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.

- Peak Power Spectral Density Limit Calculation

Band	Limit [dBm]	Antenna Gain (Worst case)	Determined Limit [dBm]
U-NII 1	11	1.130	11
U-NII 2A	11	1.190	11
U-NII 2C	11	1.395	11
U-NII 3	30	1.063	30

▣ Test Configuration

Refer to the APPENDIX I.

RSS-247[6.11]

(1) For band 5150 - 5250 MHz
The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

(2) For band 5250 - 5350 MHz
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

(3) For band 5470 - 5600 MHz and 5650 - 5725 MHz
The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

(4) For band 5725 - 5850 MHz
The power spectral density shall not exceed 30 dBm in any 500 kHz band.

- Peak Power Spectral Density Limit Calculation(IC)

Band	Limit [dBm]	ANT Gain [dBi]	Determined Limit [dBm]
U-NII 1	10	1.130	10
U-NII 2A	11	1.190	11
U-NII 2C	11	1.395	11
U-NII 3	30	1.063	30

▣ **Test procedure**

Maximum Power Spectral Density is measured using Measurement Procedure **of KDB789033 D02**

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.

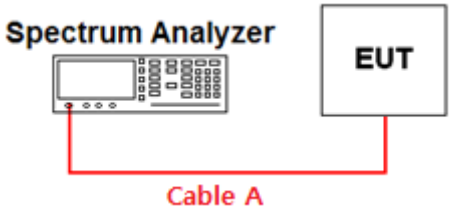
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log(500 kHz / RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

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 configuration**



▣ **Test results: Comply**

Multiple Transmit

Mode	Channel	Frequency [MHz]	Reading [dBm]			T.F [dB] Note 1	Test Result [dBm]
			ANT 1	ANT 2	SUM		SUM
802.11a	36	5180	-9.490	-8.590	-6.006	10.580	4.574
	40	5200	-8.910	-8.720	-5.804		4.776
	48	5240	-8.790	-8.330	-5.544		5.036
	52	5260	-7.990	-7.760	-4.863		5.717
	60	5300	-7.410	-7.350	-4.370		6.210
	64	5320	-6.870	-6.770	-3.809		6.771
	100	5500	-6.920	-5.410	-3.089		7.491
	116	5580	-10.140	-7.140	-5.376		5.204
	-	-	-	-	-		-
	149	5745	-9.550	-7.920	-5.649	7.570	1.921
	157	5785	-7.250	-4.940	-2.933		4.637
	165	5825	-10.700	-8.980	-6.745		0.825
802.11ac VHT20	36	5180	-9.360	-9.540	-6.439	11.130	4.691
	40	5200	-9.160	-8.830	-5.982		5.148
	48	5240	-8.610	-9.230	-5.899		5.231
	52	5260	-7.630	-7.270	-4.436		6.694
	60	5300	-7.320	-7.280	-4.290		6.840
	64	5320	-6.710	-7.110	-3.895		7.235
	100	5500	-9.100	-7.290	-5.091		6.039
	116	5580	-10.120	-7.130	-5.362		5.768
	-	-	-	-	-		-
802.11n HT20	149	5745	-10.090	-8.030	-5.929	8.110	2.181
	157	5785	-10.070	-9.400	-6.712		1.398
	165	5825	-10.820	-9.150	-6.895		1.215
802.11ac VHT40	38	5190	-15.960	-14.410	-12.106	11.940	-0.166
	46	5230	-9.360	-10.630	-6.938		5.002
	54	5270	-9.860	-9.800	-6.820		5.120
	62	5310	-13.730	-15.150	-11.372		0.568
	102	5510	-12.850	-12.930	-9.880		2.060
	118	5590	-11.290	-11.180	-8.224		3.716
	-	-	-	-	-		-
802.11n HT40	151	5755	-12.010	-12.540	-9.257	8.960	-0.297
	159	5795	-12.250	-11.830	-9.025		-0.065
802.11ac VHT80	42	5210	-18.200	-16.840	-14.457	13.150	-1.307
	-	-	-	-			-
	58	5290	-16.760	-16.970	-13.853		-0.703
	-	-	-	-			-
	106	5530	-18.290	-16.330	-14.190		-1.040
	-	-	-	-			-
	-	-	-	-			-
	155	5775	-17.970	-16.920	-14.403	10.140	-4.263
	-	-	-	-	-		-

Note 1: "Band 1, 2A, 2C [T.F] = 10*LOG(1000/100) + D.C.F"
"Band 3 [T.F] = 10*LOG(500/100) + D.C.F"
For D.C.F., please refer to appendix II.
Note 2: Test Result = Measurement Data + T.F

Multiple Transmit

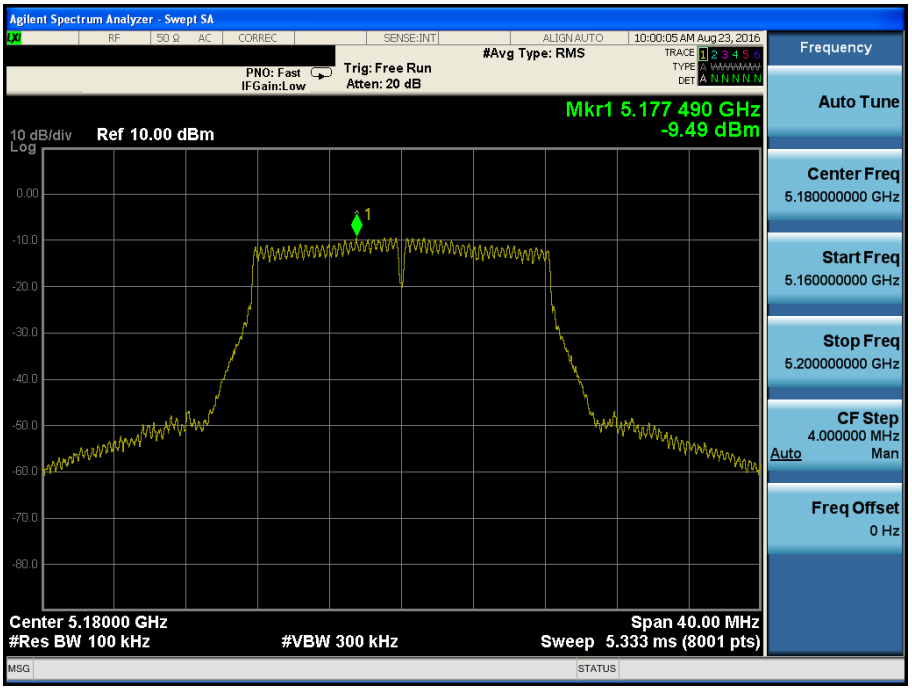
Mode		Channel	Frequency [MHz]	Reading [dBm]			T.F [dB] Note 1	Test Result [dBm]
				ANT 1	ANT 2	SUM		
802.11a	U-NII 2C	144	5720	-9.690	-7.060	-5.169	10.580	5.411
	U-NII 3	144	5720	-12.040	-9.170	-7.362	7.570	0.208
802.11ac VHT20	U-NII 2C	144	5720	-9.950	-8.160	-5.953	11.130	5.177
	U-NII 3	144	5720	-11.750	-9.660	-7.570	8.120	0.550
802.11ac VHT40	U-NII 2C	142	5710	-11.170	-10.640	-7.887	11.940	4.053
	U-NII 3	142	5710	-13.520	-12.630	-10.042	8.930	-1.112
802.11ac VHT80	U-NII 2C	138	5690	-14.460	-12.960	-10.635	13.150	2.515
	U-NII 3	138	5690	-18.470	-17.140	-14.744	10.140	-4.604

Note 1: "Band 1, 2A, 2C [T.F] = 10*LOG(1000/100) + D.C.F"
"Band 3 [T.F] = 10*LOG(500/100) + D.C.F"
For D.C.F., please refer to appendix II.
Note 2: Test Result = Measurement Data + T.F

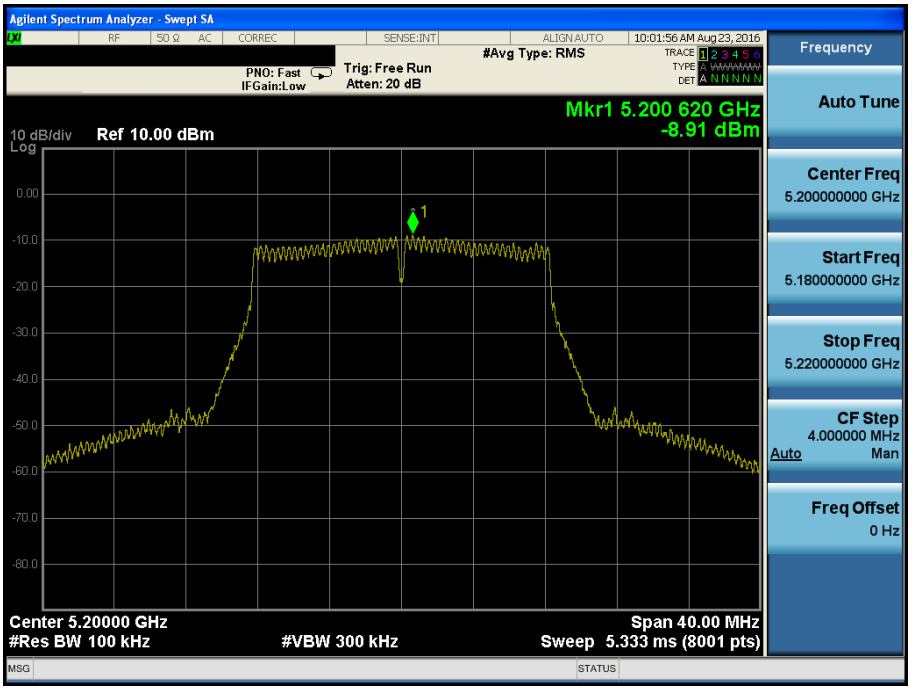
▣ RESULT PLOTS

Multiple Transmit

Maximum Power Spectral Density Test Mode: 802.11a & ANT 1 & Ch.36

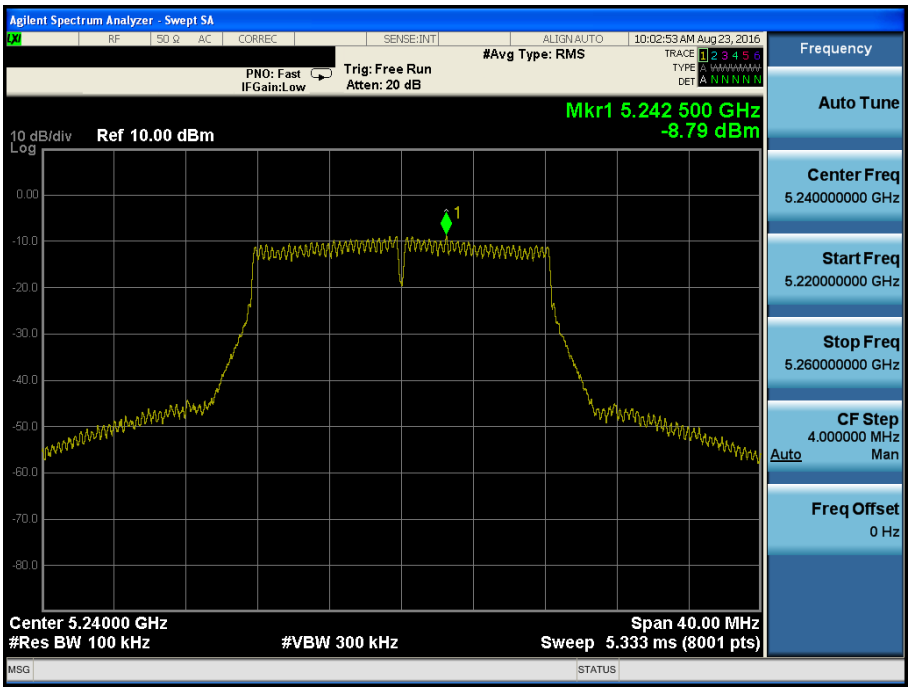


Maximum Power Spectral Density Test Mode: 802.11a & ANT 1 & Ch.40



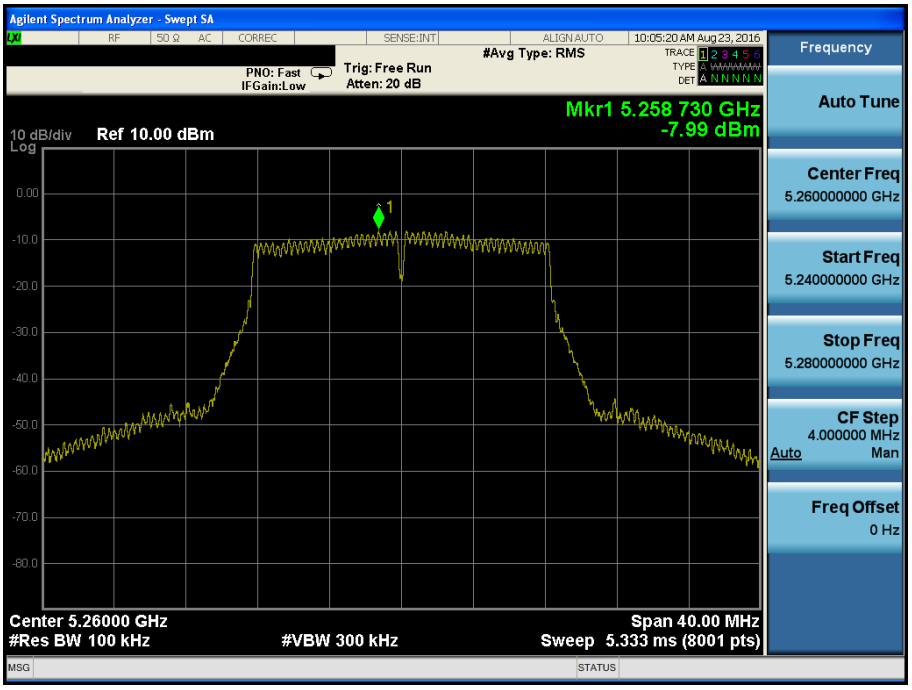
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.48



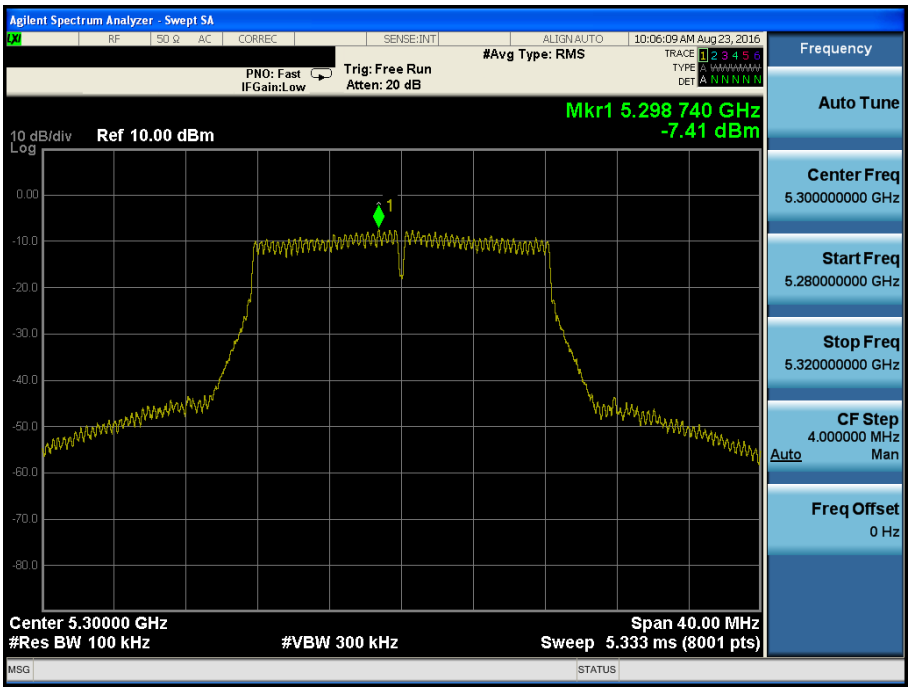
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.52



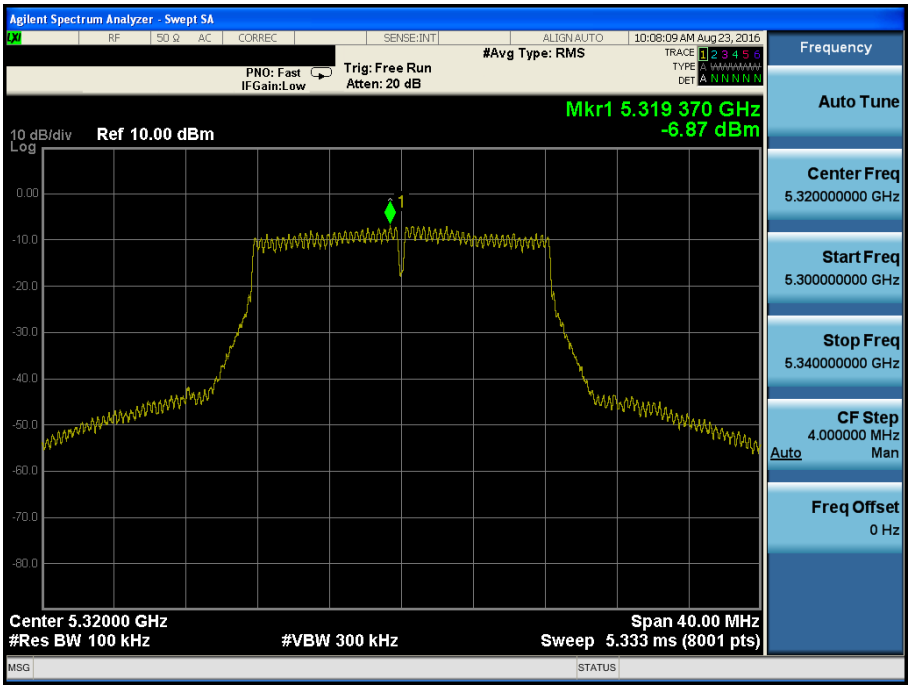
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.60



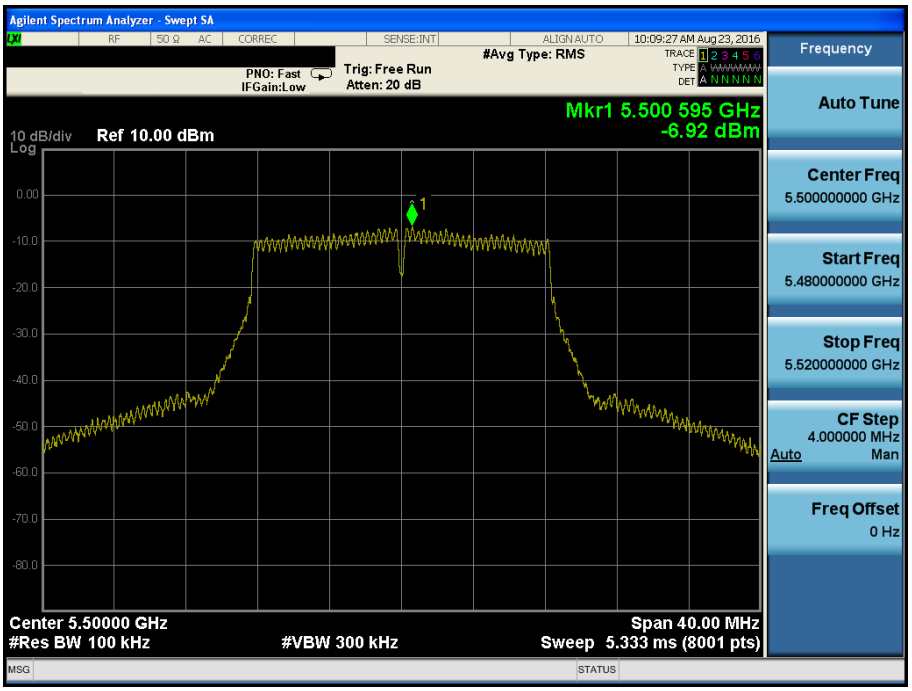
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.64



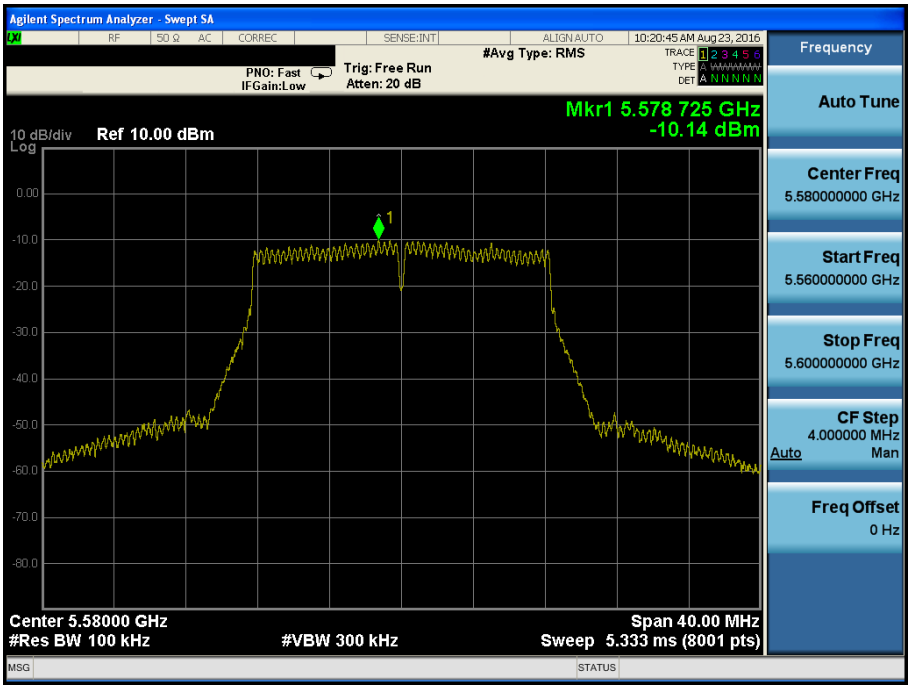
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.100



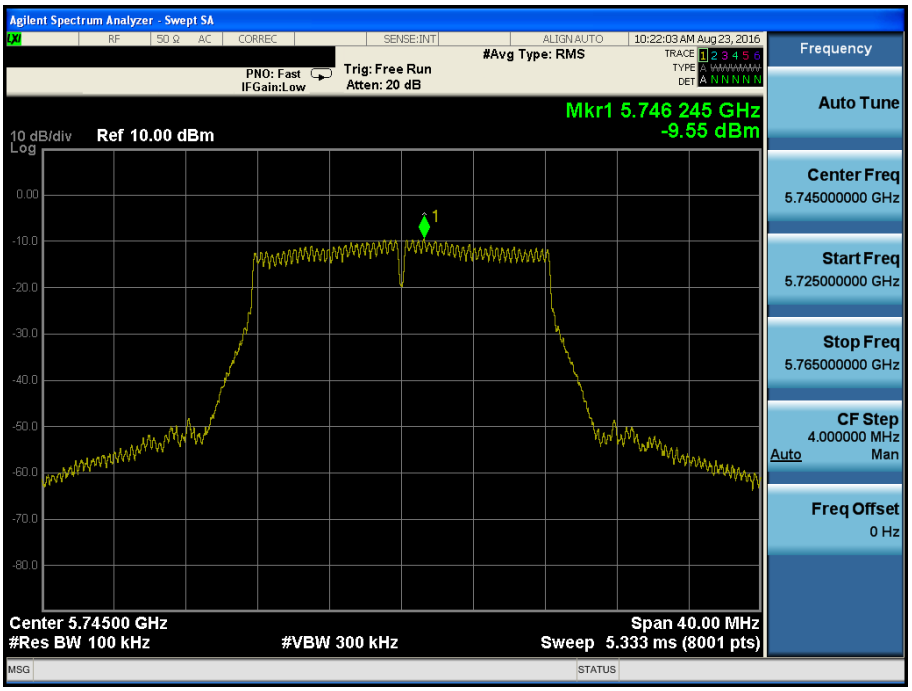
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.116



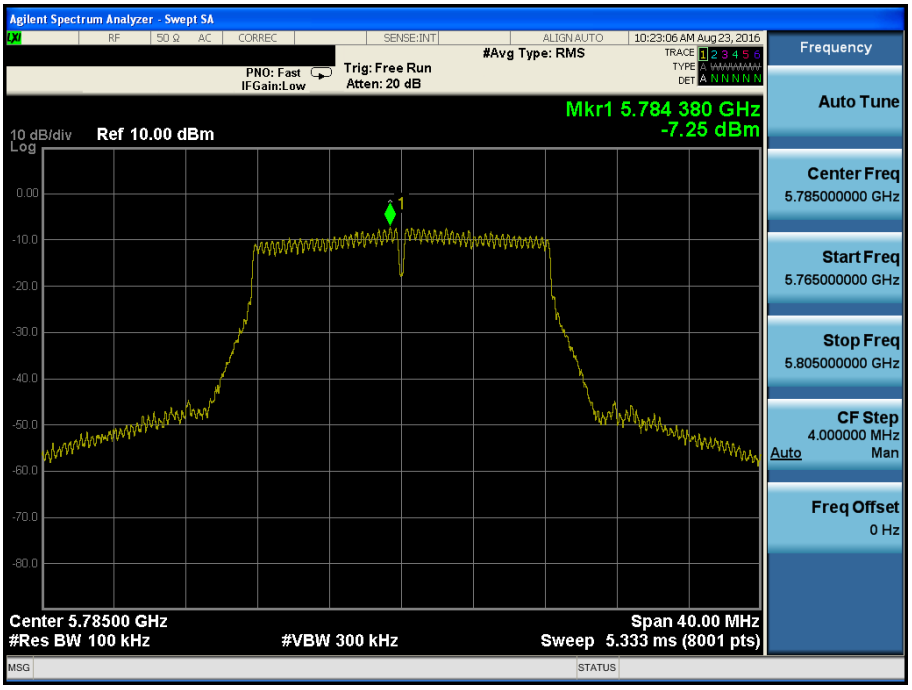
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.149



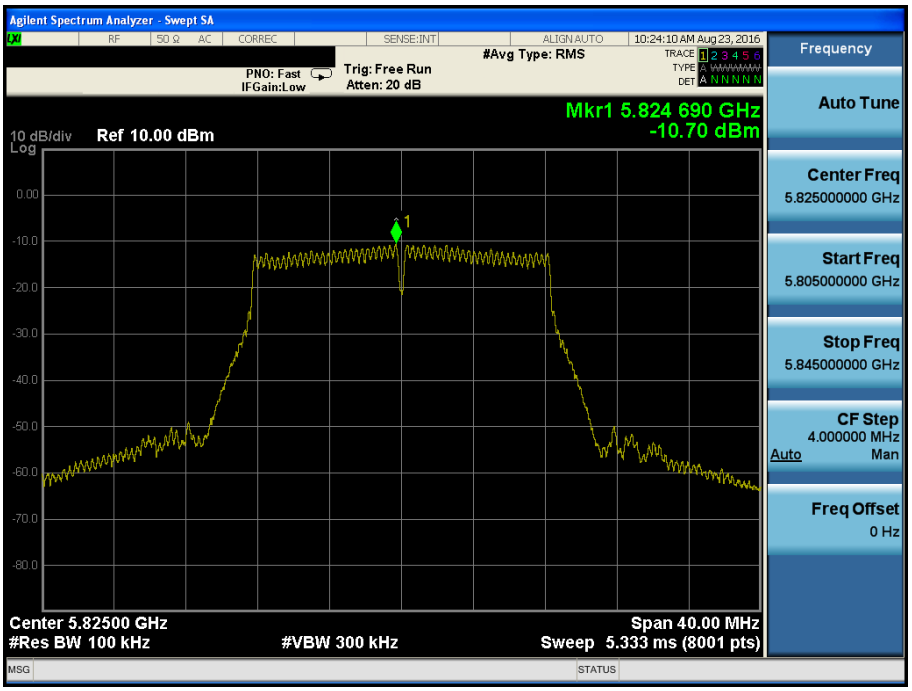
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.157



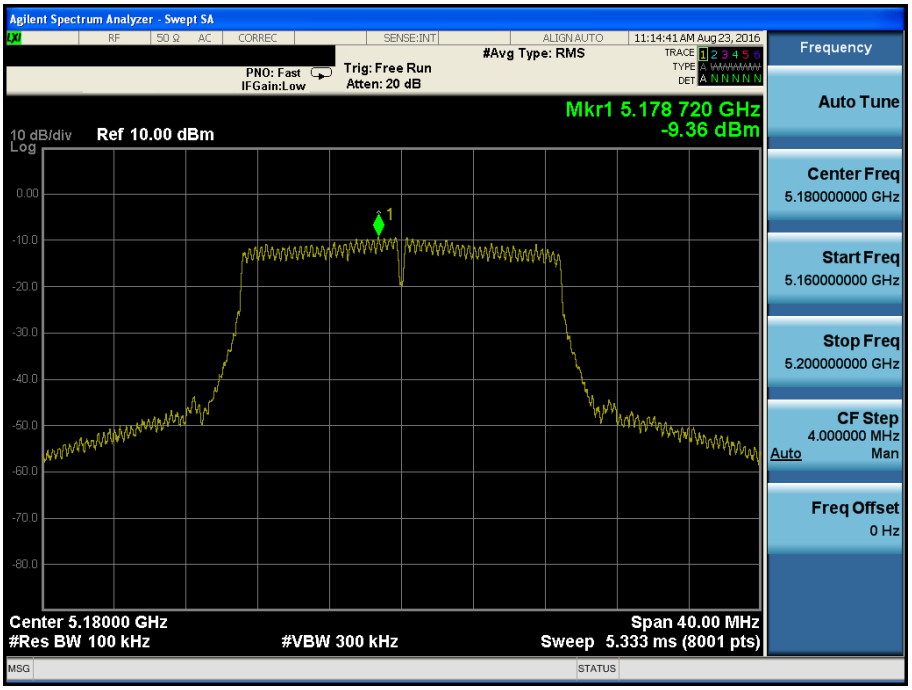
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 1 & Ch.165



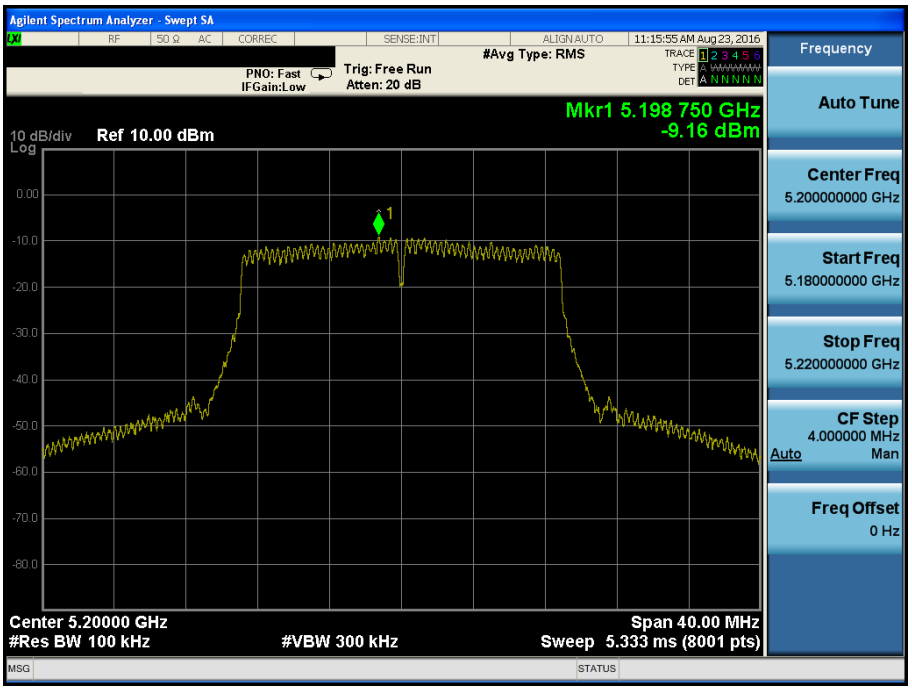
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.36



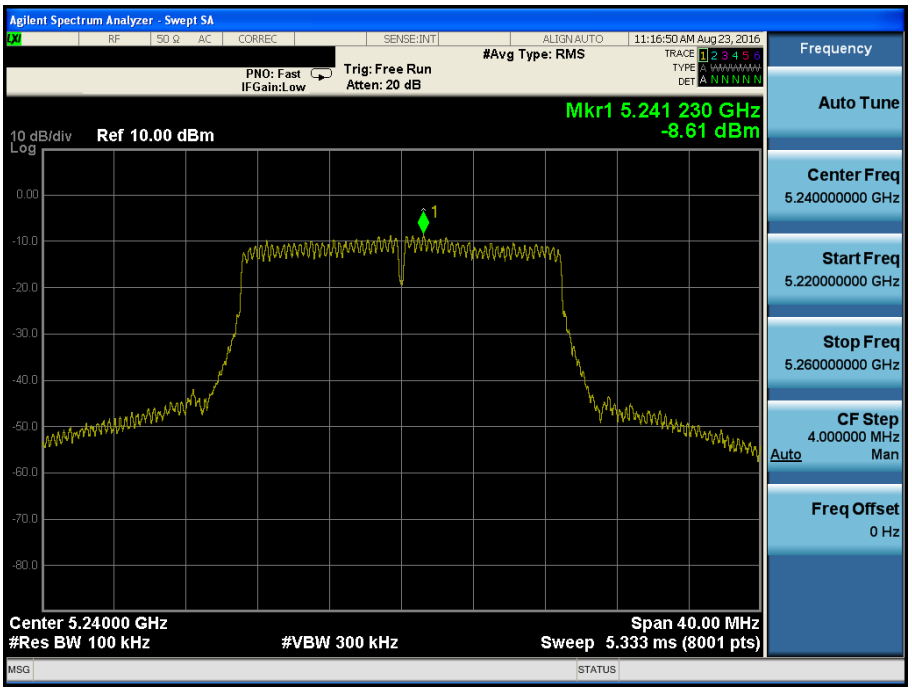
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.40



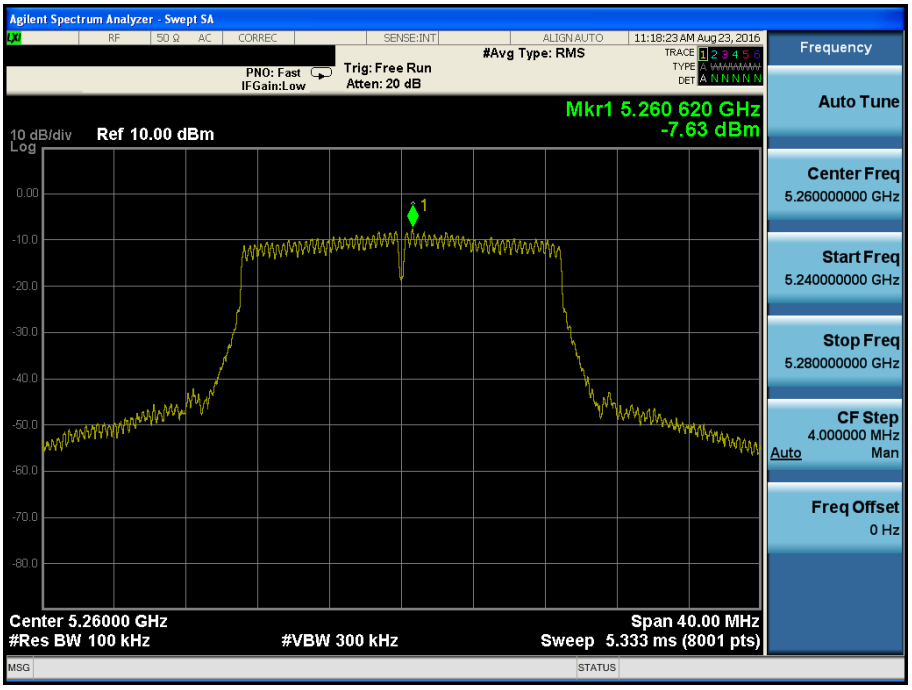
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.48



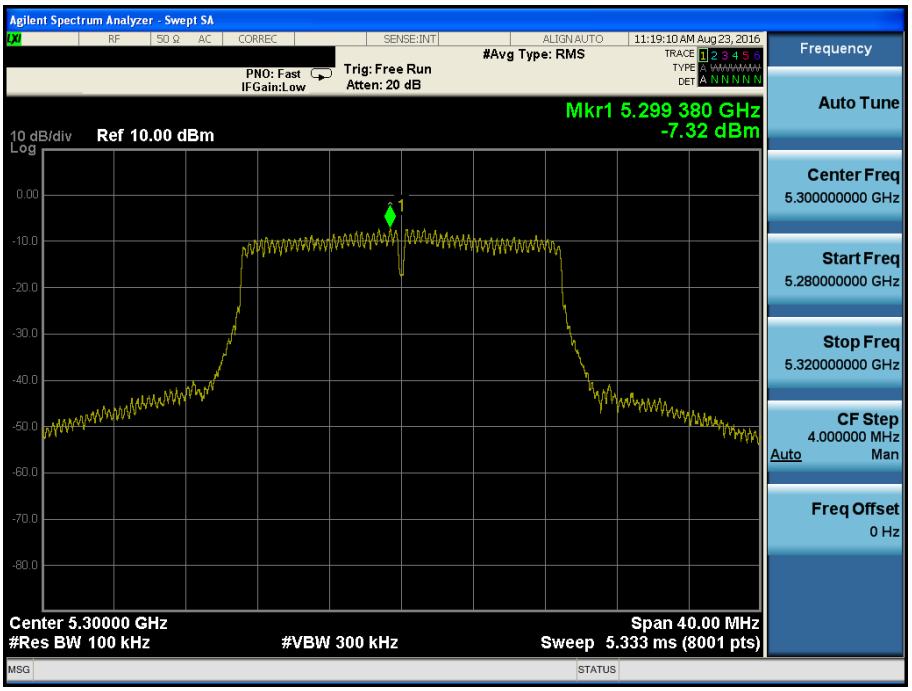
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.52



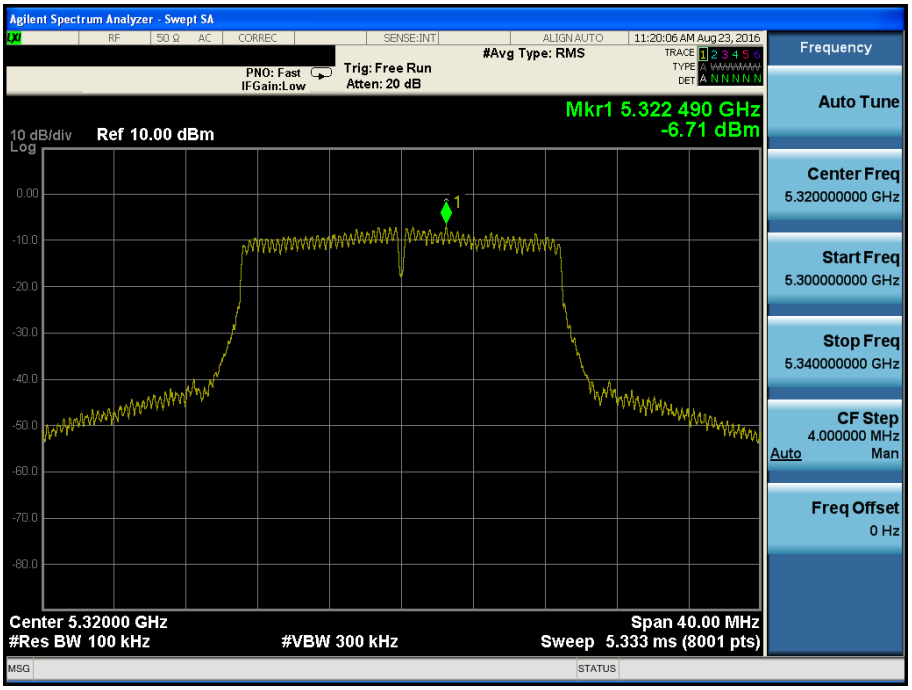
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.60



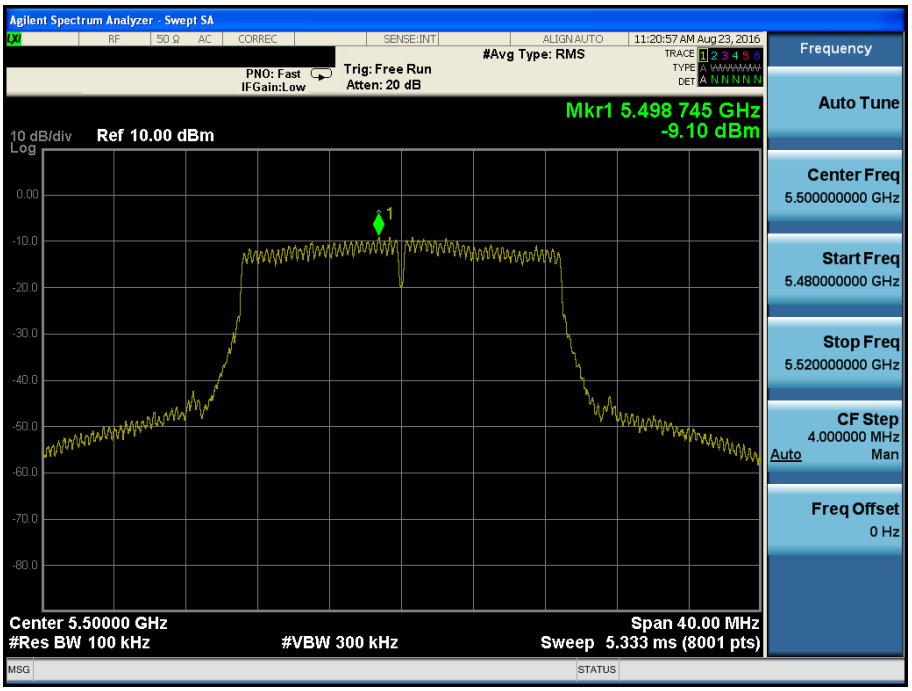
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.64



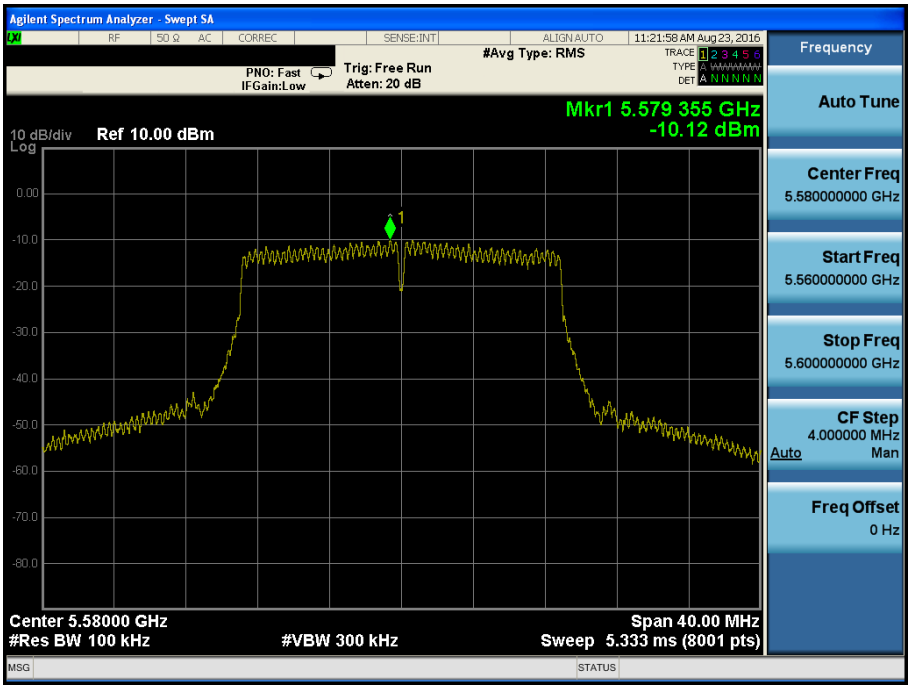
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.100



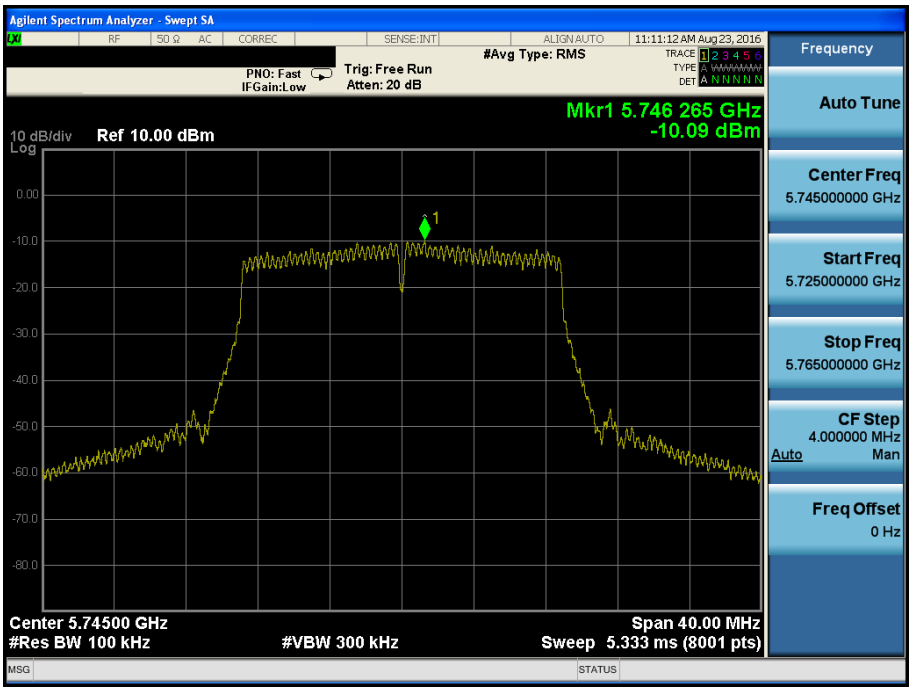
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 1 & Ch.116



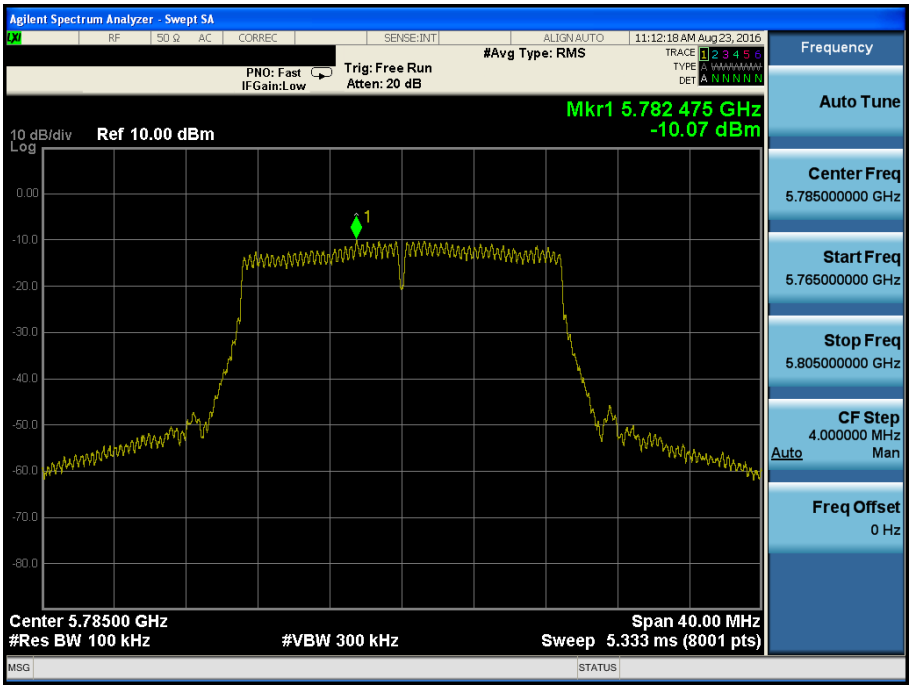
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.149



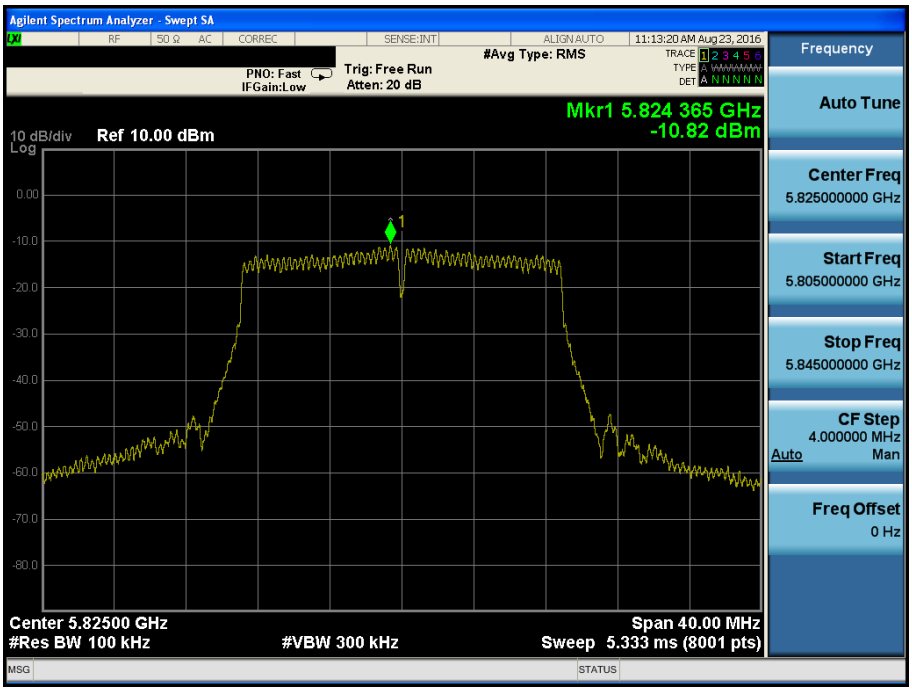
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.157



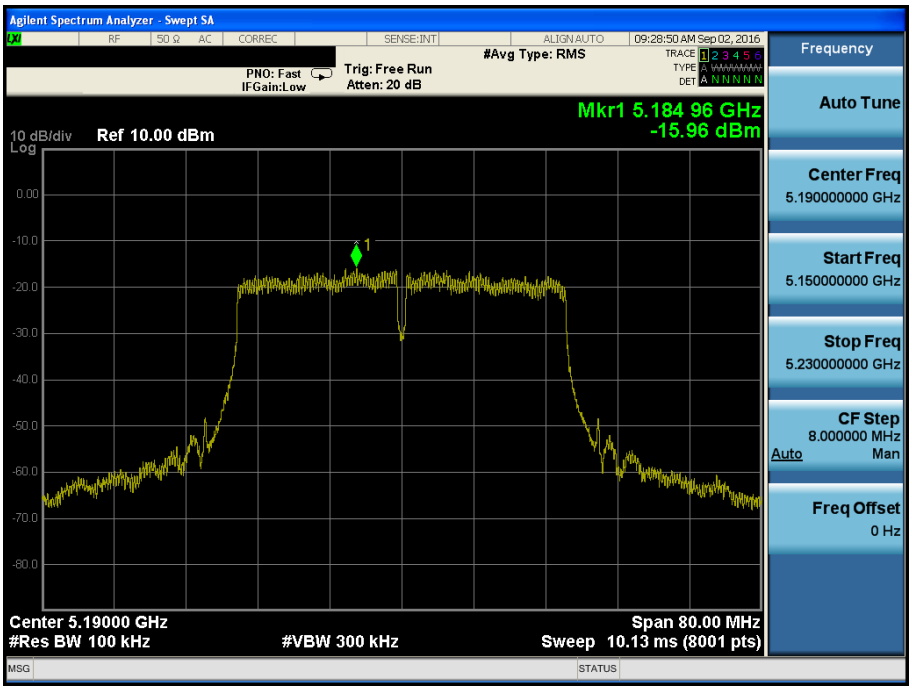
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 1 & Ch.165



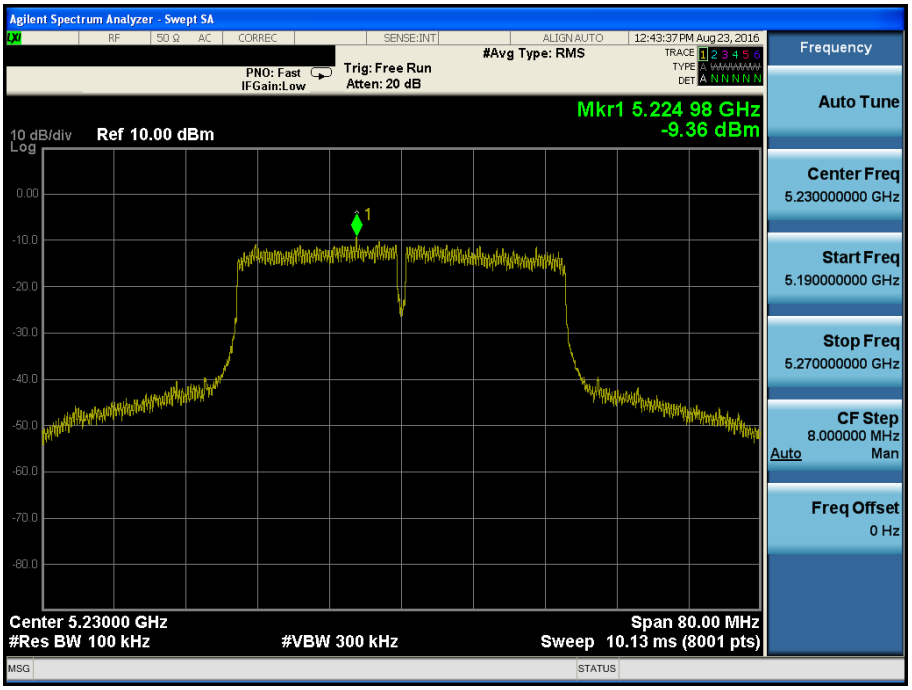
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.38



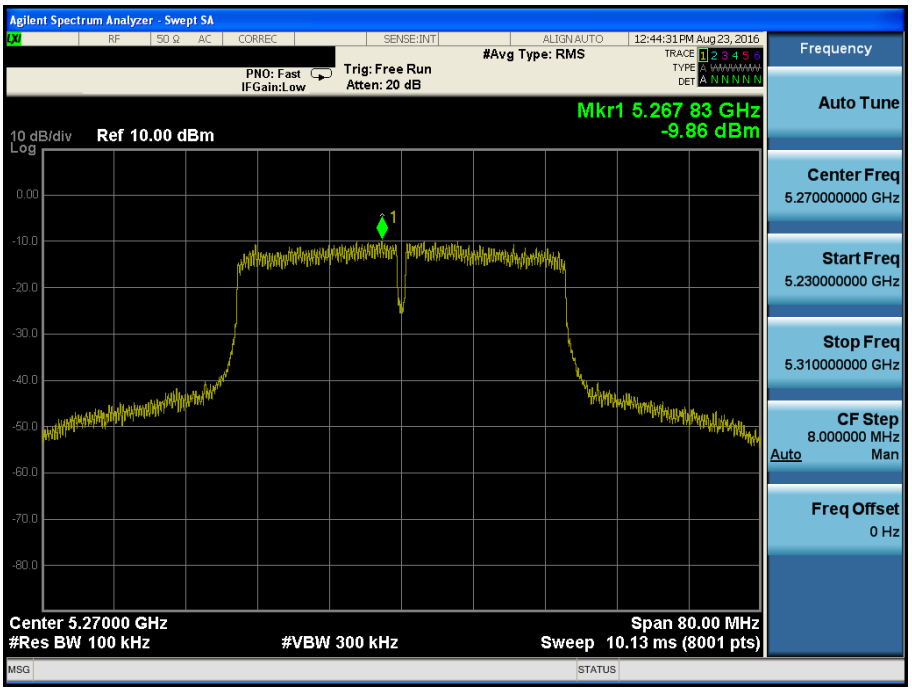
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.46



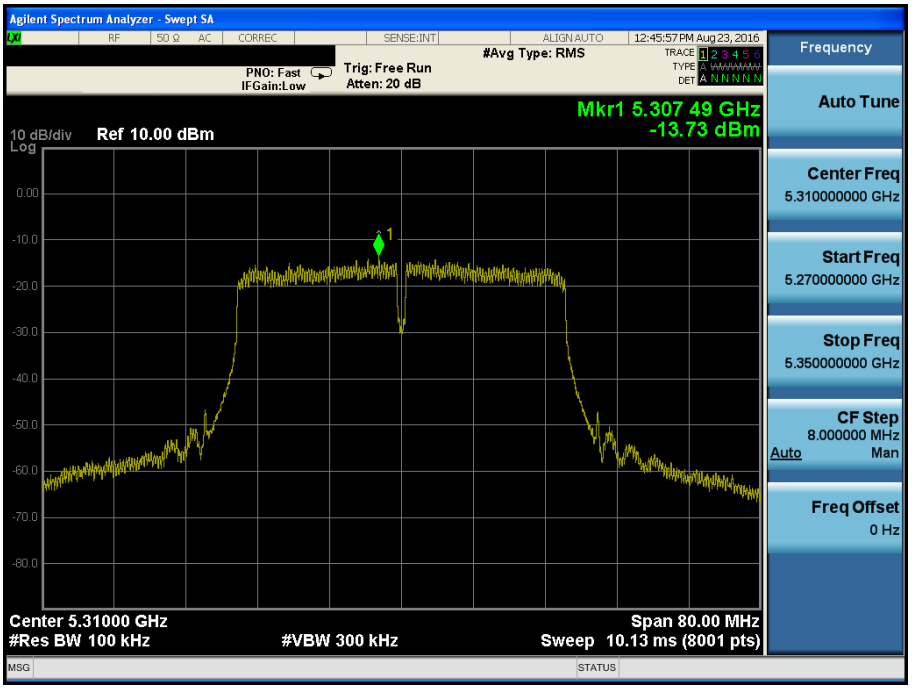
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.54



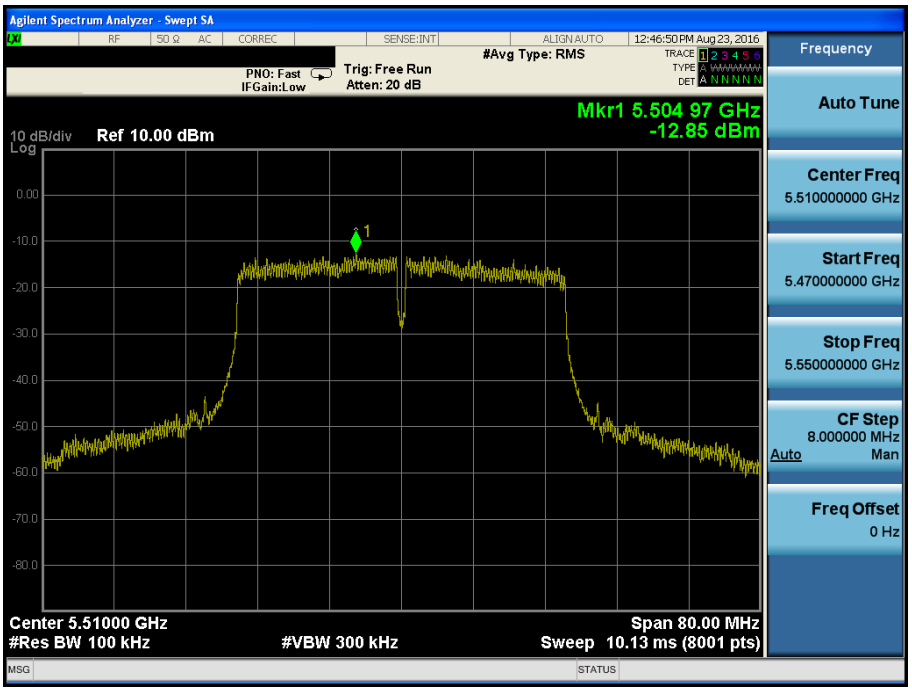
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.62



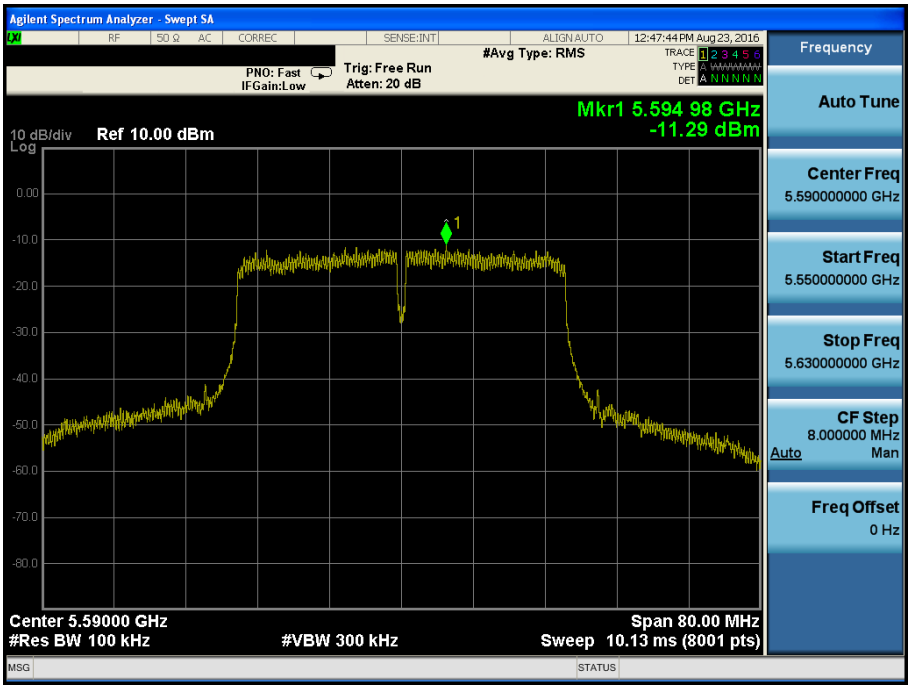
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.102



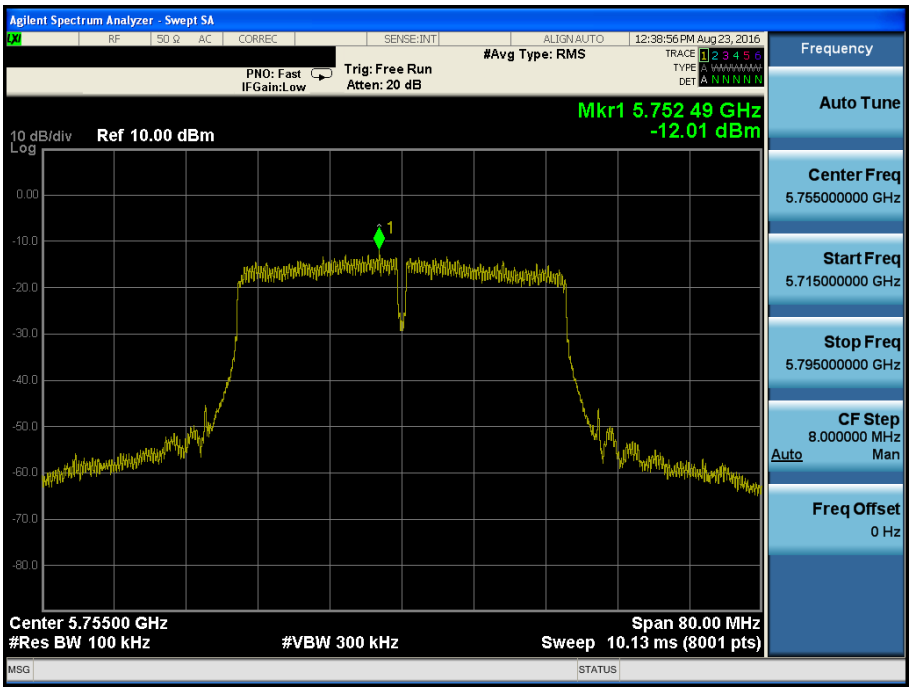
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.118



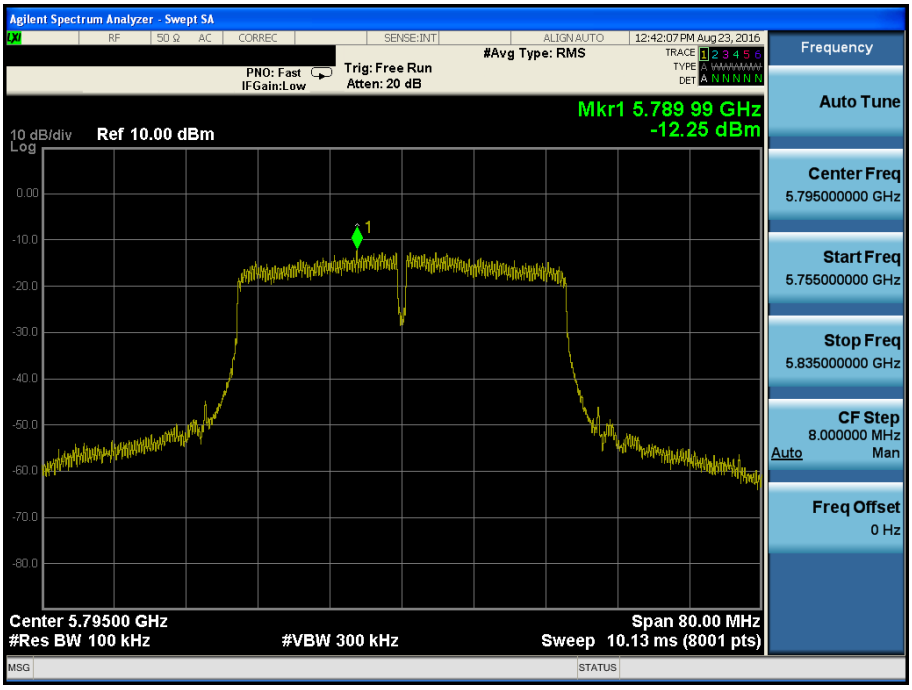
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.151



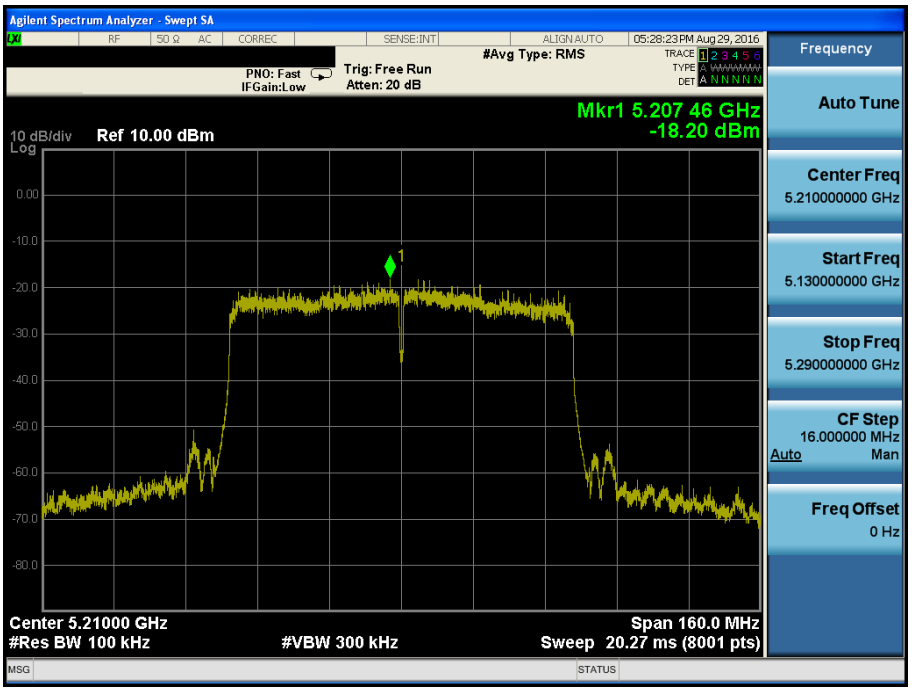
Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 1 & Ch.159



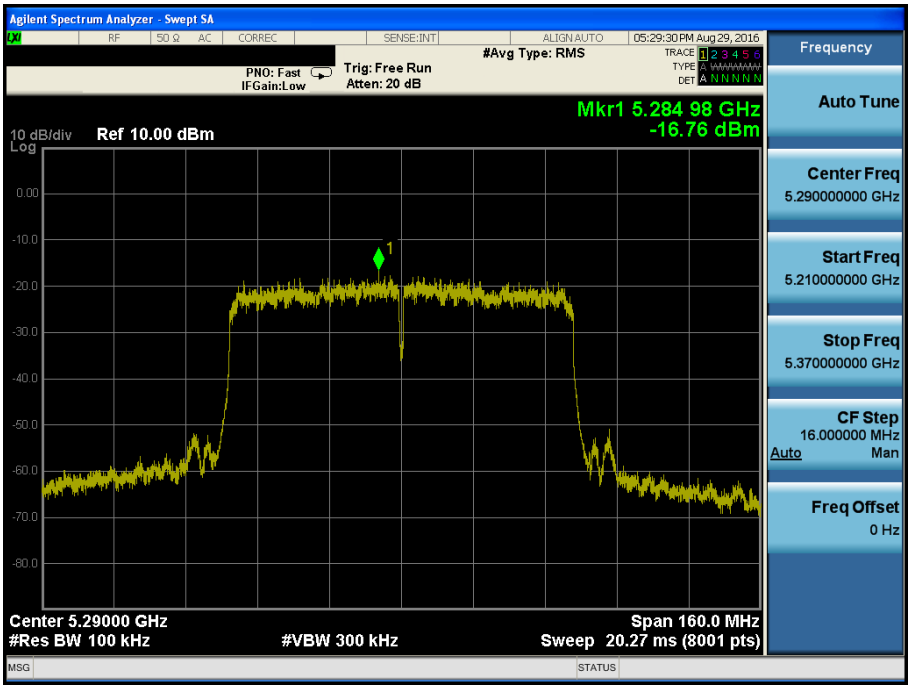
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.42



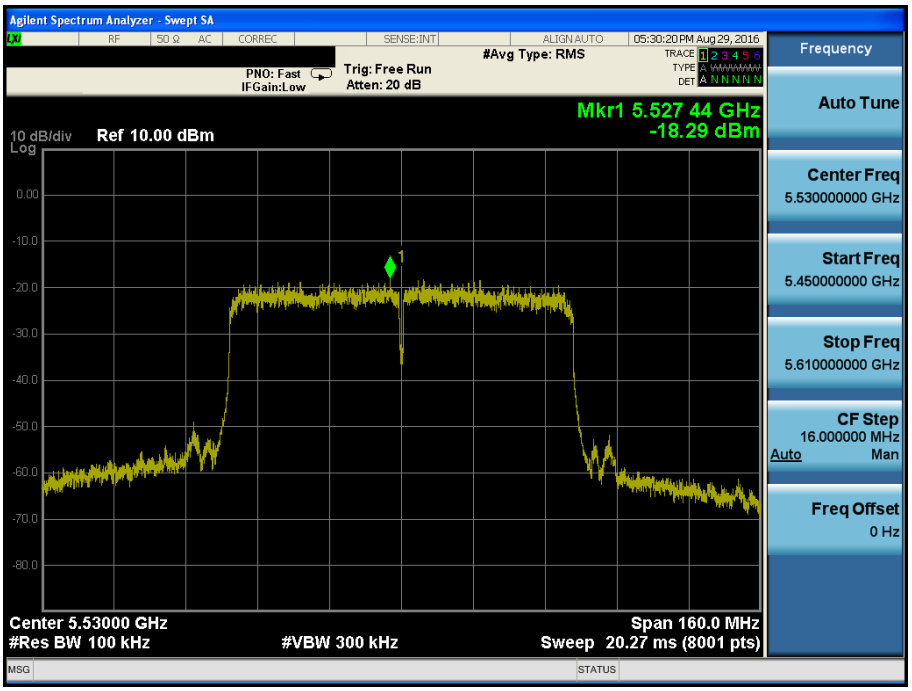
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.58



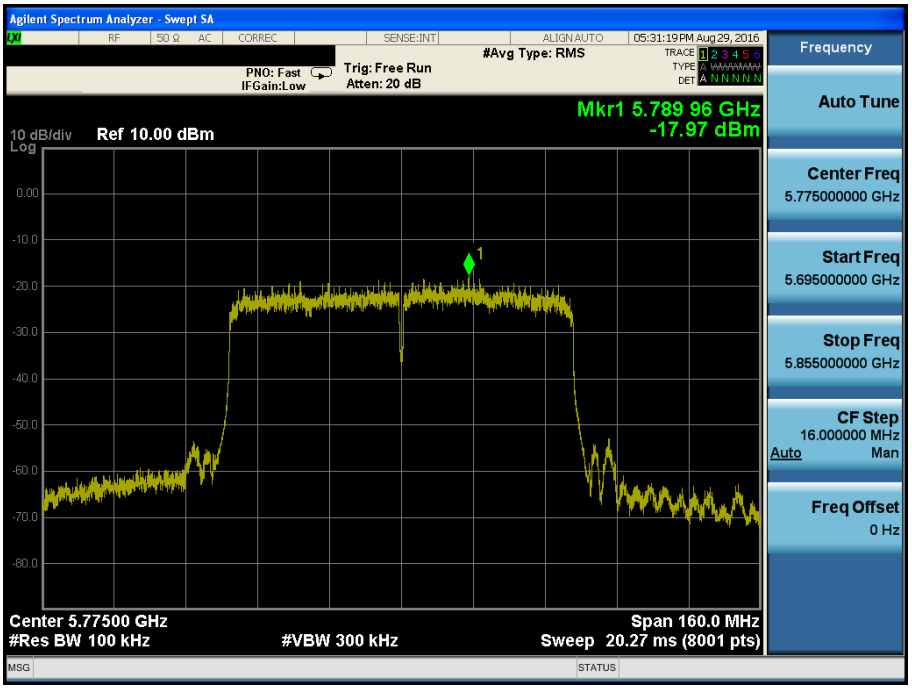
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.106



Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.155

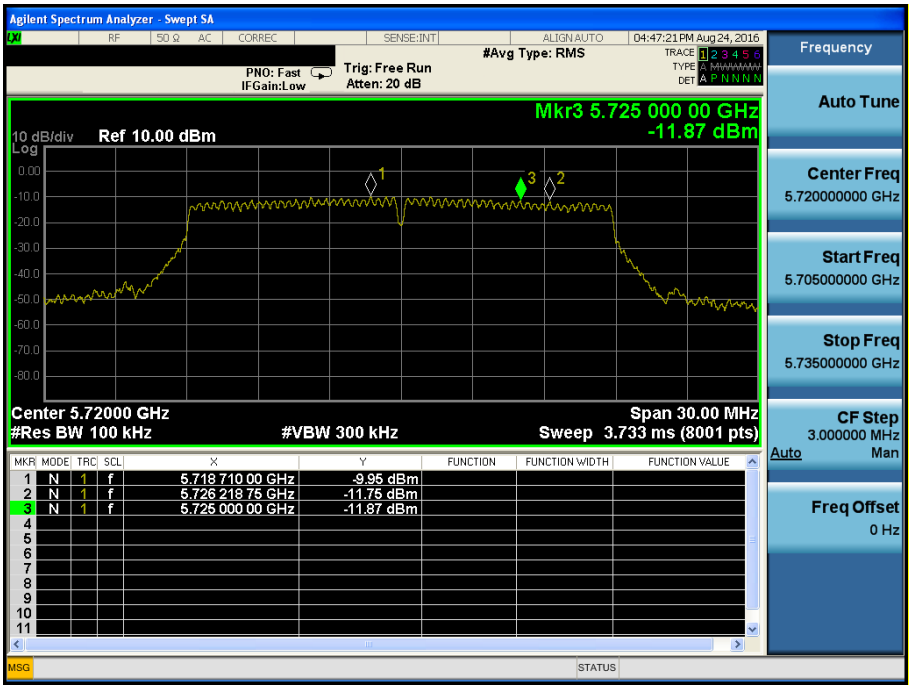


Maximum Power Spectral Density

Test Mode: 802.11a & & ANT 1 & Ch.144

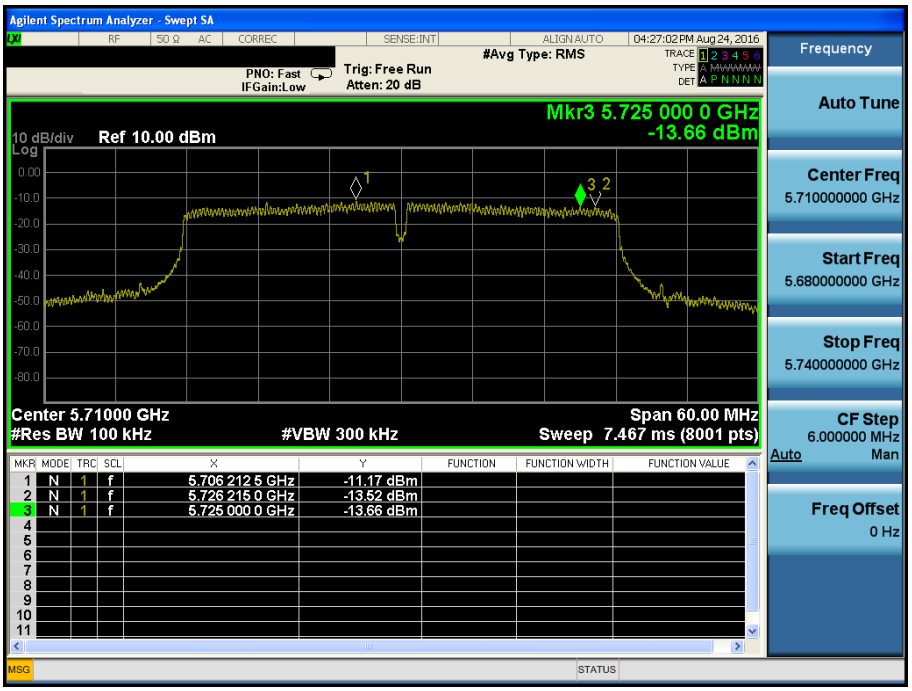
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & & ANT 1 & Ch.144



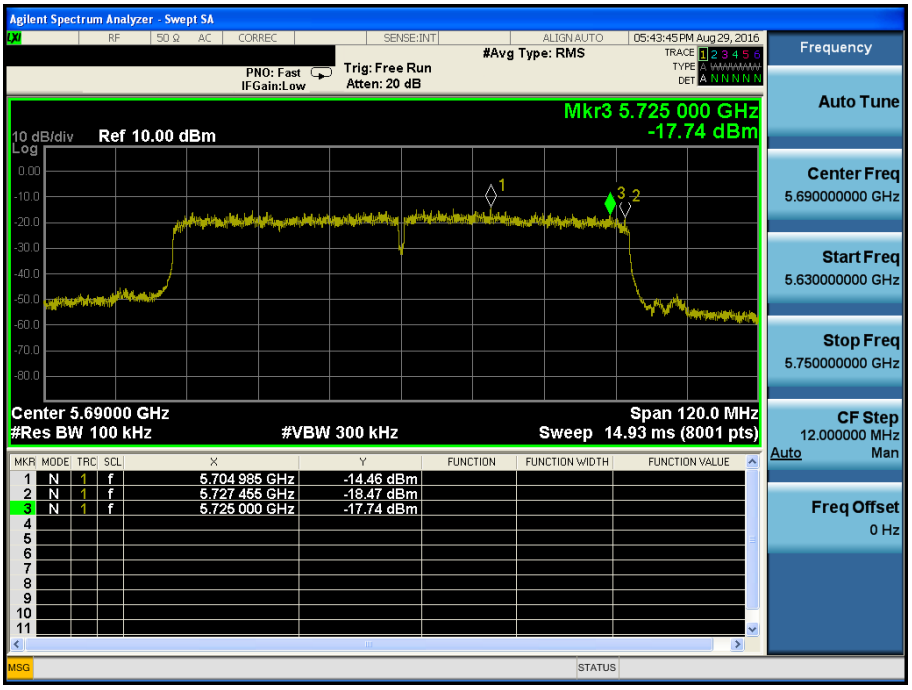
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 1 & Ch.142



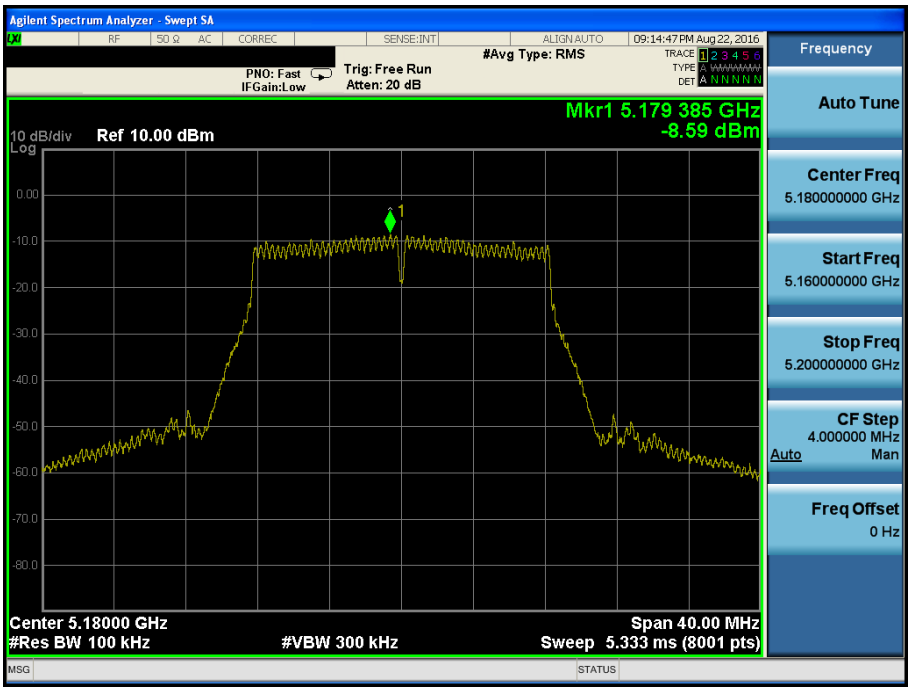
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 1 & Ch.138



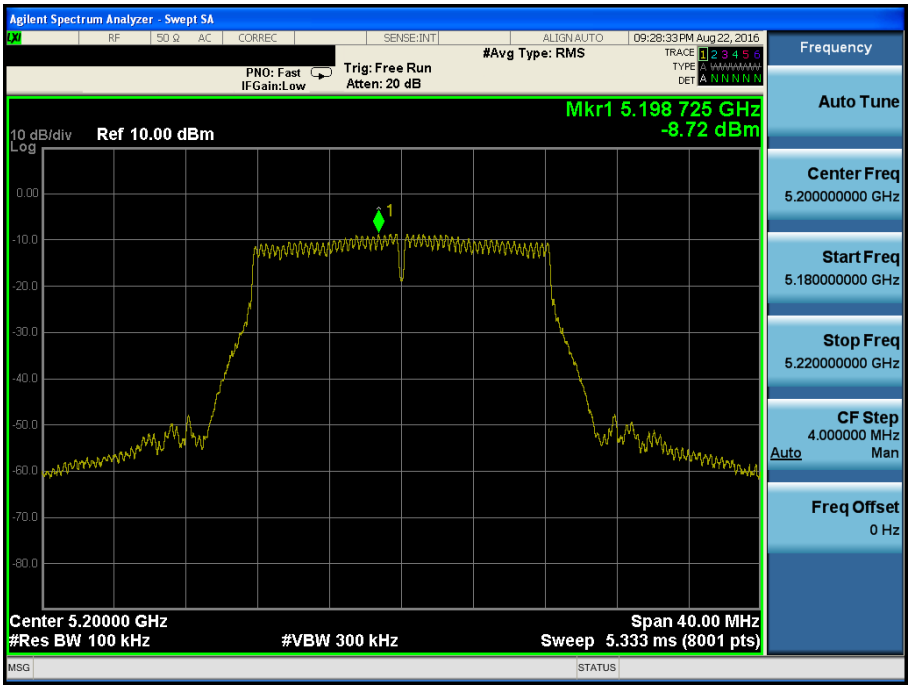
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.36



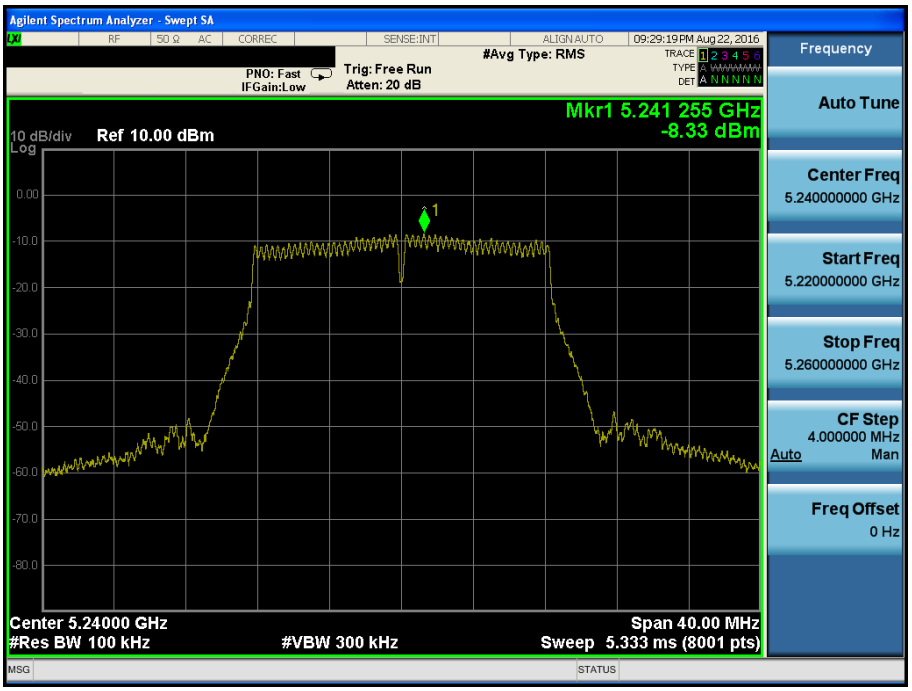
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.40



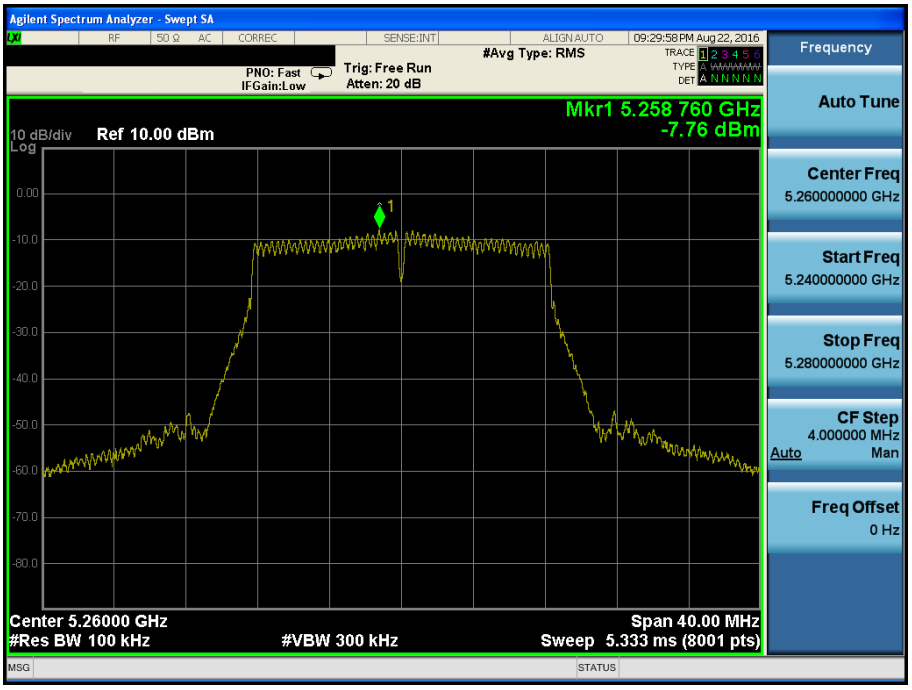
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.48



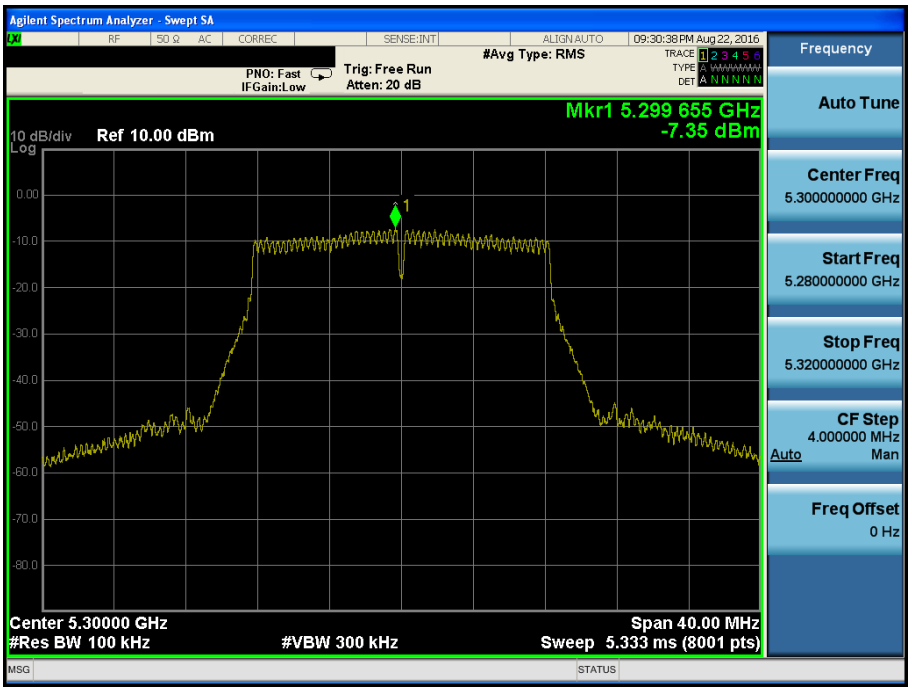
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.52



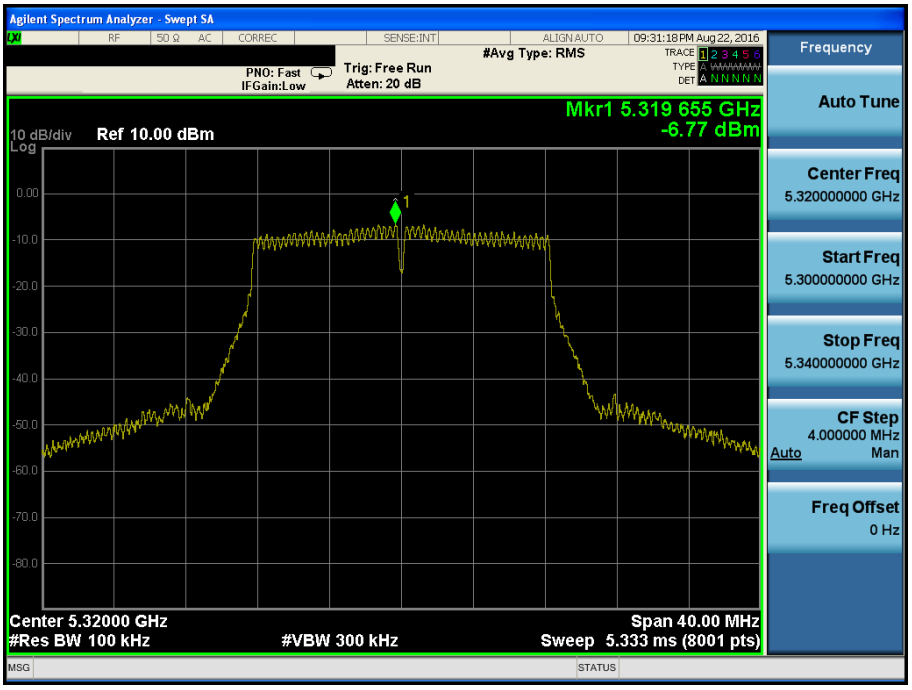
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.60



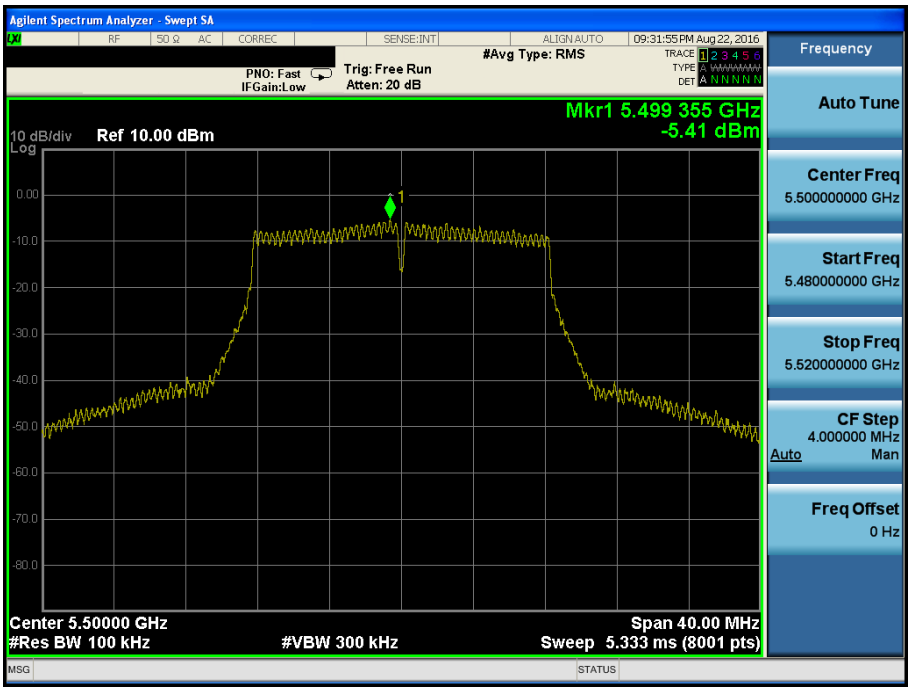
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.64



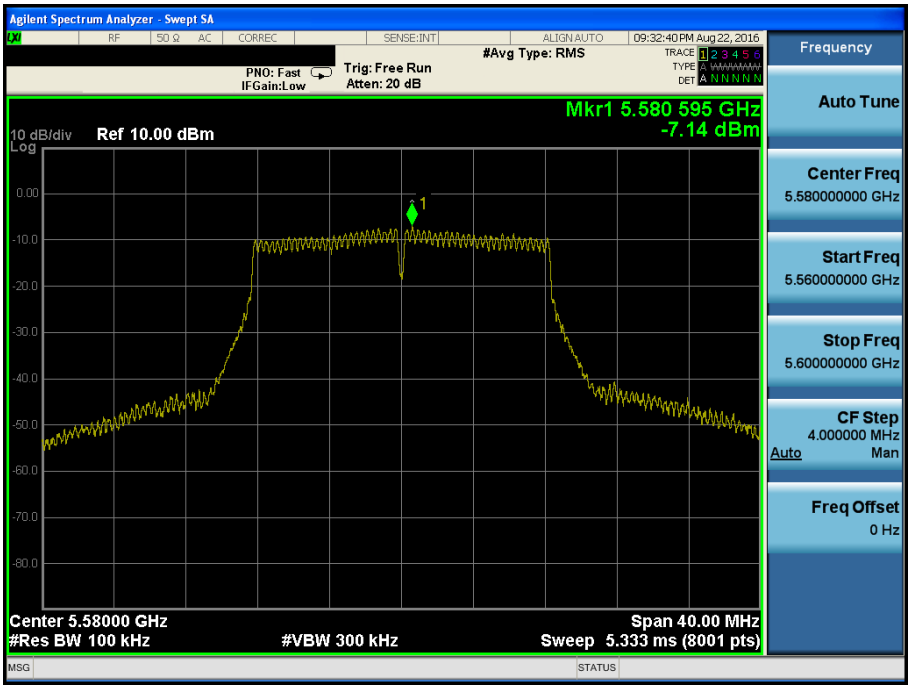
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.100



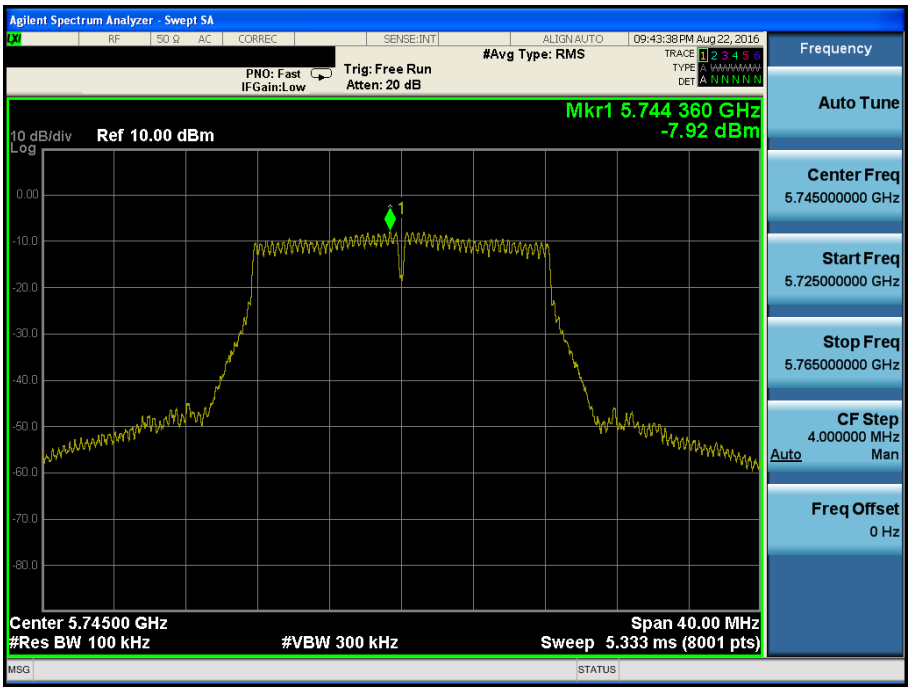
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.116



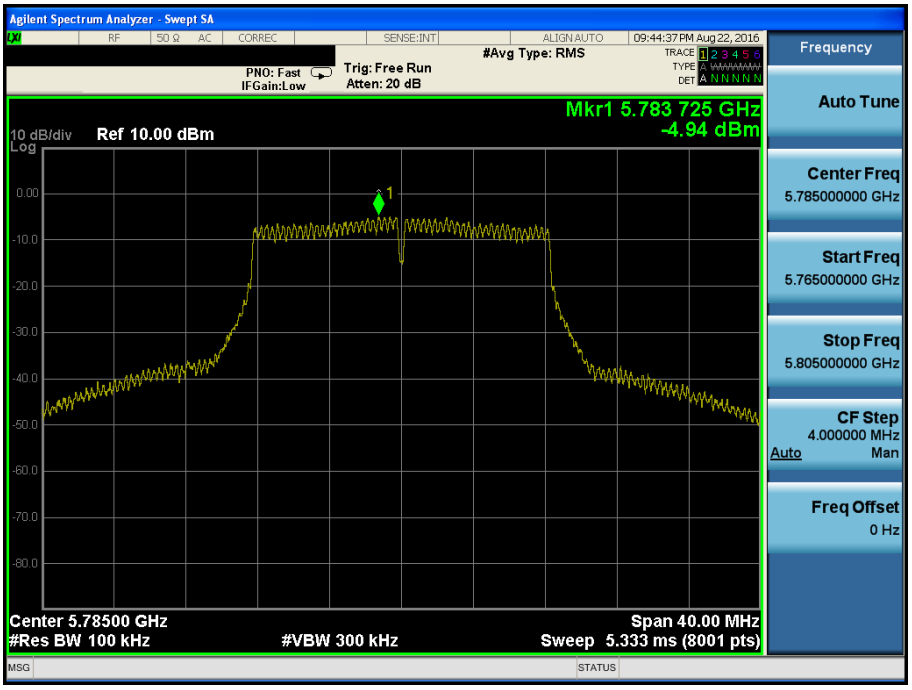
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.149



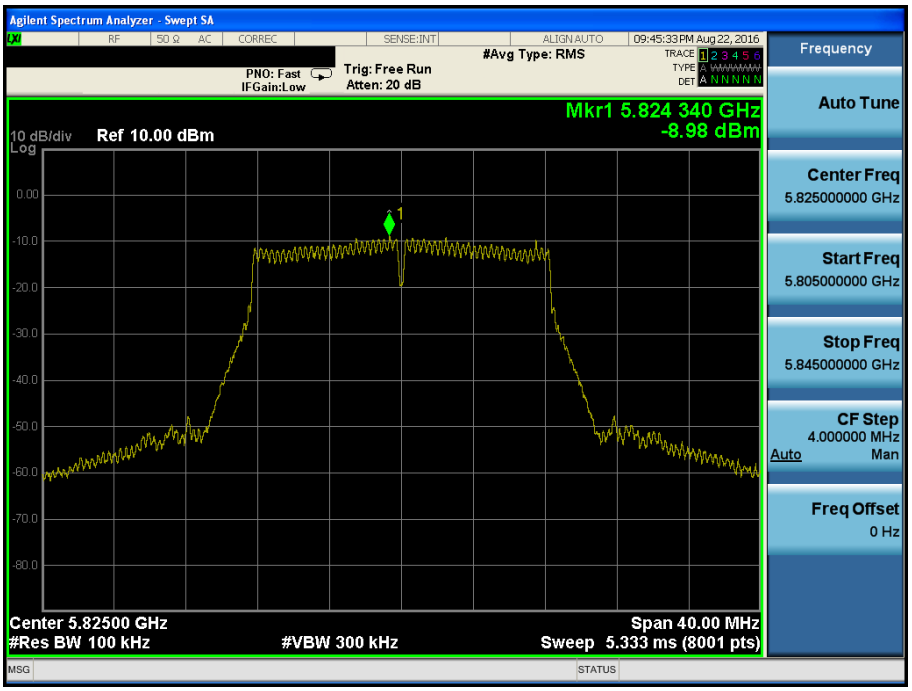
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.157



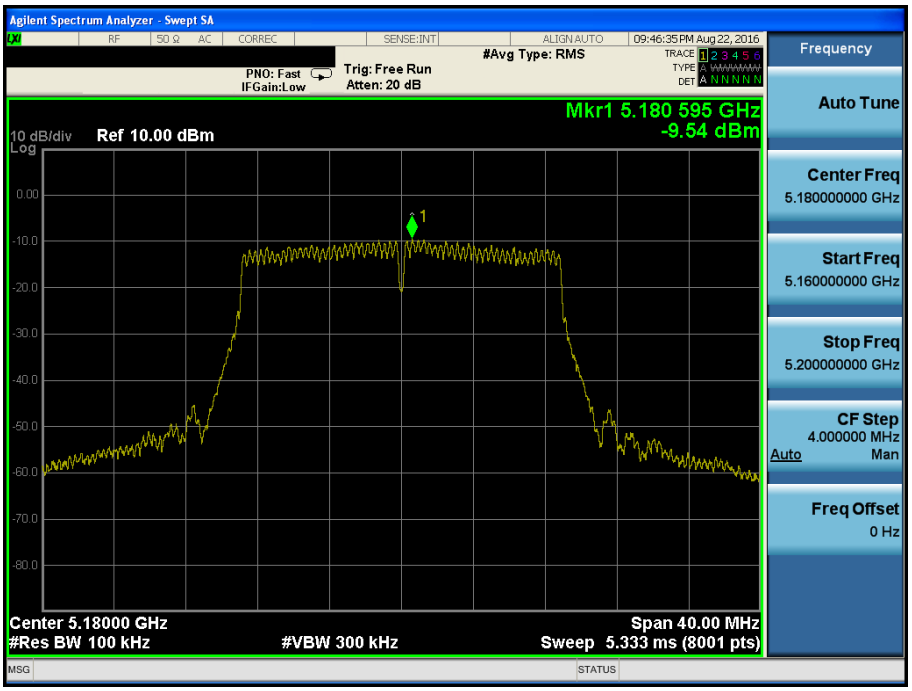
Maximum Power Spectral Density

Test Mode: 802.11a & ANT 2 & Ch.165



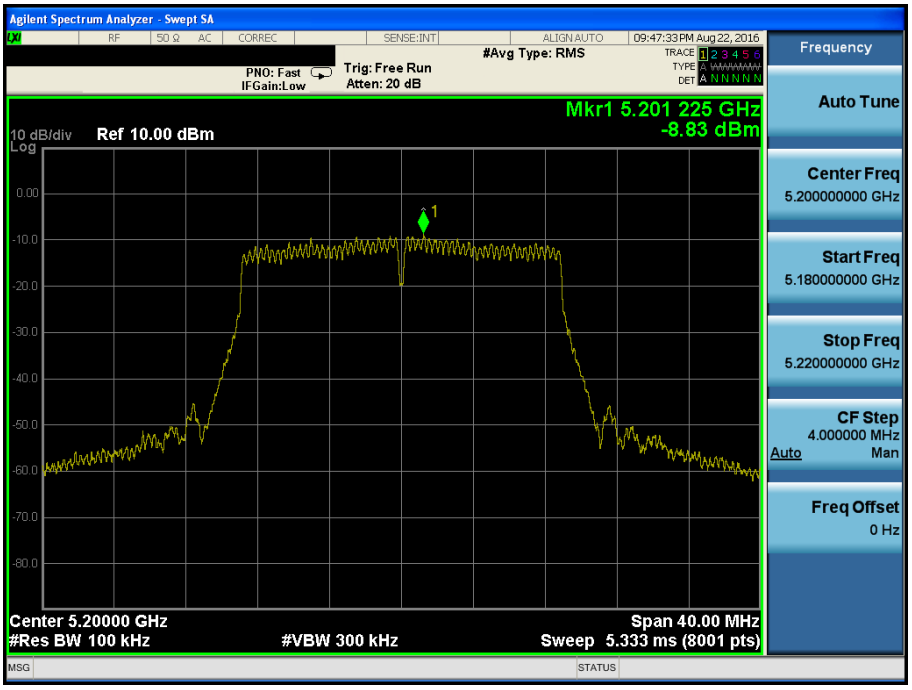
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.36



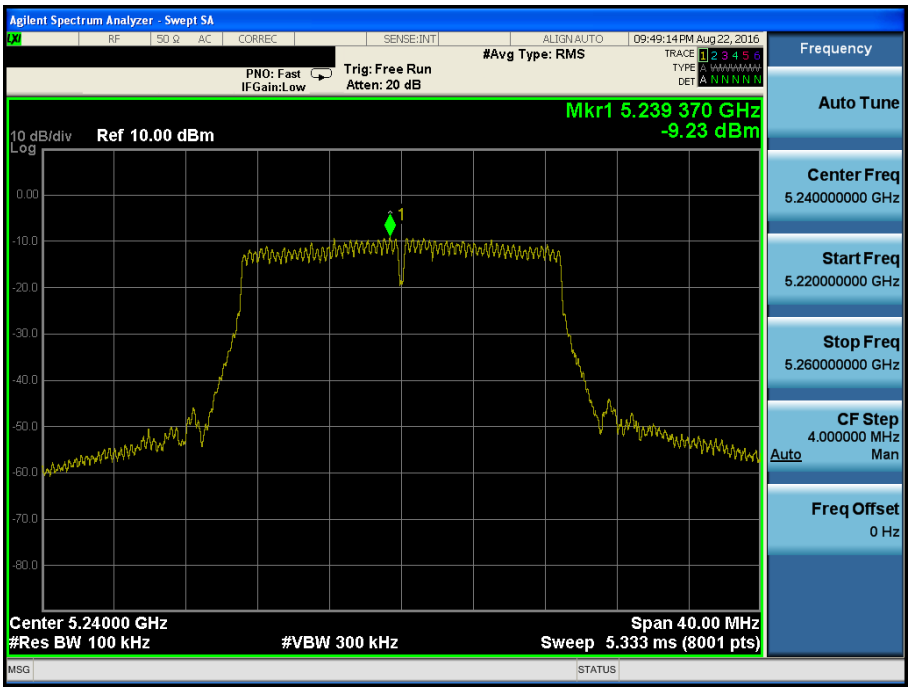
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.40



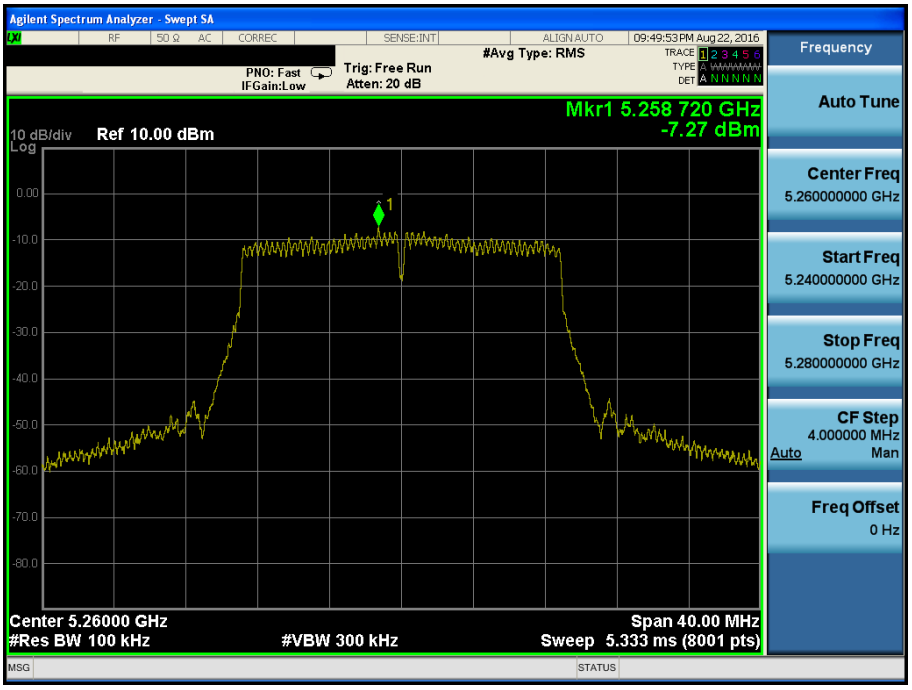
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.48



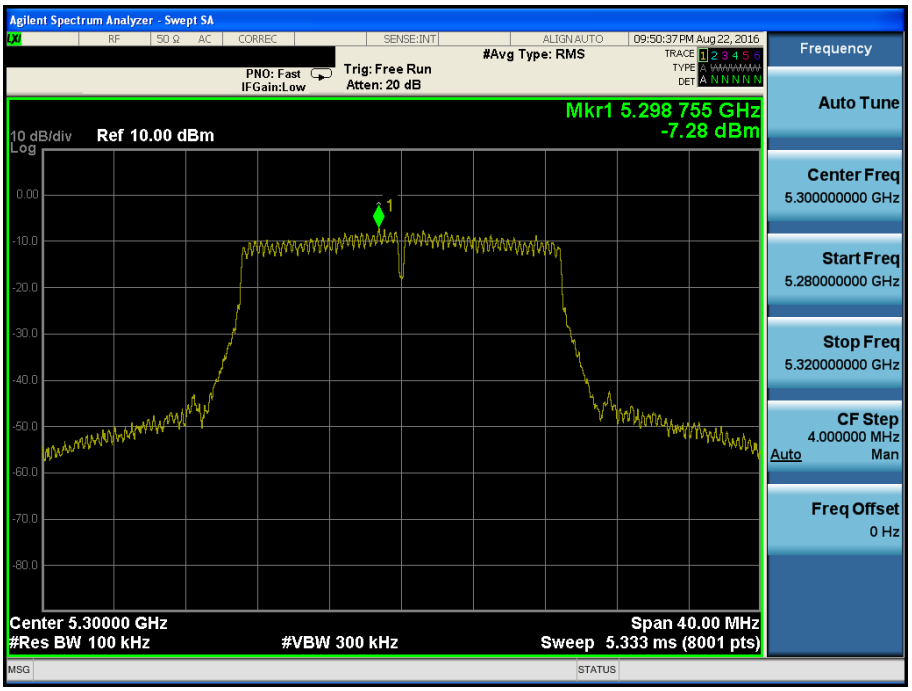
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.52



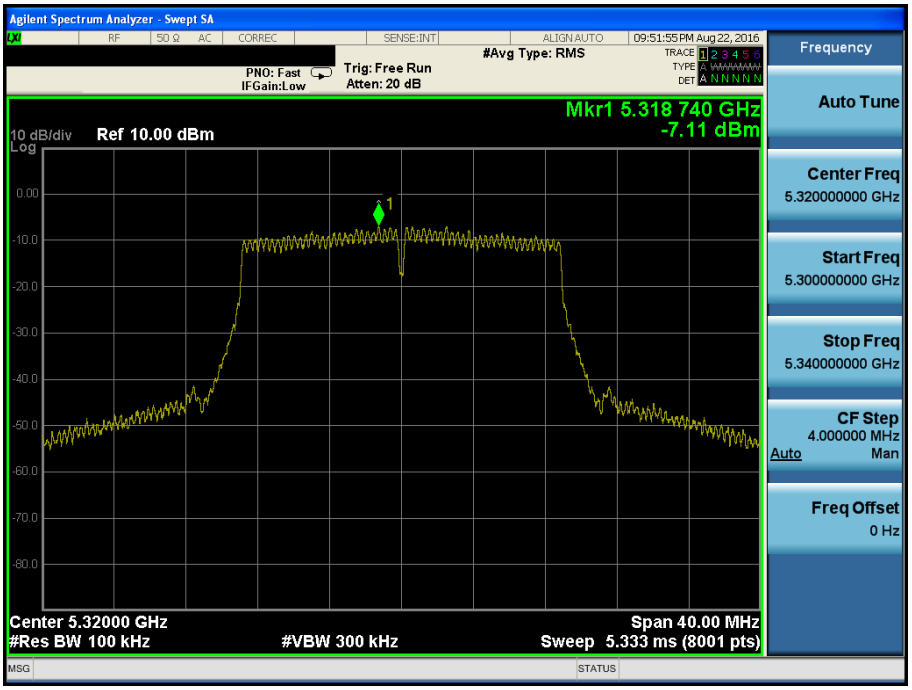
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.60



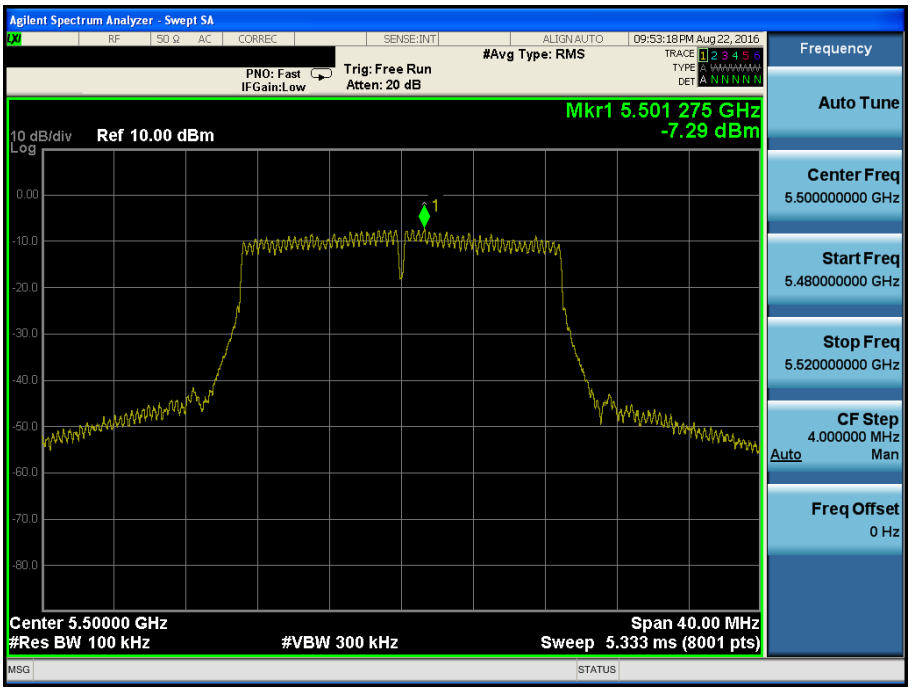
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.64



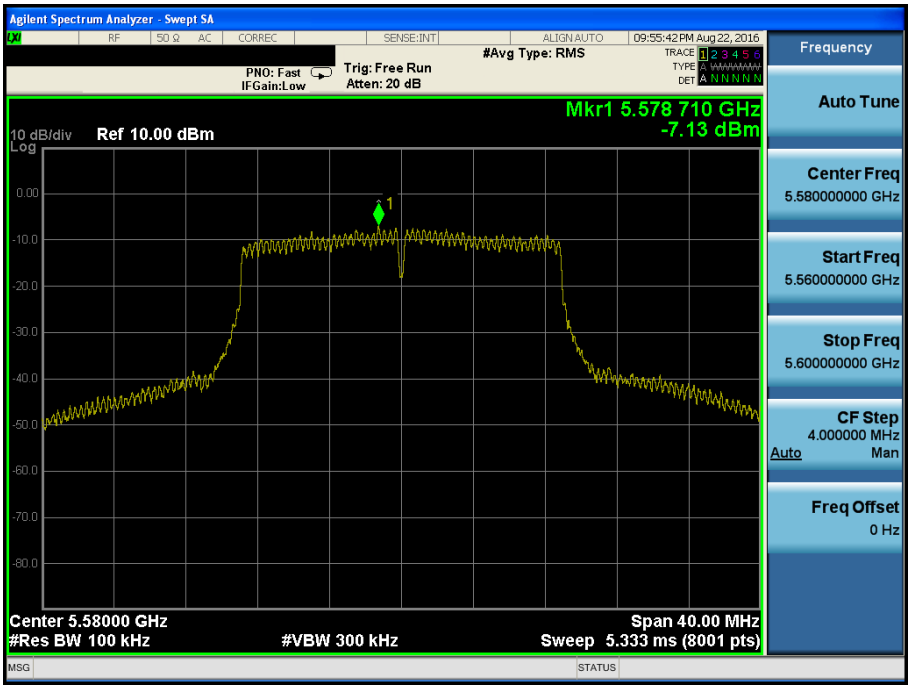
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.100



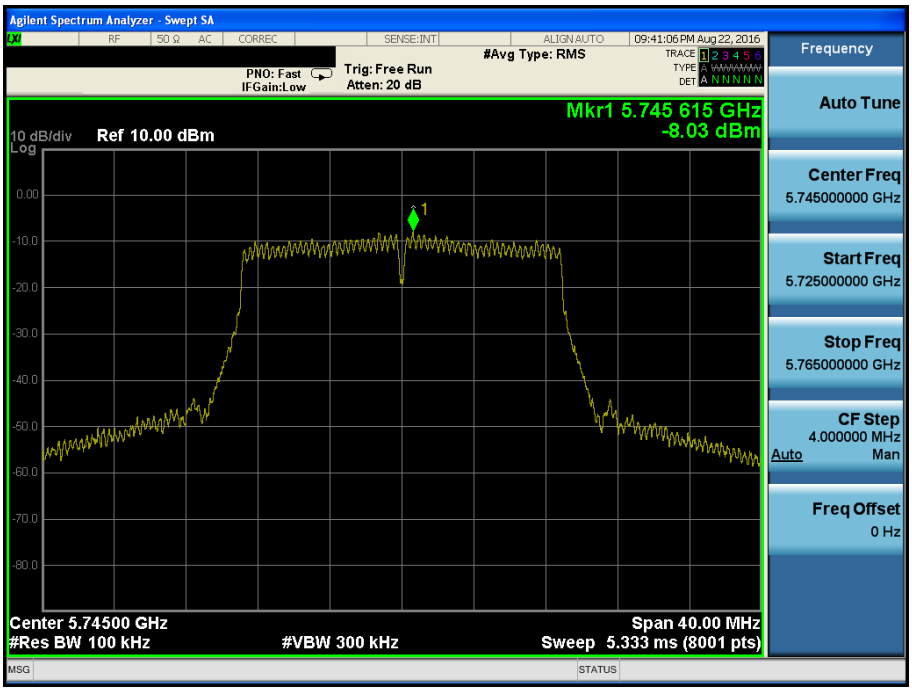
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & ANT 2 & Ch.116



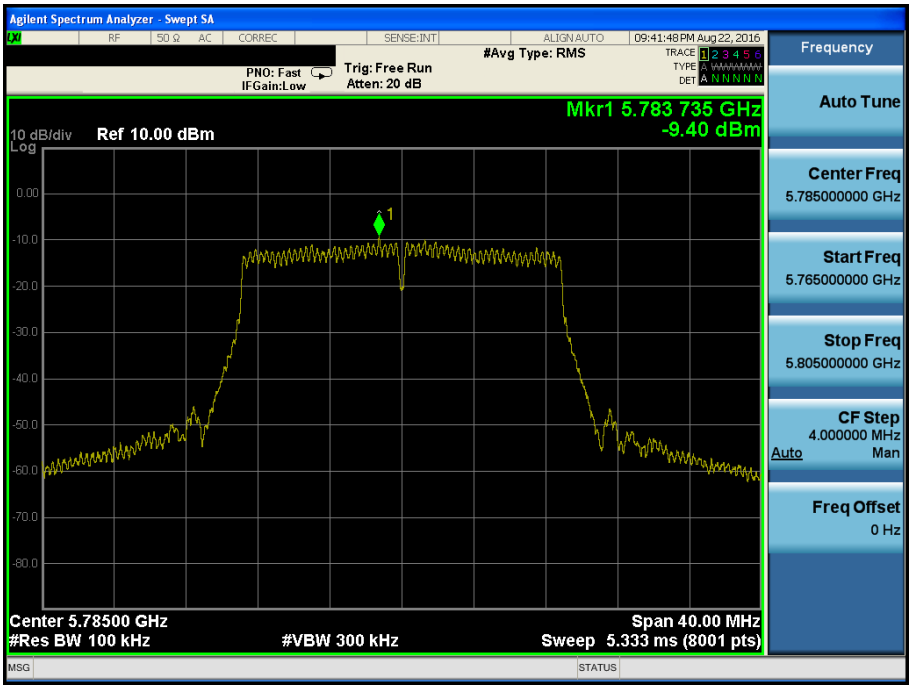
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.149



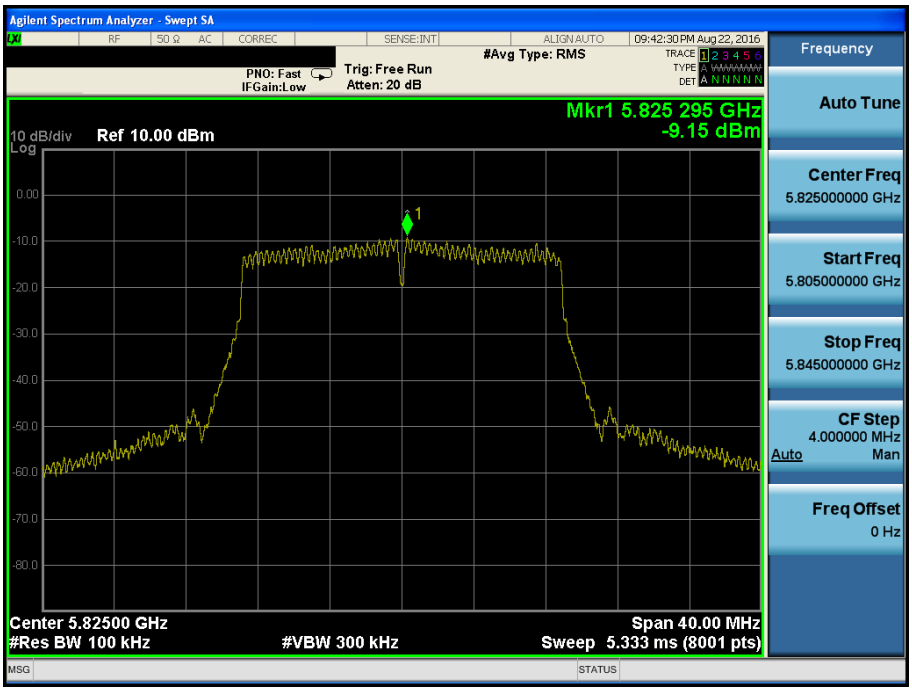
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.157



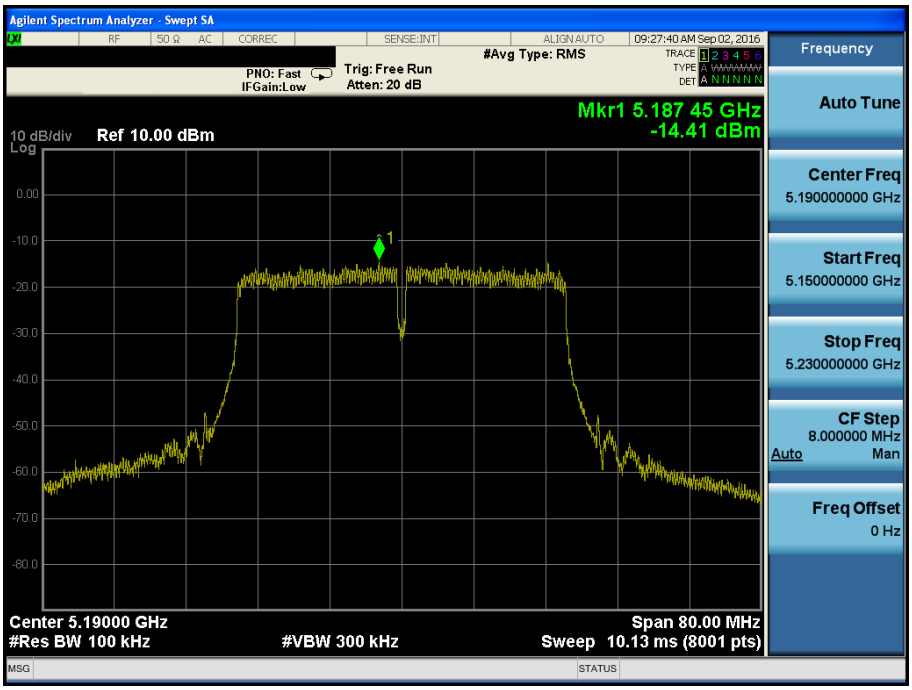
Maximum Power Spectral Density

Test Mode: 802.11n HT20 & ANT 2 & Ch.165



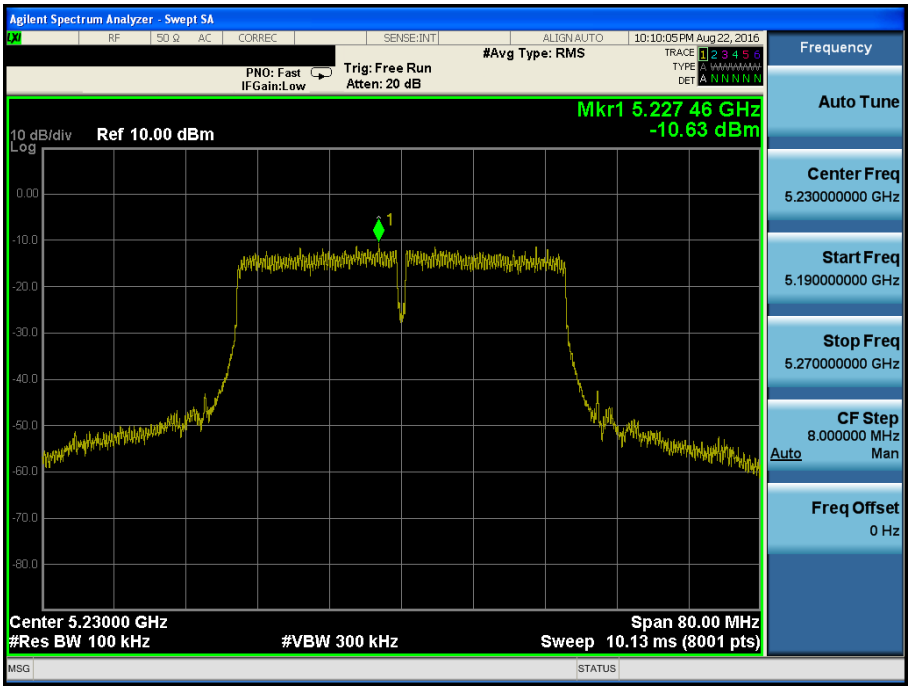
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.38



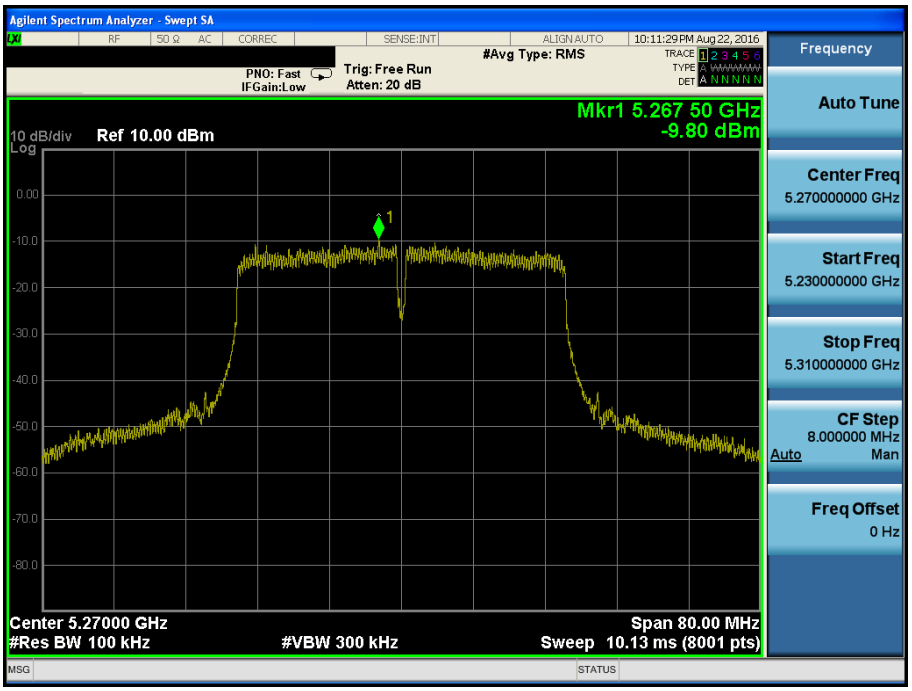
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.46



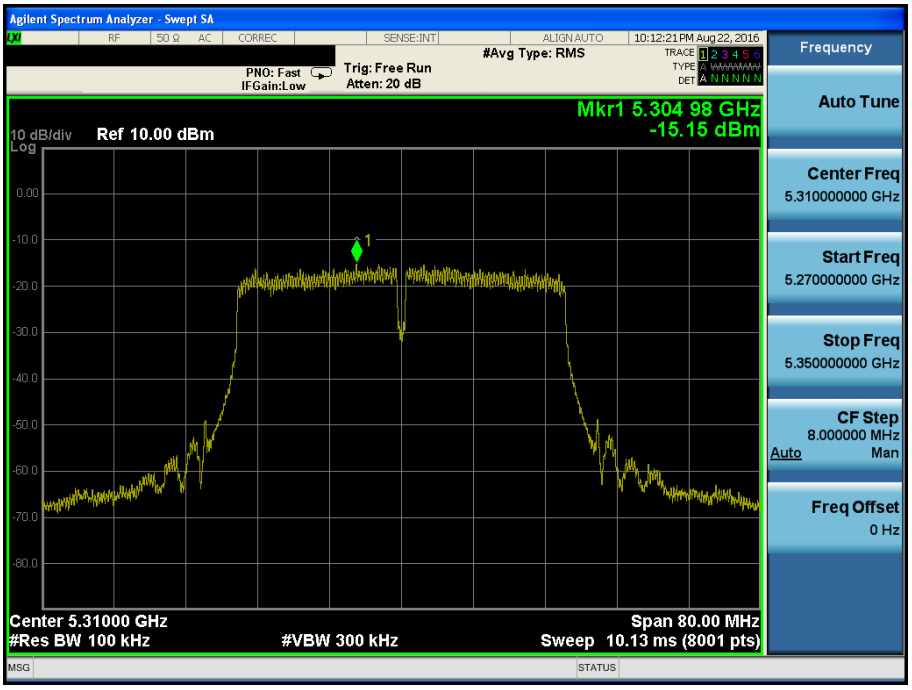
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.54



Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.62

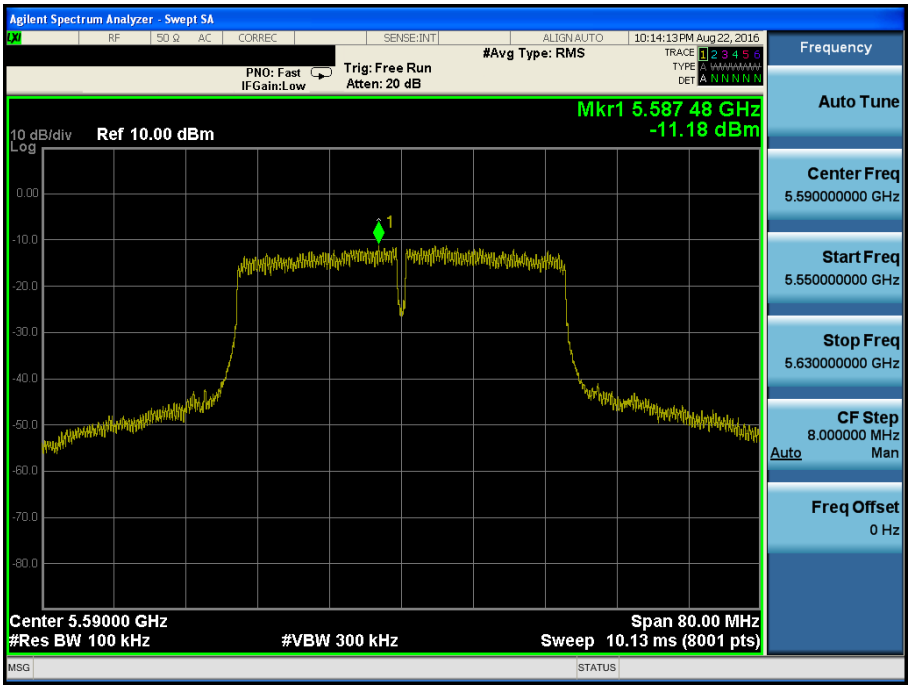


Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.102

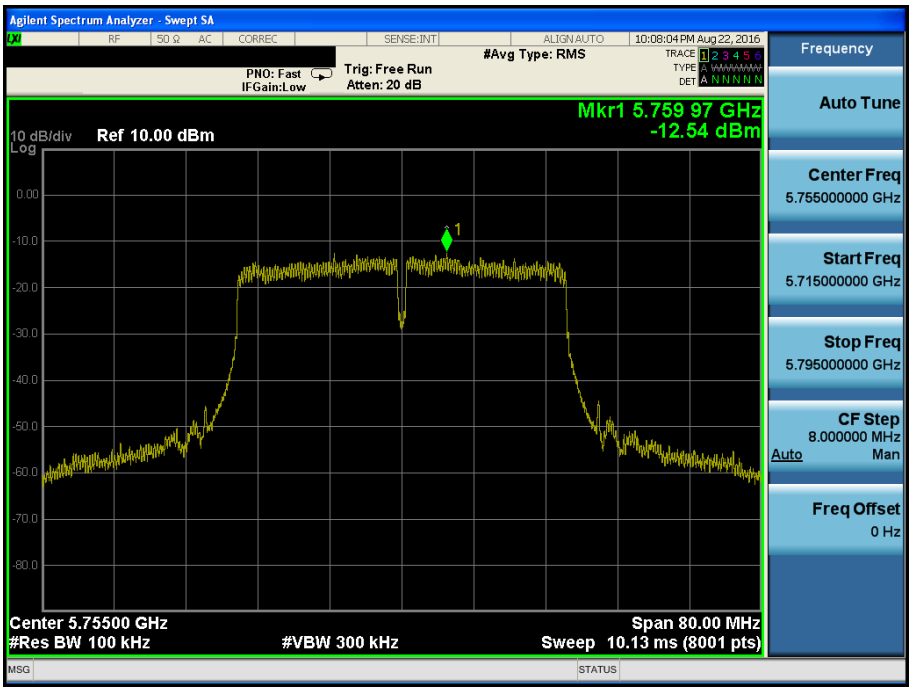
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.118



Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.151

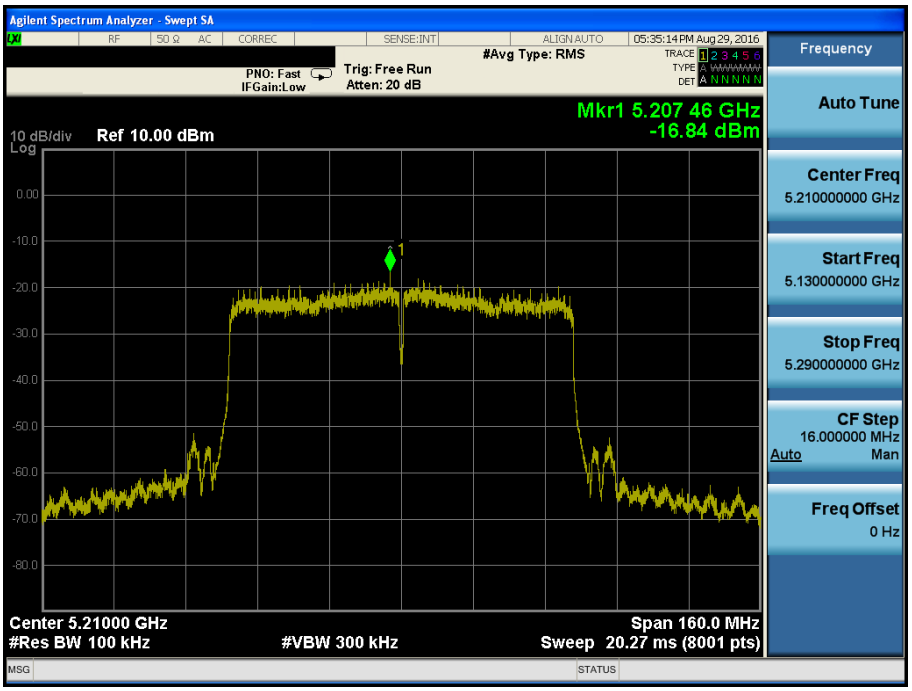


Maximum Power Spectral Density

Test Mode: 802.11n HT40 & ANT 2 & Ch.159

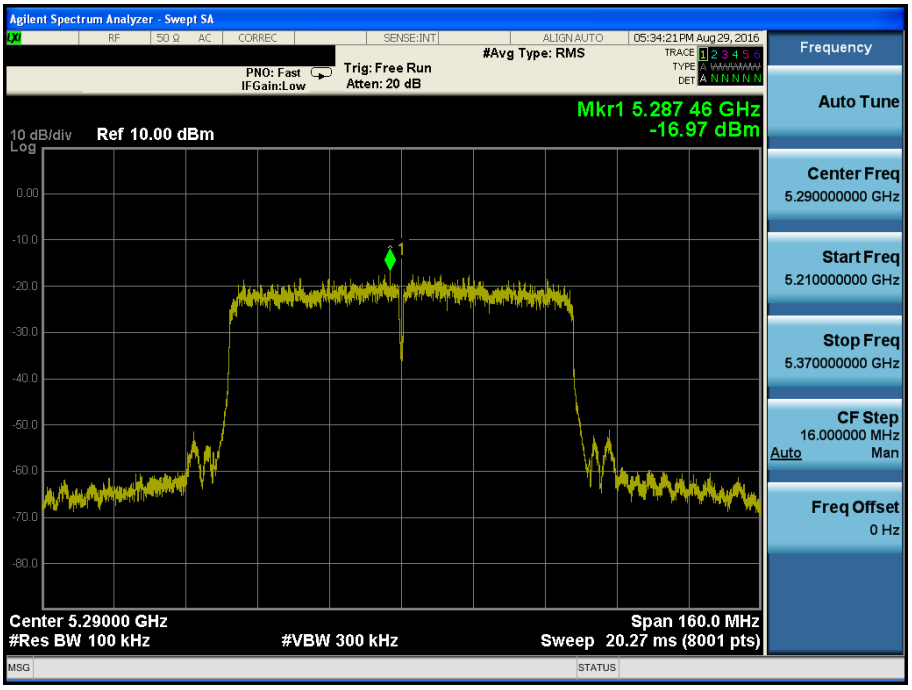
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.42



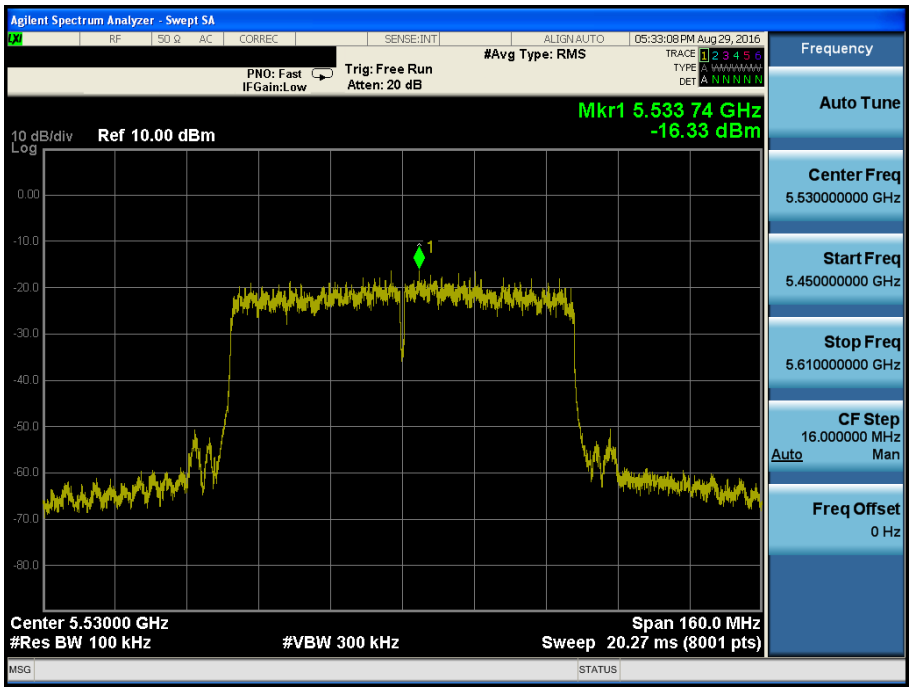
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.58



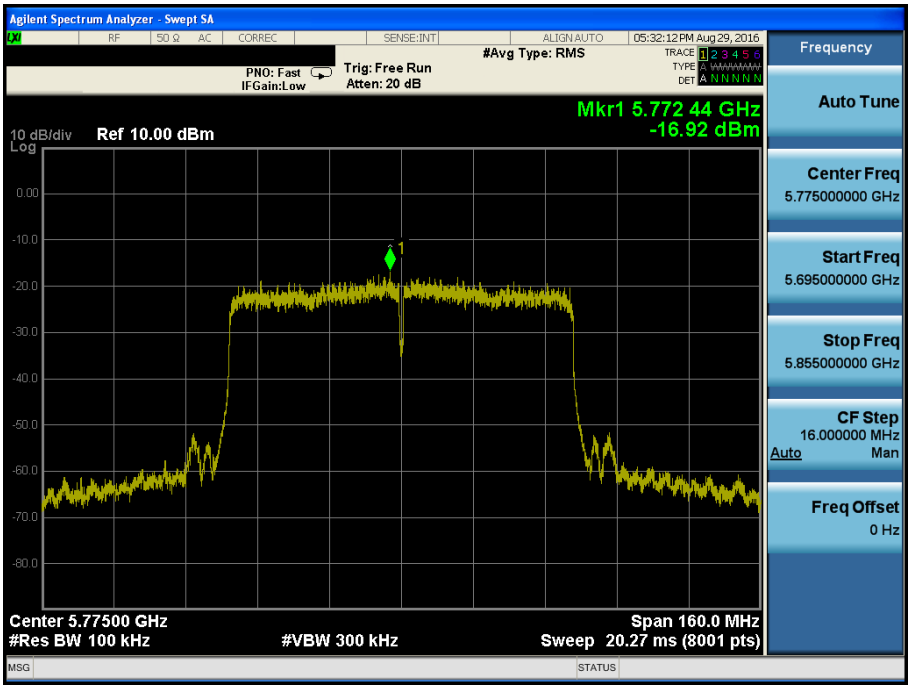
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.106



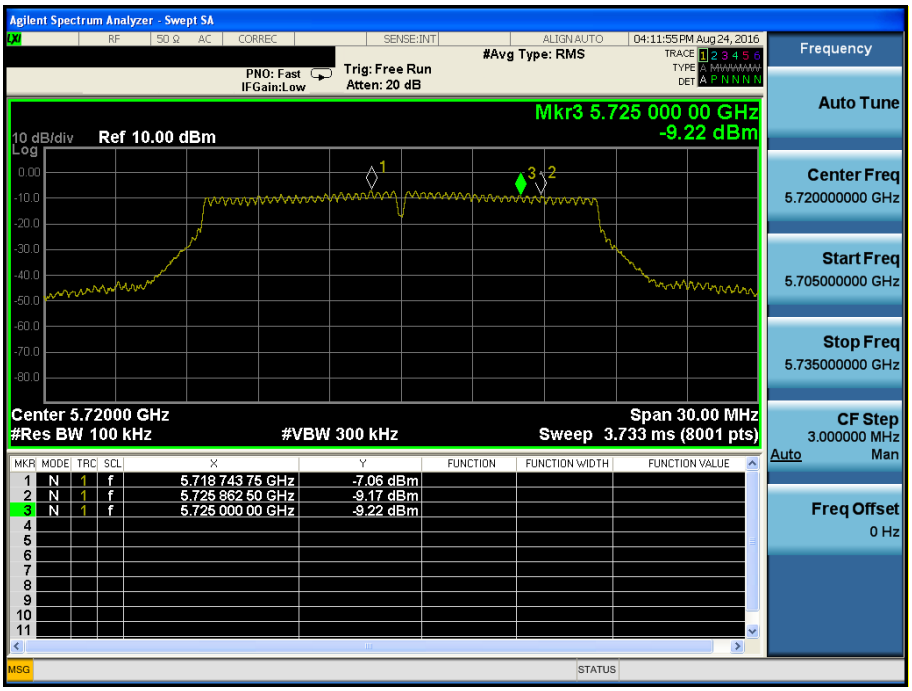
Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.155



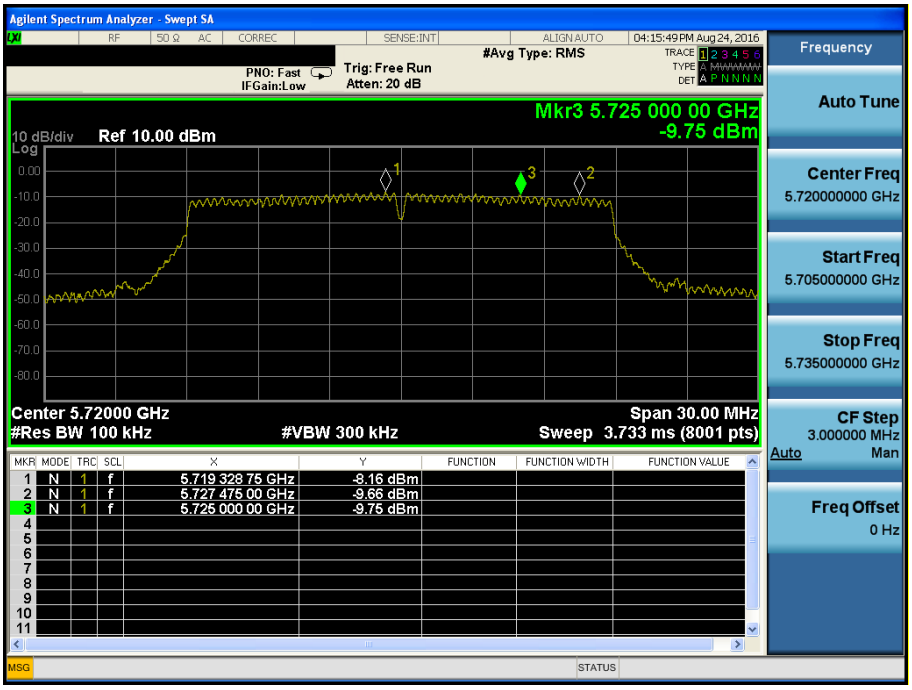
Maximum Power Spectral Density

Test Mode: 802.11a & & ANT 2 & Ch.144



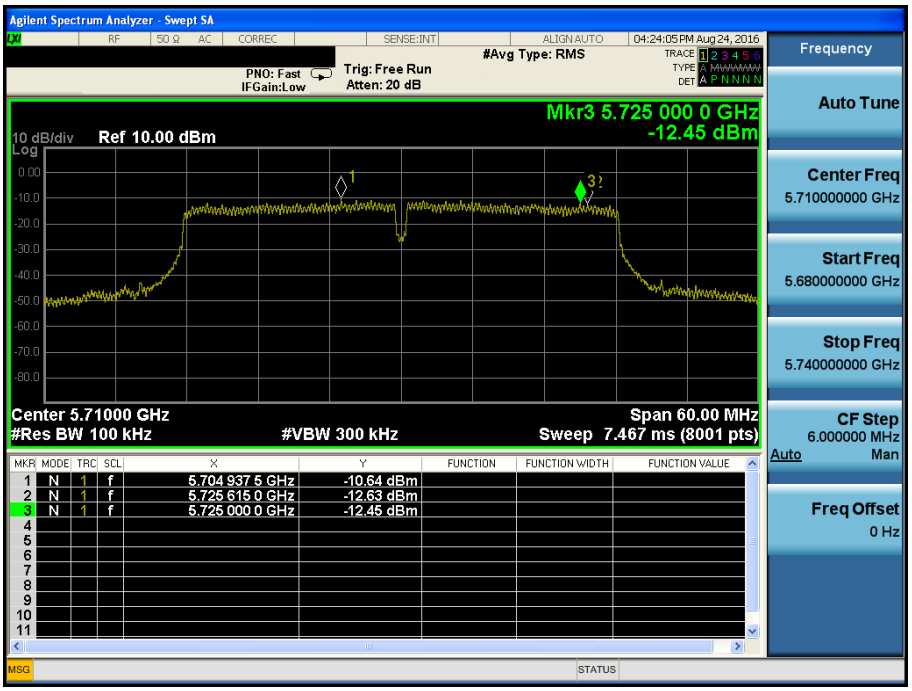
Maximum Power Spectral Density

Test Mode: 802.11ac VHT20 & & ANT 2 & Ch.144



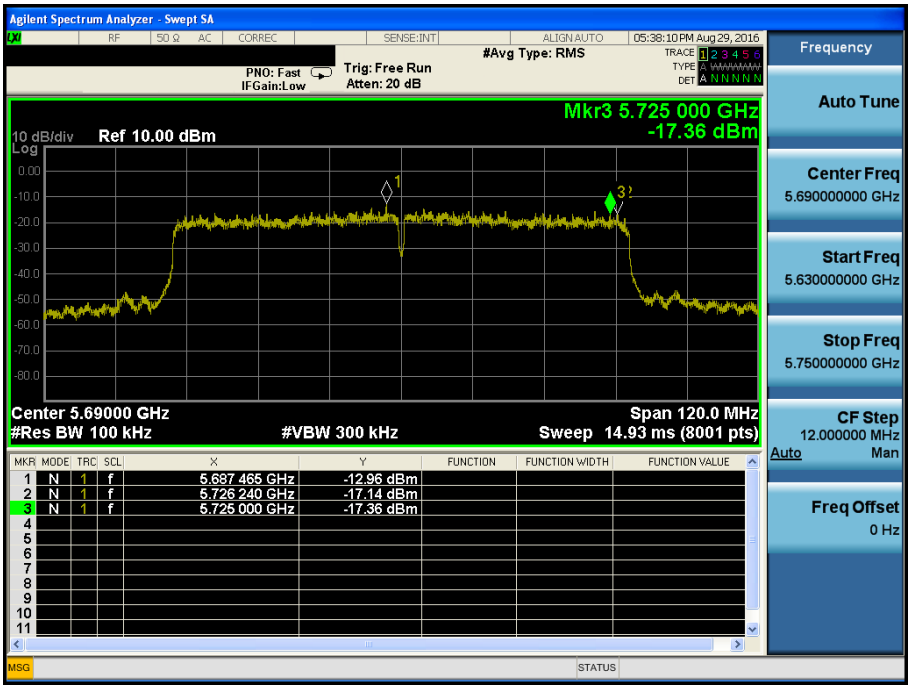
Maximum Power Spectral Density

Test Mode: 802.11ac VHT40 & ANT 2 & Ch.142



Maximum Power Spectral Density

Test Mode: 802.11ac VHT80 & ANT 2 & Ch.138



8.5 Frequency Stability

▣ Test requirements

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

▣ Test Procedure

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 0 ℃ and +60 ℃. The temperature was incremented by 10 ℃ intervals and the unit was allowed to stabilize at each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

▣ Test Results: Comply

U-NII-1 & U-NII-2A : (5150 MHz ~ 5350 MHz)_ANT 1

26 dB Bandwidth Reference	
Low edge(MHz)	**High edge(MHz)**
5170.337500	5329.493750

Supply Voltage (V DC)	TEMP (℃)	Operating Frequency					
		5180 MHz			5320 MHz		
		Measured Frequency (Hz)	Deviation (%)	26dBc low edge Note 1 (Hz)	Measured Frequency (Hz)	Deviation (%)	26dBc High edge Note 2 (Hz)
3.300	+25(Ref)	5,179,964,136	-0.000692	5,170,301,636	5,319,964,429	-0.000669	5,329,458,179
	+60	5,179,977,199	-0.000440	5,170,314,699	5,319,977,096	-0.000431	5,329,470,846
	+50	5,179,971,185	-0.000556	5,170,308,685	5,319,970,064	-0.000563	5,329,463,814
	+40	5,179,968,777	-0.000603	5,170,306,277	5,319,969,672	-0.000570	5,329,463,422
	+30	5,179,964,724	-0.000681	5,170,302,224	5,319,964,654	-0.000664	5,329,458,404
	+20	5,179,962,805	-0.000718	5,170,300,305	5,319,964,515	-0.000667	5,329,458,265
	+10	5,179,958,293	-0.000805	5,170,295,793	5,319,957,262	-0.000803	5,329,451,012
	0	5,179,953,398	-0.000900	5,170,290,898	5,319,950,252	-0.000935	5,329,444,002
	-	-	-	-	-	-	-
3.315	+25	5,179,956,426	-0.000841	5,170,293,926	5,319,954,596	-0.000853	5,329,448,346
3.465	+25	5,179,967,298	-0.000631	5,170,304,798	5,319,965,468	-0.000649	5,329,459,218

Note 1: **26 dB Bandwidth Reference Low edge (Hz)** + (**Measured Frequency (Hz)** - **Operating Frequency (Hz)**) = **26dBc low edge (Hz)**
Note 2: **26 dB Bandwidth Reference High edge (Hz)** + (**Measured Frequency (Hz)** - **Operating Frequency (Hz)**) = **26dBc High edge (Hz)**
Note 3: **ANT1 is worst case in U-NII-1 & U-NII-2A band**

U-NII-2C : (5470 MHz ~ 5725 MHz)_ANT 1

26 dB Bandwidth Reference	
Low edge	**High edge**
5490.250000	5729.600000

Supply Voltage (V DC)	TEMP (℃)	Operating Frequency					
		5500 MHz			5720 MHz		
		Measured Frequency (Hz)	Deviation (%)	26dBc low edge Note 1 (Hz)	Measured Frequency (Hz)	Deviation (%)	26dBc High edge Note 2 (Hz)
3.300	+25(Ref)	5,499,964,224	-0.000650	5,490,214,224	5,719,962,873	-0.000649	5,729,562,873
	+60	5,499,974,194	-0.000469	5,490,224,194	5,719,977,276	-0.000397	5,729,577,276
	+50	5,499,973,169	-0.000488	5,490,223,169	5,719,971,331	-0.000501	5,729,571,331
	+40	5,499,966,667	-0.000606	5,490,216,667	5,719,968,880	-0.000544	5,729,568,880
	+30	5,499,967,460	-0.000592	5,490,217,460	5,719,963,832	-0.000632	5,729,563,832
	+20	5,499,963,787	-0.000658	5,490,213,787	5,719,963,811	-0.000633	5,729,563,811
	+10	5,499,959,268	-0.000741	5,490,209,268	5,719,959,371	-0.000710	5,729,559,371
	0	5,499,952,317	-0.000867	5,490,202,317	5,719,952,580	-0.000829	5,729,552,580
	-	-	-	-	-	-	-
3.315	+25	5,499,958,318	-0.000758	5,490,208,318	5,719,956,456	-0.000761	5,729,556,456
3.465	+25	5,499,965,041	-0.000636	5,490,215,041	5,719,965,416	-0.000605	5,729,565,416

Note 1: **26 dB Bandwidth Reference Low edge (Hz)** + (**Measured Frequency (Hz)** - **Operating Frequency (Hz)**) = **26dBc low edge (Hz)**
Note 2: **26 dB Bandwidth Reference High edge (Hz)** + (**Measured Frequency (Hz)** - **Operating Frequency (Hz)**) = **26dBc High edge (Hz)**
Note 3: **ANT1 is worst case in U-NII-2C band**

U-NII-3 : (5725 MHz ~ 5850 MHz)_ANT 1

6 dB Bandwidth Reference	
Low edge	**High edge**
5736.887500	5833.162500

Supply Voltage (V DC)	TEMP (℃)	Operating Frequency					
		5745 MHz			5825 MHz		
		Measured Frequency (Hz)	Deviation (%)	26dBc low edge Note 1 (Hz)	Measured Frequency (Hz)	Deviation (%)	26dBc High edge Note 2 (Hz)
3.300	+25(Ref)	5,744,960,453	-0.000688	5,736,847,953	5,824,959,813	-0.000690	5,833,122,313
	+60	5,744,975,027	-0.000435	5,736,862,527	5,824,977,246	-0.000391	5,833,139,746
	+50	5,744,974,145	-0.000450	5,736,861,645	5,824,970,356	-0.000509	5,833,132,856
	+40	5,744,969,384	-0.000533	5,736,856,884	5,824,967,672	-0.000555	5,833,130,172
	+30	5,744,965,172	-0.000606	5,736,852,672	5,824,964,647	-0.000607	5,833,127,147
	+20	5,744,961,616	-0.000668	5,736,849,116	5,824,963,872	-0.000620	5,833,126,372
	+10	5,744,958,132	-0.000729	5,736,845,632	5,824,958,296	-0.000716	5,833,120,796
	0	5,744,953,233	-0.000814	5,736,840,733	5,824,955,418	-0.000765	5,833,117,918
	-	-	-	-	-	-	-
3.315	+25	5,744,956,097	-0.000764	5,736,843,597	5,824,955,481	-0.000764	5,833,117,981
3.465	+25	5,744,965,784	-0.000596	5,736,853,284	5,824,968,131	-0.000547	5,833,130,631

Note 1: **6 dB Bandwidth Reference Low edge (Hz)** + (**Measured Frequency (Hz)** - **Operating Frequency (Hz)**) = **6dBc low edge (Hz)**
Note 2: **26 dB Bandwidth Reference High edge (Hz)** + (**Measured Frequency (Hz)** - **Operating Frequency (Hz)**) = **26dBc High edge (Hz)**
Note 2**: ANT1 is worst case in U-NII-3 band**

8.6 Radiated Spurious Emission Measurements

▣ Test Procedure

▪ **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:

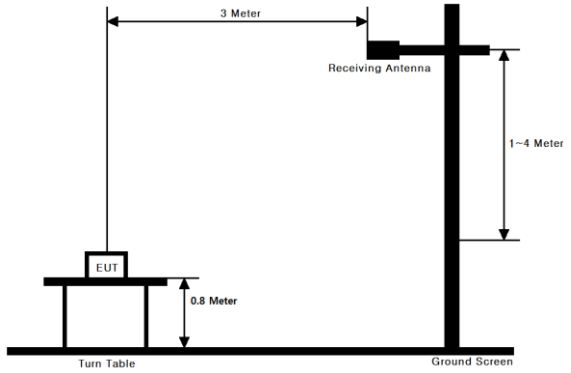
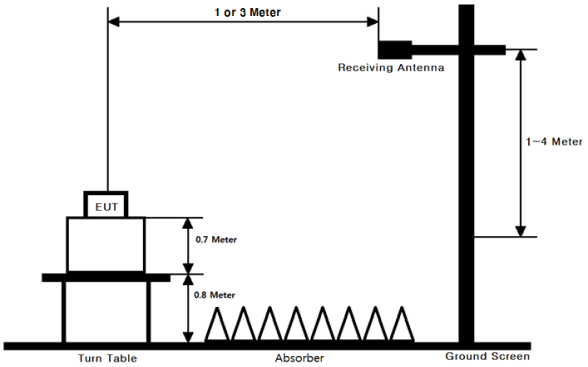
MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	160.52475 ~	1660 ~ 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 Procedure

Below 1GHz	Above 1GHz
	

▣ 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 D02**

► **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.**

► **Measurements below 1000 MHz**

a) Follow the requirements in section II.G.3, “General Requirements for Unwanted Emissions Measurements”.

b) Compliance shall be demonstrated using **CISPR quasi-peak detection**; however, **peak detection** is permitted as an alternative to quasi-peak detection.

► **Measurements Above 1000 MHz (Peak)**

a) Follow the requirements in section II.G.3, “General Requirements for Unwanted Emissions Measurements”.
b) Peak emission levels are measured by setting the analyzer as follows:
(i) **RBW = 1 MHz.**
(ii) **VBW ≥ 3 MHz.**
(iii) **Detector = Peak.**
(iv) Sweep time = Auto.
(v) Trace mode = Max hold.
(vi) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

► **Measurements Above 1000 MHz (Method AD)**

(i) **RBW = 1 MHz.**
(ii) **VBW ≥ 3 MHz.**
(iii) **Detector = RMS**, if span / (# of points in sweep) ≤ RBW / 2. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, the detector mode shall be set to peak.
(iv) Averaging type = power (i.e., RMS)
• As an alternative, the detector and averaging type may be set for linear voltage averaging. Some analyzers require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
(v) Sweep time = Auto.
(vi) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, the number of traces shall be increased by a factor of 1/x, where x is the duty cycle. For example, with 50 percent duty cycle, at least 200 traces shall be averaged.
(vii) If tests are performed with the EUT transmitting at a duty cycle less than 98 percent, a correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
• **If power averaging (RMS) mode was used in step (iv) above, the correction factor is 10 log(1/x), where x is the duty cycle.** For example, if the transmit duty cycle was 50 percent, then 3 dB must be added to the measured emission levels.
• If linear voltage averaging mode was used in step (iv) above, the correction factor is 20 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50 percent, then 6 dB must be added to the measured emission levels.
• If a specific emission is demonstrated to be continuous (100 percent duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

Please refer to Appendix II for the duty correction factor

▣ Measurement Data:

Multiple transmit

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11a*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 1	36 (5180 MHz)	5149.23	H	Y	PK	48.36	7.82	N/A	N/A	56.18	74.00	17.82
		5149.60	H	Y	AV	38.51	7.82	0.58	N/A	46.91	54.00	7.09
		10361.43	H	Y	PK	47.81	12.18	N/A	-9.54	50.45	68.20	17.75
		15538.03	H	Y	PK	46.84	19.03	N/A	-9.54	56.33	74.00	17.67
		15538.75	H	Y	AV	35.32	19.03	0.58	-9.54	45.39	54.00	8.61
	40 (5200 MHz)	10400.08	H	Y	PK	46.86	12.35	N/A	-9.54	49.67	68.20	18.53
		15602.17	H	Y	PK	45.64	19.16	N/A	-9.54	55.26	74.00	18.74
		15601.92	H	Y	AV	35.32	19.16	0.58	-9.54	45.52	54.00	8.48
	48 (5240 MHz)	10479.87	H	Y	PK	46.27	12.69	N/A	-9.54	49.42	68.20	18.78
		15719.57	H	Y	PK	48.27	19.44	N/A	-9.54	58.17	74.00	15.83
		15719.97	H	Y	AV	36.07	19.44	0.58	-9.54	46.55	54.00	7.45
U-NII 2A	52 (5260 MHz)	10520.18	H	Y	PK	45.67	12.80	N/A	-9.54	48.93	68.20	19.27
		15780.45	H	Y	PK	48.13	19.57	N/A	-9.54	58.16	74.00	15.84
		15780.53	H	Y	AV	35.93	19.57	0.58	-9.54	46.54	54.00	7.46
	60 (5300 MHz)	10600.07	H	Y	PK	44.96	12.93	N/A	-9.54	48.35	74.00	25.65
		10600.15	H	Y	AV	36.03	12.93	0.58	-9.54	40.00	54.00	14.00
		15897.30	H	Y	PK	47.36	19.85	N/A	-9.54	57.67	74.00	16.33
		15897.10	H	Y	AV	36.36	19.85	0.58	-9.54	47.25	54.00	6.75
	64 (5320 MHz)	5350.97	H	Y	PK	47.90	7.88	N/A	N/A	55.78	74.00	18.22
		5350.33	H	Y	AV	39.65	7.88	0.58	N/A	48.11	54.00	5.89
		10640.22	H	Y	PK	46.44	12.99	N/A	-9.54	49.89	74.00	24.11
		10640.15	H	Y	AV	35.97	12.99	0.58	-9.54	40.00	54.00	14.00
		15961.53	H	Y	PK	49.11	19.98	N/A	-9.54	59.55	74.00	14.45
		15962.02	H	Y	AV	38.19	19.98	0.58	-9.54	49.21	54.00	4.79

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)
4. The limit is converted to field strength.
   E[dBuV/m] = EIRP[dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
5. The measured data for U-NII 3 band is satisfied with the emissions mask in 15.407(b)(4)(i), too.
   The old rule 15.407(b)(4) is more tight than the new rule 15.407(b)(4)(i).

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11a*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 2C	100 (5500 MHz)	5459.23	H	Y	PK	47.36	7.73	N/A	N/A	55.09	74.00	18.91
		5459.83	H	Y	AV	38.68	7.73	0.58	N/A	46.99	54.00	7.01
		5467.10	H	Y	PK	51.43	7.71	N/A	N/A	59.14	68.20	9.06
		10999.98	H	Y	PK	43.00	13.55	N/A	-9.54	47.01	74.00	26.99
		11000.05	H	Y	AV	33.48	13.55	0.58	-9.54	38.07	54.00	15.93
		16500.10	H	Y	PK	52.21	20.90	N/A	-9.54	63.57	68.20	4.63
	116 (5580 MHz)	11159.87	H	Y	PK	42.21	13.75	N/A	-9.54	46.42	74.00	27.58
		11160.25	H	Y	AV	32.87	13.75	0.58	-9.54	37.66	54.00	16.34
		16741.08	H	Y	PK	47.97	21.29	N/A	-9.54	59.72	68.20	8.48
	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-
U-NII 3	149 (5745 MHz)	5714.80	H	Y	PK	47.86	8.98	N/A	N/A	56.84	68.20	11.36
		5724.50	H	Y	PK	59.05	8.98	N/A	N/A	68.03	78.20	10.17
		11490.65	H	Y	PK	43.96	14.18	N/A	-9.54	48.60	74.00	25.40
		11490.15	H	Y	AV	33.22	14.18	0.58	-9.54	38.44	54.00	15.56
	157 (5785 MHz)	11569.62	H	Y	PK	44.62	14.24	N/A	-9.54	49.32	74.00	24.68
		11570.07	H	Y	AV	34.46	14.24	0.58	-9.54	39.74	54.00	14.26
	165 (5825 MHz)	5850.03	H	Y	PK	47.98	9.47	N/A	N/A	57.45	78.20	20.75
		5862.23	H	Y	PK	48.26	9.92	N/A	N/A	58.18	68.20	10.02
		11649.95	H	Y	PK	43.33	14.29	N/A	-9.54	48.08	74.00	25.92
		11650.42	H	Y	AV	33.41	14.29	0.58	-9.54	38.74	54.00	15.26

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)
4. The limit is converted to field strength.
   E[dBuV/m] = EIRP[dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
5. The measured data for U-NII 3 band is satisfied with the emissions mask in 15.407(b)(4)(i), too.
   The old rule 15.407(b)(4) is more tight than the new rule 15.407(b)(4)(i).

▣ Measurement Data:

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11ac(VHT20)*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 1	36 (5180 MHz)	5149.20	H	Y	PK	50.09	7.82	N/A	N/A	57.91	74.00	16.09
		5149.67	H	Y	AV	40.54	7.82	1.13	N/A	49.49	54.00	4.51
		10358.50	H	Y	PK	53.04	12.18	N/A	-9.54	55.68	68.20	12.52
		15541.37	H	Y	PK	47.23	19.03	N/A	-9.54	56.72	74.00	17.28
		15541.20	H	Y	AV	34.66	19.03	1.13	-9.54	45.28	54.00	8.72
	40 (5200 MHz)	10401.13	H	Y	PK	53.22	12.35	N/A	-9.54	56.03	68.20	12.17
		15597.82	H	Y	PK	46.04	19.16	N/A	-9.54	55.66	74.00	18.34
		15597.55	H	Y	AV	35.61	19.16	1.13	-9.54	46.36	54.00	7.64
	48 (5240 MHz)	10480.37	H	Y	PK	51.44	12.69	N/A	-9.54	54.59	68.20	13.61
		15723.48	H	Y	PK	49.15	19.44	N/A	-9.54	59.05	74.00	14.95
		15723.12	H	Y	AV	36.66	19.44	1.13	-9.54	47.69	54.00	6.31
U-NII 2A	52 (5260 MHz)	10518.60	H	Y	PK	52.41	12.80	N/A	-9.54	55.67	68.20	12.53
		15781.78	H	Y	PK	49.01	19.57	N/A	-9.54	59.04	74.00	14.96
		15782.22	H	Y	AV	37.33	19.57	1.13	-9.54	48.49	54.00	5.51
	60 (5300 MHz)	10600.68	H	Y	PK	53.36	12.93	N/A	-9.54	56.75	74.00	17.25
		10600.18	H	Y	AV	41.54	12.93	1.13	-9.54	46.06	54.00	7.94
		15902.90	H	Y	PK	50.63	19.85	N/A	-9.54	60.94	74.00	13.06
		15902.23	H	Y	AV	37.84	19.85	1.13	-9.54	49.28	54.00	4.72
	64 (5320 MHz)	5350.83	H	Y	PK	52.92	7.88	N/A	N/A	60.80	74.00	13.20
		5350.40	H	Y	AV	41.81	7.88	1.13	N/A	50.82	54.00	3.18
		10638.33	H	Y	PK	52.69	12.99	N/A	-9.54	56.14	74.00	17.86
		10638.97	H	Y	AV	41.32	12.99	1.13	-9.54	45.90	54.00	8.10
		15963.35	H	Y	PK	51.98	19.98	N/A	-9.54	62.42	74.00	11.58
		15962.68	H	Y	AV	38.99	19.98	1.13	-9.54	50.56	54.00	3.44

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)
4. The limit is converted to field strength.
   E[dBuV/m] = EIRP[dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
5. The measured data for U-NII 3 band is satisfied with the emissions mask in 15.407(b)(4)(i), too.
   The old rule 15.407(b)(4) is more tight than the new rule 15.407(b)(4)(i).

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : ***802.11ac(VHT20)***

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 2C	100 (5500 MHz)	5458.20	H	Y	PK	49.26	7.73	N/A	N/A	56.99	74.00	17.01
		5457.53	H	Y	AV	39.76	7.73	1.13	N/A	48.62	54.00	5.38
		5469.30	H	Y	PK	54.29	7.71	N/A	N/A	62.00	68.20	6.20
		11000.73	H	Y	PK	57.48	13.55	N/A	-9.54	61.49	74.00	12.51
		11001.12	H	Y	AV	45.19	13.55	1.13	-9.54	50.33	54.00	3.67
		16499.30	H	Y	PK	53.69	20.90	N/A	-9.54	65.05	68.20	3.15
	116 (5580 MHz)	11158.68	H	Y	PK	53.81	13.75	N/A	-9.54	58.02	74.00	15.98
		11158.85	H	Y	AV	41.47	13.75	1.13	-9.54	46.81	54.00	7.19
		16746.53	H	Y	PK	48.66	21.29	N/A	-9.54	60.41	68.20	7.79
	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : ***802.11n(HT20)***

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 3	149 (5745 MHz)	5712.62	H	Y	PK	53.56	8.98	N/A	N/A	62.54	68.20	5.66
		5724.90	H	Y	PK	65.65	8.98	N/A	N/A	74.63	78.20	3.57
		11490.68	H	Y	PK	45.87	14.18	N/A	-9.54	50.51	74.00	23.49
		11489.78	H	Y	AV	34.91	14.18	1.12	-9.54	40.67	54.00	13.33
	157 (5785 MHz)	11569.57	H	Y	PK	44.04	14.24	N/A	-9.54	48.74	74.00	25.26
		11569.82	H	Y	AV	33.59	14.24	1.12	-9.54	39.41	54.00	14.59
	165 (5825 MHz)	5850.07	H	Y	PK	56.26	9.47	N/A	N/A	65.73	78.20	12.47
		5860.10	H	Y	PK	48.14	9.92	N/A	N/A	58.06	68.20	10.14
		11649.75	H	Y	PK	44.32	14.29	N/A	-9.54	49.07	74.00	24.93
		11649.92	H	Y	AV	34.05	14.29	1.12	-9.54	39.92	54.00	14.08

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)
4. The limit is converted to field strength.
   E[dBuV/m] = EIRP[dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
5. The measured data for U-NII 3 band is satisfied with the emissions mask in 15.407(b)(4)(i), too.
   The old rule 15.407(b)(4) is more tight than the new rule 15.407(b)(4)(i).

▣ Measurement Data:

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : ***802.11ac(VHT40)***

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 1	38 (5190 MHz)	5149.43	H	Y	PK	50.65	7.82	N/A	N/A	58.47	74.00	15.53
		5149.97	H	Y	AV	40.97	7.82	1.94	N/A	50.73	54.00	3.27
		10380.07	H	Y	PK	47.36	12.27	N/A	-9.54	50.09	68.20	18.11
		15562.70	H	Y	PK	43.45	19.10	N/A	-9.54	53.01	74.00	20.99
		15563.93	H	Y	AV	32.46	19.10	1.94	-9.54	43.96	54.00	10.04
	46 (5230 MHz)	10459.23	H	Y	PK	52.58	12.60	N/A	-9.54	55.64	68.20	12.56
		15685.07	H	Y	PK	47.81	19.37	N/A	-9.54	57.64	74.00	16.36
		15685.93	H	Y	AV	36.01	19.37	1.94	-9.54	47.78	54.00	6.22
U-NII 2A	54 (5270 MHz)	10536.33	H	Y	PK	52.05	12.83	N/A	-9.54	55.34	68.20	12.86
		15804.30	H	Y	PK	48.11	19.64	N/A	-9.54	58.21	74.00	15.79
		15804.03	H	Y	AV	36.11	19.64	1.94	-9.54	48.15	54.00	5.85
	62 (5310 MHz)	5350.03	H	Y	PK	54.52	7.88	N/A	N/A	62.40	74.00	11.60
		5350.03	H	Y	AV	41.00	7.88	1.94	N/A	50.82	54.00	3.18
		10619.43	H	Y	PK	45.84	12.96	N/A	-9.54	49.26	74.00	24.74
		10619.97	H	Y	AV	36.08	12.96	1.94	-9.54	41.44	54.00	12.56
		15936.73	H	Y	PK	42.83	19.91	N/A	-9.54	53.20	74.00	20.80
		15936.33	H	Y	AV	33.24	19.91	1.94	-9.54	45.55	54.00	8.45

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)
4. The limit is converted to field strength.
   E[dBuV/m] = EIRP[dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
5. The measured data for U-NII 3 band is satisfied with the emissions mask in 15.407(b)(4)(i), too.
   The old rule 15.407(b)(4) is more tight than the new rule 15.407(b)(4)(i).

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : ***802.11ac(VHT40)***

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 2C	102 (5510 MHz)	5459.23	H	Y	PK	49.43	7.73	N/A	N/A	57.16	74.00	16.84
		5459.83	H	Y	AV	41.11	7.73	1.94	N/A	50.78	54.00	3.22
		5468.70	H	Y	PK	57.38	7.71	N/A	N/A	65.09	68.20	3.11
		11019.47	H	Y	PK	53.37	13.57	N/A	-9.54	57.40	74.00	16.60
		11019.13	H	Y	AV	40.17	13.57	1.94	-9.54	46.14	54.00	7.86
		16536.27	H	Y	PK	46.73	20.95	N/A	-9.54	58.14	68.20	10.06
	118 (5590 MHz)	11176.60	H	Y	PK	52.52	13.78	N/A	-9.54	56.76	74.00	17.24
		11176.67	H	Y	AV	42.06	13.78	1.94	-9.54	48.24	54.00	5.76
		16764.80	H	Y	PK	48.15	21.34	N/A	-9.54	59.95	68.20	8.25
	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : ***802.11n(HT40)***

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 3	151 (5755 MHz)	5713.18	H	Y	PK	56.18	8.98	N/A	N/A	65.16	68.20	3.04
		5723.80	H	Y	PK	61.08	8.98	N/A	N/A	70.06	78.20	8.14
		11510.83	H	Y	PK	44.32	14.20	N/A	-9.54	48.98	74.00	25.02
		11510.93	H	Y	AV	33.58	14.20	1.97	-9.54	40.21	54.00	13.79
	159 (5795 MHz)	5850.73	H	Y	PK	54.74	9.47	N/A	N/A	64.21	78.20	13.99
		5860.60	H	Y	PK	53.33	9.92	N/A	N/A	63.25	68.20	4.95
		11589.27	H	Y	PK	43.40	14.25	N/A	-9.54	48.11	74.00	25.89
		11590.17	H	Y	AV	33.14	14.25	1.97	-9.54	39.82	54.00	14.18

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)
4. The limit is converted to field strength.
   E[dBuV/m] = EIRP[dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
5. The measured data for U-NII 3 band is satisfied with the emissions mask in 15.407(b)(4)(i), too.
   The old rule 15.407(b)(4) is more tight than the new rule 15.407(b)(4)(i).

▣ Measurement Data:

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11ac(VHT80)*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
U-NII 1	42 (5210 MHz)	5101.40	H	Y	PK	49.77	7.82	N/A	N/A	57.59	74.00	16.41
		5101.35	H	Y	AV	38.94	7.82	3.15	N/A	49.91	54.00	4.09
		10419.60	H	Y	PK	44.11	12.43	N/A	-9.54	47.00	68.20	21.20
U-NII 2A	58 (5290 MHz)	5364.92	H	Y	PK	49.42	7.88	N/A	N/A	57.30	74.00	16.70
		5365.09	H	Y	AV	39.26	7.88	3.15	N/A	50.29	54.00	3.71
		10579.93	H	Y	PK	42.95	12.90	N/A	-9.54	46.31	68.20	21.89
U-NII 2C	106 (5530 MHz)	5454.35	H	Y	PK	51.45	7.73	N/A	N/A	59.18	74.00	14.82
		5455.25	H	Y	AV	39.72	7.73	3.15	N/A	50.60	54.00	3.40
		5464.30	H	Y	PK	53.76	7.71	N/A	N/A	61.47	68.20	6.73
		11059.73	H	Y	PK	44.02	13.62	N/A	-9.54	48.10	74.00	25.90
		11059.87	H	Y	AV	33.35	13.62	3.15	-9.54	40.58	54.00	13.42
U-NII 3	155 (5775 MHz)	5711.07	H	Y	PK	55.17	8.98	N/A	N/A	64.15	68.20	4.05
		5719.03	H	Y	PK	58.83	8.98	N/A	N/A	67.81	78.20	10.39
		5850.44	H	Y	PK	52.24	9.47	N/A	N/A	61.71	78.20	16.49
		5861.05	H	Y	PK	52.55	9.92	N/A	N/A	62.47	68.20	5.73
		11550.18	H	Y	PK	42.30	14.22	N/A	-9.54	46.98	74.00	27.02
		11549.98	H	Y	AV	31.92	14.22	3.15	-9.54	39.75	54.00	14.25

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)
4. The limit is converted to field strength.
   E[dBuV/m] = EIRP[dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
5. The measured data for U-NII 3 band is satisfied with the emissions mask in 15.407(b)(4)(i), too.
   The old rule 15.407(b)(4) is more tight than the new rule 15.407(b)(4)(i).

▣ Measurement Data:

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11a*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Cross	144 (5720 MHz)	11440.38	H	Y	PK	43.10	14.11	N/A	-9.54	47.67	74.00	26.33
		11440.18	H	Y	AV	32.53	14.11	0.58	-9.54	37.68	54.00	16.32
		17164.93	H	Y	PK	42.21	21.97	N/A	-9.54	54.64	74.00	19.36

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11ac (VHT20)*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Cross	144 (5720 MHz)	11441.33	H	Y	PK	46.79	14.11	N/A	-9.54	51.36	74.00	22.64
		11441.73	H	Y	AV	36.20	14.11	1.13	-9.54	41.90	54.00	12.10
		17162.80	H	Y	PK	44.37	21.97	N/A	-9.54	56.80	74.00	17.20

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11ac (VHT40)*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Cross	142 (5710 MHz)	11421.80	H	Y	PK	47.11	14.09	N/A	-9.54	51.66	74.00	22.34
		11421.47	H	Y	AV	35.32	14.09	1.94	-9.54	41.81	54.00	12.19
		17127.57	H	Y	PK	44.70	21.92	N/A	-9.54	57.08	74.00	16.92

Radiated Spurious Emissions data(9 kHz ~ 40 GHz) : *802.11ac (VHT80)*

Band	Tested Channel	Freq. (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Cross	138 (5690 MHz)	11375.27	H	Y	PK	44.48	14.03	N/A	-9.54	48.97	74.00	25.03
		11374.53	H	Y	AV	32.15	14.03	3.15	-9.54	39.79	54.00	14.21

Note.

1. No other spurious and harmonic emissions were found greater than listed emissions on above table.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor (DCF) : - 9.54 dB = 20*log (1m / 3m)
4. The limit is converted to field strength.
   E [dBuV/m] = EIRP [dBm] + 95.2 dB = -27 dBm + 95.2 = 68.2 dBuV/m
   = -17 dBm + 95.2 = 78.2 dBuV/m
5. If peak measurement satisfy the average limit, then average measurement are not required.

8.7 AC Conducted Emissions

▣ Test Procedure

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. Emissions closest to the limit are measured in the quasi-peak mode (QP) and average mode (AV) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

▣ Measurement Data: Comply

Note 1: See next pages for actual measured spectrum plots and data for worst case result.

▣ Minimum Standard: FCC Part 15.207(a)

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

AC Line Conducted Emissions (Graph)

Test Mode: U-NII 1 & 802.11ac(VHT40) & MIMO & 5230 MHz

Results of Conducted Emission

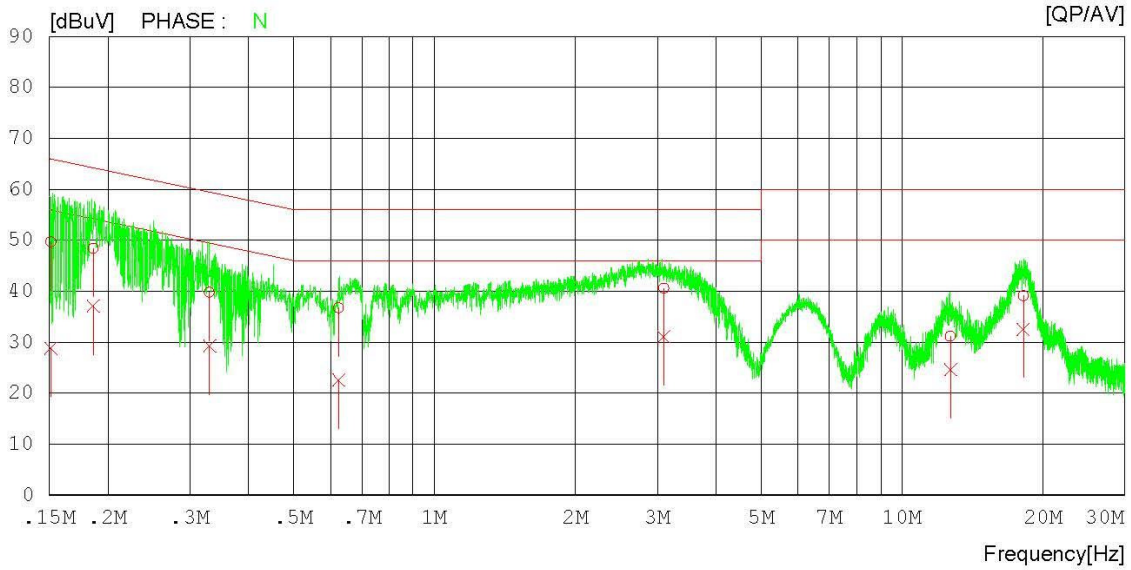
DTNC

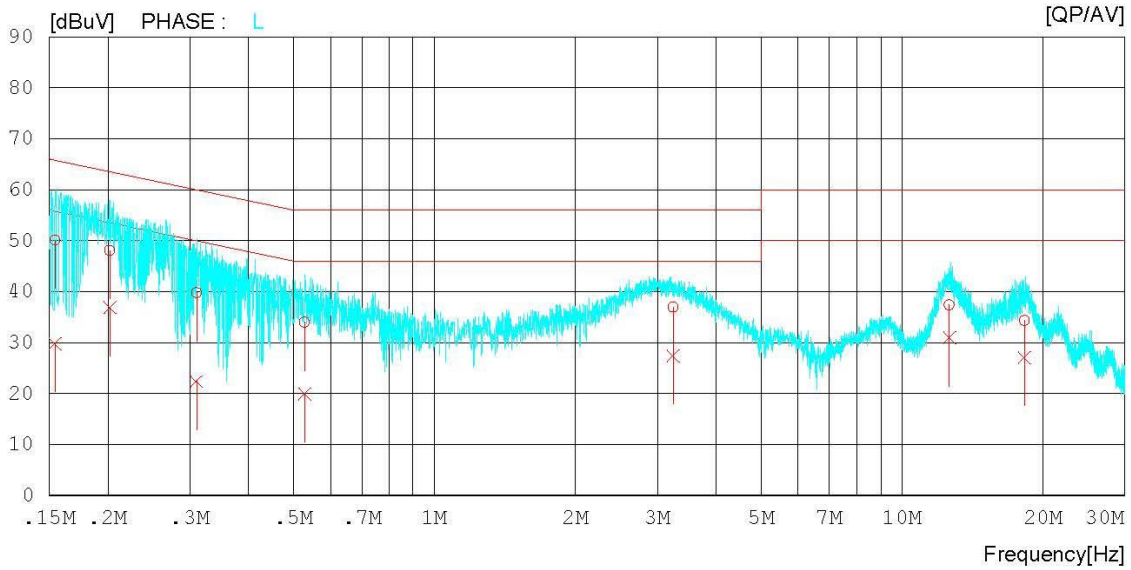
Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NII-1_802.11ac(VHT40)	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV





AC Line Conducted Emissions (Data List)

Test Mode: U-NII 1 & 802.11ac(VHT40) & MIMO & 5230 MHz

Results of Conducted Emission

DTNC

Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NII-1_802.11ac(VHT40)	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV

NO	FREQ	READING		C.FACTOR	RESULT		LIMIT		MARGIN		PHASE
		QP	AV		QP	AV	QP	AV	QP	AV	
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15111	39.6	18.8	10.1	49.7	28.9	65.9	55.9	16.2	27.0	N
2	0.18615	38.4	27.0	10.1	48.5	37.1	64.2	54.2	15.7	17.1	N
3	0.33035	29.7	19.2	10.1	39.8	29.3	59.4	49.4	19.6	20.1	N
4	0.62379	26.6	12.5	10.1	36.7	22.6	56.0	46.0	19.3	23.4	N
5	3.09560	30.3	20.9	10.2	40.5	31.1	56.0	46.0	15.5	14.9	N
6	12.70540	20.6	14.0	10.6	31.2	24.6	60.0	50.0	28.8	25.4	N
7	18.18760	28.4	21.9	10.7	39.1	32.6	60.0	50.0	20.9	17.4	N
8	0.15413	40.0	19.7	10.1	50.1	29.8	65.8	55.8	15.7	26.0	L
9	0.20211	37.9	26.8	10.1	48.0	36.9	63.5	53.5	15.5	16.6	L
10	0.30947	29.6	12.2	10.1	39.7	22.3	60.0	50.0	20.3	27.7	L
11	0.52784	23.9	9.8	10.1	34.0	19.9	56.0	46.0	22.0	26.1	L
12	3.23800	26.7	17.1	10.2	36.9	27.3	56.0	46.0	19.1	18.7	L
13	12.62580	26.6	20.2	10.7	37.3	30.9	60.0	50.0	22.7	19.1	L
14	18.28760	23.5	16.3	10.8	34.3	27.1	60.0	50.0	25.7	22.9	L

AC Line Conducted Emissions (Graph)

Test Mode: U-NII 2A & 802.11ac(VHT40) & MIMO & 5270 MHz

Results of Conducted Emission

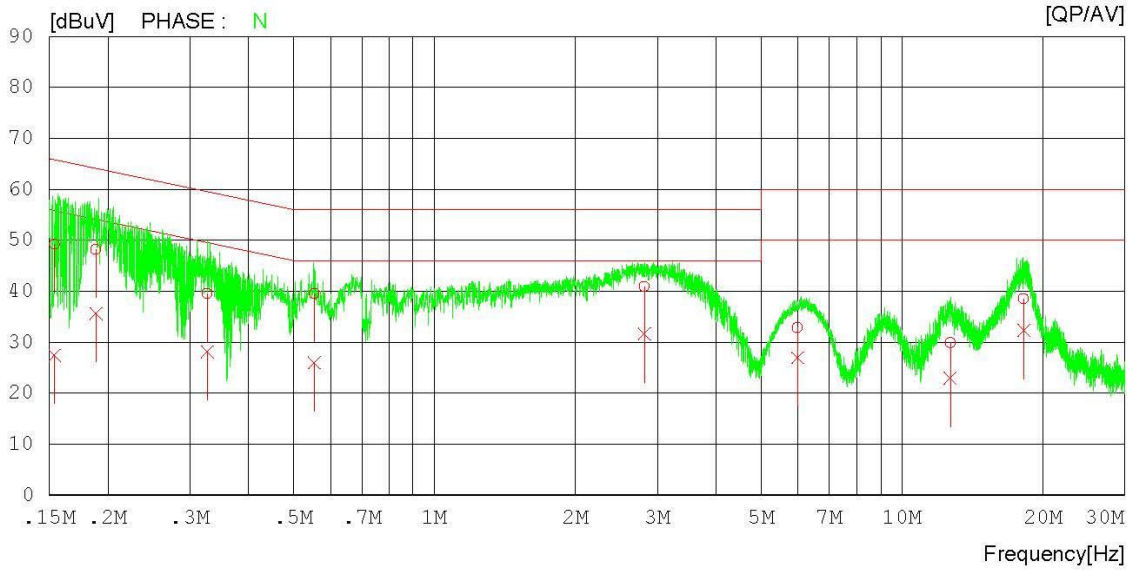
DTNC

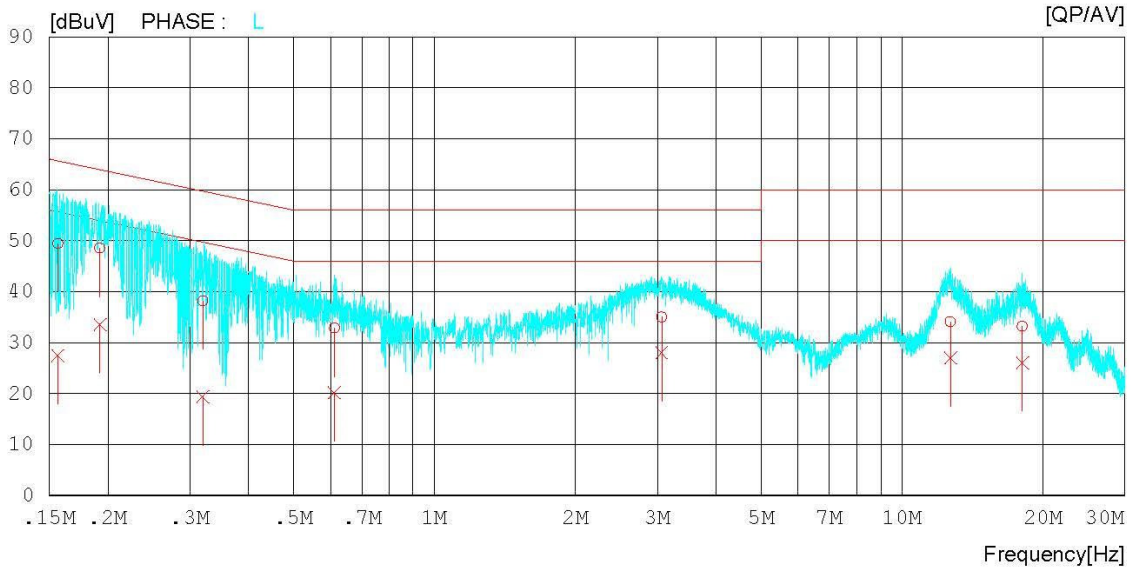
Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NII-2A_802.11ac(VHT40)	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV





AC Line Conducted Emissions (Data List)

Test Mode: U-NII 2A & 802.11ac(VHT40) & MIMO & 5270 MHz

Results of Conducted Emission

DTNC Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NII-2A_802.11ac(VHT40)	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV

NO	FREQ	READING		C.FACTOR	RESULT		LIMIT		MARGIN		PHASE
		QP	AV		QP	AV	QP	AV	QP	AV	
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15385	39.2	17.3	10.1	49.3	27.4	65.8	55.8	16.5	28.4	N
2	0.18867	38.1	25.5	10.1	48.2	35.6	64.1	54.1	15.9	18.5	N
3	0.32635	29.4	18.0	10.1	39.5	28.1	59.5	49.5	20.0	21.4	N
4	0.55318	29.5	15.9	10.1	39.6	26.0	56.0	46.0	16.4	20.0	N
5	2.81480	30.7	21.4	10.2	40.9	31.6	56.0	46.0	15.1	14.4	N
6	5.97880	22.4	16.5	10.4	32.8	26.9	60.0	50.0	27.2	23.1	N
7	12.69100	19.3	12.3	10.6	29.9	22.9	60.0	50.0	30.1	27.1	N
8	18.21520	27.8	21.6	10.7	38.5	32.3	60.0	50.0	21.5	17.7	N
9	0.15647	39.3	17.3	10.1	49.4	27.4	65.6	55.6	16.2	28.2	L
10	0.19251	38.4	23.5	10.1	48.5	33.6	63.9	53.9	15.4	20.3	L
11	0.31956	28.0	9.2	10.1	38.1	19.3	59.7	49.7	21.6	30.4	L
12	0.61118	22.7	10.0	10.1	32.8	20.1	56.0	46.0	23.2	25.9	L
13	3.06160	24.8	17.8	10.2	35.0	28.0	56.0	46.0	21.0	18.0	L
14	12.71020	23.4	16.2	10.7	34.1	26.9	60.0	50.0	25.9	23.1	L
15	18.10760	22.3	15.3	10.8	33.1	26.1	60.0	50.0	26.9	23.9	L

AC Line Conducted Emissions (Graph)

Test Mode: U-NII 2C & 802.11ac(VHT40) & MIMO & 5590 MHz

Results of Conducted Emission

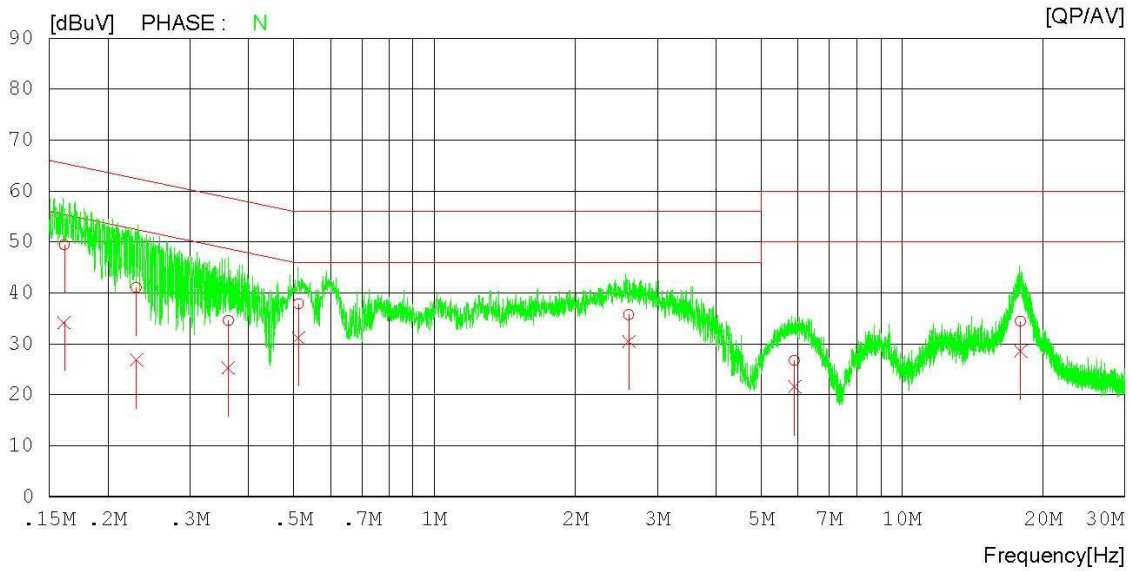
DTNC

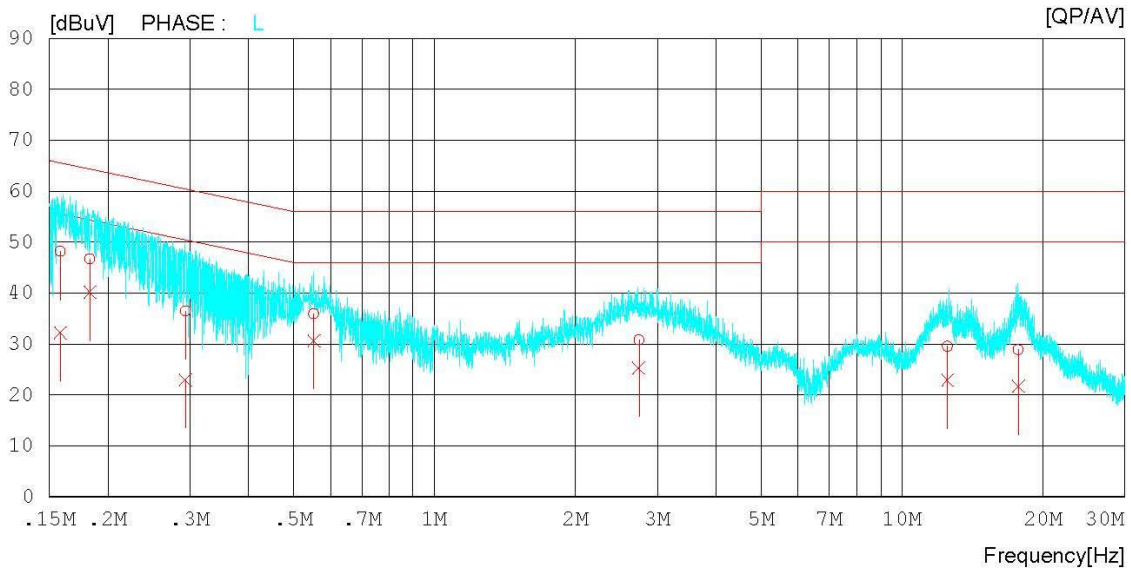
Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NII-2C_802.11AC(VHT40)	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV





AC Line Conducted Emissions (Data List)

Test Mode: U-NII 2C & 802.11ac(VHT40) & MIMO & 5590 MHz

Results of Conducted Emission

DTNC Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NII-2C_802.11AC(VHT40)	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV

NO	FREQ	READING		C.FACTOR	RESULT		LIMIT		MARGIN		PHASE
		QP	AV		QP	AV	QP	AV	QP	AV	
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.16139	39.4	24.1	10.1	49.5	34.2	65.4	55.4	15.9	21.2	N
2	0.23032	31.0	16.8	10.1	41.1	26.9	62.4	52.4	21.3	25.5	N
3	0.36211	24.5	15.2	10.1	34.6	25.3	58.7	48.7	24.1	23.4	N
4	0.51192	27.8	21.1	10.1	37.9	31.2	56.0	46.0	18.1	14.8	N
5	2.60520	25.5	20.3	10.2	35.7	30.5	56.0	46.0	20.3	15.5	N
6	5.89240	16.3	11.2	10.4	26.7	21.6	60.0	50.0	33.3	28.4	N
7	17.95360	23.8	17.9	10.7	34.5	28.6	60.0	50.0	25.5	21.4	N
8	0.15837	38.0	22.0	10.1	48.1	32.1	65.5	55.5	17.4	23.4	L
9	0.18321	36.6	30.1	10.1	46.7	40.2	64.3	54.3	17.6	14.1	L
10	0.29322	26.4	12.9	10.1	36.5	23.0	60.4	50.4	23.9	27.4	L
11	0.55211	25.8	20.5	10.1	35.9	30.6	56.0	46.0	20.1	15.4	L
12	2.73640	20.6	15.0	10.2	30.8	25.2	56.0	46.0	25.2	20.8	L
13	12.51860	18.8	12.1	10.7	29.5	22.8	60.0	50.0	30.5	27.2	L
14	17.75400	18.0	10.9	10.8	28.8	21.7	60.0	50.0	31.2	28.3	L

AC Line Conducted Emissions (Graph)

Test Mode: U-NII 3 & 802.11ac(VHT40) & MIMO & 5795 MHz

Results of Conducted Emission

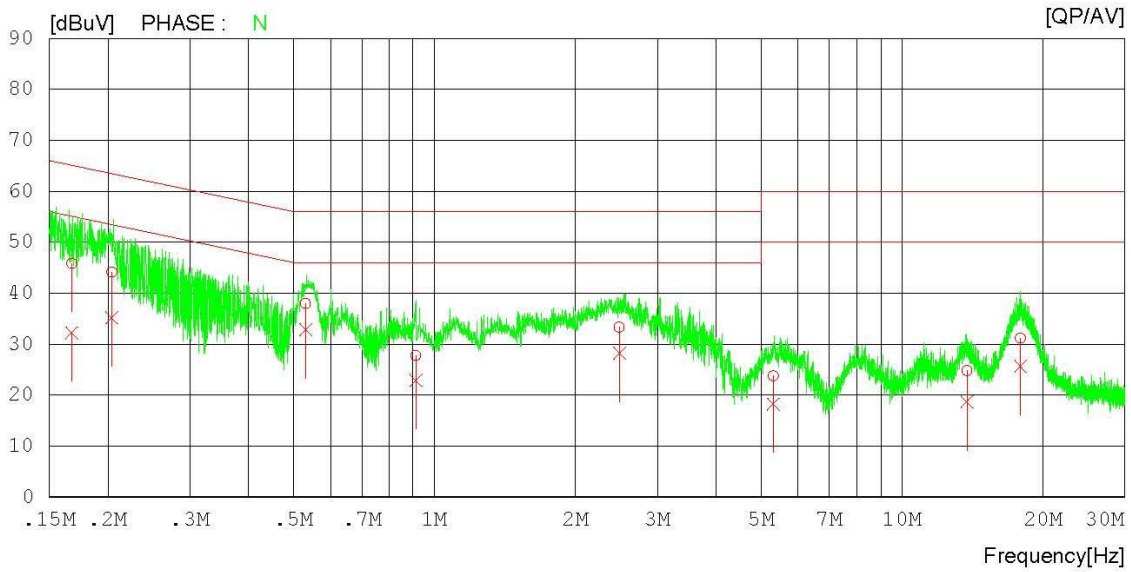
DTNC

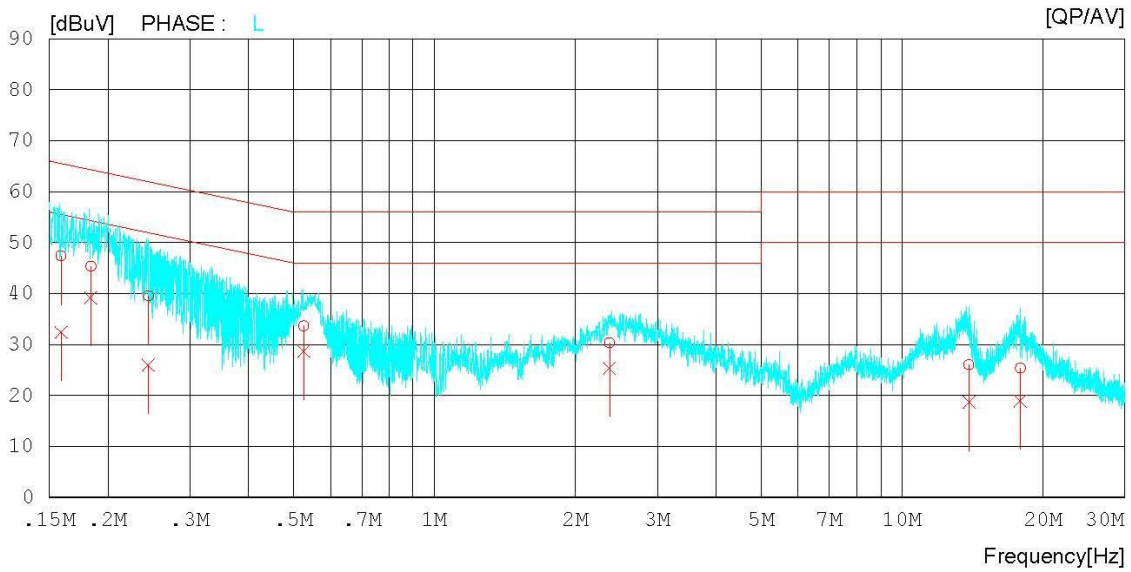
Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NIII-3_802.11a	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV





AC Line Conducted Emissions (Data List)

Test Mode: U-NII 3 & 802.11ac(VHT40) & MIMO & 5795 MHz

Results of Conducted Emission

DTNC

Date : 2016-09-01

Order No.	:		Referrence No.	:	
Model No.	:	LGSWFAC71	Power Supply	:	120V 60Hz
Serial No.	:	Identical prototype	Temp/Humi.	:	23 'C 43 % R.H.
Test Condition	:	U-NIII-3_802.11a	Operator	:	J.W.Kim

Memo :

LIMIT : FCC P15.207 QP
FCC P15.207 AV

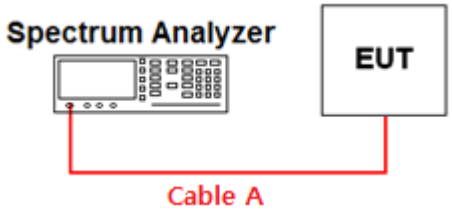
NO	FREQ	READING		C.FACTOR	RESULT		LIMIT		MARGIN		PHASE
		QP	AV		QP	AV	QP	AV	QP	AV	
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.16744	35.7	22.1	10.1	45.8	32.2	65.1	55.1	19.3	22.9	N
2	0.20395	34.0	25.1	10.1	44.1	35.2	63.4	53.4	19.3	18.2	N
3	0.53055	27.9	22.7	10.1	38.0	32.8	56.0	46.0	18.0	13.2	N
4	0.91286	17.6	12.8	10.1	27.7	22.9	56.0	46.0	28.3	23.1	N
5	2.48880	23.2	18.0	10.2	33.4	28.2	56.0	46.0	22.6	17.8	N
6	5.30880	13.3	7.9	10.4	23.7	18.3	60.0	50.0	36.3	31.7	N
7	13.78340	14.1	8.1	10.6	24.7	18.7	60.0	50.0	35.3	31.3	N
8	17.94560	20.4	14.9	10.7	31.1	25.6	60.0	50.0	28.9	24.4	N
9	0.15891	37.2	22.3	10.1	47.3	32.4	65.5	55.5	18.2	23.1	L
10	0.18416	35.1	29.0	10.1	45.2	39.1	64.3	54.3	19.1	15.2	L
11	0.24441	29.4	15.8	10.1	39.5	25.9	61.9	51.9	22.4	26.0	L
12	0.52504	23.5	18.6	10.1	33.6	28.7	56.0	46.0	22.4	17.3	L
13	2.36760	20.1	15.1	10.2	30.3	25.3	56.0	46.0	25.7	20.7	L
14	13.92220	15.2	7.8	10.8	26.0	18.6	60.0	50.0	34.0	31.4	L
15	17.92160	14.5	8.1	10.8	25.3	18.9	60.0	50.0	34.7	31.1	L

8.8 Occupied Bandwidth

▣ **Test Requirements**

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured

▣ **Test Configuration**



▣ **Test Procedure :**

- Procedure: RSS-Gen[6.6]

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

▣ **Test Result : Comply**

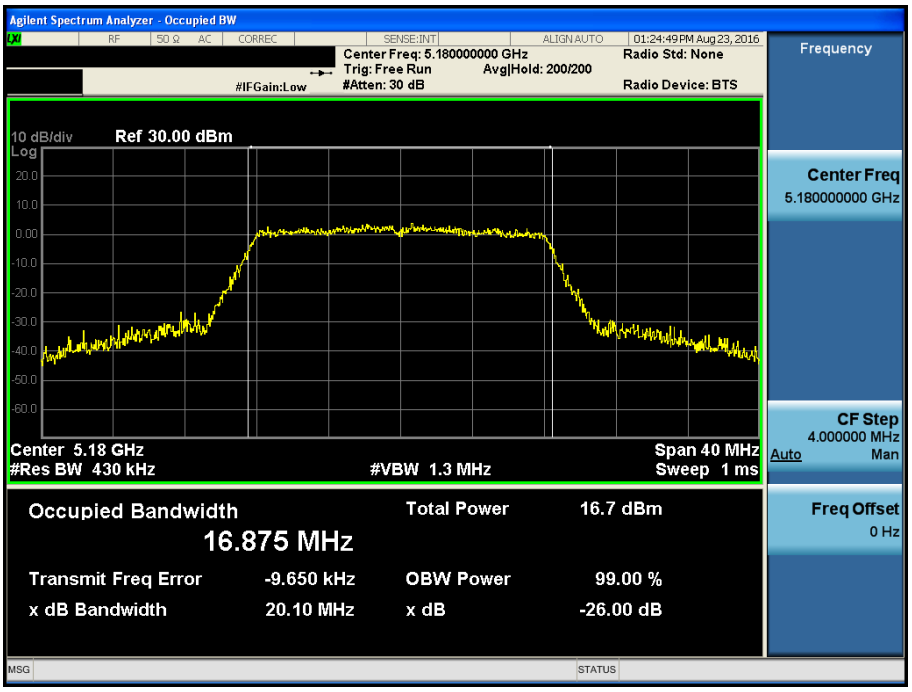
Multiple transmit

Mode	Bands	Channel	Frequency [MHz]	Test Result [MHz]	
				ANT 1	ANT 2
802.11a	U-NII 1	36	5180	16.875	16.838
		40	5200	16.879	16.908
		48	5240	17.007	16.899
	U-NII 2A	52	5260	16.958	16.848
		60	5300	16.920	16.860
		64	5320	16.925	16.890
	U-NII 2C	100	5500	16.867	16.964
		116	5580	16.920	16.946
		-	-	-	-
	U-NII 3	149	5745	16.846	16.863
		157	5785	16.855	16.991
		165	5825	16.957	16.907
802.11ac VHT20	U-NII 1	36	5180	17.792	17.730
		40	5200	17.811	17.706
		48	5240	17.808	17.761
	U-NII 2A	52	5260	17.765	17.700
		60	5300	17.801	17.714
		64	5320	17.819	17.737
	U-NII 2C	100	5500	17.770	17.746
		116	5580	17.822	17.817
		-	-	-	-
802.11n HT20	U-NII 3	149	5745	17.718	17.736
		157	5785	17.836	17.721
		165	5825	17.837	17.738
802.11ac VHT40	U-NII 1	38	5190	36.228	36.233
		46	5230	36.296	36.373
	U-NII 2A	54	5270	36.155	36.207
		62	5310	36.175	36.048
	U-NII 2C	102	5510	36.135	36.161
		118	5590	36.192	36.226
		-	-	-	-
802.11n HT40	U-NII 3	151	5755	36.088	36.130
		159	5795	36.005	36.193
802.11ac VHT80	U-NII 1	42	5210	74.900	75.020
	U-NII 2A	58	5290	75.039	74.951
	U-NII 2C	106	5530	75.008	74.985
	U-NII 3	155	5775	74.899	74.996
802.11a	Cross Band	144	5720	16.937	16.977
802.11ac VHT20	Cross Band	144	5720	17.853	17.812
802.11ac VHT40	Cross Band	142	5710	36.093	36.259
802.11ac VHT80	Cross Band	138	5690	75.111	74.943

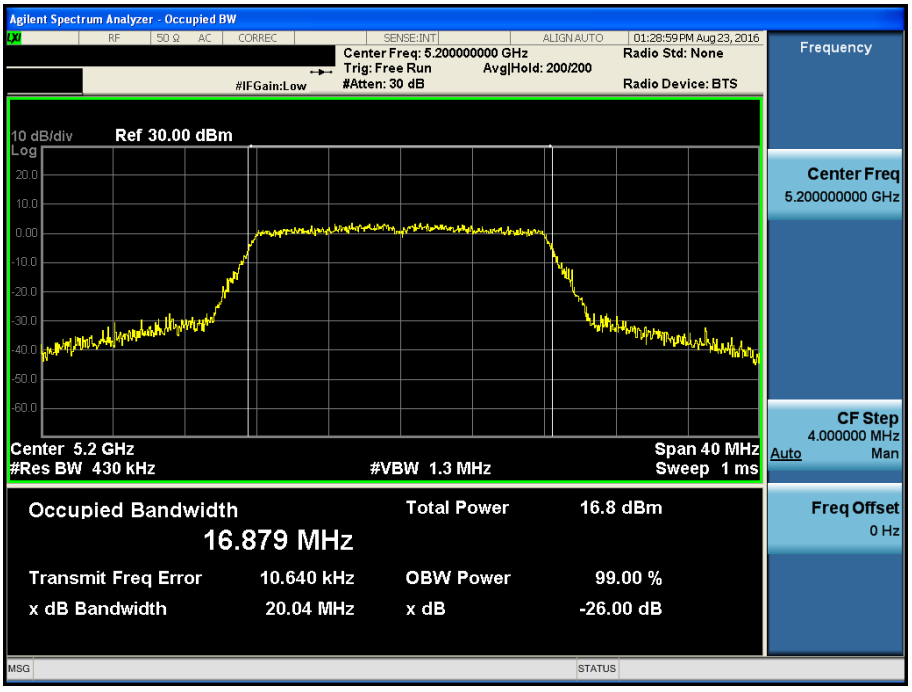
▣ RESULT PLOTS

Multiple Transmit

Occupied Bandwidth 99% Test Mode: 802.11a & ANT 1 & Ch.36

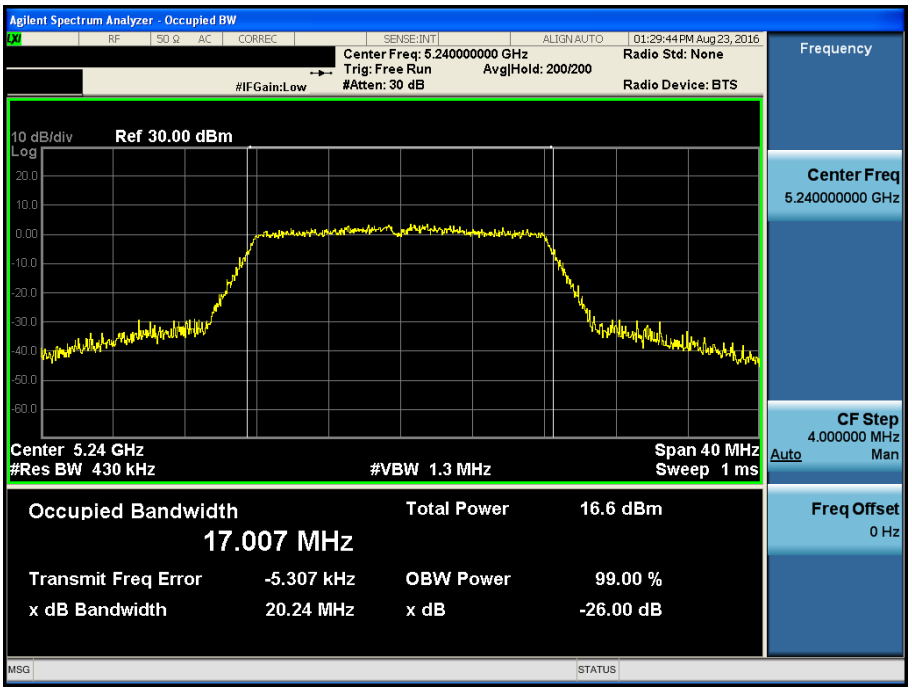


Occupied Bandwidth 99% Test Mode: 802.11a & ANT 1 & Ch.40



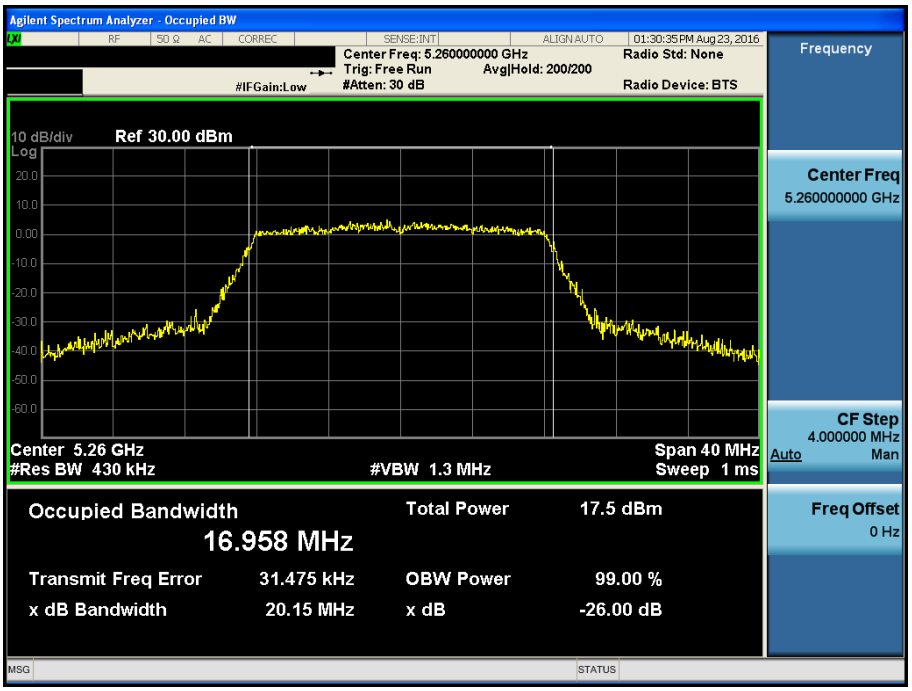
Occupied Bandwidth 99%

Test Mode: 802.11a & ANT 1 & Ch.48



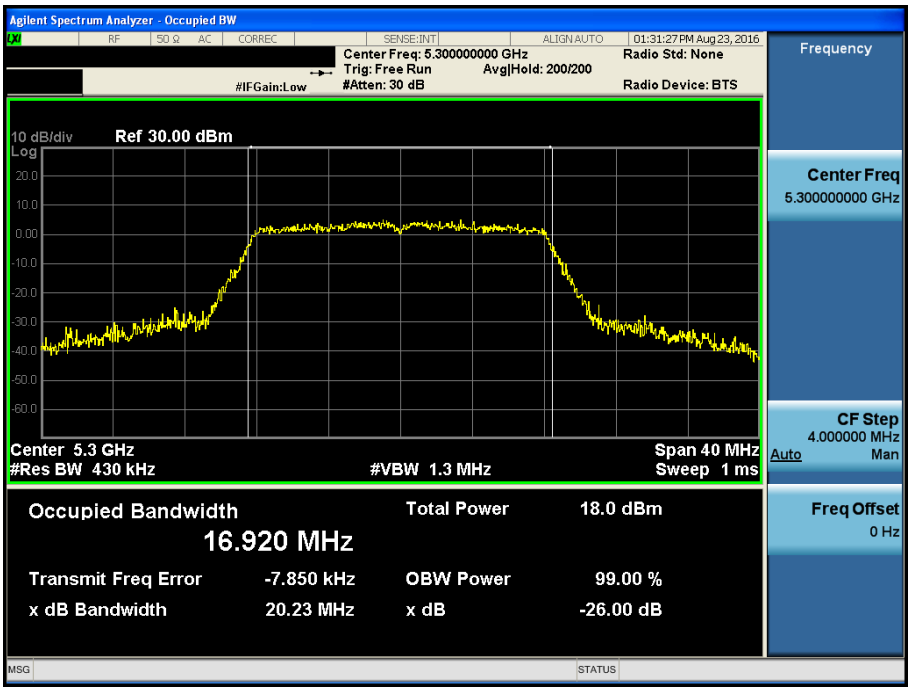
Occupied Bandwidth 99%

Test Mode: 802.11a & ANT 1 & Ch.52



Occupied Bandwidth 99%

Test Mode: 802.11a & ANT 1 & Ch.60



Occupied Bandwidth 99%

Test Mode: 802.11a & ANT 1 & Ch.64