TEST REPORT

of

FCC PART 15 SUBPART E

☒ New Application; ☐ Class I PC; ☐ Class II PC

Product :	**Receiver/Transponder**
Brand:	**Aulisa**
Model:	**GA-RT0001**
Model Difference:	**N/A**
FCC ID:	**2AI5QGA-RT0001**
FCC Rule Part:	**§15.407, Cat:NII**
Applicant:	**Taiwan Aulisa Medical Devices Technologies Inc**
Address:	**10F., No.3-2, YuanQu St., Nangang Dist., Taipei City, Taiwan 115**

Test Performed by:

International Standards Laboratory Corp.
<LT Lab.>
*Site Registration No.
BSMI: SL2-IN-E-0013; MRA TW0997; TAF: 0997; IC: IC4067B-3;
*Address:
No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-19LR055FE**
Issue Date : **2020/01/20**

Testing laboratory
0997

VERIFICATION OF COMPLIANCE

Applicant:	Taiwan Aulisa Medical Devices Technologies Inc
Product Description:	Receiver/Transponder
Brand Name:	Aulisa
Model No.:	GA-RT0001
Model Difference:	N/A
FCC ID:	2AI5QGA-RT0001
Date of test:	2019/02/27 ~ 2020/01/17
Date of EUT Received:	2019/02/27

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory Corp.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:	Barry Lee	***Date:***	2020/01/20
	Barry Lee / Senior Engineer		
Prepared By:	Gigi yeh	***Date:***	2020/01/20
	Gigi Yeh / Senior Engineer		
Approved By:	Jerry Liu	***Date:***	2020/01/20
	Jerry Liu / Technical Manager		

Version

Version No.	Date	Description
00	2020/01/20	Initial creation of document

Uncertainty of Measurement

Description Of Test	Uncertainty
Conducted Emission (AC power line)	2.586 dB
Field Strength of Spurious Radiation	≤ 30MHz: 2.96dB 30-1GHz: 4.22 dB 1-40 GHz: 4.08 dB
Conducted Power	2.412 GHz: 1.30 dB 5.805 GHz: 1.55 dB
Power Density	2.412 GHz:1.30 dB 5.805 GHz: 1.67 dB
Frequency	0.0032%
Time	0.01%
DC Voltage	1%

Table of Contents

1. General Information

1.1. Product Description

General:

Product Name	Receiver/Transponder	
Brand Name	Aulisa	
Model Name	GA-RT0001	
Model Difference	N/A	
USB port	One provided for Data link	
Power Supply	5Vdc from Adapter	
	Adapter: Asian Power	Model: MPU12A-102

WLAN

Wi-Fi	Frequency Range (MHz)	Channels	Peak / Average Rated Power	Modulation Technology
802.11b	2412 – 2462(DTS)	11	16.79Bm (PK)	OFDM
802.11g	2412 – 2462(DTS)	11	16.42dBm (PK)	
802.11n (2.4G)	HT20 2412 – 2462(DTS)	11	16.22dBm (PK)	
	HT40 2422 – 2452(DTS)	7	15.79dBm (PK)	
802.11a	5150 – 5350(NII)	8	11.91dBm (AV)	
	5470 – 5725(NII)	11	13.67dBm(AV)	
	5725 – 5850(NII)	5	13.27dBm (AV)	
802.11n	HT20 5150 – 5350(NII)	8	11.75dBm (AV)	
	HT20 5470 – 5725(NII)	11	13.43dBm(AV)	
	HT20 5725 – 5850(NII)	5	13.36dBm (AV)	
	HT40 5150 – 5350(NII)	4	11.55dBm (AV)	
	HT40 5470 – 5725(NII)	5	11.75dBm (AV)	
	HT40 5725 – 5850(NII)	2	12.65dBm (AV)	
802.11 ac	VHT80 5150 – 5350(NII)	2	9.59dBm (AV)	
	VHT80 5470 – 5725(NII)	2	8.70dBm (AV)	
	VHT80 5725 – 5850(NII)	1	11.07dBm (AV)	
Modulation type		CCK, DQPSK, DBPSK for DSSS 256QAM.64QAM. 16QAM, QPSK, BPSK for OFDM		
Antenna Designation		PIFA Antenna WiFi 5G Antenna : 3.8dBi According to KDB662911 D01 SM-MIMO signals could be considered uncorrelated for purposes of directional gain computation. Directional gain = G_{ANT}		

The EUT is compliance with IEEE 802.11 a/n/ac Standard.
This report applies for Wifi frequency band5150 MHz– 5350 MHz, 5470MHz – 5725MHz, 5725 MHz– 5850 MHz

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AI5QGA-RT0001** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

KDB Document: 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC 14-30 Revision UNII

594280 D02 U-NII Device Security v01r03

1.4. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of International Standards Laboratory Corp. <LT Lab.> No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10: 2013. FCC Registration Number is: 487532; Designation Number is: TW0997.

1.5. Special Accessories

Not available for this EUT intended for grant.

1.6. Equipment Modifications

Not available for this EUT intended for grant.

2. System Test Configuration

2.1. EUT Configuration

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

2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 6 of ANSI C63.10: 2013. Con-ducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR 16-1-1 Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on a turntable which is 0.8 m/1.5m (Frequency above 1GHz) above the ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. The 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. To find out the maximum emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 6, 11 and 12 of ANSI C63.10: 2013.

2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

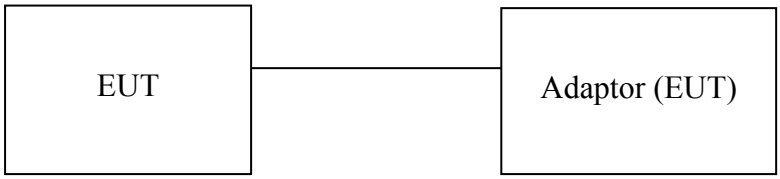


Table 1-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Adapter	Asian Power	MPU12A-102	NA	Non-Shielding	Non-Shielding

2.5. Duty Cycle

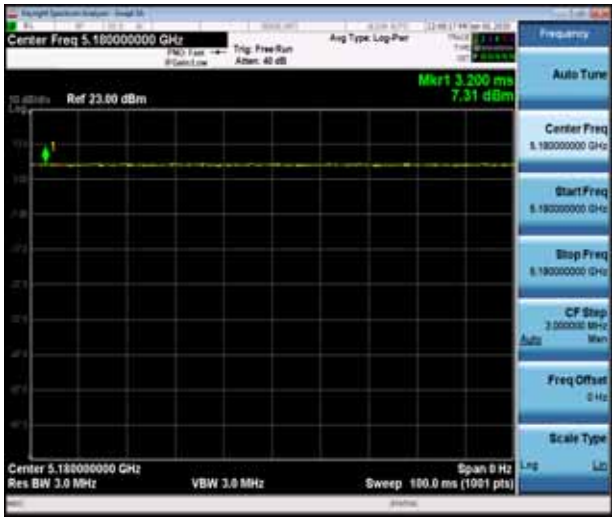
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

If duty cycle of test signal is < 98 %, duty factor shall be considered.

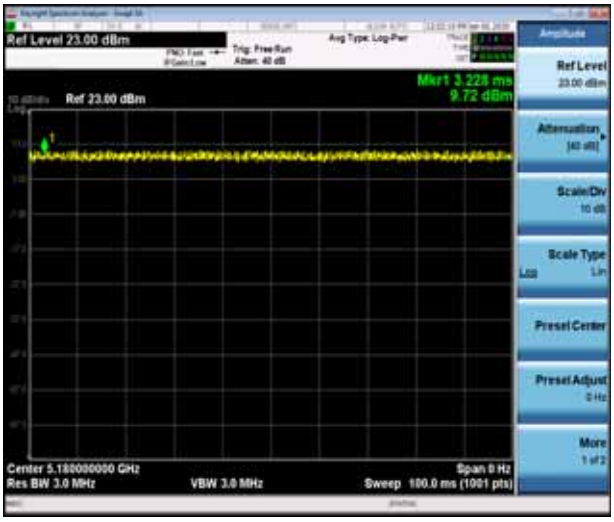
The output power = measured power + duty factor.

Mode	ON time	Total time	Duty Cycle	Duty Factor	VBW for average detector (≥ $1/T_{on}$)
802.11 a	3.200	100m see	0.99	0	10Hz
802.11n HT20	3.228	100m see	0.99	0	10Hz
802.11n HT40	3.223	100m see	0.99	0	10Hz
802.11ac VHT80	0.500	100m see	0.99	0	10Hz

802.11a

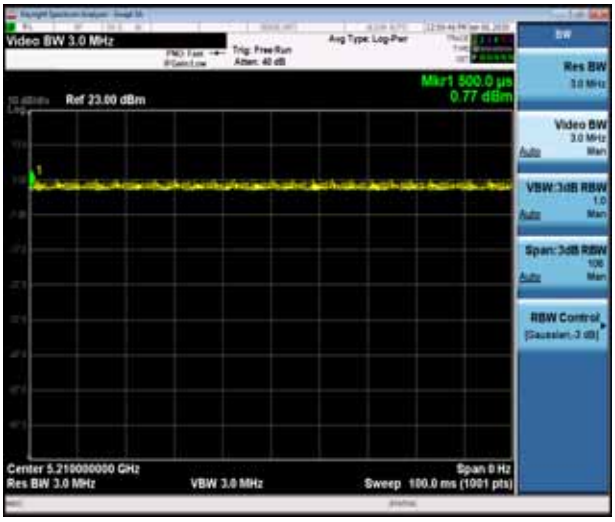


802.11n HT20



802.11n HT40

802.11ac VHT80



3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.407(a)(2)	Output Power/ EIRP/ Spectral Density Measurement	Compliant
§15.407(a)	26dB Emission Bandwidth	Compliant
§15.407(e)	6dB Emission Bandwidth	Compliant
§15.407(b)	Undesirable Emission – Radiated Measurement	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(a)	Antenna Requirement	Compliant
§15.407(d)	TPC and DFS Measurement	Compliant
§15.407(i)	Device Security	Compliant

4. Description of Test Modes

The EUT has been tested under operating condition.
Test program used to control the EUT for staying in continuous transmitting mode is programmed.

5150MHz-5350MHz:

802.11a mode: Channel low (5180MHz), mid (5260MHz) and high (5320MHz) with 6Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT20: Channel low (5180MHz), mid (5260MHz) and high (5320MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT40: Channel low (5190MHz), mid (5230MHz) and high (5310MHz) with 13.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 ac VHT80: Channel low (5210MHz) and high (5290MHz) with 13.5Mbps lowest data rate is chosen for pre-test testing of radiated emissions.

5470MHz-5725MHz:

802.11a mode: Channel low (5500MHz), mid (5600MHz) and high (5700MHz) with 6Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT20: Channel low (5500MHz), mid (5600MHz) and high (5700MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT40: Channel low (5510MHz), mid (5550MHz) and high (5670MHz) with 13.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 ac VHT80: Channel low (5530MHz) and high (5610MHz) with 13.5Mbps lowest data rate is chosen for pre-test testing of radiated emissions.

5725MHz-5850MHz:

802.11a mode: Channel low (5745MHz), mid (5785MHz) and high (5825MHz) with 6Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT20: Channel low (5745MHz), mid (5785MHz) and high (5825MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT40: Channel low (5755MHz) and high (5795MHz) with 13.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 ac VHT80: Channel (5775MHz) with 13.5Mbps lowest data rate is chosen for pre-test testing of radiated emissions.

5. Conduced Emission Test

5.1. Standard Applicable

According to §15.207, frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

5.2. Measurement Equipment Used:

Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction 02	LISN 26	R&S	ENV216	102378	11/21/2019	11/21/2020
Conduction 02	LISN 20	R&S	ENV216	101477	07/31/2019	07/31/2020
Conduction 02	Conduction 02-1 Cable	WOKEN	CFD 300-NL	Conduction 02 -1	09/11/2019	09/11/2020
Conduction 02	EMI Receiver 14	ROHDE& SCHWARZ	ESCI	101034	05/31/2019	05/31/2020
Conduction 02	ISN T8 10	Teseq GmbH	ISN T800	42773	08/02/2019	08/02/2020
Conduction 02	Capacitive Voltage Probe	FCC	F-CVP-1	68	02/19/2019	02/19/2020
Conduction 02	Current Probe	SCHAFFNER	SMZ 11	18030	02/19/2019	02/19/2020

5.3. EUT Setup:

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

5.4. Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

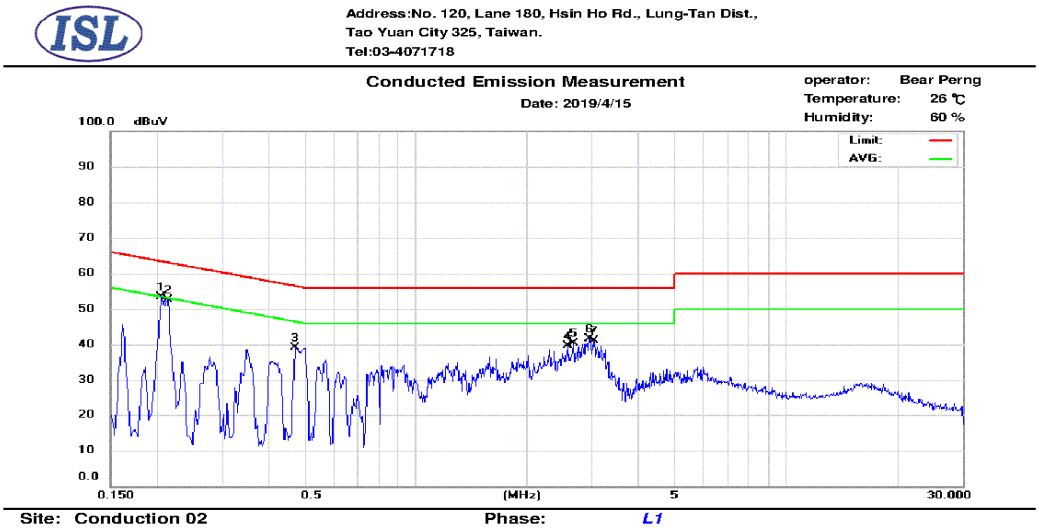
5.5. Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

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

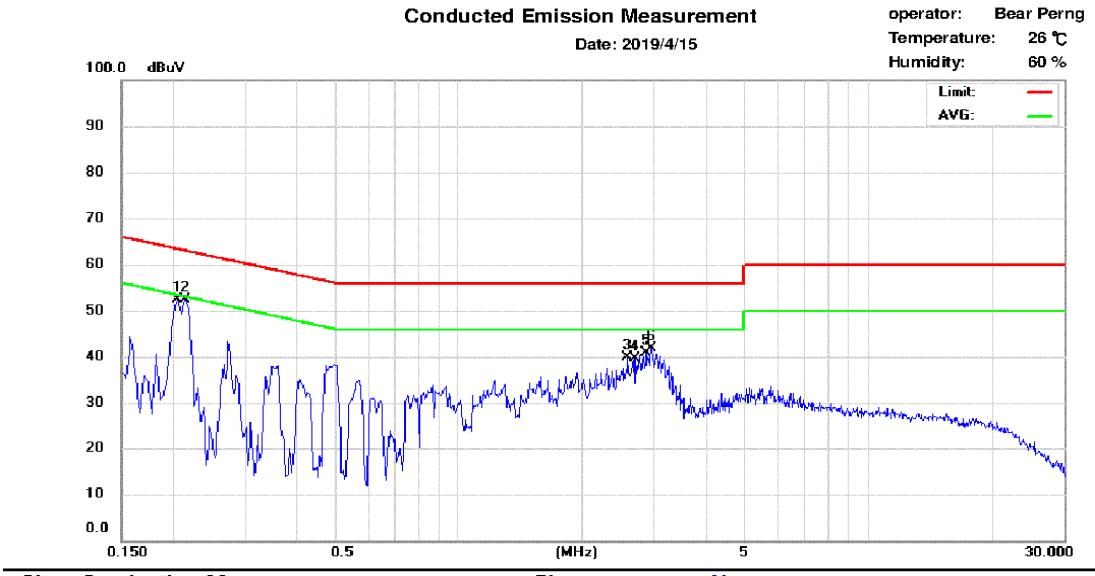
AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Normal Operation



No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.206	41.15	28.85	9.62	50.77	63.37	-12.60	38.47	53.37	-14.90
2	0.214	40.59	27.57	9.62	50.21	63.05	-12.84	37.19	53.05	-15.86
3	0.474	28.96	17.68	9.63	38.59	56.44	-17.85	27.31	46.44	-19.13
4	2.566	26.10	18.64	9.70	35.80	56.00	-20.20	28.34	46.00	-17.66
5	2.666	27.14	18.15	9.70	36.84	56.00	-19.16	27.85	46.00	-18.15
6	2.954	28.93	20.14	9.71	38.64	56.00	-17.36	29.85	46.00	-16.15
7	3.026	27.33	20.28	9.72	37.05	56.00	-18.95	30.00	46.00	-16.00

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718



Site: Conduction 02 Phase: *N*

No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.206	40.79	28.76	9.64	50.43	63.37	-12.94	38.40	53.37	-14.97
2	0.214	40.32	27.27	9.64	49.96	63.05	-13.09	36.91	53.05	-16.14
3	2.594	25.81	17.52	9.72	35.53	56.00	-20.47	27.24	46.00	-18.76
4	2.698	26.03	18.00	9.72	35.75	56.00	-20.25	27.72	46.00	-18.28
5	2.882	27.37	19.60	9.73	37.10	56.00	-18.90	29.33	46.00	-16.67
6	2.954	27.86	19.66	9.73	37.59	56.00	-18.41	29.39	46.00	-16.61

6. OUTPUT POWER / EIRP /SPECTRAL DENSITY MEASUREMENT

6.1. Standard Applicable

According to §15.407(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(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 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBiare used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2. Measurement Procedure

For Output Power

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

For Power Spectral Density

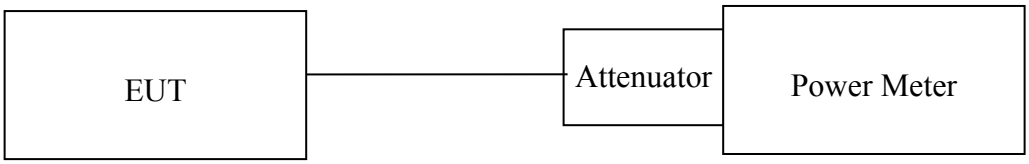
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
3. Set RBW=1MHz,VBW=3MHz, Span=50MHz (Base Mode), Sweep time = Auto, traces 100 sweeps of video averaging for 5150-5725MHz;
4. Set RBW=500kHz,VBW=1.5MHz, Span=60MHz (Base Mode), Sweep time = Auto, traces 100 sweeps of video averaging for 5725-5850MHz;
5. Record the max. reading.
6. Repeat above procedures until all frequency measured were complete.

Refer to section E3 of KDB Document: KDB 789033 D02 General UNII Test Procedures New Rules v02r01

6.3. Measurement Equipment Used:

Location Conducted	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conducted	Power Meter	Anritsu	ML2495A	1116010	10/04/2019	10/04/2020
Conducted	Power Sensor	Anritsu	MA2411B	34NKF50	10/04/2019	10/04/2020
Conducted	Power Sensor	DARE	RPR3006W	13I00030SNO33	01/11/2019	01/11/2020
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO35	06/27/2019	06/27/2020
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO36	06/27/2019	06/27/2020
Conducted	Temperature Chamber	KSON	THS-B4H100	2287	02/19/2019	02/19/2020
Conducted	DC Power supply	ABM	8185D	N/A	01/10/2019	01/10/2020
Conducted	AC Power supply	EXTECH	CFC105W	NA	N/A	N/A
Conducted	Spectrum analyzer	Keysight	N9010A	MY56070257	10/05/2019	10/05/2020
Conducted	Spectrum analyzer	R&S	FSP40	100116	01/10/2019	01/10/2020
Conducted	Test Software	DARE	Radiation Ver:2013.1.23	NA	NA	NA
Conducted	Test Software	R&S	CMUGO Ver:2.0.0	N/A	N/A	N/A
Conducted	Radio Communication Analyzer	R&S	CMU200	111968	10/29/2019	10/29/2020
Conducted	Radio Communication Analyzer	R&S	CMW500	1201.002K50108 793-JG	10/11/2019	10/11/2020
Conducted	BT Simulator	Agilent	N4010A	MY48100200	NA	NA
Conducted	GPS Simulator	Welnavigate	GS-50	701523	NA	NA

6.4. Measurement Equipment Used:



6.5. Measurement Result

According to §15.407(a)

(iii) For fixed point-to-point access points, Power limit is 1W.

802.11a

Mode	Channel	power (dBm)	limit(dBm)	result
802.11a	5180	11.91	23.97	pass
	5260	11.49	23.97	pass
	5320	11.37	23.97	pass
	5500	10.11	23.97	pass
	5600	11.06	23.97	pass
	5700	13.67	23.97	pass
	5745	13.06	30	pass
	5785	13.27	30	pass
	5825	13.09	30	pass

802.11n HT20

Mode	Channel	power (dBm)	limit(dBm)	result
802.11n HT20	5180	11.75	23.97	pass
	5260	10.85	23.97	pass
	5320	11.16	23.97	pass
	5500	10.15	23.97	pass
	5600	10.84	23.97	pass
	5700	13.43	23.97	pass
	5745	13.35	30	pass
	5785	13.36	30	pass
	5825	13.16	30	pass

802.11n HT40

Mode	Channel	power (dBm)	limit(dBm)	result
802.11n HT40	5190	11.17	23.97	pass
	5230	11.55	23.97	pass
	5310	9.93	23.97	pass
	5510	9.17	23.97	pass
	5590	10.05	23.97	pass
	5670	11.75	23.97	pass
	5755	12.3	30	pass
	5815	12.65	30	pass

802.11AC HT80

Mode	Channel	power (dBm)	limit(dBm)	result
802.11AC HT80	5210	9.59	23.97	pass
	5290	8.91	23.97	pass
	5530	8.44	23.97	pass
	5610	8.7	23.97	pass
	5775	11.07	30	pass

Power Spectral Density Measurement:

802.11a Mode

Frequency MHz	RF Power Density Reading (dBm/MHz)	Maximum Limit (dBm/MHz)
5180	3.616	11
5260	3.662	11
5320	4.278	11
5500	5.301	11
5600	5.672	11
5700	7.497	11
Frequency MHz	**RF Power Density Reading (dBm/500KHz)**	**Maximum Limit (dBm/500KHz)**
5745	6.444	30
5785	5.774	30
5825	5.883	30

802.11n HT20

Frequency MHz	RF Power Density Reading (dBm/MHz)	Maximum Limit (dBm/MHz)
5180	6.474	11
5260	6.035	11
5320	6.496	11
5500	4.611	11
5600	7.057	11
5700	6.600	11
Frequency MHz	**RF Power Density Reading (dBm/500KHz)**	**Maximum Limit (dBm/500KHz)**
5745	7.775	30
5785	8.552	30
5825	8.579	30

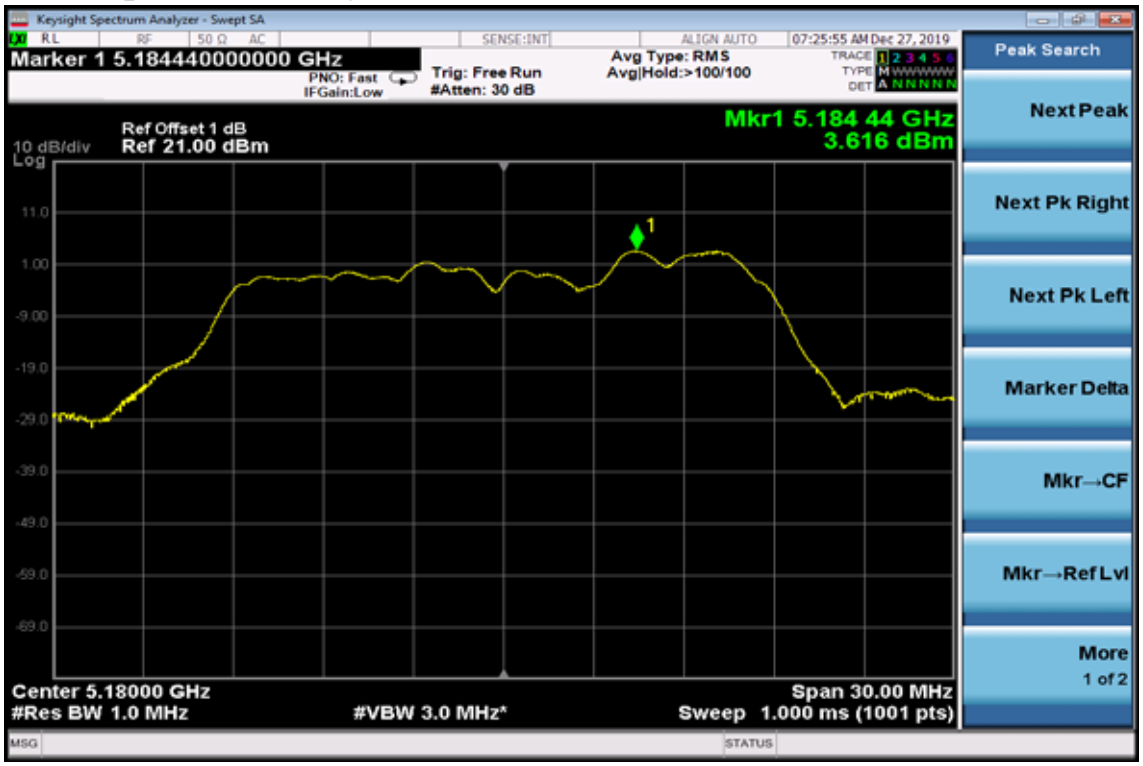
802.11n HT40 Mode

Frequency MHz	RF Power Density Reading (dBm/MHz)	Maximum Limit (dBm/MHz)
5190	2.447	11
5230	2.670	11
5310	1.983	11
5510	1.948	11
5590	2.805	11
5670	4.218	11
Frequency MHz	**RF Power Density Reading (dBm/500KHz)**	**Maximum Limit (dBm/500KHz)**
5755	3.803	30
5795	3.871	30

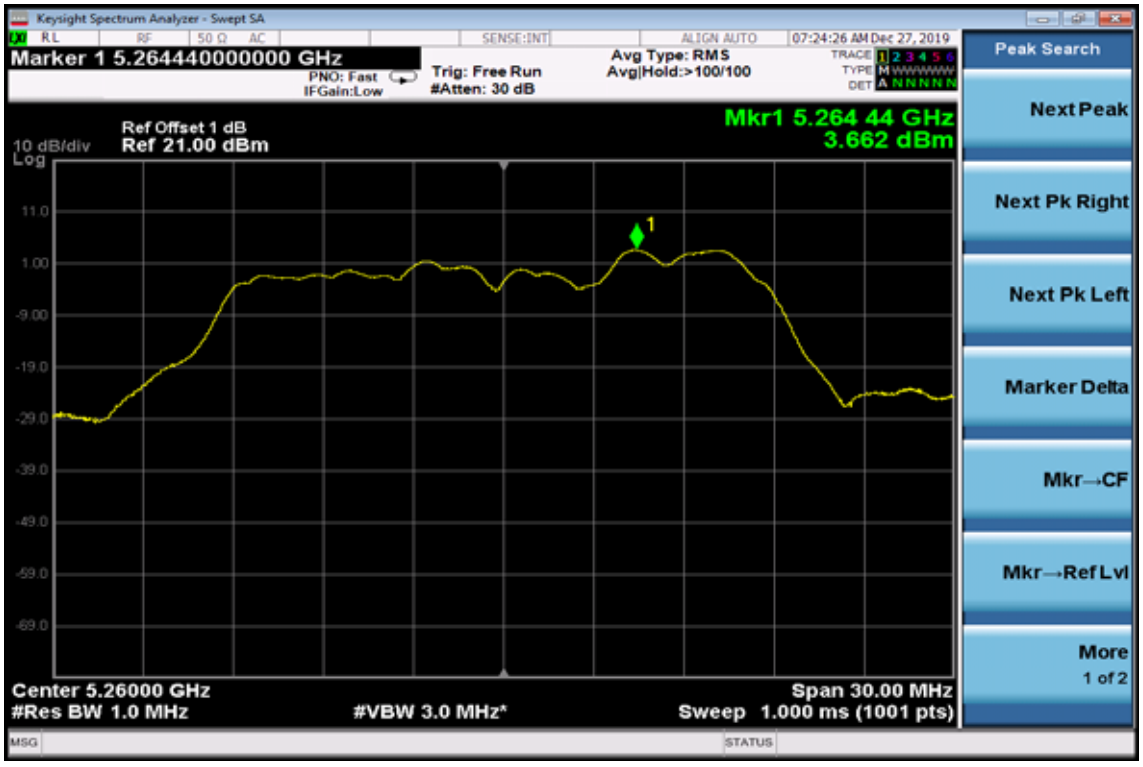
802.11AC HT80 Mode

Frequency MHz	RF Power Density Reading (dBm/MHz)	Maximum Limit (dBm/MHz)
5210	-1.127	11
5290	-2.564	11
5530	-1.370	11
5610	-1.576	11
Frequency MHz	**RF Power Density Reading (dBm/500KHz)**	**Maximum Limit (dBm/500KHz)**
5775	-0.614	30

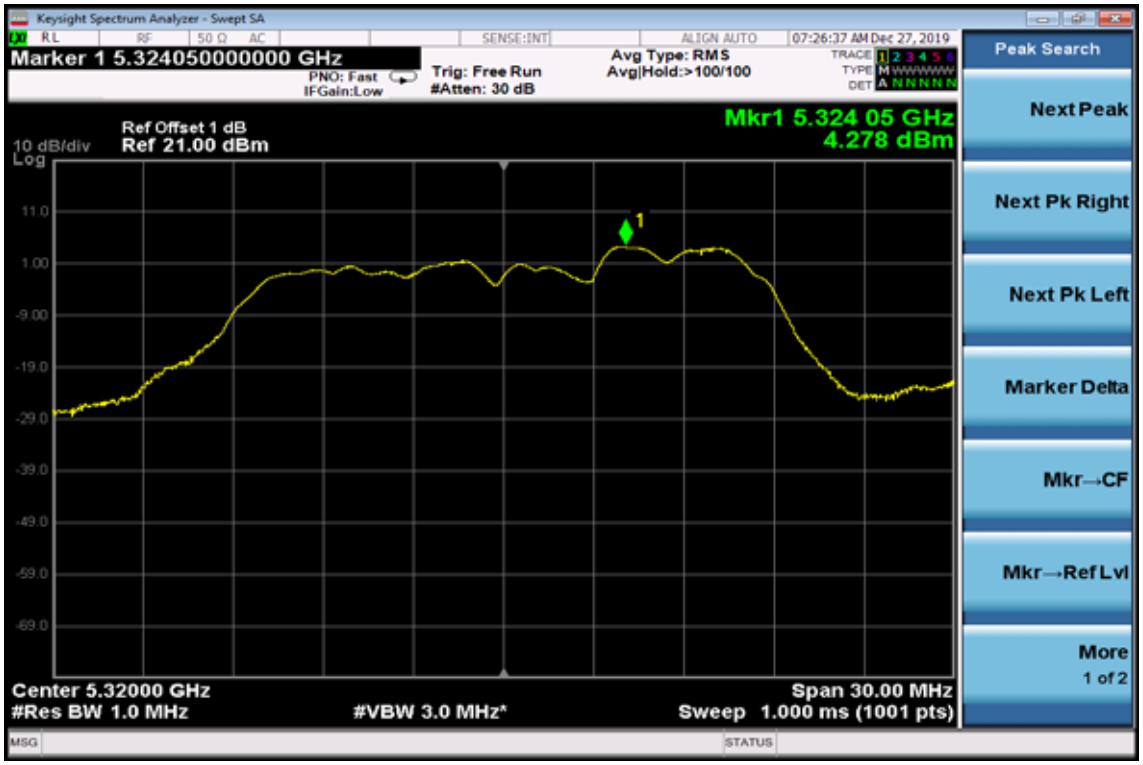
Band UNII-1/ Band UNII-2A
802.11a
Power Spectral Density Data Plot (CH Low)



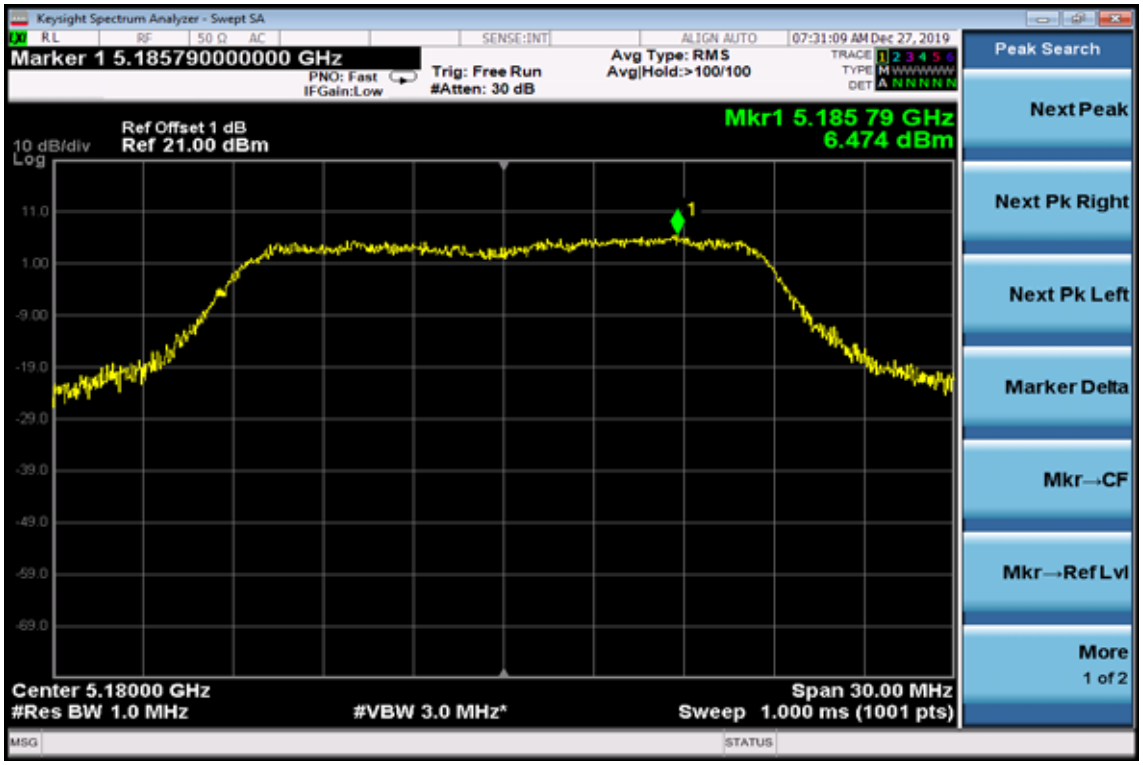
Power Spectral Density Data Plot (CH Mid)



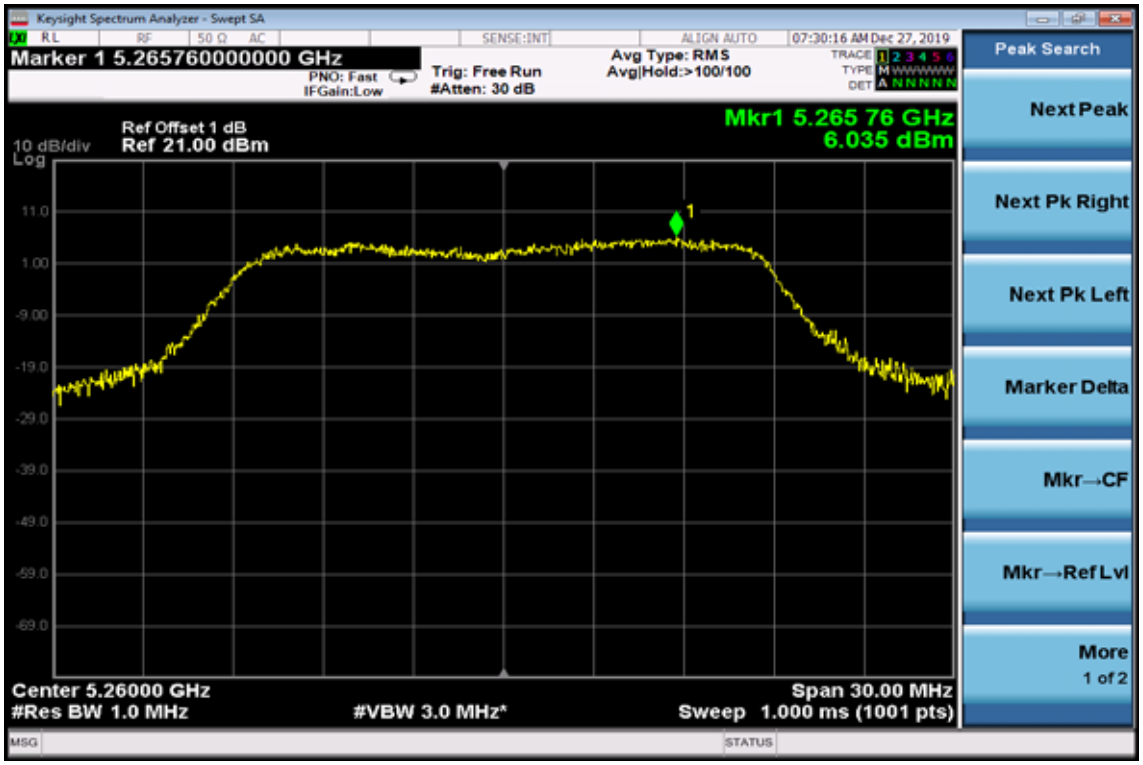
Power Spectral Density Data Plot (CH High)



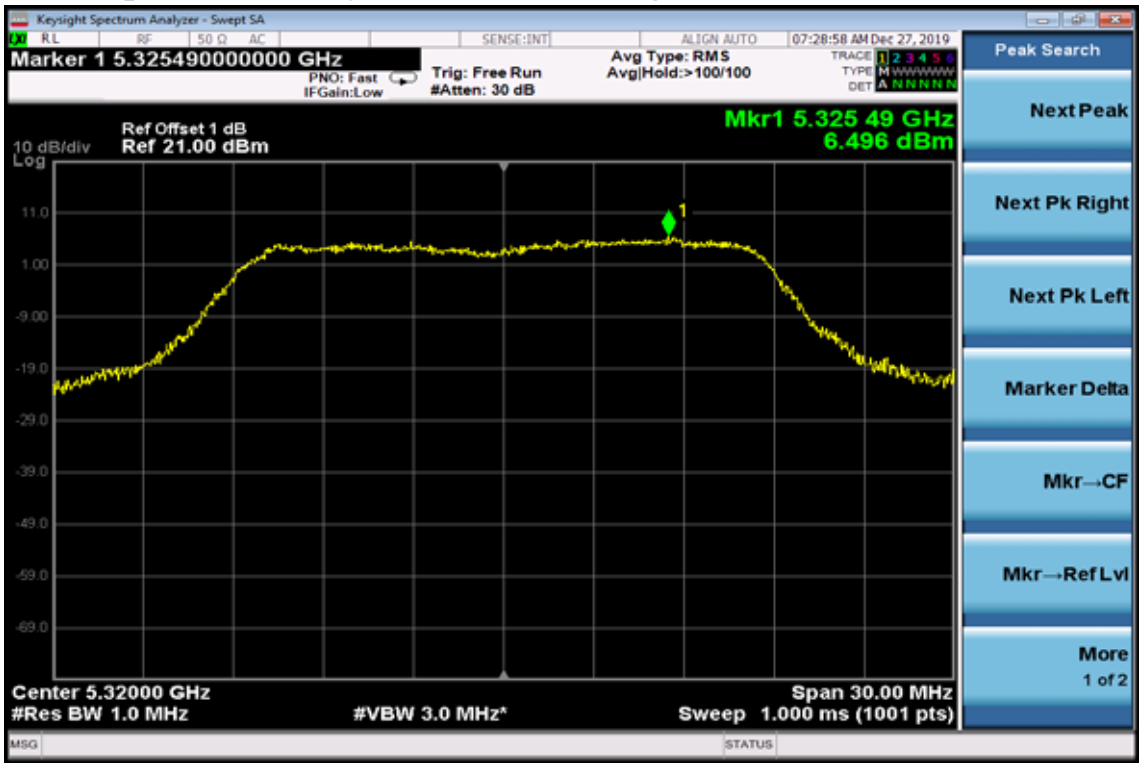
802.11n HT20,
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

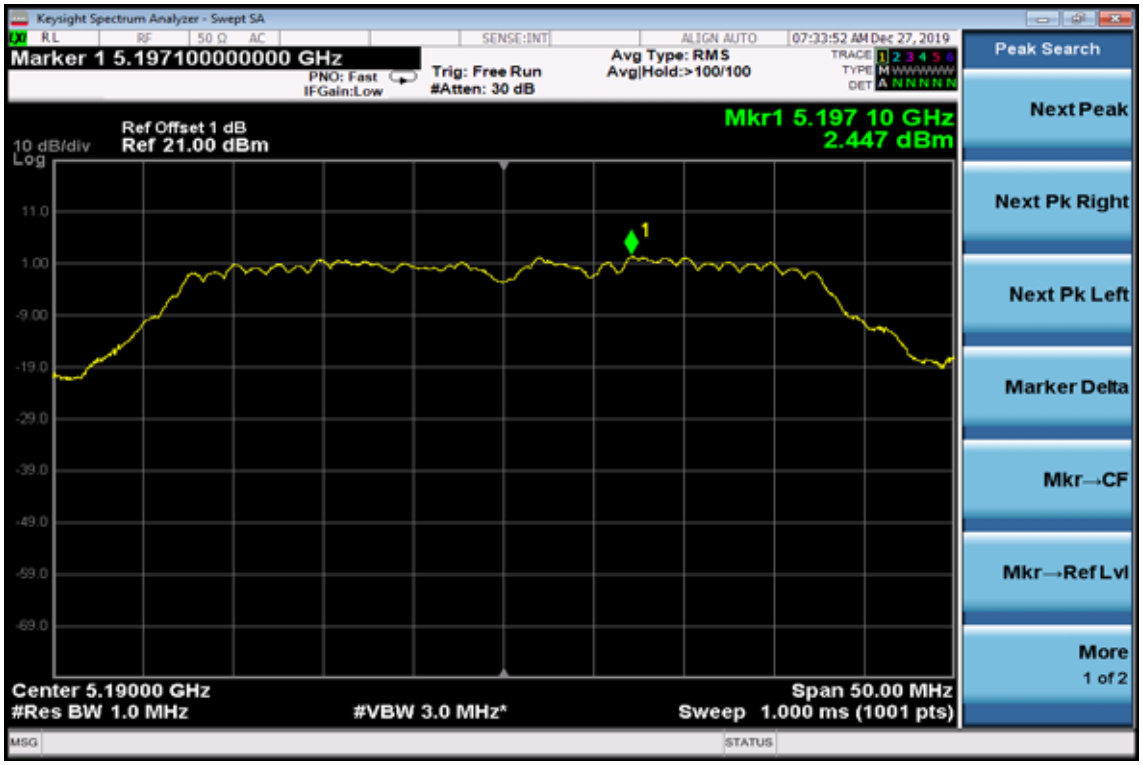


Power Spectral Density Test Plot (CH-High)

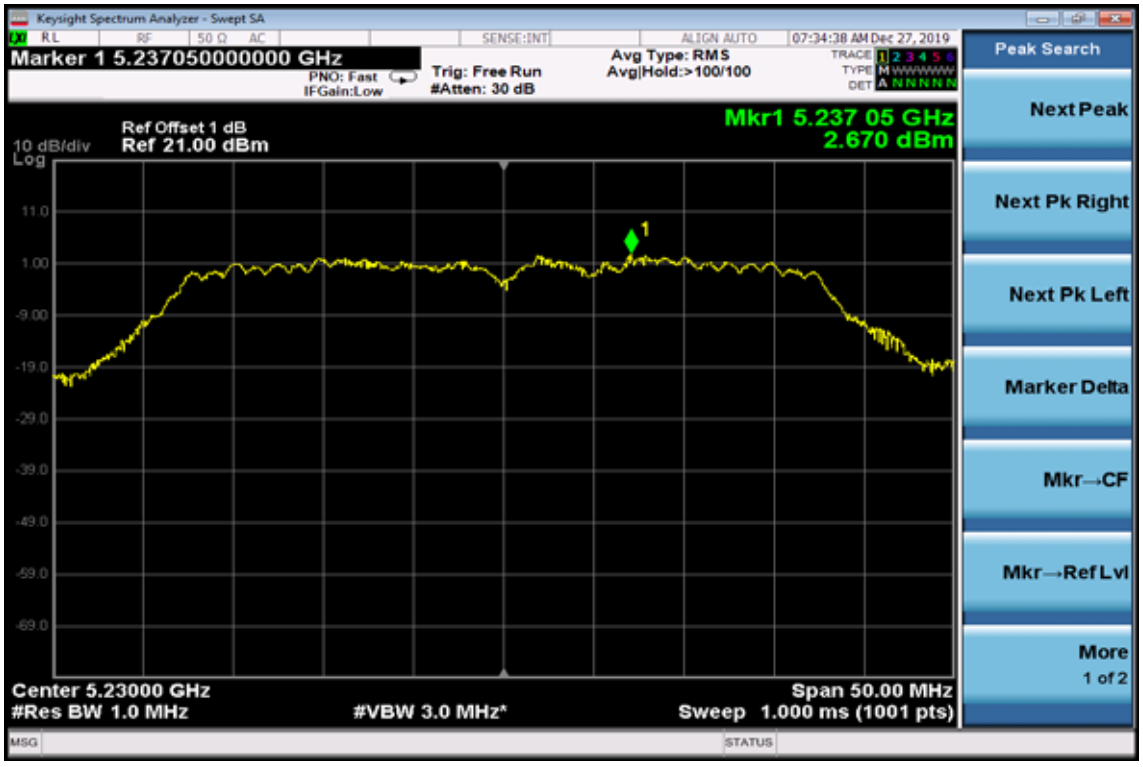


802.11n HT40

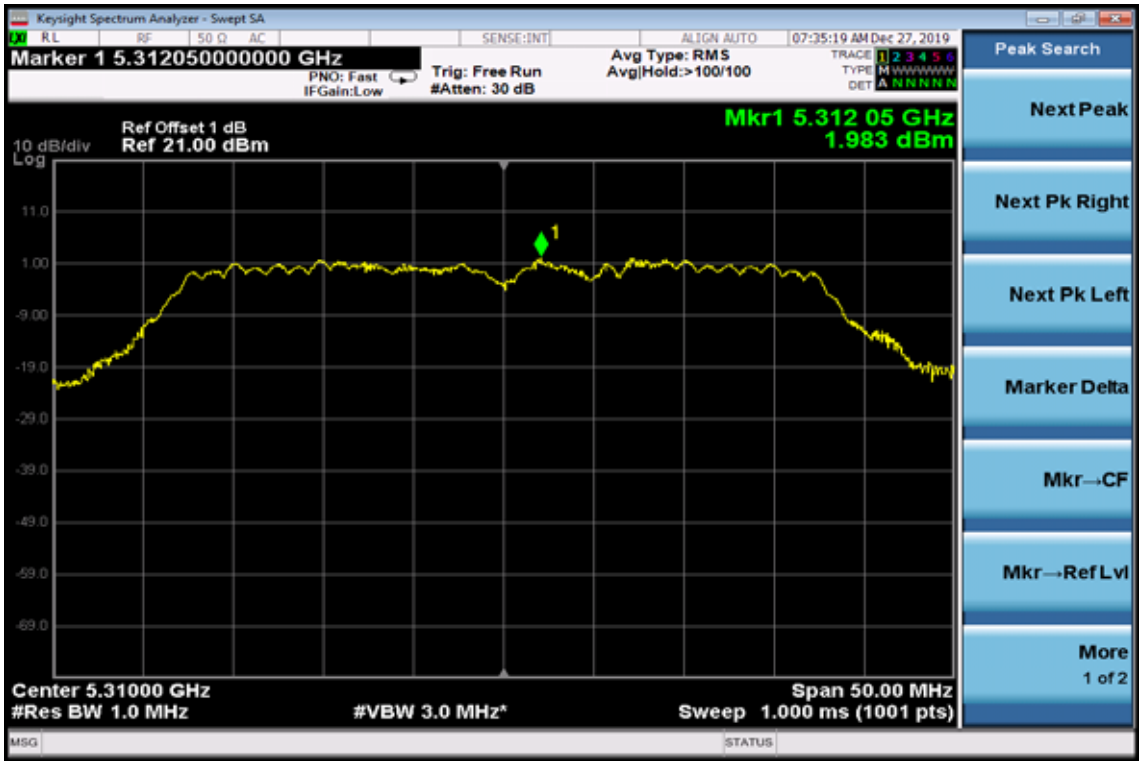
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

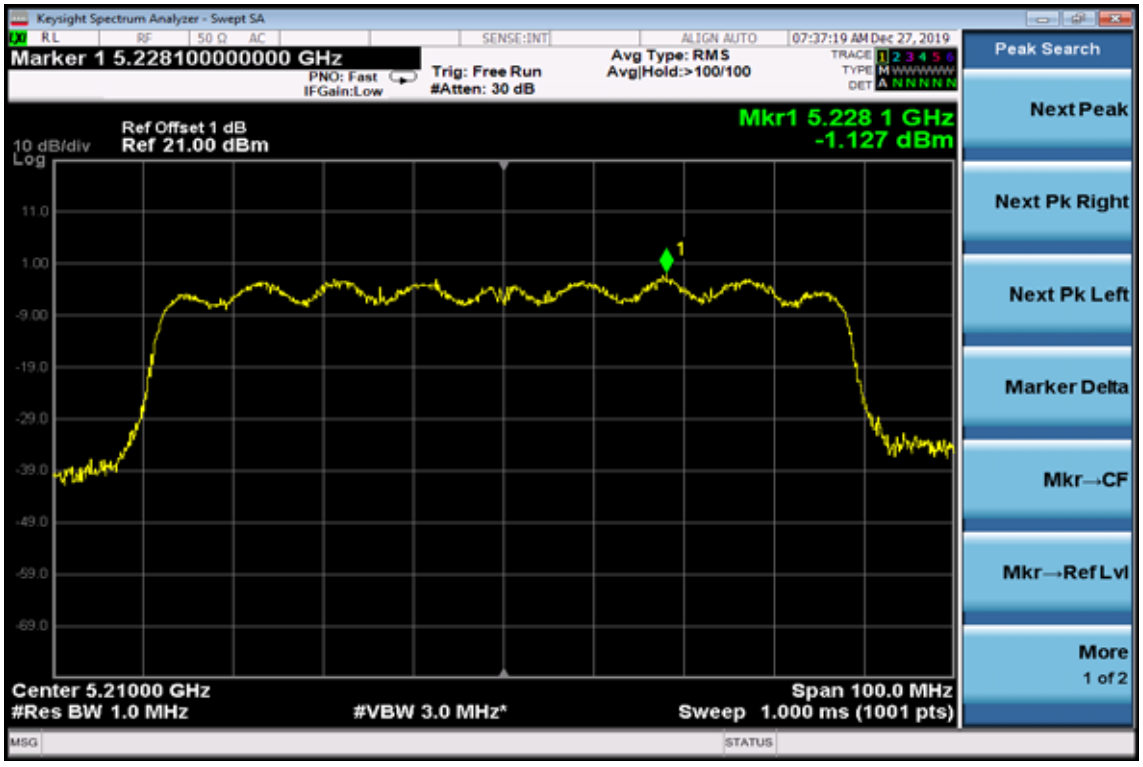


Power Spectral Density Test Plot (CH-High)



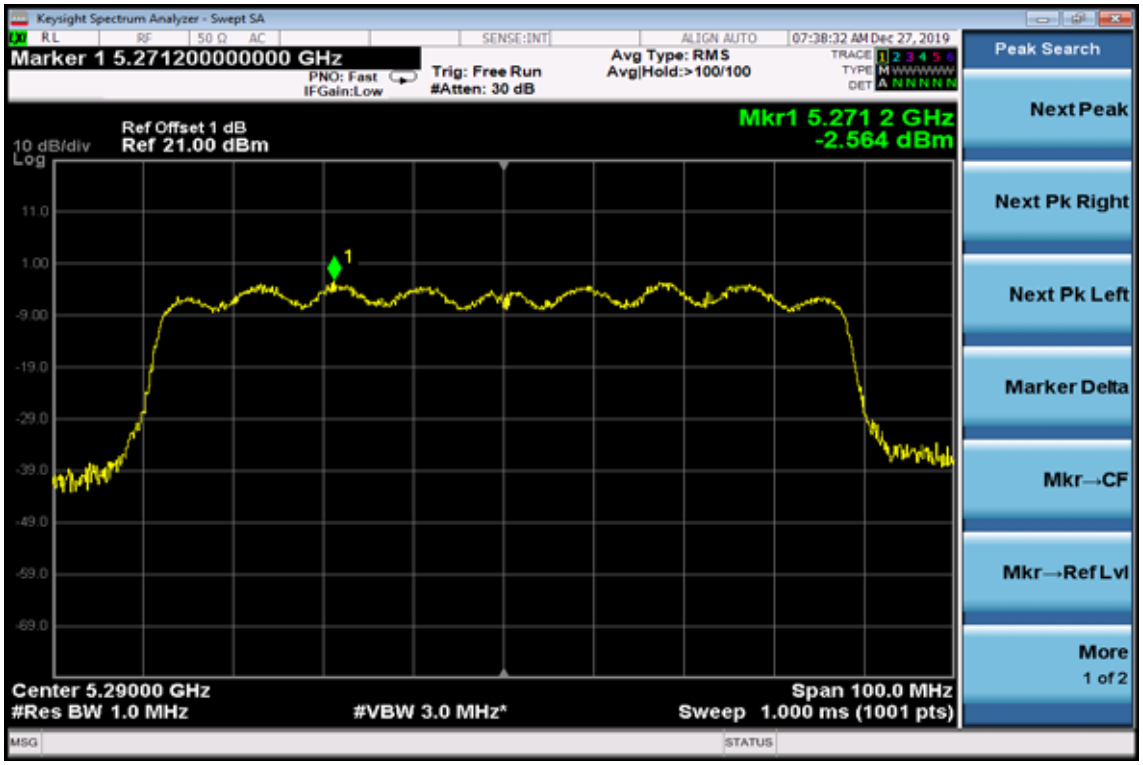
802.11 ac VHT80

Power Spectral Density Test Plot (CH-Low)



802.11 ac VHT80

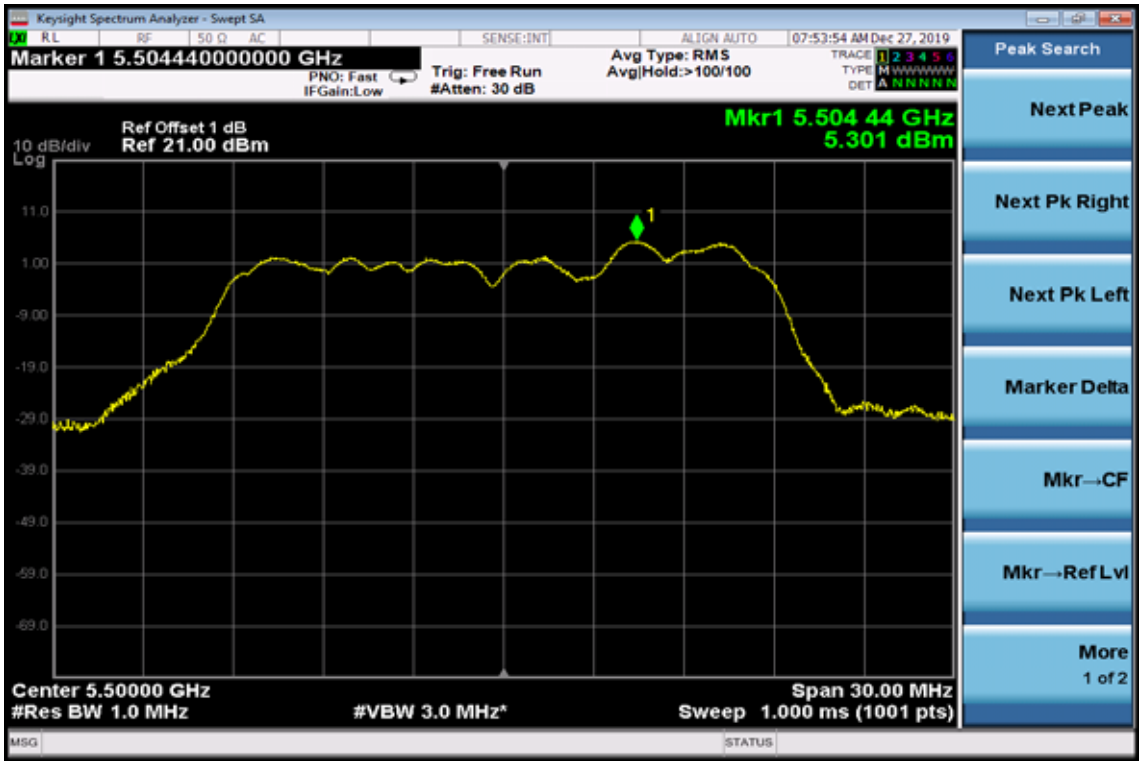
Power Spectral Density Test Plot (CH-High)



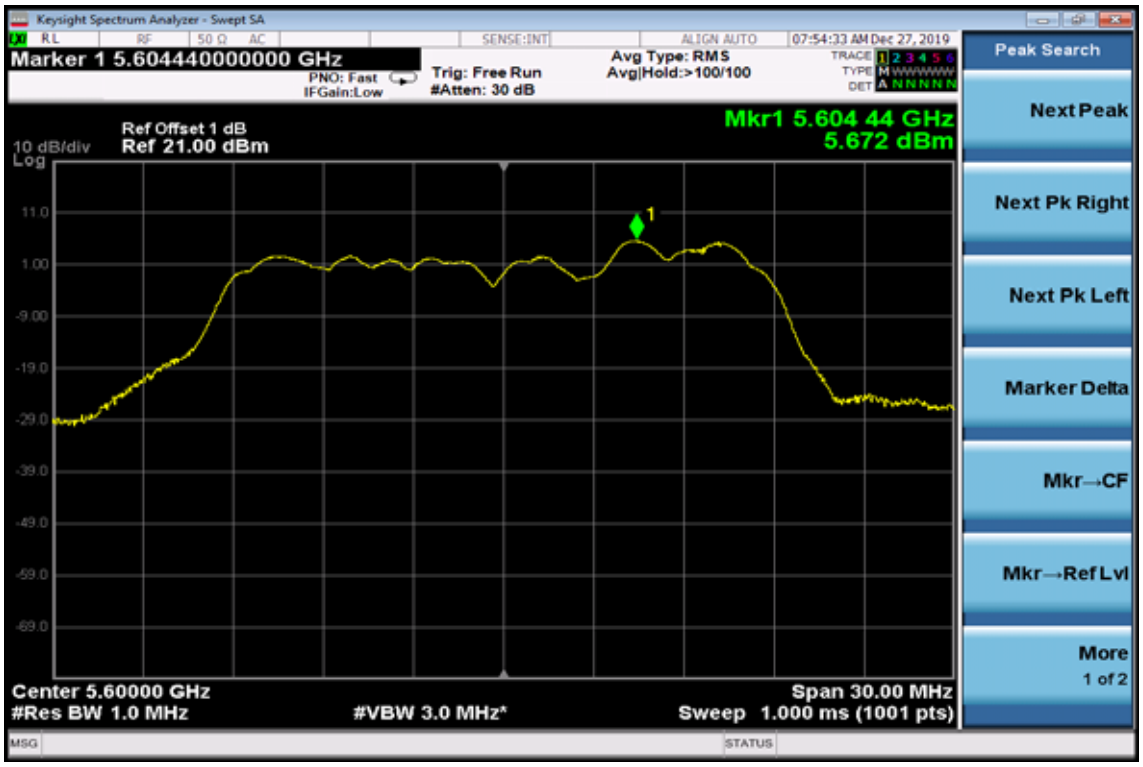
Band UNII-2C

802.11a

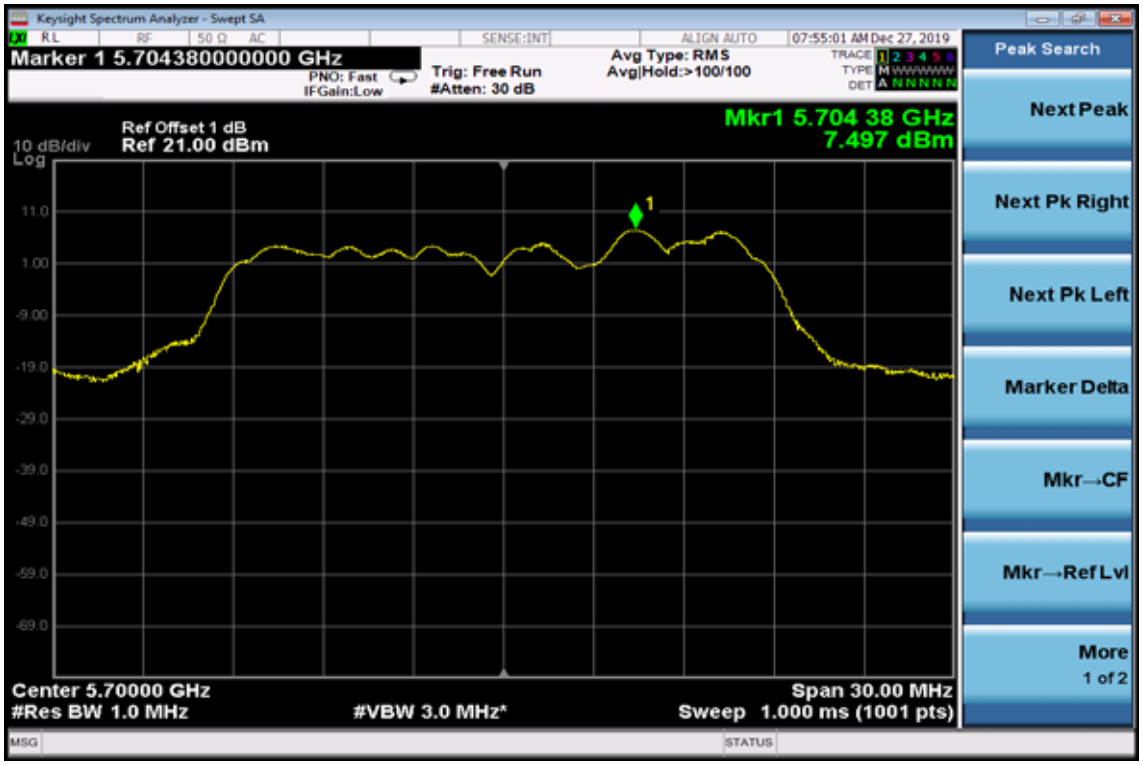
Power Spectral Density Data Plot (CH Low)



Power Spectral Density Data Plot (CH Mid)

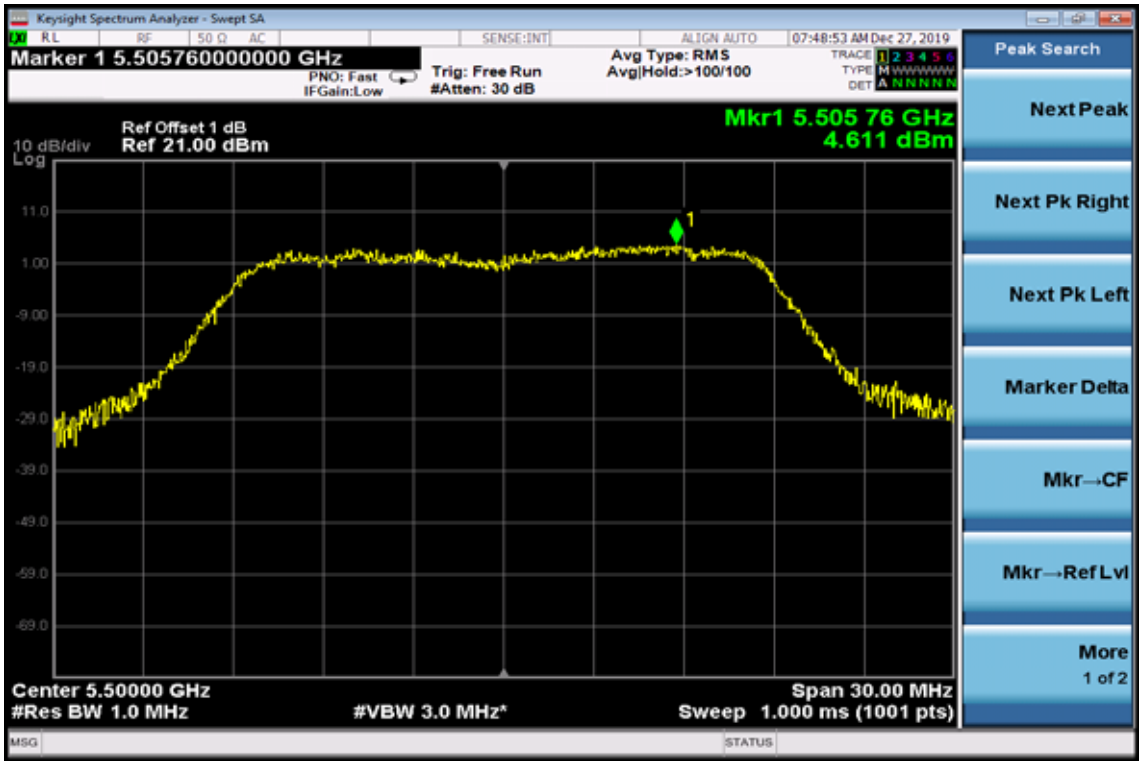


Power Spectral Density Data Plot (CH High)

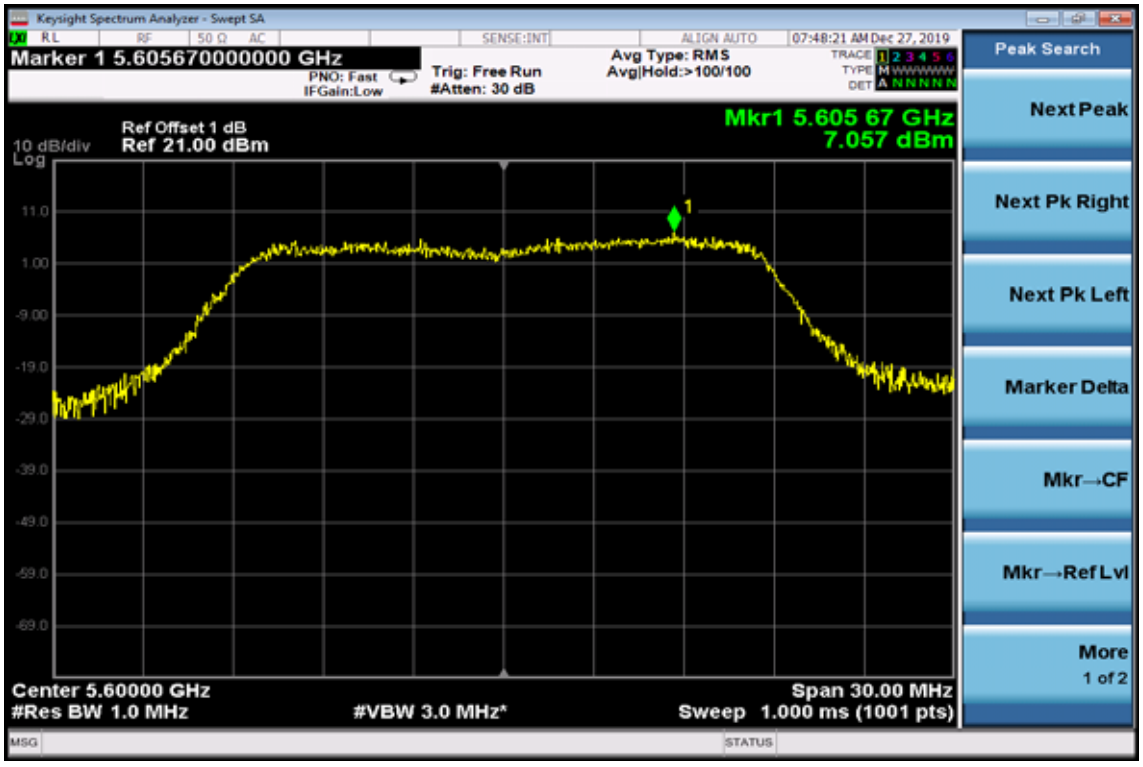


802.11n HT20

Power Spectral Density Test Plot (CH-Low)



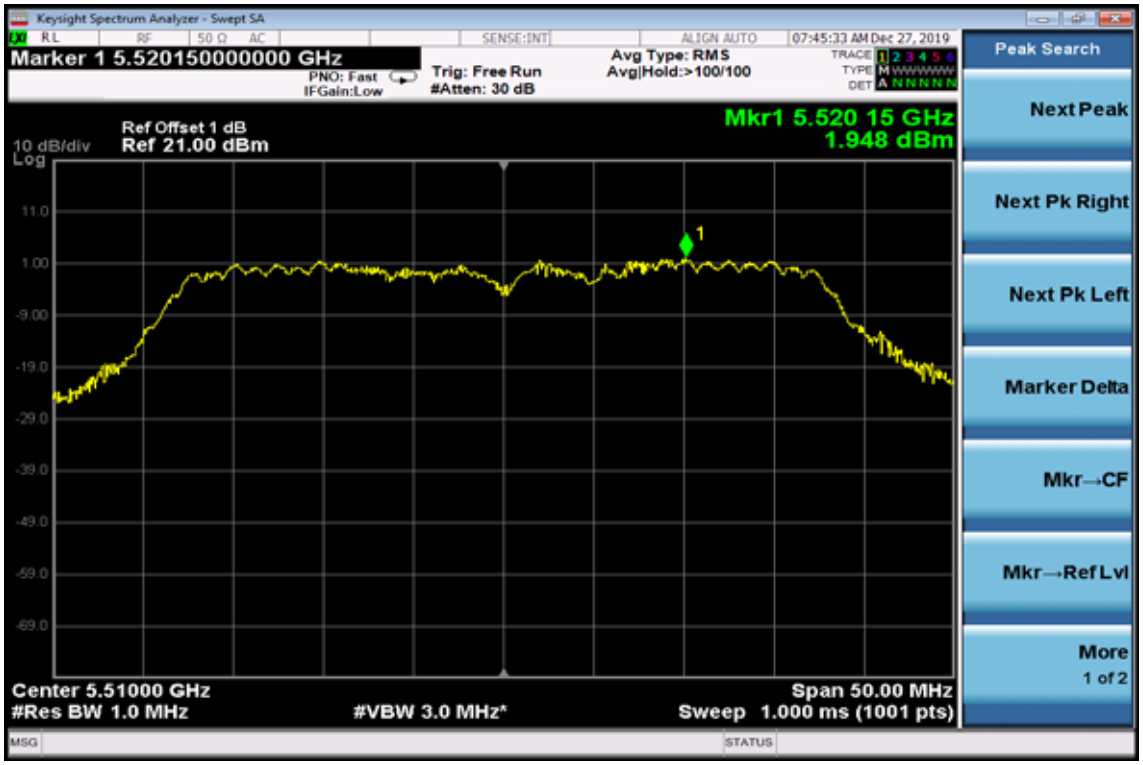
Power Spectral Density Test Plot (CH-Mid)



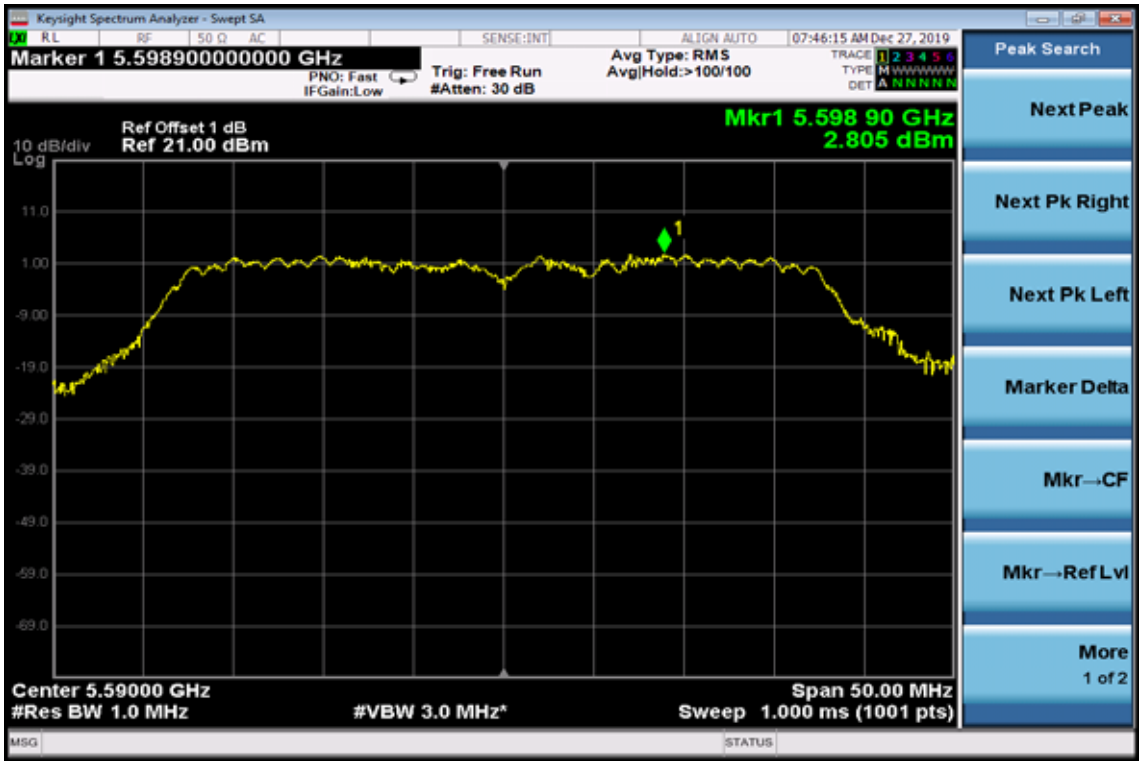
Power Spectral Density Test Plot (CH-High)

802.11n HT40

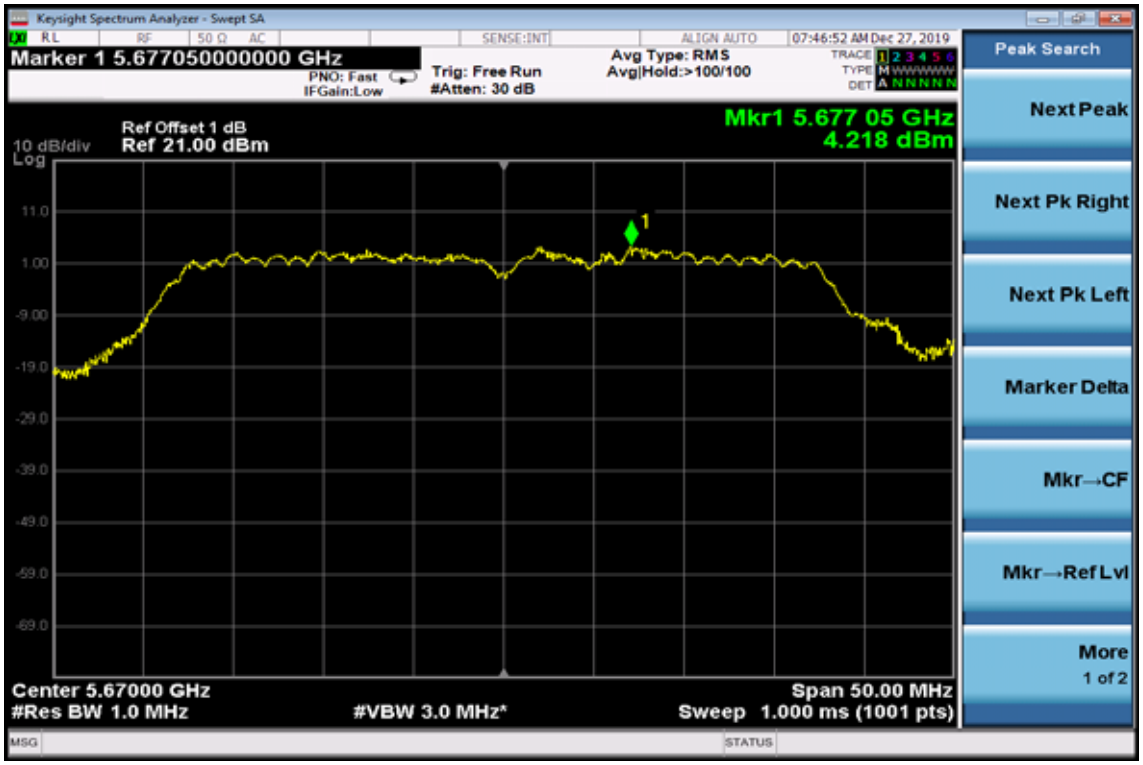
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

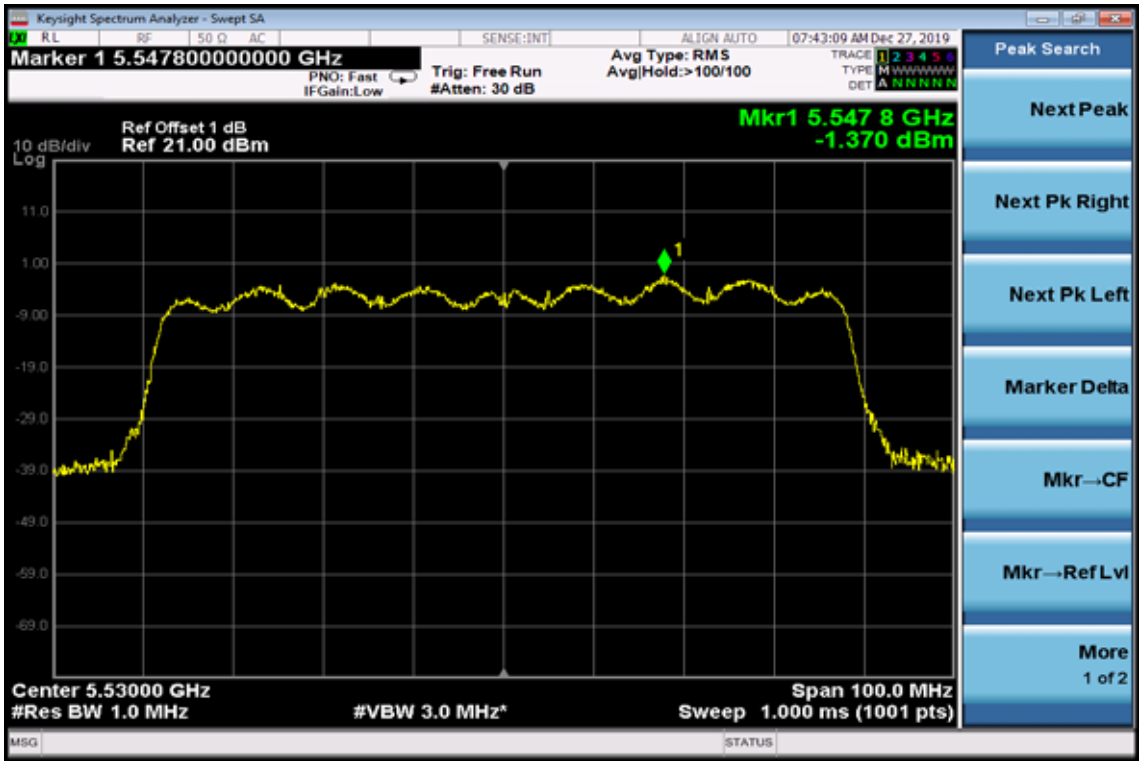


Power Spectral Density Test Plot (CH-High)



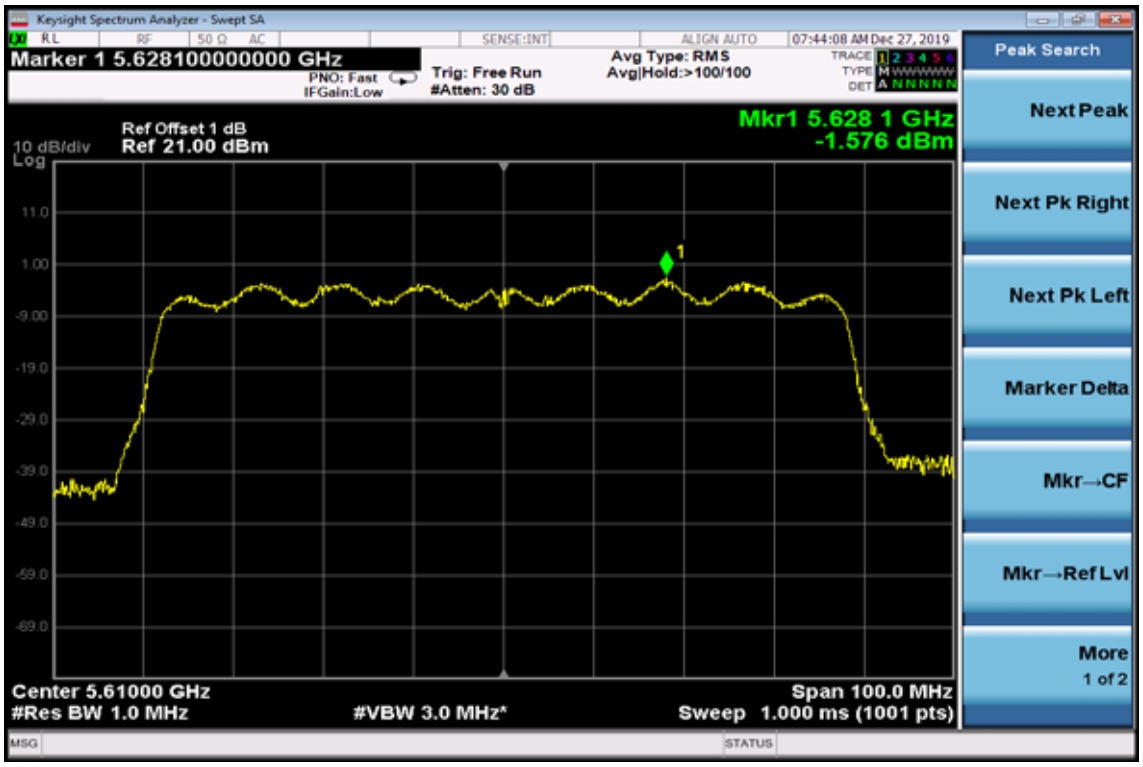
802.11 ac VHT80

Power Spectral Density Test Plot (CH-Low)

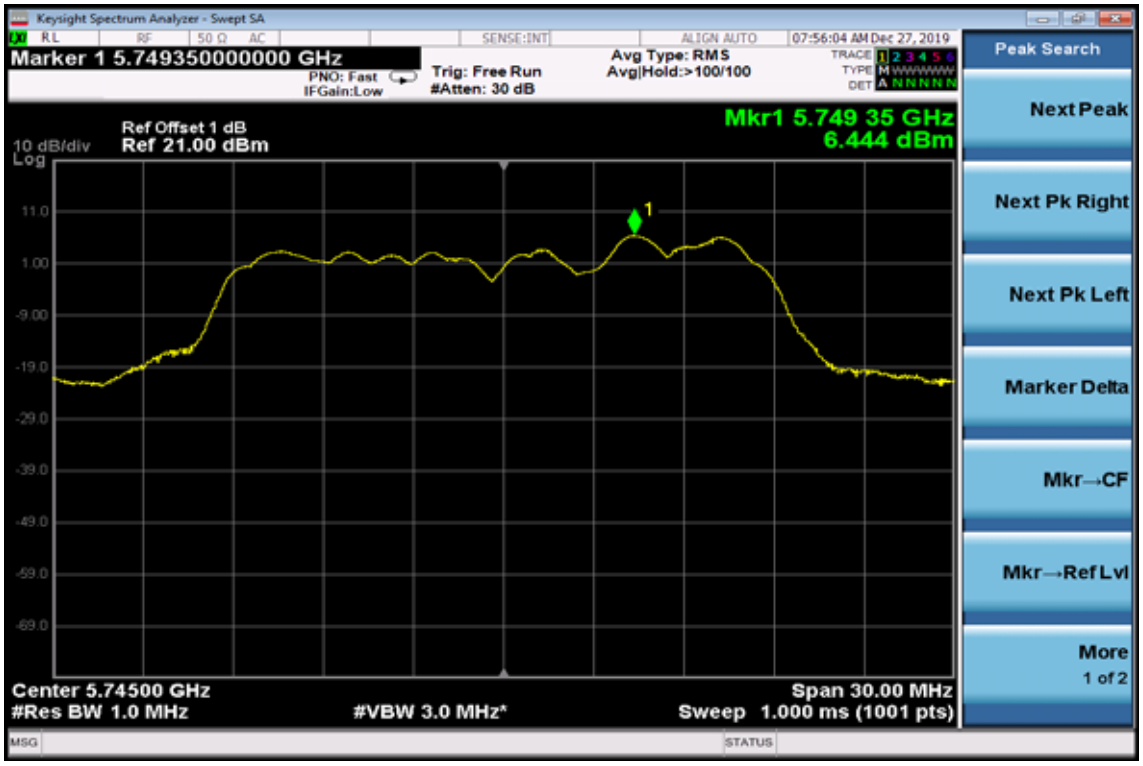


802.11 ac VHT80

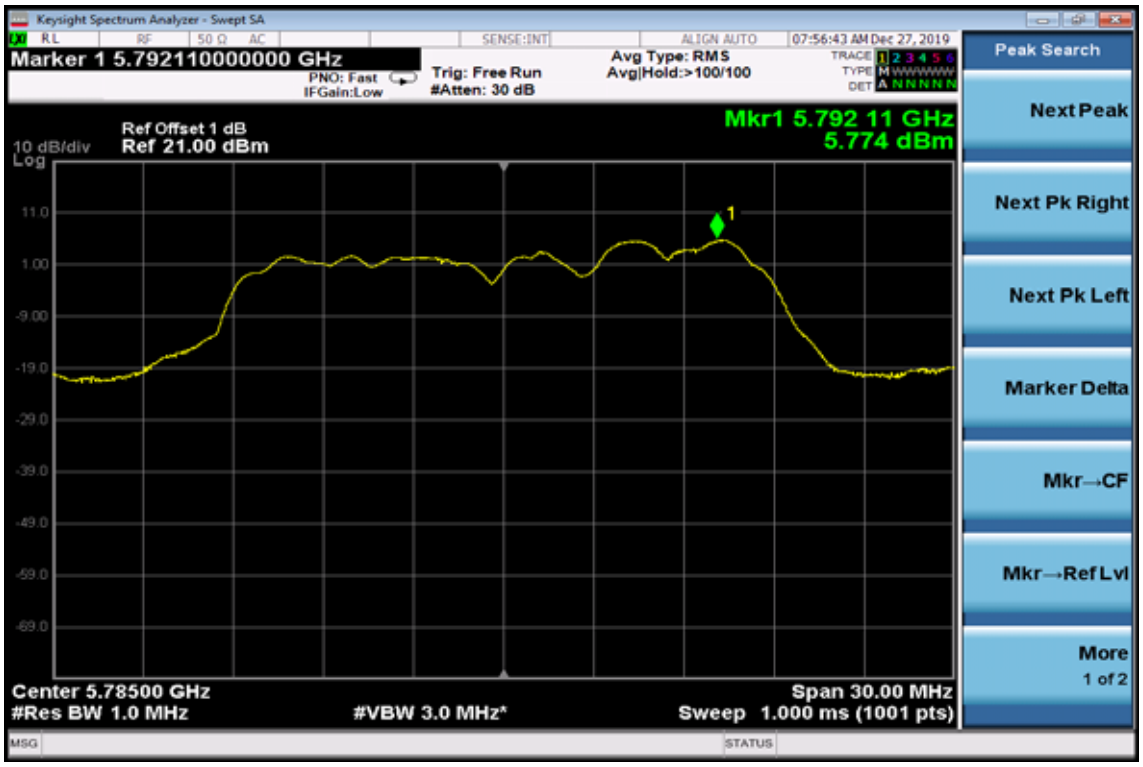
Power Spectral Density Test Plot (CH-High)



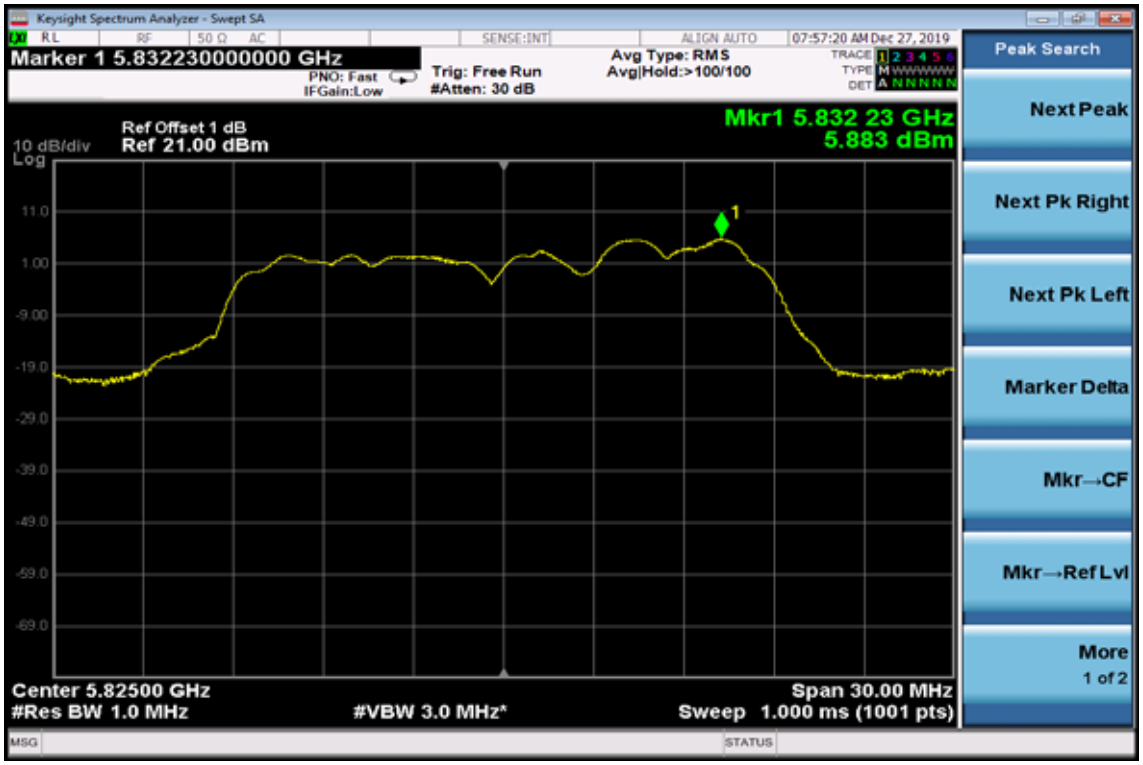
Band UNII-3
802.11a
Power Spectral Density Data Plot (CH Low)



Power Spectral Density Data Plot (CH Mid)

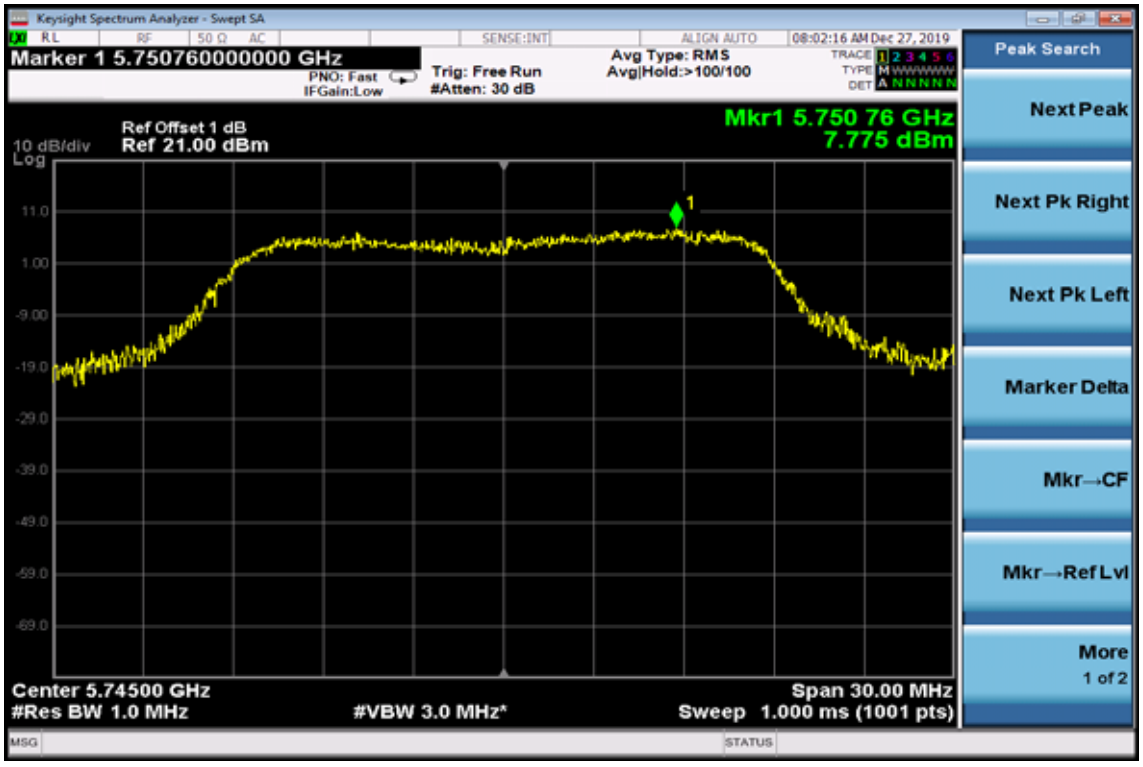


Power Spectral Density Data Plot (CH High)

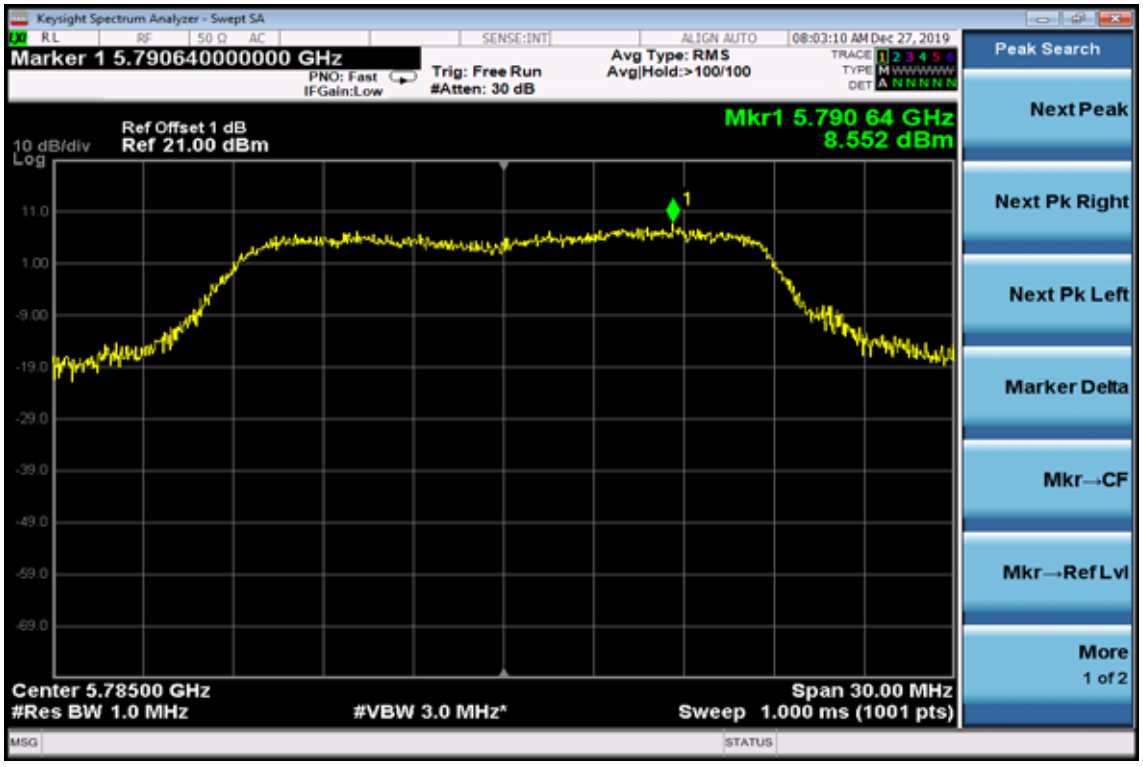


802.11n HT20

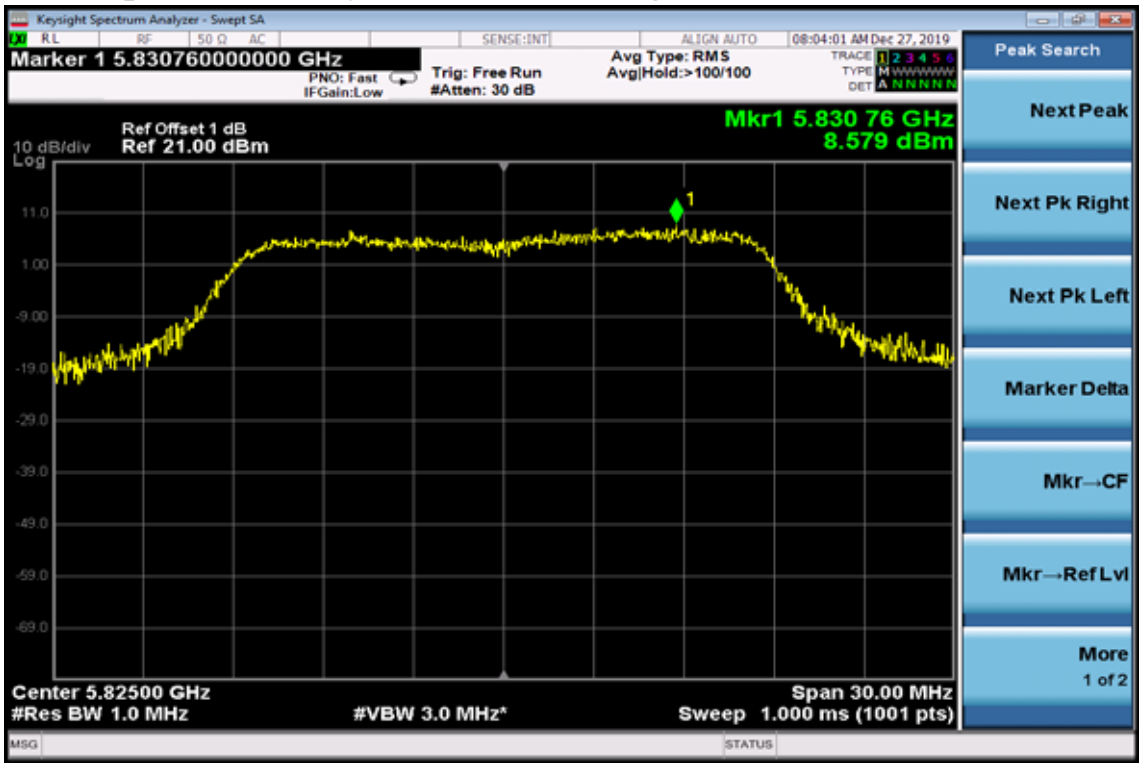
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

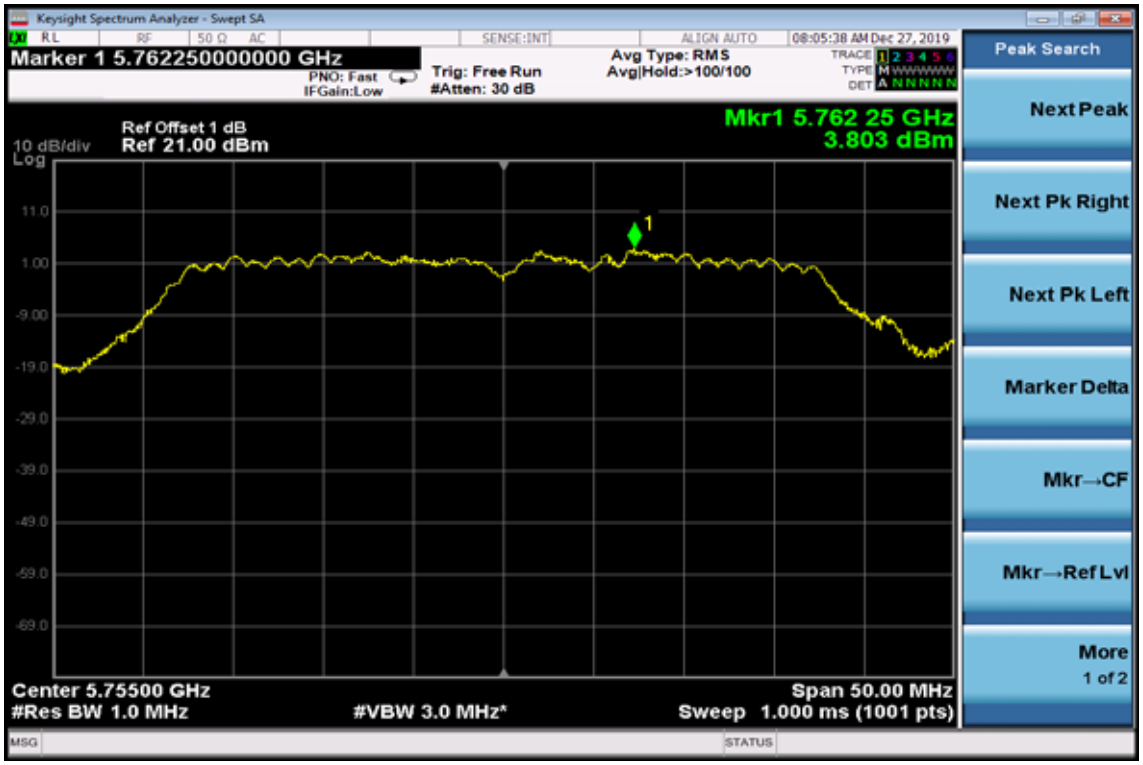


Power Spectral Density Test Plot (CH-High)

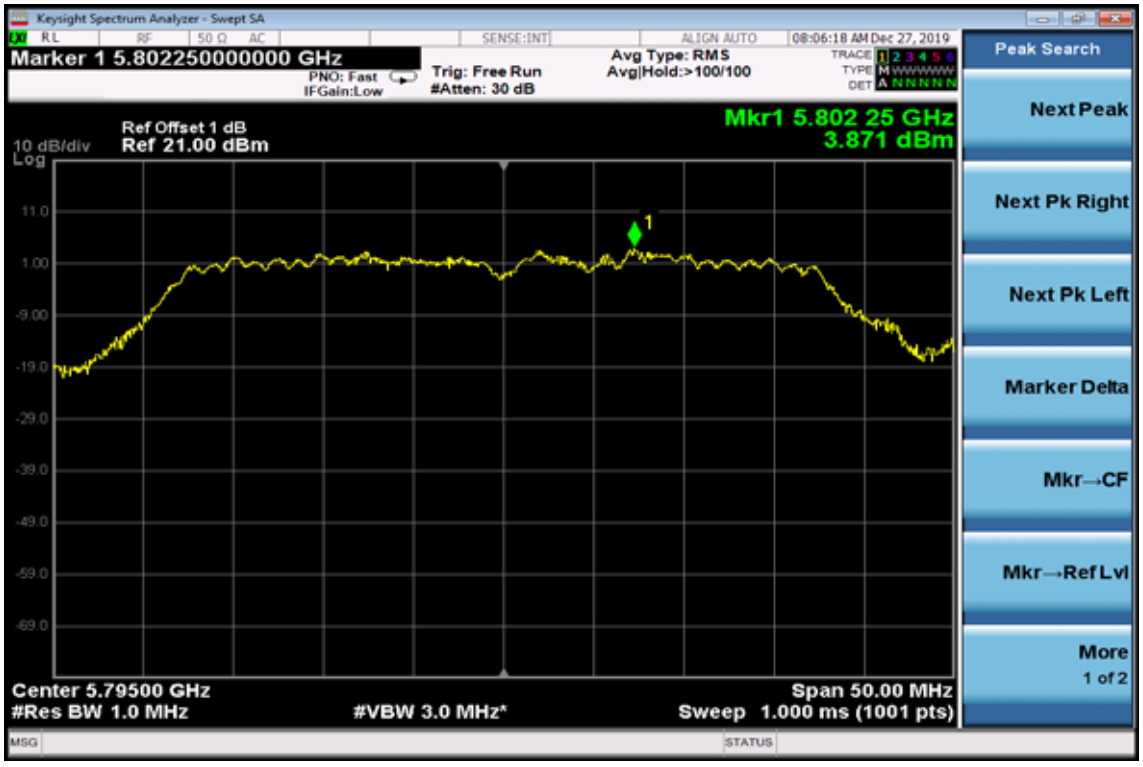


802.11n HT40

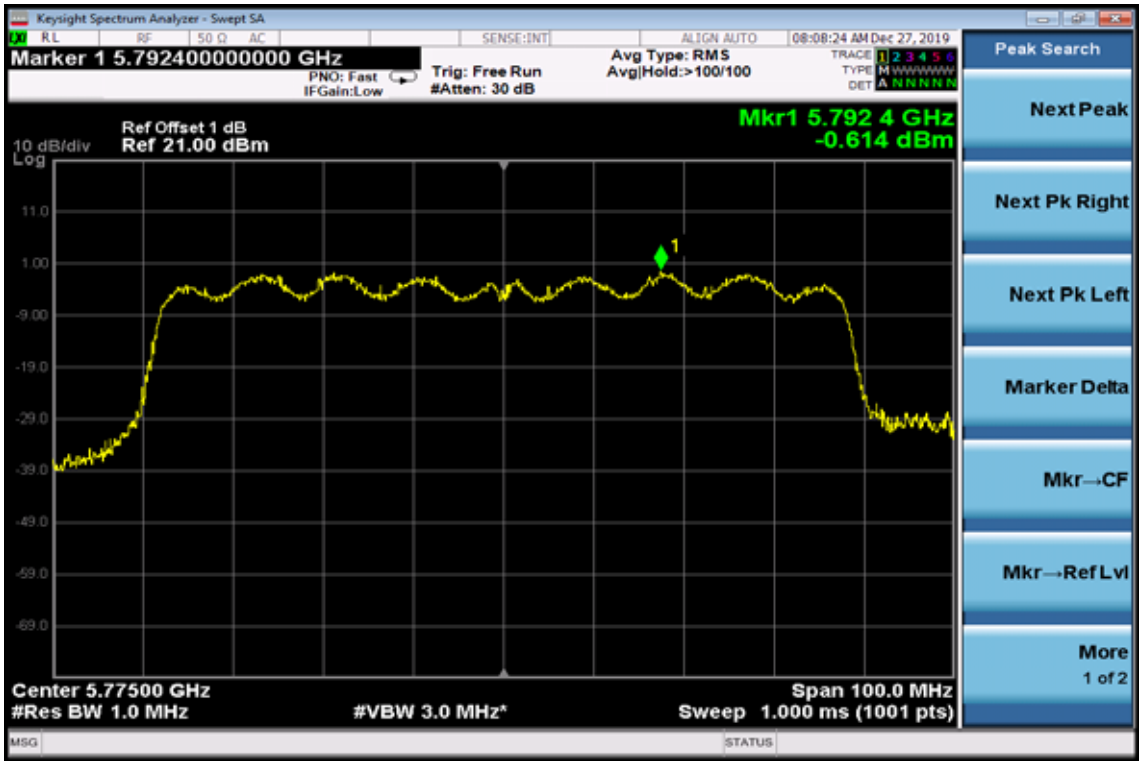
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-High)



802.11 ac VHT80,
Power Spectral Density Test Plot



7. 26dB /99% Emission Bandwidth Measurement

7.1. Standard Applicable

According to §15.407(a) foe band 1,2,3. No Limit required.

7.2. Measurement Procedure

1. Place the EUT on the table and set it in 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 analyzer as RBW=300kHz, VBW =1MHz, Span= 50MHz, Sweep=auto
4. Mark the peak frequency and –26dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

Refer to section D of KDB Document: KDB 789033 D02 General UNII Test Procedures New Rules v01r03

7.3. Measurement Equipment Used:

Refer to section 6.3 for details.

7.4. Test Set-up:

Refer to section 6.4 for details.

7.5. Measurement Result

802.11a Mode

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	23.980	18.228
5260	24.930	18.254
5320	25.900	18.222
5500	22.580	18.164
5600	22.710	18.181
5700	29.580	18.368

802.11n HT20 Mode

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	23.470	18.216
5260	22.810	18.207
5320	23.000	18.162
5500	22.430	18.099
5600	22.550	18.114
5700	28.600	18.379

802.11n HT40 Mode

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5190	50.000	38.680
5230	50.000	38.601
5310	50.000	38.000
5510	48.520	37.475
5590	48.650	37.812
5670	50.000	38.273

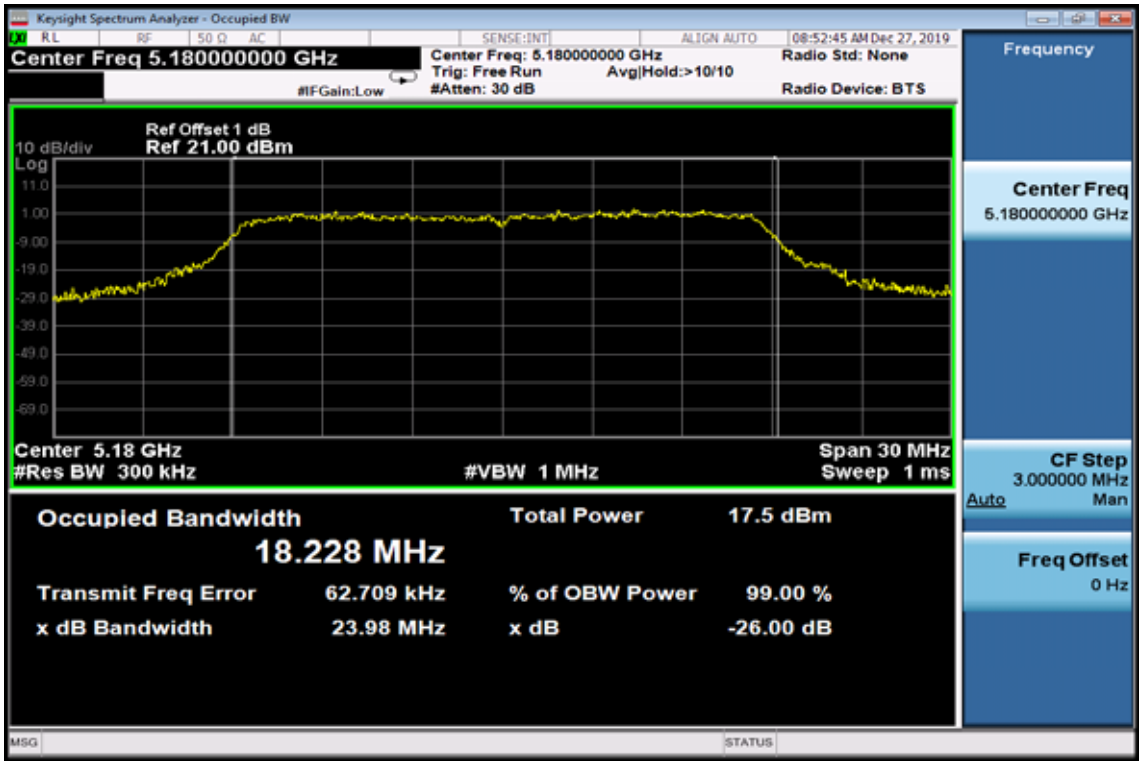
802.11a HT80 Mode

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5210	81.410	74.961
5290	81.490	74.921
5530	81.230	74.959
5610	81.230	74.997

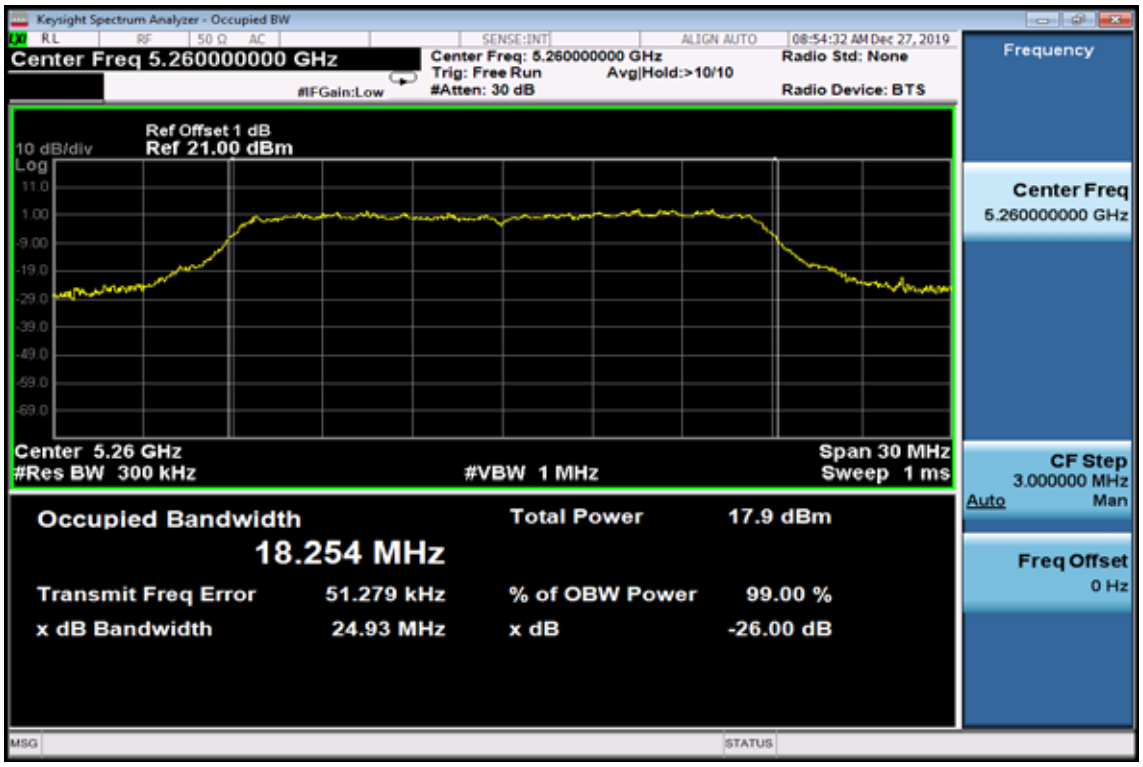
Band UNII-1 / Band UNII-2A

802.11a

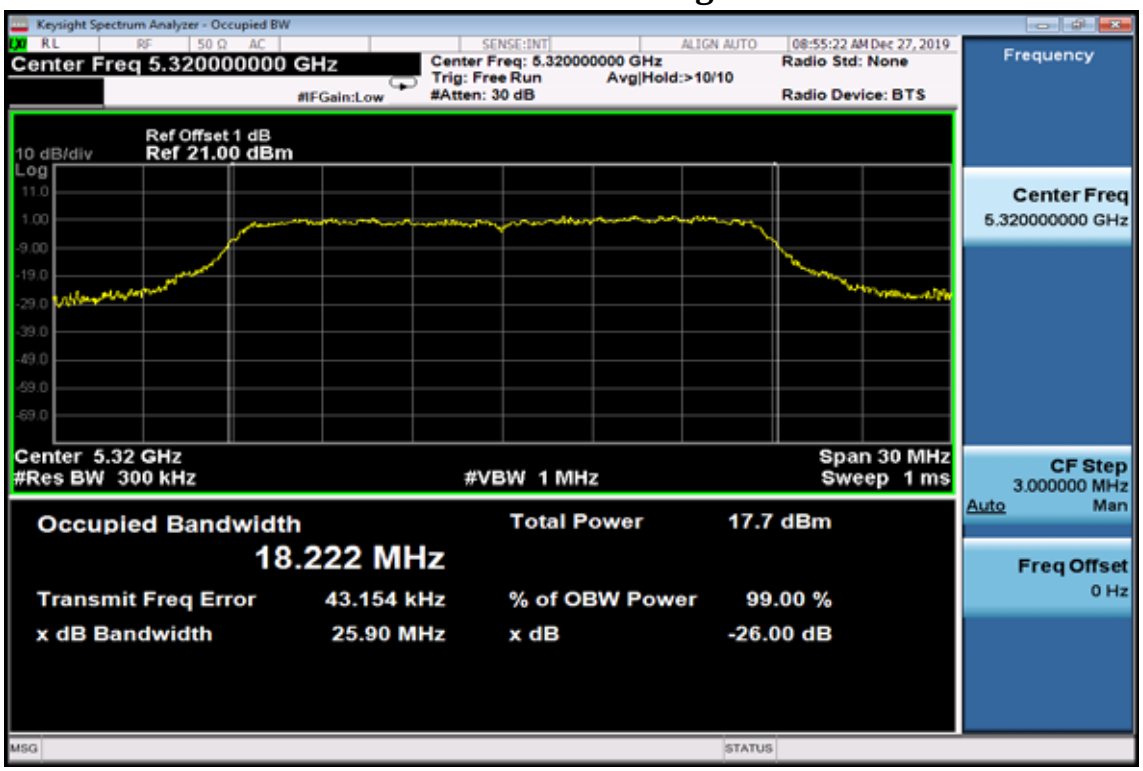
26dB / 99% Band Width Test Data CH-Low



26dB / 99% Band Width Test Data CH-Mid

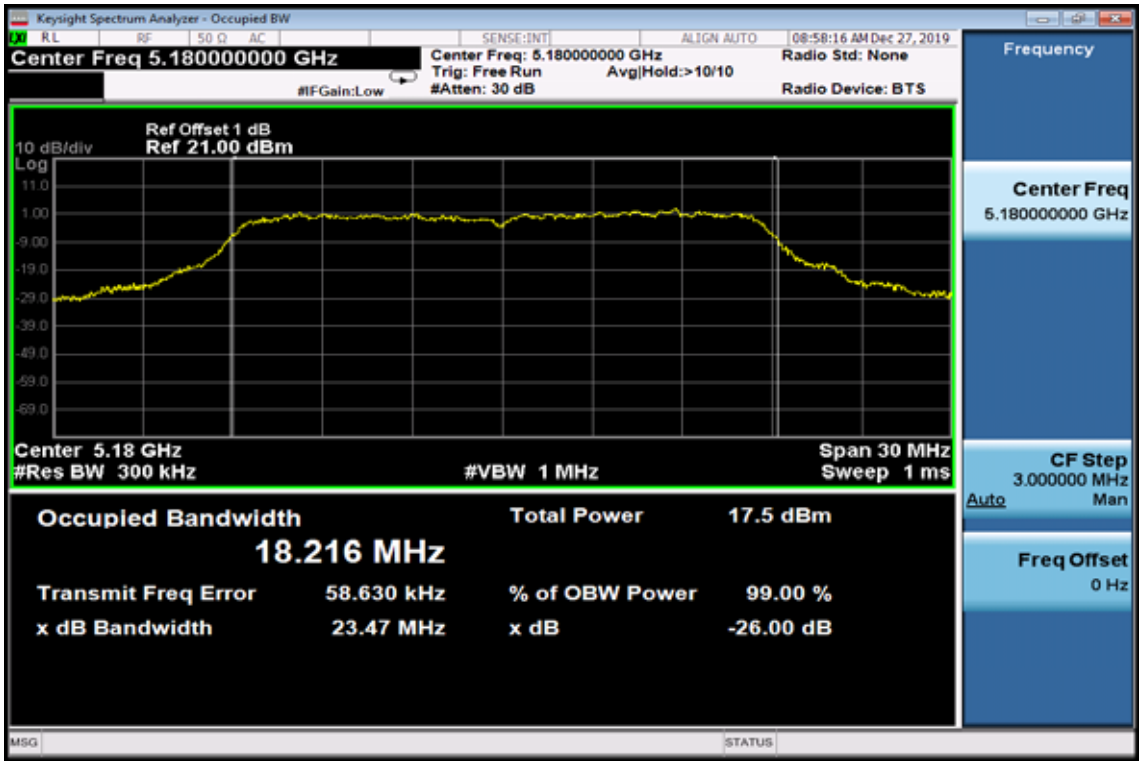


26dB / 99% Band Width Test Data CH-High

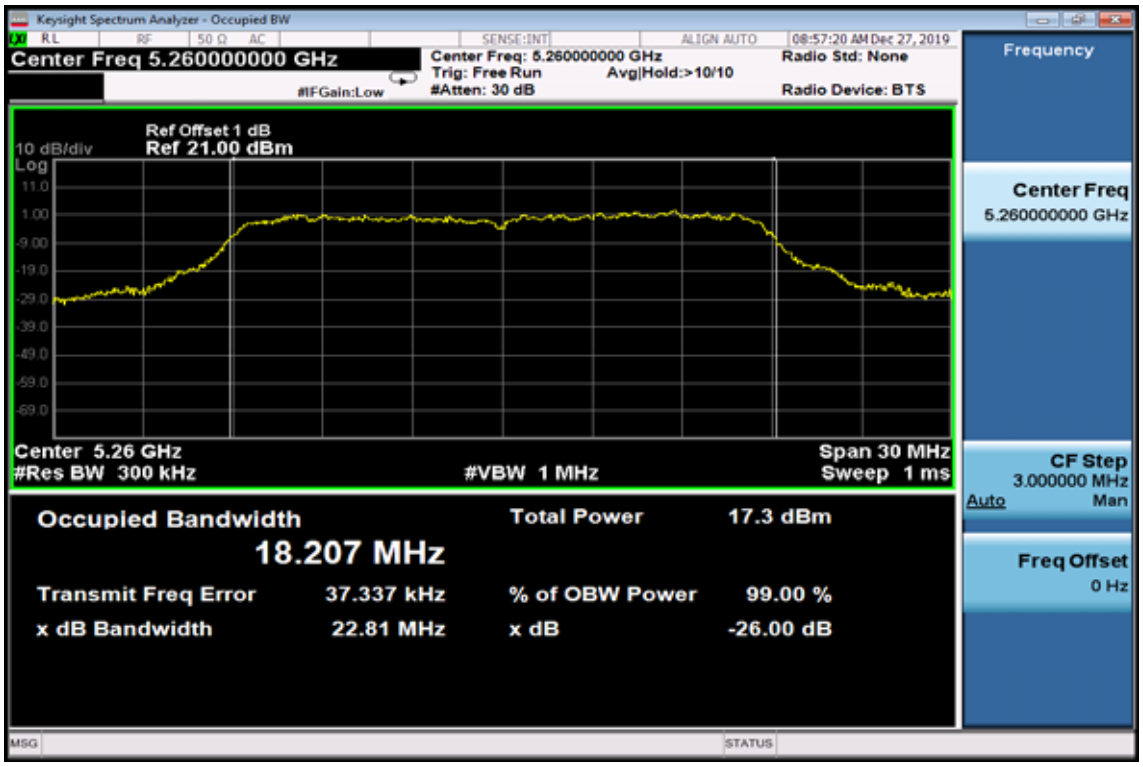


802.11n HT20

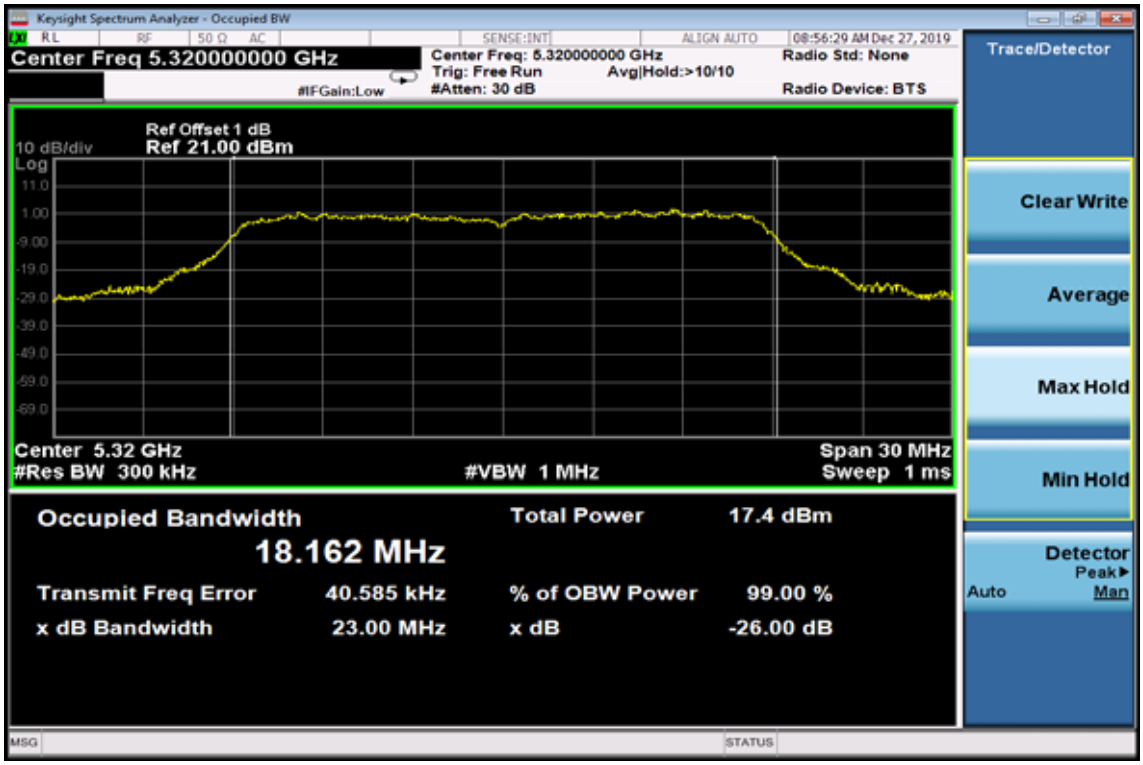
26dB / 99% Band Width Test Data CH-Low



26dB / 99% Band Width Test Data CH-Mid

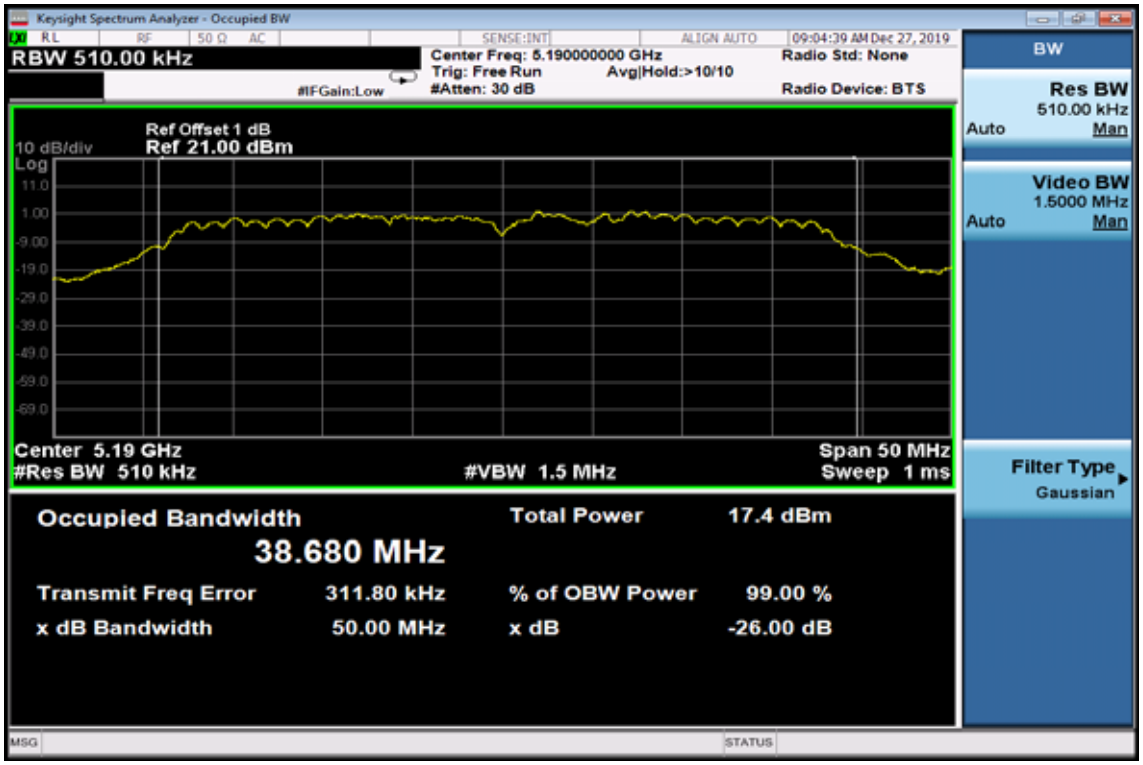


26dB / 99% Band Width Test Data CH-High

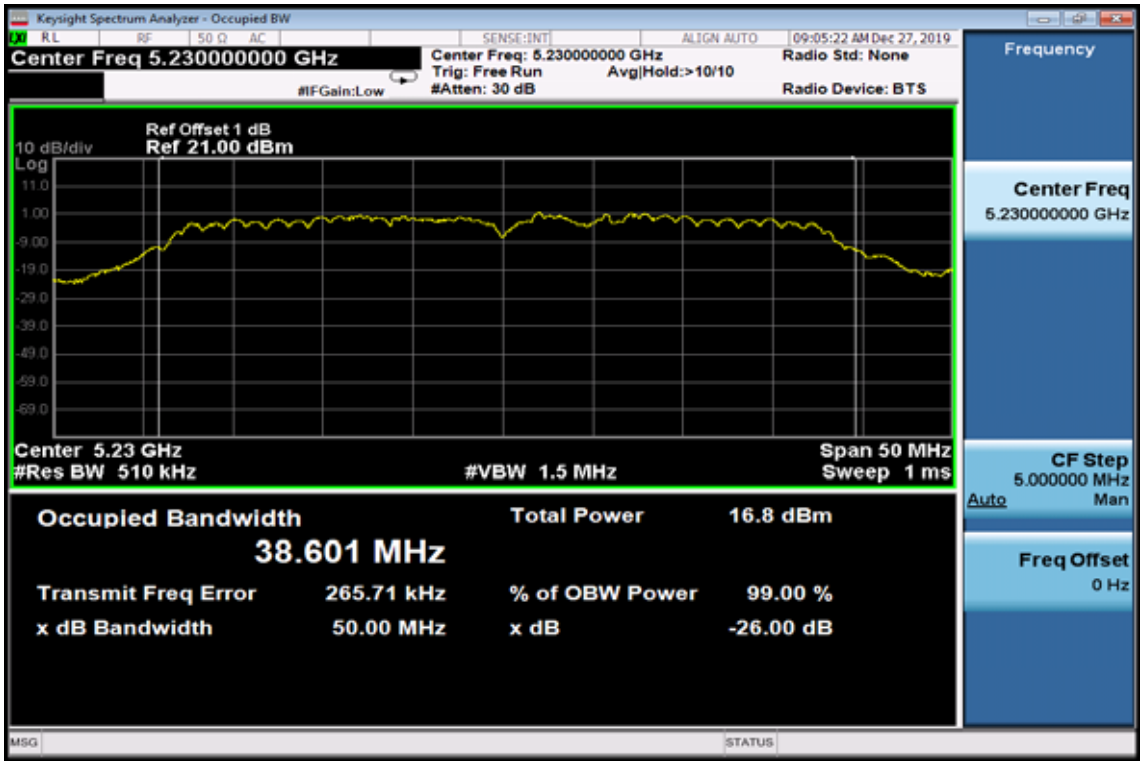


802.11n HT40

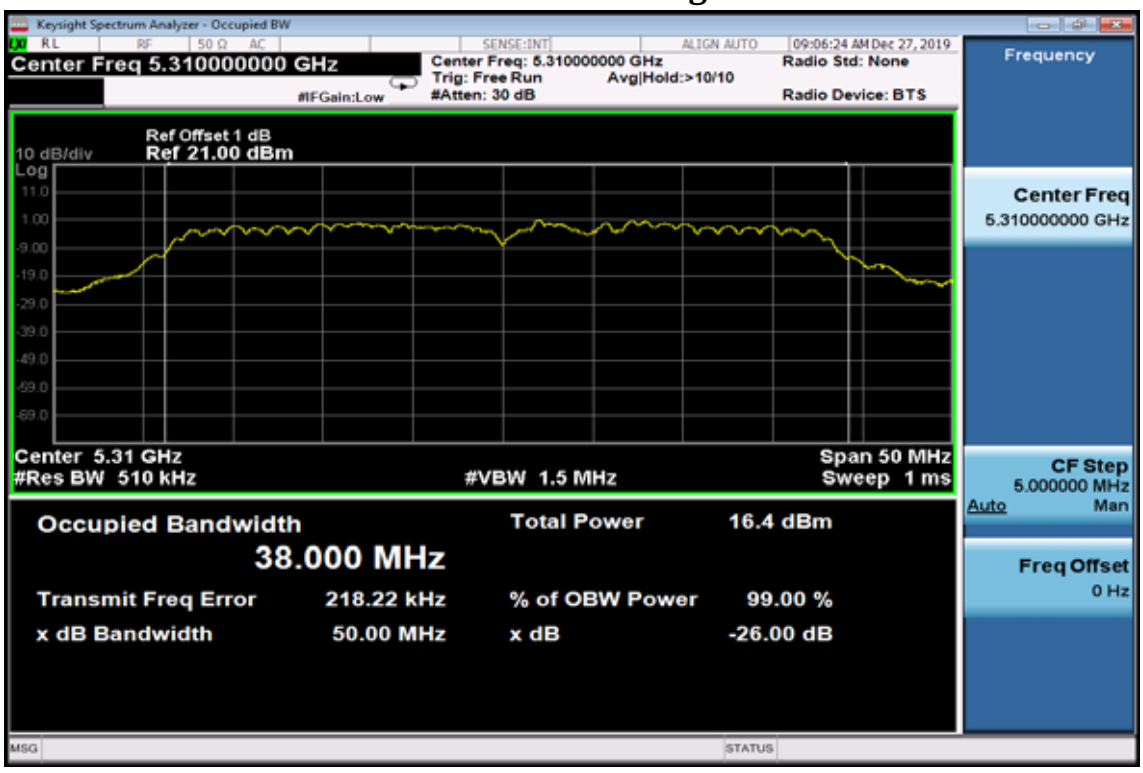
26dB / 99% Band Width Test Data CH-Low



26dB / 99%Band Width Test Data CH-Mid

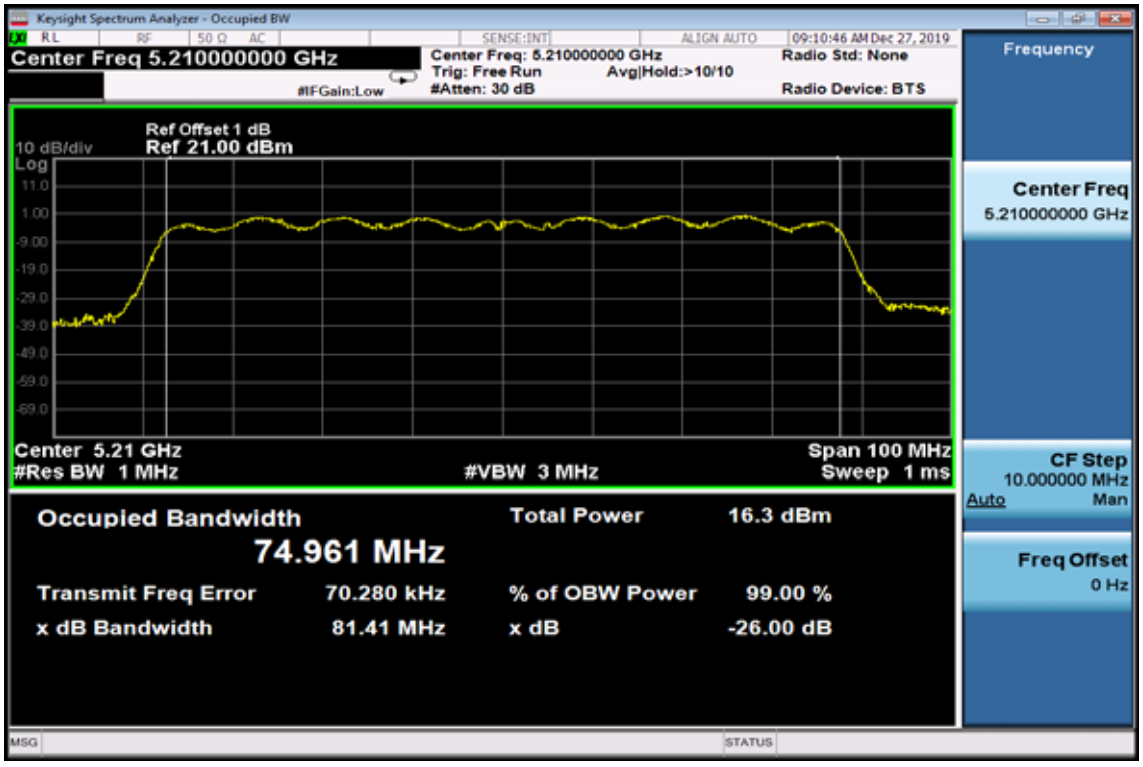


26dB / 99%Band Width Test Data CH-High

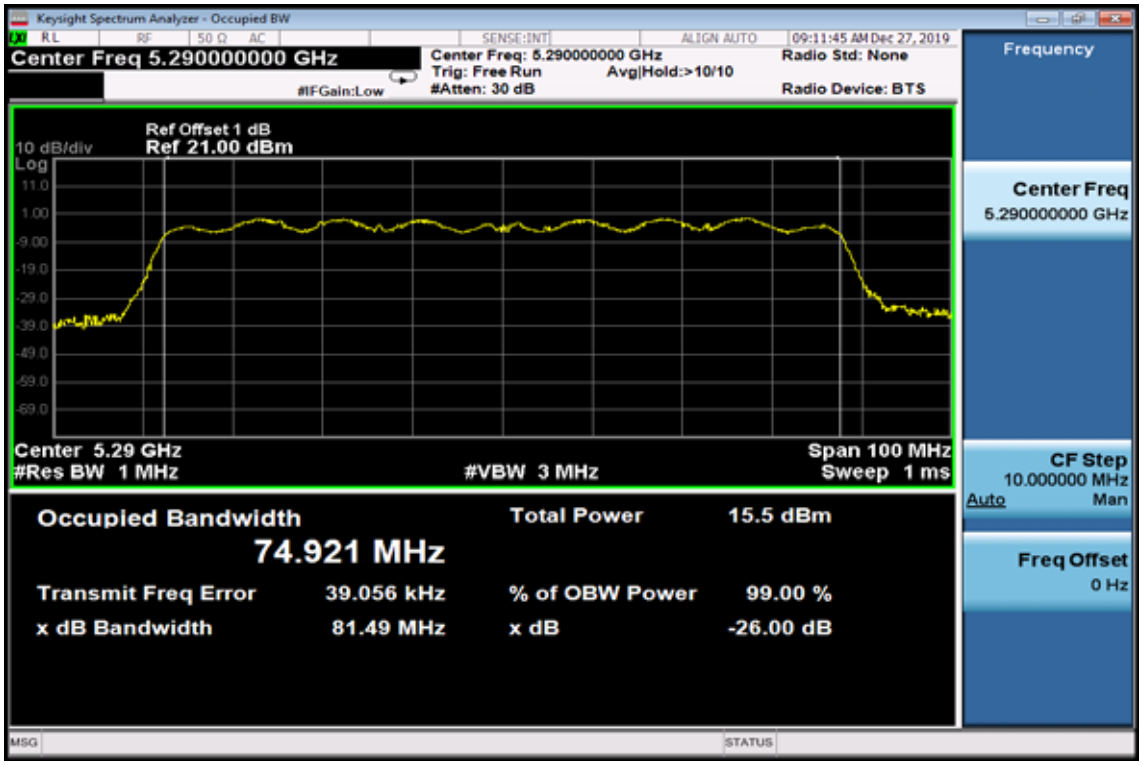


802.11 ac VHT80

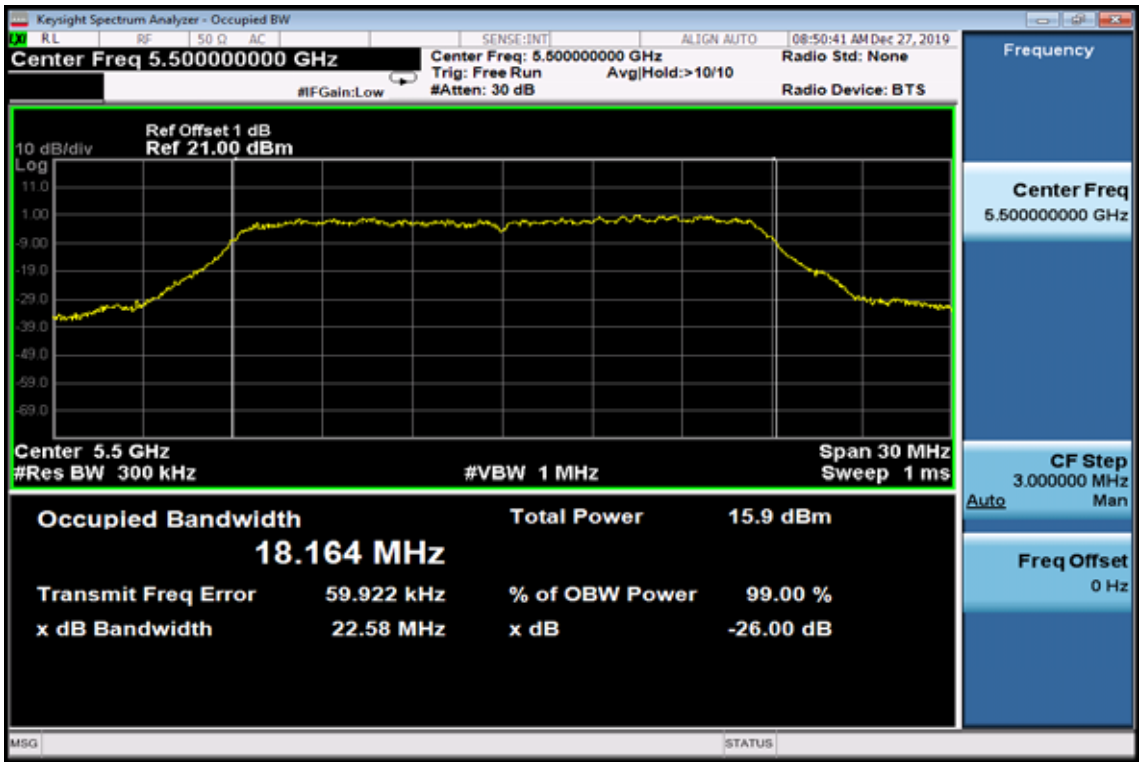
26dB / 99% Band Width Test Data CH-Low



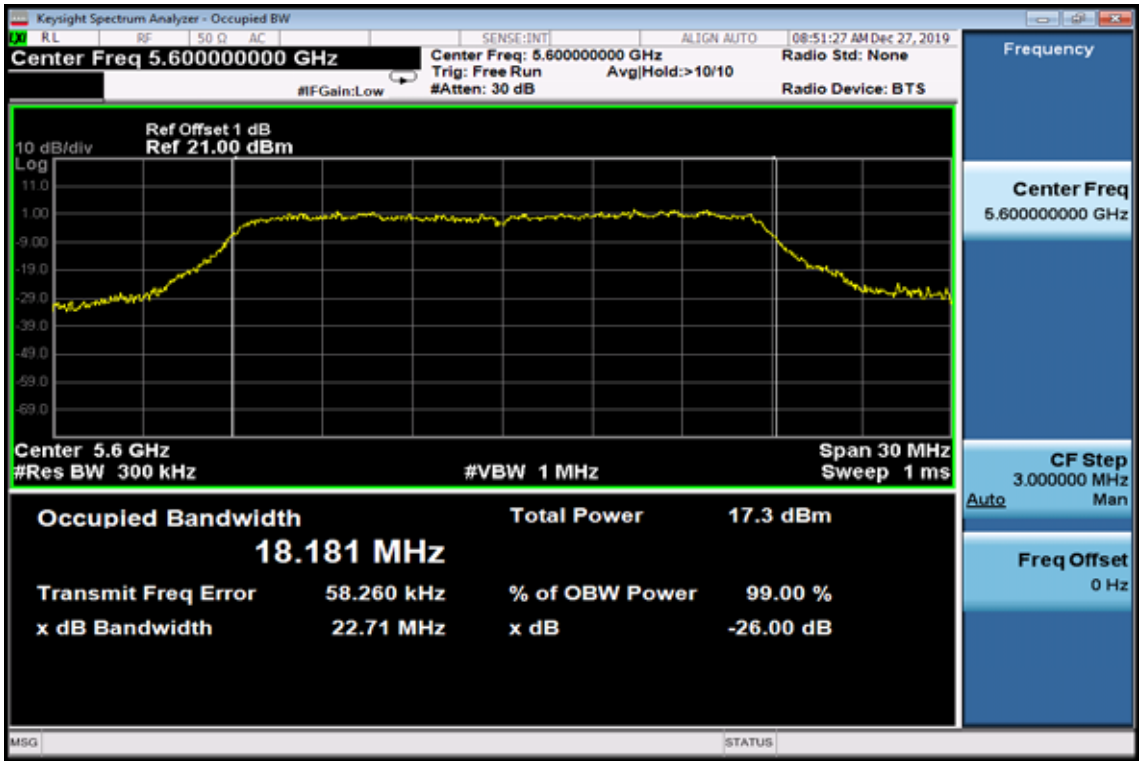
802.11 ac VHT80
26dB / 99% Band Width Test Data CH-High



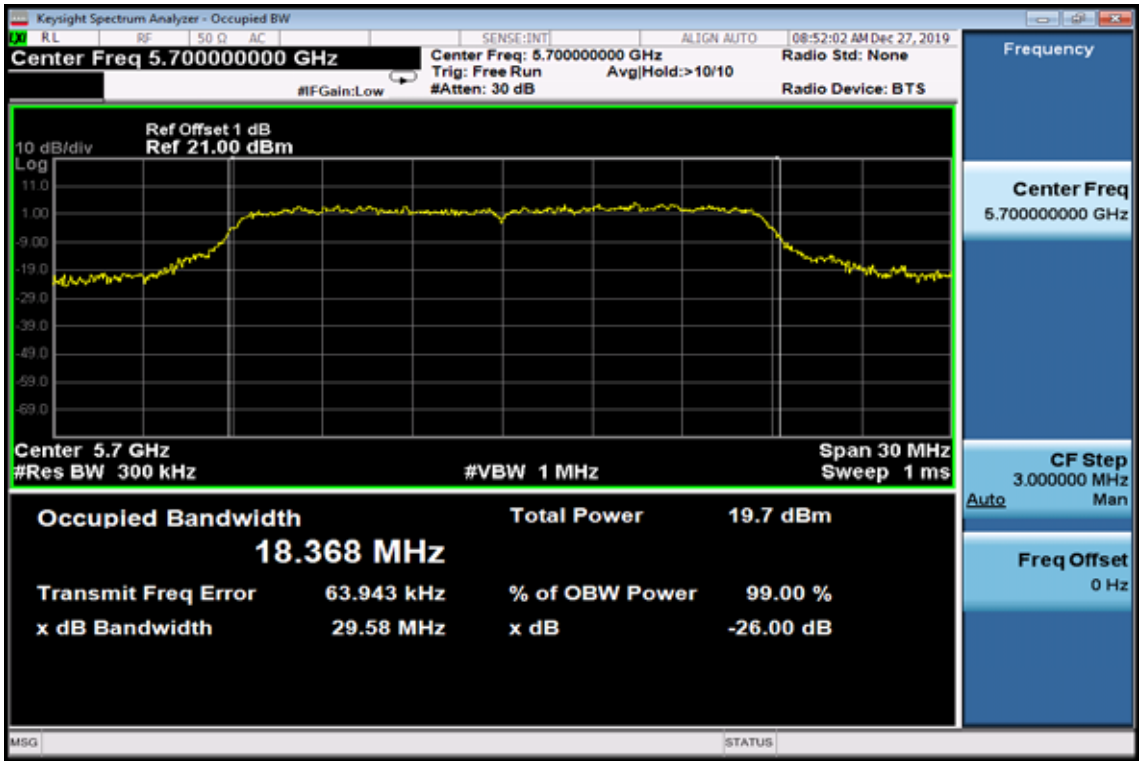
Band UNII-2C
802.11a
26dB / 99% Band Width Test Data CH-Low



26dB / 99% Band Width Test Data CH-Mid

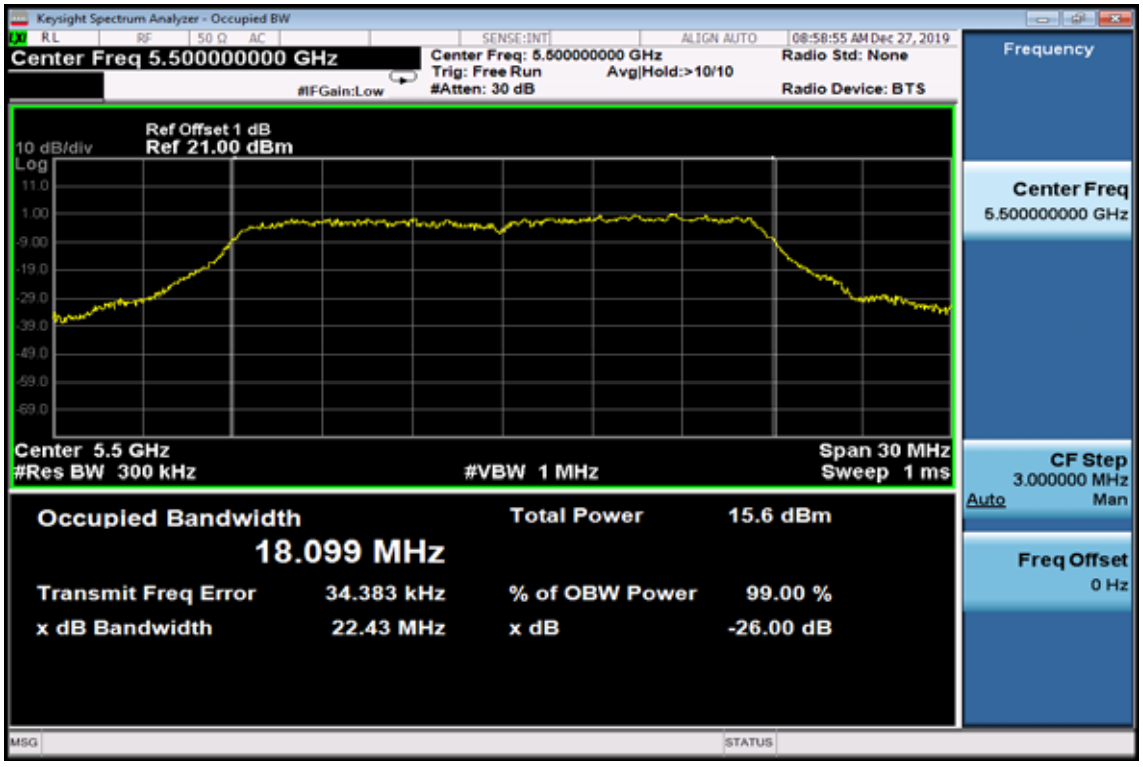


26dB / 99% Band Width Test Data CH-High

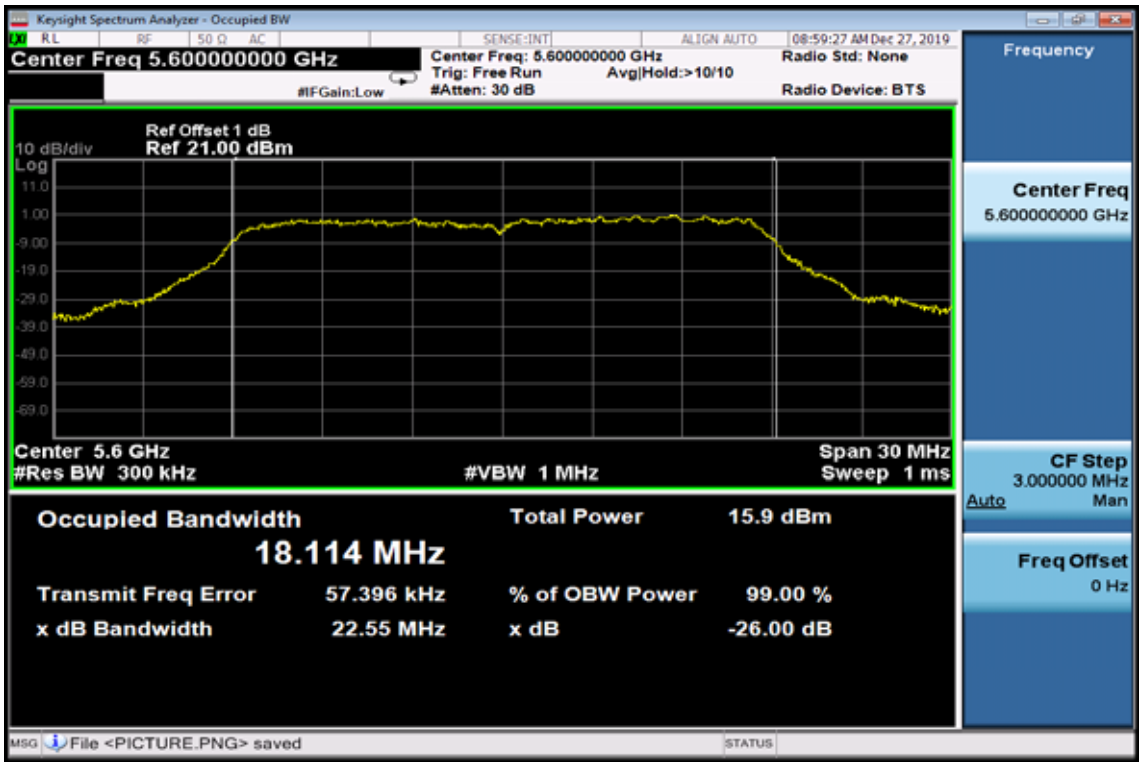


802.11n HT20

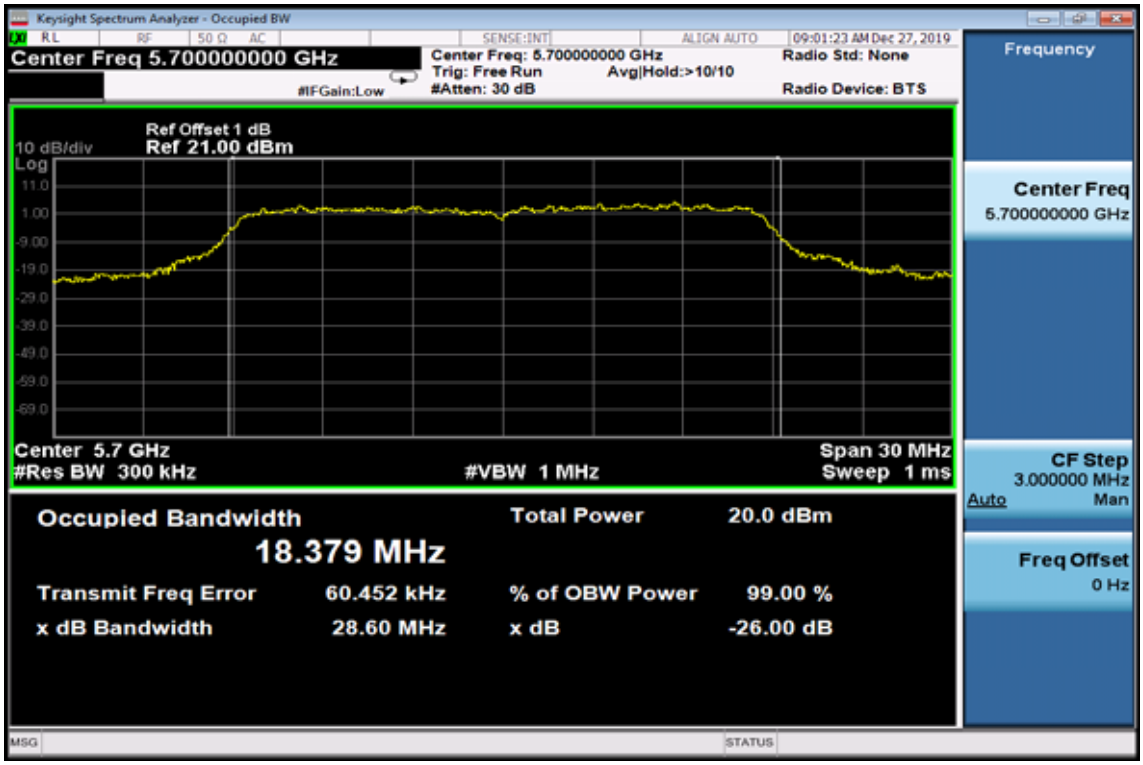
26dB / 99% Band Width Test Data CH-Low



26dB / 99% Band Width Test Data CH-Mid

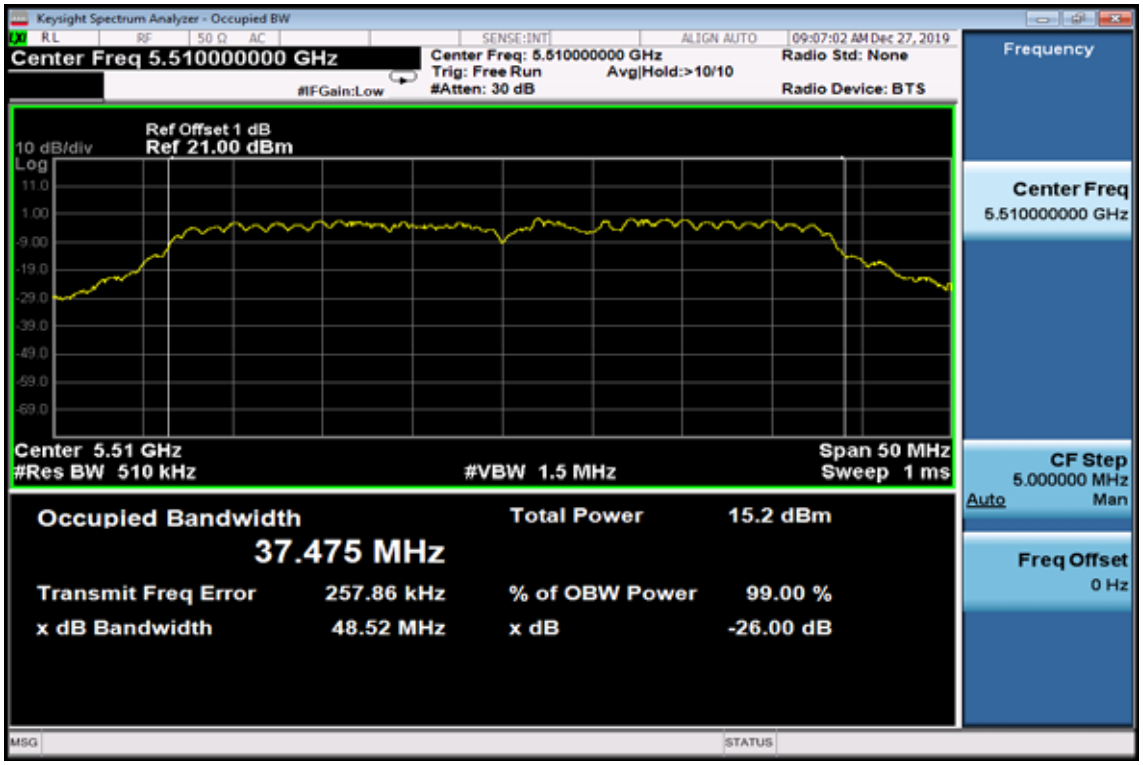


26dB / 99% Band Width Test Data CH-High

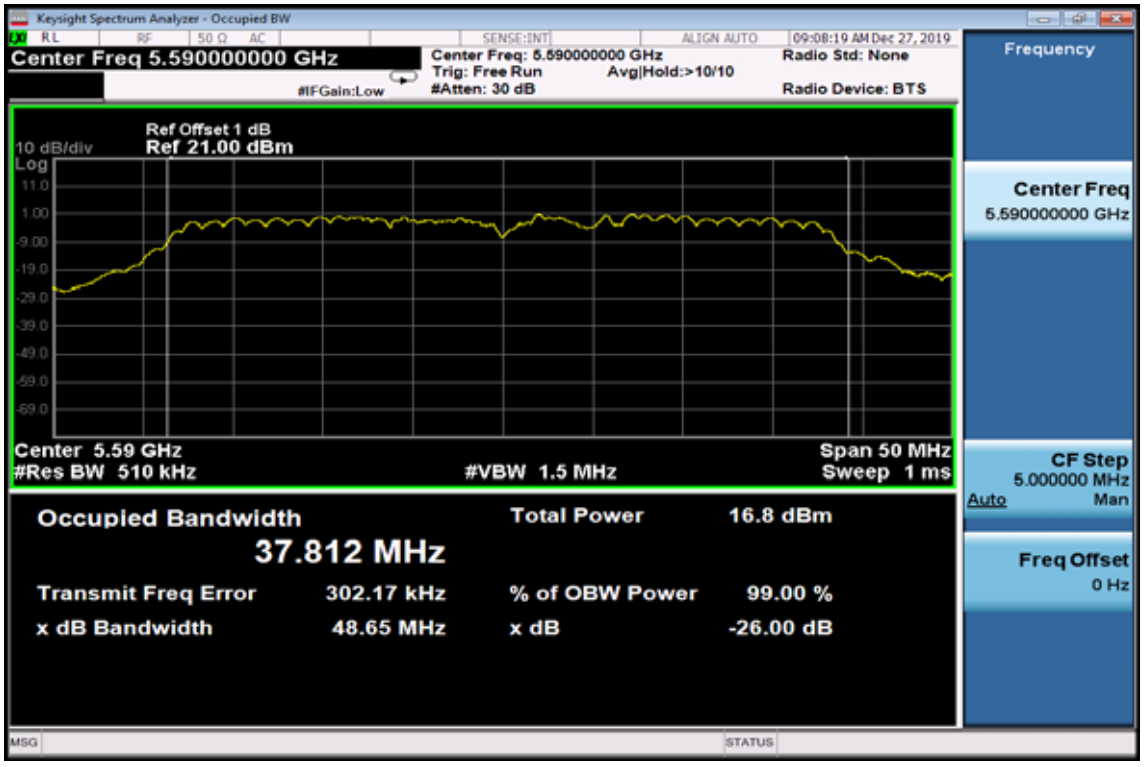


802.11n HT40

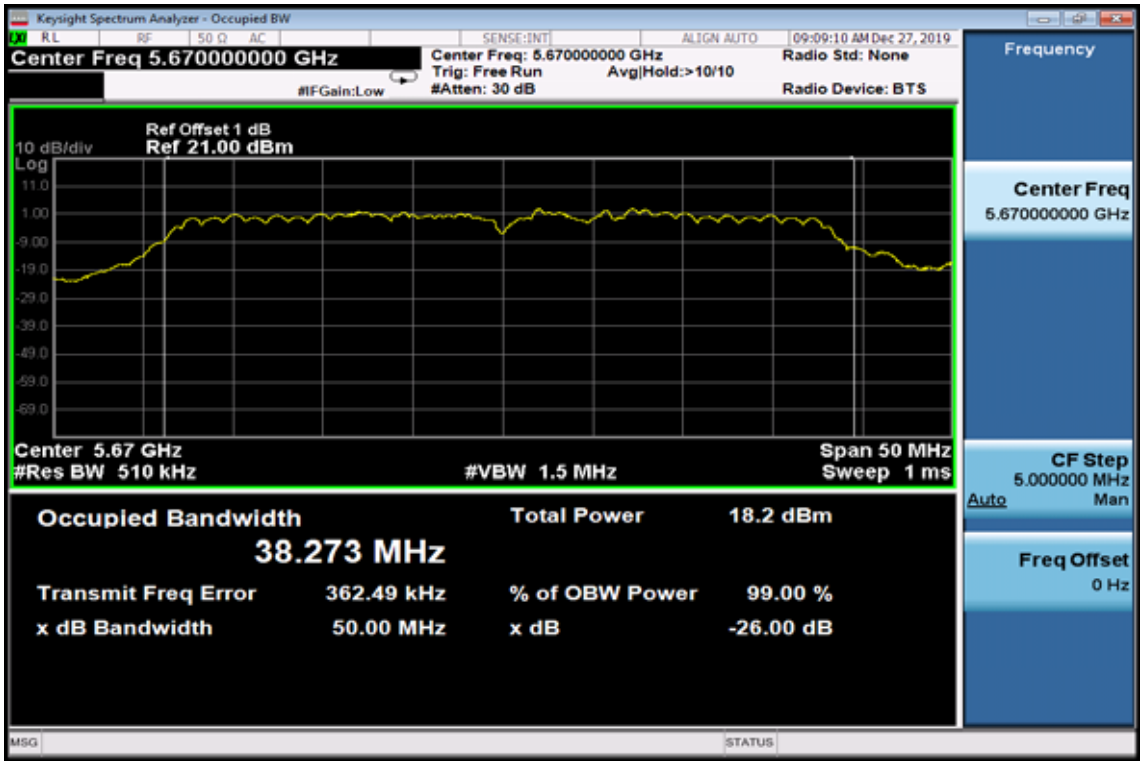
26dB / 99% Band Width Test Data CH-Low



26dB / 99%Band Width Test Data CH-Mid

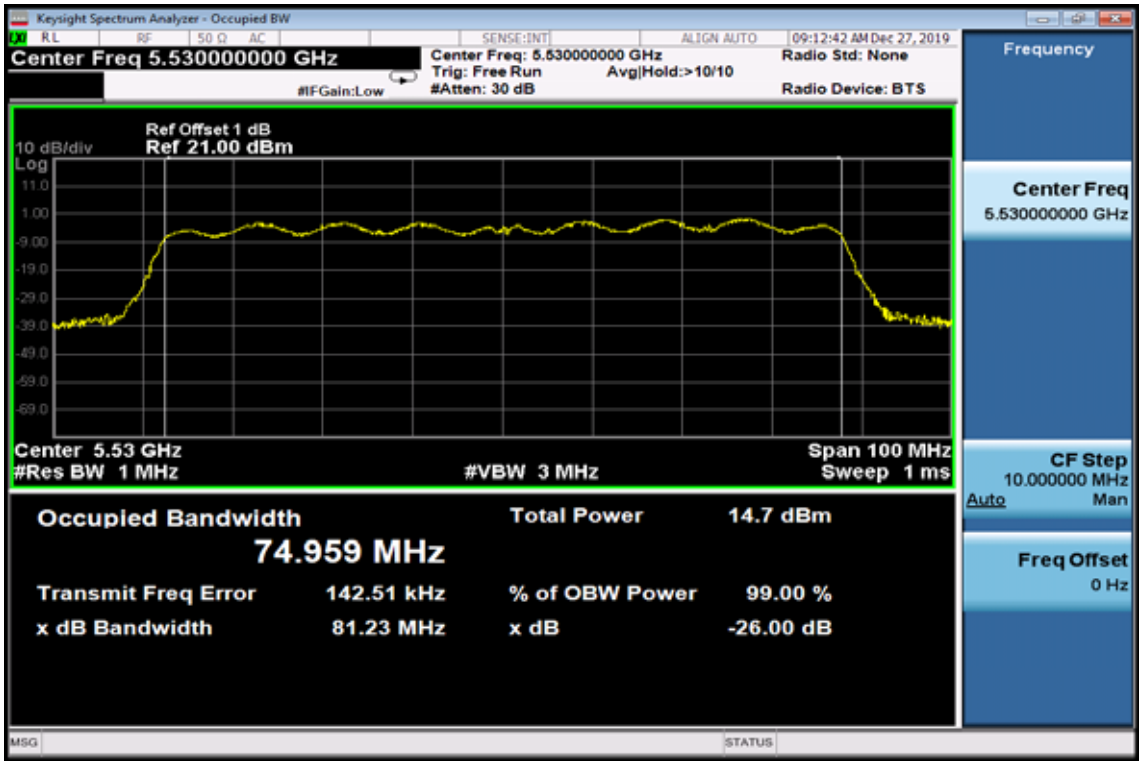


26dB / 99%Band Width Test Data CH-High



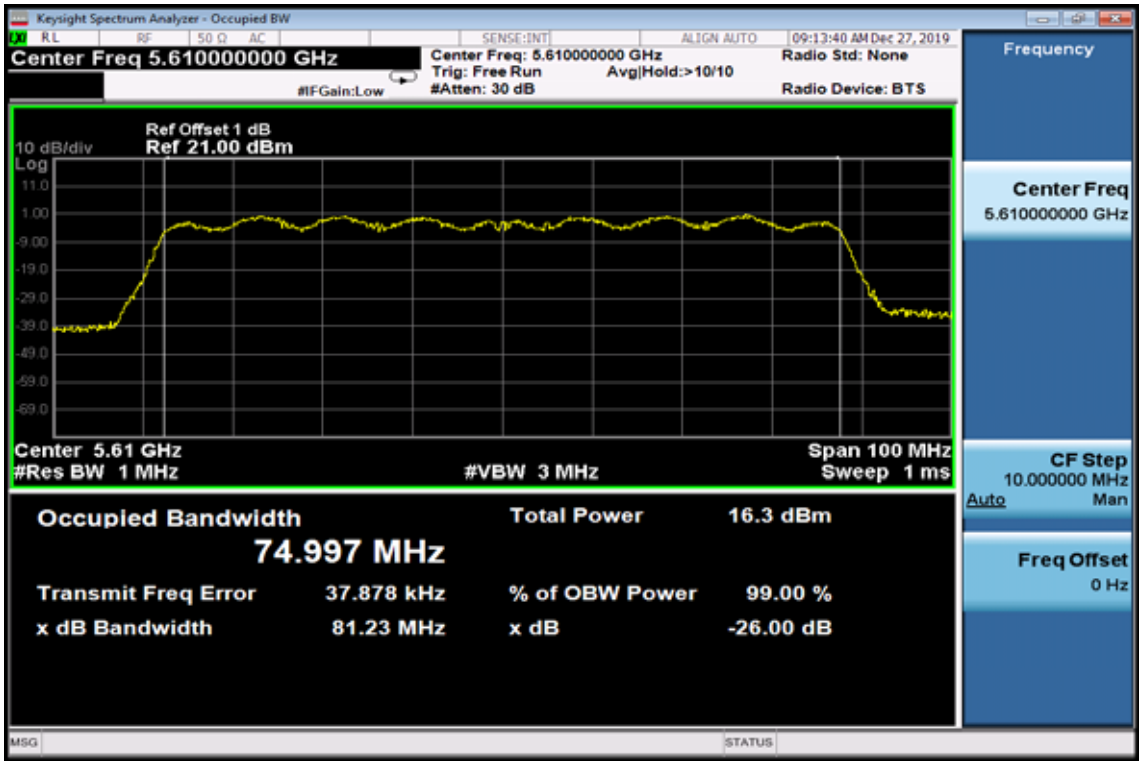
802.11 ac VHT80

26dB / 99% Band Width Test Data CH-Low



802.11 ac VHT80

26dB / 99% Band Width Test Data CH-High



8. 6dB Emission Bandwidth Measurement

8.1. Standard Applicable

According to §15.407 (e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.2. Measurement Procedure

1. Place the EUT on the table and set it in 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 analyzer as RBW=100kHz, VBW =300MHz, Span= 50MHz, Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

Refer to section D of KDB Document: KDB 789033 D02 General UNII Test Procedures New Rules v01r03

8.3. Measurement Equipment Used:

Refer to section 6.3 for details.

8.4. Test Set-up:

Refer to section 6.4 for details.

8.5. Measurement Result

802.11a Mode

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (KHz)
5745	16.540	16.660	>500
5785	16.520	17.486	>500
5825	16.540	16.825	>500

802.11n HT20 Mode

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (KHz)
5745	17.730	17.802	>500
5785	17.720	17.730	>500
5825	17.710	17.735	>500

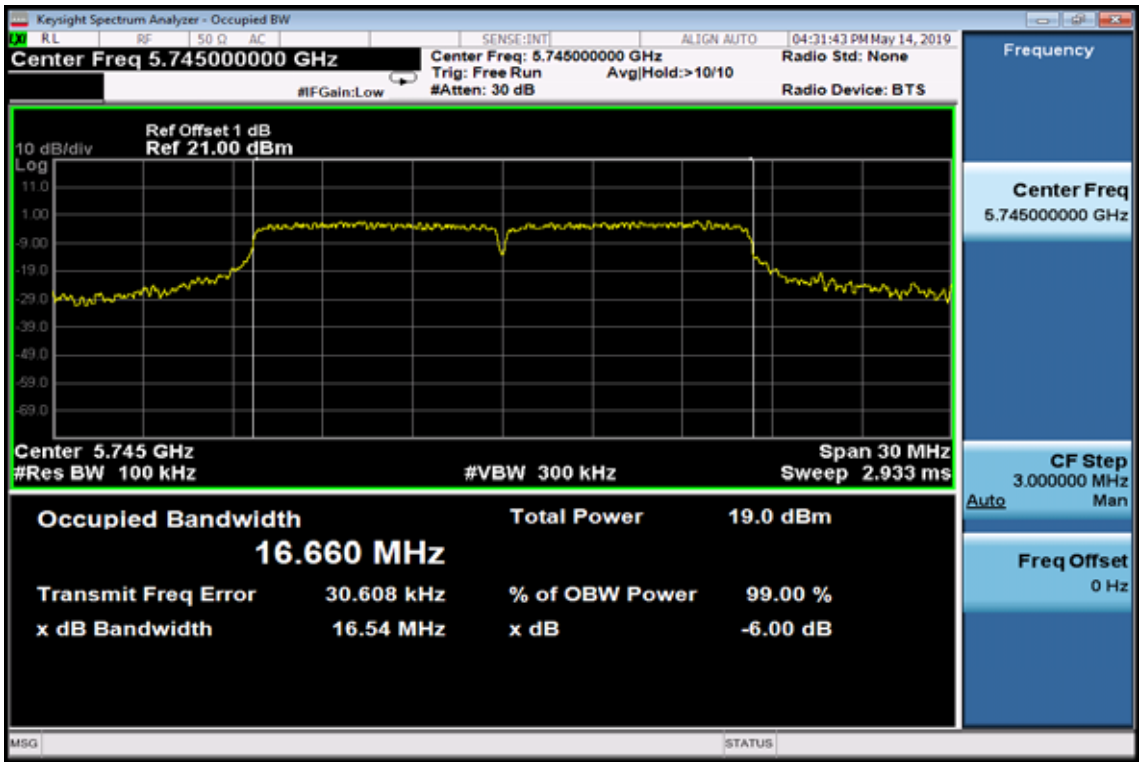
802.11n HT40 Mode

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (KHz)
5755	36.440	36.317	>500
5795	36.520	37.141	>500

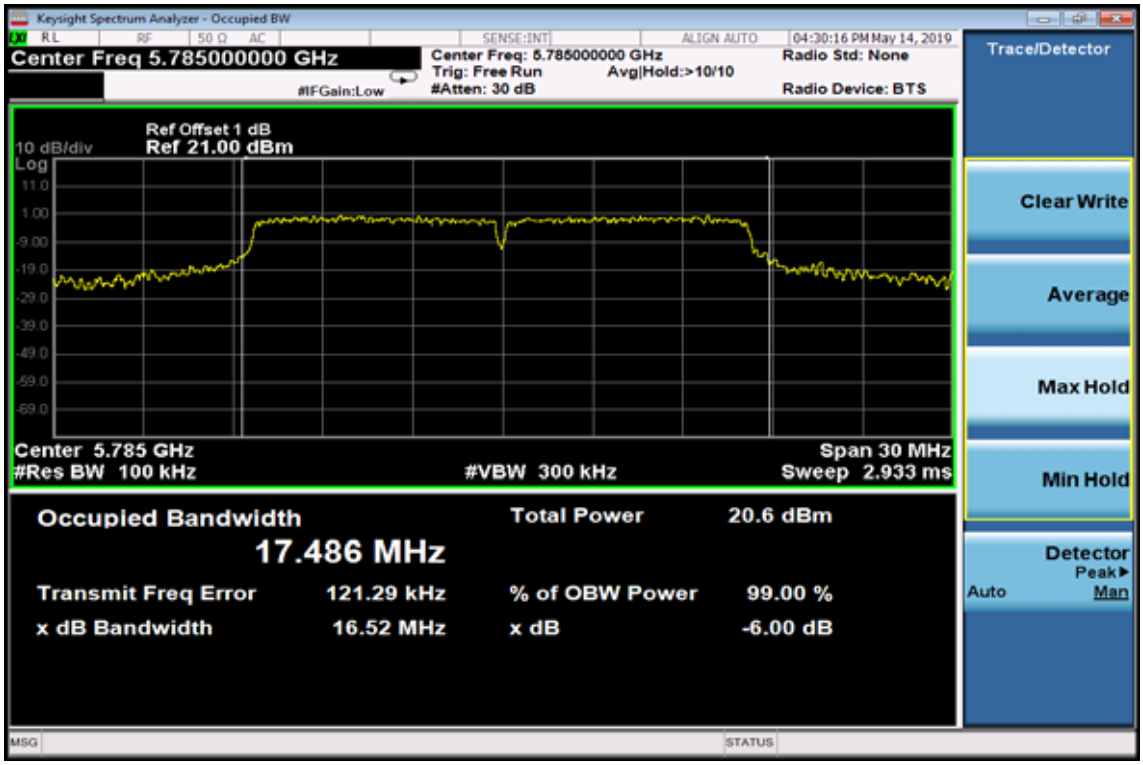
802.11 ac VHT80 Mode

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (kHz)
5775	75.120	75.252	>500

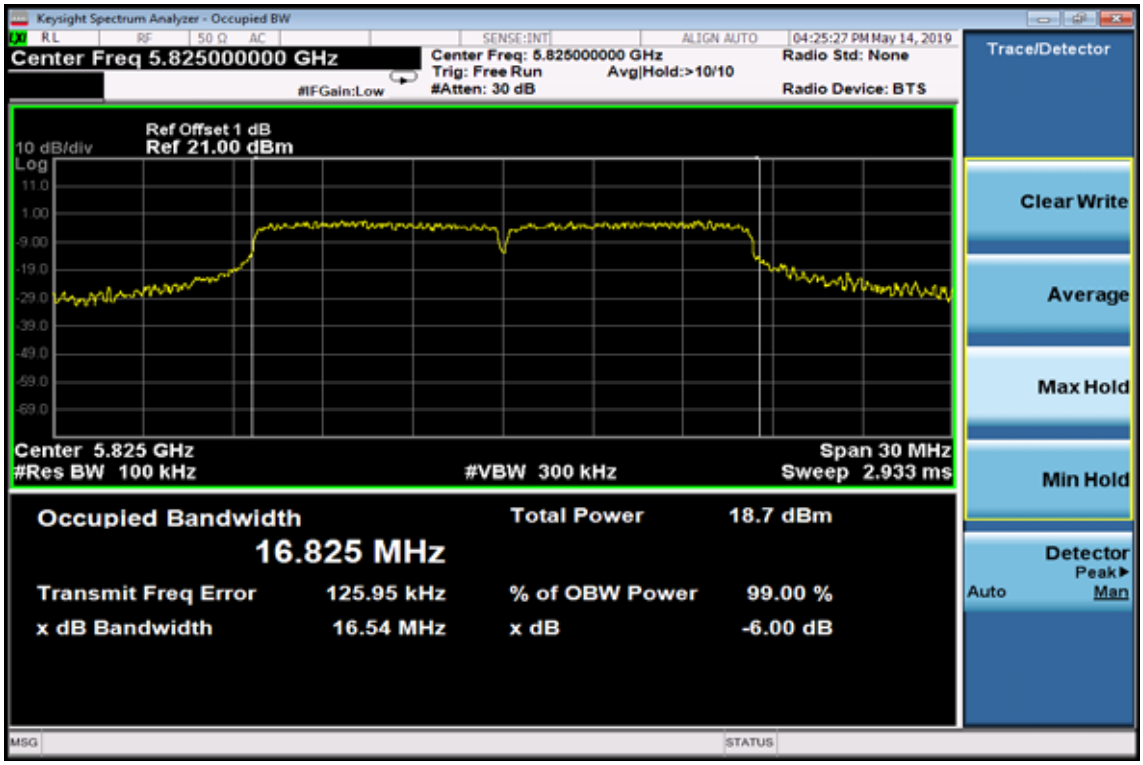
Band UNII-3
802.11a
6dB Band Width Test Data CH-Low



6dB Band Width Data CH-Mid

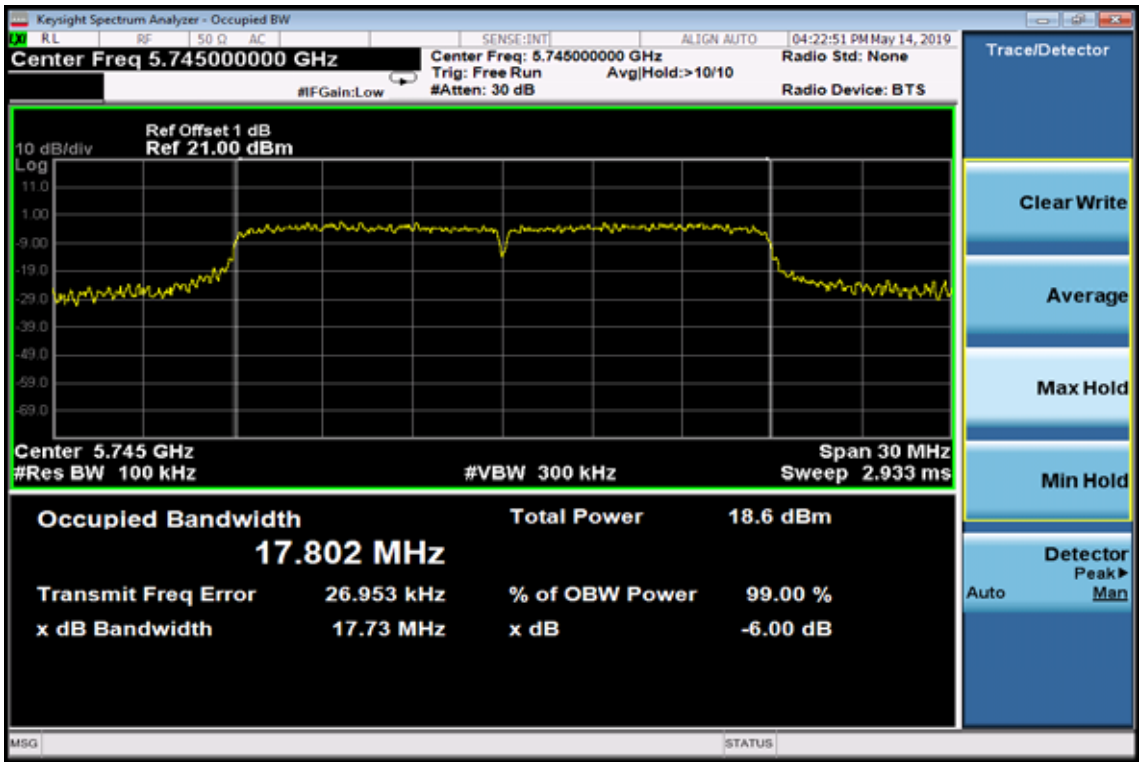


6dB Band Width Data CH-High

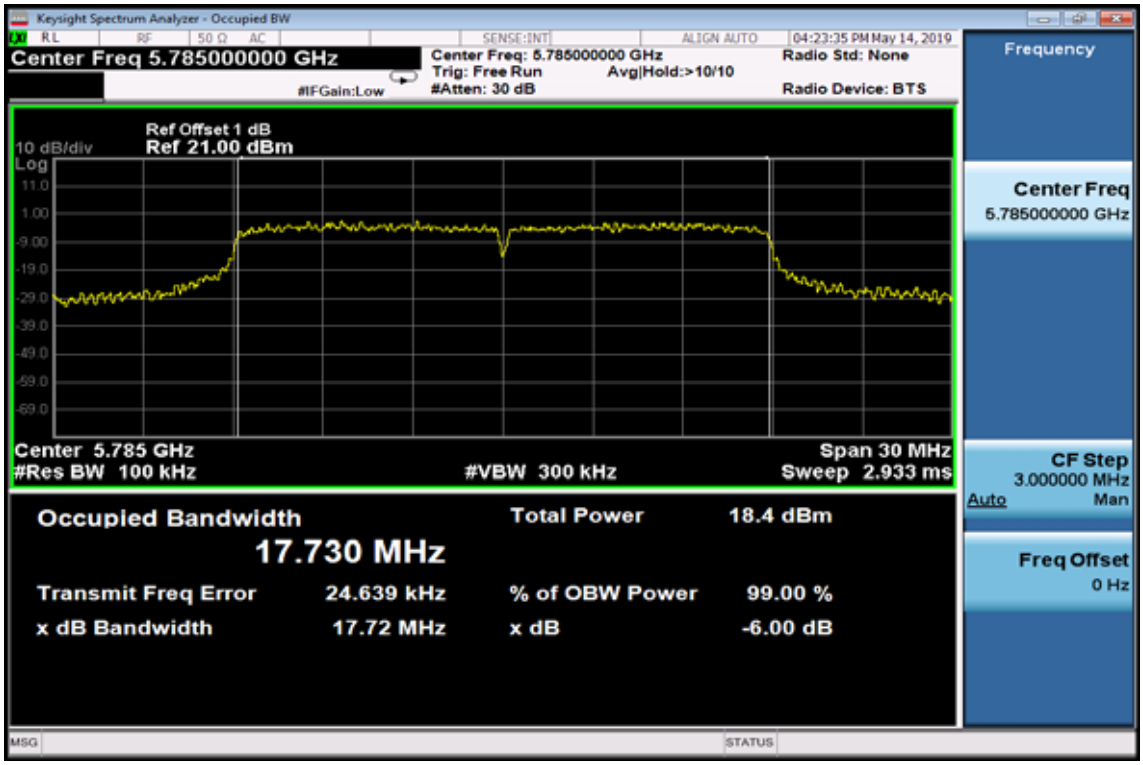


802.11n HT20

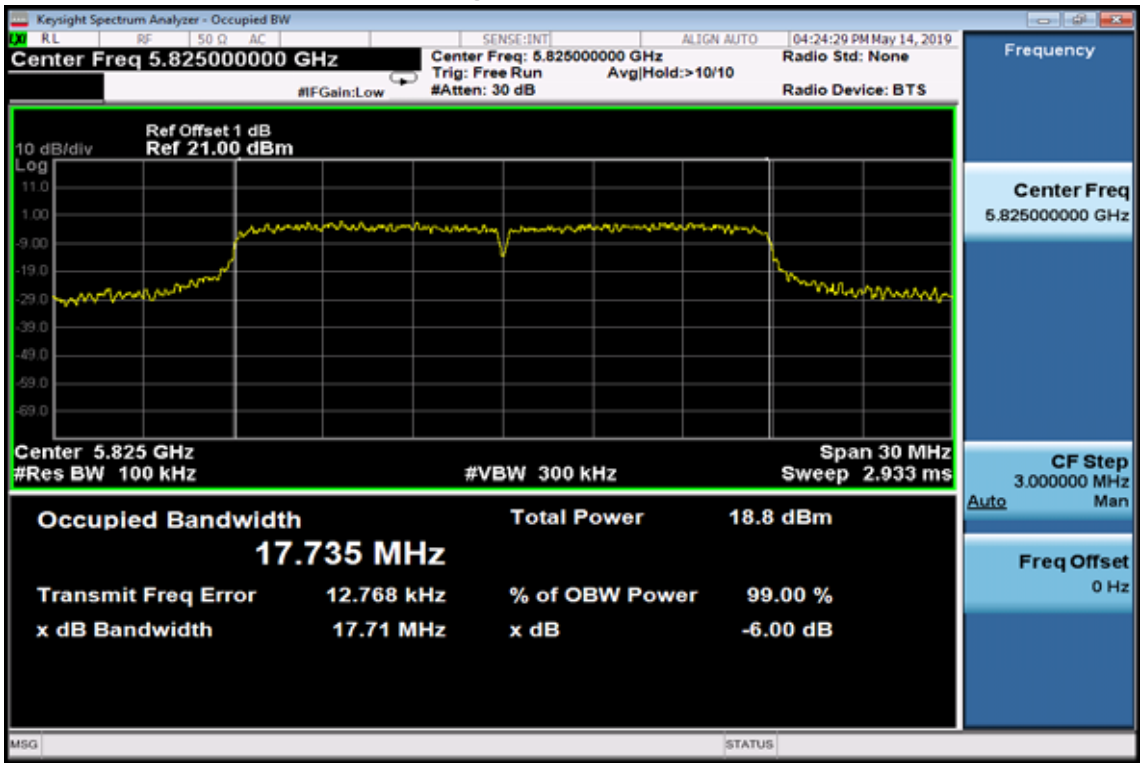
6dB Band Width Data CH-Low



6dB Band Width Data CH-Mid

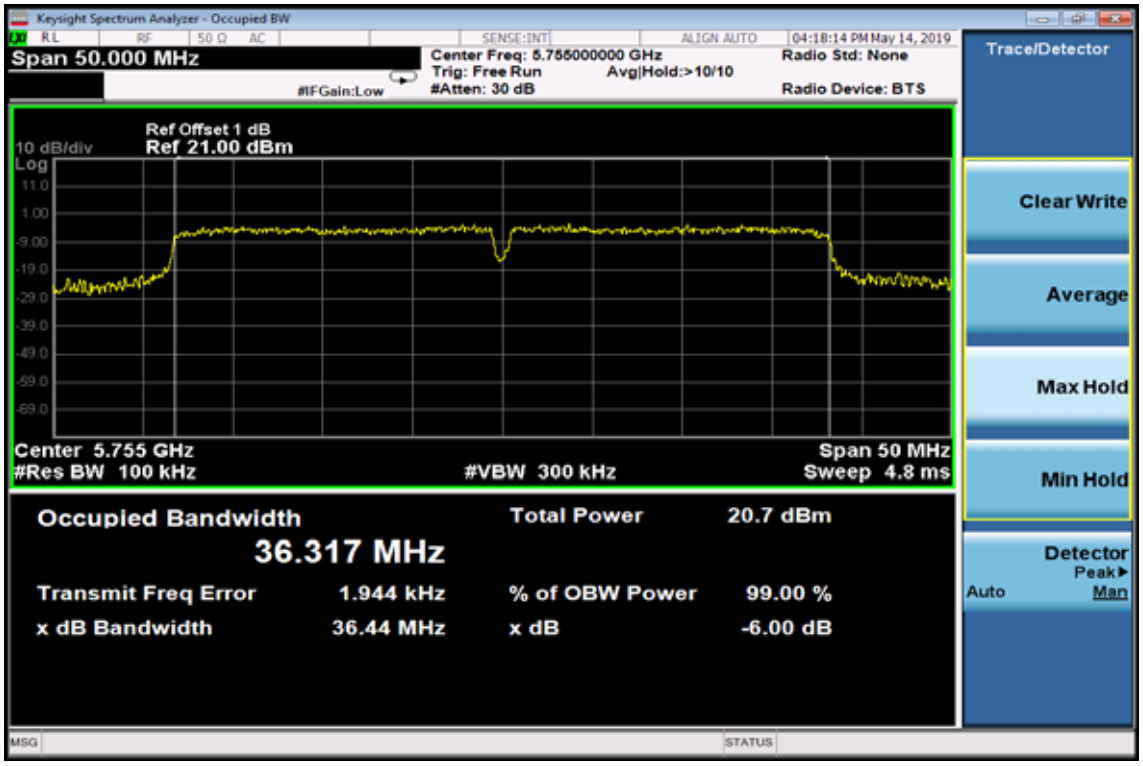


6dB Band Width Data CH-High

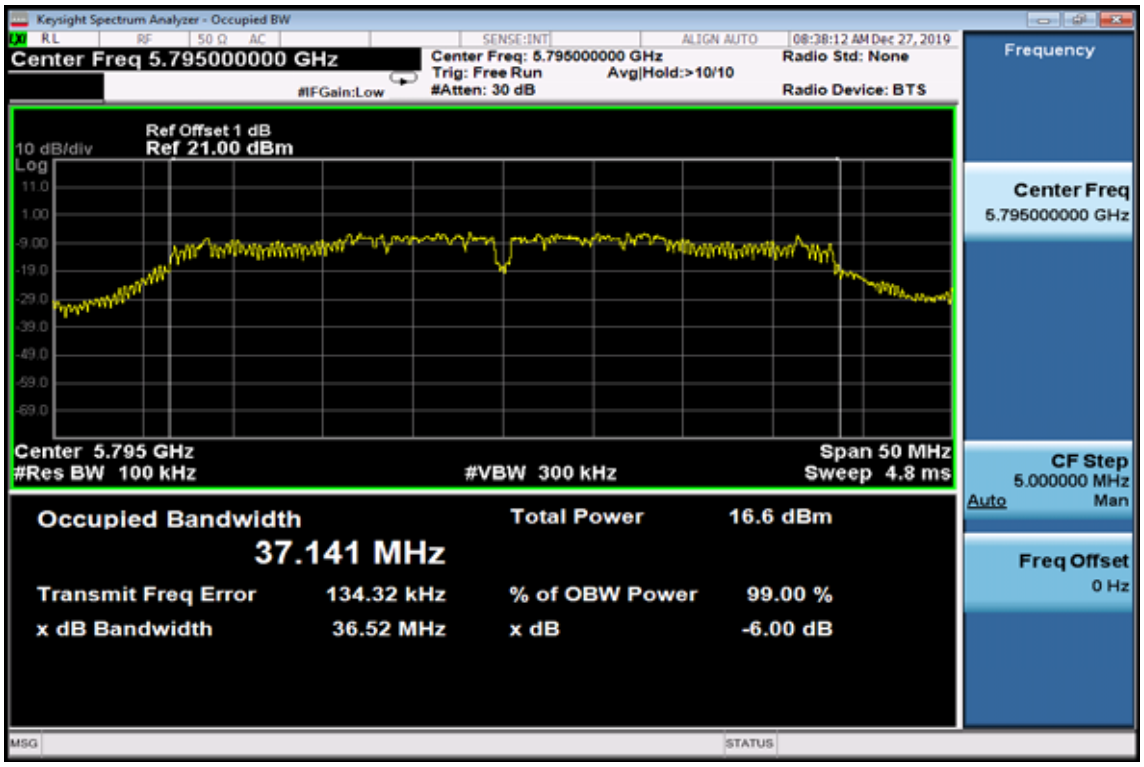


802.11n HT40

6dB Band Width Data CH-Low

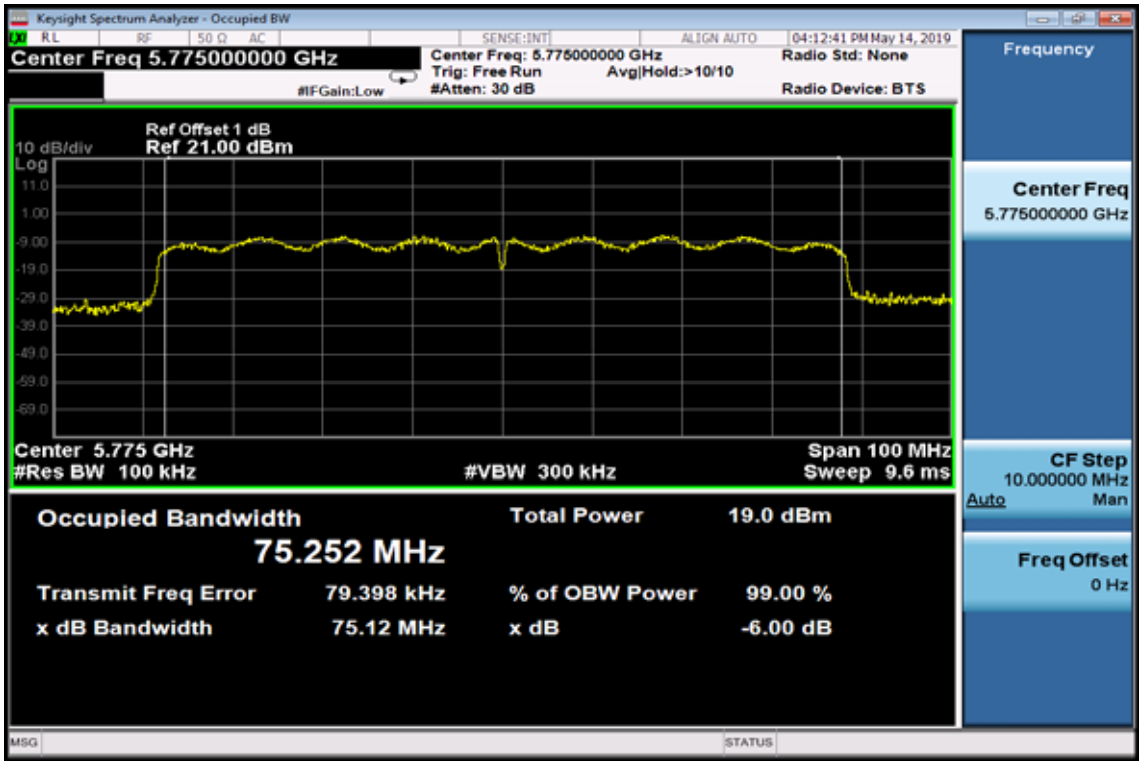


6dB Band Width Data CH-High



802.11 ac VHT80

6dB Band Width Data CH-Low



9. Undesirable emission – Radiated Measurement

9.1. Standard Applicable

According to §15.407(b), Undesirable Emission Limits: Except as shown in Paragraph (b)(7) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

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

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

(3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

(5) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

(7) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

§15.205- RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 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	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

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

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less 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.

§15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

FCC PART 15.209

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

9.2. EUT Setup

1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.10: 2013
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 120Vac/60Hz power source.

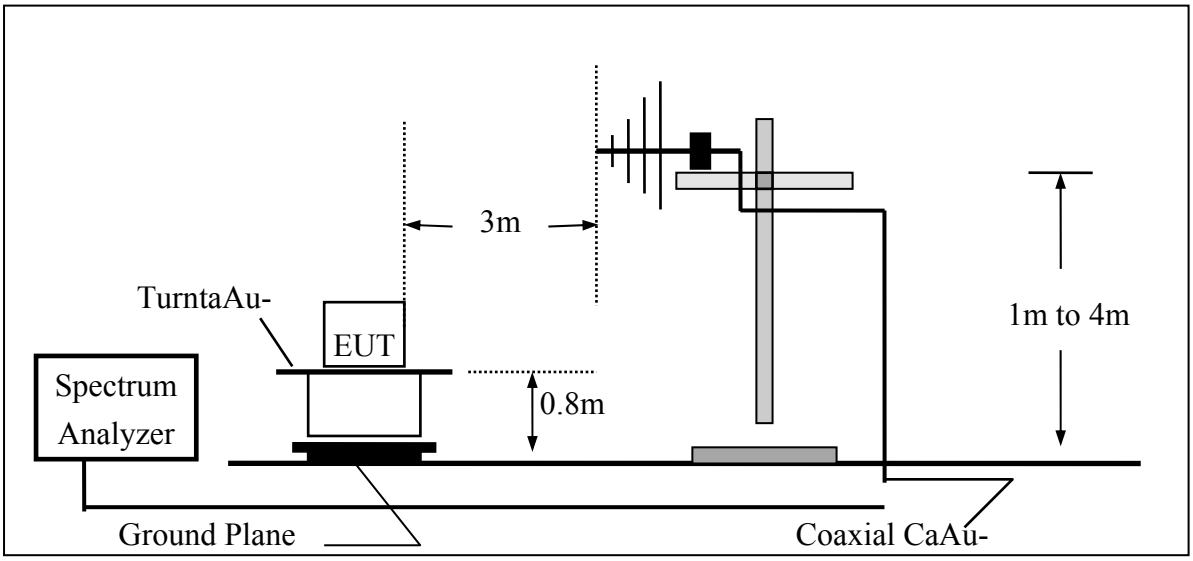
9.3. Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest 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. Repeat above procedures until all frequency measured were complete.

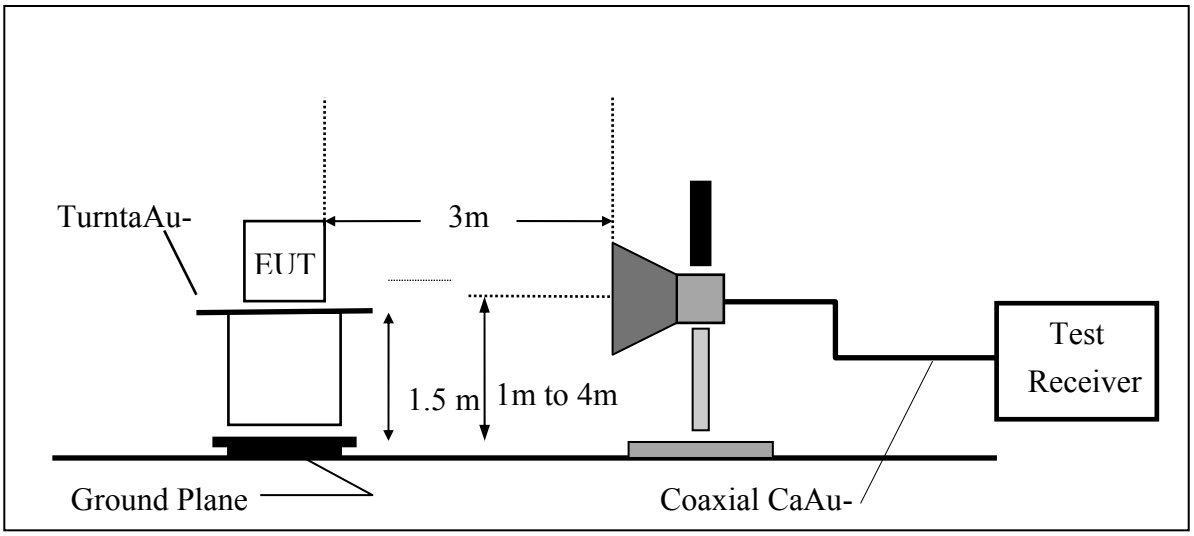
Refer to section F of KDB Document: KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

9.4. Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



9.5. Measurement Equipment Used:

Chamber 19(966)					
Equipment Type	**MFR**	**Model Number**	**Serial Num-ber**	**Last Cal.**	**Cal Due.**
Spectrum analyzer	R&S	FSP40	100116	01/10/2019	01/10/2020
EMI Receiver	R&S	ESR3	102461	08/08/2018	08/08/2020
Loop Antenna	EM	EM-6879	271	05/31/2019	05/31/2020
Bilog Antenna (30MHz-1GHz)	Schwarzbeck	VULB9168 w 5dB Att.	736	01/29/2019	01/29/2020
Horn antenna (1GHz-18GHz)	Schwarzbeck	9120D	9120D-1627	06/17/2019	06/17/2020
Horn antenna (18GHz-26GHz)	Com-power	AH-826	081001	11/21/2019	11/21/2020
Horn antenna (26GHz-40GHz)	Com-power	AH-640	100A	03/29/2019	03/29/2021
Preamplifier (9kHz-1GHz)	HP	8447F	3113A06362	01/14/2019	01/14/2020
Preamplifier (1GHz-26GHz)	Agilent	8449B	3008A02471	10/05/2019	10/05/2020
Preamplifier (26GHz-40GHz)	MITEQ	JS4-26004000-27-5A	818471	05/06/2019	05/06/2020
RF Cable (9kHz-18GHz)	HUBER SUHNER	Sucoflex 104A	MY1397/4A	01/17/2019	01/17/2020
RF Cable (18GHz-40GHz)	HUBER SUHNER	Sucoflex 102	27963/2&37421/2	11/27/2017	11/27/2019
Signal Generator	Anritsu	MG3692A	20311	01/09/2019	01/09/2020
Test Software	Audix	E3 Ver:6.12023	N/A	N/A	N/A
Magnetic Field Meter	Combinova	MFM-10	645	10/16/2019	10/16/2020
Magnetic Field Meter	Combinova	MFM-1000	619	12/06/2019	12/06/2020
Electric Field Meter	Combinova	EFM-200	402	10/16/2019	10/16/2020
E-field probe	Narda / Wandel & Goltermann	EF-0691 + NBM-520	D-0135 + D-0526	03/02/2019	03/02/2020

9.6. Field Strength Calculation

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

FS = RA + AF + CL - AG

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

9.7. Measurement Result

Refer to attach tabular data sheets.

NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz. And RBW 1MHz for frequency above 1GHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

(Band UNII-1 / Band UNII-2A, 802.11a mode)

Operation Mode	TX MODE	Test Date	2019/12/13
Channel Number	CH Low	Test By	Barry
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	58.13	42.64	-6.63	36.01	40.00	-3.99	Peak	VERTICAL
2	83.35	48.18	-11.72	36.46	40.00	-3.54	Peak	VERTICAL
3	143.49	38.91	-6.29	32.62	43.50	-10.88	Peak	VERTICAL
4	239.52	39.84	-6.98	32.86	46.00	-13.14	Peak	VERTICAL
5	336.52	37.88	-4.24	33.64	46.00	-12.36	Peak	VERTICAL
6	431.58	33.24	-2.41	30.83	46.00	-15.17	Peak	VERTICAL
1	59.10	38.24	-6.70	31.54	40.00	-8.46	Peak	HORIZONTAL
2	120.21	37.03	-8.53	28.50	43.50	-15.00	Peak	HORIZONTAL
3	143.49	40.55	-6.29	34.26	43.50	-9.24	Peak	HORIZONTAL
4	239.52	46.28	-6.98	39.30	46.00	-6.70	Peak	HORIZONTAL
5	336.52	42.94	-4.24	38.70	46.00	-7.30	Peak	HORIZONTAL
6	384.05	34.88	-3.30	31.58	46.00	-14.42	Peak	HORIZONTAL

Remark:

1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90kHz/110-490kHz using PK/AV and other Frequency Band using PK/QP

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100kHz, VBW=300kHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX MODE	Test Date	2019/12/13
Channel Number	CH Mid	Test By	Barry
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	143.49	38.72	-6.29	32.43	43.50	-11.07	Peak	VERTICAL
2	239.52	45.80	-6.98	38.82	46.00	-7.18	Peak	VERTICAL
3	299.66	38.13	-4.83	33.30	46.00	-12.70	Peak	VERTICAL
4	335.55	37.00	-4.25	32.75	46.00	-13.25	Peak	VERTICAL
5	451.95	32.75	-2.06	30.69	46.00	-15.31	Peak	VERTICAL
6	533.43	30.85	-1.10	29.75	46.00	-16.25	Peak	VERTICAL
1	143.49	40.53	-6.29	34.24	43.50	-9.26	Peak	HORIZONTAL
2	201.69	43.23	-8.59	34.64	43.50	-8.86	Peak	HORIZONTAL
3	299.66	33.98	-4.83	29.15	46.00	-16.85	Peak	HORIZONTAL
4	384.05	34.62	-3.30	31.32	46.00	-14.68	Peak	HORIZONTAL
5	431.58	35.23	-2.41	32.82	46.00	-13.18	Peak	HORIZONTAL
6	623.64	29.37	0.70	30.07	46.00	-15.93	Peak	HORIZONTAL

Remark:

1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90kHz/110-490kHz using PK/AV and other Frequency Band using PK/QP

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100kHz, VBW=300kHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX MODE	Test Date	2019/12/13
Channel Number	CH High	Test By	Barry
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	143.49	38.41	-6.29	32.12	43.50	-11.38	Peak	VERTICAL
2	239.52	45.90	-6.98	38.92	46.00	-7.08	Peak	VERTICAL
3	299.66	35.43	-4.83	30.60	46.00	-15.40	Peak	VERTICAL
4	335.55	35.30	-4.25	31.05	46.00	-14.95	Peak	VERTICAL
5	382.11	34.25	-3.35	30.90	46.00	-15.10	Peak	VERTICAL
6	490.75	29.81	-1.73	28.08	46.00	-17.92	Peak	VERTICAL
1	143.49	40.62	-6.29	34.33	43.50	-9.17	Peak	HORIZONTAL
2	206.54	43.77	-8.56	35.21	43.50	-8.29	Peak	HORIZONTAL
3	324.88	32.17	-4.43	27.74	46.00	-18.26	Peak	HORIZONTAL
4	378.23	34.31	-3.43	30.88	46.00	-15.12	Peak	HORIZONTAL
5	431.58	34.43	-2.41	32.02	46.00	-13.98	Peak	HORIZONTAL
6	602.30	29.45	0.44	29.89	46.00	-16.11	Peak	HORIZONTAL

Remark:

1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90kHz/110-490kHz using PK/AV and other Frequency Band using PK/QP

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100kHz, VBW=300kHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

(Band UNII-1 / Band UNII-2A, 802.11n HT40 mode)

Operation Mode	TX MODE	Test Date	2019/12/13
Channel Number	CH Low	Test By	Barry
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	143.49	47.37	-6.29	41.08	43.50	-2.42	Peak	VERTICAL
2	239.52	45.30	-6.98	38.32	46.00	-7.68	Peak	VERTICAL
3	300.63	38.94	-4.82	34.12	46.00	-11.88	Peak	VERTICAL
4	369.50	33.68	-3.60	30.08	46.00	-15.92	Peak	VERTICAL
5	431.58	34.15	-2.41	31.74	46.00	-14.26	Peak	VERTICAL
6	524.70	31.24	-1.23	30.01	46.00	-15.99	Peak	VERTICAL
1	143.49	39.58	-6.29	33.29	43.50	-10.21	Peak	HORIZONTAL
2	205.57	43.26	-8.57	34.69	43.50	-8.81	Peak	HORIZONTAL
3	224.97	39.59	-7.89	31.70	46.00	-14.30	Peak	HORIZONTAL
4	335.55	34.92	-4.25	30.67	46.00	-15.33	Peak	HORIZONTAL
5	431.58	34.21	-2.41	31.80	46.00	-14.20	Peak	HORIZONTAL
6	587.75	27.97	0.13	28.10	46.00	-17.90	Peak	HORIZONTAL

Remark:

1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90kHz/110-490kHz using PK/AV and other Frequency Band using PK/QP

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100kHz, VBW=300kHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX MODE	Test Date	2019/12/13
Channel Number	CH Mid	Test By	Barry
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	143.49	46.51	-6.29	40.22	43.50	-3.28	Peak	VERTICAL
2	239.52	45.60	-6.98	38.62	46.00	-7.38	Peak	VERTICAL
3	300.63	37.44	-4.82	32.62	46.00	-13.38	Peak	VERTICAL
4	450.98	33.78	-2.06	31.72	46.00	-14.28	Peak	VERTICAL
5	533.43	28.97	-1.10	27.87	46.00	-18.13	Peak	VERTICAL
6	713.85	28.83	2.22	31.05	46.00	-14.95	Peak	VERTICAL
1	143.49	43.82	-6.29	37.53	43.50	-5.97	Peak	HORIZONTAL
2	204.60	43.57	-8.57	35.00	43.50	-8.50	Peak	HORIZONTAL
3	376.29	35.73	-3.48	32.25	46.00	-13.75	Peak	HORIZONTAL
4	451.95	30.90	-2.06	28.84	46.00	-17.16	Peak	HORIZONTAL
5	592.60	30.03	0.24	30.27	46.00	-15.73	Peak	HORIZONTAL
6	730.34	26.64	2.62	29.26	46.00	-16.74	Peak	HORIZONTAL

Remark:

1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90kHz/110-490kHz using PK/AV and other Frequency Band using PK/QP

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100kHz, VBW=300kHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX MODE	Test Date	2019/12/13
Channel Number	CH High	Test By	Barry
Temperature	25 ℃	Pol	Ver./Hor
Humidity	65 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	143.49	46.89	-6.29	40.60	43.50	-2.90	Peak	VERTICAL
2	239.52	45.44	-6.98	38.46	46.00	-7.54	Peak	VERTICAL
3	299.66	38.47	-4.83	33.64	46.00	-12.36	Peak	VERTICAL
4	450.98	33.96	-2.06	31.90	46.00	-14.10	Peak	VERTICAL
5	578.05	28.91	-0.12	28.79	46.00	-17.21	Peak	VERTICAL
6	676.99	28.88	1.49	30.37	46.00	-15.63	Peak	VERTICAL
1	143.49	41.30	-6.29	35.01	43.50	-8.49	Peak	HORIZONTAL
2	205.57	43.11	-8.57	34.54	43.50	-8.96	Peak	HORIZONTAL
3	335.55	34.24	-4.25	29.99	46.00	-16.01	Peak	HORIZONTAL
4	431.58	33.75	-2.41	31.34	46.00	-14.66	Peak	HORIZONTAL
5	625.58	28.53	0.71	29.24	46.00	-16.76	Peak	HORIZONTAL
6	855.47	28.07	4.46	32.53	46.00	-13.47	Peak	HORIZONTAL

Remark:

1 emission is 20dB lower, so that emission as measured between 9kHz to 30MHz is not reported

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90kHz/110-490kHz using PK/AV and other Frequency Band using PK/QP

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100kHz, VBW=300kHz.