

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

OF

Applicant: Alco Electronics Ltd.
11/F Metropole Square, 2 On Yiu Street, Sha Tin, New Territories,
Hong Kong

Product Name: Tablet

Brand Name: Venturer, Compaq

Model No.: CT9L03W23H1, CT101

Model Difference: Different model no. for trading purpose.

FCC ID: A2HCT101

Report Number: ER/2018/80011

FCC Rule Part: §15.407, Cat:NII

Issue Date: Sep. 18, 2018

Date of Test: Aug. 01, 2018 ~ Sep. 12, 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:

Blue Yang

Blue Yang / Supervisor



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Revision History

Report Number	Revision	Description	Effectuated Page	Issue Date	Revised By
ER/2018/80011	Rev.00	Initial creation of document	All	Sep. 18, 2018	Tiffany Kao

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1 GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	Tablet	
Brand Name:	Venturer, Compaq	
Model No.:	CT9L03W23H1, CT101	
Model Difference:	Different model no. for trading purpose.	
Product SW/HW Version:	N/A / N/A	
Radio SW/HW Version:	N/A / N/A	
Test SW Version:	N/A	
RF power setting in TEST SW:	N/A	
Power Supply:	3.7Vdc from Rechargeable Li-ion Battery or 5V from AC/DC Adapter.	
	Battery:	Model No.: PT3075110-2P, Supplier: Guangdong Pow-Tech New Power Co., Ltd.
	Adapter:	Model No.: APS-H012050200W-G, Supplier: Shenzhen ACT Industrial Co., Ltd.

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FCC WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. Power (dBm)	Modulation Technology
11a_20	5150~5250	4	11.85	OFDM
	5250~5350	4	11.86	
	5470~5725	12	11.87	
	5725~5850	5	11.73	
11n_HT 20M	5150~5250	4	HT: 11.86	OFDM
	5250~5350	4	HT: 11.89	
	5470~5725	12	HT: 11.78	
	5725~5850	5	HT: 11.68	
11n_HT40M	5150~5250	2	HT: 11.83	OFDM
	5250~5350	2	HT: 11.75	
	5470~5725	6	HT:11.89	
	5725~5850	2	HT: 11.87	
Modulation type		64QAM, 16QAM, QPSK, BPSK for OFDM		
Transition Rate:		802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 65Mbps 802.11 n_40MHz: 13.5 - 135Mbps		
Antenna Designation:		Inner Antenna, 5150~5250MHz Peak Gain: 1.0dBi 5250~5350MHz Peak Gain: 0.5dBi 5470~5725MHz Peak Gain: 2.7dBi 5725~5850MHz Peak Gain: 2.6dBi		

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1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules

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, New 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.

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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 plan. 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

For all conducted test items:

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

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2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission & Conducted Emission (AC Power Line) Configuration

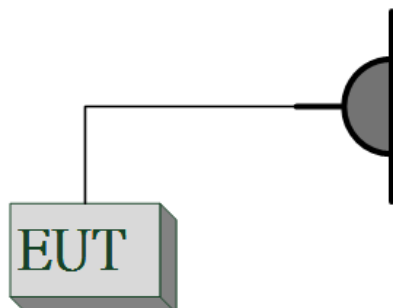


Fig.2-2 Conducted Emission (Antenna Port) Configuration



Table 2-1 Equipment Used in Tested System

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

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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 & 6dB & 99% Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(b)	Undesirable Radiated Emissions	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

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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	
Channel	Frequency
36	5180
40	5200
44	5220
48	5240

802.11 n HT40 Mode	
channel	Frequency
38	5190
46	5230

Operated band in 5250 MHz ~5350 MHz:

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

802.11 n HT40 Mode	
channel	Frequency
54	5270
62	5310

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Operated band in 5470 MHz ~5725 MHz:

802.11a / n HT20 Mode	
Channel	Freq (MHz)
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	
Channel	Freq (MHz)
102	5510
110	5550
118	5590
126	5630
134	5670

Operated band in 5745 MHz ~5850 MHz:

802.11a / n HT20 Mode	
Channel	Freq (MHz)
149	5745
153	5765
157	5785
161	5805
165	5825

802.11 n HT40 Mode	
channel	Freq (MHz)
151	5755
159	5795

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

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	Main
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Main
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	Main
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	Main
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	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	Main
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	Main

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MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5510~5710	102 to 134	102,110,134	OFDM	MCS0	Main
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	Main

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n/ac WLAN Transmitter for channel Low, Mid and High, the worst case E2 position was reported.

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	Main
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	Main
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5510~5710	102 to 134	102,110,134	OFDM	MCS0	Main
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	Main
802.11n_HT20				OFDM	MCS0	Main
802.11n_HT40	5755~5795	151 to 159	151,159	OFDM	MCS0	Main

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Measurement	+/- 0.96 dB
Maximum 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

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESC17	100335	201802/02	2019/02/01
LISN	SCHWARZ-BECK	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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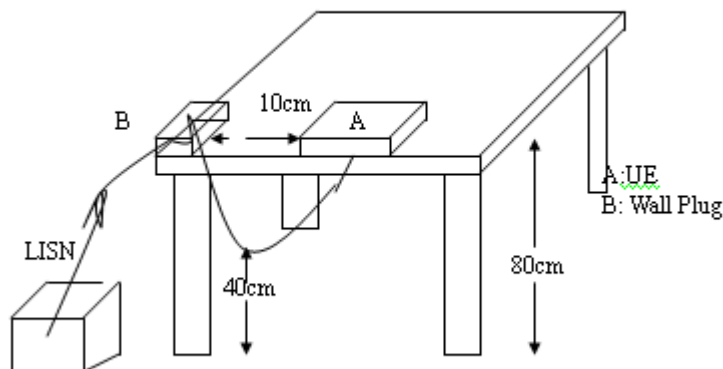
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6.4 Test SET-UP



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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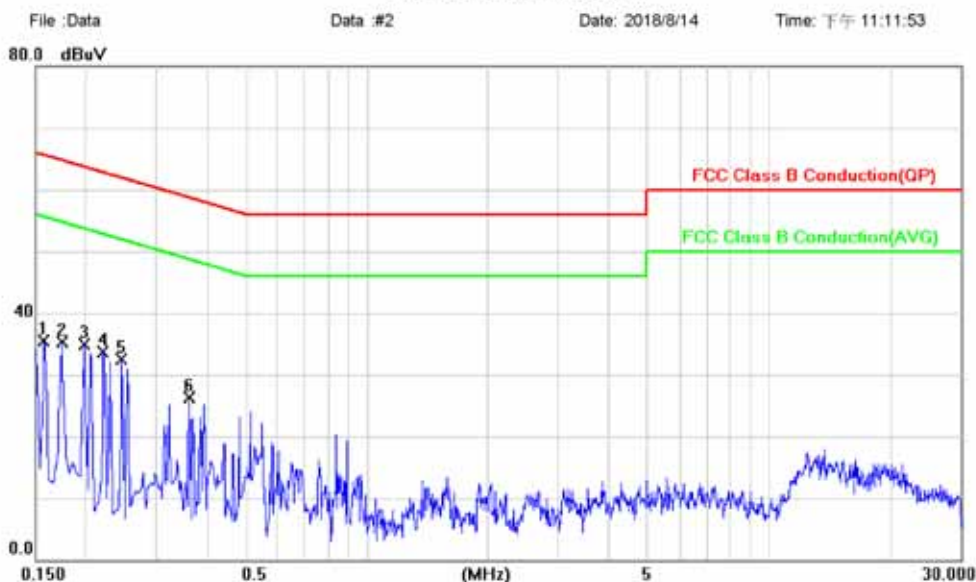
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode	Test By:	Tin
-----------------	----------------	----------	-----

Site: Conduction Room	Phase: L1	Temperature: 25 °C
Limit: FCC Class B Conduction(QP)	Power: AC 120V/60Hz	Humidity: 85 %
Mode: Operation		
Note: Adapter: APS-H012050200W-G		

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1580	35.56	0.04	35.60	65.57	-29.97	peak	
2		0.1740	35.23	0.04	35.27	64.77	-29.50	peak	
3	*	0.1980	34.80	0.04	34.84	63.69	-28.85	peak	
4		0.2220	33.70	0.04	33.74	62.74	-29.00	peak	
5		0.2460	32.53	0.04	32.57	61.89	-29.32	peak	
6		0.3620	26.27	0.04	26.31	58.68	-32.37	peak	

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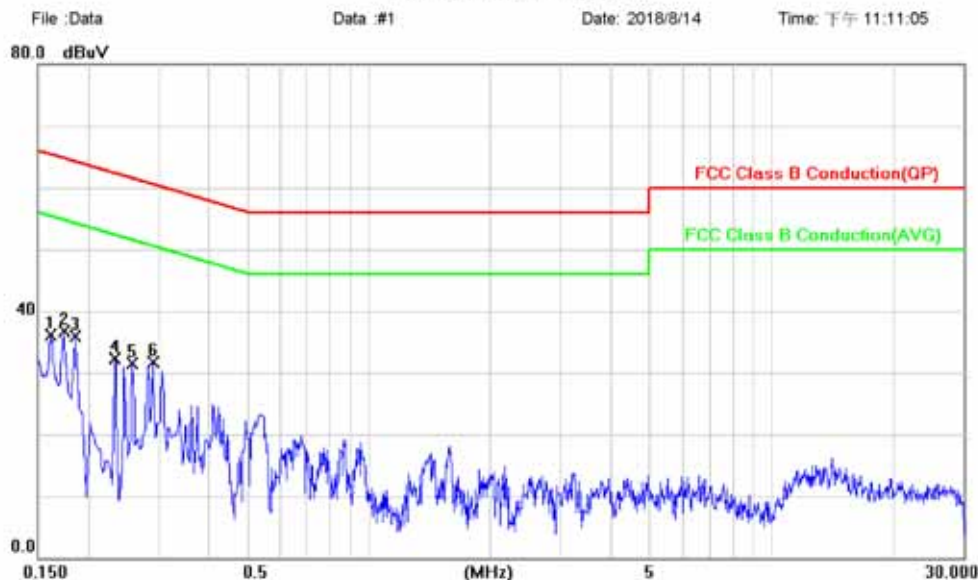
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Site: Conduction Room
Limit: FCC Class B Conduction(QP)
Mode: Operation
Note: Adapter: APS-H012050200W-G

Phase: **N**
Power: AC 120V/60Hz

Temperature: 25 °C
Humidity: 85 %

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1620	36.08	0.04	36.12	65.36	-29.24	peak	
2	*	0.1740	36.62	0.04	36.66	64.77	-28.11	peak	
3		0.1860	35.93	0.04	35.97	64.21	-28.24	peak	
4		0.2340	32.17	0.04	32.21	62.31	-30.10	peak	
5		0.2580	31.44	0.04	31.48	61.50	-30.02	peak	
6		0.2900	31.60	0.04	31.64	60.52	-28.88	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	100.00	0.00	0.00	0.01
802.11n_20	100.00	0.00	0.00	0.01
802.11n_40	100.00	0.00	0.00	0.01

$$\text{Duty Cycle Factor: } 10 * \log(1/1) = 0$$

$$\text{Duty Cycle Factor: } 10 * \log(1/1) = 0$$

$$\text{Duty Cycle Factor: } 10 * \log(1/1) = 0$$

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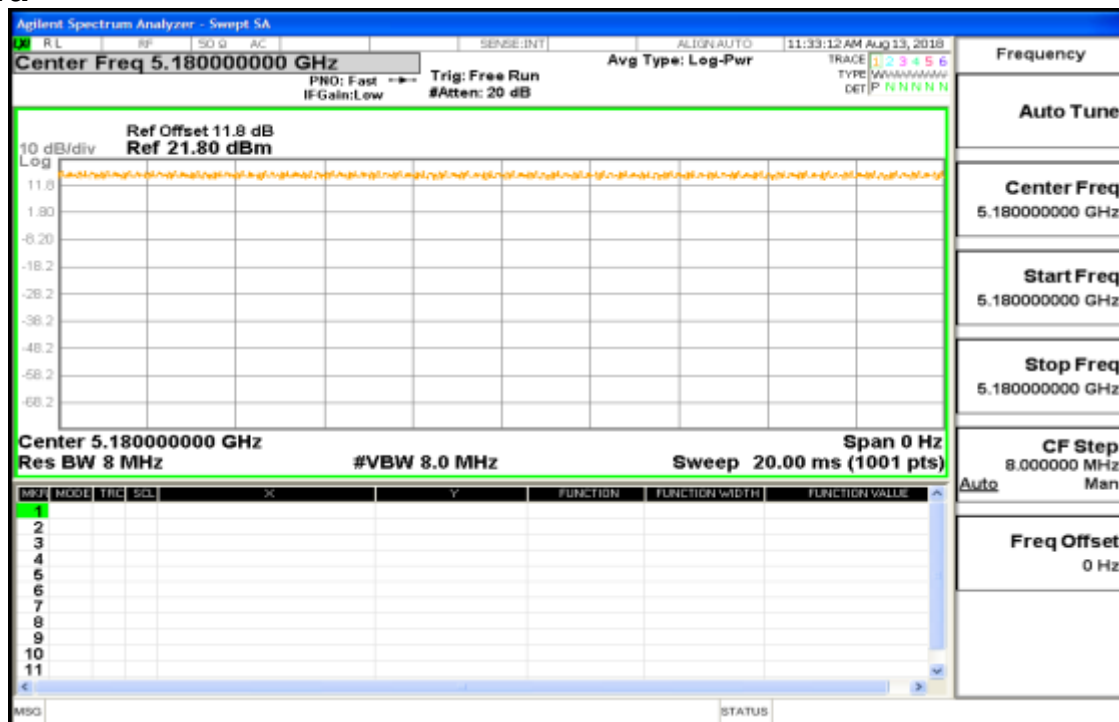
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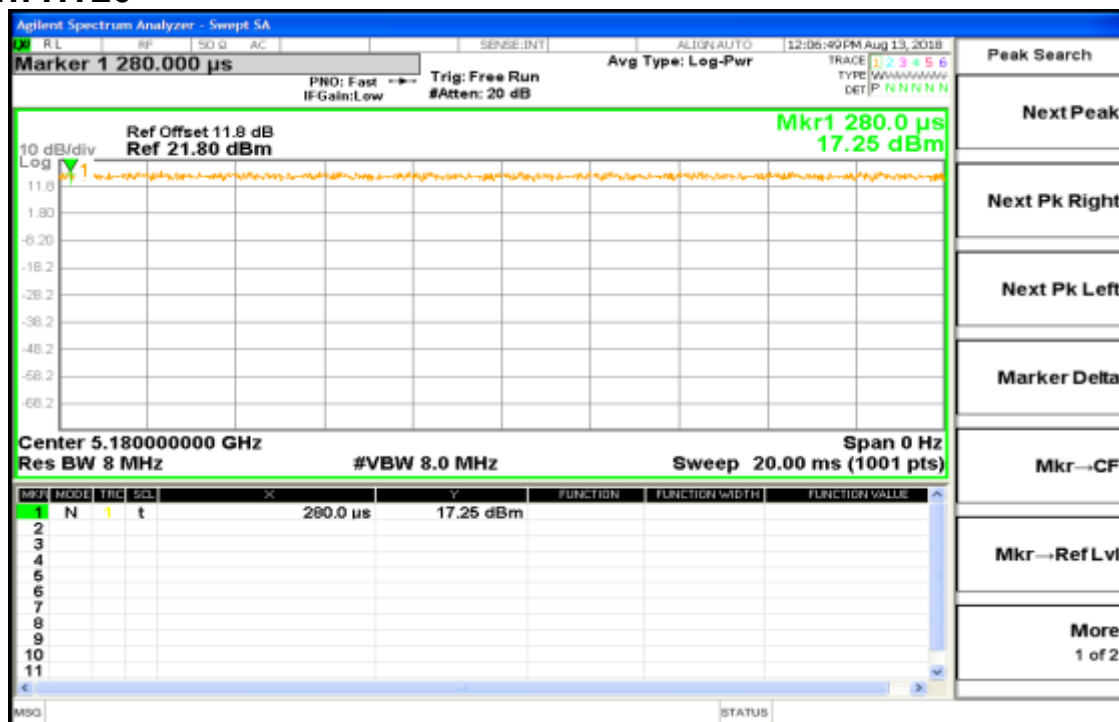
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DUTY CYCLE TEST SIGNAL Measurement Result

802.11a



802.11n HT20



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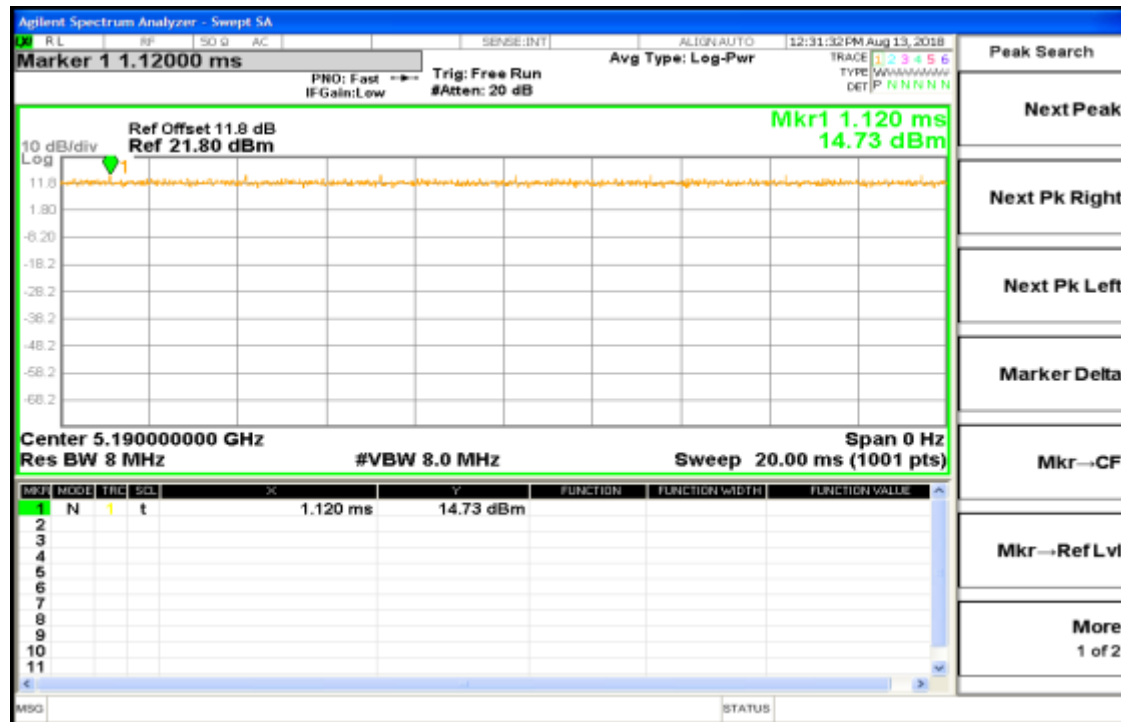
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802.11n HT 40



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8 26DB & 6DB EMISSION BANDWIDTH MEASUREMENT

8.1 Standard Applicable

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

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

8.2 Measurement Procedure

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

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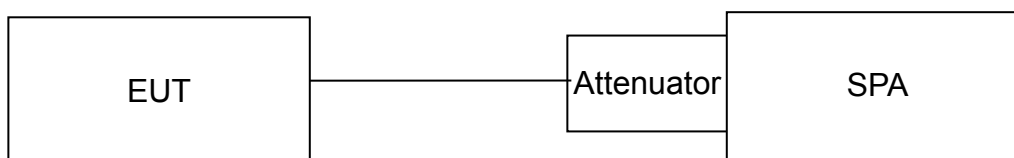
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8.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equip-ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	2018/05/03	2019/05/02
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
Coaxial Cables	N/A	WK CE Cable	N/A	2018/01/02	2019/01/01

8.4 Test Set-up



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8.5 Measurement Result

26dB and 6dB Bandwidth

802.11a_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	23.21	13.657
5220	24.61	13.912
5240	21.00	13.221
5260	24.55	13.900
5300	24.49	13.889
5320	20.23	13.060
5500	19.99	13.008
5580	19.50	12.901
5700	19.75	12.955

802.11a_Ch0

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.61	12.202
5785	16.58	12.195
5825	16.59	12.199

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802.11n_HT20_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.50	13.522
5220	20.39	13.093
5240	24.54	13.899
5260	22.23	13.470
5300	22.04	13.433
5320	19.90	12.989
5500	19.82	12.971
5580	19.80	12.966
5700	20.00	13.011

802.11n_HT20_Ch0

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.82	12.510
5785	17.85	12.515
5825	17.83	12.512

802.11n_HT40_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	41.43	16.174
5230	46.86	16.708
5270	45.06	16.538
5310	40.03	16.024
5510	40.11	16.033
5550	39.87	16.007
5670	39.92	16.012

802.11n_HT40_Ch0

Frequency (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	36.50	15.623
5795	36.54	15.628

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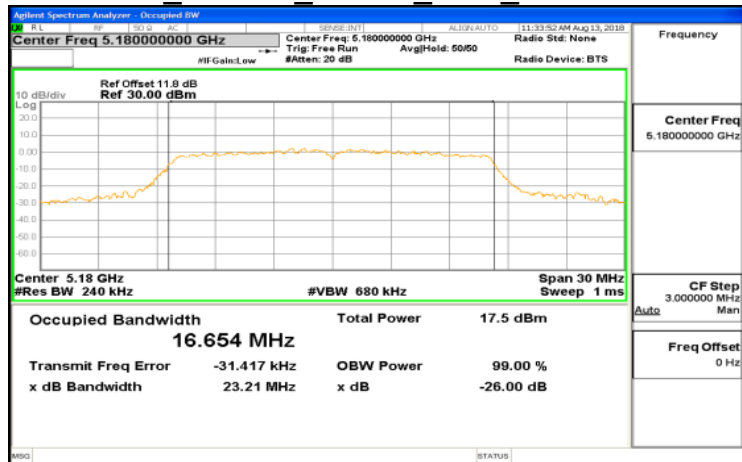
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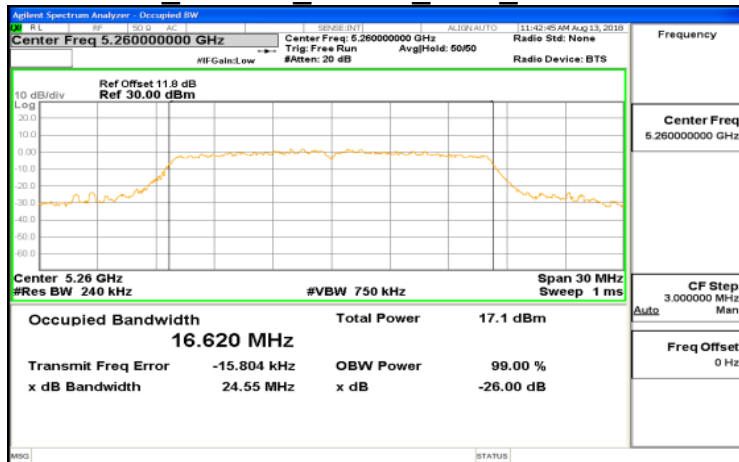
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26dB and 6dB Bandwidth

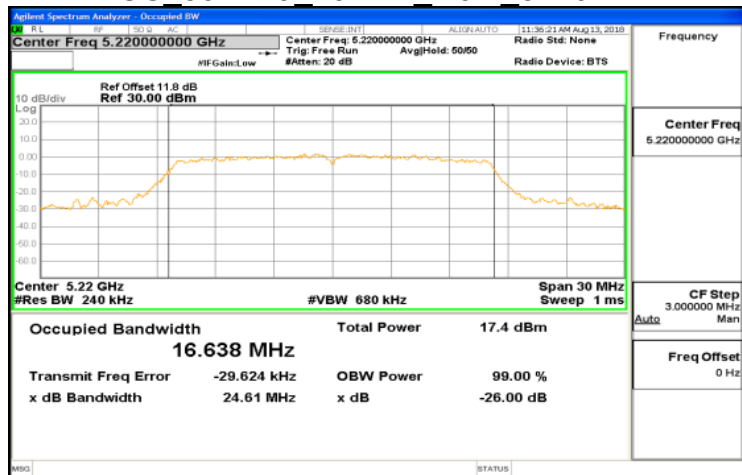
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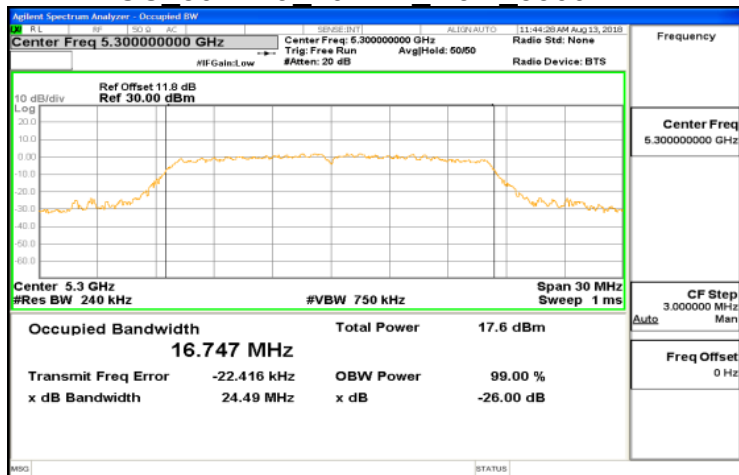
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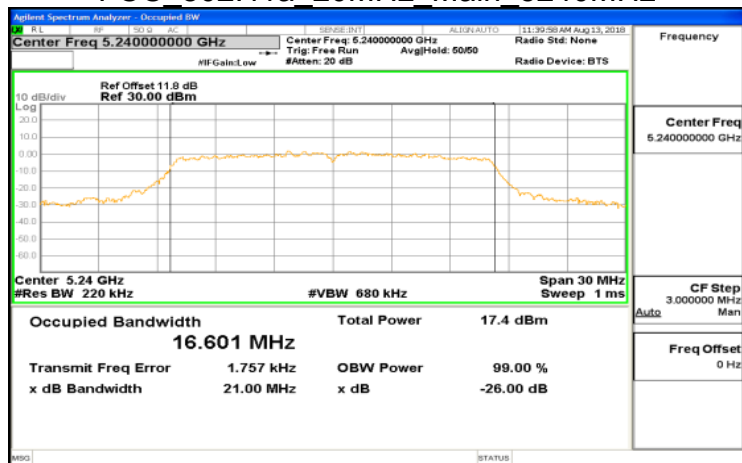
FCC 802.11a 20MHz Main_5220MHz



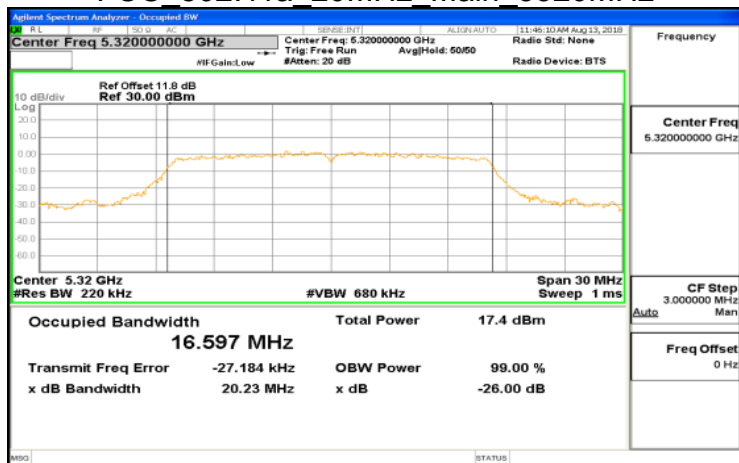
FCC 802.11a 20MHz Main_5300MHz



FCC 802.11a 20MHz Main_5240MHz



FCC 802.11a 20MHz Main_5320MHz



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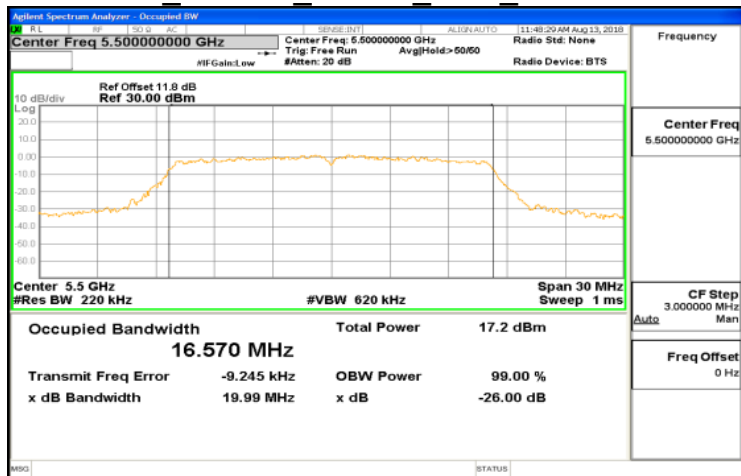
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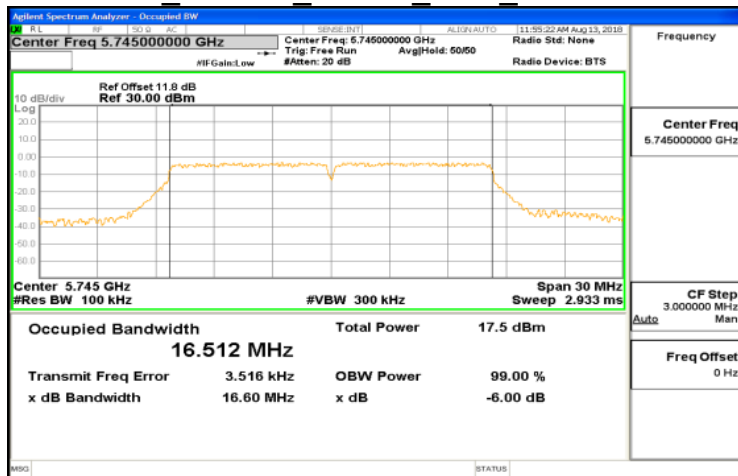
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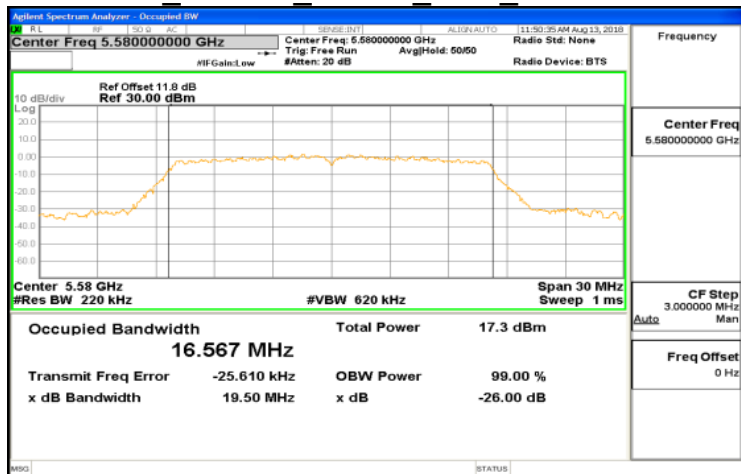
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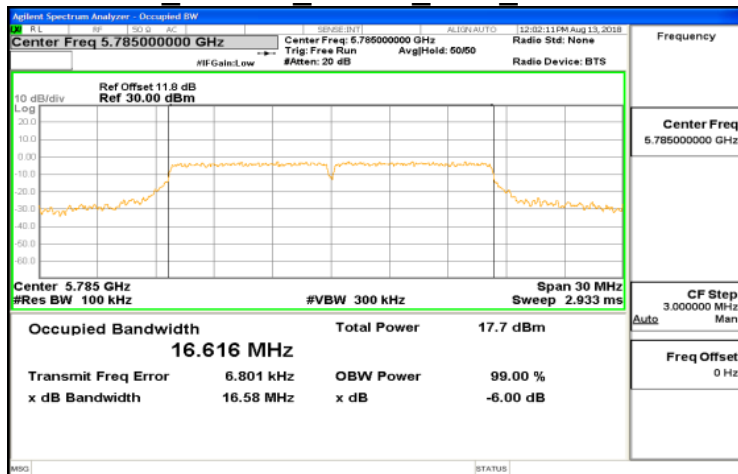
FCC 802.11a 20MHz Main 5745MHz



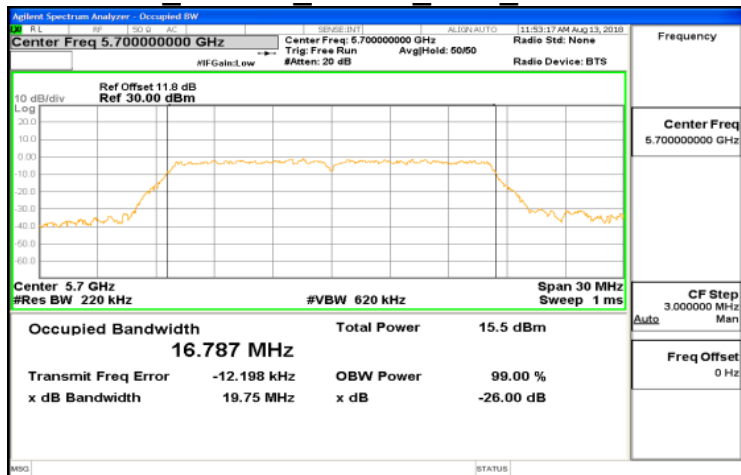
FCC 802.11a 20MHz Main 5580MHz



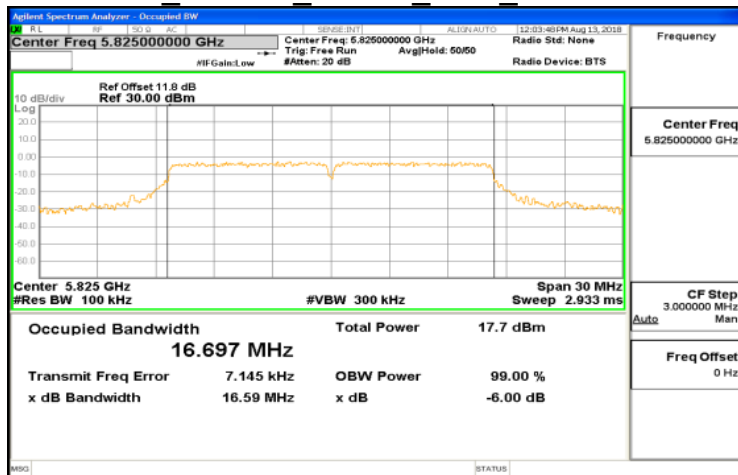
FCC 802.11a 20MHz Main 5785MHz



FCC 802.11a 20MHz Main 5700MHz



FCC 802.11a 20MHz Main 5825MHz



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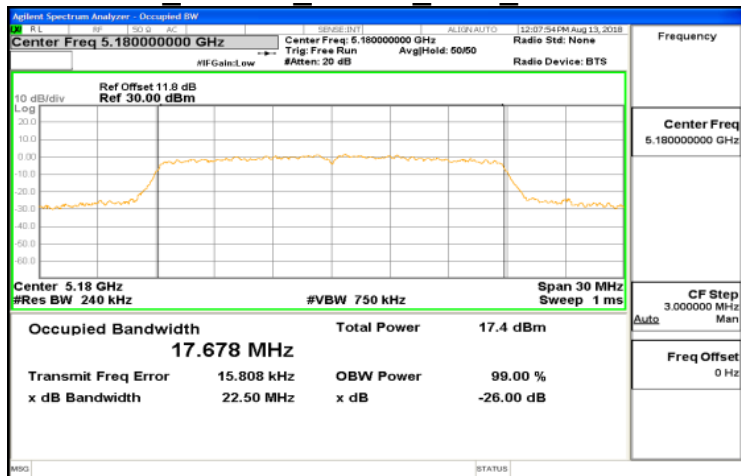
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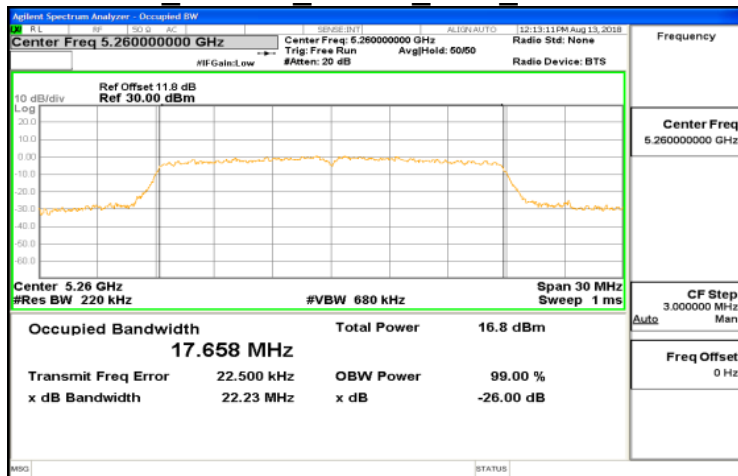
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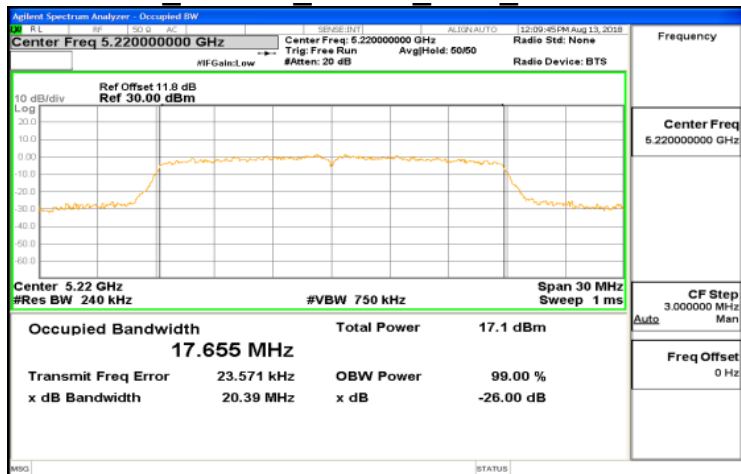
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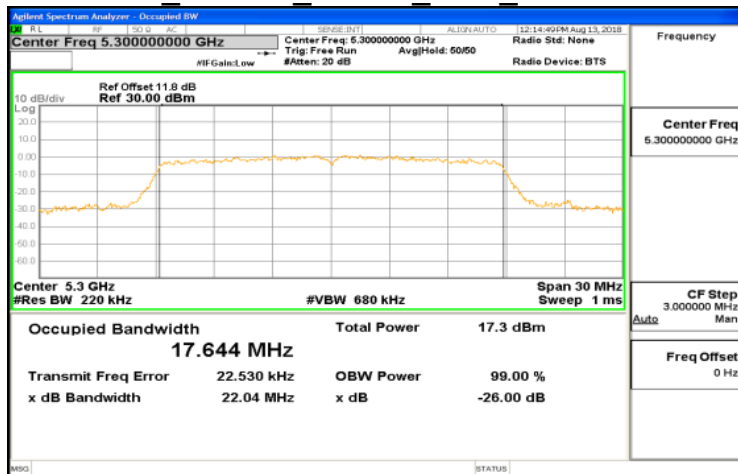
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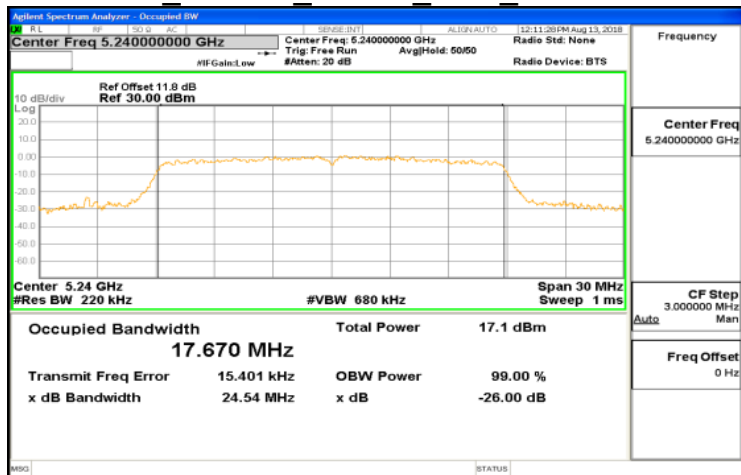
FCC 802.11n 20MHz Main 5220MHz



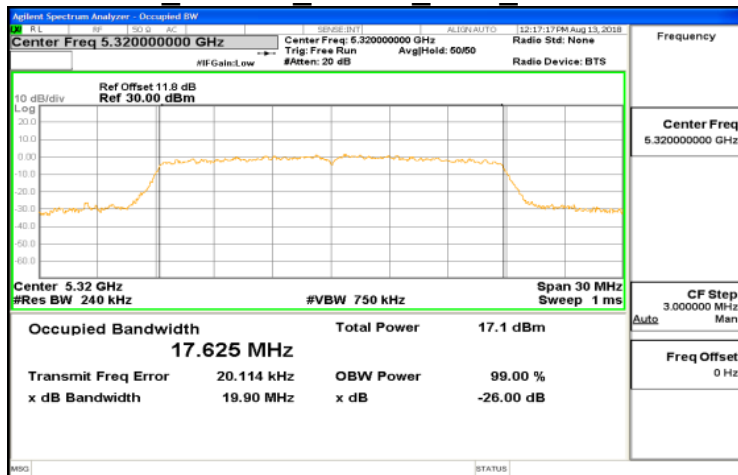
FCC 802.11n 20MHz Main 5300MHz



FCC 802.11n 20MHz Main 5240MHz



FCC 802.11n 20MHz Main 5320MHz



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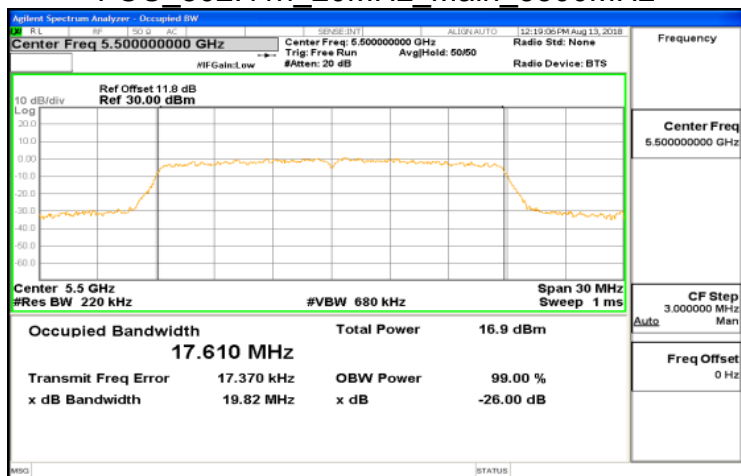
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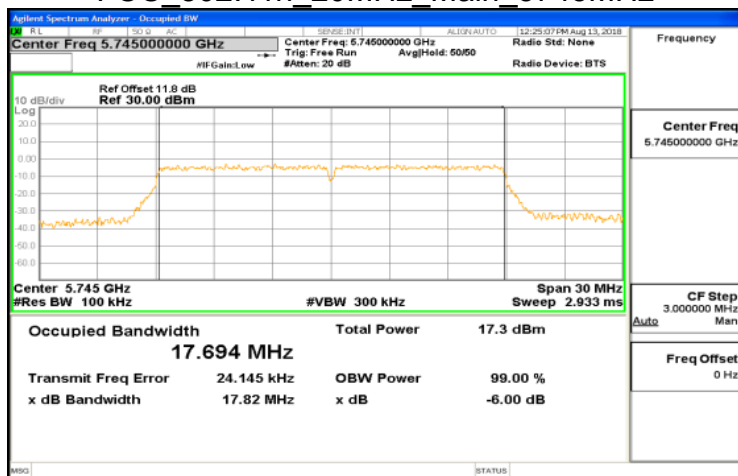
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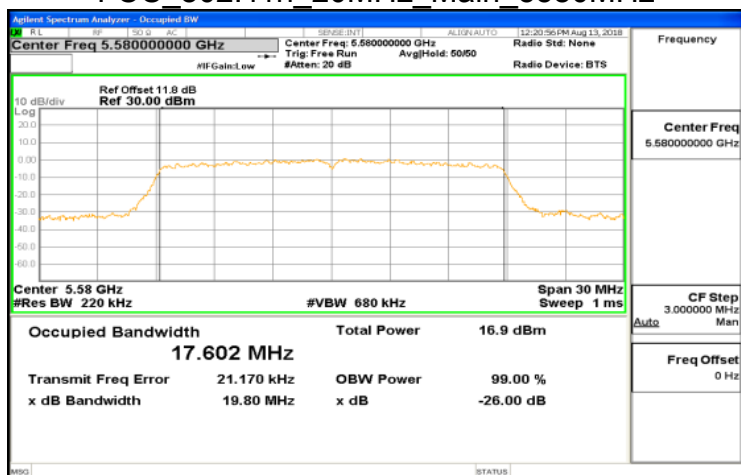
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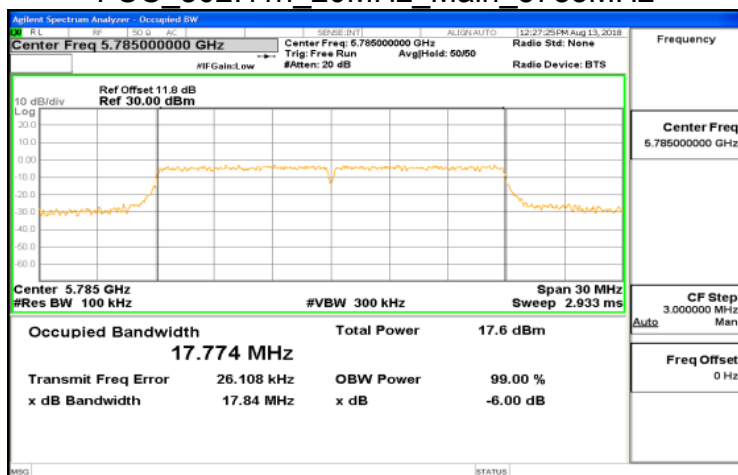
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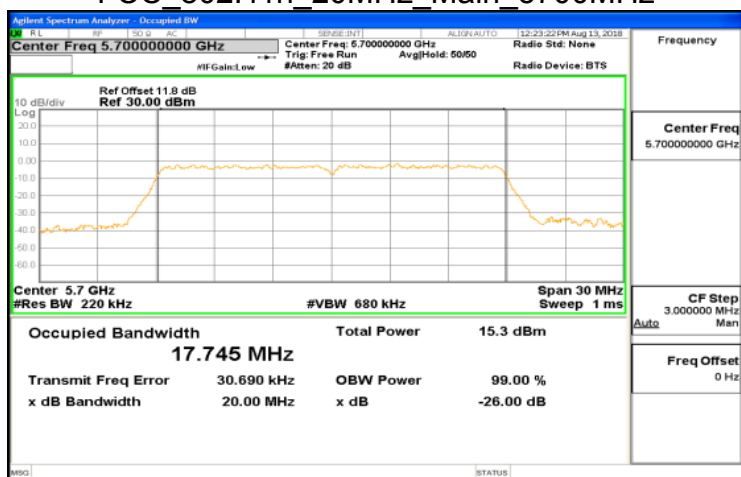
FCC 802.11n 20MHz Main 5580MHz



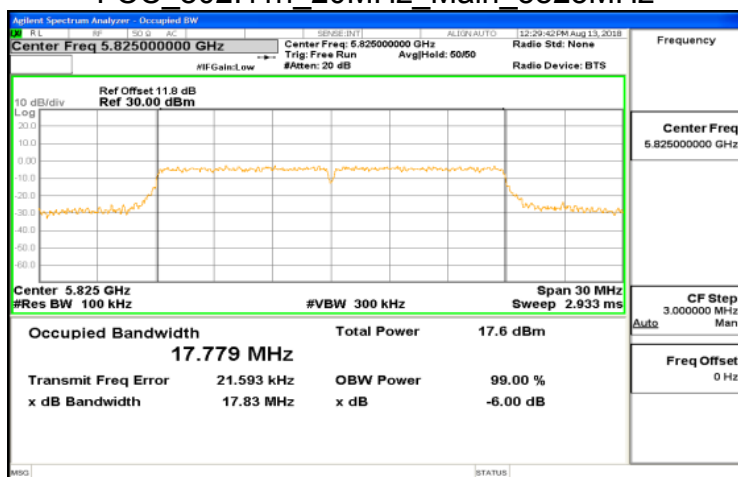
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FCC 802.11n 20MHz Main 5700MHz



FCC 802.11n 20MHz Main 5825MHz

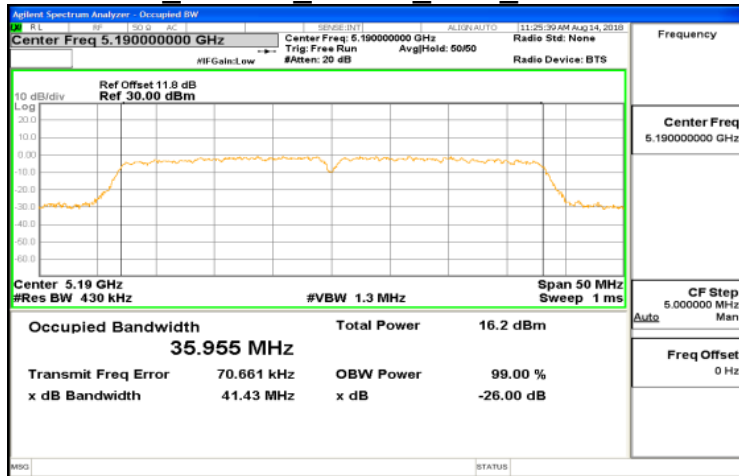


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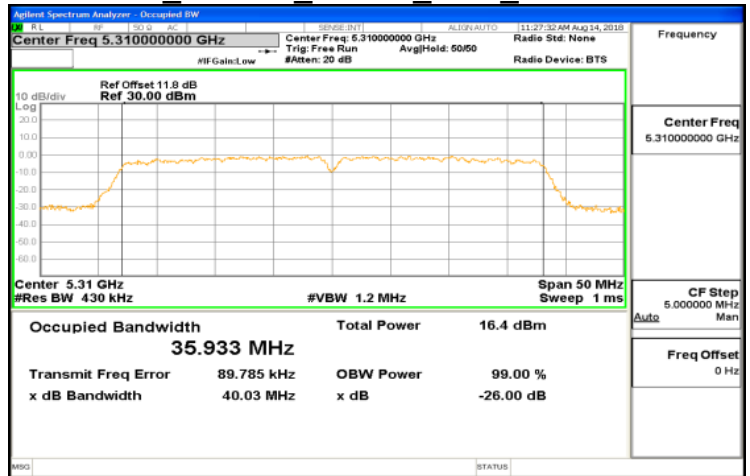
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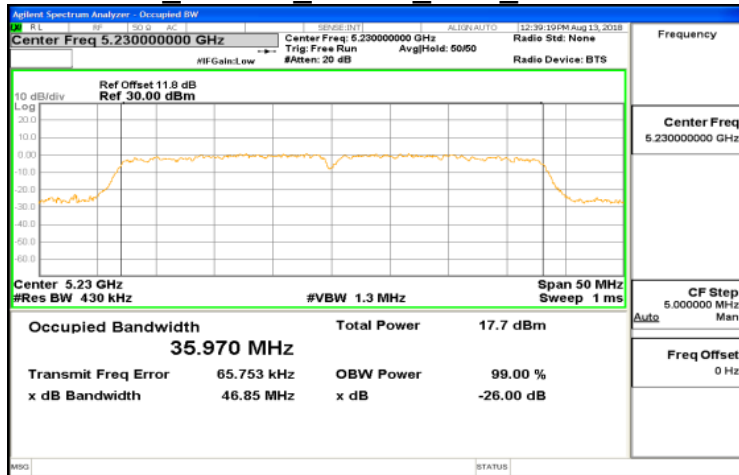
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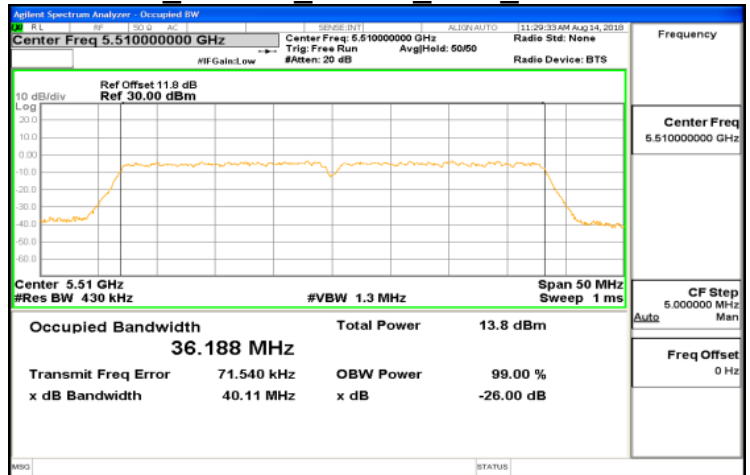
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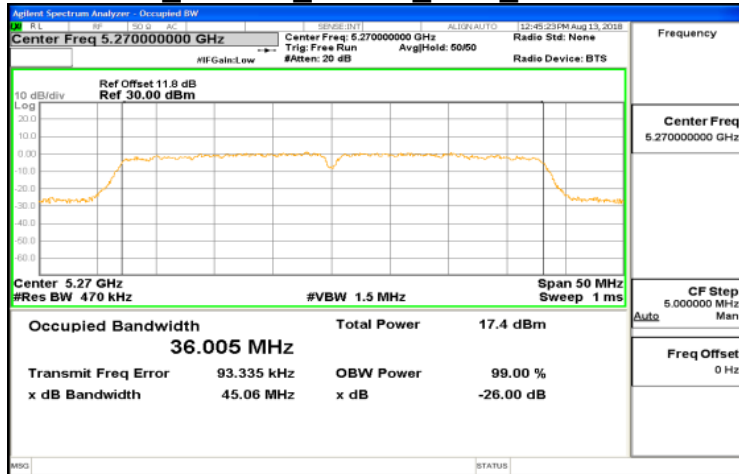
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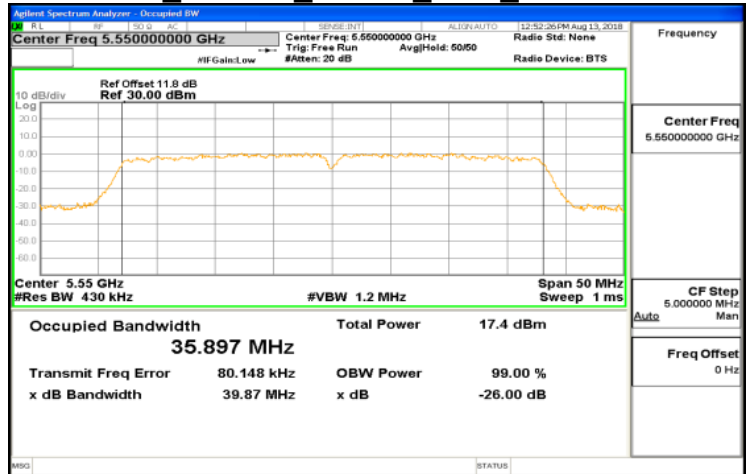
FCC 802.11n 40MHz Main 5510MHz



FCC 802.11n 40MHz Main 5270MHz



FCC 802.11n 40MHz Main 5550MHz



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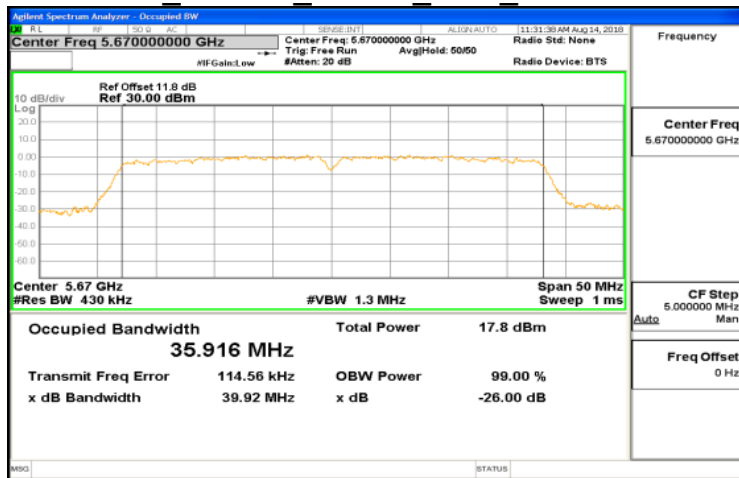
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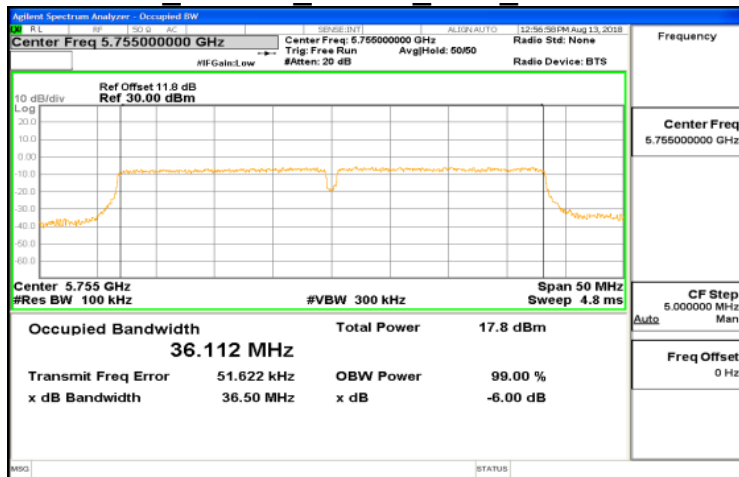
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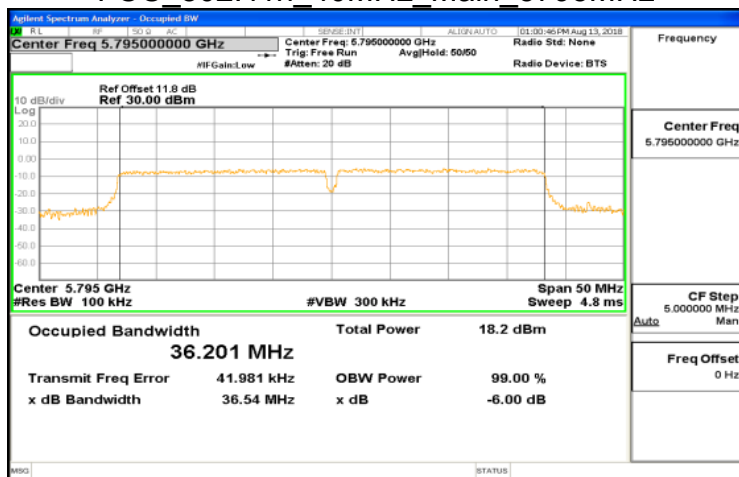
FCC 802.11n 40MHz Main 5670MHz



FCC 802.11n 40MHz Main 5755MHz



FCC 802.11n 40MHz Main 5795MHz



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9 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

9.1 Standard Applicable

FCC

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

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the Maximum 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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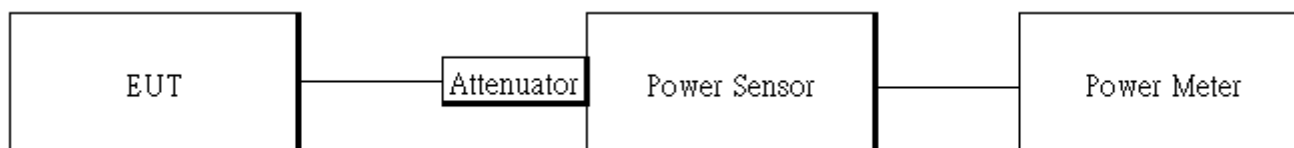
9.2 Measurement Procedure

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

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	2018/05/03	2019/05/02
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
Coaxial Cables	N/A	WK CE Cable	N/A	2018/01/02	2019/01/01

9.4 Test Set-up



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9.5 Measurement Result

Conducted output power

802.11a_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	11.81	15.171	23.98	PASS
44	5220	6	11.82	15.205	23.98	PASS
48	5240	6	11.85	15.311	23.98	PASS
52	5260	6	11.77	15.031	23.98 or $11+10\log(B) = 24.90$	PASS
60	5300	6	11.86	15.346	23.98 or $11+10\log(B) = 24.89$	PASS
64	5320	6	11.81	15.171	23.98 or $11+10\log(B) = 24.06$	PASS
100	5500	6	11.84	15.276	23.98 or $11+10\log(B) = 24.01$	PASS
116	5580	6	11.87	15.382	23.98 or $11+10\log(B) = 23.90$	PASS
140	5700	6	6.57	4.539	23.98 or $11+10\log(B) = 23.95$	PASS
149	5745	6	11.65	14.622	30	PASS
157	5785	6	11.73	14.894	30	PASS
165	5825	6	11.68	14.723	30	PASS

802.11n_HT20_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	11.83	15.241	23.98	PASS
44	5220	MCS0	11.86	15.346	23.98	PASS
48	5240	MCS0	11.83	15.241	23.98	PASS
52	5260	MCS0	11.69	14.757	23.98 or $11+10\log(B) = 24.47$	PASS
60	5300	MCS0	11.89	15.453	23.98 or $11+10\log(B) = 24.43$	PASS
64	5320	MCS0	11.71	14.825	23.98 or $11+10\log(B) = 23.99$	PASS
100	5500	MCS0	11.78	15.066	23.98 or $11+10\log(B) = 23.97$	PASS
116	5580	MCS0	11.76	14.997	23.98 or $11+10\log(B) = 23.97$	PASS
140	5700	MCS0	7.15	5.188	23.98 or $11+10\log(B) = 24.01$	PASS
149	5745	MCS0	11.63	14.555	30	PASS
157	5785	MCS0	11.68	14.723	30	PASS
165	5825	MCS0	11.61	14.488	30	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	11.70	14.791	23.98	PASS
46	5230	MCS0	11.83	15.241	23.98	PASS
54	5270	MCS0	11.75	14.962	23.98 or $11+10\log(B) = 27.54$	PASS
62	5310	MCS0	11.68	14.723	23.98 or $11+10\log(B) = 27.02$	PASS
102	5510	MCS0	11.79	15.101	23.98 or $11+10\log(B) = 27.03$	PASS
110	5550	MCS0	11.89	15.453	23.98 or $11+10\log(B) = 27.01$	PASS
134	5670	MCS0	7.75	5.957	23.98 or $11+10\log(B) = 27.01$	PASS
151	5755	MCS0	11.86	15.346	30	PASS
159	5795	MCS0	11.87	15.382	30	PASS

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10 MAXIMUM POWER SPECTRAL DENSITY

10.1 Standard Applicable

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

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the Maximum 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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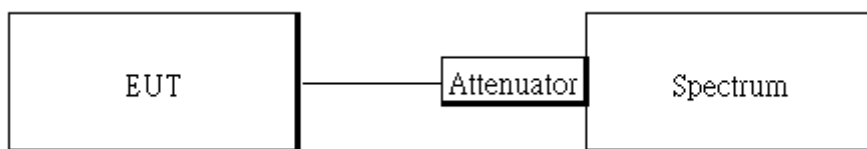
10.2 Measurement Procedure

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)
For U-NII-3 Band:
Set RBW=500 kHz, VBW $\geq$ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. 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

SGS Conducted Room					
Name of Equip-ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	2018/05/03	2019/05/02
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
Coaxial Cables	N/A	WK CE Cable	N/A	2018/01/02	2019/01/01

10.4 Test Set-up



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10.5 Measurement Result

POWER DENSITY 802.11a MODE						
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-1.19	11.80	0.00	-1.19	11	-12.19
5220	-1.08	11.80	0.00	-1.08	11	-12.08
5240	-1.33	11.80	0.00	-1.33	11	-12.33
5260	-1.06	11.80	0.00	-1.06	11	-12.06
5300	-0.59	11.80	0.00	-0.59	11	-11.59
5320	-1.46	11.80	0.00	-1.46	11	-12.46
5500	-1.39	11.80	0.00	-1.39	11	-12.39
5580	-1.56	11.80	0.00	-1.56	11	-12.56
5700	-3.99	11.80	0.00	-3.99	11	-14.99
5745	4.00	11.80	-	4.00	30	-26.00
5785	4.57	11.80	-	4.57	30	-25.43
5825	4.56	11.80	-	4.56	30	-25.44

POWER DENSITY 802.11n HT20 MODE						
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-2.10	11.80	0.00	-2.10	11	-13.10
5220	-1.66	11.80	0.00	-1.66	11	-12.66
5240	-2.00	11.80	0.00	-2.00	11	-13.00
5260	-2.21	11.80	0.00	-2.21	11	-13.21
5300	-1.34	11.80	0.00	-1.34	11	-12.34
5320	-1.55	11.80	0.00	-1.55	11	-12.55
5500	-1.66	11.80	0.00	-1.66	11	-12.66
5580	-2.03	11.80	0.00	-2.03	11	-13.03
5700	-4.68	11.80	0.00	-4.68	11	-15.68
5745	4.01	11.80	-	4.01	30	-25.99
5785	4.16	11.80	-	4.16	30	-25.84
5825	4.52	11.80	-	4.52	30	-25.48

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POWER DENSITY 802.11n HT40 MODE						
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5190	-6.26	11.80	0.00	-6.26	11	-17.26
5230	-4.82	11.80	0.00	-4.82	11	-15.82
5270	-4.9	11.80	0.00	-4.90	11	-15.90
5310	-5.88	11.80	0.00	-5.88	11	-16.88
5510	-9.22	11.80	0.00	-9.22	11	-20.22
5550	-4.95	11.80	0.00	-4.95	11	-15.95
5670	-5.01	11.80	0.00	-5.01	11	-16.01
5755	1.73	11.80	-	1.73	30	-28.27
5795	1.79	11.80	-	1.79	30	-28.21

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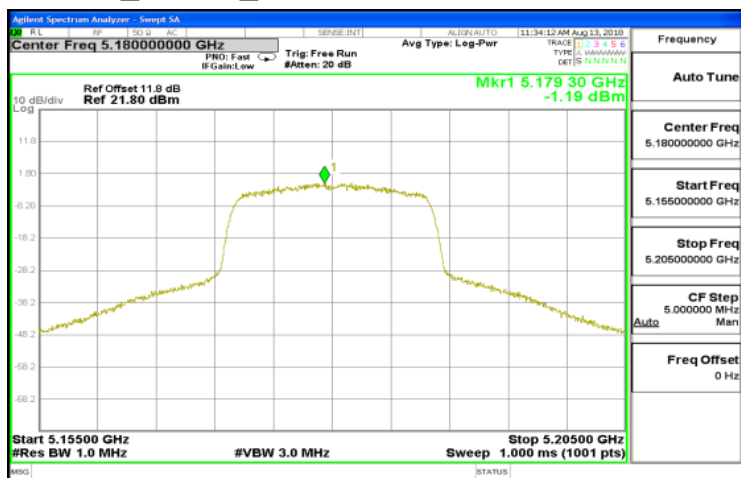
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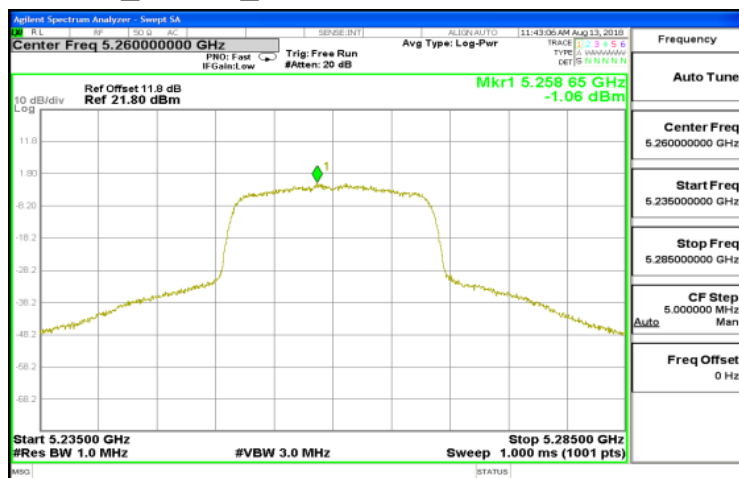
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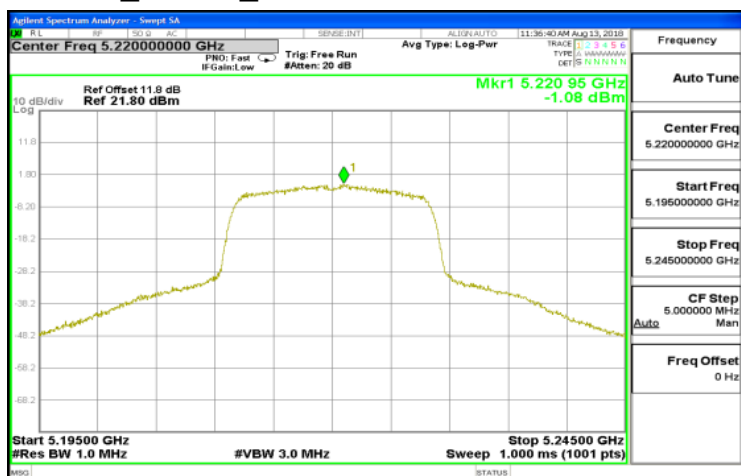
802.11a_20MHz_5180MHz



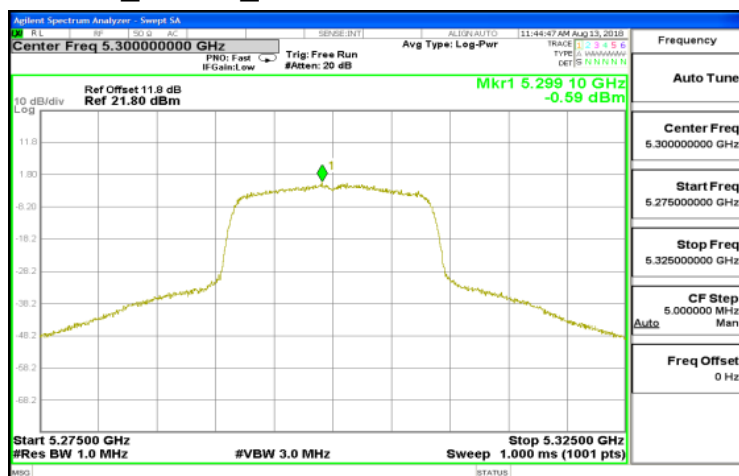
802.11a_20MHz_5260MHz



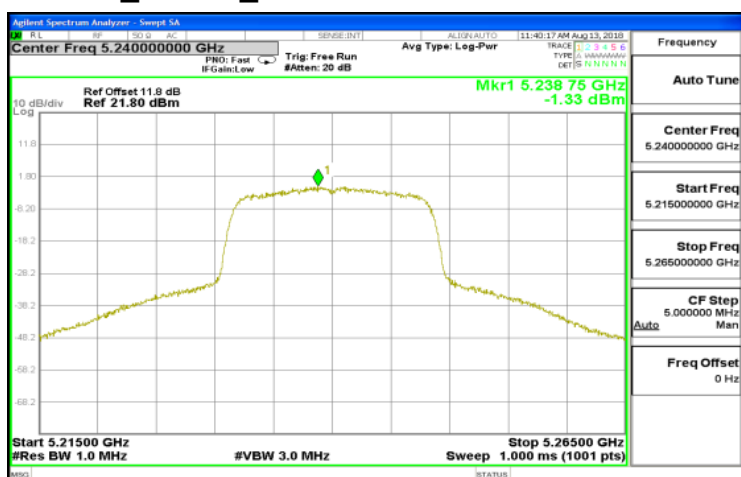
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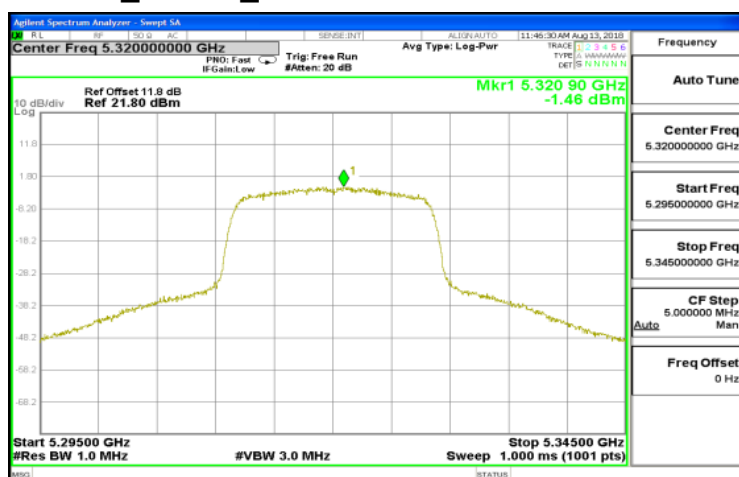
802.11a_20MHz_5300MHz



802.11a_20MHz_5240MHz



802.11a_20MHz_5320MHz

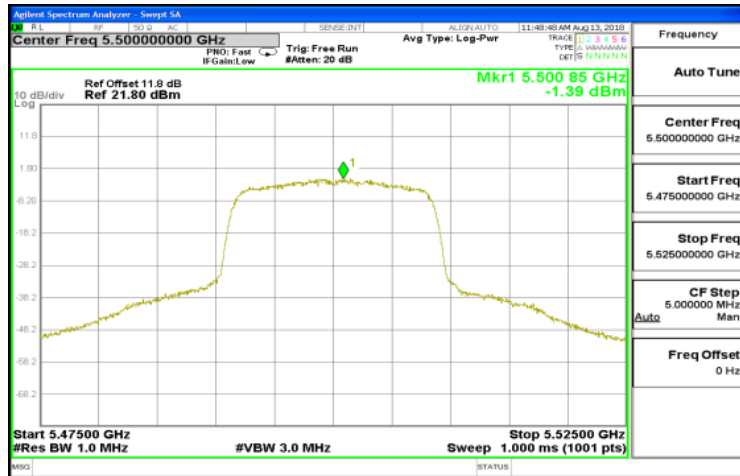


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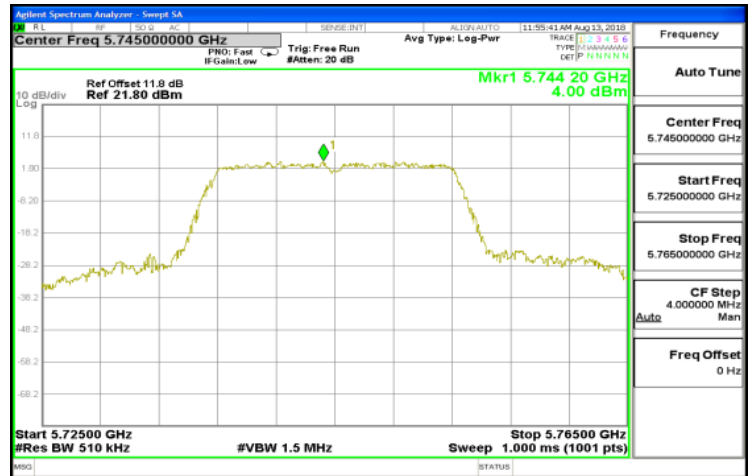
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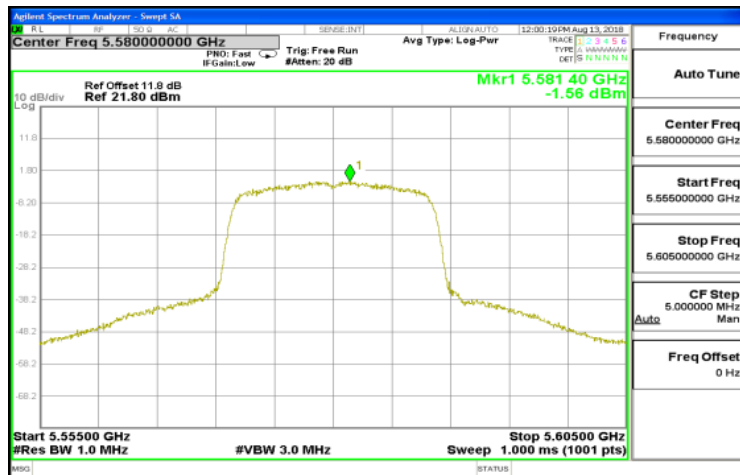
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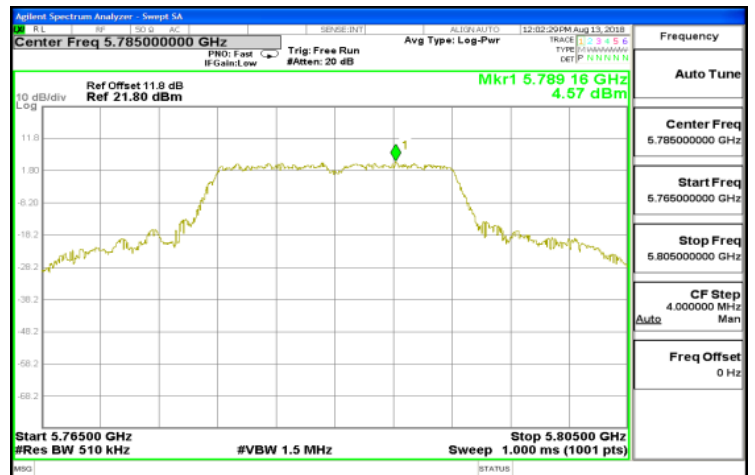
802.11a_20MHz_5745MHz



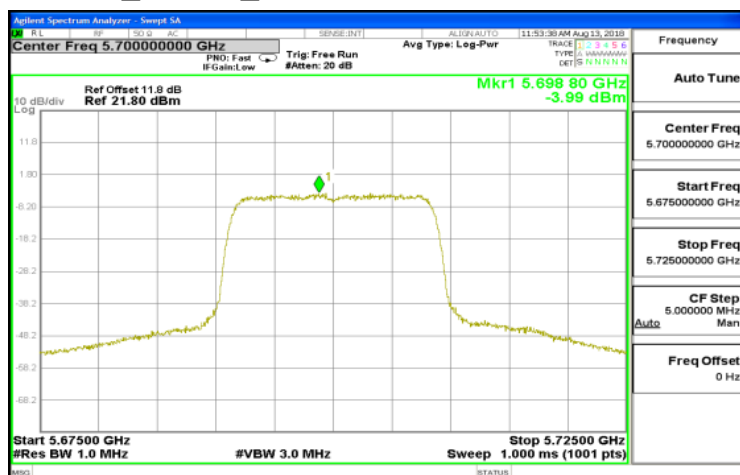
802.11a_20MHz_5580MHz



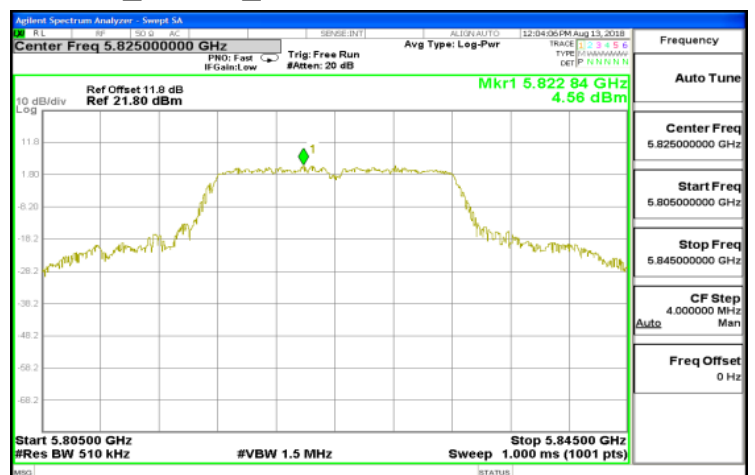
802.11a_20MHz_5785MHz



802.11a_20MHz_5700MHz



802.11a_20MHz_5825MHz

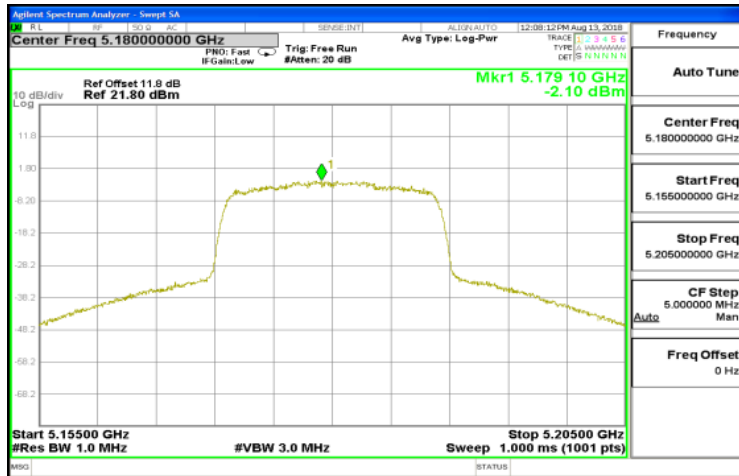


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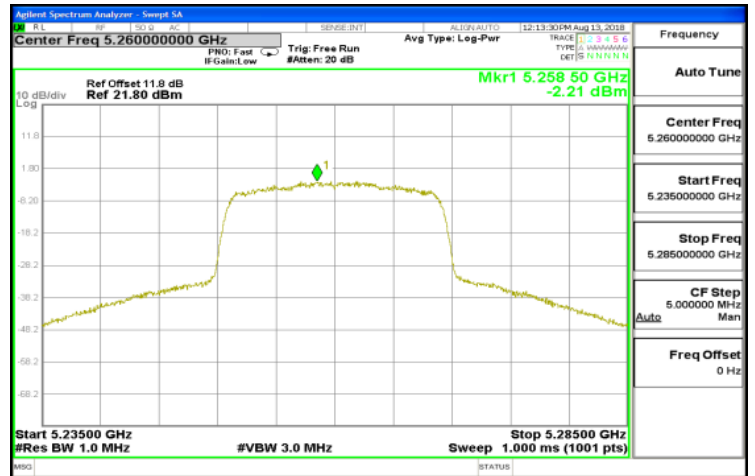
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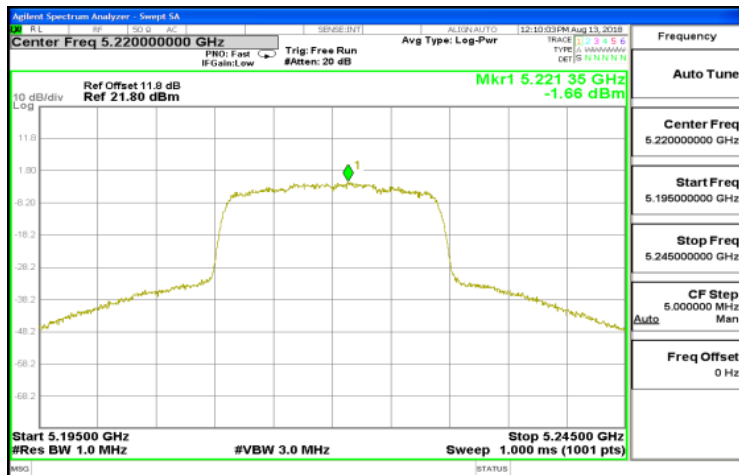
802.11n_20MHz_5180MHz



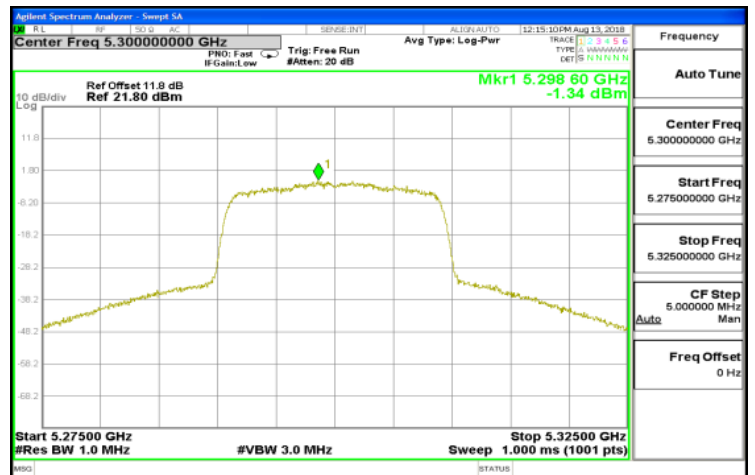
802.11n_20MHz_5260MHz



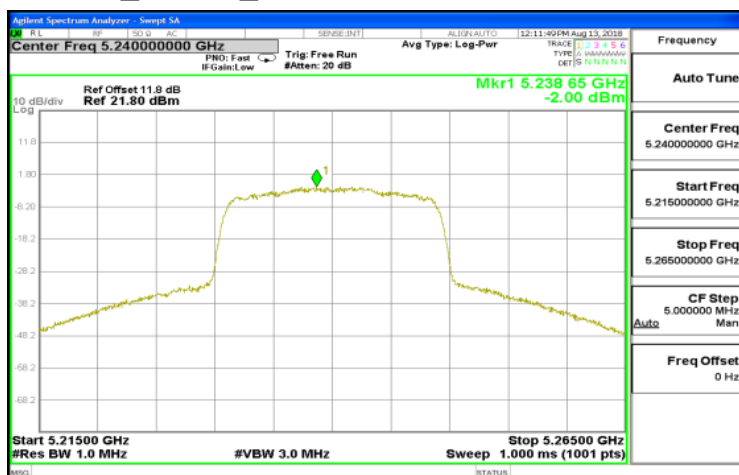
802.11n_20MHz_5220MHz



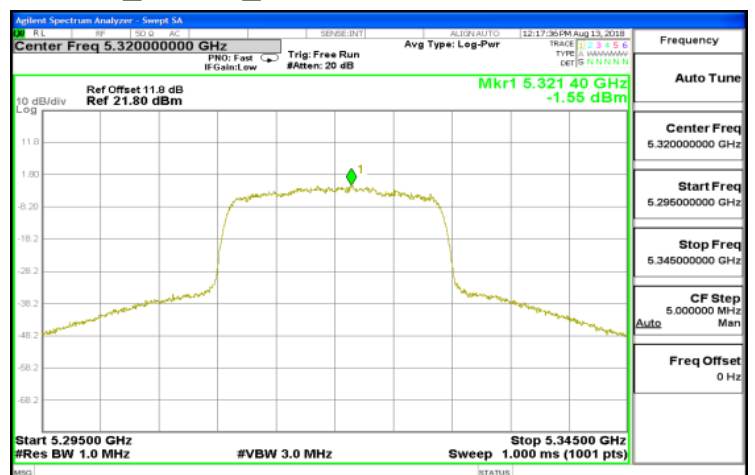
802.11n_20MHz_5300MHz



802.11n_20MHz_5240MHz



802.11n_20MHz_5320MHz

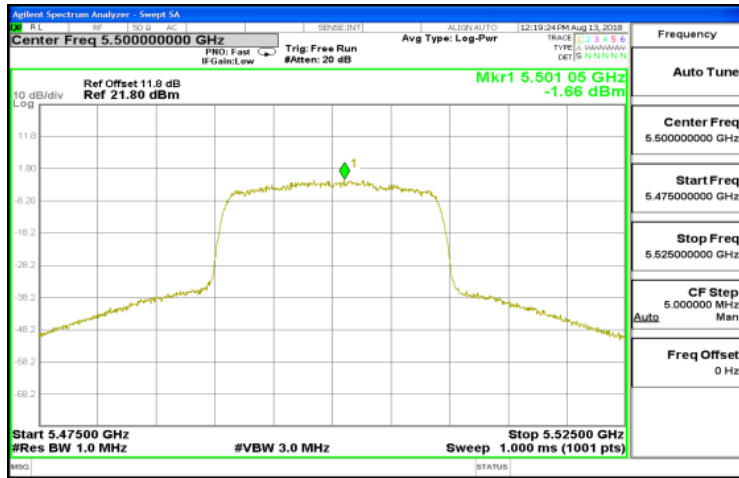


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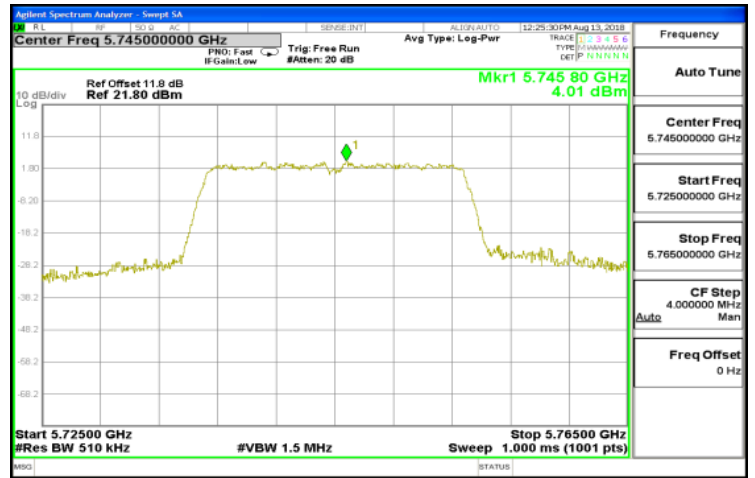
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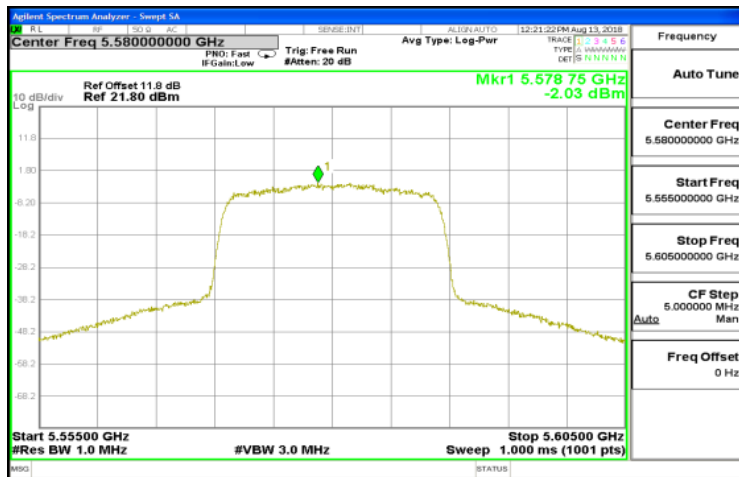
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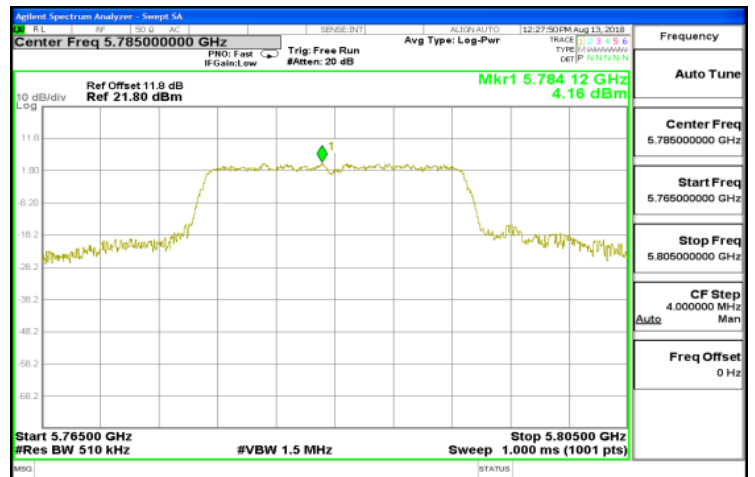
802.11n_20MHz_5745MHz



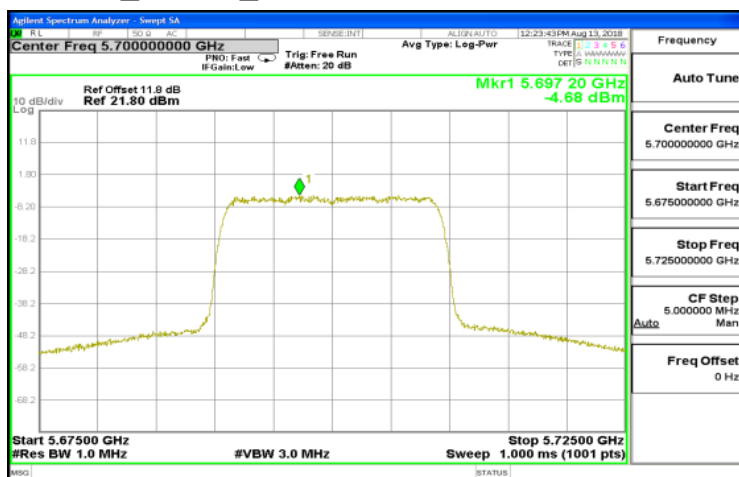
802.11n_20MHz_5580MHz



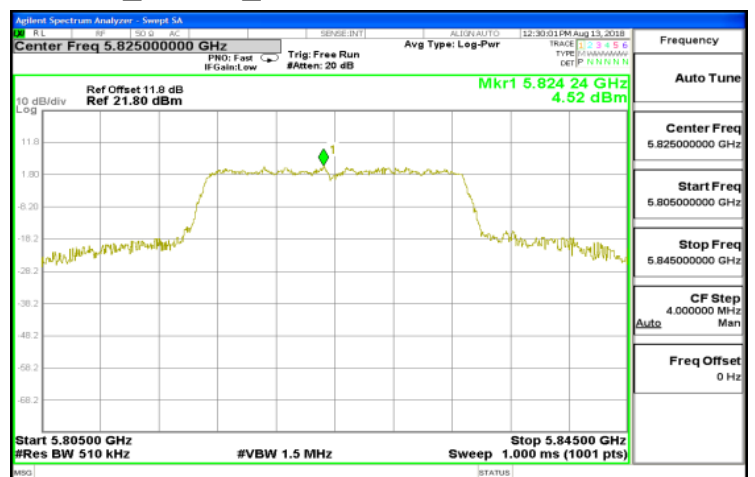
802.11n_20MHz_5785MHz



802.11n_20MHz_5700MHz



802.11n_20MHz_5825MHz



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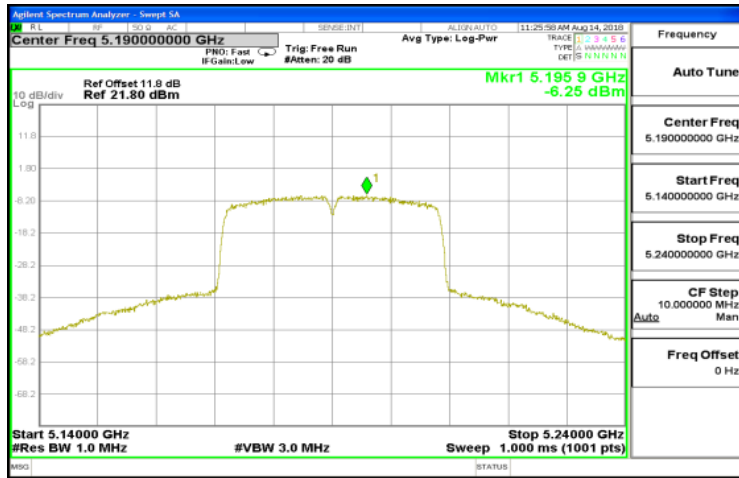
t (886-2) 2299-3279

f (886-2) 2298-0488

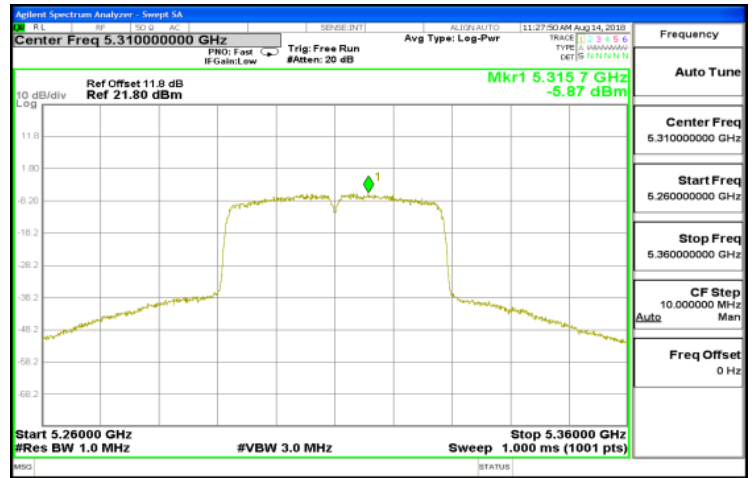
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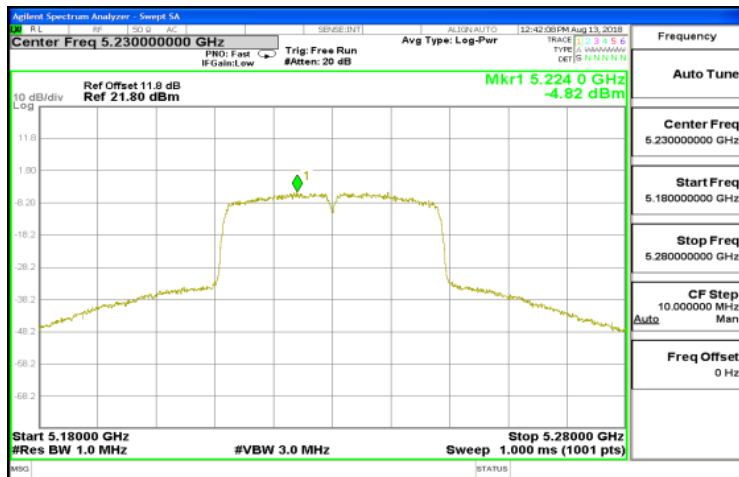
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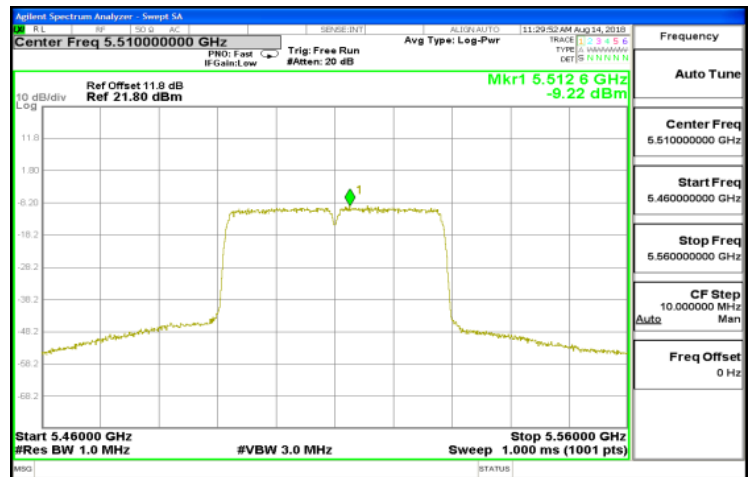
802.11n_40MHz_5310MHz



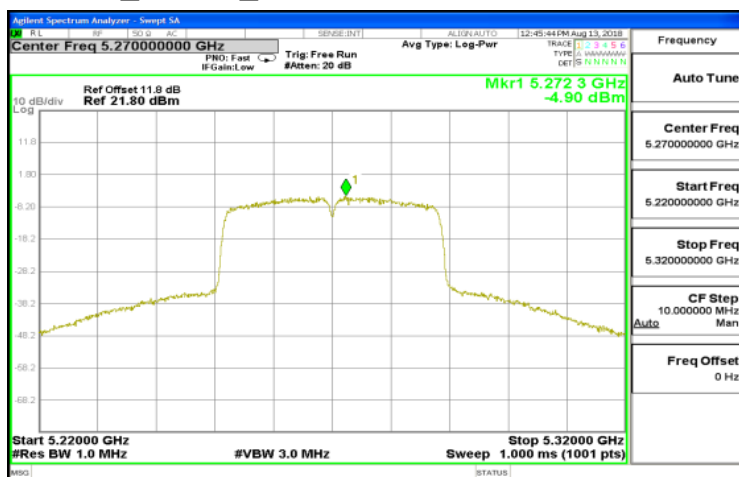
802.11n_40MHz_5230MHz



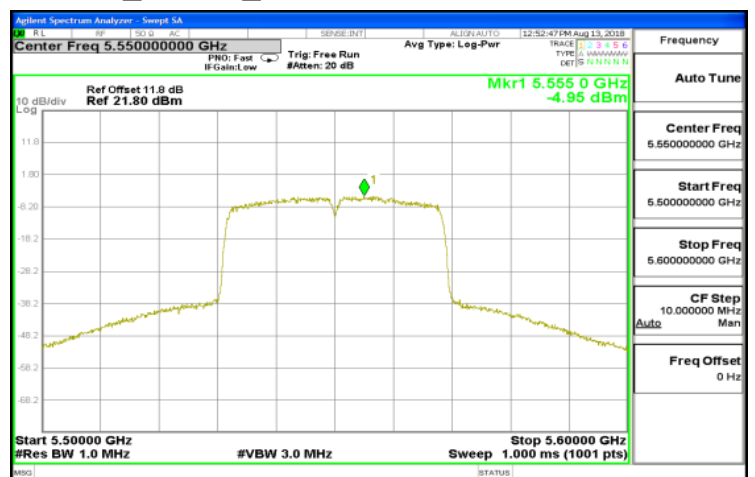
802.11n_40MHz_5510MHz



802.11n_40MHz_5270MHz



802.11n_40MHz_5550MHz



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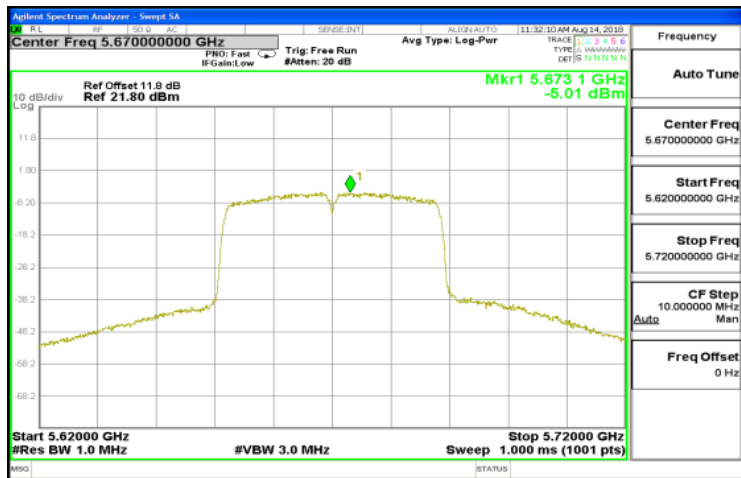
t (886-2) 2299-3279

f (886-2) 2298-0488

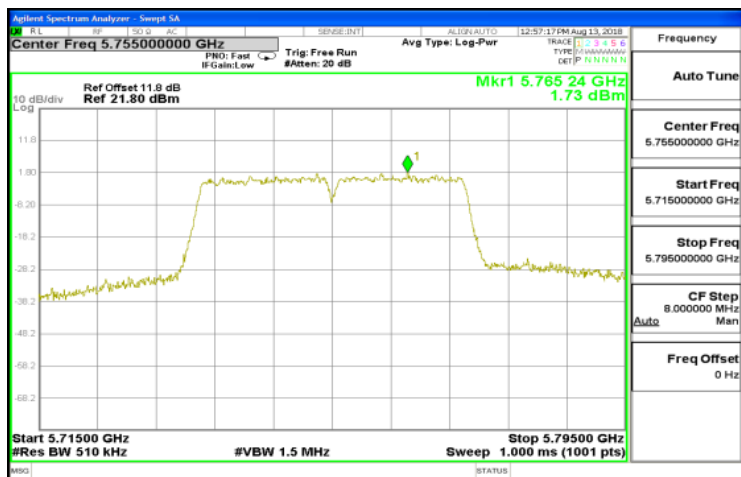
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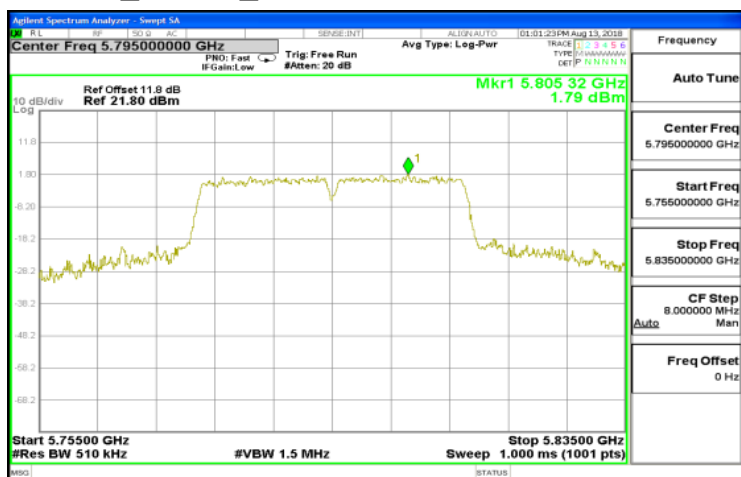
802.11n_40MHz_5670MHz



802.11n_40MHz_5755MHz



802.11n_40MHz_5795MHz



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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:

- 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.
- 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 (dB μ V/m) = 20 log Emission level (dB μ V/m)

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11.2 Measurement Equipment Used

SGS SAC-III					
Name of Equip-ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Bi-log Antenna	SCHWAZBECK	VULB9168	378	2017/12/29	2018/12/28
Horn Antenna	Schwarzbeck	BBHA9120D	1441	2018/08/14	2019/08/13
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	ESC17	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 Instruments	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

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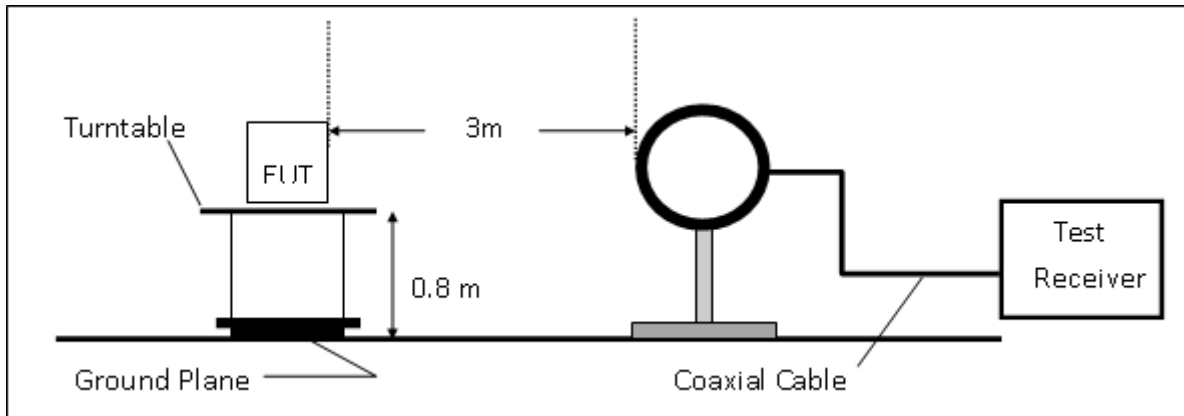
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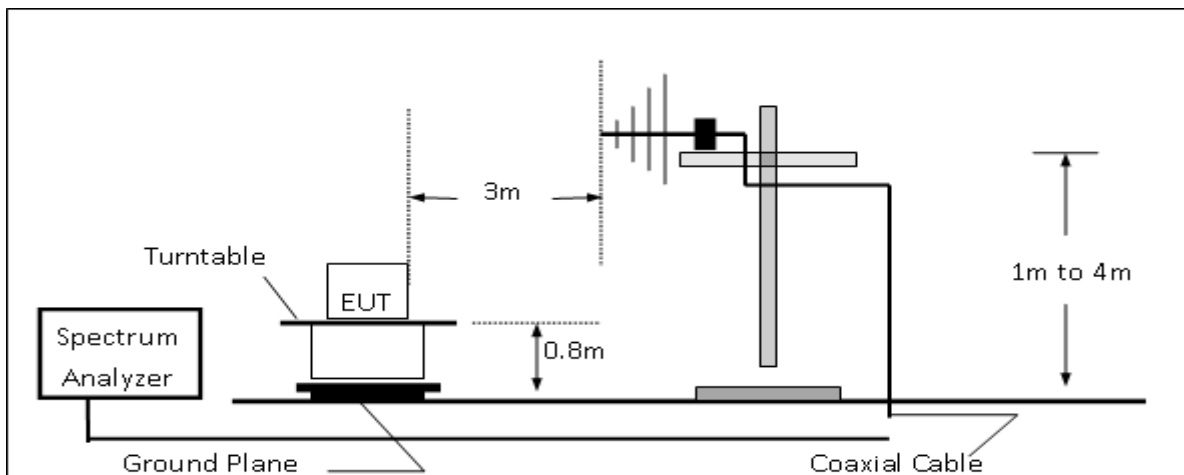
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11.3 Test SET-UP

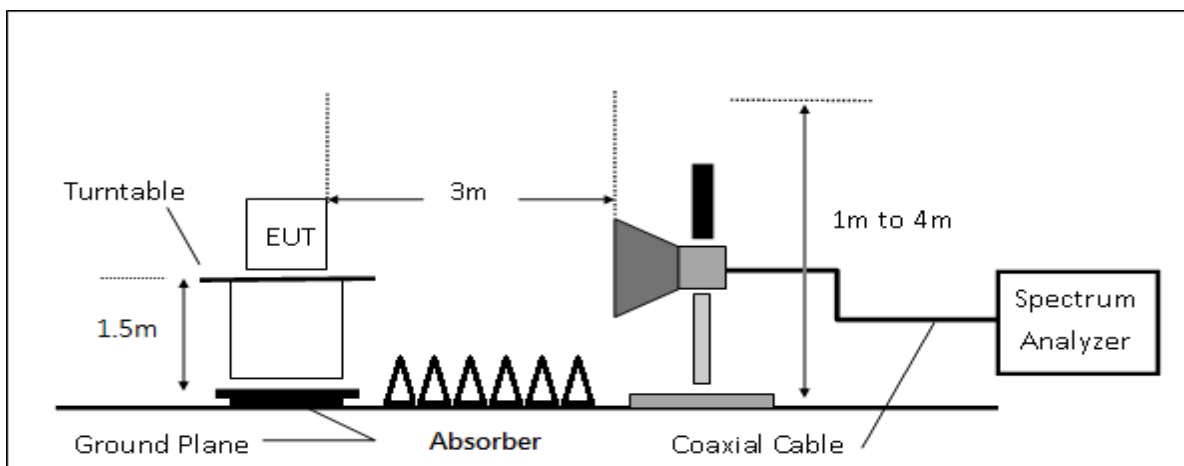
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(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)

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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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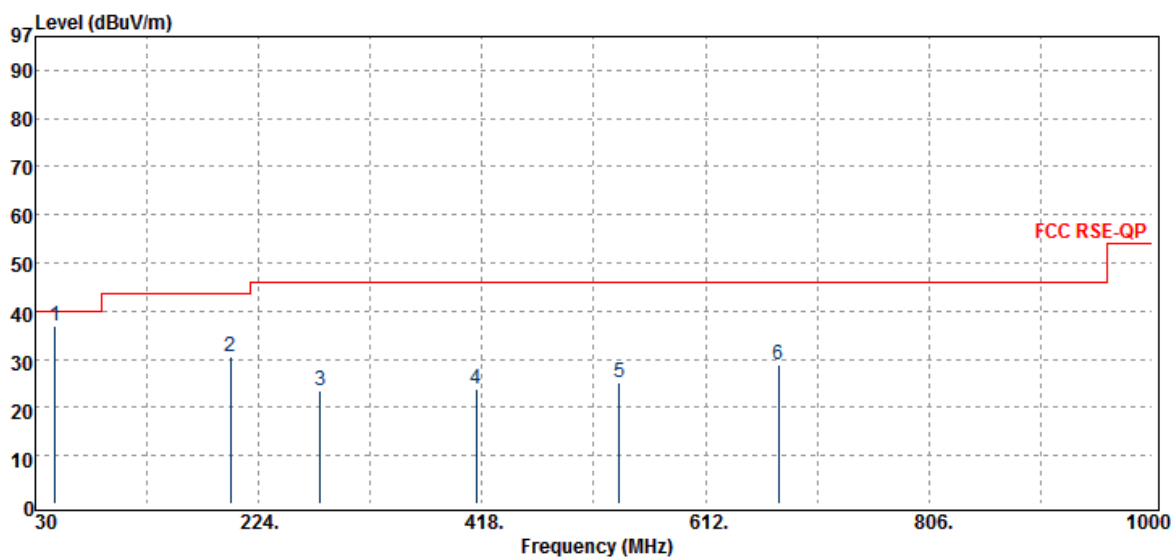
Radiated Spurious Emission Measurement Result

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. :E2 Plane

Test Date :2018-08-14
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
47.46	Peak	44.52	-7.64	36.88	40.00	-3.12
199.75	Peak	39.90	-9.26	30.64	43.50	-12.86
277.35	Peak	29.67	-6.27	23.40	46.00	-22.60
413.15	Peak	26.65	-2.95	23.70	46.00	-22.30
537.31	Peak	26.82	-1.65	25.17	46.00	-20.83
675.05	Peak	27.44	1.37	28.81	46.00	-17.19

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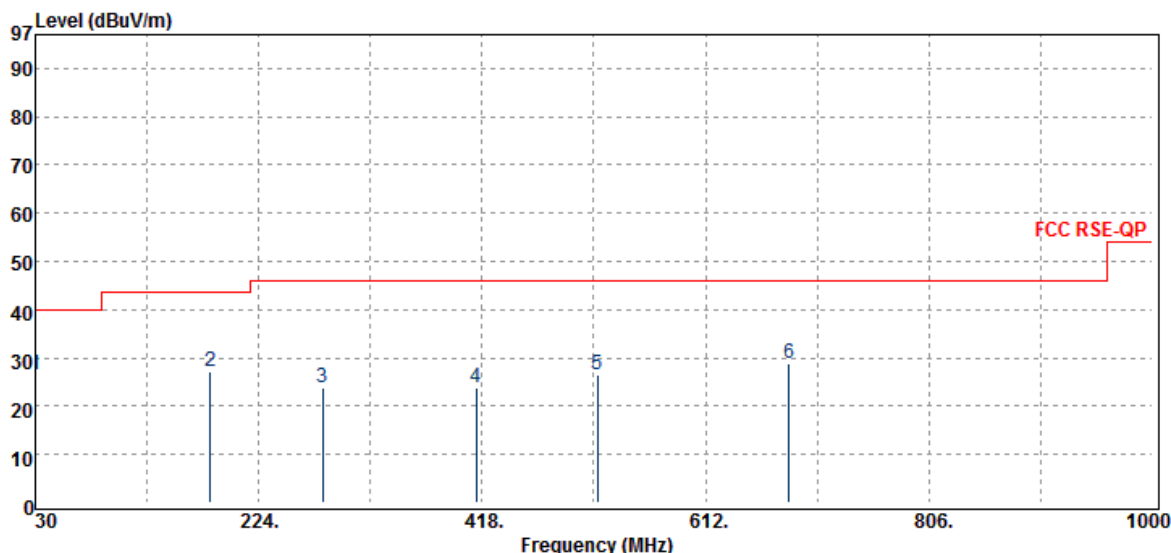
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Operation Band :802.11aB1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
30.00	Peak	35.32	-8.96	26.36	40.00	-13.64
182.29	Peak	35.62	-8.37	27.25	43.50	-16.25
279.29	Peak	29.98	-6.17	23.81	46.00	-22.19
413.15	Peak	26.83	-2.95	23.88	46.00	-22.12
517.91	Peak	28.05	-1.46	26.59	46.00	-19.41
684.75	Peak	27.43	1.58	29.01	46.00	-16.99

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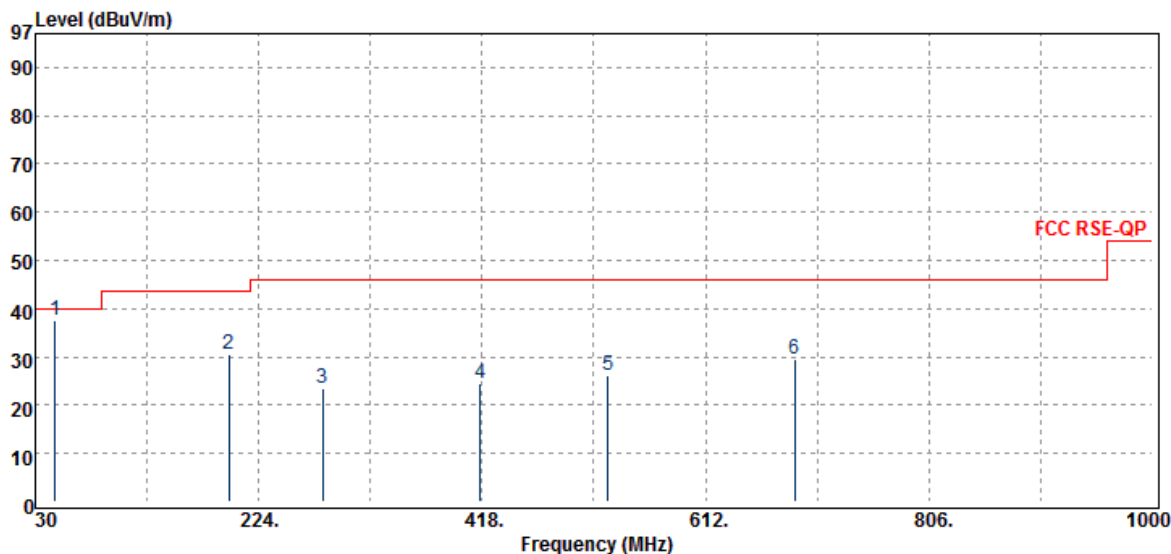
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802.11a 5250~5350 MHz

Operation Band :802.11aB2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
47.46	Peak	45.33	-7.64	37.69	40.00	-2.31
197.81	Peak	39.67	-9.20	30.47	43.50	-13.03
279.29	Peak	29.55	-6.17	23.38	46.00	-22.62
416.06	Peak	27.39	-2.91	24.48	46.00	-21.52
527.61	Peak	27.61	-1.34	26.27	46.00	-19.73
689.60	Peak	27.53	1.88	29.41	46.00	-16.59

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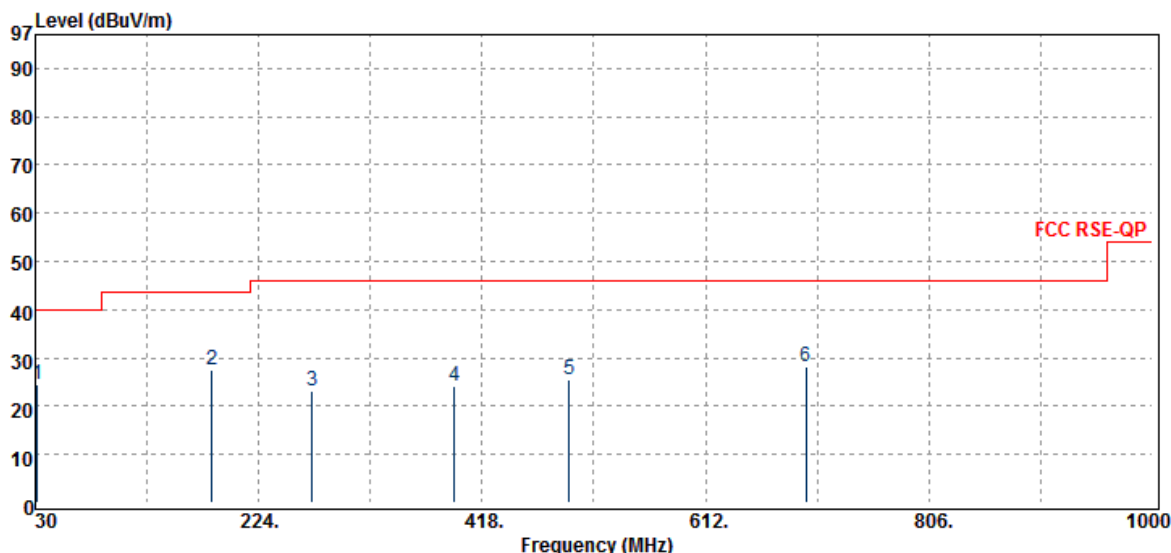
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Operation Band :802.11aB2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
31.94	Peak	33.40	-8.88	24.52	40.00	-15.48
183.26	Peak	36.04	-8.47	27.57	43.50	-15.93
270.56	Peak	29.89	-6.63	23.26	46.00	-22.74
393.75	Peak	27.63	-3.42	24.21	46.00	-21.79
493.66	Peak	28.18	-2.72	25.46	46.00	-20.54
699.30	Peak	26.54	1.74	28.28	46.00	-17.72

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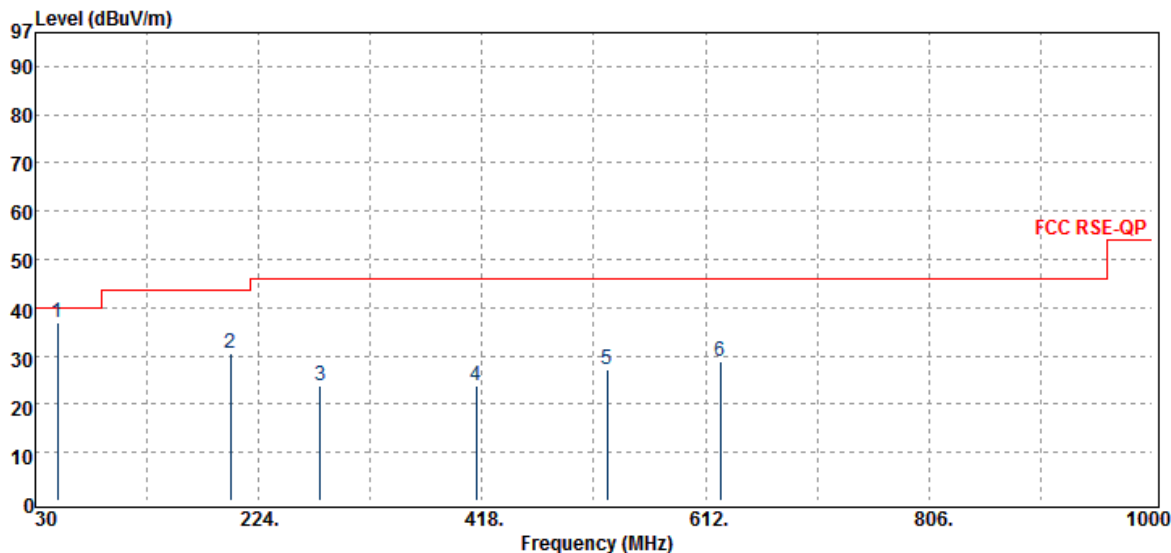
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802.11a, 5470~5725 MHz

Operation Band :802.11aB3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
49.40	Peak	44.51	-7.48	37.03	40.00	-2.97
199.75	Peak	39.86	-9.26	30.60	43.50	-12.90
277.35	Peak	30.17	-6.27	23.90	46.00	-22.10
413.15	Peak	26.74	-2.95	23.79	46.00	-22.21
526.64	Peak	28.47	-1.43	27.04	46.00	-18.96
624.61	Peak	28.01	0.71	28.72	46.00	-17.28

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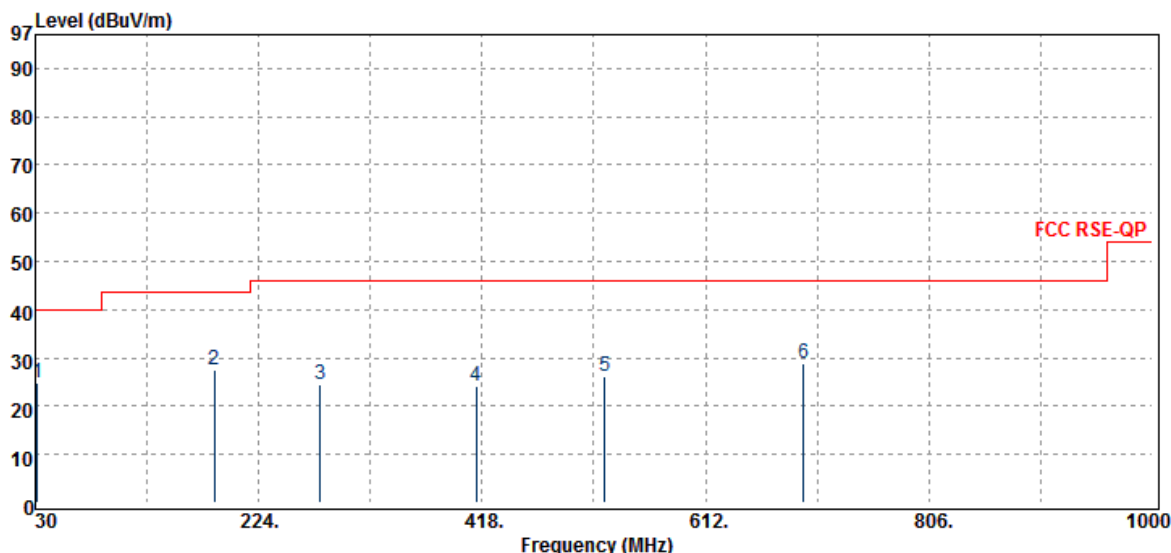
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Operation Band :802.11aB3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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	33.62	-8.88	24.74	40.00	-15.26
185.20	Peak	36.17	-8.64	27.53	43.50	-15.97
277.35	Peak	30.61	-6.27	24.34	46.00	-21.66
413.15	Peak	27.11	-2.95	24.16	46.00	-21.84
524.70	Peak	27.63	-1.56	26.07	46.00	-19.93
697.36	Peak	27.65	1.33	28.98	46.00	-17.02

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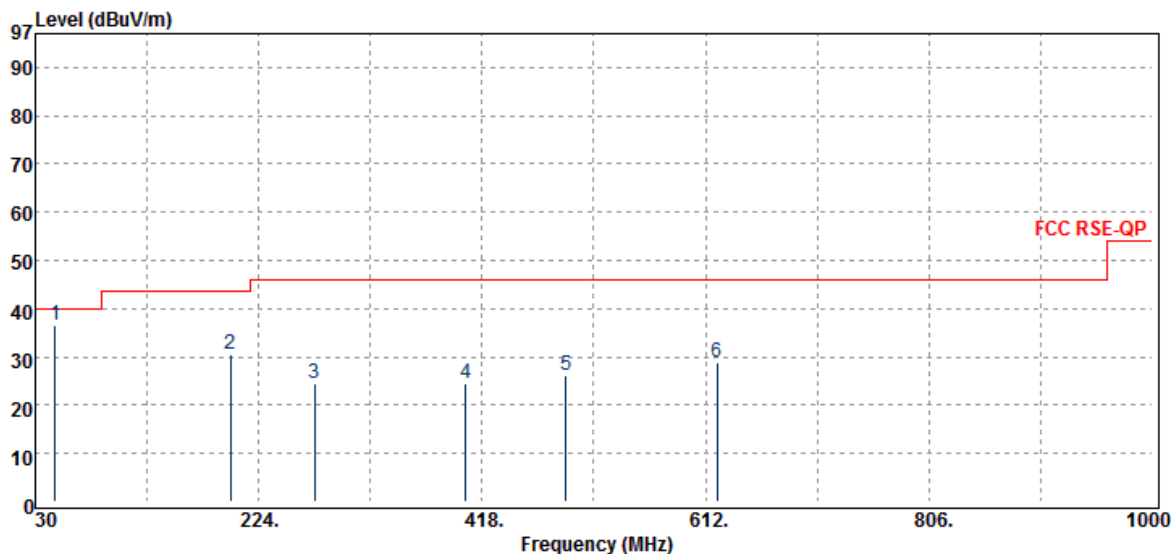
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802.11a, 5725~5850 MHz

Operation Band :802.11aB4
Fundamental Frequency :5785 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
47.46	Peak	44.16	-7.64	36.52	40.00	-3.48
199.75	Peak	39.83	-9.26	30.57	43.50	-12.93
272.50	Peak	30.91	-6.53	24.38	46.00	-21.62
403.45	Peak	27.51	-3.07	24.44	46.00	-21.56
490.75	Peak	28.53	-2.32	26.21	46.00	-19.79
621.70	Peak	28.56	0.47	29.03	46.00	-16.97

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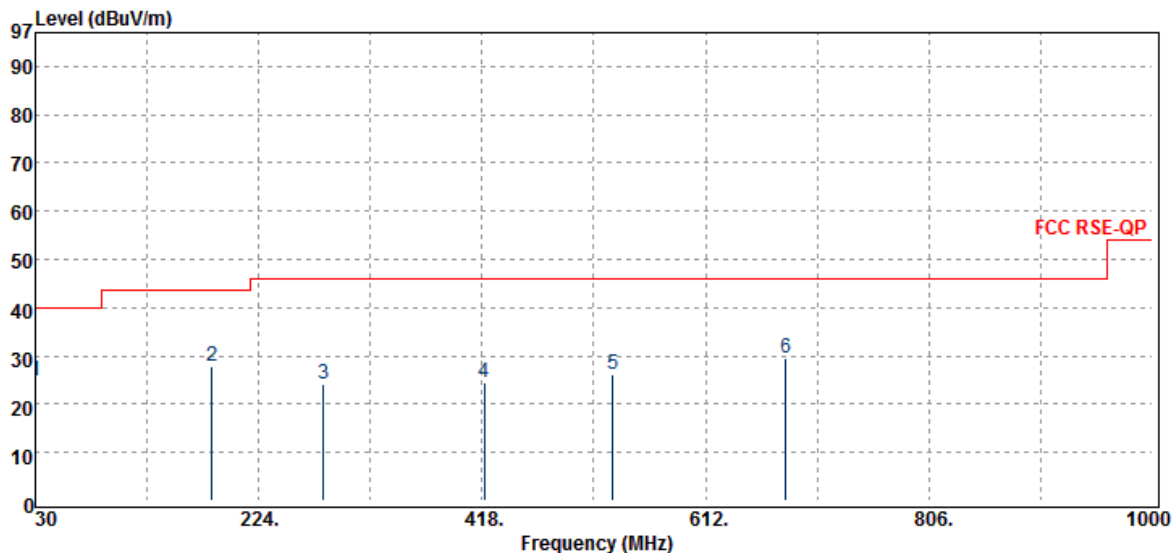
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Operation Band :802.11aB4
Fundamental Frequency :5785 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
30.00	Peak	33.85	-8.96	24.89	40.00	-15.11
183.26	Peak	36.35	-8.47	27.88	43.50	-15.62
280.26	Peak	30.22	-6.12	24.10	46.00	-21.90
419.94	Peak	27.26	-2.77	24.49	46.00	-21.51
531.49	Peak	27.45	-1.41	26.04	46.00	-19.96
681.84	Peak	27.98	1.50	29.48	46.00	-16.52

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Above 1GHz Worst-Case Data:

Operation Band	:802.11aB1	Test Date	:2018-08-14
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	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
10360.00	Peak	34.56	19.71	54.27	68.20	-13.93

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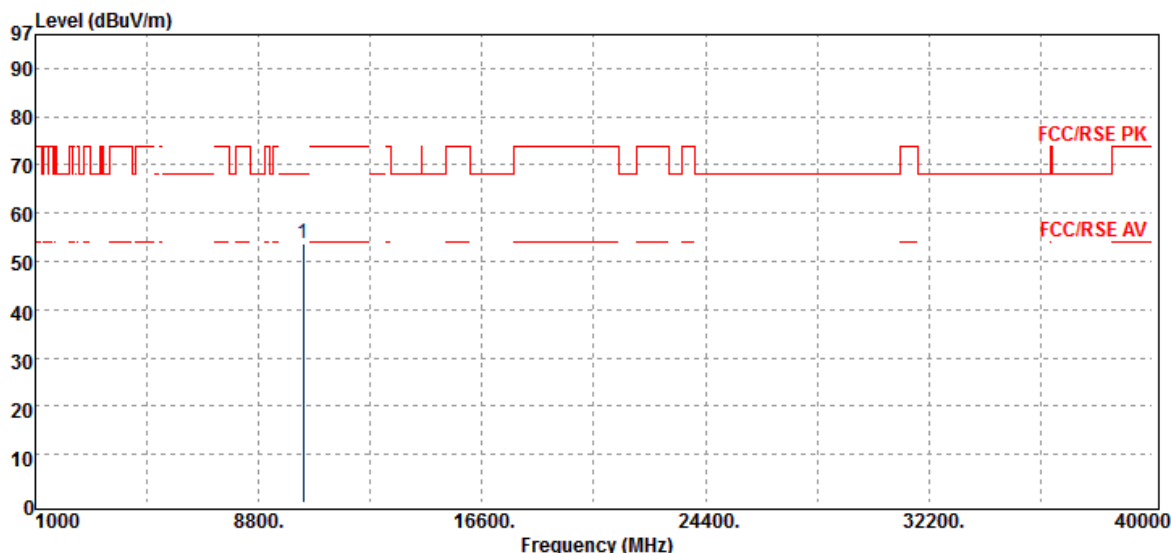
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Operation Band :802.11aB1
 Fundamental Frequency :5180 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10360.00	Peak	33.92	19.71	53.63	68.20	-14.57

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Operation Band :802.11aB1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
10440.00	Peak	33.86	20.05	53.91	68.20	-14.29

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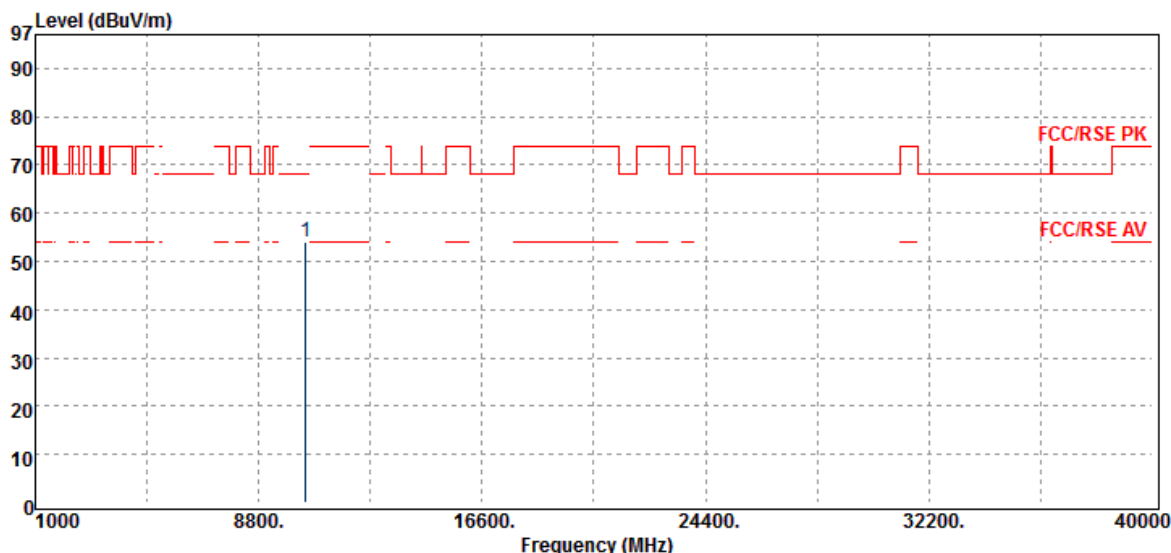
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Operation Band :802.11aB1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
10440.00	Peak	34.12	20.05	54.17	68.20	-14.03

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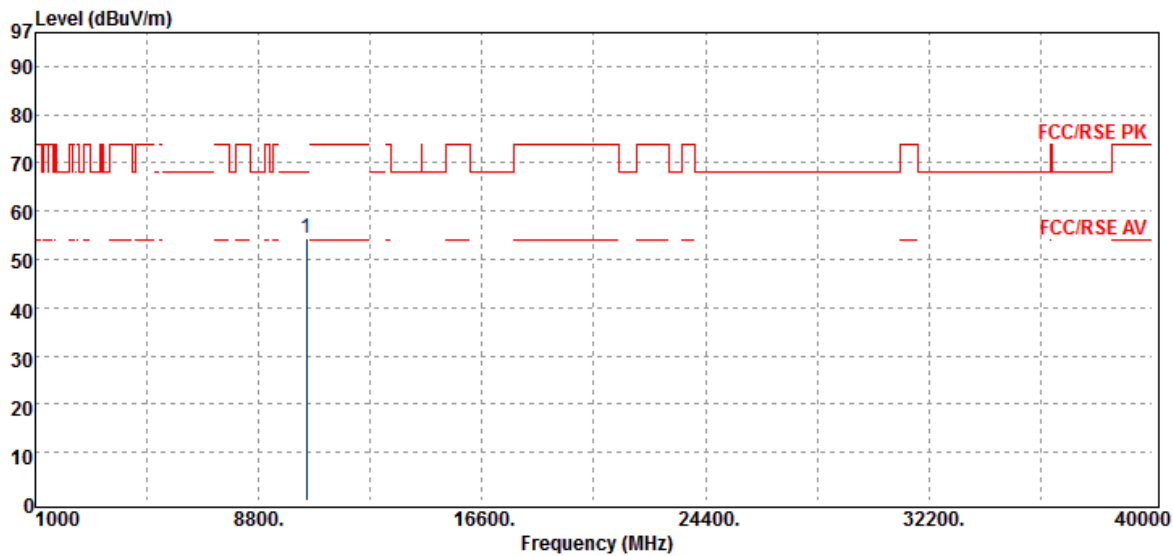
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Operation Band :802.11aB1
 Fundamental Frequency :5240 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10480.00	Peak	34.31	20.07	54.38	68.20	-13.82

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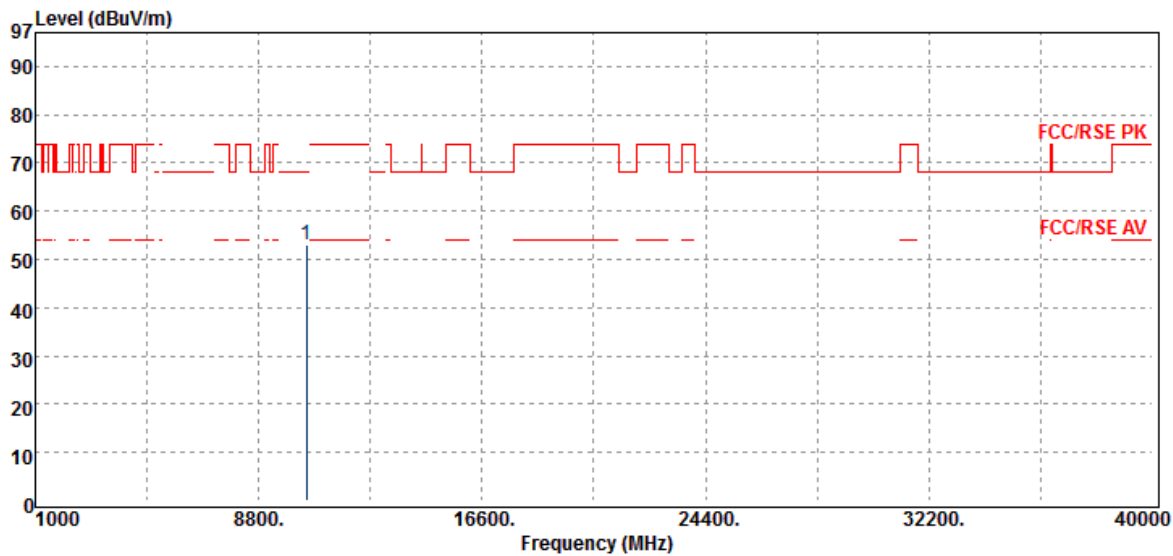
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Operation Band :802.11aB1
 Fundamental Frequency :5240 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10480.00	Peak	33.08	20.07	53.15	68.20	-15.05

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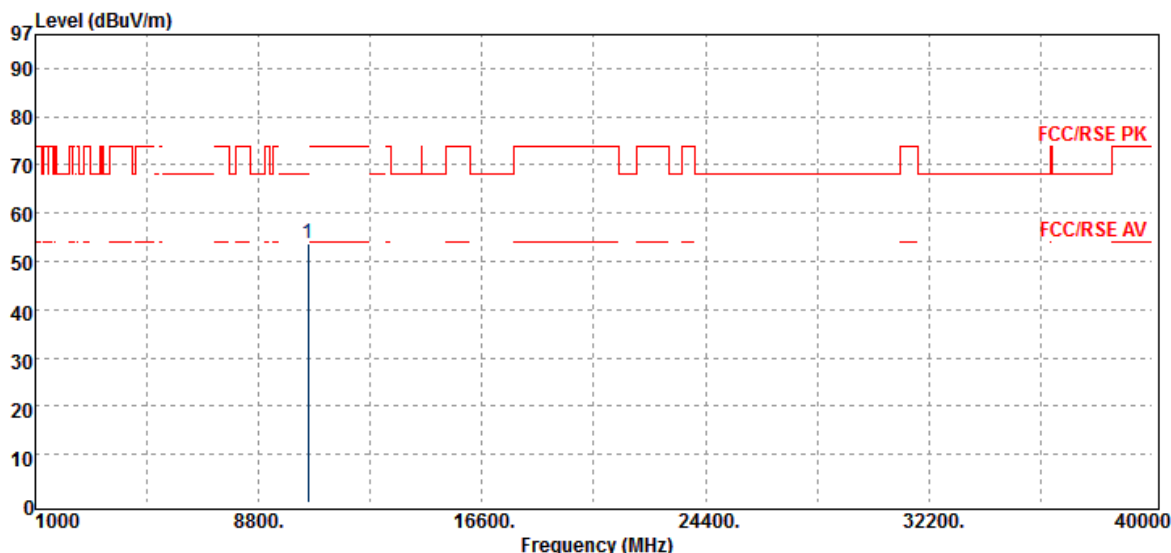
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Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band	:802.11aB2	Test Date	:2018-08-14
Fundamental Frequency	:5260 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 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
10520.00	Peak	33.58	20.00	53.58	68.20	-14.62

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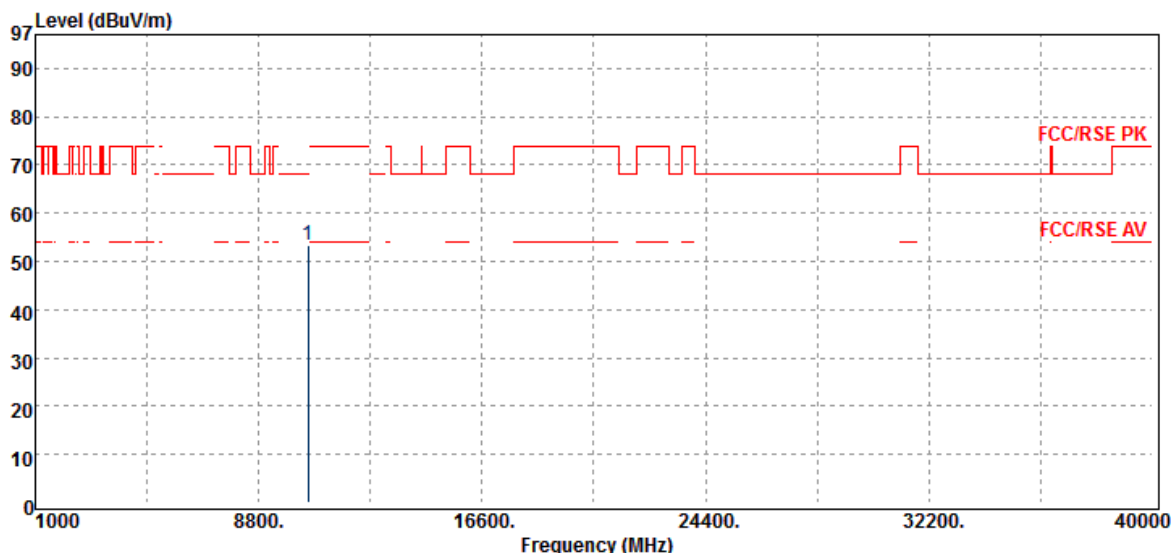
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Operation Band :802.11aB2
 Fundamental Frequency :5260 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10520.00	Peak	33.51	20.00	53.51	68.20	-14.69

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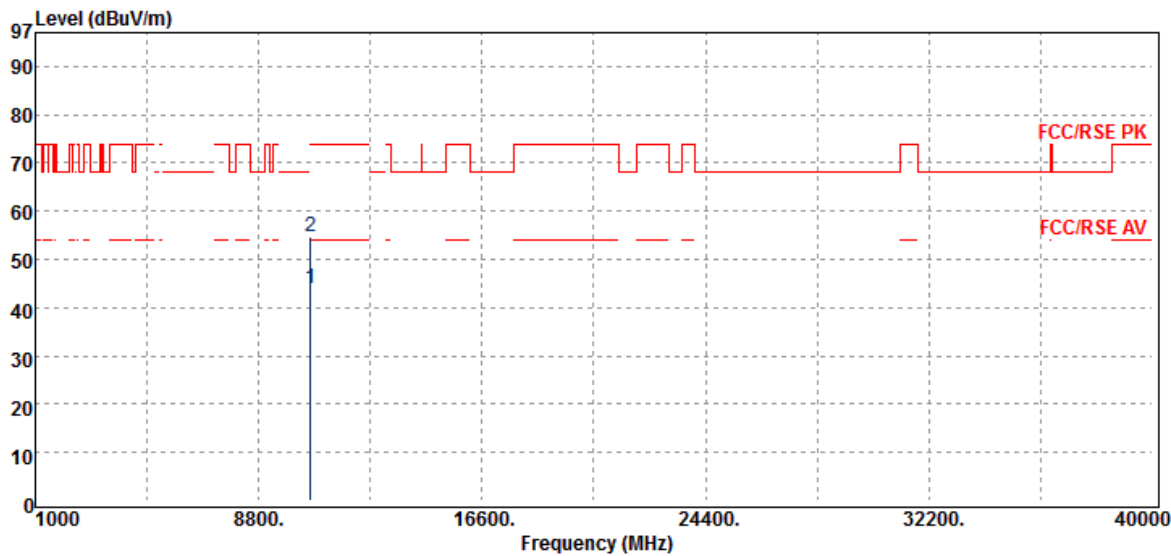
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Operation Band :802.11aB2
 Fundamental Frequency :5300 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10600.00	Average	23.54	20.38	43.92	54.00	-10.08
10600.00	Peak	34.35	20.38	54.73	74.00	-19.27

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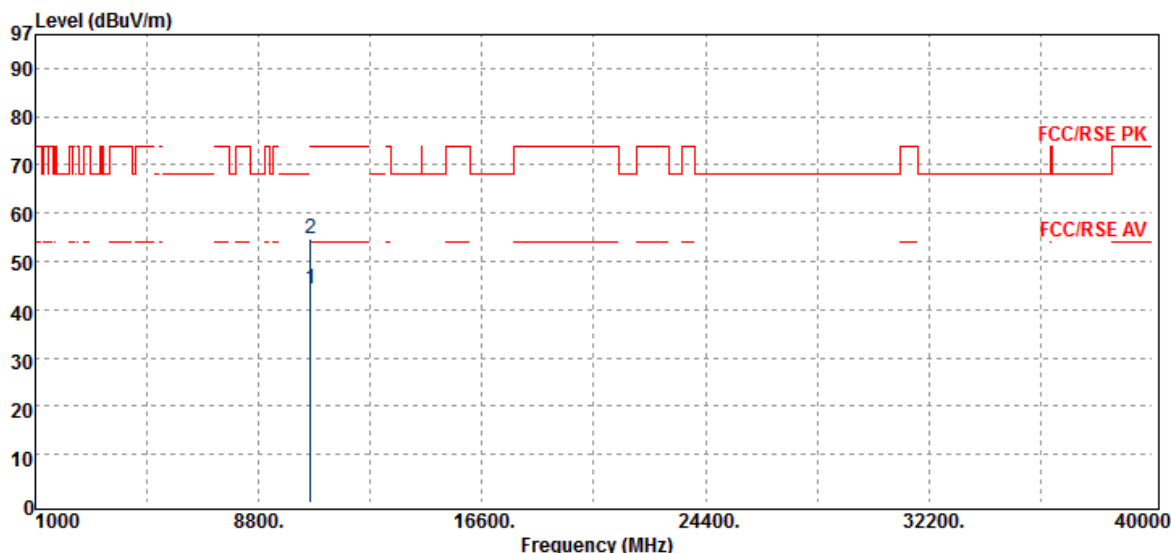
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Operation Band :802.11aB2
 Fundamental Frequency :5300 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
10600.00	Average	24.05	20.38	44.43	54.00	-9.57
10600.00	Peak	34.26	20.38	54.64	74.00	-19.36

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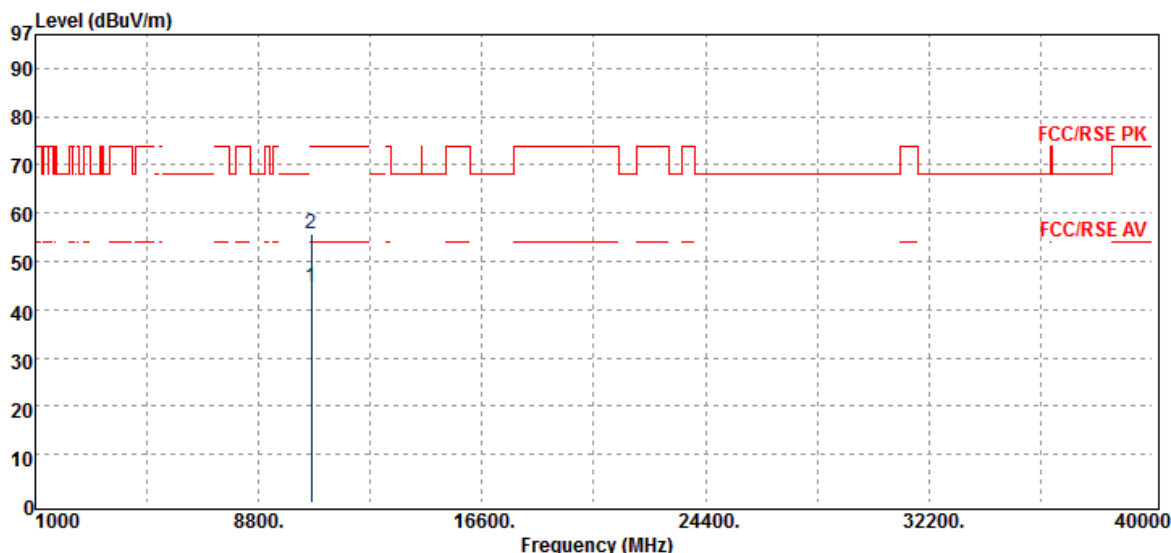
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Operation Band :802.11aB2
Fundamental Frequency :5320 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
10640.00	Average	24.15	20.44	44.59	54.00	-9.41
10640.00	Peak	35.19	20.44	55.63	74.00	-18.37

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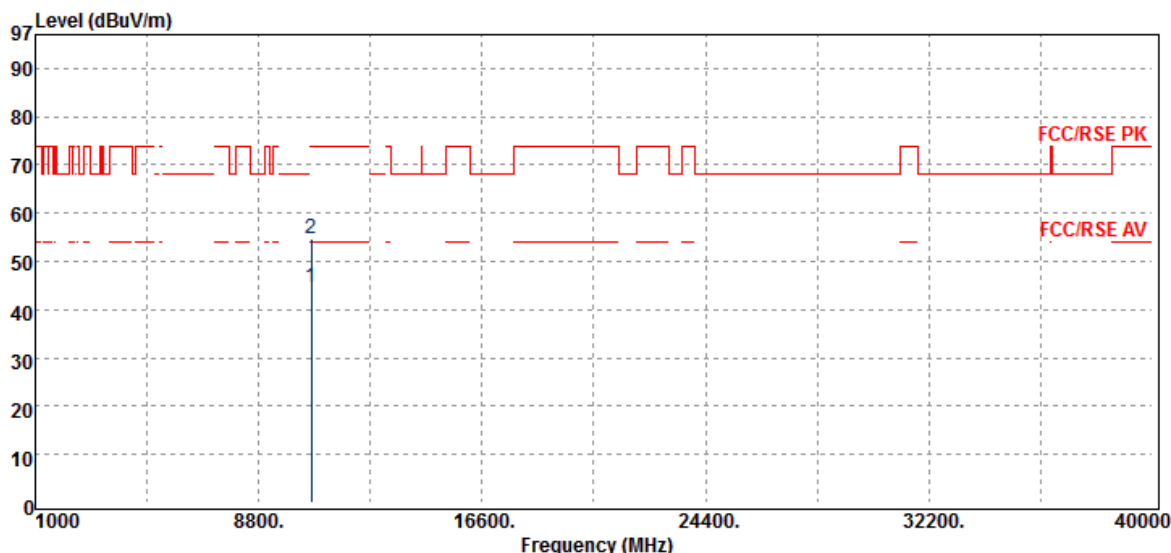
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Operation Band :802.11aB2
 Fundamental Frequency :5320 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
10640.00	Average	24.12	20.44	44.56	54.00	-9.44
10640.00	Peak	34.16	20.44	54.60	74.00	-19.40

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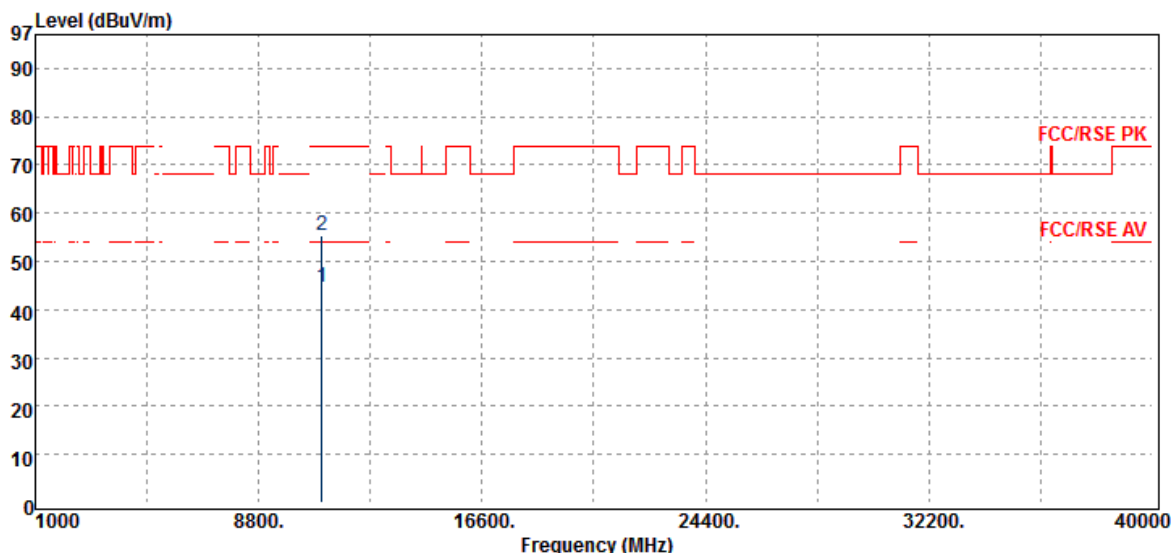
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Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Band :802.11aB3
Fundamental Frequency :5500 MHz
Operation Mode :Tx CH LOW
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11000.00	Average	23.33	21.37	44.70	54.00	-9.30
11000.00	Peak	34.12	21.37	55.49	74.00	-18.51

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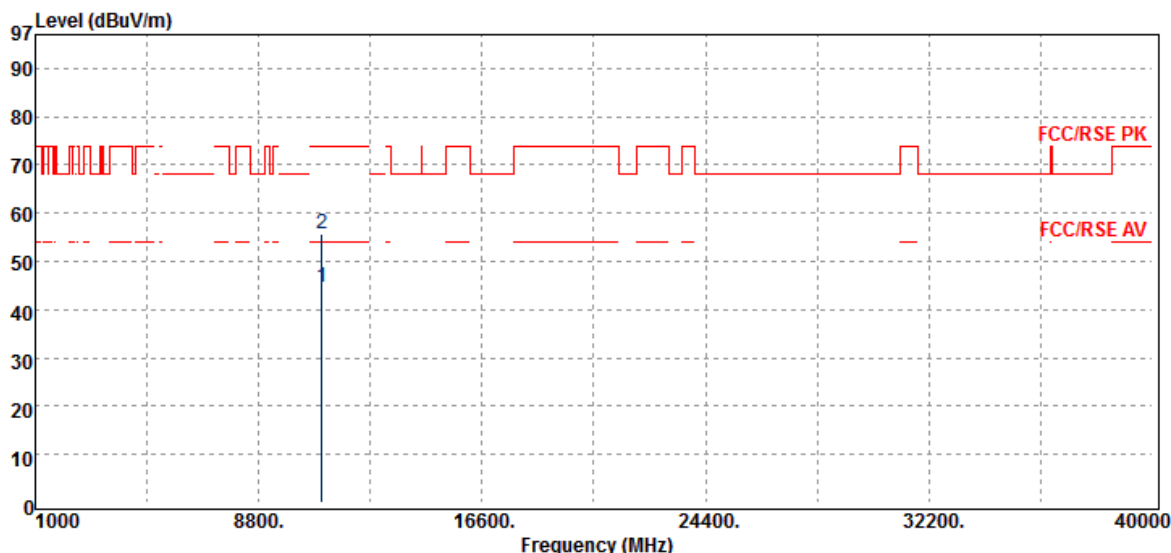
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Operation Band :802.11aB3
 Fundamental Frequency :5500 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11000.00	Average	23.33	21.37	44.70	54.00	-9.30
11000.00	Peak	34.23	21.37	55.60	74.00	-18.40

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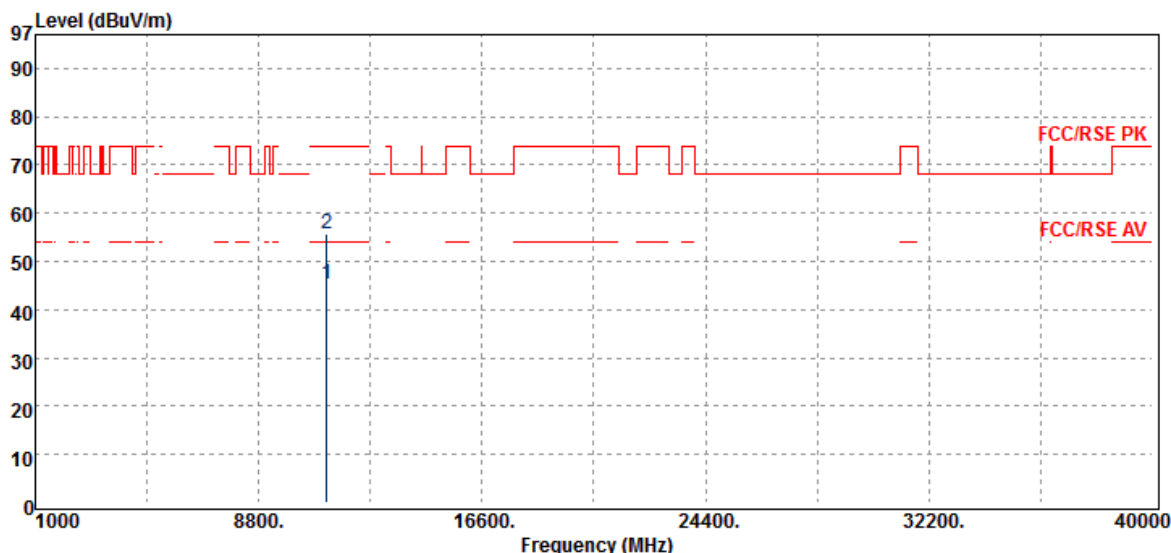
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Operation Band :802.11aB3
 Fundamental Frequency :5580 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11160.00	Average	23.84	21.51	45.35	54.00	-8.65
11160.00	Peak	34.17	21.51	55.68	74.00	-18.32

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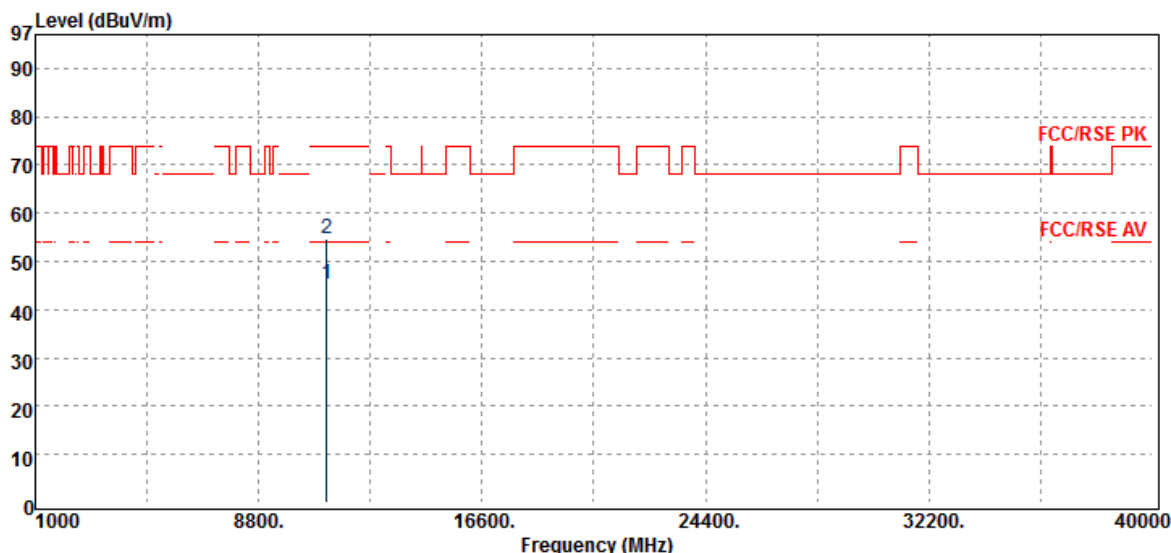
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Operation Band :802.11aB3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11160.00	Average	23.87	21.51	45.38	54.00	-8.62
11160.00	Peak	33.32	21.51	54.83	74.00	-19.17

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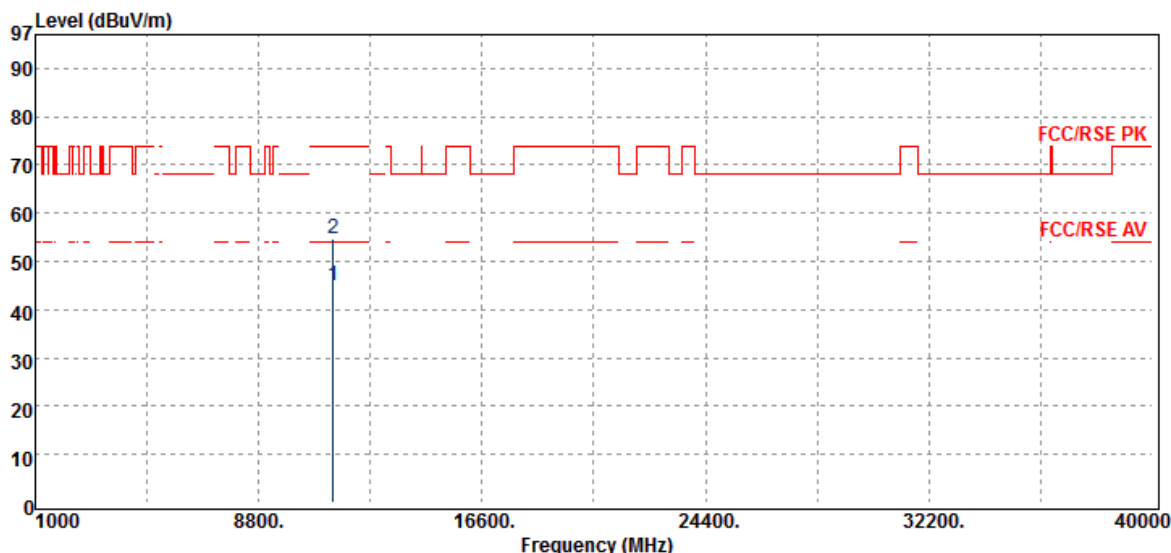
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Operation Band :802.11aB3
 Fundamental Frequency :5700 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11400.00	Average	23.39	21.62	45.01	54.00	-8.99
11400.00	Peak	33.14	21.62	54.76	74.00	-19.24

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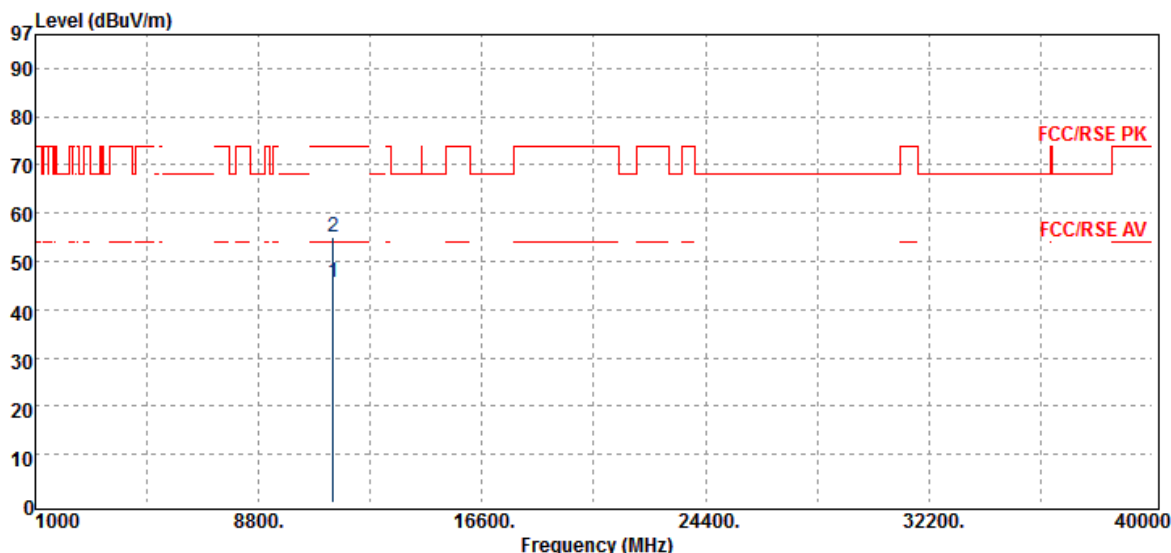
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Operation Band :802.11aB3
 Fundamental Frequency :5700 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11400.00	Average	24.08	21.62	45.70	54.00	-8.30
11400.00	Peak	33.44	21.62	55.06	74.00	-18.94

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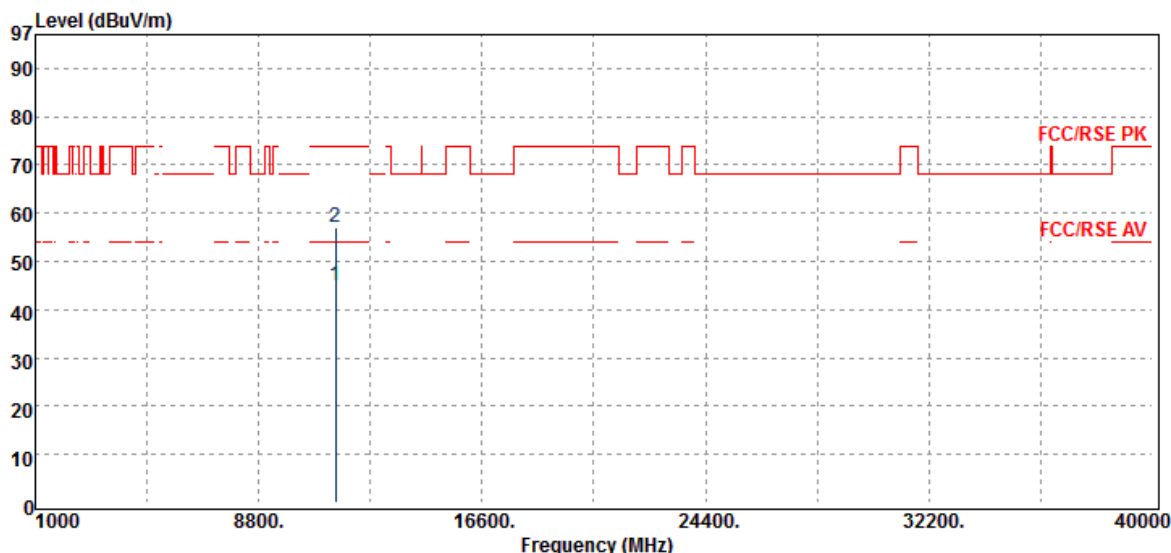
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Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

Operation Band	:802.11aB4	Test Date	:2018-08-14
Fundamental Frequency	:5745 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 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
11490.00	Average	23.41	21.61	45.02	54.00	-8.98
11490.00	Peak	35.55	21.61	57.16	74.00	-16.84

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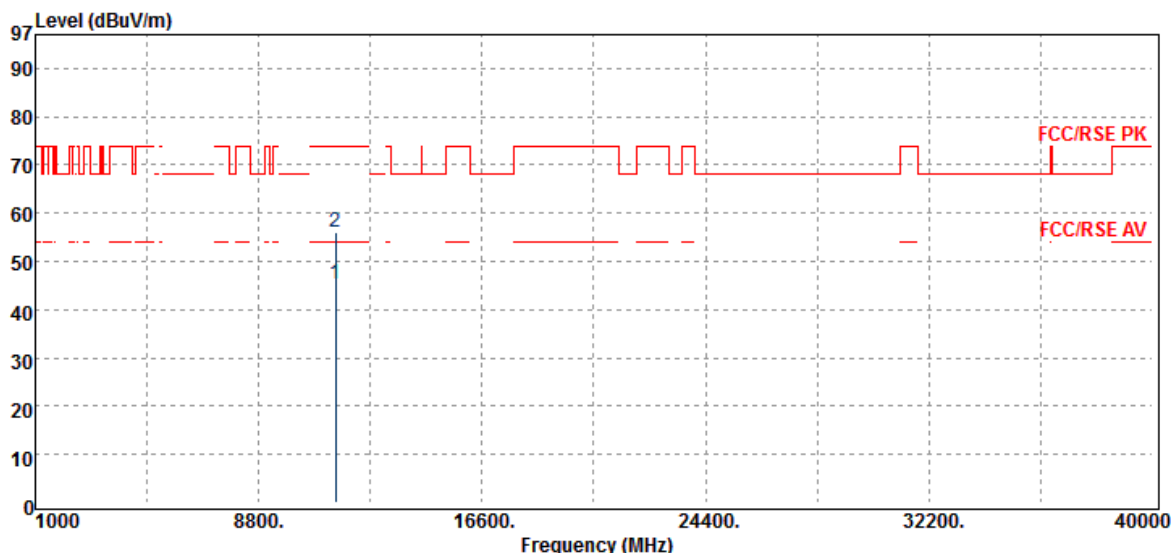
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Operation Band :802.11aB4
 Fundamental Frequency :5745 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11490.00	Average	23.84	21.61	45.45	54.00	-8.55
11490.00	Peak	34.44	21.61	56.05	74.00	-17.95

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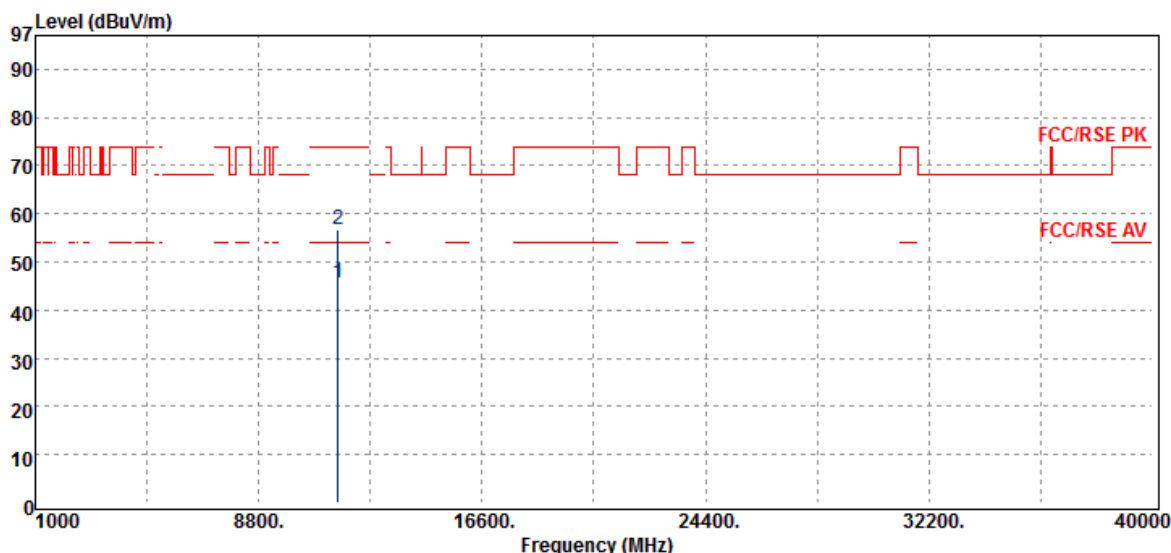
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Operation Band :802.11aB4
 Fundamental Frequency :5785 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11570.00	Average	24.13	21.66	45.79	54.00	-8.21
11570.00	Peak	35.19	21.66	56.85	74.00	-17.15

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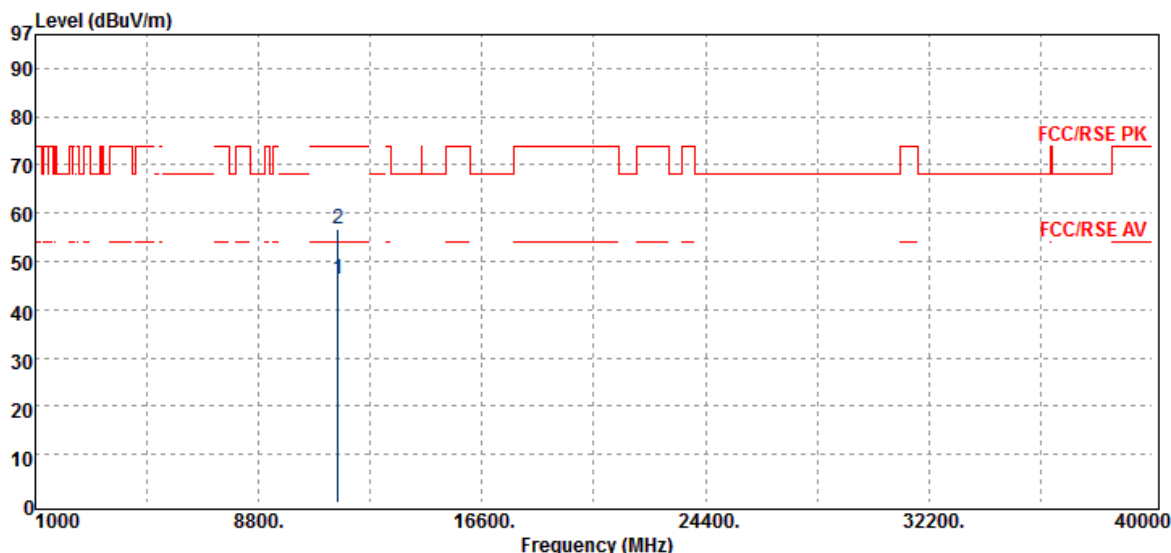
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Operation Band :802.11aB4
Fundamental Frequency :5785 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV / m	Limit @3m dBμV / m	Margin dB
11570.00	Average	24.78	21.66	46.44	54.00	-7.56
11570.00	Peak	35.15	21.66	56.81	74.00	-17.19

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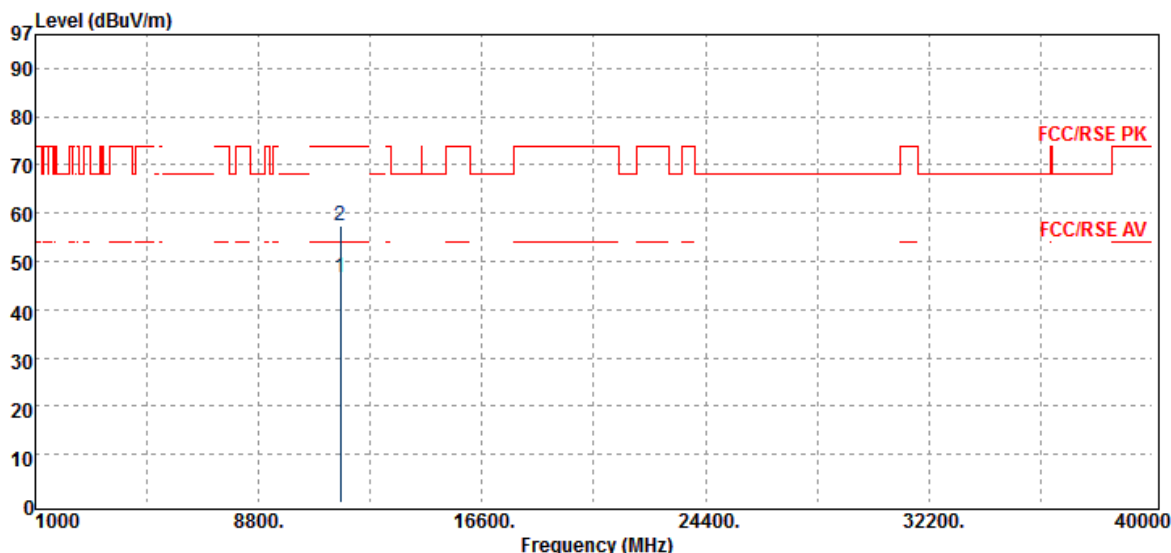
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Member of SGS Group

Operation Band :802.11aB4
 Fundamental Frequency :5825 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11650.00	Average	25.01	21.60	46.61	54.00	-7.39
11650.00	Peak	35.64	21.60	57.24	74.00	-16.76

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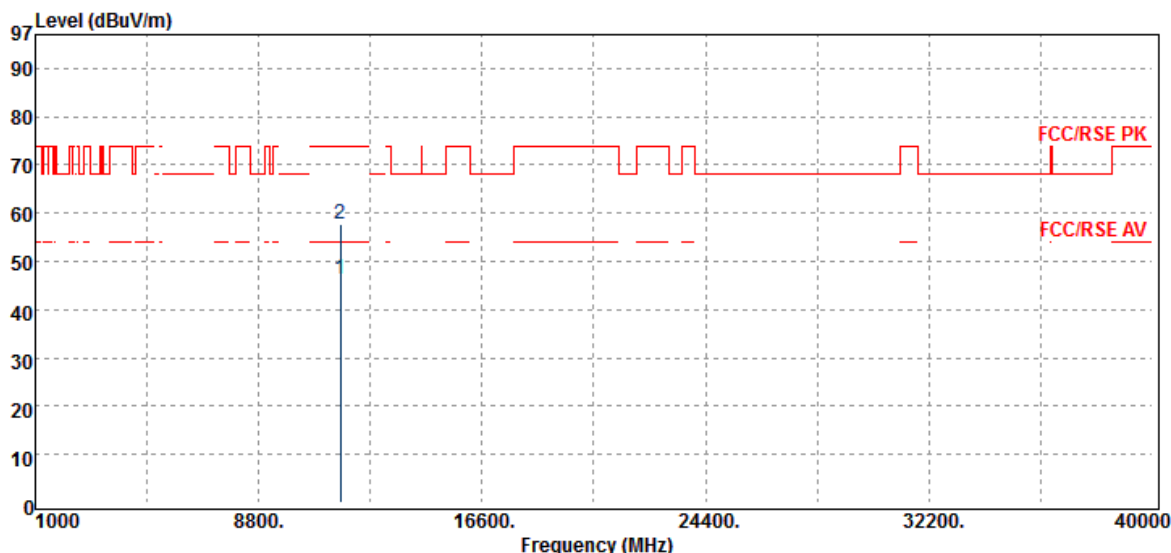
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Operation Band :802.11aB4
 Fundamental Frequency :5825 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11650.00	Average	24.88	21.60	46.48	54.00	-7.52
11650.00	Peak	36.28	21.60	57.88	74.00	-16.12

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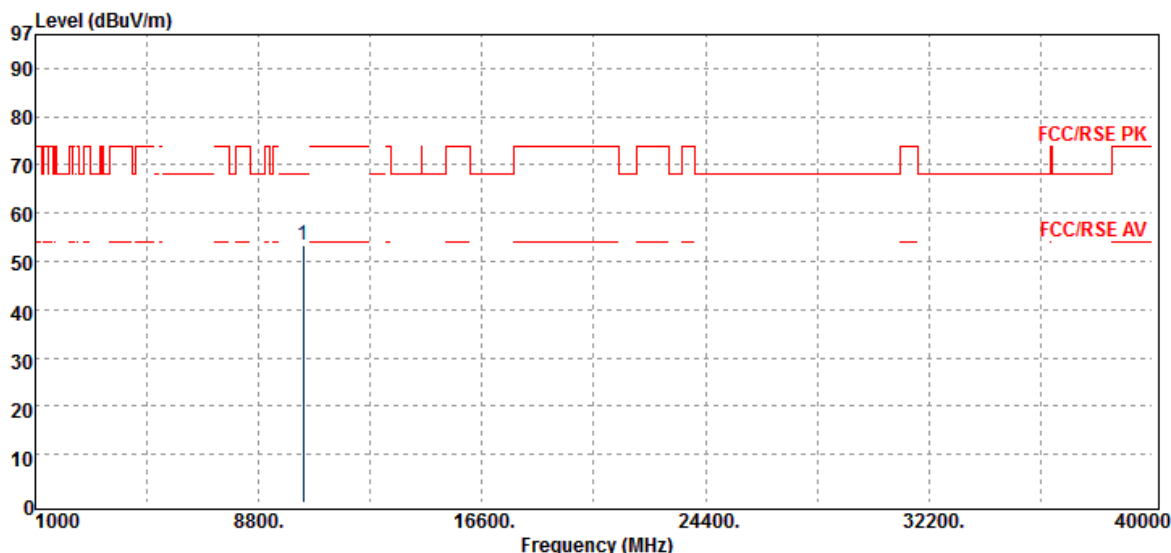
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Band	:802.11n20B1	Test Date	:2018-08-14
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 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	33.75	19.71	53.46	68.20	-14.74

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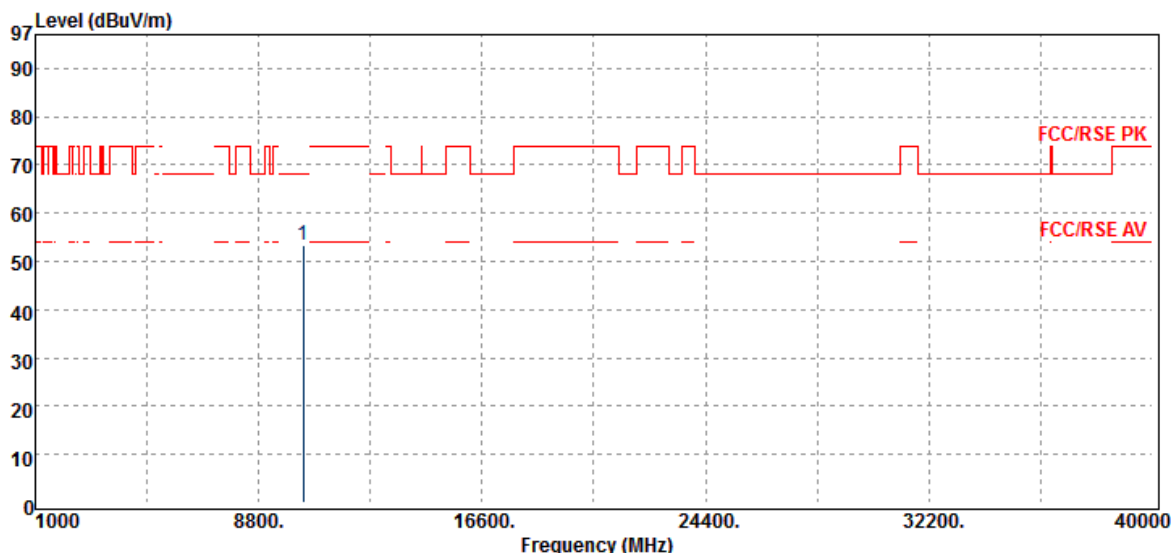
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Operation Band :802.11n20B1
 Fundamental Frequency :5180 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10360.00	Peak	33.72	19.71	53.43	68.20	-14.77

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Operation Band :802.11n20B1
 Fundamental Frequency :5220 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10440.00	Peak	33.47	20.05	53.52	68.20	-14.68

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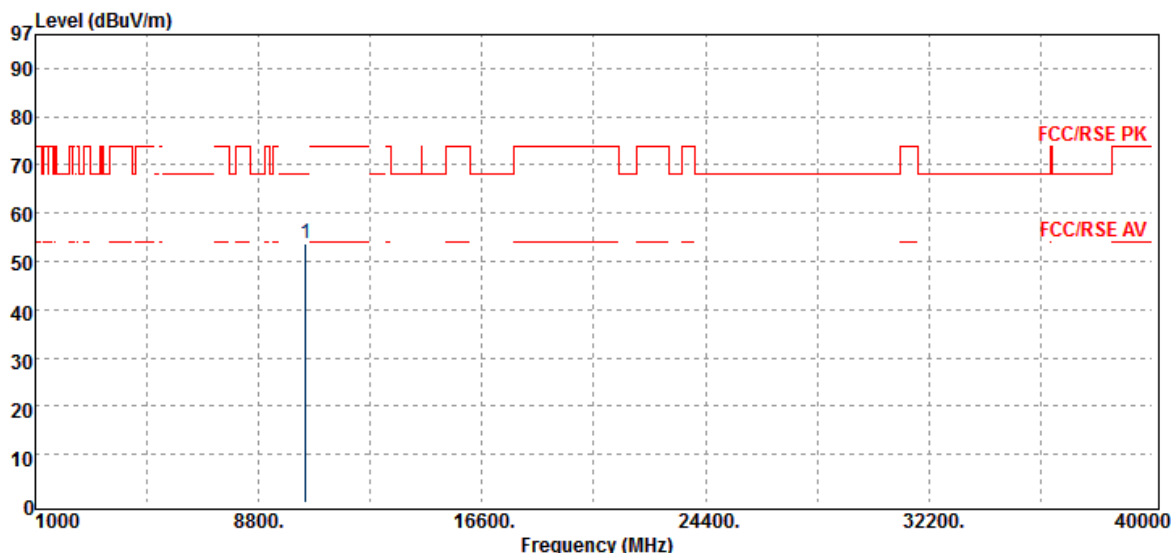
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Operation Band :802.11n20B1
Fundamental Frequency :5220 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
10440.00	Peak	33.70	20.05	53.75	68.20	-14.45

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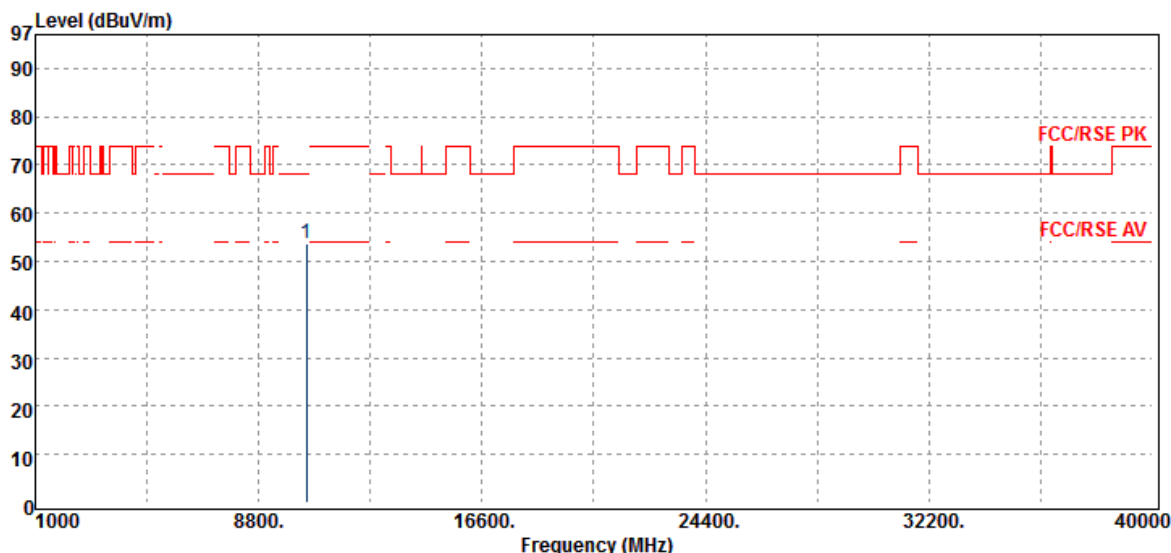
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Operation Band :802.11n20B1
 Fundamental Frequency :5240 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10480.00	Peak	33.78	20.07	53.85	68.20	-14.35

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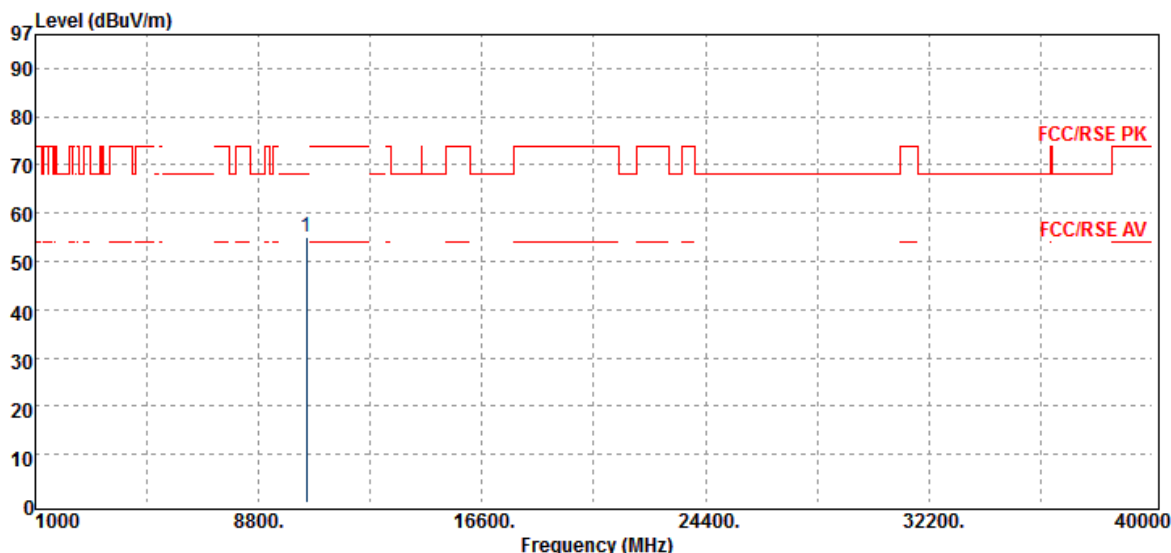
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Operation Band :802.11n20B1
 Fundamental Frequency :5240 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10480.00	Peak	35.01	20.07	55.08	68.20	-13.12

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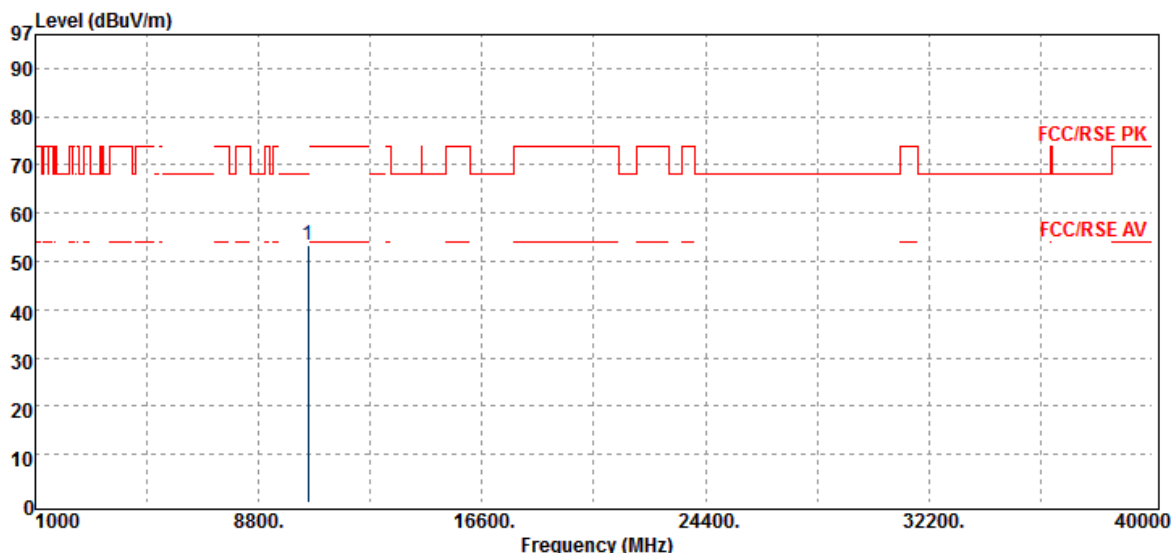
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

Operation Band	:802.11n20B2	Test Date	:2018-08-14
Fundamental Frequency	:5260 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 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
10520.00	Peak	33.44	20.00	53.44	68.20	-14.76

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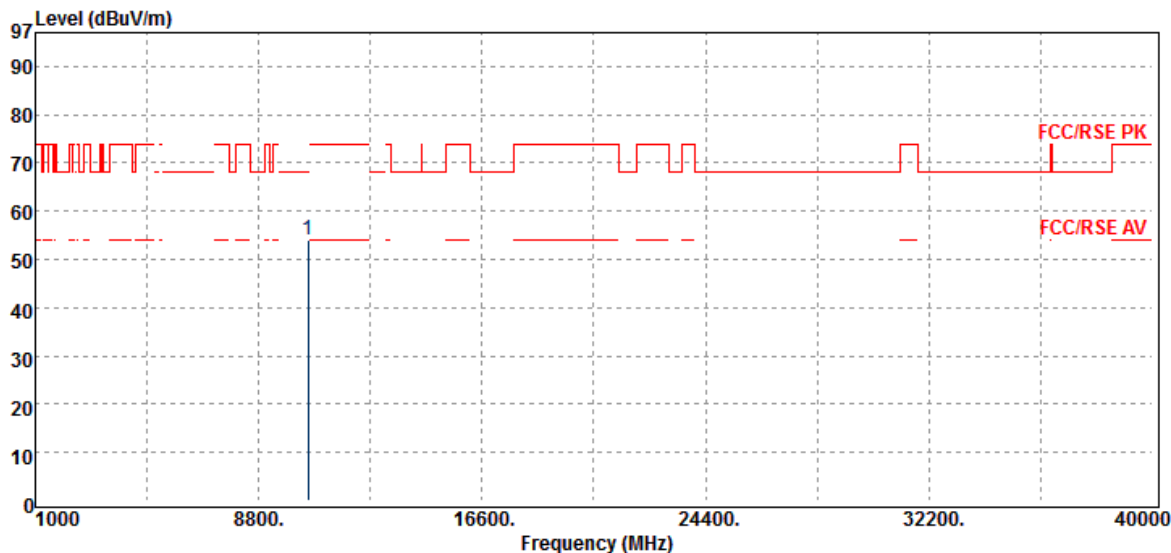
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Operation Band :802.11n20B2
 Fundamental Frequency :5260 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10520.00	Peak	33.89	20.00	53.89	68.20	-14.31

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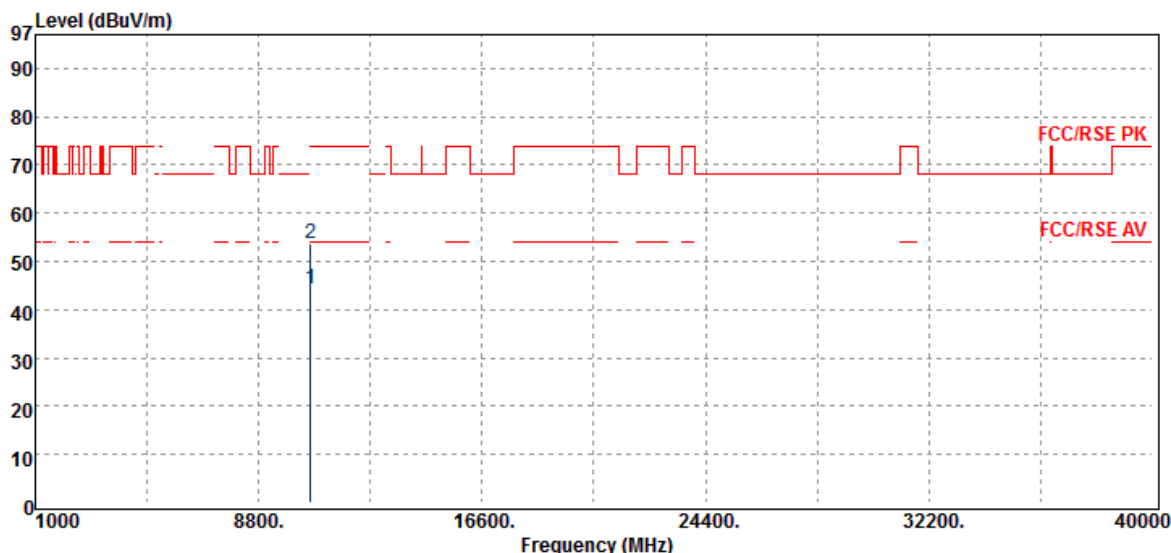
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Operation Band :802.11n20B2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
10600.00	Average	24.02	20.38	44.40	54.00	-9.60
10600.00	Peak	33.38	20.38	53.76	74.00	-20.24

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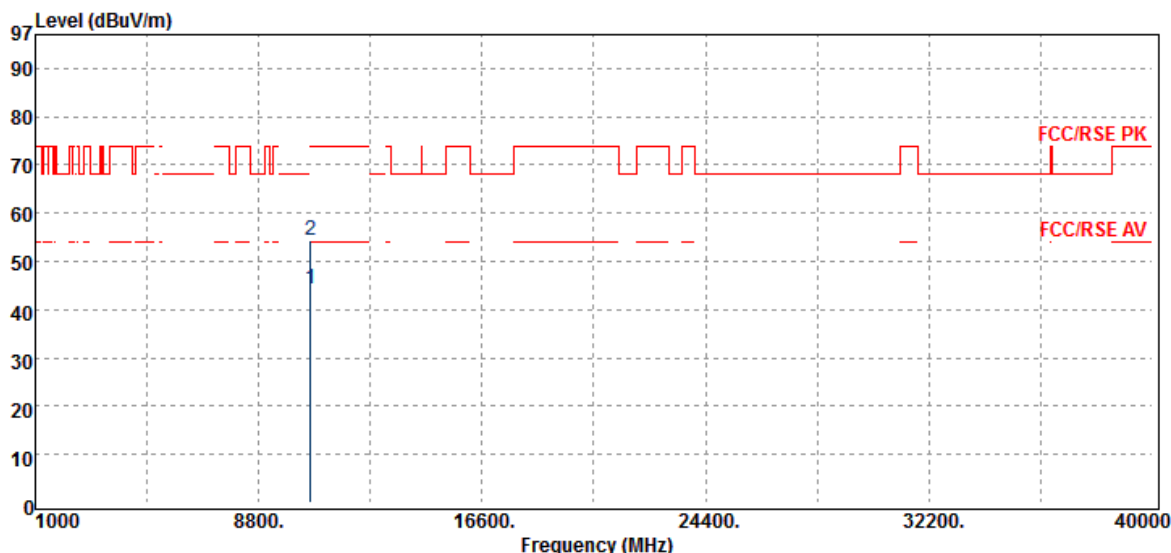
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www.tw.sgs.com

Member of SGS Group

Operation Band :802.11n20B2
Fundamental Frequency :5300 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
10600.00	Average	24.05	20.38	44.43	54.00	-9.57
10600.00	Peak	33.99	20.38	54.37	74.00	-19.63

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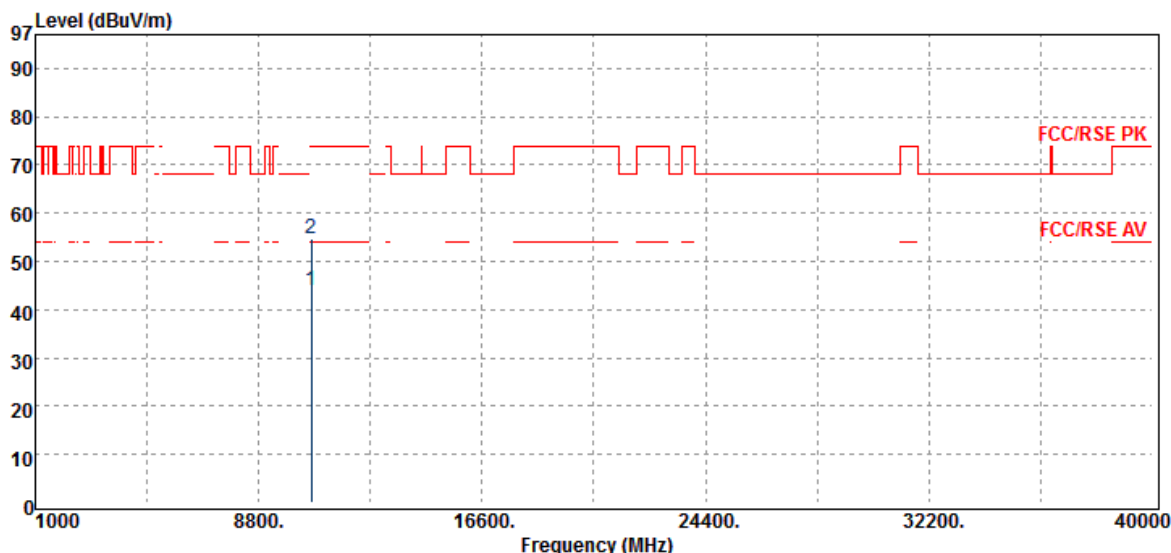
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Member of SGS Group

Operation Band :802.11n20B2
 Fundamental Frequency :5320 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10640.00	Average	23.39	20.44	43.83	54.00	-10.17
10640.00	Peak	34.39	20.44	54.83	74.00	-19.17

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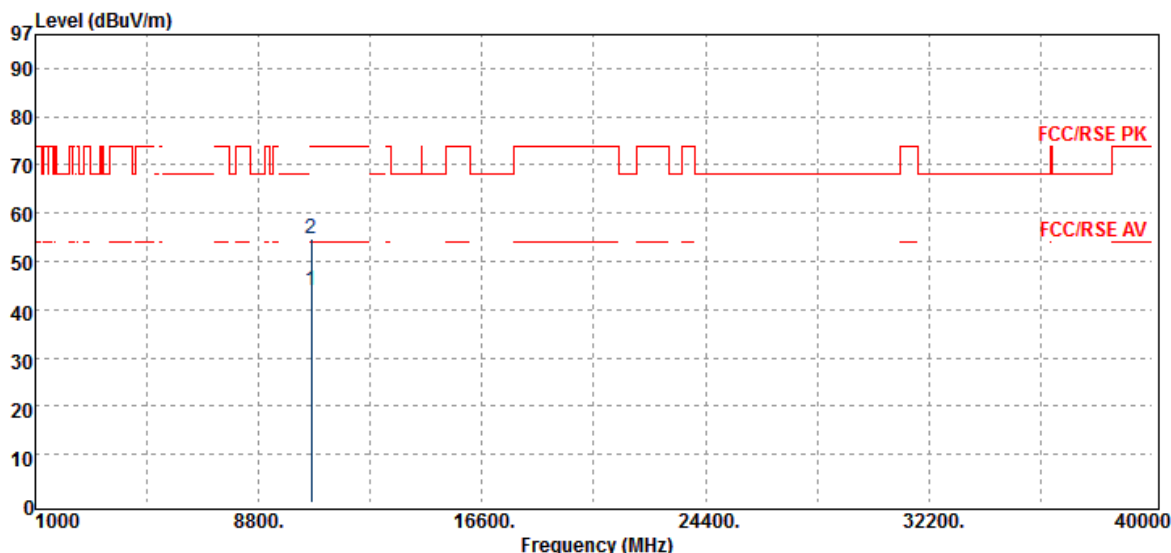
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Operation Band :802.11n20B2
Fundamental Frequency :5320 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
10640.00	Average	23.59	20.44	44.03	54.00	-9.97
10640.00	Peak	34.23	20.44	54.67	74.00	-19.33

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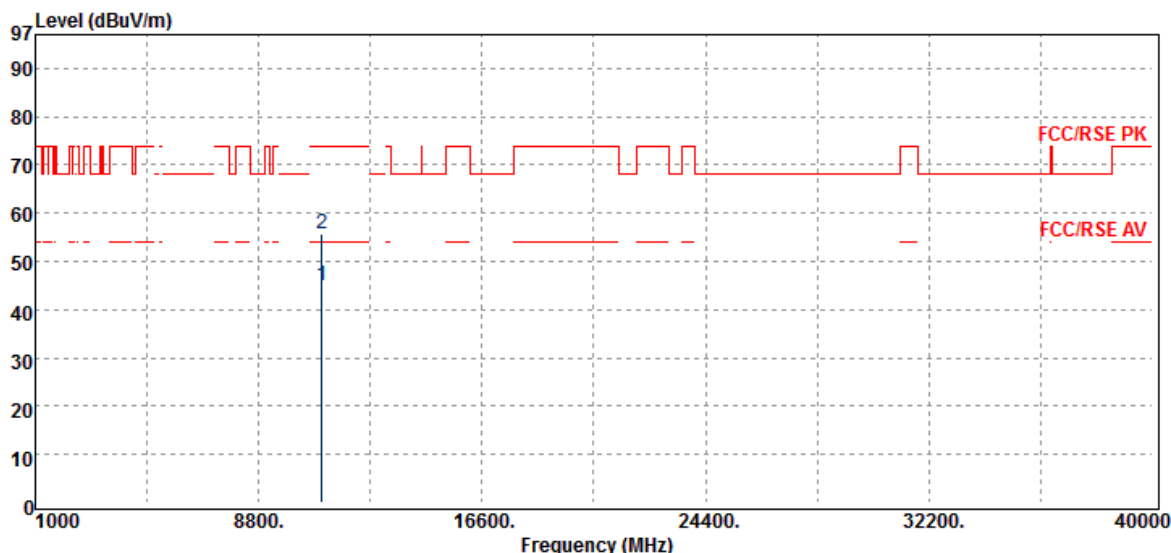
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

Operation Band :802.11n20B3
Fundamental Frequency :5500 MHz
Operation Mode :Tx CH LOW
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11000.00	Average	23.58	21.37	44.95	54.00	-9.05
11000.00	Peak	34.18	21.37	55.55	74.00	-18.45

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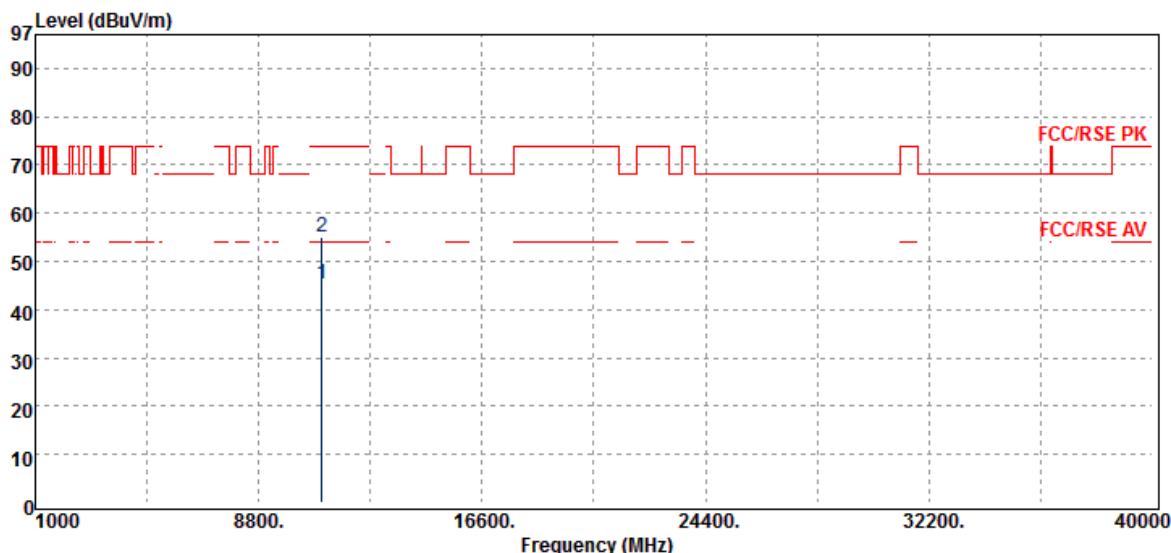
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Operation Band :802.11n20B3
 Fundamental Frequency :5500 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11000.00	Average	23.89	21.37	45.26	54.00	-8.74
11000.00	Peak	33.65	21.37	55.02	74.00	-18.98

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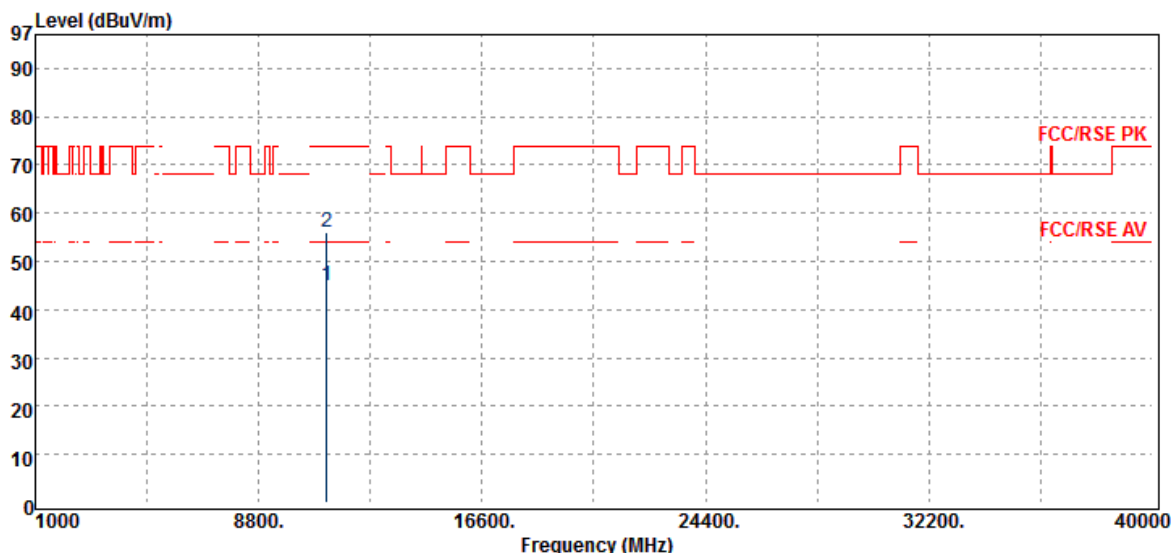
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Operation Band :802.11n20B3
 Fundamental Frequency :5580 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11160.00	Average	23.30	21.51	44.81	54.00	-9.19
11160.00	Peak	34.46	21.51	55.97	74.00	-18.03

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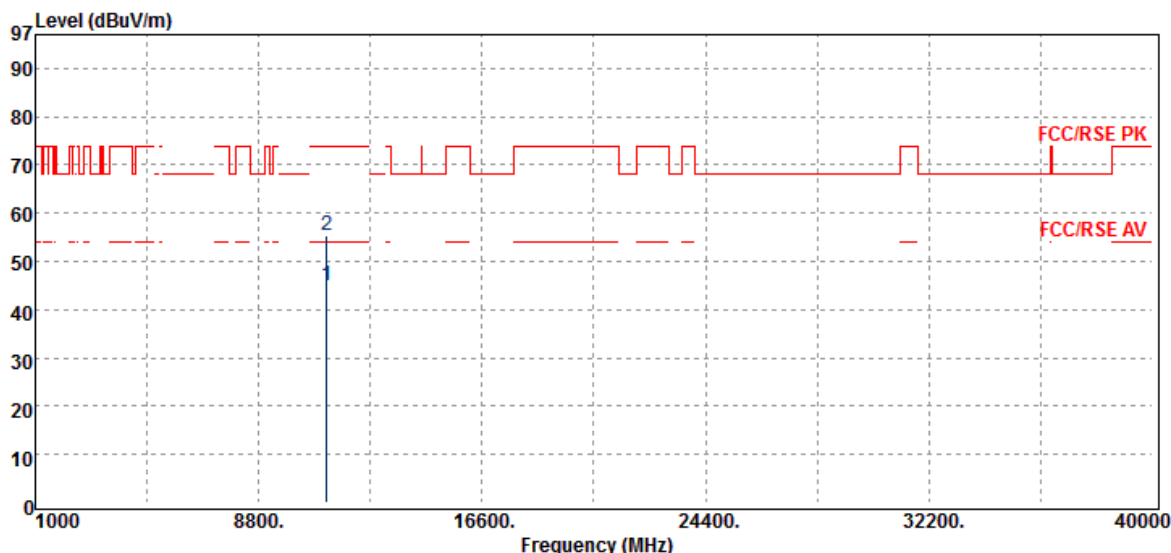
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Operation Band :802.11n20B3
Fundamental Frequency :5580 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11160.00	Average	23.53	21.51	45.04	54.00	-8.96
11160.00	Peak	33.98	21.51	55.49	74.00	-18.51

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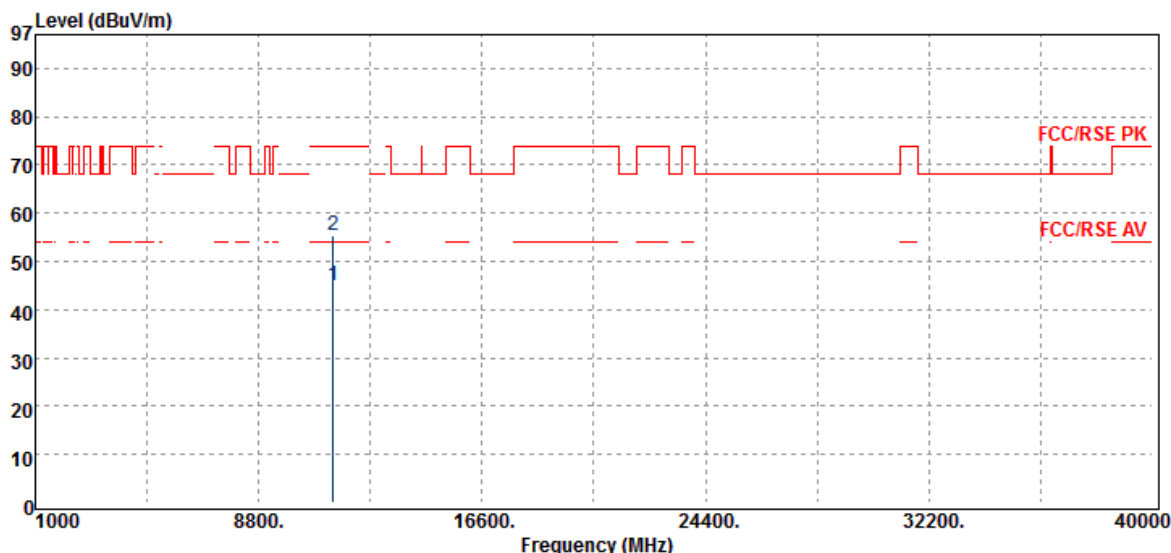
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Member of SGS Group

Operation Band :802.11n20B3
 Fundamental Frequency :5700 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11400.00	Average	23.39	21.62	45.01	54.00	-8.99
11400.00	Peak	33.88	21.62	55.50	74.00	-18.50

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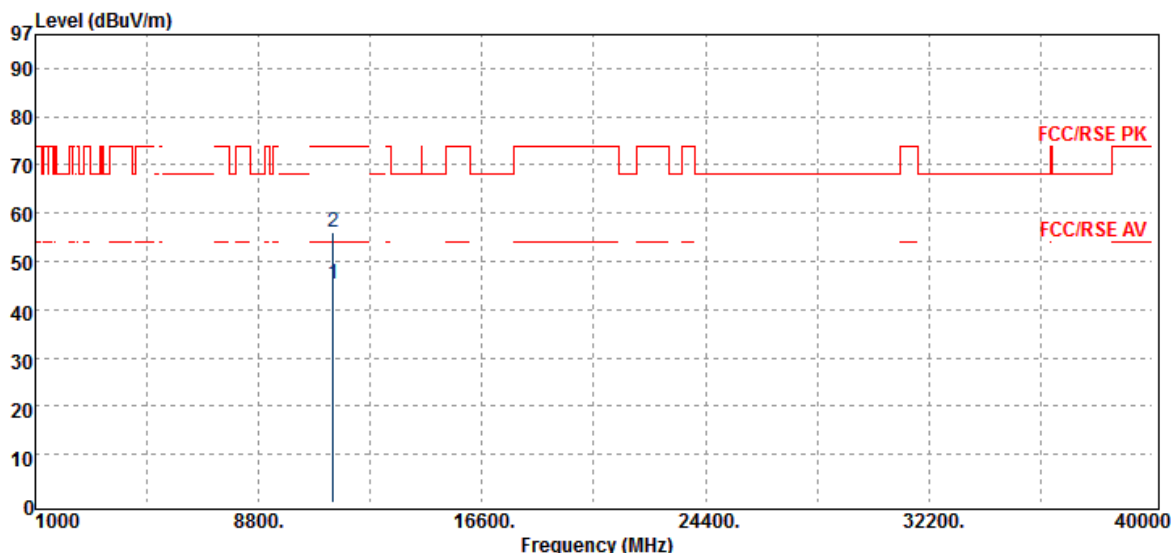
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Operation Band :802.11n20B3
 Fundamental Frequency :5700 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11400.00	Average	23.77	21.62	45.39	54.00	-8.61
11400.00	Peak	34.44	21.62	56.06	74.00	-17.94

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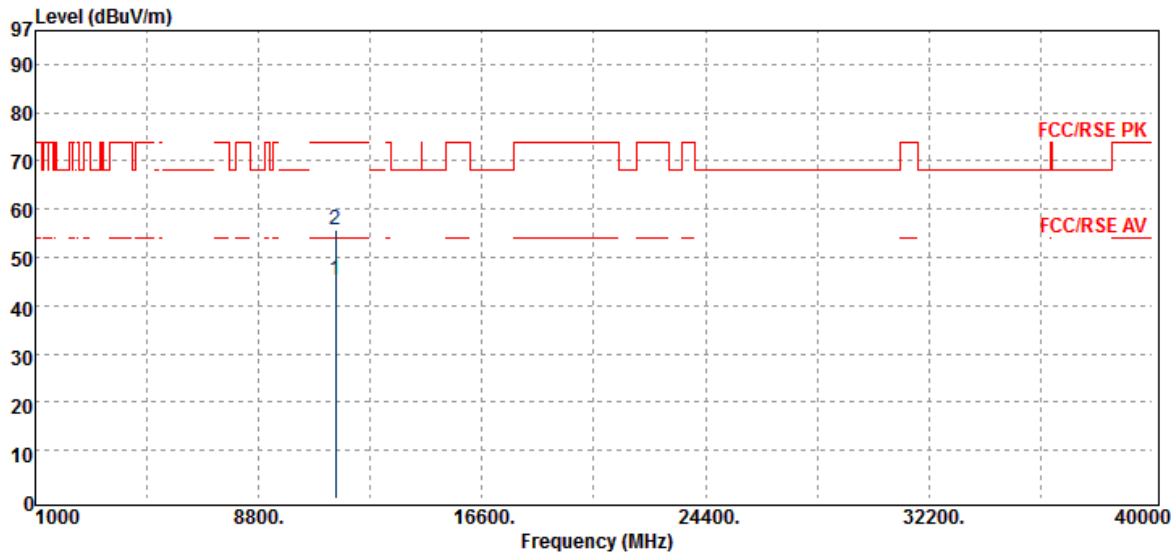
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Radiated Spurious Emission Measurement Result 802.11n HT20, 5725~5850 MHz

Operation Band	:802.11n20B4	Test Date	:2018-08-14
Fundamental Frequency	:5745 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	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
11490.00	Average	23.79	21.61	45.40	54.00	-8.60
11490.00	Peak	34.25	21.61	55.86	74.00	-18.14

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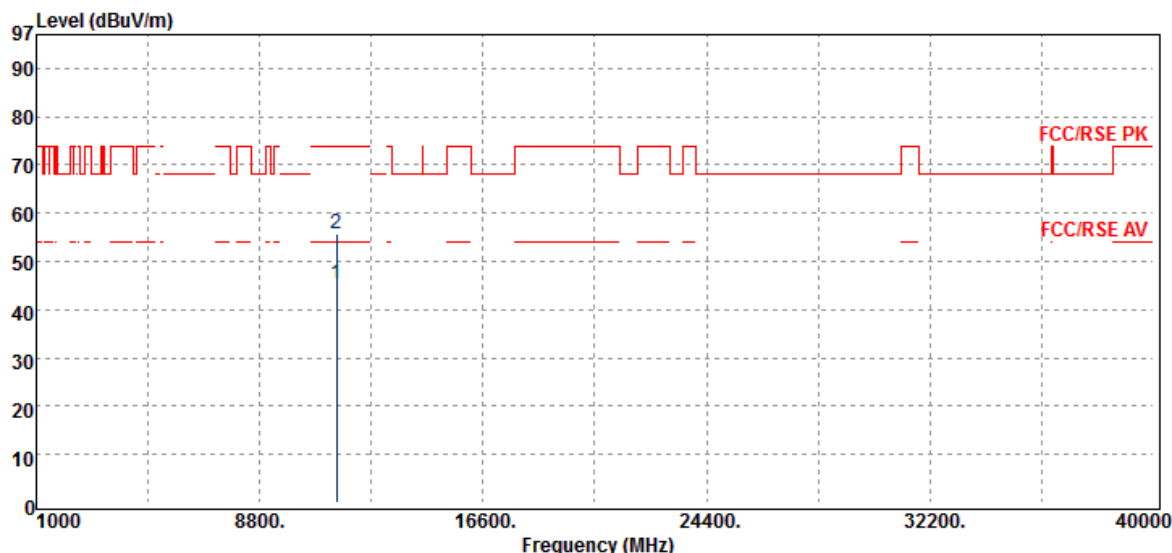
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Operation Band :802.11n20B4
Fundamental Frequency :5745 MHz
Operation Mode :Tx CH LOW
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11490.00	Average	23.84	21.61	45.45	54.00	-8.55
11490.00	Peak	34.02	21.61	55.63	74.00	-18.37

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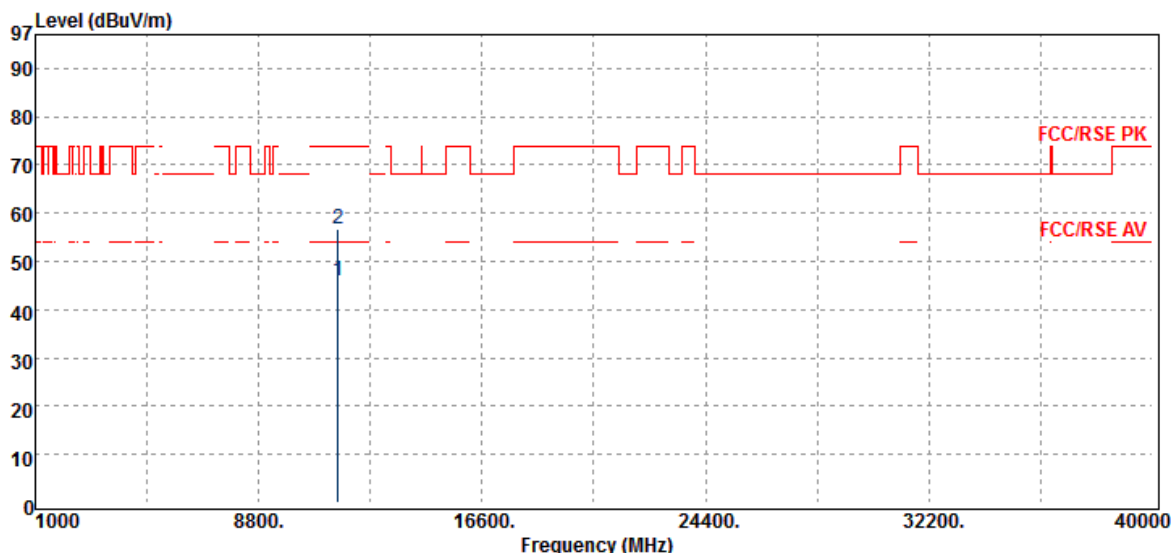
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www.tw.sgs.com

Member of SGS Group

Operation Band :802.11n20B4
 Fundamental Frequency :5785 MHz
 Operation Mode :Tx CH MID
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11570.00	Average	24.39	21.66	46.05	54.00	-7.95
11570.00	Peak	35.13	21.66	56.79	74.00	-17.21

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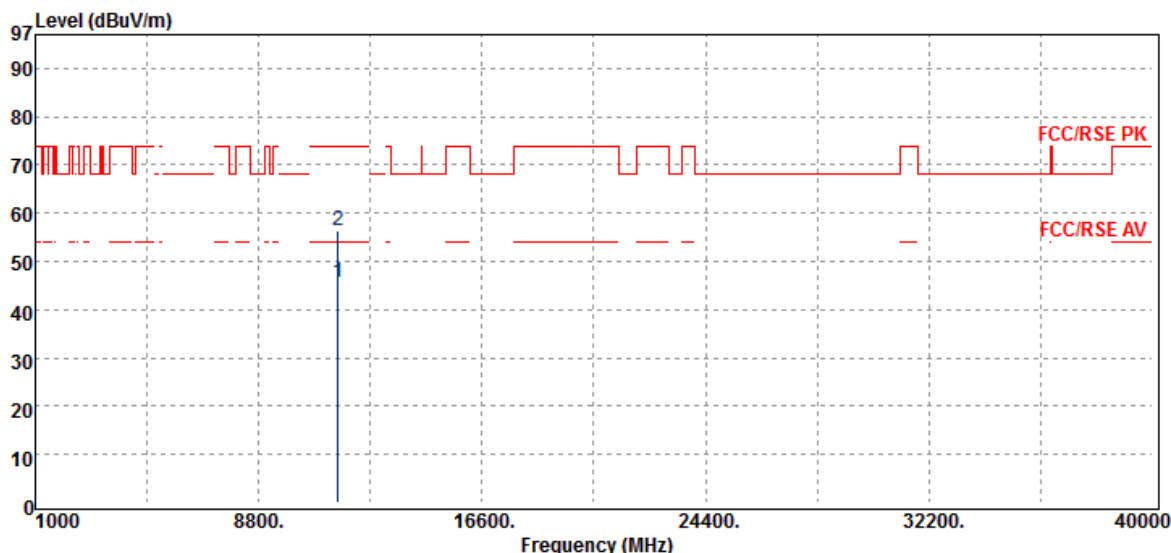
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Member of SGS Group

Operation Band :802.11n20B4
Fundamental Frequency :5785 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11570.00	Average	23.86	21.66	45.52	54.00	-8.48
11570.00	Peak	34.67	21.66	56.33	74.00	-17.67

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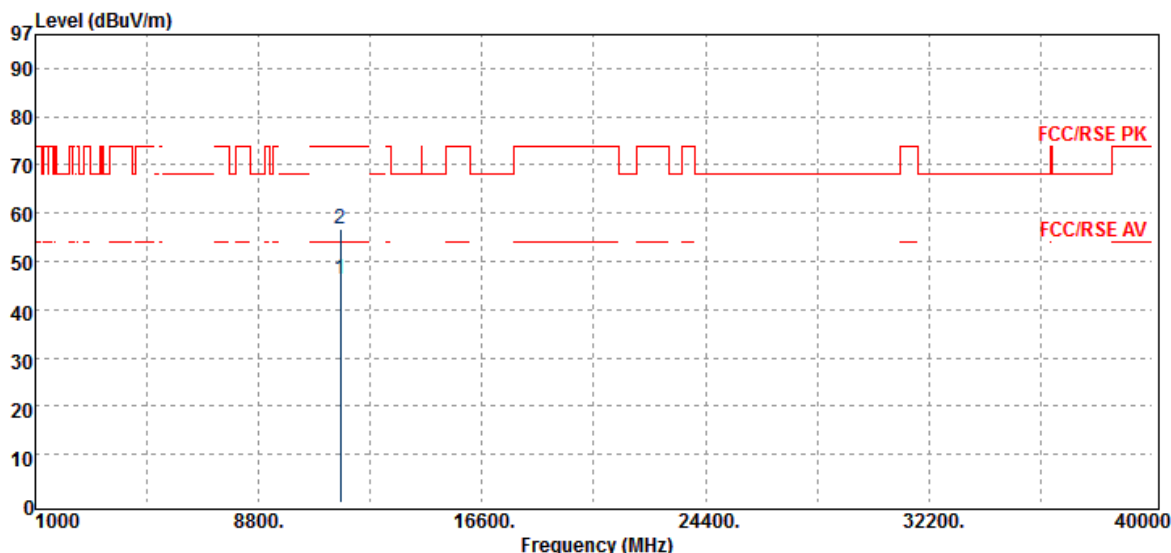
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www.tw.sgs.com

Member of SGS Group

Operation Band :802.11n20B4
 Fundamental Frequency :5825 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11650.00	Average	24.58	21.60	46.18	54.00	-7.82
11650.00	Peak	35.27	21.60	56.87	74.00	-17.13

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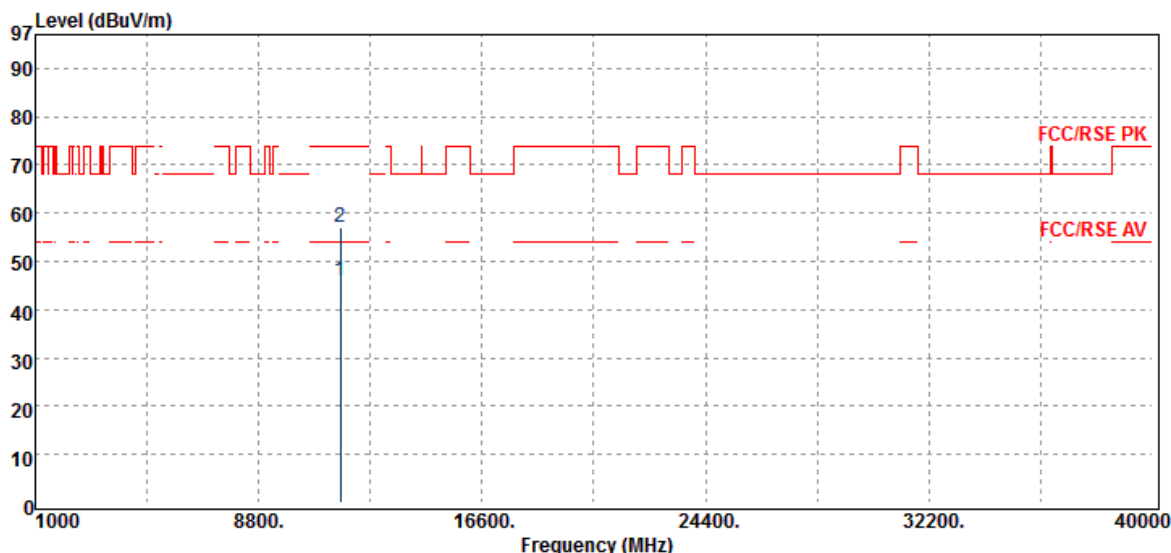
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www.tw.sgs.com

Member of SGS Group

Operation Band :802.11n20B4
Fundamental Frequency :5825 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :E2 Plane

Test Date :2018-08-14
Temp./Humi. :23 deg_C / 62 RH
Engineer :Tin
Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11650.00	Average	24.44	21.60	46.04	54.00	-7.96
11650.00	Peak	35.49	21.60	57.09	74.00	-16.91

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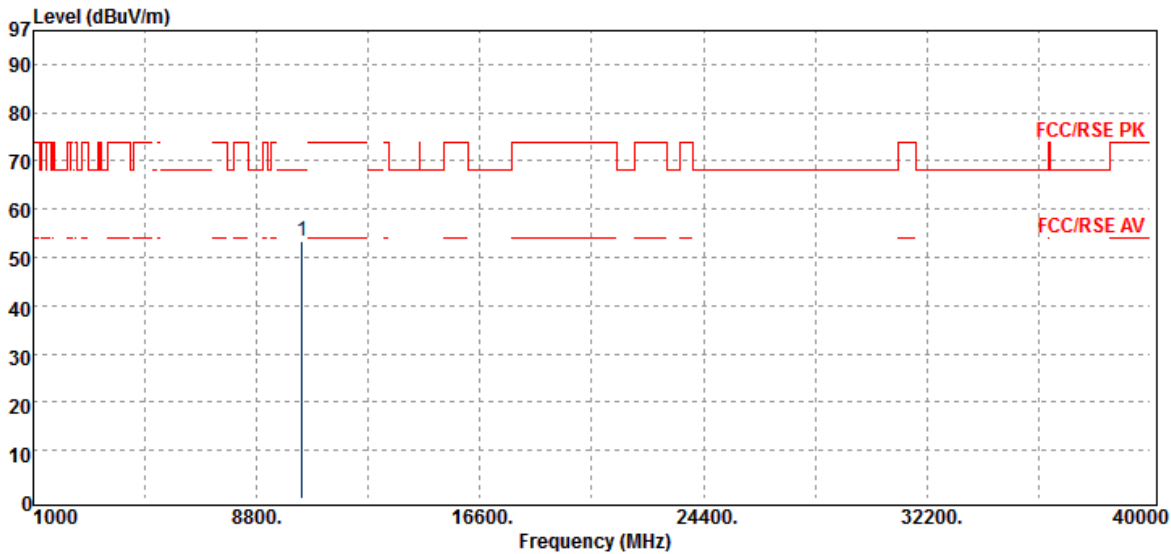
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Band	:802.11n40B1	Test Date	:2018-08-14
Fundamental Frequency	:5190 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	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
10380.00	Peak	33.51	19.78	53.29	68.20	-14.91

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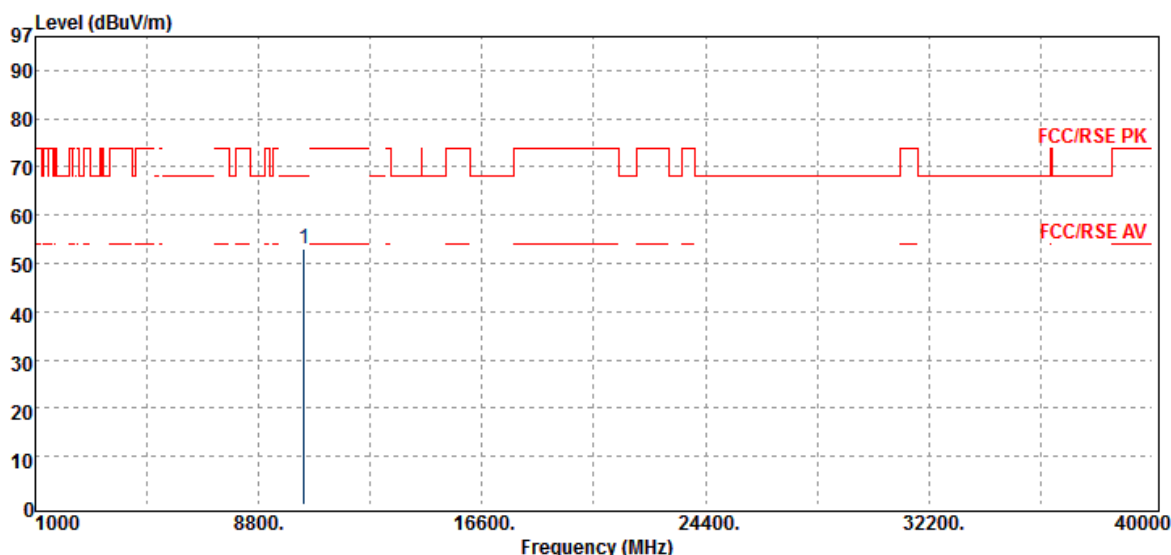
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Member of SGS Group

Operation Band :802.11n40B1
 Fundamental Frequency :5190 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10380.00	Peak	33.33	19.78	53.11	68.20	-15.09

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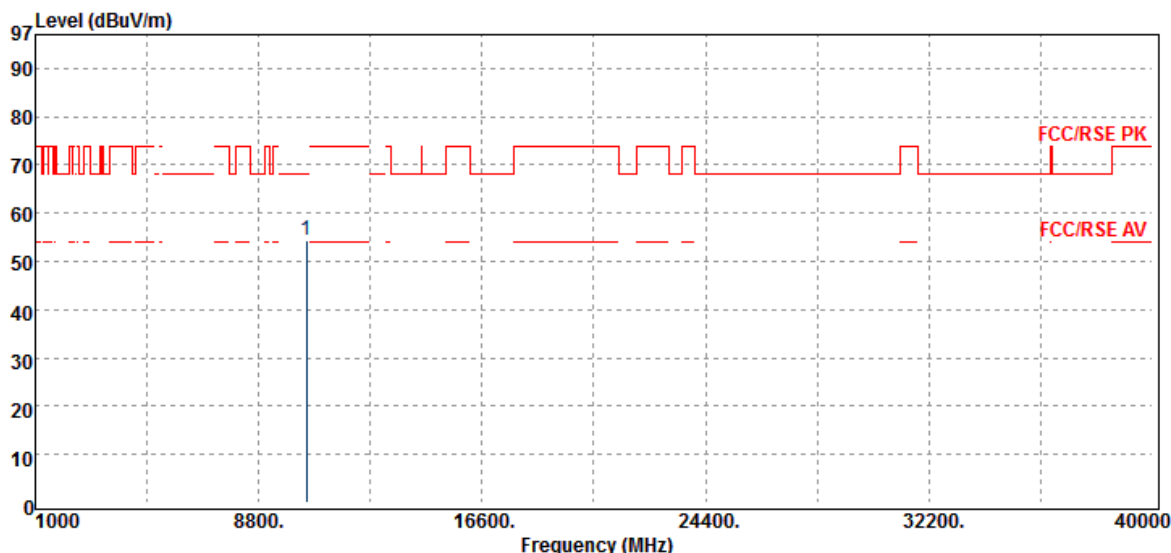
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Operation Band :802.11n40B1
 Fundamental Frequency :5230 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10460.00	Peak	34.18	20.07	54.25	68.20	-13.95

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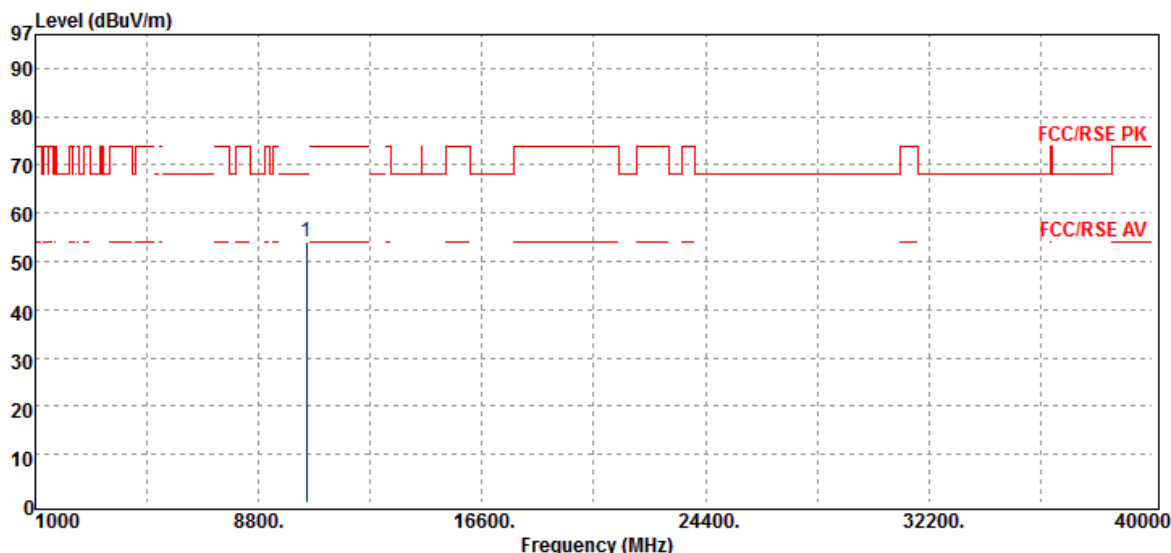
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www.tw.sgs.com

Member of SGS Group

Operation Band :802.11n40B1
 Fundamental Frequency :5230 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10460.00	Peak	34.12	20.07	54.19	68.20	-14.01

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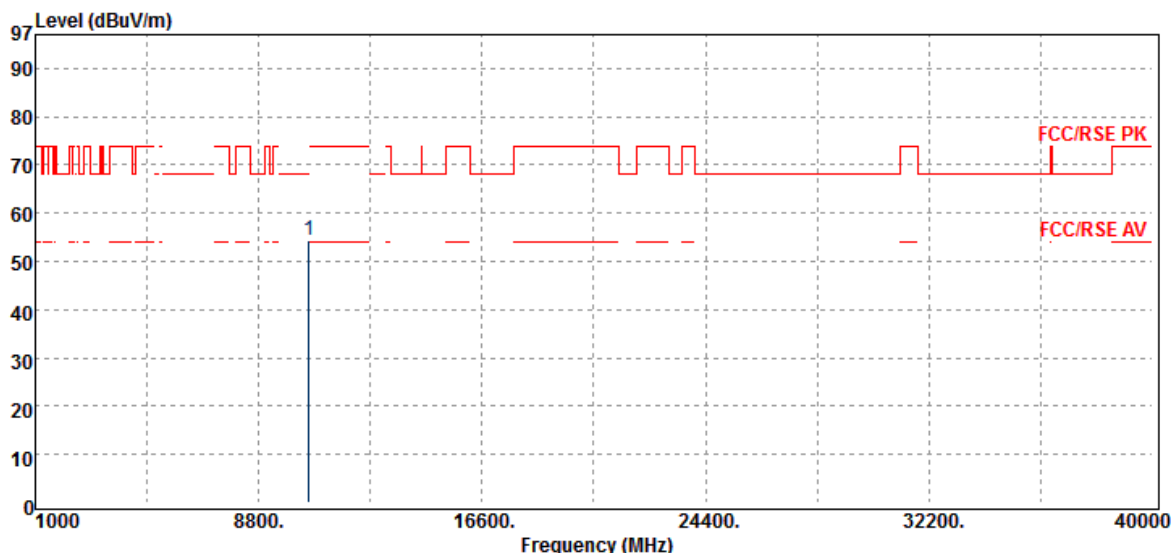
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Member of SGS Group

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

Operation Band	:802.11n40B2	Test Date	:2018-08-14
Fundamental Frequency	:5270 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 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
10540.00	Peak	34.31	20.02	54.33	68.20	-13.87

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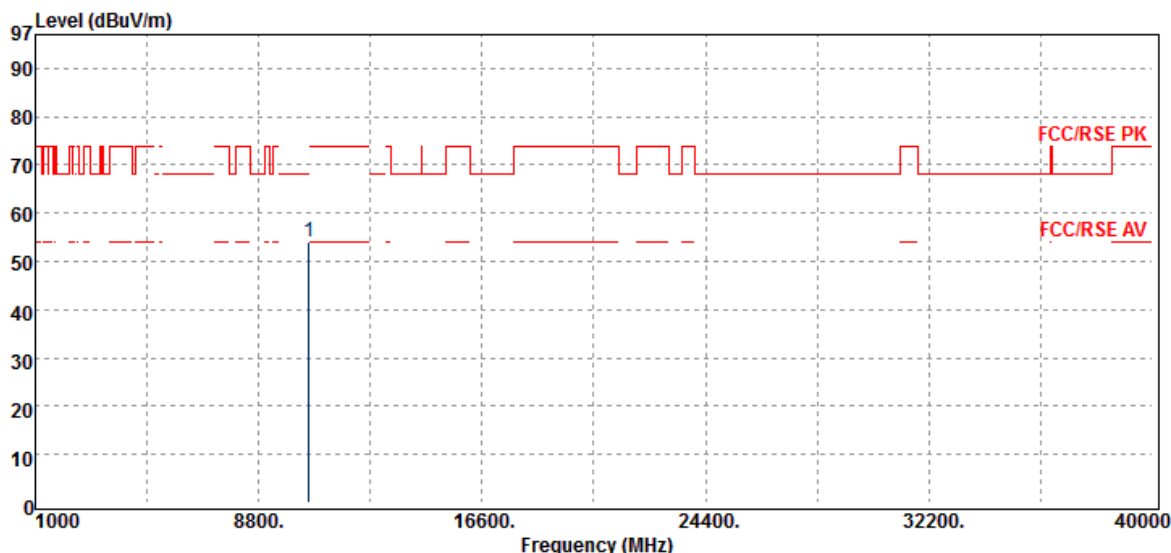
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Member of SGS Group

Operation Band :802.11n40B2
Fundamental Frequency :5270 MHz
Operation Mode :Tx CH LOW
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
10540.00	Peak	34.11	20.02	54.13	68.20	-14.07

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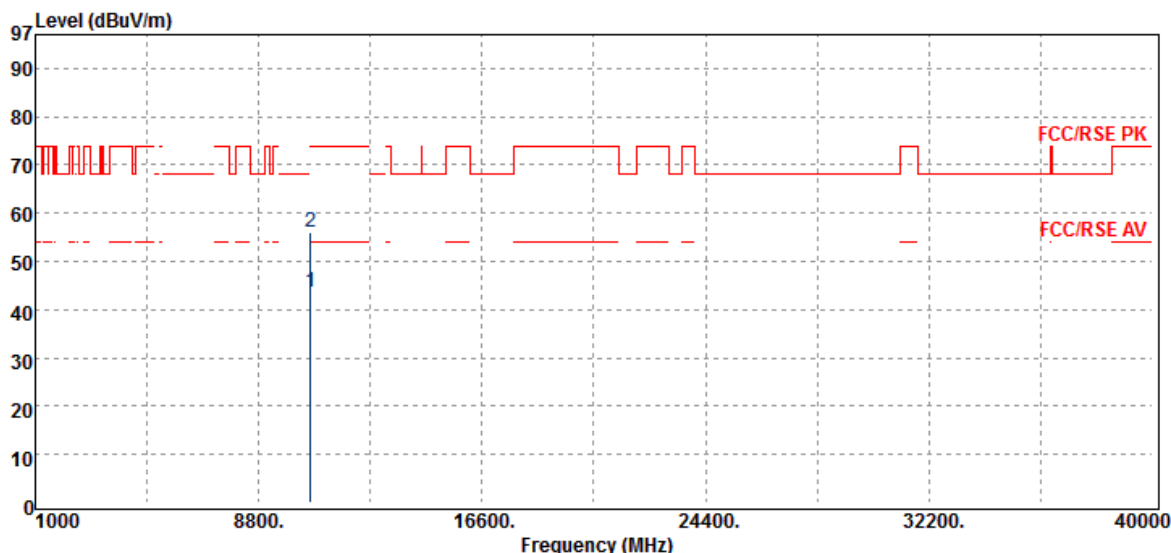
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Operation Band :802.11n40B2
 Fundamental Frequency :5310 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10620.00	Average	23.31	20.41	43.72	54.00	-10.28
10620.00	Peak	35.55	20.41	55.96	74.00	-18.04

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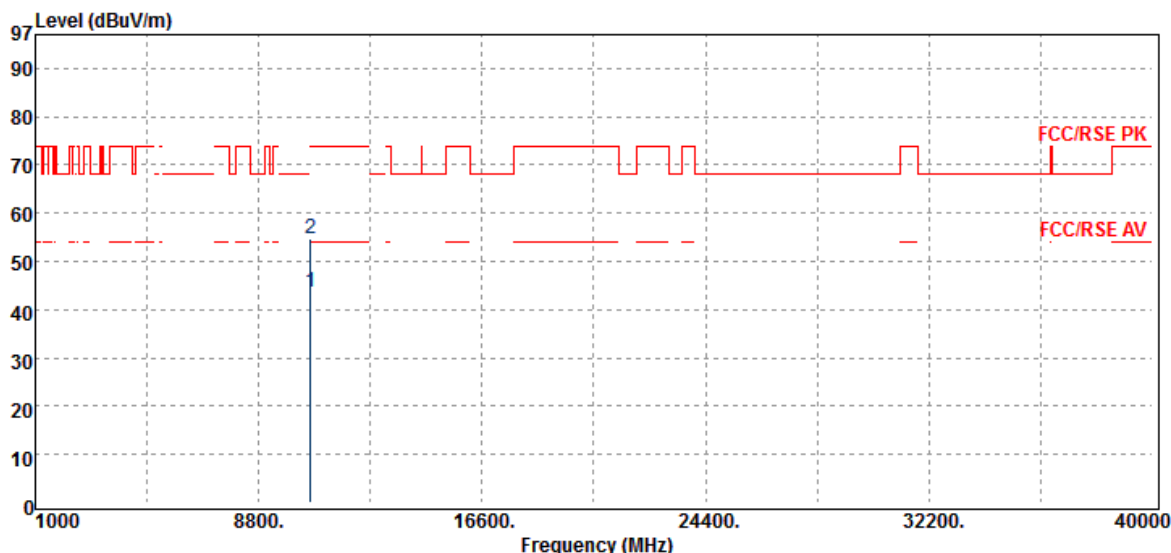
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Operation Band :802.11n40B2
 Fundamental Frequency :5310 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
10620.00	Average	23.21	20.41	43.62	54.00	-10.38
10620.00	Peak	34.28	20.41	54.69	74.00	-19.31

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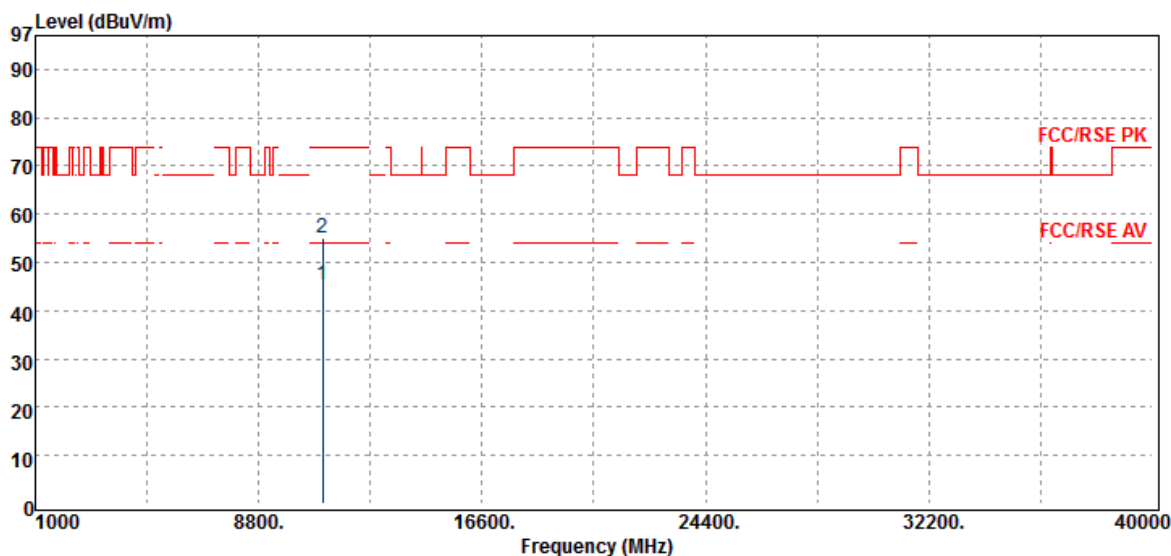
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

Operation Band :802.11n40B3
Fundamental Frequency :5510 MHz
Operation Mode :Tx CH LOW
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11020.00	Average	23.88	21.46	45.34	54.00	-8.66
11020.00	Peak	33.66	21.46	55.12	74.00	-18.88

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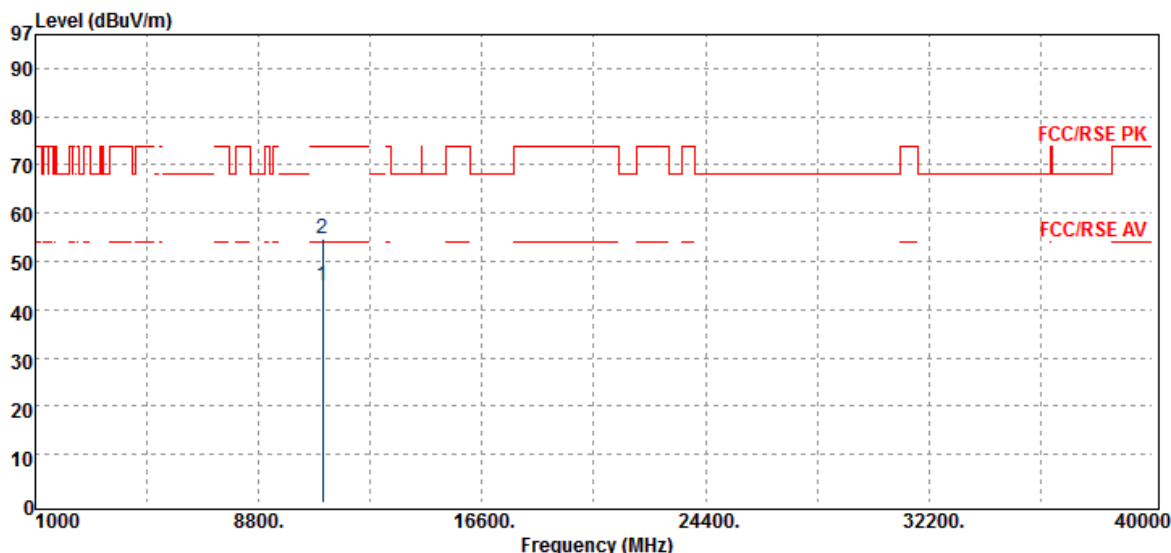
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Operation Band :802.11n40B3
 Fundamental Frequency :5510 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 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
11020.00	Average	23.39	21.46	44.85	54.00	-9.15
11020.00	Peak	33.37	21.46	54.83	74.00	-19.17

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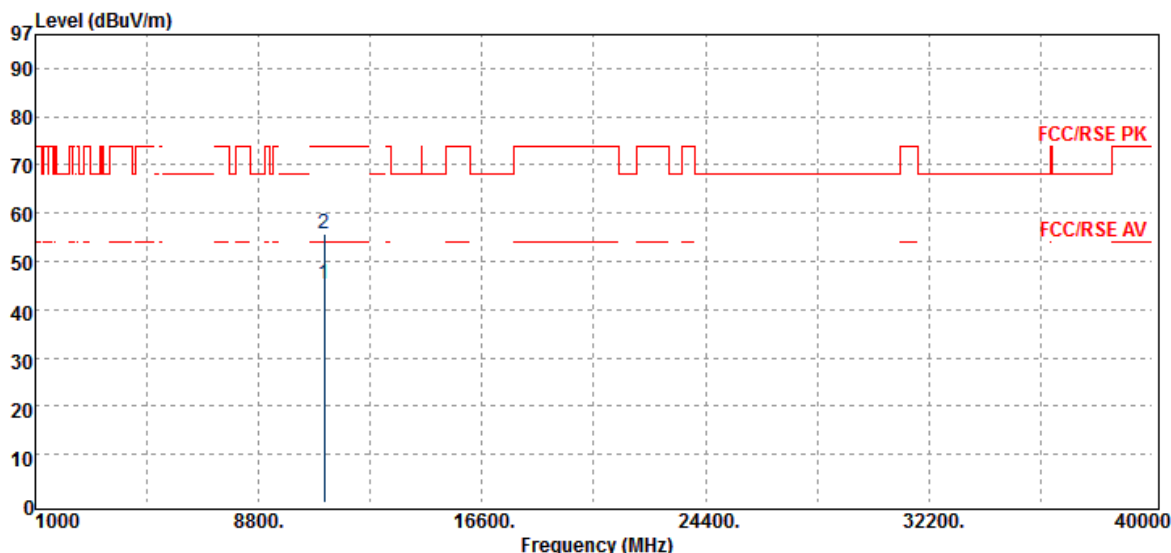
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Operation Band :802.11n40B3
Fundamental Frequency :5550 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11100.00	Average	23.82	21.53	45.35	54.00	-8.65
11100.00	Peak	34.08	21.53	55.61	74.00	-18.39

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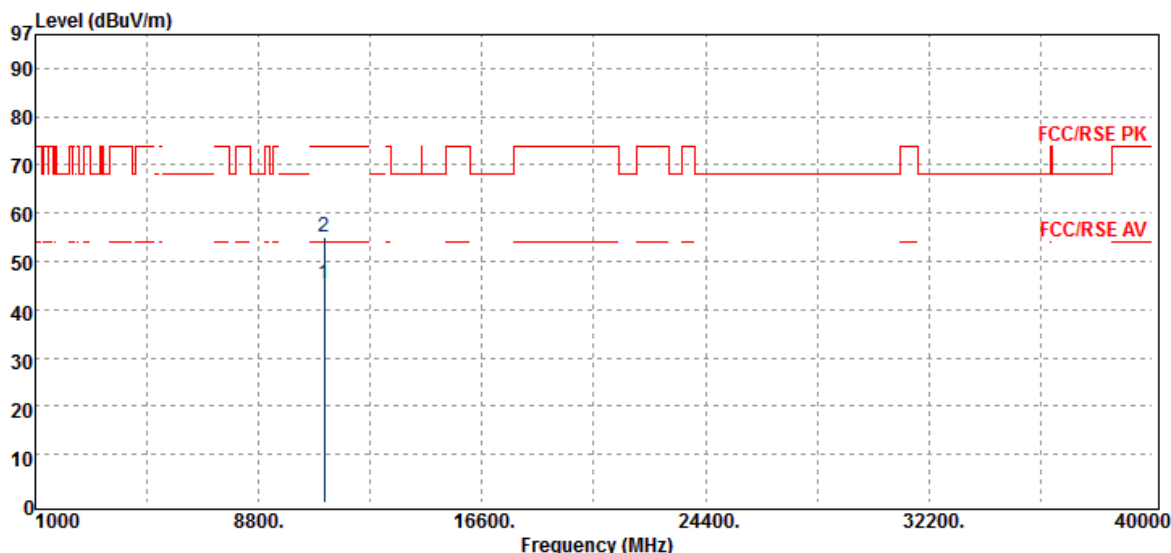
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Operation Band :802.11n40B3
Fundamental Frequency :5550 MHz
Operation Mode :Tx CH MID
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11100.00	Average	23.89	21.53	45.42	54.00	-8.58
11100.00	Peak	33.55	21.53	55.08	74.00	-18.92

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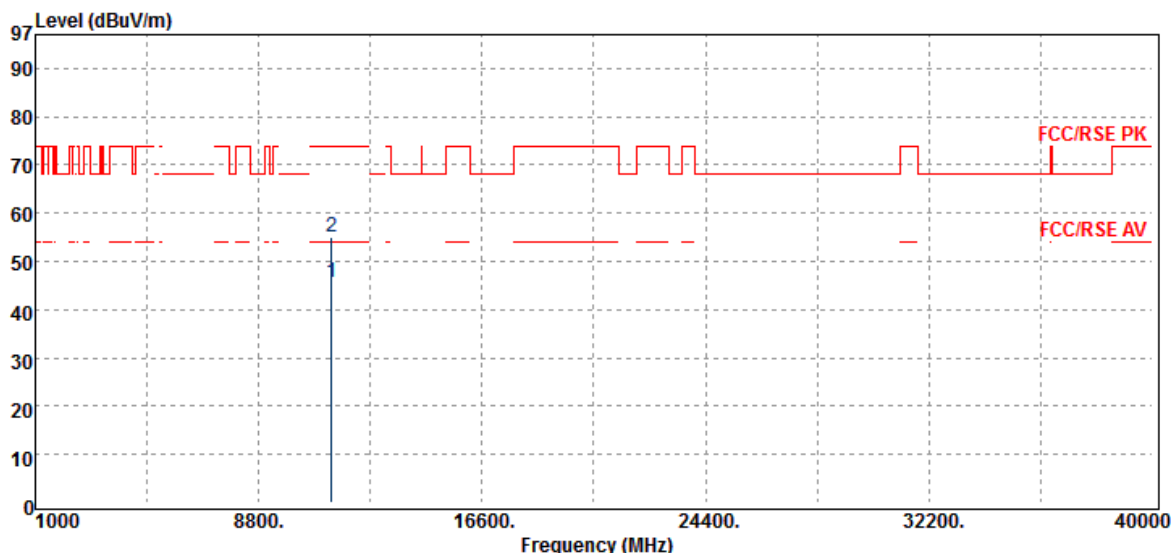
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Operation Band :802.11n40B3
Fundamental Frequency :5670 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11340.00	Average	24.18	21.54	45.72	54.00	-8.28
11340.00	Peak	33.55	21.54	55.09	74.00	-18.91

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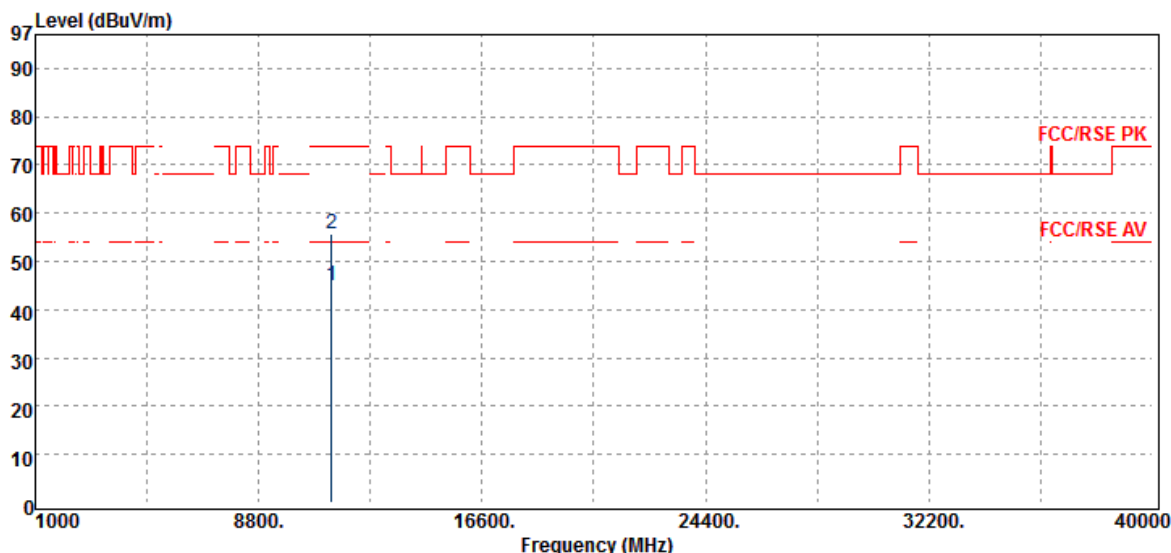
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Operation Band :802.11n40B3
Fundamental Frequency :5670 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11340.00	Average	23.57	21.54	45.11	54.00	-8.89
11340.00	Peak	34.20	21.54	55.74	74.00	-18.26

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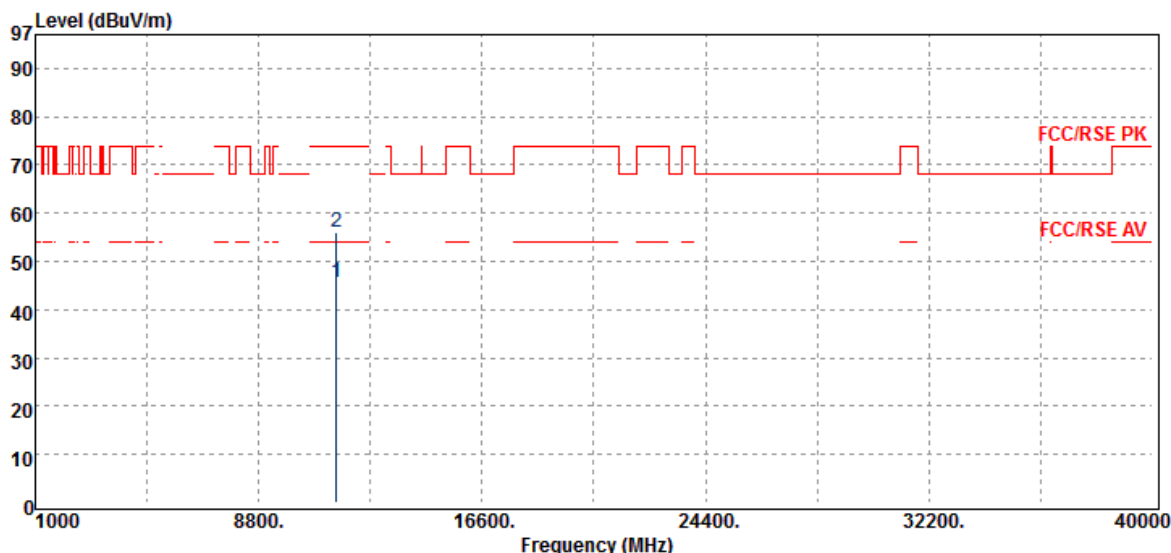
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Radiated Spurious Emission Measurement Result 802.11n HT40, 5725~5850 MHz

Operation Band	:802.11n40B4	Test Date	:2018-08-14
Fundamental Frequency	:5755 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:E2 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
11510.00	Average	24.11	21.66	45.77	54.00	-8.23
11510.00	Peak	34.41	21.66	56.07	74.00	-17.93

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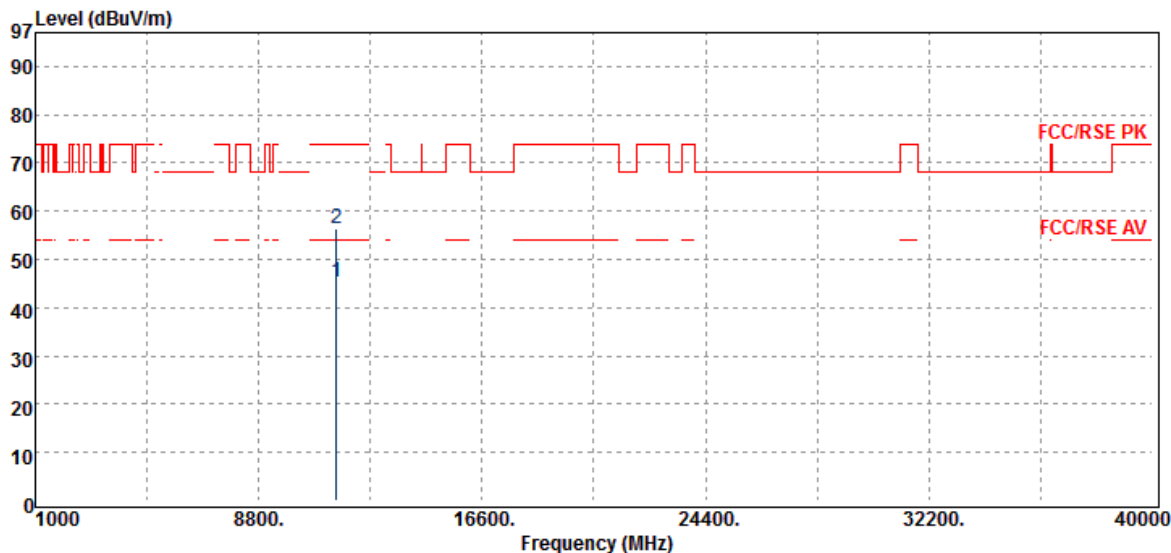
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Operation Band :802.11n40B4
 Fundamental Frequency :5755 MHz
 Operation Mode :Tx CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11510.00	Average	23.77	21.66	45.43	54.00	-8.57
11510.00	Peak	34.84	21.66	56.50	74.00	-17.50

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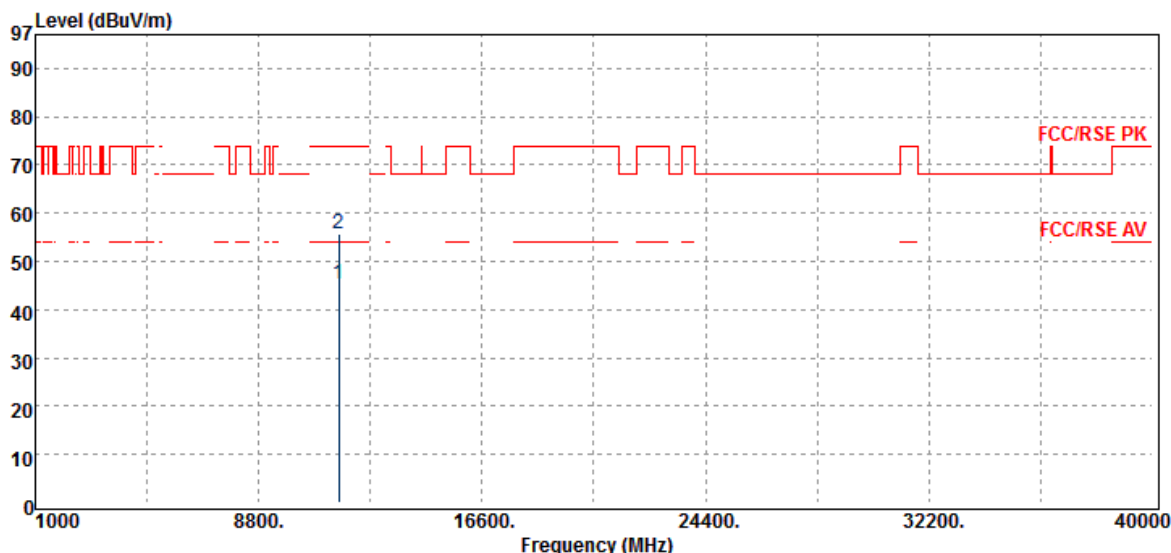
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Operation Band :802.11n40B4
Fundamental Frequency :5795 MHz
Operation Mode :Tx CH HIGH
EUT Pol. :E2 Plane

Test Date :2018-08-14
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
11590.00	Average	23.57	21.66	45.23	54.00	-8.77
11590.00	Peak	34.12	21.66	55.78	74.00	-18.22

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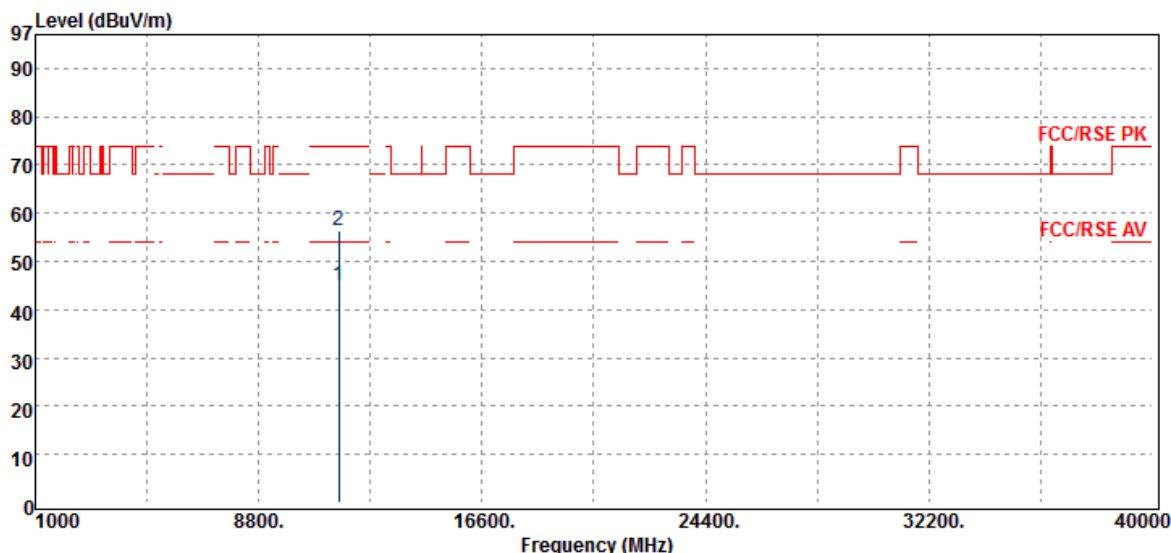
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Operation Band :802.11n40B4
 Fundamental Frequency :5795 MHz
 Operation Mode :Tx CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-14
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
11590.00	Average	23.44	21.66	45.10	54.00	-8.90
11590.00	Peak	34.71	21.66	56.37	74.00	-17.63

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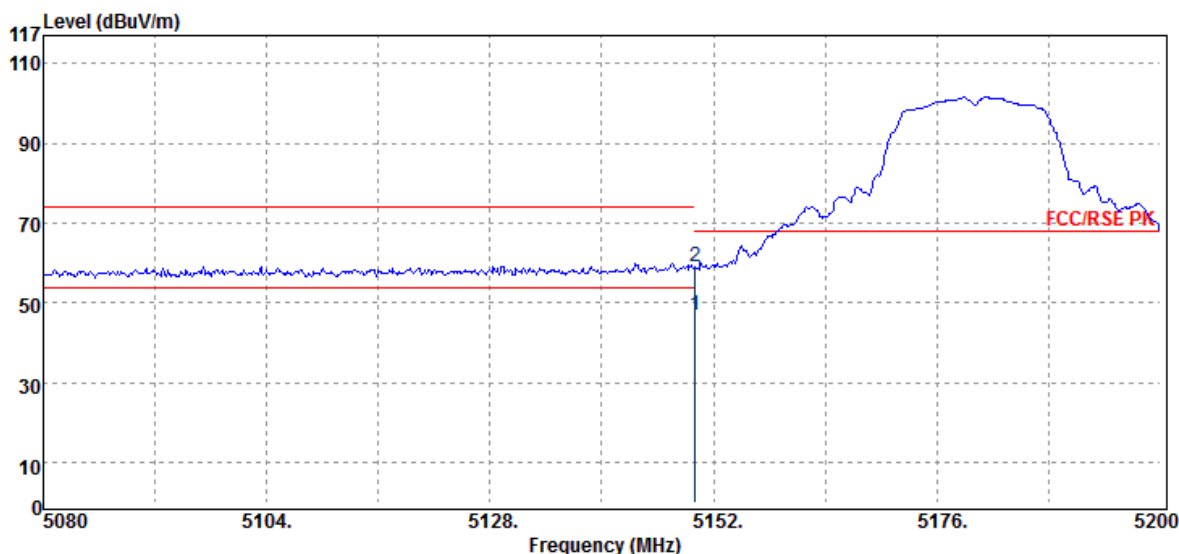
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Band edge falling to restricted band

802.11a mode

Operation Band	:802.11aB1	Test Date	:2018-09-03
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 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
5150.00	Average	38.80	8.32	47.12	54.00	-6.88
5150.00	Peak	50.84	8.32	59.16	74.00	-14.84

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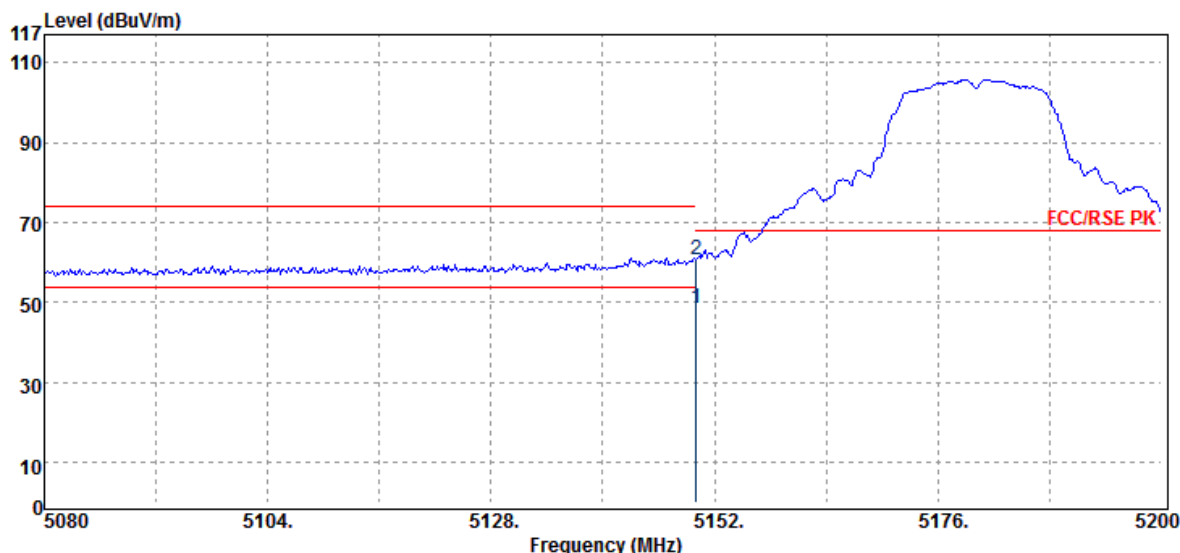
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Operation Band :802.11aB1
 Fundamental Frequency :5180 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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	40.07	8.32	48.39	54.00	-5.61
5150.00	Peak	52.58	8.32	60.90	74.00	-13.10

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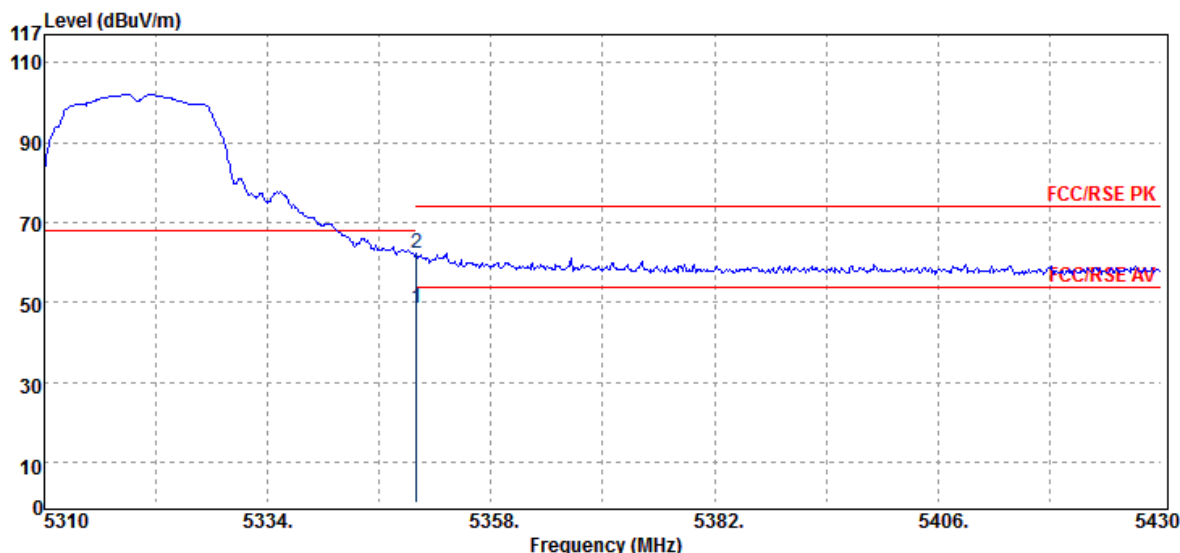
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Operation Band :802.11aB2
Fundamental Frequency :5320 MHz
Operation Mode :Bandedge CH HIGH
EUT Pol. :E2 Plane

Test Date :2018-09-03
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
5350.00	Average	39.78	8.63	48.41	54.00	-5.59
5350.00	Peak	53.73	8.63	62.36	74.00	-11.64

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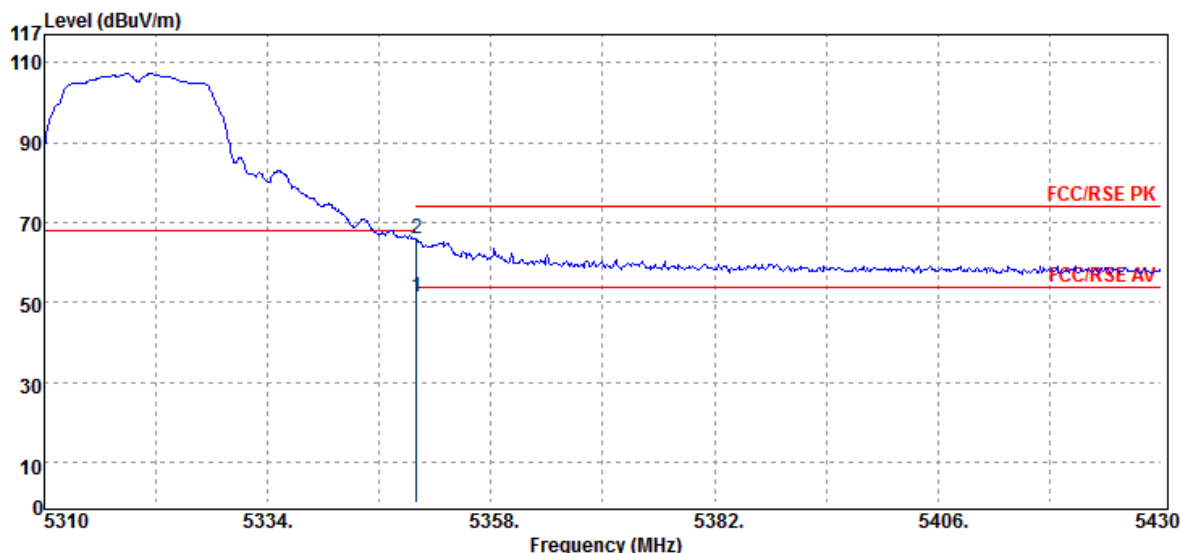
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Operation Band :802.11aB2
 Fundamental Frequency :5320 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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	42.59	8.63	51.22	54.00	-2.78
5350.00	Peak	57.39	8.63	66.02	74.00	-7.98

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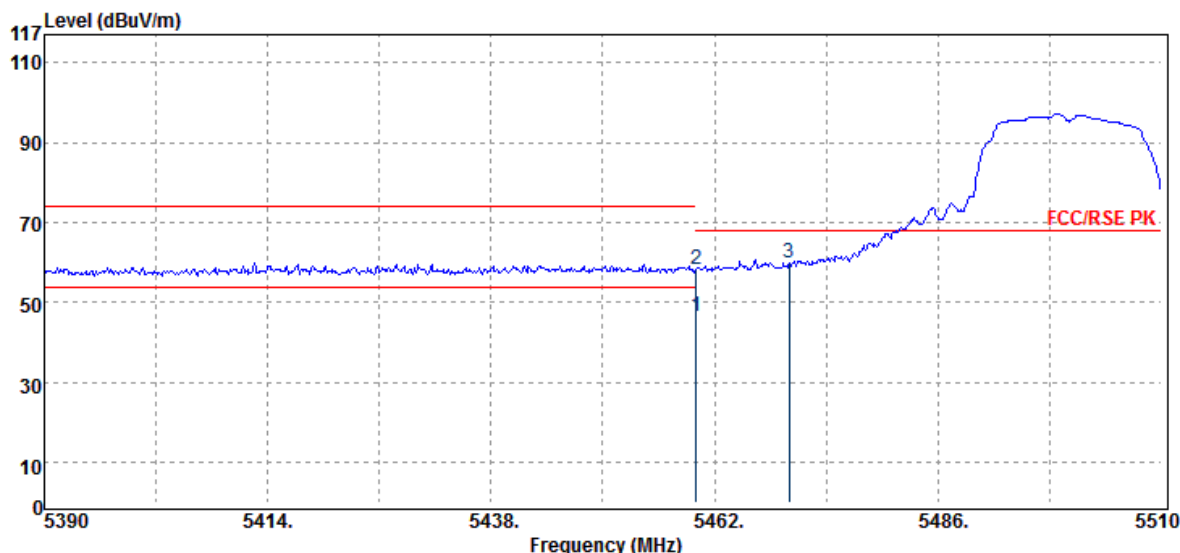
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Operation Band :802.11aB3
Fundamental Frequency :5500 MHz
Operation Mode :Bandedge CH LOW
EUT Pol. :E2 Plane

Test Date :2018-09-03
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	37.87	8.75	46.62	54.00	-7.38
5460.00	Peak	49.48	8.75	58.23	74.00	-15.77
5470.00	Peak	51.11	8.74	59.85	68.20	-8.35

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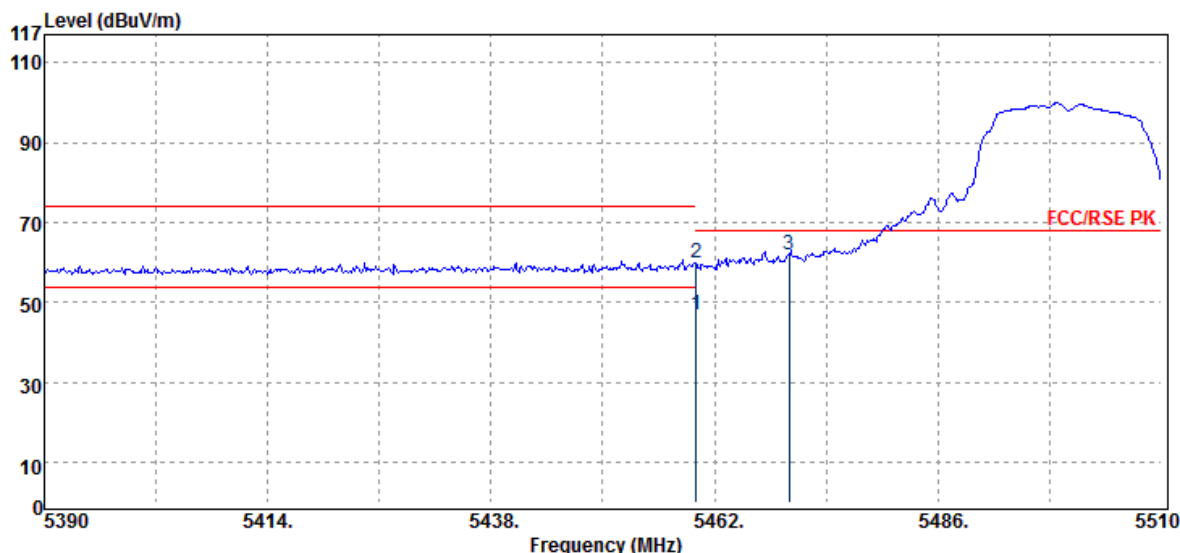
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Operation Band	:802.11aB3	Test Date	:2018-09-03
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL



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	38.34	8.75	47.09	54.00	-6.91
5460.00	Peak	51.27	8.75	60.02	74.00	-13.98
5470.00	Peak	53.16	8.74	61.90	68.20	-6.30

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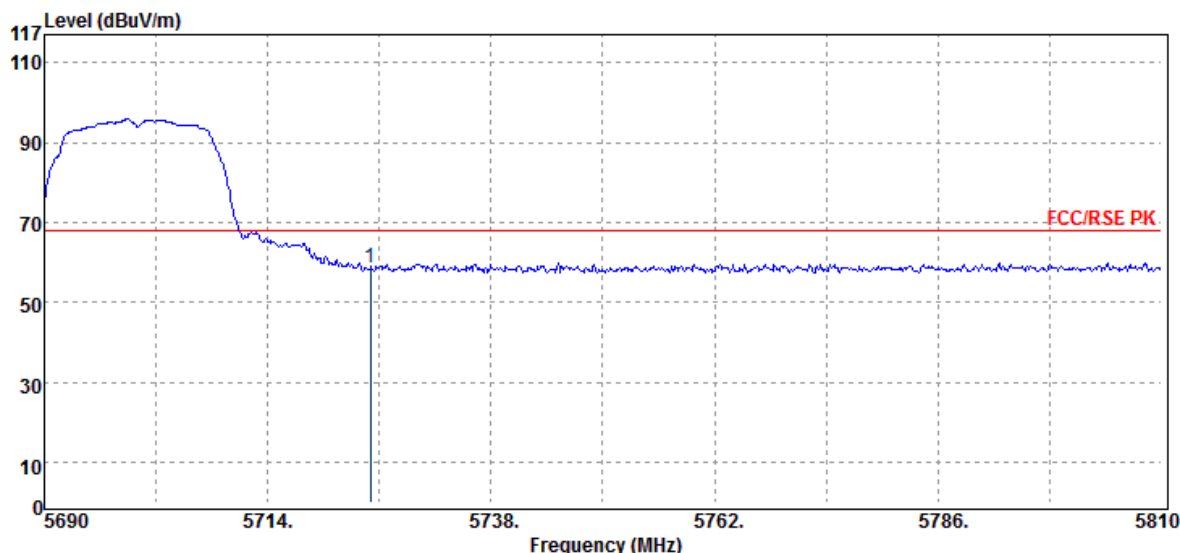
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Operation Band :802.11aB3
 Fundamental Frequency :5700 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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
5725.00	Peak	49.18	9.44	58.62	68.20	-9.58

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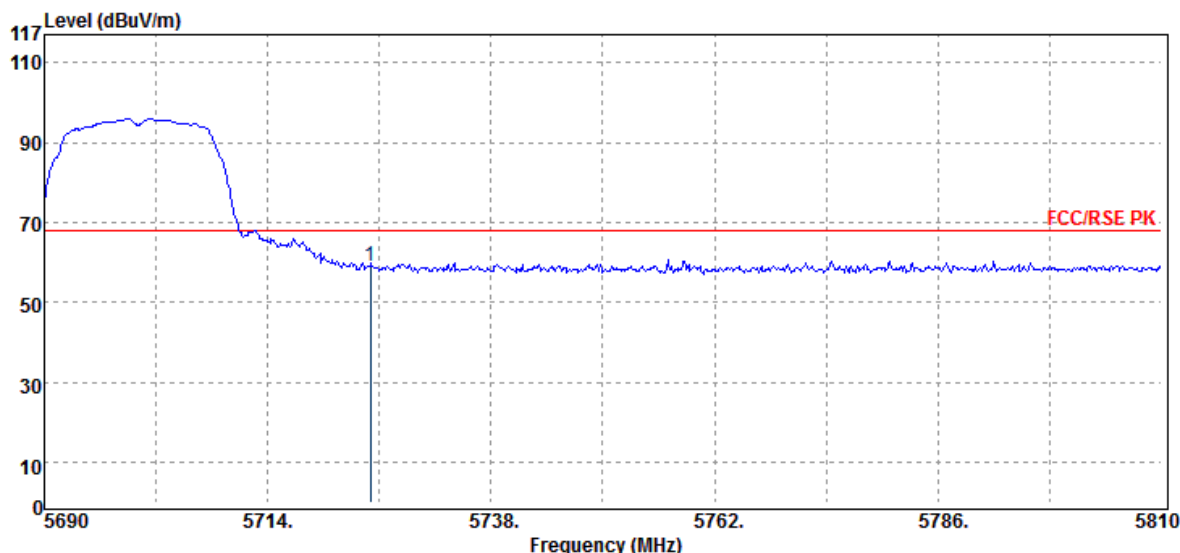
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Operation Band	:802.11aB3	Test Date	:2018-09-03
Fundamental Frequency	:5700 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5725.00	Peak	49.56	9.44	59.00	68.20	-9.20

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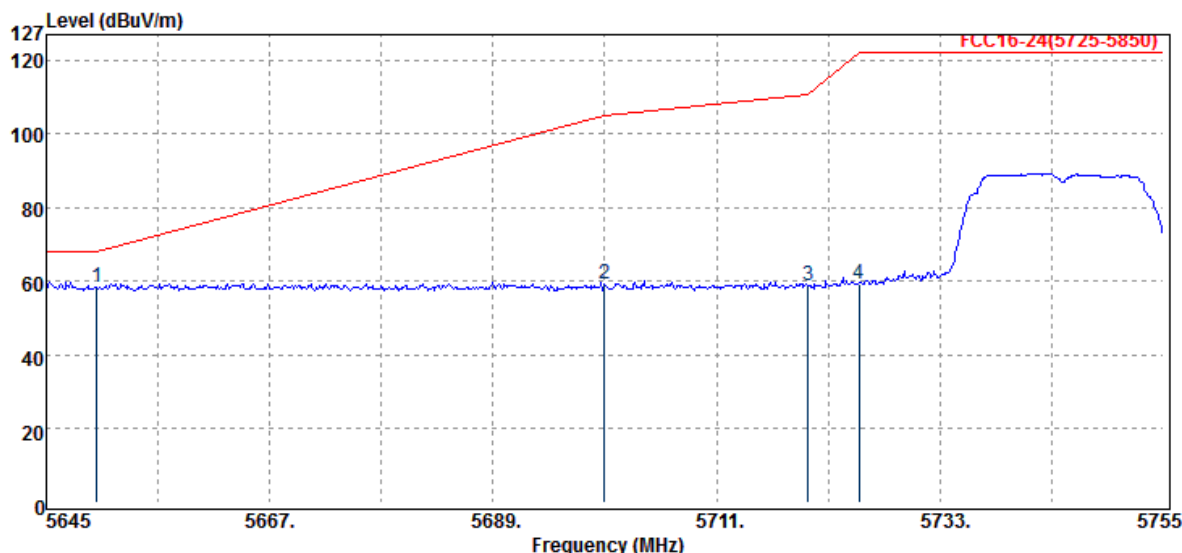
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Operation Band :802.11aB4
 Fundamental Frequency :5745 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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
5650.00	Peak	49.34	9.20	58.54	68.23	-9.69
5700.00	Peak	49.76	9.35	59.11	105.23	-46.12
5720.00	Peak	49.27	9.43	58.70	110.83	-52.13
5725.00	Peak	50.07	9.44	59.51	122.23	-62.72

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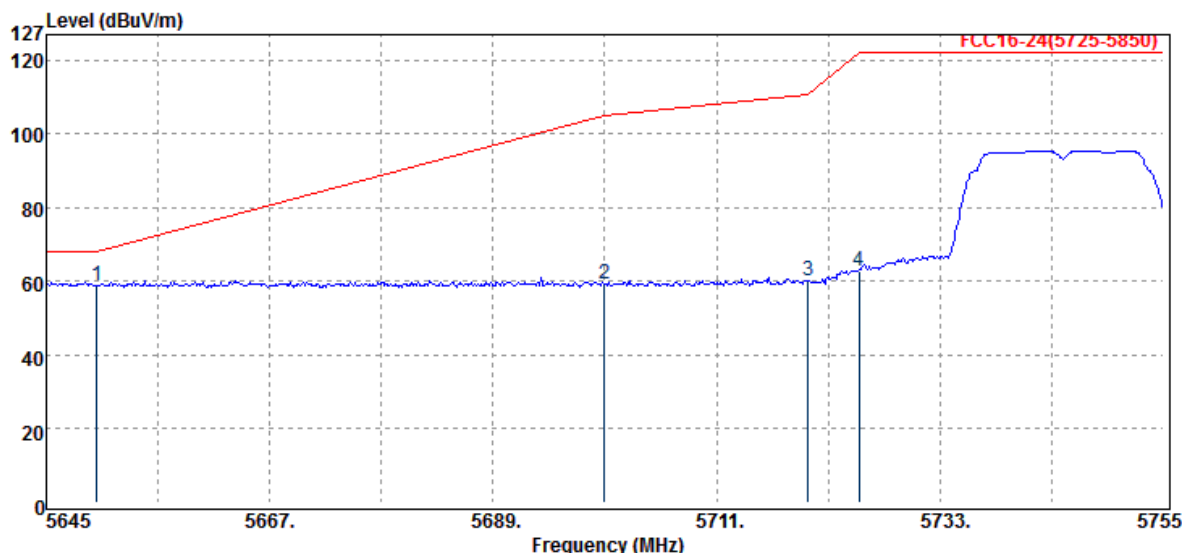
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Operation Band :802.11aB4
 Fundamental Frequency :5745 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5650.00	Peak	49.79	9.20	58.99	68.23	-9.24
5700.00	Peak	49.88	9.35	59.23	105.23	-46.00
5720.00	Peak	50.62	9.43	60.05	110.83	-50.78
5725.00	Peak	53.52	9.44	62.96	122.23	-59.27

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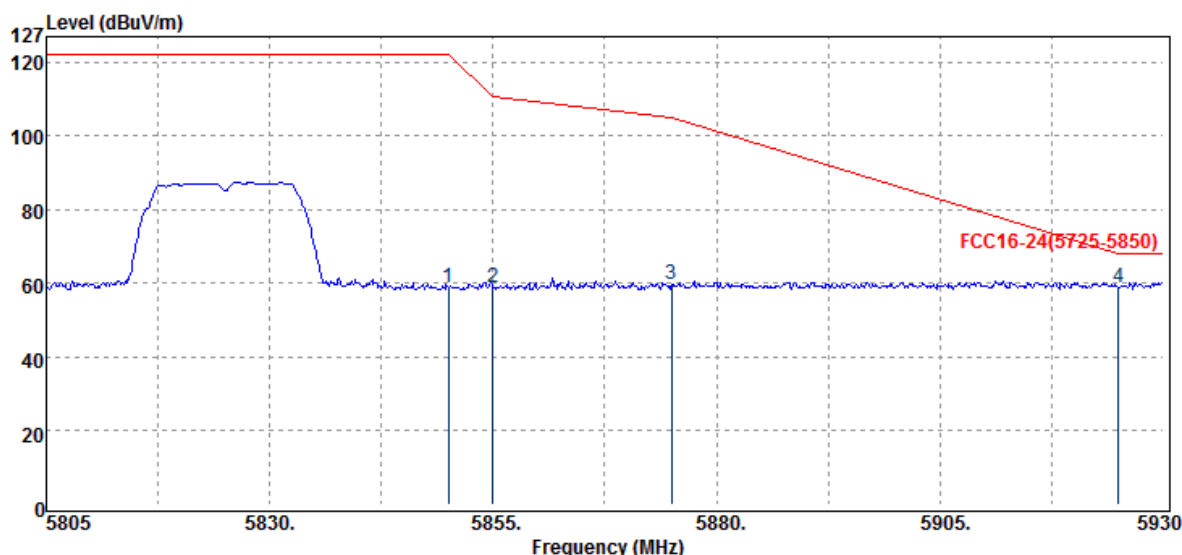
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Operation Band :802.11aB4
 Fundamental Frequency :5825 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-04
 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
5850.00	Peak	49.27	9.77	59.04	122.23	-63.19
5855.00	Peak	49.32	9.78	59.10	110.83	-51.73
5875.00	Peak	50.15	9.82	59.97	105.23	-45.26
5925.00	Peak	48.90	9.98	58.88	68.23	-9.35

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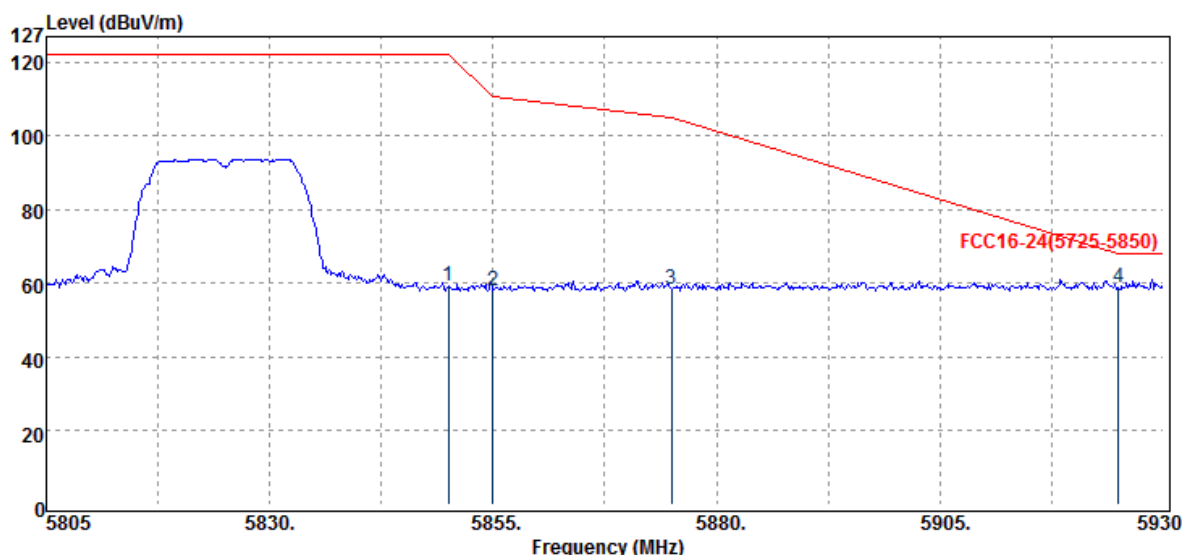
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Operation Band :802.11aB4
 Fundamental Frequency :5825 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-04
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5850.00	Peak	49.38	9.77	59.15	122.23	-63.08
5855.00	Peak	48.38	9.78	58.16	110.83	-52.67
5875.00	Peak	48.62	9.82	58.44	105.23	-46.79
5925.00	Peak	48.84	9.98	58.82	68.23	-9.41

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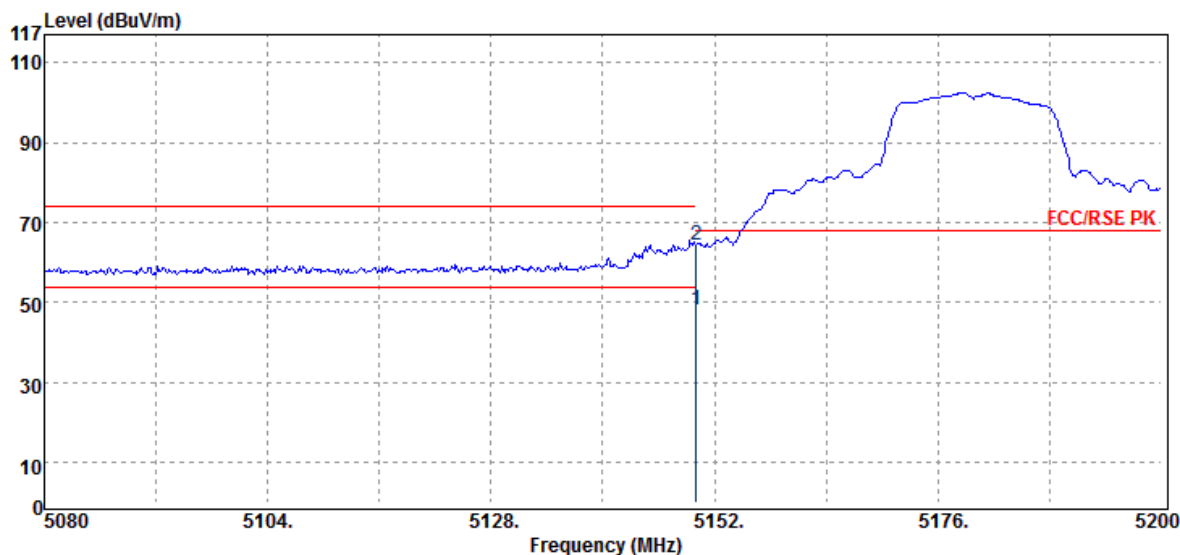
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802.11n20 HT mode

Operation Band :802.11n20B1
 Fundamental Frequency :5180 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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	39.72	8.32	48.04	54.00	-5.96
5150.00	Peak	56.13	8.32	64.45	74.00	-9.55

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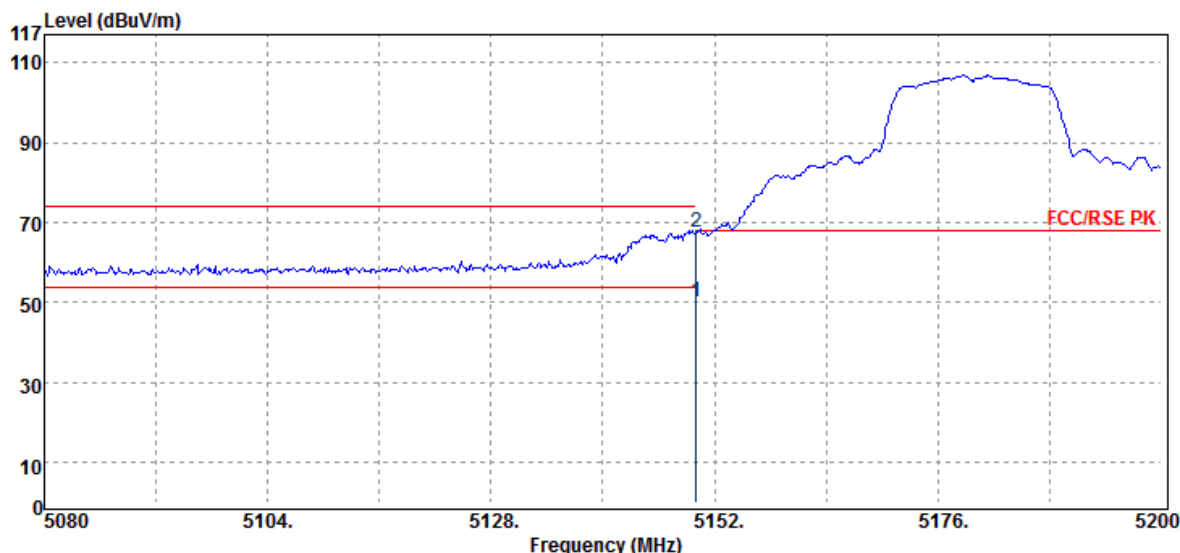
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Operation Band	:802.11n20B1	Test Date	:2018-09-03
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL



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	41.82	8.32	50.14	54.00	-3.86
5150.00	Peak	59.35	8.32	67.67	74.00	-6.33

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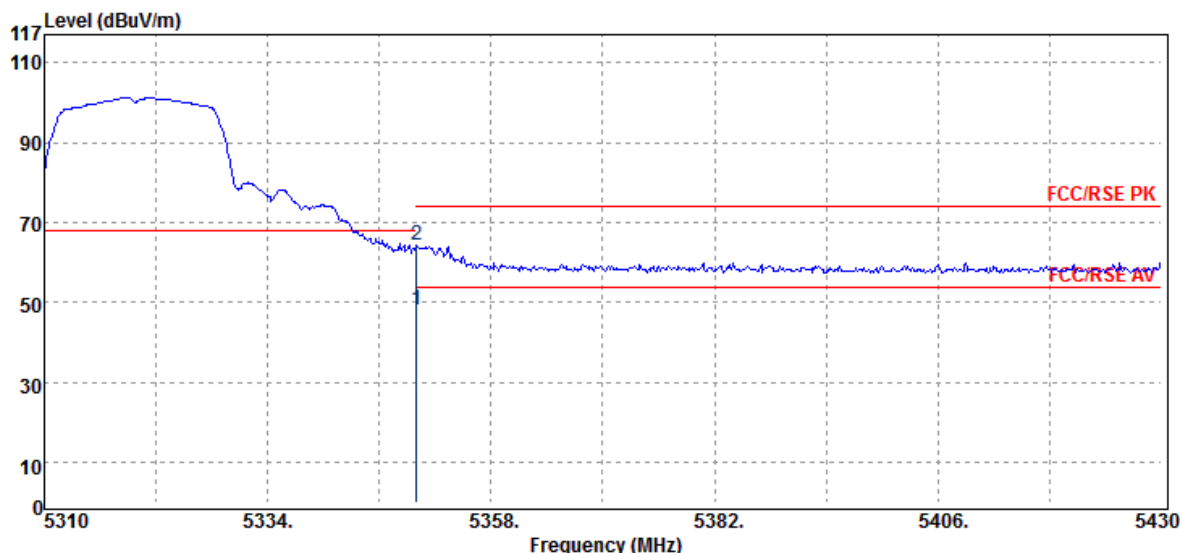
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Operation Band :802.11n20B1
 Fundamental Frequency :5320 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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	39.34	8.63	47.97	54.00	-6.03
5350.00	Peak	55.60	8.63	64.23	74.00	-9.77

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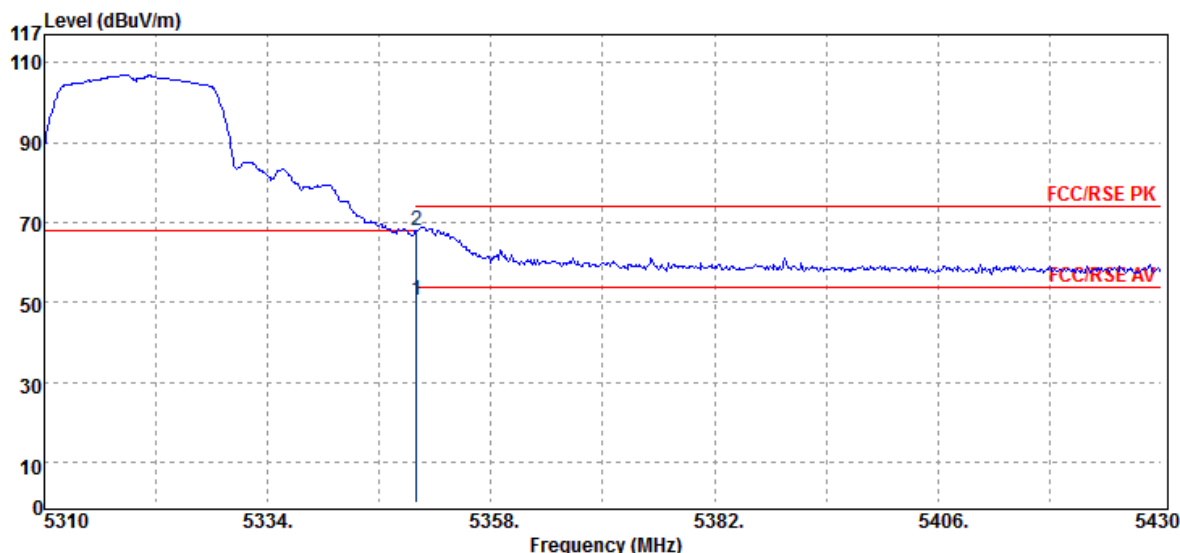
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Operation Band :802.11n20B1
 Fundamental Frequency :5320 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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	42.00	8.63	50.63	54.00	-3.37
5350.00	Peak	59.54	8.63	68.17	74.00	-5.83

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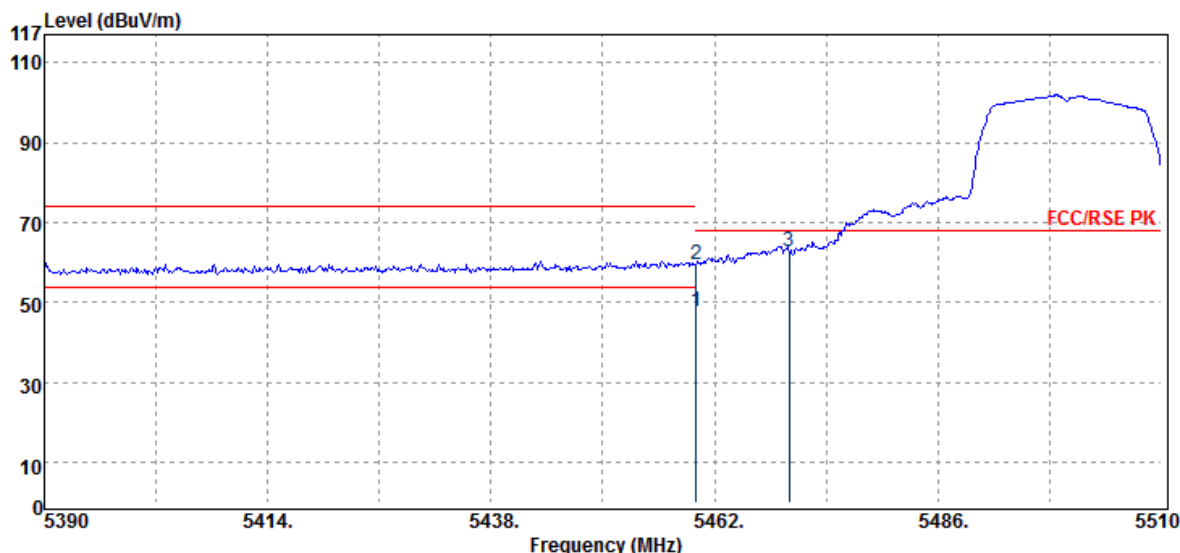
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Operation Band	:802.11n20B3	Test Date	:2018-09-03
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5460.00	Average	38.96	8.75	47.71	54.00	-6.29
5460.00	Peak	50.59	8.75	59.34	74.00	-14.66
5470.00	Peak	54.12	8.74	62.86	68.20	-5.34

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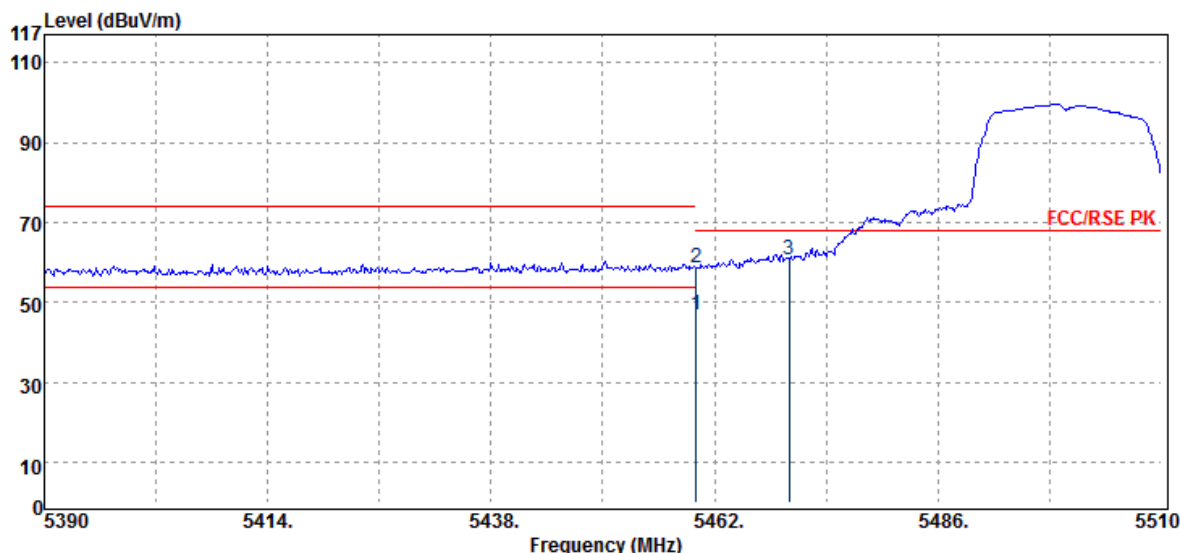
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Operation Band :802.11n20B3
 Fundamental Frequency :5500 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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	38.41	8.75	47.16	54.00	-6.84
5460.00	Peak	49.78	8.75	58.53	74.00	-15.47
5470.00	Peak	52.15	8.74	60.89	68.20	-7.31

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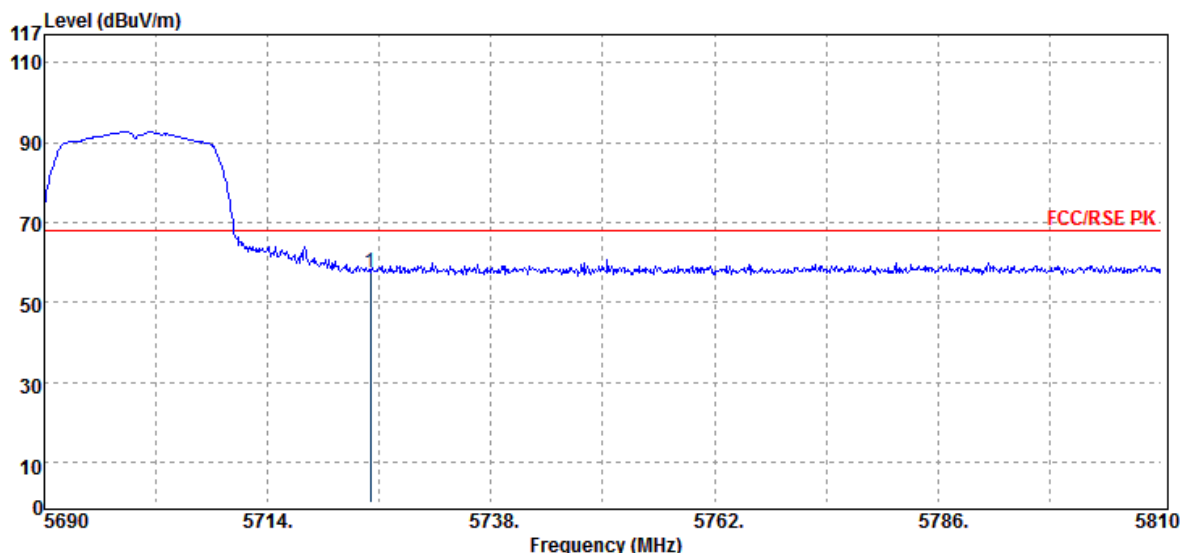
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Operation Band :802.11n20B3
 Fundamental Frequency :5700 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-31
 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
5725.00	Peak	48.24	9.44	57.68	68.20	-10.52

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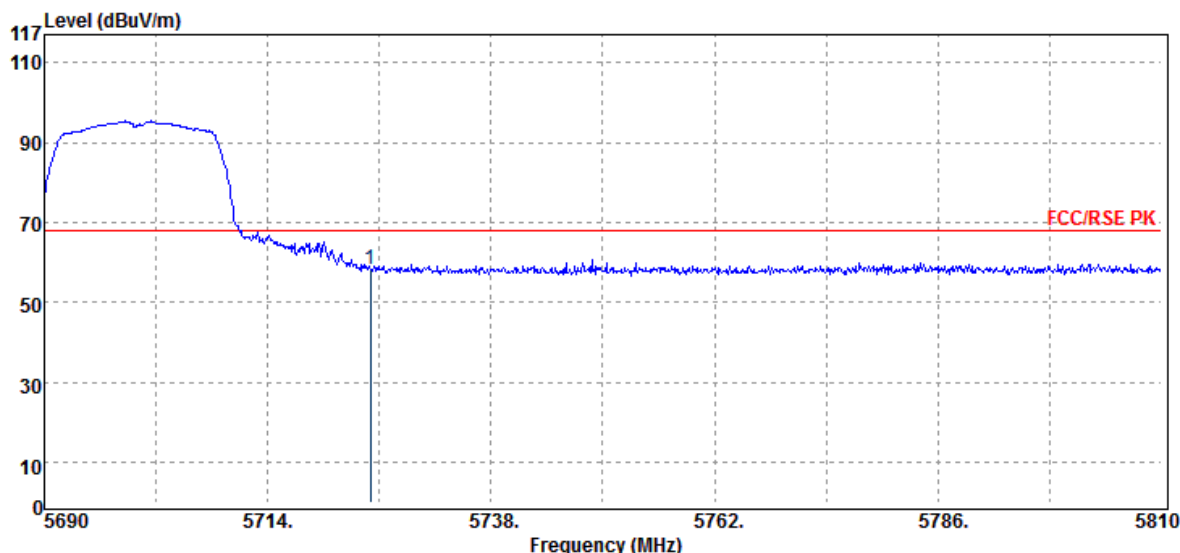
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Operation Band :802.11n20B3
 Fundamental Frequency :5700 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-31
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5725.00	Peak	48.74	9.44	58.18	68.20	-10.02

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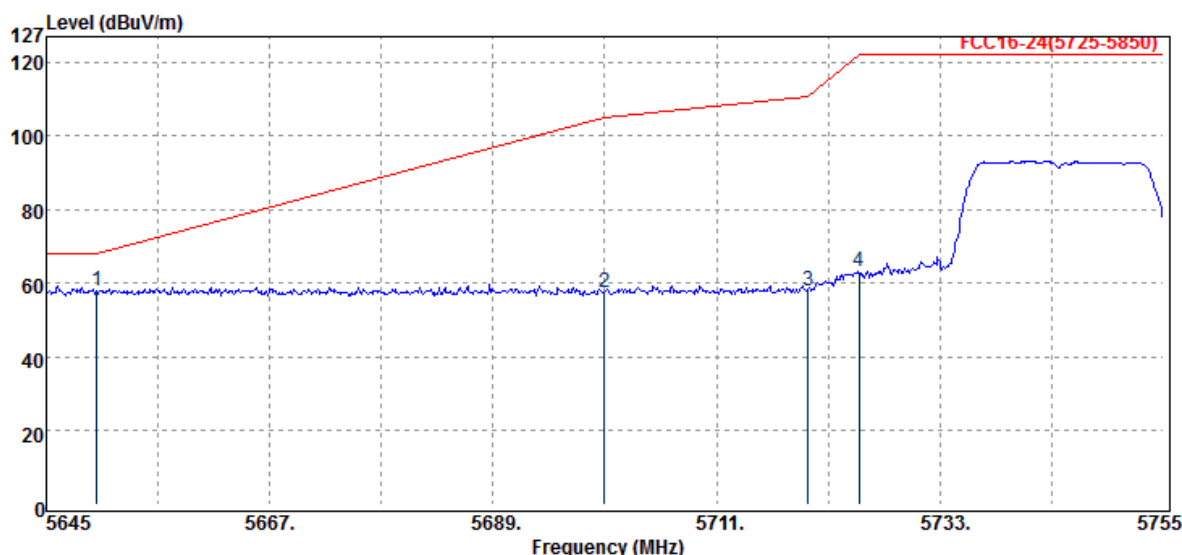
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Operation Band :802.11n20B4
 Fundamental Frequency :5745 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 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
5650.00	Peak	48.74	9.20	57.94	68.23	-10.29
5700.00	Peak	48.18	9.35	57.53	105.23	-47.70
5720.00	Peak	48.74	9.43	58.17	110.83	-52.66
5725.00	Peak	53.90	9.44	63.34	122.23	-58.89

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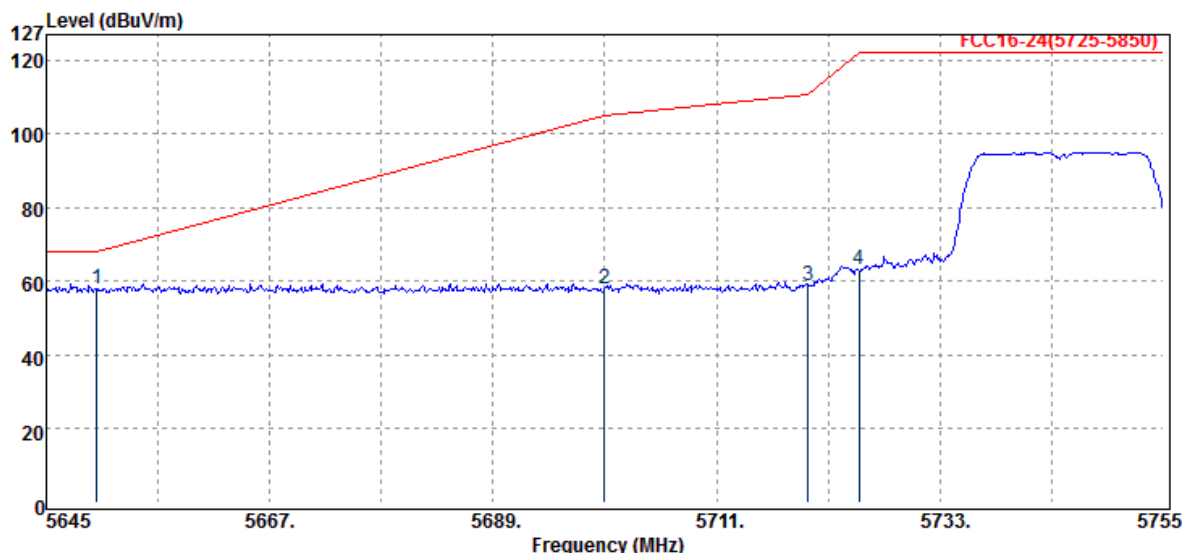
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Operation Band :802.11n20B4
 Fundamental Frequency :5745 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-09-03
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5650.00	Peak	48.94	9.20	58.14	68.23	-10.09
5700.00	Peak	48.51	9.35	57.86	105.23	-47.37
5720.00	Peak	49.41	9.43	58.84	110.83	-51.99
5725.00	Peak	53.88	9.44	63.32	122.23	-58.91

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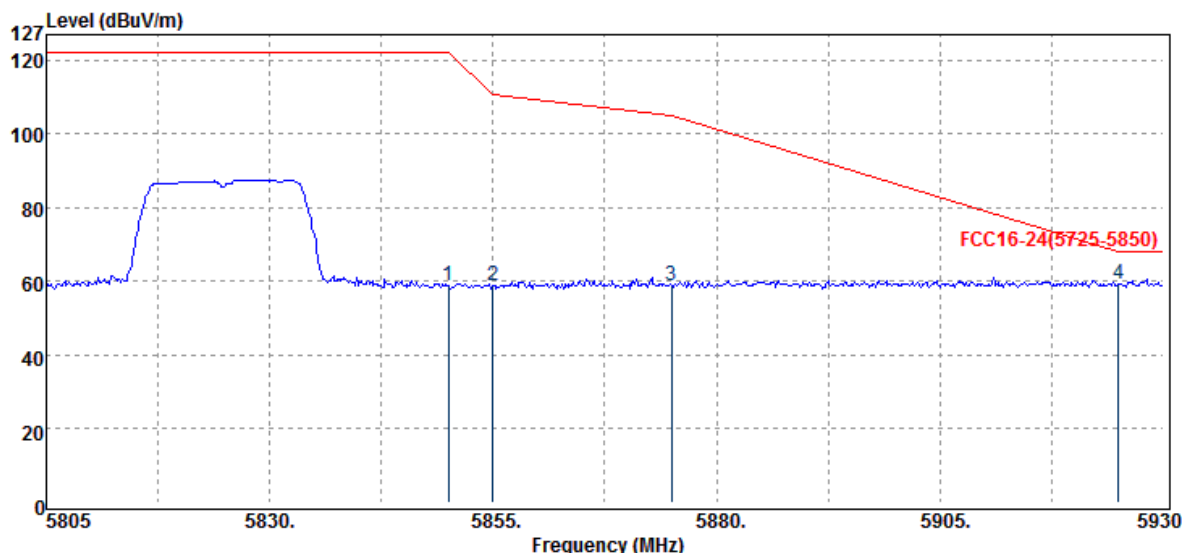
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Operation Band :802.11n20B4
 Fundamental Frequency :5825 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-04
 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
5850.00	Peak	49.03	9.77	58.80	122.23	-63.43
5855.00	Peak	49.20	9.78	58.98	110.83	-51.85
5875.00	Peak	49.19	9.82	59.01	105.23	-46.22
5925.00	Peak	49.50	9.98	59.48	68.23	-8.75

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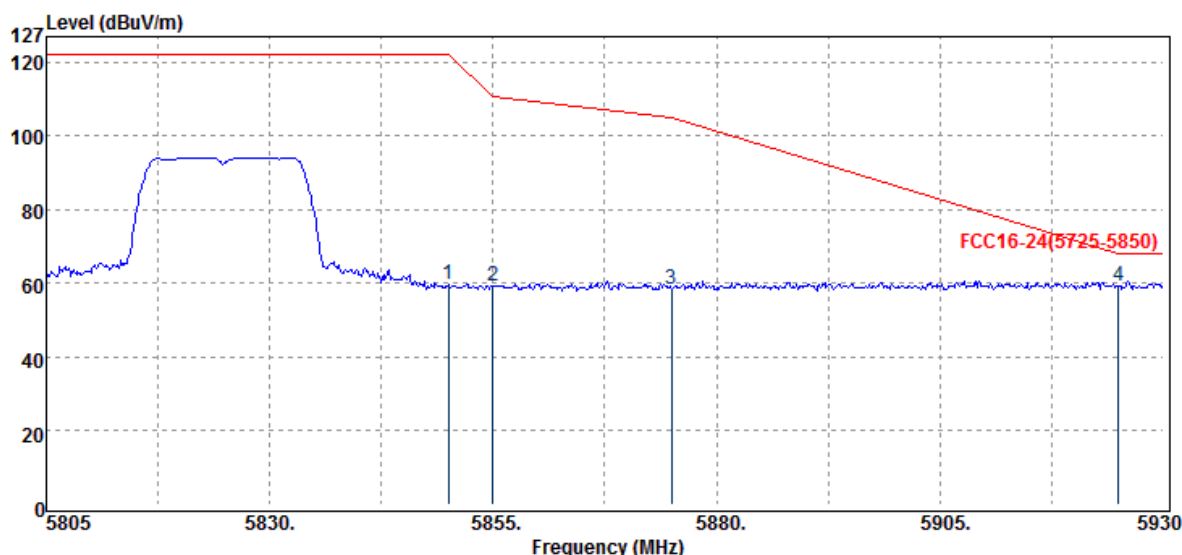
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Operation Band :802.11n20B4
 Fundamental Frequency :5825 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-04
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5850.00	Peak	49.91	9.77	59.68	122.23	-62.55
5855.00	Peak	49.38	9.78	59.16	110.83	-51.67
5875.00	Peak	48.78	9.82	58.60	105.23	-46.63
5925.00	Peak	49.26	9.98	59.24	68.23	-8.99

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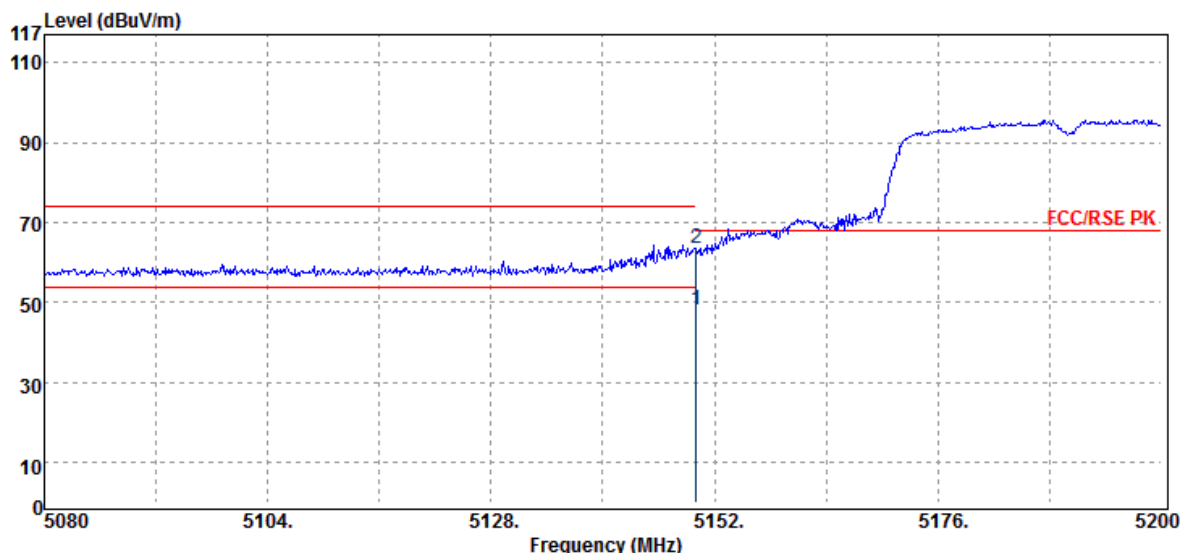
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802.11n40 HT mode

Operation Band :802.11n40B1
Fundamental Frequency :5190 MHz
Operation Mode :Bandedge CH LOW
EUT Pol. :E2 Plane

Test Date :2018-09-03
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	40.05	8.32	48.37	54.00	-5.63
5150.00	Peak	55.30	8.32	63.62	74.00	-10.38

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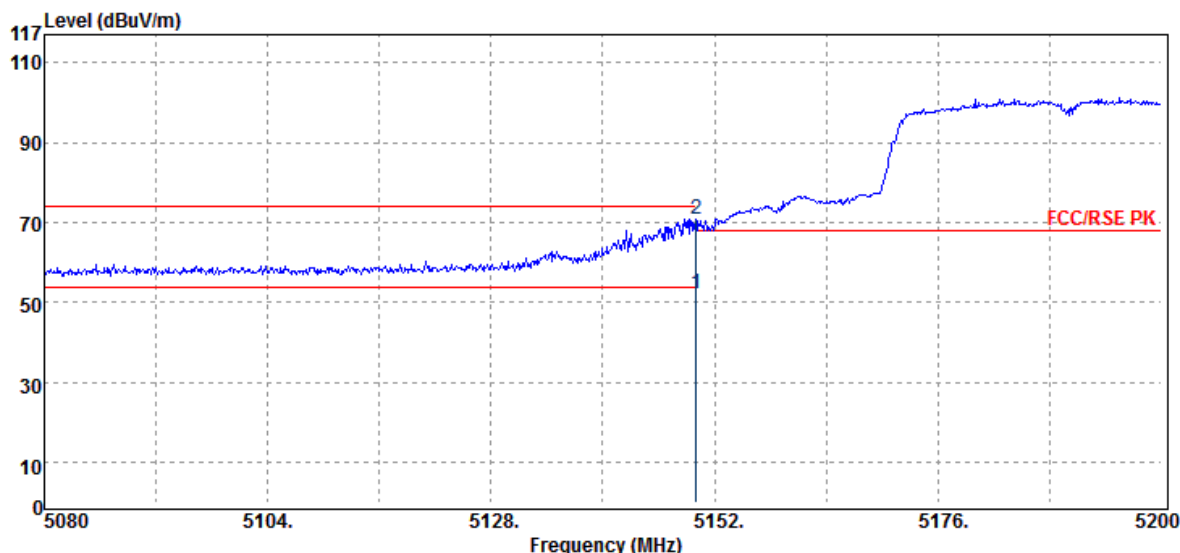
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Operation Band :802.11n40B1
 Fundamental Frequency :5190 MHz
 Operation Mode :Bandedge CH LOW
 EUT Pol. :E2 Plane

Test Date :2018-08-31
 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	43.98	8.32	52.30	54.00	-1.70
5150.00	Peak	62.62	8.32	70.94	74.00	-3.06

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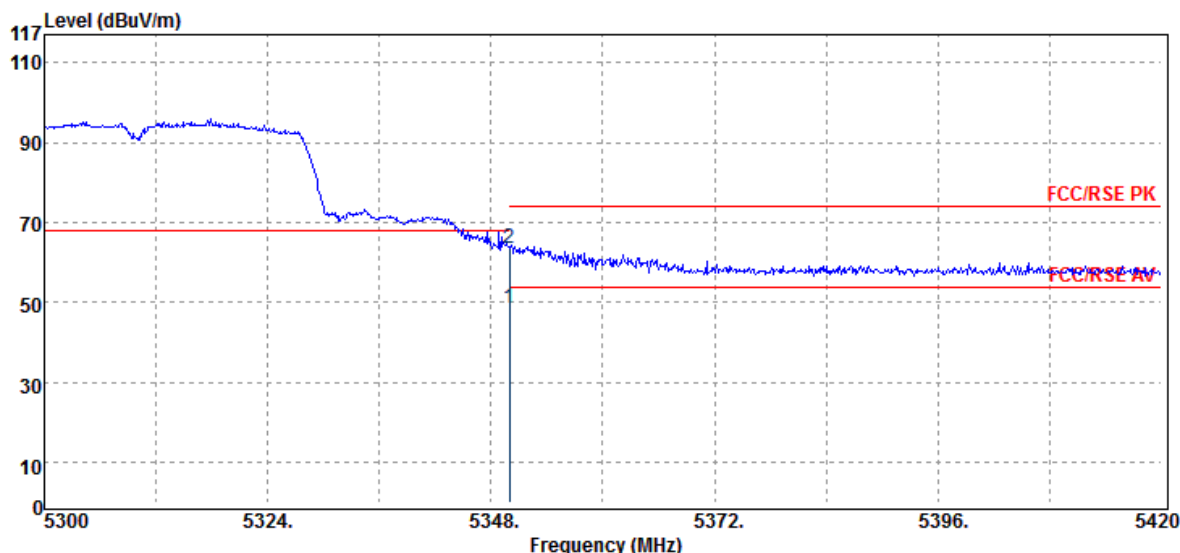
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Operation Band :802.11n40B2
 Fundamental Frequency :5310 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-08-31
 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	39.96	8.63	48.59	54.00	-5.41
5350.00	Peak	55.08	8.63	63.71	74.00	-10.29

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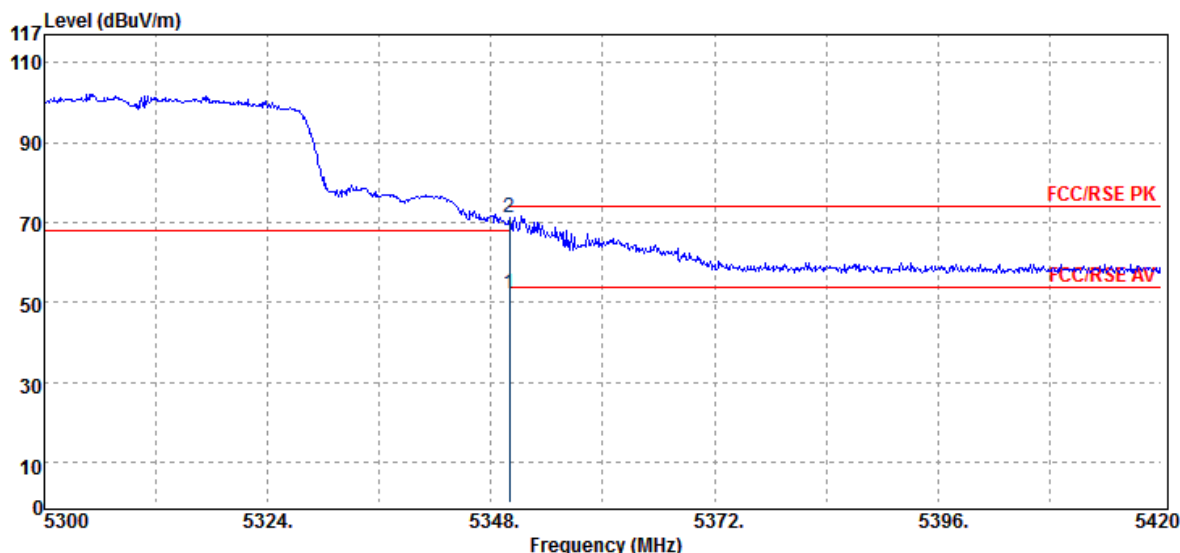
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Operation Band :802.11n40B2
 Fundamental Frequency :5310 MHz
 Operation Mode :Bandedge CH HIGH
 EUT Pol. :E2 Plane

Test Date :2018-09-04
 Temp./Humi. :23 deg_C / 62 RH
 Engineer :Tin
 Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5350.00	Average	43.67	8.63	52.30	54.00	-1.70
5350.00	Peak	62.78	8.63	71.41	74.00	-2.59

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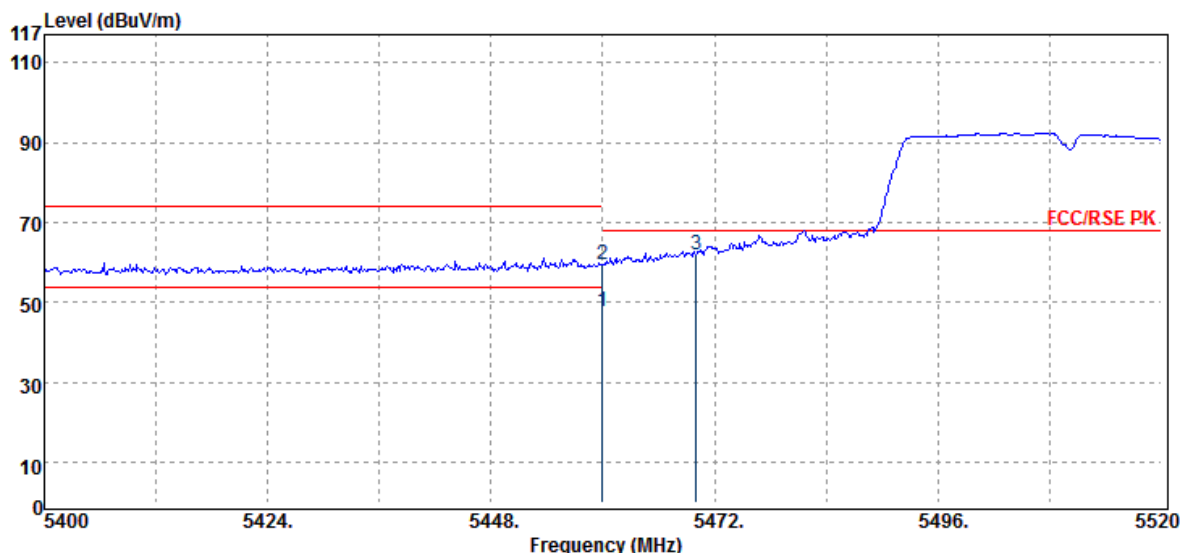
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Operation Band	:802.11n40B3	Test Date	:2018-09-03
Fundamental Frequency	:5510 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
5460.00	Average	39.06	8.75	47.81	54.00	-6.19
5460.00	Peak	50.74	8.75	59.49	74.00	-14.51
5470.00	Peak	53.35	8.74	62.09	68.20	-6.11

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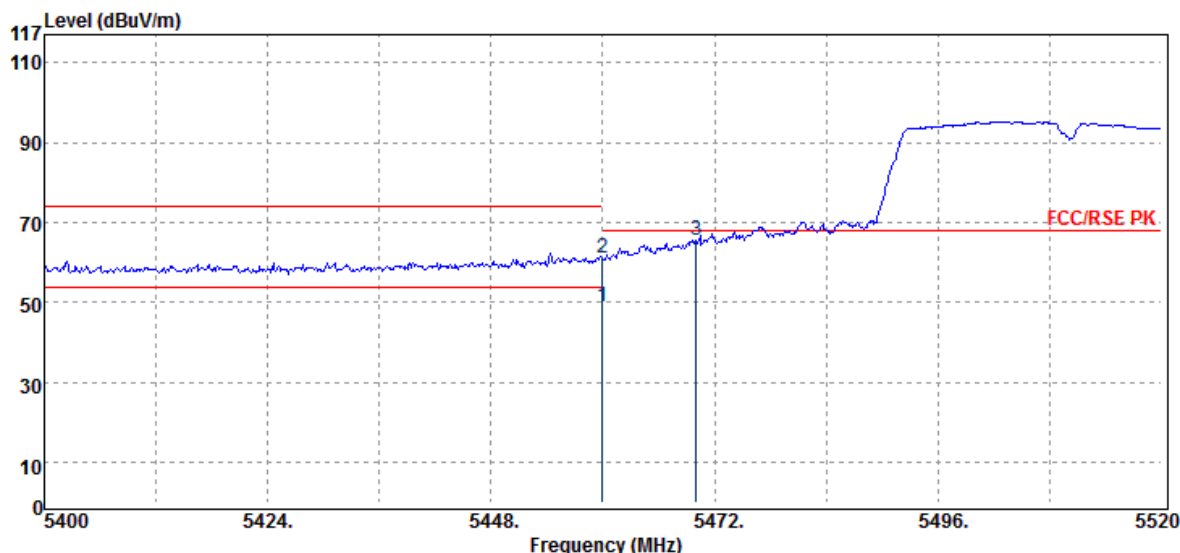
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Operation Band	:802.11n40B3	Test Date	:2018-09-03
Fundamental Frequency	:5510 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5460.00	Average	40.23	8.75	48.98	54.00	-5.02
5460.00	Peak	52.18	8.75	60.93	74.00	-13.07
5470.00	Peak	56.87	8.74	65.61	68.20	-2.59

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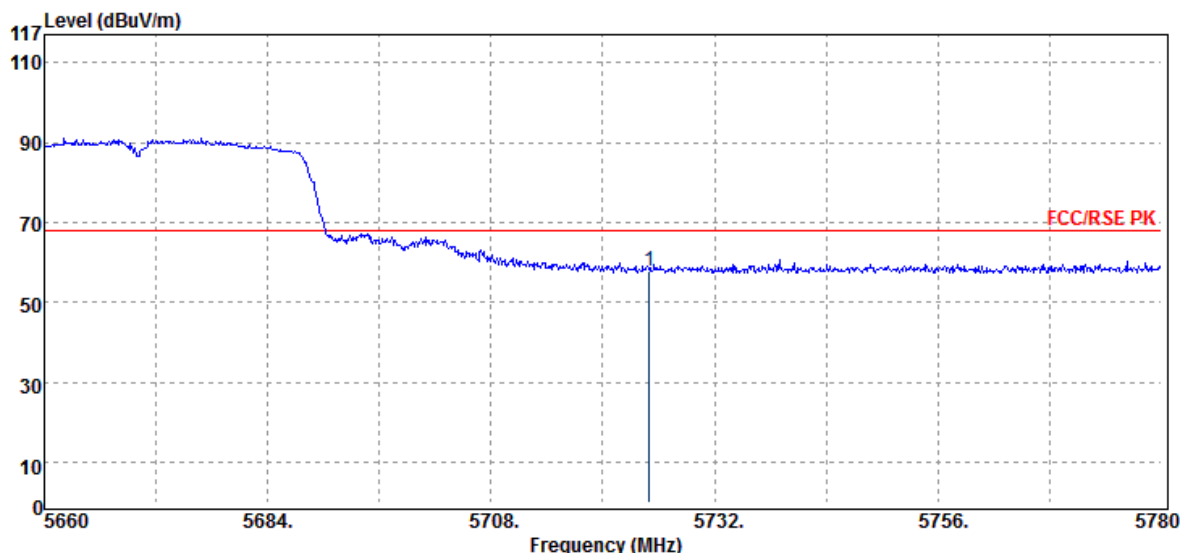
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Operation Band	:802.11n40B3	Test Date	:2018-08-31
Fundamental Frequency	:5670 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5725.00	Peak	48.61	9.44	58.05	68.20	-10.15

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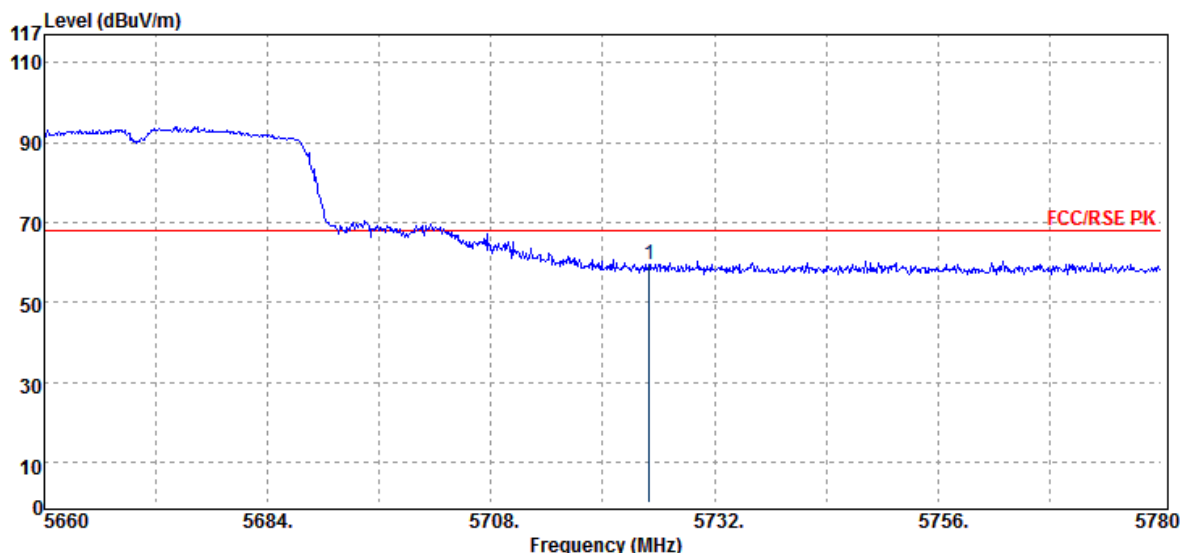
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Operation Band	:802.11n40B3	Test Date	:2018-08-31
Fundamental Frequency	:5670 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5725.00	Peak	49.94	9.44	59.38	68.20	-8.82

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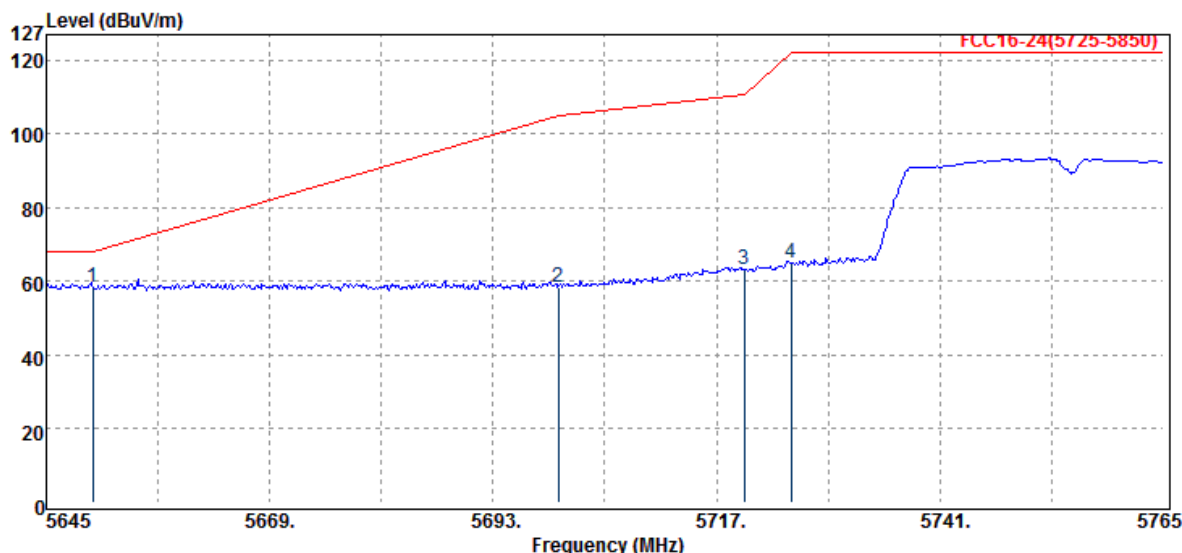
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Operation Band	:802.11n40B4	Test Date	:2018-09-03
Fundamental Frequency	:5755 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5650.00	Peak	49.45	9.20	58.65	68.23	-9.58
5700.00	Peak	49.31	9.35	58.66	105.23	-46.57
5720.00	Peak	53.72	9.43	63.15	110.83	-47.68
5725.00	Peak	55.57	9.44	65.01	122.23	-57.22

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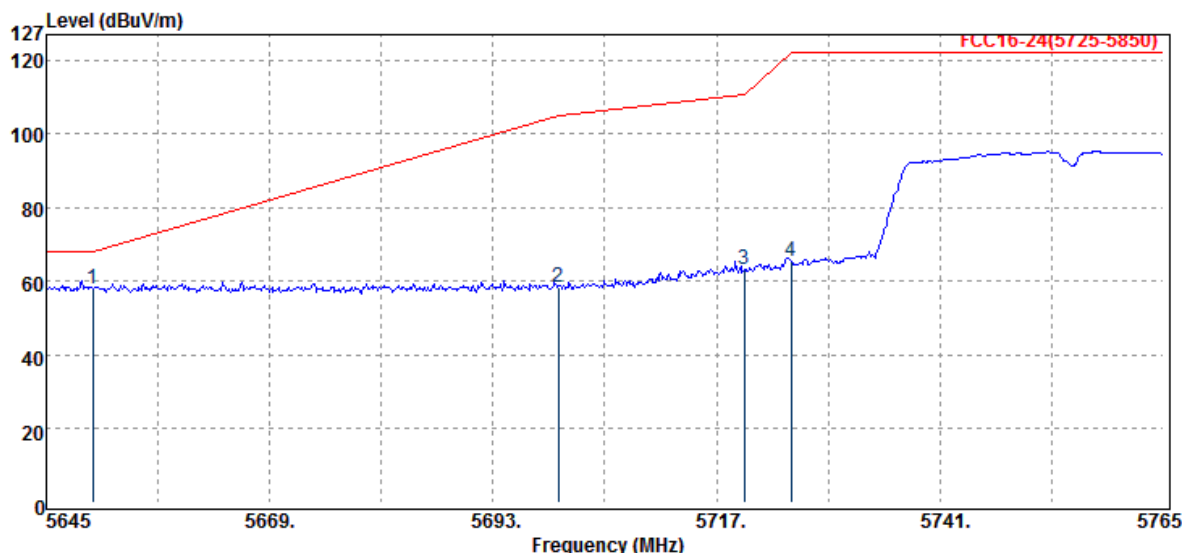
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Operation Band	:802.11n40B4	Test Date	:2018-09-03
Fundamental Frequency	:5755 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
5650.00	Peak	48.80	9.20	58.00	68.23	-10.23
5700.00	Peak	49.28	9.35	58.63	105.23	-46.60
5720.00	Peak	53.97	9.43	63.40	110.83	-47.43
5725.00	Peak	55.96	9.44	65.40	122.23	-56.83

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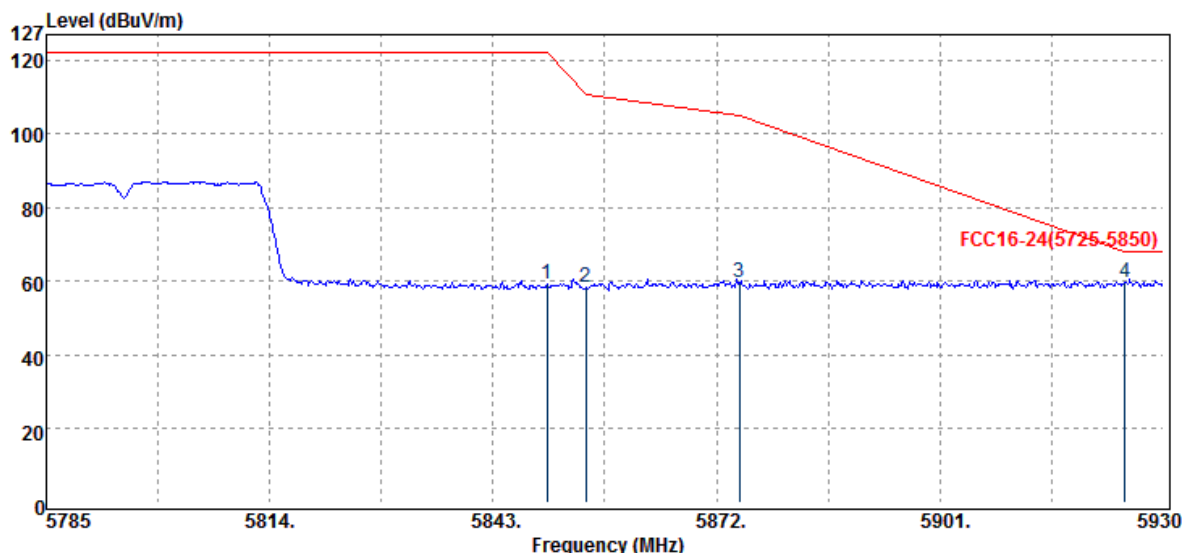
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Operation Band	:802.11n40B4	Test Date	:2018-09-04
Fundamental Frequency	:5795 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL



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
5850.00	Peak	49.47	9.77	59.24	122.23	-62.99
5855.00	Peak	48.85	9.78	58.63	110.83	-52.20
5875.00	Peak	49.84	9.82	59.66	105.23	-45.57
5925.00	Peak	49.82	9.98	59.80	68.23	-8.43

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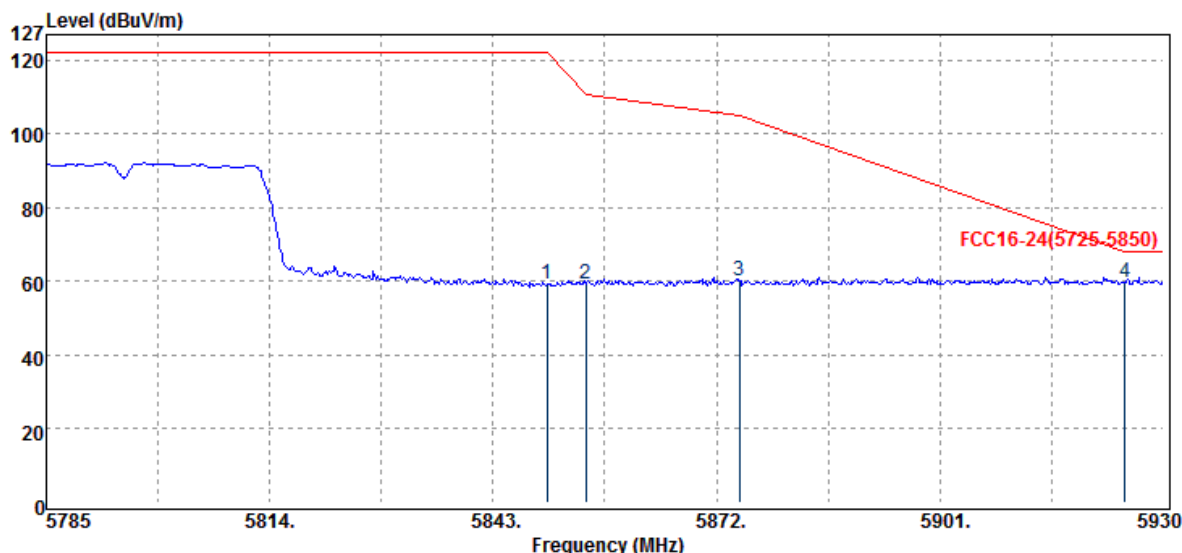
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Operation Band	:802.11n40B4	Test Date	:2018-09-04
Fundamental Frequency	:5795 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL



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
5850.00	Peak	49.34	9.77	59.11	122.23	-63.12
5855.00	Peak	49.56	9.78	59.34	110.83	-51.49
5875.00	Peak	50.49	9.82	60.31	105.23	-44.92
5925.00	Peak	49.74	9.98	59.72	68.23	-8.51

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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

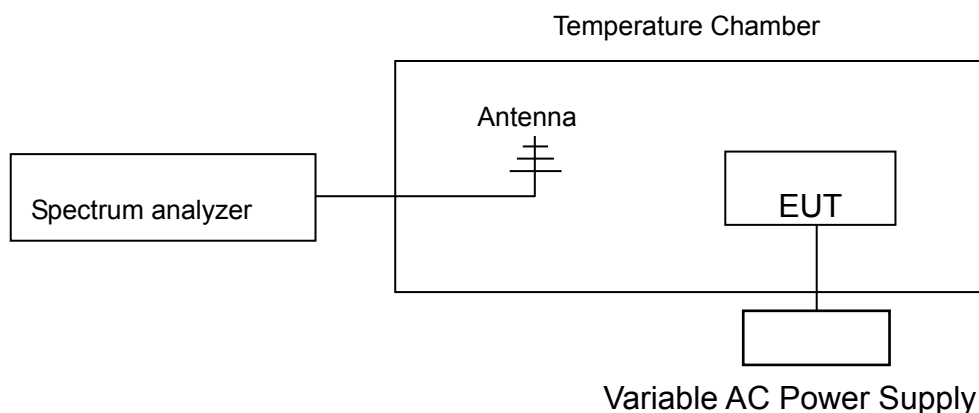
13.1 Standard Applicable

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:

SGS Conducted Room					
Name of Equip-ment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	Agilent	N9010A	MY51440113	2018/06/20	2019/6/19
Attenuator	Marvelous	MVE2213-10	RF30	2017/12/26	2018/12/25
DC Block	PASTERNAK	PE8210	RF29	2017/12/26	2018/12/25
Notebook	Lenovo	L420	S0011721	N/A	N/A

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13.5 Measurement Result

Startup:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	36	5180	5,179.98631	0.00000264
		44	5220	5,219.99248	0.00000144
		48	5240	5,239.98384	0.00000308
		52	5260	5,260.02890	-0.00000549
		60	5300	5,299.98244	0.00000331
		64	5320	5,319.99948	0.00000010
		100	5500	5,499.99451	0.00000100
		116	5580	5,579.97843	0.00000387
		140	5700	5,699.96946	0.00000536
		149	5745	5,744.98403	0.00000278
		157	5785	5,784.99213	0.00000136
		165	5825	5,824.99525	0.00000082
	3.33	36	5180	5,179.97978	0.00000390
		44	5220	5,219.98251	0.00000335
		48	5240	5,239.98260	0.00000332
		52	5260	5,260.00209	-0.00000040
		60	5300	5,299.97844	0.00000407
		64	5320	5,319.98423	0.00000296
		100	5500	5,500.00073	-0.00000013
		116	5580	5,579.99741	0.00000046
		140	5700	5,700.00317	-0.00000056
		149	5745	5,744.96931	0.00000534
		157	5785	5,784.99668	0.00000057
		165	5825	5,824.97949	0.00000352

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25 °C	3.7V	36	5180	5,179.97657	0.00000452
		44	5220	5,219.99560	0.00000084
		48	5240	5,239.97249	0.00000525
		52	5260	5,260.01792	-0.00000341
		60	5300	5,299.97706	0.00000433
		64	5320	5,319.97974	0.00000381
		100	5500	5,499.99414	0.00000107
		116	5580	5,579.98709	0.00000231
		140	5700	5,700.00412	-0.00000072
		149	5745	5,744.98454	0.00000269
		157	5785	5,785.00088	-0.00000015
		165	5825	5,824.98052	0.00000334
55 °C	4.07	36	5180	5,180.01070	-0.00000207
		44	5220	5,220.00549	-0.00000105
		48	5240	5,239.98461	0.00000294
		52	5260	5,260.00776	-0.00000147
		60	5300	5,300.00598	-0.00000113
		64	5320	5,319.98156	0.00000347
		100	5500	5,499.98238	0.00000320
		116	5580	5,580.00159	-0.00000029
		140	5700	5,699.97789	0.00000388
		149	5745	5,745.00206	-0.00000036
		157	5785	5,784.98820	0.00000204
		165	5825	5,824.99793	0.00000036
	3.33	36	5180	5,179.99214	0.00000152
		44	5220	5,219.98154	0.00000354
		48	5240	5,240.00599	-0.00000114
		52	5260	5,259.98448	0.00000295
		60	5300	5,300.00001	0.00000000
		64	5320	5,320.00136	-0.00000026
		100	5500	5,500.00834	-0.00000152
		116	5580	5,579.99279	0.00000129
		140	5700	5,700.00236	-0.00000041
		149	5745	5,744.97554	0.00000426
		157	5785	5,784.98623	0.00000238
		165	5825	5,824.97542	0.00000422

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	38	5190	5,189.98651	0.00000260
		46	5230	5,229.99707	0.00000056
		54	5270	5,269.99531	0.00000089
		62	5310	5,310.00123	-0.00000023
		102	5510	5,510.00392	-0.00000071
		110	5550	5,549.99378	0.00000112
		134	5670	5,669.99555	0.00000078
		151	5755	5,754.97397	0.00000452
		159	5795	5,794.97818	0.00000376
	3.33	38	5190	5,189.99002	0.00000192
		46	5230	5,230.01359	-0.00000260
		54	5270	5,269.98715	0.00000244
		62	5310	5,309.99567	0.00000082
		102	5510	5,509.98981	0.00000185
		110	5550	5,549.99084	0.00000165
		134	5670	5,669.99651	0.00000061
		151	5755	5,754.97923	0.00000361
		159	5795	5,794.99127	0.00000151

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25 °C	3.7V	38	5190	5,189.98856	0.00000220
		46	5230	5,230.01158	-0.00000221
		54	5270	5,269.99779	0.00000042
		62	5310	5,309.99417	0.00000110
		102	5510	5,510.00085	-0.00000015
		110	5550	5,549.99763	0.00000043
		134	5670	5,670.00902	-0.00000159
		151	5755	5,754.98615	0.00000241
		159	5795	5,794.97797	0.00000380
55 °C	4.07	38	5190	5,189.98622	0.00000265
		46	5230	5,230.00395	-0.00000075
		54	5270	5,269.99225	0.00000147
		62	5310	5,310.00060	-0.00000011
		102	5510	5,510.00872	-0.00000158
		110	5550	5,549.99625	0.00000068
		134	5670	5,669.99064	0.00000165
		151	5755	5,754.97480	0.00000438
		159	5795	5,794.99021	0.00000169
	3.33	38	5190	5,189.99229	0.00000149
		46	5230	5,229.99977	0.00000004
		54	5270	5,269.98179	0.00000346
		62	5310	5,309.99943	0.00000011
		102	5510	5,509.99287	0.00000129
		110	5550	5,549.99657	0.00000062
		134	5670	5,670.00450	-0.00000079
		151	5755	5,754.97569	0.00000422
		159	5795	5,794.98221	0.00000307

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2 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	36	5180	5,179.98497	0.00000290
		44	5220	5,220.00143	-0.00000027
		48	5240	5,239.98048	0.00000373
		52	5260	5,260.01117	-0.00000212
		60	5300	5,299.97966	0.00000384
		64	5320	5,320.00257	-0.00000048
		100	5500	5,499.99522	0.00000087
		116	5580	5,579.96878	0.00000560
		140	5700	5,699.98056	0.00000341
		149	5745	5,744.99228	0.00000134
		157	5785	5,784.99093	0.00000157
		165	5825	5,824.98875	0.00000193
	3.33	36	5180	5,179.99070	0.00000180
		44	5220	5,219.96678	0.00000636
		48	5240	5,239.98113	0.00000360
		52	5260	5,259.99491	0.00000097
		60	5300	5,299.98244	0.00000331
		64	5320	5,319.99488	0.00000096
		100	5500	5,500.00390	-0.00000071
		116	5580	5,580.00000	0.00000000
		140	5700	5,700.00557	-0.00000098
		149	5745	5,744.97628	0.00000413
		157	5785	5,785.00758	-0.00000131
		165	5825	5,824.98108	0.00000325

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25 °C	3.7V	36	5180	5,179.98329	0.00000323
		44	5220	5,220.00166	-0.00000032
		48	5240	5,239.97877	0.00000405
		52	5260	5,260.01057	-0.00000201
		60	5300	5,299.98914	0.00000205
		64	5320	5,319.98380	0.00000305
		100	5500	5,499.97795	0.00000401
		116	5580	5,579.98064	0.00000347
		140	5700	5,699.99030	0.00000170
		149	5745	5,745.00063	-0.00000011
		157	5785	5,784.99877	0.00000021
		165	5825	5,824.98178	0.00000313
55 °C	4.07	36	5180	5,180.01247	-0.00000241
		44	5220	5,219.99965	0.00000007
		48	5240	5,239.98857	0.00000218
		52	5260	5,260.00033	-0.00000006
		60	5300	5,299.99850	0.00000028
		64	5320	5,319.98353	0.00000310
		100	5500	5,499.98207	0.00000326
		116	5580	5,579.98810	0.00000213
		140	5700	5,699.98346	0.00000290
		149	5745	5,744.99738	0.00000046
		157	5785	5,784.98147	0.00000320
		165	5825	5,824.99171	0.00000142
	3.33	36	5180	5,179.99772	0.00000044
		44	5220	5,219.98316	0.00000323
		48	5240	5,240.01555	-0.00000297
		52	5260	5,259.98617	0.00000263
		60	5300	5,299.99253	0.00000141
		64	5320	5,320.01765	-0.00000332
		100	5500	5,500.01593	-0.00000290
		116	5580	5,579.99496	0.00000090
		140	5700	5,700.00287	-0.00000050
		149	5745	5,744.99177	0.00000143
		157	5785	5,784.98173	0.00000316
		165	5825	5,824.98845	0.00000198

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	38	5190	5,189.98827	0.00000226
		46	5230	5,230.00194	-0.00000037
		54	5270	5,269.98475	0.00000289
		62	5310	5,310.00592	-0.00000111
		102	5510	5,509.99765	0.00000043
		110	5550	5,549.99642	0.00000065
		134	5670	5,670.00353	-0.00000062
		151	5755	5,754.98668	0.00000231
		159	5795	5,794.97279	0.00000470
	3.33	38	5190	5,189.98829	0.00000226
		46	5230	5,229.99927	0.00000014
		54	5270	5,270.00050	-0.00000010
		62	5310	5,309.99328	0.00000127
		102	5510	5,510.00002	0.00000000
		110	5550	5,549.98939	0.00000191
		134	5670	5,670.00723	-0.00000127
		151	5755	5,754.98564	0.00000250
		159	5795	5,794.98702	0.00000224

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25 °C	3.7V	38	5190	5,189.99914	0.00000016
		46	5230	5,230.00757	-0.00000145
		54	5270	5,269.98364	0.00000310
		62	5310	5,309.99271	0.00000137
		102	5510	5,510.00522	-0.00000095
		110	5550	5,550.00190	-0.00000034
		134	5670	5,670.00502	-0.00000088
		151	5755	5,754.98815	0.00000206
		159	5795	5,794.98044	0.00000338
55 °C	4.07	38	5190	5,189.98654	0.00000259
		46	5230	5,230.01232	-0.00000236
		54	5270	5,269.99938	0.00000012
		62	5310	5,309.99825	0.00000033
		102	5510	5,509.99675	0.00000059
		110	5550	5,550.00454	-0.00000082
		134	5670	5,670.00087	-0.00000015
		151	5755	5,754.98983	0.00000177
		159	5795	5,794.97742	0.00000390
	3.33	38	5190	5,189.98680	0.00000254
		46	5230	5,230.00567	-0.00000108
		54	5270	5,269.98352	0.00000313
		62	5310	5,310.01010	-0.00000190
		102	5510	5,509.99561	0.00000080
		110	5550	5,549.99732	0.00000048
		134	5670	5,669.99561	0.00000077
		151	5755	5,754.98231	0.00000307
		159	5795	5,794.97811	0.00000378

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5 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	36	5180	5,179.98146	0.00000358
		44	5220	5,219.98973	0.00000197
		48	5240	5,239.98323	0.00000320
		52	5260	5,260.01877	-0.00000357
		60	5300	5,299.97996	0.00000378
		64	5320	5,320.01164	-0.00000219
		100	5500	5,499.99933	0.00000012
		116	5580	5,579.98066	0.00000347
		140	5700	5,699.97364	0.00000462
		149	5745	5,744.99526	0.00000083
		157	5785	5,784.97789	0.00000382
		165	5825	5,824.99036	0.00000165
	3.33	36	5180	5,179.98865	0.00000219
		44	5220	5,219.97835	0.00000415
		48	5240	5,239.97566	0.00000465
		52	5260	5,259.99148	0.00000162
		60	5300	5,299.97101	0.00000547
		64	5320	5,320.00211	-0.00000040
		100	5500	5,500.00188	-0.00000034
		116	5580	5,580.00254	-0.00000045
		140	5700	5,700.01231	-0.00000216
		149	5745	5,744.98663	0.00000233
		157	5785	5,785.00087	-0.00000015
		165	5825	5,824.97613	0.00000410

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25 °C	3.7V	36	5180	5,179.98044	0.00000378
		44	5220	5,220.00249	-0.00000048
		48	5240	5,239.98721	0.00000244
		52	5260	5,260.00999	-0.00000190
		60	5300	5,299.98485	0.00000286
		64	5320	5,319.98773	0.00000231
		100	5500	5,499.97982	0.00000367
		116	5580	5,579.99195	0.00000144
		140	5700	5,699.98761	0.00000217
		149	5745	5,744.99998	0.00000000
		157	5785	5,784.98244	0.00000304
		165	5825	5,824.99097	0.00000155
55 °C	4.07	36	5180	5,180.01623	-0.00000313
		44	5220	5,220.00821	-0.00000157
		48	5240	5,239.98620	0.00000263
		52	5260	5,259.99528	0.00000090
		60	5300	5,300.00472	-0.00000089
		64	5320	5,319.99584	0.00000078
		100	5500	5,499.98402	0.00000291
		116	5580	5,579.99509	0.00000088
		140	5700	5,699.97122	0.00000505
		149	5745	5,745.01125	-0.00000196
		157	5785	5,784.97991	0.00000347
		165	5825	5,824.98760	0.00000213
	3.33	36	5180	5,179.98517	0.00000286
		44	5220	5,219.98555	0.00000277
		48	5240	5,240.01028	-0.00000196
		52	5260	5,259.99087	0.00000173
		60	5300	5,299.99783	0.00000041
		64	5320	5,320.00817	-0.00000154
		100	5500	5,499.99955	0.00000008
		116	5580	5,579.99566	0.00000078
		140	5700	5,700.00449	-0.00000079
		149	5745	5,744.98421	0.00000275
		157	5785	5,784.98153	0.00000319
		165	5825	5,824.97579	0.00000416

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	38	5190	5,189.99830	0.00000033
		46	5230	5,230.00260	-0.00000050
		54	5270	5,269.99850	0.00000028
		62	5310	5,309.99761	0.00000045
		102	5510	5,510.00674	-0.00000122
		110	5550	5,549.99154	0.00000152
		134	5670	5,670.00822	-0.00000145
		151	5755	5,754.98011	0.00000346
		159	5795	5,794.98993	0.00000174
	3.33	38	5190	5,189.99491	0.00000098
		46	5230	5,230.01370	-0.00000262
		54	5270	5,270.00008	-0.00000002
		62	5310	5,309.99398	0.00000113
		102	5510	5,510.00876	-0.00000159
		110	5550	5,550.00274	-0.00000049
		134	5670	5,669.99045	0.00000168
		151	5755	5,754.97230	0.00000481
		159	5795	5,794.99208	0.00000137

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25 °C	3.7V	38	5190	5,189.99233	0.00000148
		46	5230	5,230.00648	-0.00000124
		54	5270	5,269.99788	0.00000040
		62	5310	5,310.00923	-0.00000174
		102	5510	5,510.00162	-0.00000029
		110	5550	5,549.99008	0.00000179
		134	5670	5,669.98951	0.00000185
		151	5755	5,754.97829	0.00000377
		159	5795	5,794.97916	0.00000360
55 °C	4.07	38	5190	5,189.99519	0.00000093
		46	5230	5,229.99687	0.00000060
		54	5270	5,269.98634	0.00000259
		62	5310	5,310.00780	-0.00000147
		102	5510	5,509.99484	0.00000094
		110	5550	5,550.00846	-0.00000152
		134	5670	5,669.99921	0.00000014
		151	5755	5,754.97919	0.00000362
		159	5795	5,794.98879	0.00000193
	3.33	38	5190	5,189.98174	0.00000352
		46	5230	5,230.01119	-0.00000214
		54	5270	5,269.98443	0.00000295
		62	5310	5,309.99677	0.00000061
		102	5510	5,510.00280	-0.00000051
		110	5550	5,550.00147	-0.00000026
		134	5670	5,669.99705	0.00000052
		151	5755	5,754.97471	0.00000439
		159	5795	5,794.97609	0.00000413

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10 Minutes:

Operation Mode	802.11 a	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	36	5180	5,179.99128	0.00000168
		44	5220	5,219.99966	0.00000006
		48	5240	5,239.97417	0.00000493
		52	5260	5,260.02779	-0.00000528
		60	5300	5,299.98300	0.00000321
		64	5320	5,320.00048	-0.00000009
		100	5500	5,499.98441	0.00000284
		116	5580	5,579.97702	0.00000412
		140	5700	5,699.96950	0.00000535
		149	5745	5,744.99250	0.00000131
		157	5785	5,784.98729	0.00000220
		165	5825	5,824.99613	0.00000066
	3.33	36	5180	5,179.98826	0.00000227
		44	5220	5,219.97481	0.00000483
		48	5240	5,239.97696	0.00000440
		52	5260	5,260.00425	-0.00000081
		60	5300	5,299.97726	0.00000429
		64	5320	5,319.98525	0.00000277
		100	5500	5,499.98708	0.00000235
		116	5580	5,579.99535	0.00000083
		140	5700	5,699.99952	0.00000009
		149	5745	5,744.97844	0.00000375
		157	5785	5,784.99115	0.00000153
		165	5825	5,824.98706	0.00000222

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25 °C	3.7V	36	5180	5,179.98871	0.00000218
		44	5220	5,220.00152	-0.00000029
		48	5240	5,239.98029	0.00000376
		52	5260	5,260.01220	-0.00000232
		60	5300	5,299.98297	0.00000321
		64	5320	5,319.97990	0.00000378
		100	5500	5,499.98696	0.00000237
		116	5580	5,579.99119	0.00000158
		140	5700	5,700.00226	-0.00000040
		149	5745	5,745.00114	-0.00000020
		157	5785	5,784.98985	0.00000175
		165	5825	5,824.98812	0.00000204
55 °C	4.07	36	5180	5,180.01225	-0.00000236
		44	5220	5,219.99126	0.00000167
		48	5240	5,239.98660	0.00000256
		52	5260	5,259.99605	0.00000075
		60	5300	5,300.00931	-0.00000176
		64	5320	5,319.98211	0.00000336
		100	5500	5,499.97384	0.00000476
		116	5580	5,579.99950	0.00000009
		140	5700	5,699.98649	0.00000237
		149	5745	5,745.00587	-0.00000102
		157	5785	5,784.98104	0.00000328
		165	5825	5,824.99159	0.00000144
	3.33	36	5180	5,179.99752	0.00000048
		44	5220	5,219.98485	0.00000290
		48	5240	5,240.01639	-0.00000313
		52	5260	5,259.98123	0.00000357
		60	5300	5,299.99273	0.00000137
		64	5320	5,320.01889	-0.00000355
		100	5500	5,500.01303	-0.00000237
		116	5580	5,579.98718	0.00000230
		140	5700	5,700.00759	-0.00000133
		149	5745	5,744.98769	0.00000214
		157	5785	5,784.98132	0.00000323
		165	5825	5,824.97200	0.00000481

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Operation Mode	802.11 n_HT40	Test Date	2018.08.30
Temperature	:23 °C	Test By	Tom
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 °C	4.07	38	5190	5,189.98379	0.00000312
		46	5230	5,230.00533	-0.00000102
		54	5270	5,269.99972	0.00000005
		62	5310	5,309.99681	0.00000060
		102	5510	5,509.99958	0.00000008
		110	5550	5,549.99335	0.00000120
		134	5670	5,669.99406	0.00000105
		151	5755	5,754.97663	0.00000406
		159	5795	5,794.98044	0.00000338
	3.33	38	5190	5,189.99892	0.00000021
		46	5230	5,230.01359	-0.00000260
		54	5270	5,269.99729	0.00000052
		62	5310	5,309.99766	0.00000044
		102	5510	5,510.00403	-0.00000073
		110	5550	5,550.00369	-0.00000066
		134	5670	5,669.99698	0.00000053
		151	5755	5,754.97700	0.00000400
		159	5795	5,794.97695	0.00000398

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25 °C	3.7V	38	5190	5,189.98993	0.00000194
		46	5230	5,230.01125	-0.00000215
		54	5270	5,269.98754	0.00000236
		62	5310	5,310.00493	-0.00000093
		102	5510	5,509.99158	0.00000153
		110	5550	5,549.99247	0.00000136
		134	5670	5,669.99238	0.00000134
		151	5755	5,754.97658	0.00000407
		159	5795	5,794.98347	0.00000285
55 °C	4.07	38	5190	5,189.99654	0.00000067
		46	5230	5,230.00948	-0.00000181
		54	5270	5,269.98102	0.00000360
		62	5310	5,309.99771	0.00000043
		102	5510	5,510.00576	-0.00000105
		110	5550	5,550.00539	-0.00000097
		134	5670	5,669.99829	0.00000030
		151	5755	5,754.98825	0.00000204
		159	5795	5,794.97768	0.00000385
	3.33	38	5190	5,190.00023	-0.00000005
		46	5230	5,230.00328	-0.00000063
		54	5270	5,269.98963	0.00000197
		62	5310	5,310.00427	-0.00000080
		102	5510	5,509.98967	0.00000188
		110	5550	5,549.99677	0.00000058
		134	5670	5,670.00457	-0.00000081
		151	5755	5,754.98293	0.00000297
		159	5795	5,794.98906	0.00000189

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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.

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