FCC TEST REPORT

Test report
On Behalf of
EMBUX Technology Co. Ltd.
For
Industrial dual band Wi-Fi radio module
Model No.: MWF220HDB

FCC ID: 2AVW3-MWF220HDB

Prepared for :	**EMBUX Technology Co. Ltd.** **13F, No. 920, Chung-Cheng Rd. Zhonghe Dist., New Taipei City 23586, Taiwan**
Prepared By :	**Shenzhen HUAK Testing Technology Co., Ltd.** **1F, B2 Building, JunfengZhongchengZhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China**
Date of Test:	**Jan. 11, 2020 ~ Mar. 03, 2020**
Date of Report:	**Mar. 03, 2020**
Report Number:	**HK2002260224-2E**

TEST RESULTCERTIFICATION

Applicant's name.....:	EMBUX Technology Co. Ltd.
Address .....:	13F, No. 920, Chung-Cheng Rd. Zhonghe Dist., New Taipei City 23586, Taiwan
Manufacture's Name .....:	EMBUX Technology Co. Ltd.
Address .....:	13F, No. 920, Chung-Cheng Rd. Zhonghe Dist., New Taipei City 23586, Taiwan

Product description

Trade Mark:	N/A
Product name .....:	Industrial dual band Wi-Fi radio module
Model and/or type reference .:	MWF220HDB
Standards.....:	FCC 47 CFR Part 15 Subpart E

Date of Test .....:	
Date (s) of performance of tests .....:	**Jan. 11, 2020 ~ Mar. 03, 2020**
Date of Issue .....:	**Mar. 03, 2020**
Test Result.....:	**Pass**

Testing Engineer : Gary Qian

(Gary Qian)

Technical Manager : Eden Hu

(Eden Hu)

Authorized Signatory : Jason Zhou

(Jason Zhou)

TABLE OF CONTENTS

Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	Mar. 03, 2020	HK2002260224-2E	ALL	N/A

1 EUT DESCRIPTION

Product Name:	Industrial dual band Wi-Fi radio module			
Brand Name:	EMBUX			
Model Name:	MWF220HDB			
Series Model:	N/A			
Model Difference:	N/A			
Power Rating	DC3.3V			
Frequency Range :	Band	Mode	Frequency Range(MHz)	Number of Channels
	Band I UNII-I	IEEE802.11a mode	5150 MHz~5250 MHz	4
		IEEE802.11 n HT20 mode		4
		IEEE802.11 n HT40 mode		2
	Band II UNII-2A	IEEE802.11a mode mode	5250 MHz ~5350 MHz	4
		IEEE802.11 n HT20 mode		4
		IEEE802.11 n HT40 mode		2
	Band III UNII-2C	IEEE802.11a mode mode	5470 MHz ~5725 MHz	4
		IEEE802.11 n HT20 mode		4
		IEEE802.11 n HT40 mode		3
Modulation Technique:	IEEE802.11a mode: OFDM (6,9,12,18,24,36,48 and 54 Mbps) IEEE802.11 n HT20 mode: OFDM (MCS0~MCS7) IEEE802.11 n HT40 mode: OFDM (MCS0~MCS7)			
Antenna Specification:	**Internal Antenna** Gain: Antenna 1:7dBi Antenna 2:7dBi MIMO: 10.01dBi			
Operating Mode:	Client without radar detection			

Remark:

1. Thesampleselectedfortestwasengineeringsamplethatapproximatedtoproductionproduct and was provided by manufacturer.
2. This submittal(s) (test report) is intended for ***FCCID: 2AVW3-MWF220HDB*** filing to comply with FCC Part 15, Subpart E Rules.

2 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10:2013 and FCC CFR 47 15.207, 15.209 and 15.407.

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

2.2 EUT EXERCISE

The EUT is operated in the engineering mode to fix the Tx frequency for the purposes of measurement.

According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

2.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turn table, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.3 of ANSI C63.10:2013, the conducted emission from the EUT is measuredinthefrequencyrangebetween0.15MHzand30MHz,usingtheCISPRQuasi-Peakdetector mode.

Radiated Emissions

Under 1GHz

The EUT is placed on a turn table, which is 0.8m above ground plane. The turntable 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 maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

Above 1GHz

The EUT is placed on a turn table, which is 1.5m above ground plane. The turntable 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 maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

2.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

Exceptasshowninparagraph(d)ofthissection,onlyspuriousemissionsarepermittedinanyofthe frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.50 - 5.15
0.495 - 0.505 [1]	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960.0 - 1240	7.25 - 7.75
4.125 - 4.128	25.50 - 25.67	1300 - 1427	8.025 - 8.500
4.17725 - 4.17775	37.50 - 38.25	1435.0 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73.00 - 74.60	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.80 - 75.20	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108.00 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.90 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -156.52525	2483.5 – 2500.0	17.7 - 21.4
8.37625 - 8.38675	156.70 - 156.90	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.1700	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.20	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358.0	36.43 - 36.5([2])
12.57675 - 12.57725	322.0- 335.4	3600 - 4400	
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510MHz.

[2] Above 38.6

Except as provided in paragraphs (d) and (e),the field strength of emissions appearing within these frequencybandsshallnotexceedthelimitsshowninSection15.209.Atfrequenciesequaltoorless than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

2.5 DESCRIPTION OF TEST MODES

Description	Modulation Technology	Modulation Type
26dB Bandwidth and 99% bandwidth	OFDM	BPSK
Maximum conducted output power	OFDM	BPSK
Band edges measurement	OFDM	BPSK
Peak Power Spectral Density	OFDM	BPSK
Radiated undesirable emission	OFDM	BPSK
Power line conducted emission	OFDM	BPSK

IEEE802.11amode:

Channel (5180MHz),Channel (5220MHz),Channel (5240MHz), Channel (5260MHz), Channel (5280MHz),Channel (5320MHz),Channel (5500MHz),Channel (5580MHz)and Channel (5700MHz) with 6Mbps data rate were chosen for full testing.

IEEE802.11nHT20mode:

Channel (5180MHz),Channel (5220MHz),Channel (5240MHz), Channel (5260MHz), Channel (5280MHz),Channel (5320MHz),Channel (5500MHz),Channel (5580MHz)and Channel (5700MHz) with 6Mbps data rate were chosen for full testing.

IEEE802.11nHT40mode:

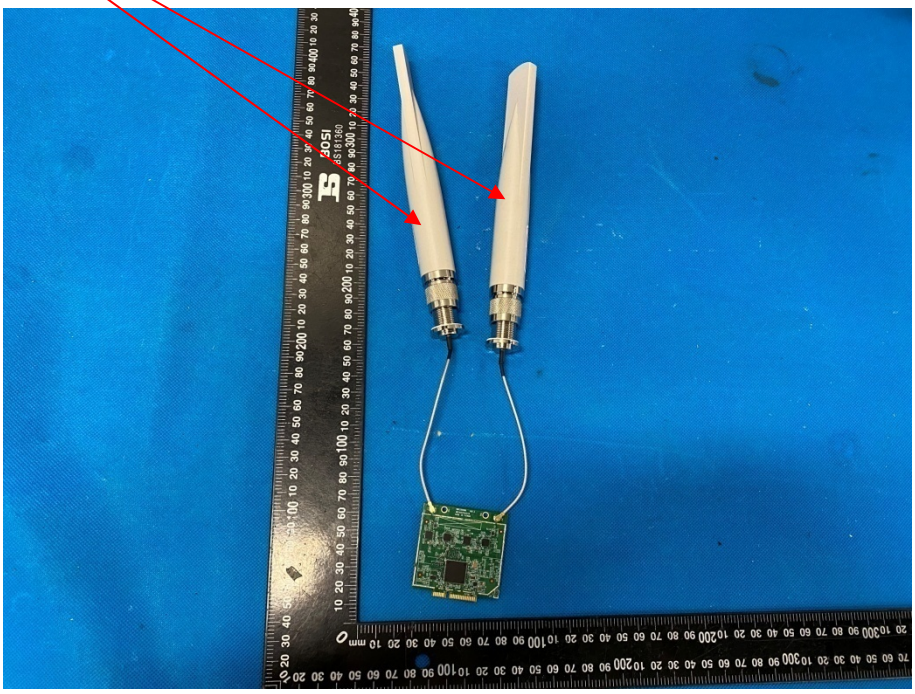
Channel (5180MHz),Channel (5220MHz),Channel (5240MHz), Channel (5260MHz), Channel (5280MHz),Channel (5320MHz),Channel (5500MHz),Channel (5580MHz)and Channel (5700MHz) with 6Mbps data rate were chosen for full testing.

2.6 ANTENNA DESCRIPTION

an intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by theresponsiblepartycanbeusedwiththedevice.Theuseofapermanentlyattachedoranantennathat uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section”

* the antenna of this EUT is a unique(**Internal Antenna** for WiFi).
* the EUT complies with the requirement of 15.203.

WIFI ANTENNA



3 INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented here in, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

3.1 MEASUREMENT EQUIPMENT USED

Conducted Emissions Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-048	2019-12-26	2020-12-25
Spectrum analyzer	R&S	FSP40	HKE-025	2019-12-26	2020-12-25
Power meter	Agilent	E4419B	HKE-085	2019-12-26	2020-12-25
Power Sensor	Agilent	E9300A	HKE-086	2019-12-26	2020-12-25
Power SPLITTER	Mini-Circuits	ZN2PD-9G	HKE-125	N.C.R	N.C.R
programmable power	Agilent	E3634A	HKE-091	N.C.R	N.C.R
Temperature and humidity	Boyang	HTC-1	HKE-079	2019-12-26	2020-12-25

977 Chamber					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum analyzer	Agilent	N9020A	HKE-048	2019-12-26	2020-12-25
Spectrum analyzer	R&S	FSP40	HKE-025	2019-12-26	2020-12-25
Spectrum analyzer	Agilent	N9020A	HKE-089	2019-12-26	2020-12-25
Receiver	R&S	ESCI 7	HKE-010	2019-12-26	2020-12-25
Preamplifier	EMCI	EMC051845SE	HKE-015	2019-12-26	2020-12-25
Preamplifier	Agilent	83051A	HKE-016	2019-12-26	2020-12-25
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	2019-12-26	2020-12-25
Horn antenna	Schwarzbeck	9120D	HKE-013	2019-12-26	2020-12-25
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	2019-12-26	2020-12-25
High gain antenna	Schwarzbeck	LB-180400KF	HKE-054	2019-12-26	2020-12-25
Position controller	Taiwan MF	MF7802	HKE-011	N.C.R	N.C.R
Antenna tower	Taiwan MF	CTERG23	HKE-120	N.C.R	N.C.R
Controller	Taiwan MF	CT1OO	HKE-121	N.C.R	N.C.R
Test Software			EZ-EMC		

Conducted Emission					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Receiver	R&S	ESCI 7	HKE-010	2019-12-26	2020-12-25
LISN	R&S	ENV216	HKE-002	2019-12-26	2020-12-25
LISN	ENV216	R&S	HKE-059	2019-12-26	2020-12-25
ISN	Schwarzbeck	ISN CAT5 8158	HKE-062	2019-12-26	2020-12-25
Test Software	EZ-EMC				

Remark: *Each piece of equipment is scheduled for calibration once a year.*

3.2 MEASUREMENT UNCERTAINTY

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028-1 [2] and shall correspond to an expansion factor(coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95% and 95,45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 6 is based on such expansion factors.

Table6:Maximummeasurementuncertainty

Parameter	UNCERTAINTY
Radio frequency	±0.8 × 10-7
RF power, conducted	0.2054
Maximum frequency deviation: -within 300Hz and 6 kHz of audio frequency -within 6 kHz and 25 kHz of audio frequency	 1.3% 0.65 dB
Adjacent channel power	0.2054
Conducted spurious emission of transmitter, valid up to 6 GHz	0.2892
Conducted emission of receivers	+1.2/-1.1 dB
Radiated emission of transmitter, valid up to 6 GHz	±3.94 dB
Radiated emission of receiver, valid up to 6 GHz	±3.94 dB
RF level uncertainty for a given BER	±0.3 dB
Temperature	0.1979
Humidity	±1 %

4 FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at
☒ 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, China.
The sites are constructed in conformance with the requirements of ANSI C63.10:2013 and CISPR Publication 22.AllreceivingequipmentconformstoCISPRPublication16-1,“RadioInterference Measuring Apparatus and Measurement Methods.”

4.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bucolical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

4.3 TABLE OF ACCREDITATIONS AND LISTINGS

The test facilities used toper form radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 200581-0 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with USA, Certification and Engineering Bureau, 424105 for 10m chamber,238958 for 3m chamber.

5 SETUP OF EQUIPMENT UNDER TEST

5.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

5.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID
1.	Notebook	/	TP00067A	N/A	N/A

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2.Groundingwas established in accordance with the manufacturer's requirements and conditions for the intended use.

6 FCC PART 15 REQUIREMENTS

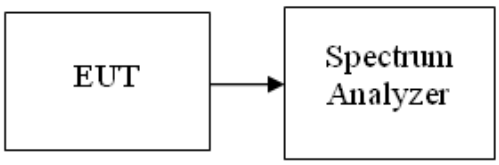
6.1 26 DB EMISSION BANDWIDTH

LIMIT

According to§15.403(i),for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Test Configuration

TESTPROCEDURE



1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzers RBW = approximately 1% of the emission bandwidth, VBW >RBW, Detector = Peak ,Span>26dB bandwidth, and Sweep = auto ,Trace mode = max hold.
4. Measurethemaximumwidthoftheemissionthatis26dBdownfromthemaximumofthe emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
5. Repeat until all the rest channels were investigated.

TESTRESULTS

No non-compliance noted

Test Data

Antenna 1

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5180	21.80
Mid	5220	21.77
High	5240	21.58

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5260	21.24
Mid	5280	21.63
High	5320	21.99

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5500	21.89
Mid	5580	21.82
High	5700	22.14

Testmode:IEEE802.11nHT20 mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5180	22.27
Mid	5220	22.54
High	5240	22.37

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5260	22.49
Mid	5280	23.12
High	5320	22.14

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5500	22.93
Mid	5580	22.52
High	5700	23.00

Testmode:IEEE802.11 n HT40 mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5190	44.89
High	5230	46.05

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5270	45.47
High	5310	45.69

5470~5725MHz

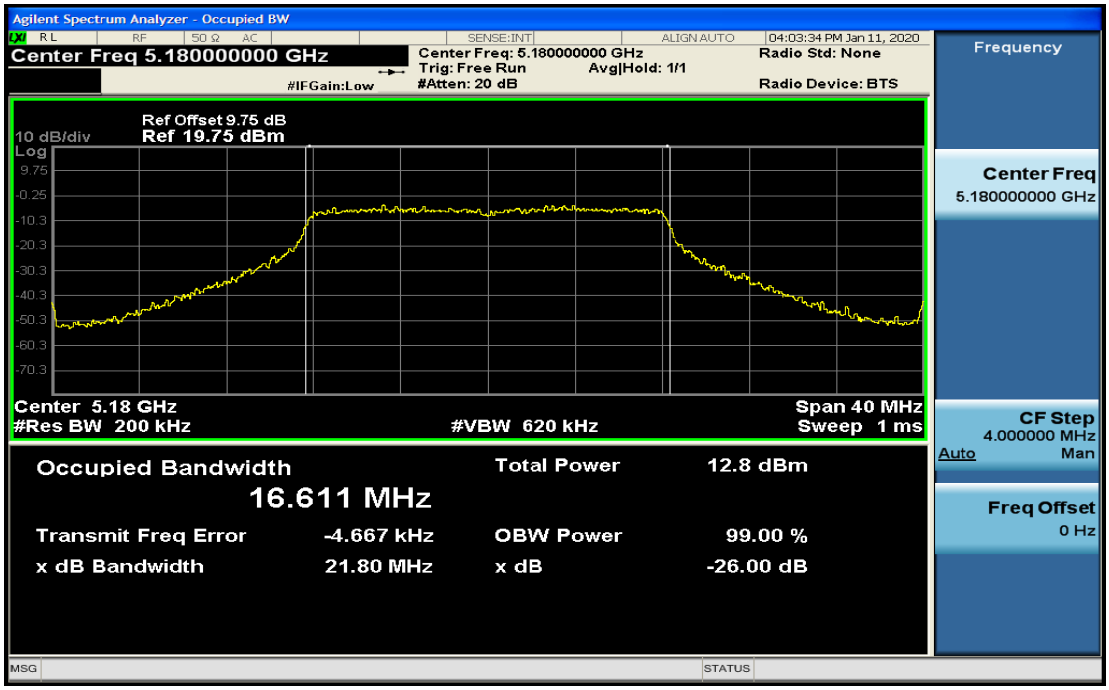
Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5510	46.27
Mid	5550	45.95
High	5670	44.86

Test Plot

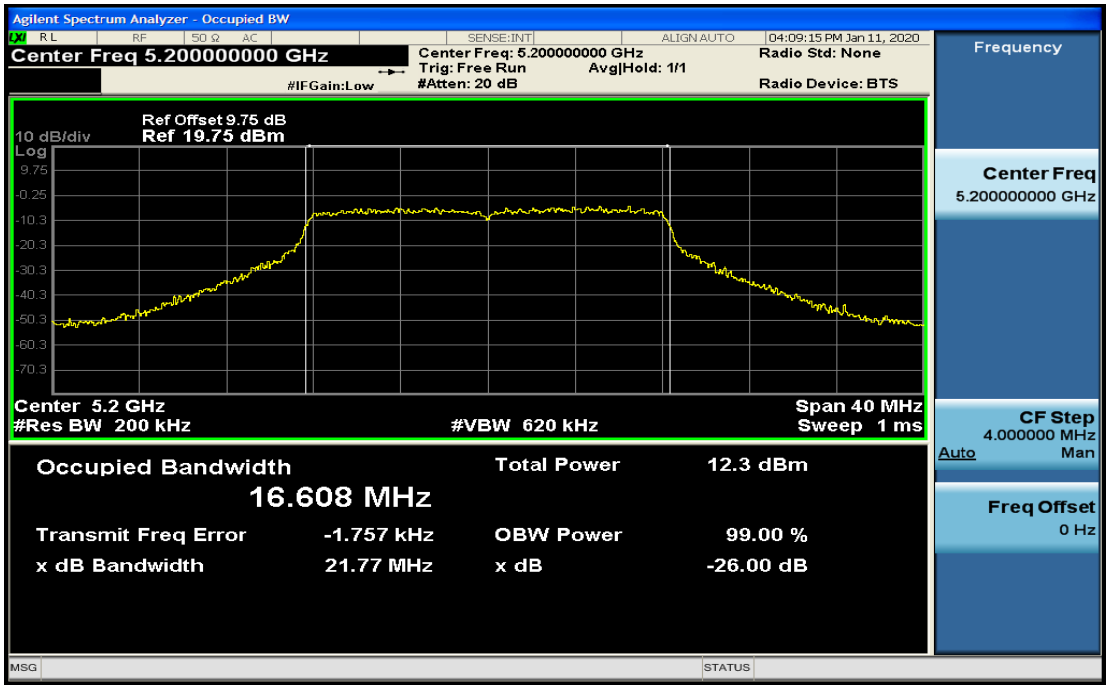
IEEE802.11amode:

5150~5250MHz

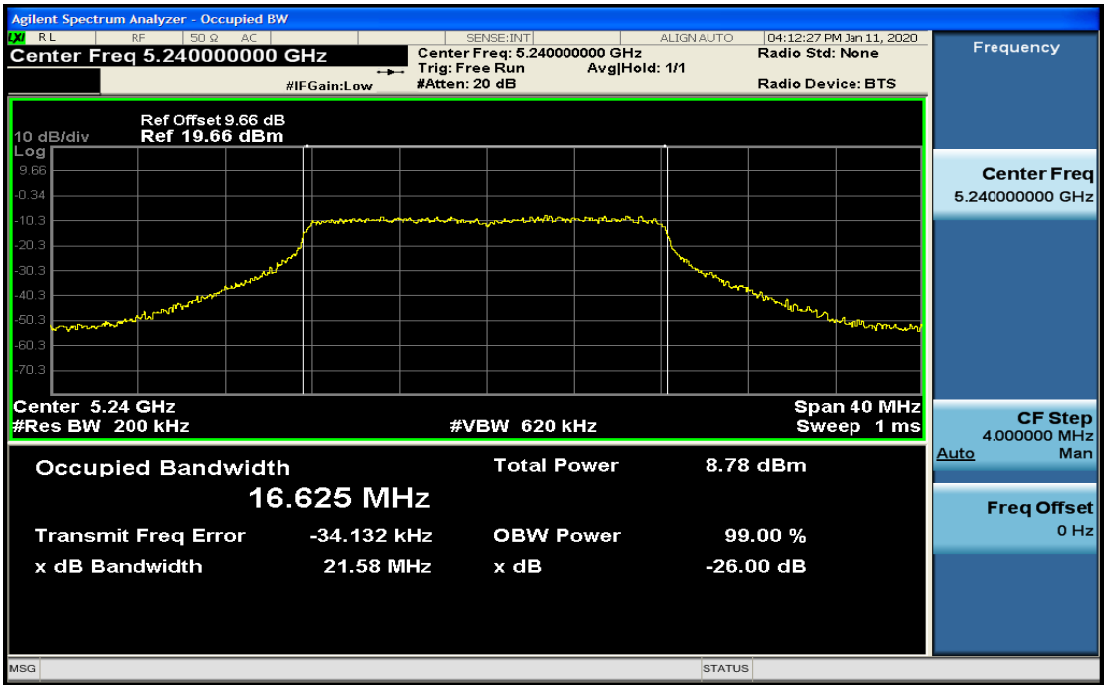
Low Channel



Mid Channel

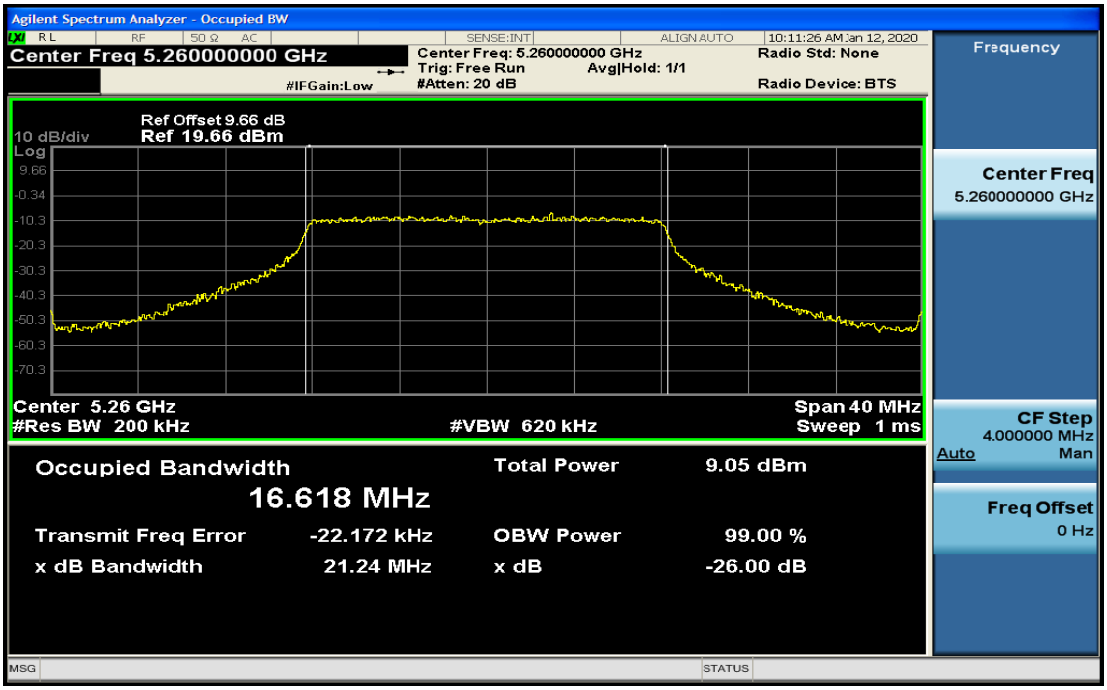


High Channel



5250~5350MHz

Low Channel



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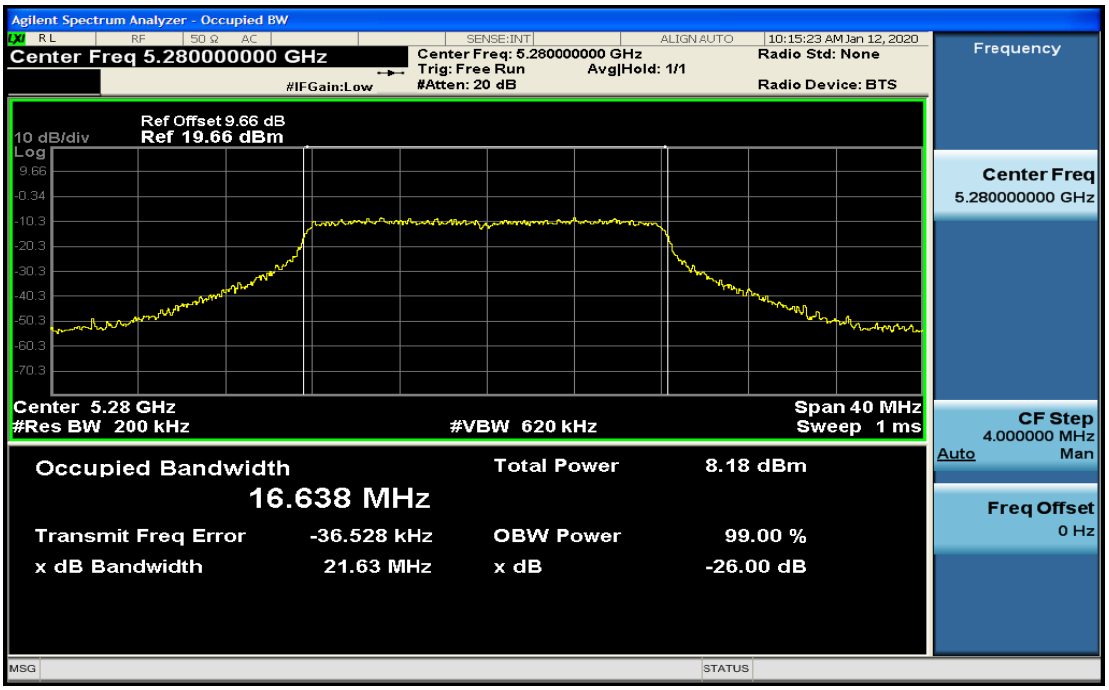

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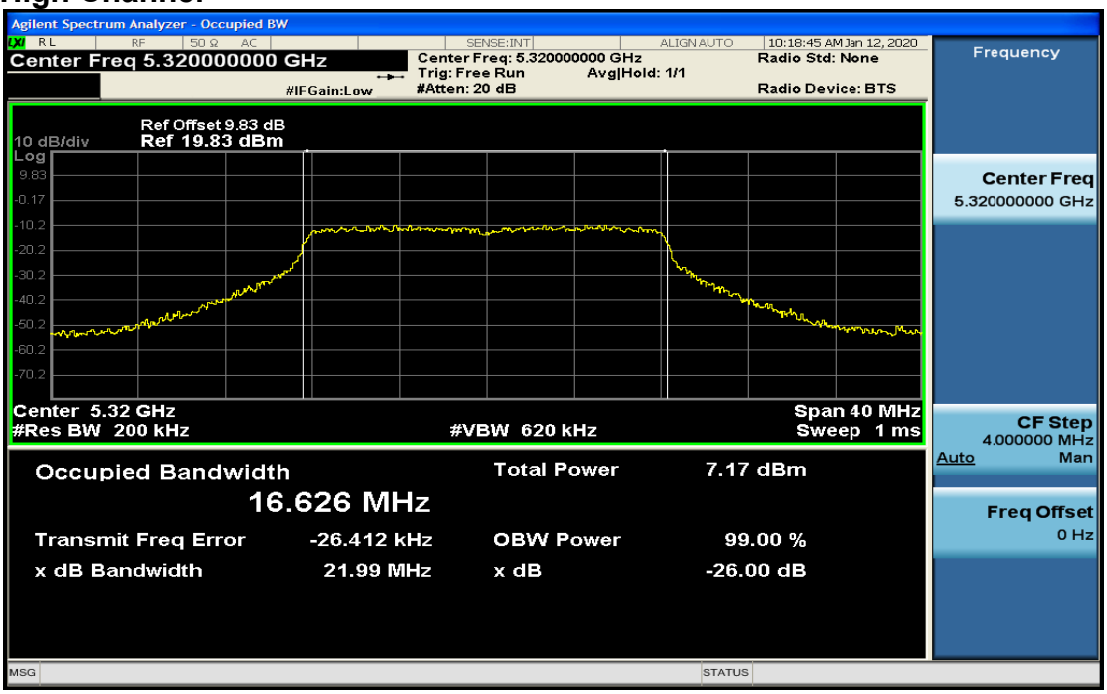
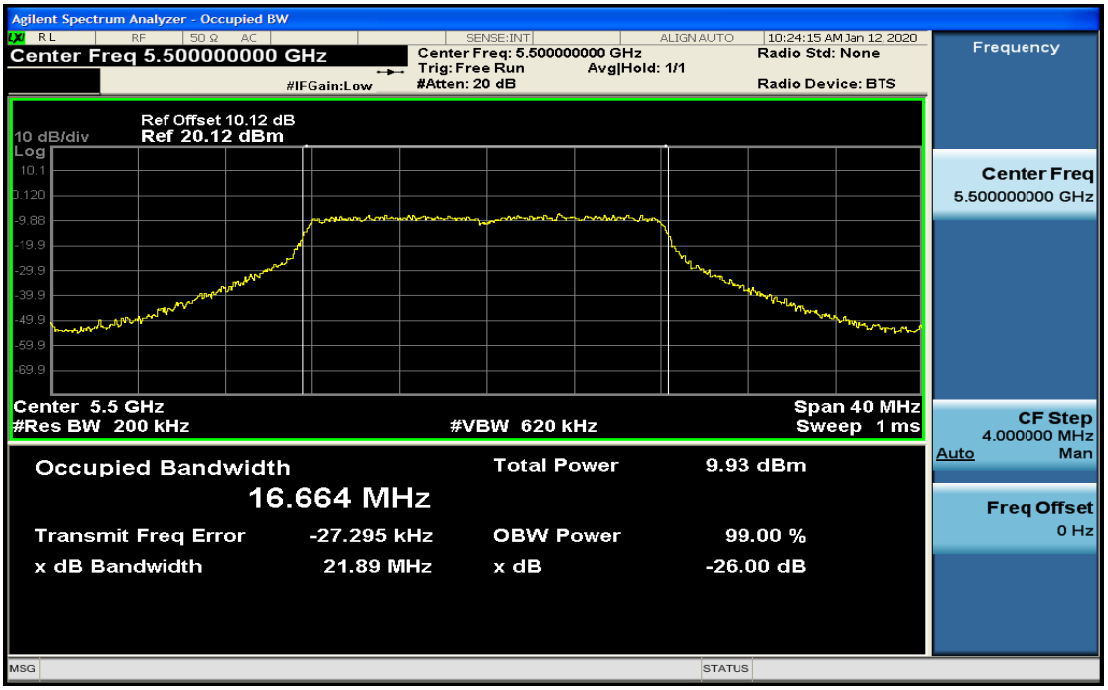


5470~5725MHz

Low Channel



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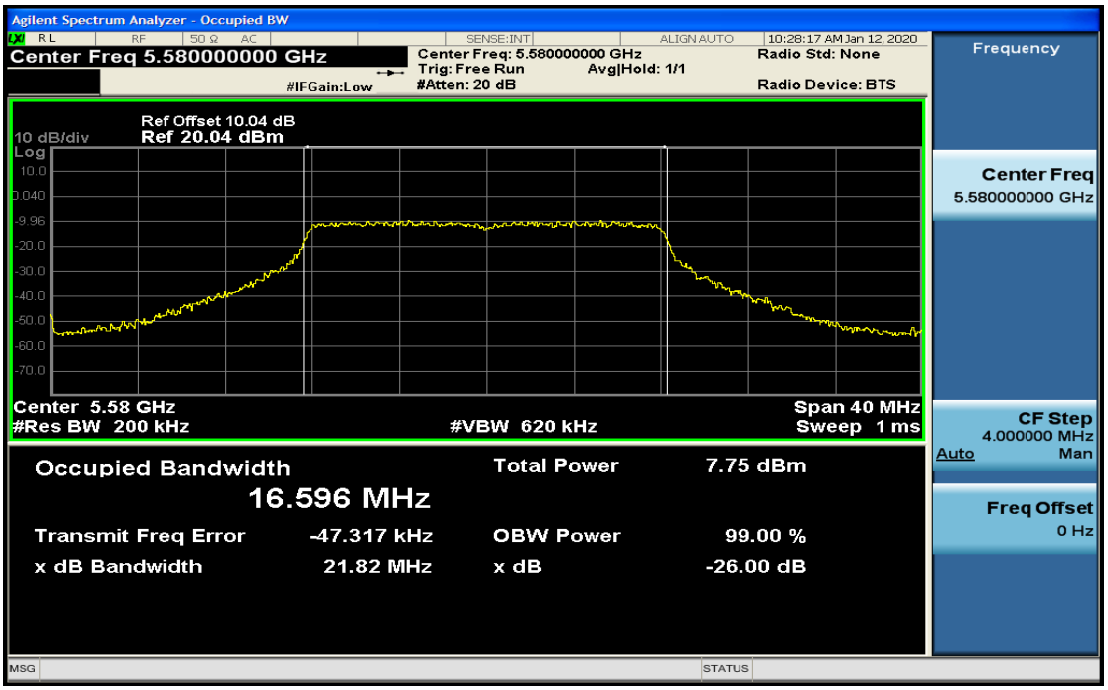

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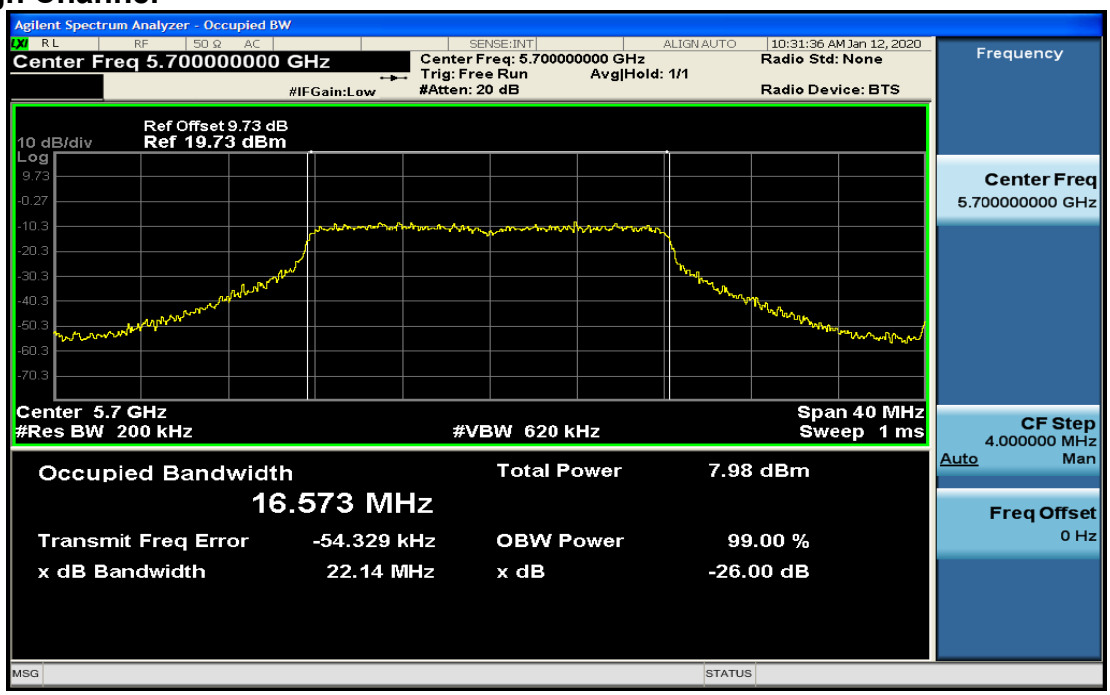
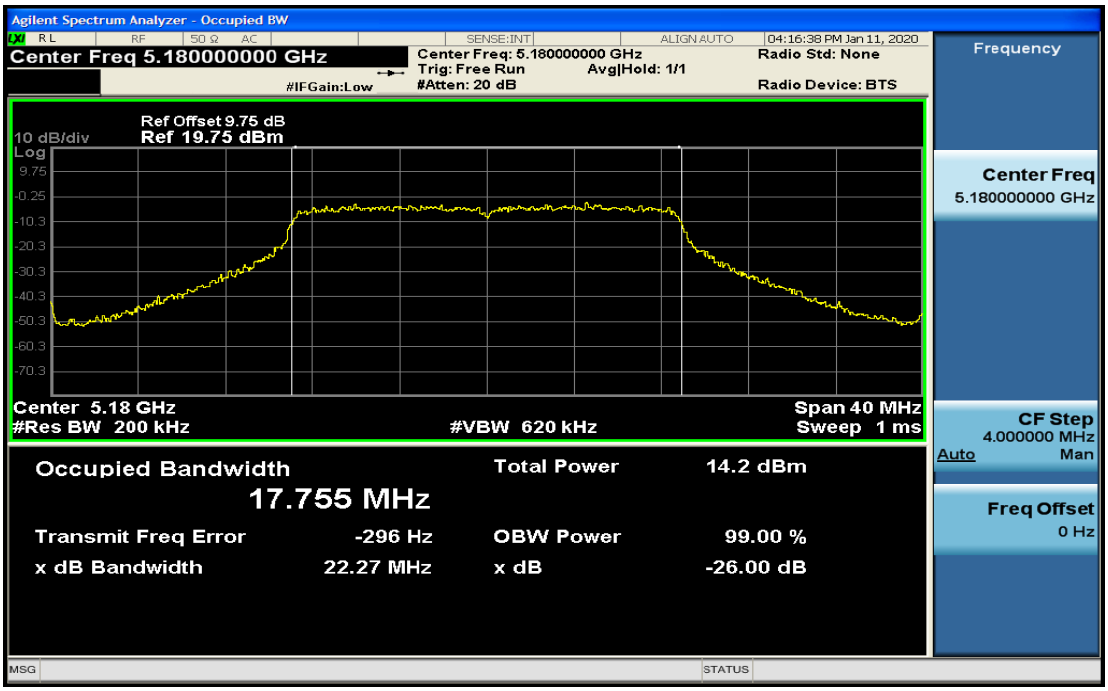


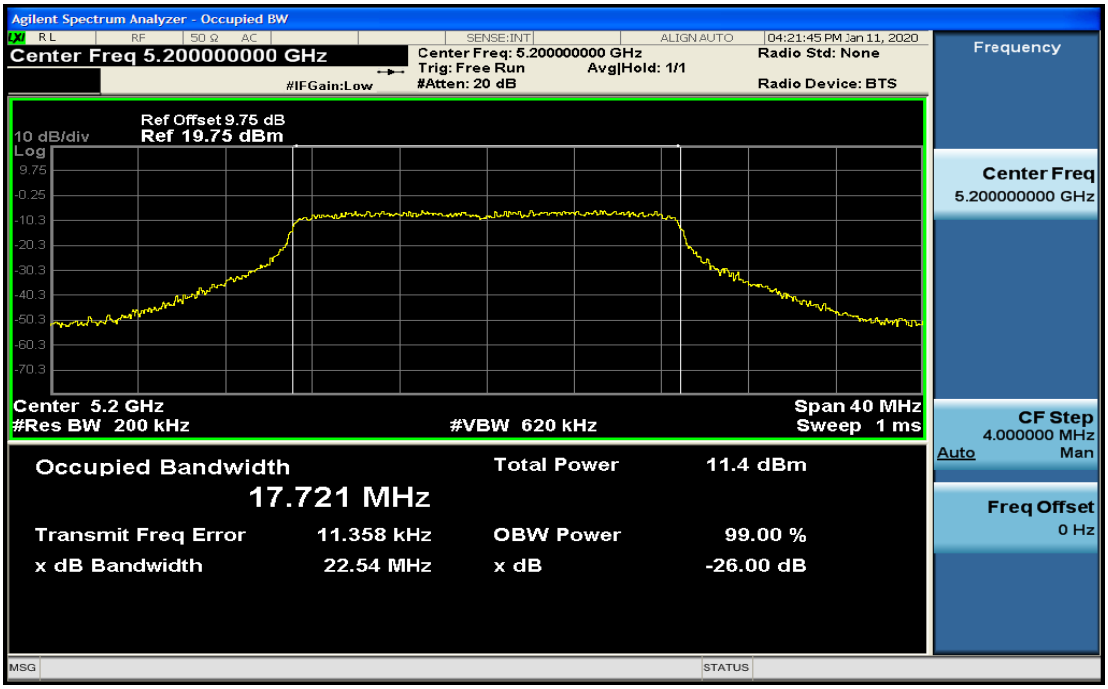
IEEE802.11nHT20mode

5150~5250MHz

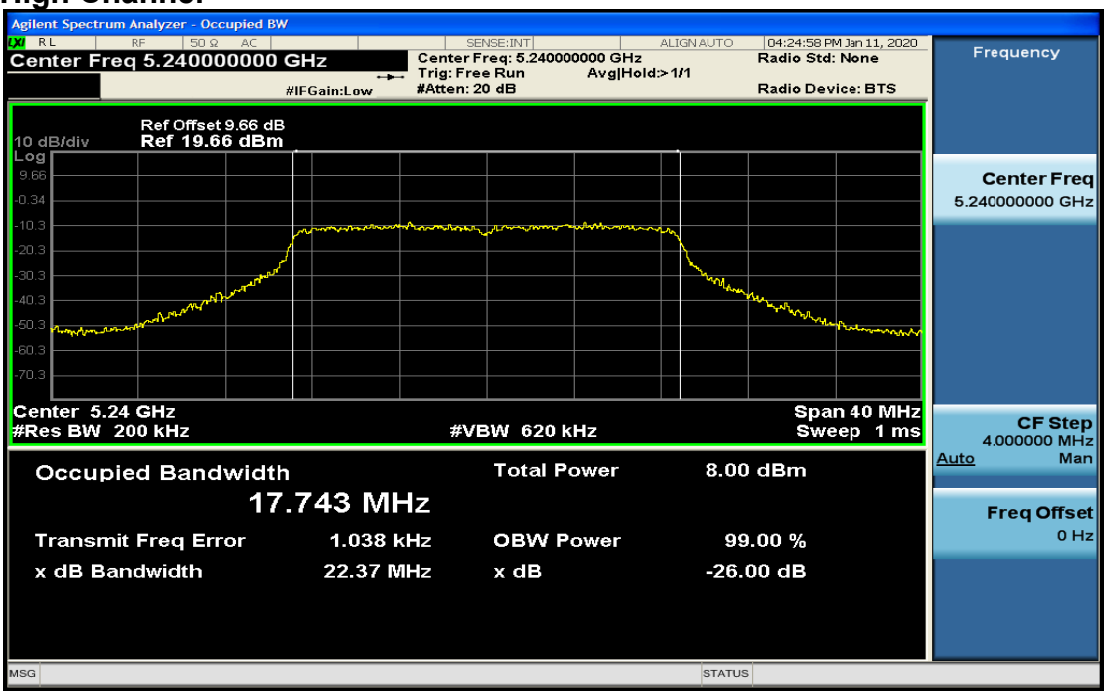
Low Channel



Mid Channel

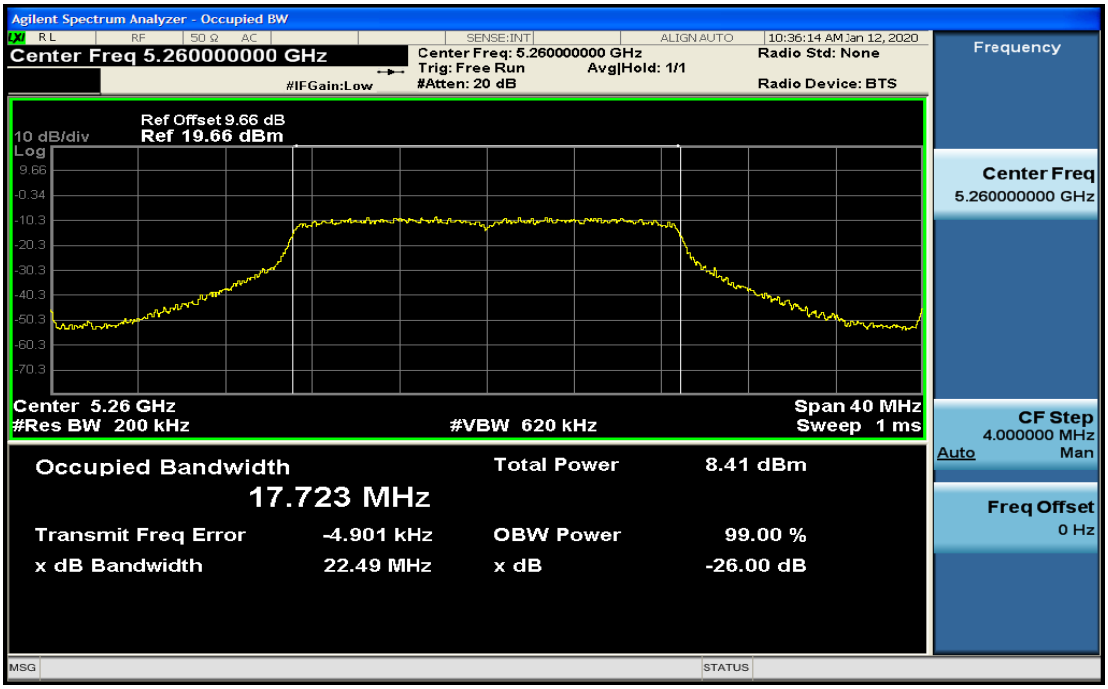


High Channel

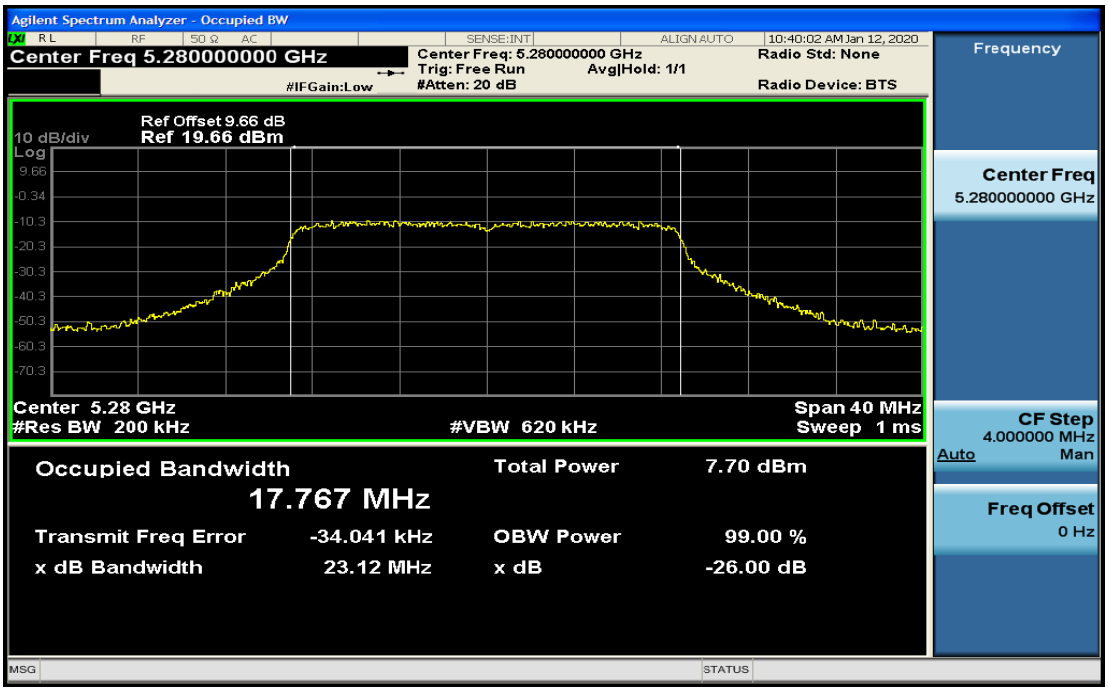


5250~5350MHz

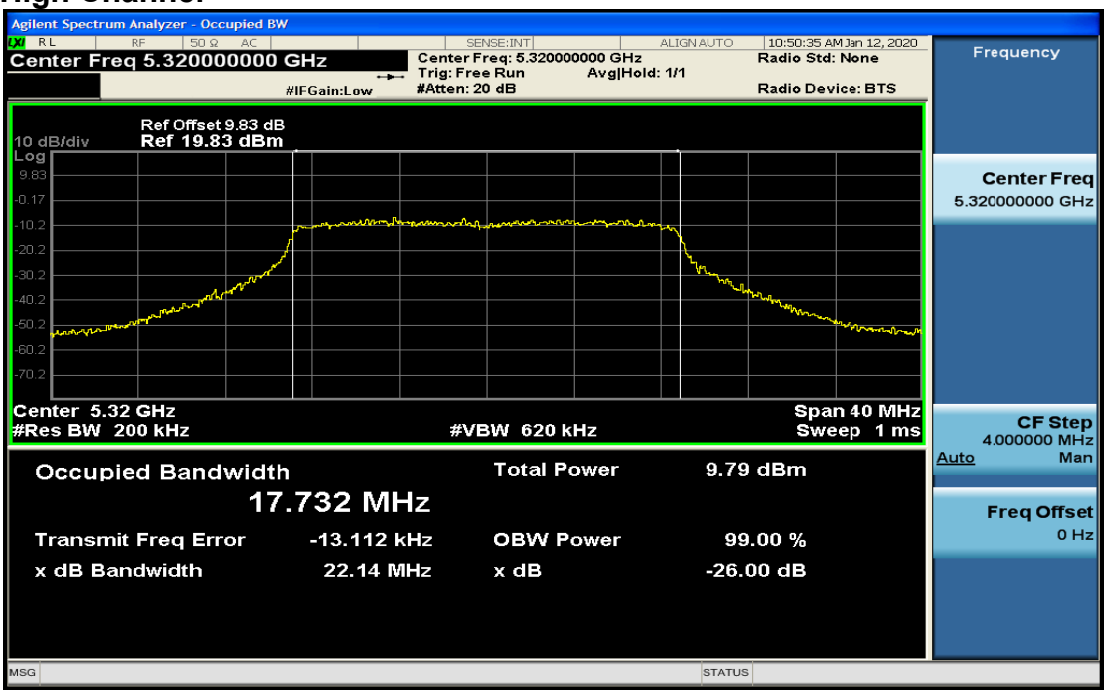
Low Channel



Mid Channel

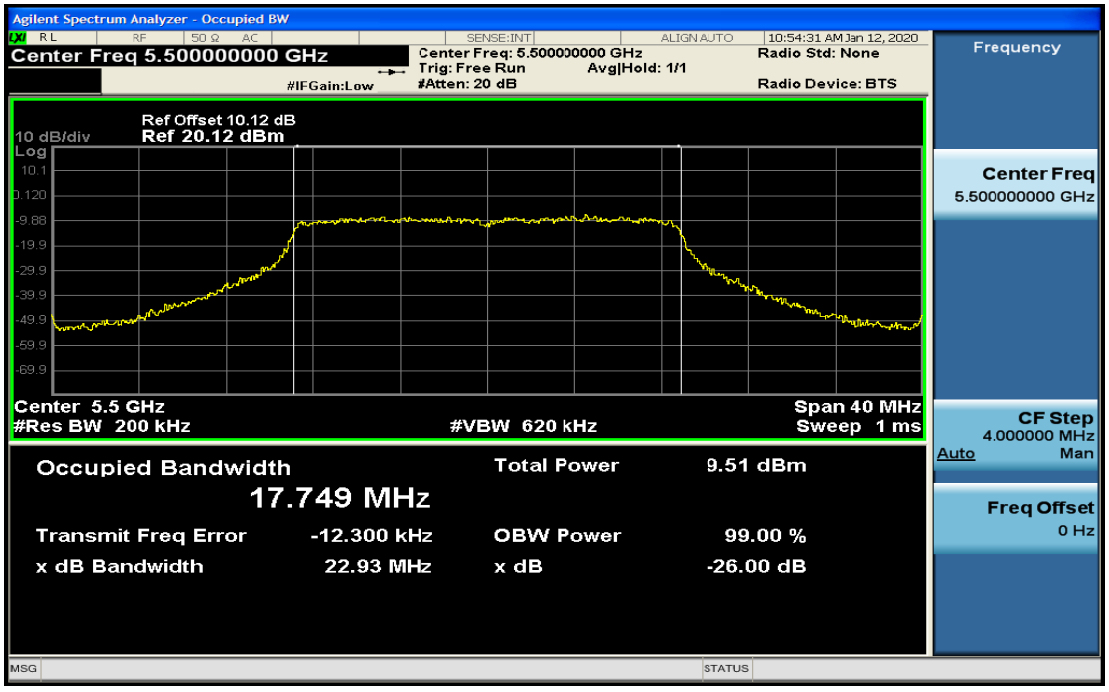


High Channel

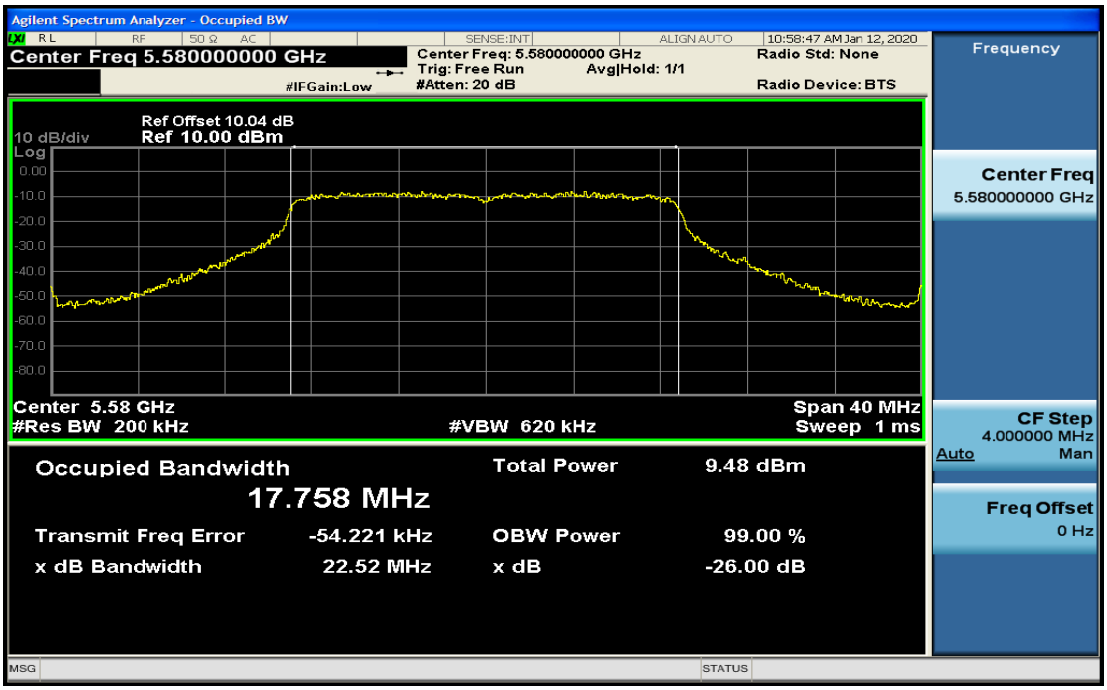


5470~5725MHz

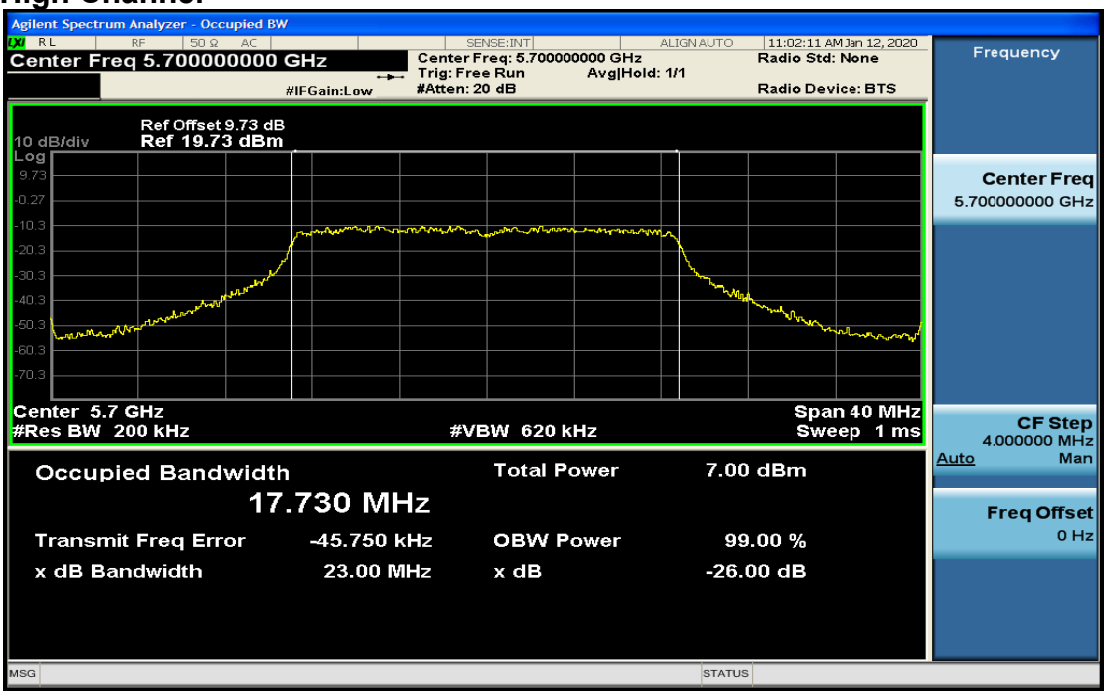
Low Channel



Mid Channel



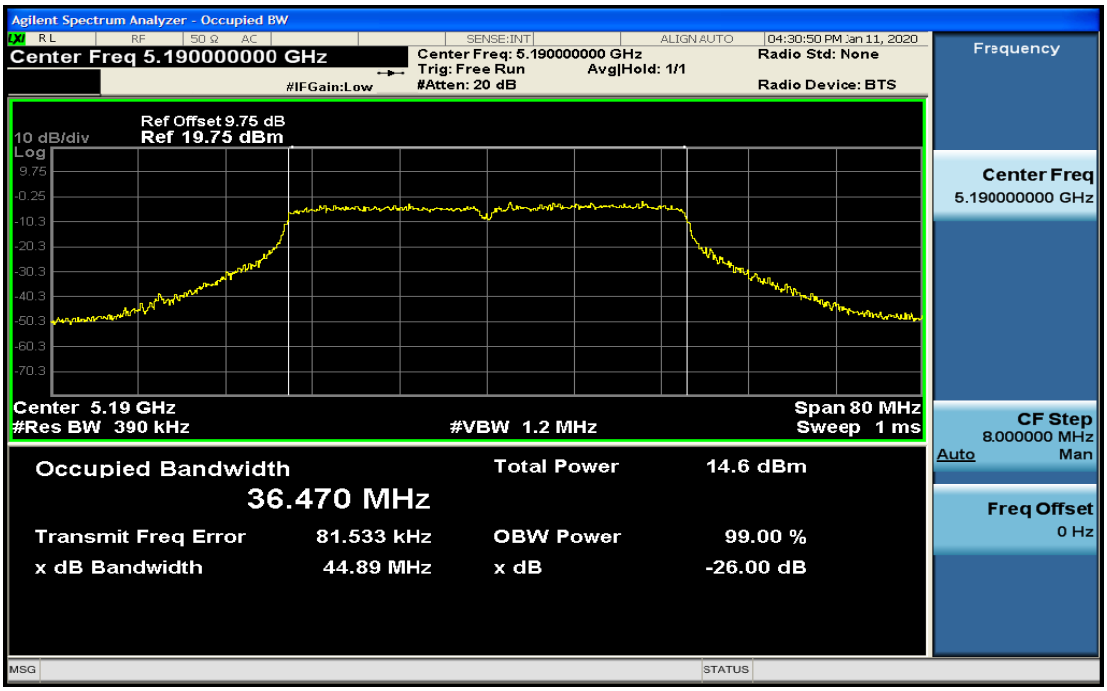
High Channel



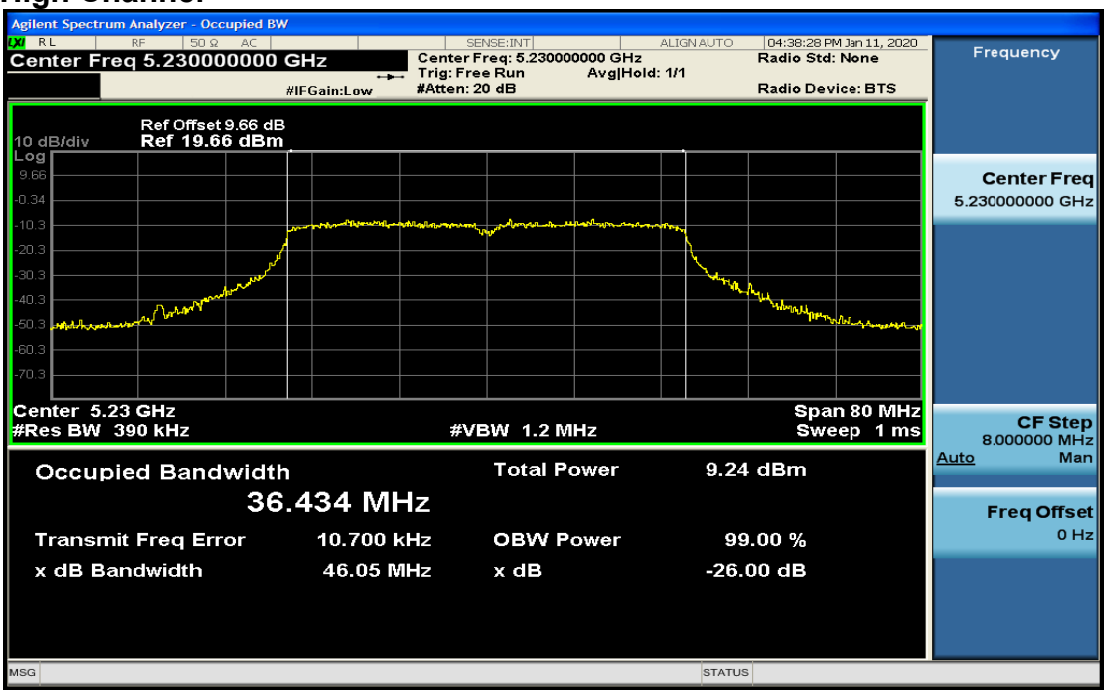
IEEE802.11nHT40mode

5150~5250MHz

Low Channel

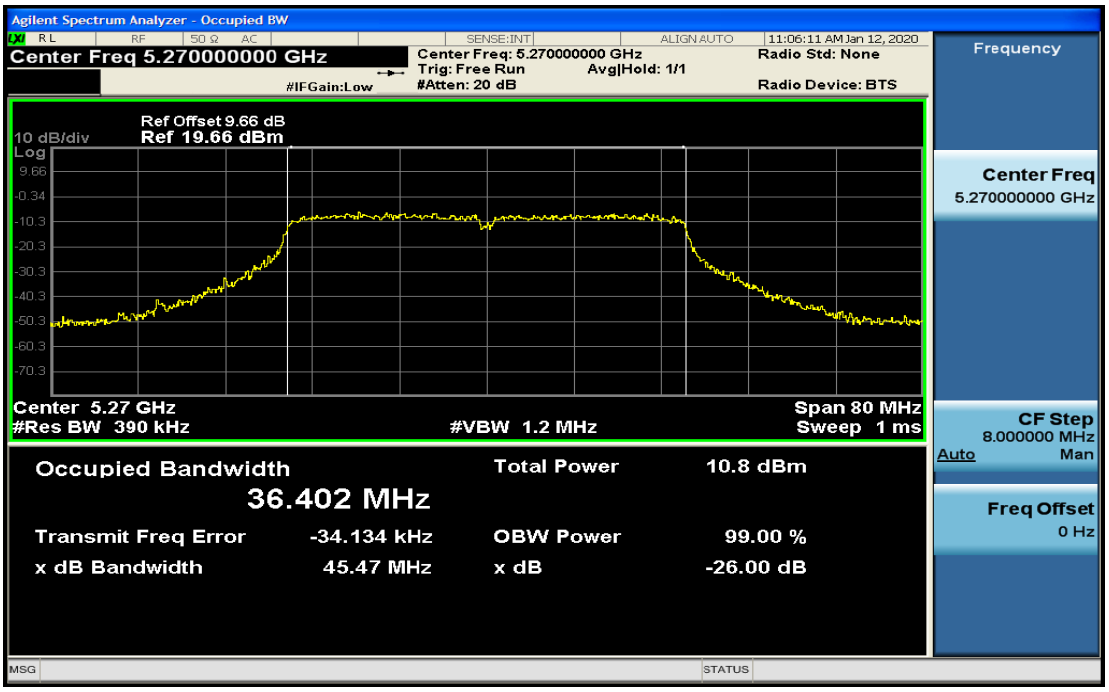


High Channel

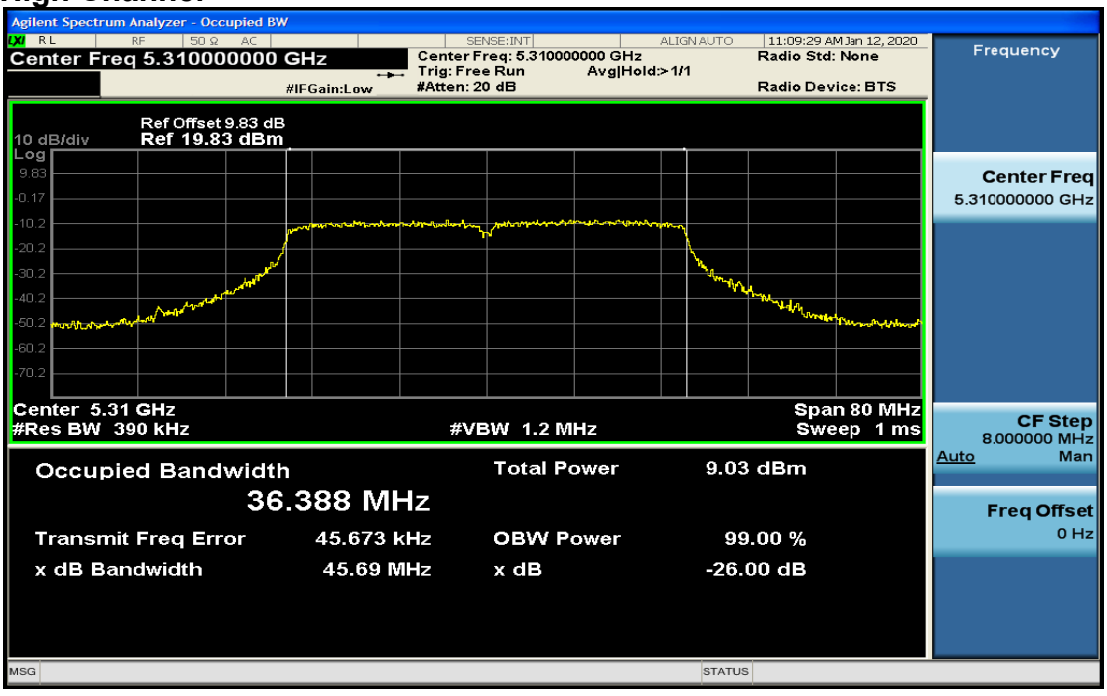


5250~5350MHz

Low Channel

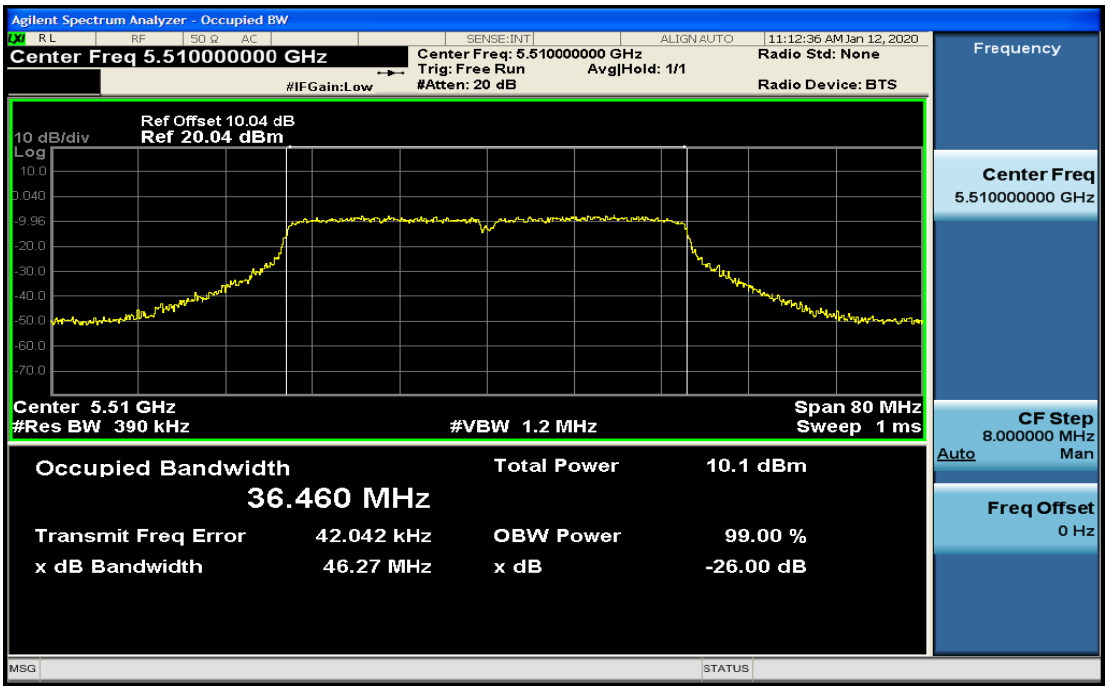


High Channel

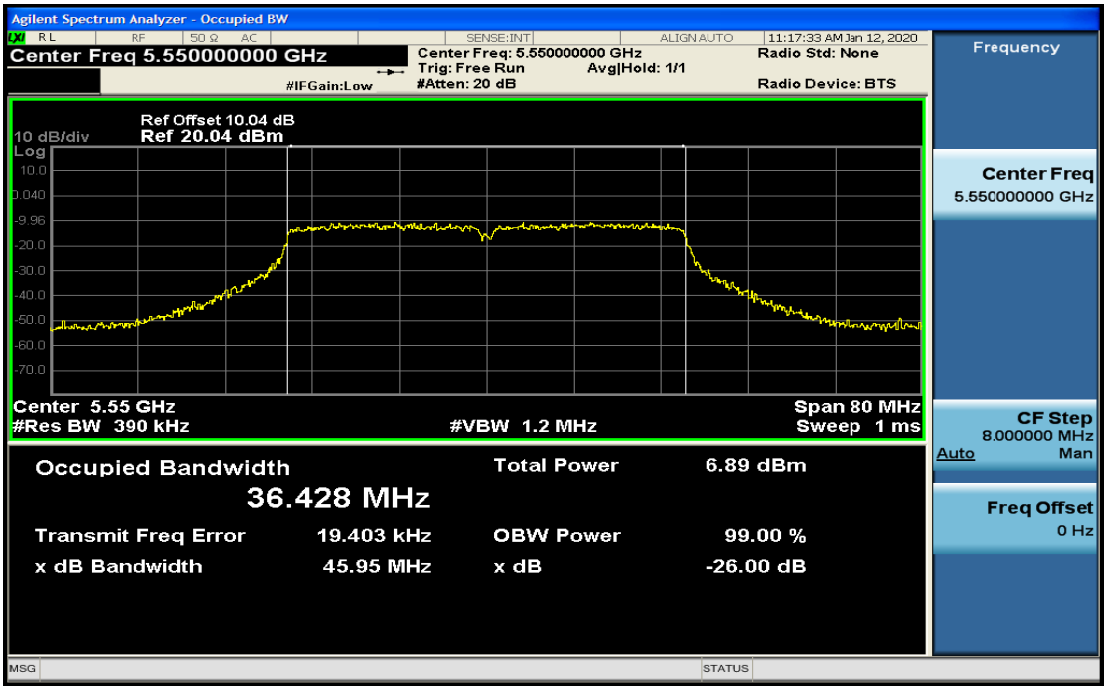


5470~5725MHz

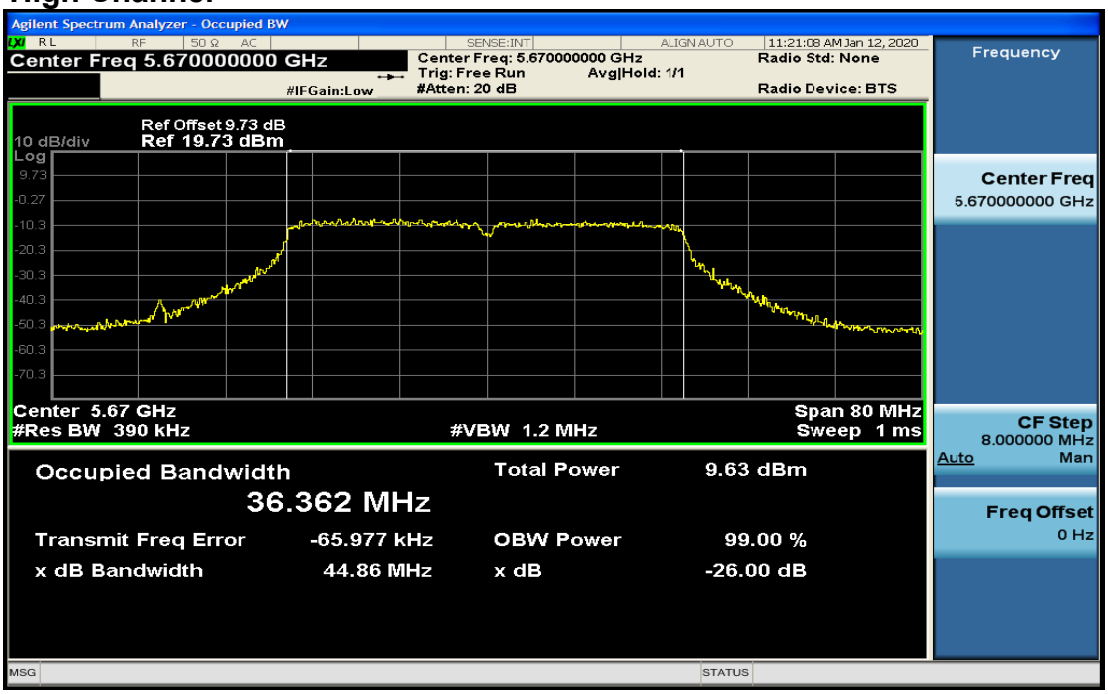
Low Channel



Mid Channel



High Channel



Antenna 2

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5180	22.33
Mid	5220	21.51
High	5240	22.39

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5260	22.02
Mid	5280	21.53
High	5320	22.84

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5500	21.77
Mid	5580	22.12
High	5700	22.03

Testmode:IEEE802.11n HT20 mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5180	22.81
Mid	5220	22.80
High	5240	22.33

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5260	22.63
Mid	5280	23.12
High	5320	23.04

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5500	22.43
Mid	5580	22.17
High	5700	23.19

Testmode:IEEE802.11n HT40 mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5190	45.46
High	5230	45.79

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5270	46.48
High	5310	45.26

5470~5725MHz

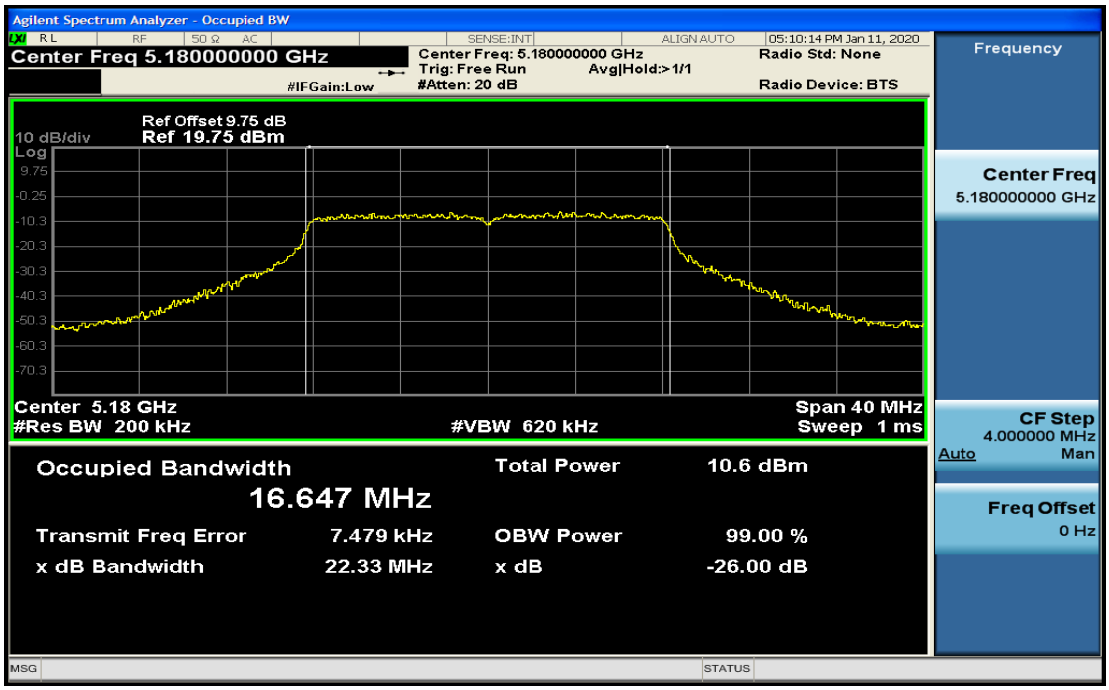
Channel	Frequency (MHz)	Bandwidth(B) (MHz)
Low	5510	45.74
Mid	5550	45.81
High	5670	46.36

Test Plot

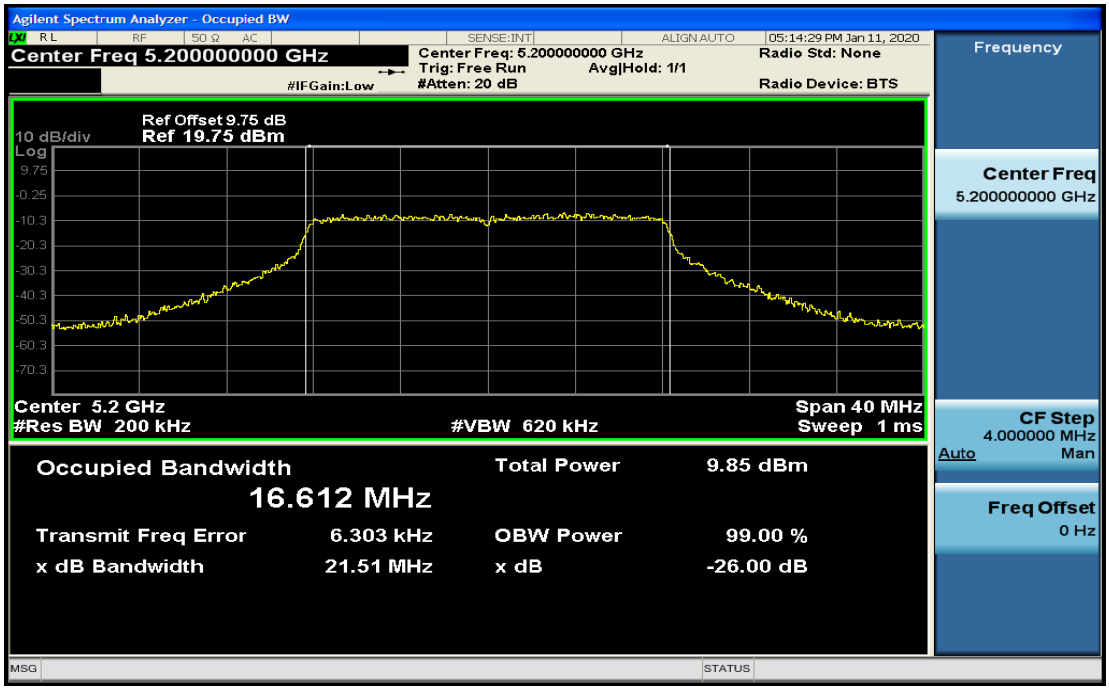
IEEE802.11a mode:

5150~5250MHz

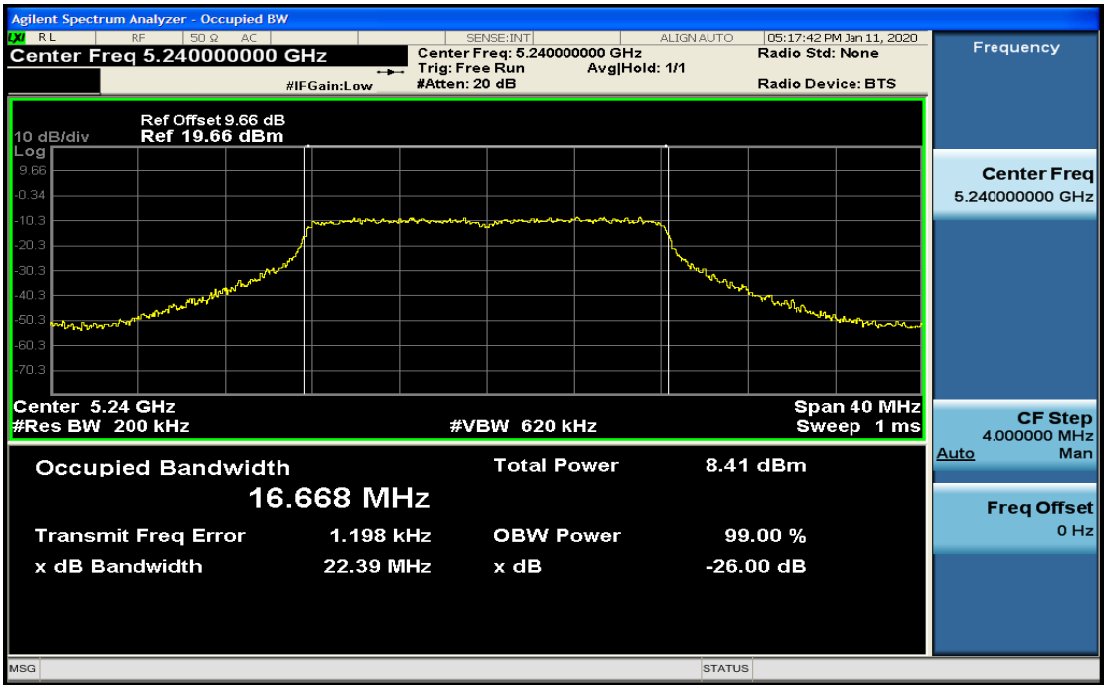
Low Channel



Mid Channel

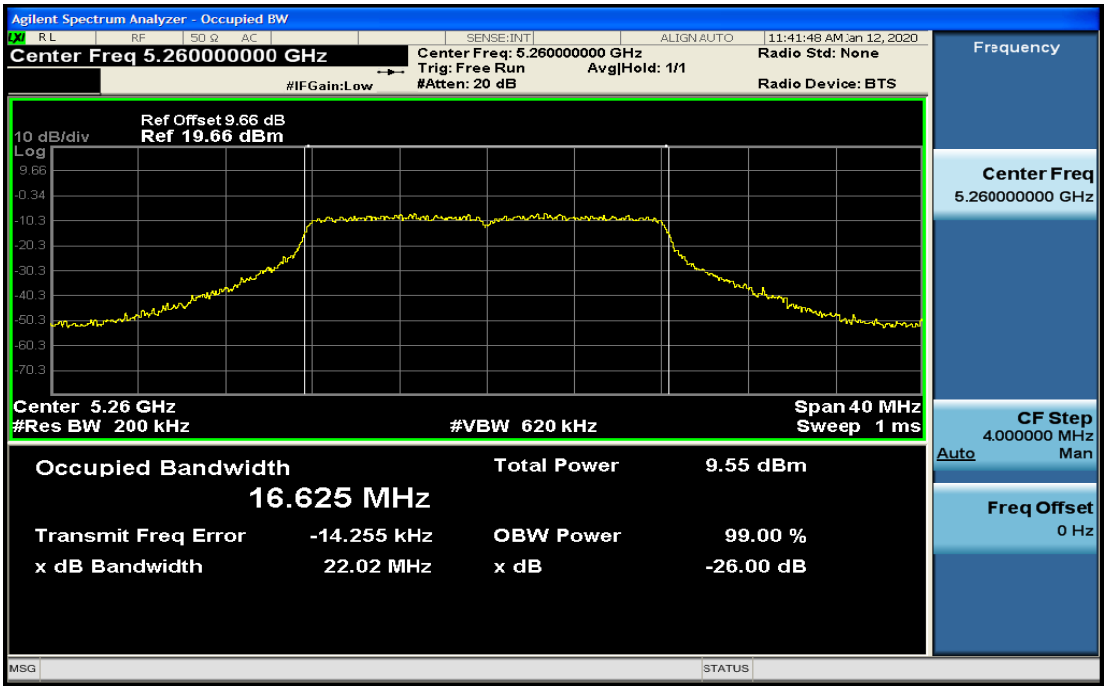


High Channel

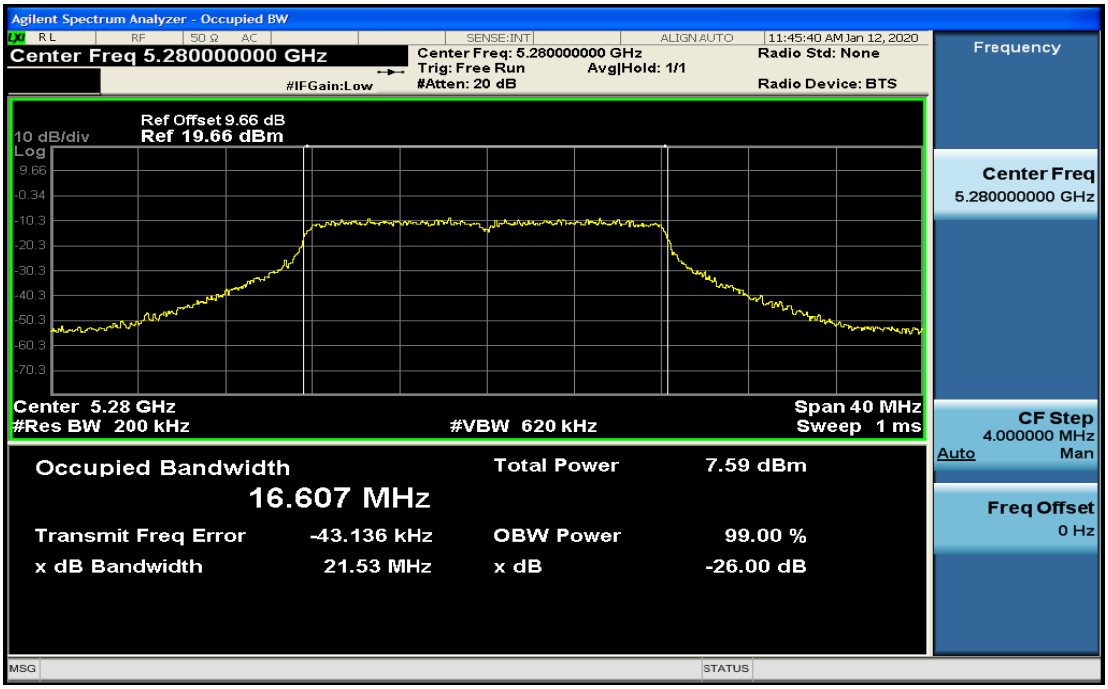


5250~5350MHz

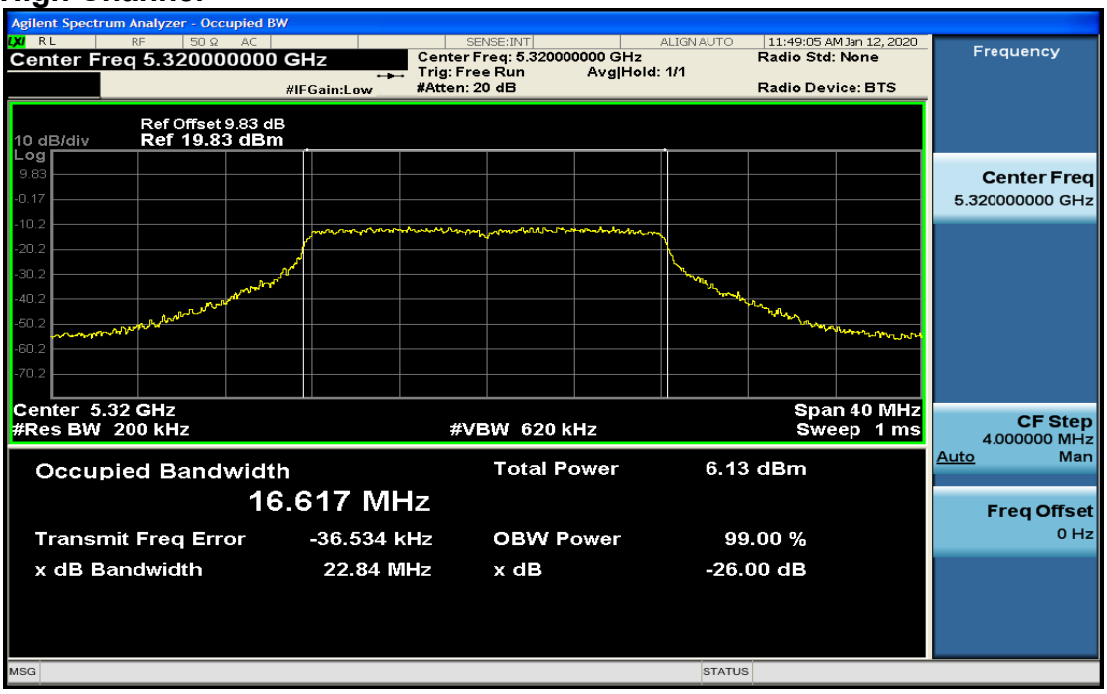
Low Channel



Mid Channel

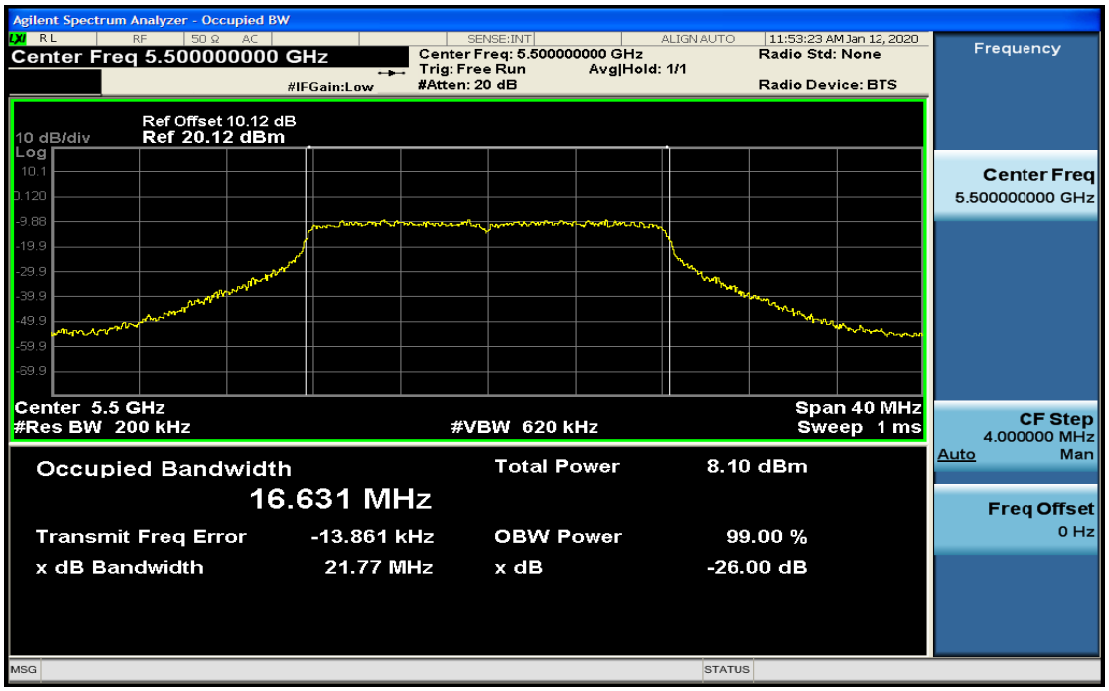


High Channel

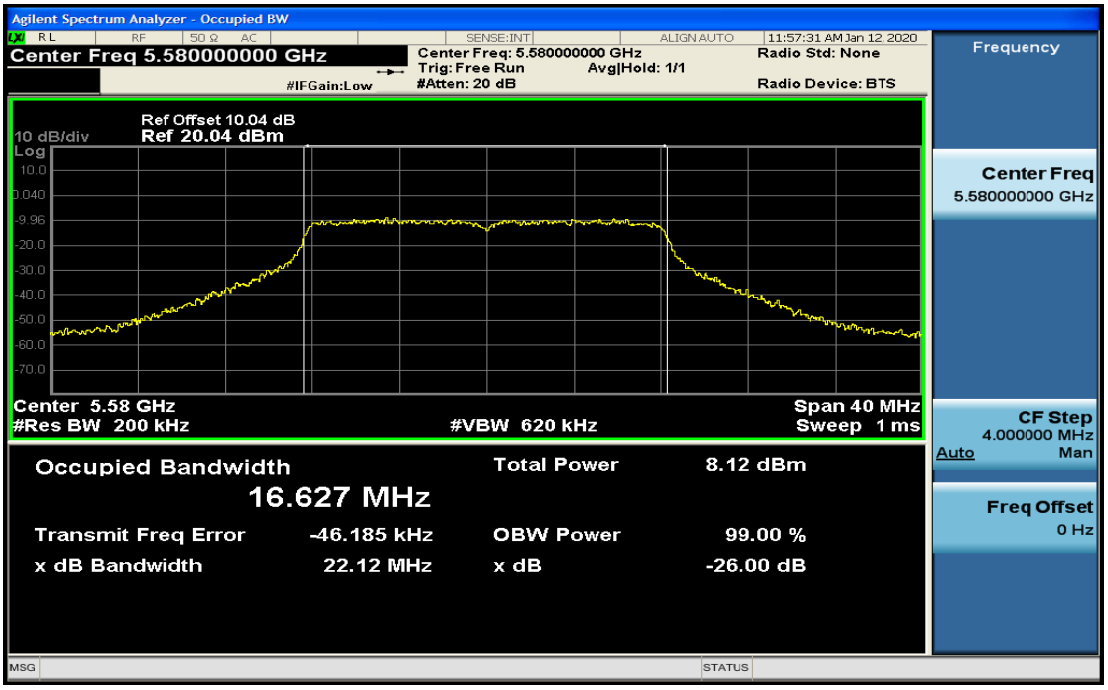


5470~5725MHz

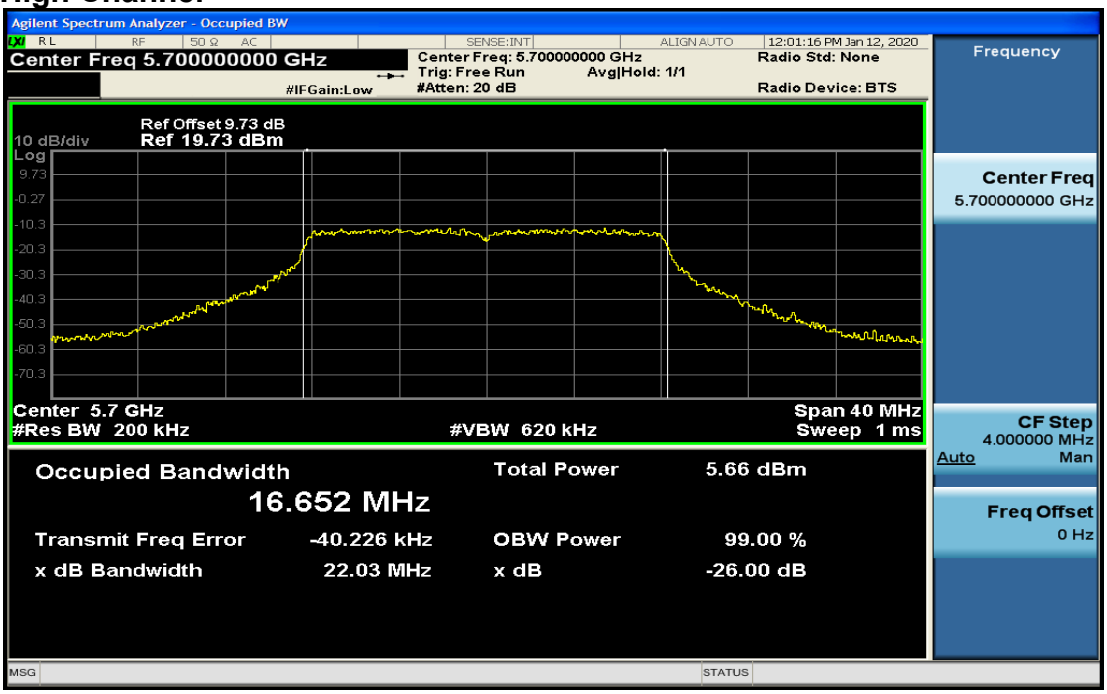
Low Channel



Mid Channel



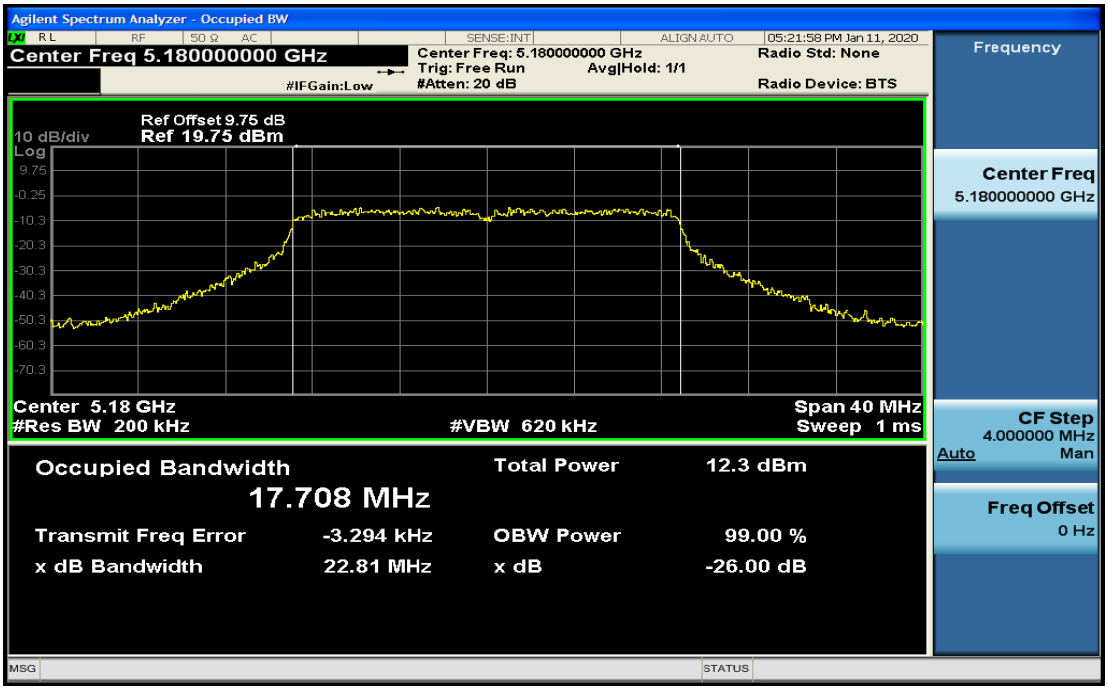
High Channel



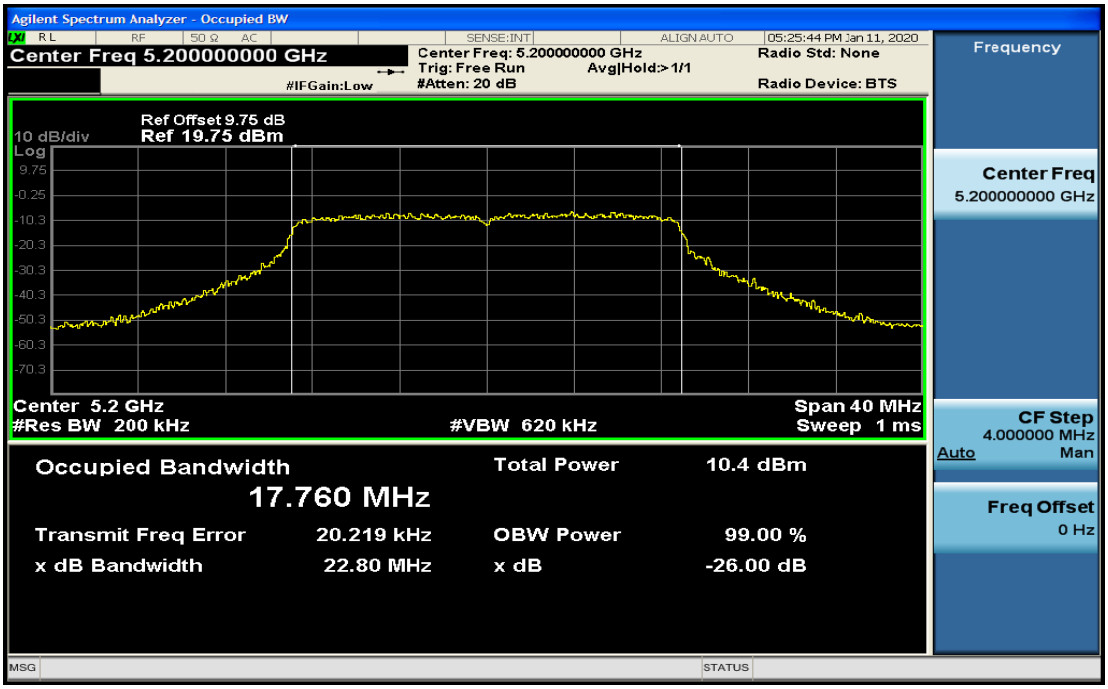
IEEE802.11n HT20 mode

5150~5250MHz

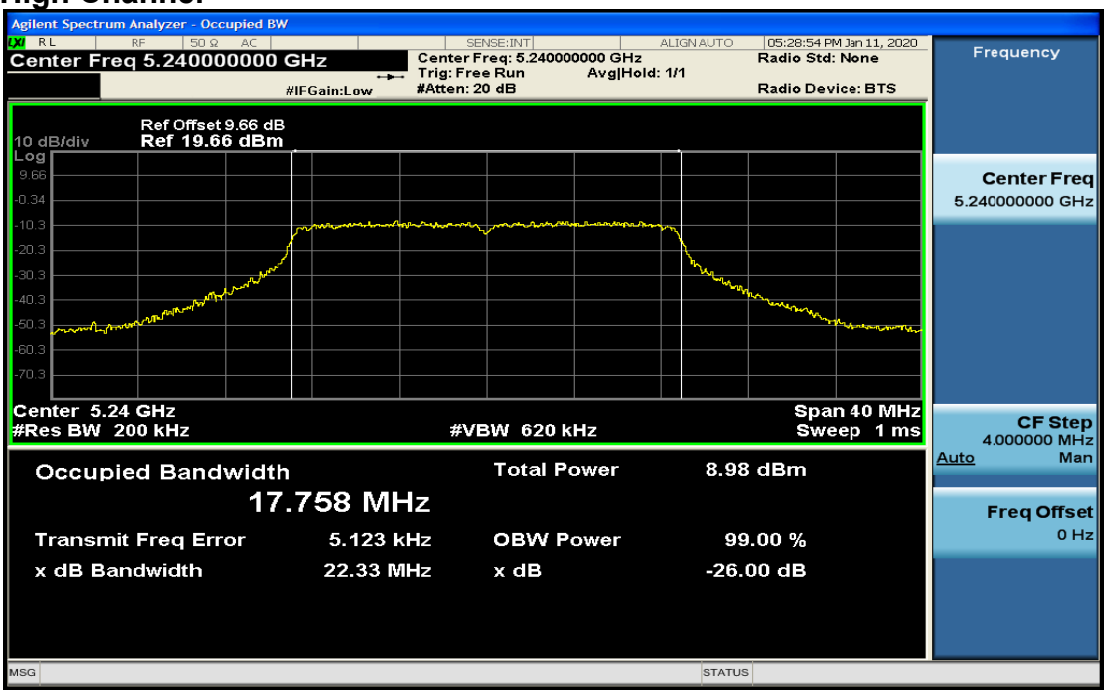
Low Channel



Mid Channel

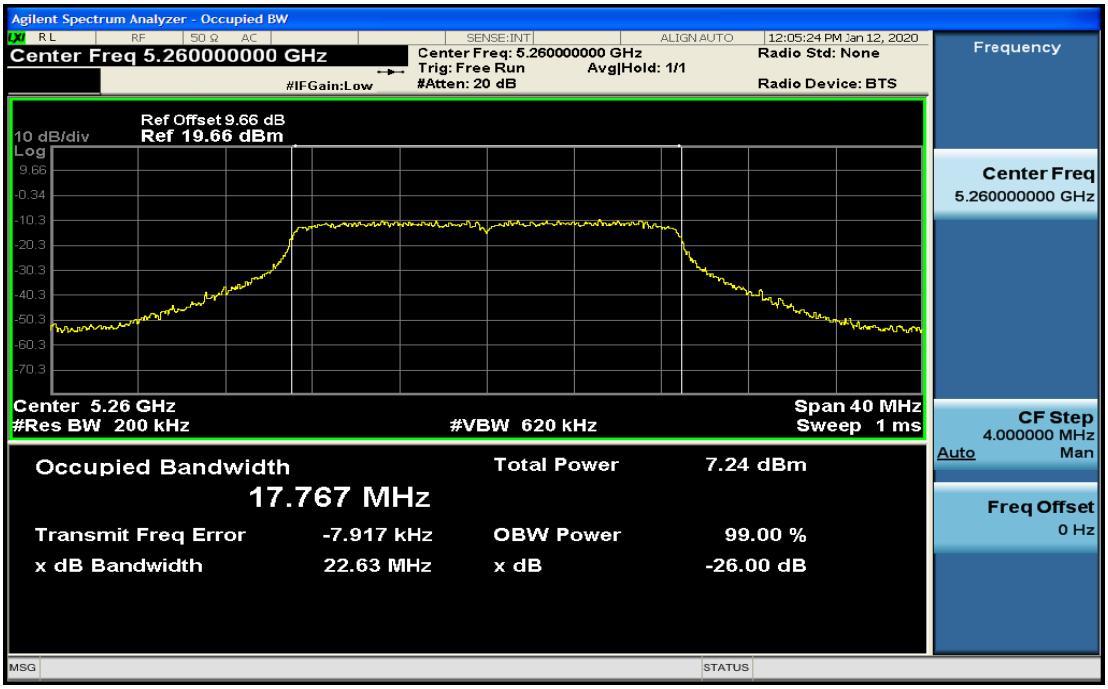


High Channel

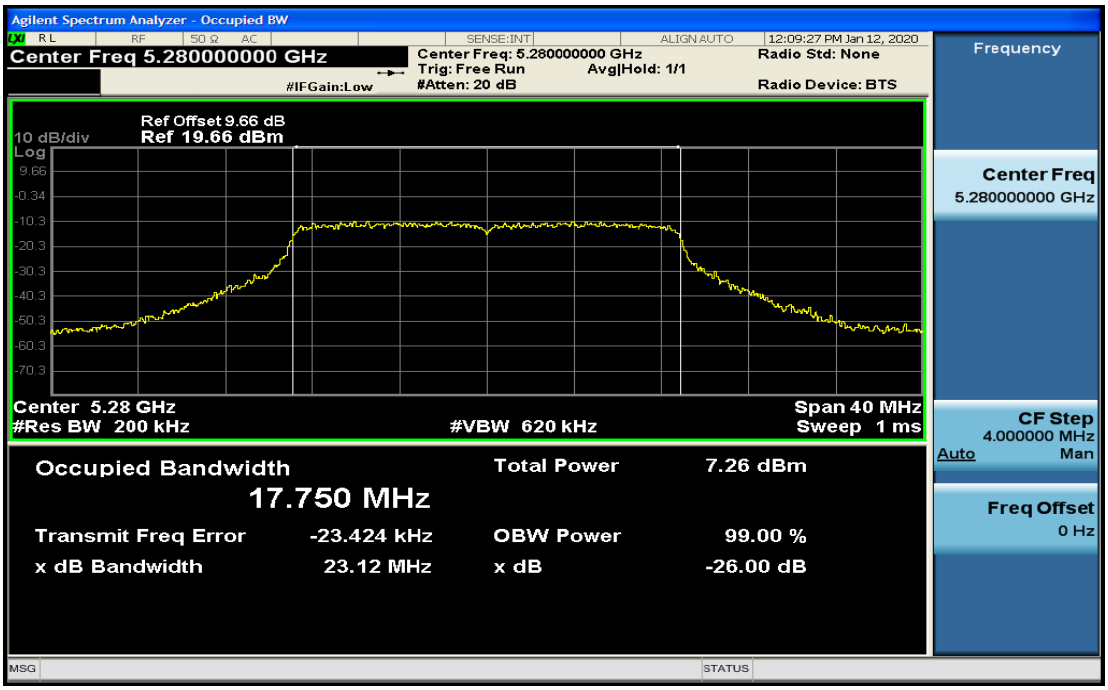


5250~5350MHz

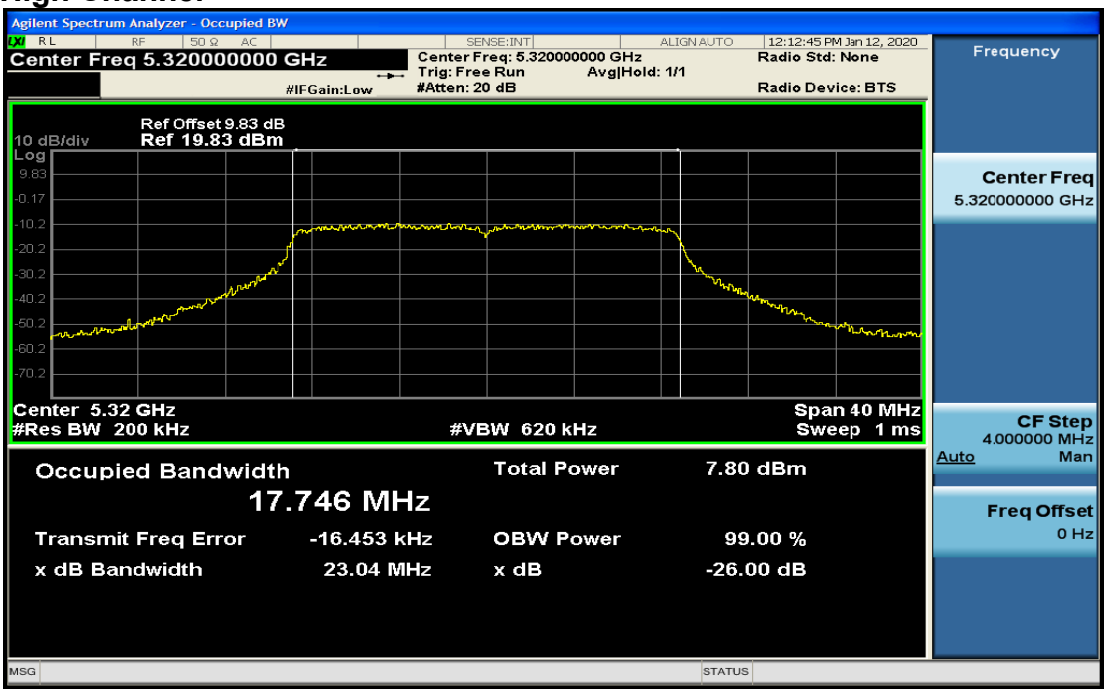
Low Channel



Mid Channel

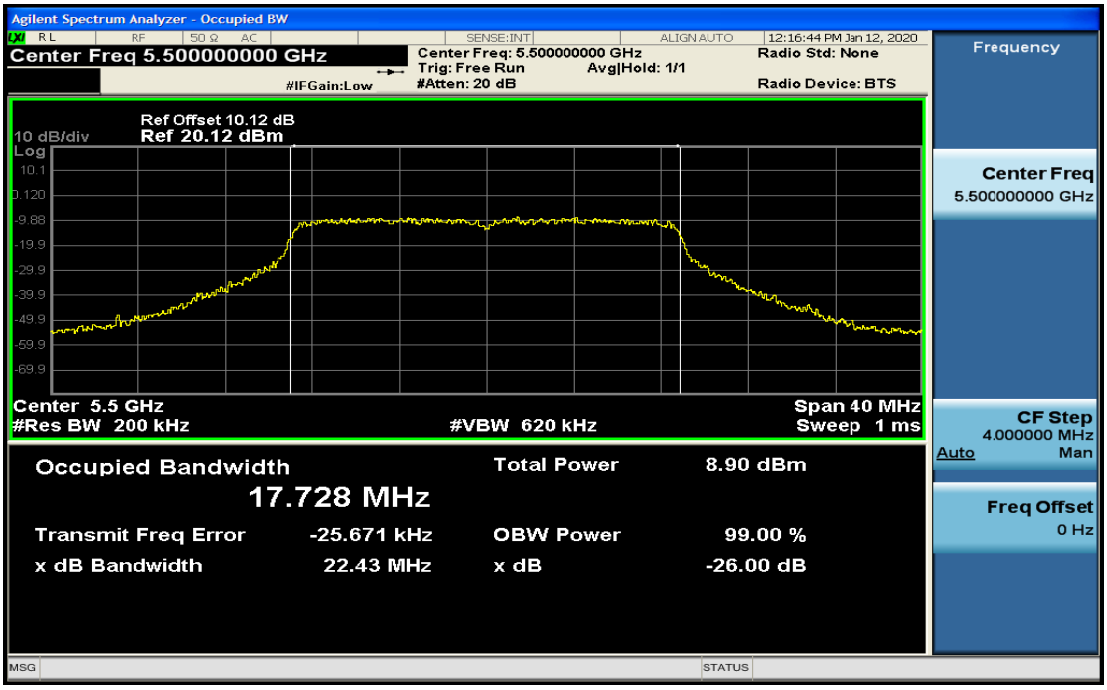


High Channel

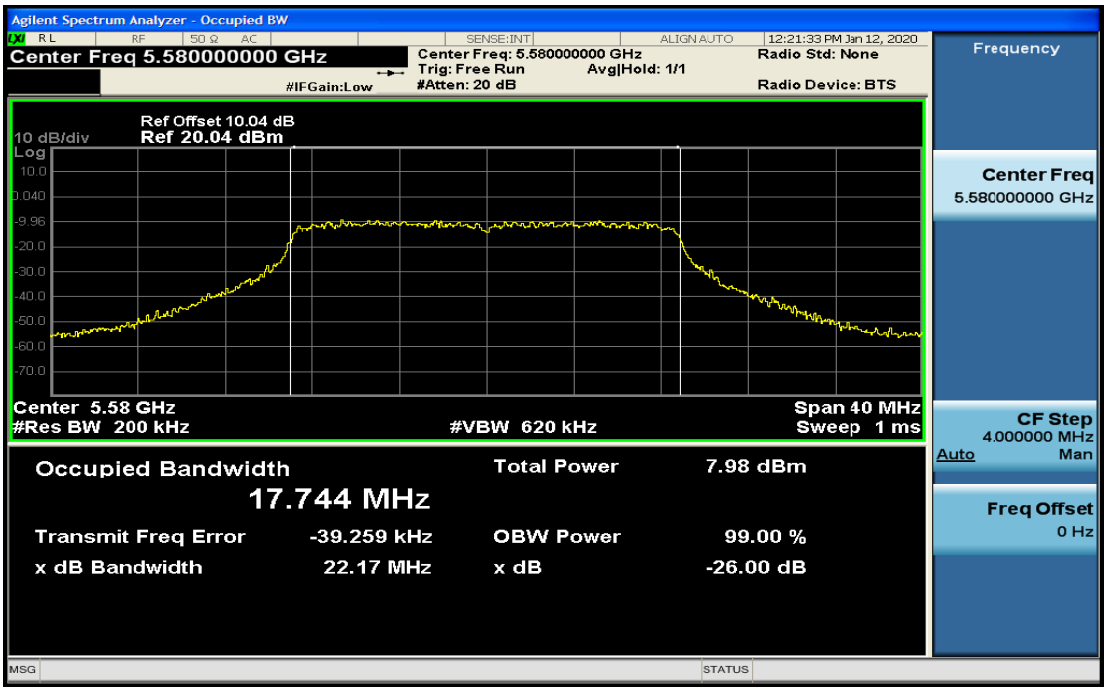


5470~5725MHz

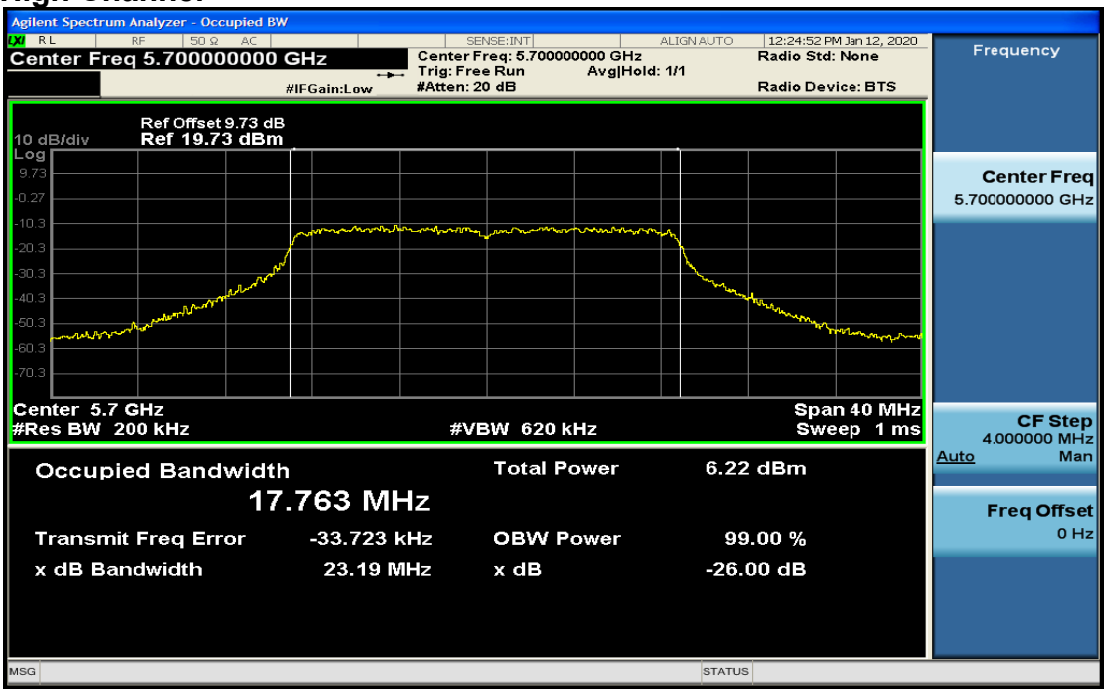
Low Channel



Mid Channel



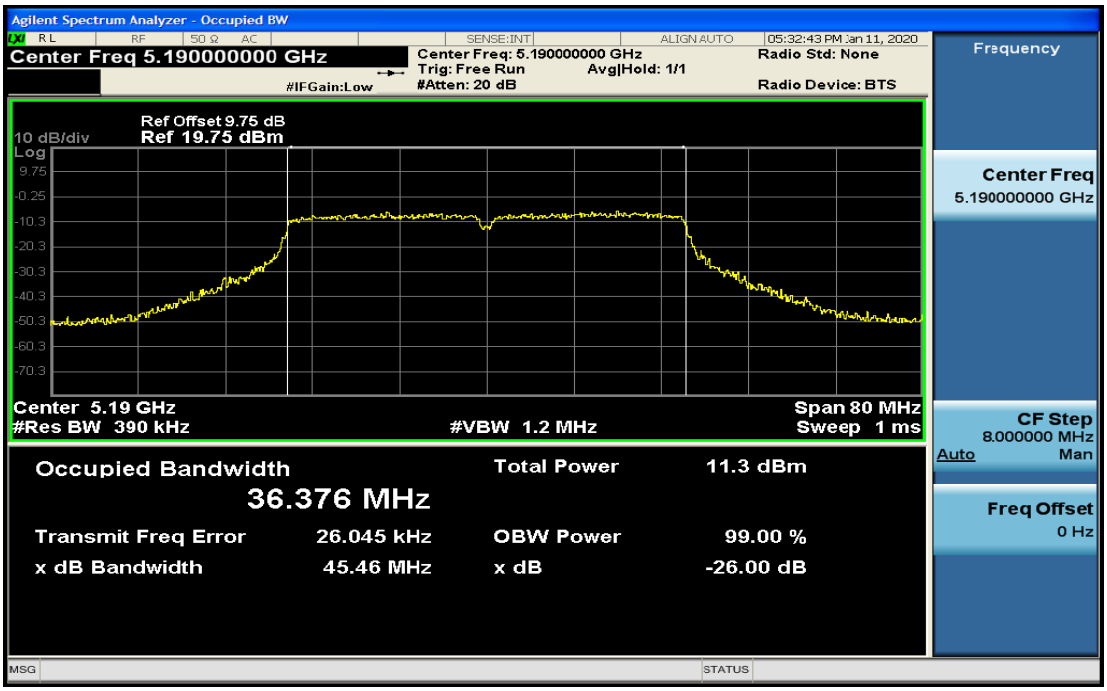
High Channel



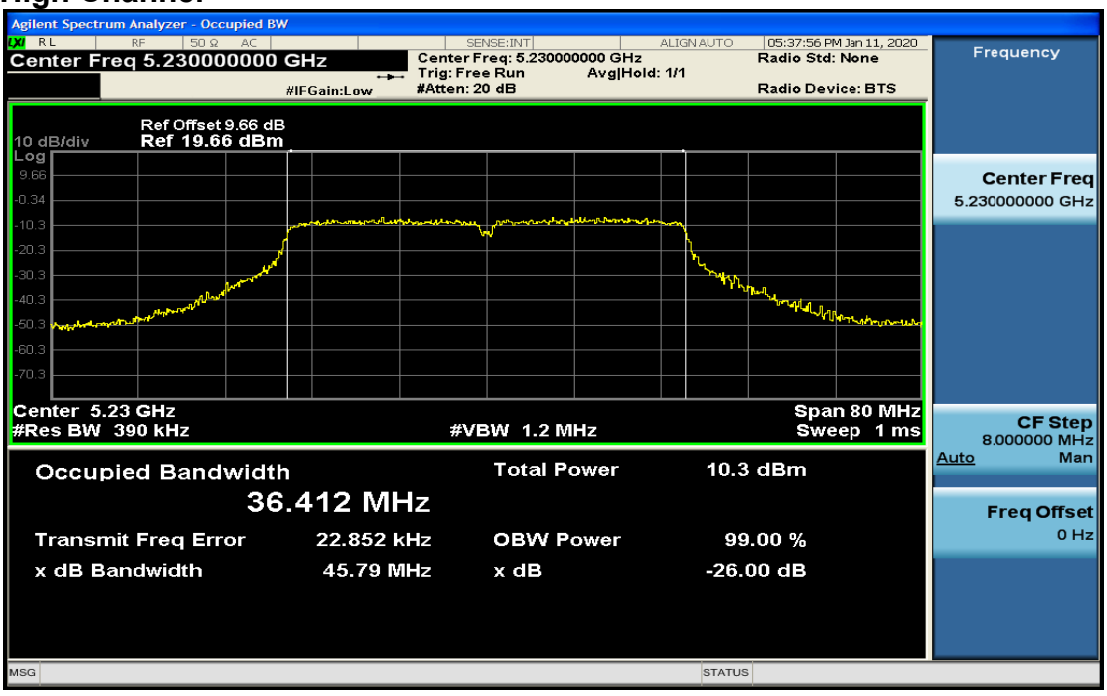
IEEE802.11n HT40 mode

5150~5250MHz

Low Channel

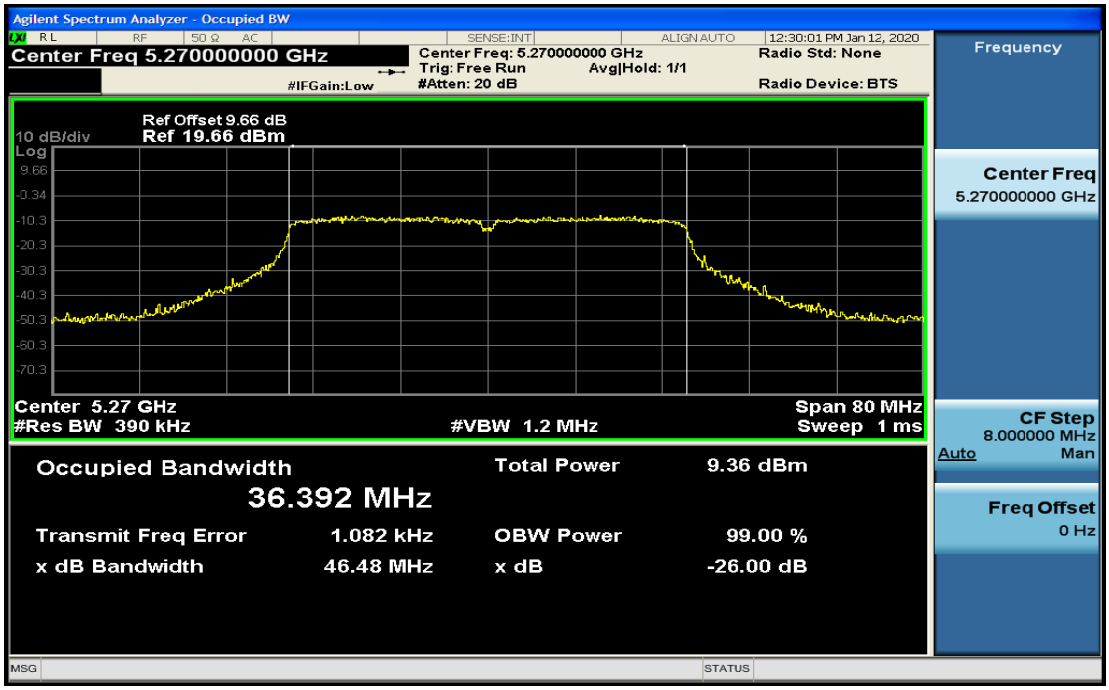


High Channel

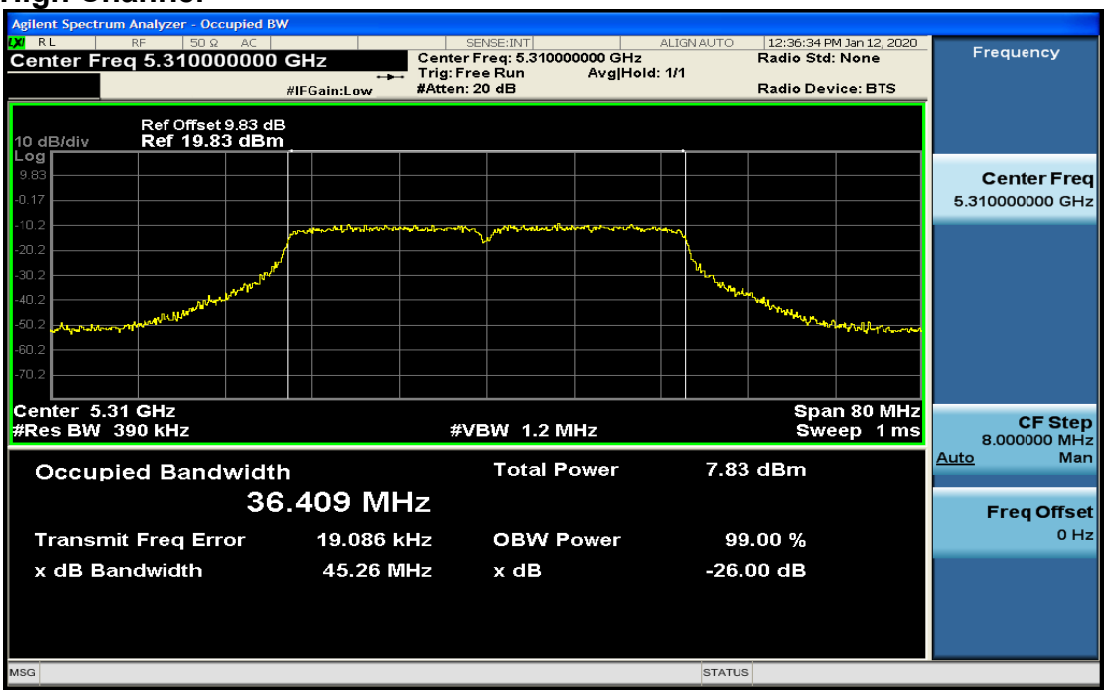


5250~5350MHz

Low Channel

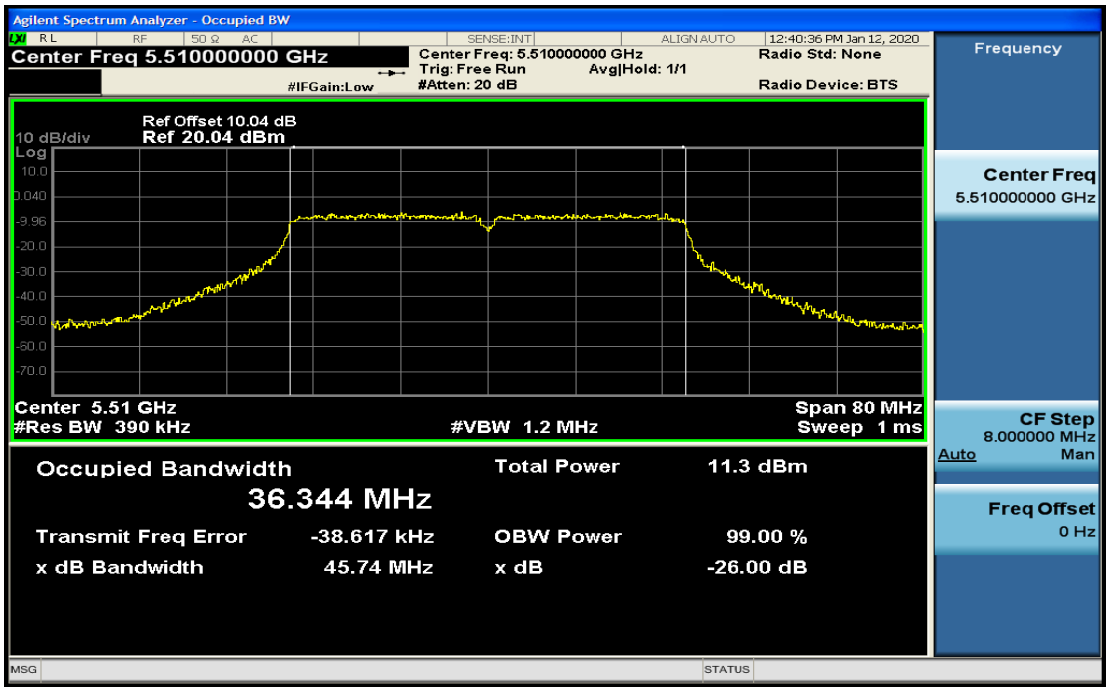


High Channel

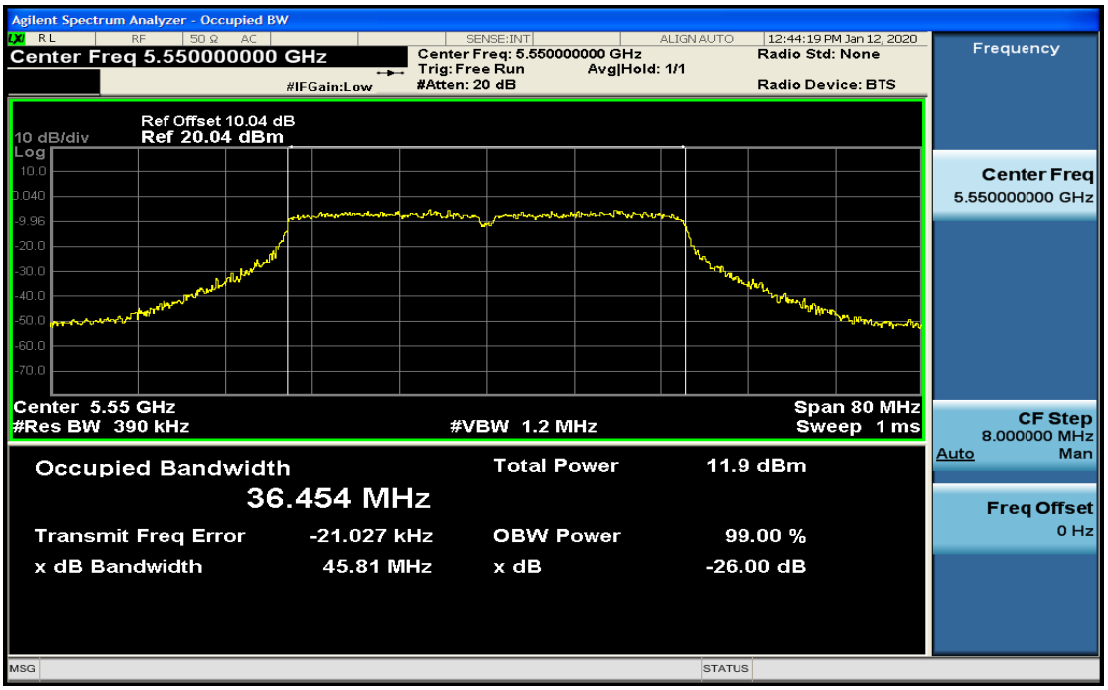


5470~5725MHz

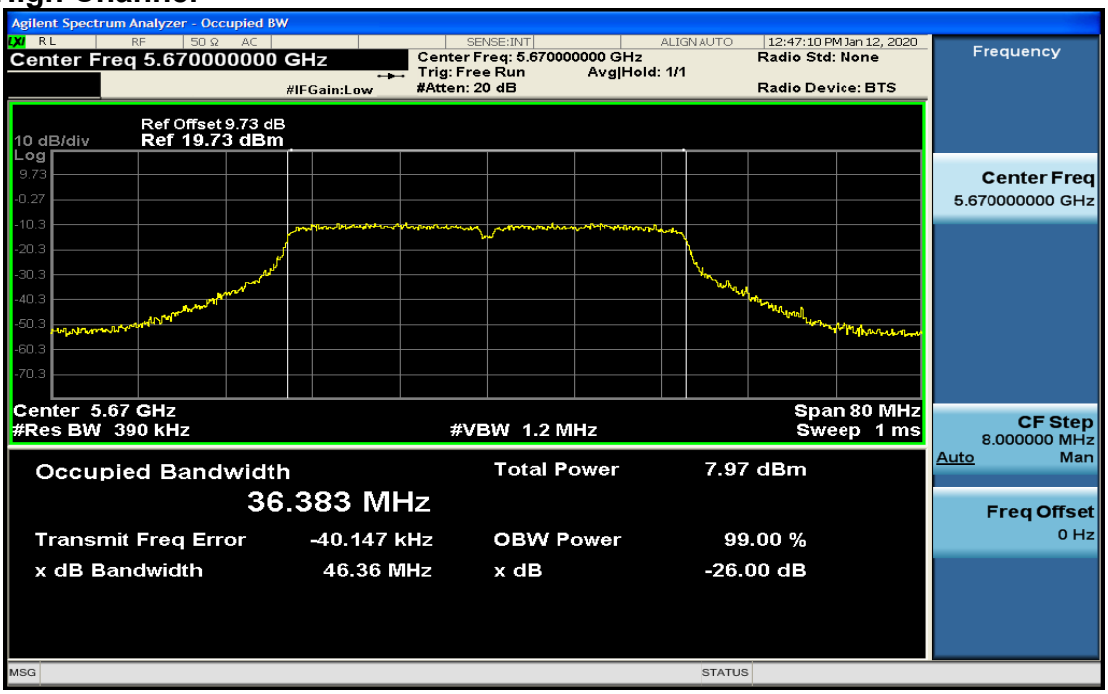
Low Channel



Mid Channel



High Channel

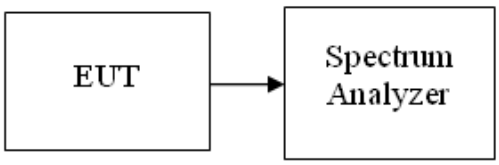


6.2 99% DB EMISSION BANDWIDTH

LIMIT

None; for reporting purposes only.

TestConfiguration



Test Procedure

2. Set center frequency to the nominal EUTchannel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1%to 5 % ofthe OBW
5. Set VBW≥3 · RBW
6. Video averaging is not permitted. Where practical, a sample detection and single sweepmode shall be used. Otherwise, peak detection and max holdmode (until the trace stabilizes) shall be used.
7. Use the 99 % power bandwidth function of the instrument (if available).

TESTRESULTS

No non-compliance noted

Test Data

Antenna 1

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	16.638
Mid	5220	16.604
High	5240	16.692

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	16.649
Mid	5280	16.707
High	5320	16.779

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	16.655
Mid	5580	16.693
High	5700	16.692

Testmode:IEEE802.11n HT20 mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	17.719
Mid	5220	17.765
High	5240	17.846

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	17.798
Mid	5280	17.837
High	5320	17.777

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	17.804
Mid	5580	17.794
High	5700	17.828

Testmode:IEEE802.11nHT40 mode 5150~5250MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	36.437
High	5230	36.635

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	36.504
High	5310	36.707

5470~5725MHz

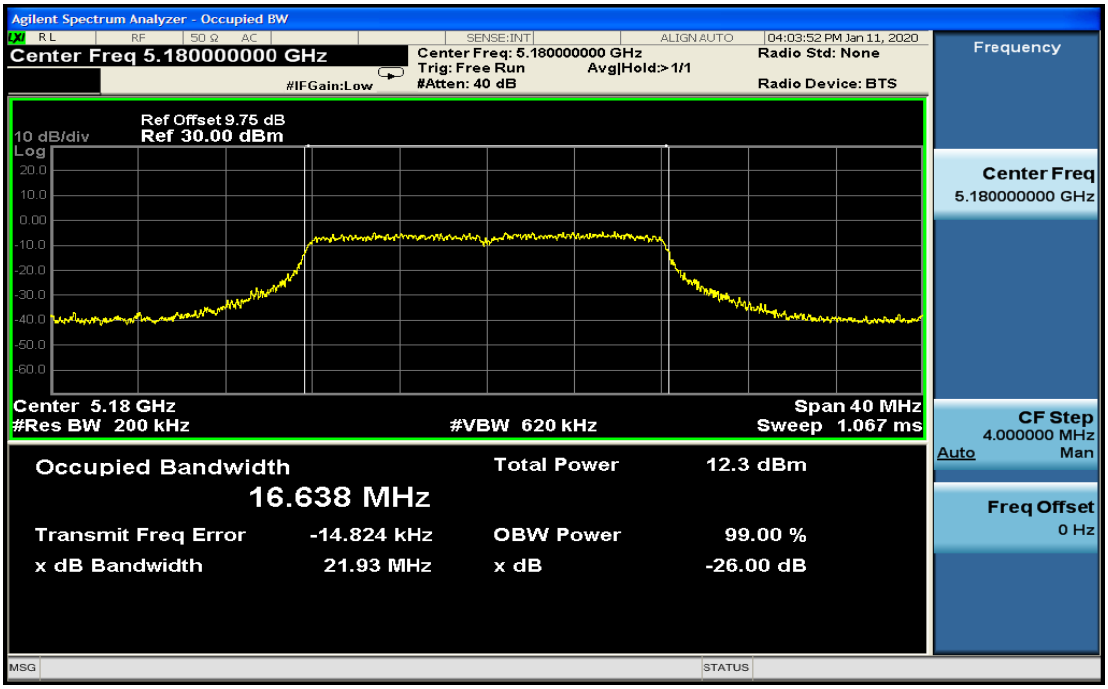
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	36.640
Mid	5550	36.794
High	5670	36.692

Test Plot

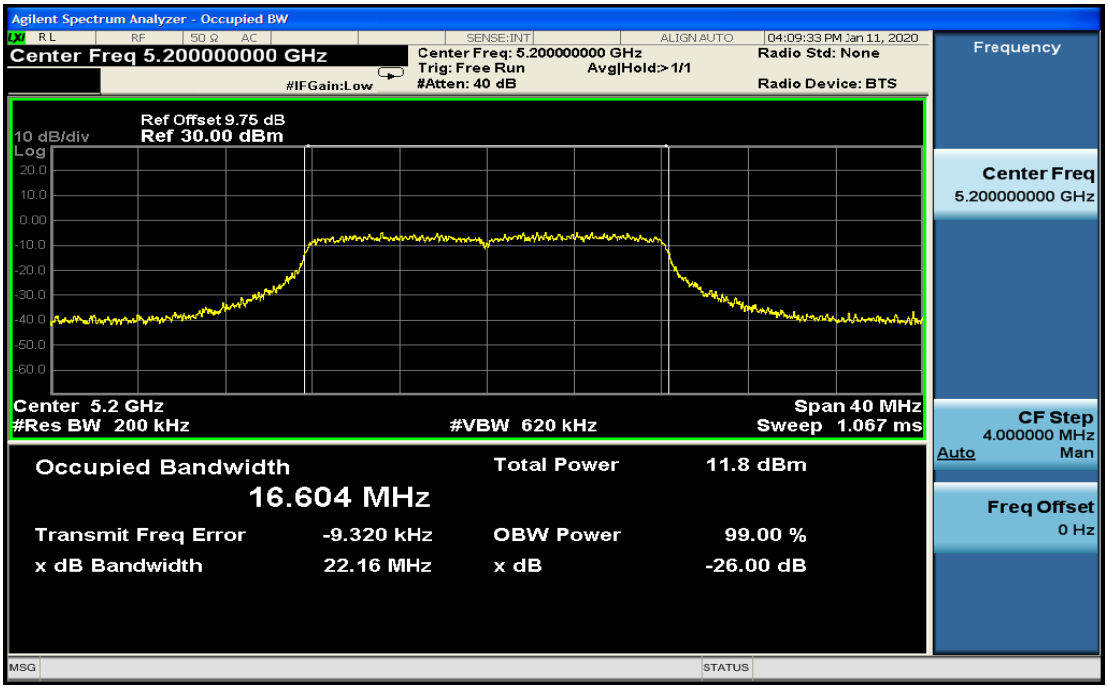
IEEE802.11a mode:

5150~5250MHz

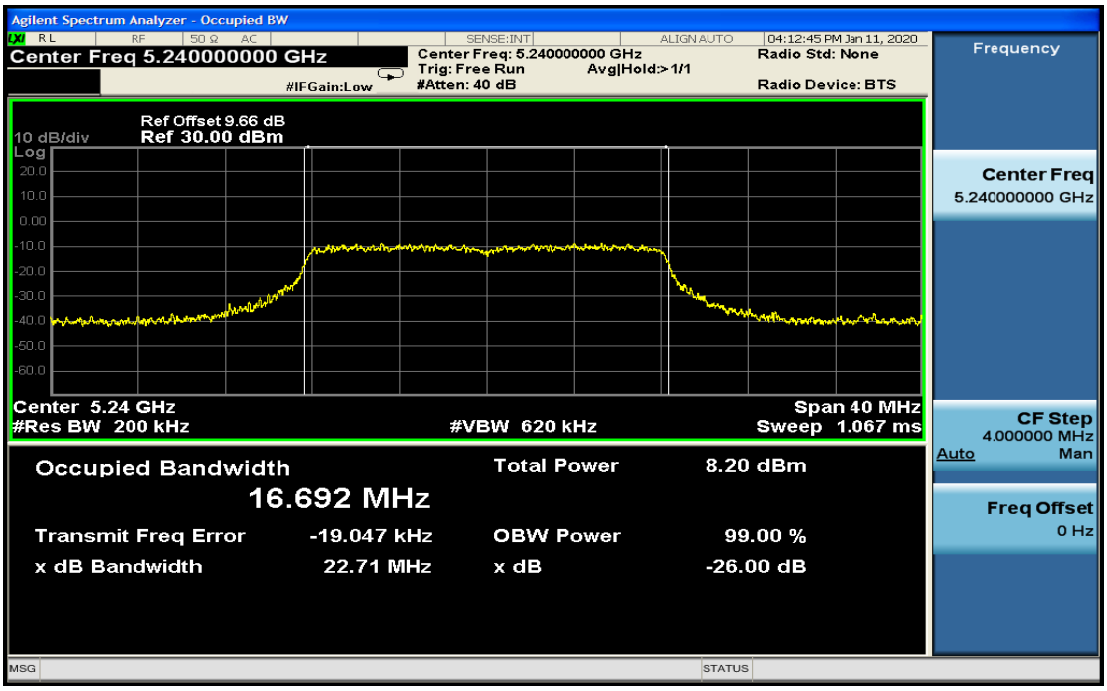
Low Channel



Mid Channel

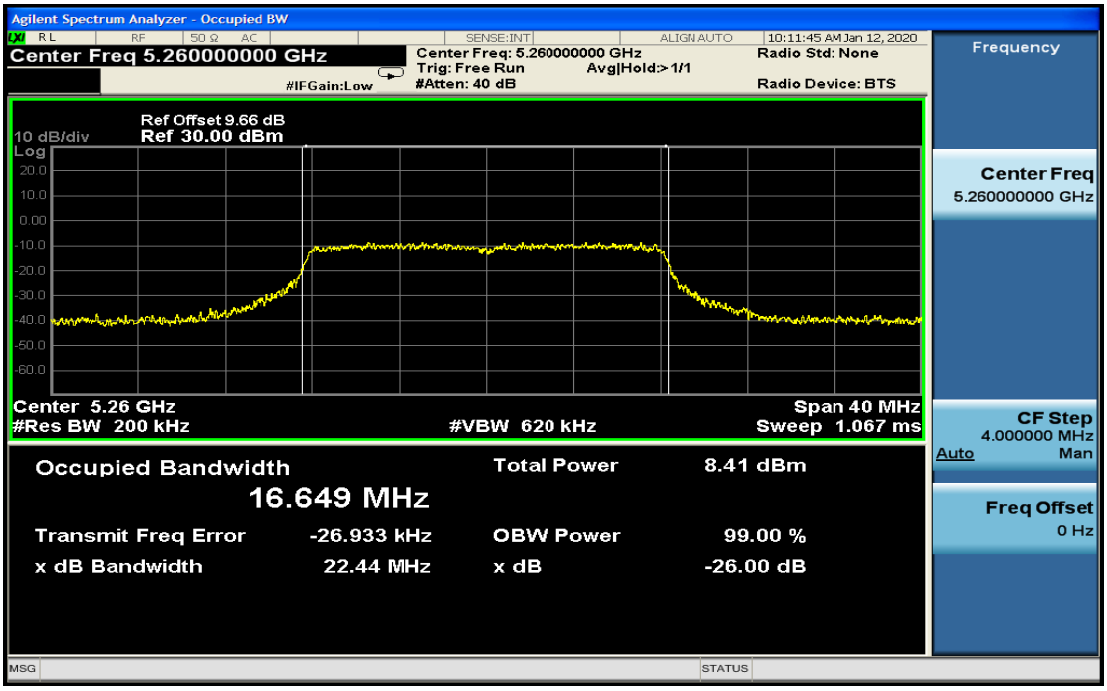


High Channel

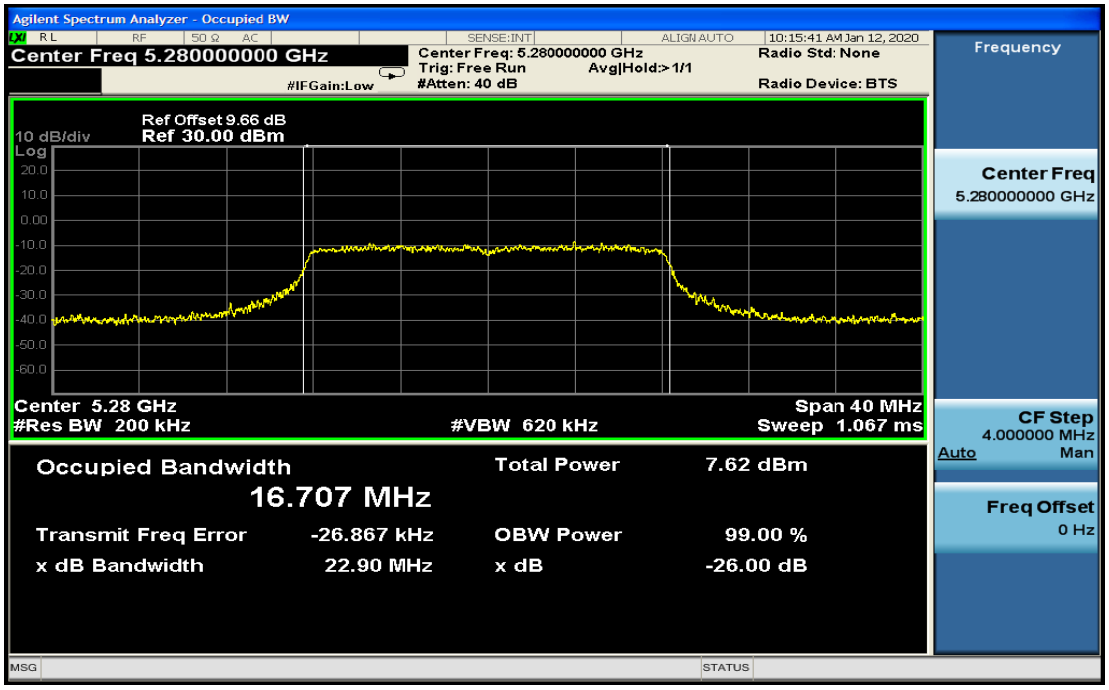


5250~5350MHz

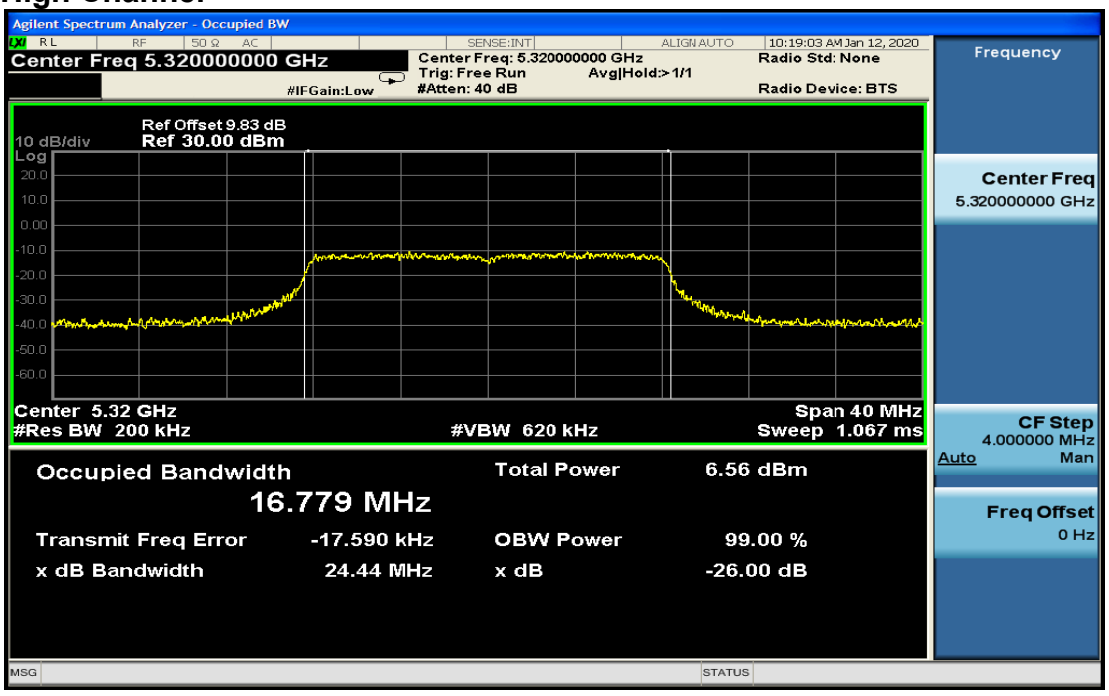
Low Channel



Mid Channel

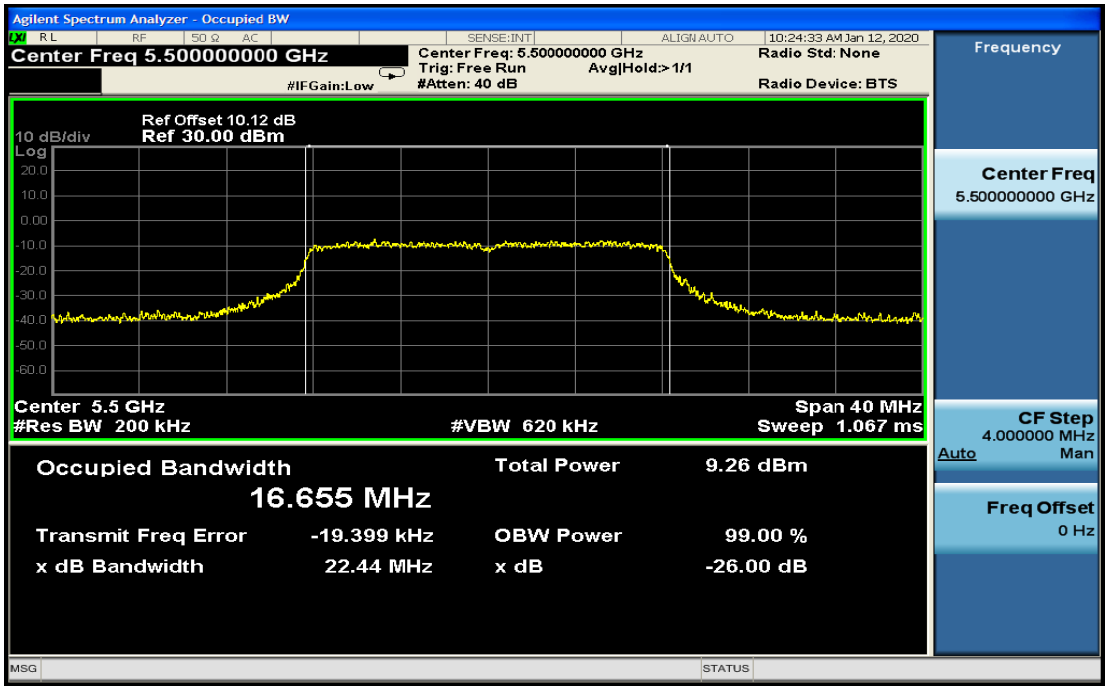


High Channel

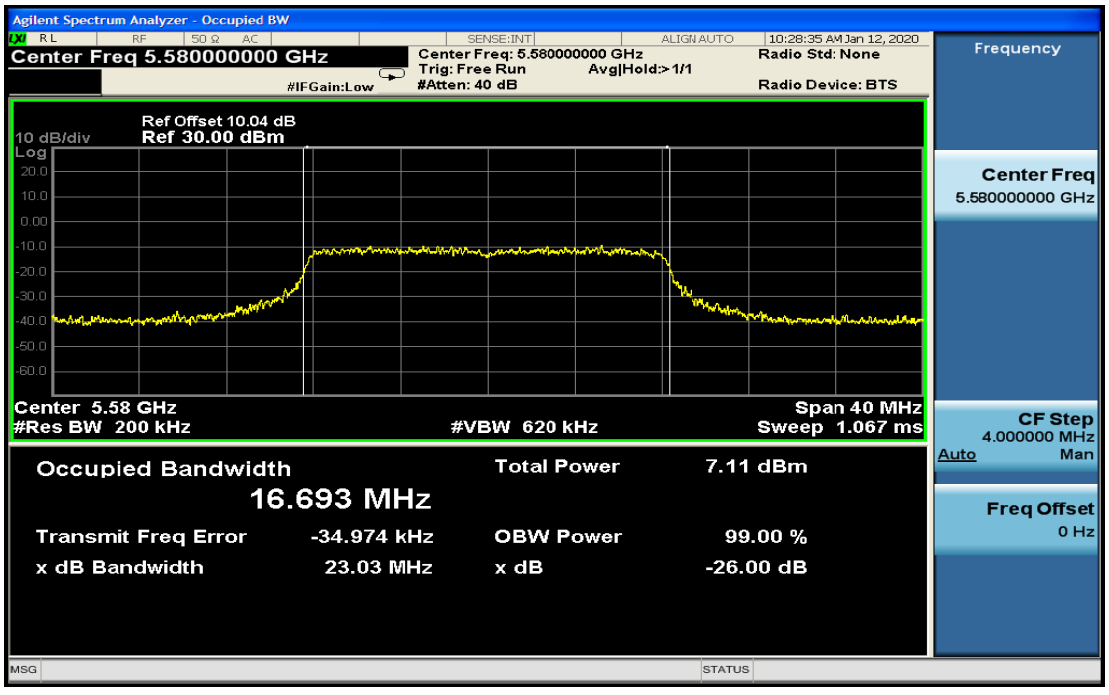


5470~5725MHz

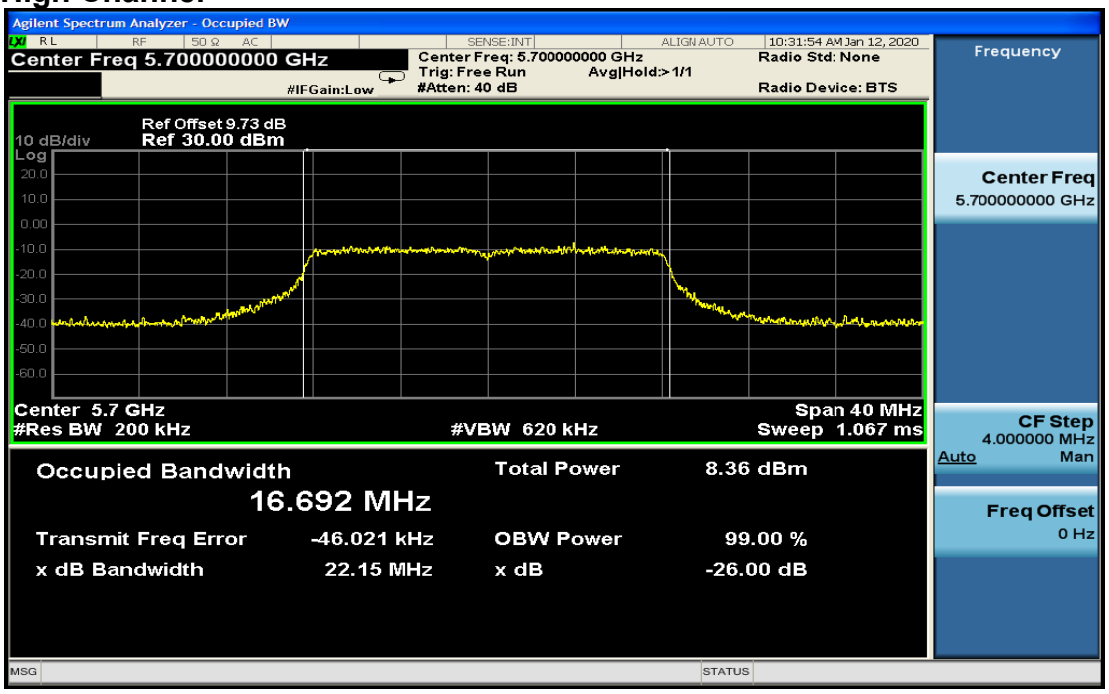
Low Channel



Mid Channel



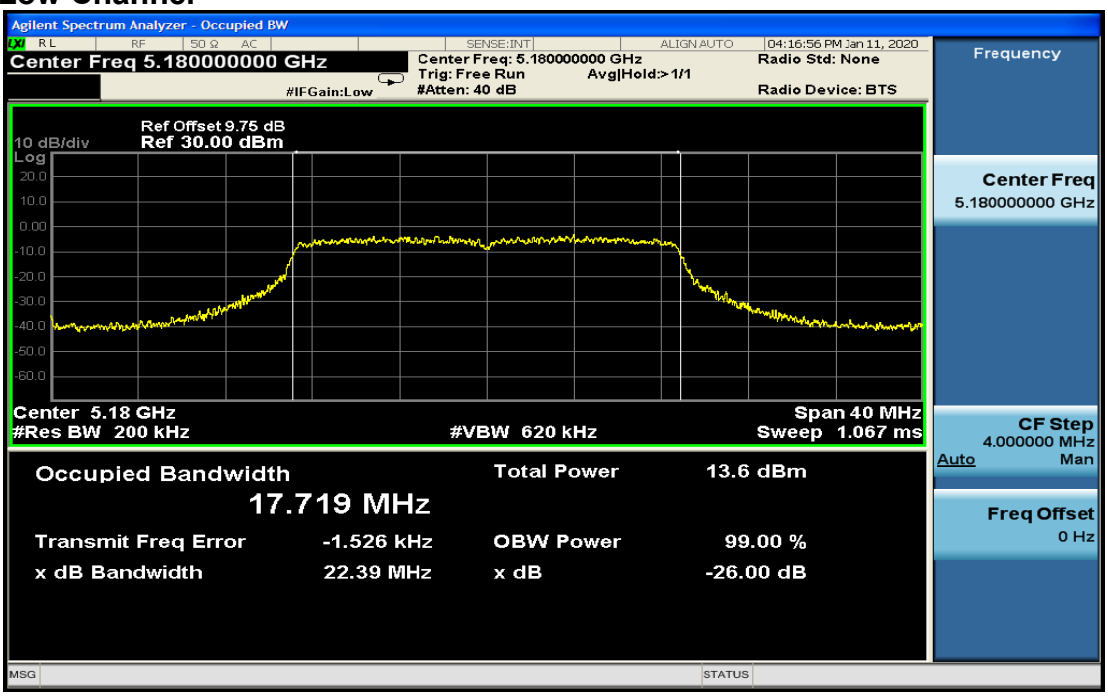
High Channel



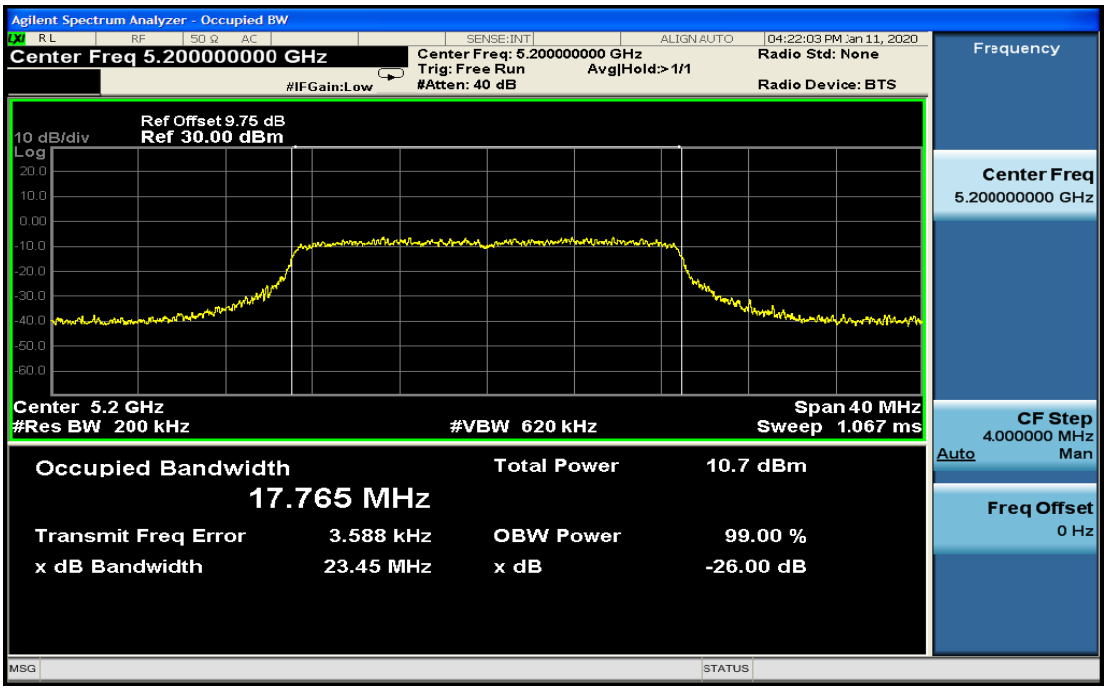
IEEE802.11n HT20 mode

5150~5250MHz

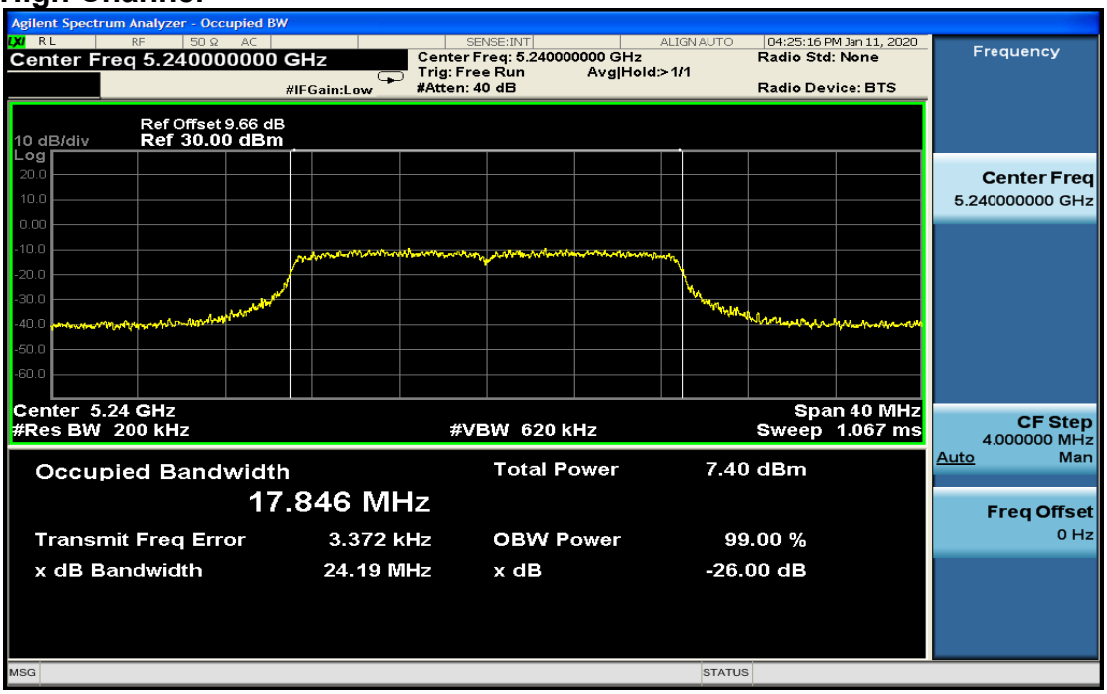
Low Channel



Mid Channel

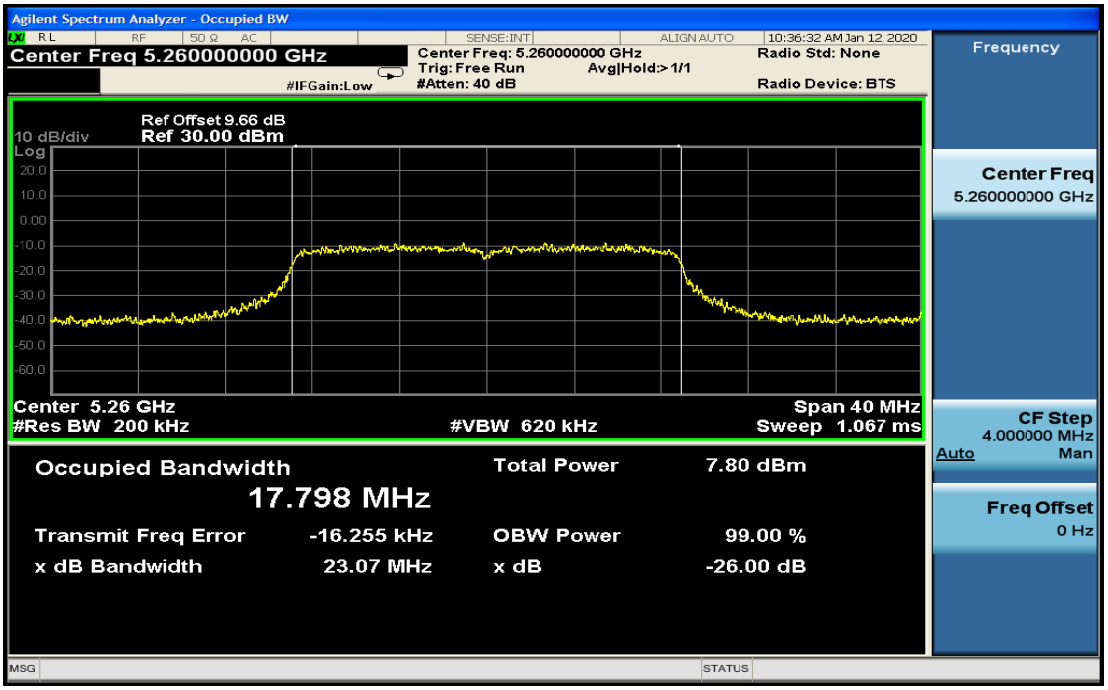


High Channel

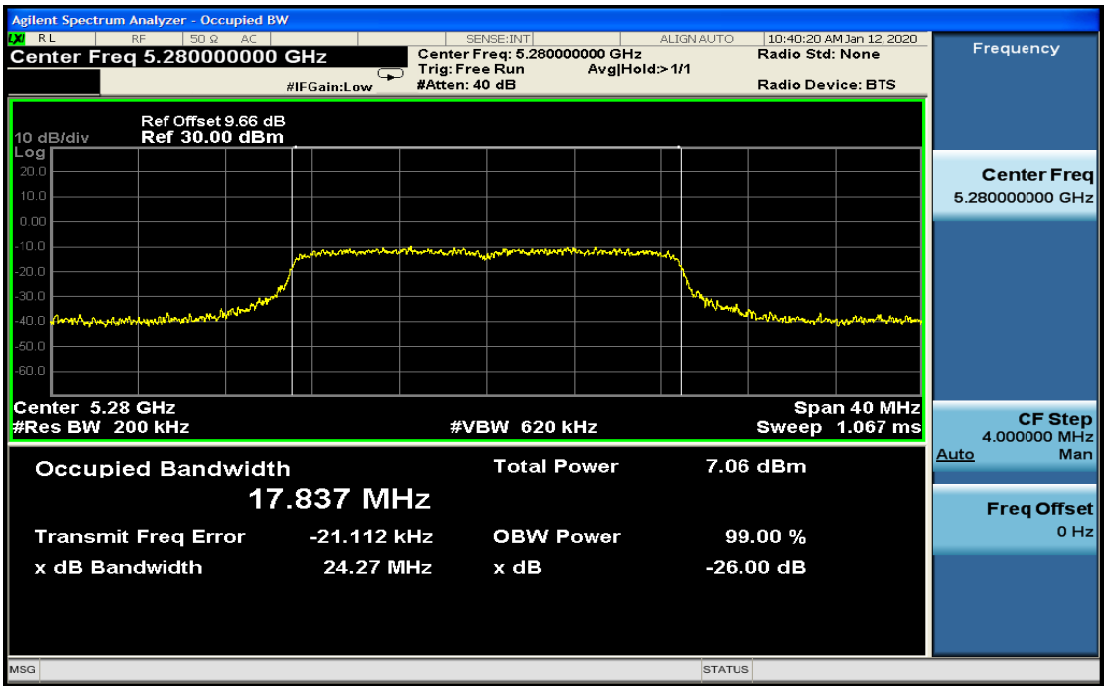


5250~5350MHz

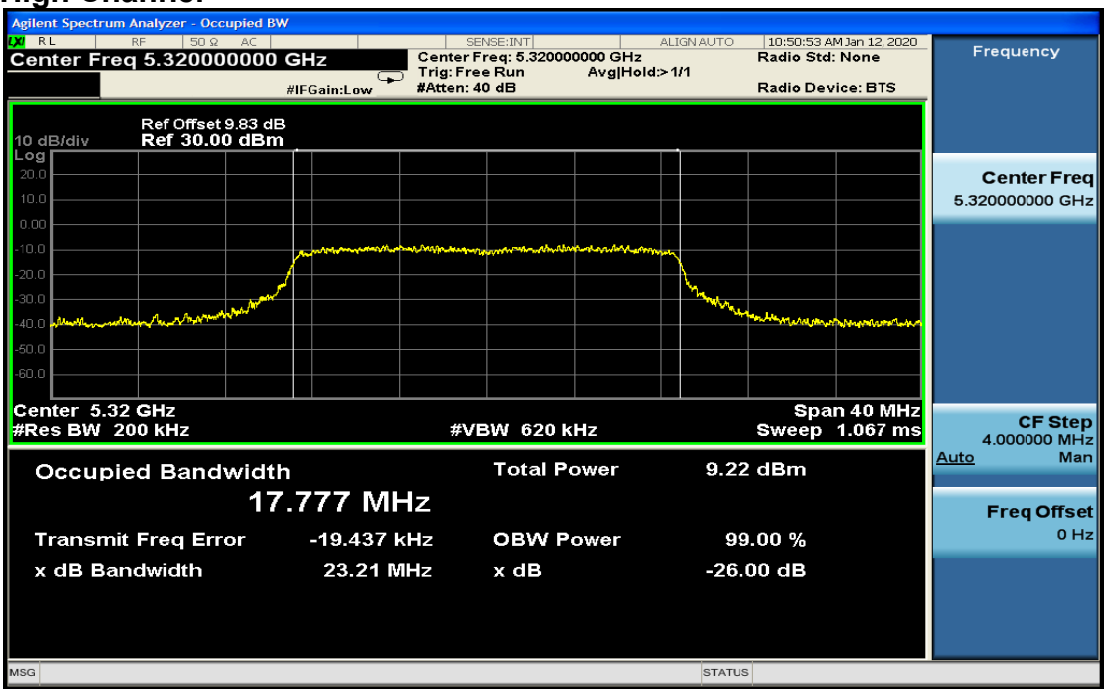
Low Channel



Mid Channel

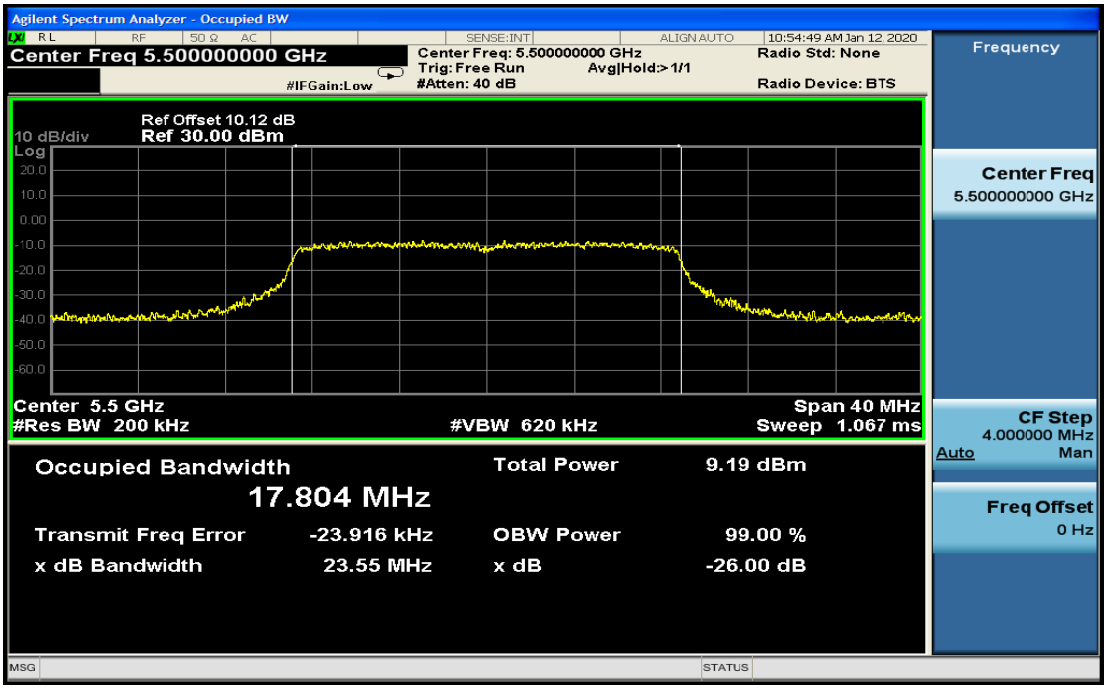


High Channel

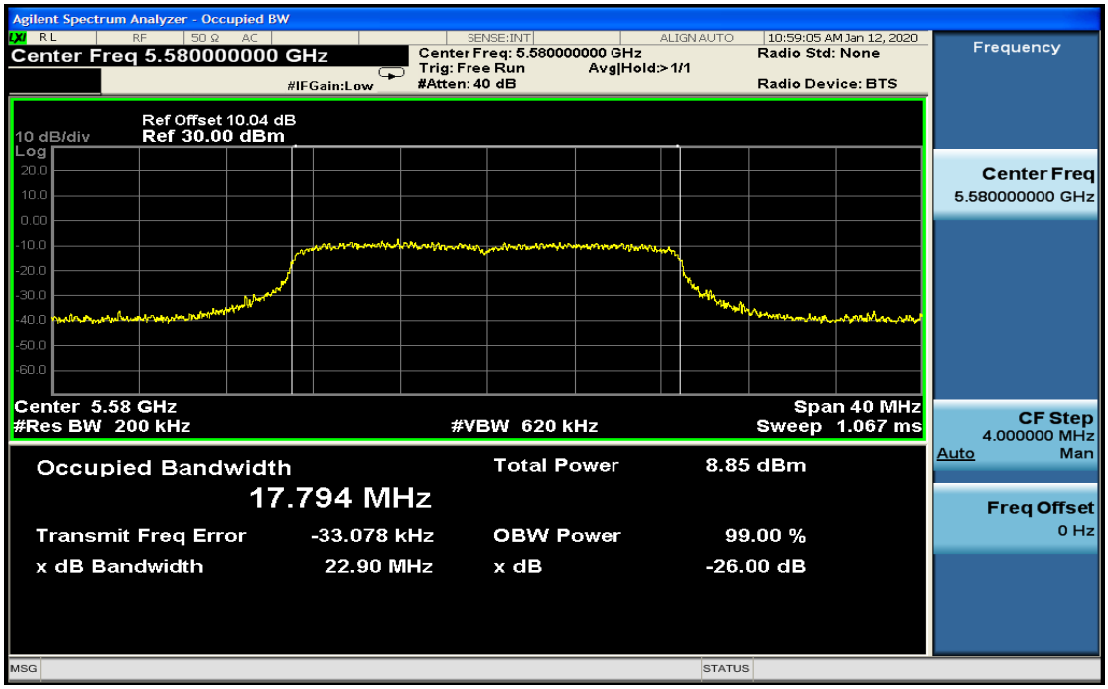


5470~5725MHz

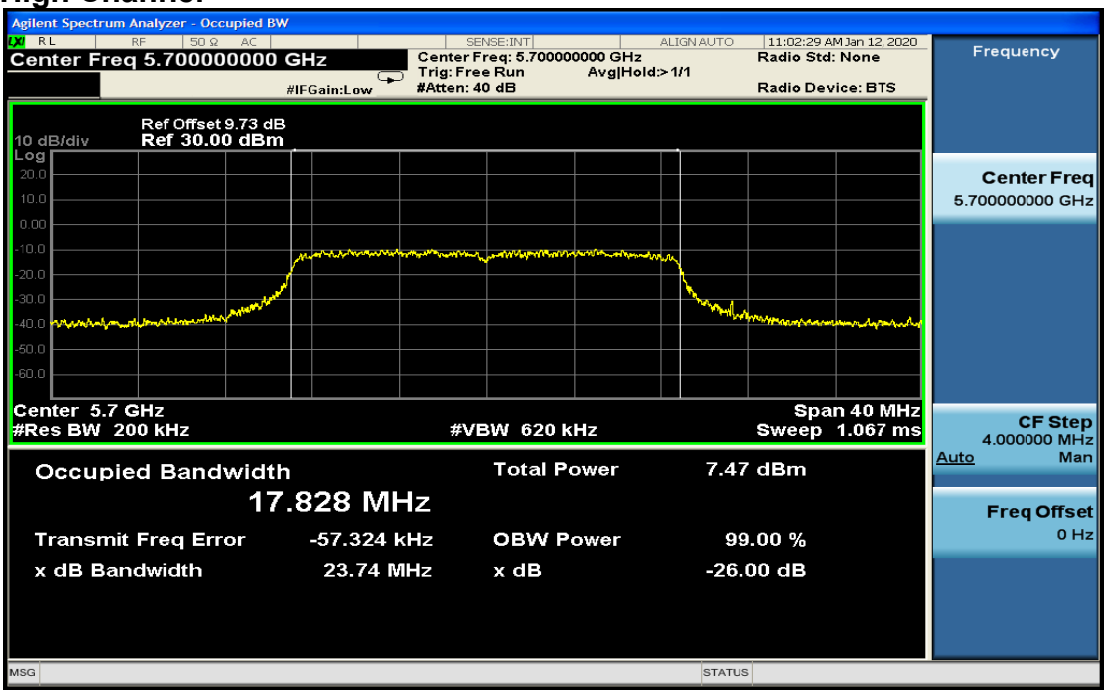
Low Channel



Mid Channel



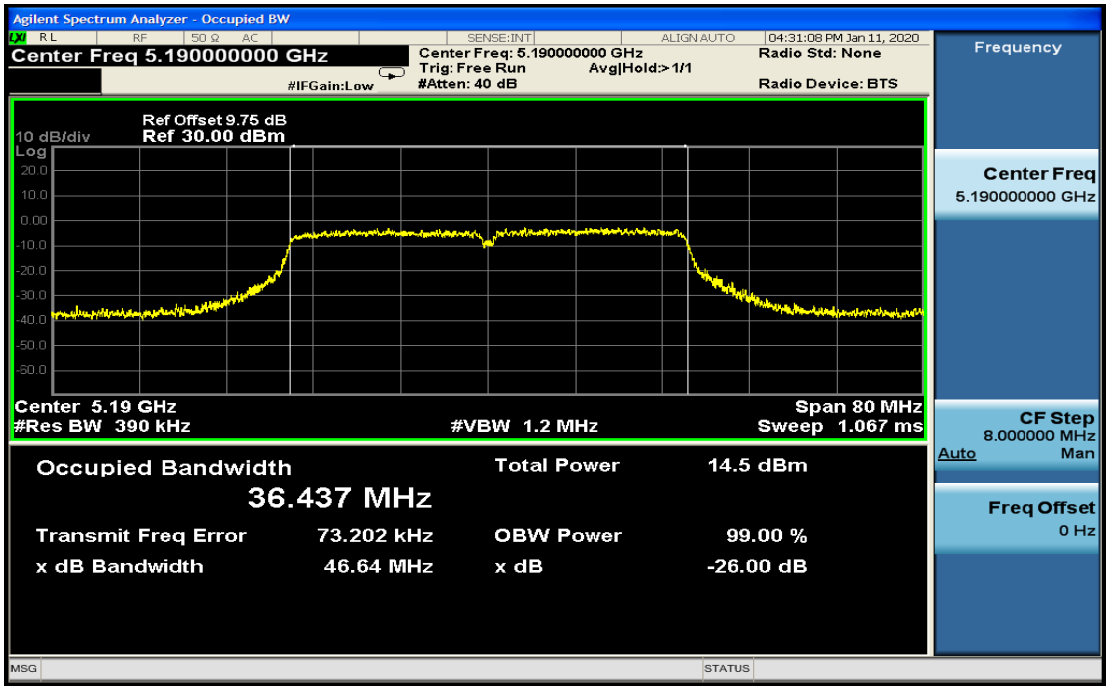
High Channel



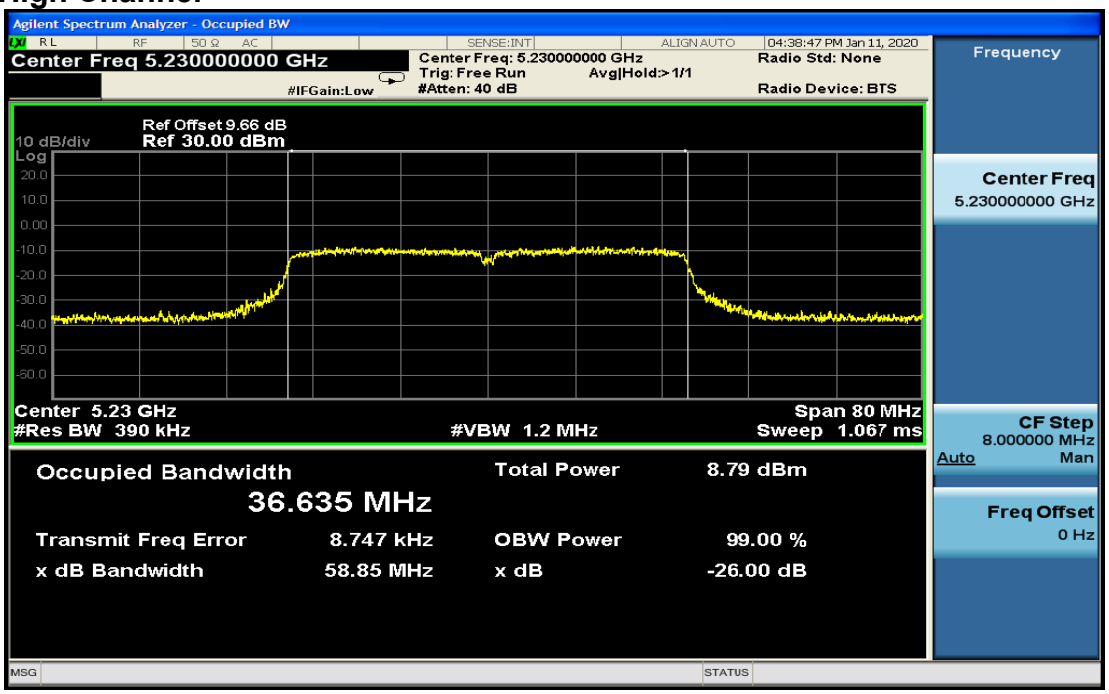
IEEE802.11n HT40 mode

5150~5250MHz

Low Channel

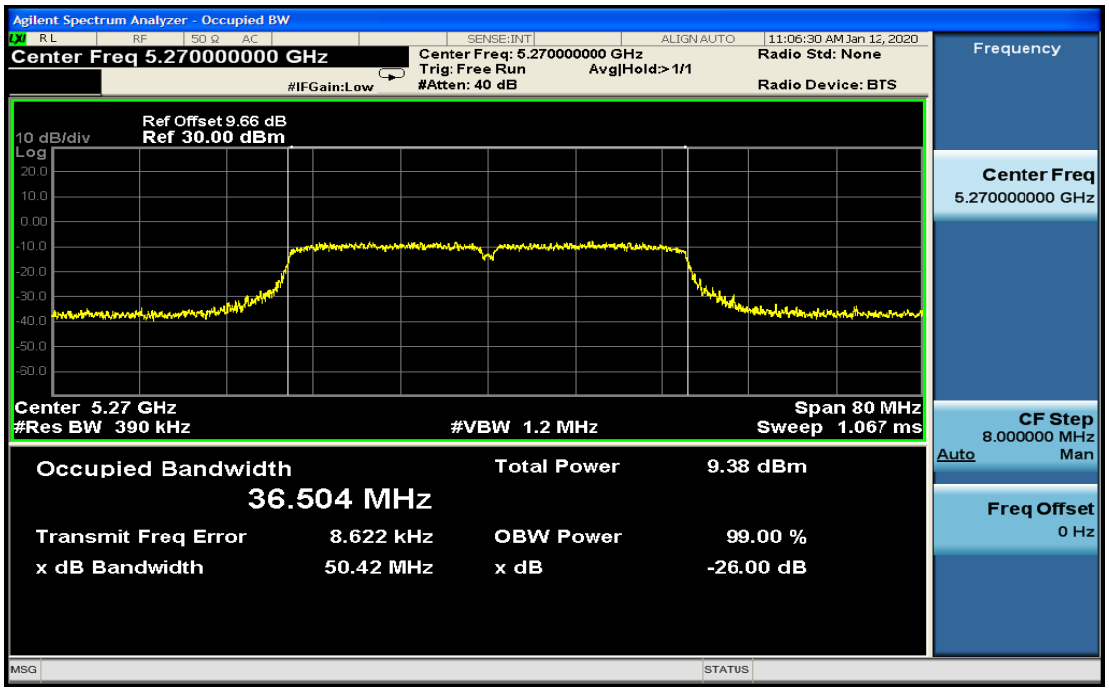


High Channel

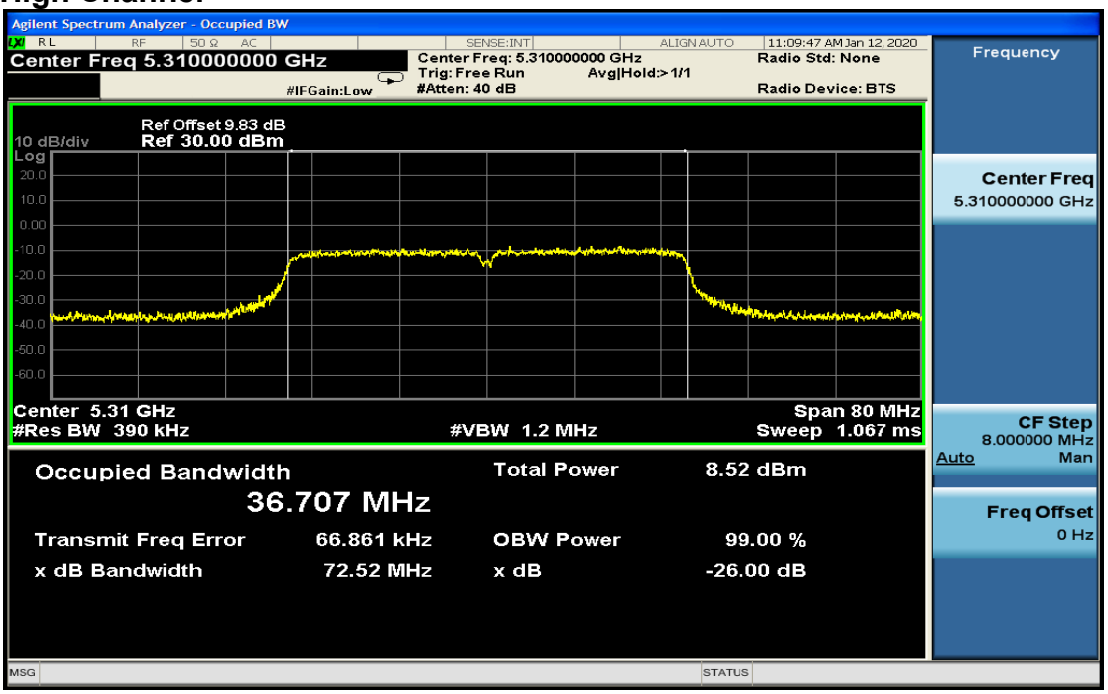


5250~5350MHz

Low Channel

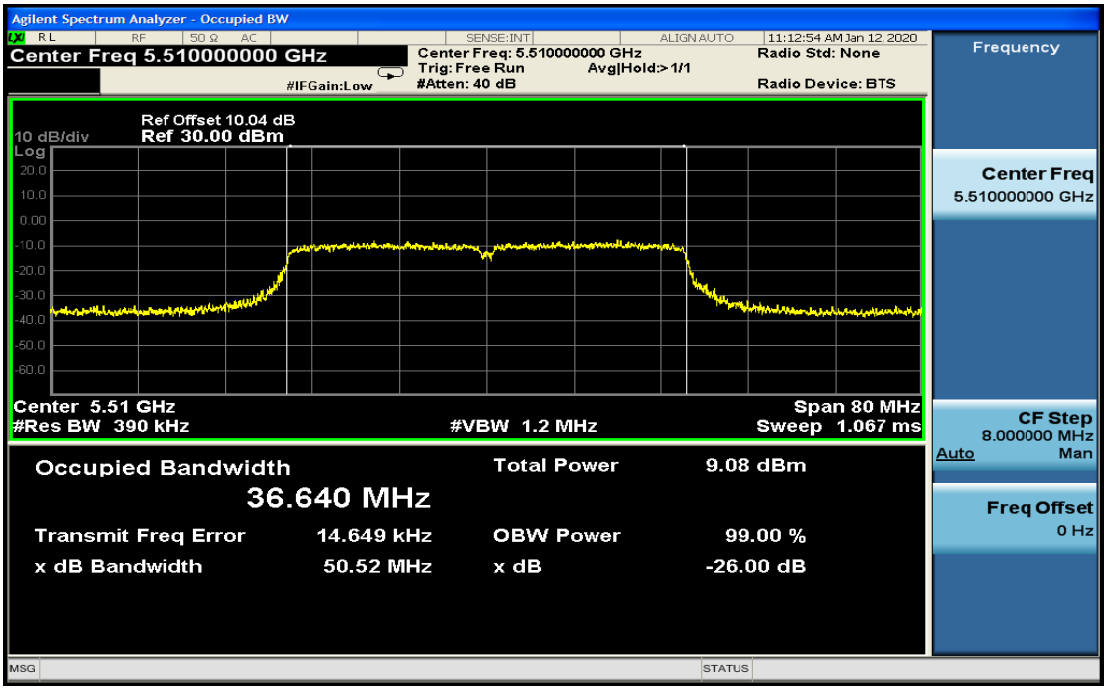


High Channel

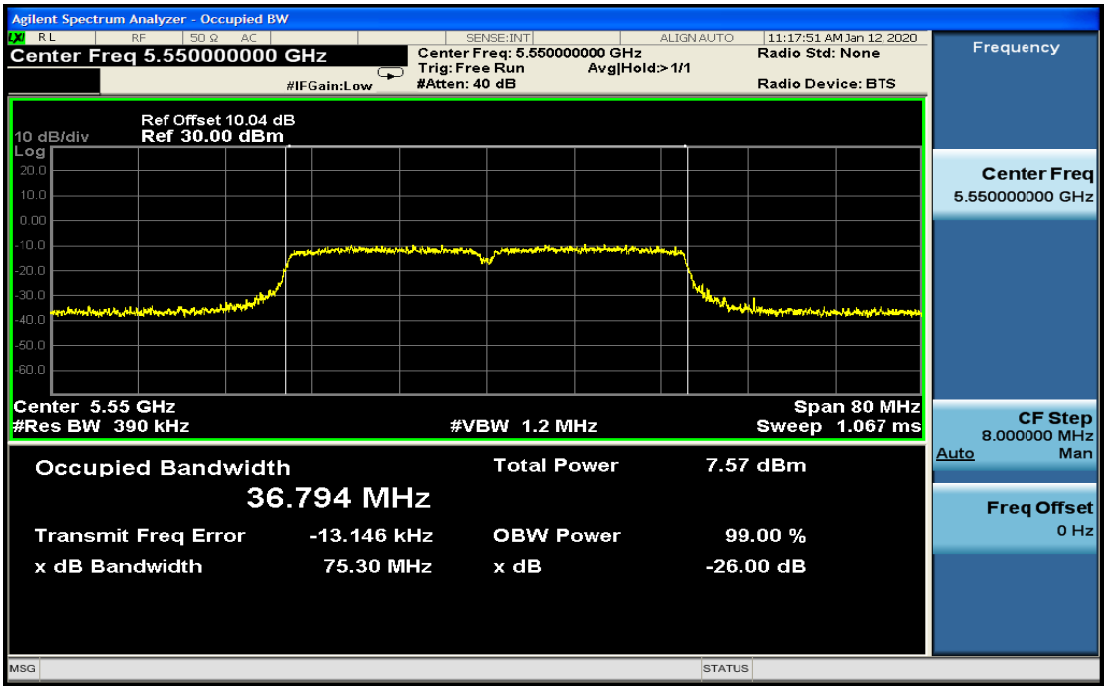


5470~5725MHz

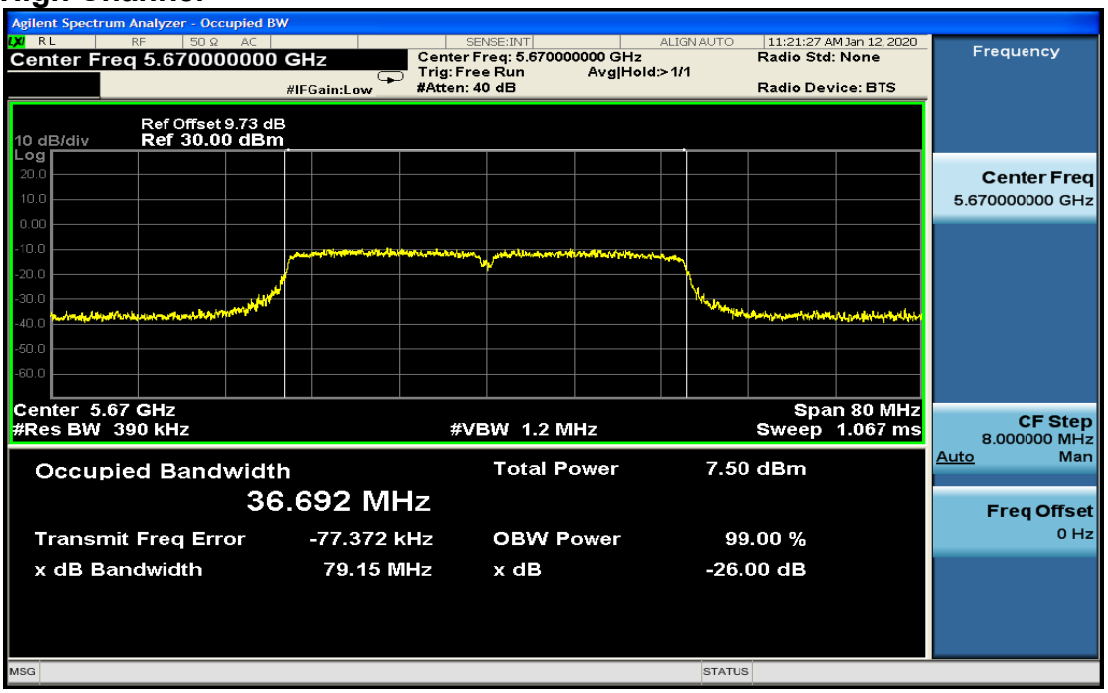
Low Channel



Mid Channel



High Channel



Antenna 2

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	16.658
Mid	5220	16.674
High	5240	16.697

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	16.667
Mid	5280	16.737
High	5320	16.812

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	16.714
Mid	5580	16.723
High	5700	16.890

Testmode:IEEE802.11n HT20 mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	17.767
Mid	5220	17.752
High	5240	17.827

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	17.850
Mid	5280	17.835
High	5320	17.841

5470~5725MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	17.811
Mid	5580	17.845
High	5700	17.842

Testmode:IEEE802.11n HT40 mode

5150~5250MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	36.561
High	5230	36.553

5250~5350MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	36.555
High	5310	36.822

5470~5725MHz

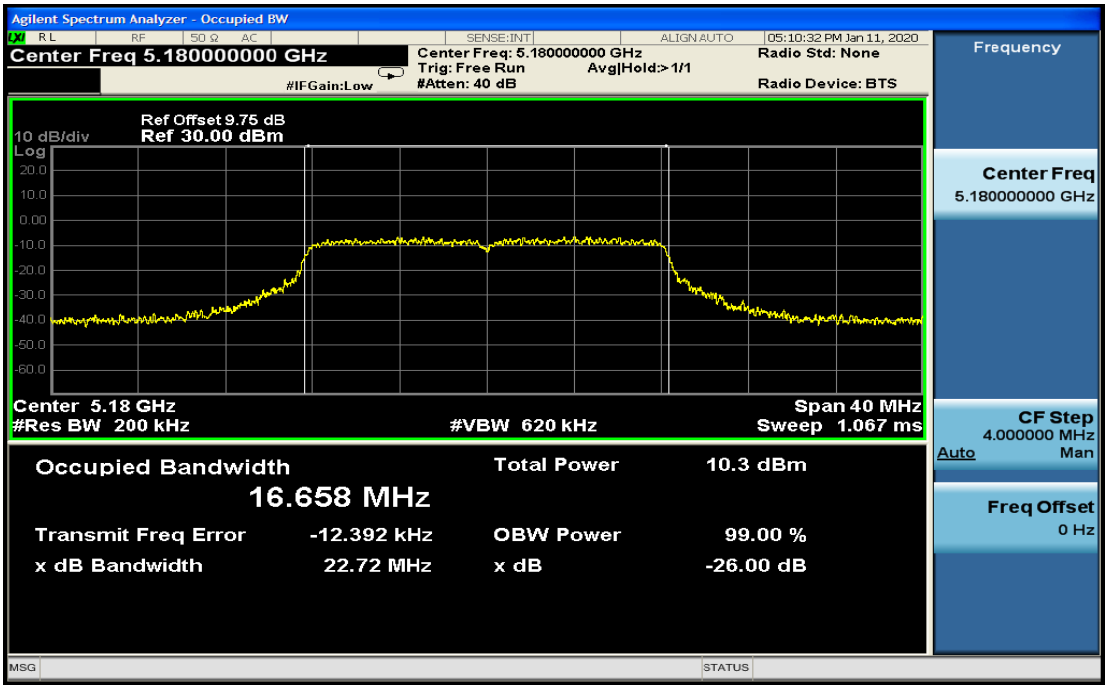
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	36.517
Mid	5550	36.520
High	5670	36.781

Test Plot

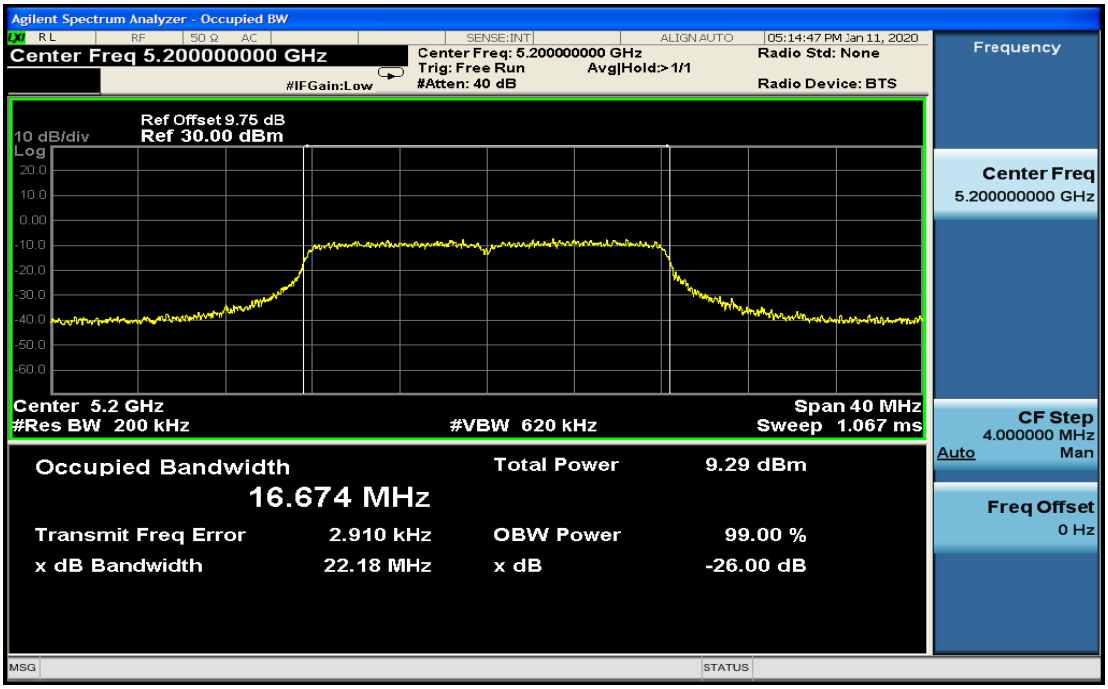
IEEE802.11a mode:

5150~5250MHz

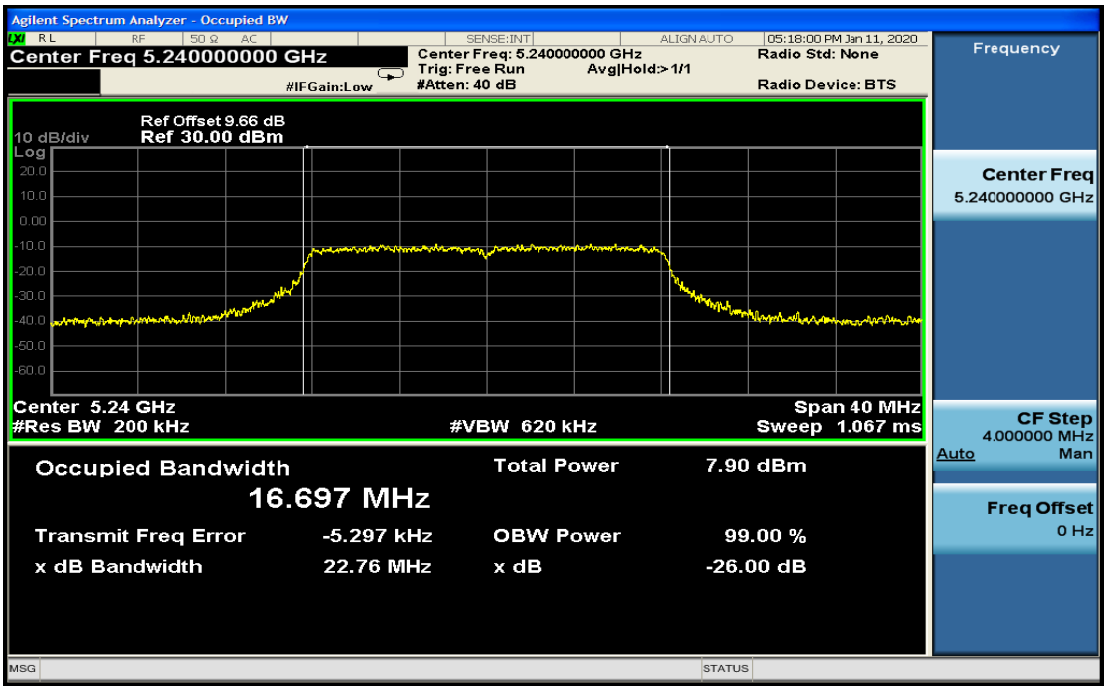
Low Channel



Mid Channel

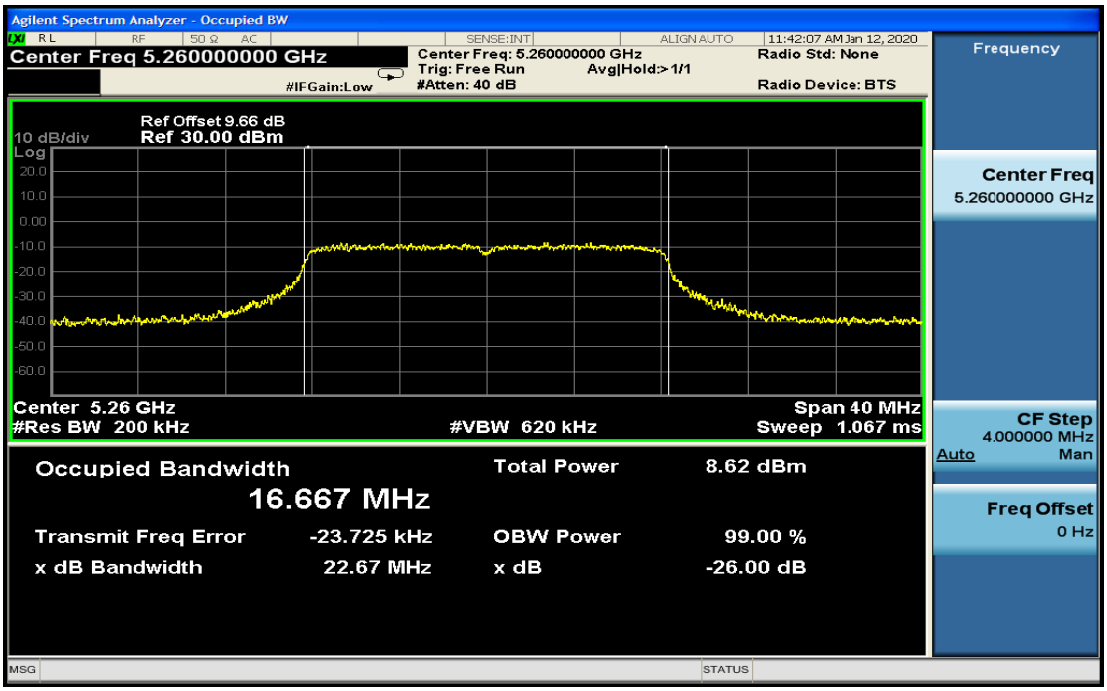


High Channel

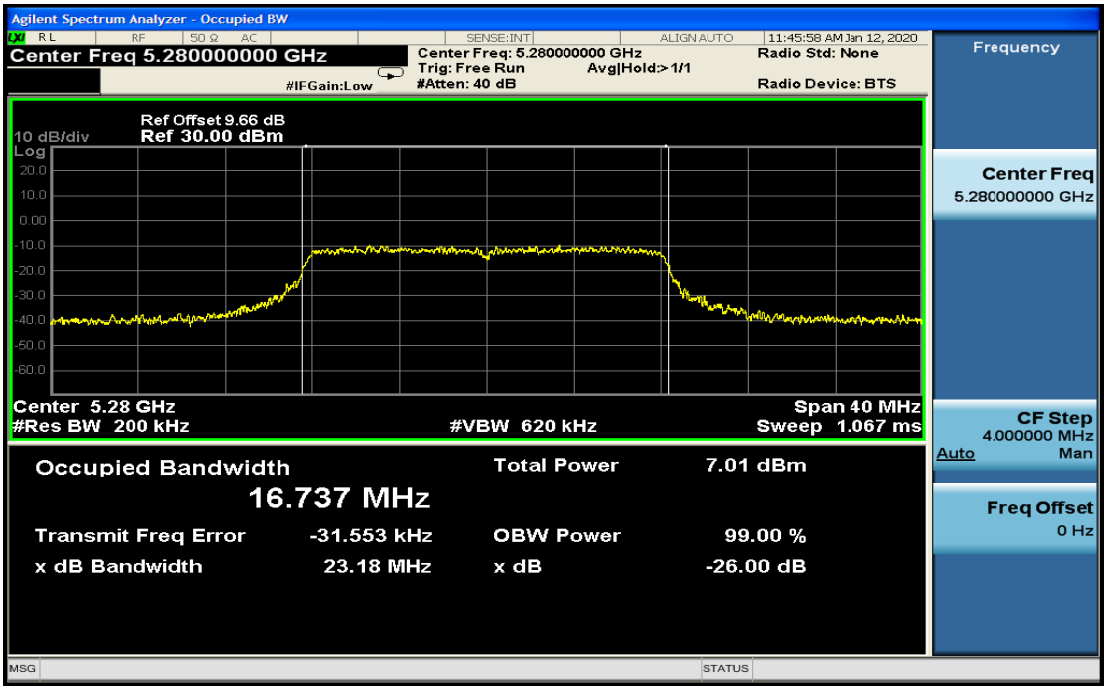


5250~5350MHz

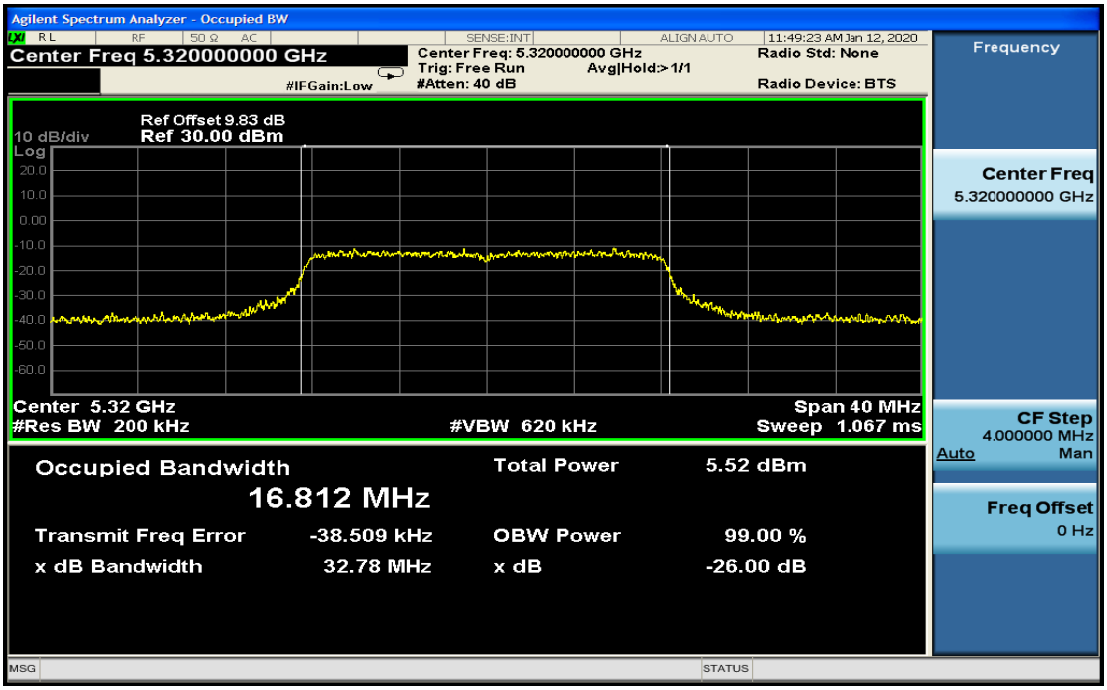
Low Channel



Mid Channel

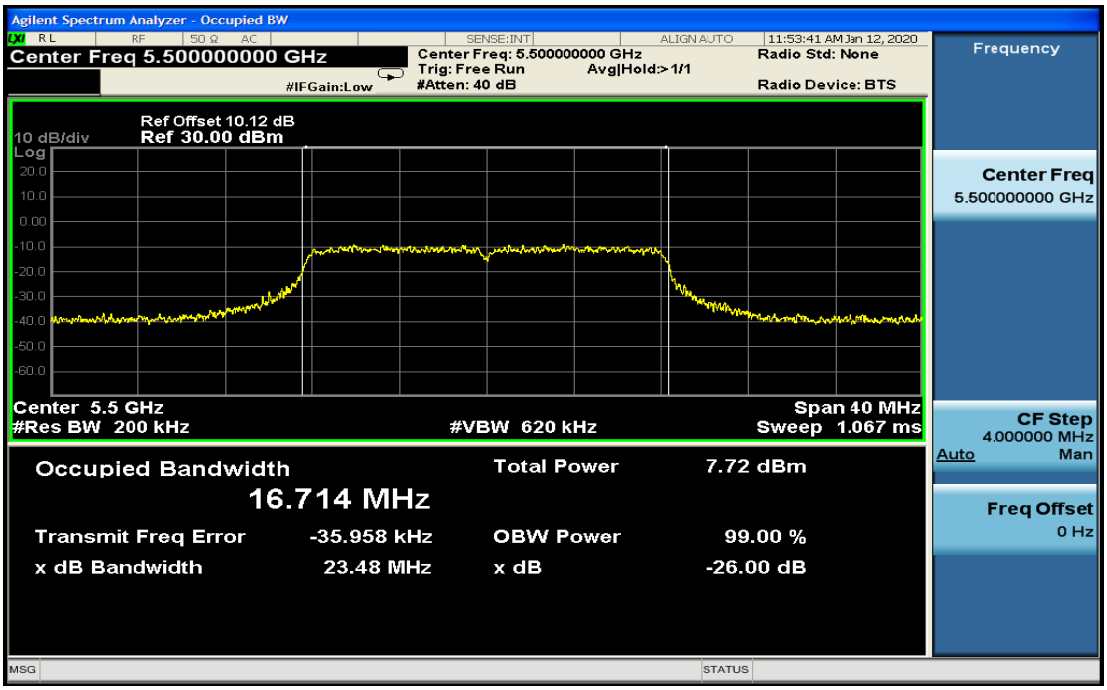


High Channel

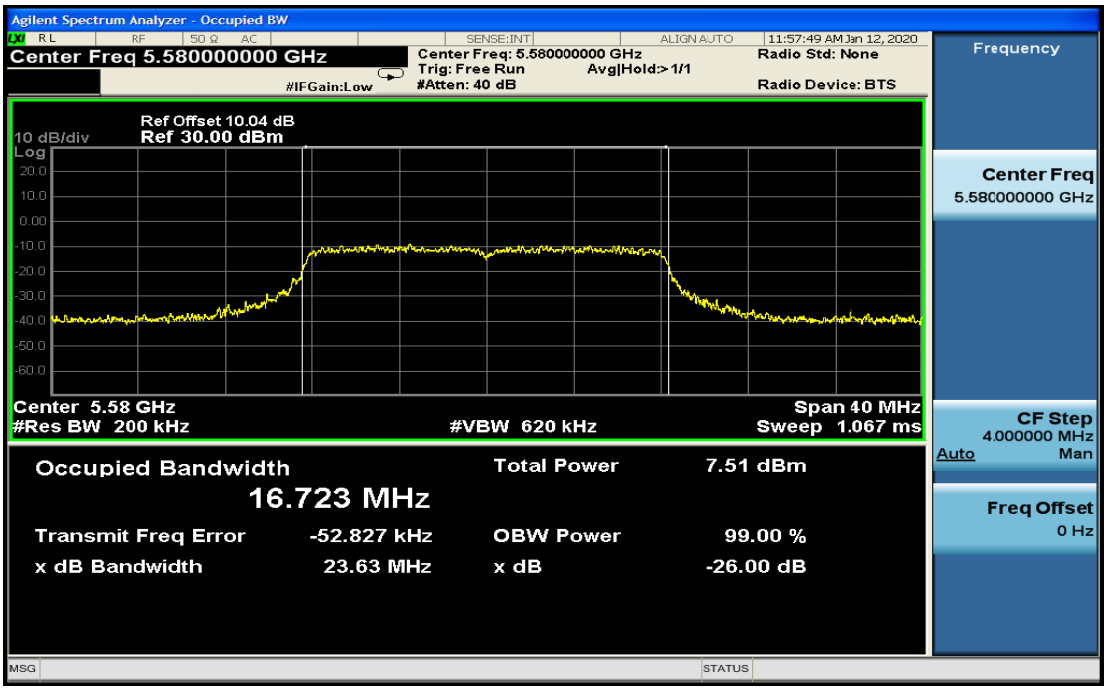


5470~5725MHz

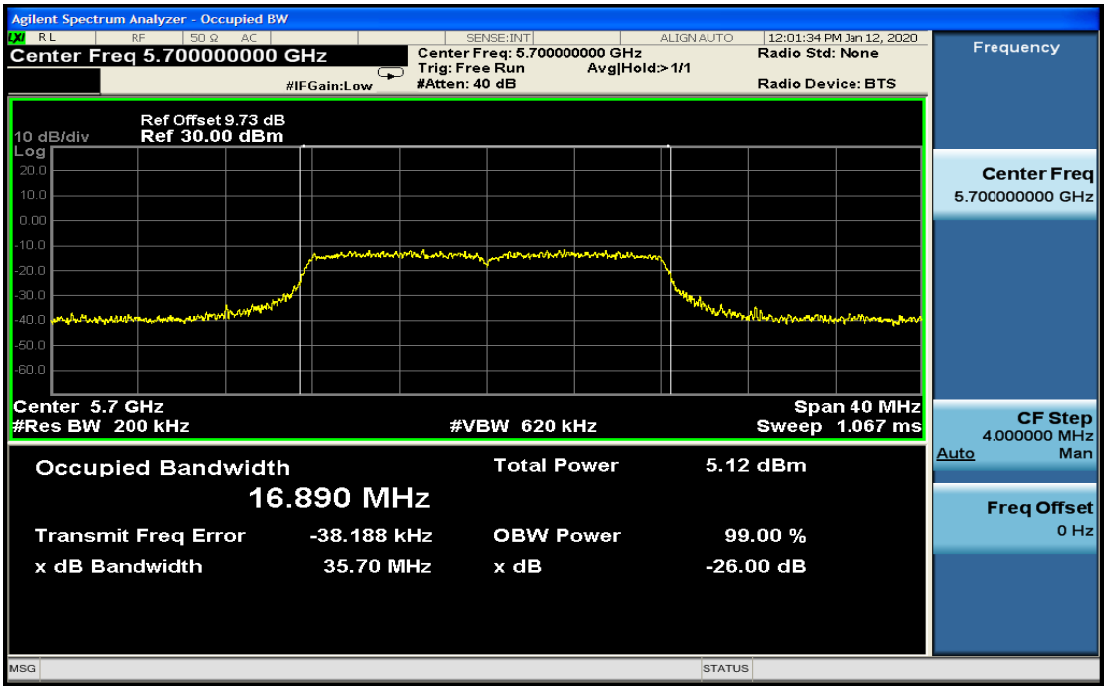
Low Channel



Mid Channel



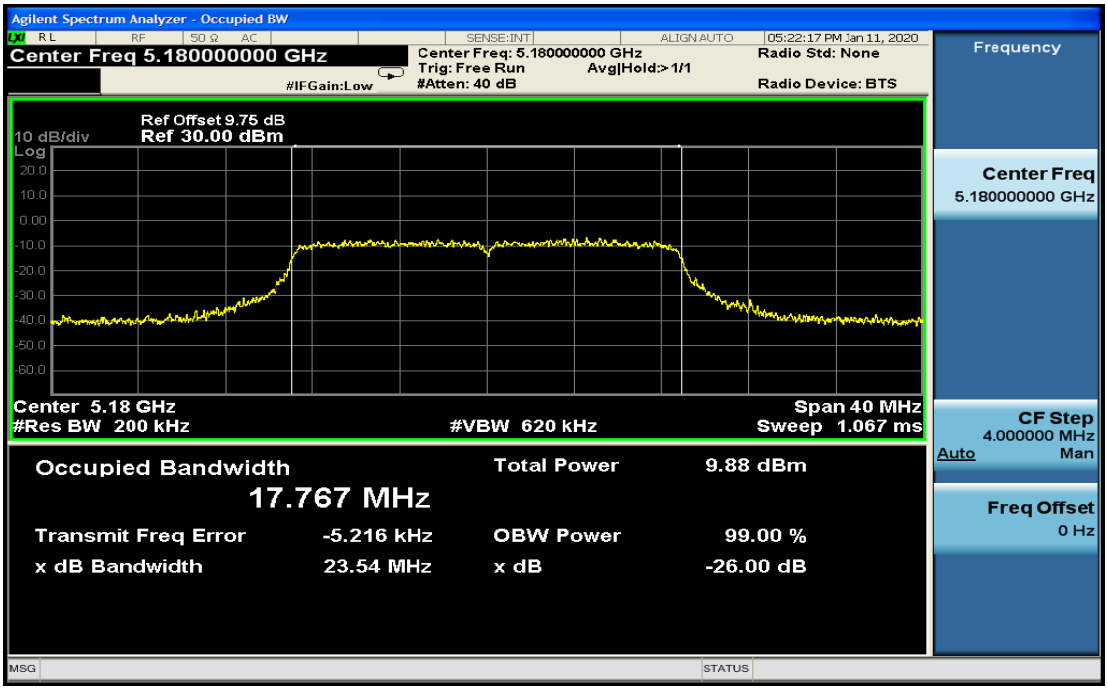
High Channel



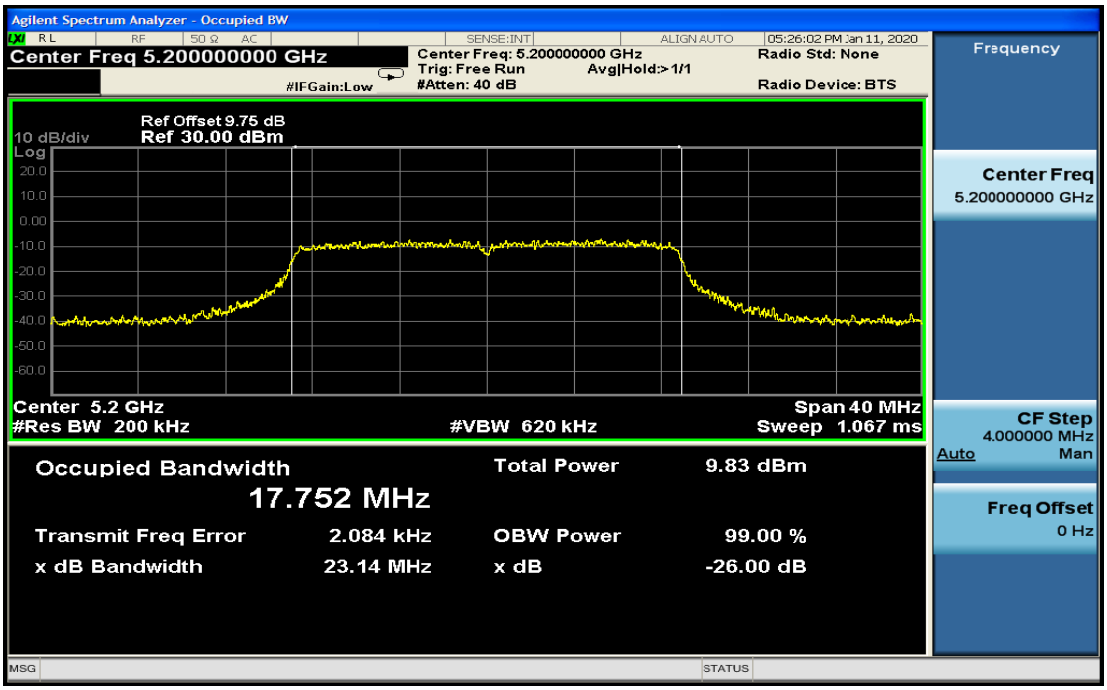
IEEE802.11nHT20 mode

5150~5250MHz

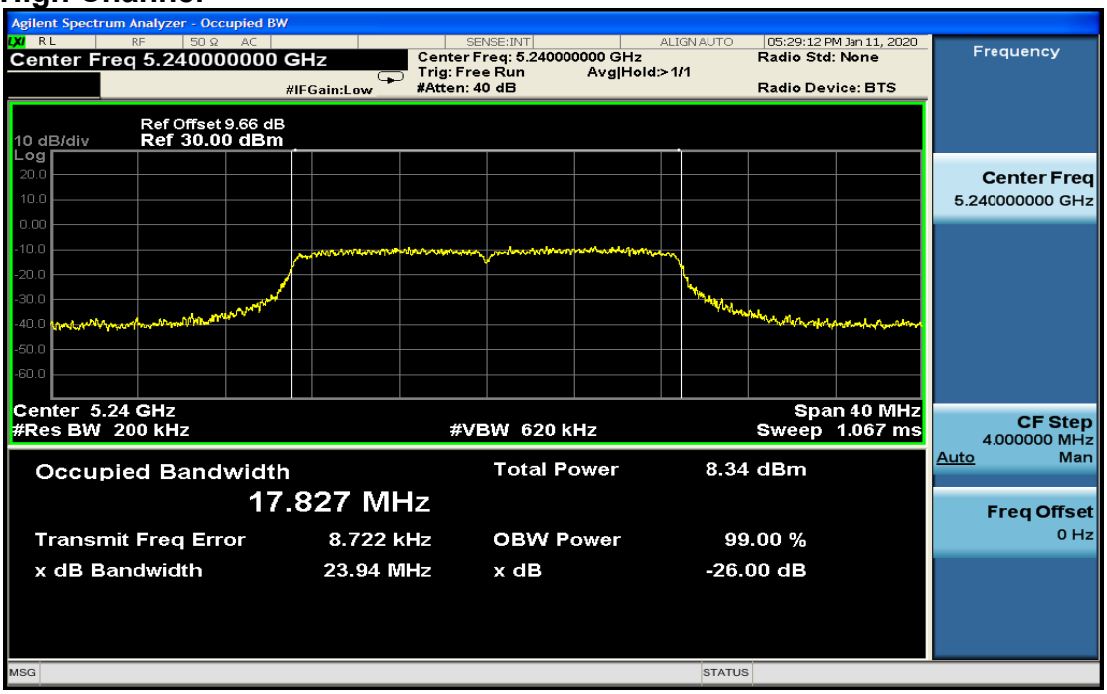
Low Channel



Mid Channel

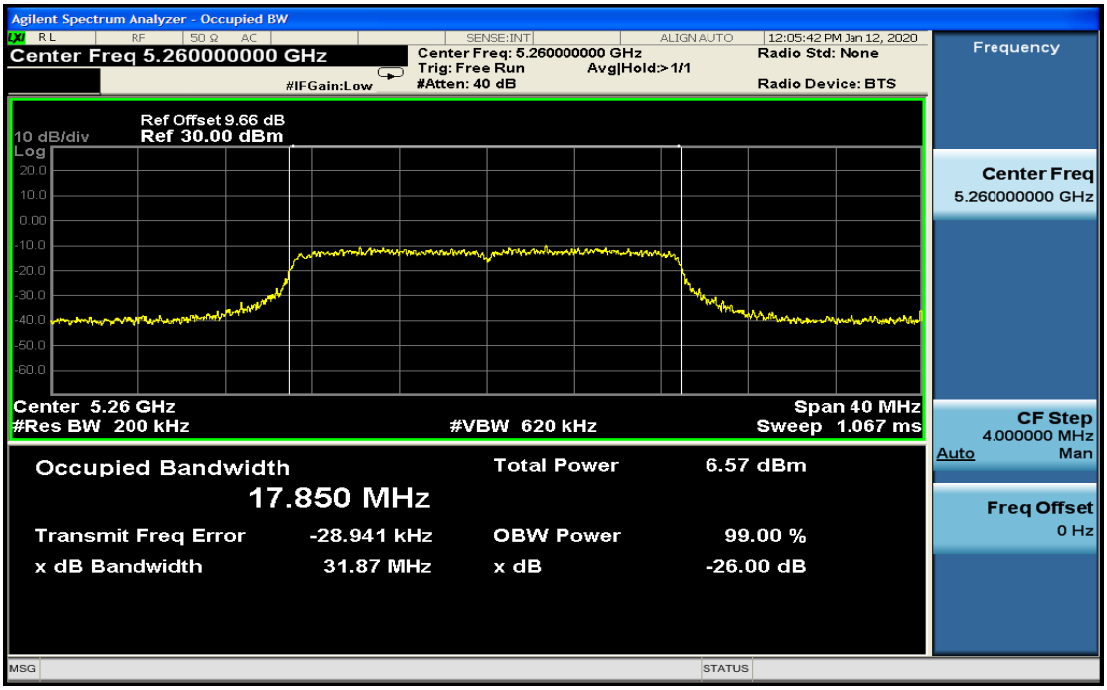


High Channel

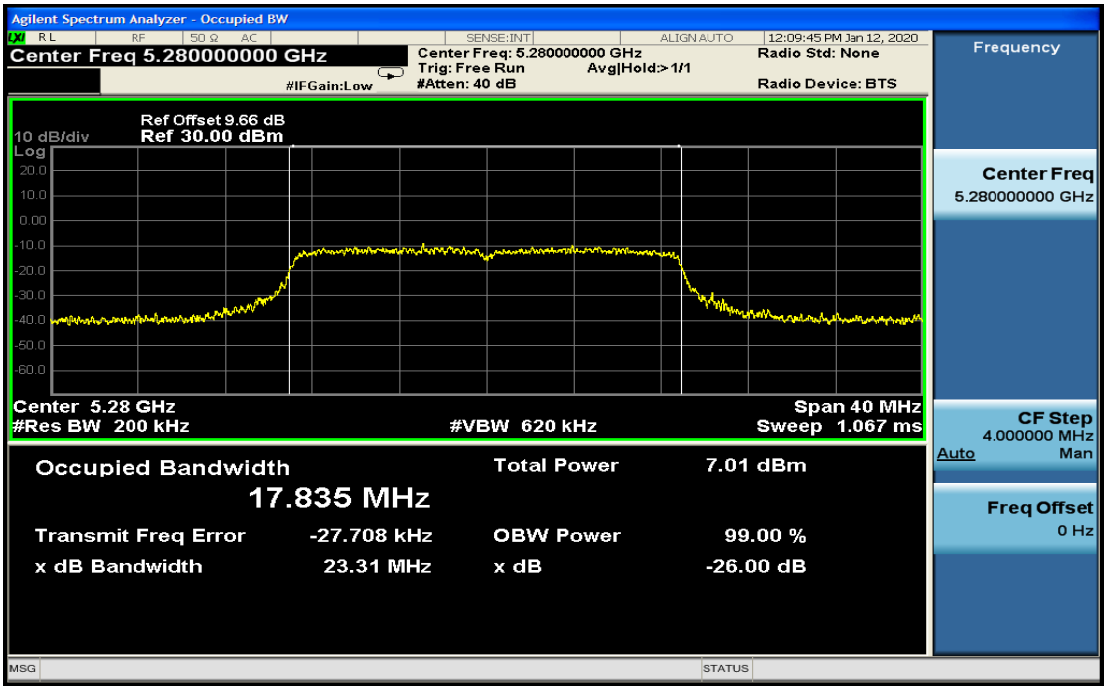


5250~5350MHz

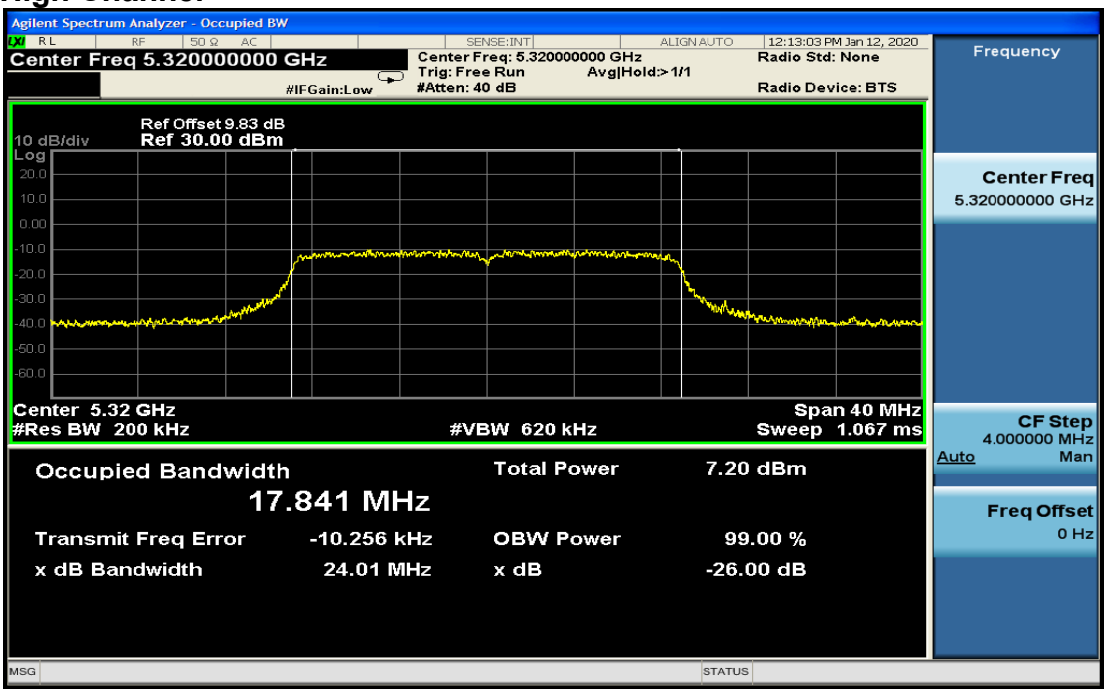
Low Channel



Mid Channel

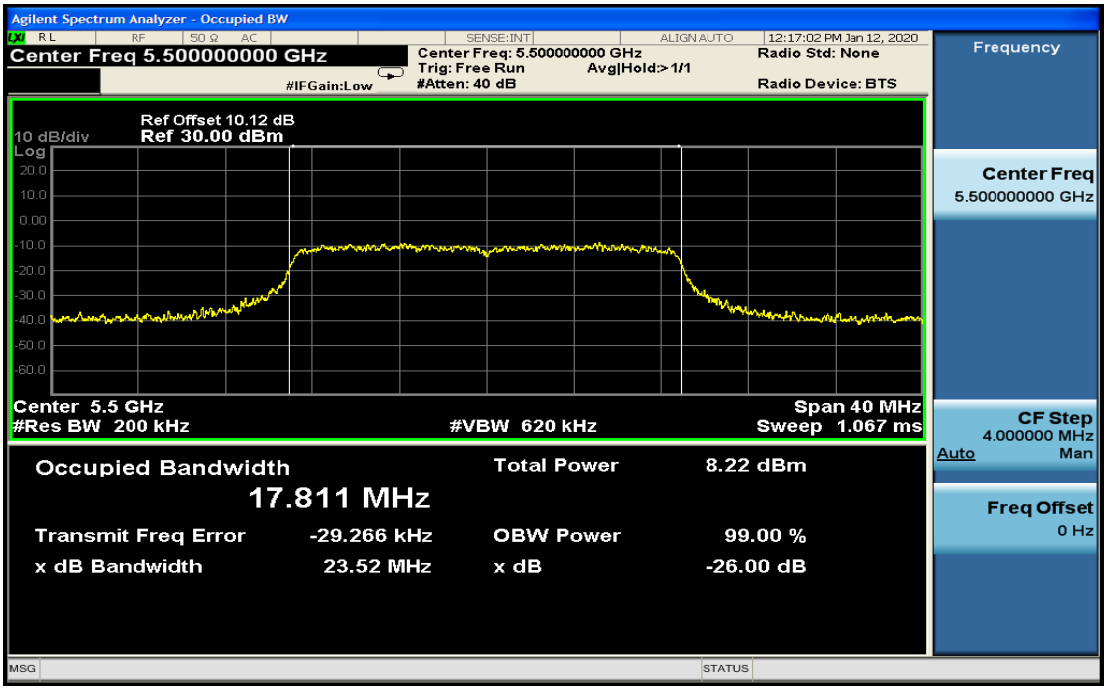


High Channel

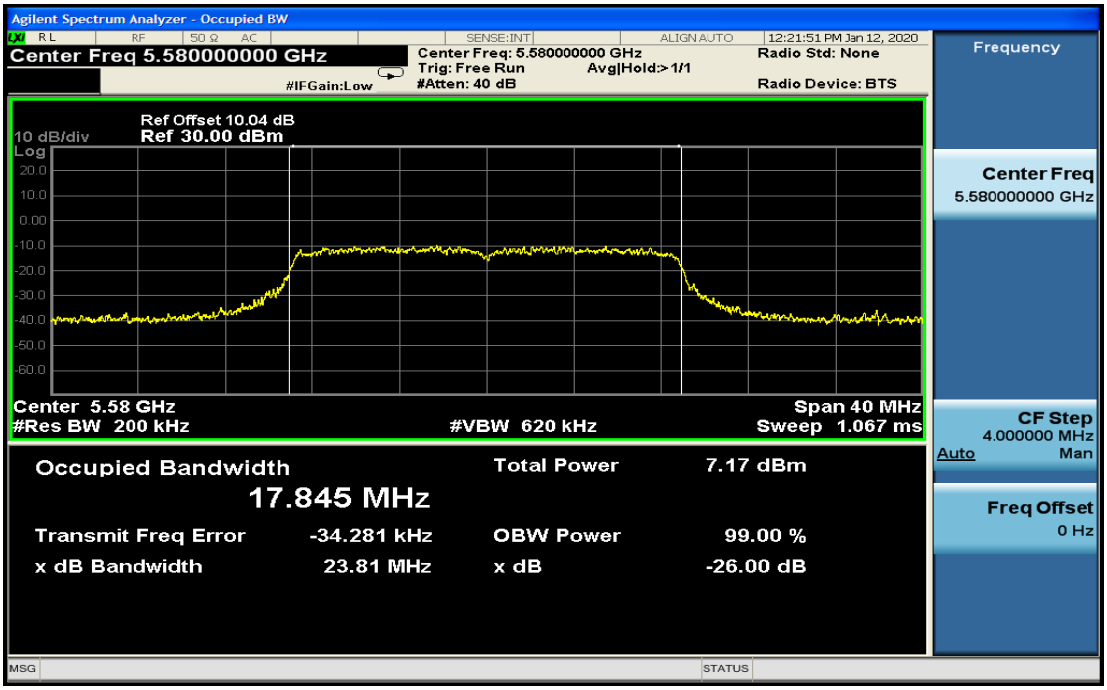


5470~5725MHz

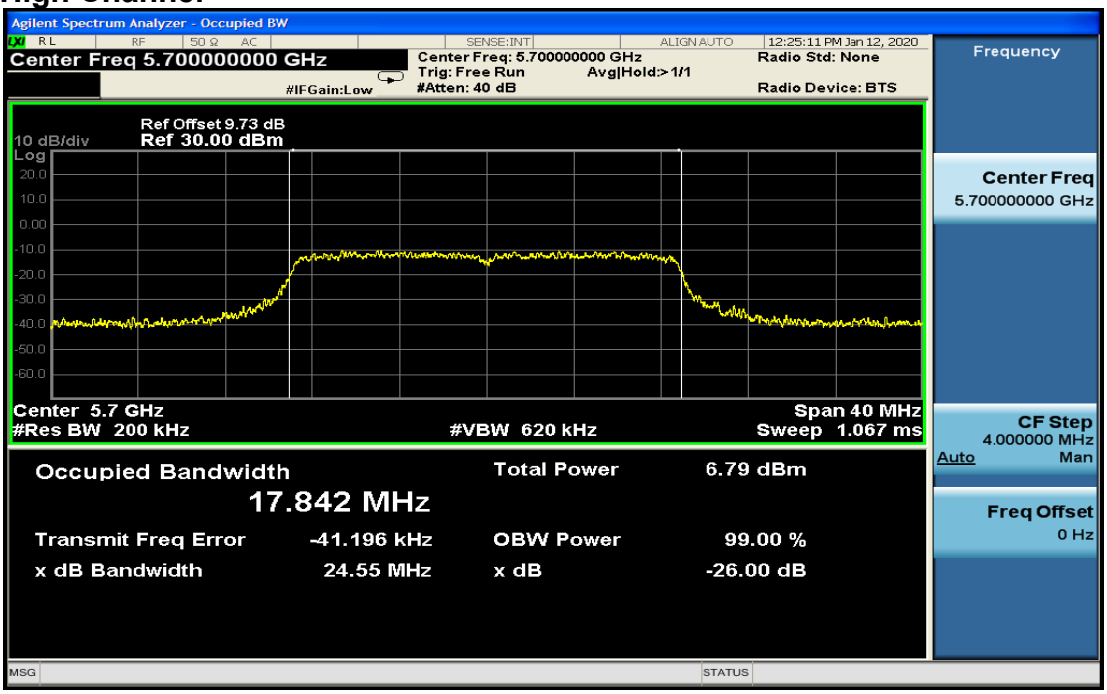
Low Channel



Mid Channel



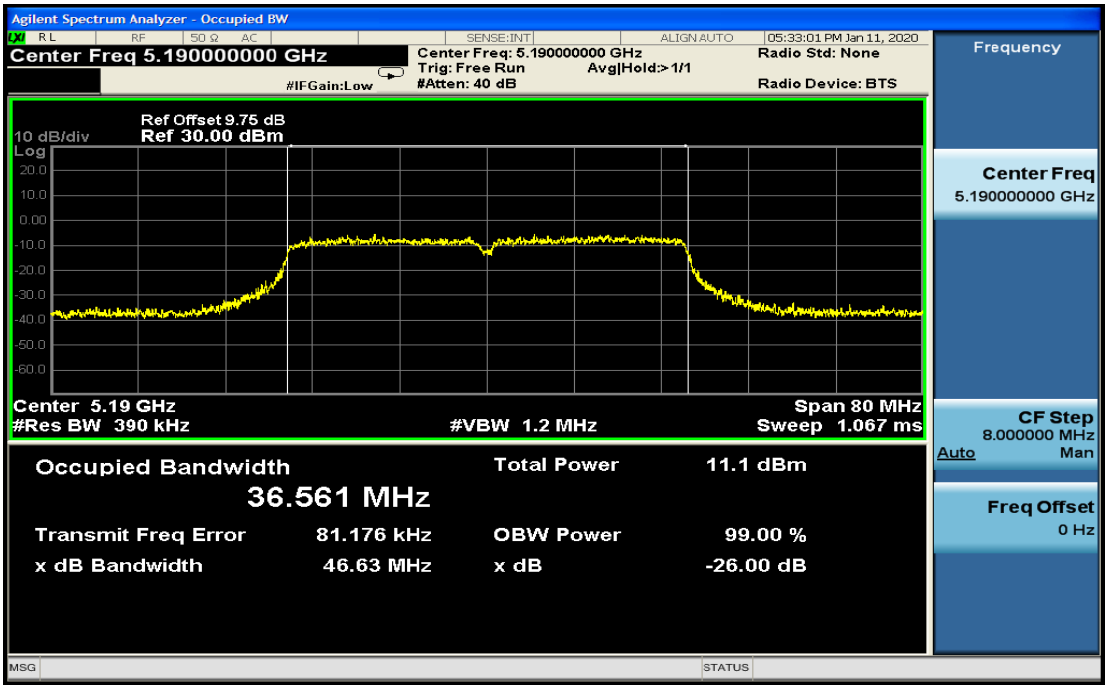
High Channel



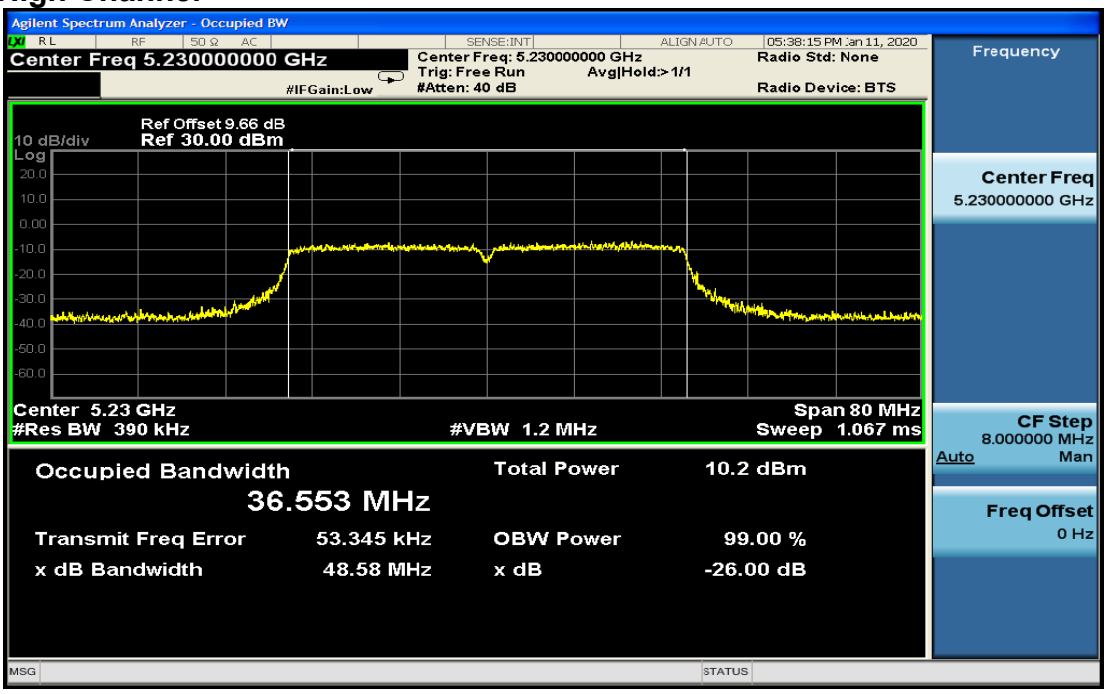
IEEE802.11n HT40 mode

5150~5250MHz

Low Channel

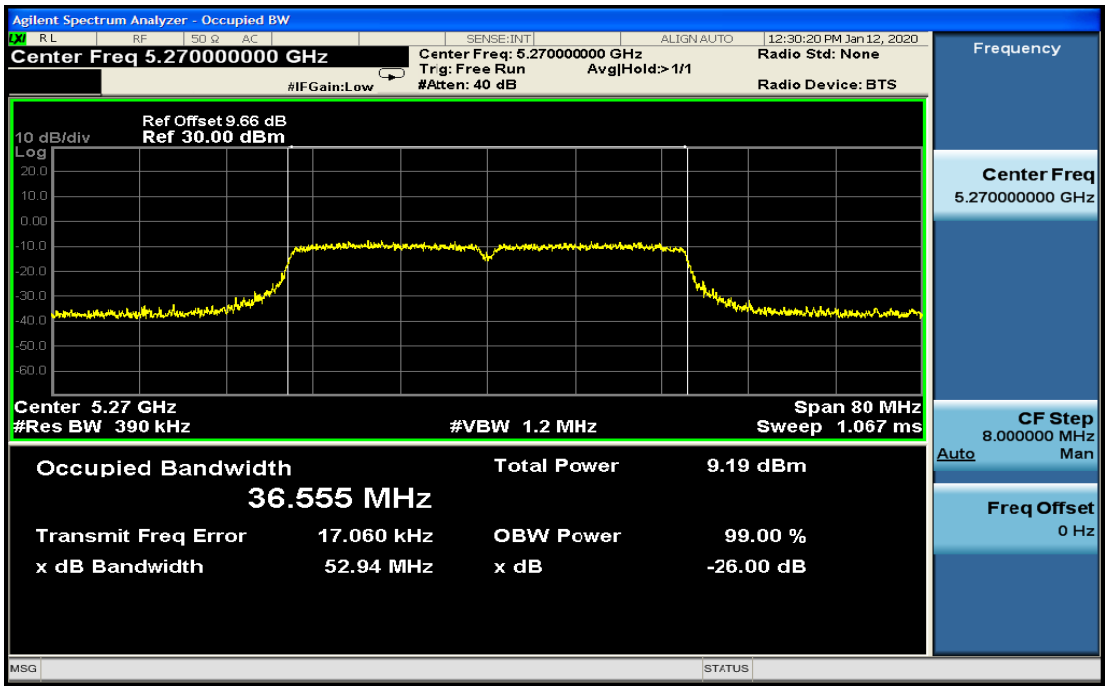


High Channel

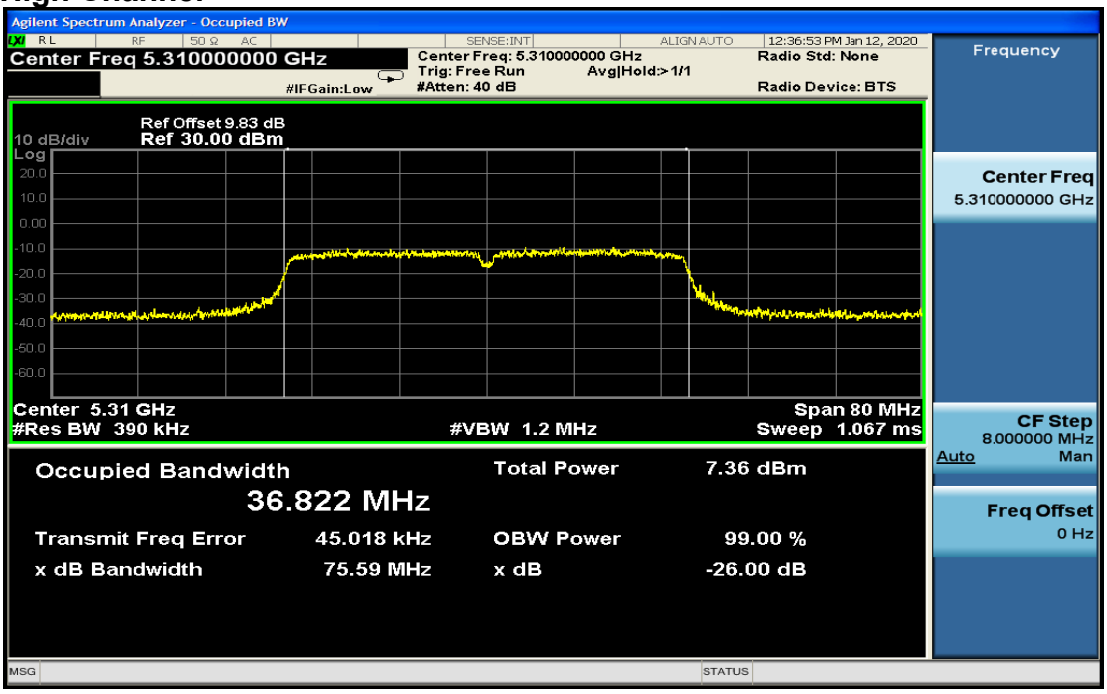


5250~5350MHz

Low Channel

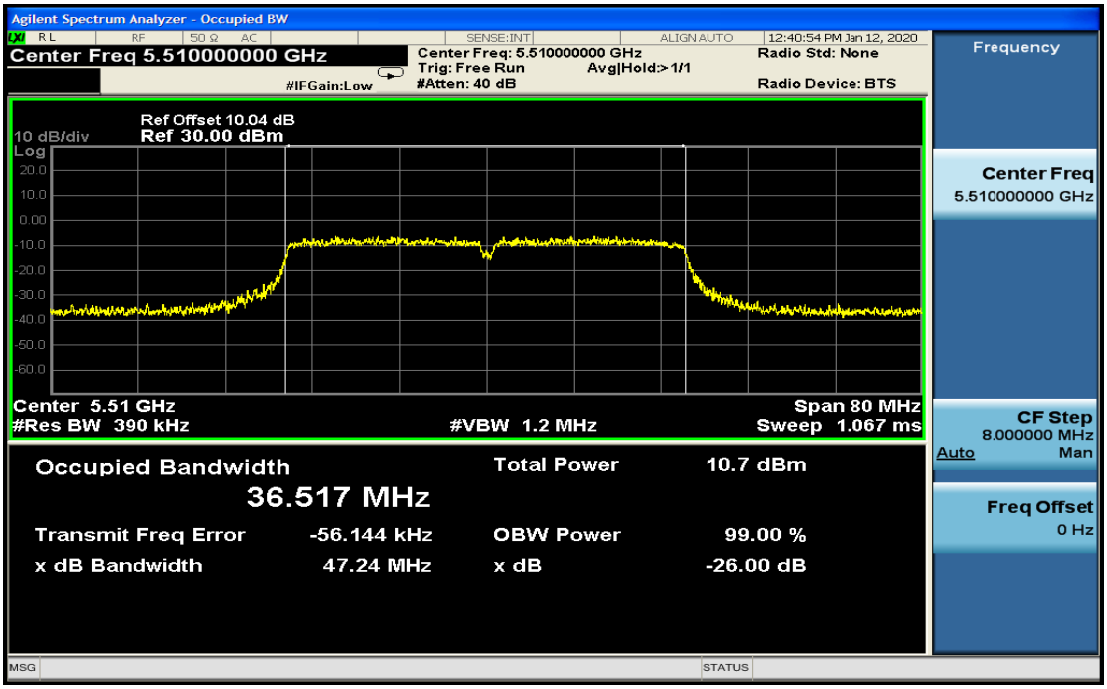


High Channel

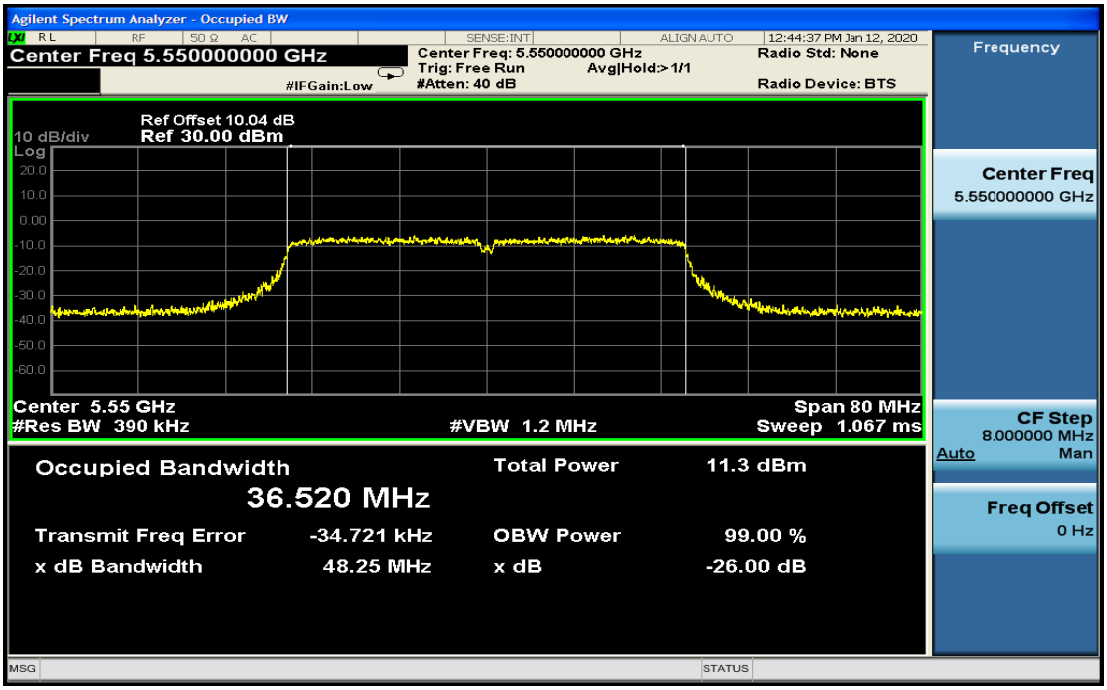


5470~5725MHz

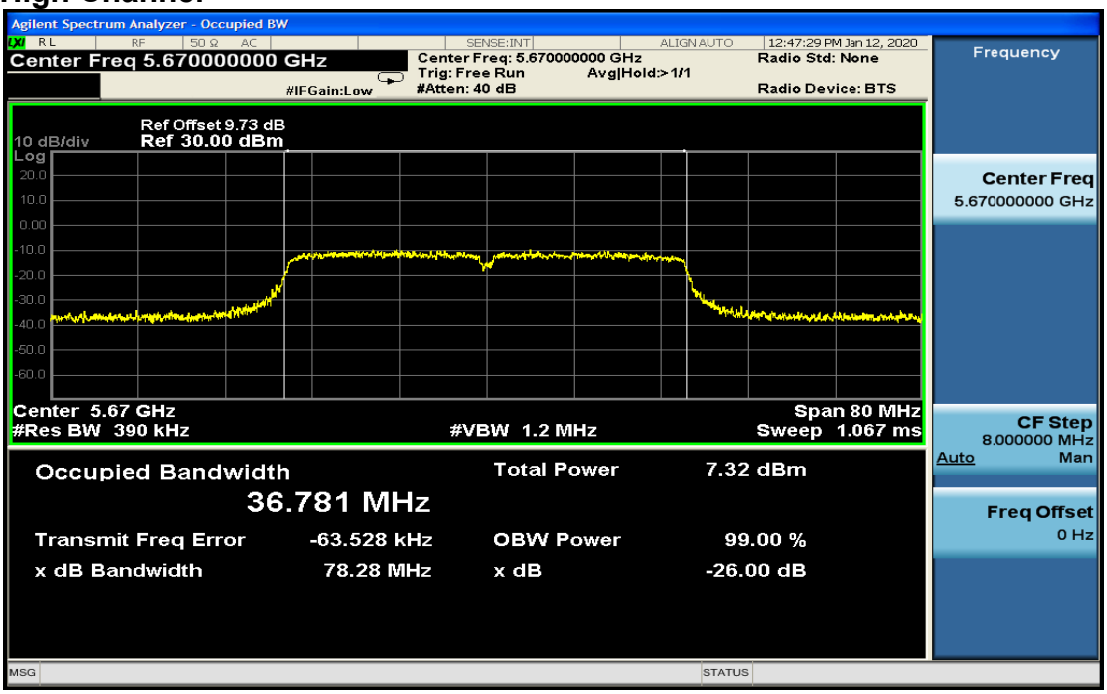
Low Channel



Mid Channel



High Channel



6.3 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

According to §15.407(a),

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi.

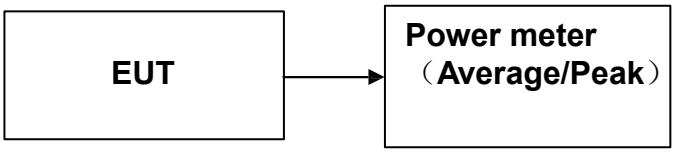
For the 5.25-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.

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

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

The peak power shall not exceed the limit as follow:

Test Configuration



The EUT was connected to a spectrum analyzer through a 50Ω RF cable.

TES TPROCEDURE

The testing follows Method PM of FCCKDB789033 D02General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF peak power meter):

1. Measurement is performed using a wideband RF power meter.
2. TheEUTisconfiguredtotransmitcontinuouslywithaconsistentdutycycleatitsmaximum power control level.

TEST RESULTS

No non-compliance noted

TEST RESULTS

No non-compliance noted

Test Data

Antenna 1

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5180	19.62	19.66	/	23.00
Mid	5220	19.65	19.68	/	23.00
High	5240	19.78	19.85	/	23.00

5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5260	19.48	19.44	/	23.00
Mid	5280	19.68	19.74	/	23.00
High	5320	19.74	19.69	/	23.00

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5500	19.72	19.54	/	23.00
Mid	5580	19.35	19.59	/	23.00
High	5700	19.66	19.63	/	23.00

Testmode:IEEE802.11nHT20mode5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Limit(dBm)
		Ant1	Ant2	
Low	5180	16.52	16.64	23.00
Mid	5220	16.88	16.72	23.00
High	5240	16.74	16.65	23.00

5250~5350MHz

Channel	Frequency(MHz)	Peak Output Power (dBm)		Limit(dBm)
		Ant1	Ant2	
Low	5260	16.74	16.58	23.00
Mid	5280	16.55	16.63	23.00
High	5320	16.76	16.67	23.00

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Limit(dBm)
		Ant1	Ant2	
Low	5500	16.69	16.74	23.00
Mid	5580	16.58	16.59	23.00
High	5700	16.62	16.67	23.00

Testmode:IEEE802.11nHT40mode5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Limit(dBm)
		Ant1	Ant2	
Low	5190	15.78	15.66	23.00
Mid	5230	15.72	15.67	23.00

5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Limit(dBm)
		Ant1	Ant2	
Low	5270	15.66	15.74	23.00
Mid	5310	15.62	15.65	23.00

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Limit(dBm)
		Ant1	Ant2	
Low	5510	15.69	15.78	23.00
Mid	5550	15.62	15.77	23.00
High	5670	15.65	15.65	23.00

Testmode:IEEE802.11nHT20mode5150~5250MHz

Channel	Frequency (MHz)	Mimo	Limit(dBm)
Low	5180	19.59	19.99
Mid	5220	19.81	19.99
High	5240	19.71	19.99

5250~5350MHz

Channel	Frequency(MHz)	Mimo	Limit(dBm)
Low	5260	19.67	19.99
Mid	5280	19.60	19.99
High	5320	19.73	19.99

5470~5725MHz

Channel	Frequency (MHz)	Mimo	Limit(dBm)
Low	5500	19.73	19.99
Mid	5580	19.60	19.99
High	5700	19.66	19.99

Testmode:IEEE802.11nHT40mode5150~5250MHz

Channel	Frequency (MHz)	Mimo	Limit(dBm)
Low	5190	18.73	19.99
Mid	5230	18.71	19.99

5250~5350MHz

Channel	Frequency (MHz)	Mimo	Limit(dBm)
Low	5270	18.71	19.99
Mid	5310	18.65	19.99

5470~5725MHz

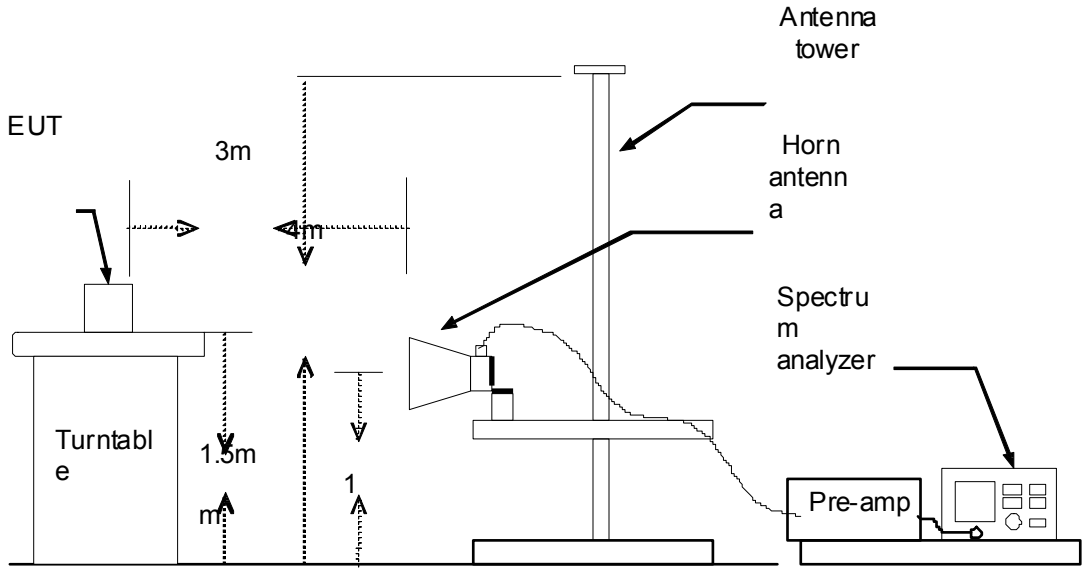
Channel	Frequency (MHz)	Mimo	Limit(dBm)
Low	5510	18.75	19.99
Mid	5550	18.71	19.99
High	5670	18.66	19.99

6.4 BAND EDGES MEASUREMENT

LIMIT

According to §15.407(b),
(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Test Configuration



TESTPROCEDURE

1. The EUT is placed on a turntable, which is 1.5m above the ground plane.
2. The turntable shall be rotated for 360degrees to determine the position of maximum emission level.
3. EUTisset3mawayfromthereceivingantenna,whichisvariedfrom1mto4mtofindoutthehighest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / Sweep=AUTO

   VBW=10Hz,whenduty cycle is no less than 98 percent.

   VBW≧1/T, when duty cycle is less than98 percent, where is the minimum transmissionduration overwhichthetransmitterisonandistransmittingatitsmaximun power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
IEEE 802.11 a	100	-	-	10Hz
IEEE 802.11n HT20	100	-	-	10Hz
IEEE 802.11n HT20	100	-	-	10Hz

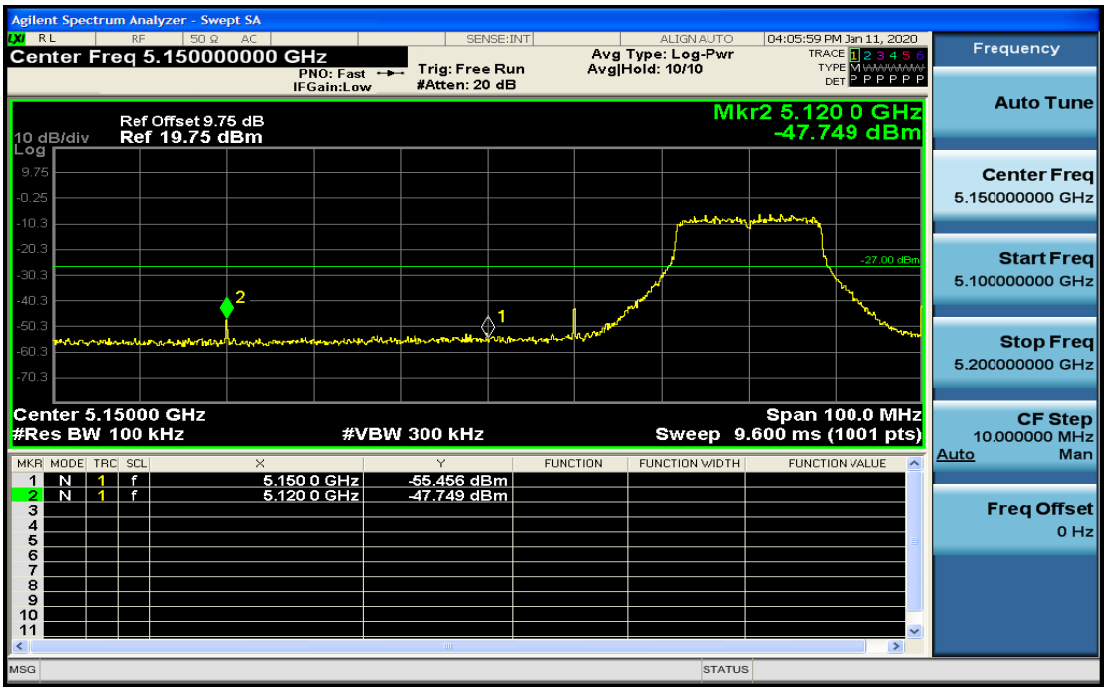
TESTRESULTS

Refer to attach spectrum analyzer data chart.

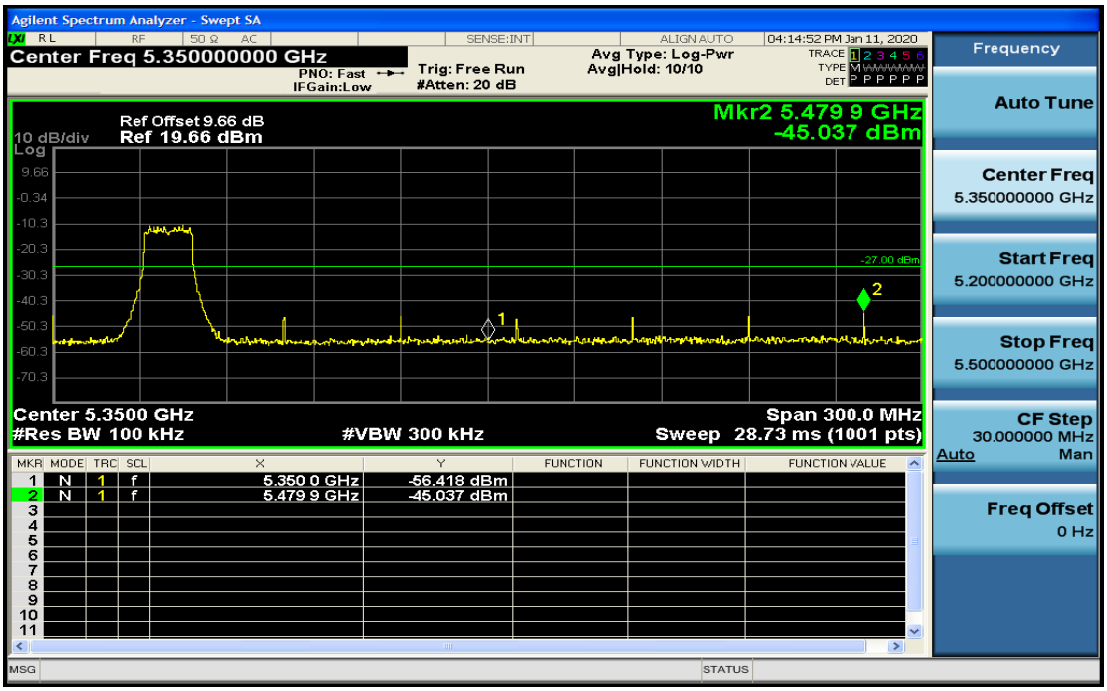
Antenna1

Band Edges(IEEE802.11a mode)

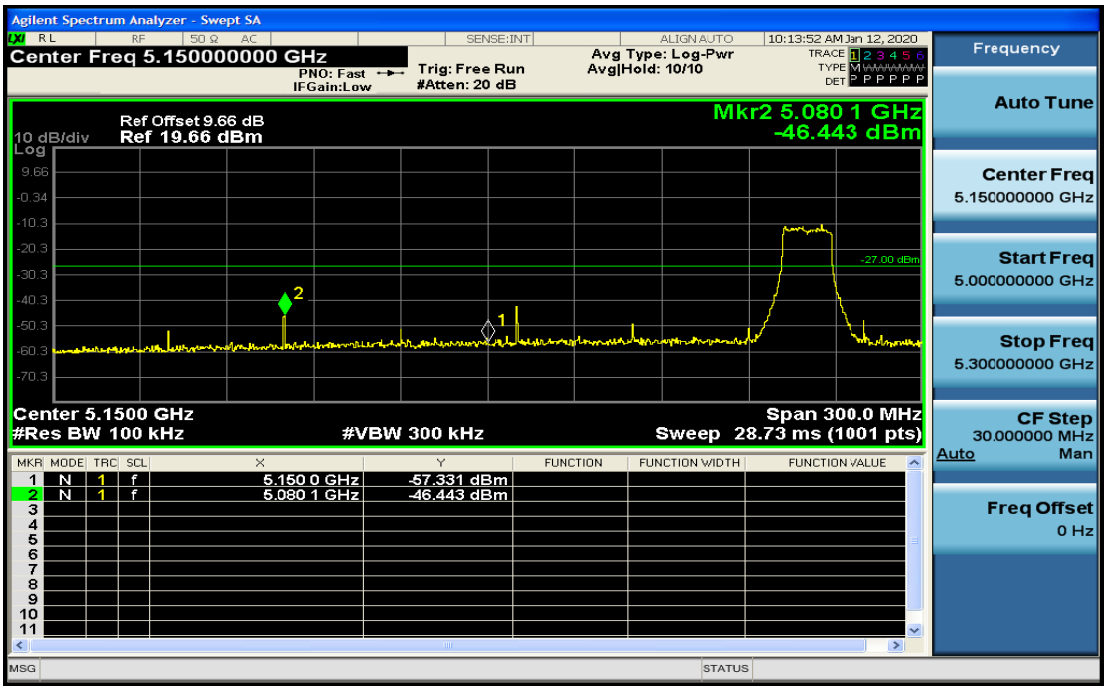
5180MHz



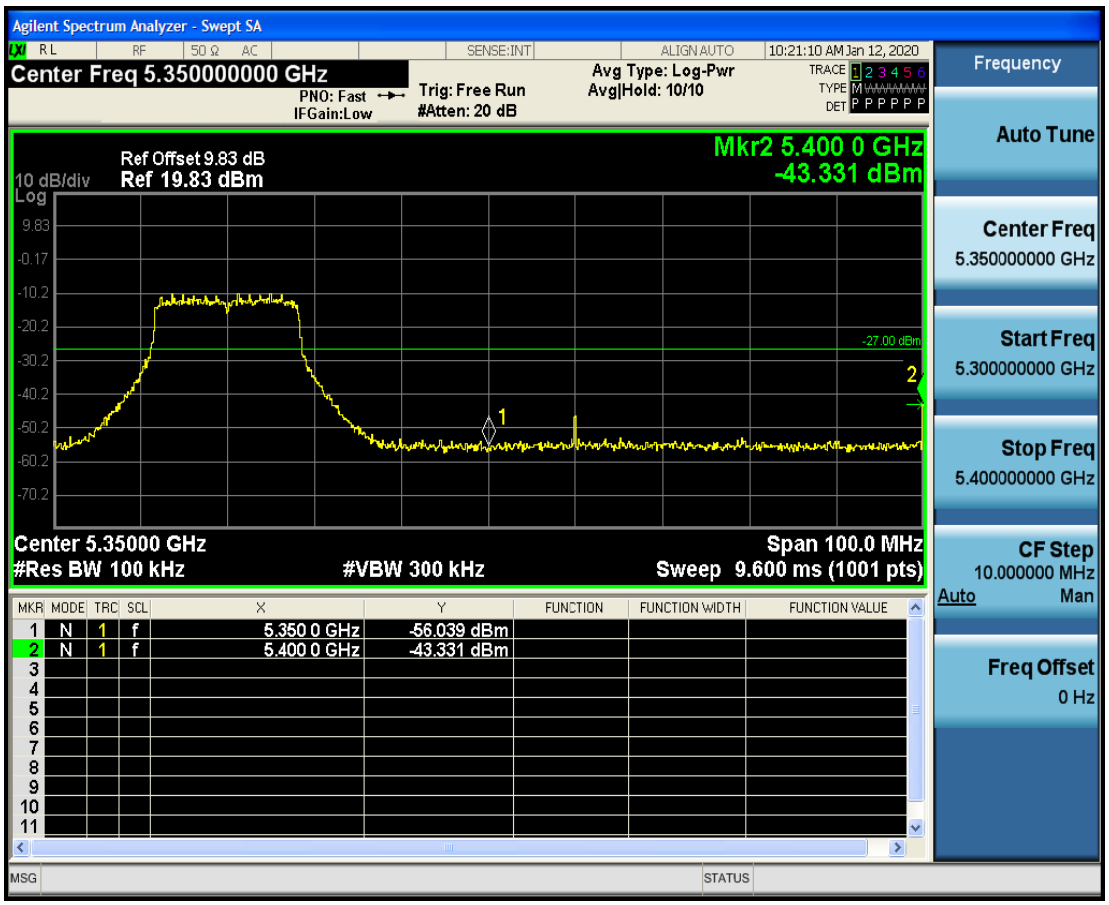
5240MHz



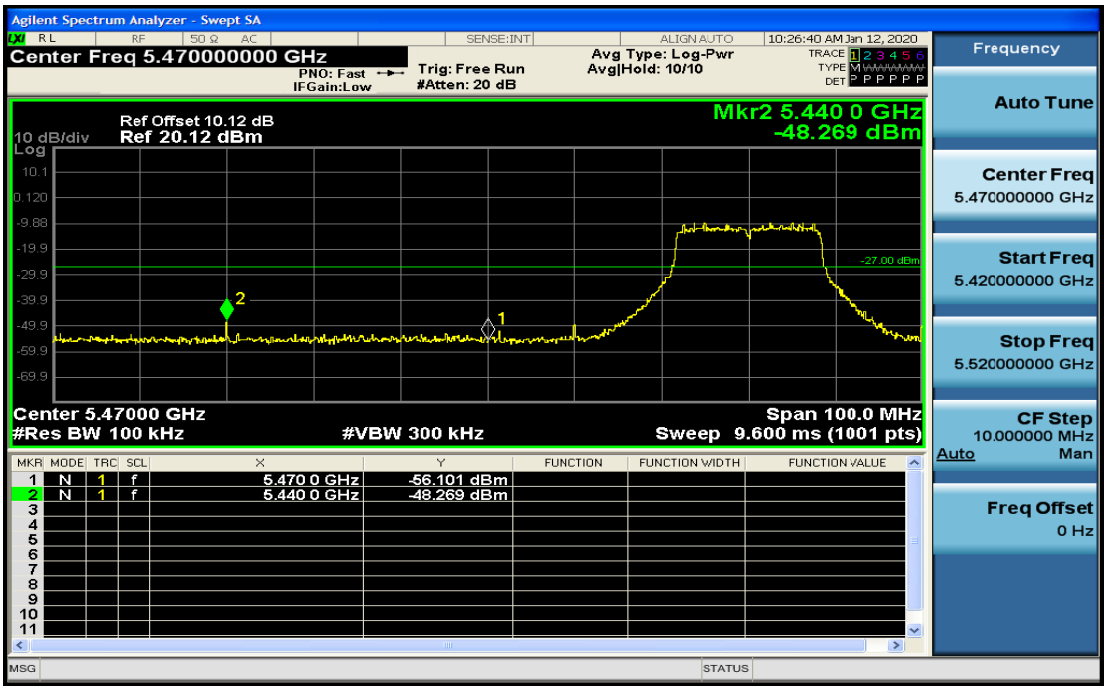
5260MHz



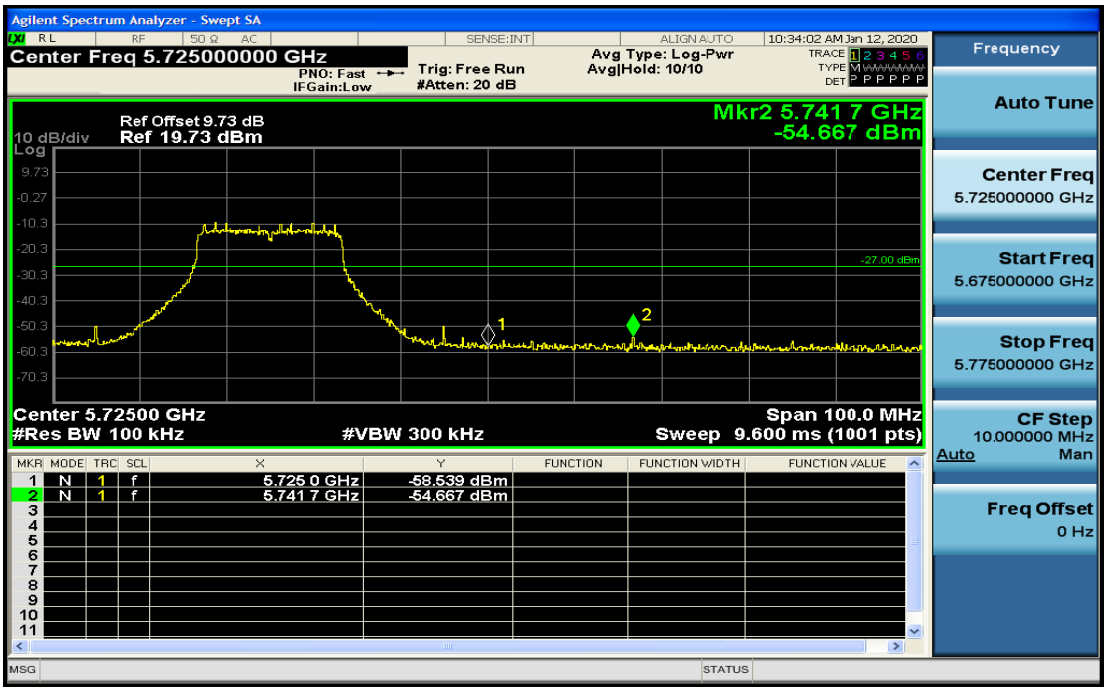
5320MHz



5500MHz

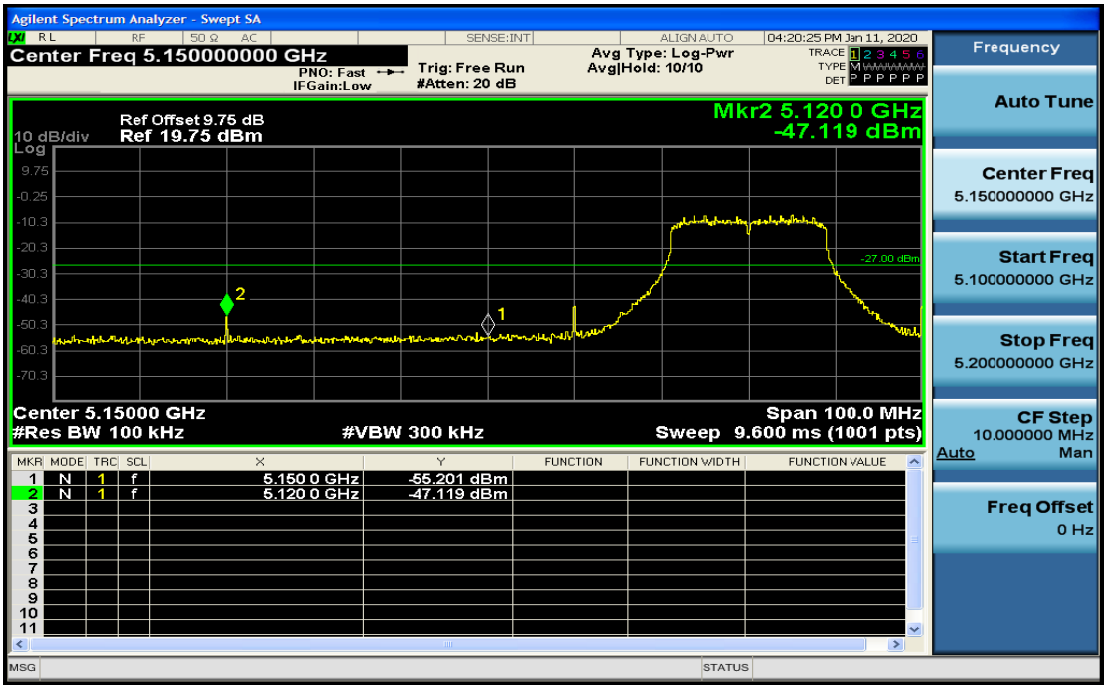


5700MHz

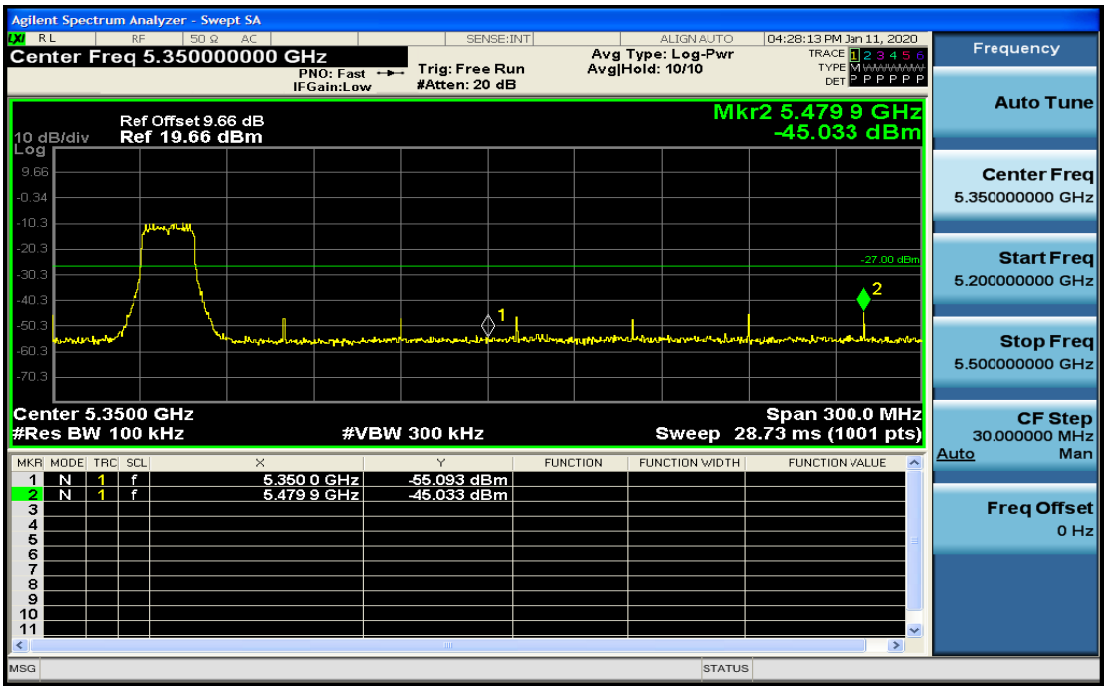


Band Edges(IEEE802.11n HT20 mode)

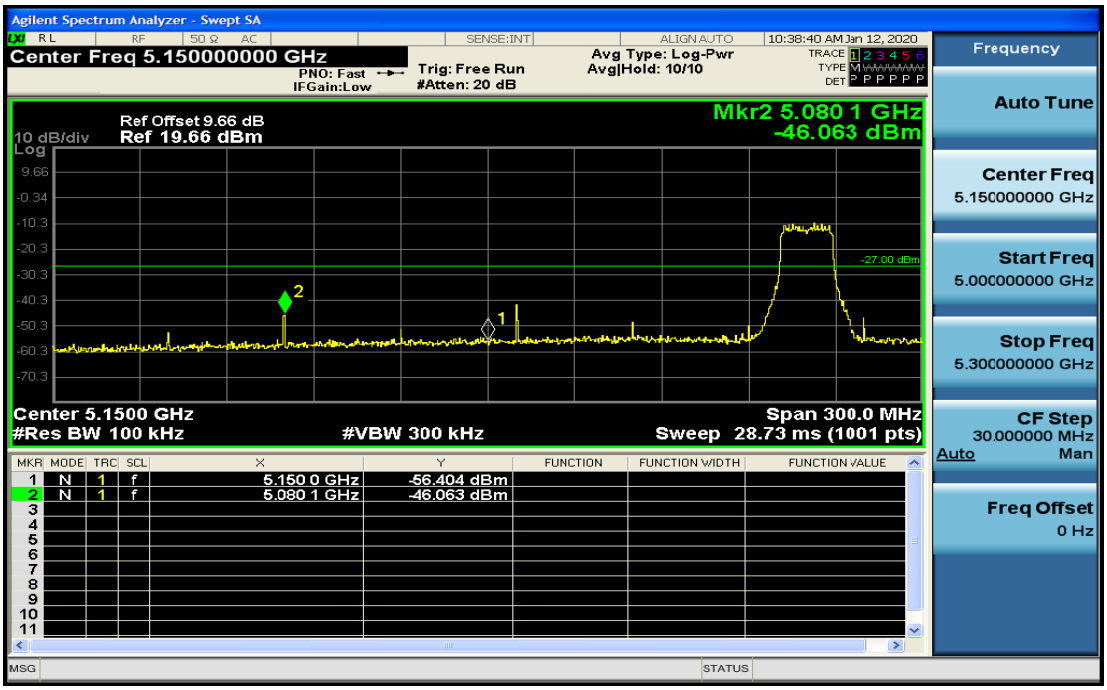
5180MHz



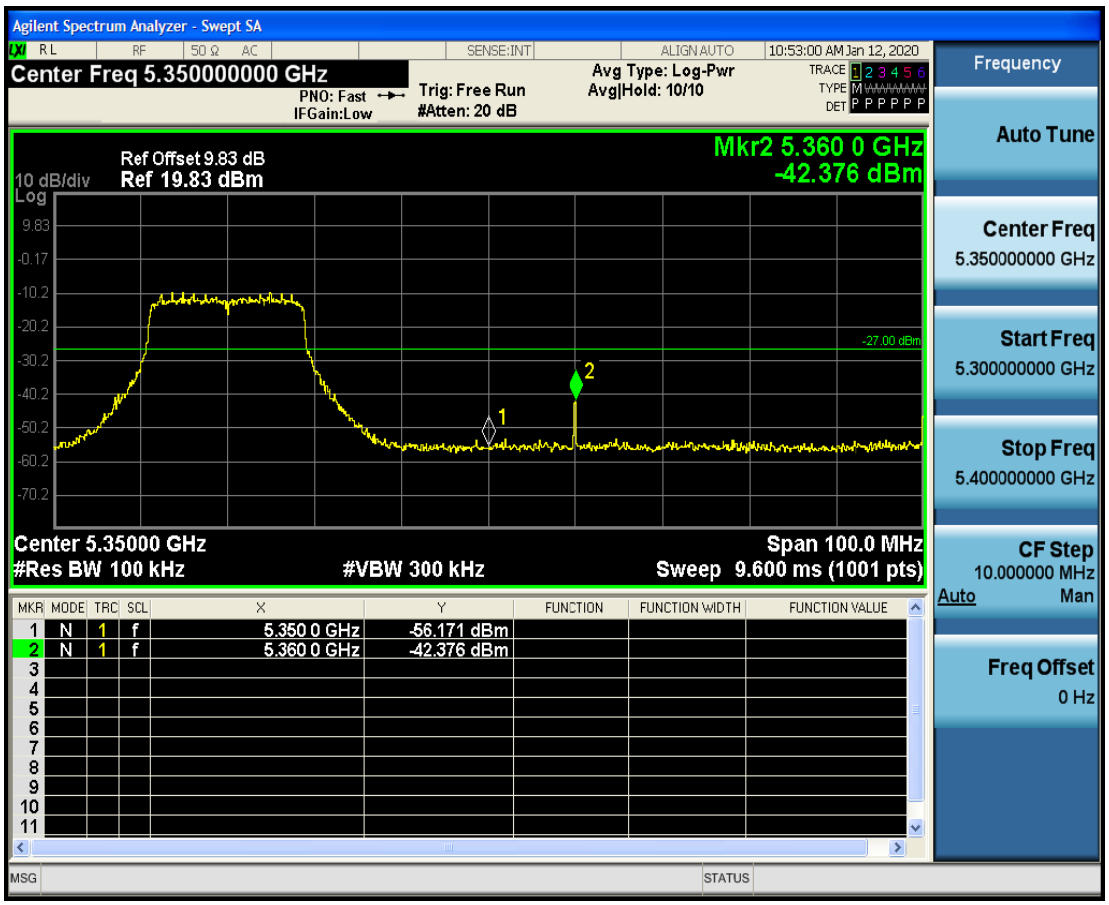
5240MHz



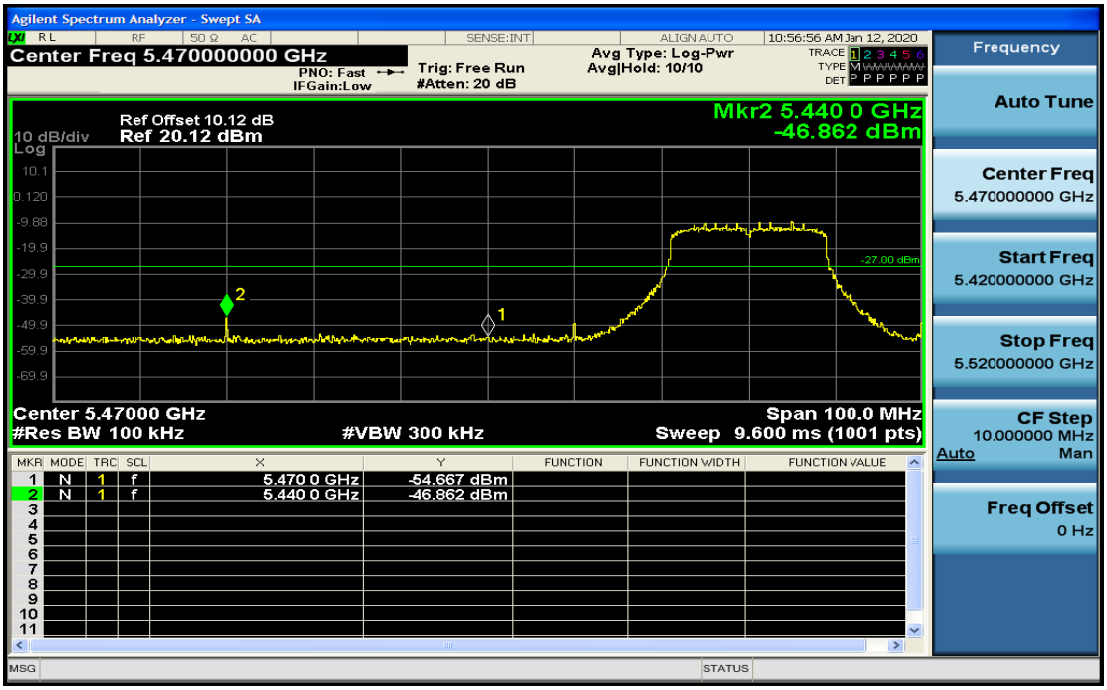
5260MHz



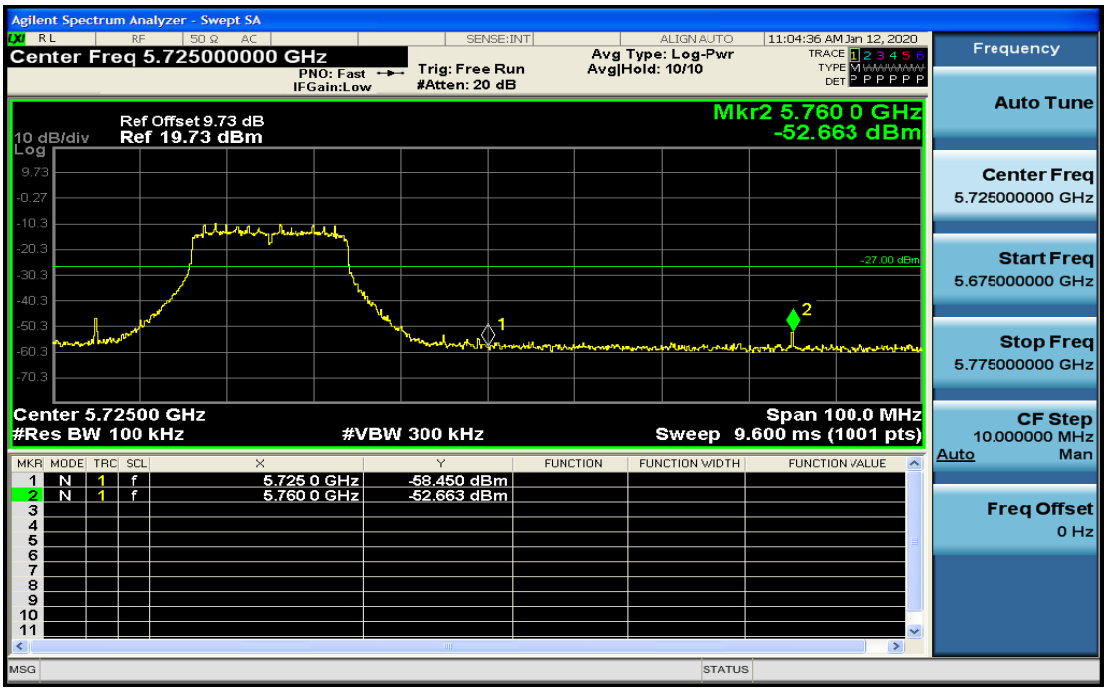
5320MHz



5500MHz

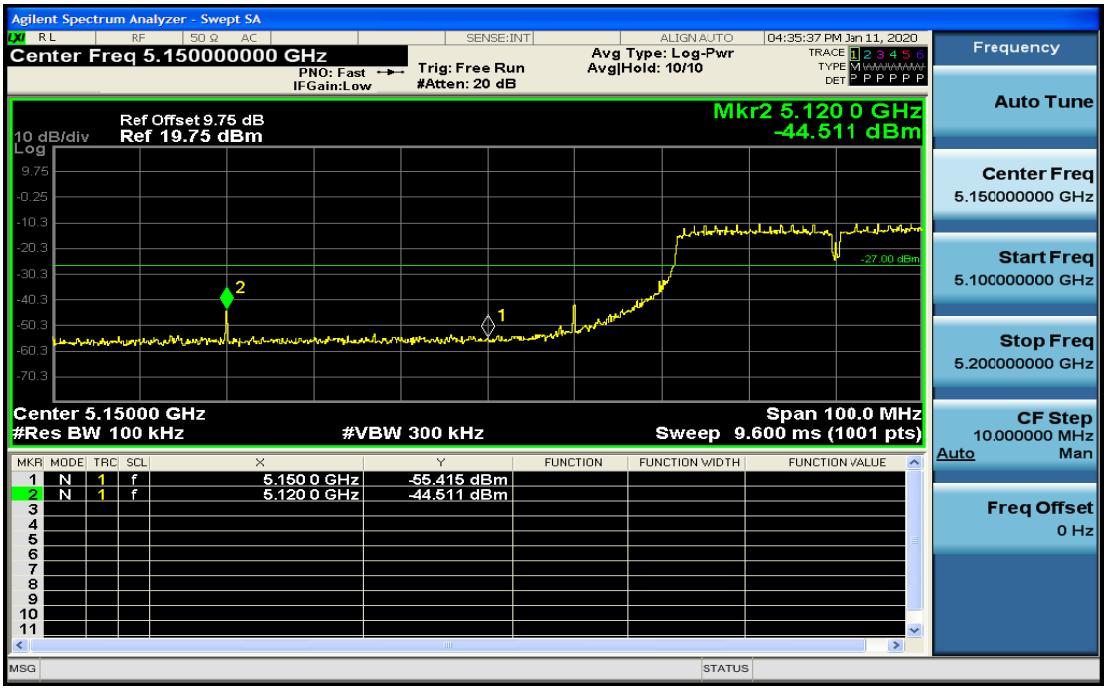


5700MHz

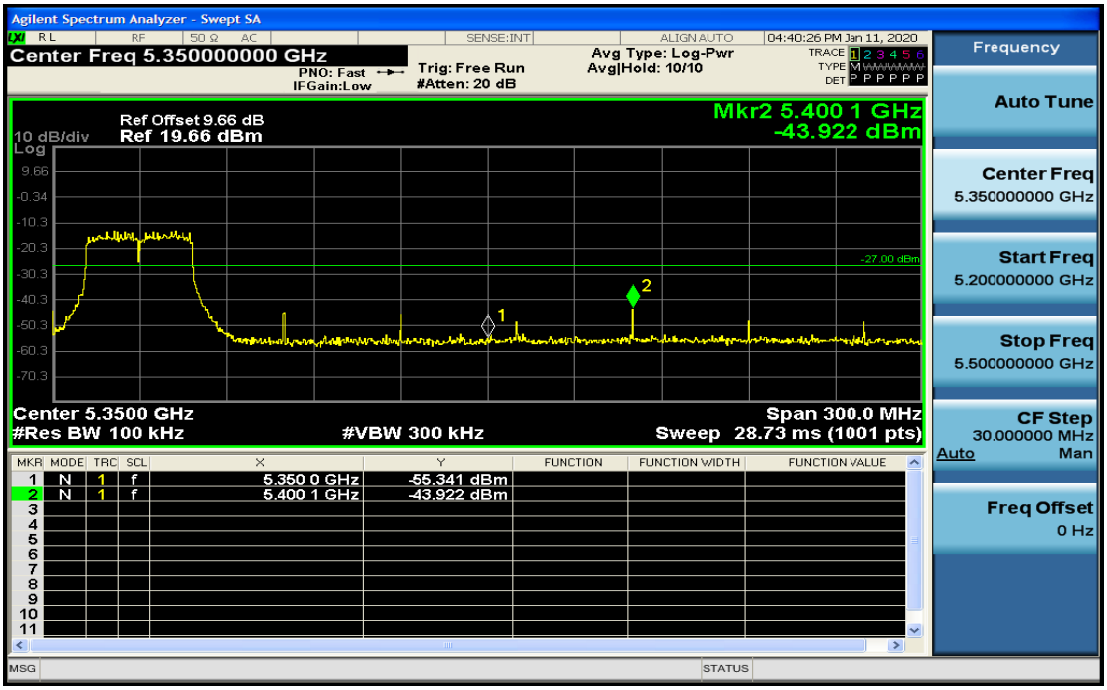


Band Edges(IEEE802.11n HT40 mode)

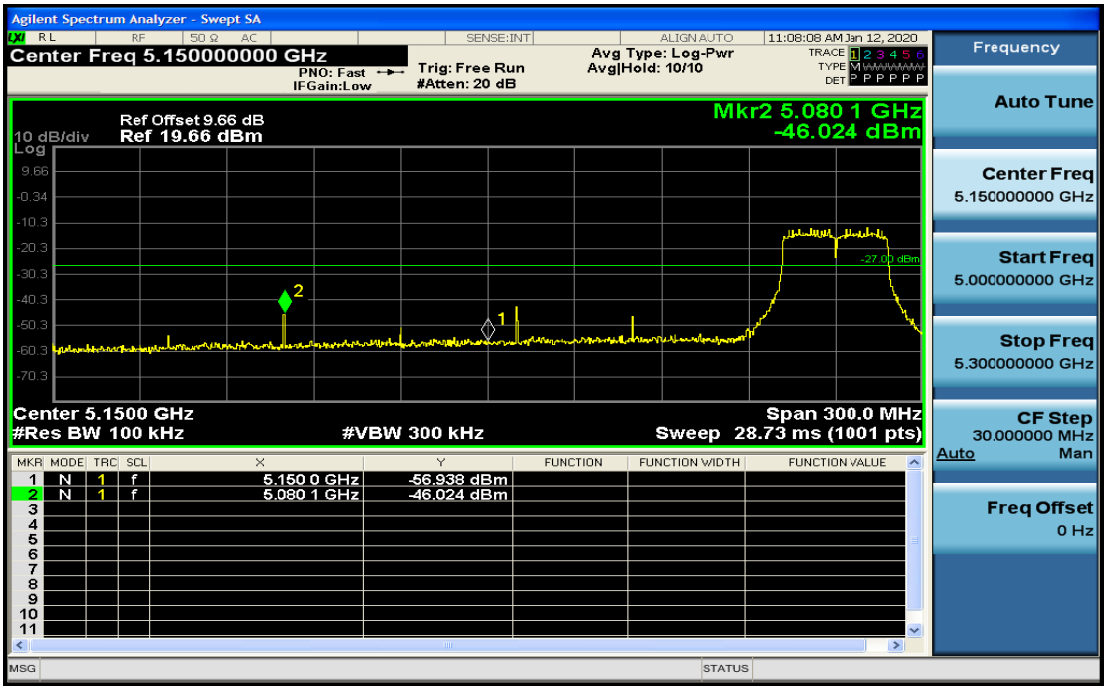
5190MHz



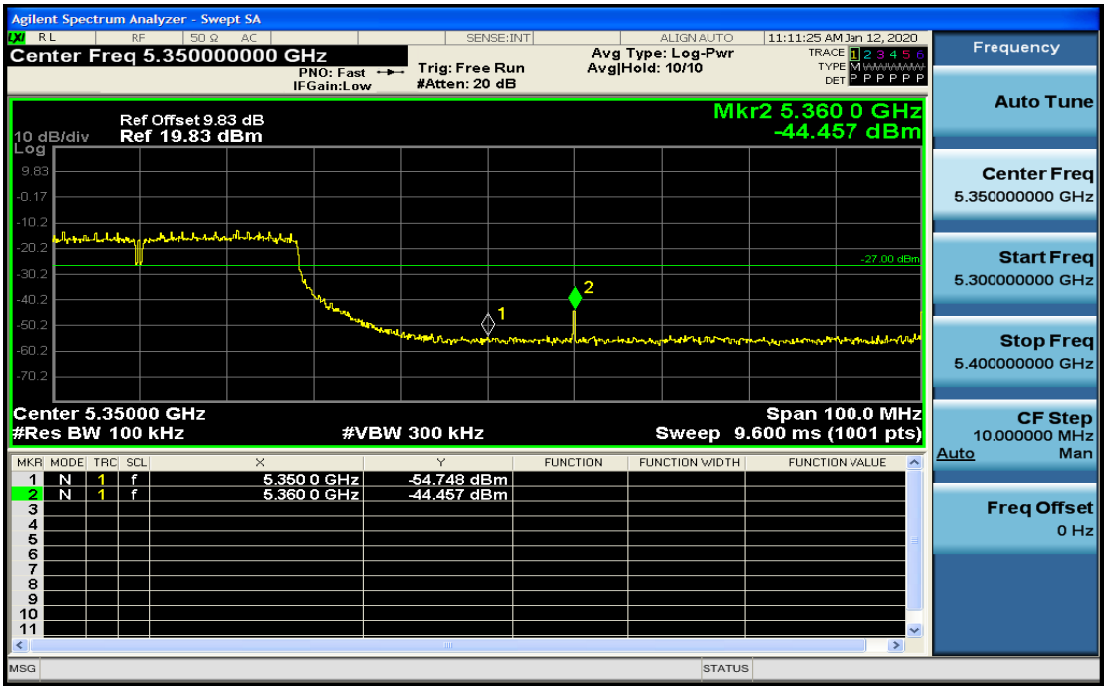
5230MHz



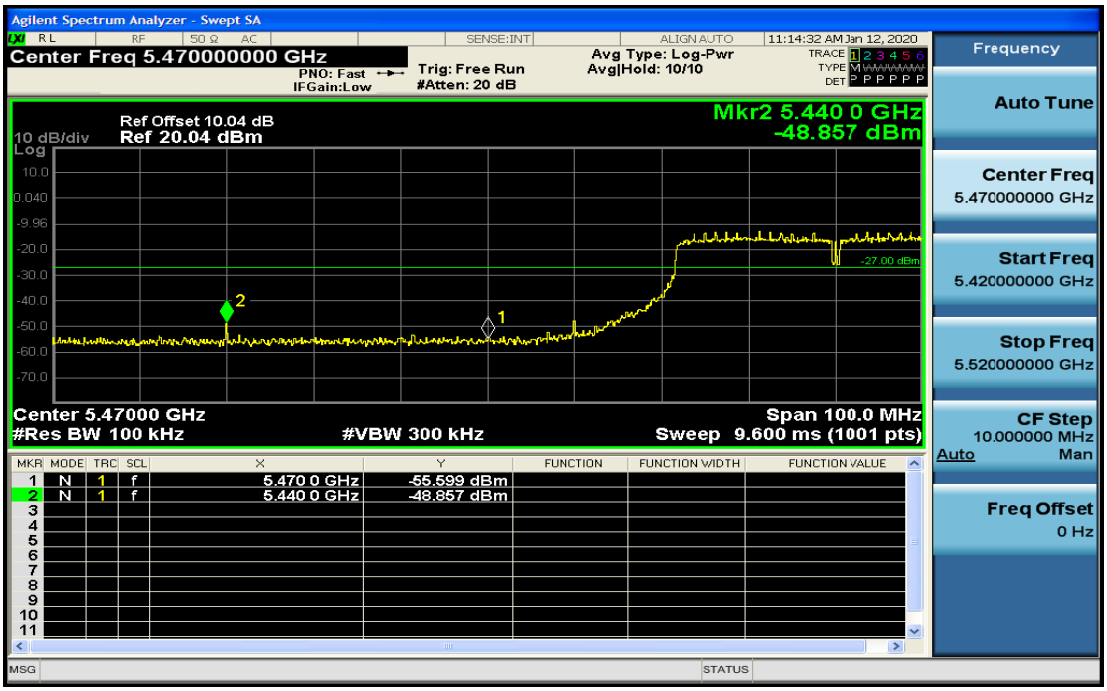
5270MHz



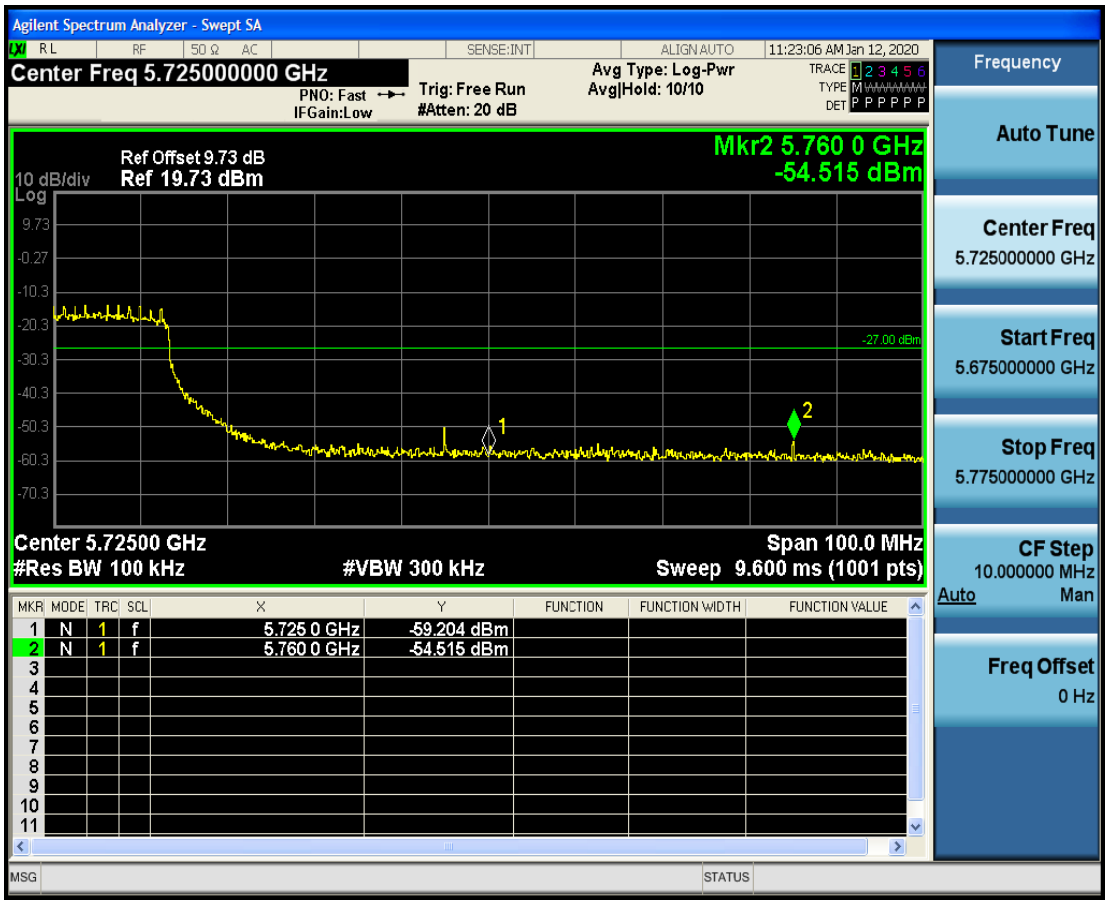
5310MHz



5510MHz



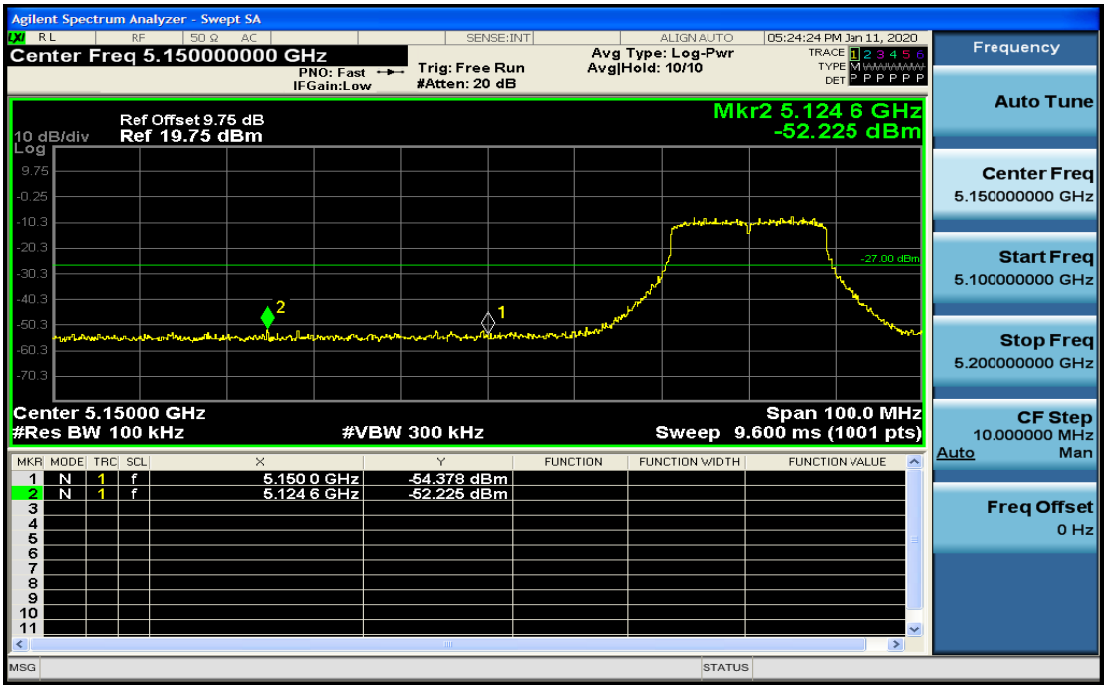
5670MHz



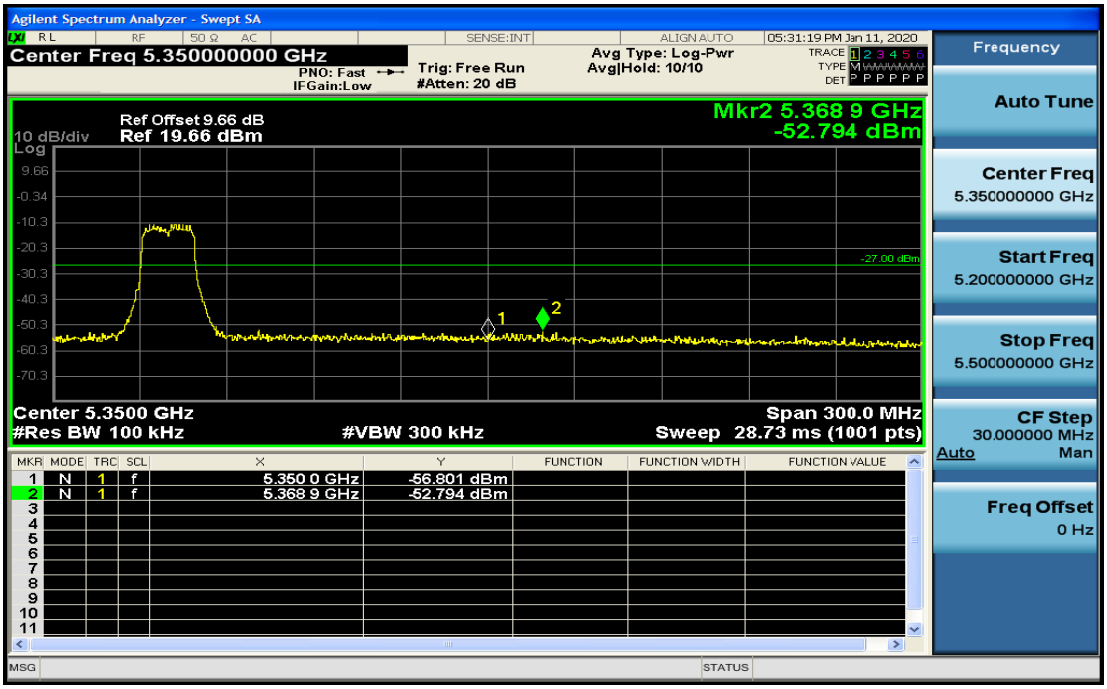
Antenna 2

Band Edges(IEEE802.11a mode)

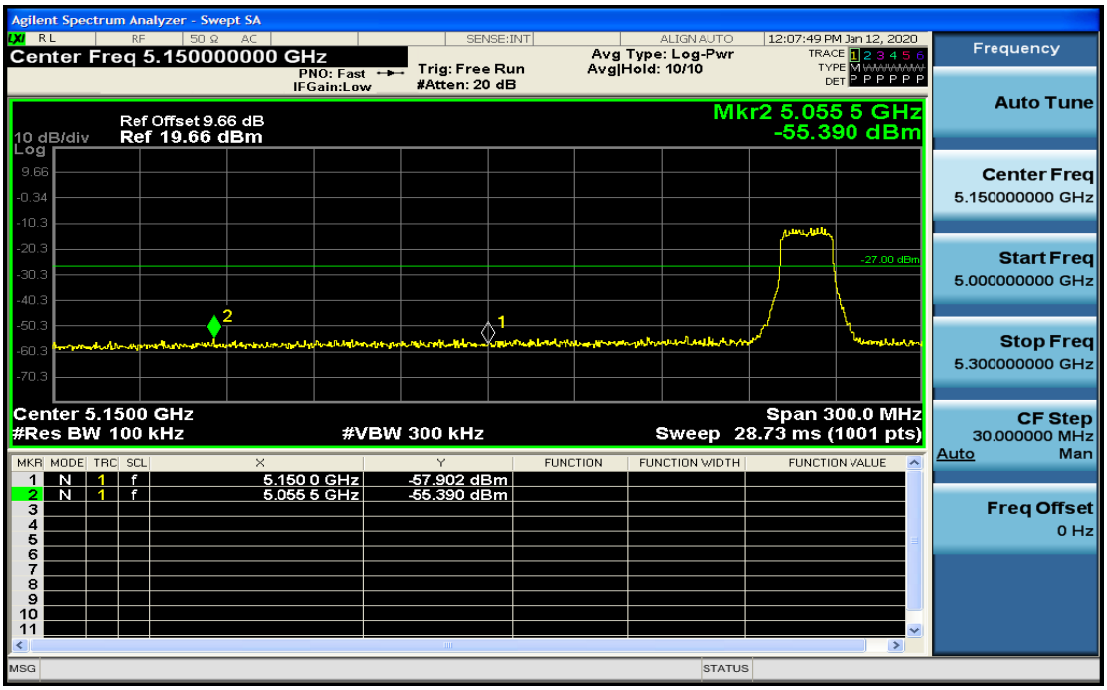
5180MHz



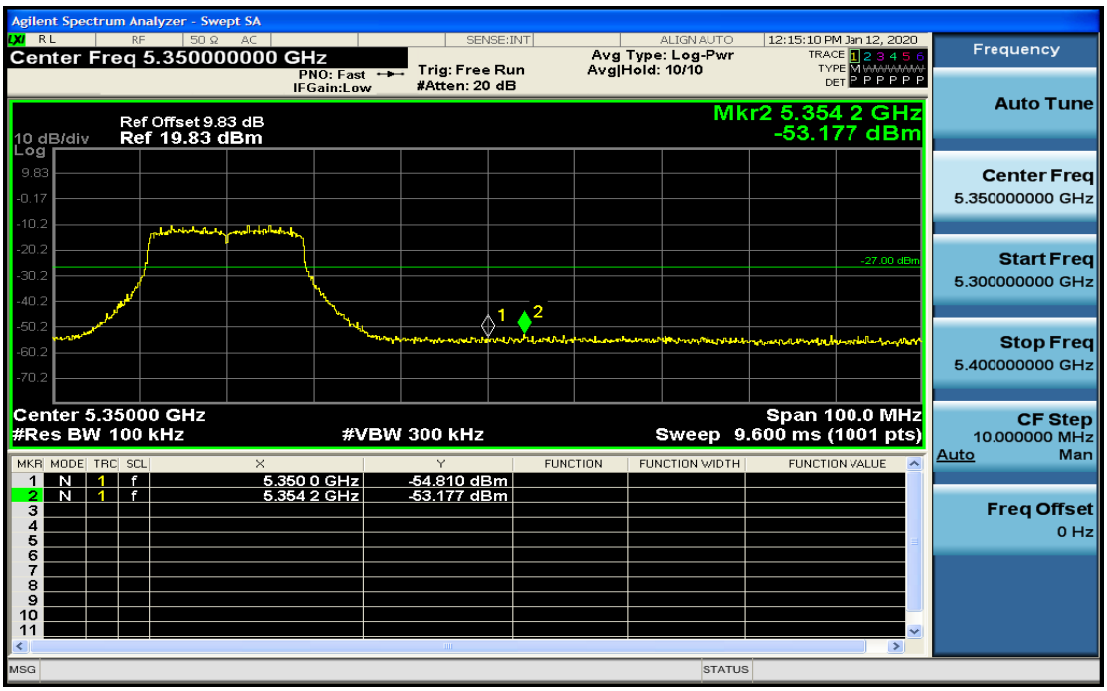
5240MHz



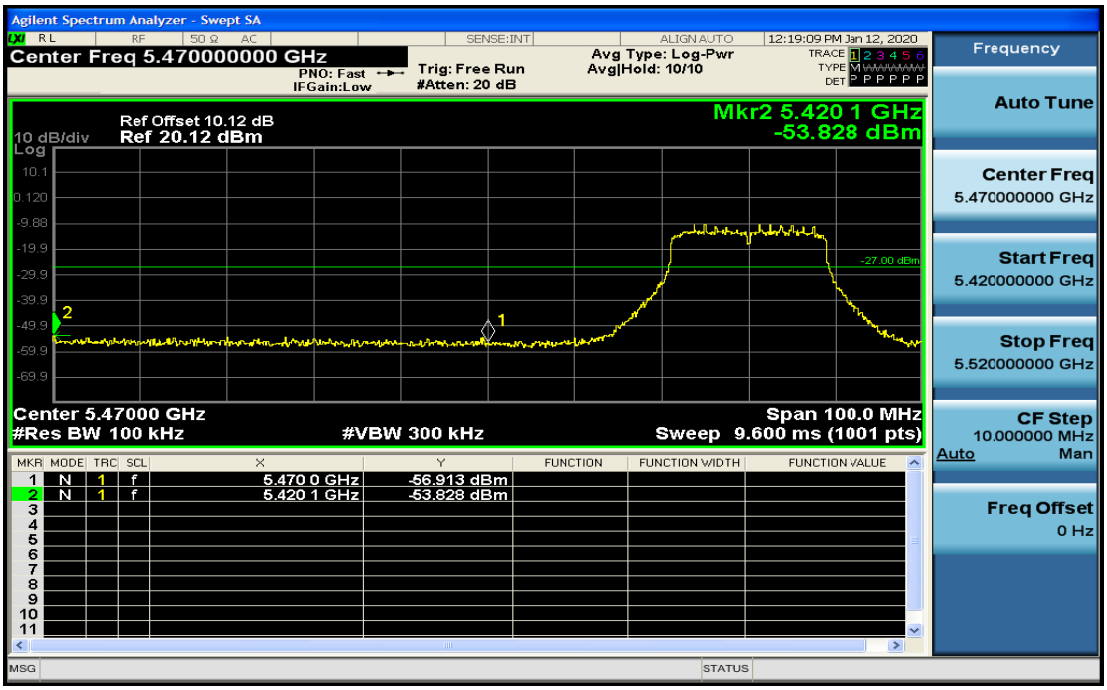
5260MHz



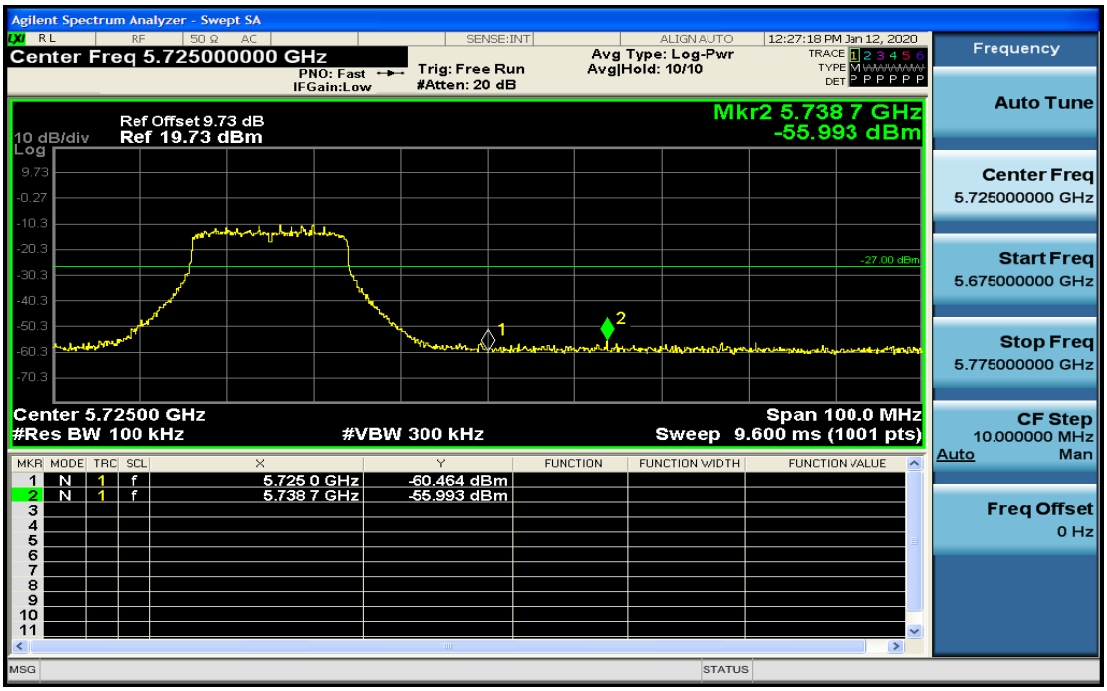
5320MHz



5500MHz

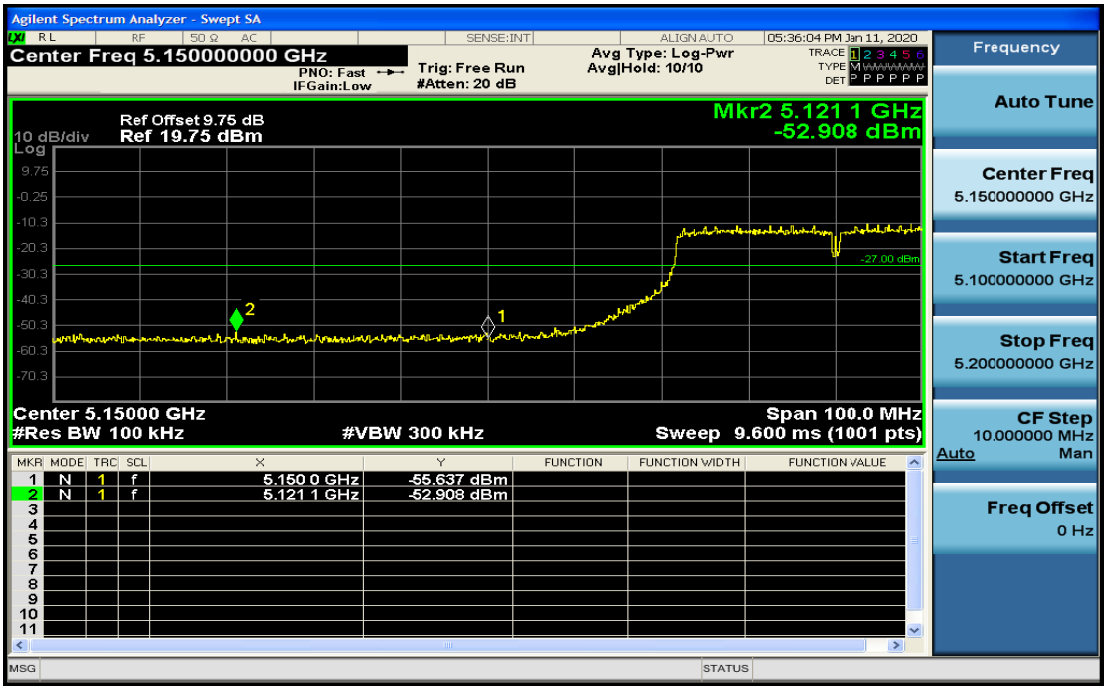


5700MHz

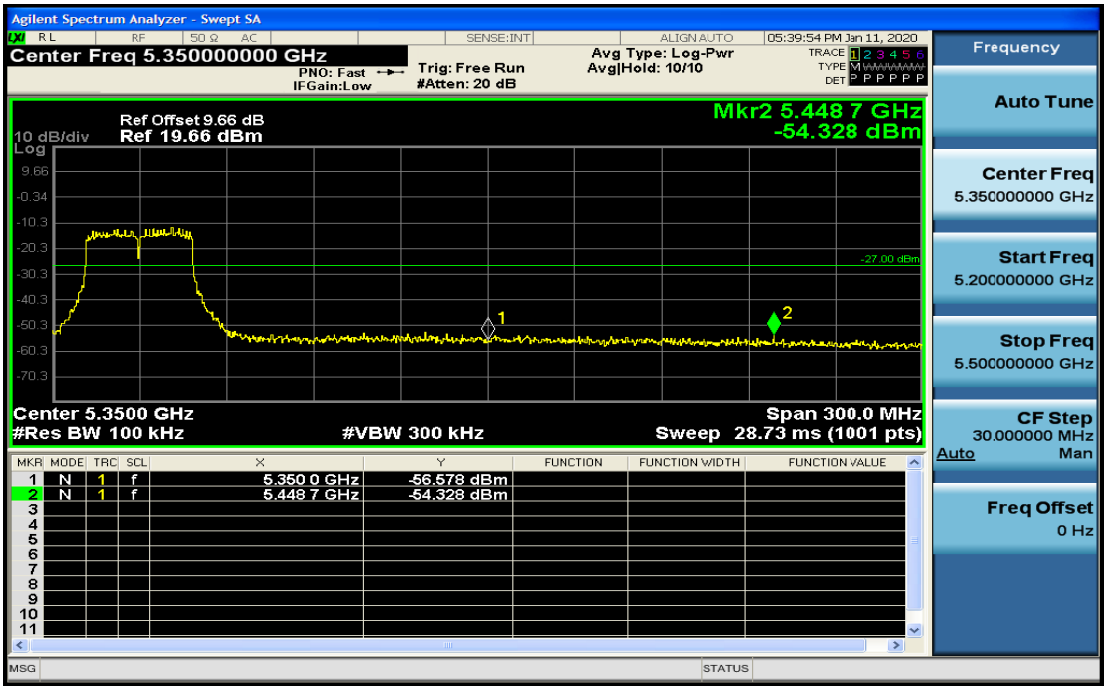


Band Edges(IEEE802.11n HT40 mode)

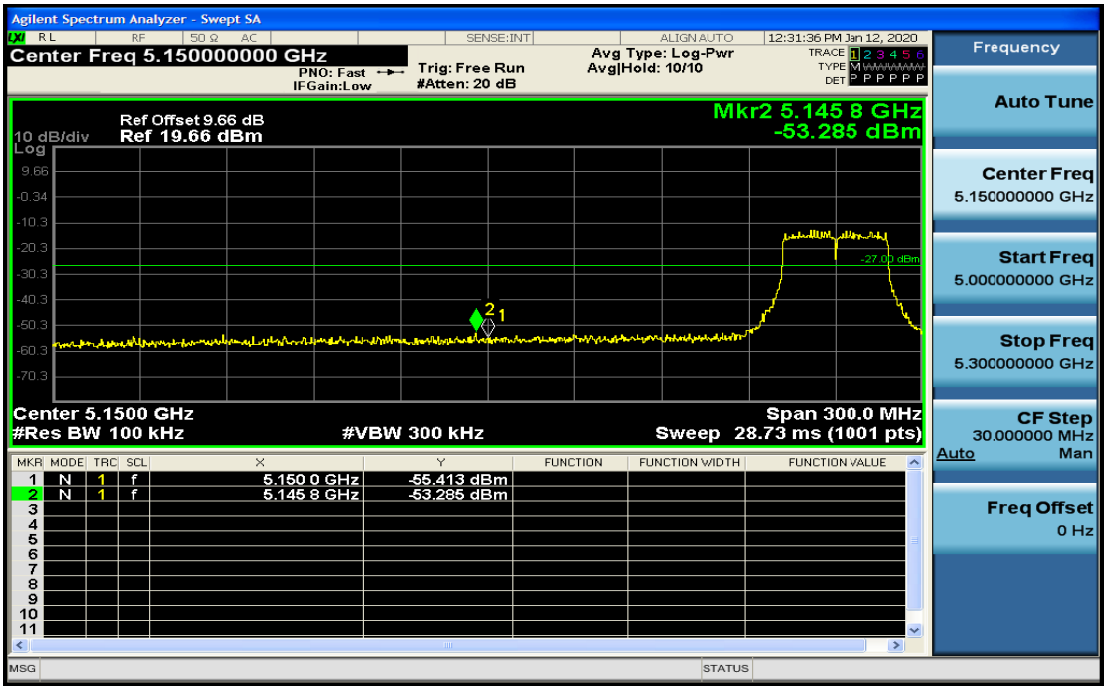
5190MHz



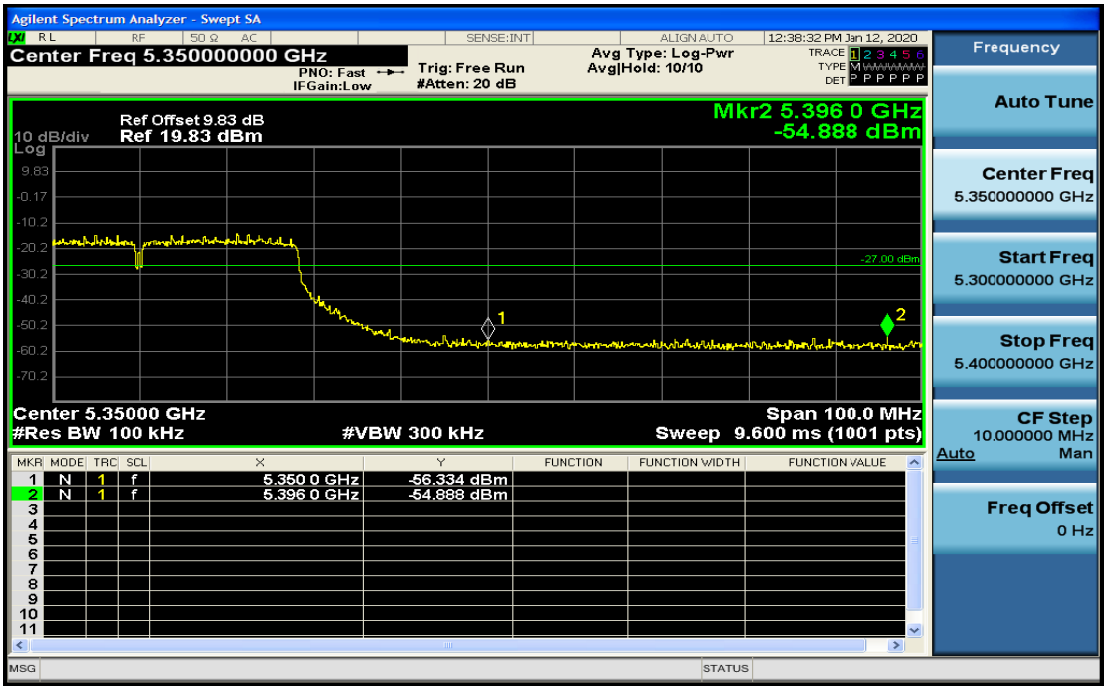
5230MHz



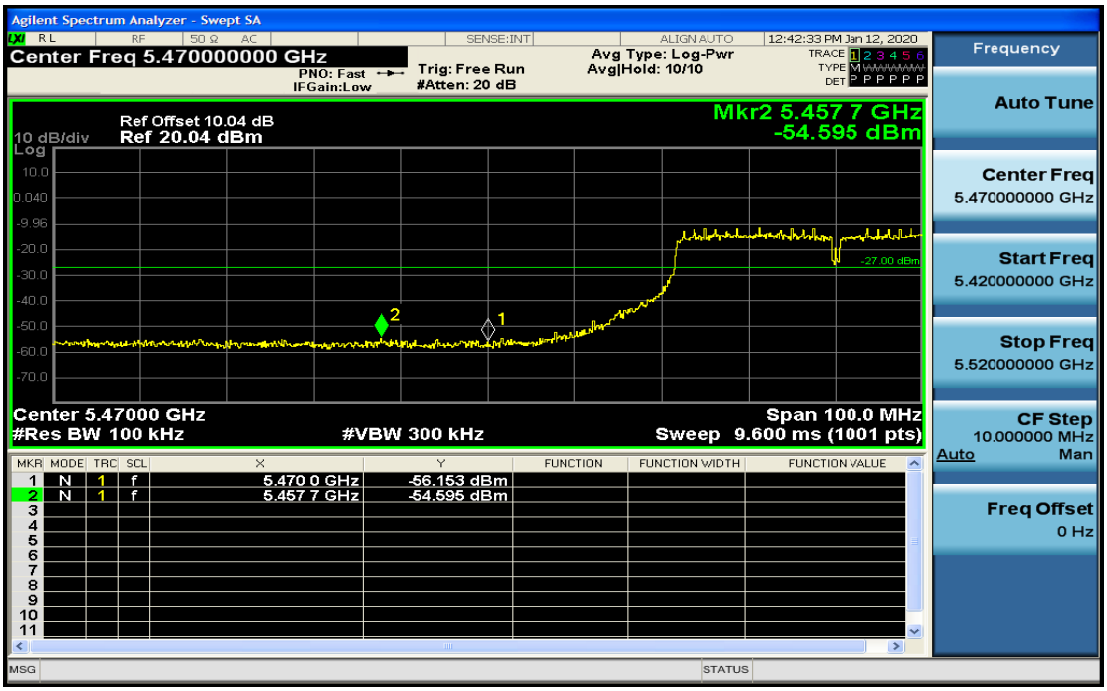
5270MHz



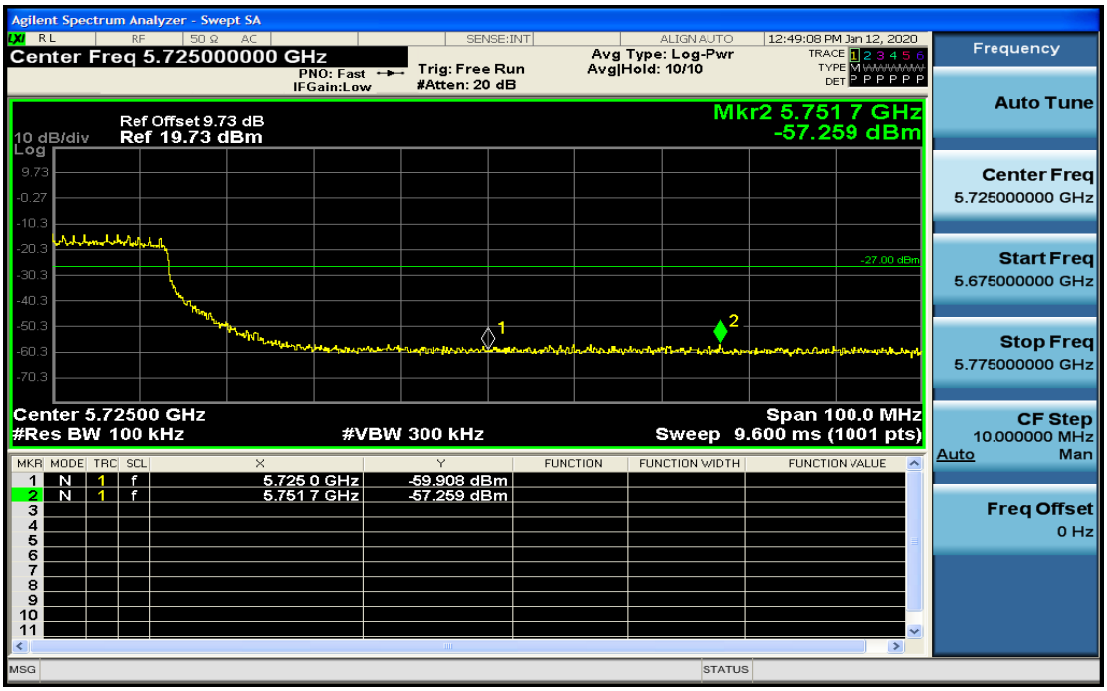
5310MHz



5510MHz



5670MHz



6.5 MAXIMUM POWER SPECTRAL DENSITY

LIMIT

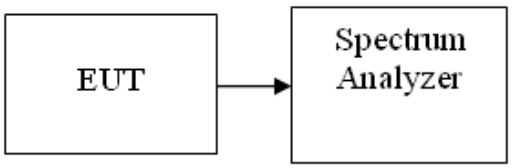
Accordingto§15.407(a),

For mobile and portable client devices in the 5.5-5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any l megahertz band

If transmitting antennas of directionalgaingreaterthan6dBiareused, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

TestConfiguration



TESTPROCEDURE

8. Place the EUTon the table andset it in transmitting mode.
   Remove the antenna from the EUTand then connect a low loss RF cable from the antenna port to the spectrum analyzer.
9. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz,Span must be greater than 26dB bandwidth, adjust as necessary, Sweep= auto, Detector RMS
10. Record themax. reading.

TESTRESULTS

No non-compliance noted

Test Data

Testmode:IEEE802.11a mode 5150~5250MHz

Channel	Frequency (MHz)	PPSD(dBm)		Mimo	Limit(dBm)	Result
		Ant1	Ant2			
Low	5180	1.04	-1.75	/	10.00	PASS
Mid	5220	1.85	-1.60	/	10.00	PASS
High	5240	-3.52	-1.98	/	10.00	PASS

5250~5350MHz

Channel	Frequency (MHz)	PPSD(dBm)		Mimo	Limit(dBm)	Result
		Ant1	Ant2			
Low	5260	-3.39	-2.97	/	10.00	PASS
Mid	5280	-3.65	-4.02	/	10.00	PASS
High	5320	-2.66	-2.51	/	10.00	PASS

5470~5725MHz

Channel	Frequency (MHz)	PPSD(dBm)		Mimo	Limit(dBm)	Result
		Ant1	Ant2			
Low	5500	-1.82	-4.04	/	10.00	PASS
Mid	5580	-1.26	-2.21	/	10.00	PASS
High	5700	-3.23	-6.92	/	10.00	PASS

Testmode:IEEE802.11n HT20 mode

5150~5250MHz

Channel	Frequency (MHz)	PPSD(dBm)		Limit(dBm)	Result
		Ant1	Ant2		
Low	5180	0.04	-0.63	10.00	PASS
Mid	5220	-0.77	-1.56	10.00	PASS
High	5240	-2.36	-3.46	10.00	PASS

Channel	Frequency (MHz)	Mimo	Limit(dBm)	Result
Low	5180	2.73	6.99	PASS
Mid	5220	1.86	6.99	PASS
High	5240	0.14	6.99	PASS

5250~5350MHz

Channel	Frequency (MHz)	PPSD(dBm)		Limit(dBm)	Result
		Ant1	Ant2		
Low	5260	-2.90	-4.33	10.00	PASS
Mid	5280	-5.04	-4.71	10.00	PASS
High	5320	-2.17	-2.74	10.00	PASS

Channel	Frequency (MHz)	Mimo	Limit(dBm)	Result
Low	5260	-0.55	6.99	PASS
Mid	5280	-1.86	6.99	PASS
High	5320	0.56	6.99	PASS

5470~5725MHz

Channel	Frequency (MHz)	PPSD(dBm)		Limit(dBm)	Result
		Ant1	Ant2		
Low	5500	-2.32	-3.39	10.00	PASS
Mid	5580	-3.00	-2.92	10.00	PASS
High	5700	-4.64	-3.85	10.00	PASS

Channel	Frequency (MHz)	Mimo	Limit(dBm)	Result
Low	5500	0.19	6.99	PASS
Mid	5580	0.05	6.99	PASS
High	5700	-1.22	6.99	PASS

Testmode:IEEE802.11nHT40 mode

5150~5250MHz

Channel	Frequency (MHz)	PPSD(dBm)		Limit(dBm)	Result
		Ant1	Ant2		
Low	5190	-3.01	-3.05	10.00	PASS
High	5230	-6.05	-5.00	10.00	PASS

Channel	Frequency (MHz)	Mimo	Limit(dBm)	Result
Low	5190	-0.02	6.99	PASS
High	5230	-2.48	6.99	PASS

5250~5350MHz

Channel	Frequency (MHz)	PPSD(dBm)		Limit(dBm)	Result
		Ant1	Ant2		
Low	5270	-5.54	-5.55	10.00	PASS
High	5310	-6.27	-7.72	10.00	PASS

Channel	Frequency (MHz)	Mimo	Limit(dBm)	Result
Low	5270	-2.53	6.99	PASS
High	5310	-3.92	6.99	PASS

5470~5725MHz

Channel	Frequency (MHz)	PPSD(dBm)		Limit(dBm)	Result
		Ant1	Ant2		
Low	5510	-5.29	-4.34	10.00	PASS
Mid	5550	-7.54	-7.39	10.00	PASS
High	5670	-7.04	-7.69	10.00	PASS

Channel	Frequency (MHz)	Mimo	Limit(dBm)	Result
Low	5510	-1.78	6.99	PASS
Mid	5550	-4.45	6.99	PASS
High	5670	-4.34	6.99	PASS

Note: Duty factor has been off seted with cable loss

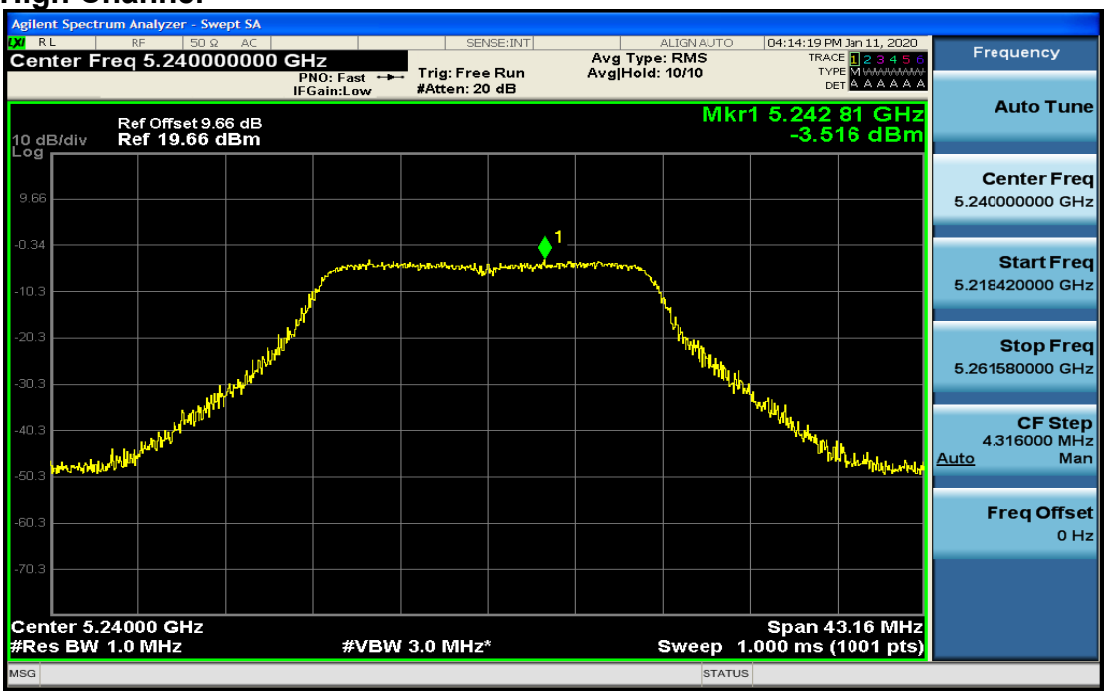
Test Plot
Antenna 1
IEEE802.11a mode:

5150~5250MHz

Low Channel

Mid Channel

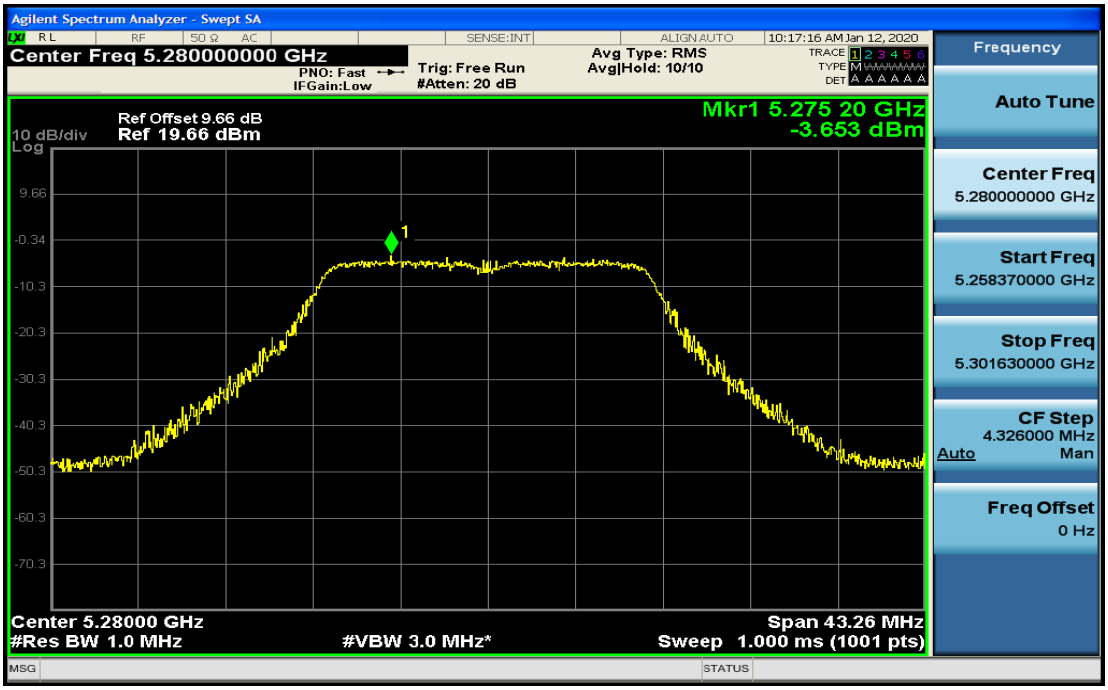
High Channel



5250~5350MHz

Low Channel

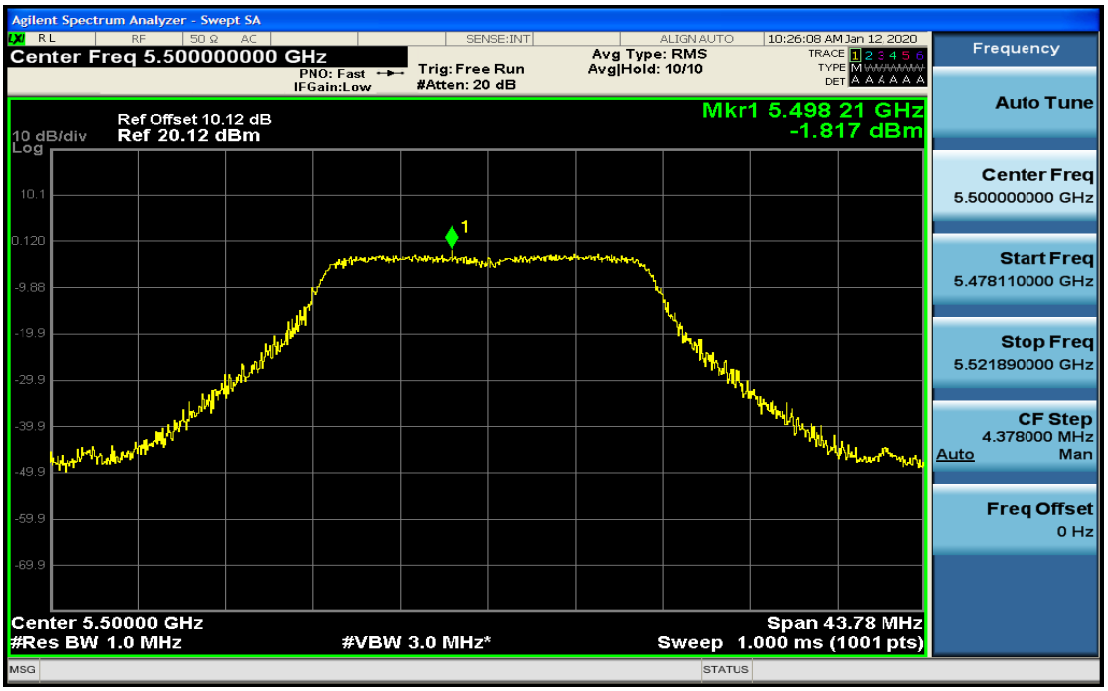
Mid Channel



High Channel

5470~5725MHz

Low Channel



Mid Channel

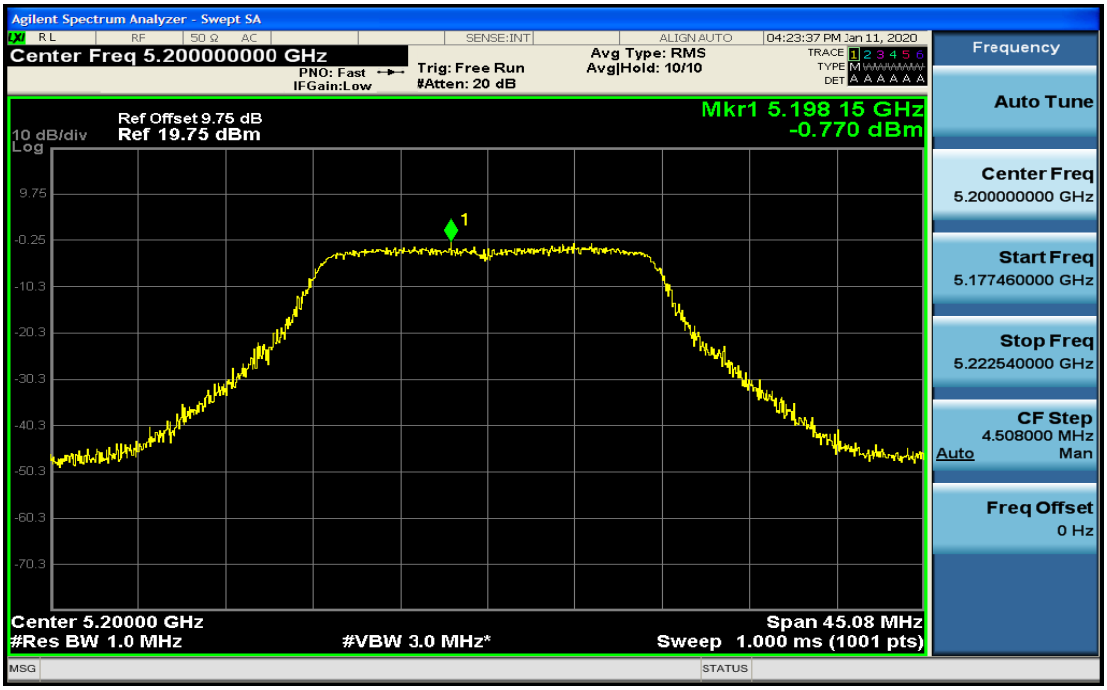
High Channel

IEEE802.11n HT20 mode

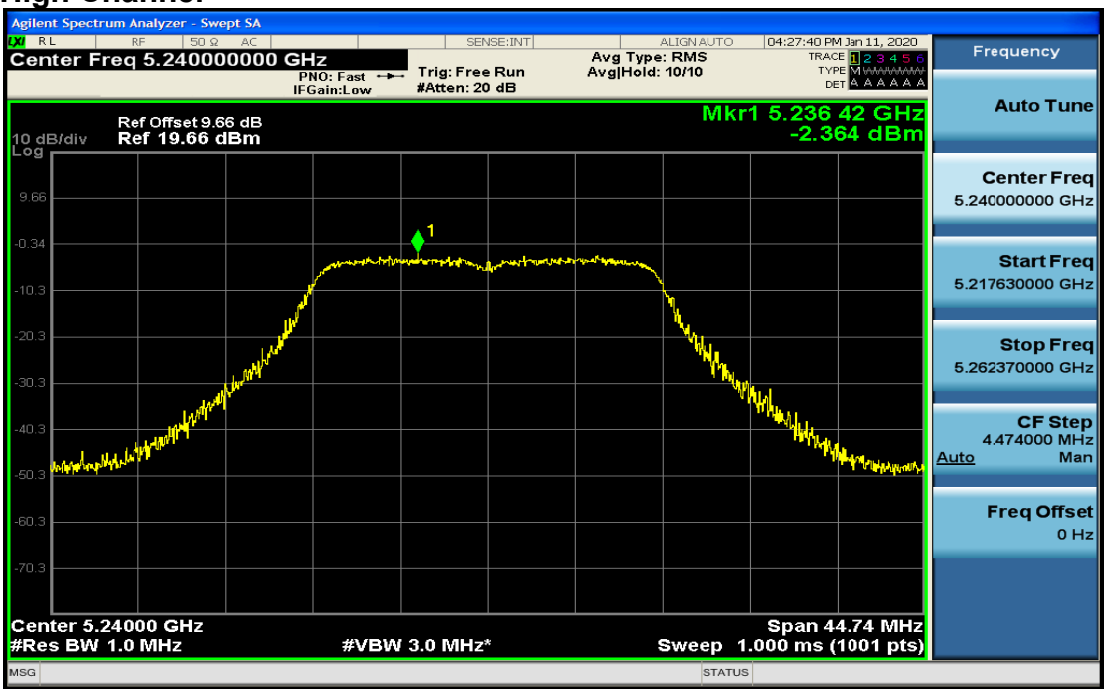
5150~5250MHz

Low Channel

Mid Channel



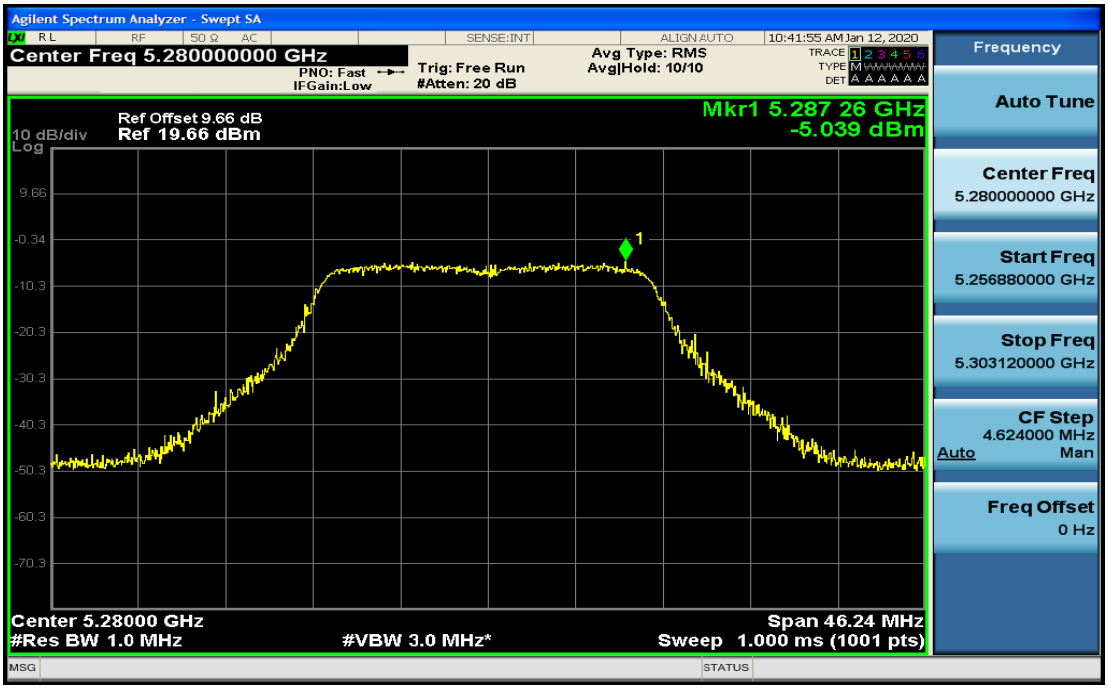
High Channel



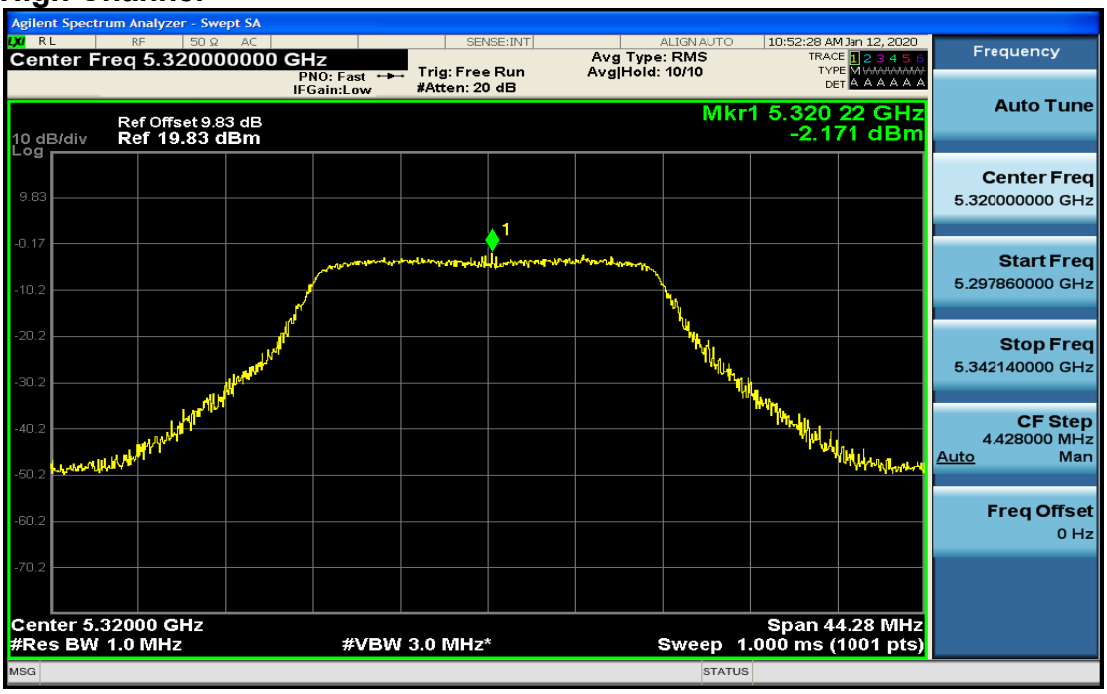
5250~5350MHz

Low Channel

Mid Channel



High Channel

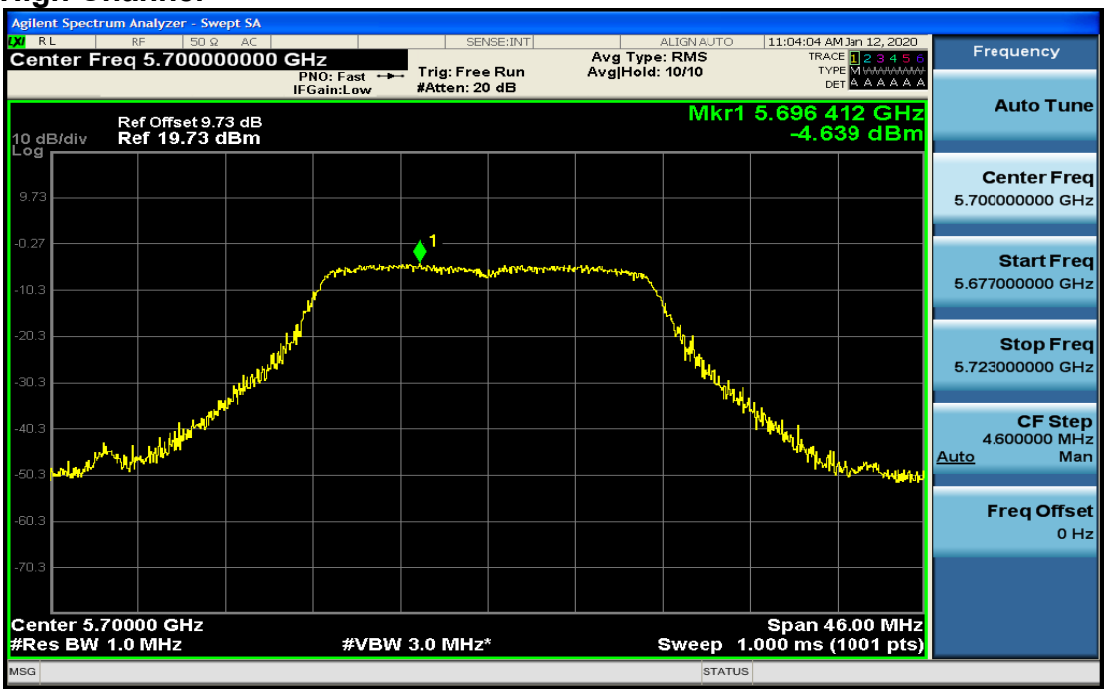


5470~5725MHz

Low Channel

Mid Channel

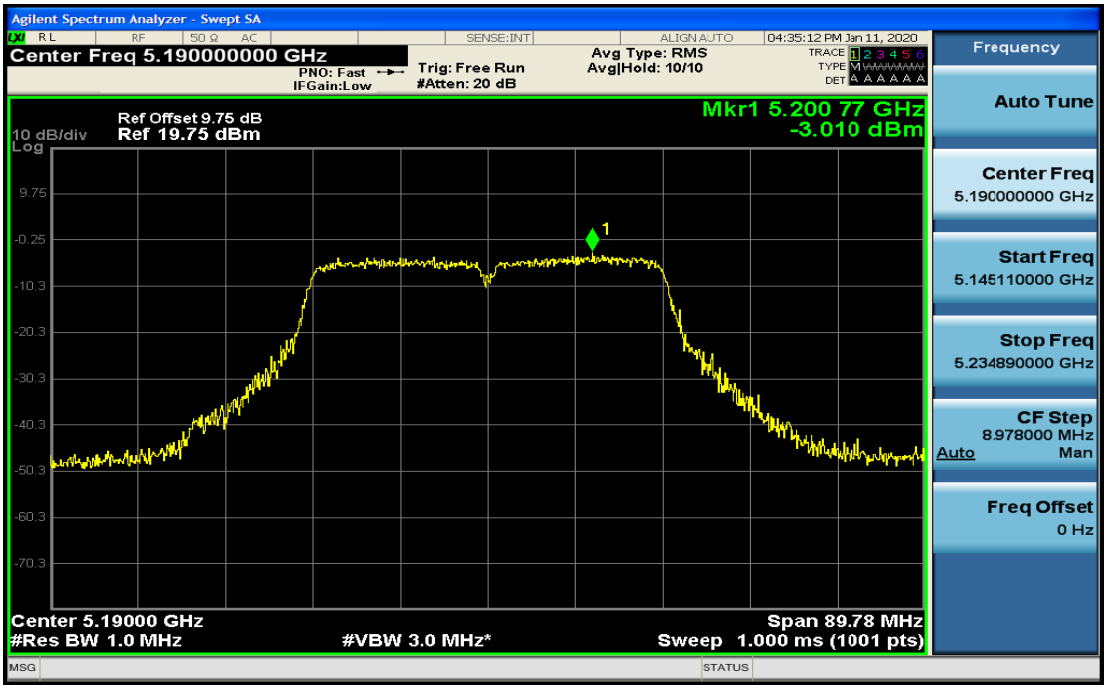
High Channel



IEEE802.11n HT40 mode

5150~5250MHz

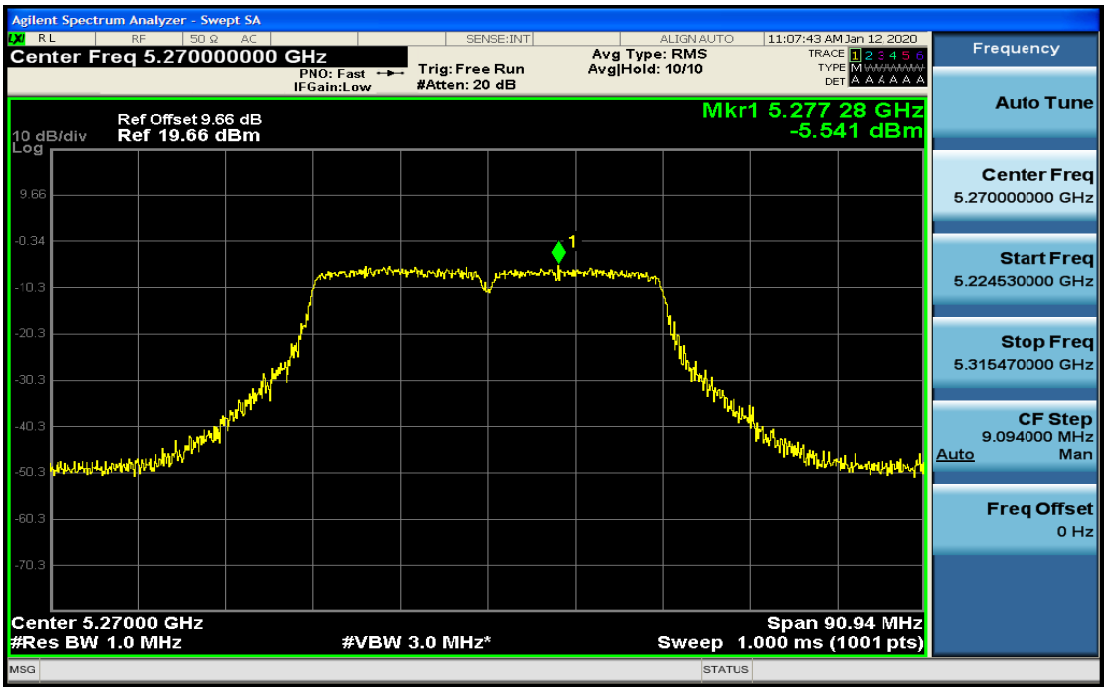
Low Channel



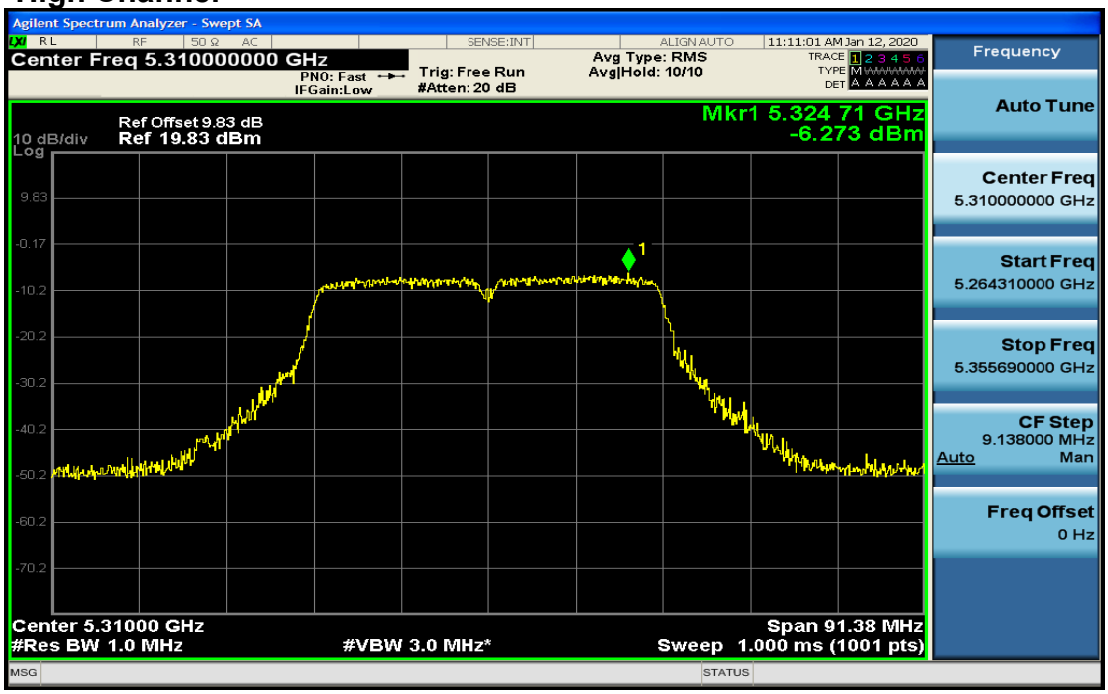
High Channel

5250~5350MHz

Low Channel

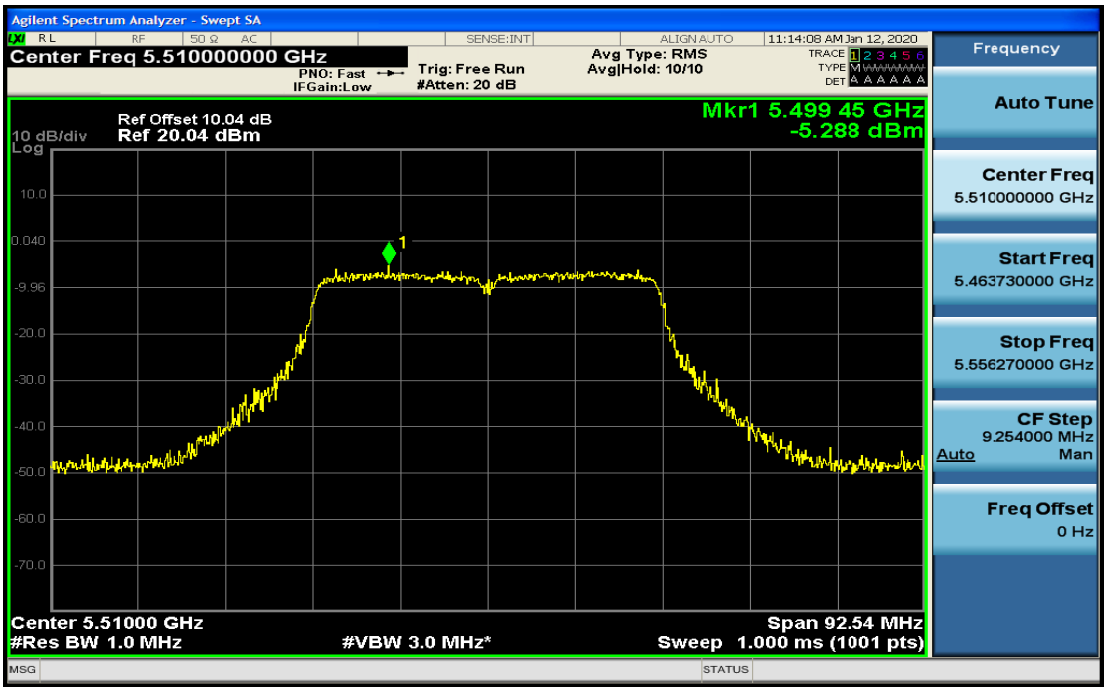


High Channel

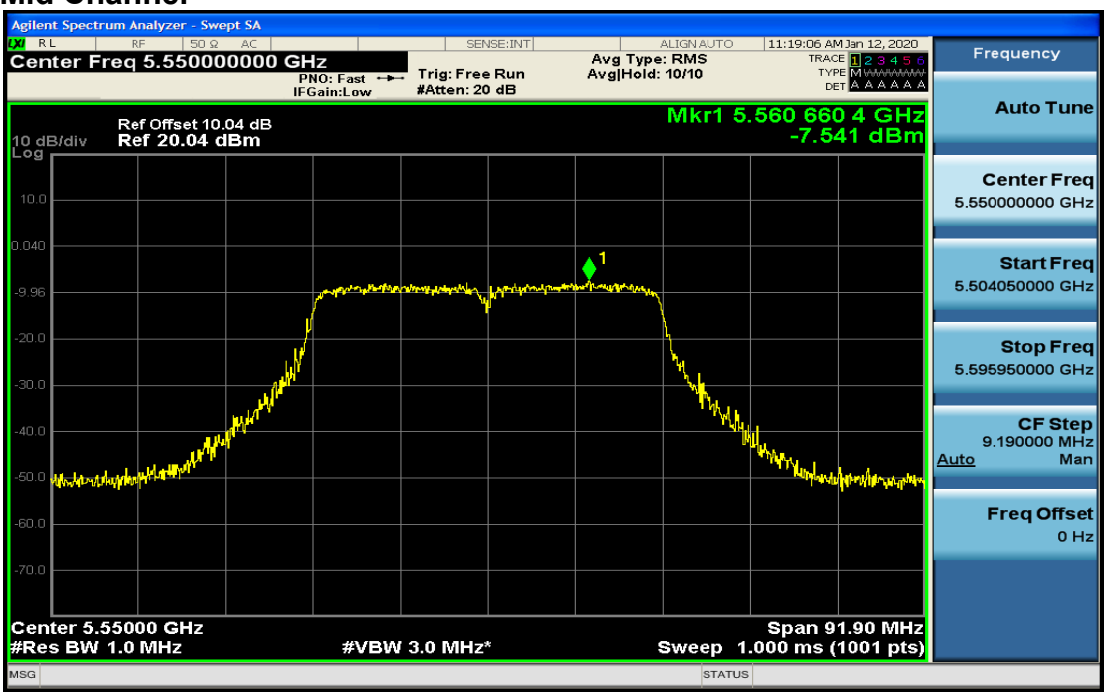


5470~5725MHz

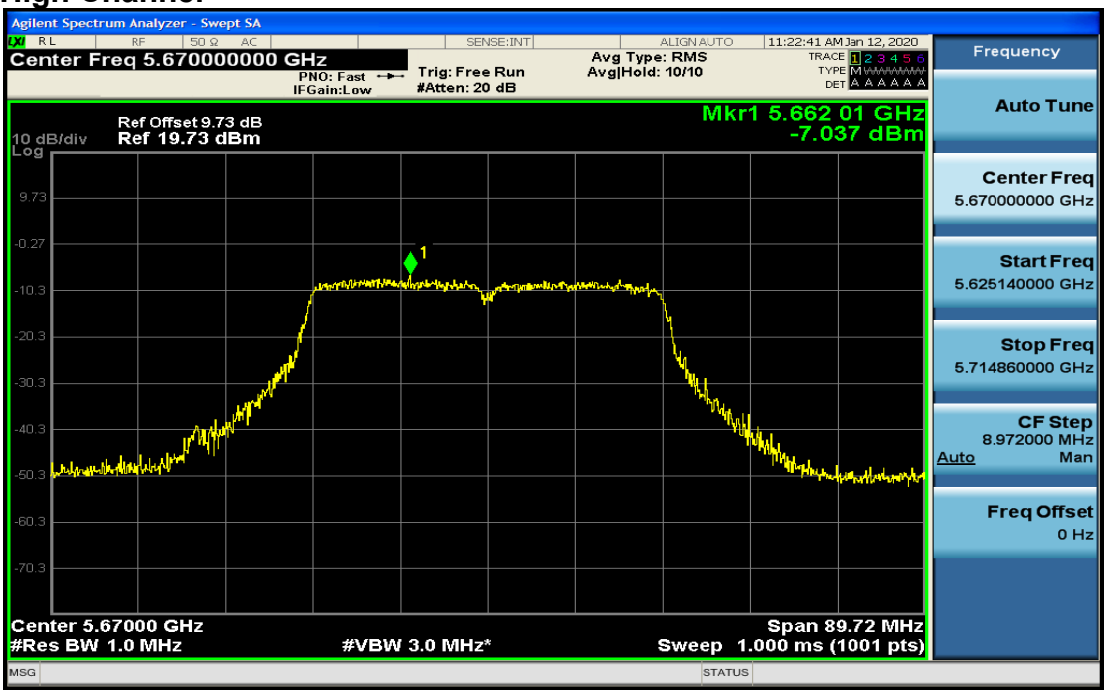
Low Channel



Mid Channel



High Channel



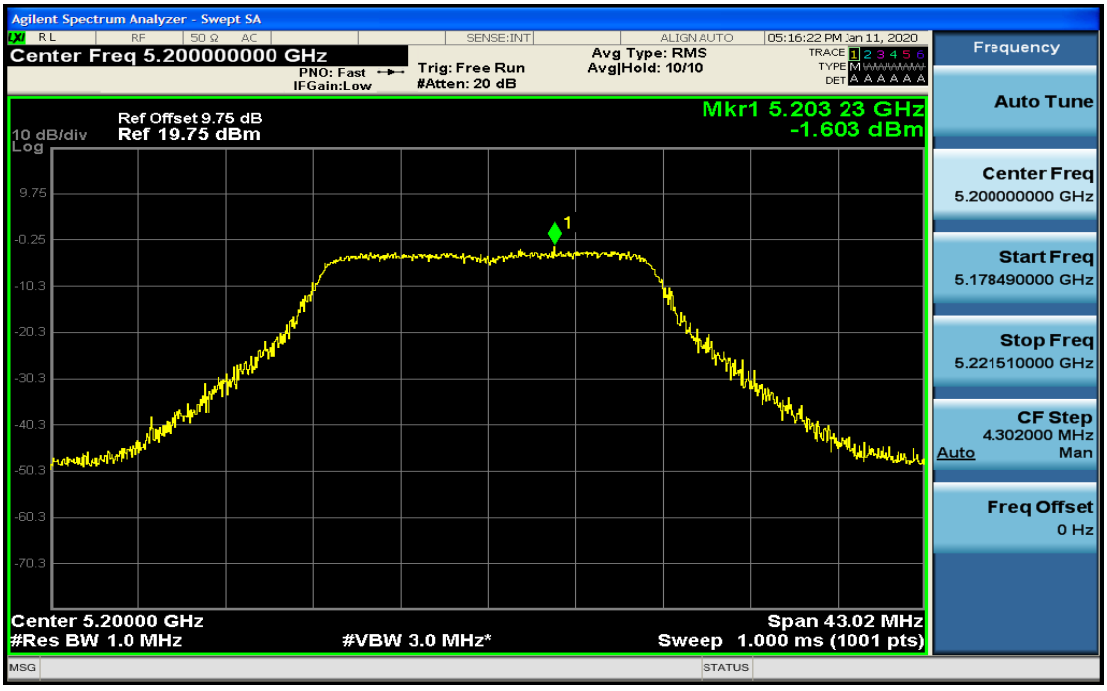
Antenna 2

IEEE802.11a mode:

5150~5250MHz

Low Channel

Mid Channel



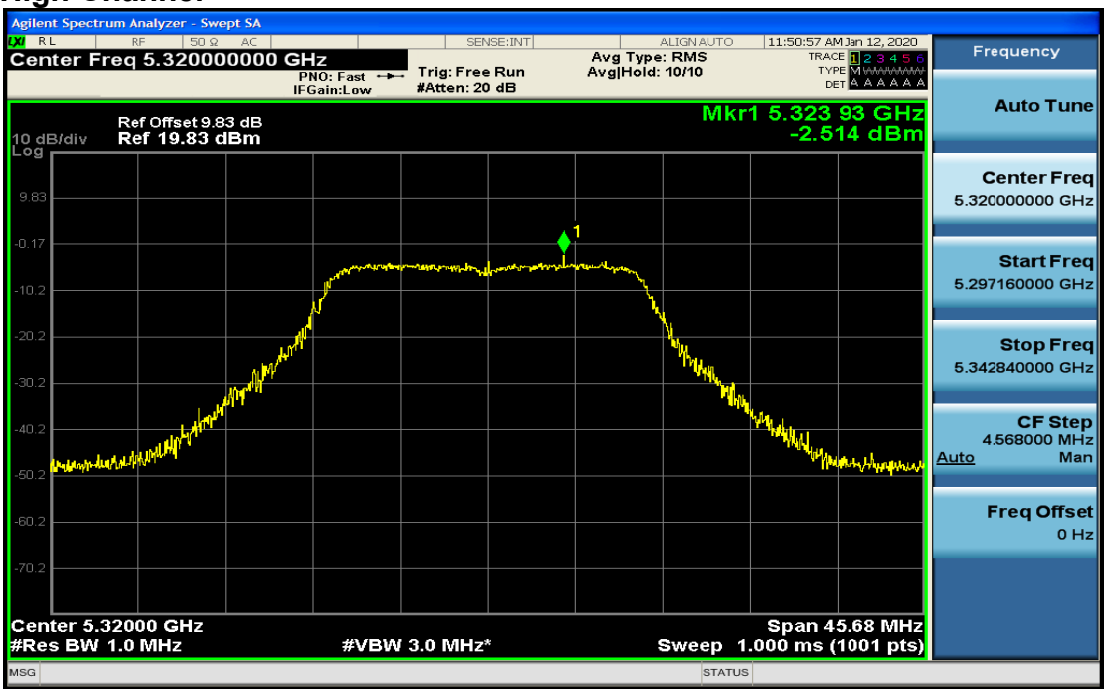
High Channel

5250~5350MHz

Low Channel

Mid Channel

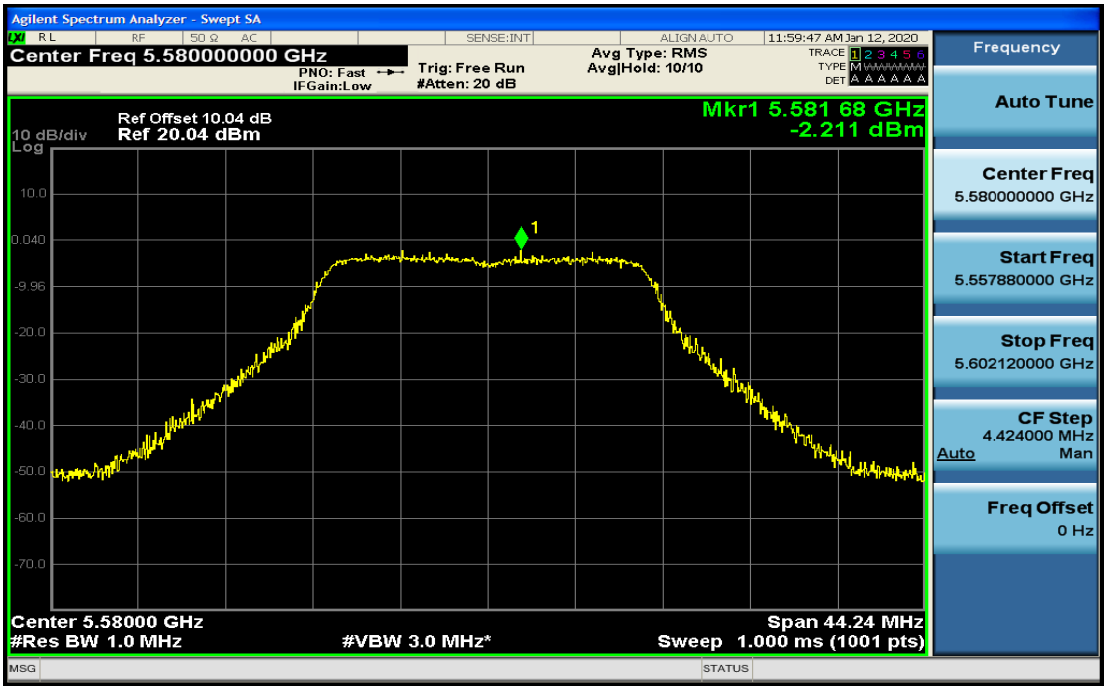
High Channel



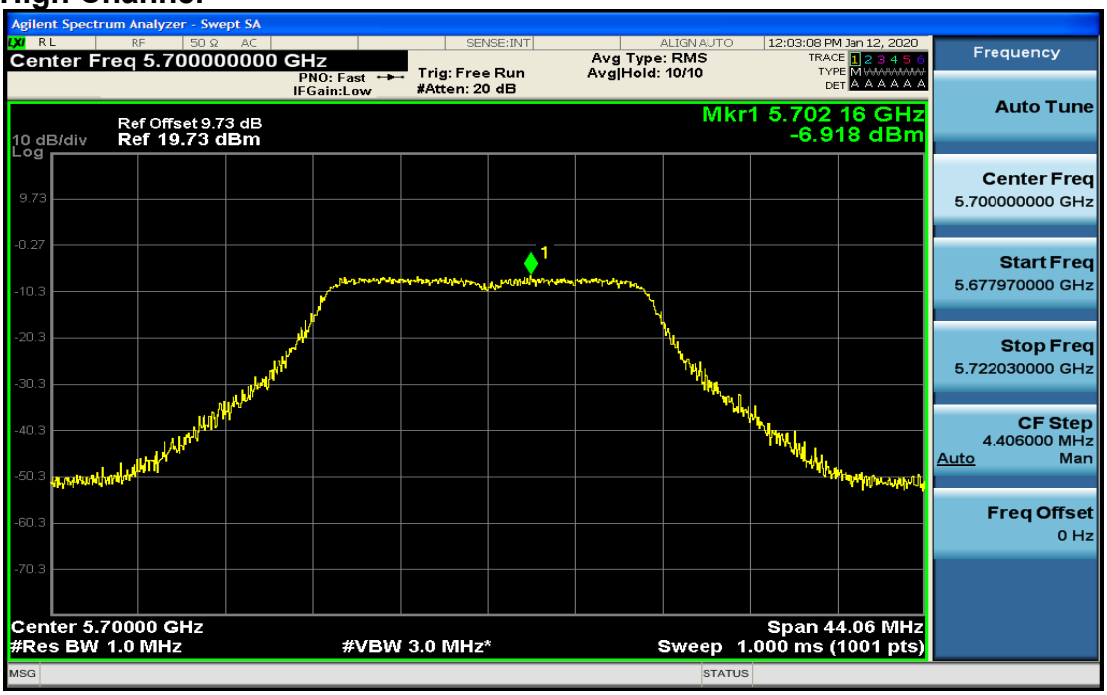
5470~5725MHz

Low Channel

Mid Channel



High Channel

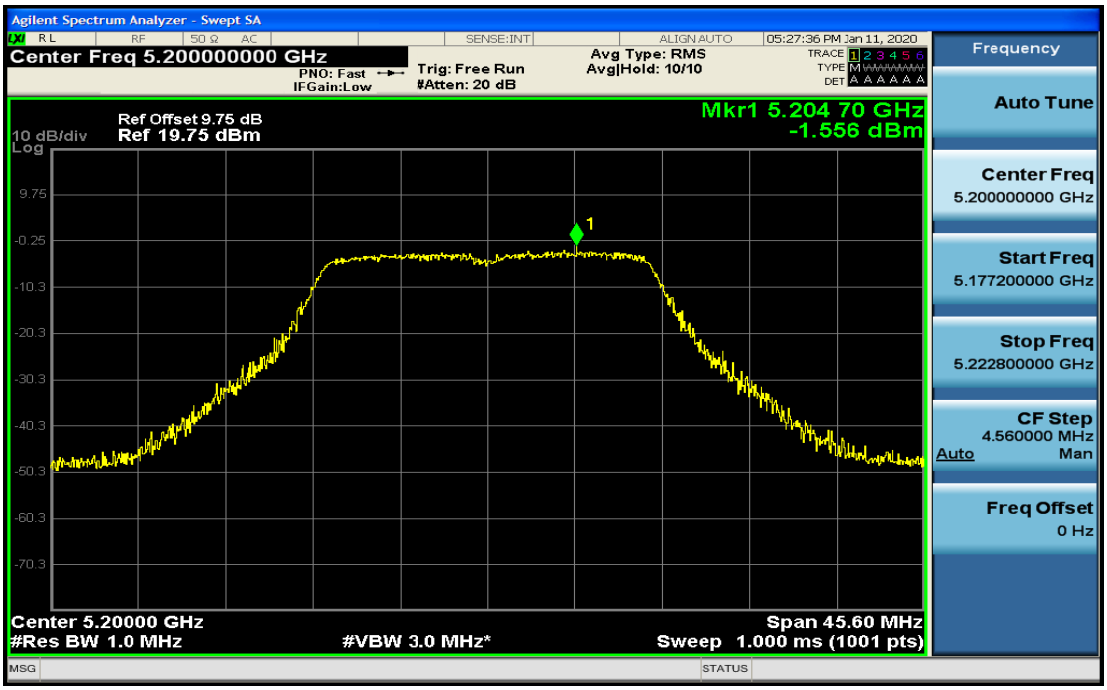


IEEE802.11n HT20 mode

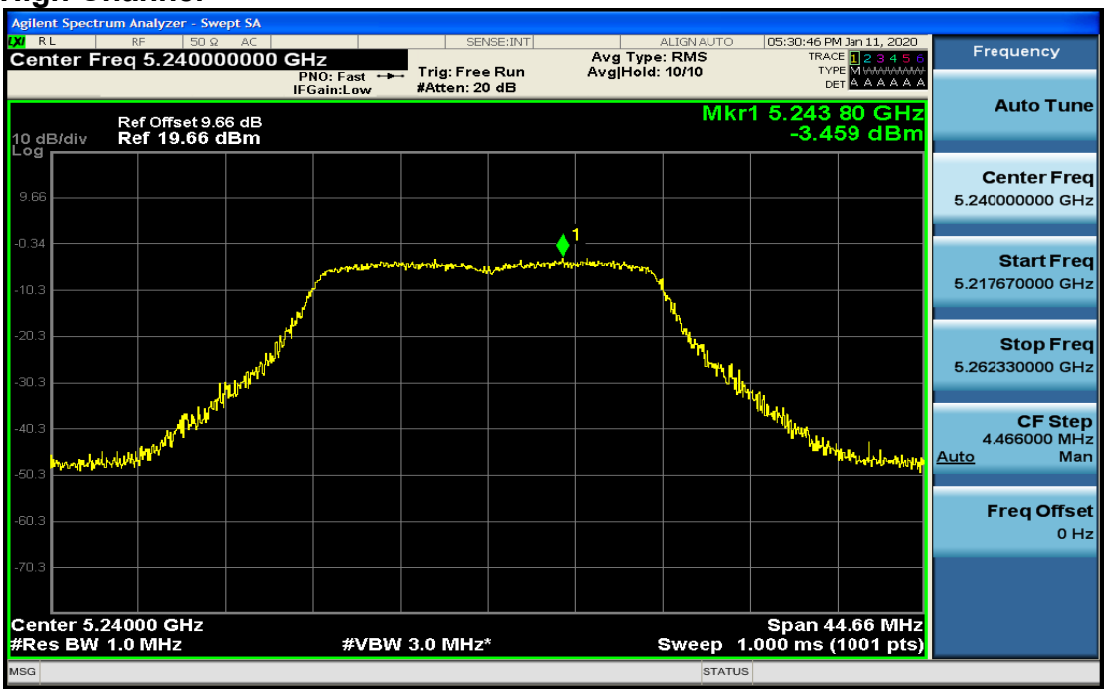
5150~5250MHz

Low Channel

Mid Channel



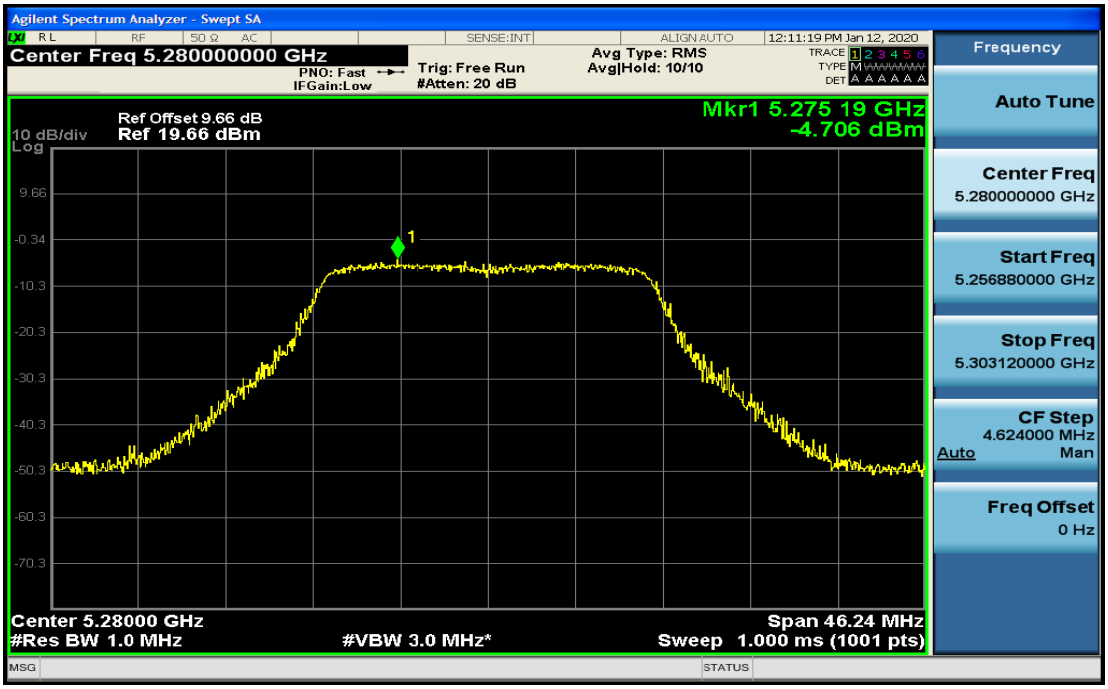
High Channel



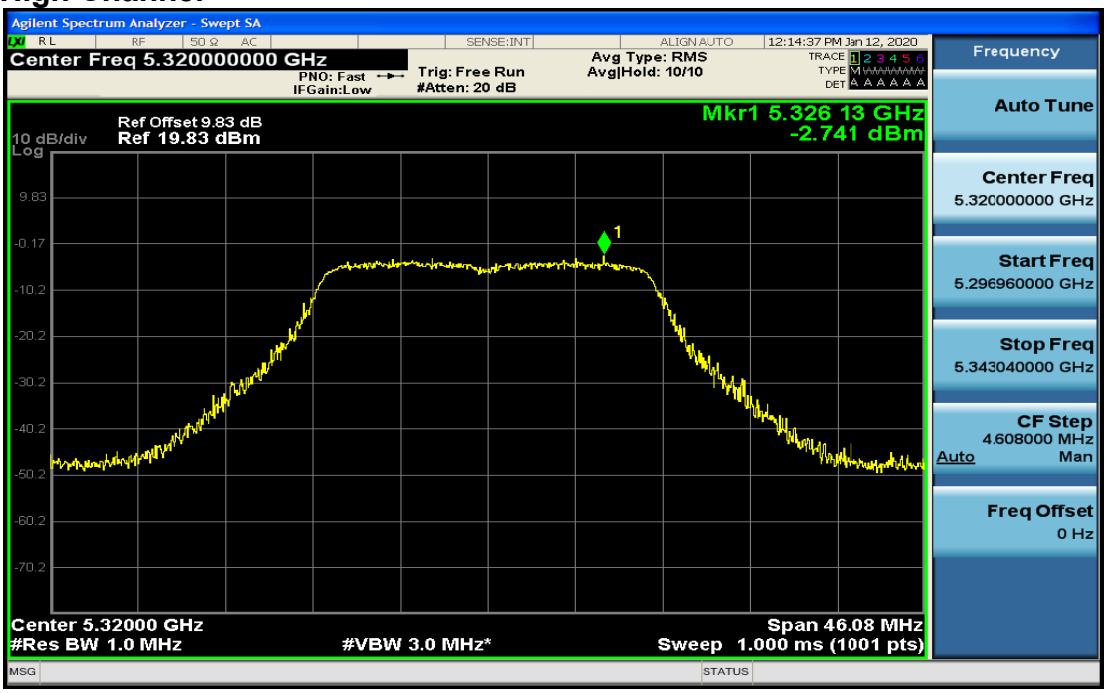
5250~5350MHz

Low Channel

Mid Channel

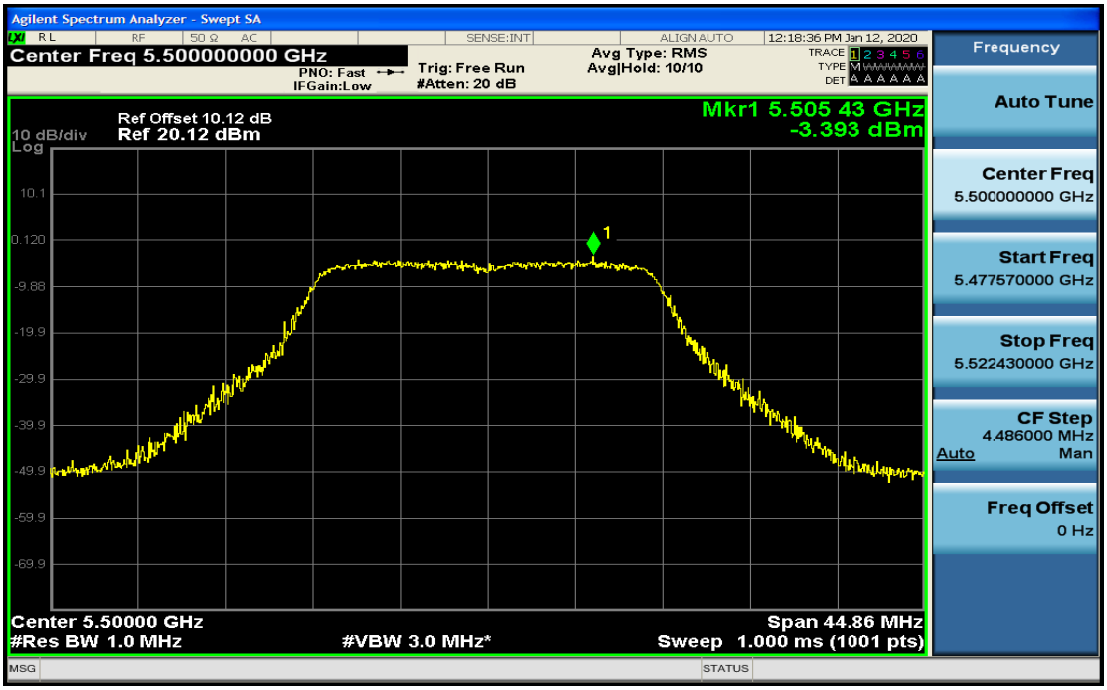


High Channel

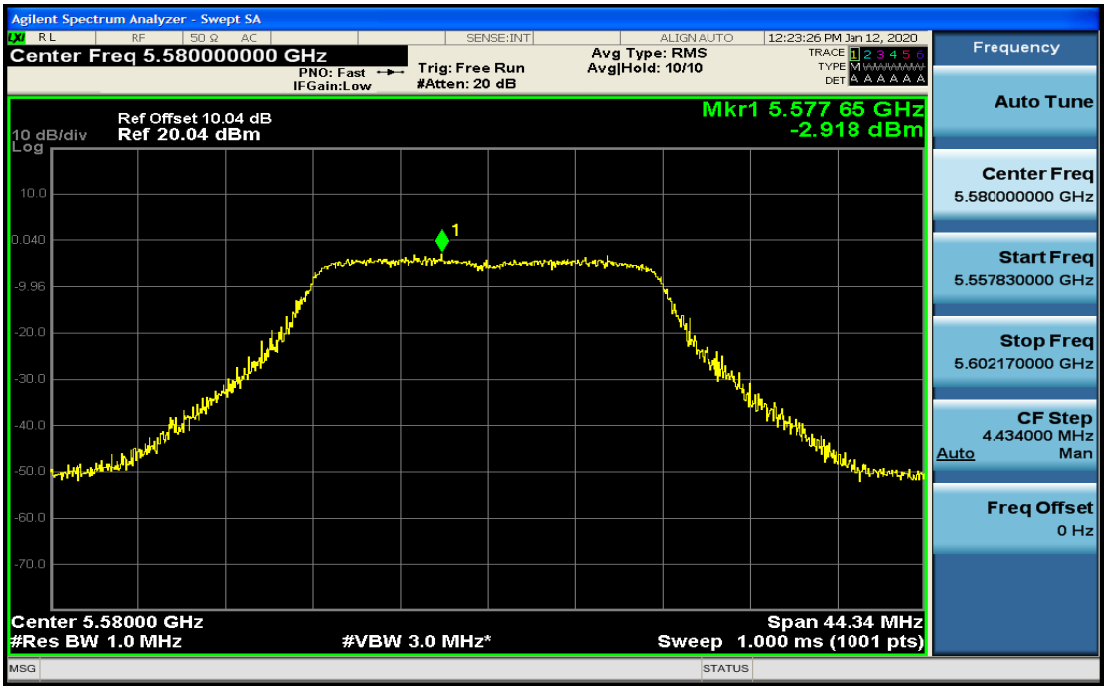


5470~5725MHz

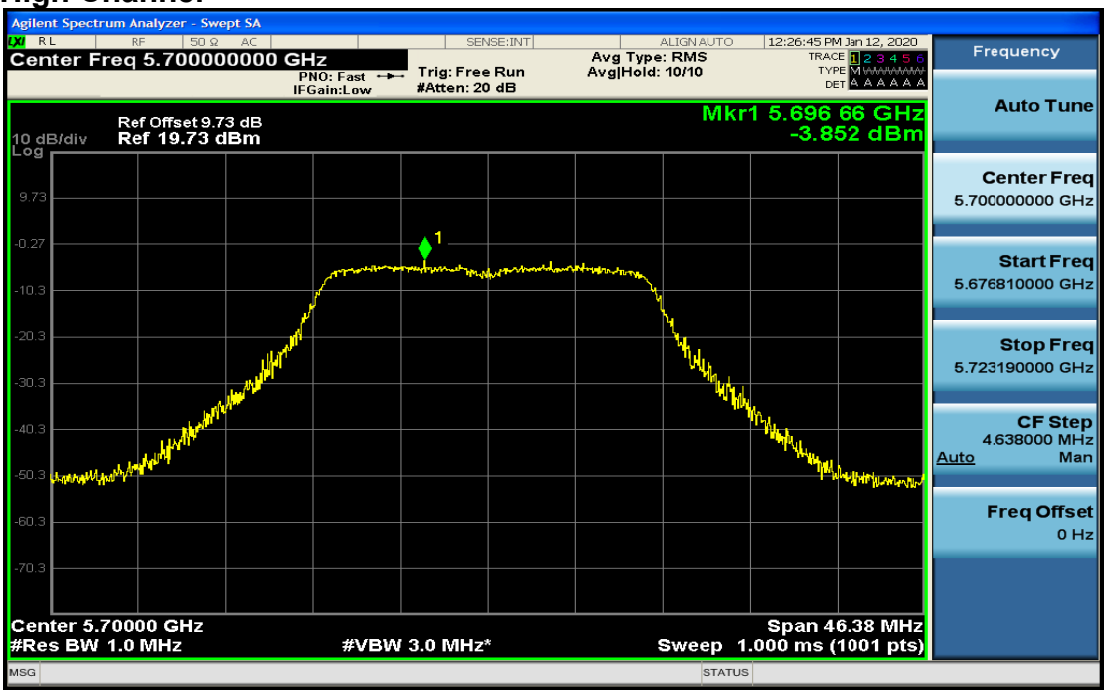
Low Channel



Mid Channel



High Channel

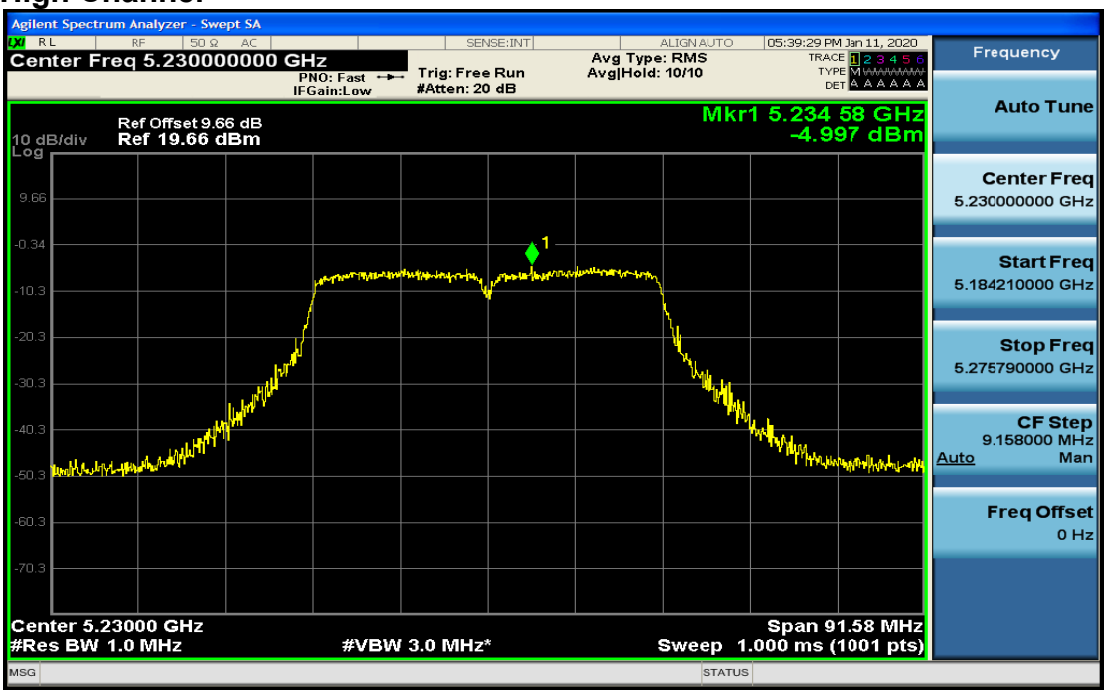


IEEE802.11n HT40 mode

5150~5250MHz

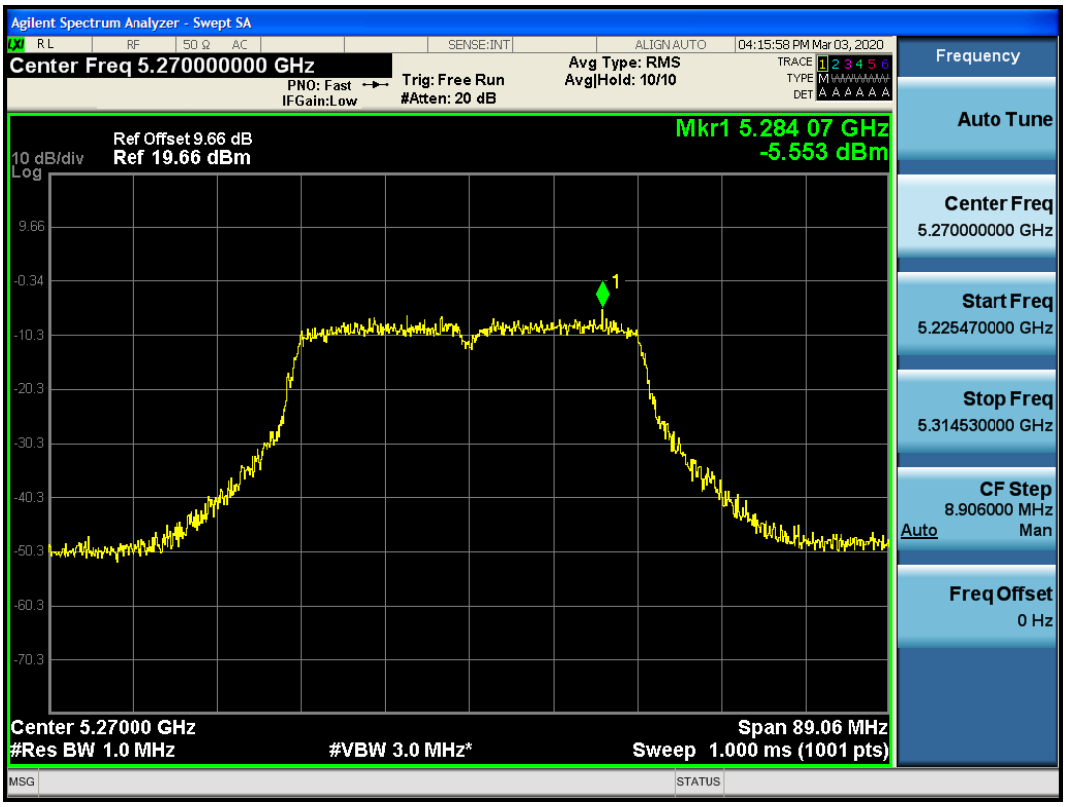
Low Channel

High Channel

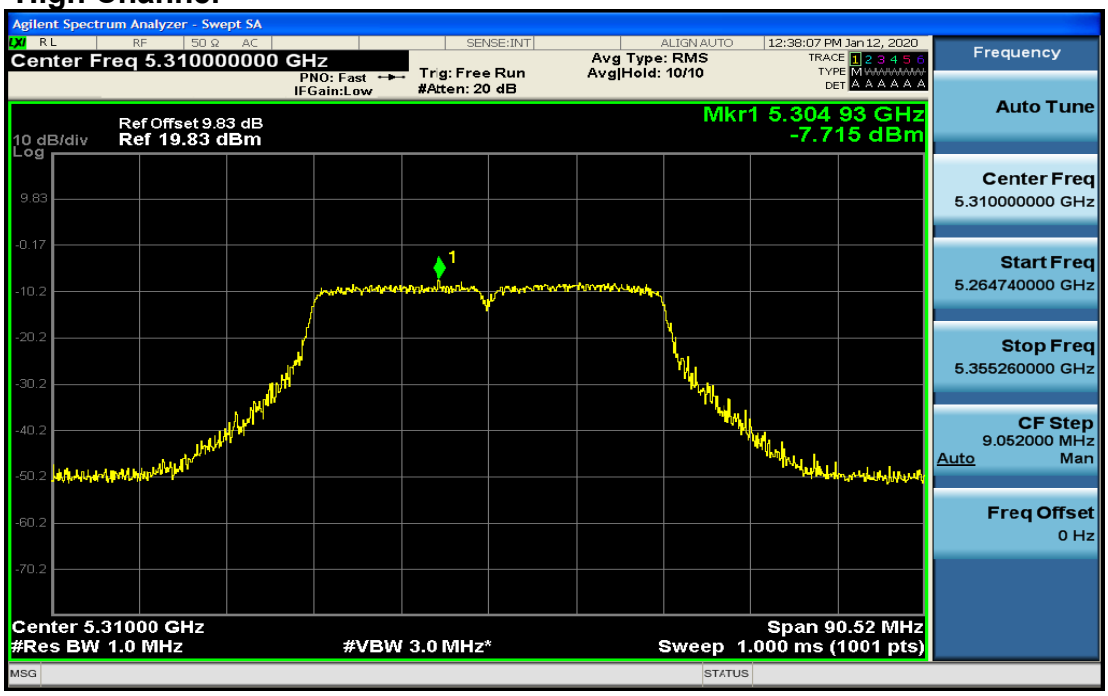


5250~5350MHz

Low Channel



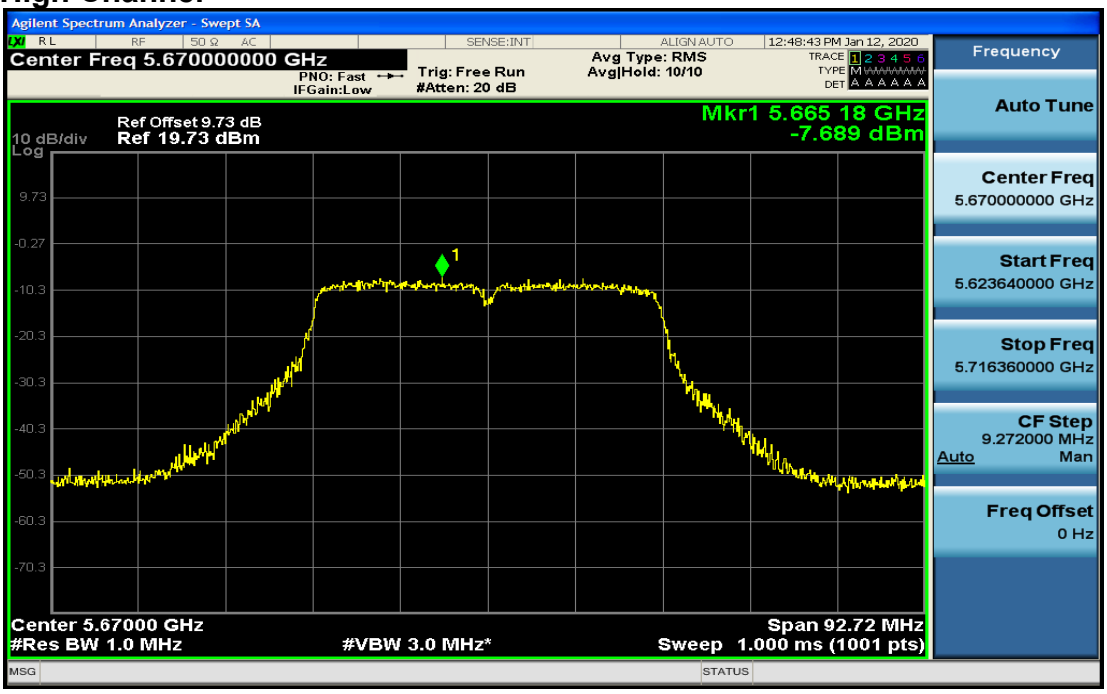
High Channel



5470~5725MHz
Low Channel

Mid Channel

High Channel

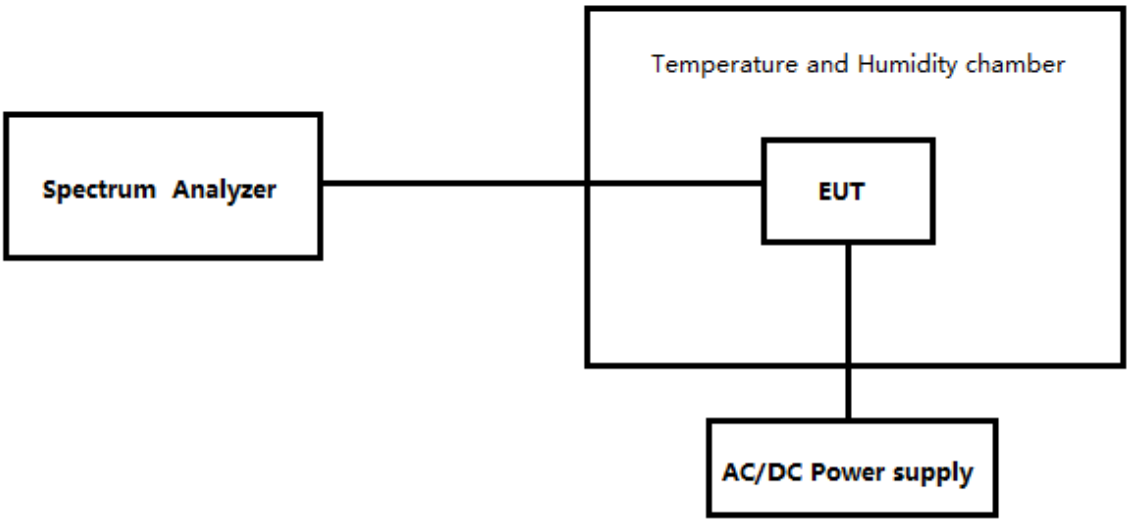


6.6 FREQUENCY STABILITY MEASUREMENT

LIMIT

According to§15.407(g),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.

TESTCONFIGURATION



TESTPROCEDURE

1. To ensure emission at the band edge is main tainted within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, whichissettomaximumholdfunctionandpeakdetector.Thepeakvalueofthepowerenvelopewas measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

TESTRESULTS

Antenna 1

U-NII-1-(5150MHz-5250MHz)					
Freq.(MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
5180	5179.956	-0.044	-8.494	25	V_{min}
5180	5180.016	0.016	3.089	25	V_{max}
5180	5179.986	-0.014	-2.703	25	V_{nor}
5180	5179.988	-0.012	-2.317	-10	V_{nor}
5180	5180.011	0.011	2.124	40	V_{nor}

U-NII-1-(5250MHz-5350MHz)					
Freq.(MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
5260	5259.977	-0.023	-4.373	25	V_{min}
5260	5260.022	0.022	4.183	25	V_{max}
5260	5259.986	-0.014	-2.662	25	V_{nor}
5260	5259.978	-0.022	-4.183	-10	V_{nor}
5260	5260.009	0.009	1.711	40	V_{nor}

U-NII-1-(5470MHz-5725MHz)					
Freq.(MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
5500	5499.978	-0.022	-4.000	25	V_{min}
5500	5500.026	0.026	4.727	25	V_{max}
5500	5499.986	-0.014	-2.545	25	V_{nor}
5500	5499.992	-0.008	-1.455	-10	V_{nor}
5500	5500.018	0.018	3.273	40	V_{nor}

Antenna 2

U-NII-1-(5150MHz-5250MHz)					
Freq.(MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
5180	5179.989	-0.011	-2.124	25	V_{min}
5180	5180.024	0.024	4.633	25	V_{max}
5180	5179.986	-0.014	-2.703	25	V_{nor}
5180	5179.993	-0.007	-1.351	-10	V_{nor}
5180	5179.988	-0.012	-2.317	40	V_{nor}

U-NII-1-(5250MHz-5350MHz)					
Freq.(MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
5260	5260.021	0.021	3.992	25	V_{min}
5260	5260.018	0.018	3.422	25	V_{max}
5260	5259.987	-0.013	-2.471	25	V_{nor}
5260	5259.989	-0.011	-2.091	-10	V_{nor}
5260	5260.007	0.007	1.331	40	V_{nor}

U-NII-1-(5470MHz-5725MHz)					
Freq.(MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
5500	5500.016	0.016	2.909	25	V_{min}
5500	5500.027	0.027	4.909	25	V_{max}
5500	5499.989	-0.011	-2.000	25	V_{nor}
5500	5499.992	-0.008	-1.455	-10	V_{nor}
5500	5500.013	0.013	2.364	40	V_{nor}

6.7 RADIATED UNDESIRABLE EMISSION

LIMIT

Radiated emissions from9 kHz to25 GHz were measured according to the methods defines in ANSI C63.10-2013.The EUT was placed above the ground plane, 0.8 meter for frequency below 1GHzand1.5meterforfrequencyabove1GHz.Theinterfacecablesandequipmentpositionswere varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

1. For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

   For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

   For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRPof -27 dBm/MHz.

2. KDB789033v02r01G)2)c)Asspecifiedin15.407(b),emissionsabove1000MHzthatareoutsideofthe restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3. According to§15.209(a),exceptasprovidedelsewhereinthisSubpart,theemissionsfroman intentionalradiatorshallnotexceedthefieldstrengthlevelsspecifiedinthefollowingtable:

FREQUENCIES(MHz)	FIELDSTRENGTH (microvolt/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

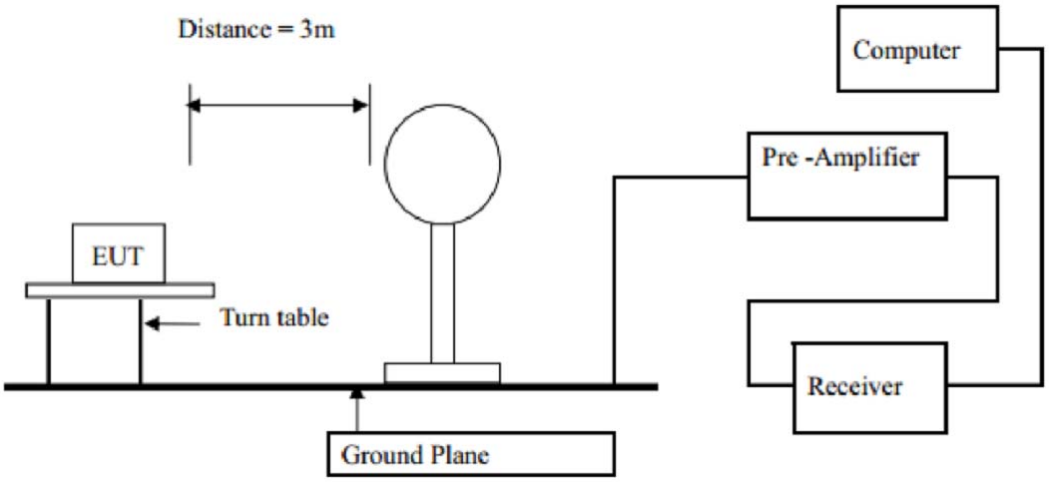
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz.However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231and 15.241.*

4. In the emission table above, the tighter limit applies at the band edges.

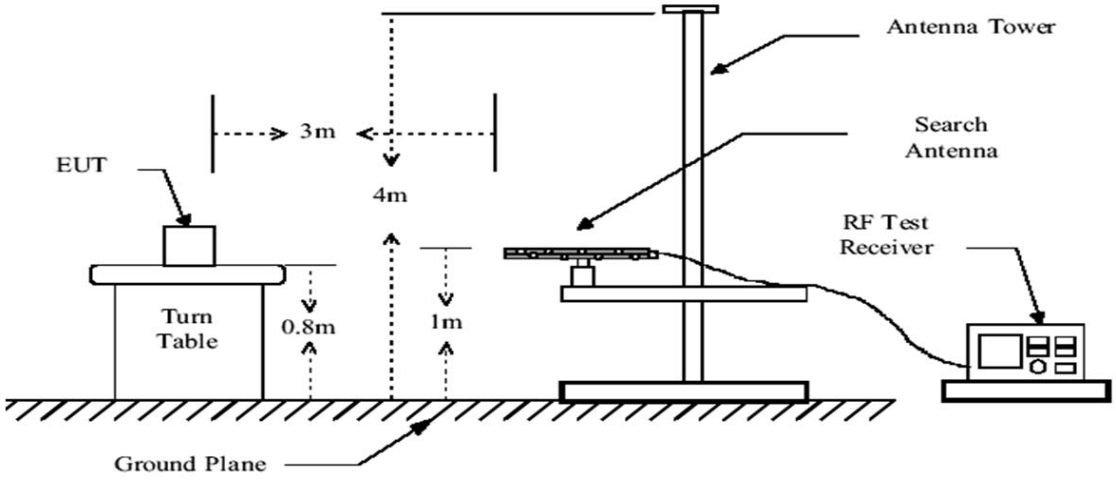
Frequency (MHz)	Field Strength(μV/mat	Field Strength(dBμV/mat
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

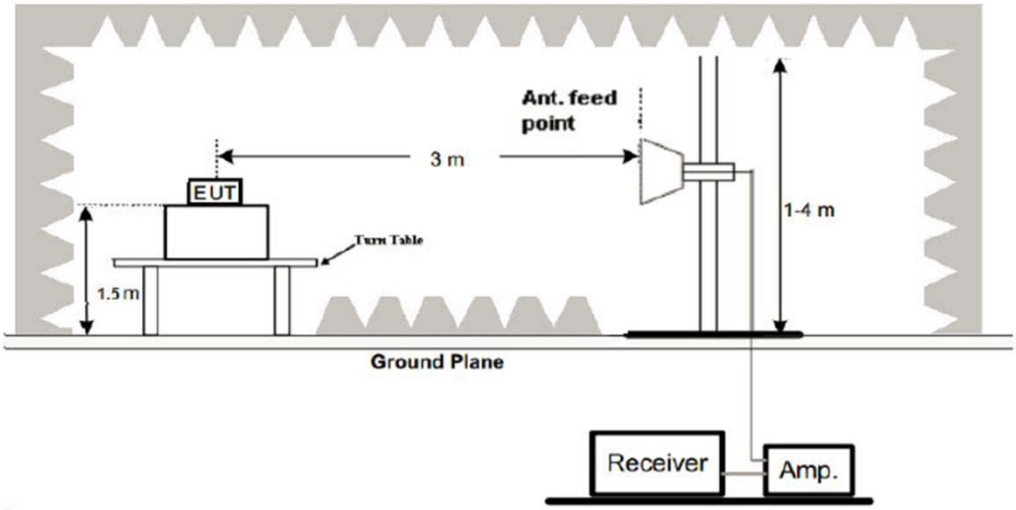
Below 30MHz



Below1GHz



Above 1 GHz



TESTPROCEDURE

1. The EUT is placed on a turntable above ground plane, which is 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz.
2. The turntable shall be rotated for 360degrees to determine the position of maximum emission level.
3. EUTisset3mawayfromthereceivingantenna,whichisvariedfrom1mto4mtofindoutthehighest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz/ VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / Sweep=AUTO

VBW=10Hz,whenduty cycle is no less than 98 percent.

VBW≧1/T, when duty cycle is less than98 percent, where is the minimum transmissiondurationoverwhichthetransmitterisonandistransmittingatitsmaximun power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
IEEE 802.11 a	100	--	--	10Hz
IEEE 802.11n HT20	100	--	--	10Hz
IEEE 802.11n HT40	100			10Hz

7. Repeat above procedures until the measurements for all frequencies are complete.

TES TRESULTS

Test Result of Radiated Emission 30MHz-1GHz
Recorded worst at Tx / IEEE 802.11a mode Low Channel.

Frequency (MHz)	Ant. Pol.(H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit(dBuV/m)	Margin(dB)	Remark
43.91	V	15.63	14.48	30.11	40.00	-9.89	peak
349.55	V	11.47	18.50	29.97	46.00	-16.03	peak
426.63	V	10.62	20.94	31.56	46.00	-14.44	peak
567.35	V	9.81	22.66	32.47	46.00	-13.53	peak
708.36	V	8.45	25.39	33.84	46.00	-12.16	peak
851.82	V	9.36	25.93	35.29	46.00	-10.71	peak
216.61	H	14.34	16.40	30.74	46.00	-9.26	peak
249.37	H	16.66	16.44	33.1	46.00	-12.9	peak
340.73	H	19.27	18.15	37.42	46.00	-8.58	peak
344.96	H	19.35	18.30	37.65	46.00	-8.35	peak
350.52	H	19.78	18.50	38.28	46.00	-7.72	peak
375.54	H	15.19	19.51	34.7	46.00	-11.3	peak

Remark: Measuring frequencies from 30 MHz to the 1GHz.(no emission found from the lowest internal used/generated frequency to 30MHz)

Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.

Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.

Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

Margin (dB)= Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

Note: Below30MHz and above 18GHz.The measured value have enough margin over20dB than the limit, therefore they are not reported.

Above 1 GHz

5150~5250MHz

Operation Mode:	Tx / IEEE 802.11a mode **Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10563.07	39.56	11.21	50.77	74.00	-23.23	100	133	peak
2	15343.51	37.22	12.25	49.47	74.00	-24.53	100	128	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10358.52	42.74	10.19	52.93	74.00	-21.07	100	215	peak
2	14403.37	36.65	16.06	52.71	74.00	-21.29	100	274	peak
N/A									

Operation Mode:	Tx / IEEE 802.11a mode **Mid Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10440.84	41.34	10.64	51.98	74.00	-22.02	100	117	peak
2	16692.42	35.52	17.24	52.76	74.00	-21.24	100	159	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10439.99	42.45	10.64	53.09	74.00	-20.91	100	217	peak
2	14690.67	36.57	16.51	53.08	74.00	-20.92	100	334	peak
N/A									

Operation Mode:	Tx / IEEE 802.11a mode **High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10480.55	40.32	10.86	51.18	74.00	-22.82	100	172	peak
2	14649.98	35.16	16.53	51.69	74.00	-22.31	100	207	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10480.35	42.87	10.86	53.73	74.00	-20.27	100	142	peak
2	16732.64	35.69	17.33	53.02	74.00	-20.98	100	320	peak
N/A									

5250~5350MHz

Operation Mode:	Tx / IEEE 802.11a mode **Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10522.06	40.63	11.05	51.68	74.00	-22.32	100	125	peak
2	14649.01	35.74	16.53	52.27	74.00	-21.73	100	41	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10644.75	39.76	11.53	51.29	74.00	-22.71	100	315	peak
2	15221.01	32.69	13.73	46.42	74.00	-27.58	100	258	peak
N/A									

Operation Mode:	Tx / IEEE 802.11a mode **Mid Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10563.26	42.38	11.21	53.59	74.00	-20.41	100	114	peak
2	14240.81	35.19	15.17	50.36	74.00	-23.64	100	127	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11011.47	38.58	12.89	51.47	74.00	-22.53	100	214	peak
2	13258.76	38.67	14.10	52.77	74.00	-21.23	100	282	peak
N/A									

Operation Mode:	Tx / IEEE 802.11a mode **High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11012.01	37.36	12.89	50.25	74.00	-23.75	100	214	peak
2	16161.36	35.79	13.49	49.28	74.00	-24.72	100	210	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	12402.43	38.68	12.00	50.68	74.00	-23.32	100	152	peak
2	15466.33	35.52	10.77	46.29	74.00	-27.71	100	302	peak
N/A									

5470~5725MHz

Operation Mode:	Tx / IEEE 802.11a mode **Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10522.11	40.89	11.05	51.94	74.00	-22.06	100	118	peak
2	14649.62	36.33	16.53	52.86	74.00	-21.14	100	53	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10644.19	39.39	11.53	50.92	74.00	-23.08	100	304	peak
2	15220.84	32.15	13.73	45.88	74.00	-28.12	100	271	peak
N/A									

Operation Mode:	Tx / IEEE 802.11a mode **Mid Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10562.27	42.63	11.21	53.84	74.00	-20.16	100	105	peak
2	14240.86	34.42	15.17	49.59	74.00	-24.41	100	149	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11014.55	38.54	12.89	51.43	74.00	-22.57	100	152	peak
2	13259.18	39.42	14.10	53.52	74.00	-20.48	100	205	peak
N/A									

Operation Mode:	Tx / IEEE 802.11a mode **High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11022.69	37.69	12.89	50.58	74.00	-23.42	100	214	peak
2	16161.33	35.62	13.49	49.11	74.00	-24.89	100	210	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	12402.45	38.74	12.00	50.74	74.00	-23.26	100	142	peak
2	15465.92	34.59	10.77	45.36	74.00	-28.64	100	239	peak
N/A									

5150~5250MHz

Operation Mode:	TX / IEEE 802.11n HT20mode /**Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10358.23	38.66	10.19	48.85	74.00	-25.15	100	22	peak
2	16448.04	35.78	16.30	52.08	74.00	-21.92	100	272	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10358.01	40.45	10.19	50.64	74.00	-23.36	100	157	peak
2	15875.47	33.63	11.52	45.15	74.00	-28.85	100	71	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT20mode /**Mid Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	9541.105	39.84	7.64	47.48	74.00	-26.52	100	215	peak
2	13831.77	37.74	14.07	51.81	74.00	-22.19	100	128	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10807.33	39.52	12.17	51.69	74.00	-22.31	100	253	peak
2	12402.09	38.48	12.00	50.48	74.00	-23.52	100	181	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT20mode /**High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10603.93	39.58	11.37	50.95	74.00	-23.05	100	215	peak
2	14362.52	35.58	15.83	51.41	74.00	-22.59	100	238	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10726.27	38.47	11.85	50.32	74.00	-23.68	100	100	peak
2	13994.48	37.44	13.87	51.31	74.00	-22.69	100	35	peak
N/A									

5250~5350MHz

Operation Mode:	TX / IEEE 802.11n HT20mode /**Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11134.72	40.53	12.54	53.07	74.00	-20.93	100	10	peak
2	13872.46	37.02	14.02	51.04	74.00	-22.96	100	183	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10971.33	38.42	12.81	51.23	74.00	-22.77	100	63	peak
2	13423.79	36.92	14.36	51.28	74.00	-22.72	100	112	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT20mode /**Mid Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10563.35	41.88	11.21	53.09	74.00	-20.91	100	126	peak
2	16569.87	33.72	16.97	50.69	74.00	-23.31	100	339	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11216.78	39.26	12.31	51.57	74.00	-22.43	100	327	peak
2	13299.61	36.52	14.16	50.68	74.00	-23.32	100	82	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT20mode /**High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10480.67	40.36	10.86	51.22	74.00	-22.78	100	305	peak
2	14689.83	33.48	16.51	49.99	74.00	-24.01	100	25	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10848.02	38.69	12.33	50.89	74.00	-23.11	100	215	peak
2	16938.12	32.87	17.77	50.71	74.00	-23.29	100	328	peak
N/A									

5470~5725MHz

Operation Mode:	TX / IEEE 802.11n HT20mode /**Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11134.66	40.67	12.54	53.21	74.00	-20.79	100	26	peak
2	13871.63	37.59	14.02	51.61	74.00	-22.39	100	128	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10970.66	38.74	12.81	51.55	74.00	-22.45	100	71	peak
2	13424.38	36.36	14.36	50.72	74.00	-23.28	100	149	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT20mode /**Mid Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10562.45	40.53	11.21	51.74	74.00	-22.26	100	148	peak
2	16570.34	33.66	16.97	50.63	74.00	-23.37	100	315	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11217.47	40.16	12.31	52.47	74.00	-21.53	100	352	peak
2	13300.22	37.27	14.16	51.43	74.00	-22.57	100	94	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT20mode /**High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10480.03	40.55	10.86	51.41	74.00	-22.59	100	152	peak
2	14689.61	33.74	16.51	50.25	74.00	-23.75	100	74	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10848.11	38.65	12.33	50.98	74.00	-23.02	100	215	peak
2	16938.48	32.77	17.77	50.54	74.00	-23.46	100	301	peak
N/A									

5150~5250MHz

Operation Mode:	TX / IEEE 802.11n HT40mode /**Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10479.95	42.31	10.86	53.17	74.00	-20.83	100	125	peak
2	15343.71	38.75	12.25	51.00	74.00	-23.00	100	17	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	10562.28	41.89	11.21	53.10	74.00	-20.90	100	242	peak
2	15342.85	36.85	12.25	49.10	74.00	-24.90	100	83	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT40mode /**High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	9214.152	42.89	7.23	50.12	74.00	-	100	205	peak
2	14649.89	36.98	16.53	53.51	74.00	-	100	82	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	9009.025	42.94	6.97	49.91	74.00	-24.09	100	160	peak
2	14689.03	36.47	16.51	52.98	74.00	-21.02	100	43	peak
N/A									

5250~5350MHz

Operation Mode:	TX / IEEE 802.11n HT40mode /**Low Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11256.39	38.42	12.19	50.61	74.00	-23.39	100	295	peak
2	14649.96	33.83	16.53	50.36	74.00	-23.64	100	217	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11133.97	40.22	12.54	52.76	74.00	-21.24	100	77	peak
2	13872.66	37.03	14.02	51.05	74.00	-22.95	100	282	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT40mode /**High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11216.53	40.02	12.31	52.33	74.00	-21.67	100	309	peak
2	17142.68	32.75	18.68	51.43	74.00	-22.57	100	175	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11093.19	38.67	12.66	50.98	74.00	-23.02	100	175	peak
2	13300.83	37.86	14.16	56.54	74.00	-17.46	100	205	peak
N/A									

5470~5725MHz

Operation Mode:	TX / IEEE 802.11n HT40mode /**Low Channel**

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11257.12	39.13	12.19	51.32	74.00	-22.68	100	241	peak
2	14650.75	34.24	16.53	50.77	74.00	-23.23	100	269	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11134.34	40.19	12.54	52.73	74.00	-21.27	100	75	peak
2	13872.82	37.32	14.02	51.34	74.00	-22.66	100	241	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT40mode /**Mid Channel**

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11255.77	37.74	12.19	49.93	74.00	-24.07	100	282	peak
2	14650.67	34.09	16.53	50.62	74.00	-23.38	100	243	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	11134.89	40.62	12.54	53.16	74.00	-20.84	100	77	peak
2	13873.55	36.69	14.02	50.71	74.00	-23.29	100	282	peak
N/A									

Operation Mode:	TX / IEEE 802.11n HT40mode /**High Channel**

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11215.61	40.36	12.31	52.67	74.00	-21.33	100	318	peak
2	17142.57	31.76	18.68	50.44	74.00	-23.56	100	194	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	11092.48	38.65	12.66	51.31	74.00	-22.69	100	175	peak
2	13300.28	38.68	14.16	52.84	74.00	-21.16	100	205	peak
N/A									

Radiated Band Edge Test:
ANT 1
Operation Mode: 802.11a Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.51	-2.49	49.02	74	-24.98	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.22	-2.49	49.73	74	-24.27	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	53.87	-2.49	51.38	74	-22.62	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.11	-2.49	48.62	74	-25.38	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 n40 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.01	-2.49	49.52	74	-24.48	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.79	-2.49	49.3	74	-24.7	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11a Mode with 5.3G TX CH High

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	50.21	-2.49	47.72	74	-26.28	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	51.22	-2.49	48.73	74	-25.27	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.3G TX CH High

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	52.65	-2.49	50.16	74	-23.84	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	52.36	-2.49	49.87	74	-24.13	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 n40 Mode with 5.2G TX CH High

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	52.47	-2.49	49.98	74	-24.02	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	52.24	-2.49	49.75	74	-24.25	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11a Mode with 5.6G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	50.36	-2.49	47.87	74	-26.13	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	51.68	-2.49	49.19	74	-24.81	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	51.66	-2.49	49.17	74	-24.83	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	51.92	-2.49	49.43	74	-24.57	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 n40 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	50.23	-2.49	47.74	74	-26.26	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	51.69	-2.49	49.2	74	-24.8	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

ANT 2
Operation Mode: 802.11a Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.74	-2.49	50.25	74	-23.75	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	52.36	-2.49	49.87	74	-24.13	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.25	-2.49	48.76	74	-25.24	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.59	-2.49	49.1	74	-24.9	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 n40 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.02	-2.49	48.53	74	-25.47	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.35	-2.49	48.86	74	-25.14	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11a Mode with 5.3G TX CH High

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	51.58	-2.49	49.09	74	-24.91	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	51.71	-2.49	49.22	74	-24.78	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.3G TX CH High

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	51.33	-2.49	48.84	74	-25.16	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	52.87	-2.49	50.38	74	-23.62	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 n40 Mode with 5.2G TX CH High

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5150	51.63	-2.49	49.14	74	-24.86	peak
5150	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5350	52.96	-2.49	50.47	74	-23.53	peak
5350	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11a Mode with 5.6G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	51.25	-2.49	48.76	74	-25.24	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	51.47	-2.49	48.98	74	-25.02	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11n20 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	52.58	-2.49	50.09	74	-23.91	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	52.75	-2.49	50.26	74	-23.74	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: 802.11 n40 Mode with 5.2G TX CH Low

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	53.69	-2.49	51.2	74	-22.8	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
5470	54.11	-2.49	51.62	74	-22.38	peak
5470	/	-2.49	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

6.8 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to§15.207(a),except as shown in paragraphs (b) and(c) of this section, for an intentional radiatorthatisdesignedtobeconnectedtothepublicutility(AC)powerline,theradiofrequencyvoltagethatis conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50ohms line impedancestabilizationnetwork(LISN).Compliancewiththeprovisionsofthisparagraphshallbebased on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBμV)	
	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

** Decreases with the logarithm of the frequency.*

TESTCONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TESTPROCEDURE

11. The EUT was placed on a table, which is 0.8m above ground plane.

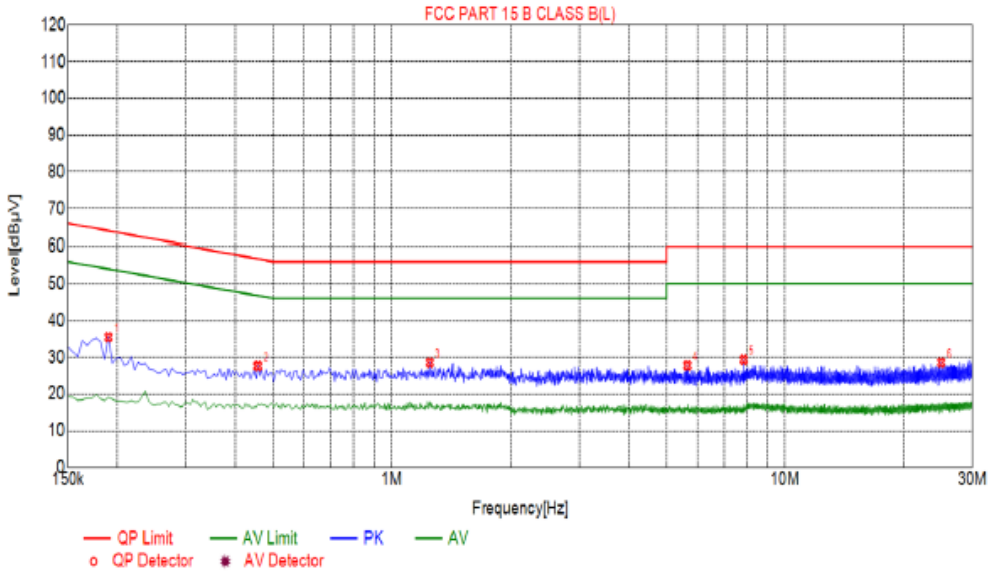
12. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

13. Repeat above procedures until all frequency measured were complete.

TESTRESULTS

Theinitialstepincollectingconducteddataisaspectrumanalyzerpeakscanofthemeasurementrange. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

TestData

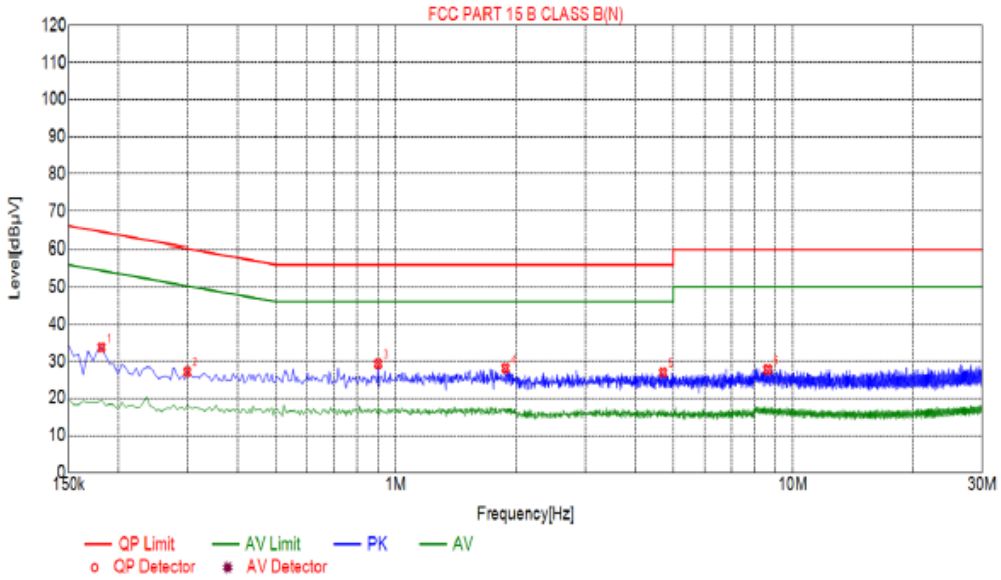


Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1905	35.47	10.04	64.01	28.54	25.43	PK	L
2	0.4560	27.65	10.04	56.77	29.12	17.61	PK	L
3	1.2480	28.56	10.09	56.00	27.44	18.47	PK	L
4	5.6445	27.78	10.25	60.00	32.22	17.53	PK	L
5	7.8495	29.33	10.16	60.00	30.67	19.17	PK	L
6	24.9630	28.58	10.24	60.00	31.42	18.34	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor



Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1815	33.74	10.06	64.42	30.68	23.68	PK	N
2	0.2985	27.15	10.04	60.28	33.13	17.11	PK	N
3	0.9015	29.30	10.06	56.00	26.70	19.24	PK	N
4	1.8915	28.14	10.14	56.00	27.86	18.00	PK	N
5	4.7040	26.99	10.26	56.00	29.01	16.73	PK	N
6	8.6415	27.77	10.12	60.00	32.23	17.65	PK	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

**********END OF REPORT**********