



Appendix for Testreport

Appendix A: DTS (6 dB) Bandwidth

In this document, the "DTS6dBBW" refers to the measured "DTS (6 dB) Bandwidth" value. In this Appendix, the "fc(DTS6dBBW)" refers to the centre of the measured "DTS6dBBW". The introduction of the "fc(DTS6dBBW)" is due to that other measurements use it as the spectrum analyzer setting.

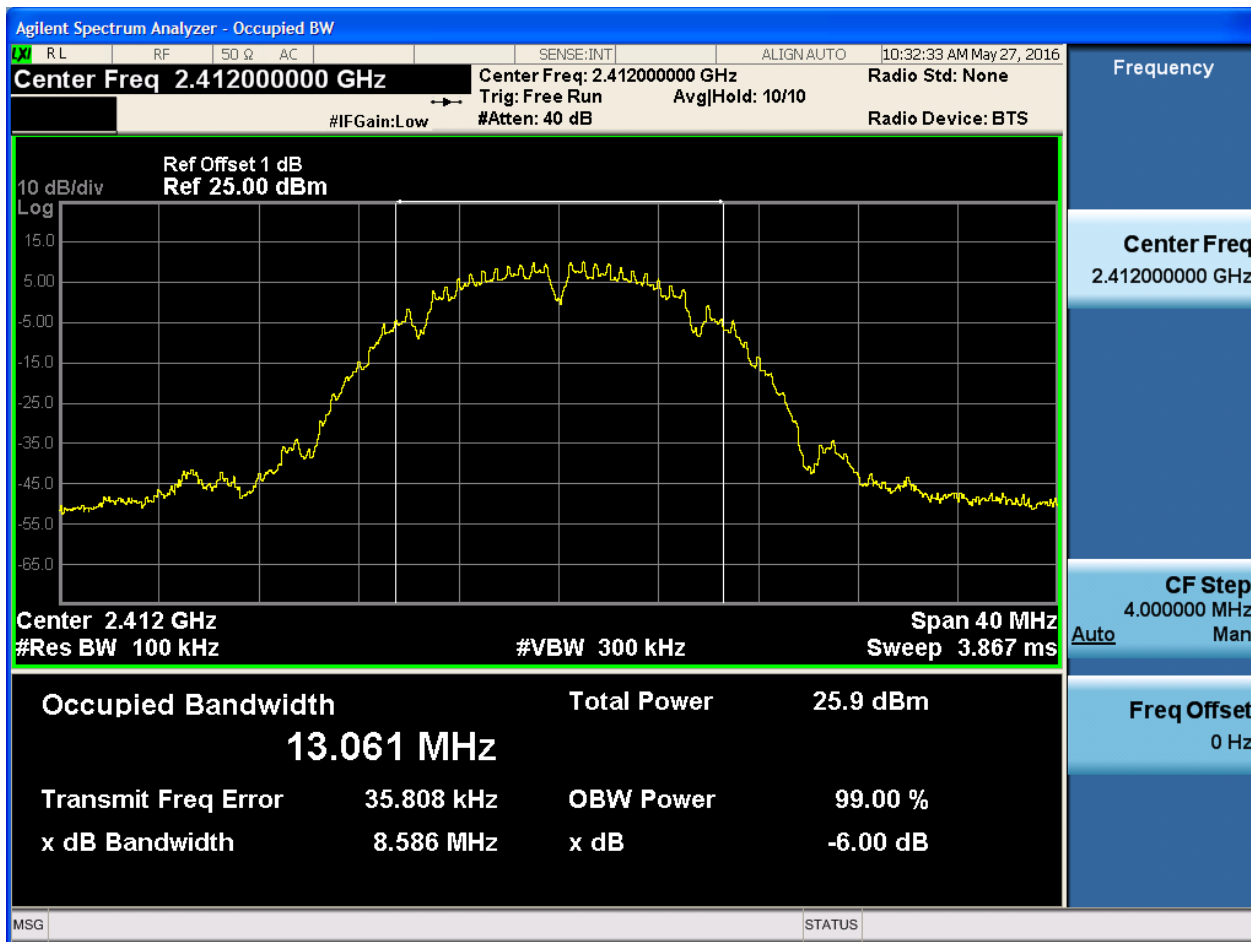
For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain, and used as respective results for each chain.

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	DTS6dBBW[MHz]	Verdict
11B	L	2412	Ant 1	8.59	pass
11B	M	2437	Ant 1	8.61	pass
11B	H	2462	Ant 1	8.10	pass
11G	L	2412	Ant 1	16.48	pass
11G	M	2437	Ant 1	16.44	pass
11G	H	2462	Ant 1	16.41	pass
11N20	L	2412	Ant 1	17.62	pass
11N20	M	2437	Ant 1	17.63	pass
11N20	H	2462	Ant 1	17.61	pass

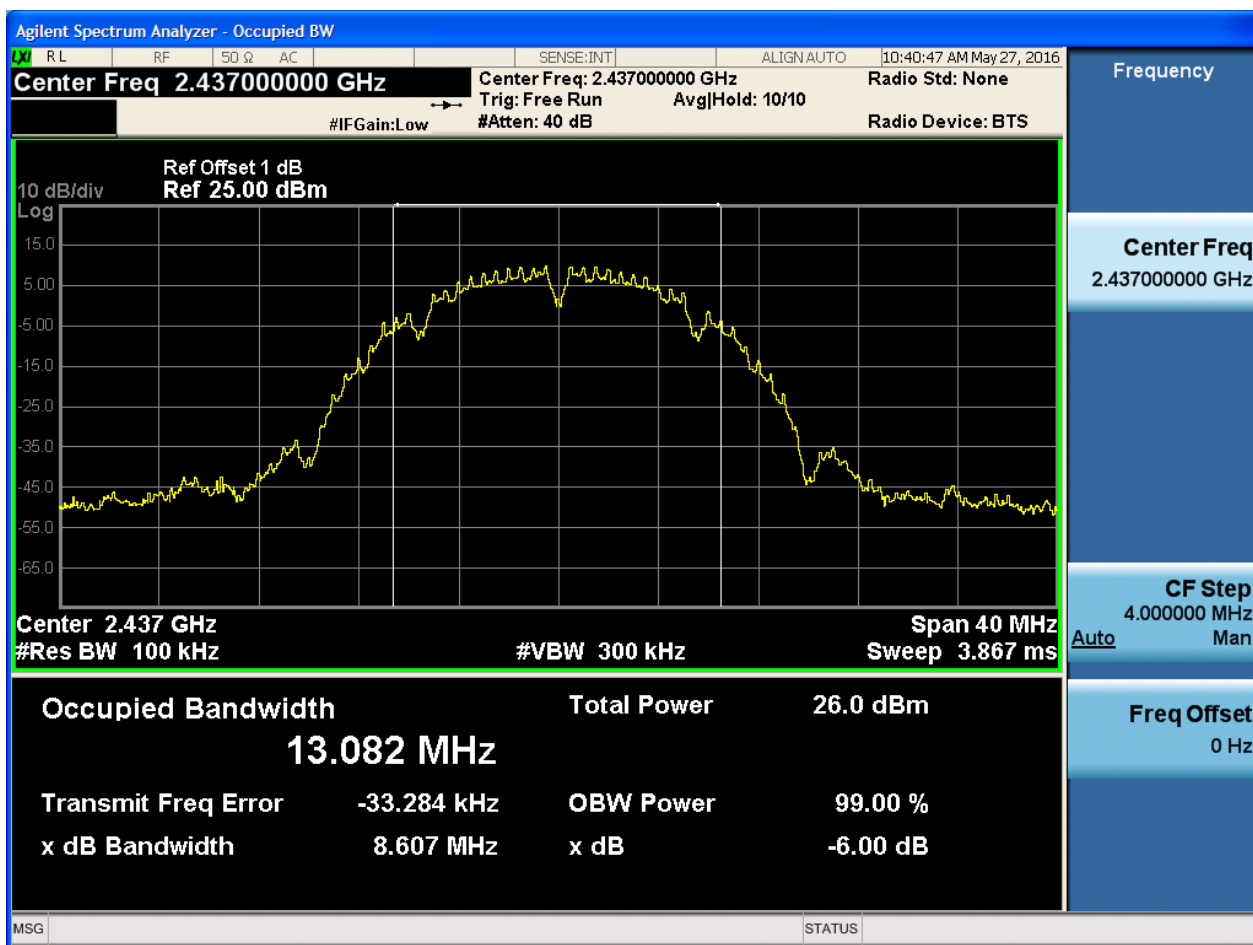
Part II - Test Plots

2.1 11B_L@Ant 1



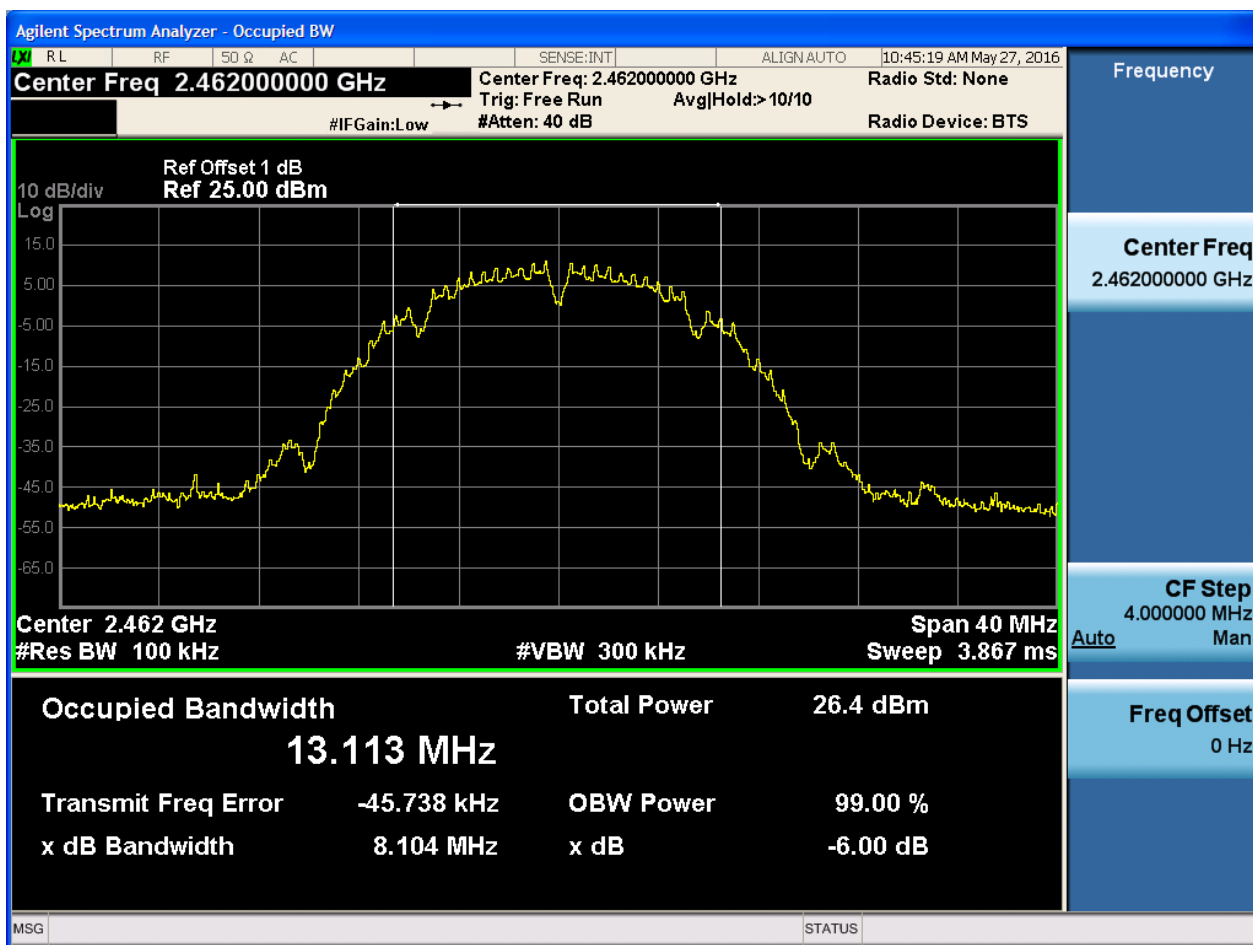


2.3 11B_M@Ant 1



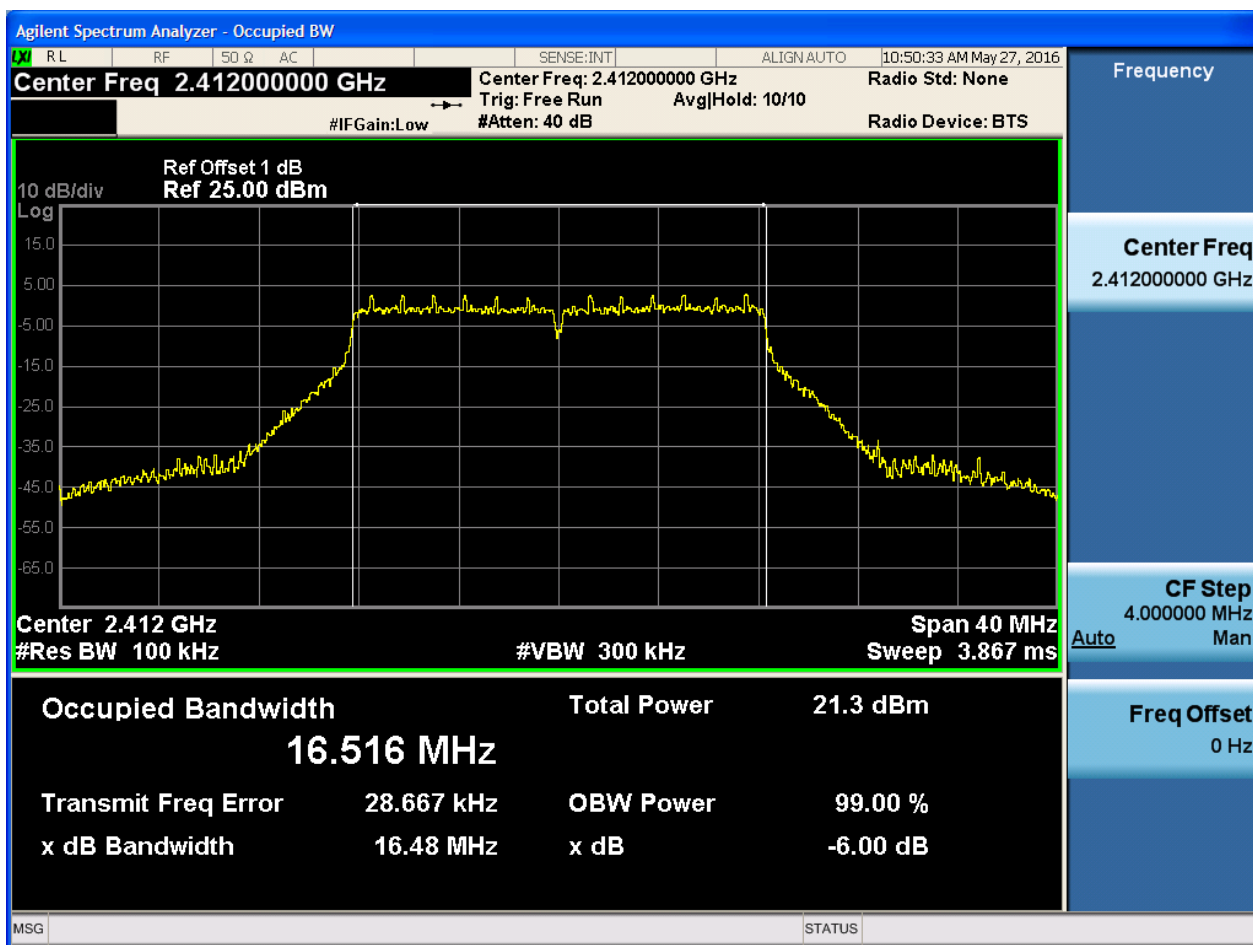


2.5 11B_H@Ant 1



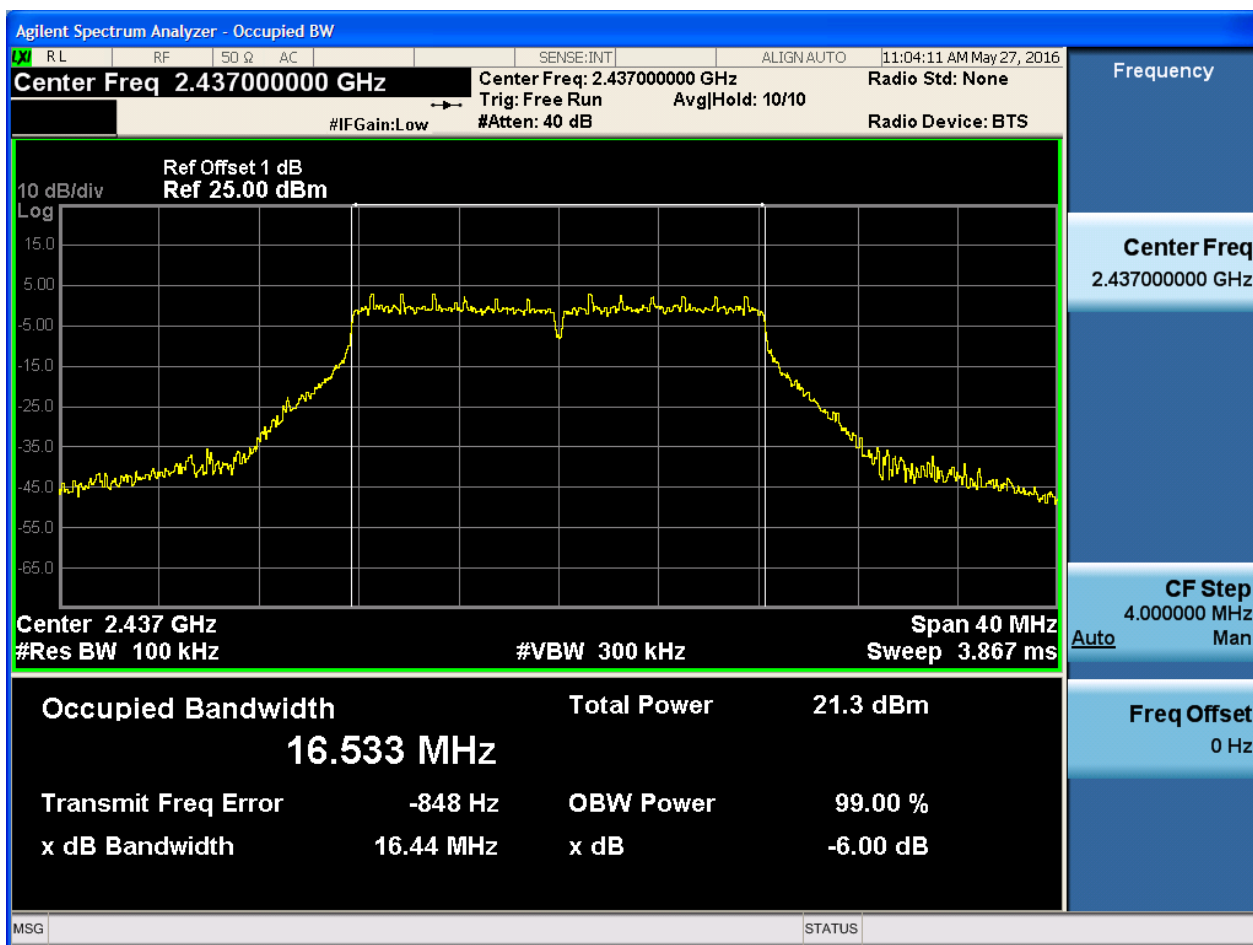


2.7 11G_L@Ant 1



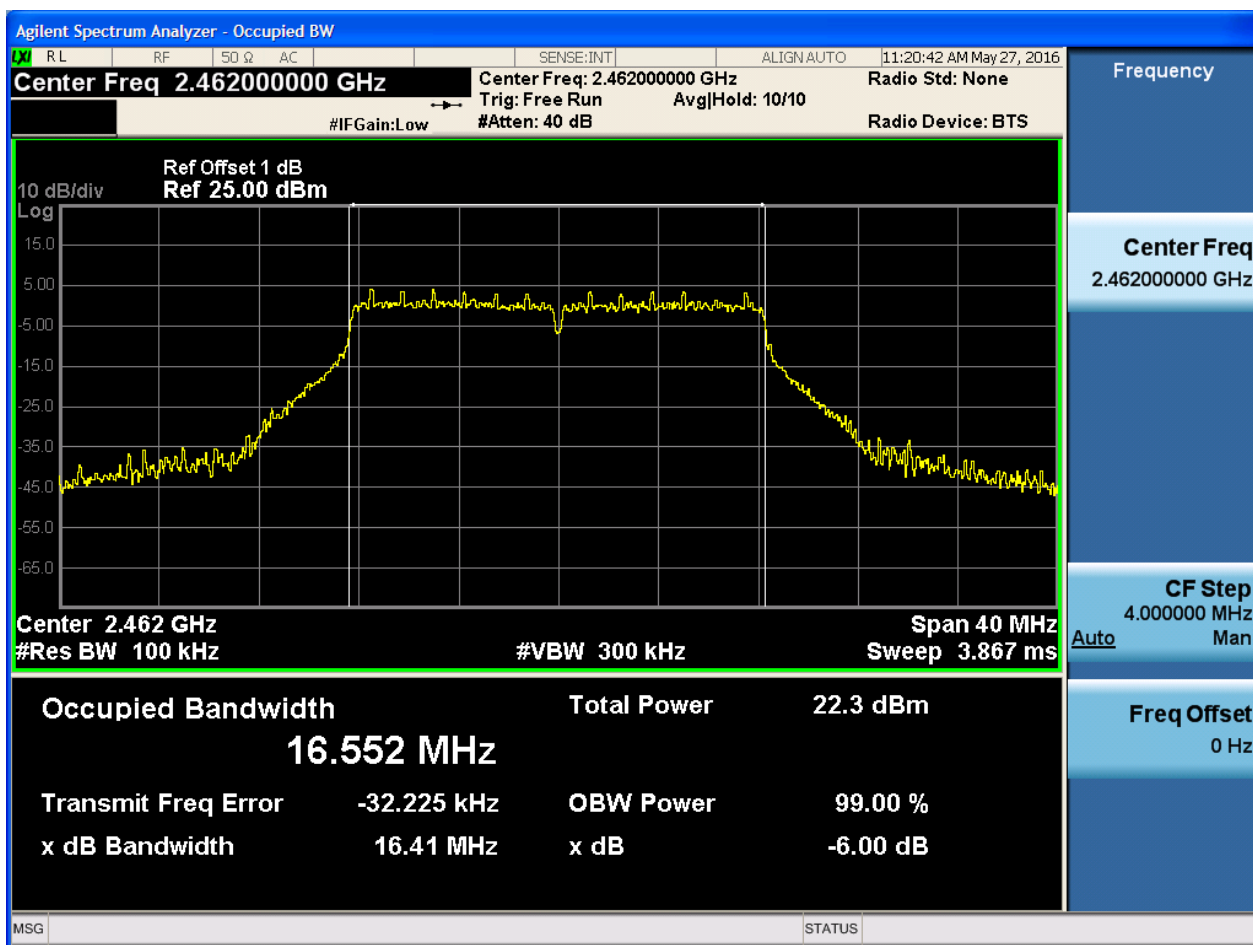


2.9 11G_M@Ant 1



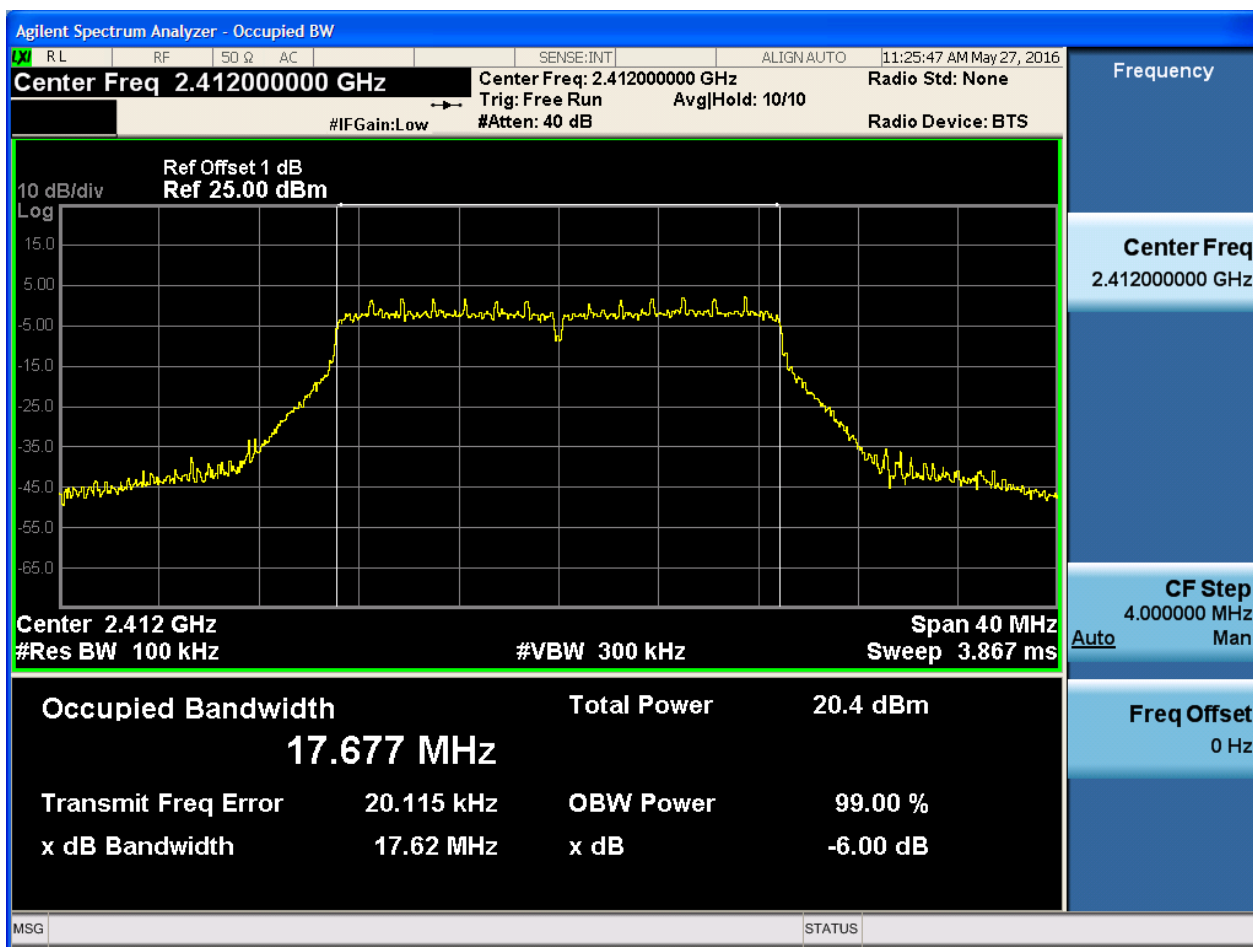


2.11 11G_H@Ant 1



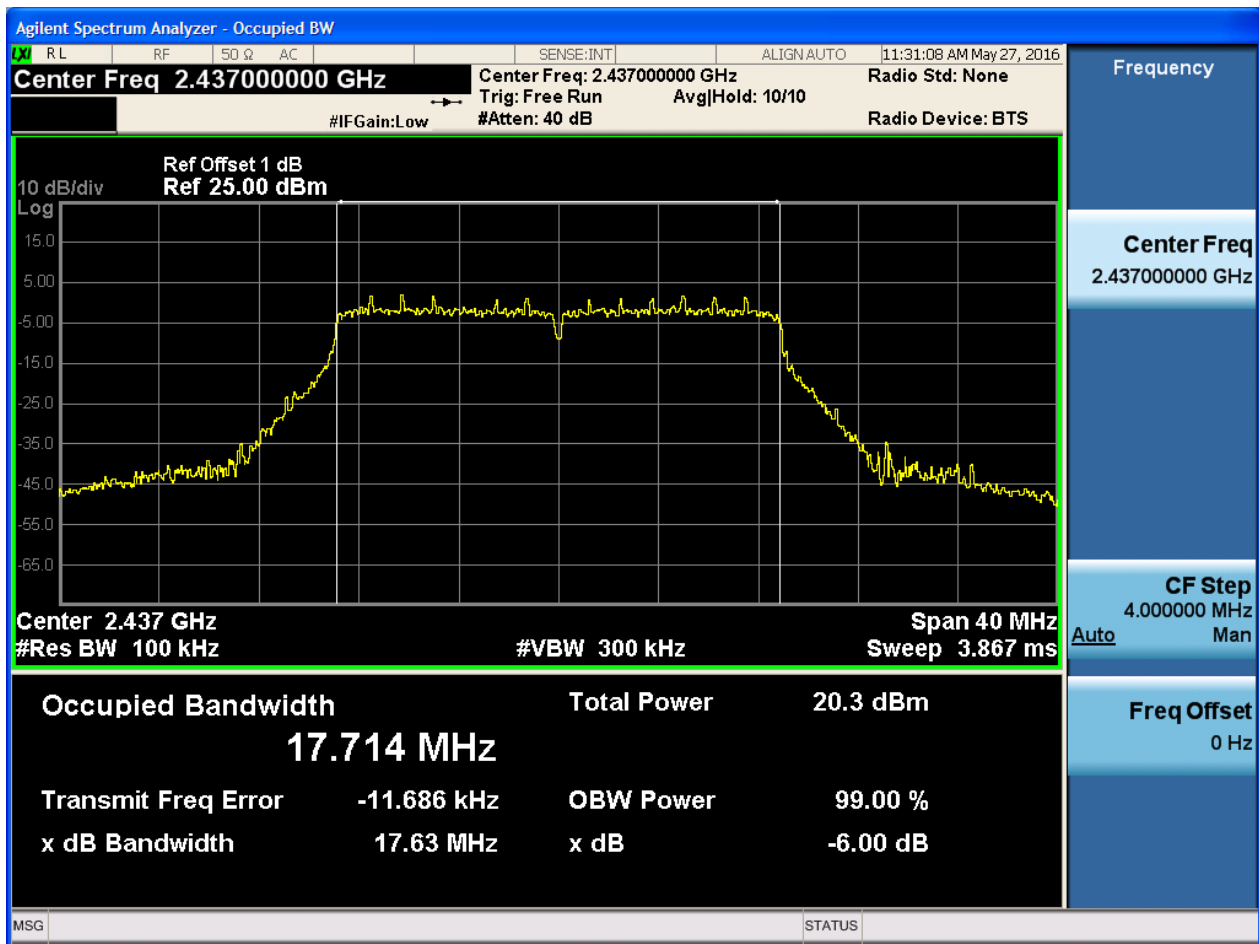


2.13 11N20_L@Ant 1



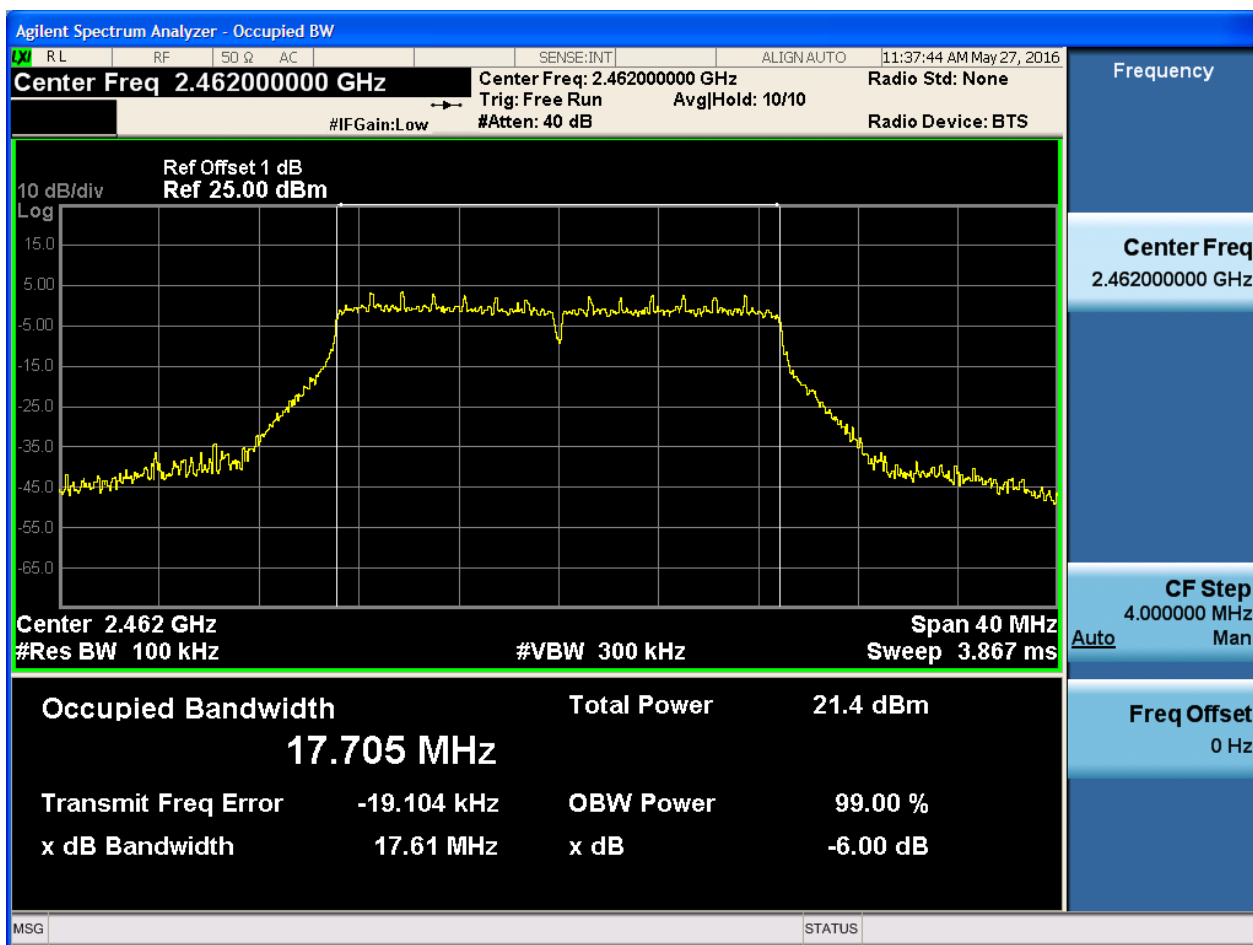


2.15 11N20_M@Ant 1





2.17 11N20_H@Ant 1



Appendix B: Occupied Bandwidth

For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain, and used as respective results for each chain.

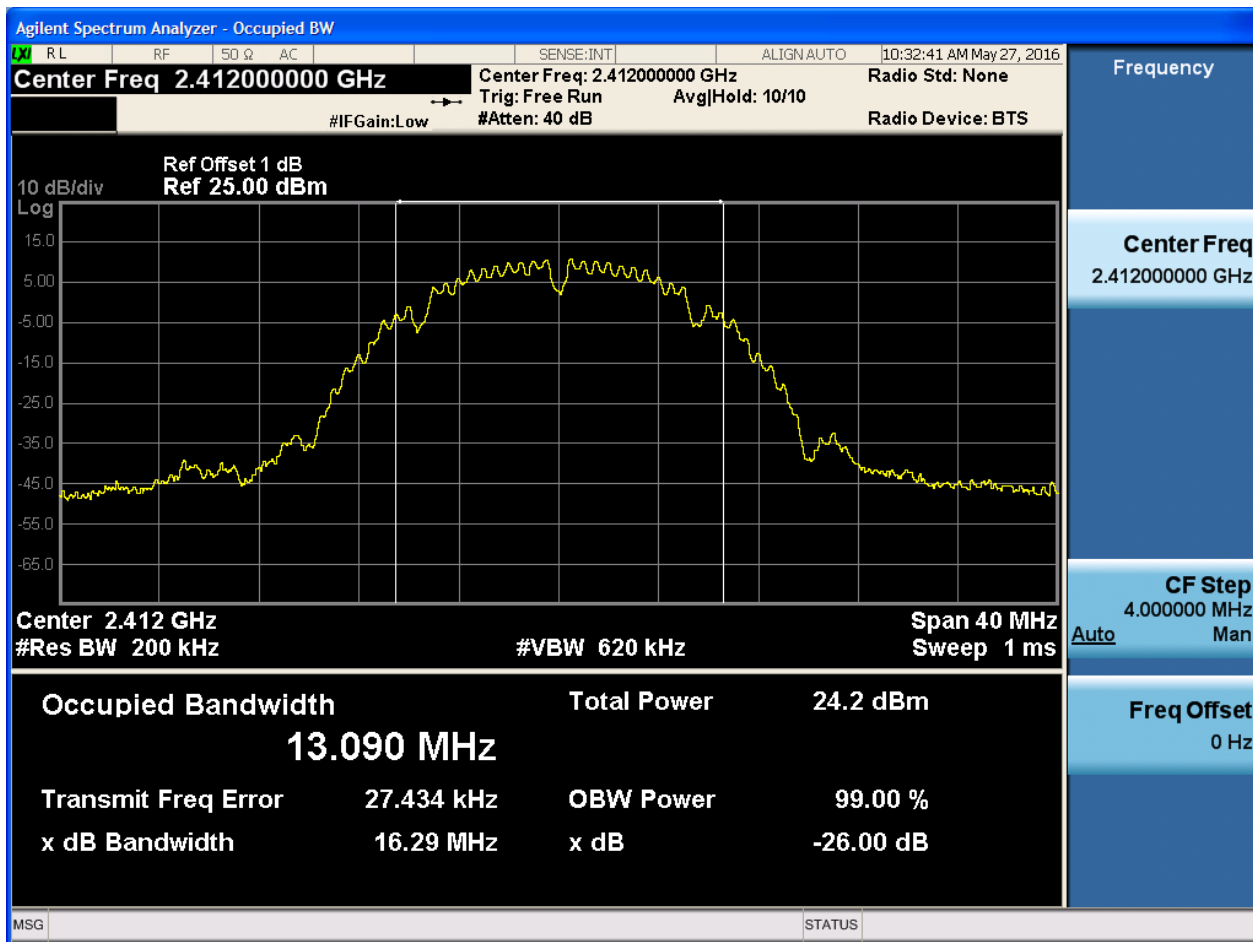
Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	Occupied Bandwidth [MHz]	Verdict
11B	L	2412	Ant 1	13.09	pass
11B	M	2437	Ant 1	13.08	pass
11B	H	2462	Ant 1	13.13	pass
11G	L	2412	Ant 1	16.73	pass
11G	M	2437	Ant 1	16.77	pass
11G	H	2462	Ant 1	16.77	pass
11N20	L	2412	Ant 1	17.82	pass
11N20	M	2437	Ant 1	17.82	pass
11N20	H	2462	Ant 1	17.85	pass



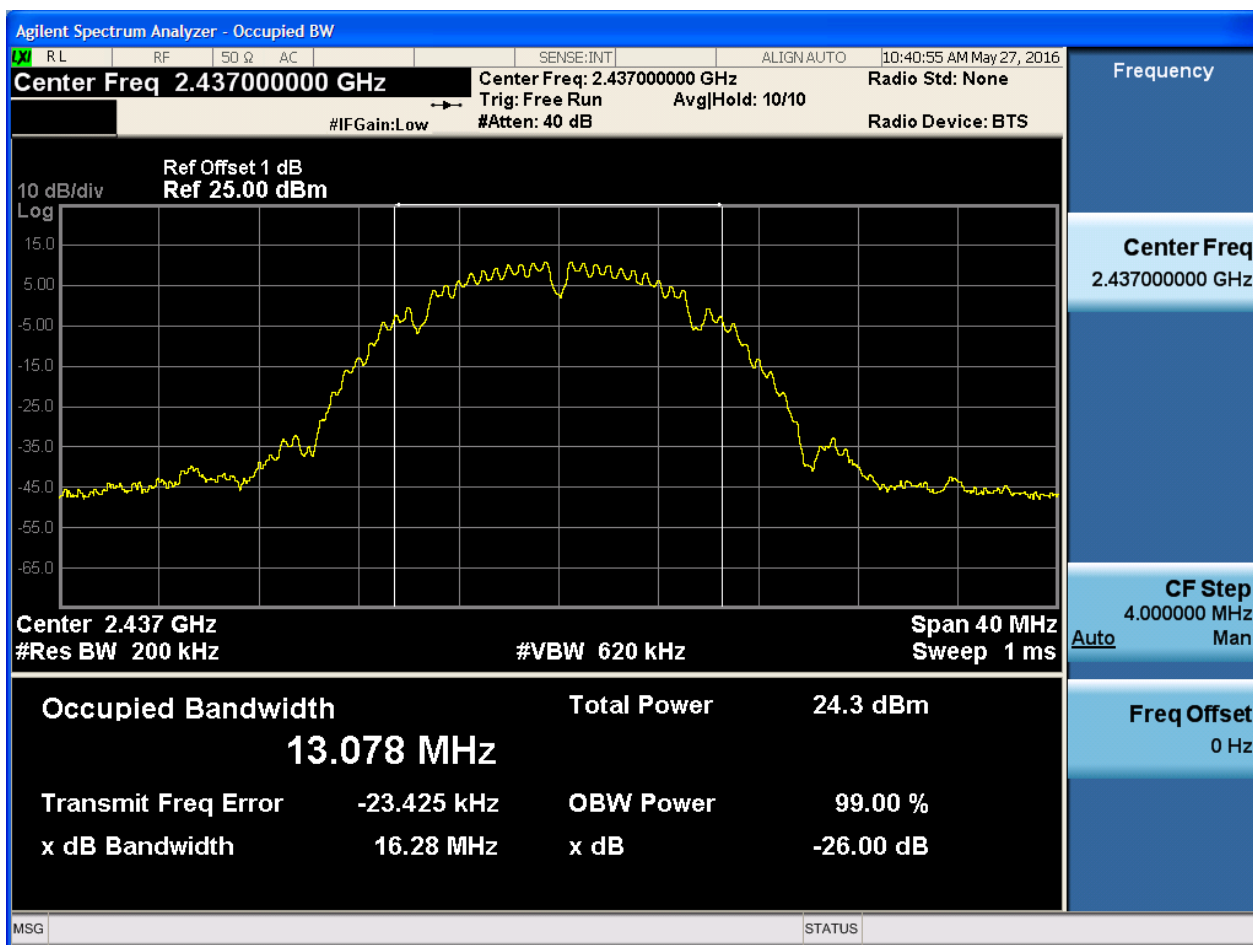
Part II - Test Plots

2.1 11B_L@Ant 1



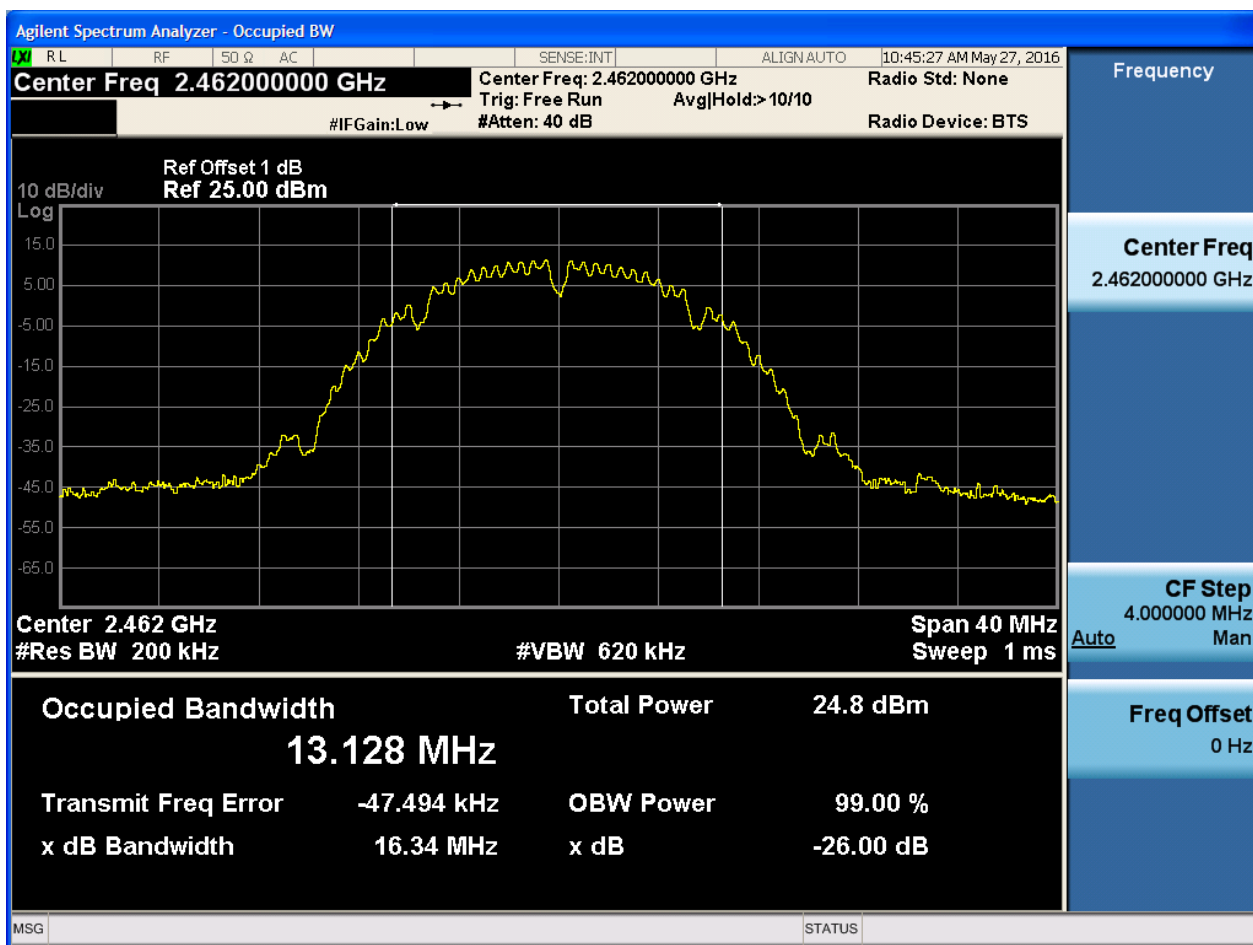


2.3 11B_M@Ant 1



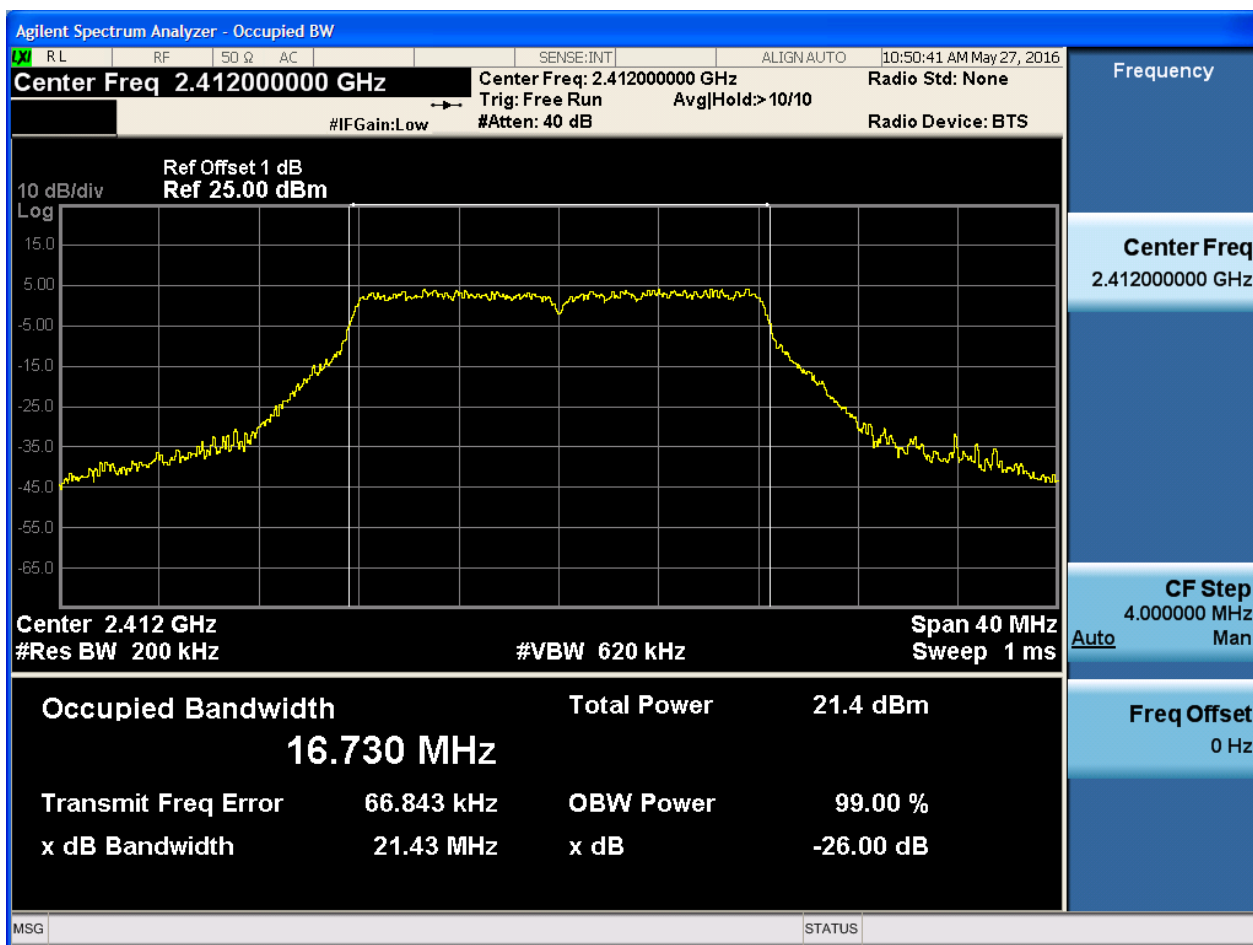


2.5 11B_H@Ant 1



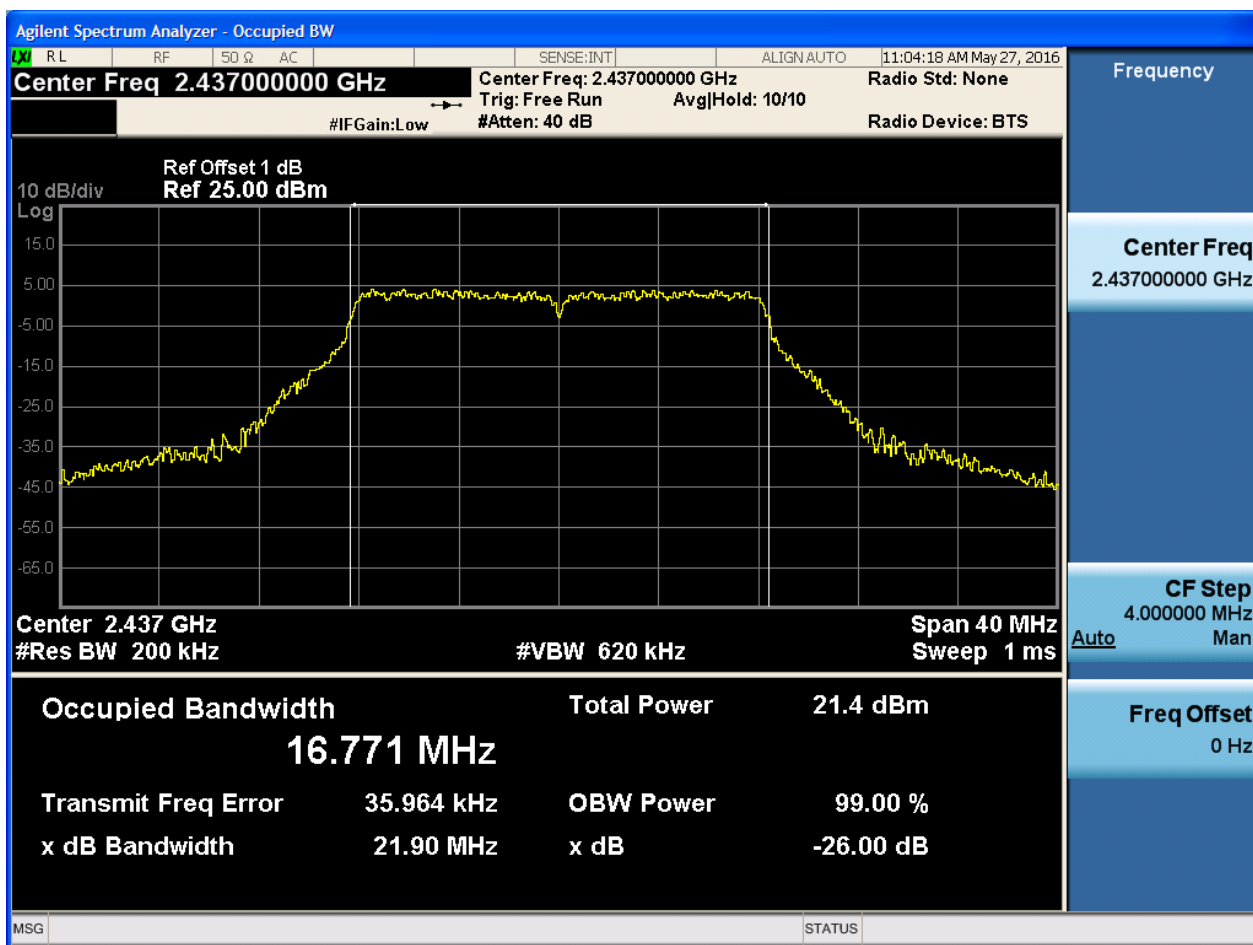


2.7 11G_L@Ant 1



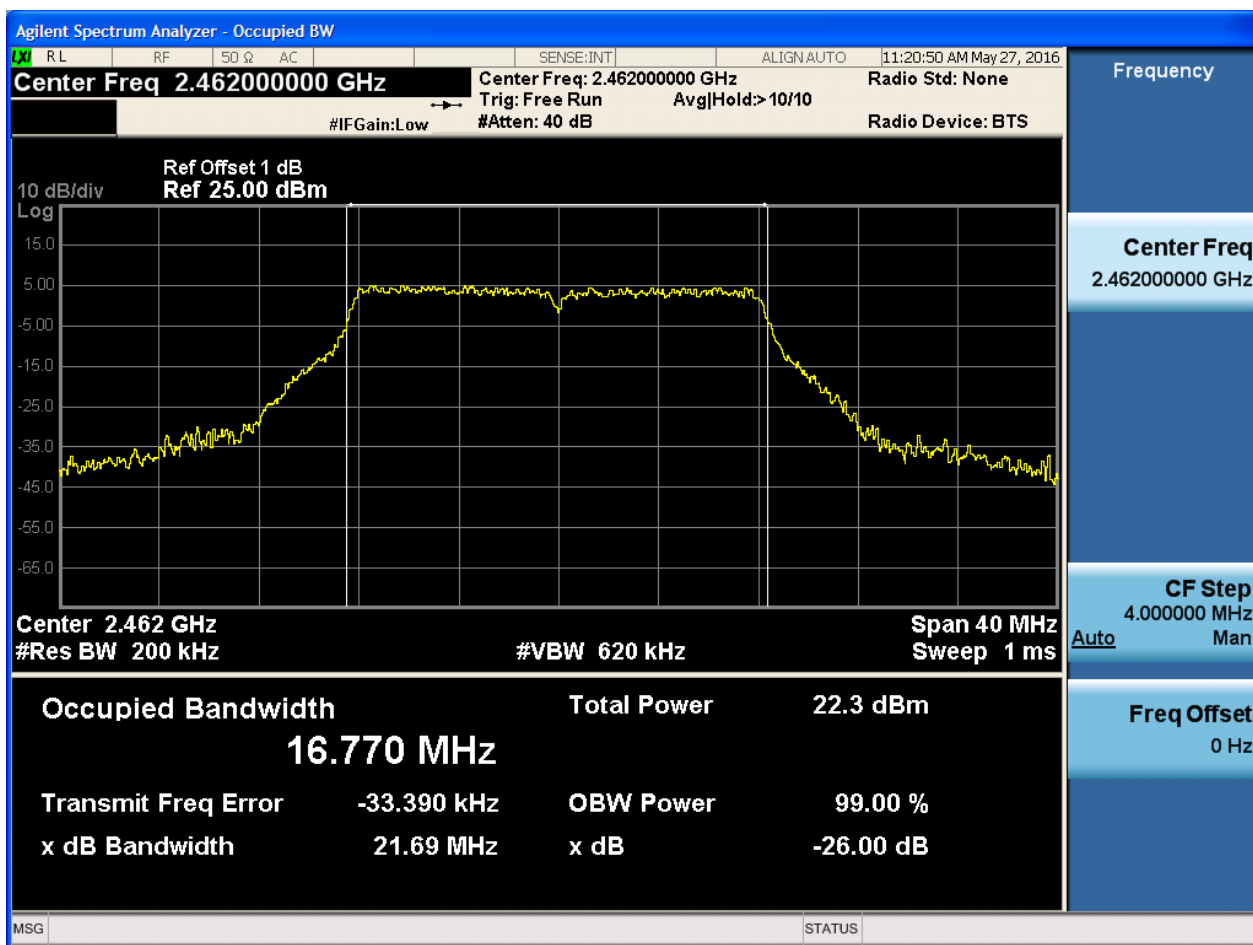


2.9 11G_M@Ant 1



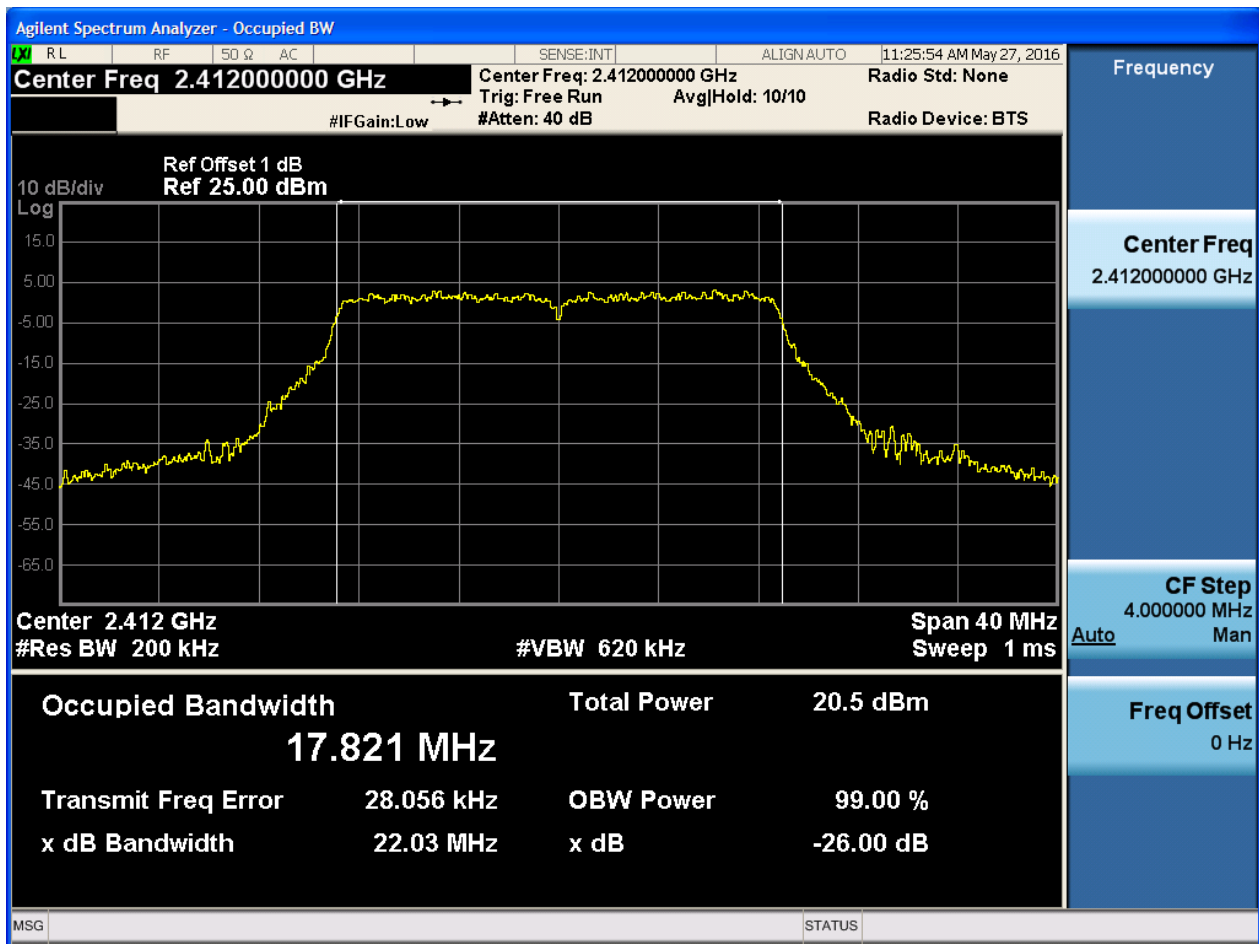


2.11 11G_H@Ant 1



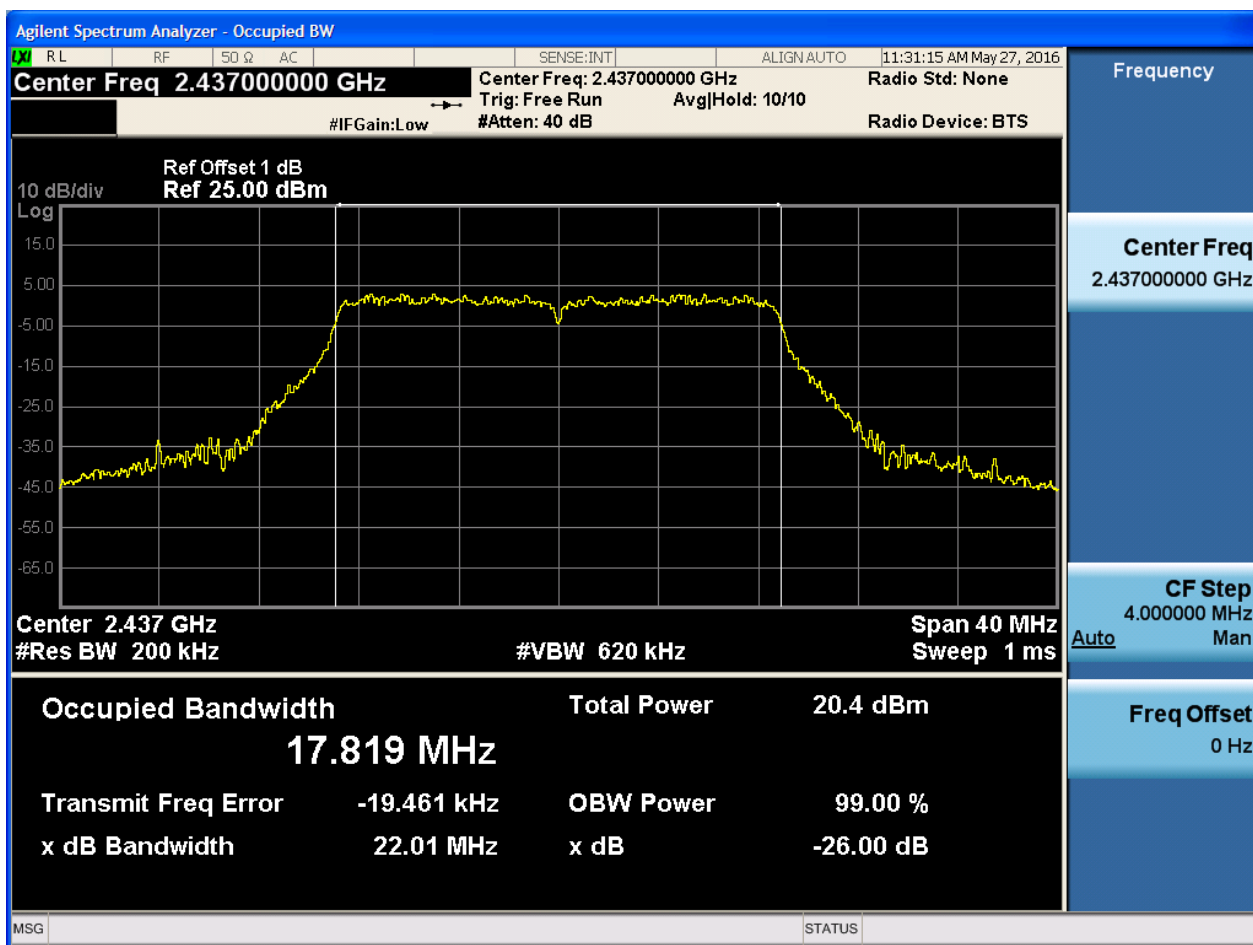


2.13 11N20_L@Ant 1



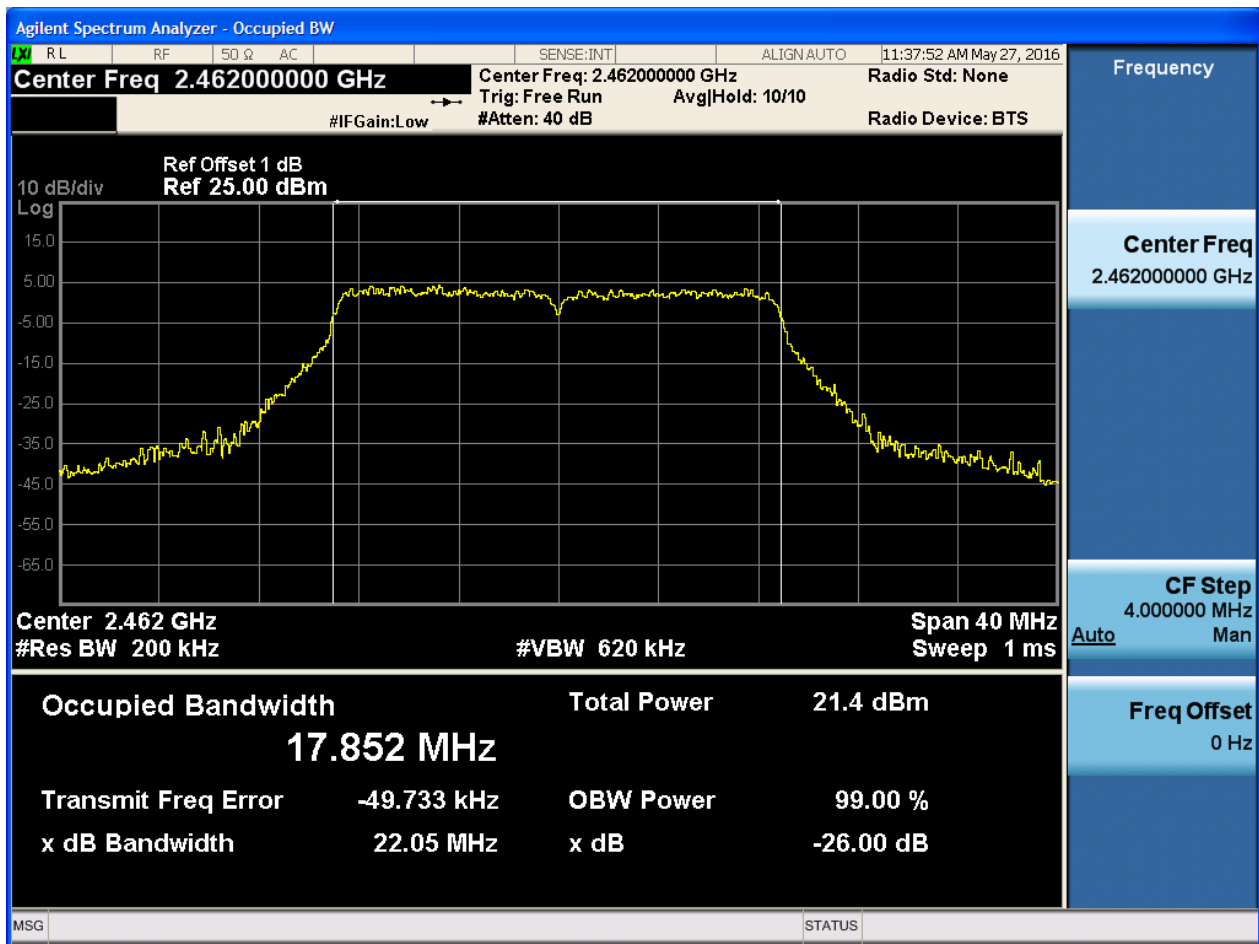


2.15 11N20_M@Ant 1





2.17 11N20_H@Ant 1



Appendix C: Duty Cycle

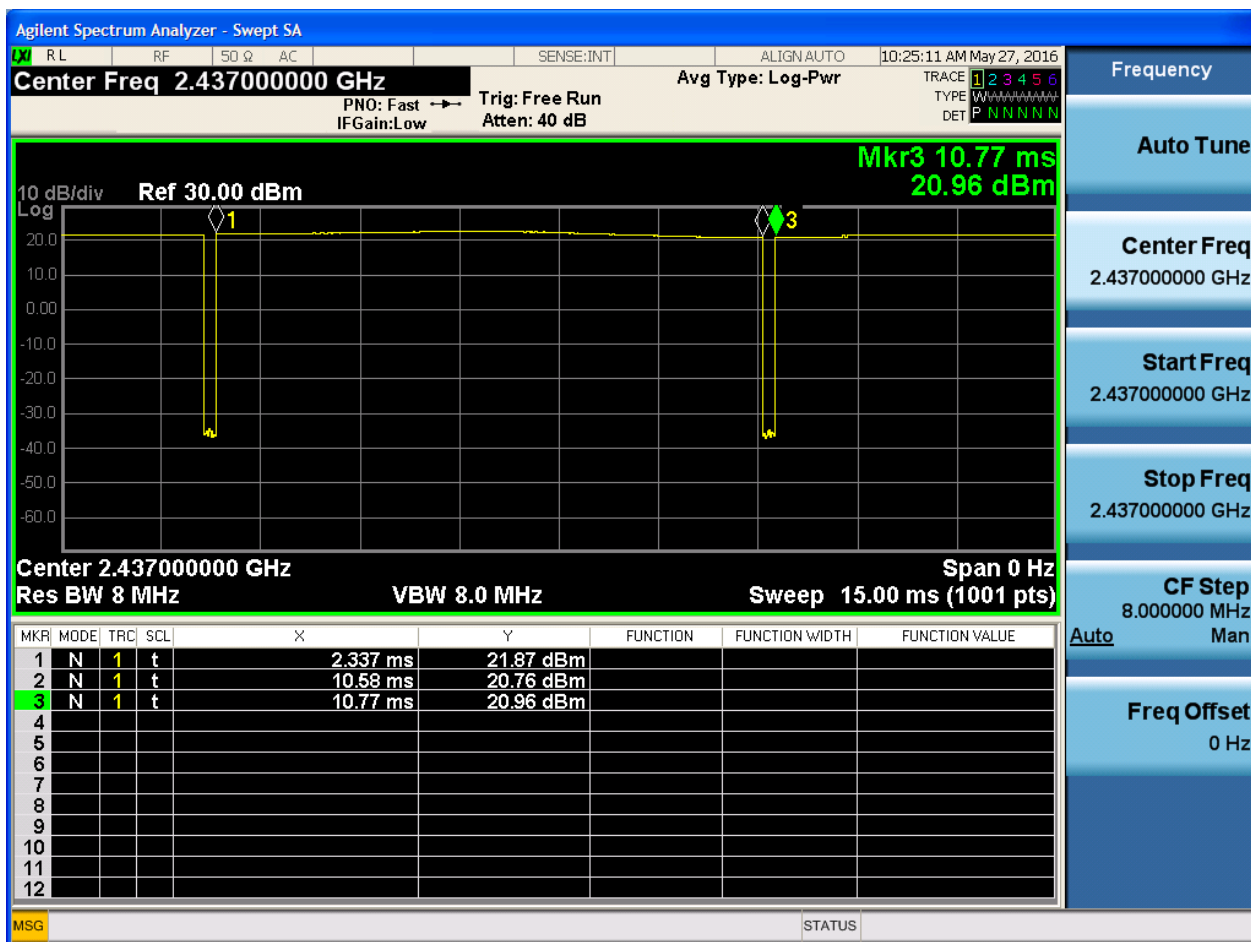
Part I - Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11B	Ant 1: CH1,CH6,CH11	98
11G	Ant 1: CH1,CH6,CH11	87
11N	Ant 1: CH1,CH6,CH11	87



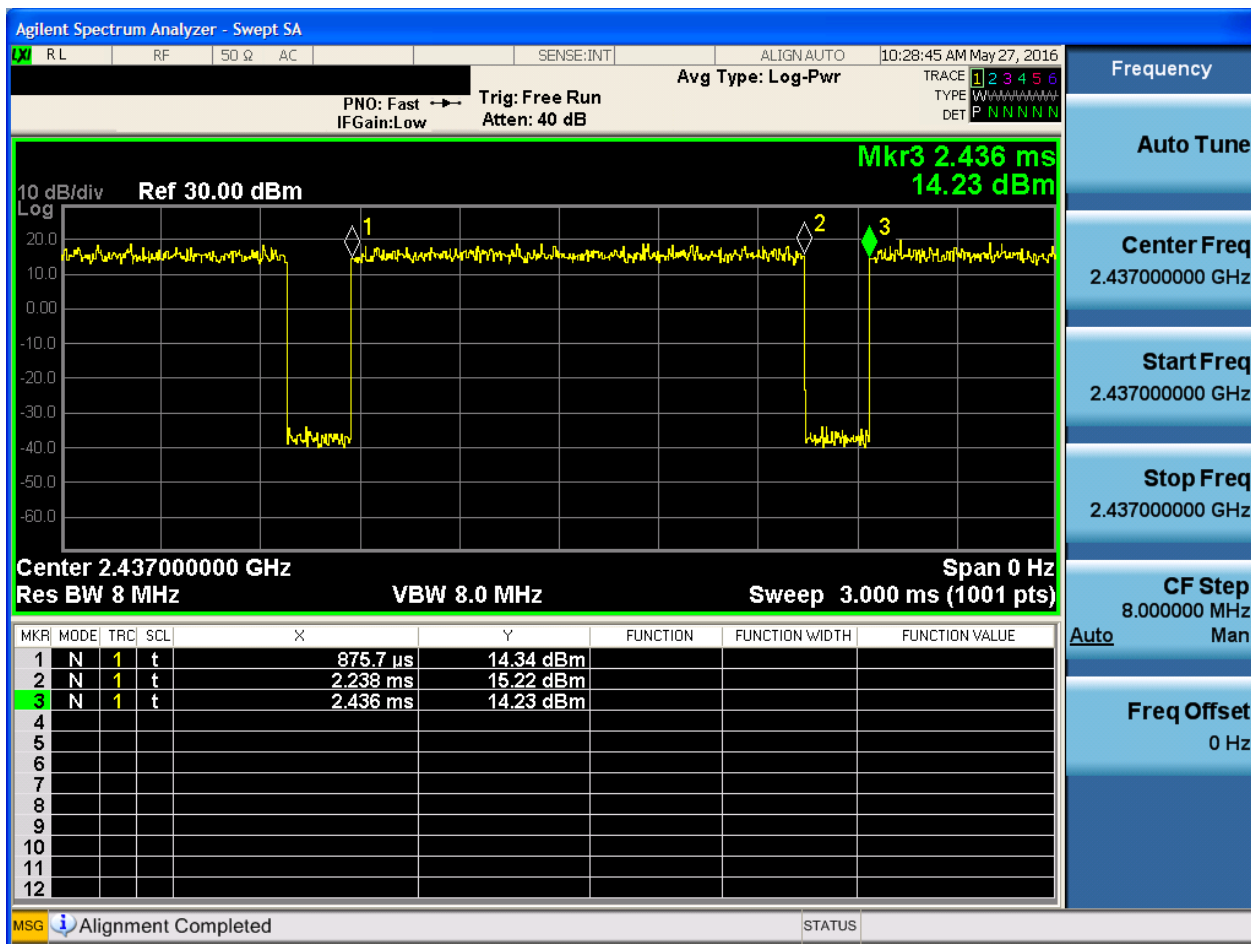
Part II - Test Plots

2.1 11B @Ant 1



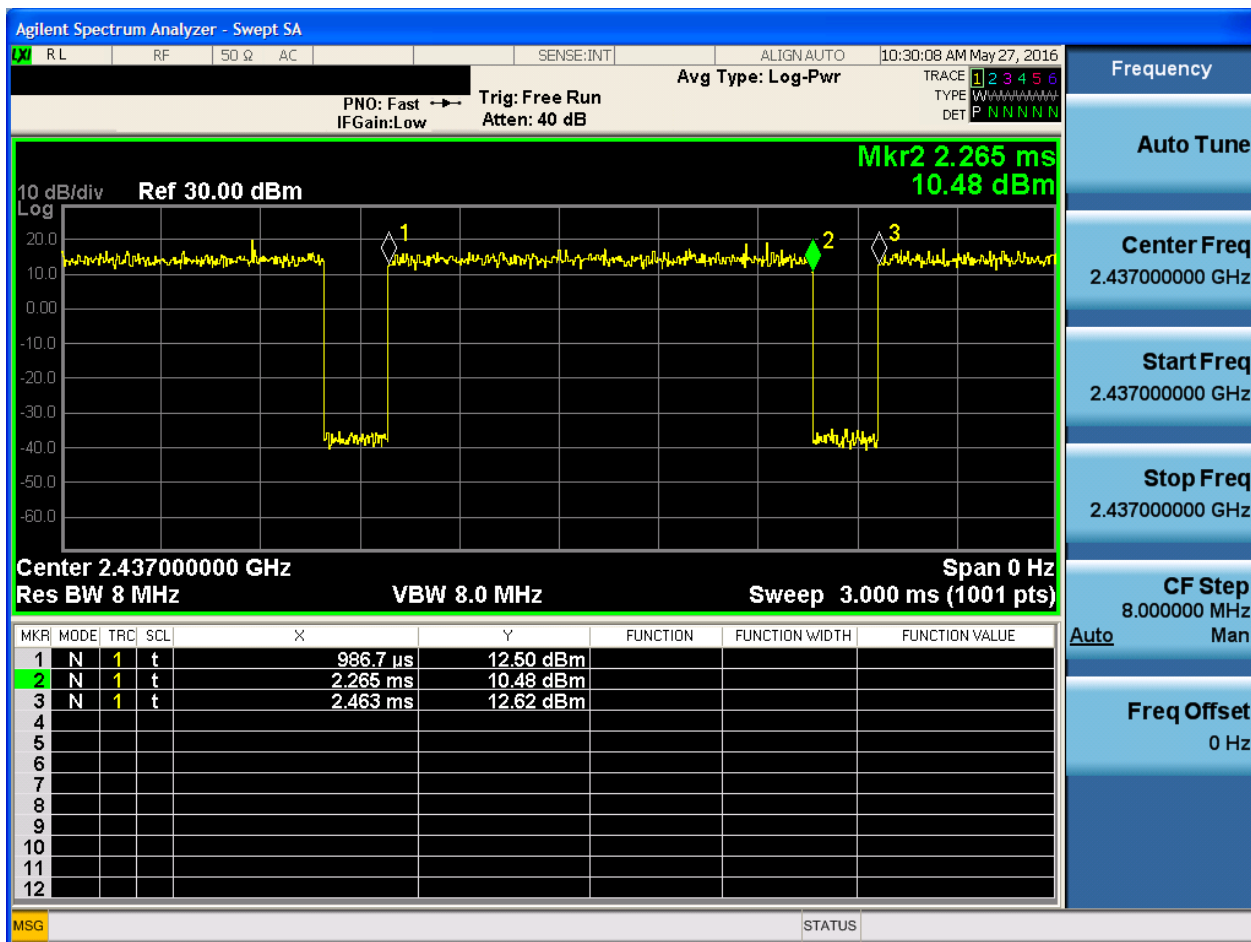


2.2 11G @Ant 1





2.3 11N @Ant 1



Appendix D: Maximum Conducted Average Output Power

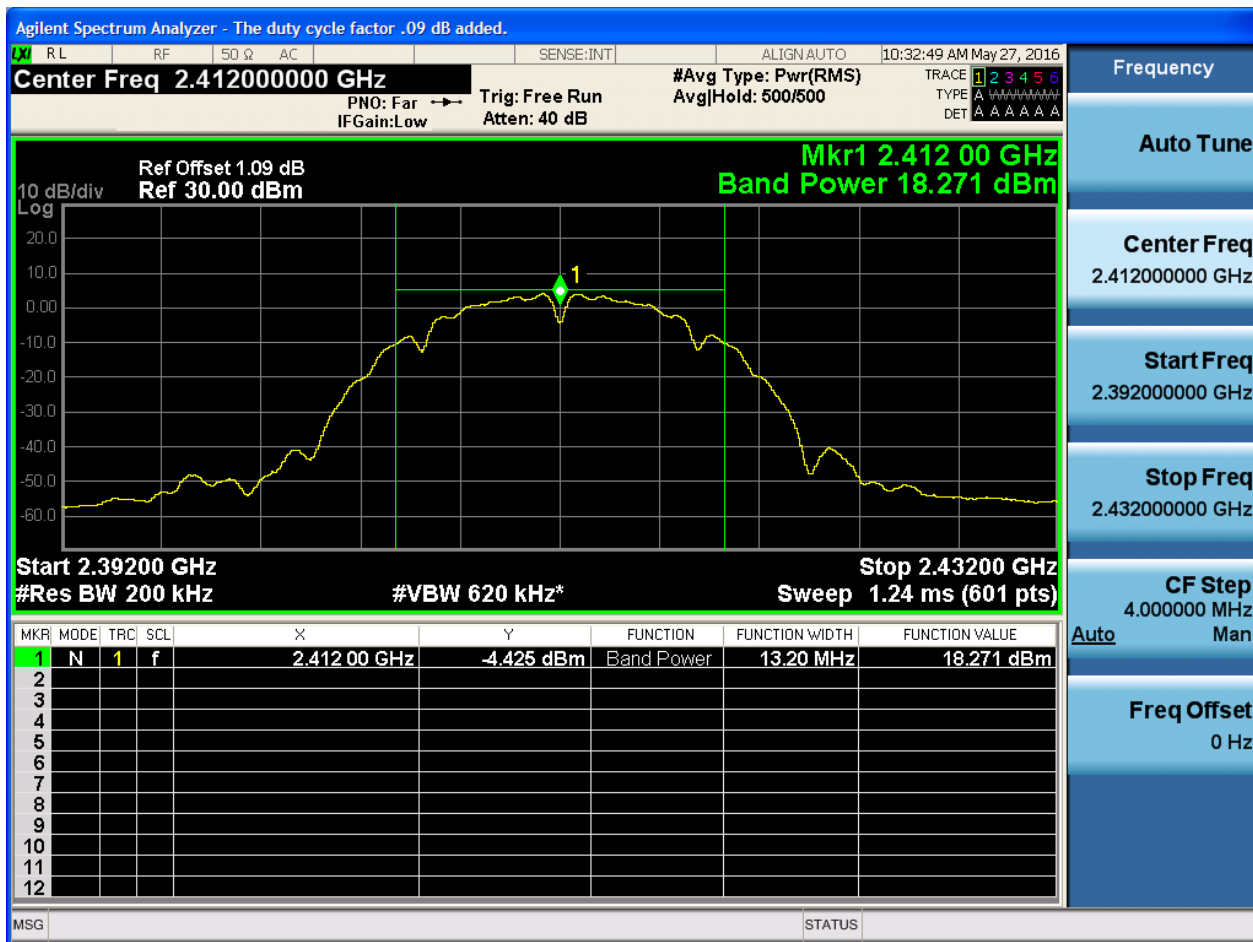
Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	Power[dBm]	Verdict
11B	L	2412	Ant 1	18.27	pass
11B	M	2437	Ant 1	18.32	pass
11B	H	2462	Ant 1	18.81	pass
11G	L	2412	Ant 1	14.28	pass
11G	M	2437	Ant 1	14.20	pass
11G	H	2462	Ant 1	15.21	pass
11N20	L	2412	Ant 1	13.20	pass
11N20	M	2437	Ant 1	13.12	pass
11N20	H	2462	Ant 1	14.21	pass



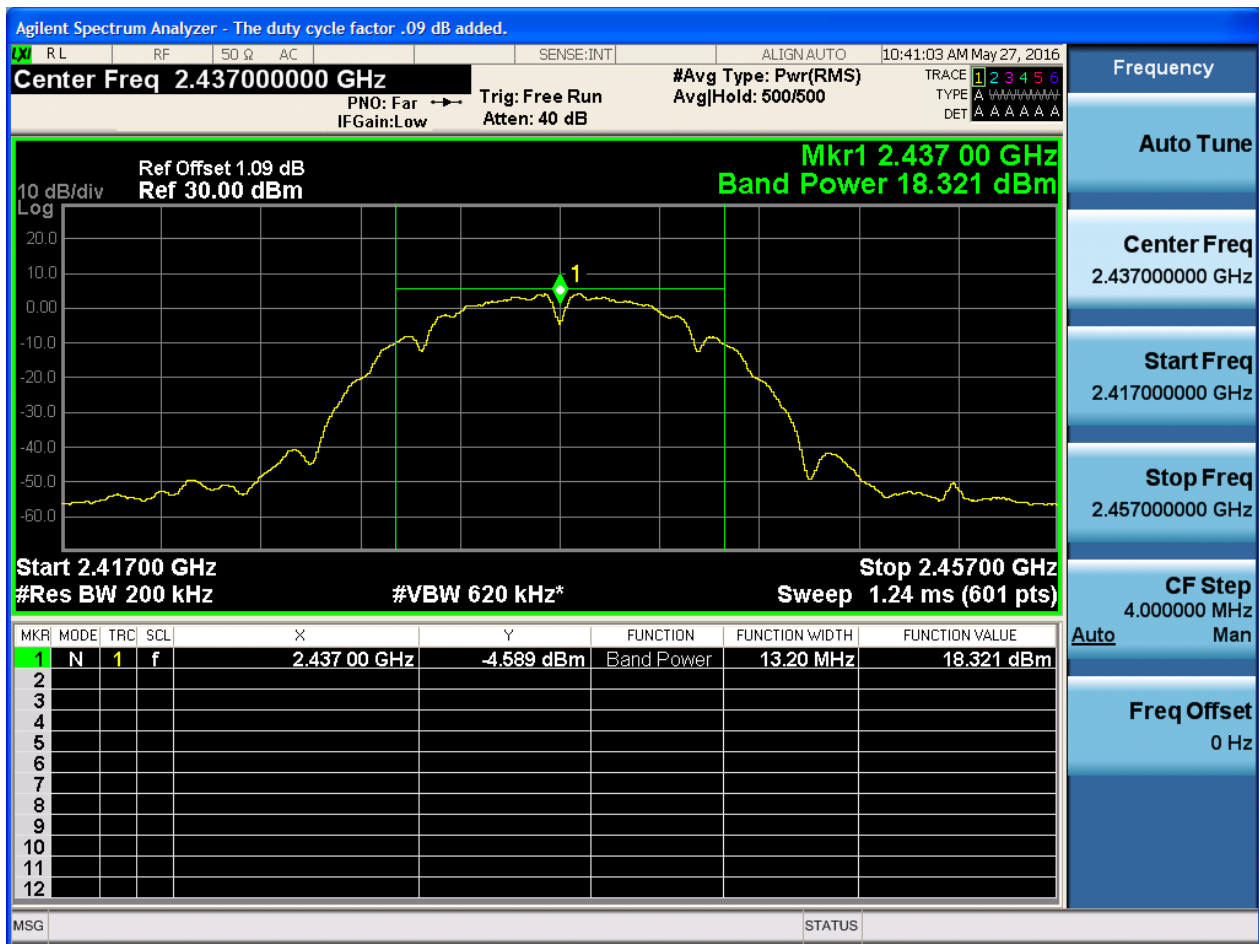
Part II - Test Plots

2.1 11B_L@Ant 1



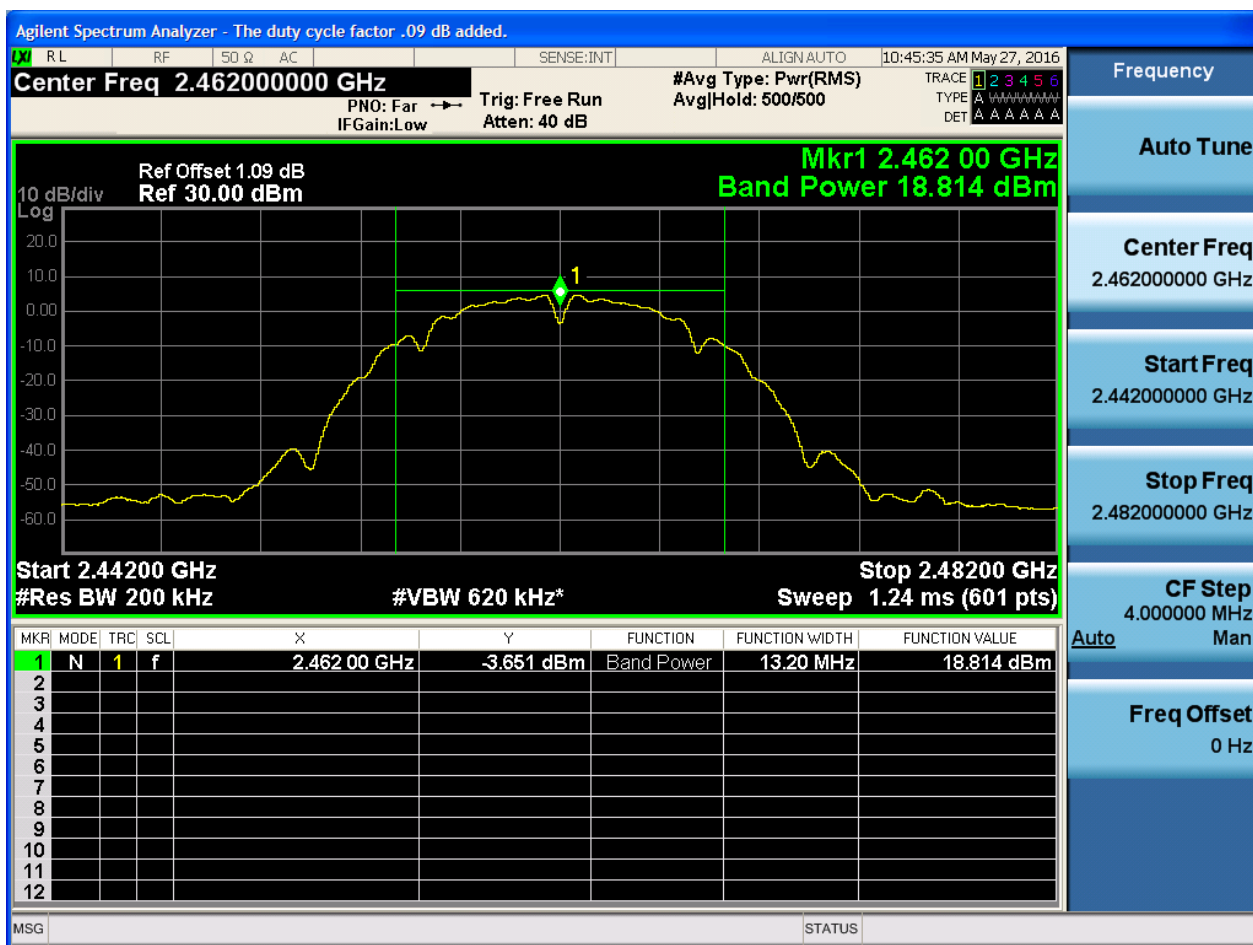


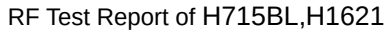
2.3 11B_M@Ant 1





2.5 11B_H@Ant 1





Agilent Spectrum Analyzer - The duty cycle factor .6 dB added.

RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 10:50:49 AM May 27, 2016

Center Freq 2.41200000 GHz #Avg Type: Pwr(RMS) AvgHold: 500/500

PNO: Far Trig: Free Run
IFGain: Low Atten: 40 dB

TRACE 1 2 3 4 5 6
TYPE A W W W W W W W W
DET A A A A A A

Ref Offset 1.6 dB
Ref 30.00 dBm

**Mkr1 2.412 00 GHz
Band Power 14.278 dBm**

10 dB/div
Log

Start 2.39200 GHz Stop 2.43200 GHz
#Res BW 200 kHz #VBW 620 kHz* Sweep 1.24 ms (601 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.412 00 GHz	-11.125 dBm	Band Power	16.80 MHz	14.278 dBm
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

MSG STATUS

Frequency

Auto Tune

Center Freq
2.41200000 GHz

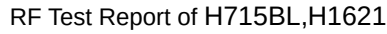
Start Freq
2.392000000 GHz

Stop Freq
2.432000000 GHz

CF Step
4.000000 MHz
Man

Freq Offset
0 Hz

Auto



Agilent Spectrum Analyzer - The duty cycle factor .6 dB added.

☒ RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 11:04:26 AM May 27, 2016

Center Freq 2.43700000 GHz #Avg Type: Pwr(RMS) TRACE 1 2 3 4 5 6
 PNO: Far → Trig: Free Run AvgHold: 500/500 TYPE A A A A A A
 IFGain:Low Atten: 40 dB DET A A A A A A

Ref Offset 1.6 dB Mkr1 2.437 00 GHz
 Ref 30.00 dBm Band Power 14.199 dBm

Start 2.4170 GHz **Stop 2.4570 GHz**
 #Res BW 200 kHz #VBW 620 kHz* Sweep 1.24 ms (601 pts)

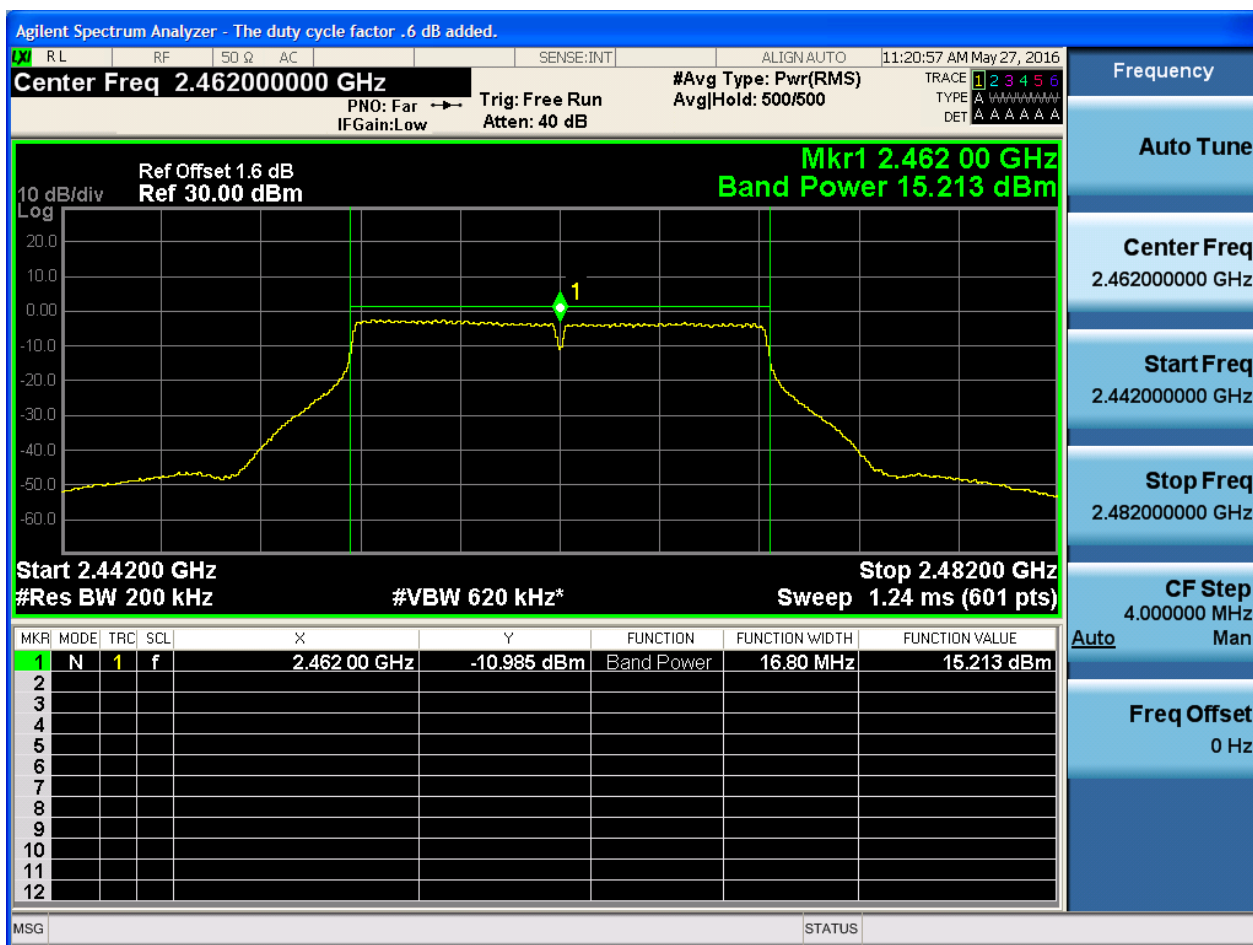
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.437 00 GHz	-11.882 dBm	Band Power	16.80 MHz	14.199 dBm
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

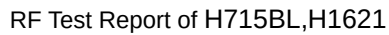
MSG STATUS

Frequency
 Auto Tune
 Center Freq 2.43700000 GHz
 Start Freq 2.41700000 GHz
 Stop Freq 2.45700000 GHz
 CF Step 4.000000 MHz Man
 Freq Offset 0 Hz



2.11 11G_H@Ant 1





Agilent Spectrum Analyzer - The duty cycle factor .6 dB added.

Center Freq 2.41200000 GHz #Avg Type: Pwr(RMS) AvgHold: 500/500

Ref Offset 1.6 dB Ref 30.00 dBm

Mkr1 2.412 00 GHz Band Power 13.197 dBm

Start 2.39200 GHz #Res BW 200 kHz #VBW 620 kHz* Stop 2.43200 GHz Sweep 1.24 ms (601 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.412 00 GHz	-13.395 dBm	Band Power	17.87 MHz	13.197 dBm
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

Frequency

Auto Tune

Center Freq 2.41200000 GHz

Start Freq 2.392000000 GHz

Stop Freq 2.432000000 GHz

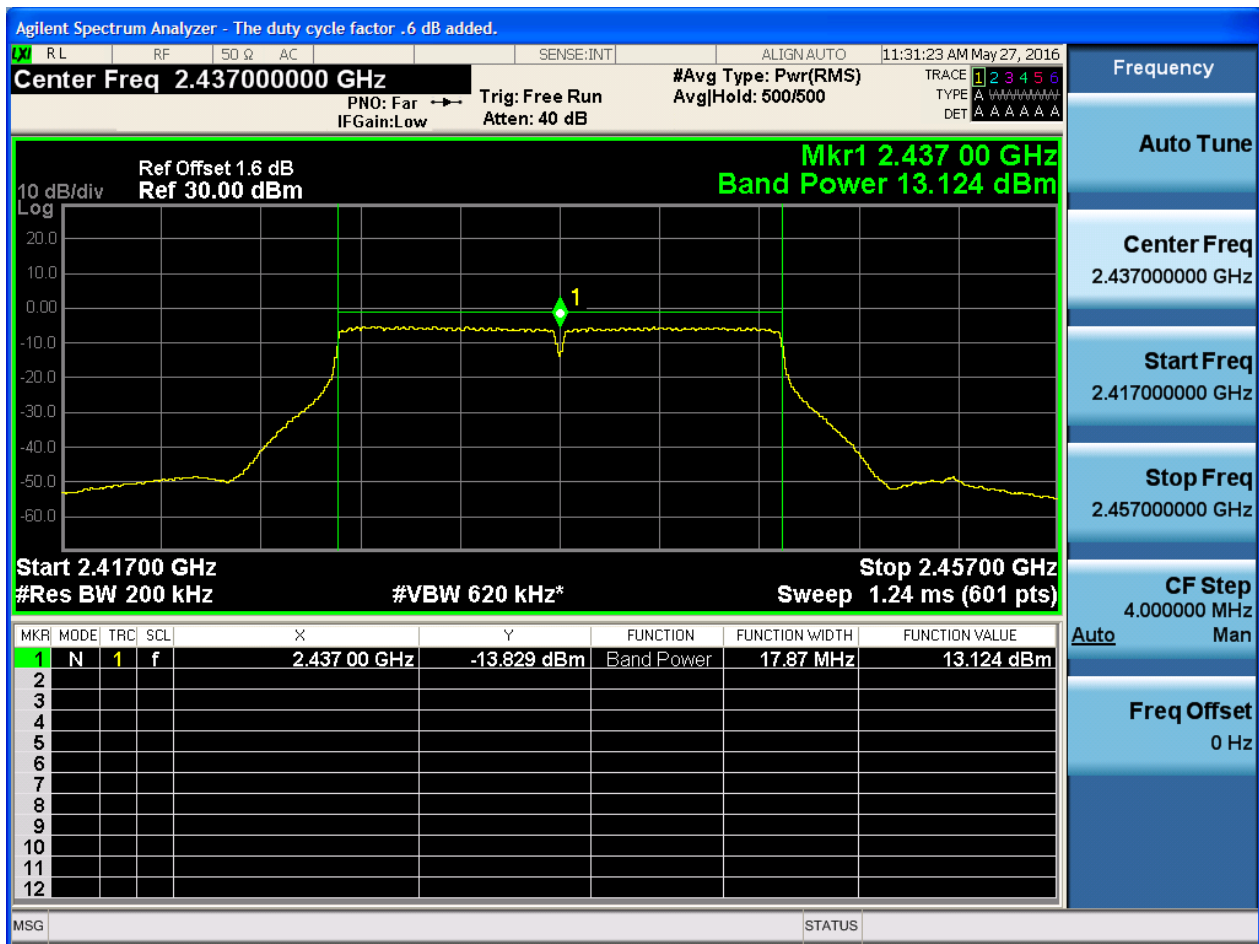
CF Step 4.000000 MHz Man

Freq Offset 0 Hz

MSG STATUS

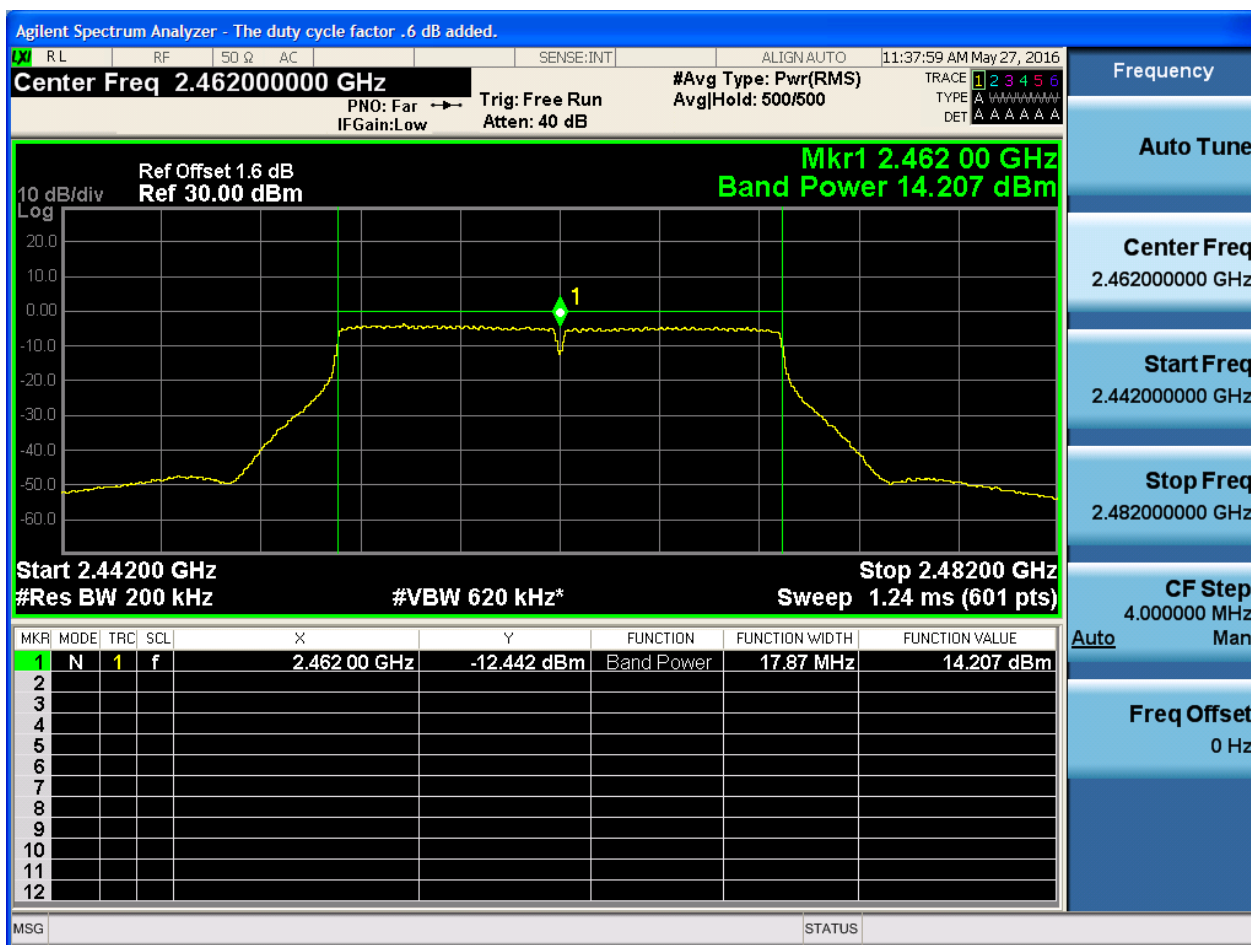


2.15 11N20_M@Ant 1





2.17 11N20_H@Ant 1



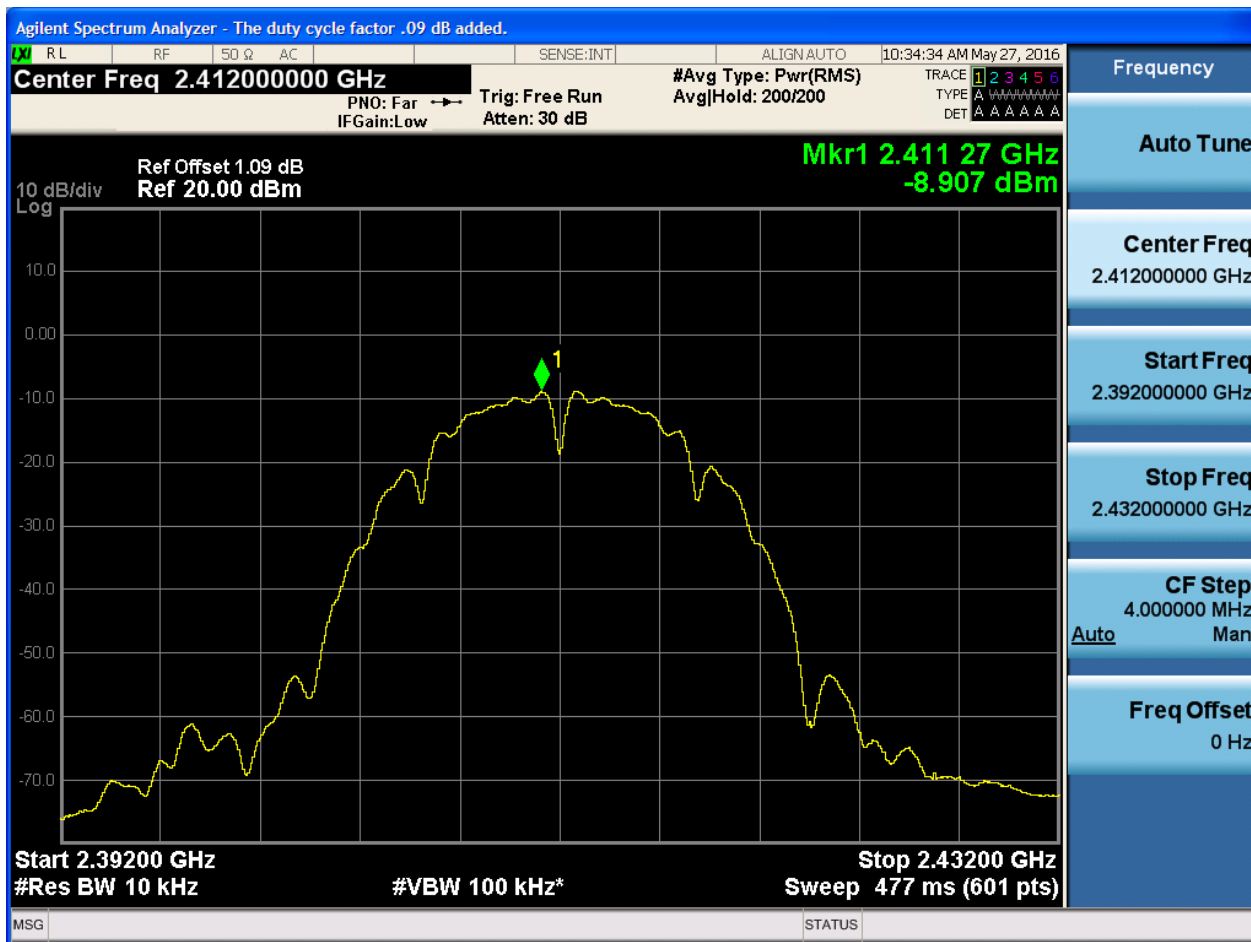
Appendix E: Maximum Power Spectral Density Level

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	PD[MHz]	Verdict
11B	L	2412	Ant 1	-8.91	pass
11B	M	2437	Ant 1	-8.66	pass
11B	H	2462	Ant 1	-8.25	pass
11G	L	2412	Ant 1	-15.72	pass
11G	M	2437	Ant 1	-15.65	pass
11G	H	2462	Ant 1	-14.66	pass
11N20	L	2412	Ant 1	-16.85	pass
11N20	M	2437	Ant 1	-17.03	pass
11N20	H	2462	Ant 1	-15.85	pass

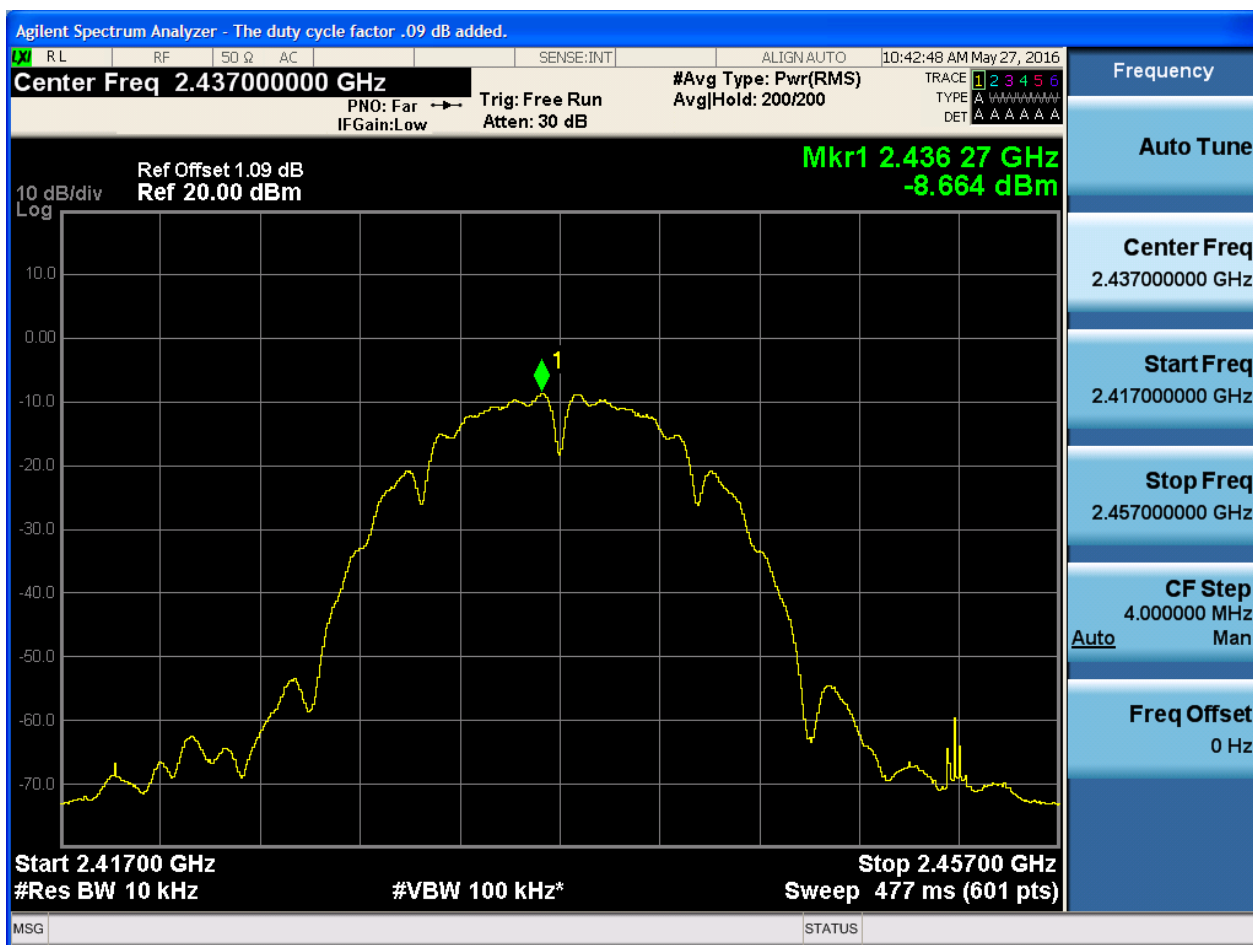
Part II - Test Plots

2.1 11B_L@Ant 1



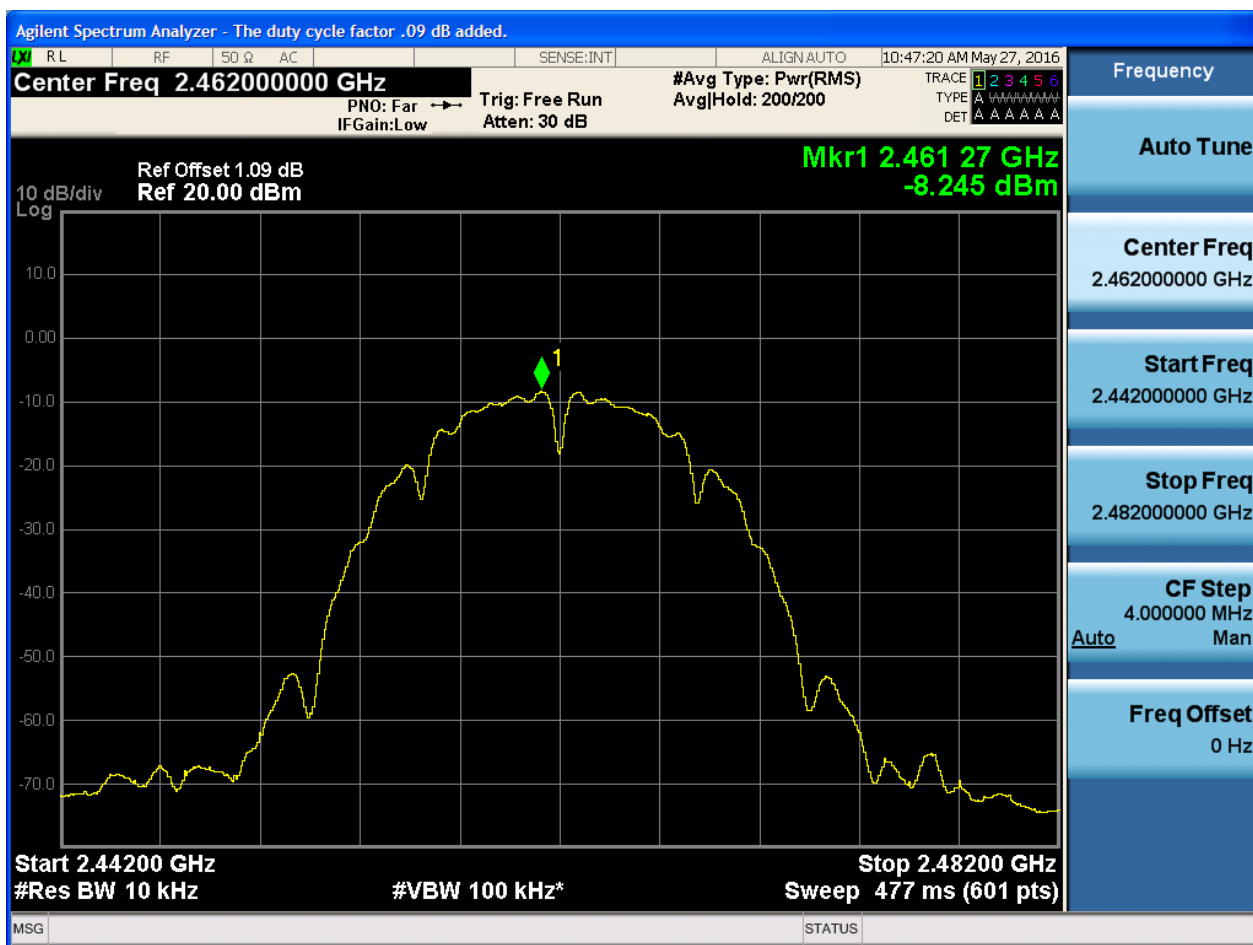


2.3 11B_M@Ant 1



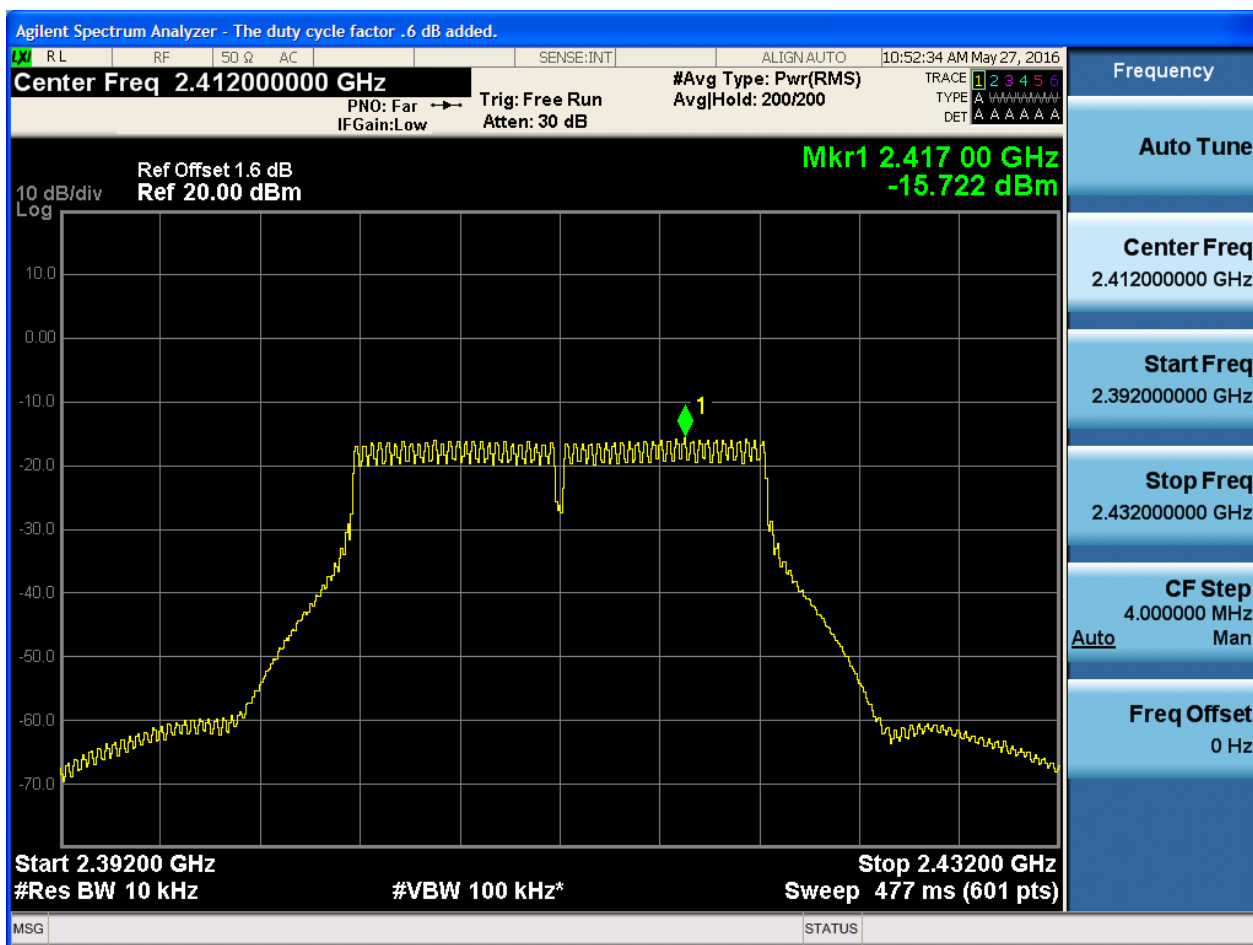


2.5 11B_H@Ant 1



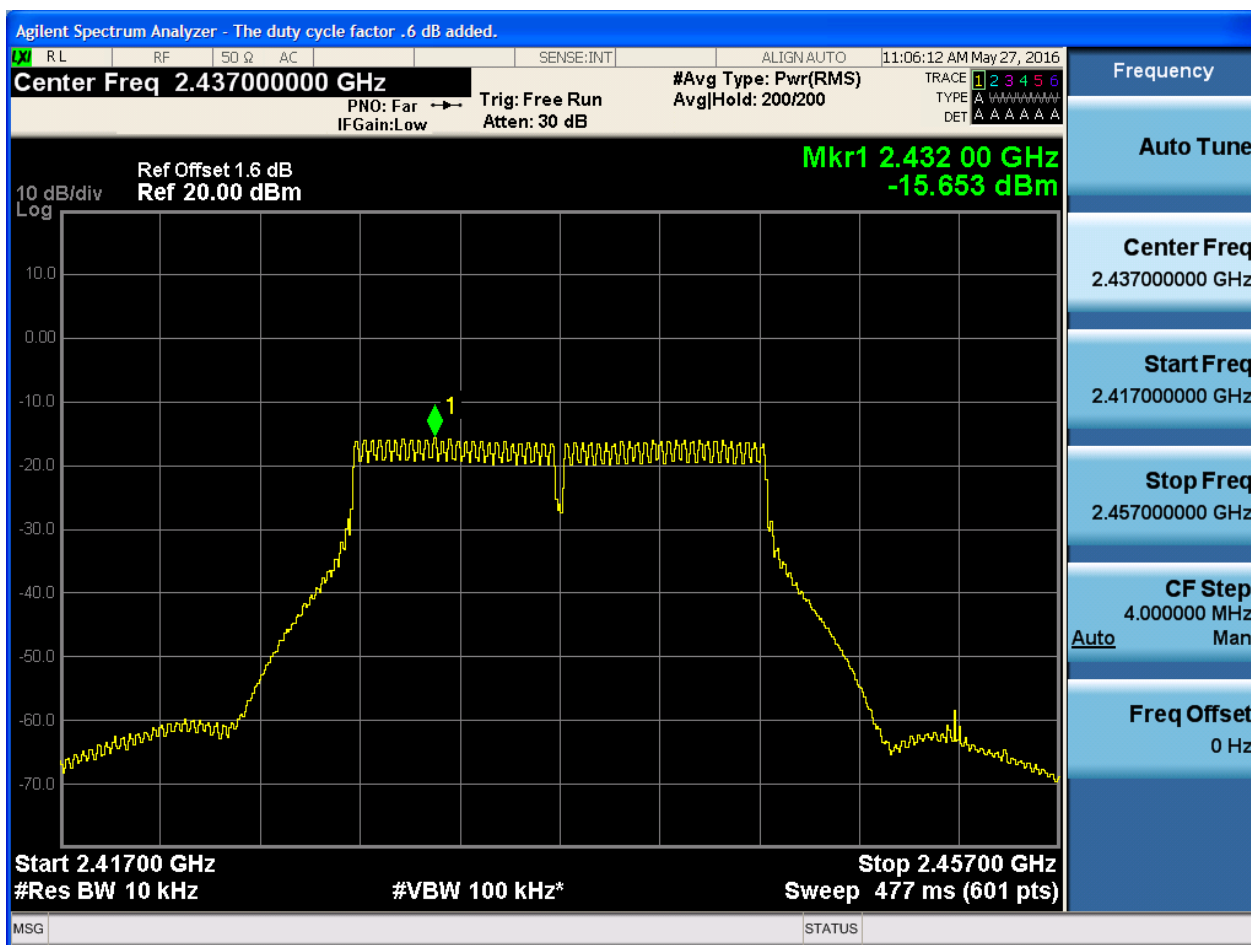


2.7 11G_L@Ant 1



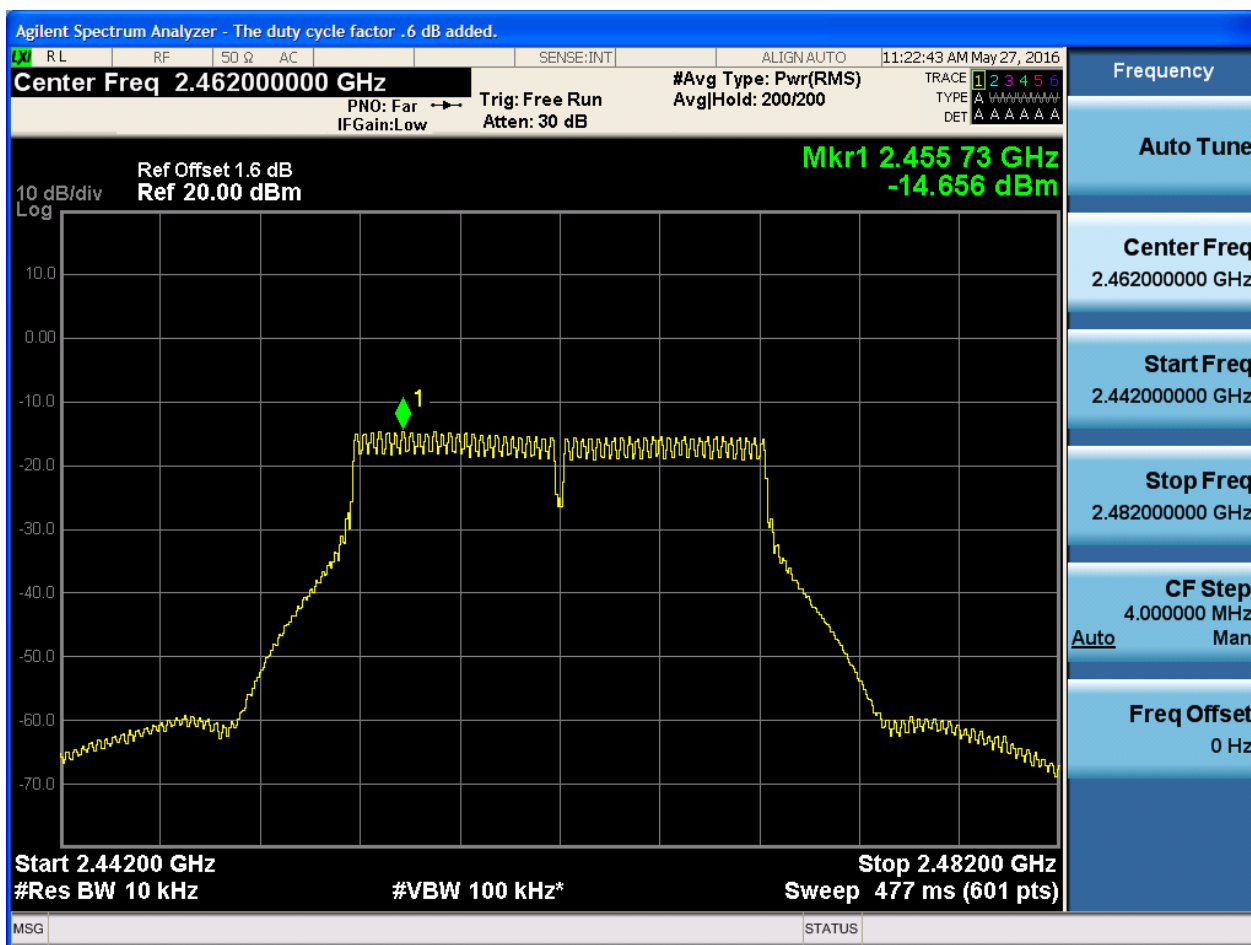


2.9 11G_M@Ant 1



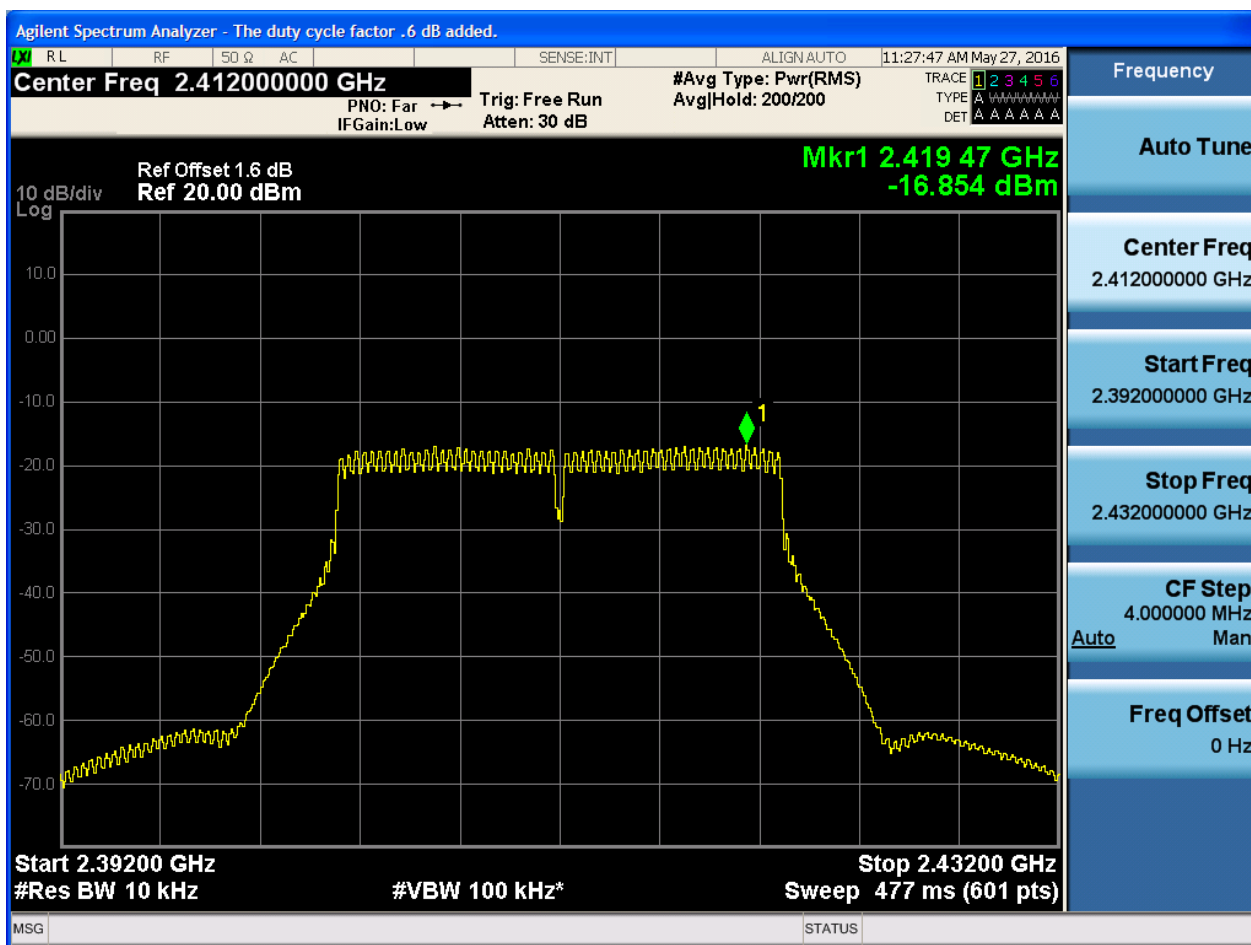


2.11 11G_H@Ant 1



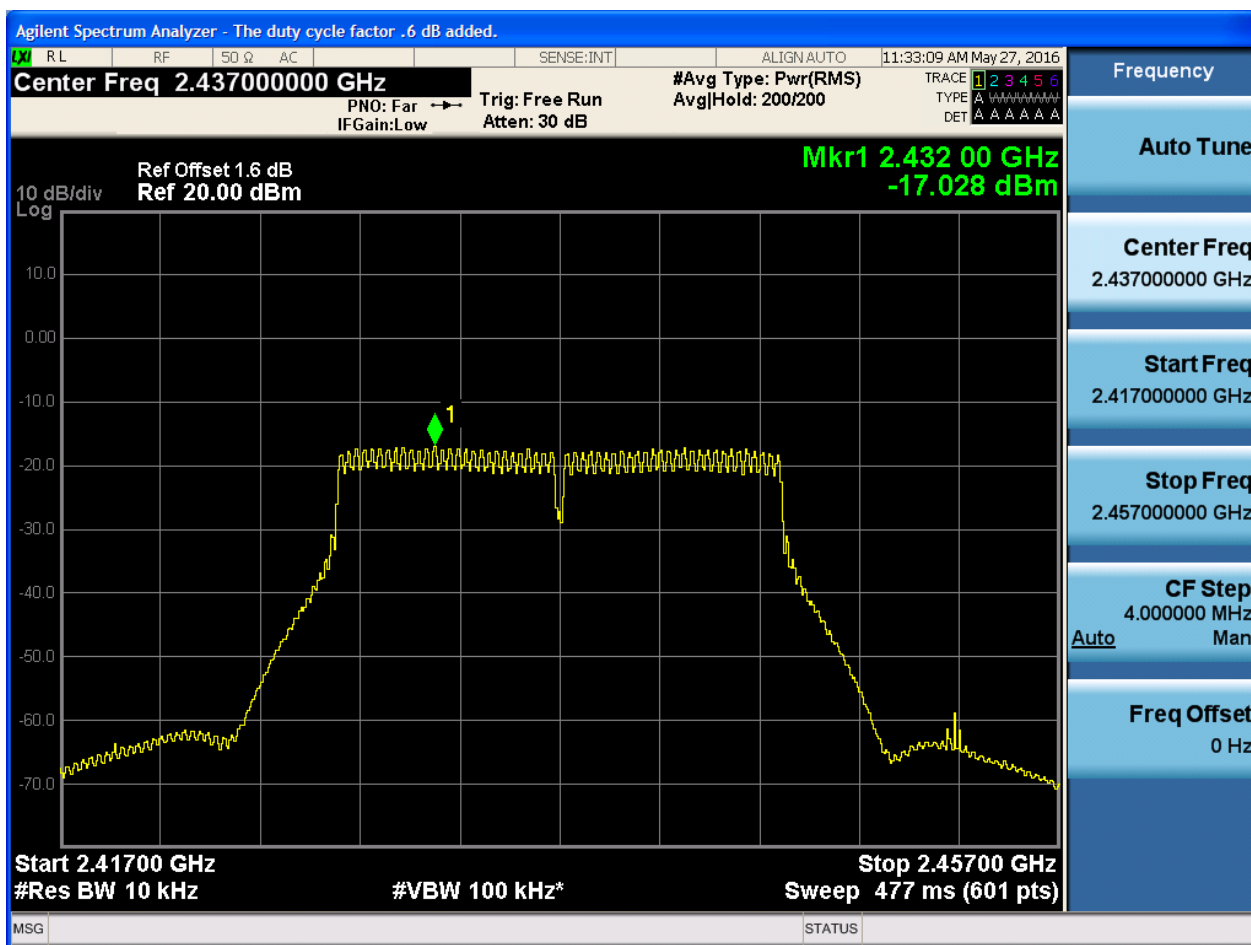


2.13 11N20_L@Ant 1



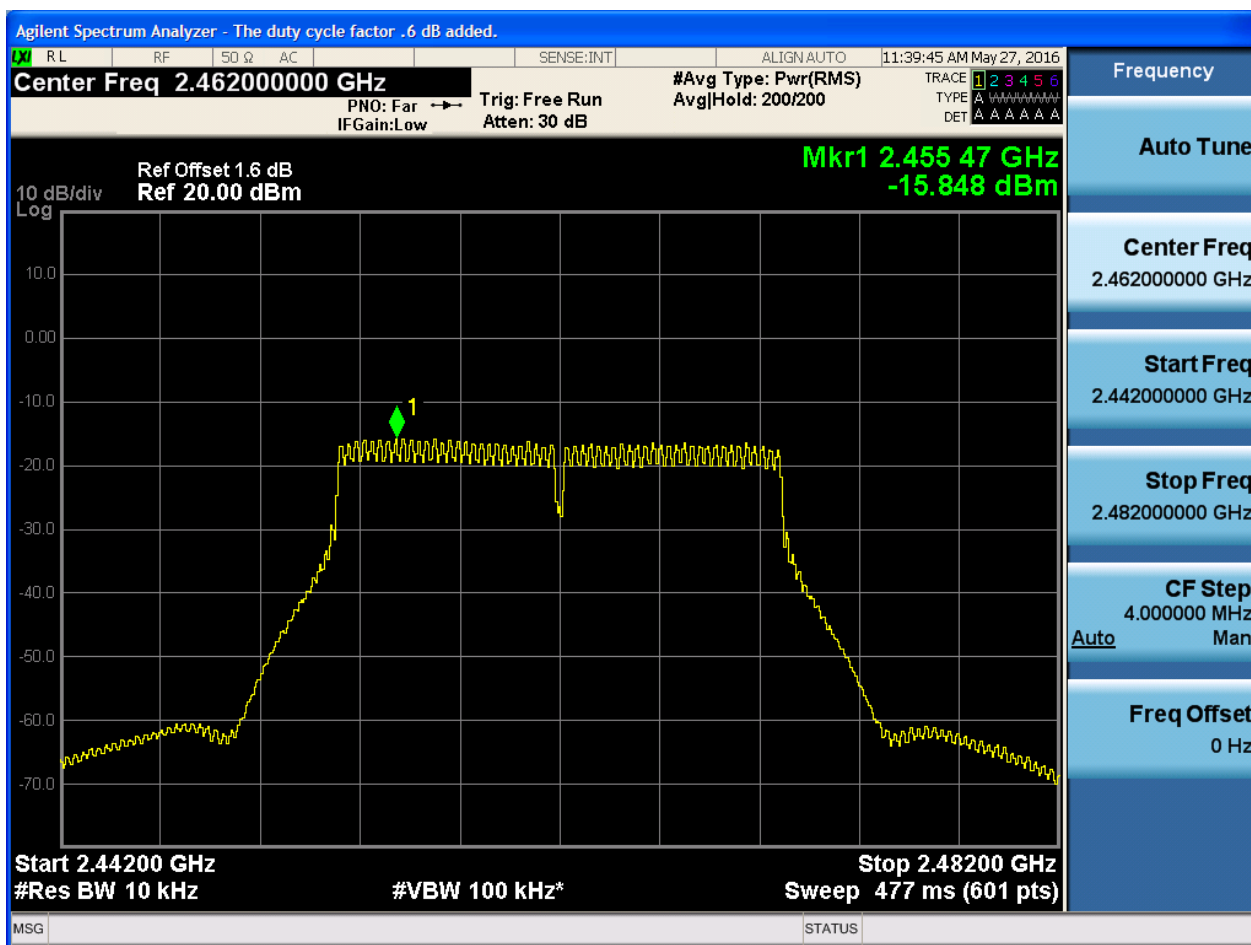


2.15 11N20_M@Ant 1





2.17 11N20_H@Ant 1



Appendix F: Band Edges Compliance

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	Carrier Power[dBm]	Max.Spurious Level[dBm]	Verdict
11B	L	2412	Ant 1	10.51	-50.96	pass
11B	H	2462	Ant 1	10.59	-49.90	pass
11G	L	2412	Ant 1	2.88	-51.73	pass
11G	H	2462	Ant 1	4.37	-47.13	pass
11N20	L	2412	Ant 1	2.00	-50.96	pass
11N20	H	2462	Ant 1	3.28	-49.28	pass



Part II - Test Plots

2.1 11B_L@Ant 1



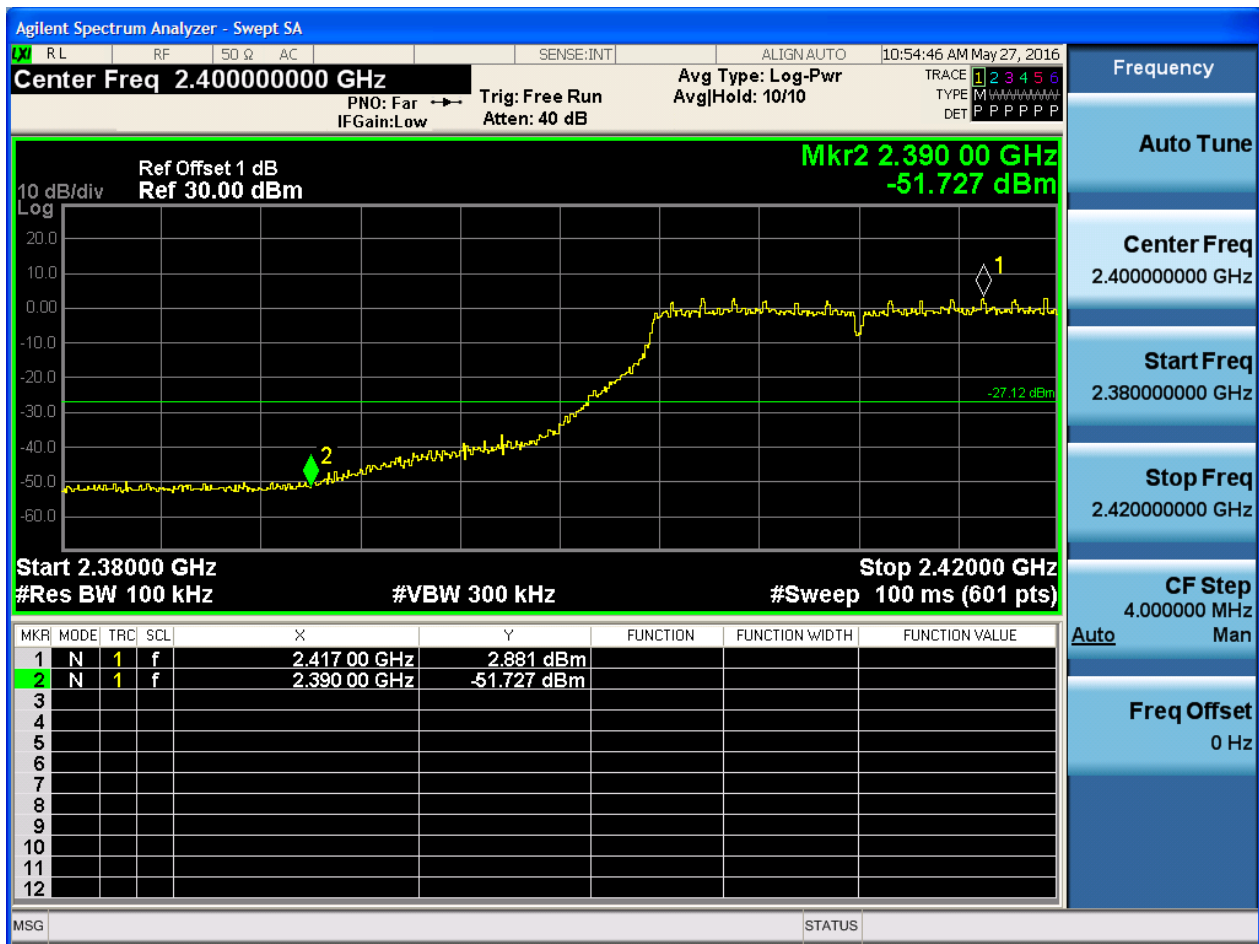


2.3 11B_H@Ant 1





2.5 11G_L@Ant 1



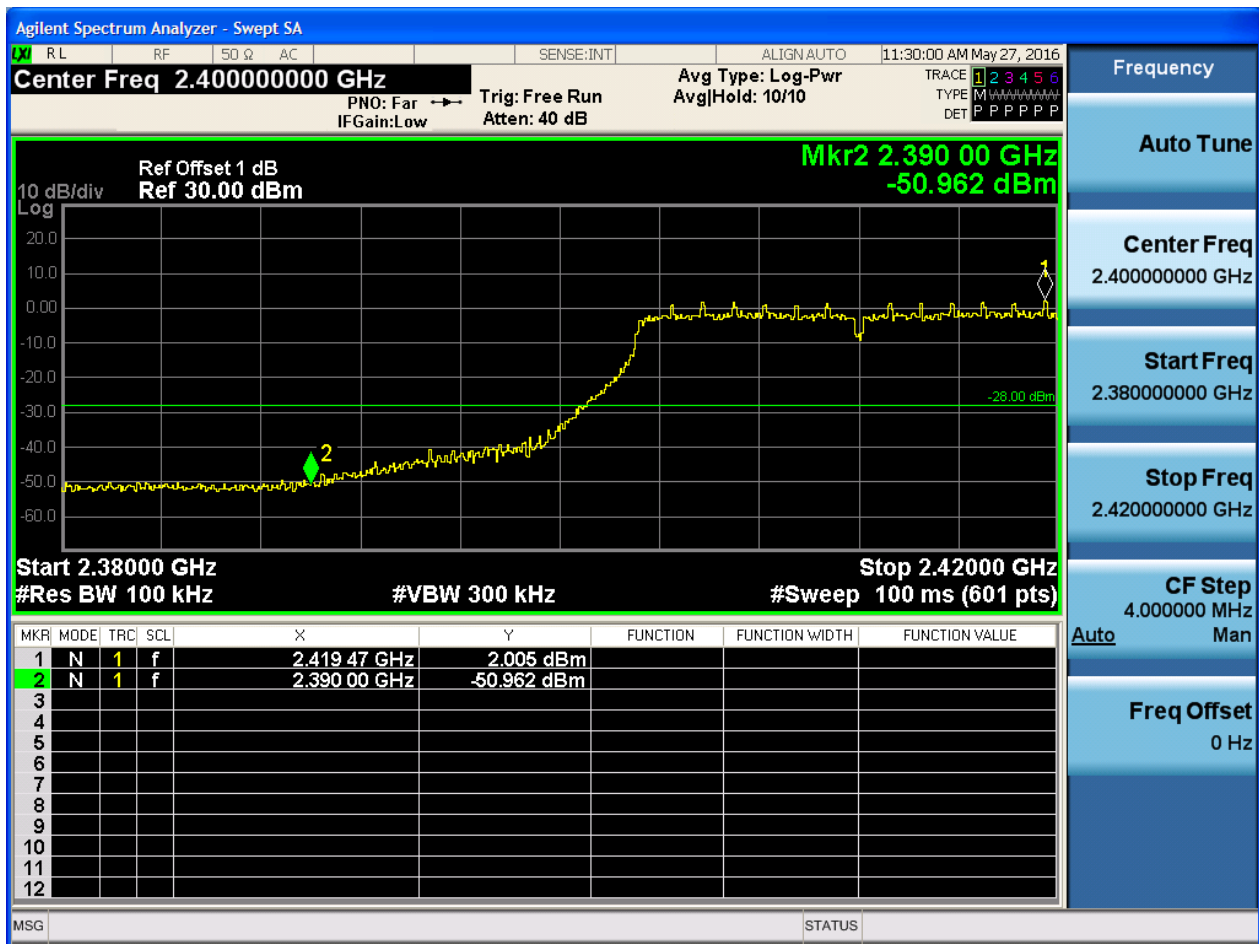


2.7 11G_H@Ant 1





2.9 11N20_L@Ant 1





2.11 11N20_H@Ant 1



Appendix G: Unwanted Emissions into Non-Restricted Frequency

Bands

In this Appendix, the "Pref", which is used as the reference level, refers to the peak power level in any 100 kHz bandwidth within the fundamental emission, the "Puw" refers to the maximum emission power in 100 kHz band segments outside of the authorized frequency band.

Considering that the higher ratio of RBW to the span for the frequency ranges below 30 MHz makes the results determination be complicated, a narrower RBW other than 100 kHz is used for these ranges. The measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 \times \lg(100 [kHz]/\text{narrower RBW [kHz]})$. As to this Appendix, the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain and used as respective results for each chain, due to the relative-limit requirement.

In the result table, the "< Limit" denotes that "The Puw [dBm] is less than Pref[dBm]-30[dBm], see test plots for detailed".

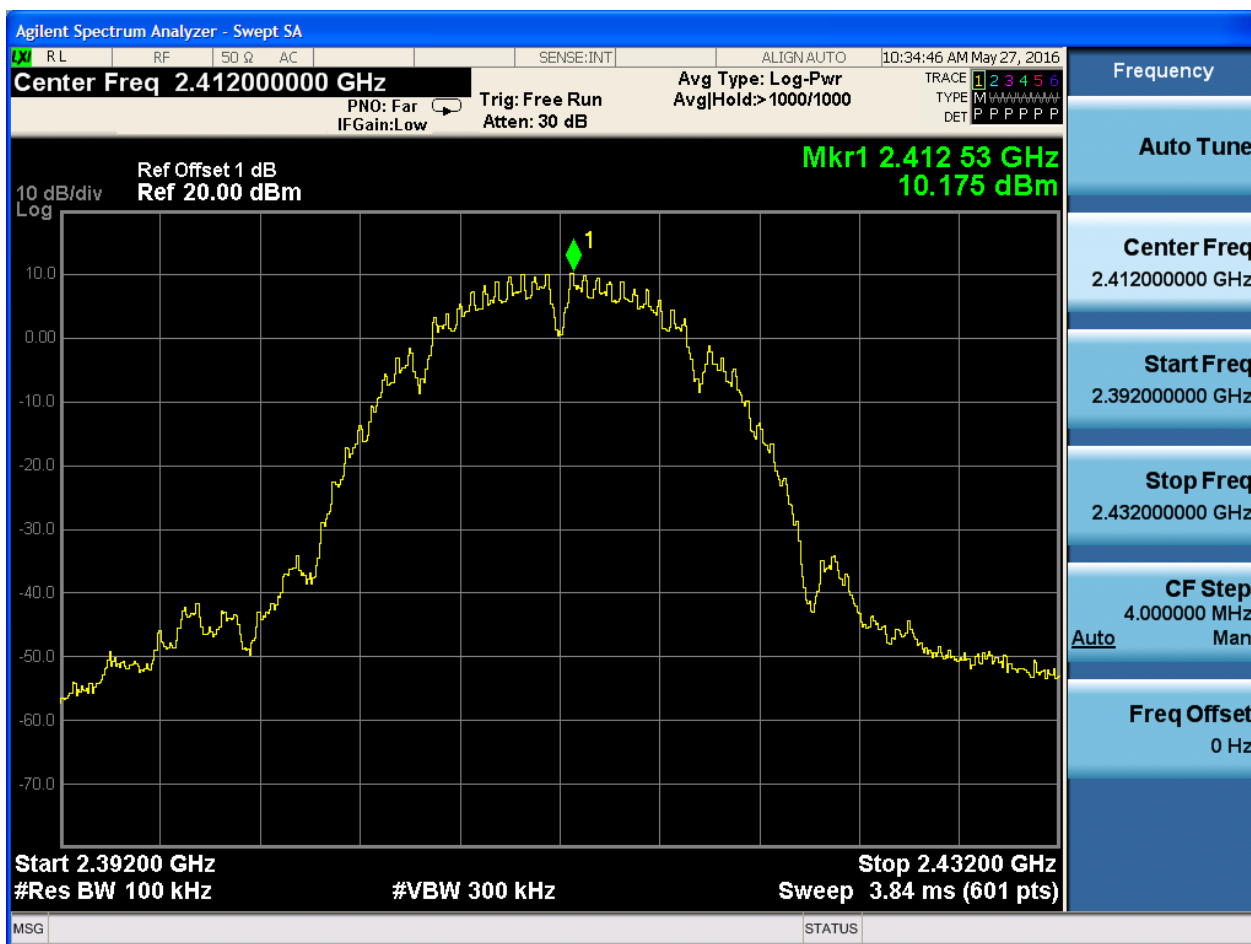
Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Ant	Pref[dBm]	Puw[dBm]	Verdict
11B	L	2412	Ant 1	10.17	<limit	pass
11B	M	2437	Ant 1	10.77	<limit	pass
11B	H	2462	Ant 1	11.02	<limit	pass
11G	L	2412	Ant 1	2.98	<limit	pass
11G	M	2437	Ant 1	3.23	<limit	pass
11G	H	2462	Ant 1	4.18	<limit	pass
11N20	L	2412	Ant 1	1.99	<limit	pass
11N20	M	2437	Ant 1	2.05	<limit	pass
11N20	H	2462	Ant 1	3.22	<limit	pass

Part II - Test Plots

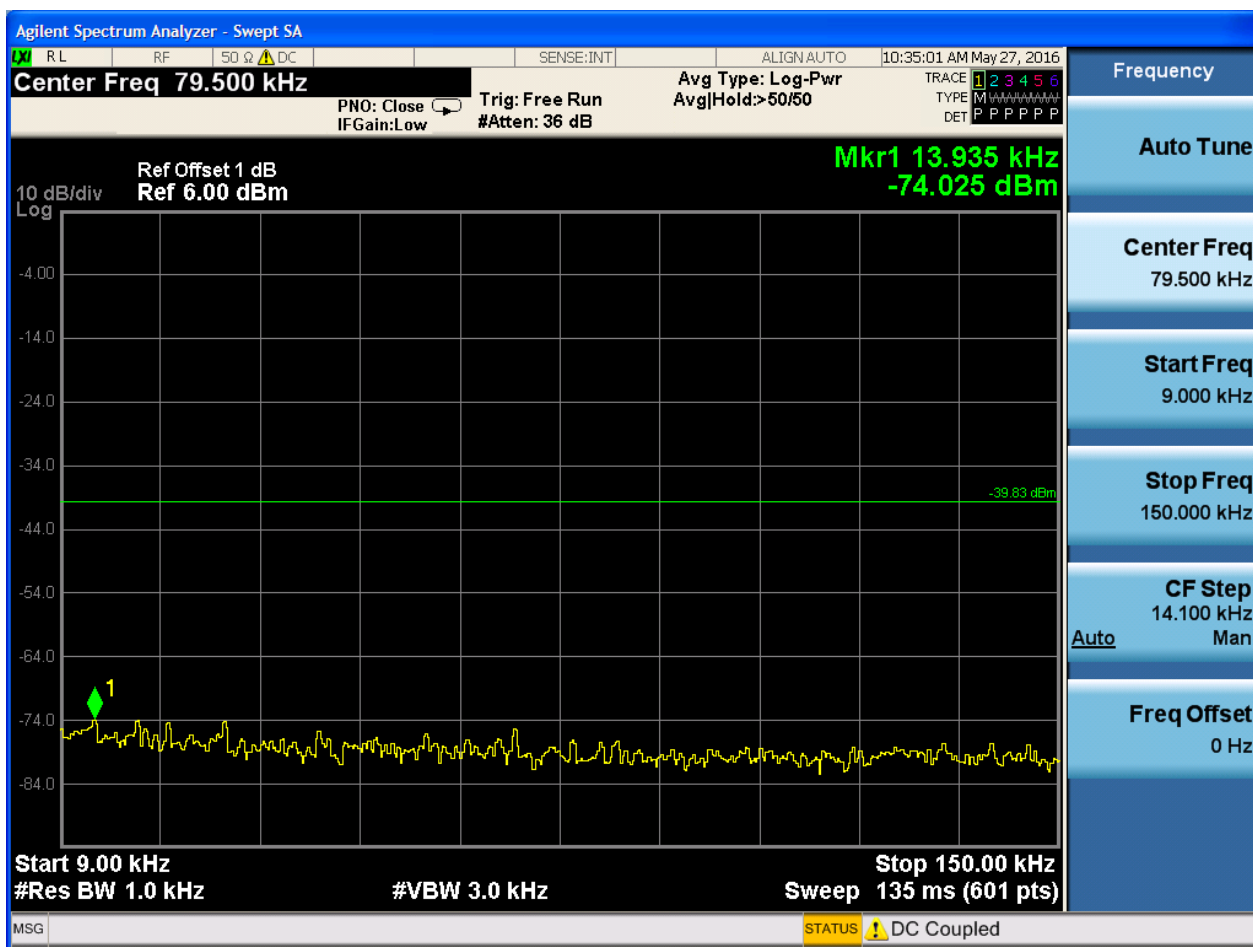
2.1 11B_L@Ant 1

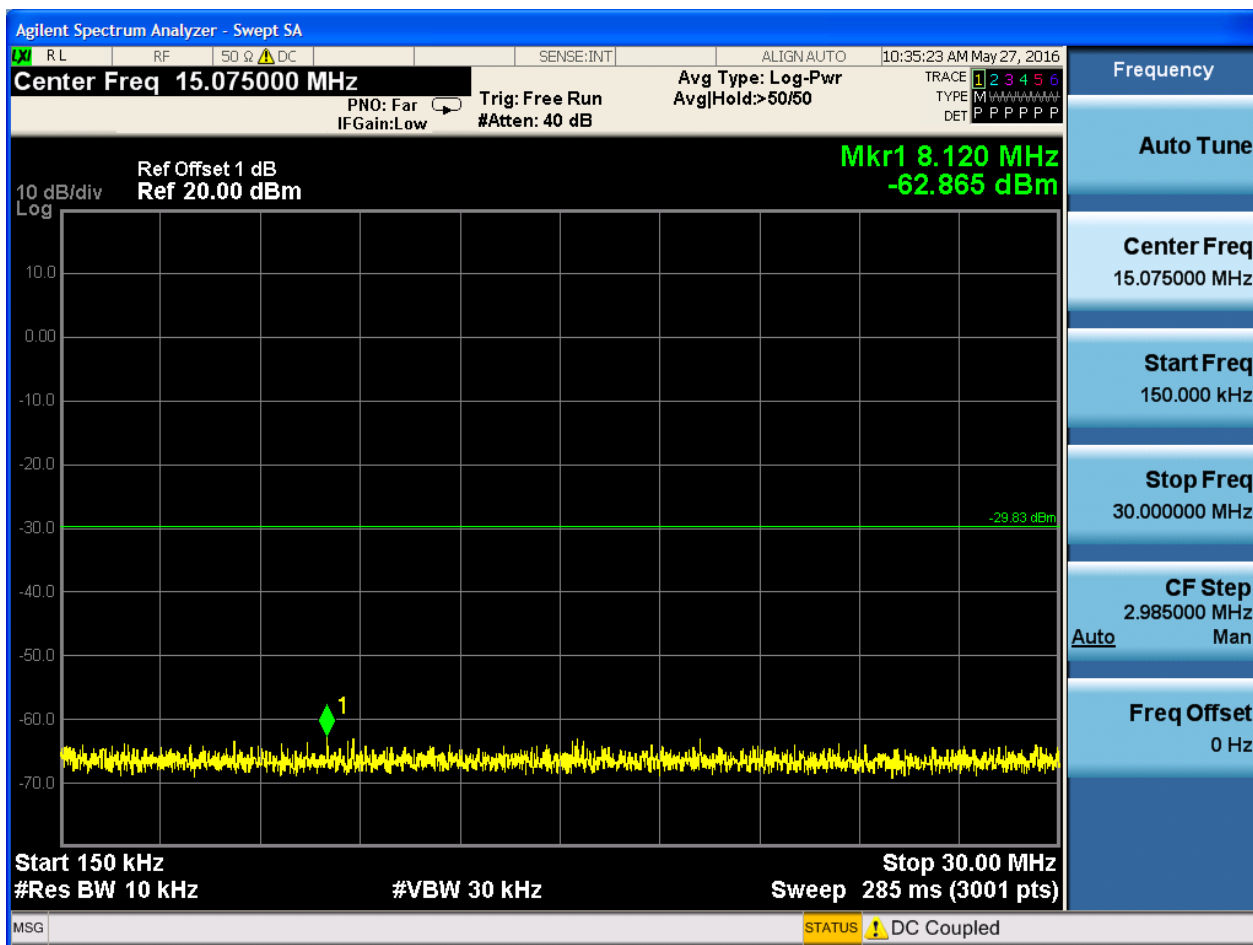
Pref:

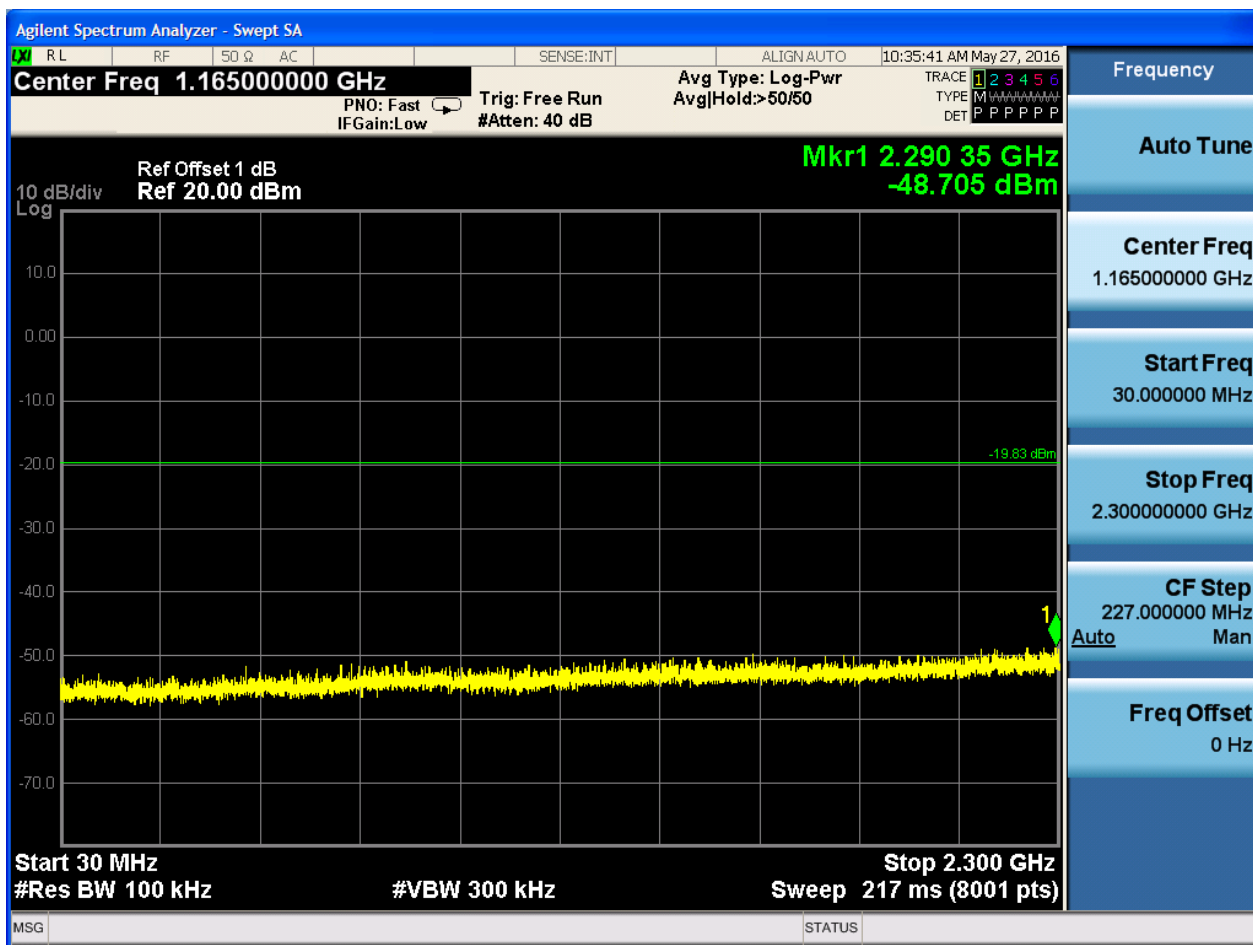


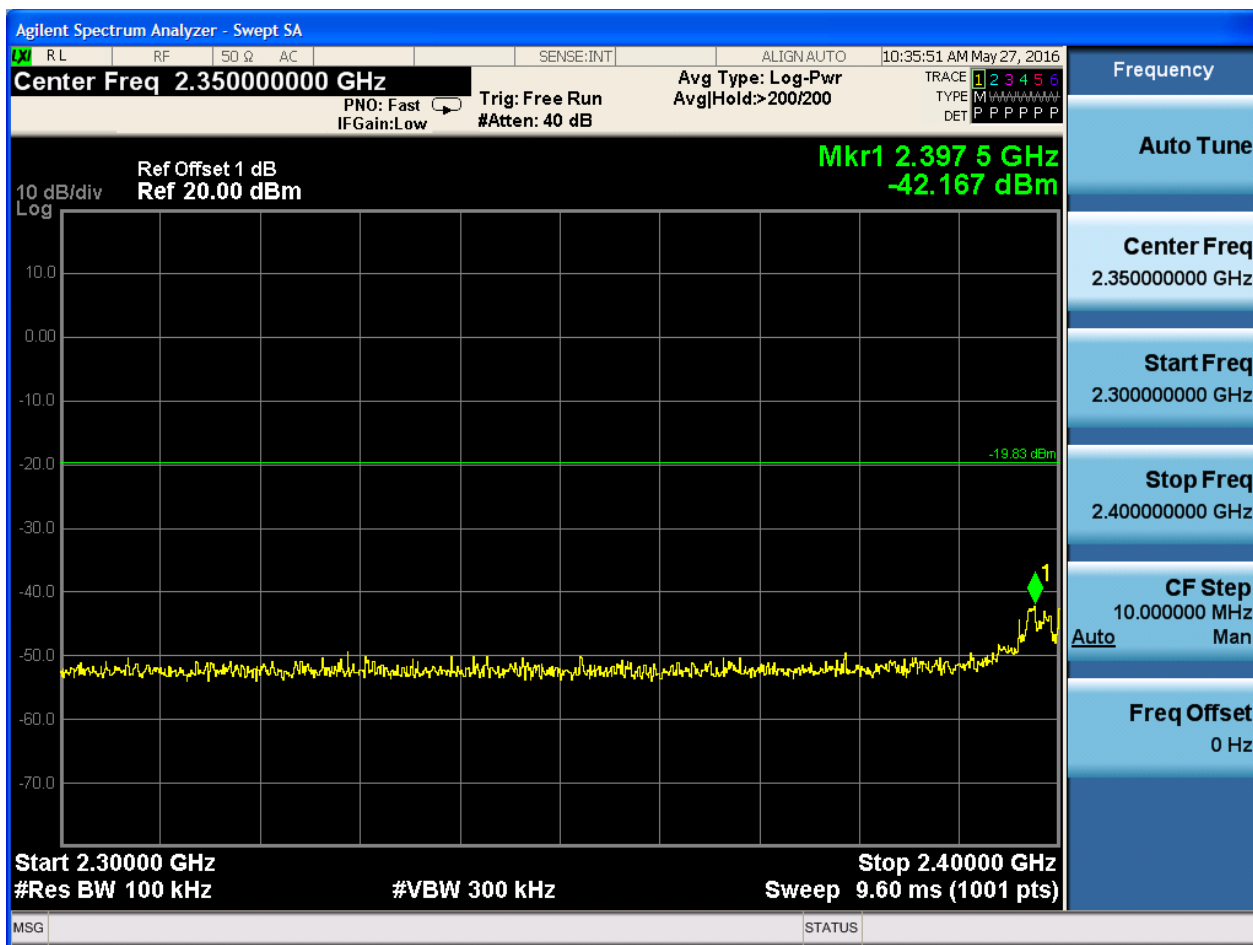


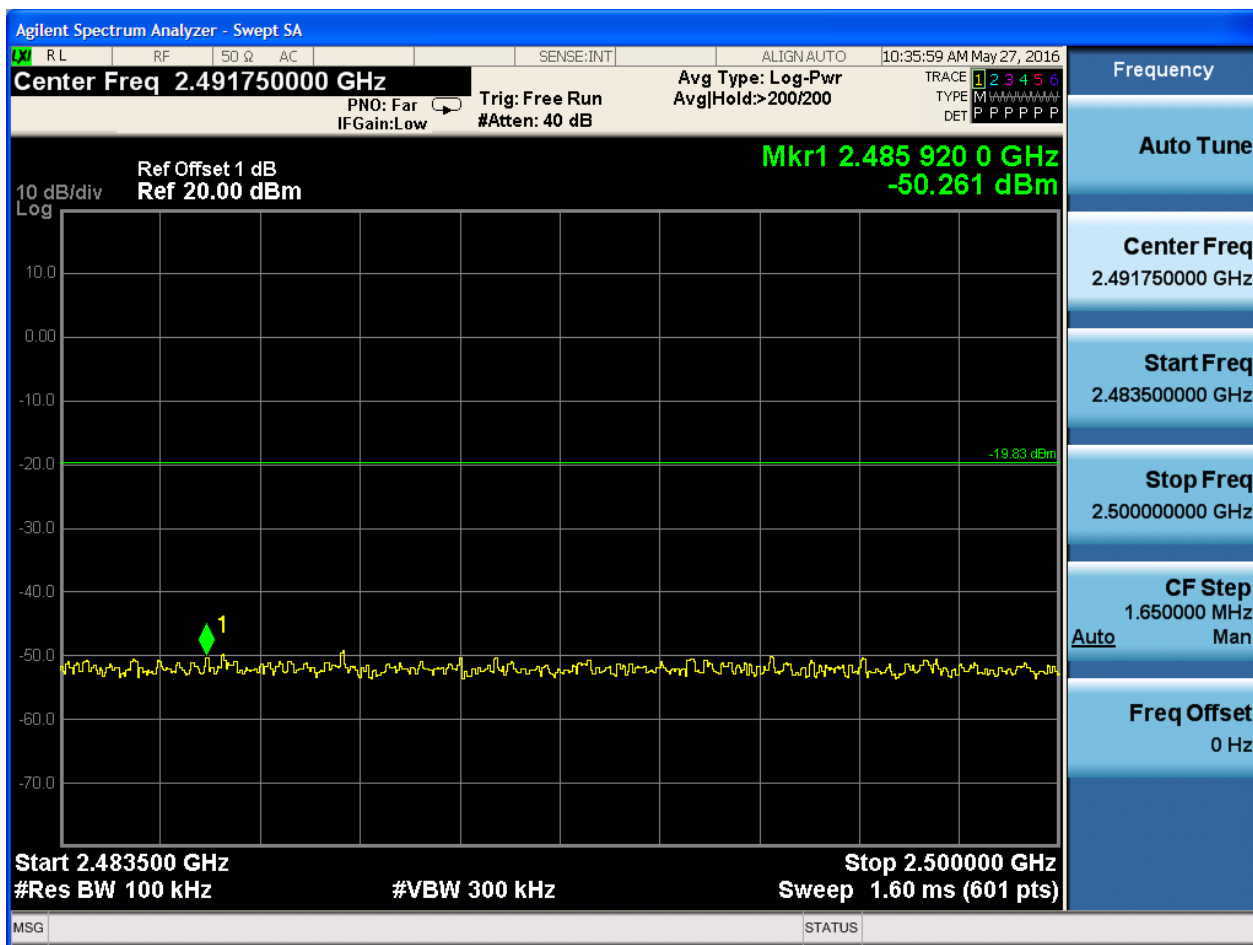
Puw:

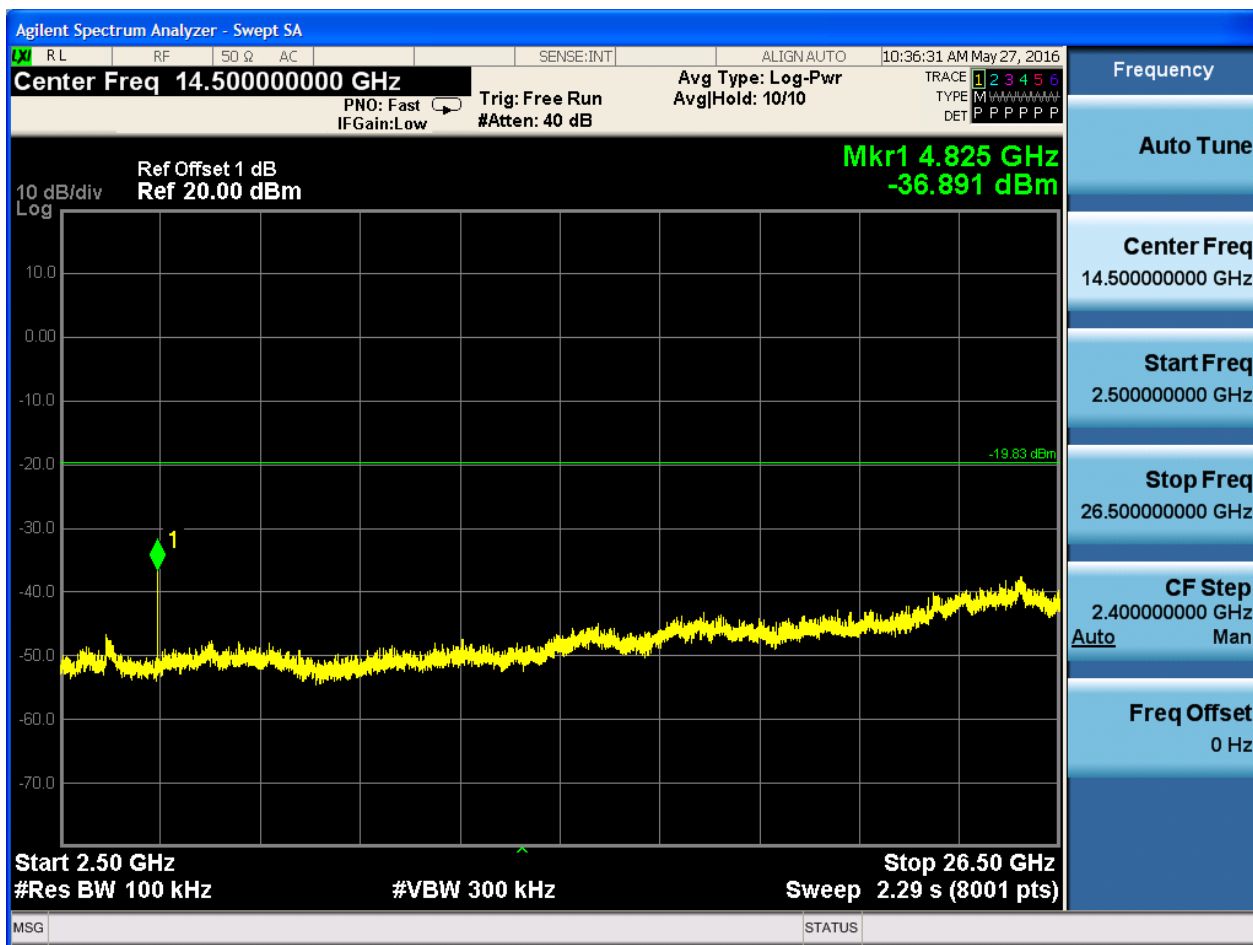






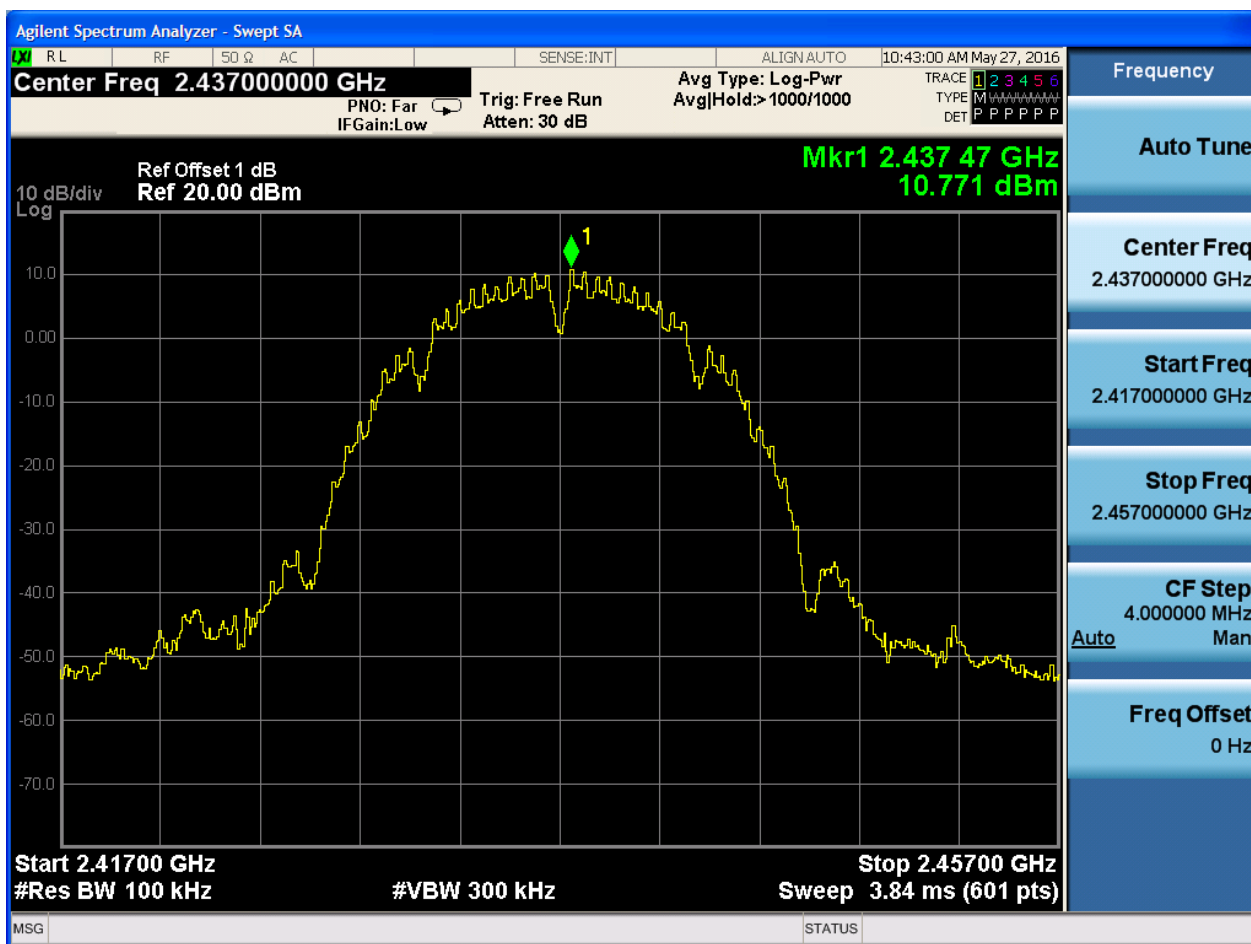






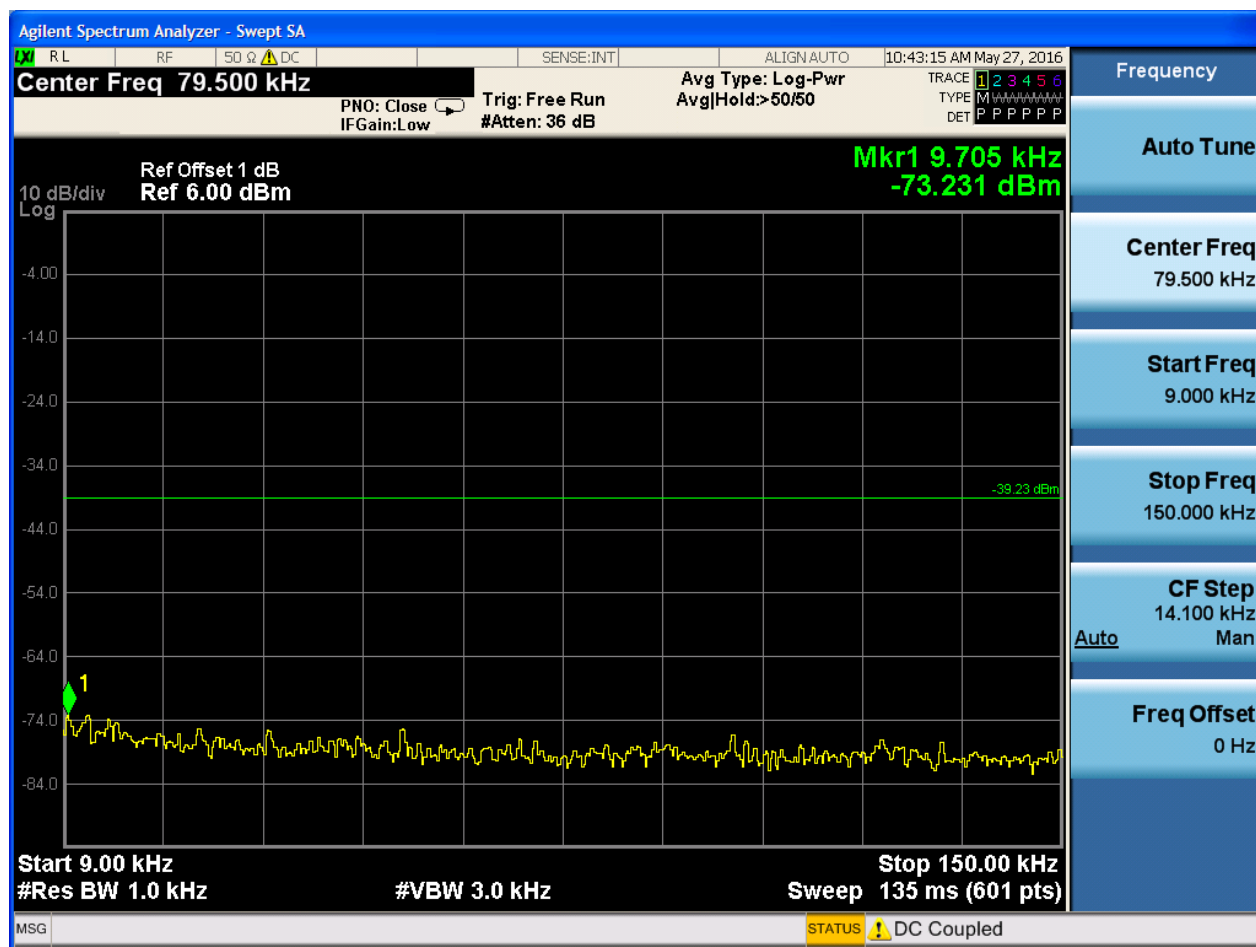
2.3 11B_M@Ant 1

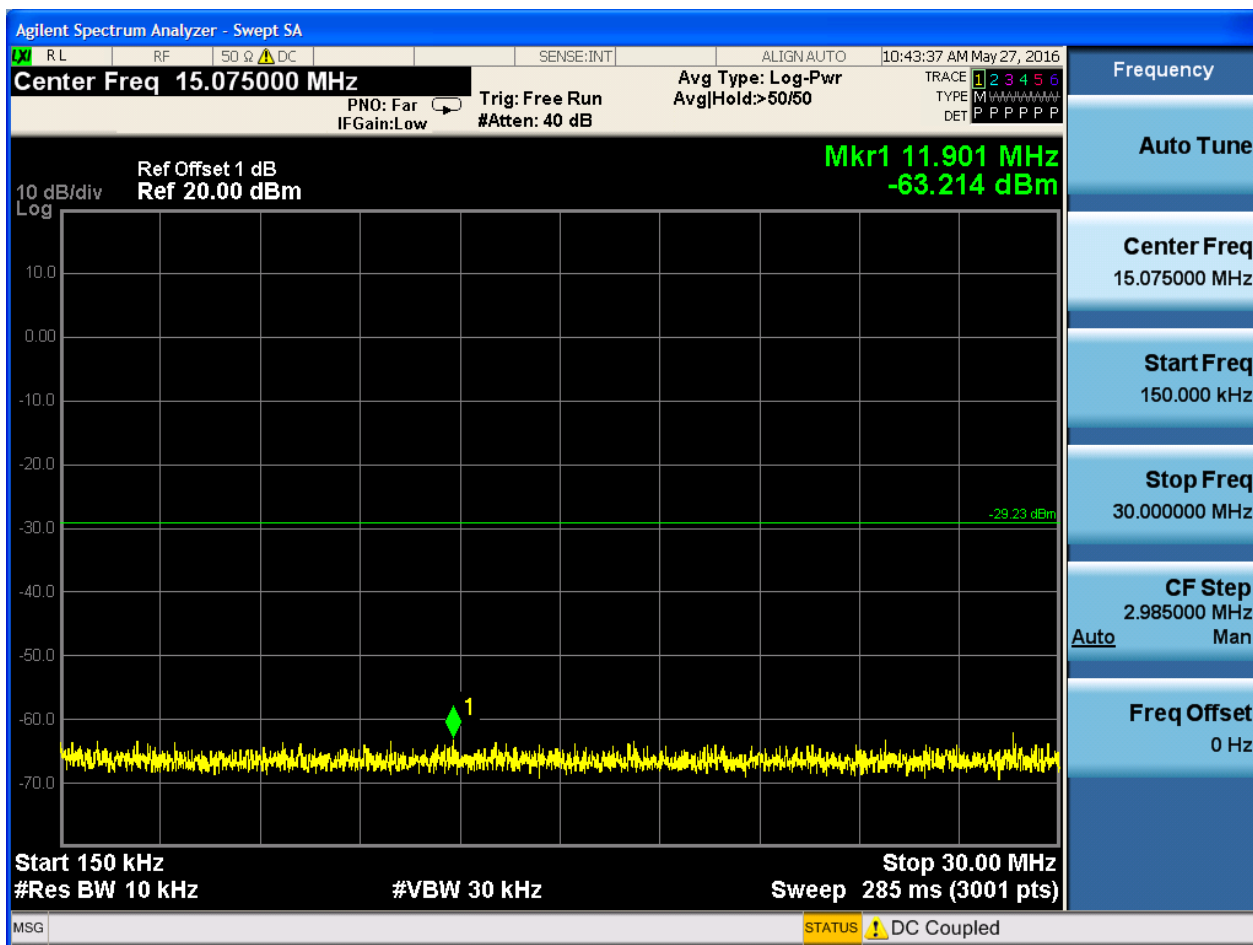
Pref:

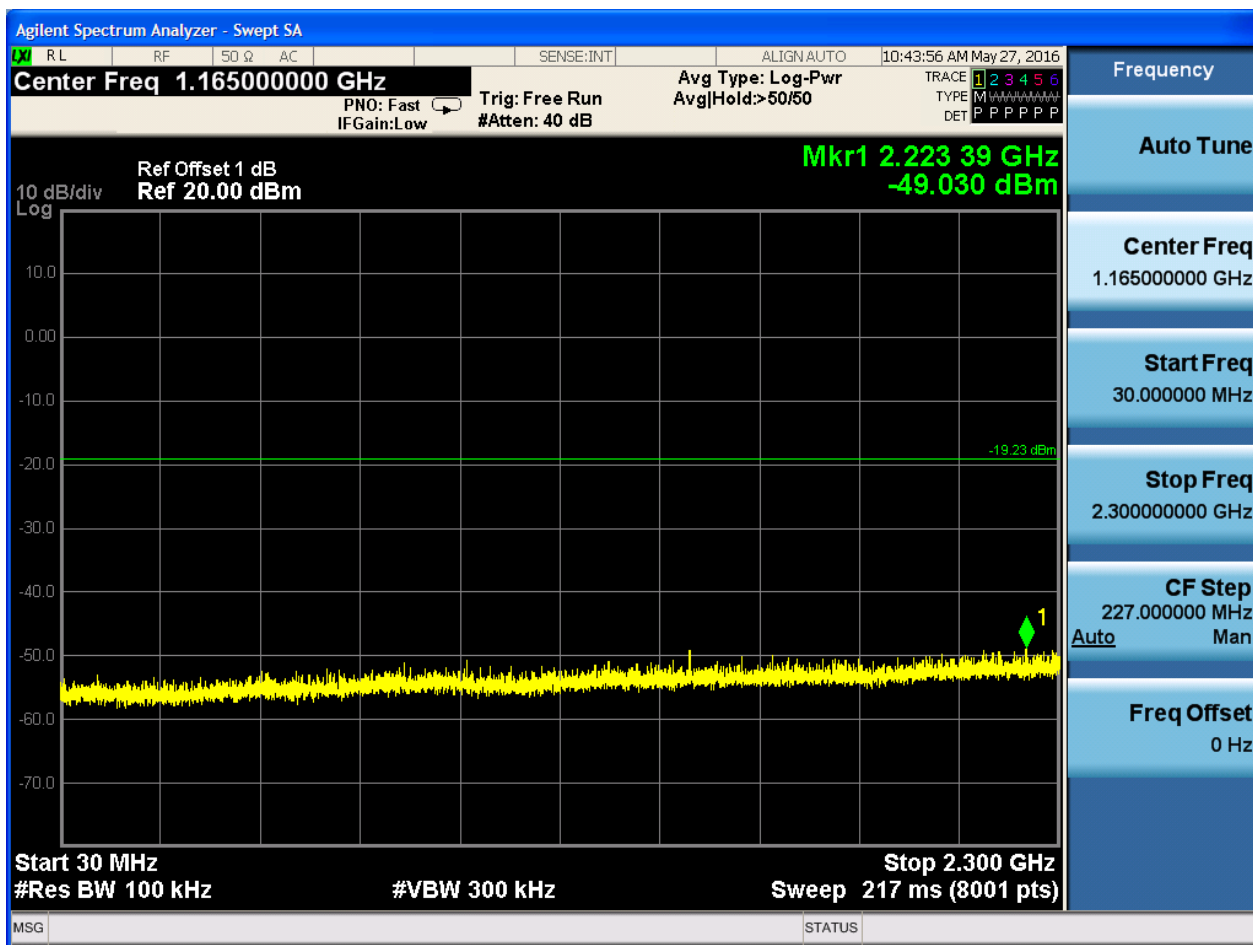


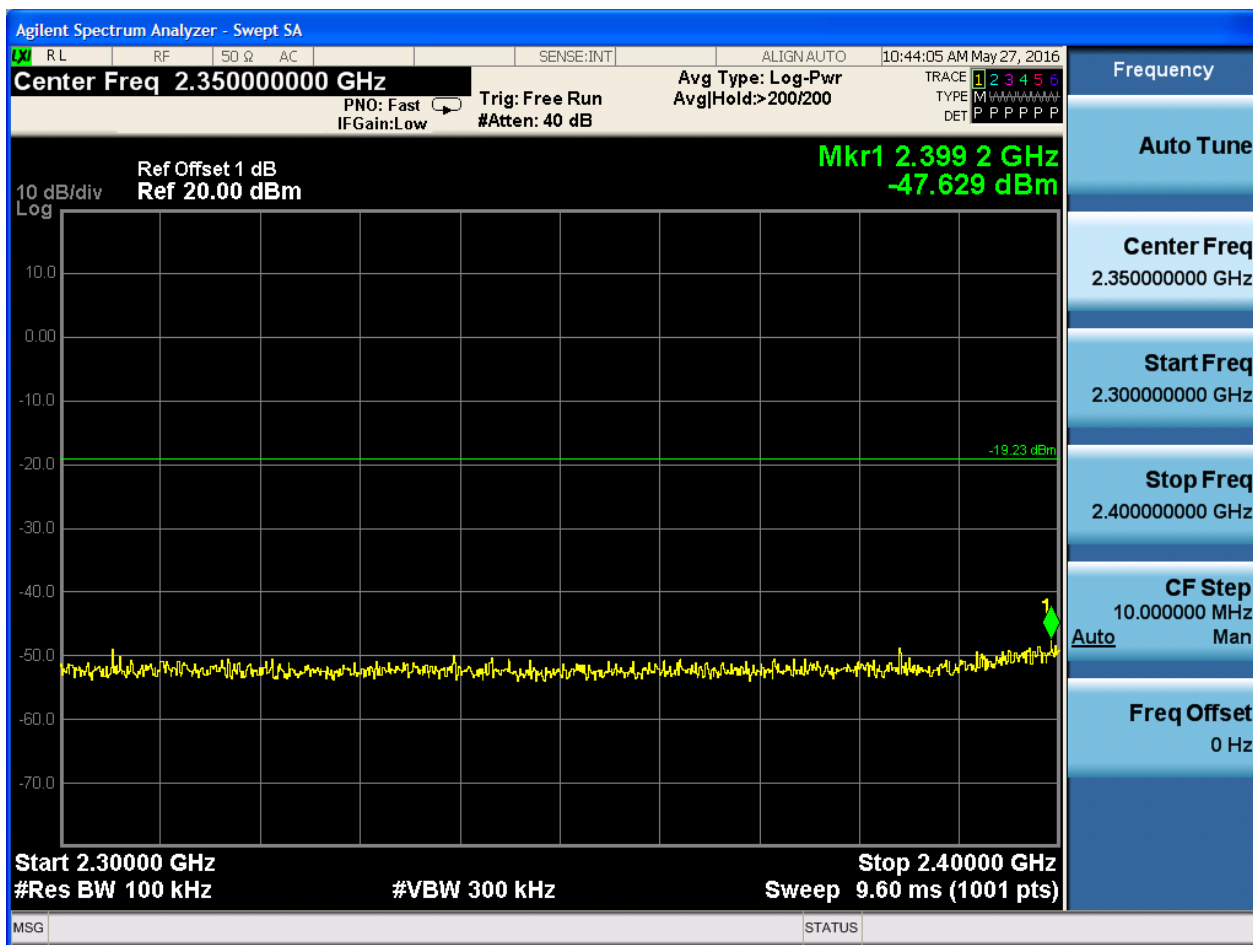


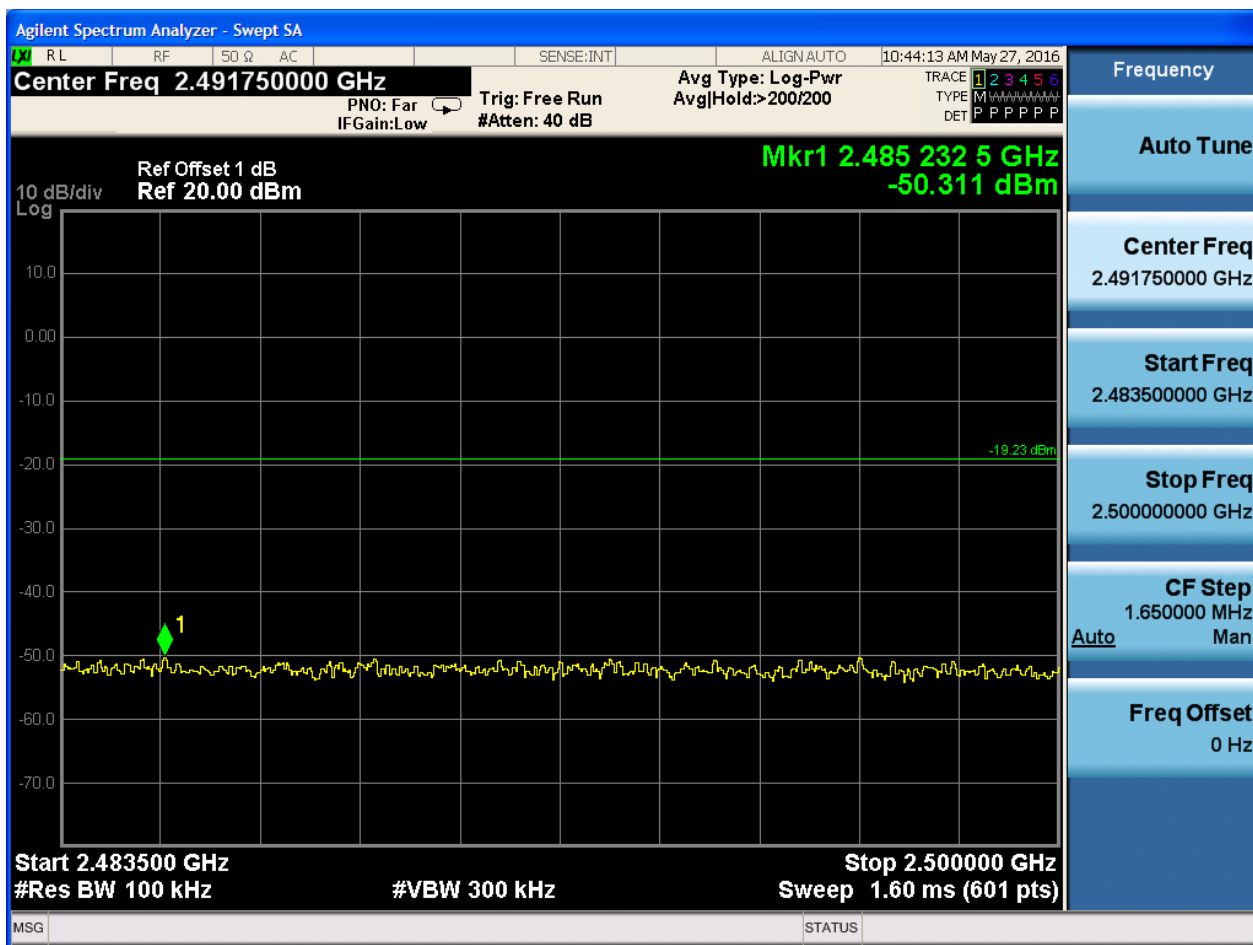
Puw:









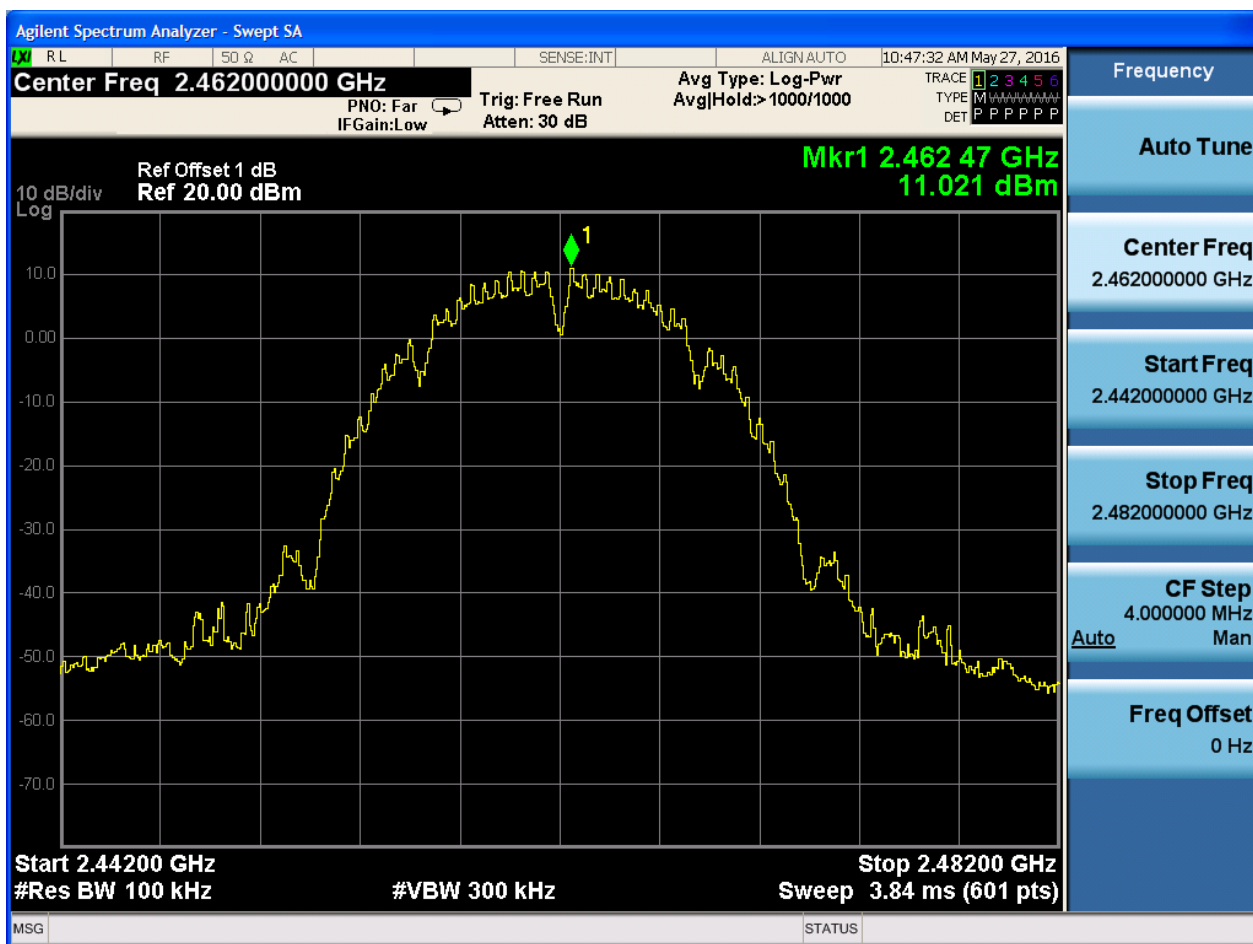






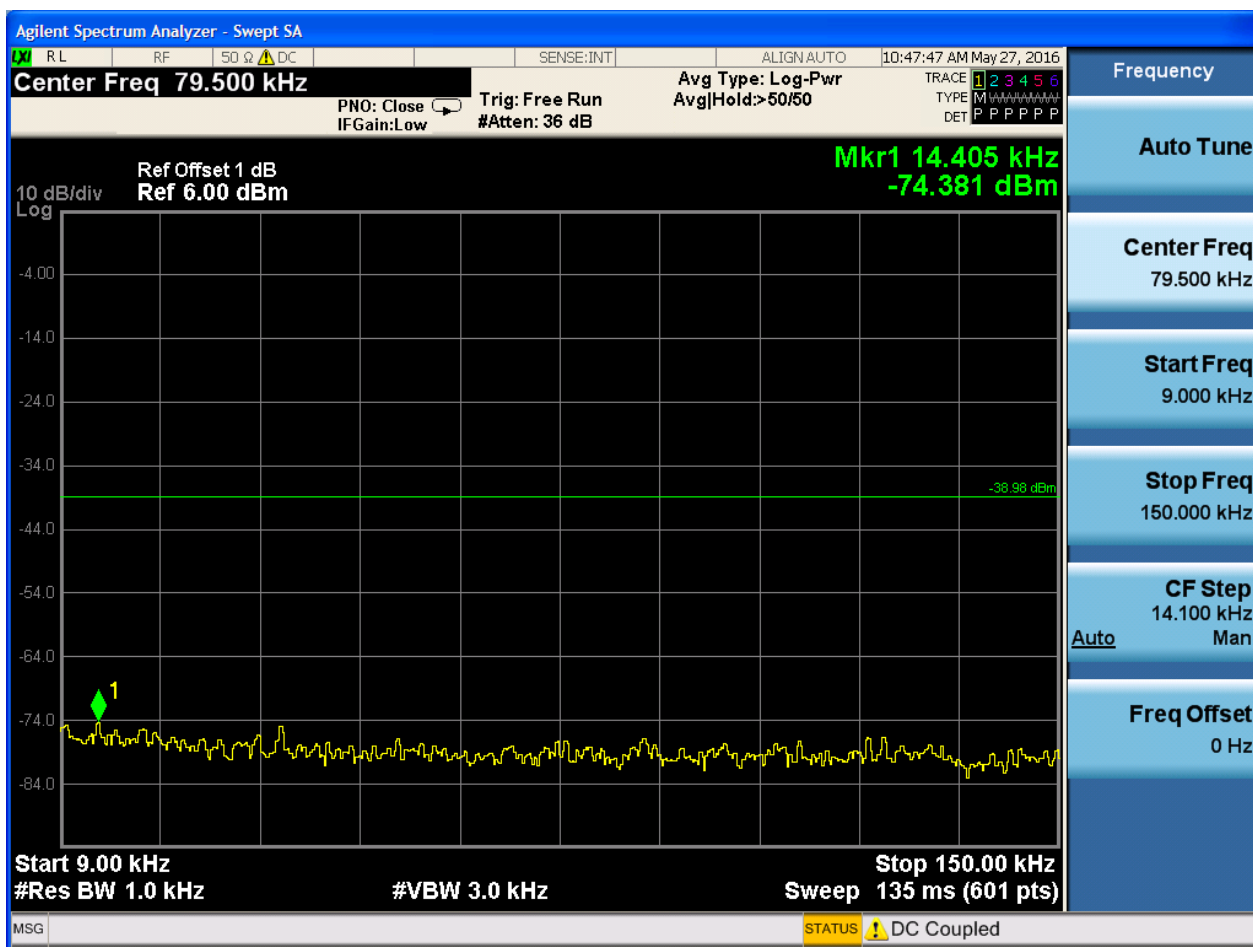
2.5 11B_H@Ant 1

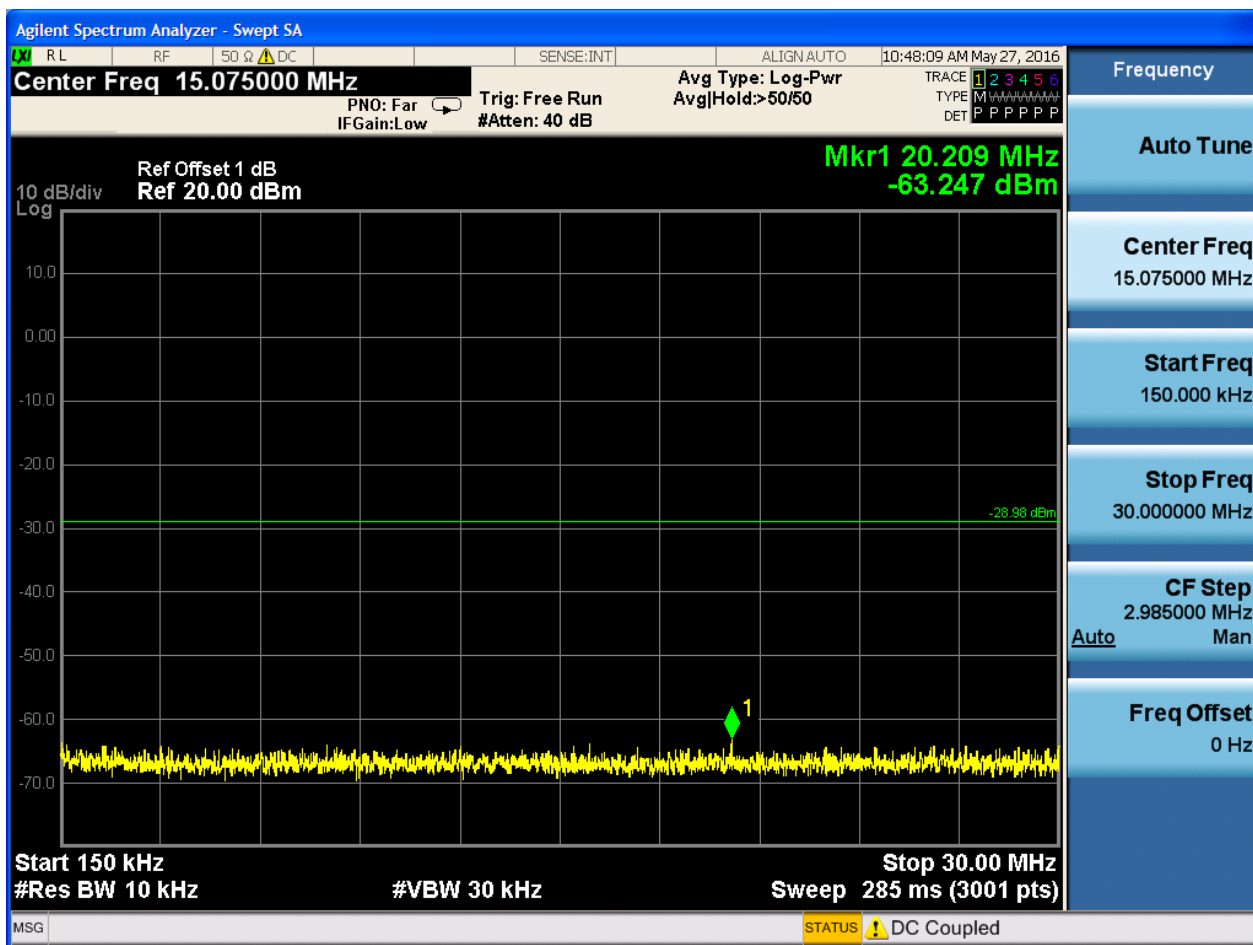
Pref:

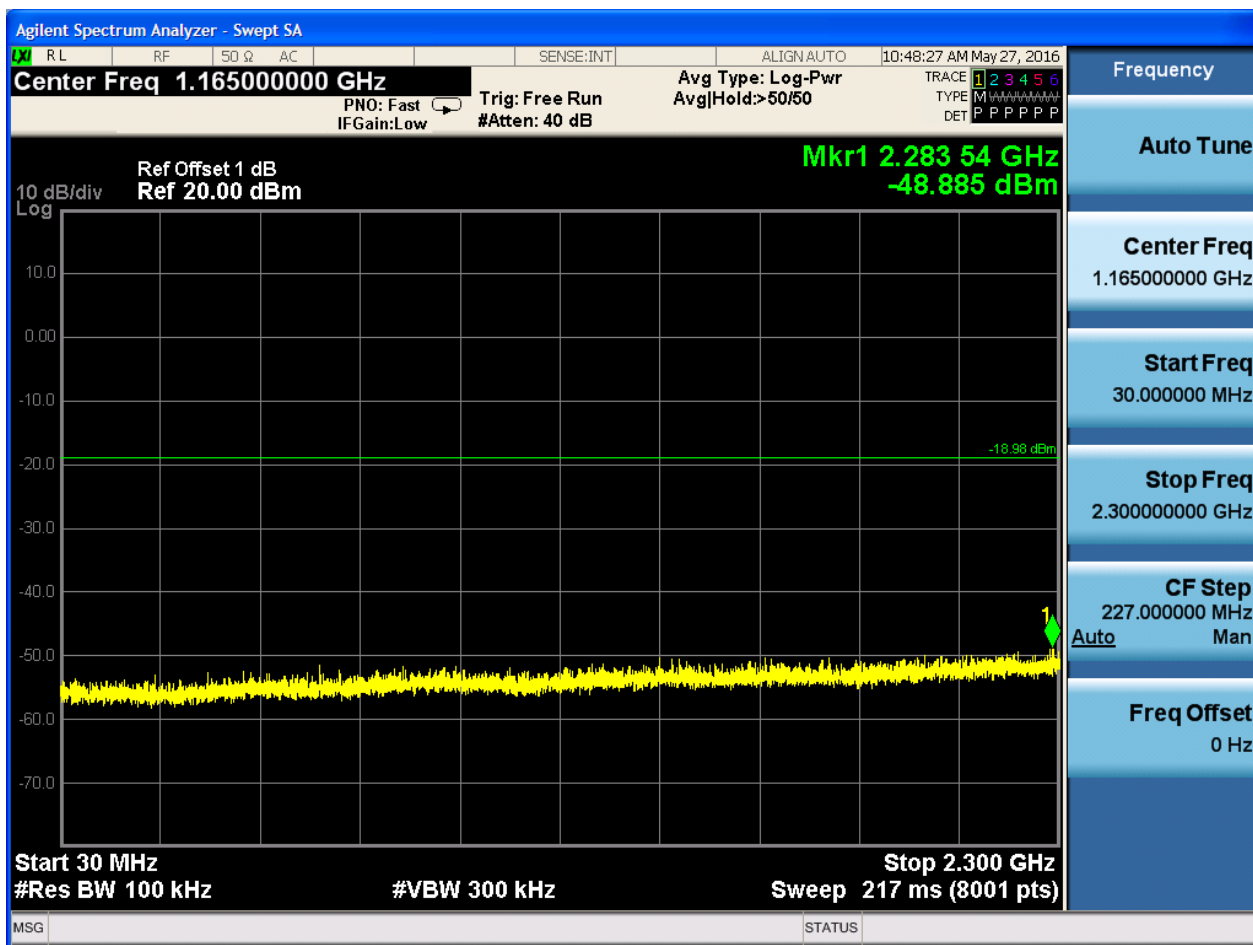


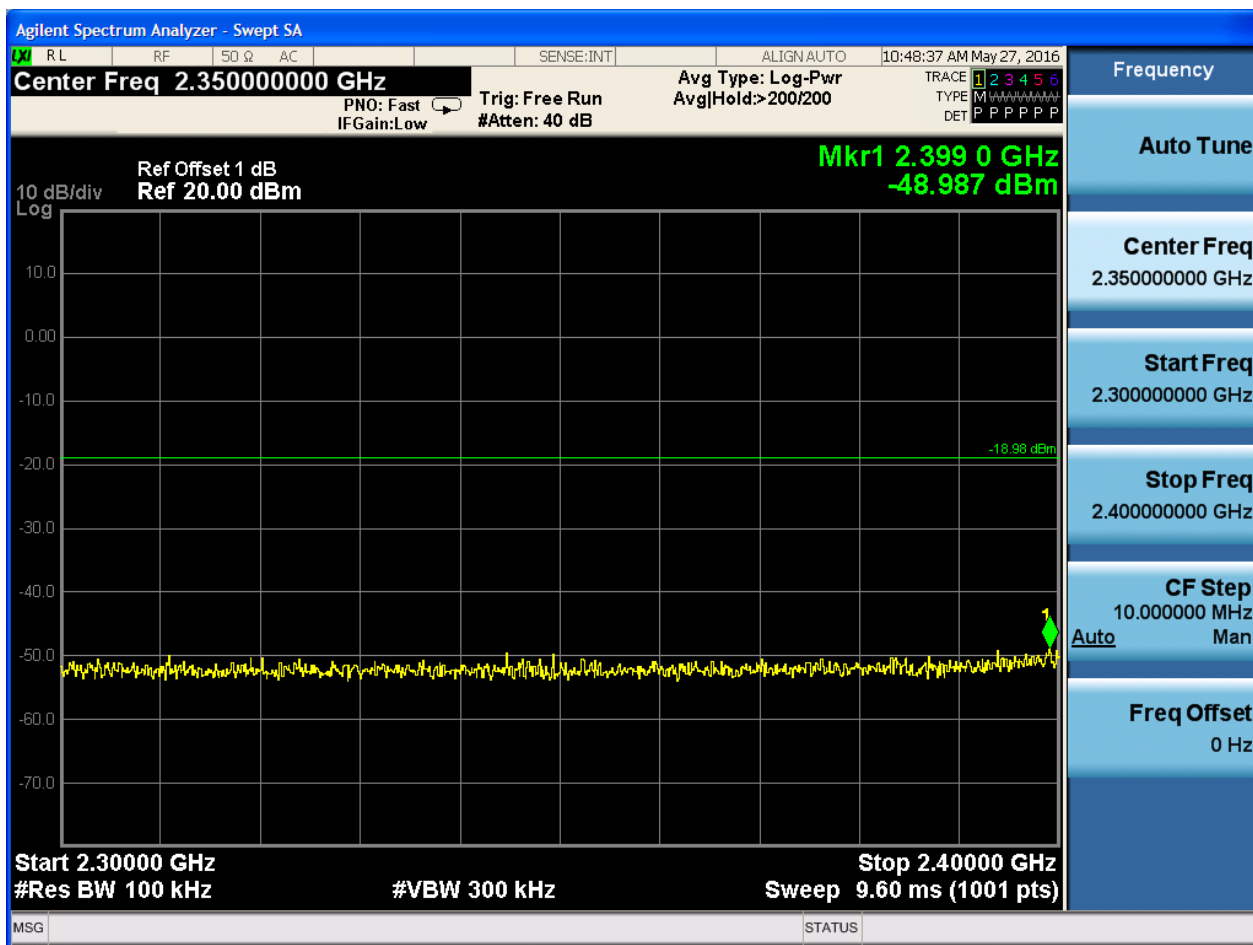


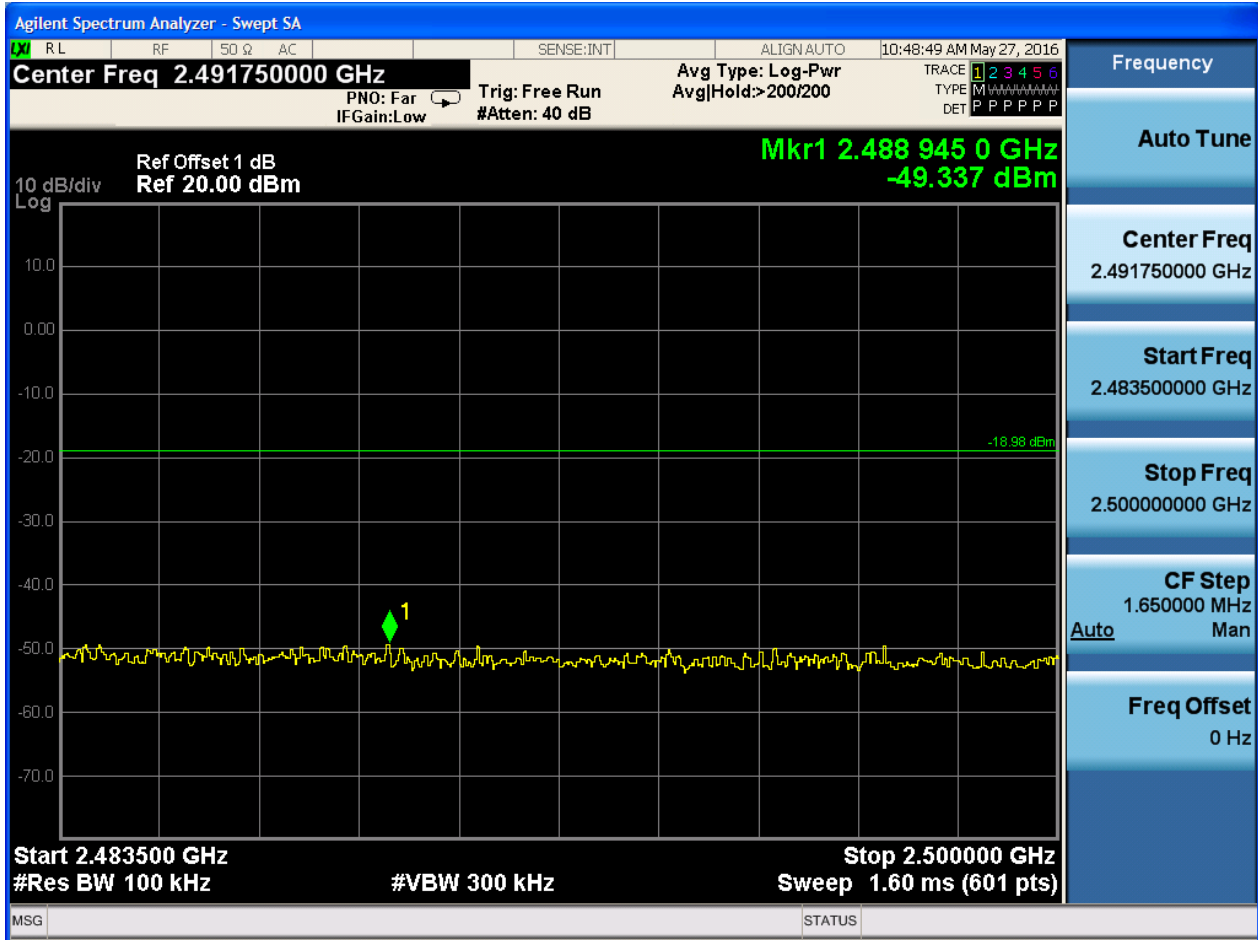
Puw:









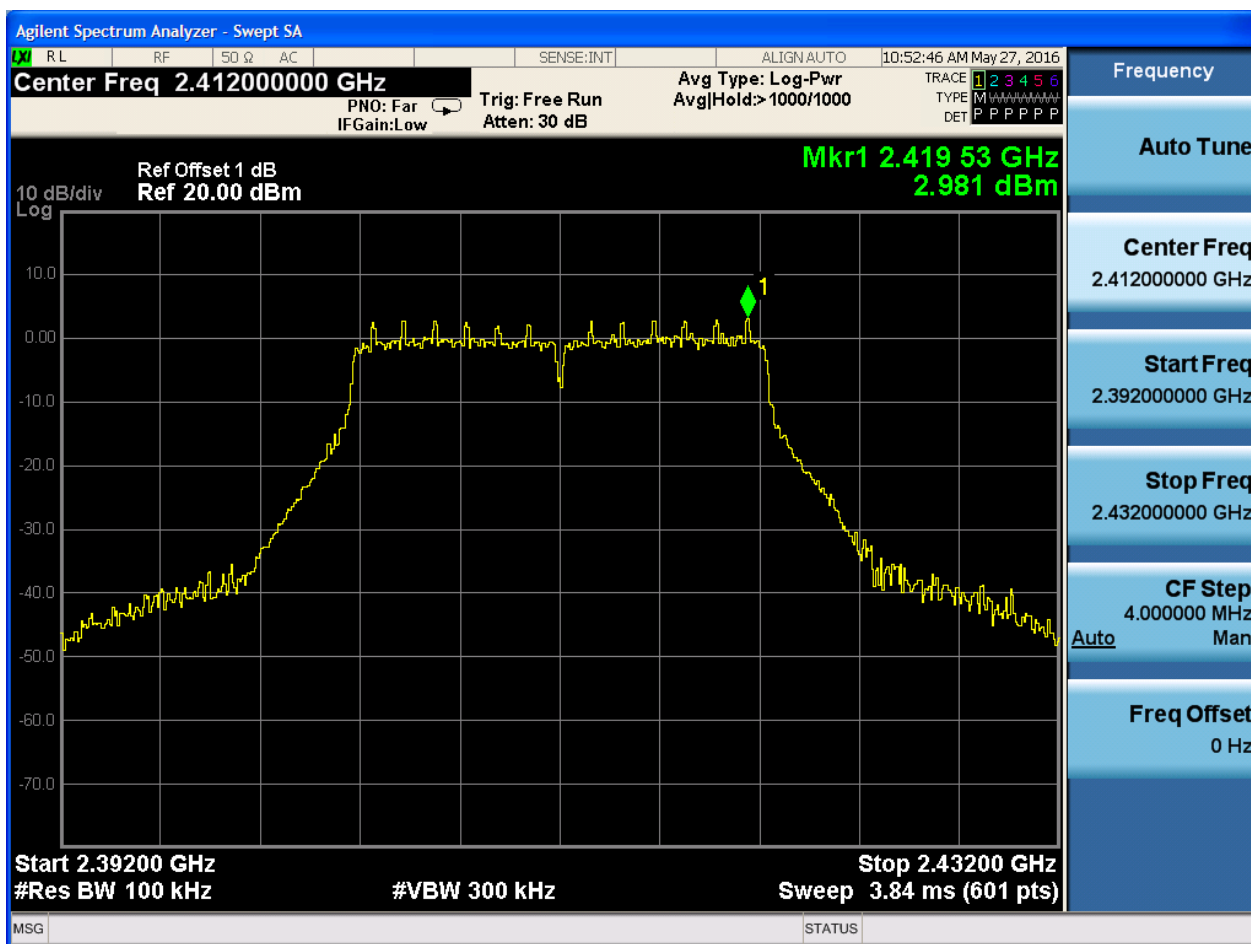






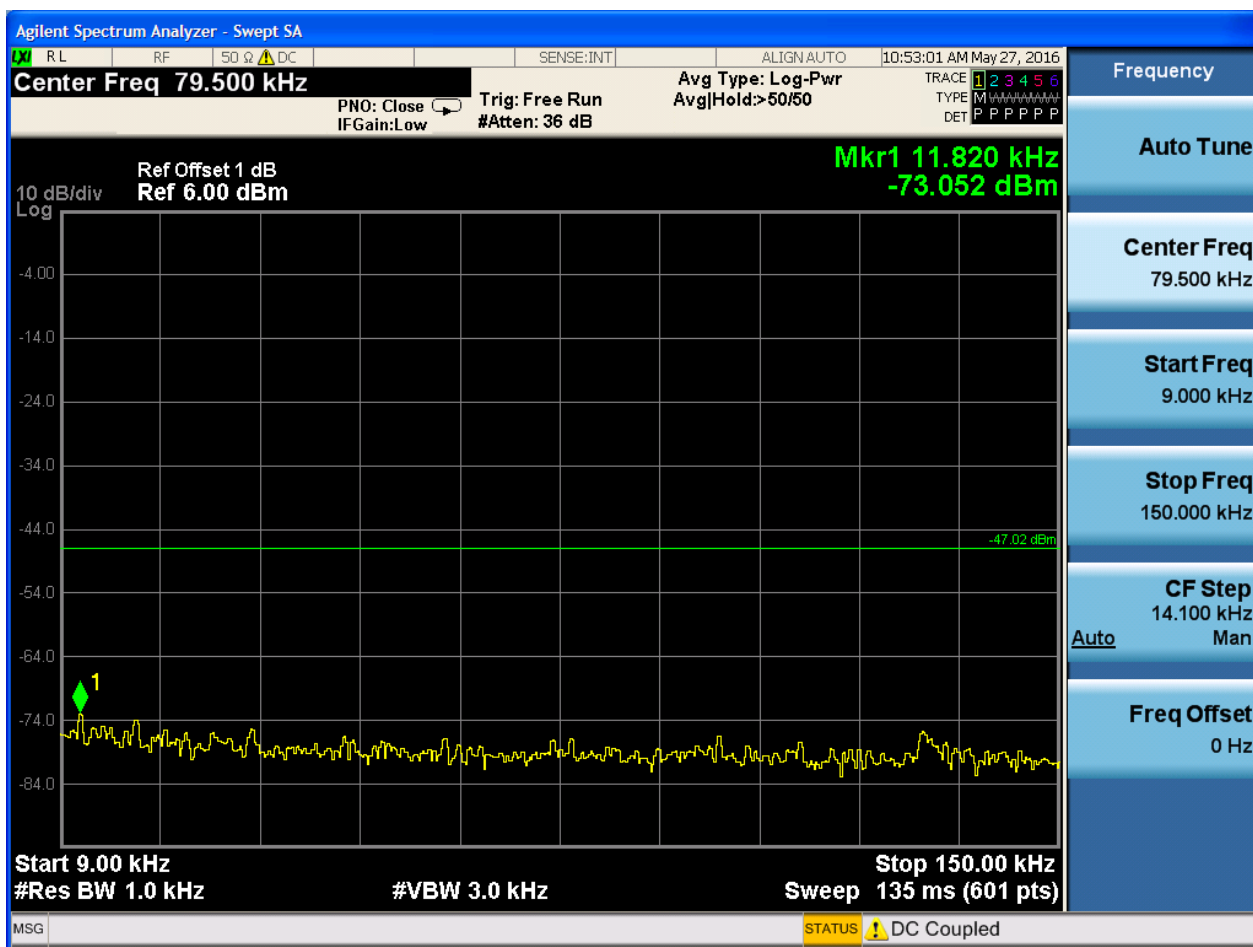
2.7 11G_L@Ant 1

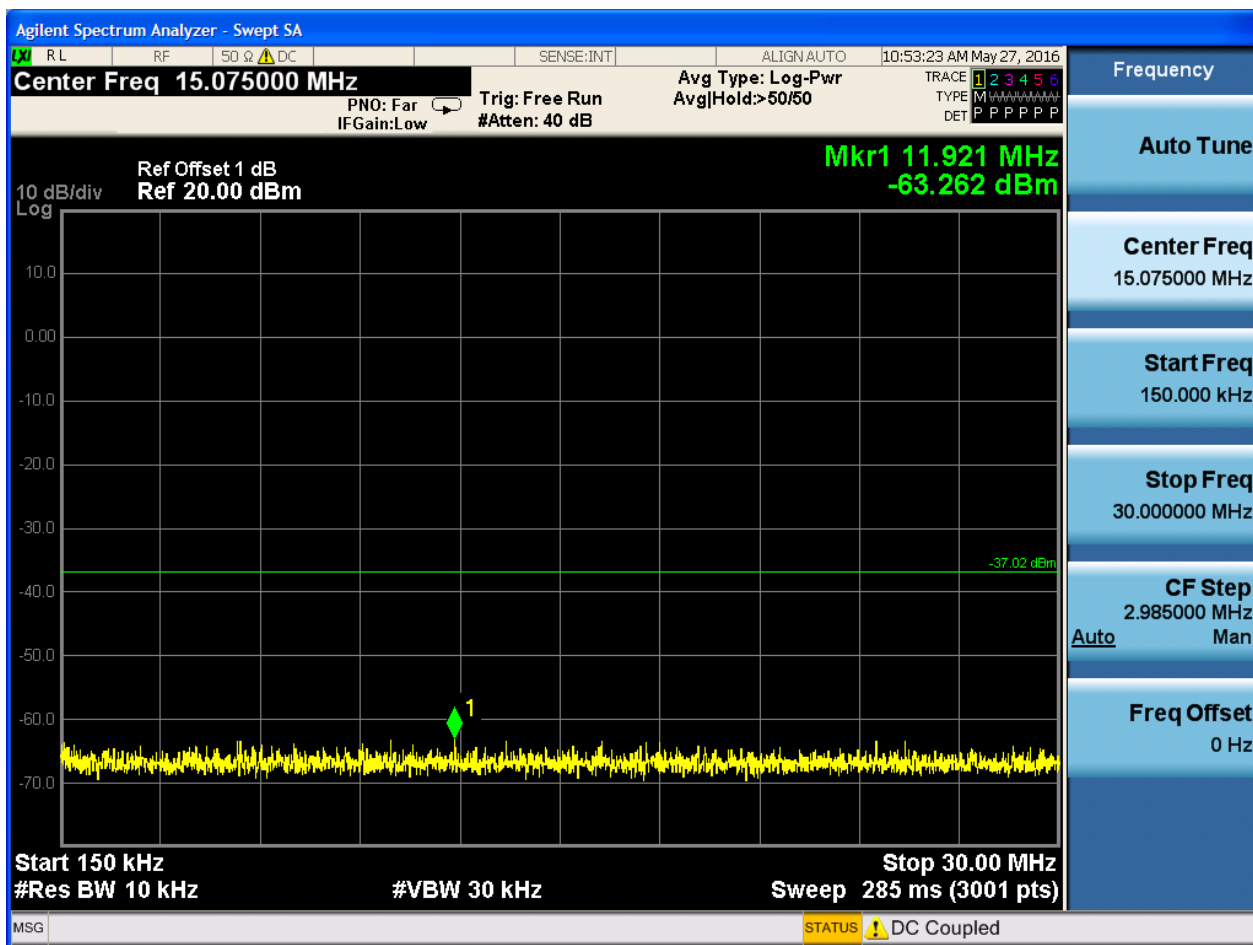
Pref:

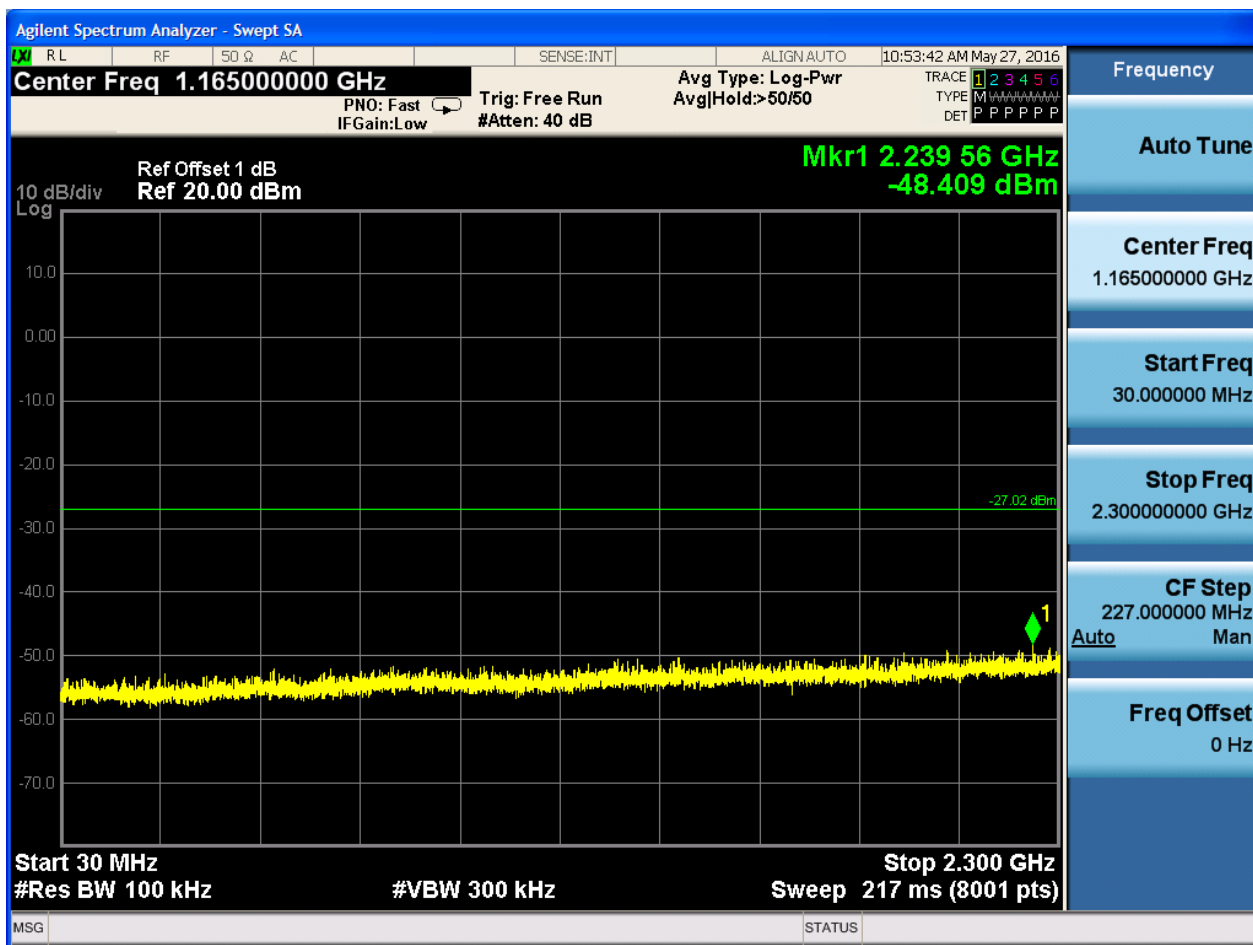


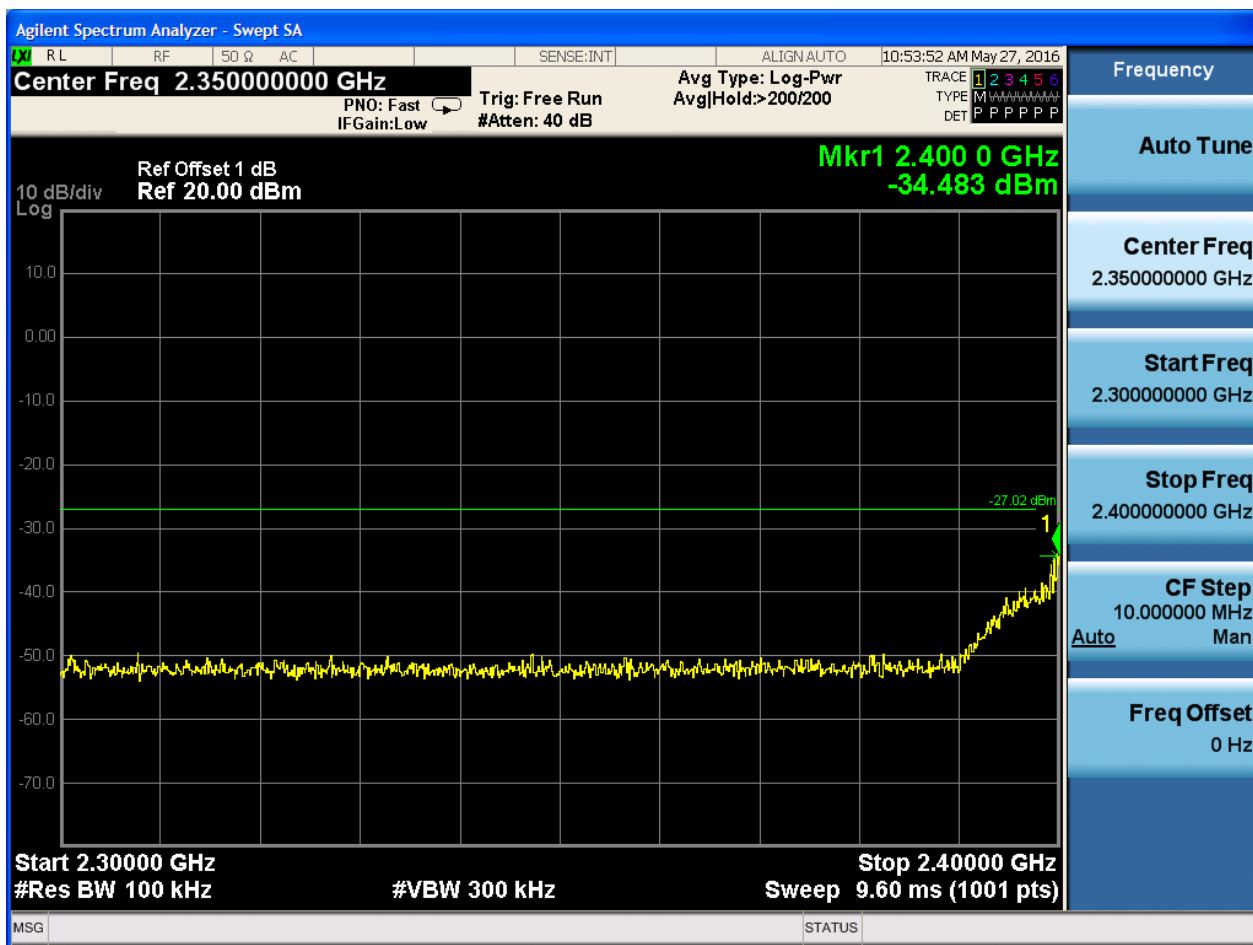


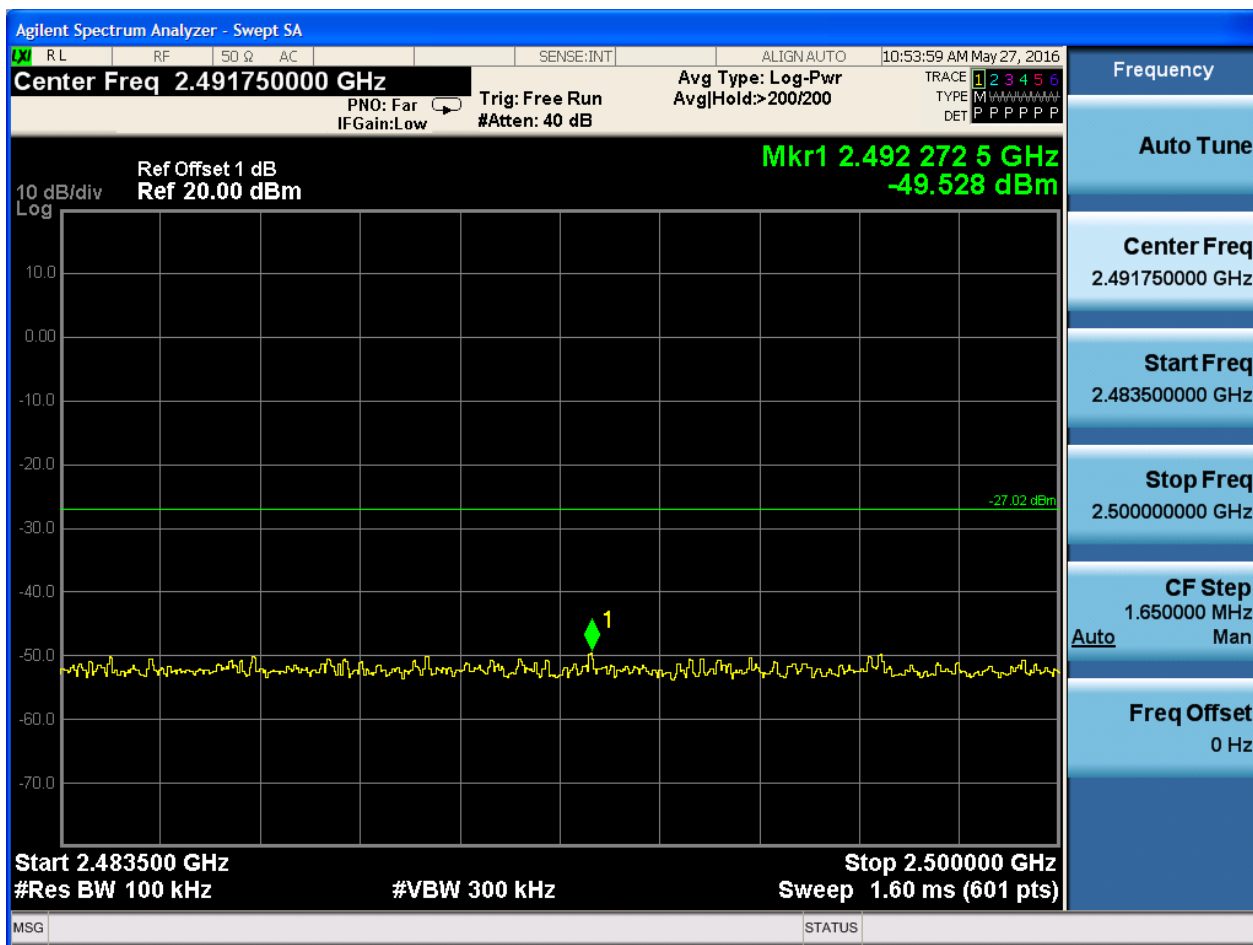
Puw:









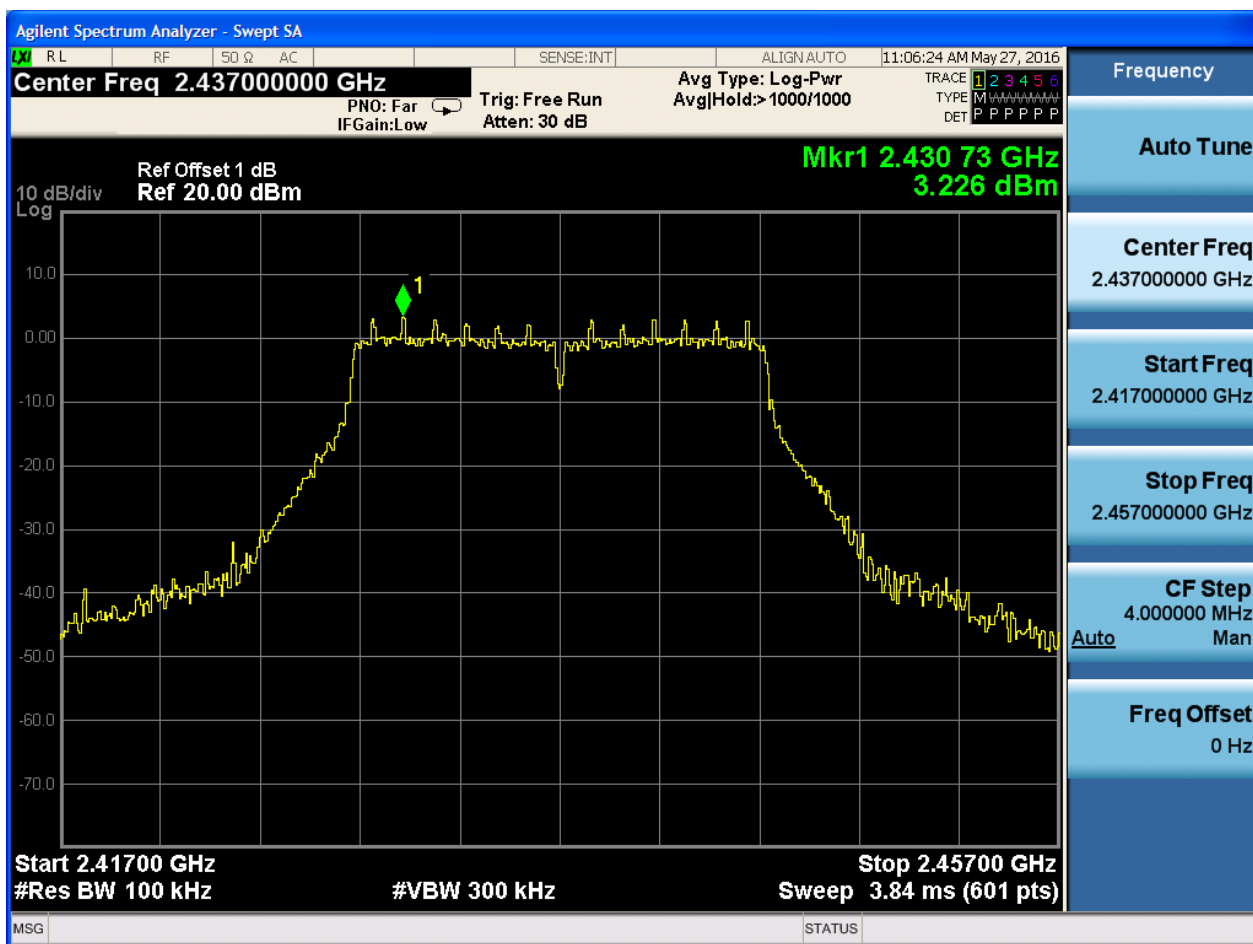






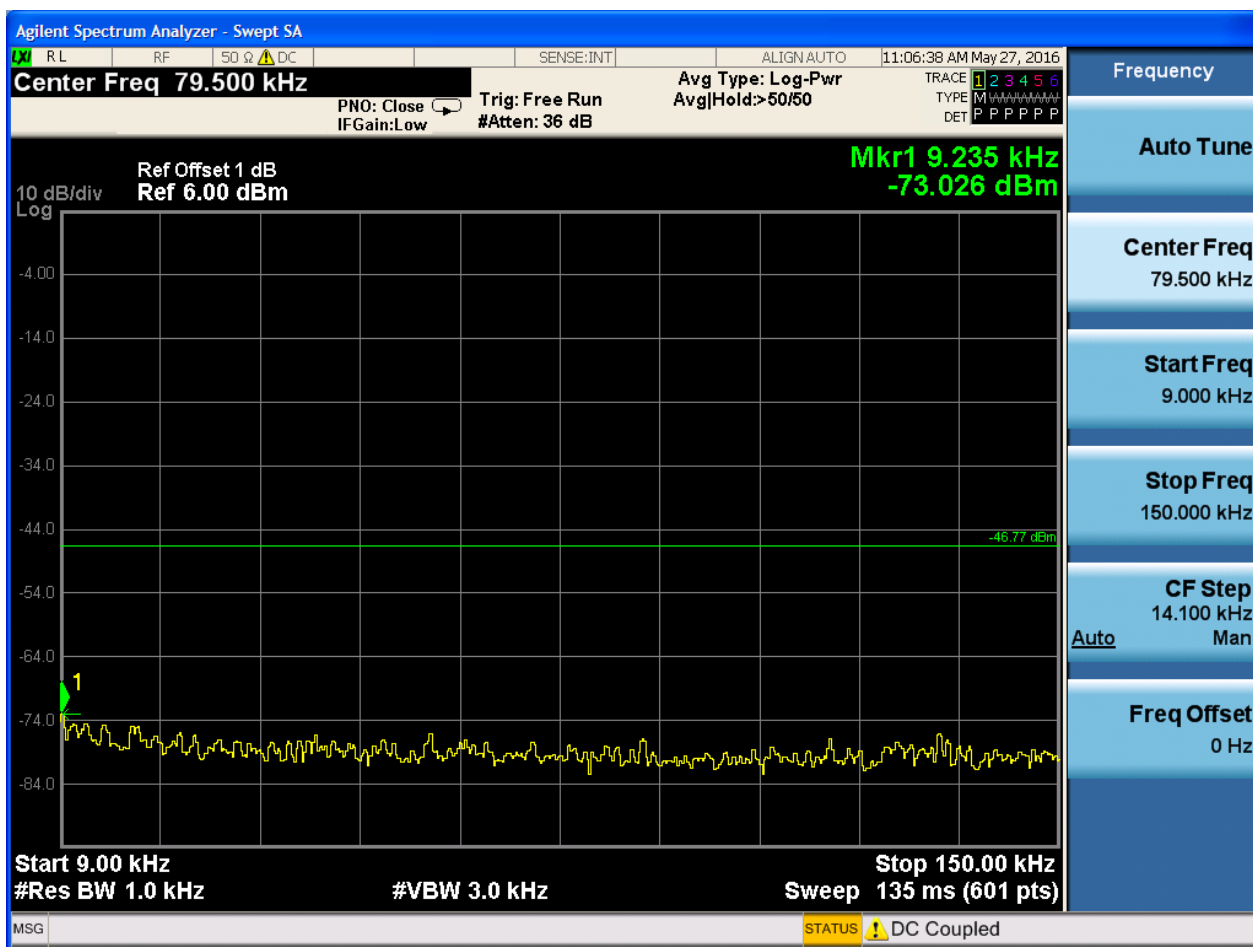
2.9 11G_M@Ant 1

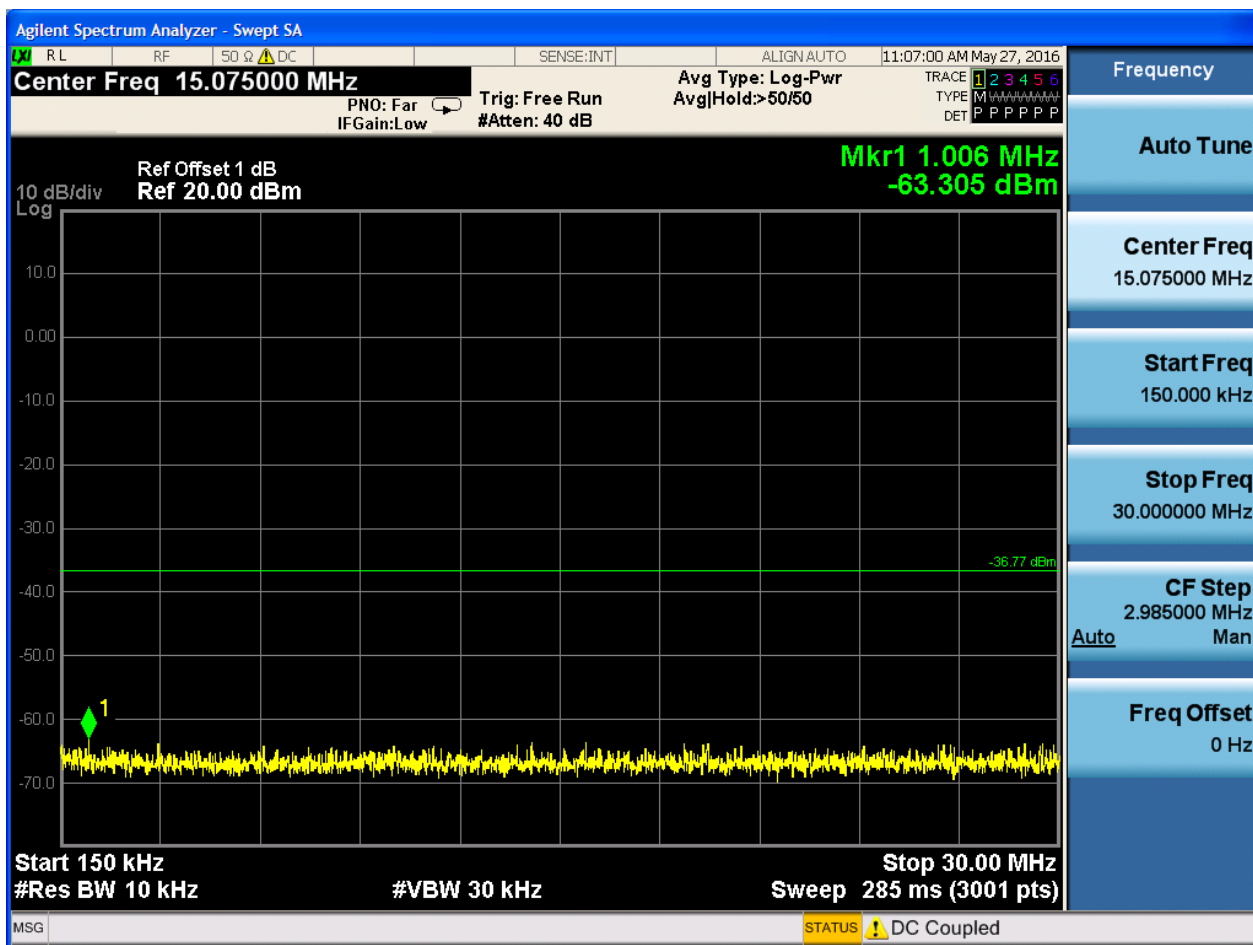
Pref:

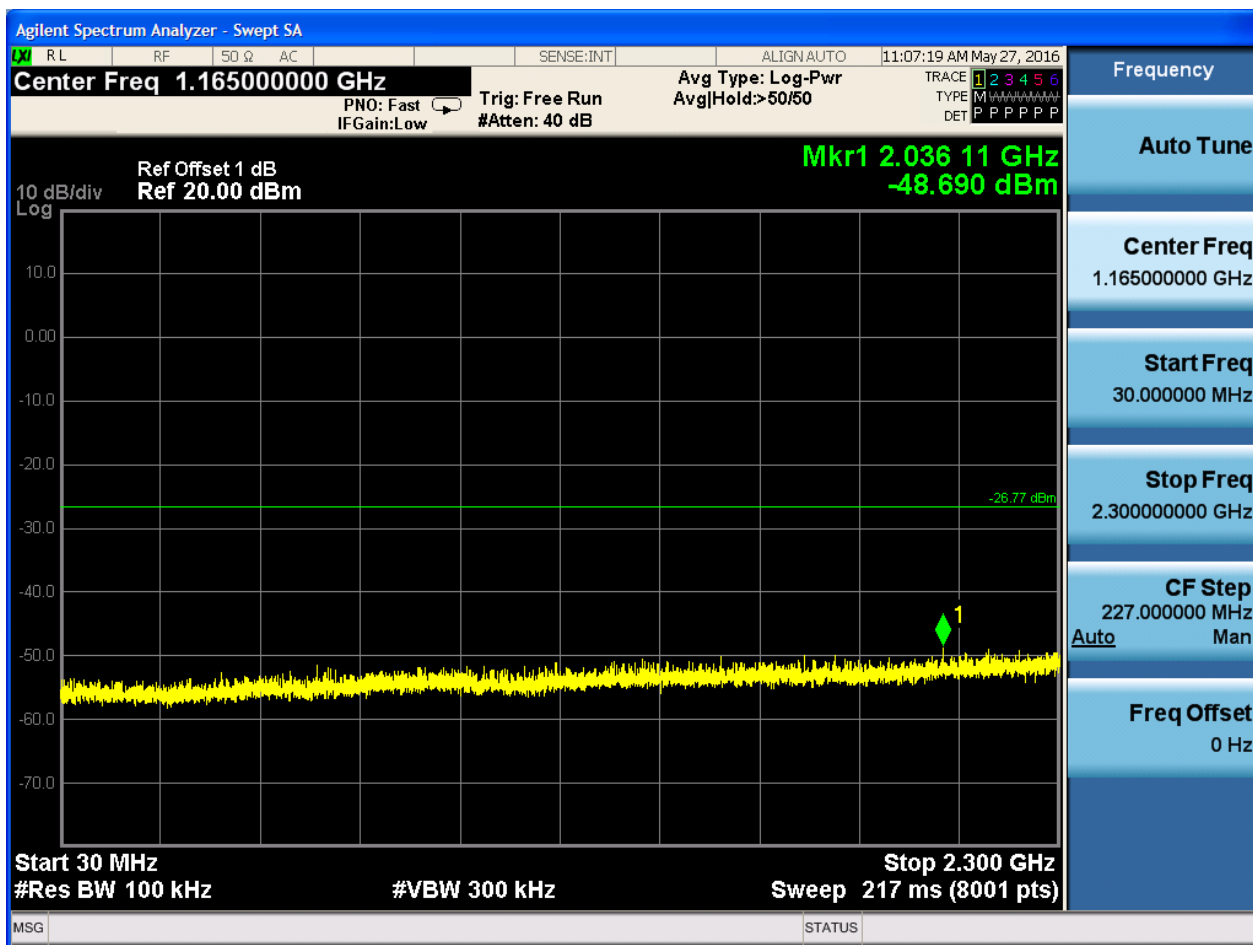


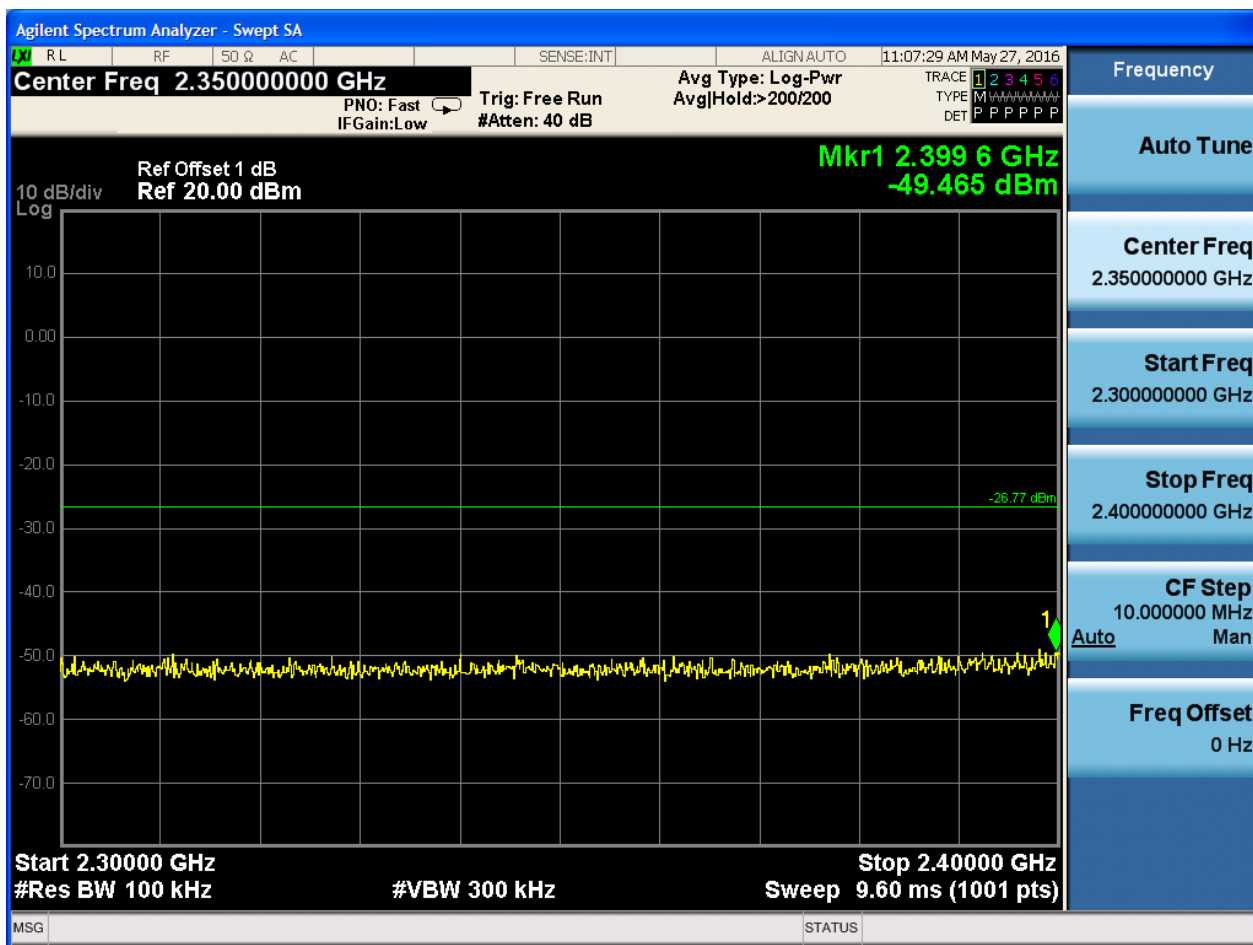


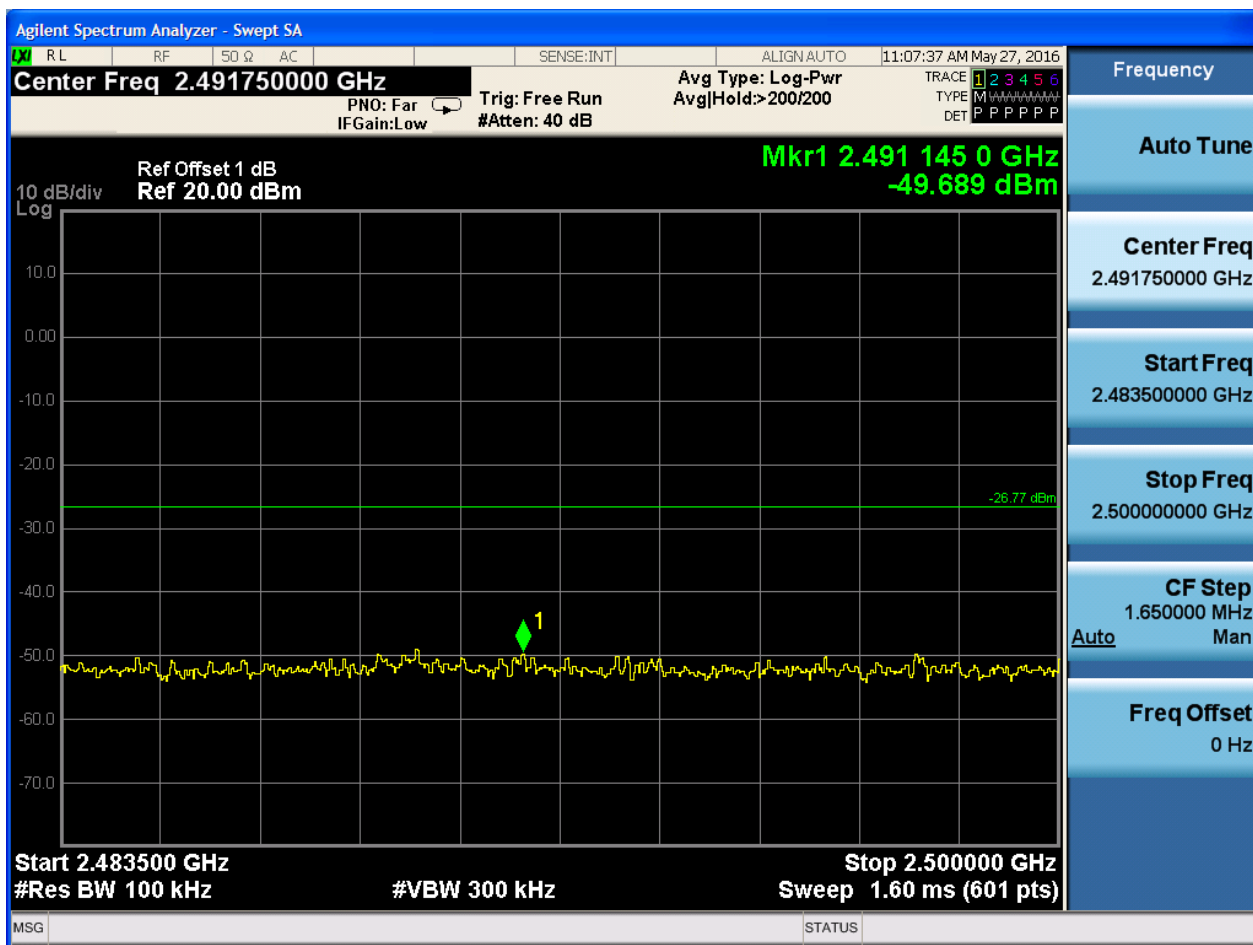
Puw:

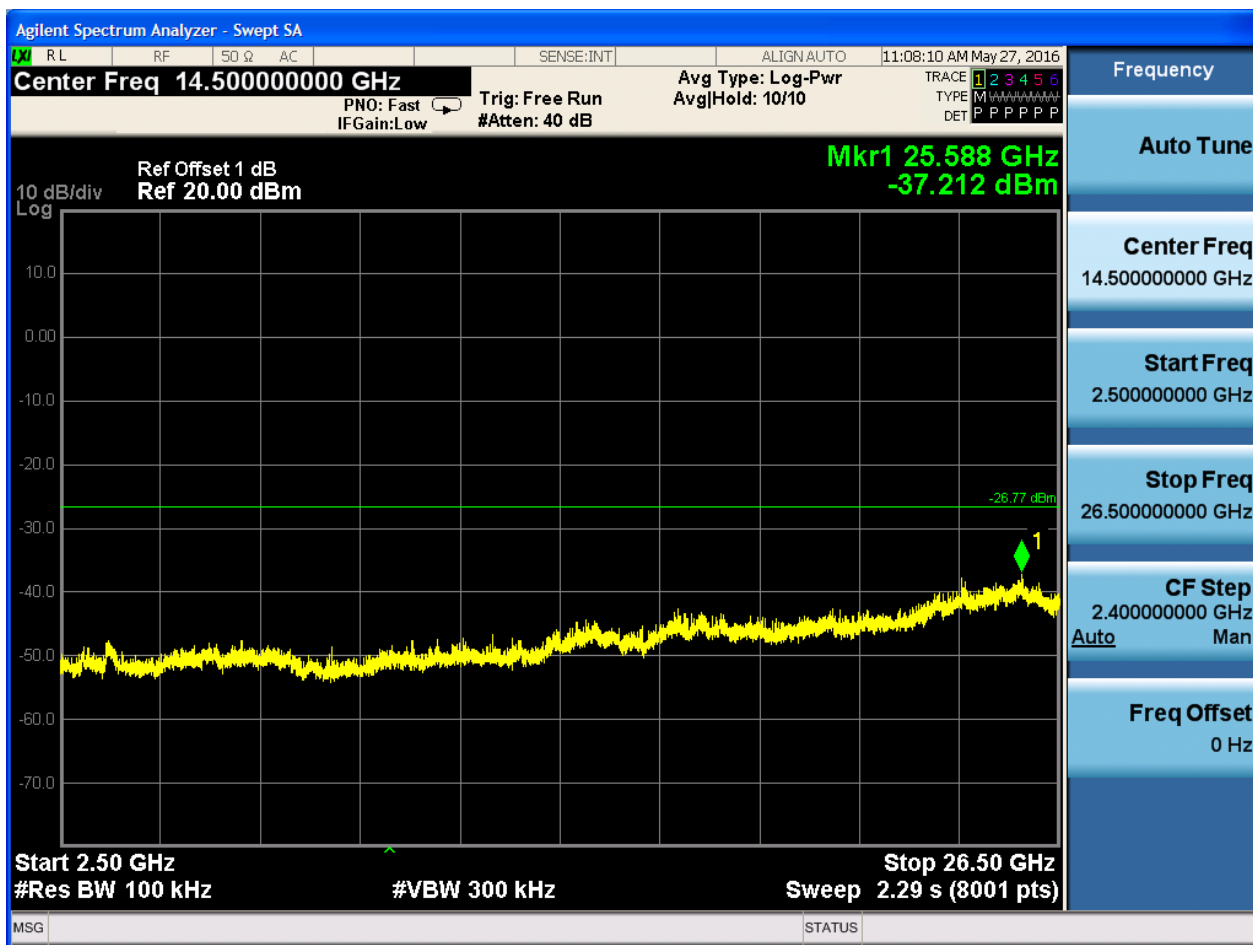






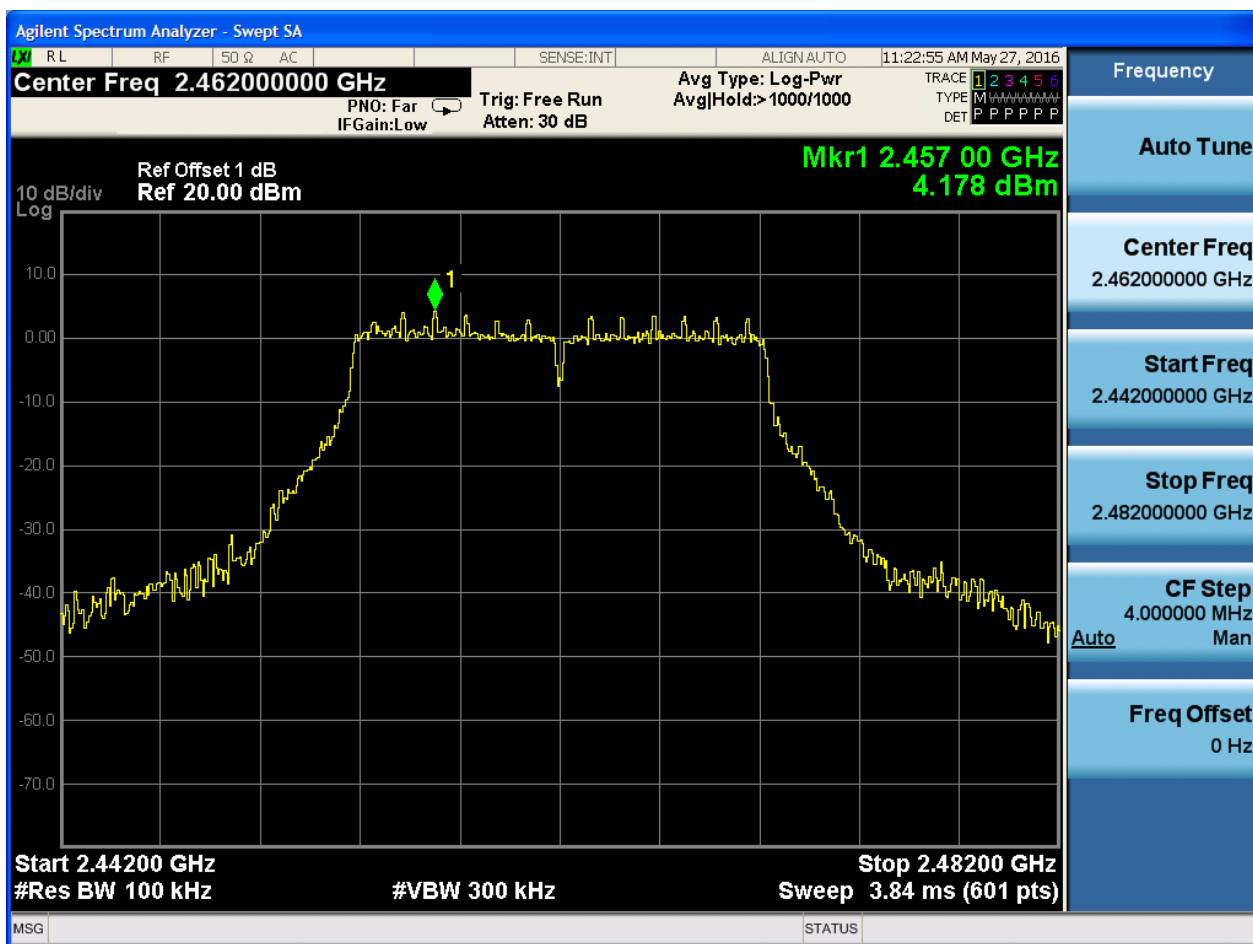






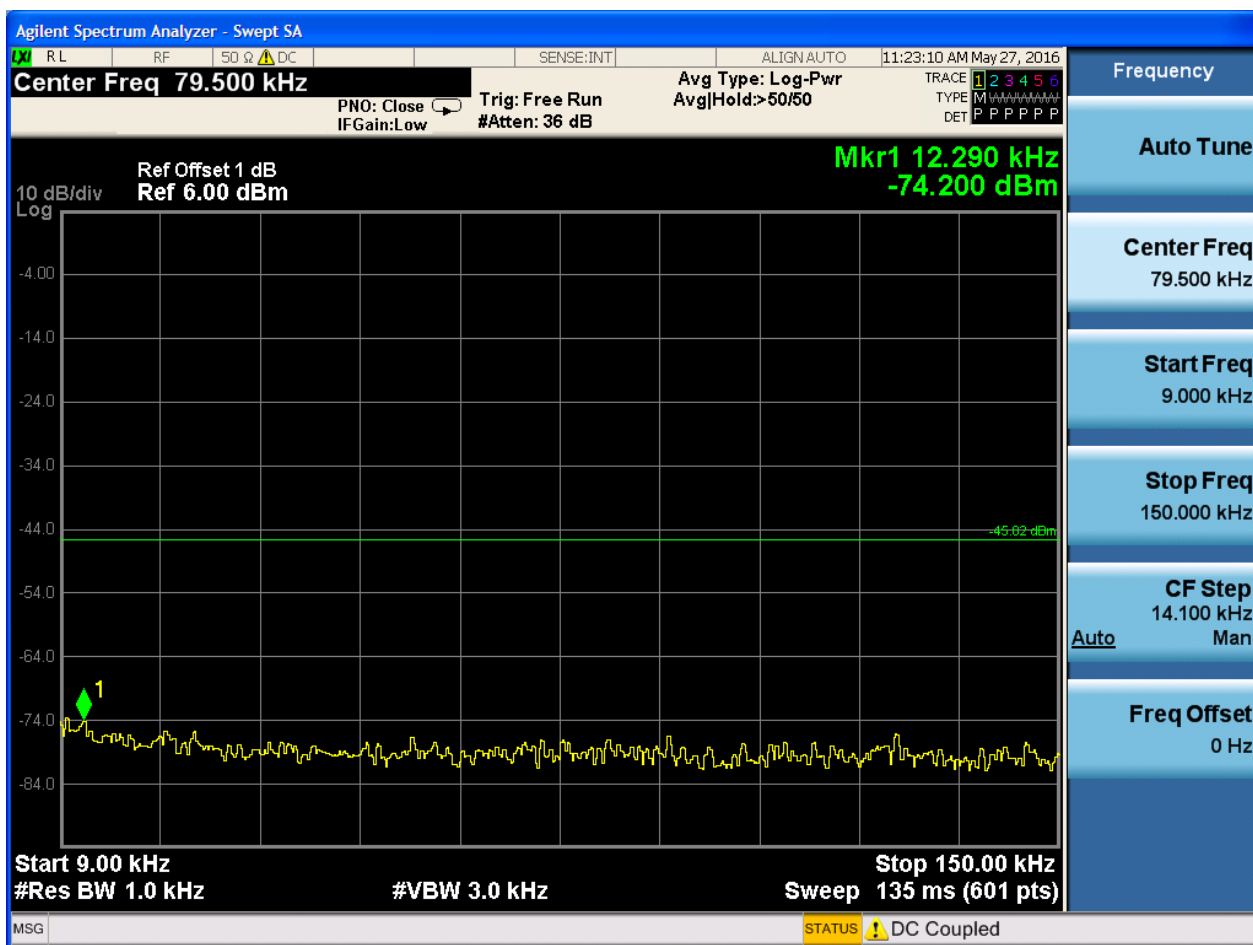
2.11 11G_H@Ant 1

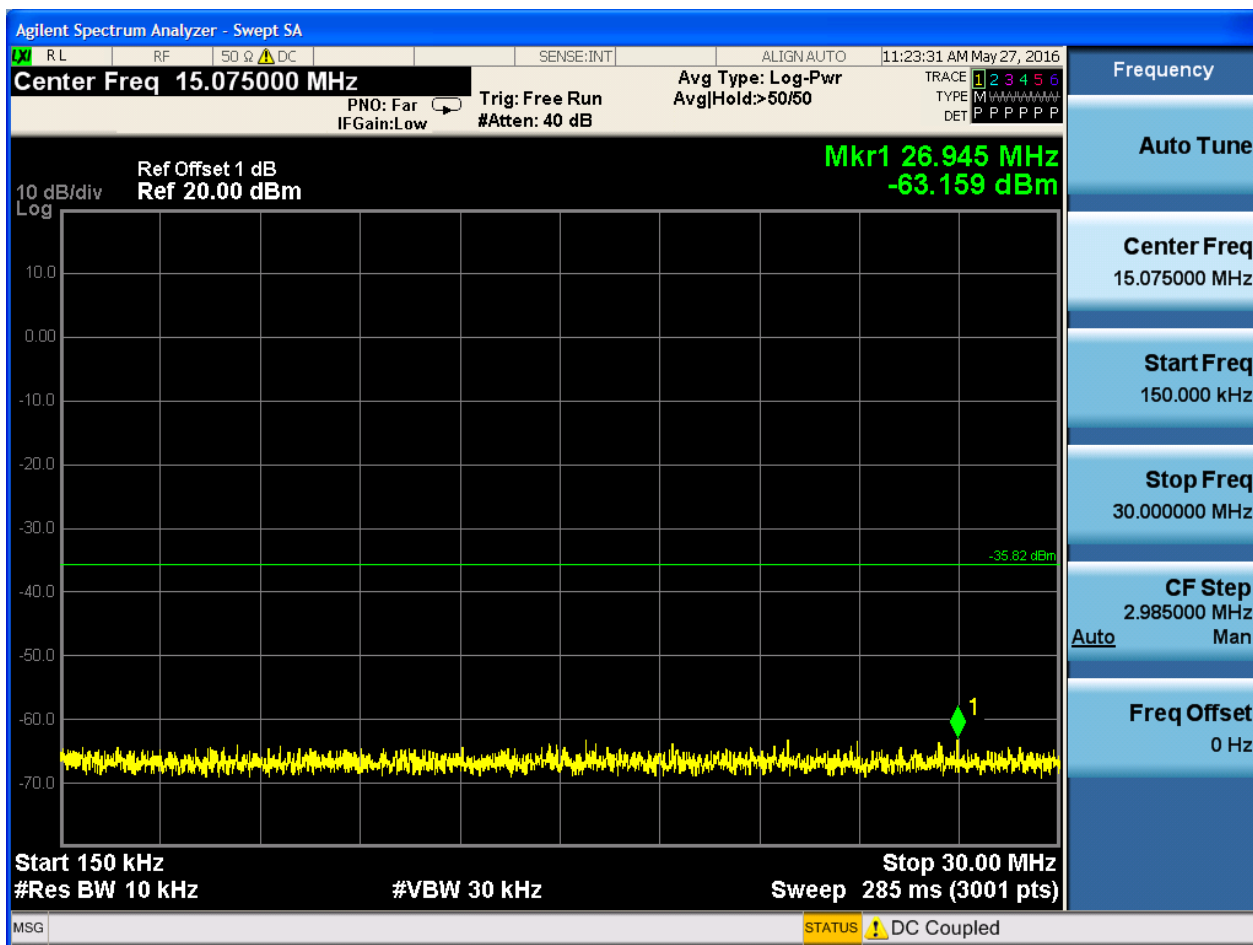
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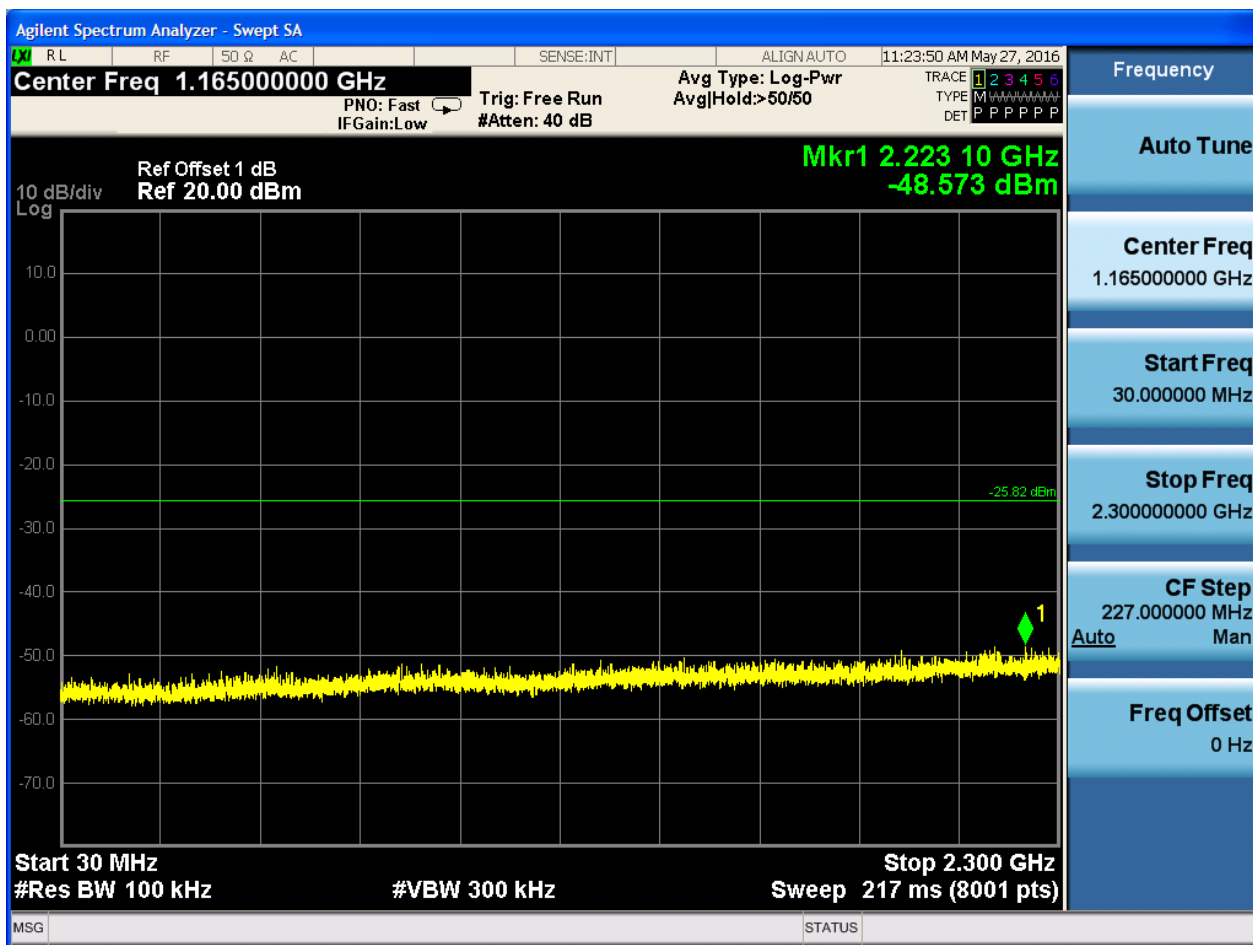


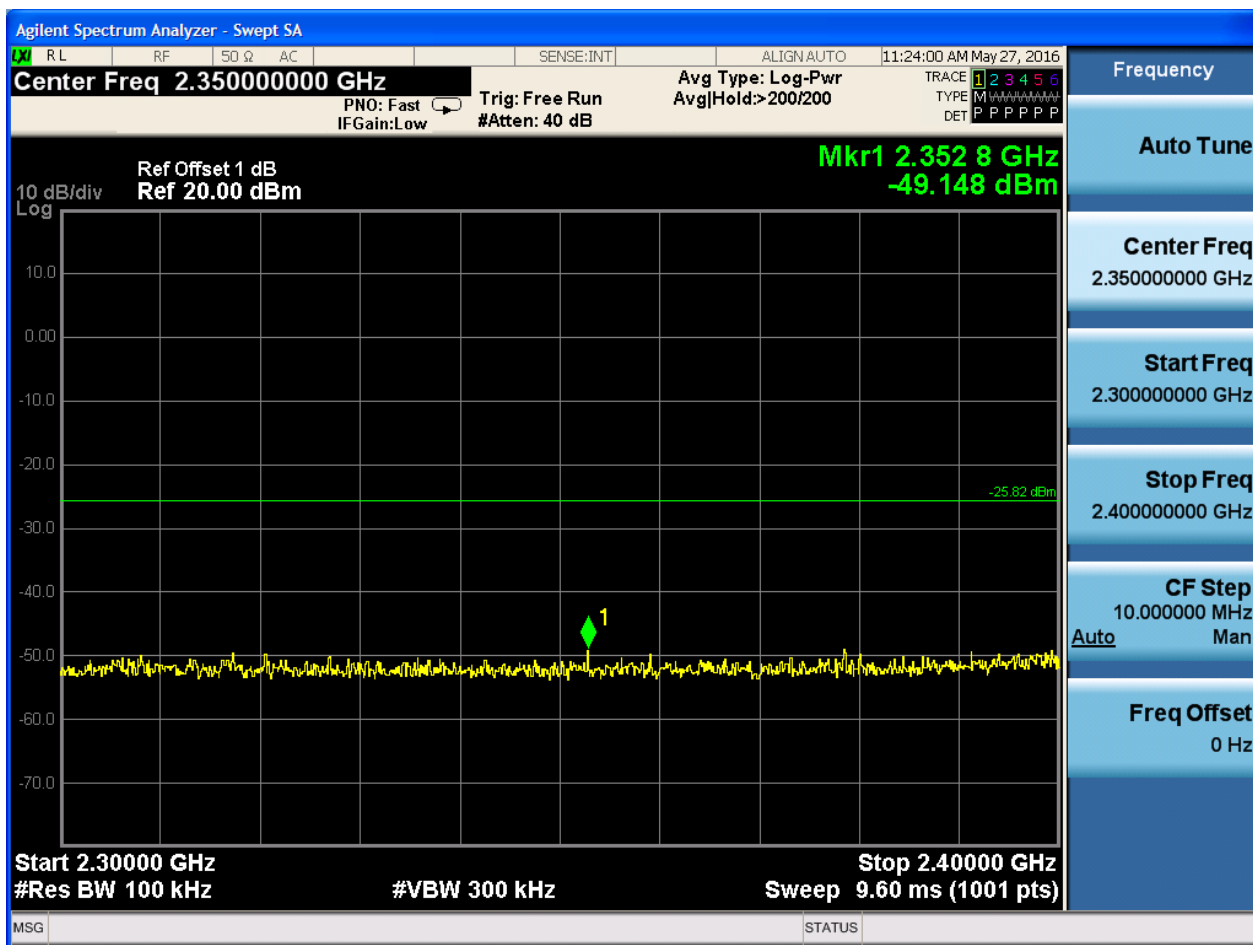


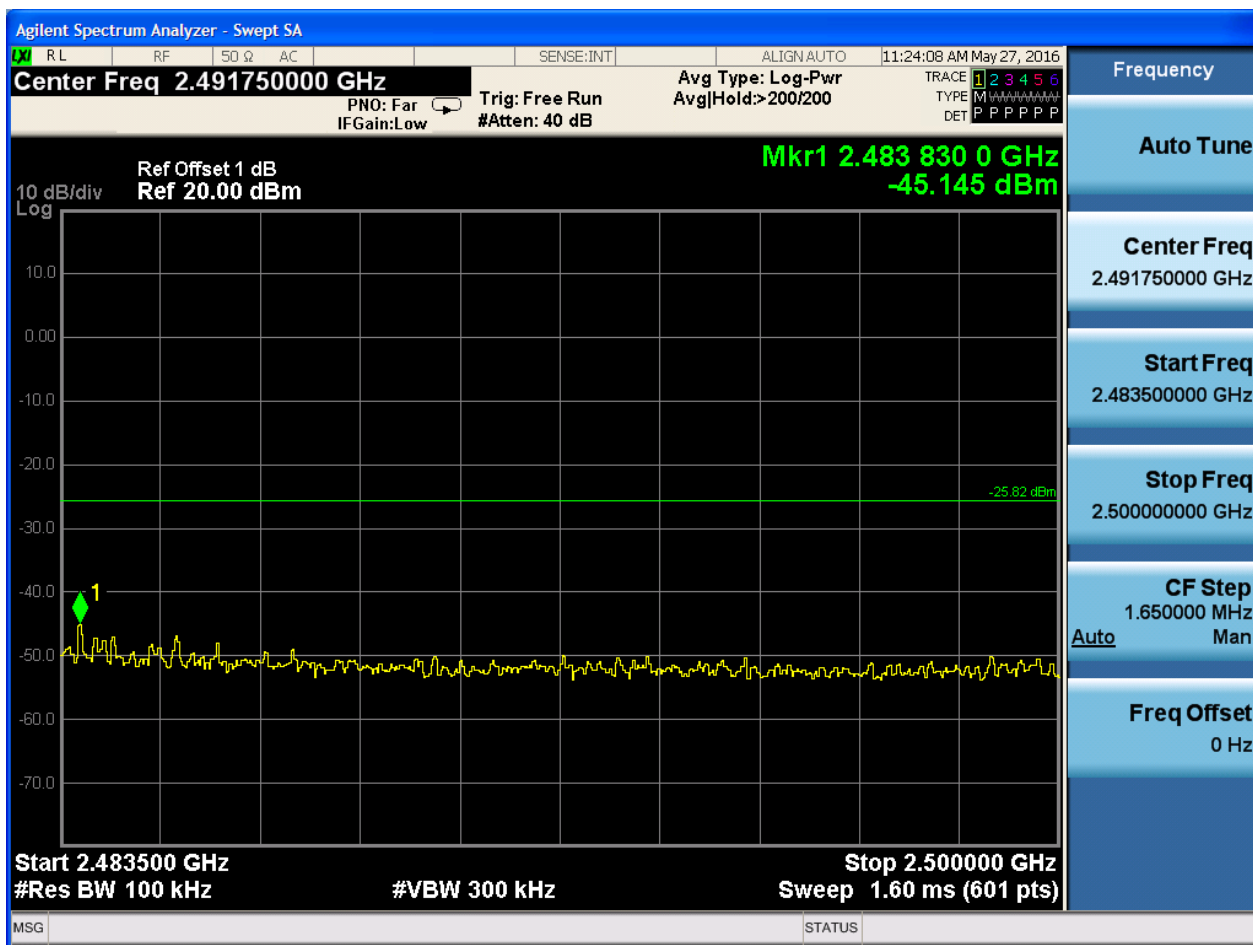
Puw:







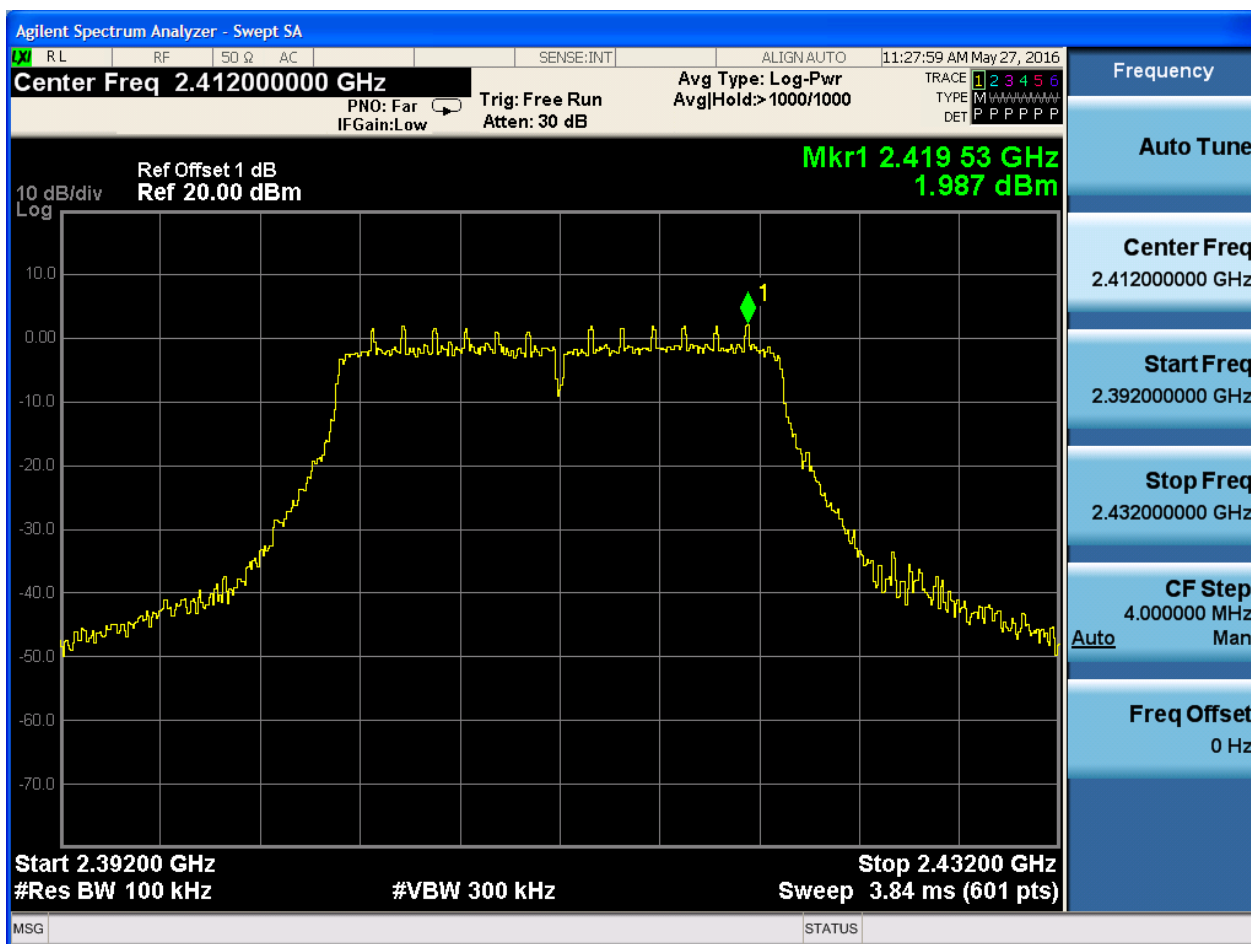






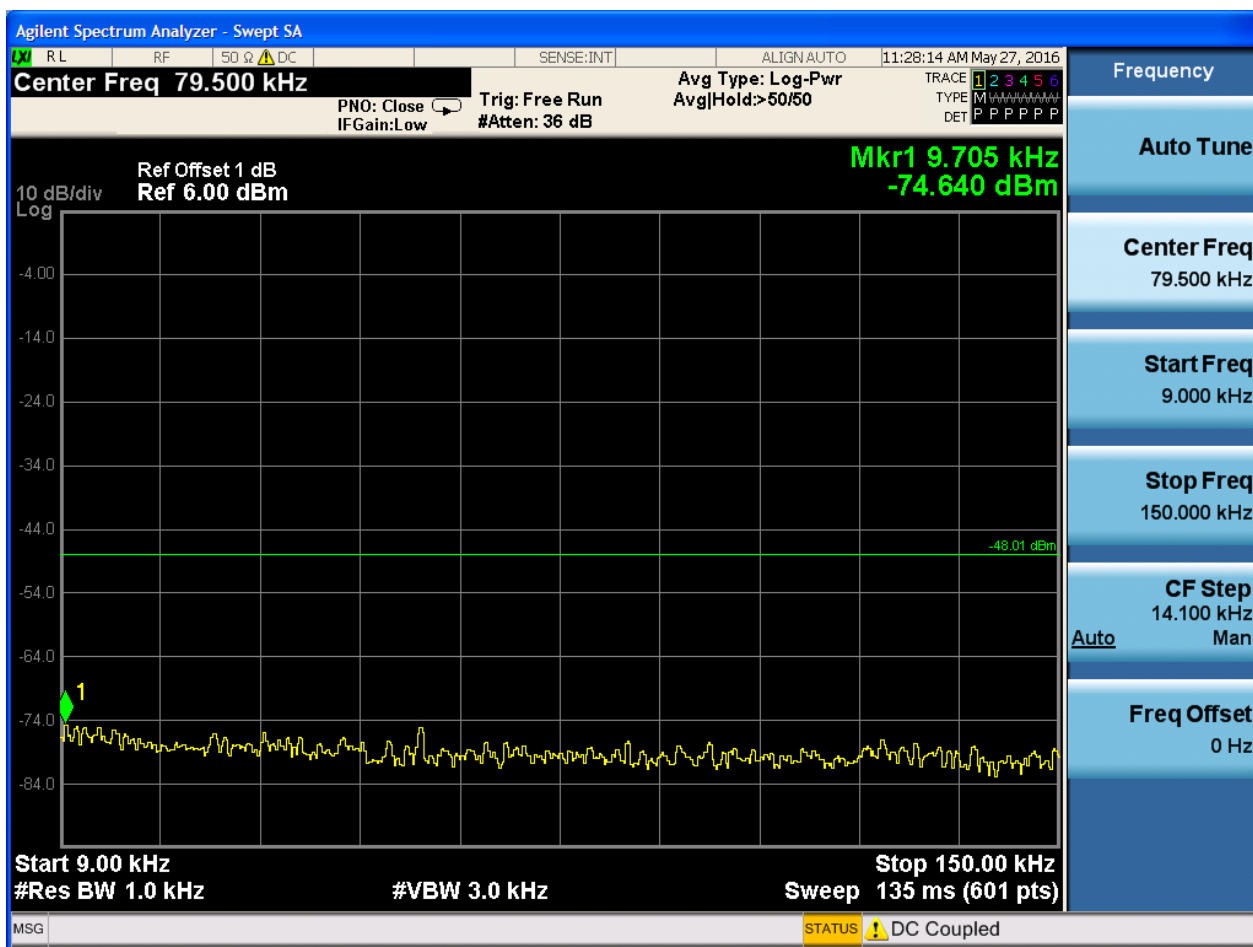
2.13 11N20_L@Ant 1

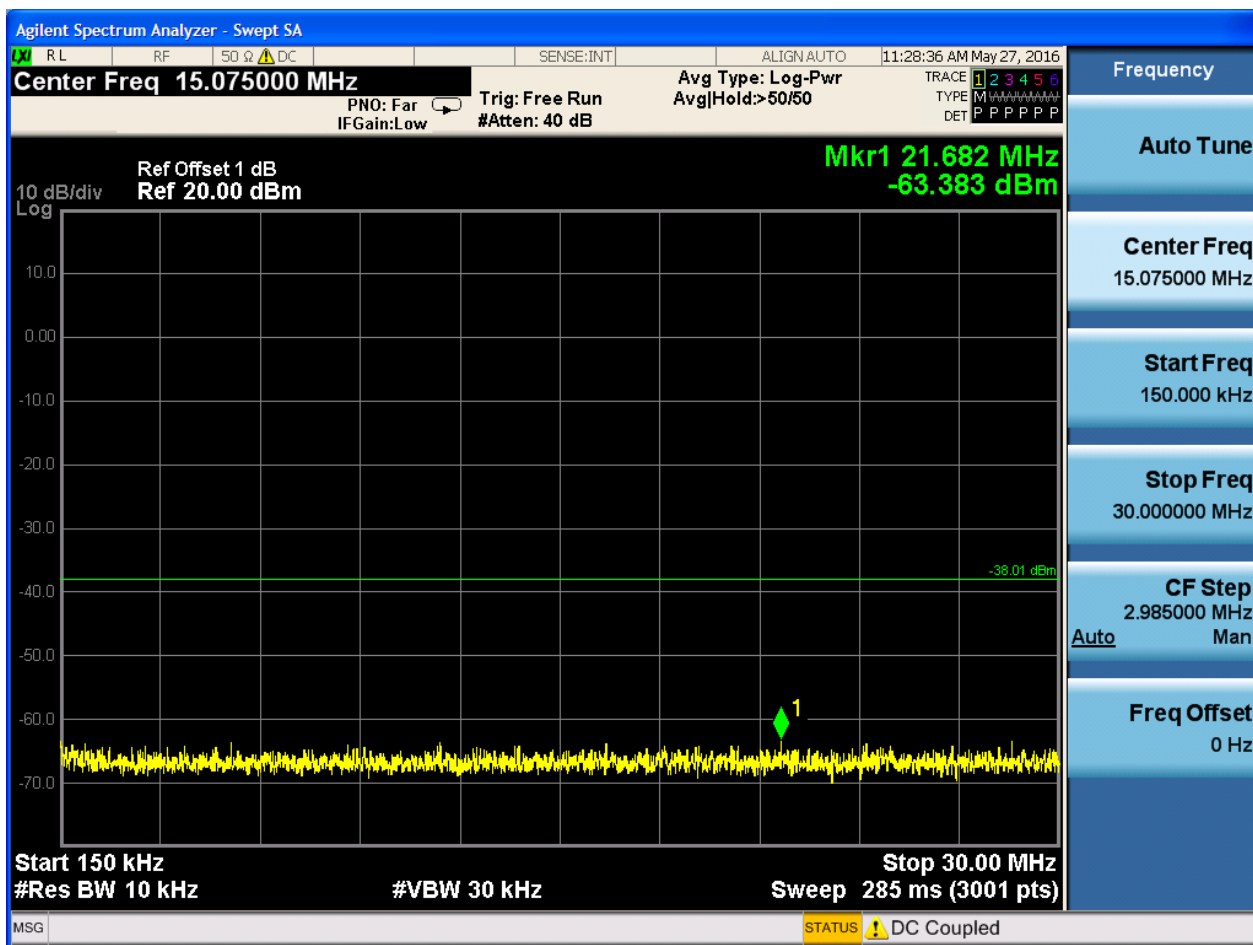
Pref:

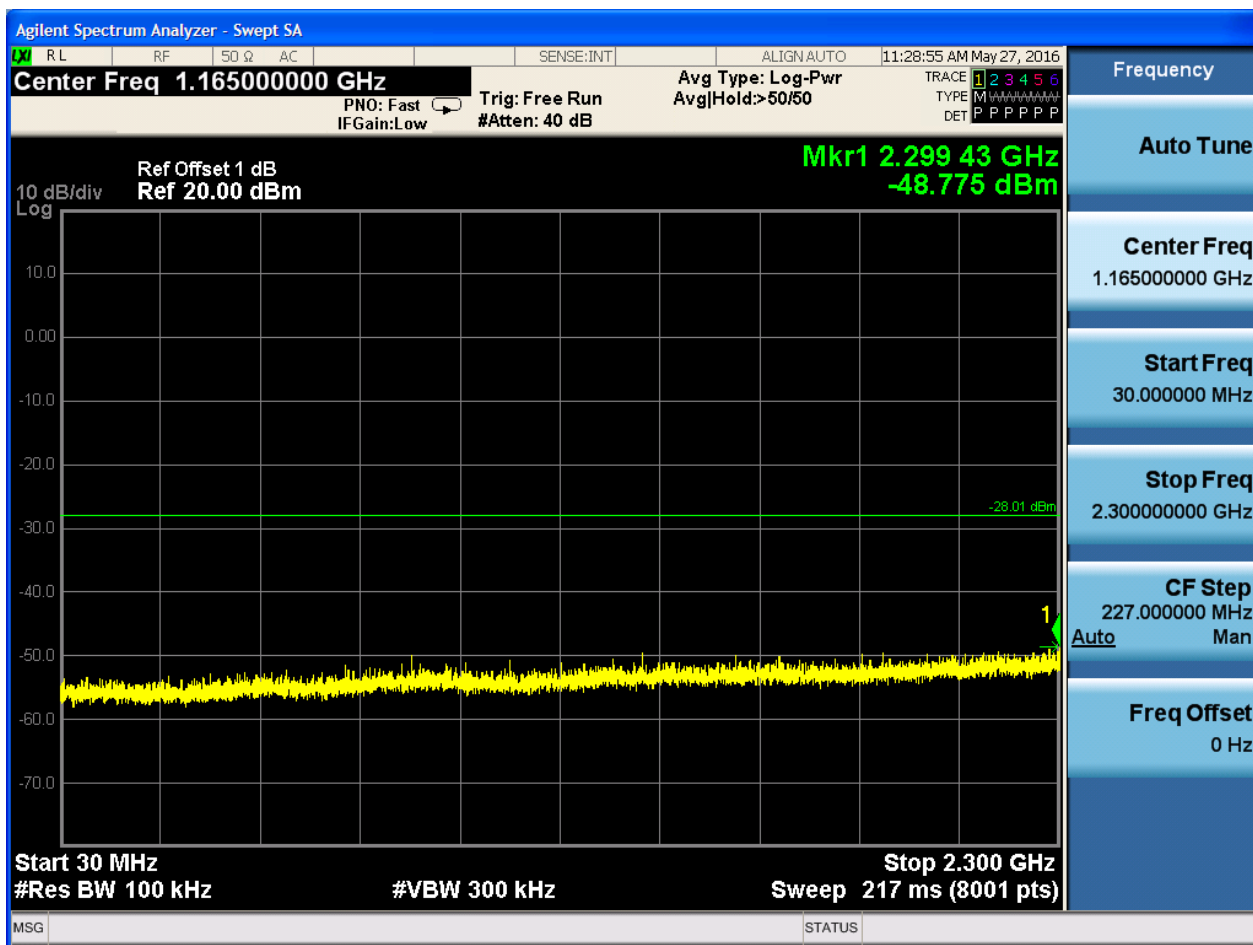


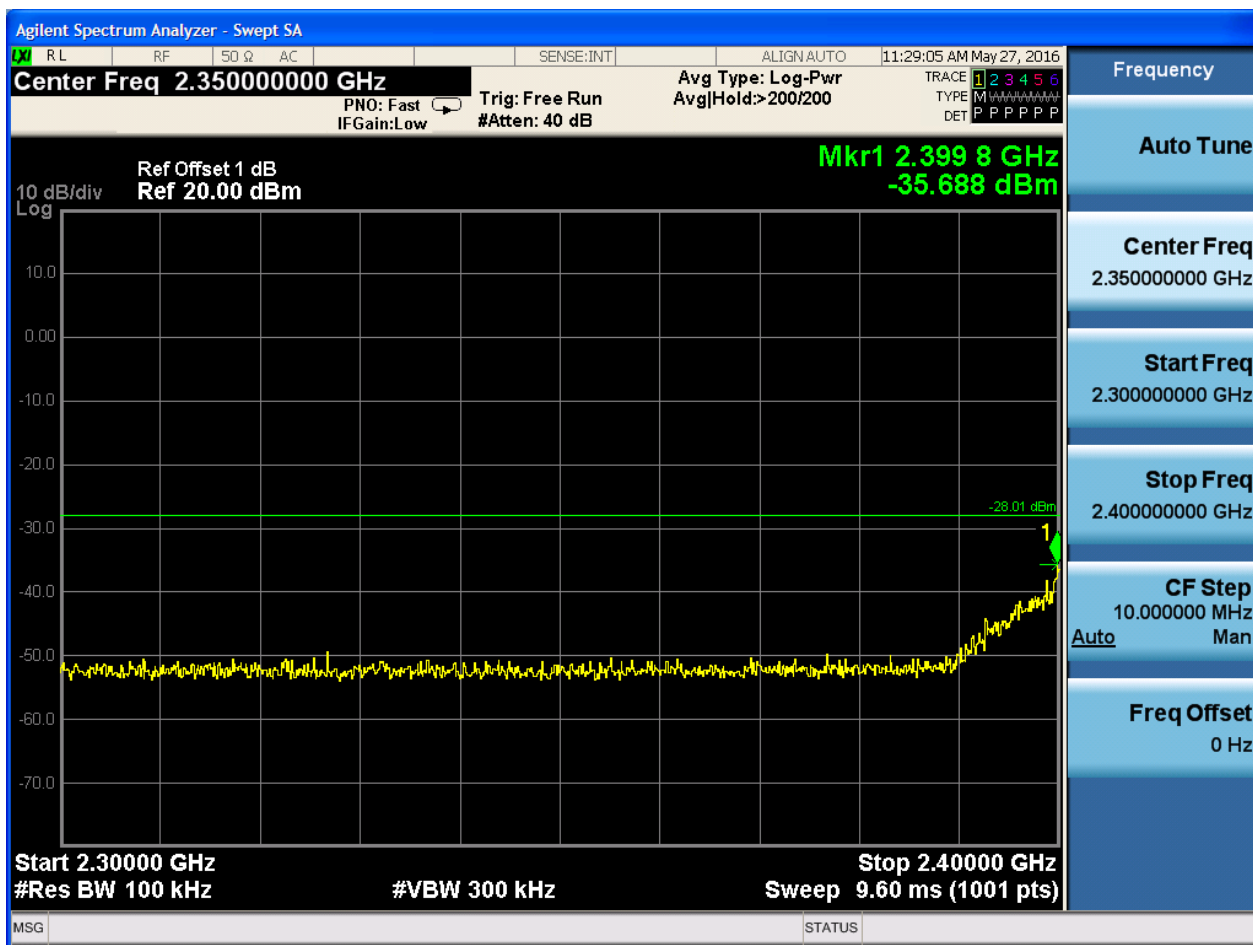


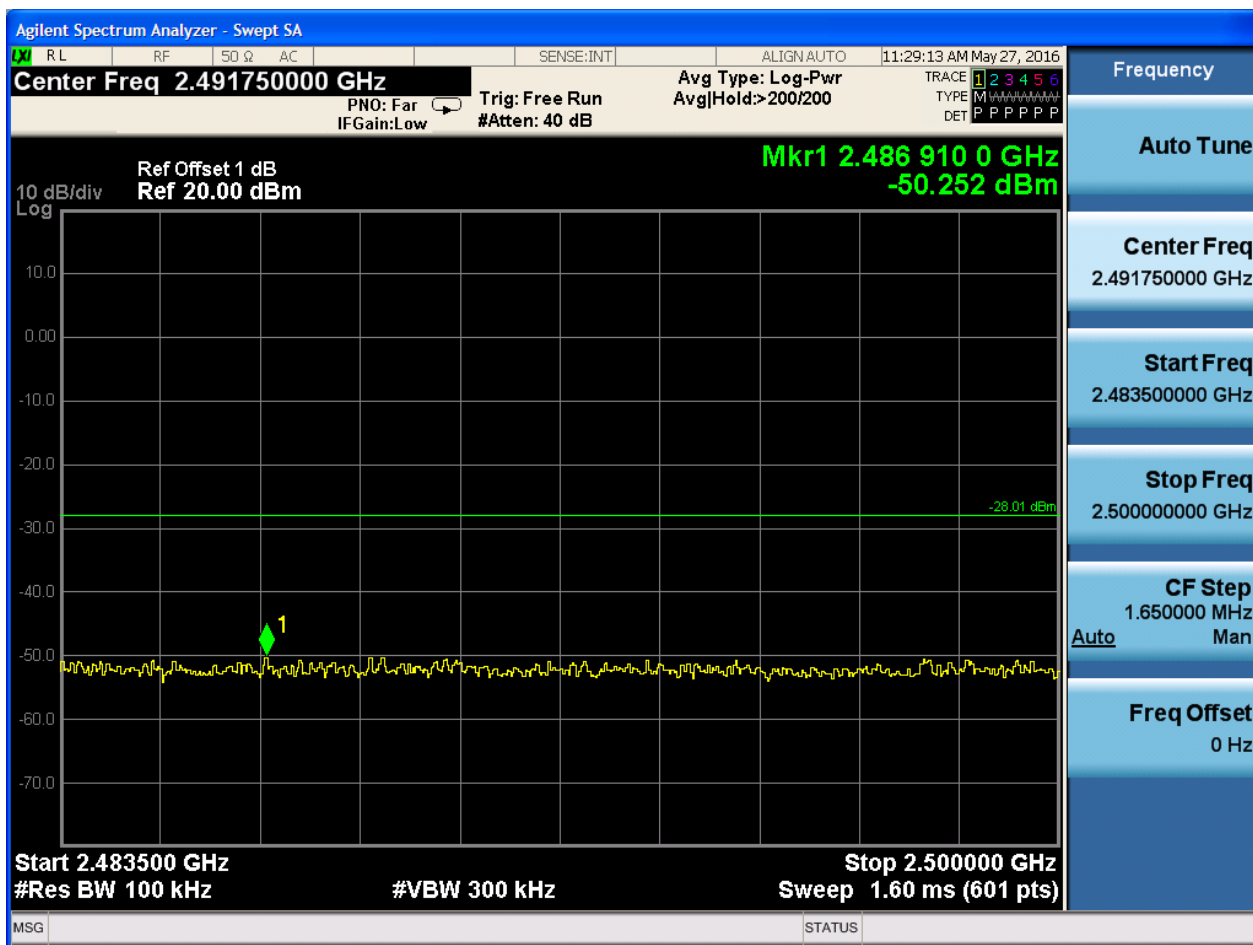
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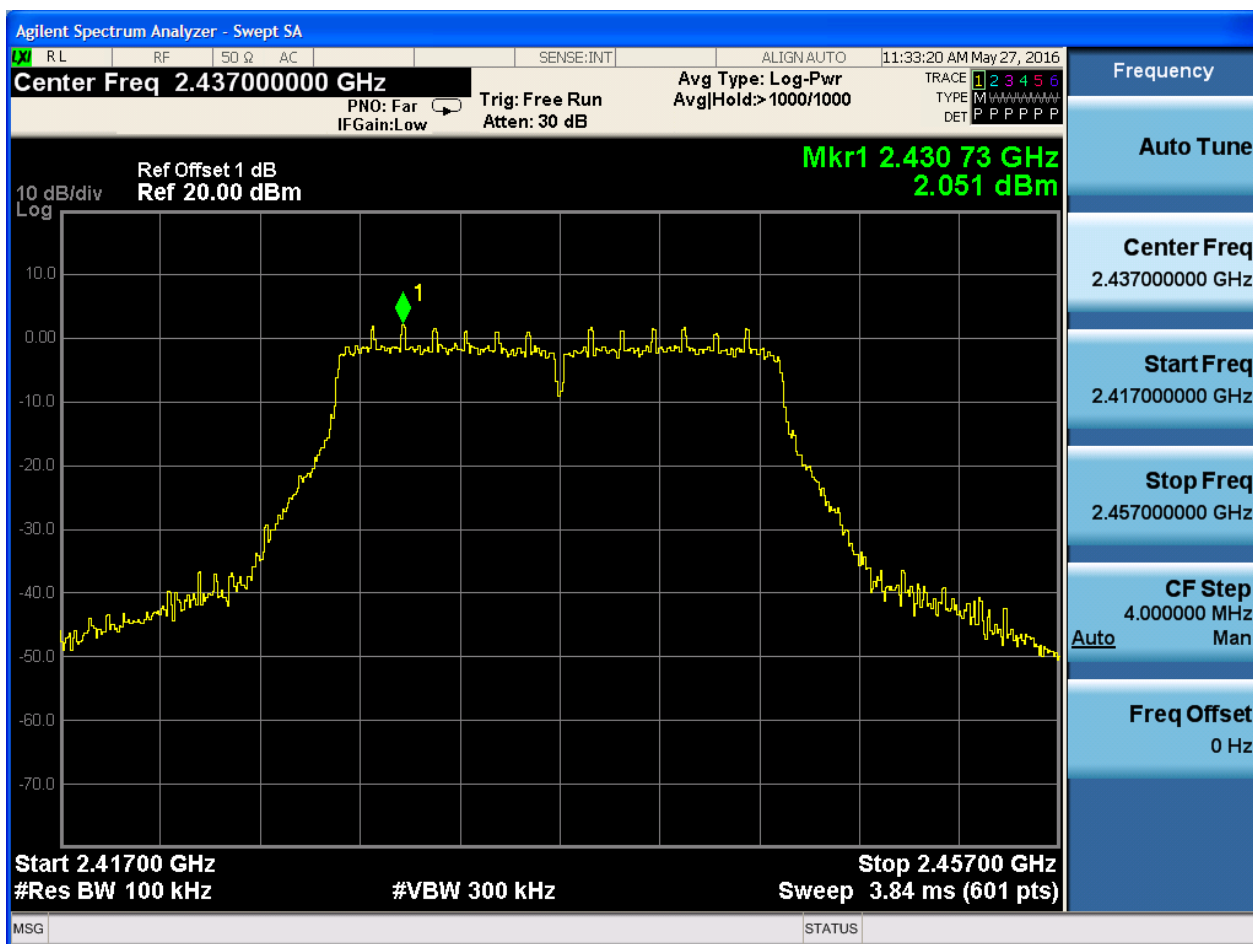






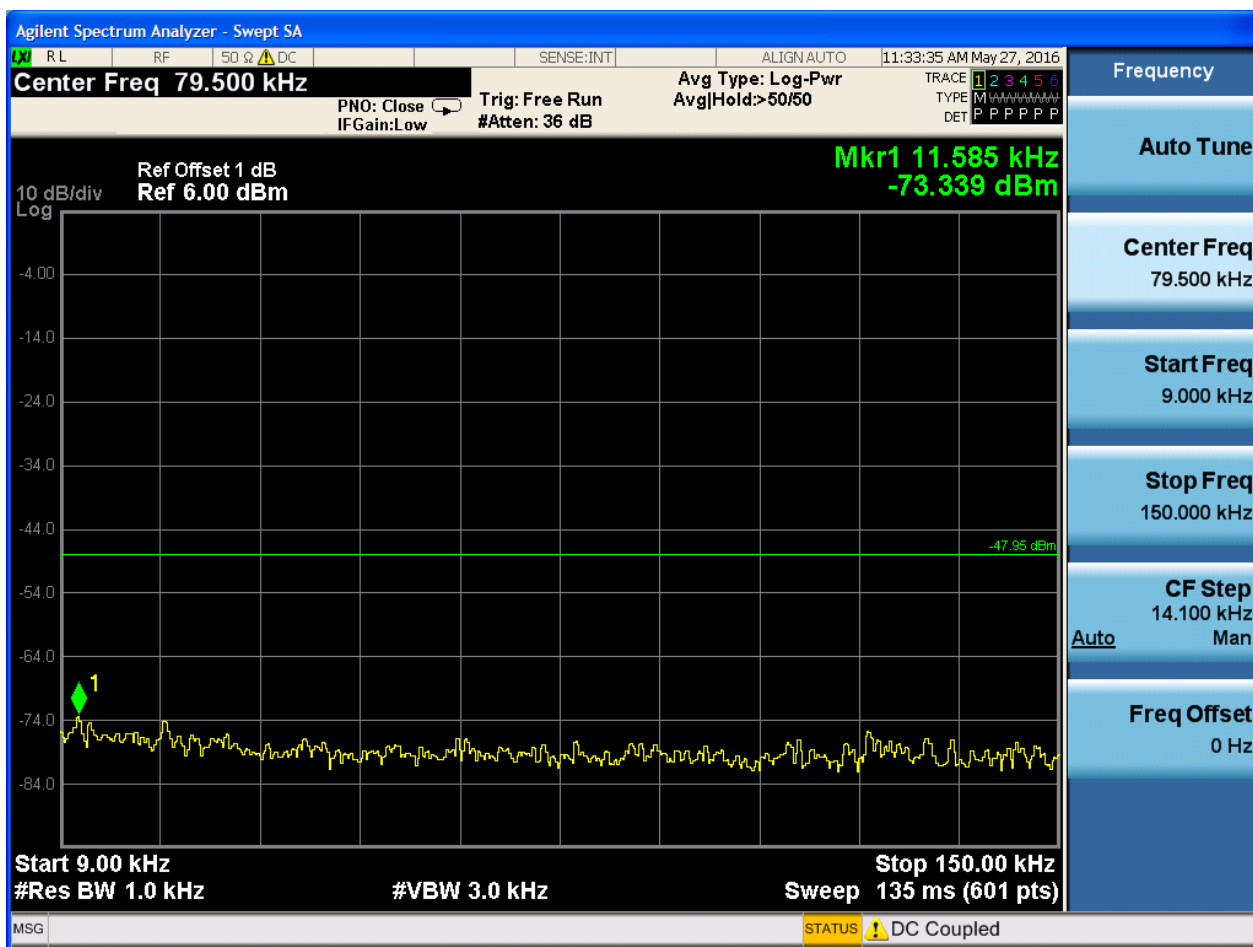
2.15 11N20_M@Ant 1

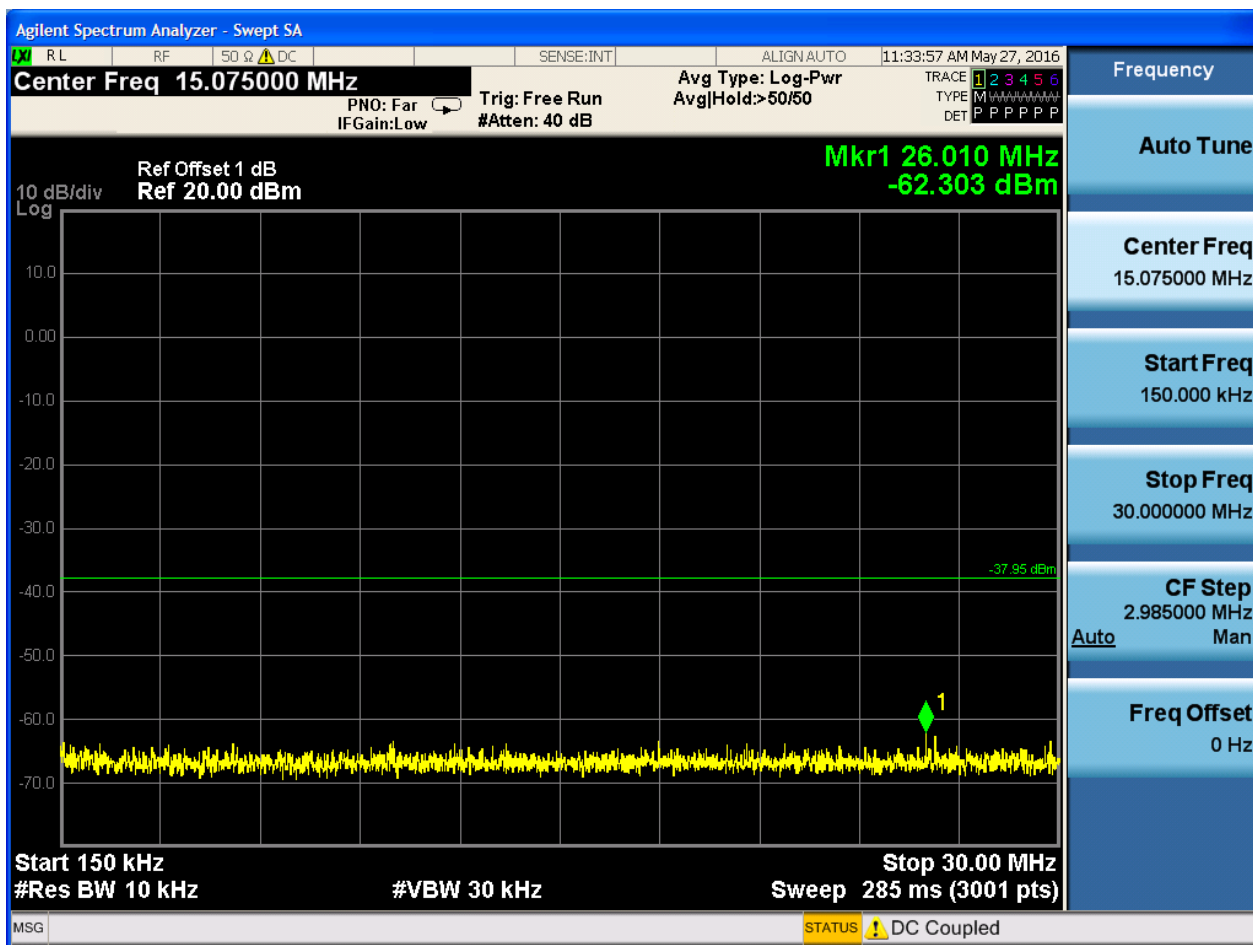
Pref:

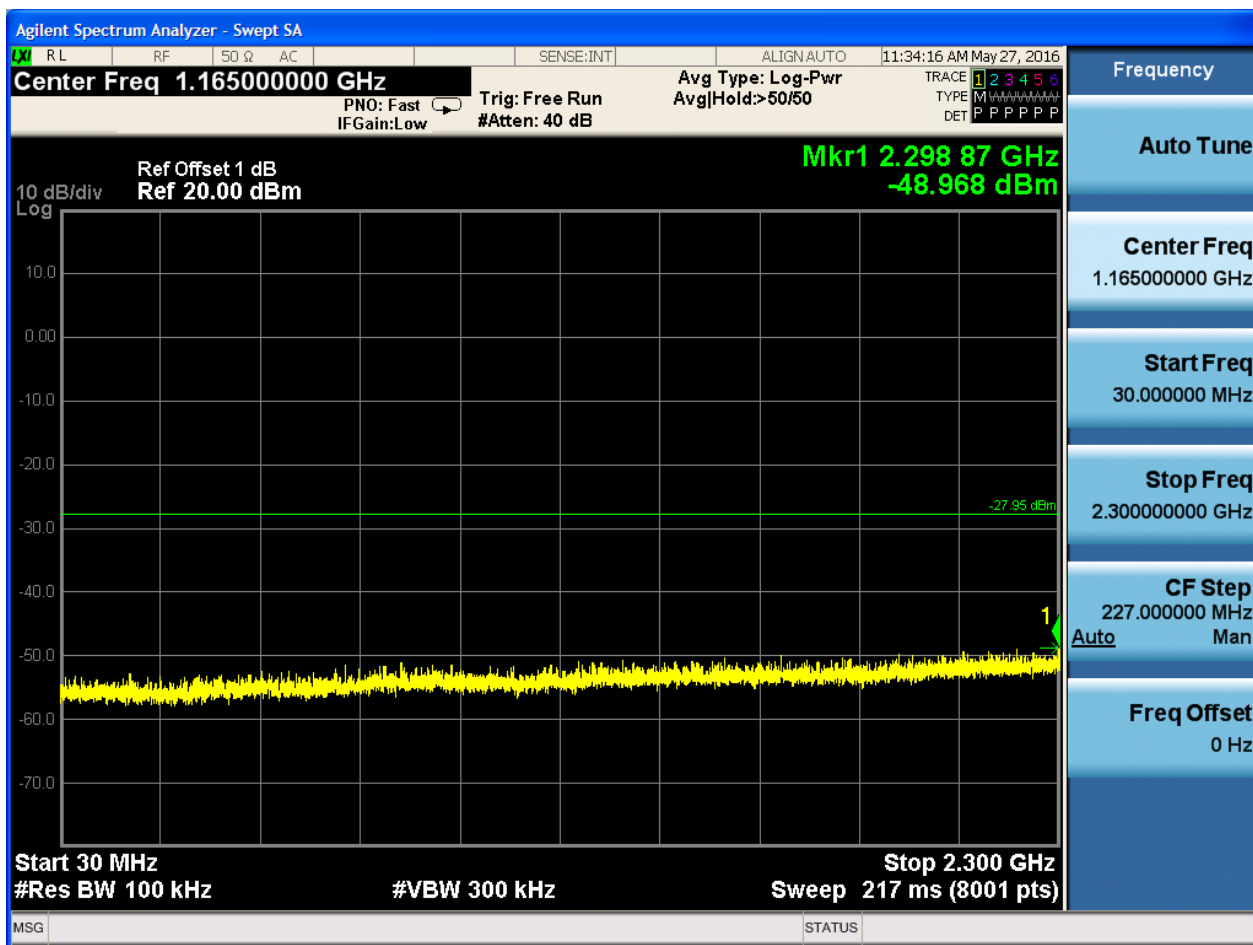


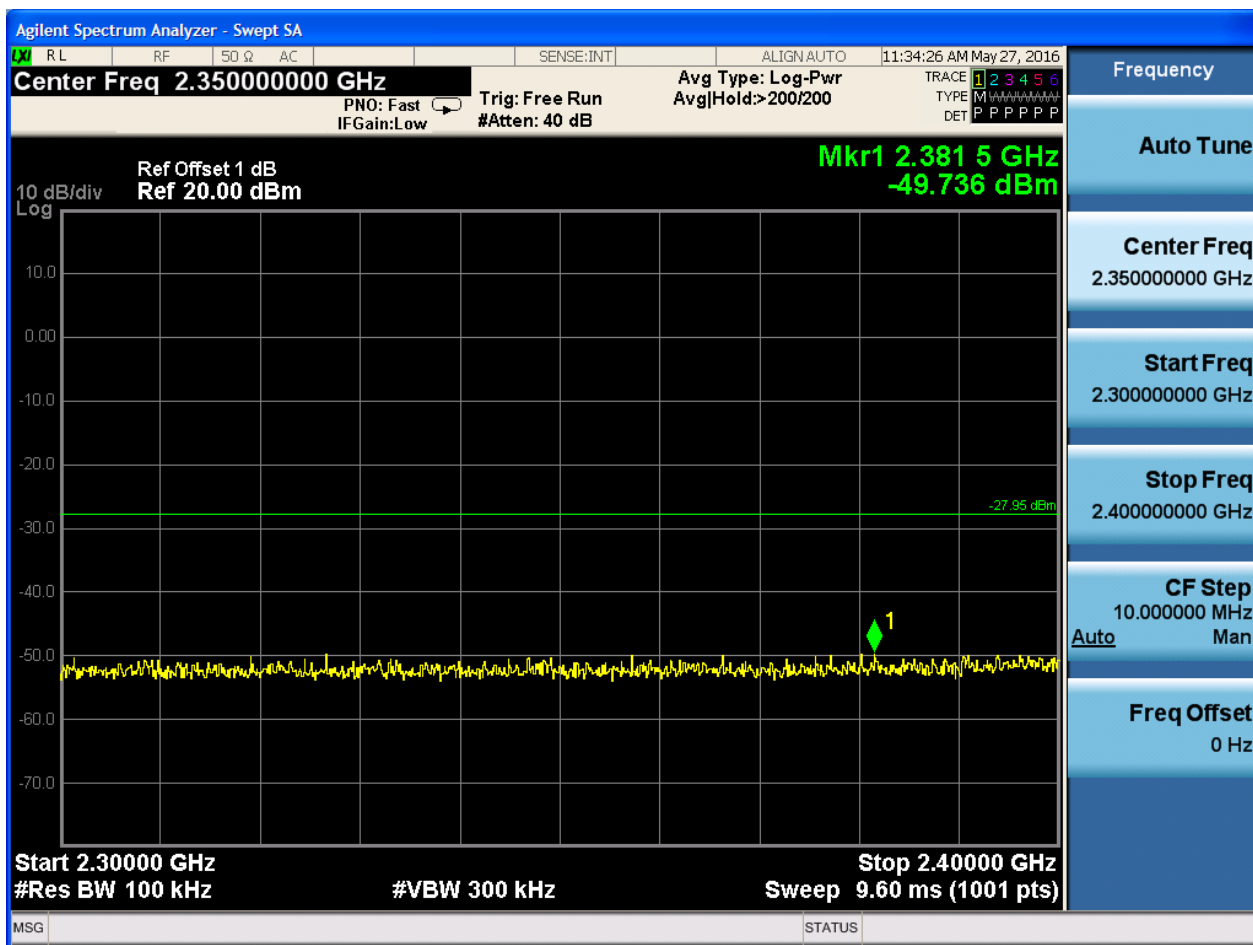


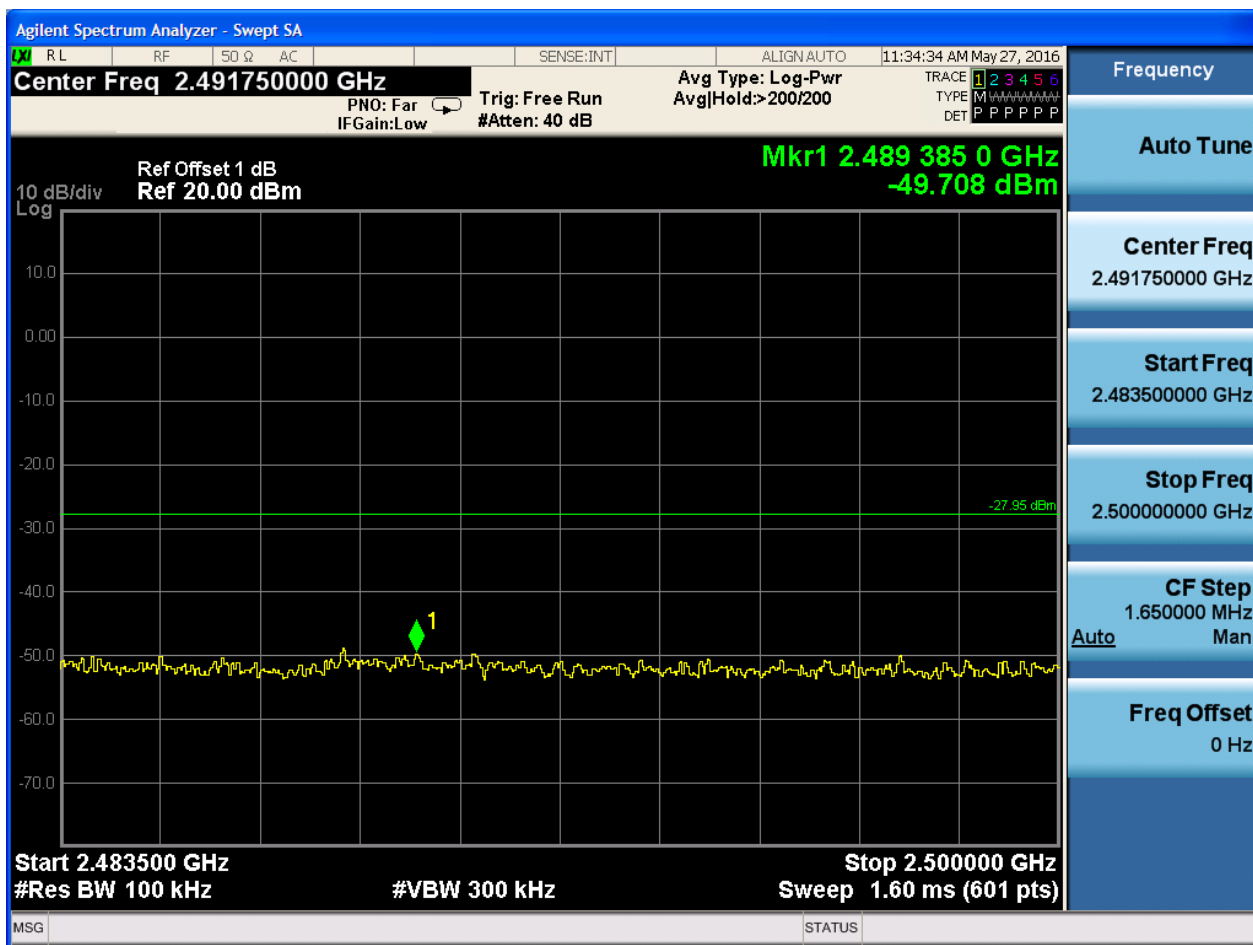
Puw:







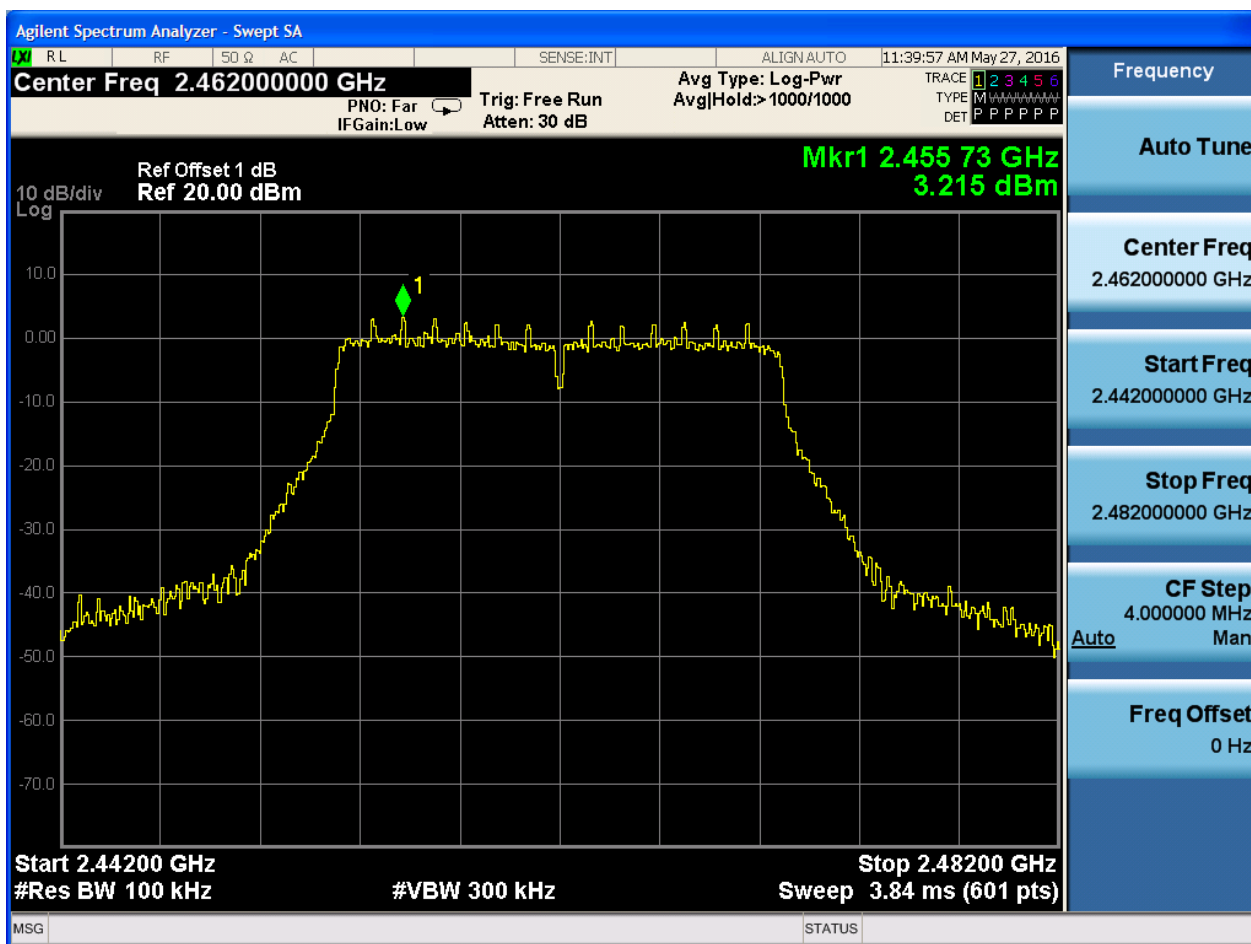






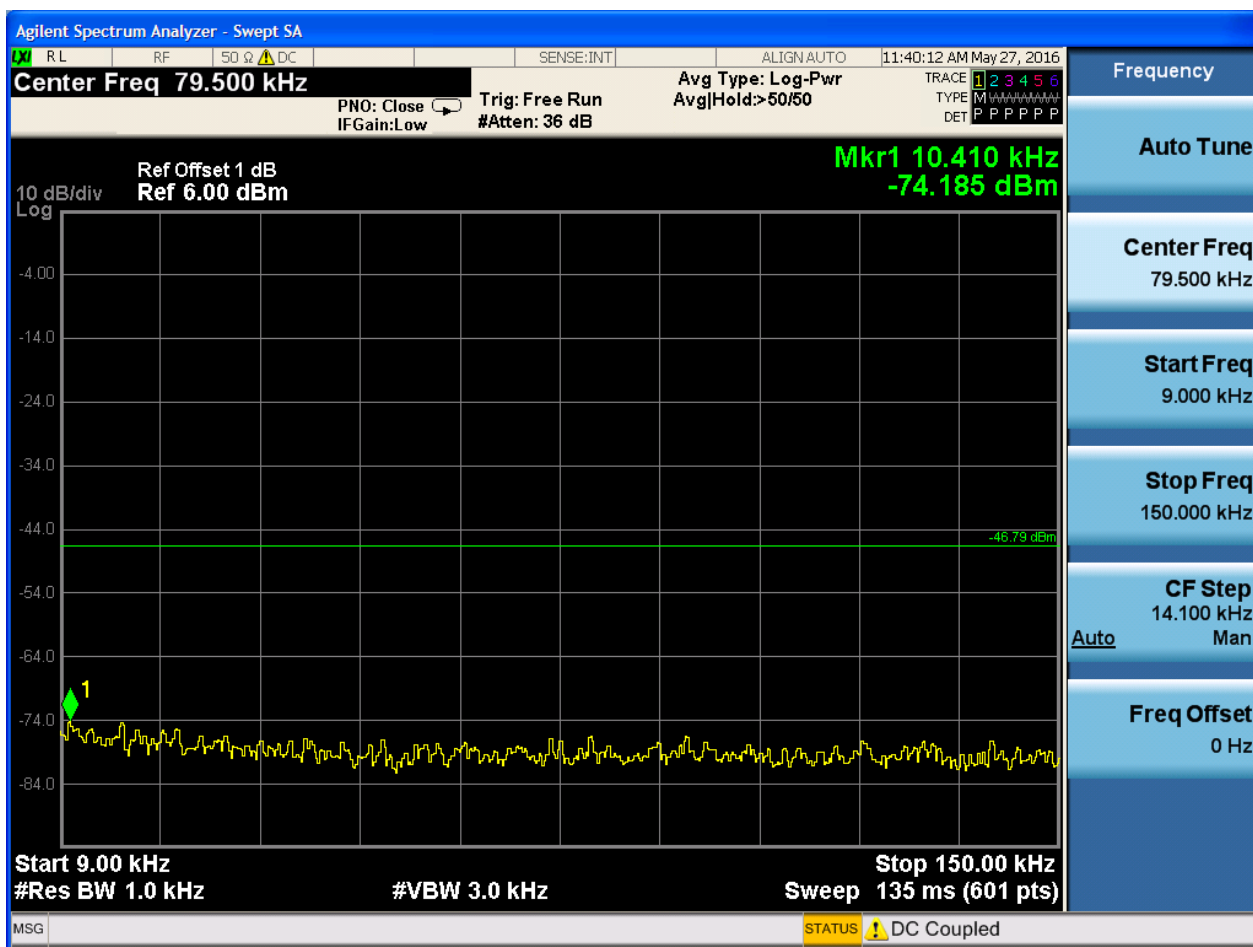
2.17 11N20_H@Ant 1

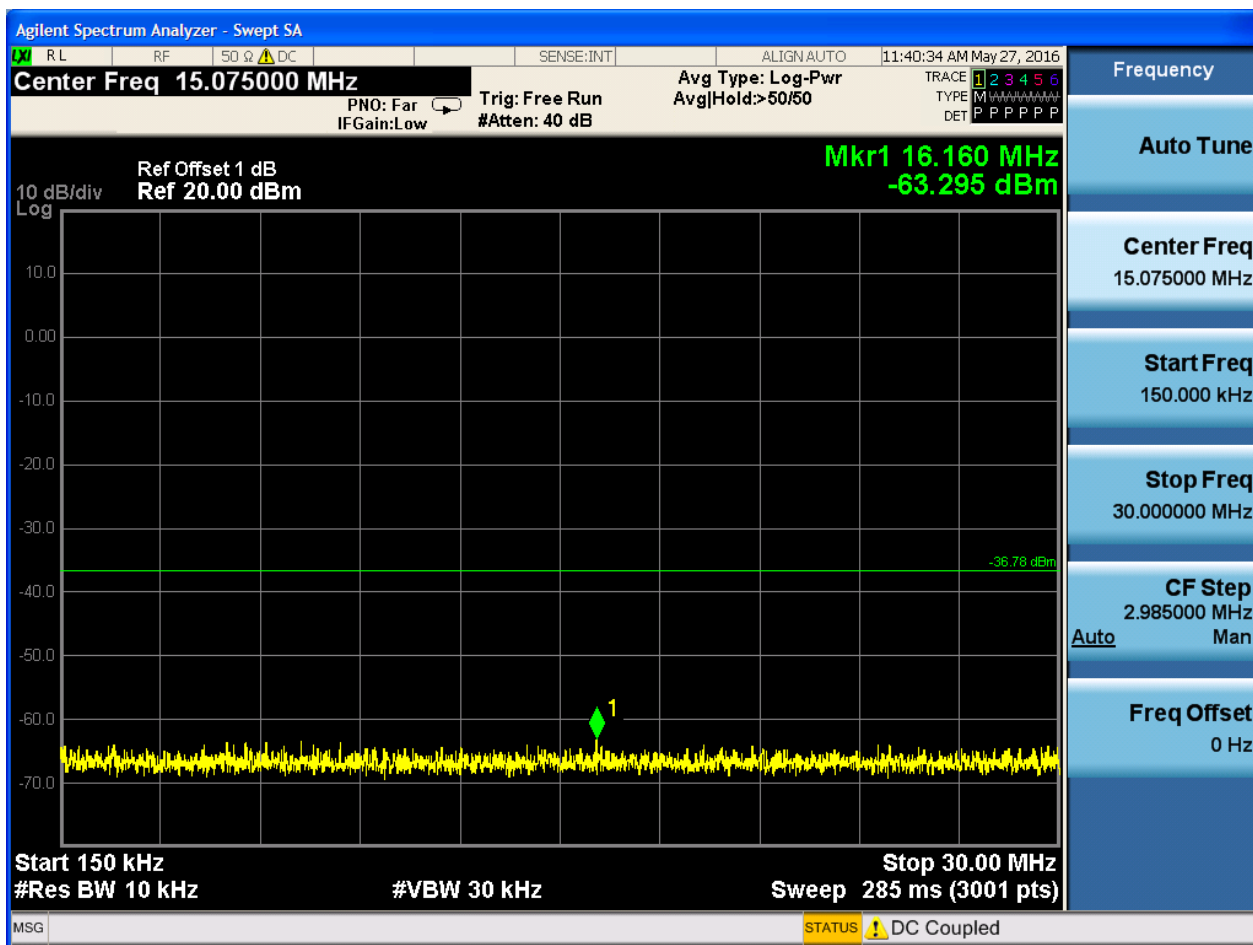
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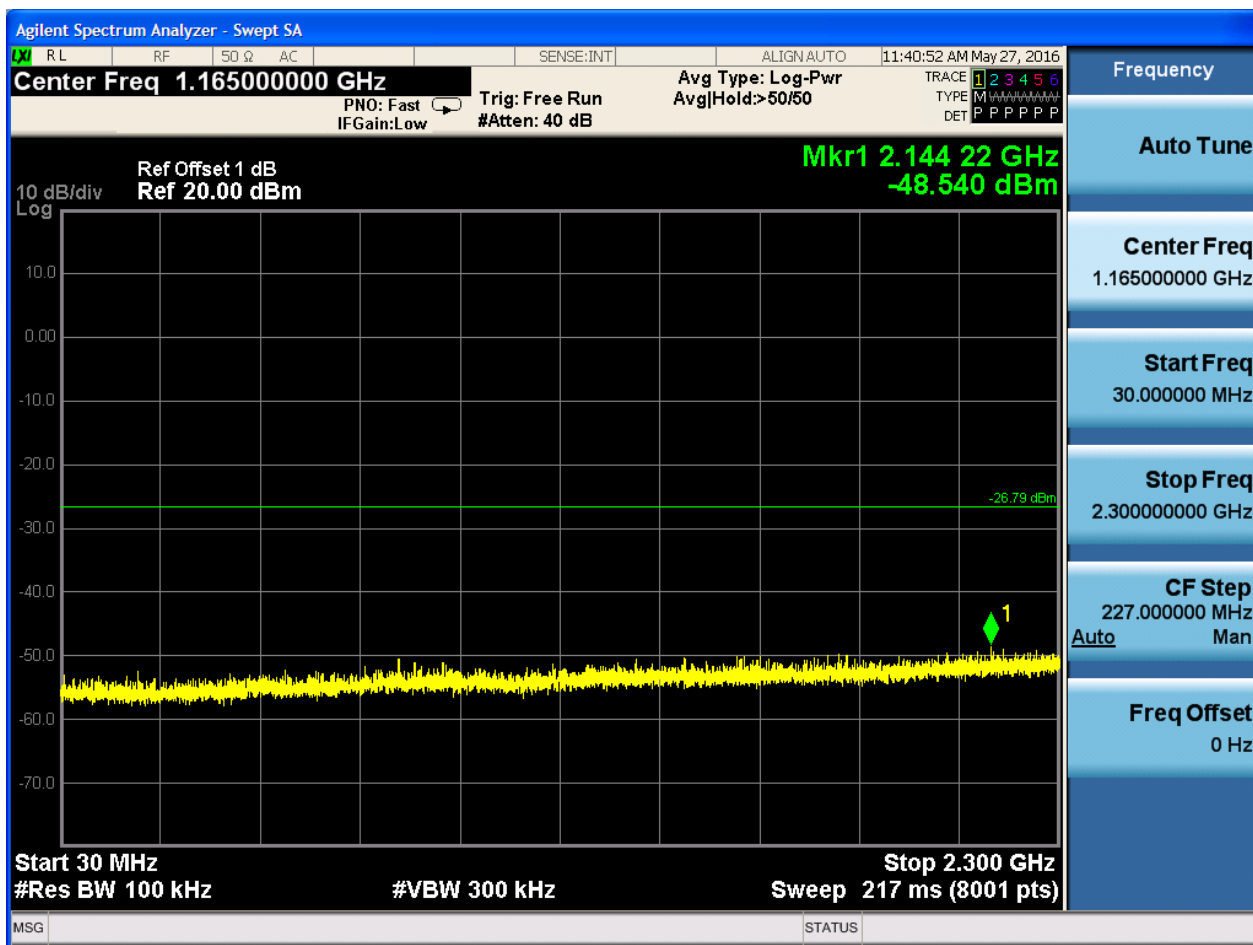


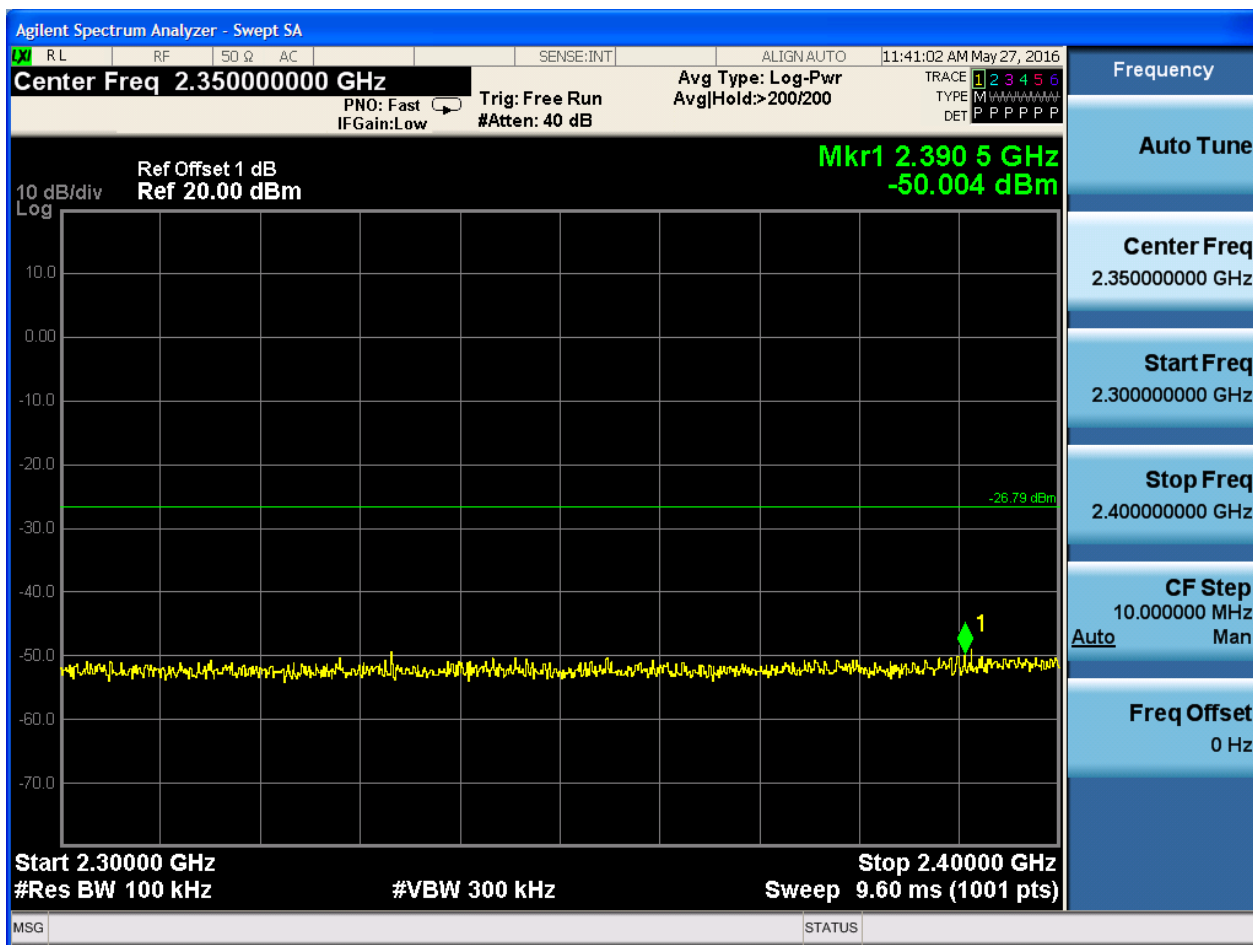


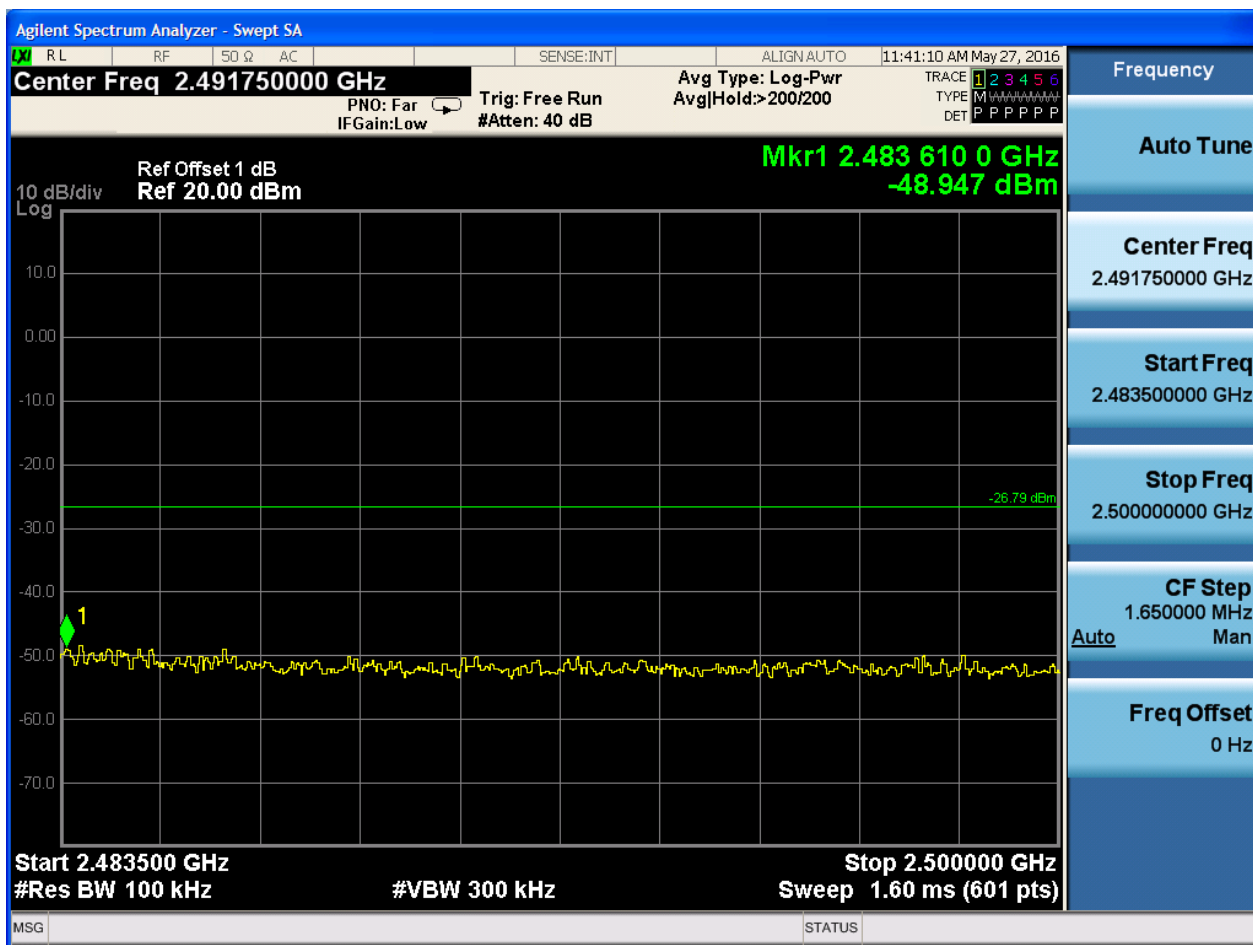
Puw:













Appendix H: Radiated Spurious Emission & Spurious in Restricted Band

Note: We tested all modes, but the data presented below is the worst case.

Below 1GHz, RBW = 100 kHz, VBW = 300 kHz.

Above 1GHz, RBW = 1 MHz, VBW = 3 MHz.

The simultaneous transmission has been considered

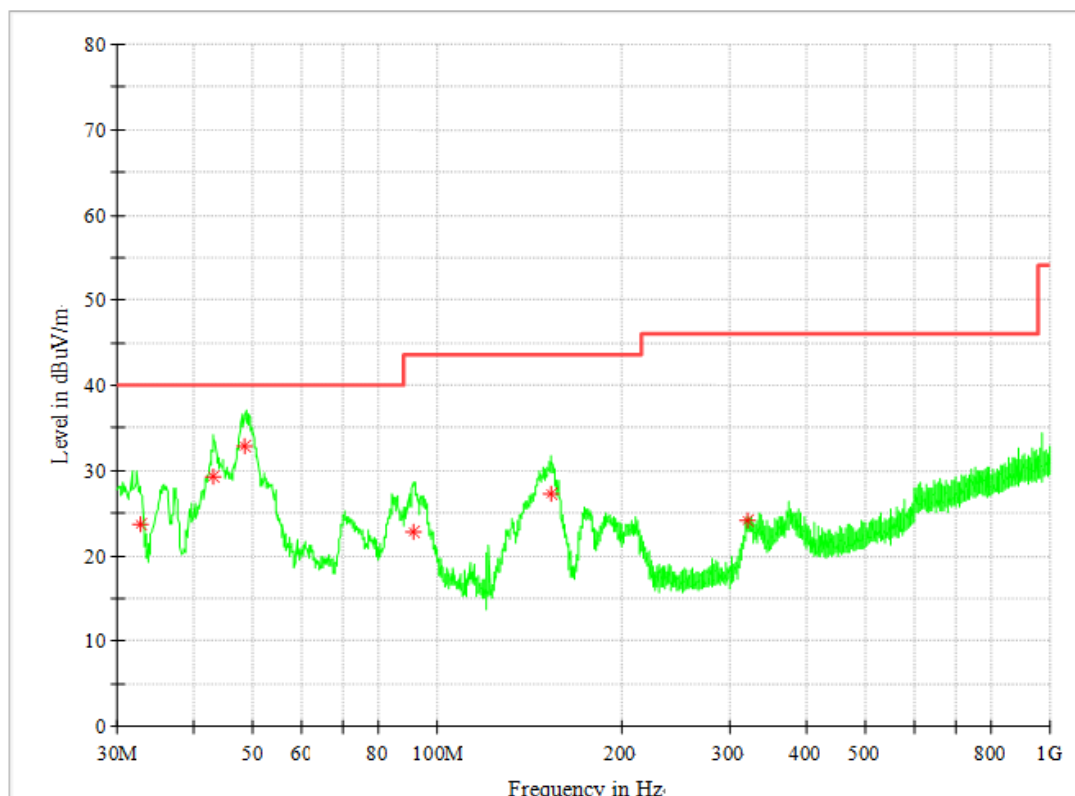
1.1 Part 1: Testing Range of “9 kHz to 30MHz”

NOTE1: No peak found in the Test Range of “9 kHz to 30MHz”

1.2 Part 2: Testing Range of “30 MHz to 1 GHz”

Note 1: The test results and plot for testing range of “30 MHz to 1 GHz” showed as below is the WORST case for all Test Modes and Channels. This range will not be presented for each Test Mode and each Channel.

Note 2: The emissions in this range are mainly from the Platform Device (Notepad PC and its ancillary components).



Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Transd. (dB)
32.802050	23.73	40.00	-16.27	100.0	V	226.0	14.9
43.164150	29.18	40.00	-10.82	100.0	V	4.0	15.3
48.570950	32.80	40.00	-7.20	100.0	V	23.0	15.2
91.606700	22.79	43.50	-20.71	200.0	V	97.0	12.5
153.280600	27.25	43.50	-16.25	100.0	V	42.0	10.3
321.664400	24.06	46.00	-21.94	129.0	H	168.0	16.3

Note:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1.3Part 3: Testing Range of “1 GHz to 3 GHz”

Note 1: The testing range of “1 GHz to 3 GHz” is for checking radiated emissions located in restricted bands near the EUT operating bands.

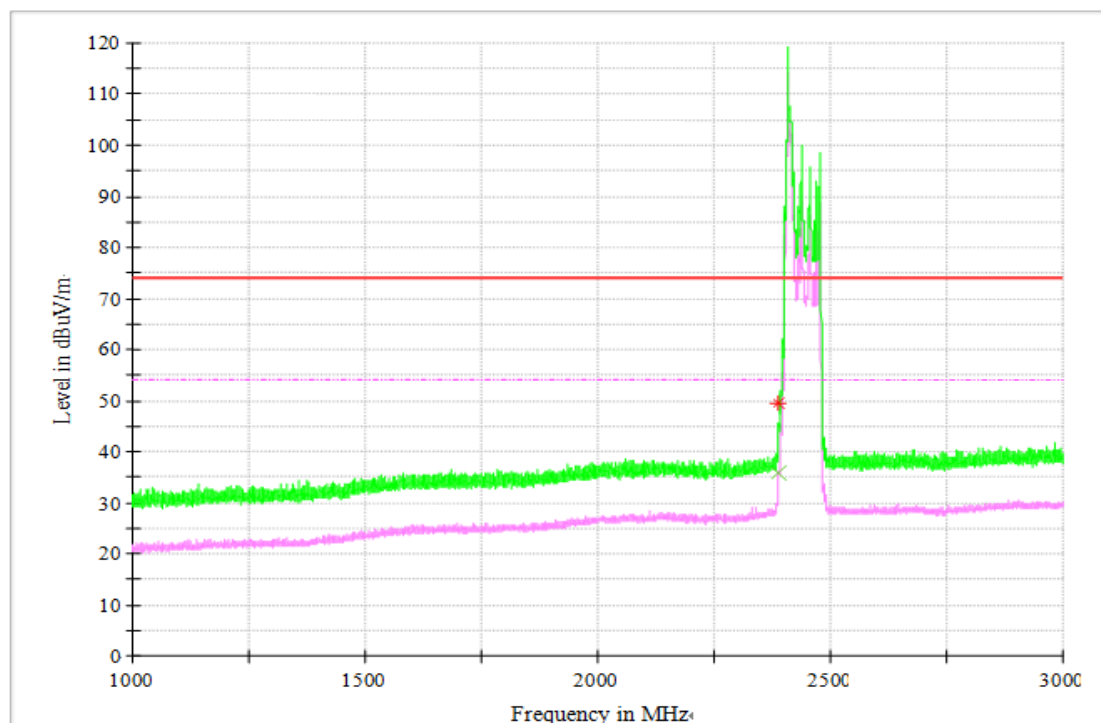
Note 2: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).

Note 3: The peak spike exceeds the limit line is EUT’s operating frequency.

Test Mode:

1.4.1Test Mode: 11B

1.4.1.1 Channel 1 @Ant 1



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimut h	Transd. (dB)
2390.000000	35.67	54.00	-18.33	150.0	H	241.0	-7.6

MEASUREMENT RESULT: PK Detector

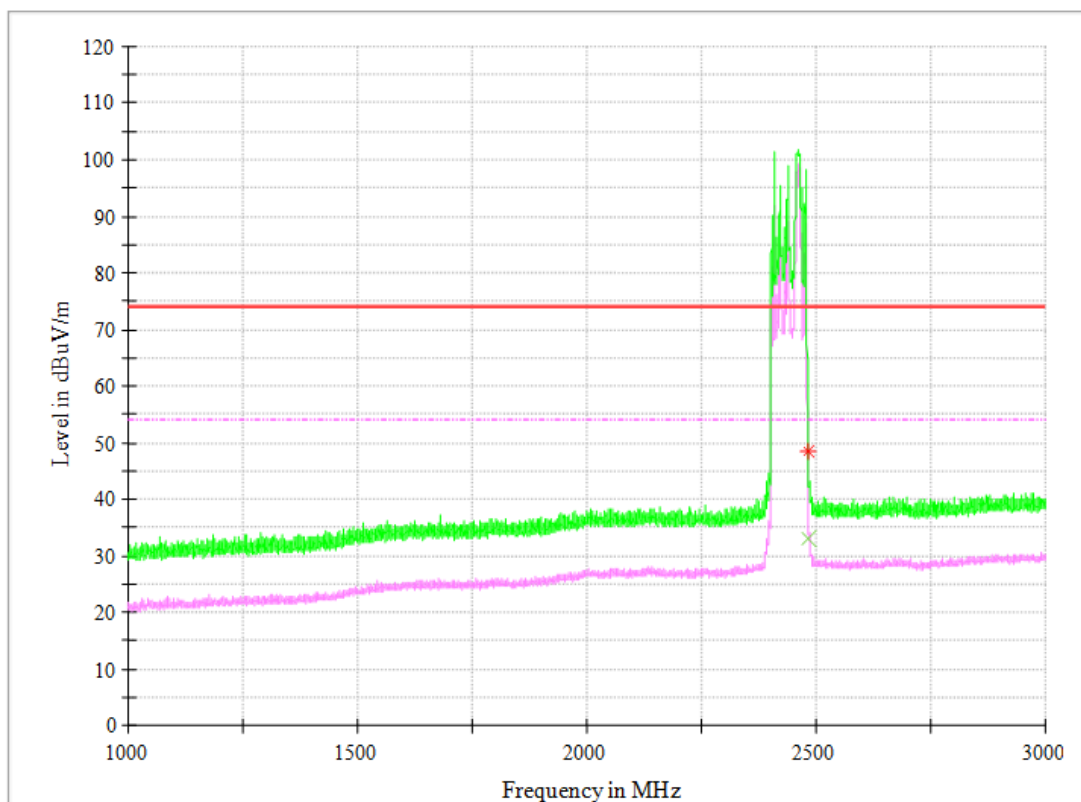
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimut h (deg)	Transd. (dB)
2390.000000	49.46	74.00	-24.54	192.0	H	241.0	-7.6

Note2:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1.4.1.2 Channel 11@Ant 1



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2483.500000	33.06	54.00	-20.94	112.0	H	298.0	-5.6

MEASUREMENT RESULT: PK Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h (deg)	Transd. (dB)
2483.500000	48.47	74.00	-25.53	150.0	H	302.0	-5.7

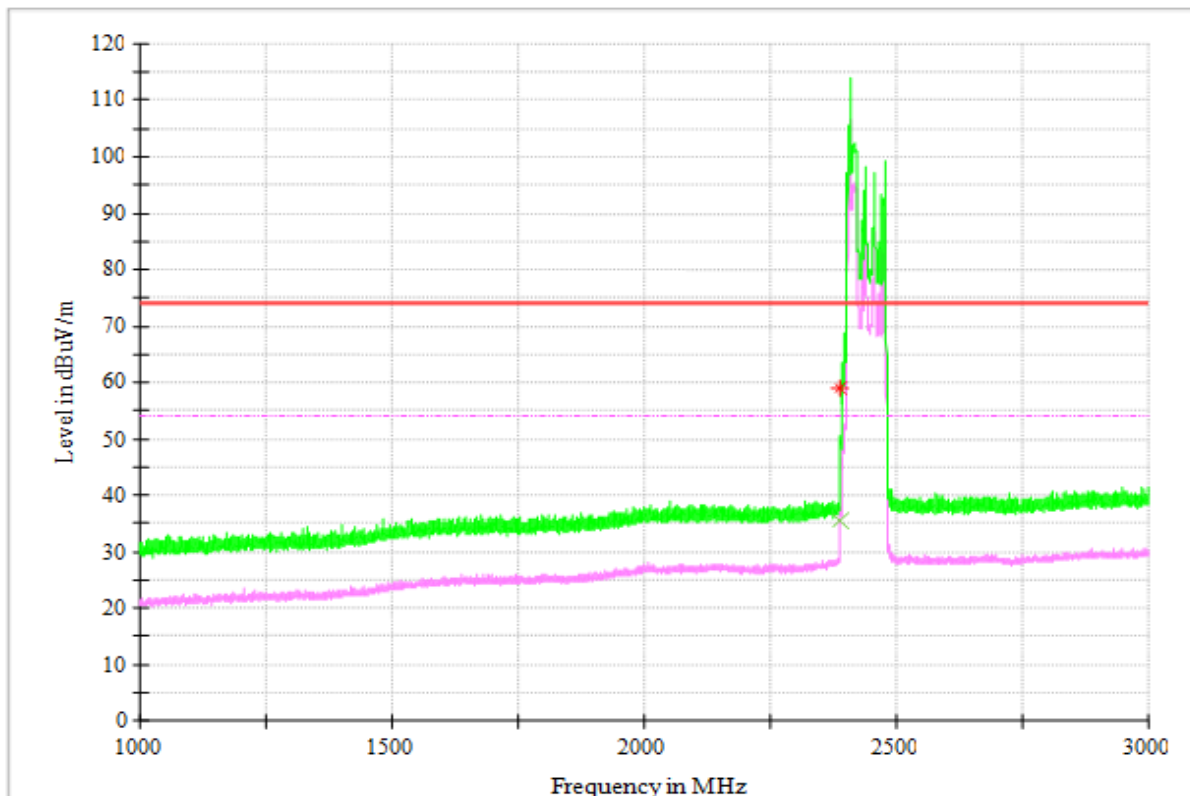
Note2:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1.4.2 Test Mode: 11G

1.4.2.1 Channel 1 @Ant 1



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2390.000000	35.59	54.00	-18.41	160.0	H	216.0	-7.6

MEASUREMENT RESULT: PK Detector

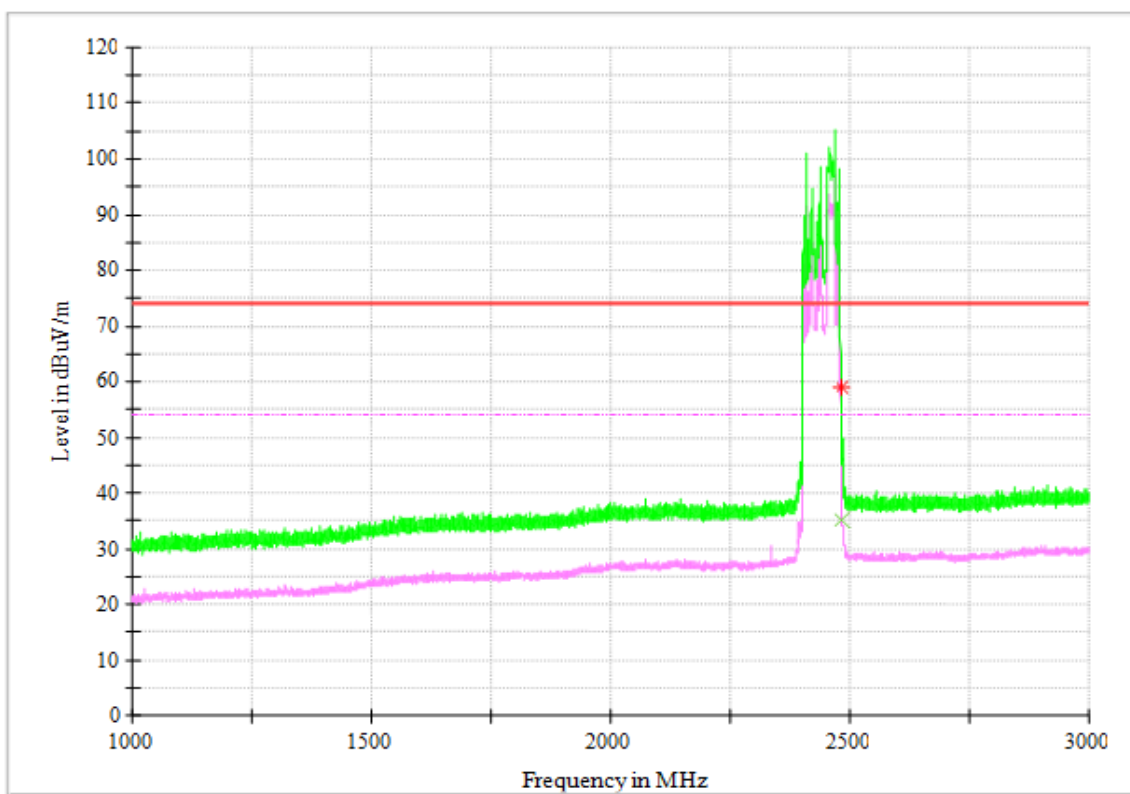
Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h (deg)	Transd. (dB)
2390.000000	59.08	74.00	-14.92	150.0	H	216.0	-7.6

Note2:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1.4.2.2 Channel 11@Ant 1



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2483.500000	35.04	54.00	-18.96	100.0	H	304.0	-5.7

MEASUREMENT RESULT: PK Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h (deg)	Transd. (dB)
2483.500000	58.84	74.00	-15.16	100.0	H	304.0	-5.9

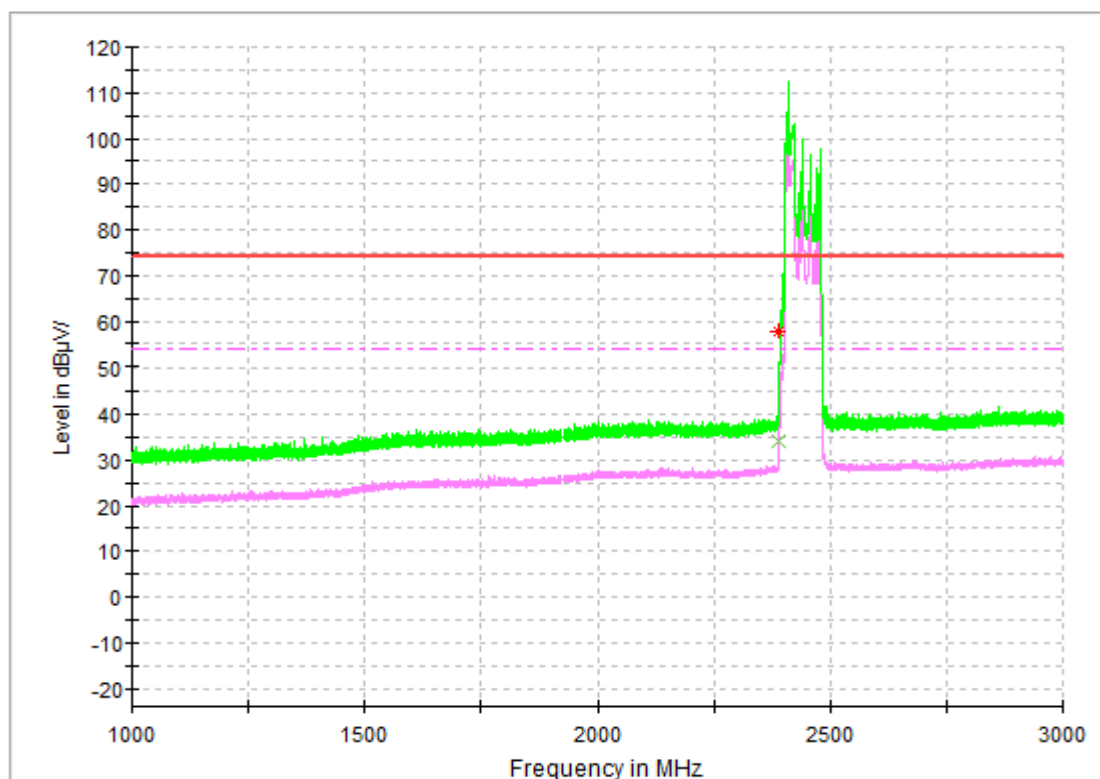
Note2:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1.4.3 Test Mode: 11N20

1.4.3.1 Channel 1 @Ant 1



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2390.000000	33.91	54.00	-20.09	166.0	H	-45.0	-7.6

MEASUREMENT RESULT: PK Detector

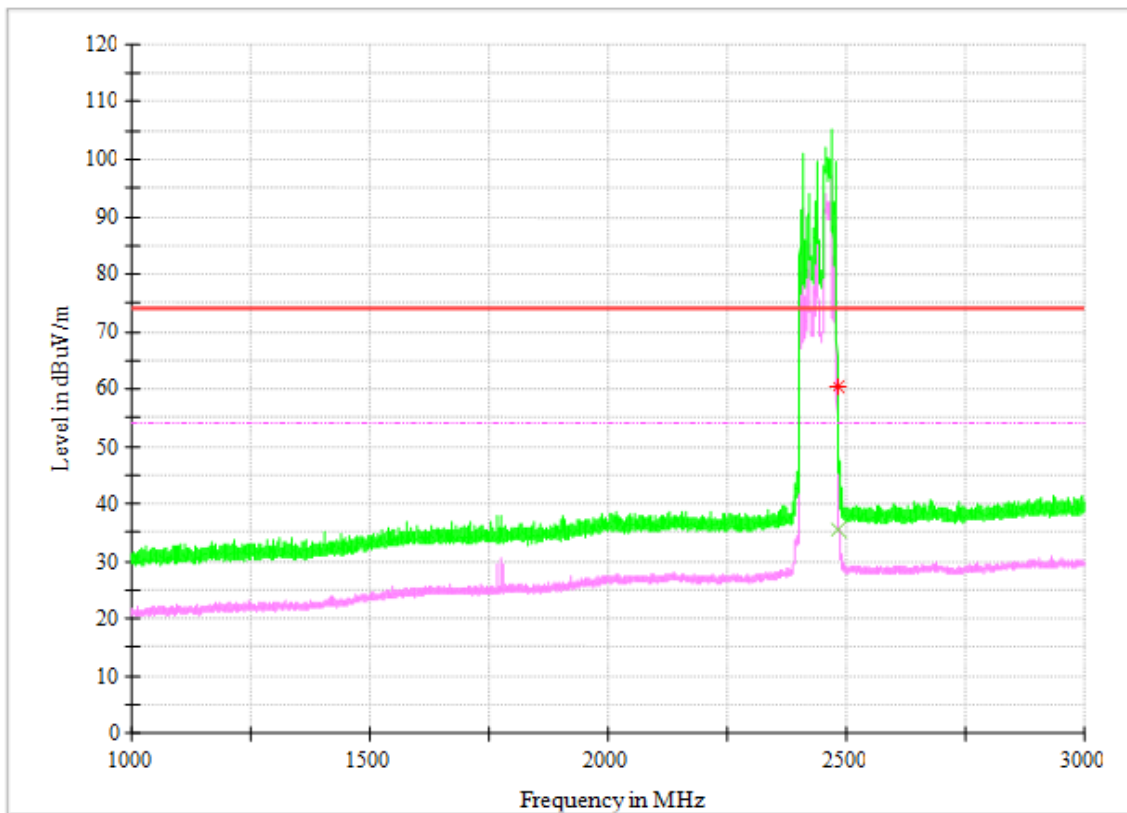
Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h (deg)	Transd. (dB)
2390.000000	57.60	74.00	-16.40	180.0	V	-45.0	-7.6

Note2:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1.4.3.2 Channel 11@Ant 1



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2483.500000	35.32	54.00	-18.68	160.0	H	352.0	-5.4

MEASUREMENT RESULT: PK Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h (deg)	Transd. (dB)
2483.500000	60.48	74.00	-13.52	134.0	H	352.0	-5.8

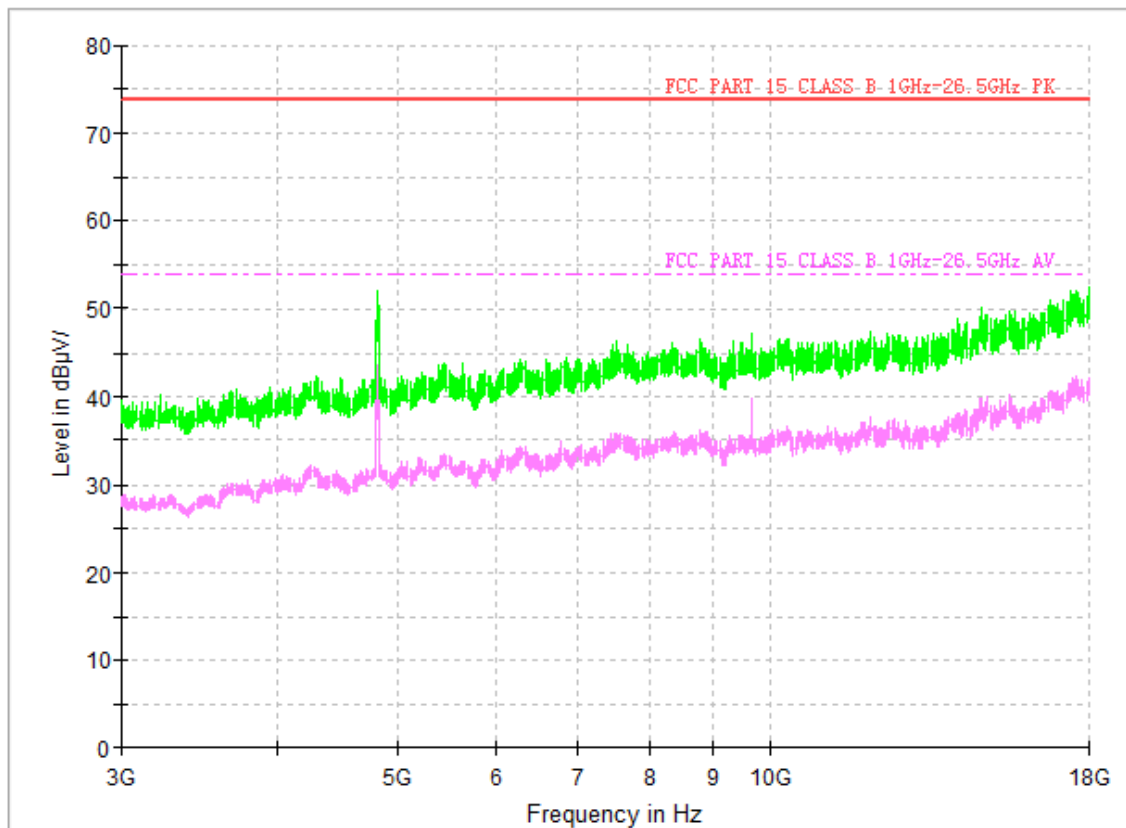
Note2:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

1.4 Part 4: Testing Range of “3 GHz to 18 GHz”

- Note 1: The test results and plot for testing range of “3 GHz to 18 GHz” showed as below is the WORST case for all Test Modes and Channels. This range will not be presented for each Test Mode and each Channel.
- Note 2: The testing range of “3 GHz to 18 GHz” is for checking radiated emissions located in restricted bands faraway from the EUT operating bands.
- Note 3: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).

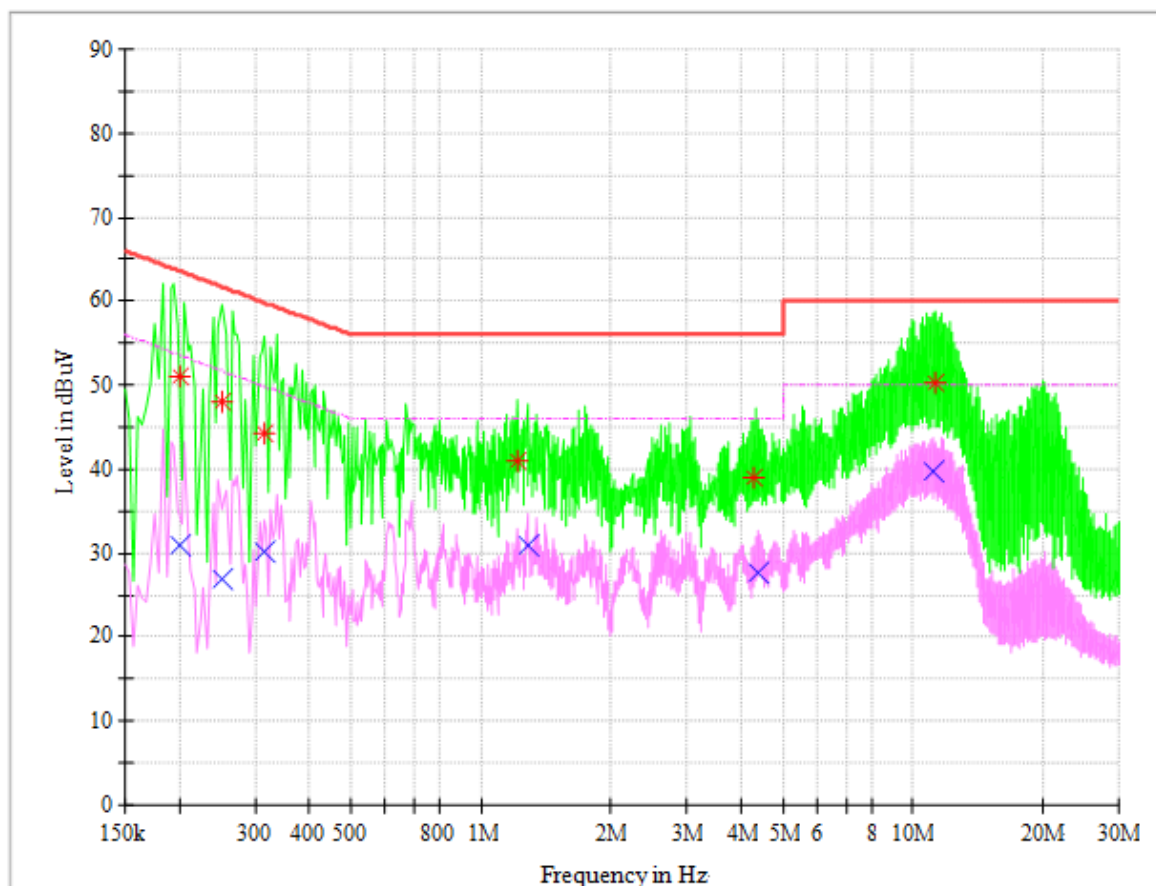


1.5 Part 5: Testing Range of “18 GHz to 26.5 GHz”

NOTE: No peak found in the Test Range of “18 GHz to 26.5GHz”

Appendix I: Conducted Emission at Power Port

Note: RBW = 9 kHz, VBW = 30 kHz



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V)	Limit (dBμ V)	Transd. (dB)	Margin (dB)	Line	PE
0.201722	30.91	53.54	9.7	-22.63	N	FLO
0.251278	26.83	51.72	9.7	-24.88	N	FLO
0.315738	30.23	49.82	9.7	-19.59	L1	FLO
1.286043	30.80	46.00	9.7	-15.20	N	FLO
4.368951	27.67	46.00	9.8	-18.33	N	FLO
11.134200	39.76	50.00	10.0	-10.24	N	FLO

MEASUREMENT RESULT: PK Detector

Frequency (MHz)	Level (dBμ V)	Limit (dBμ V)	Transd. (dB)	Margin (dB)	Line	PE
0.201640	50.98	63.54	9.7	-12.56	N	FLO
0.251817	48.12	61.70	9.7	-13.57	N	FLO
0.314496	44.27	59.85	9.7	-15.58	N	FLO
1.212260	41.10	56.00	9.7	-14.90	N	FLO
4.288324	39.04	56.00	9.8	-16.96	N	FLO
11.302469	50.19	60.00	10.0	-9.81	N	FLO

Note2:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

END