

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART E REQUIREMENT**

OF

Applicant: Sharp Corporation, Mobile Communication B.U.
2-13-1, Hachihonmatsu-lida, Higashi-hiroshima-shi,
Hiroshima 739-0192, Japan

Manufacturer: Sharp Corporation
1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka 590-8522, Japan

Product Name: Smart Phone

Report Number: ER/2018/80116

FCC ID: APYHRO00266

FCC Rule Part: §15.407, Cat: NII

Issue Date: Oct. 02, 2018

Date of Test: Aug. 01, 2018 ~ Aug. 30, 2018

Date of EUT Received: Aug. 01, 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:

Marcus Tseng
Marcus Tseng / Sr. Engineer

Approved By:

CHUN-CHIEH, CHEN
**CHUN-CHIEH, CHEN /
Asst. Supervisor**



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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/80116	Rev.00	Initial creation of document	All	Oct. 02, 2018	Yuri Tsai

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Contents

1. GENERAL INFORMATION	4
2. SYSTEM TEST CONFIGURATION	6
3. SUMMARY OF TEST RESULT	8
4. DESCRIPTION OF TEST MODES	9
5. MEASUREMENT UNCERTAINTY	12
6. CONDUCTED EMISSION TEST	13
7. DUTY CYCLE TEST SIGNAL	17
8. 26dB EMISSION BANDWIDTH MEASUREMENT	20
9. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT	27
10. POWER SPECTRAL DENSITY	31
11. UNDESIRABLE RADIATED EMISSION MEASUREMENT	39
12. TRANSMISSION IN THE ABSENCE OF DATA	137
13. FREQUENCY STABILITY	138
14. ANTENNA REQUIREMENT	159

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1. GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	Smart Phone
Hardware Version:	DVT
Software Version:	N/A
Power Supply:	3.85V from Rechargeable Li-ion Battery

WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. Power (dBm)	Modulation Technology
11a_20	5180~5240	4	12.97	OFDM
	5260~5320	4	12.98	
	5500~5700	11	12.99	
11n_HT / ac_VHT 20M	5180~5240	4	HT: 12.99 (Worst Case)	OFDM
	5260~5320	4	HT: 12.94 (Worst Case)	
	5500~5700	11	HT: 12.77 (Worst Case)	
11n_HT / ac_VHT 40M	5190~5230	2	HT: 12.88 (Worst Case)	OFDM
	5270~5310	2	HT: 12.78 (Worst Case)	
	5510~5670	5	HT: 12.98 (Worst Case)	
11ac VHT80M	5210	1	12.66	OFDM
	5290	1	12.85	
	5530~5610	2	12.87	
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 – 72.2Mbps 802.11 n_40MHz: 13.5 – 150.0Mbps 802.11 ac_20MHz: 6.5 – 86.Mbps 802.11 ac_40MHz: 13.5 – 200.0Mbps 802.11 ac_80MHz: 29.3 – 433.3Mbps		
Antenna Designation:		Inverted-L Antenna, 5150~5250MHz Gain: -1.30dBi 5250~5350MHz Gain: -1.30dBi 5470~5725MHz Gain: -2.40dBi		

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

KDB 789033 D02 v02r01 General UNII Test Procedures New Rules

ANSI C63.10:2013

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

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

(TAF code 0513)

FCC Registration Numbers are: 509634 / TW0001

1.4 Special Accessories

There are no special accessories used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

1.6 Referencing test data across separate equipment authorization

The test report ER/2018/80042 under original FCC ID: APYHRO00265 are **fully** referred for the new FCC ID: APYHRO00266 in this report.

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2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

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

2.4 Measurement Results Explanation Example

For all conducted test items:

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

Note:

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

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2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission

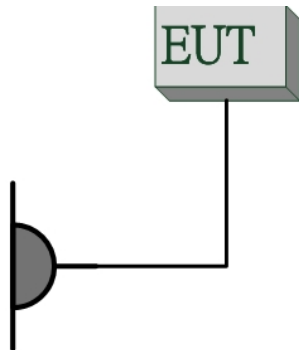


Fig. 2-2 Conducted (Antenna Port) Emission

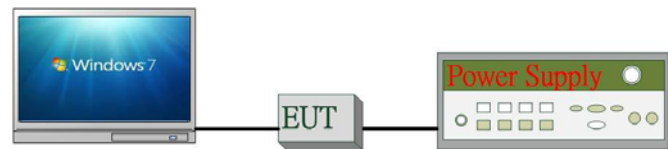


Fig. 2-2 AC Power Line Conducted Emission



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.	DC Power Supply	Anritsu	E3640A	KR93300208	N/A	Unshielded
3.	Notebook	Lenovo	T440P	P0000564	Shielded	Unshielded

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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 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

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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
40	5200
44	5220
48	5240

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

802.11ac VHT80 Mode	
channel	Frequency
42	5210

Operated band in 5250 MHz ~5350 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode	
channel	Frequency
52	5260
56	5280
60	5300
64	5320

802.11 n HT40 Mode, 802.11ac VHT40 Mode	
channel	Frequency
54	5270
62	5310

802.11ac VHT80 Mode	
Channel	Frequency
58	5290

Operated band in 5470 MHz ~5725 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode	
Channel	Frequency
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700

802.11 n HT40 Mode, 802.11ac VHT40 Mode	
channel	Frequency
102	5510
110	5550
118	5590
126	5630
134	5670

802.11ac VHT80 Mode	
channel	Frequency
106	5530
122	5610

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting mode is prorammed.
3. Investigation has been done on all the possible configurations for searching the worst case.
4. The given UE is pre-scanned among 802.11n and ac modes, and 802.11n yields the highest reading that generates the highest emission.

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	44	OFDM	6	CH0
802.11a	5260~5320	52 to 64	60	OFDM	6	CH0
802.11a	5500~5700	100 to 140	116	OFDM	6	CH0
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	CH0
802.11n_HT20				OFDM	MCS0	CH0
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	CH0
802.11ac_VHT80	5210	42	42	OFDM	MCS0	CH0
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	CH0
802.11n_HT20				OFDM	MCS0	CH0
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	CH0
802.11ac_VHT80	5290	58	58	OFDM	MCS0	CH0
802.11a	5500~5700	100 to 140	100,116,140	OFDM	6	CH0
802.11n_HT20				OFDM	MCS0	CH0
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS0	CH0
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	MCS0	CH0

Note: The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for Bluetooth BR+EDR Transmitter for channel Low, Mid and High, the worst case H position was reported.

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ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	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	CH0
802.11n_HT20				OFDM	MCS0	CH0
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	CH0
802.11ac_VHT80	5210	42	42	OFDM	MCS0	CH0
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	CH0
802.11n_HT20				OFDM	MCS0	CH0
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	CH0
802.11ac_VHT80	5290	58	58	OFDM	MCS0	CH0
802.11a	5500~5700	100 to 140	100,116,140	OFDM	6	CH0
802.11n_HT20				OFDM	MCS0	CH0
802.11n_HT40	5510~5670	102 to 134	102,110,134	OFDM	MCS0	CH0
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	MCS0	CH0

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5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26dB 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.

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

Note

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

6.2 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100335	2018/02/02	2019/02/01
LISN	SCHWARZBECK	NSLK 8127	8127-649	2018/05/18	2019/05/17

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.

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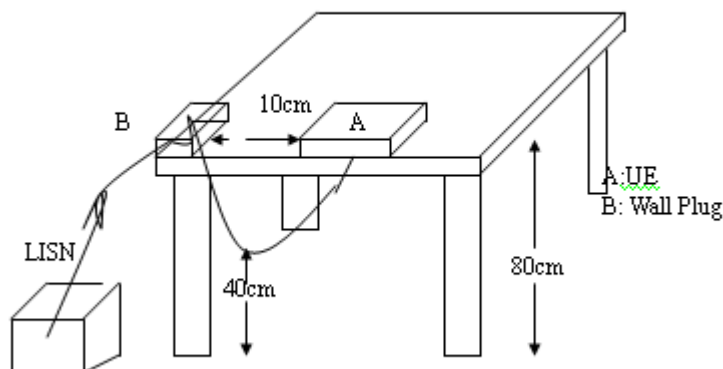
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6.4 Test SET-UP



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.

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Site Conduction Room

Phase: L1

Temperature: 25 °C

Limit: FCC Class B Conduction(QP)

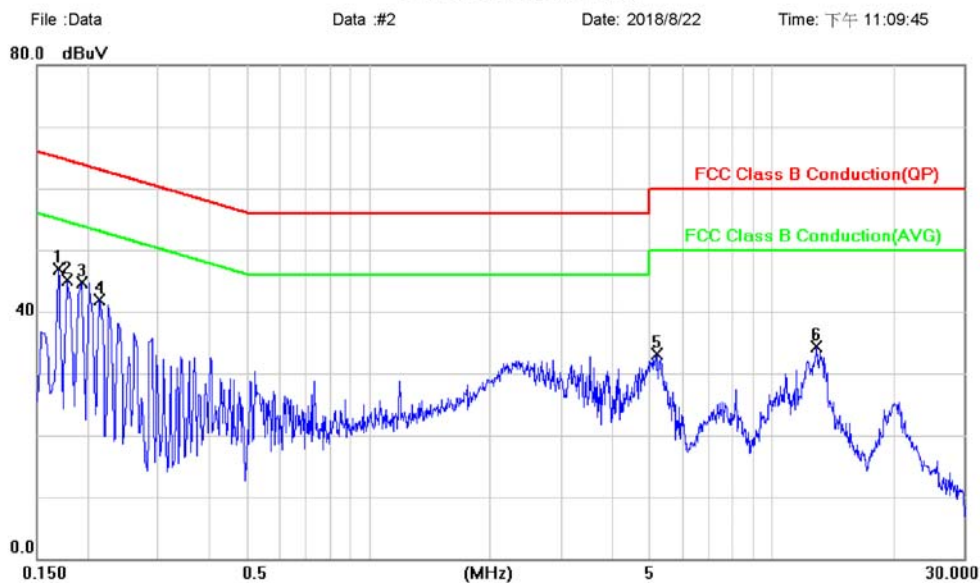
Power: AC 120V/60Hz

Humidity: 85 %

Mode: Operation

Note:

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1700	46.92	0.04	46.96	64.96	-18.00	peak	
2		0.1780	45.11	0.04	45.15	64.58	-19.43	peak	
3		0.1940	44.64	0.04	44.68	63.86	-19.18	peak	
4		0.2140	41.93	0.04	41.97	63.05	-21.08	peak	
5		5.1780	32.97	0.21	33.18	60.00	-26.82	peak	
6		12.9700	34.06	0.34	34.40	60.00	-25.60	peak	

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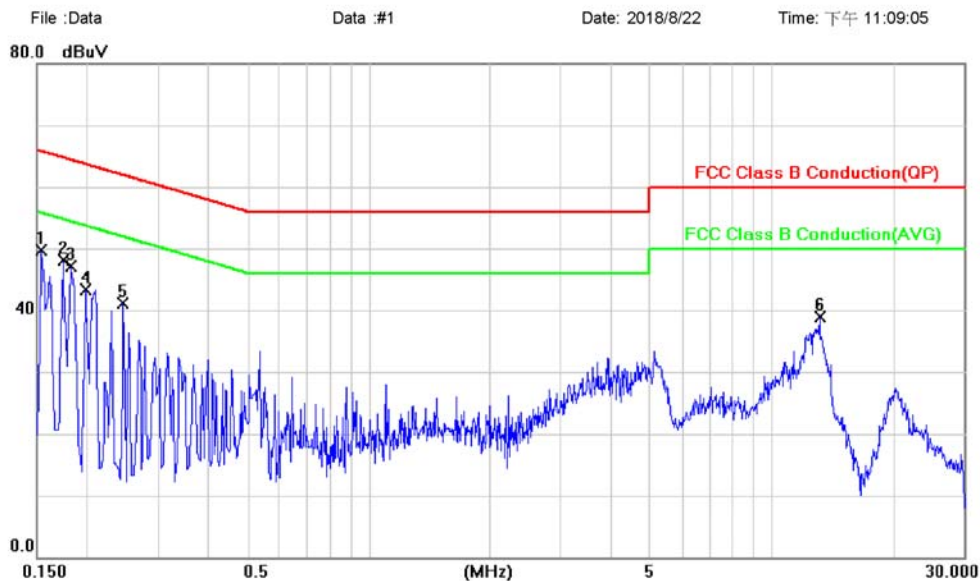
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Site: Conduction Room	Phase: N	Temperature: 25 °C
Limit: FCC Class B Conduction(QP)	Power: AC 120V/60Hz	Humidity: 85 %
Mode: Operation		
Note:		

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1540	49.72	0.04	49.76	65.78	-16.02	peak	
2		0.1740	48.12	0.04	48.16	64.77	-16.61	peak	
3		0.1820	47.02	0.04	47.06	64.39	-17.33	peak	
4		0.1980	43.32	0.04	43.36	63.69	-20.33	peak	
5		0.2460	41.04	0.04	41.08	61.89	-20.81	peak	
6		13.1460	38.60	0.34	38.94	60.00	-21.06	peak	

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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	98.60	0.06	0.73	1.00
802.11n_20	98.60	0.06	0.78	1.00
802.11n_40	98.48	0.07	0.81	1.00
802.11ac_80	92.53	0.34	4.03	5.00

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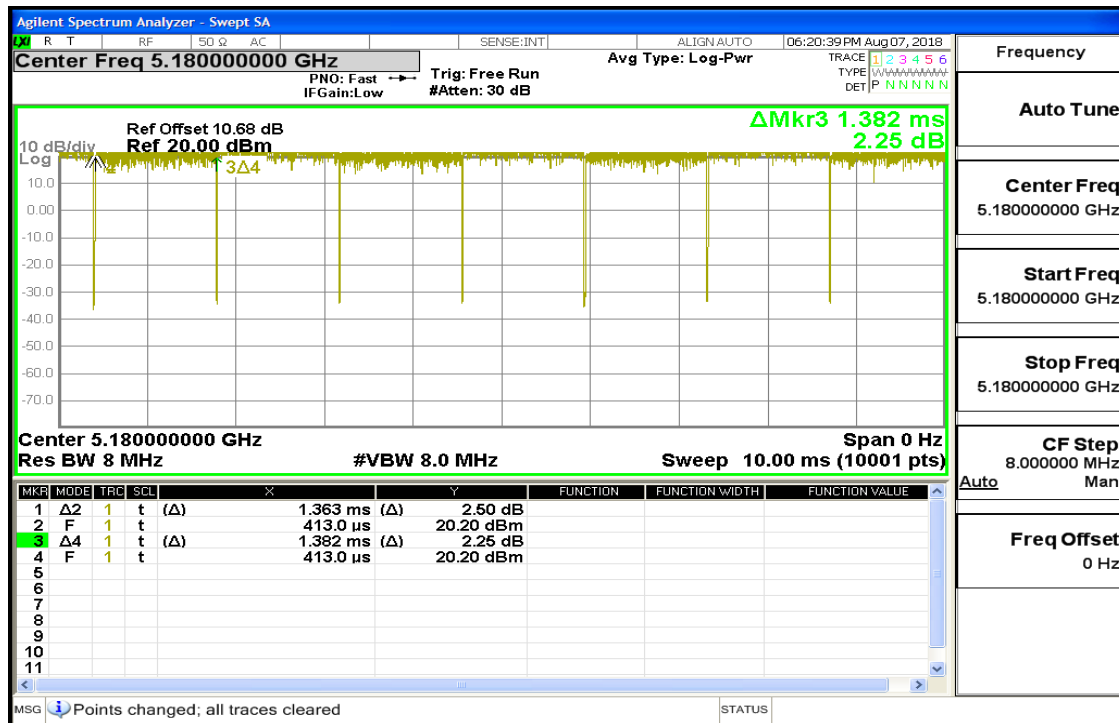
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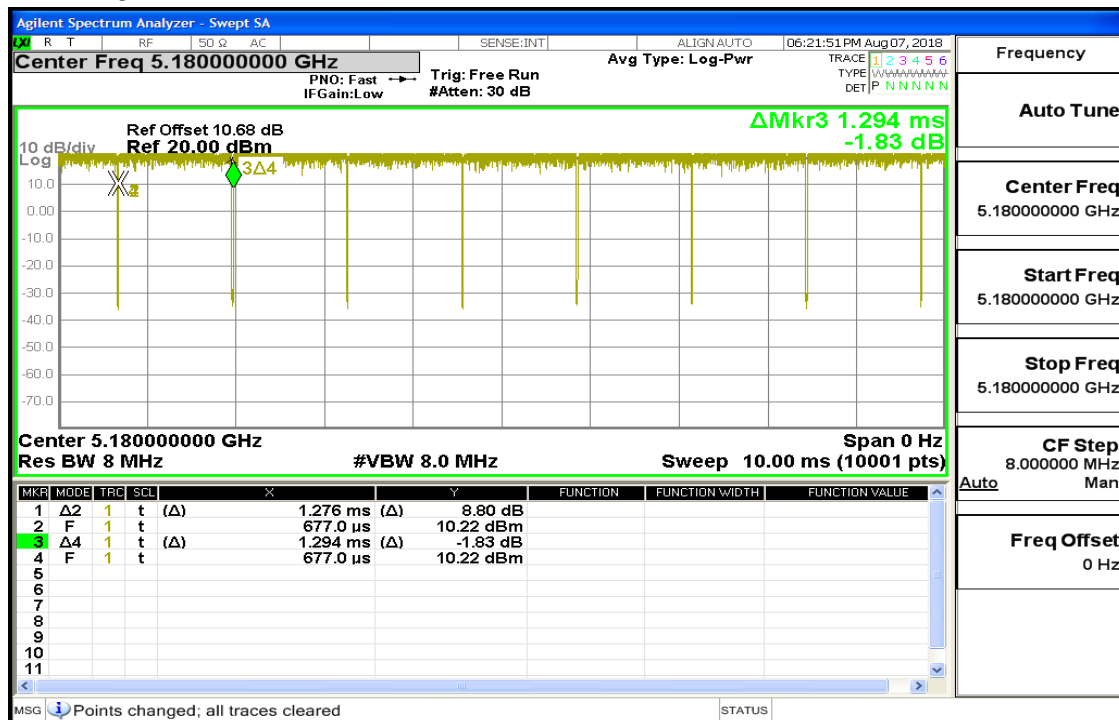
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DUTY CYCLE TEST SIGNAL Measurement Result

802.11a



802.11n HT20



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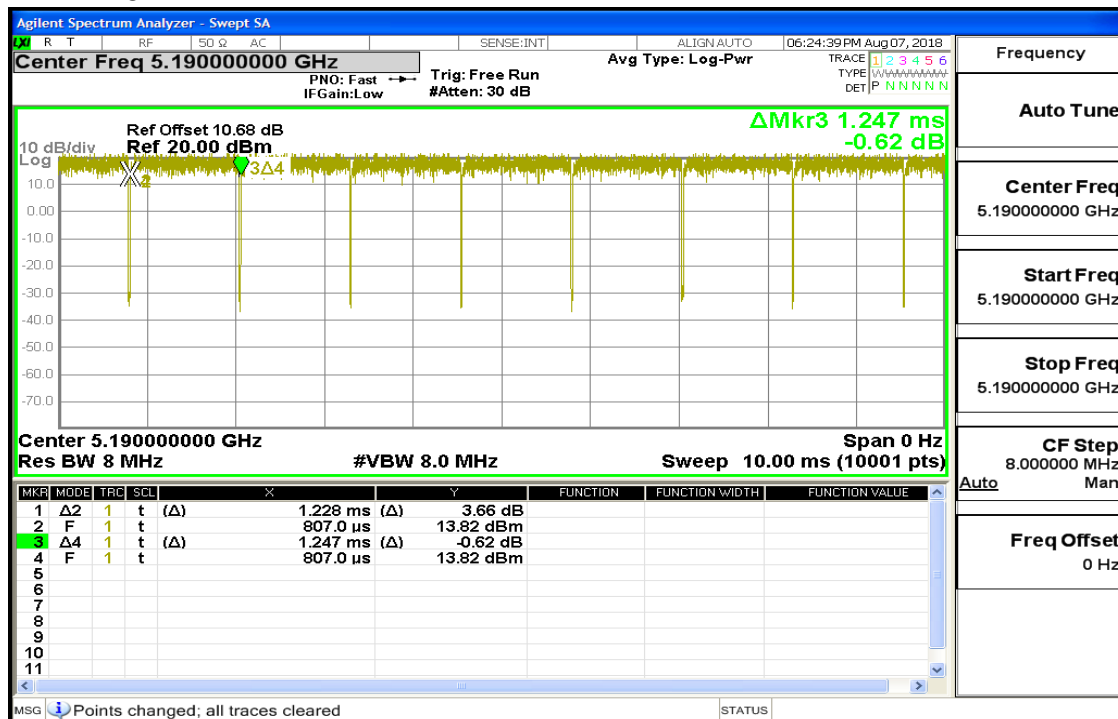
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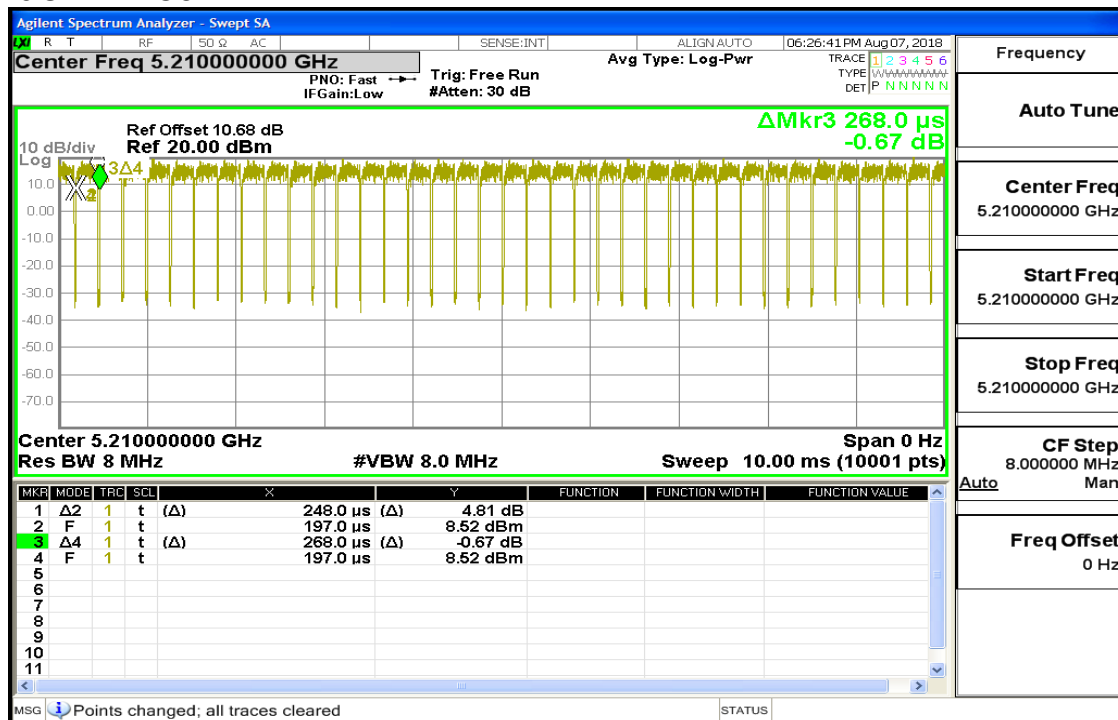
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802.11n HT 40



802.11 ac VHT 80



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8. 26DB 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

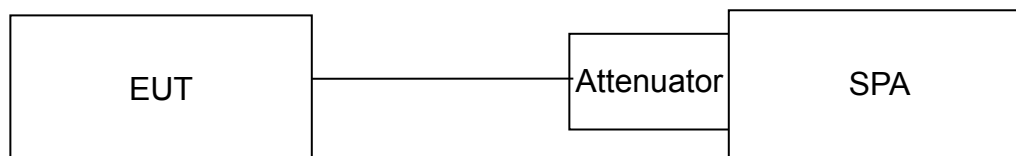
8.2 Measurement Procedure

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. Repeat above procedures until all test default channel measured were complete.

8.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	2018/05/03	2019/05/02
DC Power Supply	Anritsu	E3640A	KR93300208	2018/08/15	2019/08/14
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Notebook	Lenovo	T440P	P0000564	N/A	N/A

8.4 Test Set-up



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8.5 Measurement Result

26dB Bandwidth

802.11a_CH0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.20	13.463
5220	21.84	13.393
5240	20.06	13.023
5260	19.70	12.945
5300	19.63	12.929
5320	19.51	12.903
5500	19.77	12.960
5580	20.06	13.024
5700	19.36	12.869

802.11n_HT20_CH0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	20.48	13.113
5220	20.36	13.088
5240	20.41	13.098
5260	20.26	13.066
5300	20.52	13.121
5320	20.36	13.087
5500	20.23	13.060
5580	20.57	13.132
5700	20.35	13.086

802.11n_HT40_CH0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	38.82	15.891
5230	38.32	15.834
5270	38.87	15.896
5310	38.83	15.892
5510	38.35	15.838
5550	38.82	15.891
5670	38.58	15.864

802.11ac_VHT80_CH0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	77.32	18.883
5290	77.34	18.884
5530	77.31	18.882
5610	77.30	18.882

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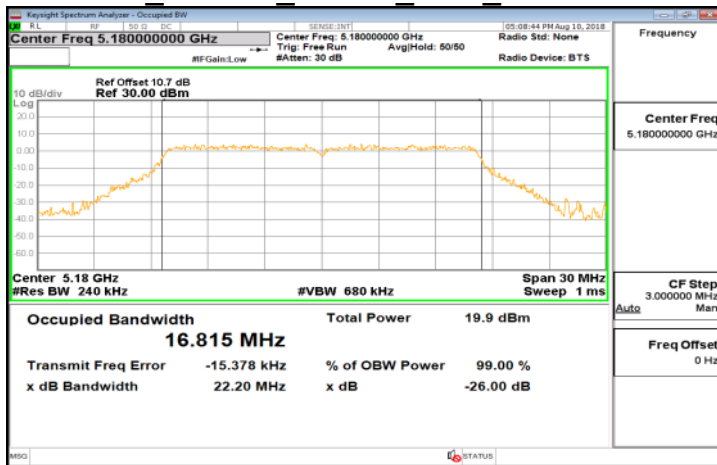
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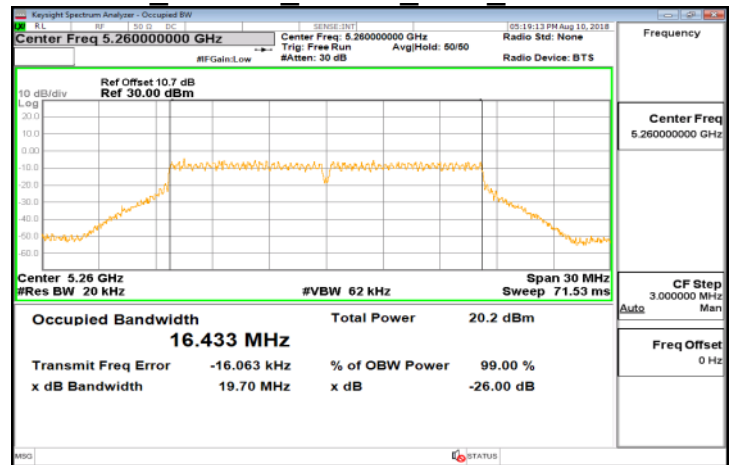
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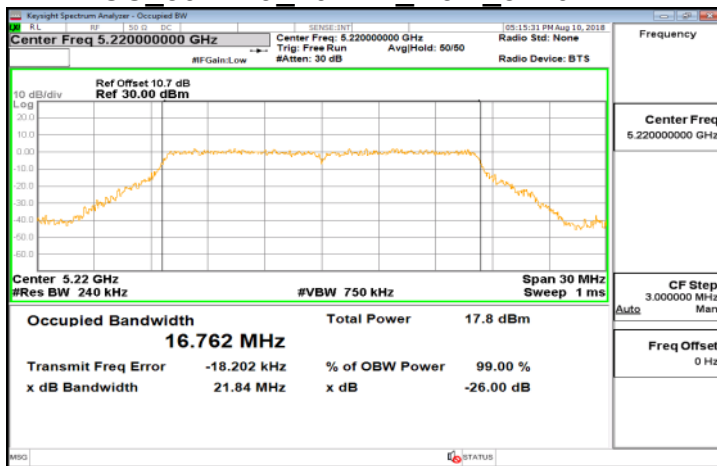
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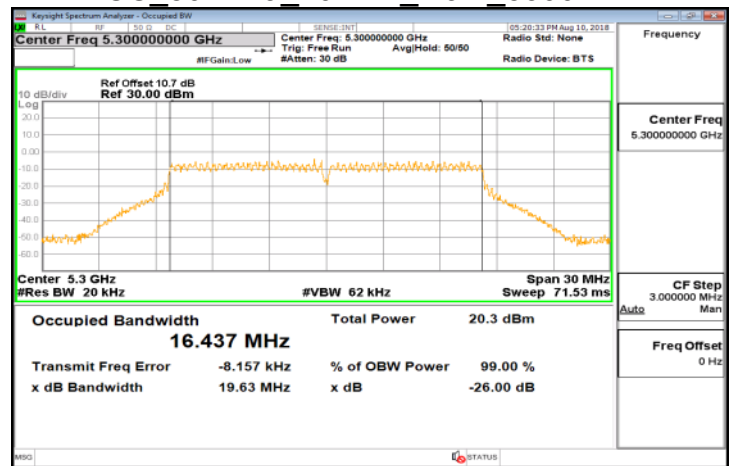
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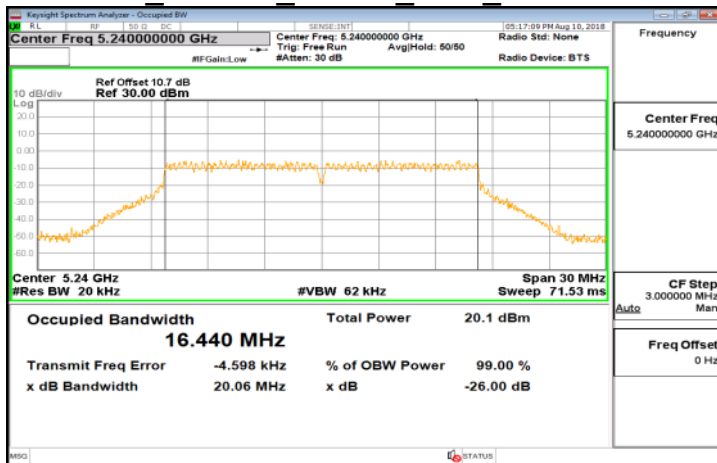
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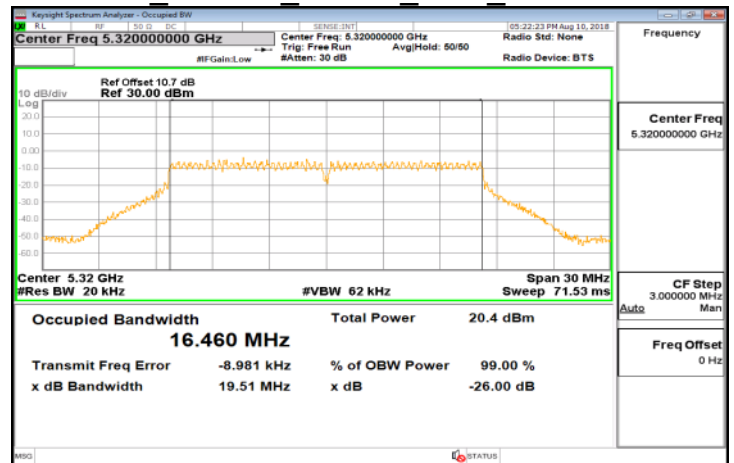
FCC 802.11a 20MHz Main 5300MHz



FCC 802.11a 20MHz Main 5240MHz



FCC 802.11a 20MHz Main 5320MHz

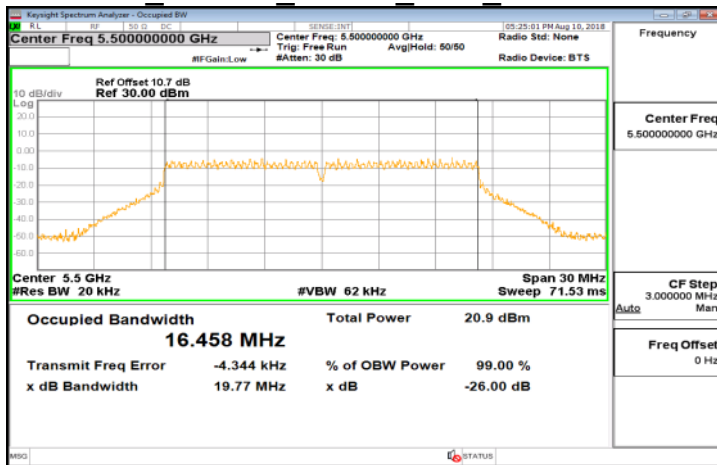


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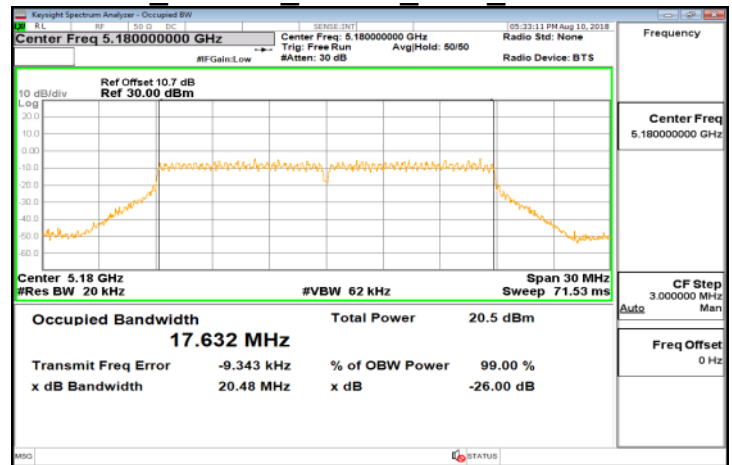
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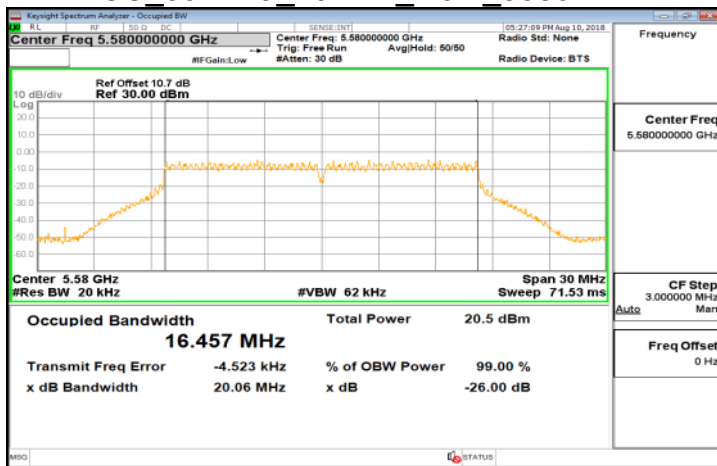
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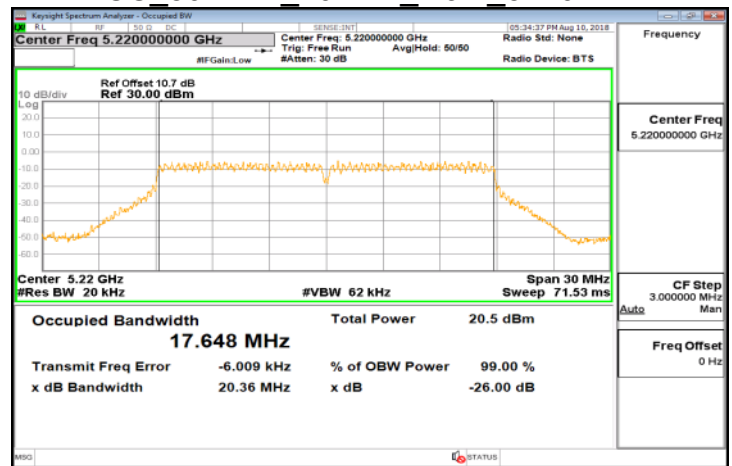
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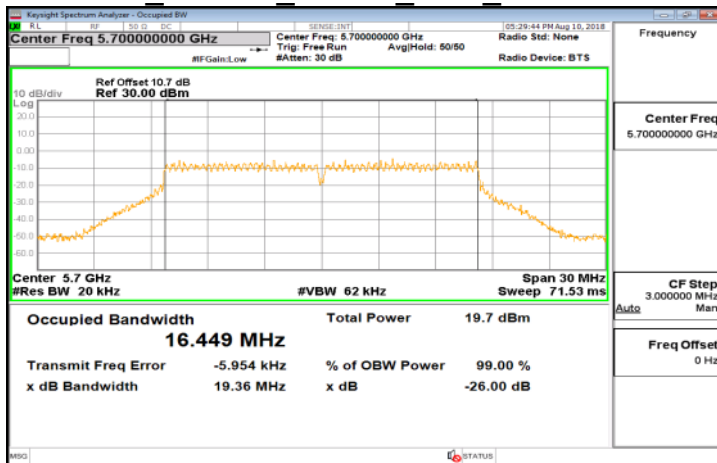
FCC 802.11a 20MHz Main 5580MHz



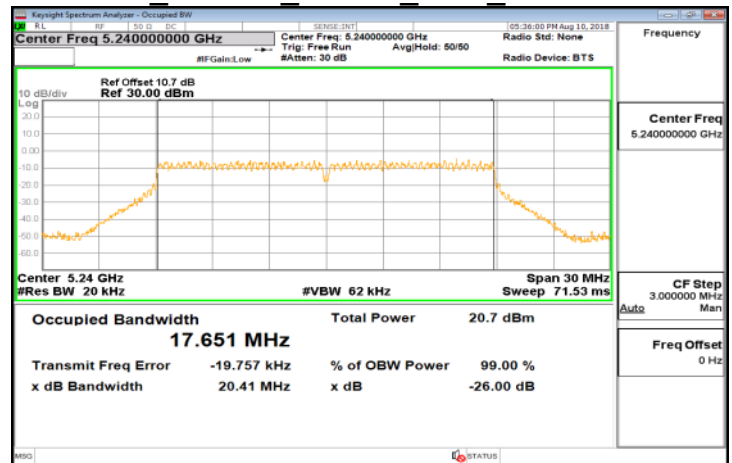
FCC 802.11n 20MHz Main 5220MHz



FCC 802.11a 20MHz Main 5700MHz



FCC 802.11n 20MHz Main 5240MHz

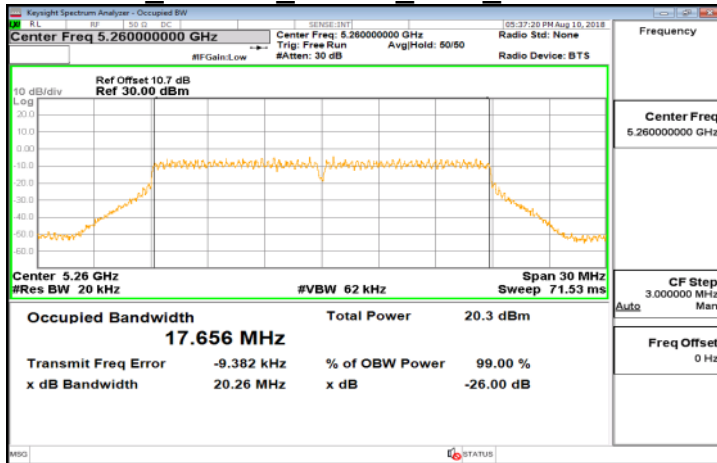


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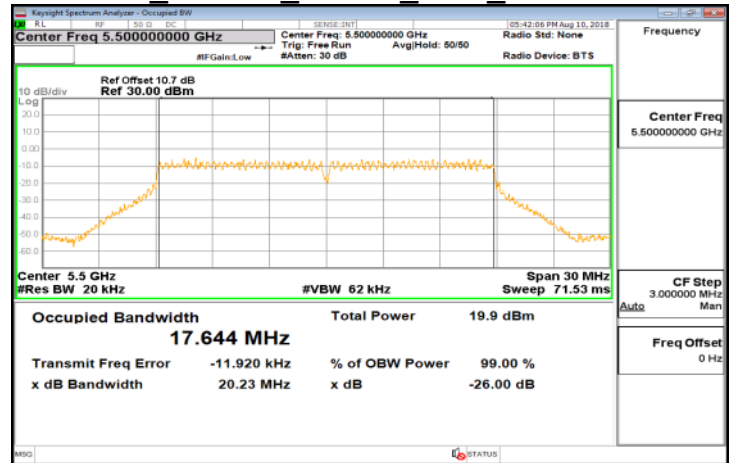
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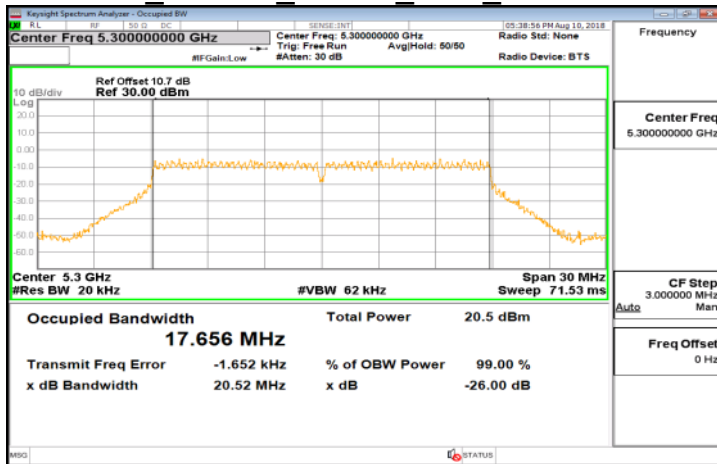
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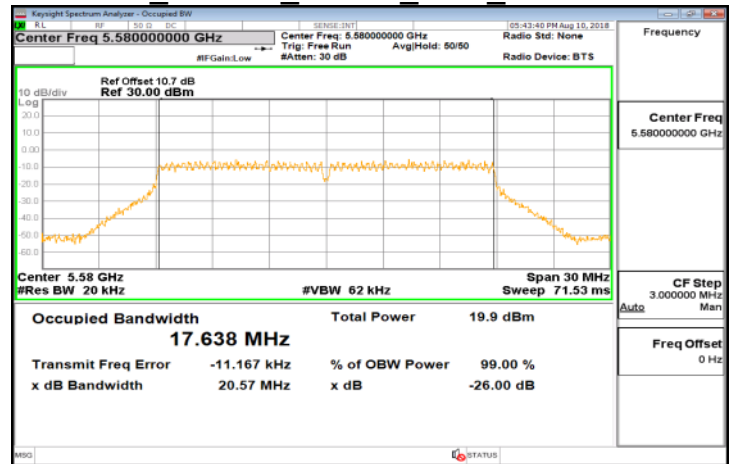
FCC 802.11n 20MHz Main 5500MHz



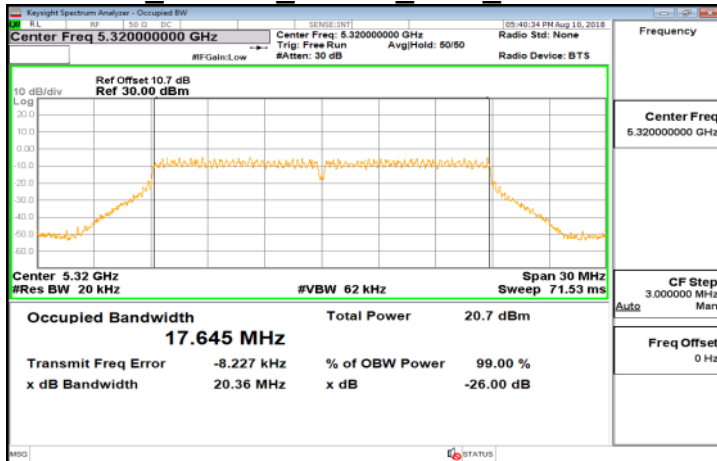
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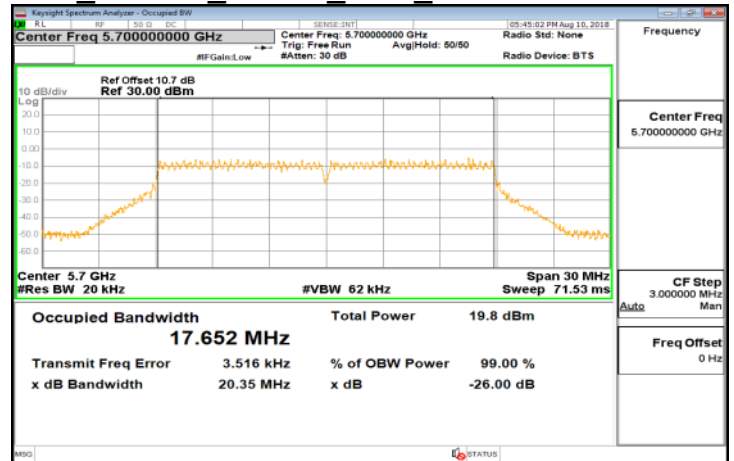
FCC 802.11n 20MHz Main 5580MHz



FCC 802.11n 20MHz Main 5320MHz



FCC 802.11n 20MHz Main 5700MHz



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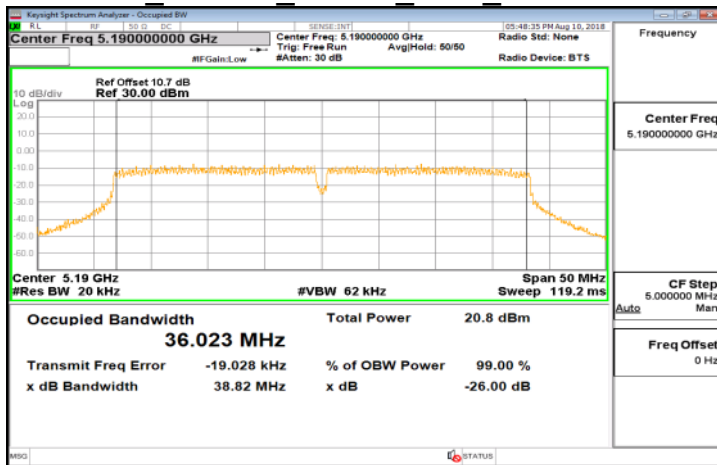
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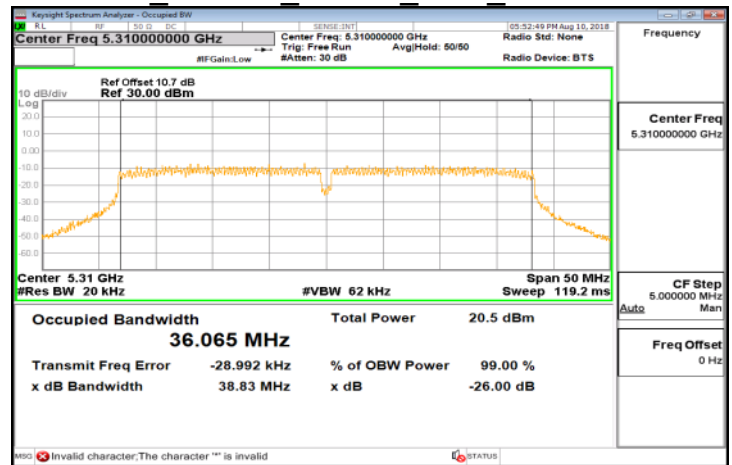
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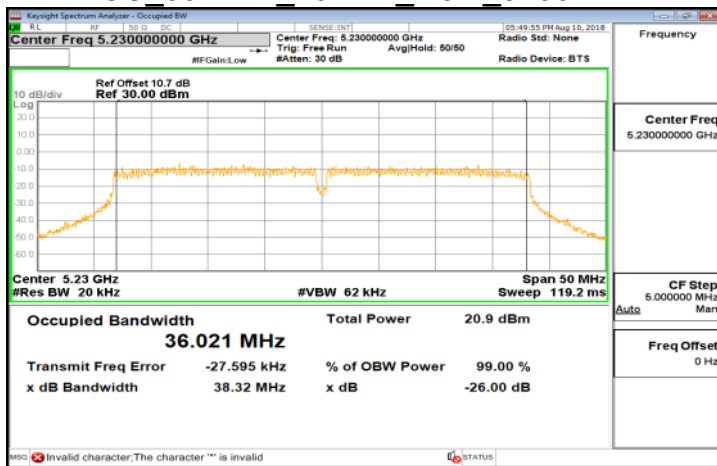
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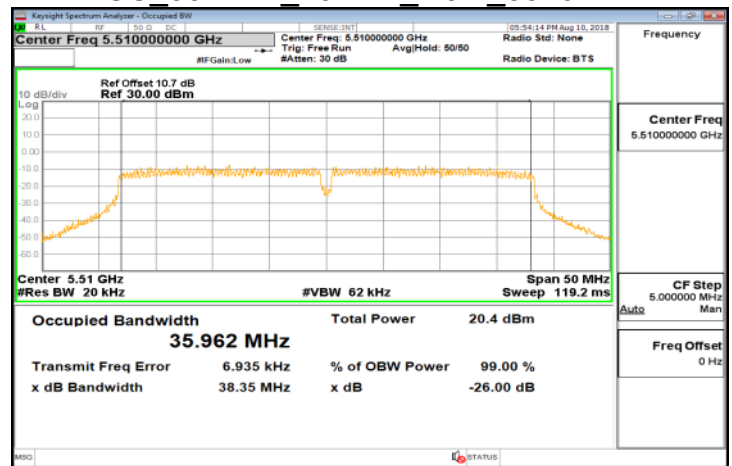
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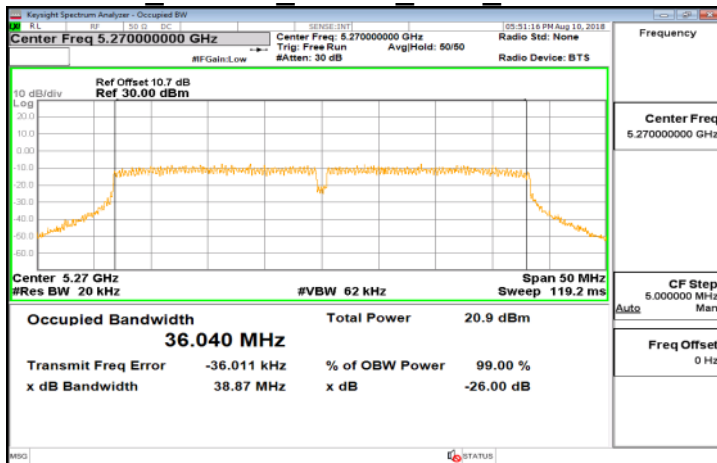
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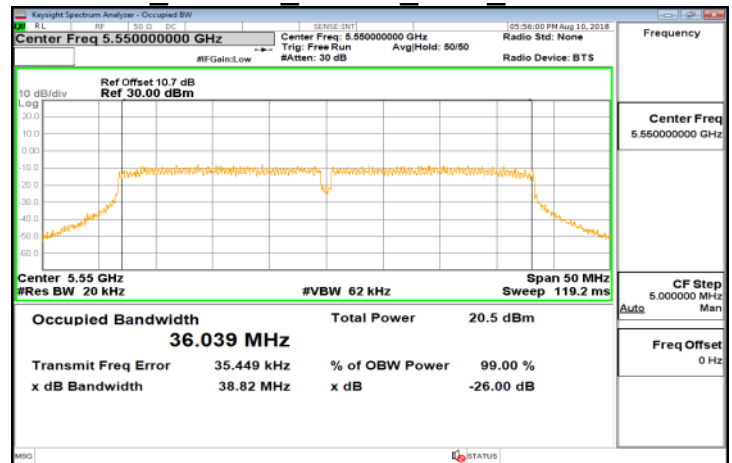
FCC 802.11n 40MHz Main 5510MHz



FCC 802.11n 40MHz Main 5270MHz



FCC 802.11n 40MHz Main 5550MHz



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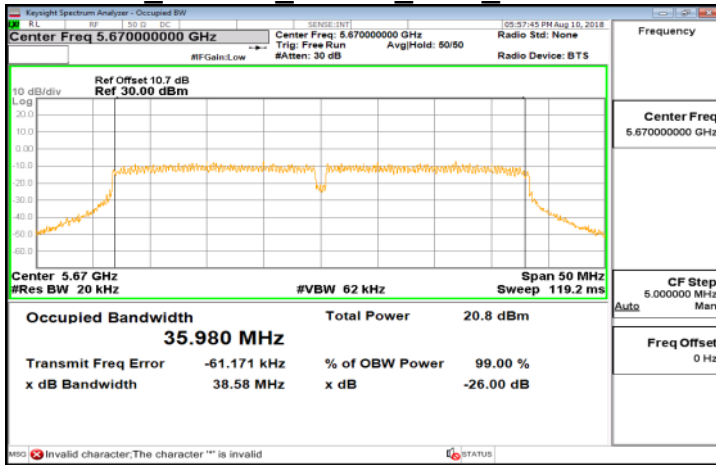
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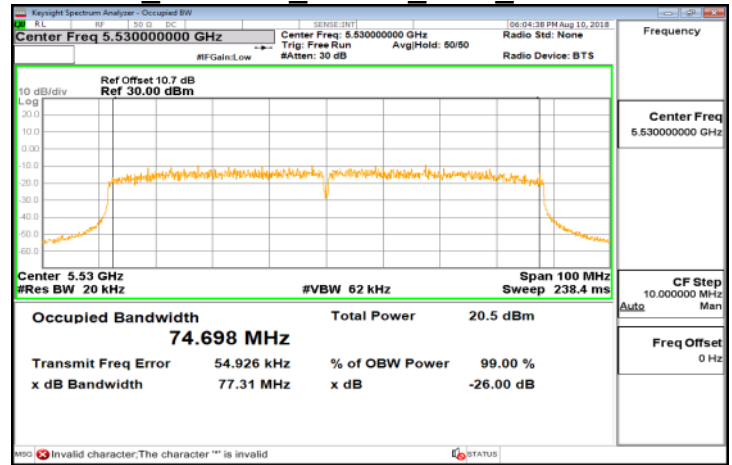
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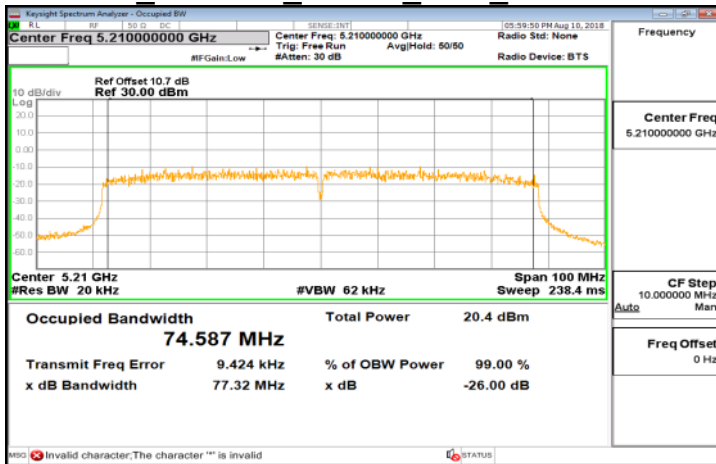
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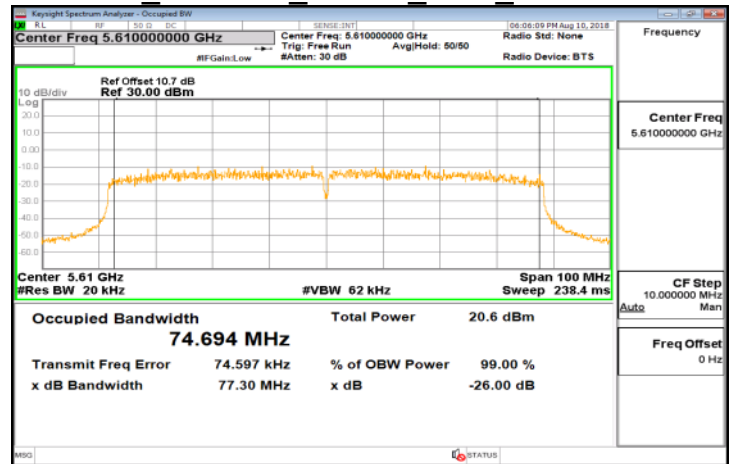
FCC 802.11ac 80MHz Main 5530MHz



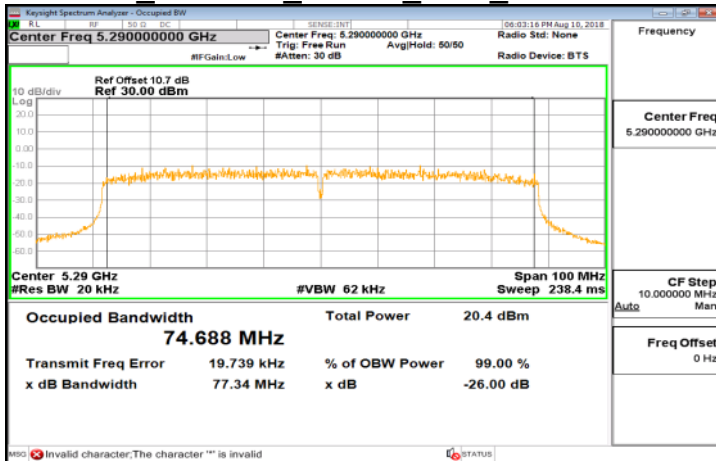
FCC 802.11ac 80MHz Main 5210MHz



FCC 802.11ac 80MHz Main 5610MHz



FCC 802.11ac 80MHz Main 5290MHz



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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 Access Ponit	1 Watt(30dBm)
	√	Mobile and portable client 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 transmit power and the power spectral density shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6 dBi.

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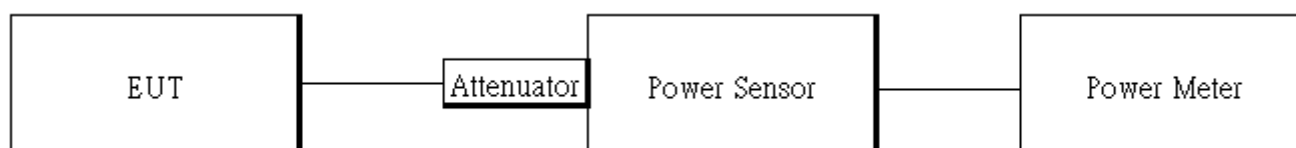
9.2 Measurement Procedure

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

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2496A	1804001	2018/02/01	2019/01/31
Power Sensor	Anritsu	MA2411B	1726104	2018/02/01	2019/01/31
Power Sensor	Anritsu	MA2411B	1726107	2018/02/01	2019/01/31
DC Power Supply	Anritsu	E3640A	KR93300208	2018/08/15	2019/08/14
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
Notebook	Lenovo	T440P	P0000564	N/A	N/A

9.4 Test Set-up



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9.5 Measurement Result

802.11a_CH0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	12.97	19.821	23.98	PASS
44	5220	6	12.78	18.972	23.98	PASS
48	5240	6	12.53	17.911	23.98	PASS
52	5260	6	12.60	18.202	23.98 or $11+10\log(B) = 23.94$	PASS
60	5300	6	12.98	19.867	23.98 or $11+10\log(B) = 23.93$	PASS
64	5320	6	12.96	19.775	23.98 or $11+10\log(B) = 23.90$	PASS
100	5500	6	12.99	19.912	23.98 or $11+10\log(B) = 23.96$	PASS
116	5580	6	12.64	18.371	23.98 or $11+10\log(B) = 24.02$	PASS
140	5700	6	12.71	18.669	23.98 or $11+10\log(B) = 23.87$	PASS

802.11n_HT20_CH0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	12.99	19.912	23.98	PASS
44	5220	MCS0	12.70	18.626	23.98	PASS
48	5240	MCS0	12.97	19.821	23.98	PASS
52	5260	MCS0	12.75	18.842	23.98 or $11+10\log(B) = 24.07$	PASS
60	5300	MCS0	12.93	19.639	23.98 or $11+10\log(B) = 24.12$	PASS
64	5320	MCS0	12.94	19.684	23.98 or $11+10\log(B) = 24.09$	PASS
100	5500	MCS0	12.62	18.286	23.98 or $11+10\log(B) = 24.06$	PASS
116	5580	MCS0	12.77	18.929	23.98 or $11+10\log(B) = 24.13$	PASS
140	5700	MCS0	12.68	18.541	23.98 or $11+10\log(B) = 24.09$	PASS

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802.11n_HT40_CH0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	12.85	19.260	23.98	PASS
46	5230	MCS0	12.88	19.393	23.98	PASS
54	5270	MCS0	12.78	18.952	23.98 or $11+10\log(B) = 26.90$	PASS
62	5310	MCS0	12.55	17.974	23.98 or $11+10\log(B) = 26.89$	PASS
102	5510	MCS0	12.85	19.260	23.98 or $11+10\log(B) = 26.84$	PASS
110	5550	MCS0	12.59	18.141	23.98 or $11+10\log(B) = 26.89$	PASS
134	5670	MCS0	12.98	19.845	23.98 or $11+10\log(B) = 26.86$	PASS

802.11ac_VHT80_CH0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	MCS0	12.66	18.438	23.98	PASS
58	5290	MCS0	12.85	19.263	23.98 or $11+10\log(B) = 29.88$	PASS
106	5530	MCS0	12.87	19.352	23.98 or $11+10\log(B) = 29.88$	PASS
122	5610	MCS0	12.85	19.263	23.98 or $11+10\log(B) = 29.88$	PASS

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10. 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 Access Ponit	
	√	Mobile and portable client 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 transmit power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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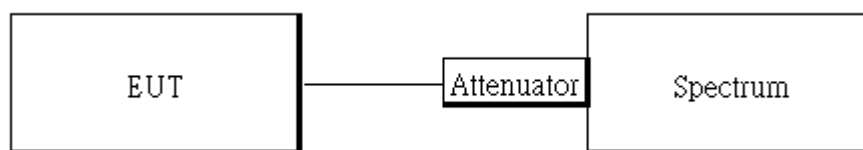
10.2 Measurement Procedure

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)
5. Use 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.

10.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	2018/05/03	2019/05/02
DC Power Supply	Anritsu	E3640A	KR93300208	2018/08/15	2019/08/14
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Notebook	Lenovo	T440P	P0000564	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	1.09	10.68	0.06	1.15	11	-9.85
5220	0.66	10.68	0.06	0.72	11	-10.28
5240	0.96	10.68	0.06	1.02	11	-9.98
5260	1.36	10.68	0.06	1.42	11	-9.58
5300	1.13	10.68	0.06	1.19	11	-9.81
5320	0.99	10.68	0.06	1.05	11	-9.95
5500	1.99	10.68	0.06	2.05	11	-8.95
5580	1.56	10.68	0.06	1.62	11	-9.38
5700	1.04	10.68	0.06	1.10	11	-9.90

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	1.24	10.68	0.06	1.30	11	-9.70
5220	1.63	10.68	0.06	1.69	11	-9.31
5240	1.03	10.68	0.06	1.09	11	-9.91
5260	0.12	10.68	0.06	0.18	11	-10.82
5300	1.09	10.68	0.06	1.15	11	-9.85
5320	1.02	10.68	0.06	1.08	11	-9.92
5500	0.03	10.68	0.06	0.09	11	-10.91
5580	1.28	10.68	0.06	1.34	11	-9.66
5700	1.12	10.68	0.06	1.18	11	-9.82

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	-2.42	10.68	0.07	-2.35	11	-13.35
5230	-2.55	10.68	0.07	-2.48	11	-13.48
5270	-2.79	10.68	0.07	-2.72	11	-13.72
5310	-3.02	10.68	0.07	-2.95	11	-13.95
5510	-2.45	10.68	0.07	-2.38	11	-13.38
5550	-2.13	10.68	0.07	-2.06	11	-13.06
5670	-1.59	10.68	0.07	-1.52	11	-12.52

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	-4.24	10.68	0.34	-3.90	11	-14.90
5290	-5.66	10.68	0.34	-5.32	11	-16.32
5530	-4.75	10.68	0.34	-4.41	11	-15.41
5610	-4.82	10.68	0.34	-4.48	11	-15.48

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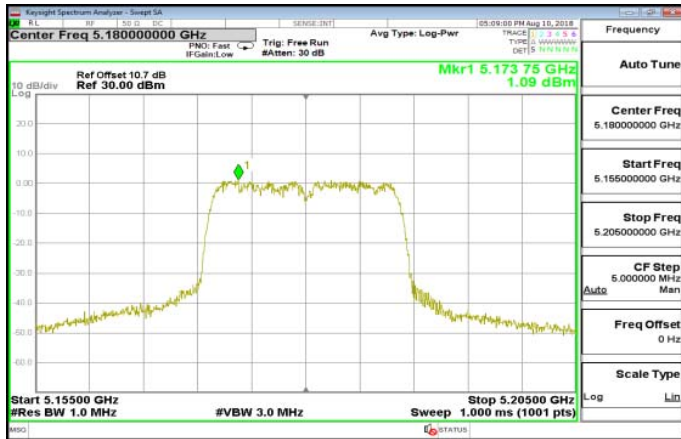
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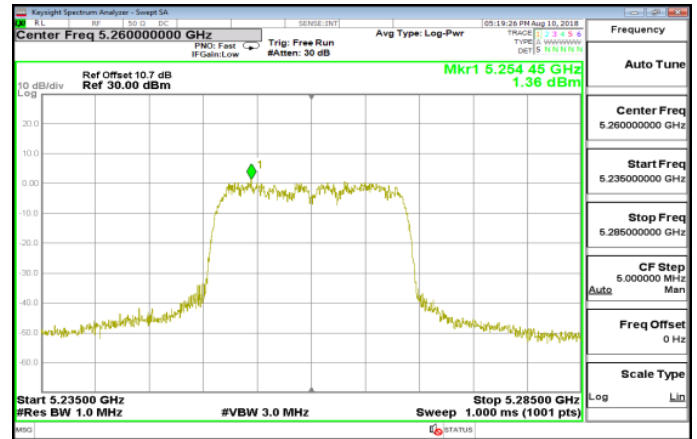
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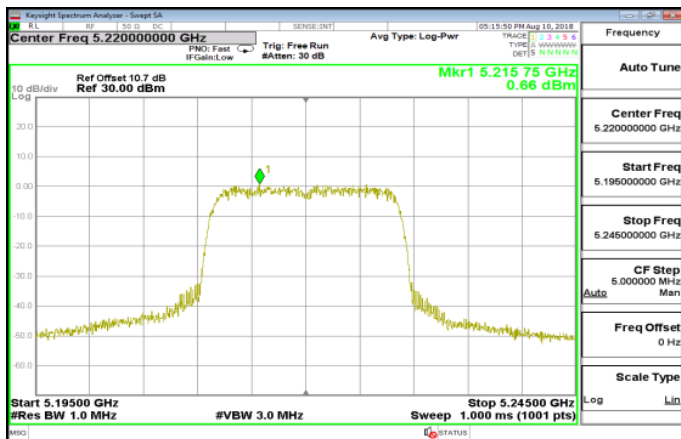
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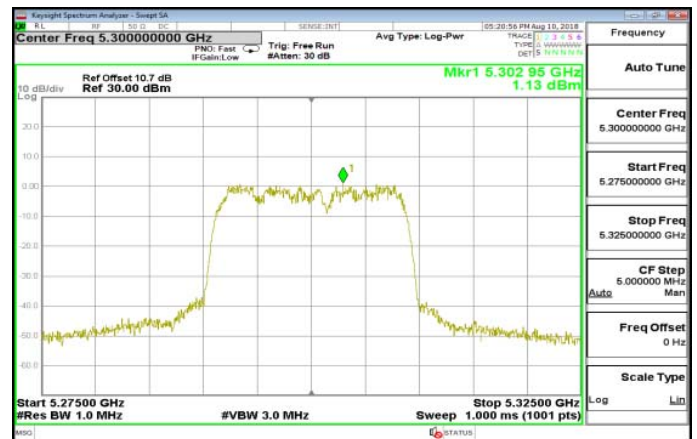
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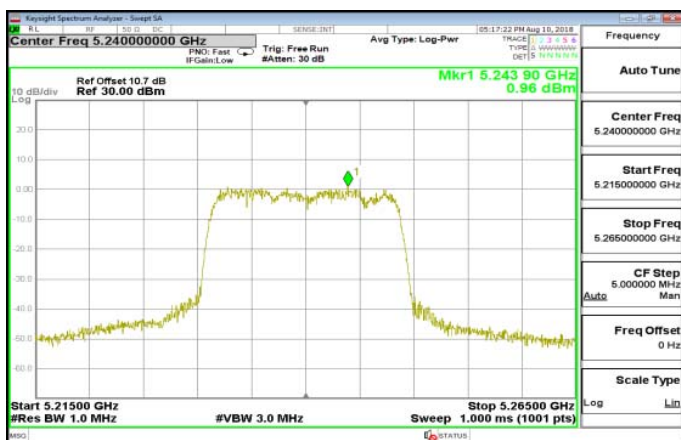
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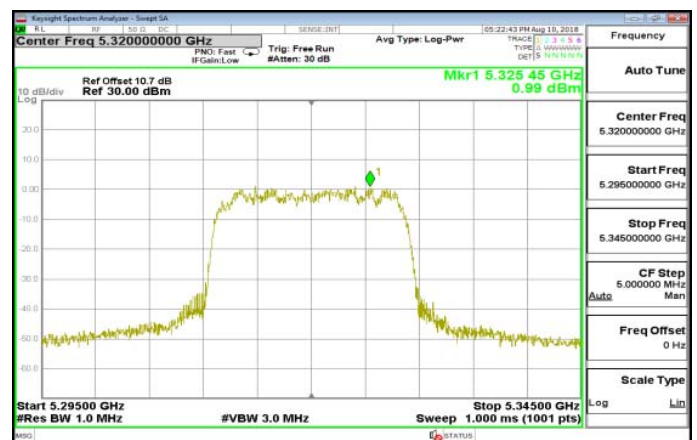
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802.11a_20MHz_5240MHz



802.11a_20MHz_5320MHz



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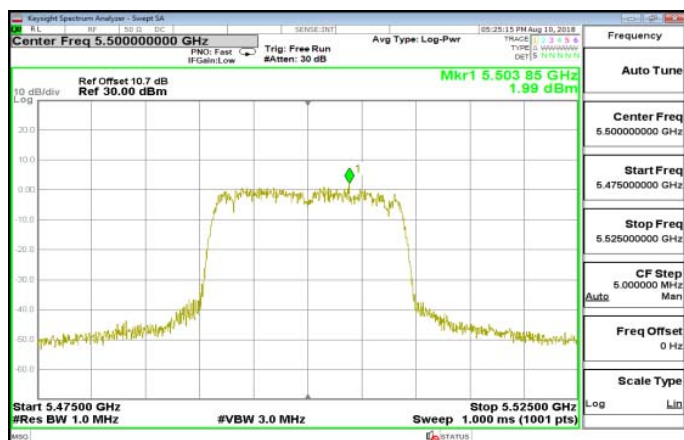
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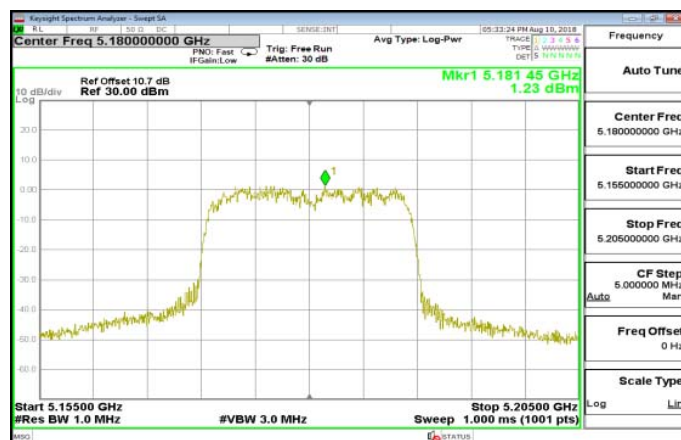
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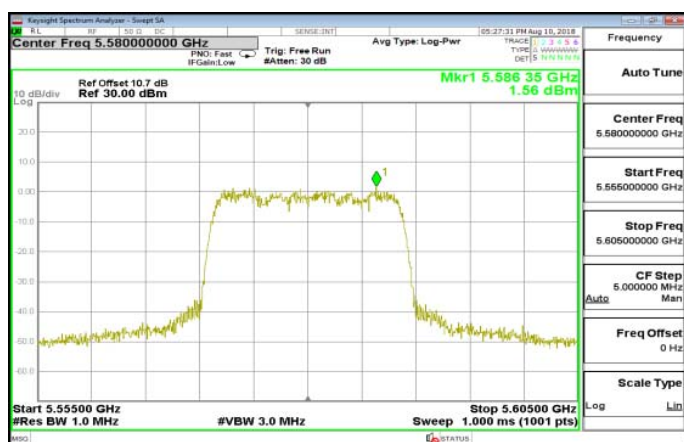
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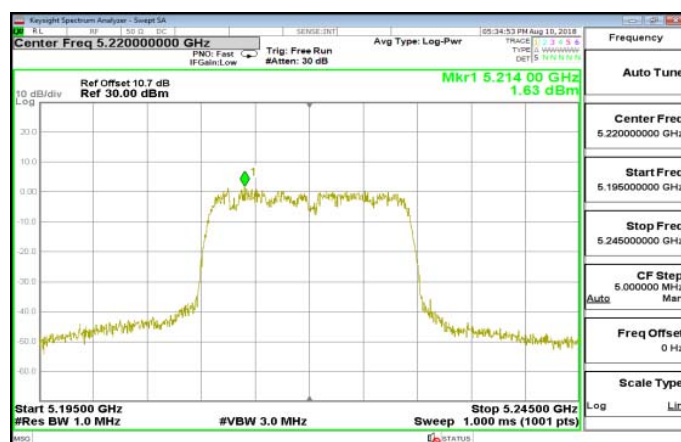
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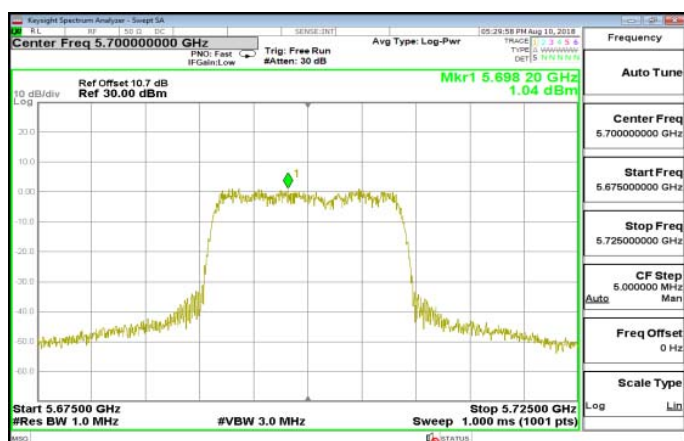
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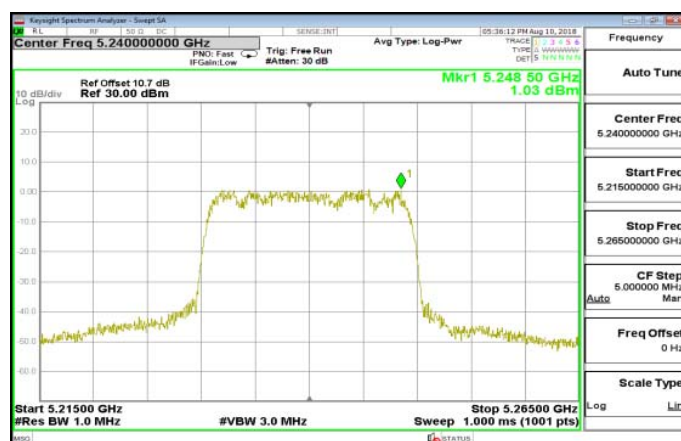
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802.11a_20MHz_5700MHz



802.11n_20MHz_5240MHz



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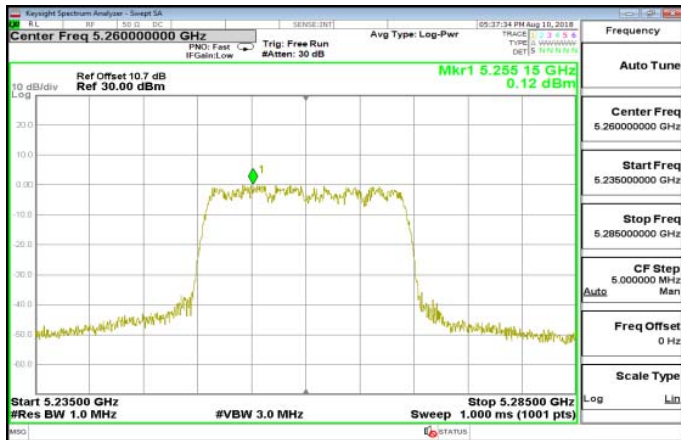
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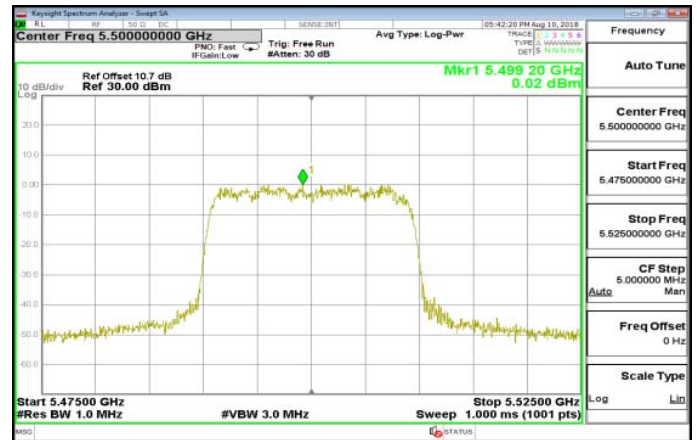
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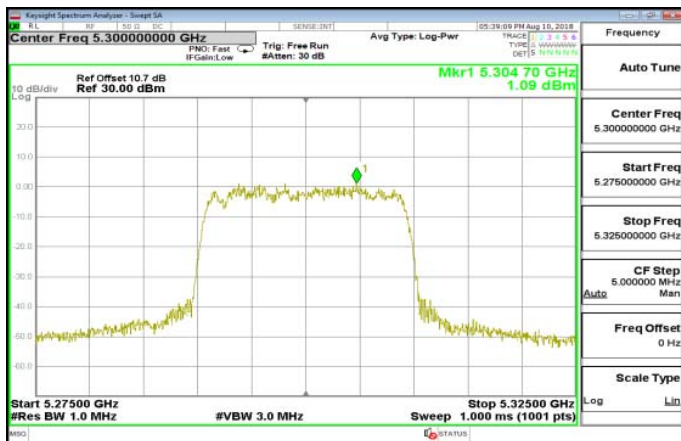
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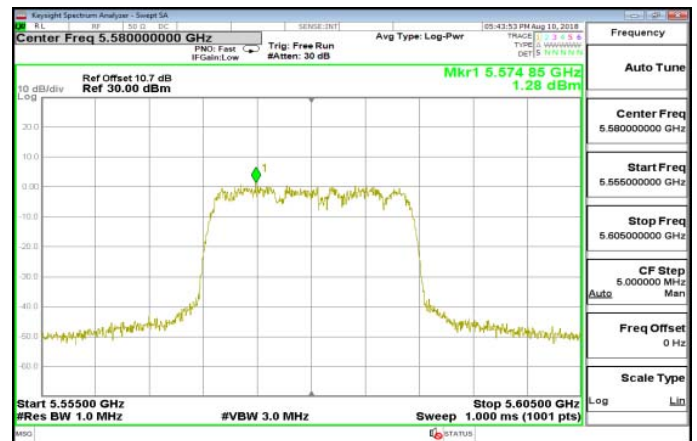
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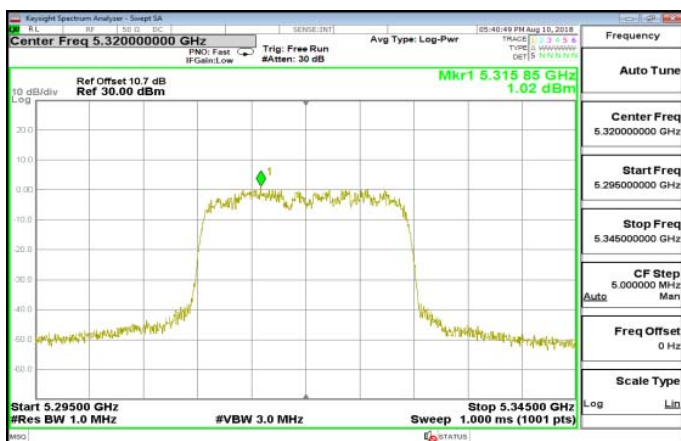
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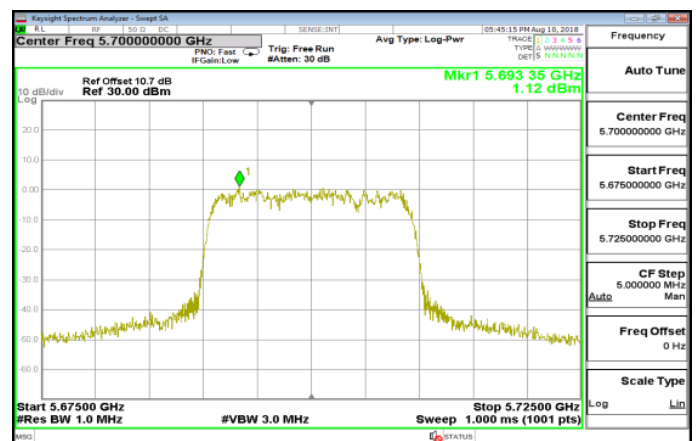
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802.11n_20MHz_5320MHz



802.11n_20MHz_5700MHz



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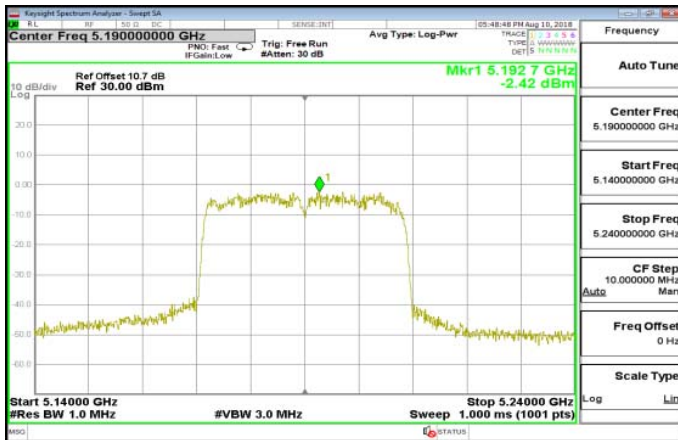
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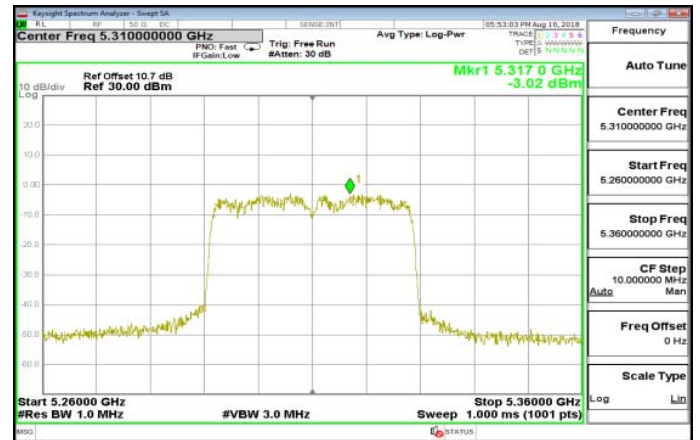
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802.11n_40MHz_5190MHz



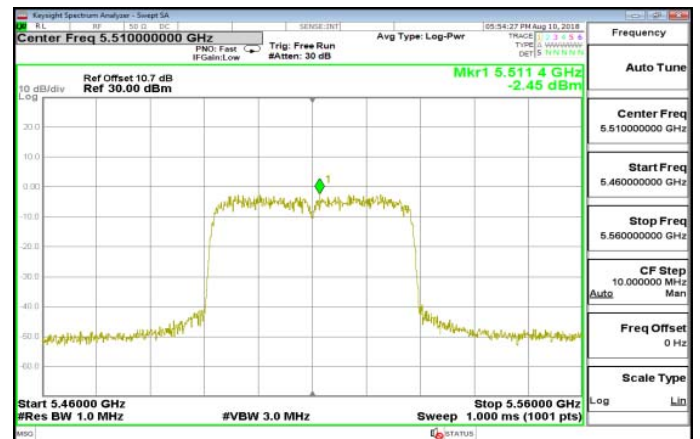
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802.11n_40MHz_5230MHz



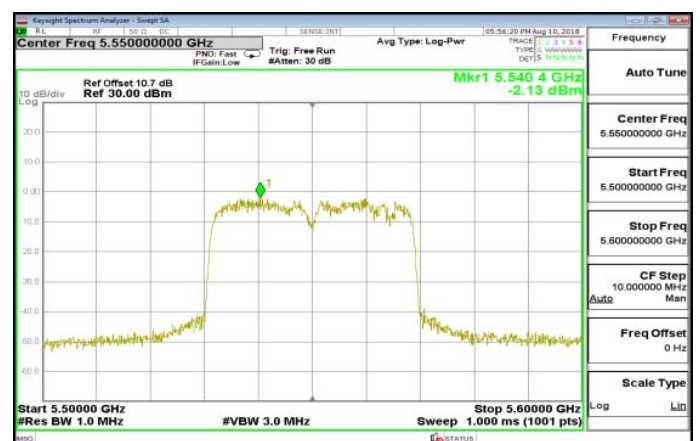
802.11n_40MHz_5510MHz



802.11n_40MHz_5270MHz



802.11n_40MHz_5550MHz



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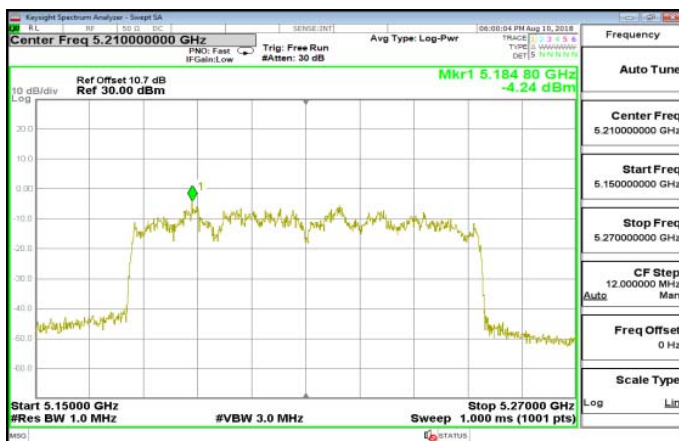
802.11n_40MHz_5670MHz



802.11ac_80MHz_5530MHz



802.11ac_80MHz_5210MHz



802.11ac_80MHz_5610MHz



802.11ac_80MHz_5290MHz



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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

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWAZBECK	VULB9168	378	2017/12/29	2018/12/28
Horn Antenna	Schwarzbeck	BBHA9120D	1441	2017/08/04	2019/08/03
Horn Antenna	Schwarzbeck	BBHA9170	184	2017/12/12	2018/12/11
Loop Antenna	ETS.LINDGREN	6502	148045	2017/09/26	2018/09/25
3m Site NSA	SGS	966 chamber	N/A	2018/01/02	2019/01/01
Spectrum Analyzer	Agilent	E4446A	MY51100003	2018/05/15	2019/05/14
EMI Test Receiver	R&S	ESCI7	100335	2018/02/02	2019/02/01
Pre-Amplifier	HP	8449B	3008A00578	2018/01/02	2019/01/01
Pre-Amplifier	HP	8447D	2944A07676	2018/01/02	2019/01/01
Pre-Amplifier	EMC Instru-ments	EMC184045B	980135	2017/10/27	2018/10/26
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	2018/01/02	2019/01/01
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966_RX	9	2018/01/02	2019/01/01
Notebook	Lenovo	L430	R9-X11BG	N/A	N/A

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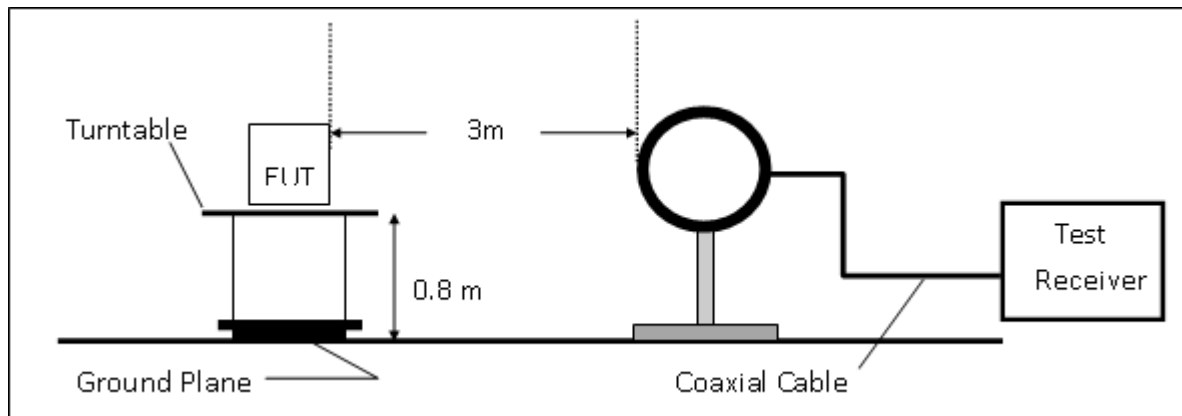
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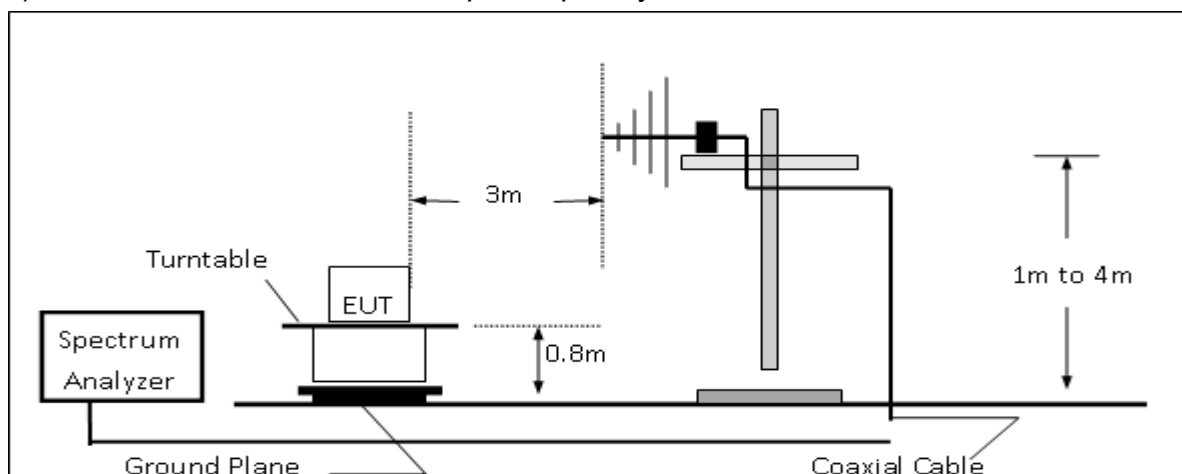
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11.3 Test SET-UP

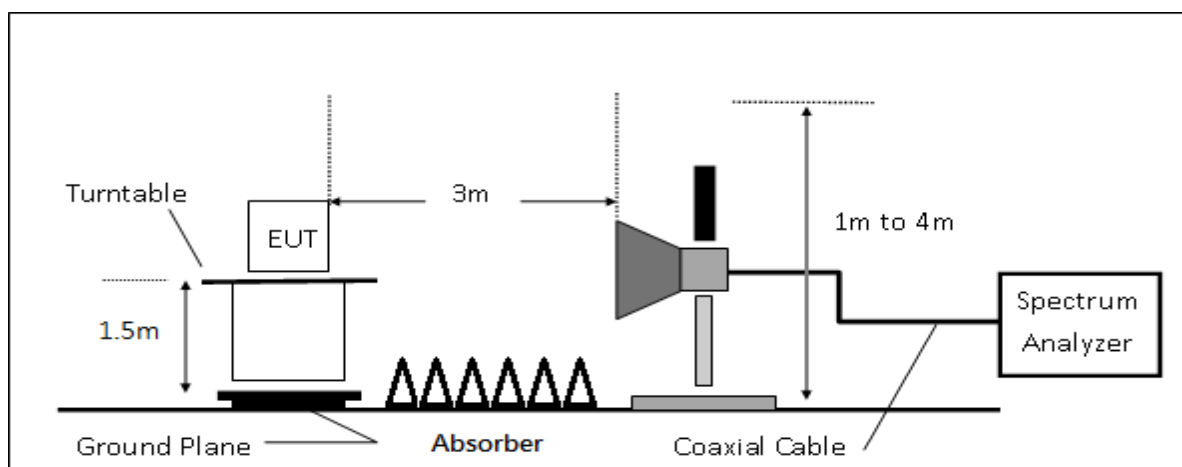
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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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11.4 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.

11.5 Field Strength Calculation

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

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

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

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

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

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

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

11.7 Measurement Result

Refer to next page for tabular data sheets.

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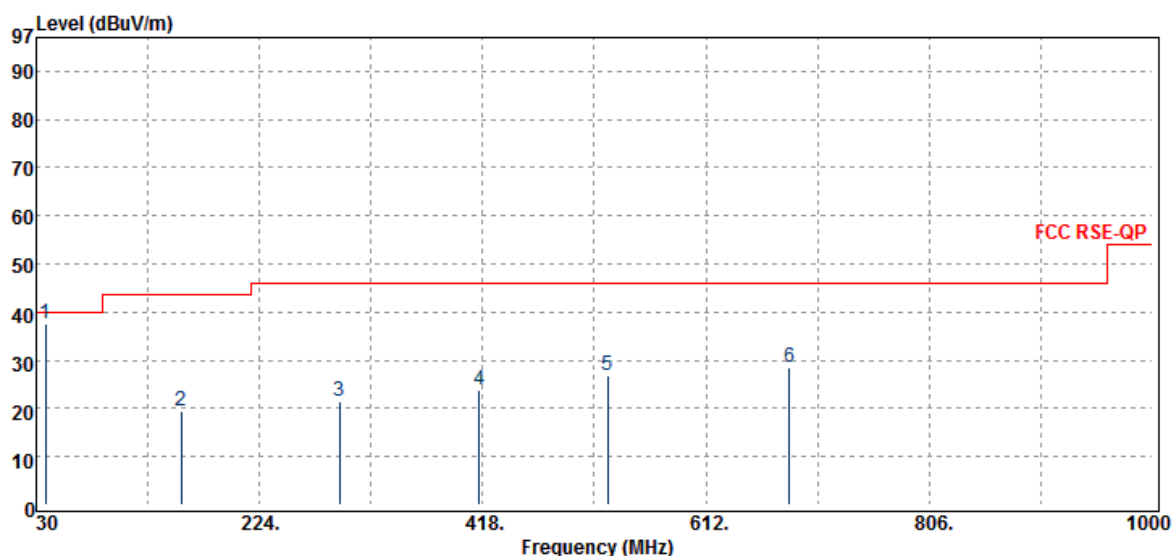
Radiated Spurious Emission Measurement Result

Below 1GHz Worst-Case Data:

802.11a 5150~5250 MHz

Operation Band :802.11aB1
 Fundamental Frequency :5220 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :H Plane

Test Date :2018-08-17
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
37.76	Peak	46.07	-8.46	37.61	40.00	-2.39
156.10	Peak	26.85	-7.24	19.61	43.50	-23.89
293.84	Peak	27.03	-5.69	21.34	46.00	-24.66
415.09	Peak	26.82	-2.95	23.87	46.00	-22.13
526.64	Peak	28.18	-1.43	26.75	46.00	-19.25
684.75	Peak	26.94	1.58	28.52	46.00	-17.48

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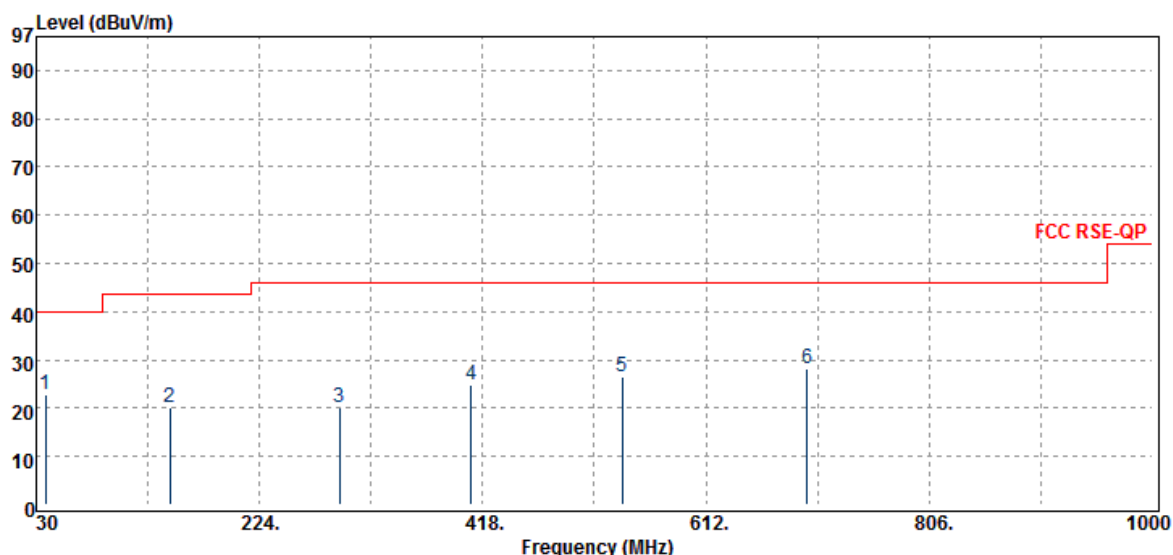
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Operation Band :802.11aB1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-17
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
37.76	Peak	31.42	-8.46	22.96	40.00	-17.04
146.40	Peak	27.61	-7.59	20.02	43.50	-23.48
293.84	Peak	25.89	-5.69	20.20	46.00	-25.80
408.30	Peak	27.76	-2.95	24.81	46.00	-21.19
539.25	Peak	27.99	-1.31	26.68	46.00	-19.32
700.27	Peak	26.36	1.82	28.18	46.00	-17.82

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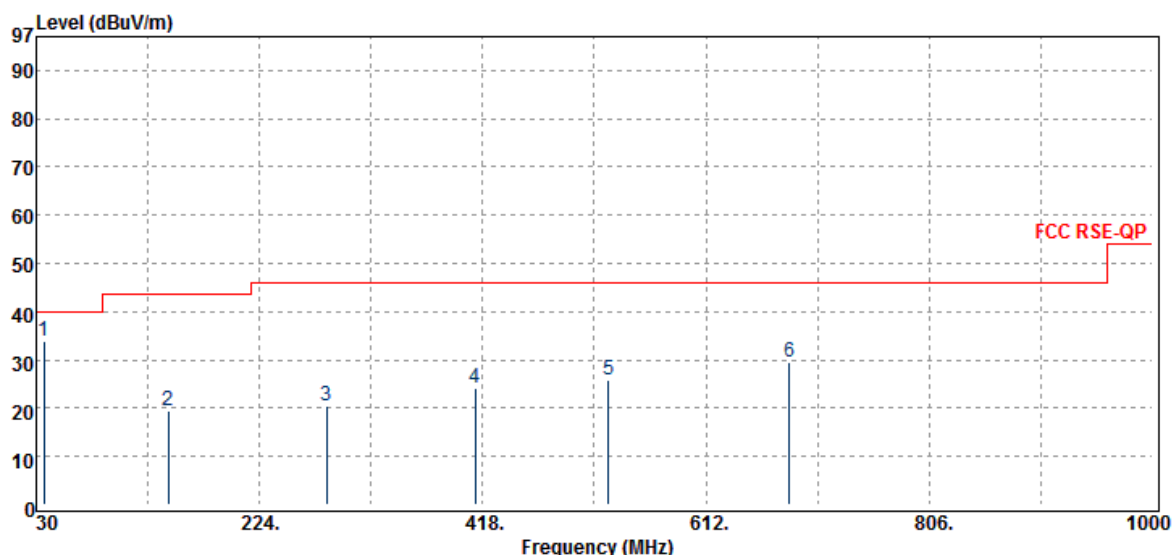
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802.11a 5250~5350 MHz

Operation Band :802.11aB2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-17
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
36.79	Peak	42.56	-8.56	34.00	40.00	-6.00
144.46	Peak	27.17	-7.72	19.45	43.50	-24.05
282.20	Peak	26.50	-6.06	20.44	46.00	-25.56
411.21	Peak	27.12	-2.97	24.15	46.00	-21.85
527.61	Peak	27.30	-1.34	25.96	46.00	-20.04
684.75	Peak	27.97	1.58	29.55	46.00	-16.45

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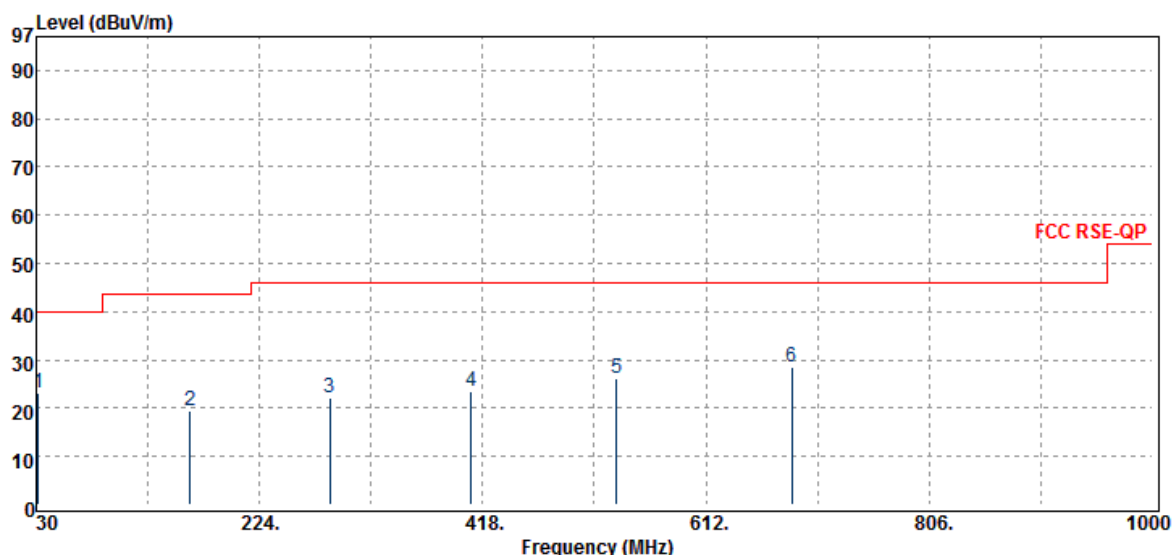
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Operation Band :802.11aB2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-17
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
31.94	Peak	32.14	-8.88	23.26	40.00	-16.74
163.86	Peak	26.70	-7.27	19.43	43.50	-24.07
285.11	Peak	28.27	-5.99	22.28	46.00	-23.72
408.30	Peak	26.56	-2.95	23.61	46.00	-22.39
534.40	Peak	28.15	-1.95	26.20	46.00	-19.80
686.69	Peak	26.67	1.70	28.37	46.00	-17.63

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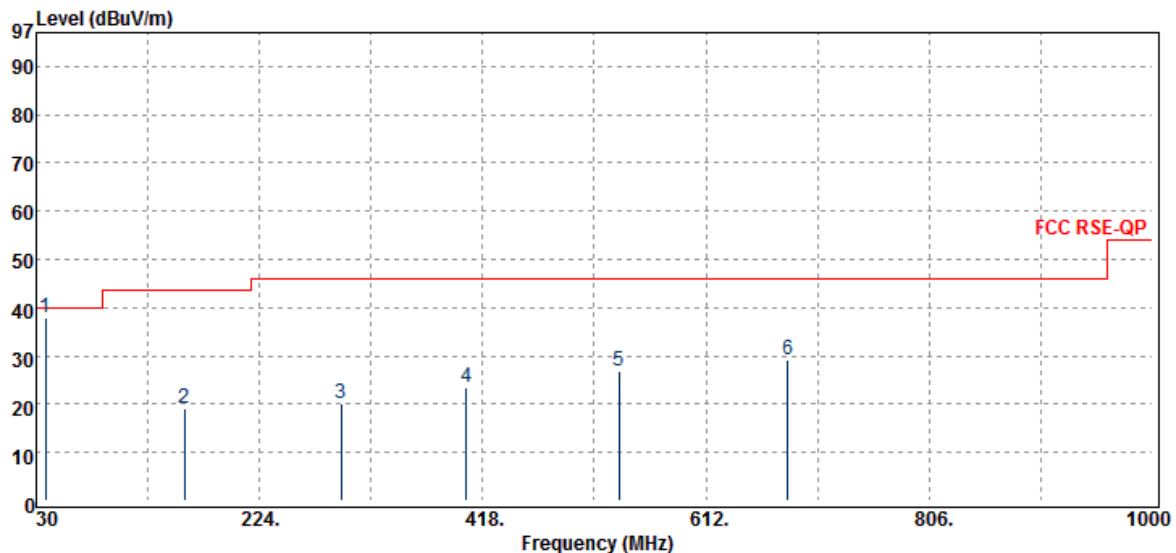
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802.11a, 5470~5725 MHz

Operation Band :802.11aB3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-17
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
37.76	Peak	46.50	-8.46	38.04	40.00	-1.96
159.01	Peak	26.14	-7.13	19.01	43.50	-24.49
294.81	Peak	25.67	-5.65	20.02	46.00	-25.98
403.45	Peak	26.69	-3.07	23.62	46.00	-22.38
536.34	Peak	28.54	-1.83	26.71	46.00	-19.29
682.81	Peak	27.67	1.53	29.20	46.00	-16.80

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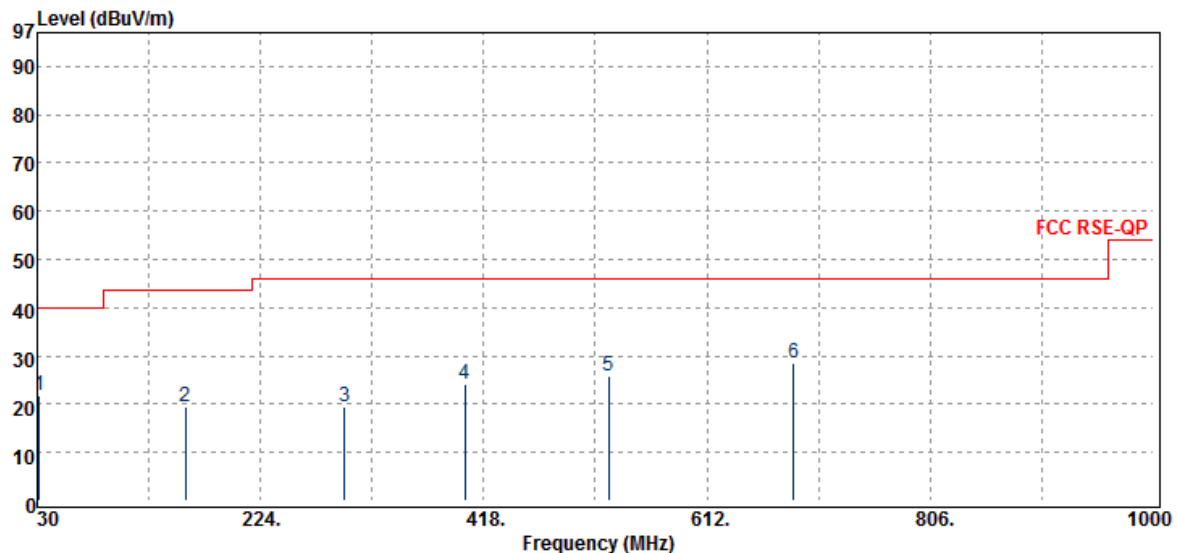
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Operation Band :802.11aB3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-17
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
31.94	Peak	30.65	-8.88	21.77	40.00	-18.23
159.01	Peak	26.67	-7.13	19.54	43.50	-23.96
296.75	Peak	25.23	-5.61	19.62	46.00	-26.38
401.51	Peak	27.28	-3.27	24.01	46.00	-21.99
526.64	Peak	27.30	-1.43	25.87	46.00	-20.13
687.66	Peak	26.66	1.76	28.42	46.00	-17.58

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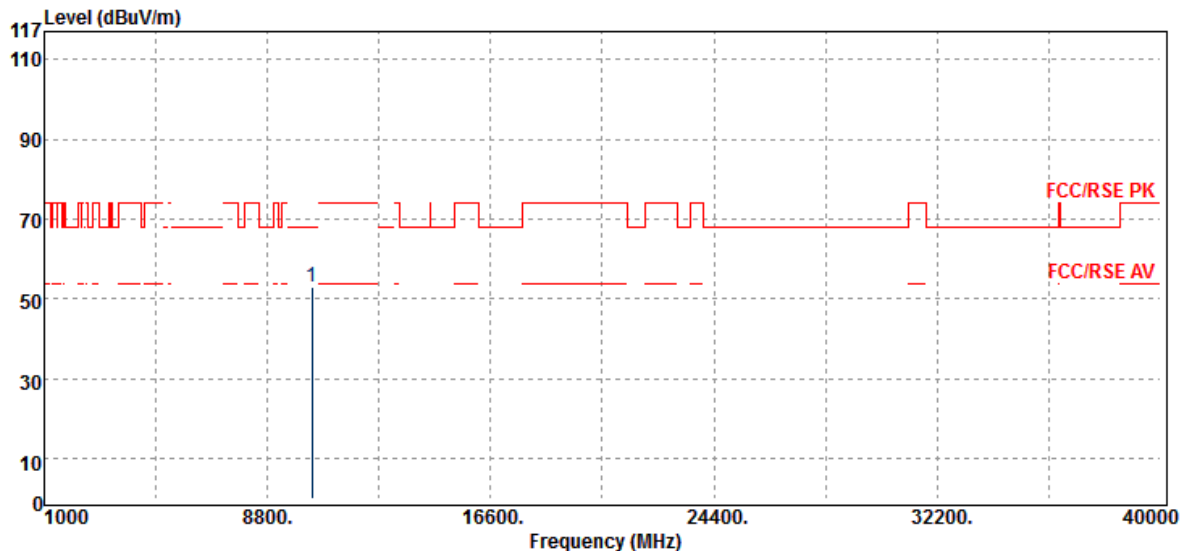
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Above 1GHz Worst-Case Data:

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

Operation Band	:802.11aB1	Test Date	:2018-08-16
Fundamental Frequency	:5180 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



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	33.13	19.71	52.84	68.20	-15.36

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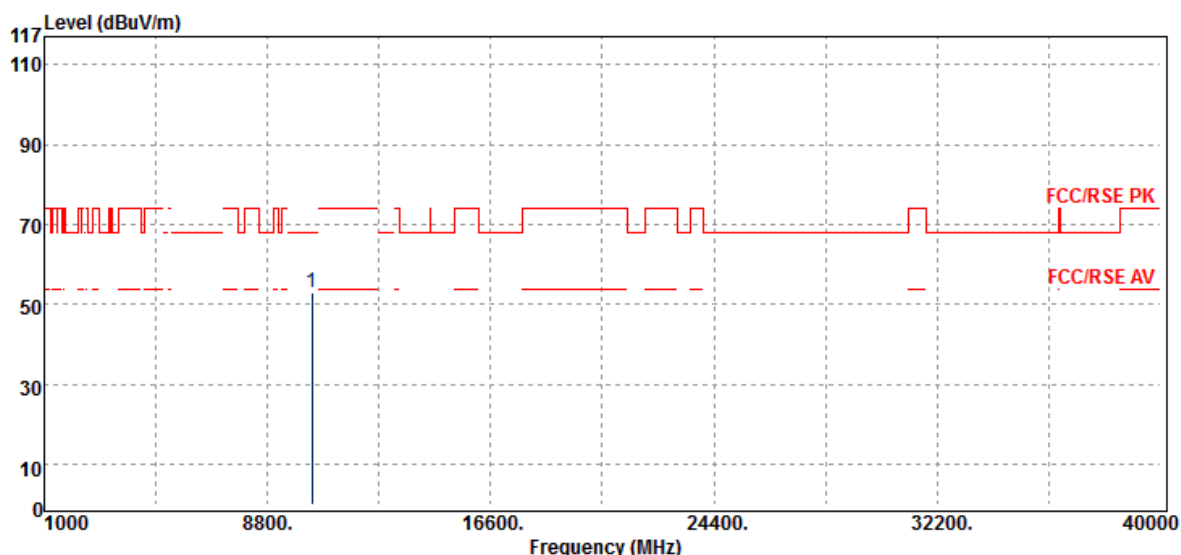
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Operation Band :802.11aB1
Fundamental Frequency :5180 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



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	33.46	19.71	53.17	68.20	-15.03

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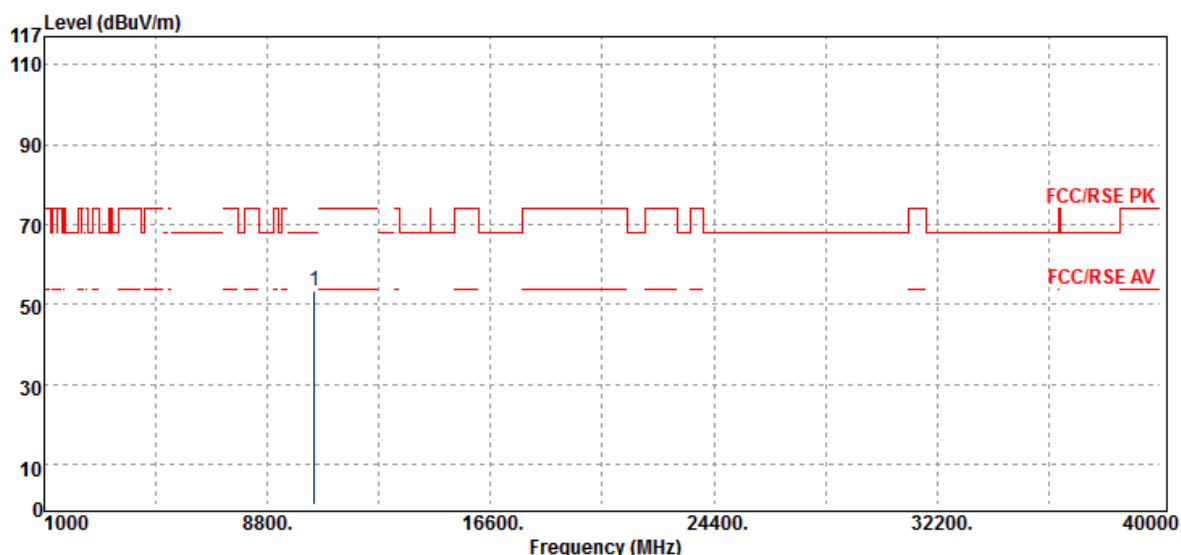
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Operation Band :802.11aB1
 Fundamental Frequency :5220 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10440.00	Peak	32.64	20.75	53.39	68.20	-14.81

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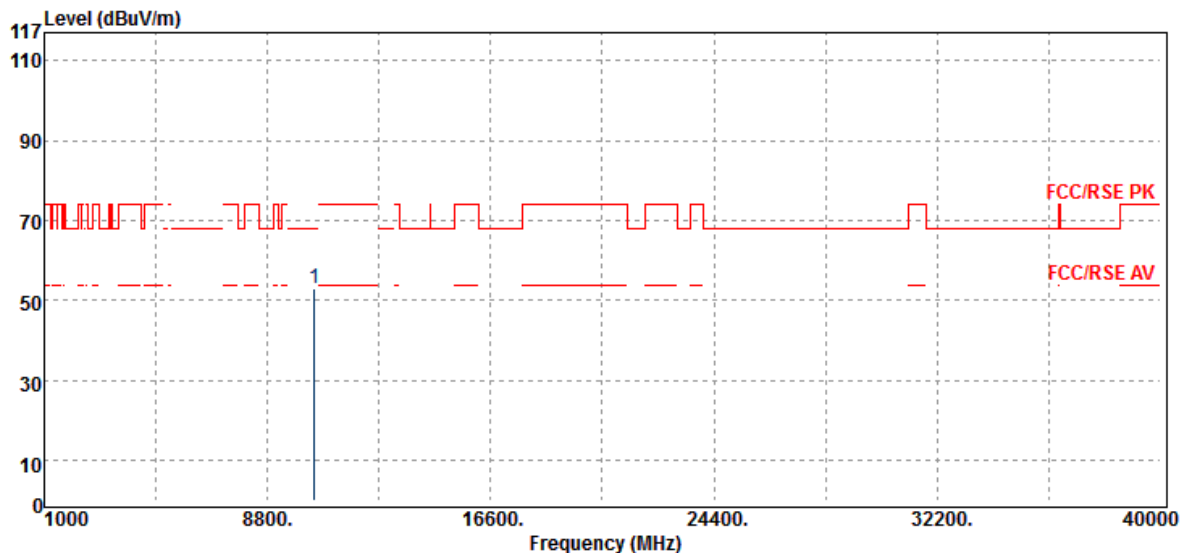
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Operation Band :802.11aB1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10440.00	Peak	32.92	20.05	52.97	68.20	-15.23

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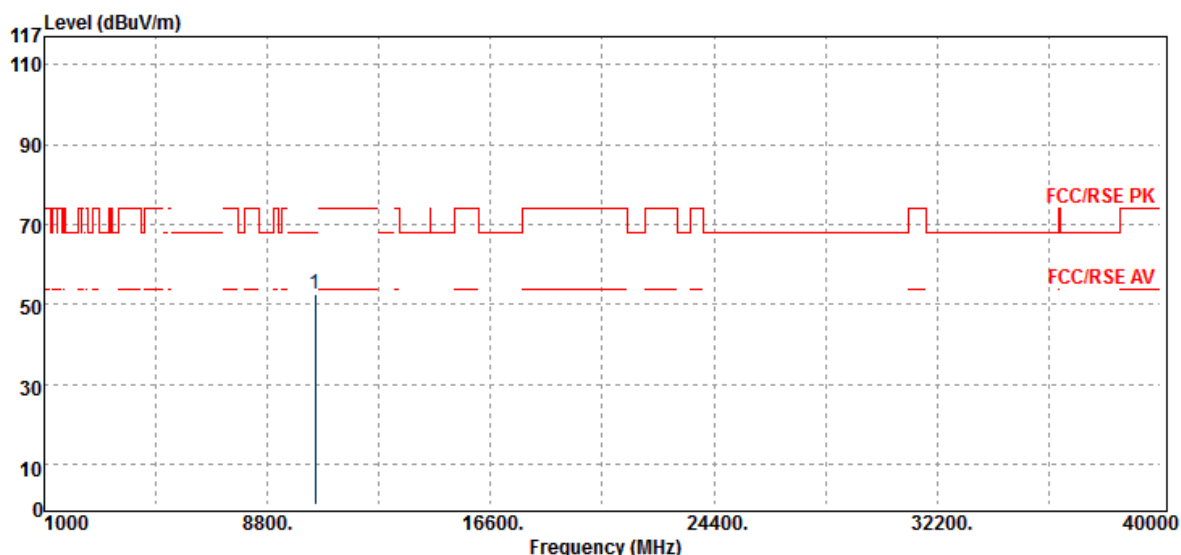
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Operation Band :802.11aB1
Fundamental Frequency :5240 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dB μ V	dB	dB μ V/m	dB μ V/m	dB
10480.00	Peak	31.75	20.79	52.54	68.20	-15.66

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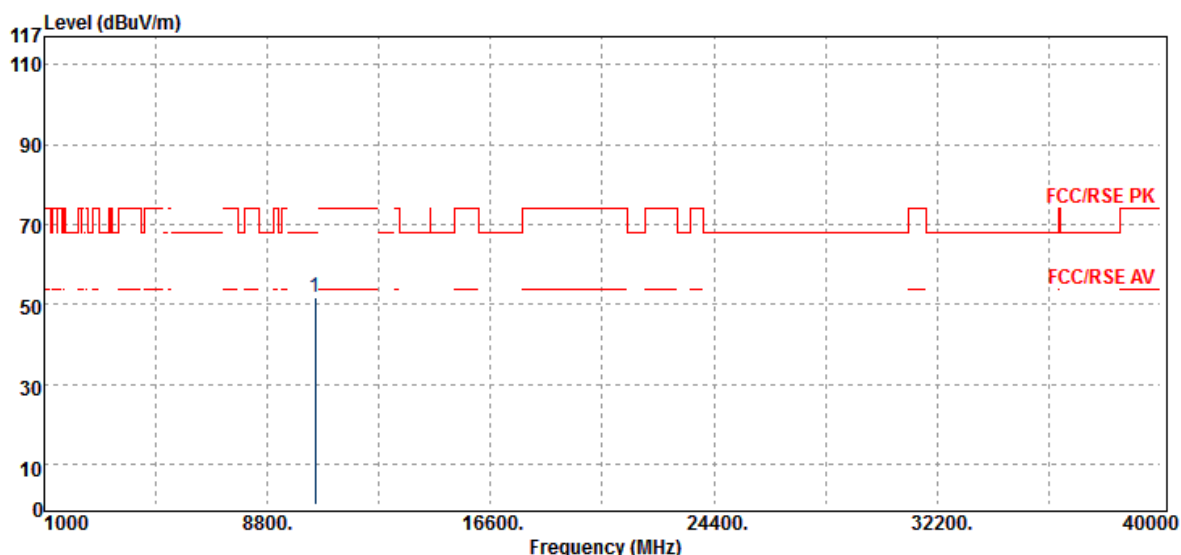
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Operation Band :802.11aB1
 Fundamental Frequency :5240 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
10480.00	Peak	31.77	20.07	51.84	68.20	-16.36

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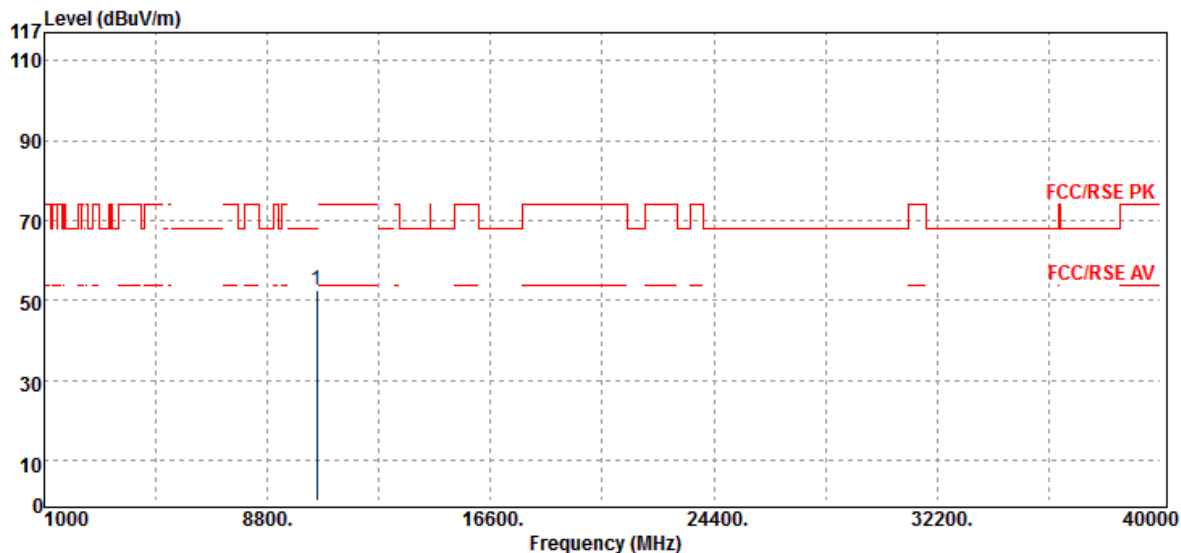
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Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band	:802.11aB2	Test Date	:2018-08-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10520.00	Peak	32.03	20.78	52.81	68.20	-15.39

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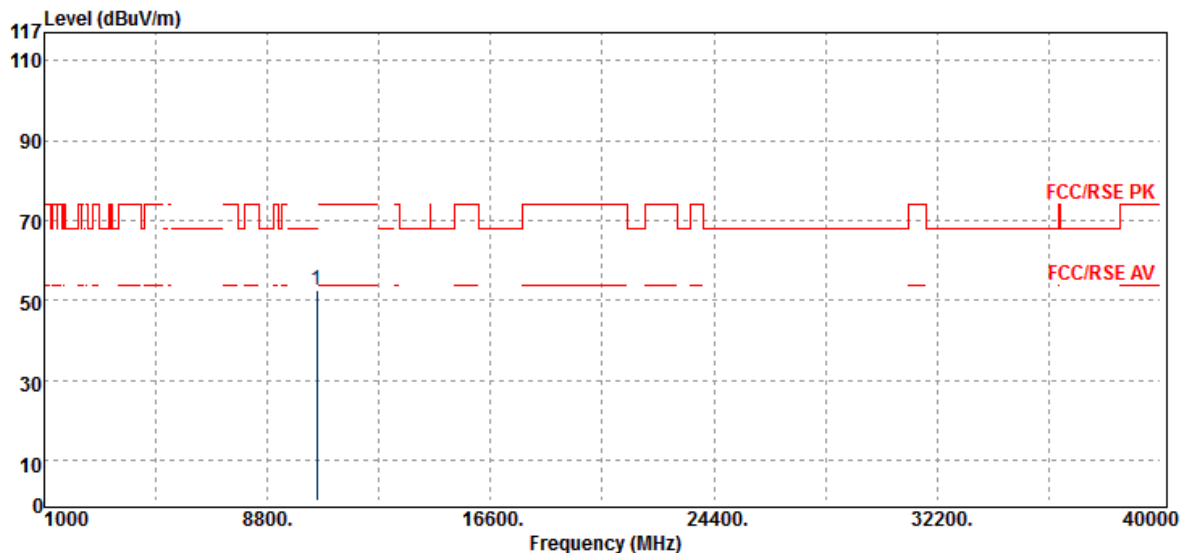
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Operation Band :802.11aB2
Fundamental Frequency :5260 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10520.00	Peak	32.53	20.00	52.53	68.20	-15.67

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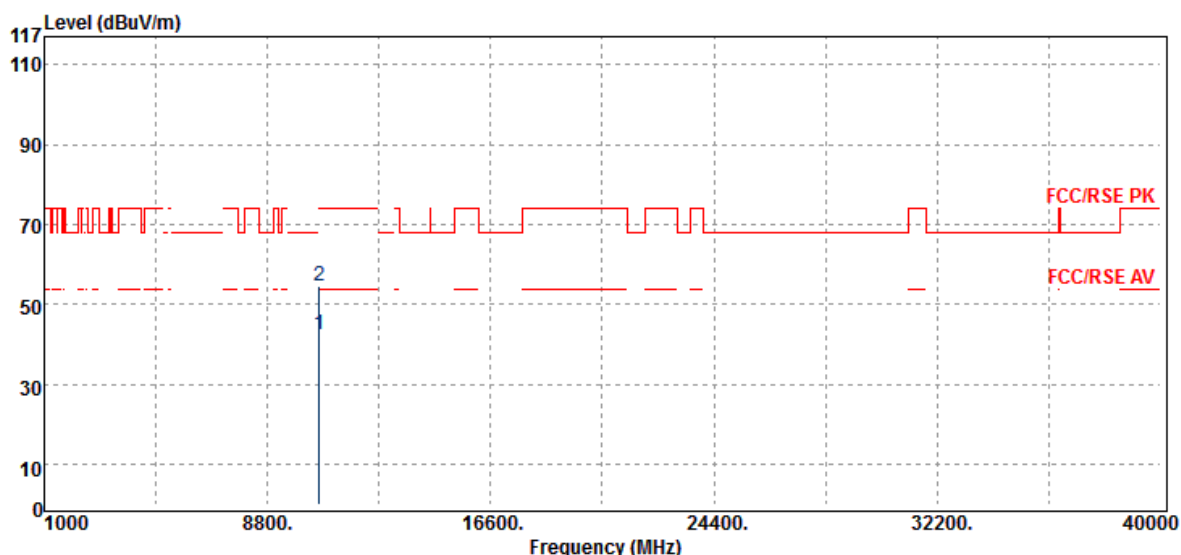
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Operation Band :802.11aB2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10600.00	Average	21.28	21.18	42.46	54.00	-11.54
10600.00	Peak	33.30	21.18	54.48	74.00	-19.52

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Operation Band :802.11aB2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
10600.00	Average	21.48	20.38	41.86	54.00	-12.14
10600.00	Peak	32.69	20.38	53.07	74.00	-20.93

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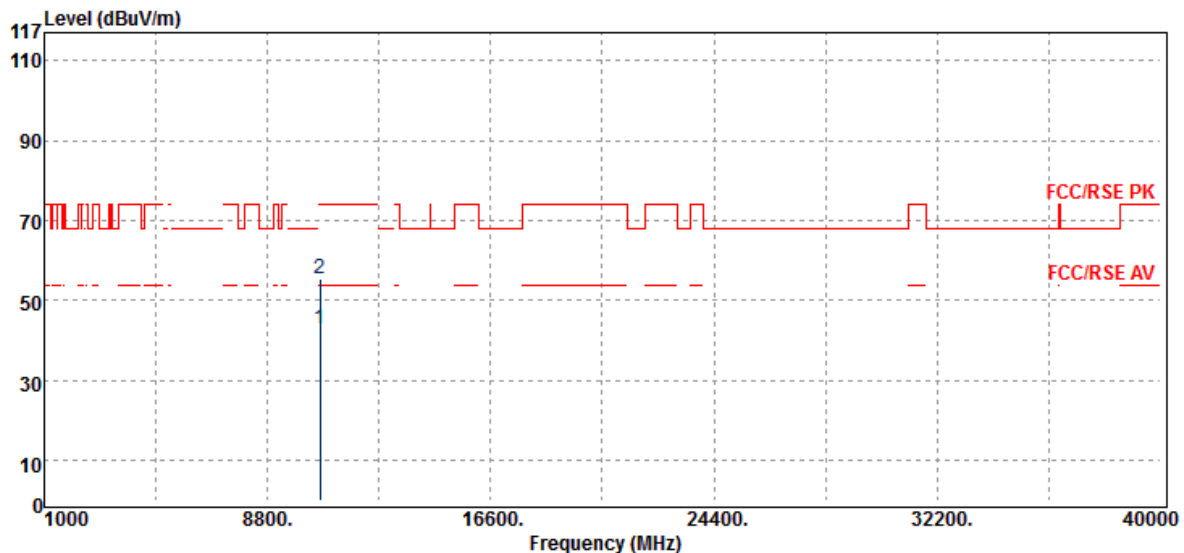
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Member of SGS Group

Operation Band :802.11aB2
Fundamental Frequency :5320 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10640.00	Average	21.86	21.24	43.10	54.00	-10.90
10640.00	Peak	34.03	21.24	55.27	74.00	-18.73

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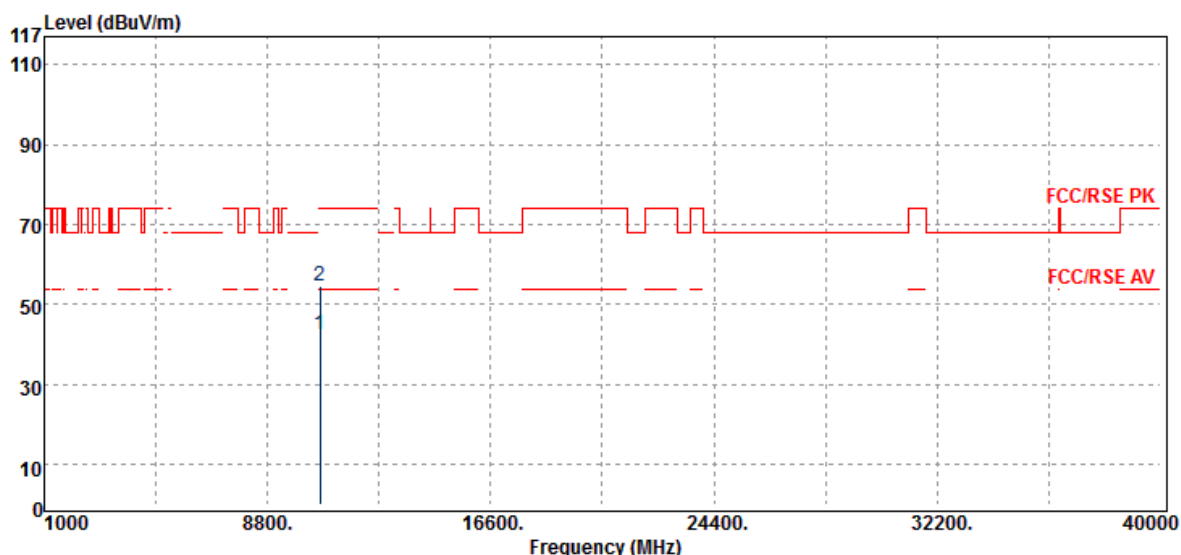
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Operation Band :802.11aB2
 Fundamental Frequency :5320 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10640.00	Average	21.93	20.44	42.37	54.00	-11.63
10640.00	Peak	34.03	20.44	54.47	74.00	-19.53

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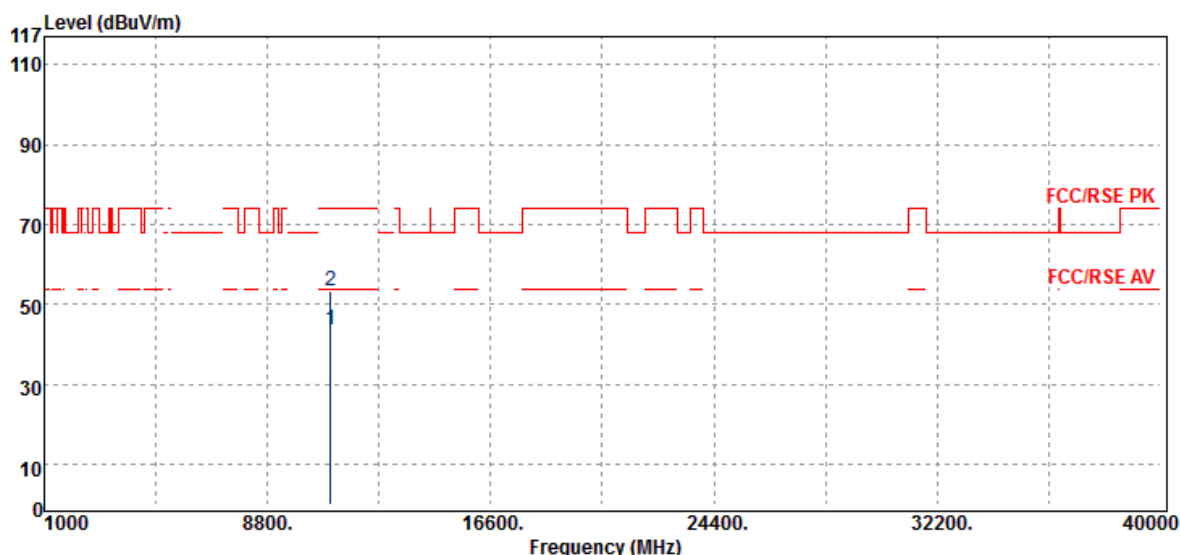
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Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Band	:802.11aB3	Test Date	:2018-08-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11000.00	Average	21.45	22.17	43.62	54.00	-10.38
11000.00	Peak	31.32	22.17	53.49	74.00	-20.51

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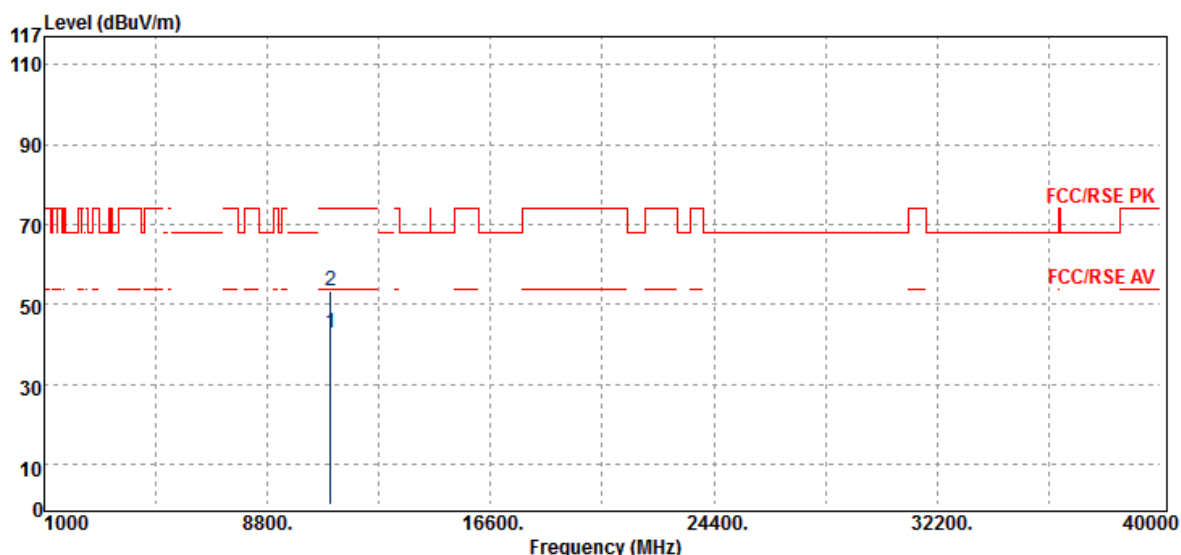
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Operation Band :802.11aB3
Fundamental Frequency :5500 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11000.00	Average	21.65	21.37	43.02	54.00	-10.98
11000.00	Peak	32.07	21.37	53.44	74.00	-20.56

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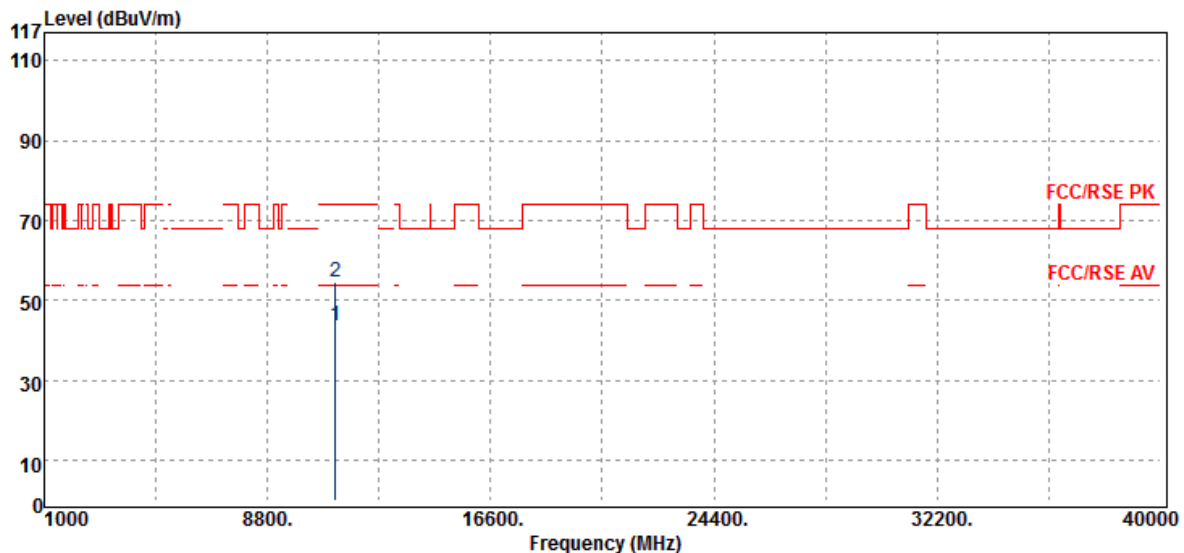
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Operation Band :802.11aB3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11160.00	Average	21.46	22.31	43.77	54.00	-10.23
11160.00	Peak	32.49	22.31	54.80	74.00	-19.20

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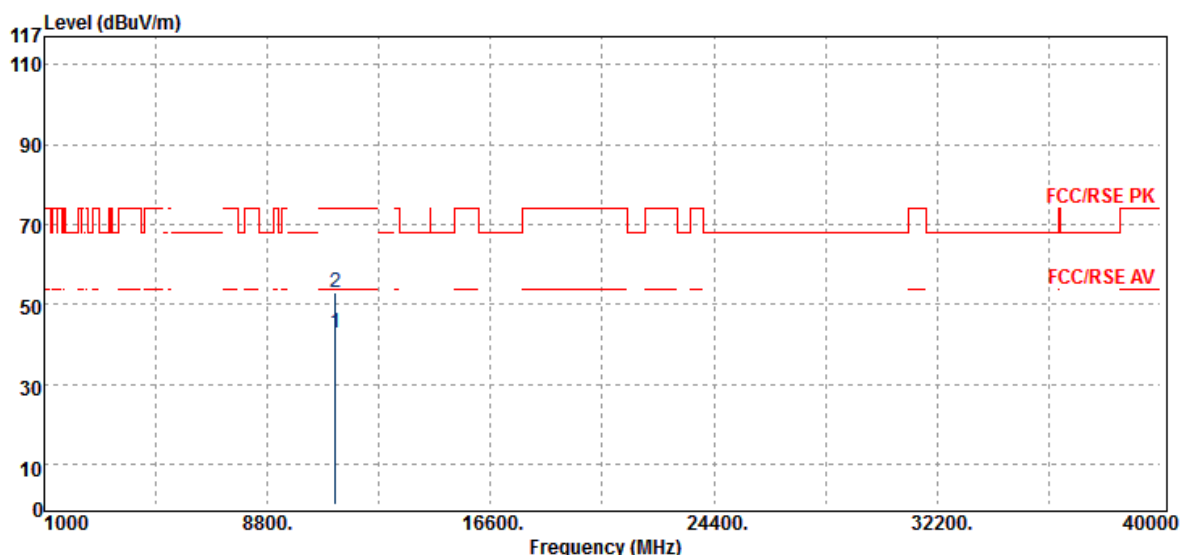
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Operation Band :802.11aB3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11160.00	Average	21.56	21.51	43.07	54.00	-10.93
11160.00	Peak	31.65	21.51	53.16	74.00	-20.84

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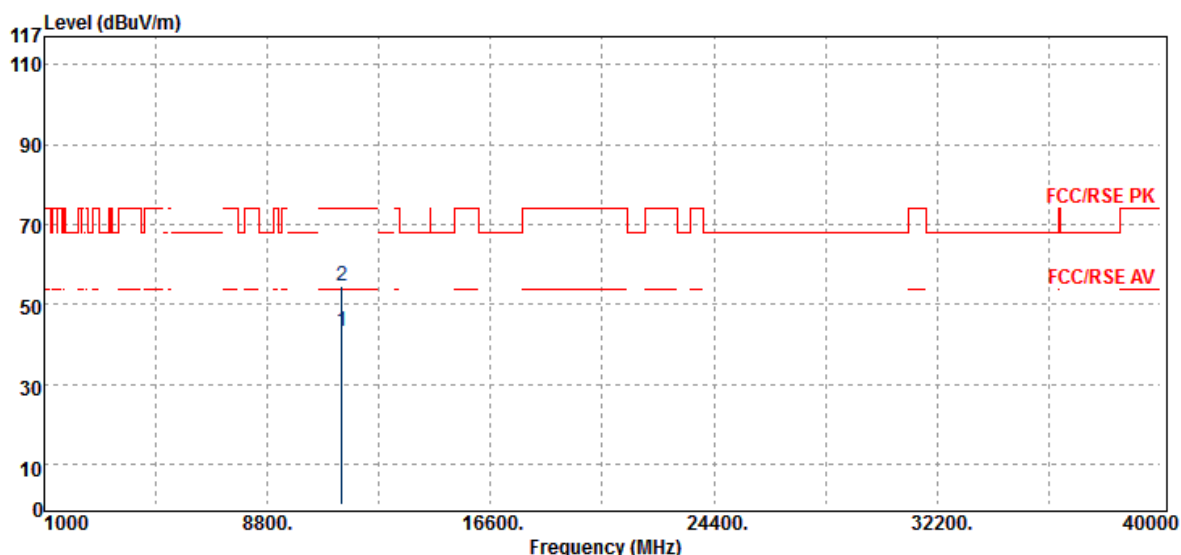
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Operation Band :802.11aB3
Fundamental Frequency :5700 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11400.00	Average	20.99	22.42	43.41	54.00	-10.59
11400.00	Peak	32.21	22.42	54.63	74.00	-19.37

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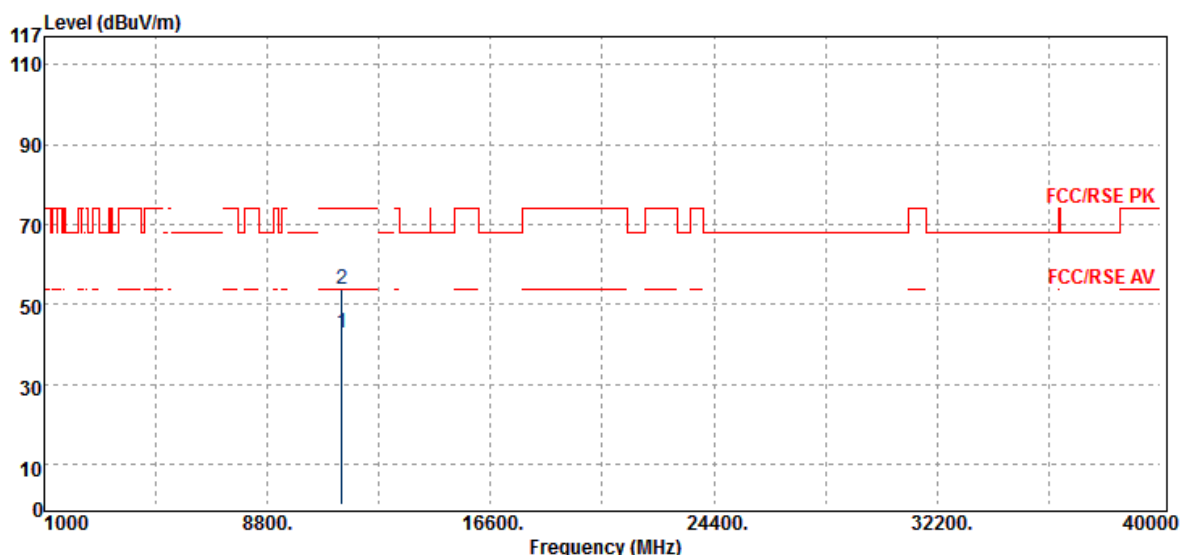
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Operation Band :802.11aB3
Fundamental Frequency :5700 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11400.00	Average	21.21	21.62	42.83	54.00	-11.17
11400.00	Peak	32.32	21.62	53.94	74.00	-20.06

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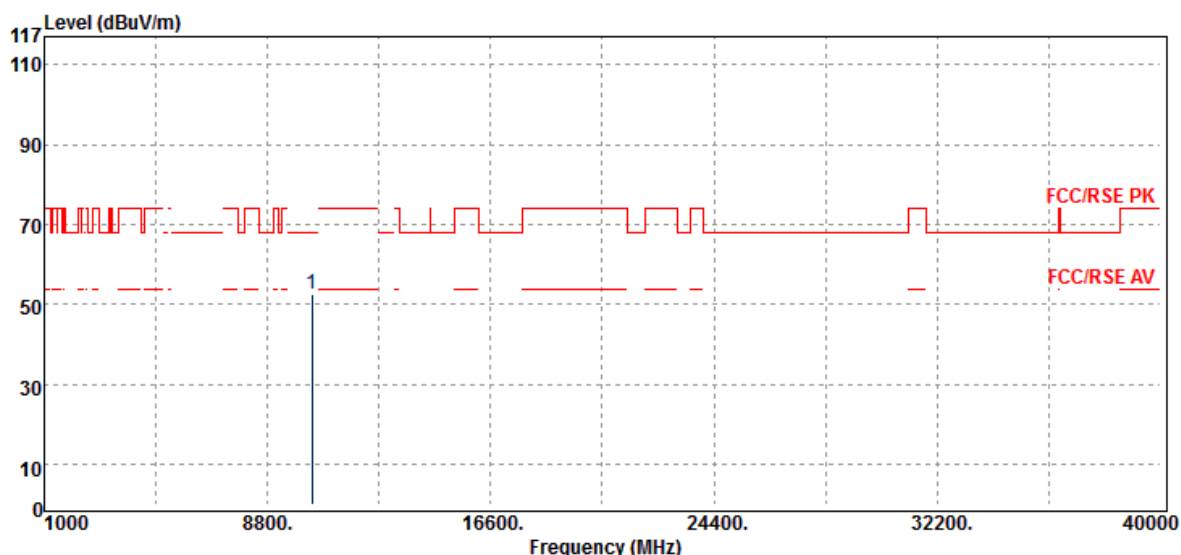
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Band	:802.11n20B1	Test Date	:2018-08-16
Fundamental Frequency	:5180 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10360.00	Peak	32.22	20.41	52.63	68.20	-15.57

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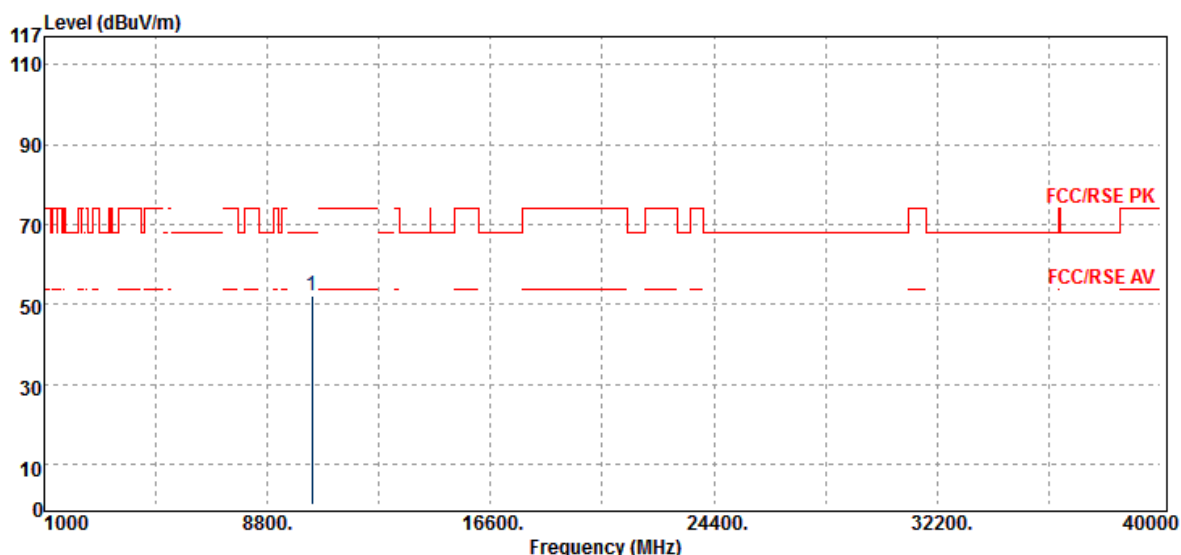
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Operation Band :802.11n20B1
Fundamental Frequency :5180 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



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	32.54	19.71	52.25	68.20	-15.95

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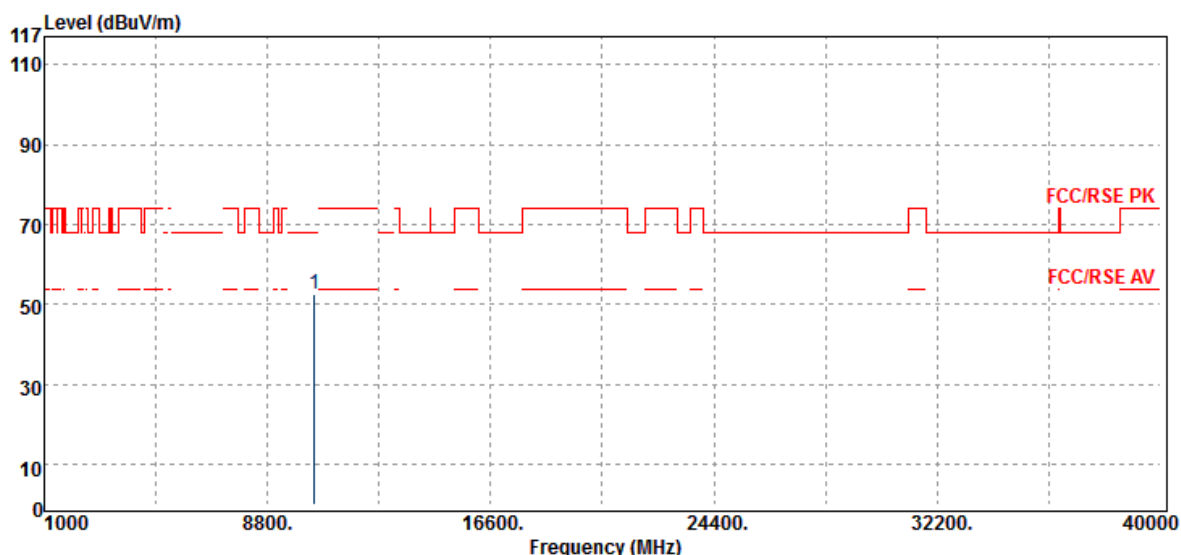
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Operation Band :802.11n20B1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10440.00	Peak	31.81	20.75	52.56	68.20	-15.64

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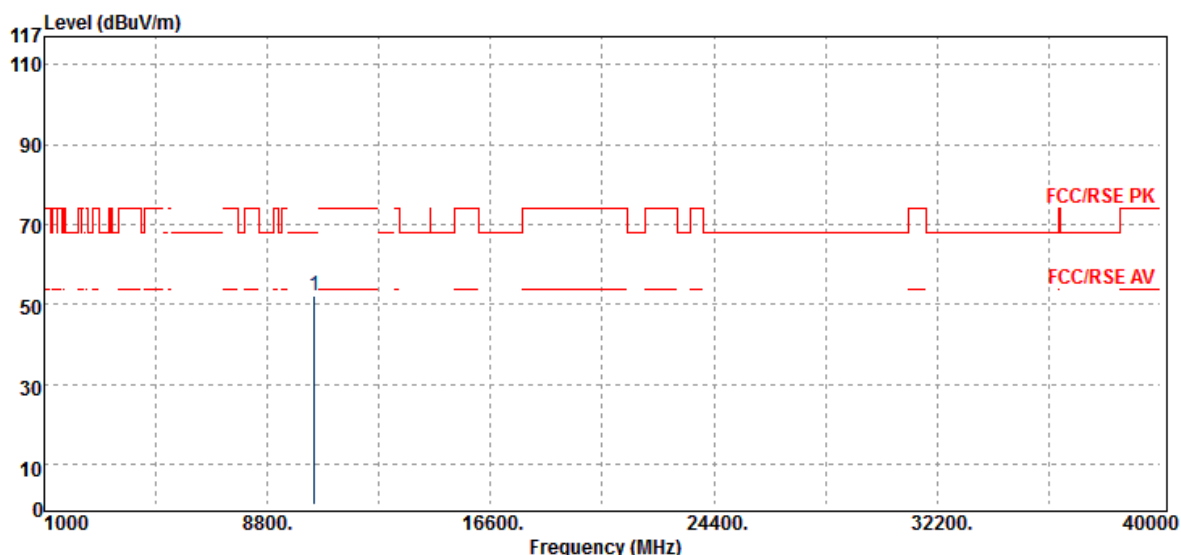
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Member of SGS Group

Operation Band :802.11n20B1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10440.00	Peak	32.32	20.05	52.37	68.20	-15.83

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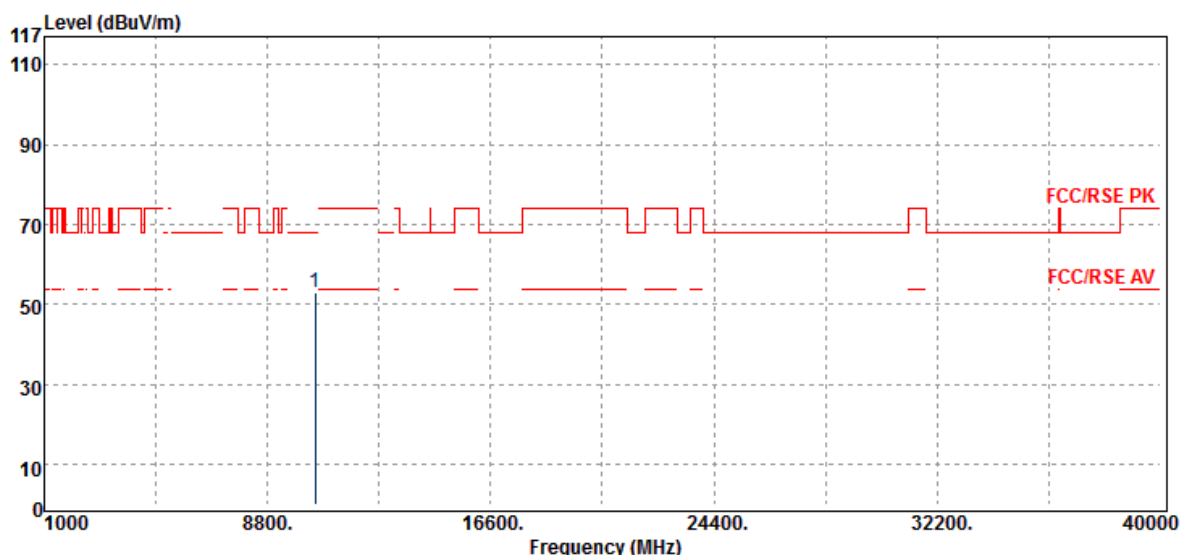
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Member of SGS Group

Operation Band :802.11n20B1
Fundamental Frequency :5240 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10480.00	Peak	32.21	20.79	53.00	68.20	-15.20

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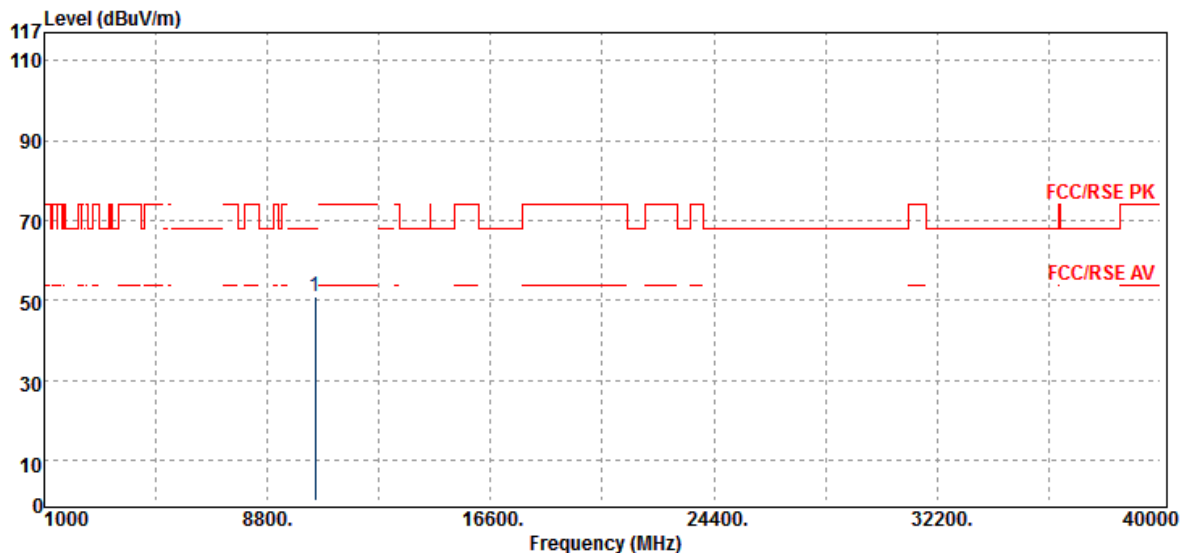
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Operation Band :802.11n20B1
Fundamental Frequency :5240 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10480.00	Peak	31.08	20.07	51.15	68.20	-17.05

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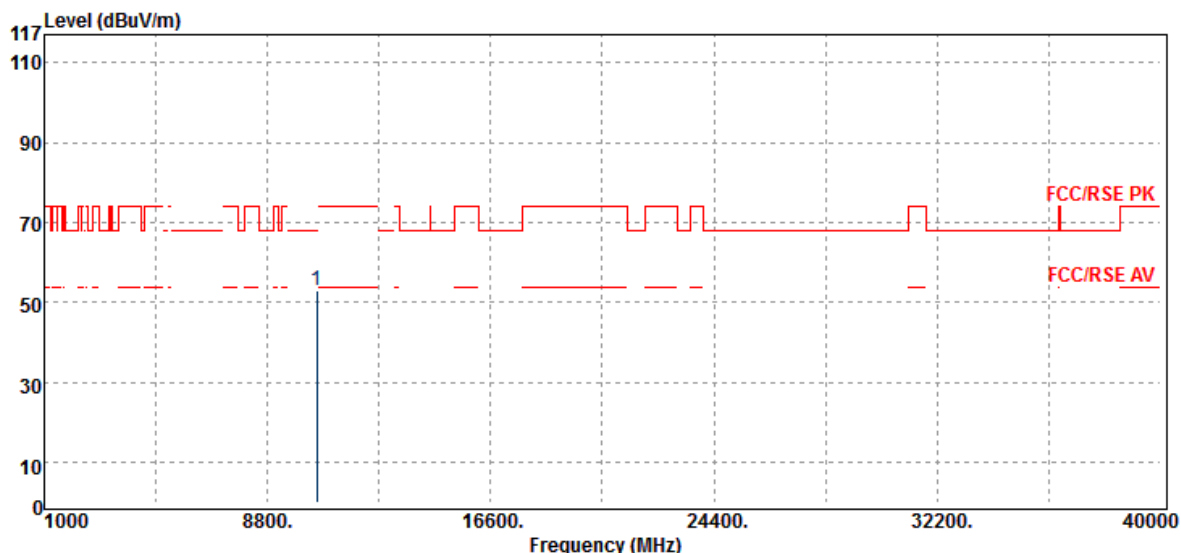
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

Operation Band	:802.11n20B2	Test Date	:2018-08-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10520.00	Peak	32.45	20.78	53.23	68.20	-14.97

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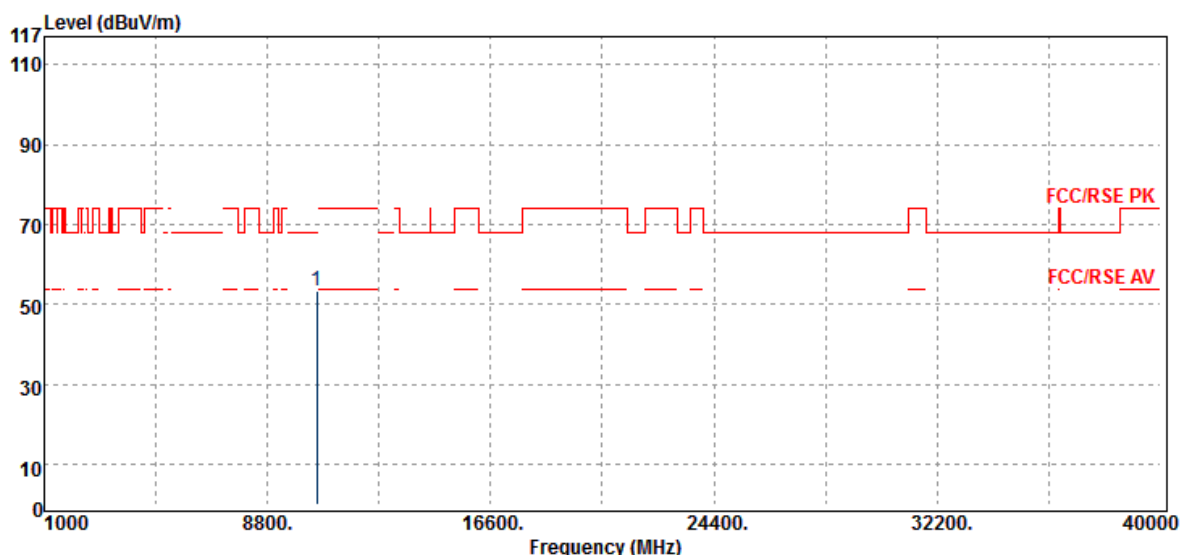
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Operation Band :802.11n20B2
Fundamental Frequency :5260 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10520.00	Peak	33.36	20.00	53.36	68.20	-14.84

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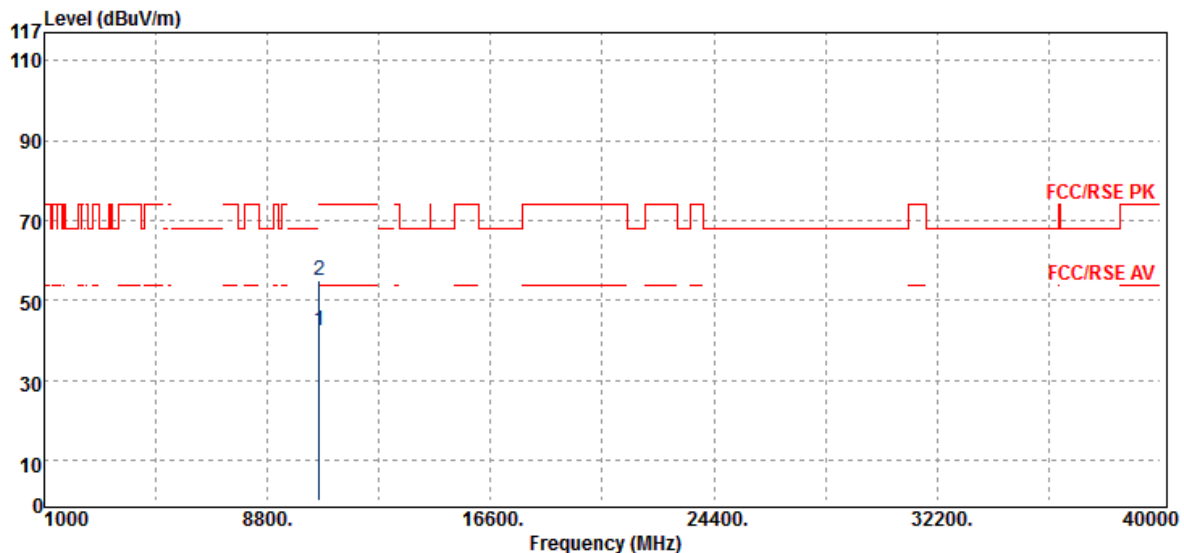
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Operation Band :802.11n20B2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10600.00	Average	21.22	21.18	42.40	54.00	-11.60
10600.00	Peak	33.77	21.18	54.95	74.00	-19.05

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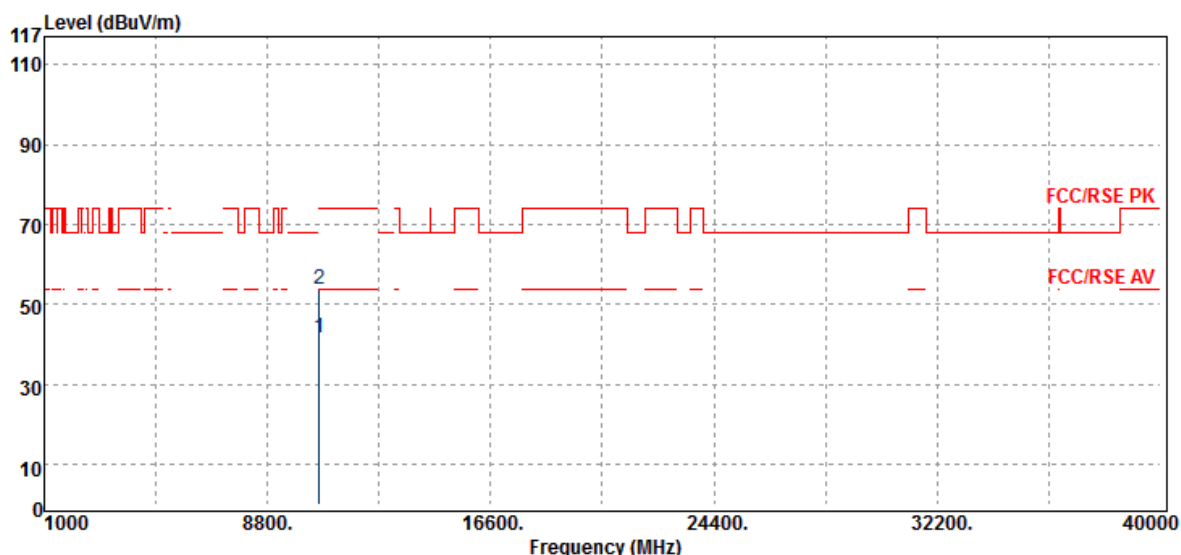
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Operation Band :802.11n20B2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10600.00	Average	21.35	20.38	41.73	54.00	-12.27
10600.00	Peak	33.34	20.38	53.72	74.00	-20.28

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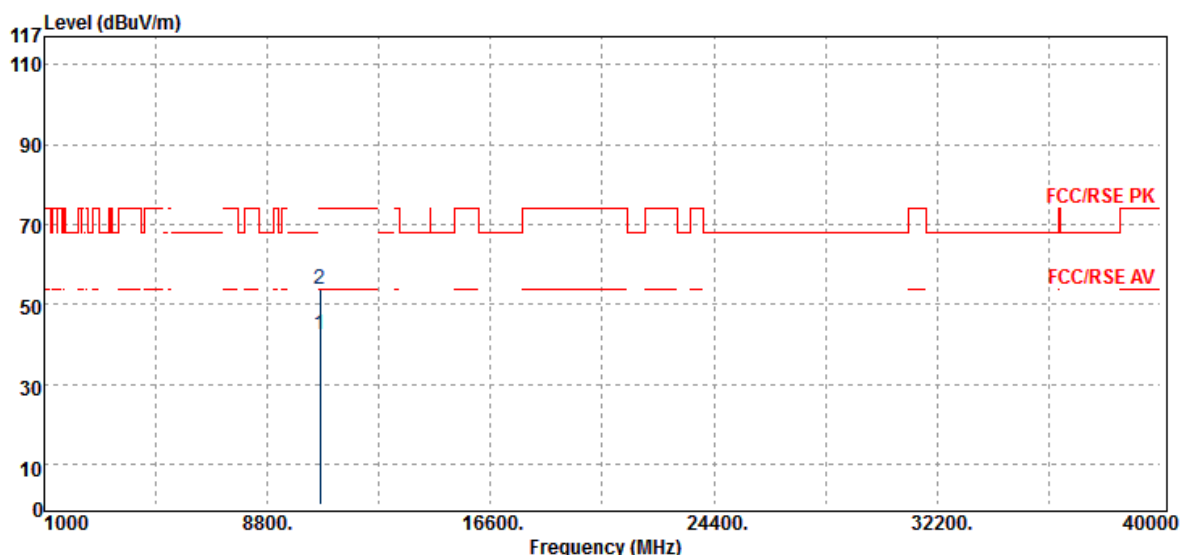
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Operation Band :802.11n20B2
Fundamental Frequency :5320 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10640.00	Average	21.42	21.24	42.66	54.00	-11.34
10640.00	Peak	32.76	21.24	54.00	74.00	-20.00

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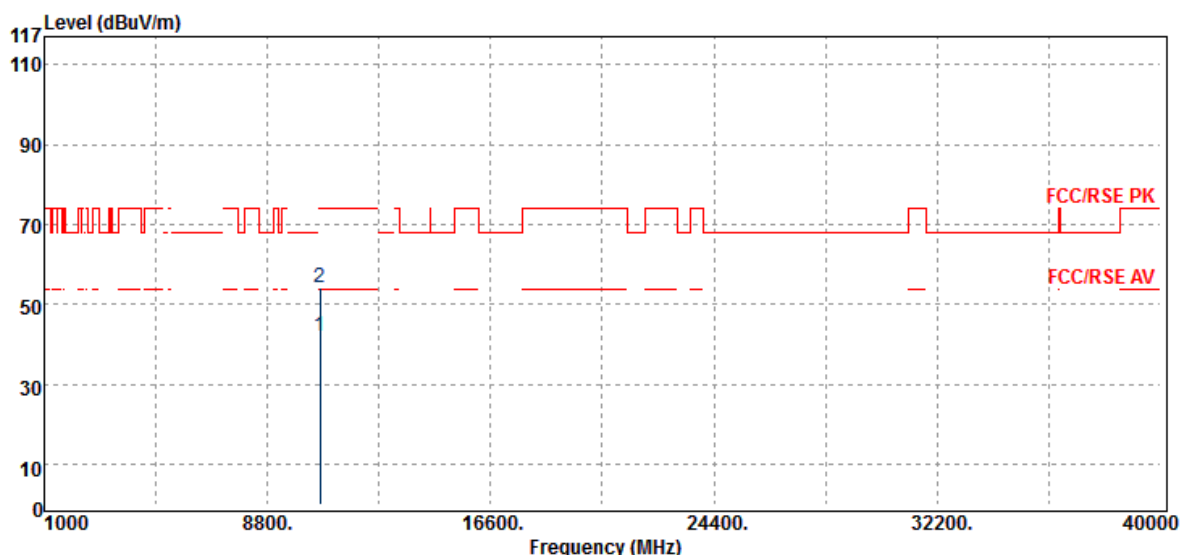
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Operation Band :802.11n20B2
Fundamental Frequency :5320 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10640.00	Average	21.68	20.44	42.12	54.00	-11.88
10640.00	Peak	33.73	20.44	54.17	74.00	-19.83

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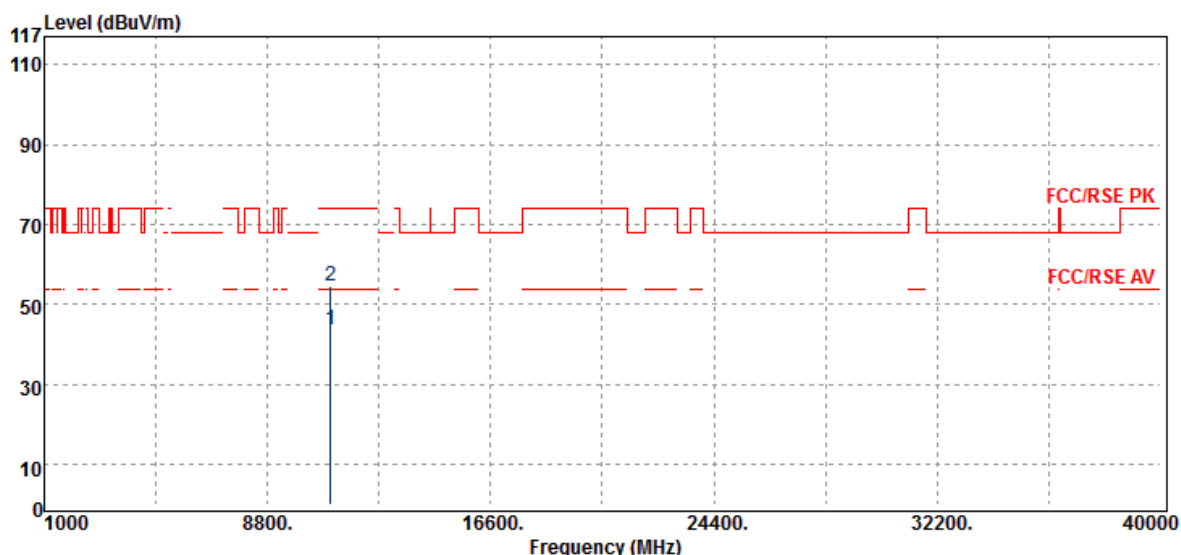
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

Operation Band	:802.11n20B3	Test Date	:2018-08-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11000.00	Average	21.44	22.17	43.61	54.00	-10.39
11000.00	Peak	32.38	22.17	54.55	74.00	-19.45

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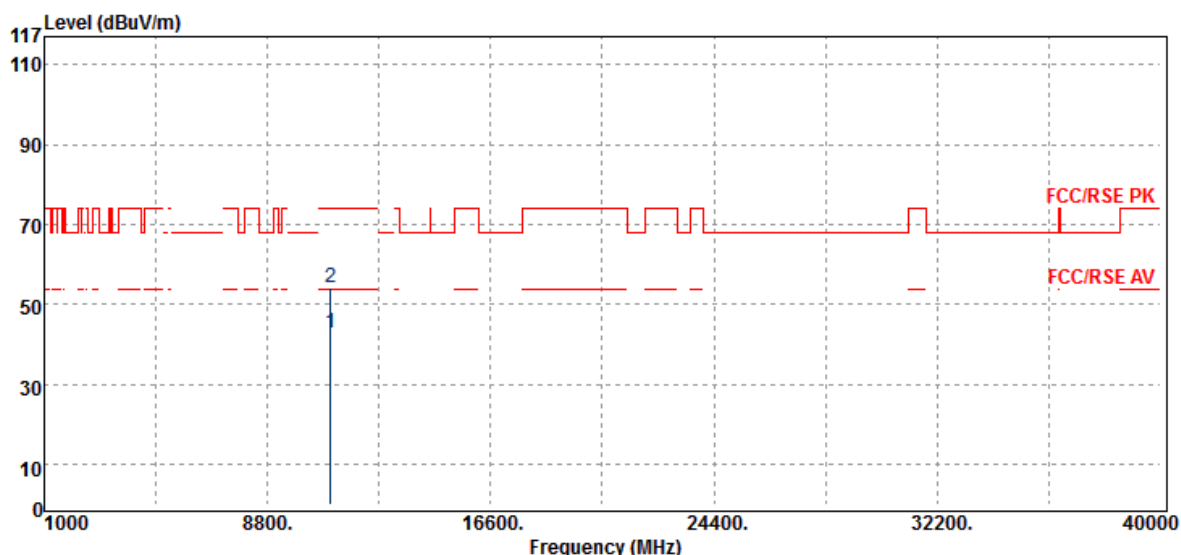
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Operation Band :802.11n20B3
Fundamental Frequency :5500 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11000.00	Average	21.54	21.37	42.91	54.00	-11.09
11000.00	Peak	32.93	21.37	54.30	74.00	-19.70

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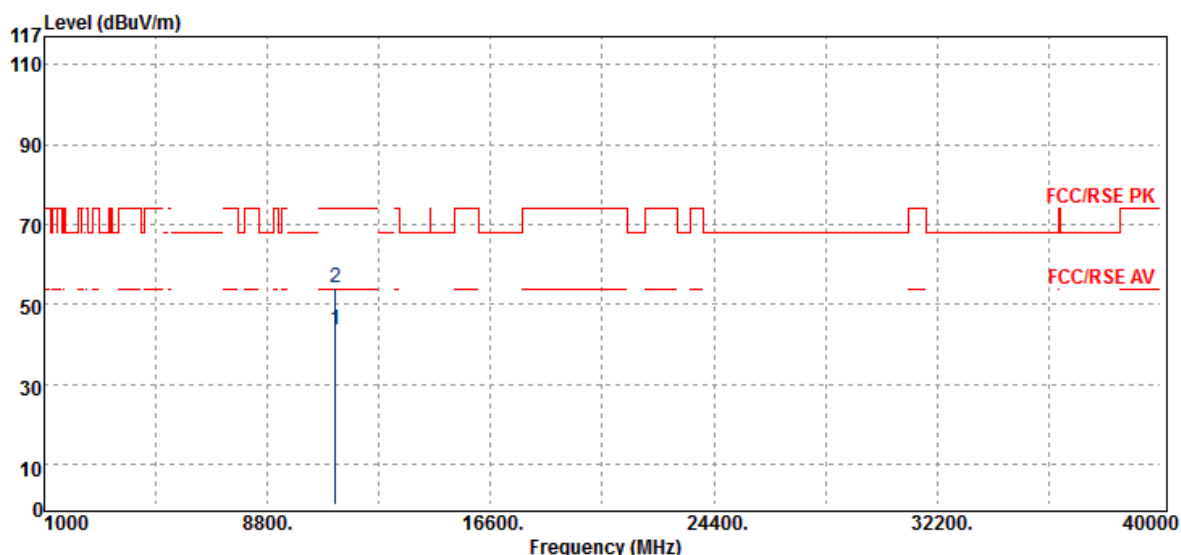
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Member of SGS Group

Operation Band :802.11n20B3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11160.00	Average	21.35	22.31	43.66	54.00	-10.34
11160.00	Peak	32.07	22.31	54.38	74.00	-19.62

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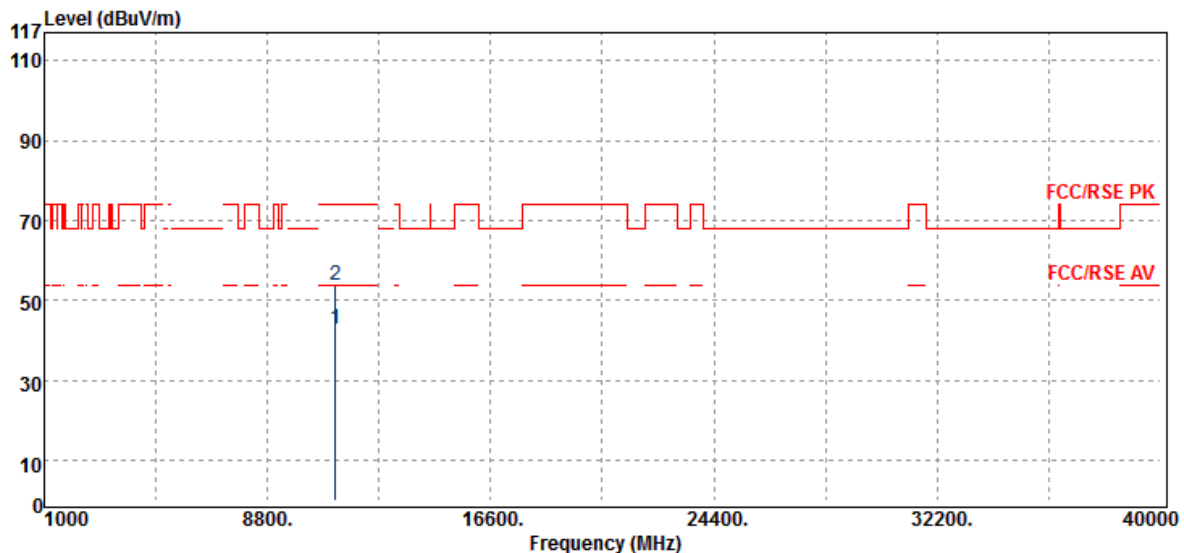
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Operation Band :802.11n20B3
 Fundamental Frequency :5580 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11160.00	Average	21.48	21.51	42.99	54.00	-11.01
11160.00	Peak	32.14	21.51	53.65	74.00	-20.35

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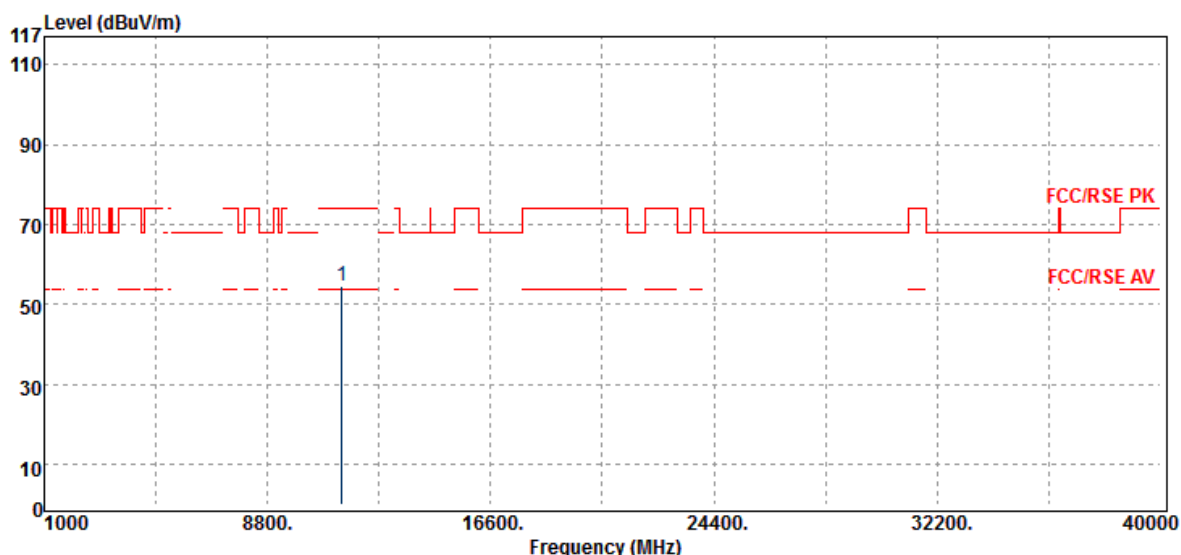
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Member of SGS Group

Operation Band :802.11n20B3
Fundamental Frequency :5700 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11400.00	Peak	32.15	22.42	54.57	74.00	-19.43

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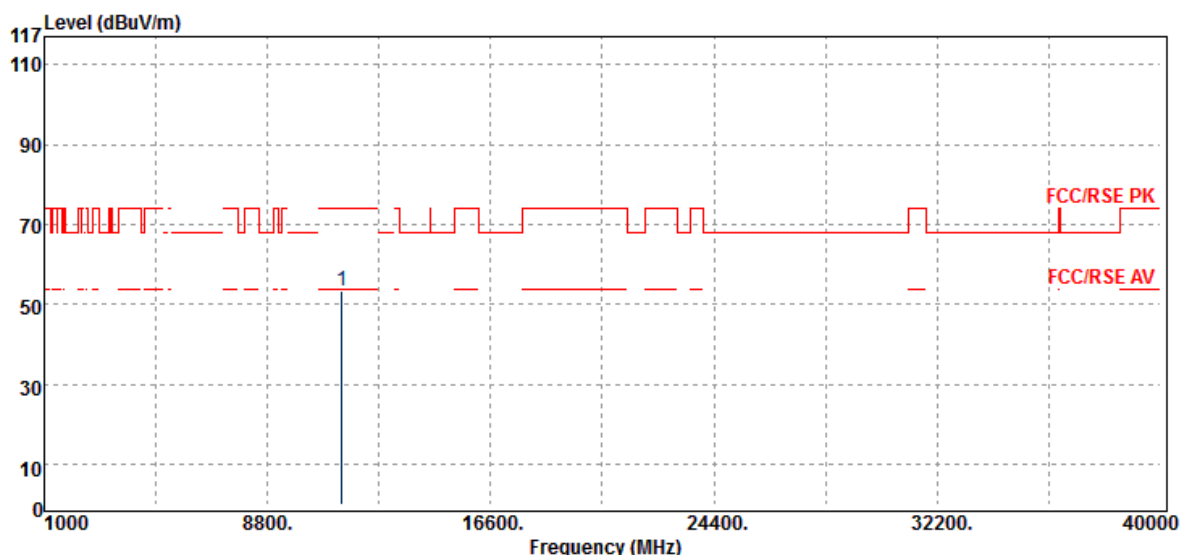
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Operation Band :802.11n20B3
Fundamental Frequency :5700 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11400.00	Peak	31.97	21.62	53.59	74.00	-20.41

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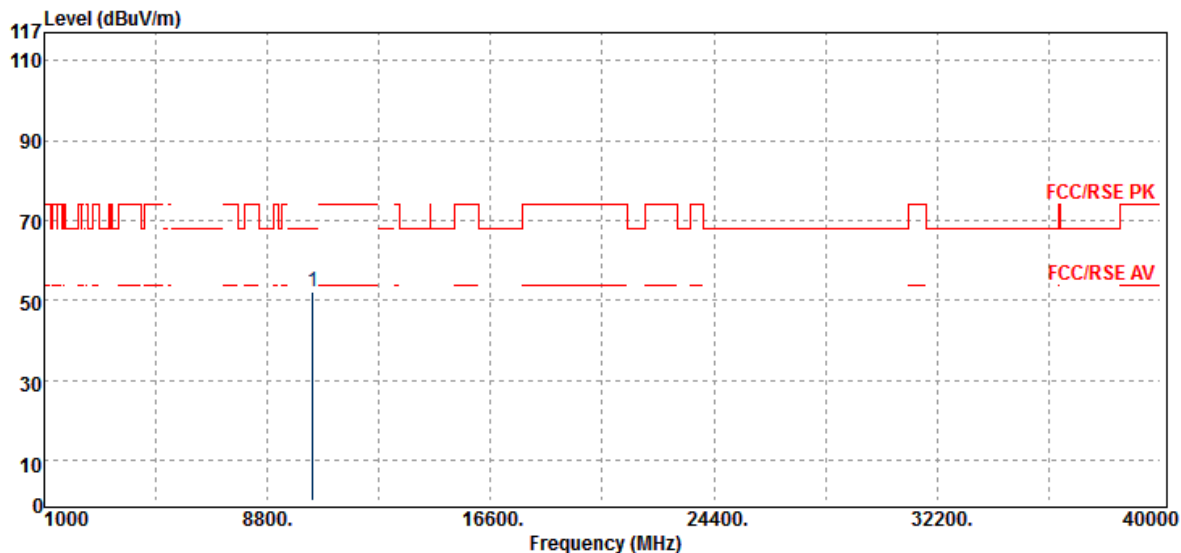
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Band	:802.11n40B1	Test Date	:2018-08-16
Fundamental Frequency	:5190 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10380.00	Peak	31.55	20.48	52.03	68.20	-16.17

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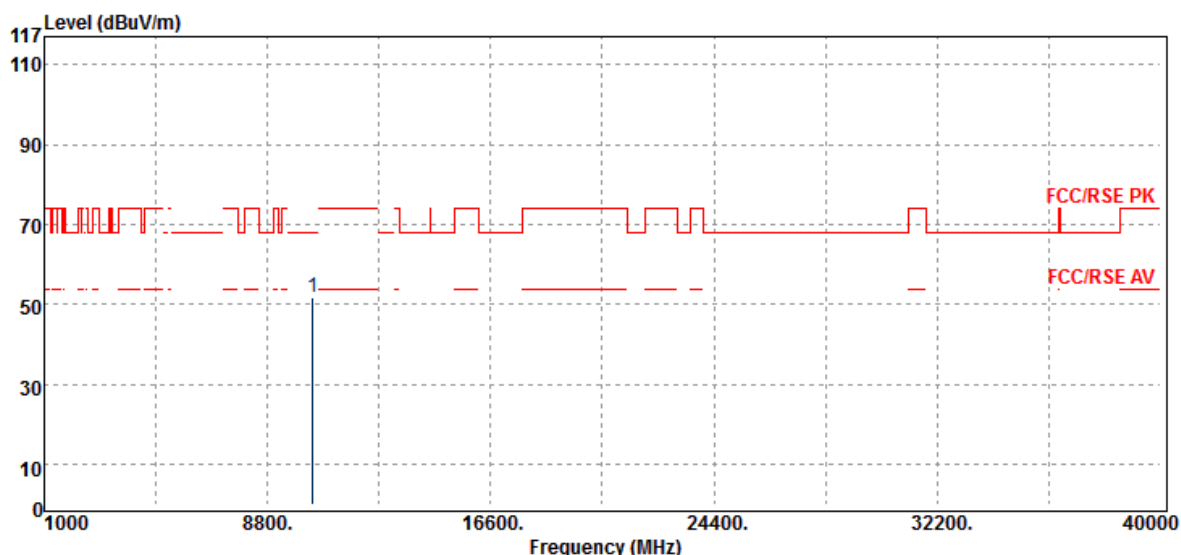
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Operation Band :802.11n40B1
 Fundamental Frequency :5190 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



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	31.94	19.78	51.72	68.20	-16.48

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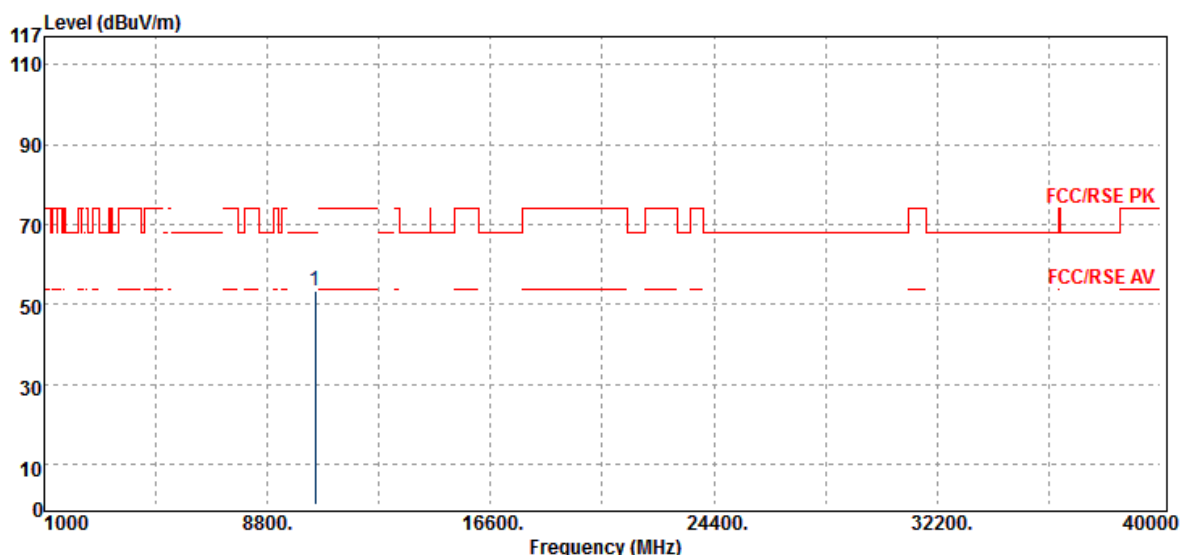
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Operation Band :802.11n40B1
Fundamental Frequency :5230 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10460.00	Peak	32.52	20.77	53.29	68.20	-14.91

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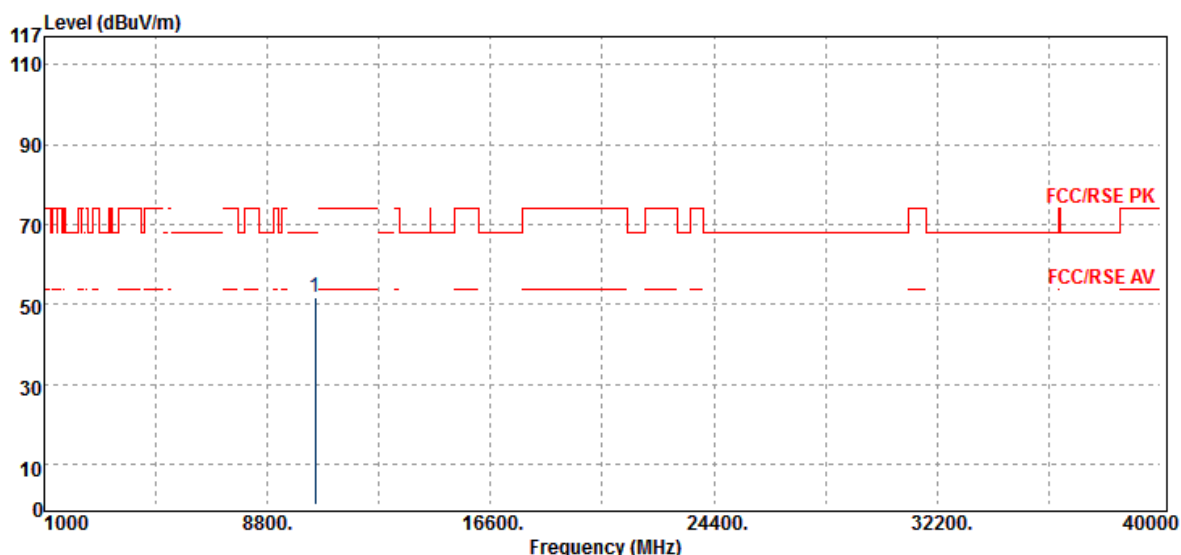
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Member of SGS Group

Operation Band :802.11n40B1
Fundamental Frequency :5230 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



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	31.87	20.07	51.94	68.20	-16.26

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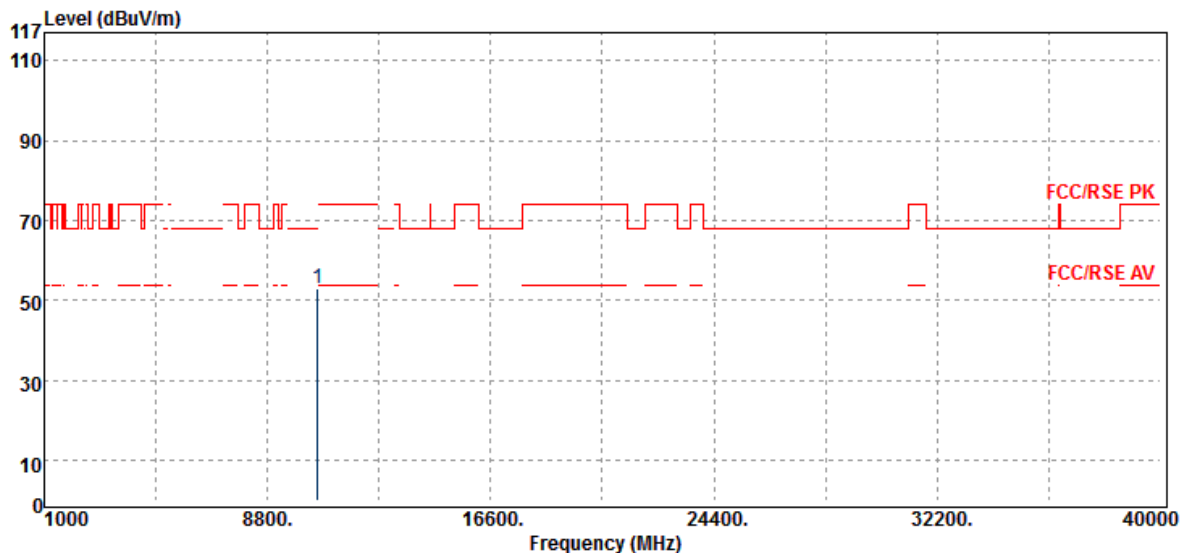
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

Operation Band	:802.11n40B2	Test Date	:2018-08-16
Fundamental Frequency	:5270 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10540.00	Peak	32.13	20.82	52.95	68.20	-15.25

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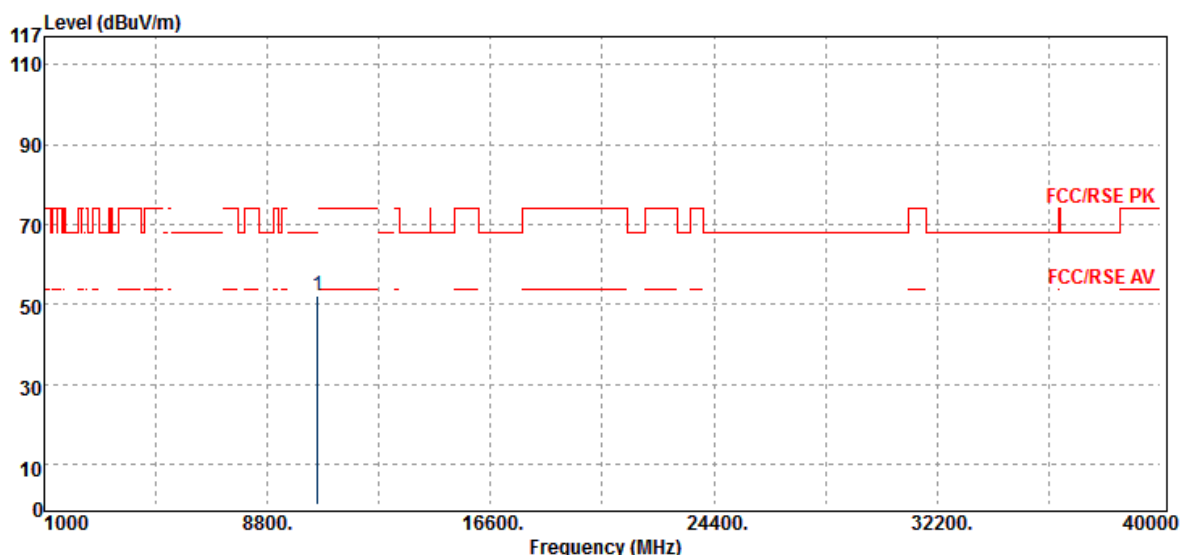
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Operation Band :802.11n40B2
Fundamental Frequency :5270 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10540.00	Peak	32.07	20.02	52.09	68.20	-16.11

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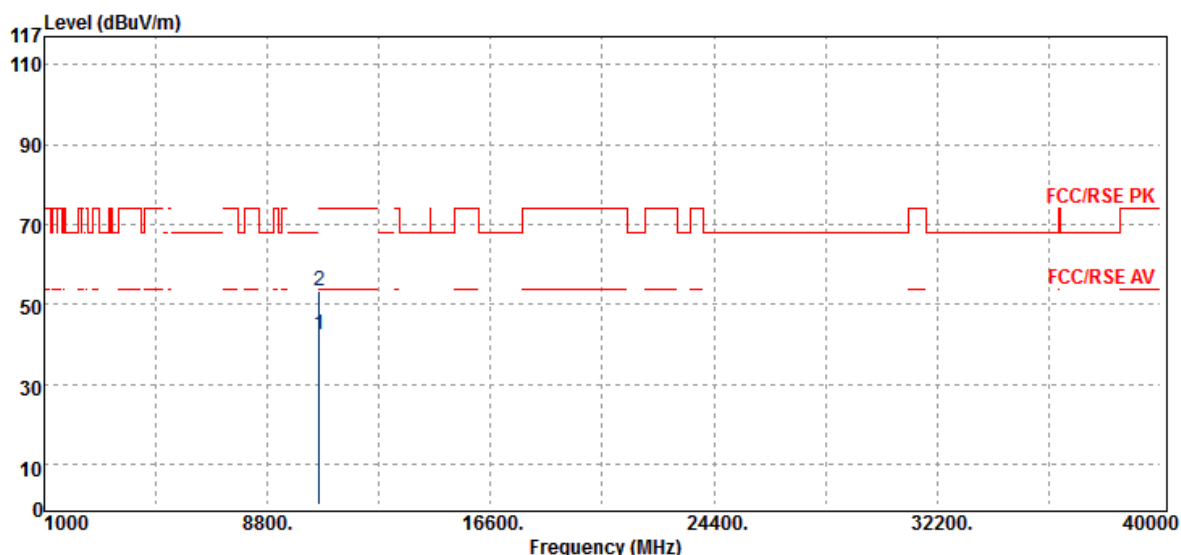
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Operation Band :802.11n40B2
Fundamental Frequency :5310 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10620.00	Average	21.28	21.21	42.49	54.00	-11.51
10620.00	Peak	32.13	21.21	53.34	74.00	-20.66

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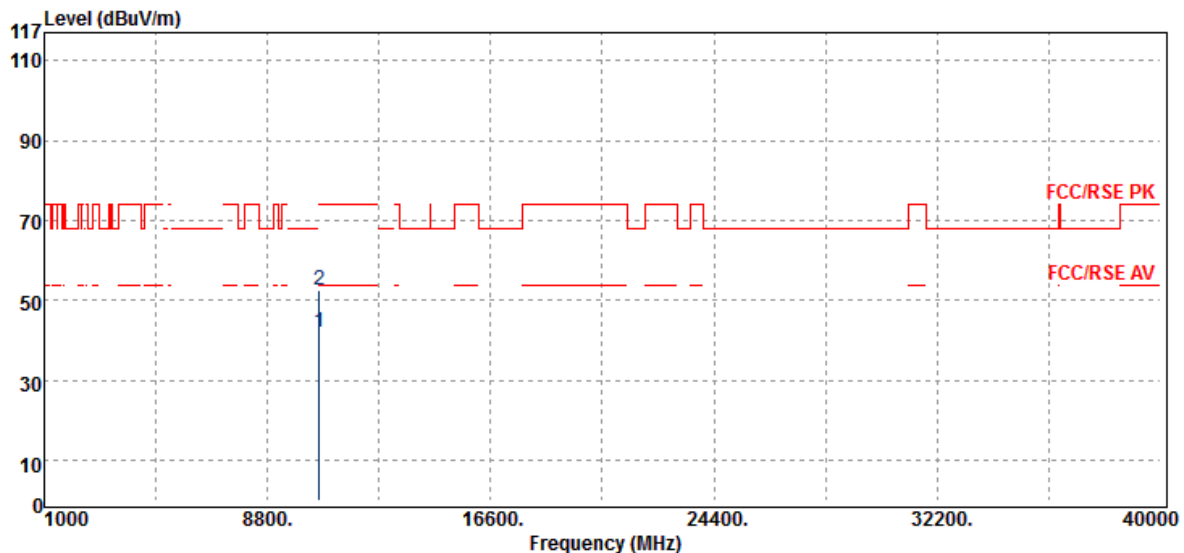
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Operation Band :802.11n40B2
Fundamental Frequency :5310 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10620.00	Average	21.49	20.41	41.90	54.00	-12.10
10620.00	Peak	32.06	20.41	52.47	74.00	-21.53

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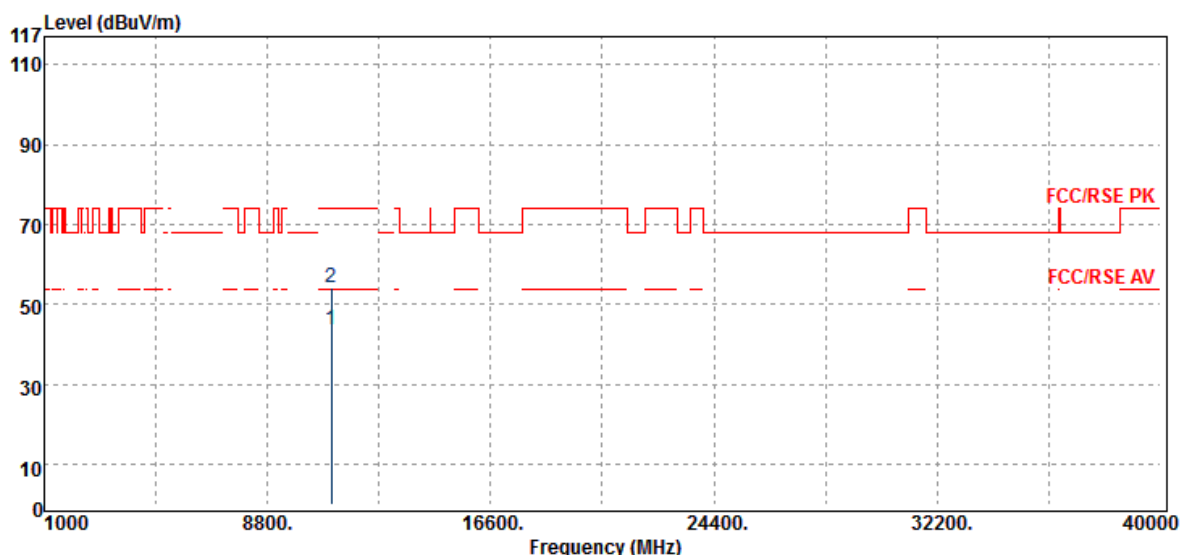
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

Operation Band	:802.11n40B3	Test Date	:2018-08-16
Fundamental Frequency	:5510 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11020.00	Average	21.30	22.28	43.58	54.00	-10.42
11020.00	Peak	31.97	22.28	54.25	74.00	-19.75

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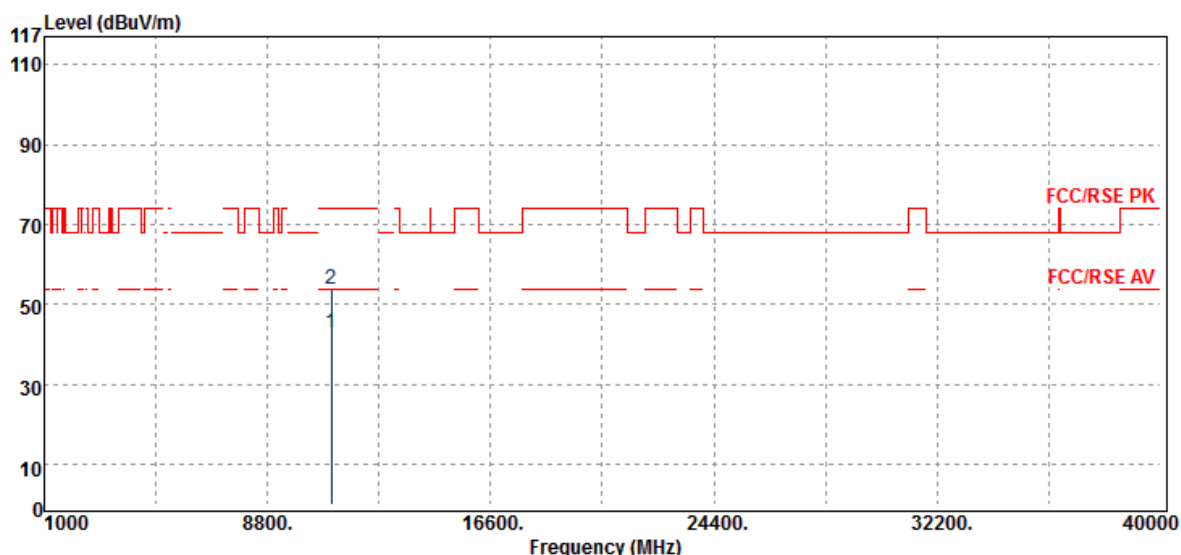
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Operation Band :802.11n40B3
Fundamental Frequency :5510 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11020.00	Average	21.41	21.46	42.87	54.00	-11.13
11020.00	Peak	32.47	21.46	53.93	74.00	-20.07

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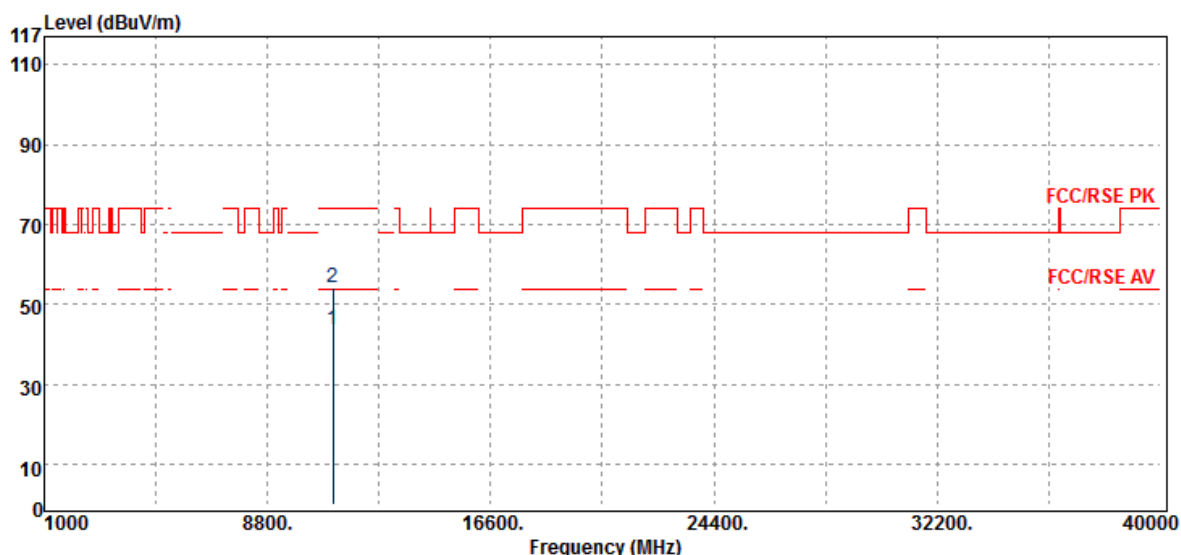
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Operation Band :802.11n40B3
 Fundamental Frequency :5550 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11100.00	Average	21.19	22.38	43.57	54.00	-10.43
11100.00	Peak	31.73	22.38	54.11	74.00	-19.89

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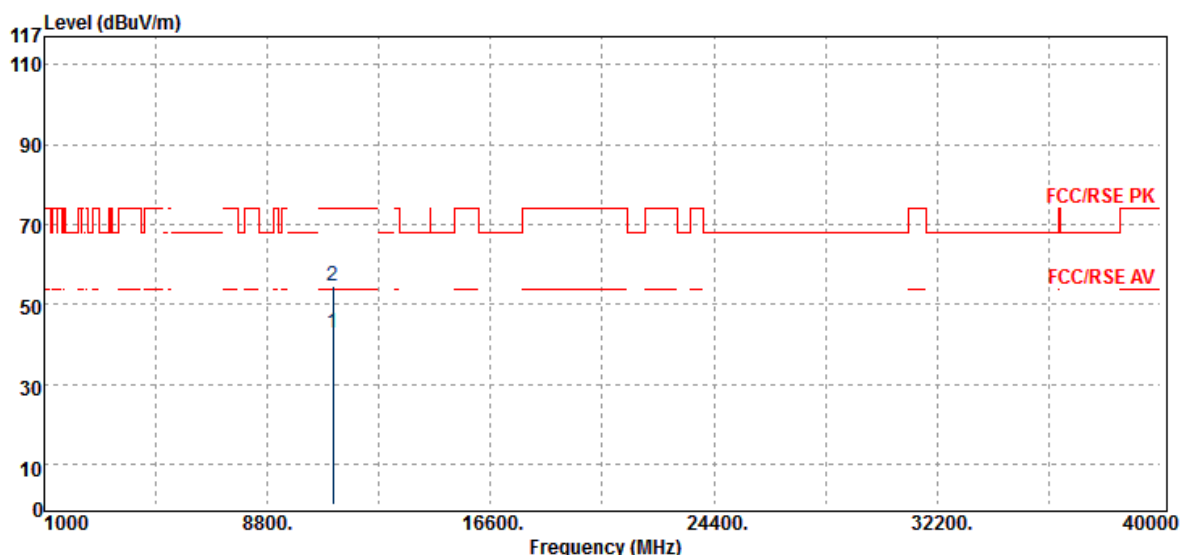
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Operation Band :802.11n40B3
Fundamental Frequency :5550 MHz
Operation Mode :Tx CH MID
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11100.00	Average	21.29	21.53	42.82	54.00	-11.18
11100.00	Peak	33.03	21.53	54.56	74.00	-19.44

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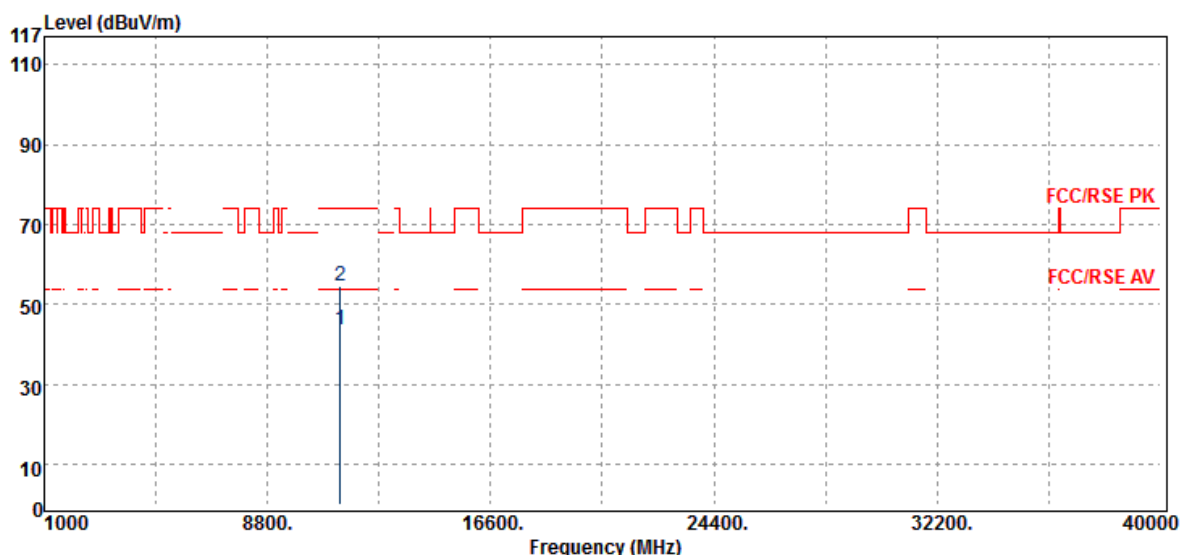
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Member of SGS Group

Operation Band :802.11n40B3
Fundamental Frequency :5670 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11340.00	Average	21.35	22.34	43.69	54.00	-10.31
11340.00	Peak	32.21	22.34	54.55	74.00	-19.45

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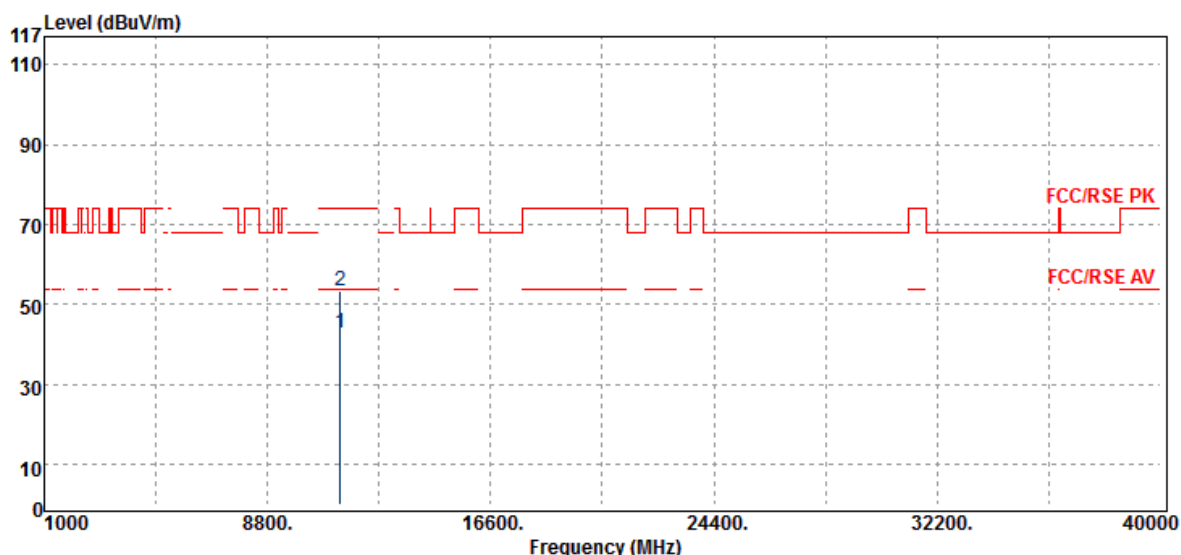
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Member of SGS Group

Operation Band :802.11n40B3
Fundamental Frequency :5670 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11340.00	Average	21.45	21.54	42.99	54.00	-11.01
11340.00	Peak	31.76	21.54	53.30	74.00	-20.70

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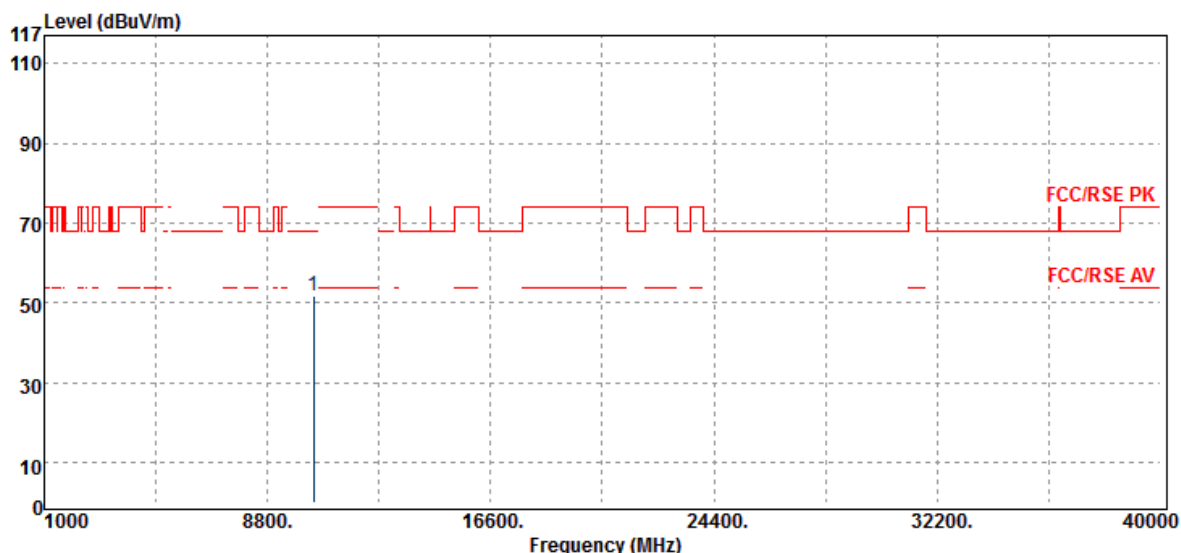
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Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5150~5250 MHz

Operation Band	:802.11ac80B1	Test Date	:2018-08-16
Fundamental Frequency	:5210 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



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	31.25	20.69	51.94	68.20	-16.26

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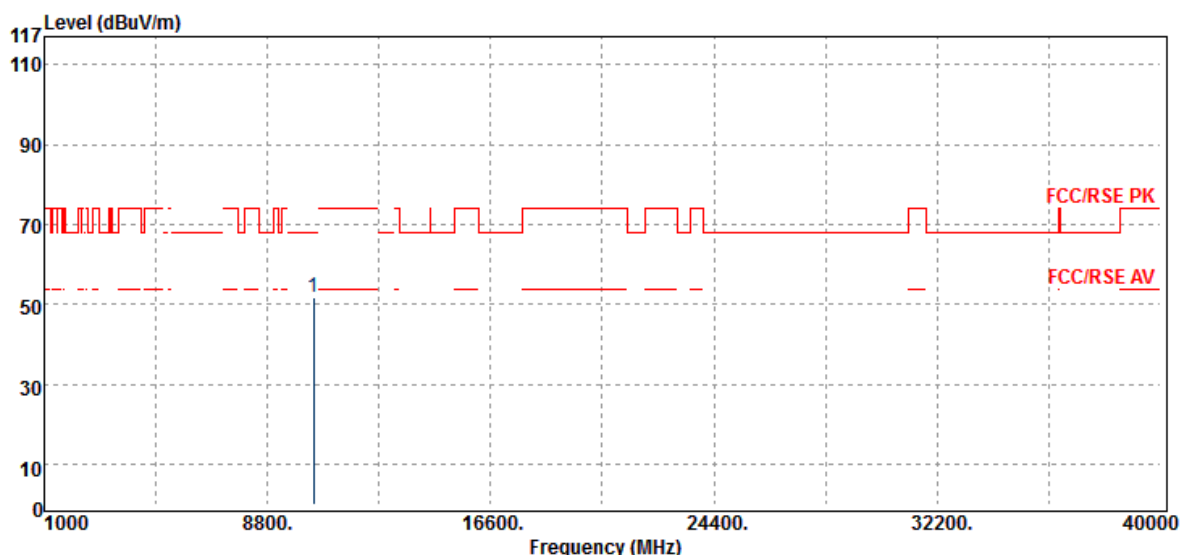
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Operation Band :802.11ac80B1
Fundamental Frequency :5210 MHz
Operation Mode :Tx CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



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	31.85	19.99	51.84	68.20	-16.36

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Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5250~5350 MHz

Operation Band :802.11ac80B2

Test Date :2018-08-16

Fundamental Frequency :5290 MHz

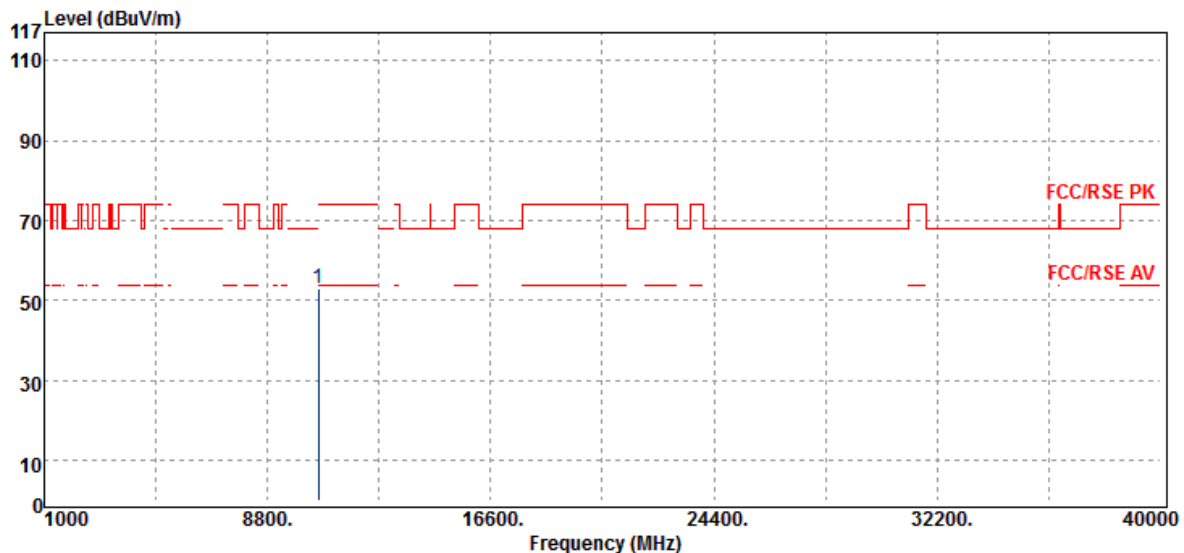
Temp./Humi. :21 deg_C / 62 RH

Operation Mode :Tx CH HIGH

Engineer :Tin

EUT Pol. :H Plane

Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dBuV	dB	dBuV/m	dBuV/m	dB
10580.00	Peak	32.05	21.03	53.08	68.20	-15.12

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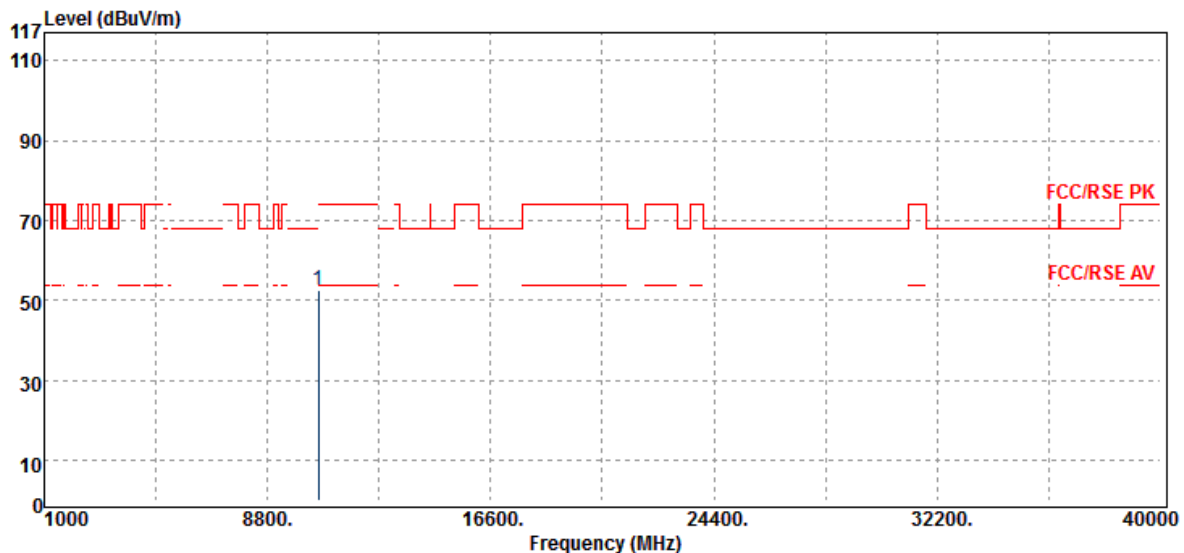
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Operation Band :802.11ac80B2
Fundamental Frequency :5290 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
10580.00	Peak	32.57	20.23	52.80	68.20	-15.40

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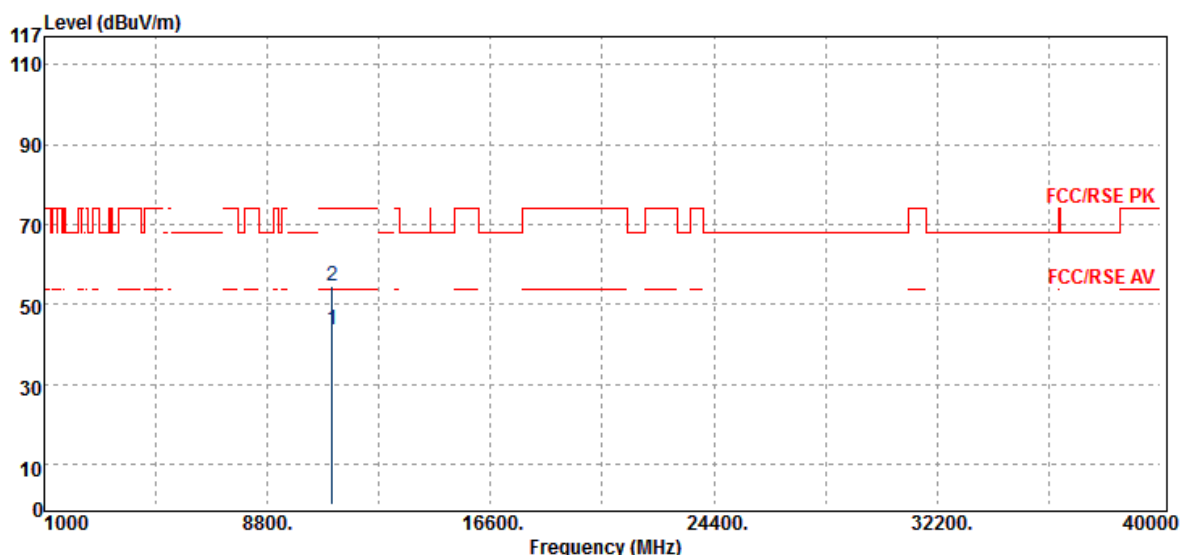
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Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5470~5725 MHz

Operation Band	:802.11ac80B3	Test Date	:2018-08-16
Fundamental Frequency	:5530 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11060.00	Average	21.37	22.41	43.78	54.00	-10.22
11060.00	Peak	32.23	22.41	54.64	74.00	-19.36

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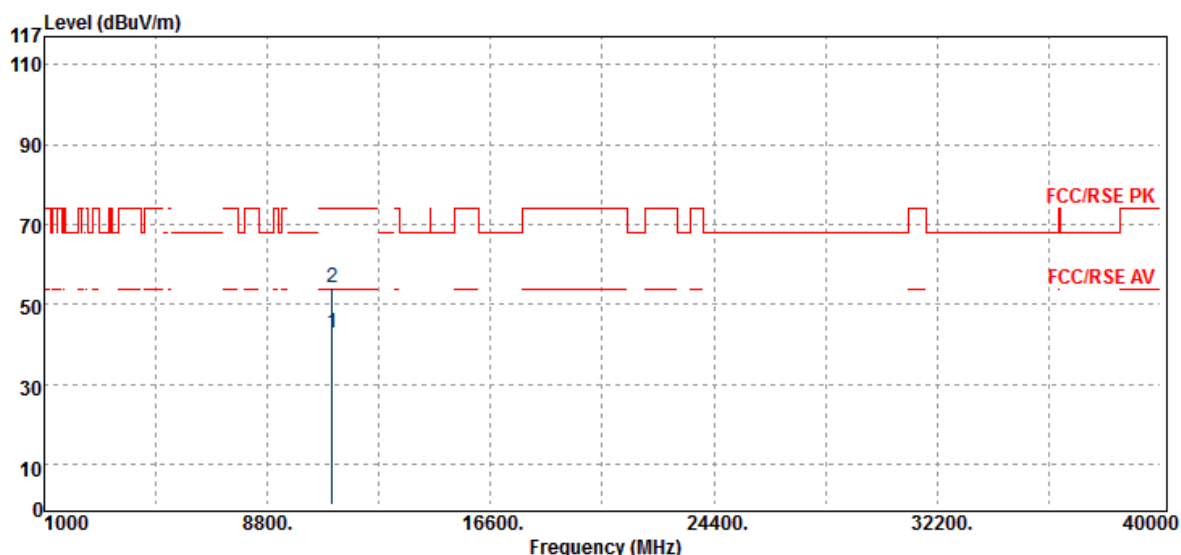
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Operation Band :802.11ac80B3
 Fundamental Frequency :5530 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11060.00	Average	21.40	21.53	42.93	54.00	-11.07
11060.00	Peak	32.83	21.53	54.36	74.00	-19.64

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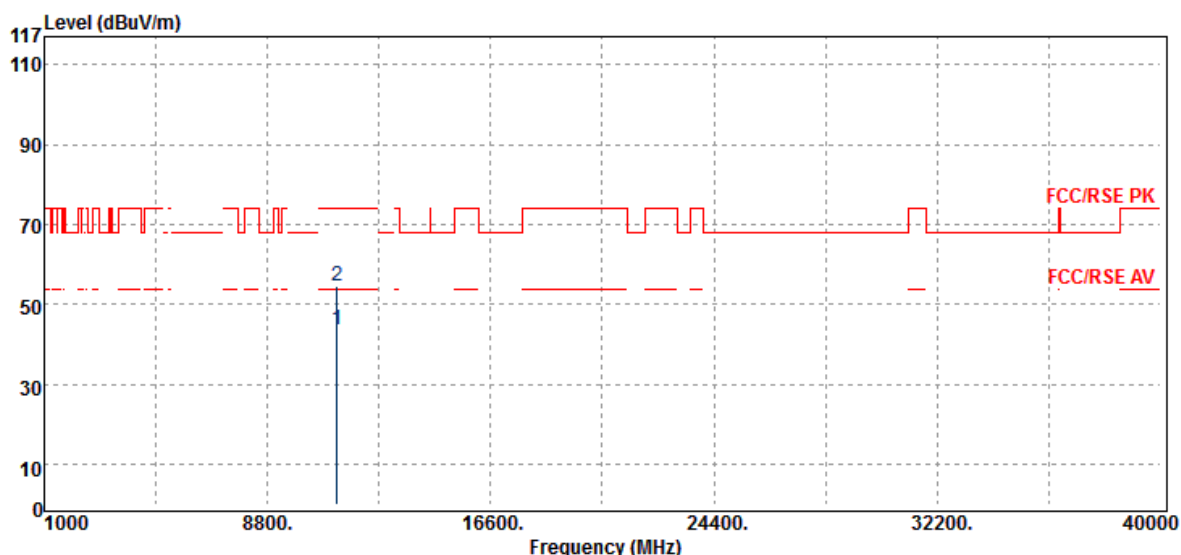
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Member of SGS Group

Operation Band :802.11ac80B3
 Fundamental Frequency :5610 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :21 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11220.00	Average	21.29	22.36	43.65	54.00	-10.35
11220.00	Peak	32.28	22.36	54.64	74.00	-19.36

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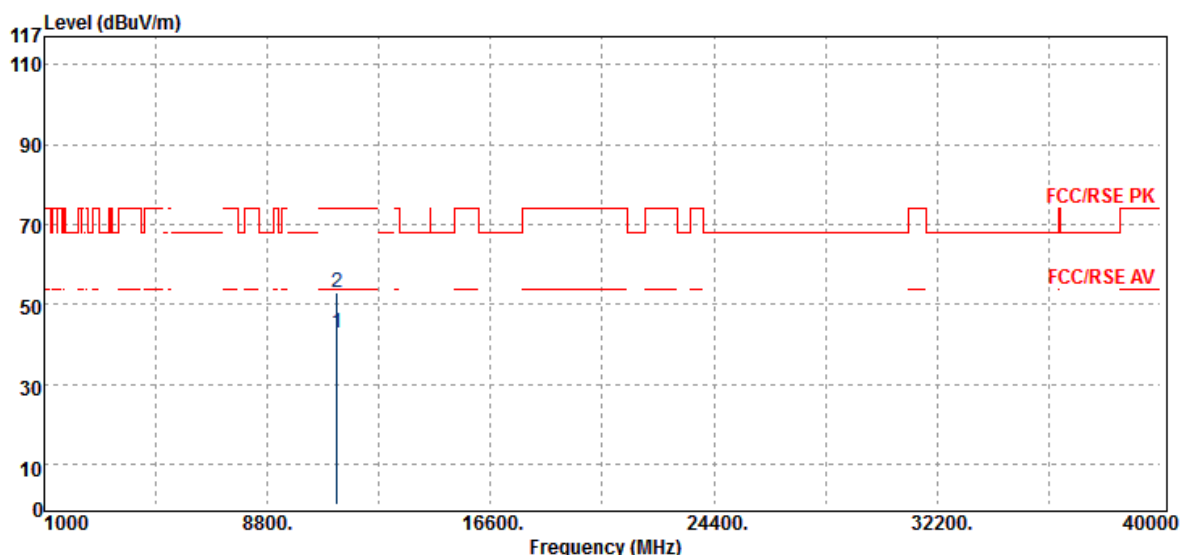
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Operation Band :802.11ac80B3
Fundamental Frequency :5610 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :21 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
11220.00	Average	21.34	21.56	42.90	54.00	-11.10
11220.00	Peak	31.51	21.56	53.07	74.00	-20.93

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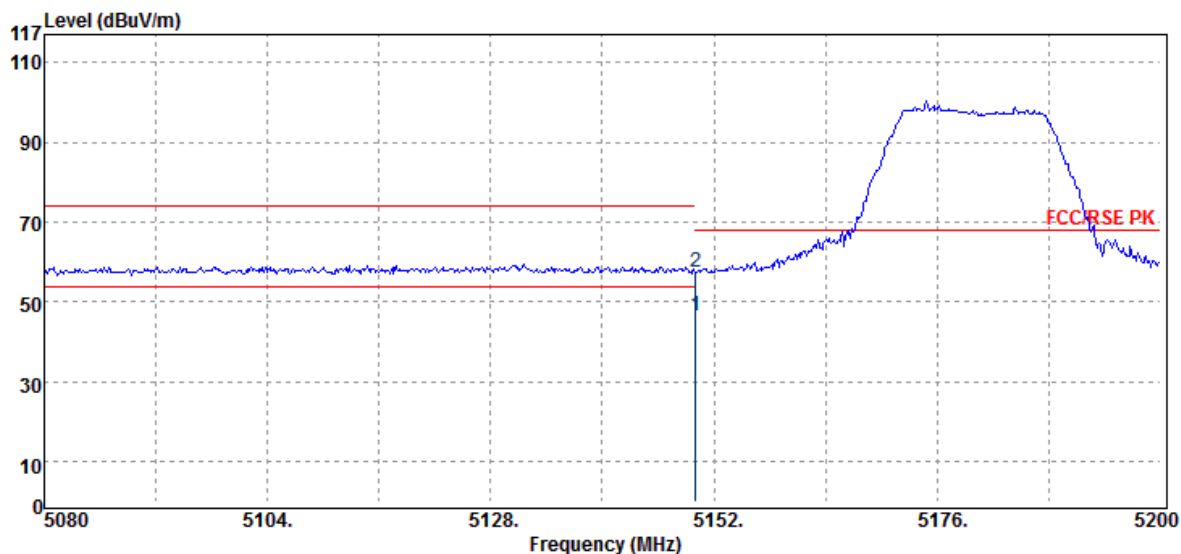
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Band Edge falling to restricted band

802.11a mode

Operation Band :802.11aB1
Fundamental Frequency :5180 MHz
Operation Mode :Bandedge CH LOW
EUT Pol. :H Plane

Test Date :2018-08-15
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5150.00	Average	38.09	8.32	46.41	54.00	-7.59
5150.00	Peak	49.20	8.32	57.52	74.00	-16.48

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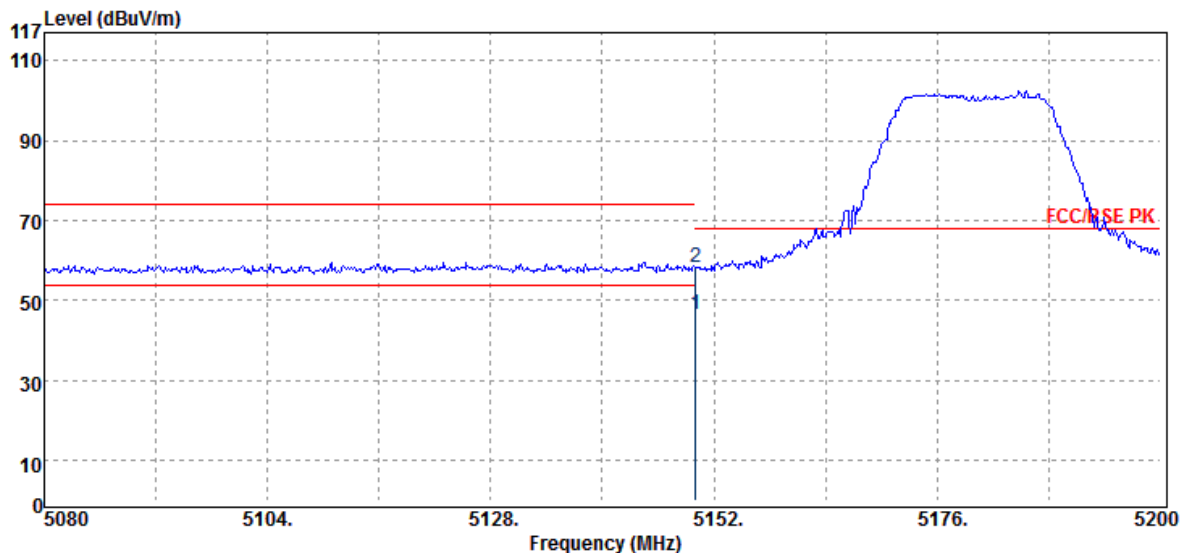
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Operation Band :802.11aB1
 Fundamental Frequency :5180 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5150.00	Average	38.06	8.32	46.38	54.00	-7.62
5150.00	Peak	49.82	8.32	58.14	74.00	-15.86

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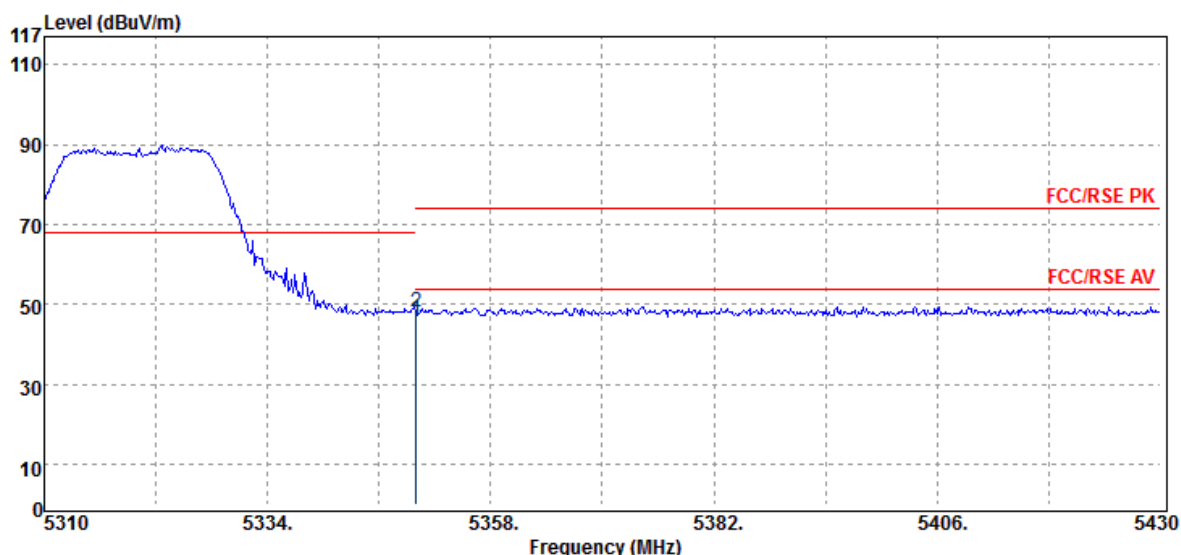
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Operation Band :802.11aB2
 Fundamental Frequency :5320 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



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	37.64	8.63	46.27	54.00	-7.73
5350.00	Peak	39.47	8.63	48.10	74.00	-25.90

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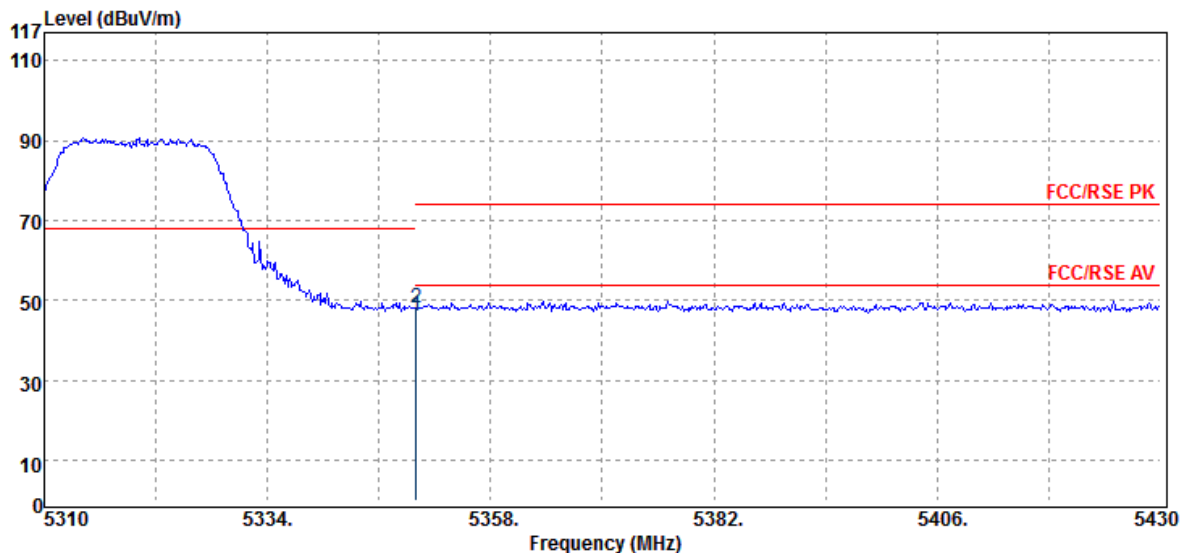
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Operation Band :802.11aB2
 Fundamental Frequency :5320 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



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	37.55	8.63	46.18	54.00	-7.82
5350.00	Peak	39.54	8.63	48.17	74.00	-25.83

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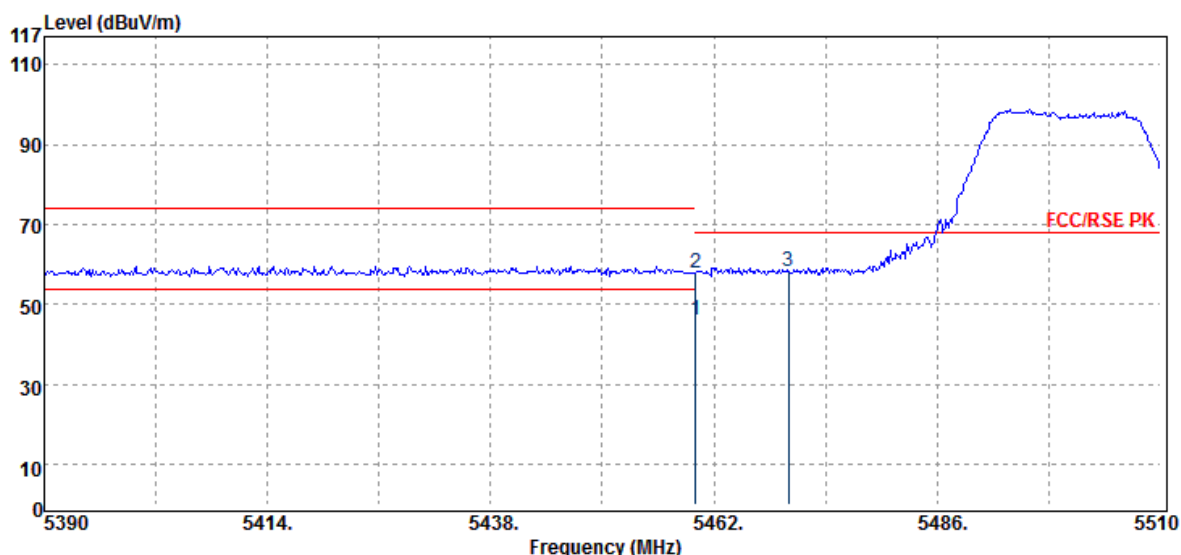
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Member of SGS Group

Operation Band :802.11aB3
 Fundamental Frequency :5500 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	37.54	8.75	46.29	54.00	-7.71
5460.00	Peak	49.22	8.75	57.97	74.00	-16.03
5470.00	Peak	49.66	8.74	58.40	68.20	-9.80

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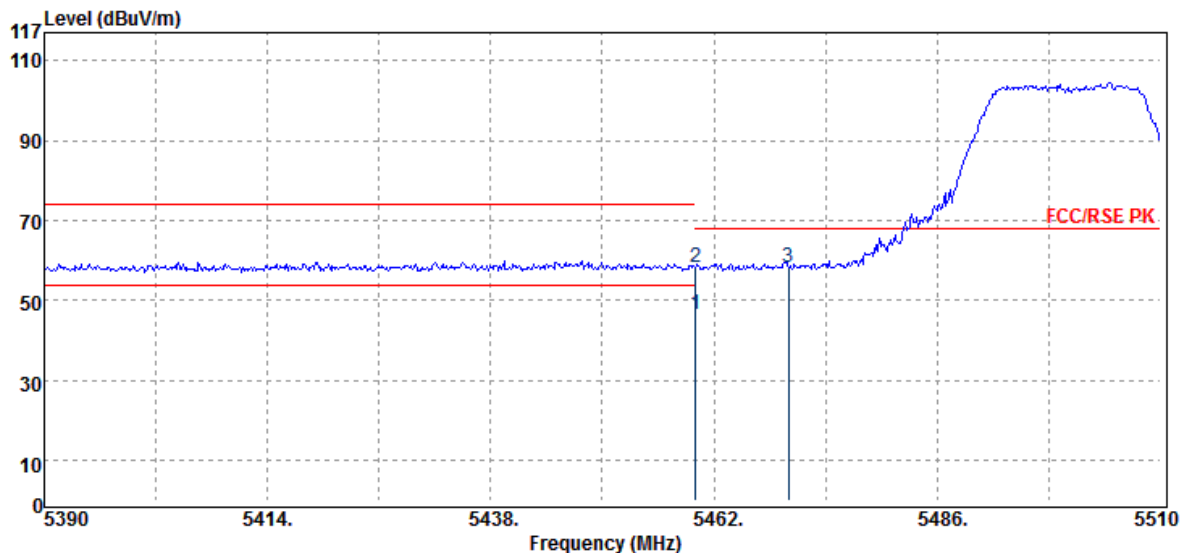
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Operation Band :802.11aB3
 Fundamental Frequency :5500 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	37.62	8.75	46.37	54.00	-7.63
5460.00	Peak	49.37	8.75	58.12	74.00	-15.88
5470.00	Peak	49.40	8.74	58.14	68.20	-10.06

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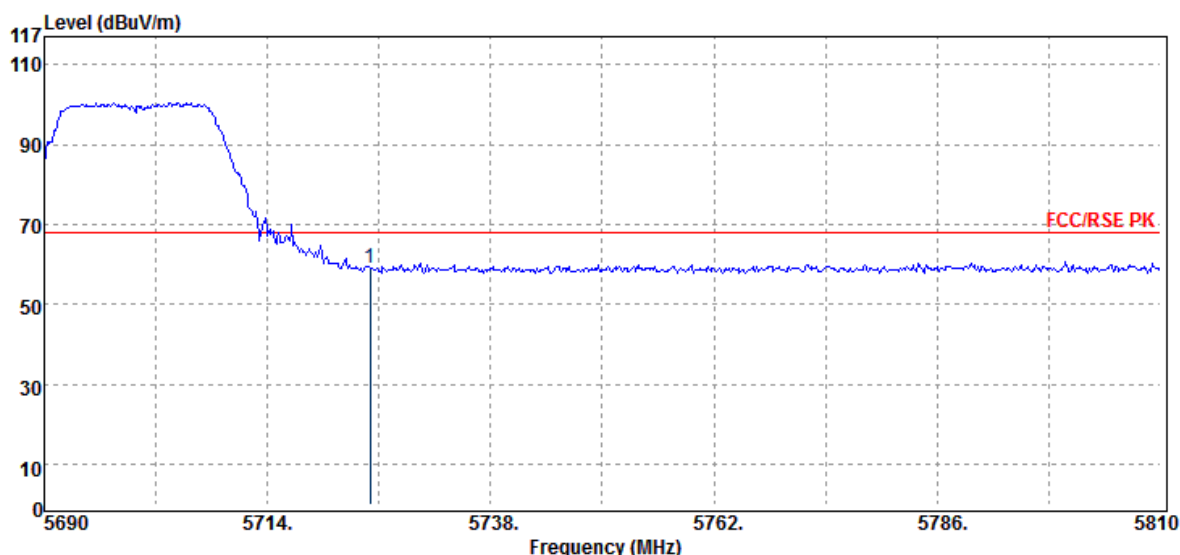
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www.tw.sgs.com

Member of SGS Group

Operation Band :802.11aB3
 Fundamental Frequency :5700 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dB μ V	dB	dB μ V/m	dB μ V/m	dB
5725.00	Peak	49.76	9.44	59.20	68.20	-9.00

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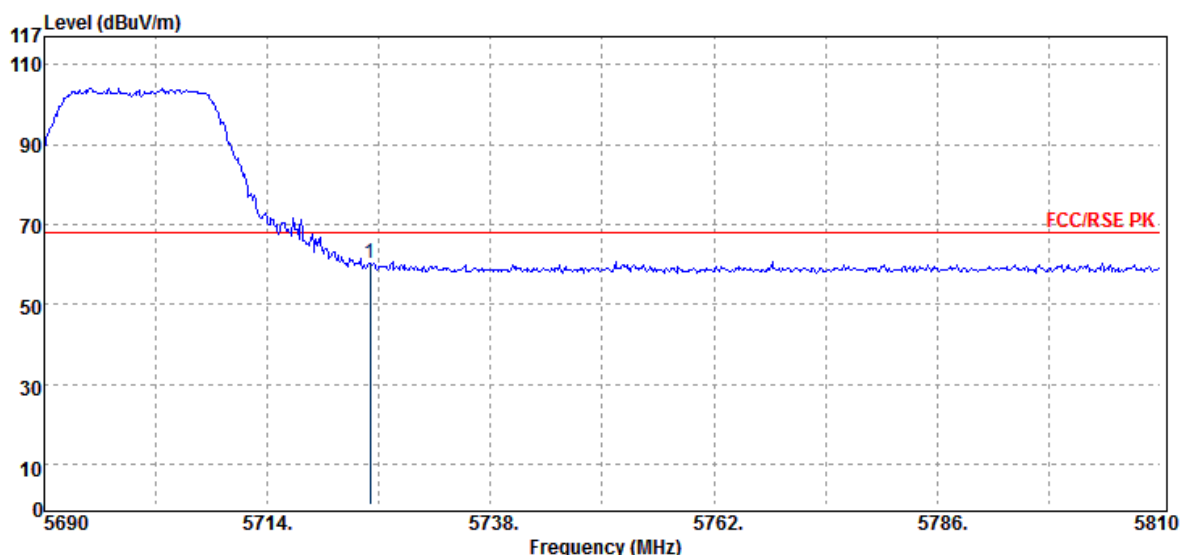
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Member of SGS Group

Operation Band :802.11aB3
 Fundamental Frequency :5700 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
5725.00	Peak	50.88	9.44	60.32	68.20	-7.88

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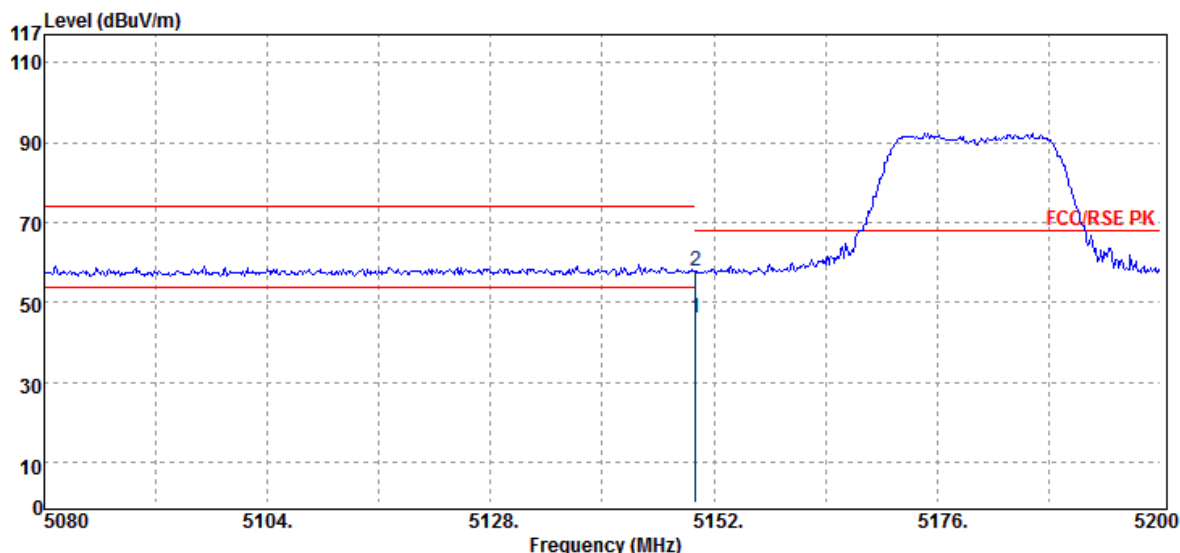
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Member of SGS Group

802.11n20 HT mode

Operation Band :802.11n20B1
Fundamental Frequency :5180 MHz
Operation Mode :Bandedge CH LOW
EUT Pol. :H Plane

Test Date :2018-08-15
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5150.00	Average	38.03	8.32	46.35	54.00	-7.65
5150.00	Peak	49.69	8.32	58.01	74.00	-15.99

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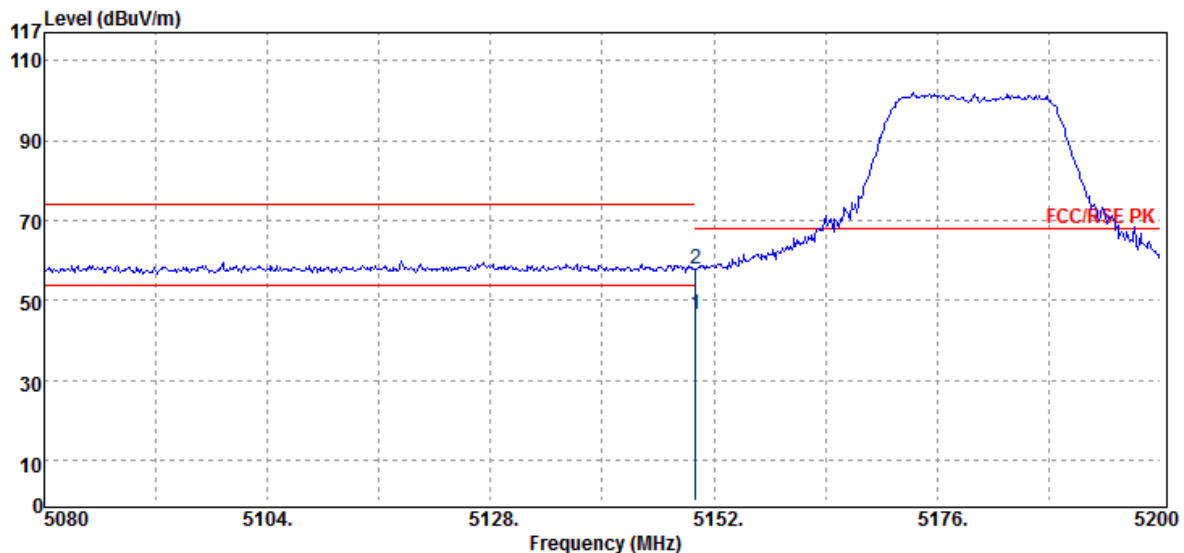
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Operation Band :802.11n20B1
 Fundamental Frequency :5180 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5150.00	Average	38.04	8.32	46.36	54.00	-7.64
5150.00	Peak	49.46	8.32	57.78	74.00	-16.22

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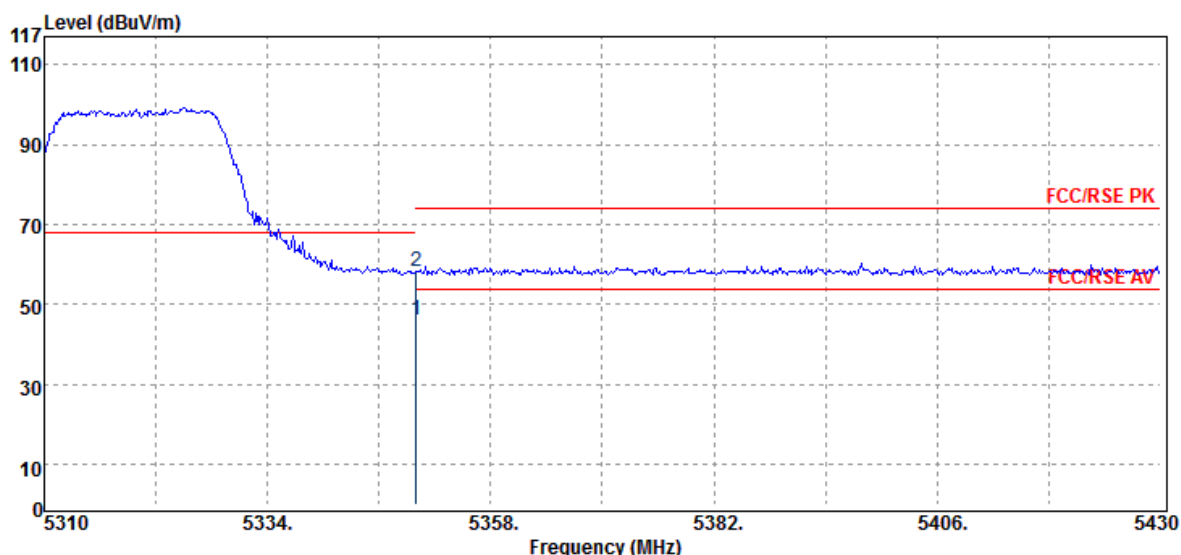
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Operation Band :802.11n20B1
 Fundamental Frequency :5320 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



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	37.62	8.63	46.25	54.00	-7.75
5350.00	Peak	49.82	8.63	58.45	74.00	-15.55

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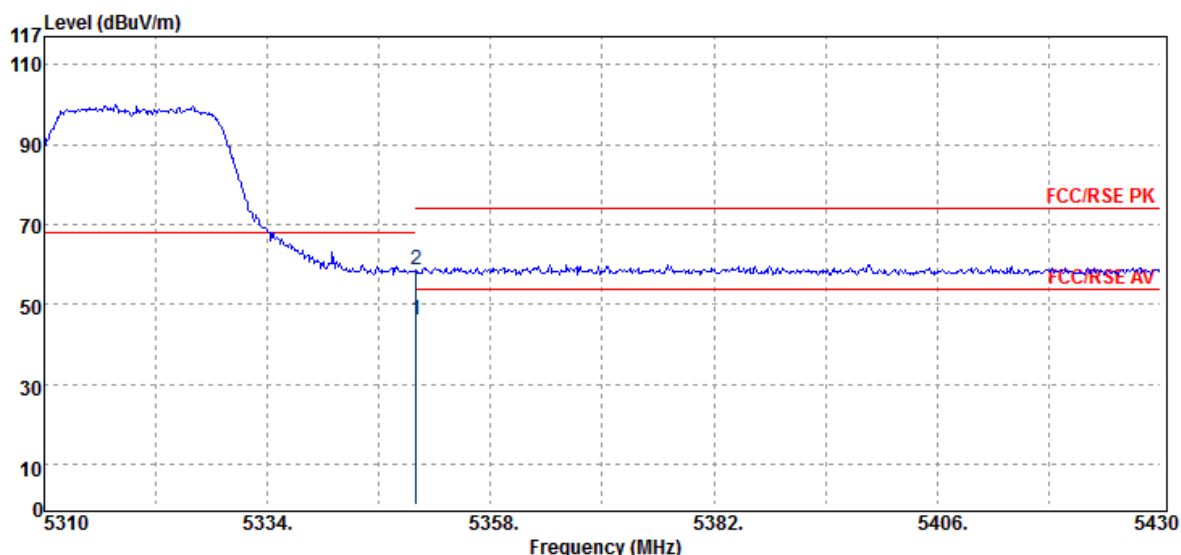
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Operation Band :802.11n20B1
 Fundamental Frequency :5320 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-15
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



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	37.70	8.63	46.33	54.00	-7.67
5350.00	Peak	50.23	8.63	58.86	74.00	-15.14

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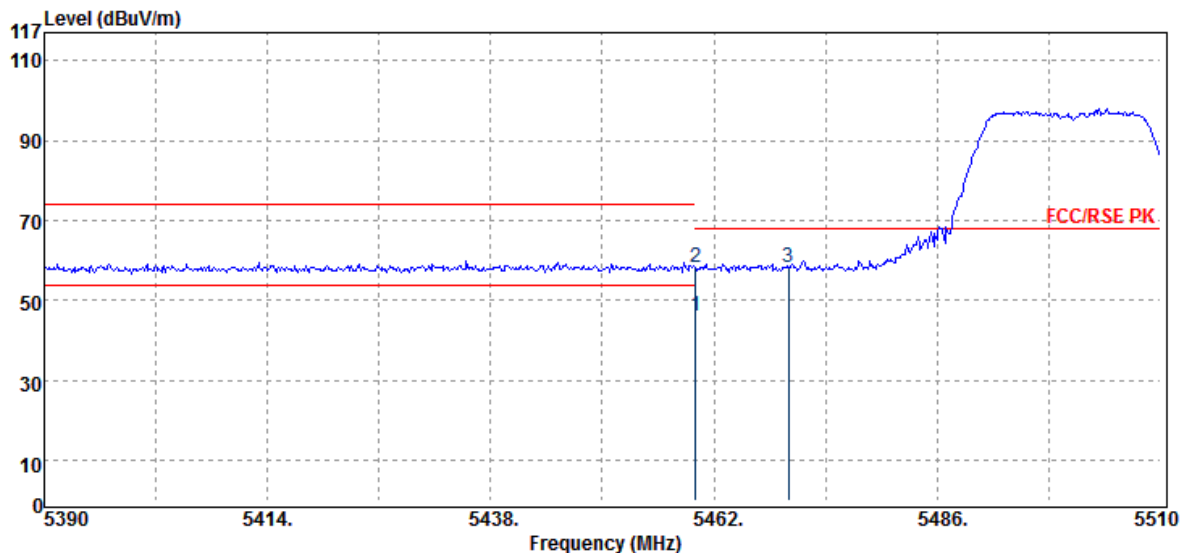
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Operation Band :802.11n20B3
 Fundamental Frequency :5500 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	37.60	8.75	46.35	54.00	-7.65
5460.00	Peak	49.43	8.75	58.18	74.00	-15.82
5470.00	Peak	49.36	8.74	58.10	68.20	-10.10

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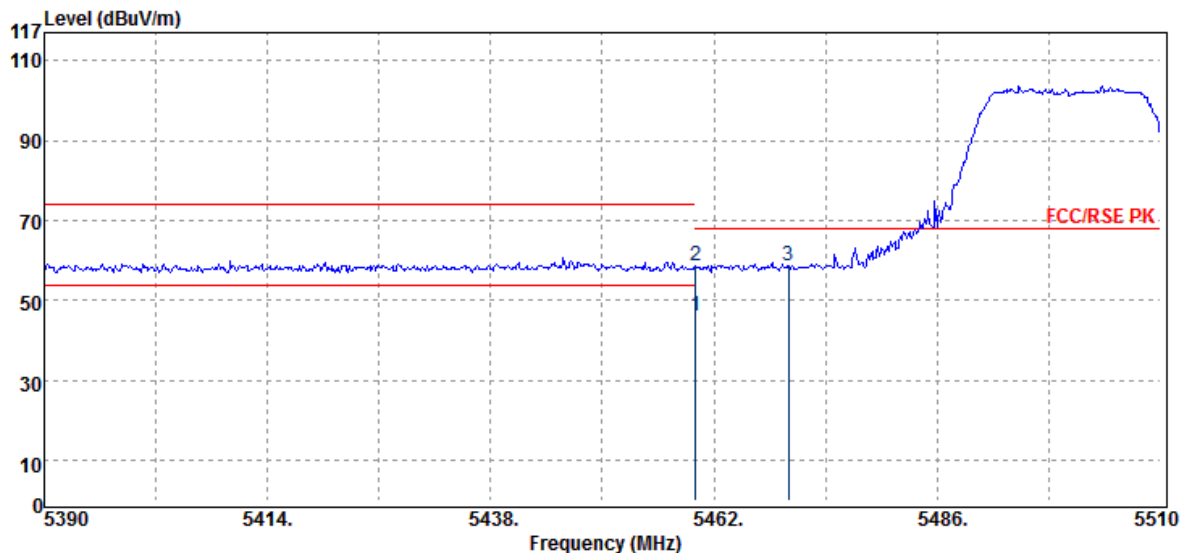
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Operation Band :802.11n20B3
 Fundamental Frequency :5500 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	37.55	8.75	46.30	54.00	-7.70
5460.00	Peak	49.89	8.75	58.64	74.00	-15.36
5470.00	Peak	49.86	8.74	58.60	68.20	-9.60

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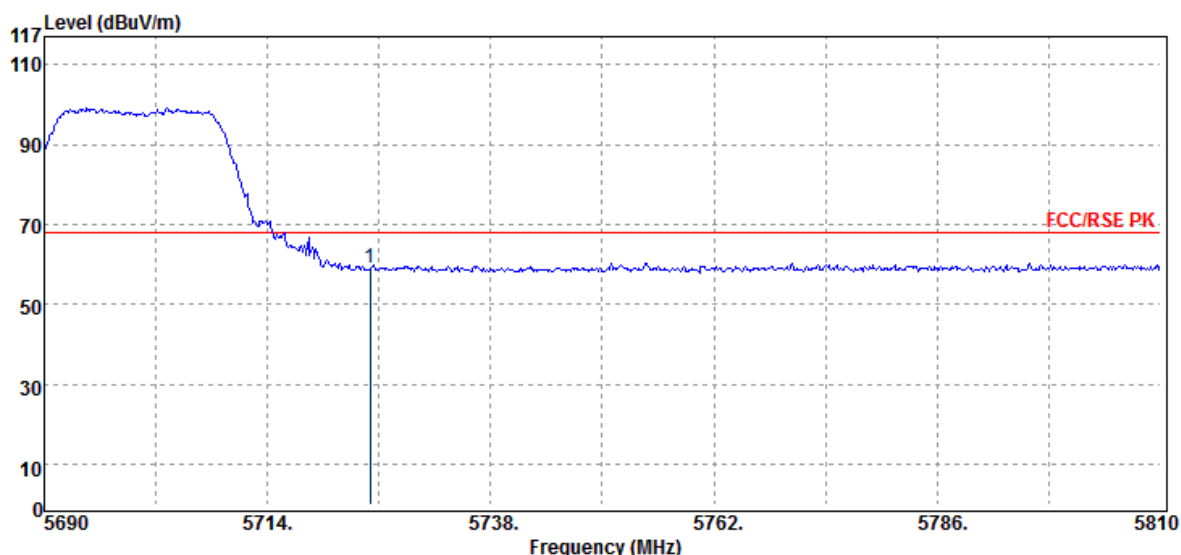
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Operation Band :802.11n20B3
 Fundamental Frequency :5700 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5725.00	Peak	49.63	9.44	59.07	68.20	-9.13

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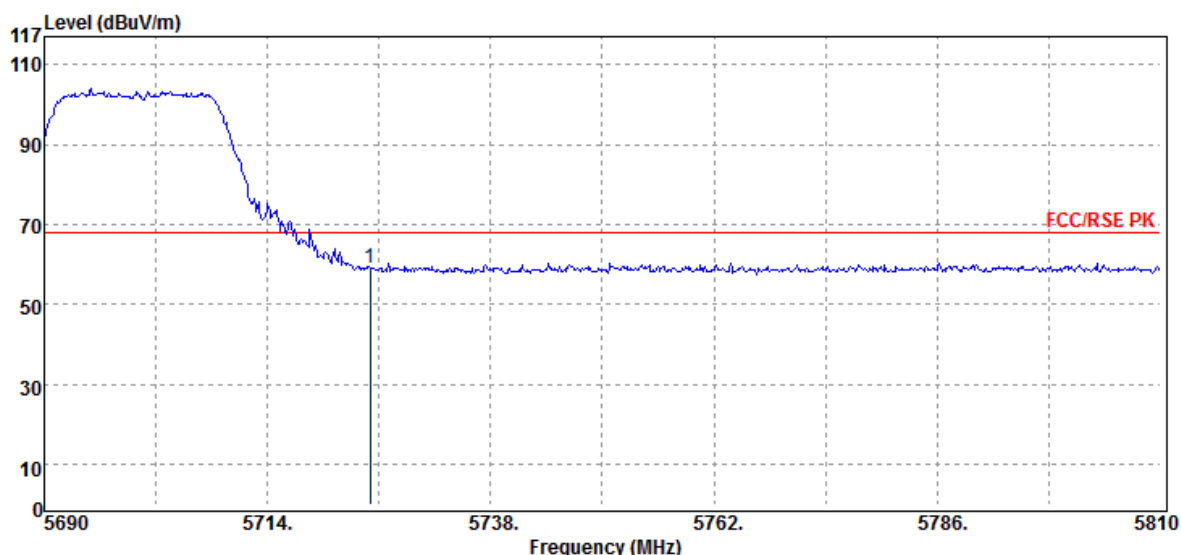
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Operation Band :802.11n20B3
Fundamental Frequency :5700 MHz
Operation Mode :Bandedge CH HIGH
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
5725.00	Peak	49.69	9.44	59.13	68.20	-9.07

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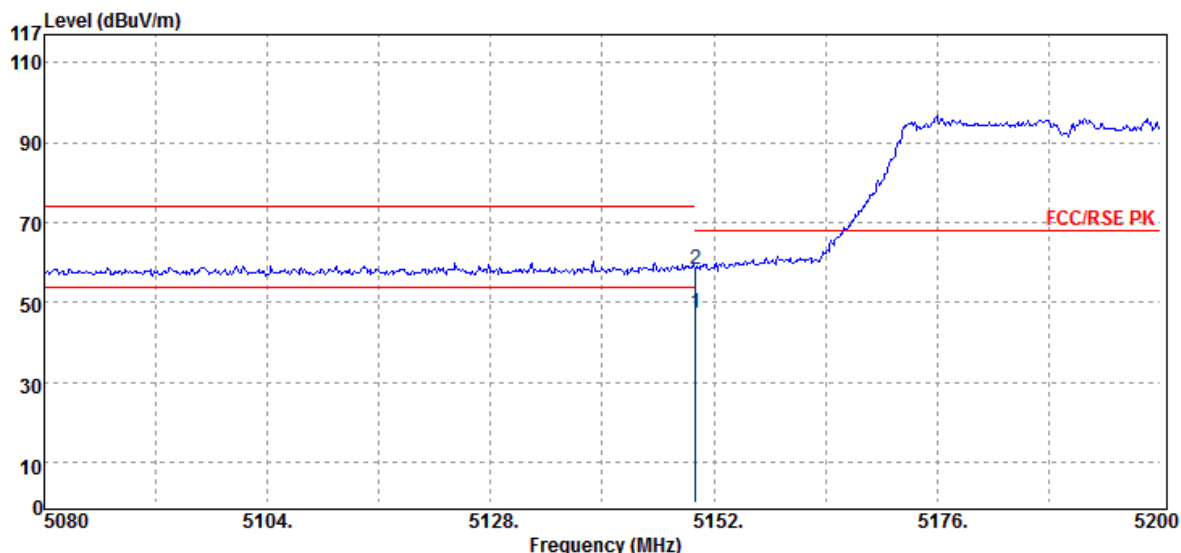
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802.11n40 HT mode

Operation Band :802.11n40B1
Fundamental Frequency :5190 MHz
Operation Mode :Bandedge CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5150.00	Average	39.09	8.32	47.41	54.00	-6.59
5150.00	Peak	50.05	8.32	58.37	74.00	-15.63

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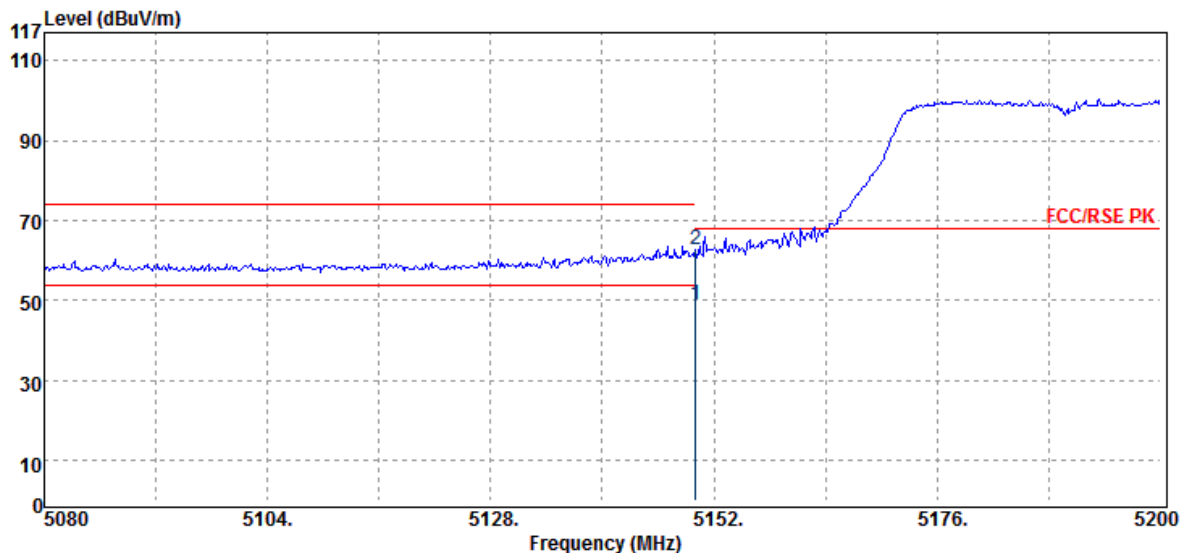
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Member of SGS Group

Operation Band :802.11n40B1
 Fundamental Frequency :5190 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5150.00	Average	40.74	8.32	49.06	54.00	-4.94
5150.00	Peak	54.51	8.32	62.83	74.00	-11.17

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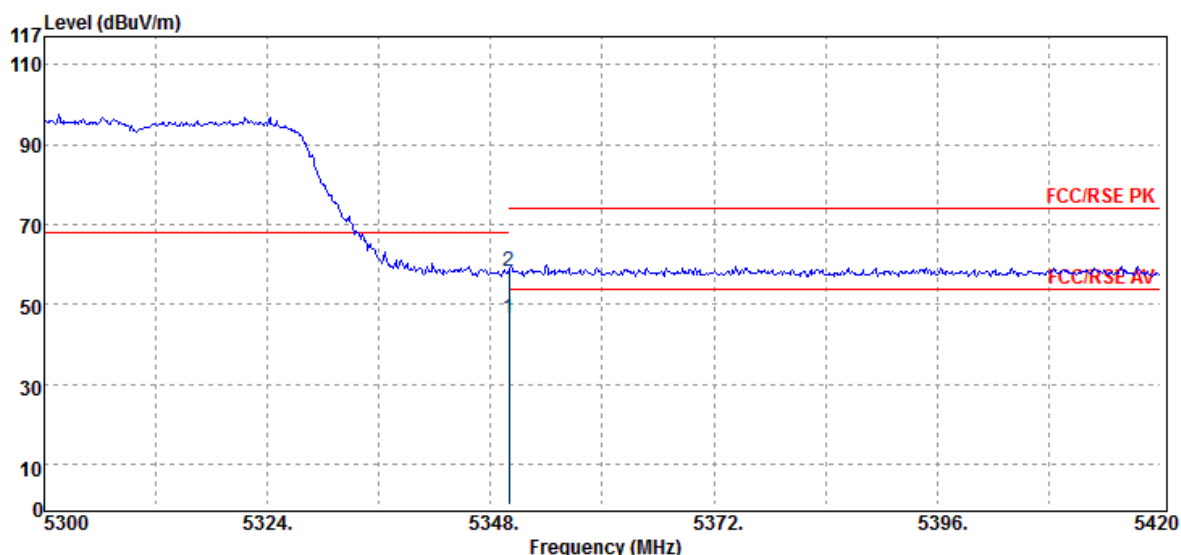
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Member of SGS Group

Operation Band :802.11n40B2
 Fundamental Frequency :5310 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V/m	Limit @3m dB μ V/m	Margin dB
5350.00	Average	37.84	8.63	46.47	54.00	-7.53
5350.00	Peak	49.57	8.63	58.20	74.00	-15.80

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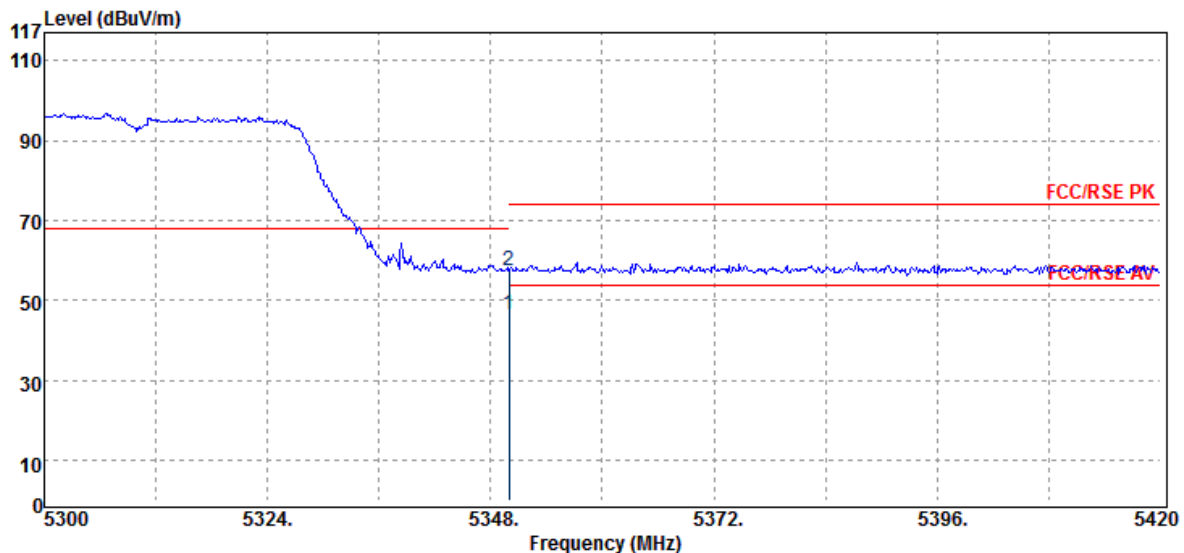
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Operation Band :802.11n40B2
 Fundamental Frequency :5310 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



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	37.74	8.63	46.37	54.00	-7.63
5350.00	Peak	49.05	8.63	57.68	74.00	-16.32

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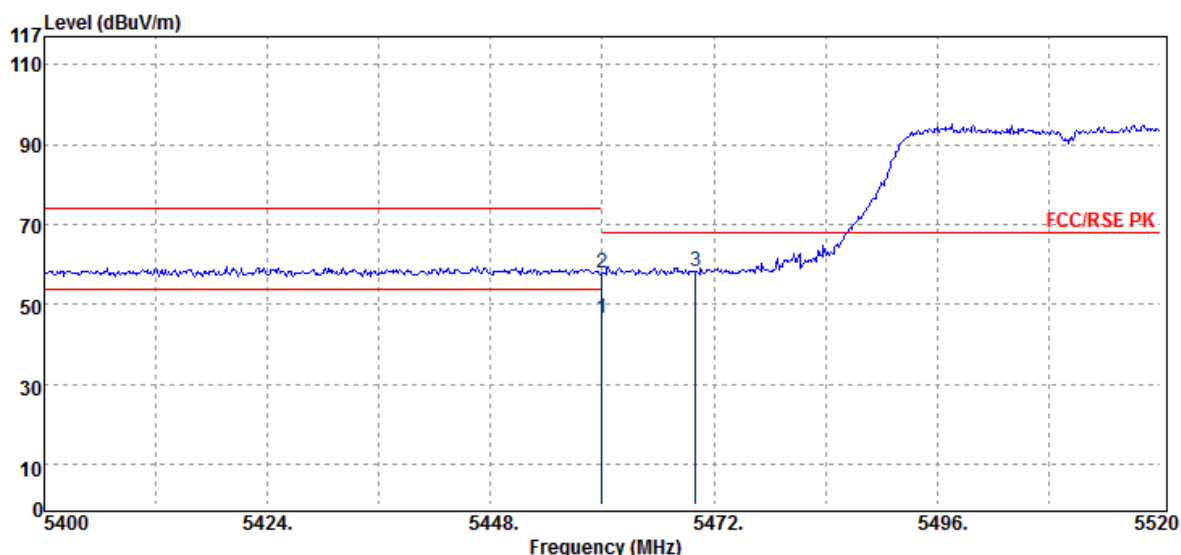
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Member of SGS Group

Operation Band :802.11n40B3
Fundamental Frequency :5510 MHz
Operation Mode :Bandedge CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	37.80	8.75	46.55	54.00	-7.45
5460.00	Peak	49.09	8.75	57.84	74.00	-16.16
5470.00	Peak	49.37	8.74	58.11	68.20	-10.09

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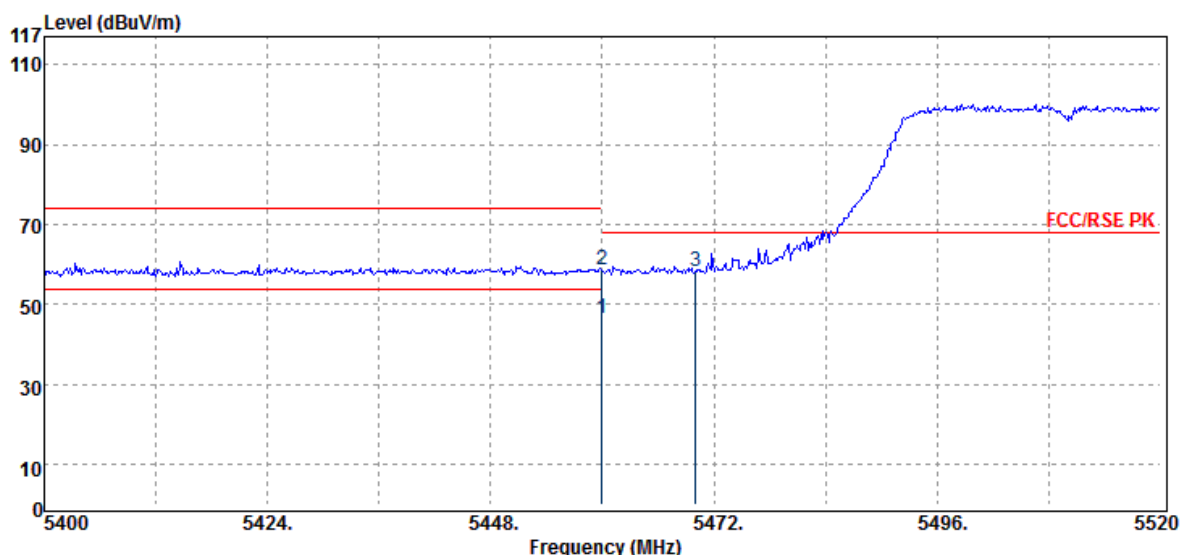
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Operation Band :802.11n40B3
 Fundamental Frequency :5510 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	37.76	8.75	46.51	54.00	-7.49
5460.00	Peak	49.85	8.75	58.60	74.00	-15.40
5470.00	Peak	49.56	8.74	58.30	68.20	-9.90

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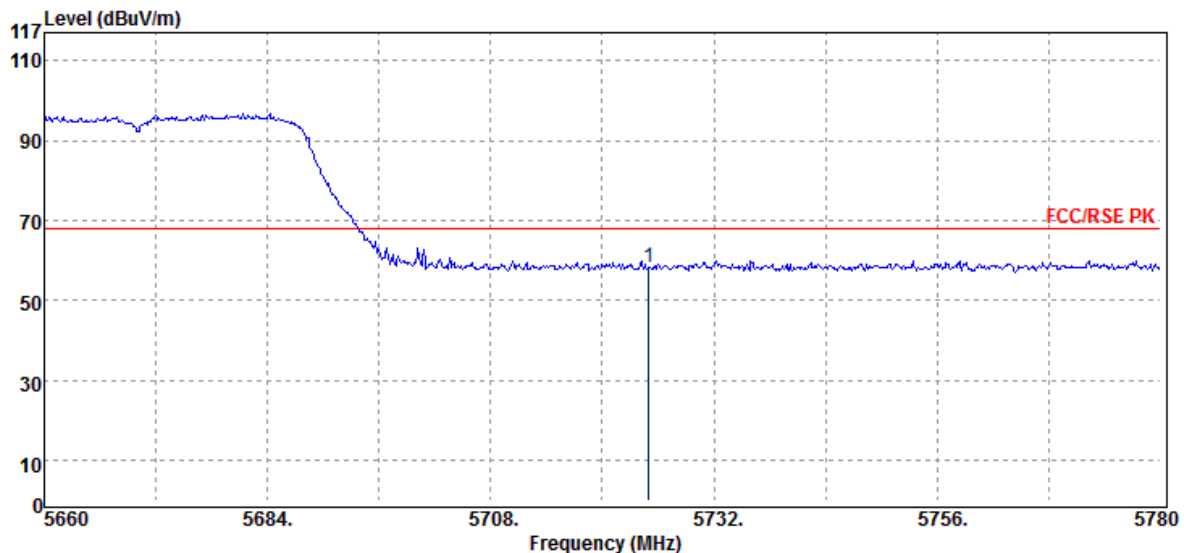
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Operation Band :802.11n40B3
 Fundamental Frequency :5670 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5725.00	Peak	48.89	9.44	58.33	68.20	-9.87

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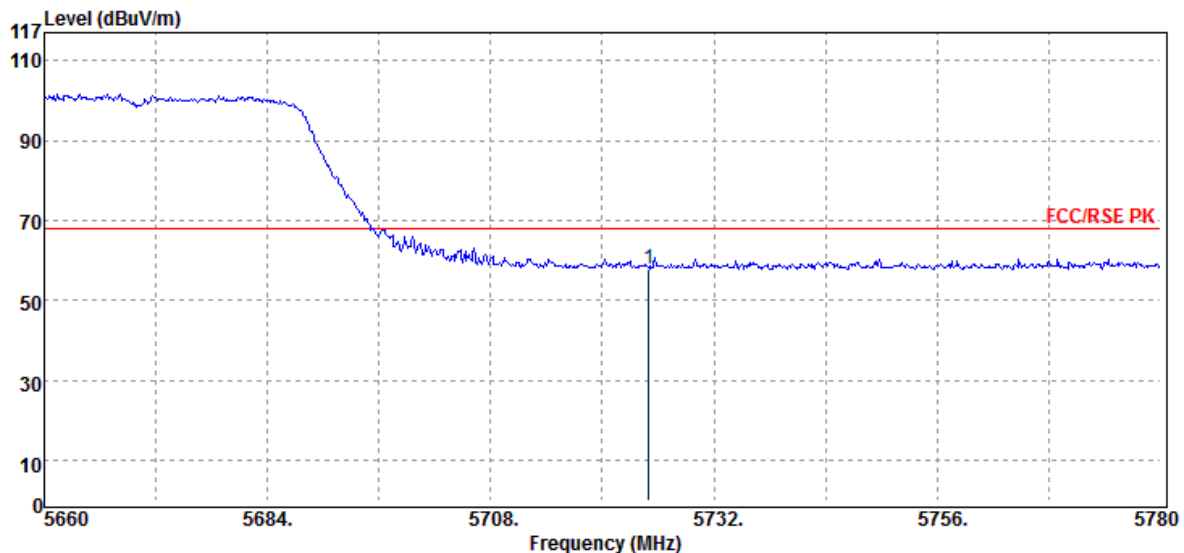
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Operation Band :802.11n40B3
 Fundamental Frequency :5670 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS	@3m	
	PK/QP/AV	dB μ V	dB	dB μ V/m	dB μ V/m	dB
5725.00	Peak	48.57	9.44	58.01	68.20	-10.19

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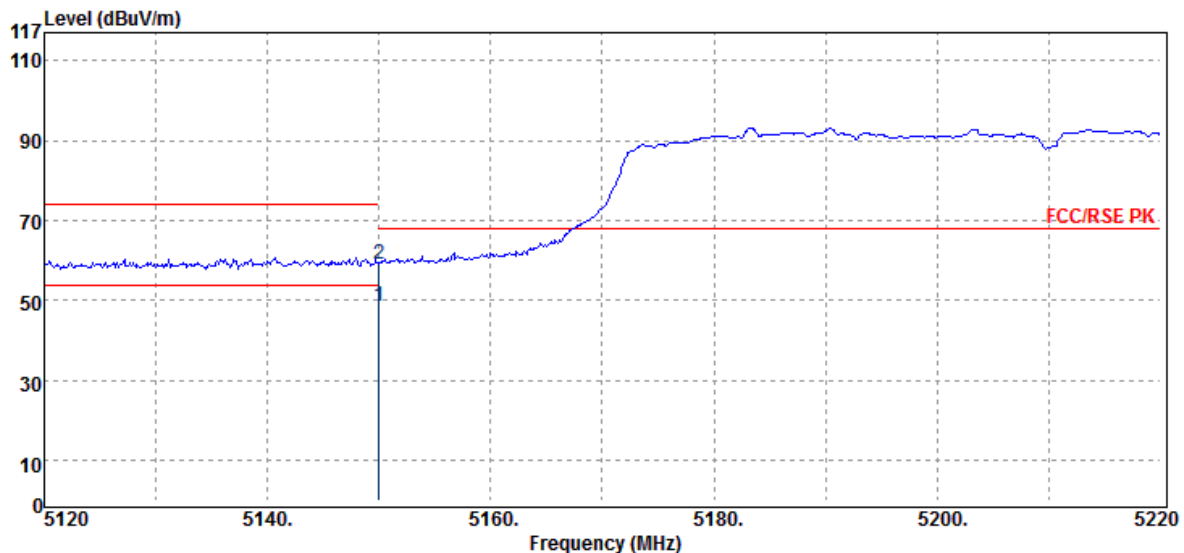
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802.11ac VHT80 mode

Operation Band :802.11ac80B1
Fundamental Frequency :5210 MHz
Operation Mode :Bandedge CH LOW
EUT Pol. :H Plane

Test Date :2018-08-16
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5150.00	Average	40.35	8.32	48.67	54.00	-5.33
5150.00	Peak	50.95	8.32	59.27	74.00	-14.73

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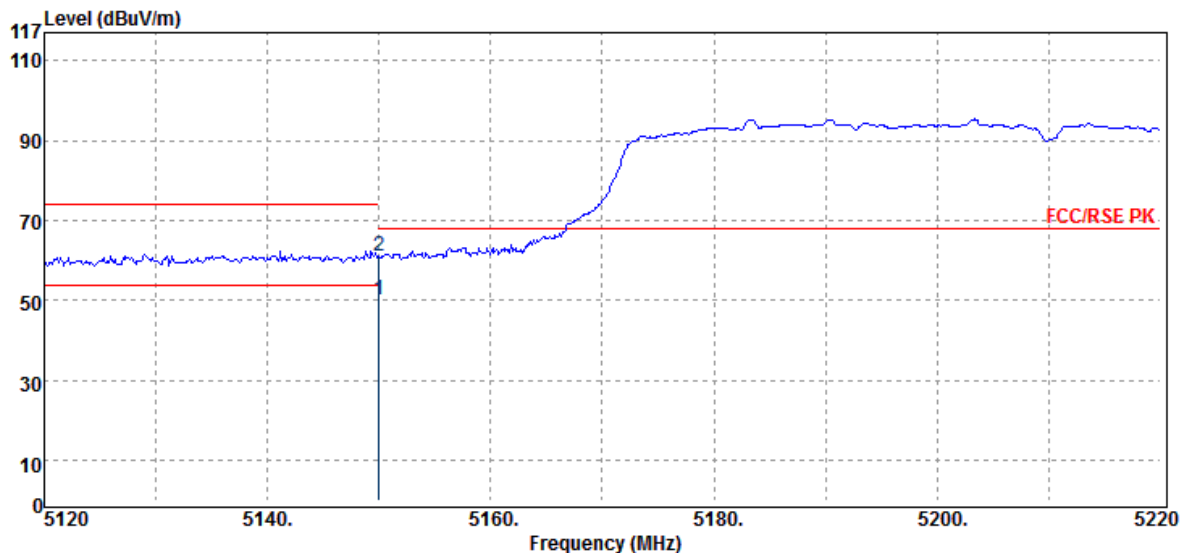
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Operation Band :802.11ac80B1
 Fundamental Frequency :5210 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5150.00	Average	41.69	8.32	50.01	54.00	-3.99
5150.00	Peak	53.00	8.32	61.32	74.00	-12.68

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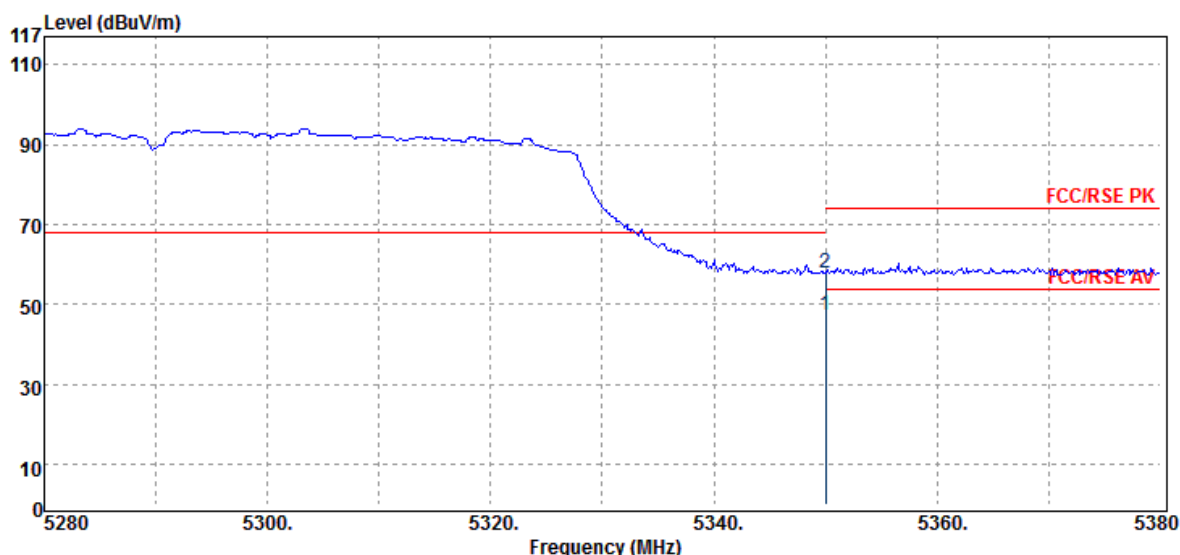
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Operation Band :802.11ac80B2
 Fundamental Frequency :5290 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



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	38.76	8.63	47.39	54.00	-6.61
5350.00	Peak	49.27	8.63	57.90	74.00	-16.10

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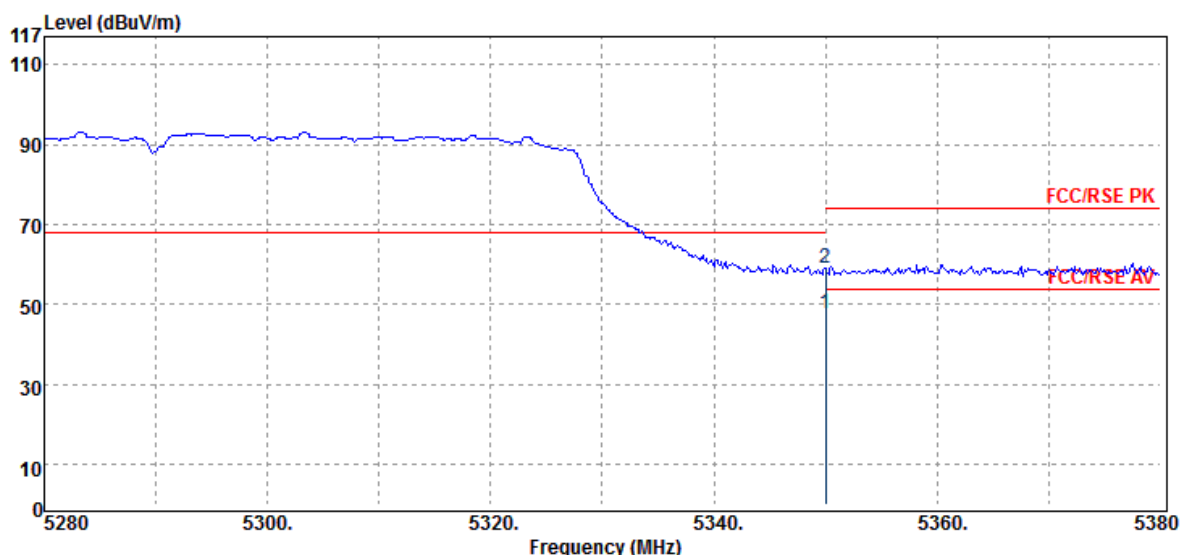
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Operation Band :802.11ac80B2
 Fundamental Frequency :5290 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



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	39.01	8.63	47.64	54.00	-6.36
5350.00	Peak	50.43	8.63	59.06	74.00	-14.94

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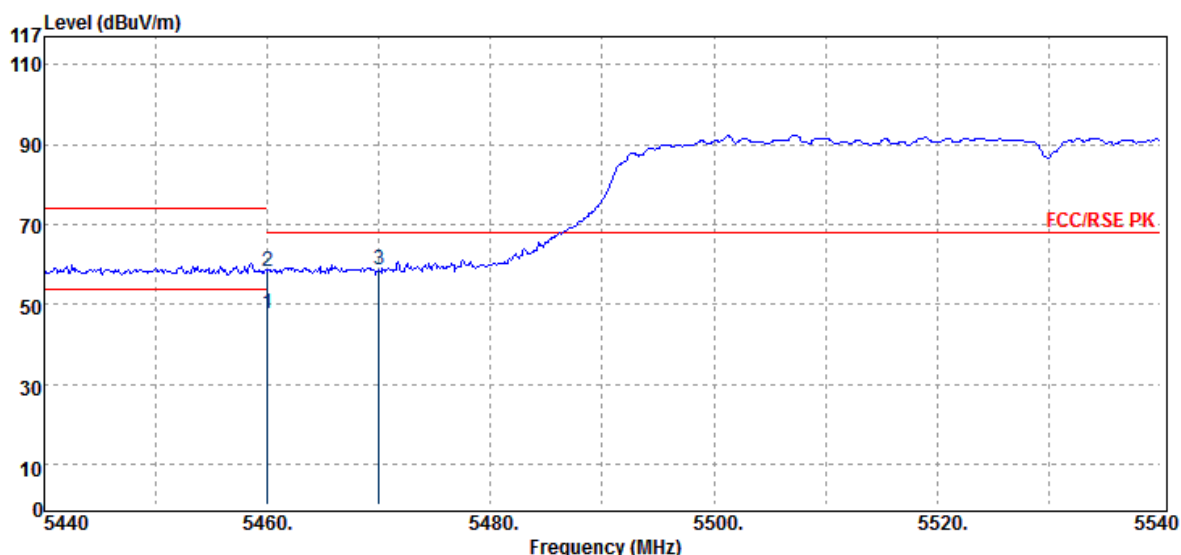
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Operation Band :802.11ac80B3
 Fundamental Frequency :5530 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	39.01	8.75	47.76	54.00	-6.24
5460.00	Peak	49.72	8.75	58.47	74.00	-15.53
5470.00	Peak	49.90	8.74	58.64	68.20	-9.56

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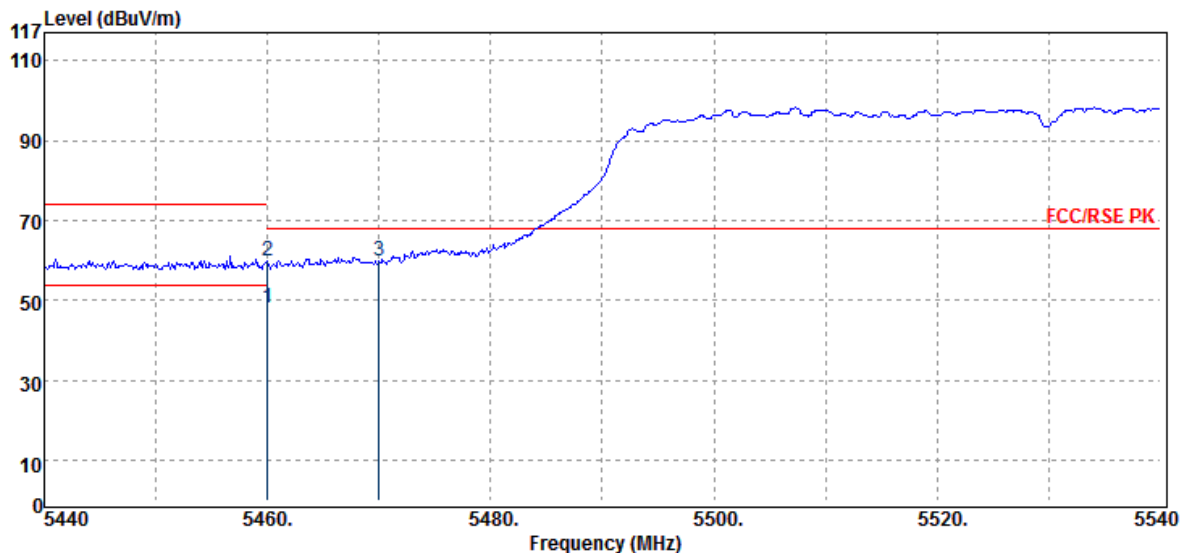
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Operation Band :802.11ac80B3
 Fundamental Frequency :5530 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :H Plane

Test Date :2018-08-16
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	39.24	8.75	47.99	54.00	-6.01
5460.00	Peak	51.11	8.75	59.86	74.00	-14.14
5470.00	Peak	50.98	8.74	59.72	68.20	-8.48

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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

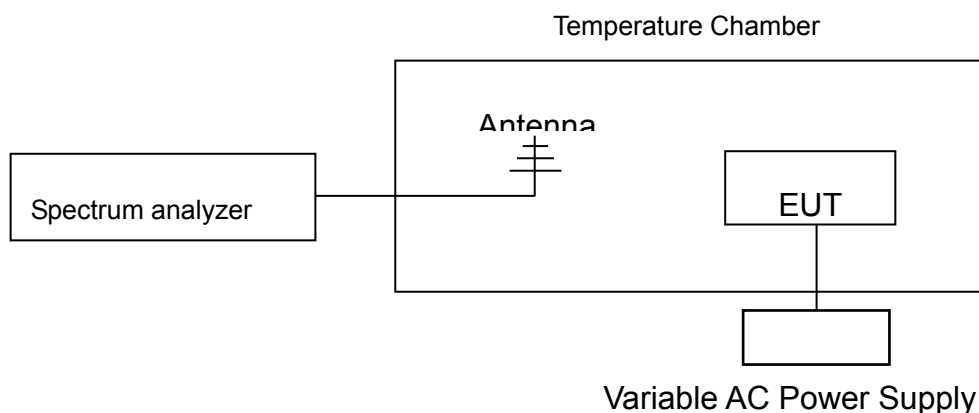
13.1 Standard Applicable

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.

13.3 Test SET-UP



13.4 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	2018/05/03	2019/05/02
DC Power Supply	Anritsu	E3640A	KR93300208	2018/08/15	2019/08/14
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Notebook	Lenovo	T440P	P0000564	N/A	N/A

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13.5 Measurement Result

Startup:

Operation Mode	802.11 a	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	36	5180	5180.005852	-0.00000113
		44	5220	5219.990212	0.00000188
		48	5240	5239.999745	0.00000005
		52	5260	5260.00011	-0.00000002
		60	5300	5299.990353	0.00000182
		64	5320	5320.001175	-0.00000022
		100	5500	5499.995691	0.00000078
		116	5580	5579.998762	0.00000022
		140	5700	5699.991476	0.00000150
	3.27V	36	5180	5179.999057	0.00000018
		44	5220	5219.994917	0.00000097
		48	5240	5240.00608	-0.00000116
		52	5260	5259.993582	0.00000122
		60	5300	5300.000202	-0.00000004
		64	5320	5320.006631	-0.00000125
		100	5500	5499.992136	0.00000143
		116	5580	5579.990197	0.00000176
		140	5700	5699.992345	0.00000134

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25 °C	3.85V	36	5180	5179.994878	0.00000099
		44	5220	5220.009926	-0.00000190
		48	5240	5240.001716	-0.00000033
		52	5260	5259.990832	0.00000174
		60	5300	5299.998938	0.00000020
		64	5320	5320.002184	-0.00000041
		100	5500	5499.993187	0.00000124
		116	5580	5579.998738	0.00000023
		140	5700	5699.992629	0.00000129
55 °C	4.43V	36	5180	5179.996121	0.00000075
		44	5220	5220.001888	-0.00000036
		48	5240	5240.005512	-0.00000105
		52	5260	5259.999907	0.00000002
		60	5300	5300.005469	-0.00000103
		64	5320	5319.995299	0.00000088
		100	5500	5499.991346	0.00000157
		116	5580	5579.99496	0.00000090
		140	5700	5700.006672	-0.00000117
	3.27V	36	5180	5180.008059	-0.00000156
		44	5220	5219.998932	0.00000020
		48	5240	5240.006855	-0.00000131
		52	5260	5259.991697	0.00000158
		60	5300	5299.994506	0.00000104
		64	5320	5319.998734	0.00000024
		100	5500	5499.999037	0.00000018
		116	5580	5580.009506	-0.00000170
		140	5700	5699.996101	0.00000068

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Operation Mode	802.11 n_HT40	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	38	5190	5,189.99777	0.00000043
		46	5230	5,229.99524	0.00000091
		54	5270	5,270.00280	-0.00000053
		62	5310	5,309.99988	0.00000002
		102	5510	5,510.00868	-0.00000158
		110	5550	5,550.00300	-0.00000054
		134	5670	5,670.00707	-0.00000125
	3.27V	38	5190	5,190.00830	-0.00000160
		46	5230	5,230.00895	-0.00000171
		54	5270	5,270.00416	-0.00000079
		62	5310	5,310.00923	-0.00000174
		102	5510	5,509.99076	0.00000168
		110	5550	5,549.99896	0.00000019
		134	5670	5,670.00897	-0.00000158

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25 °C	3.85V	38	5190	5,190.00186	-0.00000036
		46	5230	5,229.99772	0.00000044
		54	5270	5,270.00444	-0.00000084
		62	5310	5,310.00080	-0.00000015
		102	5510	5,510.00151	-0.00000027
		110	5550	5,550.00837	-0.00000151
		134	5670	5,670.00667	-0.00000118
55 °C	4.43V	38	5190	5,189.99004	0.00000192
		46	5230	5,230.00873	-0.00000167
		54	5270	5,270.00114	-0.00000022
		62	5310	5,310.00862	-0.00000162
		102	5510	5,509.99957	0.00000008
		110	5550	5,550.00406	-0.00000073
		134	5670	5,670.00858	-0.00000151
	3.27V	38	5190	5,190.00456	-0.00000088
		46	5230	5,229.99961	0.00000007
		54	5270	5,270.00306	-0.00000058
		62	5310	5,310.00839	-0.00000158
		102	5510	5,510.00218	-0.00000040
		110	5550	5,549.99316	0.00000123
		134	5670	5,670.00794	-0.00000140

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Operation Mode	802.11 ac_VHT80	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	42	5210	5,210.00184	-0.00000035
		58	5290	5,289.99585	0.00000078
		106	5530	5,529.99235	0.00000138
		122	5610	5,609.99771	0.00000041
	3.27V	42	5210	5,210.00946	-0.00000182
		58	5290	5,290.00483	-0.00000091
		106	5530	5,530.00316	-0.00000057
		122	5610	5,610.00048	-0.00000009
25 °C	3.85V	42	5210	5,209.99529	0.00000090
		58	5290	5,290.00385	-0.00000073
		106	5530	5,529.99099	0.00000163
		122	5610	5,610.00635	-0.00000113
55 °C	4.43V	42	5210	5,210.00078	-0.00000015
		58	5290	5,290.00167	-0.00000032
		106	5530	5,529.99891	0.00000020
		122	5610	5,609.99822	0.00000032
	3.27V	42	5210	5,210.00945	-0.00000181
		58	5290	5,290.00612	-0.00000116
		106	5530	5,530.00087	-0.00000016
		122	5610	5,610.00817	-0.00000146

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2 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	36	5180	5,180.00434	-0.00000084
		44	5220	5,219.99336	0.00000127
		48	5240	5,239.99158	0.00000161
		52	5260	5,259.99017	0.00000187
		60	5300	5,299.99589	0.00000078
		64	5320	5,319.99856	0.00000027
		100	5500	5,500.00438	-0.00000080
		116	5580	5,579.99591	0.00000073
		140	5700	5,699.99018	0.00000172
	3.27V	36	5180	5,180.00085	-0.00000016
		44	5220	5,219.99668	0.00000064
		48	5240	5,239.99971	0.00000005
		52	5260	5,259.98497	0.00000286
		60	5300	5,300.00757	-0.00000143
		64	5320	5,320.00015	-0.00000003
		100	5500	5,499.98489	0.00000275
		116	5580	5,579.98961	0.00000186
		140	5700	5,699.98771	0.00000216
25 °C	3.85V	36	5180	5,179.98564	0.00000277
		44	5220	5,220.01211	-0.00000232
		48	5240	5,239.99888	0.00000021
		52	5260	5,259.99696	0.00000058
		60	5300	5,300.00037	-0.00000007
		64	5320	5,319.99961	0.00000007
		100	5500	5,499.98909	0.00000198
		116	5580	5,579.99135	0.00000155
		140	5700	5,699.99129	0.00000153

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55 °C	4.43V	36	5180	5,179.99222	0.00000150
		44	5220	5,219.99343	0.00000126
		48	5240	5,240.00975	-0.00000186
		52	5260	5,260.00402	-0.00000076
		60	5300	5,300.01513	-0.00000285
		64	5320	5,320.00313	-0.00000059
		100	5500	5,499.99255	0.00000136
		116	5580	5,580.00197	-0.00000035
		140	5700	5,700.01593	-0.00000279
	3.27V	36	5180	5,180.01113	-0.00000215
		44	5220	5,220.00042	-0.00000008
		48	5240	5,240.00947	-0.00000181
		52	5260	5,259.98313	0.00000321
		60	5300	5,299.99087	0.00000172
		64	5320	5,319.99305	0.00000131
		100	5500	5,500.00448	-0.00000082
		116	5580	5,580.01172	-0.00000210
		140	5700	5,699.99282	0.00000126

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Operation Mode	802.11 n_HT40	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	38	5190	5,190.00987	-0.00000190
		46	5230	5,229.99367	0.00000121
		54	5270	5,269.99843	0.00000030
		62	5310	5,309.99826	0.00000033
		102	5510	5,510.00446	-0.00000081
		110	5550	5,550.00390	-0.00000070
		134	5670	5,670.00495	-0.00000087
	3.27V	38	5190	5,190.00503	-0.00000097
		46	5230	5,229.99155	0.00000162
		54	5270	5,270.00750	-0.00000142
		62	5310	5,309.99408	0.00000112
		102	5510	5,510.00850	-0.00000154
		110	5550	5,550.00805	-0.00000145
		134	5670	5,670.00115	-0.00000020

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25 °C	3.85V	38	5190	5,189.99891	0.00000021
		46	5230	5,230.00975	-0.00000186
		54	5270	5,270.00870	-0.00000165
		62	5310	5,309.99670	0.00000062
		102	5510	5,510.00933	-0.00000169
		110	5550	5,549.99787	0.00000038
		134	5670	5,669.99525	0.00000084
55 °C	4.43V	38	5190	5,190.00466	-0.00000090
		46	5230	5,229.99918	0.00000016
		54	5270	5,270.00110	-0.00000021
		62	5310	5,309.99393	0.00000114
		102	5510	5,509.99938	0.00000011
		110	5550	5,549.99632	0.00000066
		134	5670	5,669.99791	0.00000037
	3.27V	38	5190	5,190.00985	-0.00000190
		46	5230	5,229.99657	0.00000066
		54	5270	5,269.99324	0.00000128
		62	5310	5,310.00736	-0.00000139
		102	5510	5,509.99622	0.00000069
		110	5550	5,550.00261	-0.00000047
		134	5670	5,670.00697	-0.00000123

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Operation Mode	802.11 ac_VHT80	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	42	5210	5,209.99934	0.00000013
		58	5290	5,290.00485	-0.00000092
		106	5530	5,529.99843	0.00000028
		122	5610	5,610.00839	-0.00000150
	3.27V	42	5210	5,209.99334	0.00000128
		58	5290	5,290.00433	-0.00000082
		106	5530	5,529.99295	0.00000128
		122	5610	5,609.99080	0.00000164
25 °C	3.85V	42	5210	5,209.99064	0.00000180
		58	5290	5,290.00967	-0.00000183
		106	5530	5,529.99735	0.00000048
		122	5610	5,610.00376	-0.00000067
55 °C	4.43V	42	5210	5,209.99844	0.00000030
		58	5290	5,290.00635	-0.00000120
		106	5530	5,529.99015	0.00000178
		122	5610	5,609.99870	0.00000023
	3.27V	42	5210	5,210.00181	-0.00000035
		58	5290	5,290.00216	-0.00000041
		106	5530	5,529.99470	0.00000096
		122	5610	5,609.99088	0.00000163

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5 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	36	5180	5,180.01563	-0.00000302
		44	5220	5,219.99451	0.00000105
		48	5240	5,240.00230	-0.00000044
		52	5260	5,260.00290	-0.00000055
		60	5300	5,299.98949	0.00000198
		64	5320	5,320.00544	-0.00000102
		100	5500	5,500.00432	-0.00000079
		116	5580	5,579.99766	0.00000042
		140	5700	5,699.99875	0.00000022
	3.27V	36	5180	5,180.00757	-0.00000146
		44	5220	5,219.98976	0.00000196
		48	5240	5,240.00116	-0.00000022
		52	5260	5,259.98918	0.00000206
		60	5300	5,300.00364	-0.00000069
		64	5320	5,319.99819	0.00000034
		100	5500	5,499.99123	0.00000159
		116	5580	5,579.98111	0.00000339
		140	5700	5,699.99627	0.00000066
25 °C	3.85V	36	5180	5,179.98701	0.00000251
		44	5220	5,220.00306	-0.00000059
		48	5240	5,239.99181	0.00000156
		52	5260	5,259.98456	0.00000294
		60	5300	5,299.99861	0.00000026
		64	5320	5,319.99276	0.00000136
		100	5500	5,499.99470	0.00000096
		116	5580	5,580.00714	-0.00000128
		140	5700	5,699.98510	0.00000261

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55 °C	4.43V	36	5180	5,180.00595	-0.00000115
		44	5220	5,219.99467	0.00000102
		48	5240	5,240.00927	-0.00000177
		52	5260	5,259.99866	0.00000025
		60	5300	5,300.00661	-0.00000125
		64	5320	5,319.98559	0.00000271
		100	5500	5,499.98890	0.00000202
		116	5580	5,579.98608	0.00000250
		140	5700	5,700.01104	-0.00000194
	3.27V	36	5180	5,179.99919	0.00000016
		44	5220	5,219.99949	0.00000010
		48	5240	5,240.00796	-0.00000152
		52	5260	5,259.99580	0.00000080
		60	5300	5,299.99422	0.00000109
		64	5320	5,320.00501	-0.00000094
		100	5500	5,499.99682	0.00000058
		116	5580	5,580.00462	-0.00000083
		140	5700	5,699.99957	0.00000008

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Operation Mode	802.11 n_HT40	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	38	5190	5,190.00287	-0.00000055
		46	5230	5,230.00108	-0.00000021
		54	5270	5,269.99745	0.00000048
		62	5310	5,309.99490	0.00000096
		102	5510	5,509.99657	0.00000062
		110	5550	5,549.99705	0.00000053
		134	5670	5,670.00886	-0.00000156
	3.27V	38	5190	5,190.00000	0.00000000
		46	5230	5,230.00761	-0.00000146
		54	5270	5,269.99115	0.00000168
		62	5310	5,309.99350	0.00000122
		102	5510	5,510.00843	-0.00000153
		110	5550	5,550.00409	-0.00000074
		134	5670	5,670.00963	-0.00000170

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25 °C	3.85V	38	5190	5,189.99455	0.00000105
		46	5230	5,229.99160	0.00000161
		54	5270	5,270.00136	-0.00000026
		62	5310	5,310.00231	-0.00000043
		102	5510	5,509.99897	0.00000019
		110	5550	5,549.99593	0.00000073
		134	5670	5,669.99444	0.00000098
55 °C	4.43V	38	5190	5,189.99914	0.00000017
		46	5230	5,230.00007	-0.00000001
		54	5270	5,269.99273	0.00000138
		62	5310	5,309.99272	0.00000137
		102	5510	5,510.00965	-0.00000175
		110	5550	5,550.00288	-0.00000052
		134	5670	5,670.00998	-0.00000176
	3.27V	38	5190	5,189.99195	0.00000155
		46	5230	5,230.00106	-0.00000020
		54	5270	5,270.00241	-0.00000046
		62	5310	5,310.00562	-0.00000106
		102	5510	5,510.00175	-0.00000032
		110	5550	5,550.00973	-0.00000175
		134	5670	5,670.00899	-0.00000159

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Operation Mode	802.11 ac_VHT80	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	42	5210	5,210.00757	-0.00000145
		58	5290	5,289.99334	0.00000126
		106	5530	5,530.00772	-0.00000140
		122	5610	5,609.99387	0.00000109
	3.27V	42	5210	5,210.00694	-0.00000133
		58	5290	5,290.00472	-0.00000089
		106	5530	5,529.99305	0.00000126
		122	5610	5,610.00323	-0.00000058
25 °C	3.85V	42	5210	5,210.00337	-0.00000065
		58	5290	5,289.99246	0.00000142
		106	5530	5,529.99989	0.00000002
		122	5610	5,609.99049	0.00000170
55 °C	4.43V	42	5210	5,210.00542	-0.00000104
		58	5290	5,290.00743	-0.00000141
		106	5530	5,529.99763	0.00000043
		122	5610	5,609.99073	0.00000165
	3.27V	42	5210	5,209.99940	0.00000012
		58	5290	5,289.99335	0.00000126
		106	5530	5,529.99056	0.00000171
		122	5610	5,610.00160	-0.00000029

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Operation Mode	802.11 a	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	36	5180	5,180.00307	-0.00000059
		44	5220	5,219.99617	0.00000073
		48	5240	5,239.99092	0.00000173
		52	5260	5,259.99667	0.00000063
		60	5300	5,299.99760	0.00000045
		64	5320	5,320.01085	-0.00000204
		100	5500	5,499.98785	0.00000221
		116	5580	5,579.99542	0.00000082
		140	5700	5,699.98794	0.00000212
	3.27V	36	5180	5,180.00311	-0.00000060
		44	5220	5,219.99690	0.00000059
		48	5240	5,240.01277	-0.00000244
		52	5260	5,259.98653	0.00000256
		60	5300	5,299.99898	0.00000019
		64	5320	5,320.00361	-0.00000068
		100	5500	5,499.99339	0.00000120
		116	5580	5,579.99111	0.00000159
		140	5700	5,699.98961	0.00000182
25 °C	3.85V	36	5180	5,180.00068	-0.00000013
		44	5220	5,220.00267	-0.00000051
		48	5240	5,239.99362	0.00000122
		52	5260	5,260.00057	-0.00000011
		60	5300	5,300.00402	-0.00000076
		64	5320	5,320.00003	-0.00000001
		100	5500	5,499.98897	0.00000201
		116	5580	5,579.99216	0.00000140
		140	5700	5,699.99454	0.00000096

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55 °C	4.43V	36	5180	5,179.99748	0.00000049
		44	5220	5,219.99389	0.00000117
		48	5240	5,240.00139	-0.00000027
		52	5260	5,260.00186	-0.00000035
		60	5300	5,300.00255	-0.00000048
		64	5320	5,319.99941	0.00000011
		100	5500	5,499.99361	0.00000116
		116	5580	5,579.99904	0.00000017
		140	5700	5,700.00845	-0.00000148
	3.27V	36	5180	5,180.00877	-0.00000169
		44	5220	5,220.00739	-0.00000142
		48	5240	5,239.99814	0.00000036
		52	5260	5,259.99398	0.00000114
		60	5300	5,299.99008	0.00000187
		64	5320	5,319.99639	0.00000068
		100	5500	5,499.99561	0.00000080
		116	5580	5,579.99997	0.00000001
		140	5700	5,700.00318	-0.00000056

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Operation Mode	802.11 n_HT40	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	38	5190	5,189.99631	0.00000071
		46	5230	5,230.00065	-0.00000012
		54	5270	5,269.99979	0.00000004
		62	5310	5,309.99604	0.00000075
		102	5510	5,509.99477	0.00000095
		110	5550	5,549.99376	0.00000112
		134	5670	5,670.00908	-0.00000160
	3.27V	38	5190	5,190.00263	-0.00000051
		46	5230	5,229.99217	0.00000150
		54	5270	5,270.00102	-0.00000019
		62	5310	5,309.99994	0.00000001
		102	5510	5,509.99307	0.00000126
		110	5550	5,550.00965	-0.00000174
		134	5670	5,670.00684	-0.00000121

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25 °C	3.85V	38	5190	5,190.00831	-0.00000160
		46	5230	5,229.99569	0.00000082
		54	5270	5,270.00254	-0.00000048
		62	5310	5,309.99884	0.00000022
		102	5510	5,510.00978	-0.00000178
		110	5550	5,549.99934	0.00000012
		134	5670	5,670.00384	-0.00000068
55 °C	4.43V	38	5190	5,190.00760	-0.00000147
		46	5230	5,230.00242	-0.00000046
		54	5270	5,269.99538	0.00000088
		62	5310	5,309.99506	0.00000093
		102	5510	5,510.00470	-0.00000085
		110	5550	5,550.00878	-0.00000158
		134	5670	5,669.99956	0.00000008
	3.27V	38	5190	5,190.00087	-0.00000017
		46	5230	5,230.00533	-0.00000102
		54	5270	5,269.99655	0.00000066
		62	5310	5,310.00107	-0.00000020
		102	5510	5,510.00024	-0.00000004
		110	5550	5,549.99479	0.00000094
		134	5670	5,669.99174	0.00000146

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Operation Mode	802.11 ac_VHT80	Test Date	2018.08.10
Temperature	:23 °C	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.43V	42	5210	5,209.99241	0.00000146
		58	5290	5,289.99247	0.00000142
		106	5530	5,529.99941	0.00000011
		122	5610	5,610.00221	-0.00000039
	3.27V	42	5210	5,210.00399	-0.00000077
		58	5290	5,290.00902	-0.00000170
		106	5530	5,529.99534	0.00000084
		122	5610	5,609.99870	0.00000023
25 °C	3.85V	42	5210	5,209.99577	0.00000081
		58	5290	5,290.00675	-0.00000128
		106	5530	5,529.99826	0.00000031
		122	5610	5,609.99029	0.00000173
55 °C	4.43V	42	5210	5,209.99004	0.00000191
		58	5290	5,290.00851	-0.00000161
		106	5530	5,530.00128	-0.00000023
		122	5610	5,609.99850	0.00000027
	3.27V	42	5210	5,209.99001	0.00000192
		58	5290	5,289.99456	0.00000103
		106	5530	5,530.00302	-0.00000055
		122	5610	5,610.00557	-0.00000099

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

~ End of Report ~

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