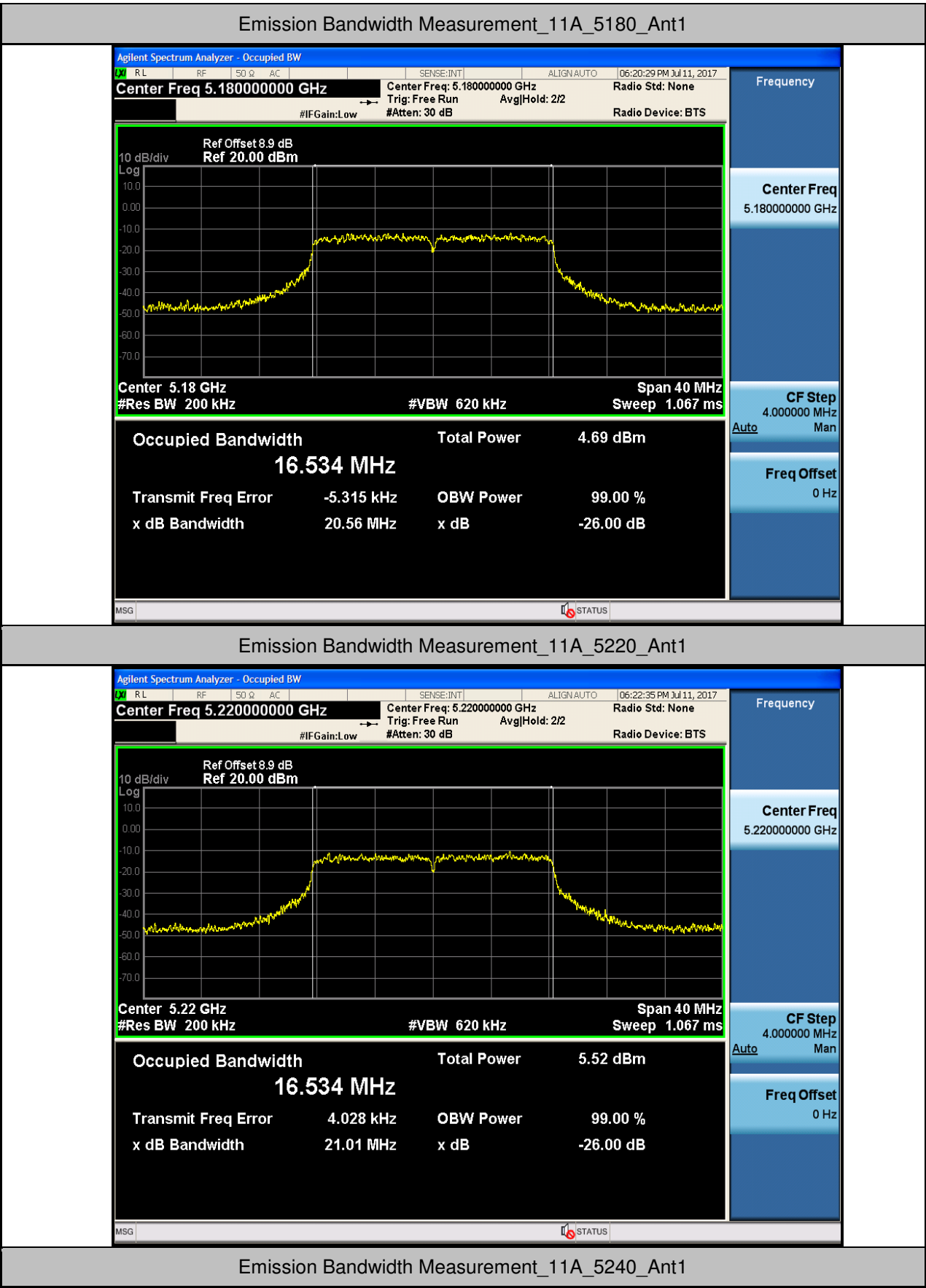


Appendix A for SHEM170600347902

1.Emission Bandwidth Measurement

Test Mode	Test Channel	EBW[MHz](Ant1)	EBW[MHz](Ant2)	Limit[MHz]	Verdict
11A	5180	20.56	21.33	---	PASS
11A	5220	21.01	21.67	---	PASS
11A	5240	21.18	21.17	---	PASS
11N20	5180	21.73	23.06	---	PASS
11N20	5220	22.10	22.59	---	PASS
11N20	5240	22.52	22.73	---	PASS
11N40	5190	46.53	45.83	---	PASS
11N40	5230	45.82	46.06	---	PASS

Test Mode	Test Channel	EBW[MHz](Ant1)	EBW[MHz](Ant2)	Limit[MHz]	Verdict
11N20MIMO	5180	21.00	20.98	---	PASS
11N20MIMO	5220	20.66	20.77	---	PASS
11N20MIMO	5240	20.55	21.46	---	PASS
11N40MIMO	5190	45.06	43.68	---	PASS
11N40MIMO	5230	44.20	45.73	---	PASS



Emission Bandwidth Measurement_11A_5220_Ant1

Agilent Spectrum Analyzer - Occupied BW

RL

RF

50 Ω

AC

SENSE:INT

ALIGN: AUTO

06:22:35 PM Jul 11, 2017

Center Freq 5.220000000 GHz

Center Freq: 5.220000000 GHz

Trig: Free Run

Avg/Hold: 2/2

Radio Std: None

#IFGain: Low

#Atten: 30 dB

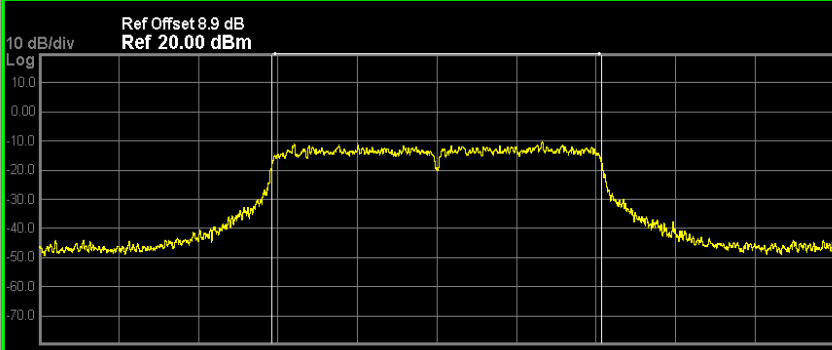
Radio Device: BTS

Ref Offset 8.9 dB

Ref 20.00 dBm

10 dB/div

Log



Center 5.22 GHz

#Res BW 200 kHz

#VBW 620 kHz

Span 40 MHz

Sweep 1.067 ms

Occupied Bandwidth

16.534 MHz

Total Power

5.52 dBm

Transmit Freq Error

4.028 kHz

OBW Power

99.00 %

x dB Bandwidth

21.01 MHz

x dB

-26.00 dB

MSG

STATUS

Frequency

Center Freq

5.220000000 GHz

CF Step

4.000000 MHz

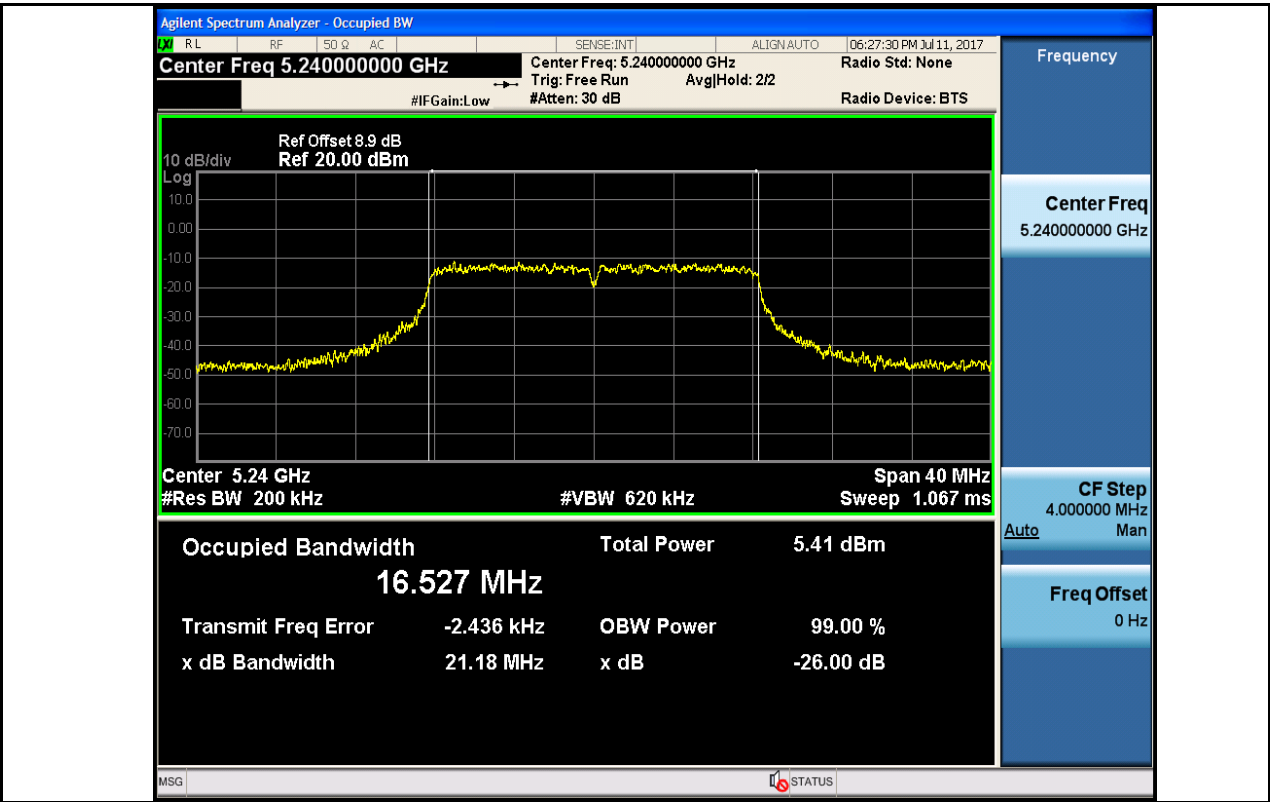
Auto

Man

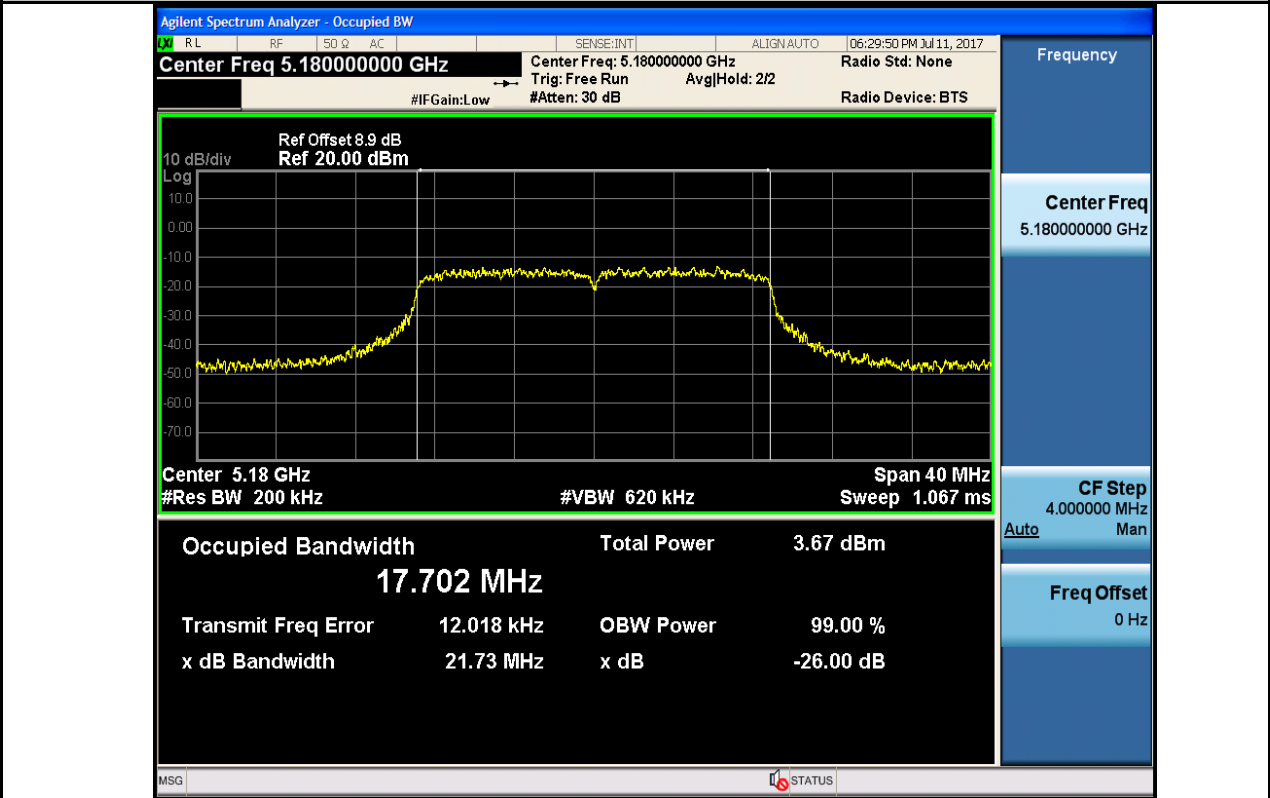
Freq Offset

0 Hz

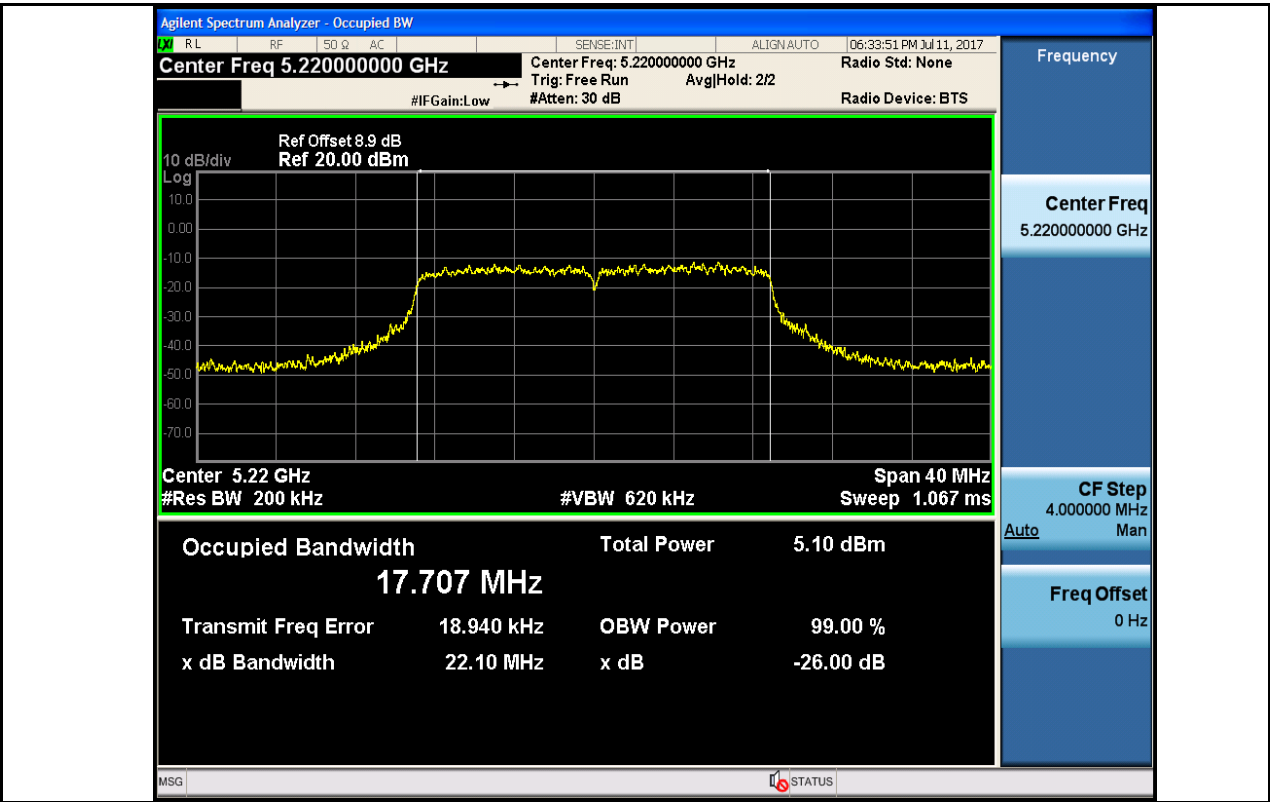
Emission Bandwidth Measurement_11A_5240_Ant1



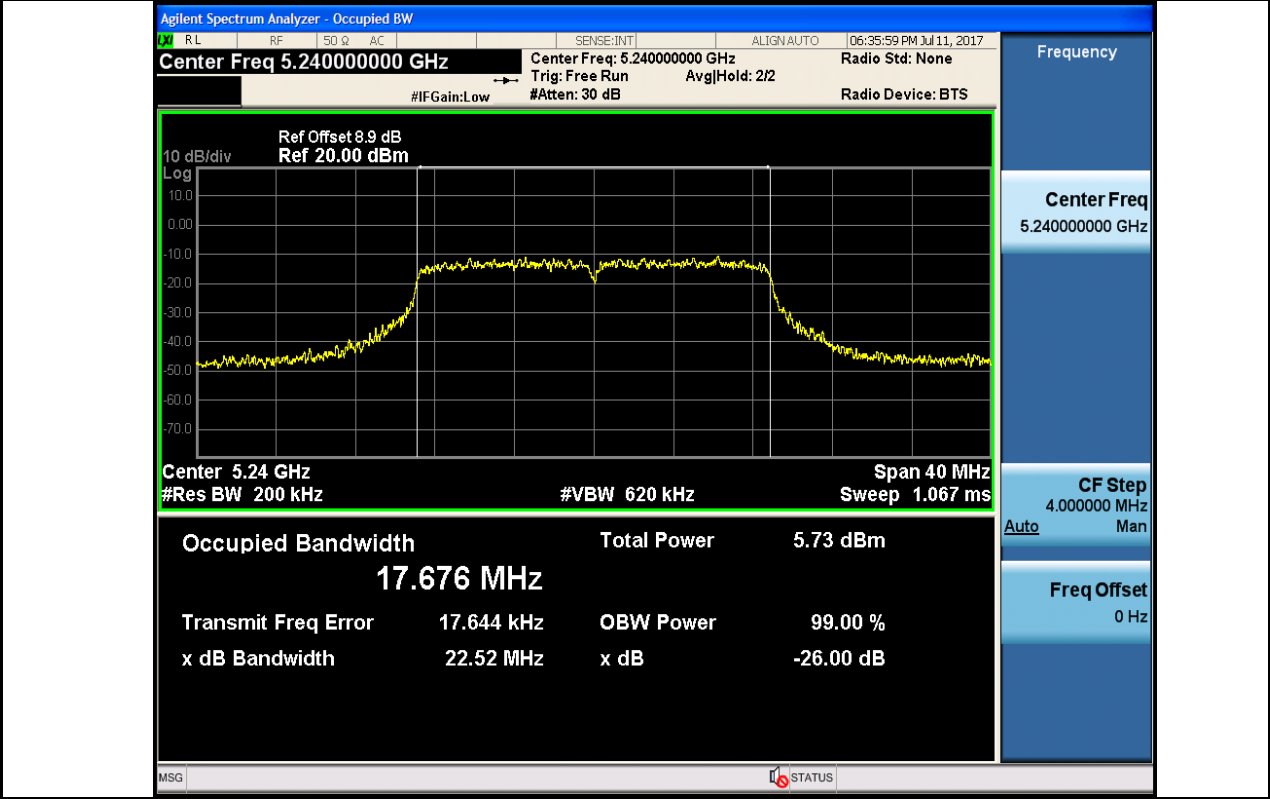
Emission Bandwidth Measurement_11N20_5180_Ant1



Emission Bandwidth Measurement_11N20_5220_Ant1

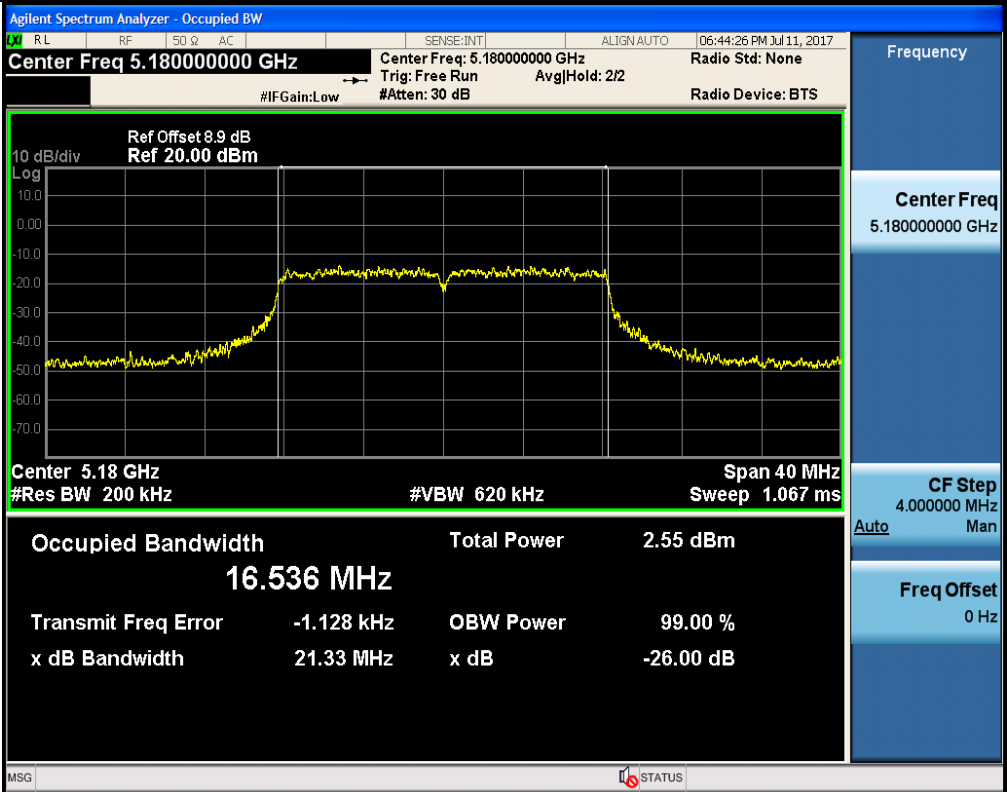


Emission Bandwidth Measurement_11N20_5240_Ant1

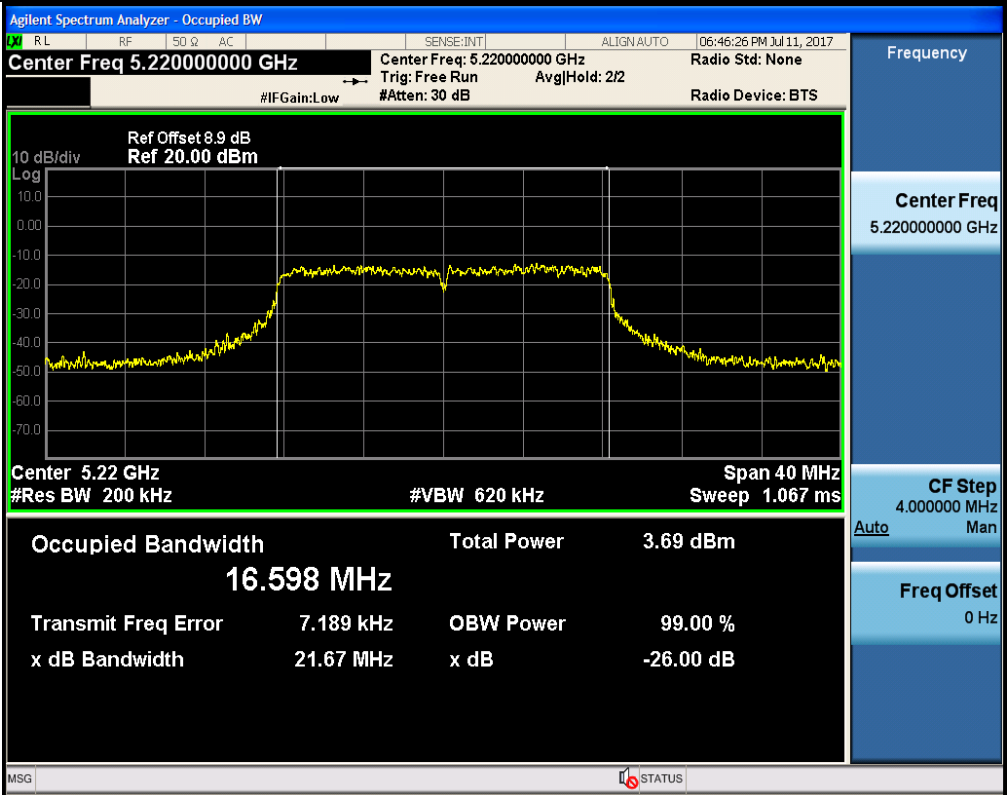


Emission Bandwidth Measurement_11N40_5190_Ant1

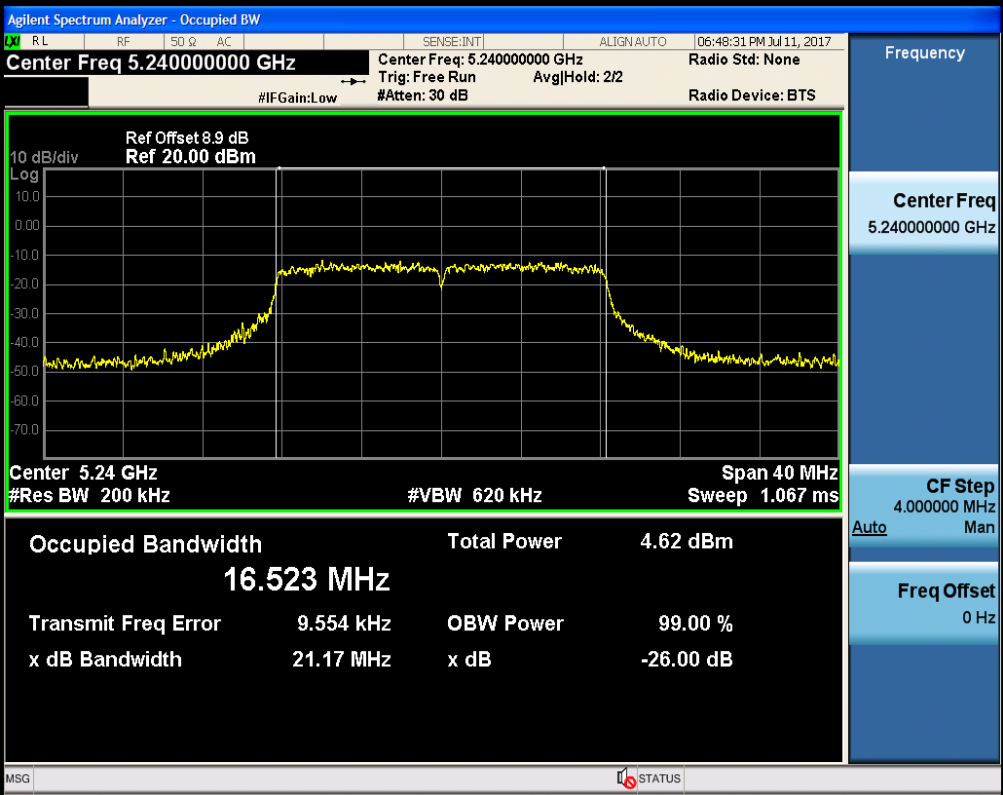
Emission Bandwidth Measurement_11A_5180_Ant2



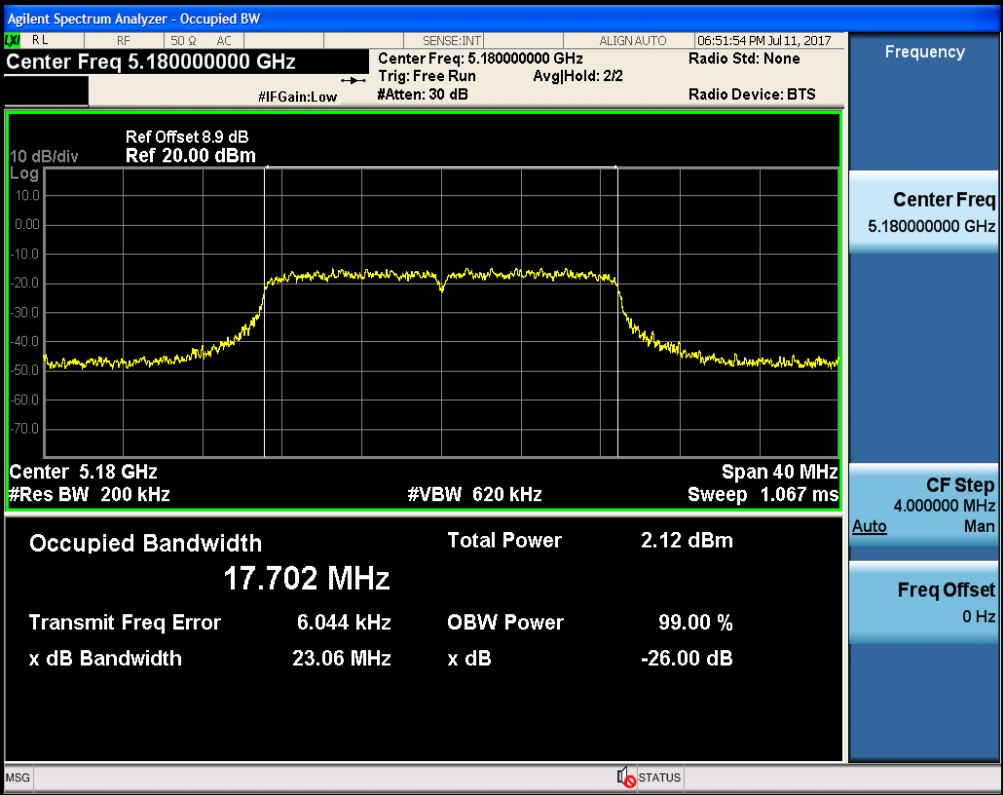
Emission Bandwidth Measurement_11A_5220_Ant2



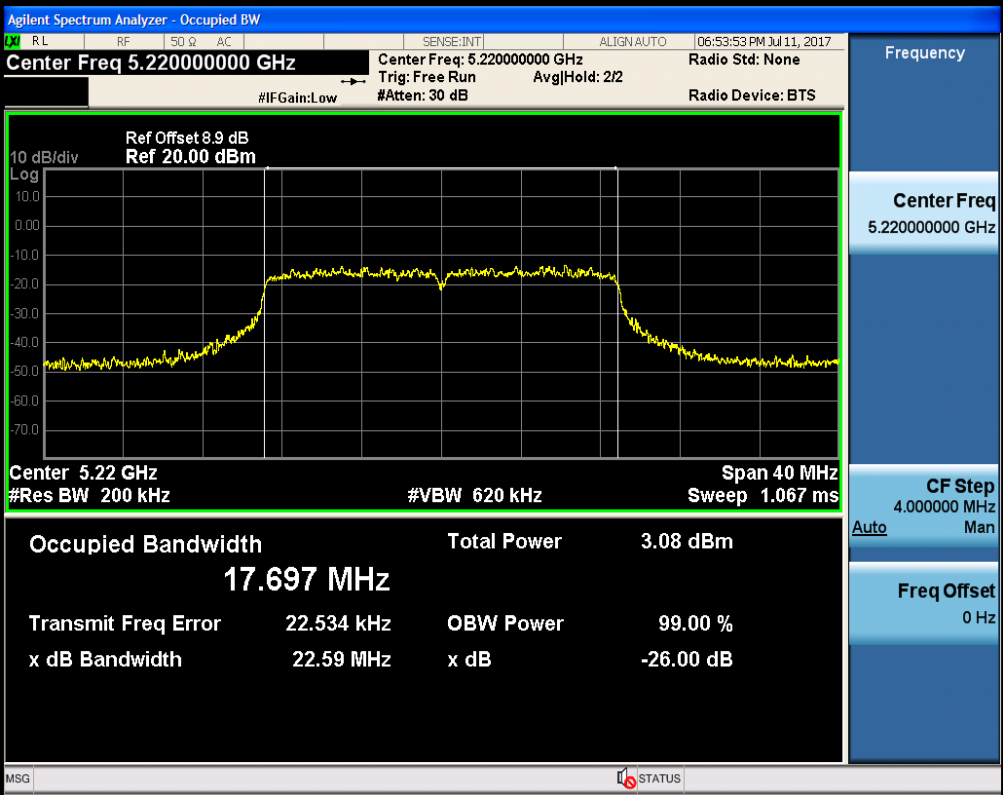
Emission Bandwidth Measurement_11A_5240_Ant2



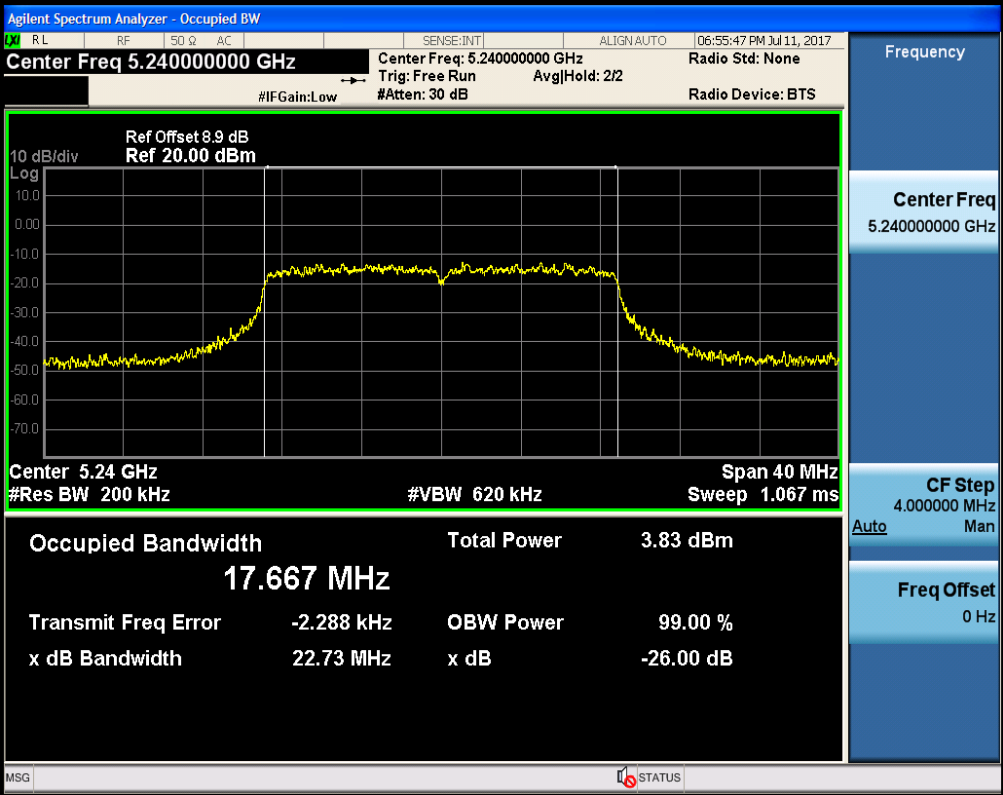
Emission Bandwidth Measurement_11N20_5180_Ant2



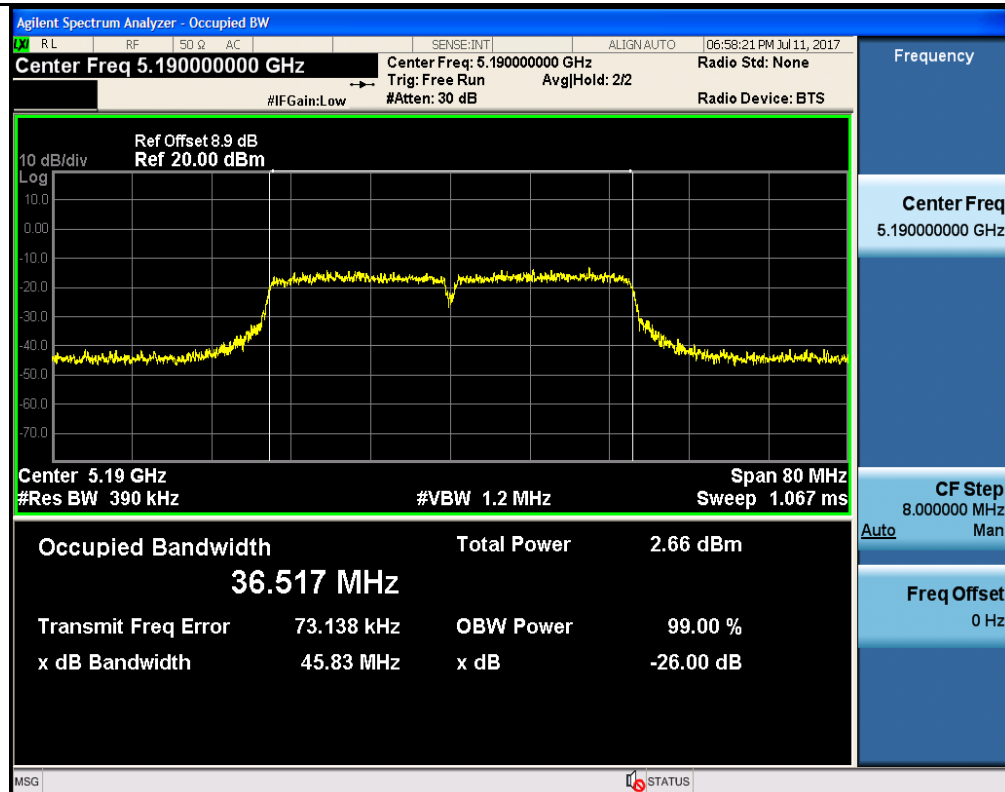
Emission Bandwidth Measurement_11N20_5220_Ant2



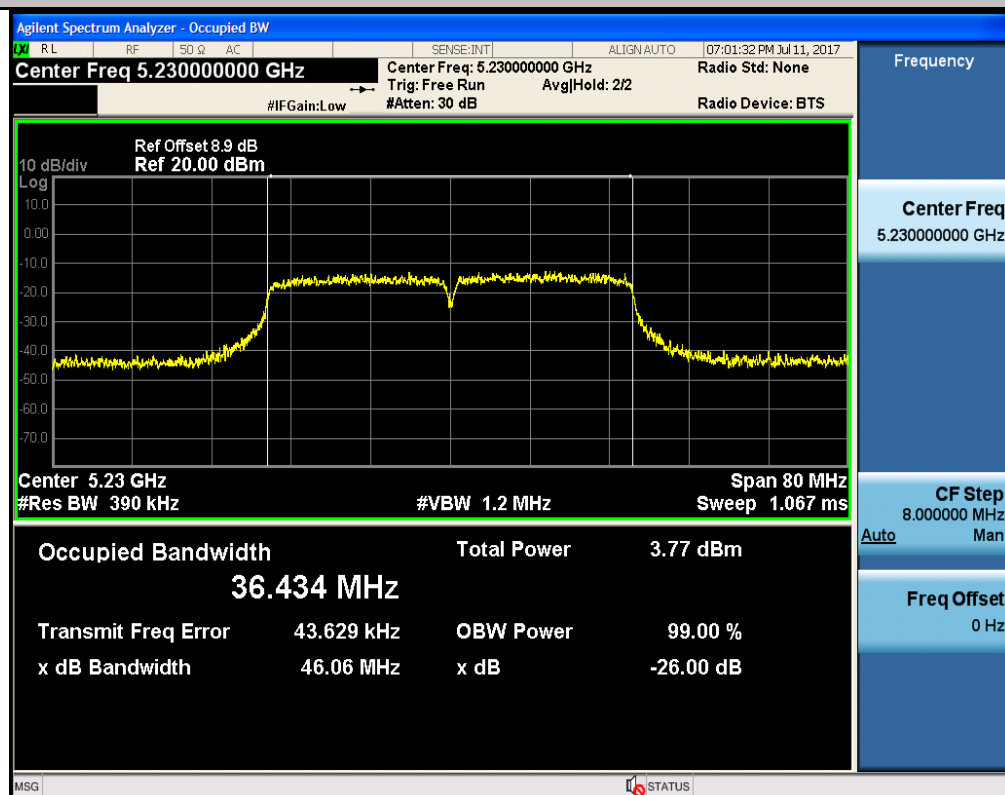
Emission Bandwidth Measurement_11N20_5240_Ant2



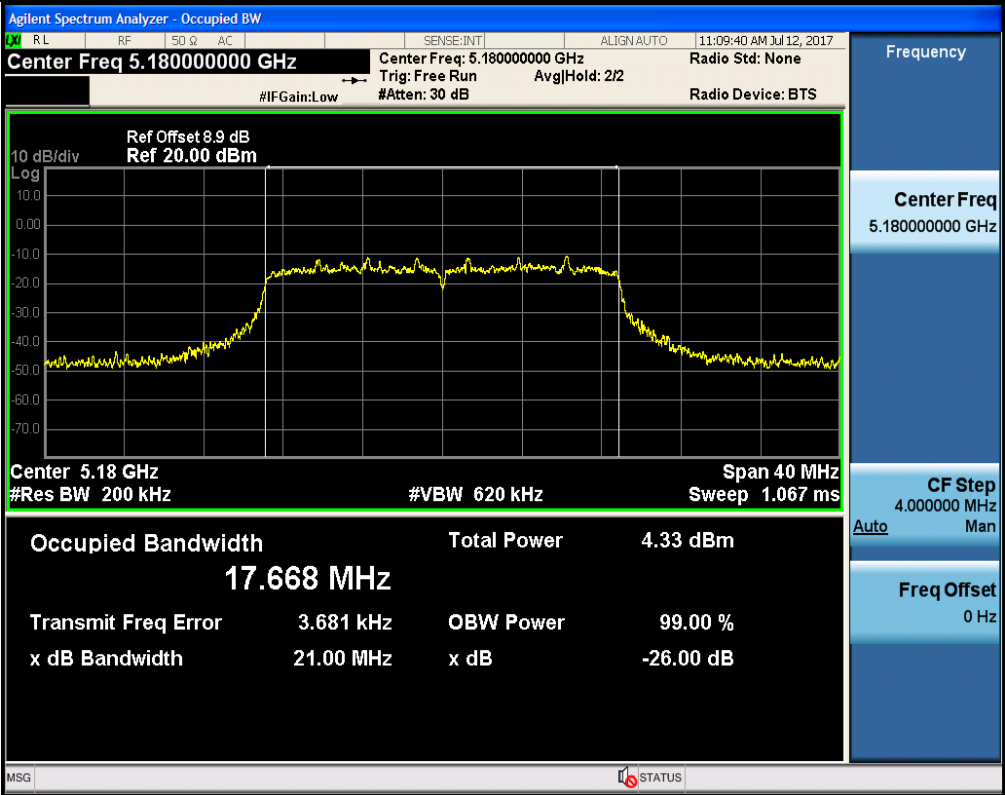
Emission Bandwidth Measurement_11N40_5190_Ant2



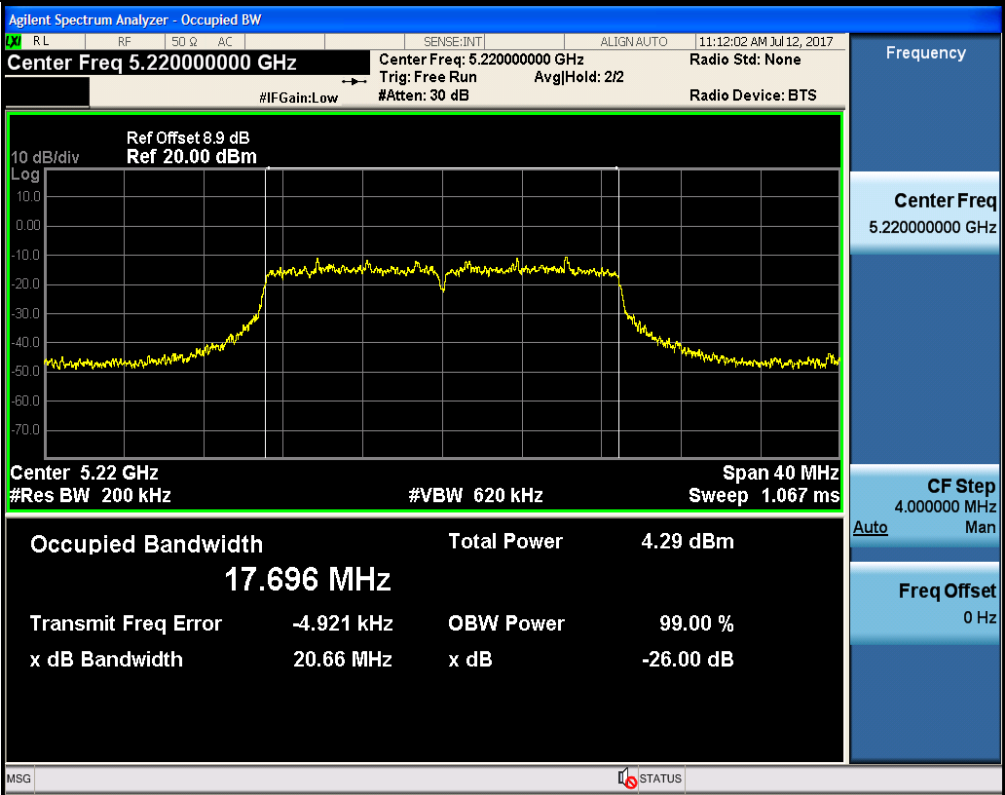
Emission Bandwidth Measurement_11N40_5230_Ant2



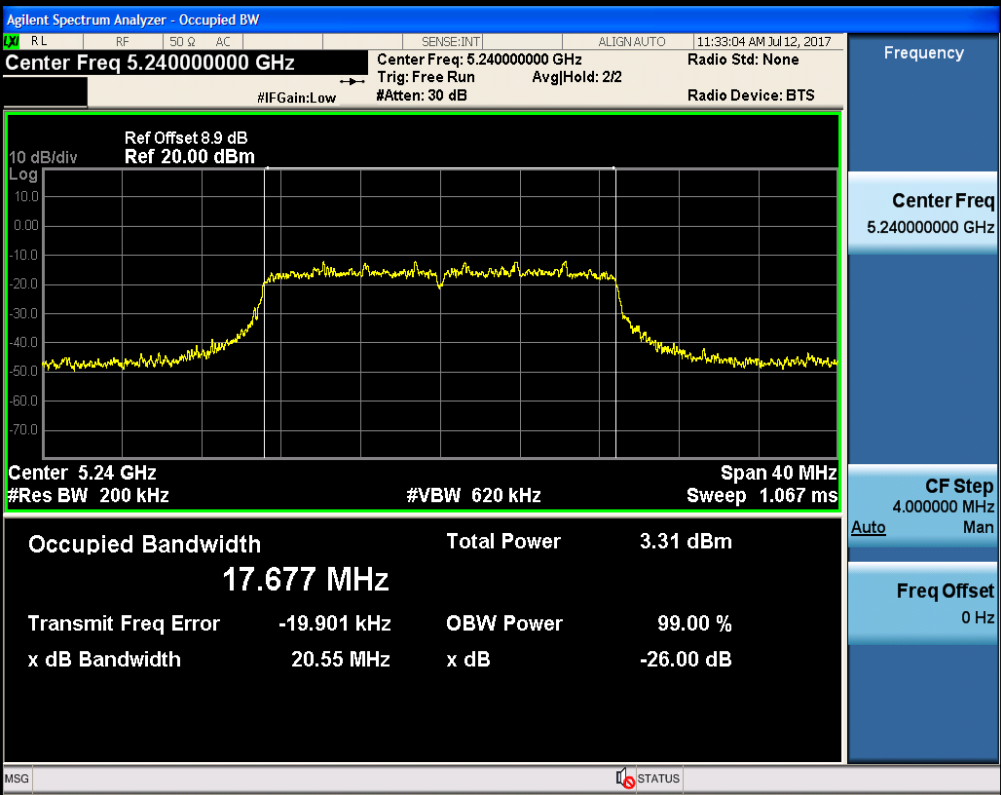
Emission Bandwidth Measurement_11N20MIMO_5180_Ant1



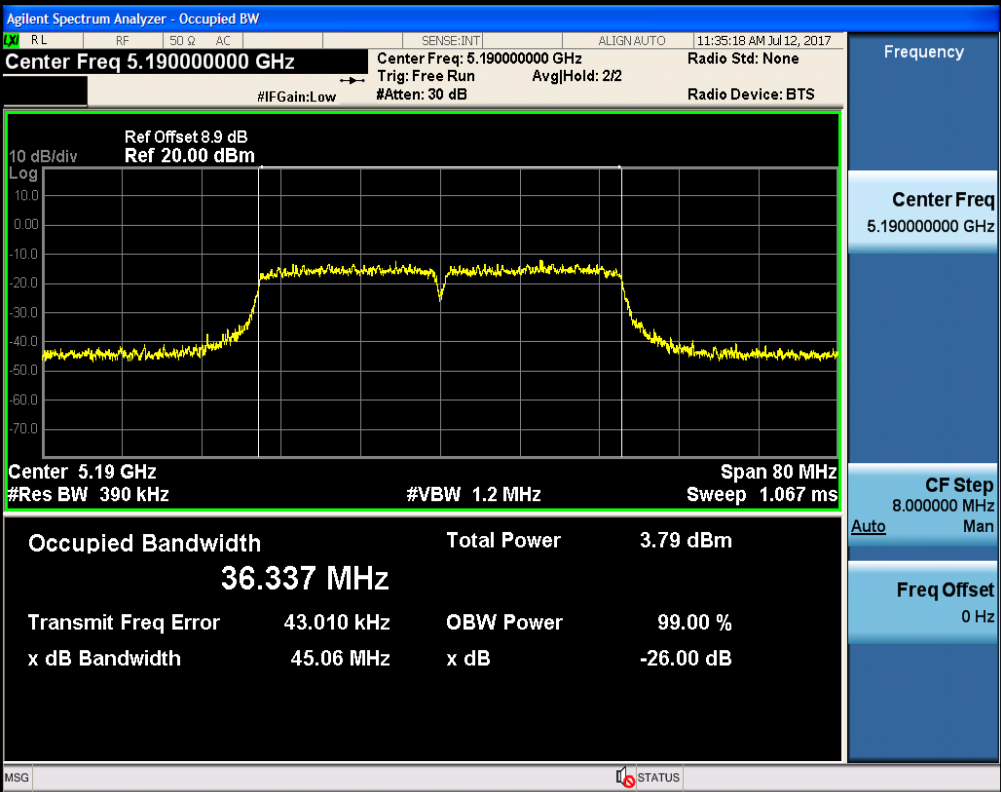
Emission Bandwidth Measurement_11N20MIMO_5220_Ant1



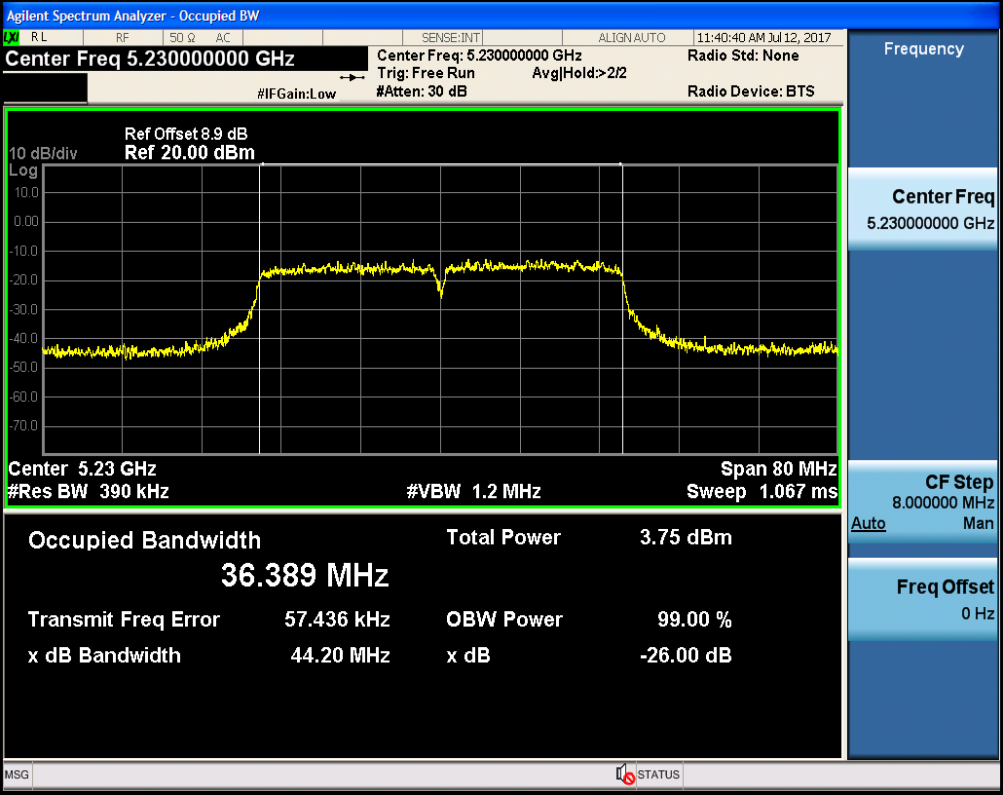
Emission Bandwidth Measurement_11N20MIMO_5240_Ant1



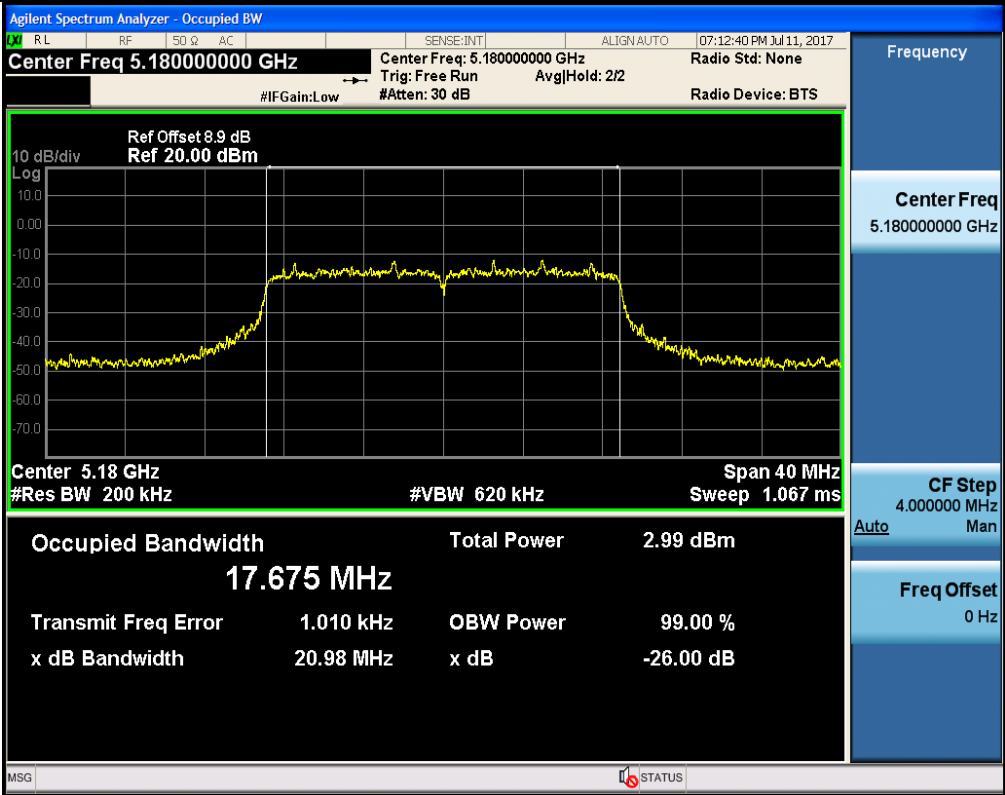
Emission Bandwidth Measurement_11N40MIMO_5190_Ant1



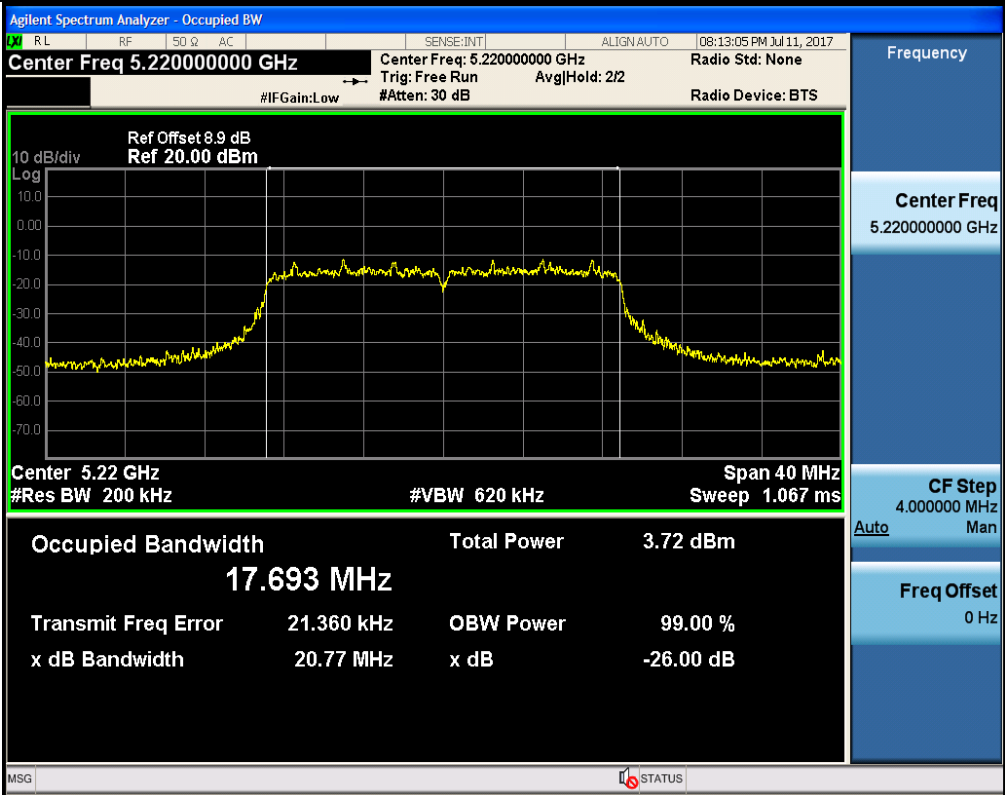
Emission Bandwidth Measurement_11N40MIMO_5230_Ant1



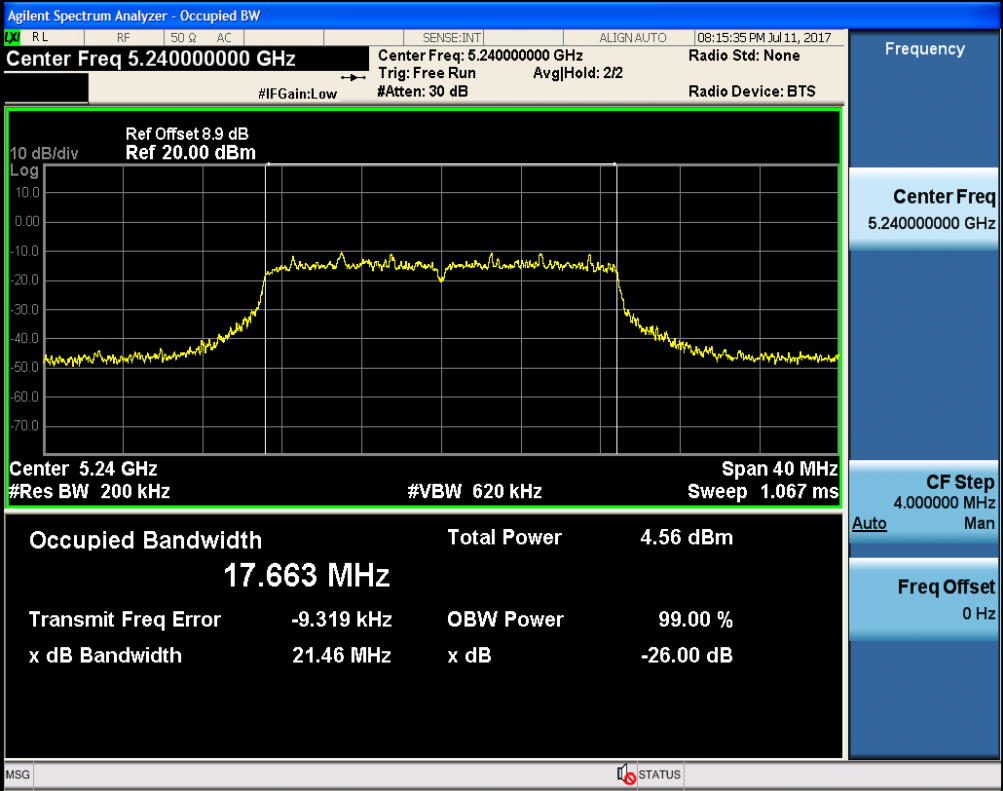
Emission Bandwidth Measurement_11N20MIMO_5180_Ant2



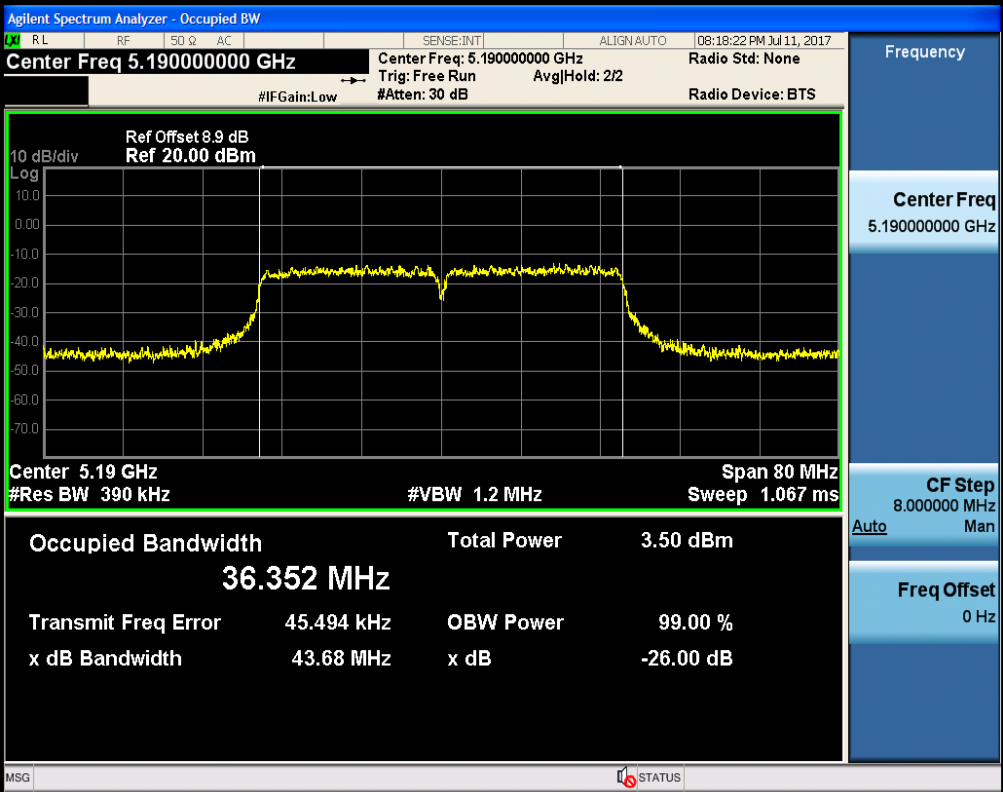
Emission Bandwidth Measurement_11N20MIMO_5220_Ant2



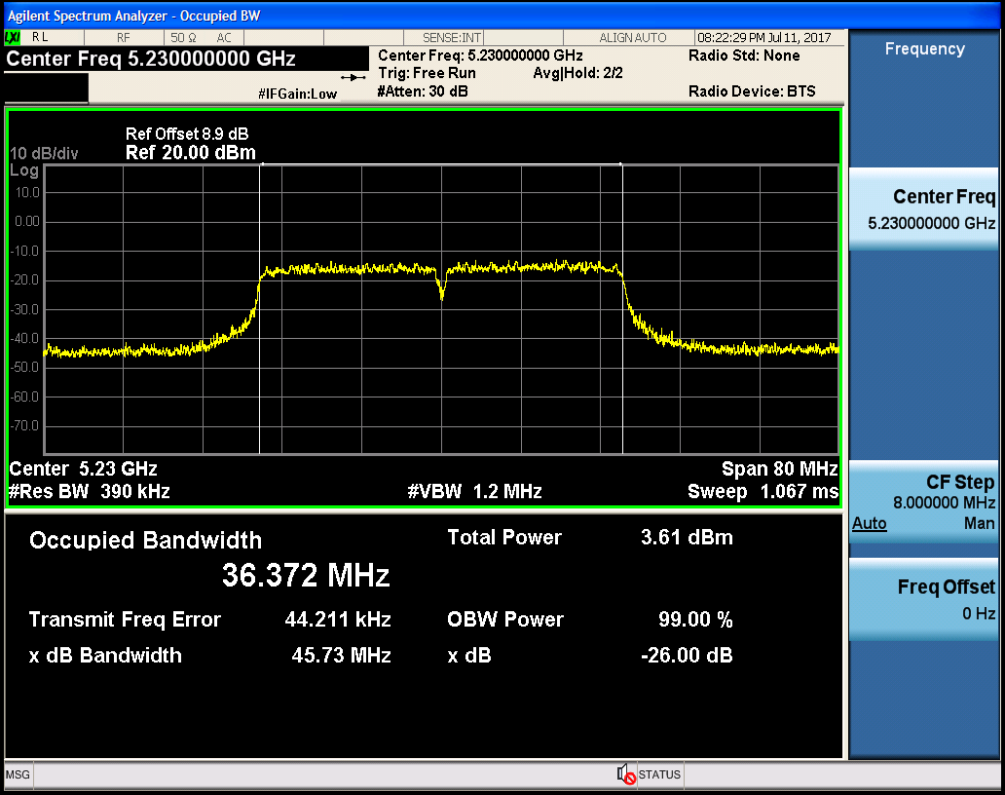
Emission Bandwidth Measurement_11N20MIMO_5240_Ant2



Emission Bandwidth Measurement_11N40MIMO_5190_Ant2



Emission Bandwidth Measurement_11N40MIMO_5230_Ant2



2.Maximum Conduct Output Power

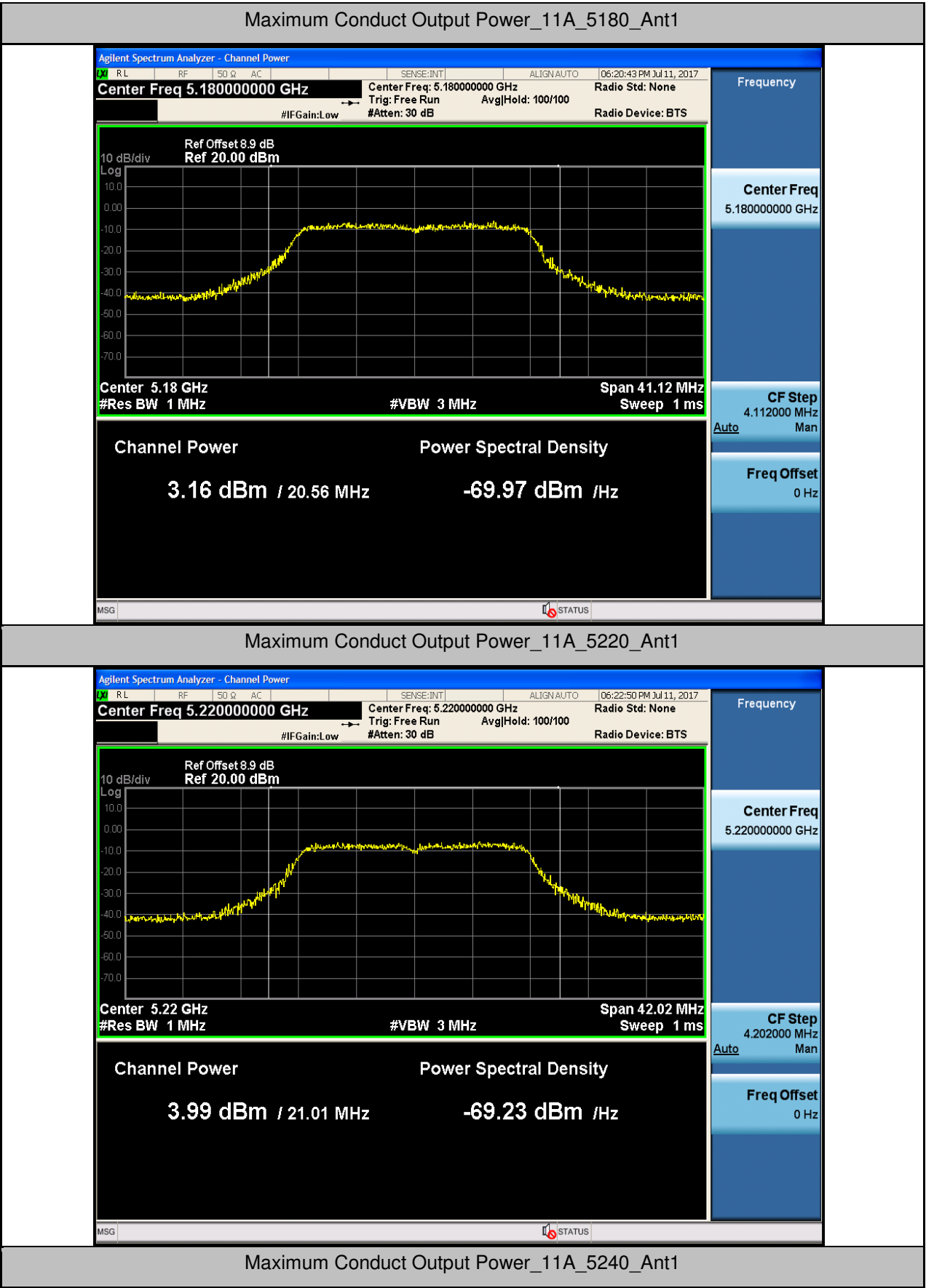
Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
11A	5180	Ant1	3.16	1.09858539935423	4.26	30.00	PASS
11A	5220	Ant1	3.99	1.1650890981107	5.16	30.00	PASS
11A	5240	Ant1	3.87	1.14978205137702	5.02	30.00	PASS
11N20	5180	Ant1	2.08	0.56406567231631	2.64	30.00	PASS
11N20	5220	Ant1	3.5	0.56406567231631	4.06	30.00	PASS
11N20	5240	Ant1	4.22	0.56406567231631	4.78	30.00	PASS
11N40	5190	Ant1	3.19	0.811836096396205	4.00	30.00	PASS
11N40	5230	Ant1	3.79	0.801377464444619	4.59	30.00	PASS

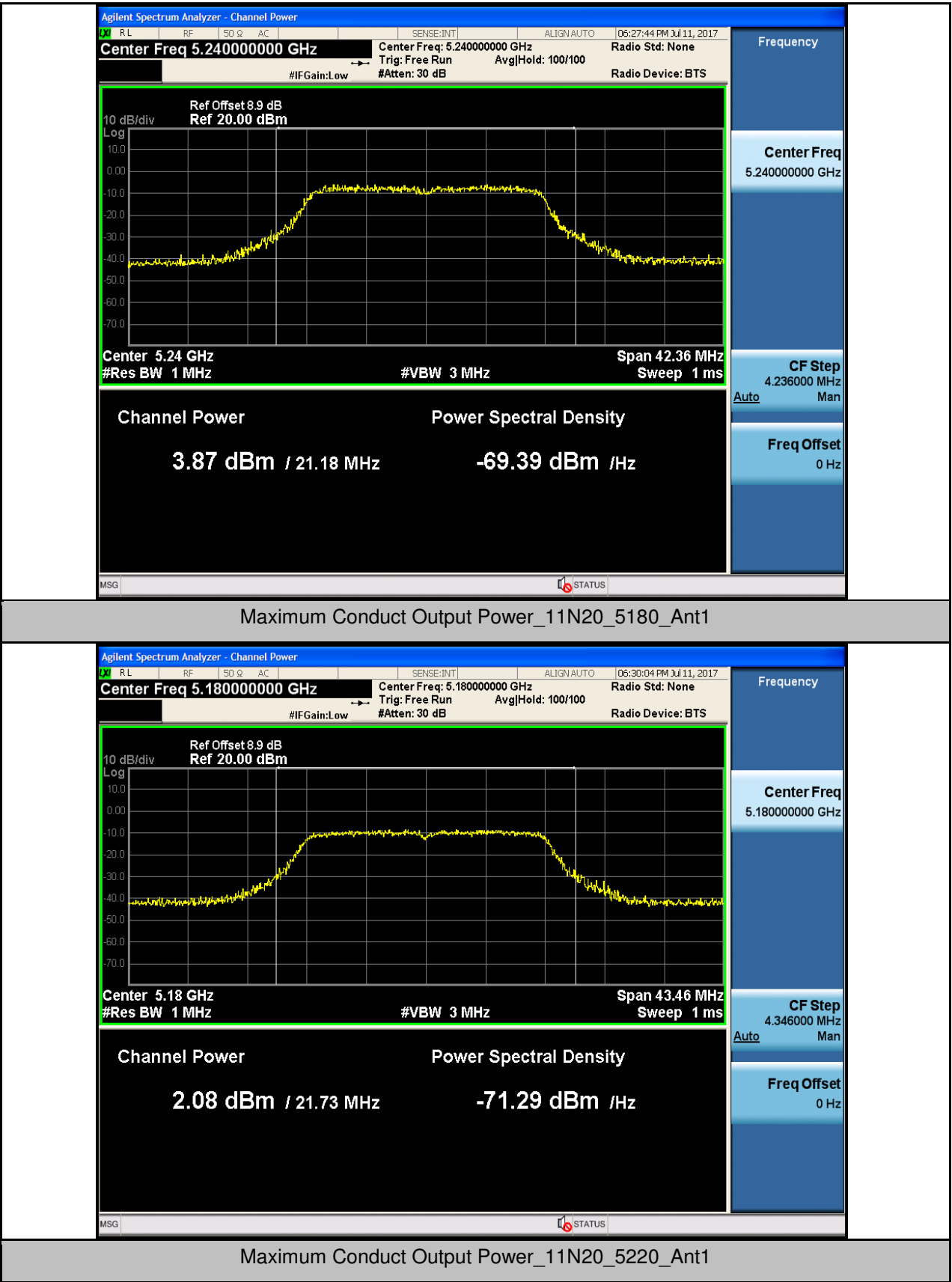
Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
11A	5180	Ant2	0.99	1.14978205137702	2.14	30.00	PASS
11A	5220	Ant2	2.12	1.1650890981107	3.29	30.00	PASS
11A	5240	Ant2	3.07	1.09858539935423	4.17	30.00	PASS
11N20	5180	Ant2	0.52	0.595831353183348	1.12	30.00	PASS
11N20	5220	Ant2	1.45	0.591847913491986	2.04	30.00	PASS
11N20	5240	Ant2	2.27	0.56406567231631	2.83	30.00	PASS
11N40	5190	Ant2	1.18	0.811836096396205	1.99	30.00	PASS
11N40	5230	Ant2	2.46	0.752556475200514	3.21	30.00	PASS

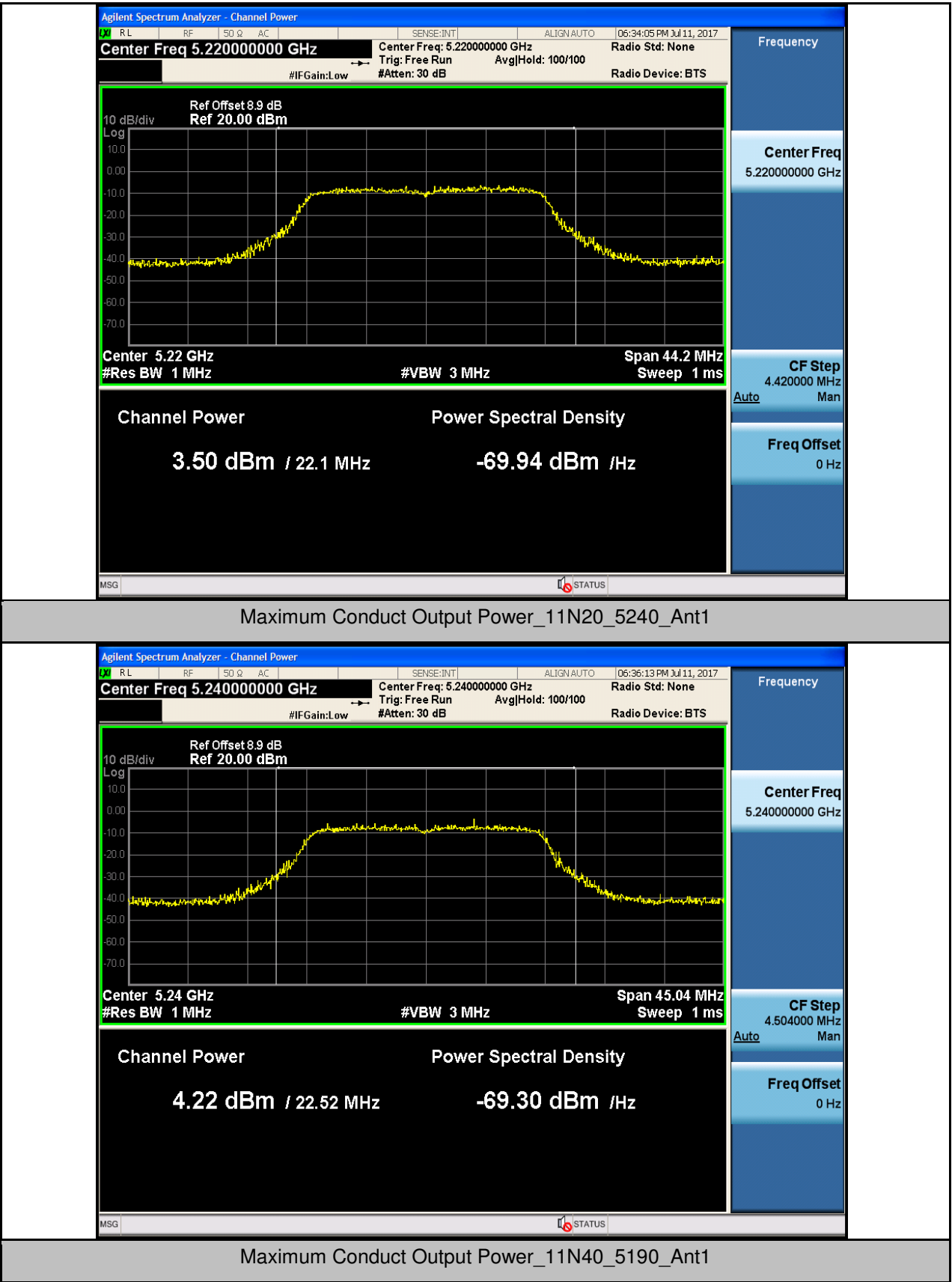
Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
11N20MIMO	5180	Ant1	2.42	0.595831353183348	3.02	30.00	PASS
11N20MIMO	5220	Ant1	2.62	0.591847913491986	3.21	30.00	PASS
11N20MIMO	5240	Ant1	1.36	0.56406567231631	1.92	30.00	PASS
11N40MIMO	5190	Ant1	2.1	0.801377464444619	2.90	30.00	PASS
11N40MIMO	5230	Ant1	2.12	0.801377464444619	2.92	30.00	PASS

Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
11N20MIMO	5180	Ant2	1.45	0.591847913491986	2.04	30.00	PASS
11N20MIMO	5220	Ant2	2.04	0.591847913491986	2.63	30.00	PASS
11N20MIMO	5240	Ant2	2.93	0.56406567231631	3.49	30.00	PASS
11N40MIMO	5190	Ant2	1.98	0.811836096396205	2.79	30.00	PASS
11N40MIMO	5230	Ant2	2.23	0.801377464444619	3.03	30.00	PASS

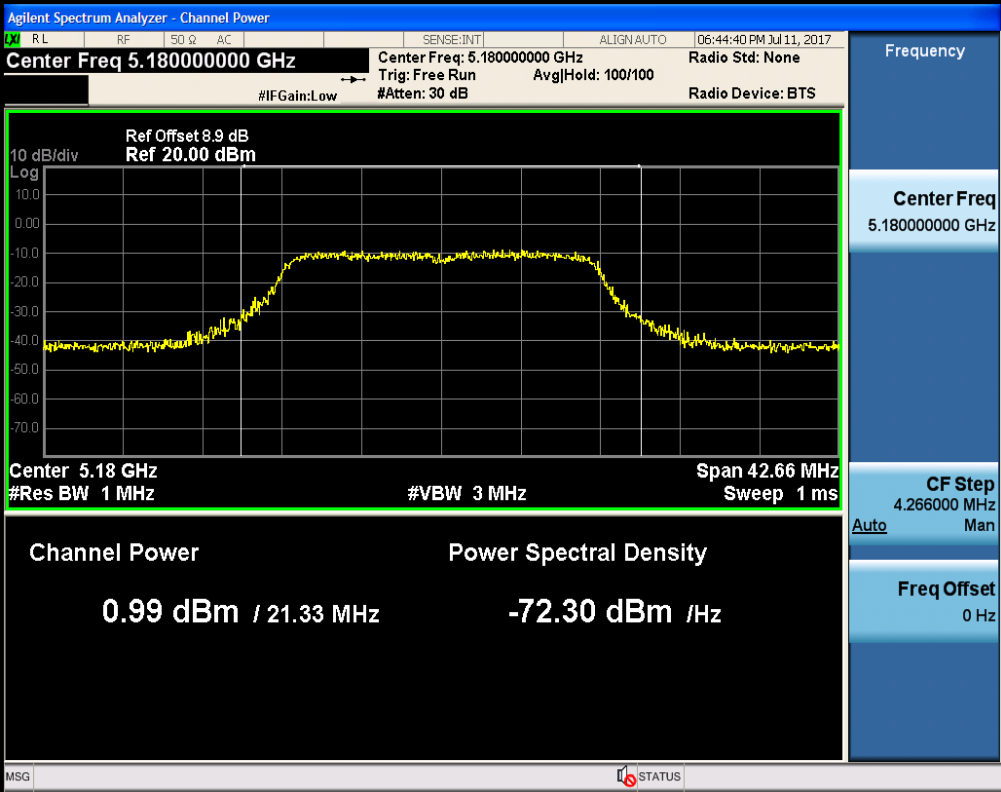
Test Mode	Test Channel	Ant1 Power [dBm]	Ant2 Power [dBm]	MIMO Power [dBm]	Limit [dBm]	Verdict
11N20MIMO	5180	3.02	2.04	5.57	30.00	PASS
11N20MIMO	5220	3.21	2.63	5.94	30.00	PASS
11N20MIMO	5240	1.92	3.49	5.79	30.00	PASS
11N40MIMO	5190	2.90	2.79	5.86	30.00	PASS
11N40MIMO	5230	2.92	3.03	5.99	30.00	PASS



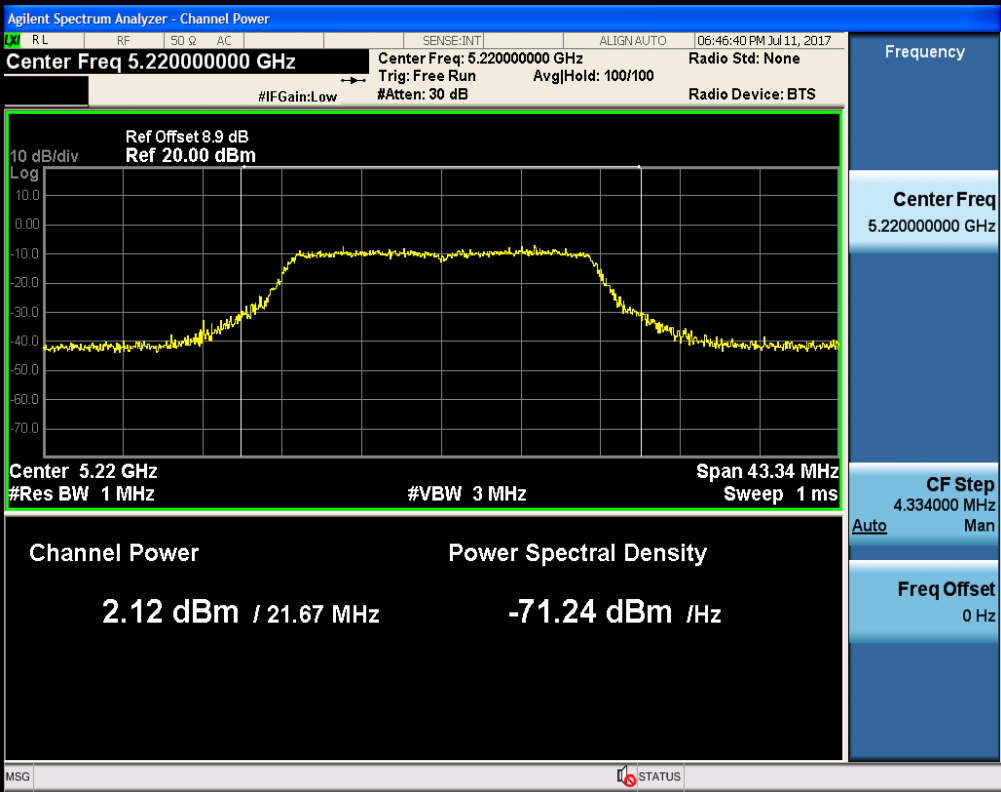




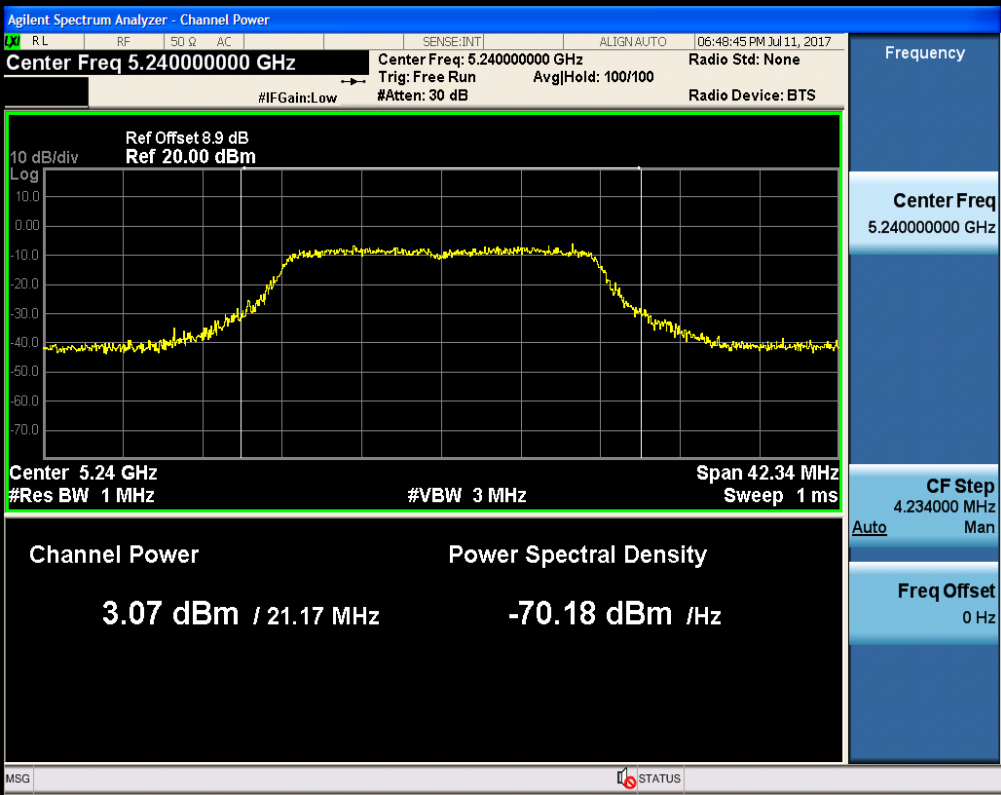
Maximum Conduct Output Power_11A_5180_Ant2



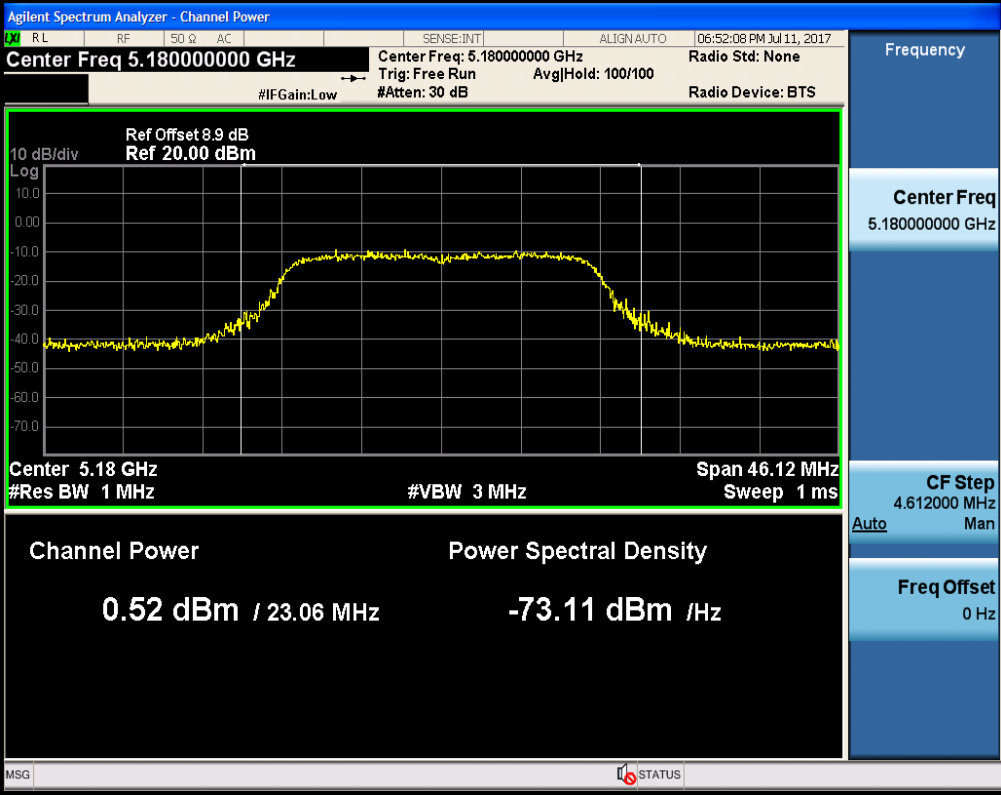
Maximum Conduct Output Power_11A_5220_Ant2



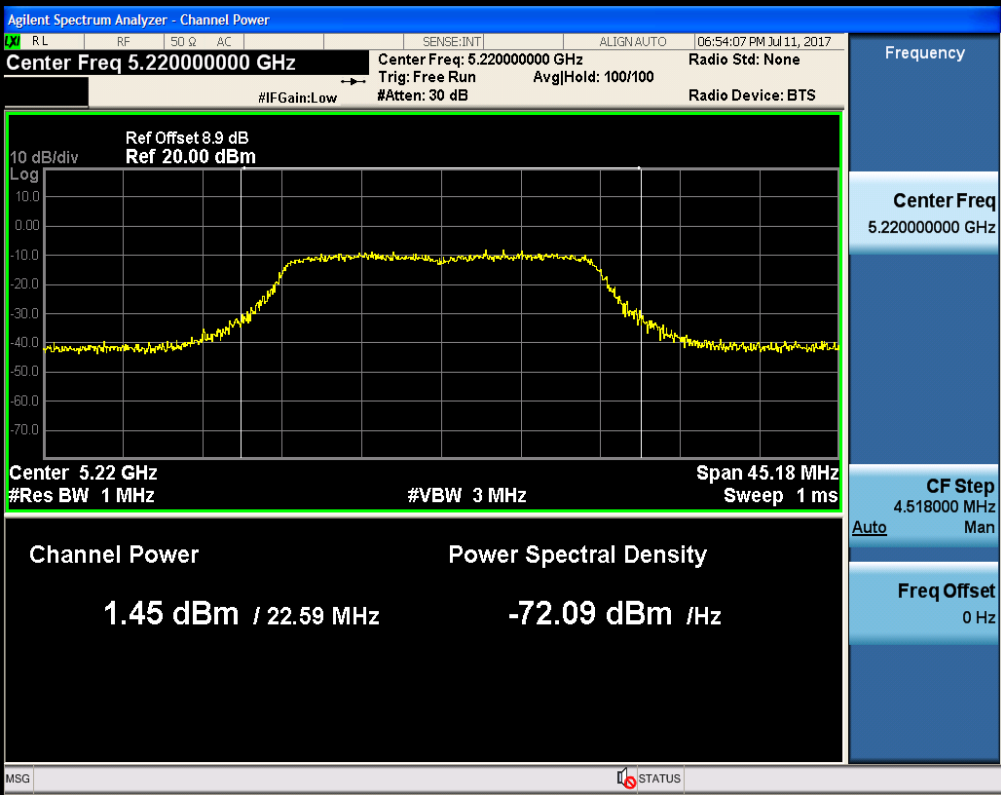
Maximum Conduct Output Power_11A_5240_Ant2



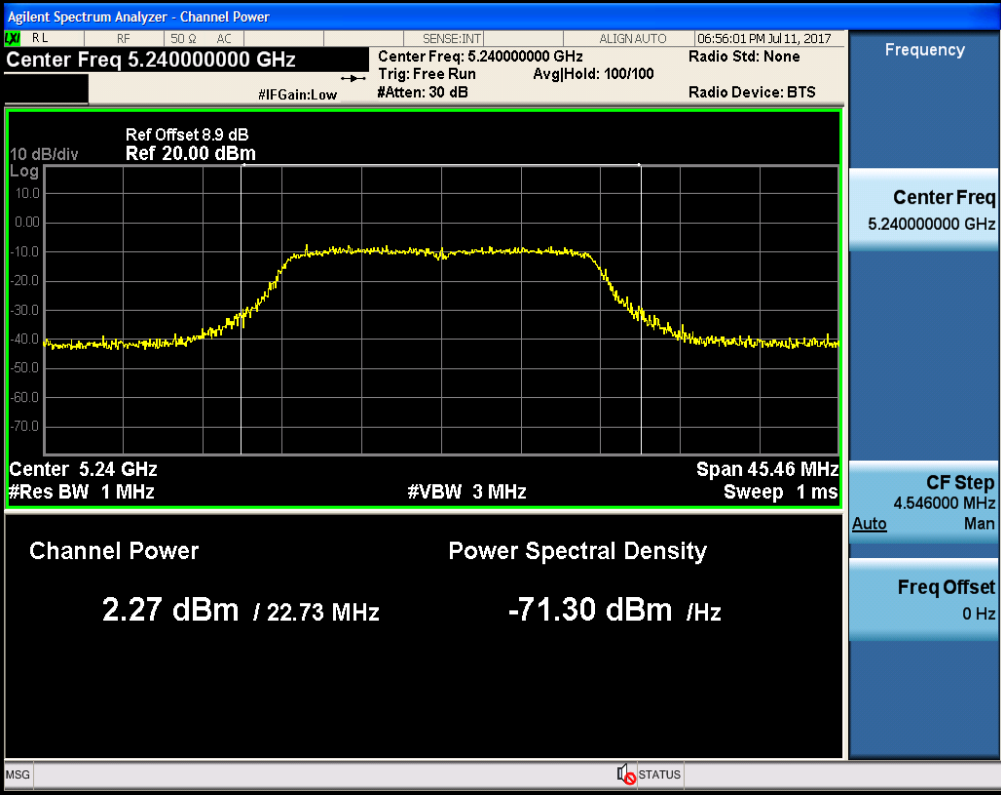
Maximum Conduct Output Power_11N20_5180_Ant2



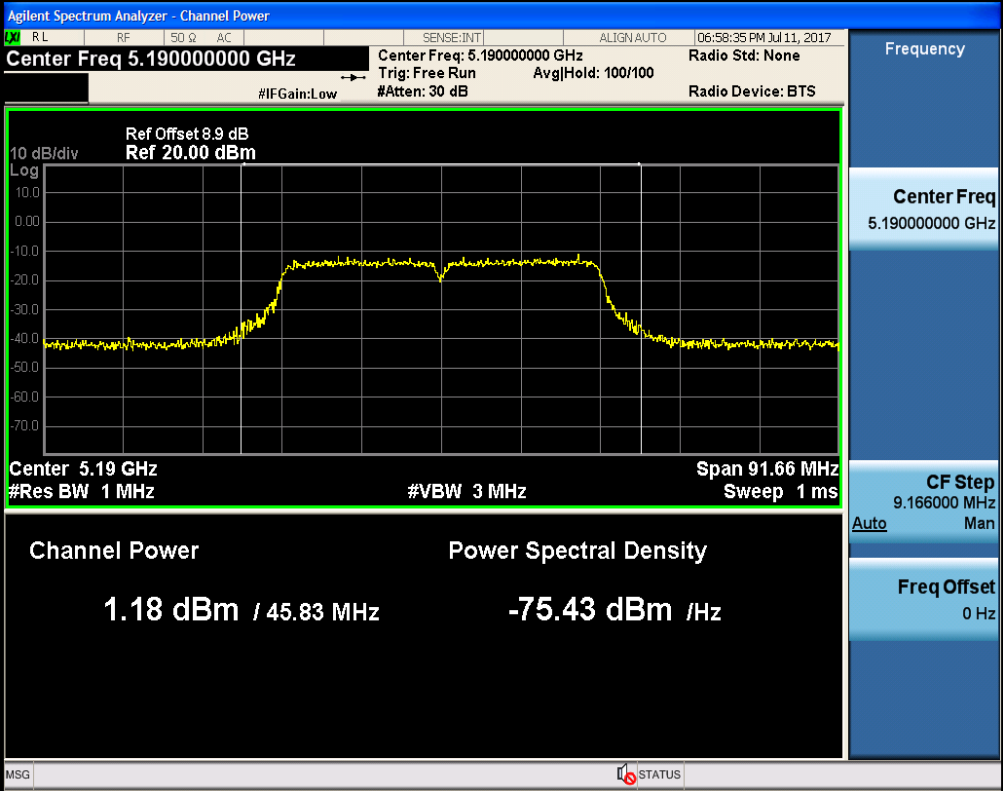
Maximum Conduct Output Power_11N20_5220_Ant2



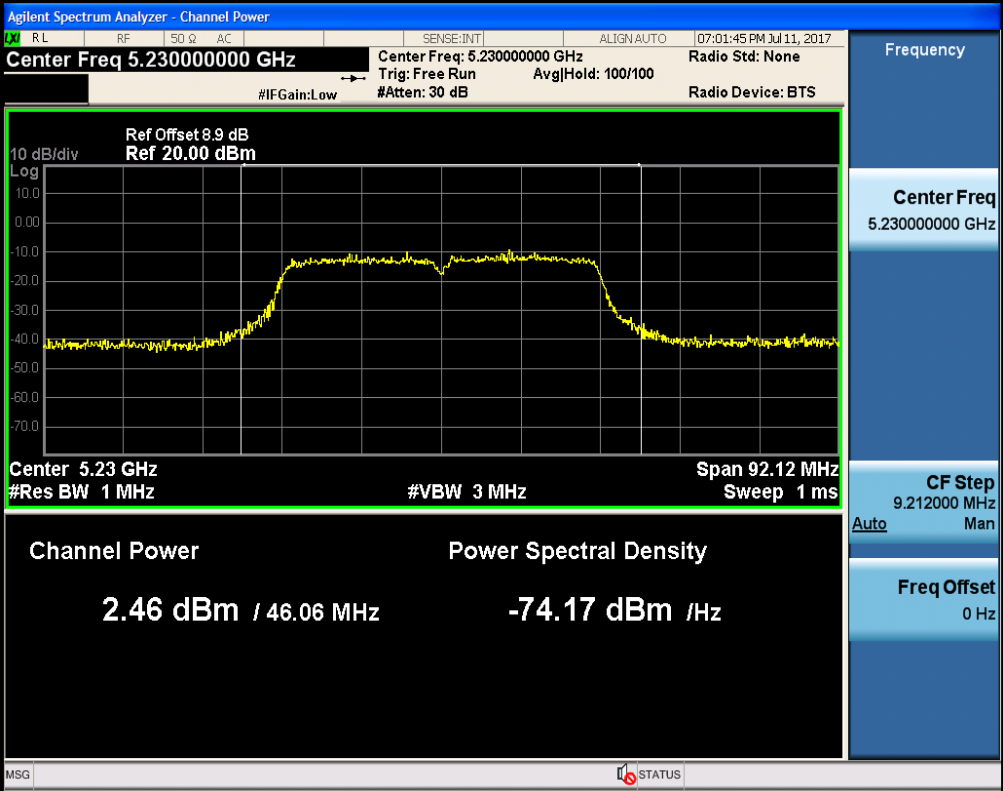
Maximum Conduct Output Power_11N20_5240_Ant2



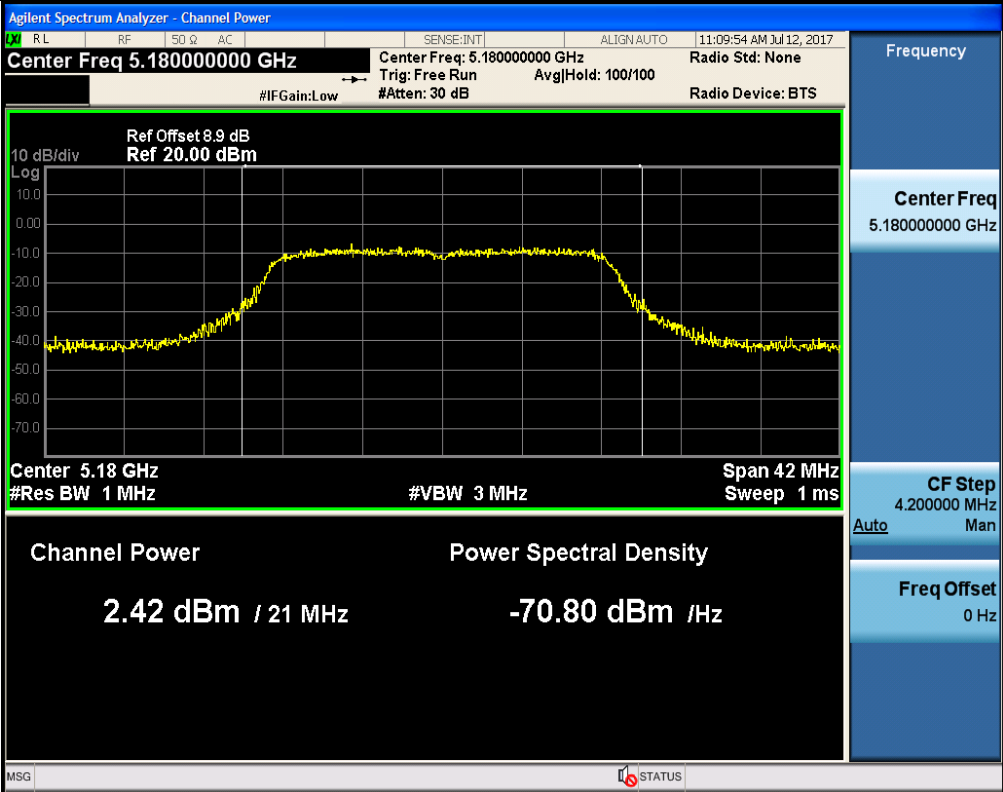
Maximum Conduct Output Power_11N40_5190_Ant2



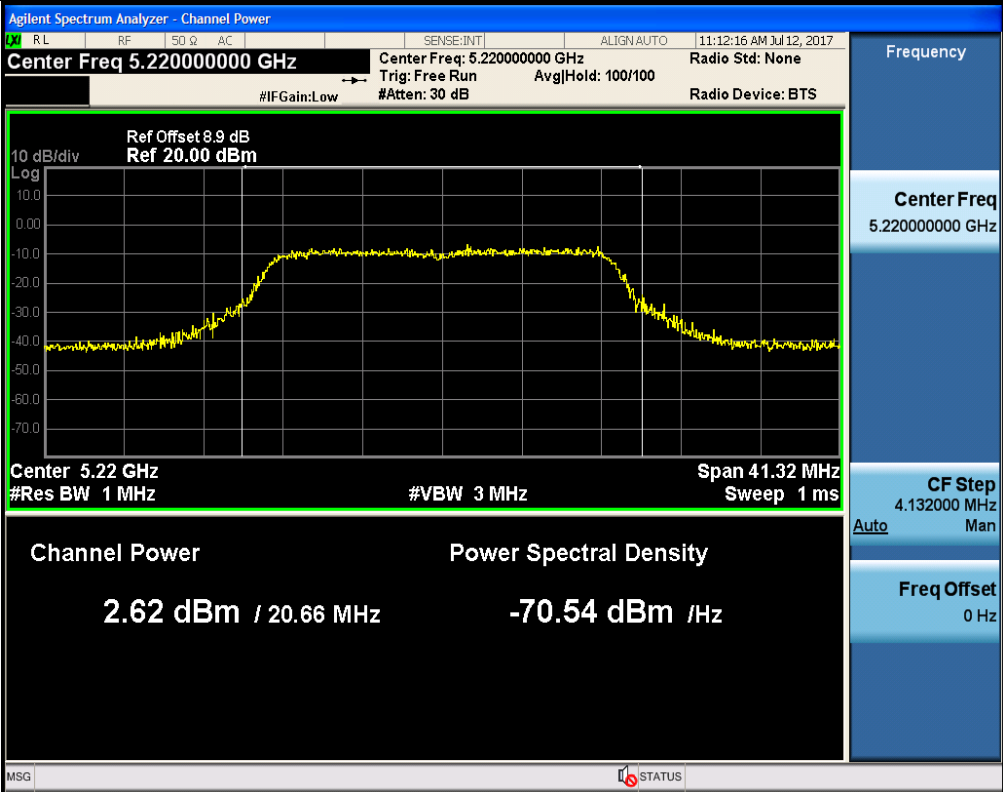
Maximum Conduct Output Power_11N40_5230_Ant2



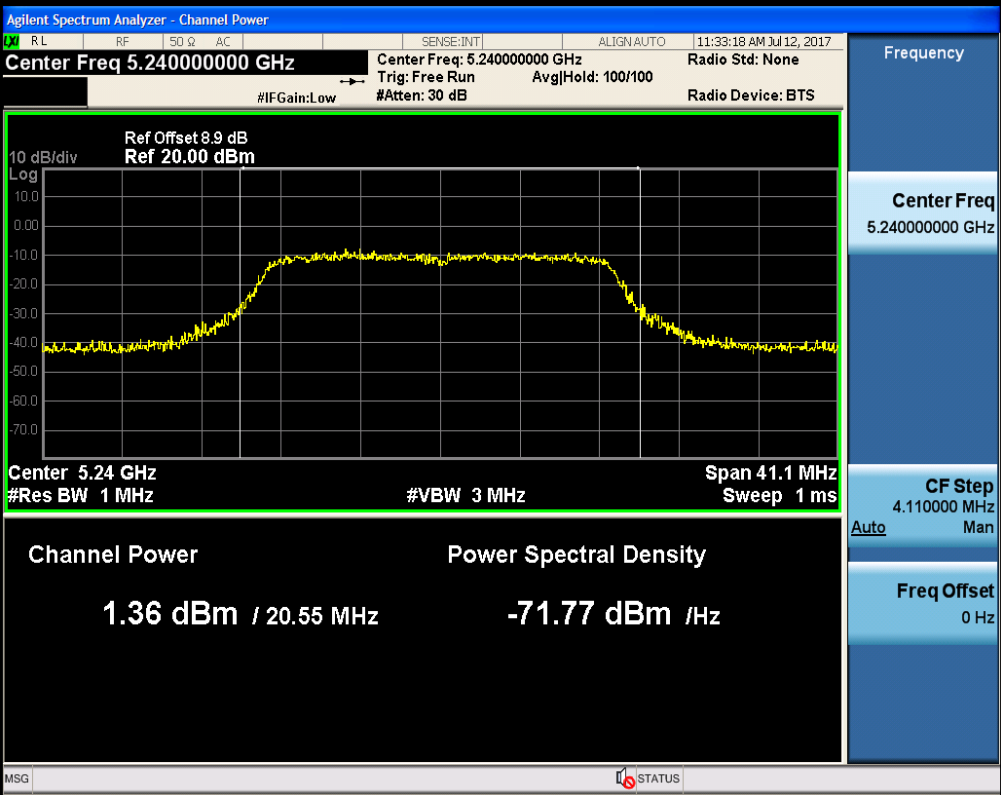
Maximum Conduct Output Power_11N20MIMO_5180_Ant1



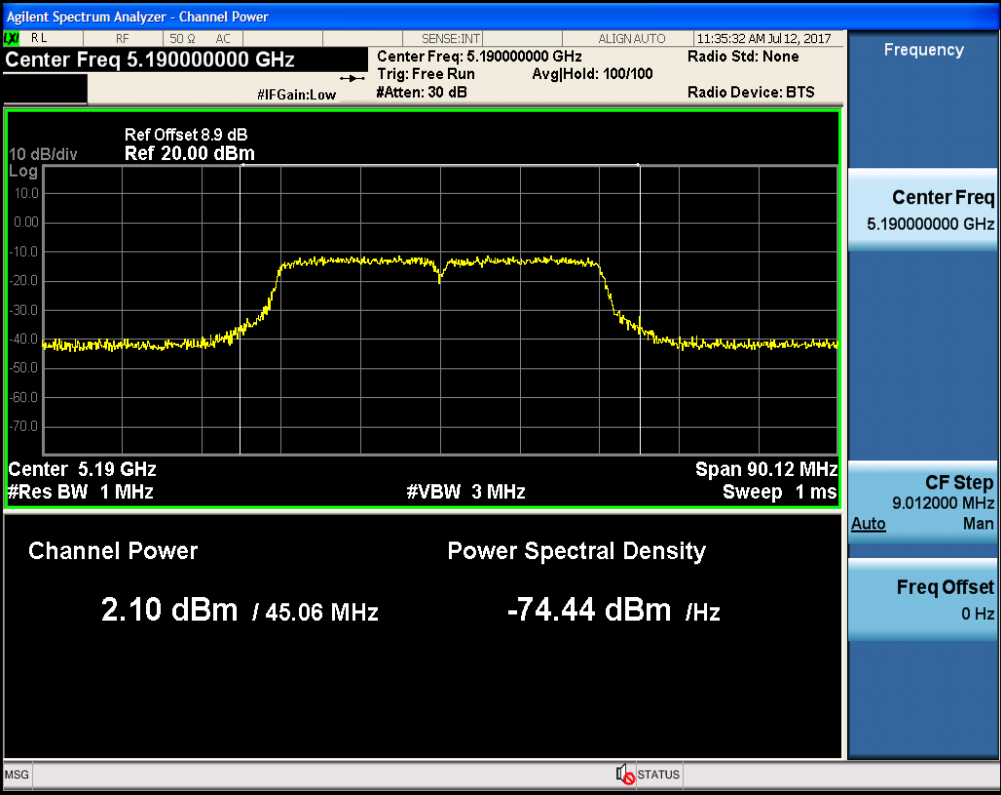
Maximum Conduct Output Power_11N20MIMO_5220_Ant1



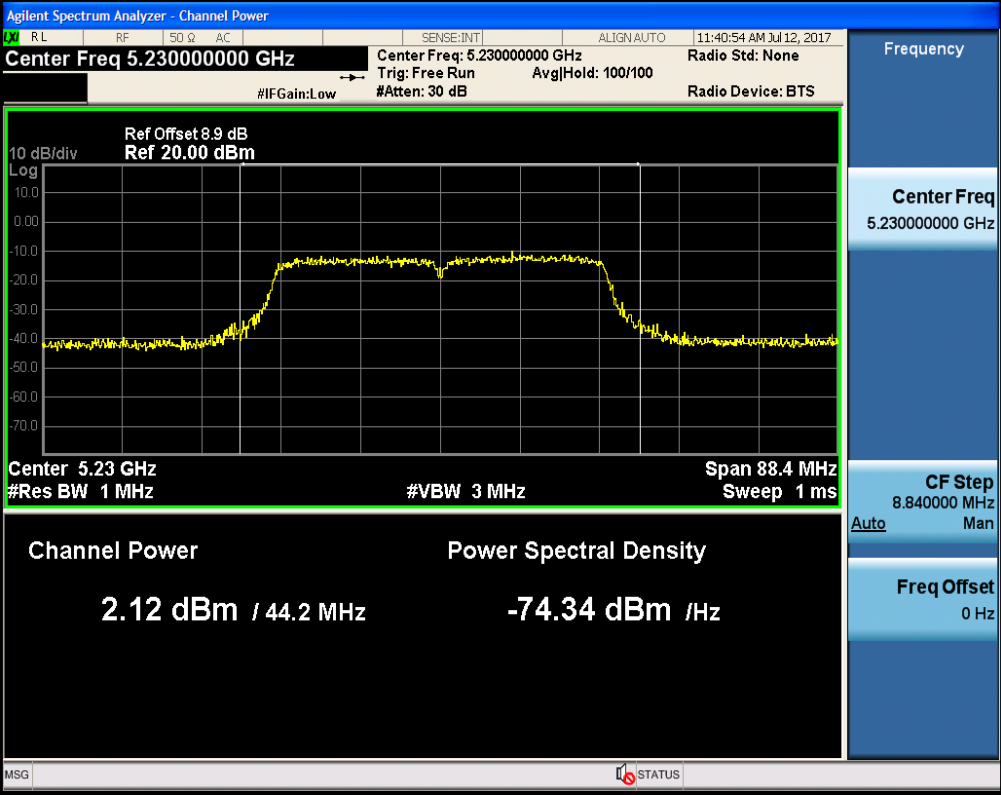
Maximum Conduct Output Power_11N20MIMO_5240_Ant1



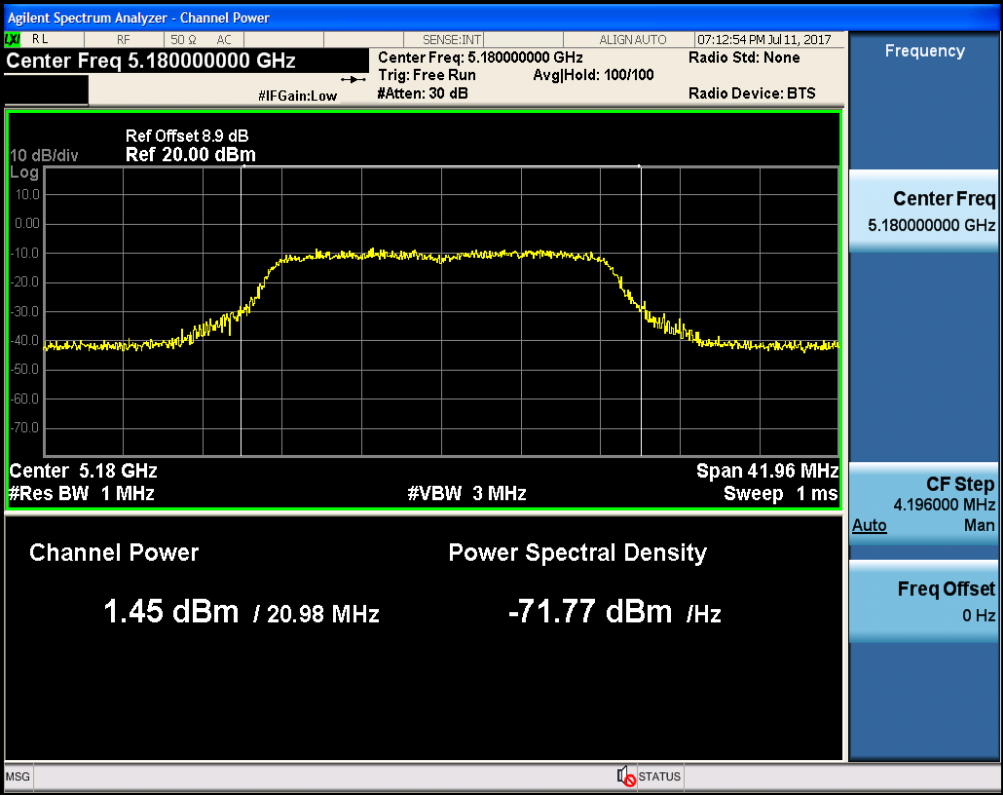
Maximum Conduct Output Power_11N40MIMO_5190_Ant1



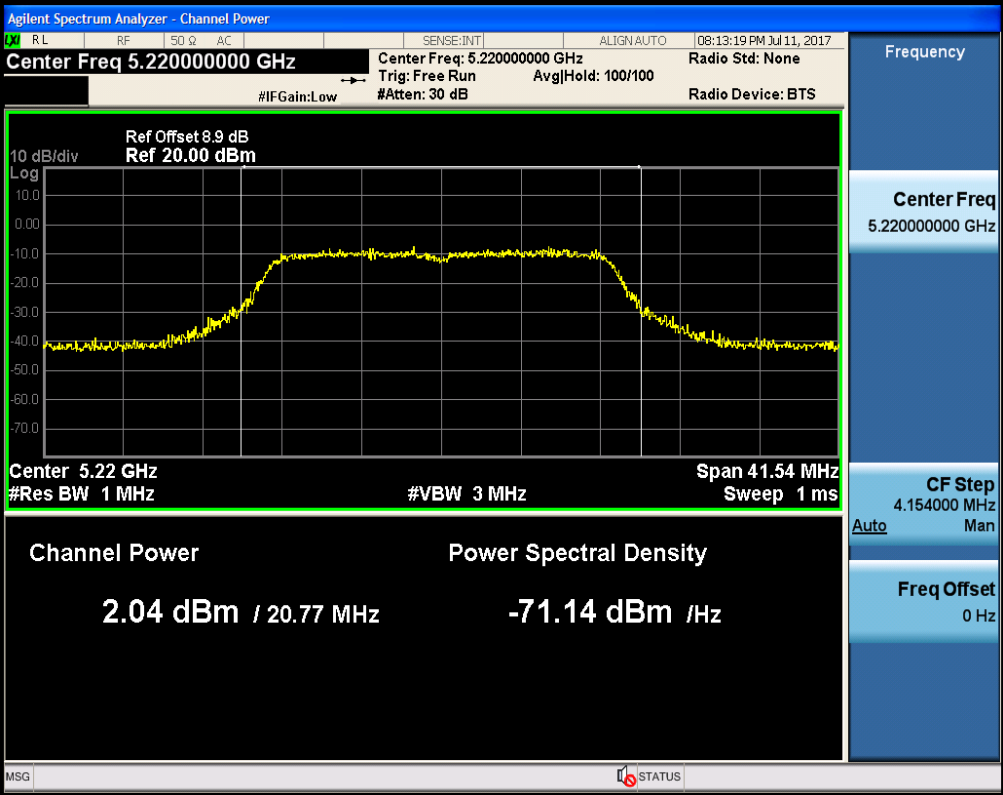
Maximum Conduct Output Power_11N40MIMO_5230_Ant1



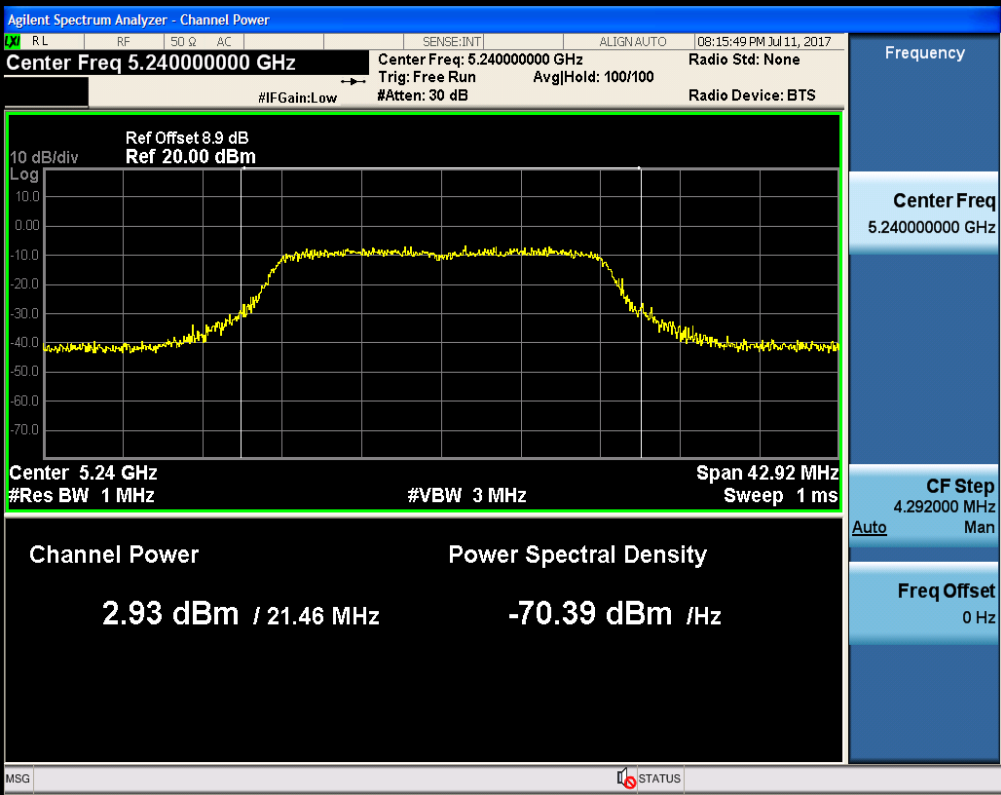
Maximum Conduct Output Power_11N20MIMO_5180_Ant2



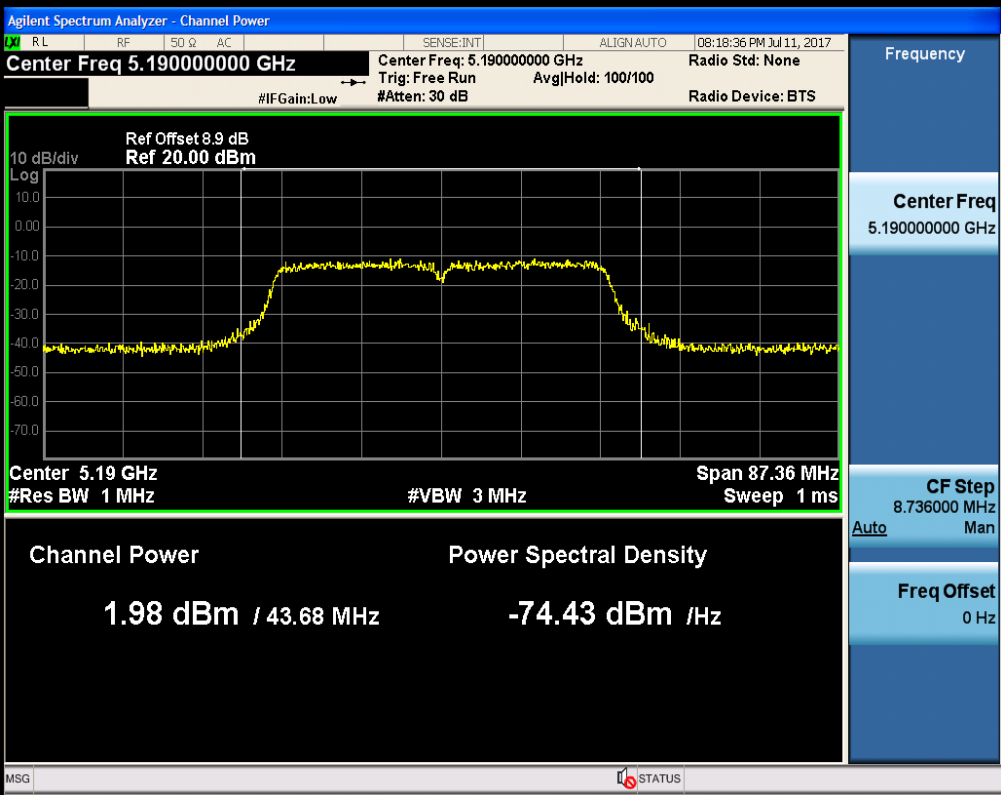
Maximum Conduct Output Power_11N20MIMO_5220_Ant2



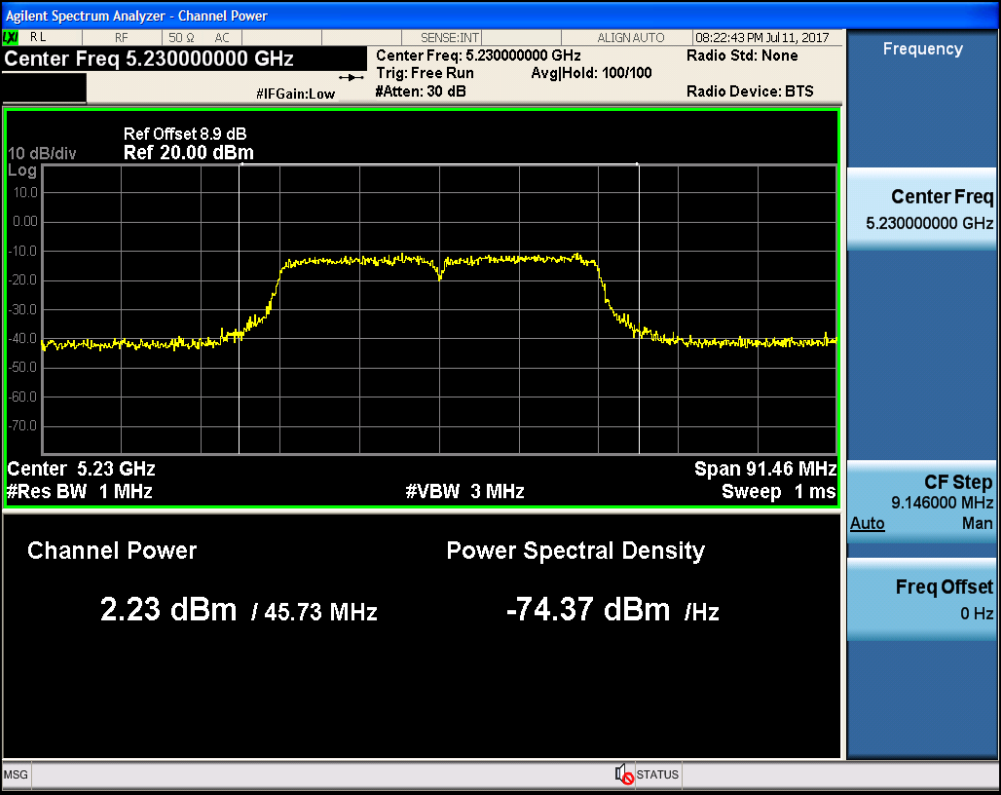
Maximum Conduct Output Power_11N20MIMO_5240_Ant2



Maximum Conduct Output Power_11N40MIMO_5190_Ant2



Maximum Conduct Output Power_11N40MIMO_5230_Ant2



3.Maximum Power Spectral Density

Test Mode	Test Channel	Ant	Level [dBm/MHz]	10log(1/x) Factor [dB]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	5180	Ant1	-9.772	1.09858539935423	-8.673	17.00	PASS
11A	5220	Ant1	-9.305	1.1650890981107	-8.14	17.00	PASS
11A	5240	Ant1	-9.141	1.14978205137702	-7.991	17.00	PASS
11N20	5180	Ant1	-9.03	0.56406567231631	-8.466	17.00	PASS
11N20	5220	Ant1	-9.701	0.56406567231631	-9.137	17.00	PASS
11N20	5240	Ant1	-10.237	0.56406567231631	-9.673	17.00	PASS
11N40	5190	Ant1	-12.274	0.811836096396205	-11.462	17.00	PASS
11N40	5230	Ant1	-12.323	0.801377464444619	-11.522	17.00	PASS

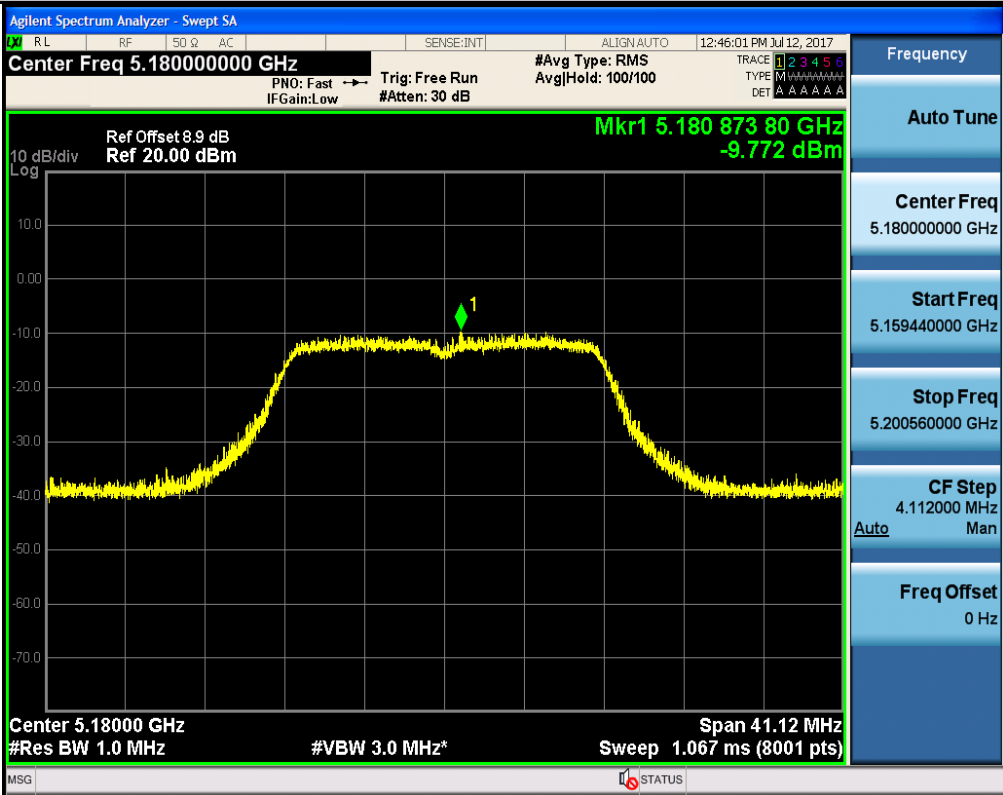
Test Mode	Test Channel	Ant	Level [dBm/MHz]	10log(1/x) Factor [dB]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	5180	Ant2	-11.004	1.14978205137702	-9.854	17.00	PASS
11A	5220	Ant2	-10.41	1.1650890981107	-9.245	17.00	PASS
11A	5240	Ant2	-9.977	1.09858539935423	-8.878	17.00	PASS
11N20	5180	Ant2	-11.549	0.595831353183348	-10.953	17.00	PASS
11N20	5220	Ant2	-10.803	0.591847913491986	-10.211	17.00	PASS
11N20	5240	Ant2	-10.704	0.56406567231631	-10.14	17.00	PASS
11N40	5190	Ant2	-13.265	0.811836096396205	-12.453	17.00	PASS
11N40	5230	Ant2	-13.303	0.752556475200514	-12.55	17.00	PASS

Test Mode	Test Channel	Ant	Level [dBm/MHz]	10log(1/x) Factor [dB]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11N20MIMO	5180	Ant1	-10.679	0.595831353183348	-10.083	17.00	PASS
11N20MIMO	5220	Ant1	-9.951	0.591847913491986	-9.359	17.00	PASS
11N20MIMO	5240	Ant1	-10.819	0.56406567231631	-10.255	17.00	PASS
11N40MIMO	5190	Ant1	-11.032	0.801377464444619	-10.231	17.00	PASS
11N40MIMO	5230	Ant1	-12.185	0.801377464444619	-11.384	17.00	PASS

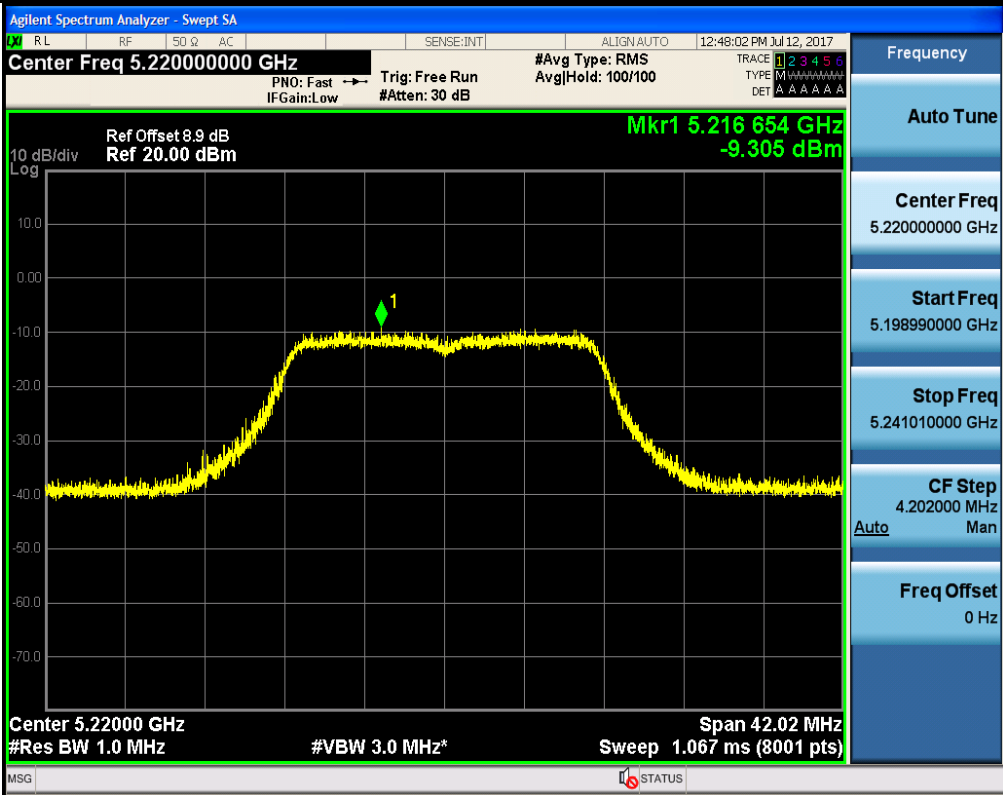
Test Mode	Test Channel	Ant	Level [dBm/MHz]	10log(1/x) Factor [dB]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11N20MIMO	5180	Ant2	-12.053	0.591847913491986	-11.461	17.00	PASS
11N20MIMO	5220	Ant2	-11.377	0.591847913491986	-10.785	17.00	PASS
11N20MIMO	5240	Ant2	-11.488	0.56406567231631	-10.924	17.00	PASS
11N40MIMO	5190	Ant2	-12.773	0.811836096396205	-11.961	17.00	PASS
11N40MIMO	5230	Ant2	-11.939	0.801377464444619	-11.138	17.00	PASS

Test Mode	Test Channel	Ant1 Level [dBm/MHz]	Ant2 Level [dBm/MHz]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11N20MIMO	5180	-10.083	-11.461	-7.71	17.00	PASS
11N20MIMO	5220	-9.359	-10.785	-7.00	17.00	PASS
11N20MIMO	5240	-10.255	-10.924	-7.57	17.00	PASS
11N40MIMO	5190	-10.231	-11.961	-8.00	17.00	PASS
11N40MIMO	5230	-11.384	-11.138	-8.25	17.00	PASS

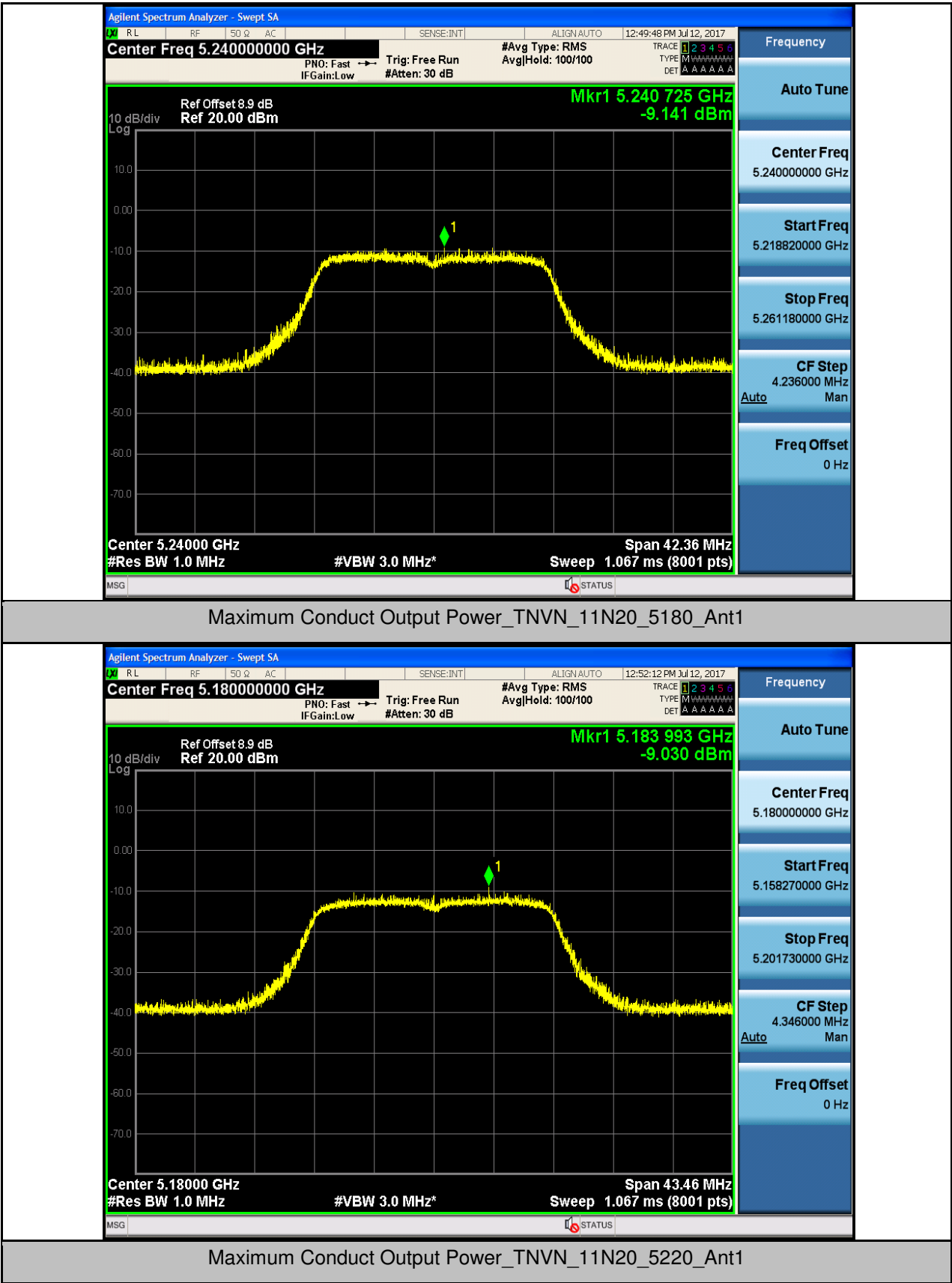
Maximum Conduct Output Power_TNVN_11A_5180_Ant1

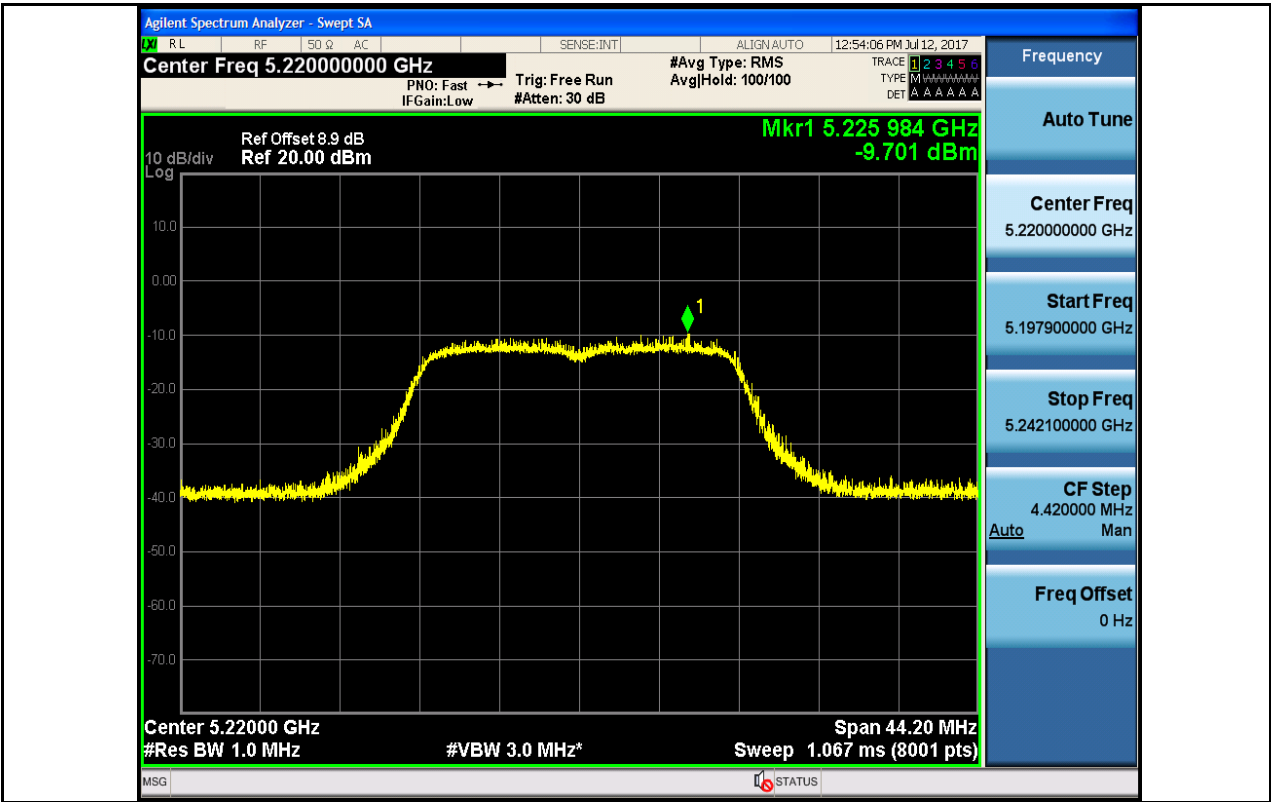


Maximum Conduct Output Power_TNVN_11A_5220_Ant1

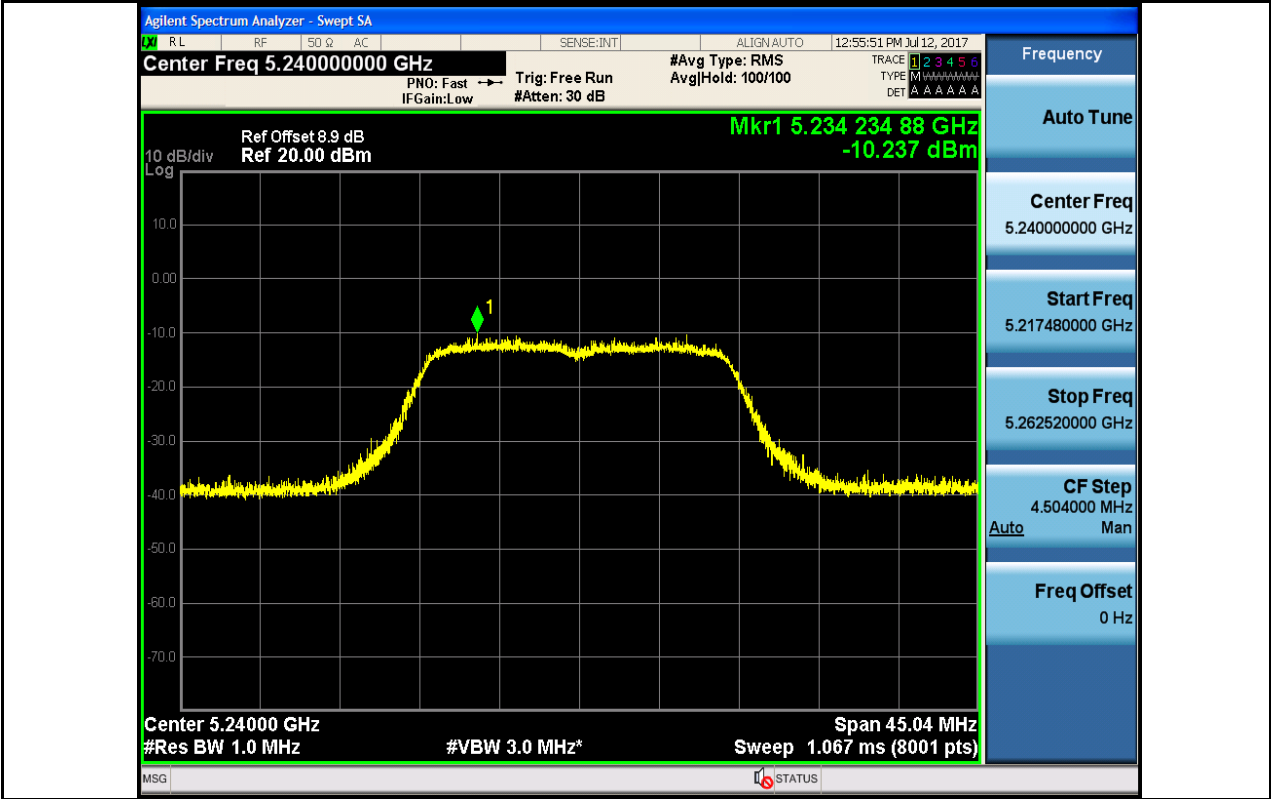


Maximum Conduct Output Power_TNVN_11A_5240_Ant1

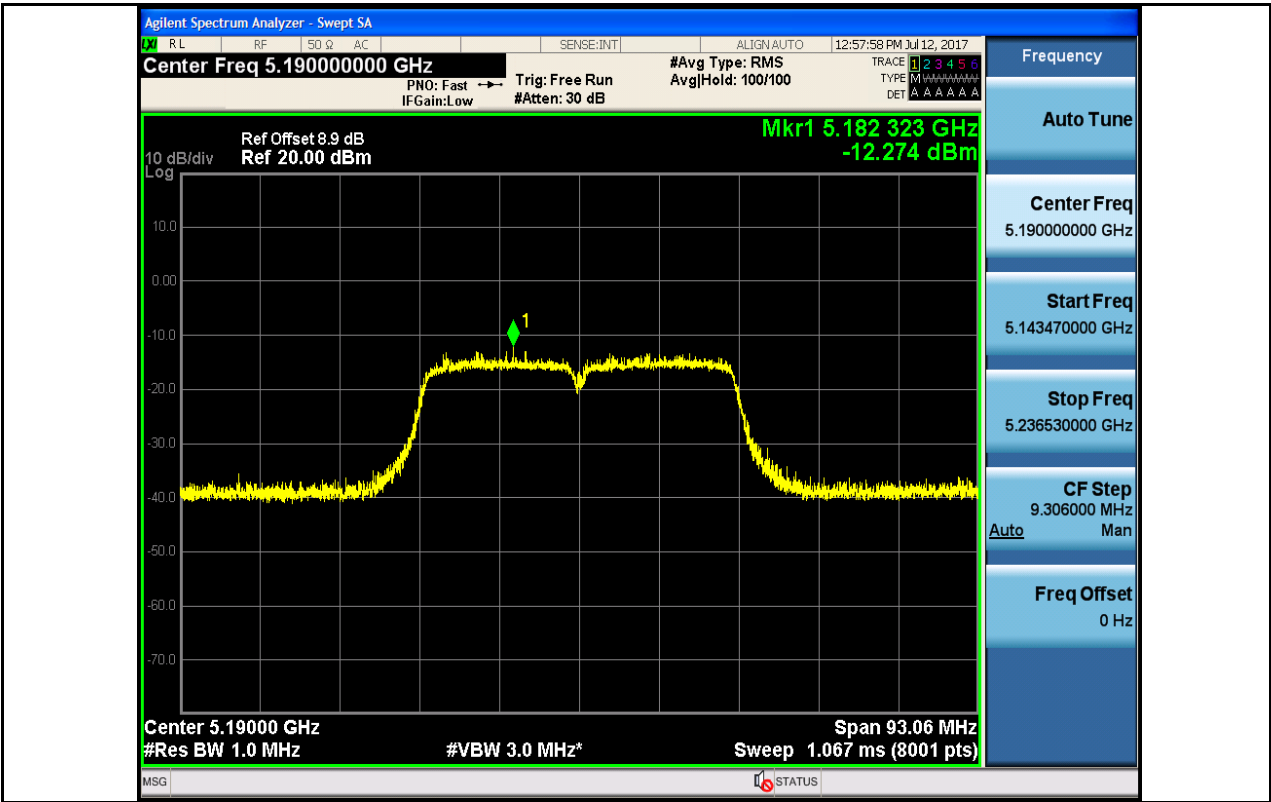




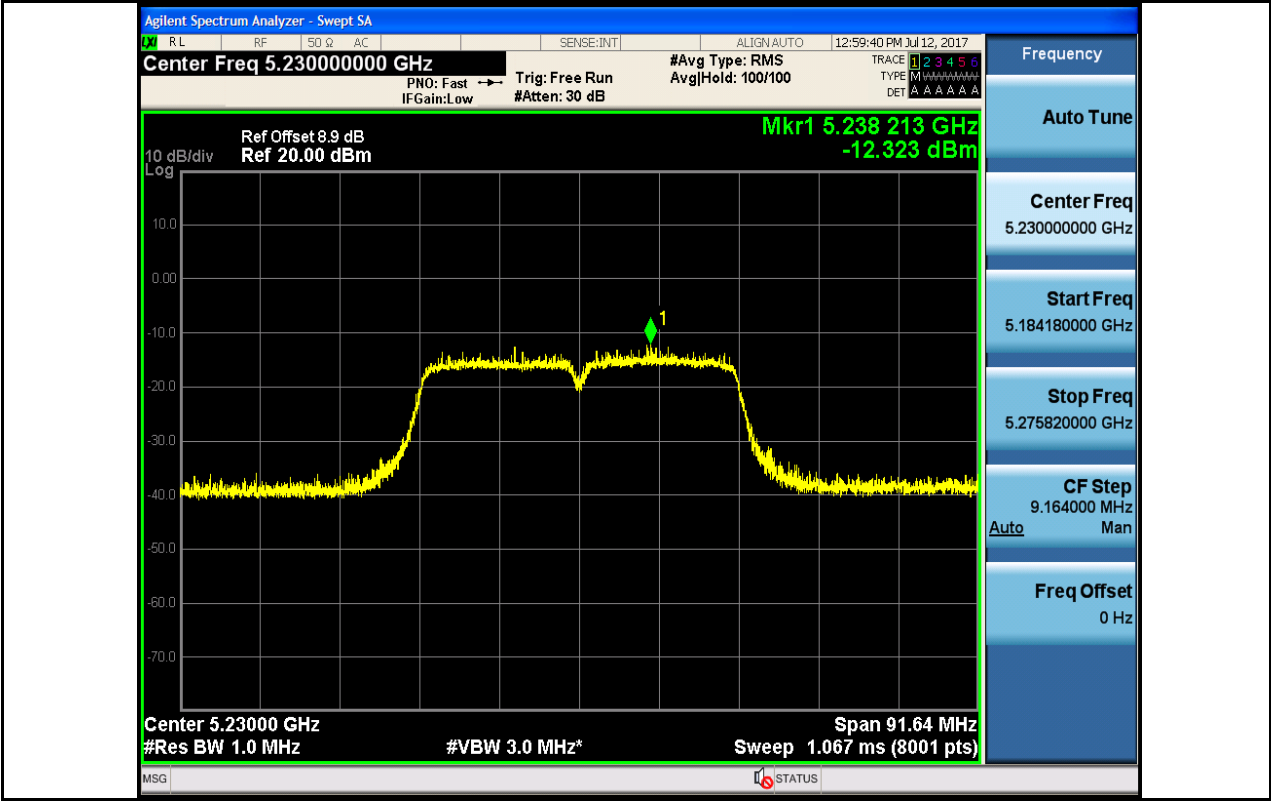
Maximum Conduct Output Power_TNVN_11N20_5240_Ant1



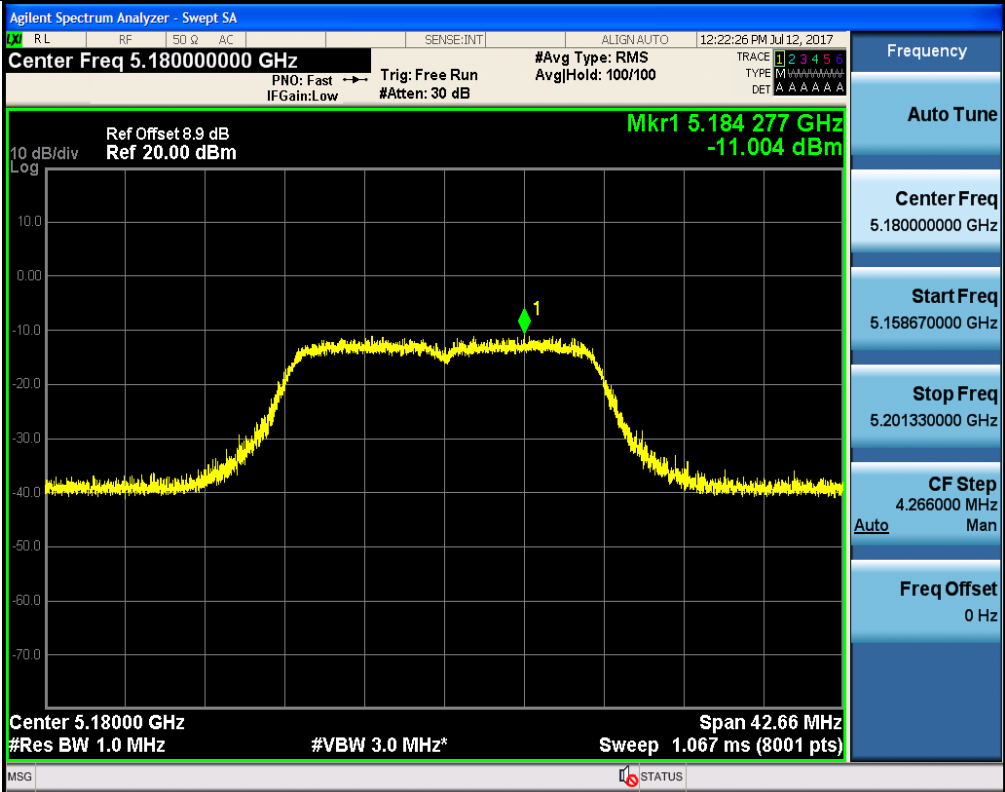
Maximum Conduct Output Power_TNVN_11N40_5190_Ant1



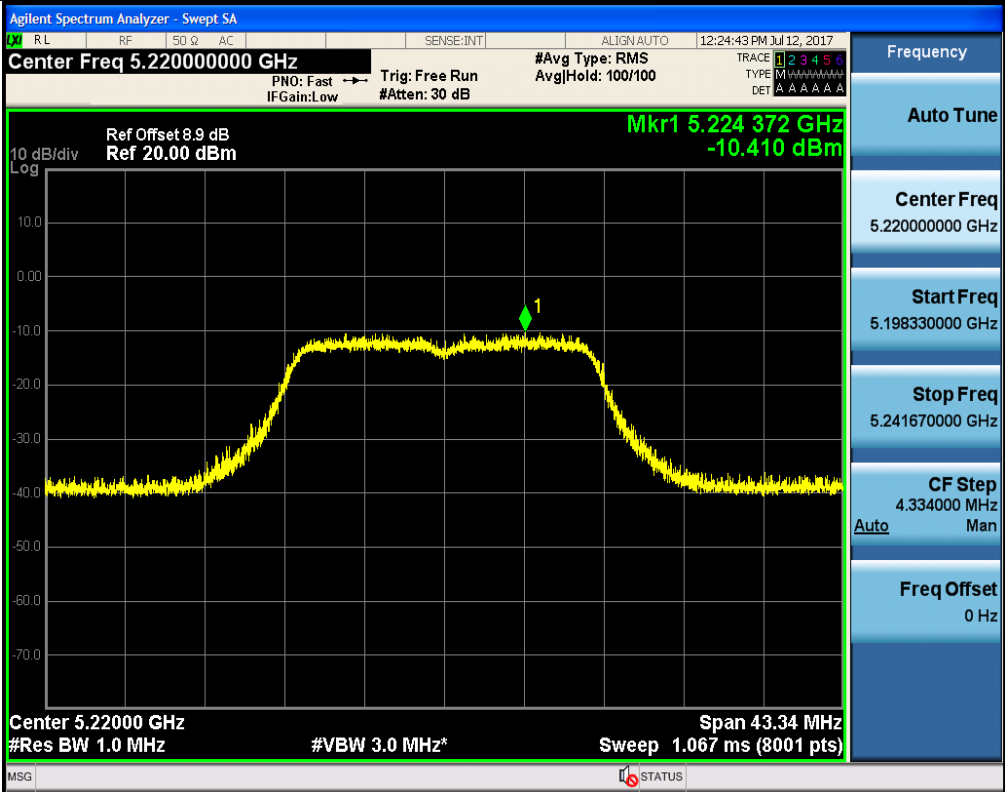
Maximum Conduct Output Power_TNVN_11N40_5230_Ant1



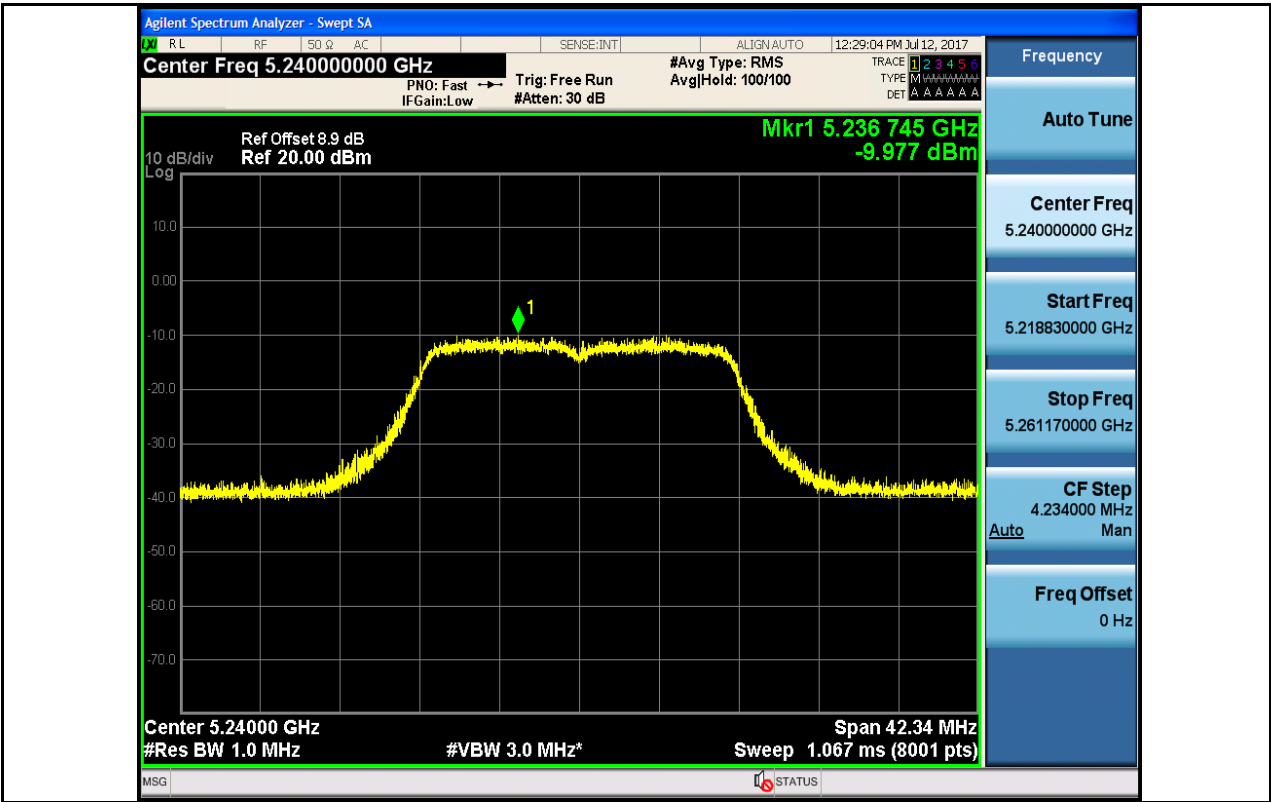
Maximum Conduct Output Power_TNVN_11A_5180_Ant2



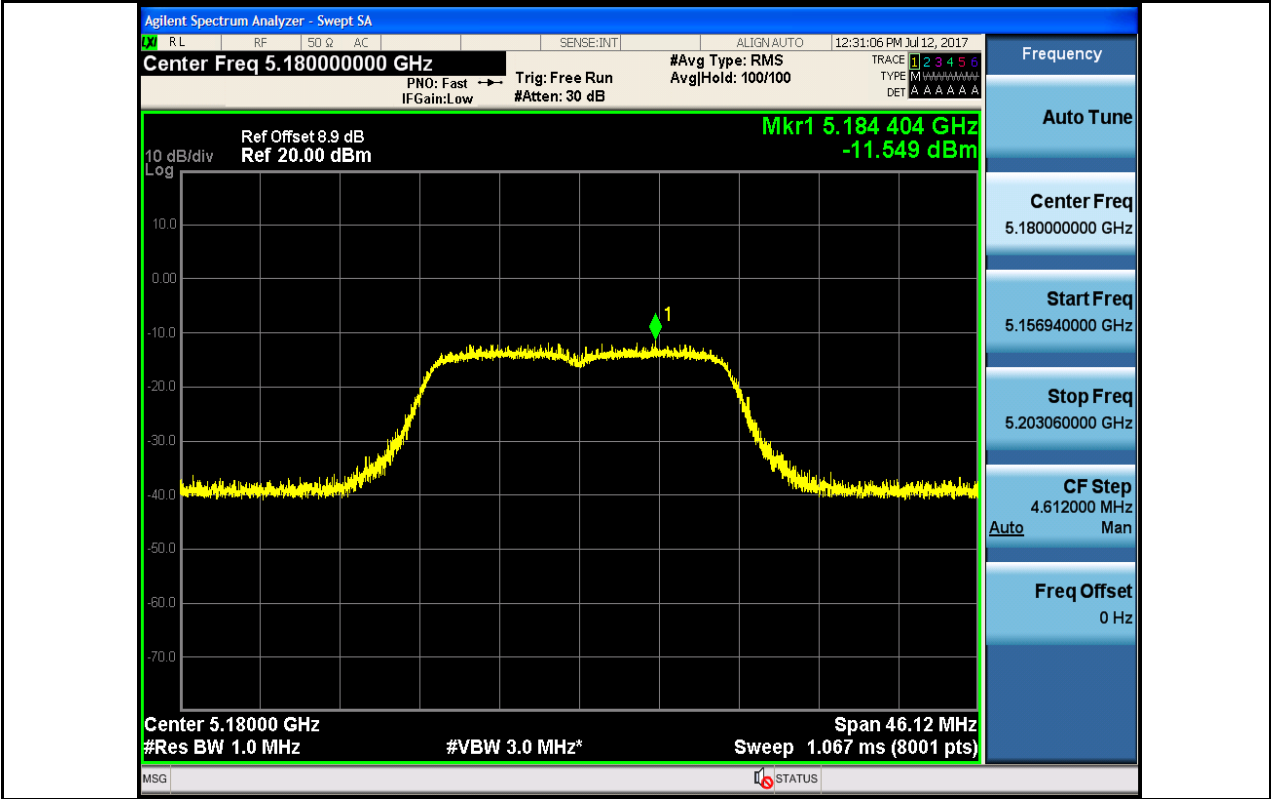
Maximum Conduct Output Power_TNVN_11A_5220_Ant2



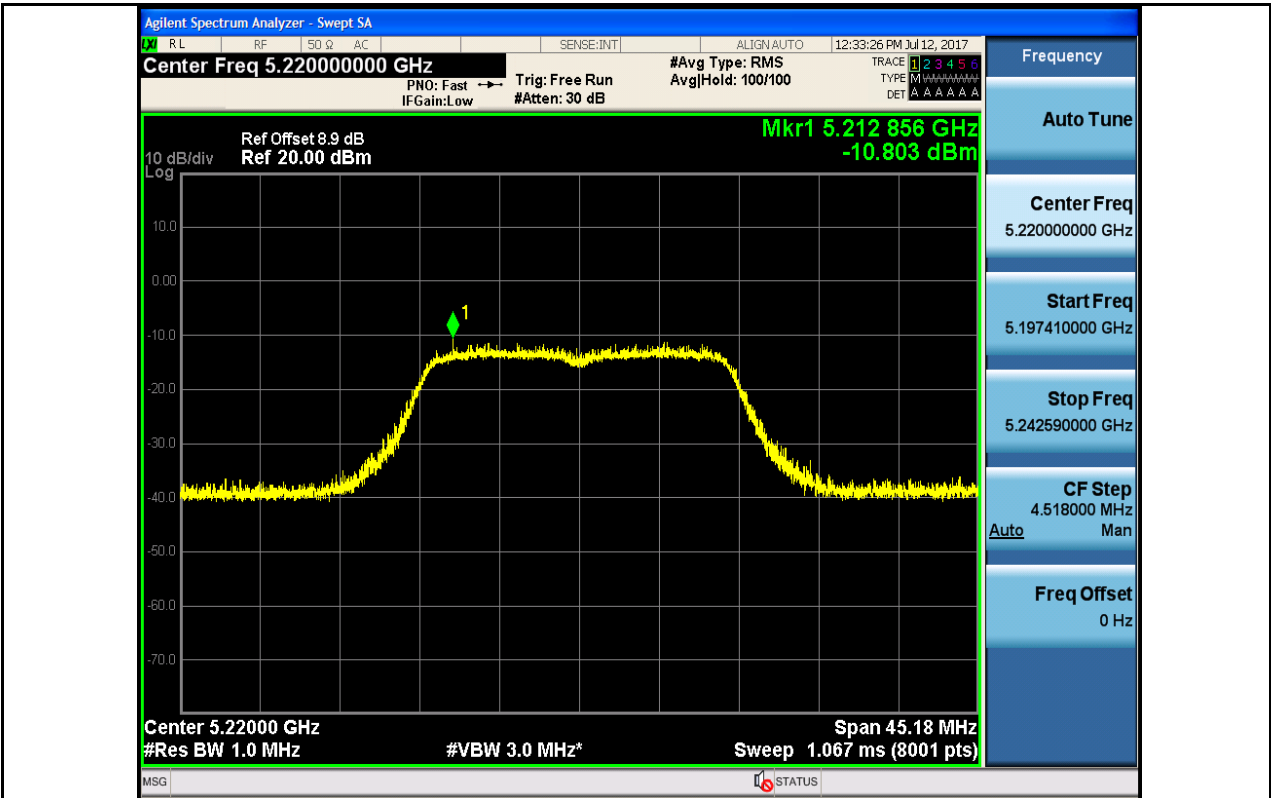
Maximum Conduct Output Power_TNVN_11A_5240_Ant2



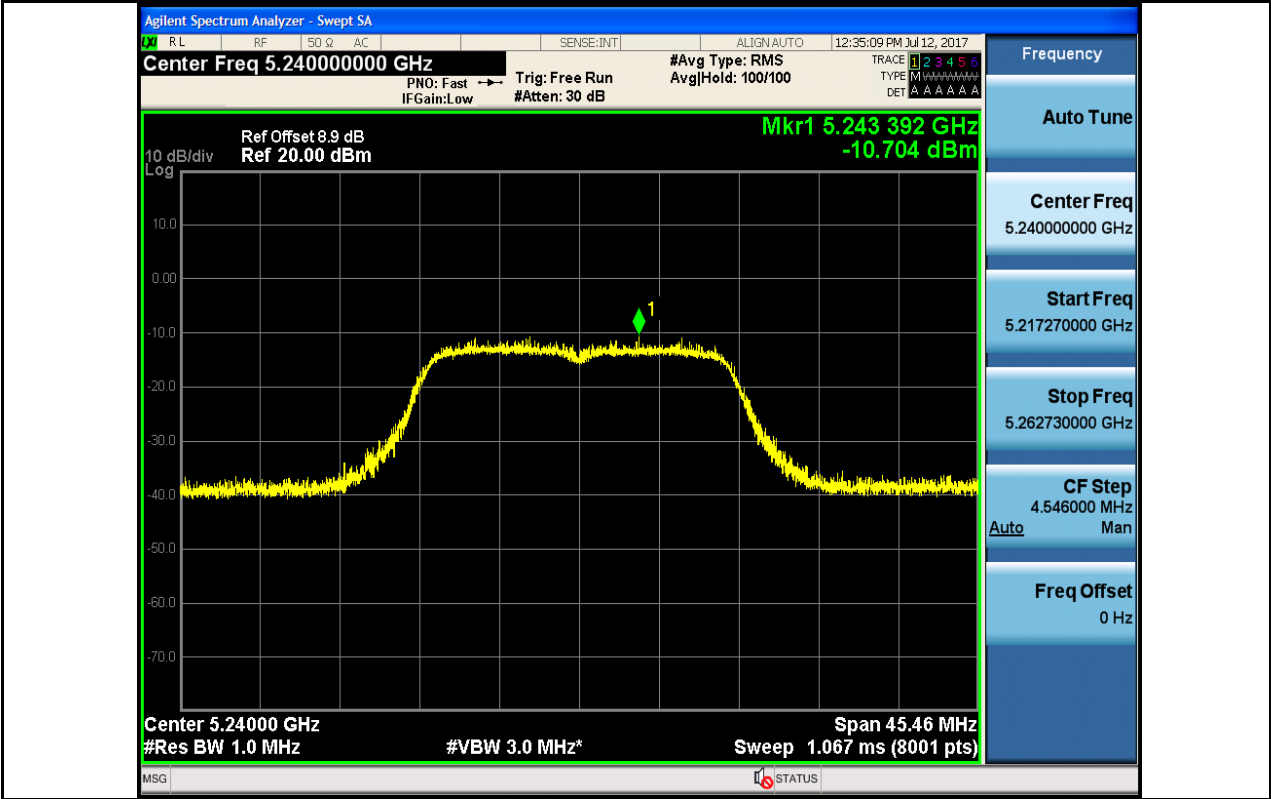
Maximum Conduct Output Power_TNVN_11N20_5180_Ant2



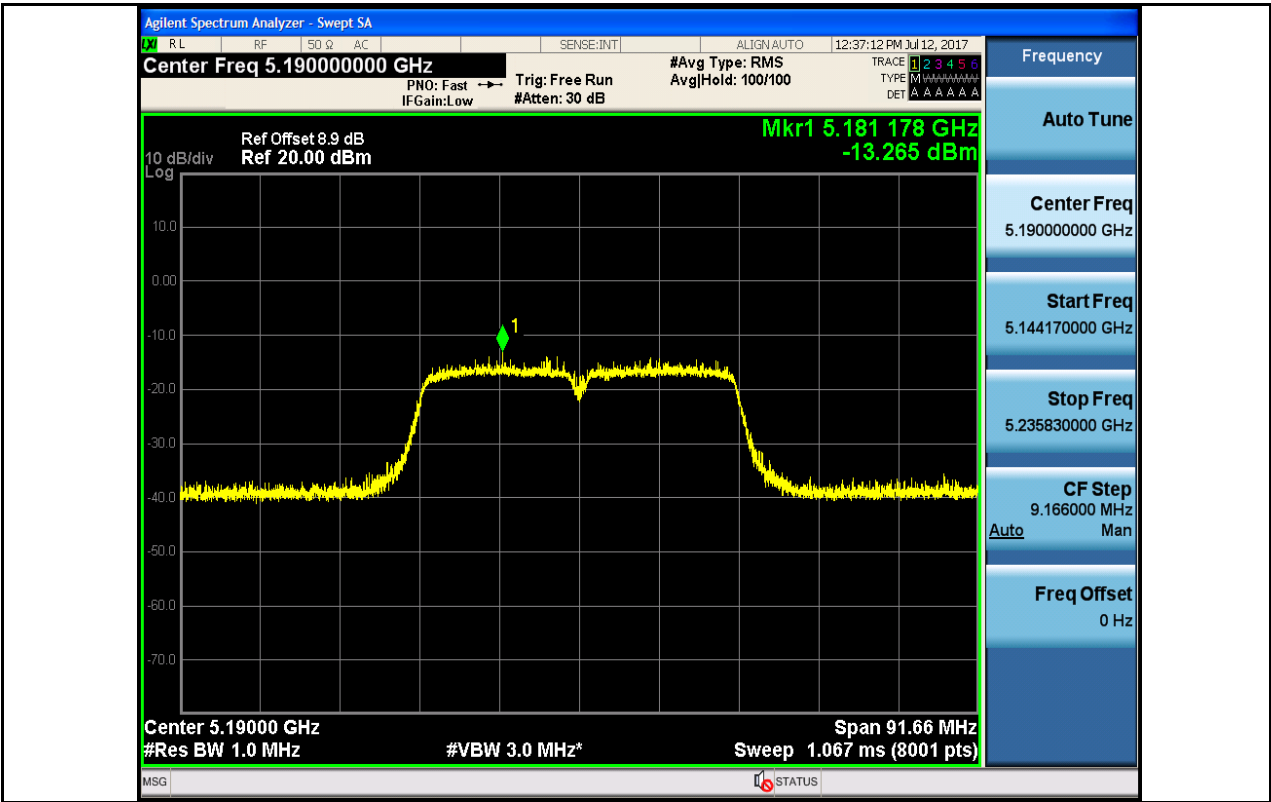
Maximum Conduct Output Power_TNVN_11N20_5220_Ant2



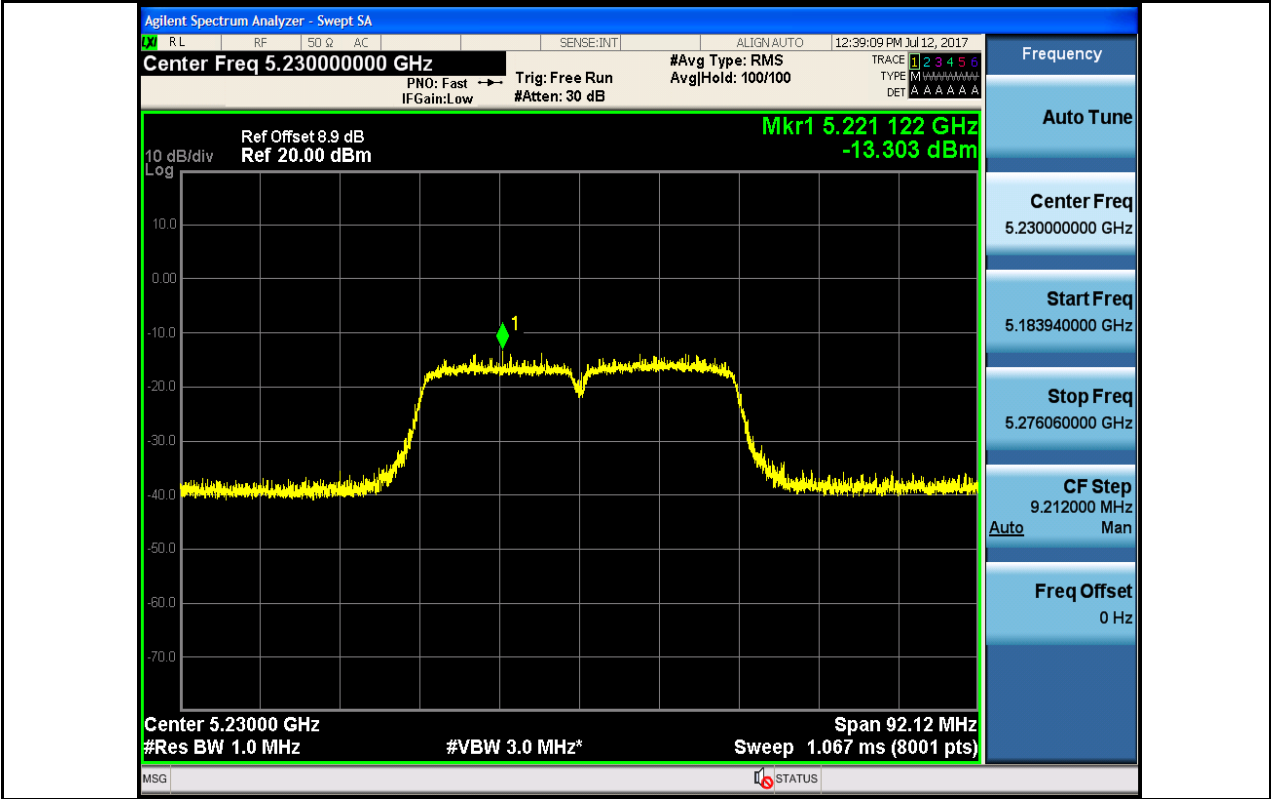
Maximum Conduct Output Power_TNVN_11N20_5240_Ant2

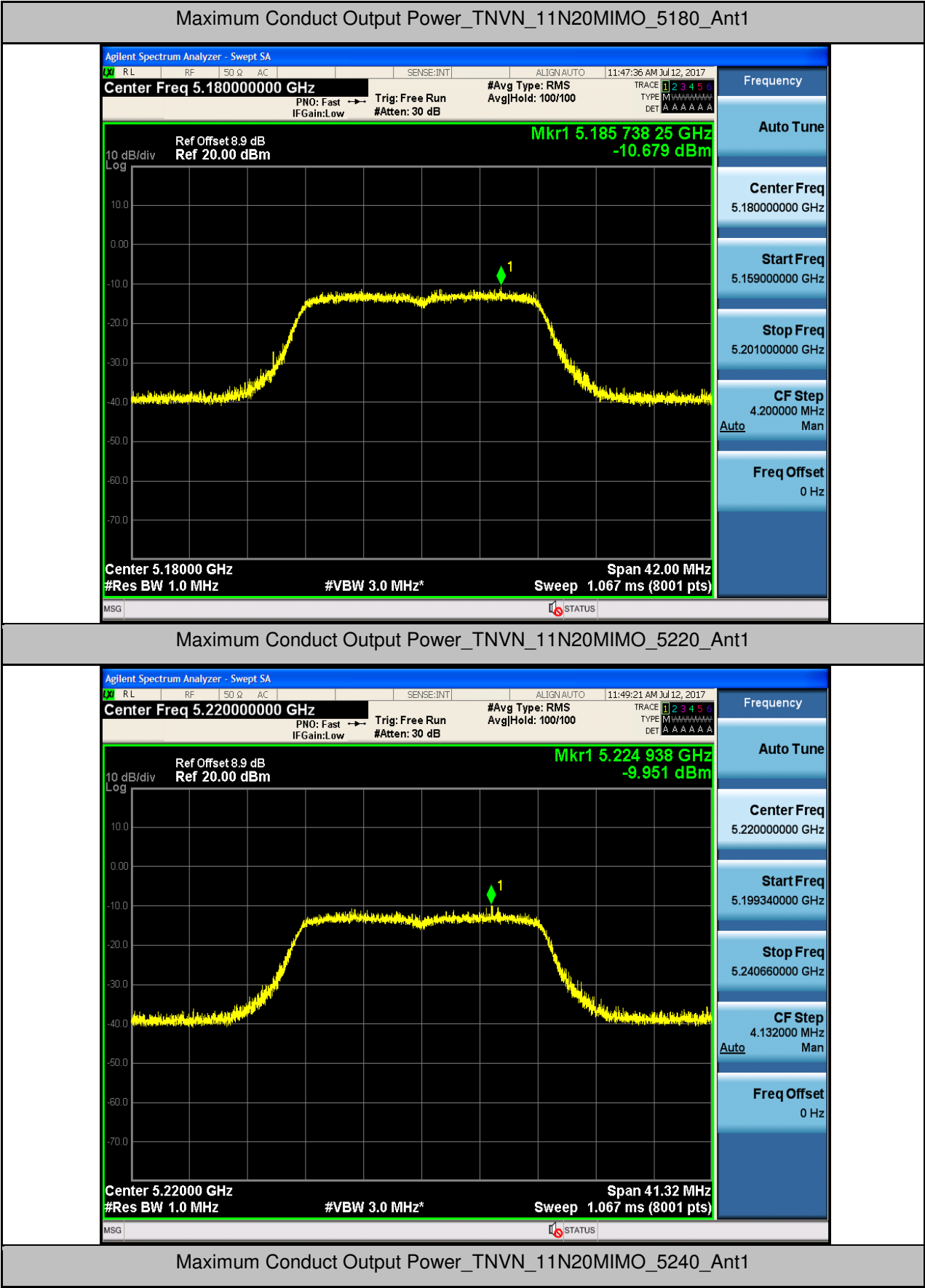


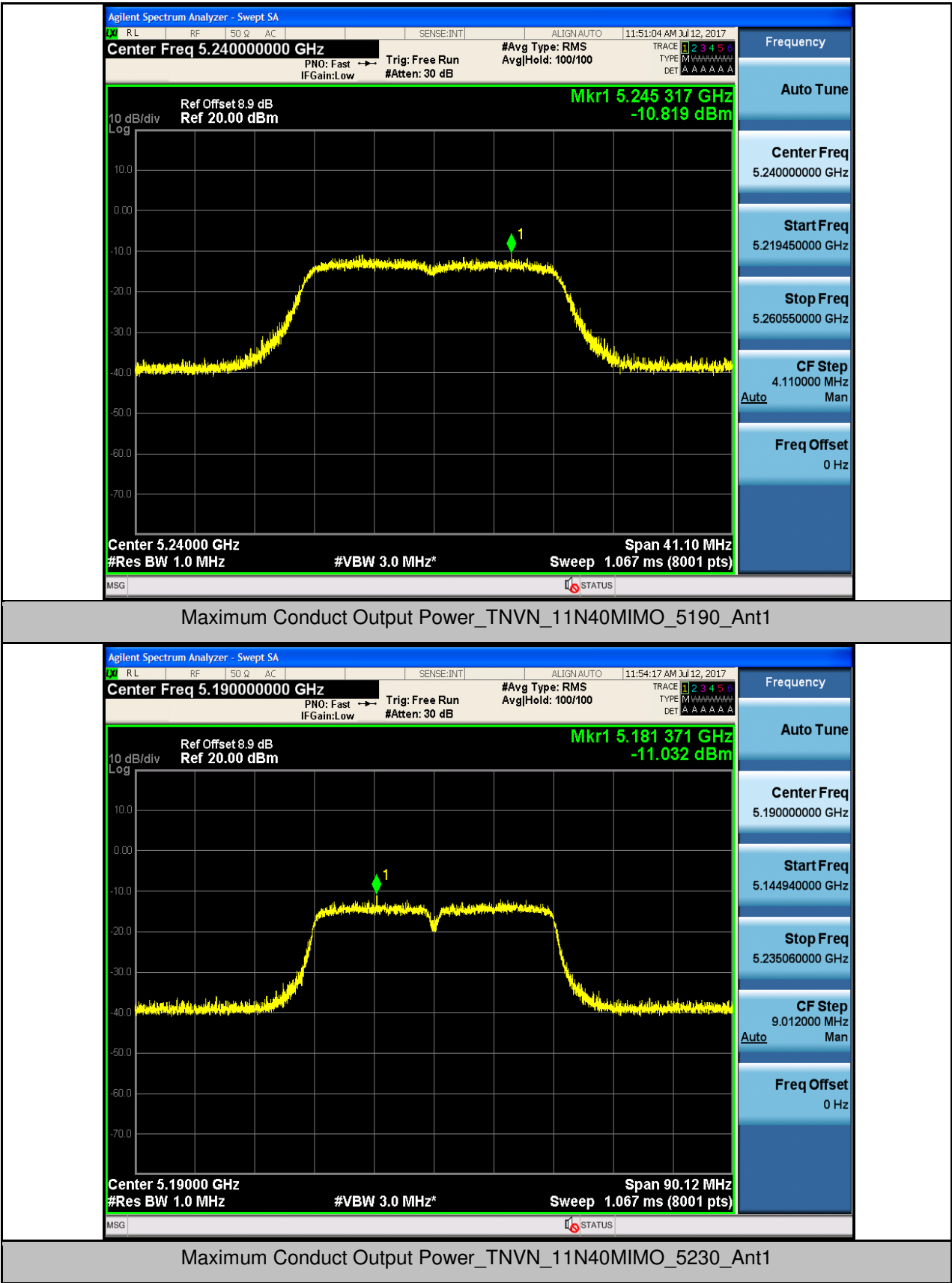
Maximum Conduct Output Power_TNVN_11N40_5190_Ant2



Maximum Conduct Output Power_TNVN_11N40_5230_Ant2







Maximum Conduct Output Power_TNVN_11N40MIMO_5190_Ant1

Agilent Spectrum Analyzer - Swept SA

RL

RF

50 Ω

AC

SENSE:INT

ALIGN:AUTO

11:54:17 AM Jul 12, 2017

Center Freq 5.19000000 GHz

PNO: Fast

IF Gain: Low

Trig: Free Run

#Atten: 30 dB

#Avg Type: RMS

Avg/Hold: 100/100

TRACE 1 2 3 4 5 6

TYPE M

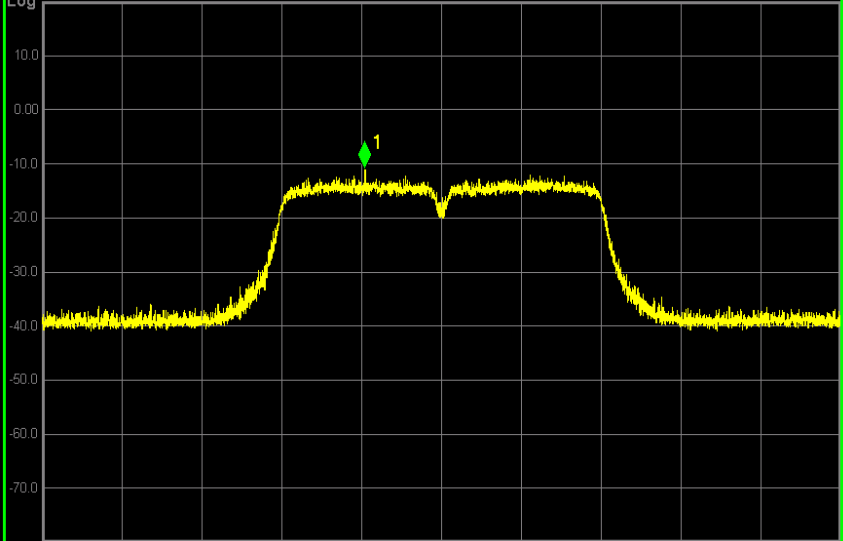
DET A A A A A A

Ref Offset 8.9 dB

Ref 20.00 dBm

Mkr1 5.181 371 GHz

-11.032 dBm



Center 5.19000 GHz

#Res BW 1.0 MHz

#VBW 3.0 MHz*

Span 90.12 MHz

Sweep 1.067 ms (8001 pts)

MSG

STATUS

Frequency

Auto Tune

Center Freq 5.19000000 GHz

Start Freq 5.144940000 GHz

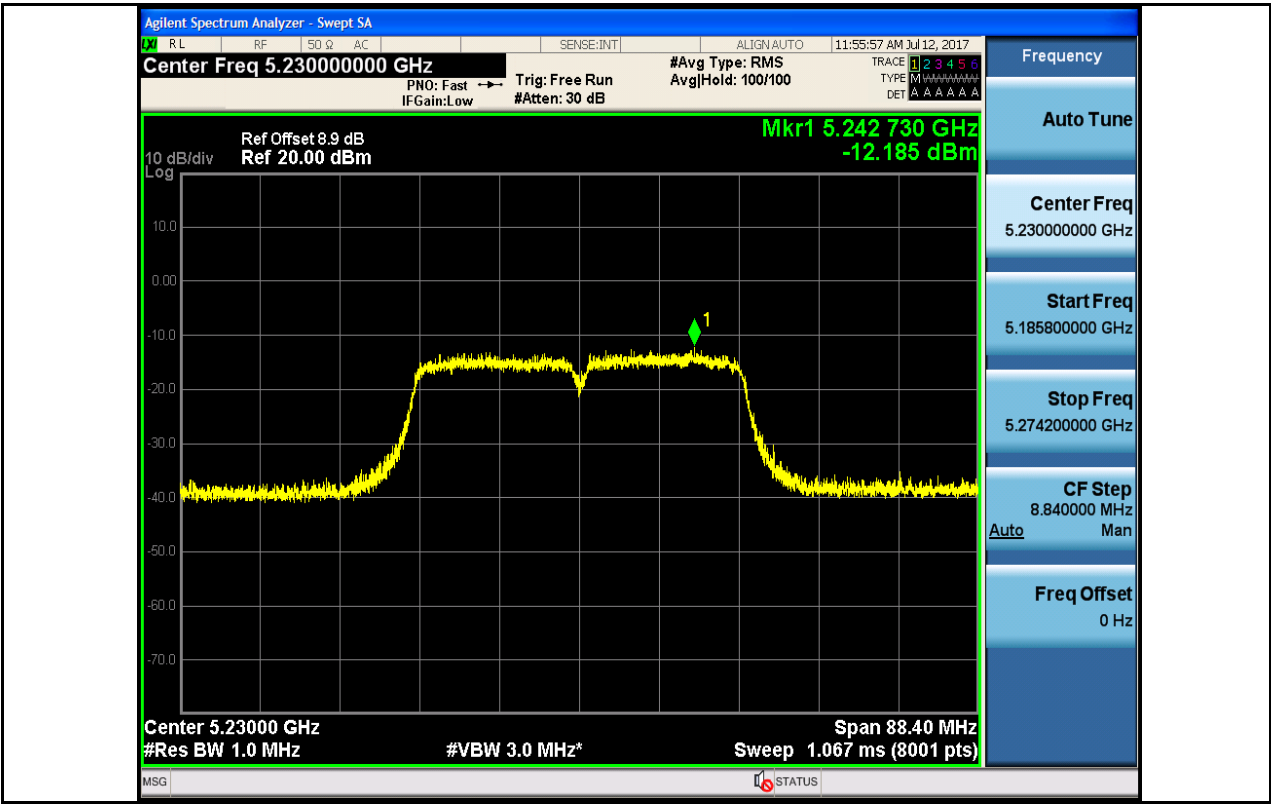
Stop Freq 5.235060000 GHz

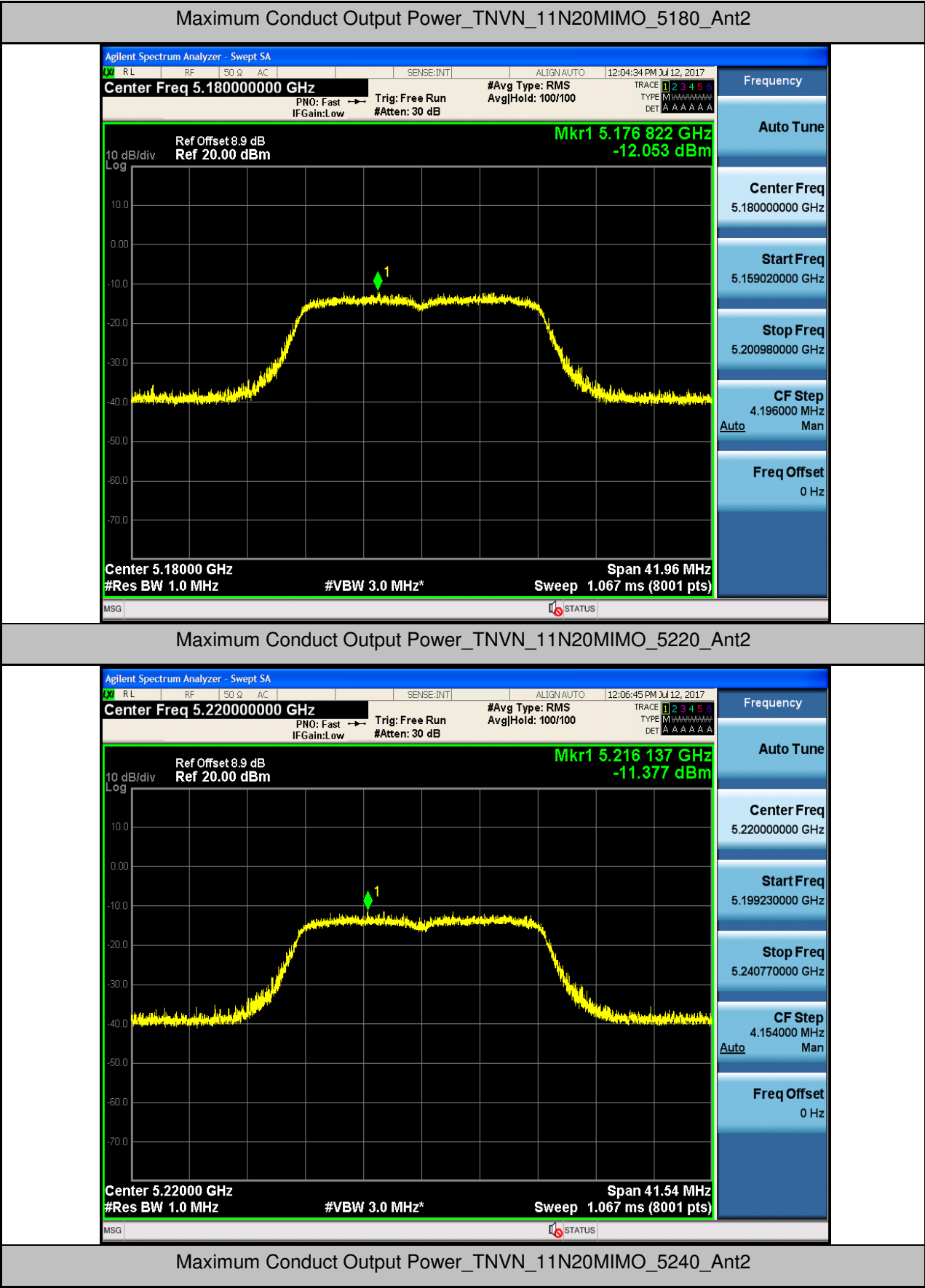
CF Step 9.012000 MHz

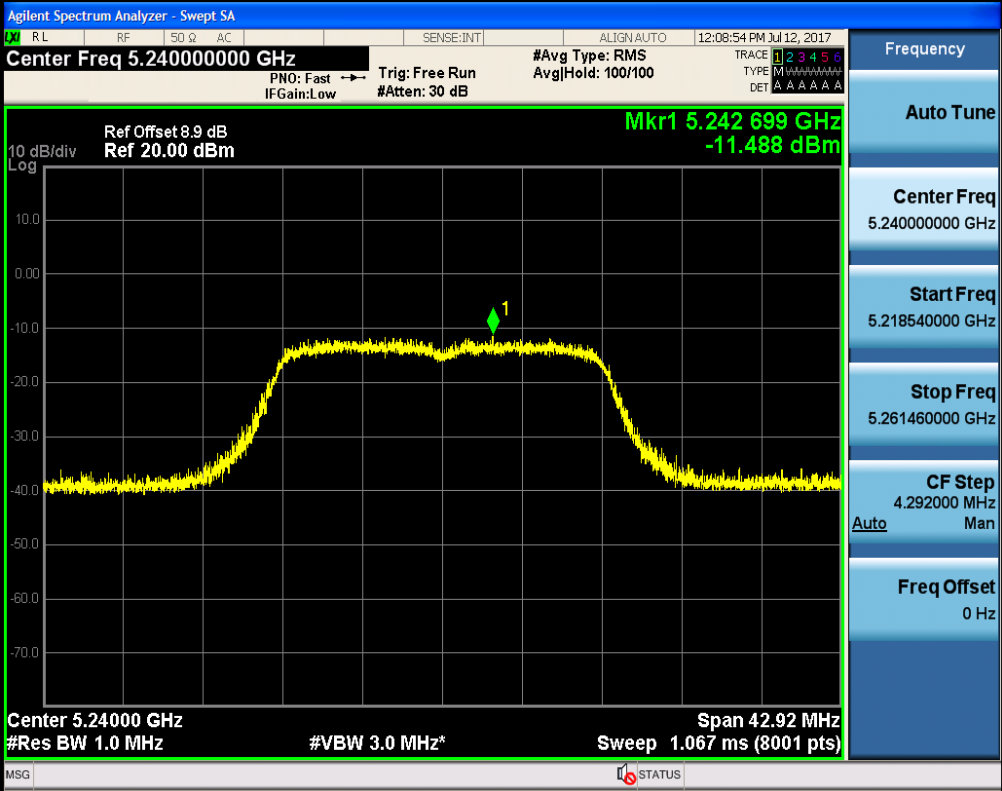
Auto Man

Freq Offset 0 Hz

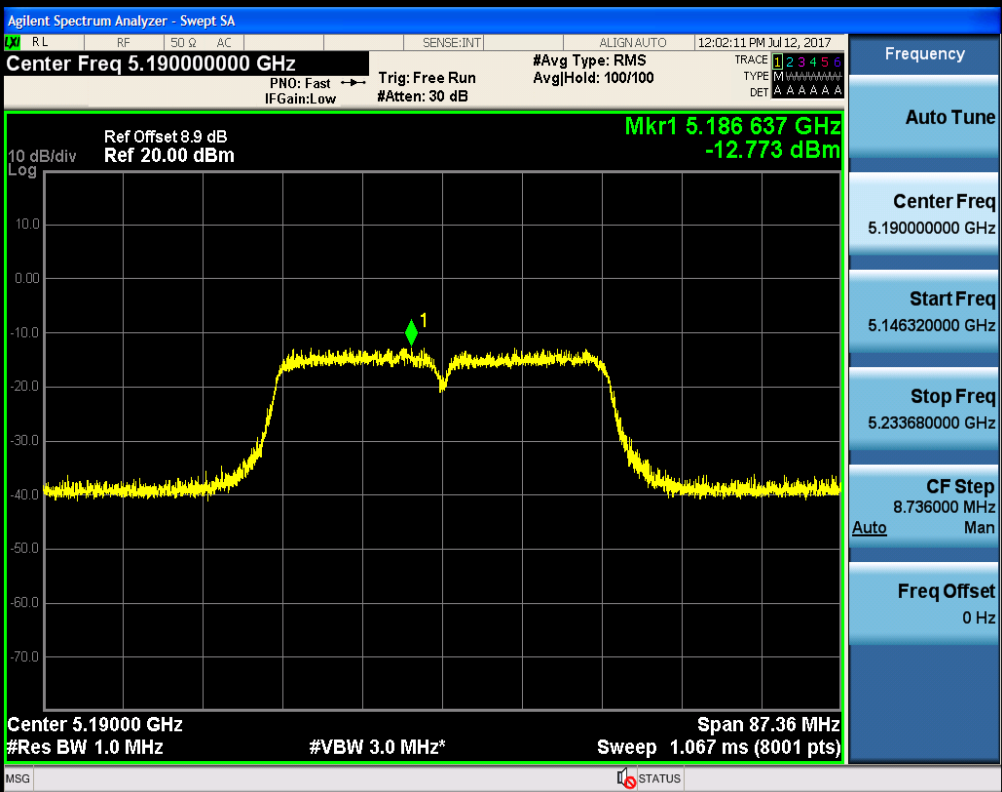
Maximum Conduct Output Power_TNVN_11N40MIMO_5230_Ant1



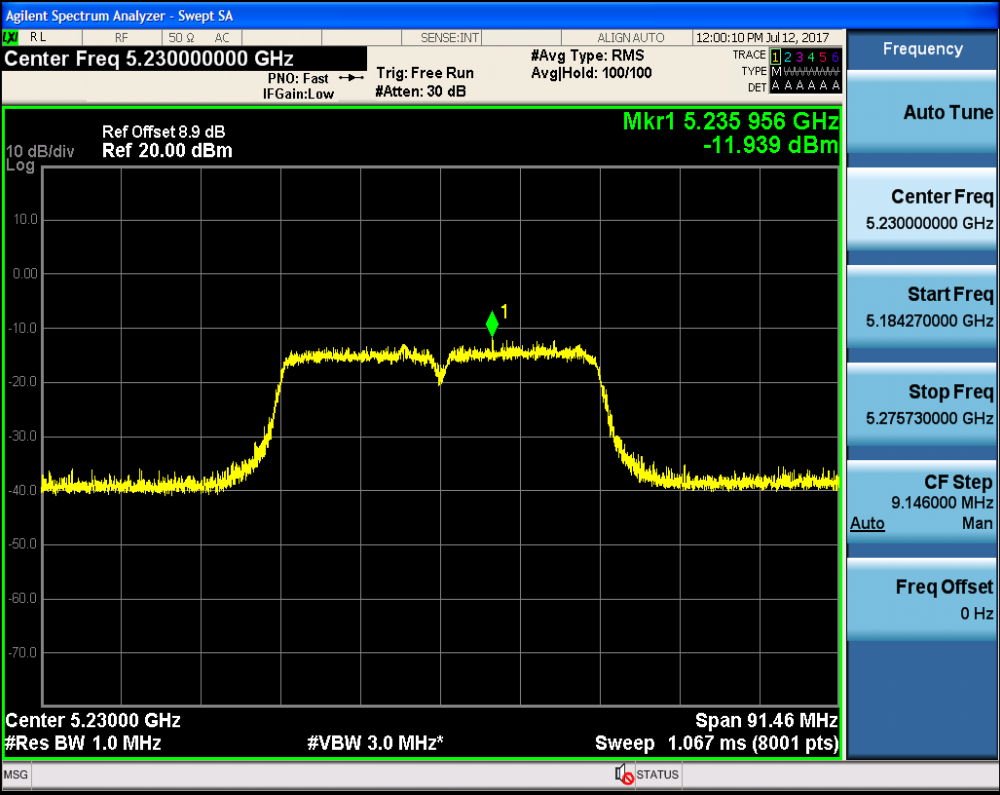




Maximum Conduct Output Power_TNVN_11N40MIMO_5190_Ant2



Maximum Conduct Output Power_TNVN_11N40MIMO_5230_Ant2



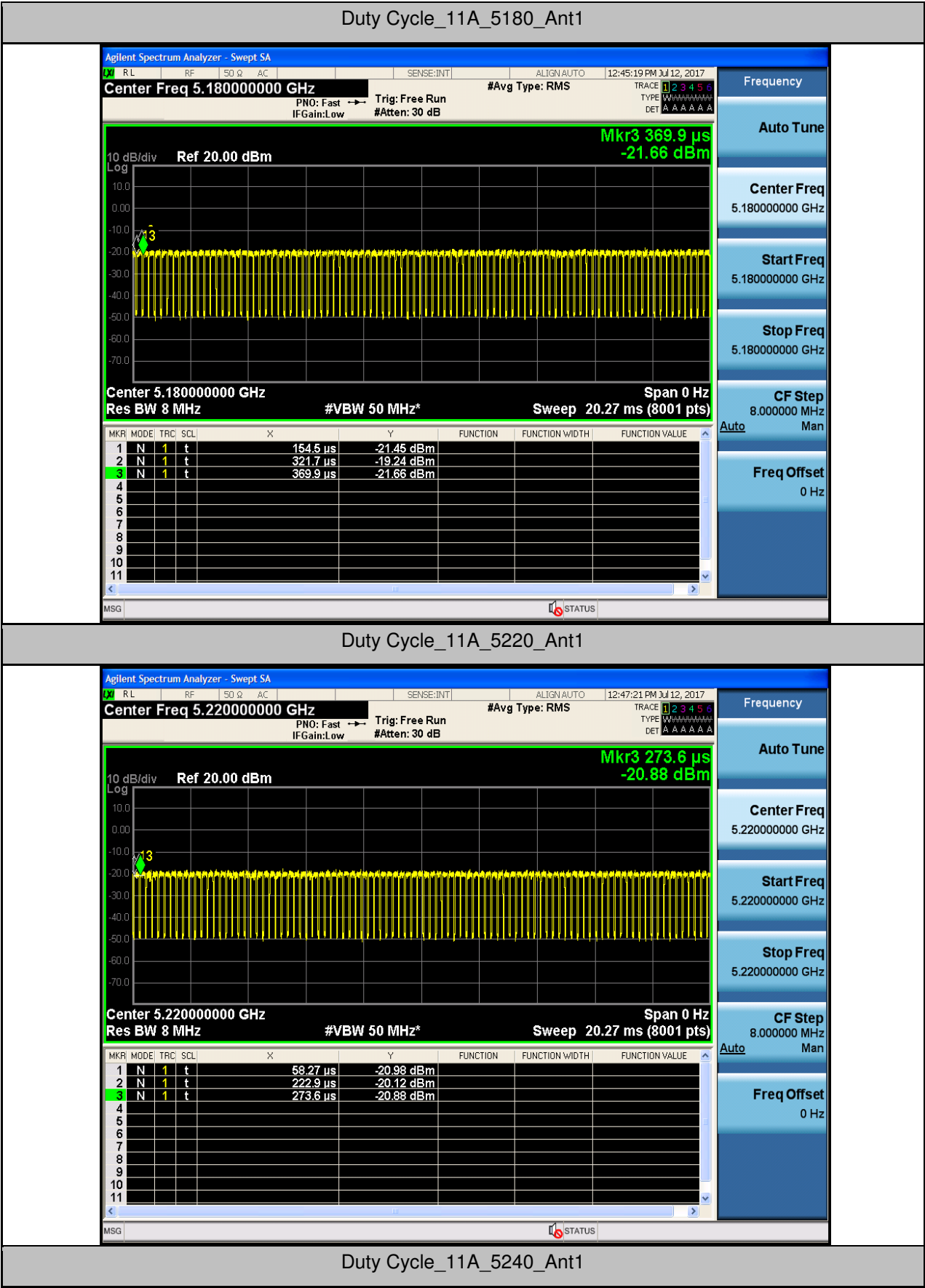
4.Duty Cycle (x)

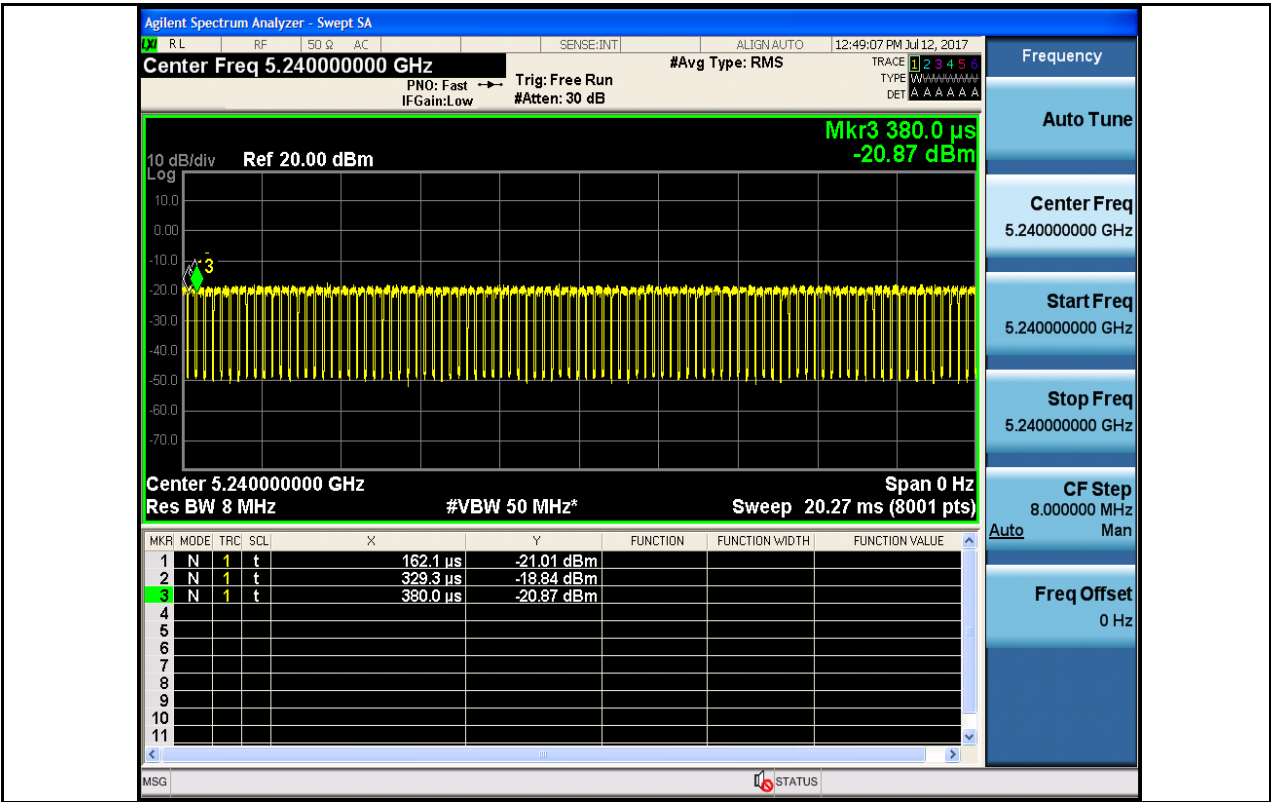
Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
11A	5180	Ant1	77.65	1.09858539935423
11A	5220	Ant1	76.47	1.1650890981107
11A	5240	Ant1	76.74	1.14978205137702
11N20	5180	Ant1	87.82	0.56406567231631
11N20	5220	Ant1	87.82	0.56406567231631
11N20	5240	Ant1	87.82	0.56406567231631
11N40	5190	Ant1	82.95	0.811836096396205
11N40	5230	Ant1	83.15	0.801377464444619

Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
11A	5180	Ant2	76.74	1.14978205137702
11A	5220	Ant2	76.47	1.1650890981107
11A	5240	Ant2	77.65	1.09858539935423
11N20	5180	Ant2	87.18	0.595831353183348
11N20	5220	Ant2	87.26	0.591847913491986
11N20	5240	Ant2	87.82	0.56406567231631
11N40	5190	Ant2	82.95	0.811836096396205
11N40	5230	Ant2	84.09	0.752556475200514

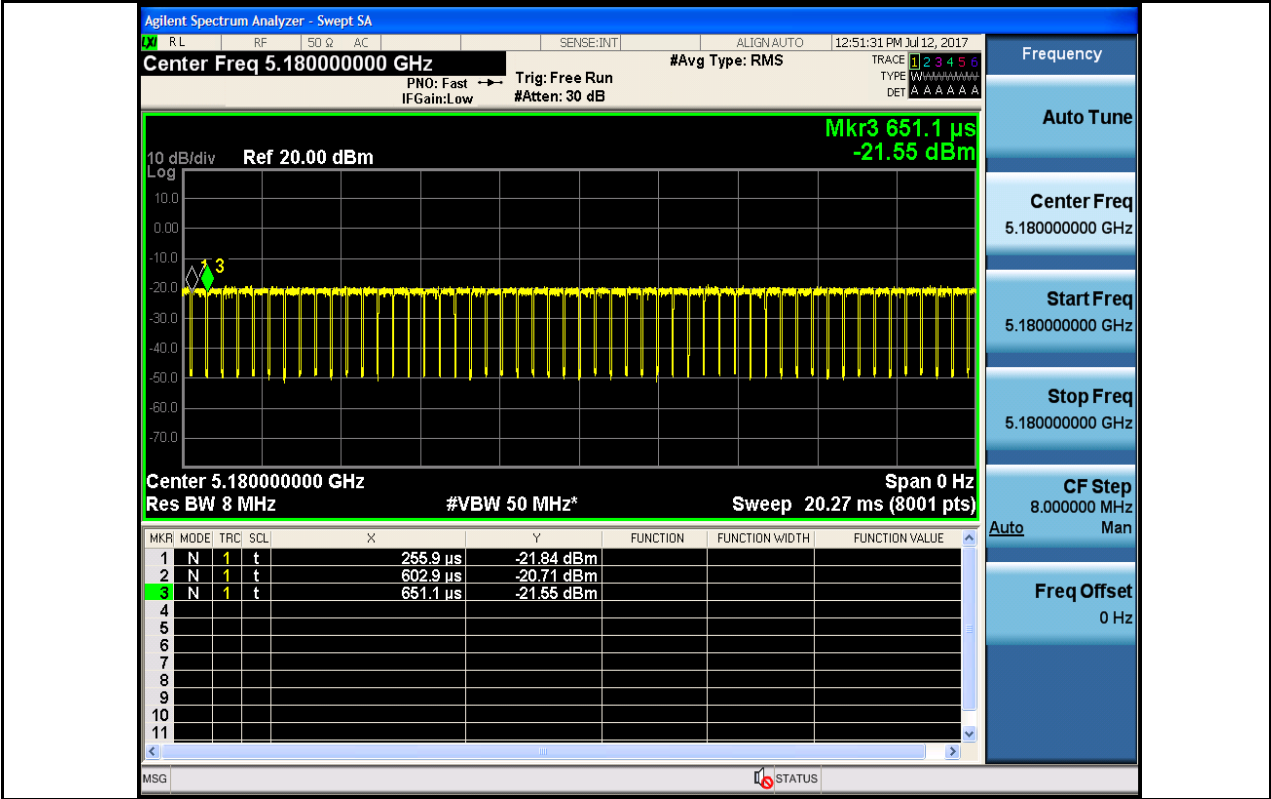
Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
11N20MIMO	5180	Ant1	87.18	0.595831353183348
11N20MIMO	5220	Ant1	87.26	0.591847913491986
11N20MIMO	5240	Ant1	87.82	0.56406567231631
11N40MIMO	5190	Ant1	83.15	0.801377464444619
11N40MIMO	5230	Ant1	83.15	0.801377464444619

Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
11N20MIMO	5180	Ant2	87.26	0.591847913491986
11N20MIMO	5220	Ant2	87.26	0.591847913491986
11N20MIMO	5240	Ant2	87.82	0.56406567231631
11N40MIMO	5190	Ant2	82.95	0.811836096396205
11N40MIMO	5230	Ant2	83.15	0.801377464444619

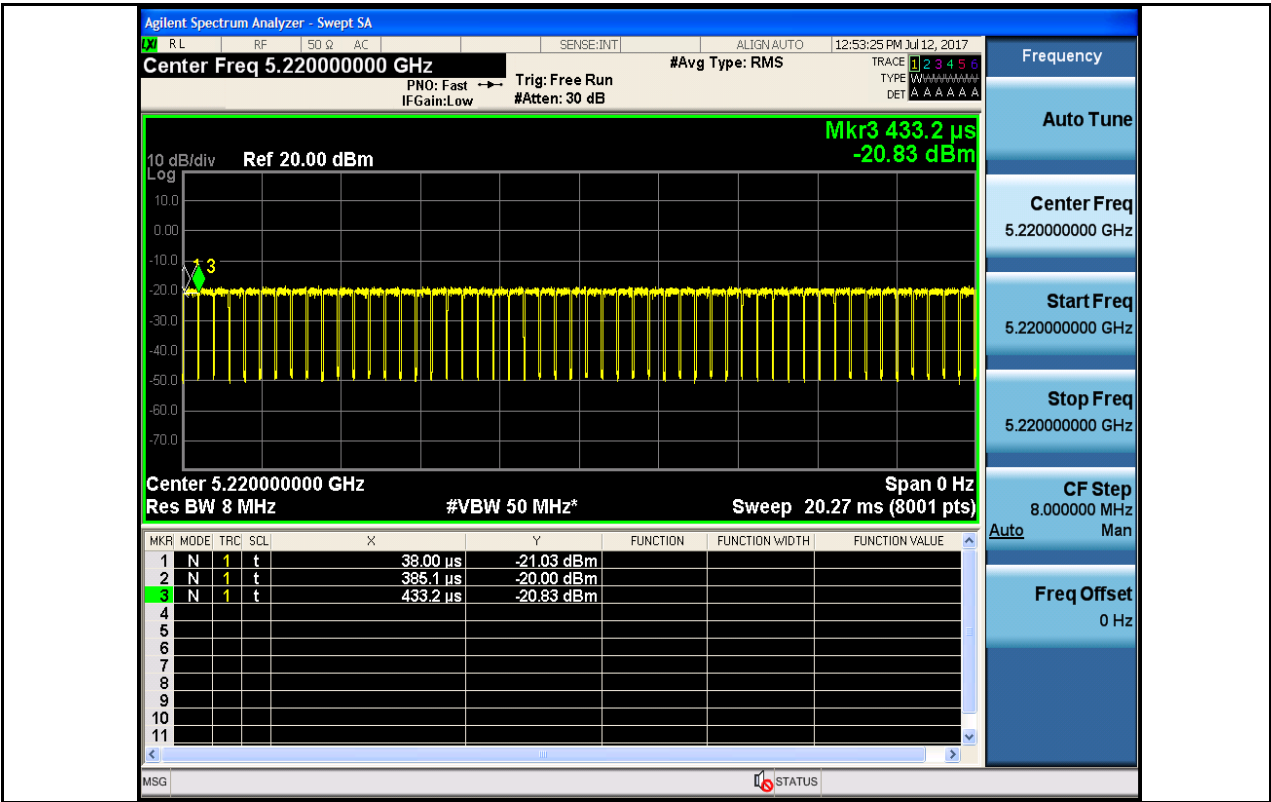




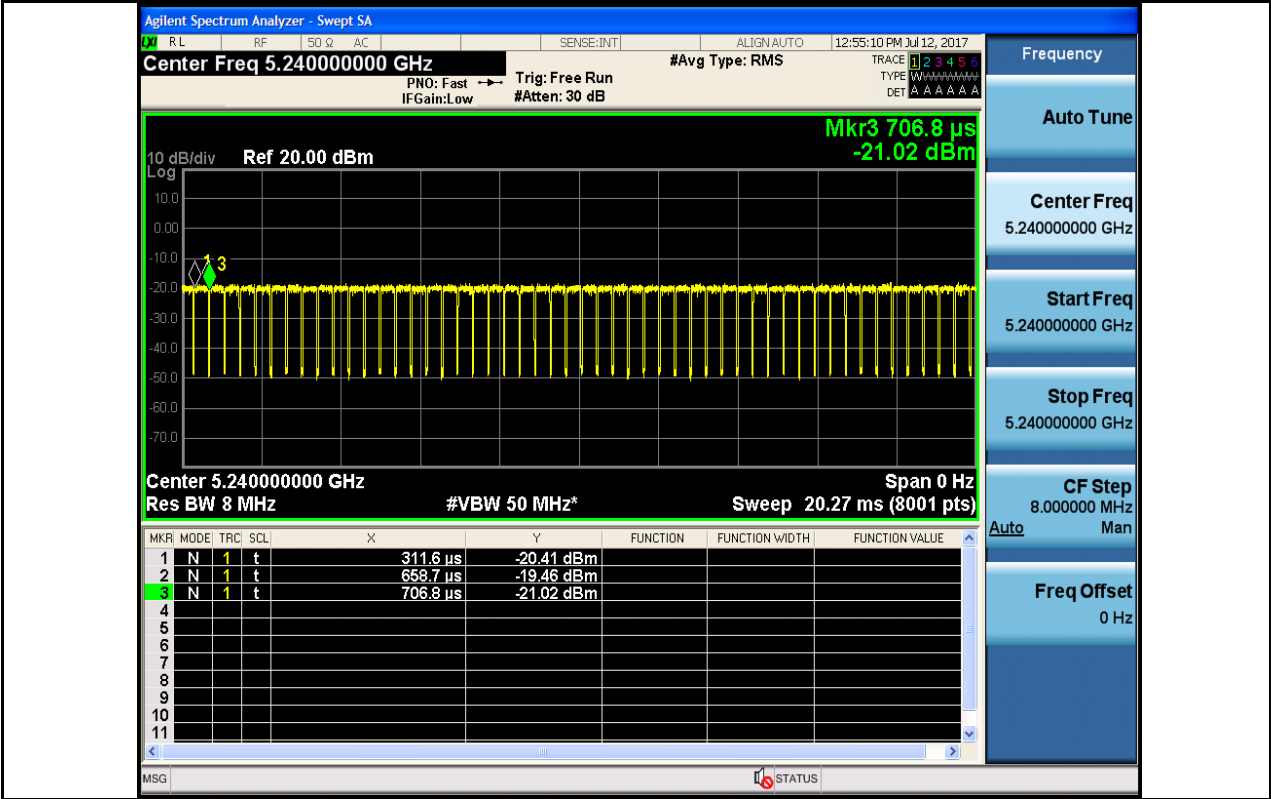
Duty Cycle_11N20_5180_Ant1



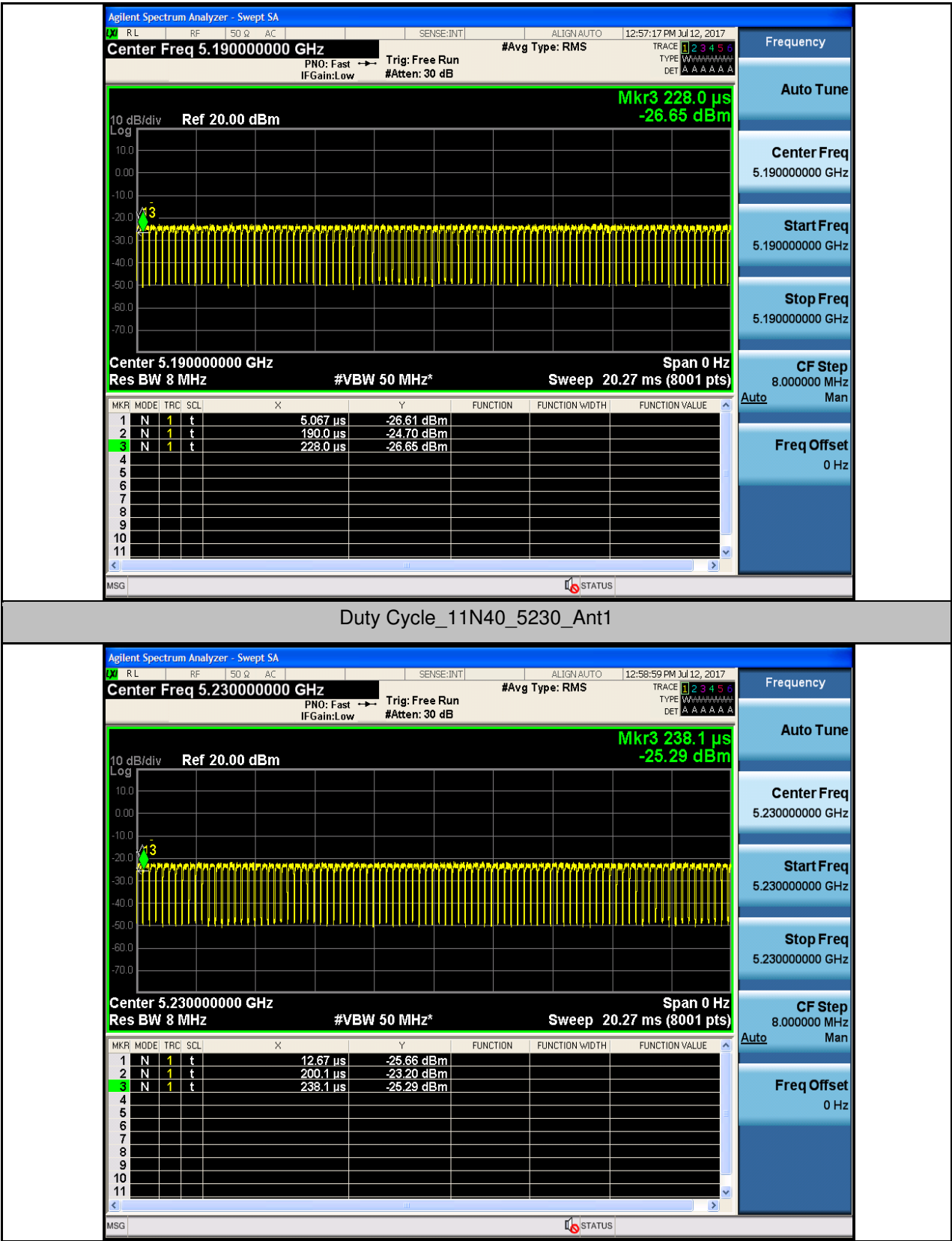
Duty Cycle_11N20_5220_Ant1



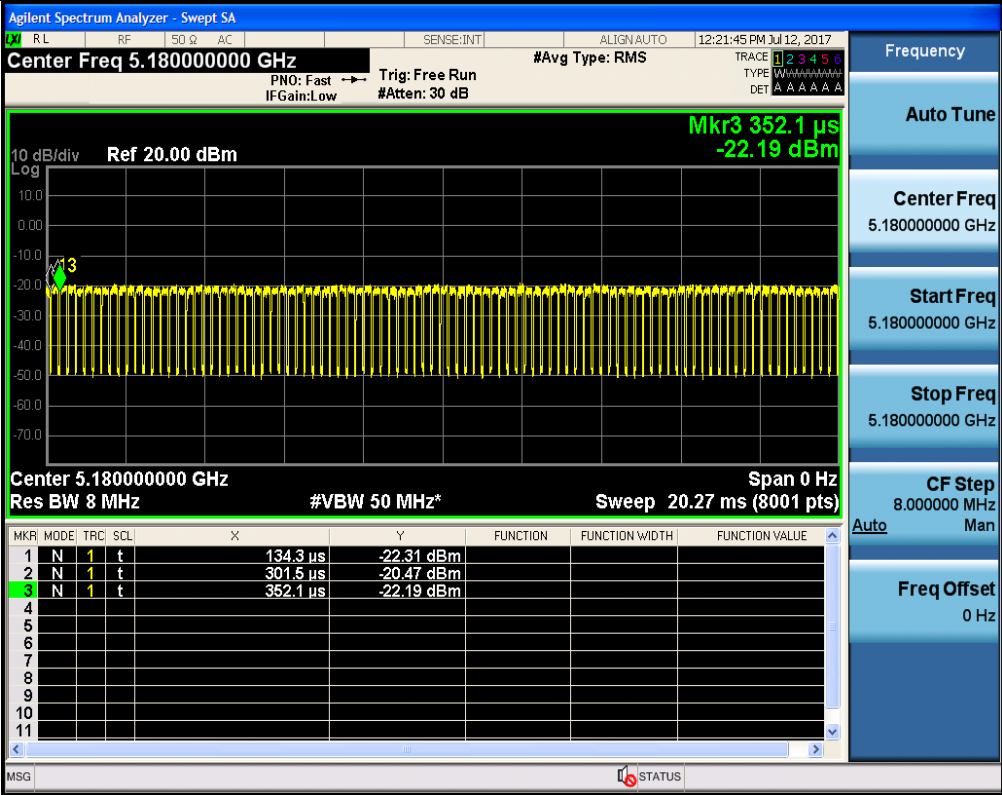
Duty Cycle_11N20_5240_Ant1



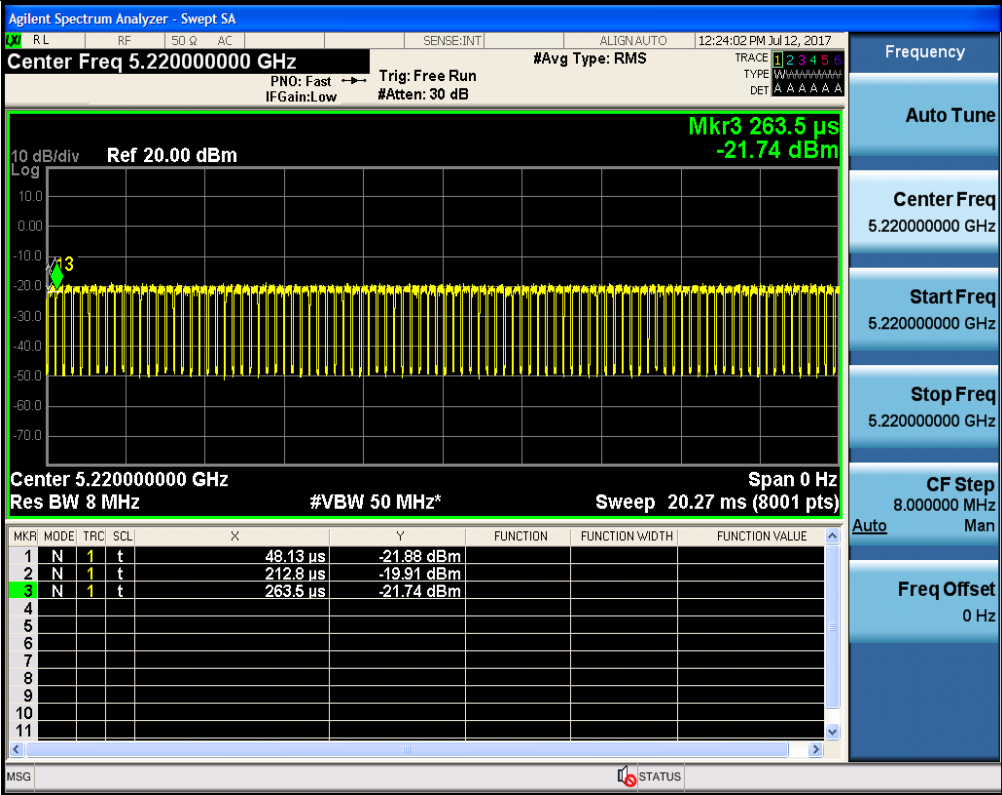
Duty Cycle_11N40_5190_Ant1



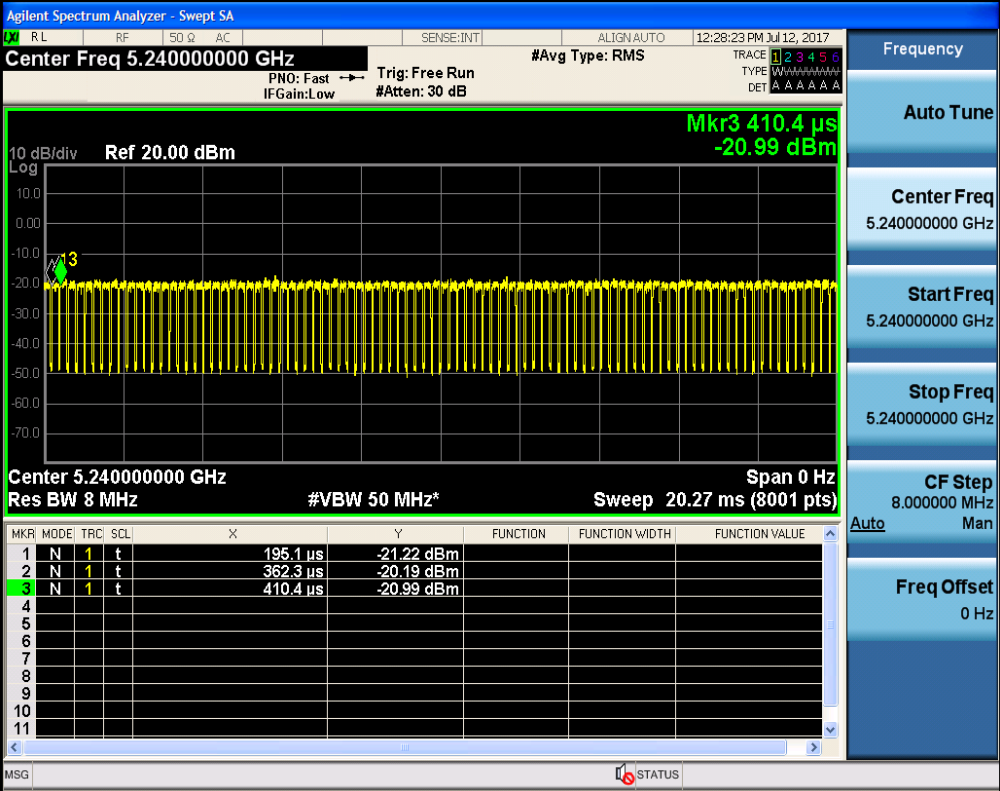
Duty Cycle_11A_5180_Ant2



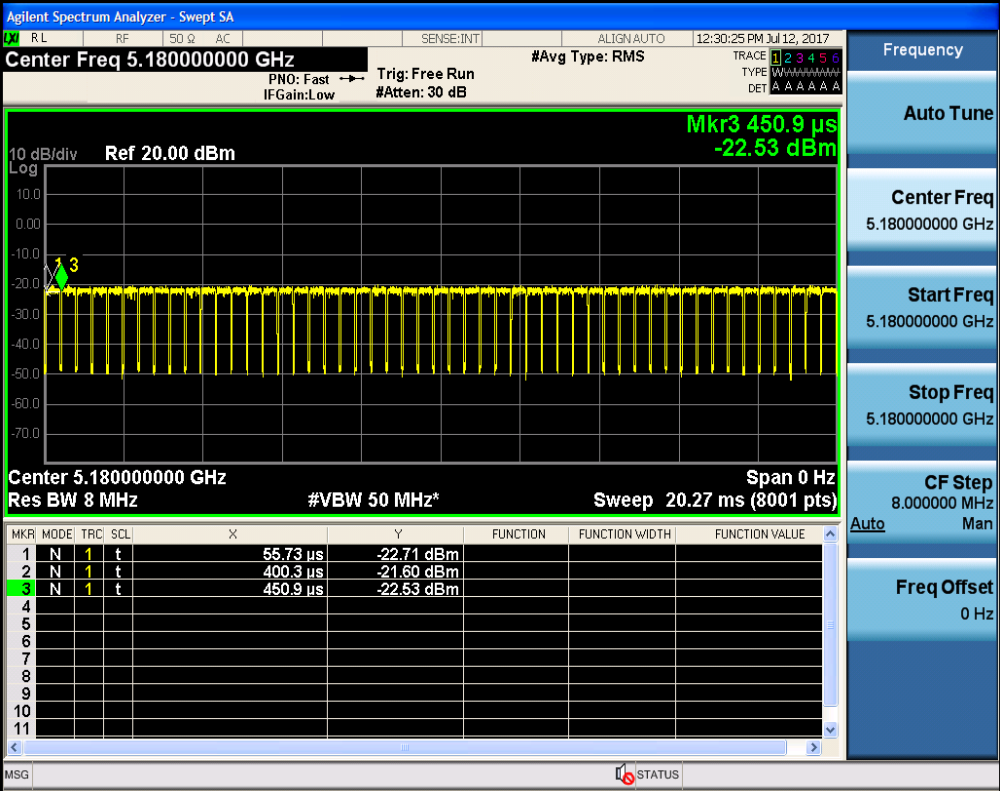
Duty Cycle_11A_5220_Ant2



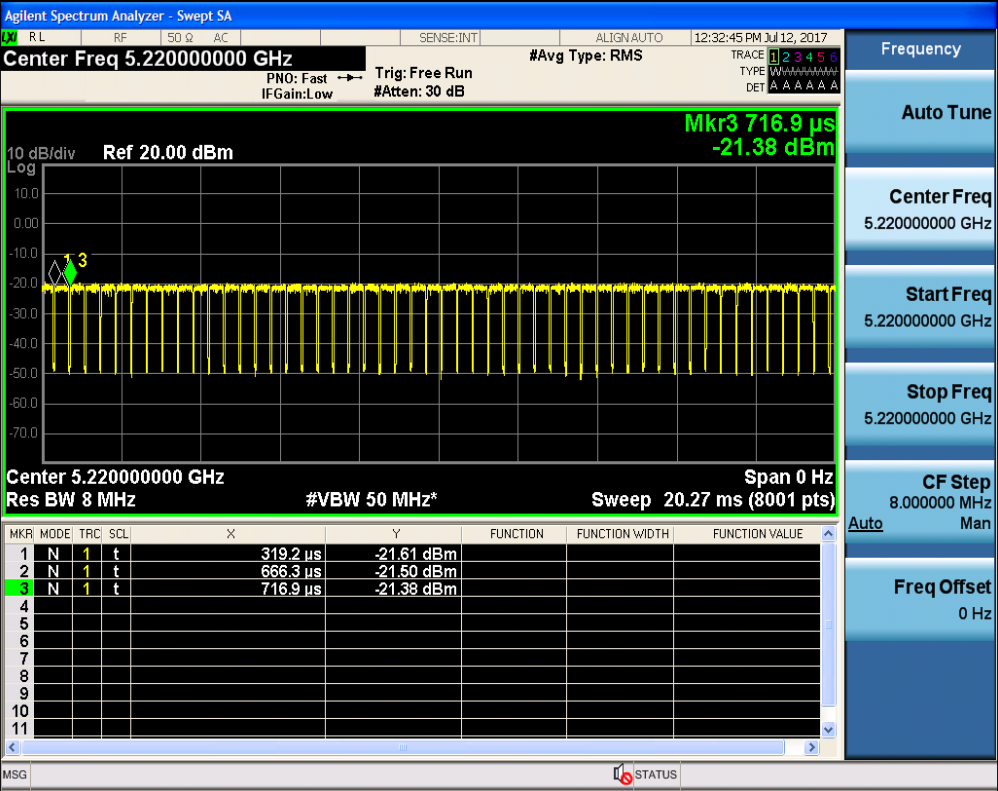
Duty Cycle_11A_5240_Ant2



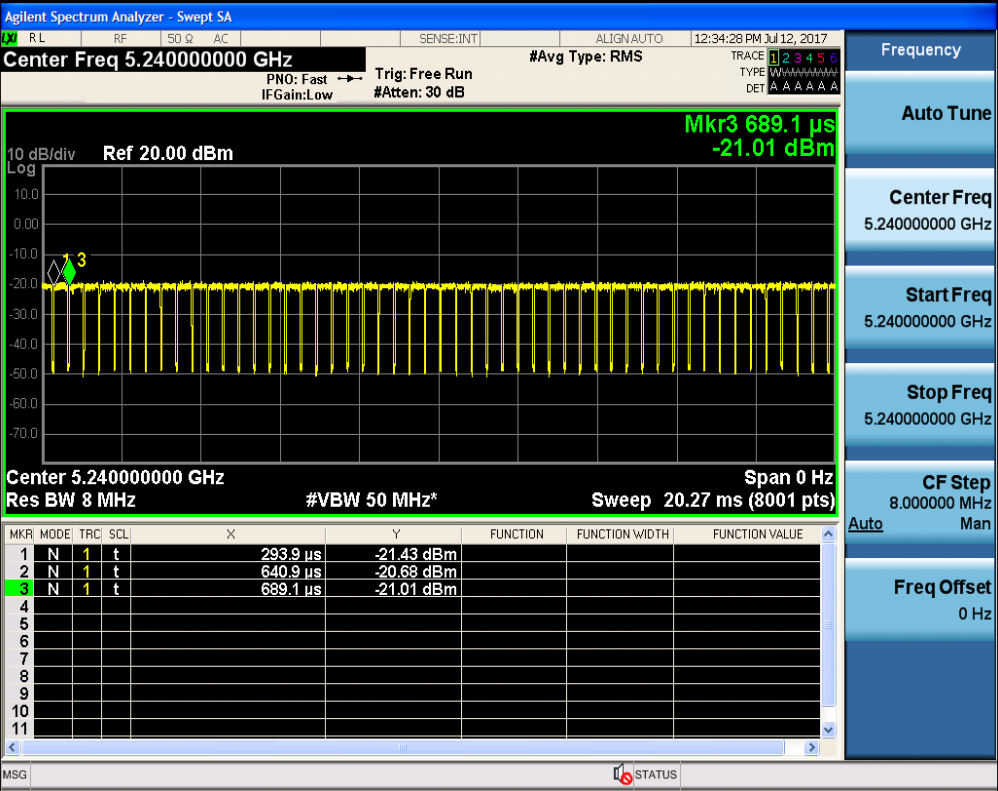
Duty Cycle_11N20_5180_Ant2



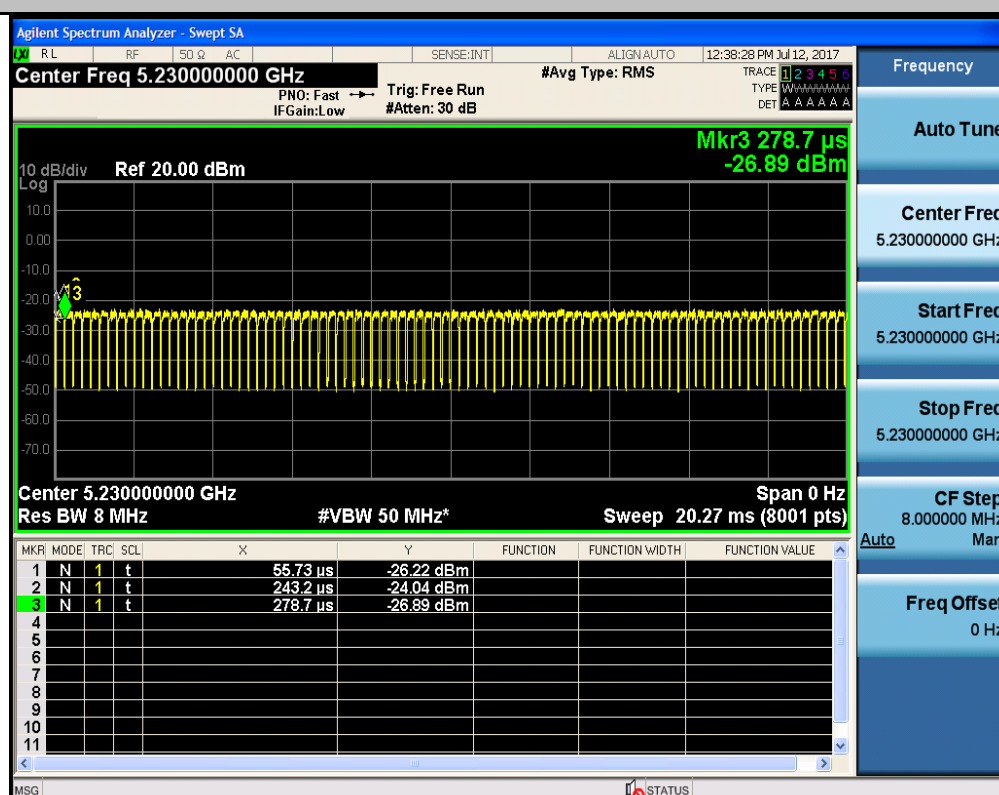
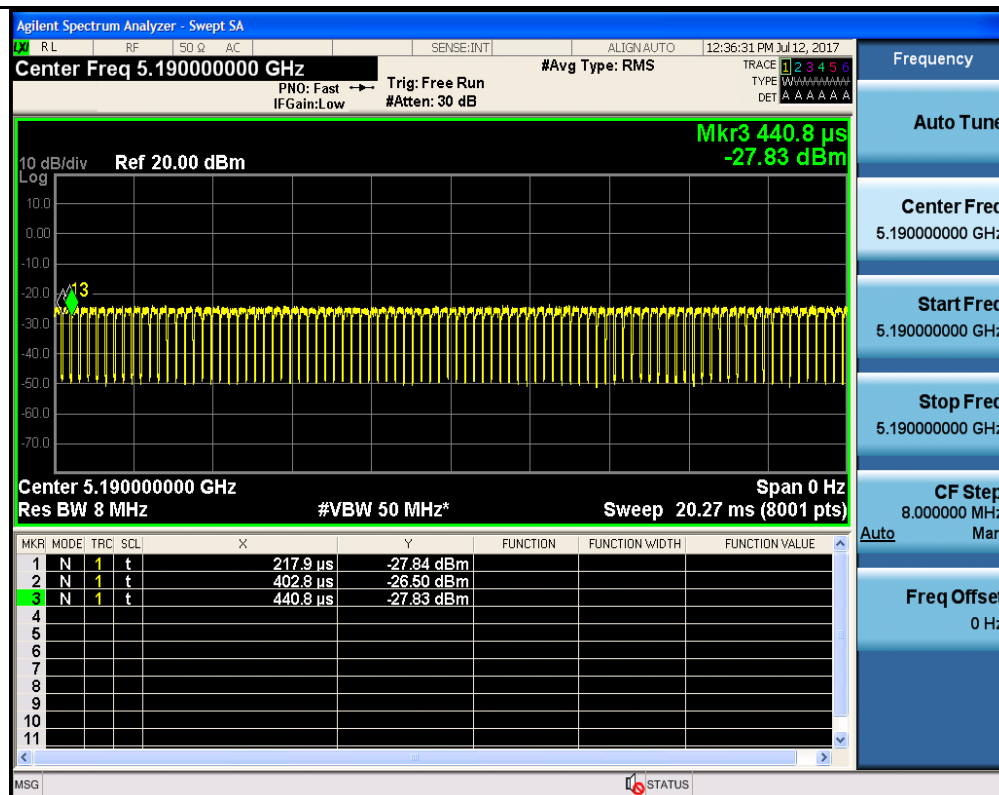
Duty Cycle_11N20_5220_Ant2

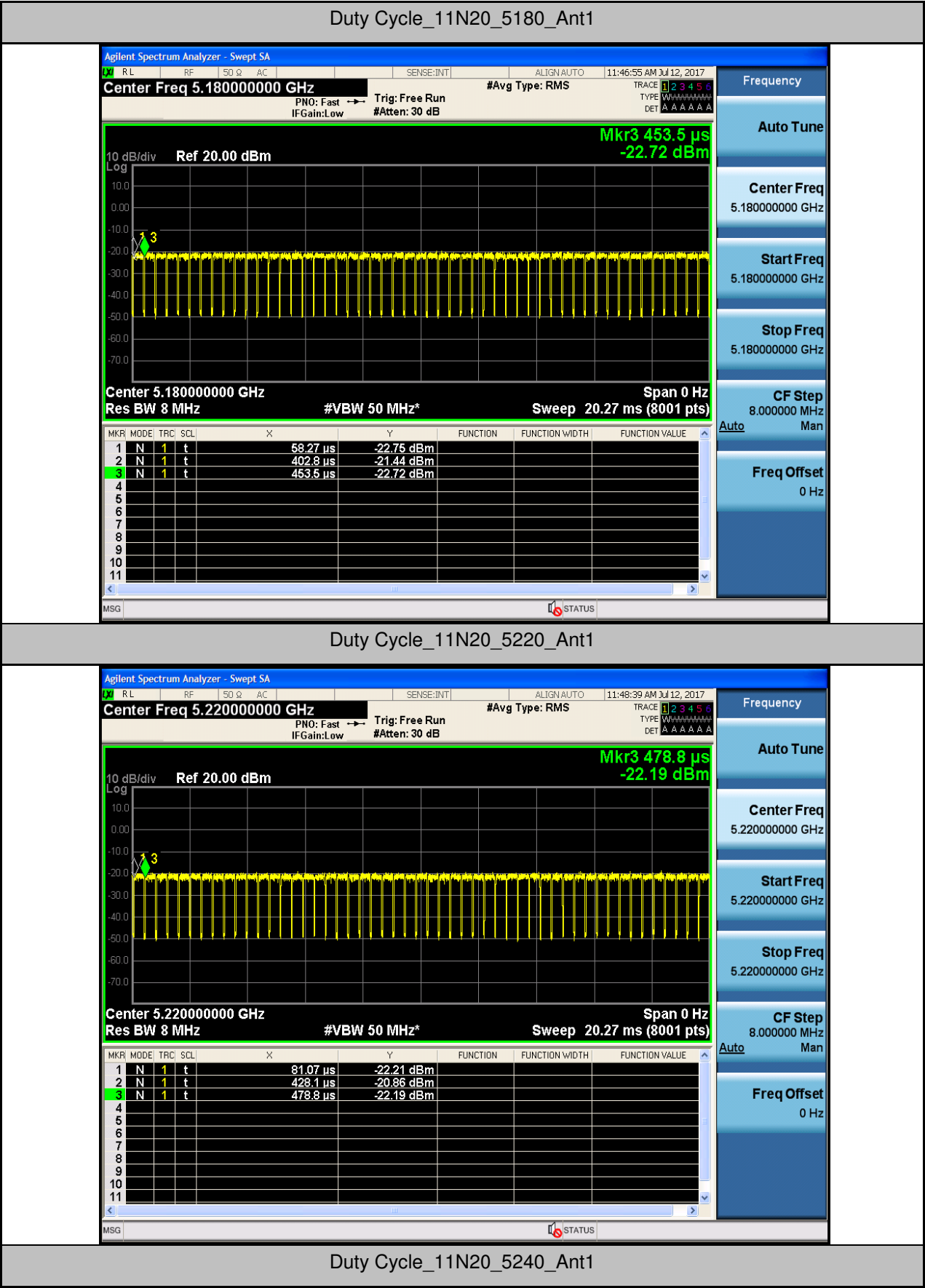


Duty Cycle_11N20_5240_Ant2



Duty Cycle_11N40_5190_Ant2





Duty Cycle_11N20_5220_Ant1

Agilent Spectrum Analyzer - Swept SA

RL

RF

50 Q

AC

SENSE:INT

ALIGN: AUTO

11:48:39 AM Jul 12, 2017

Center Freq 5.220000000 GHz

PNO: Fast

IF Gain: Low

Trig: Free Run

#Atten: 30 dB

#Avg Type: RMS

TRACE 1 2 3 4 5 6

TYPE W W W W W W W W

DET A A A A A A A

10 dB/div

Ref 20.00 dBm

Mkr3 478.8 μ s

-22.19 dBm

Center 5.220000000 GHz

Res BW 8 MHz

#VBW 50 MHz*

Sweep 20.27 ms (8001 pts)

Span 0 Hz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	t	81.07 μ s	-22.21 dBm			
2	N	1	t	428.1 μ s	-20.86 dBm			
3	N	1	t	478.8 μ s	-22.19 dBm			
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq
5.220000000 GHz

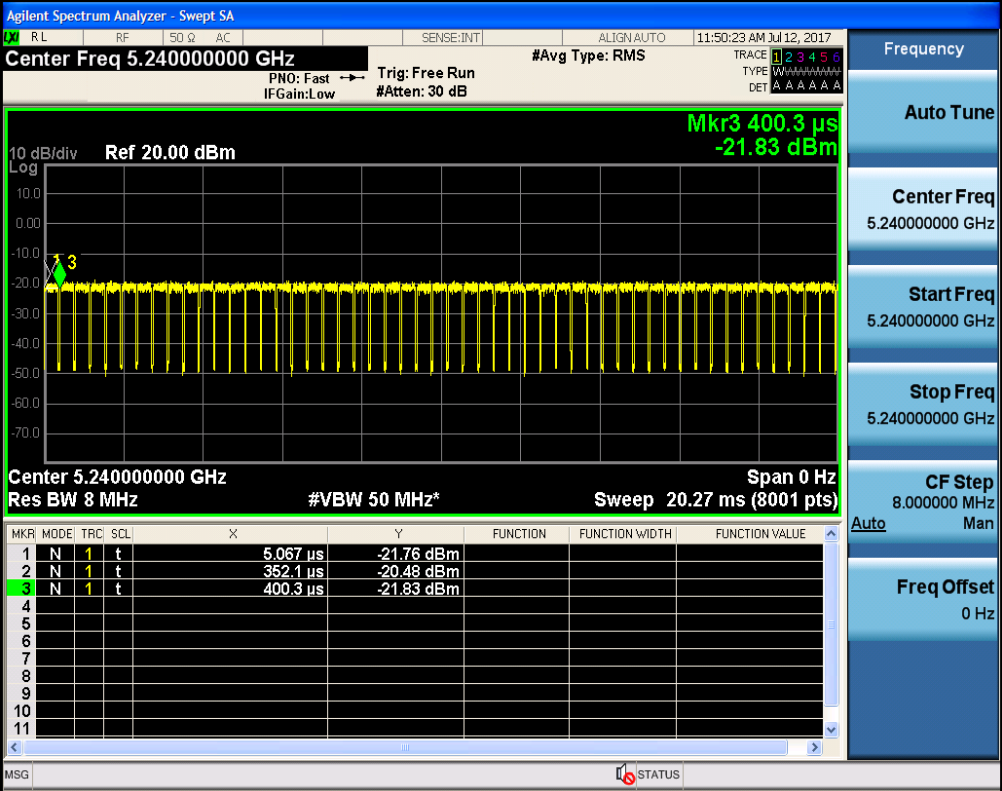
Start Freq
5.220000000 GHz

Stop Freq
5.220000000 GHz

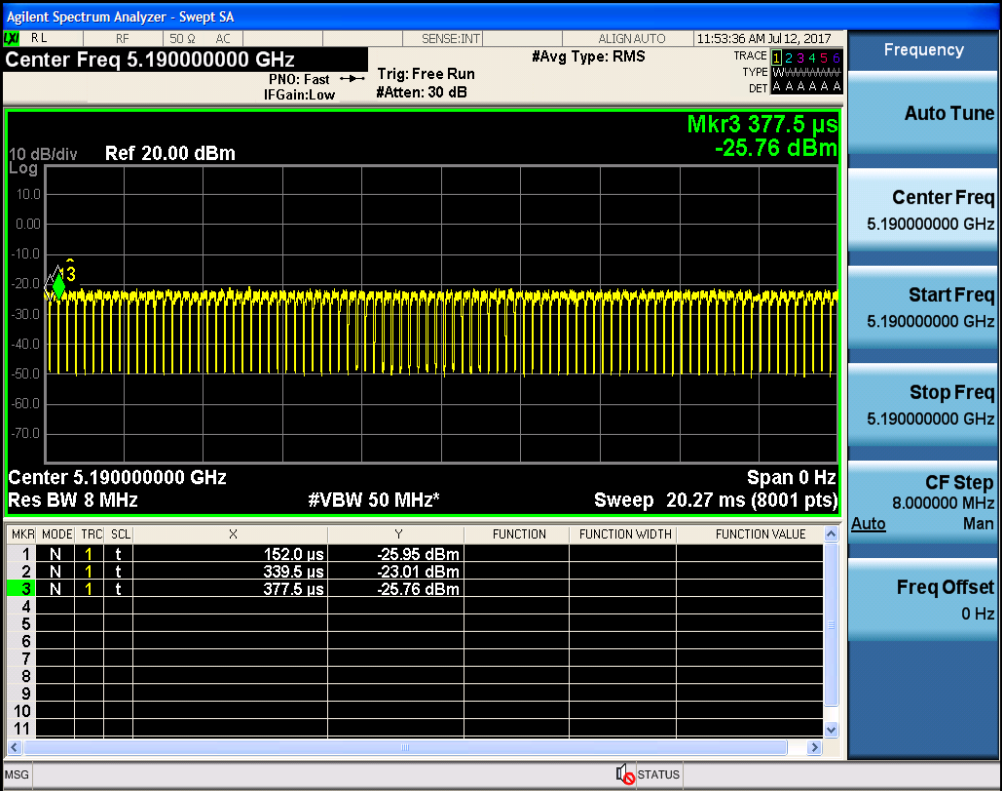
CF Step
8.000000 MHz
Auto Man

Freq Offset
0 Hz

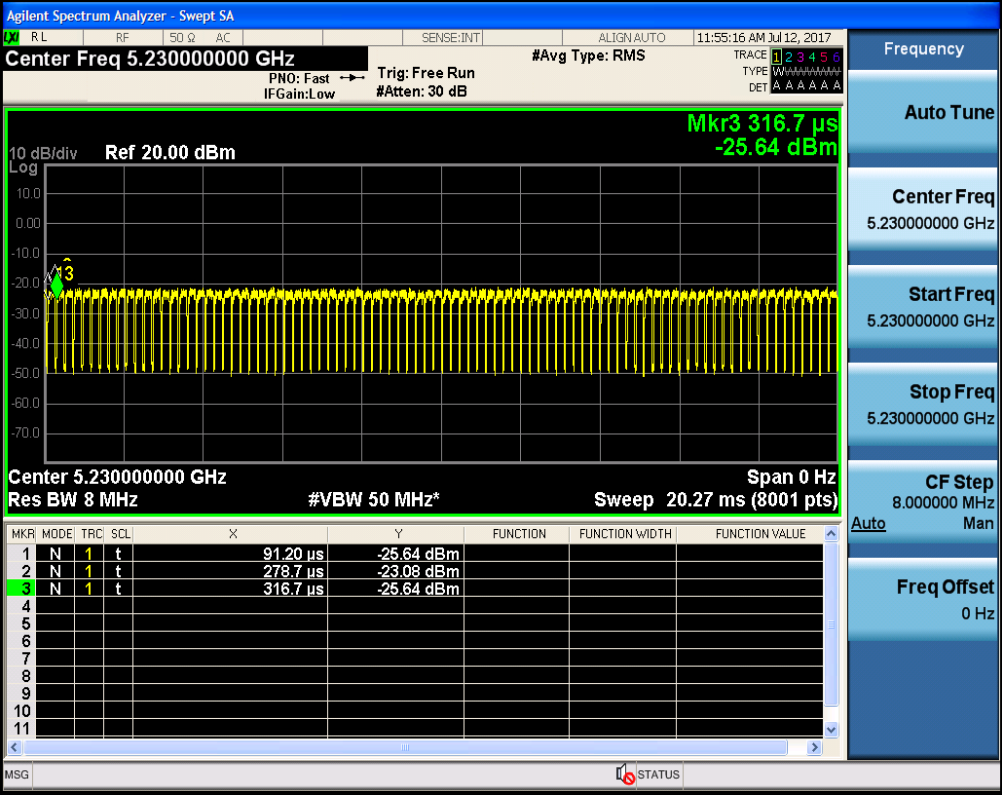
Duty Cycle_11N20_5240_Ant1

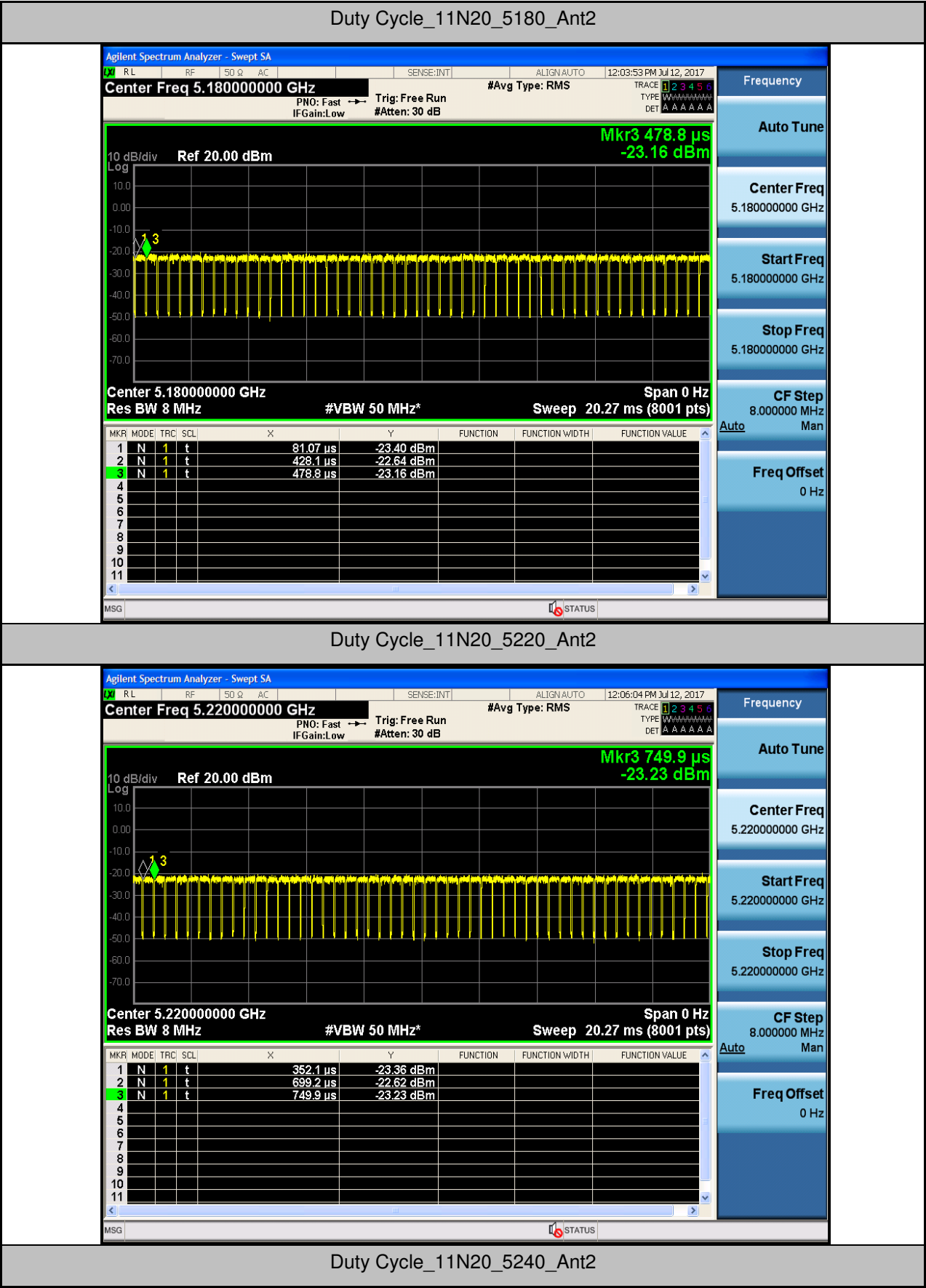


Duty Cycle_11N40_5190_Ant1



Duty Cycle_11N40_5230_Ant1





Duty Cycle_11N20_5220_Ant2

Agilent Spectrum Analyzer - Swept SA

RL

RF

50 Ω

AC

SENSE:INT

ALIGN:AUTO

12:06:04 PM Jul 12, 2017

Center Freq 5.220000000 GHz

PN0: Fast

IFGain:Low

Trig: Free Run

#Atten: 30 dB

#Avg Type: RMS

TRACE 1 2 3 4 5 6

TYPE W W W W W W

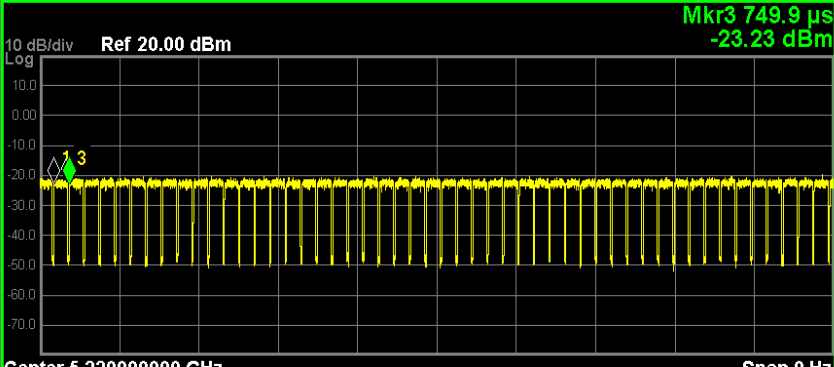
DET A A A A A A

10 dB/div

Ref 20.00 dBm

Mkr3 749.9 μs

-23.23 dBm



Center 5.220000000 GHz

Res BW 8 MHz

#VBW 50 MHz*

Sweep 20.27 ms (8001 pts)

Span 0 Hz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	t	352.1 μs	-23.36 dBm			
2	N	1	t	699.2 μs	-22.62 dBm			
3	N	1	t	749.9 μs	-23.23 dBm			
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq
5.220000000 GHz

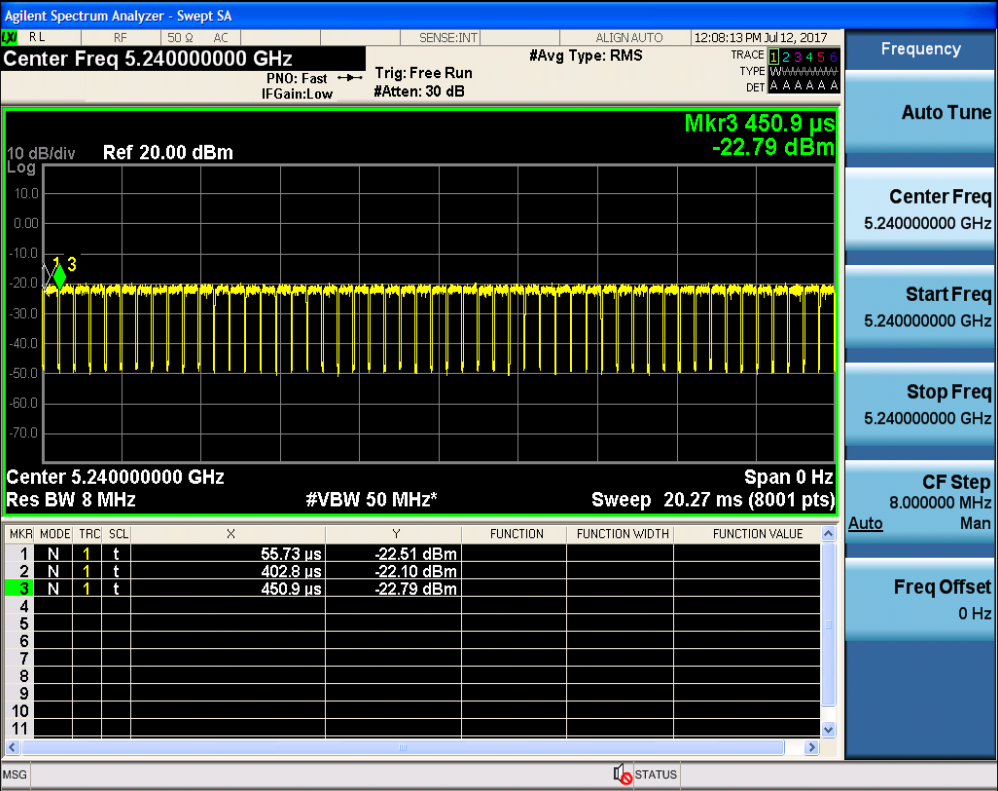
Start Freq
5.220000000 GHz

Stop Freq
5.220000000 GHz

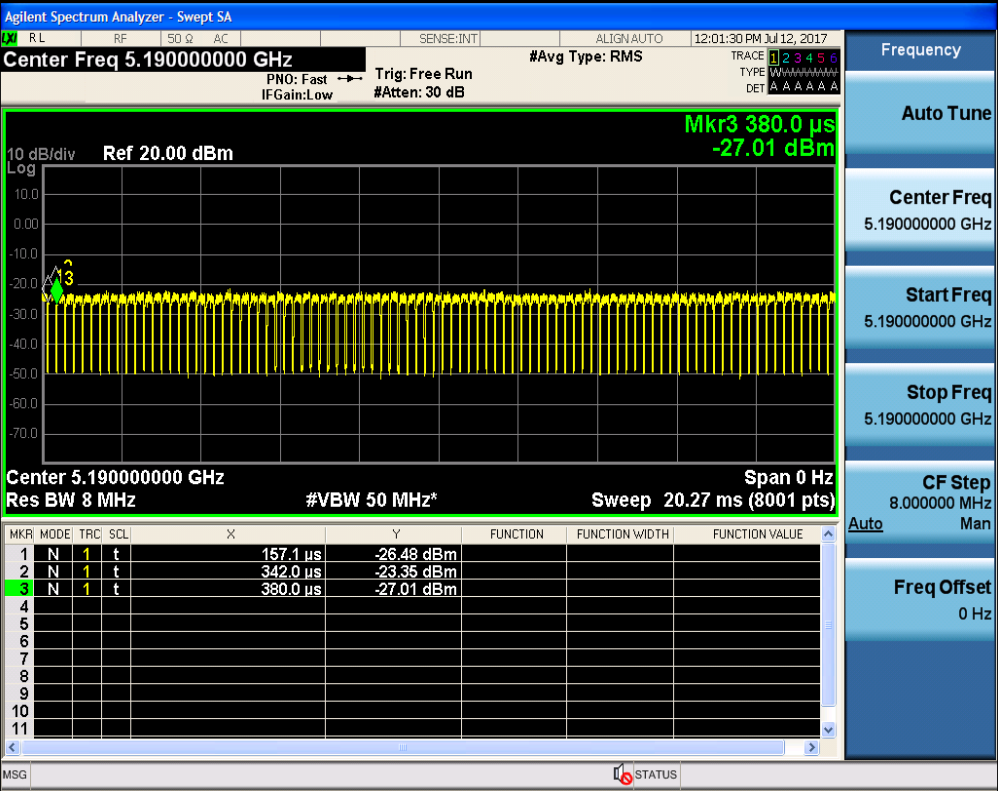
CF Step
8.000000 MHz
Auto Man

Freq Offset
0 Hz

Duty Cycle_11N20_5240_Ant2



Duty Cycle_11N40_5190_Ant2



Duty Cycle_11N40_5230_Ant2

