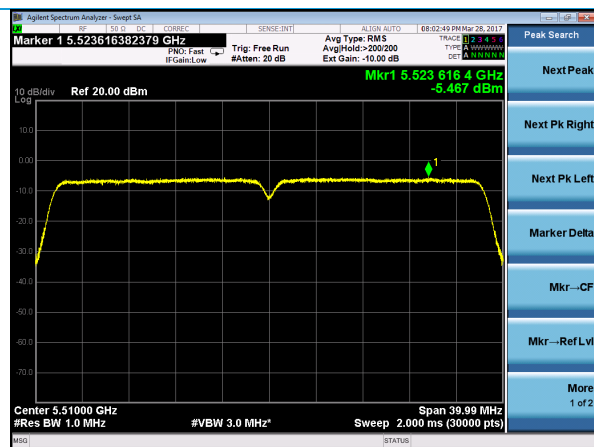
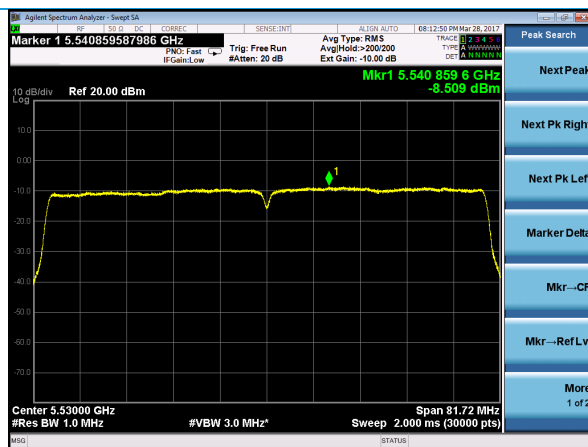


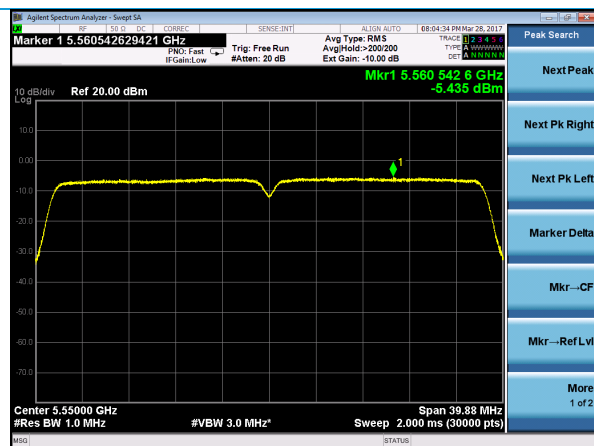
Plots – U-NII-2C PSD, continued



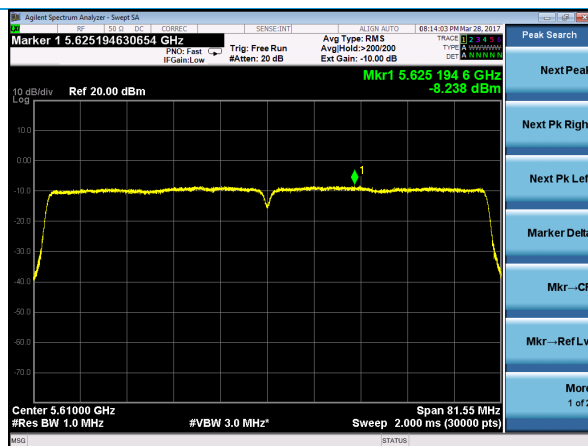
Low Channel – 802.11ac HT-40



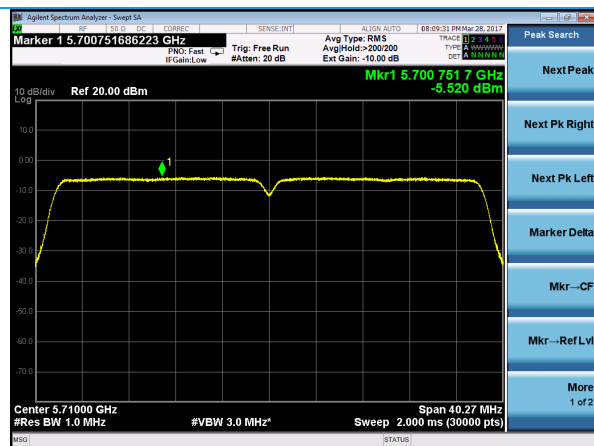
Low Channel – 802.11ac HT-80



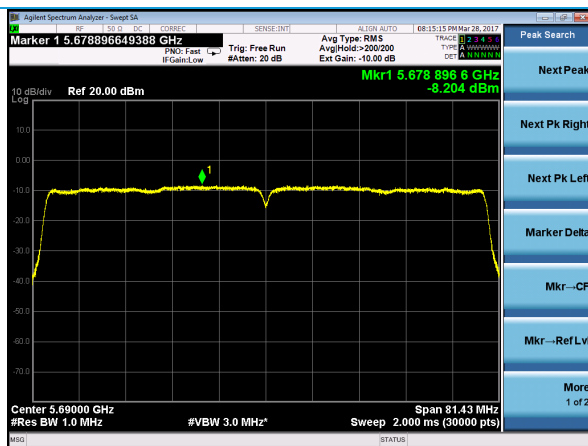
Mid Channel – 802.11ac HT-40



Mid Channel – 802.11ac HT-80

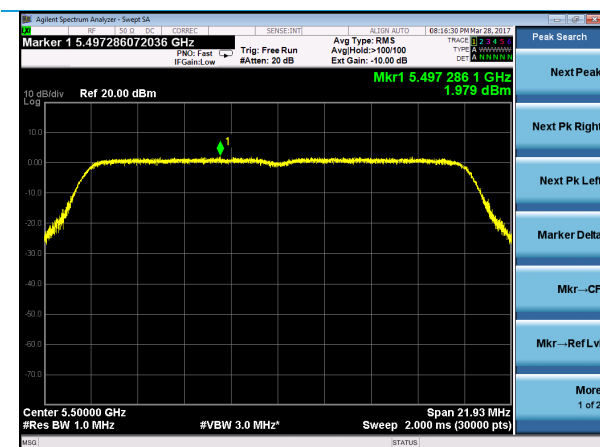


High Channel – 802.11ac HT-40

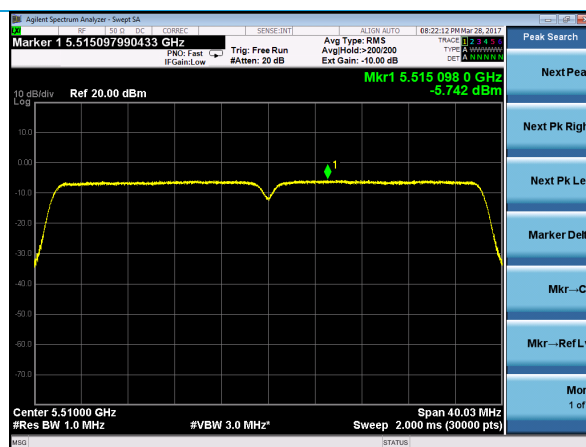


High Channel – 802.11ac HT-80

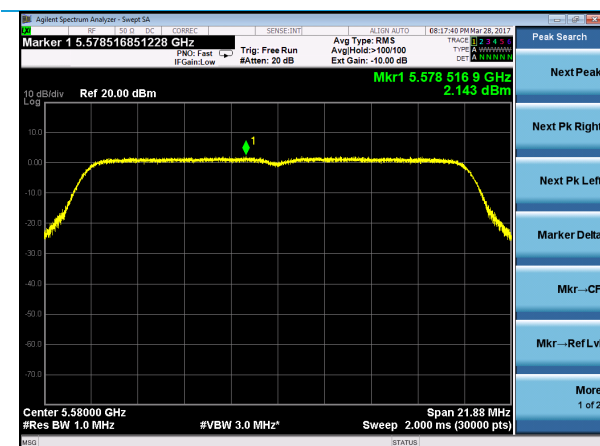
Plots – U-NII-2C PSD, continued



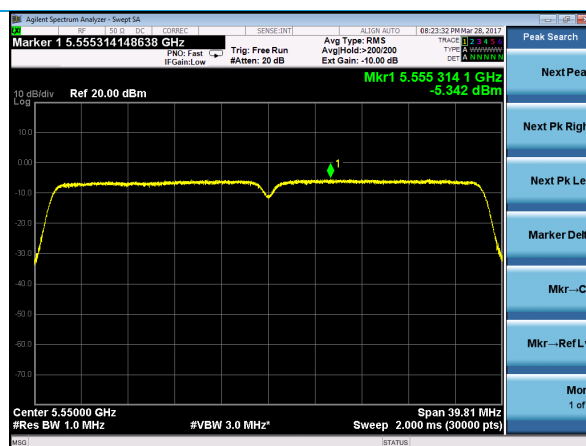
Low Channel – 802.11n HT-20



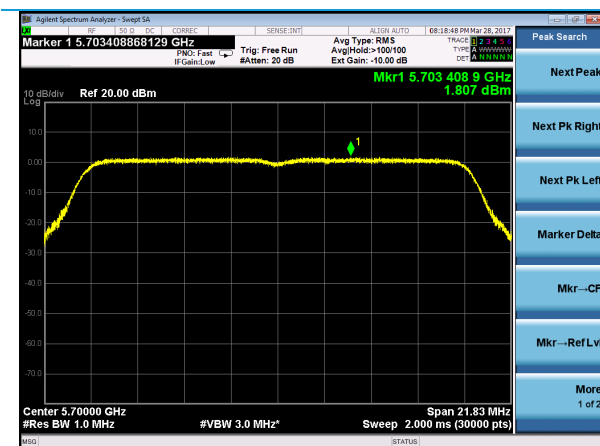
Low Channel – 802.11n HT-40



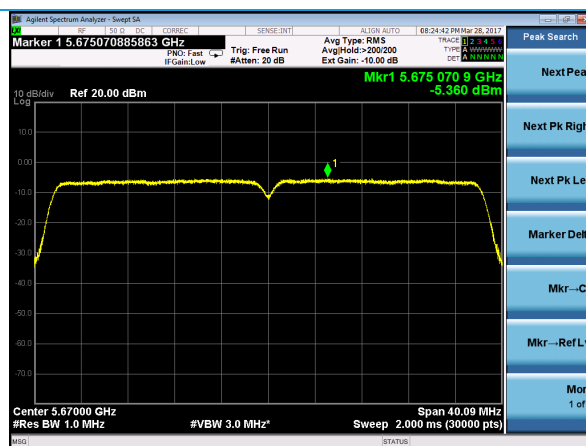
Mid Channel – 802.11n HT-20



Mid Channel – 802.11n HT-40

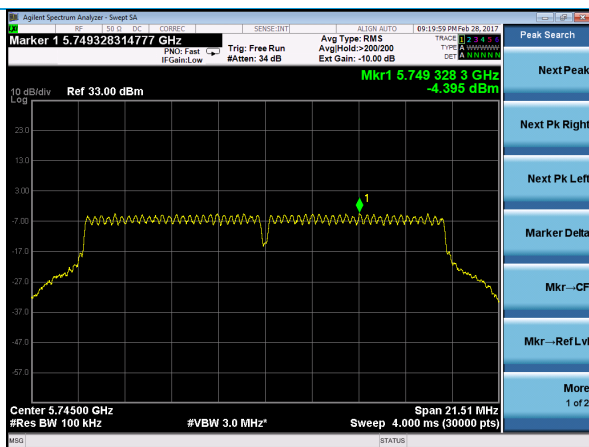


High Channel – 802.11n HT-20

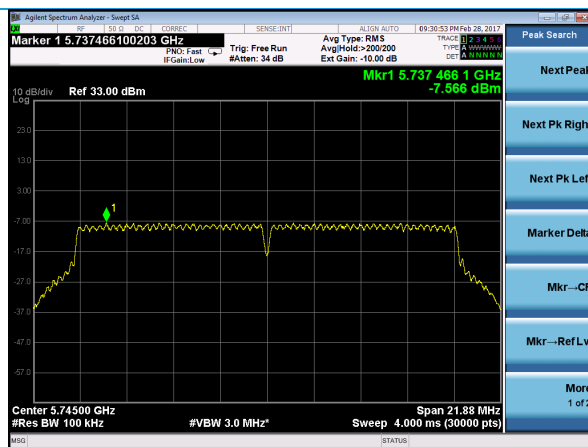


High Channel – 802.11n HT-40

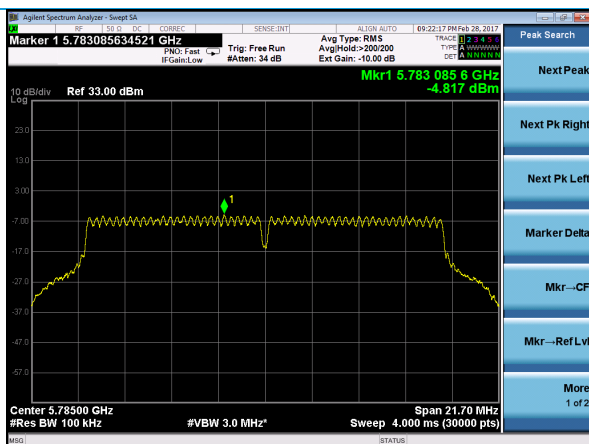
Plots – U-NII-3 PSD



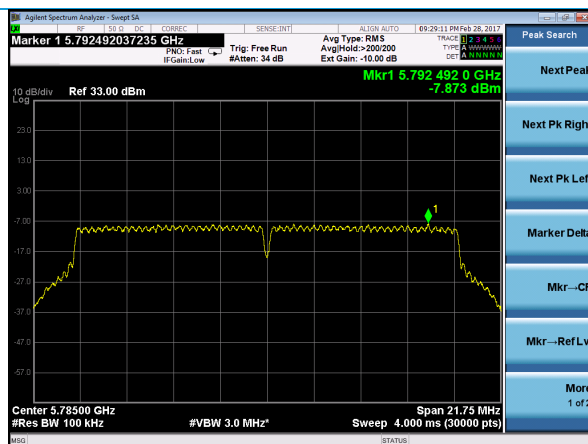
Low Channel – 802.11a HT-20



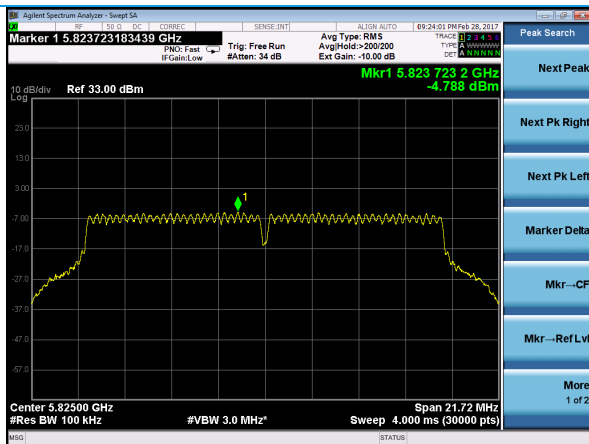
Low Channel – 802.11ac HT-20



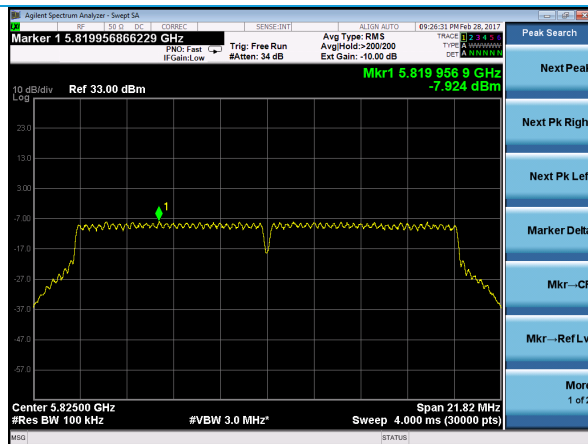
Mid Channel – 802.11a HT-20



Mid Channel – 802.11ac HT-20

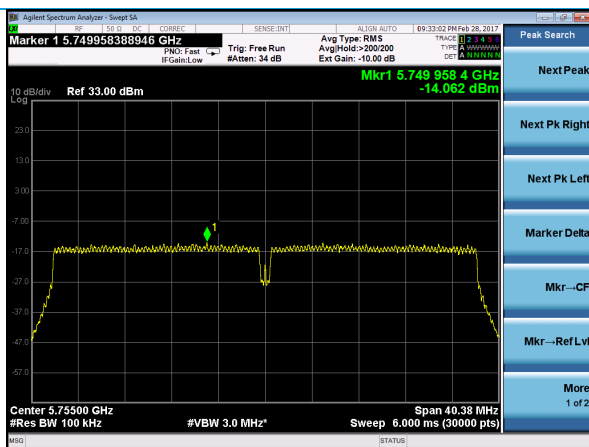


High Channel – 802.11a HT-20

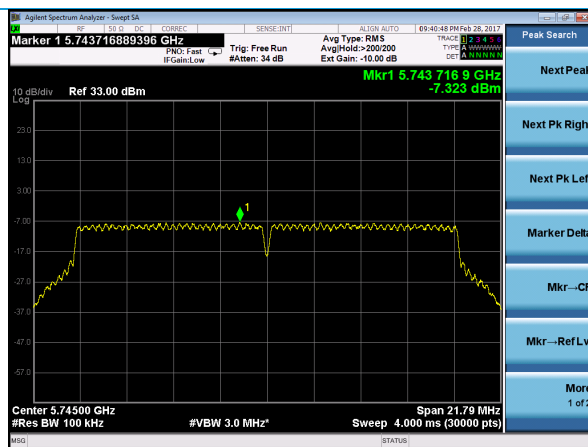


High Channel – 802.11ac HT-20

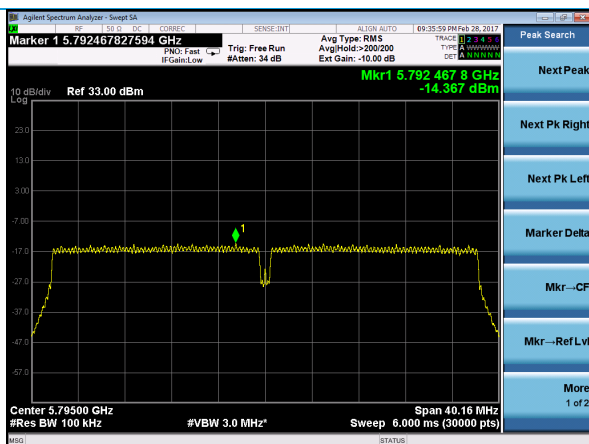
Plots – U-NII-3 PSD, continued



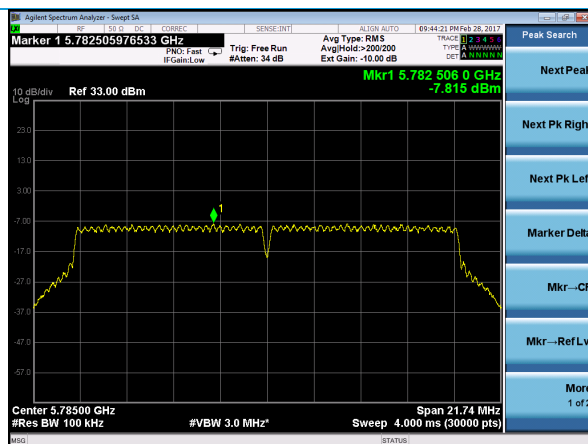
Low Channel – 802.11ac HT-40



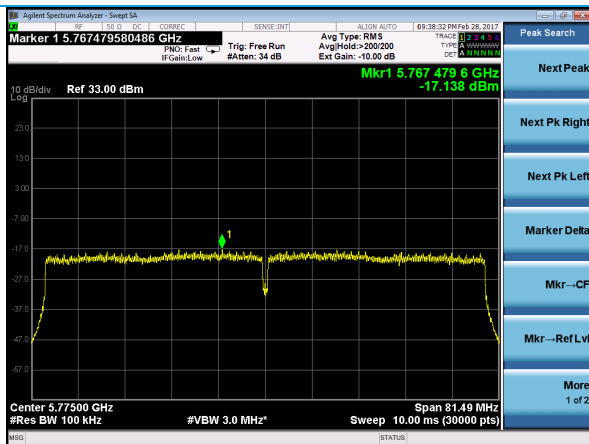
Low Channel – 802.11n HT-20



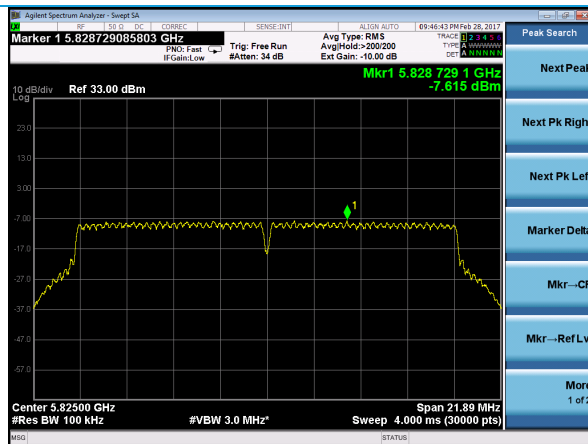
High Channel – 802.11ac HT-40



Mid Channel – 802.11n HT-20



Only Channel – 802.11ac HT-80



High Channel – 802.11n HT-20

Company: LSR a Laird Buissness

Report: TR 316356 C (U-NII)

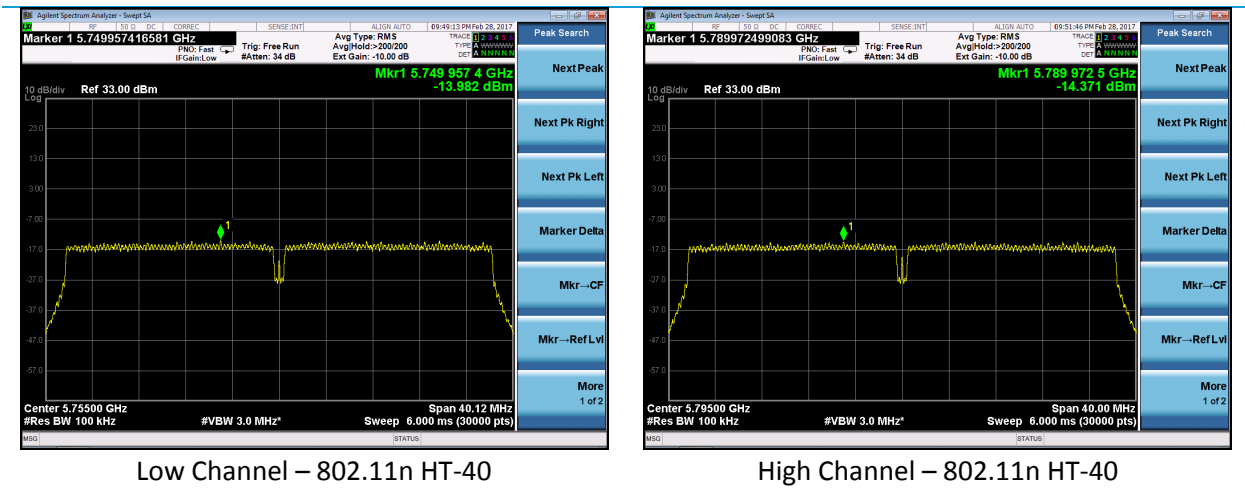
Job: C-2602

Name: Sterling-LWB5

Model: Sterling-LWB5

Serial: 00008, 00035

Plots – U-NII-3 PSD, continued



5.1.5 Antenna Port Conducted Emissions – Band Edges

Operator	Kimberly Bay
QA	Aidi Zainal / Shane Dock
Test Date	U-NII-1: March 7, 10 & 17, 2017, May 6, 2017; U-NII-2A: March 16, 2017 U-NII-2C: March 28, 2017; U-NII-3: March 2, 2017
Location	Conducted RF Test Bench
Temp. / R.H.	21°- 22°C / 25%-40% RH
Requirement	FCC 15.407 (b)(4)(i), (b)(7) RSS 247 Issue 2 Sections 3.3, 6.2.4.2
Method	KDB 789033 D02 v01r04 Section II.G.1,3,5 (max), 6 (average)

Limits: 15.205

U-NII Band	Measured Range (MHz)	FCC 15.407 Limit RSS 247 Limit	FCC 15.209 Limit
U-NII-1	4500-5150	-27 dBm/MHz e.i.r.p	Peak -21.23 dBm Average -41.23 dBm
U-NII-1	5350-5460	-27 dBm/MHz e.i.r.p	Peak -21.23 dBm Average -41.23 dBm
U-NII-1	5250-5350 (ISED only)	-27 dBm/MHz e.i.r.p	N/A
U-NII-2A	4500-5150	-27 dBm/MHz e.i.r.p	Peak -21.23 dBm Average -41.23 dBm
U-NII-2A	5350-5460	-27 dBm/MHz e.i.r.p	Peak -21.23 dBm Average -41.23 dBm
U-NII-2A	5460-10000	-27 dBm/MHz e.i.r.p	N/A
U-NII-2C	5350-5460	-27 dBm/MHz e.i.r.p	Peak -21.23 dBm Average -41.23 dBm
U-NII-2C	5725-10000	-27 dBm/MHz e.i.r.p	N/A
U-NII-3	5645-5930	See table below	N/A

Limits - U-NII-3 FCC 15.407 / RSS-247 Limits (EIRP)

E.I.R.P. of unwanted emissions must comply with the following	Frequency Range (MHz)
1) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges	5720-5725 5850-5855
2) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges	5700-5720 5855-5875
3) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz above or below the band edges; and -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.	5645-5700 5875-5930

Test Parameters

Settings	<u>802.11a HT-20:</u> 5180, 5220 (ISED only), 5240 (FCC only) MHz (U-NII-1) 5260, 5320 MHz (U-NII-2A) 5500 MHz (U-NII-2C) 5745, 5785, 5825 MHz (U-NII-3)
Settings	<u>802.11ac HT-20:</u> 5180, 5220 (ISED only), 5240 (FCC only)MHz (U-NII-1) 5260, 5320 MHz (U-NII-2A) 5500 MHz (U-NII-2C) 5745, 5785, 5825 MHz (U-NII-3)
Settings	<u>802.11ac HT-40:</u> 5190, 5230 MHz (U-NII-1); 5270, 5310 MHz (U-NII-2A); 5510 MHz (U-NII-2C); 5755, 5795 MHz (U-NII-3)
Settings	<u>802.11ac HT-80:</u> 5210 MHz (U-NII-1); 5290 MHz (U-NII-2A); 5530 (U-NII-2C); 5775 MHz (U-NII-3)
Settings	<u>802.11n HT-20:</u> 5180, 5220 (ISED only), 5240 (FCC only)MHz (U-NII-1) 5260, 5320 MHz (U-NII-2A) 5500 MHz (U-NII-2C) 5745, 5785, 5825 MHz (U-NII-3)
Settings	<u>802.11n HT-40:</u> 5190, 5230 MHz, (U-NII-1); 5270, 5310 MHz(U-NII-2A); 5510 MHz (U-NII-2C); 5755, 5795 MHz (U-NII-3)
Note	Maximum antenna gain: 4 dBi
Note	U-NII-1, U-NII-2A, and U-NII-3 each have only two HT-40 channels and one HT-80 channel.
Note	U-NII-2C 802.11ac HT-80 channel 5610 MHz tested here, but not used in Canada. U-NII-2C 802.11ac HT-80 has only two available ISED channels.
Note	<u>Measurements made with peak and average method:</u> Peak limit line does not reflect the actual limit line used.

Instrumentation



Date : 6-Feb-2017			Type Test : Conducted RF Emissions			Job # : C-2602		
Prepared By: Kim			Customer : LSR			Quote # : 316356		
No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960087	Spectrum Analyzer	Agilent	N9010A	MY53400296	12/22/2016	12/22/2017	Active Calibration
2	AA 960143	Phaseflex	Gore	EKD01D01048.0	5546519	6/26/2015	6/25/2017	Active Calibration
3	AA 960172	Cable - low loss 1m	A.H. Systems, Inc	SAC-26G-1	387	5/16/2016	5/16/2017	Active Verification

Company: LSR a Laird Business	Page 75 of 149	Name: Sterling-LWB5
Report: TR 316356 C (U-NII)		Model: Sterling-LWB5
Job: C-2602		Serial: 00008, 00035

Table – U-NII-1 Restricted-Band Lower Band-Edge

Mode	BW	Peak Freq. (MHz)	Peak Reading (dBm)	Average Freq. (MHz)	Average Reading (dB)	Antenna Gain (dBi)	Peak/Avg Limit (dBm)	Peak Margin (dB)	Average Margin (dB)
802.11a	HT-20	5145	-37.8	5149	-49.8	4	-21.23/ -41.23	12.6	4.6
802.11ac	HT-20	5144	-39.3	5150	-53.9	4	-21.23/ -41.23	14.1	8.7
802.11ac	HT-40	5149	-34.8	5149	-48.7	4	-21.23/ -41.23	9.57	3.5
802.11ac	HT-80	5149	-38.1	5147	-50.5	4	-21.23/ -41.23	12.9	5.3
802.11n	HT-20	5144	-41.0	5150	-53.9	4	-21.23/ -41.23	15.8	8.7
802.11n	HT-40	5148	-35.4	5149	-48.7	4	-21.23/ -41.23	10.2	3.5

Table – U-NII-1 Restricted-Band Upper Band-Edge

Mode	BW	Peak Freq. (MHz)	Peak Reading (dBm)	Average Freq. (MHz)	Average Reading (dB)	Antenna Gain (dBi)	Peak/Avg Limit (dBm)	Peak Margin (dB)	Average Margin (dB)
802.11a	HT-20	5460	-42.7	5458	-53.2	4	-21.23/ -41.23	17.5	8.0
802.11ac	HT-20	5454	-43.8	5459	-54.7	4	-21.23/ -41.23	18.6	9.5
802.11ac	HT-40	5371	-51.3	5377	-64.5	4	-21.23/ -41.23	26.1	19.3
802.11ac	HT-80	5351	-49.6	5351	-63.2	4	-21.23/ -41.23	24.4	18.0
802.11n	HT-20	5460	-44.0	5455	-55.1	4	-21.23/ -41.23	18.8	9.9
802.11n	HT-40	5387	-49.6	5373	-64.6	4	-21.23/ -41.23	24.4	19.4

Table – U-NII-1 ISSED Upper Band-Edge

Mode	BW	Peak Freq. (MHz)	Peak Reading (dBm)	Antenna Gain (dBi)	Limit EIRP (dBm)	Margin (dB)
802.11a	HT-20	5433	-43.2	4	-27	16.2
802.11ac	HT-20	5433	-44.7	4	-27	17.7
802.11ac	HT-40	5368	-51.5	4	-27	24.5
802.11ac	HT-80	5352	-48.1	4	-27	21.1
802.11n	HT-20	5444	-47.8	4	-27	20.8
802.11n	HT-40	5377	-51.0	4	-27	24.0

Table – U-NII-2A Restricted-Band Lower Band-Edge

Mode	BW	Peak Freq. (MHz)	Peak Reading (dBm)	Average Freq. (MHz)	Average Reading (dB)	Antenna Gain (dBi)	Peak/Avg Limit (dBm)	Peak Margin (dB)	Average Margin (dB)
802.11a	HT-20	5149	-51.7	5149	-62.9	4	-21.23/ -41.23	26.5	17.7
802.11ac	HT-20	5146	-53.1	5041	-63.6	4	-21.23/ -41.23	27.9	18.4
802.11ac	HT-40	5145	-56.0	4831	-65.6	4	-21.23/ -41.23	30.8	20.4
802.11ac	HT-80	5147	-55.2	4702	-64.3	4	-21.23/ -41.23	30.0	19.1
802.11n	HT-20	5141	-54.8	5041	-63.5	4	-21.23/ -41.23	29.6	18.3
802.11n	HT-40	5141	-56.7	4831	-65.8	4	-21.23/ -41.23	31.5	20.6

Table – U-NII-2A Restricted-Band Upper Band-Edge

Mode	BW	Peak Freq. (MHz)	Peak Reading (dBm)	Average Freq. (MHz)	Average Reading (dB)	Antenna Gain (dBi)	Peak/Avg Limit (dBm)	Peak Margin (dB)	Average Margin (dB)
802.11a	HT-20	5350	-38.3	5350	-50.6	4	-21.23/ -41.23	13.1	5.4
802.11ac	HT-20	5351	-41.5	5350	-53.7	4	-21.23/ -41.23	16.3	11.5
802.11ac	HT-40	5355	-40.5	5351	-52.8	4	-21.23/ -41.23	15.3	7.6
802.11ac	HT-80	5353	-44.0	5350	-55.7	4	-21.23/ -41.23	18.8	10.5
802.11n	HT-20	5351	-40.3	5350	-53.5	4	-21.23/ -41.23	15.1	8.3
802.11n	HT-40	5354	-40.7	5351	-53.9	4	-21.23/ -41.23	15.5	8.7

Table – U-NII-2A: Upper Edge of U-NII-2A Band

Mode	BW	Channel	Peak Freq. (MHz)	Peak Reading (dBm)	Antenna Gain (dBi)	Limit EIRP (dBm)	Margin (dB)
802.11a	HT-20	Low	8759	-44.0	4	-27	13.0
802.11a	HT-20	Mid	5528	-43.4	4	-27	12.4
802.11a	HT-20	High	5527	-44.4	4	-27	13.4
802.11ac	HT-20	Low	8766	-45.2	4	-27	14.2
802.11ac	HT-20	Mid	5527	-45.0	4	-27	14.0
802.11ac	HT-20	High	5546	-45.3	4	-27	14.3
802.11ac	HT-40	Low	8791	-50.3	4	-27	19.3
802.11ac	HT-40	High	8845	-50.4	4	-27	19.4
802.11ac	HT-80	Only	8824	-53.5	4	-27	22.5
802.11n	HT-20	Low	8773	-44.9	4	-27	13.9
802.11n	HT-20	Mid	5525	-46.1	4	-27	15.1
802.11n	HT-20	High	5548	-45.8	4	-27	14.8
802.11n	HT-40	Low	8776	-50.3	4	-27	19.3
802.11n	HT-40	High	8847	-51.4	4	-27	20.4

Table – U-NII-2C Restricted-Band Upper Band-Edge

Mode	BW	Peak Freq. (MHz)	Peak Reading (dBm)	Average Freq. (MHz)	Average Reading (dB)	Antenna Gain (dBi)	Peak/Avg Limit (dBm)	Peak Margin (dB)	Average Margin (dB)
802.11a	HT-20	5457	-39.8	5460	-51.6	4	-21.23/ -41.23	14.6	6.4
802.11ac	HT-20	5460	-42.1	5459	-54.1	4	-21.23/ -41.23	16.9	8.9
802.11ac	HT-40	5460	-38.3	5460	-53.5	4	-21.23/ -41.23	13.1	8.4
802.11ac	HT-80	5456	-38.7	5459	-51.9	4	-21.23/ -41.23	13.5	6.7
802.11n	HT-20	5457	-41.1	5460	-53.1	4	-21.23/ -41.23	15.9	7.9
802.11n	HT-40	5460	-39.6	5460	-53.8	4	-21.23/ -41.23	14.4	8.6

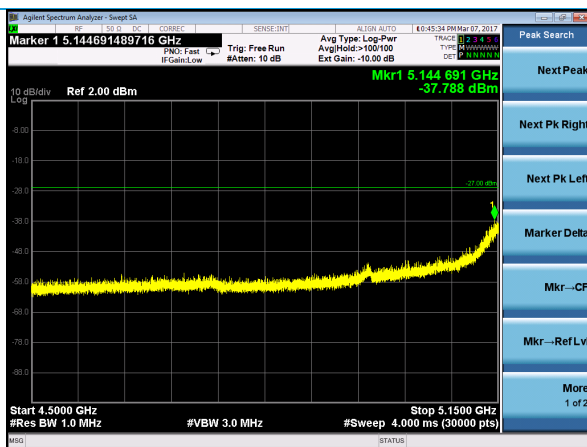
Table – U-NII-2C: Upper Edge of U-NII-2C Band

Mode	BW	Channel	Peak Freq. (MHz)	Peak Reading (dBm)	Antenna Gain (dBi)	Limit EIRP (dBm)	Margin (dB)
802.11a	HT-20	Low	5728	-44.3	4	-27	13.3
802.11a	HT-20	Mid	5808	-43.5	4	-27	12.5
802.11a	HT-20	High	5726	-32.9	4	-27	1.9
802.11ac	HT-20	Low	5732	-45.0	4	-27	14.0
802.11ac	HT-20	Mid	5814	-46.5	4	-27	15.5
802.11ac	HT-20	High	5955	-48.0	4	-27	17.0
802.11ac	HT-40	Low	5734	-55.8	4	-27	24.8
802.11ac	HT-40	Mid	5748	-56.0	4	-27	25.0
802.11ac	HT-40	High	5862	-54.0	4	-27	23.0
802.11ac	HT-80	Low	5735	-55.4	4	-27	24.4
802.11ac	HT-80	Mid	5737	-49.6	4	-27	18.6
802.11ac	HT-80	High	5859	-55.3	4	-27	24.3
802.11n	HT-20	Low	5737	-44.3	4	-27	13.3
802.11n	HT-20	Mid	5806	-45.4	4	-27	14.4
802.11n	HT-20	High	5730	-40.5	4	-27	9.5
802.11n	HT-40	Low	5732	-55.2	4	-27	24.2
802.11n	HT-40	Mid	5728	-55.7	4	-27	24.7
802.11n	HT-40	High	5733	-50.9	4	-27	19.9

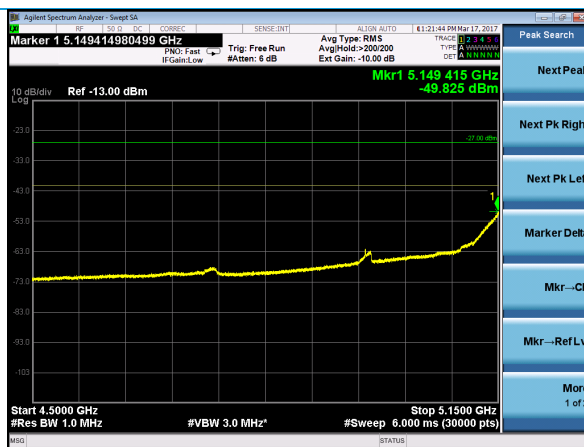
Table – U-NII-3 Mask Band-Edges

There were no emissions within 10 dB of any of the mask limits in this band.

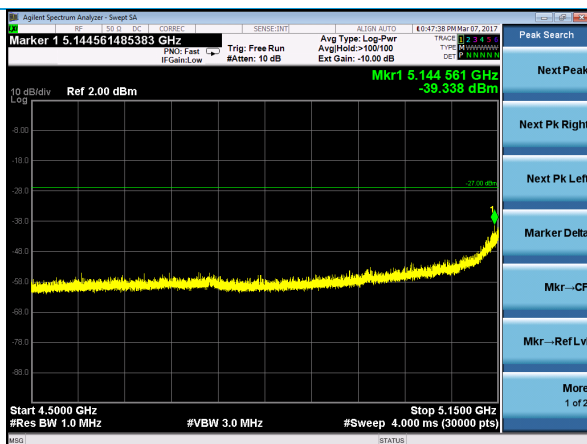
Plots – U-NII-1 Restricted-Band Lower Band-Edge



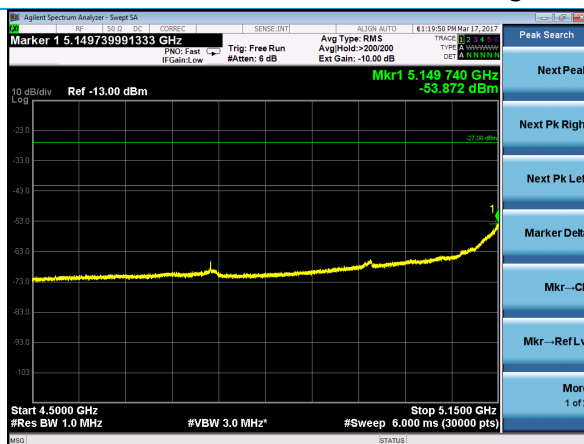
Low Channel – 802.11a HT-20 – Peak



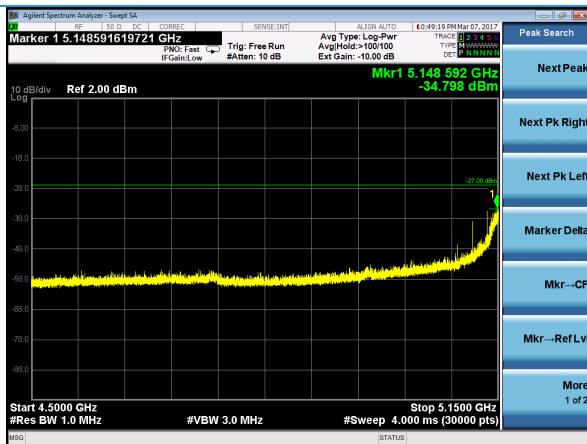
Low Channel – 802.11a HT-20 - Average



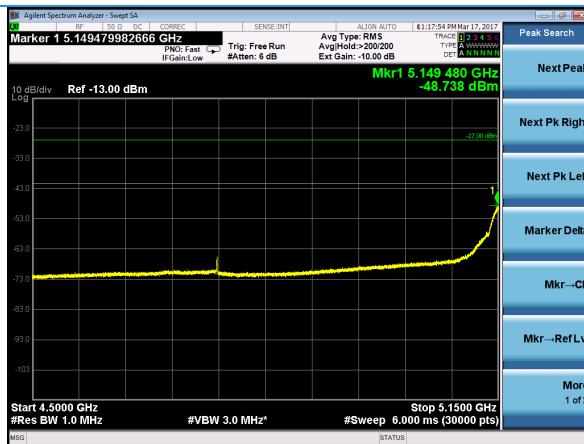
Low Channel – 802.11ac HT-20 - Peak



Low Channel – 802.11ac HT-20 - Average

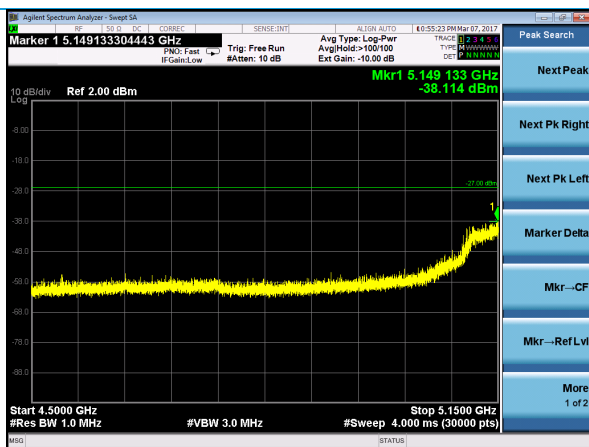


Low Channel – 802.11ac HT-40 - Peak

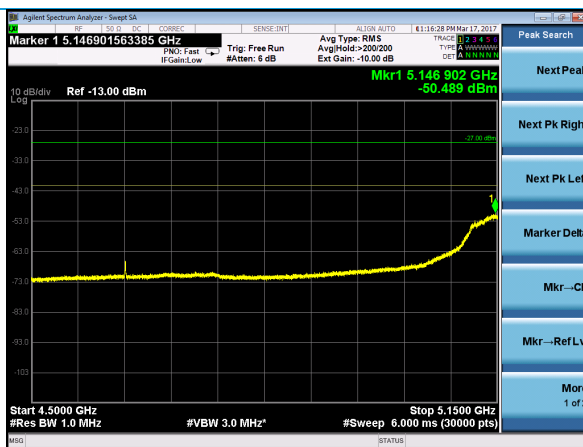


Low Channel – 802.11ac HT-40 - Average

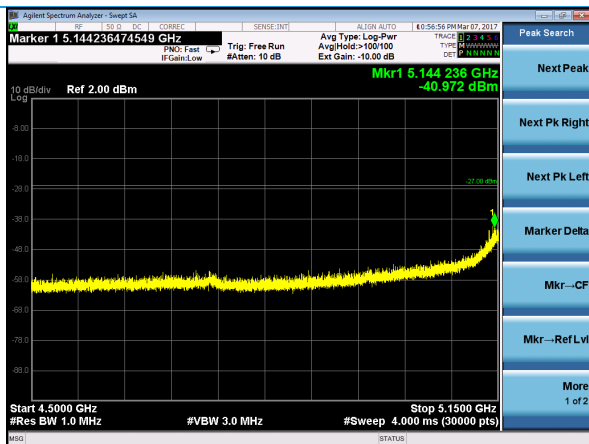
Plots – U-NII-1 Restricted-Band Lower Band-Edge, continued



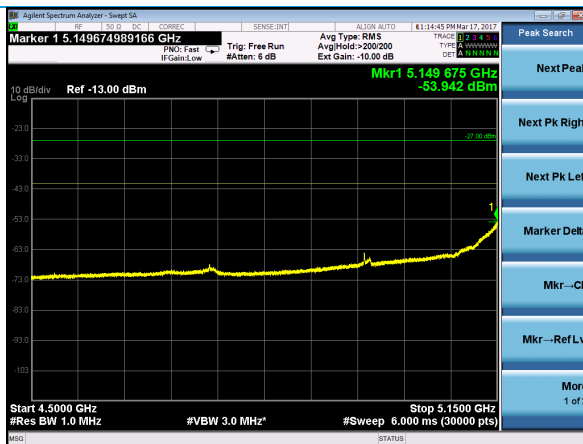
Low Channel – 802.11ac HT-80 – Peak



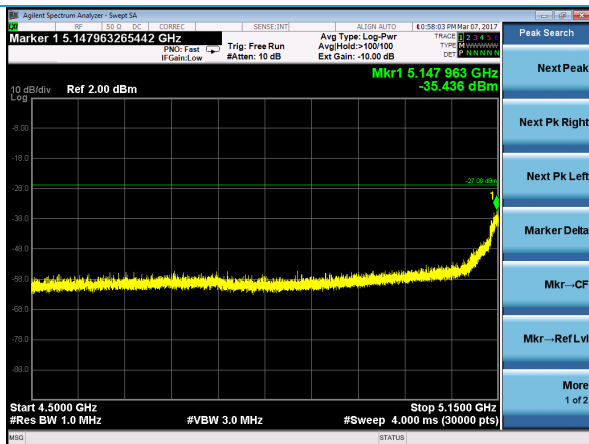
Low Channel – 802.11ac HT-80 - Average



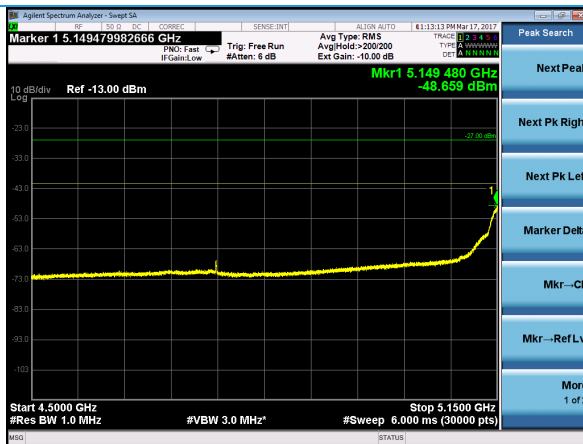
Low Channel – 802.11n HT-20 - Peak



Low Channel – 802.11n HT-20 - Average

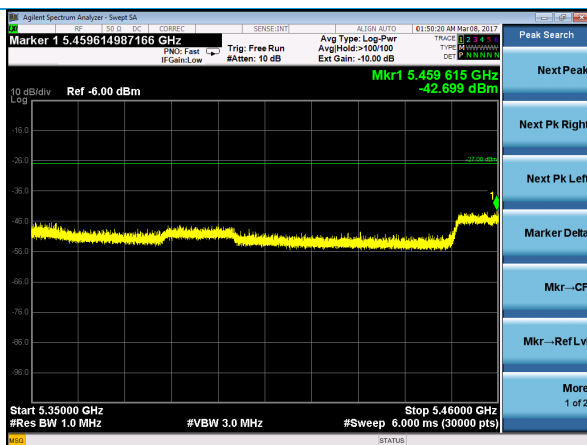


Low Channel – 802.11n HT-40 - Peak

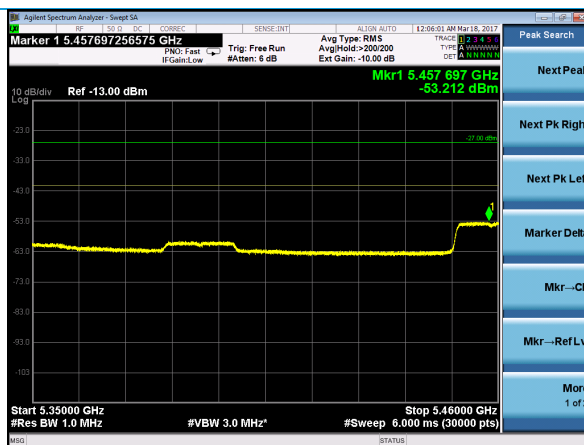


Low Channel – 802.11n HT-40 - Average

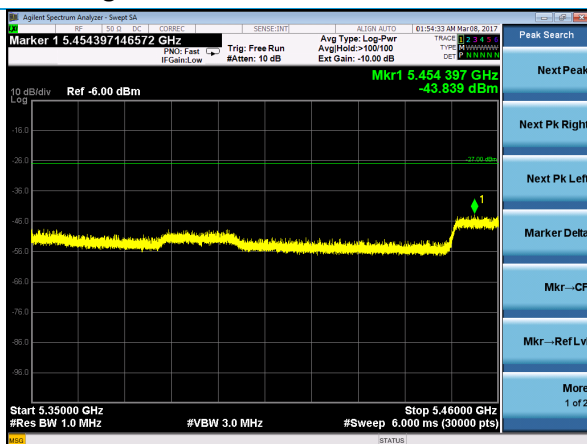
Plots – U-NII-1 FCC Restricted-Band Upper Band-Edge



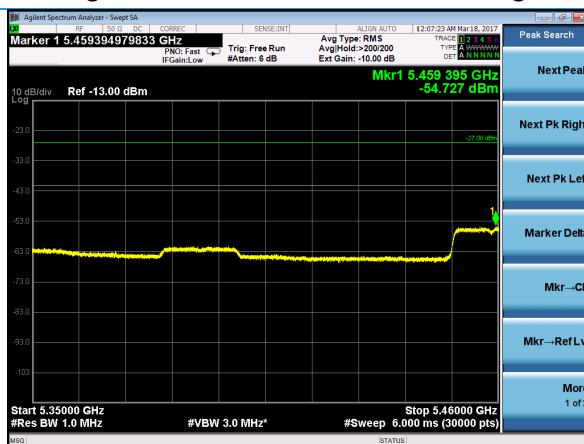
High Channel – 802.11a HT-20 – Peak



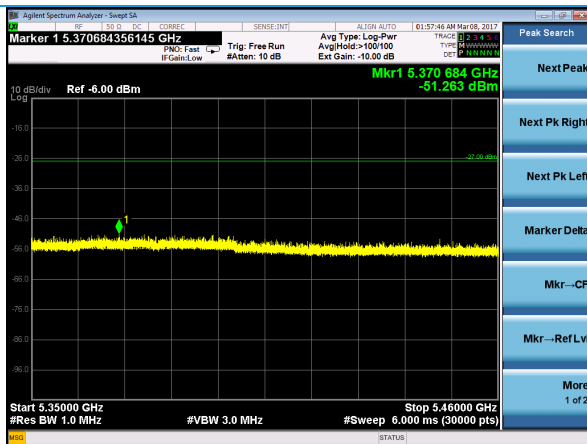
High Channel – 802.11a HT-20 - Average



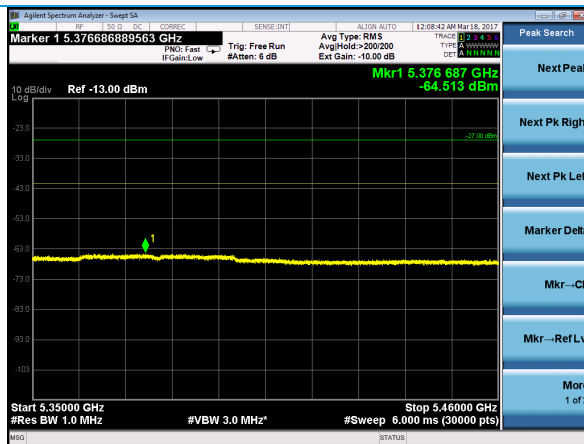
High Channel – 802.11ac HT-20 - Peak



High Channel – 802.11ac HT-20 - Average

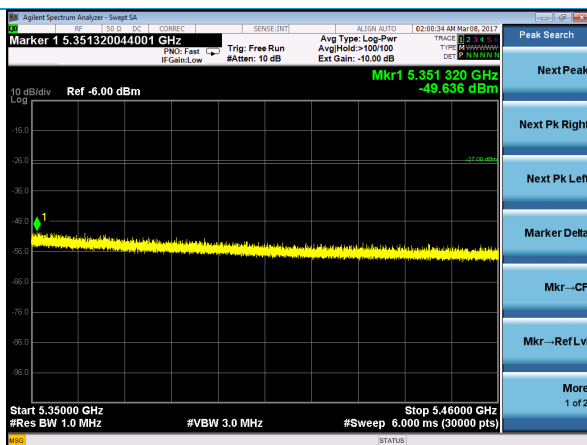


High Channel – 802.11ac HT-40 - Peak

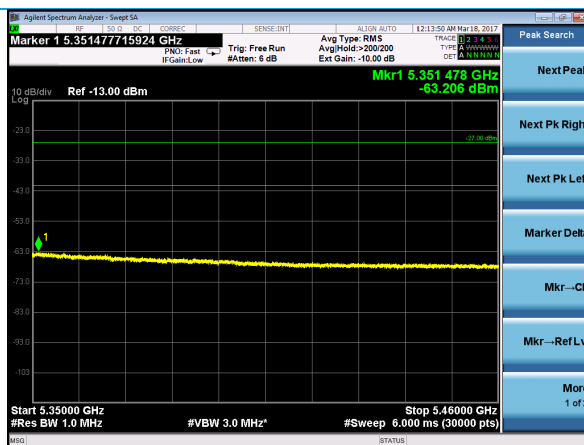


High Channel – 802.11ac HT-40 - Average

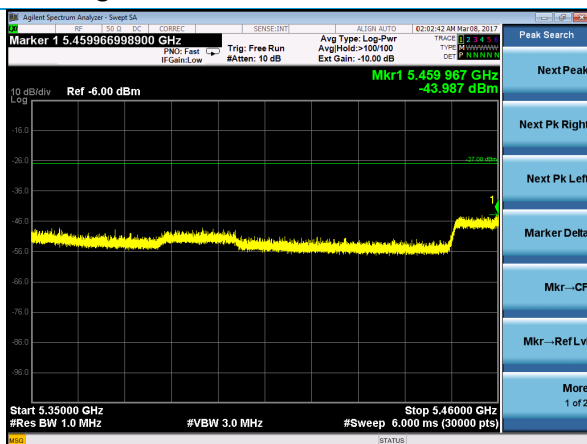
Plots – U-NII-1 FCC Restricted-Band Upper Band-Edge, continued



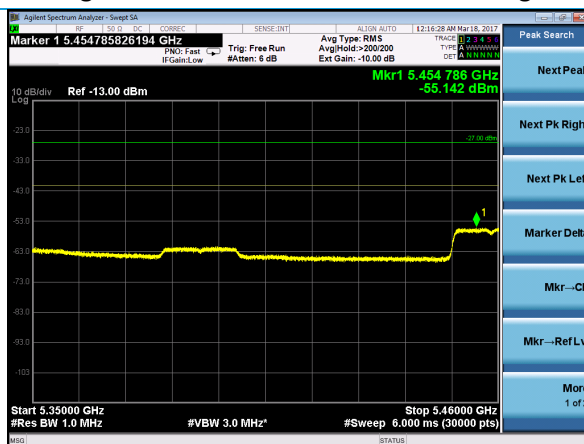
High Channel – 802.11ac HT-80 – Peak



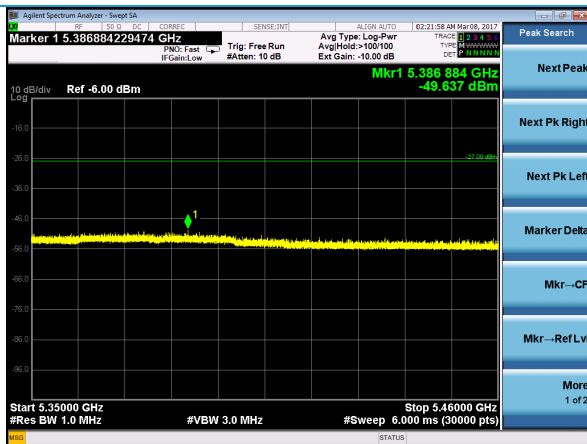
High Channel – 802.11ac HT-80 - Average



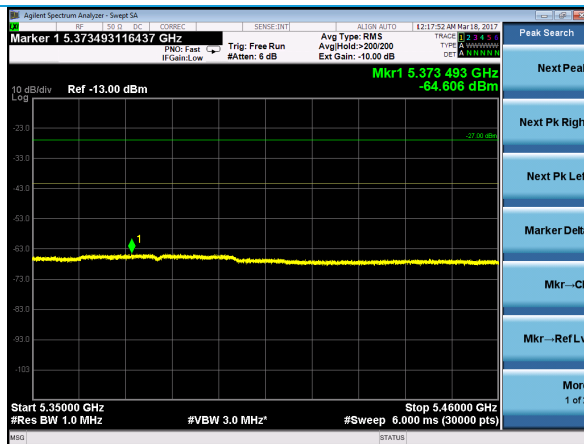
High Channel – 802.11n HT-20 - Peak



High Channel – 802.11n HT-20 - Average

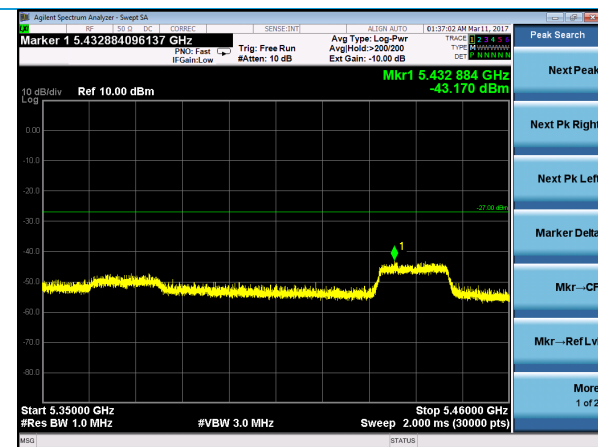


High Channel – 802.11n HT-40 - Peak

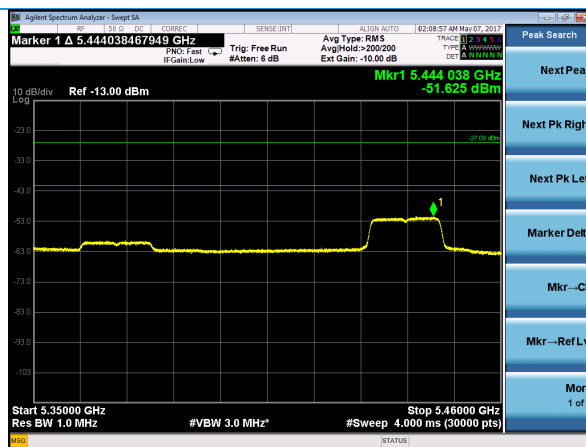


High Channel – 802.11n HT-40 - Average

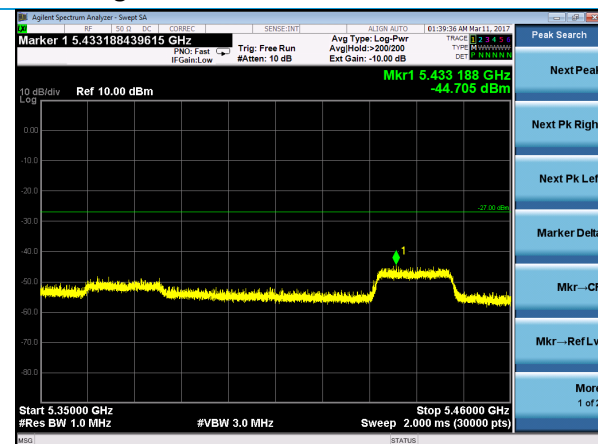
Plots – U-NII-1 ISED Upper Band-Edge



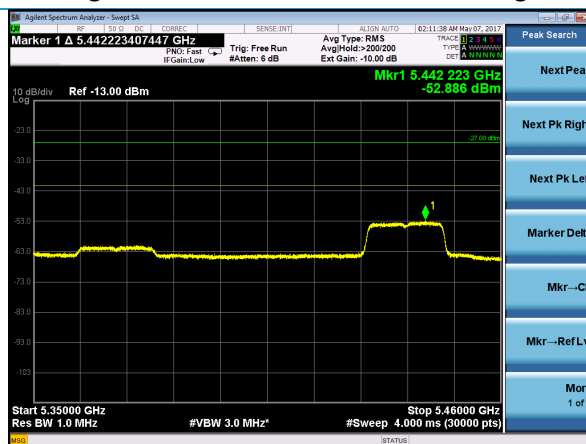
High Channel – 802.11a HT-20 – Peak



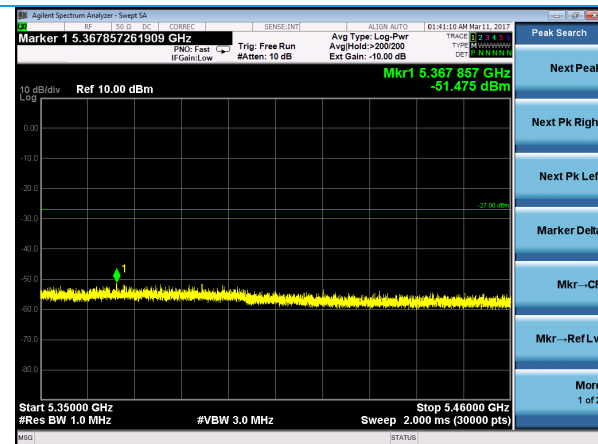
High Channel – 802.11a HT-20 - Average



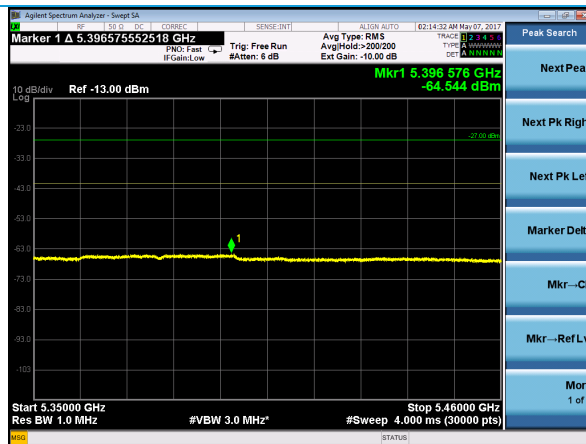
High Channel – 802.11ac HT-20 - Peak



High Channel – 802.11ac HT-20 - Average

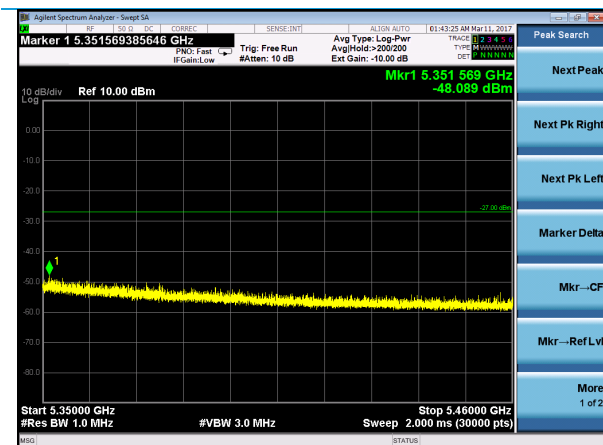


High Channel – 802.11ac HT-40 - Peak

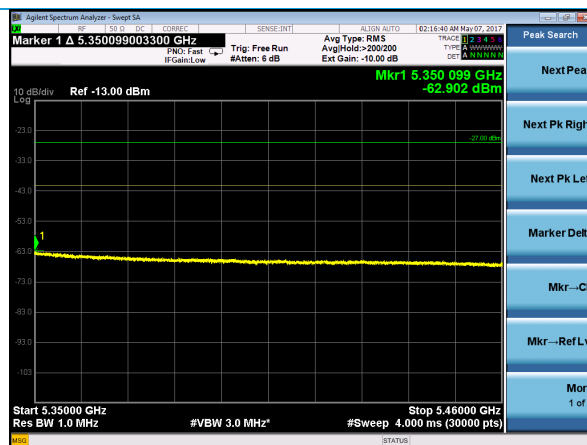


High Channel – 802.11ac HT-40 - Average

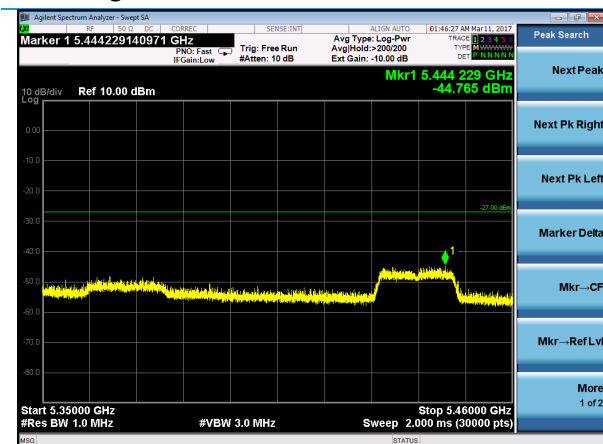
Plots – U-NII-1 ISED Upper Band Edge, continued



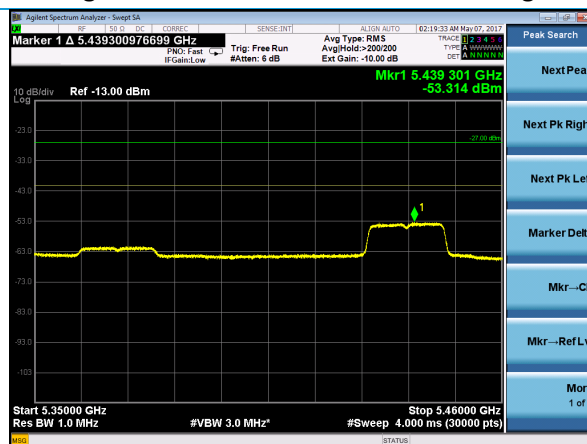
High Channel – 802.11ac HT-80 – Peak



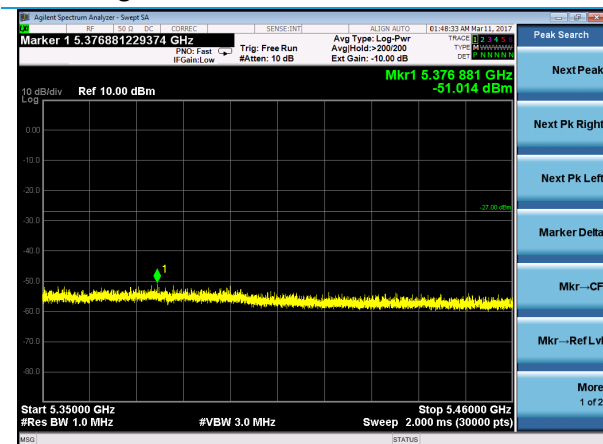
High Channel – 802.11ac HT-80 - Average



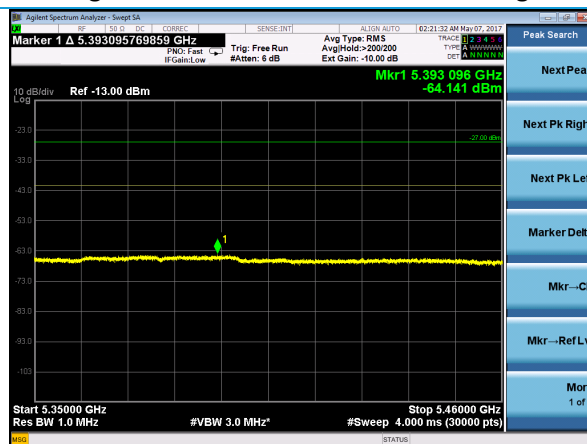
High Channel – 802.11n HT-20 - Peak



High Channel – 802.11n HT-20 - Average

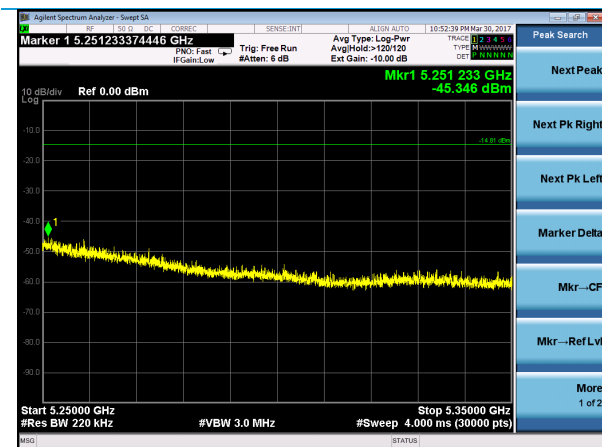


High Channel – 802.11n HT-40 - Peak

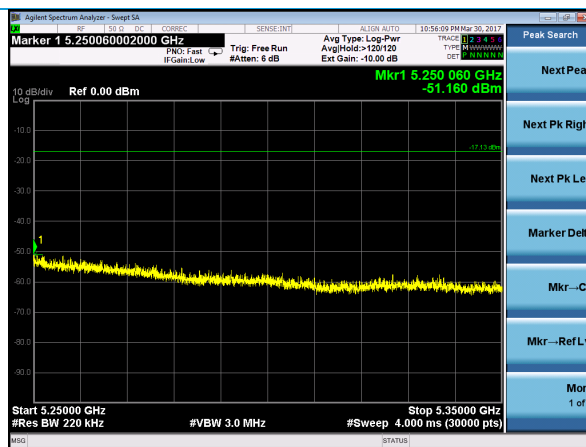


High Channel – 802.11n HT-40 - Average

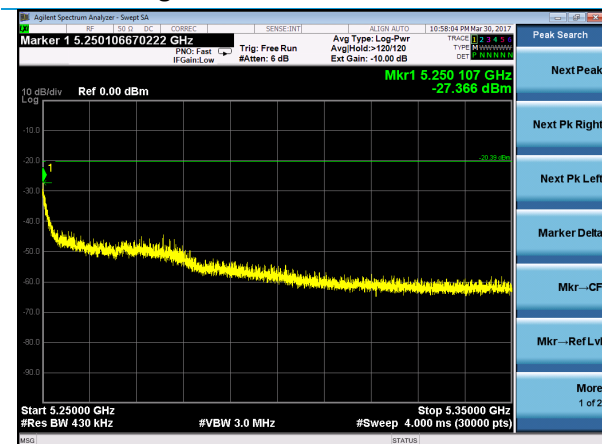
Plots – U-NII-1 ISED 5250-5350 MHz Band-Edge



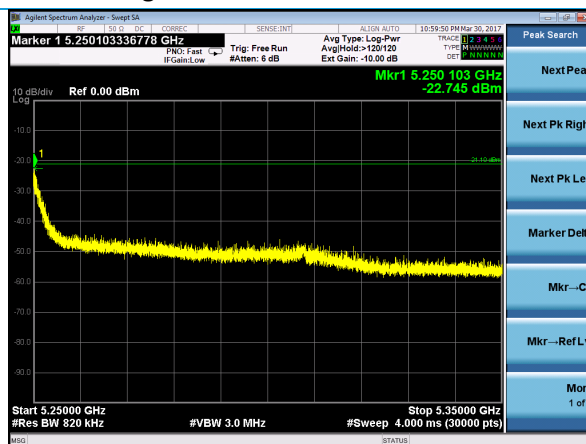
High Channel – 802.11a HT-20



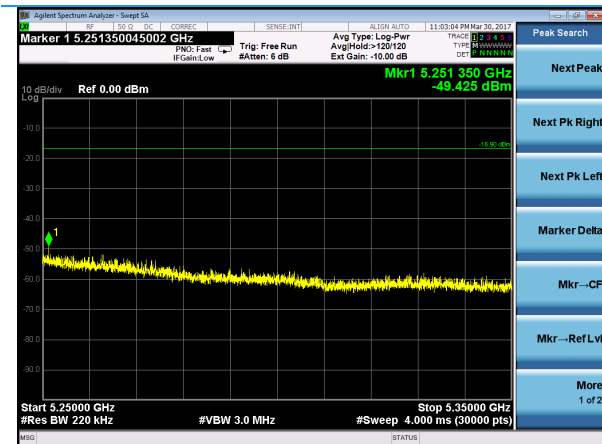
High Channel – 802.11ac HT-20



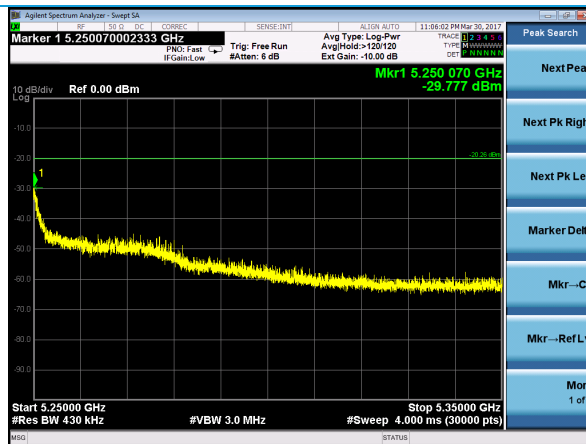
High Channel – 802.11ac HT-40



High Channel – 802.11ac HT-80

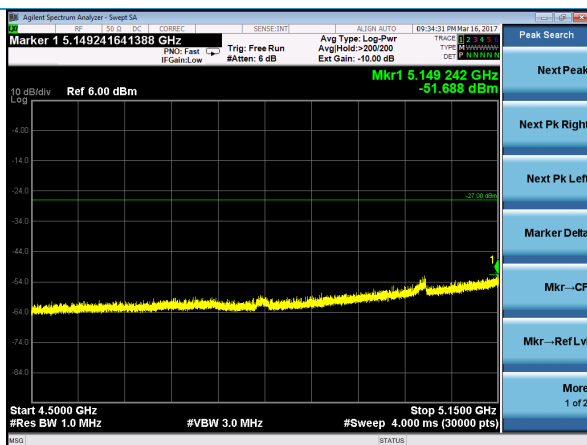


High Channel – 802.11 HT-20

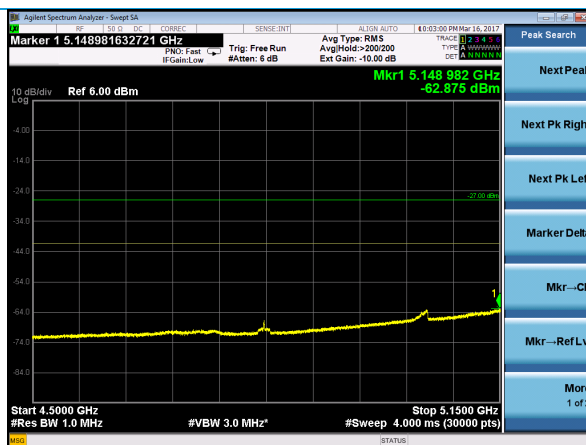


High Channel – 802.11n HT-40

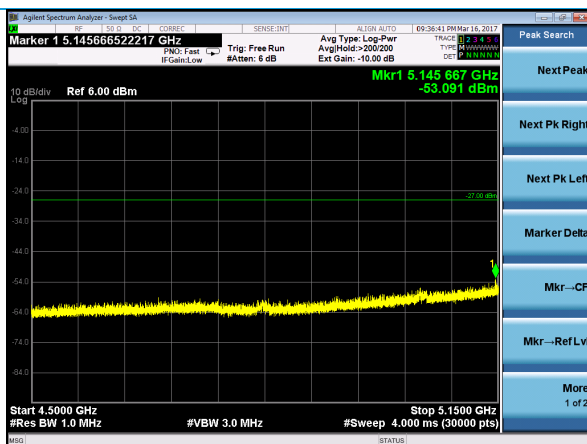
Plots – U-NII-2A Restricted-Band Lower Band-Edge



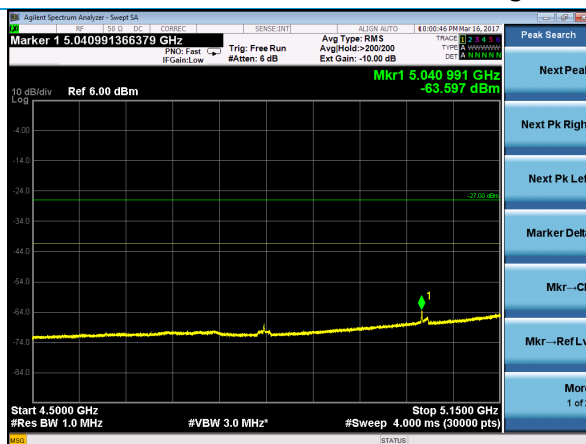
Low Channel – 802.11a HT-20 – Peak



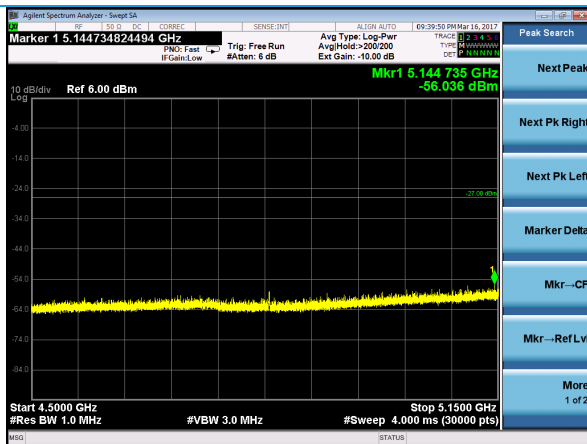
Low Channel – 802.11a HT-20 - Average



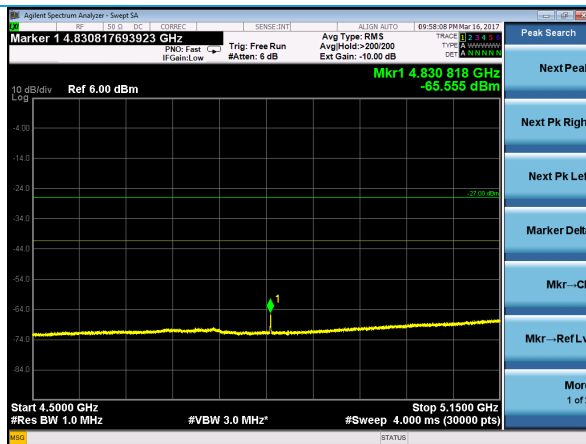
Low Channel – 802.11ac HT-20 - Peak



Low Channel – 802.11ac HT-20 - Average

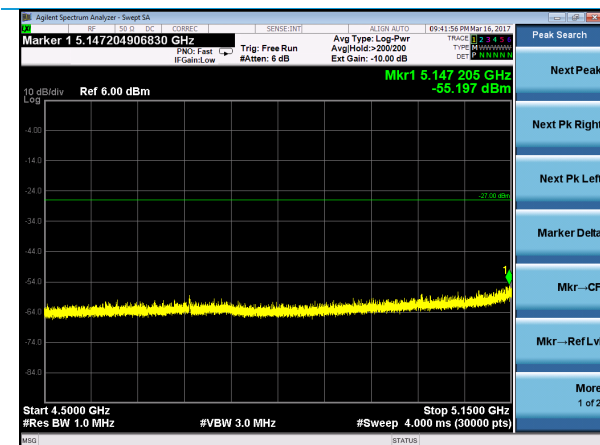


Low Channel – 802.11ac HT-40 - Peak

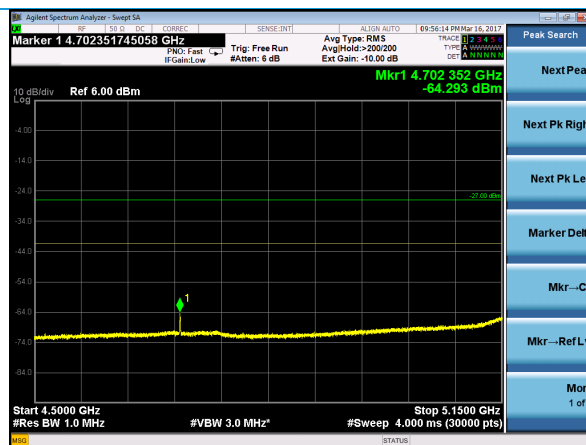


Low Channel – 802.11ac HT-40 - Average

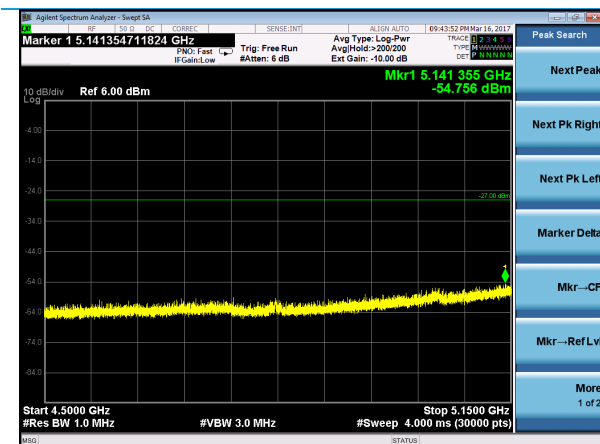
Plots – U-NII-2A Restricted-Band Lower Band-Edge, continued



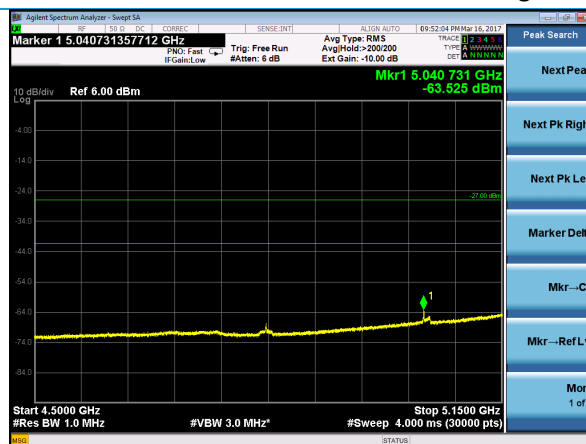
Low Channel – 802.11ac HT-80 – Peak



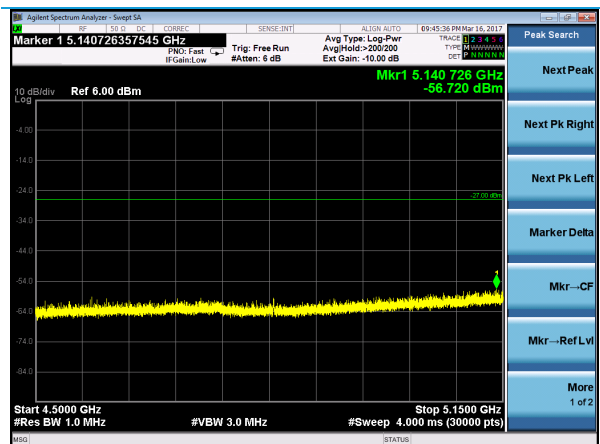
Low Channel – 802.11ac HT-80 - Average



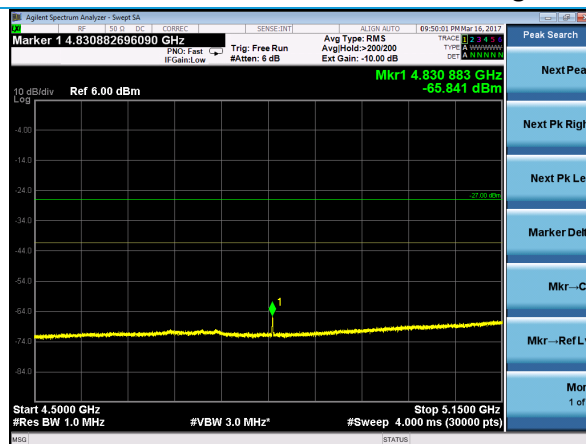
Low Channel – 802.11n HT-20 - Peak



Low Channel – 802.11n HT-20 - Average

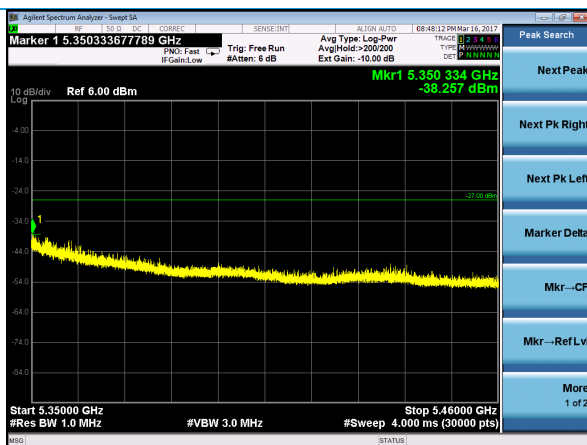


Low Channel – 802.11n HT-40 - Peak

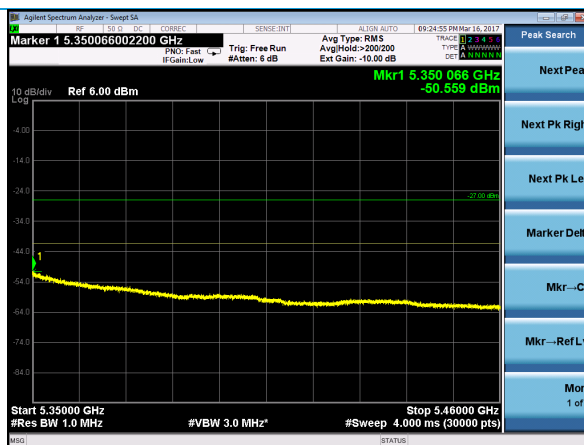


Low Channel – 802.11n HT-40 - Average

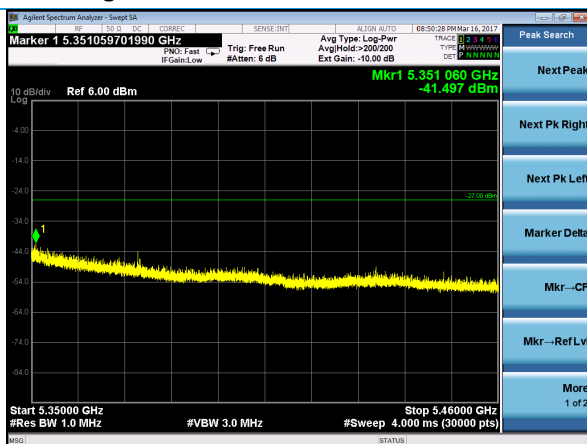
Plots – U-NII-2A Restricted-Band Upper Band-Edge



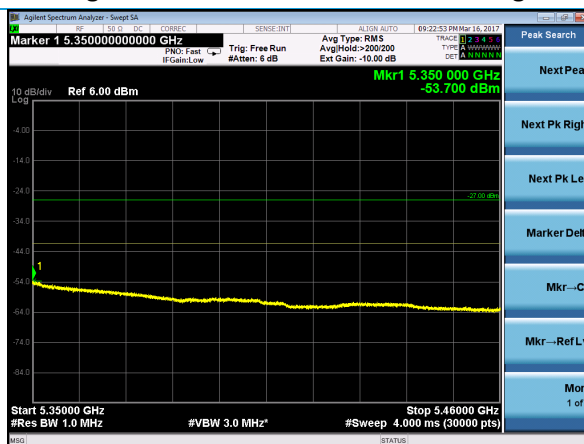
High Channel – 802.11a HT-20 – Peak



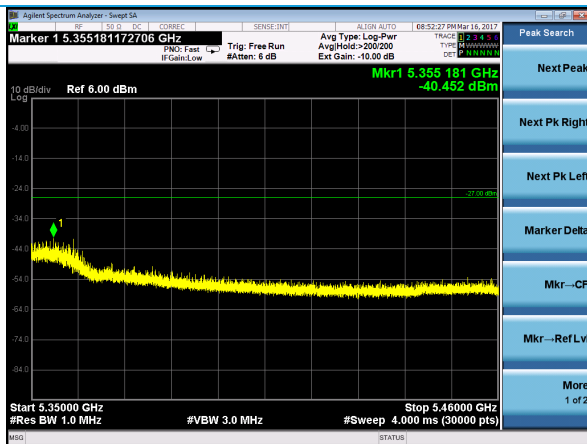
High Channel – 802.11a HT-20 - Average



High Channel – 802.11ac HT-20 - Peak



High Channel – 802.11ac HT-20 - Average

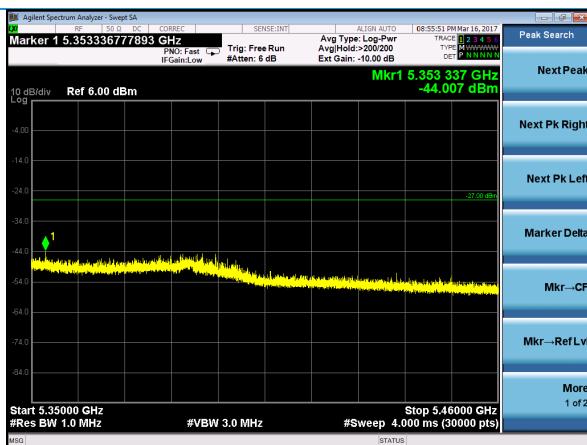


High Channel – 802.11ac HT-40 - Peak

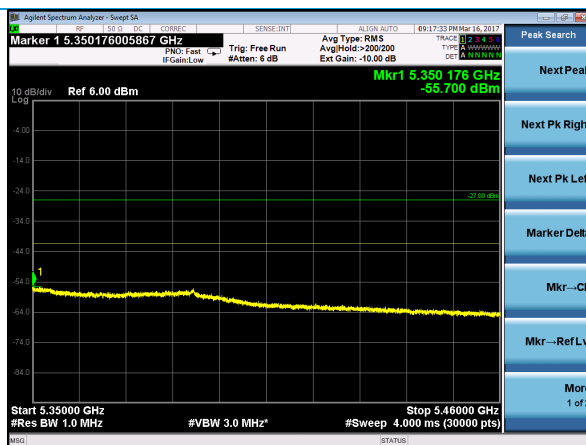


High Channel – 802.11ac HT-40 - Average

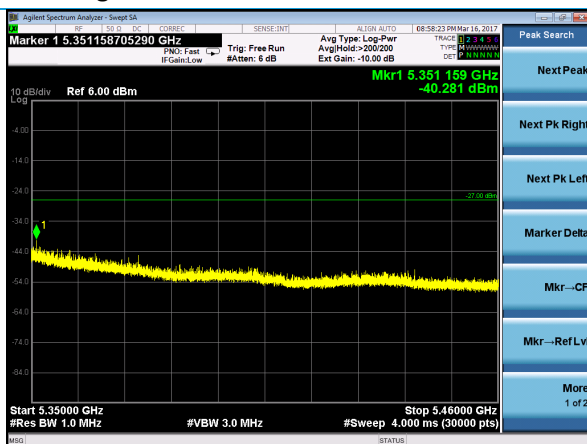
Plots – U-NII-2A Restricted-Band Upper Band-Edge, continued



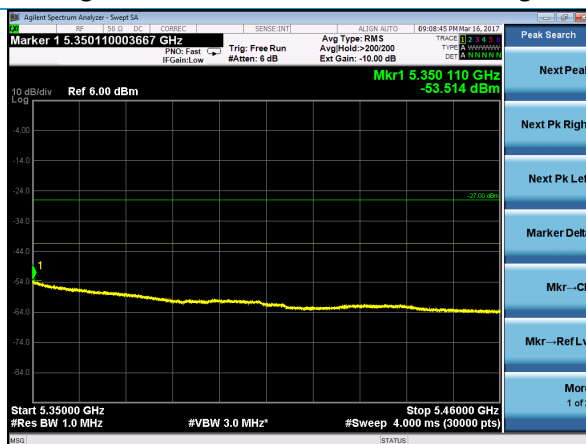
High Channel – 802.11ac HT-80 – Peak



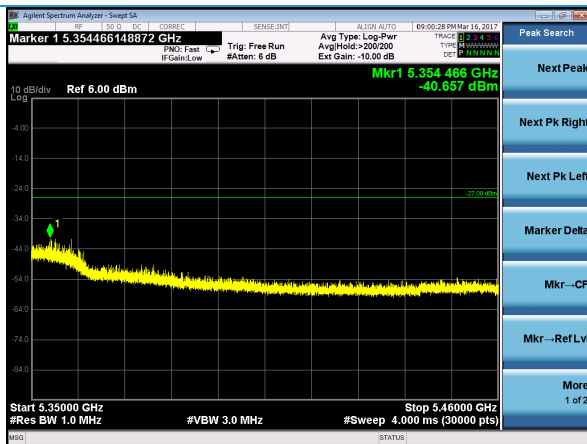
High Channel – 802.11ac HT-80 - Average



High Channel – 802.11n HT-20 - Peak



High Channel – 802.11n HT-20 - Average

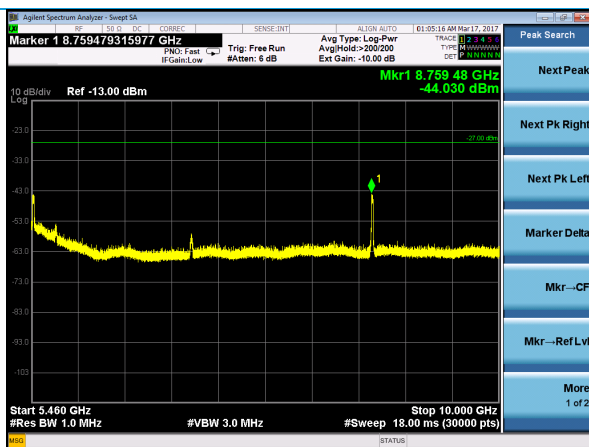


High Channel – 802.11n HT-40 - Peak

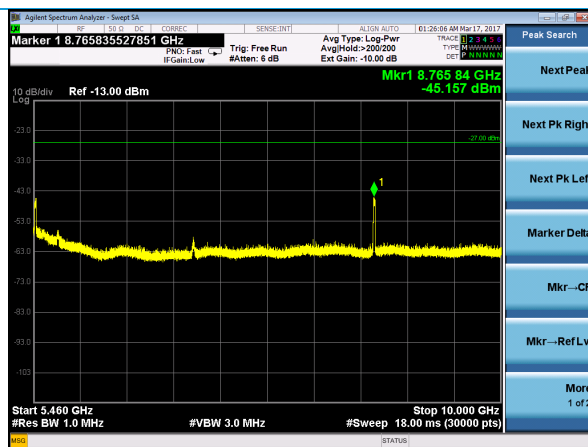


High Channel – 802.11n HT-40 - Average

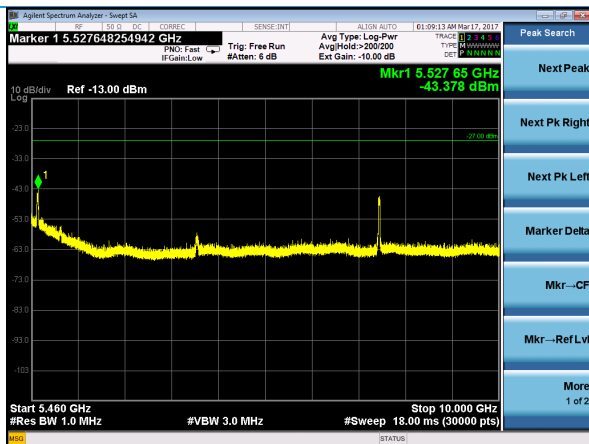
Plots – U-NII-2A: Upper Edge of U-NII-2A Band



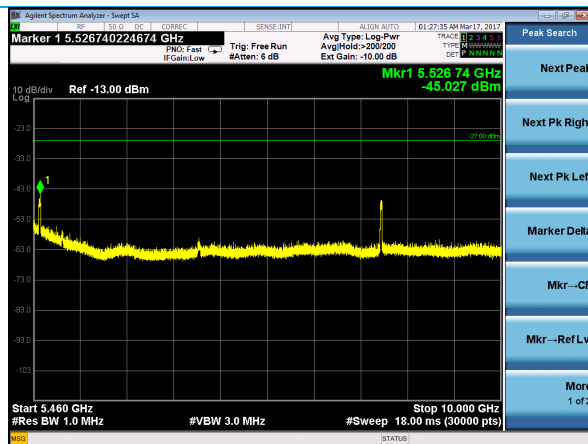
Low Channel – 802.11a HT-20



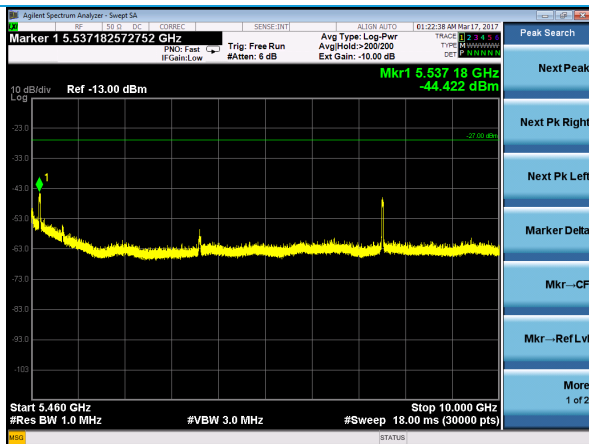
Low Channel – 802.11ac HT-20



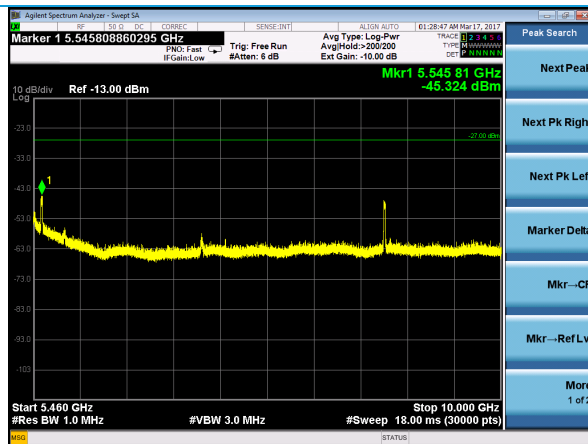
Mid Channel – 802.11a HT-20



Mid Channel – 802.11ac HT-20

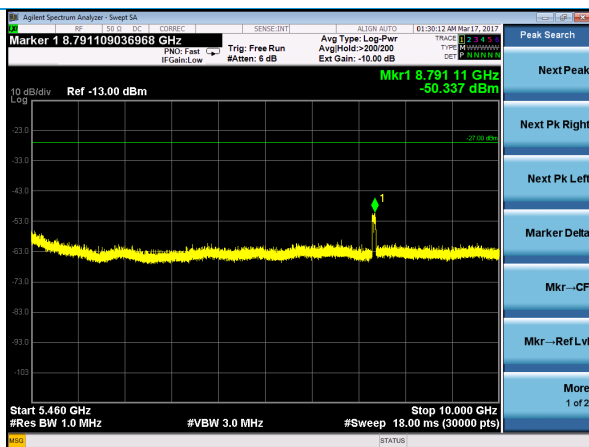


High Channel – 802.11a HT-20

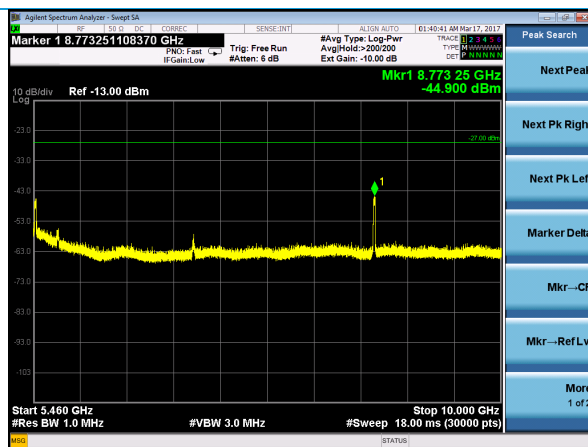


High Channel – 802.11ac HT-20

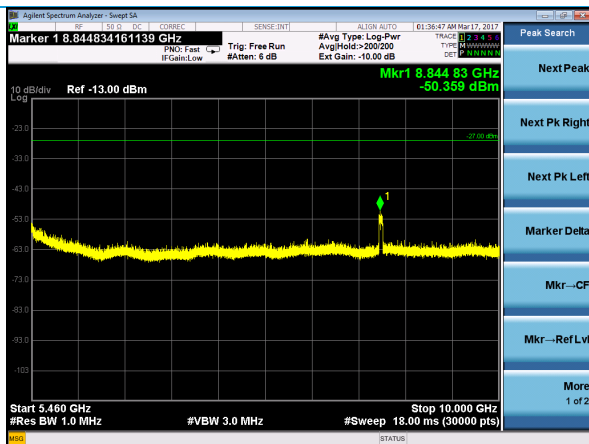
Plots – U-NII-2A: Upper Edge of U-NII-2A Band, continued



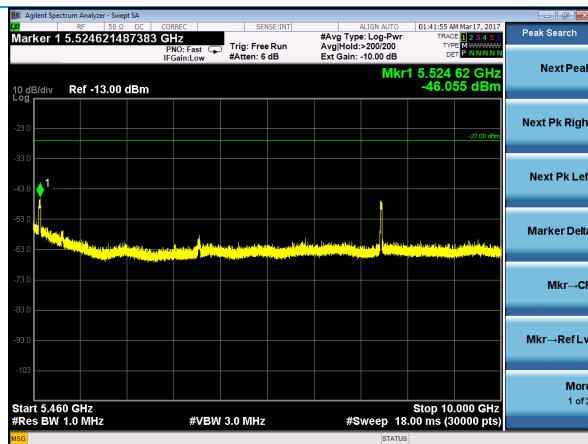
Low Channel – 802.11ac HT-40



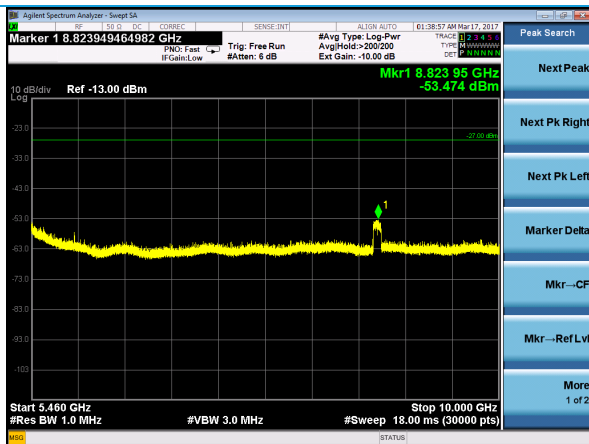
Low Channel – 802.11n HT-20



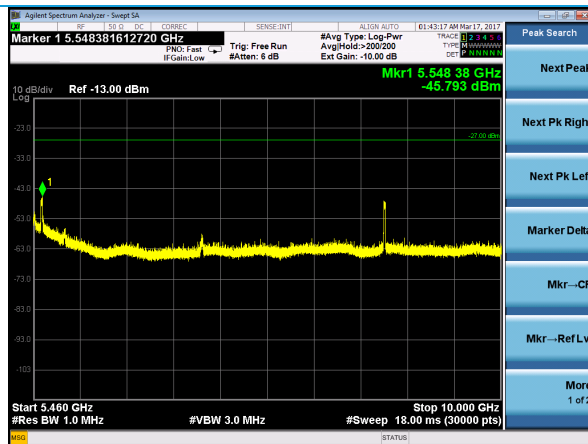
High Channel – 802.11ac HT-40



Mid Channel – 802.11n HT-20

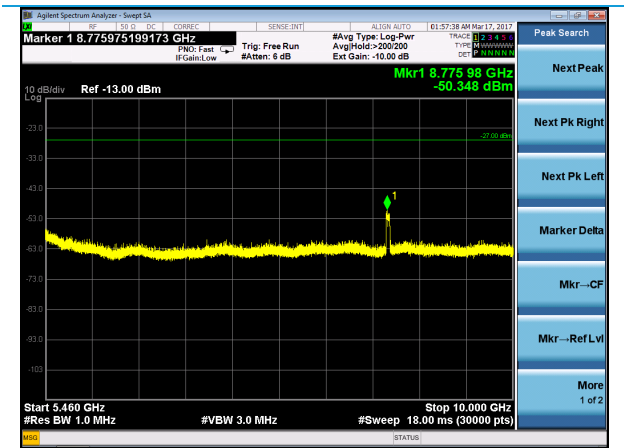


Only Channel – 802.11ac HT-80

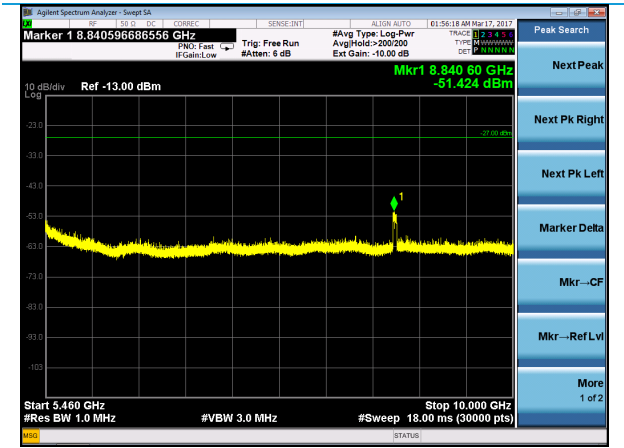


High Channel – 802.11n HT-20

Plots – U-NII-2A Upper Band-Edge, continued

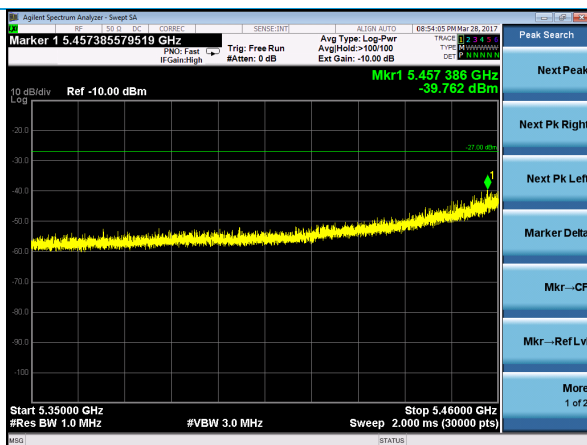


Low Channel – 802.11n HT-40

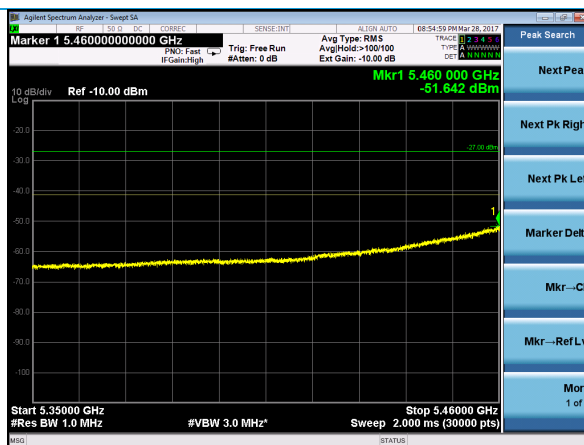


High Channel – 802.11n HT-40

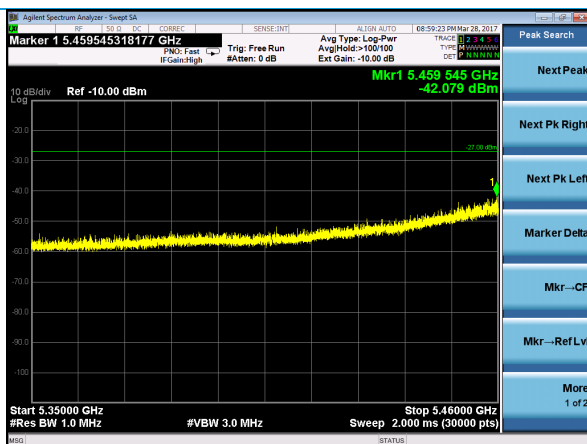
Plots – U-NII-2C Restricted-Band Lower Band-Edge



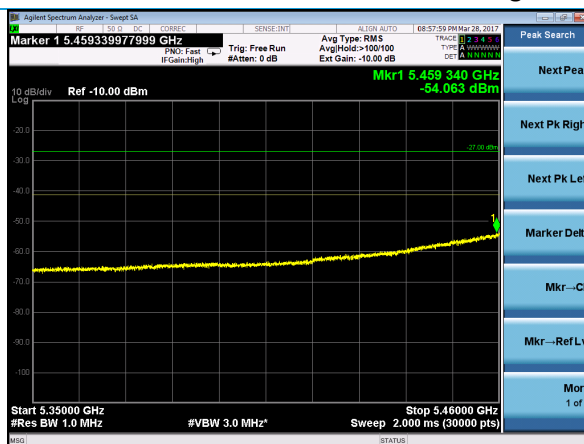
Low Channel – 802.11a HT-20 – Peak



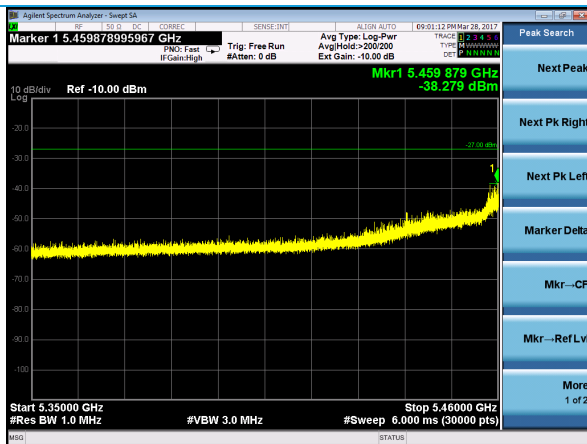
Low Channel – 802.11a HT-20 - Average



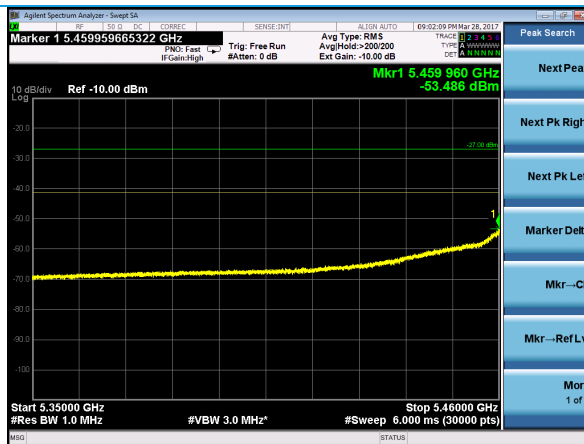
Low Channel – 802.11ac HT-20 - Peak



Low Channel – 802.11ac HT-20 - Average



Low Channel – 802.11ac HT-40 - Peak



Low Channel – 802.11ac HT-40 - Average