12.00	1.18	-2.28	11.03	-13.31
5775	8.52	12.00	1.18	8.52	24.43	-15.91

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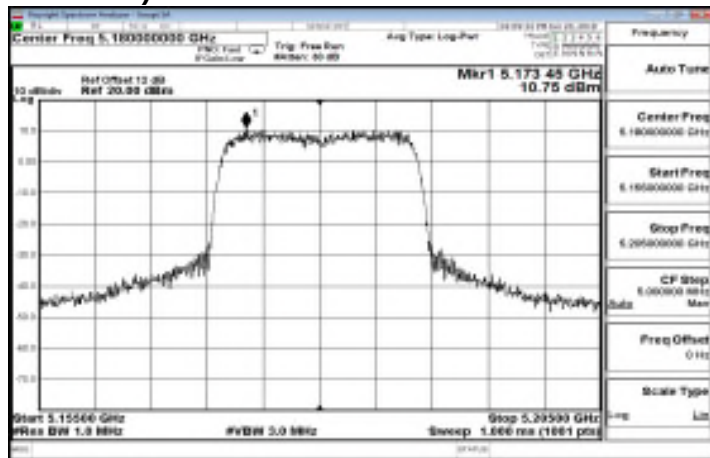
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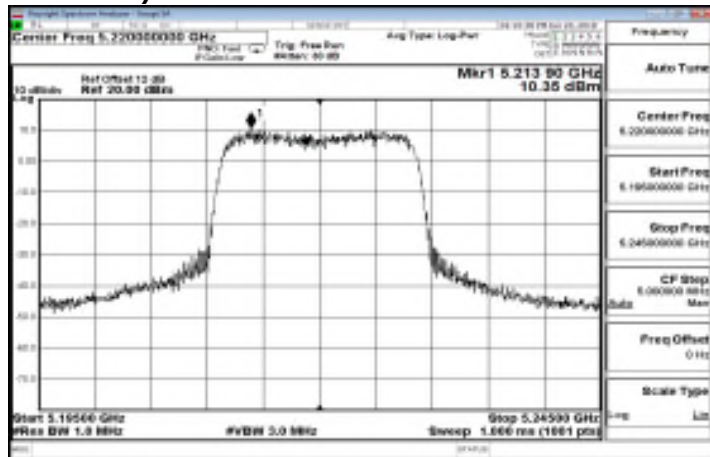
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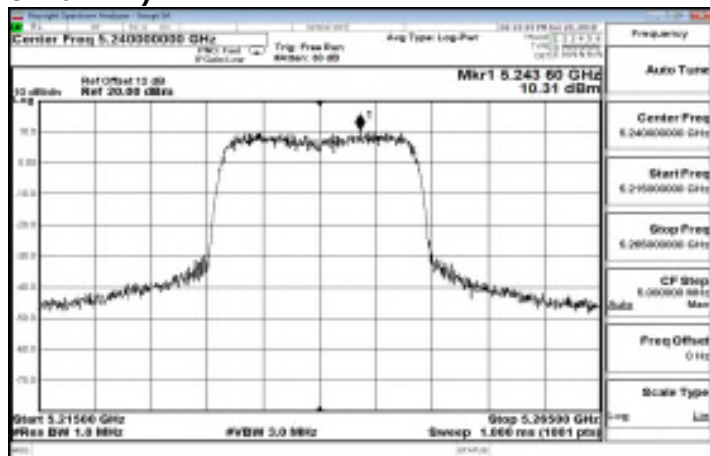
802.11a 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



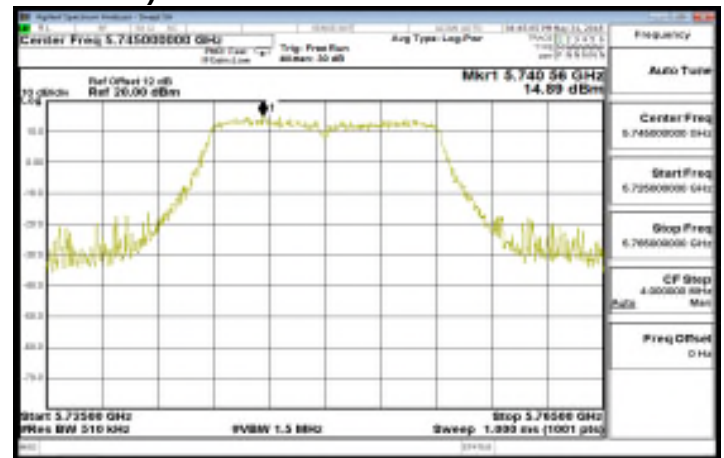
Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



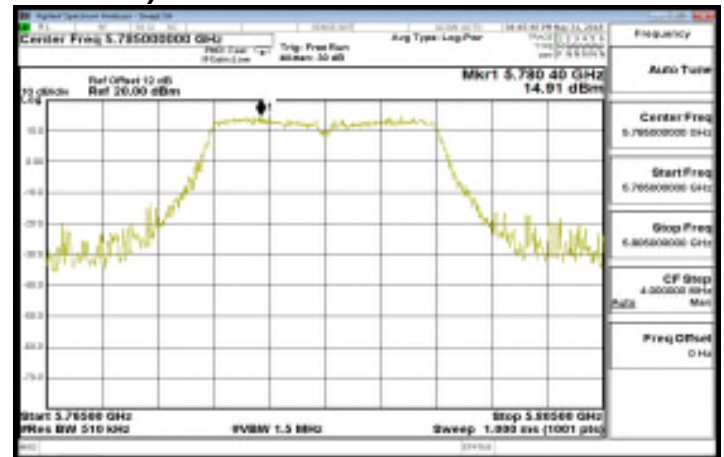
Peak Power Spectral Density Data Plot (CH High 5240 MHz)



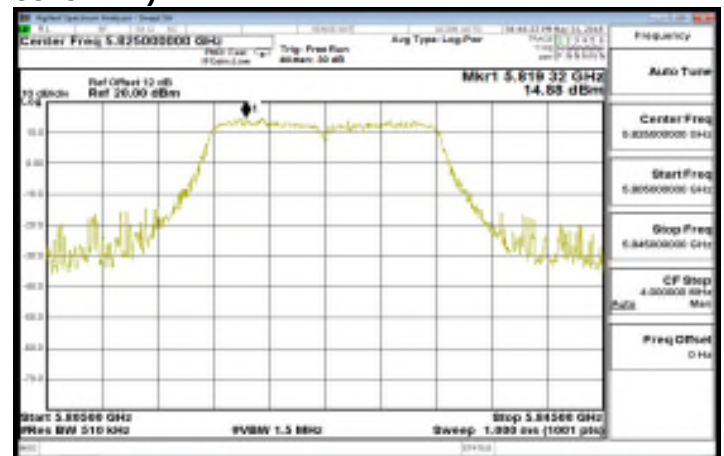
802.11a 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



Peak Power Spectral Density Data Plot (CH High 5825 MHz)

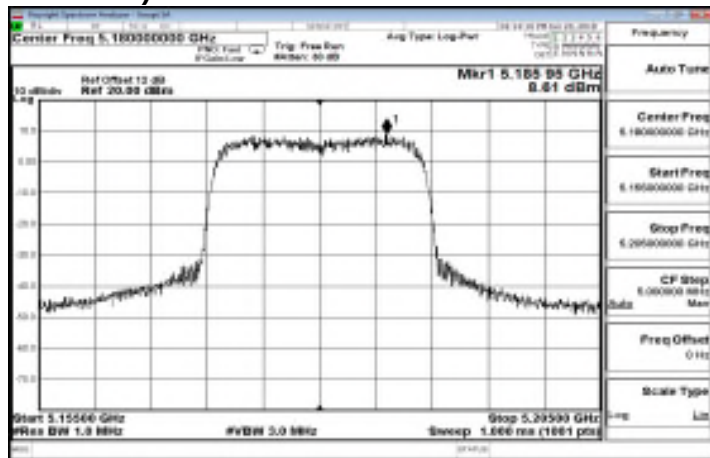


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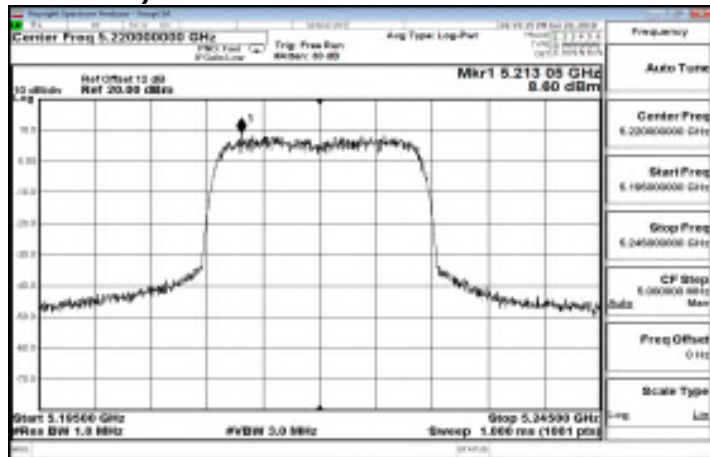
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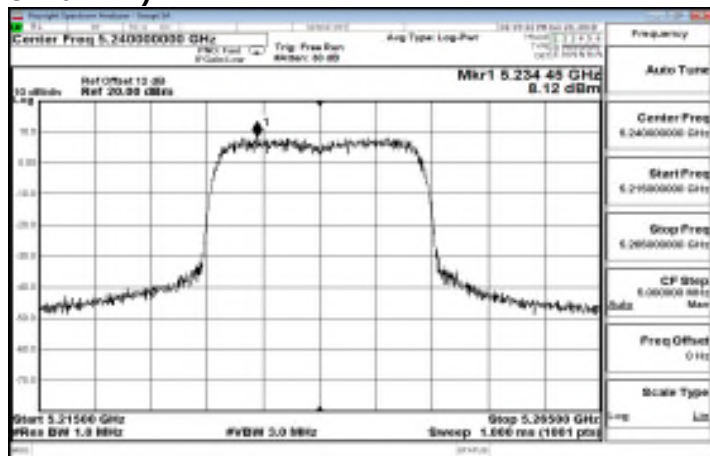
802.11n HT20, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



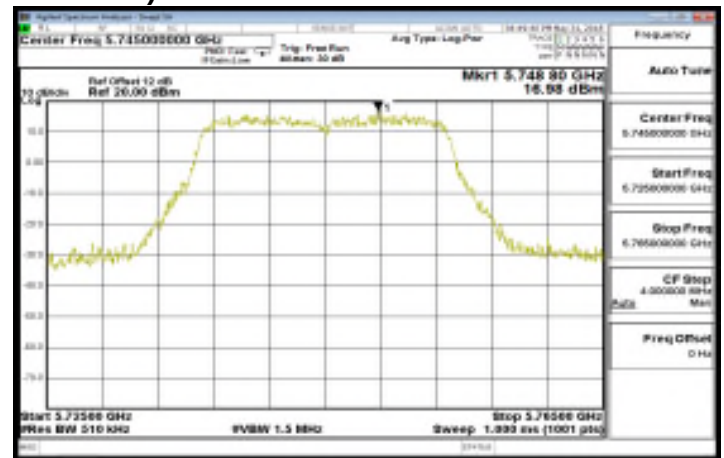
Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



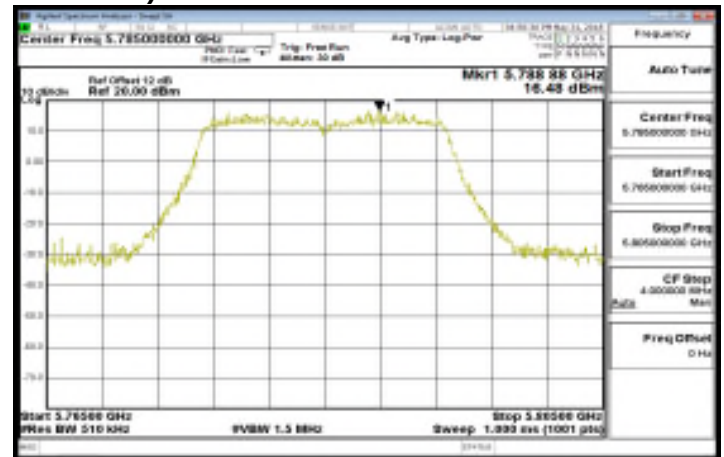
Peak Power Spectral Density Data Plot (CH High 5240 MHz)



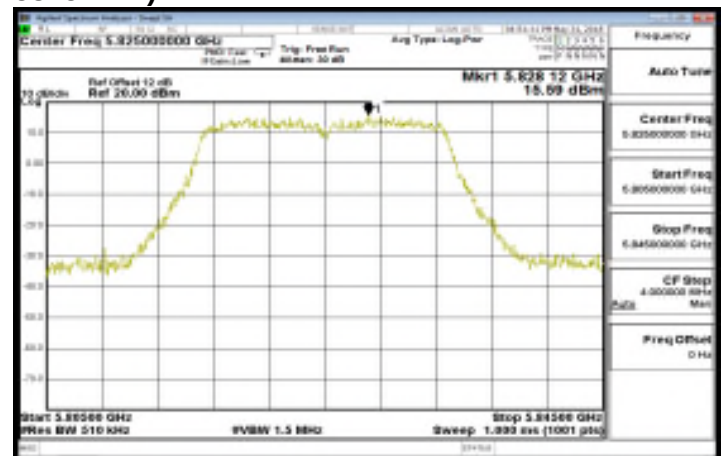
802.11n HT20, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



Peak Power Spectral Density Data Plot (CH High 5825 MHz)

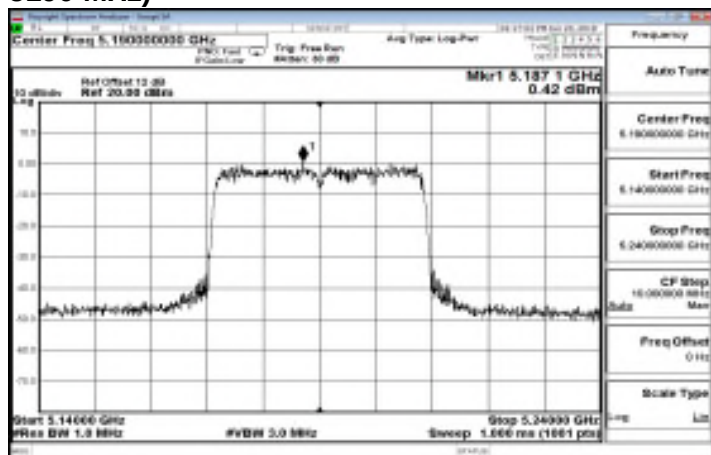


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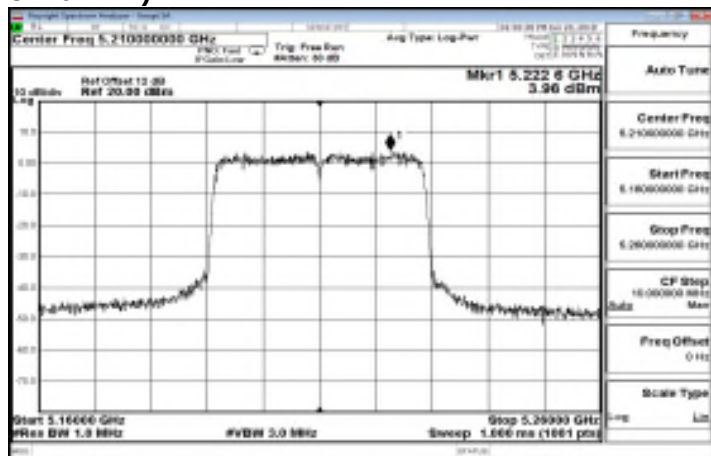
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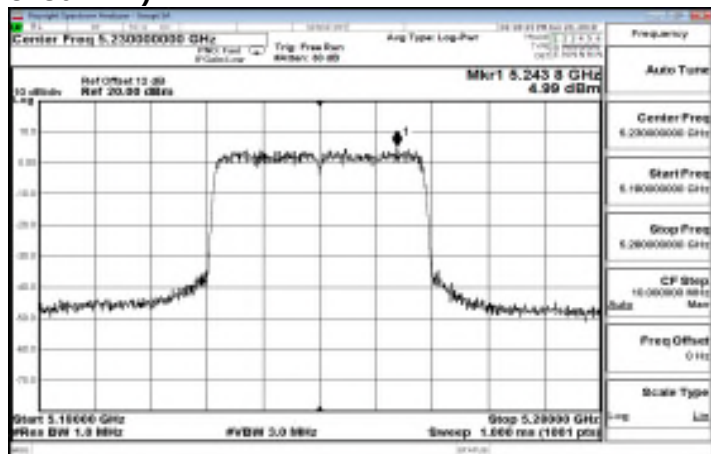
802.11n HT40, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5190 MHz)



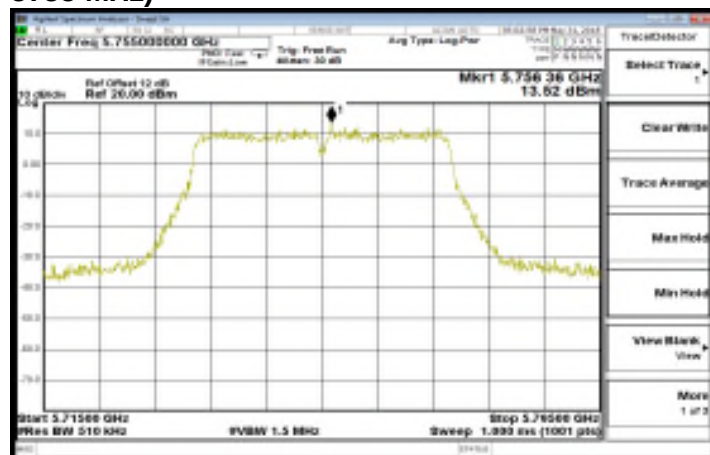
Peak Power Spectral Density Data Plot (CH High 5210 MHz)



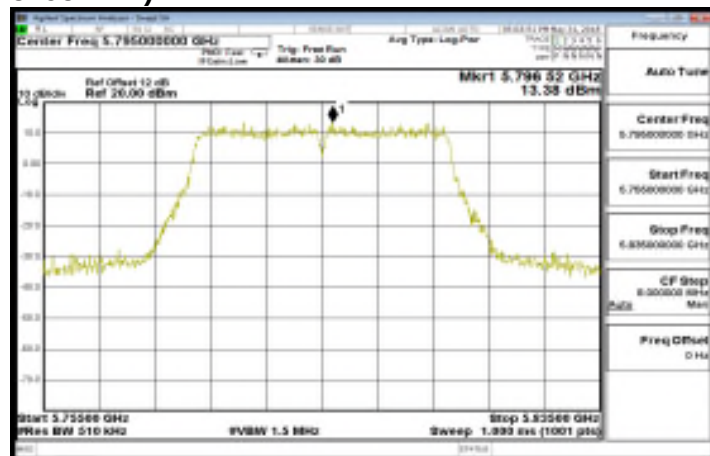
Peak Power Spectral Density Data Plot (CH High 5230 MHz)



802.11n HT40, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5755 MHz)



Peak Power Spectral Density Data Plot (CH High 5795 MHz)



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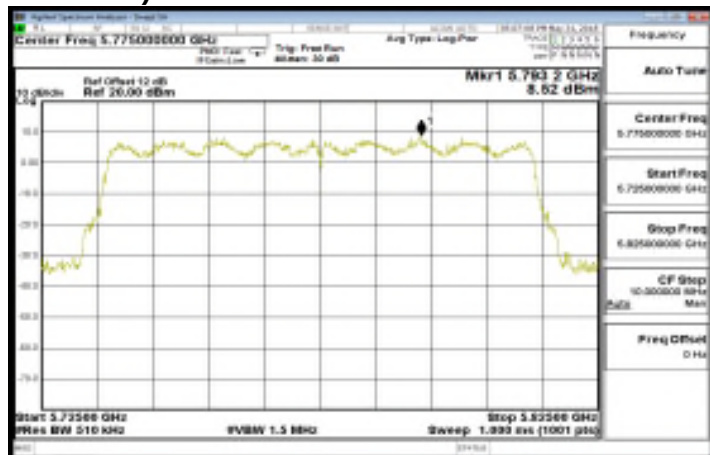
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802.11ac VHT80, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Mid 5210 MHz)



802.11ac VHT80, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Mid 5775 MHz)



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11 UNDESIRABLE RADIATED EMISSION MEASUREMENT

11.1 Standard Applicable

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
2. For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

APPLICABLE TO	LIMIT	
FCC KDB 789033 D02 General UNII Test Procedures New Rules	FIELD STRENGTH AT 3m	
	PK: 74 (dBμV/m)	AV 54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	FIELD STRENGTH AT 3m
15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.3 (dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK:122.2 (dBμV/m) *4
*1 beyond 75 MHz or more above of the bandedge. *2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. *3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. *4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.		

$EIRP = (E \cdot d)^2 / 30$, where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

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Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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)

11.2 Measurement Equipment Used

SGS SAC-III					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Broadband Antenna	SCHWAZBECK	VULB 9168	9168-617	2017/10/27	2018/10/26
Horn Antenna	Schwarzbeck	BBHA9120D	1341	2017/05/31	2018/5/30
Loop Antenna	ETS.LINDGREN	6502	148045	2017/09/26	2018/9/25
3m Site NSA	SGS	966 chamber D	N/A	2018/07/06	2019/7/5
Spectrum Analyzer	Agilent	N9010A	MY53400256	2017/10/30	2018/10/29
Pre-Amplifier	EMC Instruments	EMC184045B	980135	2017/10/27	2018/10/26
Pre-Amplifier	EMC Instruments	EMC9135	980234	2017/12/26	2018/12/25
Pre-Amplifier	EMC Instruments	EMC12630SE	980271	2017/12/26	2018/12/25
Attenuator	Marvelous	WATT-218FS-10	RF246	2017/12/26	2018/12/25
DC Block	PASTERNAK	PE8210	RF81	2017/12/26	2018/12/25
Band Rejection Filter	Micro-Tronics	G015	RF100	2017/12/26	2018/12/25
Band Rejection Filter	Micro-Tronics	G021	RF102	2017/12/26	2018/12/25
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	2017/12/26	2018/12/25

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Coaxial Cable	Huber Suhner	EMC106-SM-SM-7200	150703	2017/12/26	2018/12/25
Notebook	Lenovo	L420	S0012467	N/A	N/A

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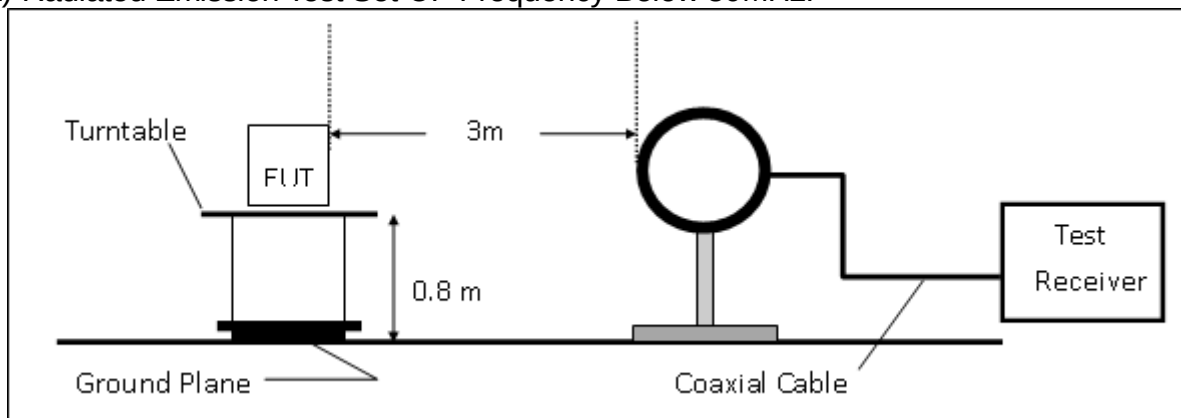
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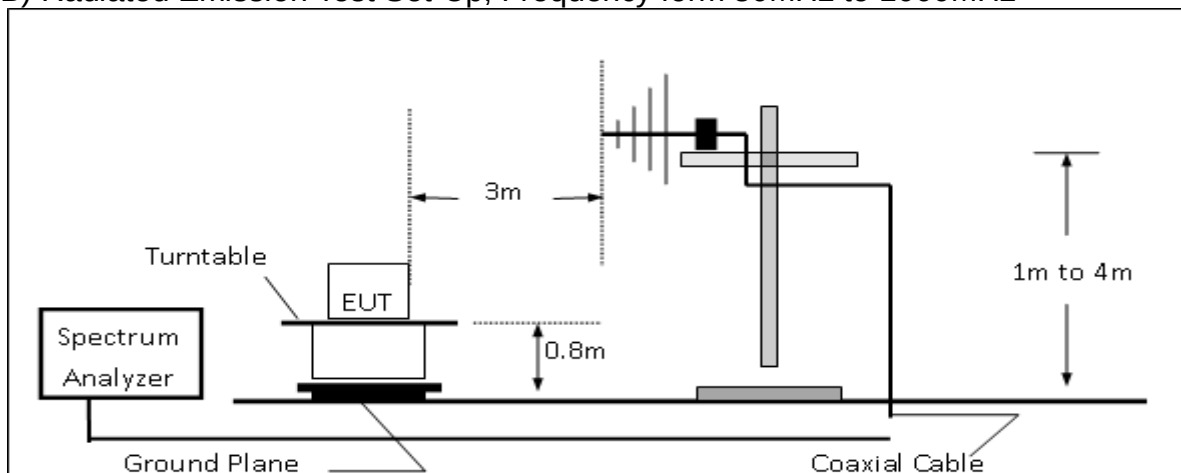
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11.3 Test SET-UP

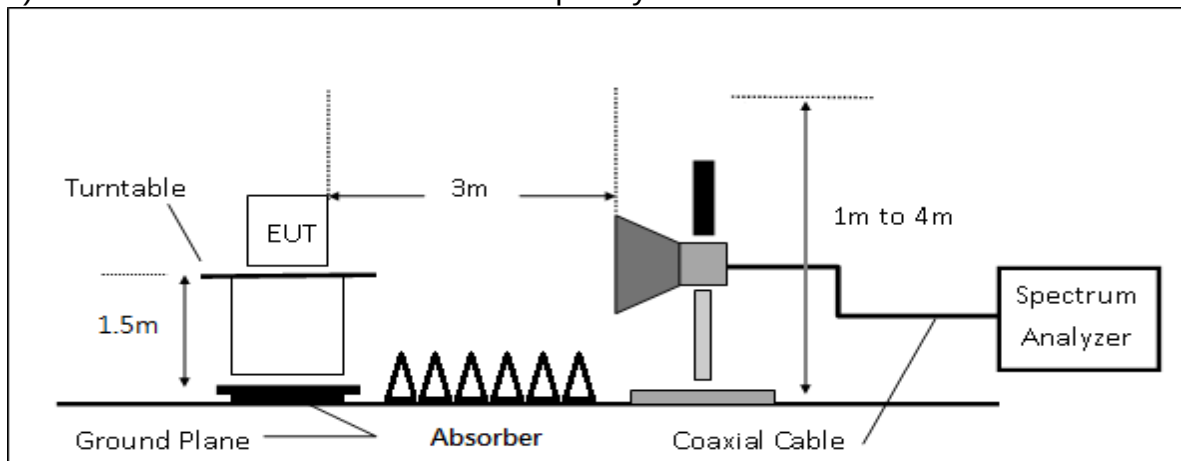
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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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11.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. The EUT was placed on a turn table with 0.8m for frequency < 1GHz and 1.5m for frequency > 1GHz above ground plane.
4. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
5. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
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. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
11. Repeat above procedures until all frequency measured were complete.

11.4 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)

11.5 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.

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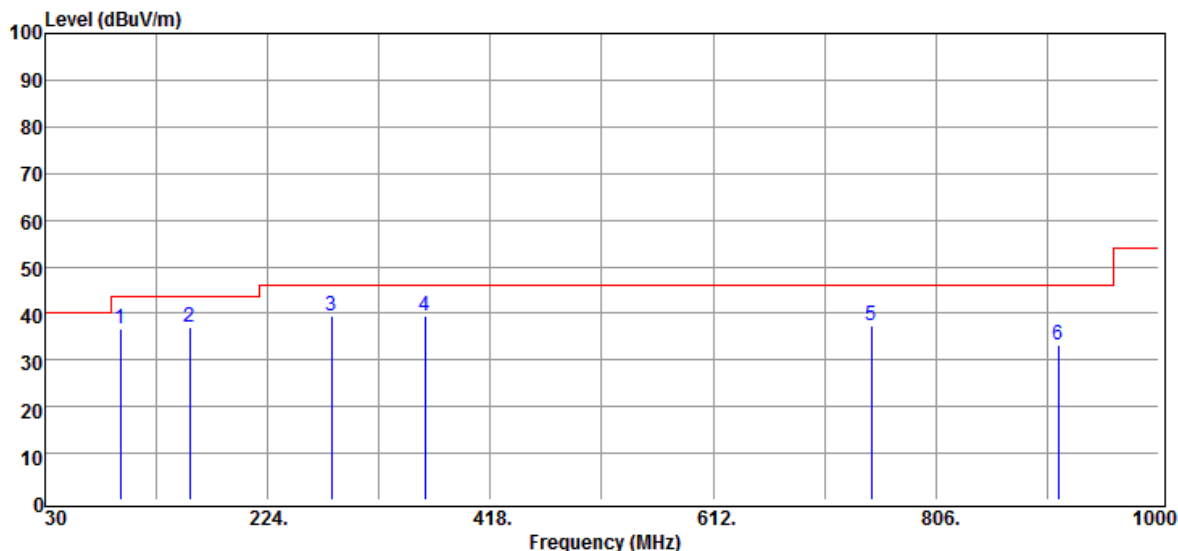
11.6 Measurement Result

Radiated Spurious Emission Measurement Result Below 1GHz Worst-Case Data:

802.11a 5150~5250 MHz

Operation Mode :802.11a / Band1
Test Mode :Tx CH Mid
EUT Pol :H Plan
Test Channel :5220 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
95.96	Peak	58.86	-22.08	36.78	43.50	-6.72
156.10	Peak	53.26	-16.18	37.08	43.50	-6.42
279.29	Peak	55.16	-15.75	39.41	46.00	-6.59
360.77	Peak	53.22	-13.72	39.50	46.00	-6.50
749.74	Peak	44.16	-6.78	37.38	46.00	-8.62
912.70	Peak	37.92	-4.59	33.33	46.00	-12.67

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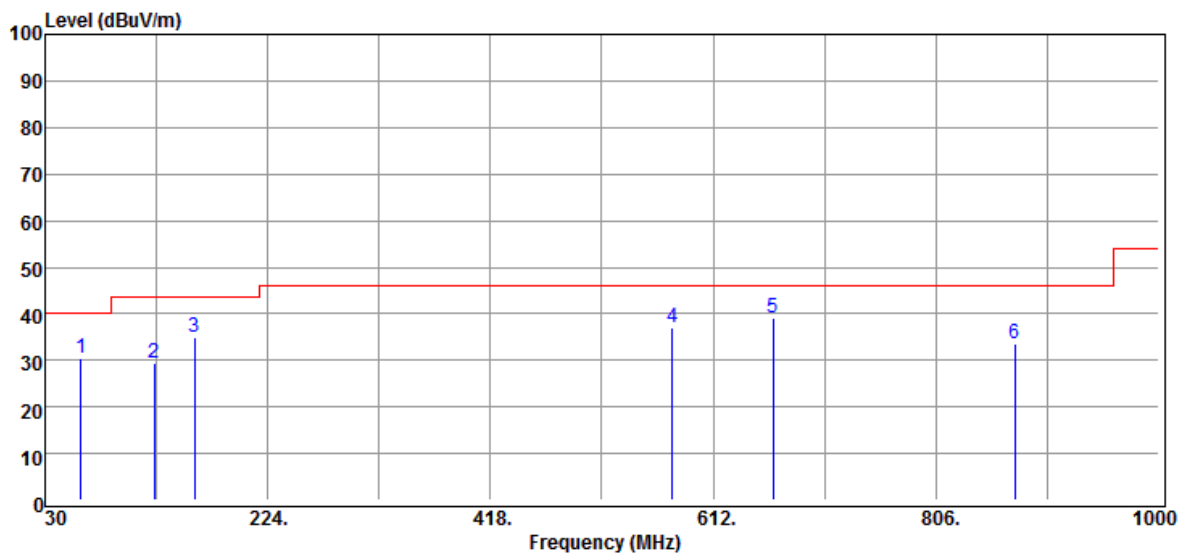
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Operation Mode :802.11a / Band1
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5220 MHz

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
61.04	Peak	49.40	-18.81	30.59	40.00	-9.41
125.06	Peak	50.12	-20.78	29.34	43.50	-14.16
159.98	Peak	51.00	-16.19	34.81	43.50	-8.69
576.11	Peak	46.19	-9.21	36.98	46.00	-9.02
664.38	Peak	47.98	-8.78	39.20	46.00	-6.80
874.87	Peak	38.57	-5.14	33.43	46.00	-12.57

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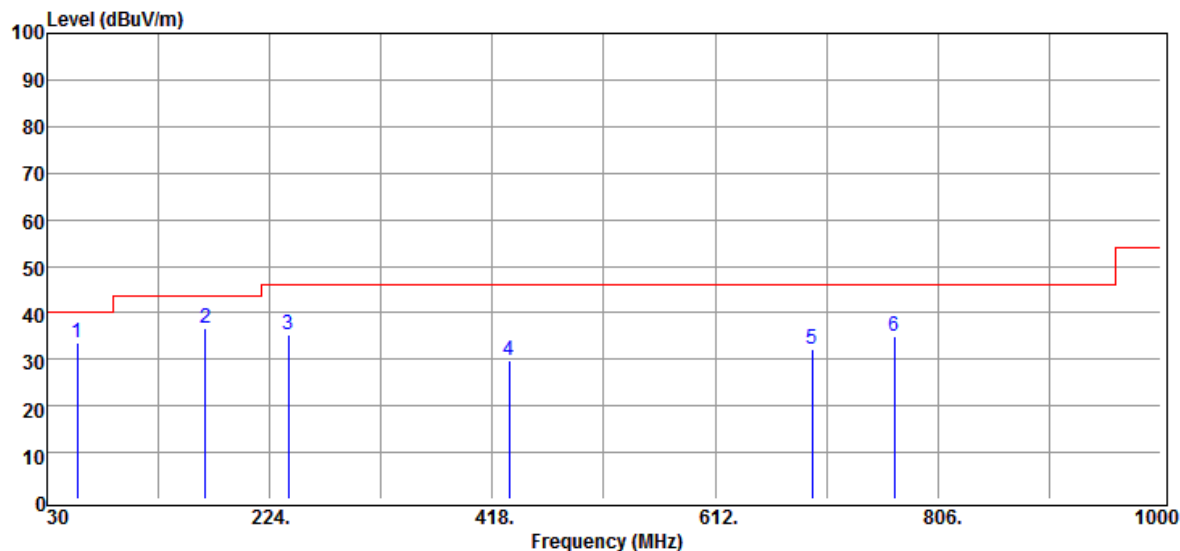
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802.11a, 5725~5850 MHz

Operation Mode :802.11a / Band4
Test Mode :Tx CH Mid
EUT Pol :H Plan
Test Channel :5785 MHz

Test Date :2018-05-28
Temp./Humi. :25/60
Antenna Pol. :VERTICAL
Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
56.19	Peak	51.03	-17.33	33.70	40.00	-6.30
167.74	Peak	53.00	-16.42	36.58	43.50	-6.92
240.49	Peak	52.32	-17.12	35.20	46.00	-10.80
432.55	Peak	41.58	-11.93	29.65	46.00	-16.35
696.39	Peak	39.65	-7.56	32.09	46.00	-13.91
768.17	Peak	41.69	-6.87	34.82	46.00	-11.18

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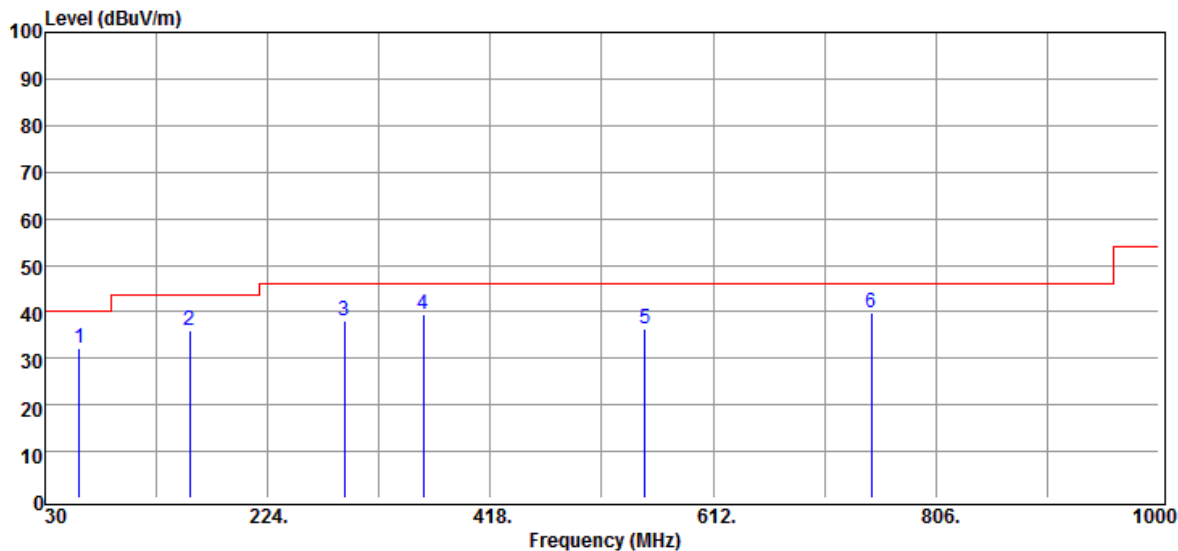
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Operation Mode :802.11a / Band4
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5785 MHz

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
60.07	Peak	49.82	-17.68	32.14	40.00	-7.86
156.10	Peak	52.25	-16.18	36.07	43.50	-7.43
290.93	Peak	54.09	-15.99	38.10	46.00	-7.90
359.80	Peak	53.36	-13.76	39.60	46.00	-6.40
552.83	Peak	46.68	-10.34	36.34	46.00	-9.66
749.74	Peak	46.47	-6.78	39.69	46.00	-6.31

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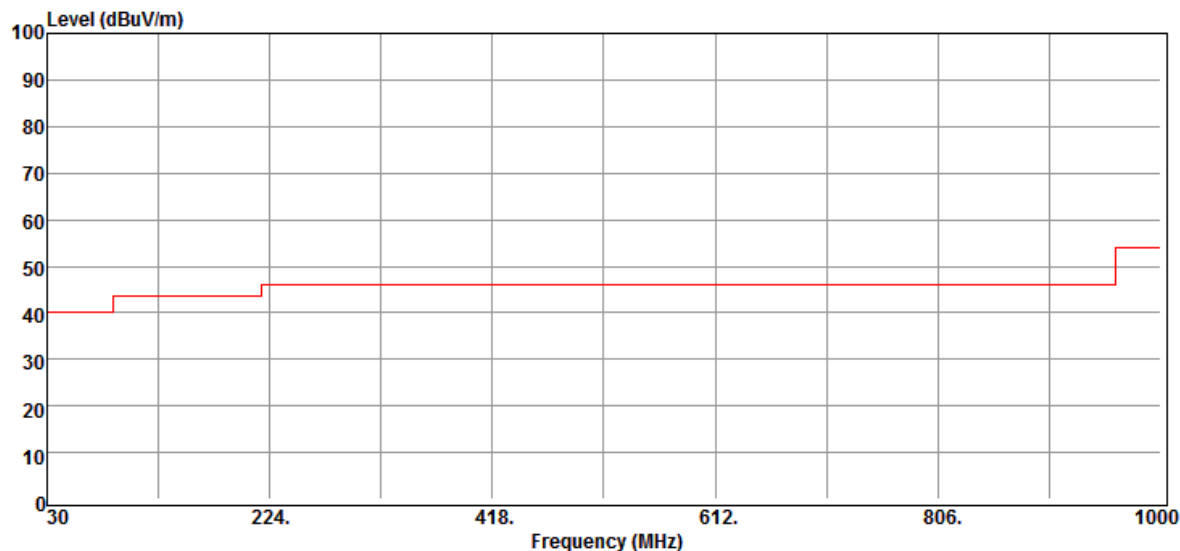
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802.11ac VHT80, 5150~5250 MHz

Operation Mode :802.11ac80 / Band1
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5210 MHz

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



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB

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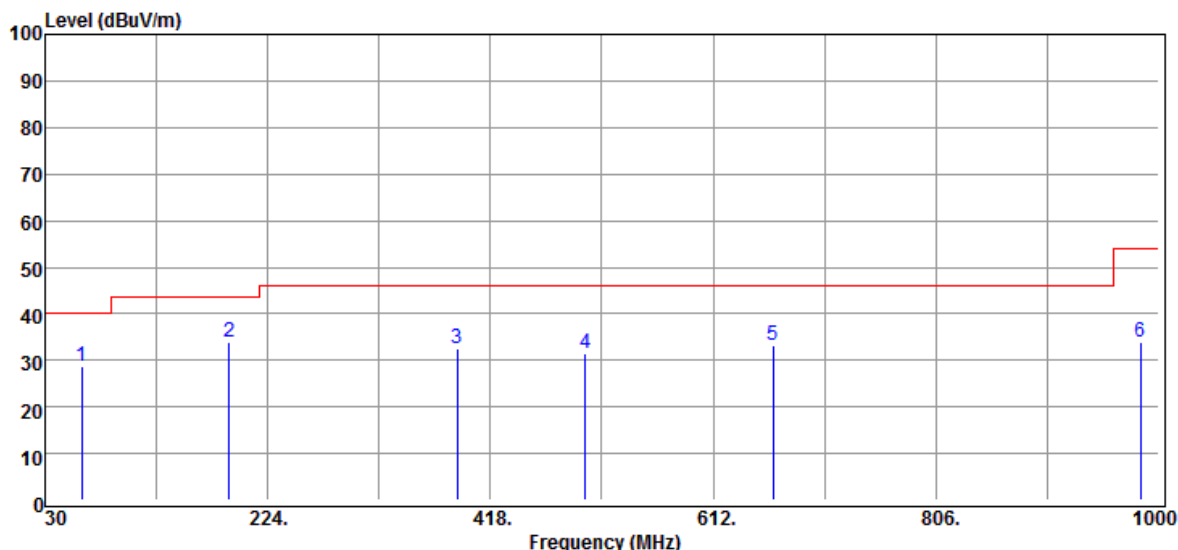
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Operation Mode :802.11ac80 / Band1
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5210 MHz

Test Date :2018-05-28
 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
62.01	Peak	48.73	-19.95	28.78	40.00	-11.22
190.05	Peak	52.42	-18.36	34.06	43.50	-9.44
388.90	Peak	45.45	-13.07	32.38	46.00	-13.62
500.45	Peak	42.76	-11.13	31.63	46.00	-14.37
664.38	Peak	41.93	-8.78	33.15	46.00	-12.85
984.48	Peak	37.55	-3.65	33.90	54.00	-20.10

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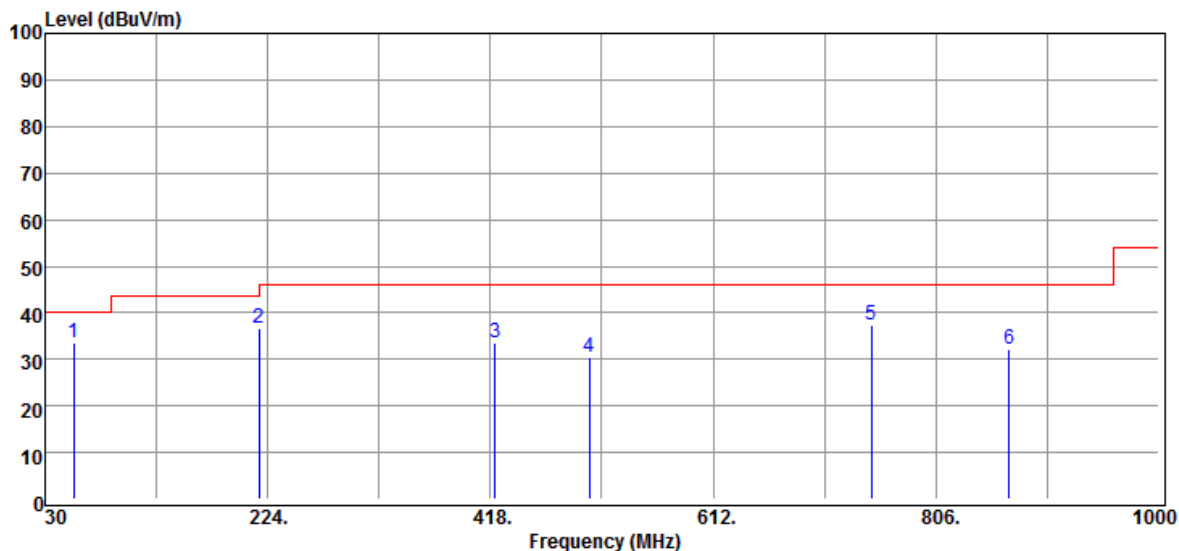
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802.11ac VHT80, 5725~5850 MHz

Operation Mode :802.11ac80 / Band4
Test Mode :Tx CH Low
EUT Pol :H Plan
Test Channel :5775 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 dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
55.22	Peak	50.79	-17.26	33.53	40.00	-6.47
216.24	Peak	55.27	-18.68	36.59	46.00	-9.41
421.88	Peak	45.71	-12.19	33.52	46.00	-12.48
504.33	Peak	41.38	-11.09	30.29	46.00	-15.71
749.74	Peak	44.24	-6.78	37.46	46.00	-8.54
870.02	Peak	37.00	-4.84	32.16	46.00	-13.84

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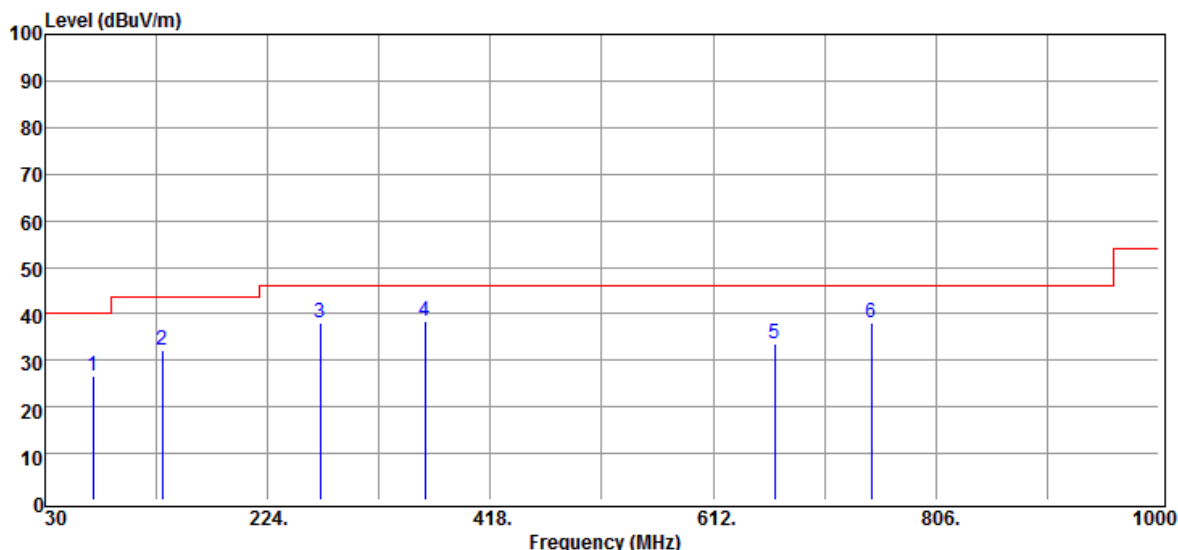
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Operation Mode :802.11ac80 / Band4
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5775 MHz

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
71.71	Peak	47.71	-20.98	26.73	40.00	-13.27
131.85	Peak	51.09	-18.84	32.25	43.50	-11.25
269.59	Peak	54.43	-16.26	38.17	46.00	-7.83
360.77	Peak	52.28	-13.72	38.56	46.00	-7.44
665.35	Peak	42.35	-8.76	33.59	46.00	-12.41
749.74	Peak	44.98	-6.78	38.20	46.00	-7.80

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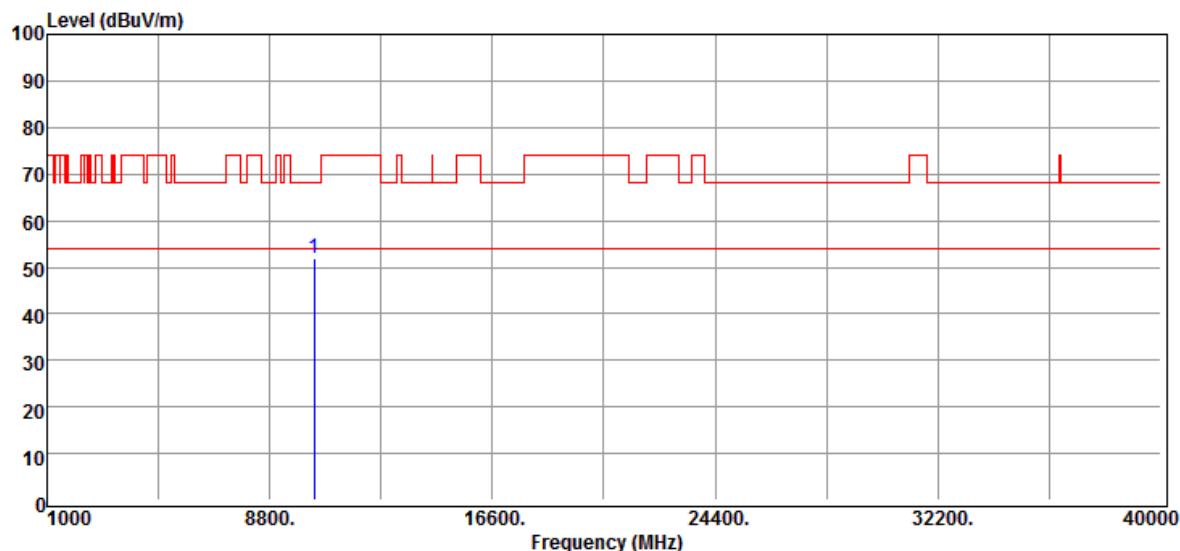
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Above 1GHz Worst-Case Data:

Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

Operation Mode	:802.11a / Band1	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5180 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
10360.00	Peak	39.59	12.41	52.00	68.20	-16.20

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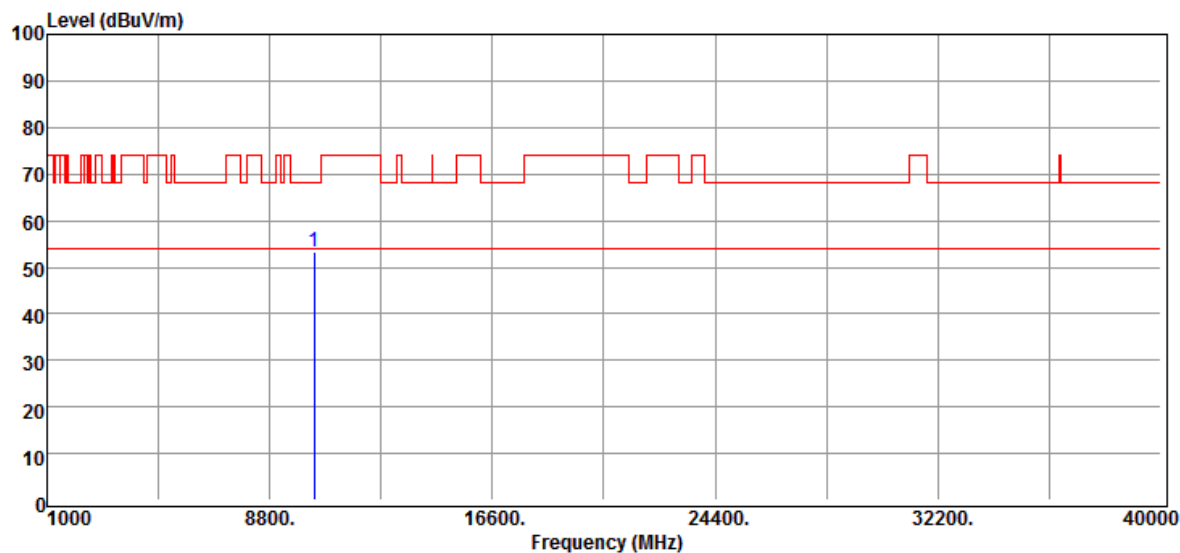
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Operation Mode :802.11a / Band1
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5180 MHz

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
10360.00	Peak	40.90	12.41	53.31	68.20	-14.89

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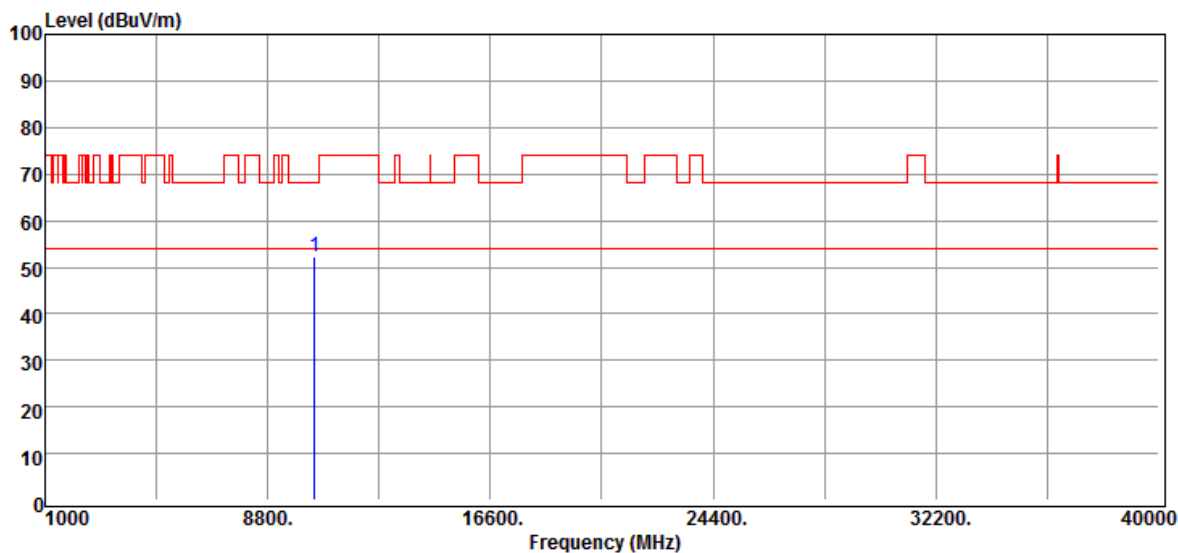
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Operation Mode :802.11a / Band1
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5220 MHz

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
10440.00	Peak	39.84	12.52	52.36	68.20	-15.84

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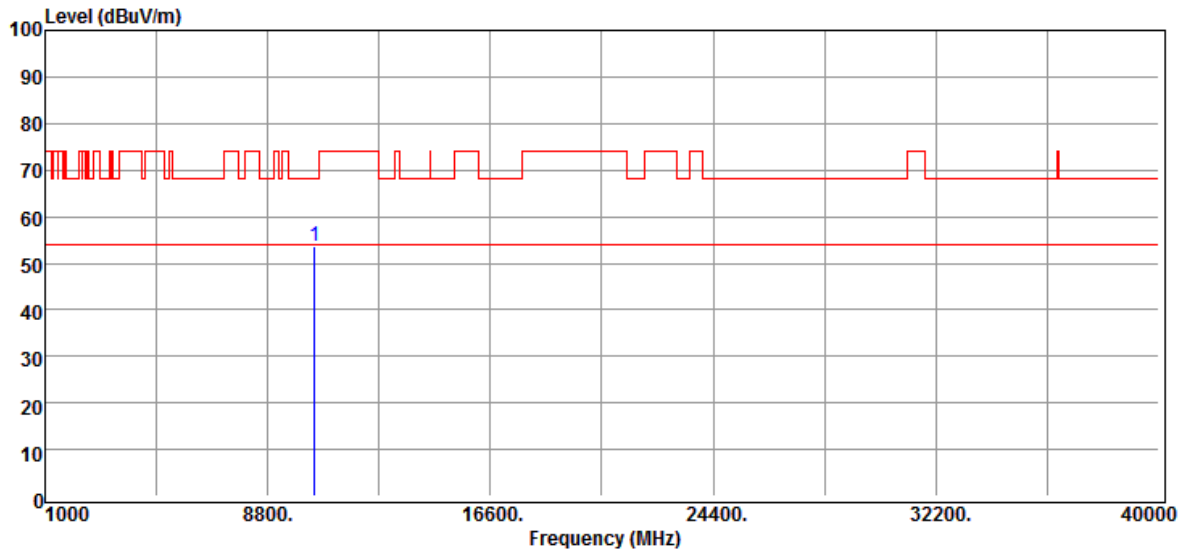
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Operation Mode :802.11a / Band1
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5220 MHz

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
10440.00	Peak	41.14	12.52	53.66	68.20	-14.54

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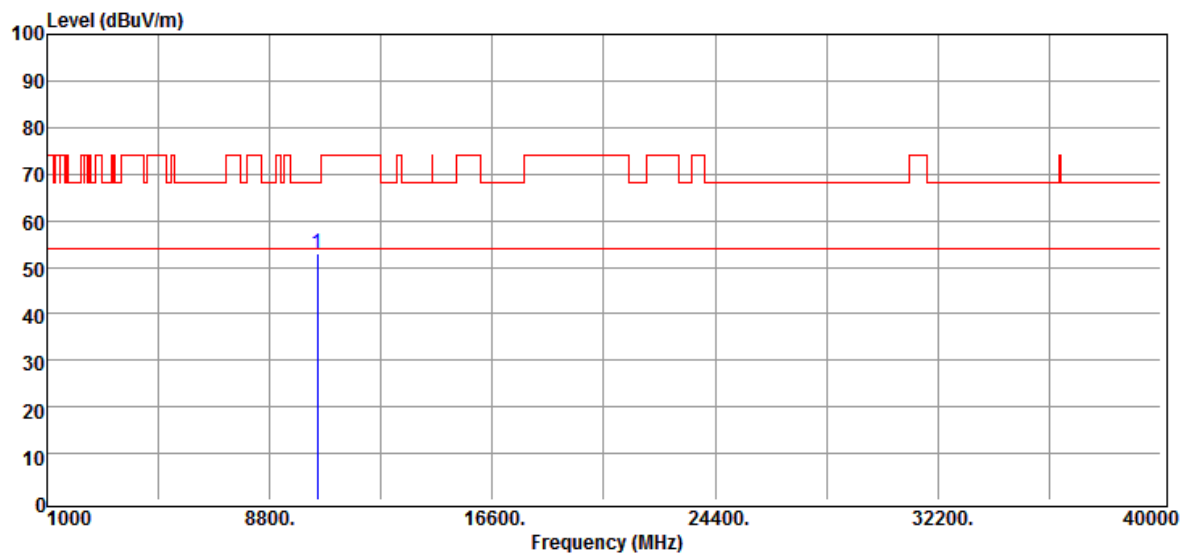
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Operation Mode :802.11a / Band1
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

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
10480.00	Peak	40.24	12.58	52.82	68.20	-15.38

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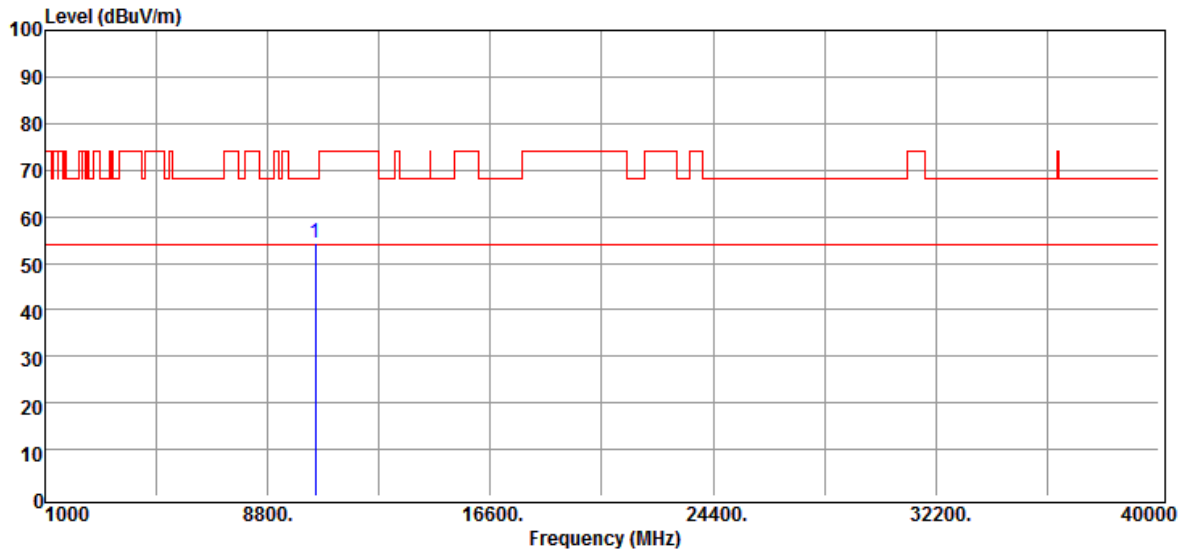
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Operation Mode :802.11a / Band1
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

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
10480.00	Peak	41.74	12.58	54.32	68.20	-13.88

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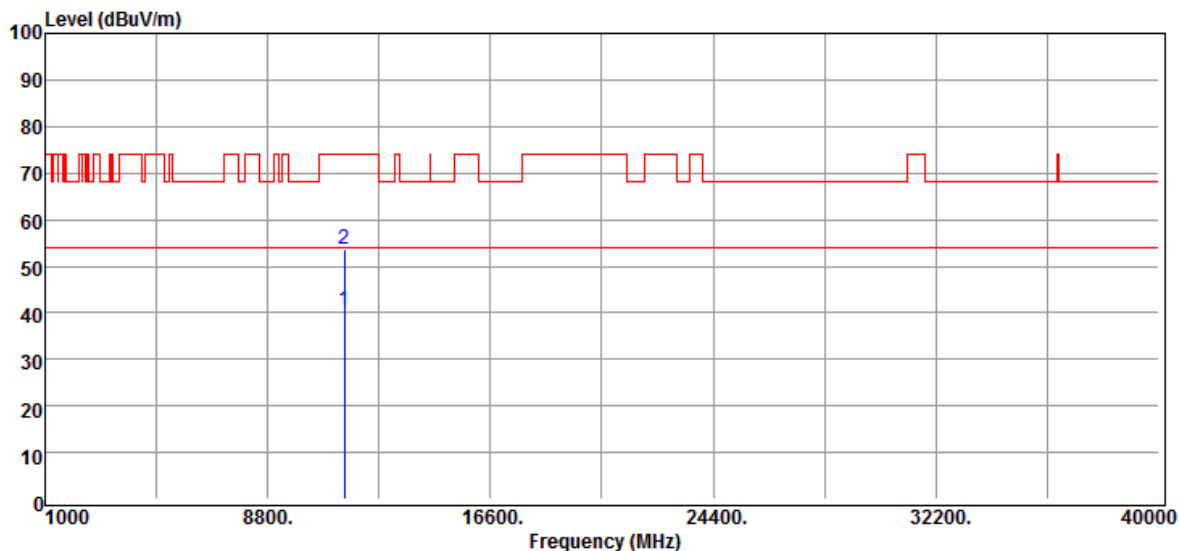
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Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

Operation Mode	:802.11a / Band4	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5745 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11490.00	Average	27.32	13.32	40.64	54.00	-13.36
11490.00	Peak	40.37	13.32	53.69	74.00	-20.31

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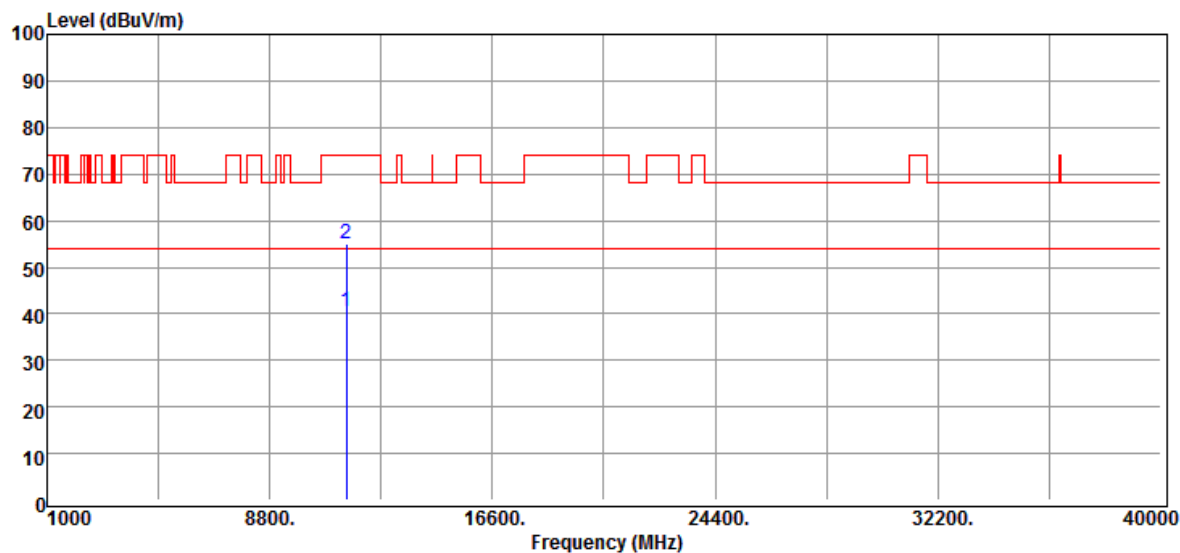
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Operation Mode :802.11a / Band4
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5745 MHz

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
11490.00	Average	27.32	13.32	40.64	54.00	-13.36
11490.00	Peak	41.68	13.32	55.00	74.00	-19.00

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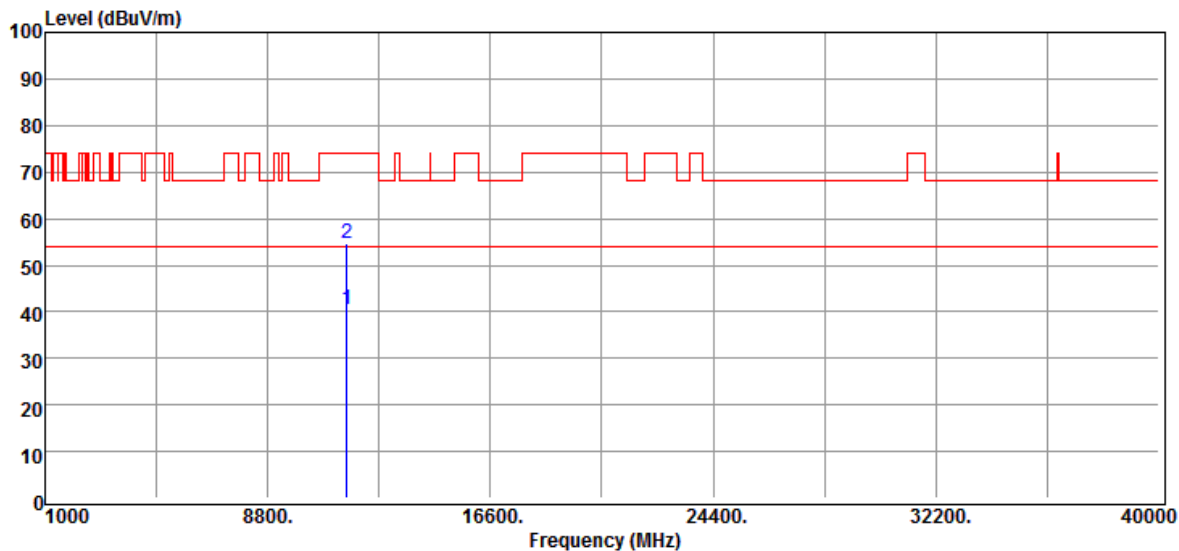
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Operation Mode :802.11a / Band4
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5785 MHz

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
11570.00	Average	27.31	13.01	40.32	54.00	-13.68
11570.00	Peak	41.70	13.01	54.71	74.00	-19.29

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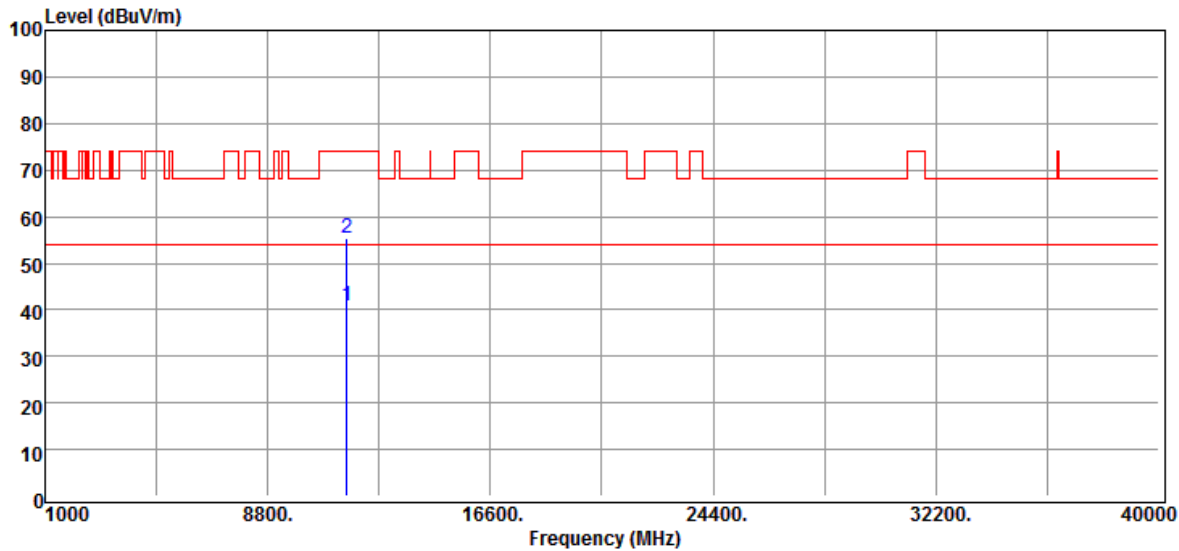
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Operation Mode :802.11a / Band4
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5785 MHz

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
11570.00	Average	27.90	13.01	40.91	54.00	-13.09
11570.00	Peak	42.39	13.01	55.40	74.00	-18.60

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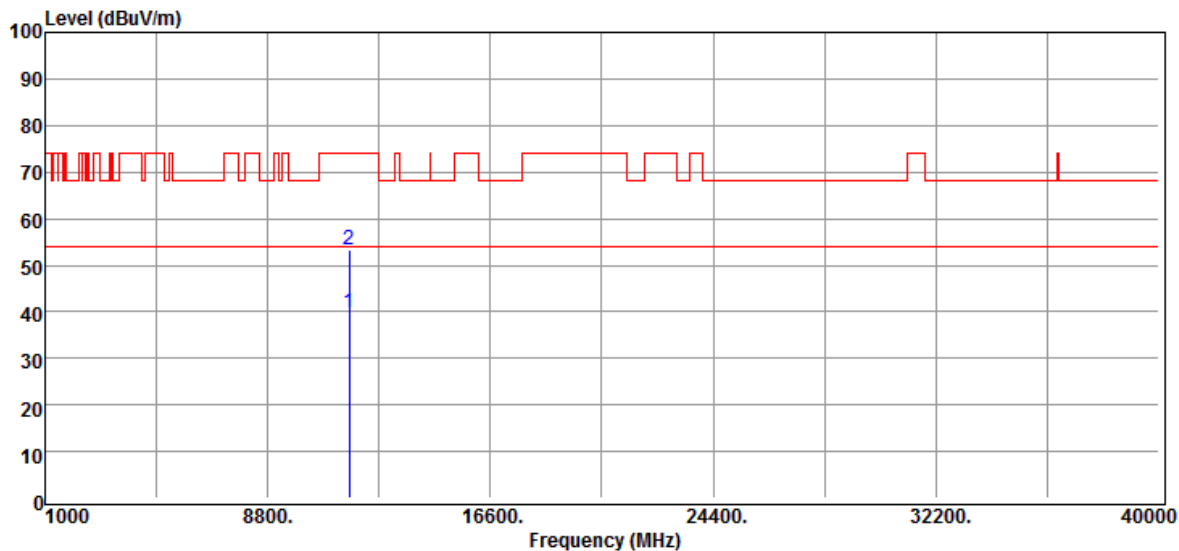
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Operation Mode :802.11a / Band4
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

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
11650.00	Average	26.84	12.95	39.79	54.00	-14.21
11650.00	Peak	40.27	12.95	53.22	74.00	-20.78

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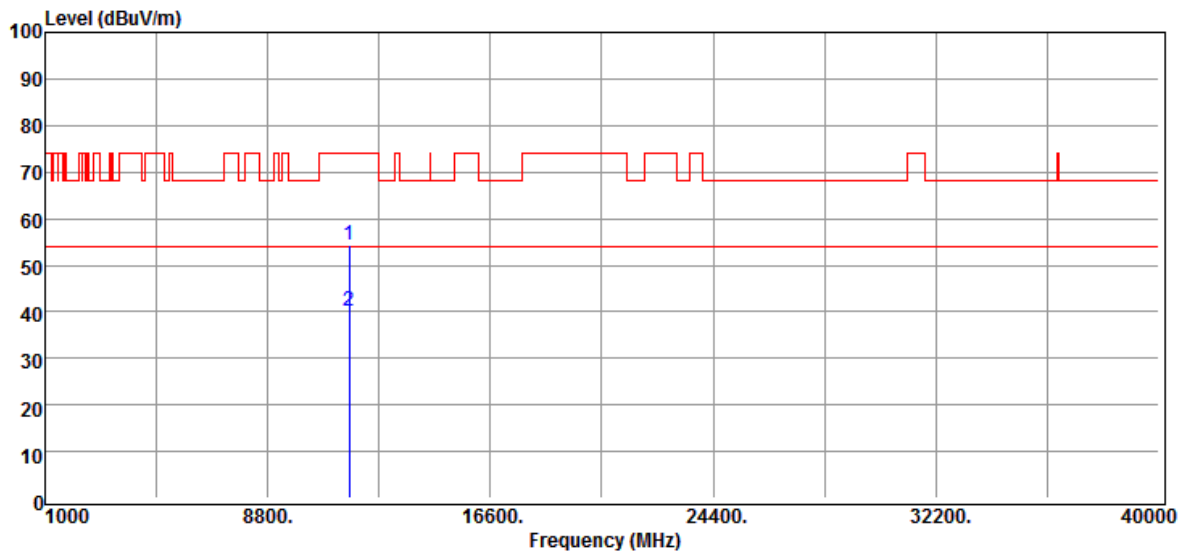
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Operation Mode :802.11a / Band4
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

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
11650.00	Peak	41.52	12.95	54.47	74.00	-19.53
11650.00	Peak	27.33	12.95	40.28	74.00	-33.72

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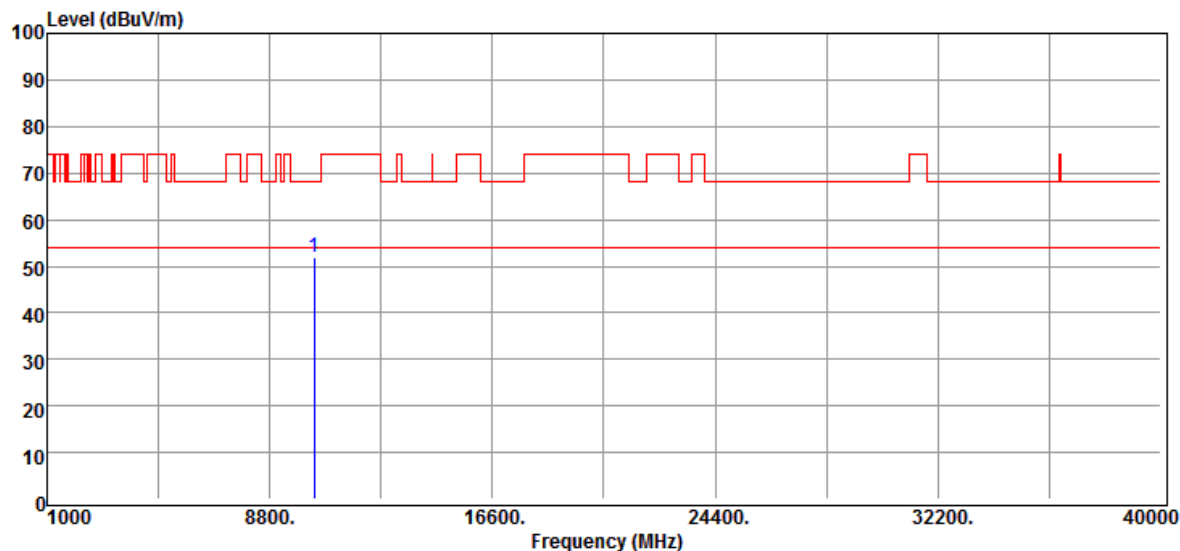
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Mode	:802.11n20 / Band1	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5180 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10360.00	Peak	39.64	12.41	52.05	68.20	-16.15

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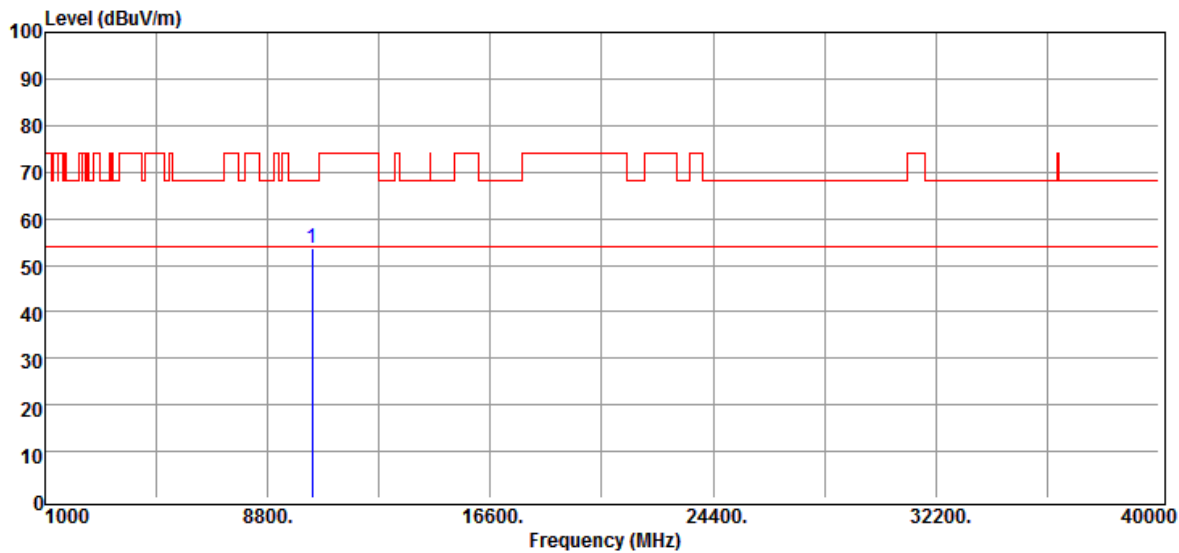
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Operation Mode :802.11n20 / Band1
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5180 MHz

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
10360.00	Peak	41.23	12.41	53.64	68.20	-14.56

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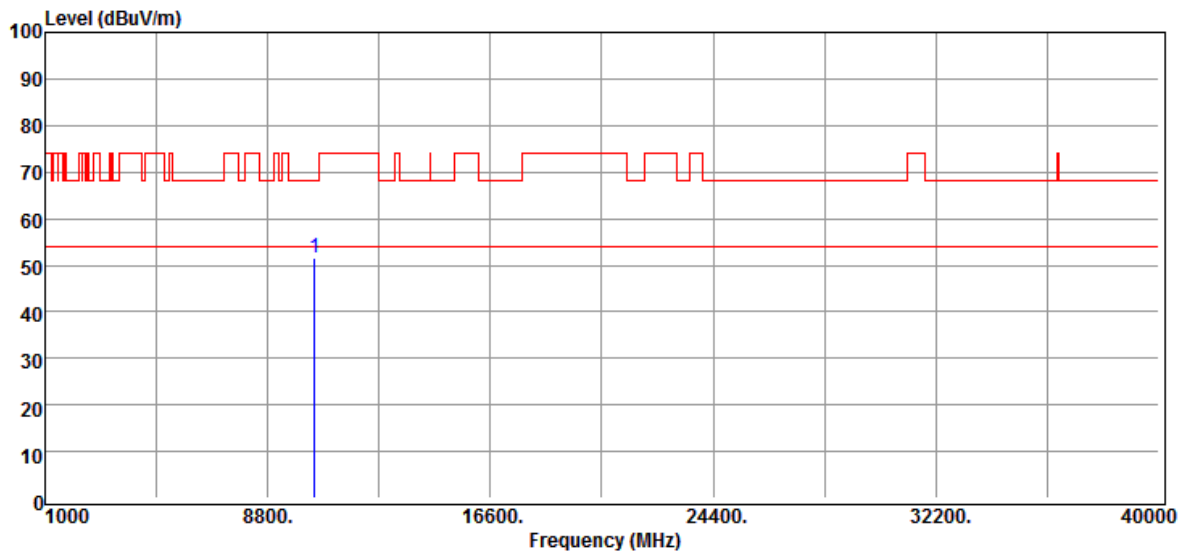
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Operation Mode :802.11n20 / Band1
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5220 MHz

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
10440.00	Peak	39.11	12.52	51.63	68.20	-16.57

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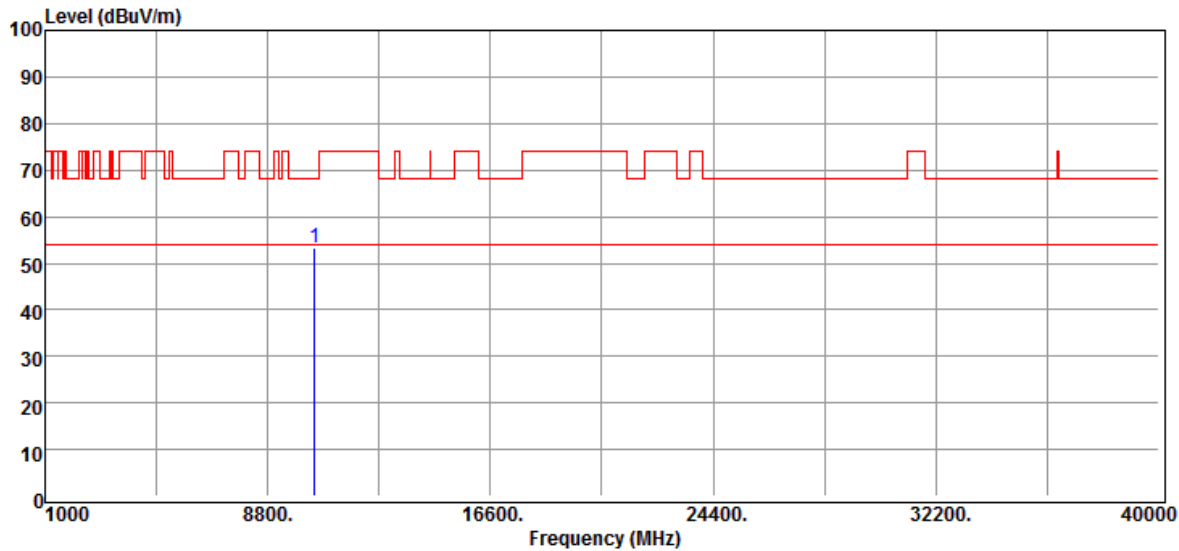
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Operation Mode	:802.11n20 / Band1	Test Date	:2018-05-25
Test Mode	:Tx CH Mid	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:5220 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
10440.00	Peak	40.64	12.52	53.16	68.20	-15.04

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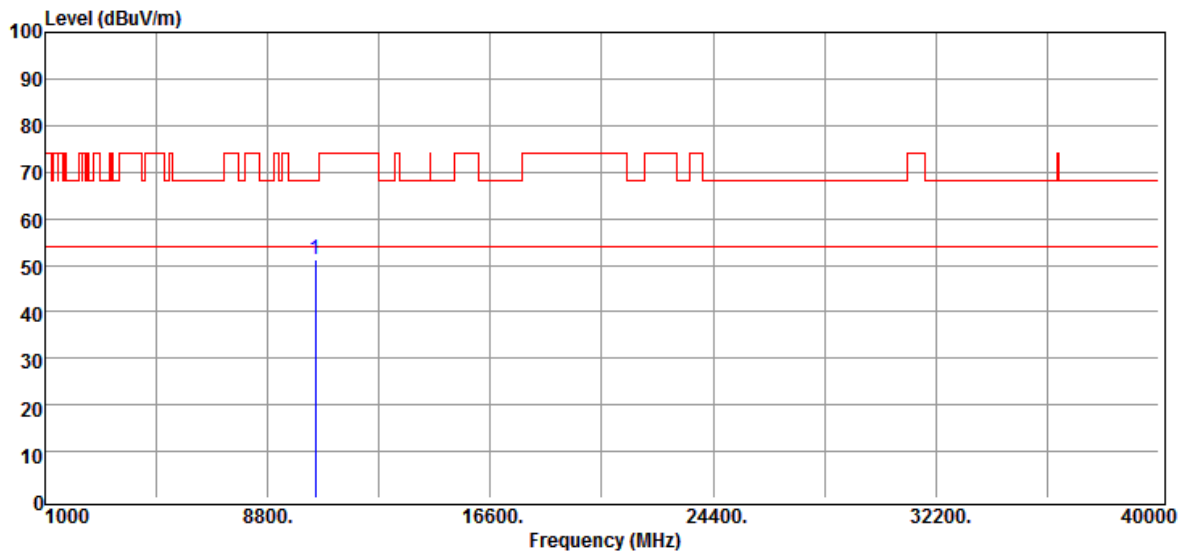
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Operation Mode :802.11n20 / Band1
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

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
10480.00	Peak	38.57	12.58	51.15	68.20	-17.05

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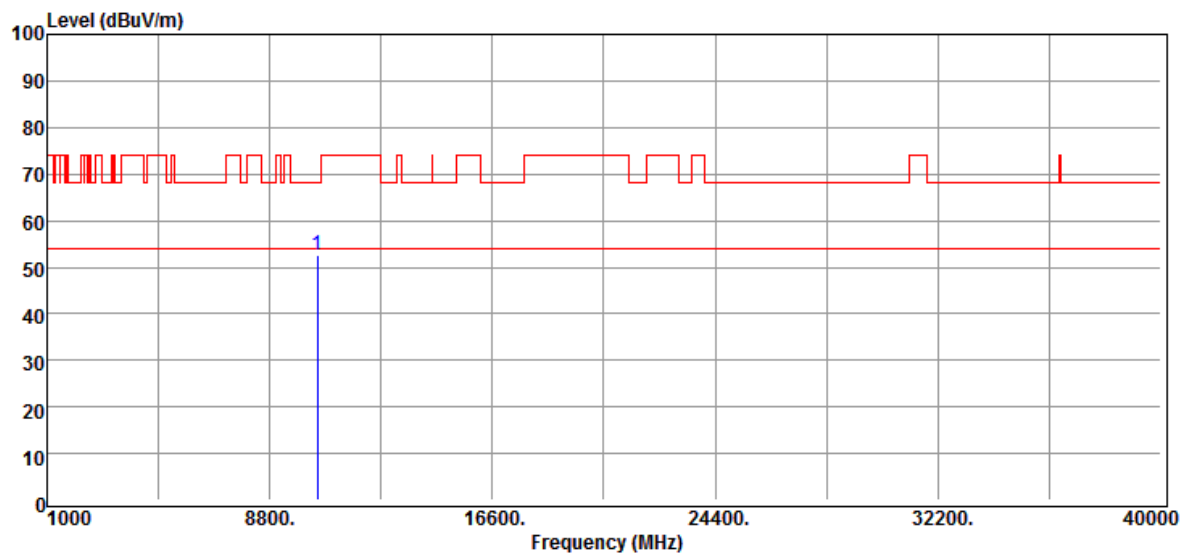
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Operation Mode :802.11n20 / Band1
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

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
10480.00	Peak	39.88	12.58	52.46	68.20	-15.74

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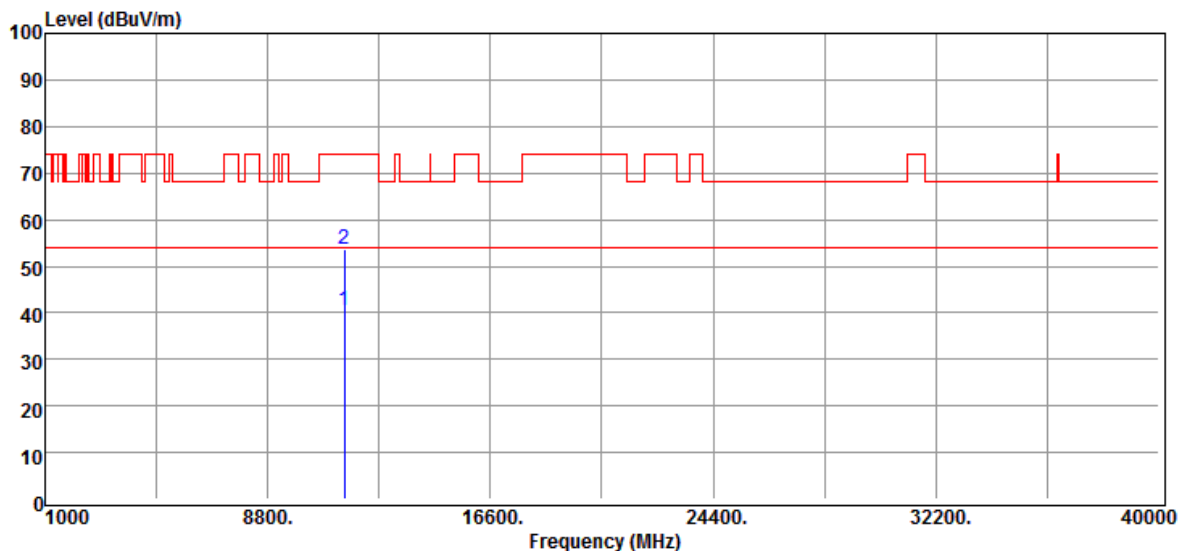
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Operation Mode	:802.11n20 / Band4	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5745 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11490.00	Average	27.03	13.32	40.35	54.00	-13.65
11490.00	Peak	40.38	13.32	53.70	74.00	-20.30

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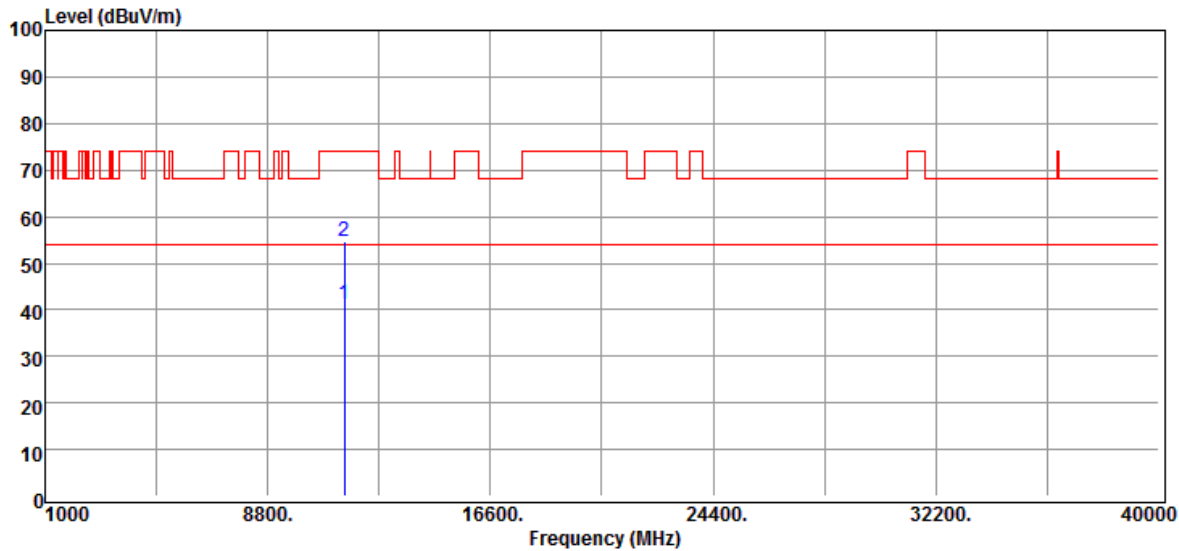
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Operation Mode :802.11n20 / Band4
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5745 MHz

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
11490.00	Average	27.82	13.32	41.14	54.00	-12.86
11490.00	Peak	41.20	13.32	54.52	74.00	-19.48

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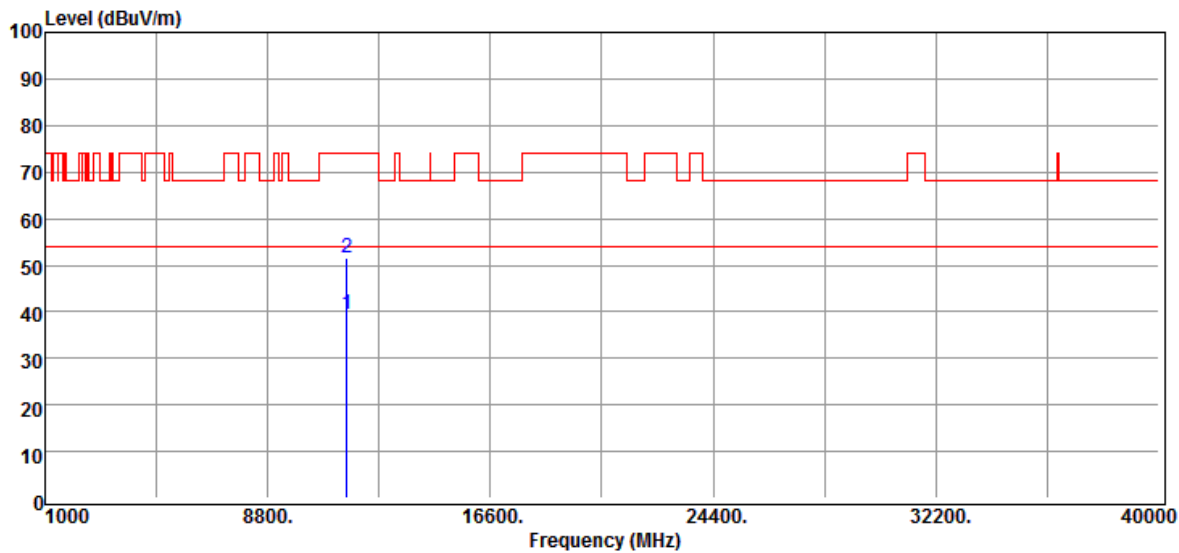
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Operation Mode :802.11n20 / Band4
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5785 MHz

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
11570.00	Average	26.39	13.01	39.40	54.00	-14.60
11570.00	Peak	38.68	13.01	51.69	74.00	-22.31

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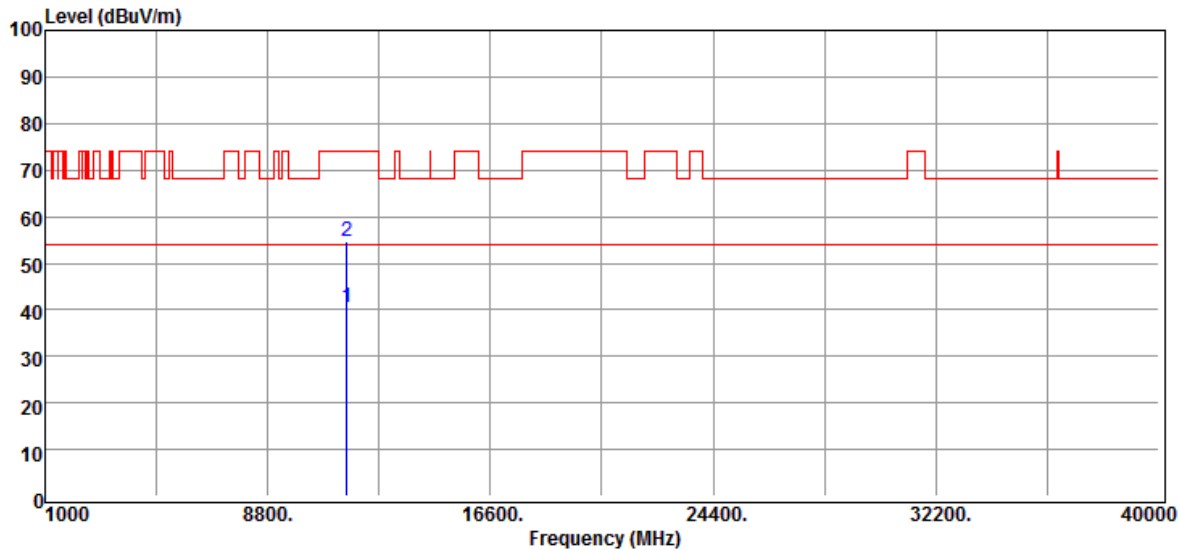
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Operation Mode :802.11n20 / Band4
 Test Mode :Tx CH Mid
 EUT Pol :H Plan
 Test Channel :5785 MHz

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
11570.00	Average	27.39	13.01	40.40	54.00	-13.60
11570.00	Peak	41.54	13.01	54.55	74.00	-19.45

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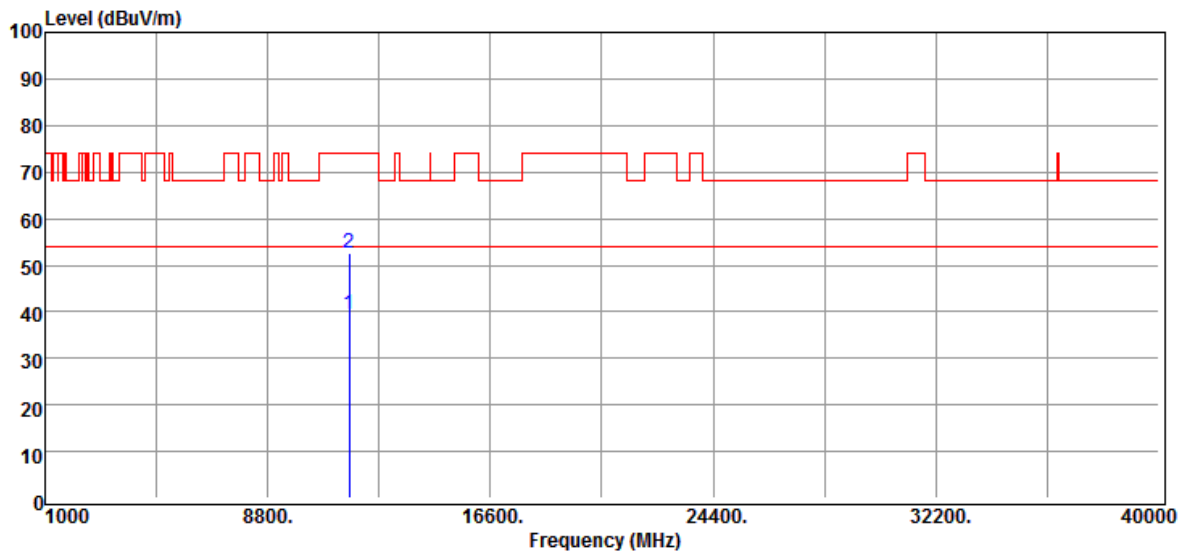
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Operation Mode :802.11n20 / Band4
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

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
11650.00	Average	26.54	12.95	39.49	54.00	-14.51
11650.00	Peak	39.72	12.95	52.67	74.00	-21.33

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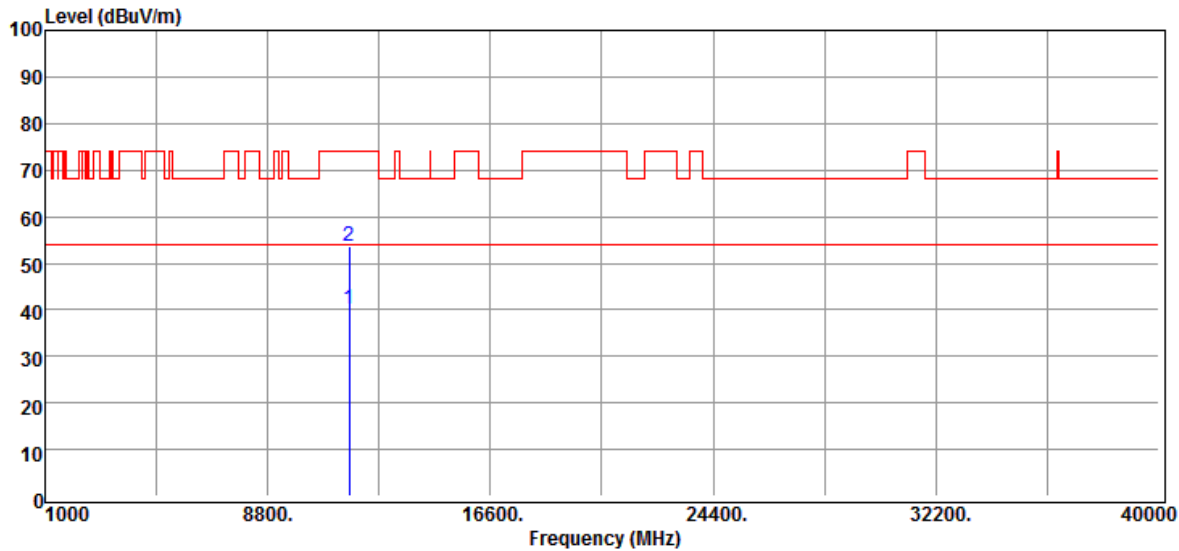
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Operation Mode :802.11n20 / Band4
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

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
11650.00	Average	27.19	12.95	40.14	54.00	-13.86
11650.00	Peak	40.61	12.95	53.56	74.00	-20.44

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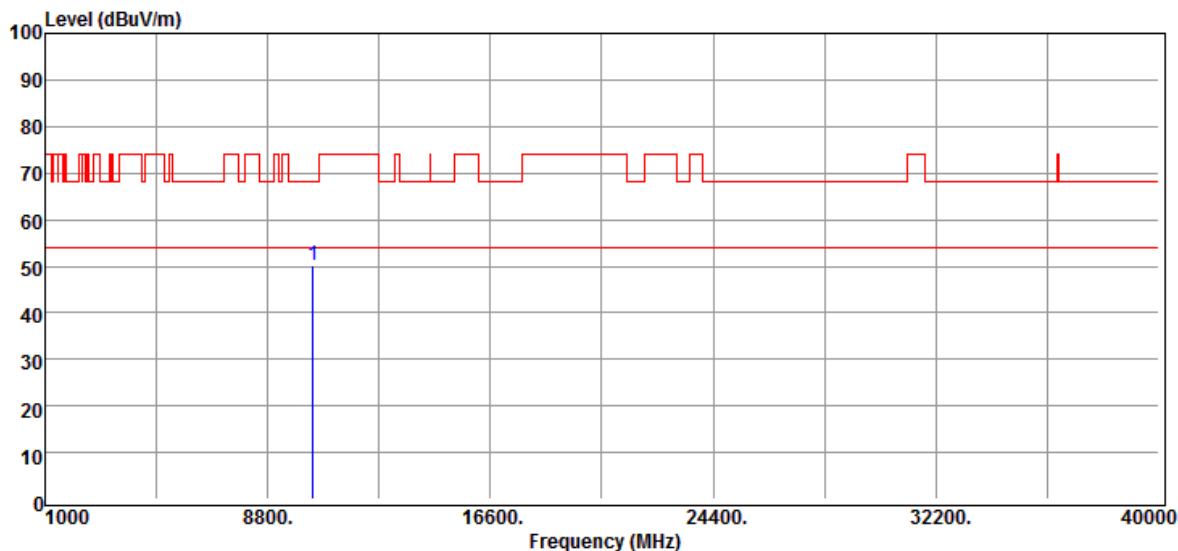
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Mode	:802.11n40 / Band1	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5190 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10380.00	Peak	37.65	12.44	50.09	68.20	-18.11

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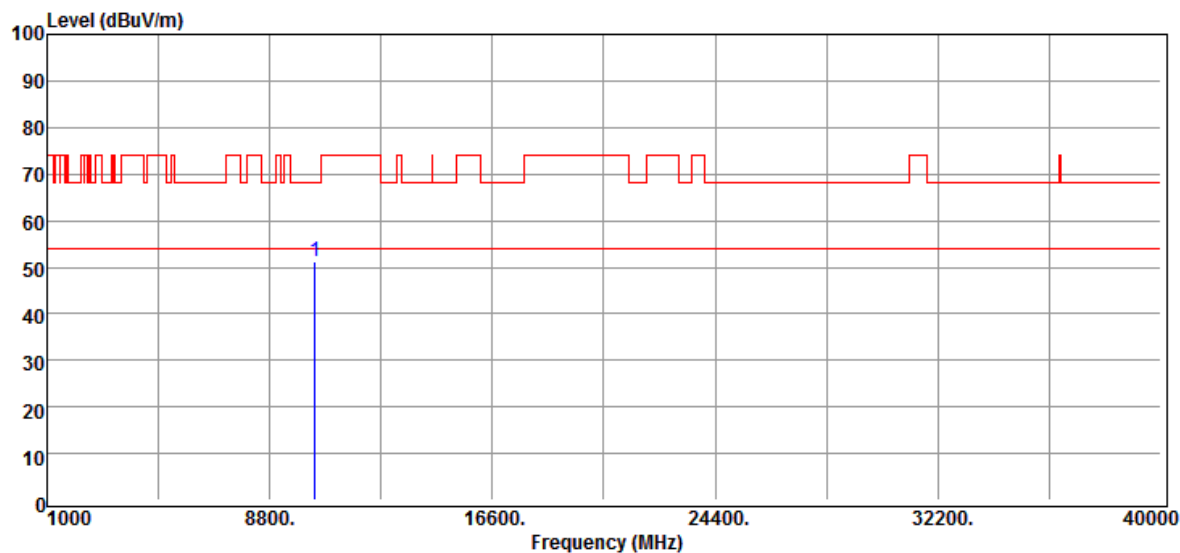
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Operation Mode :802.11n40 / Band1
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5190 MHz

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
10380.00	Peak	38.75	12.44	51.19	68.20	-17.01

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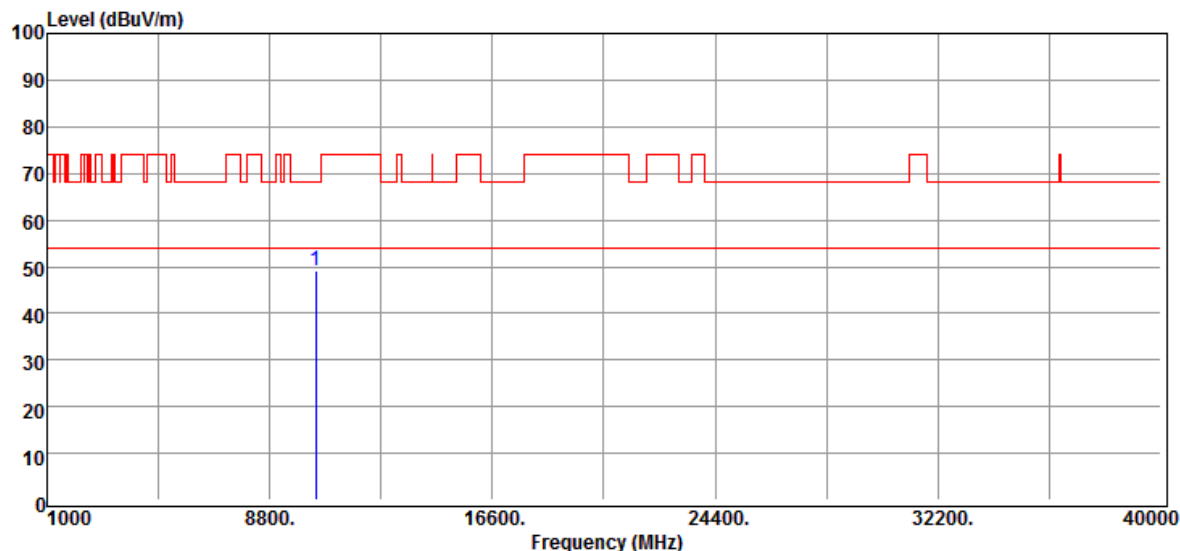
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Operation Mode :802.11n40 / Band 1
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5210 MHz

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



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10420.00	Peak	36.61	12.49	49.10	68.20	-19.10

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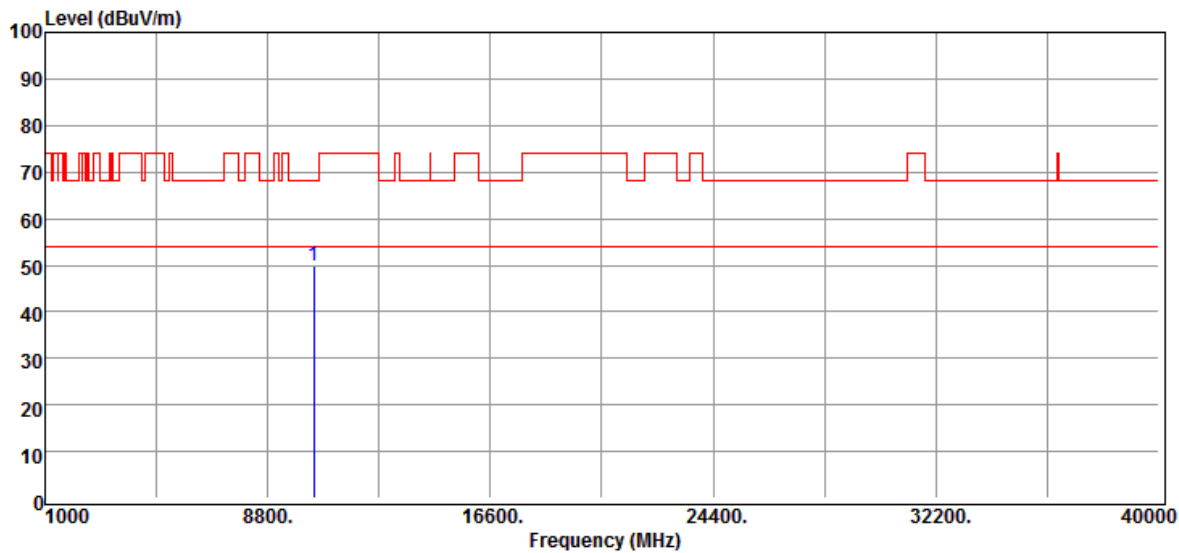
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Operation Mode :802.11n40 / Band 1
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5210 MHz

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



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
10420.00	Peak	37.44	12.49	49.93	68.20	-18.27

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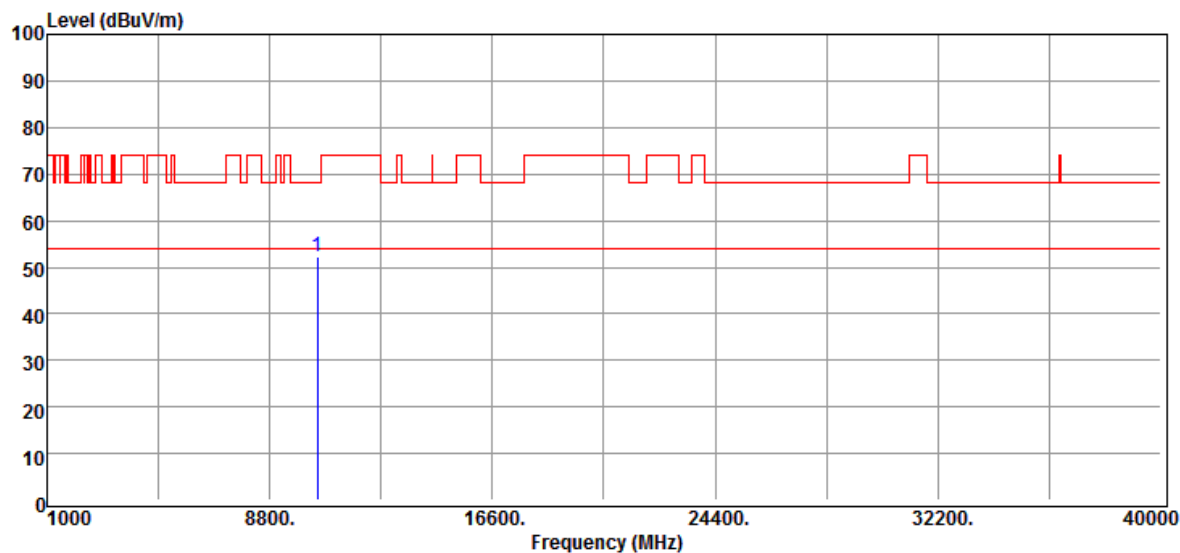
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Operation Mode :802.11n40 / Band1
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5230 MHz

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
10460.00	Peak	39.64	12.55	52.19	68.20	-16.01

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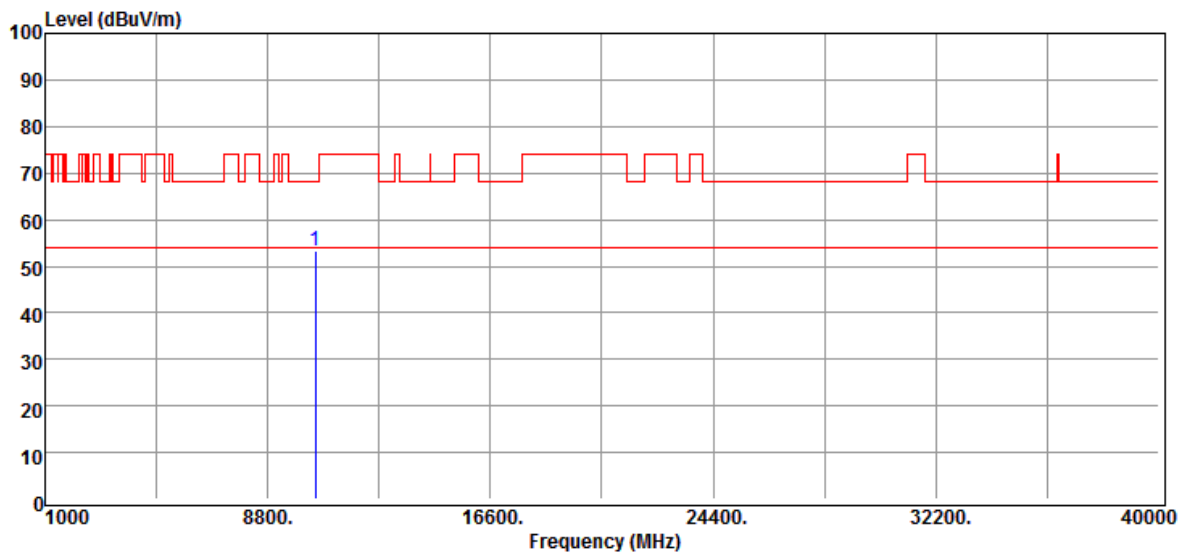
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Operation Mode	:802.11n40 / Band1	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:5230 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10460.00	Peak	40.84	12.55	53.39	68.20	-14.81

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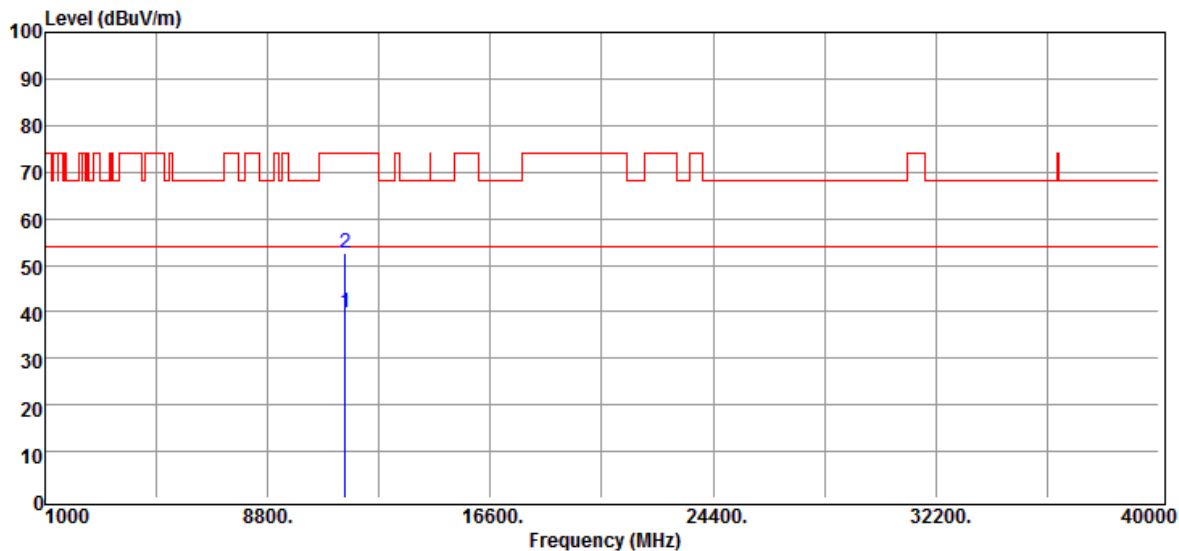
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation Mode	:802.11n40 / Band4	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5755 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
11510.00	Average	26.33	13.31	39.64	54.00	-14.36
11510.00	Peak	39.38	13.31	52.69	74.00	-21.31

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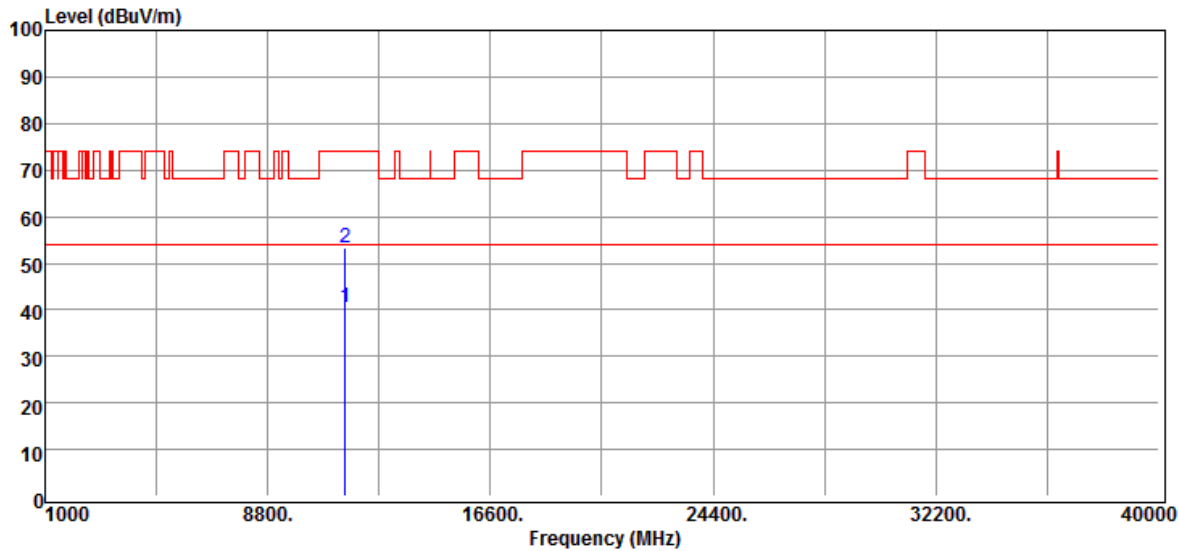
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Operation Mode :802.11n40 / Band4
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5755 MHz

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
11510.00	Average	27.02	13.31	40.33	54.00	-13.67
11510.00	Peak	39.86	13.31	53.17	74.00	-20.83

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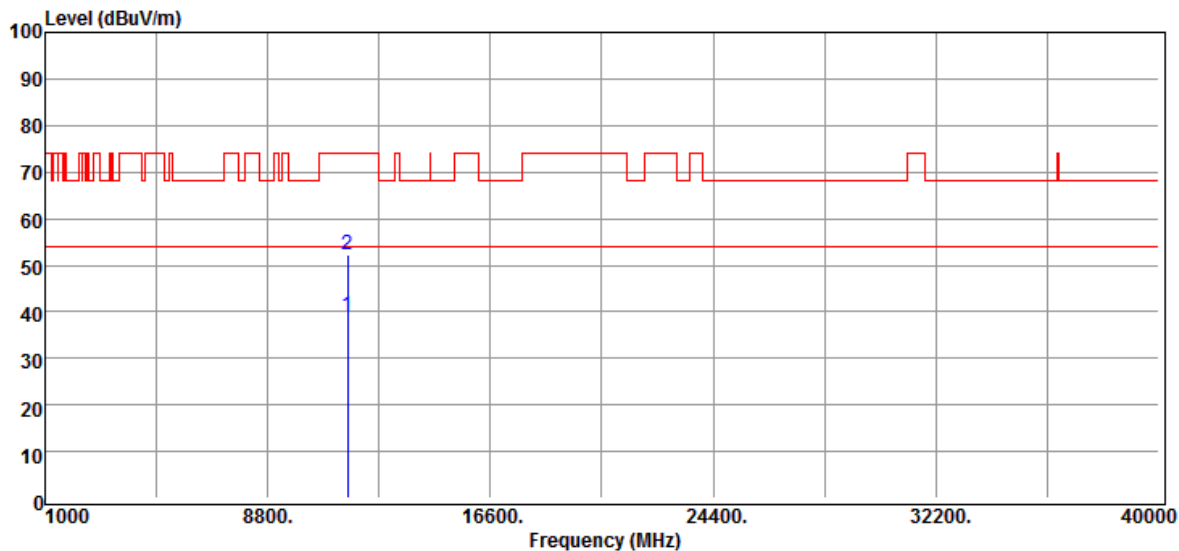
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Operation Mode :802.11n40 / Band4
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5795 MHz

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
11590.00	Average	26.24	12.92	39.16	54.00	-14.84
11590.00	Peak	39.25	12.92	52.17	74.00	-21.83

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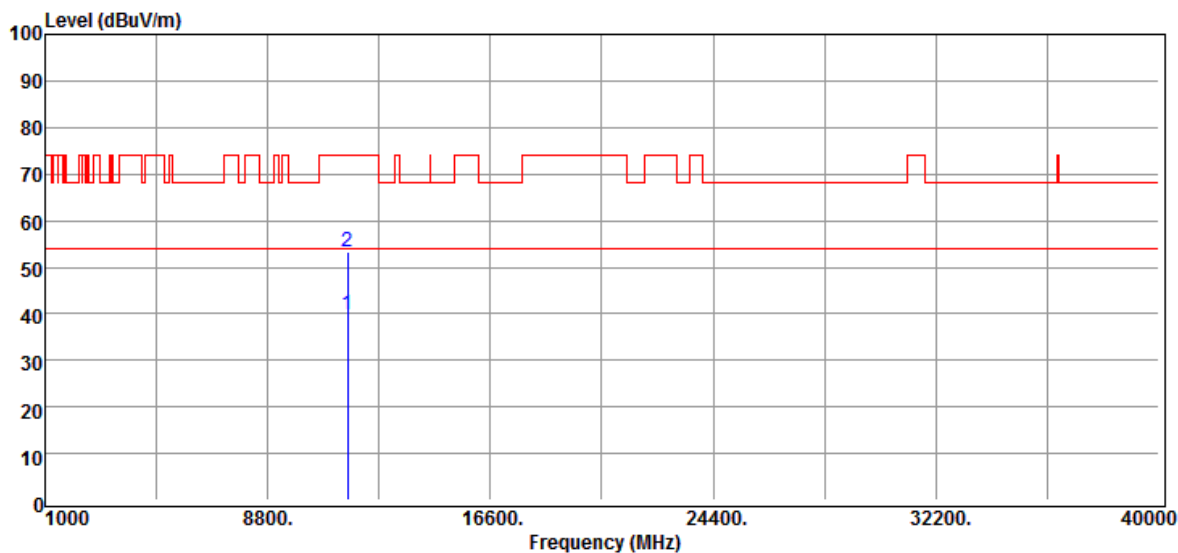
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Operation Mode :802.11n40 / Band4
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5795 MHz

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
11590.00	Average	27.02	12.92	39.94	54.00	-14.06
11590.00	Peak	40.32	12.92	53.24	74.00	-20.76

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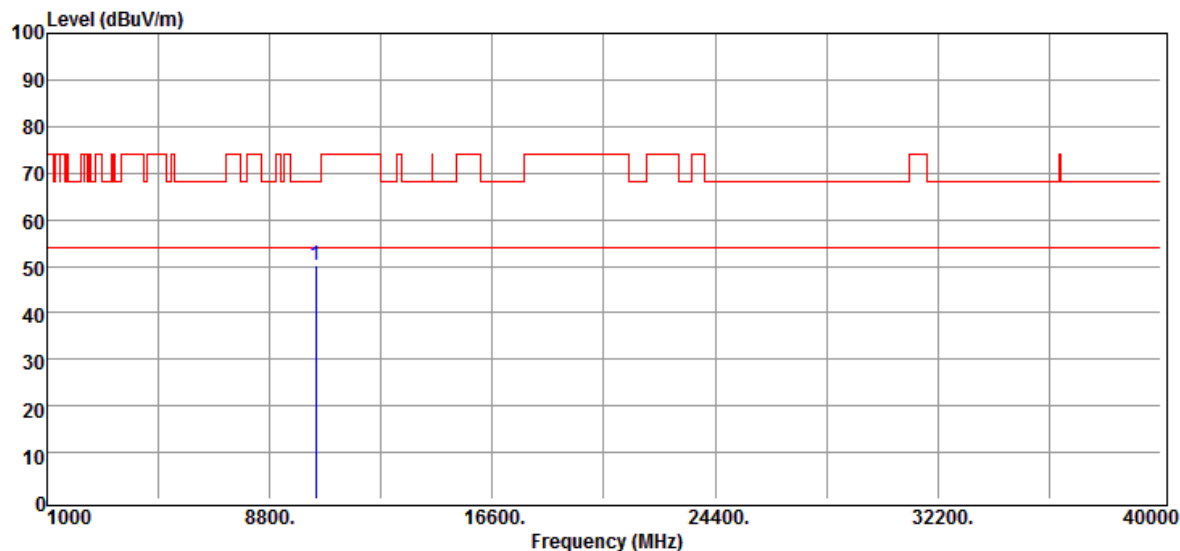
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Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5150~5250 MHz

Operation Mode	:802.11ac80 / Band1	Test Date	:2018-05-25
Test Mode	:Tx CH Low	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5210 MHz	Engineer	:Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10420.00	Peak	37.54	12.49	50.03	68.20	-18.17

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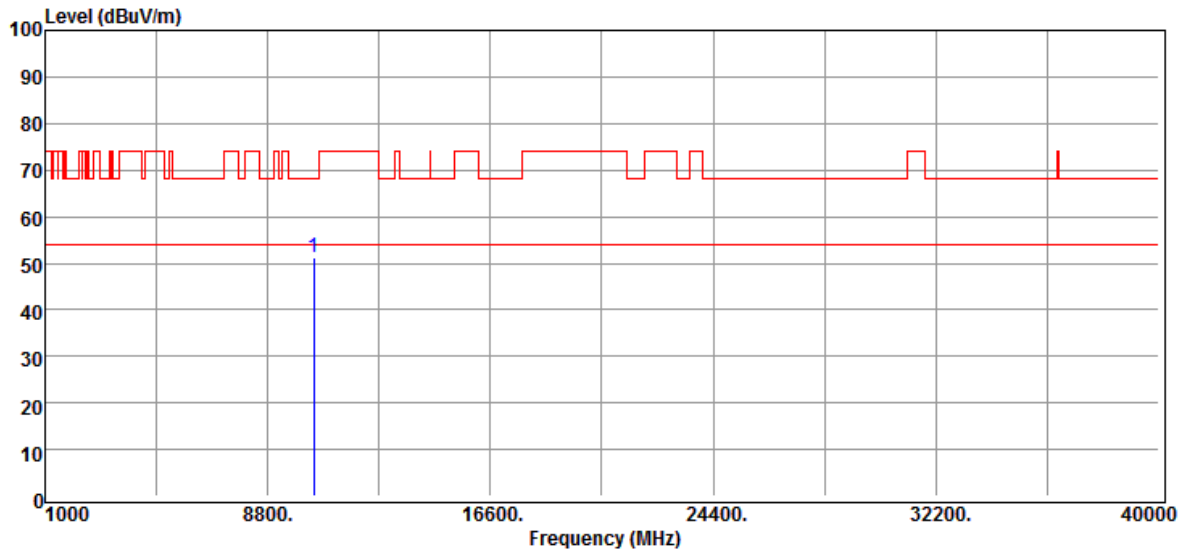
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Operation Mode :802.11ac80 / Band1
 Test Mode :Tx CH Low
 EUT Pol :H Plan
 Test Channel :5210 MHz

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
10420.00	Peak	38.64	12.49	51.13	68.20	-17.07

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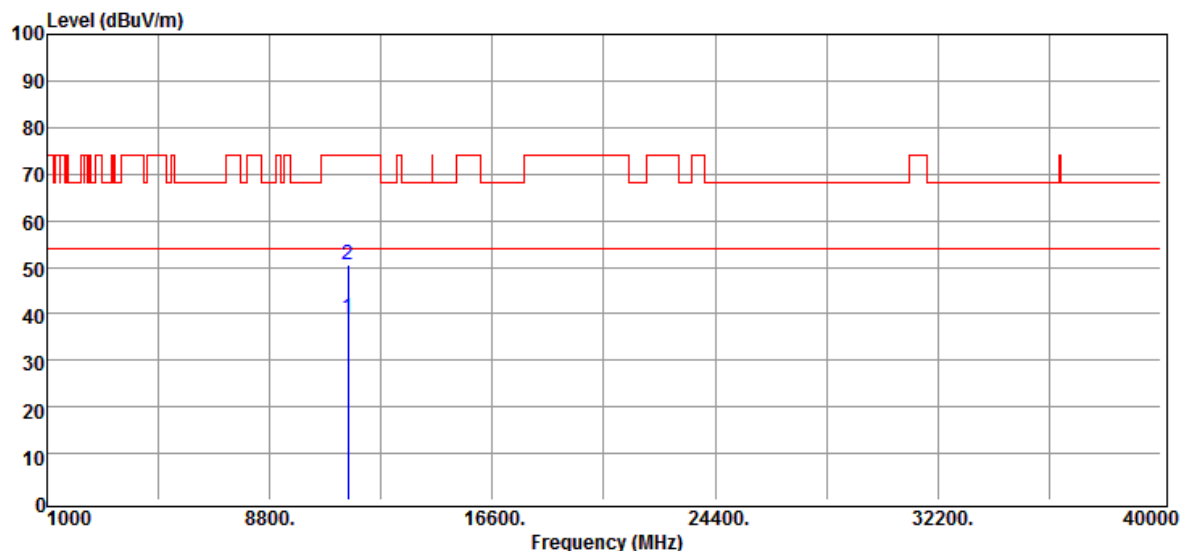
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Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5725~5850 MHz

Operation Mode	:802.11ac80 / Band4	Test Date	:2018-05-25
Test Mode	:Tx CH High	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:5775 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
11550.00	Average	25.83	13.11	38.94	54.00	-15.06
11550.00	Peak	37.24	13.11	50.35	74.00	-23.65

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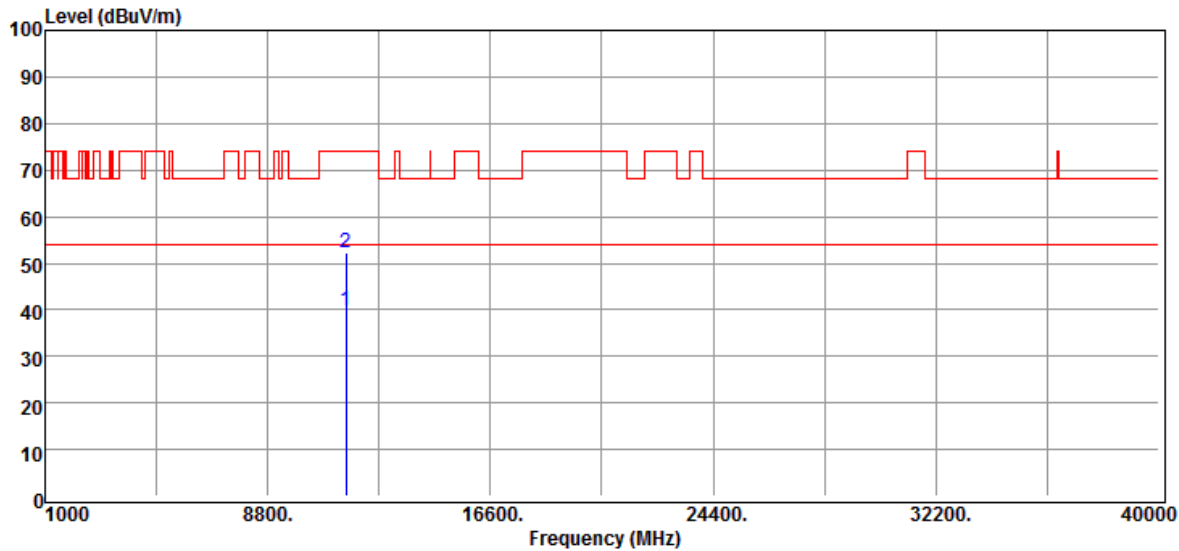
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Operation Mode :802.11ac80 / Band4
 Test Mode :Tx CH High
 EUT Pol :H Plan
 Test Channel :5775 MHz

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
11550.00	Average	26.54	13.11	39.65	54.00	-14.35
11550.00	Peak	39.23	13.11	52.34	74.00	-21.66

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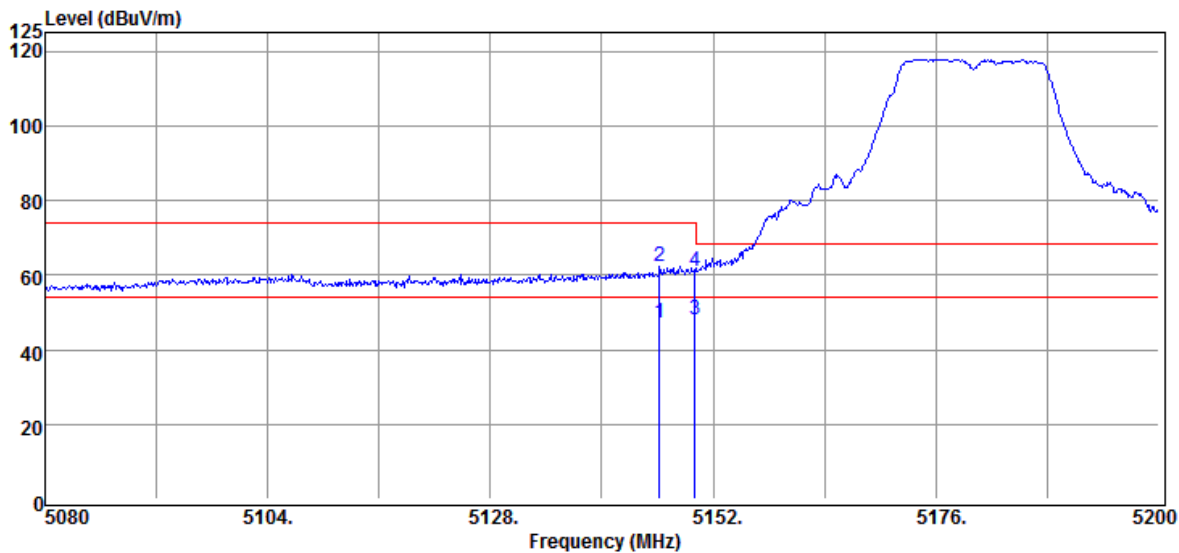
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Band edge falling to restricted band

802.11a mode

Operation Mode :802.11a / Band1
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5180 MHz

Test Date :2018-05-24
 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
5146.24	Average	45.37	1.83	47.20	54.00	-6.80
5146.24	Peak	60.31	1.83	62.14	74.00	-11.86
5150.00	Average	46.02	1.84	47.86	54.00	-6.14
5150.00	Peak	59.19	1.84	61.03	74.00	-12.97

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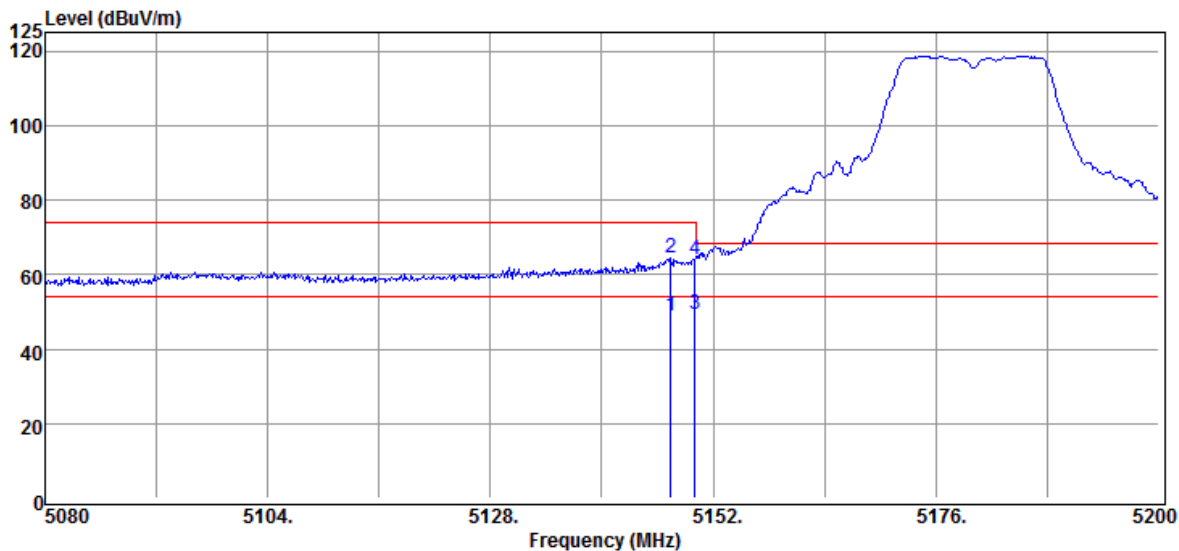
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Operation Mode :802.11a / Band1
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5180 MHz

Test Date :2018-05-24
 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
5147.44	Average	47.02	1.84	48.86	54.00	-5.14
5147.44	Peak	62.71	1.84	64.55	74.00	-9.45
5150.00	Average	47.66	1.84	49.50	54.00	-4.50
5150.00	Peak	62.13	1.84	63.97	74.00	-10.03

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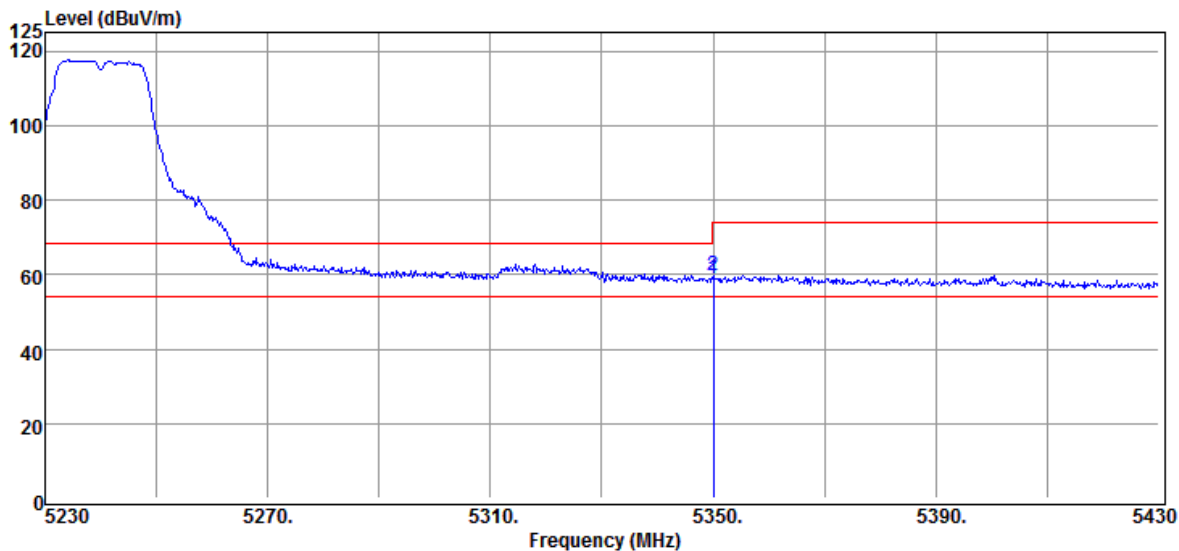
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Operation Mode :802.11a / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

Test Date :2018-05-24
 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
5350.00	Peak	56.42	2.24	58.66	74.00	-15.34
5350.00	Peak	57.42	2.24	59.66	74.00	-14.34

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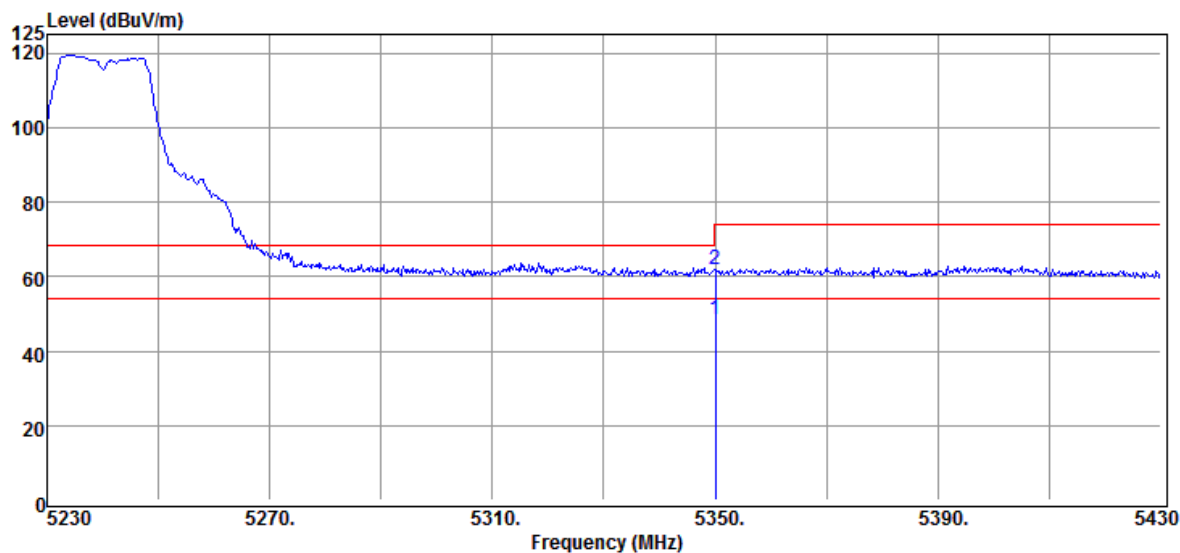
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Operation Mode :802.11a / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

Test Date :2018-05-24
 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
5350.00	Average	46.06	2.24	48.30	54.00	-5.70
5350.00	Peak	59.76	2.24	62.00	74.00	-12.00

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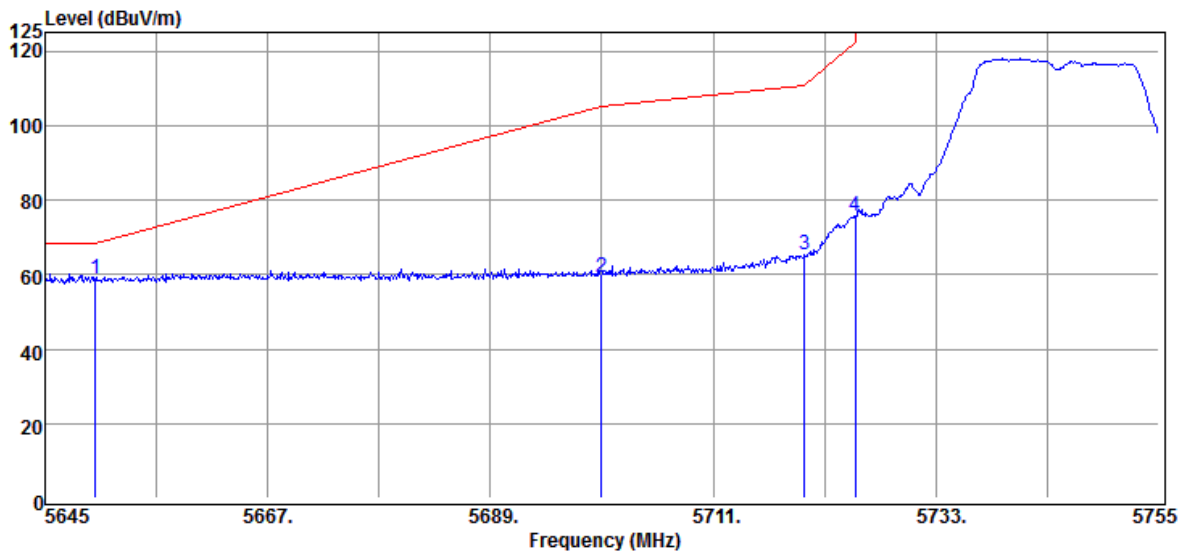
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Operation Mode :802.11a / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5745 MHz

Test Date :2018-05-24
 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
5650.00	Peak	56.36	2.25	58.61	68.20	-9.59
5700.00	Peak	56.90	2.42	59.32	105.20	-45.88
5720.00	Peak	62.84	2.32	65.16	110.80	-45.64
5725.00	Peak	73.23	2.28	75.51	122.20	-46.69

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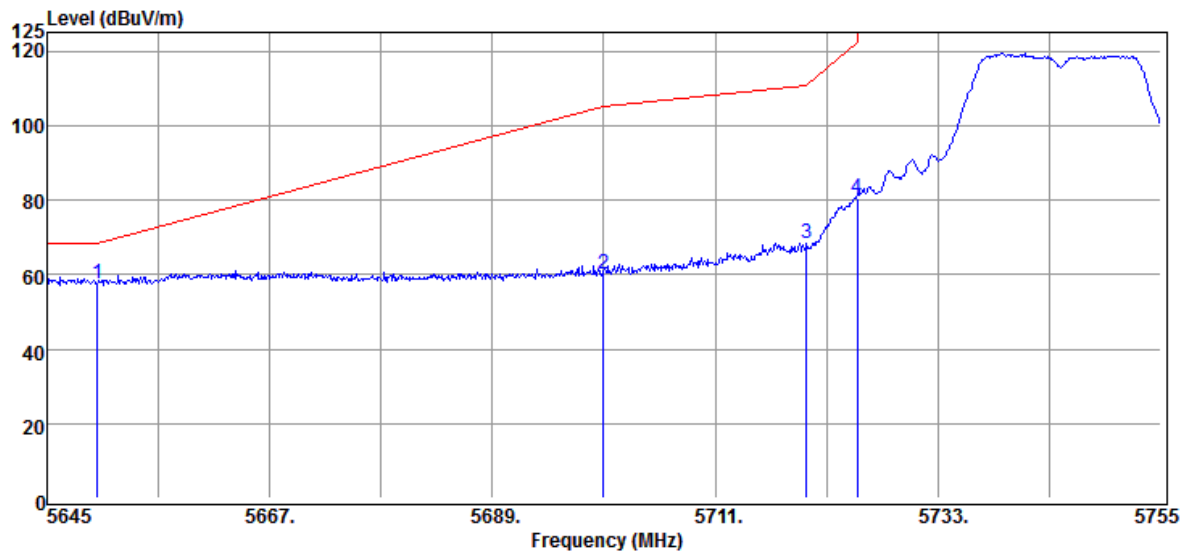
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Operation Mode :802.11a / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5745 MHz

Test Date :2018-05-24
 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
5650.00	Peak	55.46	2.25	57.71	68.20	-10.49
5700.00	Peak	57.58	2.42	60.00	105.20	-45.20
5720.00	Peak	65.85	2.32	68.17	110.80	-42.63
5725.00	Peak	78.36	2.28	80.64	122.20	-41.56

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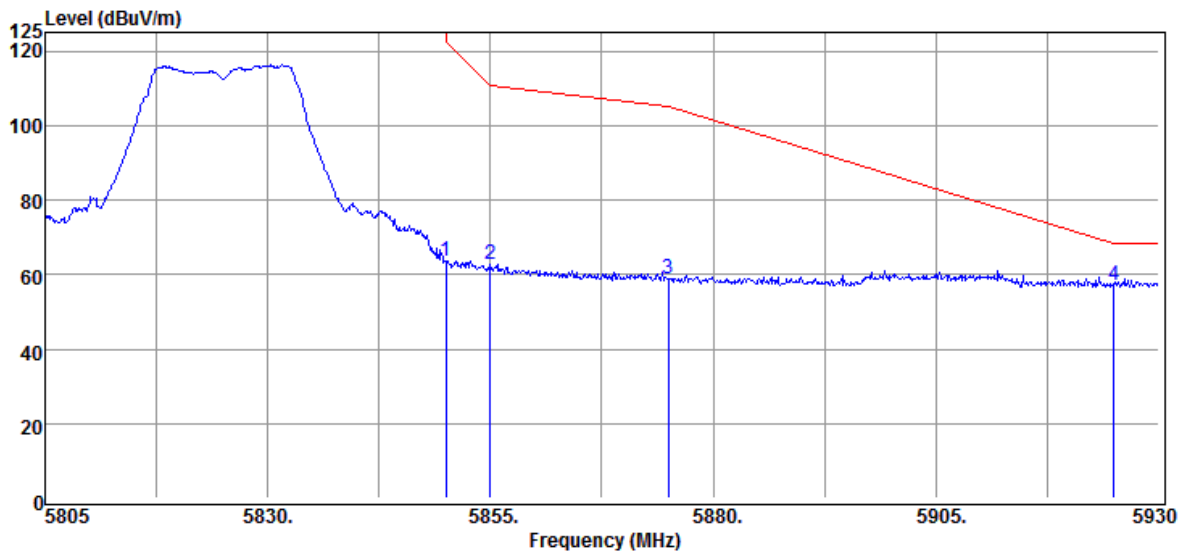
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Operation Mode :802.11a / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

Test Date :2018-05-24
 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
5850.00	Peak	61.70	1.88	63.58	122.20	-58.62
5855.00	Peak	60.73	1.89	62.62	110.80	-48.18
5875.00	Peak	56.98	1.90	58.88	105.20	-46.32
5925.00	Peak	54.91	2.16	57.07	68.20	-11.13

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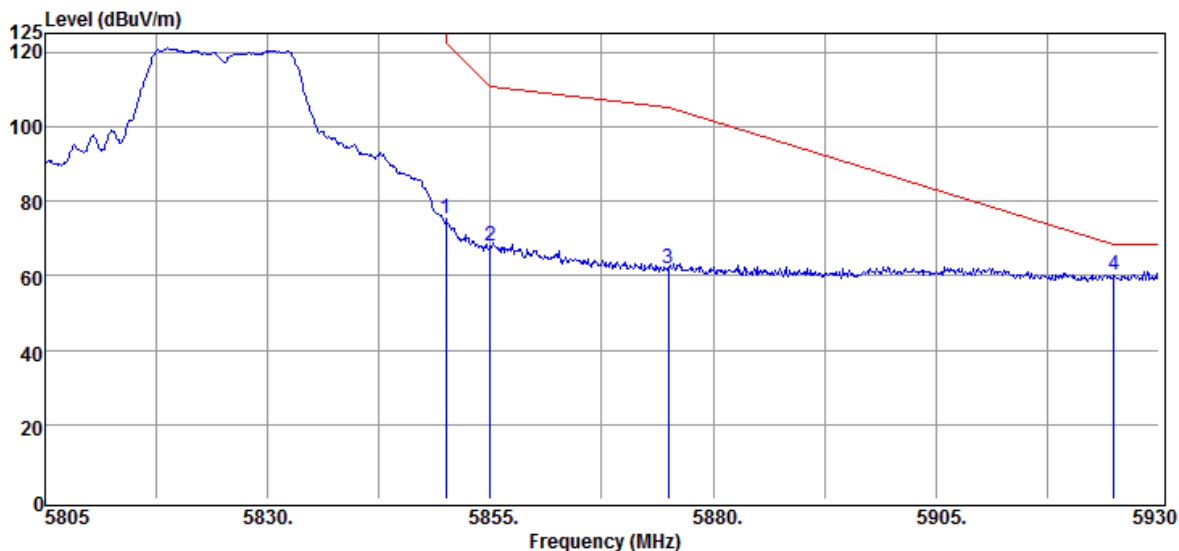
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Operation Mode :802.11a / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

Test Date :2018-05-24
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5850.00	Peak	73.46	1.88	75.34	122.20	-46.86
5855.00	Peak	66.04	1.89	67.93	110.80	-42.87
5875.00	Peak	59.78	1.90	61.68	105.20	-43.52
5925.00	Peak	57.78	2.16	59.94	68.20	-8.26

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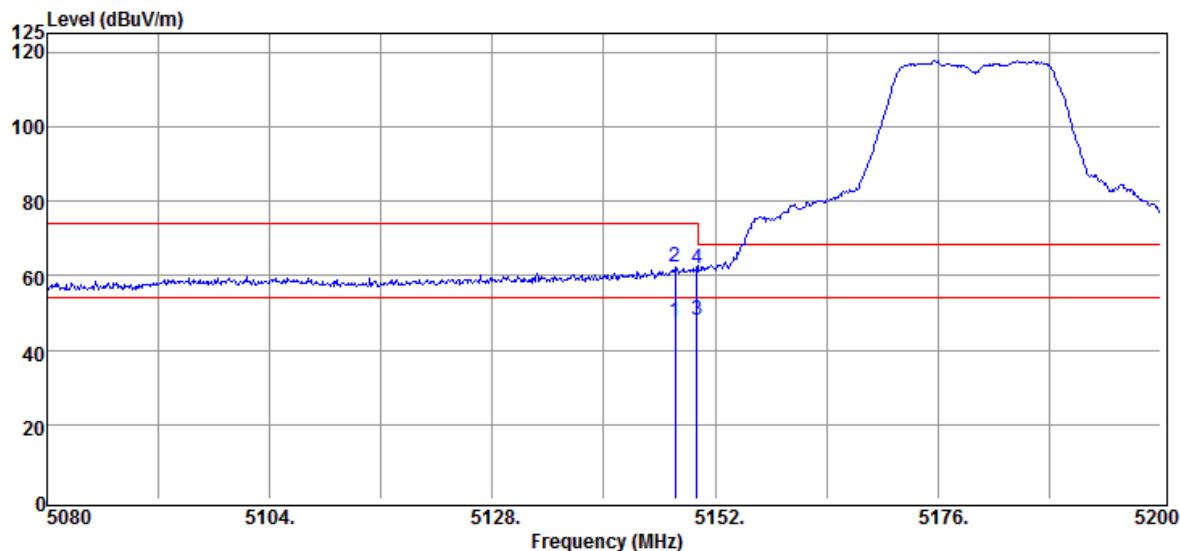
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802.11n20 HT mode

Operation Mode :802.11n20 / Band1
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5180 MHz

Test Date :2018-05-24
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5147.68	Average	45.54	1.84	47.38	54.00	-6.62
5147.68	Peak	60.32	1.84	62.16	74.00	-11.84
5150.00	Average	45.97	1.84	47.81	54.00	-6.19
5150.00	Peak	60.14	1.84	61.98	74.00	-12.02

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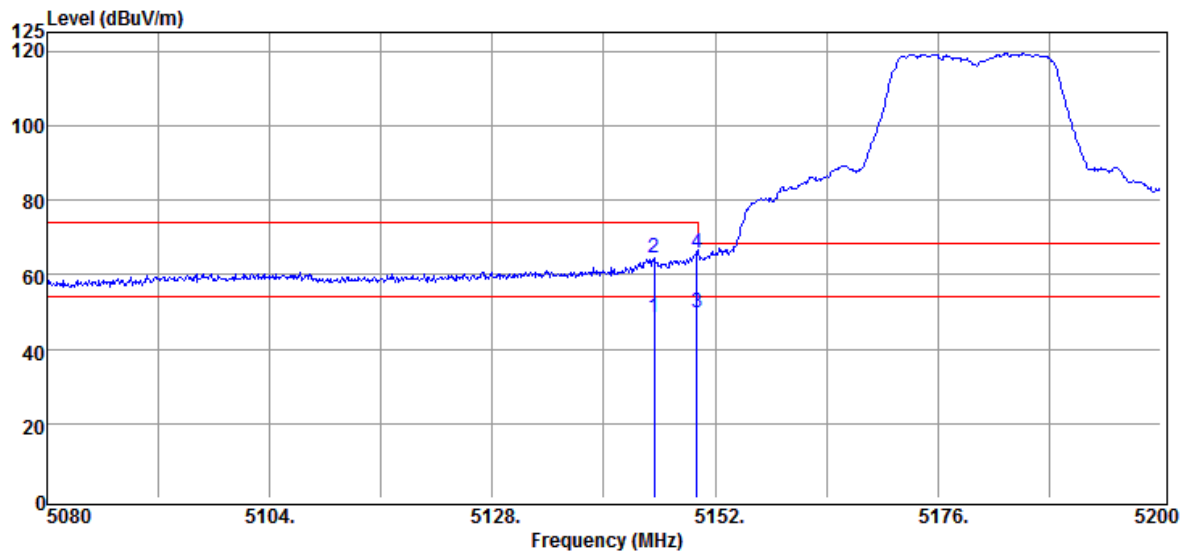
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Operation Mode :802.11n20 / Band1
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5180 MHz

Test Date :2018-05-24
 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
5145.40	Average	46.61	1.83	48.44	54.00	-5.56
5145.40	Peak	62.46	1.83	64.29	74.00	-9.71
5150.00	Average	48.01	1.84	49.85	54.00	-4.15
5150.00	Peak	63.73	1.84	65.57	74.00	-8.43

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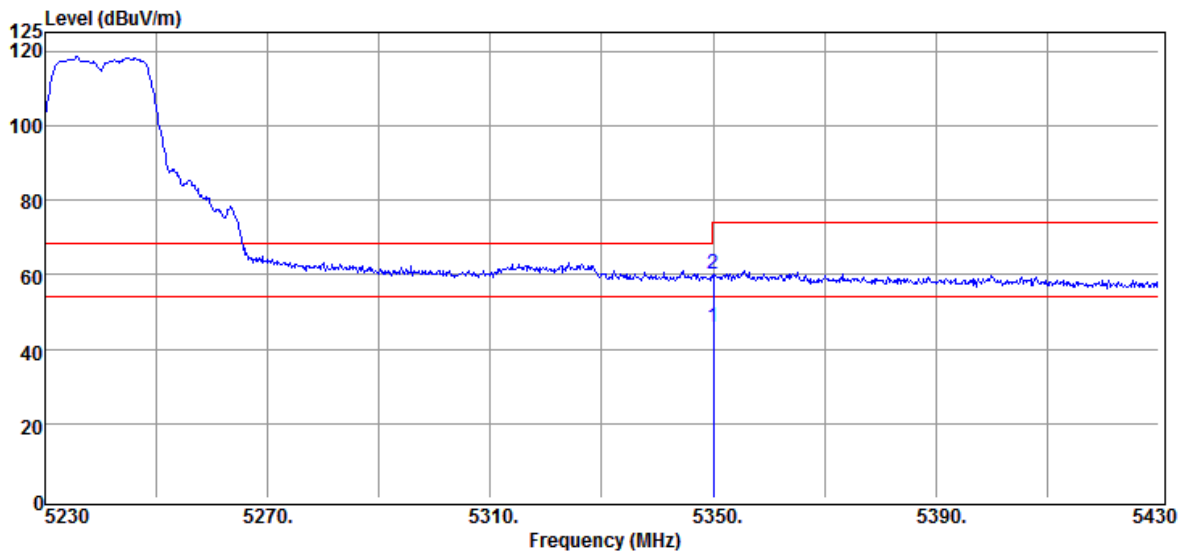
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Member of SGS Group

Operation Mode :802.11n20 / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

Test Date :2018-05-24
 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
5350.00	Average	43.78	2.24	46.02	54.00	-7.98
5350.00	Peak	58.00	2.24	60.24	74.00	-13.76

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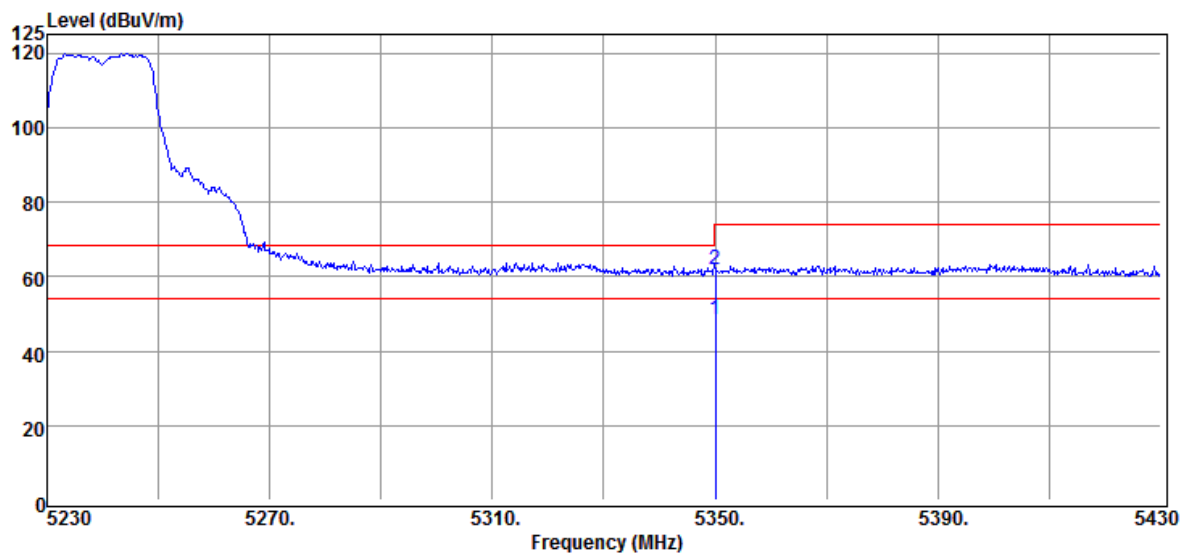
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Operation Mode :802.11n20 / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5240 MHz

Test Date :2018-05-24
 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
5350.00	Average	46.30	2.24	48.54	54.00	-5.46
5350.00	Peak	59.69	2.24	61.93	74.00	-12.07

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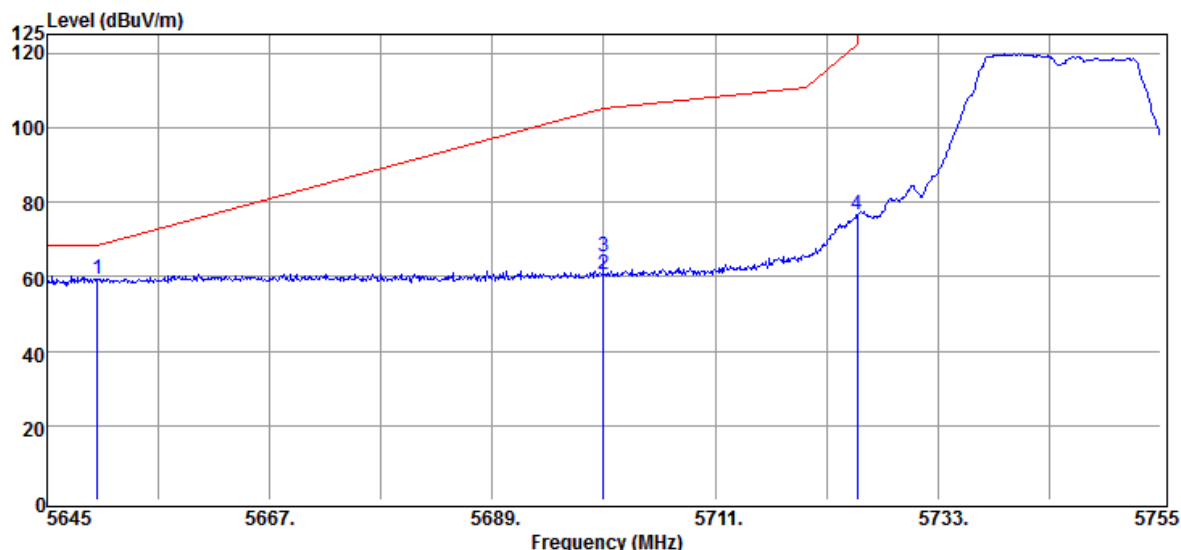
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Operation Mode :802.11n20 / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5745 MHz

Test Date :2018-05-24
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5650.00	Peak	57.15	2.25	59.40	68.20	-8.80
5700.00	Peak	58.19	2.42	60.61	105.20	-44.59
5700.00	Peak	62.77	2.42	65.19	105.20	-40.01
5725.00	Peak	74.34	2.28	76.62	122.20	-45.58

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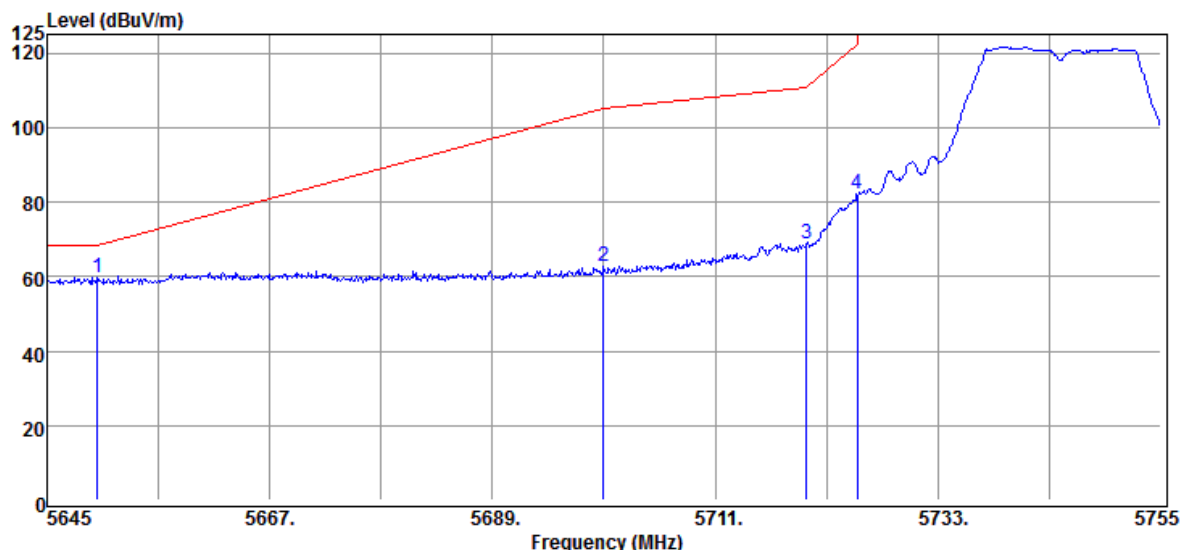
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Operation Mode :802.11n20 / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5745 MHz

Test Date :2018-05-24
 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
5650.00	Peak	57.34	2.25	59.59	68.20	-8.61
5700.00	Peak	60.51	2.42	62.93	105.20	-42.27
5720.00	Peak	66.55	2.32	68.87	110.80	-41.93
5725.00	Peak	79.78	2.28	82.06	122.20	-40.14

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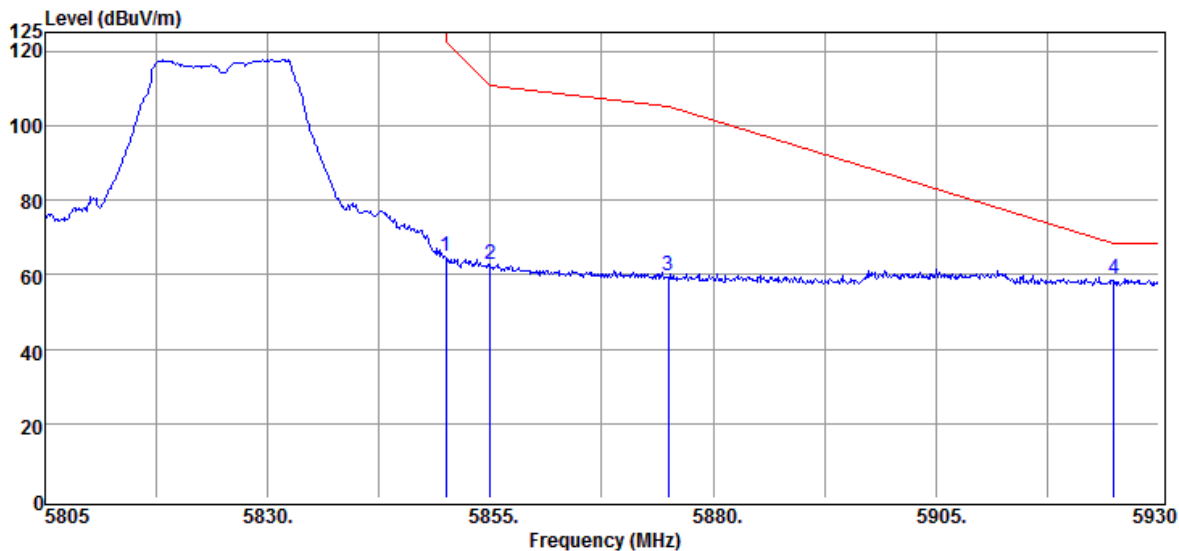
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Operation Mode :802.11n20 / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

Test Date :2018-05-24
 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
5850.00	Peak	62.93	1.88	64.81	122.20	-57.39
5855.00	Peak	60.93	1.89	62.82	110.80	-47.98
5875.00	Peak	57.82	1.90	59.72	105.20	-45.48
5925.00	Peak	56.63	2.16	58.79	68.20	-9.41

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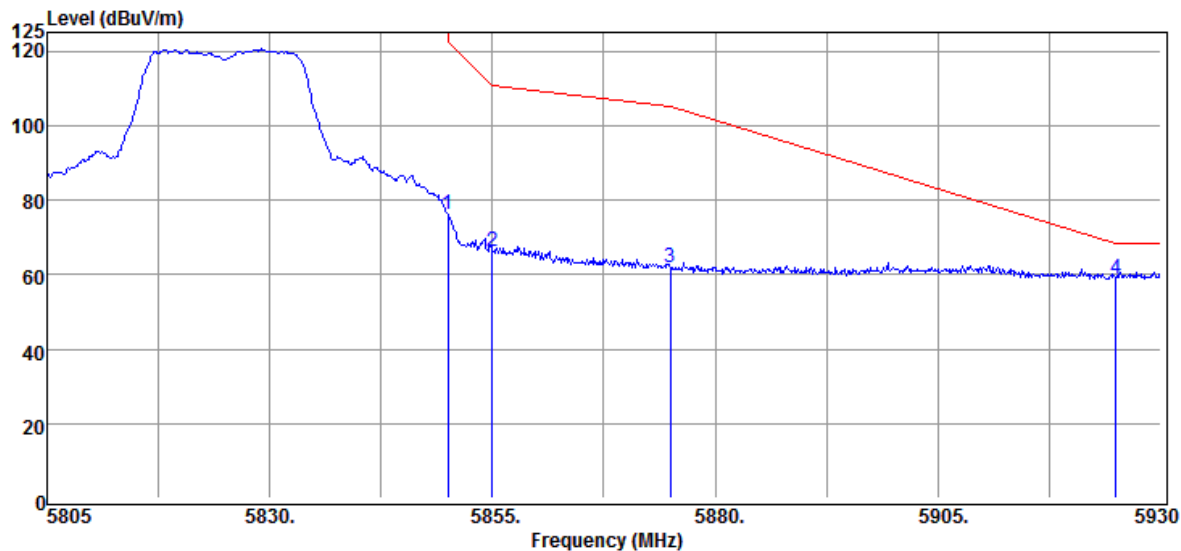
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Operation Mode :802.11n20 / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5825 MHz

Test Date :2018-05-24
 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
5850.00	Peak	74.21	1.88	76.09	122.20	-46.11
5855.00	Peak	64.43	1.89	66.32	110.80	-44.48
5875.00	Peak	59.97	1.90	61.87	105.20	-43.33
5925.00	Peak	56.76	2.16	58.92	68.20	-9.28

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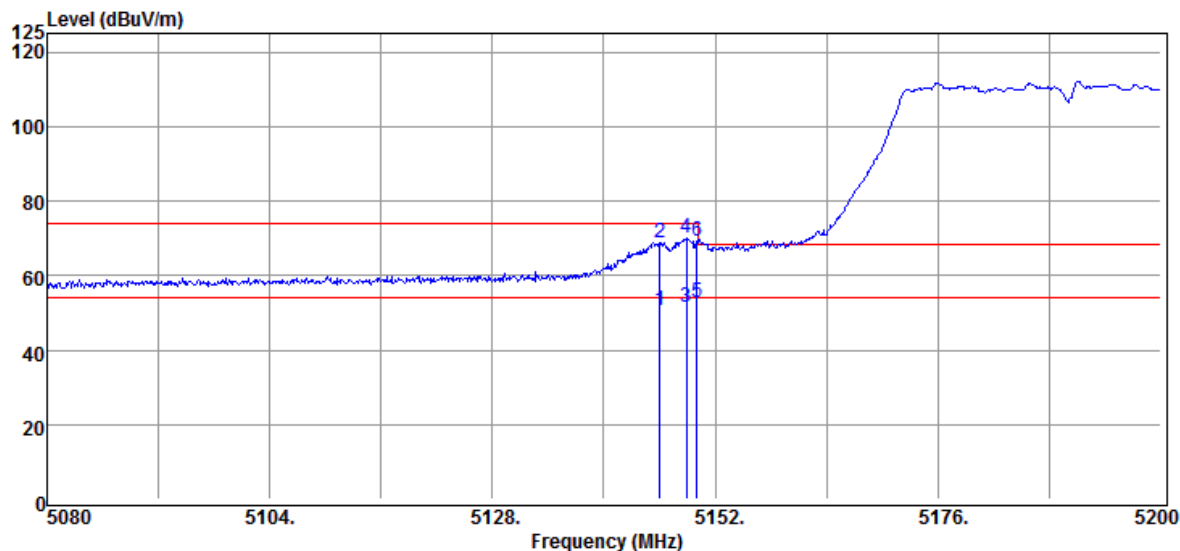
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802.11n40 HT mode

Operation Mode :802.11n40 / Band1
Test Mode :Bandedge CH Low
EUT Pol :H Plan
Test Channel :5190 MHz

Test Date :2018-05-24
Temp./Humi. :25/60
Antenna Pol. :HORIZONTAL
Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5146.00	Average	48.97	1.83	50.80	54.00	-3.20
5146.00	Peak	67.08	1.83	68.91	74.00	-5.09
5148.88	Average	49.65	1.84	51.49	54.00	-2.51
5148.88	Peak	68.20	1.84	70.04	74.00	-3.96
5150.00	Average	50.97	1.84	52.81	54.00	-1.19
5150.00	Peak	67.49	1.84	69.33	74.00	-4.67

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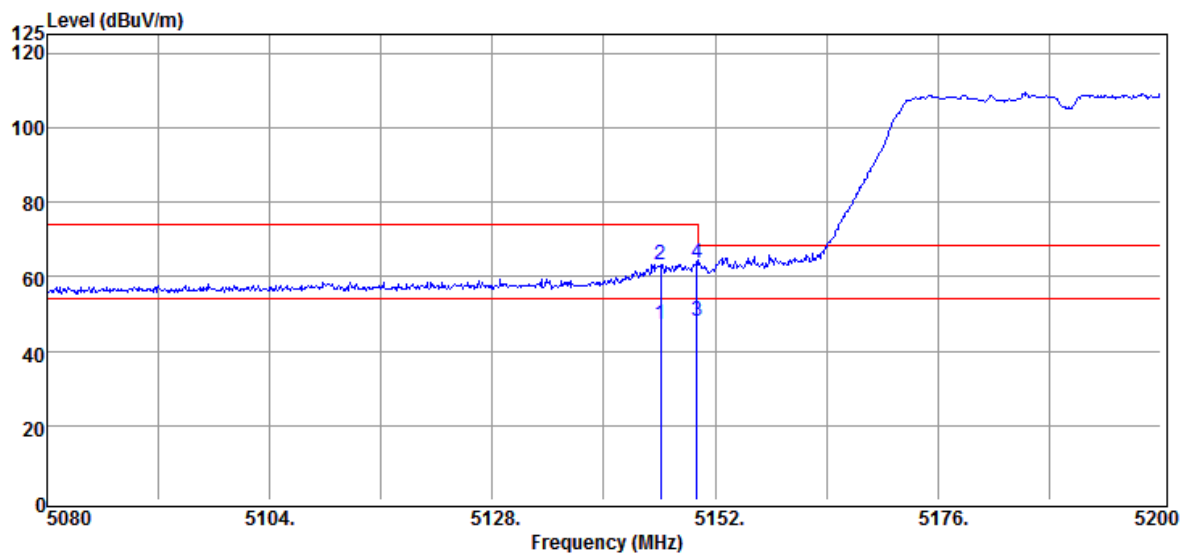
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Operation Mode :802.11n40 / Band1
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5190 MHz

Test Date :2018-05-24
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBUV	Factor dB	Actual FS dBUV/m	Limit @3m dBUV/m	Margin dB
5146.12	Average	45.18	1.83	47.01	54.00	-6.99
5146.12	Peak	61.47	1.83	63.30	74.00	-10.70
5150.00	Average	46.19	1.84	48.03	54.00	-5.97
5150.00	Peak	61.91	1.84	63.75	74.00	-10.25

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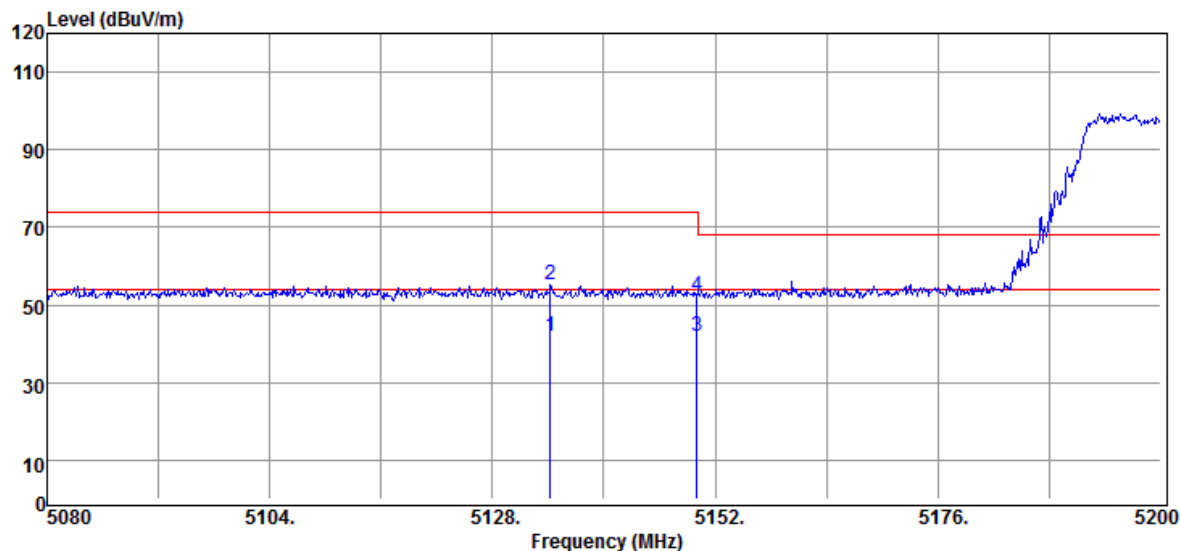
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Operation Mode :802.11n40 / Band 1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5210 MHz

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



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5134.24	Average	40.16	1.78	41.94	54.00	-12.06
5134.24	Peak	53.46	1.78	55.24	74.00	-18.76
5150.00	Average	40.15	1.84	41.99	54.00	-12.01
5150.00	Peak	50.44	1.84	52.28	74.00	-21.72

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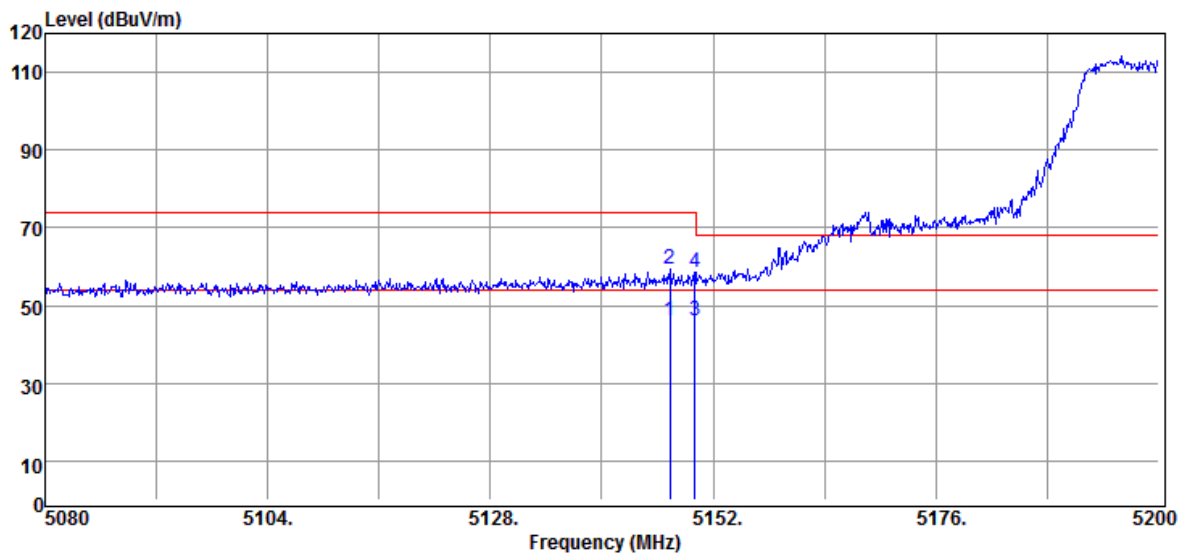
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Operation Mode :802.11n40 / Band 1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5210 MHz

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



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5147.32	Average	44.24	1.84	46.08	54.00	-7.92
5147.32	Peak	57.52	1.84	59.36	74.00	-14.64
5150.00	Average	44.29	1.84	46.13	54.00	-7.87
5150.00	Peak	56.66	1.84	58.50	74.00	-15.50

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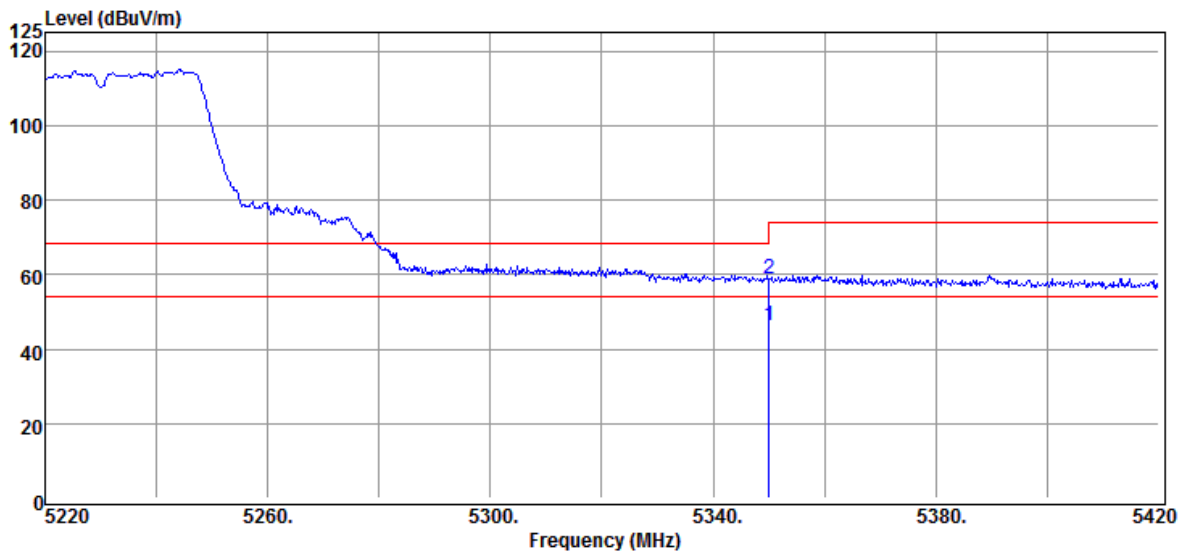
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Member of SGS Group

Operation Mode :802.11n40 / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5230 MHz

Test Date :2018-05-24
 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
5350.00	Average	43.98	2.24	46.22	54.00	-7.78
5350.00	Peak	56.73	2.24	58.97	74.00	-15.03

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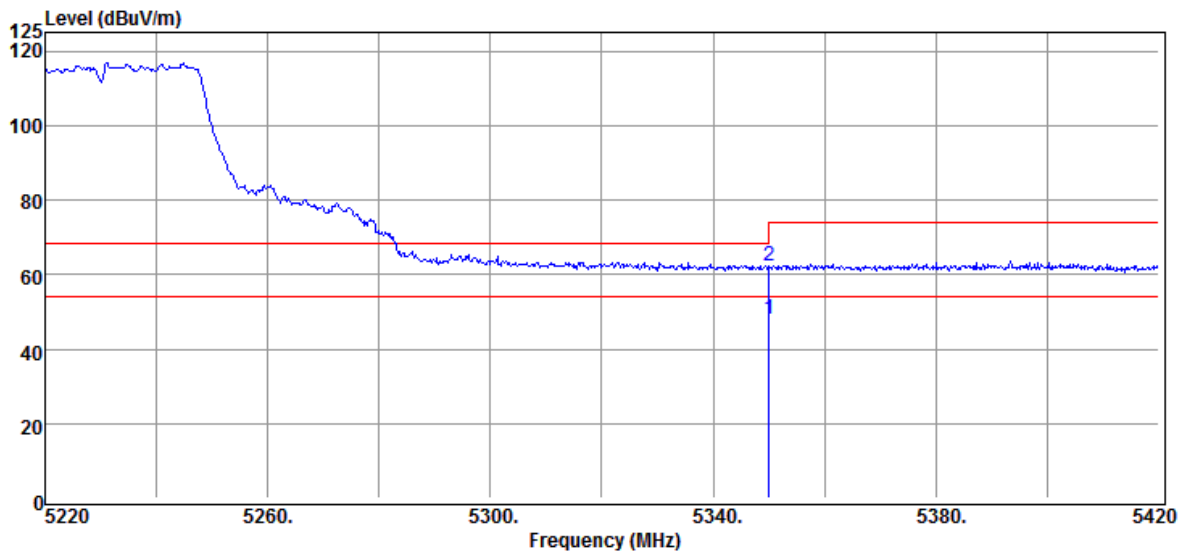
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Operation Mode :802.11n40 / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5230 MHz

Test Date :2018-05-24
 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
5350.00	Average	45.96	2.24	48.20	54.00	-5.80
5350.00	Peak	60.17	2.24	62.41	74.00	-11.59

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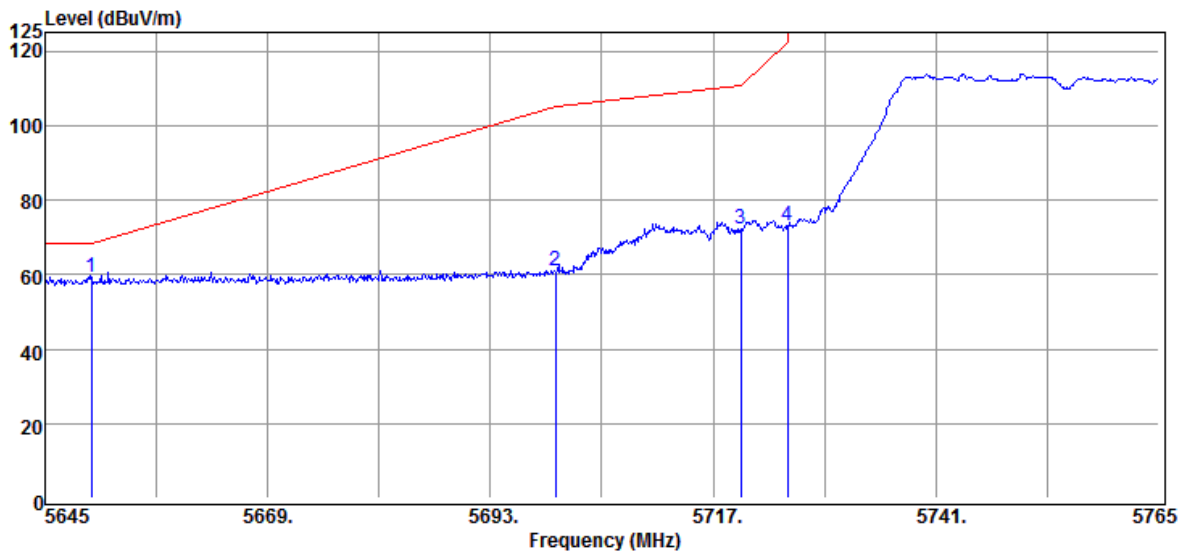
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Member of SGS Group

Operation Mode :802.11n40 / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5755 MHz

Test Date :2018-05-24
 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
5650.00	Peak	56.93	2.25	59.18	68.20	-9.02
5700.00	Peak	58.58	2.42	61.00	105.20	-44.20
5720.00	Peak	69.72	2.32	72.04	110.80	-38.76
5725.00	Peak	71.02	2.28	73.30	122.20	-48.90

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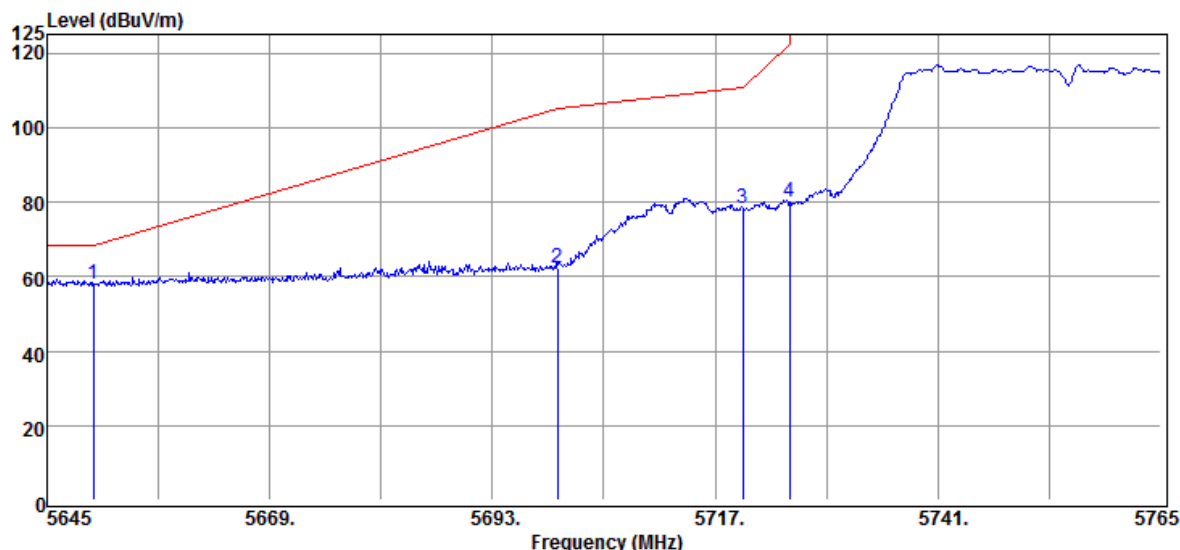
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Operation Mode :802.11n40 / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5755 MHz

Test Date :2018-05-24
 Temp./Humi. :25/60
 Antenna Pol. :HORIZONTAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5650.00	Peak	55.83	2.25	58.08	68.20	-10.12
5700.00	Peak	60.05	2.42	62.47	105.20	-42.73
5720.00	Peak	75.78	2.32	78.10	110.80	-32.70
5725.00	Peak	77.73	2.28	80.01	122.20	-42.19

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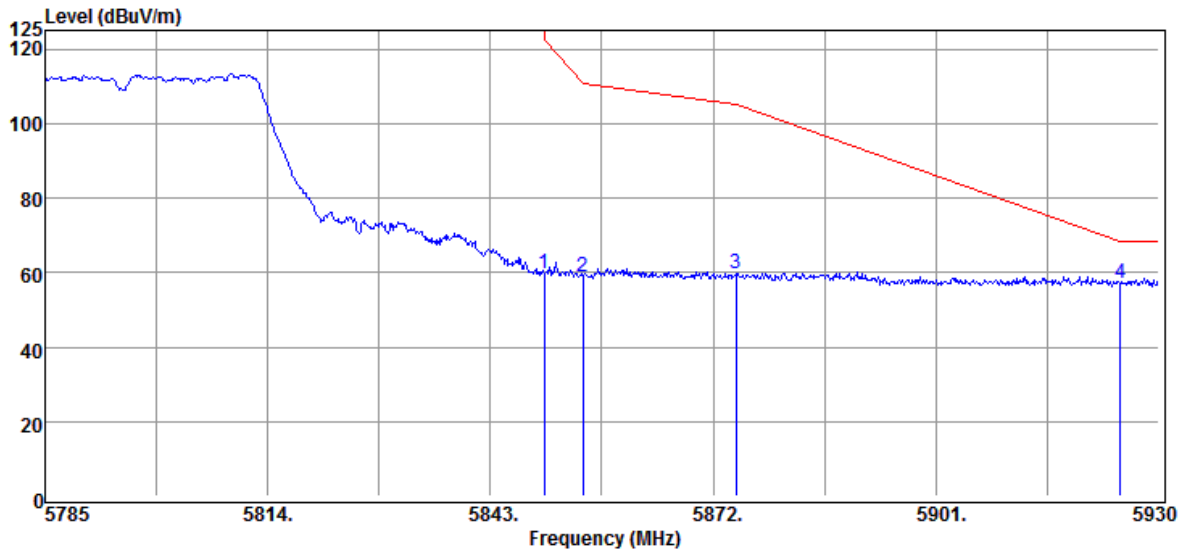
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Operation Mode :802.11n40 / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5795 MHz

Test Date :2018-05-24
 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
5850.00	Peak	57.61	1.88	59.49	122.20	-62.71
5855.00	Peak	57.00	1.89	58.89	110.80	-51.91
5875.00	Peak	57.79	1.90	59.69	105.20	-45.51
5925.00	Peak	54.94	2.16	57.10	68.20	-11.10

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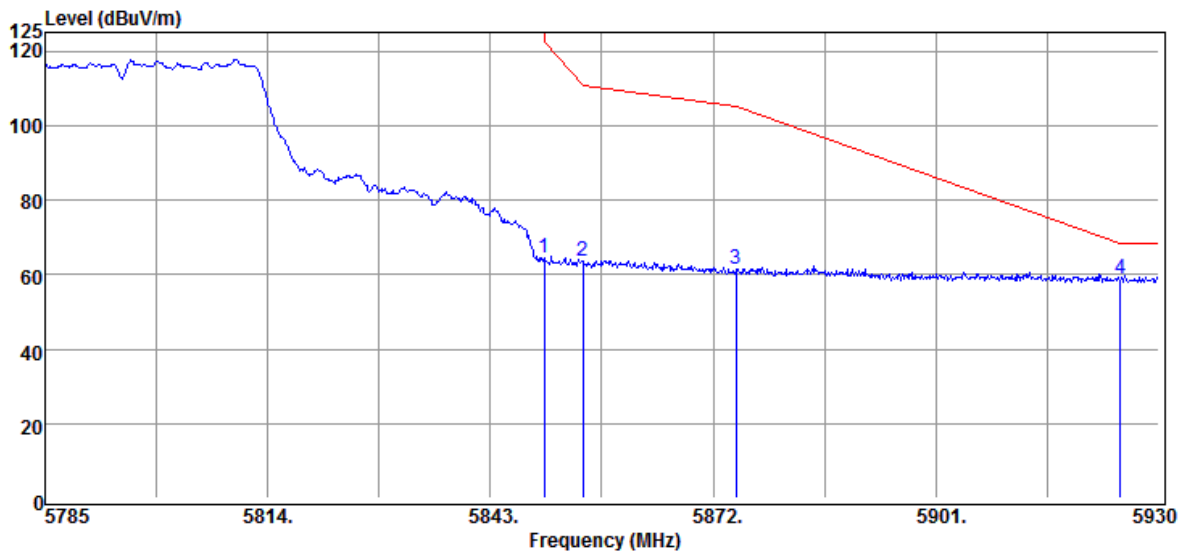
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Operation Mode :802.11n40 / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5795 MHz

Test Date :2018-05-24
 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
5850.00	Peak	62.43	1.88	64.31	122.20	-57.89
5855.00	Peak	61.55	1.89	63.44	110.80	-47.36
5875.00	Peak	59.45	1.90	61.35	105.20	-43.85
5925.00	Peak	56.75	2.16	58.91	68.20	-9.29

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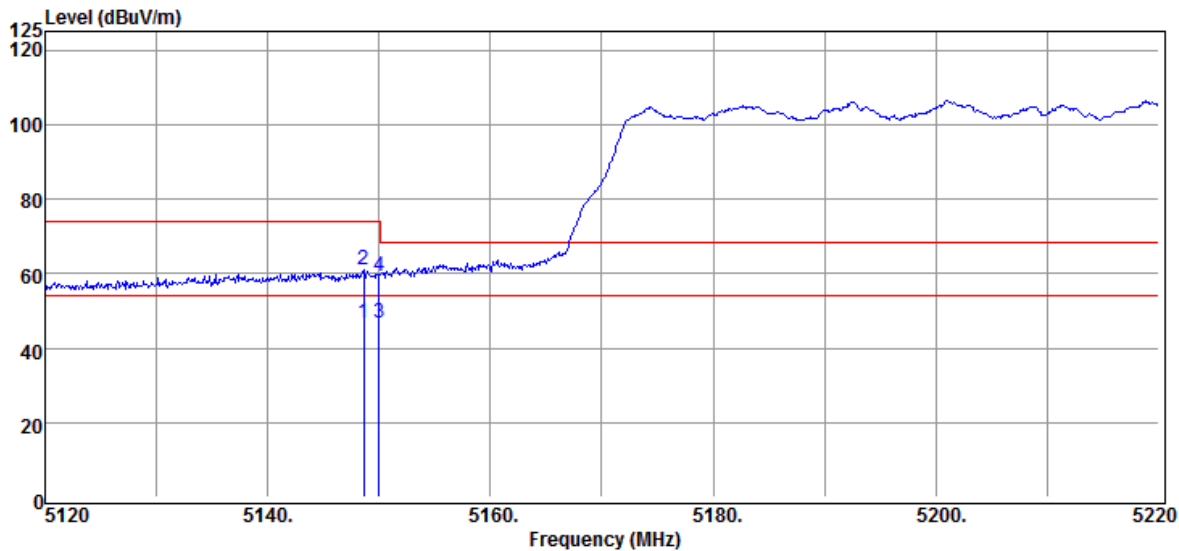
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802.11ac80 VHT mode

Operation Mode :802.11ac80 / Band1
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5210 MHz

Test Date :2018-05-24
 Temp./Humi. :25/60
 Antenna Pol. :VERTICAL
 Engineer :Jerry



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5148.60	Average	44.68	1.84	46.52	54.00	-7.48
5148.60	Peak	59.03	1.84	60.87	74.00	-13.13
5150.00	Average	44.80	1.84	46.64	54.00	-7.36
5150.00	Peak	57.39	1.84	59.23	74.00	-14.77

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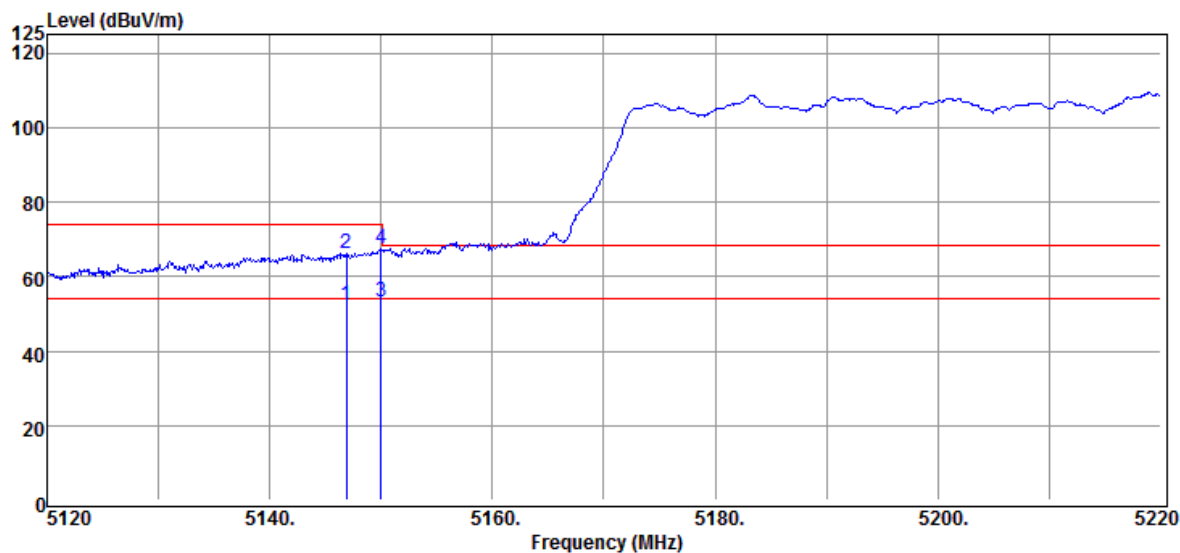
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Operation Mode :802.11ac80 / Band1
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5210 MHz

Test Date :2018-05-24
 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
5146.90	Average	50.47	1.84	52.31	54.00	-1.69
5146.90	Peak	64.40	1.84	66.24	74.00	-7.76
5150.00	Average	51.16	1.84	53.00	54.00	-1.00
5150.00	Peak	65.47	1.84	67.31	74.00	-6.69

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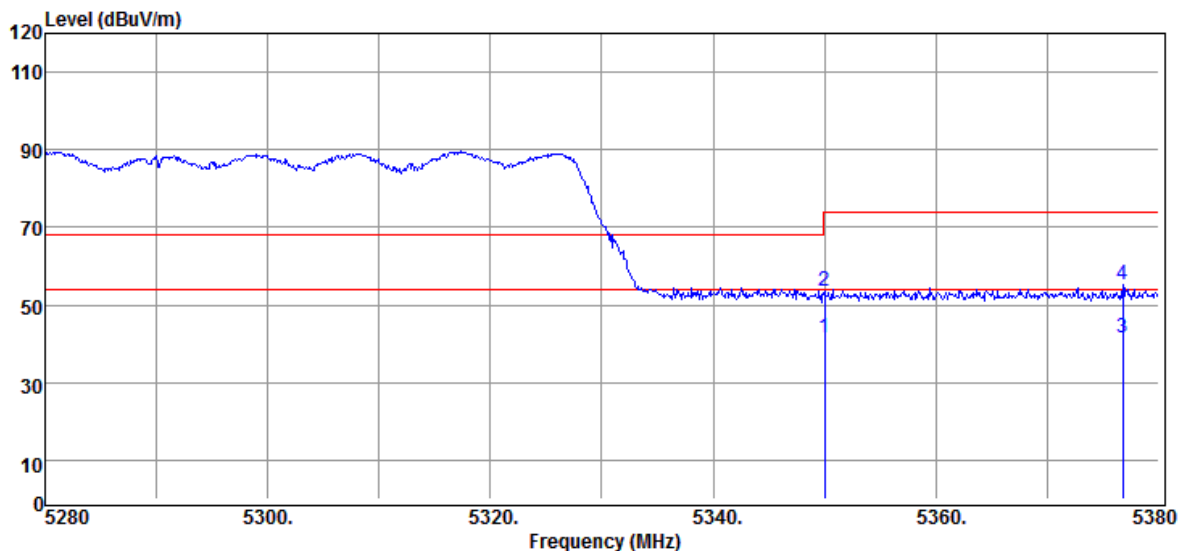
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Operation Mode :802.11ac80 / Band 2
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5290 MHz

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



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5350.00	Average	39.09	2.24	41.33	54.00	-12.67
5350.00	Peak	51.28	2.24	53.52	74.00	-20.48
5376.80	Average	39.06	2.37	41.43	54.00	-12.57
5376.80	Peak	52.69	2.37	55.06	74.00	-18.94

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台灣檢驗科技股份有限公司

t (886-2) 2299-3279

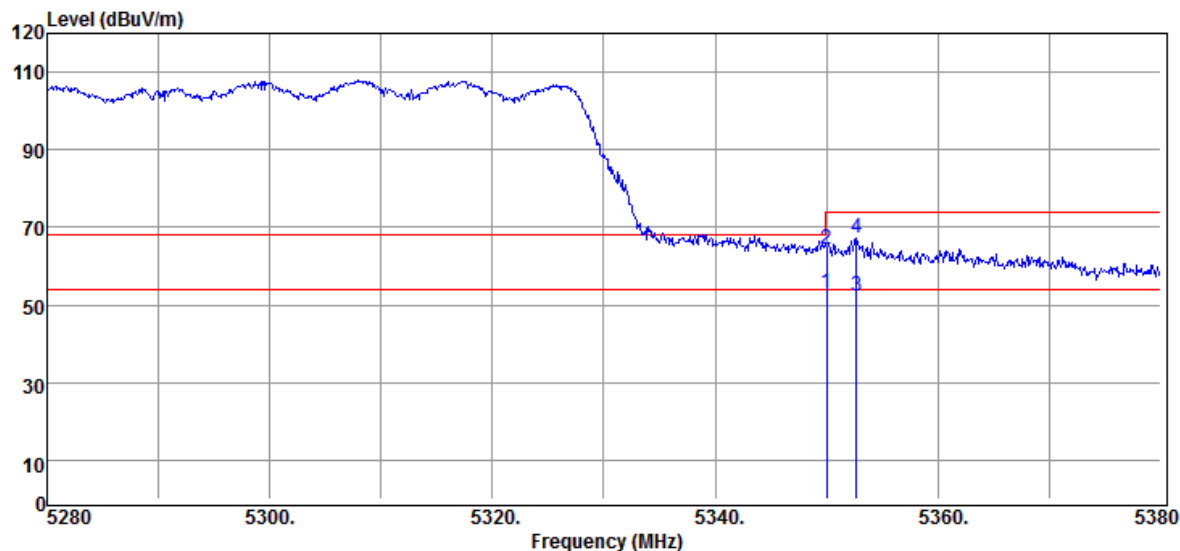
f (886-2) 2298-0488

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Operation Mode :802.11ac80 / Band 2
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5290 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 dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5350.00	Average	50.74	2.24	52.98	54.00	-1.02
5350.00	Peak	61.97	2.24	64.21	74.00	-9.79
5352.70	Average	50.17	2.25	52.42	54.00	-1.58
5352.70	Peak	65.11	2.25	67.36	74.00	-6.64

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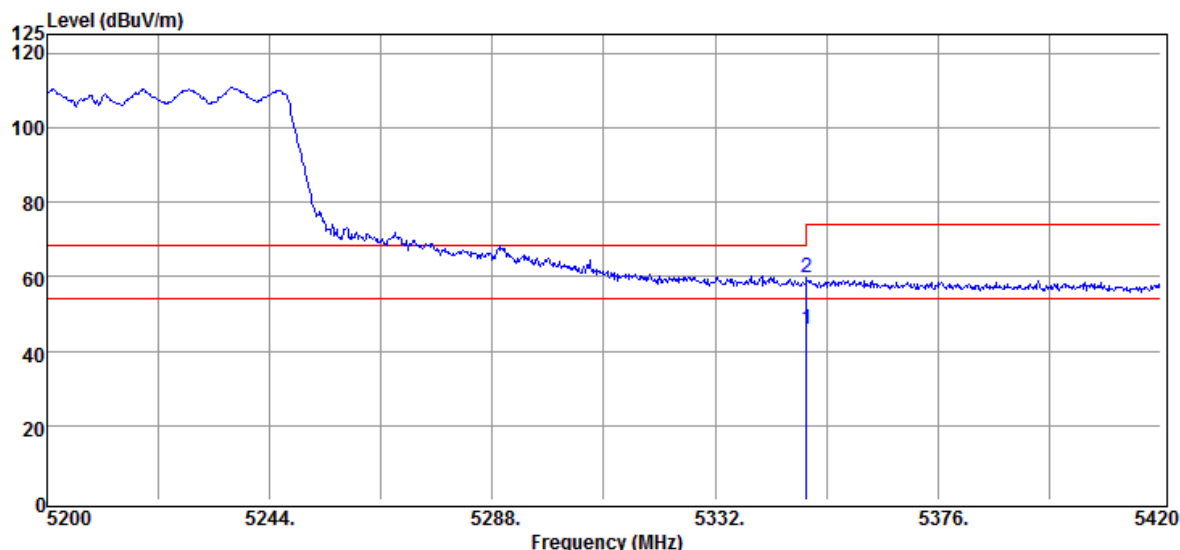
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Operation Mode :802.11ac80 / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5210 MHz

Test Date :2018-05-24
 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
5350.00	Average	43.77	2.24	46.01	54.00	-7.99
5350.00	Peak	57.25	2.24	59.49	74.00	-14.51

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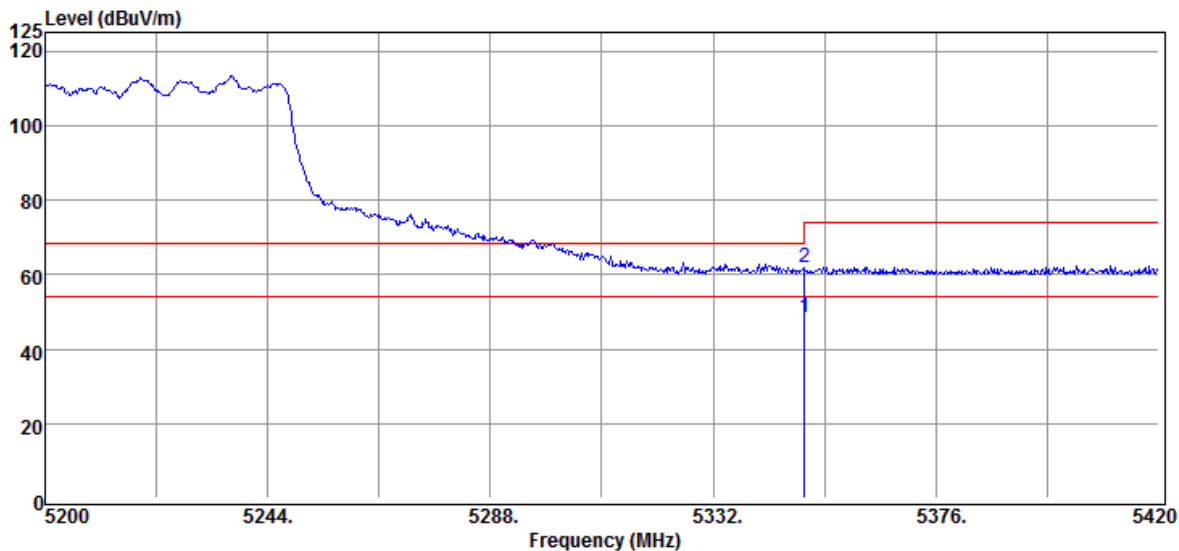
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Operation Mode :802.11ac80 / Band1
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5210 MHz

Test Date :2018-05-24
 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
5350.04	Average	46.26	2.24	48.50	54.00	-5.50
5350.04	Peak	59.71	2.24	61.95	74.00	-12.05

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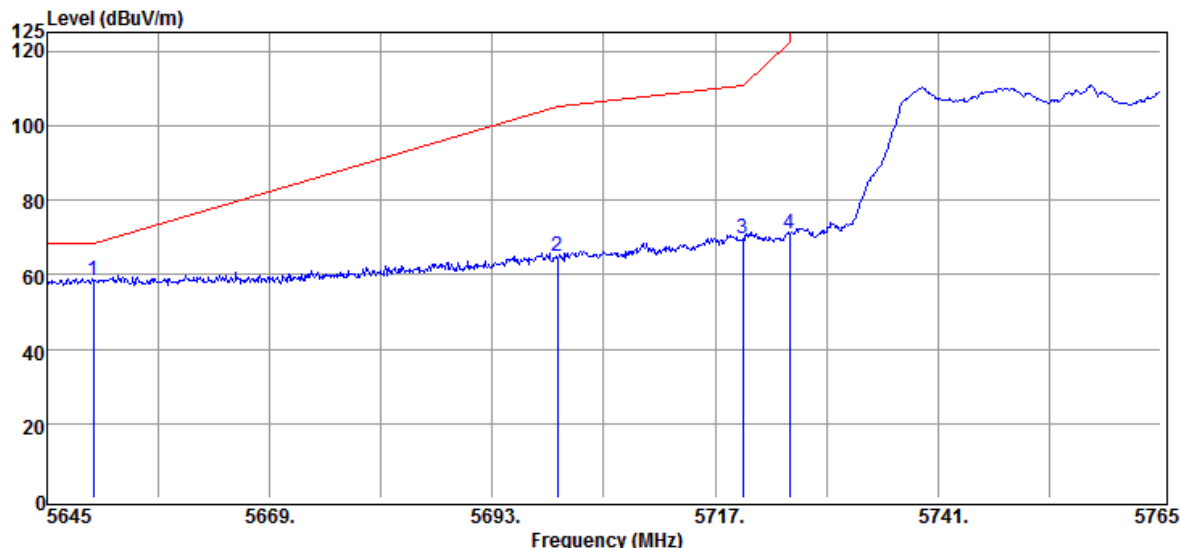
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Operation Mode :802.11ac80 / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5775 MHz

Test Date :2018-05-24
 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
5650.00	Peak	56.32	2.25	58.57	68.20	-9.63
5700.00	Peak	62.57	2.42	64.99	105.20	-40.21
5720.00	Peak	67.20	2.32	69.52	110.80	-41.28
5725.00	Peak	68.86	2.28	71.14	122.20	-51.06

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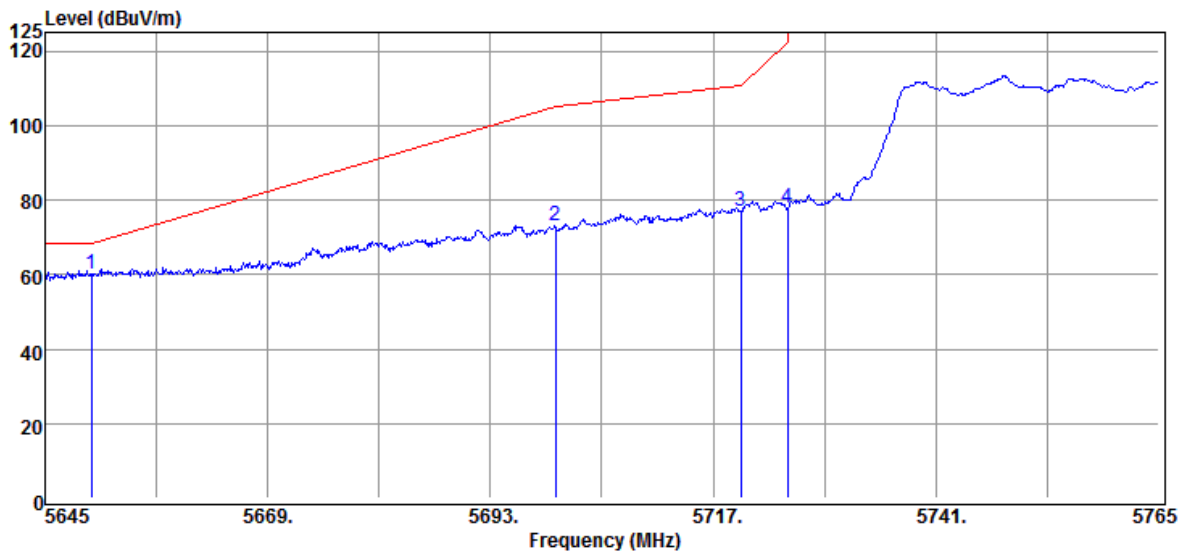
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Member of SGS Group

Operation Mode :802.11ac80 / Band4
 Test Mode :Bandedge CH Low
 EUT Pol :H Plan
 Test Channel :5775 MHz

Test Date :2018-05-24
 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
5650.00	Peak	57.83	2.25	60.08	68.20	-8.12
5700.00	Peak	70.87	2.42	73.29	105.20	-31.91
5720.00	Peak	74.52	2.32	76.84	110.80	-33.96
5725.00	Peak	75.42	2.28	77.70	122.20	-44.50

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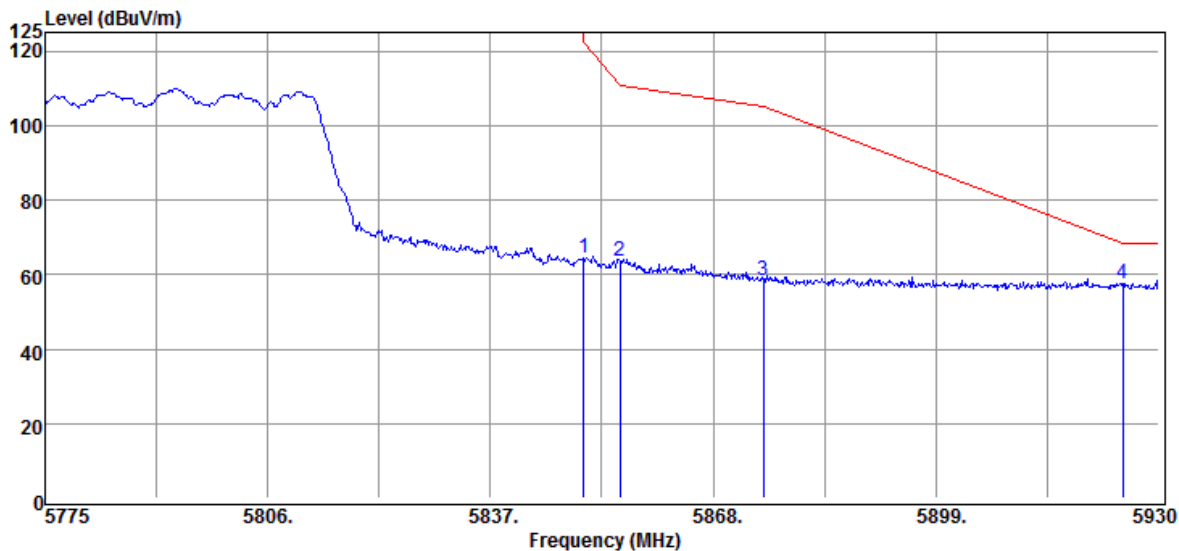
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Operation Mode :802.11ac80 / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5775 MHz

Test Date :2018-05-24
 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
5850.00	Peak	62.71	1.88	64.59	122.20	-57.61
5855.00	Peak	61.49	1.89	63.38	110.80	-47.42
5875.00	Peak	56.44	1.90	58.34	105.20	-46.86
5925.00	Peak	55.35	2.16	57.51	68.20	-10.69

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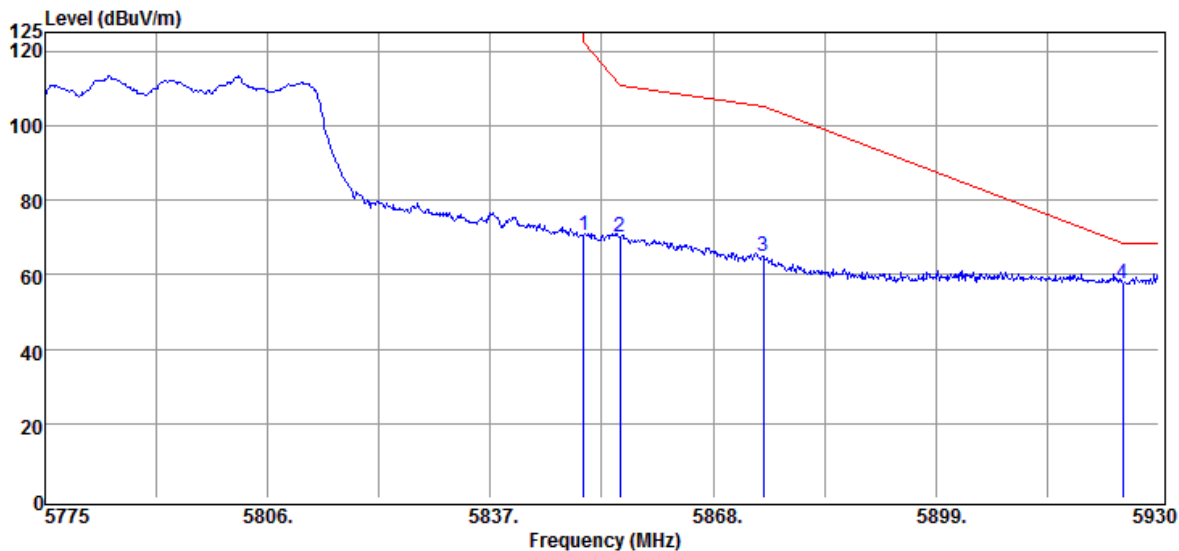
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Operation Mode :802.11ac80 / Band4
 Test Mode :Bandedge CH High
 EUT Pol :H Plan
 Test Channel :5775 MHz

Test Date :2018-05-24
 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
5850.00	Peak	68.71	1.88	70.59	122.20	-51.61
5855.00	Peak	68.13	1.89	70.02	110.80	-40.78
5875.00	Peak	63.01	1.90	64.91	105.20	-40.29
5925.00	Peak	55.40	2.16	57.56	68.20	-10.64

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12 TRANSMISSION IN THE ABSENCE OF DATA

12.1 Standard Applicable

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

12.2 Result

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ASK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

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13 FREQUENCY STABILITY

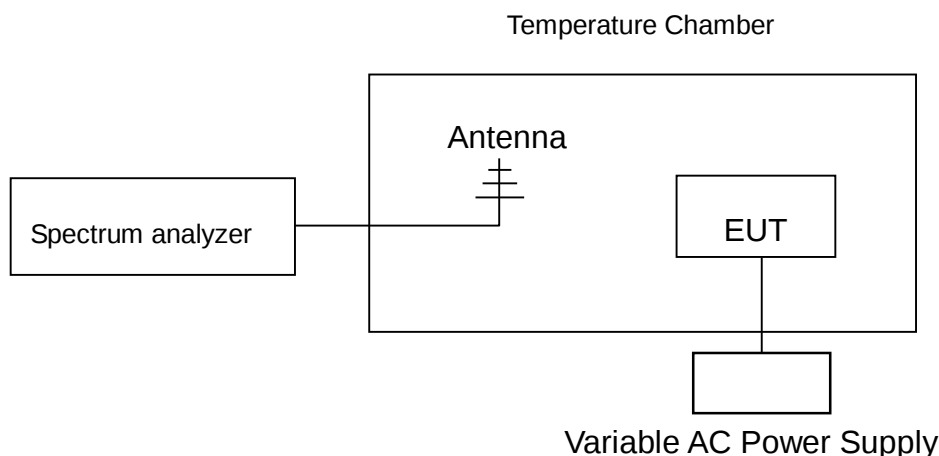
13.1 Standard Applicable

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

13.2 Measurement Procedure

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.

13.1 Test SET-UP



13.3 Measurement Equipment Used:

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Meter	Anritsu	ML2496A	1326001	2017/07/26	2018/07/25
Power Sensor	Anritsu	MA2411B	1315048	2017/07/26	2018/07/25
Power Sensor	Anritsu	MA2411B	1315049	2017/07/26	2018/07/25
Attenuator	Marvelous	WATT-218FS-10	RF246	2017/12/26	2018/12/25
Notebook	Lenovo	T420	S0012599	N/A	N/A

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13.4 Measurement Result

Operation Mode	802.11 a	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	36	5180	5,179.97961	0.00000394
		44	5220	5,219.97911	0.00000400
		48	5240	5,239.97960	0.00000389
		149	5745	5,744.97758	0.00000390
		157	5785	5,784.97765	0.00000386
		165	5825	5,824.97731	0.00000390
	43.2V	36	5180	5,179.97911	0.00000403
		44	5220	5,219.97969	0.00000389
		48	5240	5,239.97891	0.00000402
		149	5745	5,744.97742	0.00000393
		157	5785	5,784.97723	0.00000394
		165	5825	5,824.97774	0.00000382
25 °C	48V	36	5180	5,179.97989	0.00000388
		44	5220	5,219.97971	0.00000389
		48	5240	5,239.97970	0.00000387
		149	5745	5,744.97770	0.00000388
		157	5785	5,784.97786	0.00000383
		165	5825	5,824.97813	0.00000375
70 °C	55.2V	36	5180	5,179.97935	0.00000399
		44	5220	5,219.97901	0.00000402
		48	5240	5,239.97945	0.00000392
		149	5745	5,744.97715	0.00000398
		157	5785	5,784.97732	0.00000392
		165	5825	5,824.97735	0.00000389
	43.2V	36	5180	5,179.97987	0.00000389
		44	5220	5,219.97923	0.00000398
		48	5240	5,239.97947	0.00000392
		149	5745	5,744.97687	0.00000403
		157	5785	5,784.97747	0.00000389
		165	5825	5,824.97738	0.00000388

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Operation Mode	802.11 a	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0	55.2V	36	5180	5,179.97981	0.00000390
		44	5220	5,219.97962	0.00000390
		48	5240	5,239.97915	0.00000398
		149	5745	5,744.97739	0.00000394
		157	5785	5,784.97720	0.00000394
		165	5825	5,824.97724	0.00000391
	43.2V	36	5180	5,179.97912	0.00000403
		44	5220	5,219.97968	0.00000389
		48	5240	5,239.97883	0.00000404
		149	5745	5,744.97686	0.00000403
		157	5785	5,784.97697	0.00000398
		165	5825	5,824.97756	0.00000385
25 °C	48V	36	5180	5,179.97950	0.00000396
		44	5220	5,219.97953	0.00000392
		48	5240	5,239.97898	0.00000401
		149	5745	5,744.97711	0.00000398
		157	5785	5,784.97774	0.00000385
		165	5825	5,824.97746	0.00000387
70 °C	55.2V	36	5180	5,179.97973	0.00000391
		44	5220	5,219.97892	0.00000404
		48	5240	5,239.97932	0.00000395
		149	5745	5,744.97686	0.00000403
		157	5785	5,784.97728	0.00000393
		165	5825	5,824.97743	0.00000387
	43.2V	36	5180	5,179.97927	0.00000400
		44	5220	5,219.97921	0.00000398
		48	5240	5,239.97959	0.00000390
		149	5745	5,744.97711	0.00000398
		157	5785	5,784.97769	0.00000386
		165	5825	5,824.97731	0.00000390

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Operation Mode	802.11 a	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0	55.2V	36	5180	5,179.97899	0.00000406
		44	5220	5,219.97920	0.00000398
		48	5240	5,239.97887	0.00000403
		149	5745	5,744.97747	0.00000392
		157	5785	5,784.97738	0.00000391
		165	5825	5,824.97800	0.00000378
	43.2V	36	5180	5,179.97986	0.00000389
		44	5220	5,219.97899	0.00000402
		48	5240	5,239.97944	0.00000392
		149	5745	5,744.97749	0.00000392
		157	5785	5,784.97767	0.00000386
		165	5825	5,824.97796	0.00000378
25 °C	48V	36	5180	5,179.97915	0.00000403
		44	5220	5,219.97924	0.00000398
		48	5240	5,239.97941	0.00000393
		149	5745	5,744.97728	0.00000395
		157	5785	5,784.97710	0.00000396
		165	5825	5,824.97732	0.00000389
70 °C	55.2V	36	5180	5,179.97969	0.00000392
		44	5220	5,219.97932	0.00000396
		48	5240	5,239.97888	0.00000403
		149	5745	5,744.97712	0.00000398
		157	5785	5,784.97785	0.00000383
		165	5825	5,824.97755	0.00000385
	43.2V	36	5180	5,179.97922	0.00000401
		44	5220	5,219.97912	0.00000400
		48	5240	5,239.97907	0.00000399
		149	5745	5,744.97741	0.00000393
		157	5785	5,784.97750	0.00000389
		165	5825	5,824.97760	0.00000385

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Operation Mode	802.11 a	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0	55.2V	36	5180	5,179.97933	0.00000399
		44	5220	5,219.97902	0.00000402
		48	5240	5,239.97915	0.00000398
		149	5745	5,744.97717	0.00000397
		157	5785	5,784.97760	0.00000387
		165	5825	5,824.97803	0.00000377
	43.2V	36	5180	5,179.97966	0.00000393
		44	5220	5,219.97941	0.00000394
		48	5240	5,239.97903	0.00000400
		149	5745	5,744.97687	0.00000403
		157	5785	5,784.97712	0.00000396
		165	5825	5,824.97783	0.00000381
25 °C	48V	36	5180	5,179.97909	0.00000404
		44	5220	5,219.97932	0.00000396
		48	5240	5,239.97968	0.00000388
		149	5745	5,744.97683	0.00000403
		157	5785	5,784.97782	0.00000383
		165	5825	5,824.97783	0.00000381
70 °C	55.2V	36	5180	5,179.97916	0.00000402
		44	5220	5,219.97898	0.00000403
		48	5240	5,239.97955	0.00000390
		149	5745	5,744.97741	0.00000393
		157	5785	5,784.97742	0.00000390
		165	5825	5,824.97777	0.00000382
	43.2V	36	5180	5,179.97918	0.00000402
		44	5220	5,219.97929	0.00000397
		48	5240	5,239.97911	0.00000399
		149	5745	5,744.97733	0.00000395
		157	5785	5,784.97702	0.00000397
		165	5825	5,824.97795	0.00000379

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Operation Mode	802.11 n_HT40	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	38	5190	5,189.97998	0.00000386
		46	5230	5,209.99975	0.00382414
		54	5270	5,229.97985	0.00759396
		151	5755	5,742.97780	0.00208900
		159	5795	5,794.97746	0.00000389
	43.2V	38	5190	5,189.98038	0.00000378
		46	5230	5,209.99983	0.00382412
		54	5270	5,229.98003	0.00759392
		151	5755	5,742.97807	0.00208895
		159	5795	5,794.97768	0.00000385
25 °C	48V	38	5190	5,189.98043	0.00000377
		46	5230	5,209.99933	0.00382422
		54	5270	5,229.98021	0.00759389
		151	5755	5,742.97814	0.00208894
		159	5795	5,794.97801	0.00000379
70 °C	55.2V	38	5190	5,189.98038	0.00000378
		46	5230	5,209.99947	0.00382419
		54	5270	5,229.97948	0.00759403
		151	5755	5,742.97742	0.00208907
		159	5795	5,794.97731	0.00000392
	43.2V	38	5190	5,189.97965	0.00000392
		46	5230	5,209.99970	0.00382415
		54	5270	5,229.97953	0.00759402
		151	5755	5,742.97724	0.00208910
		159	5795	5,794.97756	0.00000387

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Operation Mode	802.11 n_HT40	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	38	5190	5,189.97956	0.00000394
		46	5230	5,209.99920	0.00382425
		54	5270	5,229.97976	0.00759397
		151	5755	5,742.97773	0.00208901
		159	5795	5,794.97738	0.00000390
	43.2V	38	5190	5,189.97992	0.00000387
		46	5230	5,209.99958	0.00382417
		54	5270	5,229.97947	0.00759403
		151	5755	5,742.97768	0.00208902
		159	5795	5,794.97779	0.00000383
25 °C	48V	38	5190	5,189.97997	0.00000386
		46	5230	5,209.99954	0.00382418
		54	5270	5,229.98003	0.00759392
		151	5755	5,742.97811	0.00208895
		159	5795	5,794.97786	0.00000382
70 °C	55.2V	38	5190	5,189.97969	0.00000391
		46	5230	5,209.99995	0.00382410
		54	5270	5,229.97997	0.00759393
		151	5755	5,742.97751	0.00208905
		159	5795	5,794.97742	0.00000390
	43.2V	38	5190	5,189.98013	0.00000383
		46	5230	5,209.99970	0.00382415
		54	5270	5,229.97968	0.00759399
		151	5755	5,742.97740	0.00208907
		159	5795	5,794.97750	0.00000388

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Operation Mode	802.11 n_HT40	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	38	5190	5,189.98019	0.00000382
		46	5230	5,209.99976	0.00382414
		54	5270	5,229.97934	0.00759405
		151	5755	5,742.97803	0.00208896
		159	5795	5,794.97771	0.00000385
	43.2V	38	5190	5,189.97956	0.00000394
		46	5230	5,209.99967	0.00382416
		54	5270	5,229.97963	0.00759400
		151	5755	5,742.97733	0.00208908
		159	5795	5,794.97752	0.00000388
25 °C	48V	38	5190	5,189.98036	0.00000378
		46	5230	5,209.99950	0.00382419
		54	5270	5,229.97938	0.00759405
		151	5755	5,742.97742	0.00208907
		159	5795	5,794.97714	0.00000394
70 °C	55.2V	38	5190	5,189.98021	0.00000381
		46	5230	5,209.99951	0.00382419
		54	5270	5,229.98003	0.00759392
		151	5755	5,742.97738	0.00208907
		159	5795	5,794.97724	0.00000393
	43.2V	38	5190	5,189.97961	0.00000393
		46	5230	5,209.99987	0.00382412
		54	5270	5,229.97934	0.00759405
		151	5755	5,742.97801	0.00208896
		159	5795	5,794.97720	0.00000393

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Operation Mode	802.11 n_HT40	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	38	5190	5,189.98019	0.00000382
		46	5230	5,209.99989	0.00382411
		54	5270	5,229.98015	0.00759390
		151	5755	5,742.97729	0.00208909
		159	5795	5,794.97716	0.00000394
	43.2V	38	5190	5,189.97962	0.00000393
		46	5230	5,209.99991	0.00382411
		54	5270	5,229.97932	0.00759406
		151	5755	5,742.97724	0.00208910
		159	5795	5,794.97755	0.00000387
25 °C	48V	38	5190	5,189.98027	0.00000380
		46	5230	5,209.99930	0.00382422
		54	5270	5,229.97948	0.00759403
		151	5755	5,742.97737	0.00208908
		159	5795	5,794.97778	0.00000383
70 °C	55.2V	38	5190	5,189.98000	0.00000385
		46	5230	5,209.99953	0.00382418
		54	5270	5,229.97934	0.00759405
		151	5755	5,742.97771	0.00208902
		159	5795	5,794.97768	0.00000385
	43.2V	38	5190	5,189.98014	0.00000383
		46	5230	5,209.99911	0.00382426
		54	5270	5,229.97983	0.00759396
		151	5755	5,742.97793	0.00208898
		159	5795	5,794.97785	0.00000382

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Operation Mode	802.11 ac_VHT80	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	42	5210	5,209.98002	0.00000383
		155	5775	5,774.97742	0.00000391
	43.2V	42	5210	5,209.97968	0.00000390
		155	5775	5,774.97733	0.00000393
25 °C	48V	42	5210	5,209.98047	0.00000375
		155	5775	5,774.97816	0.00000378
70 °C	55.2V	42	5210	5,209.98014	0.00000381
		155	5775	5,774.97794	0.00000382
	43.2V	42	5210	5,209.98006	0.00000383
		155	5775	5,774.97743	0.00000391

Operation Mode	802.11 ac_VHT80	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	42	5210	5,209.98021	0.00000380
		155	5775	5,774.97785	0.00000384
	43.2V	42	5210	5,209.97995	0.00000385
		155	5775	5,774.97793	0.00000382
25 °C	48V	42	5210	5,209.97960	0.00000392
		155	5775	5,774.97742	0.00000391
70 °C	55.2V	42	5210	5,209.97981	0.00000388
		155	5775	5,774.97800	0.00000381
	43.2V	42	5210	5,209.97983	0.00000387
		155	5775	5,774.97800	0.00000381

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Operation Mode	802.11 ac_VHT80	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	42	5210	5,209.97973	0.00000389
		155	5775	5,774.97746	0.00000390
	43.2V	42	5210	5,209.98035	0.00000377
		155	5775	5,774.97733	0.00000393
25 °C	48V	42	5210	5,209.98044	0.00000375
		155	5775	5,774.97799	0.00000381
70 °C	55.2V	42	5210	5,209.98027	0.00000379
		155	5775	5,774.97737	0.00000392
	43.2V	42	5210	5,209.97964	0.00000391
		155	5775	5,774.97762	0.00000388

Operation Mode	802.11 ac_VHT80	Test Date	2018.05.31
Temperature	:23 °C	Test By	Henry
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
0 °C	55.2V	42	5210	5,209.98044	0.00000375
		155	5775	5,774.97780	0.00000384
	43.2V	42	5210	5,209.97987	0.00000386
		155	5775	5,774.97767	0.00000387
25 °C	48V	42	5210	5,209.97967	0.00000390
		155	5775	5,774.97739	0.00000392
70 °C	55.2V	42	5210	5,209.98020	0.00000380
		155	5775	5,774.97809	0.00000379
	43.2V	42	5210	5,209.98042	0.00000376
		155	5775	5,774.97750	0.00000390

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14 ANTENNA REQUIREMENT

14.1 Standard Applicable

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.

According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

14.2 Antenna Connected Construction

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

~ End of Report ~

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