ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

OF

Applicant:	FUJITSU CONNECTED TECHNOLOGIES Ltd. 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan
Product Name:	Smart Phone
Brand Name:	FUJITSU
Model No.:	F-01L
Model Difference:	N/A
FCC ID:	2AQYEFMP167
Report Number:	ER/2018/70057
FCC Rule Part:	§15.407, Cat: NII
Issue Date:	Sep. 20th, 2018
Date of Test:	Aug. 28th, 2018 ~ Sep.14th, 2018
Date of EUT Received:	Aug. 28th, 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 / Engineer

Approved By: Blue Yang

Blue Yang / Supervisor

Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/70057	Rev.00	Initial creation of document	All	Sep. 20th, 2018	Stefanie Yu / Clerk

Contents

1 GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	Smart Phone	
Brand Name:	FUJITSU	
Model No.:	F-01L	
Model Difference:	N/A	
Product SW/HW version:	V01R028Ae / V2.1.0	
Power Supply:	3.8Vdc from Rechargeable Li-ion Battery or 5Vdc /9Vdc / 12Vdc from AC/DC Adapter	
	Battery:	Model No.: CA54310-0075-A1, Supplier: FUJITSU CONNECTED TECHNOLOGIES LIMITED
	Adapter:	Model No.: AC Adapter 06 Supplier: NTT docomo

WLAN 5GHz:

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (Avg.) (dBm)	Modulation Technology
a	5150~5250	4	11.32	OFDM
	5250~5350	4	11.34	
	5470~5725	12	11.29	
n_HT ac_VHT 20M	5150~5250	4	HT: 11.34 (Worst Case)	OFDM
	5250~5350	4	HT: 11.25 (Worst Case)	
	5470~5725	11	HT: 11.36 (Worst Case)	
n_HT ac_VHT 40M	5150~5250	2	HT: 11.46 (Worst Case)	OFDM
	5250~5350	2	HT: 11.37 (Worst Case)	
	5470~5725	5	HT: 11.58 Worst Case)	
ac_VHT 80M	5150~5250	1	11.07	OFDM
	5250~5350	1	11.01	
	5470~5725	2	11.18	
Antenna Designation	λ/4 Monopole Antenna 5GHz Gain: -2dBi (5150MHz-5250MHz) 5GHz Gain: -2dBi (5250MHz-5350MHz) 5GHz Gain: -2dBi (5470MHz-5725MHz)			
Modulation type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only			
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 72.2Mbps 802.11 n_40MHz: 13.5 – 150Mbps 802.11 ac_20MHz: 6.5 –86.7Mbps 802.11 ac_40MHz: 13.5 –200Mbps 802.11 ac_80MHz: 29.3 – 433.3Mbps			

1.2 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10:2013

Note:

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

1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Number and Designation 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.

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 a placed on as 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 30MHz,. 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 a placed on as 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 Example

For all conducted test items:

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

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example.

2.5 Configuration of Tested System

Fig. 2-1 Conducted (Antenna Port) Emission Configuration

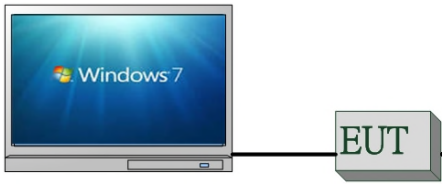


Fig 2-2 Radiated Emission

Fig 2-3 Conduction (AC Power Line) Radiated Emission

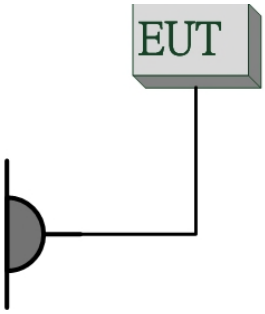


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	Notebook	Lenovo	L430	R9-WR6X4	Shielded	Unshielded
2.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A

3 SUMMARY OF TEST RESULT

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

4 DESCRIPTION OF TEST MODES

4.1 Operated in U-NII Bands

Operated band in 5150 MHz ~5250 MHz:

802.11a / n HT20 Mode, 802.11ac VHT20 Mode	
Channel	Frequency
36	5180
40	5200
44	5220
48	5240

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

802.11ac VHT80 Mode	
channel	Frequency
42	5210

Operated band in 5250 MHz ~5350 MHz:

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

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

802.11ac VHT80 Mode	
Channel	Frequency
58	5290

Operated band in 5500 MHz ~5700 MHz:

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

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

802.11ac VHT80 Mode	
channel	Frequency
106	5530
122	5610

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	Ch0
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Ch0
802.11a	5500~5720	100 to 140	100,116,140	OFDM	6	Ch0
802.11a	5745~5825	149 to 165	149,157,165	OFDM	6	Ch0
RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	Ch0
802.11n_HT20				OFDM	MCS0	Ch0
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	Ch0
802.11ac_VHT80	5210	42	42	OFDM	VHT0	Ch0
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Ch0
802.11n_HT20				OFDM	MCS0	Ch0
802.11n_HT40	5270~5310	54 to 62	54,62	OFDM	MCS0	Ch0
802.11ac_VHT80	5290	58	58	OFDM	VHT0	Ch0

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

ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	Ch0
802.11n_HT20 802.11ac_VHT20				OFDM	MCS0	Ch0
802.11n_HT40 802.11ac_VHT40	5190~5230	38 to 46	38,46	OFDM	MCS0	Ch0
802.11ac_VHT80	5210	42	42	OFDM	VHT0	Ch0
802.11a	5260~5320	52 to 64	52,60,64	OFDM	6	Ch0
802.11n_HT20 802.11ac_VHT20				OFDM	MCS0	Ch0
802.11n_HT40 802.11ac_VHT40	5270~5310	54 to 62	54,62	OFDM	MCS0	Ch0
802.11ac_VHT80	5290	58	58	OFDM	VHT0	Ch0
802.11a	5500~5700	100 to 140	100,116,140	OFDM	6	Ch0
802.11n_HT20 802.11ac_VHT20				OFDM	MCS0	Ch0
802.11n_HT40 802.11ac_VHT40	5510~5670	102 to 134	102,110,134	OFDM	MCS0	Ch0
802.11ac_VHT80	5530~5610	106 to 122	106,122	OFDM	VHT0	Ch0

5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26dB & 6dB Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Measurement	+/- 0.96 dB
Peak Power Spectral Density Measurement	+/- 1.67 dB
Frequency Stability	+/- 123.36 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%

Radiated Spurious Emission:

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

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

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

6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

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

Frequency range MHz	Limits dB(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.		

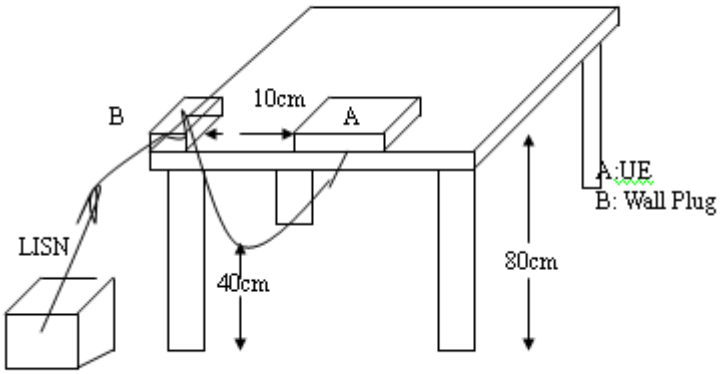
6.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCI7	100335	Feb. 2nd, 2018	Feb. 1st, 2019
LISN	SCHWARZBECK	NSLK 8127	8127-649	May 18th, 2018	May 17th, 2019

6.3 EUT Setup

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

6.4 Test SET-UP



6.5 Measurement Procedure

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

6.6 Measurement Result

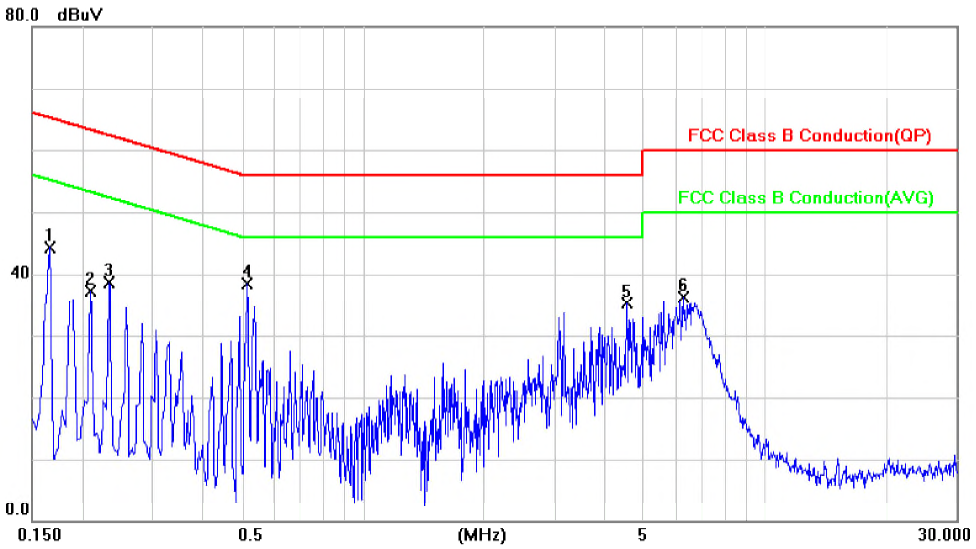
Note: Refer to next page for measurement data and plots.
Note2: The * reveals the worst-case results that closet to the limit

AC POWER LINE CONDUCTED EMISSION TEST DATA

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

Conducted Emission

File :Data Data :#2 Date: 2018/9/10 Time: 下午 10:48:37

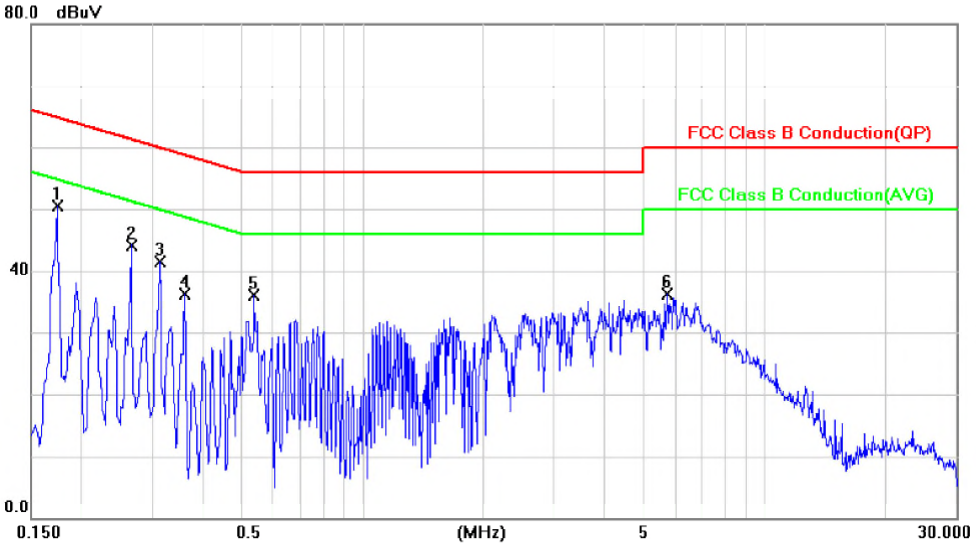


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1660	44.17	0.04	44.21	65.16	-20.95	peak	
2		0.2100	37.19	0.04	37.23	63.21	-25.98	peak	
3		0.2340	38.62	0.04	38.66	62.31	-23.65	peak	
4	*	0.5140	38.38	0.04	38.42	56.00	-17.58	peak	
5		4.5300	35.08	0.18	35.26	56.00	-20.74	peak	
6		6.2540	36.04	0.23	36.27	60.00	-23.73	peak	

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

Conducted Emission

File :Data Data :#1 Date: 2018/9/10 Time: 下午 10:47:46



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1740	50.47	0.04	50.51	64.77	-14.26	peak	
2		0.2660	44.16	0.04	44.20	61.24	-17.04	peak	
3		0.3140	41.54	0.04	41.58	59.86	-18.28	peak	
4		0.3620	36.31	0.04	36.35	58.68	-22.33	peak	
5		0.5380	36.13	0.04	36.17	56.00	-19.83	peak	
6		5.7220	36.09	0.22	36.31	60.00	-23.69	peak	

7 DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.
All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

Formula:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

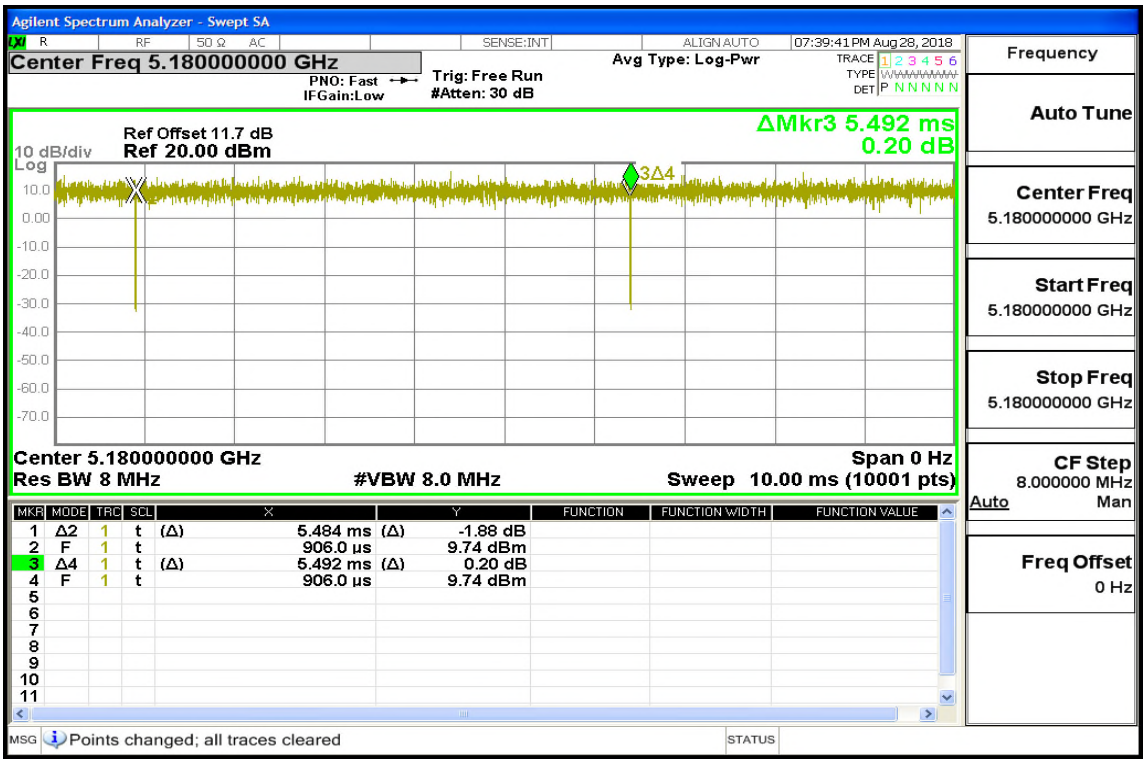
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

Duty Cycle:

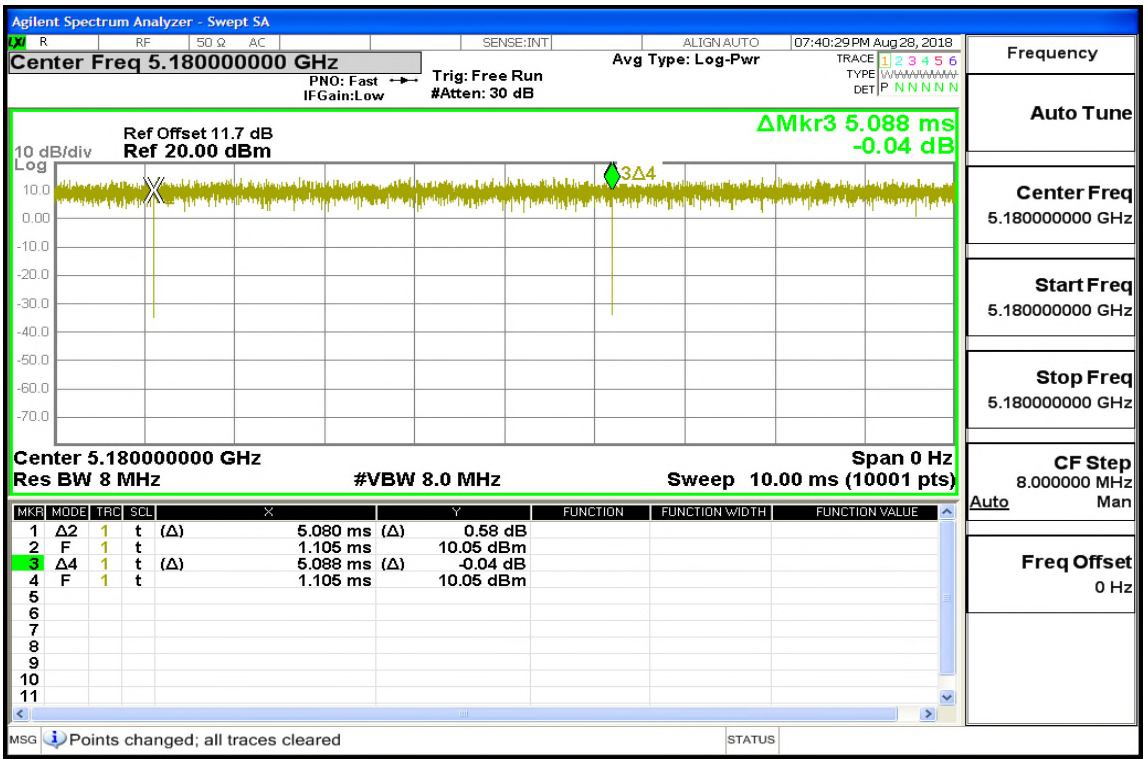
Mode	Duty Cycle (%)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11a	99.85	0.01	0.18	1.00
802.11n_20	99.84	0.01	0.20	1.00
802.11n_40	99.18	0.04	1.02	2.00
802.11ac_80	98.98	0.04	1.02	2.00

DUTY CYCLE TEST SIGNAL Measurement Result

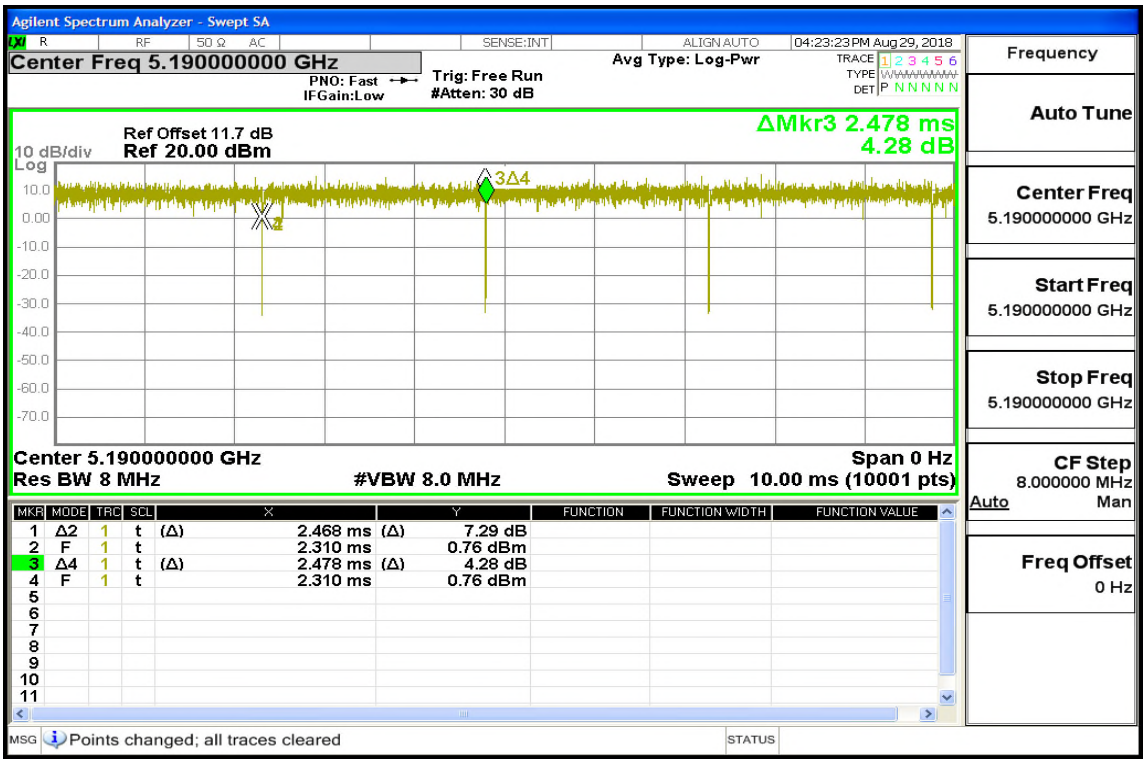
802.11a



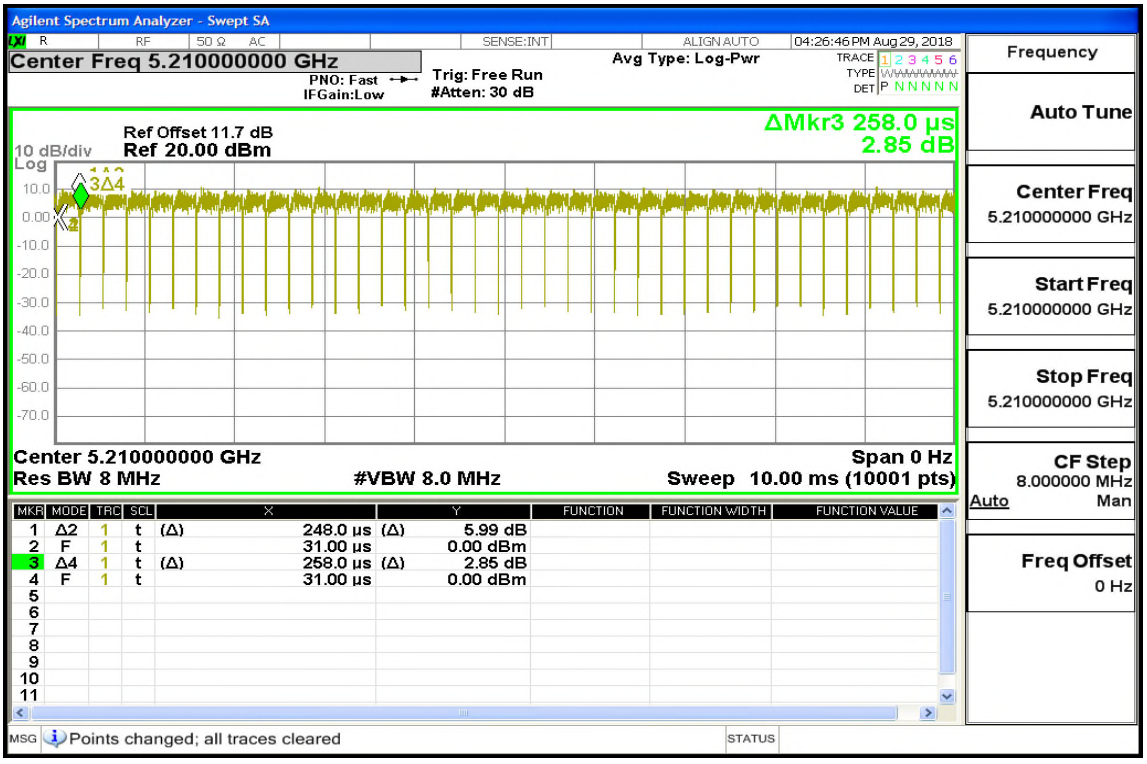
802.11n HT20



802.11n HT 40



802.11 ac VHT 80



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

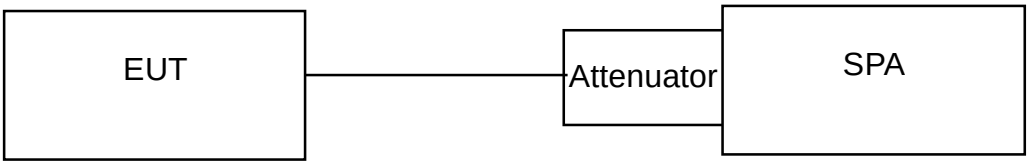
1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
   a. 26dB Band width Measurement: Set 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. For 99% Bandwidth:

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

8.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	R&S	FSV-30	101398	Oct. 19th, 2017	Oct. 18th, 2018
DC Power Supply	Anritsu	E3640A	MY52410006	Nov. 28th, 2017	Nov. 27th, 2018
Temperature Chamber	TERCHY	MHG-120LF	911009	May 18th, 2018	May 17th, 2019
Attenuator	Mini-Circuit	BW-S10W2+	2	Jan. 02nd, 2018	Jan. 01st, 2019
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019
Notebook	Lenovo	L430	R9-WGNK5	N/A	N/A

8.4 Test Set-up



8.5 Measurement Result

26dB Bandwidth

802.11a_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	21.74	13.373
5220	19.66	12.936
5240	21.56	13.337
5260	21.92	13.408
5300	21.09	13.240
5320	21.54	13.332
5500	22.05	13.433
5580	21.75	13.374
5700	21.52	13.329

802.11n_HT20_Ch0

Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.27	13.478
5220	21.78	13.380
5240	22.21	13.465
5260	21.89	13.403
5300	21.54	13.332
5320	21.89	13.402
5500	22.34	13.490
5580	22.13	13.450
5700	22.08	13.439

802.11n _HT40_Ch0

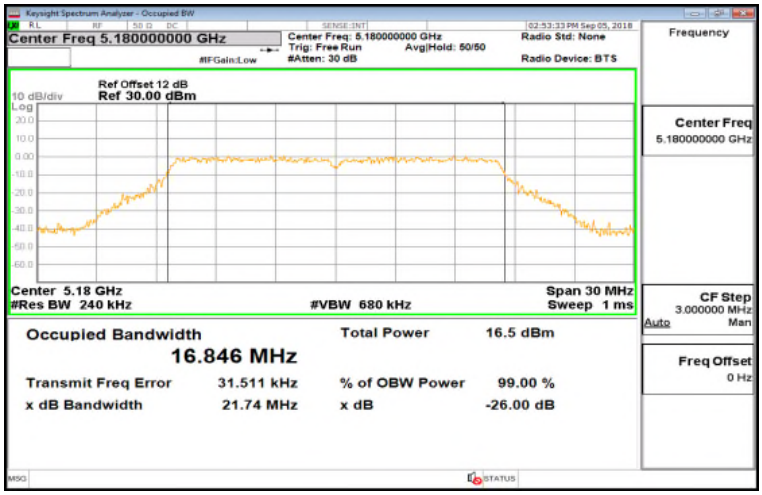
Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	42.68	16.302
5230	43.07	16.341
5270	43.17	16.352
5310	43.18	16.353
5510	38.91	15.901
5550	**43.47**	16.382
5670	42.42	16.276

802.11ac _VHT80_Ch0

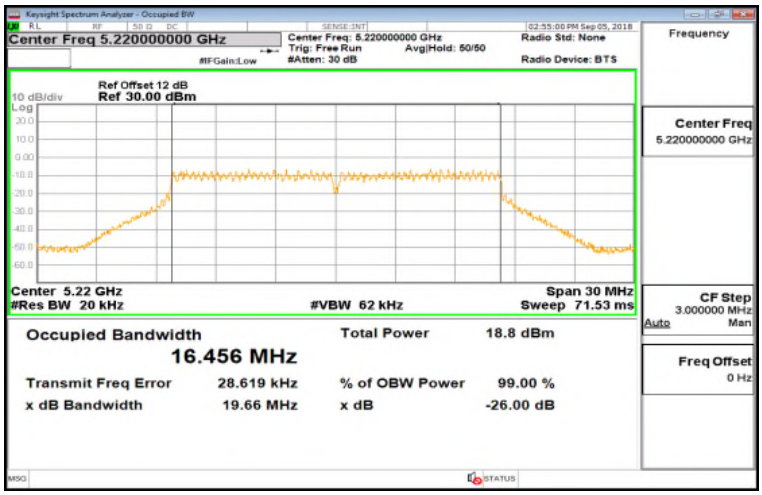
Frequency (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	83.88	19.236
5290	83.06	19.194
5530	84.02	19.244
5610	83.29	19.206

802.11a, 5150~5250 MHz

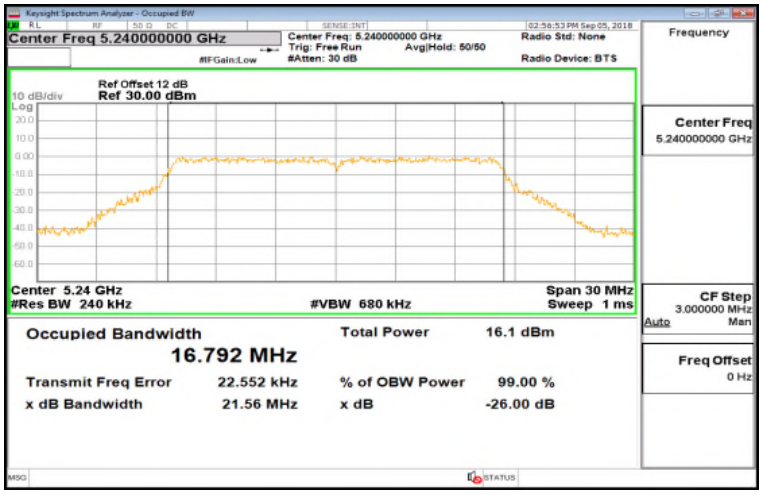
26dB Band Width Test Data CH-Low (5180MHz)



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

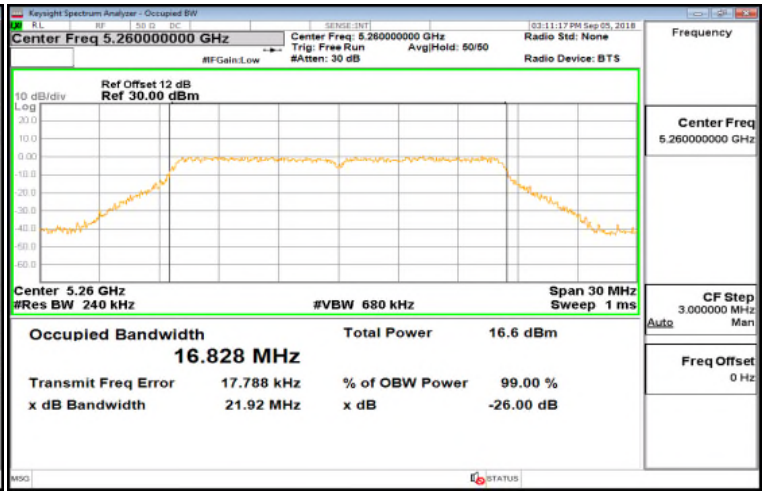


26dB Band Width Test Data CH-High (5240MHz)

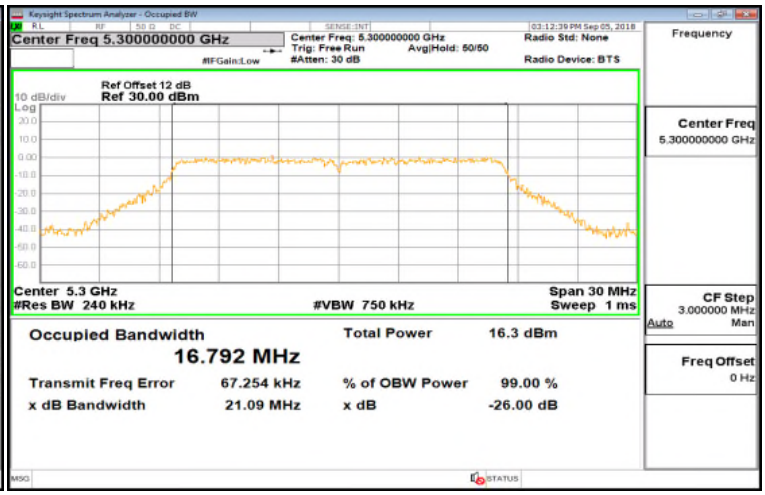


802.11a, 5250~5350 MHz

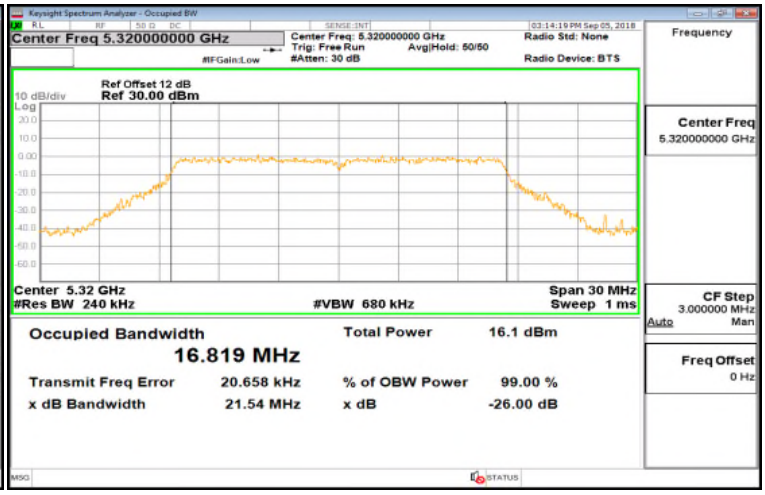
26dB Band Width Test Data CH-Low (5260MHz)



26dB Band Width Test Data CH-Mid (5300MHz)

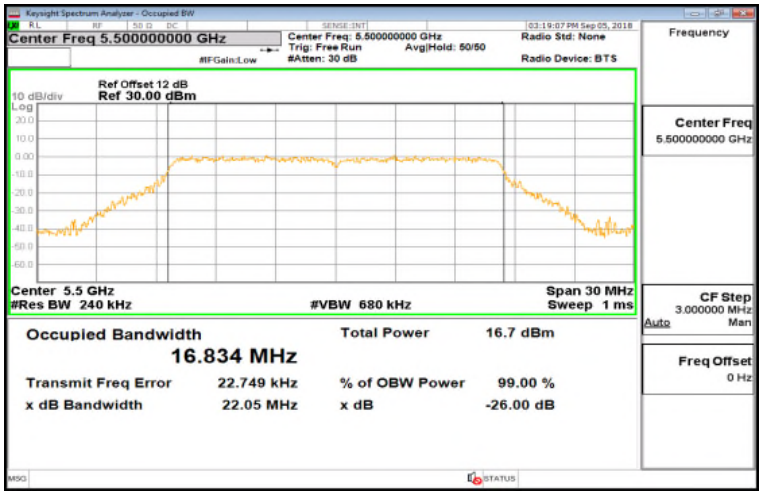


26dB Band Width Test Data CH-High (5320MHz)

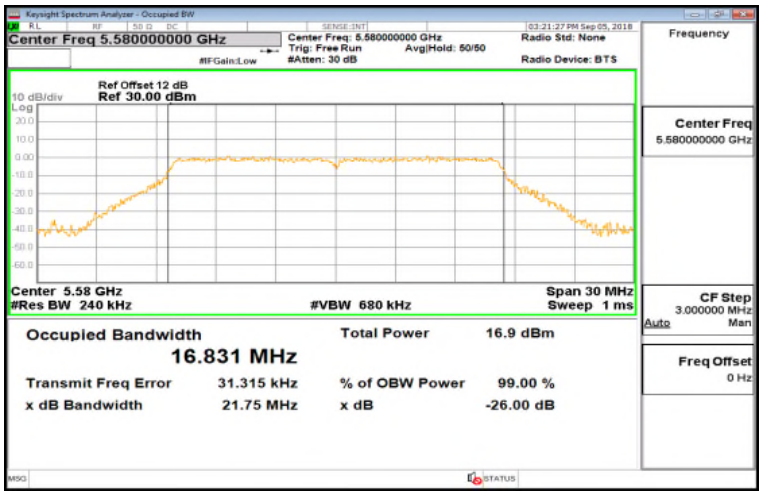


802.11a, 5470~5725 MHz

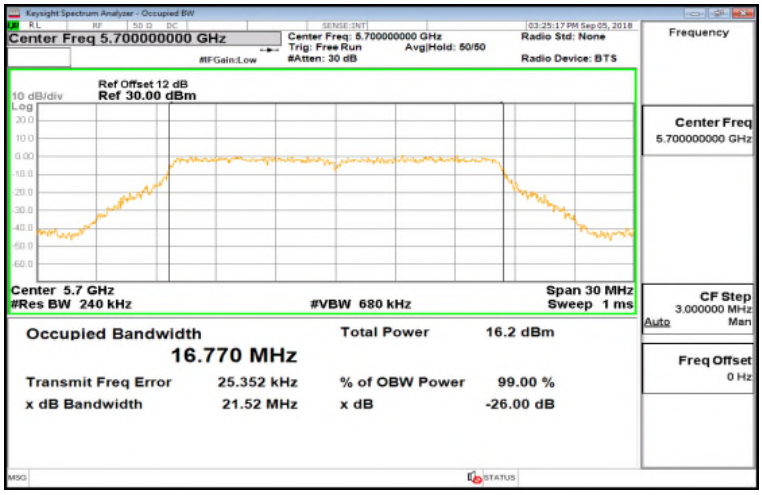
26dB Band Width Test Data CH-Low (5500MHz)



26dB Band Width Test Data CH-Mid (5580MHz)

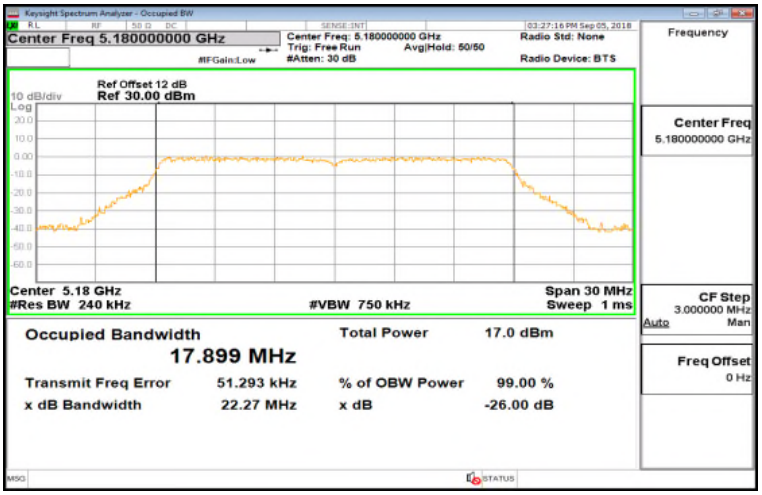


26dB Band Width Test Data CH-High (5700MHz)

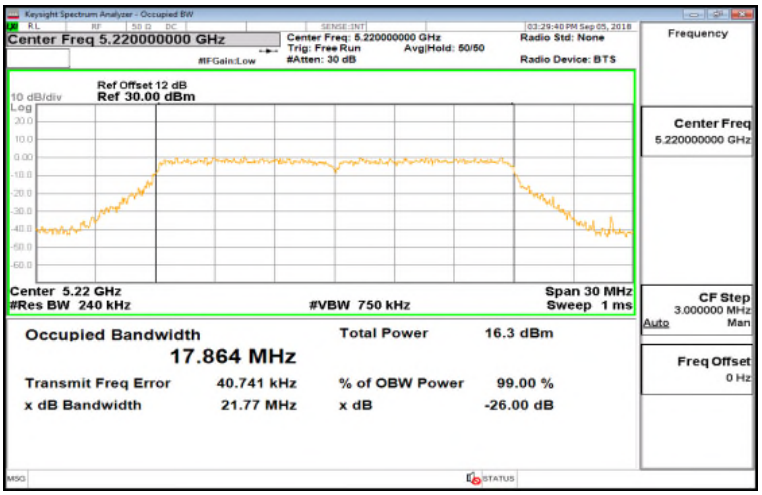


802.11n HT20, 5150~5250 MHz

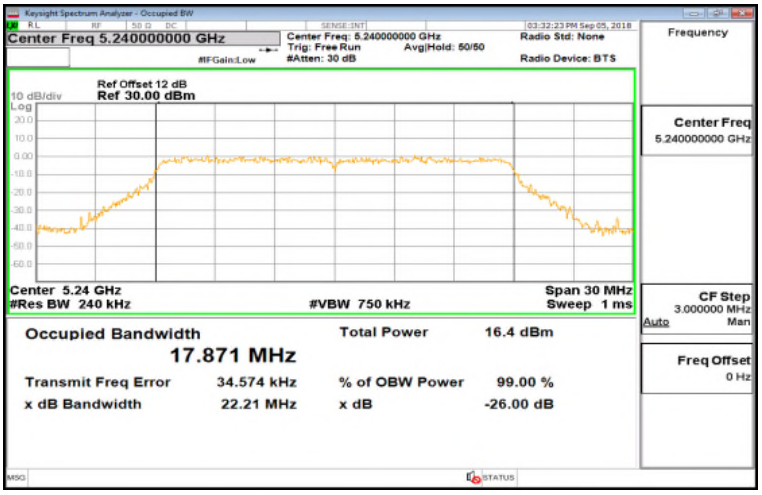
26dB Band Width Test Data CH-Low (5180 MHz)



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

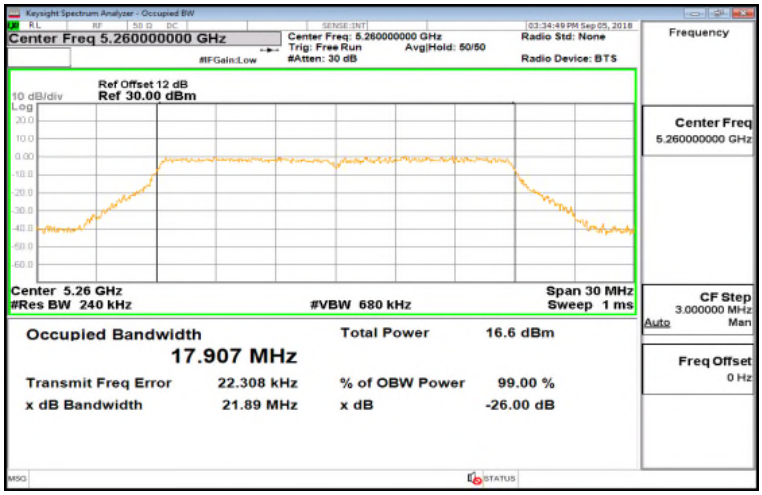


26dB Band Width Test Data CH-High (5240 MHz)

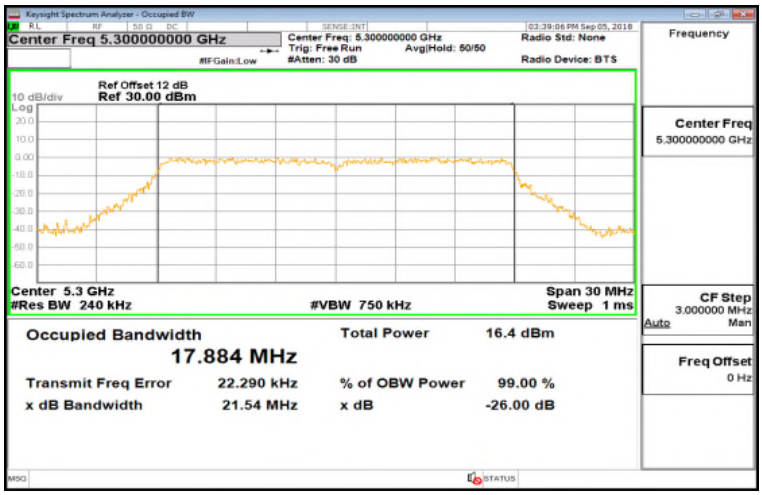


802.11n HT20, 5250~5350 MHz

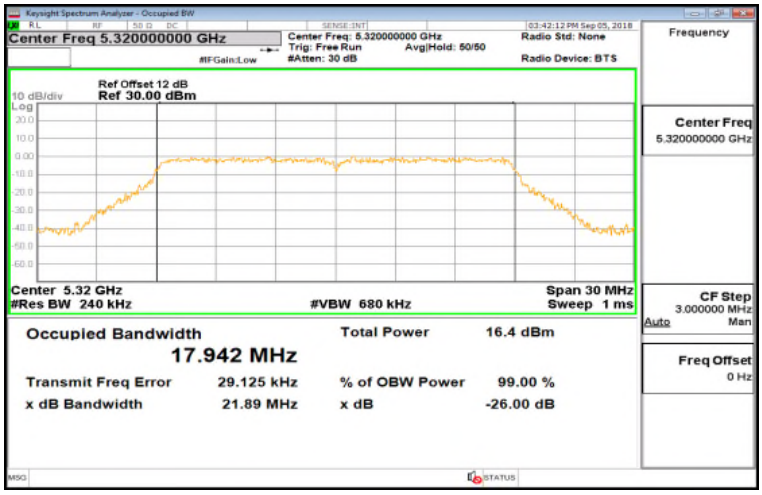
26dB Band Width Test Data CH-Low (5260 MHz)



26dB Band Width Test Data CH-Mid (5300 MHz)

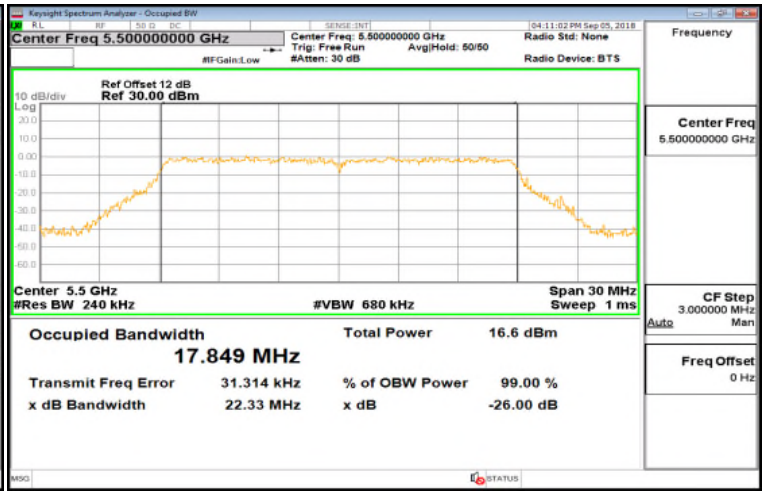


26dB Band Width Test Data CH-High (5320 MHz)

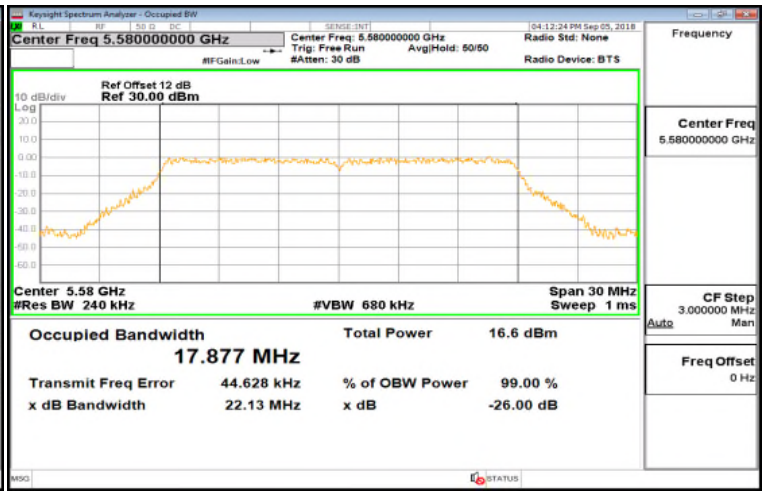


802.11n HT20, 5470~5725 MHz

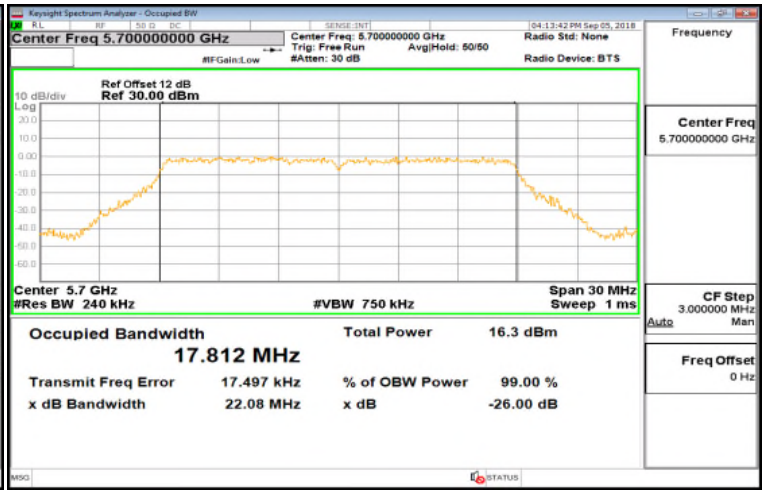
26dB Band Width Test Data CH-Low (5500 MHz)



26dB Band Width Test Data CH-Mid (5580 MHz)

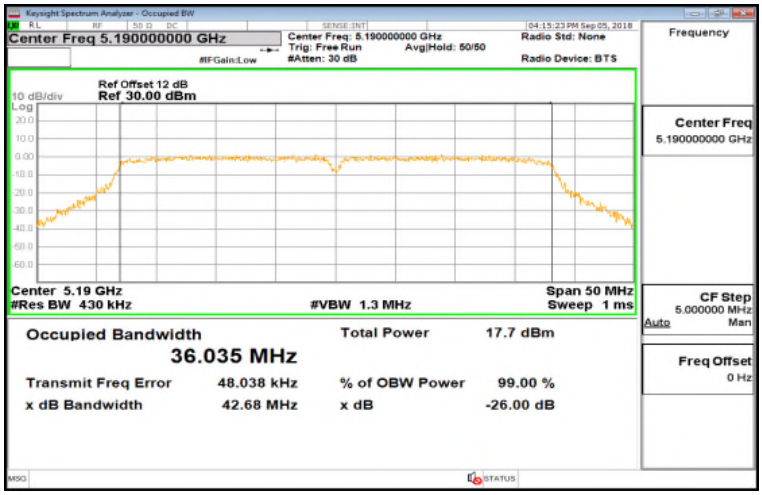


26dB Band Width Test Data CH-High (5700 MHz)



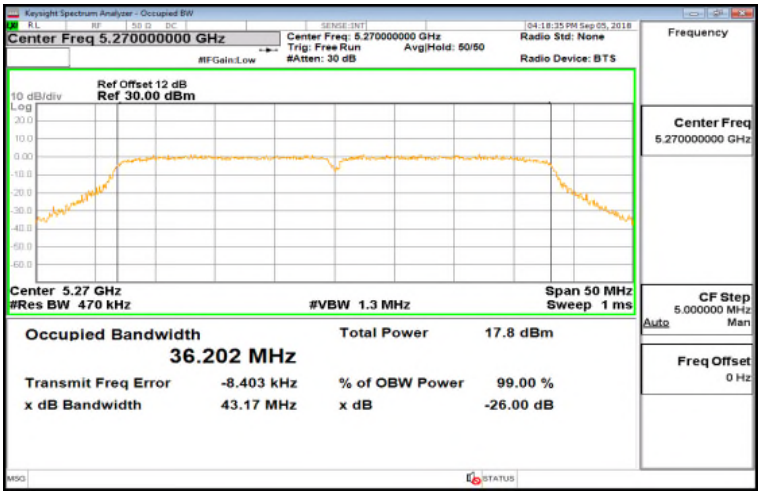
802.11n HT40, 5150~5250 MHz

26dB Band Width Test Data CH-Low (5190 MHz)

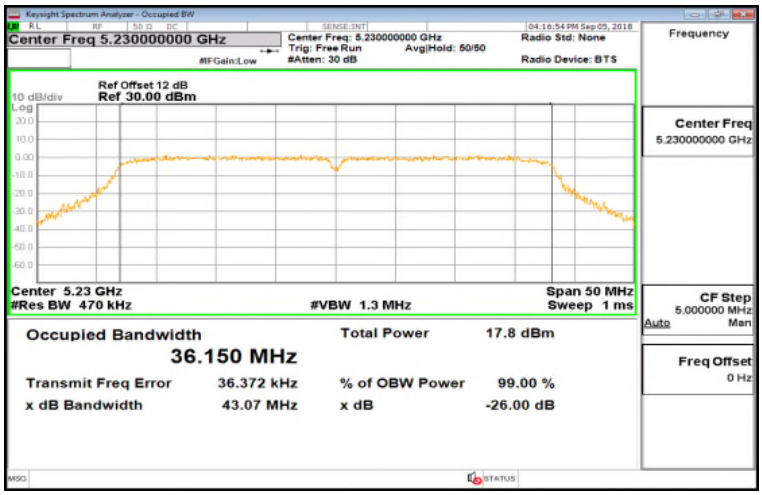


802.11n HT40, 5250~5350 MHz

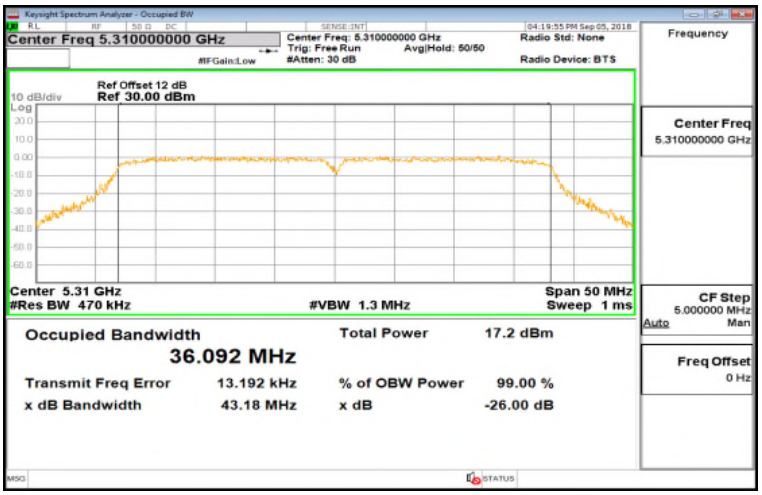
26dB Band Width Test Data CH-Low (5270 MHz)



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

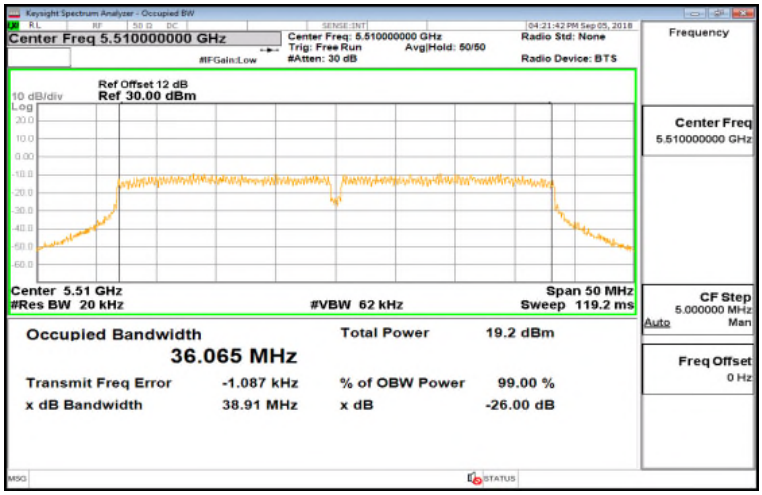


26dB Band Width Test Data CH-High (5310MHz)



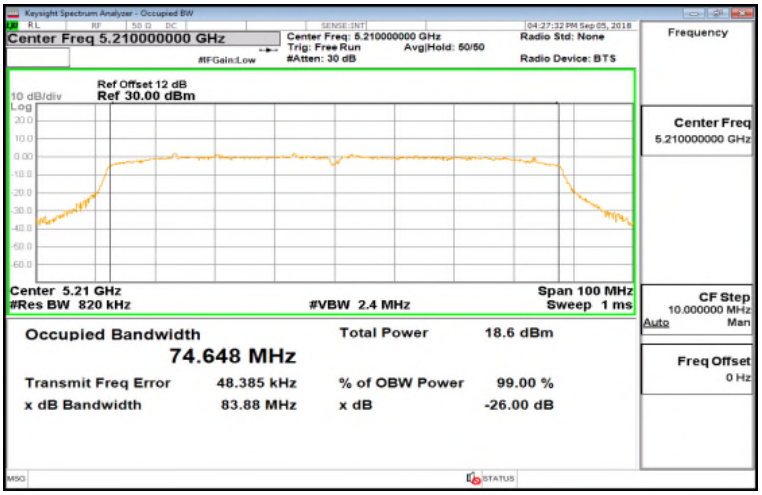
802.11n HT40, 5470~5725 MHz

26dB Band Width Test Data CH-Low (5510 MHz)

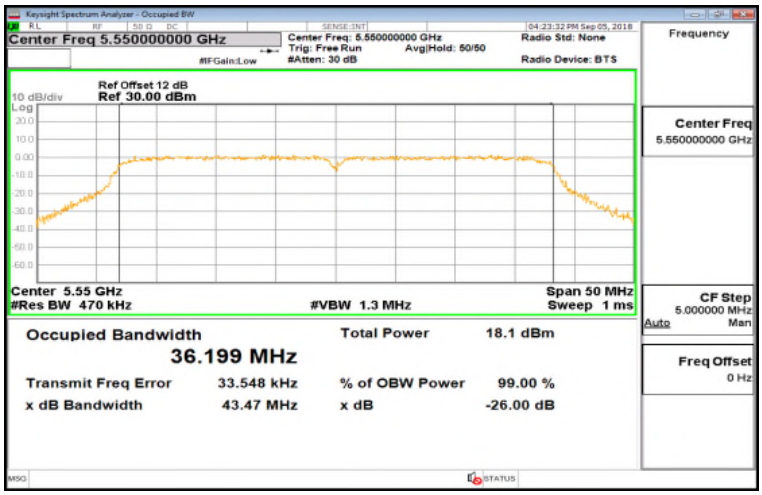


802.11ac VHT80, 5150~5250 MHz

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

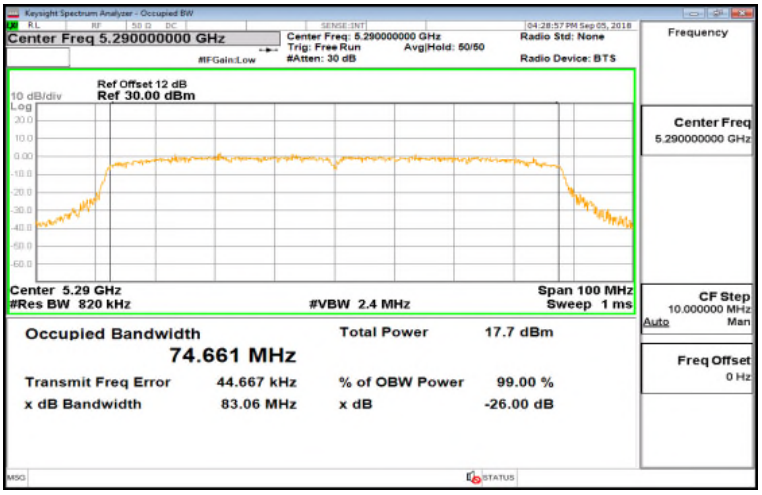


26dB Band Width Test Data CH-Mid (5550 MHz)

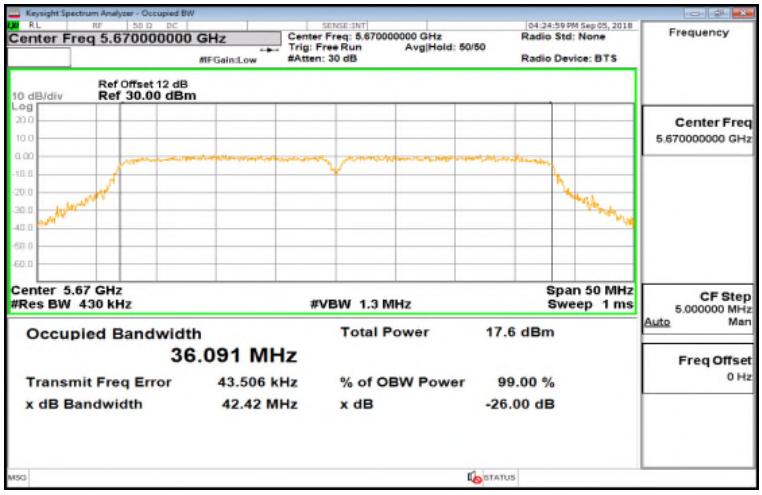


802.11ac VHT80, 5250~5350 MHz

26dB Band Width Test Data CH-Mid (5290 MHz)

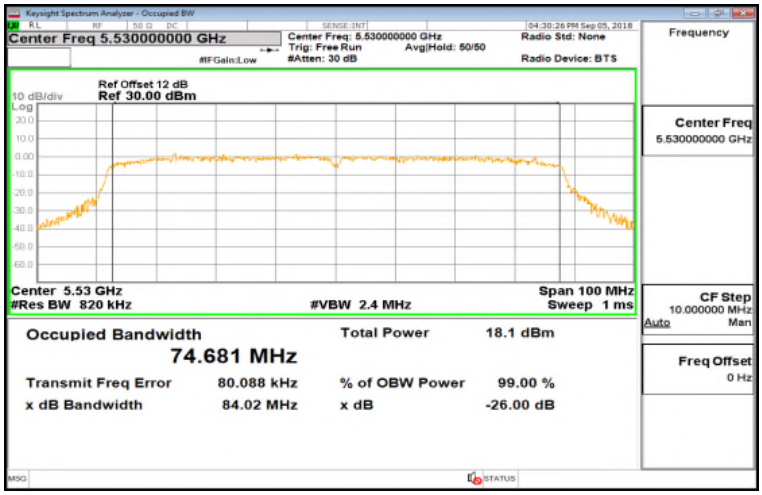


26dB Band Width Test Data CH-High (5670 MHz)



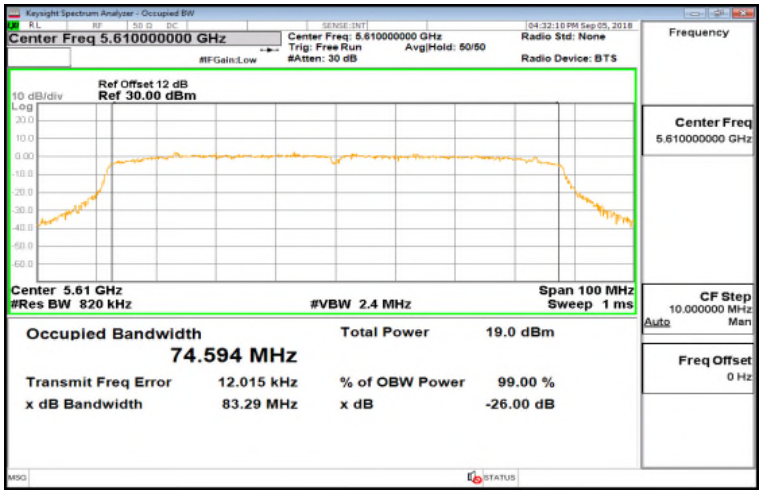
802.11ac VHT80, 5470~5725 MHz

26dB Band Width Test Data CH-Low (5530 MHz)



802.11ac VHT80, 5470~5725 MHz

26dB Band Width Test Data CH-High (5610 MHz)



9 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

9.1 Standard Applicable

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Master device)	1 Watt(30dBm)
		Fixed point-to-point Access Ponit	1 Watt(30dBm)
	√	Mobile and portable client device	250mW(23.98dBm)
U-NII-2A	√		250mW(23.98dBm) or 11dBm+10 log B
U-NII-2C	√		250mW(23.98dBm) or 11dBm+10 log B
U-NII-3			1 Watt(30dBm)
If transmitting antennas of directional gain greater than 6 dBi are used, the Maximum transmit power shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6 dBi.			

The antenna gain is not grater than 6 dBi. Therefore, reduction of power is not required.

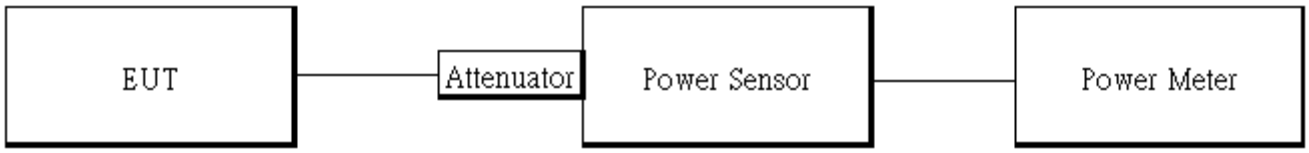
9.2 Measurement Procedure

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/duty cycle).
6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

9.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Power Meter	Anritsu	ML2496A	1804001	Feb. 01st, 2018	Jan. 31th, 2019
Power Sensor	Anritsu	MA2411B	1726104	Feb. 01st, 2018	Jan. 31th, 2019
Power Sensor	Anritsu	MA2411B	1726107	Feb. 01st, 2018	Jan. 31th, 2019
DC Power Supply	Anritsu	E3640A	MY52410006	Nov. 28tg, 2017	Nov. 27th, 2018
Attenuator	Mini-Circuit	BW-S10W2+	2	Jan. 02nd, 2018	Jan. 01st, 2019
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019
Notebook	Lenovo	L430	R9-WGNK5	N/A	N/A

9.4 Test Set-up



9.5 Measurement Result

Conducted output power (FCC)

802.11a_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	6	11.32	13.541	23.98	PASS
44	5220	6	11.28	13.417	23.98	PASS
48	5240	6	11.30	13.479	23.98	PASS
52	5260	6	**11.34**	13.604	23.98 or 11+10log(B) = 24.41	PASS
60	5300	6	11.12	12.932	23.98 or 11+10log(B) = 24.24	PASS
64	5320	6	11.06	12.754	23.98 or 11+10log(B) = 24.33	PASS
100	5500	6	11.28	13.417	23.98 or 11+10log(B) = 24.43	PASS
116	5580	6	11.14	12.991	23.98 or 11+10log(B) = 24.37	PASS
140	5700	6	**11.29**	13.448	23.98 or 11+10log(B) = 24.33	PASS

802.11n_HT20_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
36	5180	MCS0	11.34	13.605	23.98	PASS
44	5220	MCS0	11.32	13.542	23.98	PASS
48	5240	MCS0	11.24	13.295	23.98	PASS
52	5260	MCS0	11.19	13.143	23.98 or 11+10log(B) = 24.40	PASS
60	5300	MCS0	11.19	13.143	23.98 or 11+10log(B) = 24.33	PASS
64	5320	MCS0	**11.25**	13.326	23.98 or 11+10log(B) = 24.40	PASS
100	5500	MCS0	**11.36**	13.668	23.98 or 11+10log(B) = 24.49	PASS
116	5580	MCS0	11.11	12.903	23.98 or 11+10log(B) = 24.45	PASS
140	5700	MCS0	11.32	13.542	23.98 or 11+10log(B) = 24.44	PASS

802.11n_HT40_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	11.46	13.989	23.98	PASS
46	5230	MCS0	11.43	13.893	23.98	PASS
54	5270	MCS0	11.36	13.670	23.98 or 11+10log(B) = 27.35	PASS
62	5310	MCS0	**11.37**	13.702	23.98 or 11+10log(B) = 27.35	PASS
102	5510	MCS0	**11.58**	14.381	23.98 or 11+10log(B) = 26.90	PASS
110	5550	MCS0	11.44	13.925	23.98 or 11+10log(B) = 27.38	PASS
134	5670	MCS0	11.38	13.734	23.98 or 11+10log(B) = 27.28	PASS

802.11ac_VHT80_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
42	5210	MCS0	11.07	12.799	23.98	PASS
58	5290	MCS0	**11.01**	12.624	23.98 or 11+10log(B) = 30.19	PASS
106	5530	MCS0	**11.18**	13.128	23.98 or 11+10log(B) = 30.24	PASS
122	5610	MCS0	10.65	11.619	23.98 or 11+10log(B) = 30.21	PASS

10 MAXIMUM POWER SPECTRAL DENSITY

10.1 Standard Applicable

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1		Access Point (Master device)	17dBm/ MHz
		Fixed point-to-point Access Ponit	
	√	Mobile and portable client device	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3			30dBm/ 500kHz
If transmitting antennas of directional gain greater than 6 dBi are used, the Maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.			

The antenna gain is not grater than 6 dBi. Therefore, reduction of power is not required.

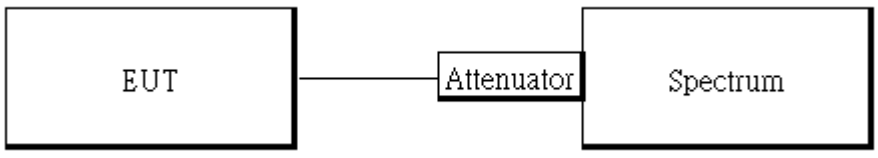
10.2 Measurement Procedure

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≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. User the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

10.3 Measurement Equipment Used

SGS Conducted Room					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	R&S	FSV-30	101398	Feb. 01st, 2018	Jan. 31th, 2019
DC Power Supply	Anritsu	E3640A	MY52410006	Feb. 01st, 2018	Jan. 31th, 2019
Temperature Chamber	TERCHY	MHG-120LF	911009	Feb. 01st, 2018	Jan. 31th, 2019
Attenuator	Mini-Circuit	BW-S10W2+	2	Nov. 28tg, 2017	Nov. 27th, 2018
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019
Notebook	Lenovo	L430	R9-WGNK5	Jan. 02nd, 2018	Jan. 01st, 2019

10.4 Test Set-up



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	-0.31	12.00	0.01	-0.30	11	-11.30
5220	-0.92	12.00	0.01	-0.91	11	-11.91
5240	-1.12	12.00	0.01	-1.11	11	-12.11
5260	-0.97	12.00	0.01	-0.96	11	-11.96
5300	-1.30	12.00	0.01	-1.29	11	-12.29
5320	-0.94	12.00	0.01	-0.93	11	-11.93
5500	-1.20	12.00	0.01	-1.19	11	-12.19
5580	-0.37	12.00	0.01	-0.36	11	-11.36
5700	-0.32	12.00	0.01	-0.31	11	-11.31

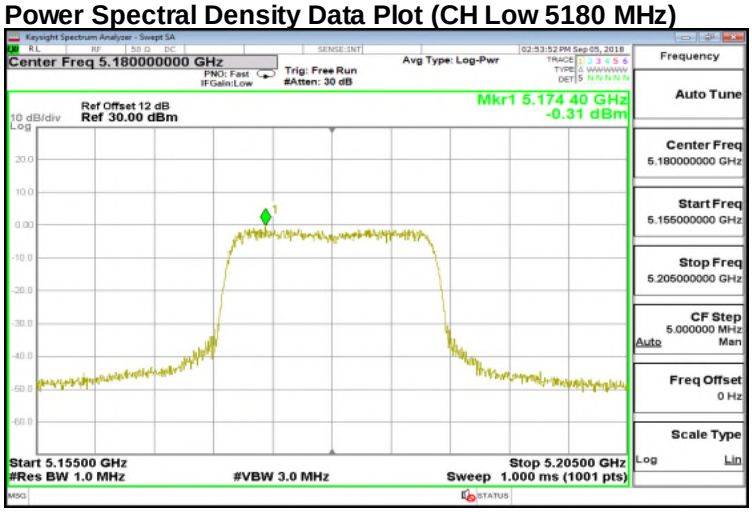
POWER DENSITY 802.11n HT20 MODE						
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5180	-0.45	12.00	0.01	-0.44	11	-11.44
5220	-0.44	12.00	0.01	-0.43	11	-11.43
5240	-0.69	12.00	0.01	-0.68	11	-11.68
5260	-1.21	12.00	0.01	-1.20	11	-12.20
5300	-1.27	12.00	0.01	-1.26	11	-12.26
5320	-1.56	12.00	0.01	-1.55	11	-12.55
5500	-1.45	12.00	0.01	-1.44	11	-12.44
5580	-0.12	12.00	0.01	-0.11	11	-11.11
5700	-0.41	12.00	0.01	-0.40	11	-11.40

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	-3.99	12.00	0.04	-3.95	11	-14.95
5230	-4.27	12.00	0.04	-4.23	11	-15.23
5270	-4.1	12.00	0.04	-4.06	11	-15.06
5310	-3.92	12.00	0.04	-3.88	11	-14.88
5510	-4.28	12.00	0.04	-4.24	11	-15.24
5550	-3.87	12.00	0.04	-3.83	11	-14.83
5670	-3.55	12.00	0.04	-3.51	11	-14.51

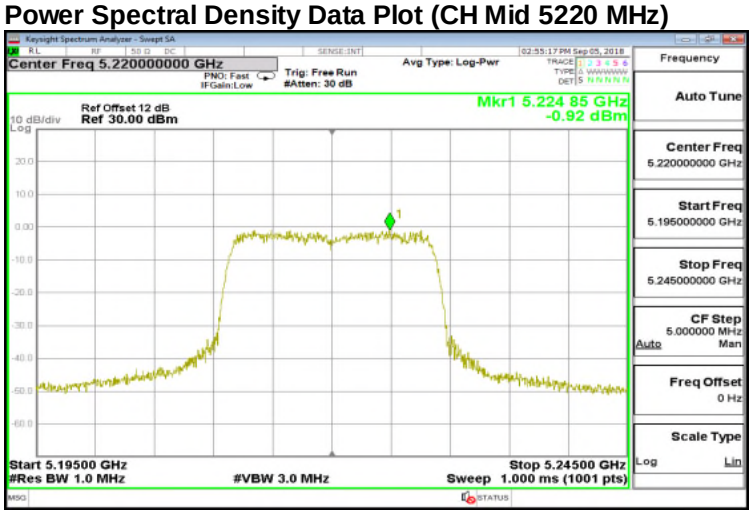
POWER DENSITY 802.11ac VHT80 MODE						
Frequency (MHz)	PSD W/O Duty Factor (dBm)	Offset	Duty Factor	PSD With Duty Factor (dBm)	Limit (dBm)	Margin (dB)
5210	-7.26	12.00	0.04	-7.22	11	-18.22
5290	-7.51	12.00	0.04	-7.47	11	-18.47
5530	-7.08	12.00	0.04	-7.04	11	-18.04
5610	-6.54	12.00	0.04	-6.50	11	-17.50

802.11a 5150~5250 MHz

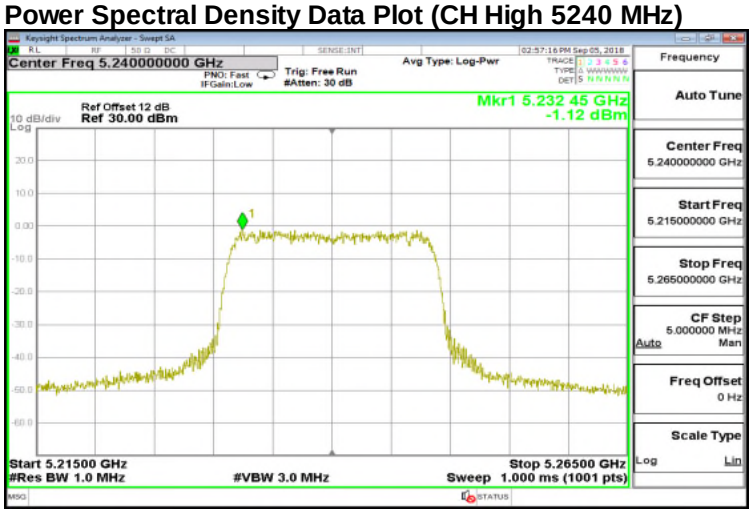
Power Spectral Density Data Plot (CH Low 5180 MHz)



Power Spectral Density Data Plot (CH Mid 5220 MHz)

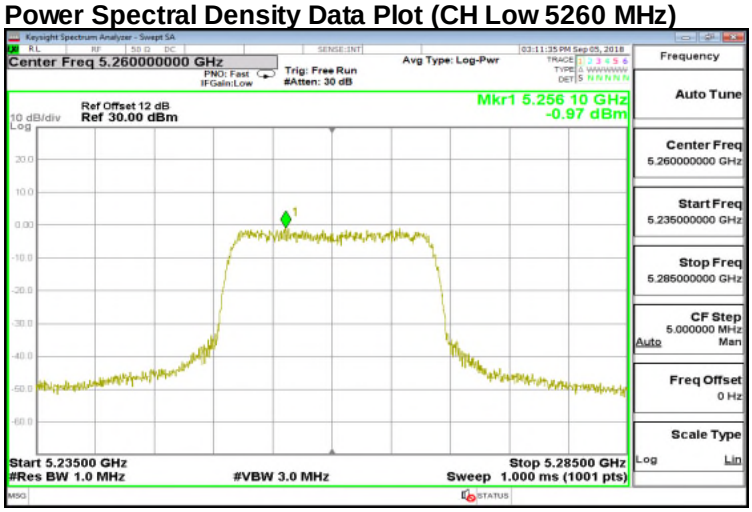


Power Spectral Density Data Plot (CH High 5240 MHz)

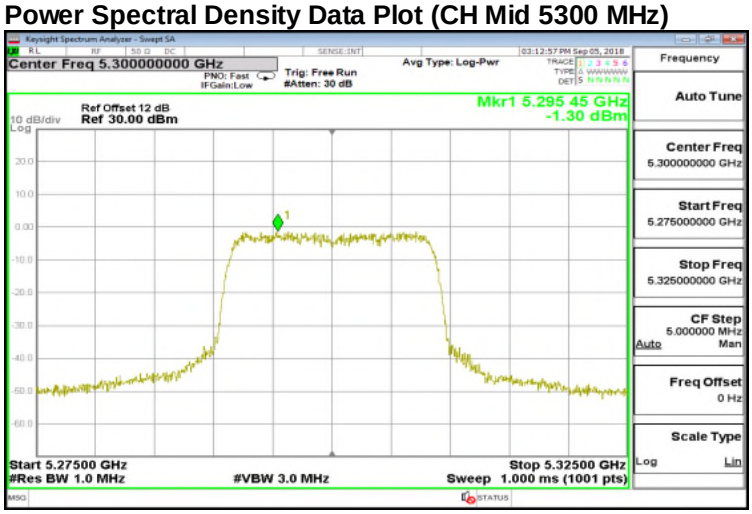


802.11a 5250~5350 MHz

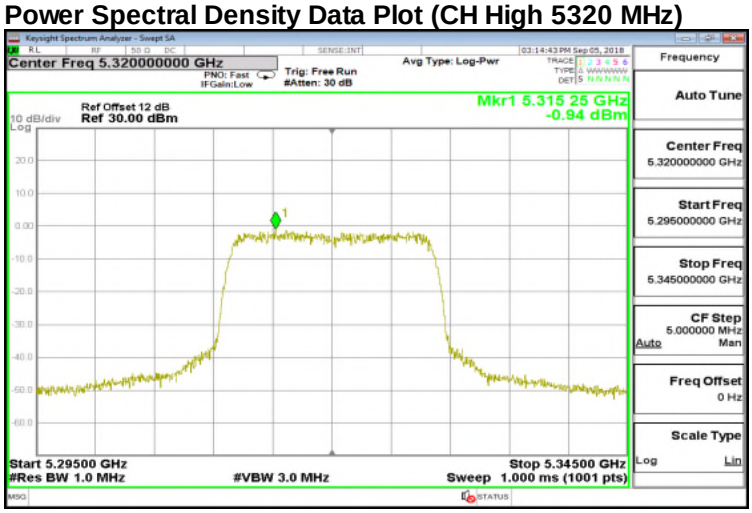
Power Spectral Density Data Plot (CH Low 5260 MHz)



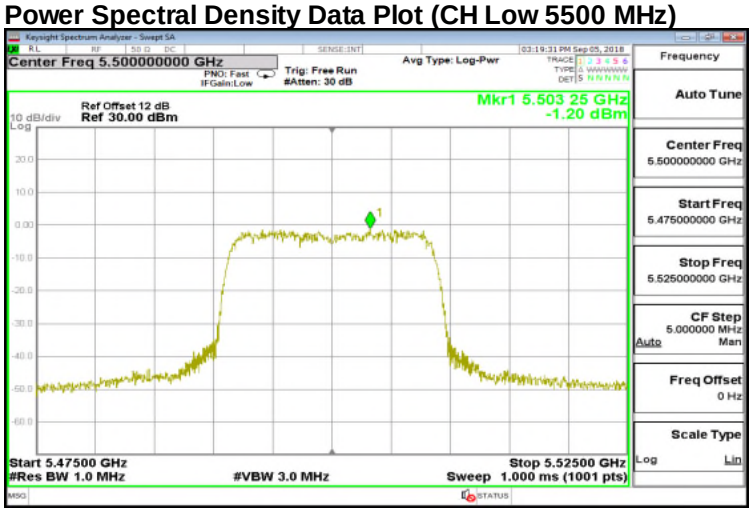
Power Spectral Density Data Plot (CH Mid 5300 MHz)



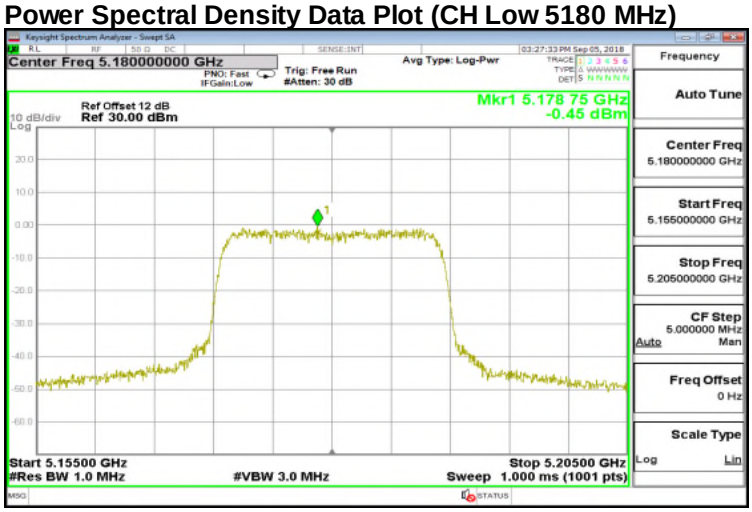
Power Spectral Density Data Plot (CH High 5320 MHz)



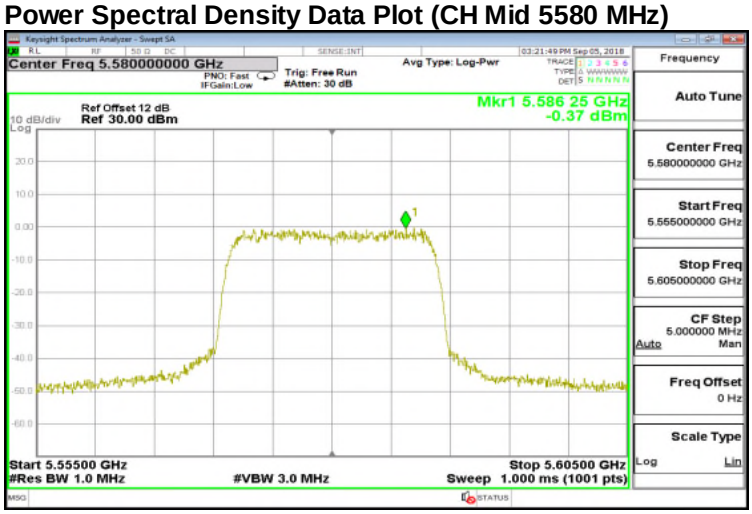
802.11a 5470~5725 MHz
Power Spectral Density Data Plot (CH Low 5500 MHz)



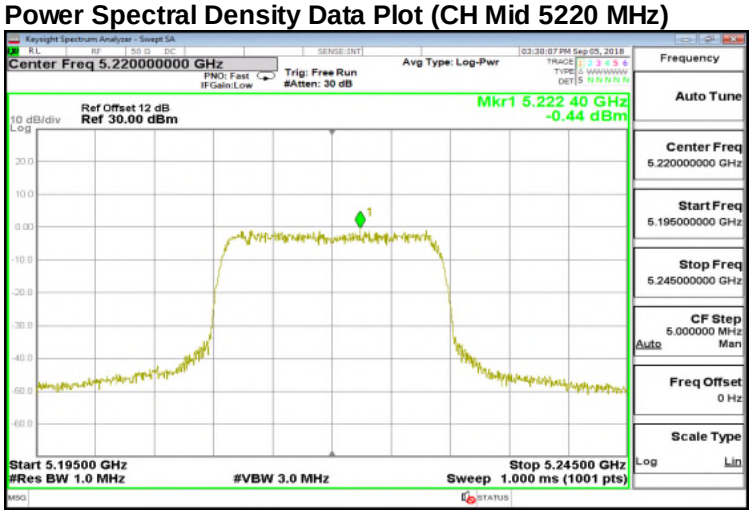
802.11n HT20, 5150~5250 MHz
Power Spectral Density Data Plot (CH Low 5180 MHz)



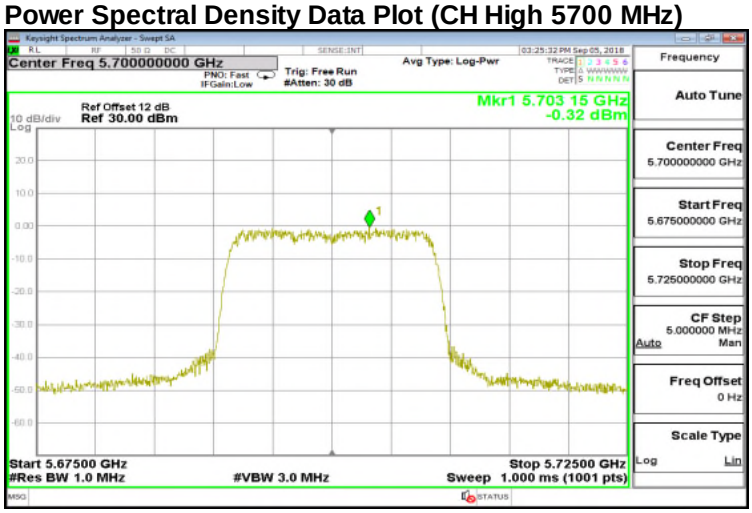
Power Spectral Density Data Plot (CH Mid 5580 MHz)



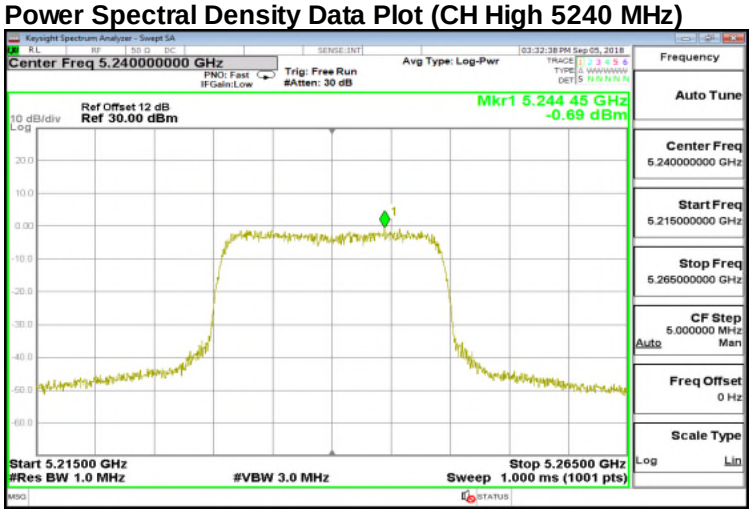
Power Spectral Density Data Plot (CH Mid 5220 MHz)



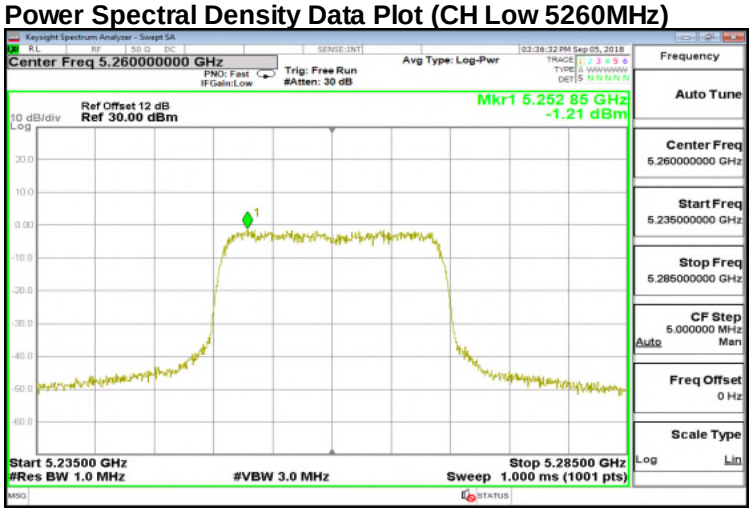
Power Spectral Density Data Plot (CH High 5700 MHz)



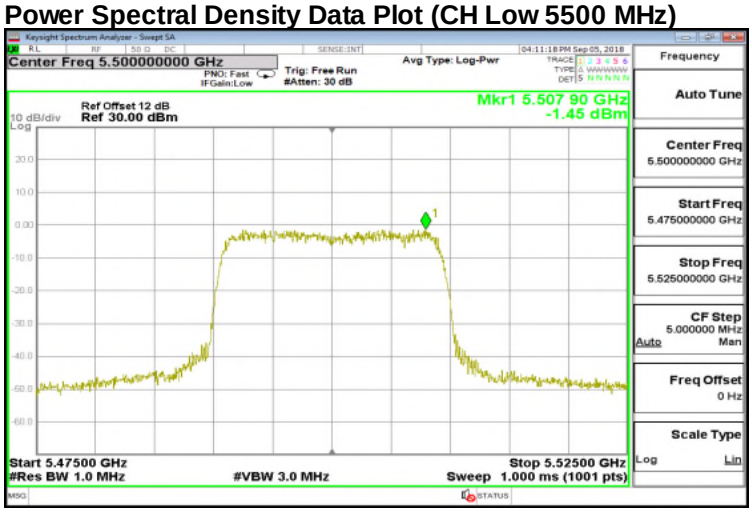
Power Spectral Density Data Plot (CH High 5240 MHz)



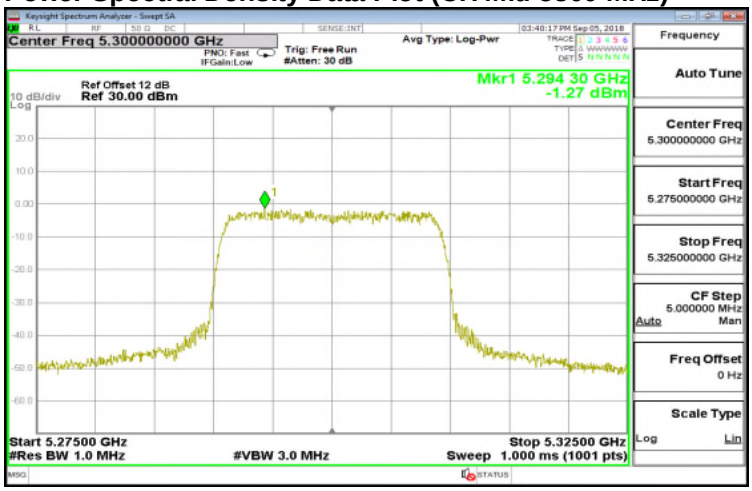
802.11n HT20, 5250~5350 MHz
Power Spectral Density Data Plot (CH Low 5260MHz)



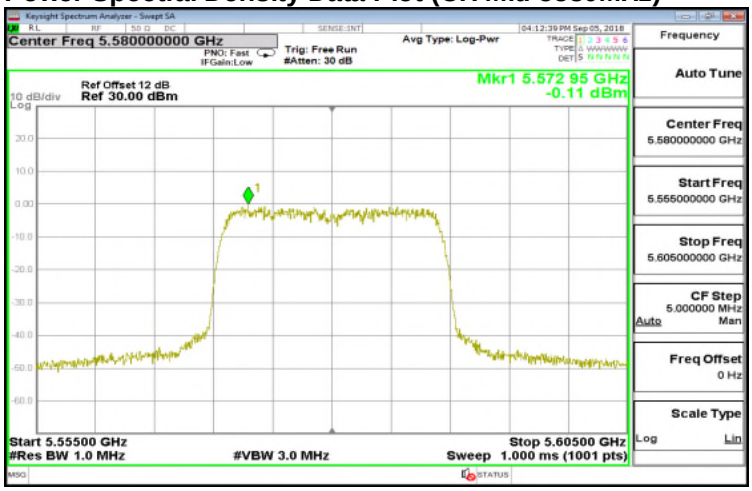
802.11n HT20, 5470~5725 MHz
Power Spectral Density Data Plot (CH Low 5500 MHz)



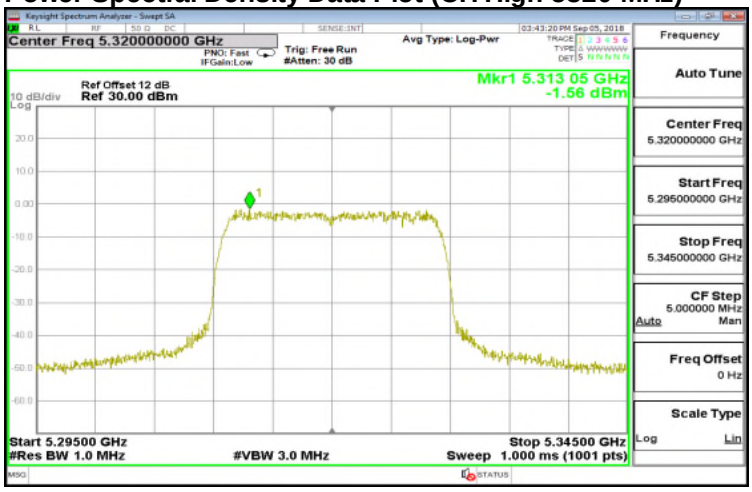
Power Spectral Density Data Plot (CH Mid 5300 MHz)



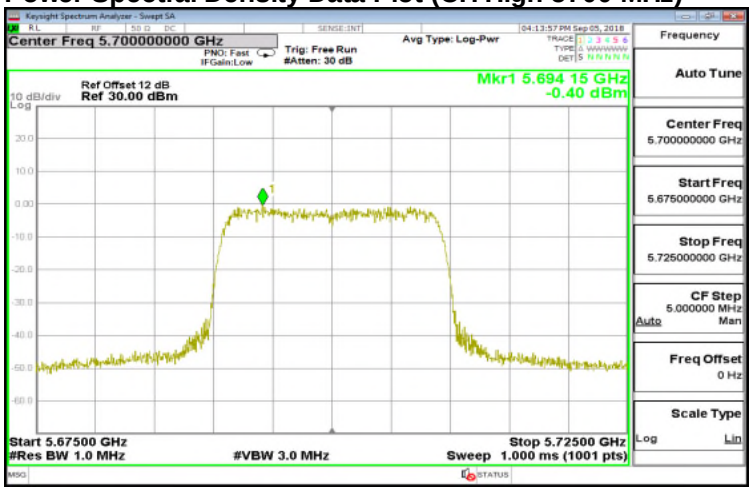
Power Spectral Density Data Plot (CH Mid 5580MHz)



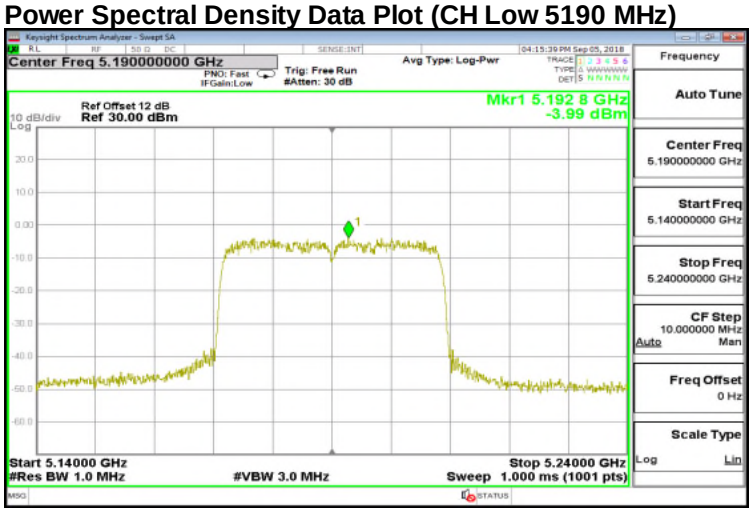
Power Spectral Density Data Plot (CH High 5320 MHz)



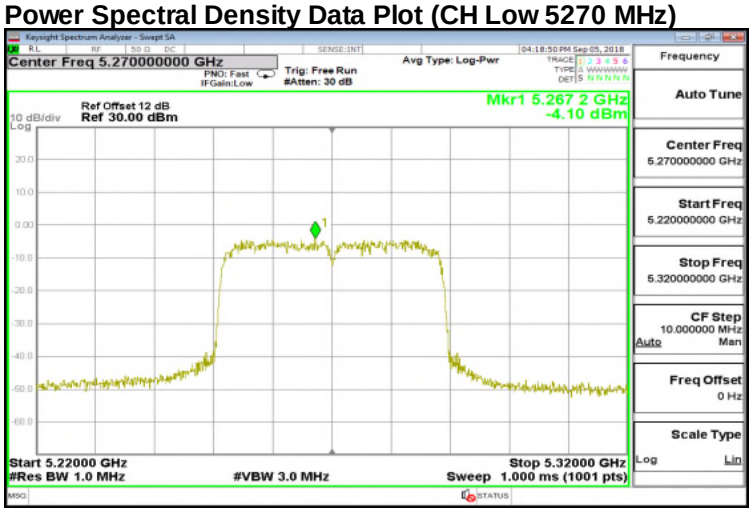
Power Spectral Density Data Plot (CH High 5700 MHz)



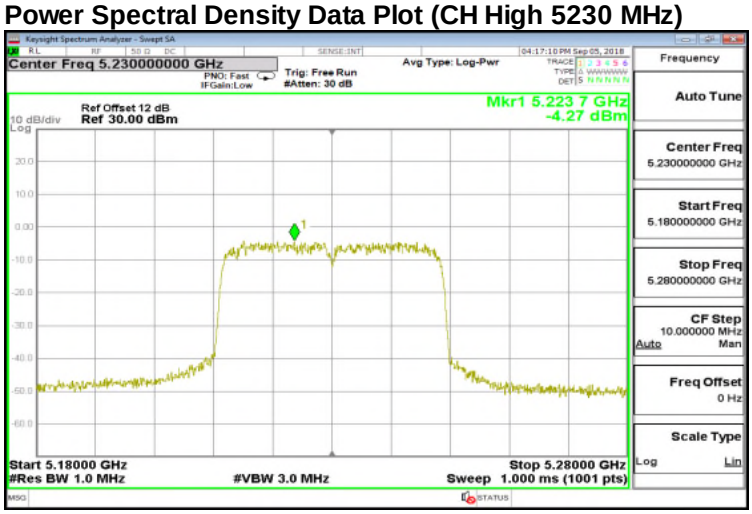
02.11n HT40, 5150~5250 MHz
Power Spectral Density Data Plot (CH Low 5190 MHz)



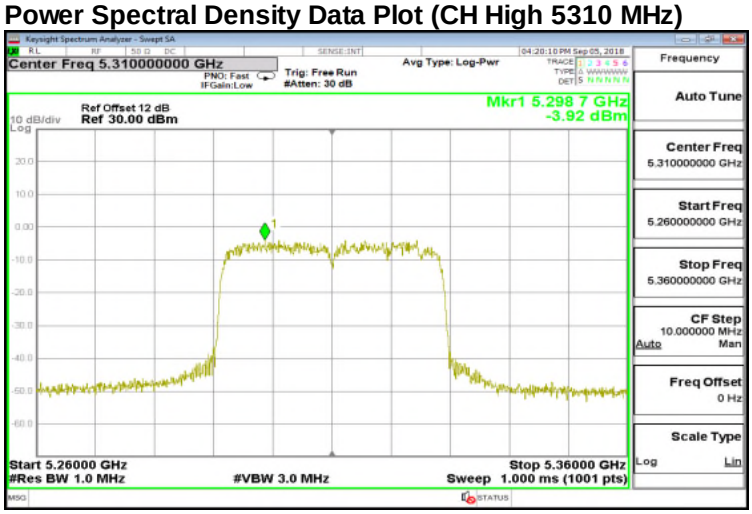
802.11n HT40, 5250~5350 MHz
Power Spectral Density Data Plot (CH Low 5270 MHz)



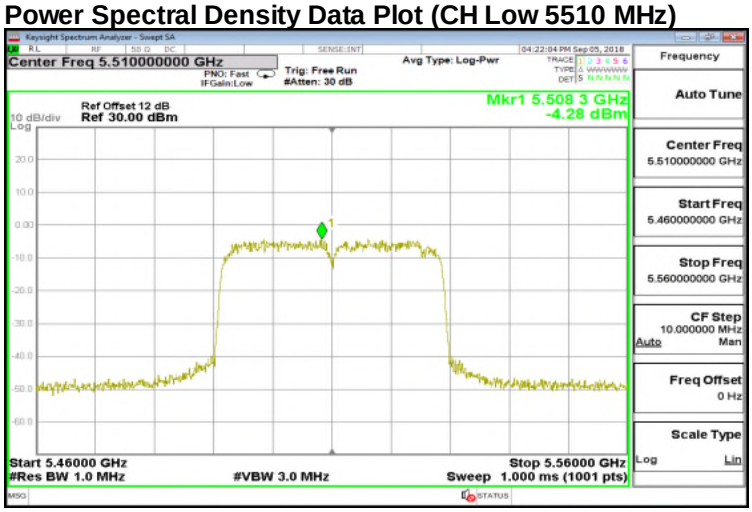
Power Spectral Density Data Plot (CH High 5230 MHz)



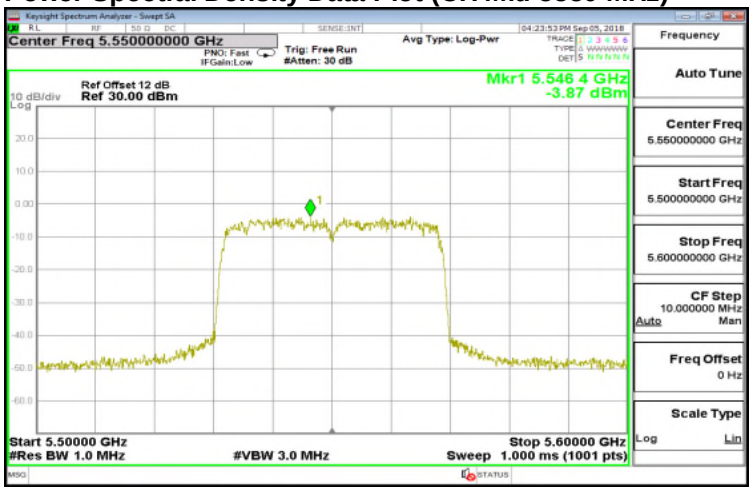
Power Spectral Density Data Plot (CH High 5310 MHz)



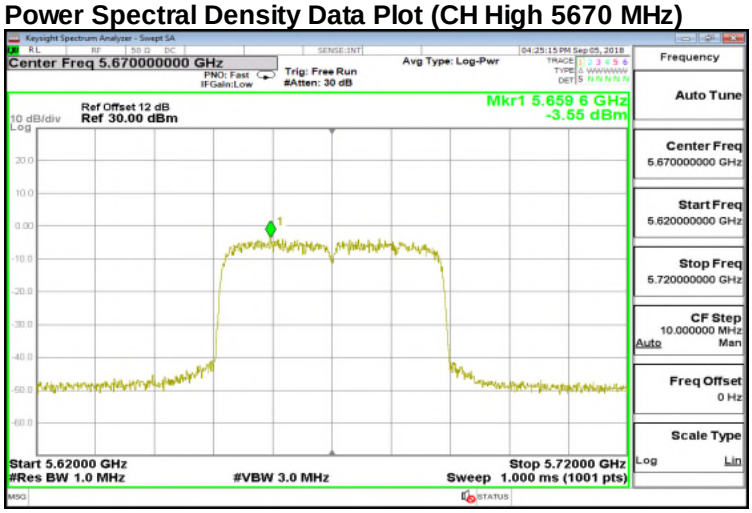
802.11n HT40, 5470~5725 MHz
Power Spectral Density Data Plot (CH Low 5510 MHz)



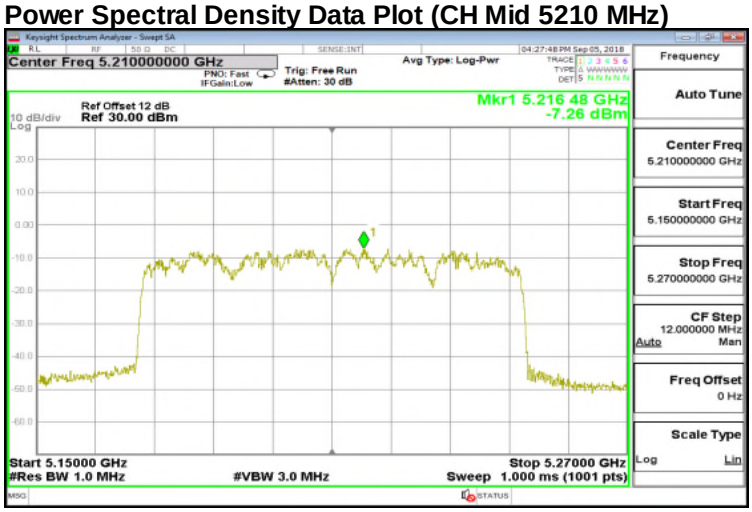
Power Spectral Density Data Plot (CH Mid 5550 MHz)



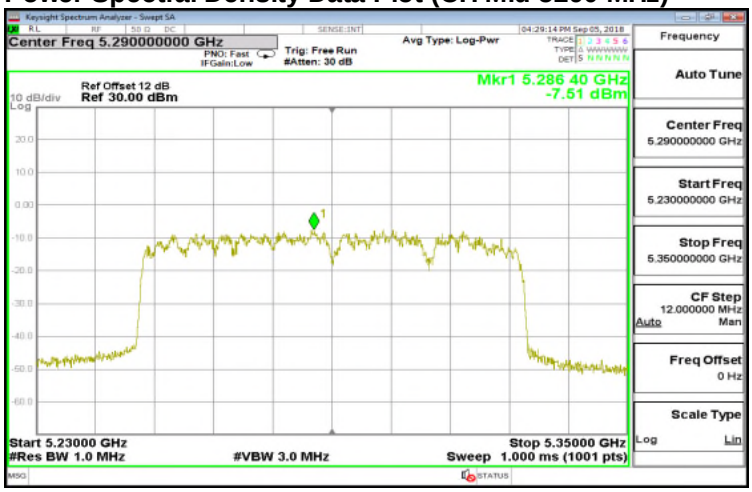
Power Spectral Density Data Plot (CH High 5670 MHz)



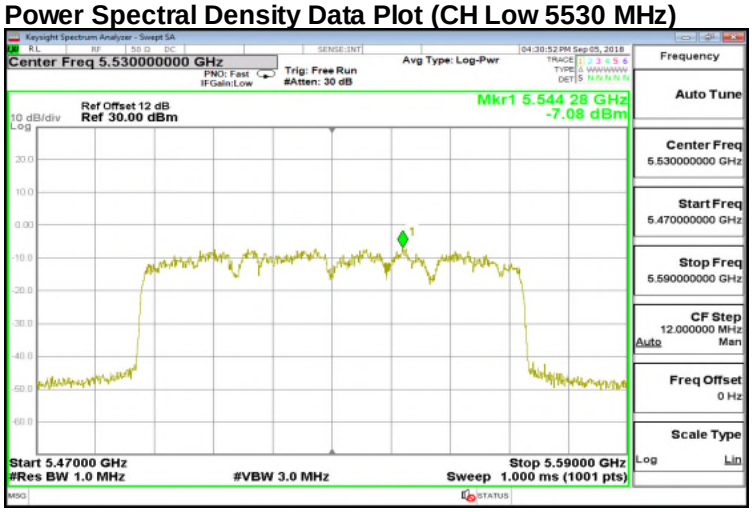
802.11ac VHT80, 5150~5250 MHz
Power Spectral Density Data Plot (CH Mid 5210 MHz)



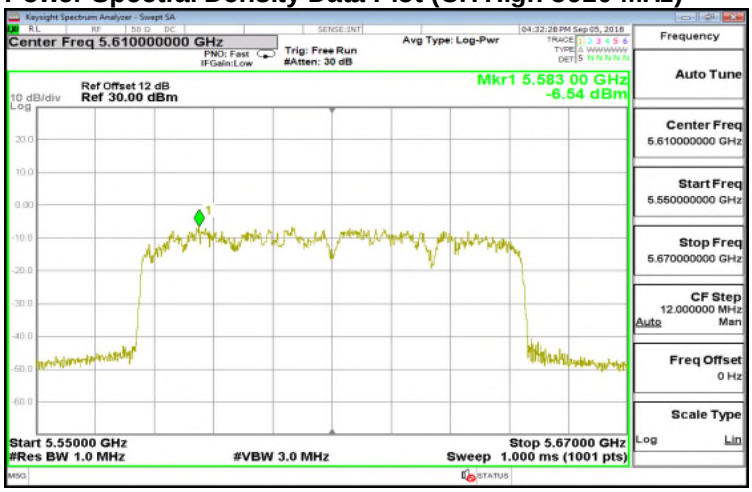
802.11ac VHT80, 5250~5350 MHz
Power Spectral Density Data Plot (CH Mid 5290 MHz)



802.11ac VHT80, 5470~5725 MHz
Power Spectral Density Data Plot (CH Low 5530 MHz)



802.11ac VHT80, 5470~5725 MHz
Power Spectral Density Data Plot (CH High 5610 MHz)



11 UNDESIRABLE RADIATED EMISSION MEASUREMENT

11.1 Standard Applicable

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

1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

2. For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

EIRP = ((E*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.

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

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

Note:

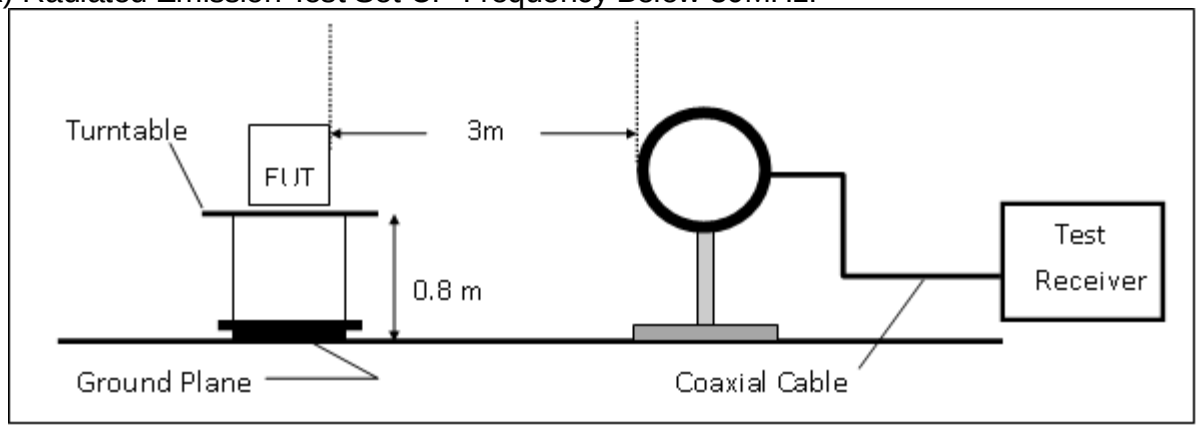
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (dBμV/m)

11.2 Measurement Equipment Used

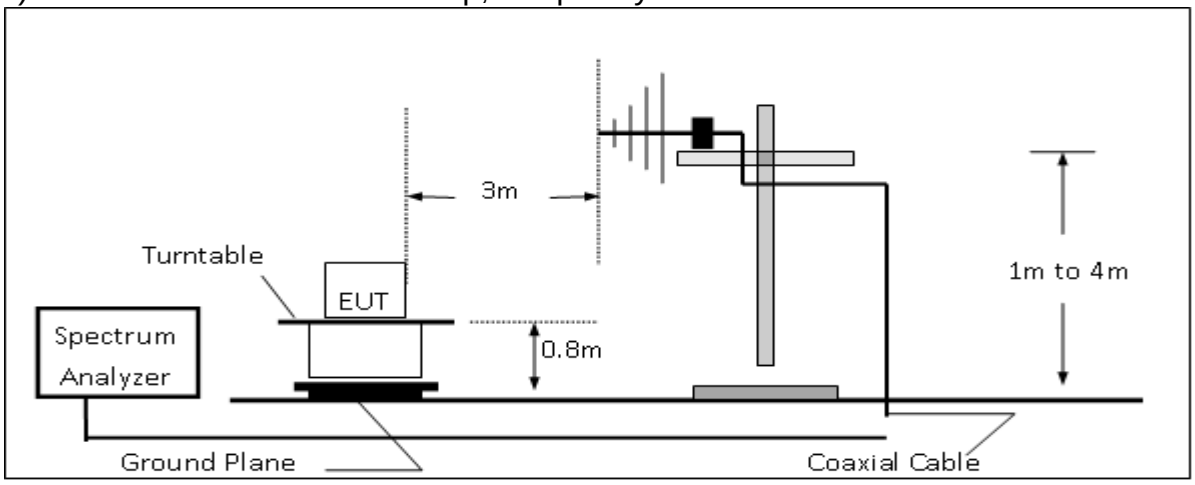
SGS SAC-III					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Bi-log Antenna	SCHWAZBECK	VULB9168	378	Dec. 29th, 2017	Dec. 28th, 2018
Horn Antenna	Schwarzbeck	BBHA9120D	1441	Aug. 16th, 2018	Aug. 15th, 2019
Horn Antenna	Schwarzbeck	BBHA9170	184	Dec. 12th, 2017	Dec. 11th, 2018
Loop Antenna	ETS.LINDGREN	6502	148045	Sep. 26th, 2017	Sep. 25th, 2018
3m Site NSA	SGS	966 chamber	N/A	Jan. 02nd, 2018	Jan. 01st, 2019
Spectrum Analyzer	Agilent	E4446A	MY51100003	May 15th, 2018	May 14th, 2019
EMI Test Receiver	R&S	ESCI7	100335	Feb. 02nd, 2018	Feb. 01st, 2019
Pre-Amplifier	HP	8449B	3008A00578	Jan. 02nd, 2018	Jan. 01st, 2019
Pre-Amplifier	HP	8447D	2944A07676	Jan. 02nd, 2018	Jan. 01st, 2019
Pre-Amplifier	EMC Instruments	EMC184045B	980135	Oct. 27th, 2017	Oct. 26th, 2018
Attenuator	Mini-Circuit	BW-S10W2+	2	Jan. 02nd, 2018	Jan. 01st, 2019
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	Jan. 02nd, 2018	Jan. 01st, 2019
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	Jan. 02nd, 2018	Jan. 01st, 2019
Low Loss Cable	Huber Suhner	966_RX	9	Jan. 02nd, 2018	Jan. 01st, 2019
Notebook	Lenovo	L430	R9-X11BG	N/A	N/A

11.3 Test SET-UP

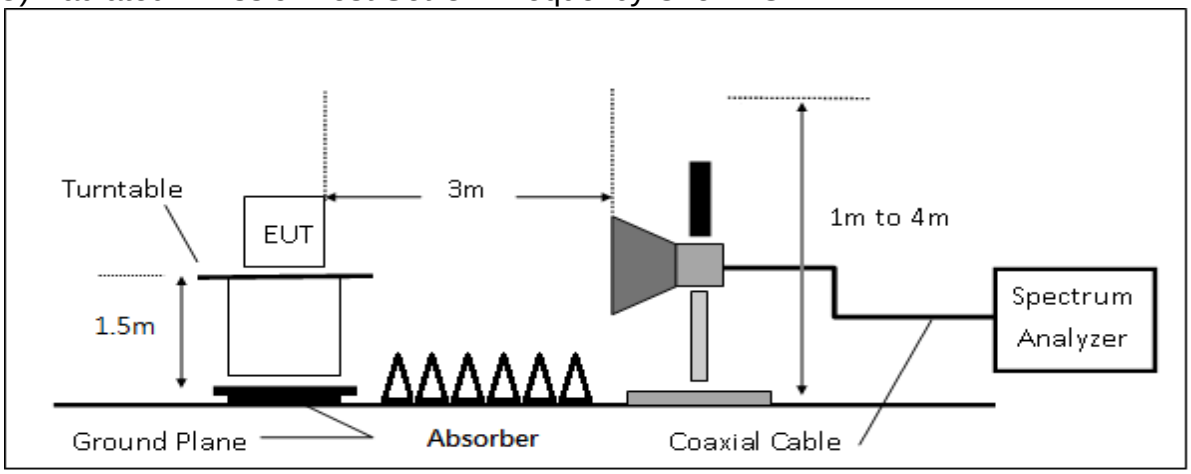
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



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



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



11.4 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
3. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
4. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
5. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW ≥ 1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
9. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
11. Repeat above procedures until all frequency measured were complete.

11.5 Field Strength Calculation

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

FS = RA + AF + CL - AG

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

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)
Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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

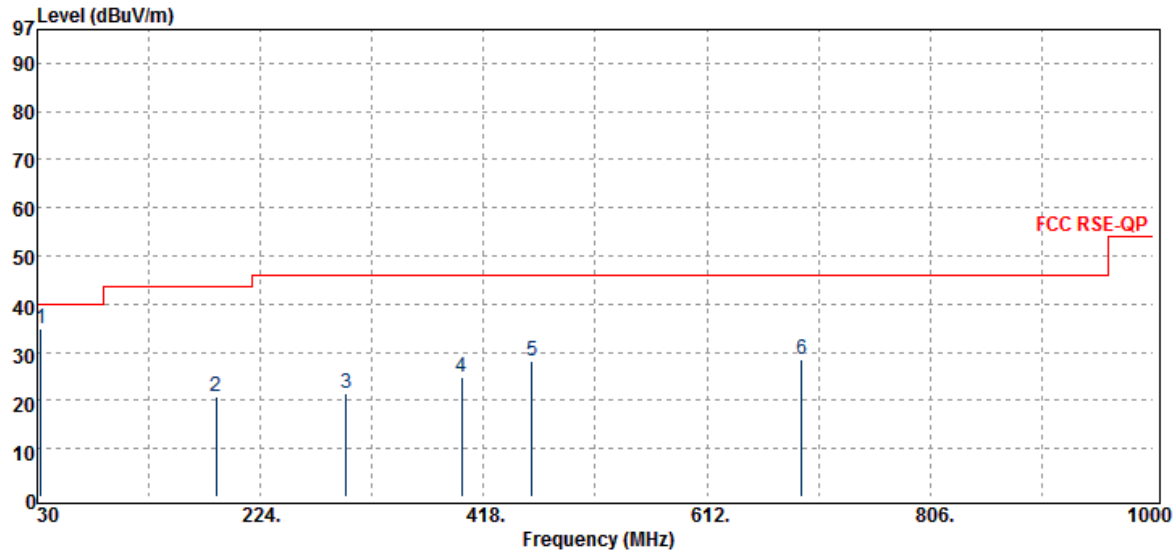
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

11.7 Measurement Result

Refer to attach tabular data sheets.

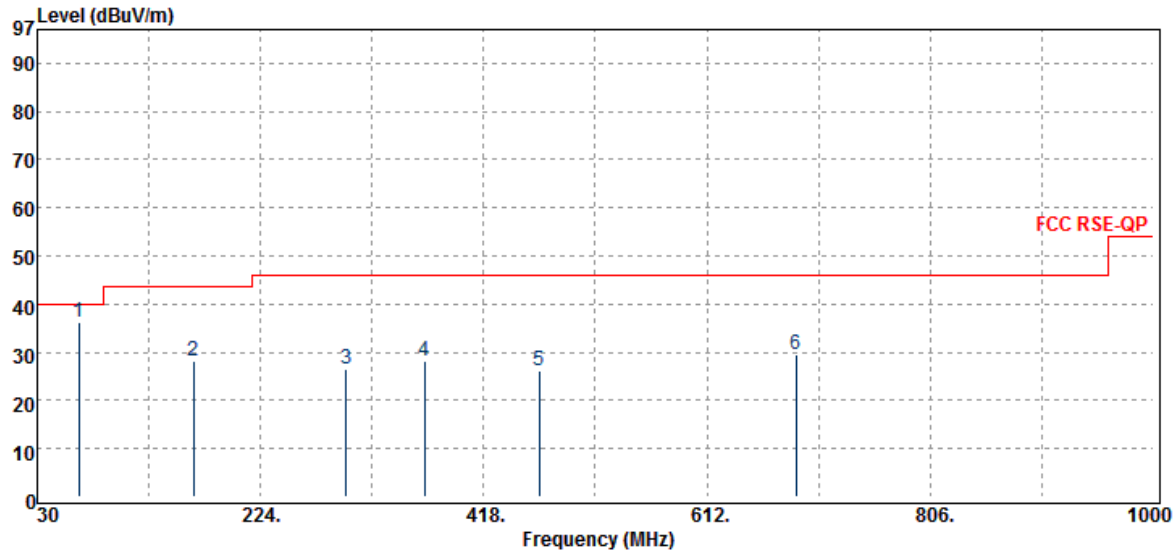
Radiated Spurious Emission Measurement Result
Below 1GHz Worst-Case Data:
802.11a 5150~5250 MHz

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	43.72	-8.82	34.90	40.00	-5.10
185.20	Peak	29.49	-8.64	20.85	43.50	-22.65
298.69	Peak	26.92	-5.55	21.37	46.00	-24.63
398.60	Peak	28.25	-3.41	24.84	46.00	-21.16
459.71	Peak	30.53	-2.46	28.07	46.00	-17.93
694.45	Peak	27.69	0.94	28.63	46.00	-17.37

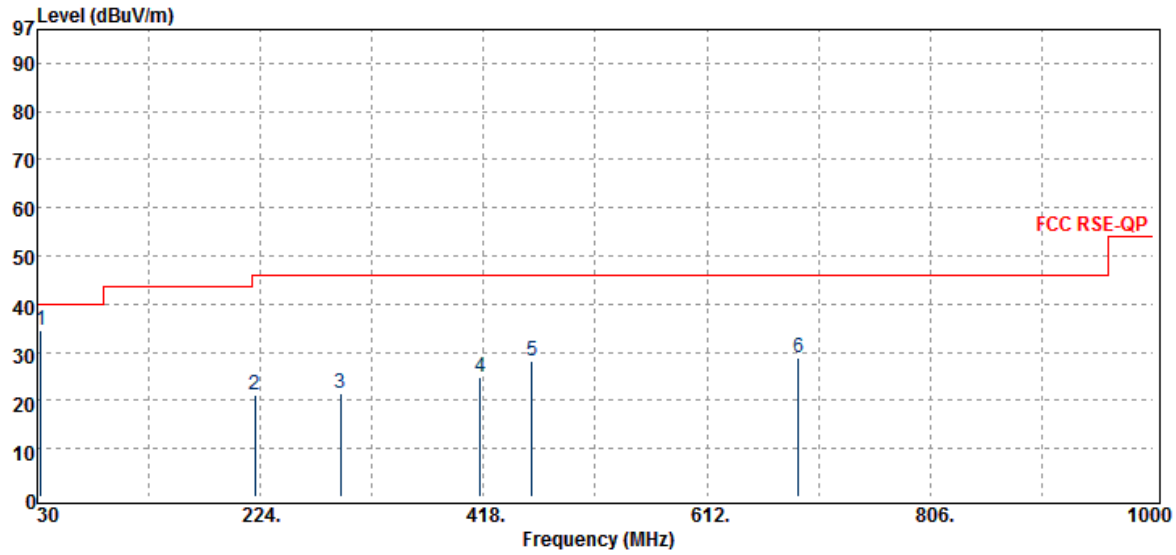
Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	45.45	-9.20	36.25	40.00	-3.75
165.80	Peak	35.50	-7.32	28.18	43.50	-15.32
298.69	Peak	31.92	-5.55	26.37	46.00	-19.63
366.59	Peak	32.32	-4.02	28.30	46.00	-17.70
466.50	Peak	28.33	-2.07	26.26	46.00	-19.74
689.60	Peak	27.82	1.88	29.70	46.00	-16.30

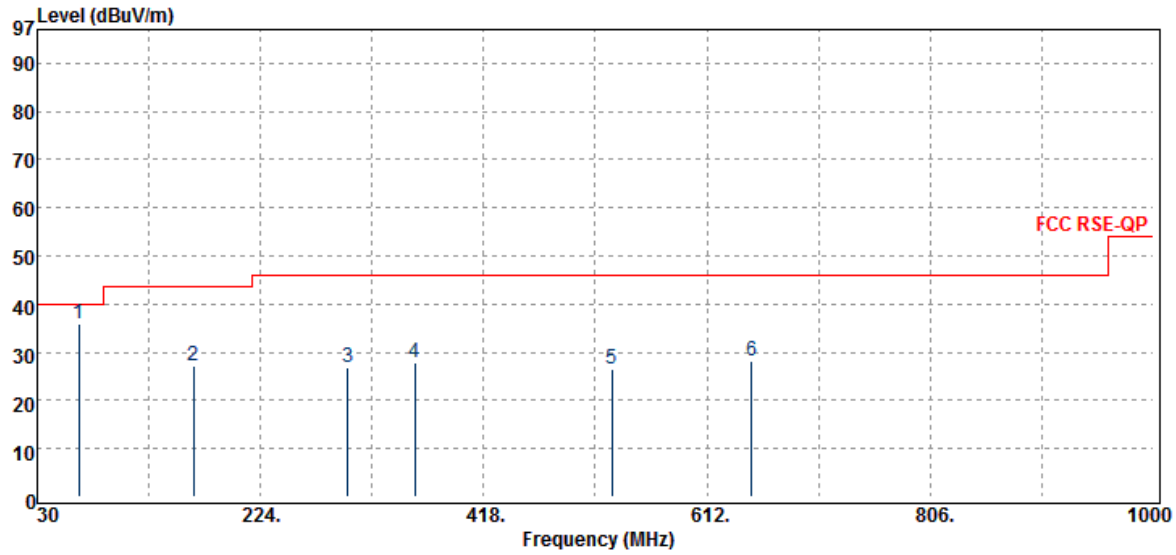
802.11a 5250~5350 MHz

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	43.24	-8.82	34.42	40.00	-5.58
219.15	Peak	30.07	-9.08	20.99	46.00	-25.01
293.84	Peak	27.30	-5.69	21.61	46.00	-24.39
415.09	Peak	27.70	-2.95	24.75	46.00	-21.25
459.71	Peak	30.66	-2.46	28.20	46.00	-17.80
691.54	Peak	27.23	1.57	28.80	46.00	-17.20

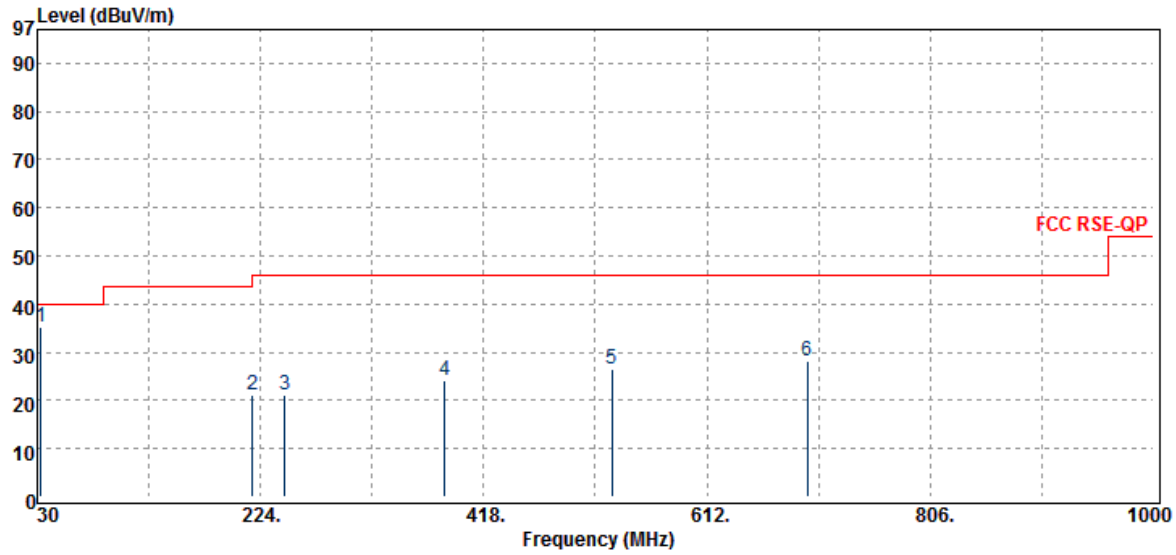
Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	45.18	-9.20	35.98	40.00	-4.02
165.80	Peak	34.65	-7.32	27.33	43.50	-16.17
299.66	Peak	32.40	-5.52	26.88	46.00	-19.12
357.86	Peak	32.25	-4.22	28.03	46.00	-17.97
529.55	Peak	27.72	-1.18	26.54	46.00	-19.46
650.80	Peak	27.79	0.50	28.29	46.00	-17.71

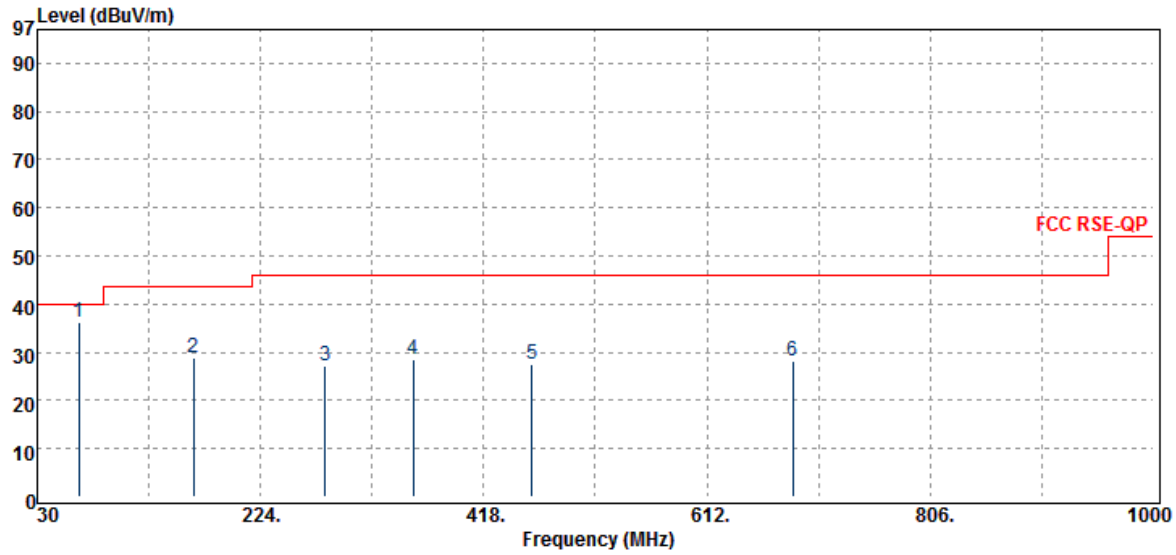
802.11a, 5470~5725 MHz

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5580 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	Peak	44.03	-8.82	35.21	40.00	-4.79
217.21	Peak	30.33	-9.12	21.21	46.00	-24.79
245.34	Peak	28.56	-7.49	21.07	46.00	-24.93
384.05	Peak	27.81	-3.79	24.02	46.00	-21.98
529.55	Peak	27.67	-1.18	26.49	46.00	-19.51
699.30	Peak	26.52	1.74	28.26	46.00	-17.74

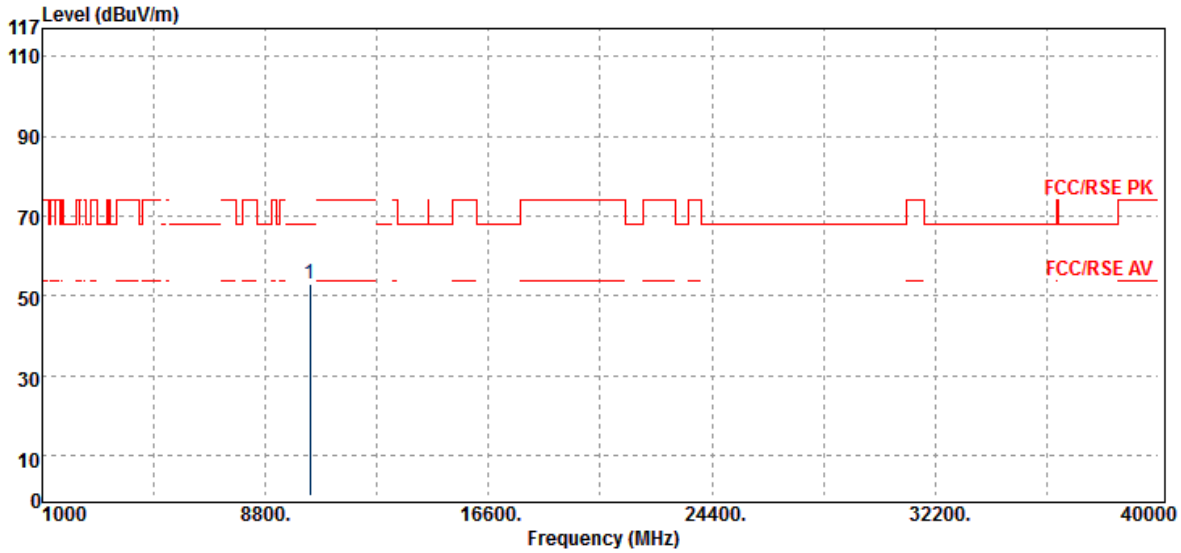
Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5580 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	45.30	-9.20	36.10	40.00	-3.90
165.80	Peak	36.31	-7.32	28.99	43.50	-14.51
280.26	Peak	33.35	-6.12	27.23	46.00	-18.77
356.89	Peak	32.64	-4.21	28.43	46.00	-17.57
459.71	Peak	30.10	-2.46	27.64	46.00	-18.36
686.69	Peak	26.58	1.70	28.28	46.00	-17.72

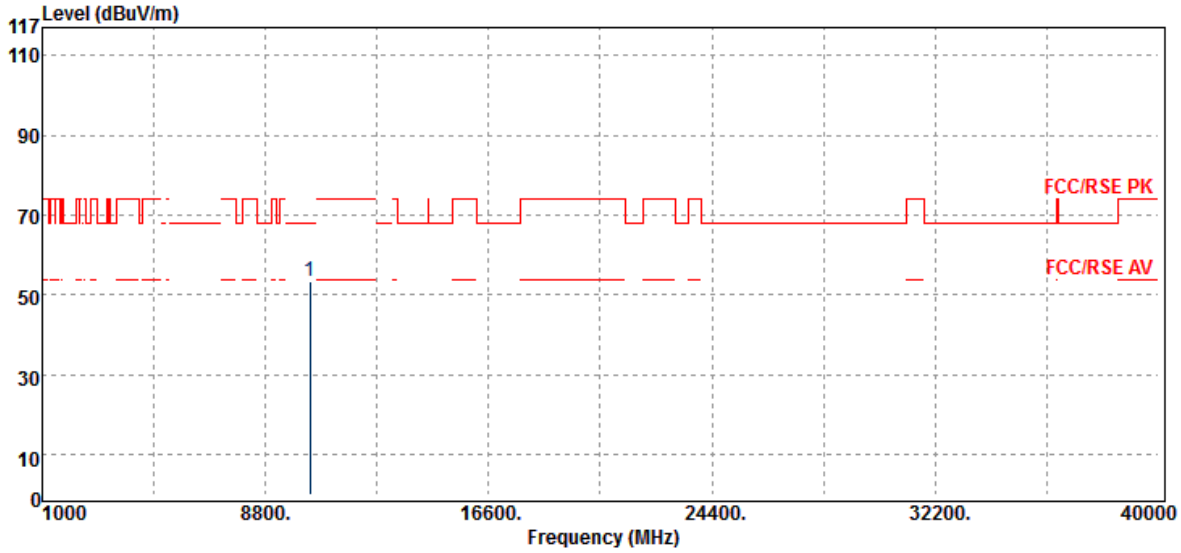
Above 1GHz Worst-Case Data:
Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5180 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



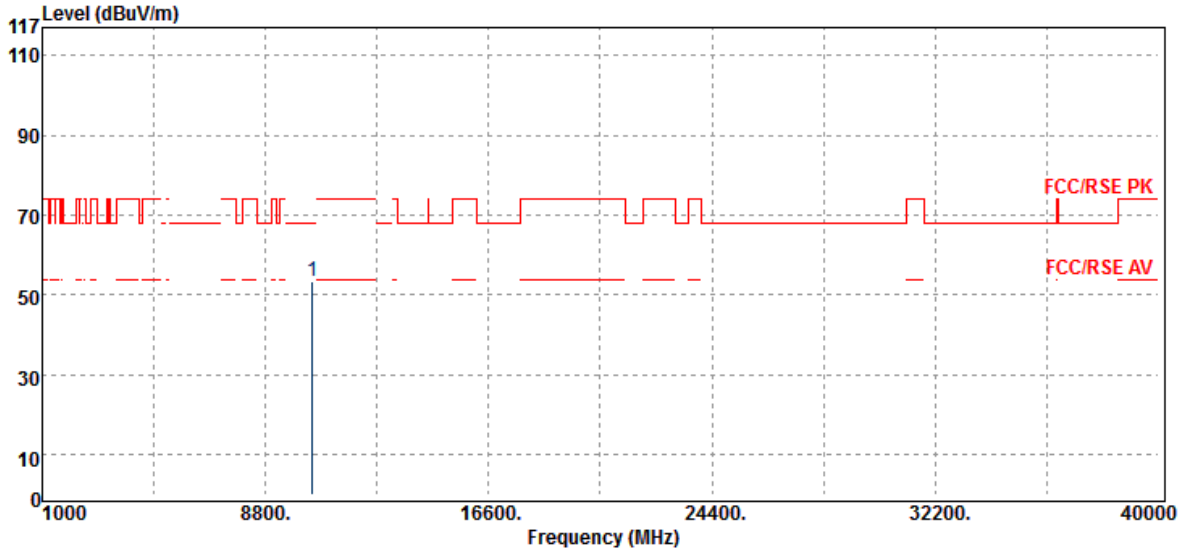
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	33.23	19.71	52.94	68.20	-15.26

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5180 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



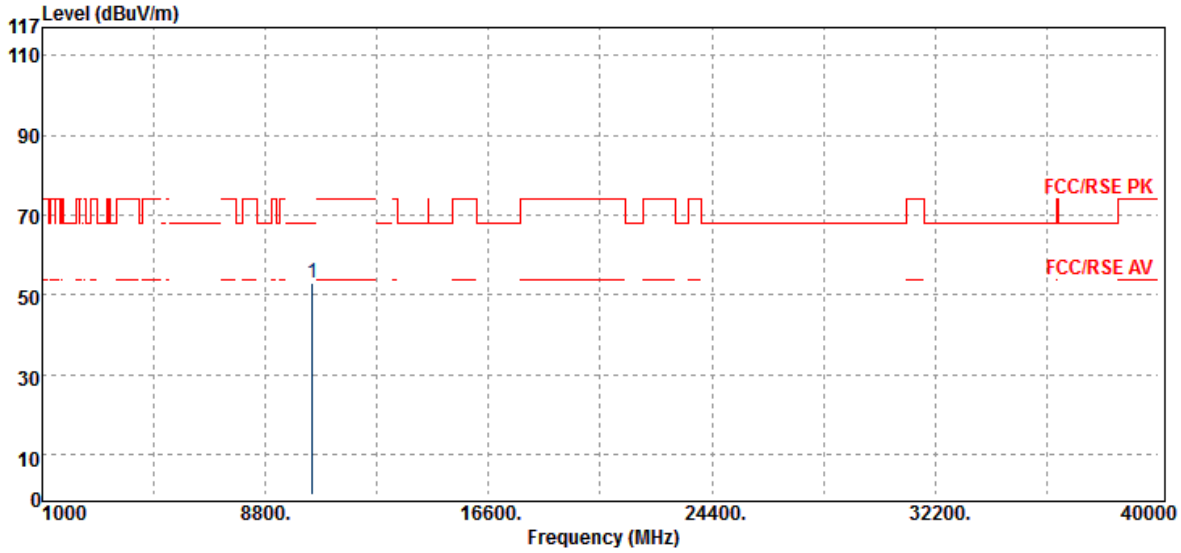
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	33.56	19.71	53.27	68.20	-14.93

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



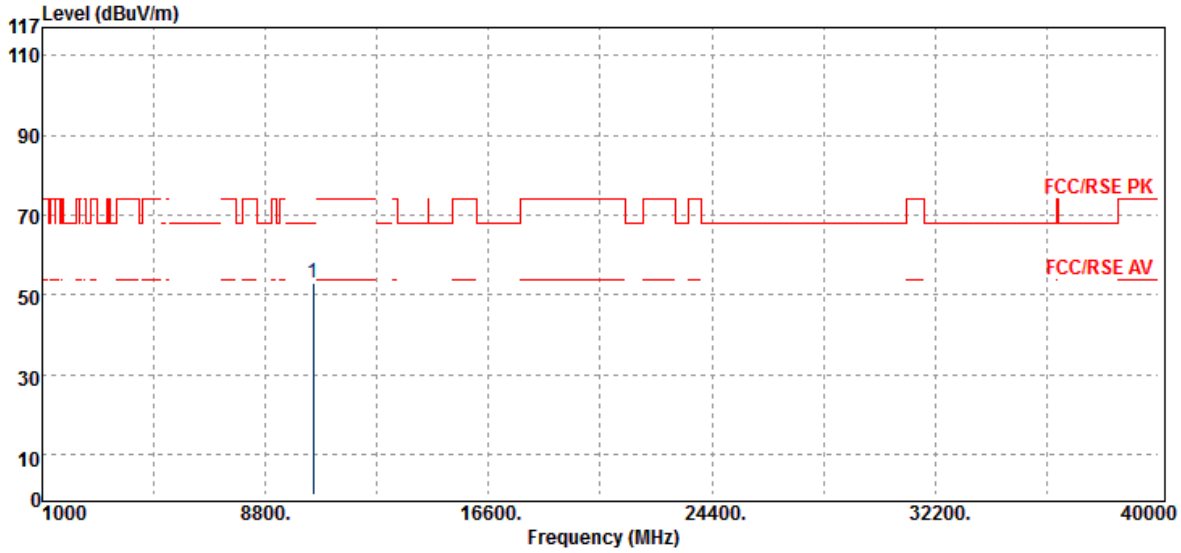
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	32.77	20.75	53.52	68.20	-14.68

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



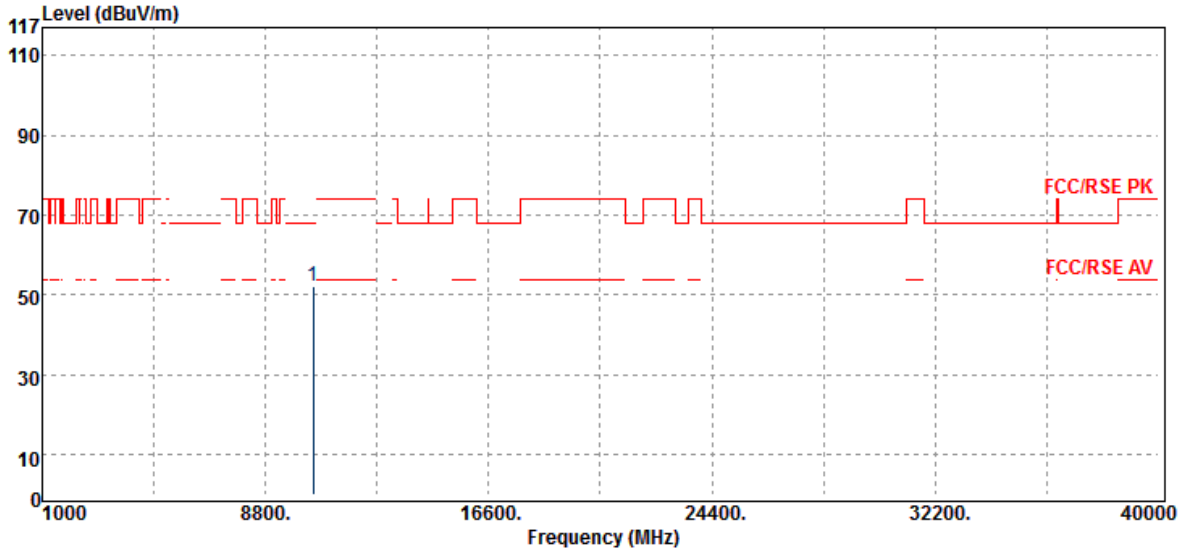
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	33.06	20.05	53.11	68.20	-15.09

Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5240 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	32.19	20.79	52.98	68.20	-15.22

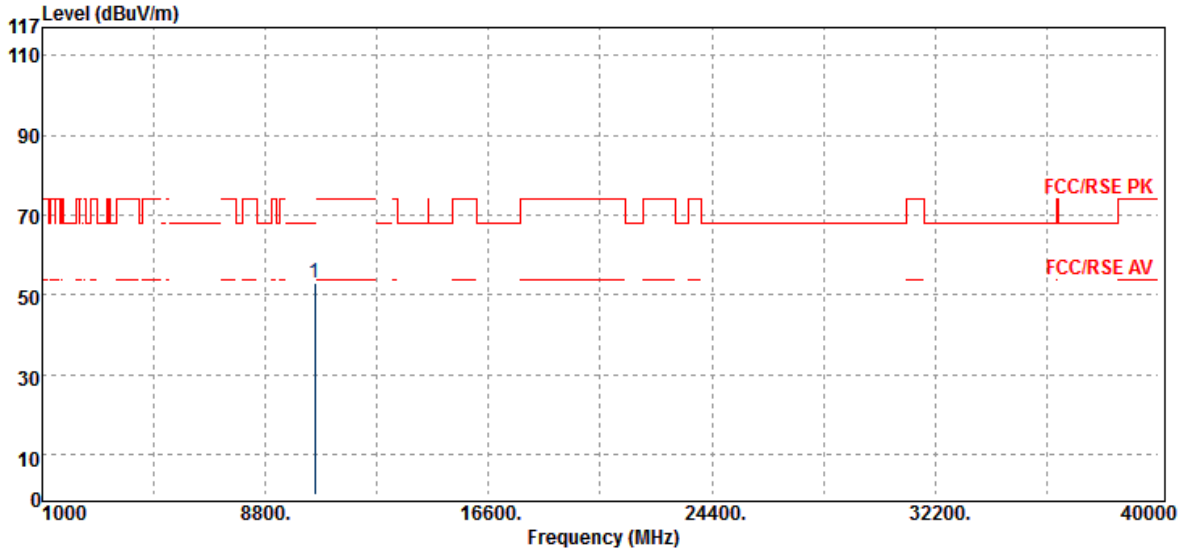
Operation Band	:802.11aB1	Test Date	:2018-08-30
Fundamental Frequency	:5240 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	32.11	20.07	52.18	68.20	-16.02

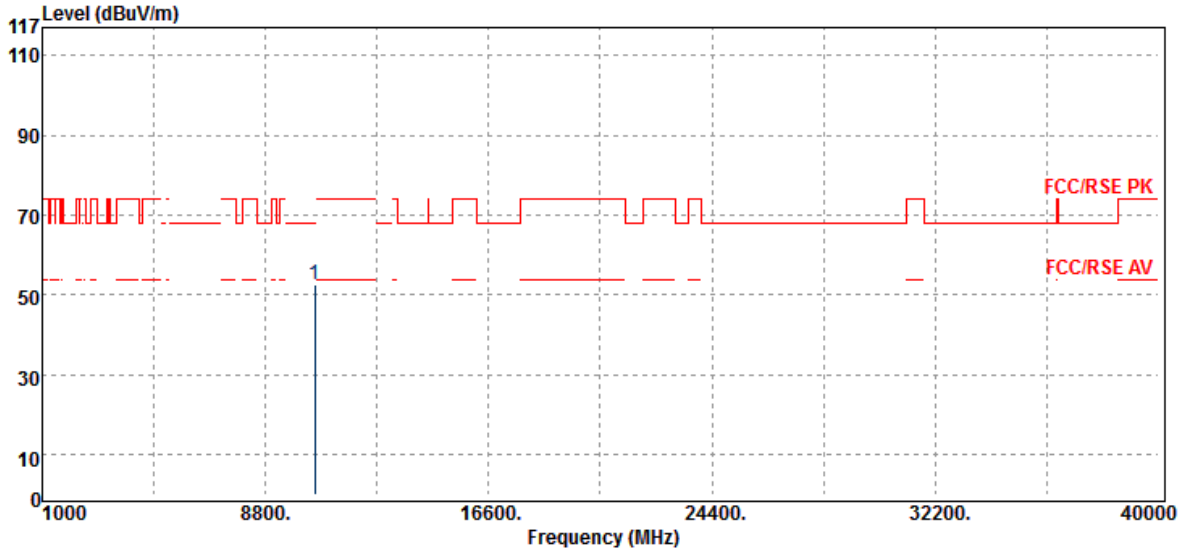
Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5260 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



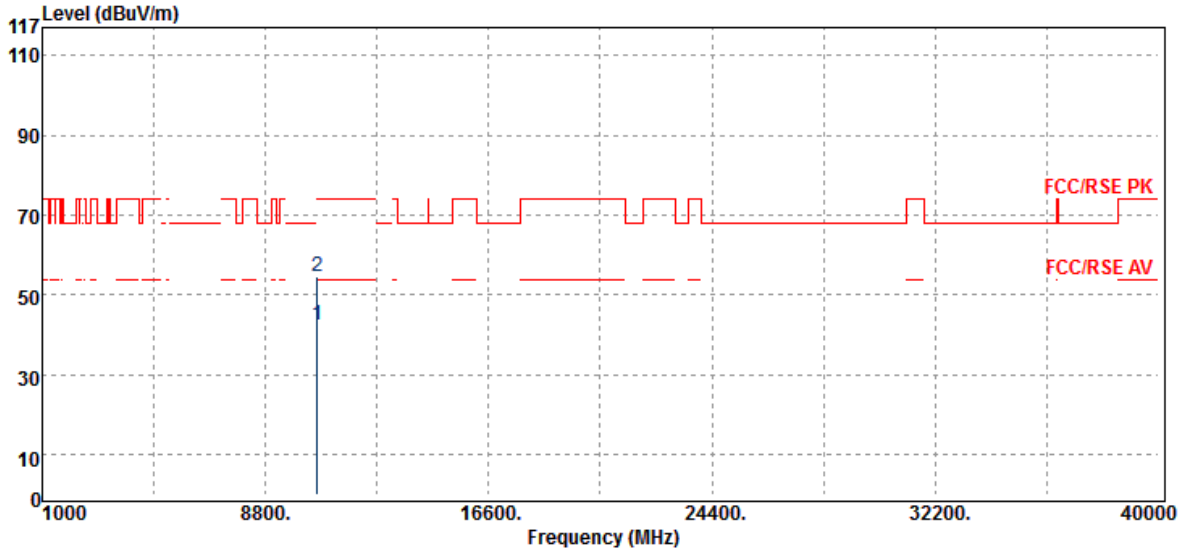
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Peak	32.22	20.78	53.00	68.20	-15.20

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5260 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



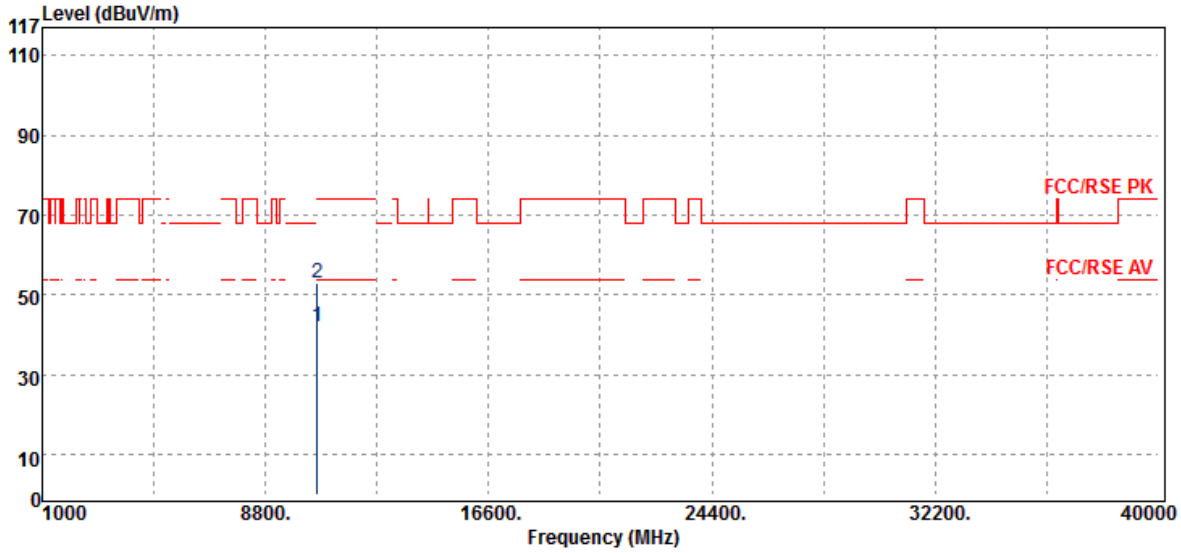
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Peak	32.74	20.00	52.74	68.20	-15.46

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



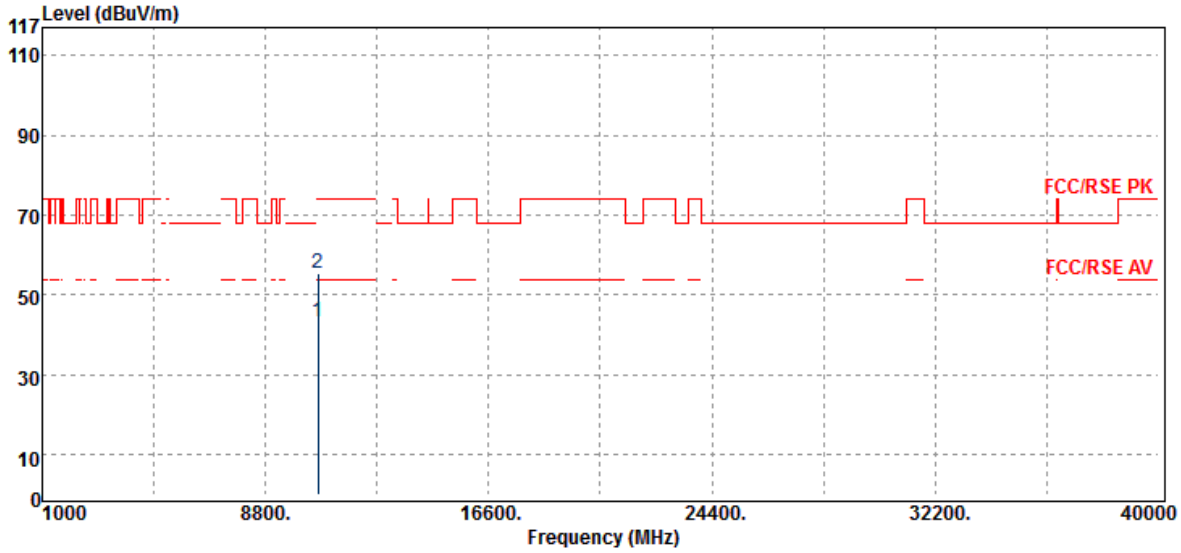
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	21.35	21.18	42.53	54.00	-11.47
10600.00	Peak	33.44	21.18	54.62	74.00	-19.38

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



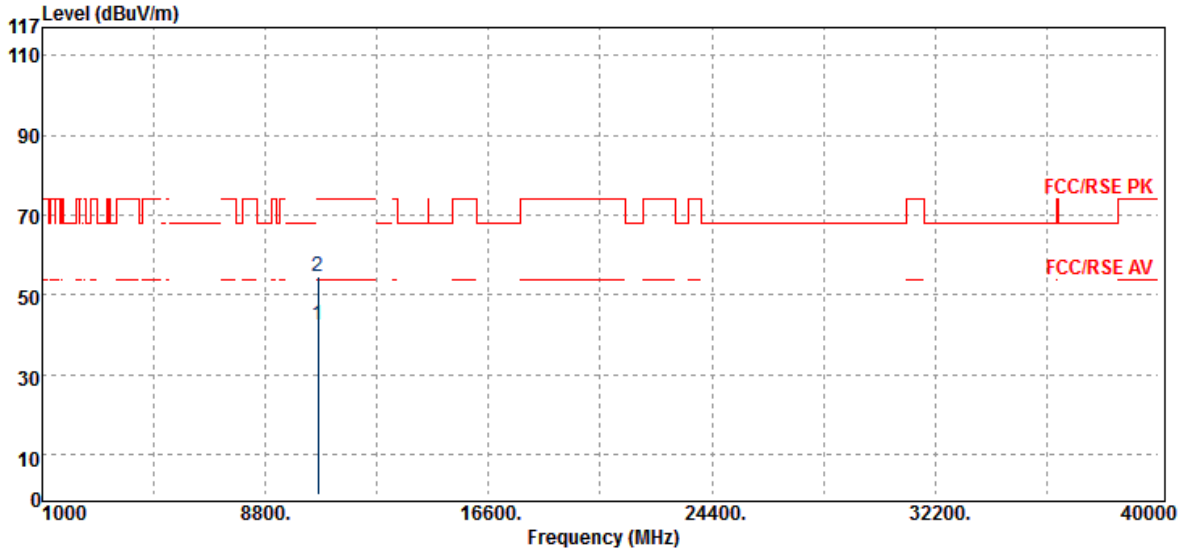
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	21.59	20.38	41.97	54.00	-12.03
10600.00	Peak	32.69	20.38	53.07	74.00	-20.93

Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5320 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	21.96	21.24	43.20	54.00	-10.80
10640.00	Peak	34.09	21.24	55.33	74.00	-18.67

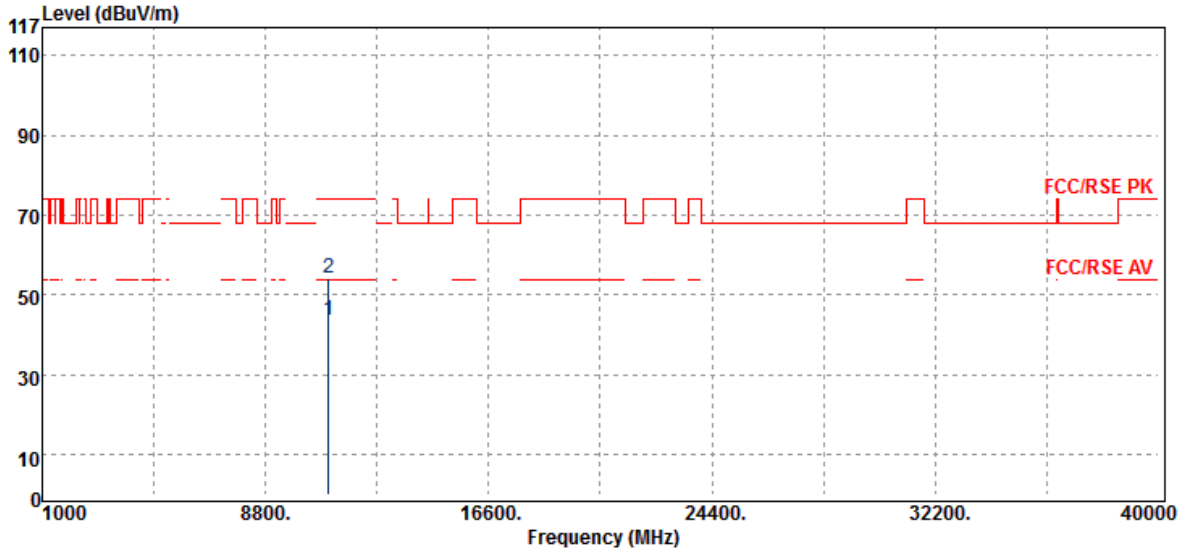
Operation Band	:802.11aB2	Test Date	:2018-08-30
Fundamental Frequency	:5320 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	22.09	20.44	42.53	54.00	-11.47
10640.00	Peak	34.13	20.44	54.57	74.00	-19.43

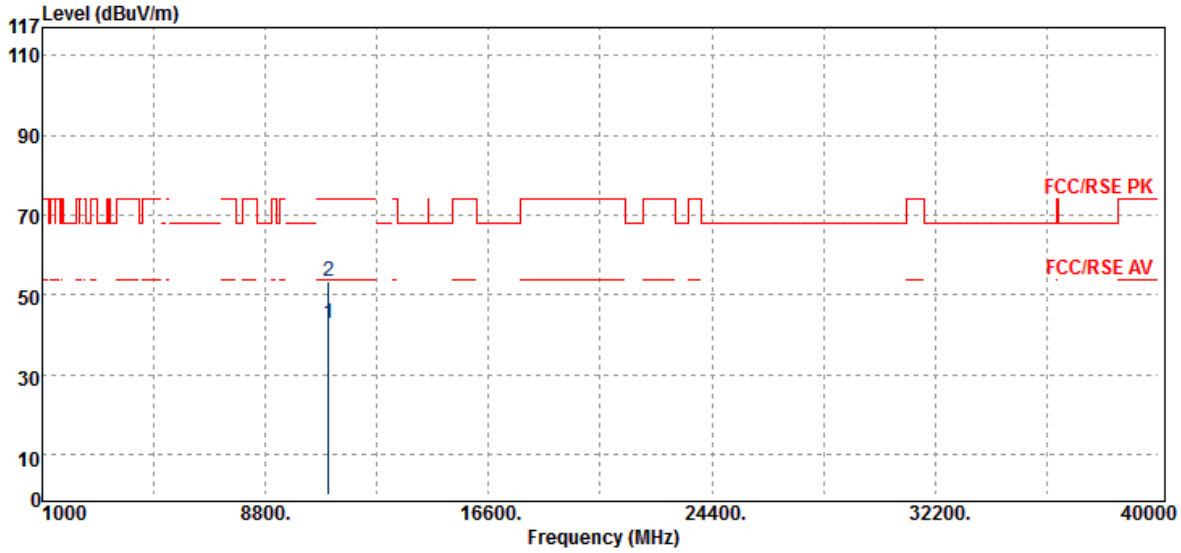
Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



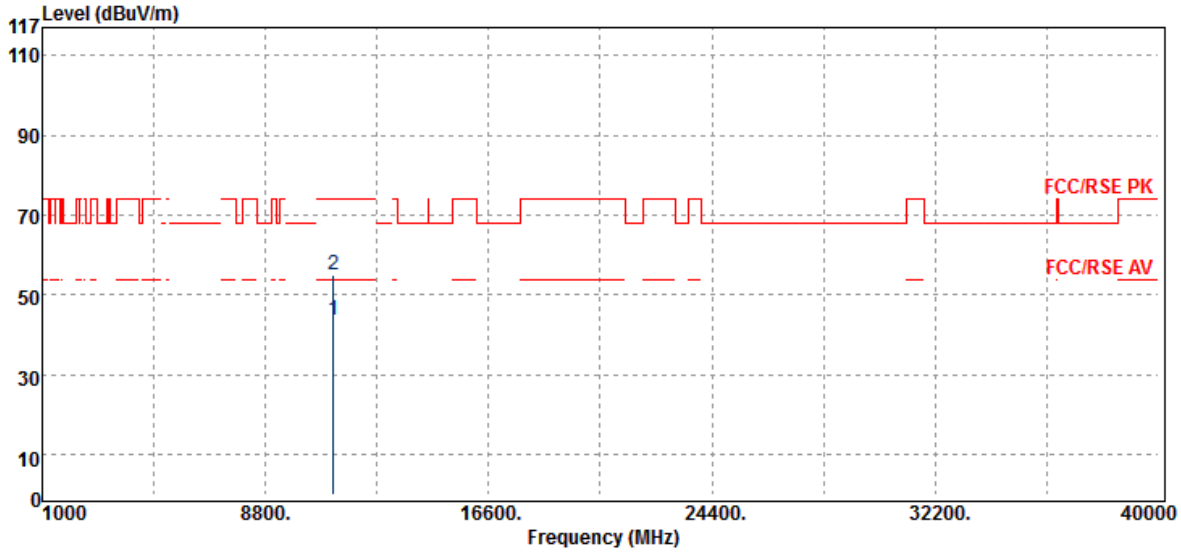
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.59	22.17	43.76	54.00	-10.24
11000.00	Peak	31.88	22.17	54.05	74.00	-19.95

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



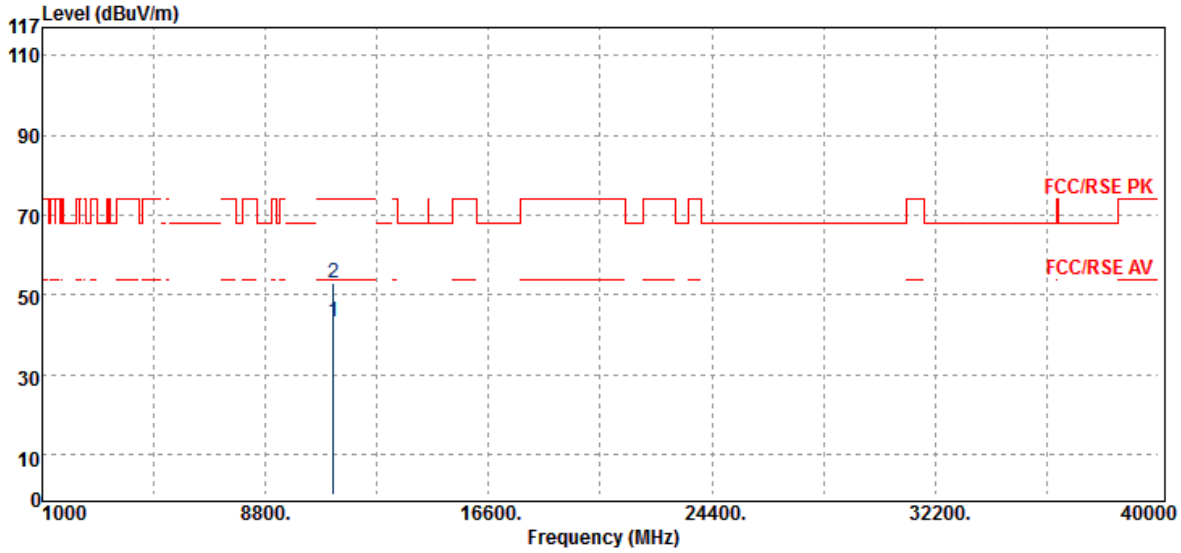
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.74	21.37	43.11	54.00	-10.89
11000.00	Peak	32.12	21.37	53.49	74.00	-20.51

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5580 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



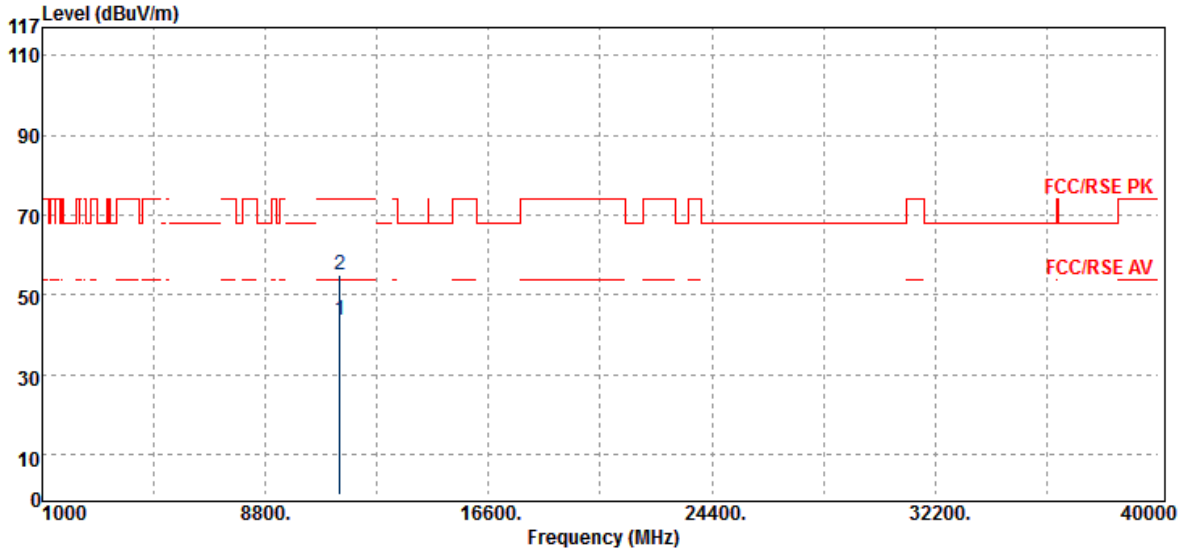
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.52	22.31	43.83	54.00	-10.17
11160.00	Peak	32.60	22.31	54.91	74.00	-19.09

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5580 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



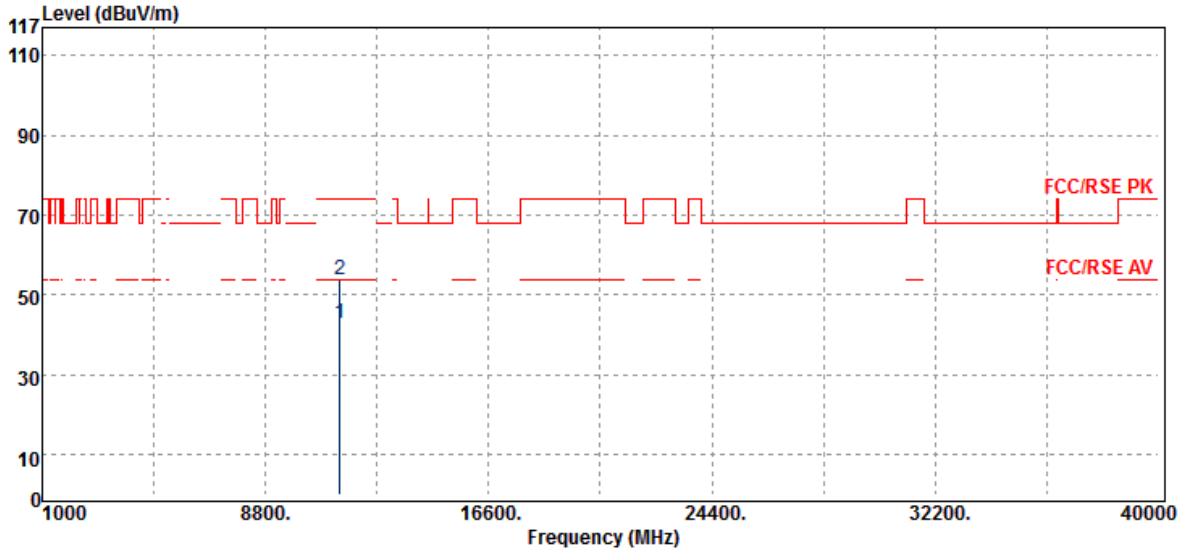
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.65	21.51	43.16	54.00	-10.84
11160.00	Peak	31.70	21.51	53.21	74.00	-20.79

Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Average	21.11	22.42	43.53	54.00	-10.47
11400.00	Peak	32.44	22.42	54.86	74.00	-19.14

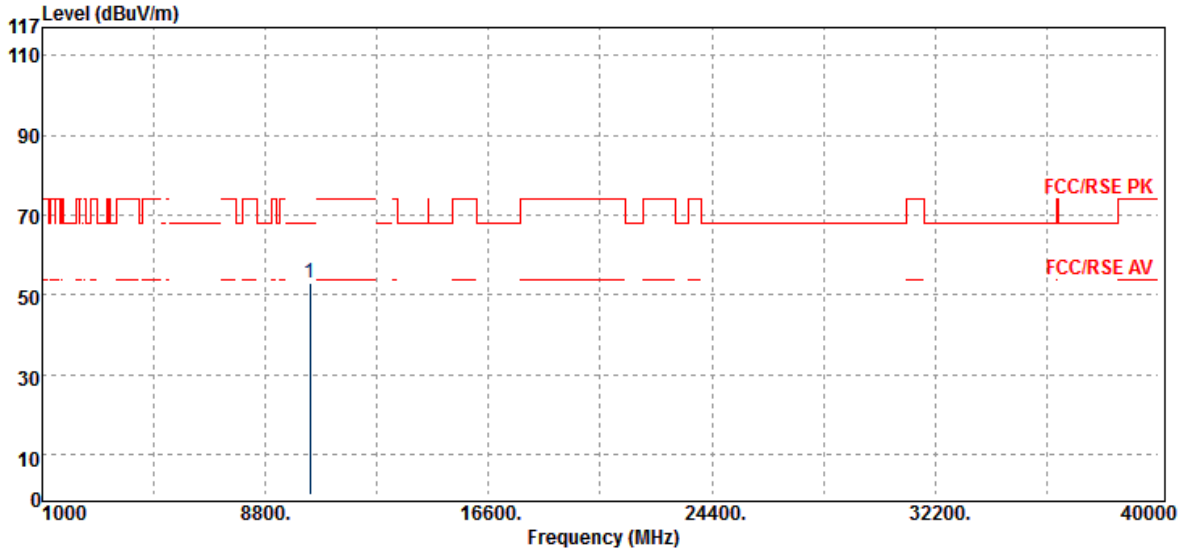
Operation Band	:802.11aB3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Average	21.31	21.62	42.93	54.00	-11.07
11400.00	Peak	32.41	21.62	54.03	74.00	-19.97

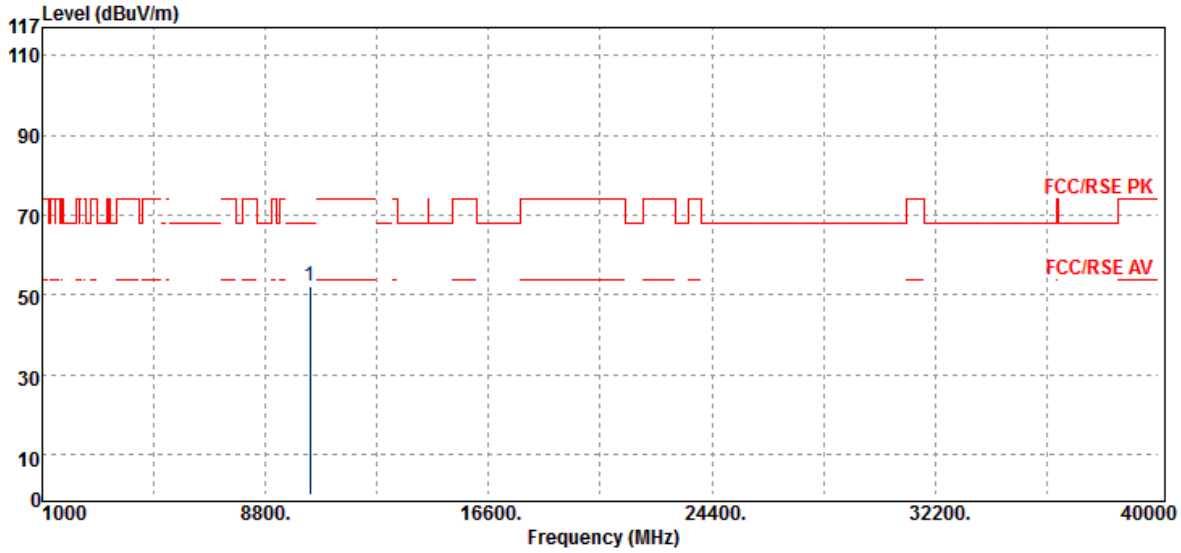
Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz

Operation Band	:802.11n20B1	Test Date	:2018-08-30
Fundamental Frequency	:5180 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



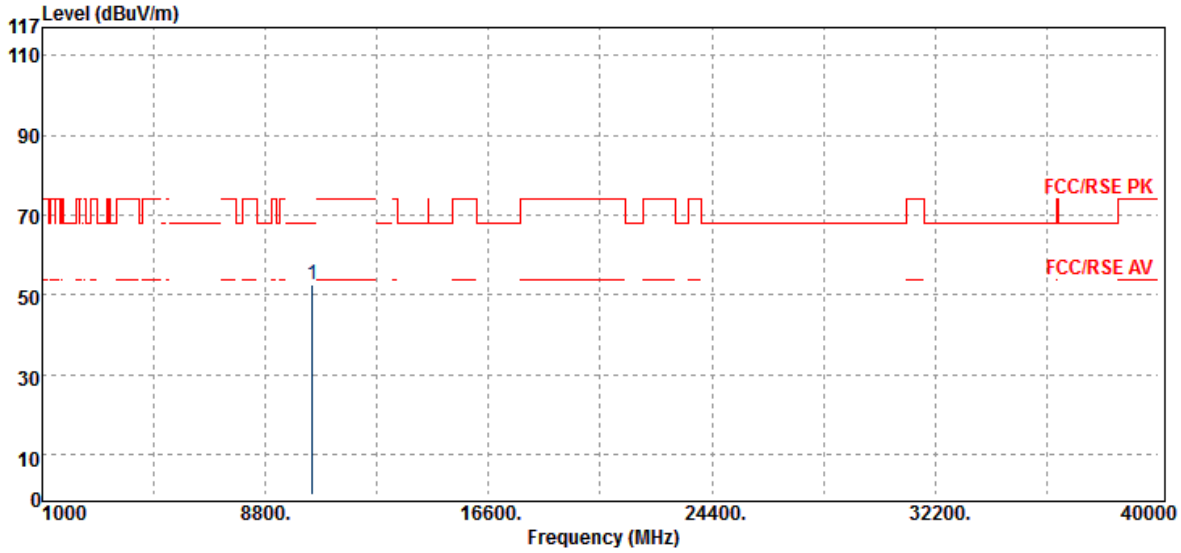
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	32.43	20.41	52.84	68.20	-15.36

Operation Band	:802.11n20B1	Test Date	:2018-08-30
Fundamental Frequency	:5180 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



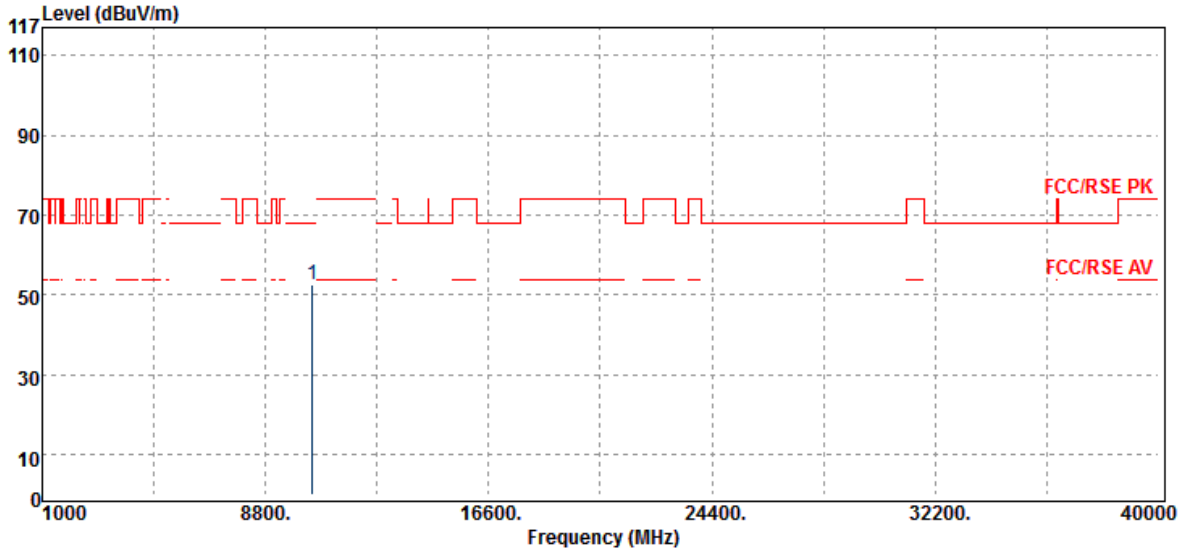
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10360.00	Peak	32.64	19.71	52.35	68.20	-15.85

Operation Band	:802.11n20B1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



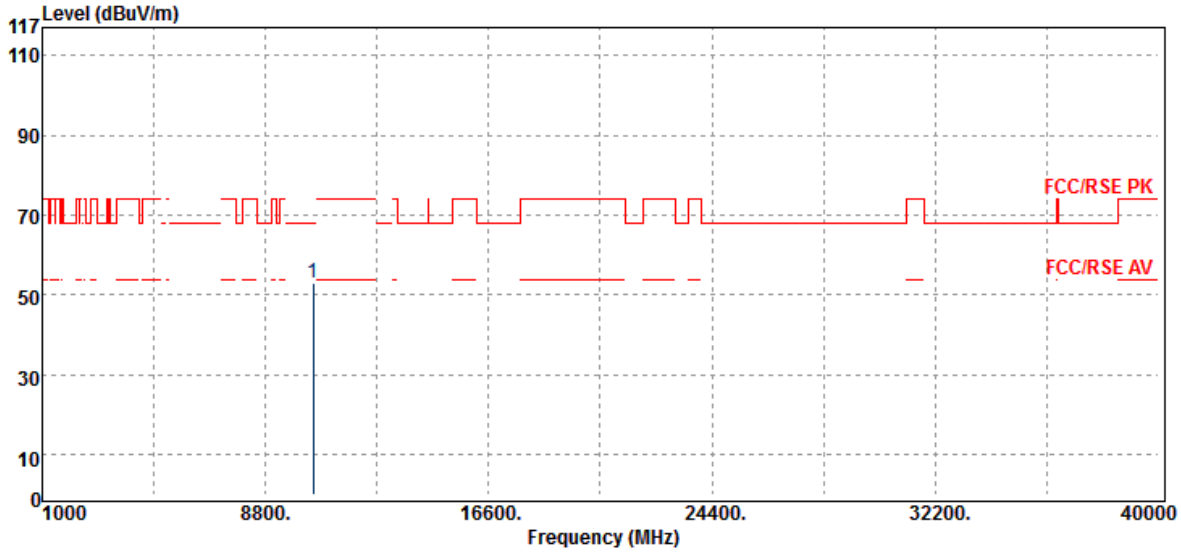
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	31.92	20.75	52.67	68.20	-15.53

Operation Band	:802.11n20B1	Test Date	:2018-08-30
Fundamental Frequency	:5220 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



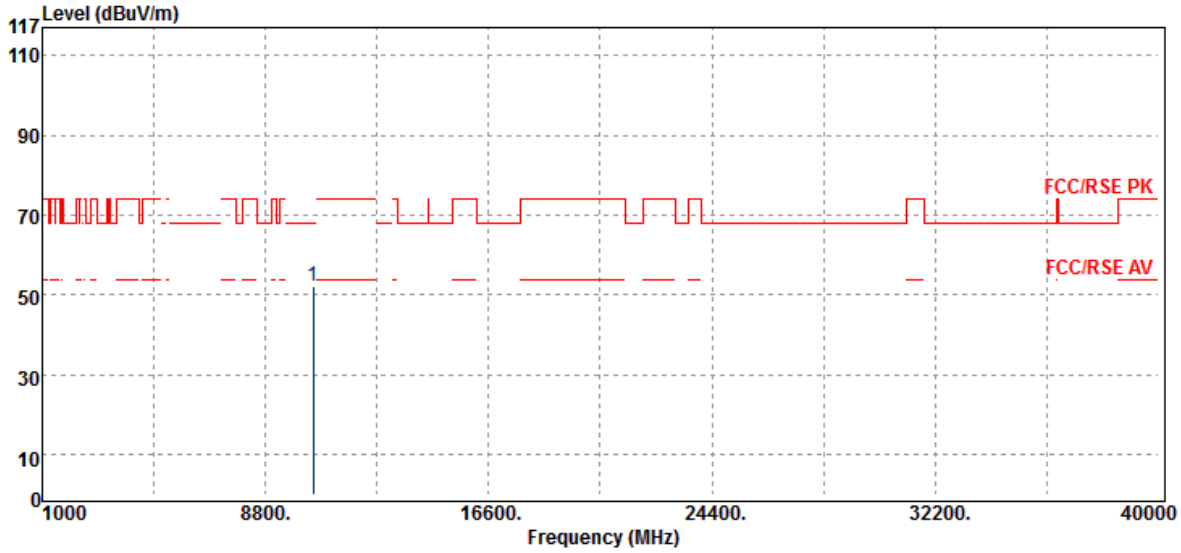
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10440.00	Peak	32.40	20.05	52.45	68.20	-15.75

Operation Band	:802.11n20B1	Test Date	:2018-08-30
Fundamental Frequency	:5240 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	32.38	20.79	53.17	68.20	-15.03

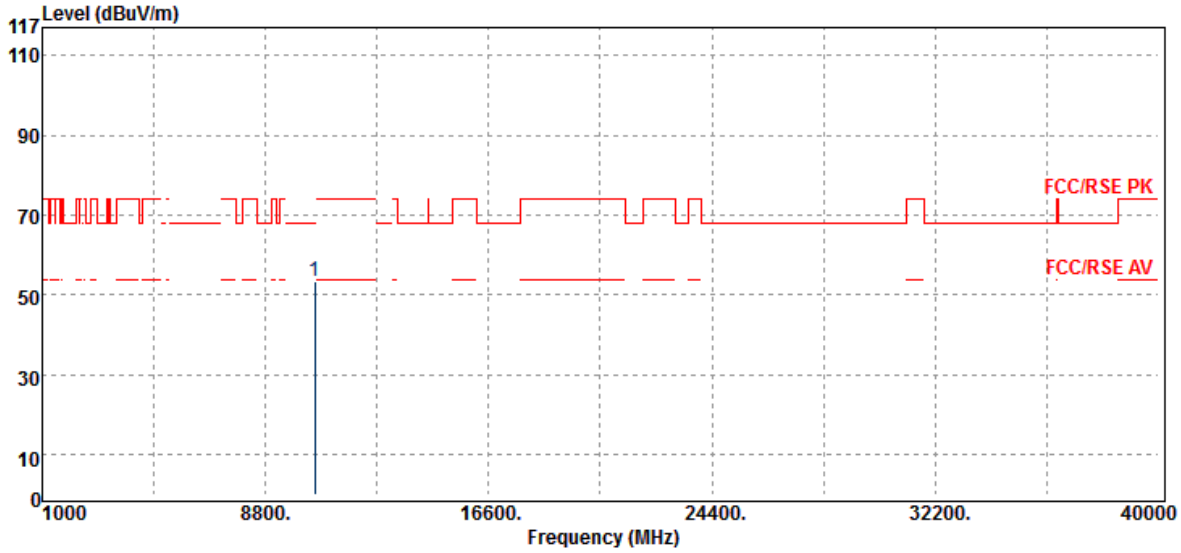
Operation Band	:802.11n20B1	Test Date	:2018-08-30
Fundamental Frequency	:5240 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10480.00	Peak	32.11	20.07	52.18	68.20	-16.02

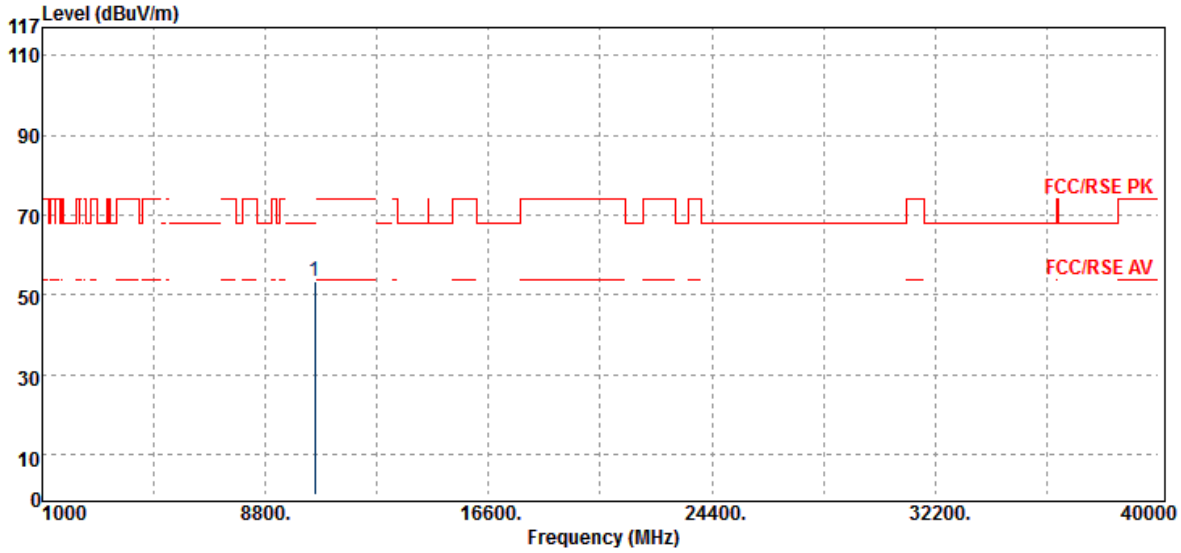
Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

Operation Band	:802.11n20B2	Test Date	:2018-08-30
Fundamental Frequency	:5260 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



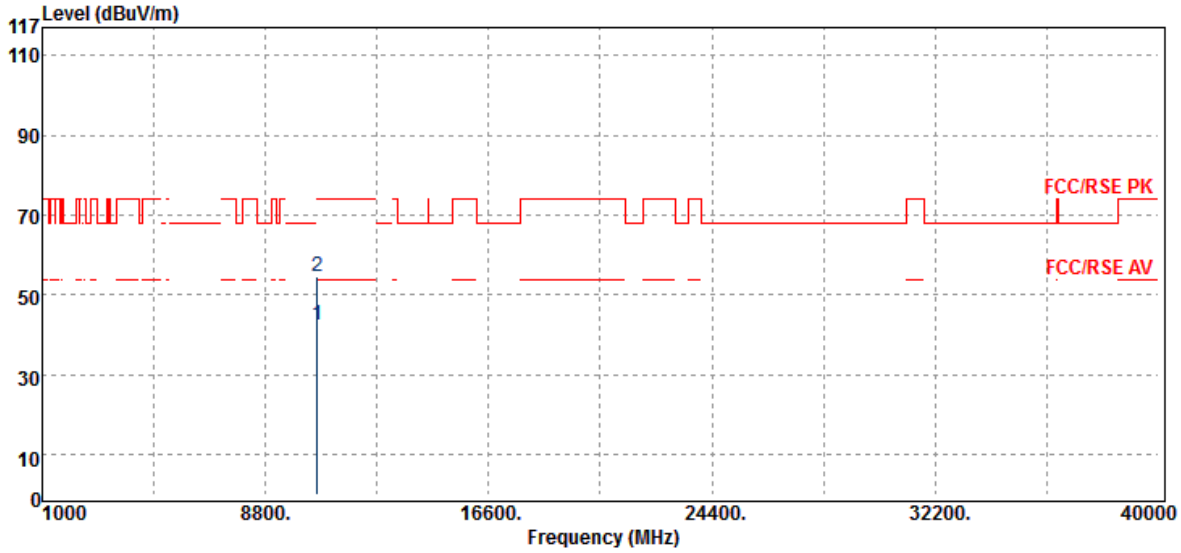
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Peak	32.54	20.78	53.32	68.20	-14.88

Operation Band	:802.11n20B2	Test Date	:2018-08-30
Fundamental Frequency	:5260 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



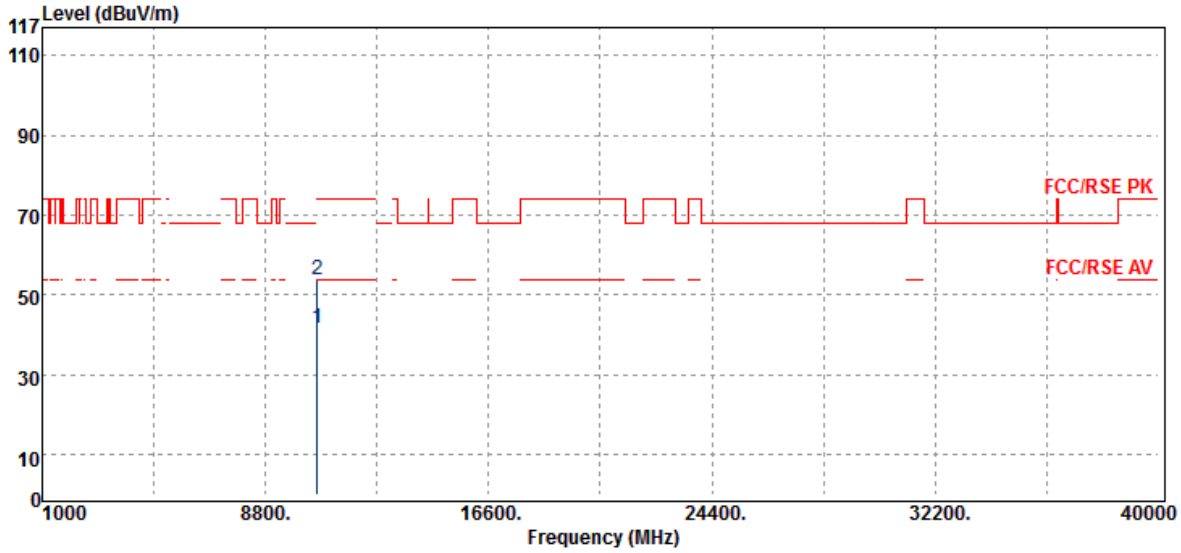
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	Peak	33.62	20.00	53.62	68.20	-14.58

Operation Band	:802.11n20B2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



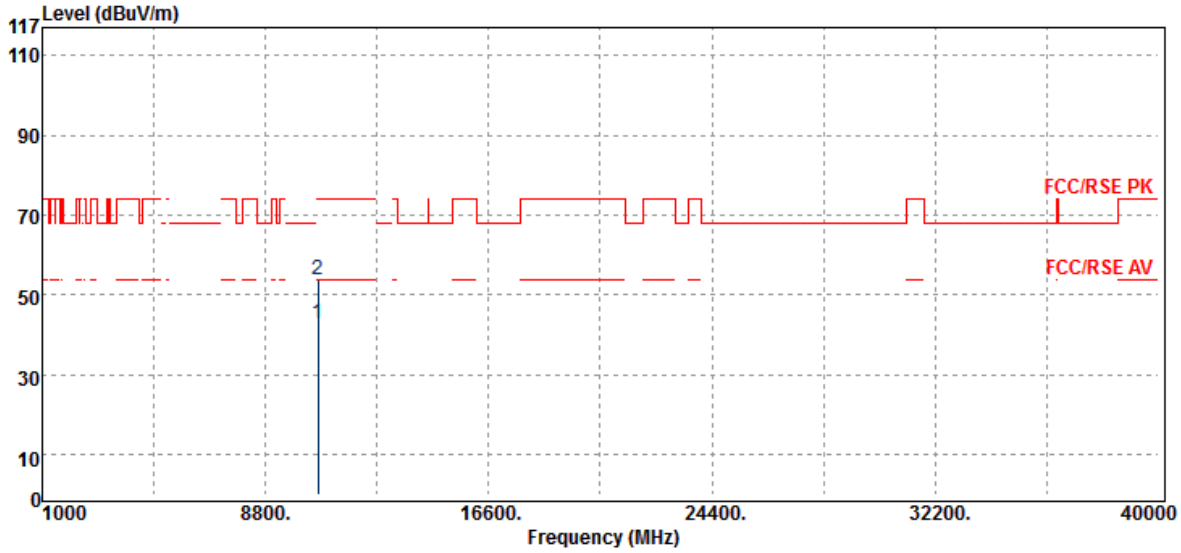
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	21.42	21.18	42.60	54.00	-11.40
10600.00	Peak	33.66	21.18	54.84	74.00	-19.16

Operation Band	:802.11n20B2	Test Date	:2018-08-30
Fundamental Frequency	:5300 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



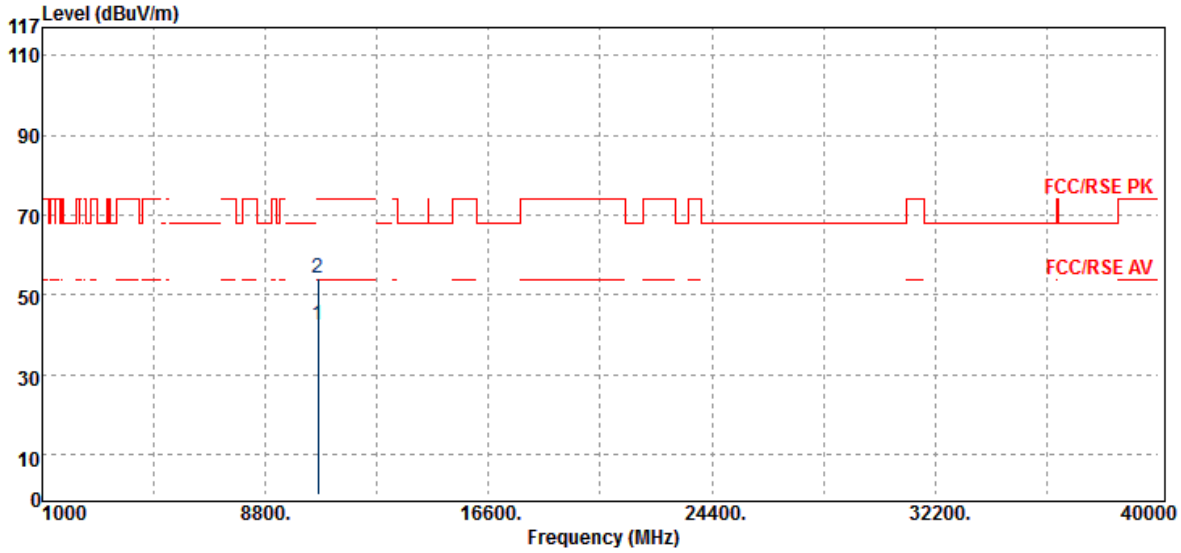
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10600.00	Average	21.47	20.38	41.85	54.00	-12.15
10600.00	Peak	33.41	20.38	53.79	74.00	-20.21

Operation Band	:802.11n20B2	Test Date	:2018-08-30
Fundamental Frequency	:5320 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	21.52	21.24	42.76	54.00	-11.24
10640.00	Peak	32.70	21.24	53.94	74.00	-20.06

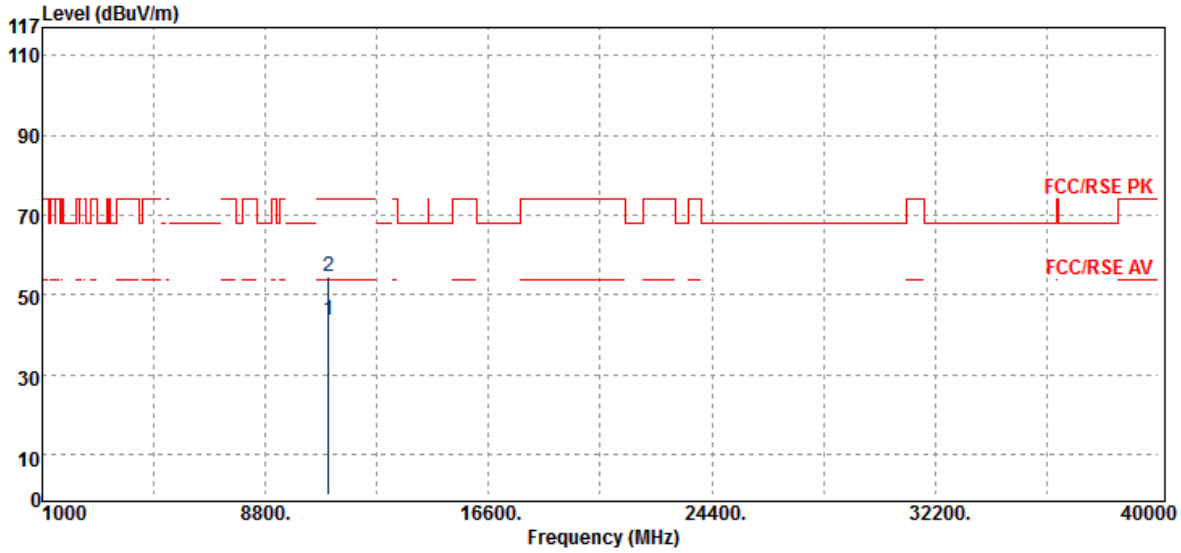
Operation Band	:802.11n20B2	Test Date	:2018-08-30
Fundamental Frequency	:5320 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10640.00	Average	21.98	20.44	42.42	54.00	-11.58
10640.00	Peak	33.89	20.44	54.33	74.00	-19.67

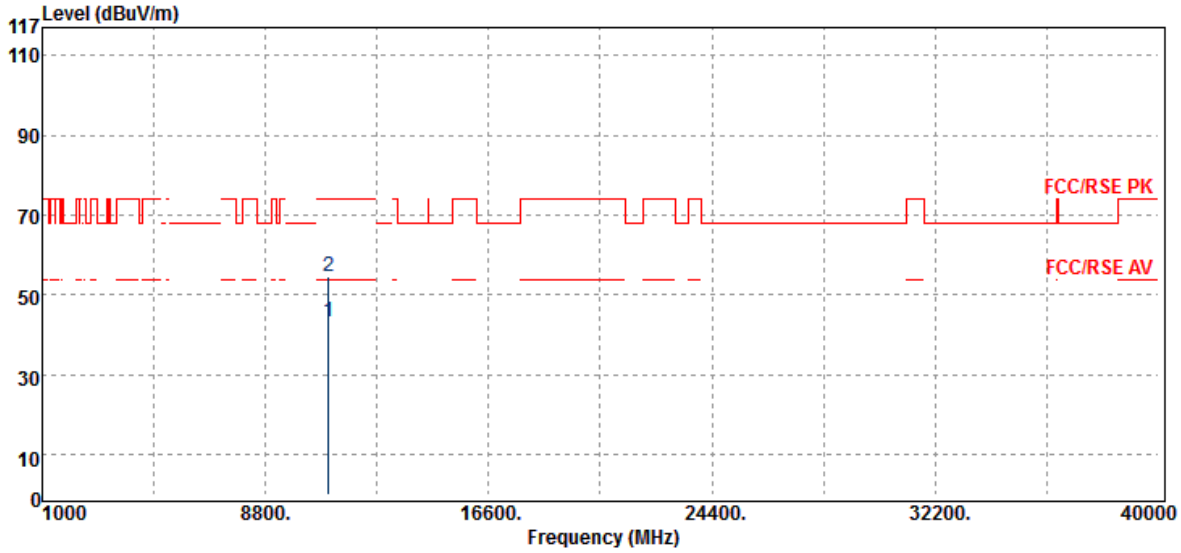
Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



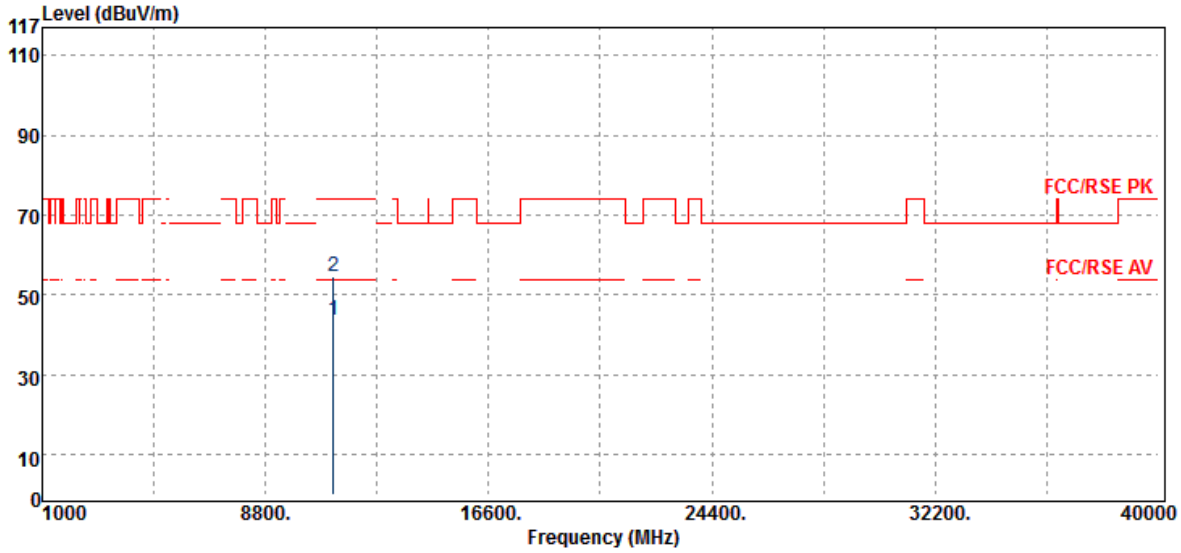
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.58	22.17	43.75	54.00	-10.25
11000.00	Peak	32.49	22.17	54.66	74.00	-19.34

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5500 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



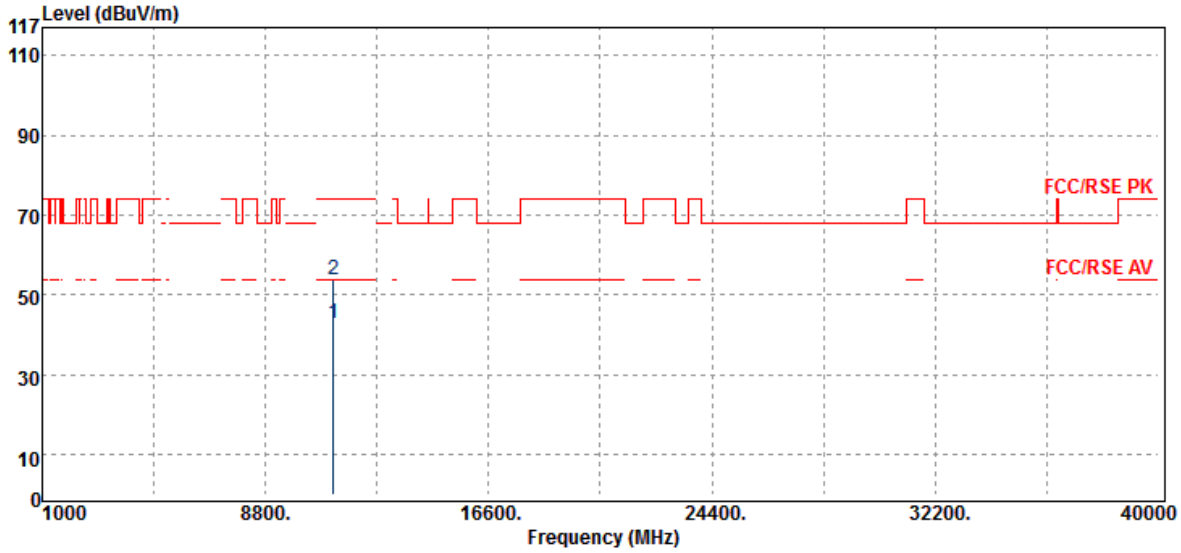
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11000.00	Average	21.75	21.37	43.12	54.00	-10.88
11000.00	Peak	33.18	21.37	54.55	74.00	-19.45

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5580 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



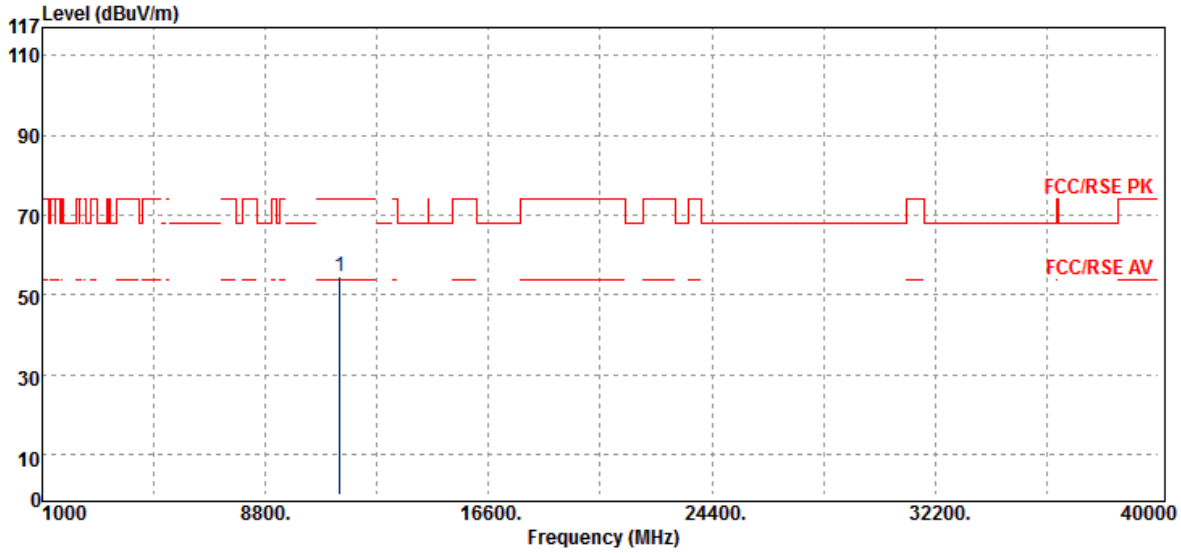
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.47	22.31	43.78	54.00	-10.22
11160.00	Peak	32.17	22.31	54.48	74.00	-19.52

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5580 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



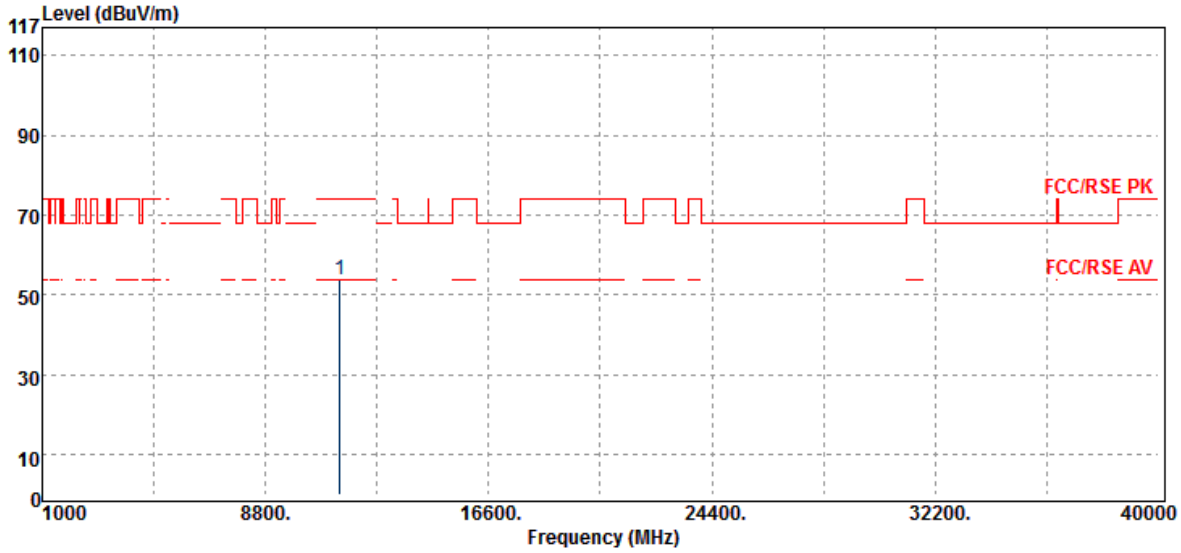
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11160.00	Average	21.57	21.51	43.08	54.00	-10.92
11160.00	Peak	32.31	21.51	53.82	74.00	-20.18

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Peak	32.27	22.42	54.69	74.00	-19.31

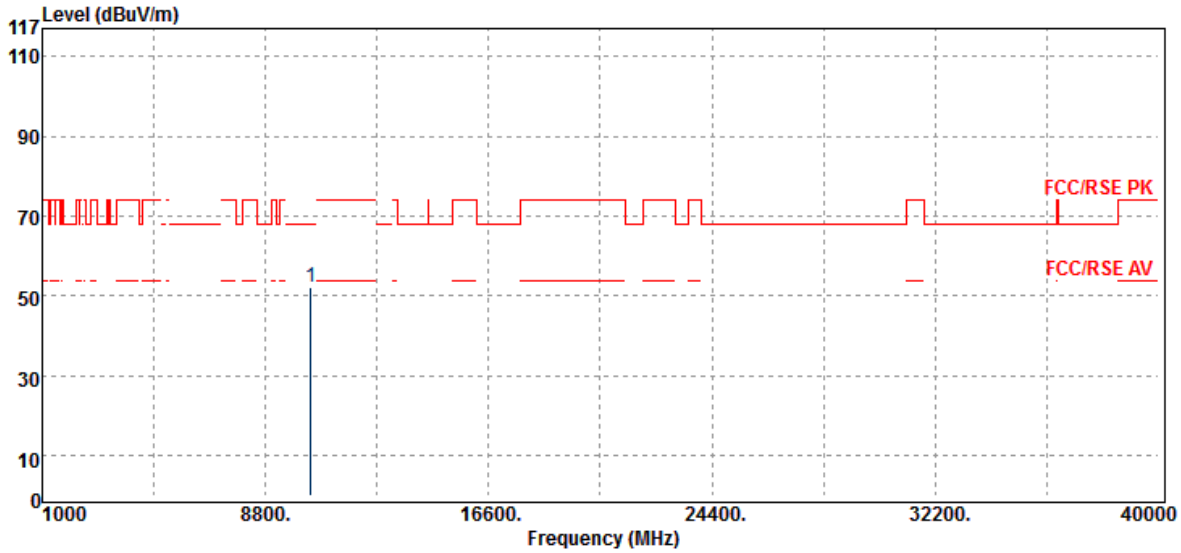
Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11400.00	Peak	32.22	21.62	53.84	74.00	-20.16

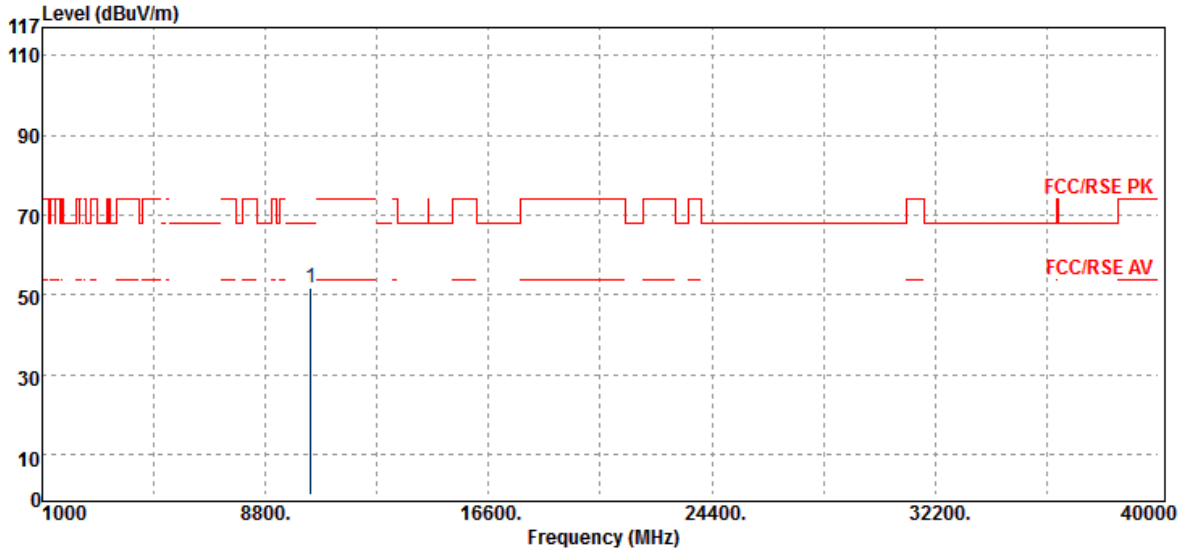
Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz

Operation Band	:802.11n40B1	Test Date	:2018-08-30
Fundamental Frequency	:5190 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



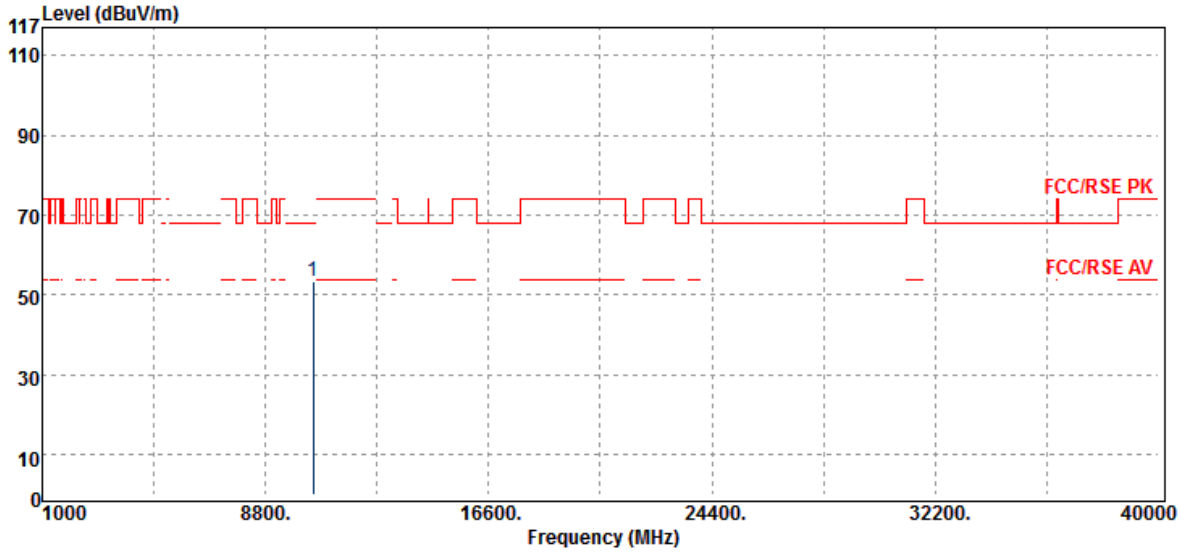
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10380.00	Peak	31.64	20.48	52.12	68.20	-16.08

Operation Band	:802.11n40B1	Test Date	:2018-08-30
Fundamental Frequency	:5190 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



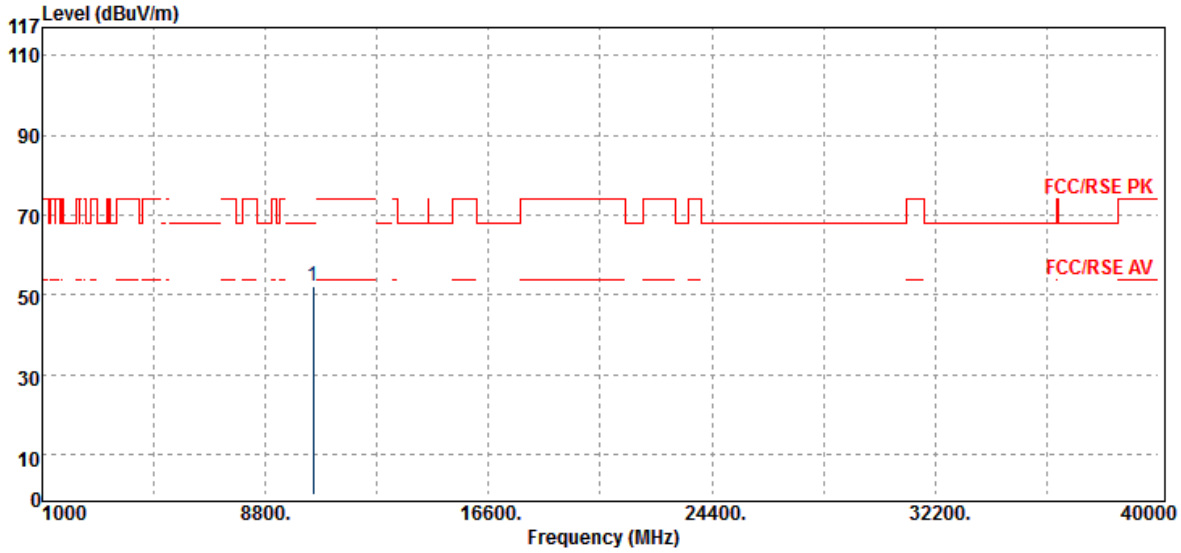
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10380.00	Peak	32.17	19.78	51.95	68.20	-16.25

Operation Band	:802.11n40B1	Test Date	:2018-08-30
Fundamental Frequency	:5230 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10460.00	Peak	32.61	20.77	53.38	68.20	-14.82

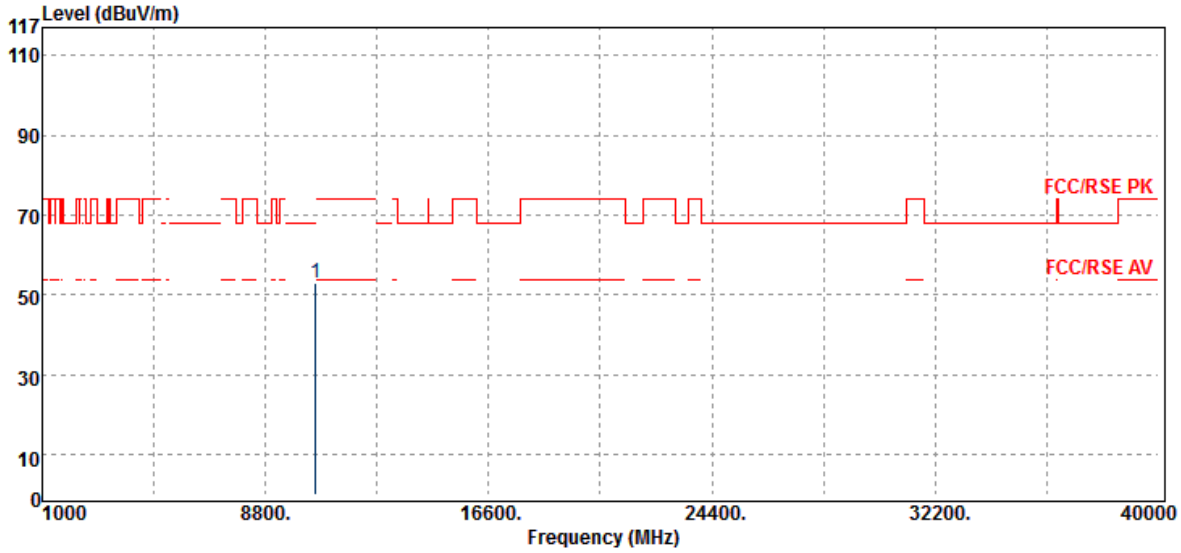
Operation Band	:802.11n40B1	Test Date	:2018-08-30
Fundamental Frequency	:5230 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10460.00	Peak	31.99	20.07	52.06	68.20	-16.14

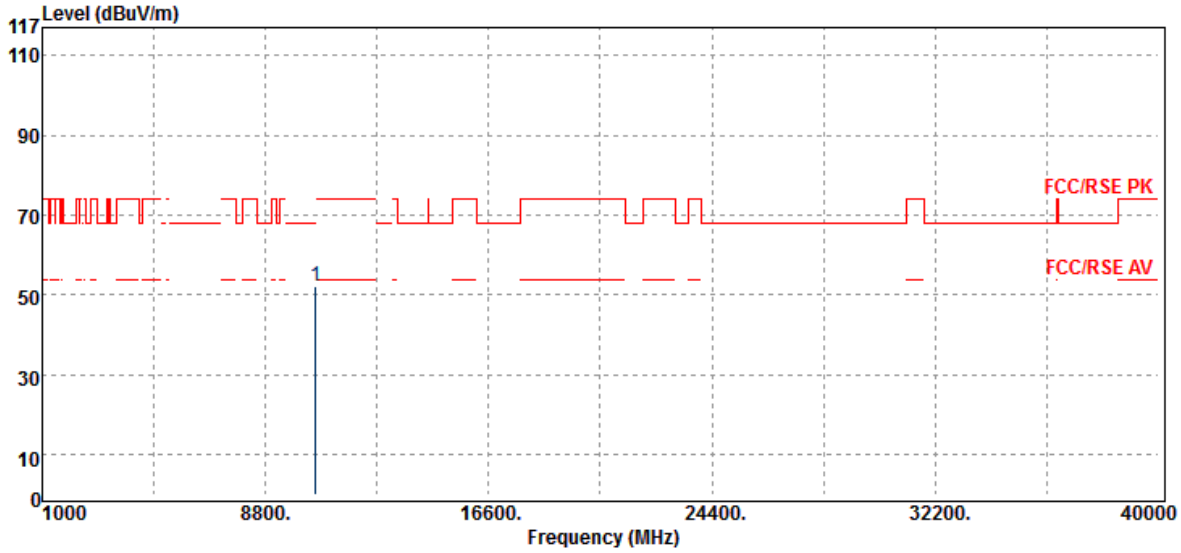
Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz

Operation Band	:802.11n40B2	Test Date	:2018-08-30
Fundamental Frequency	:5270 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



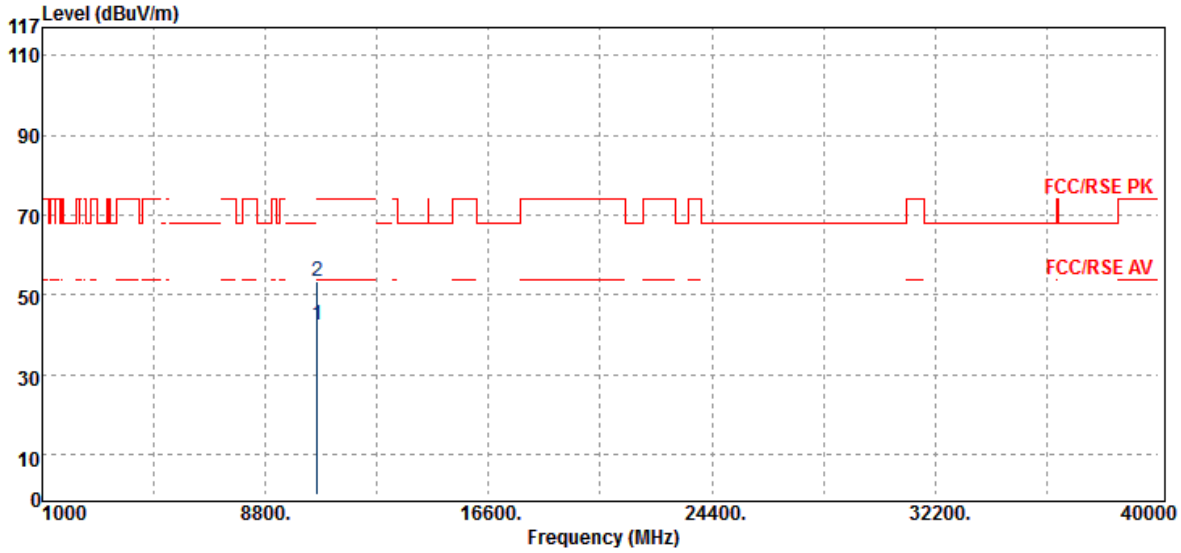
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10540.00	Peak	32.28	20.82	53.10	68.20	-15.10

Operation Band	:802.11n40B2	Test Date	:2018-08-30
Fundamental Frequency	:5270 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



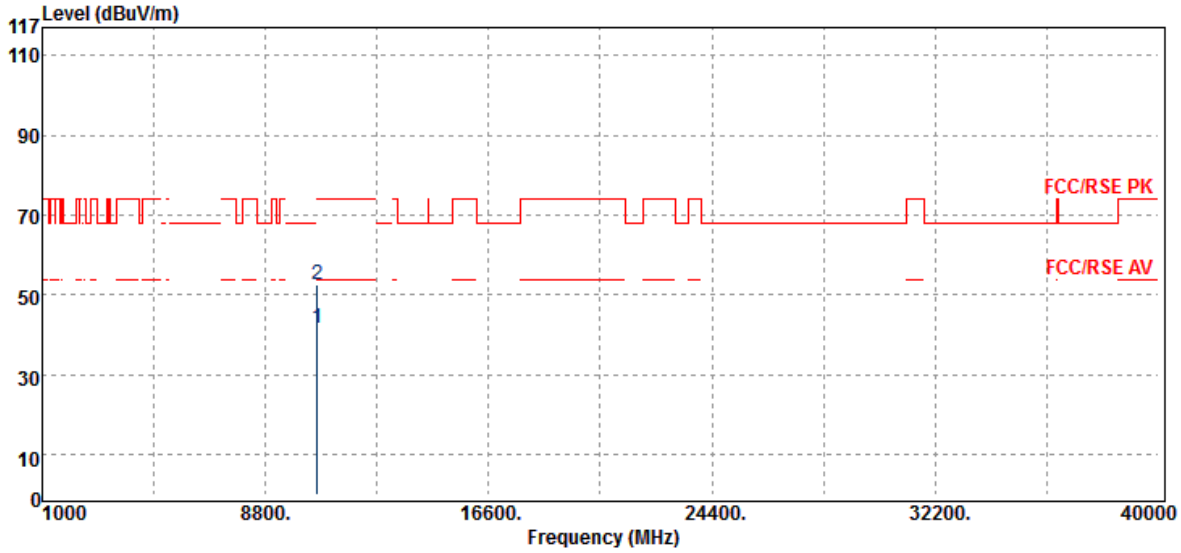
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10540.00	Peak	32.17	20.02	52.19	68.20	-16.01

Operation Band	:802.11n40B2	Test Date	:2018-08-30
Fundamental Frequency	:5310 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10620.00	Average	21.32	21.21	42.53	54.00	-11.47
10620.00	Peak	32.21	21.21	53.42	74.00	-20.58

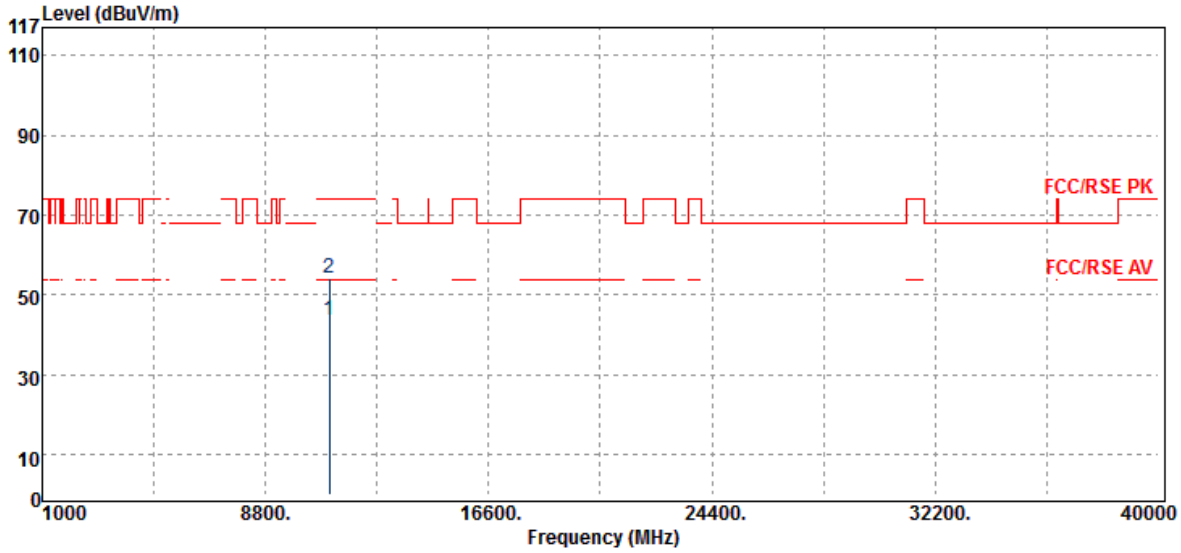
Operation Band	:802.11n40B2	Test Date	:2018-08-30
Fundamental Frequency	:5310 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10620.00	Average	21.45	20.41	41.86	54.00	-12.14
10620.00	Peak	32.20	20.41	52.61	74.00	-21.39

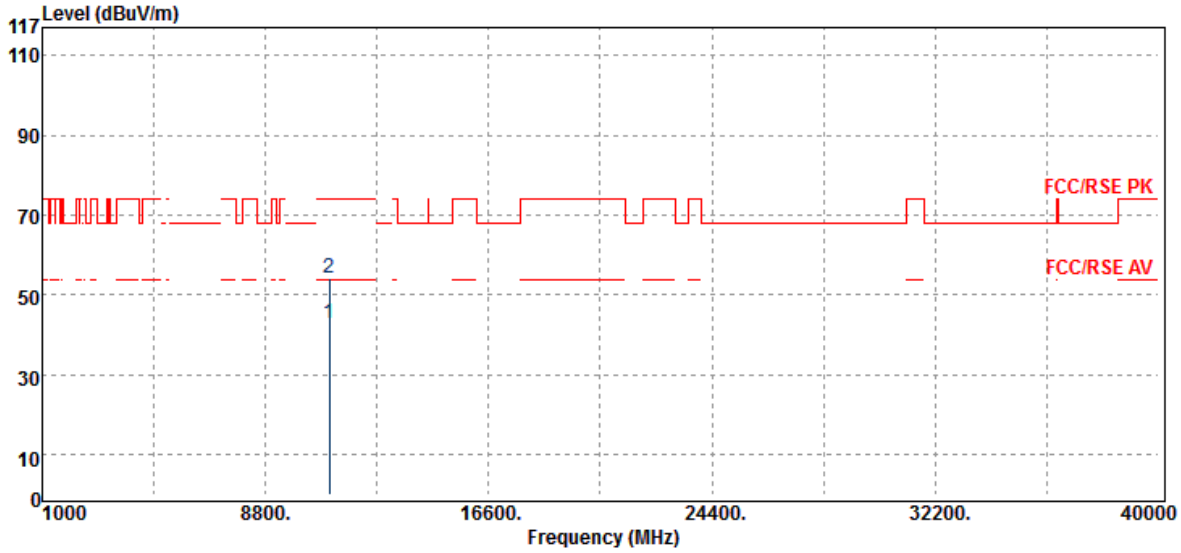
Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5510 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



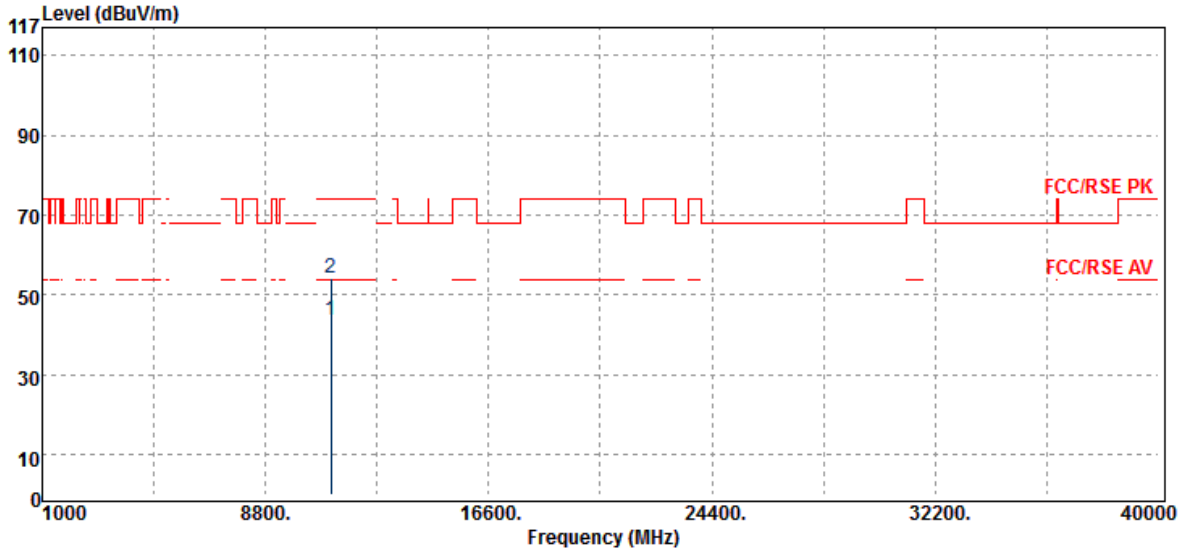
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11020.00	Average	21.40	22.28	43.68	54.00	-10.32
11020.00	Peak	31.88	22.28	54.16	74.00	-19.84

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5510 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



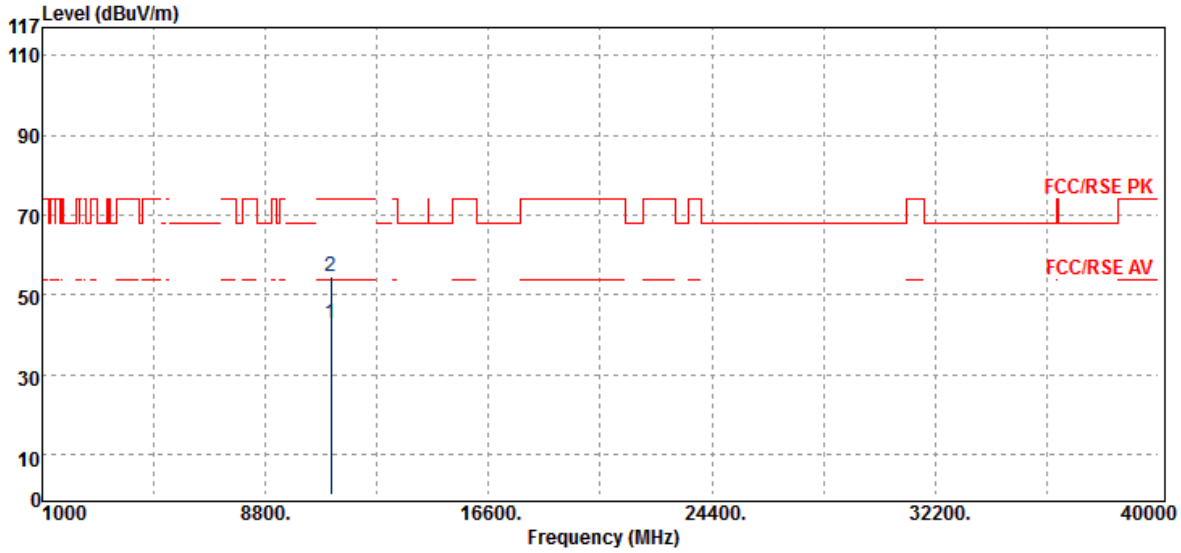
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11020.00	Average	21.51	21.46	42.97	54.00	-11.03
11020.00	Peak	32.74	21.46	54.20	74.00	-19.80

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5550 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



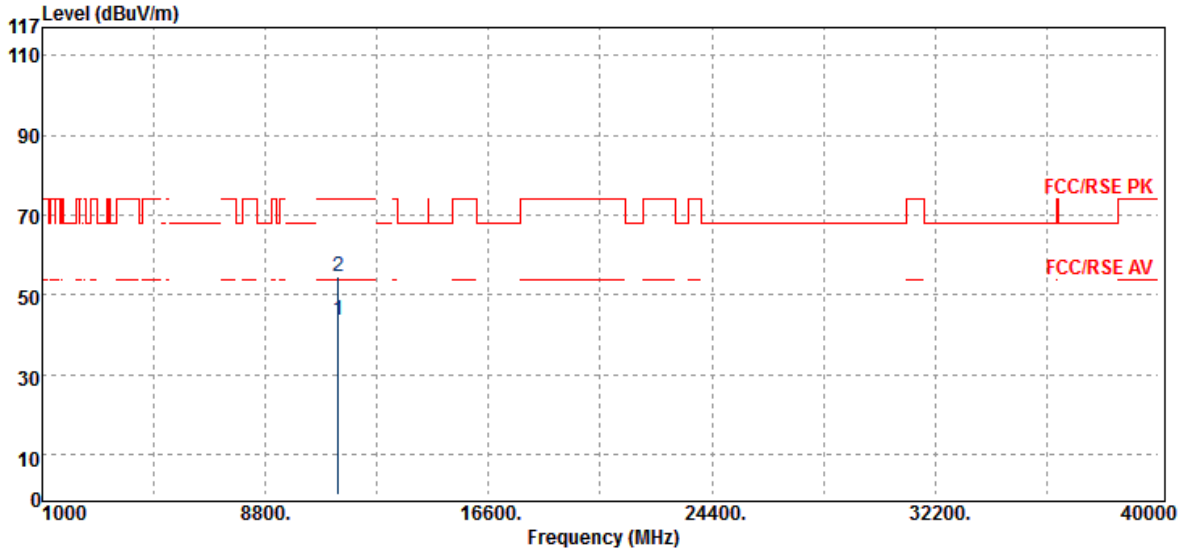
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11100.00	Average	21.24	22.38	43.62	54.00	-10.38
11100.00	Peak	31.77	22.38	54.15	74.00	-19.85

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5550 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH MID	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



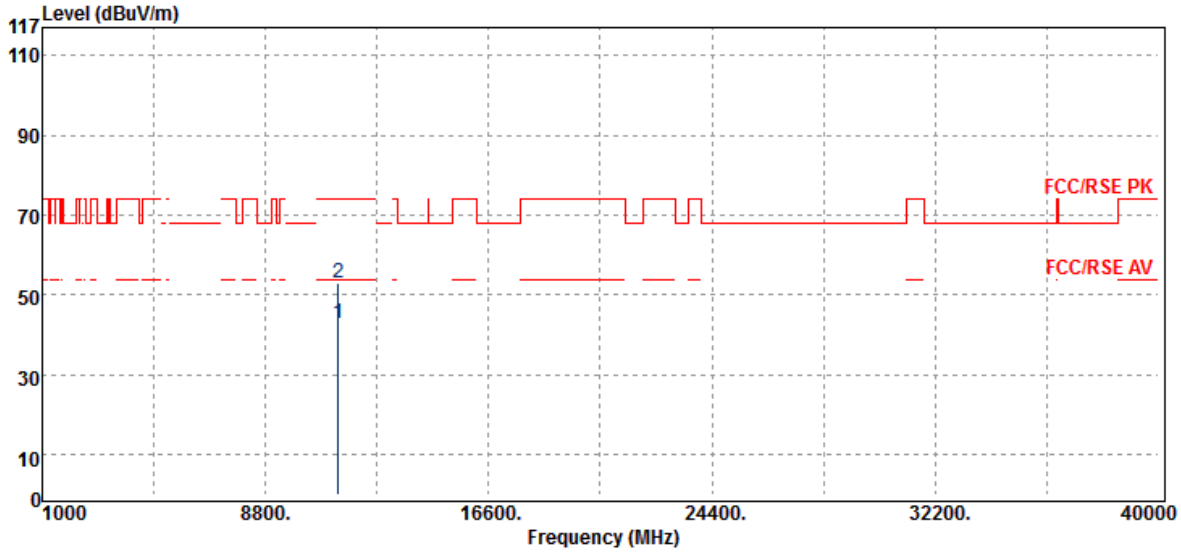
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11100.00	Average	21.33	21.53	42.86	54.00	-11.14
11100.00	Peak	33.08	21.53	54.61	74.00	-19.39

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5670 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11340.00	Average	21.44	22.34	43.78	54.00	-10.22
11340.00	Peak	32.33	22.34	54.67	74.00	-19.33

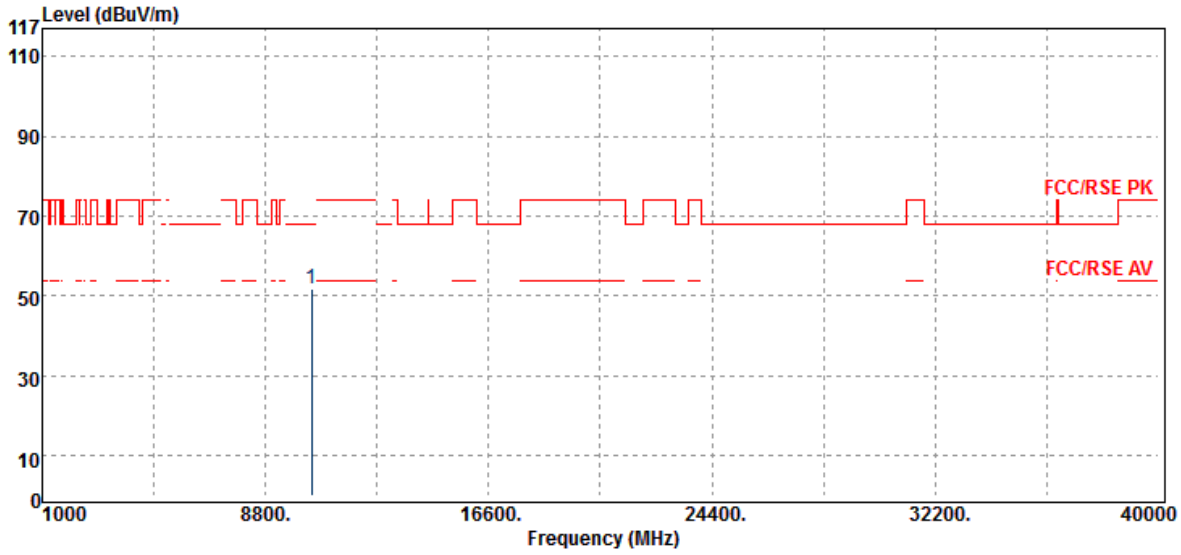
Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5670 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11340.00	Average	21.42	21.54	42.96	54.00	-11.04
11340.00	Peak	31.48	21.54	53.02	74.00	-20.98

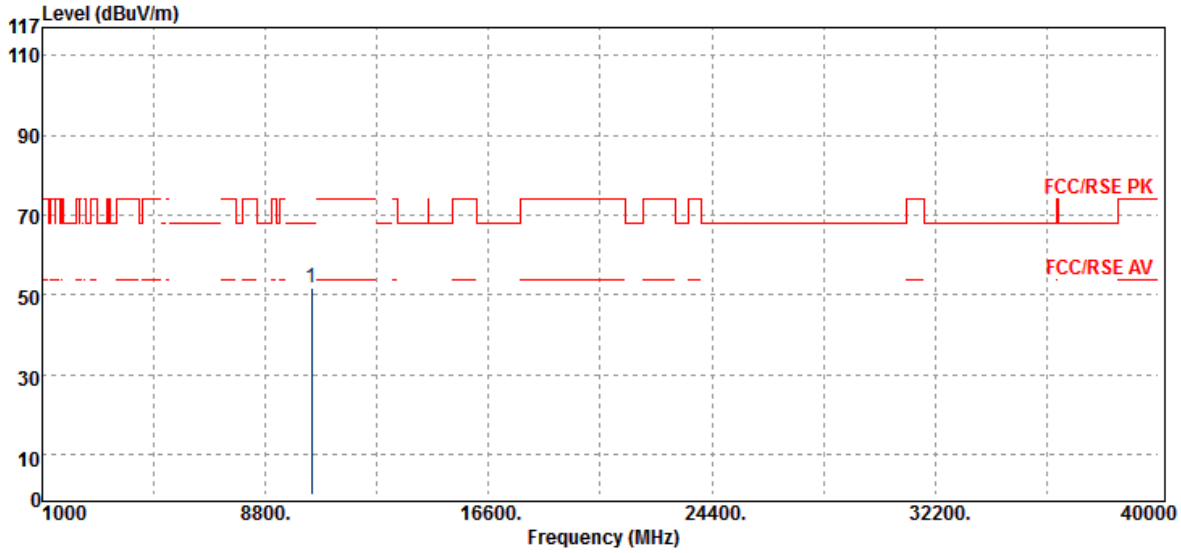
Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5150~5250 MHz

Operation Band	:802.11ac80B1	Test Date	:2018-08-30
Fundamental Frequency	:5210 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10420.00	Peak	31.15	20.69	51.84	68.20	-16.36

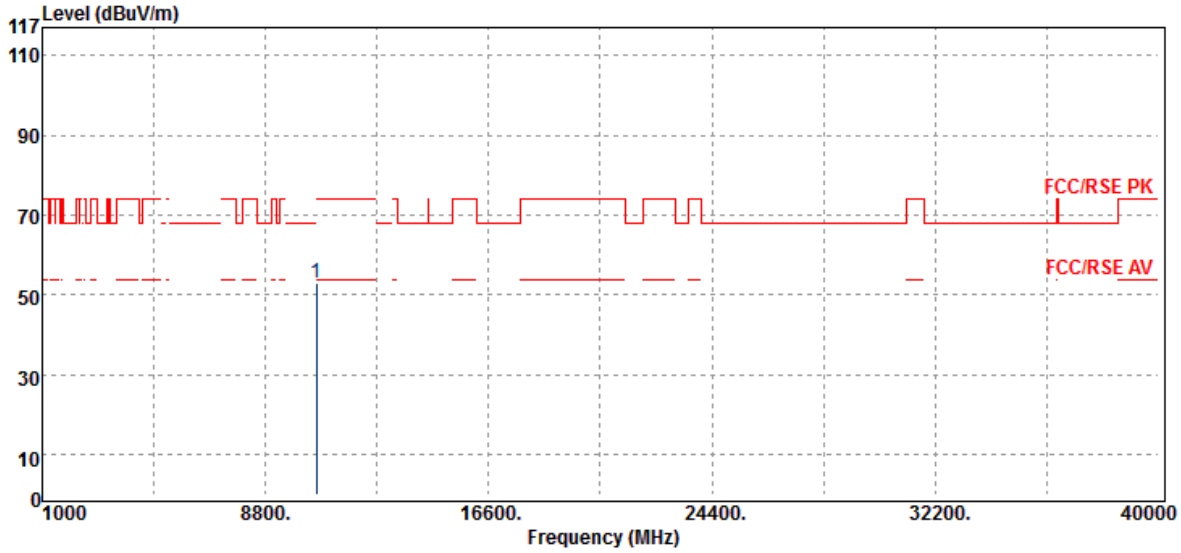
Operation Band	:802.11ac80B1	Test Date	:2018-08-30
Fundamental Frequency	:5210 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10420.00	Peak	31.94	19.99	51.93	68.20	-16.27

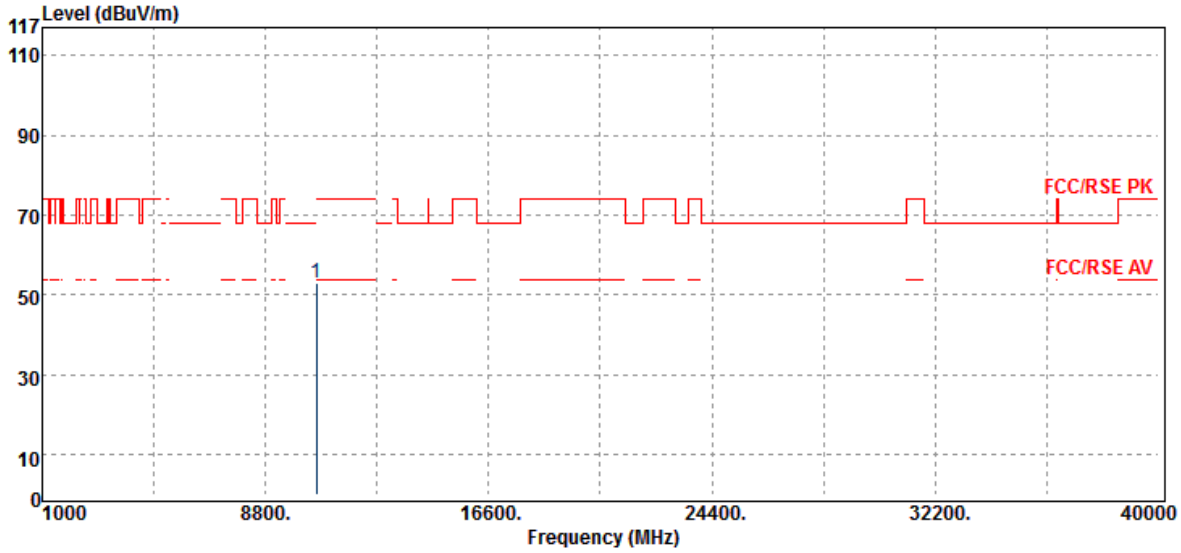
Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5250~5350 MHz

Operation Band	:802.11ac80B2	Test Date	:2018-08-30
Fundamental Frequency	:5290 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10580.00	Peak	32.15	21.03	53.18	68.20	-15.02

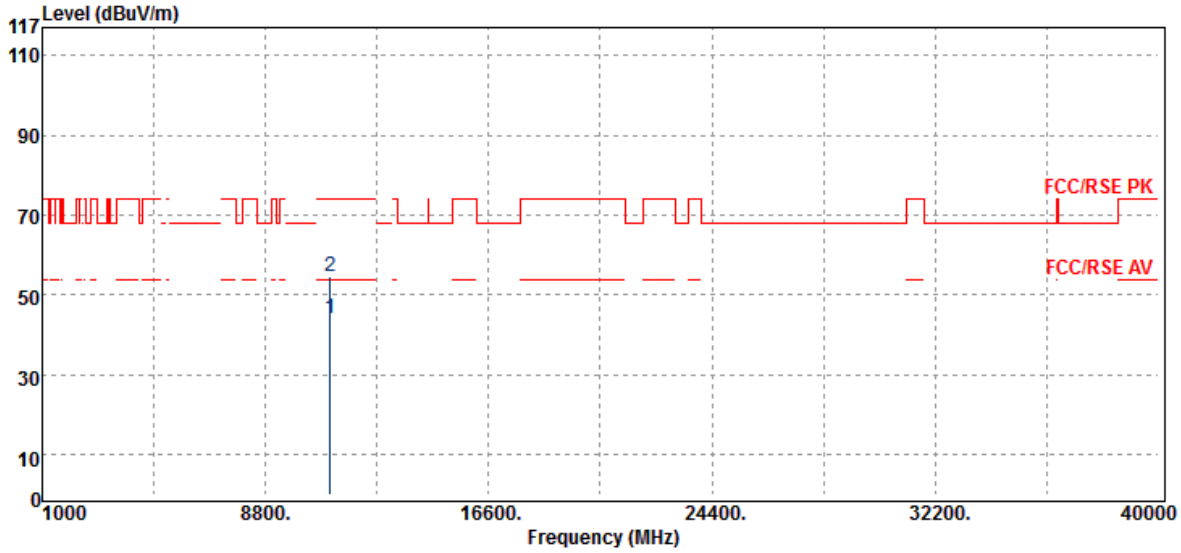
Operation Band	:802.11ac80B2	Test Date	:2018-08-30
Fundamental Frequency	:5290 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10580.00	Peak	32.75	20.23	52.98	68.20	-15.22

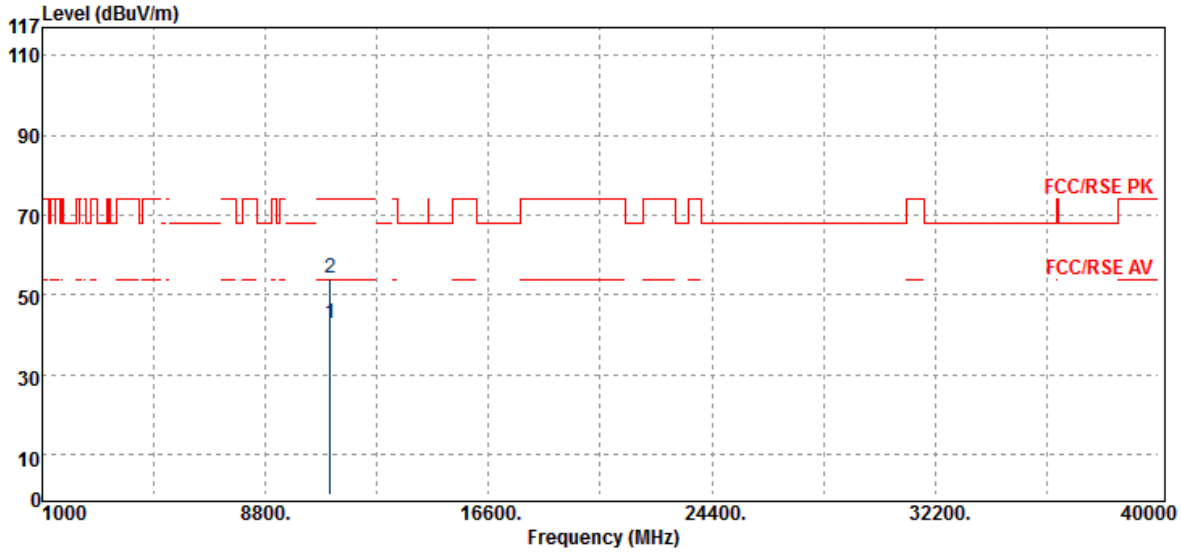
Radiated Spurious Emission Measurement Result 802.11ac VHT80, 5470~5725 MHz

Operation Band	:802.11ac80B3	Test Date	:2018-08-30
Fundamental Frequency	:5530 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



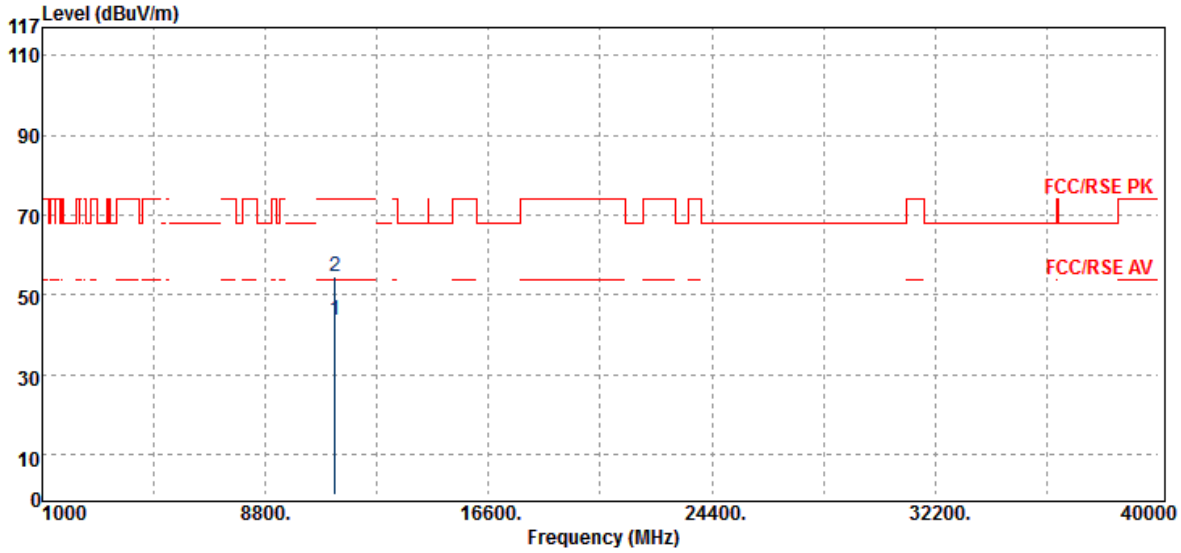
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11060.00	Average	21.71	22.41	44.12	54.00	-9.88
11060.00	Peak	32.13	22.41	54.54	74.00	-19.46

Operation Band	:802.11ac80B3	Test Date	:2018-08-30
Fundamental Frequency	:5530 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



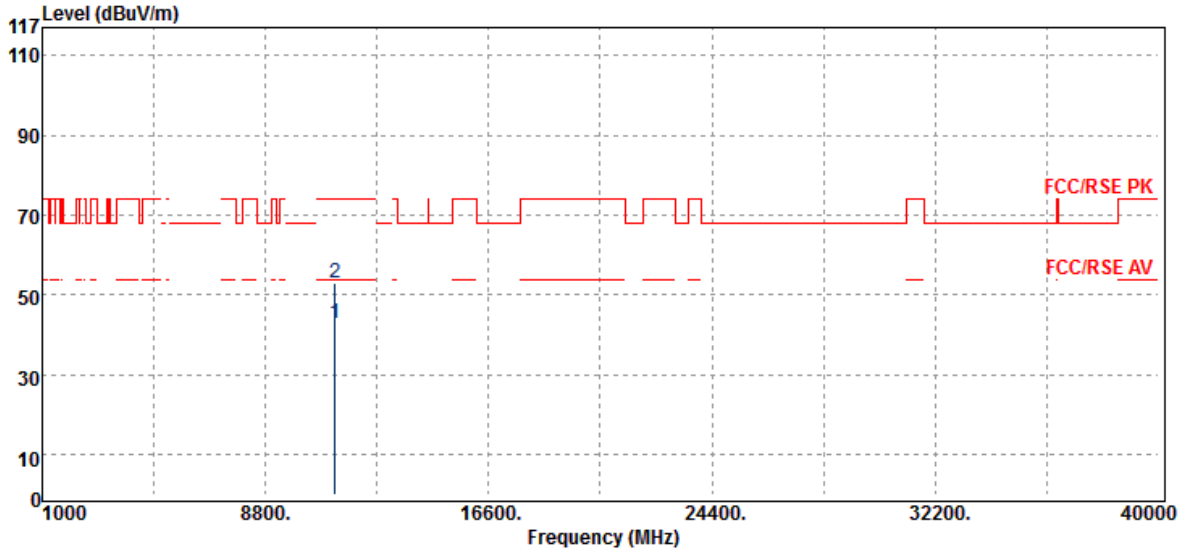
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11060.00	Average	21.54	21.53	43.07	54.00	-10.93
11060.00	Peak	32.88	21.53	54.41	74.00	-19.59

Operation Band	:802.11ac80B3	Test Date	:2018-08-30
Fundamental Frequency	:5610 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11220.00	Average	21.32	22.36	43.68	54.00	-10.32
11220.00	Peak	32.29	22.36	54.65	74.00	-19.35

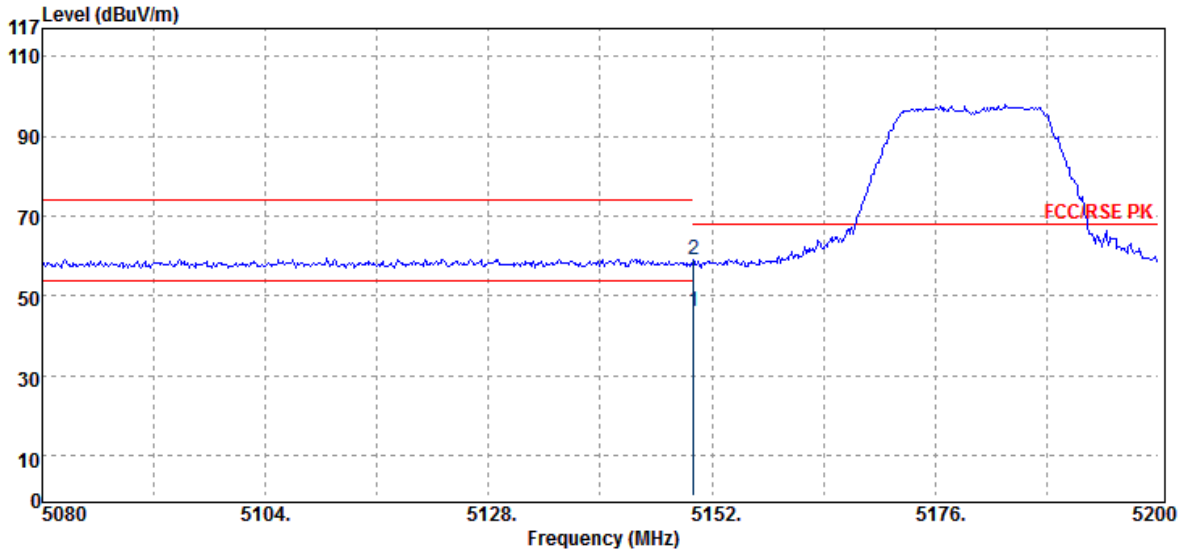
Operation Band	:802.11ac80B3	Test Date	:2018-08-30
Fundamental Frequency	:5610 MHz	Temp./Humi.	:21 deg_C / 62 RH
Operation Mode	:Tx CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
11220.00	Average	21.44	21.56	43.00	54.00	-11.00
11220.00	Peak	31.61	21.56	53.17	74.00	-20.83

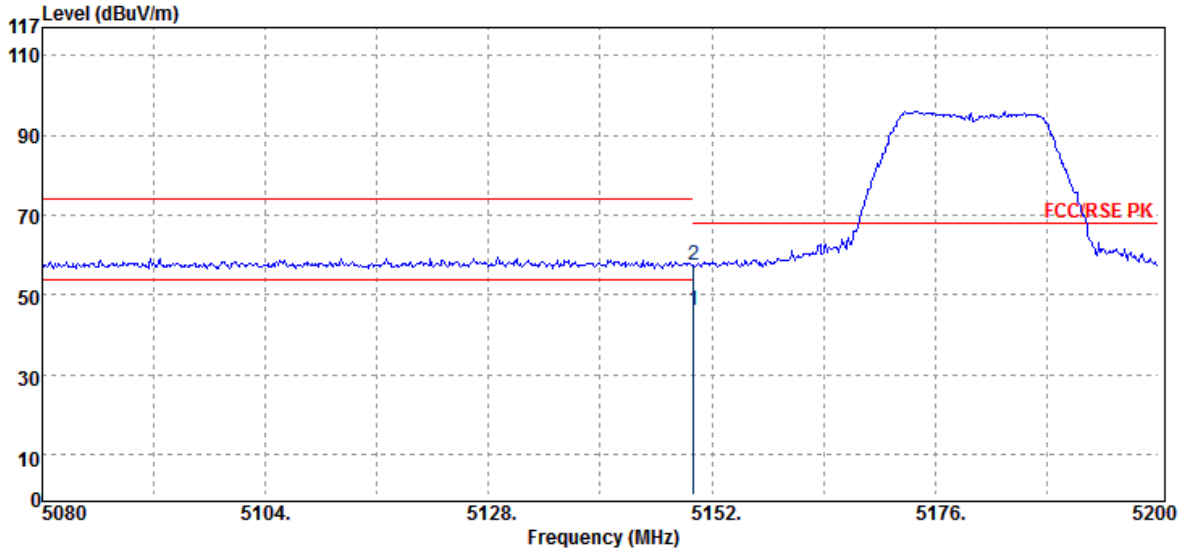
Band edge falling to restricted band
802.11a mode

Operation Band	:802.11aB1	Test Date	:2018-08-29
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



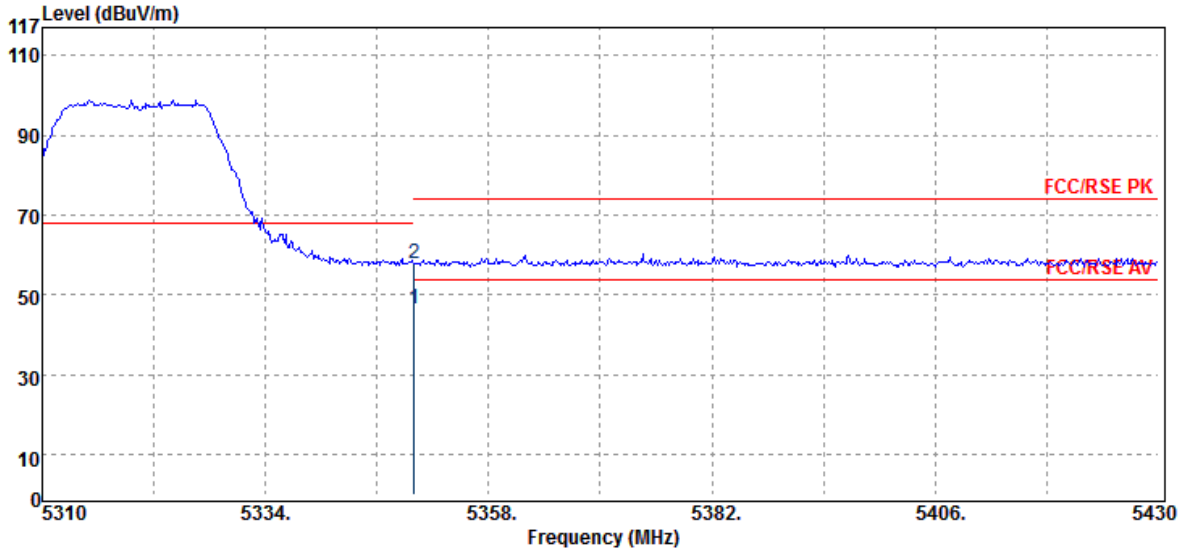
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	38.01	8.32	46.33	54.00	-7.67
5150.00	Peak	50.90	8.32	59.22	74.00	-14.78

Operation Band	:802.11aB1	Test Date	:2018-08-29
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



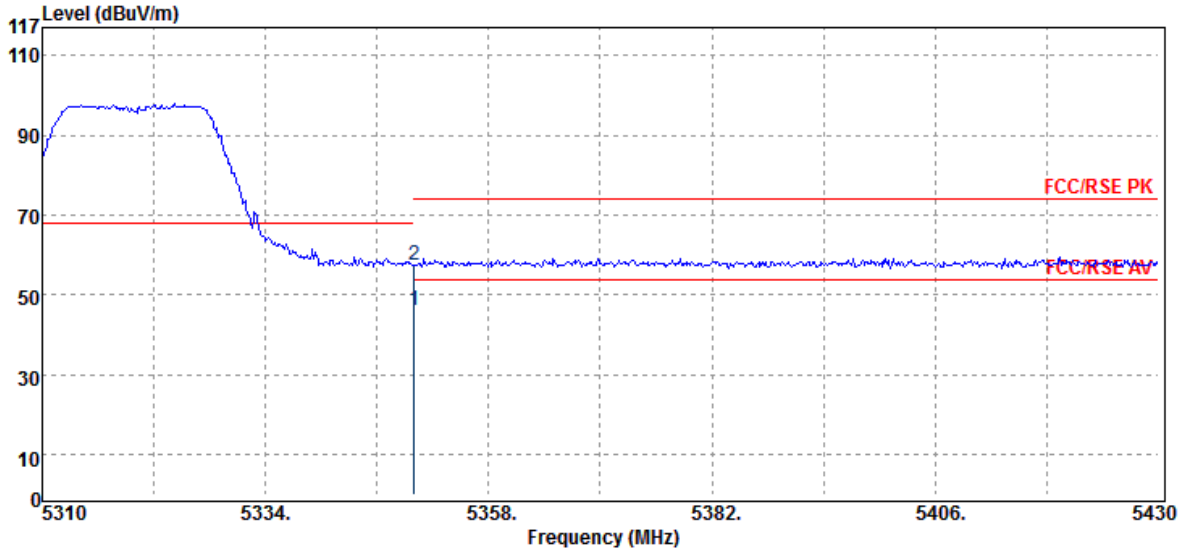
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.84	8.32	46.16	54.00	-7.84
5150.00	Peak	49.02	8.32	57.34	74.00	-16.66

Operation Band	:802.11aB2	Test Date	:2018-08-29
Fundamental Frequency	:5320 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



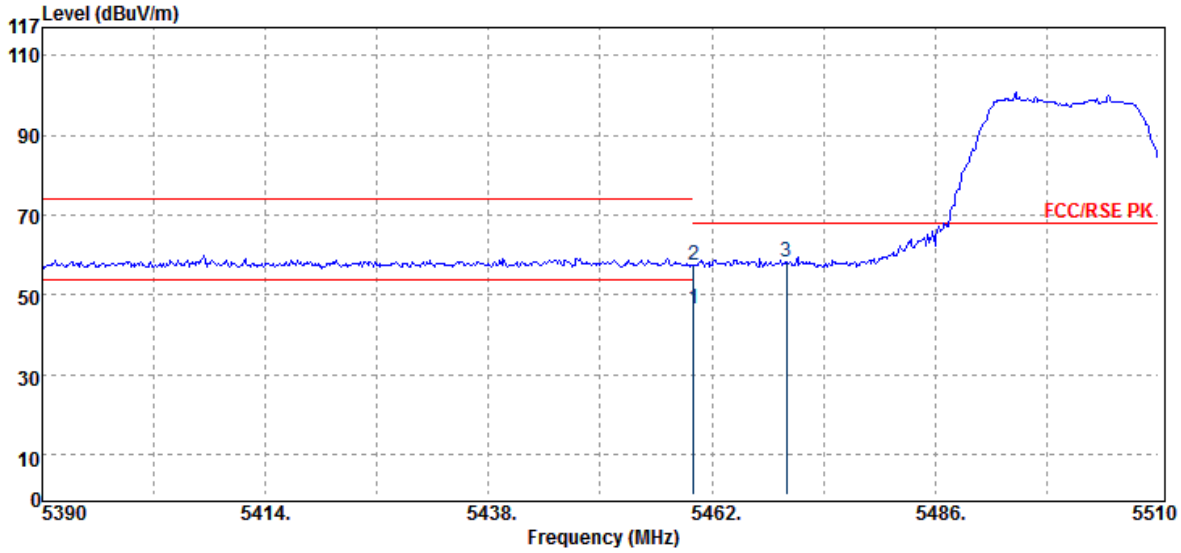
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.75	8.63	46.38	54.00	-7.62
5350.00	Peak	49.21	8.63	57.84	74.00	-16.16

Operation Band	:802.11aB2	Test Date	:2018-08-29
Fundamental Frequency	:5320 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



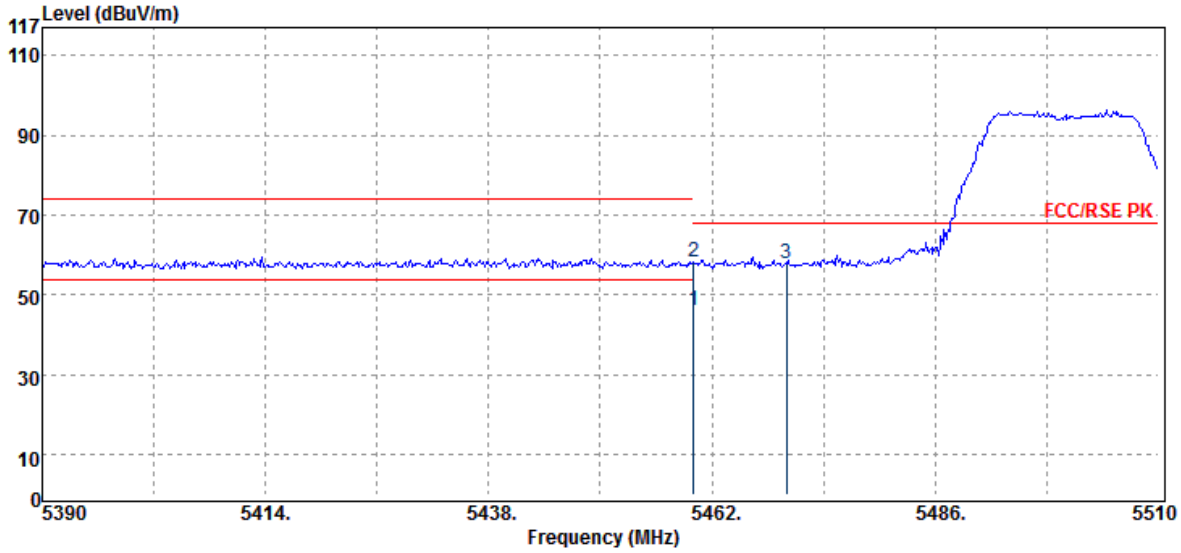
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.55	8.63	46.18	54.00	-7.82
5350.00	Peak	48.84	8.63	57.47	74.00	-16.53

Operation Band	:802.11aB3	Test Date	:2018-08-29
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



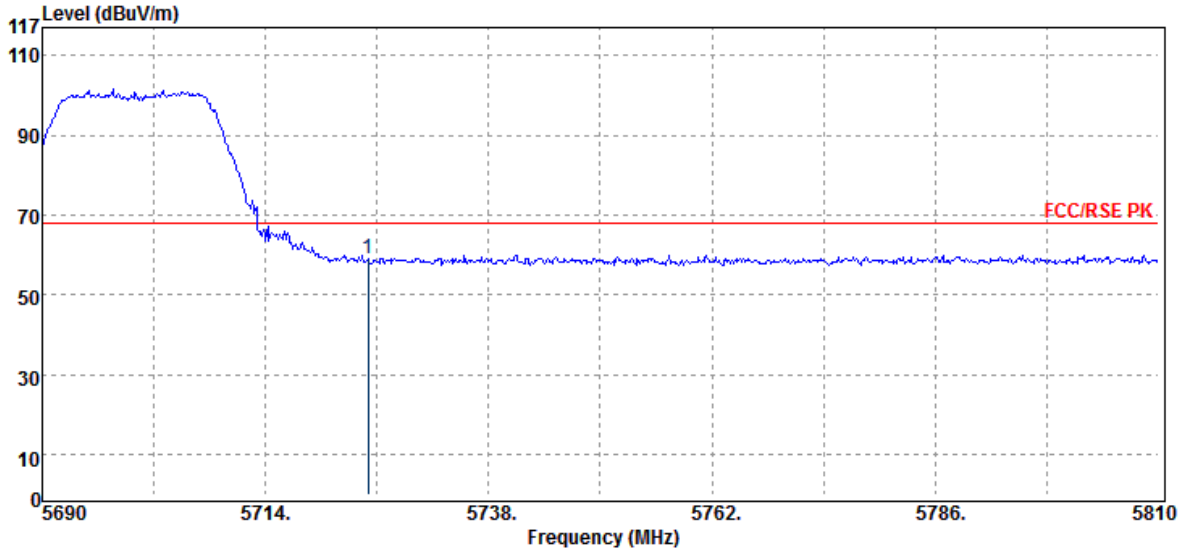
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.64	8.75	46.39	54.00	-7.61
5460.00	Peak	48.76	8.75	57.51	74.00	-16.49
5470.00	Peak	49.65	8.74	58.39	68.20	-9.81

Operation Band	:802.11aB3	Test Date	:2018-08-29
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



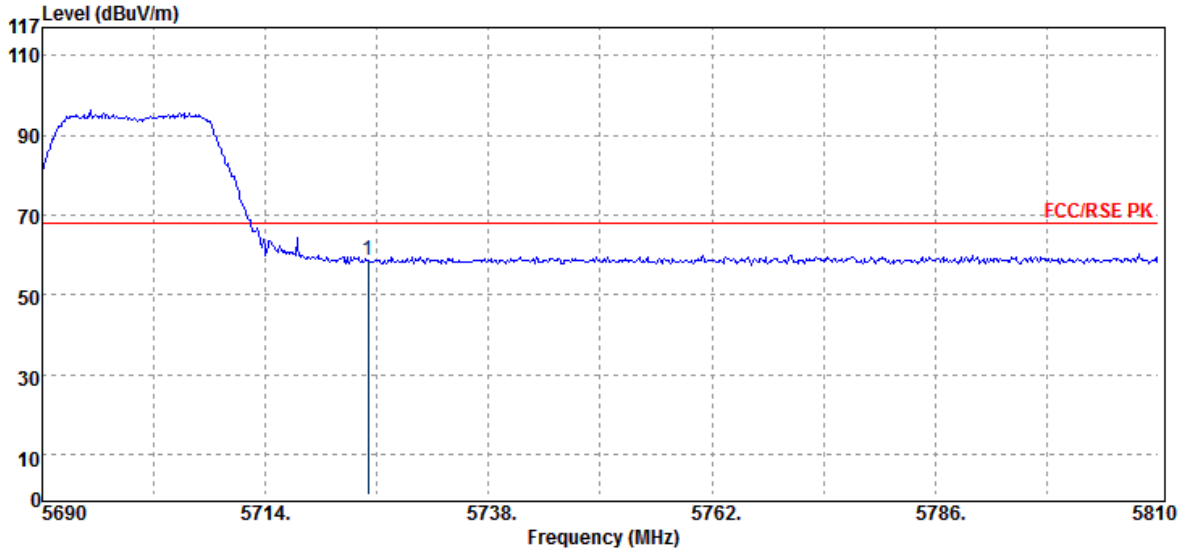
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.52	8.75	46.27	54.00	-7.73
5460.00	Peak	49.35	8.75	58.10	74.00	-15.90
5470.00	Peak	48.95	8.74	57.69	68.20	-10.51

Operation Band	:802.11aB3	Test Date	:2018-08-29
Fundamental Frequency	:5700 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



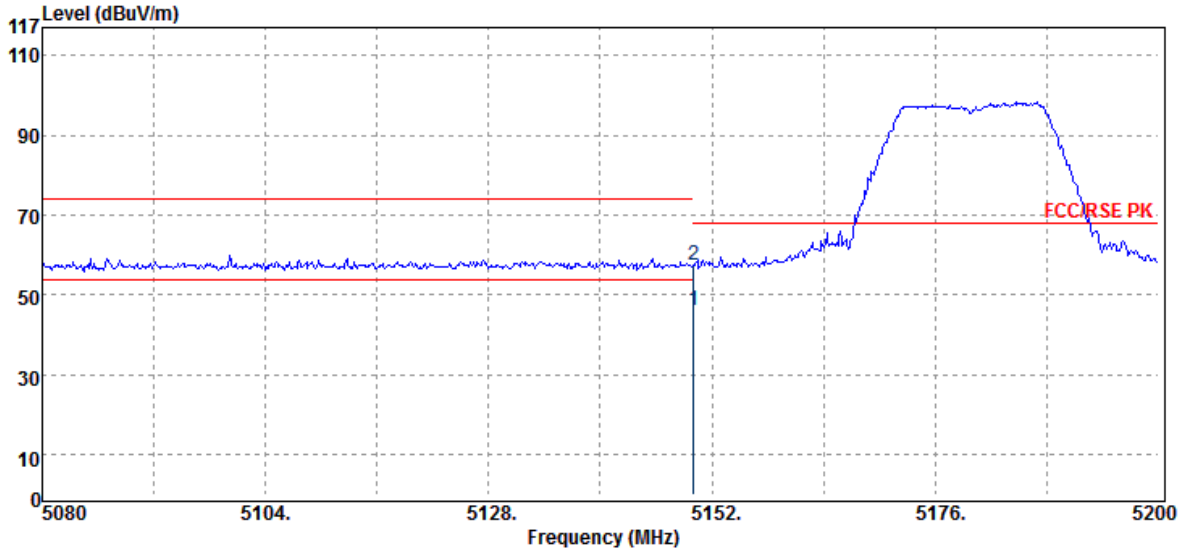
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	49.48	9.44	58.92	68.20	-9.28

Operation Band	:802.11aB3	Test Date	:2018-08-29
Fundamental Frequency	:5700 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	49.09	9.44	58.53	68.20	-9.67

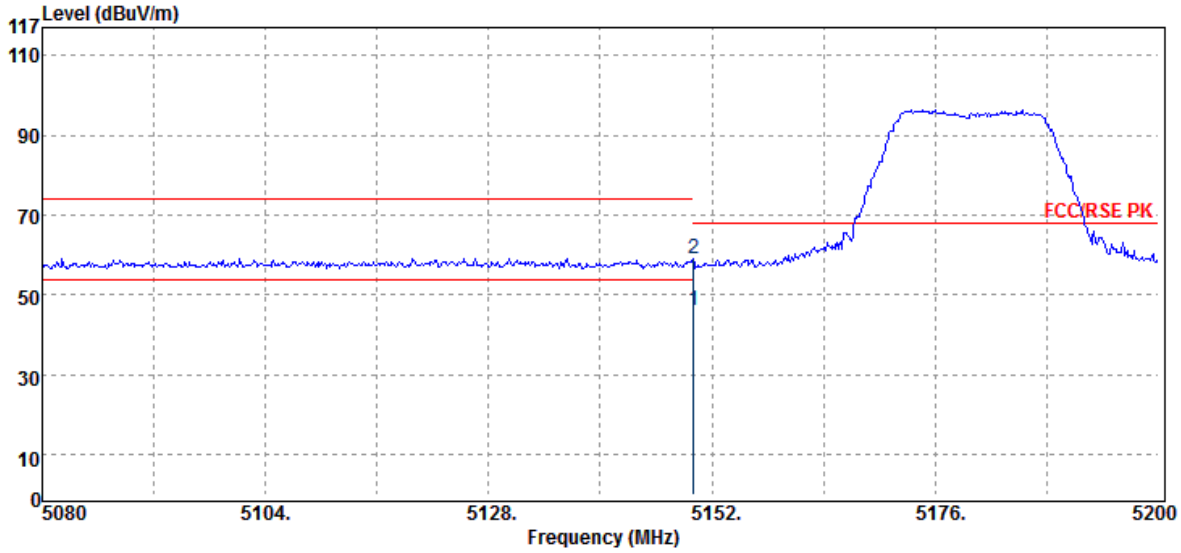
Operation Band	:802.11n20B1	Test Date	:2018-08-29
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.80	8.32	46.12	54.00	-7.88
5150.00	Peak	49.22	8.32	57.54	74.00	-16.46

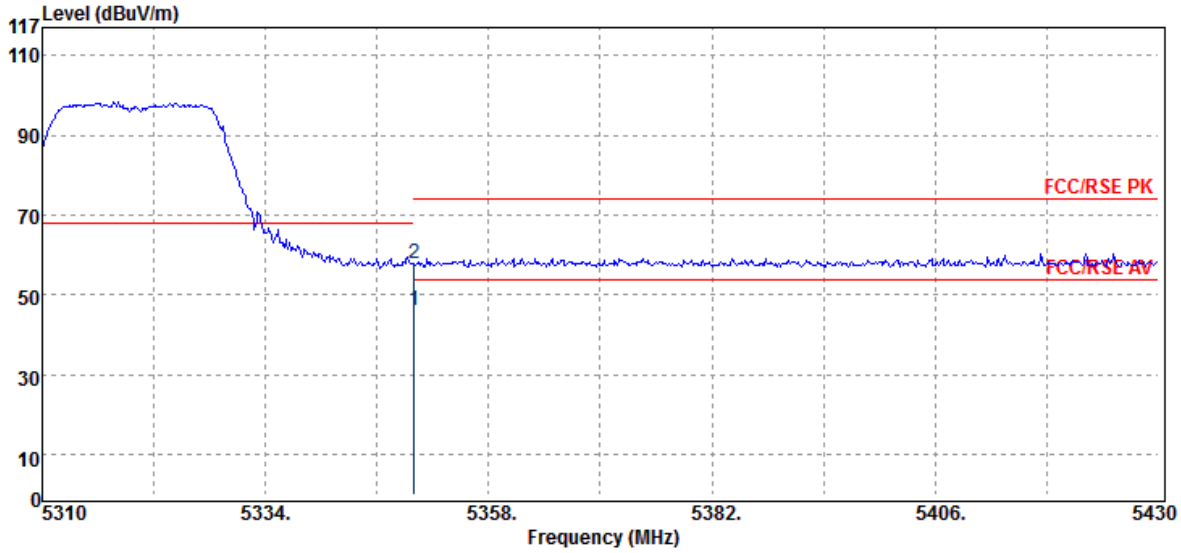
802.11n20 HT mode

Operation Band	:802.11n20B1	Test Date	:2018-08-29
Fundamental Frequency	:5180 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



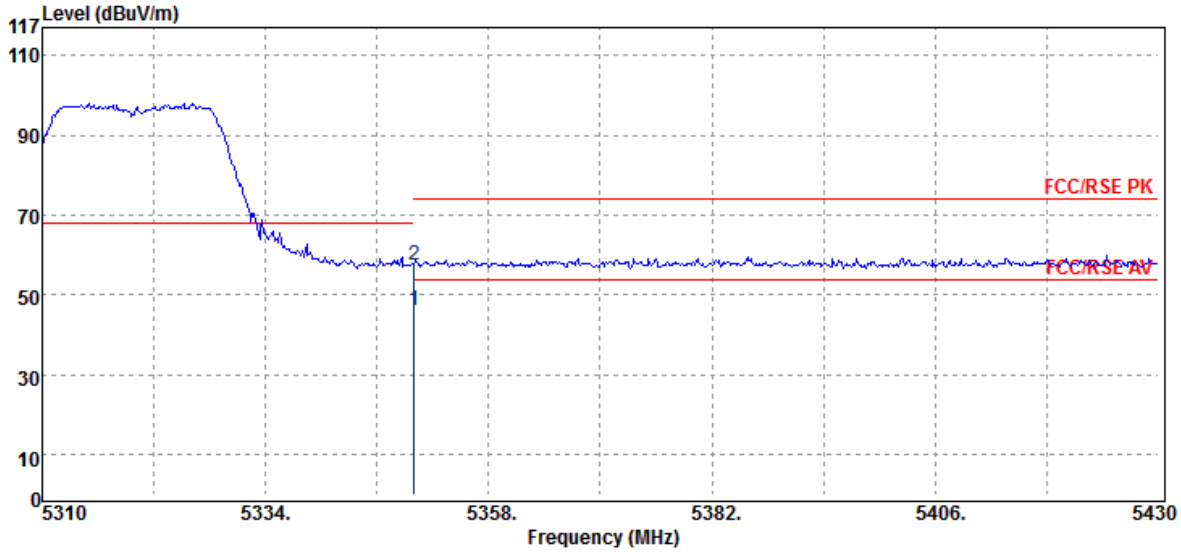
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.83	8.32	46.15	54.00	-7.85
5150.00	Peak	50.76	8.32	59.08	74.00	-14.92

Operation Band	:802.11n20B1	Test Date	:2018-08-29
Fundamental Frequency	:5320 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



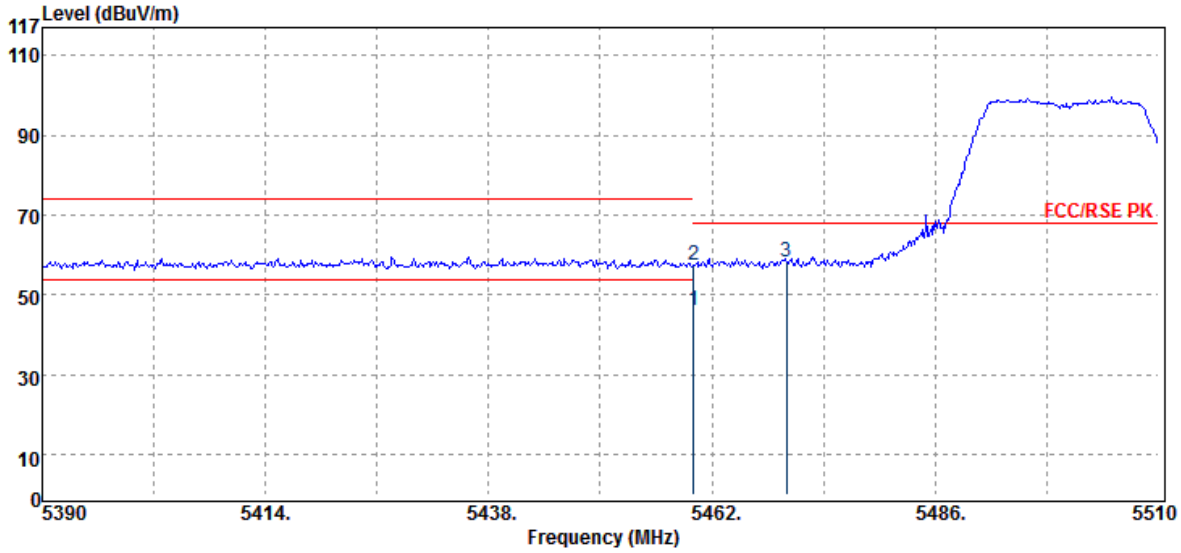
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.66	8.63	46.29	54.00	-7.71
5350.00	Peak	49.23	8.63	57.86	74.00	-16.14

Operation Band	:802.11n20B1	Test Date	:2018-08-29
Fundamental Frequency	:5320 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



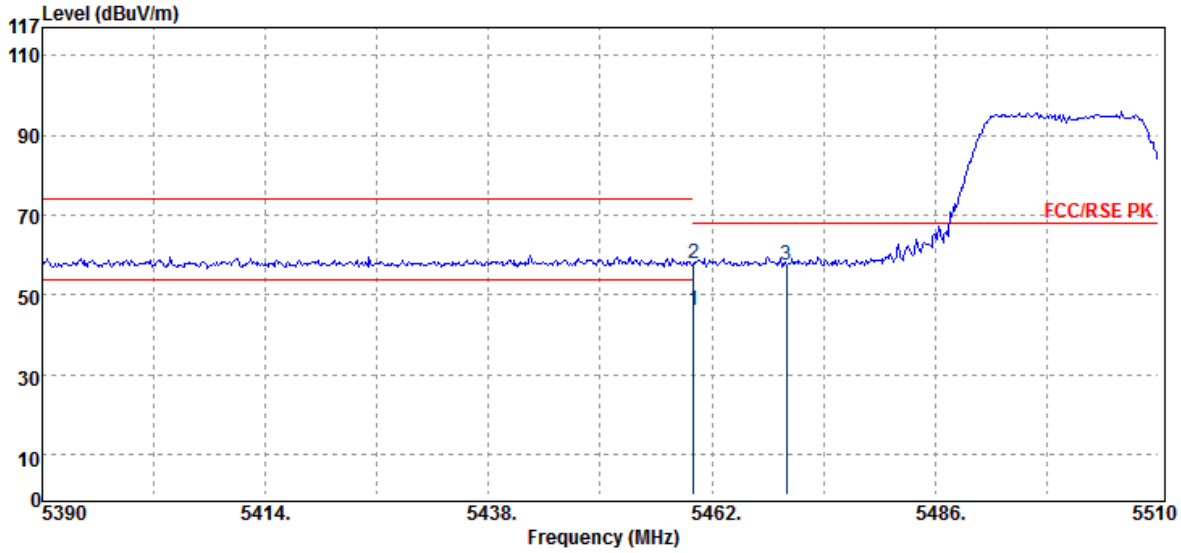
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.67	8.63	46.30	54.00	-7.70
5350.00	Peak	49.01	8.63	57.64	74.00	-16.36

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



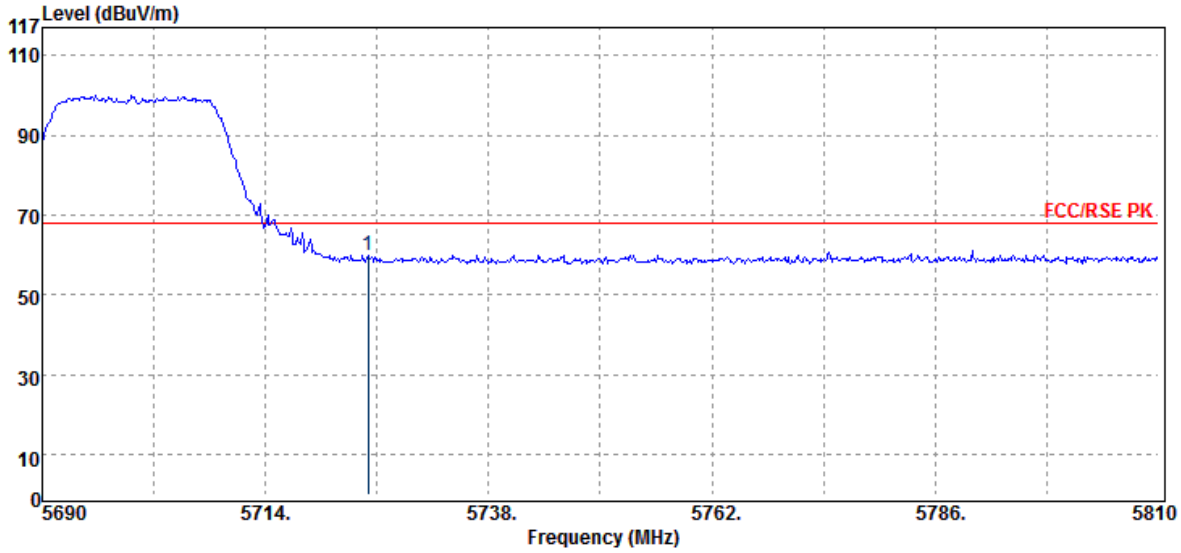
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.56	8.75	46.31	54.00	-7.69
5460.00	Peak	48.66	8.75	57.41	74.00	-16.59
5470.00	Peak	49.39	8.74	58.13	68.20	-10.07

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5500 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



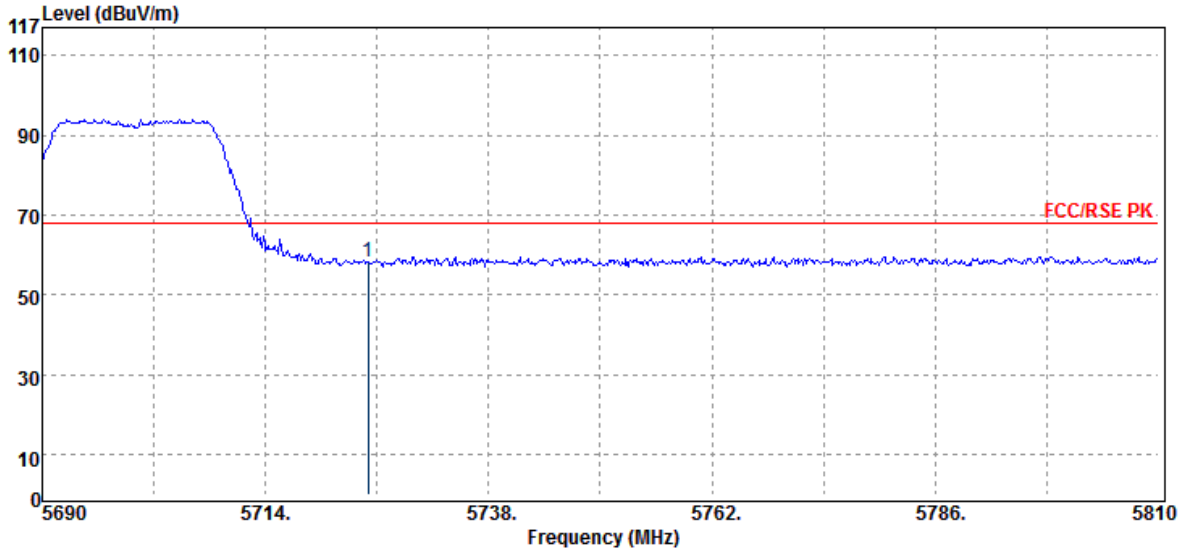
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.44	8.75	46.19	54.00	-7.81
5460.00	Peak	48.95	8.75	57.70	74.00	-16.30
5470.00	Peak	48.67	8.74	57.41	68.20	-10.79

Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	50.29	9.44	59.73	68.20	-8.47

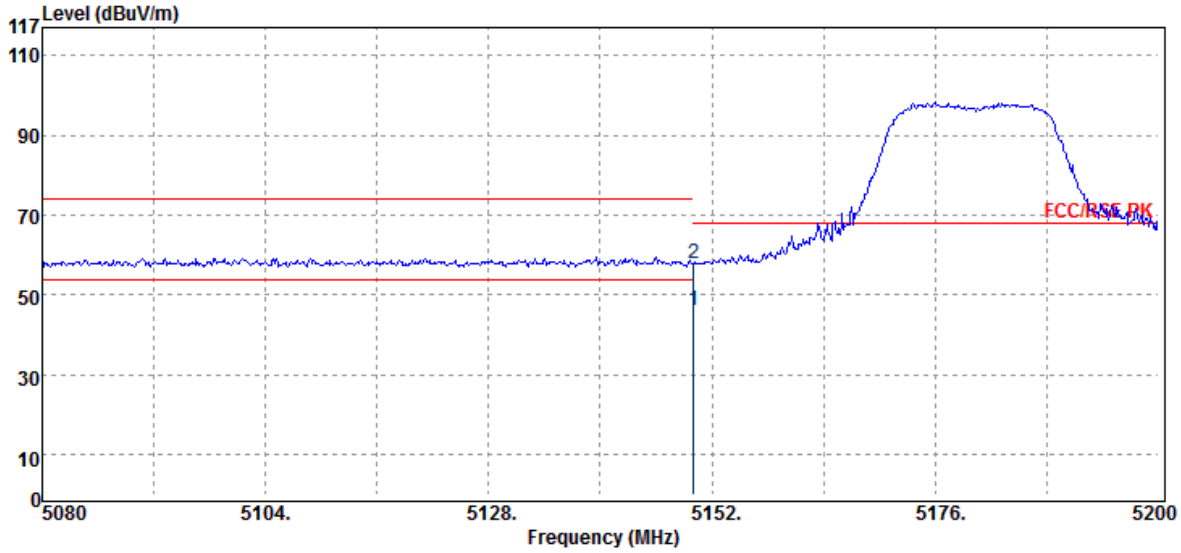
Operation Band	:802.11n20B3	Test Date	:2018-08-30
Fundamental Frequency	:5700 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	48.92	9.44	58.36	68.20	-9.84

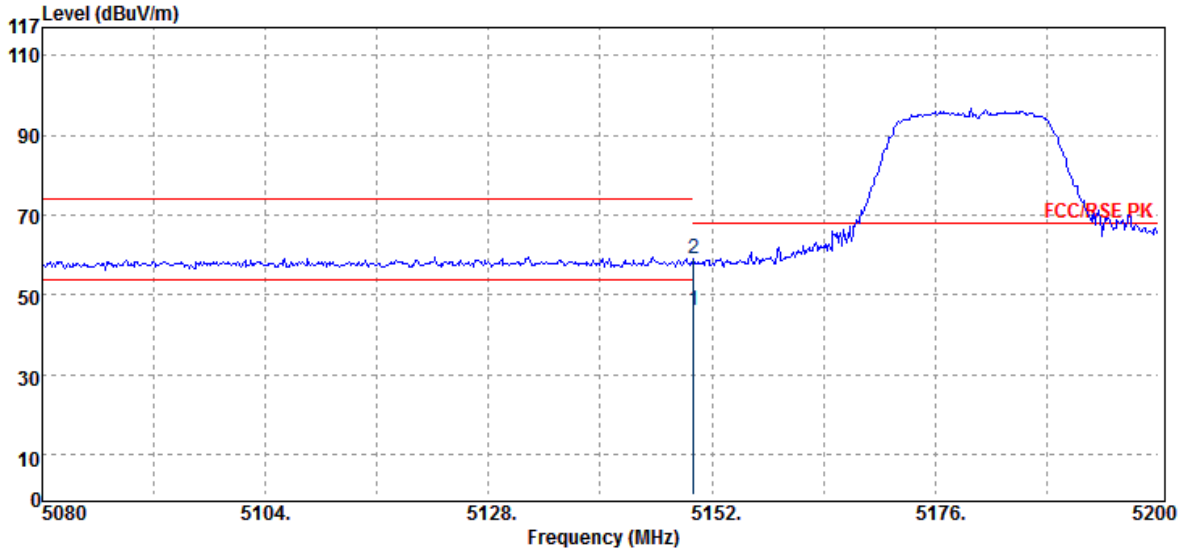
802.11n40 HT mode

Operation Band	:802.11n40B1	Test Date	:2018-08-30
Fundamental Frequency	:5190 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



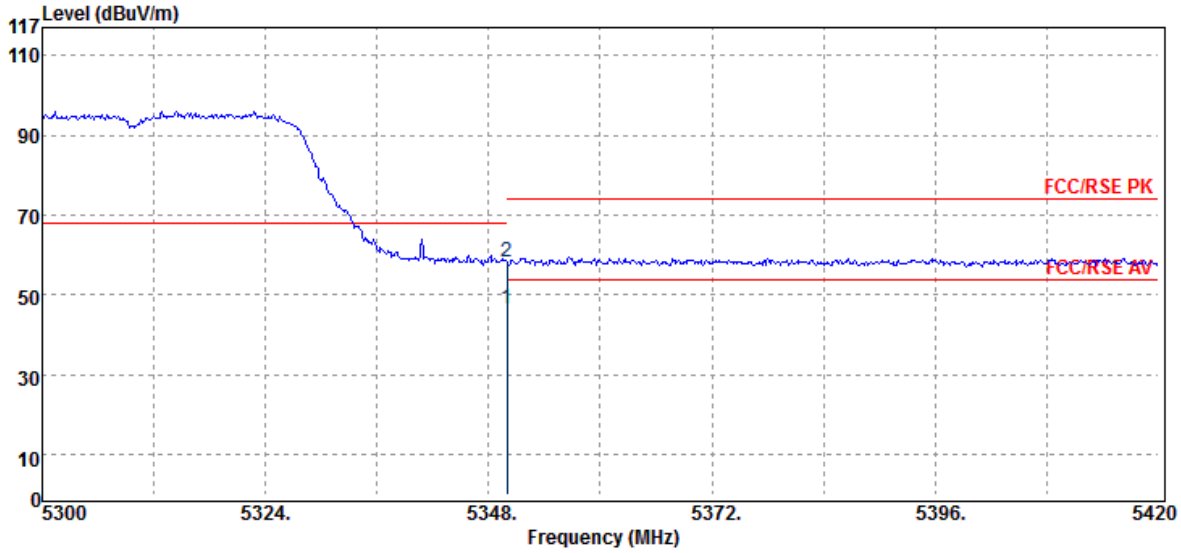
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.93	8.32	46.25	54.00	-7.75
5150.00	Peak	49.59	8.32	57.91	74.00	-16.09

Operation Band	:802.11n40B1	Test Date	:2018-08-30
Fundamental Frequency	:5190 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



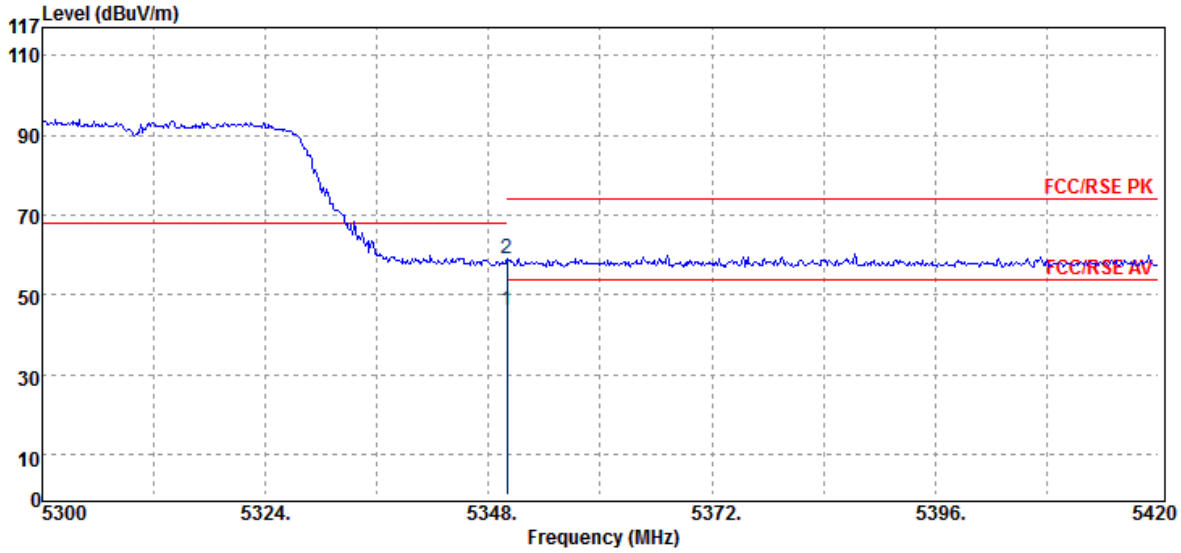
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	37.87	8.32	46.19	54.00	-7.81
5150.00	Peak	50.70	8.32	59.02	74.00	-14.98

Operation Band	:802.11n40B2	Test Date	:2018-08-30
Fundamental Frequency	:5310 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



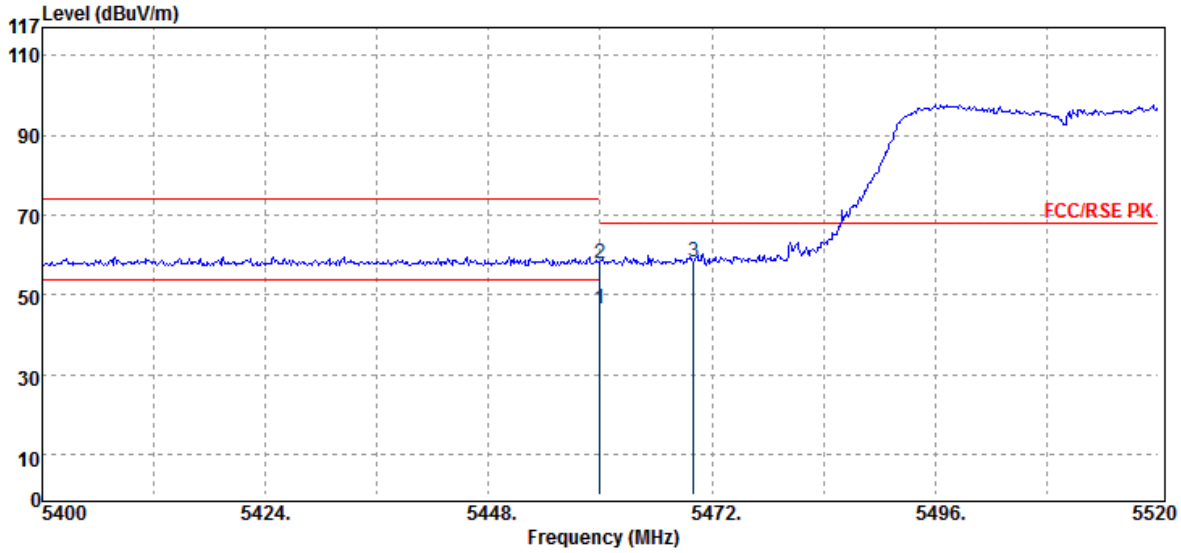
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.80	8.63	46.43	54.00	-7.57
5350.00	Peak	49.76	8.63	58.39	74.00	-15.61

Operation Band	:802.11n40B2	Test Date	:2018-08-30
Fundamental Frequency	:5310 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



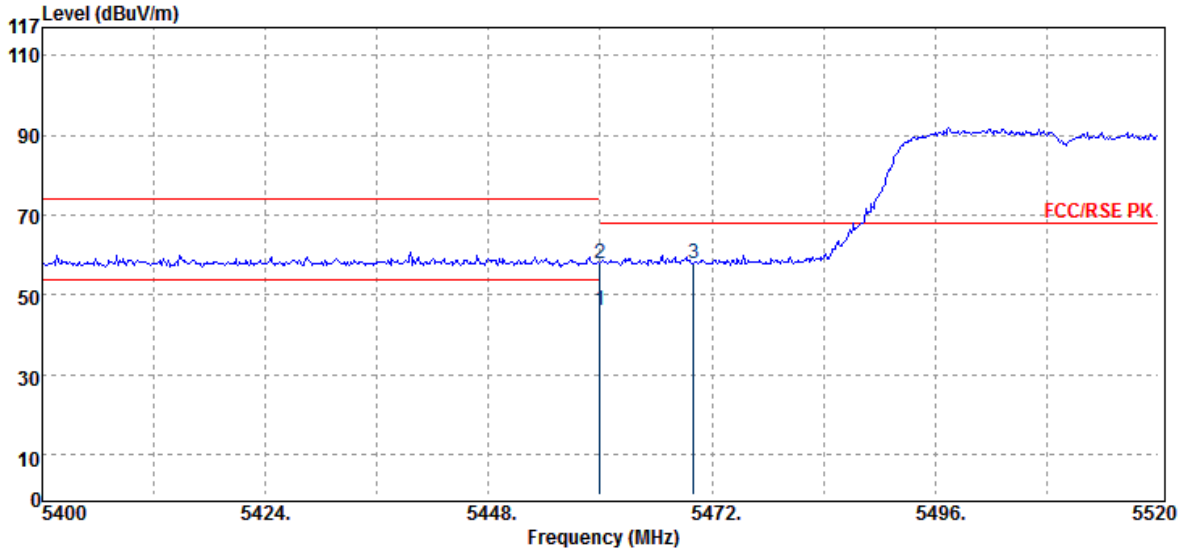
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	37.54	8.63	46.17	54.00	-7.83
5350.00	Peak	50.39	8.63	59.02	74.00	-14.98

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5510 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



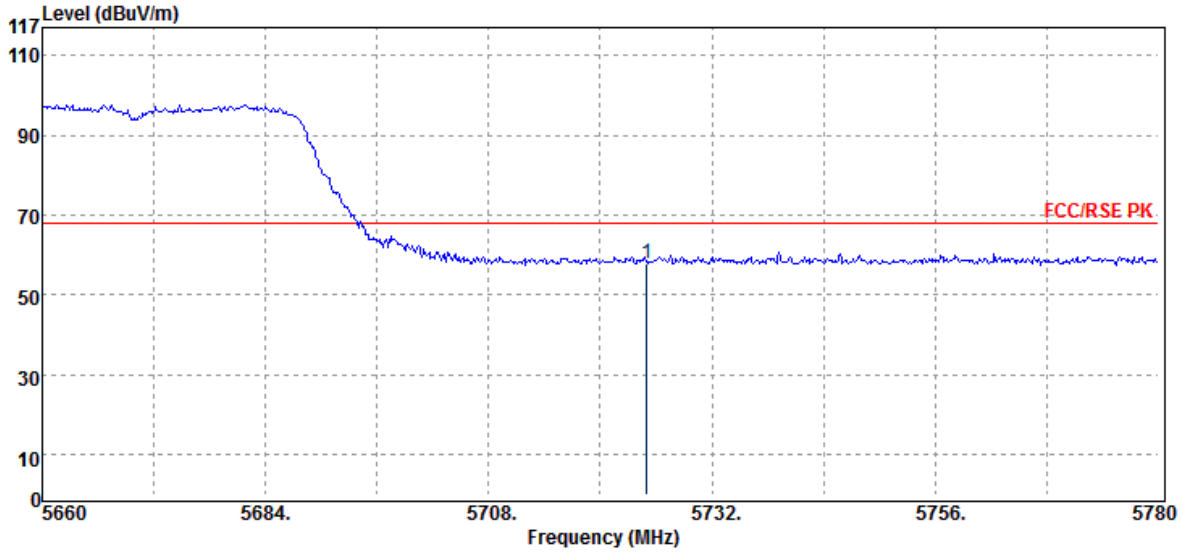
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.67	8.75	46.42	54.00	-7.58
5460.00	Peak	49.30	8.75	58.05	74.00	-15.95
5470.00	Peak	49.39	8.74	58.13	68.20	-10.07

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5510 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



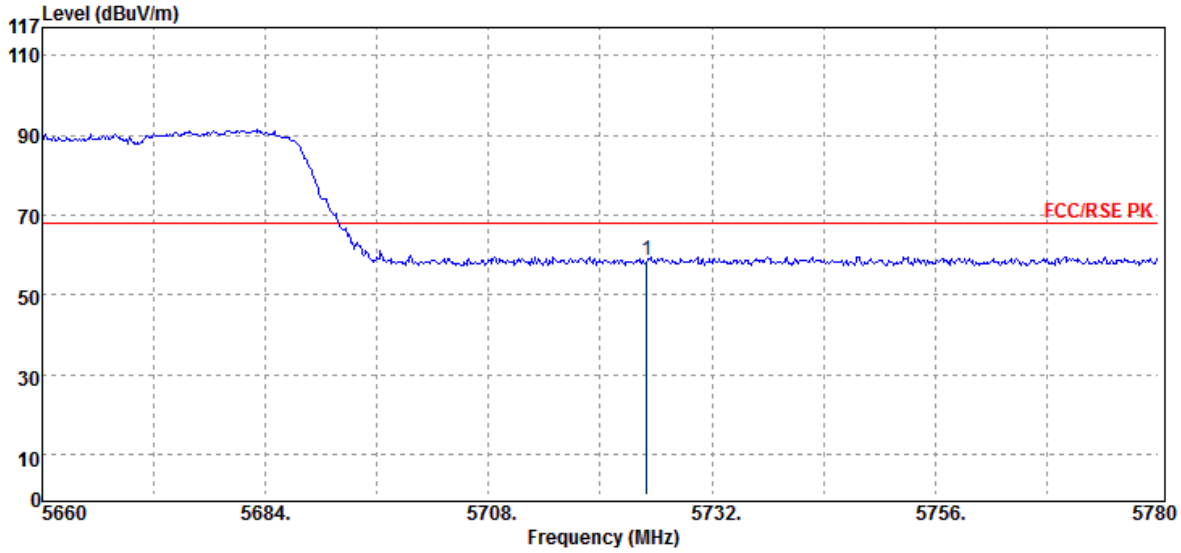
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	37.59	8.75	46.34	54.00	-7.66
5460.00	Peak	48.95	8.75	57.70	74.00	-16.30
5470.00	Peak	49.03	8.74	57.77	68.20	-10.43

Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5670 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	48.54	9.44	57.98	68.20	-10.22

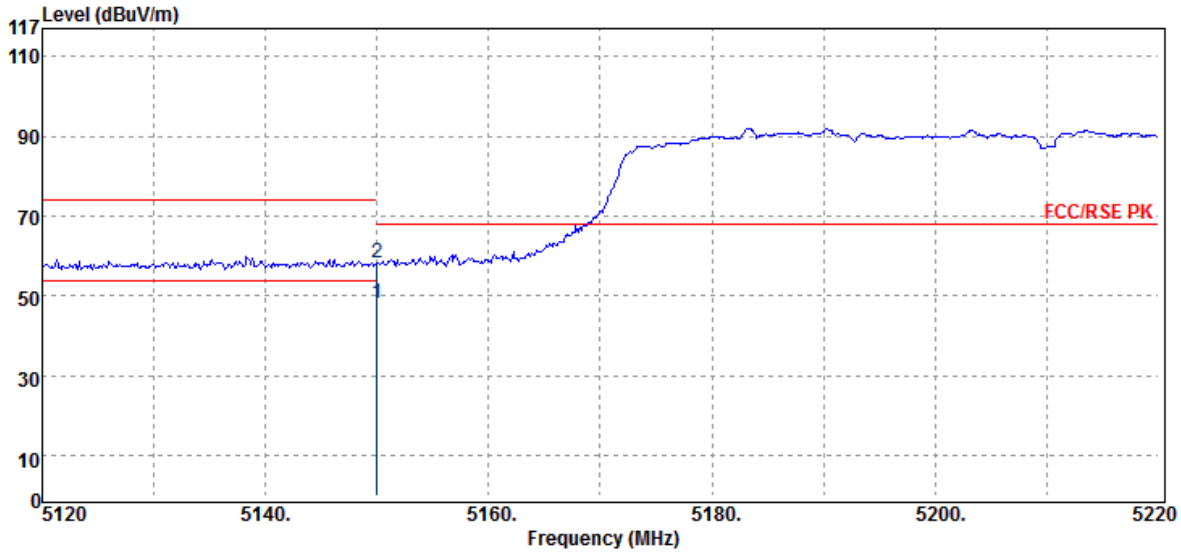
Operation Band	:802.11n40B3	Test Date	:2018-08-30
Fundamental Frequency	:5670 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	49.11	9.44	58.55	68.20	-9.65

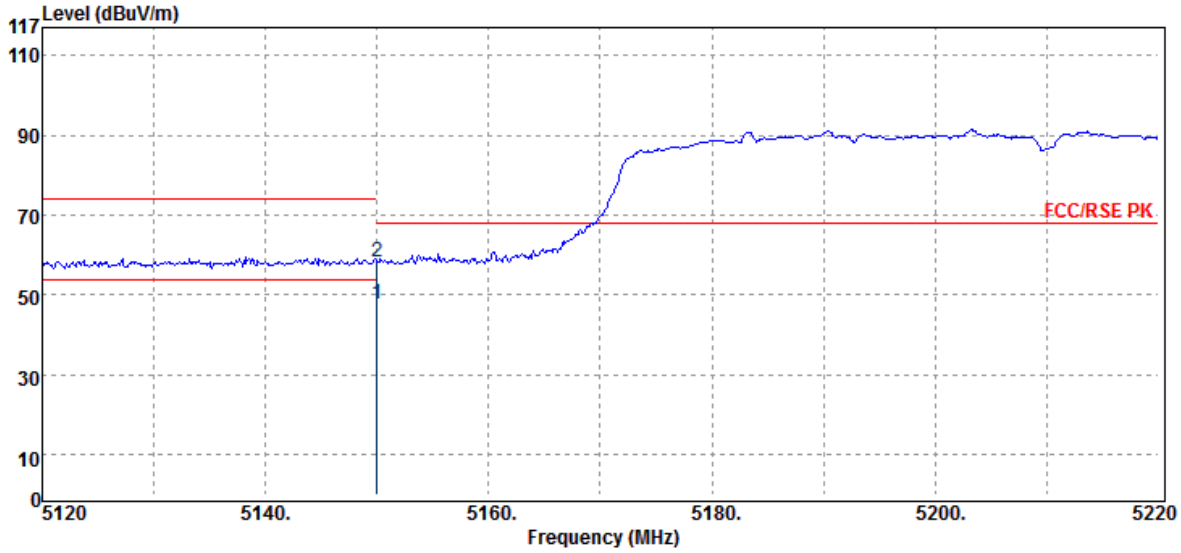
802.11ac80 VHT mode

Operation Band	:802.11ac80B1	Test Date	:2018-08-30
Fundamental Frequency	:5210 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



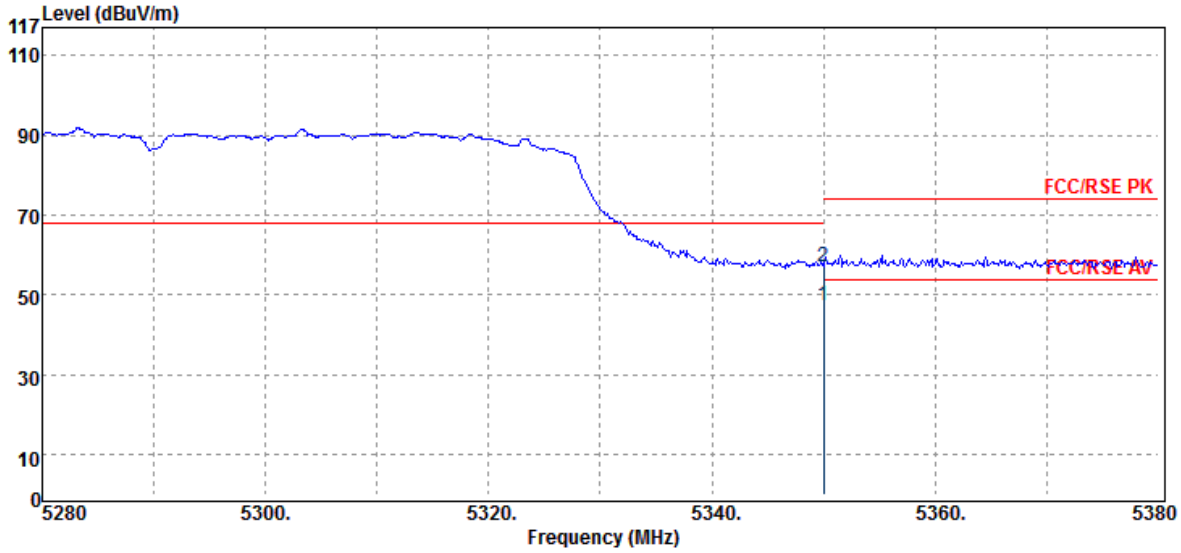
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	39.86	8.32	48.18	54.00	-5.82
5150.00	Peak	50.14	8.32	58.46	74.00	-15.54

Operation Band	:802.11ac80B1	Test Date	:2018-08-30
Fundamental Frequency	:5210 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



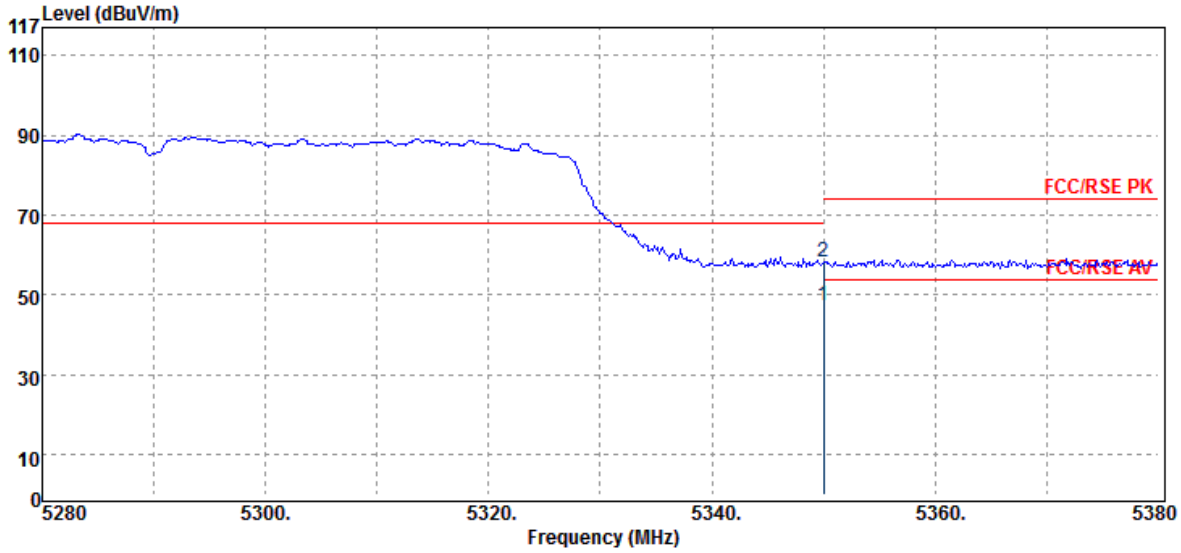
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Average	39.44	8.32	47.76	54.00	-6.24
5150.00	Peak	50.14	8.32	58.46	74.00	-15.54

Operation Band	:802.11ac80B2	Test Date	:2018-08-30
Fundamental Frequency	:5290 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



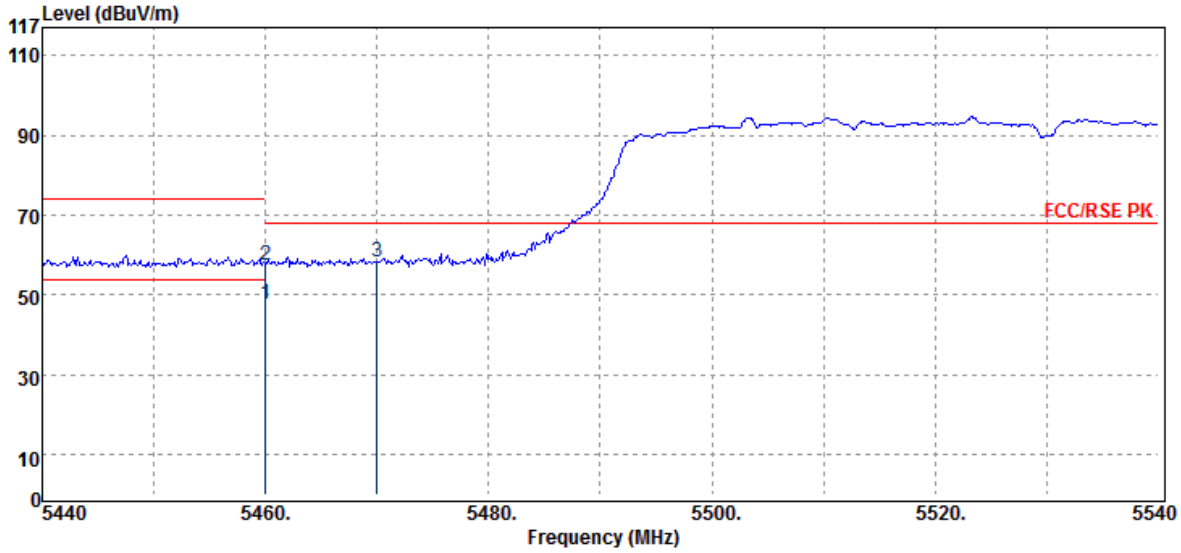
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	38.66	8.63	47.29	54.00	-6.71
5350.00	Peak	48.56	8.63	57.19	74.00	-16.81

Operation Band	:802.11ac80B2	Test Date	:2018-08-30
Fundamental Frequency	:5290 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH HIGH	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



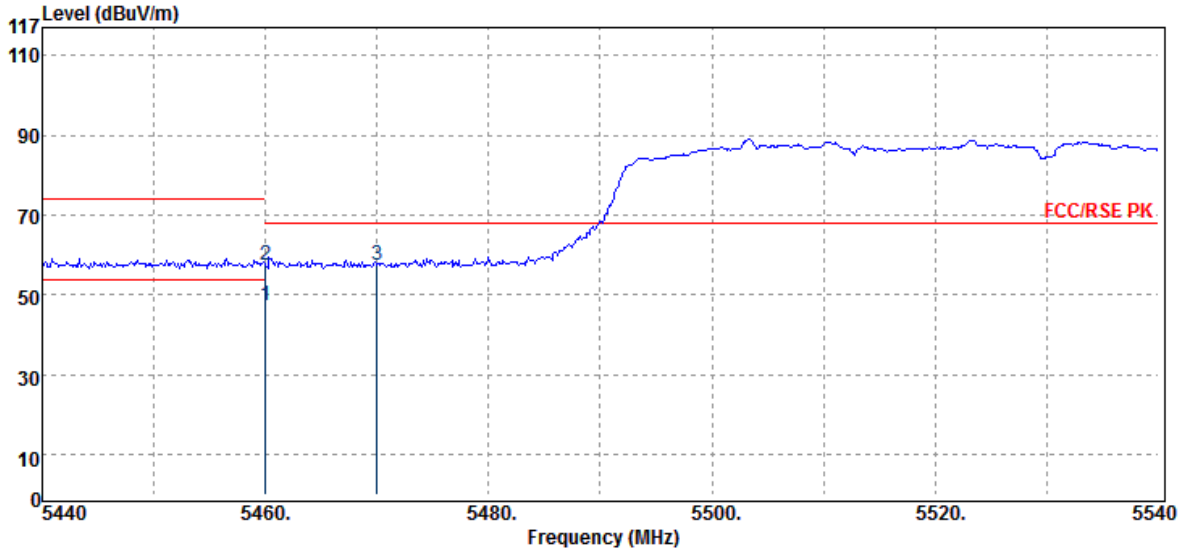
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Average	38.65	8.63	47.28	54.00	-6.72
5350.00	Peak	49.68	8.63	58.31	74.00	-15.69

Operation Band	:802.11ac80B3	Test Date	:2018-08-30
Fundamental Frequency	:5530 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	38.83	8.75	47.58	54.00	-6.42
5460.00	Peak	48.85	8.75	57.60	74.00	-16.40
5470.00	Peak	49.62	8.74	58.36	68.20	-9.84

Operation Band	:802.11ac80B3	Test Date	:2018-08-30
Fundamental Frequency	:5530 MHz	Temp./Humi.	:23 deg_C / 62 RH
Operation Mode	:Bandedge CH LOW	Engineer	:Tin
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Average	38.68	8.75	47.43	54.00	-6.57
5460.00	Peak	48.86	8.75	57.61	74.00	-16.39
5470.00	Peak	48.69	8.74	57.43	68.20	-10.77

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.

13 FREQUENCY STABILITY

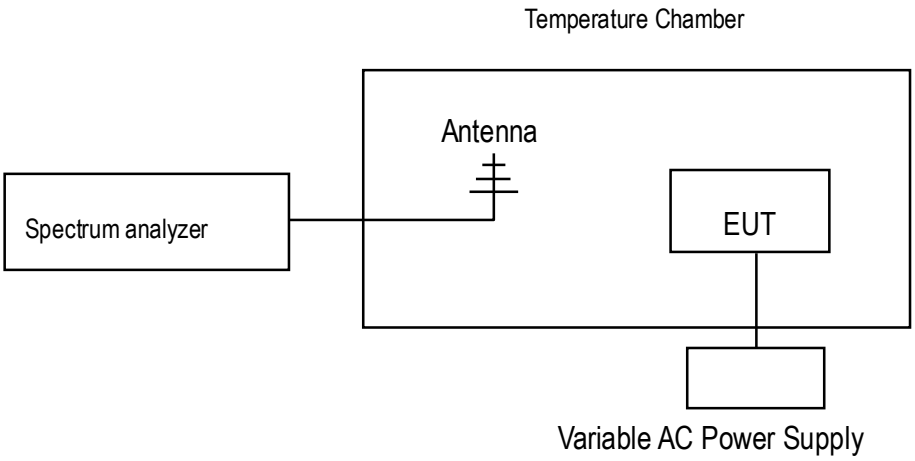
13.1 Standard Applicable

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 Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	R&S	FSV-30	101398	Feb. 01st, 2018	Jan. 31th, 2019
DC Power Supply	Anritsu	E3640A	MY52410006	Feb. 01st, 2018	Jan. 31th, 2019
Temperature Chamber	TERCHY	MHG-120LF	911009	Feb. 01st, 2018	Jan. 31th, 2019
Attenuator	Mini-Circuit	BW-S10W2+	2	Nov. 28tg, 2017	Nov. 27th, 2018
DC Block	Mini-Circuits	BLK-18-S+	1	Jan. 02nd, 2018	Jan. 01st, 2019
Coaxial Cables	N/A	WK CE Cable	N/A	Jan. 02nd, 2018	Jan. 01st, 2019
Notebook	Lenovo	L430	R9-WGNK5	Jan. 02nd, 2018	Jan. 01st, 2019

13.5 Measurement Result

Startup:

Operation Mode	802.11 a	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	36	5180	5,179.99335	0.00000128
		44	5220	5,220.00680	-0.00000130
		48	5240	5,240.00206	-0.00000039
		52	5260	5,259.99751	0.00000047
		60	5300	5,299.99772	0.00000043
		64	5320	5,320.00463	-0.00000087
		100	5500	5,500.00918	-0.00000167
		116	5580	5,579.99452	0.00000098
		140	5700	5,700.00588	-0.00000103
	3.51V	36	5180	5,179.99862	0.00000027
		44	5220	5,219.99415	0.00000112
		48	5240	5,239.99528	0.00000090
		52	5260	5,259.99637	0.00000069
		60	5300	5,300.00970	-0.00000183
		64	5320	5,320.00142	-0.00000027
		100	5500	5,499.99668	0.00000060
		116	5580	5,579.99867	0.00000024
		140	5700	5,699.99363	0.00000112
25 ℃	3.8V	36	5180	5,180.00206	-0.00000040
		44	5220	5,220.00280	-0.00000054
		48	5240	5,240.00238	-0.00000045
		52	5260	5,260.00474	-0.00000090
		60	5300	5,299.99619	0.00000072
		64	5320	5,319.99091	0.00000171
		100	5500	5,499.99200	0.00000146
		116	5580	5,580.00346	-0.00000062
		140	5700	5,700.00199	-0.00000035

55 ℃	4.29V	36	5180	5,179.99166	0.00000161
		44	5220	5,220.00974	-0.00000187
		48	5240	5,240.00653	-0.00000125
		52	5260	5,260.00783	-0.00000149
		60	5300	5,300.00391	-0.00000074
		64	5320	5,319.99123	0.00000165
		100	5500	5,499.99546	0.00000083
		116	5580	5,580.00072	-0.00000013
		140	5700	5,699.99032	0.00000170
	3.51V	36	5180	5,180.00785	-0.00000151
		44	5220	5,220.00771	-0.00000148
		48	5240	5,240.00076	-0.00000015
		52	5260	5,259.99863	0.00000026
		60	5300	5,300.00804	-0.00000152
		64	5320	5,320.00208	-0.00000039
		100	5500	5,499.99782	0.00000040
		116	5580	5,580.00020	-0.00000004
		140	5700	5,700.00039	-0.00000007

Operation Mode	802.11 n_HT40	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	38	5190	5,190.00645	-0.00000124
		46	5230	5,229.99261	0.00000141
		54	5270	5,269.99578	0.00000080
		62	5310	5,310.00887	-0.00000167
		102	5510	5,510.00765	-0.00000139
		110	5550	5,550.00685	-0.00000123
		134	5670	5,669.99236	0.00000135
	3.51V	38	5190	5,190.00552	-0.00000106
		46	5230	5,229.99507	0.00000094
		54	5270	5,270.00604	-0.00000115
		62	5310	5,310.00439	-0.00000083
		102	5510	5,509.99503	0.00000090
		110	5550	5,549.99334	0.00000120
		134	5670	5,669.99685	0.00000056

25 ℃	3.8V	38	5190	5,189.99694	0.00000059
		46	5230	5,229.99049	0.00000182
		54	5270	5,269.99235	0.00000145
		62	5310	5,309.99283	0.00000135
		102	5510	5,510.00464	-0.00000084
		110	5550	5,550.00220	-0.00000040
		134	5670	5,670.00677	-0.00000119
55 ℃	4.29V	38	5190	5,189.99752	0.00000048
		46	5230	5,229.99348	0.00000125
		54	5270	5,270.00995	-0.00000189
		62	5310	5,309.99743	0.00000048
		102	5510	5,509.99831	0.00000031
		110	5550	5,549.99944	0.00000010
		134	5670	5,669.99314	0.00000121
	3.51V	38	5190	5,190.00975	-0.00000188
		46	5230	5,230.00517	-0.00000099
		54	5270	5,270.00802	-0.00000152
		62	5310	5,310.00055	-0.00000010
		102	5510	5,510.00610	-0.00000111
		110	5550	5,549.99320	0.00000122
		134	5670	5,670.00093	-0.00000016

Operation Mode	802.11 ac_VHT80	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	42	5210	5,210.00234	-0.00000045
		58	5290	5,290.00699	-0.00000132
		106	5530	5,529.99146	0.00000155
		122	5610	5,609.99432	0.00000101
	3.51V	42	5210	5,209.99433	0.00000109
		58	5290	5,289.99917	0.00000016
		106	5530	5,530.00236	-0.00000043
		122	5610	5,610.00320	-0.00000057
25 ℃	3.8V	42	5210	5,210.00325	-0.00000062
		58	5290	5,289.99661	0.00000064
		106	5530	5,530.00403	-0.00000073
		122	5610	5,609.99400	0.00000107
55 ℃	4.29V	42	5210	5,210.00823	-0.00000158
		58	5290	5,289.99126	0.00000165
		106	5530	5,530.00824	-0.00000149
		122	5610	5,610.00288	-0.00000051
	3.51V	42	5210	5,210.00530	-0.00000102
		58	5290	5,290.00465	-0.00000088
		106	5530	5,529.99954	0.00000008
		122	5610	5,610.00841	-0.00000150

2 minutes:

Operation Mode	802.11 a	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	36	5180	5,179.99690	0.00000060
		44	5220	5,219.99118	0.00000169
		48	5240	5,240.00340	-0.00000065
		52	5260	5,260.00832	-0.00000158
		60	5300	5,299.99968	0.00000006
		64	5320	5,320.00874	-0.00000164
		100	5500	5,499.99660	0.00000062
		116	5580	5,579.99329	0.00000120
		140	5700	5,700.00493	-0.00000086
	3.51V	36	5180	5,179.99694	0.00000059
		44	5220	5,220.00802	-0.00000154
		48	5240	5,239.99818	0.00000035
		52	5260	5,260.00111	-0.00000021
		60	5300	5,299.99721	0.00000053
		64	5320	5,319.99796	0.00000038
		100	5500	5,500.00374	-0.00000068
		116	5580	5,579.99906	0.00000017
		140	5700	5,700.00667	-0.00000117
25 ℃	3.8V	36	5180	5,179.99419	0.00000112
		44	5220	5,220.00033	-0.00000006
		48	5240	5,239.99306	0.00000132
		52	5260	5,260.00924	-0.00000176
		60	5300	5,299.99177	0.00000155
		64	5320	5,320.00293	-0.00000055
		100	5500	5,499.99426	0.00000104
		116	5580	5,580.00311	-0.00000056
		140	5700	5,699.99069	0.00000163

55 ℃	4.29V	36	5180	5,180.00202	-0.00000039
		44	5220	5,219.99215	0.00000150
		48	5240	5,239.99139	0.00000164
		52	5260	5,260.00009	-0.00000002
		60	5300	5,299.99813	0.00000035
		64	5320	5,320.00174	-0.00000033
		100	5500	5,500.00166	-0.00000030
		116	5580	5,579.99215	0.00000141
		140	5700	5,700.00508	-0.00000089
	3.51V	36	5180	5,179.99535	0.00000090
		44	5220	5,220.00613	-0.00000117
		48	5240	5,239.99565	0.00000083
		52	5260	5,260.00264	-0.00000050
		60	5300	5,299.99032	0.00000183
		64	5320	5,319.99782	0.00000041
		100	5500	5,499.99888	0.00000020
		116	5580	5,580.00088	-0.00000016
		140	5700	5,699.99522	0.00000084

Operation Mode	802.11 n_HT40	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	38	5190	5,190.00705	-0.00000136
		46	5230	5,230.00945	-0.00000181
		54	5270	5,270.00042	-0.00000008
		62	5310	5,309.99850	0.00000028
		102	5510	5,509.99811	0.00000034
		110	5550	5,549.99592	0.00000074
		134	5670	5,669.99821	0.00000032
	3.51V	38	5190	5,189.99850	0.00000029
		46	5230	5,230.00196	-0.00000038
		54	5270	5,269.99602	0.00000076
		62	5310	5,310.00231	-0.00000044
		102	5510	5,510.00183	-0.00000033
		110	5550	5,550.00100	-0.00000018
		134	5670	5,669.99680	0.00000057

25 ℃	3.8V	38	5190	5,189.99498	0.00000097
		46	5230	5,229.99446	0.00000106
		54	5270	5,269.99110	0.00000169
		62	5310	5,310.00659	-0.00000124
		102	5510	5,510.00548	-0.00000099
		110	5550	5,550.00381	-0.00000069
		134	5670	5,670.00170	-0.00000030
55 ℃	4.29V	38	5190	5,190.00890	-0.00000172
		46	5230	5,230.00736	-0.00000141
		54	5270	5,270.00645	-0.00000122
		62	5310	5,310.00388	-0.00000073
		102	5510	5,509.99289	0.00000129
		110	5550	5,549.99461	0.00000097
		134	5670	5,669.99772	0.00000040
	3.51V	38	5190	5,189.99679	0.00000062
		46	5230	5,230.00164	-0.00000031
		54	5270	5,270.00434	-0.00000082
		62	5310	5,309.99302	0.00000132
		102	5510	5,509.99980	0.00000004
		110	5550	5,549.99290	0.00000128
		134	5670	5,670.00711	-0.00000125

Operation Mode	802.11 ac_VHT80	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	42	5210	5,209.99370	0.00000121
		58	5290	5,289.99079	0.00000174
		106	5530	5,529.99260	0.00000134
		122	5610	5,610.00742	-0.00000132
	3.51V	42	5210	5,210.00857	-0.00000164
		58	5290	5,290.00817	-0.00000154
		106	5530	5,529.99631	0.00000067
		122	5610	5,609.99209	0.00000141
25 ℃	3.8V	42	5210	5,209.99424	0.00000110
		58	5290	5,289.99021	0.00000185
		106	5530	5,529.99017	0.00000178
		122	5610	5,610.00544	-0.00000097
55 ℃	4.29V	42	5210	5,210.00766	-0.00000147
		58	5290	5,289.99995	0.00000001
		106	5530	5,529.99805	0.00000035
		122	5610	5,610.00605	-0.00000108
	3.51V	42	5210	5,209.99489	0.00000098
		58	5290	5,290.00418	-0.00000079
		106	5530	5,530.00785	-0.00000142
		122	5610	5,609.99567	0.00000077

5 minutes

Operation Mode	802.11 a	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	36	5180	5,179.99756	0.00000047
		44	5220	5,220.00461	-0.00000088
		48	5240	5,240.00652	-0.00000124
		52	5260	5,259.99506	0.00000094
		60	0	5,299.99605	0.00000074
		64	5320	5,319.99665	0.00000063
		100	5500	5,500.00942	-0.00000171
		116	5580	5,579.99994	0.00000001
		140	5700	5,699.99681	0.00000056
	3.51V	36	5180	5,180.00449	-0.00000087
		44	5220	5,220.00660	-0.00000126
		48	5240	5,240.00305	-0.00000058
		52	5260	5,259.99903	0.00000018
		60	5300	5,300.00930	-0.00000176
		64	5320	5,319.99428	0.00000108
		100	5500	5,499.99790	0.00000038
		116	5580	5,580.00665	-0.00000119
		140	5700	5,700.00007	-0.00000001
25 ℃	3.8V	36	5180	5,179.99682	0.00000061
		44	5220	5,220.00775	-0.00000149
		48	5240	5,240.00300	-0.00000057
		52	5260	5,260.00848	-0.00000161
		60	5300	5,300.00699	-0.00000132
		64	5320	5,319.99640	0.00000068
		100	5500	5,500.00598	-0.00000109
		116	5580	5,579.99924	0.00000014
		140	5700	5,699.99401	0.00000105

55 ℃	4.29V	36	5180	5,179.99156	0.00000163
		44	5220	5,219.99380	0.00000119
		48	5240	5,239.99931	0.00000013
		52	5260	5,259.99130	0.00000165
		60	5300	5,300.00604	-0.00000114
		64	5320	5,319.99892	0.00000020
		100	5500	5,499.99339	0.00000120
		116	5580	5,579.99533	0.00000084
		140	5700	5,700.00937	-0.00000164
	3.51V	36	5180	5,180.00296	-0.00000057
		44	5220	5,219.99183	0.00000157
		48	5240	5,240.00934	-0.00000178
		52	5260	5,260.00297	-0.00000057
		60	5300	5,300.00543	-0.00000102
		64	5320	5,319.99098	0.00000169
		100	5500	5,499.99884	0.00000021
		116	5580	5,580.00518	-0.00000093
		140	5700	5,699.99881	0.00000021

Operation Mode	802.11 n_HT40	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	38	5190	5,189.99626	0.00000072
		46	5230	5,229.99048	0.00000182
		54	5270	5,269.99053	0.00000180
		62	5310	5,309.99420	0.00000109
		102	5510	5,509.99166	0.00000151
		110	5550	5,549.99905	0.00000017
		134	5670	5,670.00937	-0.00000165
	3.51V	38	5190	5,189.99092	0.00000175
		46	5230	5,229.99257	0.00000142
		54	5270	5,270.00199	-0.00000038
		62	5310	5,309.99496	0.00000095
		102	5510	5,510.00054	-0.00000010
		110	5550	5,550.00511	-0.00000092
		134	5670	5,670.00470	-0.00000083

25 ℃	3.8V	38	5190	5,190.00597	-0.00000115
		46	5230	5,230.00619	-0.00000118
		54	5270	5,270.00199	-0.00000038
		62	5310	5,309.99125	0.00000165
		102	5510	5,510.00484	-0.00000088
		110	5550	5,549.99238	0.00000137
		134	5670	5,670.00560	-0.00000099
55 ℃	4.29V	38	5190	5,190.00412	-0.00000079
		46	5230	5,229.99774	0.00000043
		54	5270	5,269.99068	0.00000177
		62	5310	5,310.00734	-0.00000138
		102	5510	5,510.00078	-0.00000014
		110	5550	5,549.99088	0.00000164
		134	5670	5,670.00690	-0.00000122
	3.51V	38	5190	5,189.99340	0.00000127
		46	5230	5,230.00420	-0.00000080
		54	5270	5,270.00374	-0.00000071
		62	5310	5,309.99623	0.00000071
		102	5510	5,509.99339	0.00000120
		110	5550	5,549.99742	0.00000047
		134	5670	5,670.00692	-0.00000122

Operation Mode	802.11 ac_VHT80	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	42	5210	5,210.00938	-0.00000180
		58	5290	5,290.00362	-0.00000068
		106	5530	5,529.99505	0.00000090
		122	5610	5,610.00101	-0.00000018
	3.51V	42	5210	5,210.00990	-0.00000190
		58	5290	5,290.00643	-0.00000122
		106	5530	5,529.99882	0.00000021
		122	5610	5,609.99150	0.00000152
25 ℃	3.8V	42	5210	5,210.00469	-0.00000090
		58	5290	5,290.00973	-0.00000184
		106	5530	5,530.00131	-0.00000024
		122	5610	5,609.99847	0.00000027
55 ℃	4.29V	42	5210	5,209.99682	0.00000061
		58	5290	5,289.99960	0.00000008
		106	5530	5,530.00522	-0.00000094
		122	5610	5,610.00695	-0.00000124
	3.51V	42	5210	5,210.00746	-0.00000143
		58	5290	5,289.99632	0.00000070
		106	5530	5,529.99306	0.00000125
		122	5610	5,610.00757	-0.00000135

10 minutes:

Operation Mode	802.11 a	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	36	5180	5,180.00885	-0.00000171
		44	5220	5,219.99417	0.00000112
		48	5240	5,239.99995	0.00000001
		52	5260	5,260.00092	-0.00000017
		60	5300	5,299.99813	0.00000035
		64	5320	5,320.00922	-0.00000173
		100	5500	5,500.00381	-0.00000069
		116	5580	5,579.99048	0.00000171
		140	5700	5,700.00366	-0.00000064
	3.51V	36	5180	5,180.00075	-0.00000014
		44	5220	5,220.00890	-0.00000171
		48	5240	5,240.00613	-0.00000117
		52	5260	5,260.00305	-0.00000058
		60	5300	5,299.99112	0.00000168
		64	5320	5,319.99257	0.00000140
		100	5500	5,499.99089	0.00000166
		116	5580	5,579.99016	0.00000176
		140	5700	5,700.00469	-0.00000082
25 ℃	3.8V	36	5180	5,179.99084	0.00000177
		44	5220	5,220.00857	-0.00000164
		48	5240	5,240.00227	-0.00000043
		52	5260	5,260.00465	-0.00000088
		60	5300	5,300.00586	-0.00000111
		64	5320	5,320.00483	-0.00000091
		100	5500	5,500.00686	-0.00000125
		116	5580	5,580.00109	-0.00000019
		140	5700	5,699.99203	0.00000140

55 ℃	4.29V	36	5180	5,180.00161	-0.00000031
		44	5220	5,220.00261	-0.00000050
		48	5240	5,240.00407	-0.00000078
		52	5260	5,260.00493	-0.00000094
		60	5300	5,299.99758	0.00000046
		64	5320	5,319.99169	0.00000156
		100	5500	5,499.99509	0.00000089
		116	5580	5,579.99564	0.00000078
		140	5700	5,699.99339	0.00000116
	3.51V	36	5180	5,180.00595	-0.00000115
		44	5220	5,220.00289	-0.00000055
		48	5240	5,239.99094	0.00000173
		52	5260	5,260.00594	-0.00000113
		60	5300	5,300.00426	-0.00000080
		64	5320	5,319.99822	0.00000034
		100	5500	5,500.00473	-0.00000086
		116	5580	5,579.99146	0.00000153
		140	5700	5,700.00814	-0.00000143

Operation Mode	802.11 n_HT40	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	38	5190	5,189.99211	0.00000152
		46	5230	5,229.99132	0.00000166
		54	5270	5,270.00864	-0.00000164
		62	5310	5,310.00030	-0.00000006
		102	5510	5,509.99446	0.00000100
		110	5550	5,550.00057	-0.00000010
		134	5670	5,669.99249	0.00000132
	3.51V	38	5190	5,190.00102	-0.00000020
		46	5230	5,230.00659	-0.00000126
		54	5270	5,270.00895	-0.00000170
		62	5310	5,309.99194	0.00000152
		102	5510	5,510.00433	-0.00000079
		110	5550	5,550.00387	-0.00000070
		134	5670	5,669.99995	0.00000001

25 ℃	3.8V	38	5190	5,189.99773	0.00000044
		46	5230	5,229.99572	0.00000082
		54	5270	5,269.99424	0.00000109
		62	5310	5,310.00158	-0.00000030
		102	5510	5,509.99656	0.00000062
		110	5550	5,550.00585	-0.00000105
		134	5670	5,669.99791	0.00000037
55 ℃	4.29V	38	5190	5,189.99254	0.00000144
		46	5230	5,229.99613	0.00000074
		54	5270	5,270.00591	-0.00000112
		62	5310	5,309.99768	0.00000044
		102	5510	5,510.00211	-0.00000038
		110	5550	5,549.99846	0.00000028
		134	5670	5,669.99240	0.00000134
	3.51V	38	5190	5,189.99014	0.00000190
		46	5230	5,229.99083	0.00000175
		54	5270	5,270.00768	-0.00000146
		62	5310	5,310.00061	-0.00000012
		102	5510	5,509.99509	0.00000089
		110	5550	5,550.00717	-0.00000129
		134	5670	5,670.00426	-0.00000075

Operation Mode	802.11 ac_VHT80	Test Date	2018.09.13
Temperature	:23 ℃	Test By	Gary
Humidity	:68 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
-10 ℃	4.29V	42	5210	5,210.00254	-0.00000049
		58	5290	5,289.99872	0.00000024
		106	5530	5,530.00938	-0.00000170
		122	5610	5,609.99031	0.00000173
	3.51V	42	5210	5,209.99754	0.00000047
		58	5290	5,290.00512	-0.00000097
		106	5530	5,529.99910	0.00000016
		122	5610	5,609.99460	0.00000096
25 ℃	3.8V	42	5210	5,210.00470	-0.00000090
		58	5290	5,289.99762	0.00000045
		106	5530	5,529.99489	0.00000092
		122	5610	5,610.00339	-0.00000060
55 ℃	4.29V	42	5210	5,210.00766	-0.00000147
		58	5290	5,290.00509	-0.00000096
		106	5530	5,529.99669	0.00000060
		122	5610	5,609.99933	0.00000012
	3.51V	42	5210	5,209.99638	0.00000070
		58	5290	5,290.00781	-0.00000148
		106	5530	5,530.00108	-0.00000020
		122	5610	5,609.99333	0.00000119

14 ANTENNA REQUIREMENT

14.1 Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.
According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

14.2 Antenna Connected Construction

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

~ End of Report ~