



Appendix for Test report



Appendix A: DTS (6 dB) Bandwidth

Part I - Test Results

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	9.05	2407.49	2416.54	---	PASS
11B	Ant2	2412	9.06	2407.48	2416.54	---	PASS
11B	Ant1	2417	8.54	2412.48	2421.02	---	PASS
11B	Ant2	2417	8.12	2412.95	2421.07	---	PASS
11B	Ant1	2437	9.08	2432.47	2441.55	---	PASS
11B	Ant2	2437	9.04	2432.5	2441.54	---	PASS
11B	Ant1	2462	9.03	2457.47	2466.5	---	PASS
11B	Ant2	2462	8.57	2457.95	2466.53	---	PASS
11G	Ant1	2412	16.28	2403.88	2420.16	---	PASS
11G	Ant2	2412	16.07	2404.08	2420.15	---	PASS
11G	Ant1	2417	15.52	2409.21	2424.73	---	PASS
11G	Ant2	2417	16.13	2409.02	2425.15	---	PASS
11G	Ant1	2437	15.64	2429.25	2444.89	---	PASS
11G	Ant2	2437	15.78	2429.1	2444.88	---	PASS
11G	Ant1	2457	16.05	2448.86	2464.9	---	PASS
11G	Ant2	2457	15.67	2449.12	2464.8	---	PASS
11G	Ant1	2462	16.28	2453.87	2470.15	---	PASS
11G	Ant2	2462	16.01	2453.85	2469.87	---	PASS
11G20CDD	Ant1	2412	15.67	2404.48	2420.15	---	PASS
11G20CDD	Ant2	2412	16.08	2404.08	2420.16	---	PASS
11G20CDD	Ant1	2417	15.44	2409.11	2424.55	---	PASS
11G20CDD	Ant2	2417	15.85	2409.29	2425.15	---	PASS
11G20CDD	Ant1	2437	16.05	2429.1	2445.15	---	PASS
11G20CDD	Ant2	2437	16.3	2428.86	2445.15	---	PASS
11G20CDD	Ant1	2457	16.01	2448.87	2464.88	---	PASS
11G20CDD	Ant2	2457	15.06	2449.47	2464.52	---	PASS
11G20CDD	Ant1	2462	16.3	2453.86	2470.16	---	PASS
11G20CDD	Ant2	2462	15.9	2453.87	2469.77	---	PASS
11N20SISO	Ant1	2412	16.87	2403.64	2420.52	---	PASS
11N20SISO	Ant2	2412	16.81	2403.61	2420.42	---	PASS
11N20SISO	Ant1	2417	16.26	2408.62	2424.89	---	PASS
11N20SISO	Ant2	2417	16.2	2409.21	2425.41	---	PASS
11N20SISO	Ant1	2437	15.49	2429.43	2444.92	---	PASS
11N20SISO	Ant2	2437	17.03	2428.49	2445.52	---	PASS
11N20SISO	Ant1	2457	17.53	2448.23	2465.76	---	PASS
11N20SISO	Ant2	2457	15.76	2449.1	2464.87	---	PASS
11N20SISO	Ant1	2462	16.77	2453.63	2470.4	---	PASS
11N20SISO	Ant2	2462	15.58	2454.01	2469.58	---	PASS
11N20MIMO	Ant1	2412	15.5	2404.88	2420.38	---	PASS
11N20MIMO	Ant2	2412	16.9	2403.87	2420.78	---	PASS
11N20MIMO	Ant1	2417	15.72	2409.04	2424.76	---	PASS
11N20MIMO	Ant2	2417	16.89	2408.87	2425.76	---	PASS
11N20MIMO	Ant1	2437	15.67	2429.72	2445.39	---	PASS
11N20MIMO	Ant2	2437	16.87	2428.5	2445.37	---	PASS
11N20MIMO	Ant1	2457	17.05	2448.47	2465.52	---	PASS
11N20MIMO	Ant2	2457	16.55	2448.62	2465.17	---	PASS



11N20MIMO	Ant1	2462	17.05	2453.46	2470.52	---	PASS
11N20MIMO	Ant2	2462	15.92	2453.84	2469.77	---	PASS
11N40SISO	Ant1	2422	35.57	2404.6	2440.17	---	PASS
11N40SISO	Ant2	2422	35.71	2404.44	2440.15	---	PASS
11N40SISO	Ant1	2427	36.05	2409.12	2445.16	---	PASS
11N40SISO	Ant2	2427	35.93	2409.21	2445.14	---	PASS
11N40SISO	Ant1	2437	35.75	2419.13	2454.88	---	PASS
11N40SISO	Ant2	2437	36.3	2418.86	2455.16	---	PASS
11N40SISO	Ant1	2452	36.29	2433.87	2470.16	---	PASS
11N40SISO	Ant2	2452	36.04	2433.86	2469.9	---	PASS
11N40MIMO	Ant1	2422	35.72	2404.45	2440.16	---	PASS
11N40MIMO	Ant2	2422	36.28	2403.85	2440.14	---	PASS
11N40MIMO	Ant1	2427	36.04	2409.11	2445.15	---	PASS
11N40MIMO	Ant2	2427	36.06	2409.1	2445.16	---	PASS
11N40MIMO	Ant1	2437	35.78	2419.08	2454.85	---	PASS
11N40MIMO	Ant2	2437	36.31	2418.85	2455.16	---	PASS
11N40MIMO	Ant1	2452	36.07	2434.09	2470.16	---	PASS
11N40MIMO	Ant2	2452	36.29	2433.85	2470.14	---	PASS



Part II - Test Graphs

1.1 11B_Ant1_2412





1.2 11B_Ant2_2412





1.3 11B_Ant1_2417





1.4 11B_Ant2_2417





1.5 11B_Ant1_2437



1.6 11B_Ant2_2437





1.7 11B_Ant1_2462



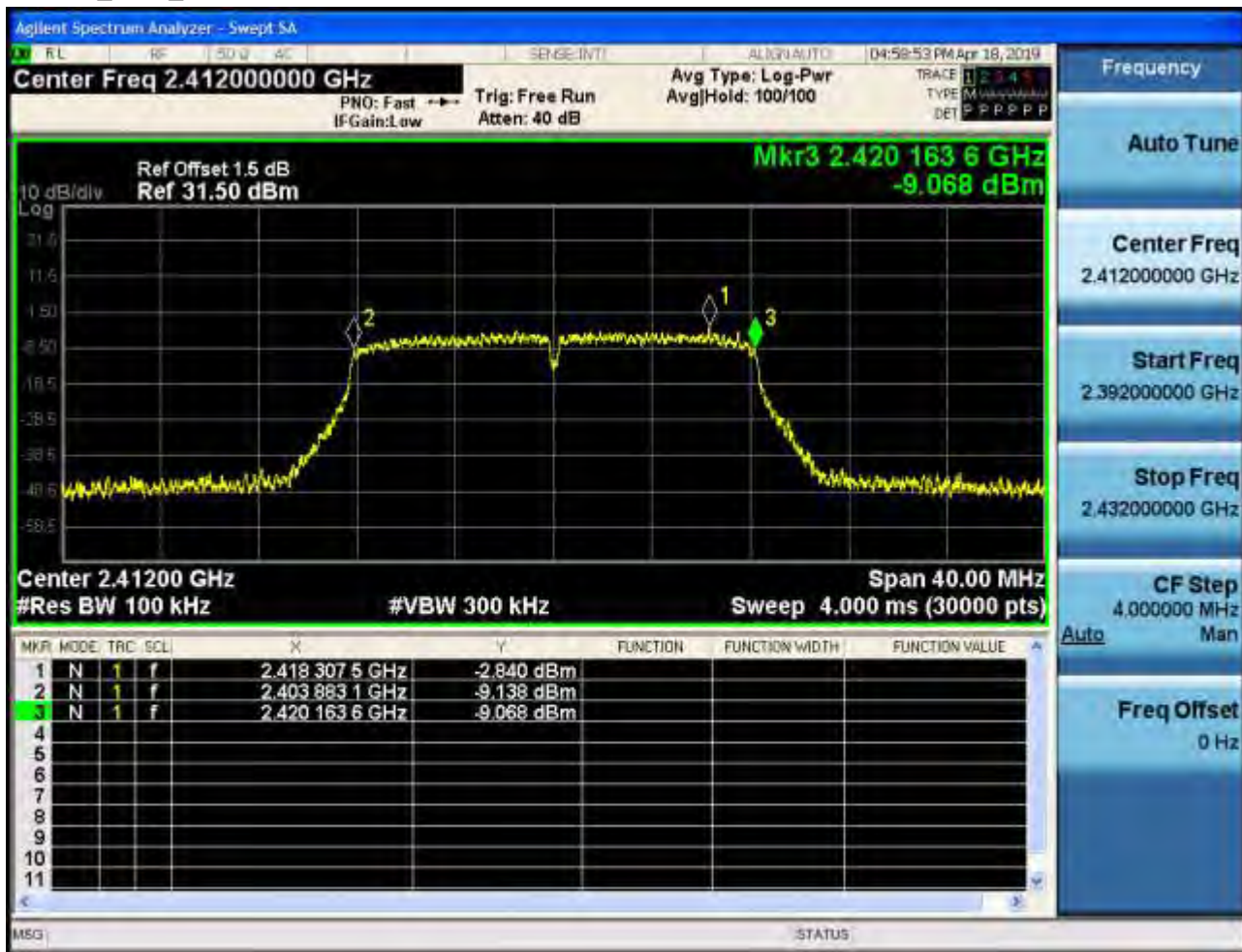


1.8 11B_Ant2_2462





1.9 11G_Ant1_2412





1.10 11G_Ant2_2412





1.11 11G_Ant1_2417





1.12 11G_Ant2_2417





1.13 11G_Ant1_2437





1.14 11G_Ant2_2437





1.15 11G_Ant1_2457





1.16 11G_Ant2_2457





1.17 11G_Ant1_2462





1.18 11G_Ant2_2462



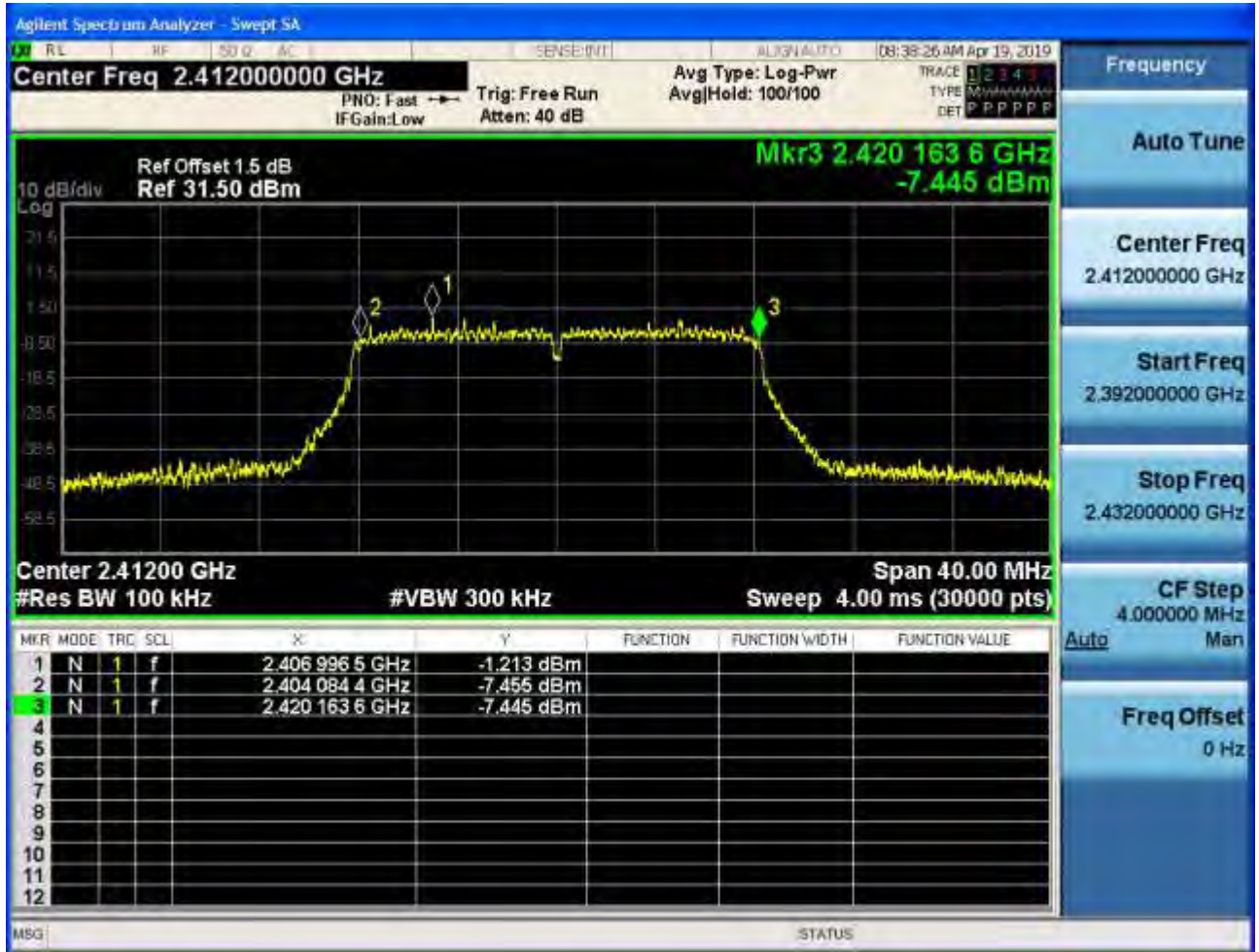


1.19 11G20CDD_Ant1_2412





1.20 11G20CDD_Ant2_2412





1.21 11G20CDD_Ant1_2417





1.22 11G20CDD_Ant2_2417





1.23 11G20CDD_Ant1_2437





1.24 11G20CDD_Ant2_2437





1.25 11G20CDD_Ant1_2457





1.26 11G20CDD_Ant2_2457





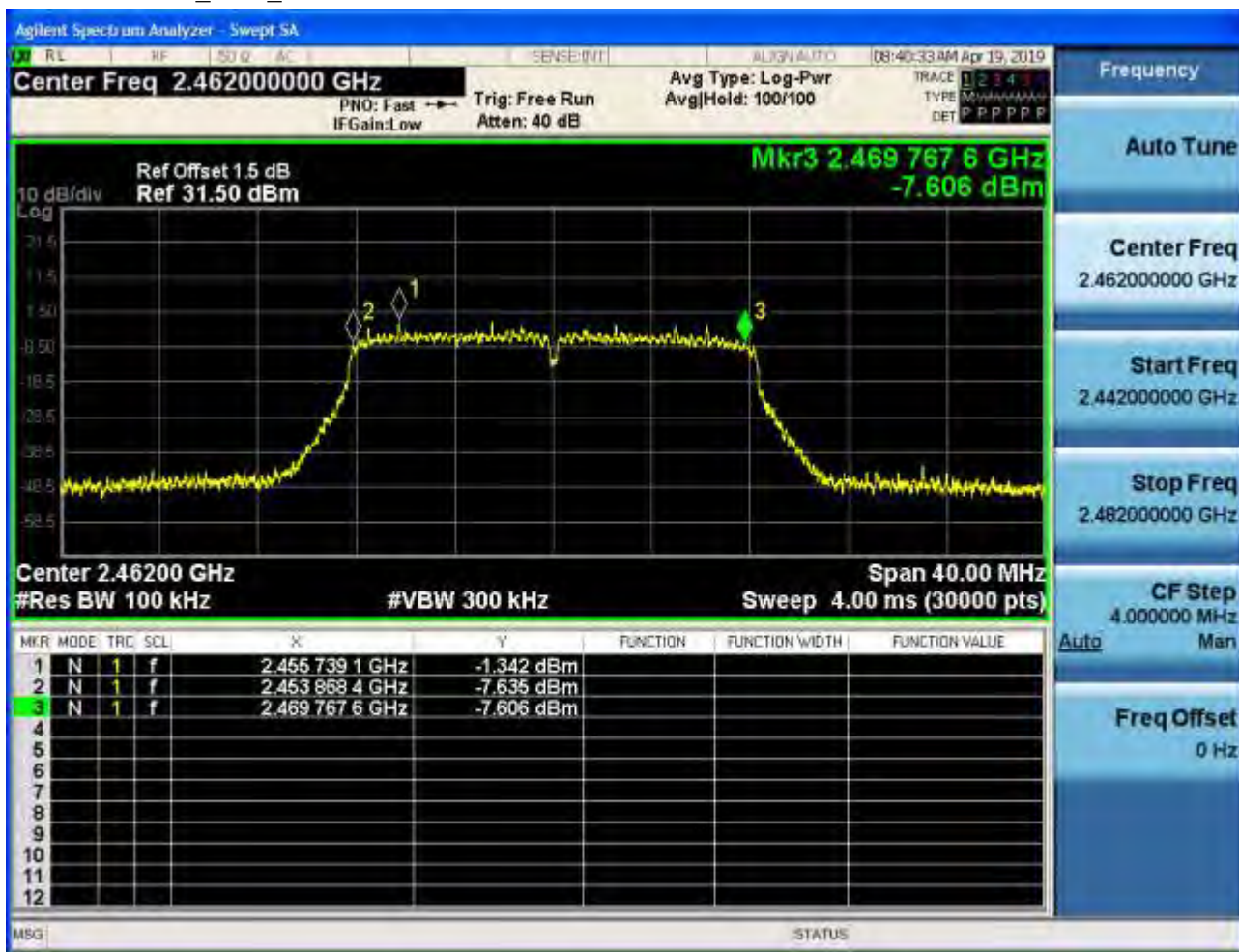
Center Freq 2.46200000 GHz
Avg Type: Log-Pwr
Avg/Hold: 100/100
PNO: Fast
IF Gain: Low
Trig: Free Run
Atten: 40 dB
Ref Offset 1.5 dB
Ref 31.50 dBm
Mkr3 2.470 160 9 GHz
-8.502 dBm

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.458 261 9 GHz	-2.233 dBm			
2	N	1	f	2.453 861 7 GHz	-8.518 dBm			
3	N	1	f	2.470 160 9 GHz	-8.502 dBm			
4								
5								
6								
7								
8								
9								
10								
11								

Center 2.46200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40.00 MHz
Sweep 4.000 ms (30000 pts)



1.28 11G20CDD_Ant2_2462





Agilent Spectrum Analyzer - Swept SA

Center Freq 2.41200000 GHz

PNO: Fast Trig: Free Run
IF Gain: Low Atten: 40 dB

Avg Type: Log-Pwr
Avg/Hold: 100/100

TRACE 1 2 3 4
TYPE M
DET P P P P P

Ref Offset 1.5 dB
Ref 31.50 dBm

Mkr3 2.420 515 6 GHz
-8.172 dBm

10 dB/div
Log

Center 2.41200 GHz
#Res BW 100 kHz

Span 40.00 MHz
#VBW 300 kHz
Sweep 4.000 ms (30000 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.405 739 1 GHz	-1.938 dBm			
2	N	1	f	2.403 644 4 GHz	-8.235 dBm			
3	N	1	f	2.420 515 6 GHz	-8.172 dBm			
4								
5								
6								
7								
8								
9								
10								
11								

Frequency

Auto Tune

Center Freq
2.412000000 GHz

Start Freq
2.392000000 GHz

Stop Freq
2.432000000 GHz

CF Step
4.000000 MHz

Man

Freq Offset
0 Hz

MSG STATUS

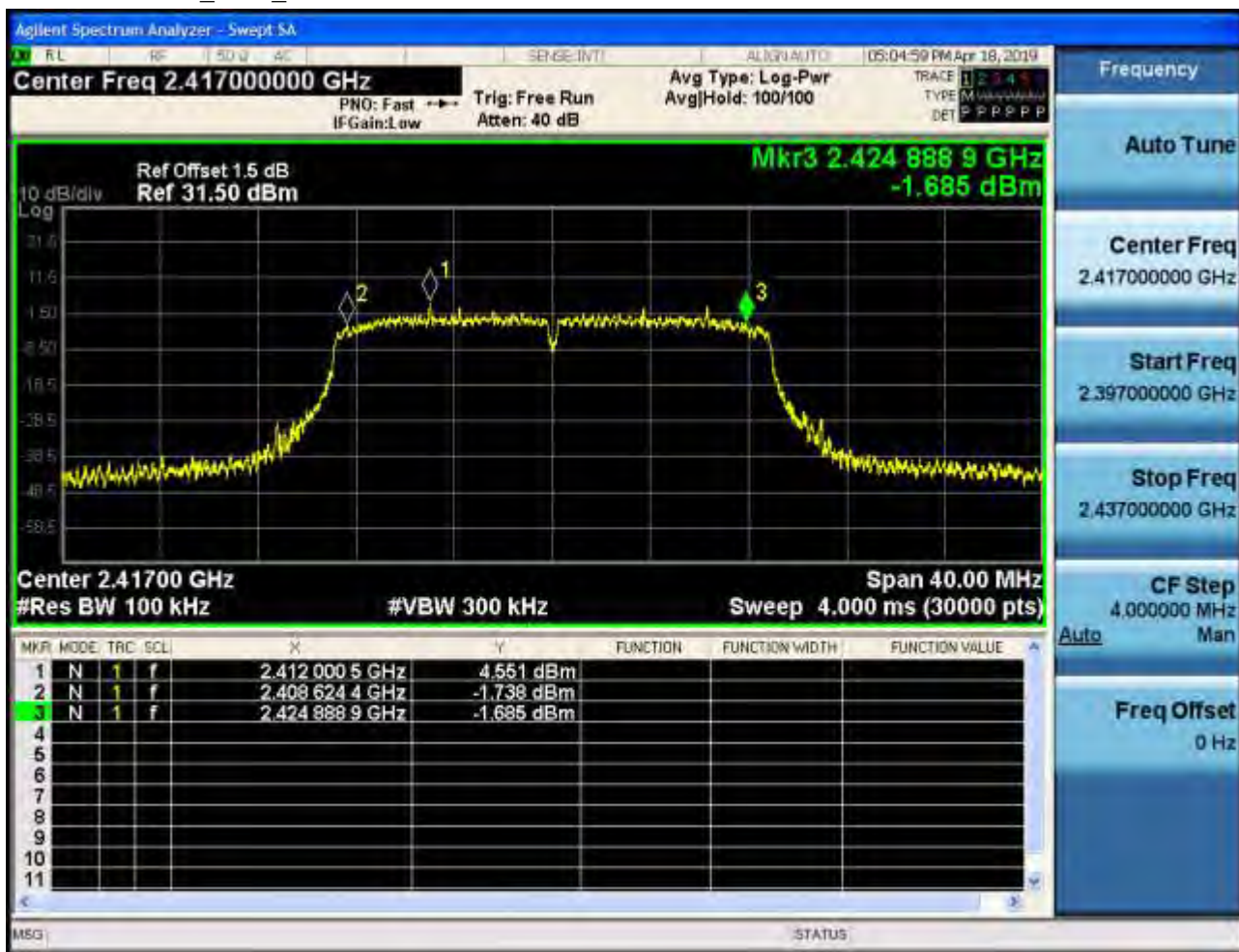


1.30 11N20SISO_Ant2_2412



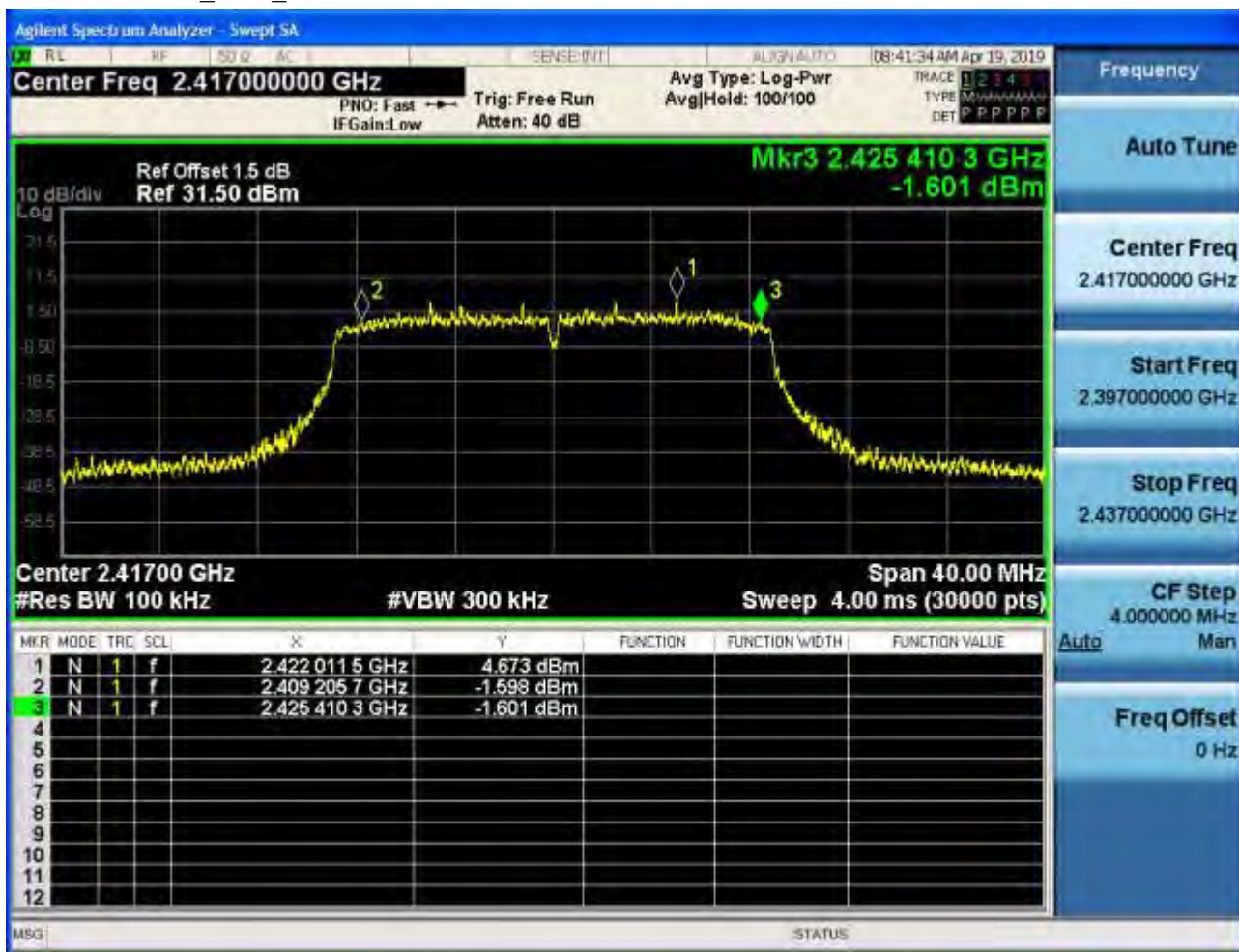


1.31 11N20SISO_Ant1_2417





1.32 11N20SISO_Ant2_2417





1.33 11N20SISO_Ant1_2437





1.34 11N20SISO_Ant2_2437





1.35 11N20SISO_Ant1_2457



1.36 11N20SISO_Ant2_2457





1.37 11N20SISO_Ant1_2462



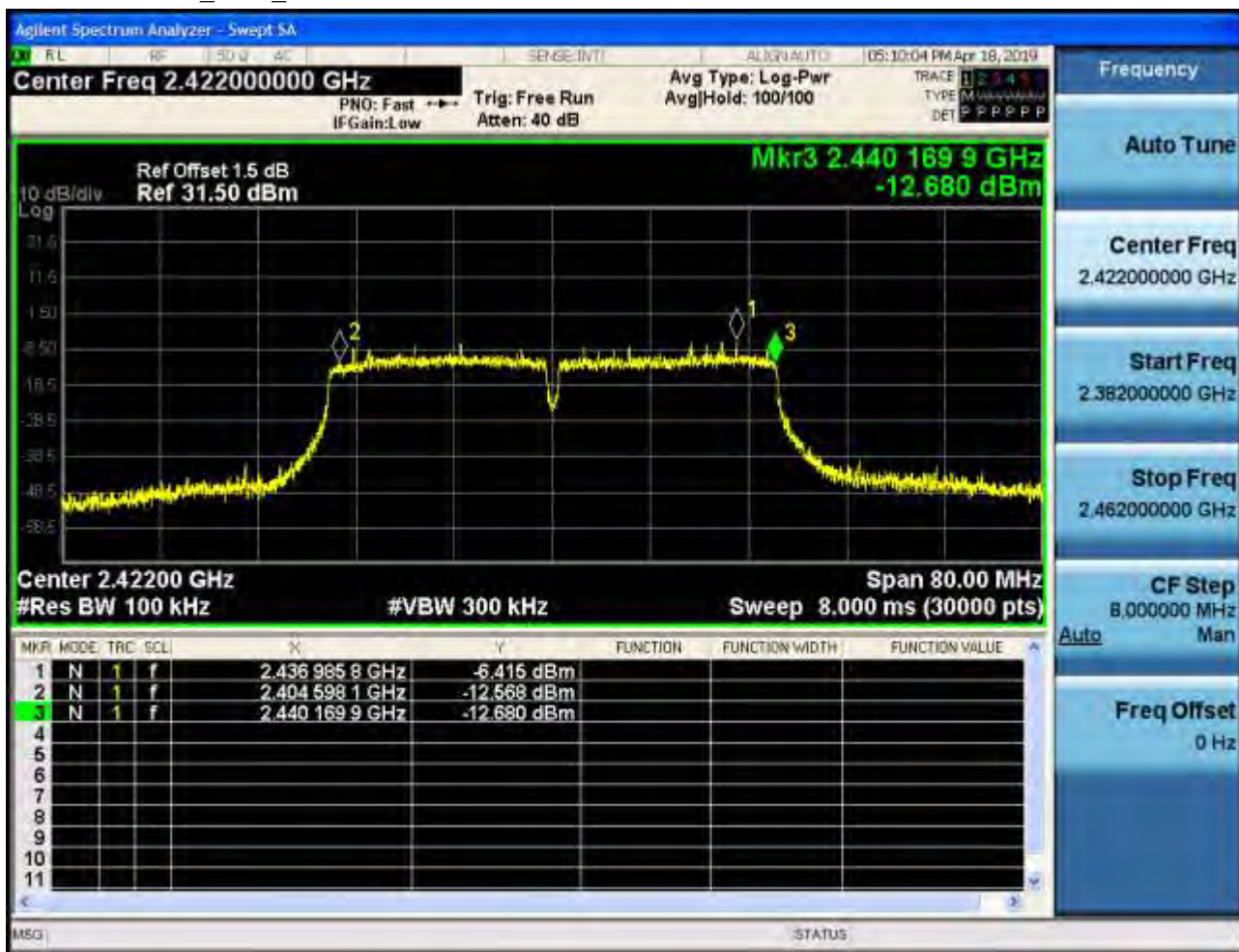


1.38 11N20SISO_Ant2_2462

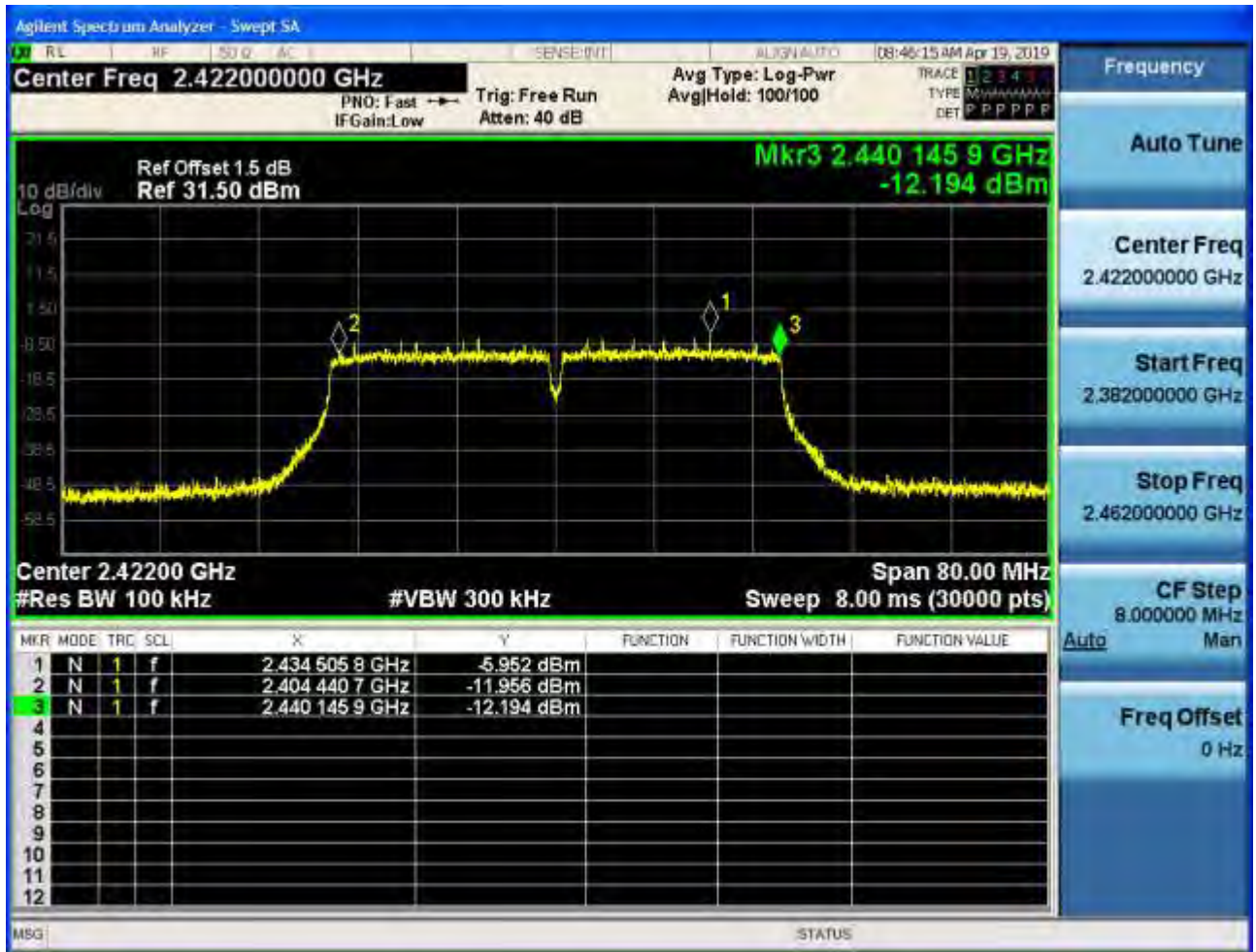




1.39 11N40SISO_Ant1_2422

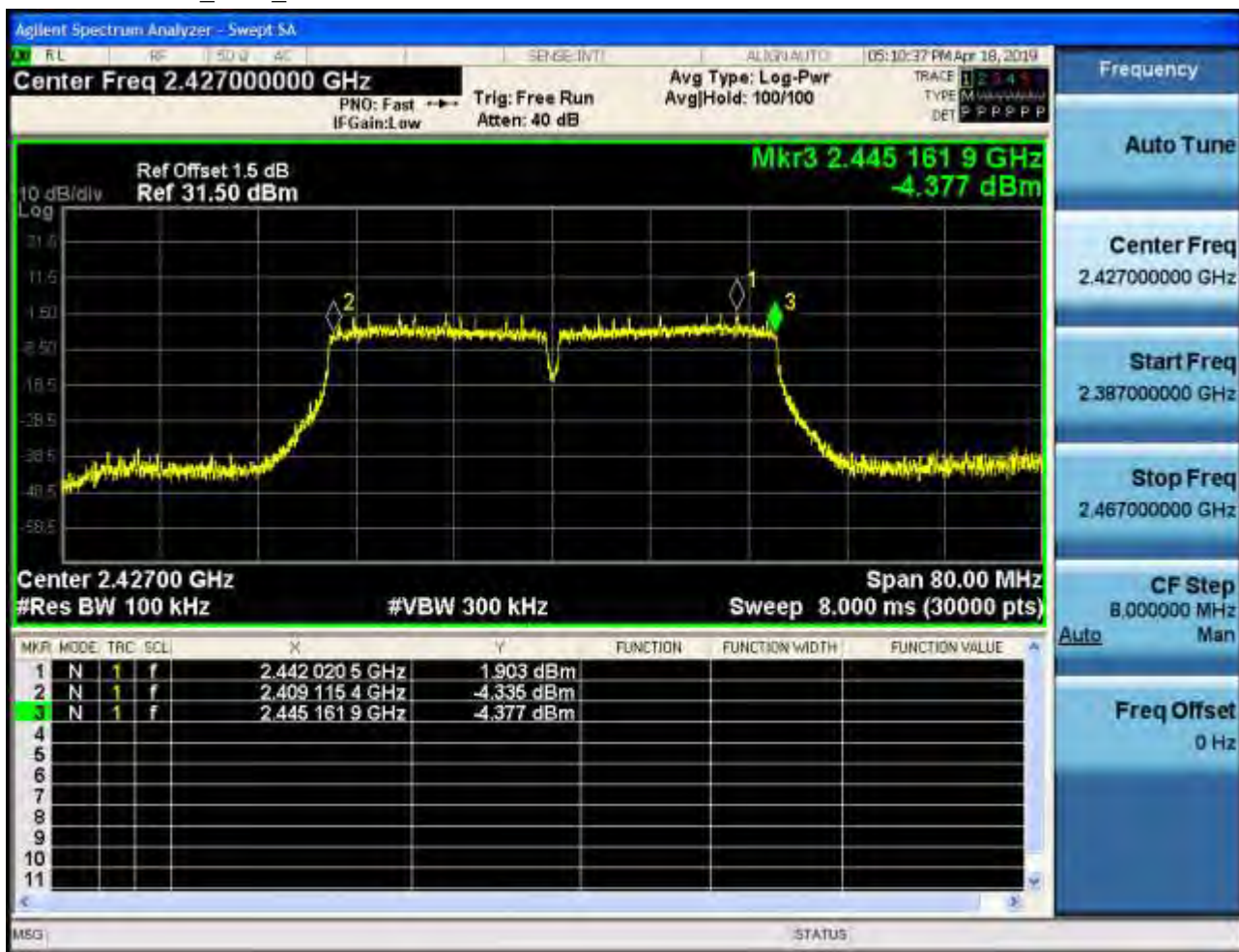


1.40 11N40SISO_Ant2_2422



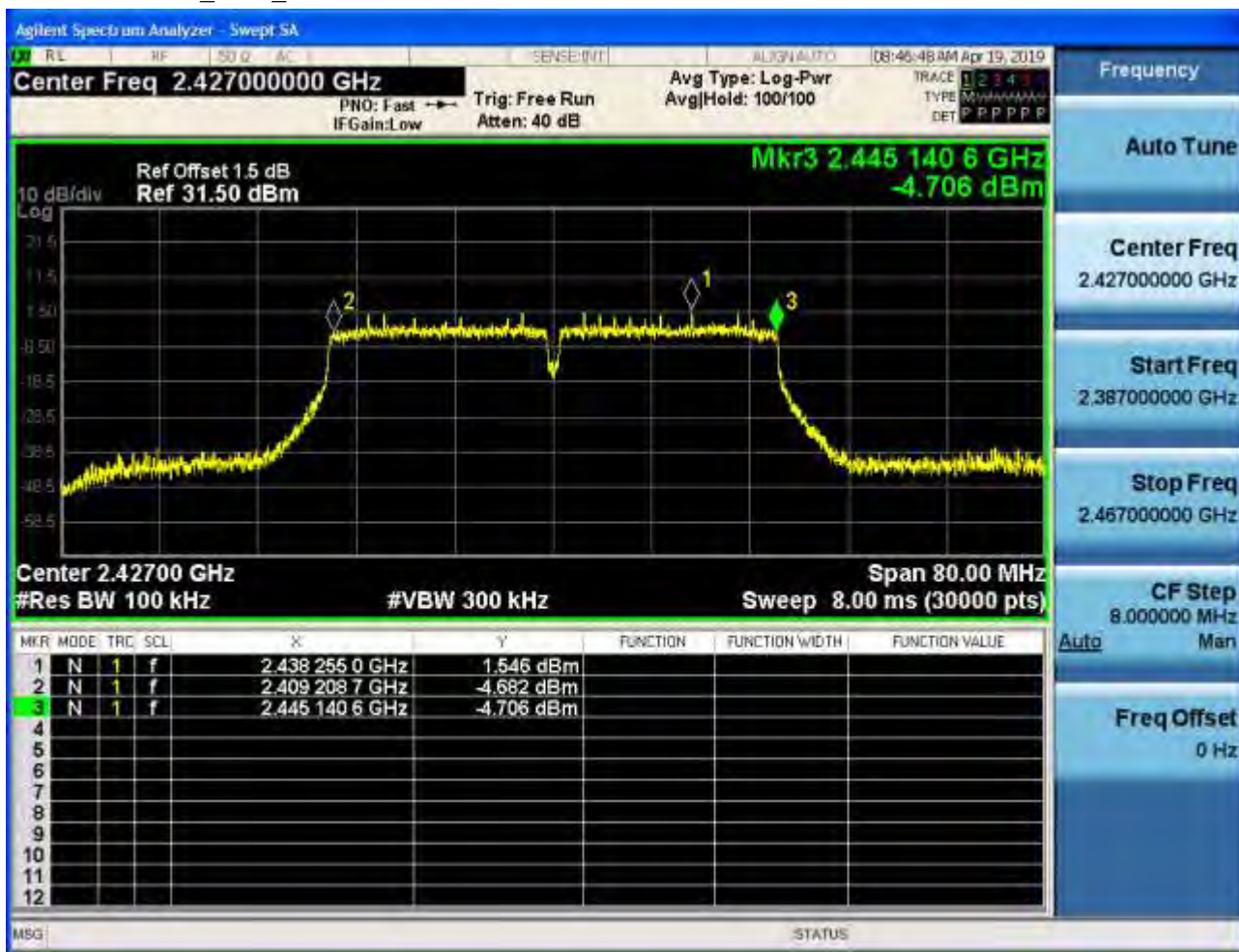


1.41 11N40SISO_Ant1_2427



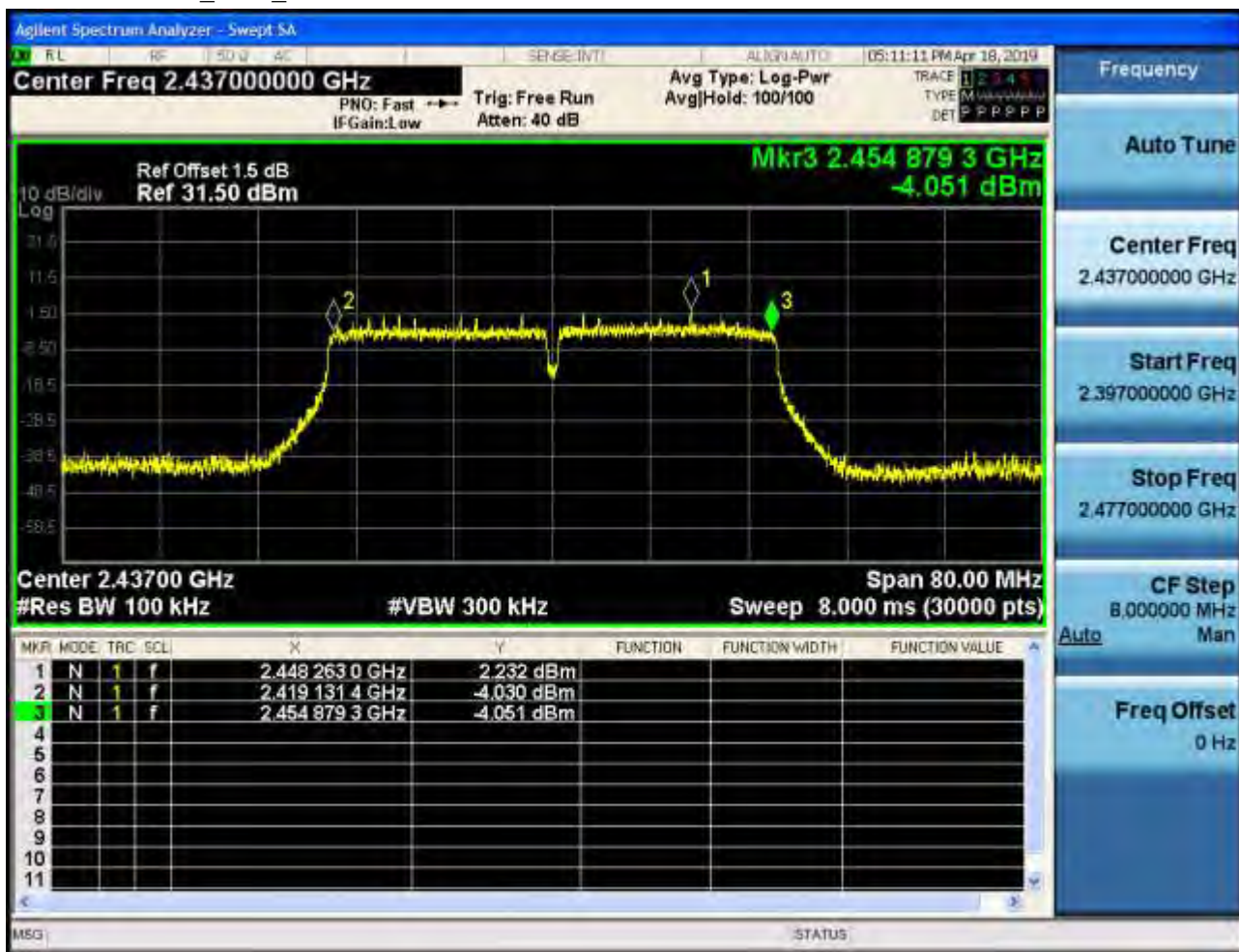


1.42 11N40SISO_Ant2_2427





1.43 11N40SISO_Ant1_2437





Center Freq 2.43700000 GHz
Avg Type: Log-Pwr
Avg/Hold: 100/100
PNO: Fast →
Trig: Free Run
I/F Gain: Low
Atten: 40 dB
Date/Time: 08:47:20 AM Apr 19, 2019
TRACE 1 2 3 4 5
TYPE M W N H A V I D E T
DET P P P P P P

Mkr3 2.455 159 3 GHz
-4.820 dBm

Ref Offset 1.5 dB
Ref 31.50 dBm

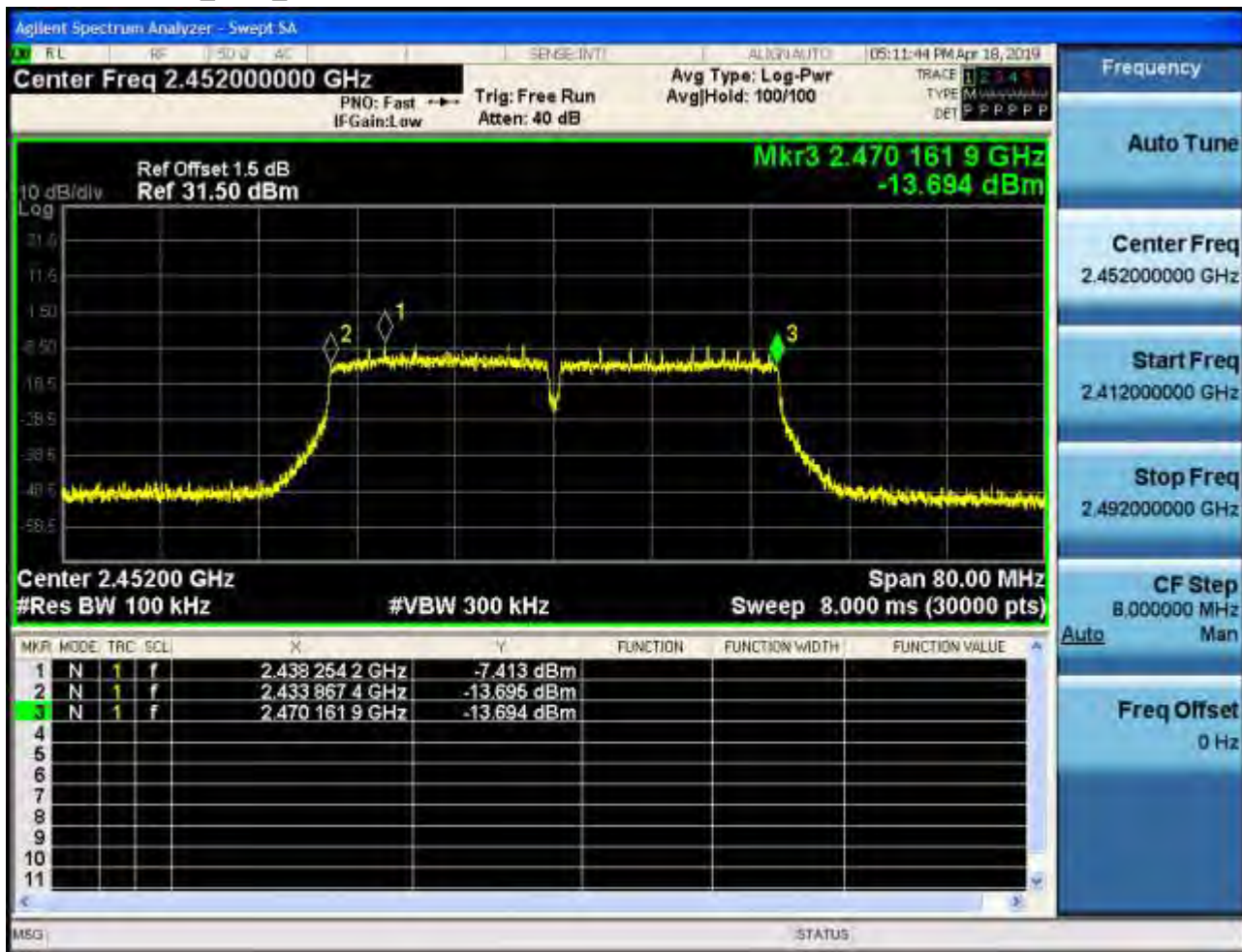
MFR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.448 279 0 GHz	-1.454 dBm			
2	N	1	f	2.418 859 4 GHz	-4.762 dBm			
3	N	1	f	2.455 159 3 GHz	-4.820 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								

Center 2.43700 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 80.00 MHz
Sweep 8.00 ms (30000 pts)

Freq Offset 0 Hz



1.45 11N40SISO_Ant1_2452

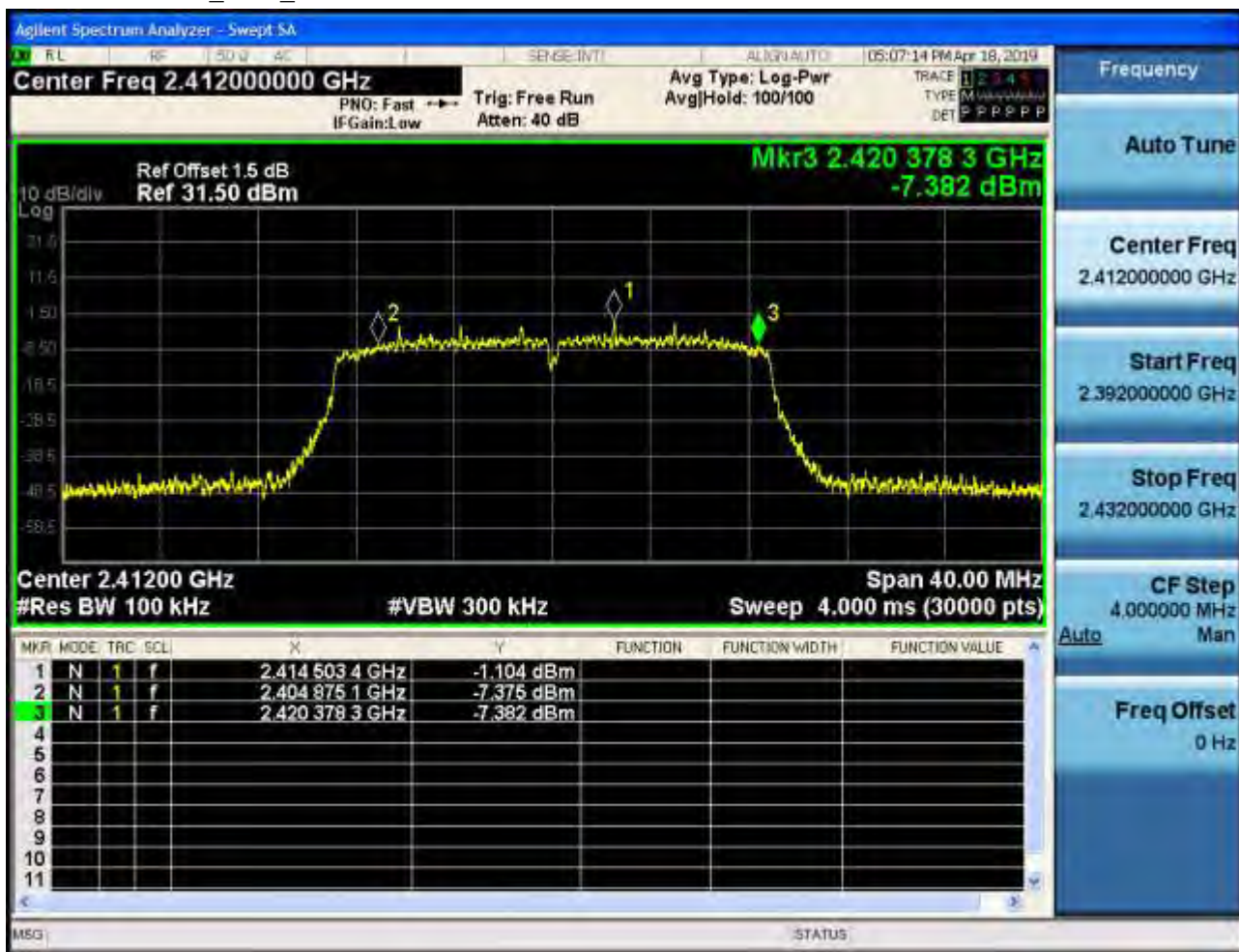


1.46 11N40SISO_Ant2_2452





1.47 11N20MIMO_Ant1_2412



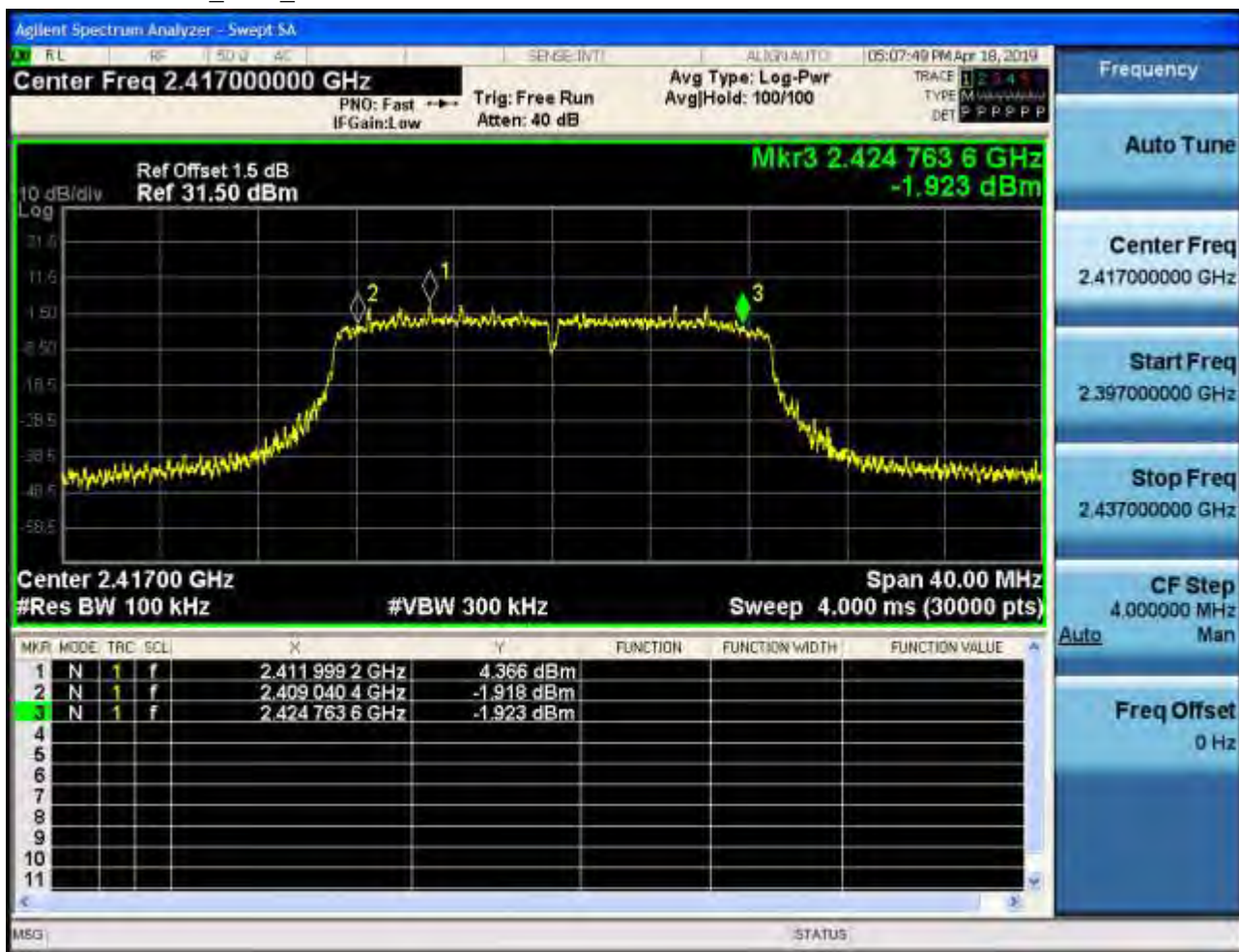


1.48 11N20MIMO_Ant2_2412





1.49 11N20MIMO_Ant1_2417



1.50 11N20MIMO_Ant2_2417





1.51 11N20MIMO_Ant1_2437



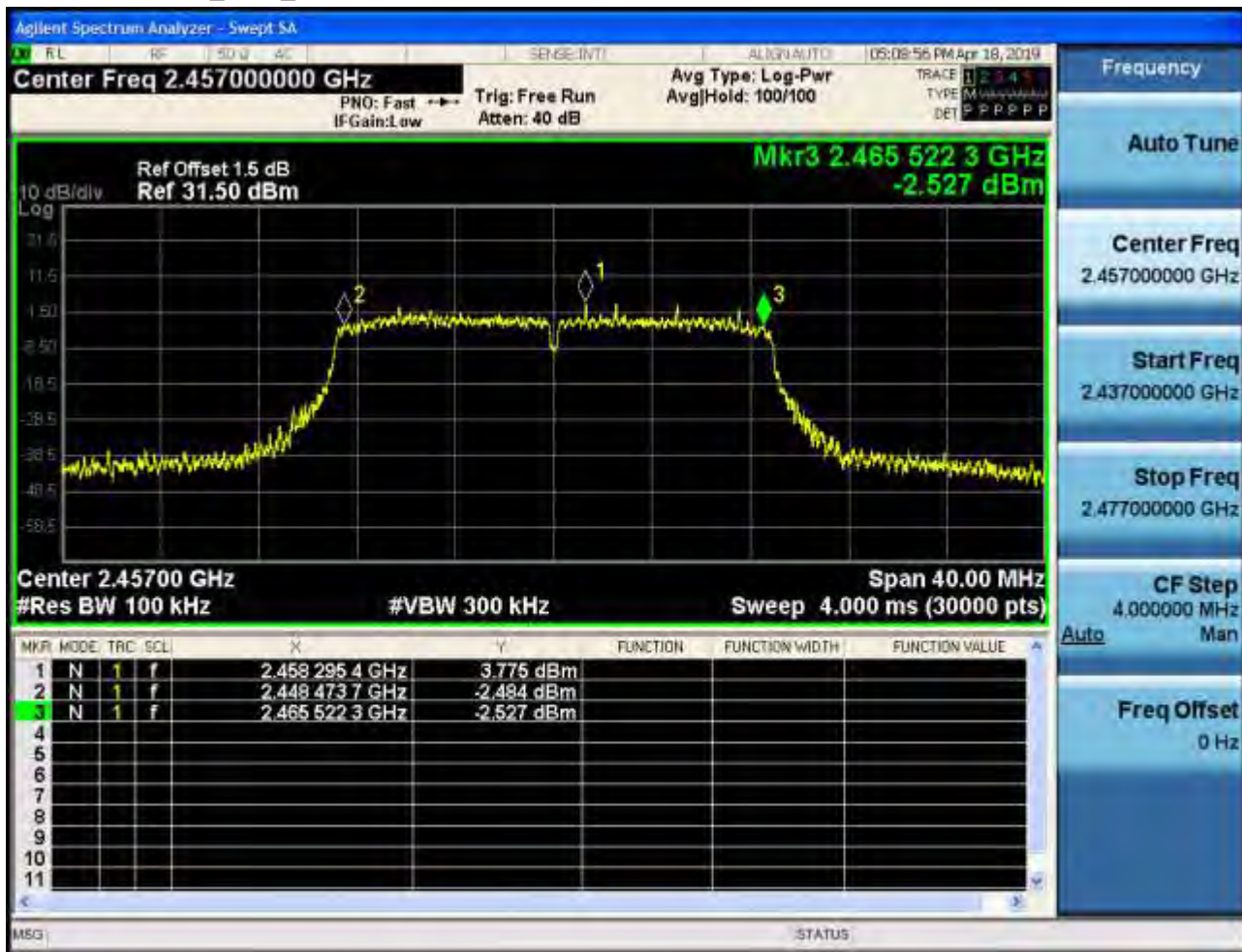


1.52 11N20MIMO_Ant2_2437



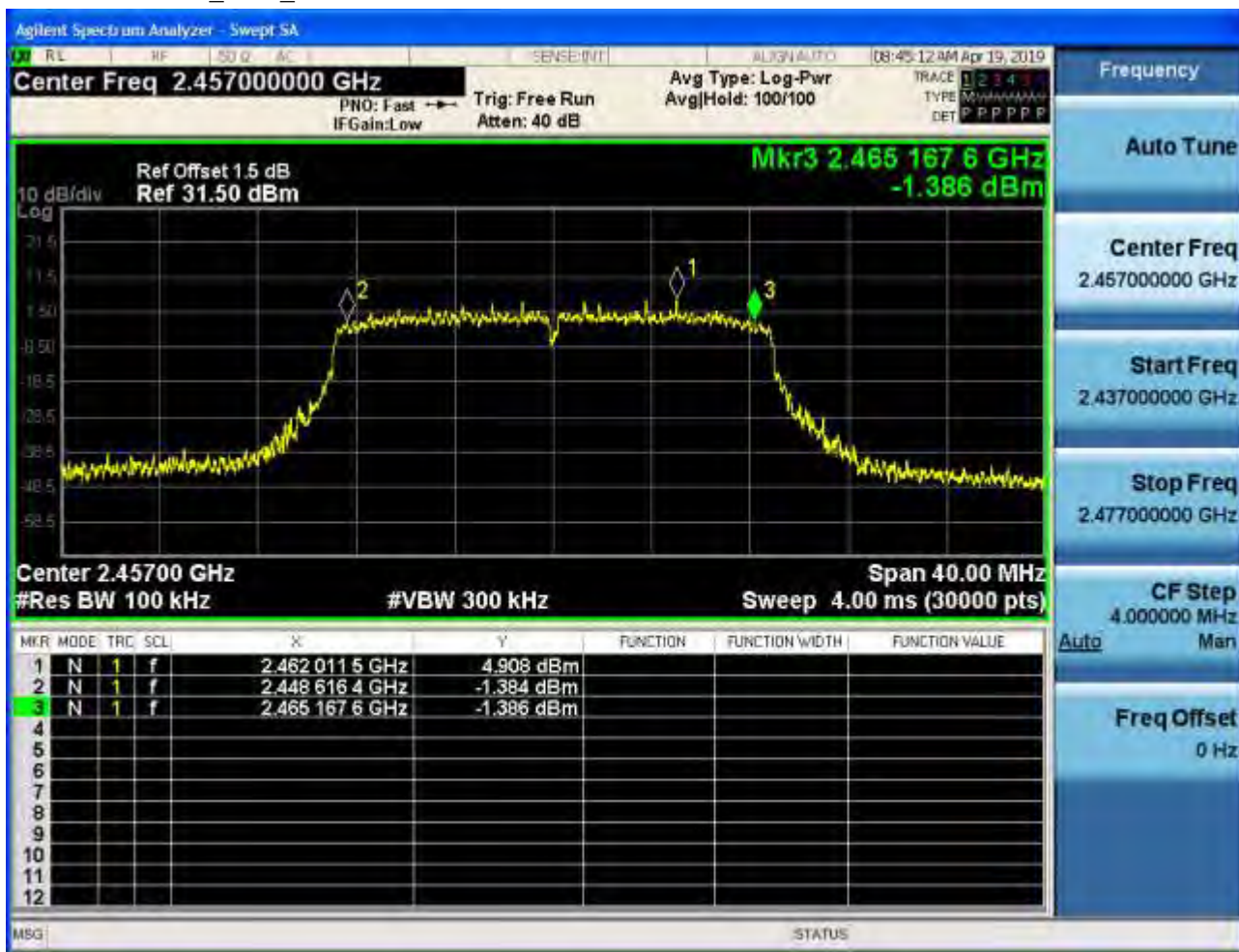


1.53 11N20MIMO_Ant1_2457



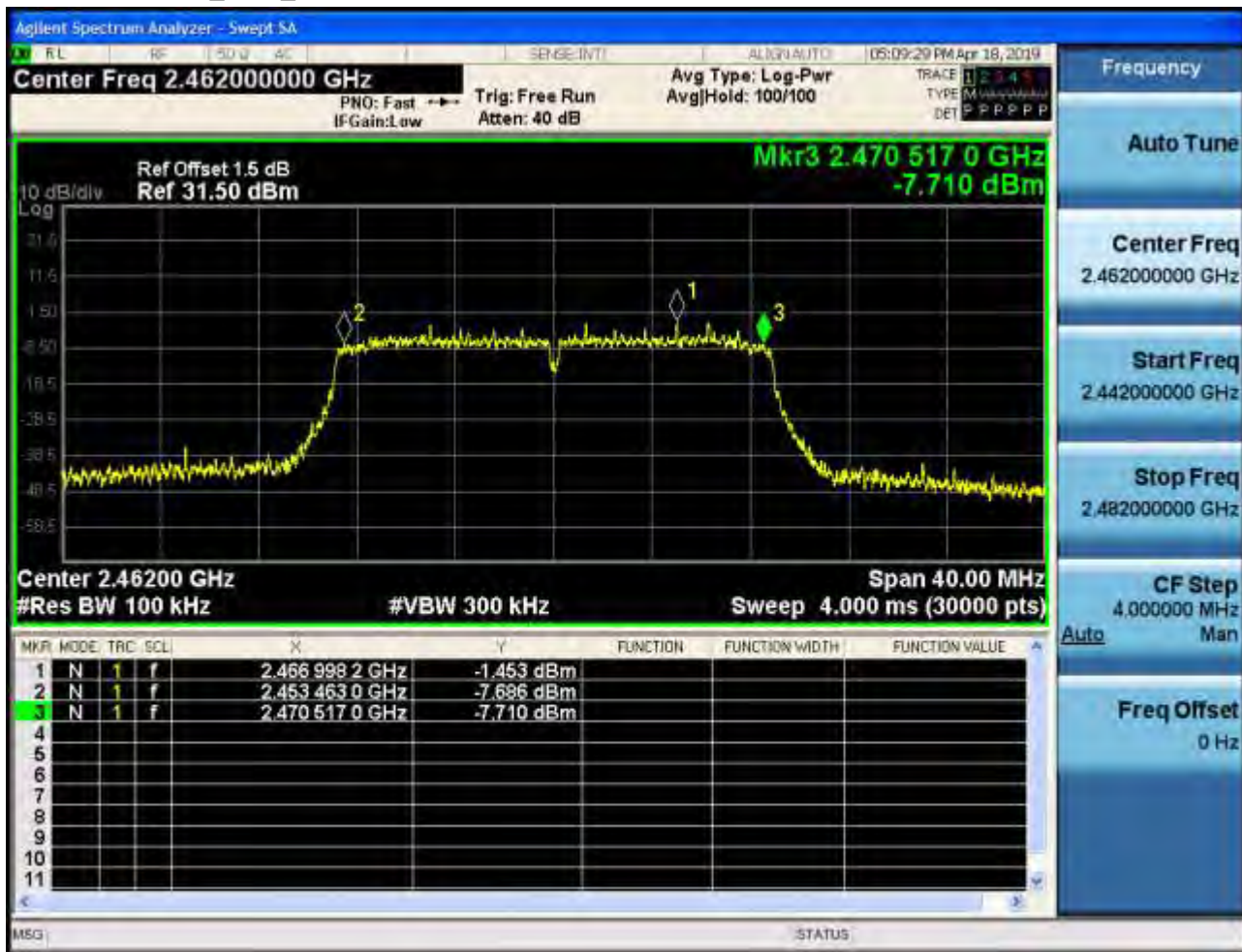


1.54 11N20MIMO_Ant2_2457



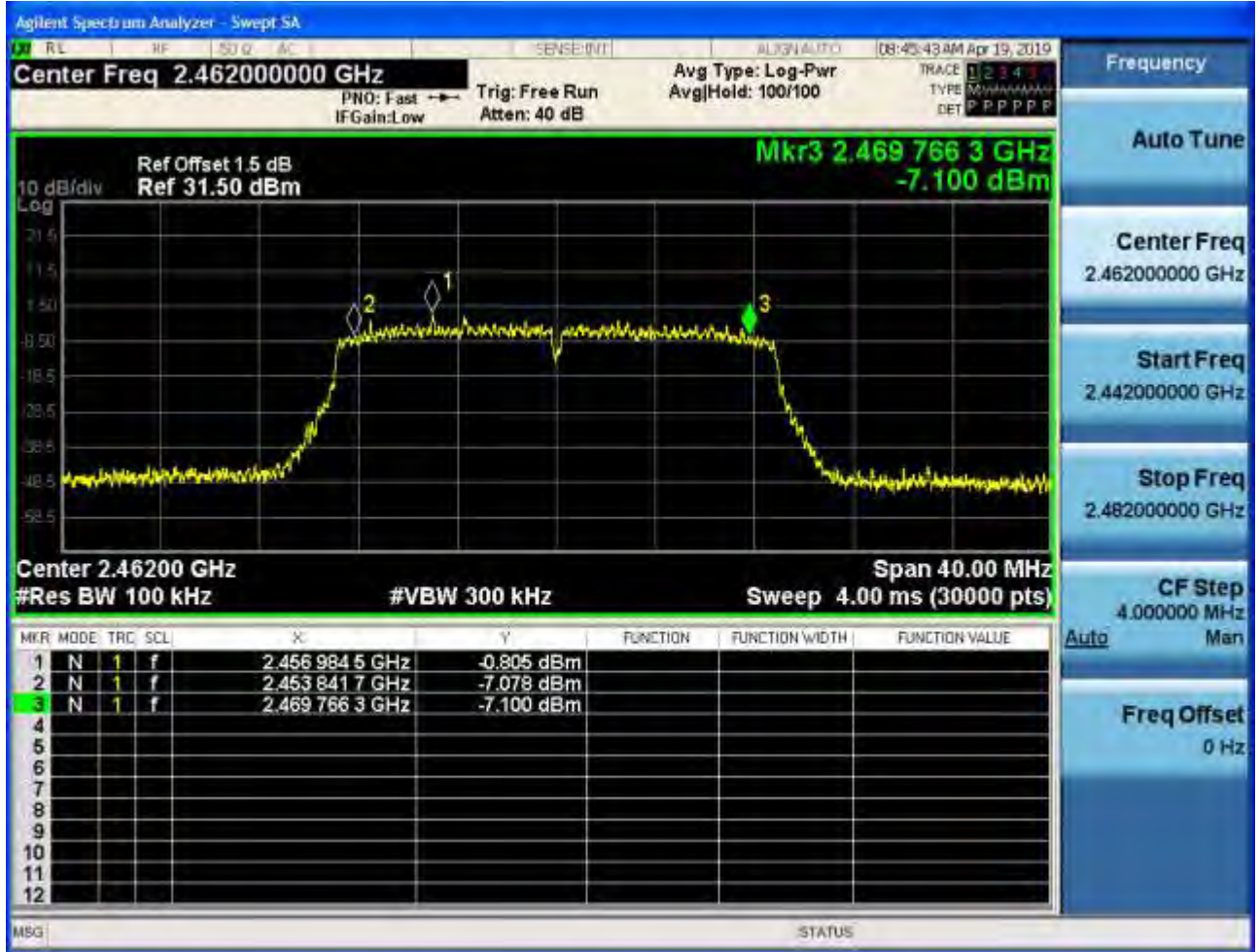


1.55 11N20MIMO_Ant1_2462



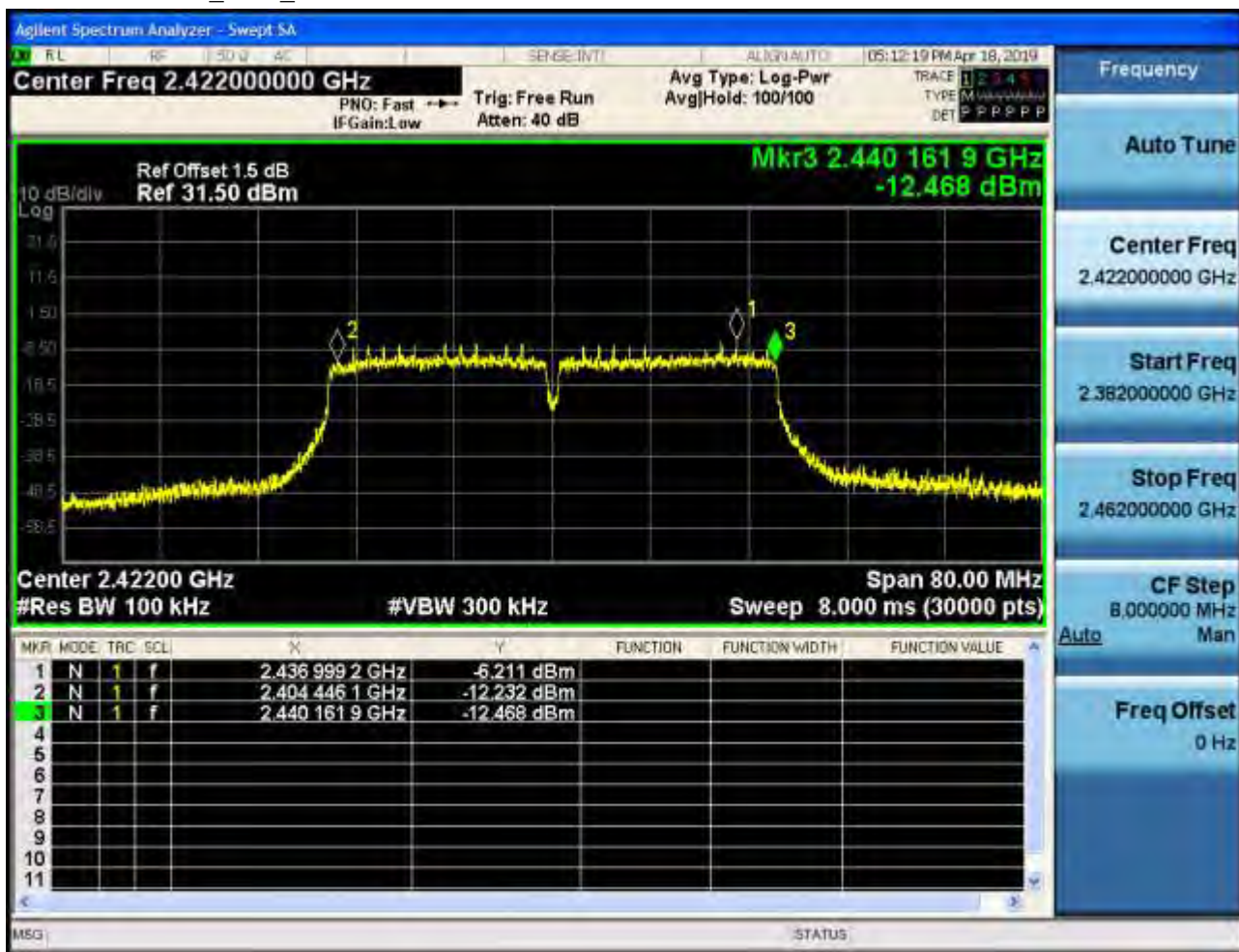


1.56 11N20MIMO_Ant2_2462

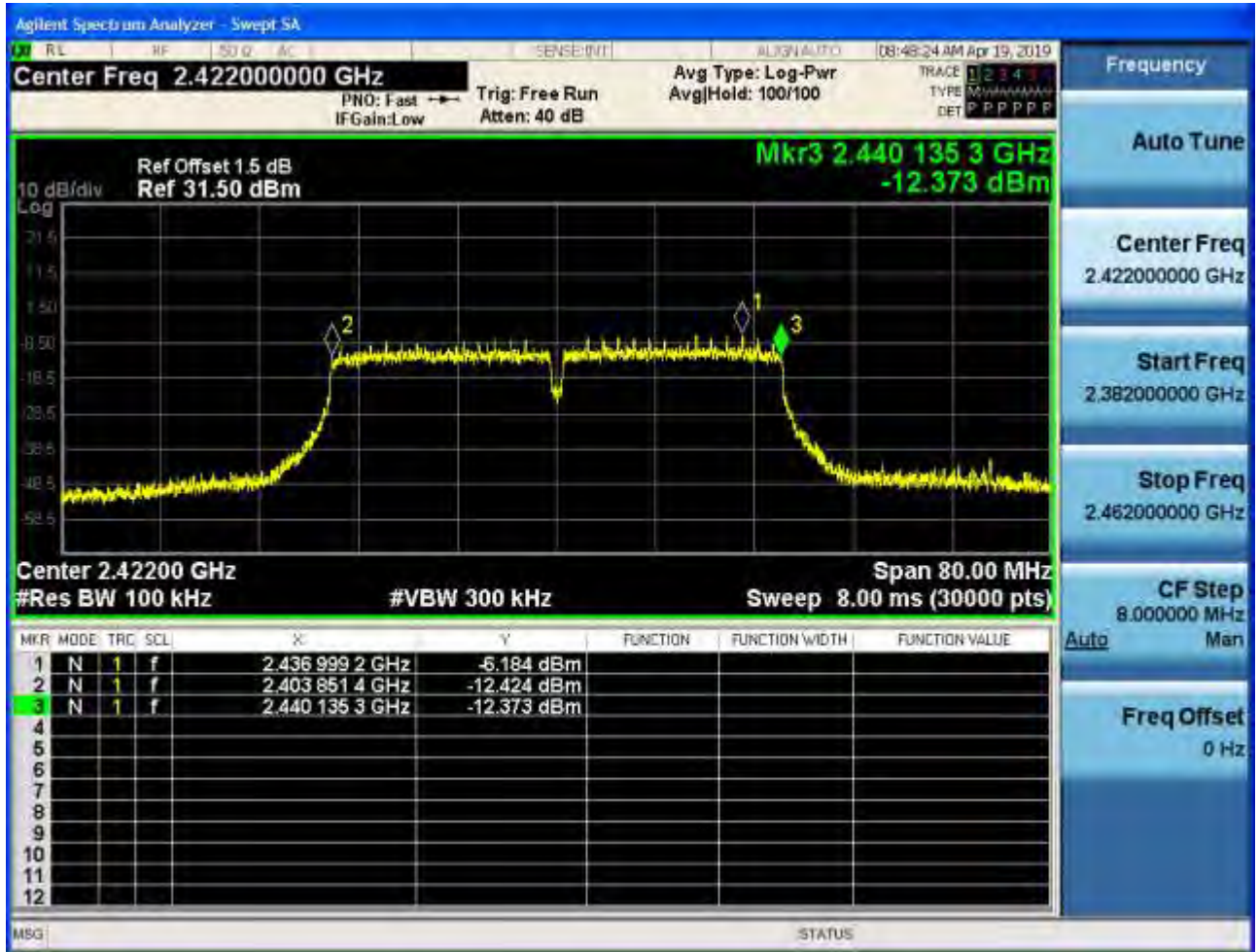




1.57 11N40MIMO_Ant1_2422

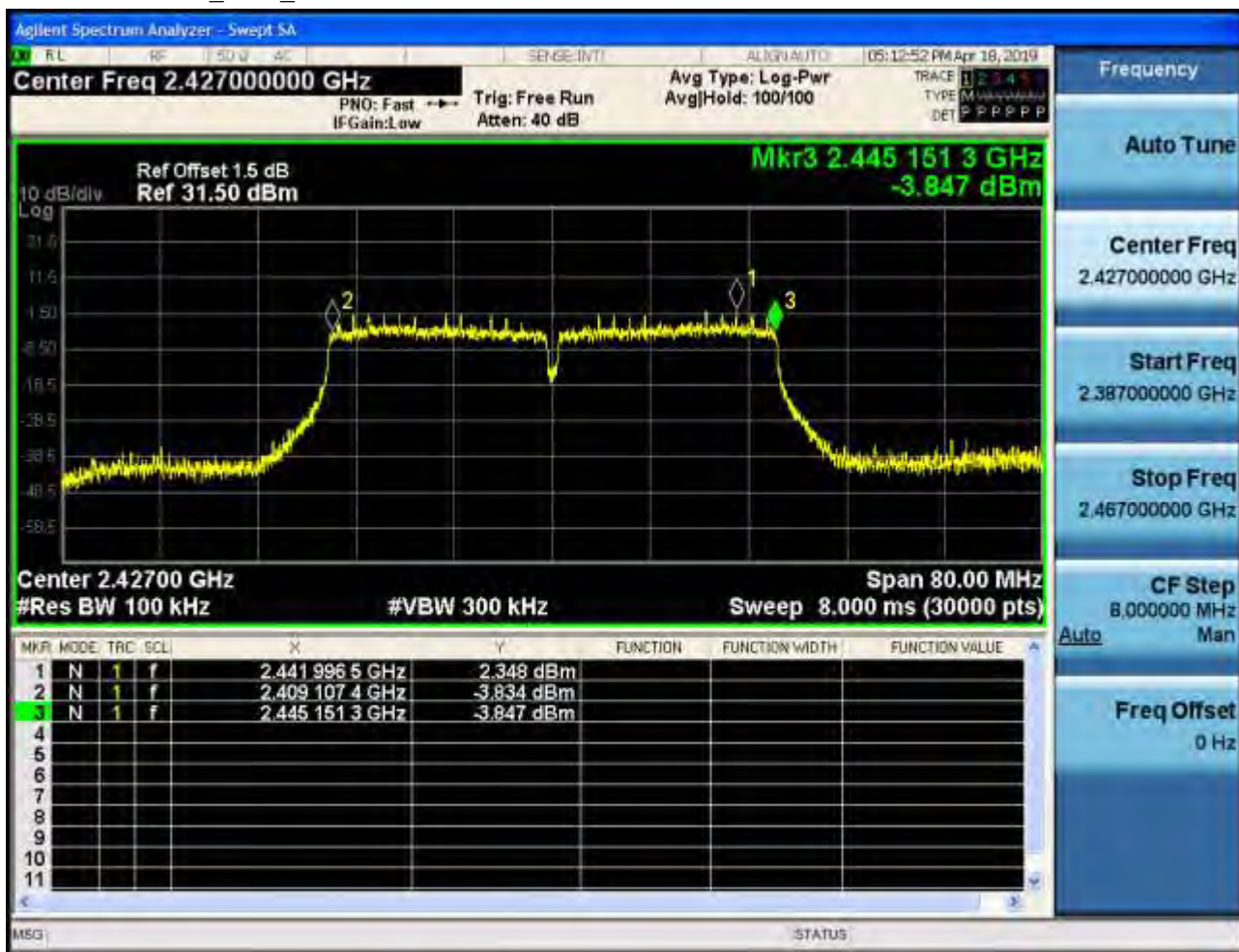


1.58 11N40MIMO_Ant2_2422



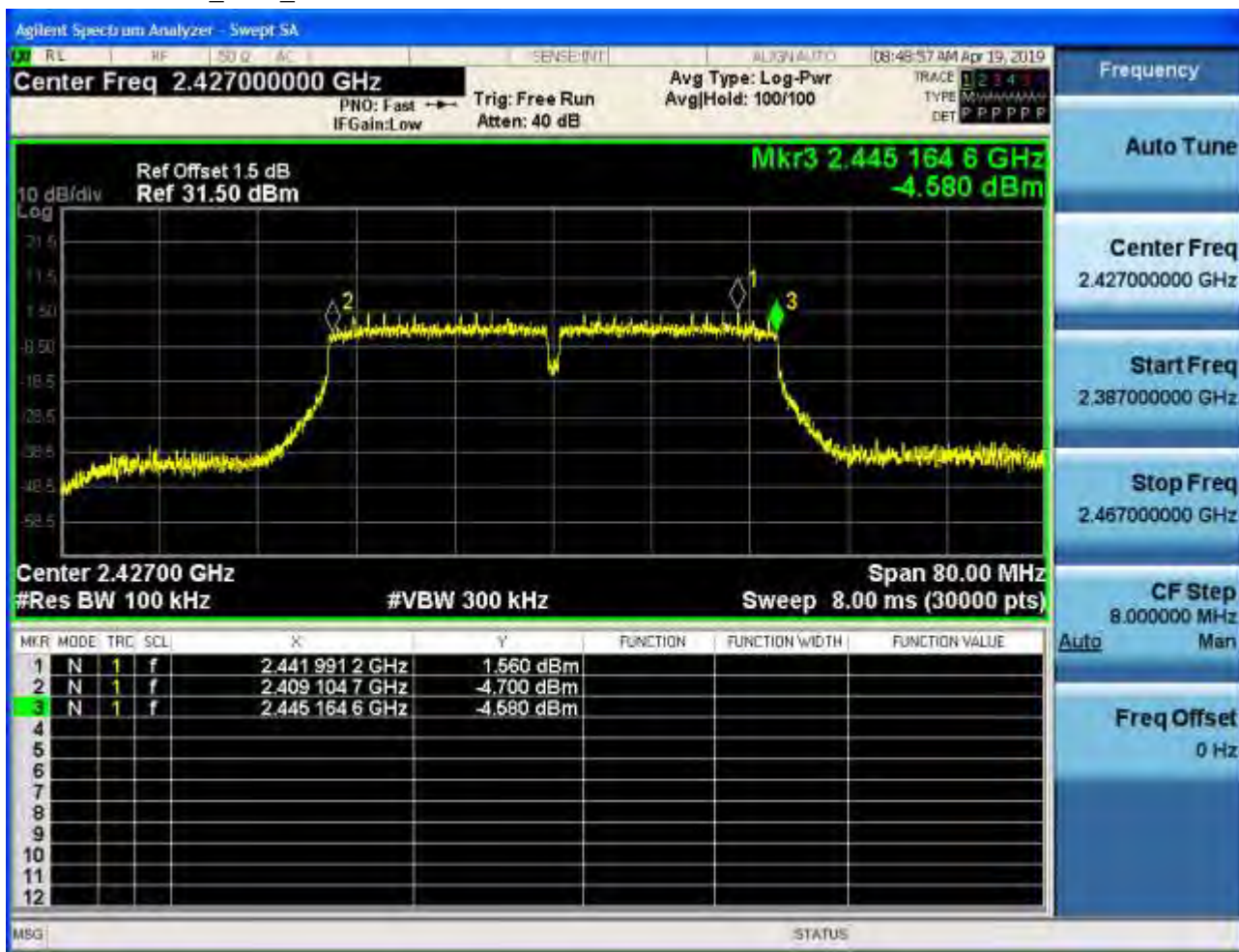


1.59 11N40MIMO_Ant1_2427





1.60 11N40MIMO_Ant2_2427





1.61 11N40MIMO_Ant1_2437





Agilent Spectrum Analyzer - Swept SA

Center Freq 2.43700000 GHz

Avg Type: Log-Pwr

Trig: Free Run

Ref Offset 1.5 dB

Ref 31.50 dBm

Mkr3 2.455 164 6 GHz

-4.649 dBm

Center 2.43700 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 80.00 MHz

Sweep 8.00 ms (30000 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.460 769 8 GHz	1.627 dBm			
2	N	1	f	2.418 851 4 GHz	-6.603 dBm			
3	N	1	f	2.455 164 6 GHz	-4.649 dBm			
4								
5								
6								
7								
8								
9								
10								
11								
12								

Frequency

Auto Tune

Center Freq 2.43700000 GHz

Start Freq 2.397000000 GHz

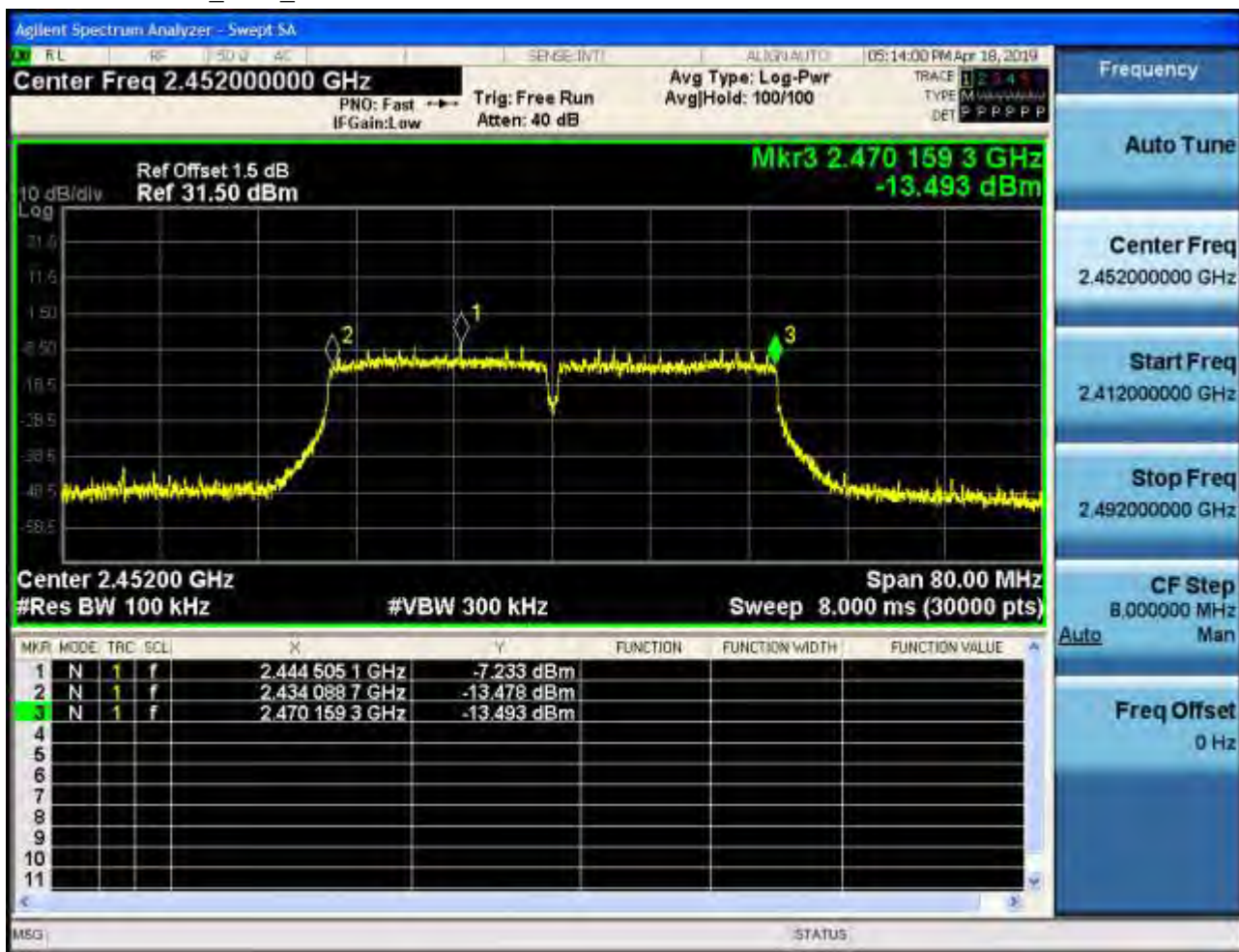
Stop Freq 2.477000000 GHz

CF Step 8.000000 MHz

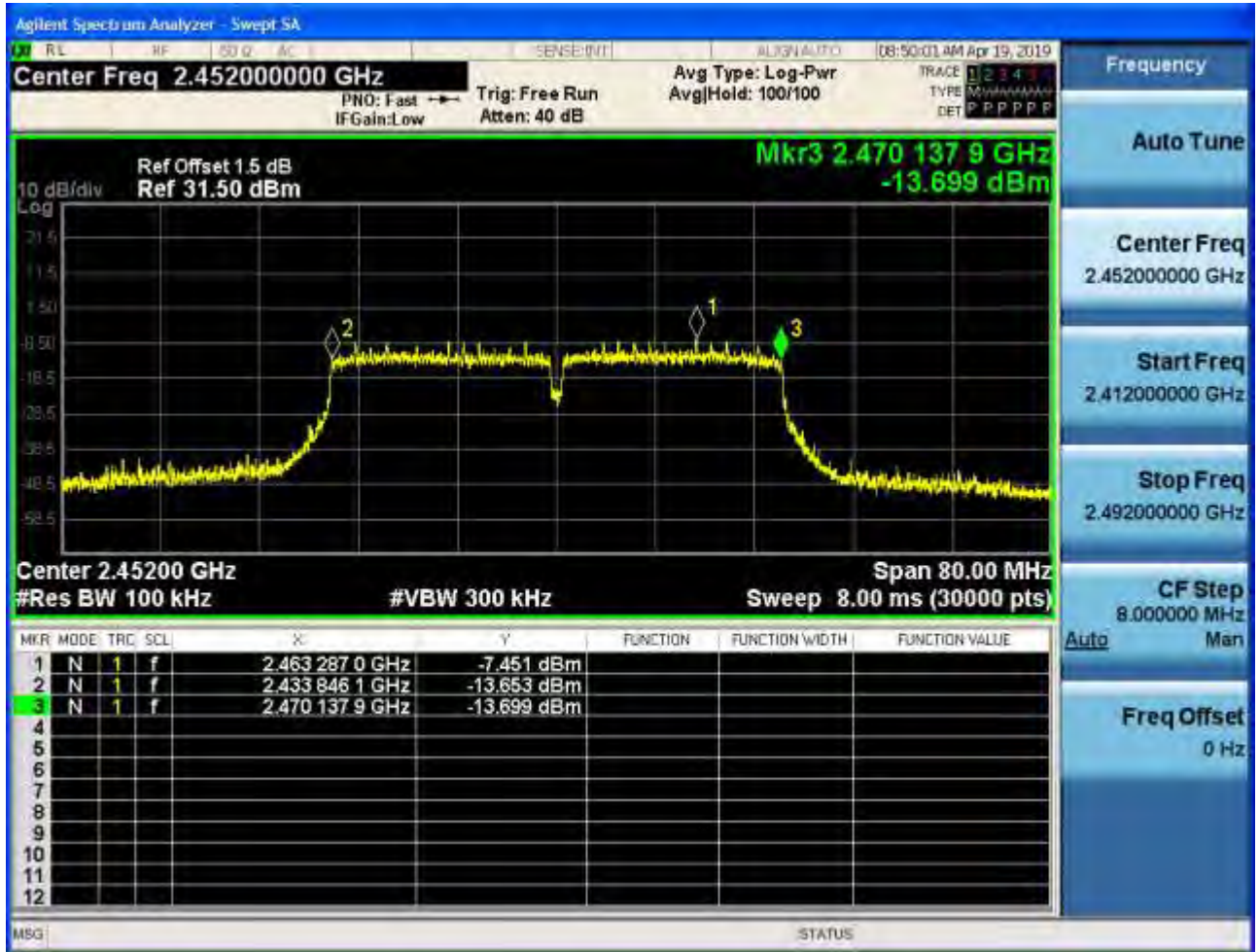
Freq Offset 0 Hz



1.63 11N40MIMO_Ant1_2452



1.64 11N40MIMO_Ant2_2452



Appendix B: Occupied Bandwidth

Part I - Test Results

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	11.36	2406.45	2417.81	---	PASS
11B	Ant2	2412	11.63	2406.27	2417.9	---	PASS
11B	Ant1	2417	11.5	2411.24	2422.74	---	PASS
11B	Ant2	2417	11.7	2411.23	2422.93	---	PASS
11B	Ant1	2437	11.53	2431.37	2442.9	---	PASS
11B	Ant2	2437	11.66	2431.15	2442.81	---	PASS
11B	Ant1	2462	11.77	2456.15	2467.92	---	PASS
11B	Ant2	2462	11.64	2456.14	2467.78	---	PASS
11G	Ant1	2412	16.4	2403.85	2420.25	---	PASS
11G	Ant2	2412	16.51	2403.79	2420.3	---	PASS
11G	Ant1	2417	16.46	2408.77	2425.23	---	PASS
11G	Ant2	2417	16.59	2408.78	2425.37	---	PASS
11G	Ant1	2437	16.53	2428.79	2445.32	---	PASS
11G	Ant2	2437	16.56	2428.71	2445.27	---	PASS
11G	Ant1	2457	16.63	2448.65	2465.28	---	PASS
11G	Ant2	2457	16.49	2448.76	2465.25	---	PASS
11G	Ant1	2462	16.56	2453.72	2470.28	---	PASS
11G	Ant2	2462	16.41	2453.78	2470.19	---	PASS
11G20CDD	Ant1	2412	16.39	2403.85	2420.24	---	PASS
11G20CDD	Ant2	2412	16.43	2403.82	2420.25	---	PASS
11G20CDD	Ant1	2417	16.5	2408.76	2425.26	---	PASS
11G20CDD	Ant2	2417	16.49	2408.8	2425.29	---	PASS
11G20CDD	Ant1	2437	16.57	2416.99	2420.86	---	PASS
11G20CDD	Ant2	2437	16.51	2428.75	2445.26	---	PASS
11G20CDD	Ant1	2457	16.69	2448.62	2465.31	---	PASS
11G20CDD	Ant2	2457	16.44	2448.79	2465.23	---	PASS
11G20CDD	Ant1	2462	16.51	2453.76	2470.27	---	PASS
11G20CDD	Ant2	2462	16.39	2453.8	2470.19	---	PASS
11N20SISO	Ant1	2412	17.43	2403.34	2420.77	---	PASS
11N20SISO	Ant2	2412	17.52	2403.28	2420.8	---	PASS
11N20SISO	Ant1	2417	17.48	2408.26	2425.74	---	PASS
11N20SISO	Ant2	2417	17.54	2408.26	2425.8	---	PASS
11N20SISO	Ant1	2437	17.52	2428.29	2445.81	---	PASS
11N20SISO	Ant2	2437	17.54	2428.23	2445.77	---	PASS
11N20SISO	Ant1	2457	17.58	2448.19	2465.77	---	PASS
11N20SISO	Ant2	2457	17.5	2448.25	2465.75	---	PASS
11N20SISO	Ant1	2462	17.59	2442.16	2481.8	---	PASS
11N20SISO	Ant2	2462	17.48	2453.23	2470.71	---	PASS
11N20MIMO	Ant1	2412	17.43	2403.34	2420.77	---	PASS
11N20MIMO	Ant2	2412	17.49	2403.3	2420.79	---	PASS
11N20MIMO	Ant1	2417	17.48	2408.28	2425.76	---	PASS
11N20MIMO	Ant2	2417	17.52	2408.27	2425.79	---	PASS
11N20MIMO	Ant1	2437	17.52	2417.19	2456.82	---	PASS
11N20MIMO	Ant2	2437	17.53	2428.23	2445.76	---	PASS
11N20MIMO	Ant1	2457	17.59	2448.18	2465.77	---	PASS
11N20MIMO	Ant2	2457	17.46	2448.27	2465.73	---	PASS
11N20MIMO	Ant1	2462	17.59	2453.21	2470.8	---	PASS



11N20MIMO	Ant2	2462	17.41	2453.27	2470.68	---	PASS
11N40SISO	Ant1	2422	36.72	2403.85	2440.57	---	PASS
11N40SISO	Ant2	2422	36.78	2403.71	2440.49	---	PASS
11N40SISO	Ant1	2427	36.84	2408.71	2445.55	---	PASS
11N40SISO	Ant2	2427	36.83	2408.65	2445.48	---	PASS
11N40SISO	Ant1	2437	36.67	2418.67	2455.34	---	PASS
11N40SISO	Ant2	2437	36.91	2418.59	2455.5	---	PASS
11N40SISO	Ant1	2452	36.77	2433.68	2470.45	---	PASS
11N40SISO	Ant2	2452	36.75	2433.6	2470.35	---	PASS
11N40MIMO	Ant1	2422	36.66	2403.86	2440.52	---	PASS
11N40MIMO	Ant2	2422	36.5	2403.87	2440.37	---	PASS
11N40MIMO	Ant1	2427	36.82	2408.67	2445.49	---	PASS
11N40MIMO	Ant2	2427	36.56	2408.78	2445.34	---	PASS
11N40MIMO	Ant1	2437	36.78	2418.56	2455.34	---	PASS
11N40MIMO	Ant2	2437	36.67	2418.7	2455.37	---	PASS
11N40MIMO	Ant1	2452	36.81	2433.63	2470.44	---	PASS
11N40MIMO	Ant2	2452	36.53	2433.68	2470.21	---	PASS



Part II - Test Graphs

1.1 11B_Ant1_2412





1.2 11B_Ant2_2412



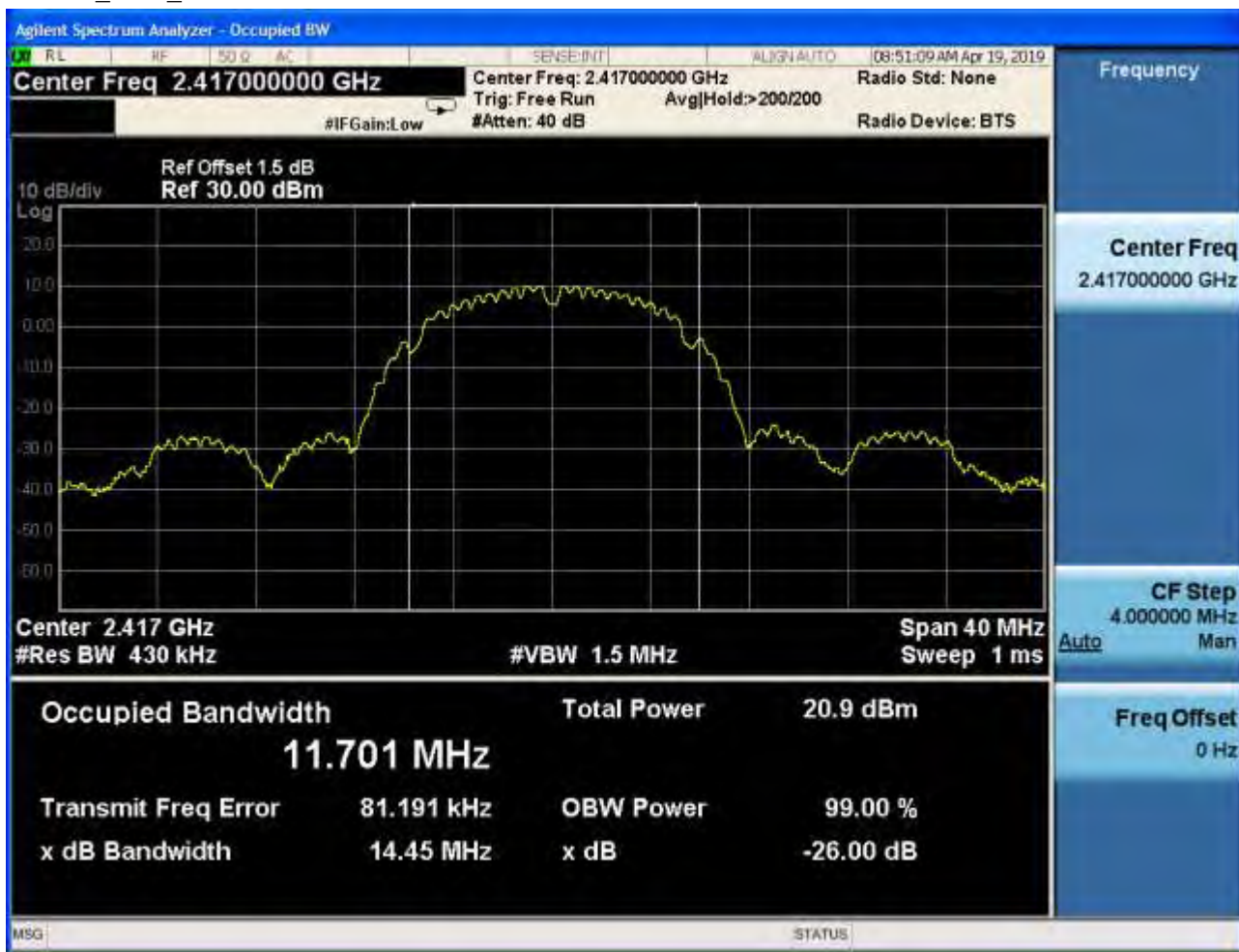


1.3 11B_Ant1_2417





1.4 11B_Ant2_2417



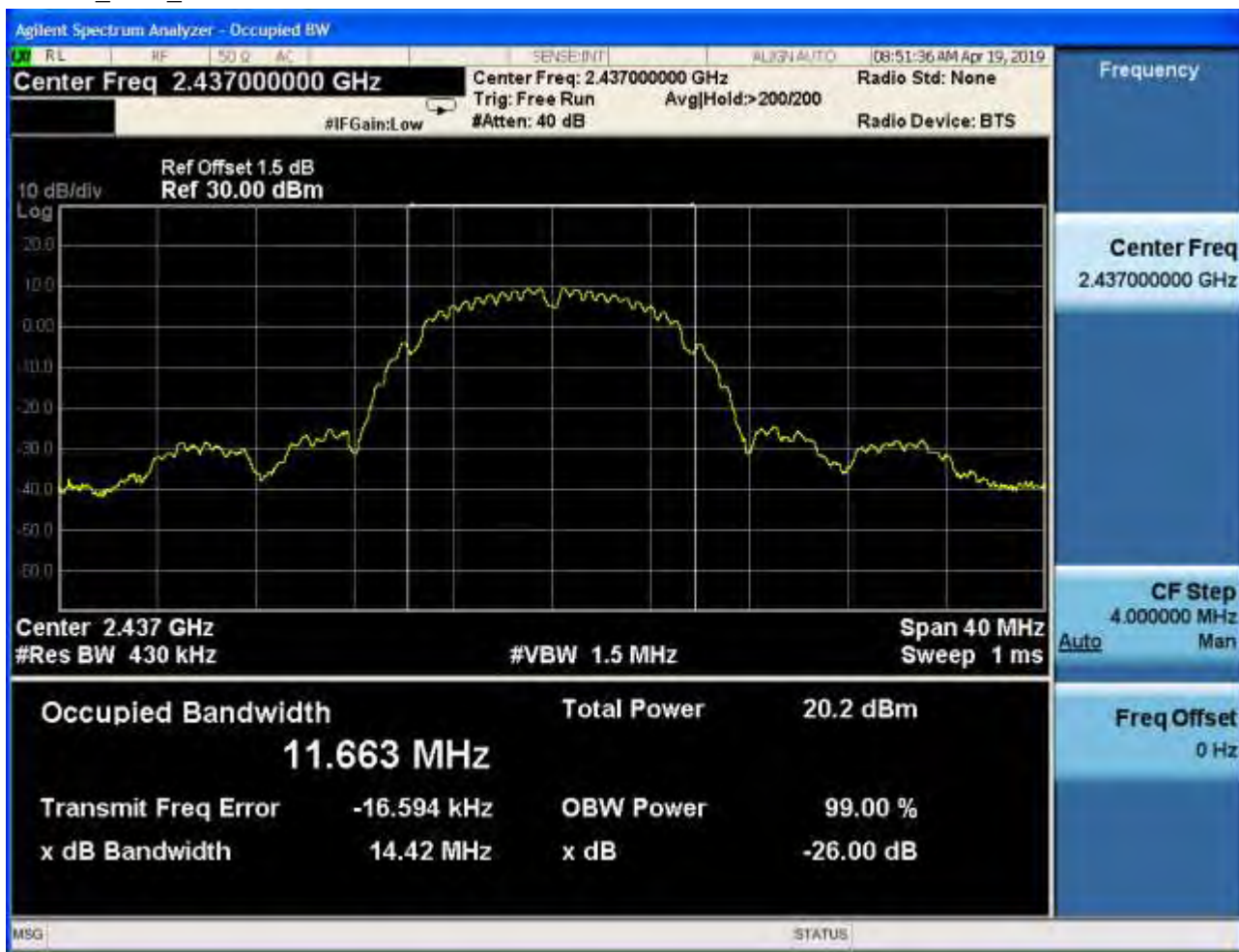


1.5 11B_Ant1_2437





1.6 11B_Ant2_2437



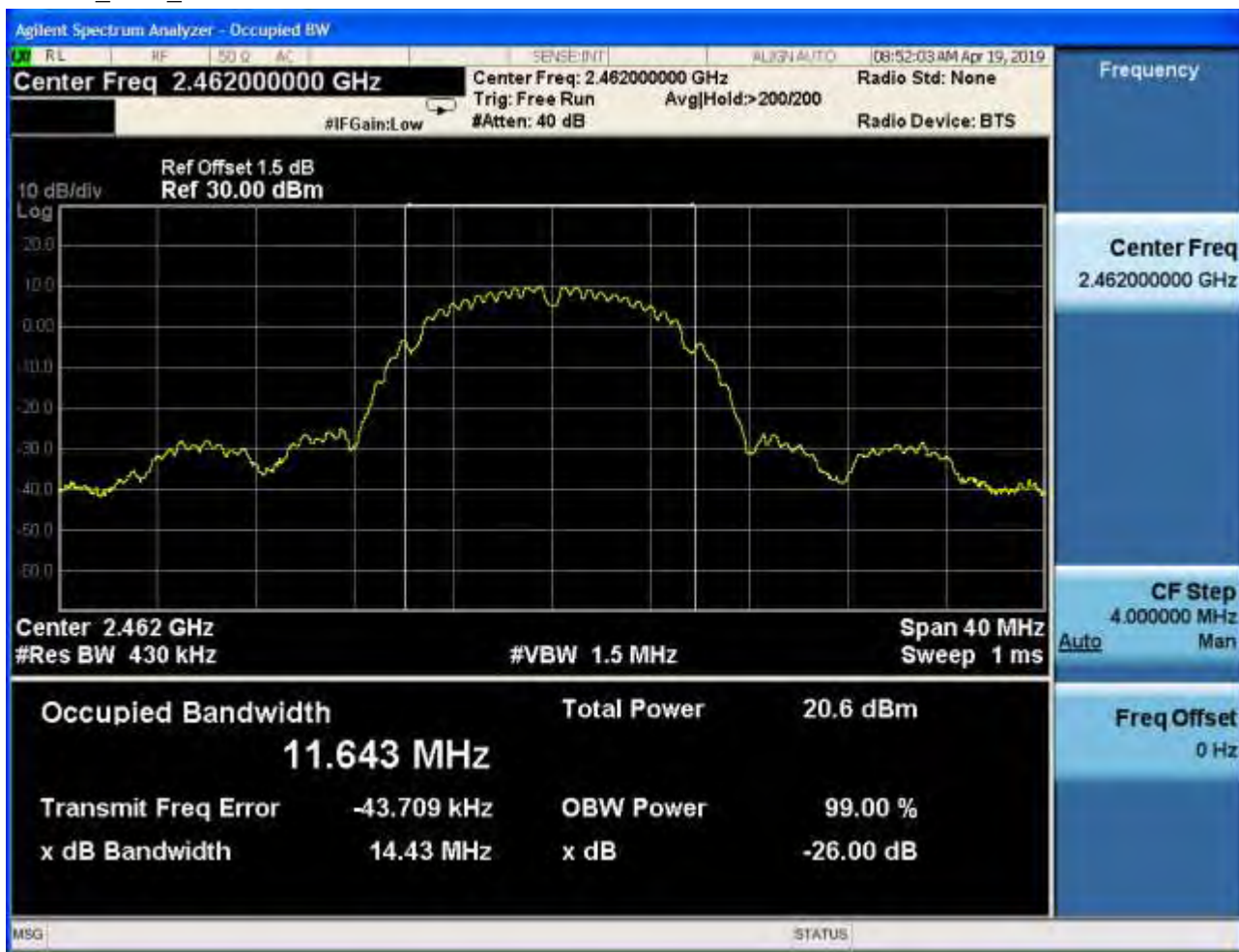


1.7 11B_Ant1_2462





1.8 11B_Ant2_2462



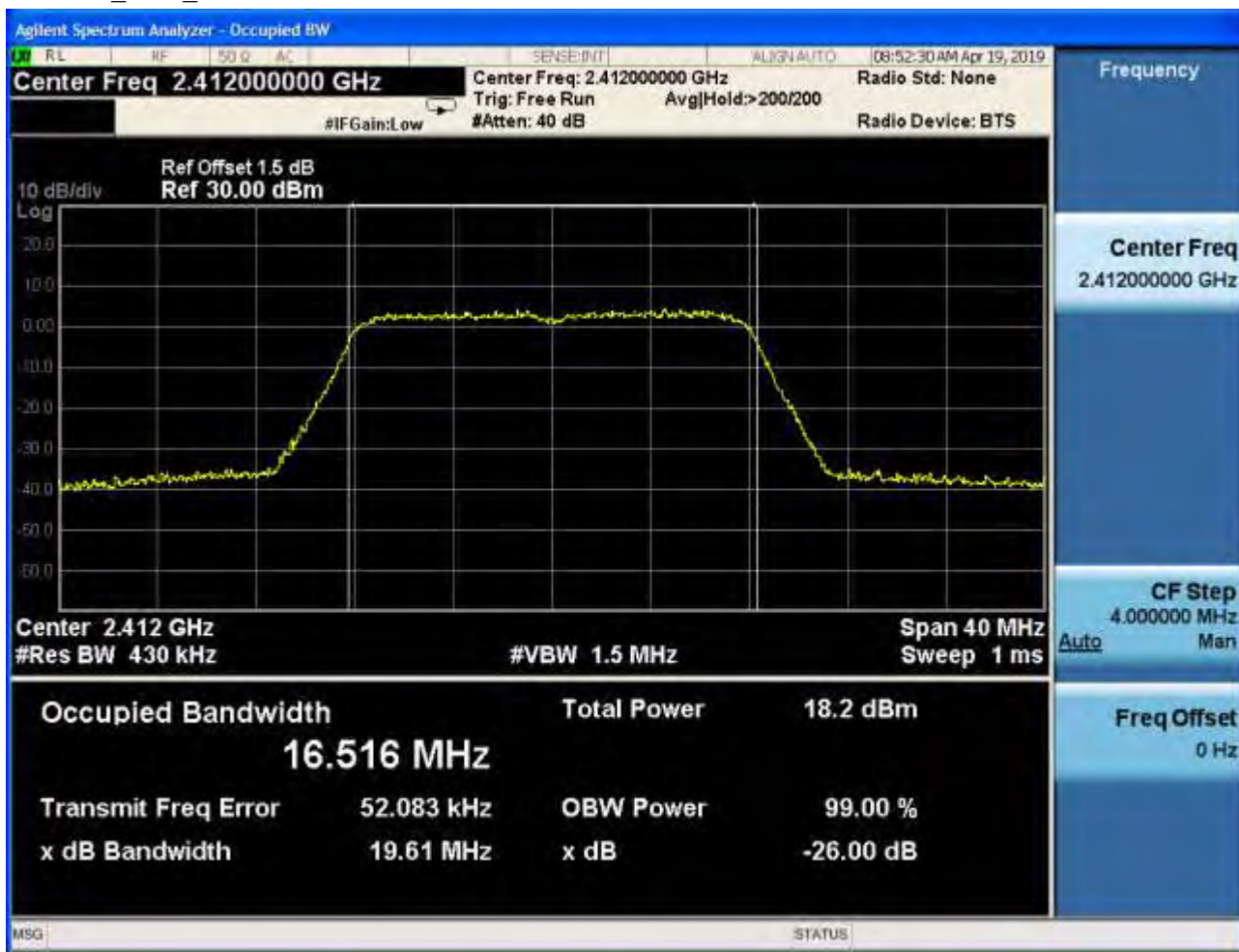


1.9 11G_Ant1_2412





1.10 11G_Ant2_2412



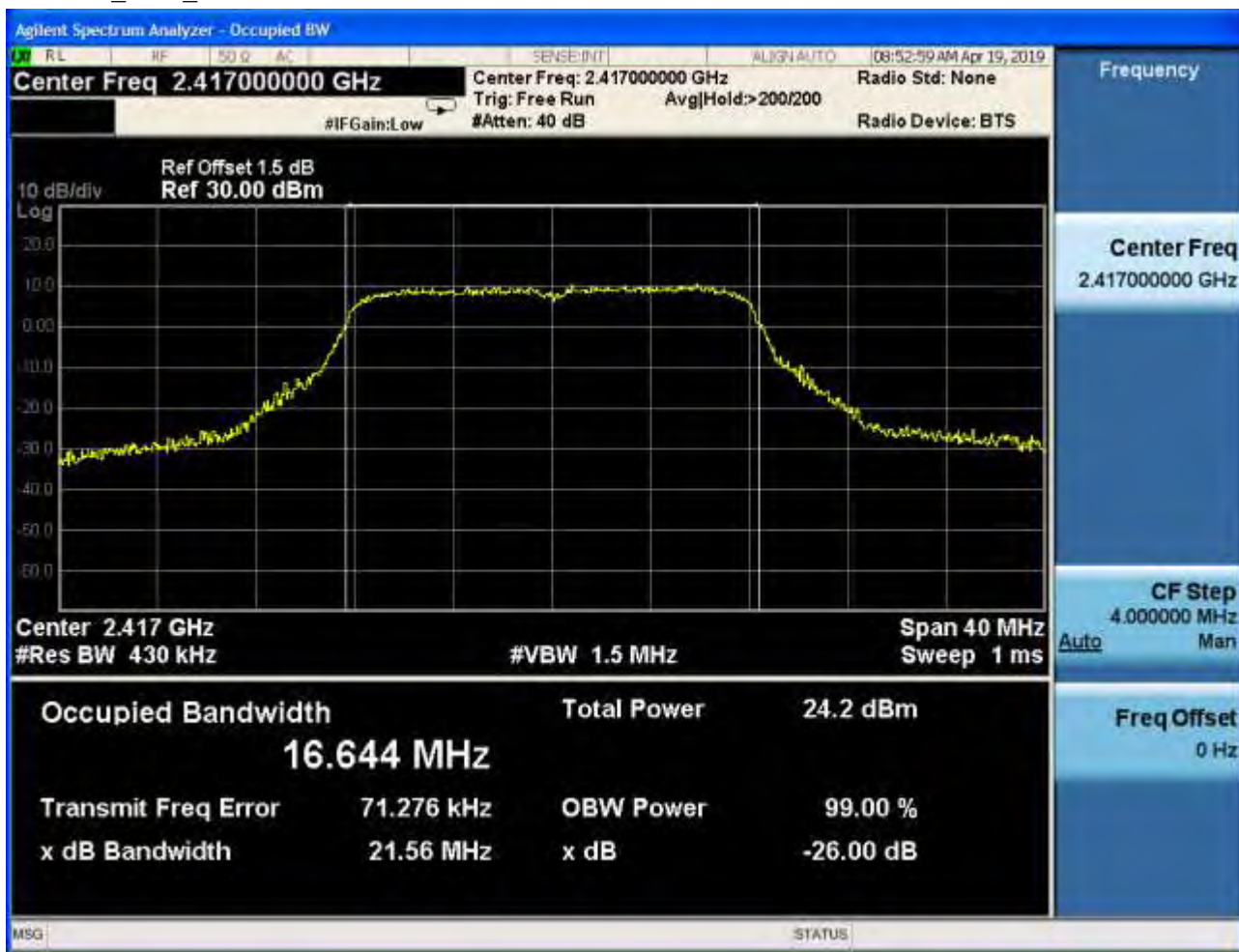


1.11 11G_Ant1_2417





1.12 11G_Ant2_2417



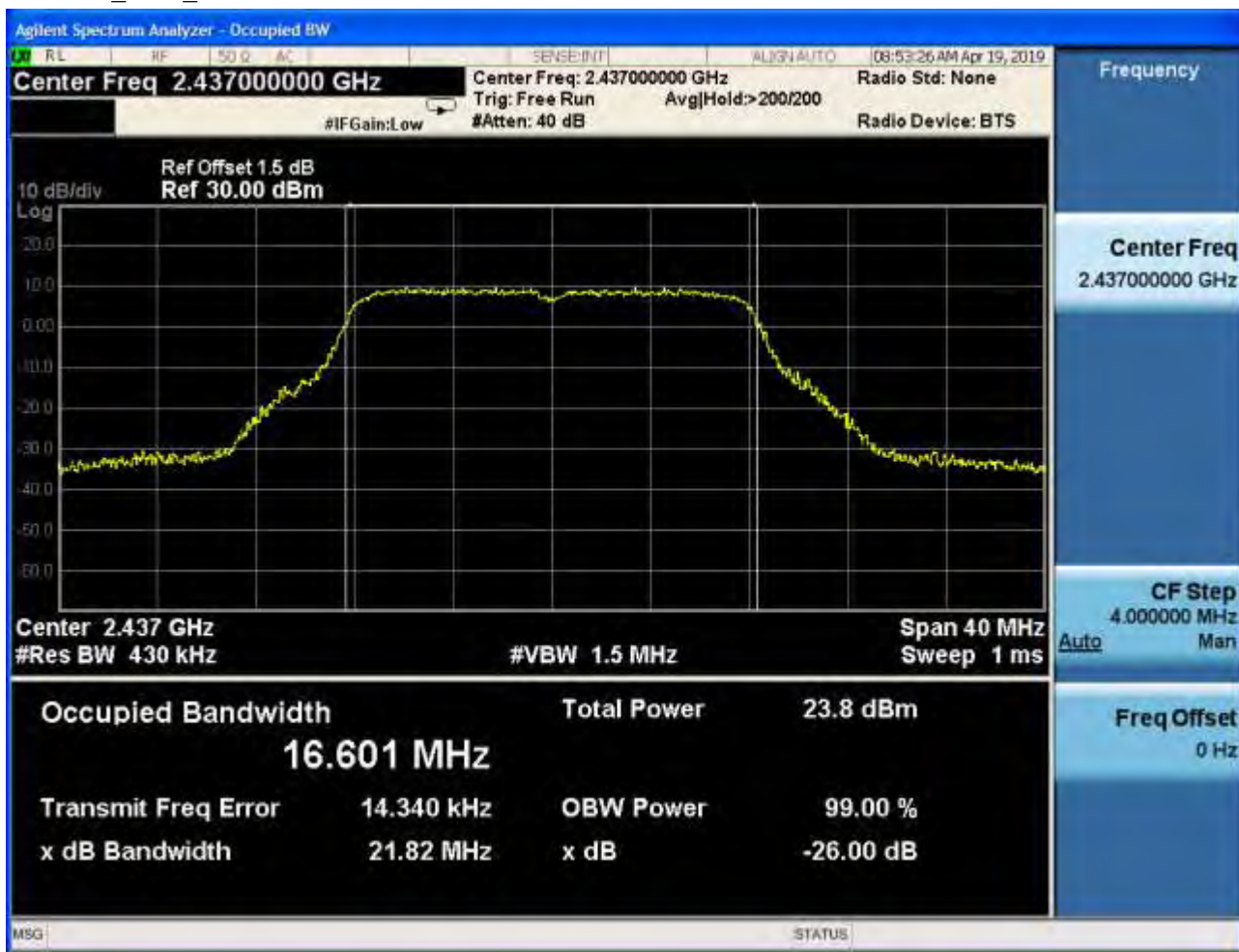


1.13 11G_Ant1_2437





1.14 11G_Ant2_2437



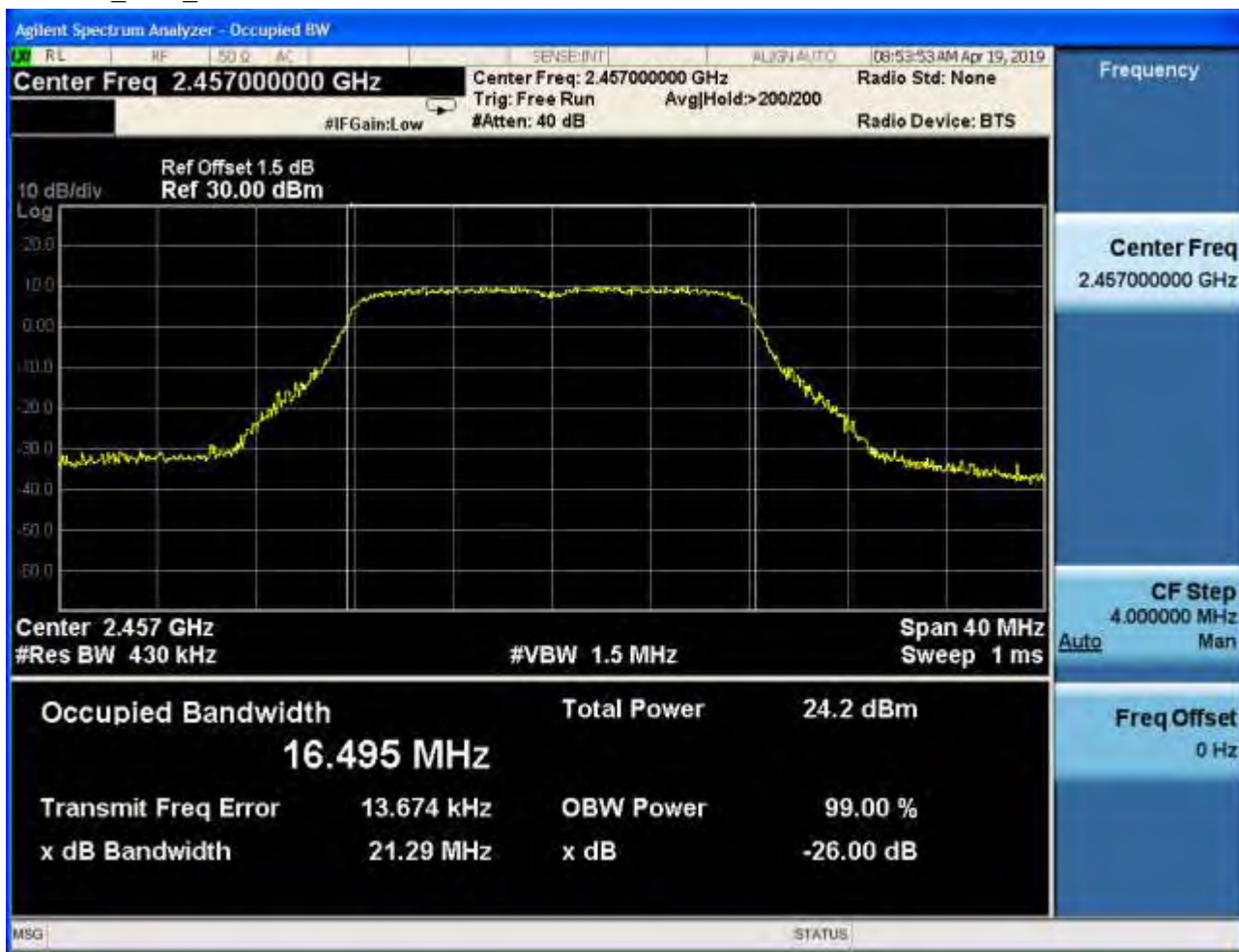


1.15 11G_Ant1_2457





1.16 11G_Ant2_2457



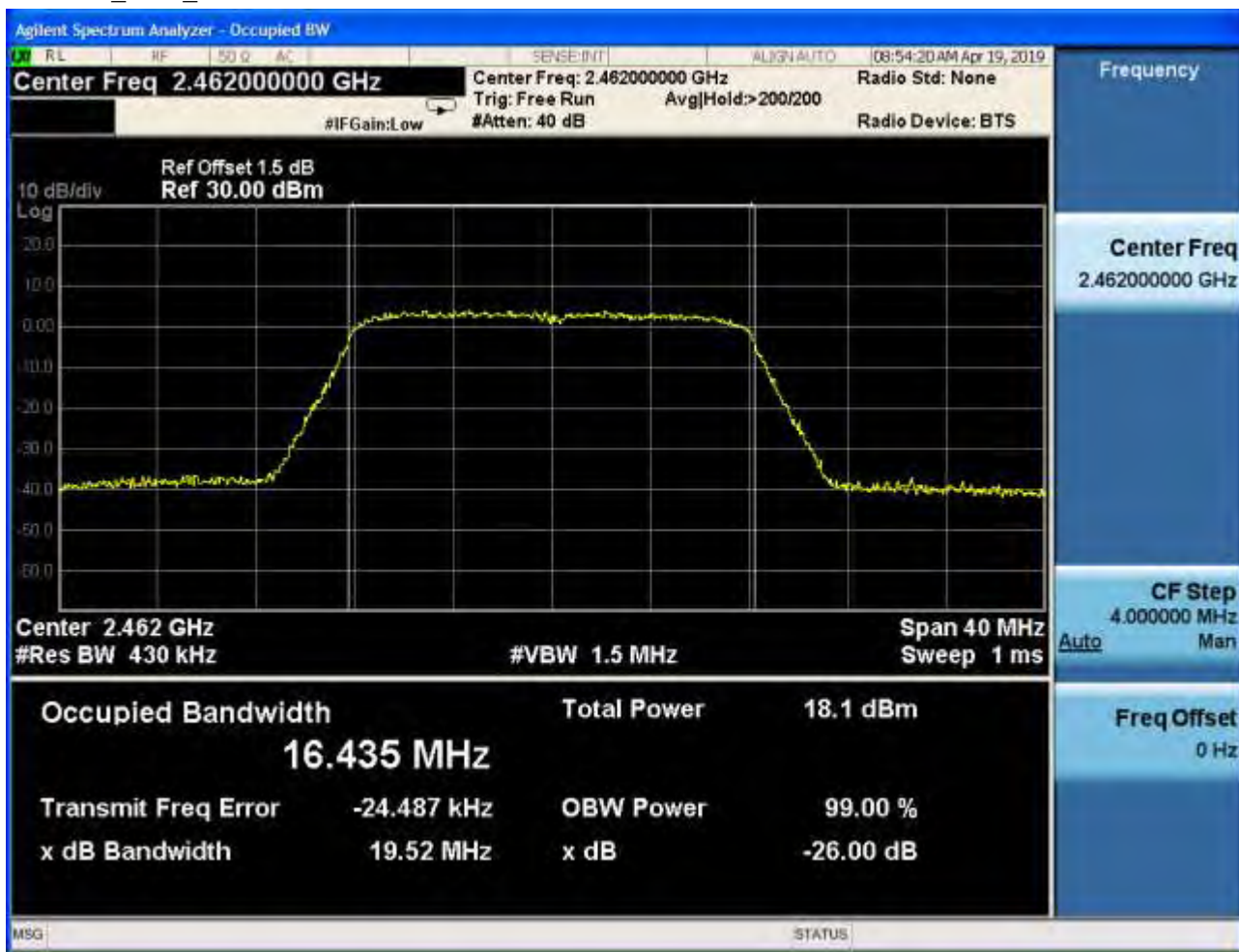


1.17 11G_Ant1_2462





1.18 11G_Ant2_2462



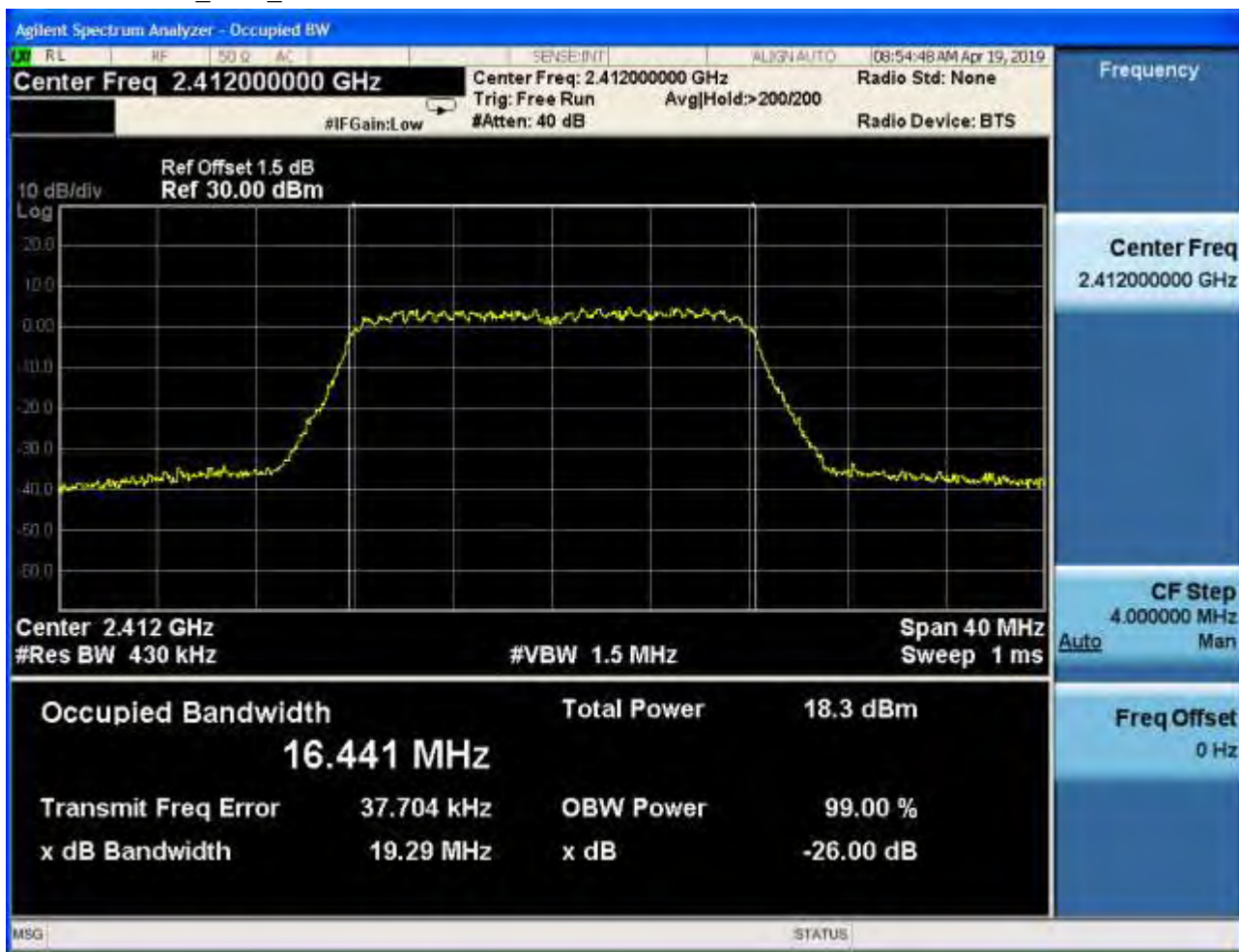


1.19 11G20CDD_Ant1_2412





1.20 11G20CDD_Ant2_2412



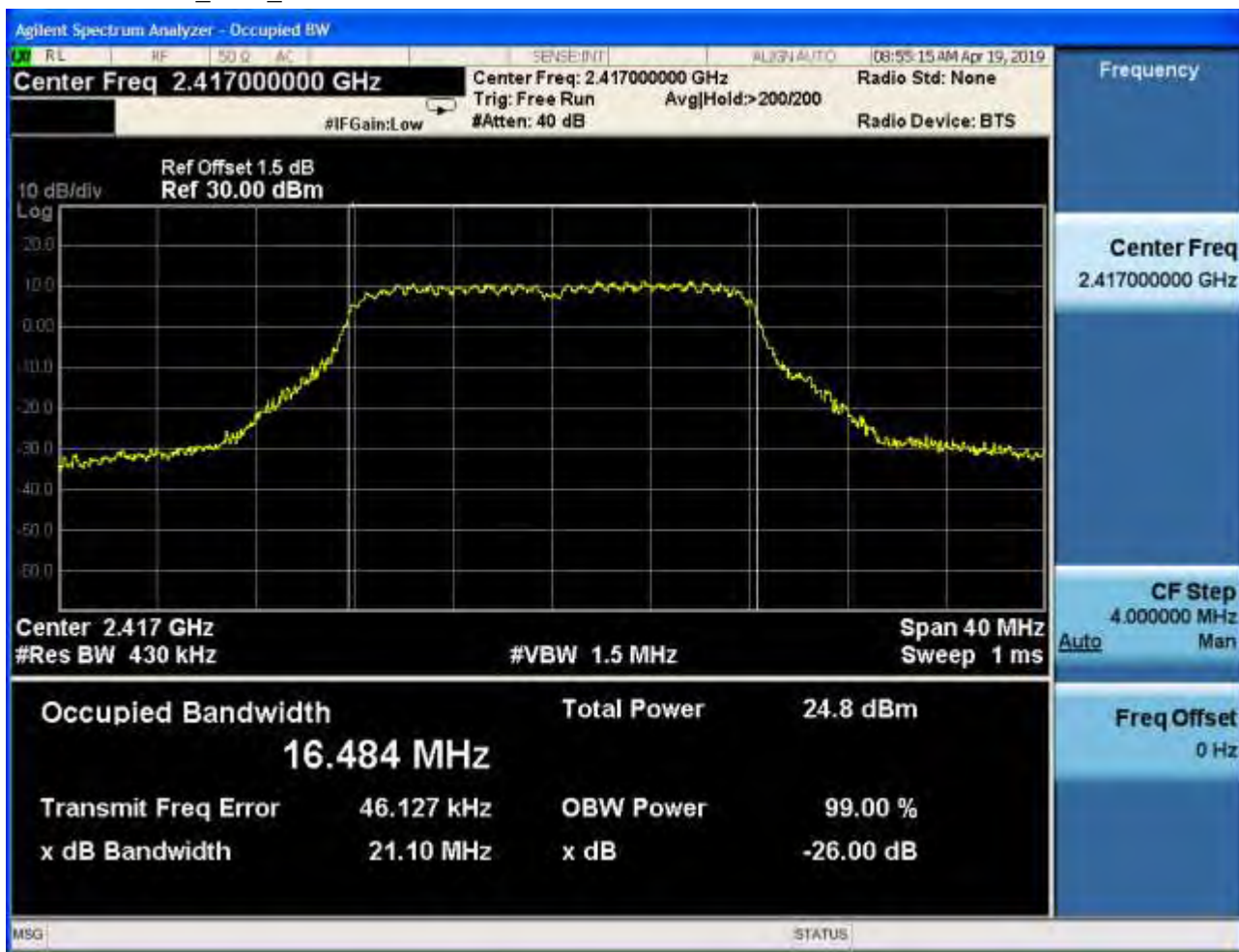


1.21 11G20CDD_Ant1_2417



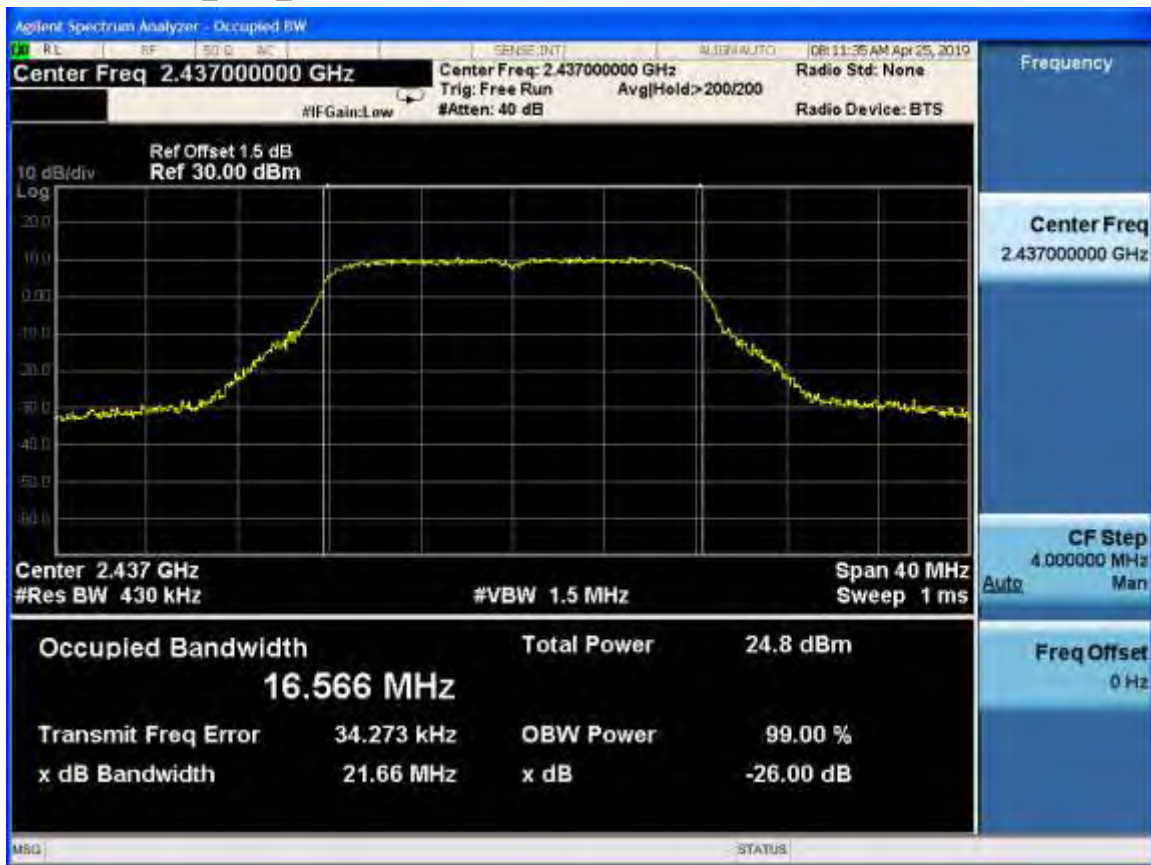


1.22 11G20CDD_Ant2_2417



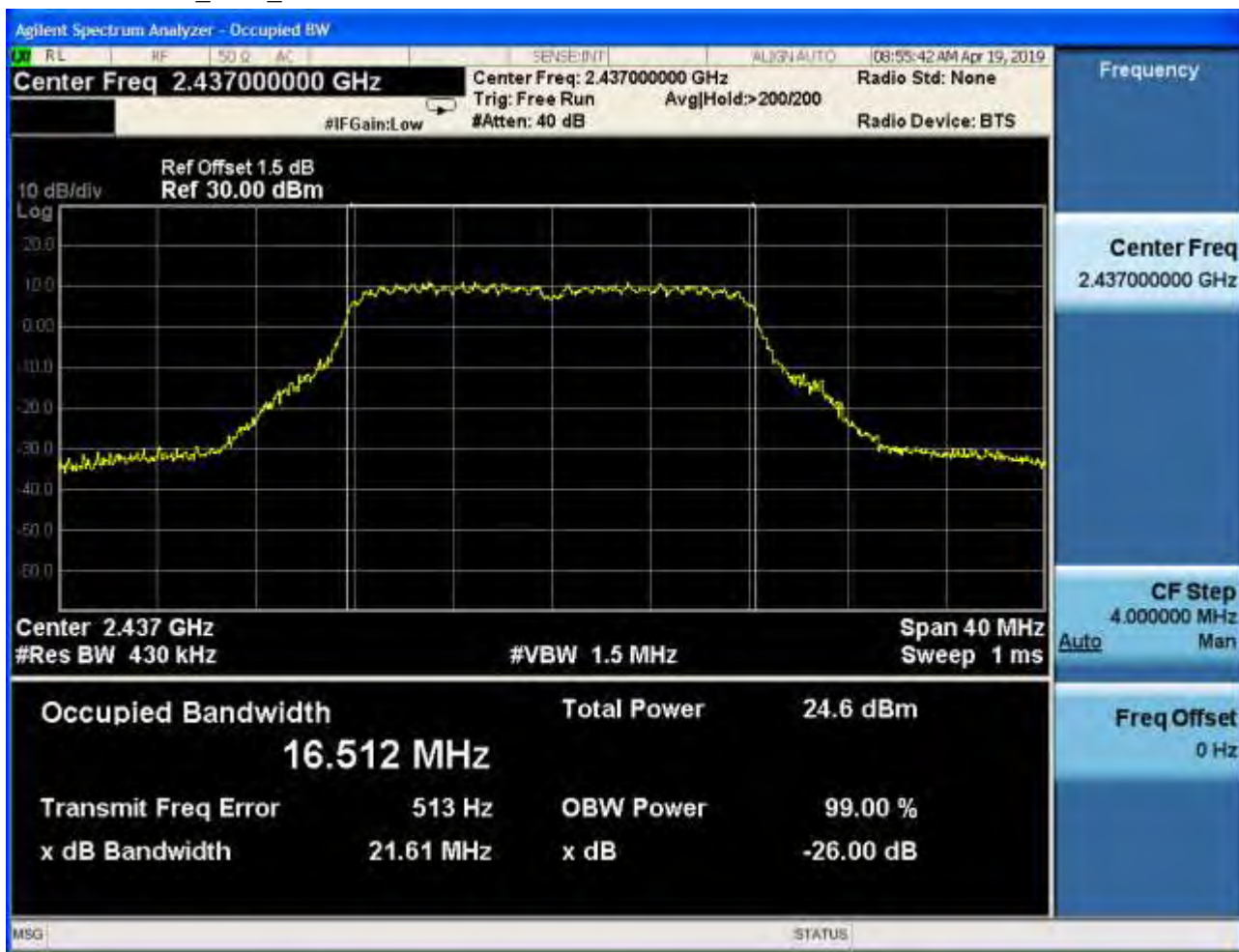


1.23 11G20CDD_Ant1_2437





1.24 11G20CDD_Ant2_2437



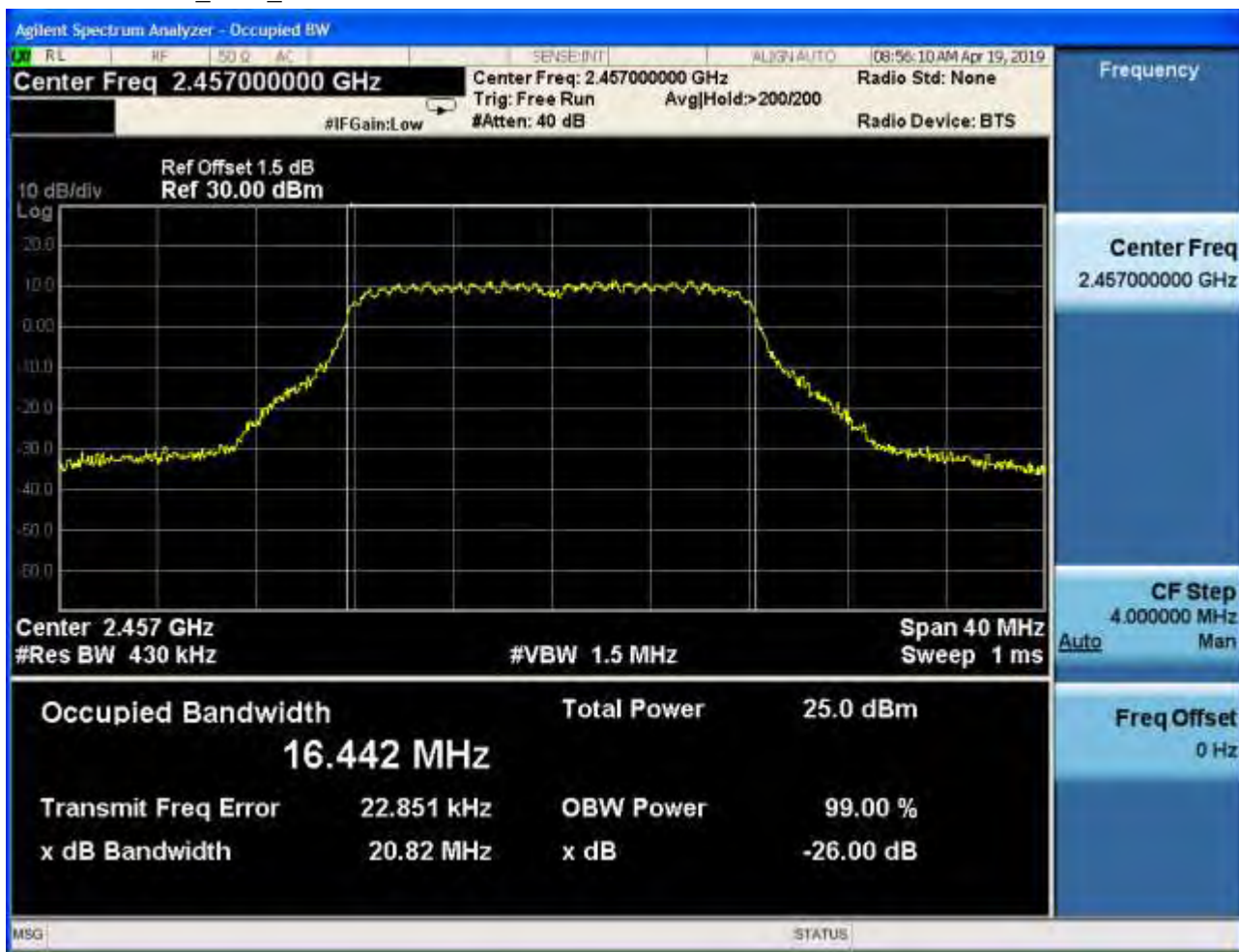


1.25 11G20CDD_Ant1_2457





1.26 11G20CDD_Ant2_2457



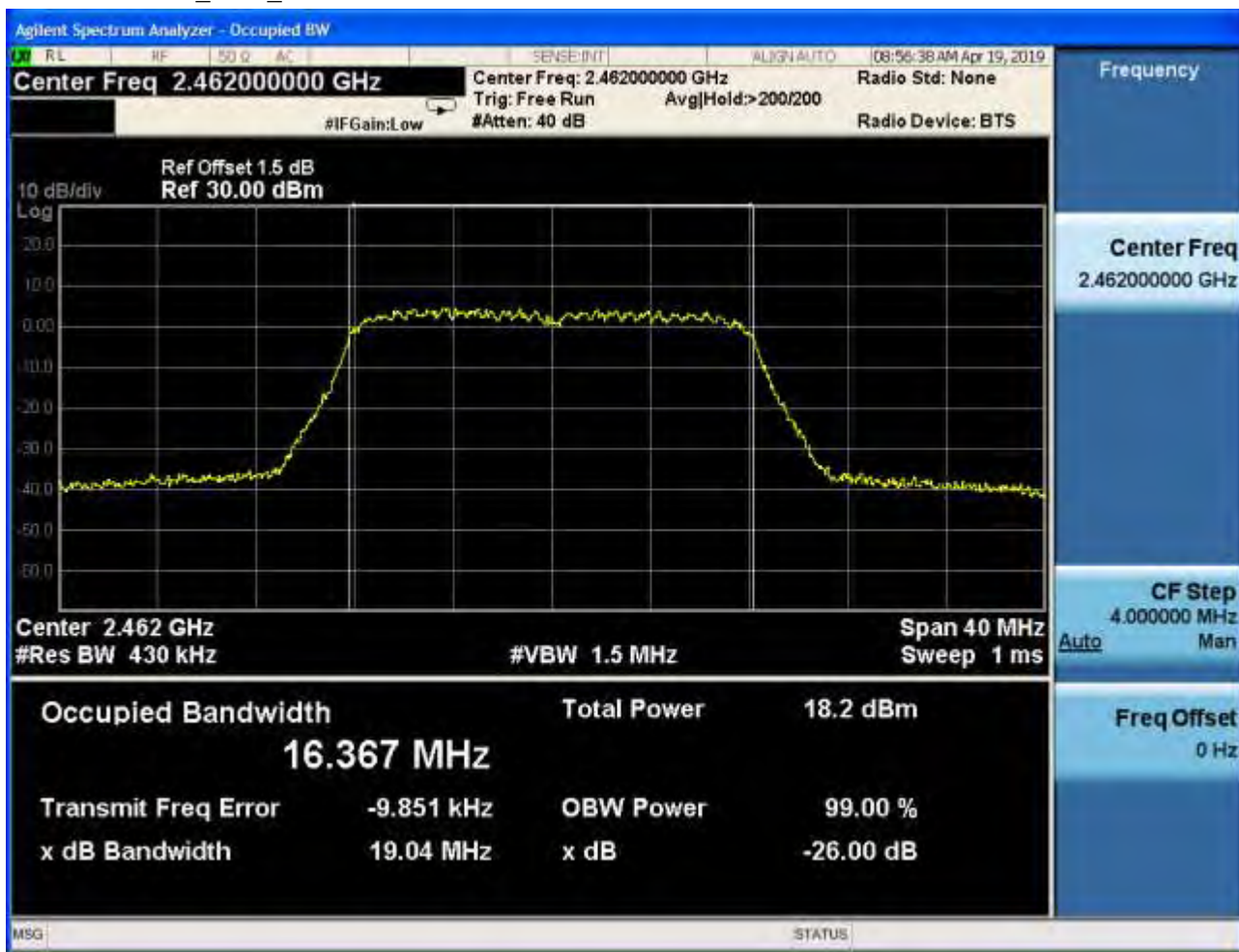


1.27 11G20CDD_Ant1_2462





1.28 11G20CDD_Ant2_2462



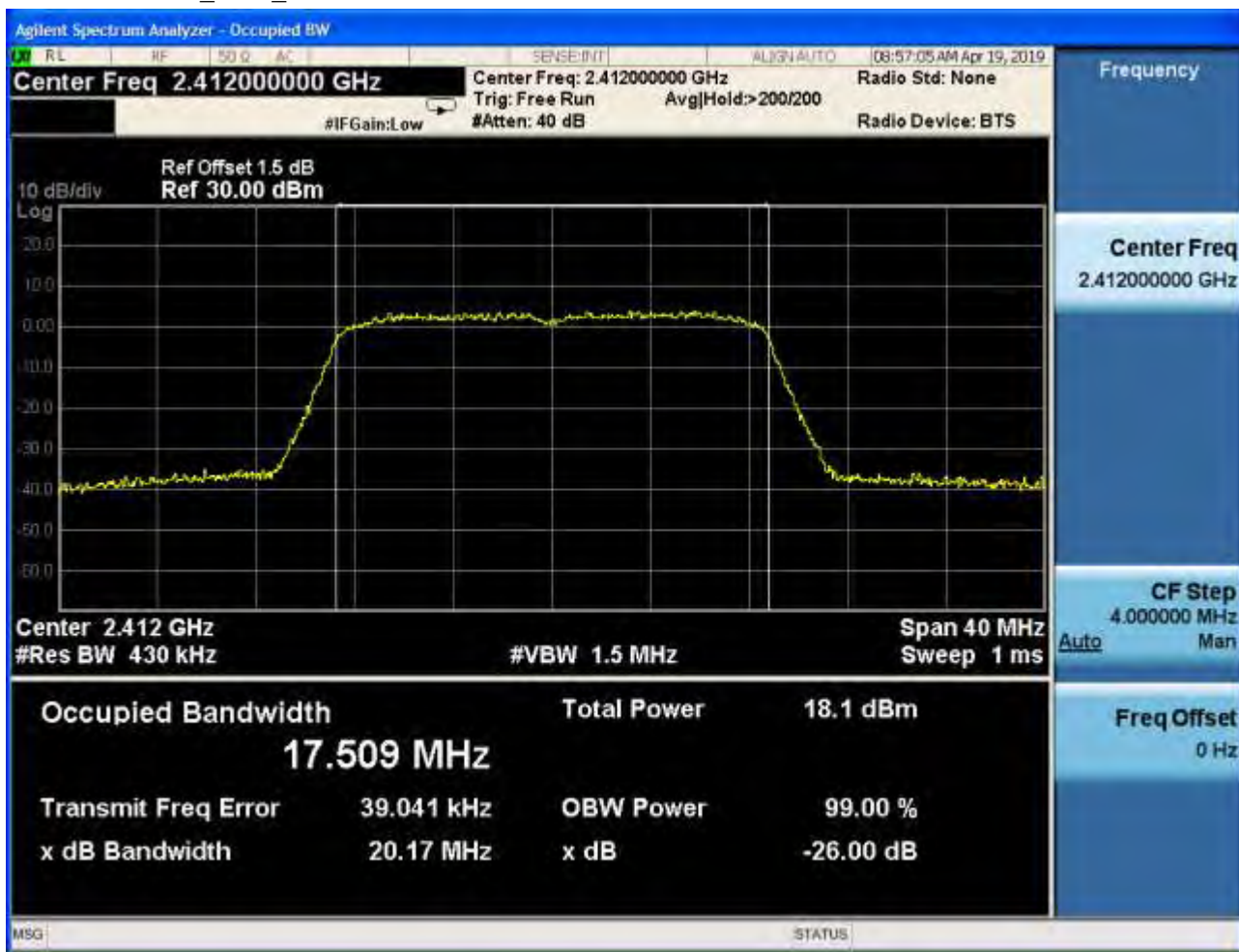


1.29 11N20SISO_Ant1_2412

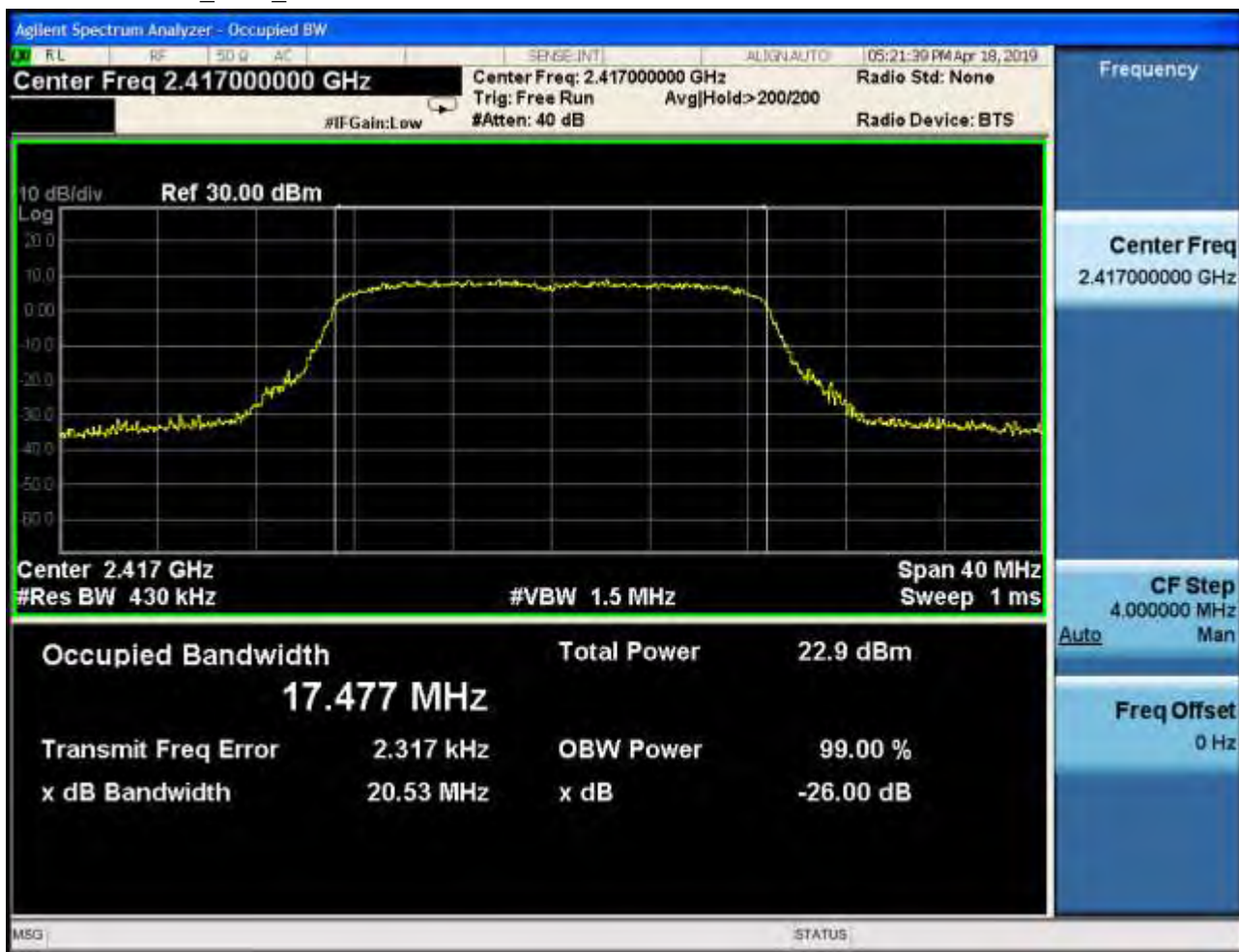




1.30 11N20SISO_Ant2_2412



1.31 11N20SISO_Ant1_2417





Agilent Spectrum Analyzer - Occupied BW

RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 08:57:32 AM Apr 19, 2019

Center Freq 2.417000000 GHz Center Freq: 2.417000000 GHz Radio Std: None
Trig: Free Run Avg/Hold: >200/200
#IFGain: Low #Atten: 40 dB Radio Device: BTS

Ref Offset 1.5 dB
Ref 30.00 dBm

10 dB/div
Log

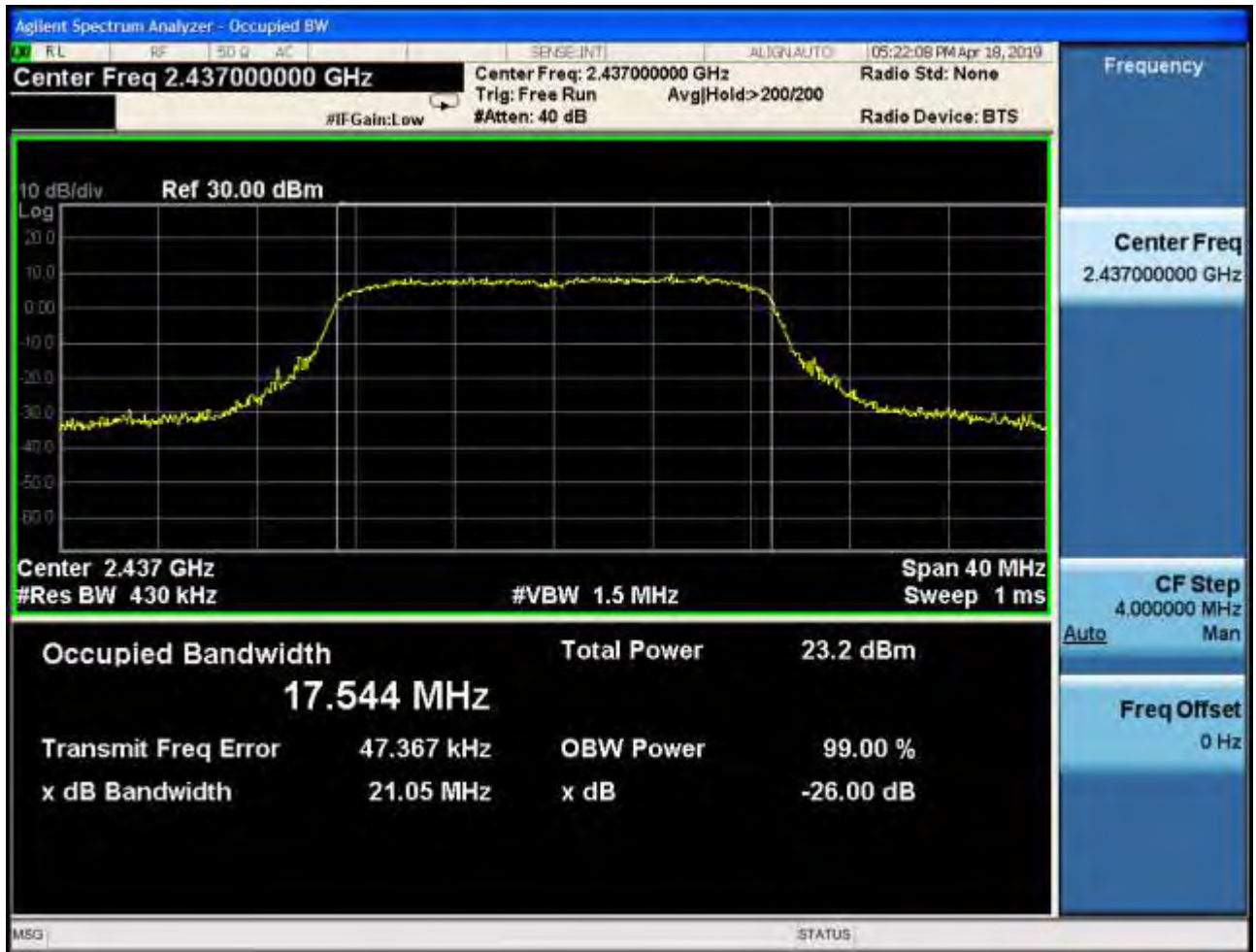
Center 2.417 GHz Span 40 MHz
#Res BW 430 kHz #VBW 1.5 MHz Sweep 1 ms

Occupied Bandwidth		Total Power	
17.529 MHz		23.1 dBm	
Transmit Freq Error	31.673 kHz	OBW Power	99.00 %
x dB Bandwidth	21.76 MHz	x dB	-26.00 dB

MSG STATUS

Frequency
Center Freq
2.417000000 GHz
CF Step
4.000000 MHz
Auto Man
Freq Offset
0 Hz

1.33 11N20SISO_Ant1_2437





1.34 11N20SISO_Ant2_2437





1.35 11N20SISO_Ant1_2457

