

9. LIST OF TEST EQUIPMENT

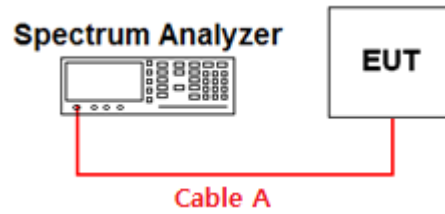
Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	17/07/12	18/07/12	MY46471601
Spectrum Analyzer	Agilent Technologies	N9020A	17/09/05	18/09/05	MY46471251
Spectrum Analyzer	Agilent Technologies	N9030A	17/09/07	18/09/07	MY53310140
DC Power Supply	Agilent Technologies	66332A	17/09/05	18/09/05	MY43000211
Multimeter	FLUKE	17B	17/12/26	18/12/26	26030065WS
Thermohygrometer	BODYCOM	BJ5478	17/09/11	18/09/11	N/A
Thermohygrometer	BODYCOM	BJ5478	18/01/03	19/01/03	120612-2
50W 10dB ATT	SMAJK	SMAJK-50-10	17/09/06	18/09/06	2-50-10
Signal Generator	R&S	SMBV100A	17/12/27	18/12/27	255571
Signal Generator	R&S	SMF100A	17/12/27	18/12/27	102341
Temp & Humi Test Chamber	SJ Science	SJ-TH-S50	17/09/07	18/09/07	U5542113
Loop Antenna	ETS	6502	17/03/24	19/03/24	3471
Bilog Antenna	Schwarzbeck	VULB9160	16/11/11	18/11/11	3151
HORN ANT	ETS-LINDGREN	3117	16/05/03	18/05/03	140394
HORN ANT	A.H.Systems	SAS-574	17/07/17	19/07/17	155
High-pass Filter	Wainwright Instruments	WHNX6-6320-8000-26500-40CC	17/09/05	18/09/05	1
PreAmplifier	Agilent	8449B	17/09/05	18/09/05	3008A02108
PreAmplifier	H.P	8447D	17/12/26	18/12/26	2944A07774
PreAmplifier	A.H.Systems Inc.	PAM-1840VH	17/09/17	18/09/17	163
EMI Test Receiver	Rohde Schwarz	ESR7	18/02/13	19/02/13	101061
EMI TEST RECEIVER	Rohde Schwarz	ESCi7	18/02/12	19/02/12	100910
PULSE LIMITER	Rohde Schwarz	ESH3-Z2	17/09/29	18/09/29	101333
LISN	SCHWARZBECK	NNLK 8121	17/04/03 18/03/20	18/04/03 19/03/20	06183
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2495A	17/04/11 18/04/17	18/04/11 19/04/17	1306007
		MA2490A	17/04/11 18/04/17	18/04/11 19/04/17	1249001
CABLE	DTNC	CABLE	NA	NA	C-016-4
CABLE	DTNC	CABLE	NA	NA	RF-80
CABLE	DTNC	CABLE	NA	NA	RF-81
CABLE	DTNC	CABLE	NA	NA	RF-82
CABLE	Radiall	TESTPRO3	NA	NA	RF-74
CABLE	HUBER+SUHNER	SUCOFLEX103	NA	NA	RF-75
CABLE	Radiall	TESTPRO3	NA	NA	RF-66

Note: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017

APPENDIX I

Conducted Test set up Diagram

- Conducted Measurement



APPENDIX II

Duty Cycle Information

■ Test Procedure

Duty Cycle $[X = \text{On Time} / (\text{On} + \text{Off time})]$ 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 $\geq$ EBW if possible; otherwise, set RBW to the largest available value.
3. Set VBW $\geq$ 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 $T \leq 16.7$ 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.

($T = \text{On time}$ of the above table since the EUT operates with above fixed Duty Cycle and it is the minimum On time)

■ Test Results:

Duty cycle: Single

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	6Mbps	5180	2.03	2.07	98.07	0.09	24.63
802.11ac (VHT20)	MCS0	5180	1.90	1.94	97.94	0.10	26.32
802.11ac (VHT40)	MCS0	5190	1.27	1.31	97.33	0.12	39.25
802.11ac (VHT80)	MCS0	5210	1.17	1.21	96.69	0.15	42.74

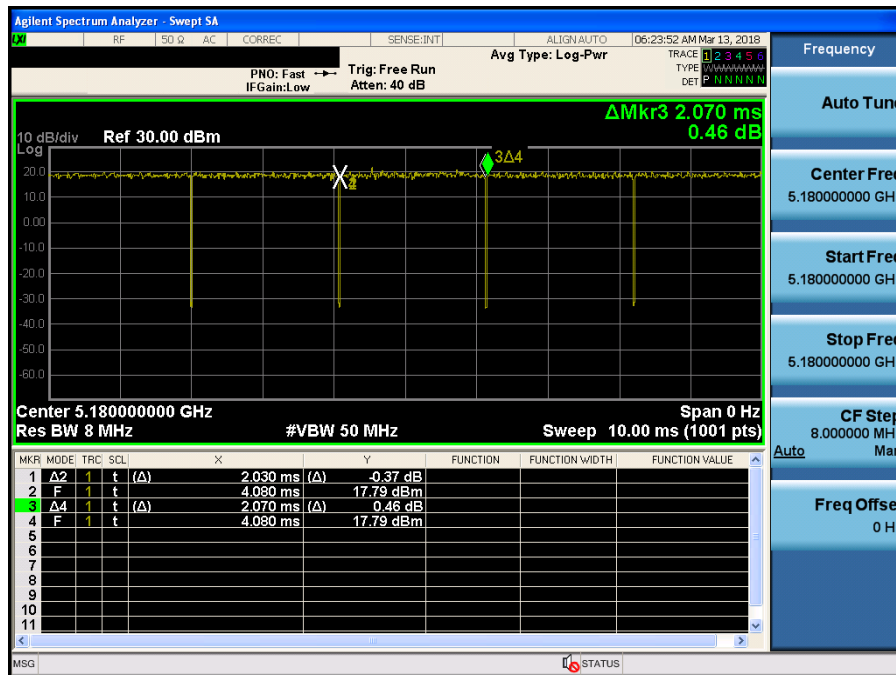
Duty cycle: SDM

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		
802.11ac (VHT20)	MCS8	5180	0.98	1.02	96.06	0.18	51.28
802.11ac (VHT40)	MCS8	5190	0.67	0.70	94.87	0.23	75.08
802.11ac (VHT80)	MCS0	5210	0.61	0.65	94.44	0.25	81.70

Single Transmit

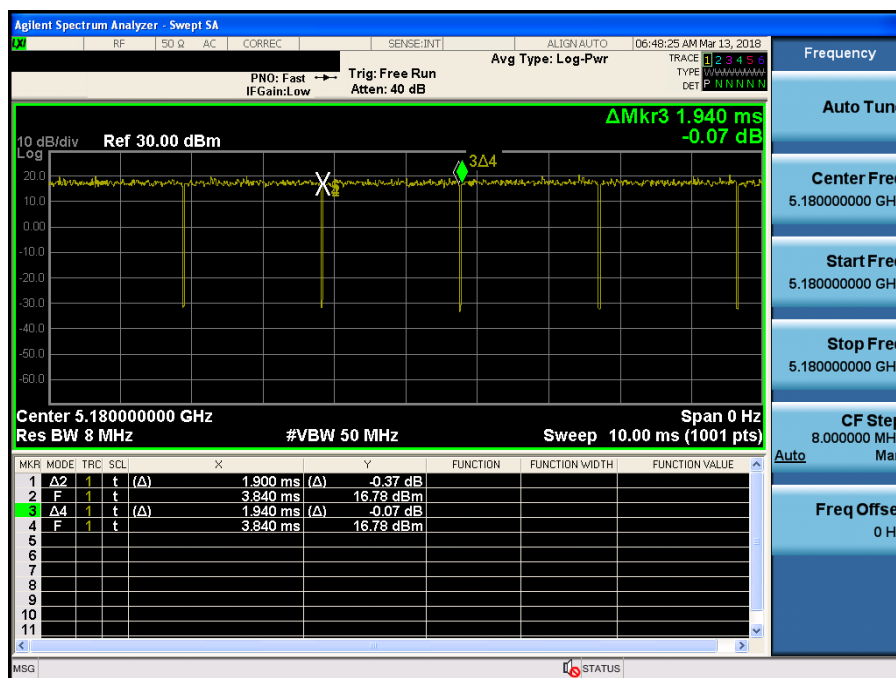
Duty Cycle

Test Mode: 802.11a & Ch.36

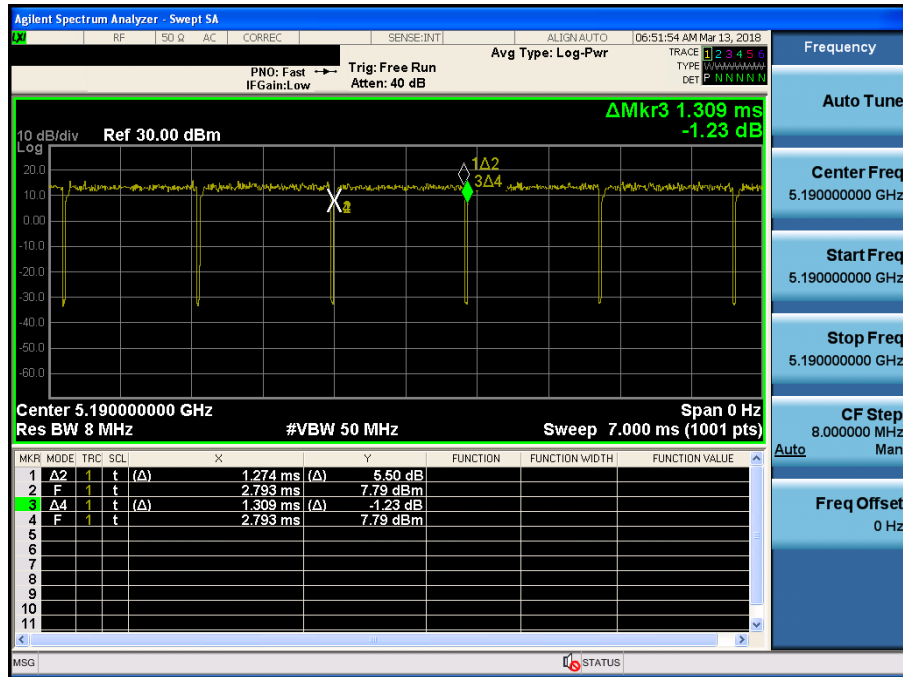


Duty Cycle

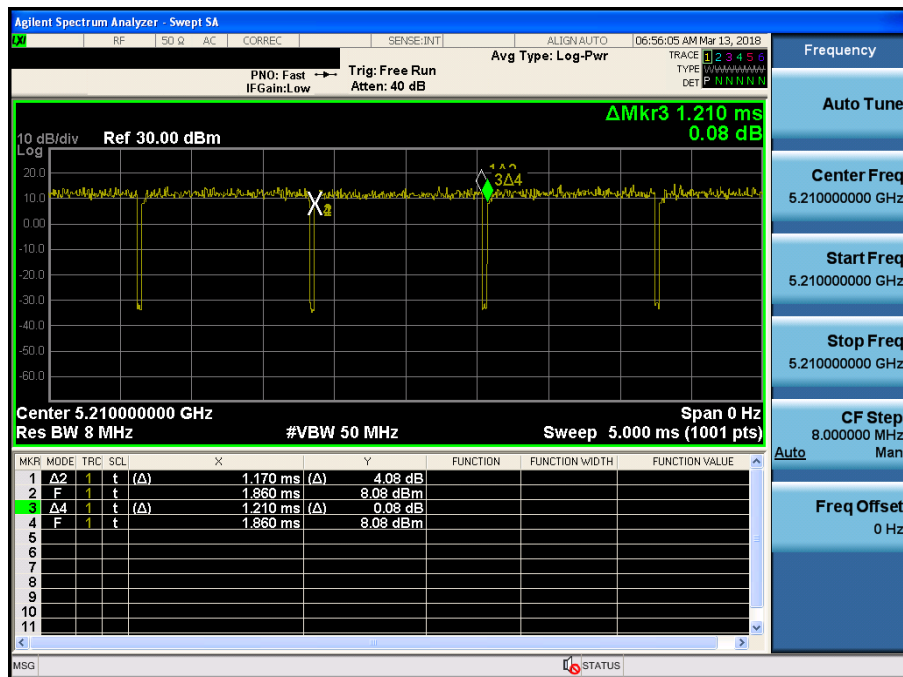
Test Mode: 802.11ac VHT20 & Ch.36



Test Mode: 802.11ac VHT40 & Ch.38



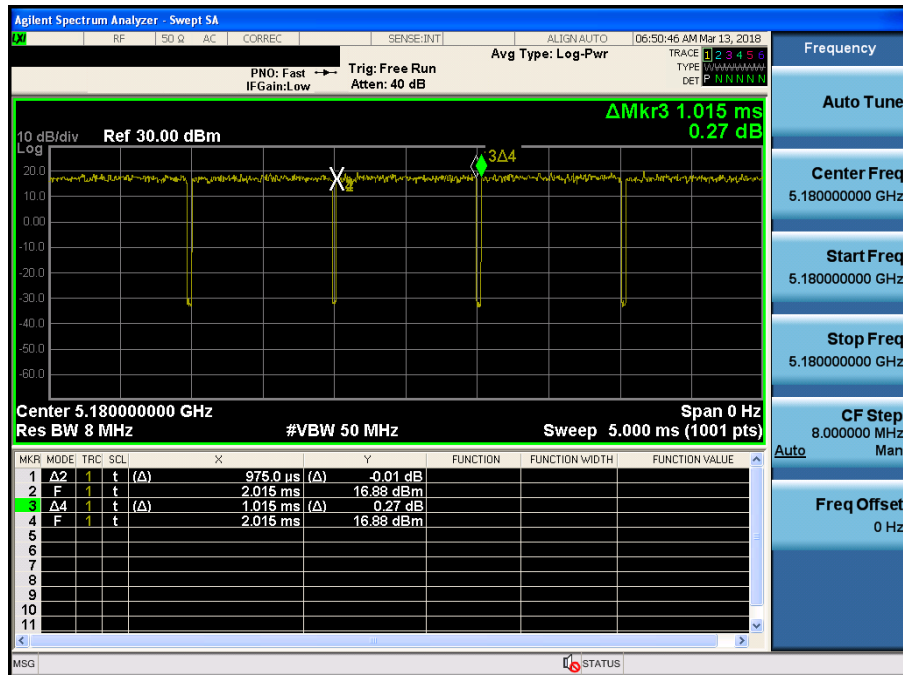
Test Mode: 802.11ac VHT80 & Ch.42



Multiple Transmit _ SDM

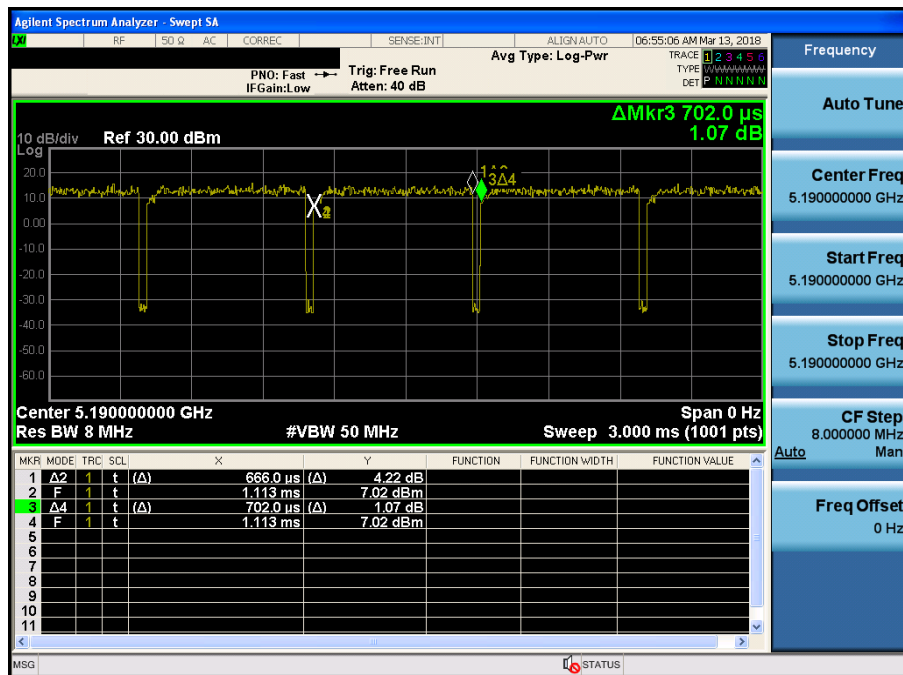
Duty Cycle

Test Mode: 802.11ac VHT20 & Ch.36



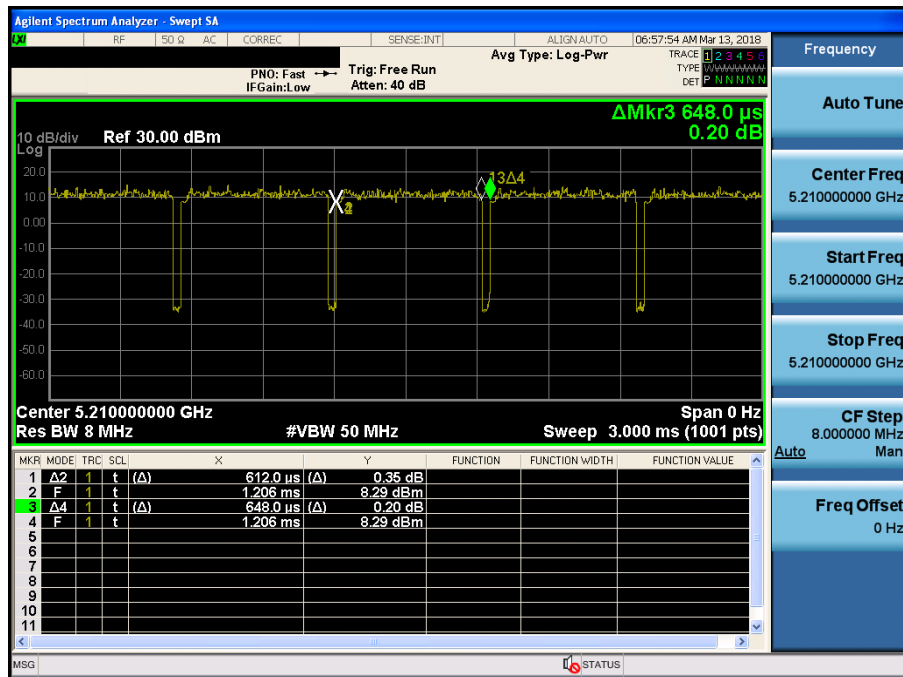
Duty Cycle

Test Mode: 802.11ac VHT40 & Ch.38



Duty Cycle

Test Mode: 802.11ac VHT80 & Ch.42

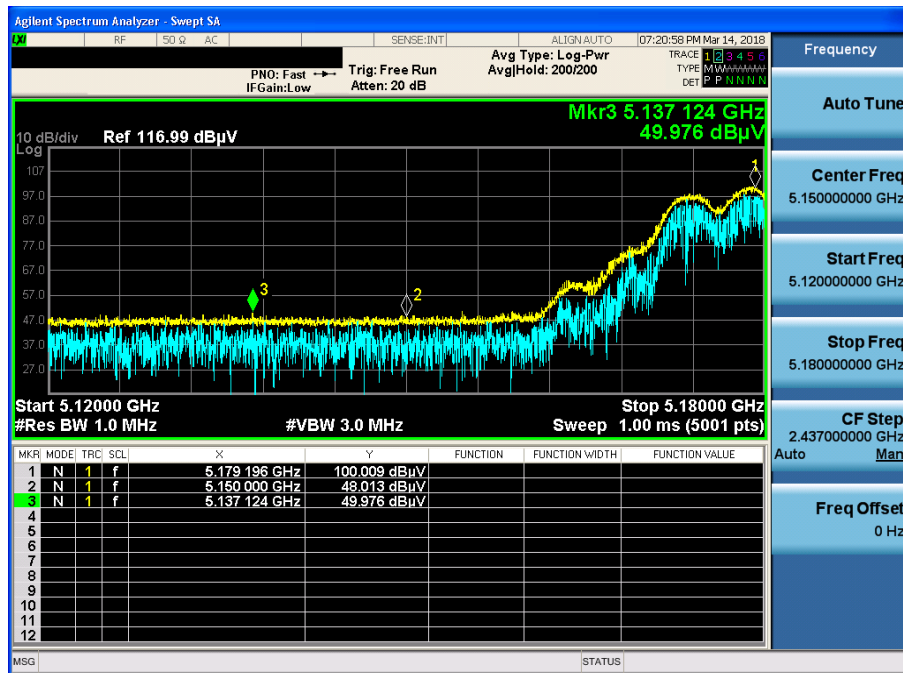


APPENDIX III

Unwanted Emissions (Radiated) Test Plot: MIMO(CDD) _ Normal

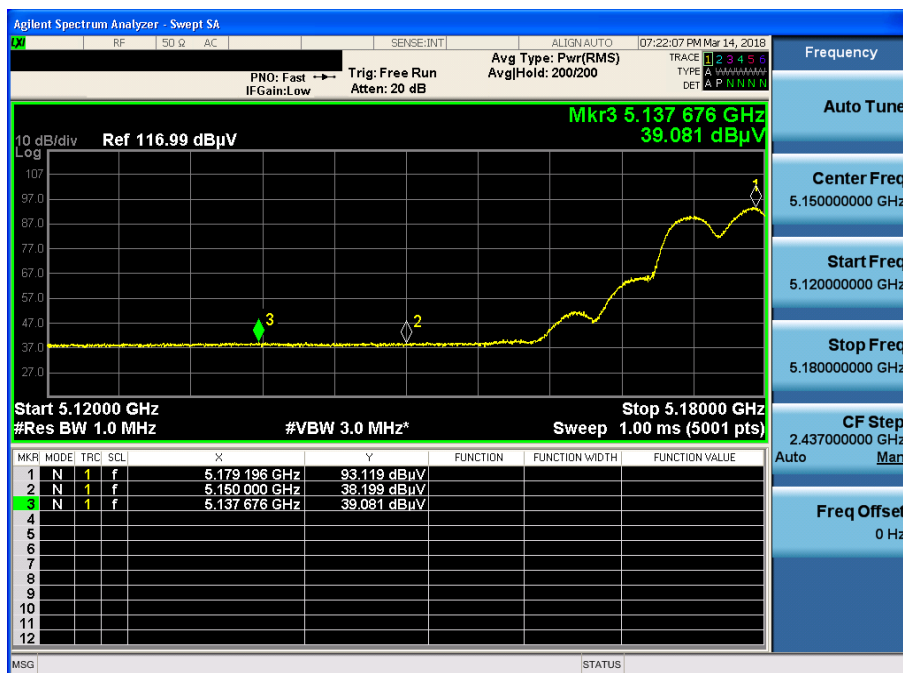
802.11a & U-NII 1 & Ch.36 & Z axis & Ver

Detector Mode : PK

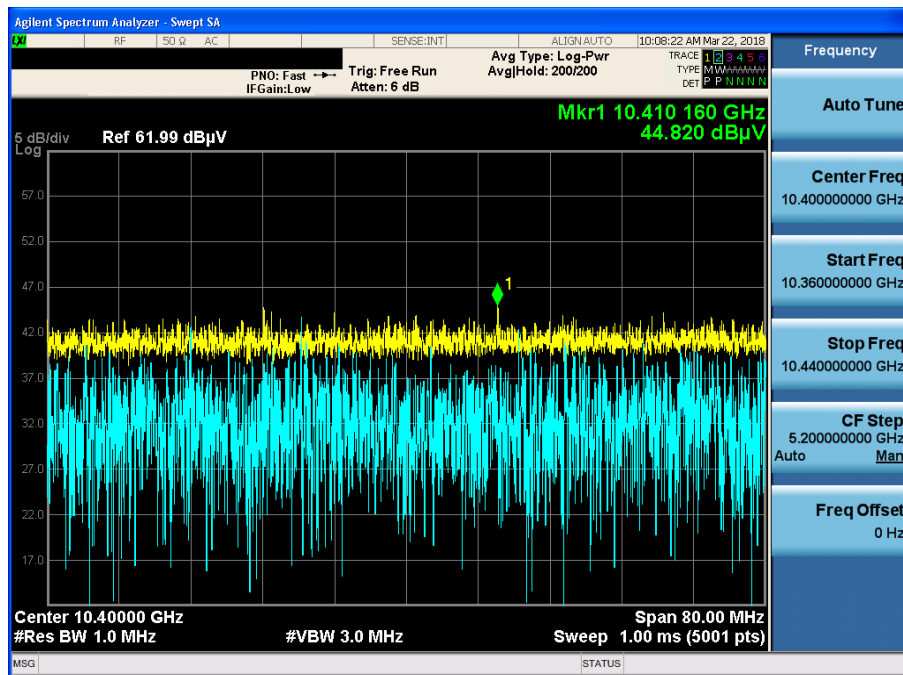


802.11a & U-NII 1 & Ch.36 & Z axis & Ver

Detector Mode : AV

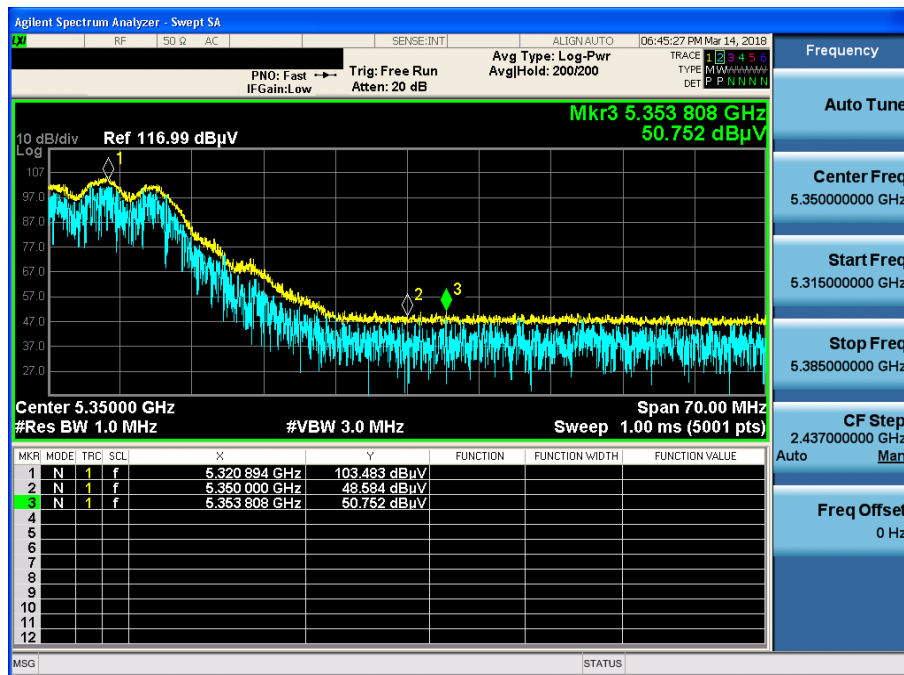


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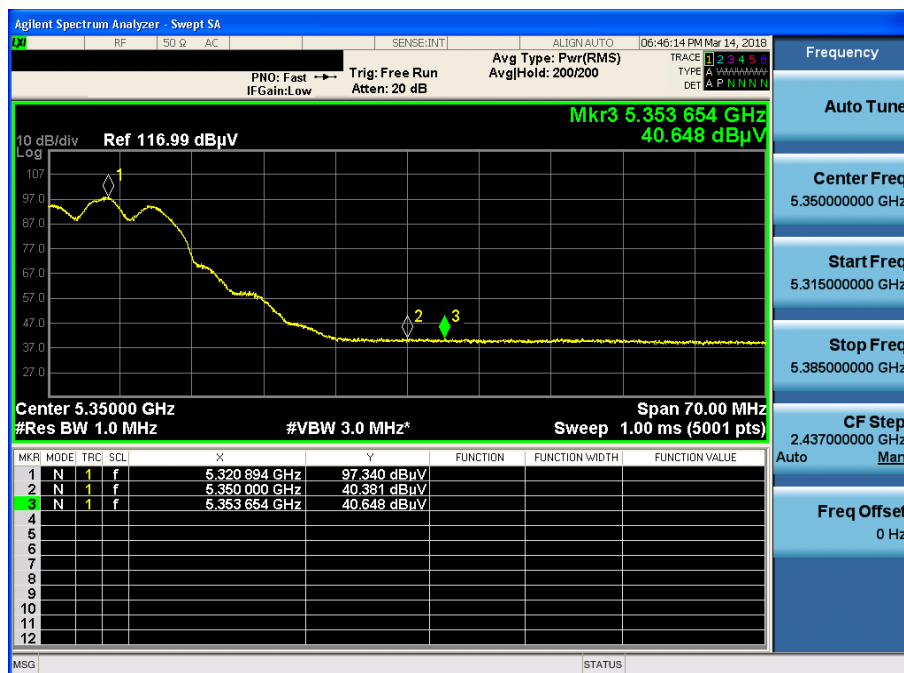
802.11a & U-NII 2A & Ch.64 & Z axis & Hor

Detector Mode : PK



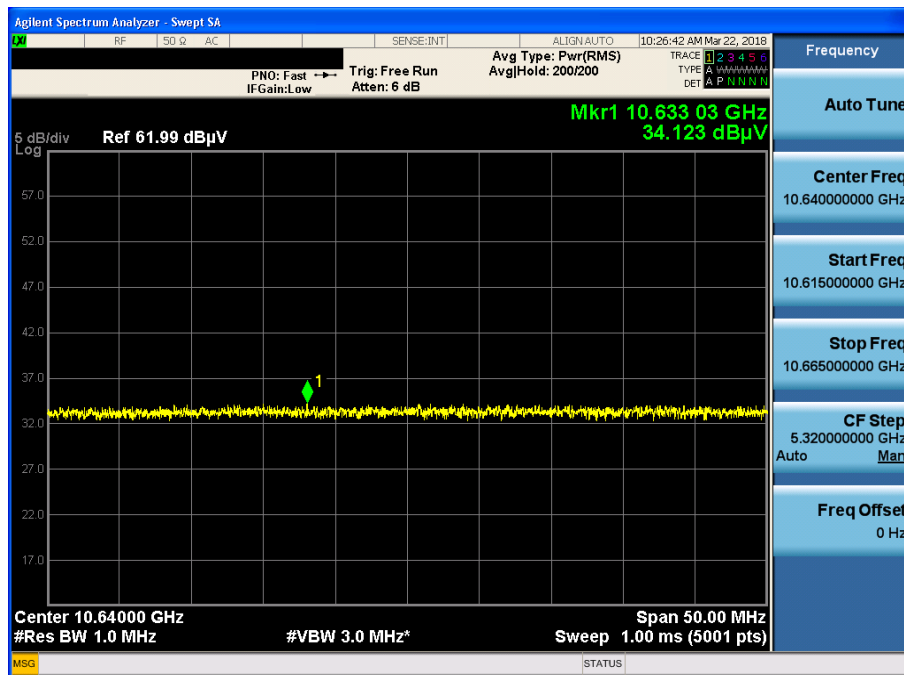
802.11a & U-NII 2A & Ch.64 & Z axis & Hor

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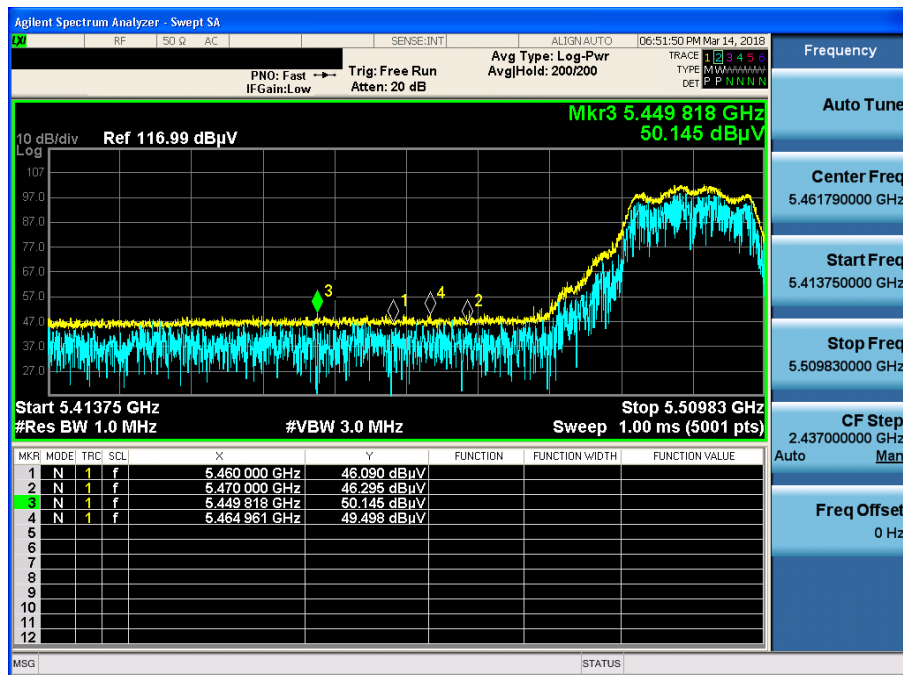
802.11a & U-NII 2A & Ch.64 & Z axis & Hor

Detector Mode : AV



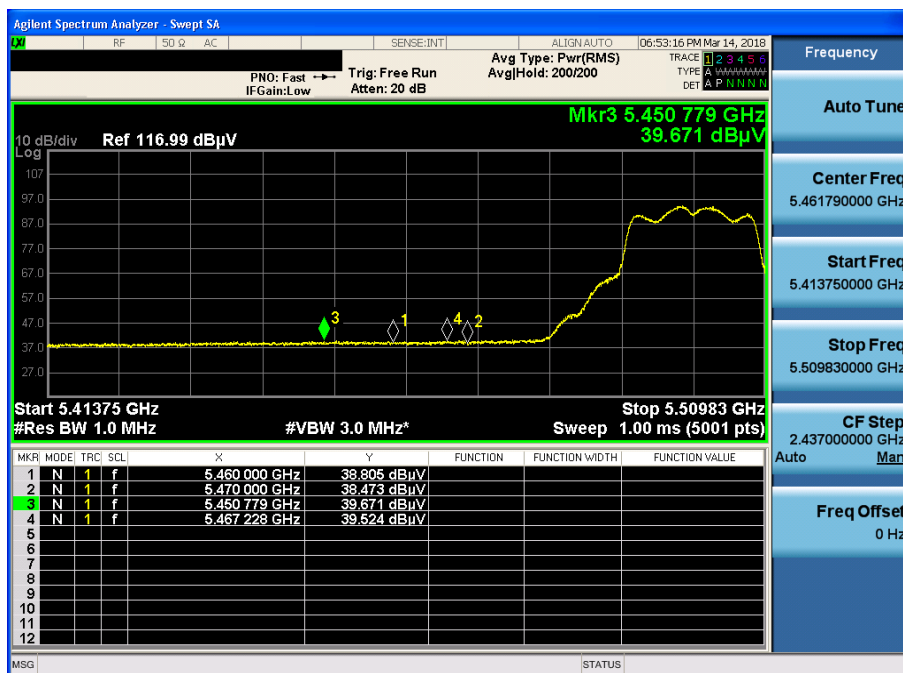
802.11a & U-NII 2C & Ch.100 & Z axis & Hor

Detector Mode : PK



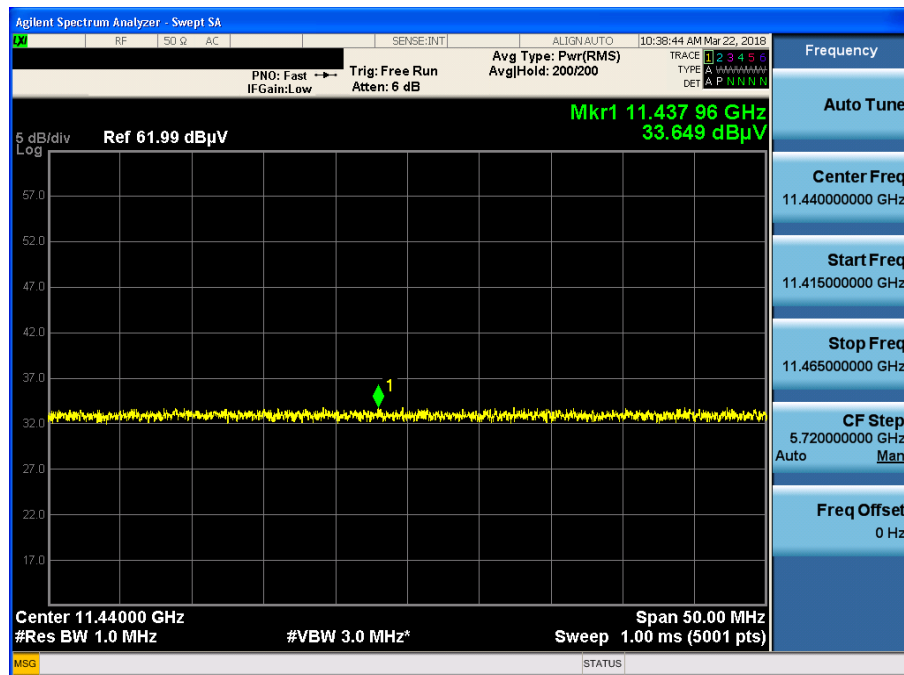
802.11a & U-NII 2C & Ch.100 & Z axis & Hor

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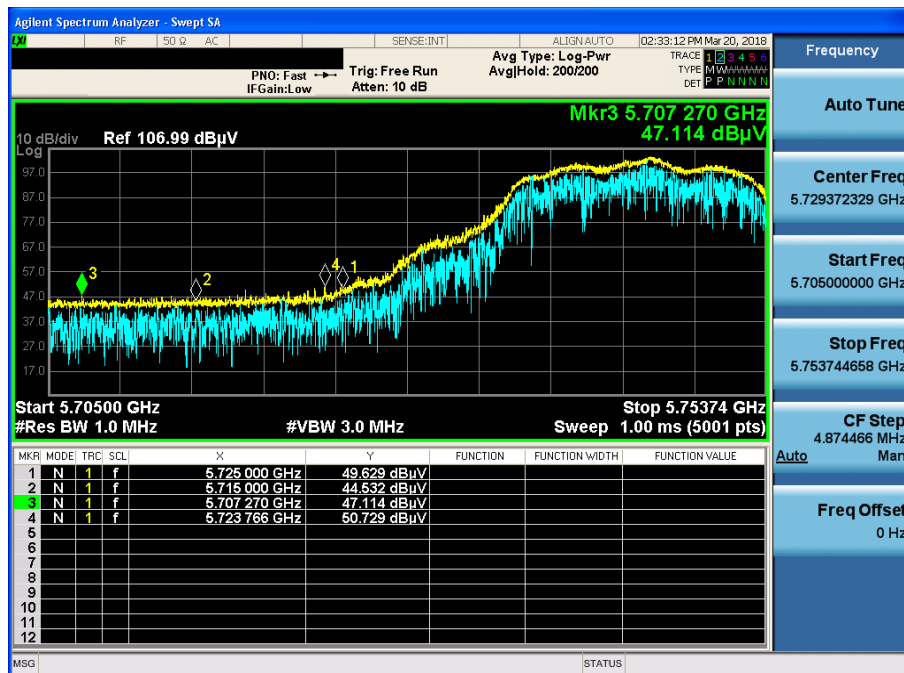
802.11a & U-NII 2C & Ch.144 & Z axis & Hor

Detector Mode : AV



802.11a & U-NII 3 & Ch.149 & Y axis & Ver

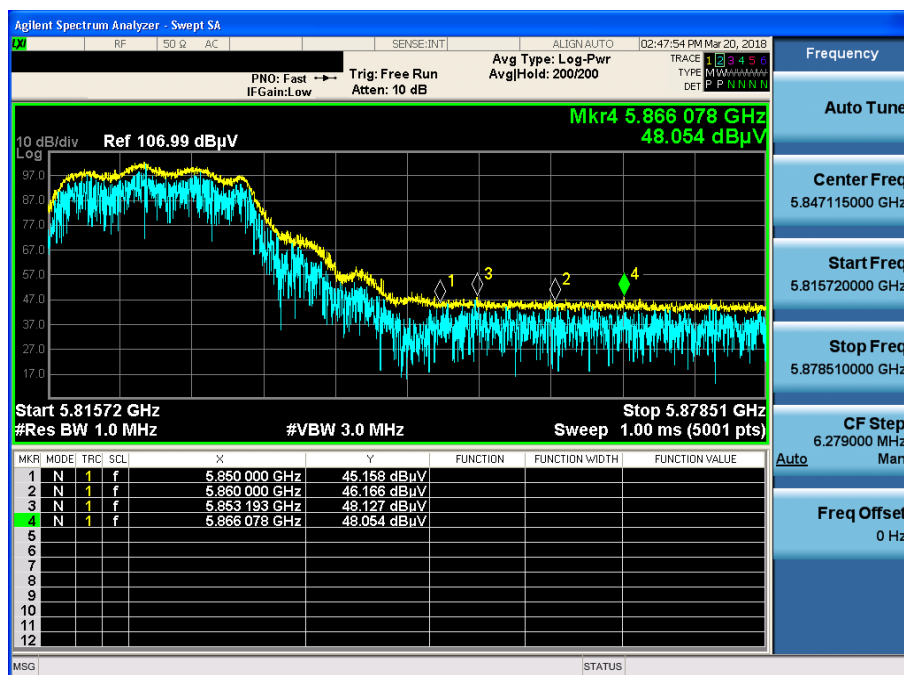
Detector Mode : PK



Note: Total Factor was included on this plot.

802.11a & U-NII 3 & Ch.165 & Z axis & Hor

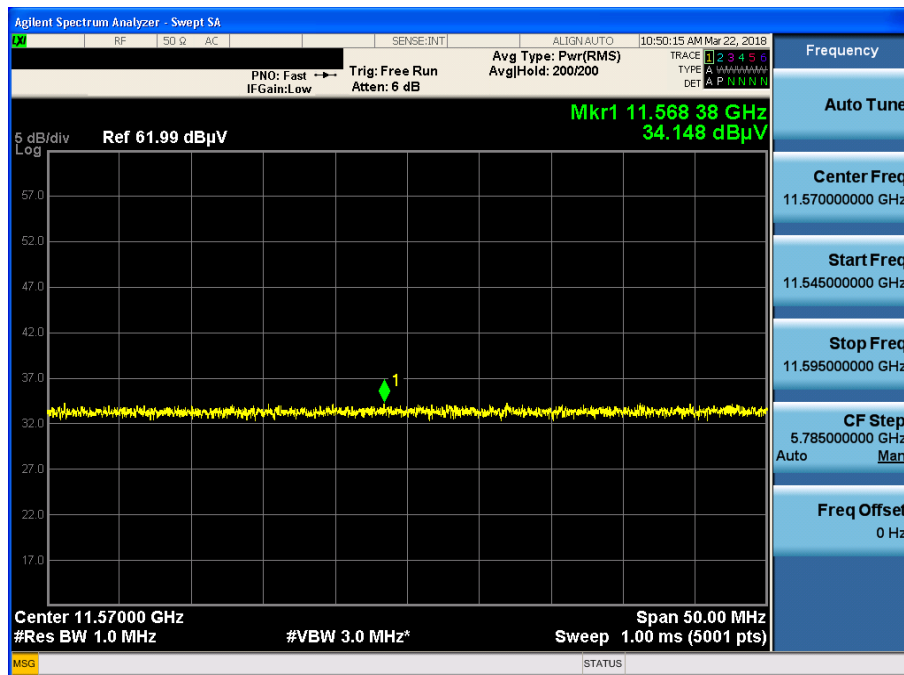
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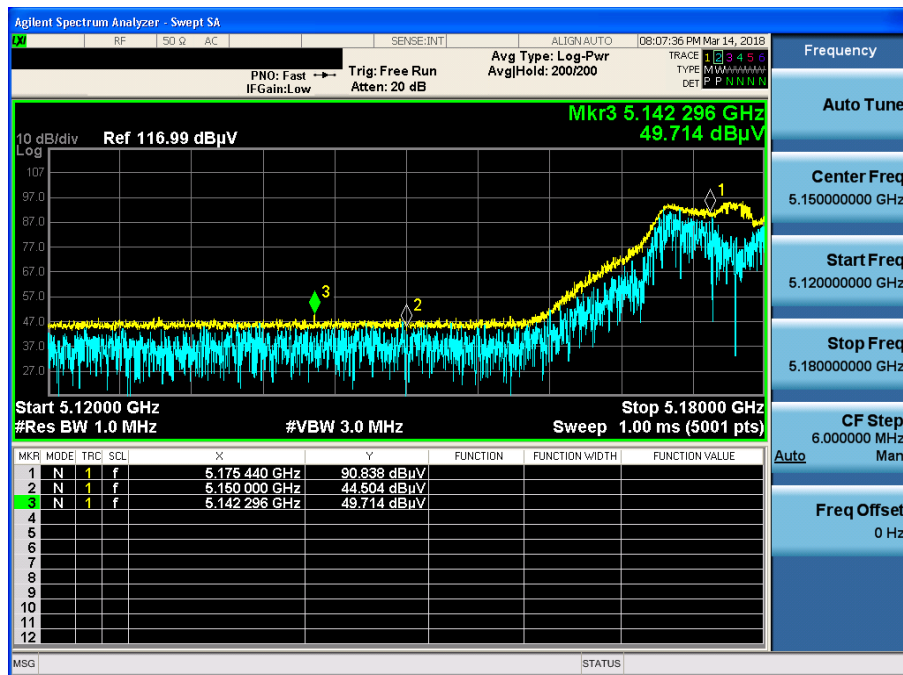
802.11a & U-NII 3 & Ch.157 & Z axis & Hor

Detector Mode : AV



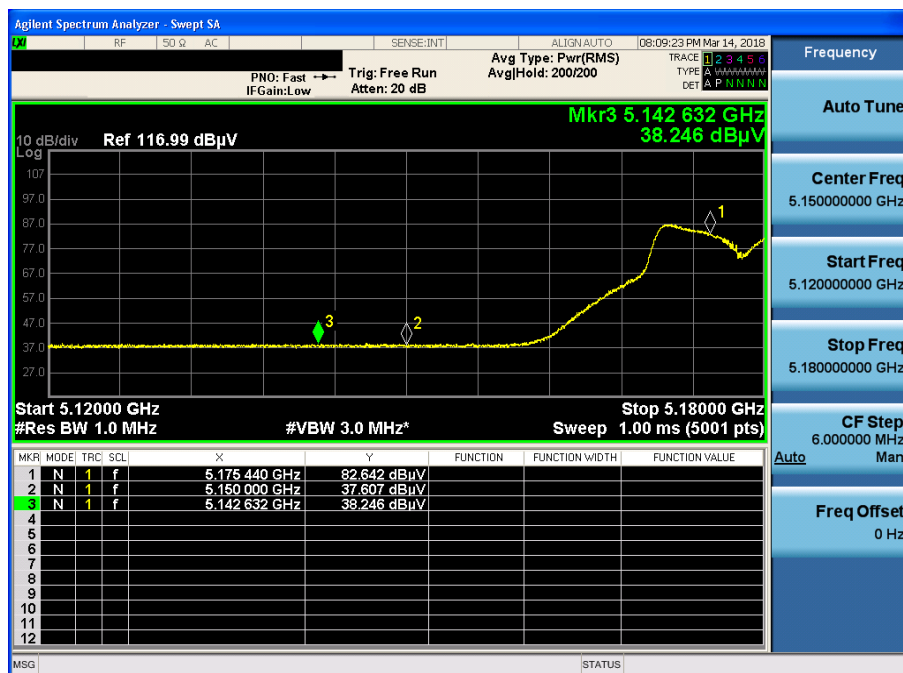
802.11ac(VHT20) & U-NII 1 & Ch.36 & Y axis & Hor

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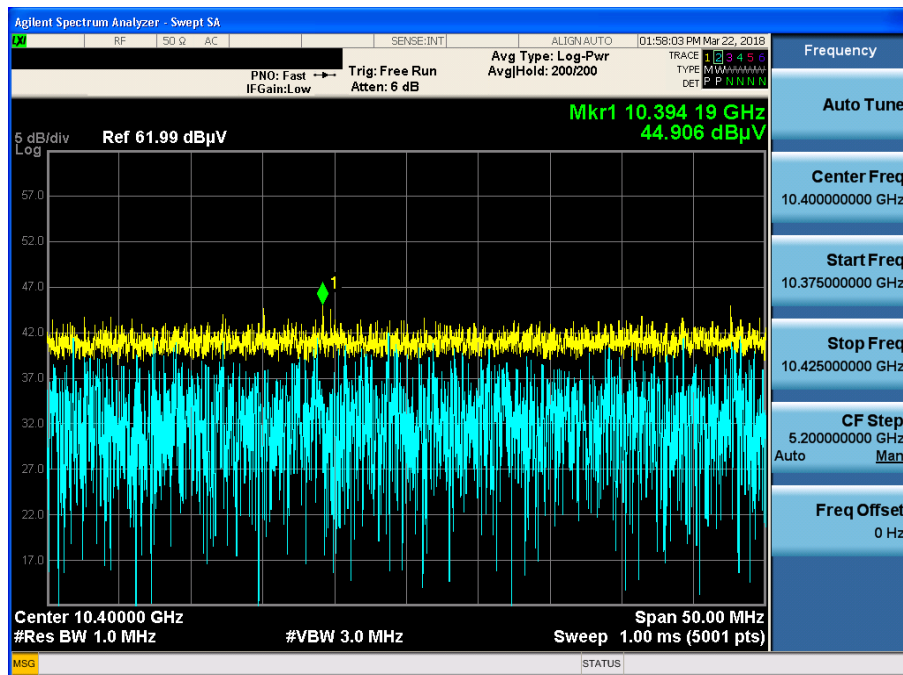
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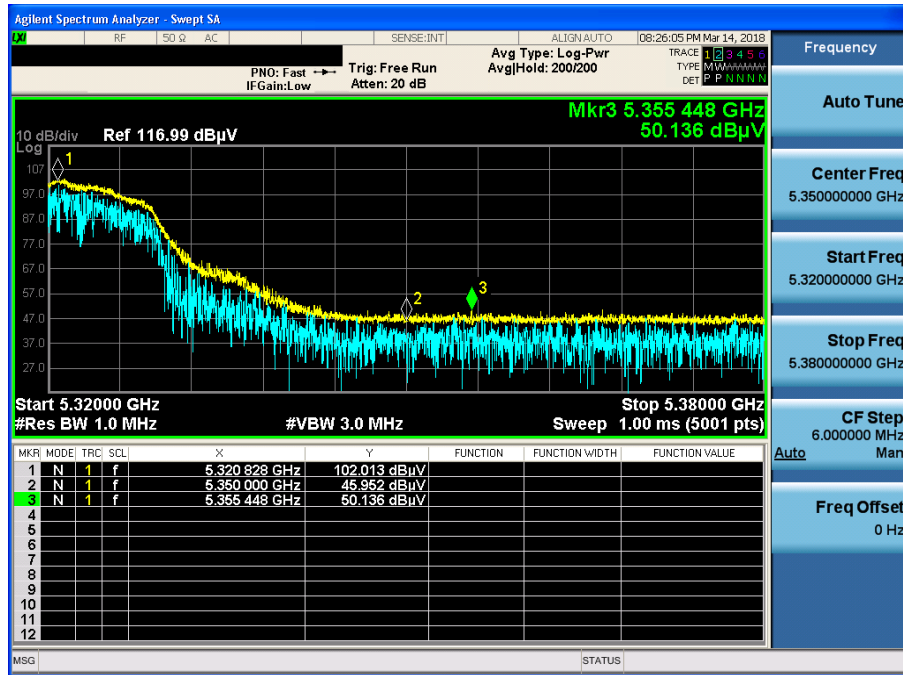
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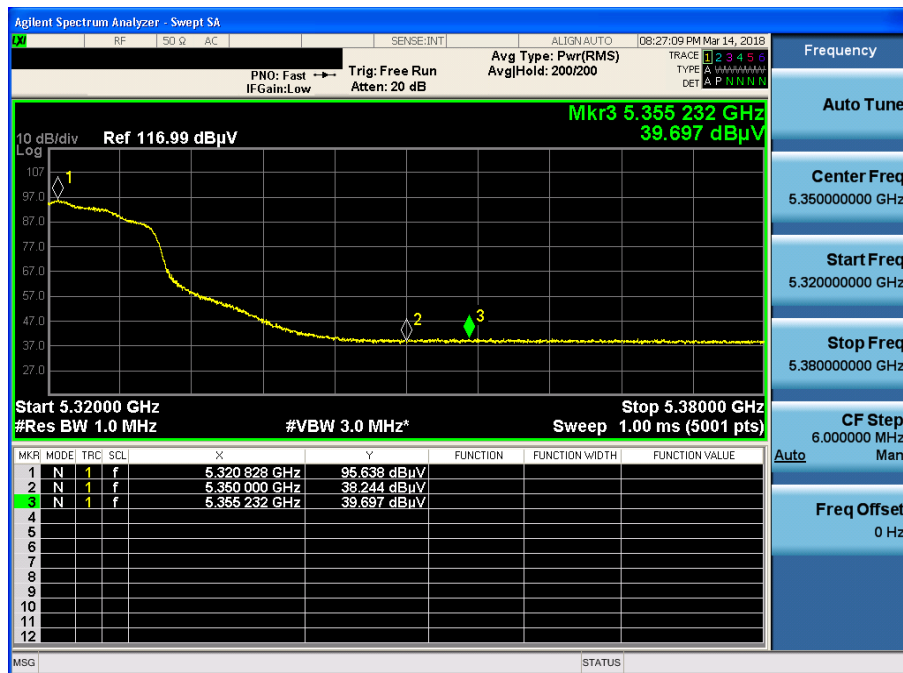
802.11ac(VHT20) & U-NII 2A & Ch.64 & Z axis & Hor

Detector Mode : PK



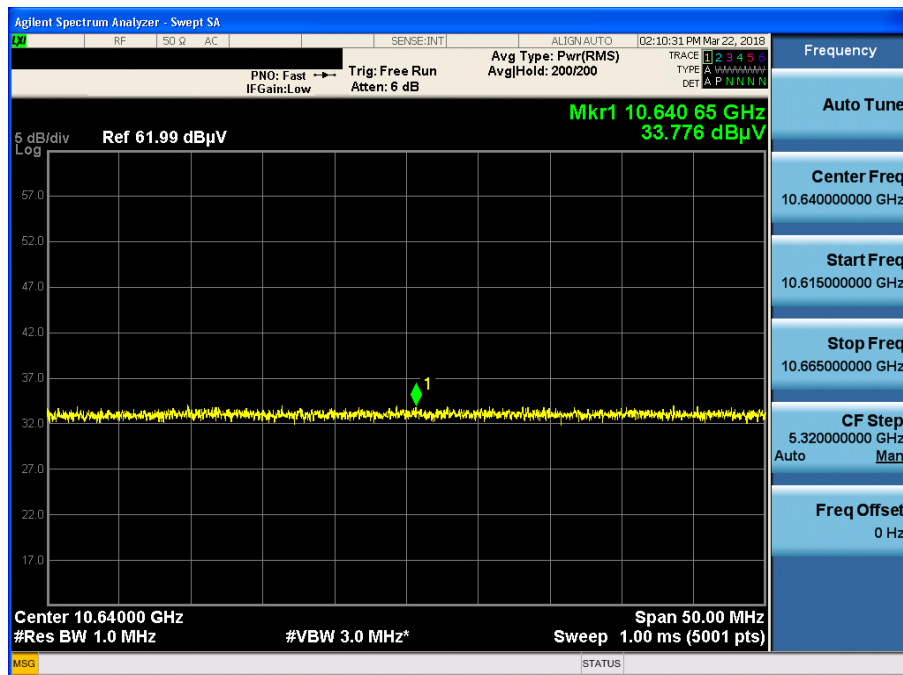
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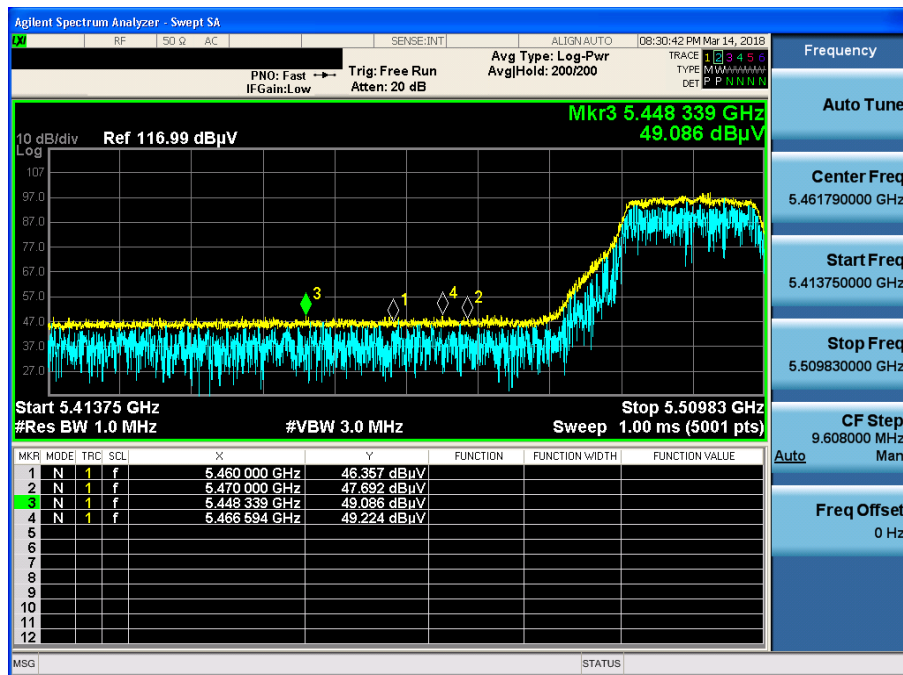
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Detector Mode : AV



802.11ac(VHT20) & U-NII 2C & Ch.100 & Z axis & Hor

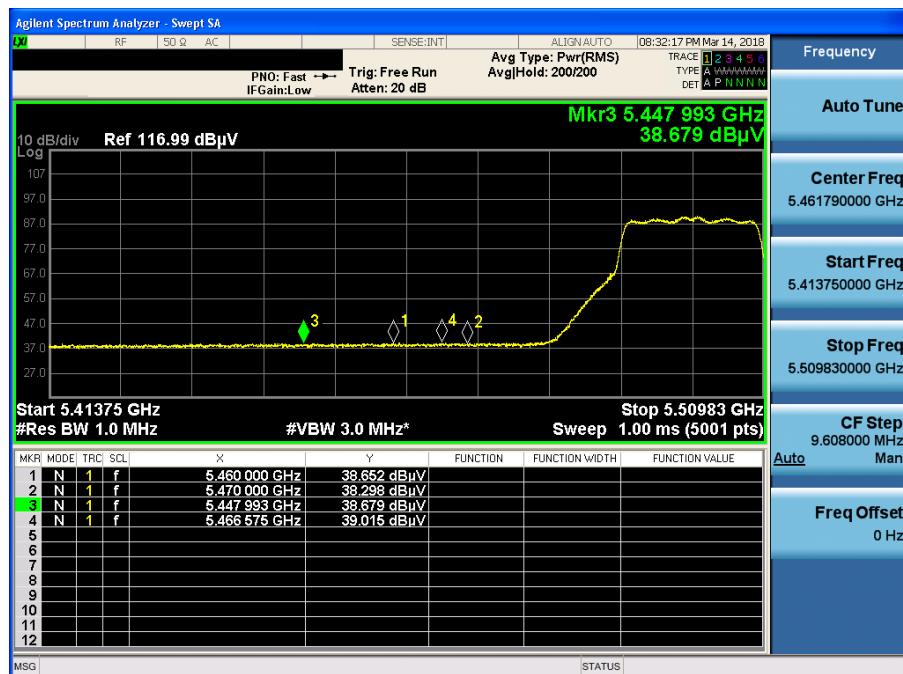
Detector Mode : PK



Note: Total Factor was included on this plot.

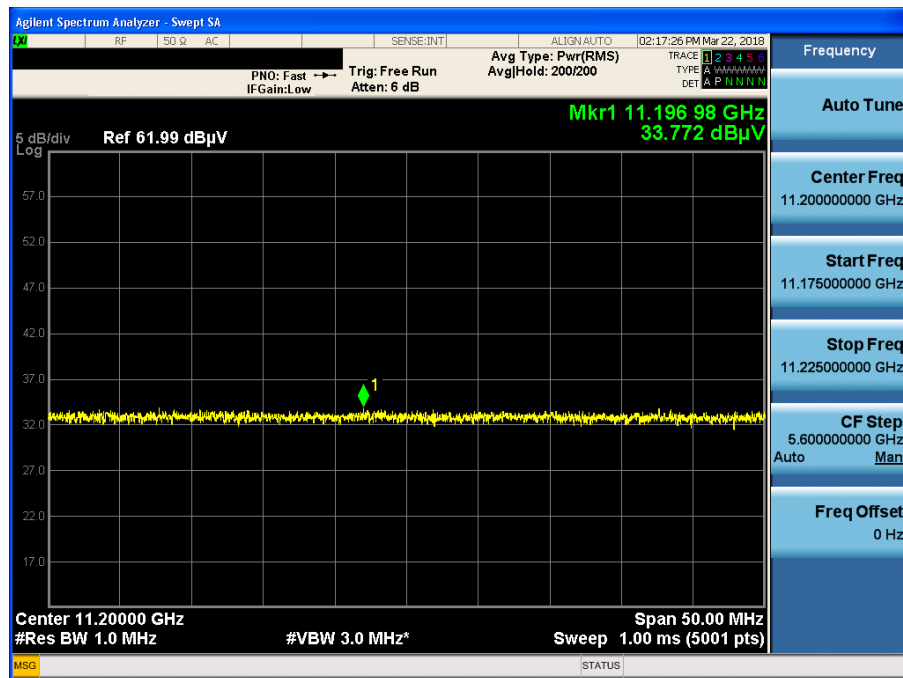
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Detector Mode : AV



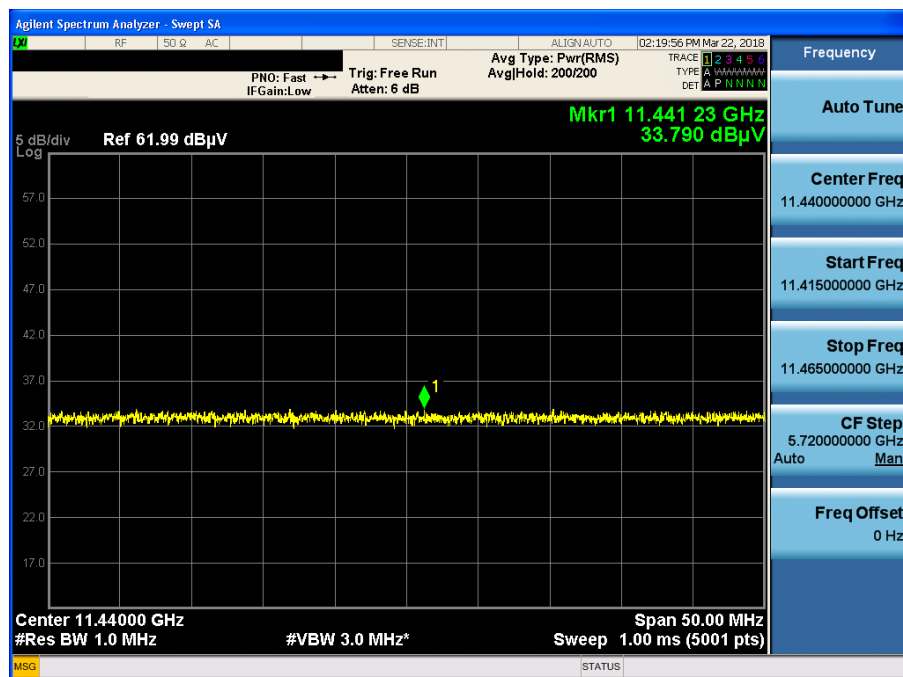
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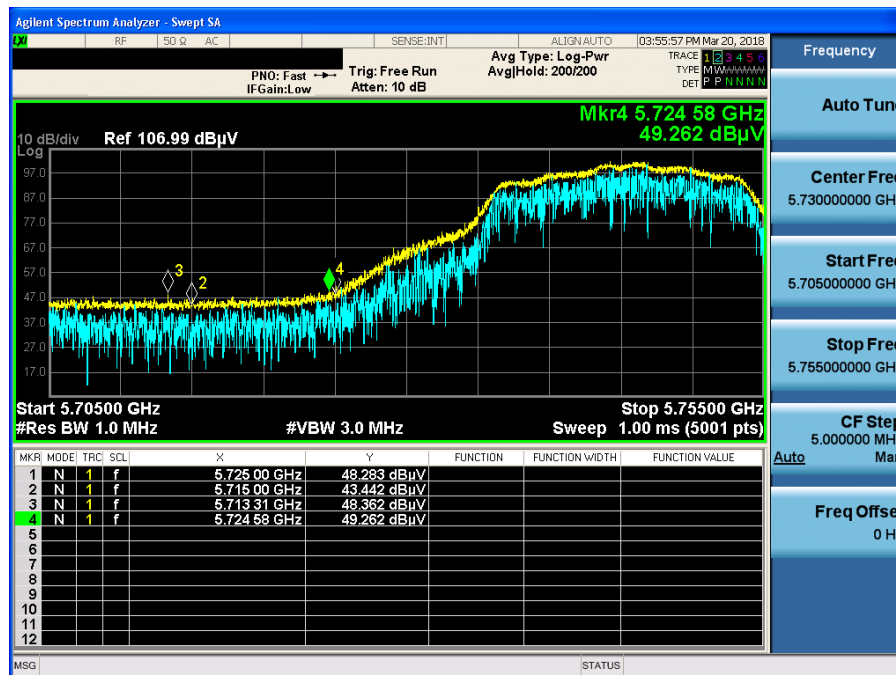
802.11ac(VHT20) & U-NII 2C & Ch.144 & X axis & Hor

Detector Mode : AV



802.11ac(VHT20) & U-NII 3 & Ch.149 & Y axis & Ver

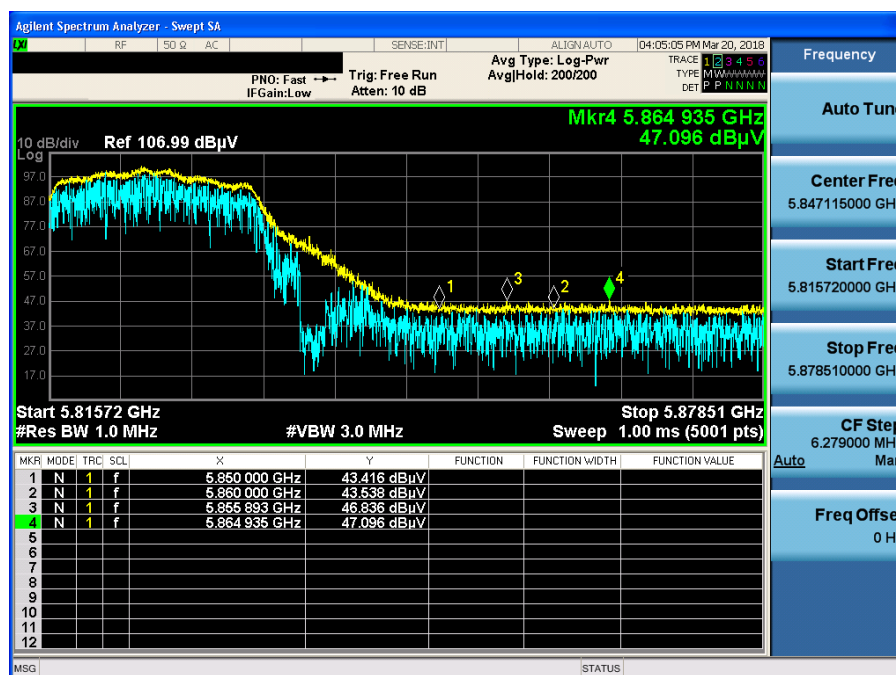
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Note: Total Factor was included on this plot.

802.11ac(VHT20) & U-NII 3 & Ch.165 & Z axis & Hor

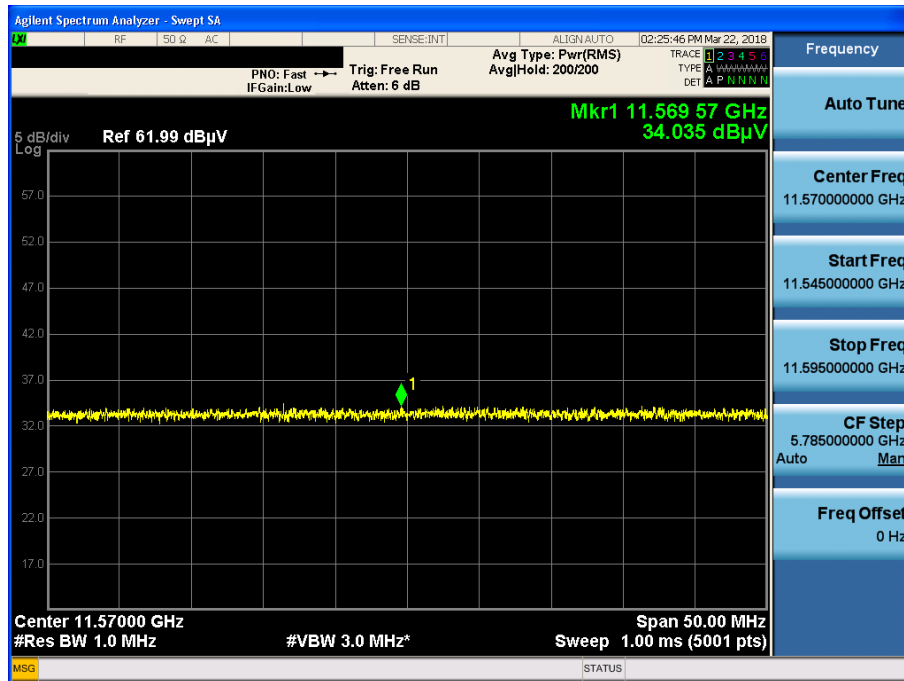
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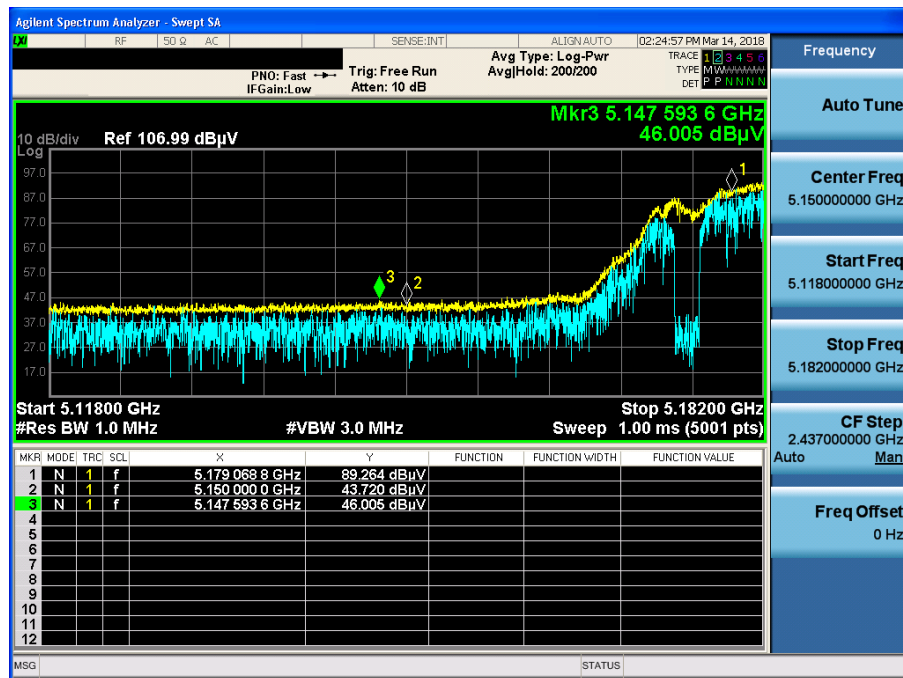
802.11ac(VHT20) & U-NII 3 & Ch.157 & Z axis & Hor

Detector Mode : AV



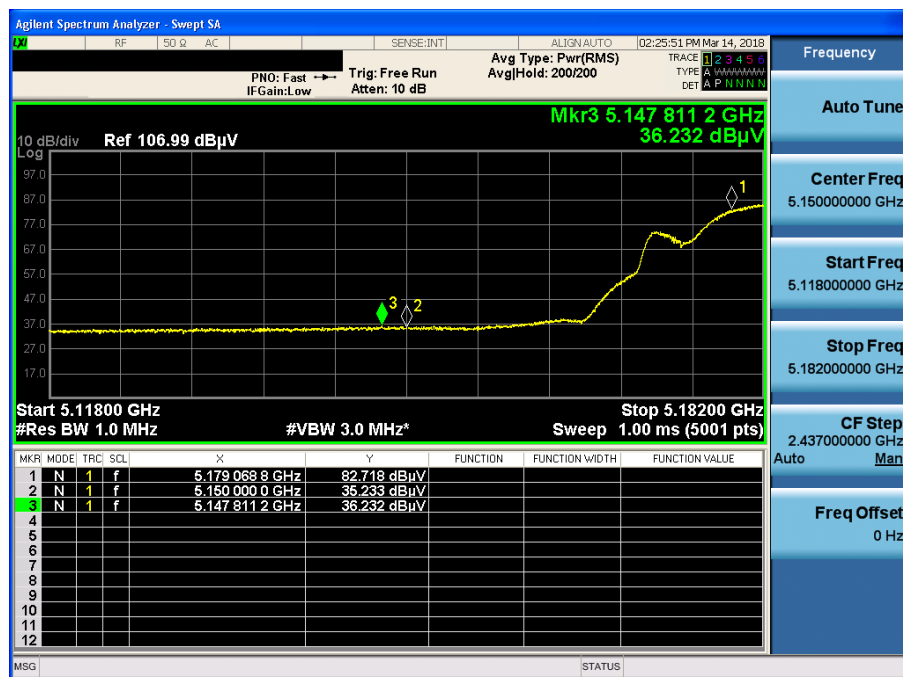
802.11ac(VHT40) & U-NII 1 & Ch.38 & Z axis & Ver

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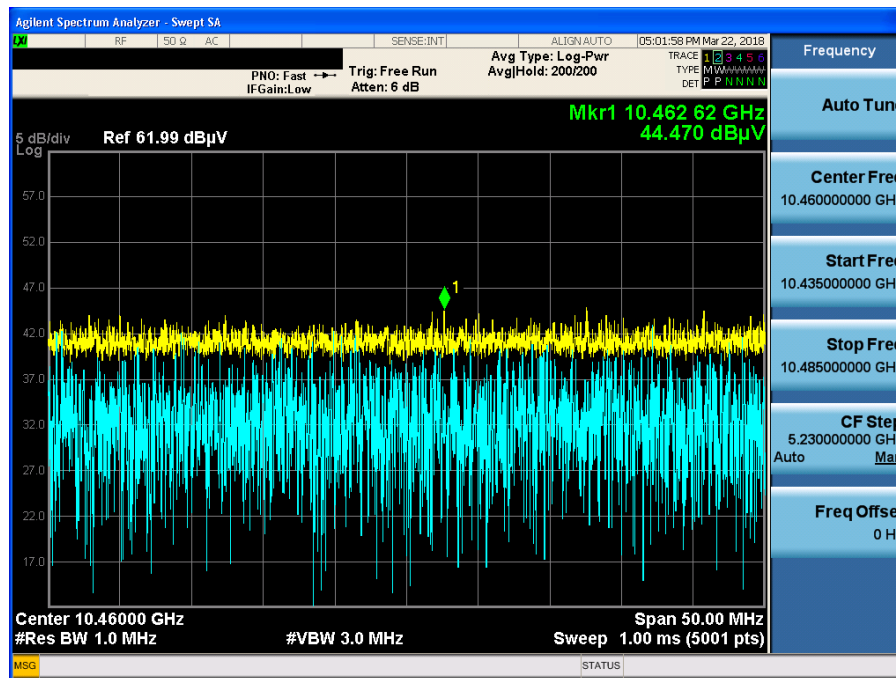


802.11ac(VHT40) & U-NII 1 & Ch.38 & Z axis & Ver

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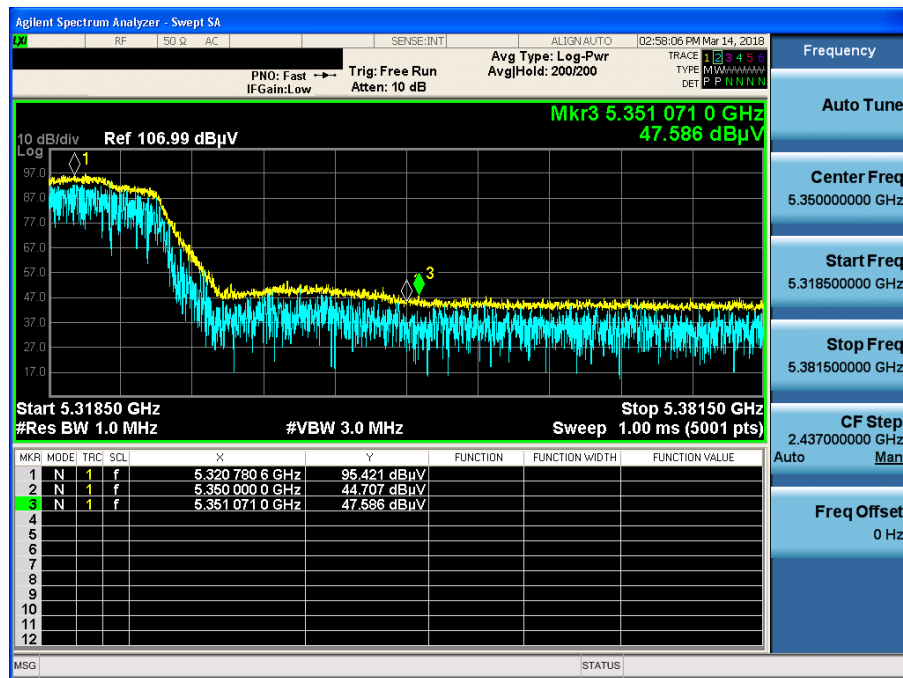


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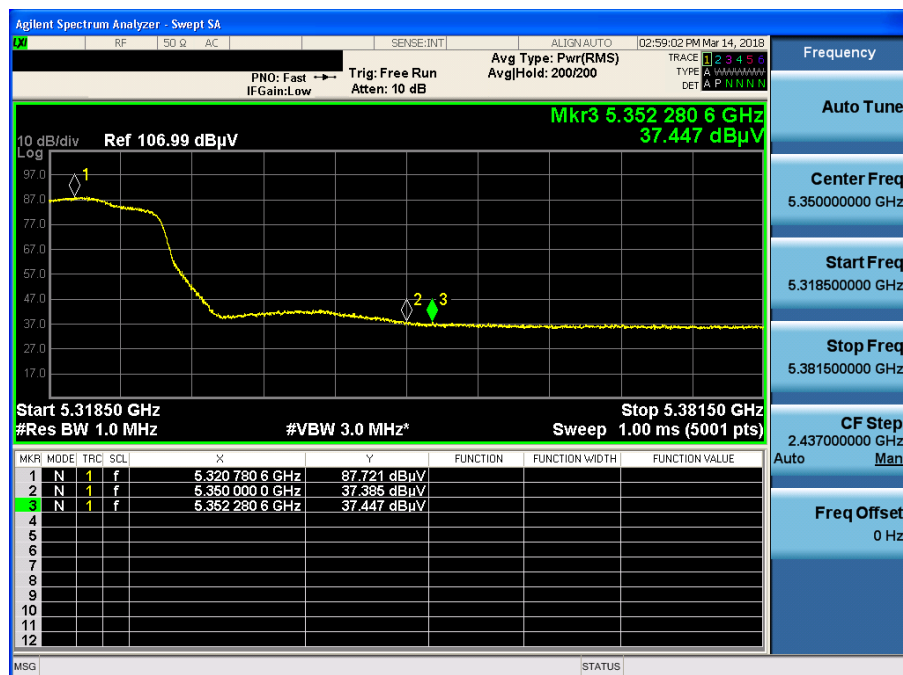
802.11ac(VHT40) & U-NII 2A & Ch.62 & Z axis & Hor

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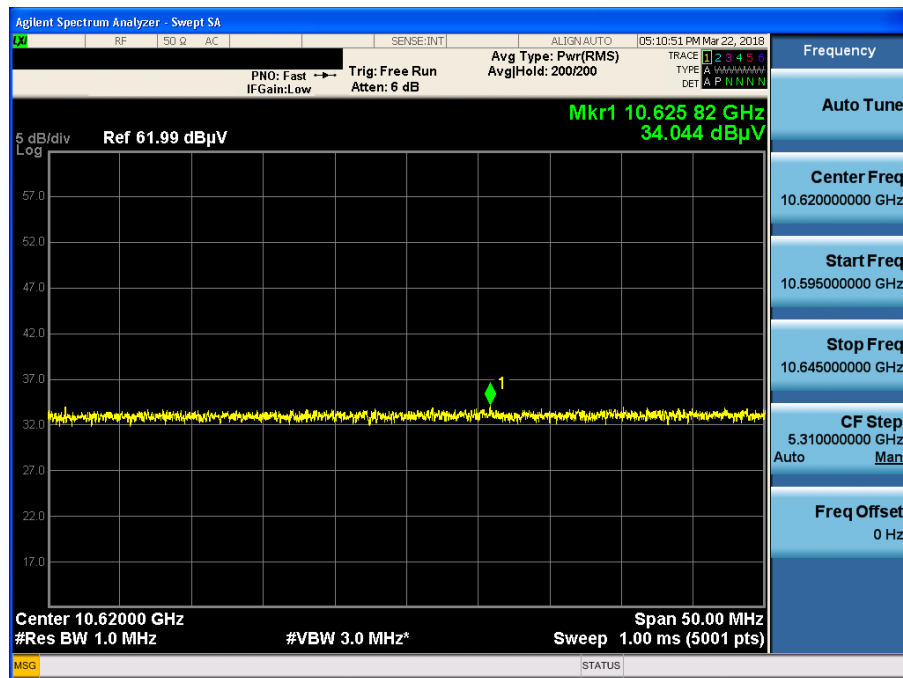


802.11ac(VHT40) & U-NII 2A & Ch.62 & Z axis & Hor

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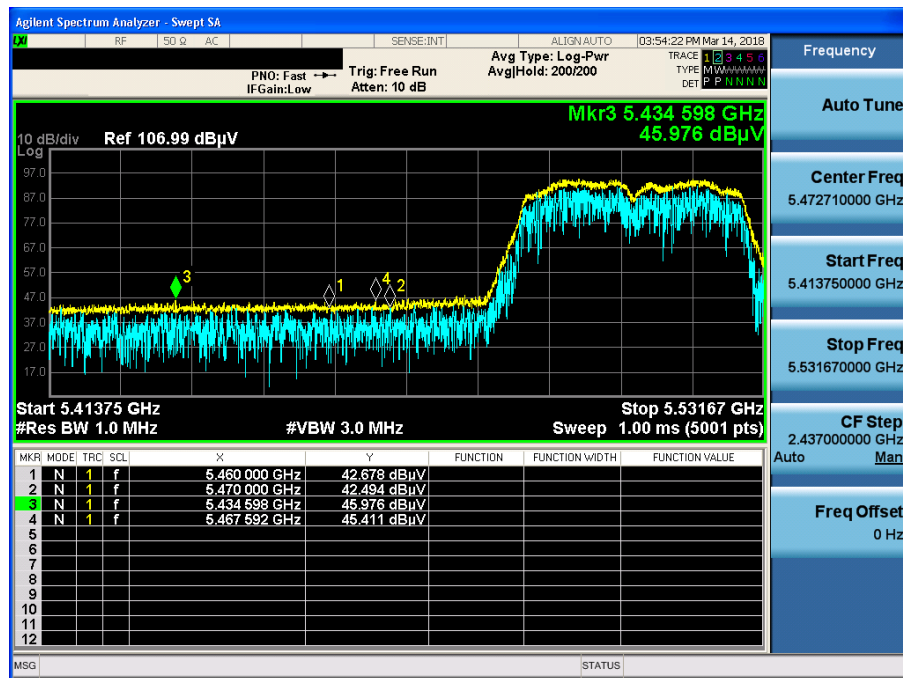


Detector Mode : AV



802.11ac(VHT40) & U-NII 2C & Ch.102 & Z axis & Hor

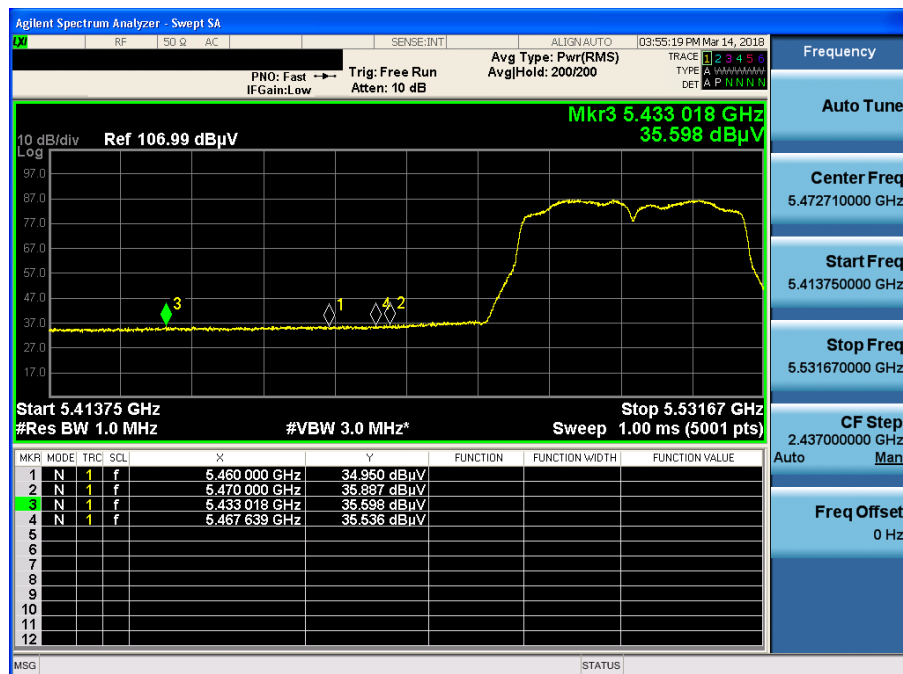
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Note: Total Factor was included on this plot.

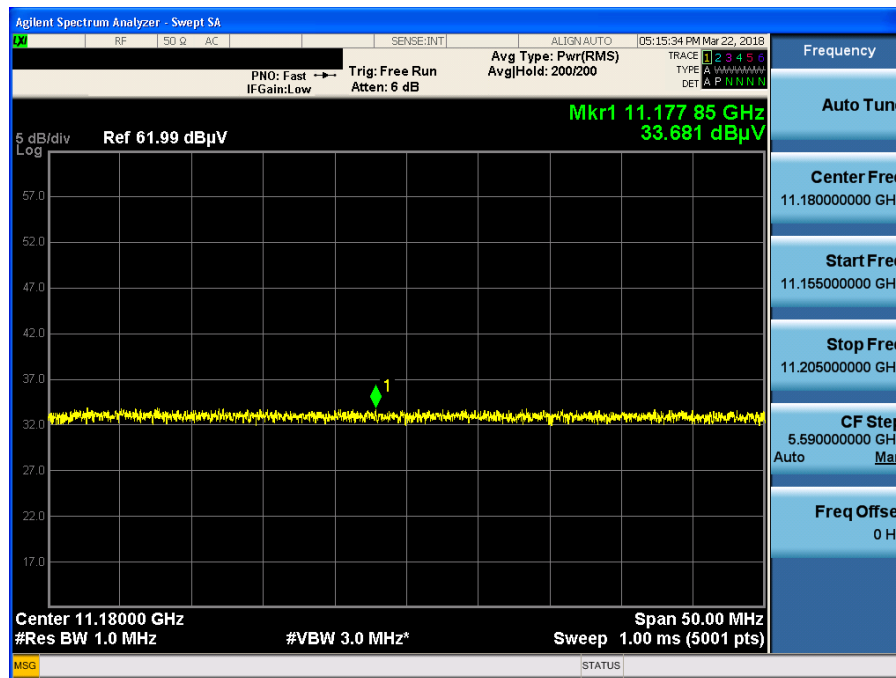
802.11ac(VHT40) & U-NII 2C & Ch.102 & Z axis & Hor

Detector Mode : AV



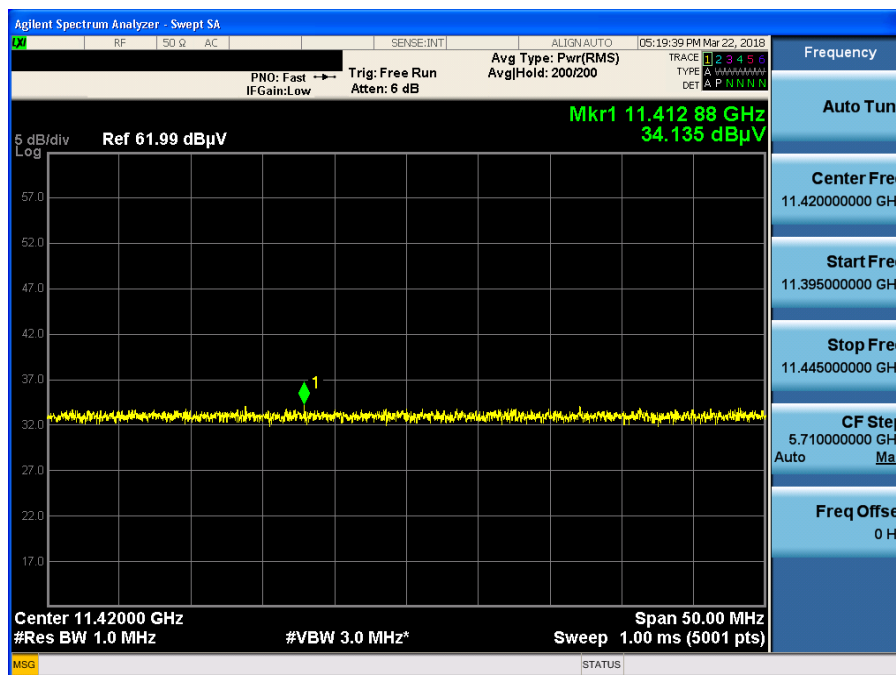
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Detector Mode : AV



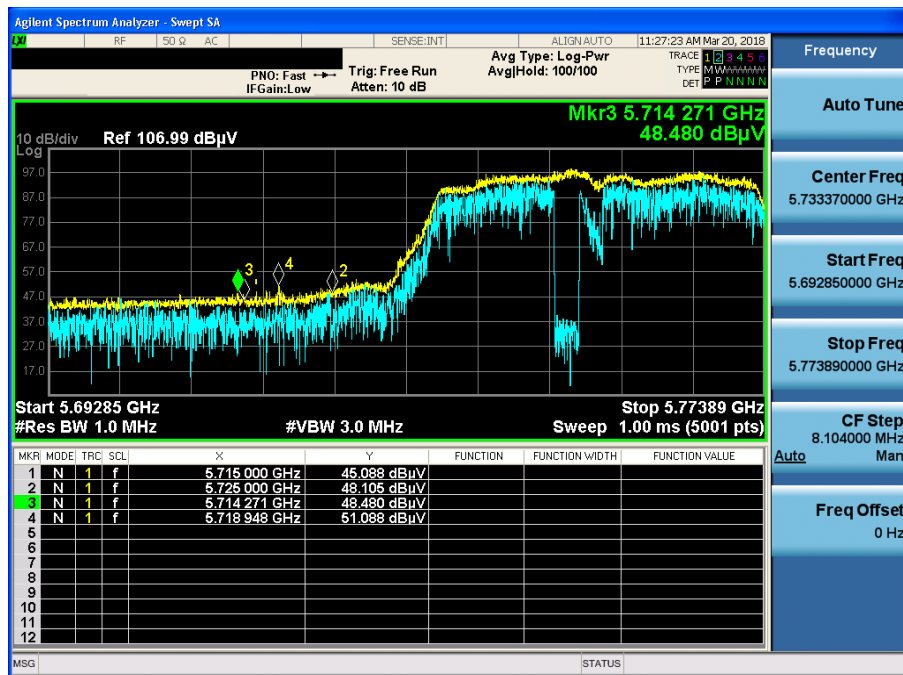
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Detector Mode : AV



802.11ac(VHT40) & U-NII 3 & Ch.151 & Y axis & Ver

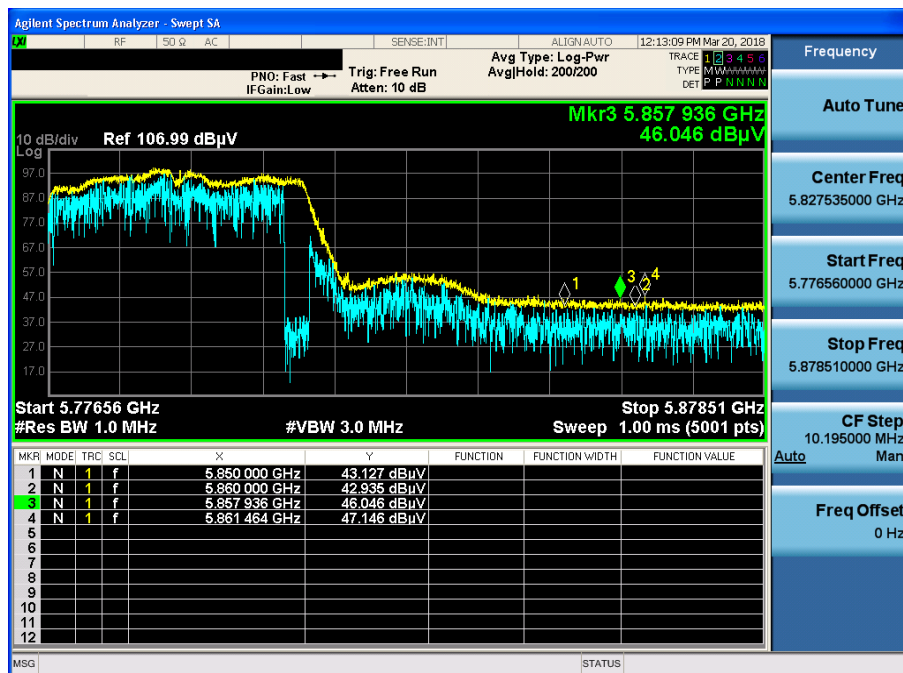
Detector Mode : PK



Note: Total Factor was included on this plot.

802.11ac(VHT40) & U-NII 3 & Ch.159 & Z axis & Hor

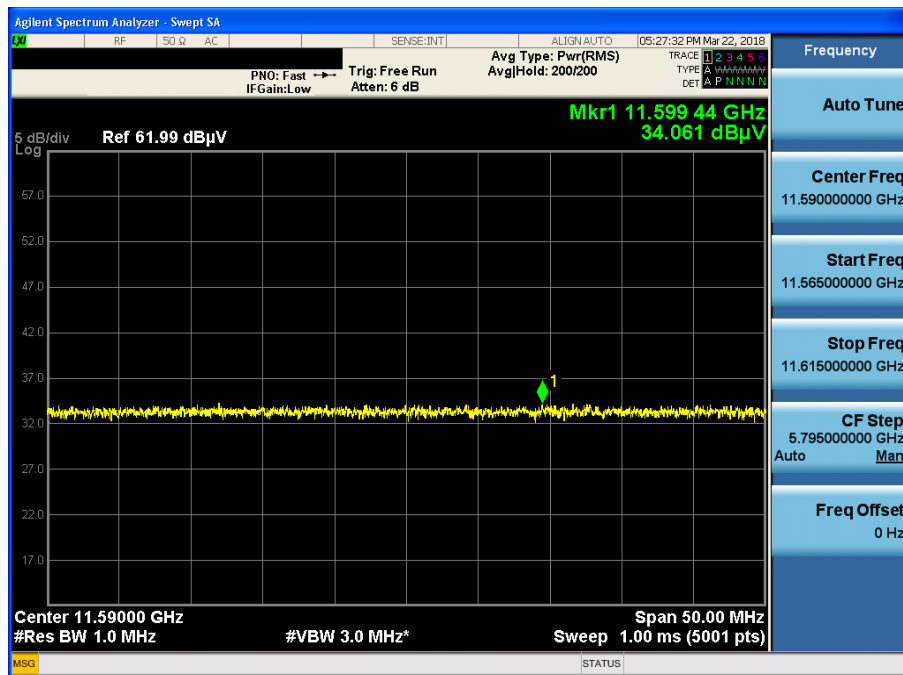
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Note: Total Factor was included on this plot.

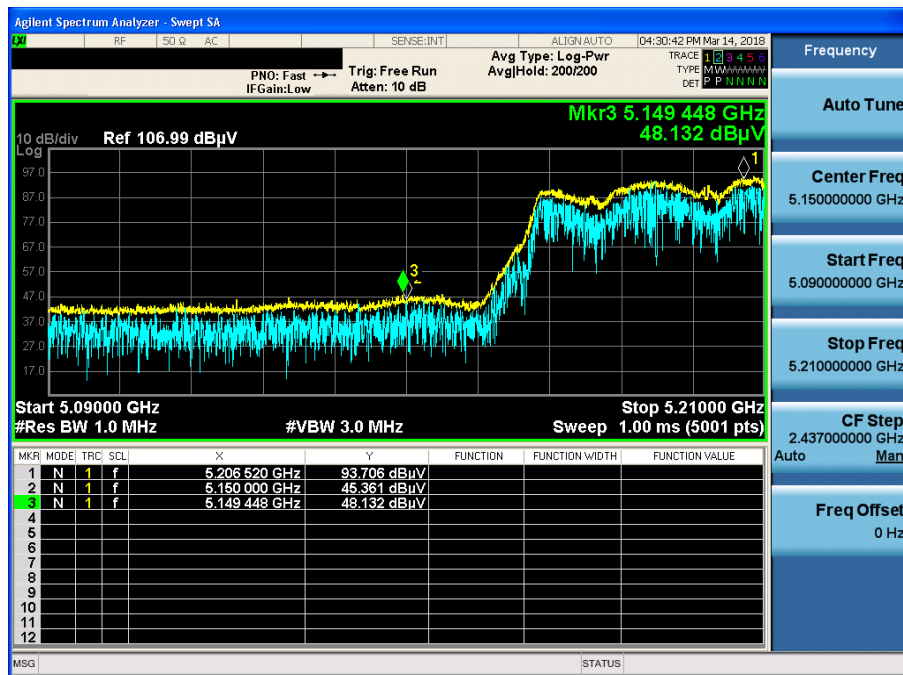
802.11ac(VHT40) & U-NII 3 & Ch.159 & Z axis & Hor

Detector Mode : AV



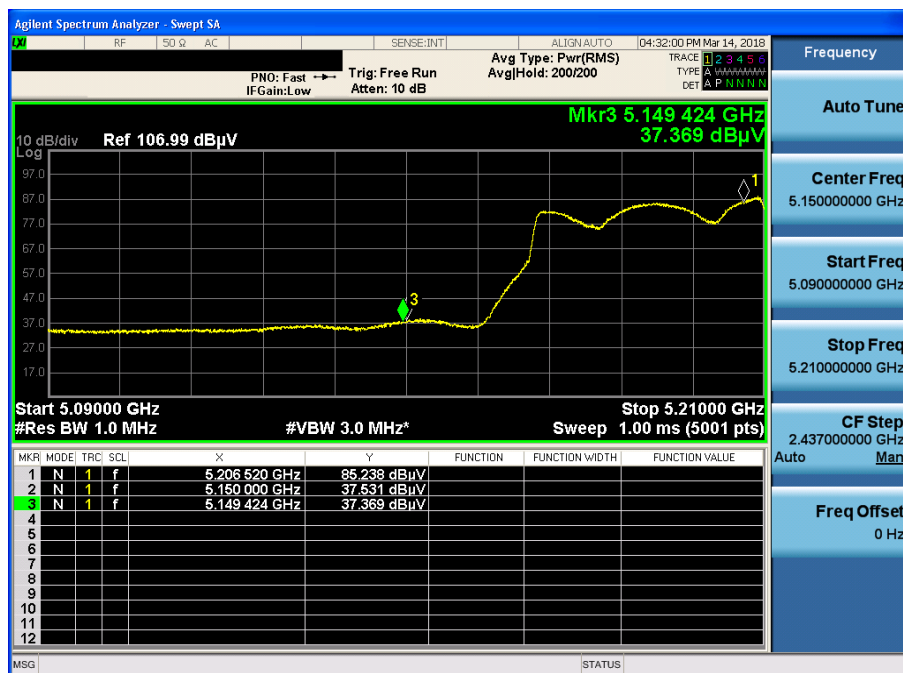
802.11ac(VHT80) & U-NII 1 & Ch.42 & Y axis & Ver

Detector Mode : PK



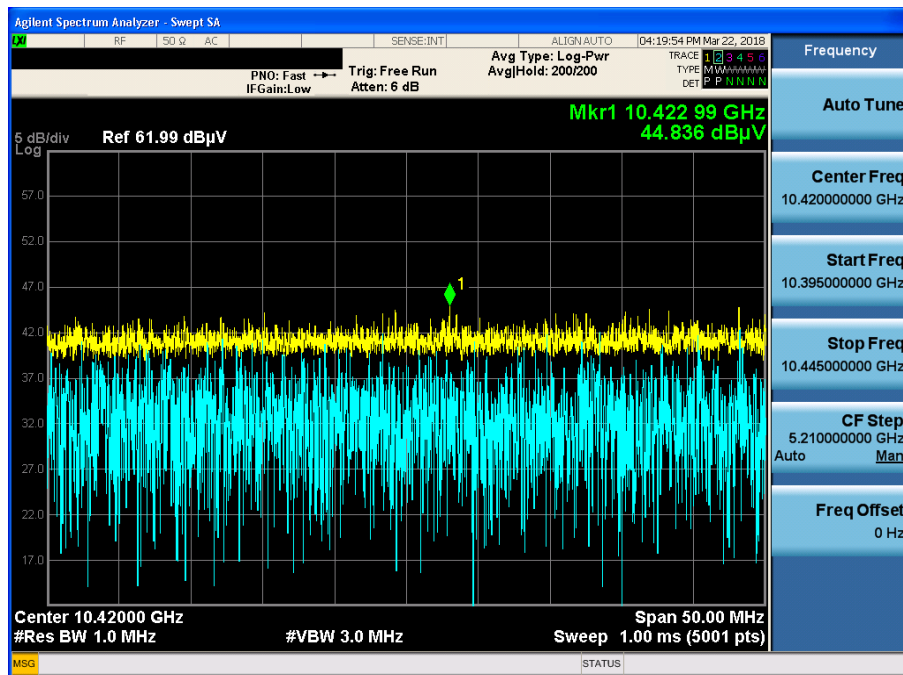
802.11ac(VHT80) & U-NII 1 & Ch.42 & Y axis & Ver

Detector Mode : AV



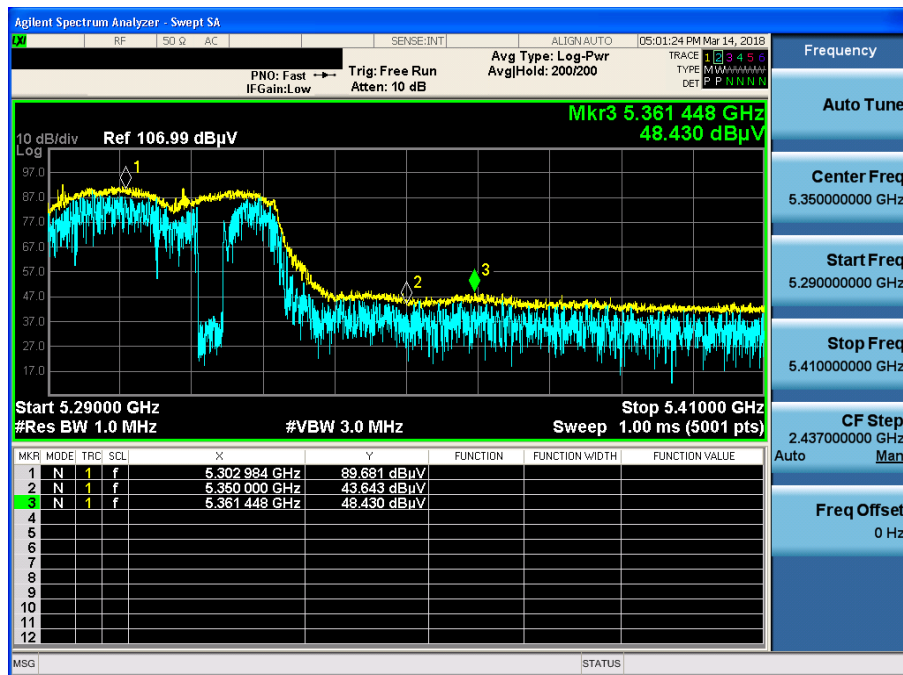
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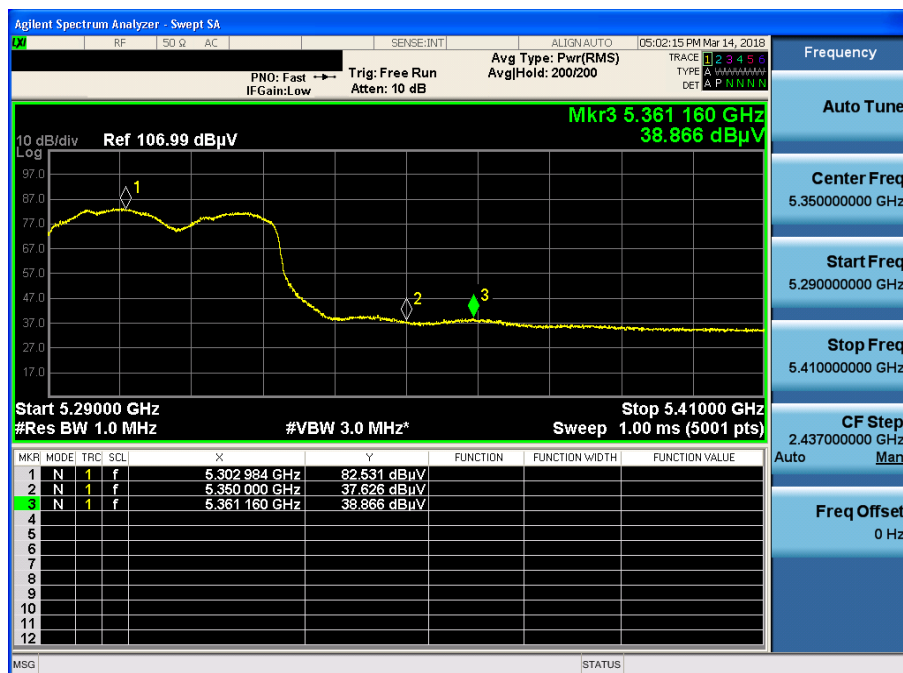
802.11ac(VHT80) & U-NII 2A & Ch.58 & Z axis & Hor

Detector Mode : PK

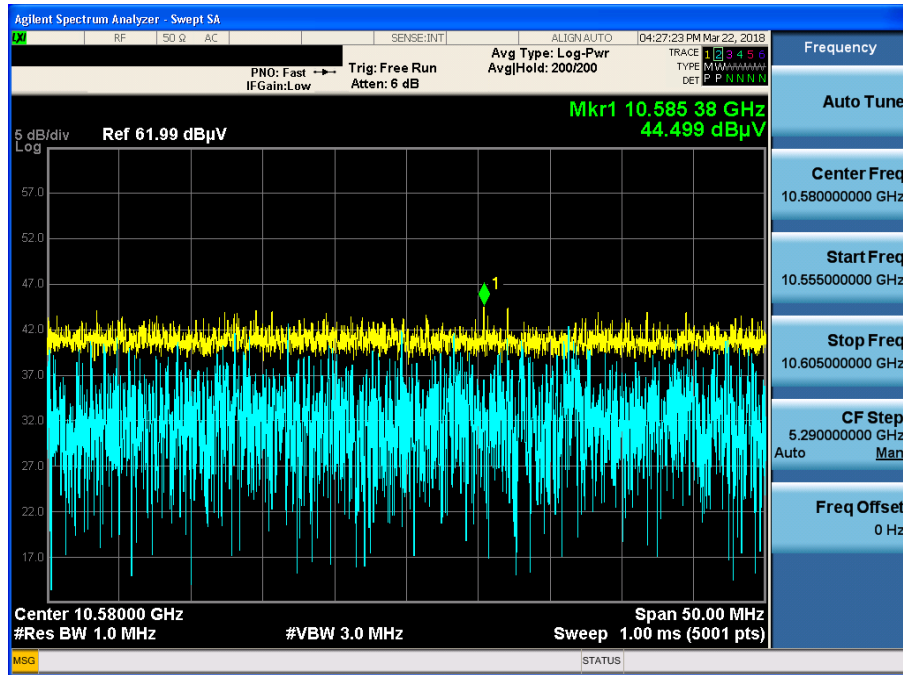


802.11ac(VHT80) & U-NII 2A & Ch.58 & Z axis & Hor

Detector Mode : AV

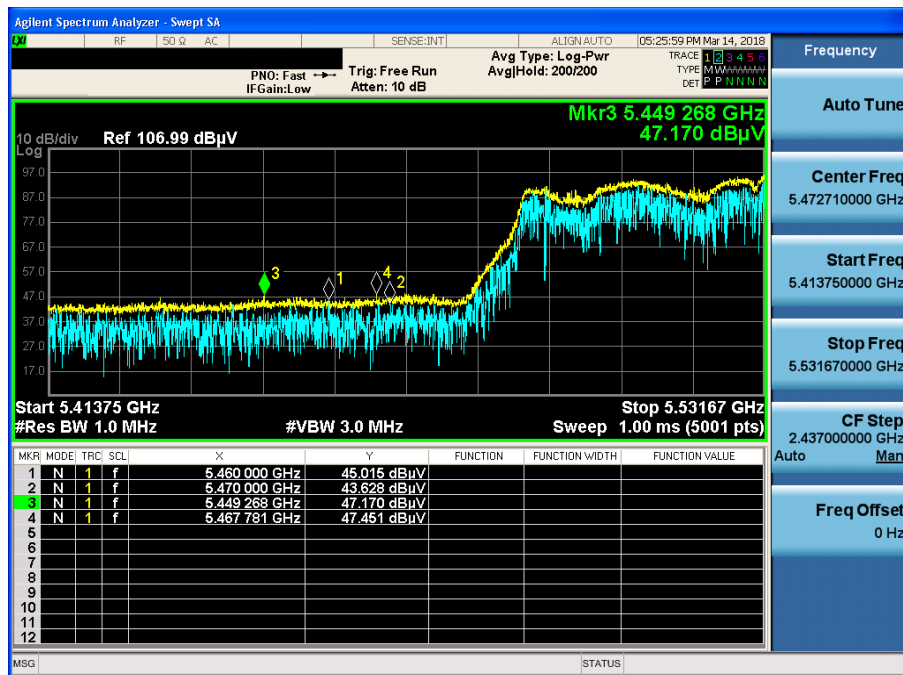


Detector Mode : PK



802.11ac(VHT80) & U-NII 2C & Ch.106 & Y axis & Ver

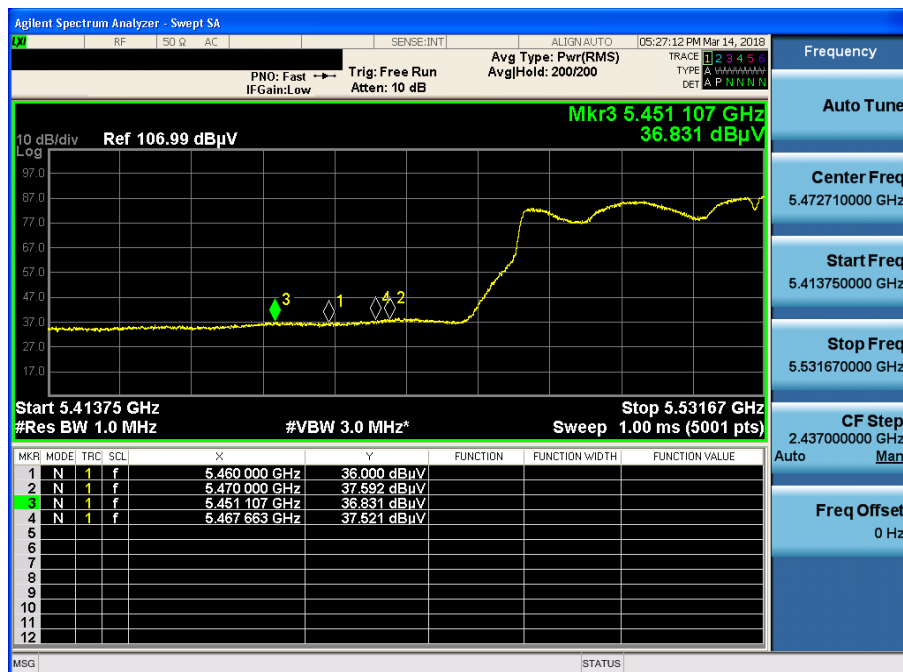
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Note: Total Factor was included on this plot.

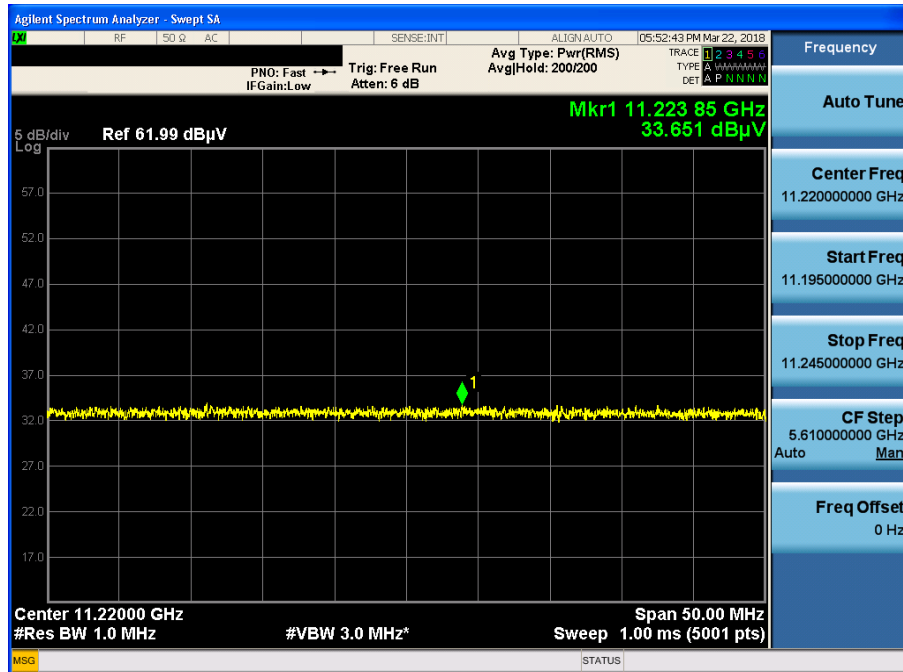
802.11ac(VHT80) & U-NII 2C & Ch.106 & Y axis & Ver

Detector Mode : AV



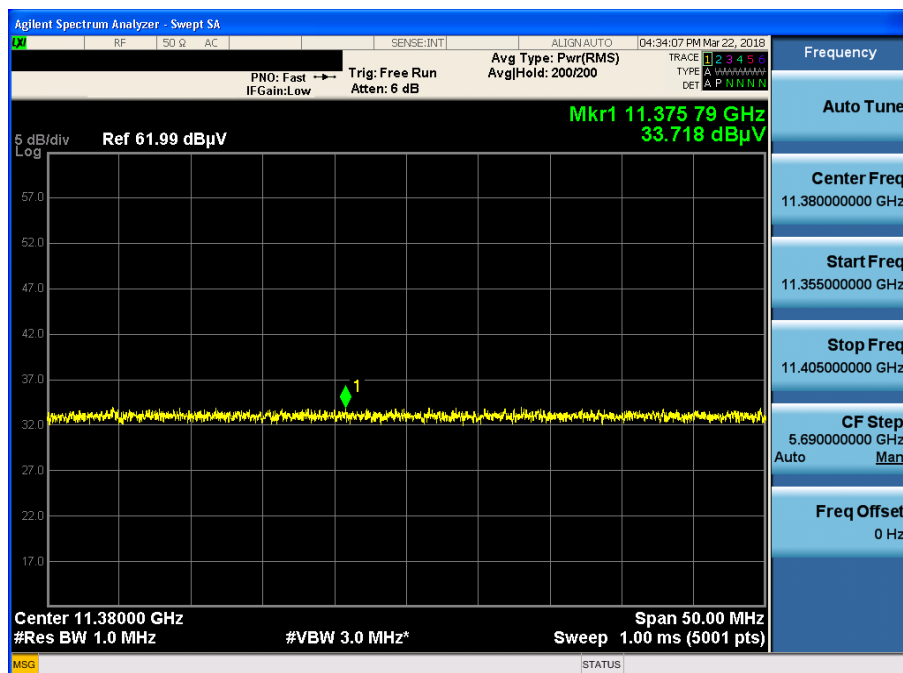
802.11ac(VHT80) & U-NII 2C & Ch.122 & X axis & Hor

Detector Mode : AV



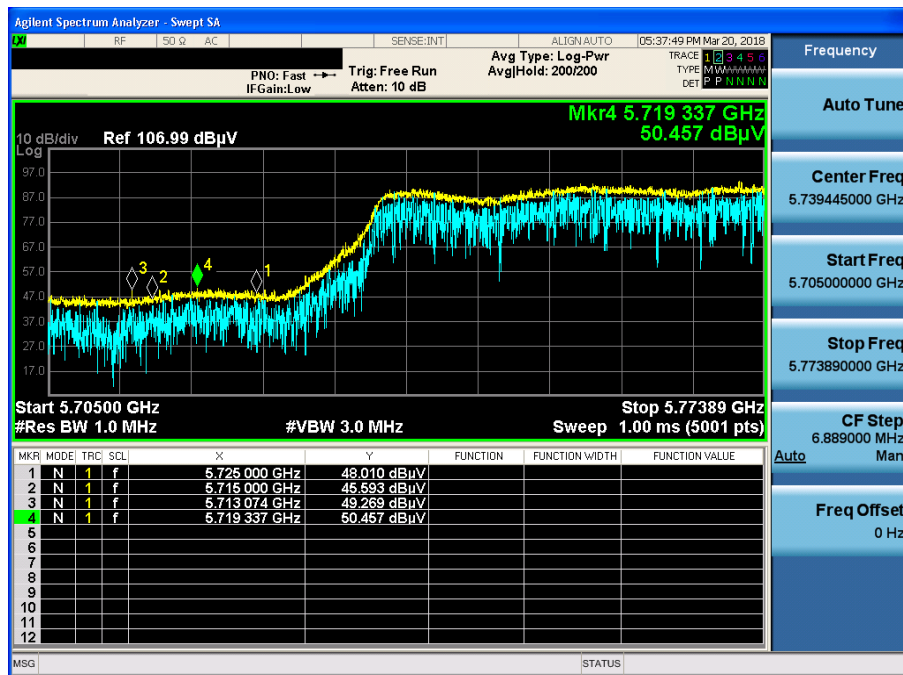
802.11ac(VHT80) & U-NII 2C & Ch.138 & Z axis & Hor

Detector Mode : AV



802.11ac(VHT80) & U-NII 3 & Ch.155 & Y axis & Ver

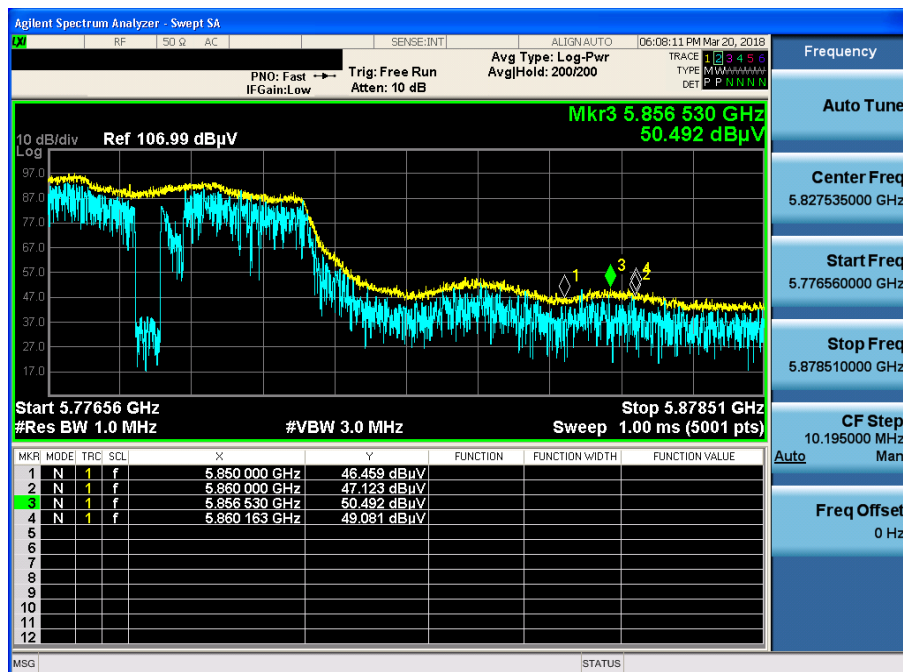
Detector Mode : PK



Note: Total Factor was included on this plot.

802.11ac(VHT80) & U-NII 3 & Ch.155 & Z axis & Hor

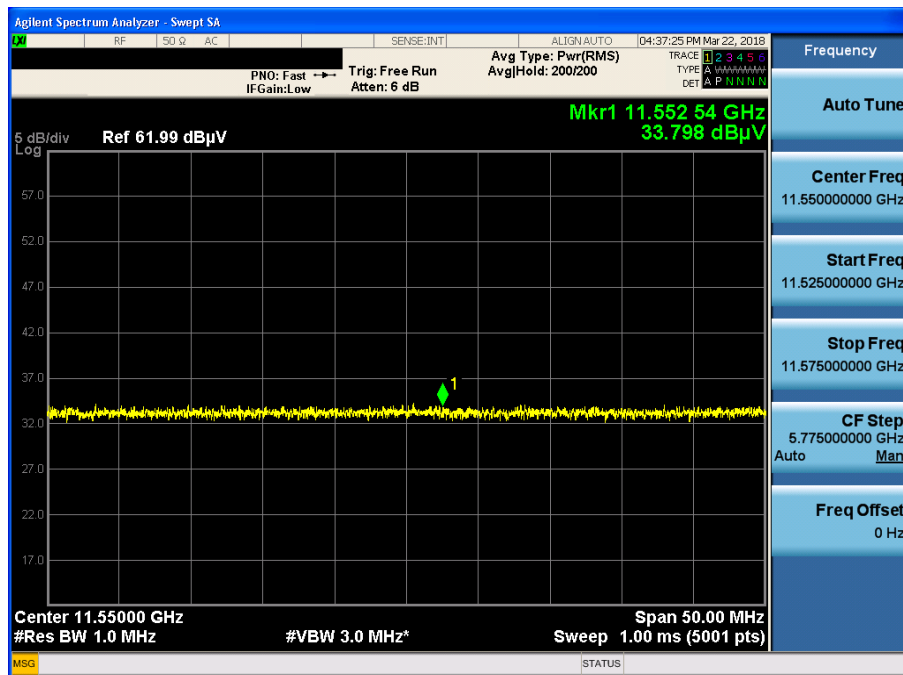
Detector Mode : PK



Note: Total Factor was included on this plot.

802.11ac(VHT80) & U-NII 3 & Ch.155 & Z axis & Hor

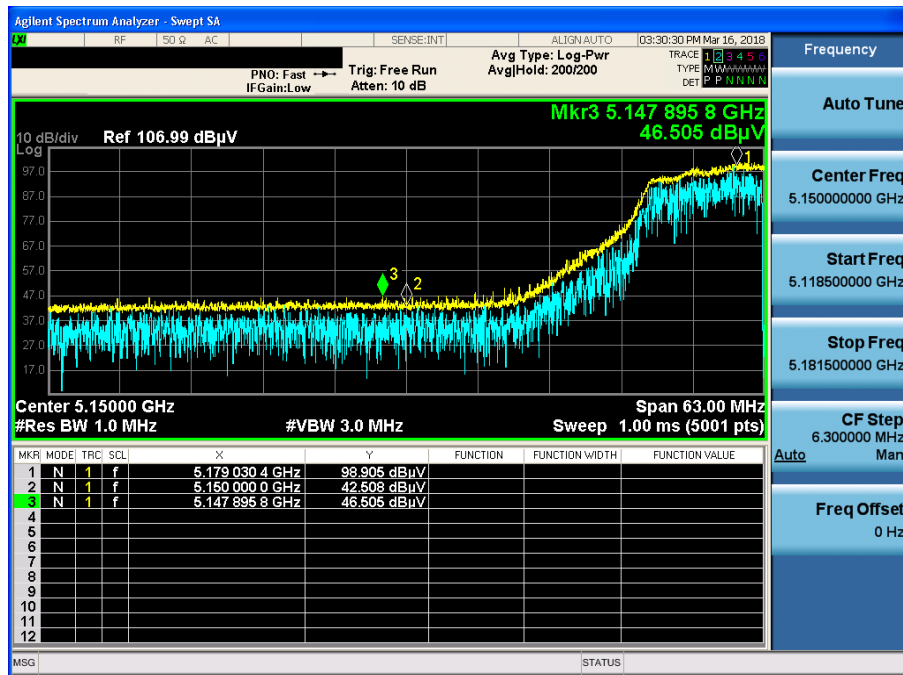
Detector Mode : AV



Unwanted Emissions (Radiated) Test Plot : SDM _ Normal

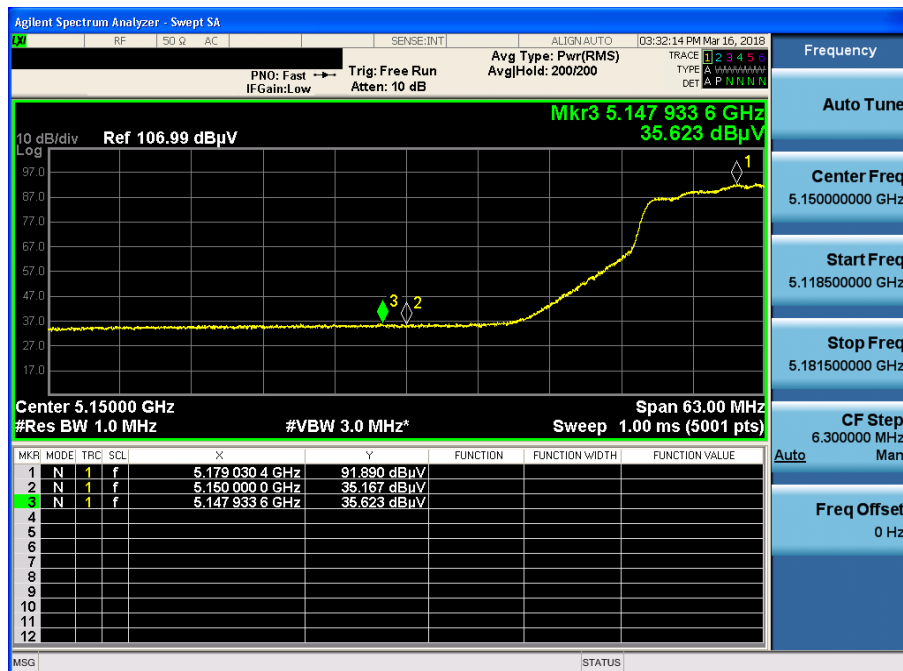
802.11ac(VHT20) & U-NII 1 & Ch.36 & X axis & Hor

Detector Mode : PK

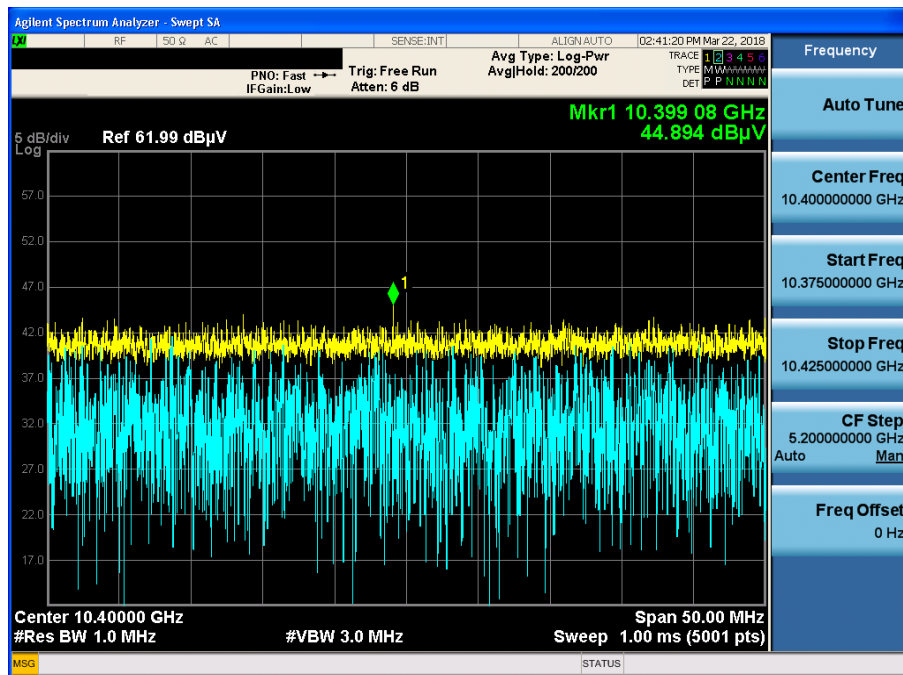


802.11ac(VHT20) & U-NII 1 & Ch.36 & X axis & Hor

Detector Mode : AV

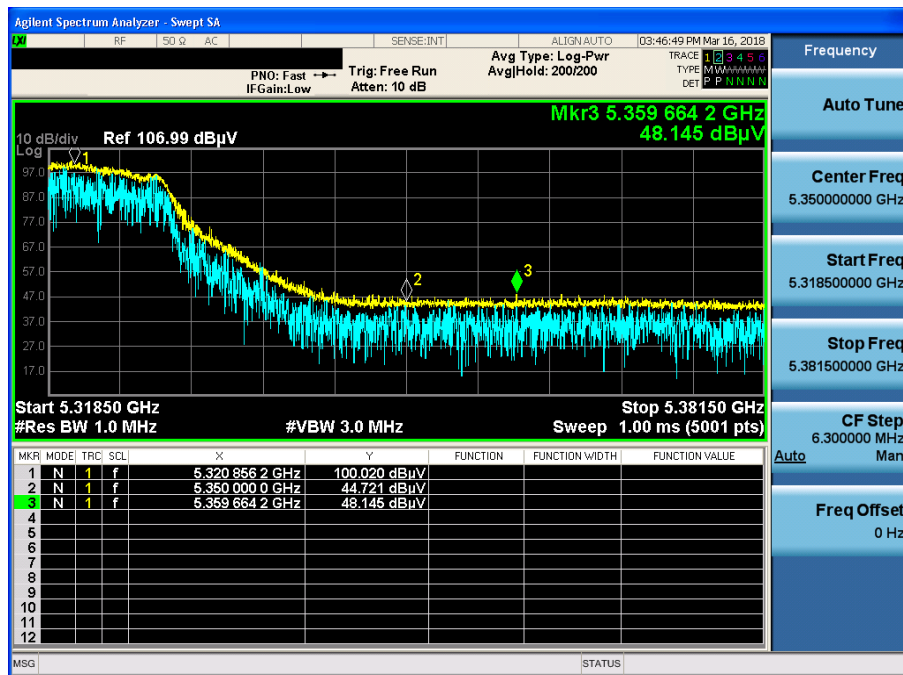


Detector Mode : PK



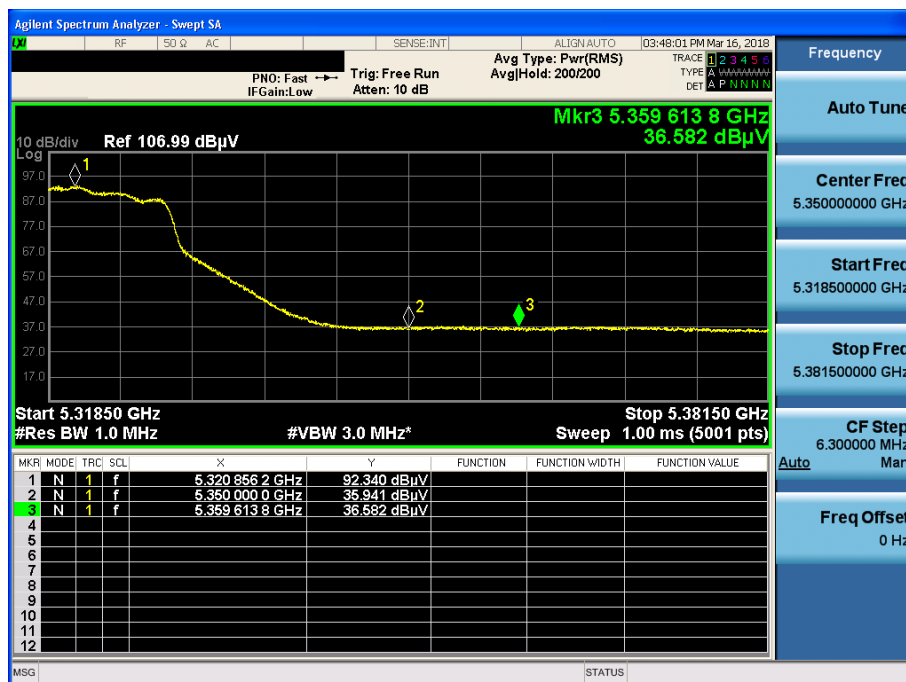
802.11ac(VHT20) & U-NII 2A & Ch.64 & Z axis & Hor

Detector Mode : PK



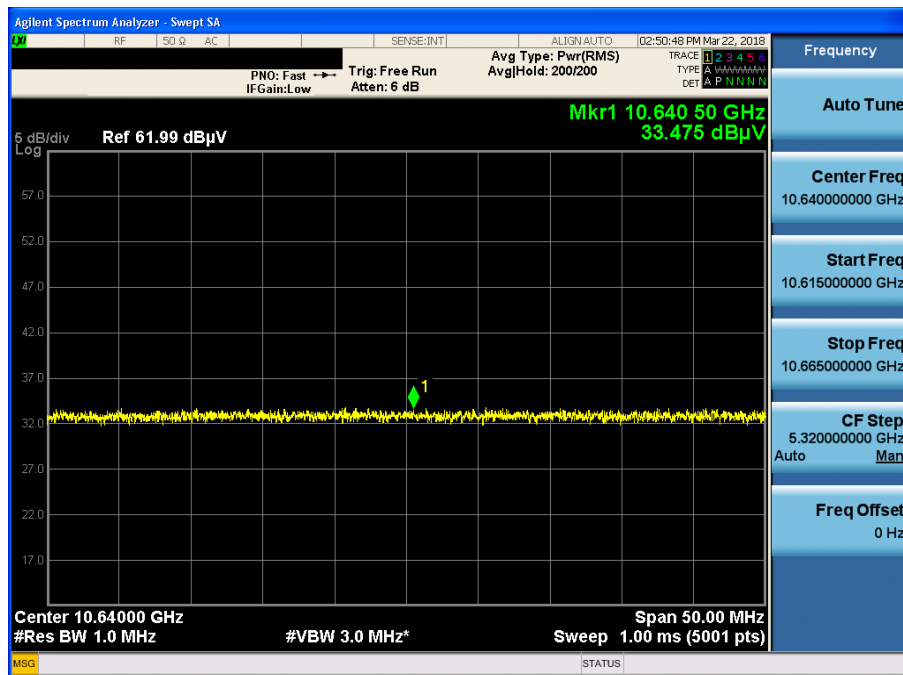
802.11ac(VHT20) & U-NII 2A & Ch.64 & Z axis & Hor

Detector Mode : AV



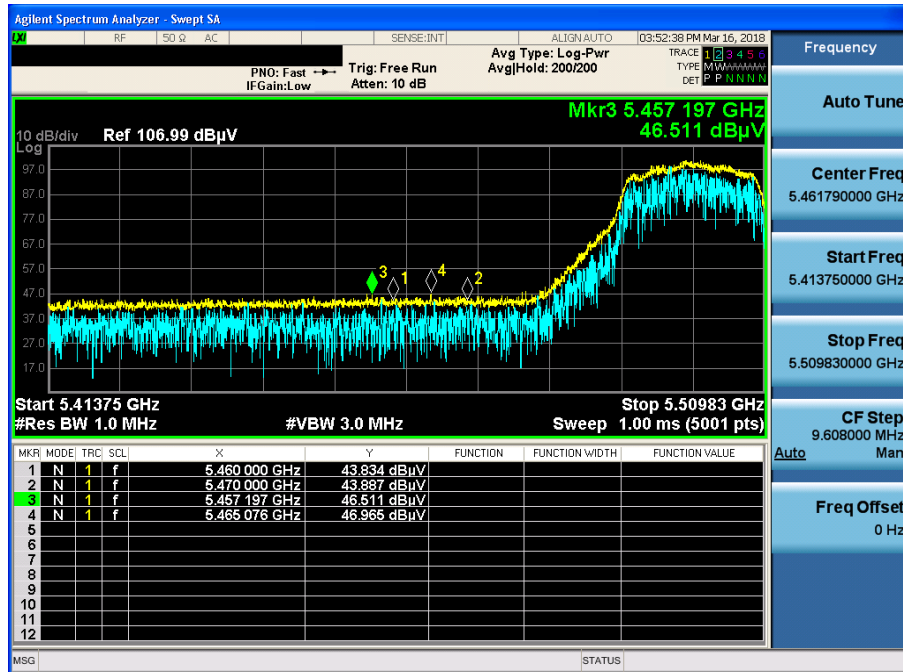
802.11ac(VHT20) & U-NII 2A & Ch.64 & Z axis & Hor

Detector Mode : AV



802.11ac(VHT20) & U-NII 2C & Ch.100 & Z axis & Hor

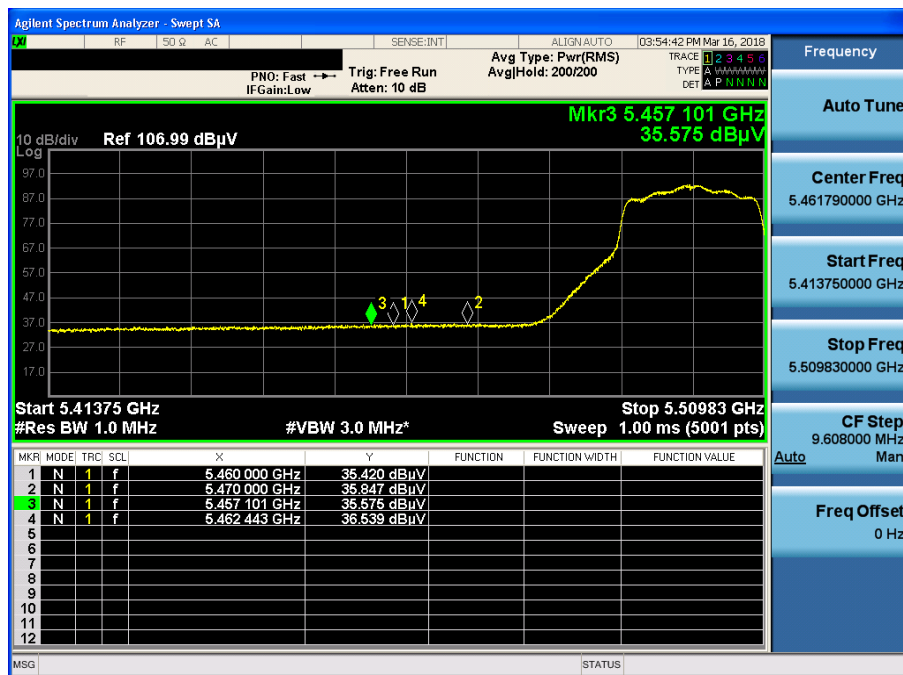
Detector Mode : PK



Note: Total Factor was included on this plot.

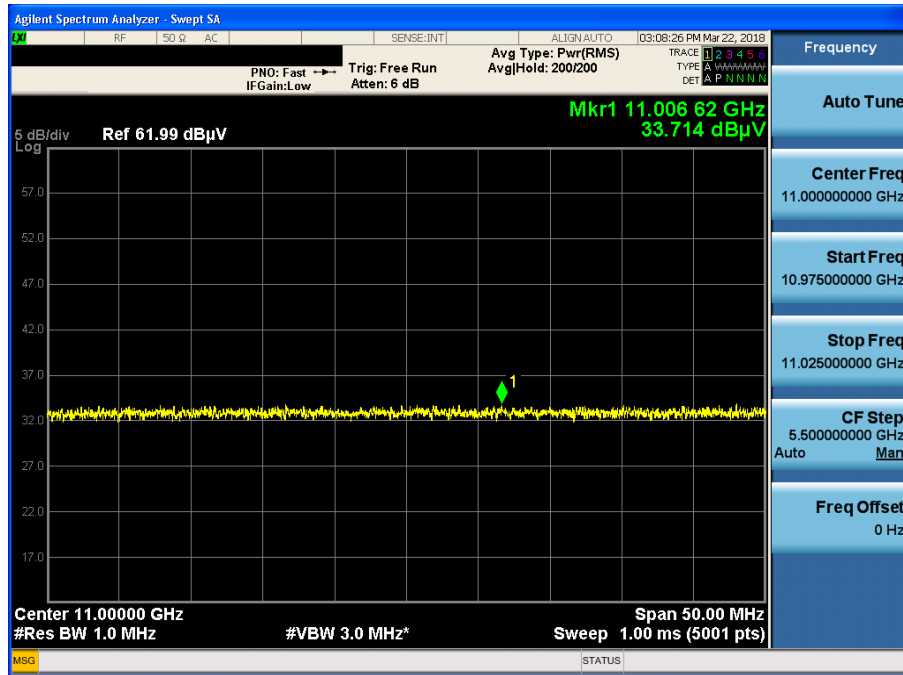
802.11ac(VHT20) & U-NII 2C & Ch.100 & Z axis & Hor

Detector Mode : AV



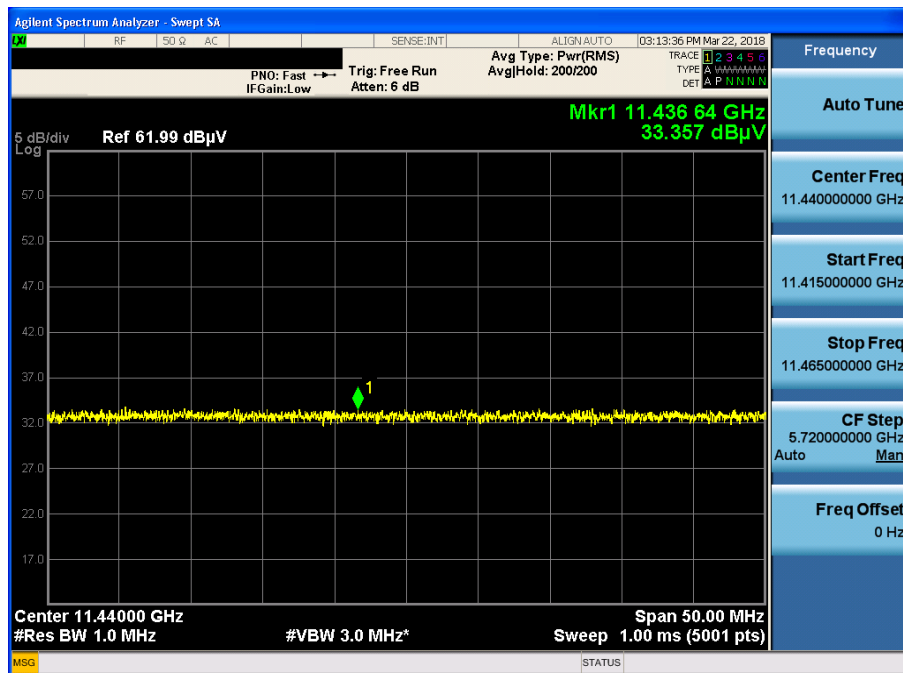
802.11ac(VHT20) & U-NII 2C & Ch.100 & Z axis & Hor

Detector Mode : AV



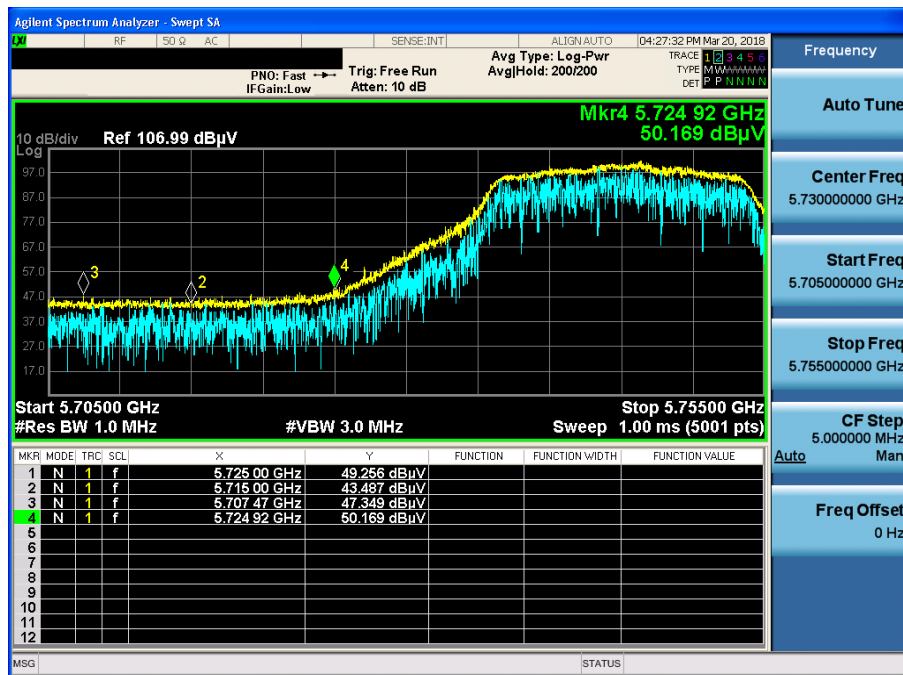
802.11ac(VHT20) & U-NII 2C & Ch.144 & Z axis & Hor

Detector Mode : AV



802.11ac(VHT20) & U-NII 3 & Ch.149 & Y axis & Ver

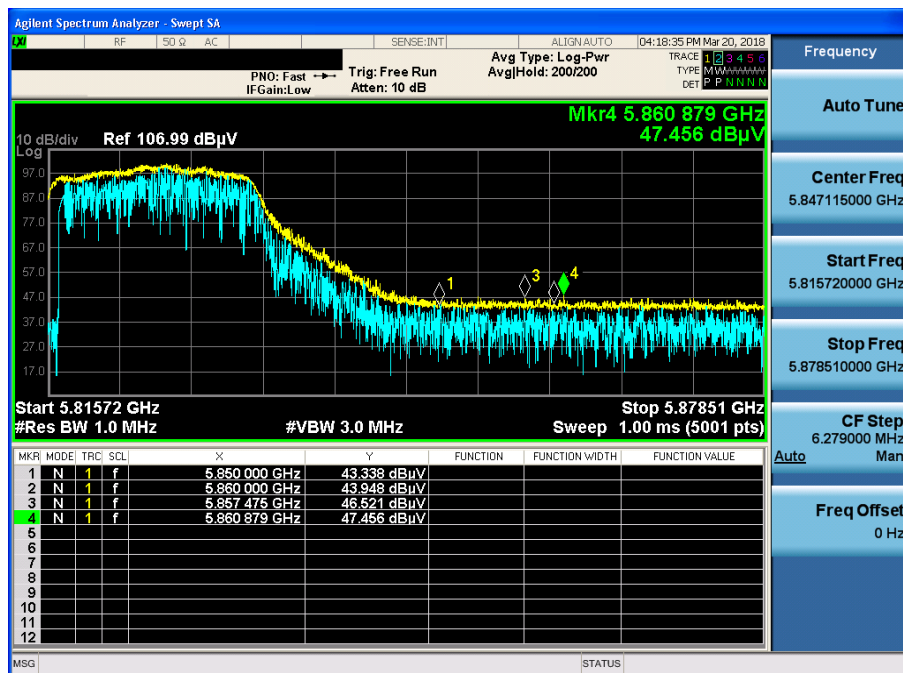
Detector Mode : PK



Note: Total Factor was included on this plot.

802.11ac(VHT20) & U-NII 3 & Ch.165 & Y axis & Ver

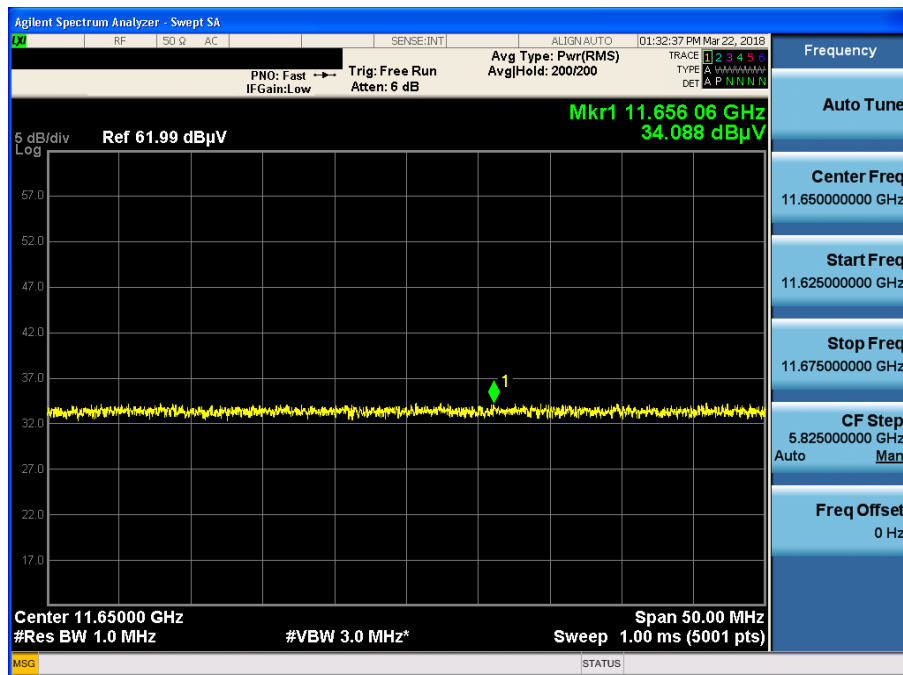
Detector Mode : PK



Note: Total Factor was included on this plot.

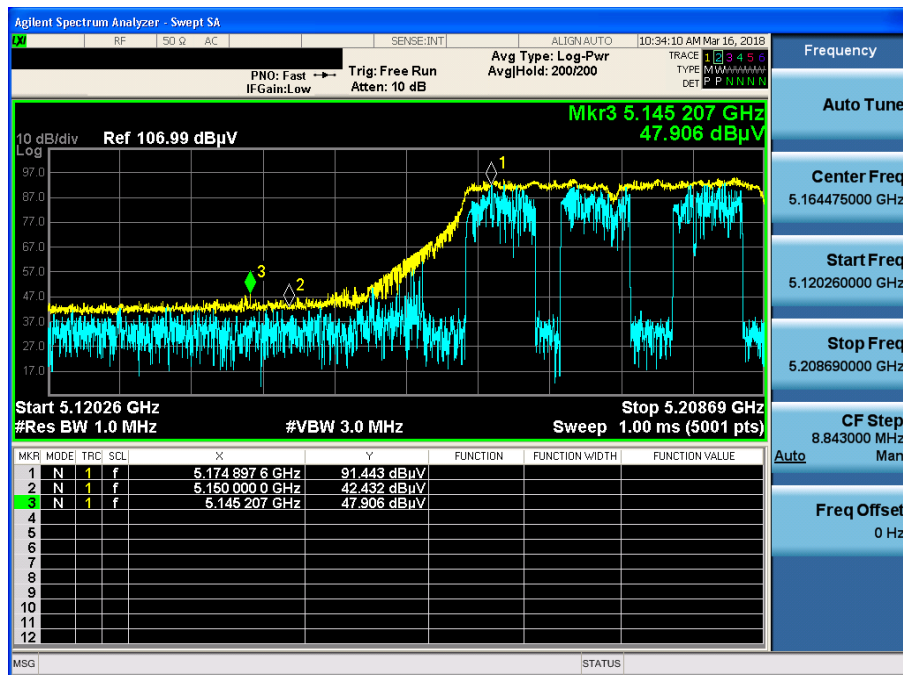
802.11ac(VHT20) & U-NII 3 & Ch.165 & Z axis & Hor

Detector Mode : AV



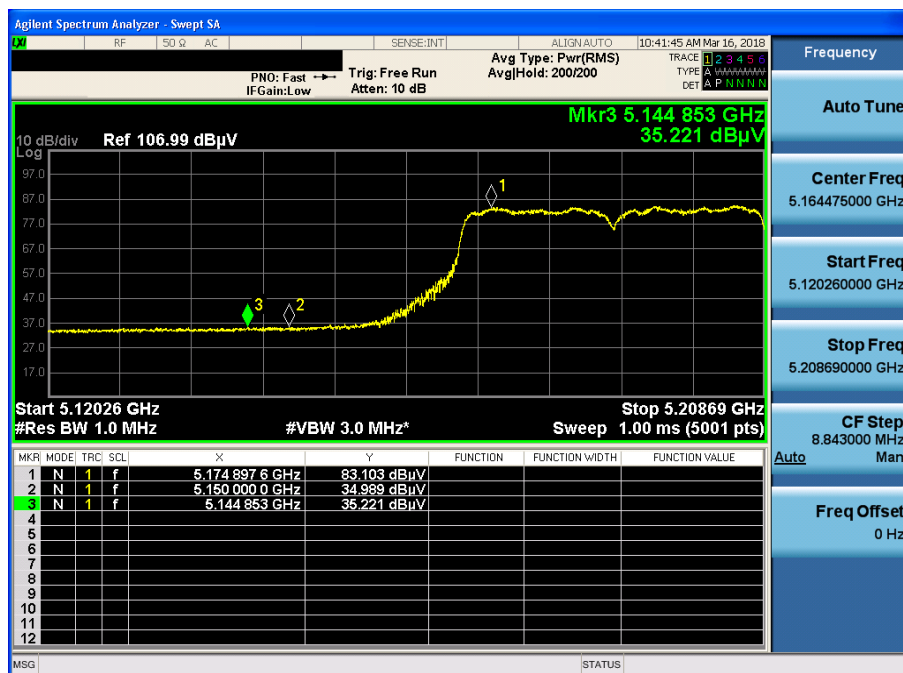
802.11ac(VHT40) & U-NII 1 & Ch.38 & Z axis & Hor

Detector Mode : PK



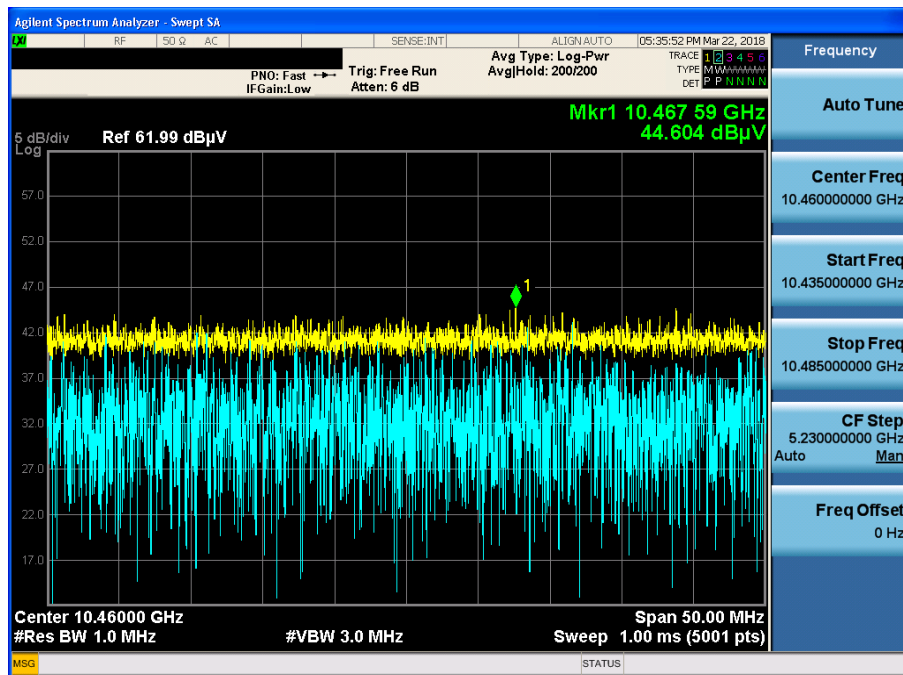
802.11ac(VHT40) & U-NII 1 & Ch.38 & Z axis & Hor

Detector Mode : AV



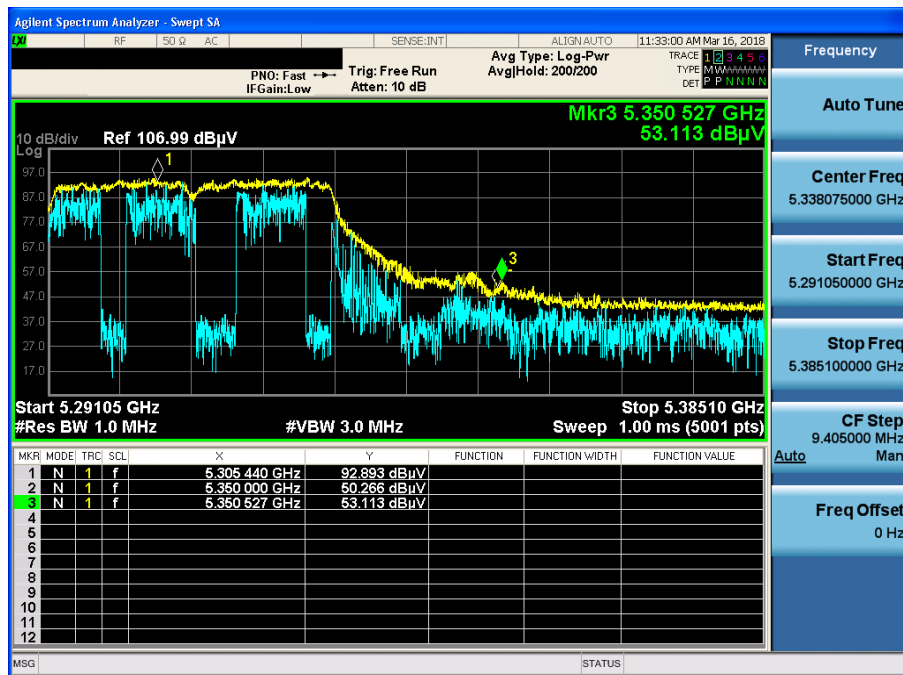
802.11ac(VHT40) & U-NII 1 & Ch.46 & Z axis & Hor

Detector Mode : PK



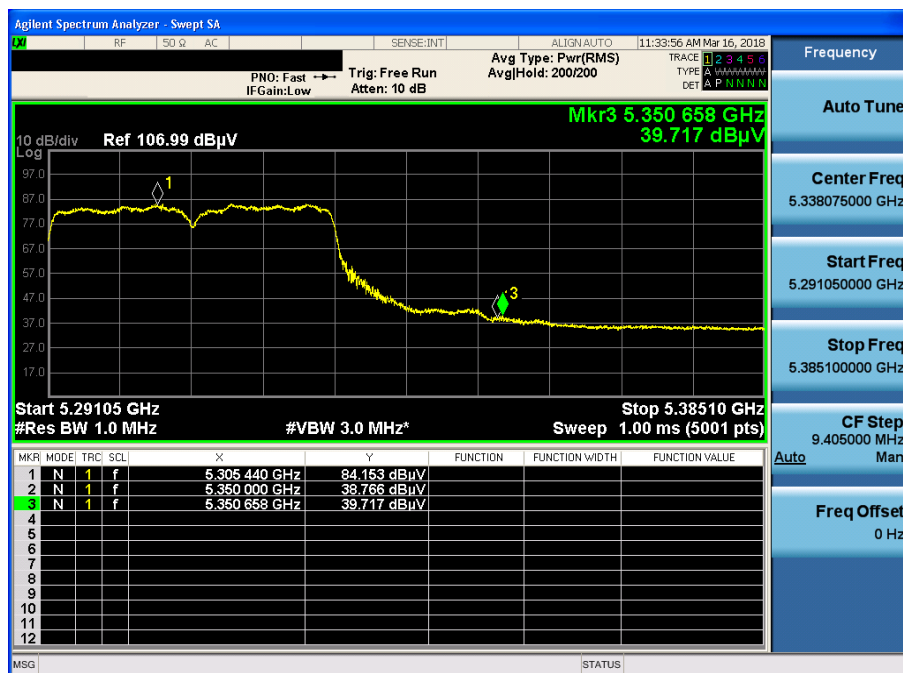
802.11ac(VHT40) & U-NII 2A & Ch.62 & Z axis & Hor

Detector Mode : PK



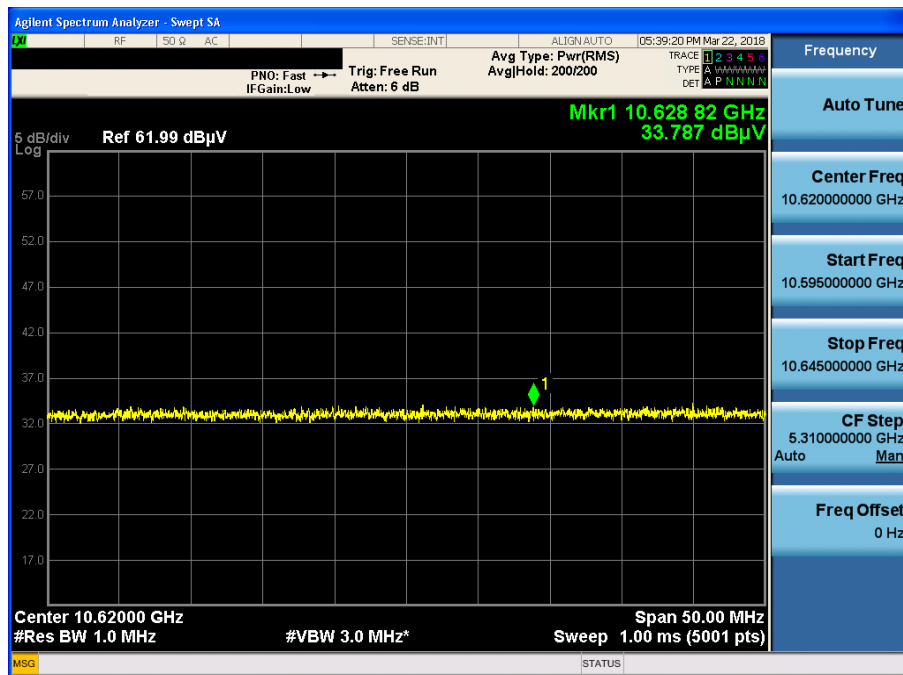
802.11ac(VHT40) & U-NII 2A & Ch.62 & Z axis & Hor

Detector Mode : AV



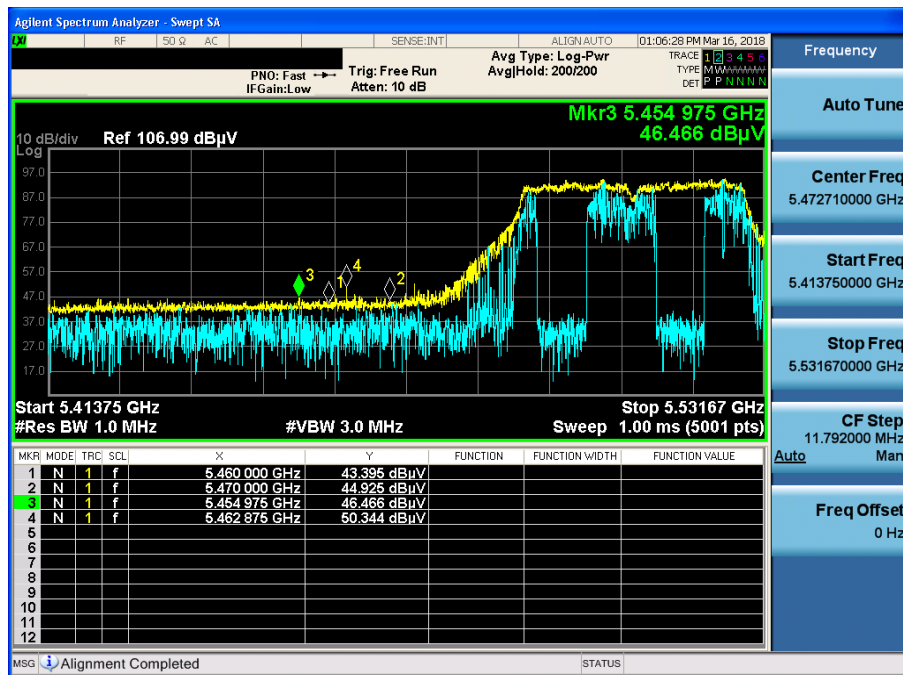
802.11ac(VHT40) & U-NII 2A & Ch.62 & Z axis & Hor

Detector Mode : AV



802.11ac(VHT40) & U-NII 2C & Ch.102 & Z axis & Hor

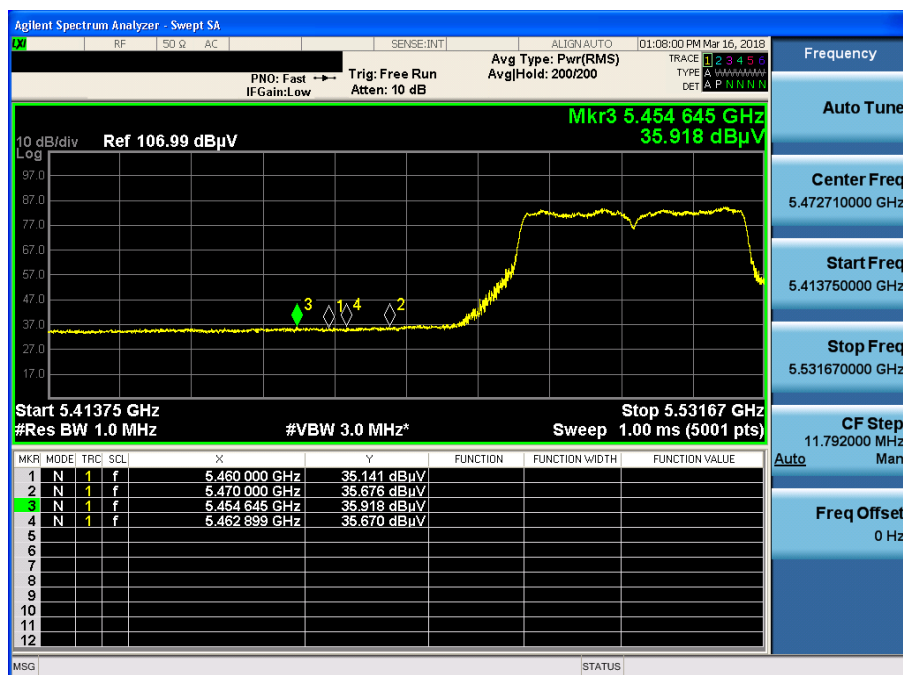
Detector Mode : PK



Note: Total Factor was included on this plot.

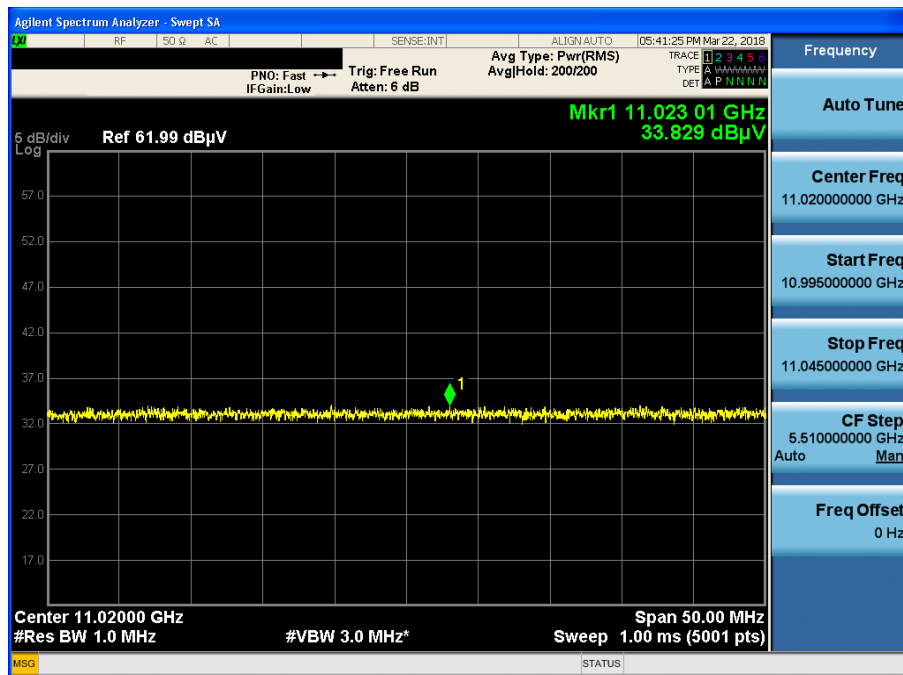
802.11ac(VHT40) & U-NII 2C & Ch.102 & Z axis & Hor

Detector Mode : AV



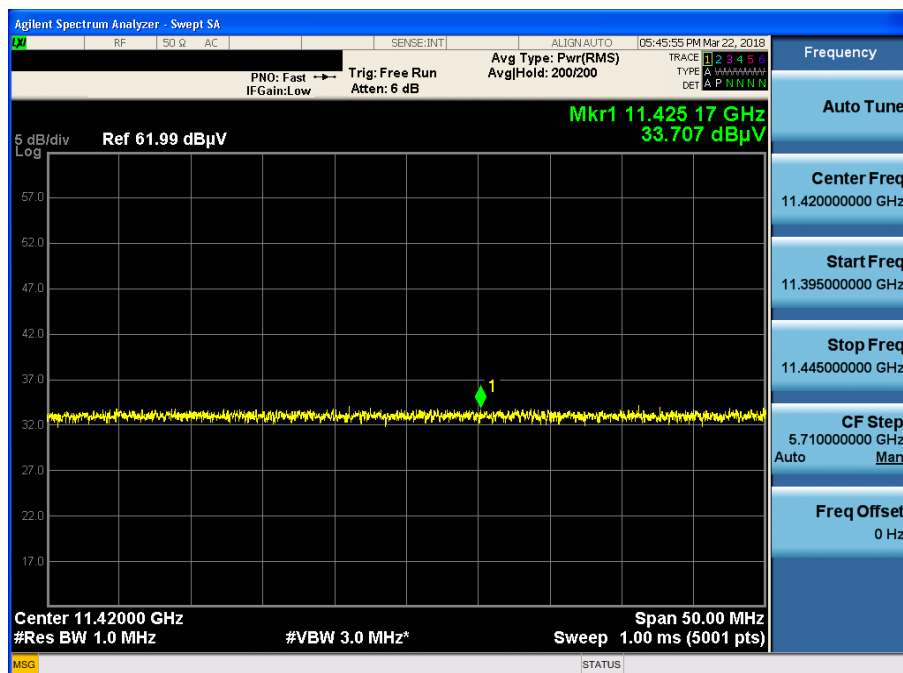
802.11ac(VHT40) & U-NII 2C & Ch.102 & Z axis & Hor

Detector Mode : AV



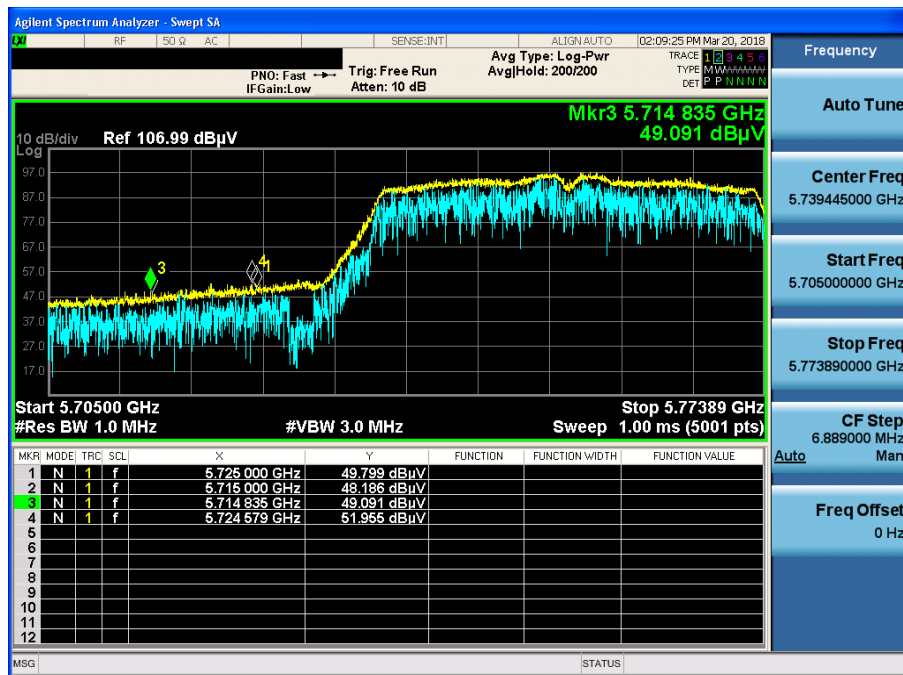
802.11ac(VHT40) & U-NII 2C & Ch.142 & Z axis & Hor

Detector Mode : AV



802.11ac(VHT40) & U-NII 3 & Ch.151 & Y axis & Hor

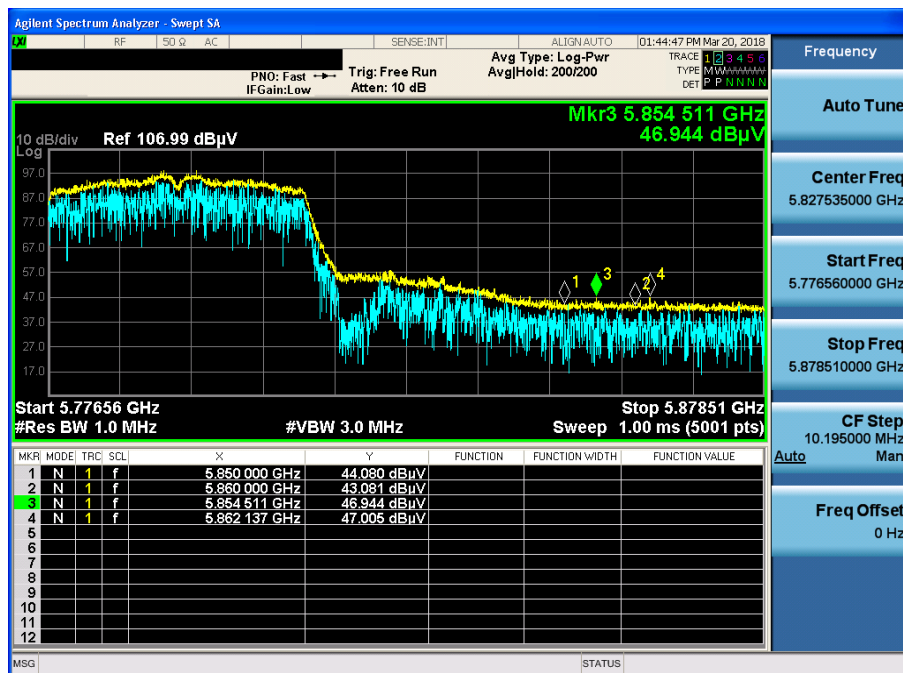
Detector Mode : PK



Note: Total Factor was included on this plot.

802.11ac(VHT40) & U-NII 3 & Ch.159 & Y axis & Hor

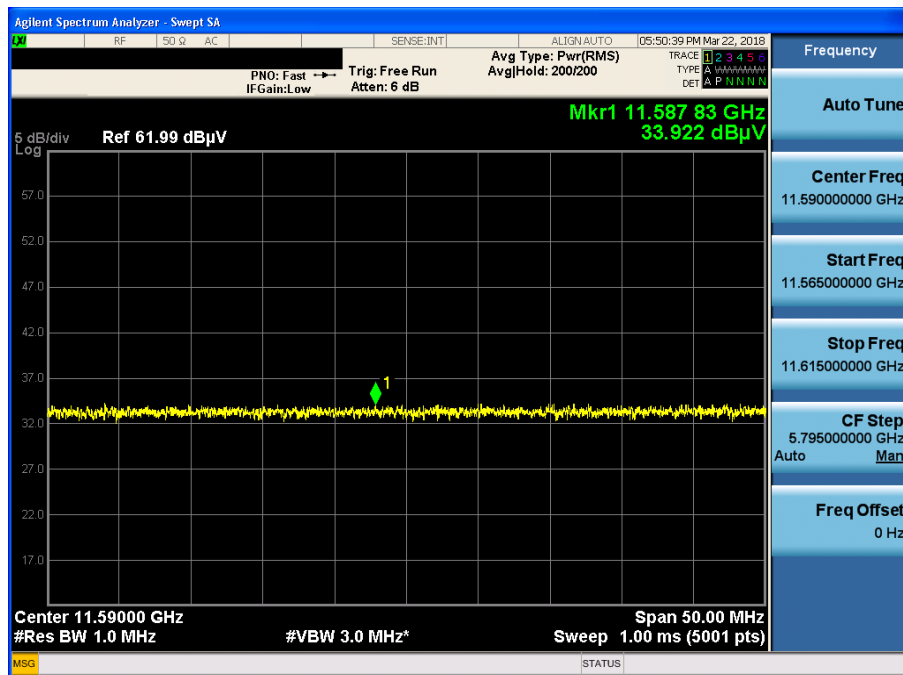
Detector Mode : PK



Note: Total Factor was included on this plot.

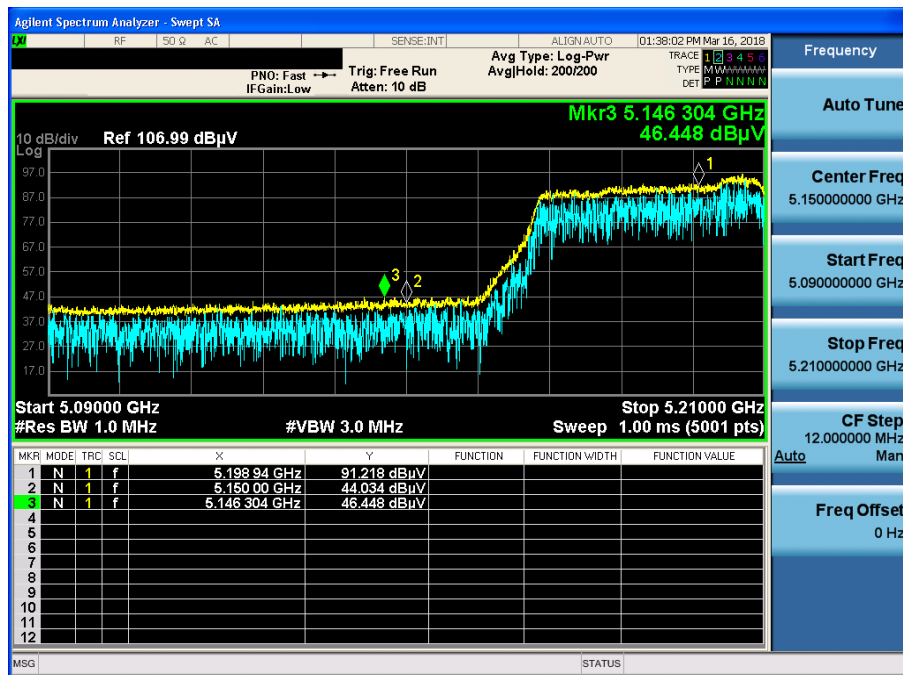
802.11ac(VHT40) & U-NII 3 & Ch.159 & Z axis & Hor

Detector Mode : AV



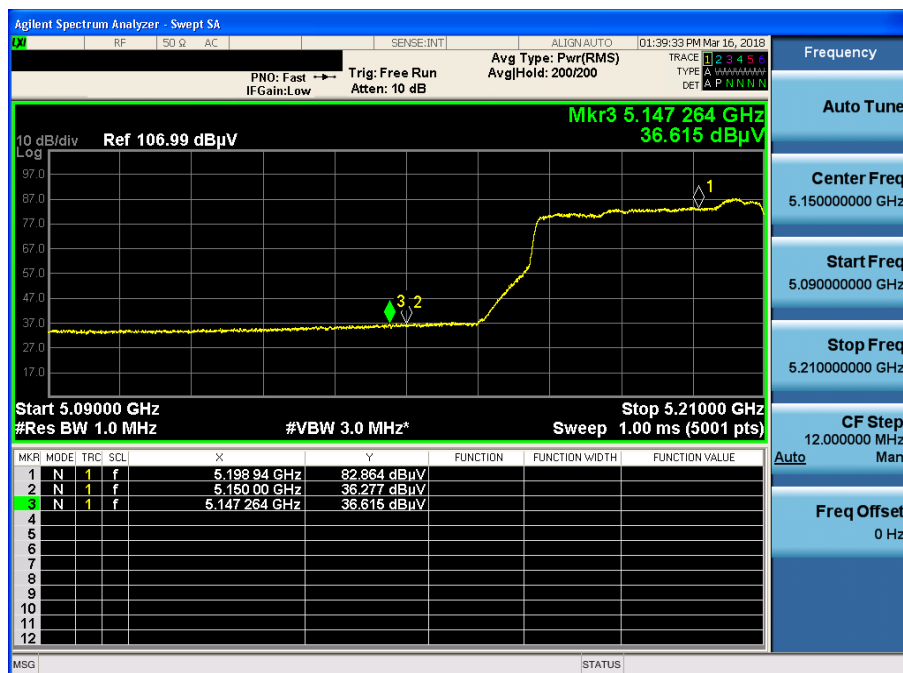
802.11ac(VHT80) & U-NII 1 & Ch.42 & Y axis & Ver

Detector Mode : PK

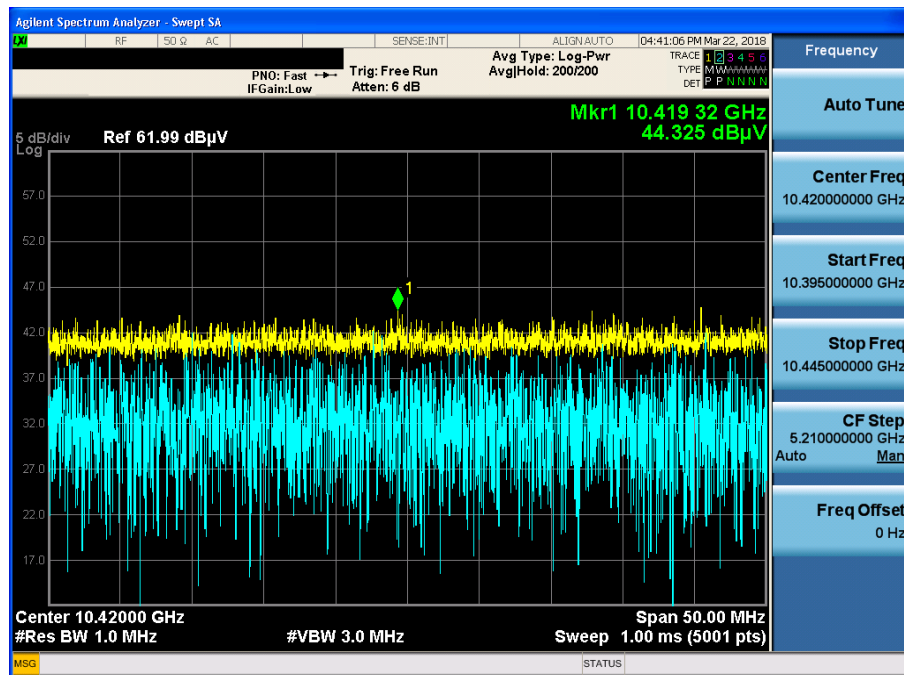


802.11ac(VHT80) & U-NII 1 & Ch.42 & Y axis & Ver

Detector Mode : AV

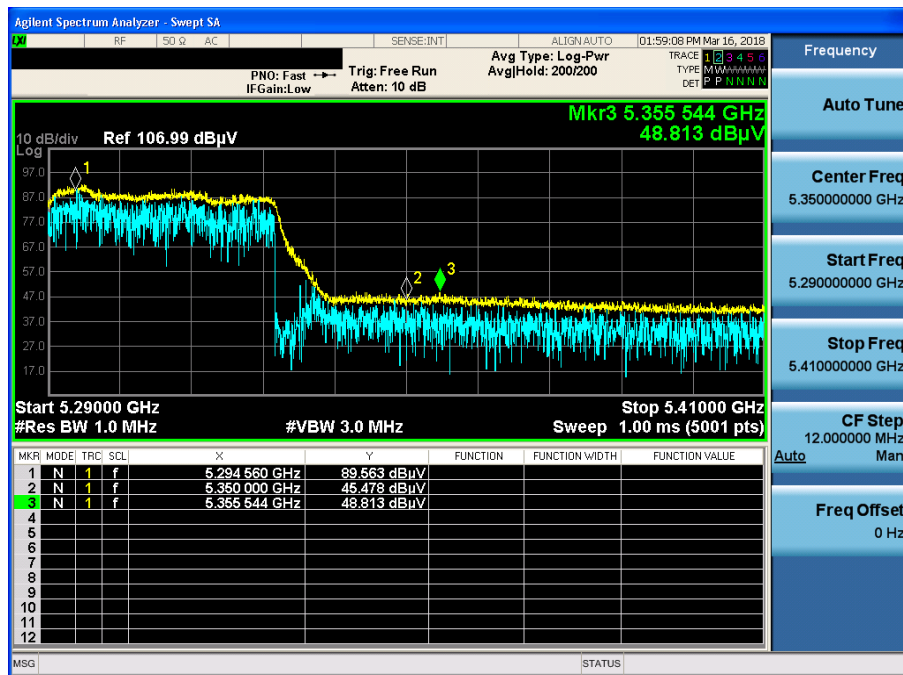


Detector Mode : PK



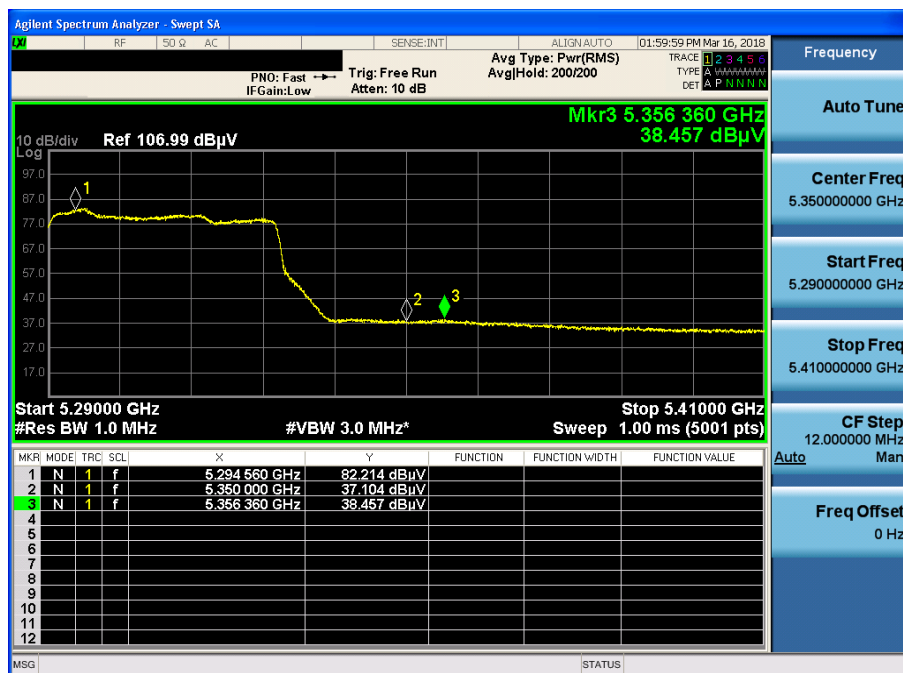
802.11ac(VHT80) & U-NII 2A & Ch.58 & Y axis & Ver

Detector Mode : PK

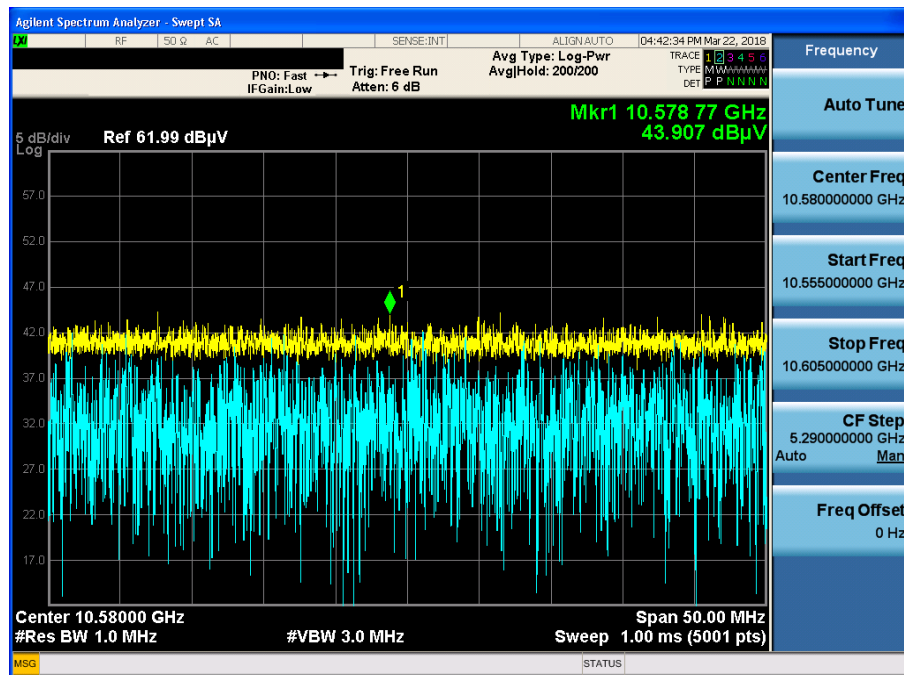


802.11ac(VHT80) & U-NII 2A & Ch.58 & Y axis & Ver

Detector Mode : AV

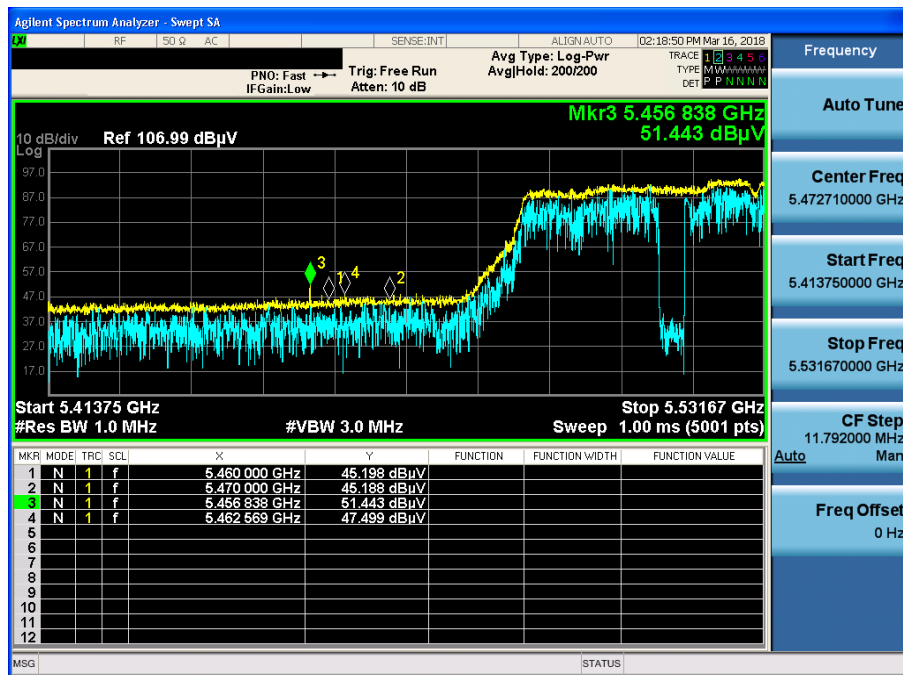


Detector Mode : PK



802.11ac(VHT80) & U-NII 2C & Ch.106 & Y axis & Ver

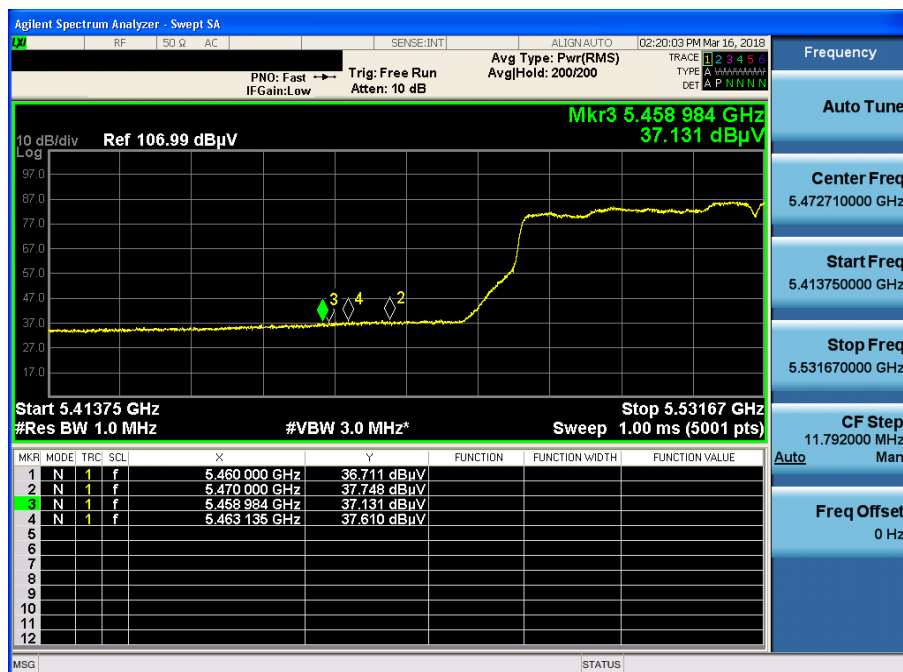
Detector Mode : PK



Note: Total Factor was included on this plot.

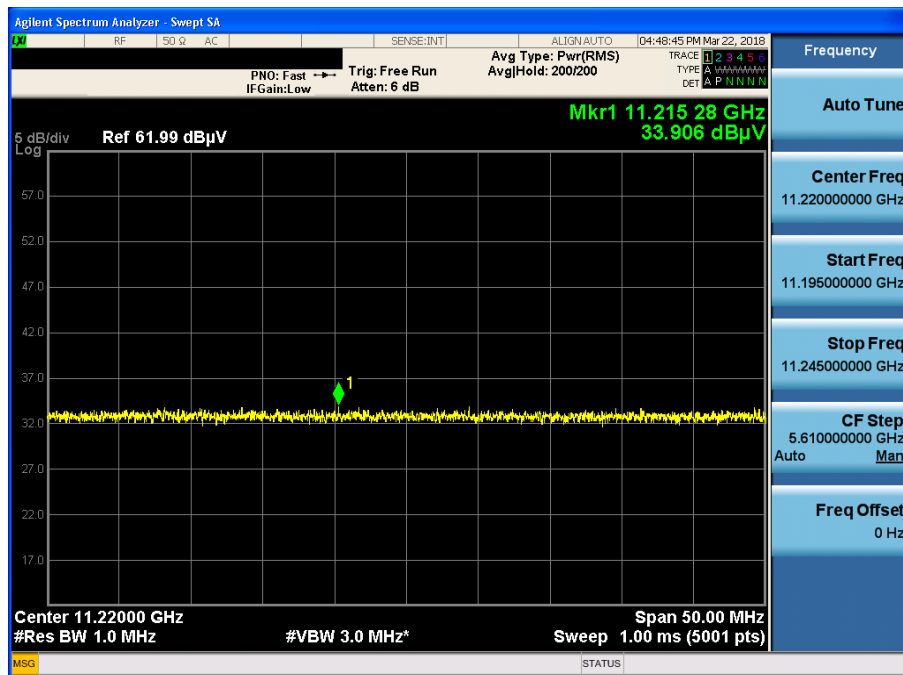
802.11ac(VHT80) & U-NII 2C & Ch.106 & Y axis & Ver

Detector Mode : AV



802.11ac(VHT80) & U-NII 2C & Ch.122 & Z axis & Hor

Detector Mode : AV



802.11ac(VHT80) & U-NII 2C & Ch.138 & Z axis & Hor

Detector Mode : AV

