TEST REPORT

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Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC2007-0218

2. Customer

- Name(FCC) : Pittasoft Co., Ltd.
- Name(IC) : PITTASOFT CO., LTD.
- Address(FCC) : A 4th floor, ABN Tower, 331, Pangyo-ro Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea 13488
- Address(IC) : A 4th floor, ABN Tower, 331, Pangyo-ro Bundang-gu, Seongnam-si Gyeonggi-do, 08506, Korea (Republic Of)

3. Use of Report : FCC & IC Original Grant

4. Product Name / Model Name : Car Dashcam / DR900X-2CH
FCC ID : YCK-DR900X-2CH / IC : 23402-DR900X2CH

5. Test Method Used : KDB789033 D02v02r01, ANSI C 63.10-2013
Test Specification : FCC Part 15.407
RSS-247 Issue 2, RSS-GEN Issue 5

6. Date of Test : 2020.04.01 ~ 2020.06.03

7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

8. Testing Environment : See appended test report.

9. Test Result : Refer to the attached test result.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation	Tested by Name : JungWoo Kim (Signature)	Reviewed by Name : JaeJin Lee (Signature)

2020 . 07 . 21 .

DT&C Co., Ltd.

Not abided by KS Q ISO / IEC 17025 and KOLAS accreditation.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2007-0218	Jul. 21, 2020	Initial issue	JungWoo Kim	JaeJin Lee

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1. EUT DESCRIPTION

Equipment Class	Unlicensed National Information Infrastructure (UNII)
Product	Car Dashcam
Model Name	DR900X-2CH
Add Model Name	DR900X-1CH, DR900X-2CH IR, DR900X-2CH Truck, DR900G-2CH, DR900G-1CH, DR900X-2CH Plus, DR900X-1CH Plus, DR900X-3CH, DR900XJ-2CH
Hardware Version	V 1.0
Software Version	V 1.000
Serial Number	Radiated: DR9XS3J2E00021 Conducted: DR9XS3J2E00041
Power Supply	DC 12 V , 24 V
Modulation type	OFDM
Antenna Specification	**Antenna type:** CHIP Antenna **Antenna gain:** U-NII 1: 3.60 dBi U-NII 3: 3.60 dBi

5GHz Band	Mode	Frequency range(MHz)	Max power(dBm)	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
U-NII 1	802.11a	5 180 ~ 5 240	**9.58**	3.60	**13.18**
	802.11n(HT20)	5 180 ~ 5 240	9.38		12.98
	802.11ac(VHT20)	5 180 ~ 5 240	9.34		12.94
	802.11n(HT40)	5 190 ~ 5 230	9.65		13.25
	802.11ac(VHT40)	5 190 ~ 5 230	9.61		13.21
	802.11ac(VHT80)	5 210	8.81		12.41
U-NII 3	802.11a	5 745 ~ 5 825	**8.02**	3.60	**11.62**
	802.11n(HT20)	5 745 ~ 5 825	7.75		11.35
	802.11ac(VHT20)	5 745 ~ 5 825	7.68		11.28
	802.11n(HT40)	5 755 ~ 5 795	9.79		13.39
	802.11ac(VHT40)	5 755 ~ 5 795	9.75		13.35
	802.11ac(VHT80)	5 775	10.79		14.39

Note 1: e.i.r.p = Conducted Output Power + Antenna Gain

2. Information about test items

2.1 Transmitting configuration of EUT

Mode	Data rate
802.11a	6~54Mbps
802.11n(HT20)	MCS 0 ~ 7
802.11ac(VHT20)	MCS 0 ~ 8
802.11n(HT40)	MCS 0 ~ 7
802.11ac(VHT40)	MCS 0 ~ 9
802.11ac(VHT80)	MCS 0 ~ 9

2.2 Tested Channel Information

5GHz Band	802.11a/n(HT20)/ ac(VHT20)			802.11n(HT40)/ ac(VHT40)			802.11ac(VHT80)		
	Channel	Frequency [MHz]	Power setting	Channel	Frequency [MHz]	Power setting	Channel	Frequency [MHz]	Power setting
U-NII 1	36	5180	43	38	5190	41	42	5210	40
	40	5200	43	-	-	-	-	-	-
	48	5240	43	46	5230	43	-	-	-
U-NII 3	149	5745	40	151	5755	44	155	5775	46
	157	5785	40	-	-	-	-	-	-
	165	5825	40	159	5795	44	-	-	-

2.3 Testing Environment

Temperature	:	20 ºC ~ 25 ºC
Relative humidity content	:	34 % ~ 40 %
Details of power supply	:	DC 12 V , 24 V

2.4 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing
→ None

2.5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014 and ANSI C 63.10-2013. All measurement uncertainty values are shown with a coverage factor of *k* = 2 to indicate a 95 % level of confidence.

Test items	Measurement uncertainty
Transmitter Output Power	0.7 dB (The confidence level is about 95 %, k = 2)
Conducted spurious emission	0.9 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (1 GHz Below)	4.9 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (1 GHz ~ 18 GHz)	5.1 dB (The confidence level is about 95 %, k = 2)
Radiated spurious emission (18 GHz Above)	5.3 dB (The confidence level is about 95 %, k = 2)

3. SUMMARY OF TESTS

FCC Part Section(s)	RSS Section(s)	Parameter	Limit	Test Condition	Status Note 1
15.407(a)	-	Emission Bandwidth (26 dB Bandwidth)	N/A	Conducted	C
15.407(e)	RSS-247[6.2.4]	Minimum Emission Bandwidth (6 dB Bandwidth)	> 500 kHz in 5725 ~ 5850 MHz		C
15.407(a)	RSS-247[6.2]	Maximum Conducted Output Power	Refer to the section 8.3		C
15.407(a)	RSS-247[6.2]	Peak Power Spectral Density	Refer to the section 8.4		C
-	RSS GEN[6.7]	Occupied Bandwidth (99%)	N/A		C
15.407(h)	RSS-247[6.3]	Dynamic Frequency Selection	FCC 15.407(h)		NA
15.205 15.209 15.407(b)	RSS-247[6.2] RSS-GEN[8.9] RSS-GEN[8.10]	Undesirable Emissions	Refer to the section 8.6	Radiated	C
15.207	RSS-GEN[8.8]	AC Conducted Emissions	FCC 15.207	AC Line Conducted	NA Note 3
15.203	-	Antenna Requirements	FCC 15.203	-	C

Note 1: **C** = Comply **NC** = Not Comply **NT** = Not Tested **NA** = Not Applicable

Note 2: For radiated emission tests below 30 MHz were performed on semi-anechoic chamber which is correlated with OATS.

Note 3: This device is installed in a car. Therefore the power source is a battery of car.

4. TEST METHODOLOGY

The measurement procedures described in the ANSI C63.10-2013 and the guidance provided in KDB 7899033 D02v02r01 were used in measurement of the EUT.
The EUT was tested per the guidance of KDB789033 D02v02r01. And ANSI C63.10-2013 was used to reference appropriate EUT setup and maximizing procedures of radiated spurious emission and AC line conducted emission testing.

4.1 EUT configuration

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

4.2 EUT exercise

The EUT was operated in the test mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

4.3 General test procedures

Conducted Emissions

The power-line conducted emission test procedure is not described on the KDB789033 D02v02r01. So this test was fulfilled with the requirements in Section 6.2 of ANSI C63.10-2013.
The EUT is placed on the wooden table, which is 0.8 m above ground plane and the conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and Average detector.

Radiated Emissions

Basically the radiated tests were performed with KDB789033 D02v02r01. But some requirements and procedures like test site requirements, EUT setup and maximizing procedure were fulfilled with the requirements in Section 5 and 6 of the ANSI C63.10-2013 as stated on KDB789033 D02v02r01.
The EUT is placed on a non-conductive table, which is 0.8 m above ground plane. For emission measurements above 1 GHz, the table height is 1.5 m. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 1 or 3 m away from the receiving antenna, which varied from 1 m to 4 m 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 highest emission, the relative positions of the EUT were rotated through three orthogonal axis.

4.4 Description of test modes

The EUT has been tested with all modes of operating conditions to determine the worst case emission characteristics.
A test program is used to control the EUT for staying in continuous transmitting mode with maximum fixed duty cycle.
The worst case data rate was determined as below test mode according to the power measurements.

Test mode	Worst case data rate
802.11a	6 Mbps
802.11n(HT20)	MCS 0
802.11n(HT40)	MCS 0
802.11ac(VHT80)	MCS 0

Operation test setup for EUT

- Test Software Version: MPTool / 1.0.0.10

5. INSTRUMENT CALIBRATION

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

6. FACILITIES AND ACCREDITATIONS

6.1 Facilities

DT&C Co., Ltd.		
The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The test site complies with the requirements of § 2.948 according to ANSI C63.4-2014. **- FCC & ISED MRA Designation No. : KR0034** **- ISED# : 5740A**		
www.dtnc.net		
Telephone	:	+ 82-31-321-2664
FAX	:	+ 82-31-321-1664

6.2 Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, loop, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and peak, 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.”

7. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The antenna type is a SMD antenna. The antenna is attached permanently using soldering. (Refer to Internal Photo file.)
Therefore this E.U.T Complies with the requirement of §15.203

8. TEST RESULT

8.1 Emission Bandwidth (26 dB Bandwidth)

▣ Test Requirements

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The 26 dB bandwidth is used to determine the conducted output power limit.

▣ Test Configuration

Refer to the APPENDIX I.

▣ Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of **KDB789033 D02v02r01**.

1. Set resolution bandwidth (RBW) = approximately **1 %** of the EBW.
2. Set the video bandwidth **(VBW) > RBW**.
3. Detector = **Peak**.
4. Trace mode = **max hold**.

Measure the maximum width of the emission that is 26 dB down from the peak of the 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%.

▣ **Test Results: Comply**

Mode	Band	Channel	Frequency [MHz]	Test Result [MHz]	
				DC 12 V	DC 24 V
802.11a	U-NII 1	36	5 180	38.16	38.23
		40	5 200	40.41	39.32
		48	5 240	40.57	43.10
802.11n (HT20)	U-NII 1	36	5 180	41.34	38.75
		40	5 200	40.56	39.66
		48	5 240	39.53	38.73
802.11n (HT40)	U-NII 1	38	5 190	77.87	75.59
		46	5 230	90.18	88.59
802.11ac (VHT80)	U-NII 1	42	5 210	140.51	140.32

▣ Result Plots

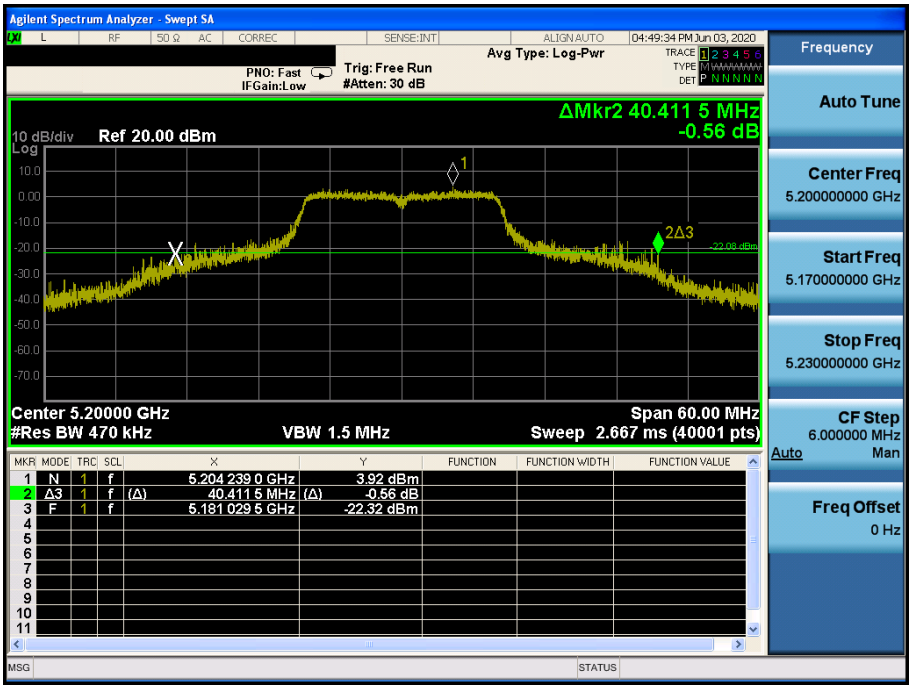
- Tested Power Supply: DC 12 V

26 dB Bandwidth

Test Mode: 802.11a & Ch.36

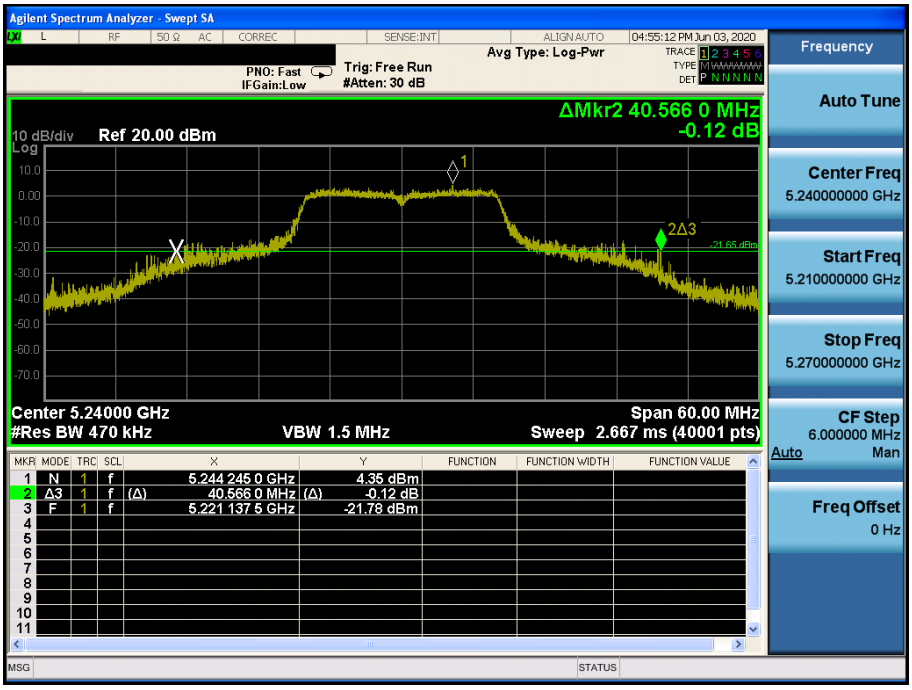
26 dB Bandwidth

Test Mode: 802.11a & Ch.40



26 dB Bandwidth

Test Mode: 802.11a & Ch.48



26 dB Bandwidth

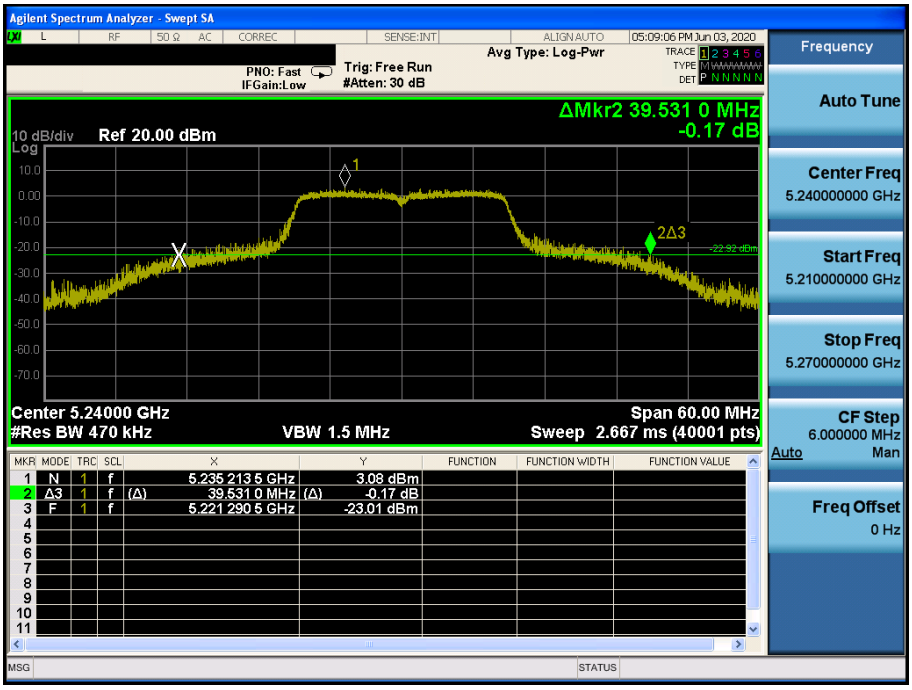
Test Mode: 802.11n HT20 & Ch.36

26 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.40

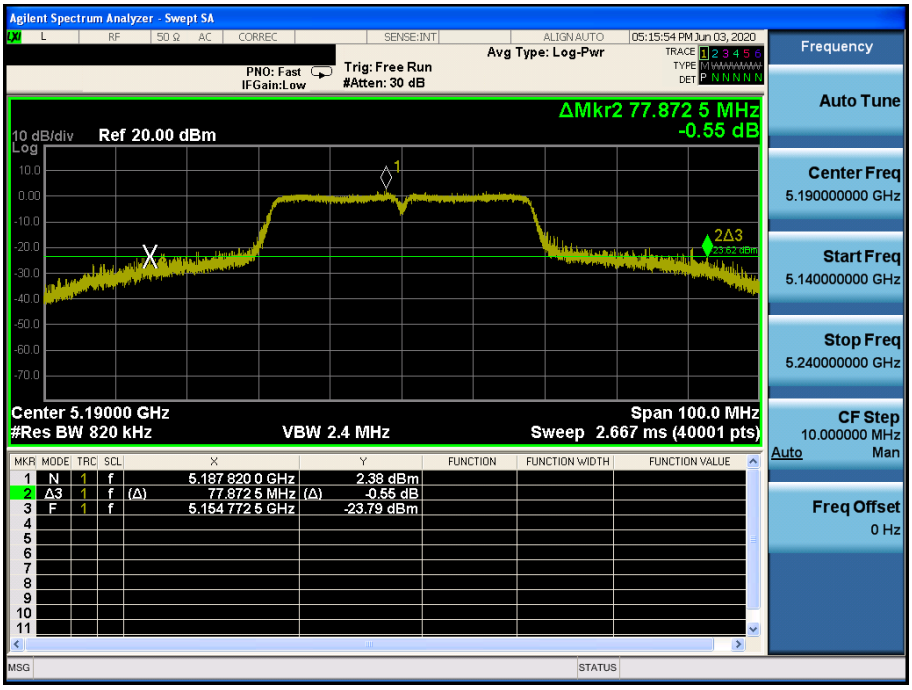
26 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.48



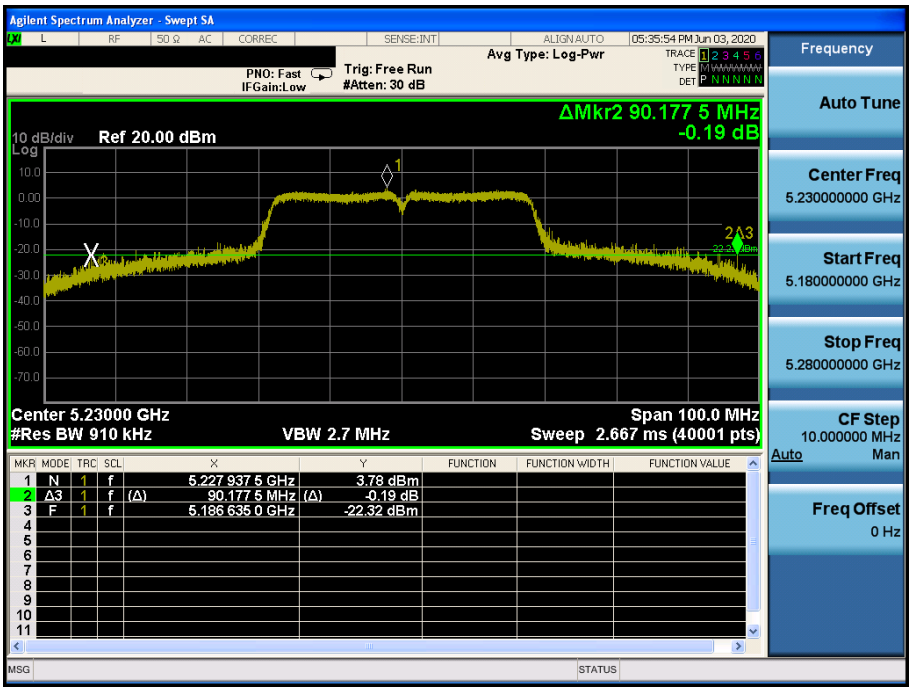
26 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.38



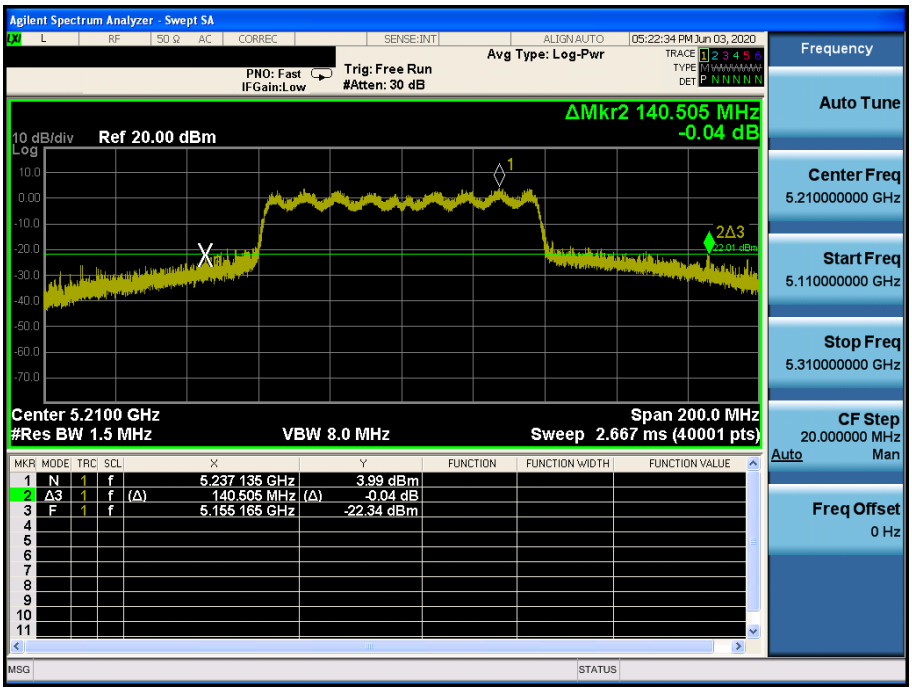
26 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.46



26 dB Bandwidth

Test Mode: 802.11ac VHT80 & Ch.42



- Tested Power Supply: DC 24 V

26 dB Bandwidth

Test Mode: 802.11a & Ch.36

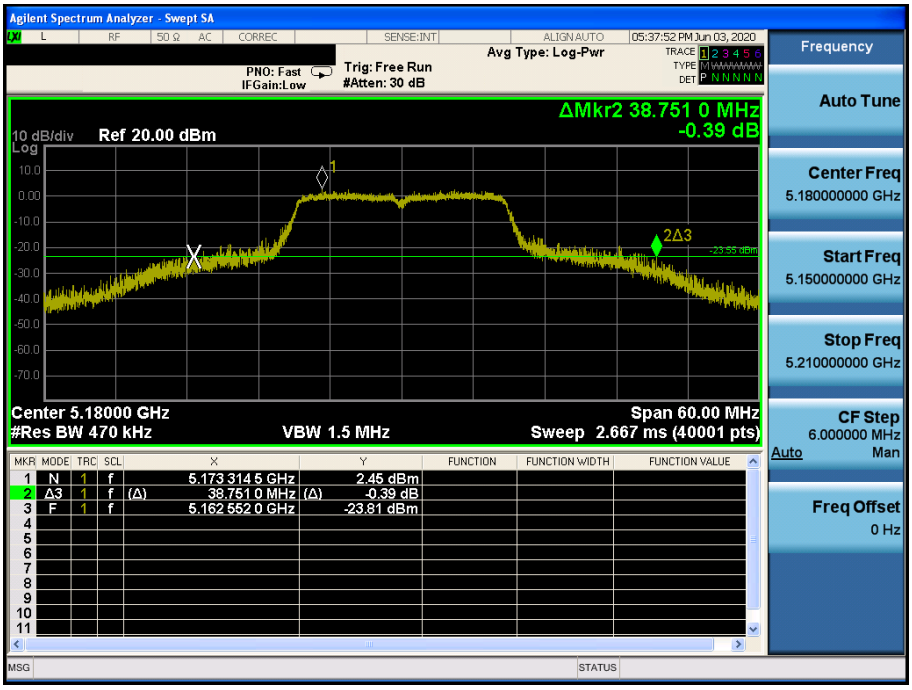
26 dB Bandwidth

Test Mode: 802.11a & Ch.40

26 dB Bandwidth Test Mode: 802.11a & Ch.48

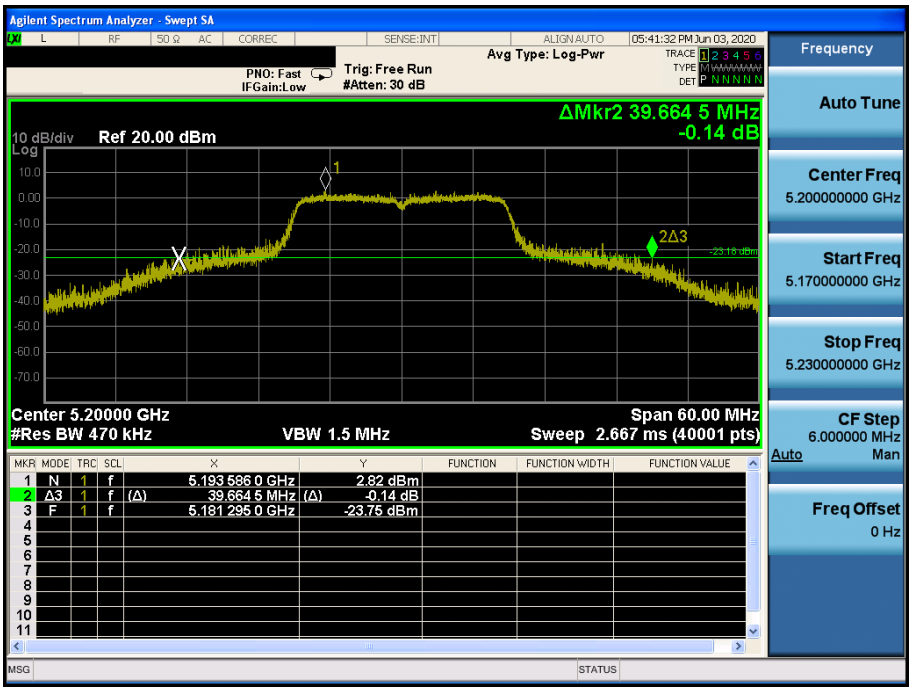
26 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.36



26 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.40

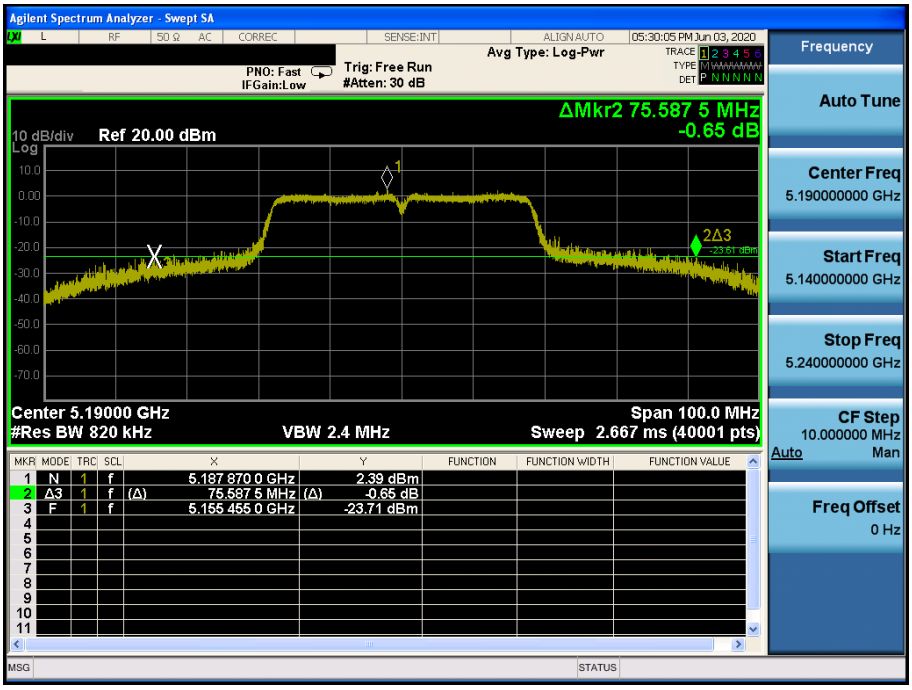


26 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.48

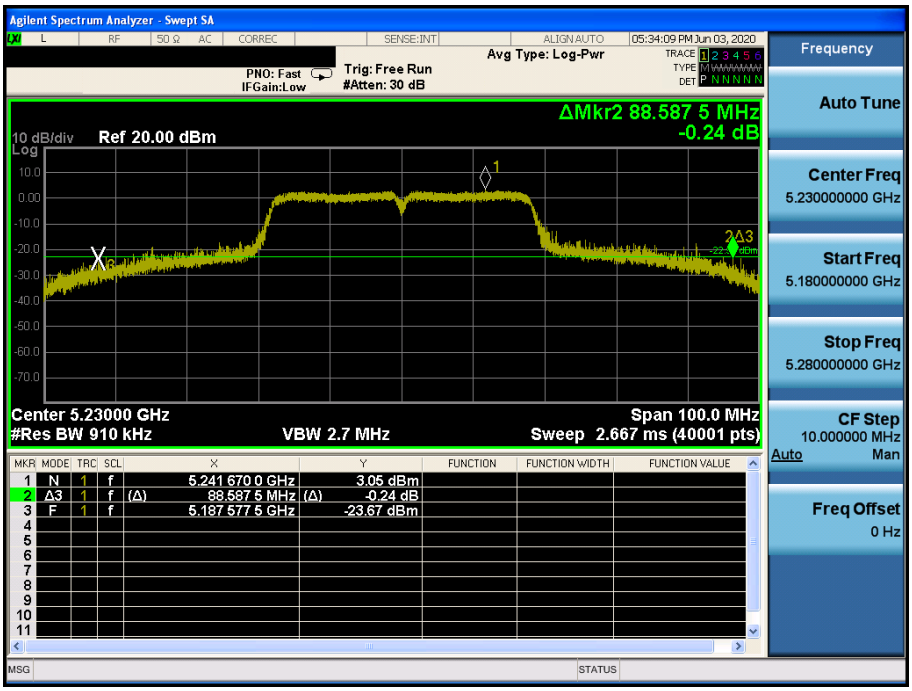
26 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.38



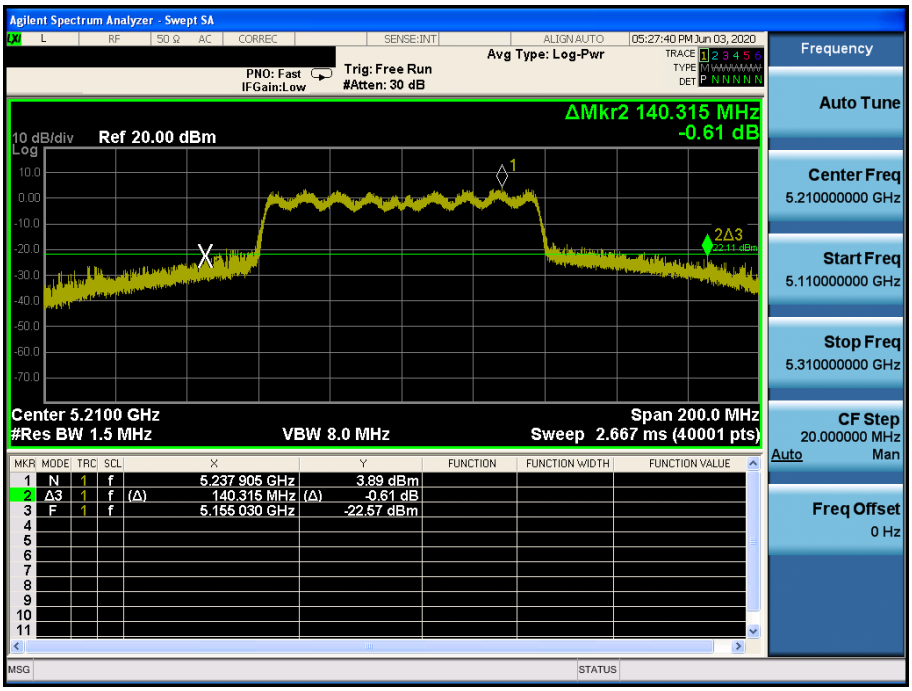
26 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.46



26 dB Bandwidth

Test Mode: 802.11ac VHT80 & Ch.42



8.2 Minimum Emission Bandwidth (6 dB Bandwidth)

▣ Test Requirements

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

▣ Test Configuration

Refer to the APPENDIX I.

▣ Test Procedure

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of **KDB789033 D02v02r01**.

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth **≥ 3 x RBW**.
3. Detector = **Peak**.
4. Trace mode = **max hold**.

   Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

▣ Test Results: Comply

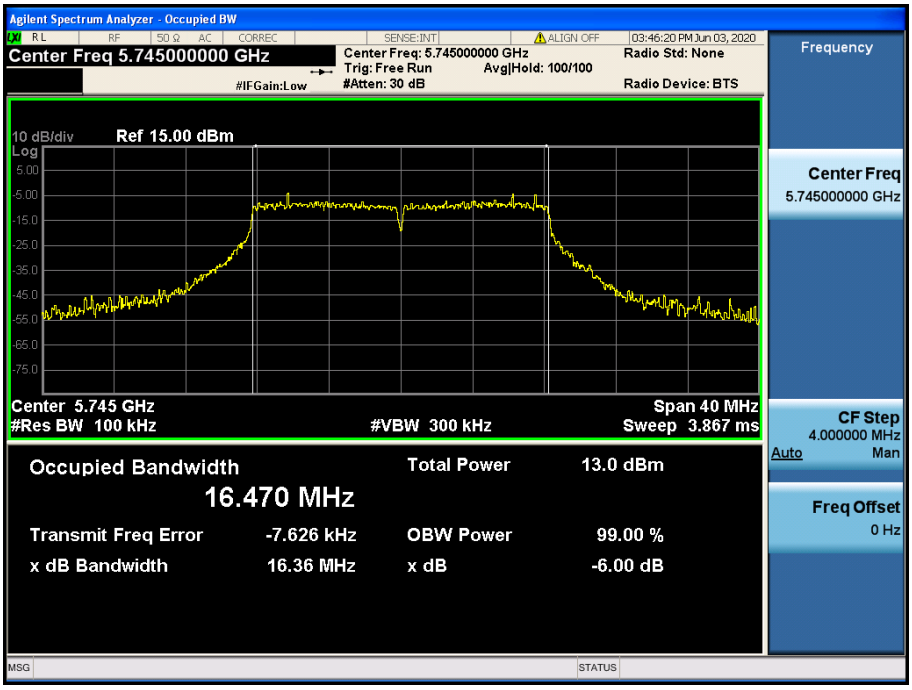
Mode	Band	Channel	Frequency [MHz]	Test Result [MHz]	
				DC 12 V	DC 24 V
802.11a	U-NII 3	149	5 745	16.36	16.32
		157	5 785	16.37	16.34
		165	5 825	16.35	16.36
802.11n (HT20)	U-NII 3	149	5 745	17.63	17.09
		157	5 785	17.14	17.06
		165	5 825	17.01	17.62
802.11n (HT40)	U-NII 3	151	5 755	35.74	35.45
		159	5 795	35.07	35.45
802.11ac (VHT80)	U-NII 3	155	5 775	75.24	75.48

▣ Result Plots

- Tested Power Supply: DC 12 V

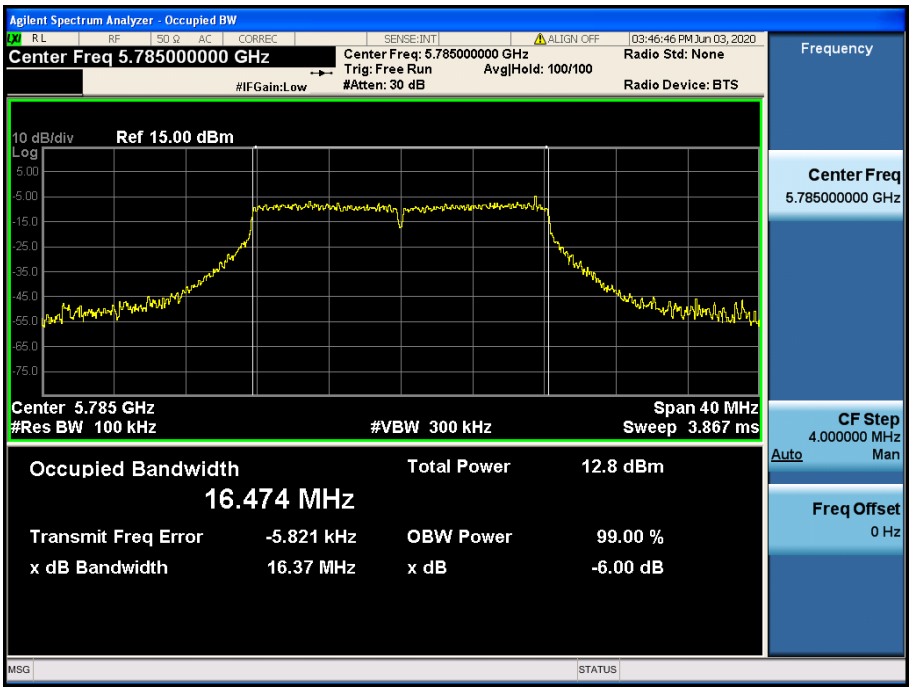
6 dB Bandwidth

Test Mode: 802.11a & Ch.149



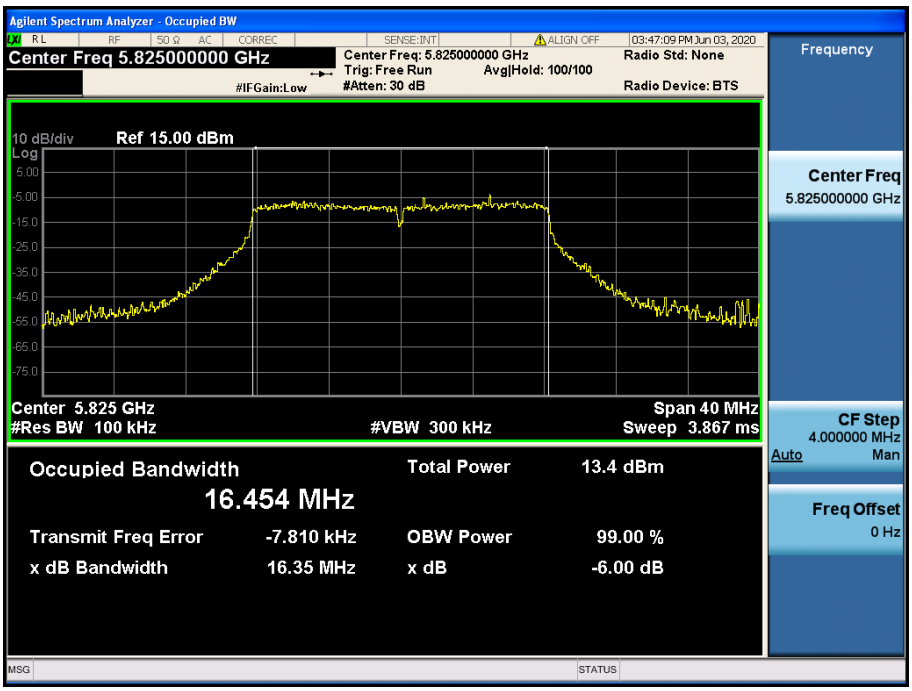
6 dB Bandwidth

Test Mode: 802.11a & Ch.157



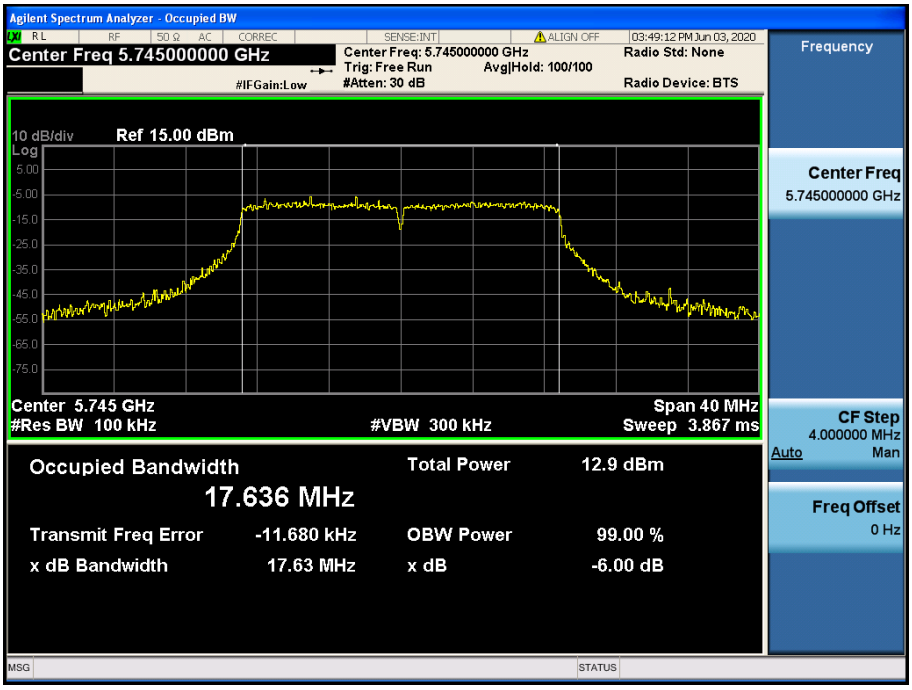
6 dB Bandwidth

Test Mode: 802.11a & Ch.165



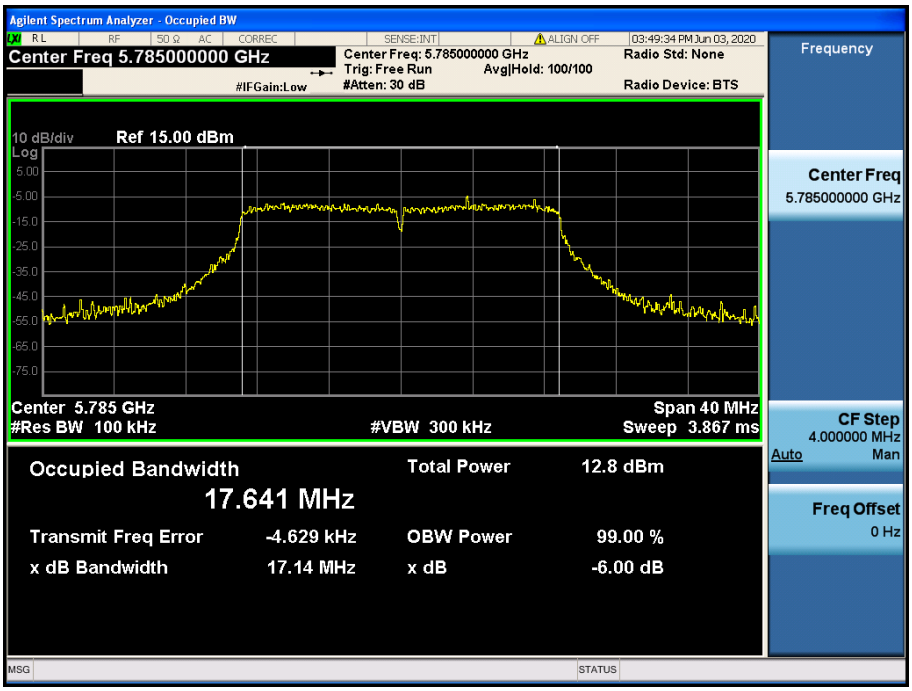
6 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.149



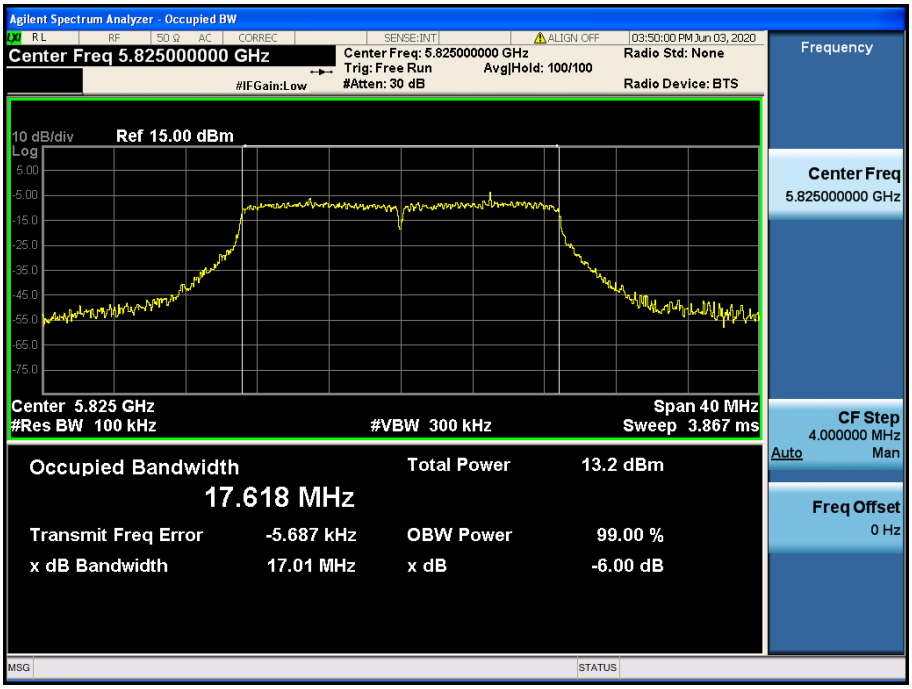
6 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.157



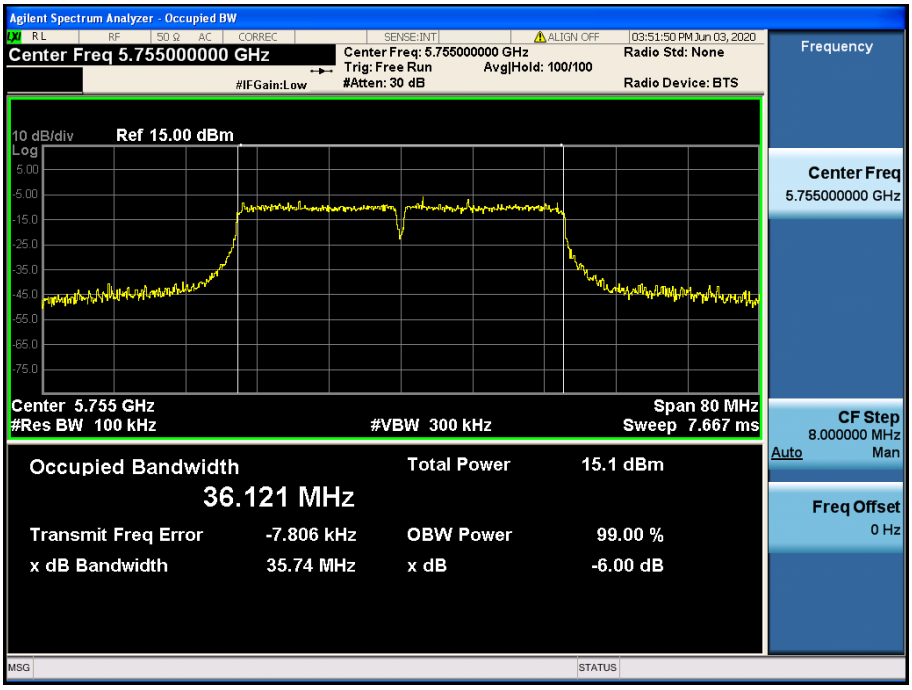
6 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.165



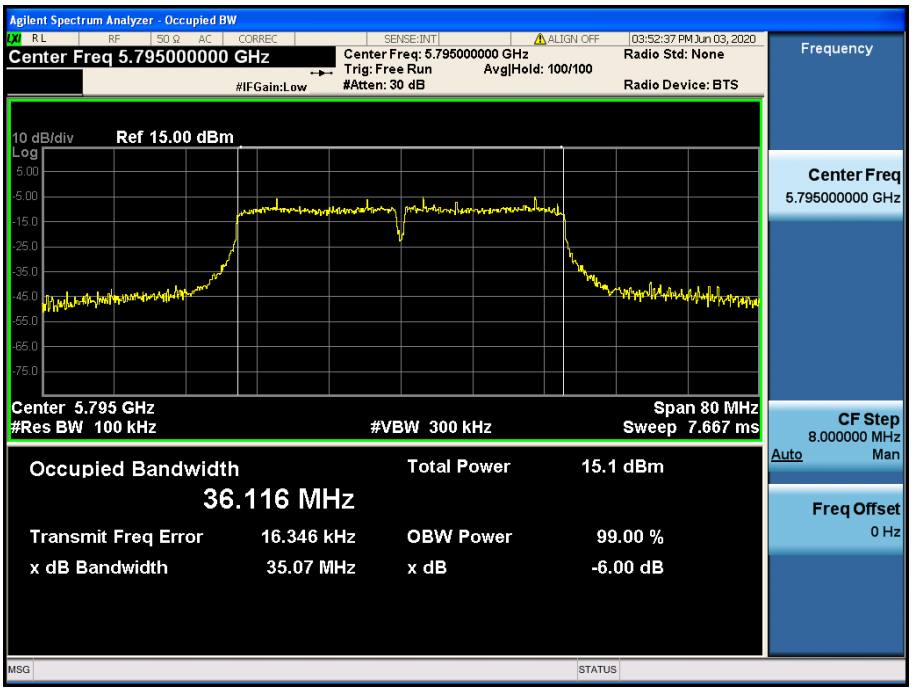
6 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.151



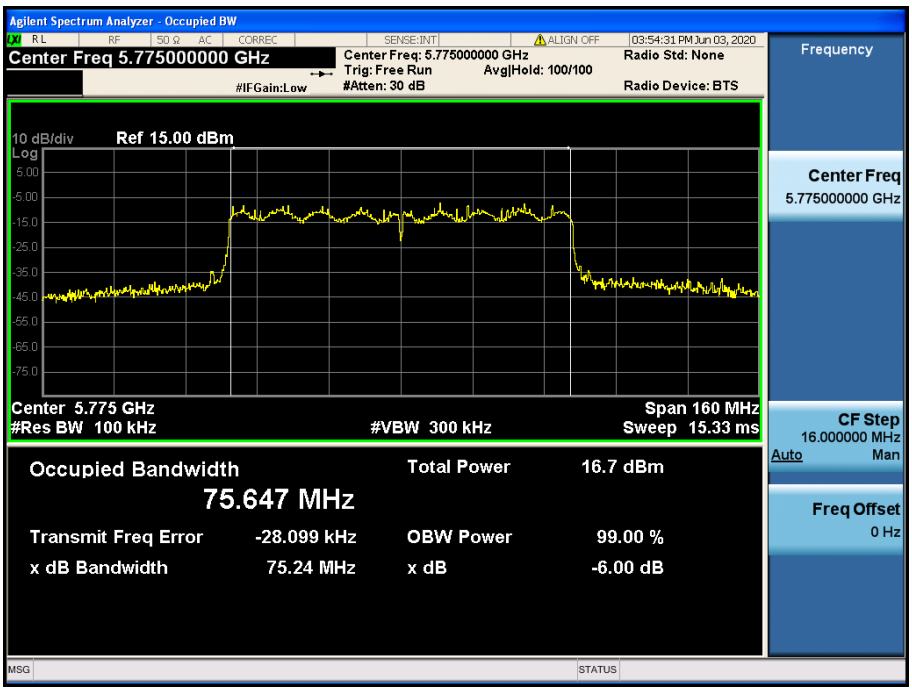
6 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.159



6 dB Bandwidth

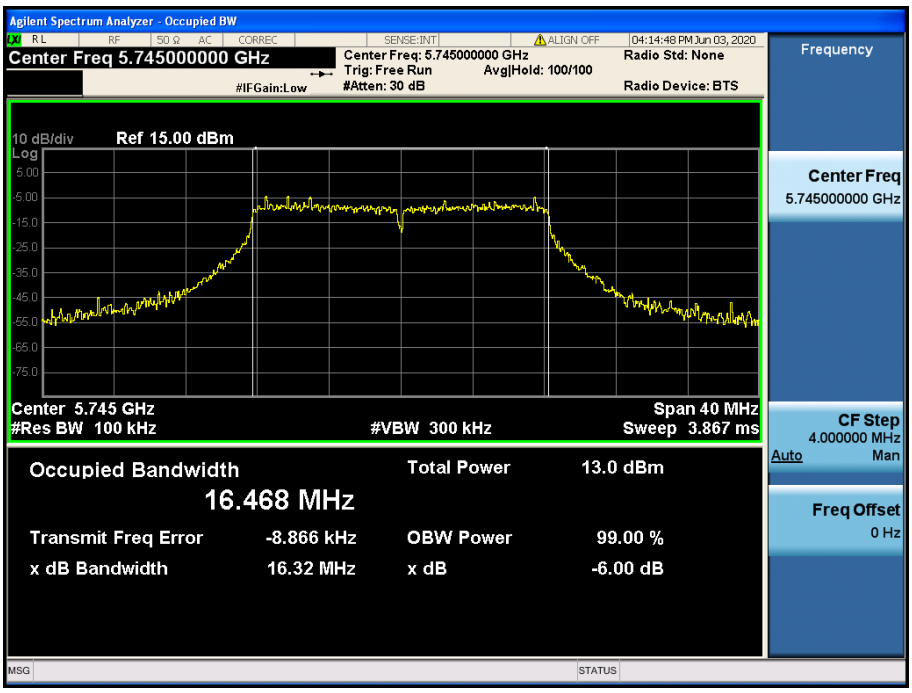
Test Mode: 802.11ac VHT80 & Ch.155



- Tested Power Supply: DC 24 V

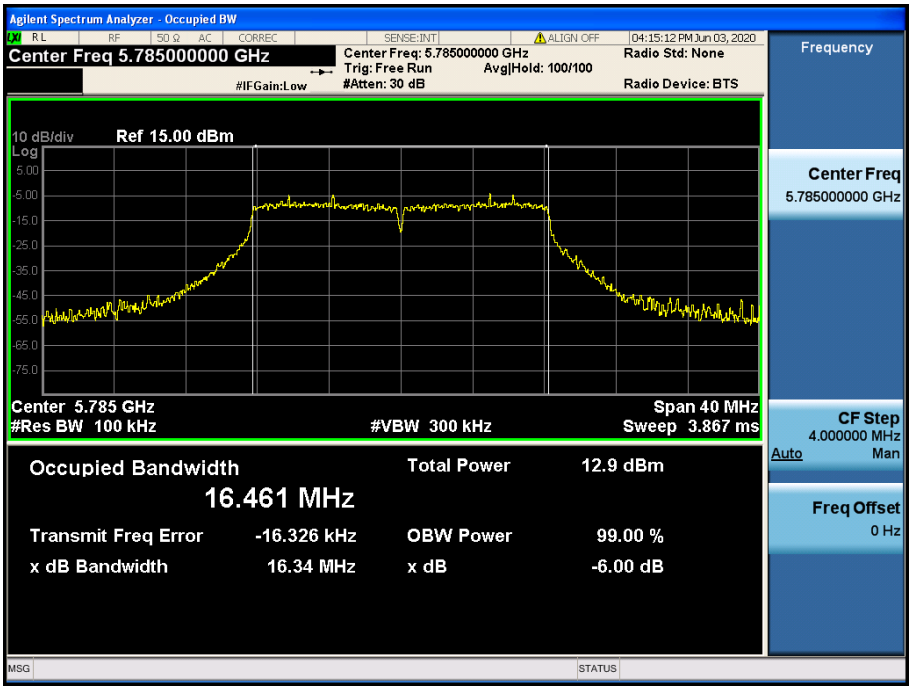
6 dB Bandwidth

Test Mode: 802.11a & Ch.149



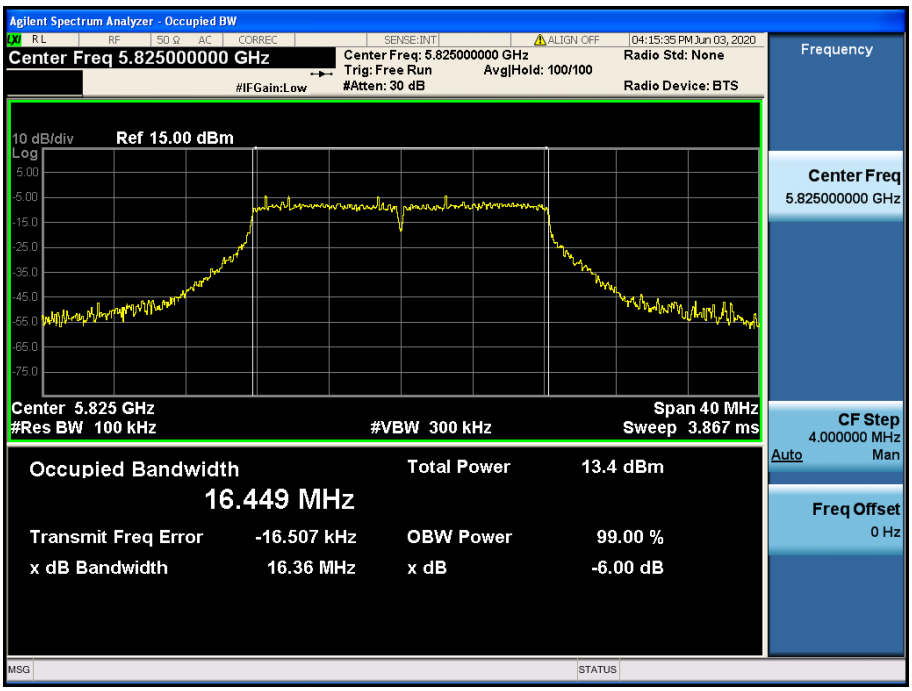
6 dB Bandwidth

Test Mode: 802.11a & Ch.157



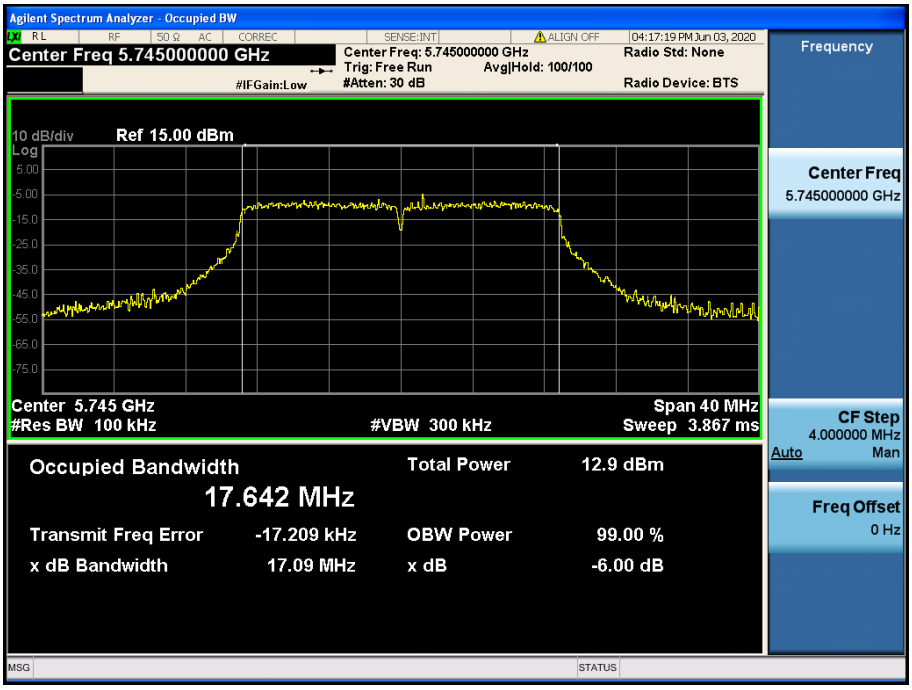
6 dB Bandwidth

Test Mode: 802.11a & Ch.165



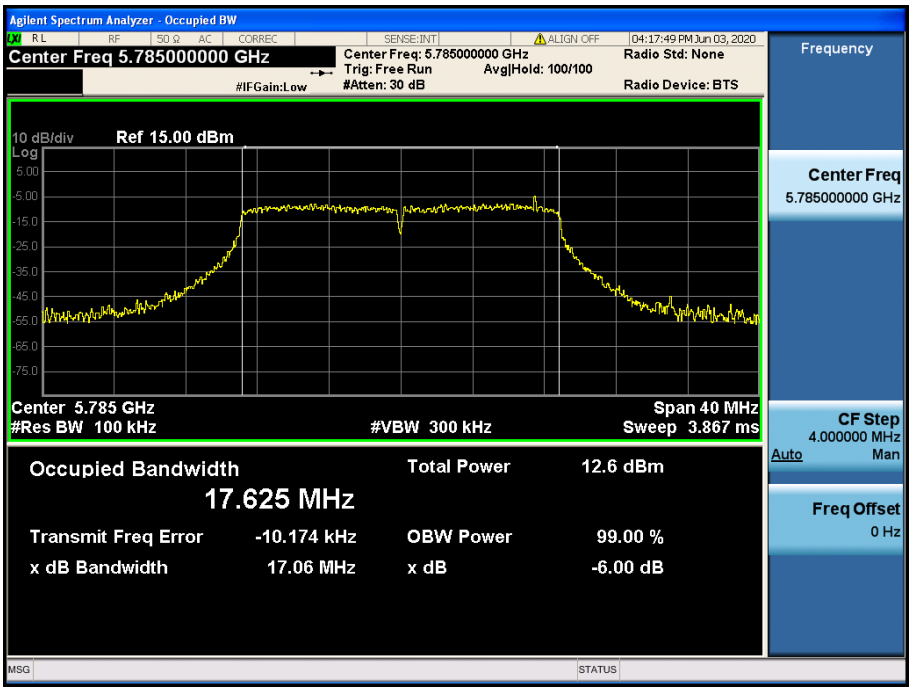
6 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.149



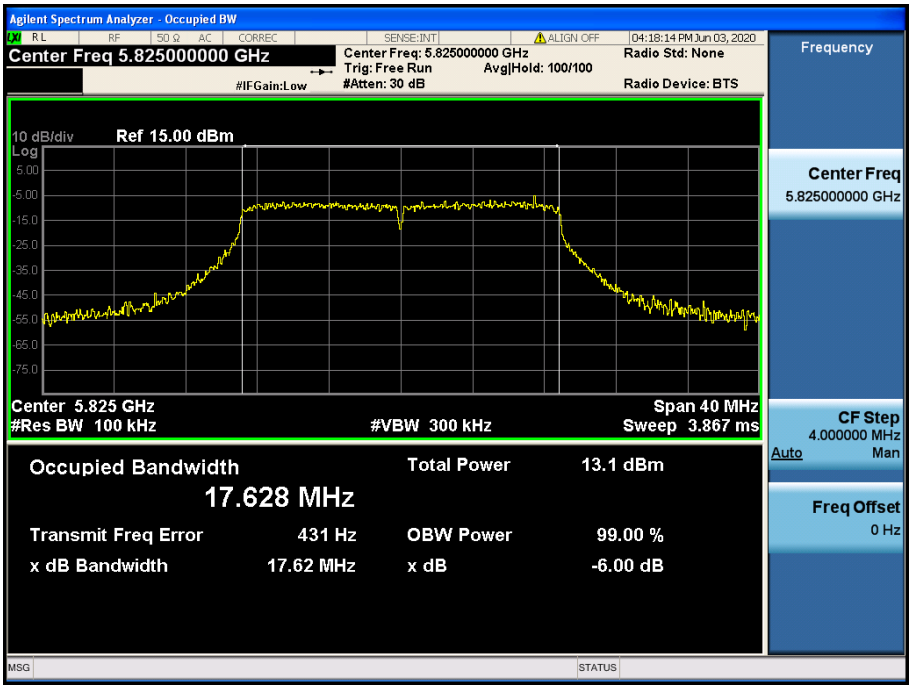
6 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.157



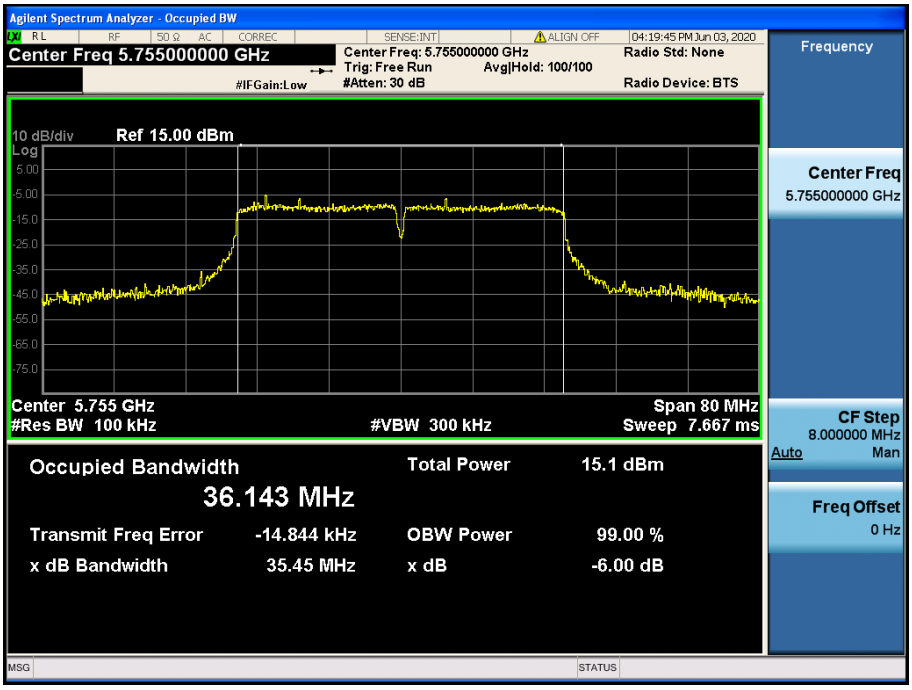
6 dB Bandwidth

Test Mode: 802.11n HT20 & Ch.165



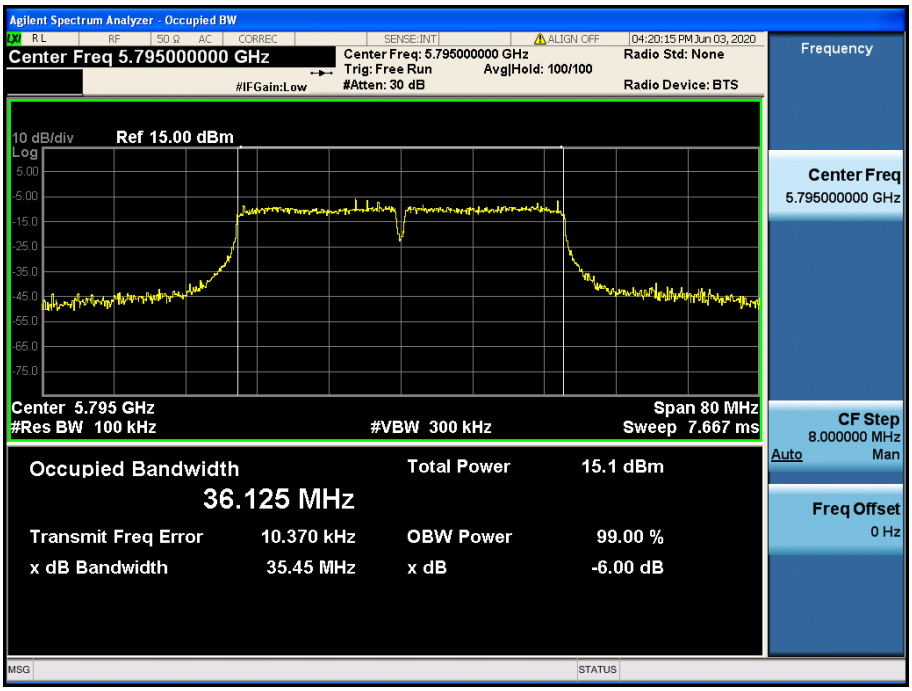
6 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.151



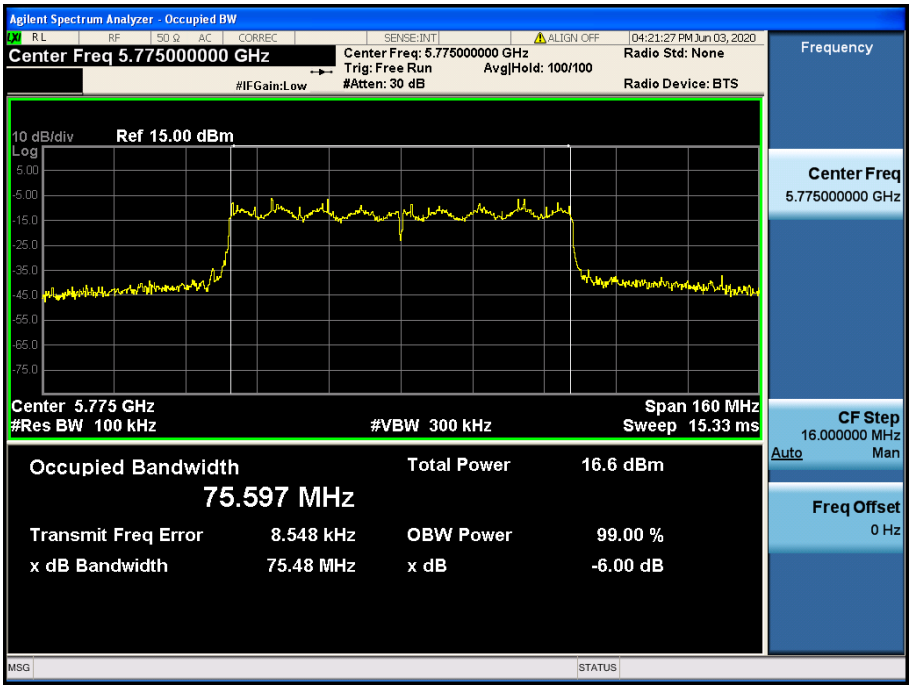
6 dB Bandwidth

Test Mode: 802.11n HT40 & Ch.159



6 dB Bandwidth

Test Mode: 802.11ac VHT80 & Ch.155



8.3 Maximum Conducted Output Power

▣ Test Requirements

Part. 15.407(a)

(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. 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. 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. 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. 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.

(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. 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.

RSS-247[6.2]

(1) For band 5150 - 5250 MHz

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.
For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

(2) For band 5250 - 5350 MHz

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.
Devices, other than devices installed in vehicles, shall comply with the following:
a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW 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.

(3) For band 5470 - 5600 MHz and 5650 - 5725 MHz

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than
500 mW 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.

(4) For band 5725 - 5850 MHz

The maximum conducted output power shall not exceed 1 W. The output 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 output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

▣ Test Configuration

Method PM-G

▣ Test Procedure

Method PM-G of KDB789033 D02v02r01

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

▣ **Test Results: Comply**

- Output Power : DC 12 V

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11a	36	5 180	9.05	3.60	12.65
	40	5 200	9.33	3.60	12.93
	48	5 240	**9.58**	**3.60**	**13.18**
	149	5 745	**8.02**	**3.60**	**11.62**
	157	5 785	7.94	3.60	11.54
	165	5 825	7.75	3.60	11.35

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11n(HT20)	36	5 180	8.87	3.60	12.47
	40	5 200	9.12	**3.60**	12.72
	48	5 240	**9.38**	3.60	**12.98**
	149	5 745	**7.72**	**3.60**	**11.32**
	157	5 785	7.71	3.60	11.31
	165	5 825	7.57	3.60	11.17

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11ac(VHT20)	36	5 180	8.84	3.60	12.44
	40	5 200	9.13	3.60	12.73
	48	5 240	**9.34**	**3.60**	**12.94**
	149	5 745	**7.68**	**3.60**	**11.28**
	157	5 785	7.65	3.60	11.25
	165	5 825	7.55	3.60	11.15

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11n(HT40)	38	5 190	8.61	3.60	12.21
	46	5 230	**9.65**	**3.60**	**13.25**
	151	5 755	**9.77**	**3.60**	**13.37**
	159	5 795	9.69	3.60	13.29

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11ac(VHT40)	38	5 190	8.60	3.60	12.20
	46	5 230	**9.61**	**3.60**	**13.21**
	151	5 755	**9.75**	**3.60**	**13.35**
	159	5 795	9.74	3.60	13.34

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11ac(VHT80)	42	5 210	**8.78**	**3.60**	**12.38**
	155	5 775	**10.77**	**3.60**	**14.37**

Note 1: e.i.r.p = Conducted Output Power + Antenna Gain

- Output Power : DC 24 V

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11a	36	5 180	9.01	3.60	12.61
	40	5 200	9.32	3.60	12.92
	48	5 240	**9.54**	**3.60**	**13.14**
	149	5 745	**8.01**	**3.60**	**11.61**
	157	5 785	7.93	3.60	11.53
	165	5 825	7.72	3.60	11.32

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11n(HT20)	36	5 180	8.81	3.60	12.41
	40	5 200	**9.10**	**3.60**	**12.70**
	48	5 240	9.33	3.60	12.93
	149	5 745	7.70	3.60	11.30
	157	5 785	**7.75**	**3.60**	**11.35**
	165	5 825	7.53	3.60	11.13

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11ac(VHT20)	36	5 180	8.82	3.60	12.42
	40	5 200	9.14	3.60	12.74
	48	5 240	**9.31**	**3.60**	**12.91**
	149	5 745	7.59	3.60	11.19
	157	5 785	**7.61**	**3.60**	**11.21**
	165	5 825	7.53	3.60	11.13

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11n(HT40)	38	5 190	8.62	3.60	12.22
	46	5 230	**9.63**	**3.60**	**13.23**
	151	5 755	**9.79**	**3.60**	**13.39**
	159	5 795	9.63	3.60	13.23

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11ac(VHT40)	38	5 190	8.55	3.60	12.15
	46	5 230	**9.61**	**3.60**	**13.21**
	151	5 755	9.72	3.60	13.32
	159	5 795	**9.73**	**3.60**	**13.33**

Mode	CH	Freq.[MHz]	Conducted Output Power[dBm]	Antenna Gain[dBi]	e.i.r.p[Note1] [dBm]
802.11ac(VHT80)	42	5 210	**8.81**	**3.60**	**12.41**
	155	5 775	**10.79**	**3.60**	**14.39**

Note 1: e.i.r.p = Conducted Output Power + Antenna Gain

8.4 Maximum Power Spectral Density

▣ Test requirements

Part. 15.407(a)

(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 power spectral density shall not exceed 17 dBm in any 1 MHz band. note1

(ii) For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band. note1

(iii) For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.

(iv) For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band. note1

(2) For the 5.25 - 5.35 GHz and 5.47 - 5.725 GHz bands, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. note1

(3) For the band 5.725 - 5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.note1,note2

Note1: If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note2: 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.

RSS-247[6.2]

(1) For band 5150 - 5250 MHz

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.
For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

(2) For band 5250 - 5350 MHz

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.
Devices, other than devices installed in vehicles, shall comply with the following:
a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW 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.

(3) For band 5470 - 5600 MHz and 5650 - 5725 MHz

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than
500 mW 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.

(4) For band 5725 - 5850 MHz

The maximum conducted output power shall not exceed 1 W. The output 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 output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

▣ Test Configuration

Refer to the APPENDIX I.

▣ Test procedure

Maximum Power Spectral Density is measured using Measurement Procedure **of KDB789033 D02v02r01**

1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA - 1, SA - 2, SA - 3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

2) Use the peak search function on the instrument to find the peak of the spectrum and record its value.

3) Make the following adjustments to the peak value of the spectrum, if applicable:

a) If Method SA - 2 or SA - 2 Alternative was used, add 10 log(1 / x), where x is the duty cycle, to the peak of the spectrum.

b) If Method SA - 3 Alternative was used and the linear mode was used in step II.E.2.g (viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

4) The result is the Maximum PSD over 1 MHz reference bandwidth.

5) For devices operating in the bands 5.15 - 5.25 GHz, 5.25 - 5.35 GHz, and 5.47 - 5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in §15.407(a)(5). For devices operating in the band 5.725 - 5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1 / T, where T is defined in section II.B.1.a). (Refer to Appendix II)

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log(500 kHz / RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log(1 MHz / RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW = 100 kHz is available on nearly all spectrum analyzers.

▣ **Test results: Comply**

- Tested Power Supply: DC 12 V

Mode	Channel	Frequency [MHz]	Reading [dBm/MHz]	T.F Note 1 [dB]	Power Spectral Density [dBm/MHz]	Antenna Gain [dBi]	e.i.r.p Spectral Density [dBm/MHz]
802.11a	36	5 180	-1.86	1.03	-0.83	3.60	2.77
	40	5 200	-1.68		-0.65	3.60	2.95
	48	5 240	-1.60		-0.57	3.60	3.03
	149	5 745	-13.15	8.02	-5.13	3.60	-1.53
	157	5 785	-14.02		-6.00	3.60	-2.40
	165	5 825	-13.09		-5.07	3.60	-1.47
802.11n (HT20)	36	5 180	-1.92	0.52	-1.40	3.60	2.20
	40	5 200	-2.13		-1.61	3.60	1.99
	48	5 240	-1.60		-1.08	3.60	2.52
	149	5 745	-13.98	7.51	-6.47	3.60	-2.87
	157	5 785	-14.15		-6.64	3.60	-3.04
	165	5 825	-13.66		-6.15	3.60	-2.55
802.11n (HT40)	38	5 190	-6.09	0.99	-5.10	3.60	-1.50
	46	5 230	-4.98		-3.99	3.60	-0.39
	151	5 755	-15.46	7.98	-7.48	3.60	-3.88
	159	5 795	-15.56		-7.58	3.60	-3.98
802.11ac (VHT80)	42	5 210	-8.38	1.89	-6.53	3.60	-2.93
	155	5 775	-17.46	8.88	-8.62	3.60	-5.02

Note 1: "U-NII 1, 2A, 2C [T.F] = DCCF"
"U-NII 3 [T.F] = 10*LOG(500kHz/100kHz) + DCCF"
For DCCF(Duty Cycle Correction Factor) please refer to appendix II.
Note 2: Test Result = Measurement Data + T.F
Note 3: e.i.r.p Spectral Density= Power spectral density + Antenna Gain

- Tested Power Supply: DC 24 V

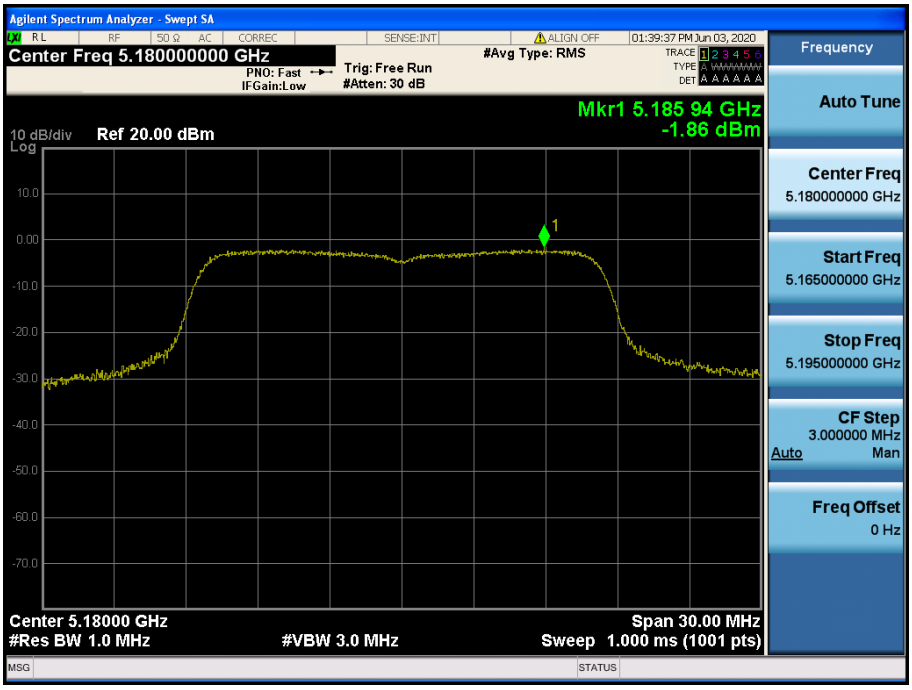
Mode	Channel	Frequency [MHz]	Reading [dBm/MHz]	T.F Note 1 [dB]	Power Spectral Density [dBm/MHz]	Antenna Gain [dBi]	e.i.r.p Spectral Density [dBm/MHz]
802.11a	36	5 180	-2.51	1.03	-1.48	3.60	2.12
	40	5 200	-2.18		-1.15	3.60	2.45
	48	5 240	-1.87		-0.84	3.60	2.76
	149	5 745	-13.53	8.02	-5.51	3.60	-1.91
	157	5 785	-14.19		-6.17	3.60	-2.57
	165	5 825	-13.92		-5.90	3.60	-2.30
802.11n (HT20)	36	5 180	-2.25	0.52	-1.73	3.60	1.87
	40	5 200	-2.15		-1.63	3.60	1.97
	48	5 240	-1.71		-1.19	3.60	2.41
	149	5 745	-13.72	7.51	-6.21	3.60	-2.61
	157	5 785	-14.09		-6.58	3.60	-2.98
	165	5 825	-13.51		-6.00	3.60	-2.40
802.11n (HT40)	38	5 190	-6.18	0.99	-5.19	3.60	-1.59
	46	5 230	-4.98		-3.99	3.60	-0.39
	151	5 755	-15.34	7.98	-7.36	3.60	-3.76
	159	5 795	-15.38		-7.40	3.60	-3.80
802.11ac (VHT80)	42	5 210	-9.10	1.89	-7.25	3.60	-3.65
	155	5 775	-17.15	8.88	-8.31	3.60	-4.71

Note 1: "U-NII 1, 2A, 2C [T.F] = DCCF"
"U-NII 3 [T.F] = 10*LOG(500kHz/100kHz) + DCCF"
For DCCF(Duty Cycle Correction Factor) please refer to appendix II.
Note 2: Test Result = Measurement Data + T.F
Note 3: e.i.r.p Spectral Density= Power spectral density + Antenna Gain

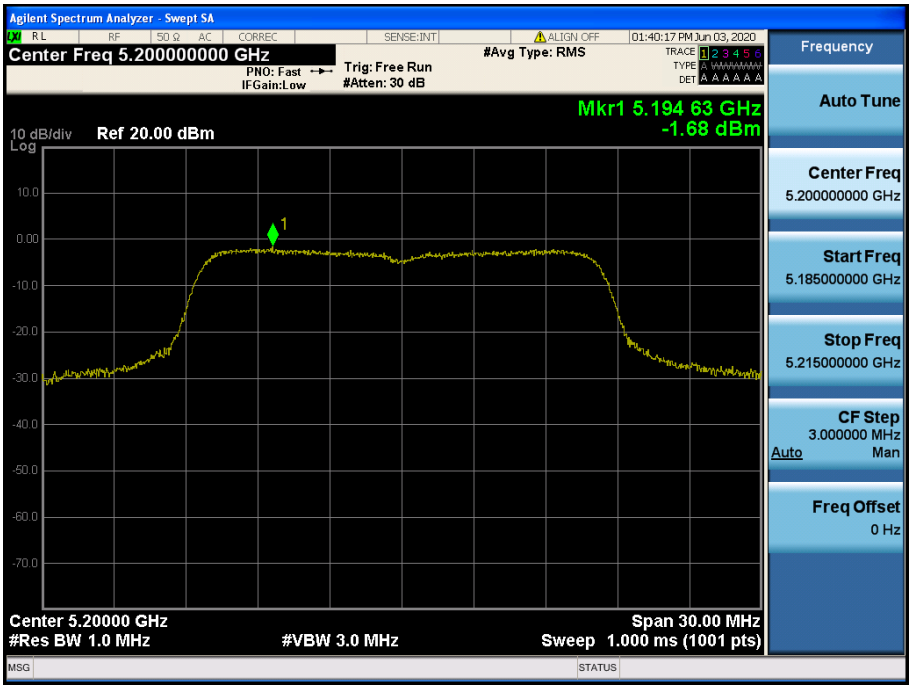
▣ RESULT PLOTS

- Power spectral density : DC 12 V

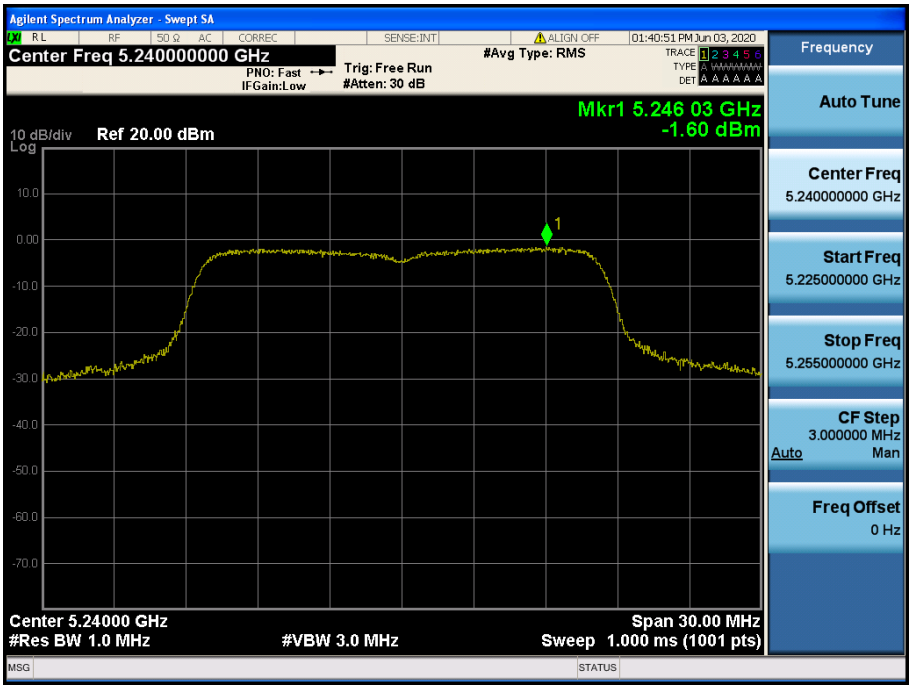
Maximum Power Spectral Density Test Mode: 802.11a & Ch.36



Maximum Power Spectral Density Test Mode: 802.11a & Ch.40

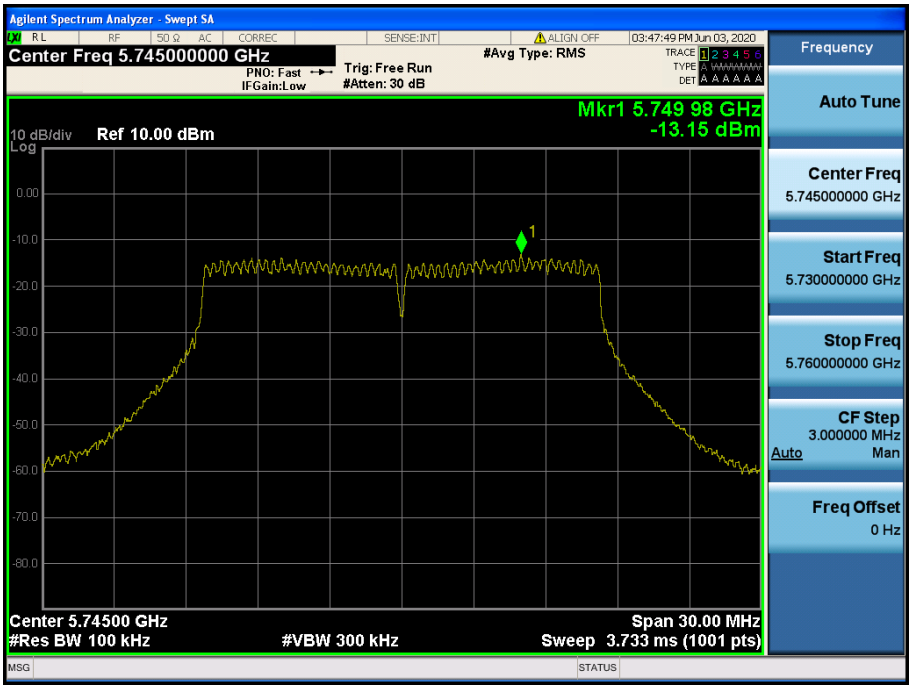


Maximum Power Spectral Density Test Mode: 802.11a & Ch.48



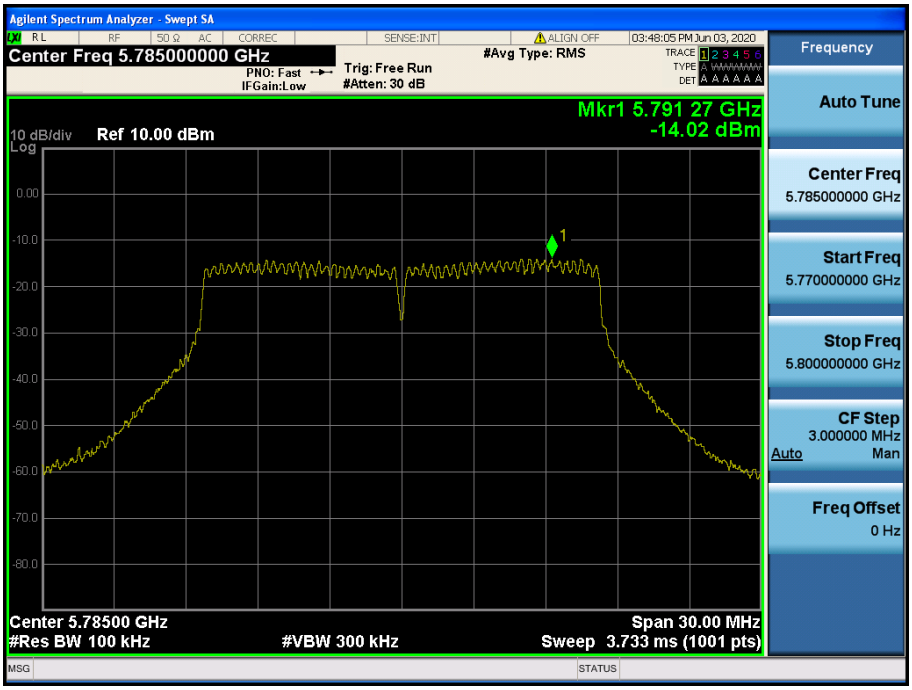
Maximum Power Spectral Density

Test Mode: 802.11a & Ch.149

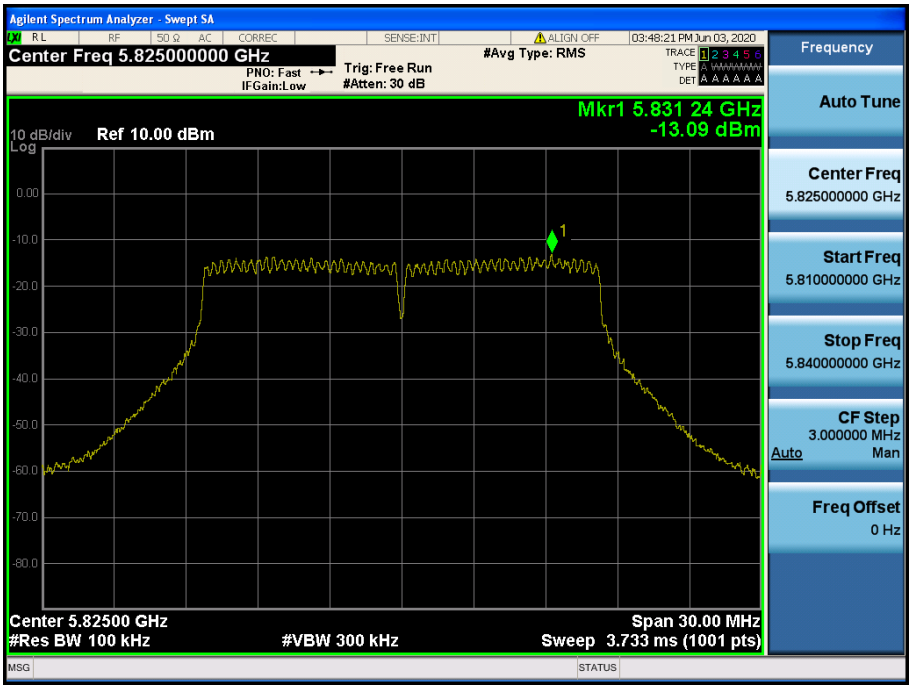


Maximum Power Spectral Density

Test Mode: 802.11a & Ch.157

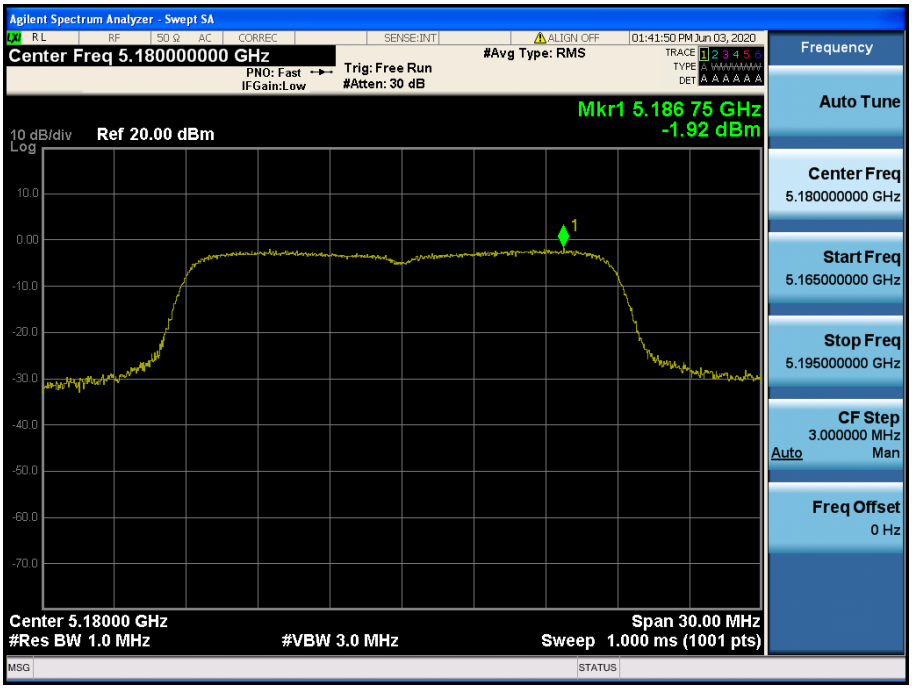


Maximum Power Spectral Density Test Mode: 802.11a & Ch.165



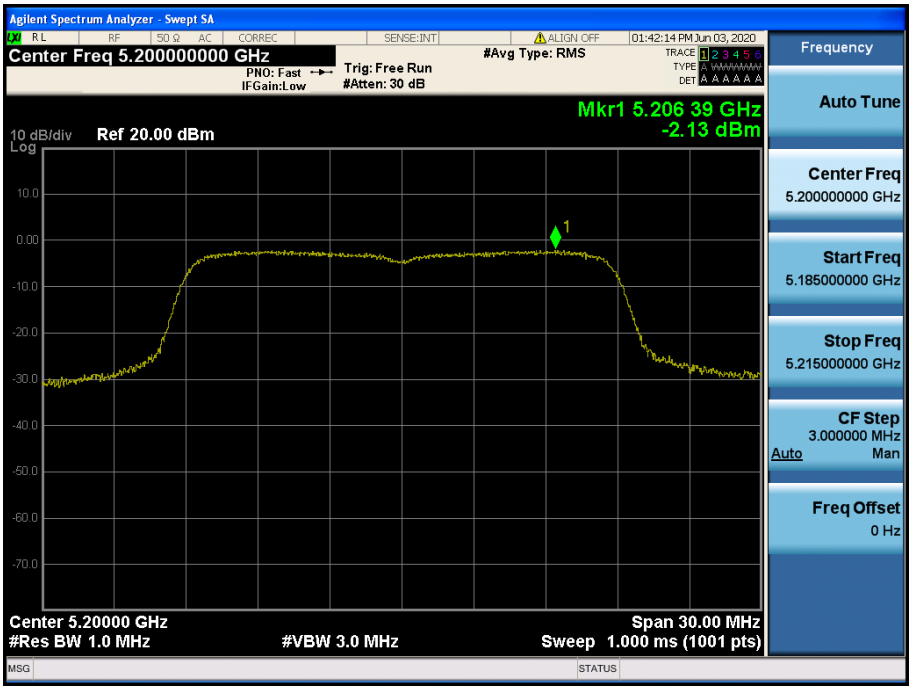
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & Ch.36

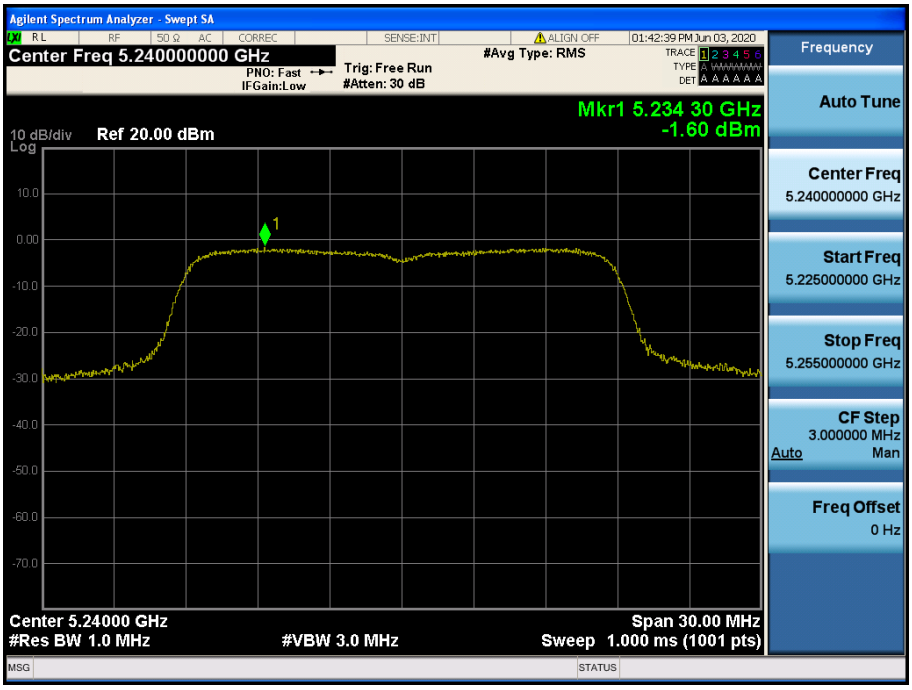


Maximum Power Spectral Density

Test Mode: 802.11n HT20 & Ch.40

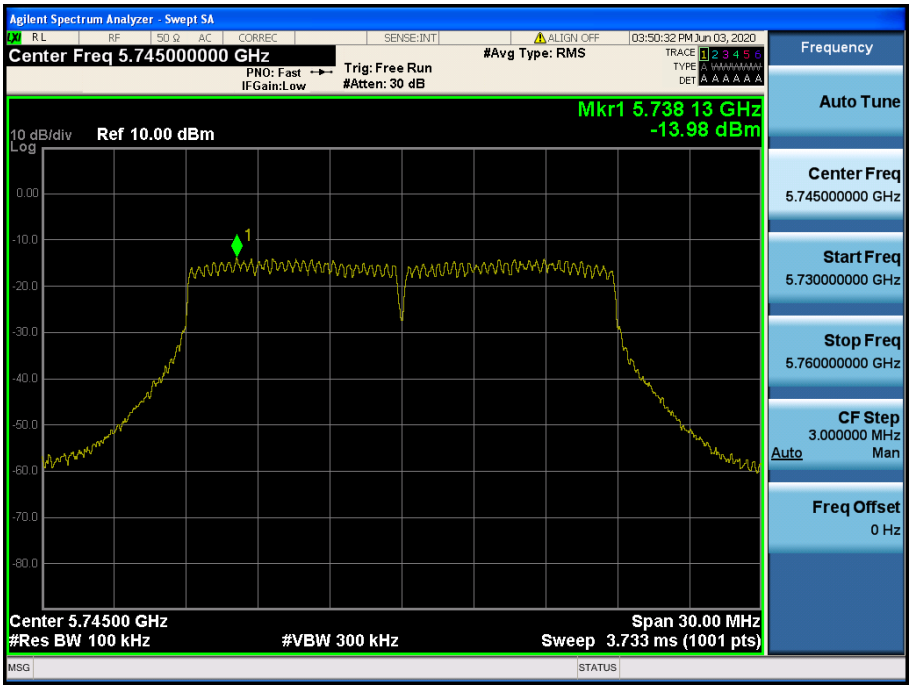


Maximum Power Spectral Density Test Mode: 802.11n HT20 & Ch.48



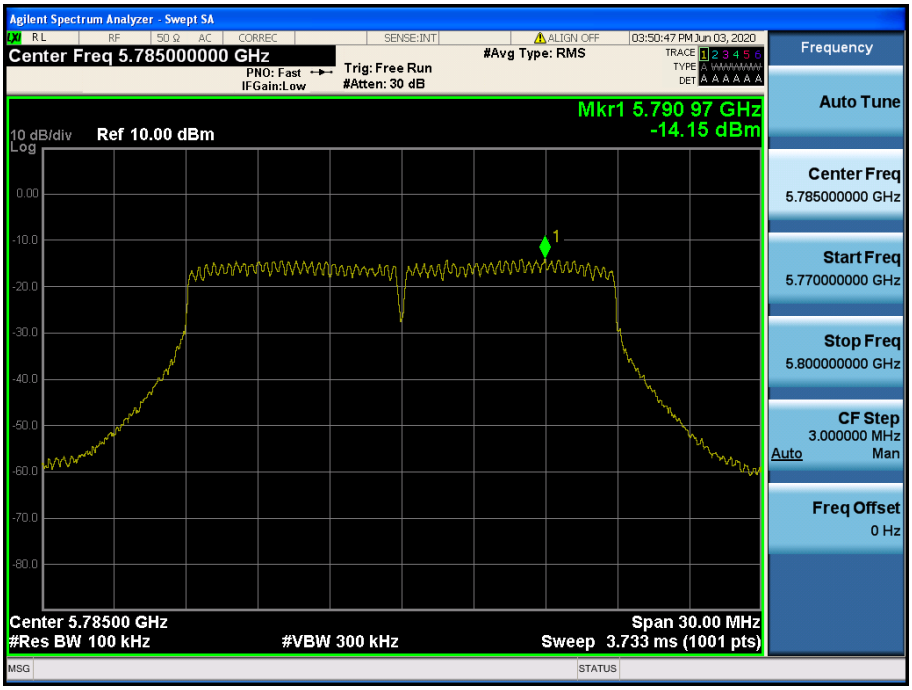
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & Ch.149

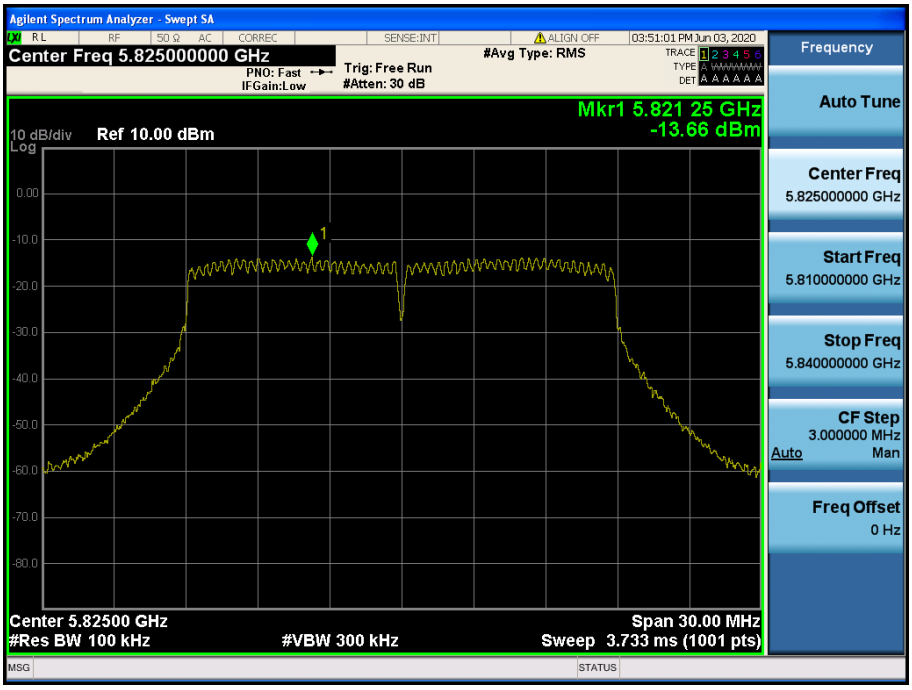


Maximum Power Spectral Density

Test Mode: 802.11n HT20 & Ch.157

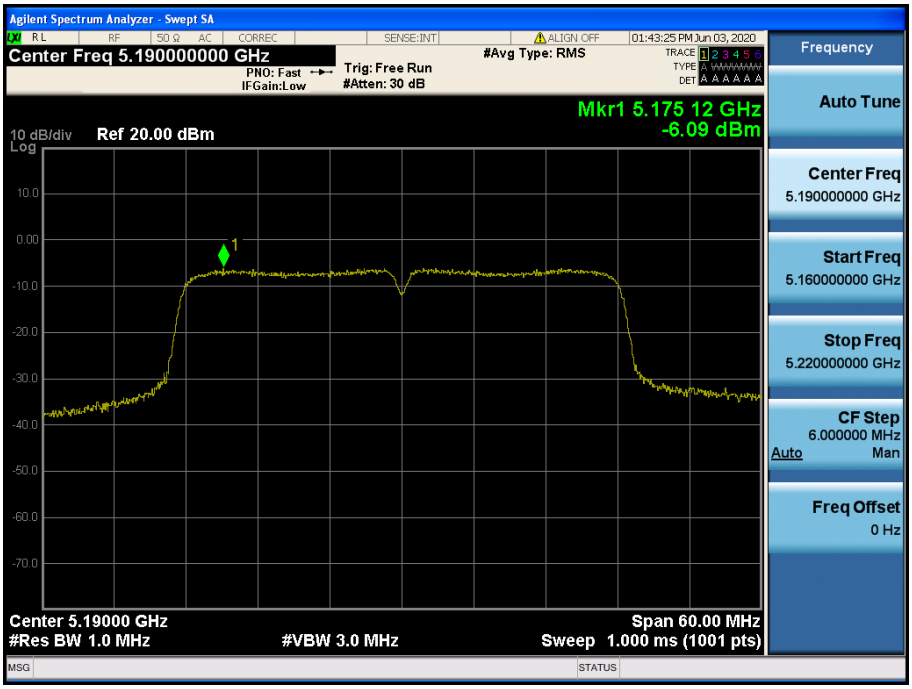


Maximum Power Spectral Density Test Mode: 802.11n HT20 & Ch.165



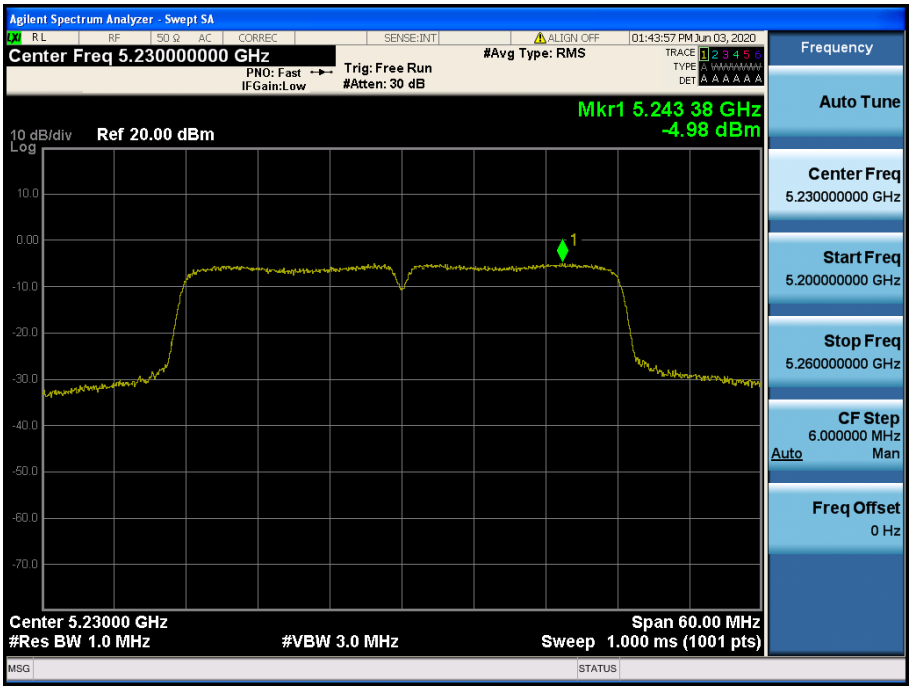
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.38



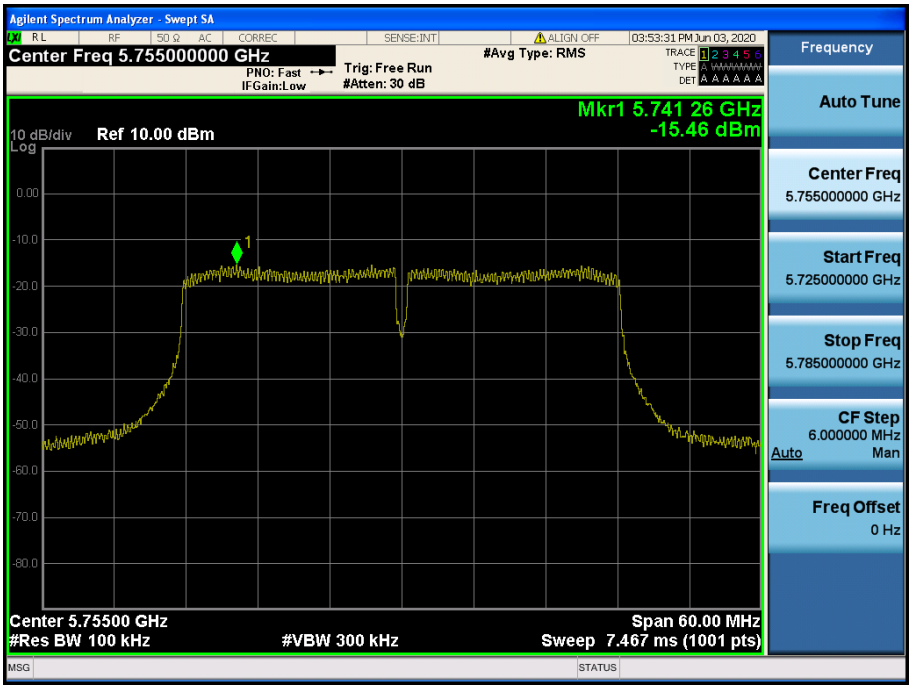
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.46



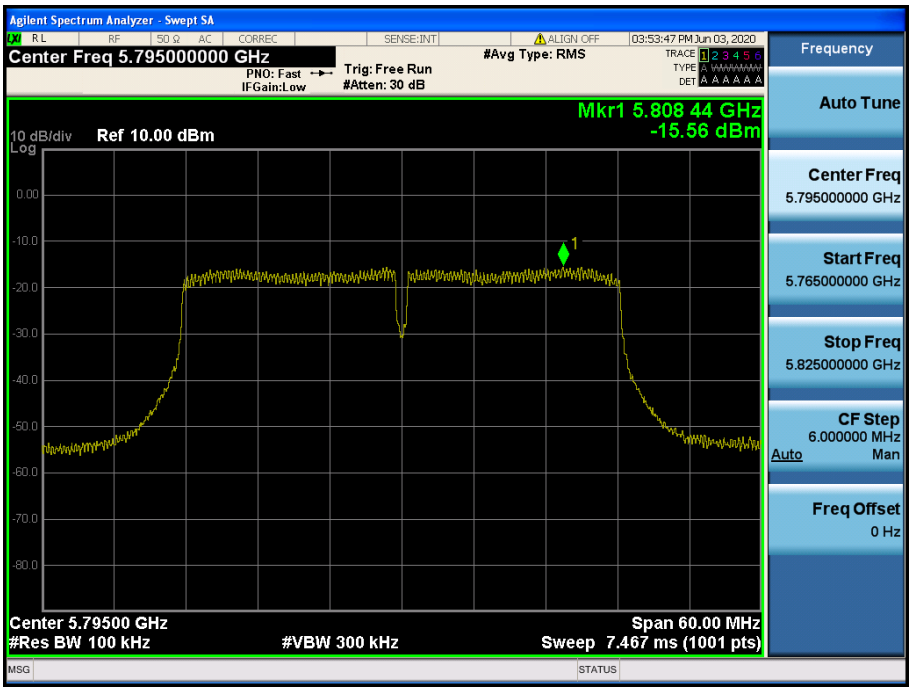
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.151

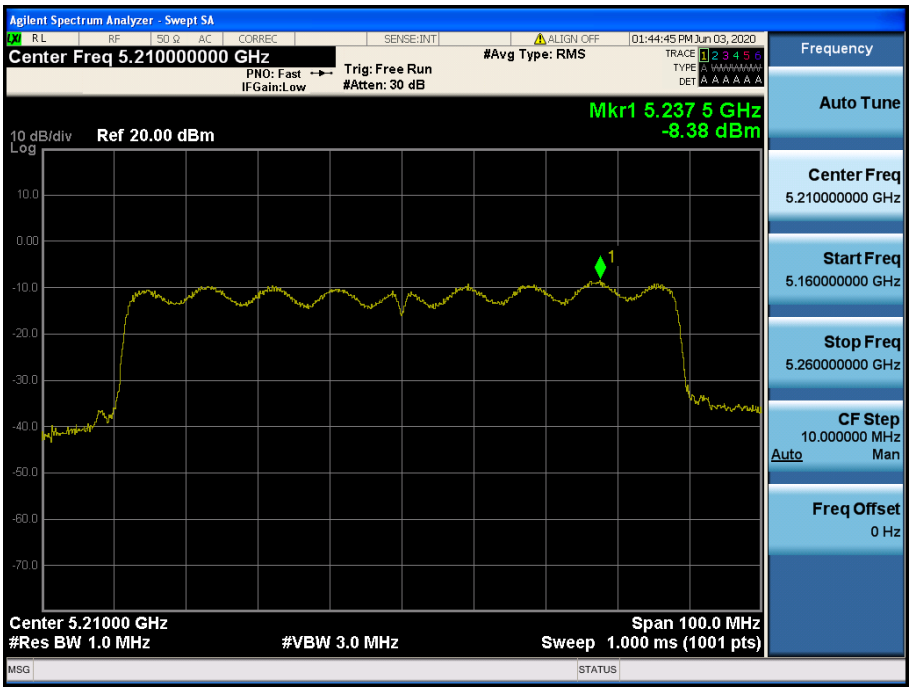


Maximum Power Spectral Density

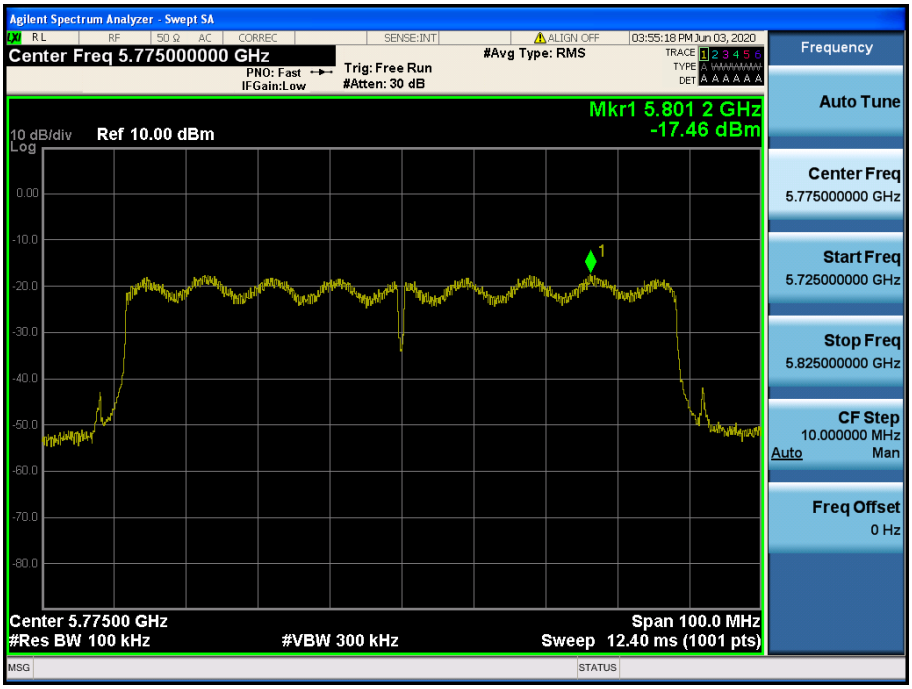
Test Mode: 802.11n HT40 & Ch.159



Maximum Power Spectral Density Test Mode: 802.11ac VHT80 & Ch.42

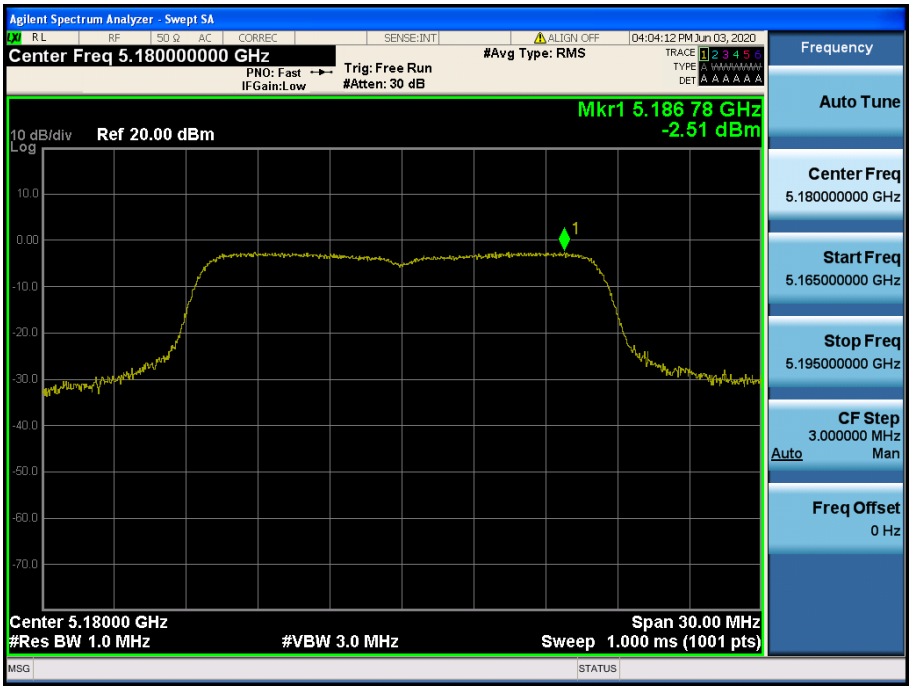


Maximum Power Spectral Density Test Mode: 802.11ac VHT80 & Ch.155



- Power spectral density : DC 24 V

Maximum Power Spectral Density Test Mode: 802.11a & Ch.36

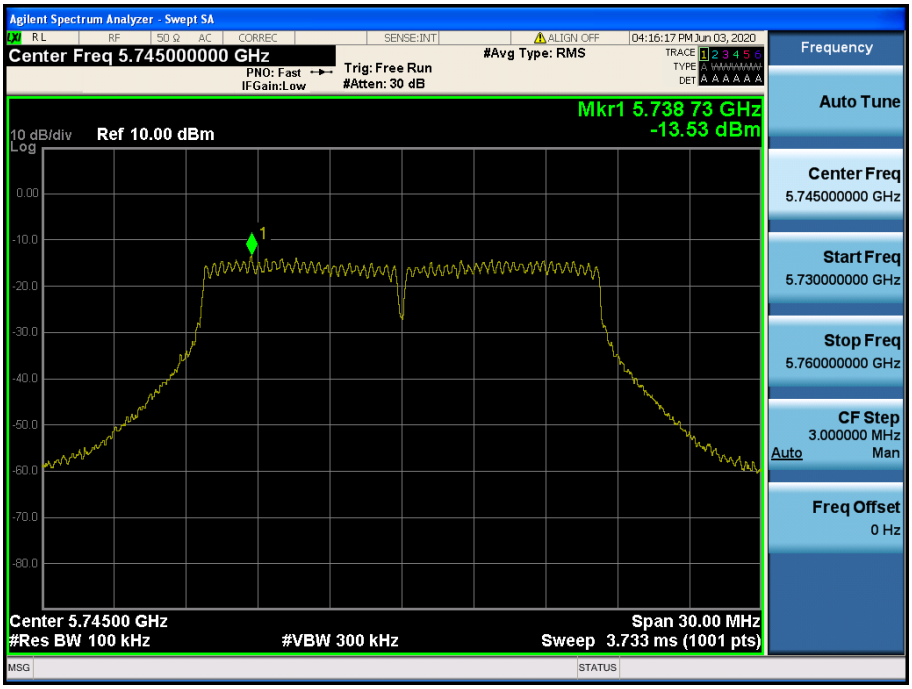


Maximum Power Spectral Density Test Mode: 802.11a & Ch.40

Maximum Power Spectral Density Test Mode: 802.11a & Ch.48

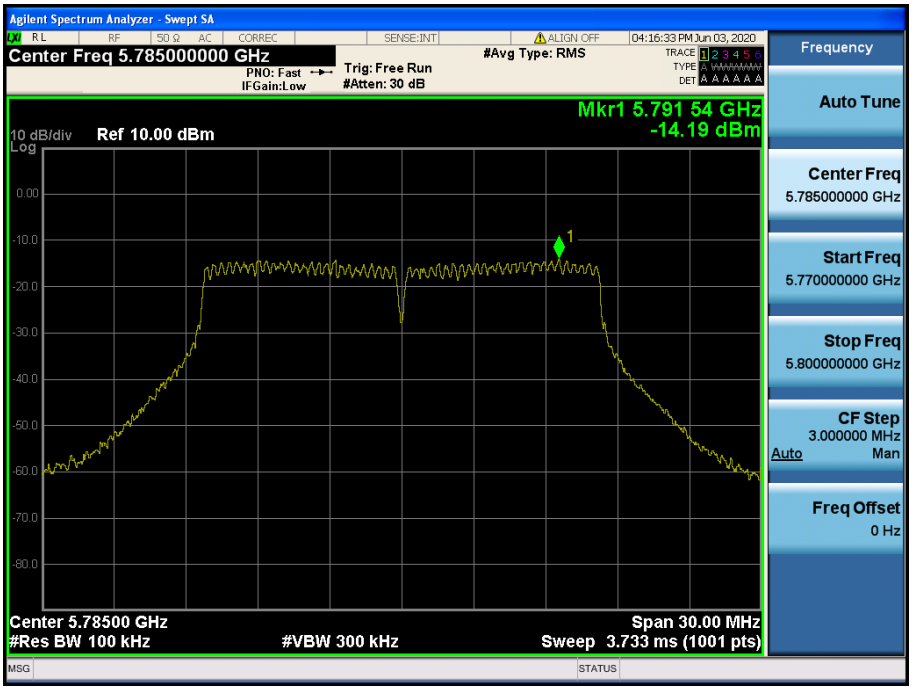
Maximum Power Spectral Density

Test Mode: 802.11a & Ch.149

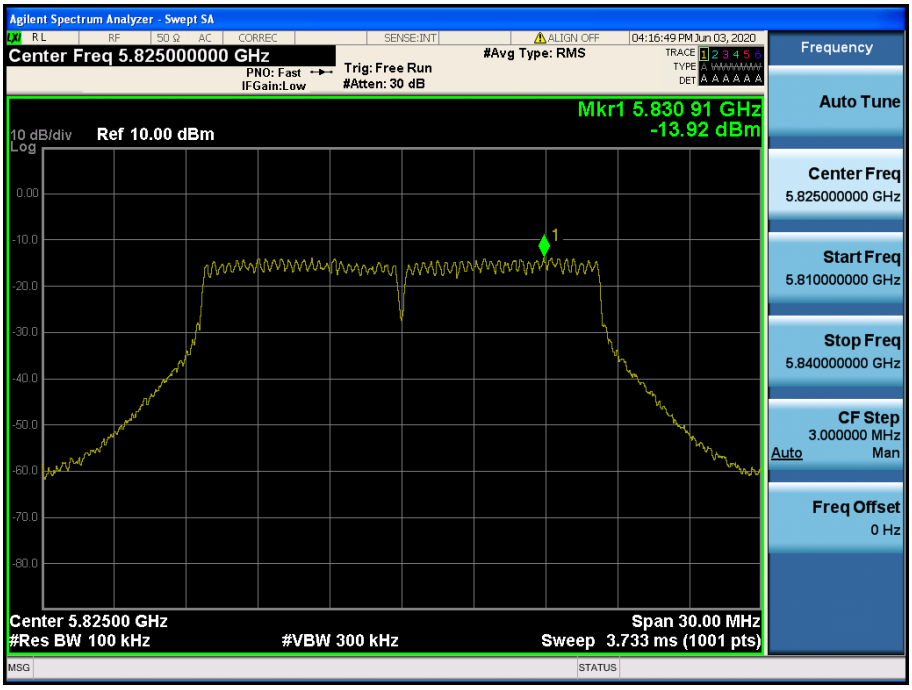


Maximum Power Spectral Density

Test Mode: 802.11a & Ch.157

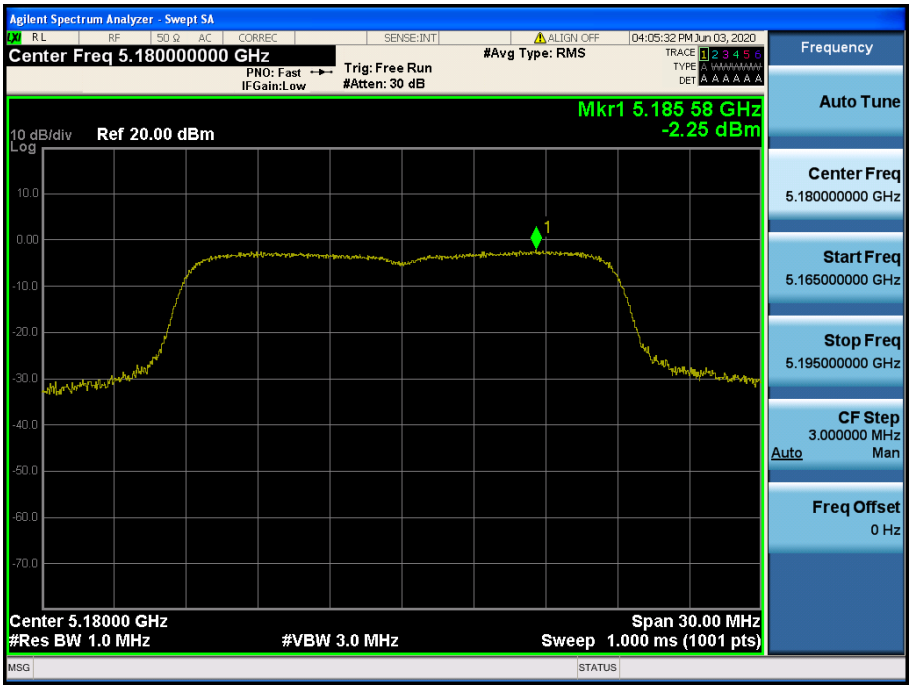


Maximum Power Spectral Density Test Mode: 802.11a & Ch.165



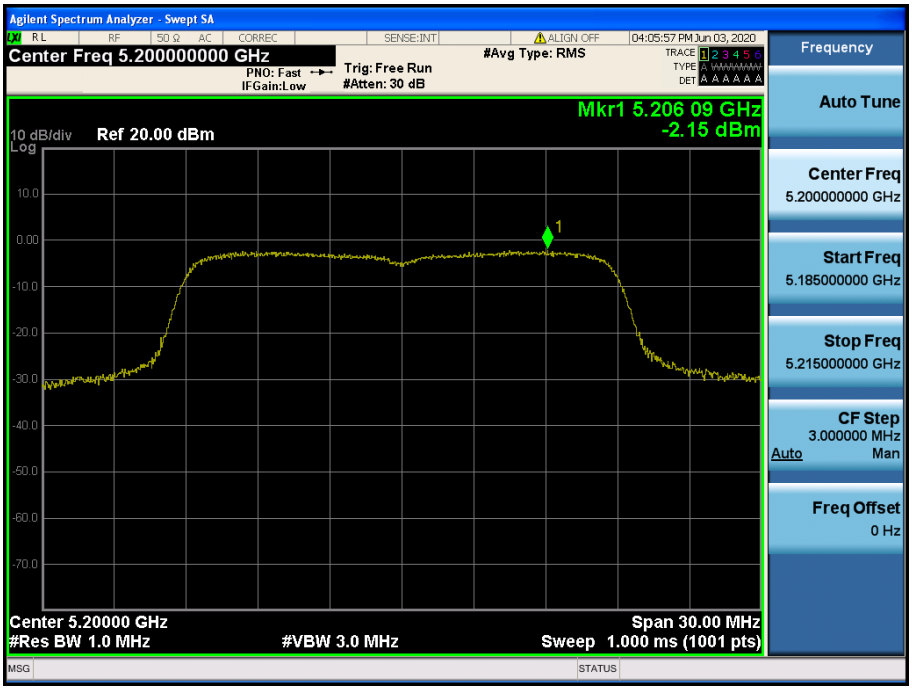
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & Ch.36

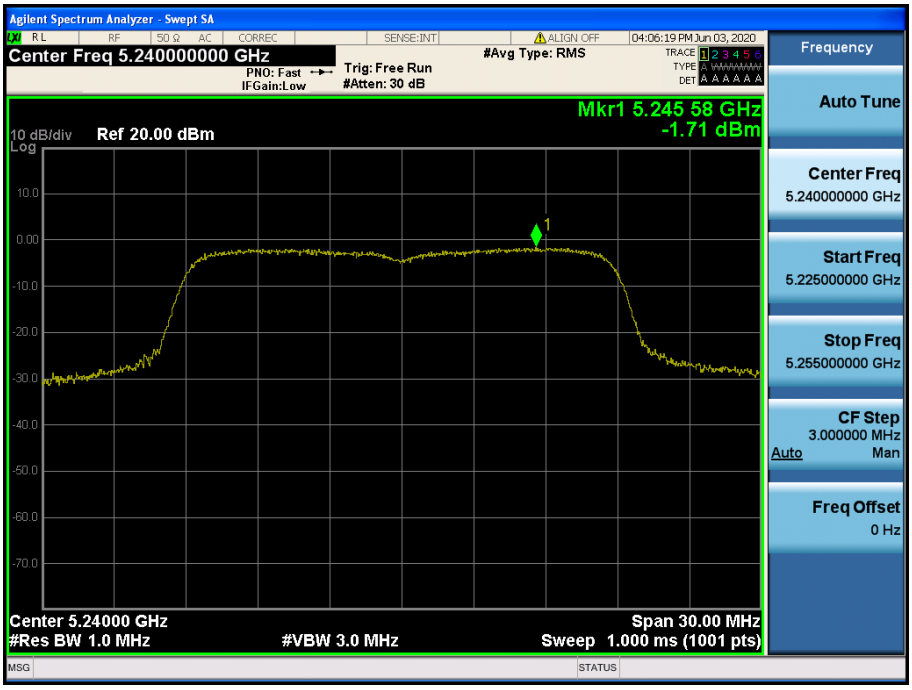


Maximum Power Spectral Density

Test Mode: 802.11n HT20 & Ch.40



Maximum Power Spectral Density Test Mode: 802.11n HT20 & Ch.48

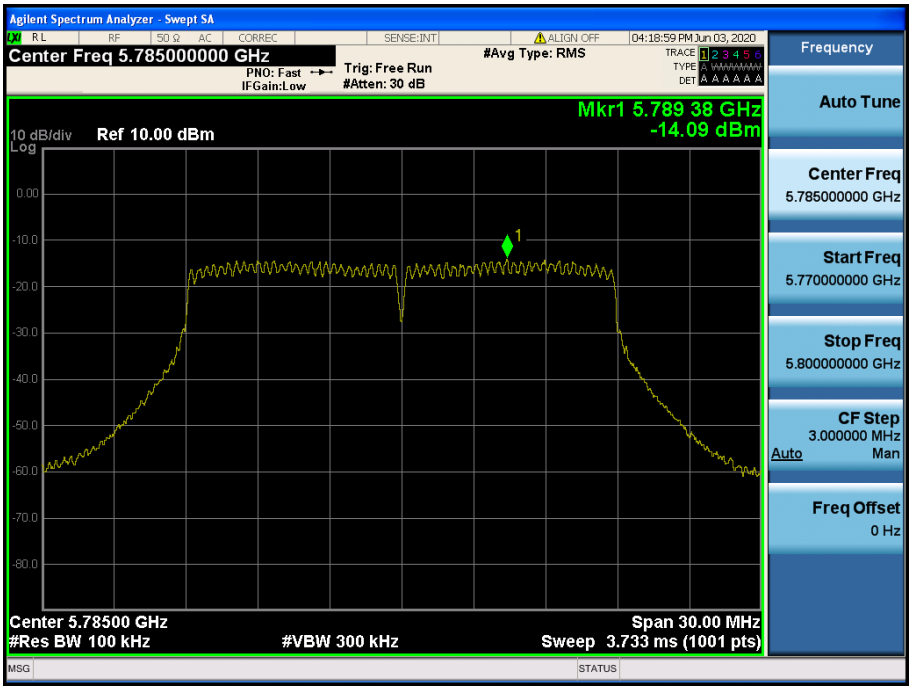


Maximum Power Spectral Density

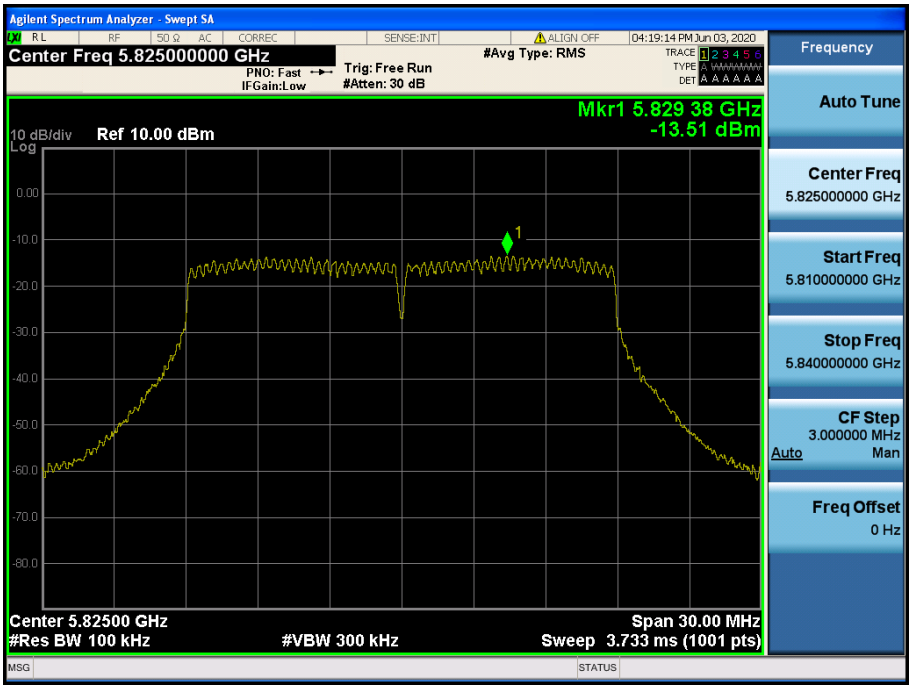
Test Mode: 802.11n HT20 & Ch.149

Maximum Power Spectral Density

Test Mode: 802.11n HT20 & Ch.157

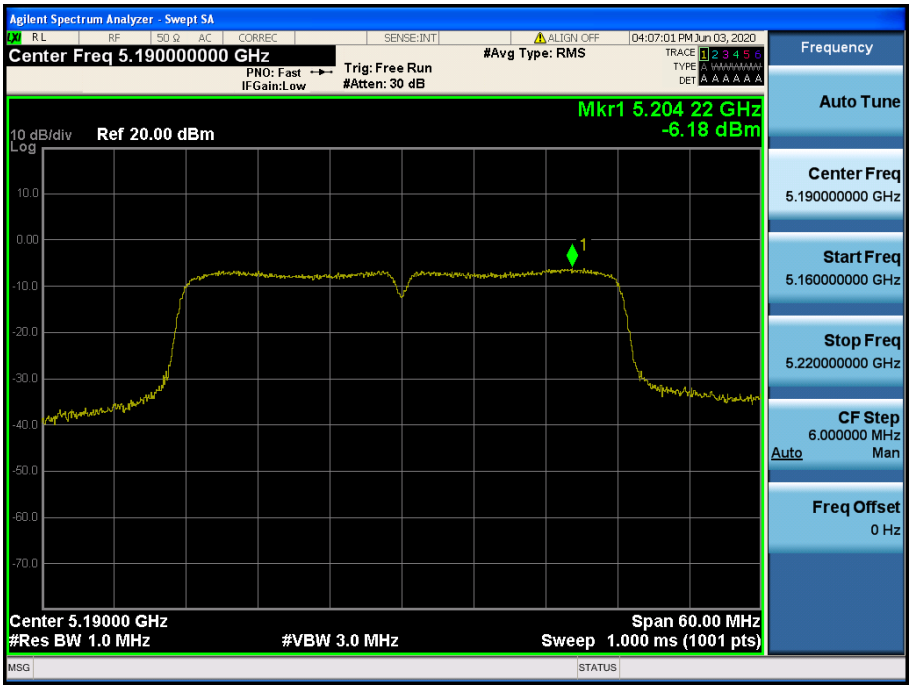


Maximum Power Spectral Density Test Mode: 802.11n HT20 & Ch.165



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.38

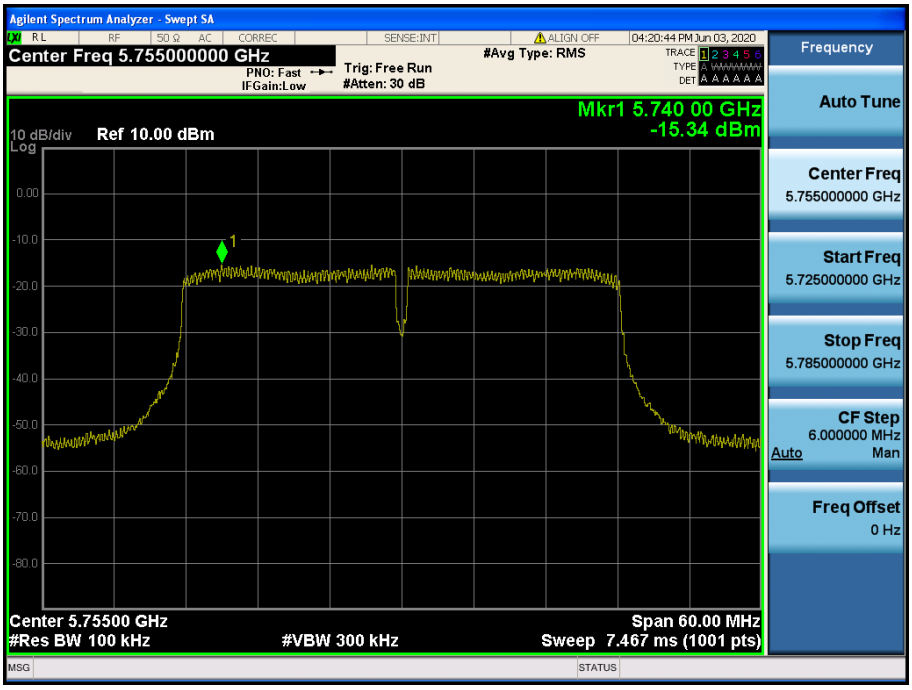


Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.46

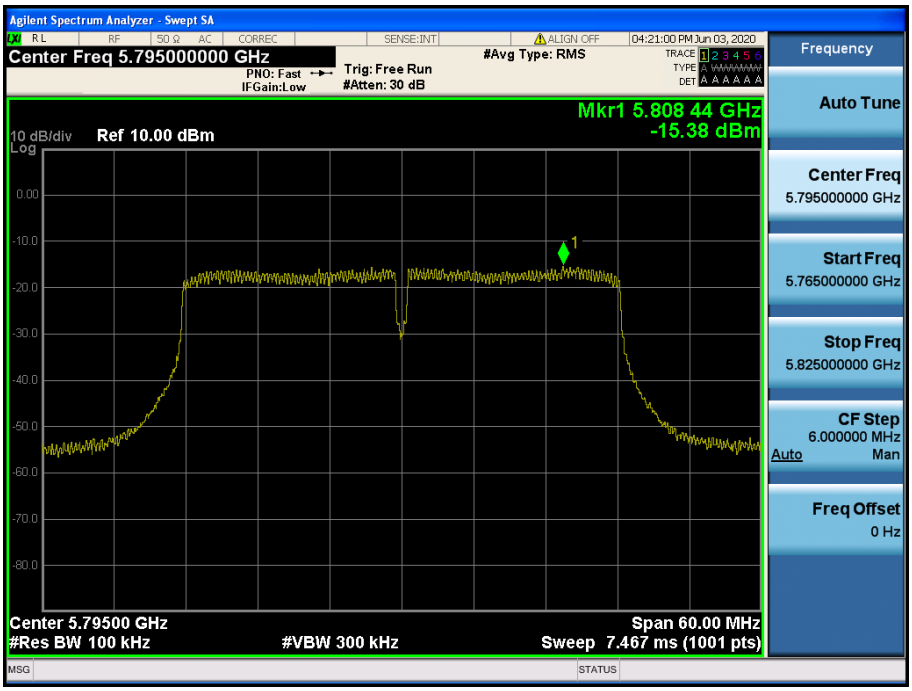
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.151

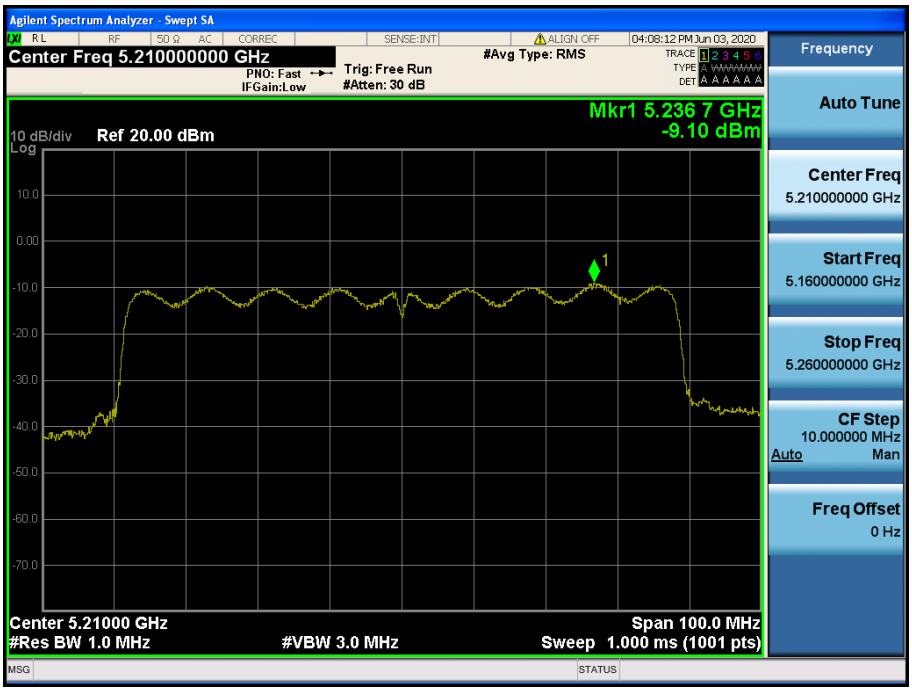


Maximum Power Spectral Density

Test Mode: 802.11n HT40 & Ch.159



Maximum Power Spectral Density Test Mode: 802.11ac VHT80 & Ch.42



Maximum Power Spectral Density Test Mode: 802.11ac VHT80 & Ch.155

8.5 Radiated Spurious Emission Measurements

▣ Test Requirements

▪ **FCC Part 15.209(a) and (b)**

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
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

** Except as provided in 15.209(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 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ **FCC Part 15.205 (a):** Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	160.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	160.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	160.7 ~ 160.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900		
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240	3600 ~ 4000		
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

▪ **FCC Part 15.407 (b):** Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the **5.15-5.25 GHz band**: all emissions outside of the **5.15-5.35 GHz band** shall not exceed an **EIRP 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 **EIRP 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 **EIRP of -27 dBm/MHz.**
(4) For transmitters operating in the **5.725-5.85 GHz band**: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
(5) The 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 §15.205 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.

▣ Test Configuration

Refer to the APPENDIX I.

▣ Test Procedure

1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m.
2. The turn table shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 1m or 3 m away from the receiving antenna, which is varied from 1m to 4 m 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 the measurements for all frequencies are complete.

Radiated spurious emission measured using following Measurement Procedure **of KDB789033 D02v02r01**

► General Requirements for Unwanted Emissions Measurements

The following requirements apply to all unwanted emissions measurements, both in and outside of the restricted bands:

▪ EUT Duty Cycle

(1) The EUT shall be configured or modified to **transmit continuously** except as stated in (ii), below. The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (**to no lower than 98 percent**) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

(2) If **continuous transmission (or at least 98 percent duty cycle) cannot be achieved** due to hardware limitations of the EUT (e.g., overheating), the following additions to the measurement and reporting procedures are required:

- The EUT shall be configured to operate at the maximum achievable duty cycle.
- Measure the duty cycle, x, of the transmitter output signal.
- Adjustments to measurement procedures (e.g., increasing test time and number of traces averaged) shall be performed as described in the procedures below.
- The test report shall include the following additional information:
  - The reason for the duty cycle limitation.
  - The duty cycle achieved for testing and the associated transmit duration and interval between transmissions.
  - The sweep time and the amount of time used for trace stabilization during max-hold measurements for peak emission measurements.

(3) Reduction of the measured emission amplitude levels to account for operational duty factor is not permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.