AC Line Conducted Emissions (Data List)

Test Mode: U-NII 3 & 802.11a & 5 745 MHz

Results of Conducted Emission

DTNC

Date 2020-07-10

Order No.		Referrence No.	
Model No.	VF550	Power Supply	120 V, 60 Hz
Serial No.		Temp/Humi.	23 'C / 35 %
Test Condition	5.7G WLAN	Operator	J.H.Bang

Memo

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

NO	FREQ	READING		C.FACTOR	RESULT		LIMIT		MARGIN		PHASE
		QP	CAV		QP	CAV	QP	CAV	QP	CAV	
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.16494	8.88	3.21	9.96	18.84	13.17	65.21	55.21	46.37	42.04	N
2	0.41822	14.31	7.87	9.97	24.28	17.84	57.48	47.48	33.20	29.64	N
3	0.79901	7.90	1.62	9.98	17.88	11.60	56.00	46.00	38.12	34.40	N
4	1.47487	8.08	1.79	9.99	18.07	11.78	56.00	46.00	37.93	34.22	N
5	1.68021	13.53	4.37	10.01	23.54	14.38	56.00	46.00	32.46	31.62	N
6	3.79553	3.72	-1.92	10.12	13.84	8.20	56.00	46.00	42.16	37.80	N
7	6.10449	3.66	-2.18	10.20	13.86	8.02	60.00	50.00	46.14	41.98	N
8	15.24974	6.12	-0.36	10.45	16.57	10.09	60.00	50.00	43.43	39.91	N
9	0.17670	9.82	3.58	9.95	19.77	13.53	64.64	54.64	44.87	41.11	L
10	0.41405	18.60	11.48	9.95	28.55	21.43	57.57	47.57	29.02	26.14	L
11	0.72598	12.96	6.09	9.97	22.93	16.06	56.00	46.00	33.07	29.94	L
12	0.84956	18.48	9.19	9.98	28.46	19.17	56.00	46.00	27.54	26.83	L
13	2.02595	12.20	4.32	10.04	22.24	14.36	56.00	46.00	33.76	31.64	L
14	3.25008	11.15	2.69	10.08	21.23	12.77	56.00	46.00	34.77	33.23	L
15	3.28553	8.83	1.85	10.08	18.91	11.93	56.00	46.00	37.09	34.07	L
16	13.02891	9.32	1.82	10.39	19.71	12.21	60.00	50.00	40.29	37.79	L
17	21.04805	1.88	-3.72	10.48	12.36	6.76	60.00	50.00	47.64	43.24	L

8.7 Occupied Bandwidth (99%)

▣ 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

Refer to the APPENDIX I.

▣ Test Procedure

RSS-Gen[6.7]

- 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.

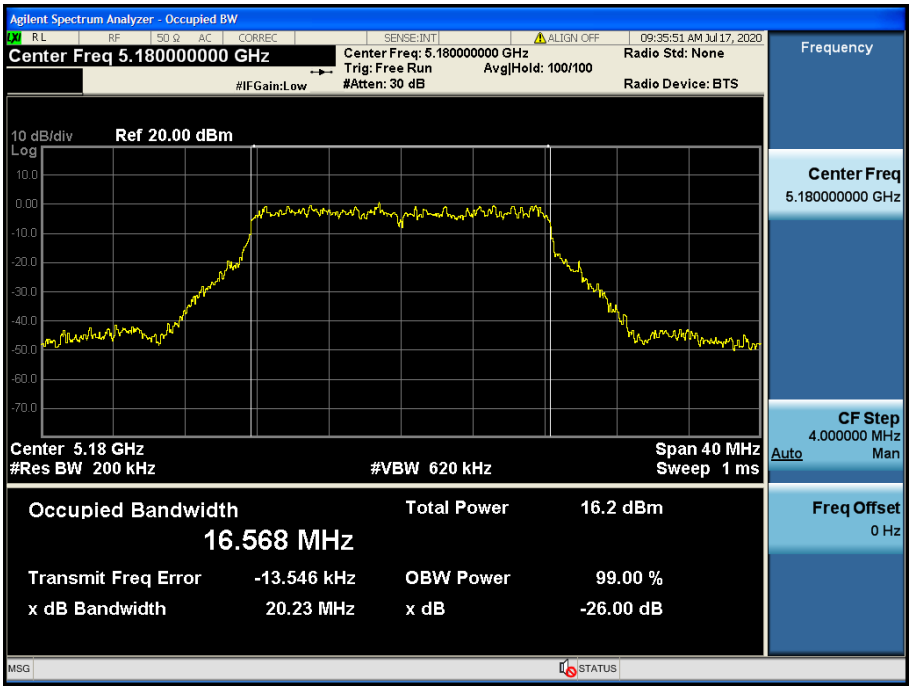
▣ **Test Results: Comply**

Mode	Channel	Frequency [MHz]	Test Result [dBm]
802.11a	36	5180	16.57
	40	5200	16.60
	48	5240	16.63
	52	5260	16.58
	60	5300	16.63
	64	5320	16.59
	100	5500	16.57
	120	5600	16.55
	144	5720	16.61
	149	5745	16.60
	157	5785	16.60
	165	5825	16.65
802.11n (HT20)	36	5180	17.75
	40	5200	17.74
	48	5240	17.74
	52	5260	17.75
	60	5300	17.75
	64	5320	17.73
	100	5500	17.73
	120	5600	17.74
	144	5720	17.71
	149	5745	17.78
	157	5785	17.78
	165	5825	17.76
802.11n (HT40)	38	5190	36.08
	46	5230	36.15
	54	5270	36.24
	62	5310	36.09
	102	5510	36.10
	118	5590	36.19
	142	5710	36.07
	151	5755	36.06
	159	5795	36.14
802.11ac (VHT80)	42	5210	75.03
	58	5290	75.15
	106	5530	75.01
	138	5690	75.34
	155	5775	74.97

▣ Result Plots

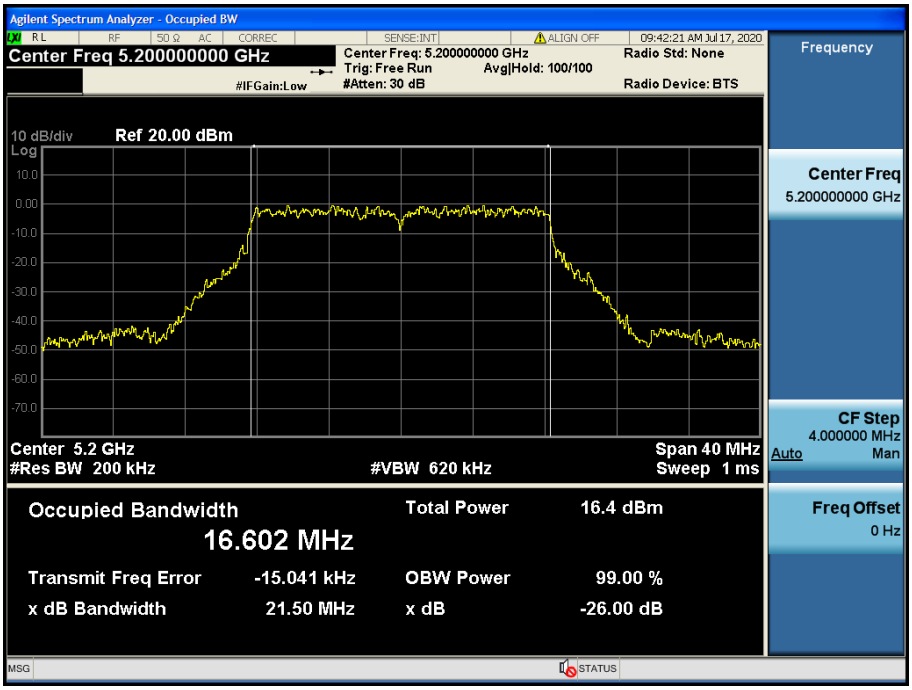
Occupied Bandwidth 99%

Test Mode: 802.11a & Ch.36

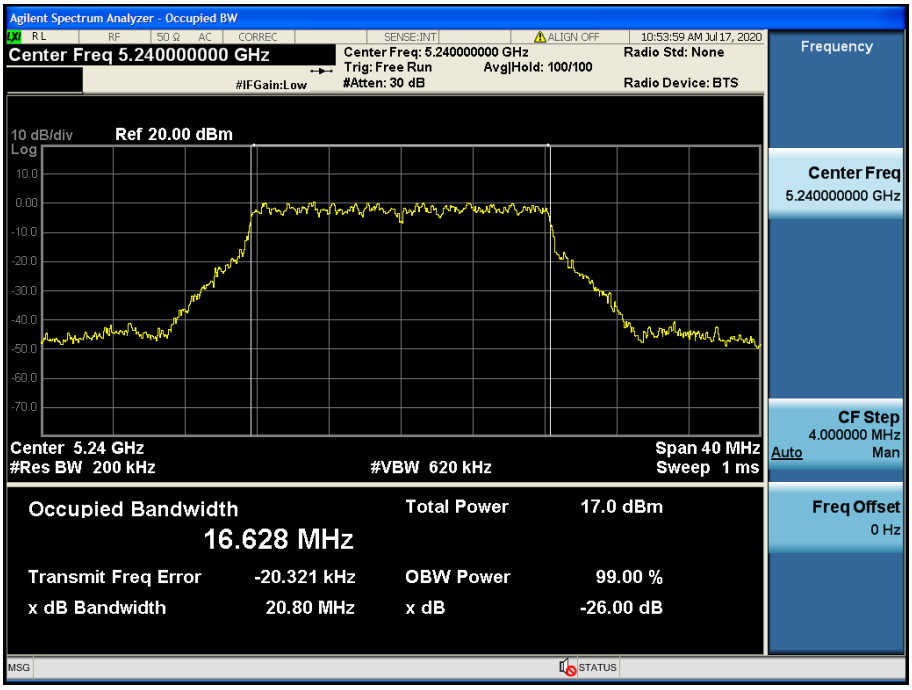


Occupied Bandwidth 99%

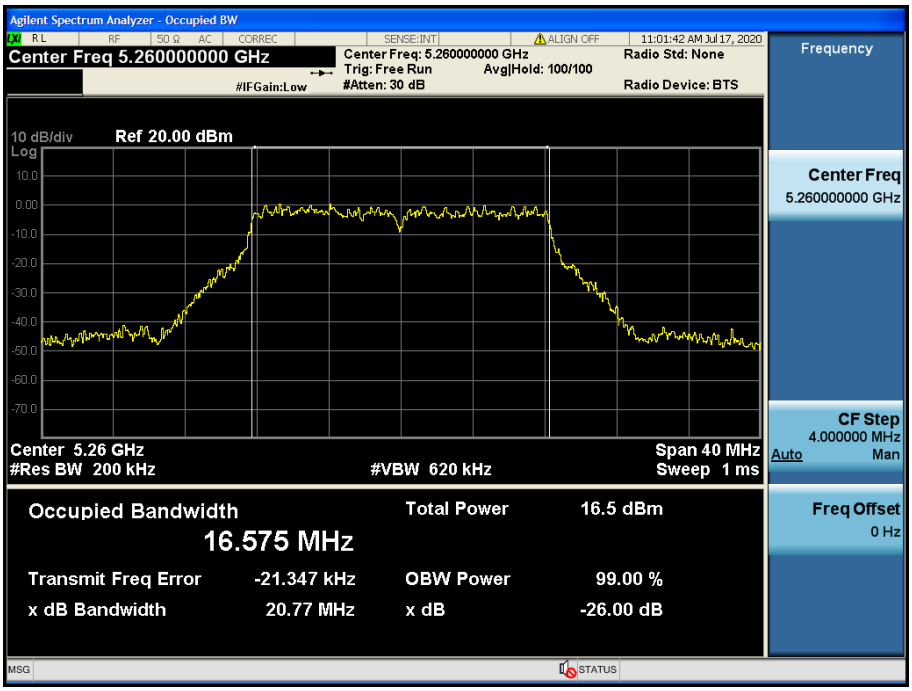
Test Mode: 802.11a & Ch.40



Occupied Bandwidth 99% Test Mode: 802.11a & Ch.48

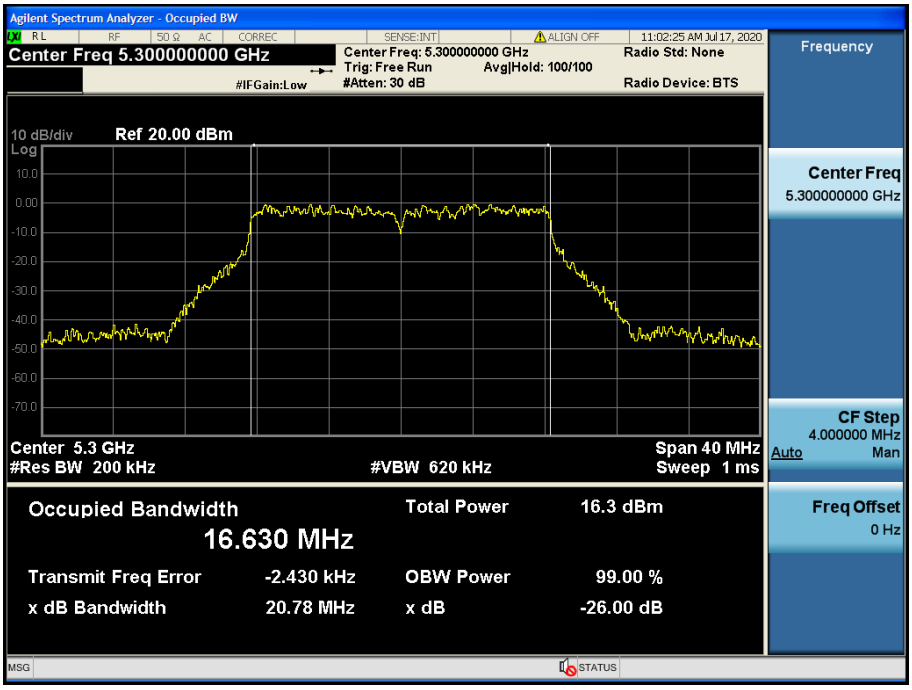


Occupied Bandwidth 99% Test Mode: 802.11a & Ch.52



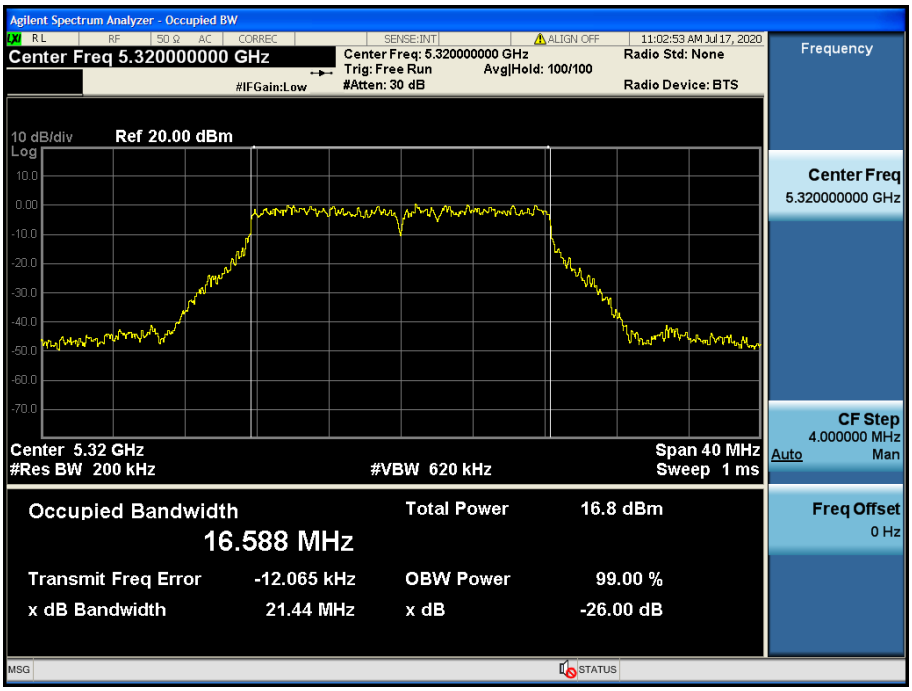
Occupied Bandwidth 99%

Test Mode: 802.11a & Ch.60



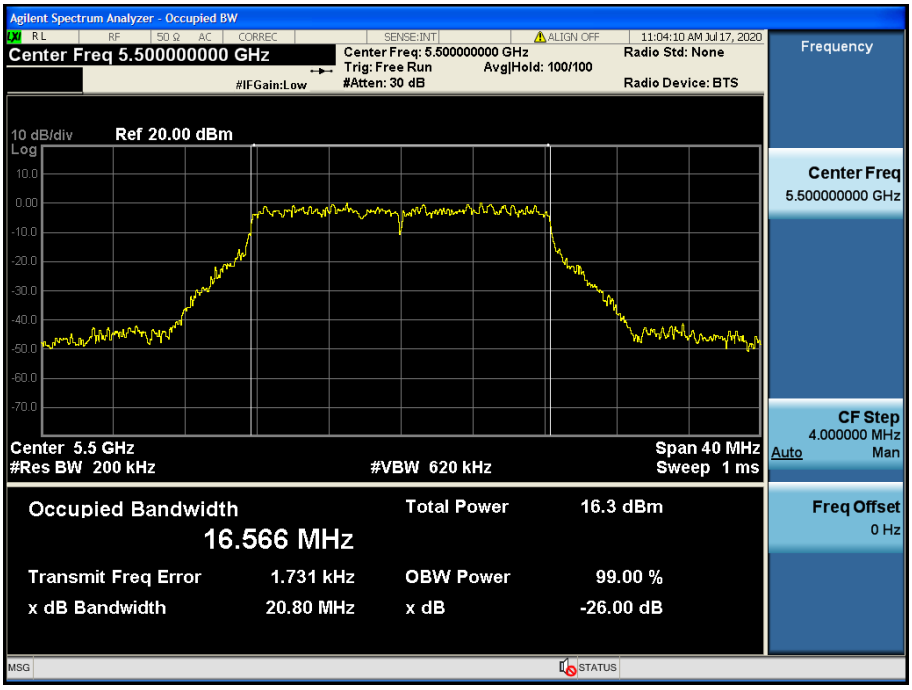
Occupied Bandwidth 99%

Test Mode: 802.11a & Ch.64



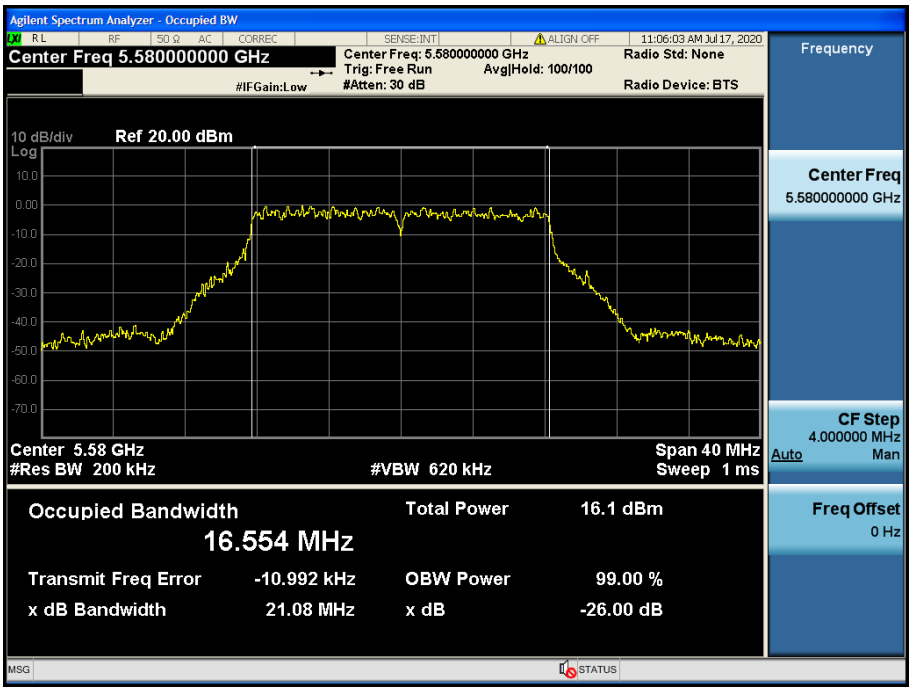
Occupied Bandwidth 99%

Test Mode: 802.11a & Ch.100

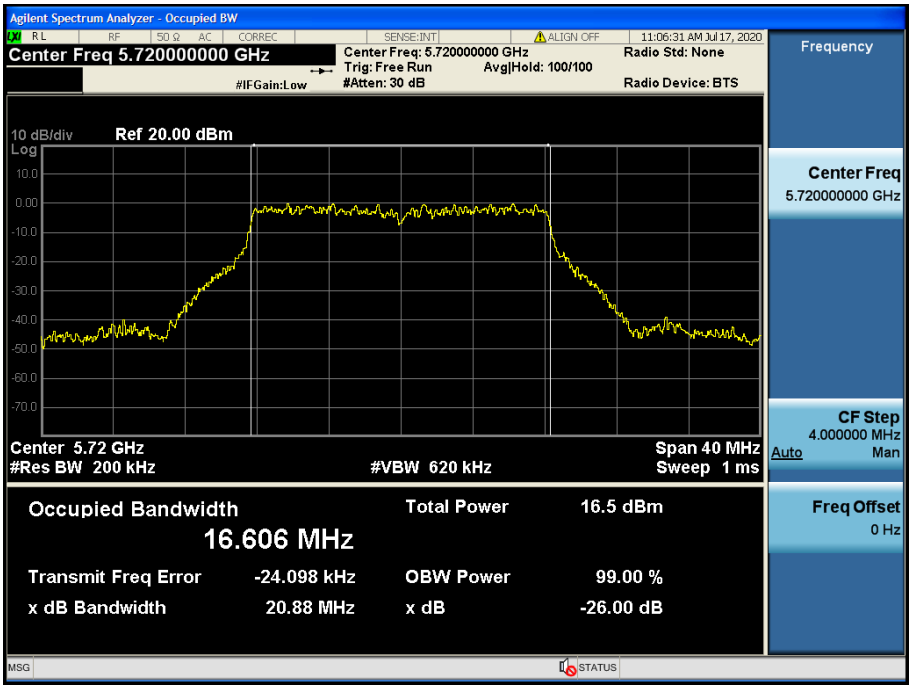


Occupied Bandwidth 99%

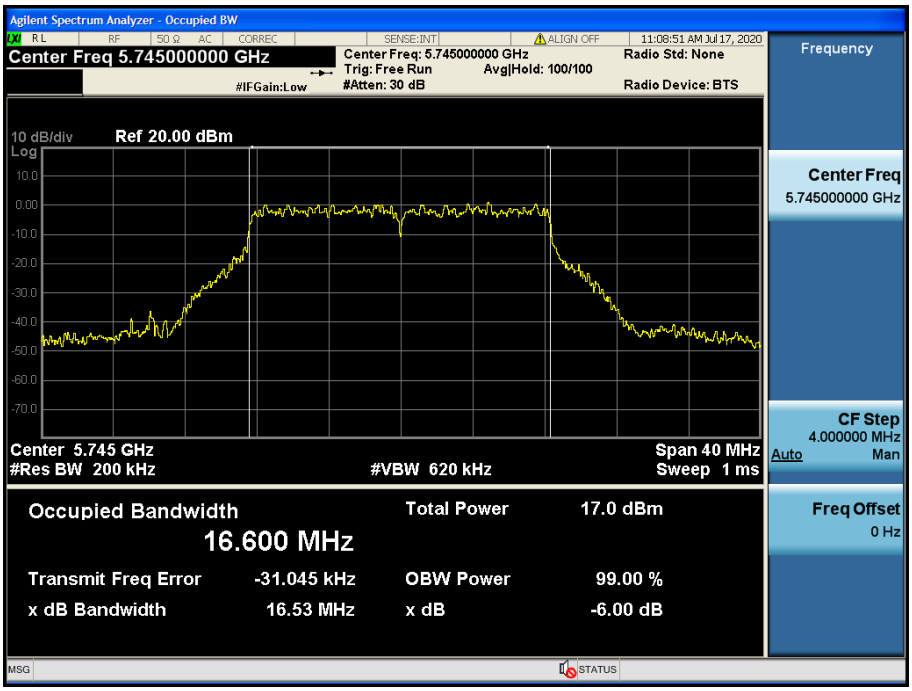
Test Mode: 802.11a & Ch.118



Occupied Bandwidth 99% Test Mode: 802.11a & Ch.144

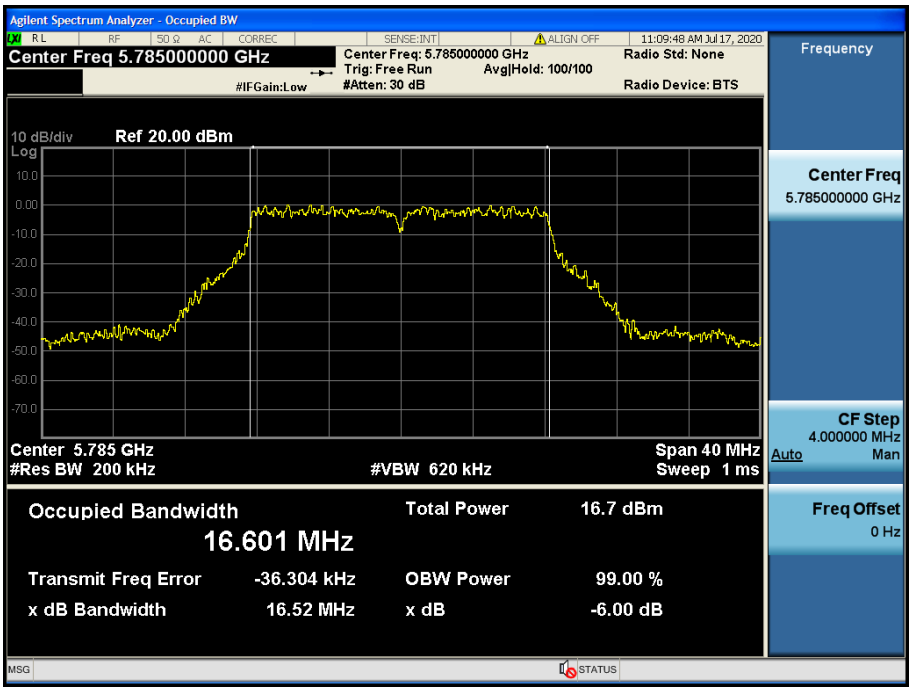


Occupied Bandwidth 99% Test Mode: 802.11a & Ch.149



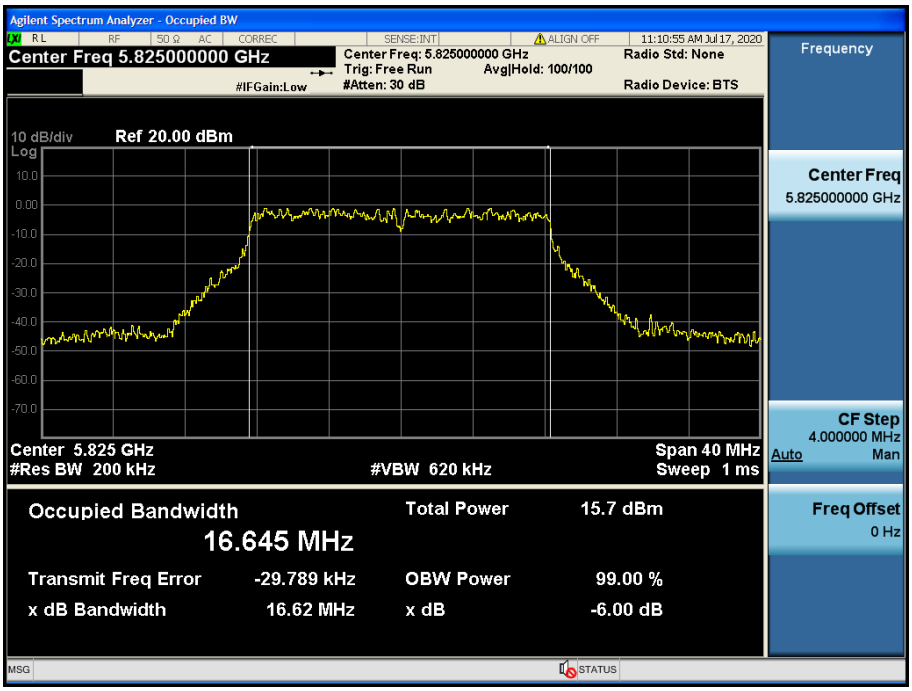
Occupied Bandwidth 99%

Test Mode: 802.11a & Ch.157



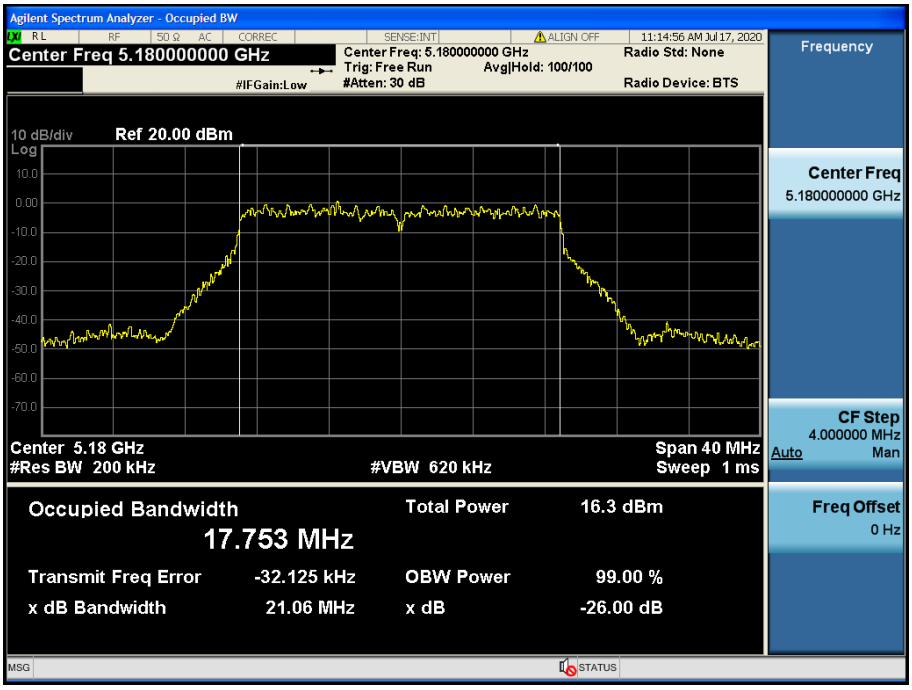
Occupied Bandwidth 99%

Test Mode: 802.11a & Ch.165



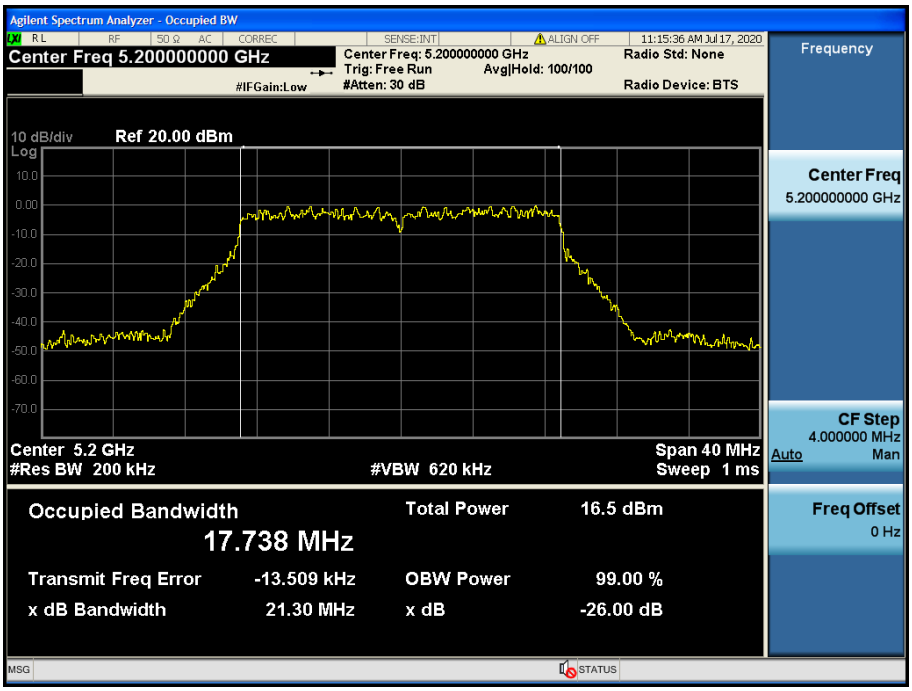
Occupied Bandwidth 99%

Test Mode: 802.11n HT20 & Ch.36



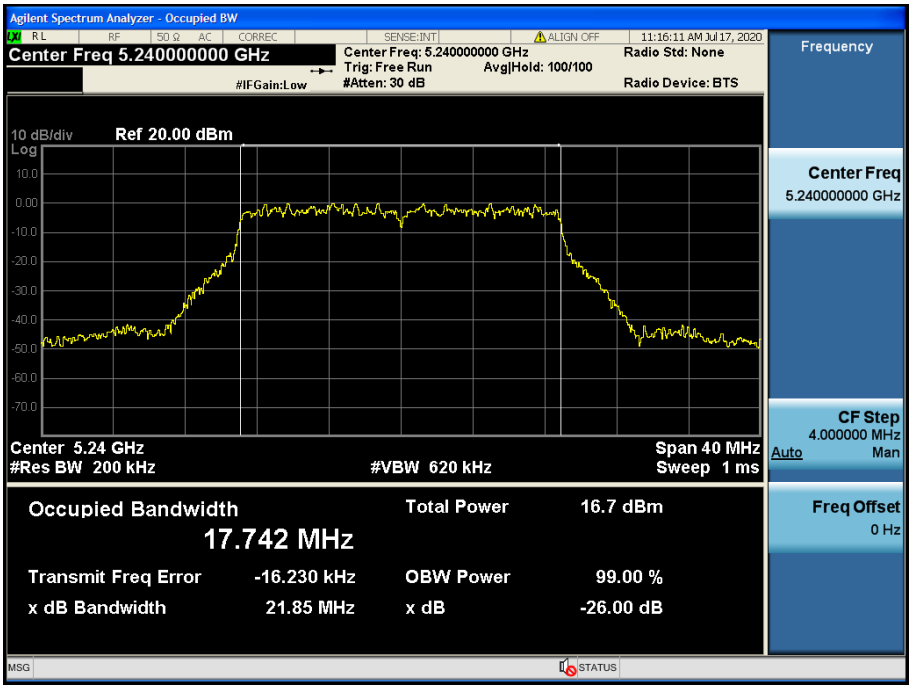
Occupied Bandwidth 99%

Test Mode: 802.11n HT20 & Ch.40



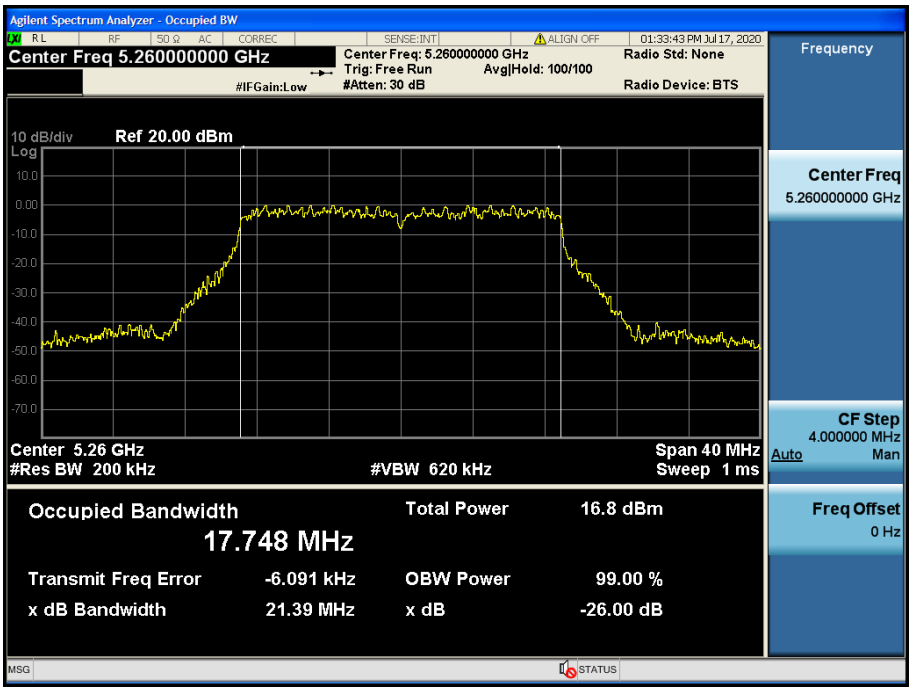
Occupied Bandwidth 99%

Test Mode: 802.11n HT20 & Ch.48

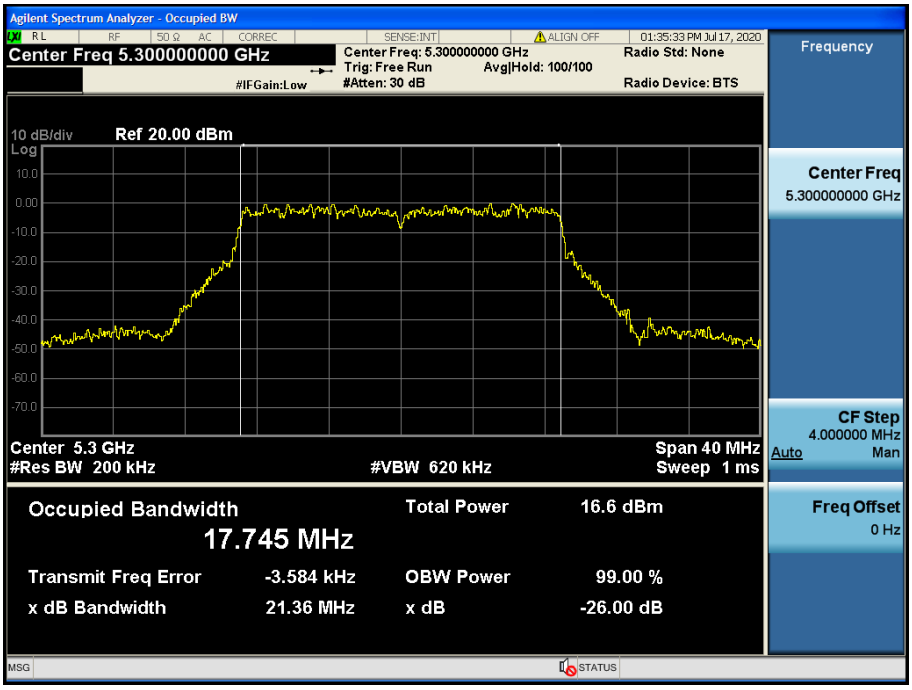


Occupied Bandwidth 99%

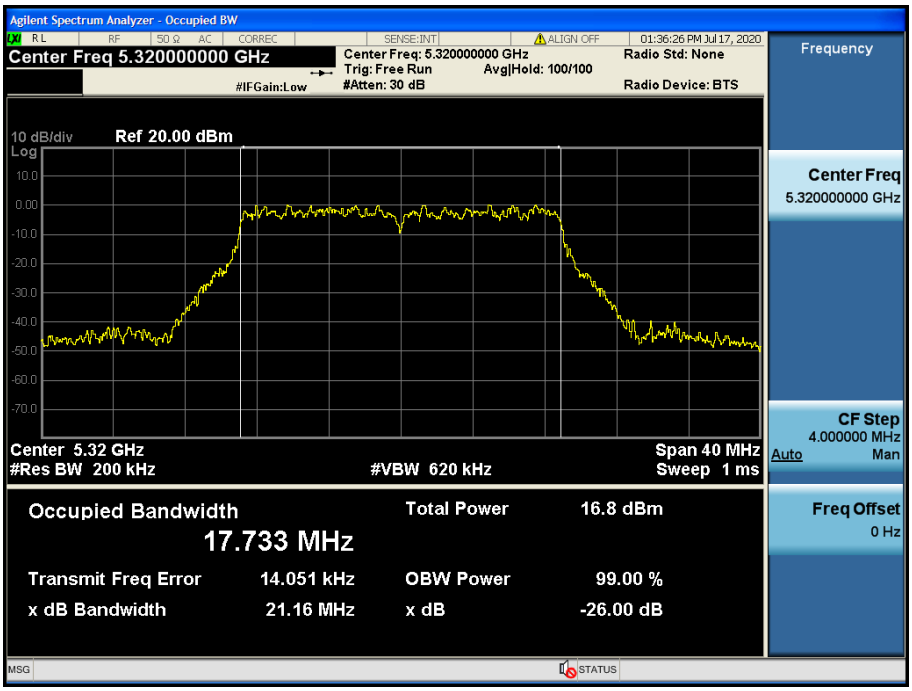
Test Mode: 802.11n HT20 & Ch.52



Occupied Bandwidth 99% Test Mode: 802.11n HT20 & Ch.60

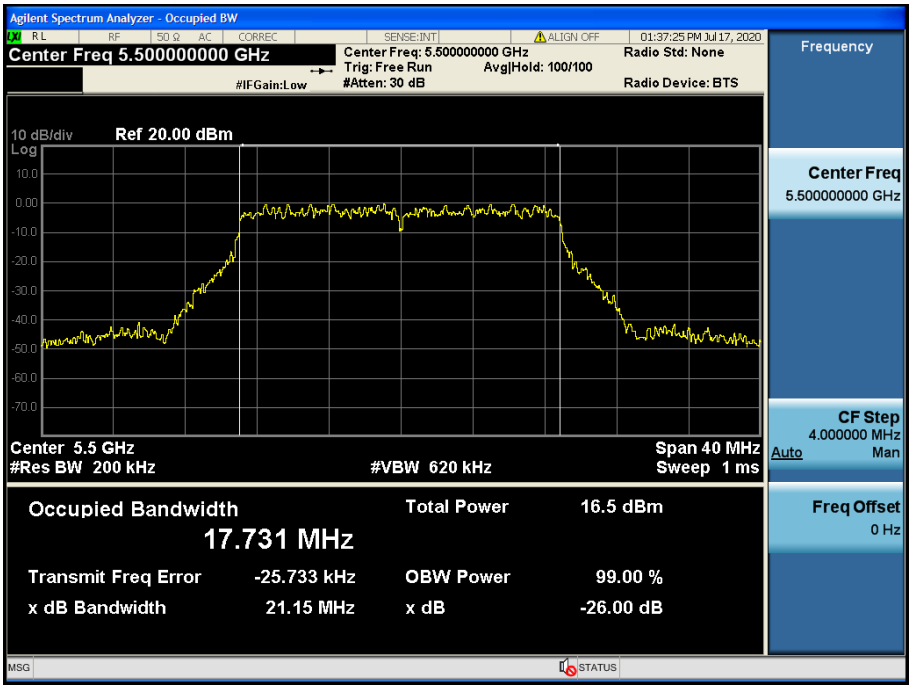


Occupied Bandwidth 99% Test Mode: 802.11n HT20 & Ch.64



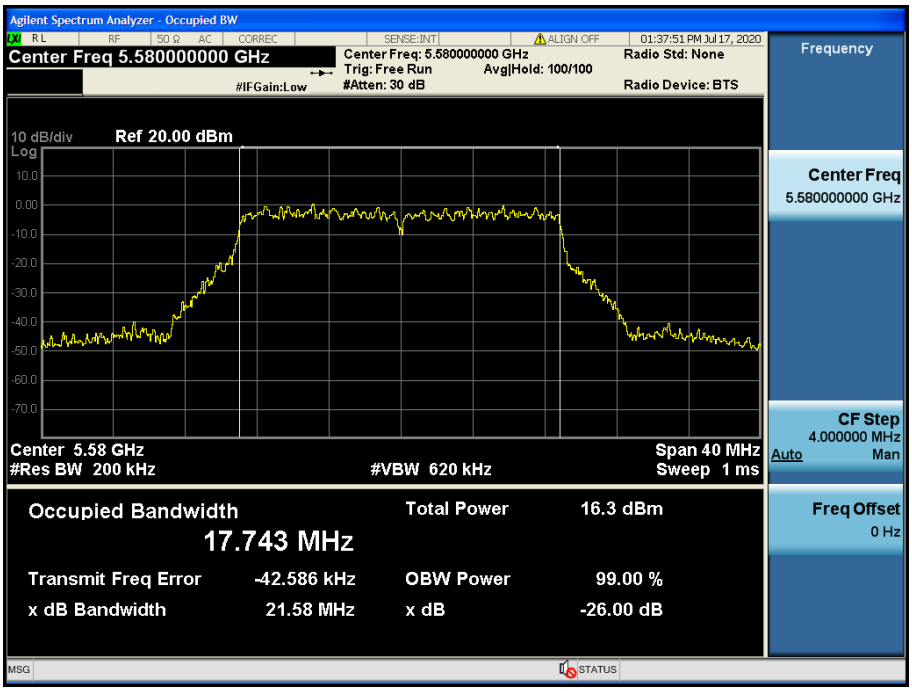
Occupied Bandwidth 99%

Test Mode: 802.11n HT20 & Ch.100



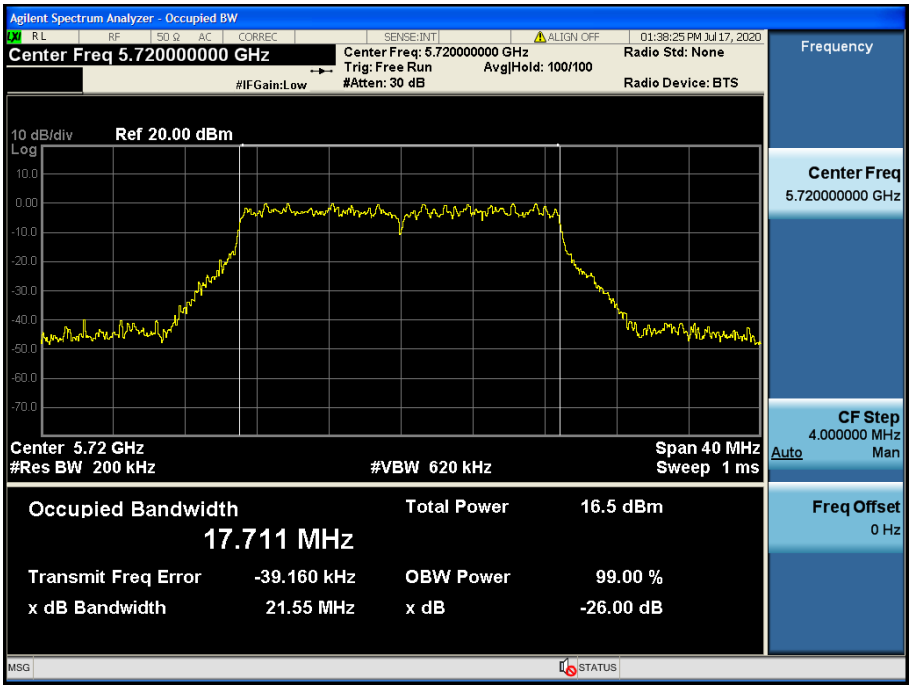
Occupied Bandwidth 99%

Test Mode: 802.11n HT20 & Ch.118



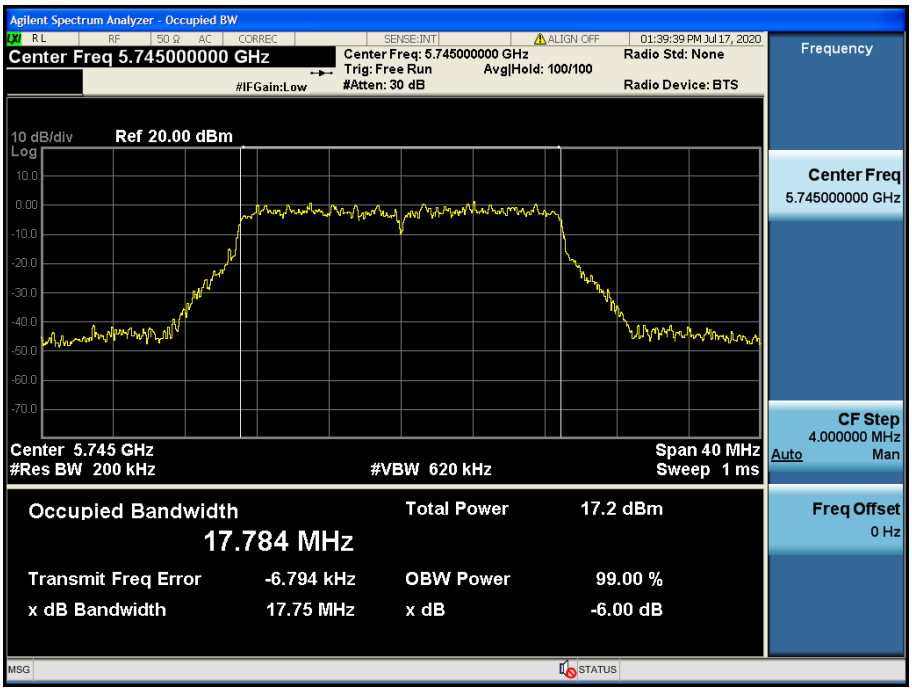
Occupied Bandwidth 99%

Test Mode: 802.11n HT20 & Ch.144

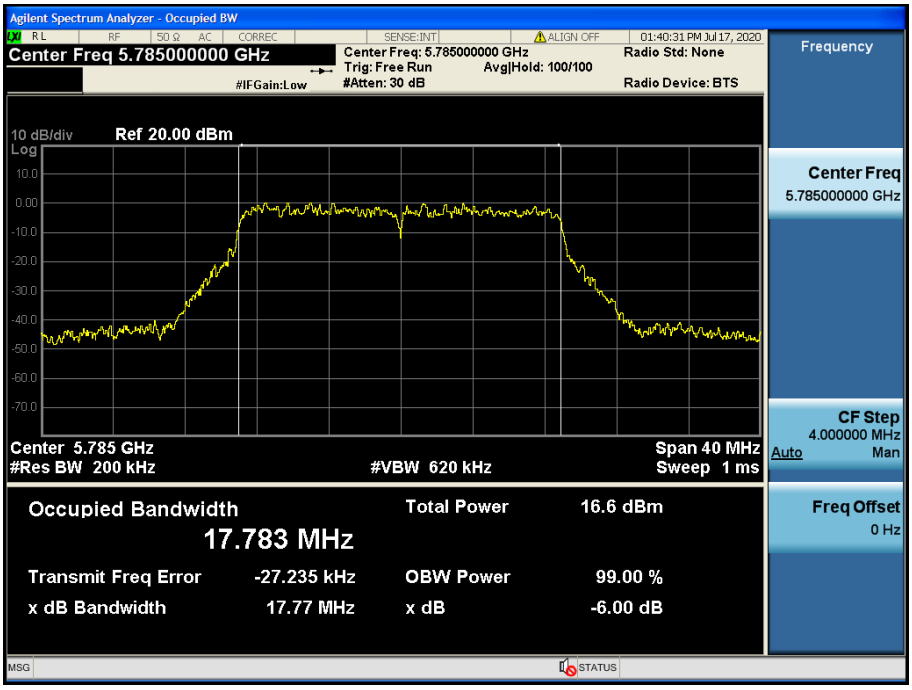


Occupied Bandwidth 99%

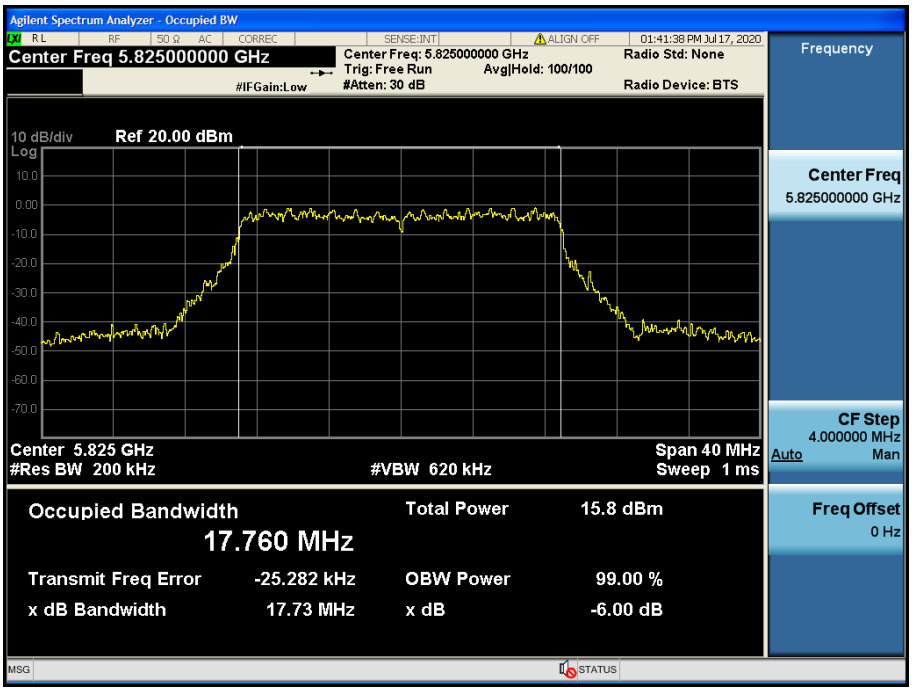
Test Mode: 802.11n HT20 & Ch.149



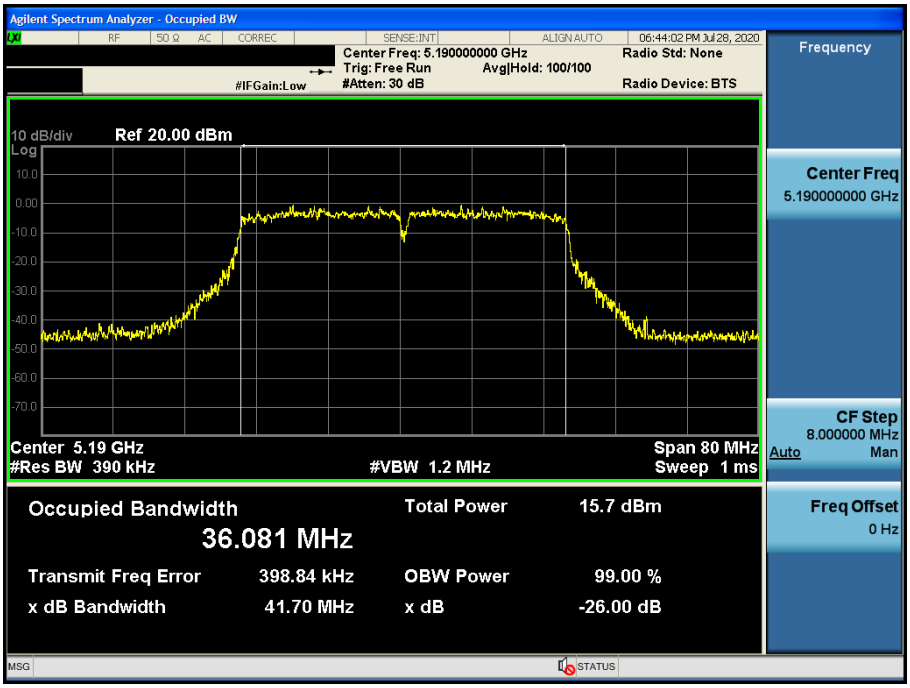
Occupied Bandwidth 99% Test Mode: 802.11n HT20 & Ch.157



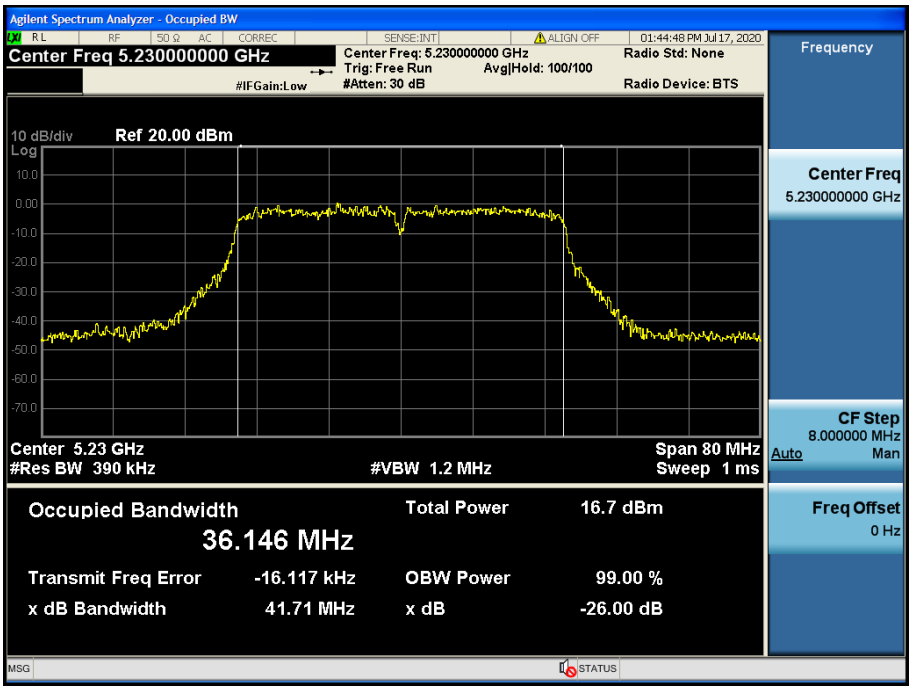
Occupied Bandwidth 99% Test Mode: 802.11n HT20 & Ch.165



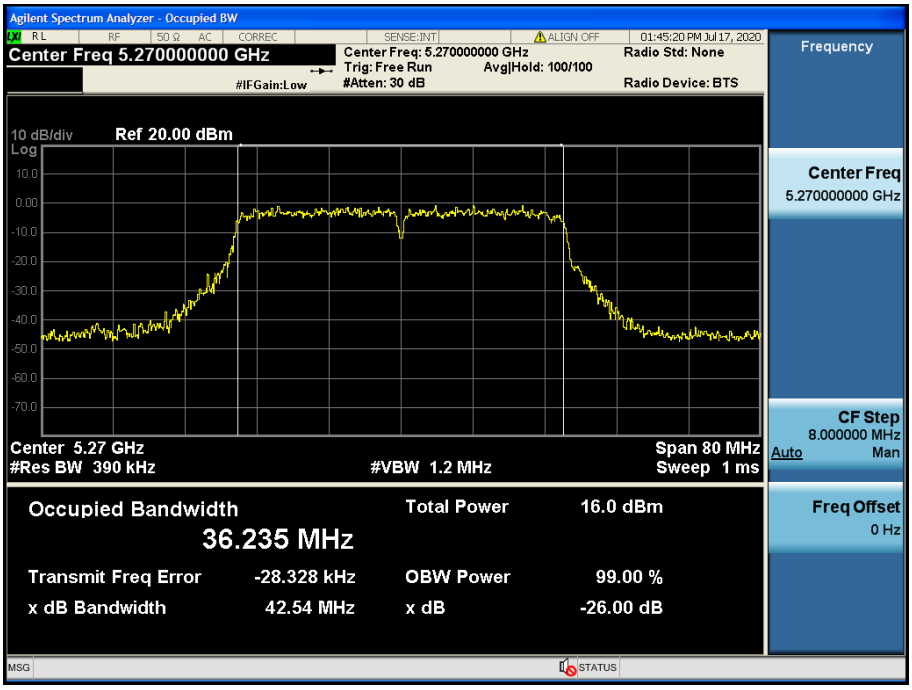
Occupied Bandwidth 99% Test Mode: 802.11n HT40 & Ch.38



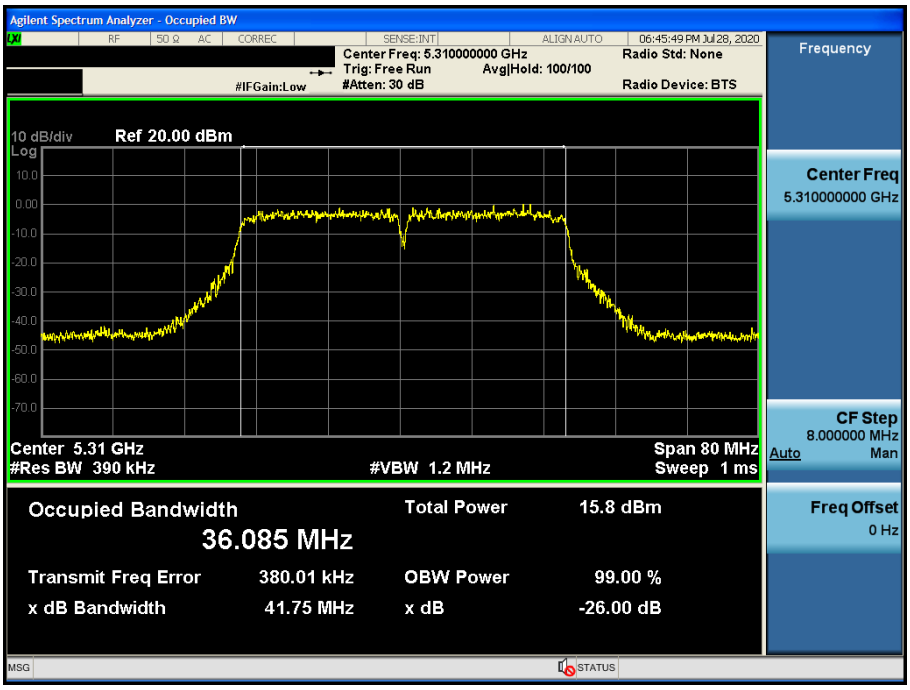
Occupied Bandwidth 99% Test Mode: 802.11n HT40 & Ch.46



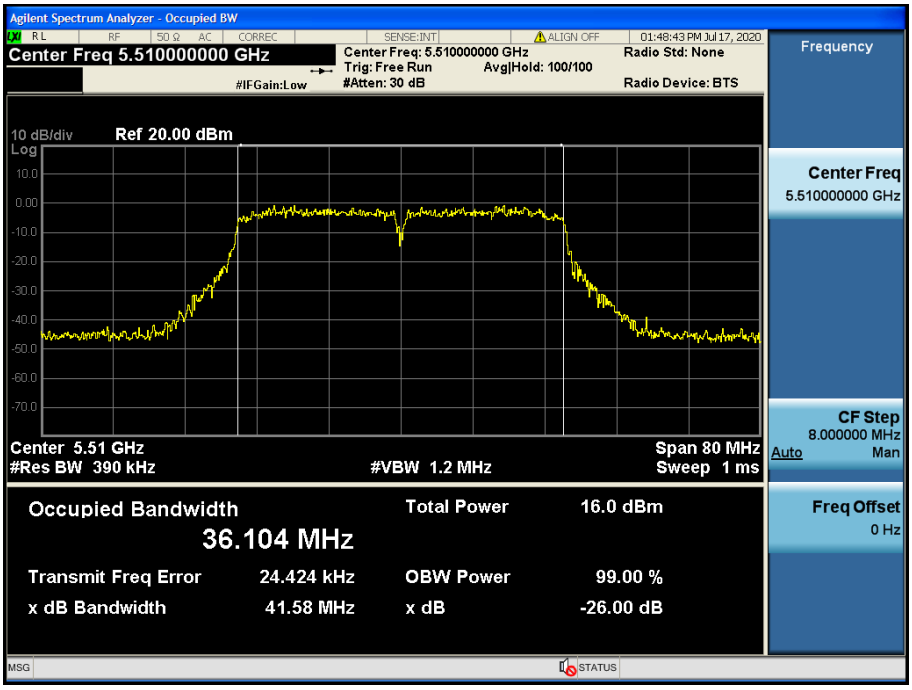
Occupied Bandwidth 99% Test Mode: 802.11n HT40 & Ch.54



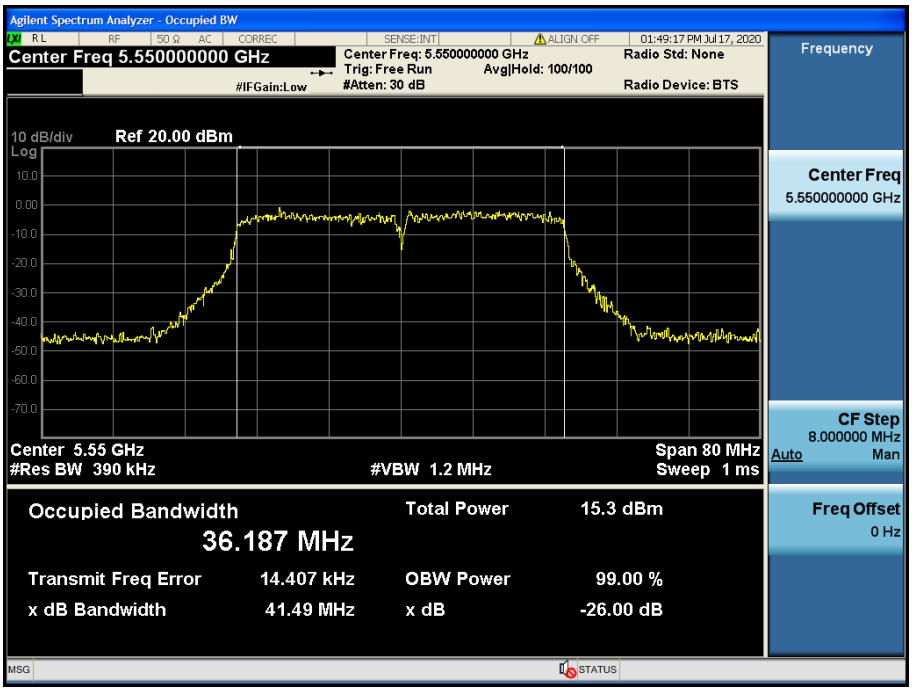
Occupied Bandwidth 99% Test Mode: 802.11n HT40 & Ch.62



Occupied Bandwidth 99% Test Mode: 802.11n HT40 & Ch.102

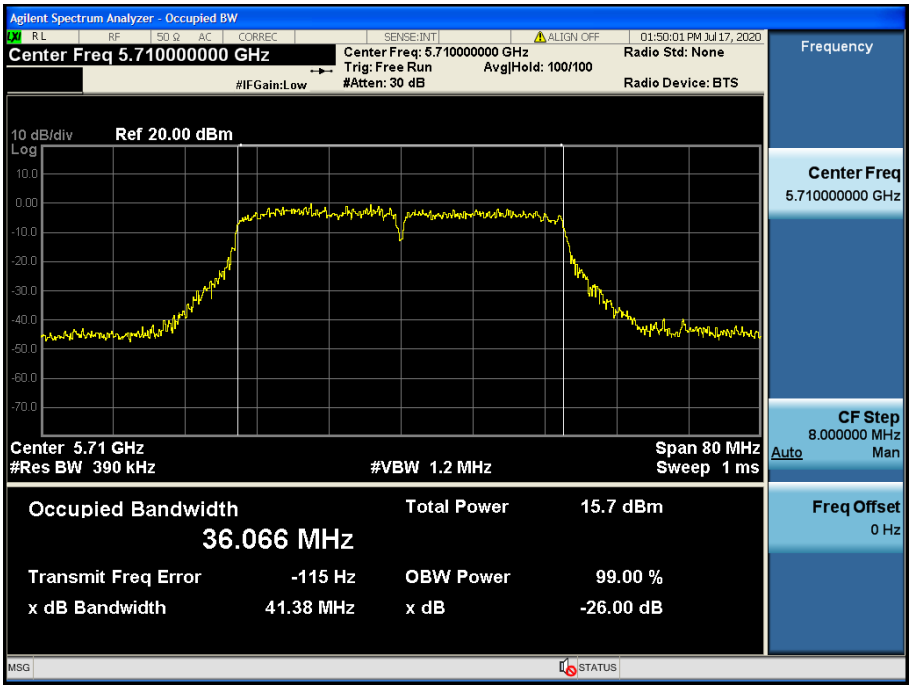


Occupied Bandwidth 99% Test Mode: 802.11n HT40 & Ch.110



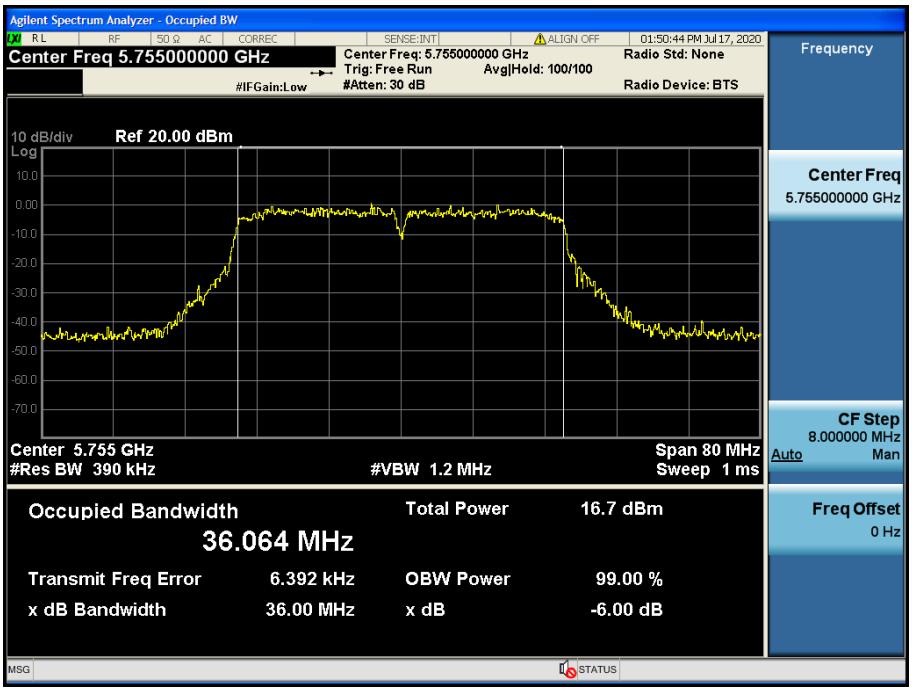
Occupied Bandwidth 99%

Test Mode: 802.11n HT40 & Ch.142

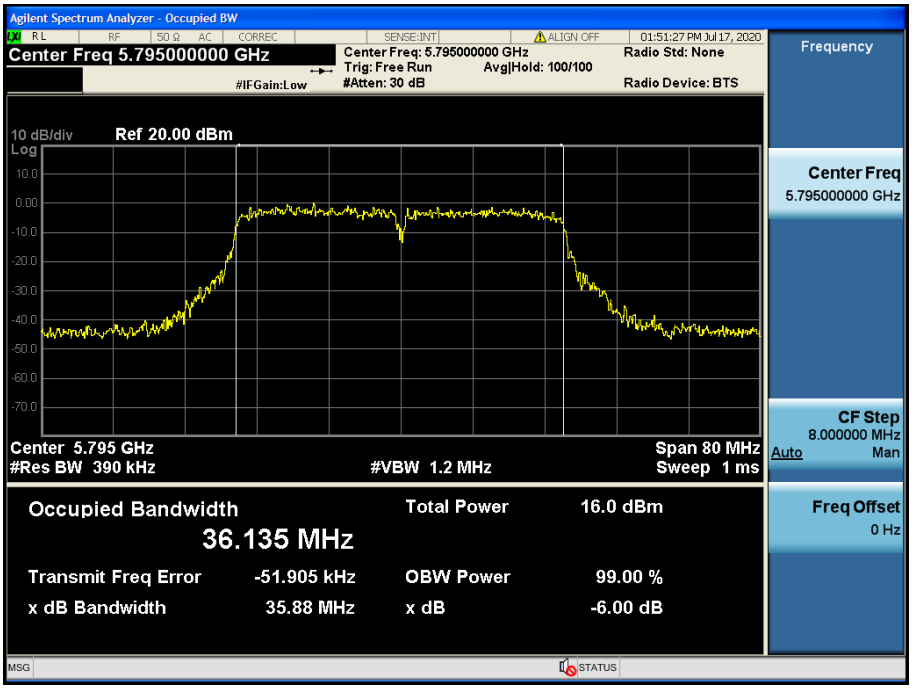


Occupied Bandwidth 99%

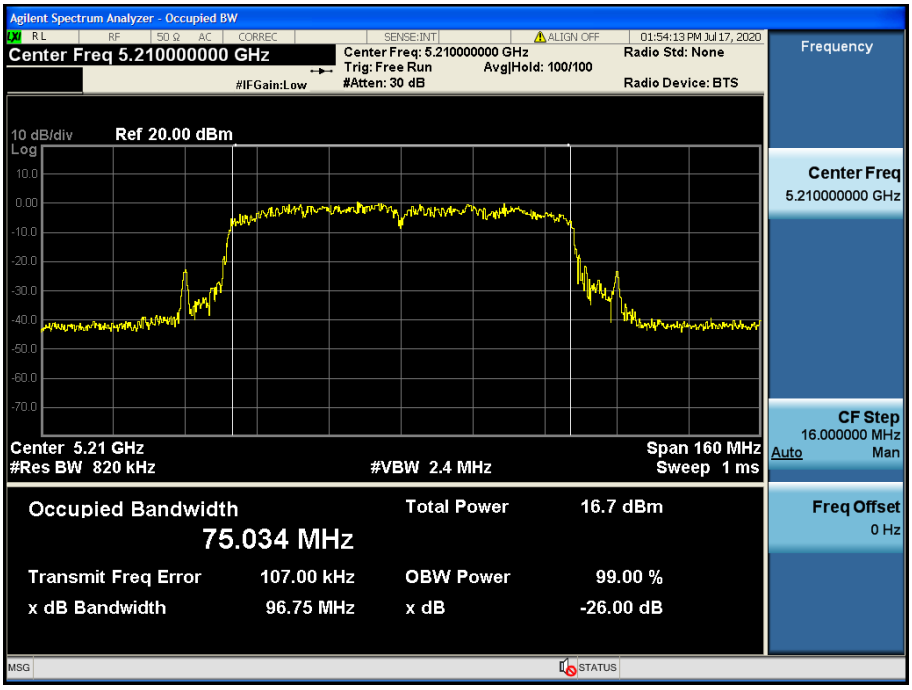
Test Mode: 802.11n HT40 & Ch.151



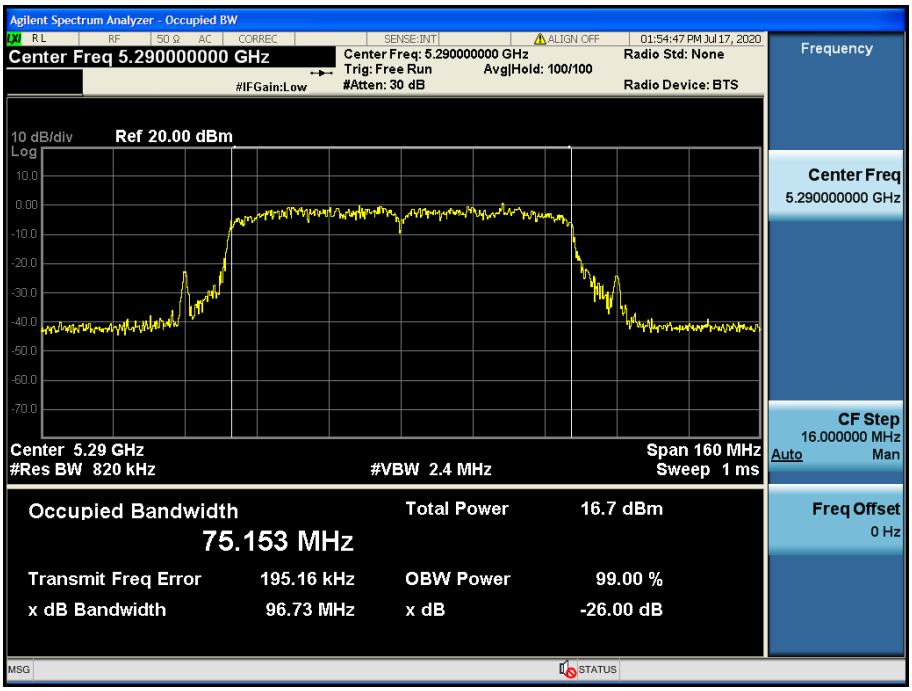
Occupied Bandwidth 99% Test Mode: 802.11n HT40 & Ch.159



Occupied Bandwidth 99% Test Mode: 802.11ac VHT80 & Ch.42

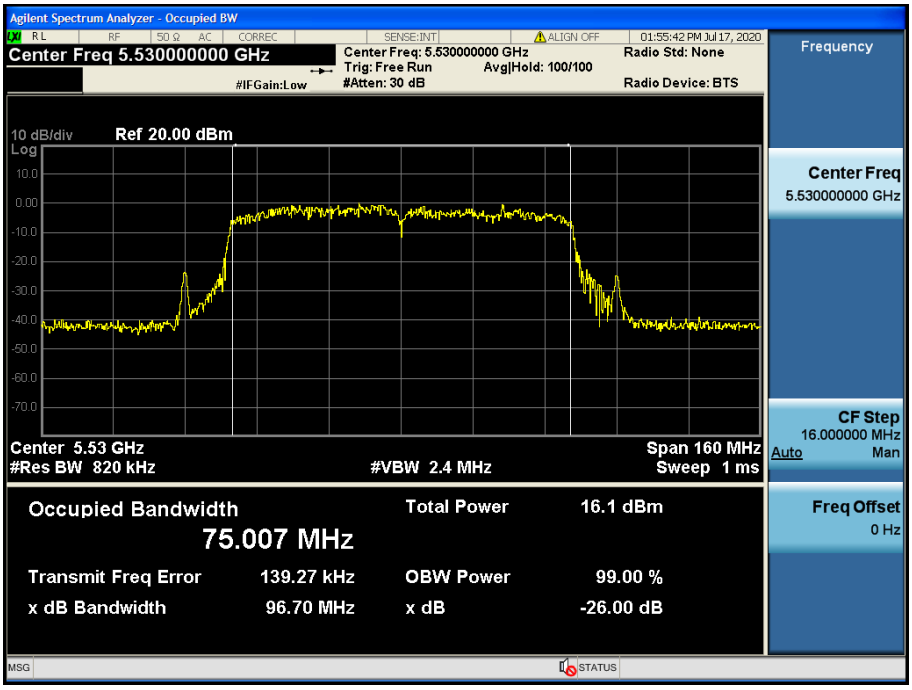


Occupied Bandwidth 99% Test Mode: 802.11ac VHT80 & Ch.58



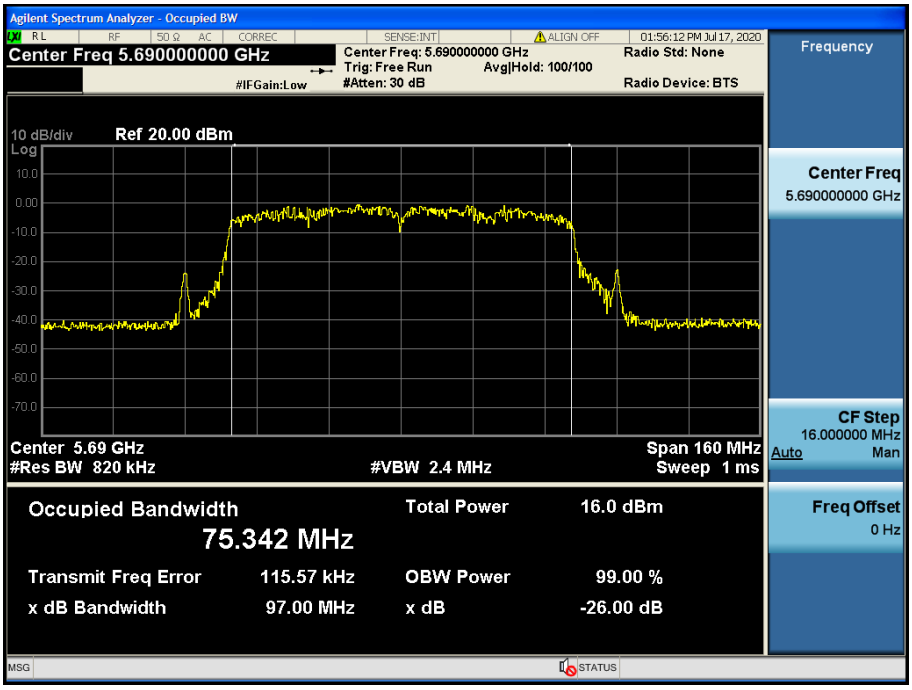
Occupied Bandwidth 99%

Test Mode: 802.11ac VHT80 & Ch.106

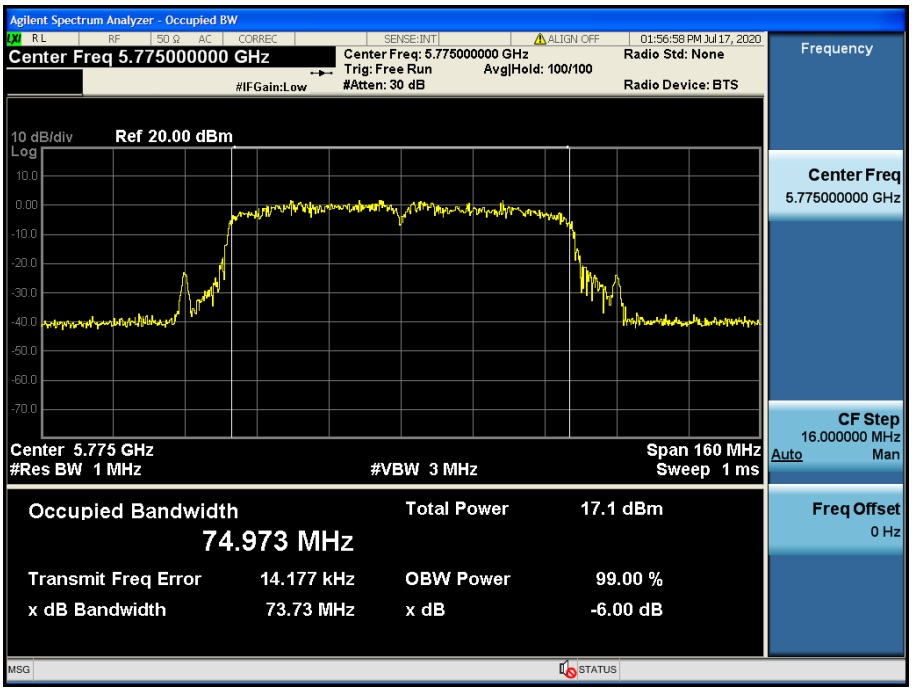


Occupied Bandwidth 99%

Test Mode: 802.11ac VHT80 & Ch.138



Occupied Bandwidth 99% Test Mode: 802.11ac VHT80 & Ch.155



9. LIST OF TEST EQUIPMENT

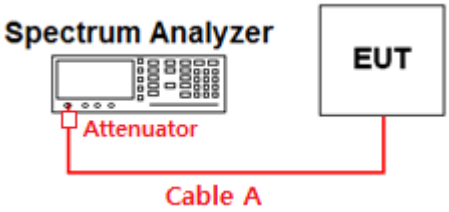
Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/16	MY50410357
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/16	MY48011700
Spectrum Analyzer	Agilent Technologies	N9020A	19/12/16	20/12/16	MY48010133
Spectrum Analyzer	Agilent Technologies	N9030A	19/12/16	20/12/16	MY53310140
DC Power Supply	Agilent Technologies	66332A	19/06/25 20/06/24	20/06/25 21/06/24	MY43000211
Multimeter	FLUKE	17B	19/12/16	20/12/16	26030065WS
Signal Generator	Rohde Schwarz	SMBV100A	19/12/16	20/12/16	255571
Signal Generator	ANRITSU	MG3695C	19/12/16	20/12/16	173501
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-1
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-2
Thermohygrometer	BODYCOM	BJ5478	19/07/03 20/07/01	20/07/03 21/07/01	N/A
HYGROMETER	TESTO	608-H1	20/01/21	21/01/21	34862883
Loop Antenna	ETS-Lindgren	6502	19/09/18	21/09/18	00226186
BILOG ANTENNA	Schwarzbeck	VULB 9160	19/04/23	21/04/23	9160-3362
Horn Antenna	ETS-Lindgren	3115	20/01/30	22/01/30	6419
Horn Antenna	Schwarzbeck	BBHA 9120C	19/12/04	21/12/04	9120C-561
Horn Antenna	A.H.Systems Inc.	SAS-574	19/07/03	21/07/03	155
PreAmplifier	tsj	MLA-0118-B01-40	19/12/16	20/12/16	1852267
PreAmplifier	tsj	MLA-1840-J02-45	19/06/27 20/06/24	20/06/27 21/06/24	16966-10728
PreAmplifier	H.P	8447D	19/12/16	20/12/16	2944A07774
High Pass Filter	Wainwright Instruments	WHKX12-935-1000-15000-40SS	19/06/26 20/06/24	20/06/26 21/06/24	8
High Pass Filter	Wainwright Instruments	WHKX10-2838-3300-18000-60SS	19/06/26 20/06/24	20/06/26 21/06/24	1
High Pass Filter	Wainwright Instruments	WHNX8.0/26.5-6SS	19/06/27 20/06/24	20/06/27 21/06/24	3
Attenuator	Hefei Shunze	SS5T2.92-10-40	19/06/27 20/06/24	20/06/27 21/06/24	16012202
Attenuator	SRTechnology	F01-B0606-01	19/06/27 20/06/24	20/06/27 21/06/24	13092403
Attenuator	Aeroflex/Weinschel	56-3	19/06/27 20/06/24	20/06/27 21/06/24	Y2370
Attenuator	SMAJK	SMAJK-2-3	19/06/27 20/06/24	20/06/27 21/06/24	2
Attenuator	SMAJK	SMAJK-50-10	19/06/25 20/06/24	20/06/25 21/06/24	15081901
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2488B MA2491A	20/01/02	21/01/02	0910025 0845333
EMI Test Receiver	ROHDE&SCHWARZ	ESR	19/12/17	20/12/17	101767
PULSE LIMITER	Rohde Schwarz	ESH3-Z2	19/09/17	20/09/17	101333
LISN	SCHWARZBECK	NSLK 8128 RC	19/11/04	20/11/04	8128 RC-387
Cable	Junkosha	MWX241	20/01/13	21/01/13	G-04
Cable	Junkosha	MWX241	20/01/13	21/01/13	G-07
Cable	DT&C	Cable	20/01/13	21/01/13	G-13
Cable	DT&C	Cable	20/01/13	21/01/13	G-14
Cable	HUBER+SUHNER	SUCOFLEX 104	20/01/13	21/01/13	G-15
Cable	Radiall	TESTPRO3	20/01/16	21/01/16	M-01
Cable	Junkosha	MWX315	20/01/16	21/01/16	M-05
Cable	Junkosha	MWX221	20/01/16	21/01/16	M-06
Cable	Radiall	TESTPRO3	20/01/16	21/01/16	RF-82
Test Software	tsj	Raidated Emission Measurement	NA	NA	Version 2.00.0177
Test Software	tsj	Noise Terminal Measurement	NA	NA	Version 2.00.0170

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017
Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

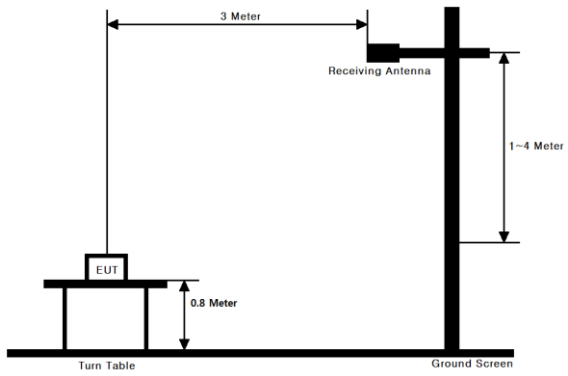
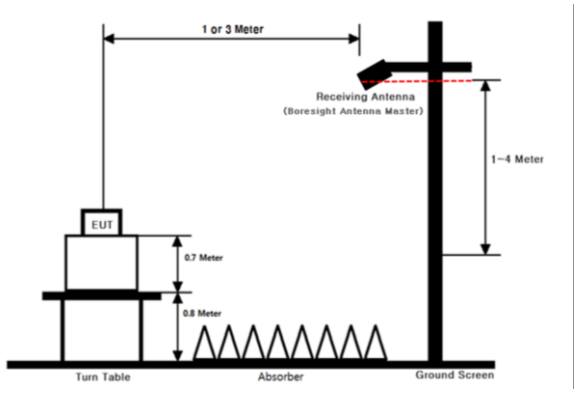
APPENDIX I

Test set up Diagram

▪ Conducted Measurement



▪ Radiated Measurement

Below 1 GHz	Above 1 GHz
	

APPENDIX II

Duty Cycle Information

▣ Test Procedure

Duty Cycle [X = On Time / (On + Off time)] is measured using Measurement Procedure **of KDB789033 D02v02r01**

1. Set the center frequency of the spectrum analyzer to the center frequency of the transmission.
2. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value.
3. Set VBW ≥ RBW. Set detector = peak.
4. Note : The zero-span measurement method shall not be used unless both **RBW and VBW are > 50/*T***, where *T* is defined in section II.B.1.a), and **the number of sweep points across duration *T* exceeds 100**. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if *T* ≤ 16.7 microseconds.)

   T : The minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
   (***T* = On time** of the above table since the EUT operates with above fixed Duty Cycle and it is the minimum On time)

▣ Test Results:

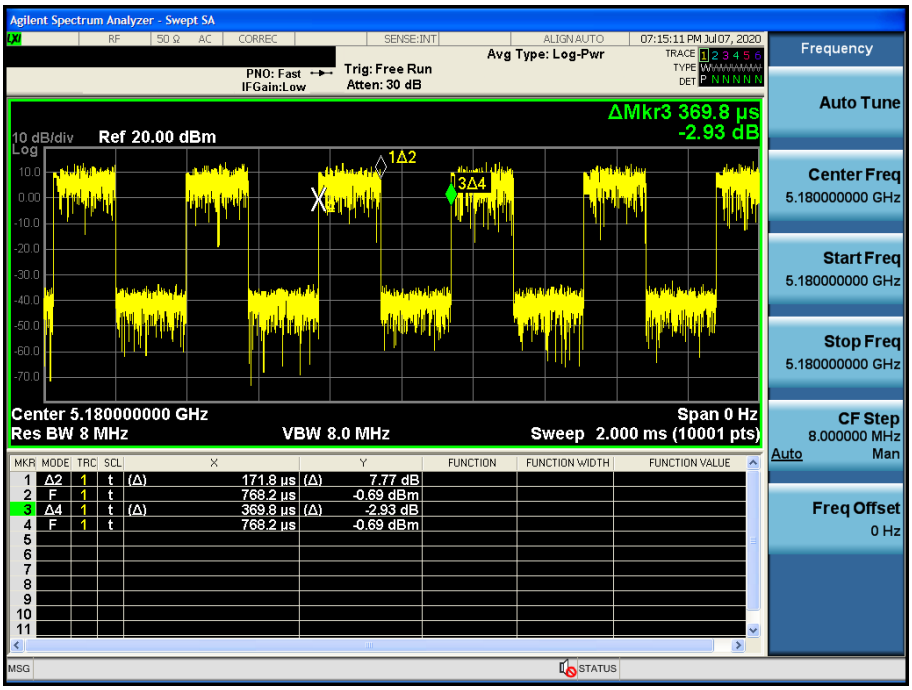
Duty cycle

Mode	Data Rate	Tested Frequency [MHz]	Maximum Achievable Duty Cycle (*x*) = On / (On+Off)			Duty Cycle Correction Factor [dB]	50/*T* [kHz]
			On Time [ms]	(On+Off) Time [ms]	*x*		
802.11a	54Mbps	5180	0.172	0.370	0.4646	3.33	291.04
802.11n (HT20)	MCS7	5180	0.160	0.358	0.4464	3.50	312.50
802.11n (HT40)	MCS7	5190	0.096	0.295	0.3257	4.87	519.75
802.11ac (VHT80)	MCS9	5210	0.056	0.256	0.2192	6.59	891.27

Single Transmit

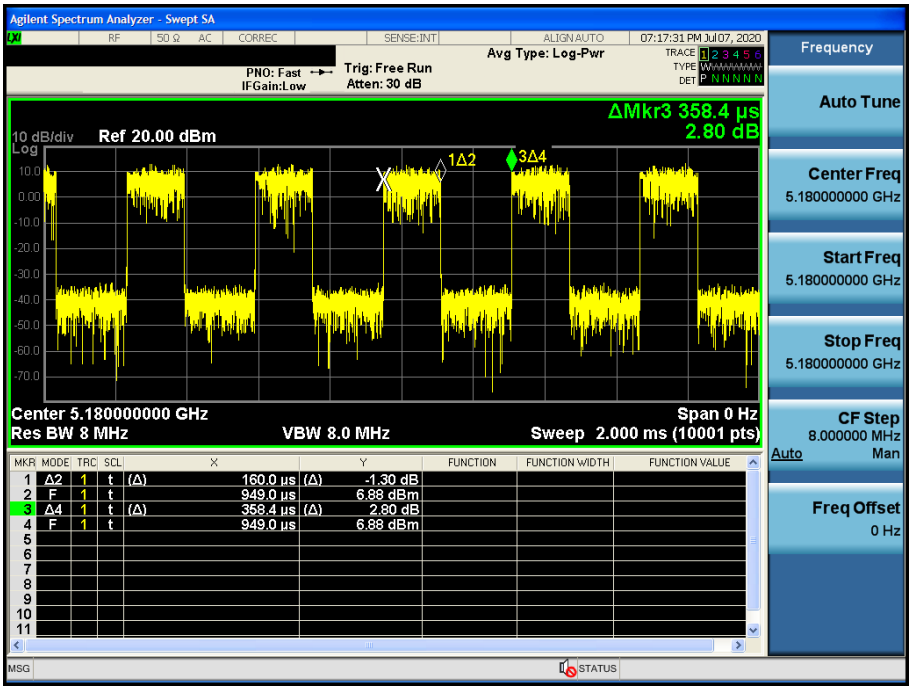
Duty Cycle

Test Mode: 802.11a & Ch.36

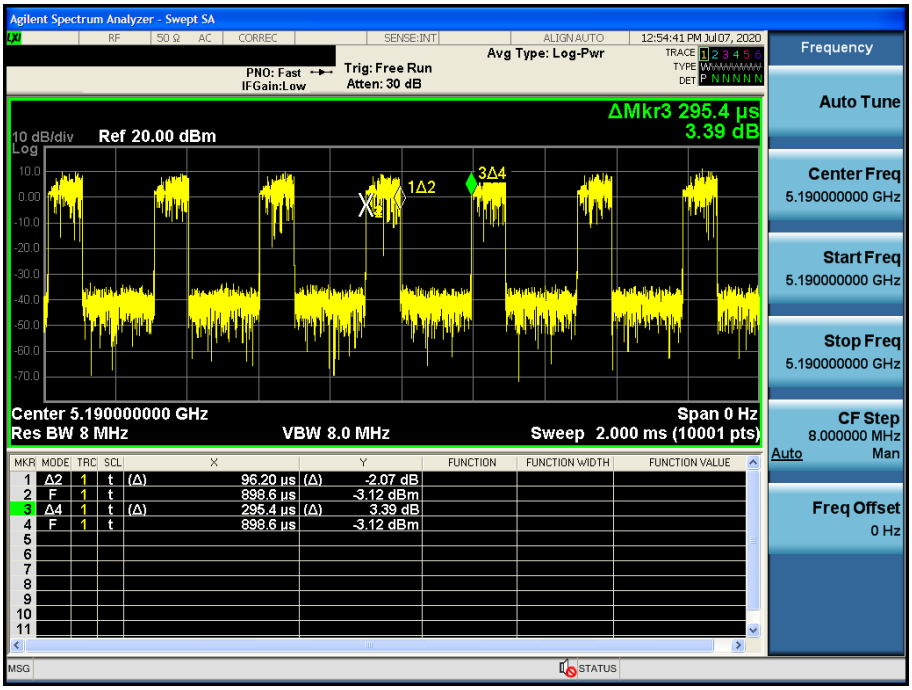


Duty Cycle

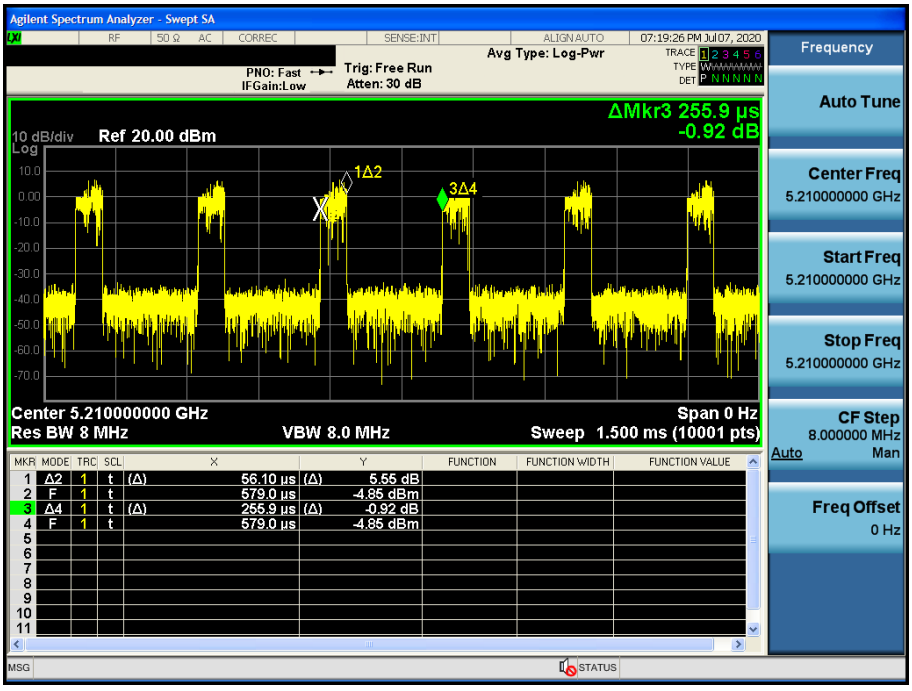
Test Mode: 802.11n HT20 & Ch.36



Duty Cycle Test Mode: 802.11n HT40 & Ch.38



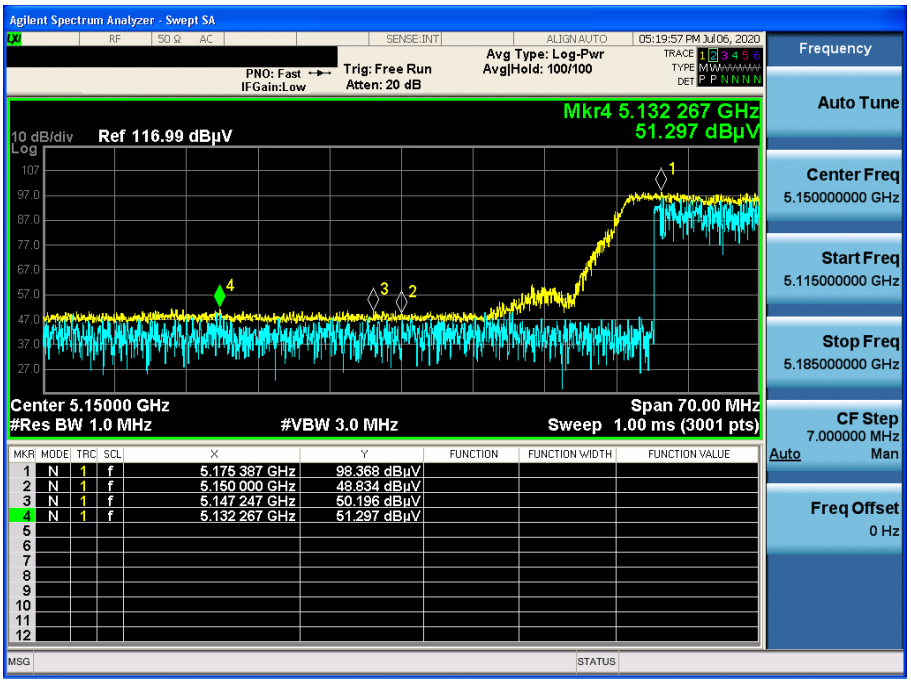
Duty Cycle Test Mode: 802.11ac VHT80 & Ch.42



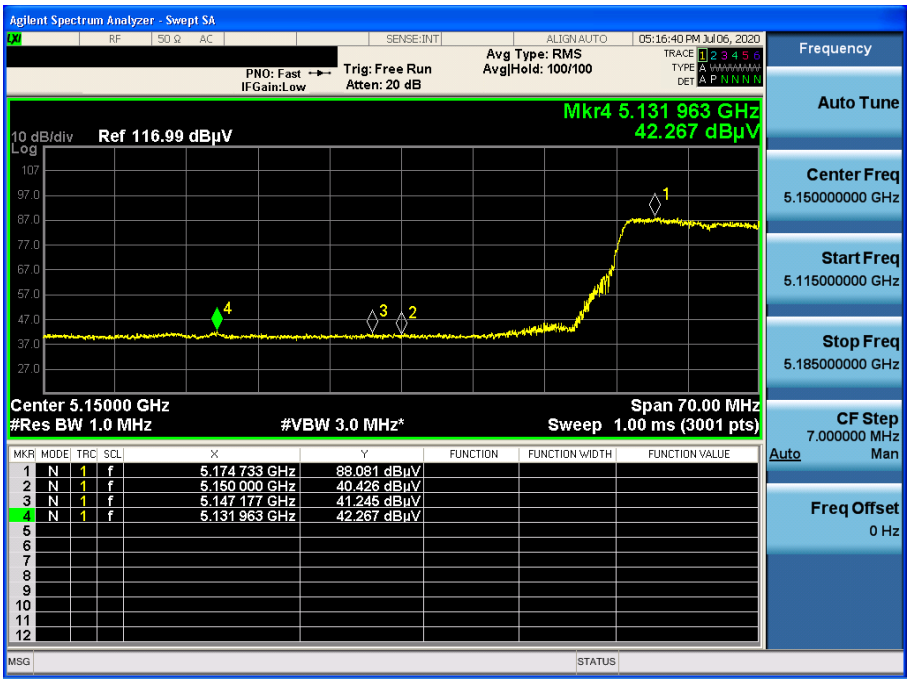
APPENDIX III

Unwanted Emissions (Radiated) Test Plot

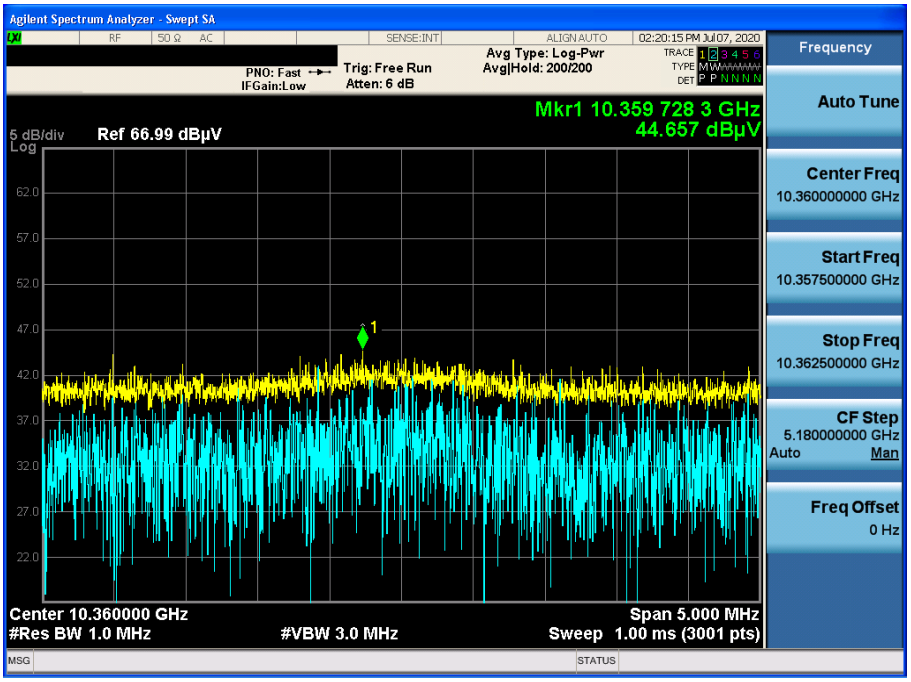
802.11a & U-NII 1 & Ch.36 & Z axis & Ver — Detector Mode : PK



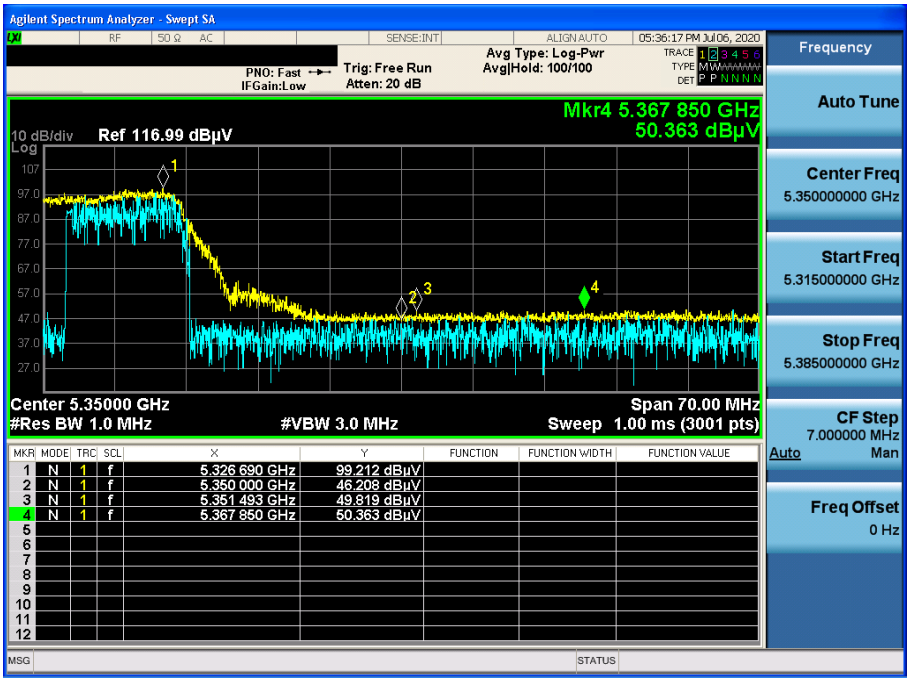
802.11a & U-NII 1 & Ch.36 & Z axis & Ver — Detector Mode : AV



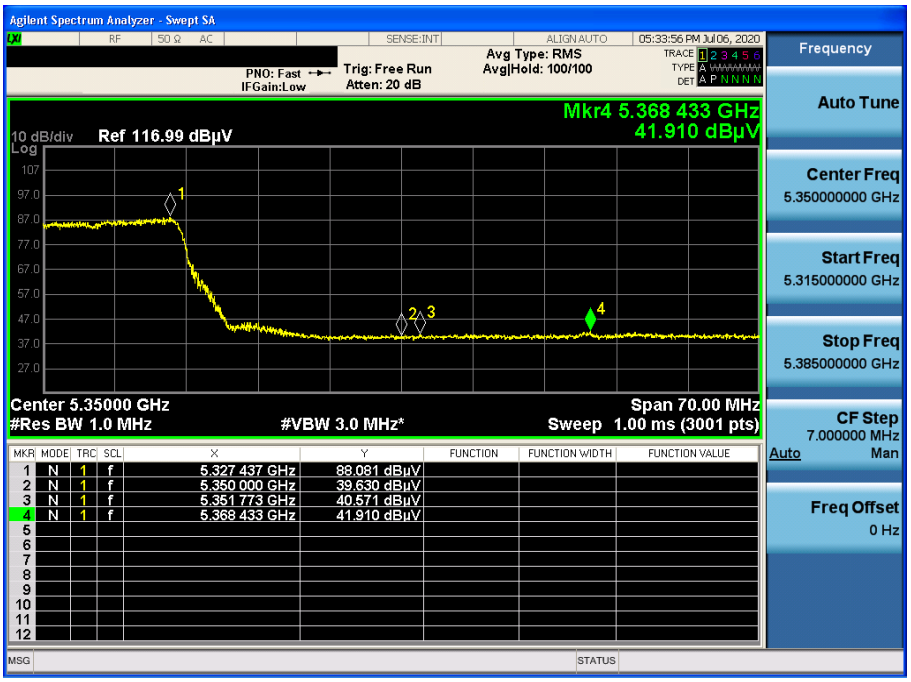
802.11a & U-NII 1 & Ch.36 & X axis & Ver **Detector Mode : PK**



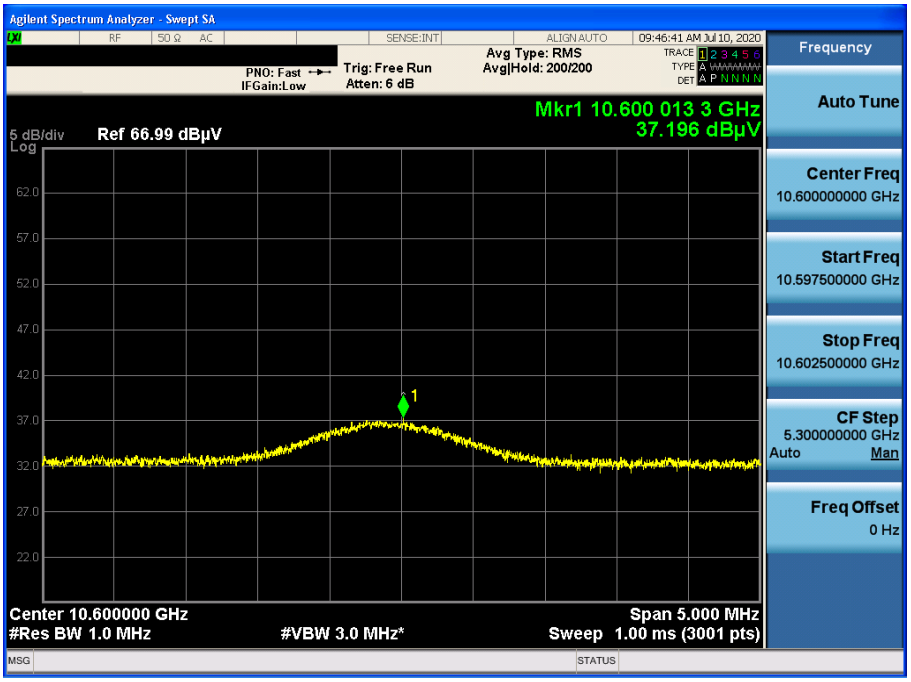
802.11a & U-NII 2A & Ch.64 & X axis & Ver **Detector Mode : PK**



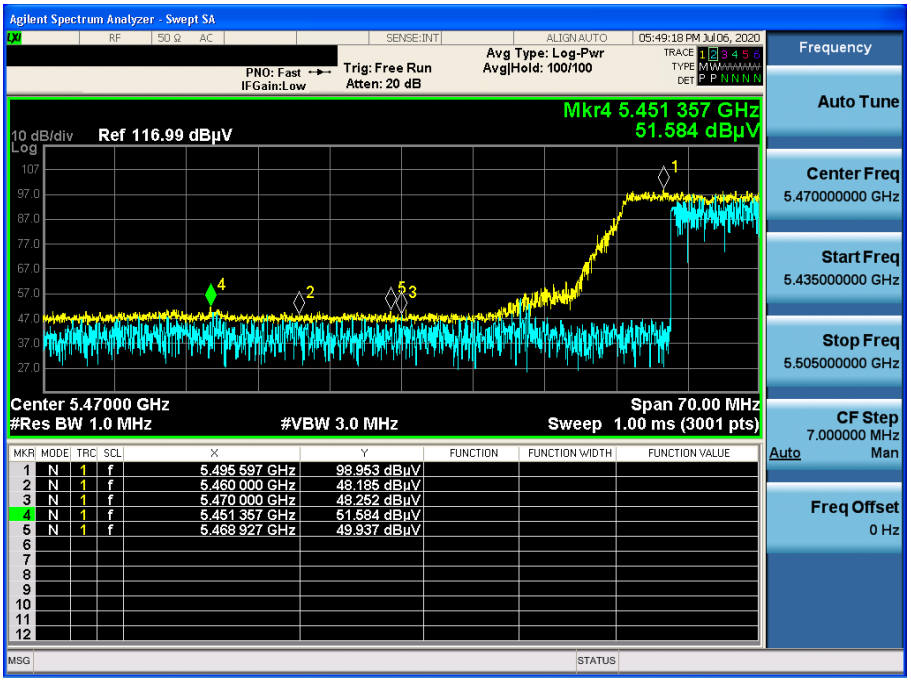
802.11a & U-NII 2A & Ch.64 & X axis & Ver **Detector Mode : AV**



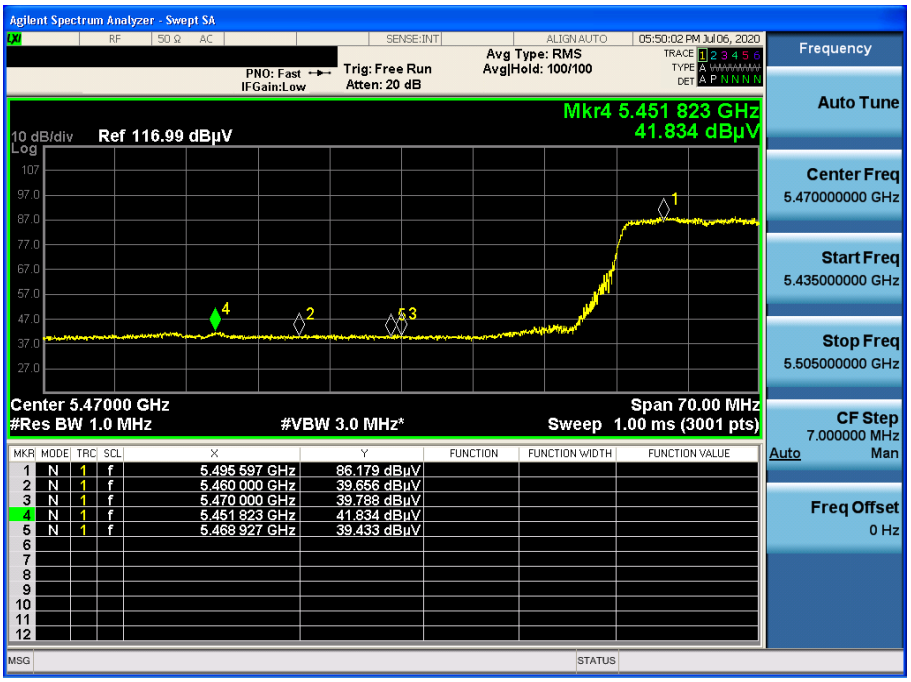
802.11a & U-NII 2A & Ch.60 & X axis & Ver **Detector Mode : AV**



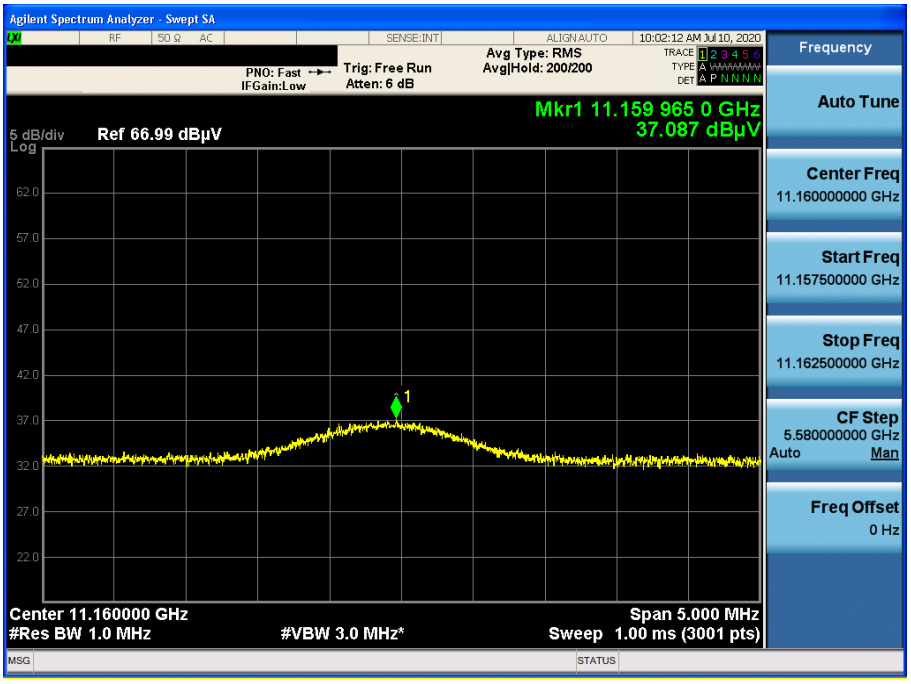
802.11a & U-NII 2C & Ch.100 & Z axis & Ver **Detector Mode : PK**



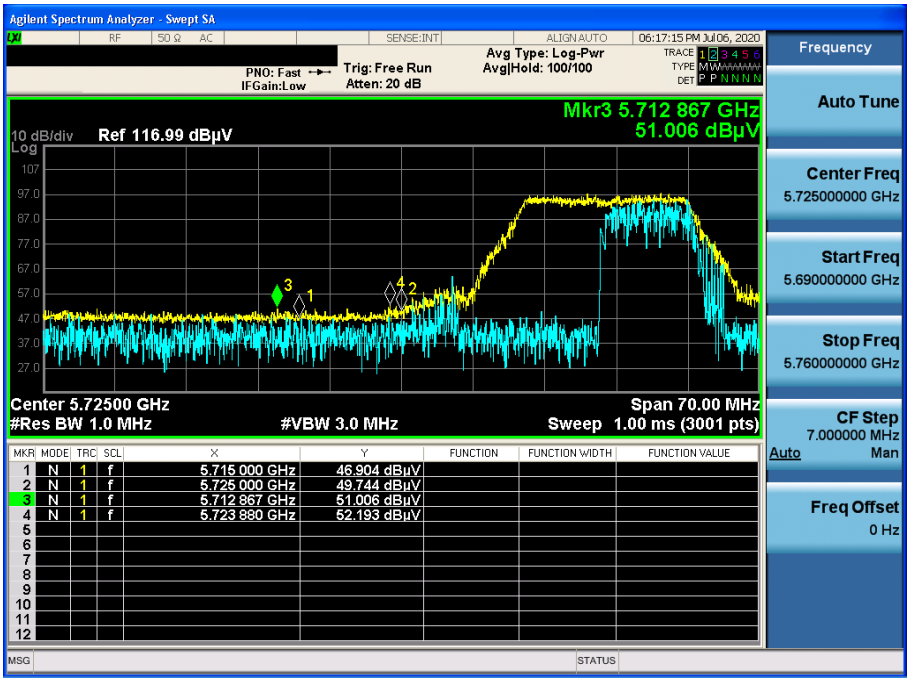
802.11a & U-NII 2C & Ch.100 & Z axis & Ver **Detector Mode : AV**



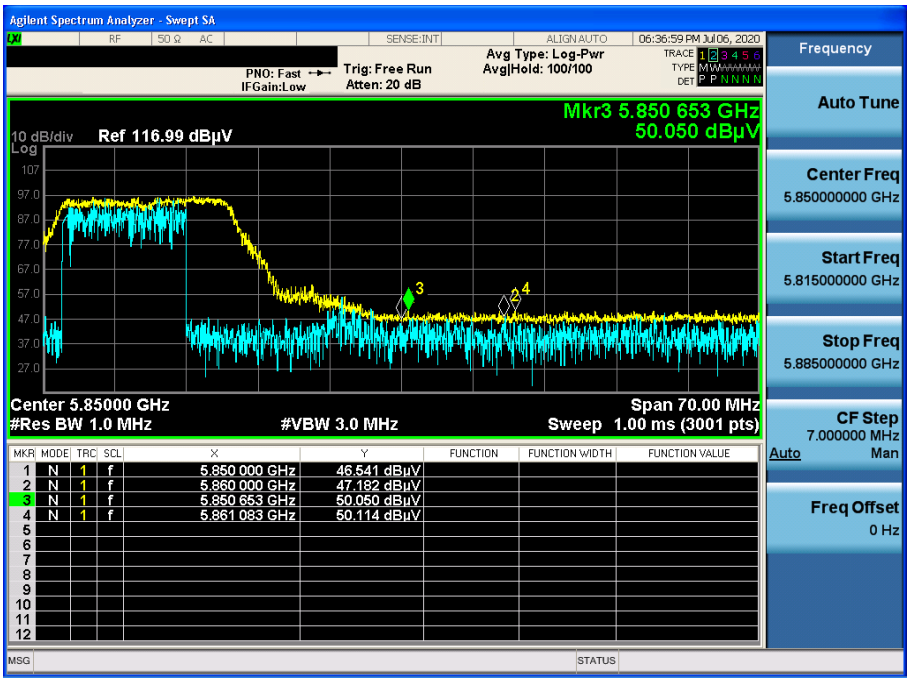
802.11a & U-NII 2C & Ch.116 & X axis & Ver **Detector Mode : AV**



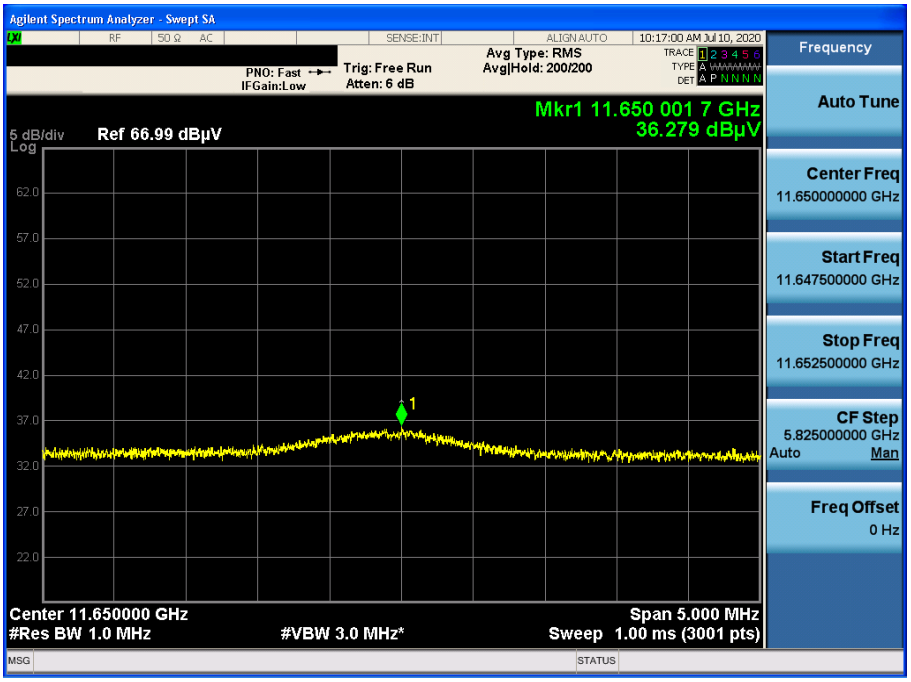
802.11a & U-NII 3 & Ch.149 & Z axis & Ver **Detector Mode : PK**



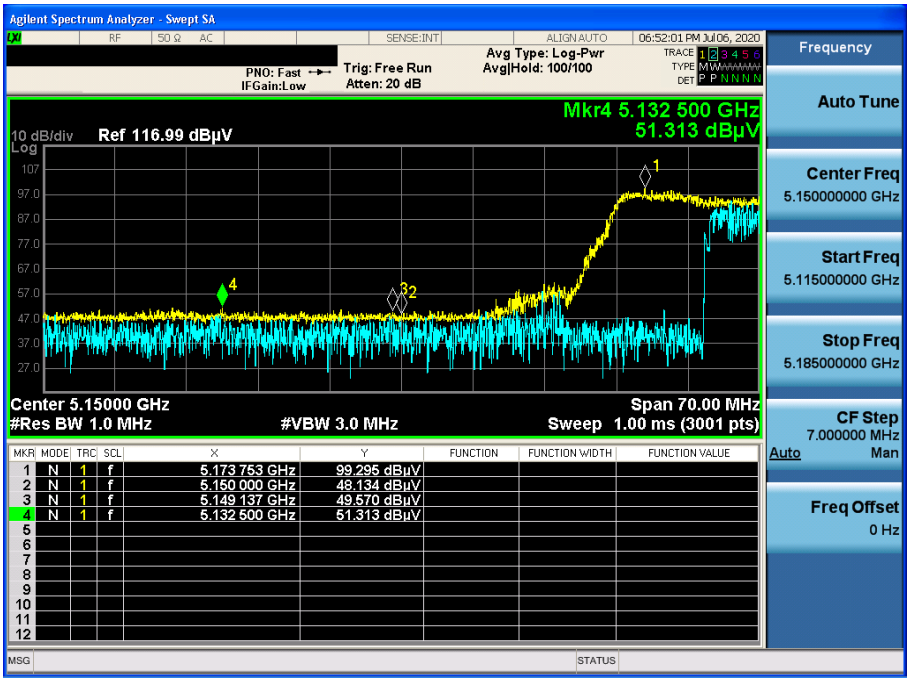
802.11a & U-NII 3 & Ch.165 & Z axis & Ver **Detector Mode : PK**



802.11a & U-NII 3 & Ch.165 & X axis & Ver **Detector Mode : AV**



802.11n(HT20) & U-NII 1 & Ch.36 & X axis & Ver **Detector Mode : PK**



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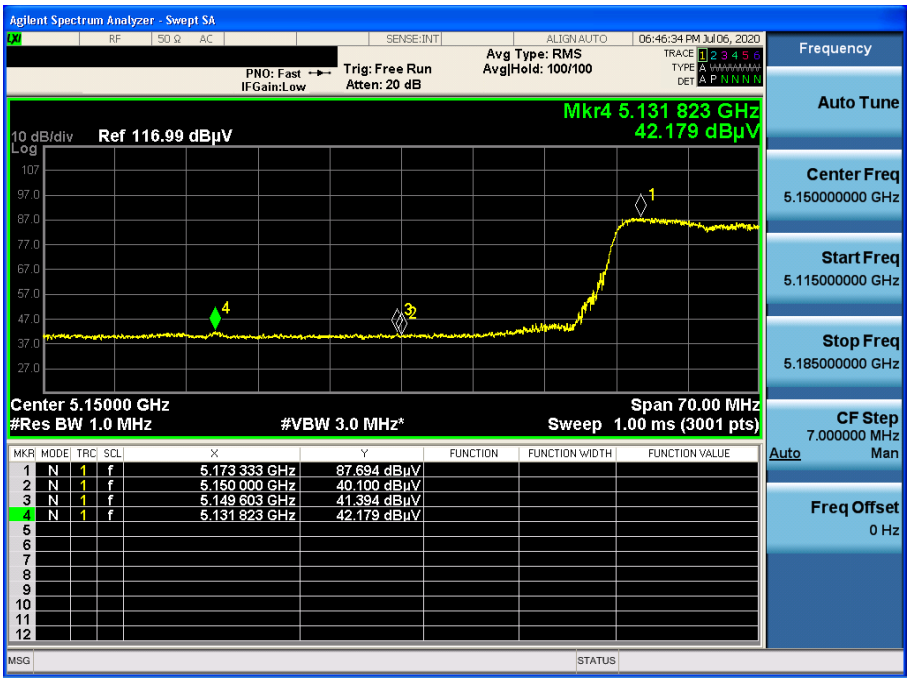
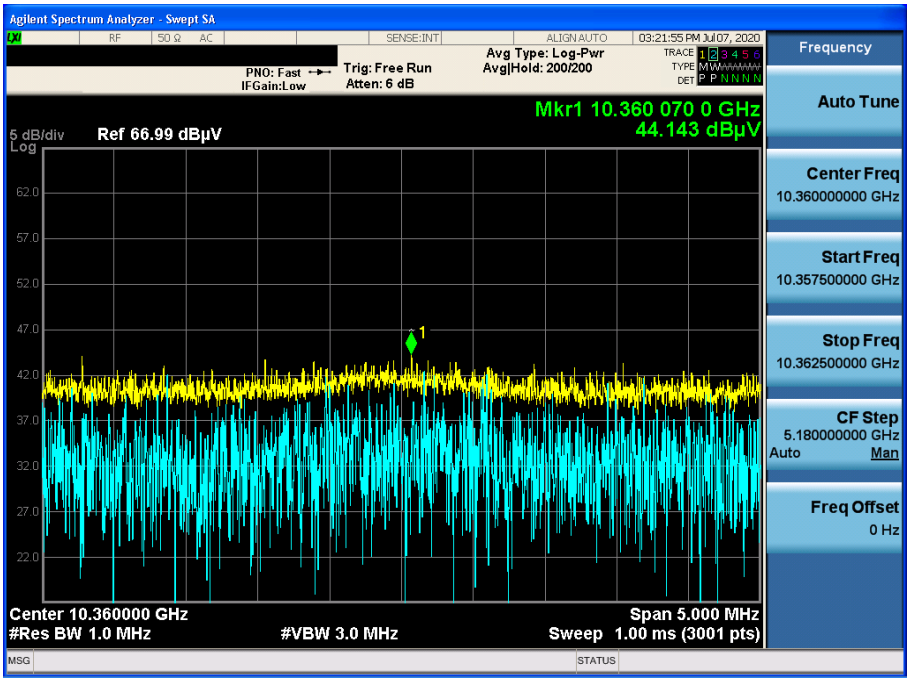
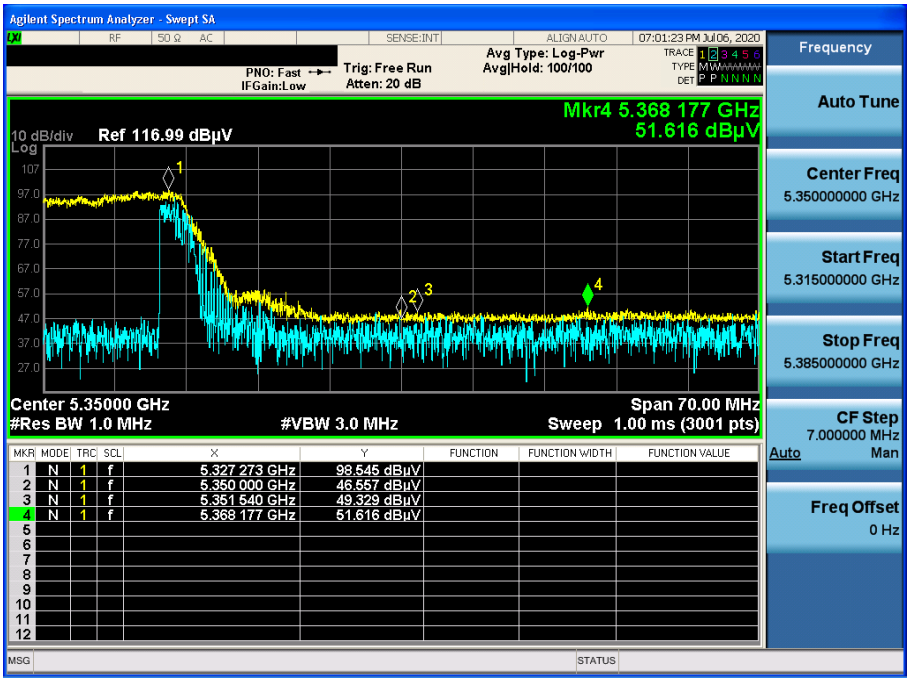


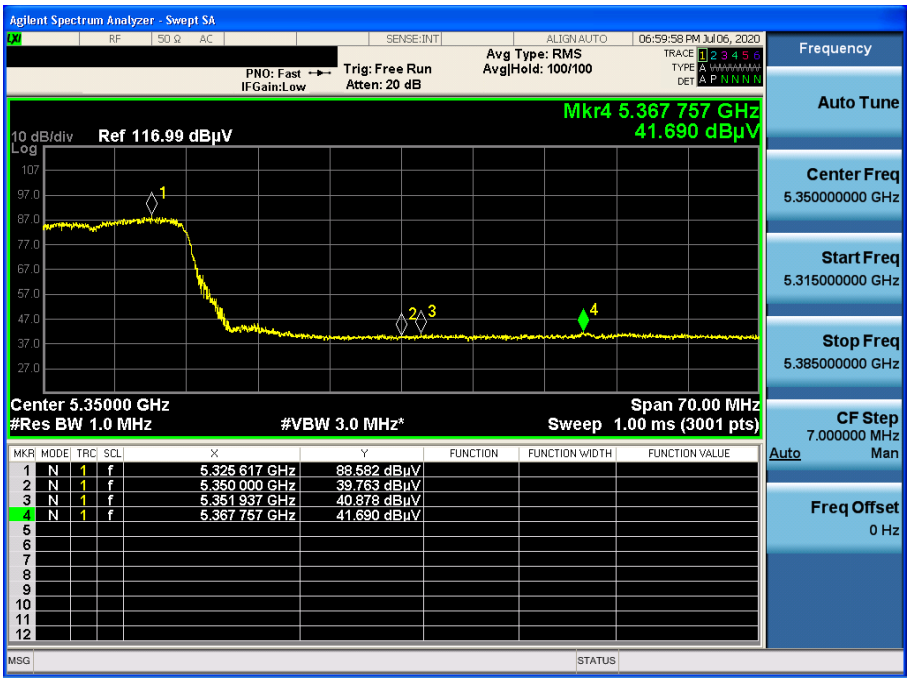
802.11n(HT20) & U-NII 1 & Ch.36 & X axis & Ver Detector Mode : PK



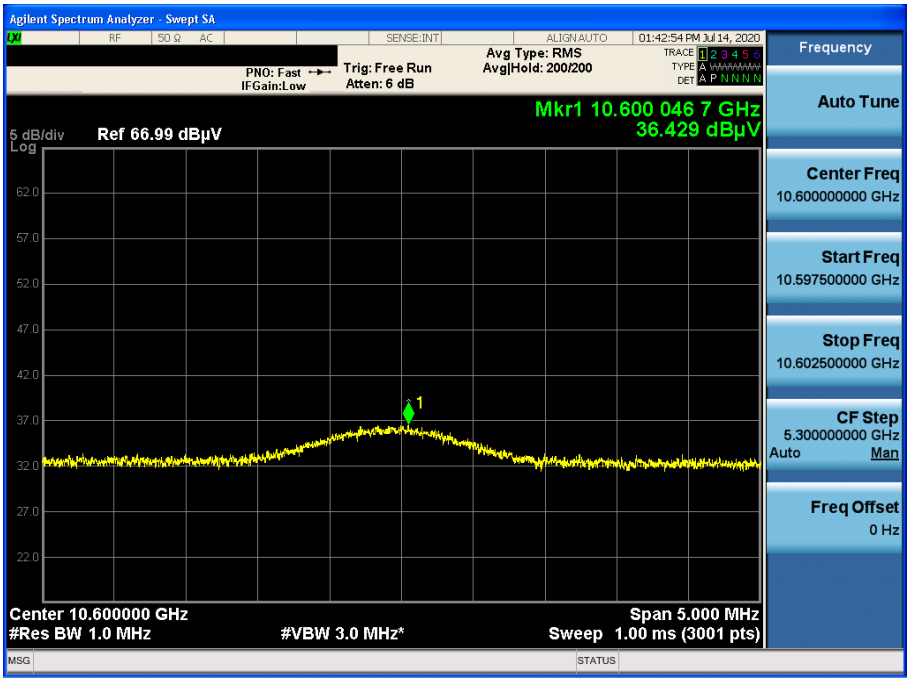
802.11n(HT20) & U-NII 2A & Ch.64 & Y axis & Hor Detector Mode : PK



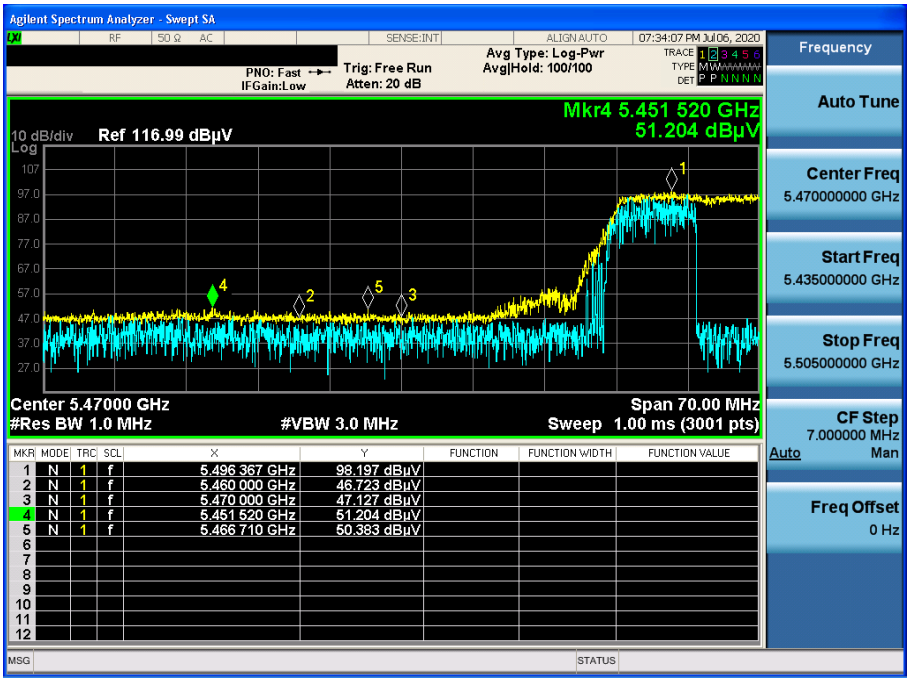
802.11n(HT20) & U-NII 2A & Ch.64 & Y axis & Hor Detector Mode : AV



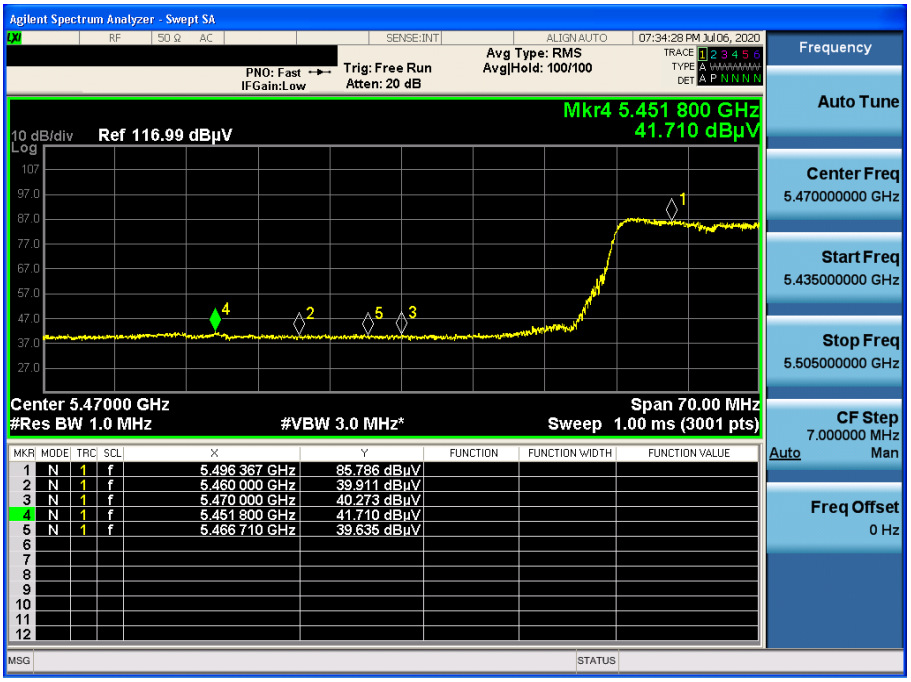
802.11n(HT20) & U-NII 2A & Ch.60 & X axis & Ver Detector Mode : AV



802.11n(HT20) & U-NII 2C & Ch.100 & Z axis & Ver Detector Mode : PK



802.11n(HT20) & U-NII 2C & Ch.100 & Z axis & Ver Detector Mode : AV



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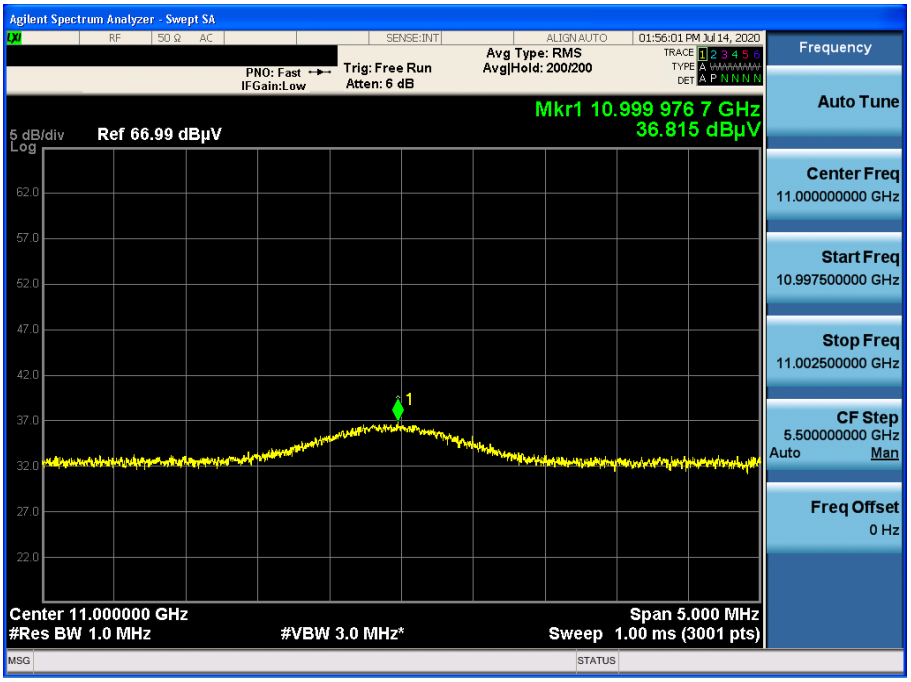
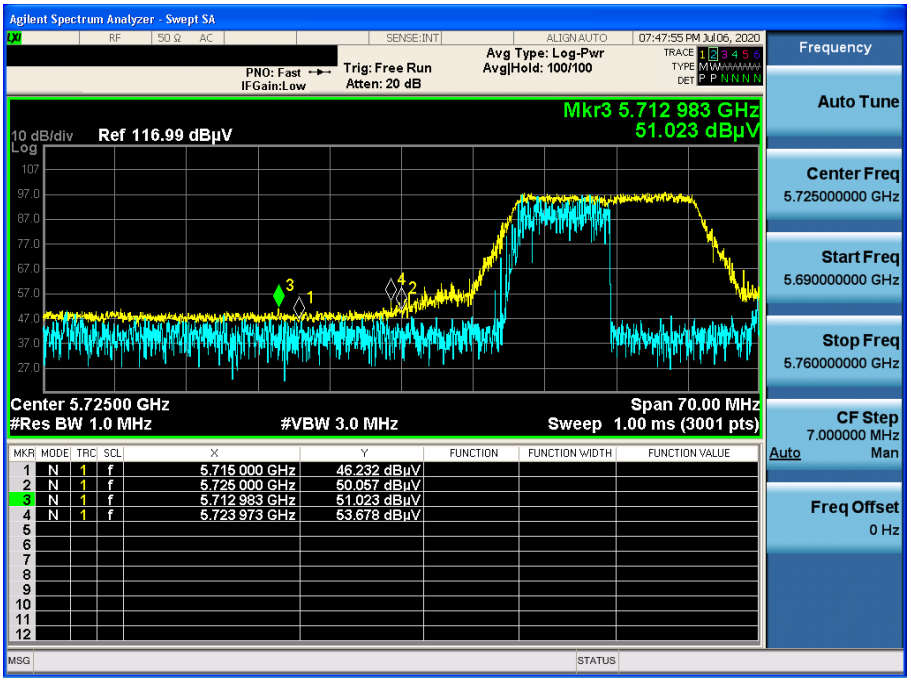
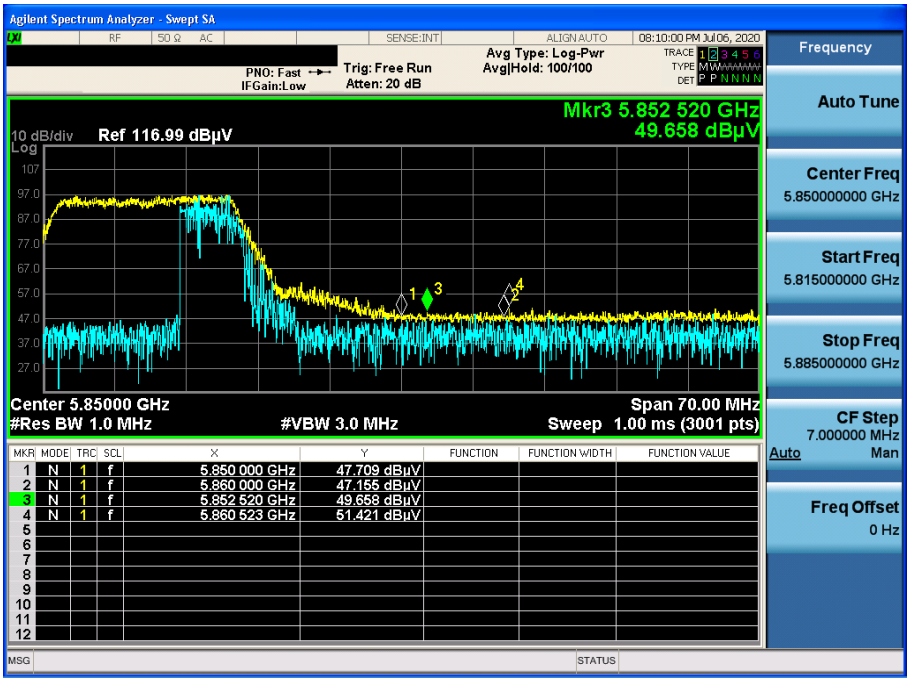


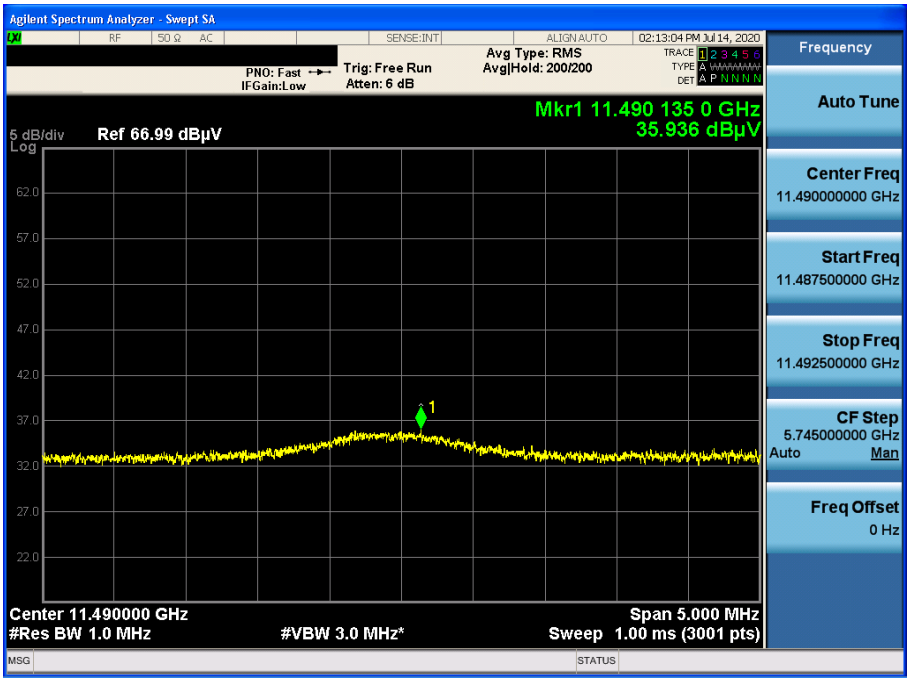
802.11n(HT20) & U-NII 3 & Ch.149 & Z axis & Ver Detector Mode : PK



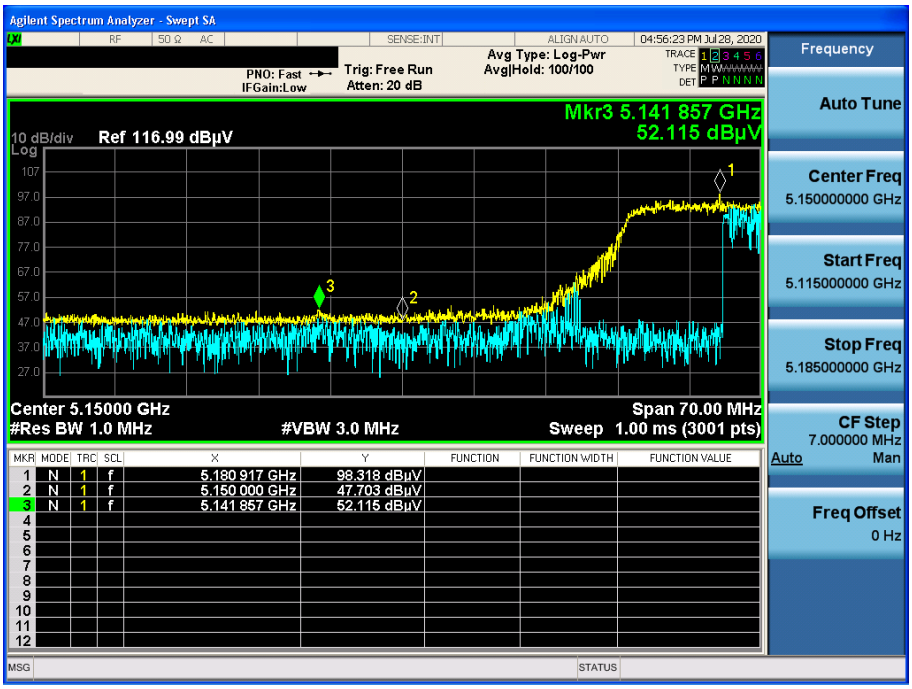
802.11n(HT20) & U-NII 3 & Ch.165 & Z axis & Ver Detector Mode : PK



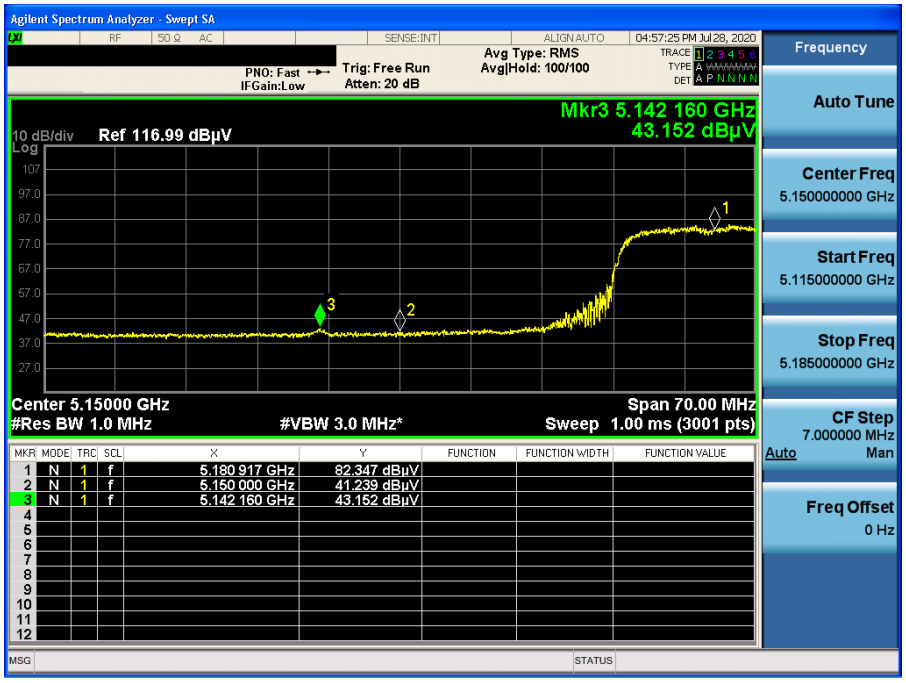
802.11n(HT20) & U-NII 3 & Ch.149 & X axis & Ver Detector Mode : AV



802.11n(HT40) & U-NII 1 & Ch.38 & Z axis & Ver **Detector Mode : PK**



802.11n(HT40) & U-NII 1 & Ch.38 & Z axis & Ver **Detector Mode : AV**



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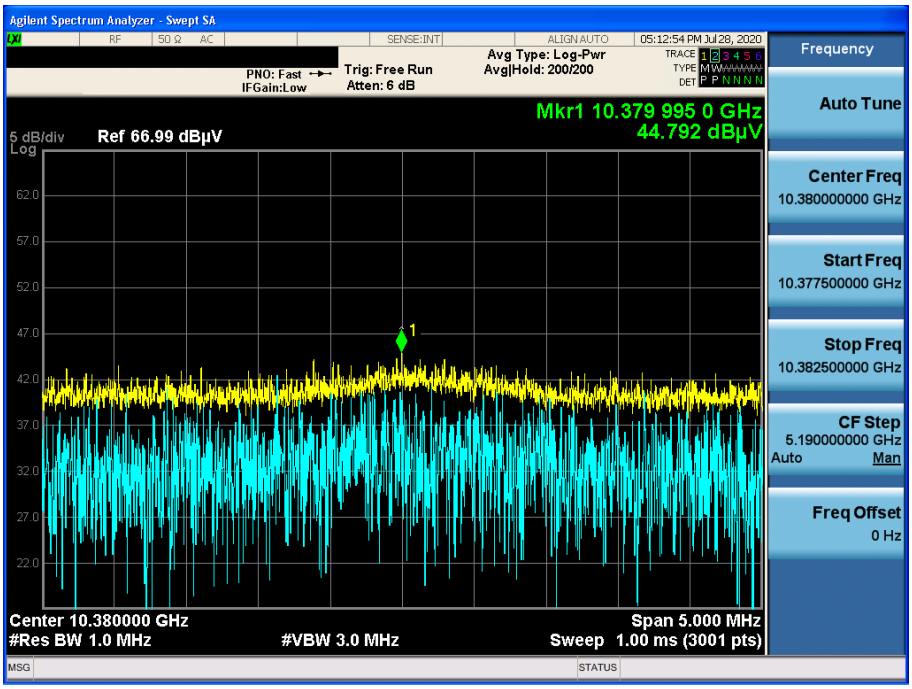
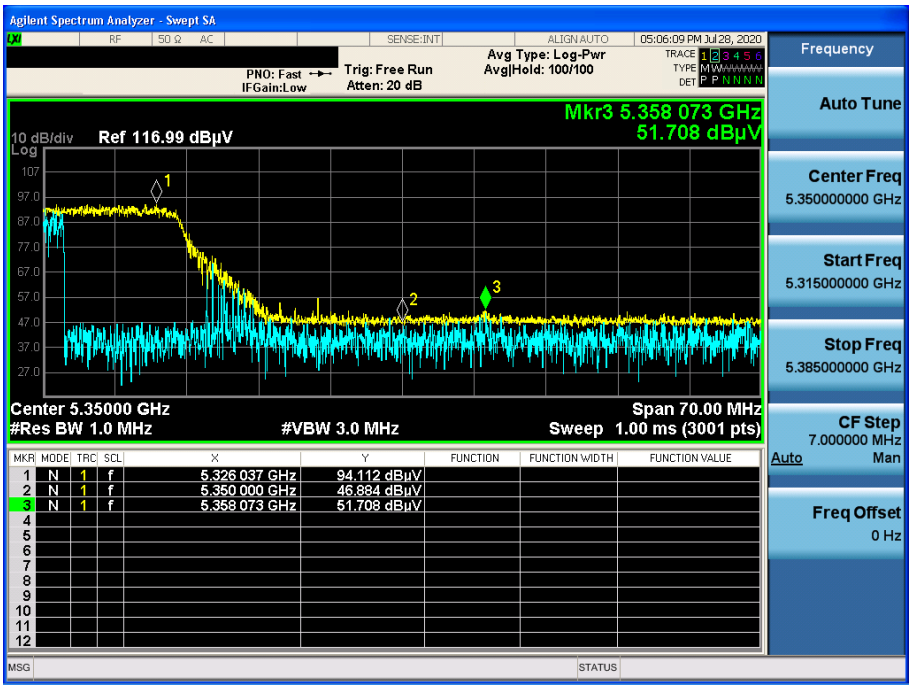
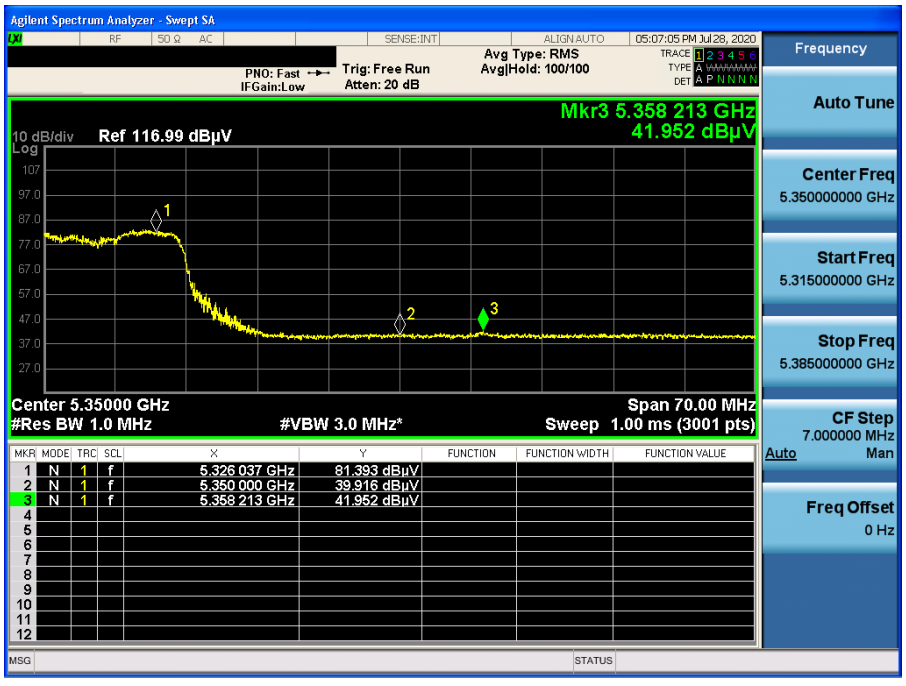


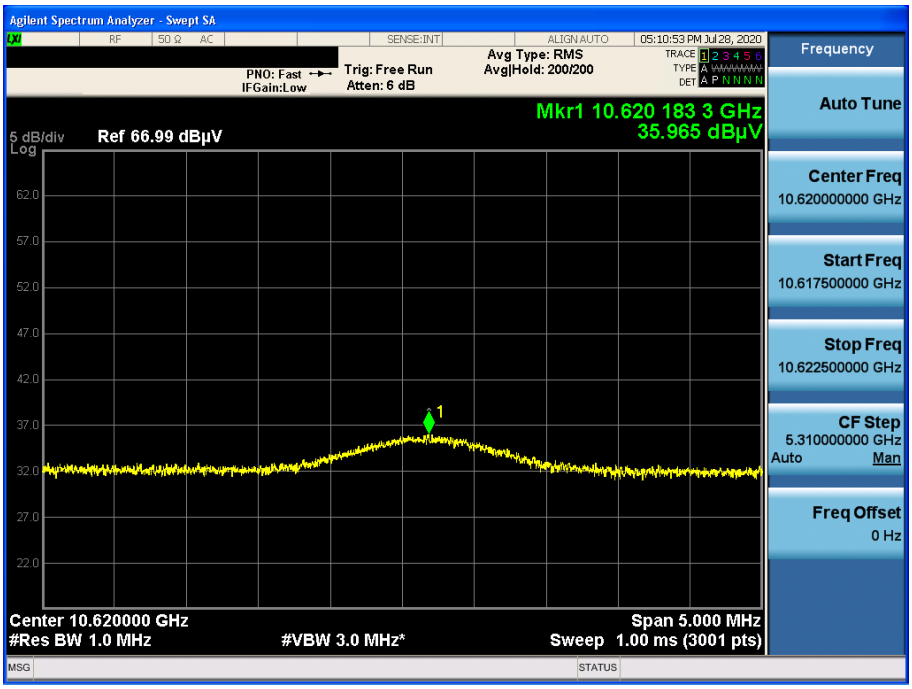
802.11n(HT40) & U-NII 2A & Ch.62 & Z axis & Ver Detector Mode : PK



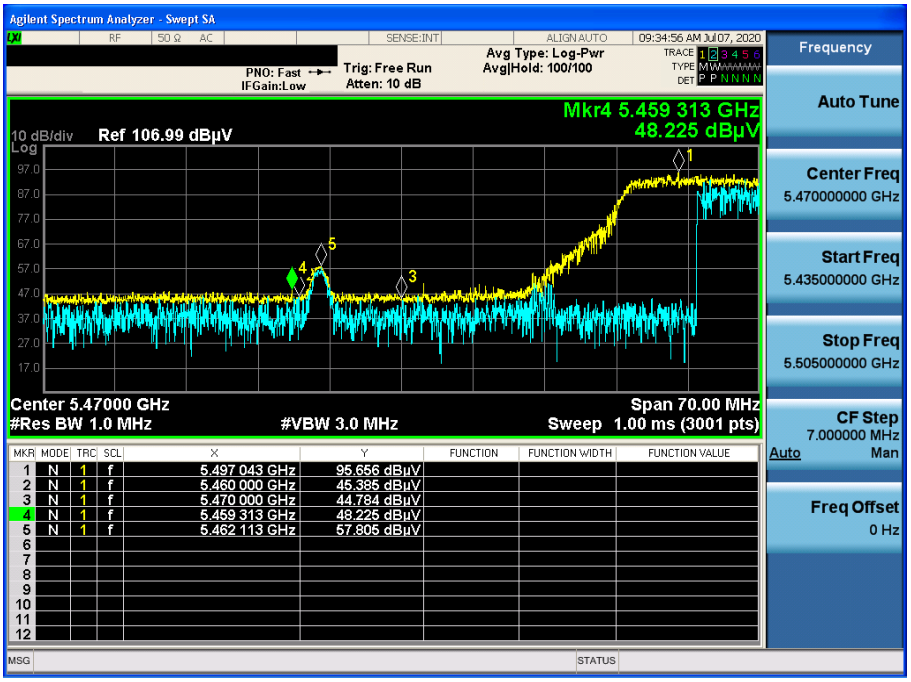
802.11n(HT40) & U-NII 2A & Ch.62 & Z axis & Ver Detector Mode : AV



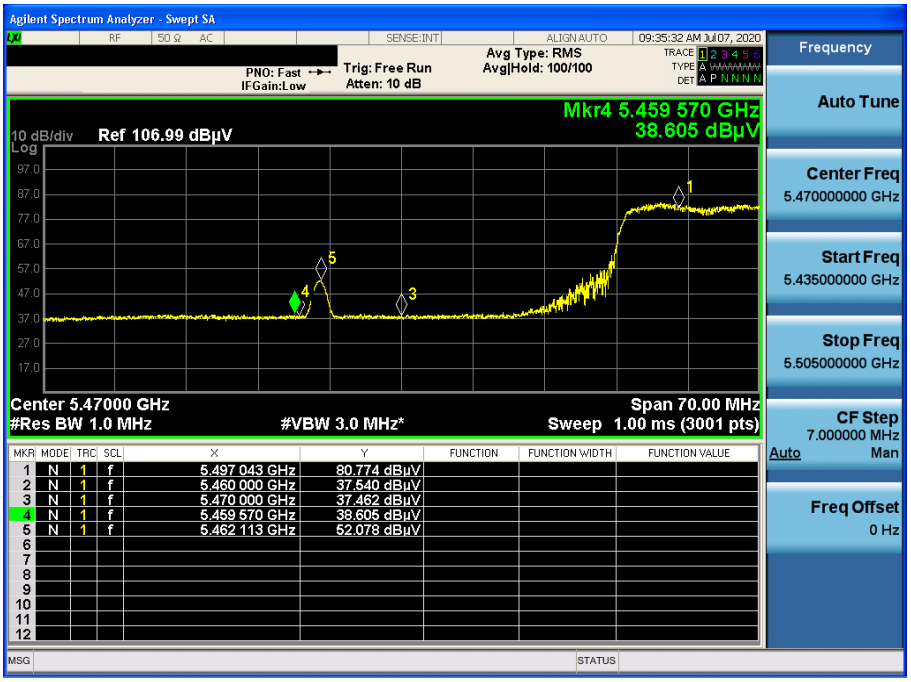
802.11n(HT40) & U-NII 2A & Ch.62 & X axis & Ver Detector Mode : AV



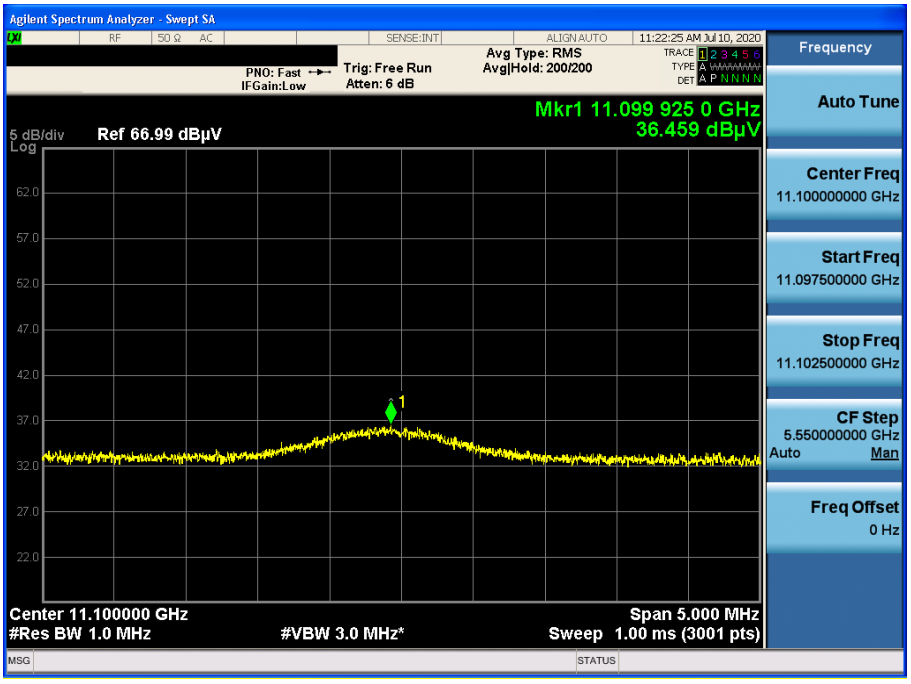
802.11n(HT40) & U-NII 2C & Ch.102 & Z axis & Ver Detector Mode : PK



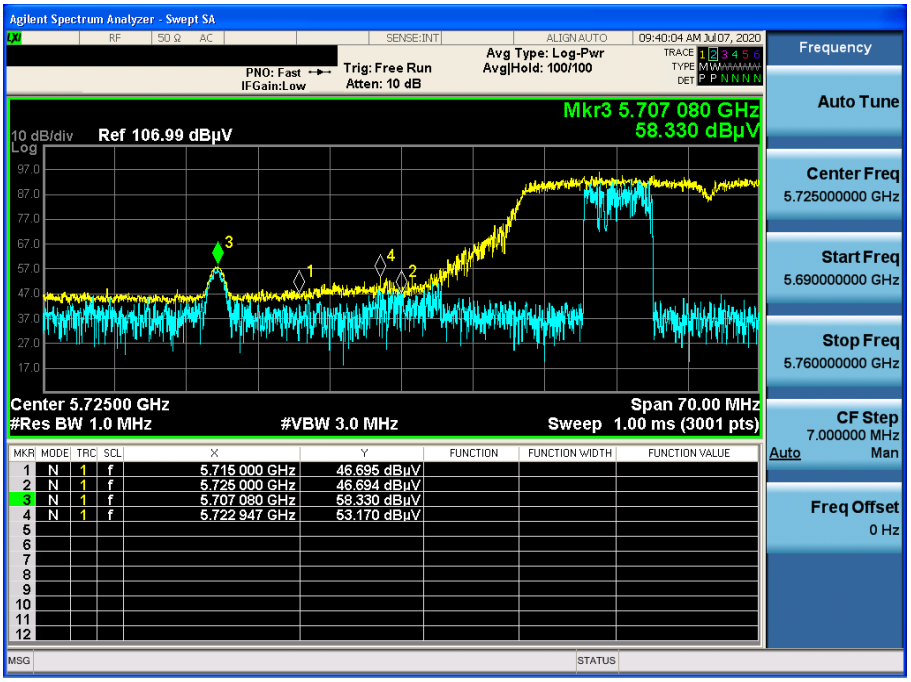
802.11n(HT40) & U-NII 2C & Ch.102 & Z axis & Ver Detector Mode : AV



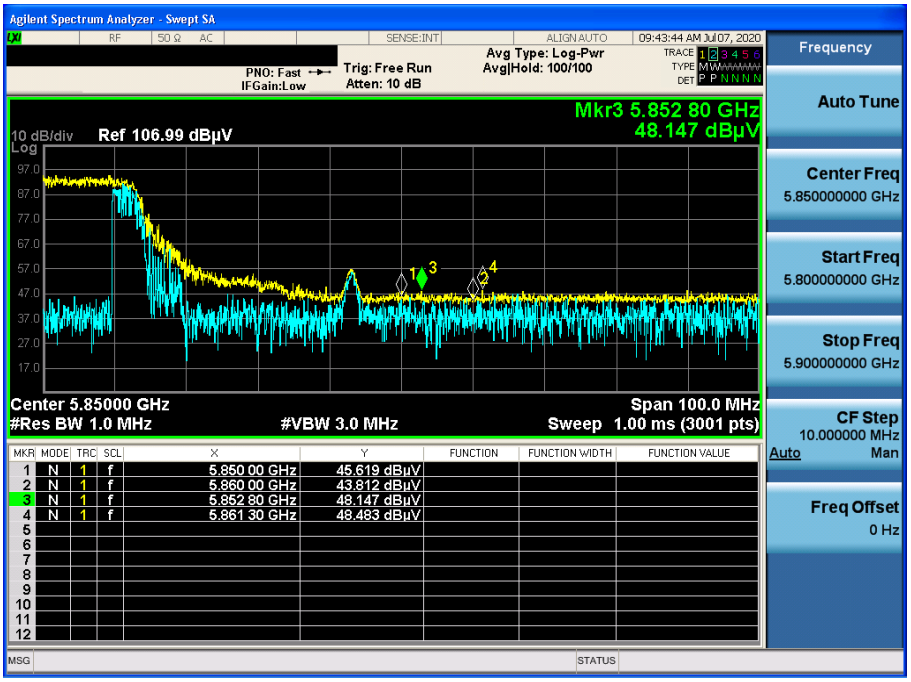
802.11n(HT40) & U-NII 2C & Ch.110 & X axis & Ver Detector Mode : AV



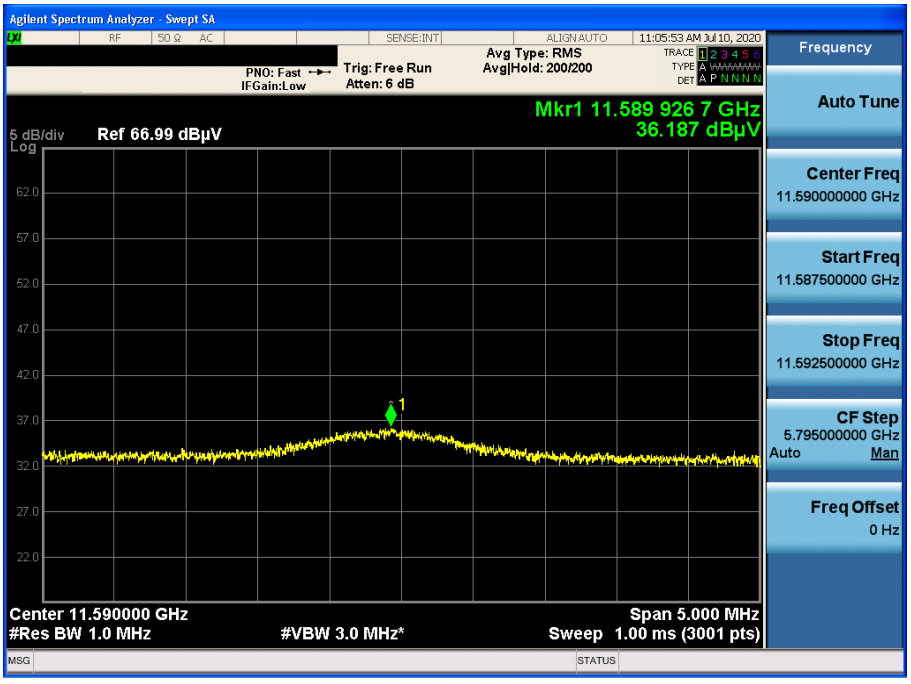
802.11n(HT40) & U-NII 3 & Ch.151 & Z axis & Ver Detector Mode : PK



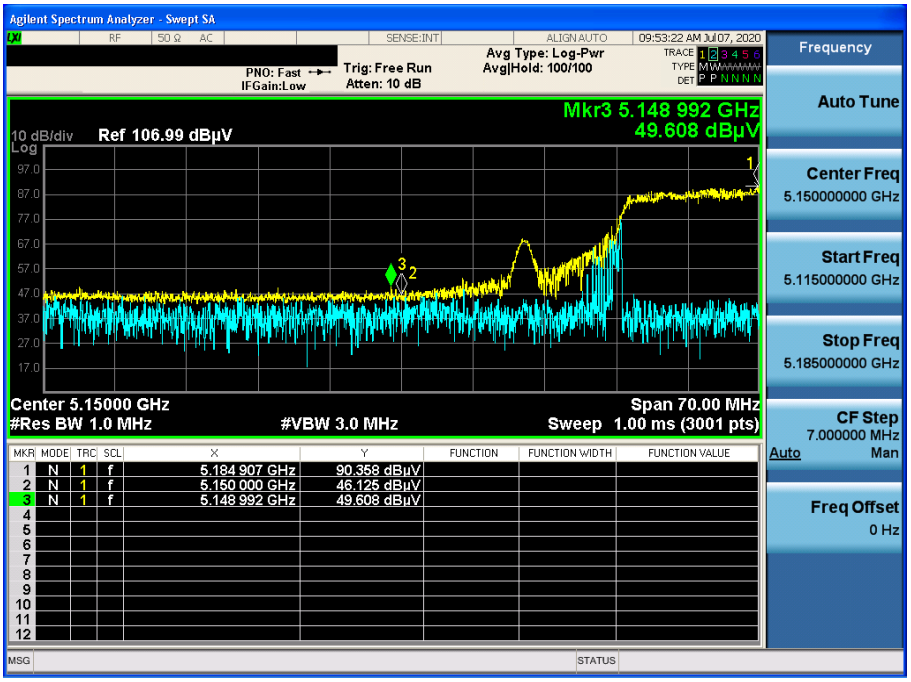
802.11n(HT40) & U-NII 3 & Ch.159 & Z axis & Ver Detector Mode : PK



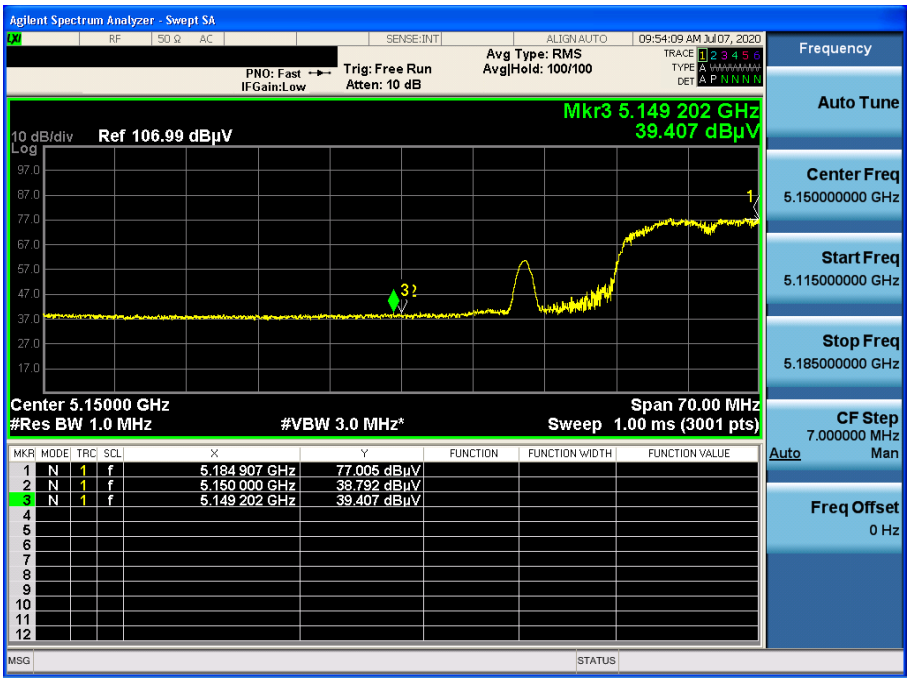
802.11n(HT40) & U-NII 3 & Ch.159 & X axis & Ver Detector Mode : AV



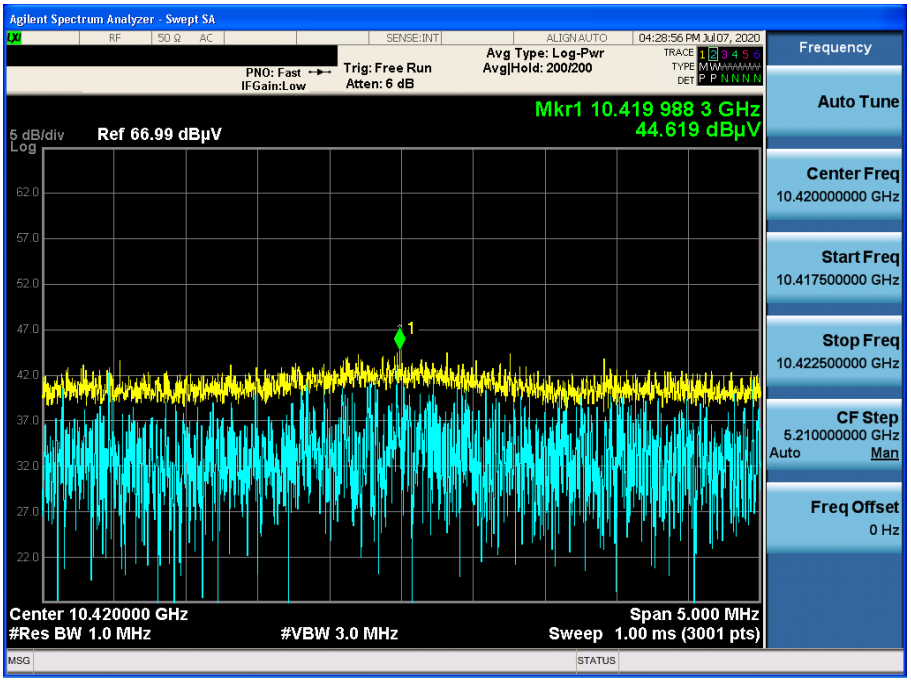
802.11ac(VHT80) & U-NII 1 & Ch.42 & Z axis & Ver **Detector Mode : PK**



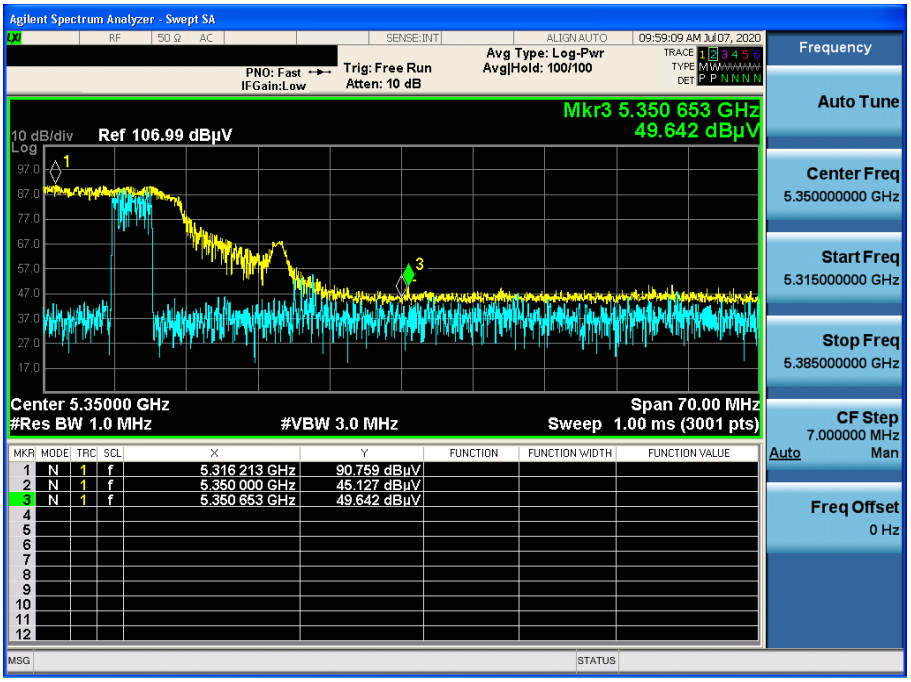
802.11ac(VHT80) & U-NII 1 & Ch.42 & Z axis & Ver **Detector Mode : AV**



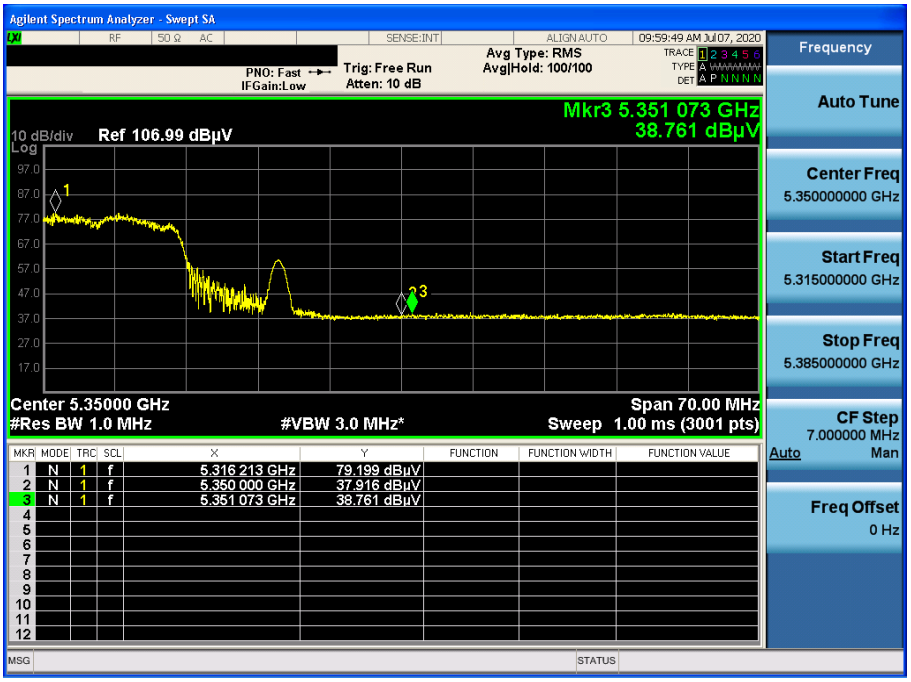
802.11ac(VHT80) & U-NII 1 & Ch.42 & X axis & Ver Detector Mode : PK



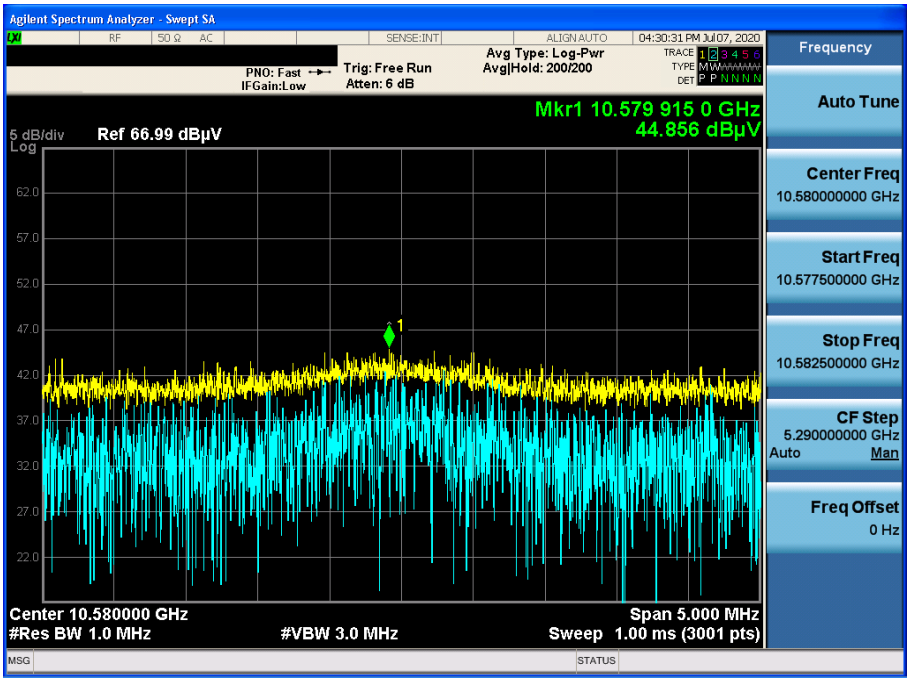
802.11ac(VHT80) & U-NII 3 & Ch.58 & Z axis & Ver Detector Mode : PK



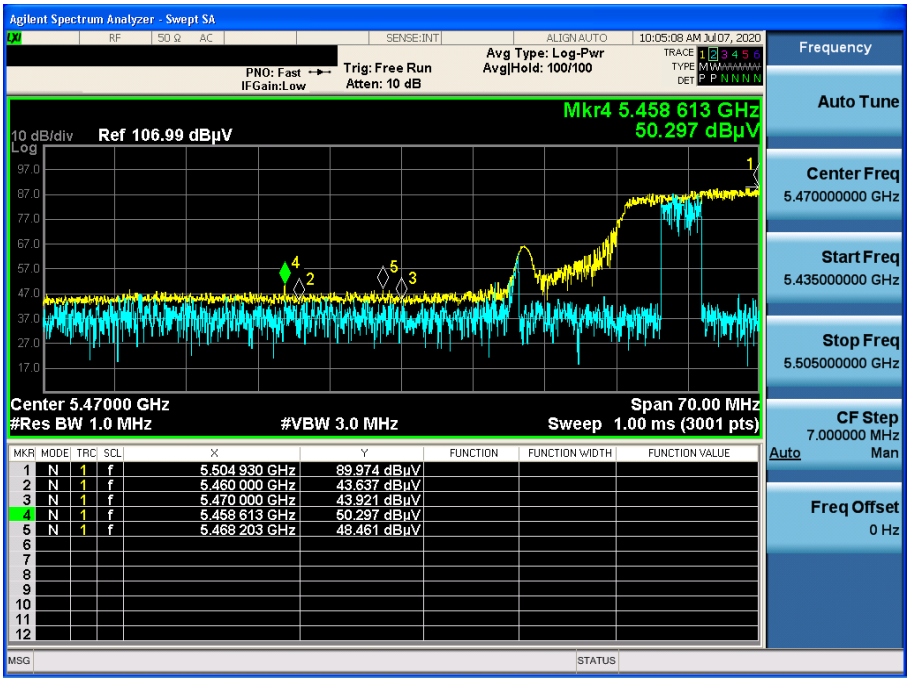
802.11ac(VHT80) & U-NII 3 & Ch.58 & Z axis & Ver Detector Mode : PK



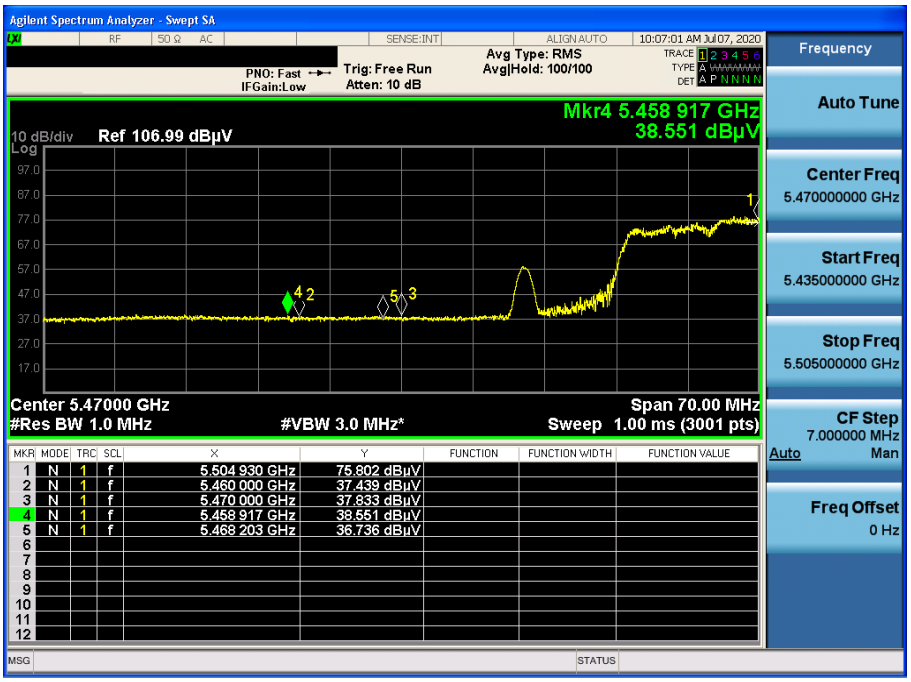
802.11ac(VHT80) & U-NII 3 & Ch.58 & X axis & Ver Detector Mode : PK



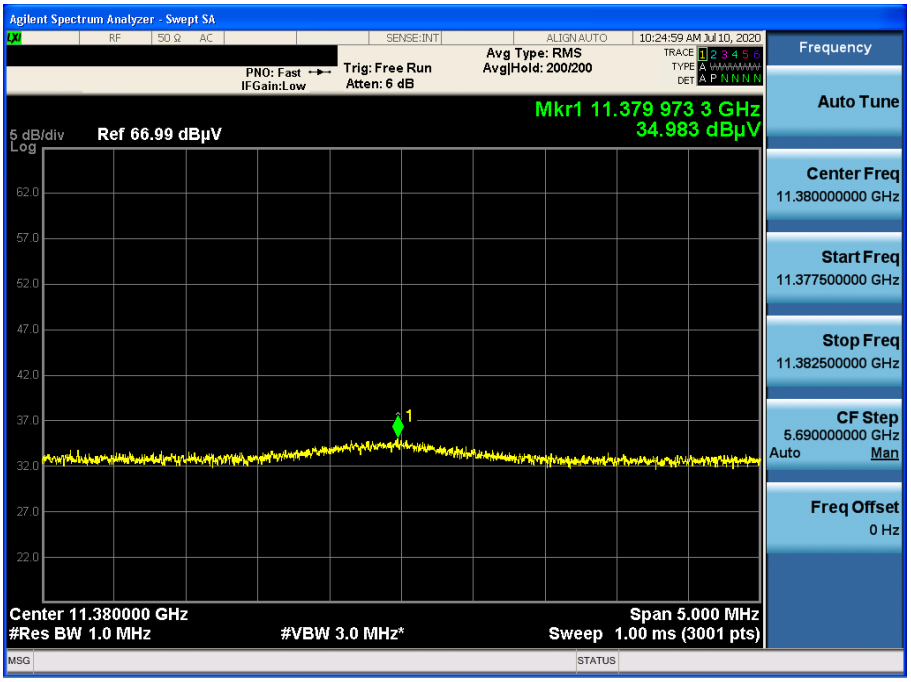
802.11ac(VHT80) & U-NII 2A & Ch.106 & Z axis & Ver Detector Mode : PK



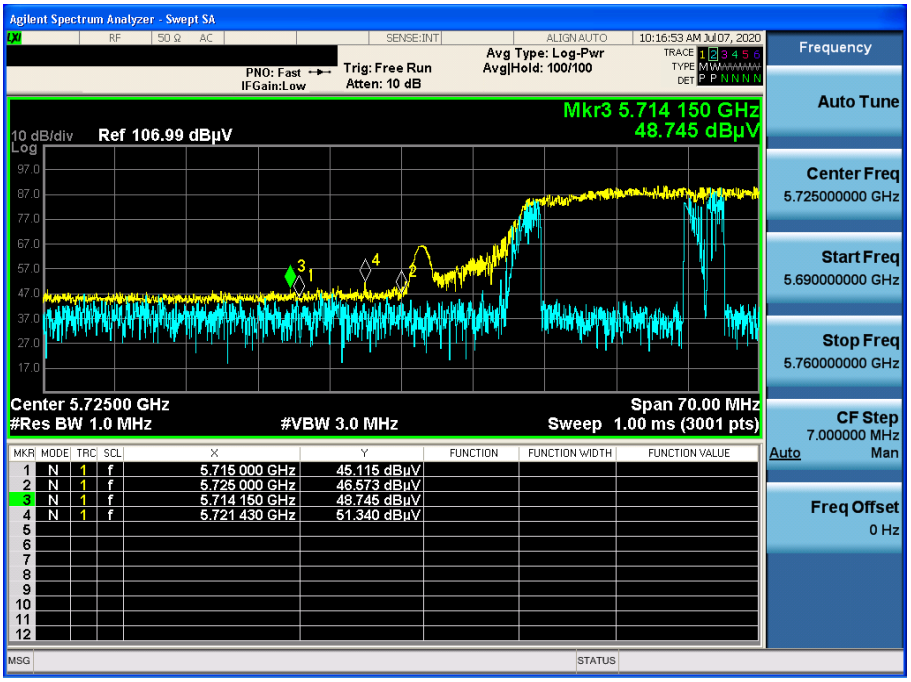
802.11ac(VHT80) & U-NII 2A & Ch.106 & Z axis & Ver Detector Mode : AV



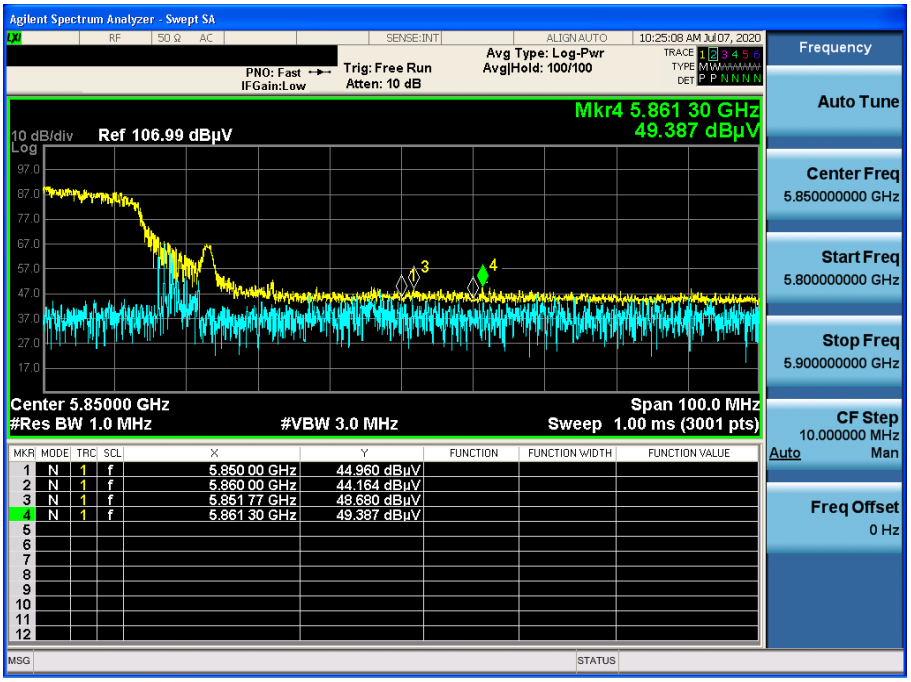
802.11ac(VHT80) & U-NII 2A & Ch.138 & X axis & Ver Detector Mode : AV



802.11ac(VHT80) & U-NII 2C & Ch.155 & Z axis & Ver Detector Mode : PK



802.11ac(VHT80) & U-NII 2C & Ch.155 & Z axis & Ver Detector Mode : PK



802.11ac(VHT80) & U-NII 2C & Ch.155 & X axis & Ver Detector Mode : AV