Appendix D

RF Test Data for 5GWIFI B1-B3 (Conducted Measurement)

Product Name: Comms Gateway

Trade Mark: Acorn Stairlifts

Test Model: T715 Comms Gateway

Environmental Conditions

Temperature:	24.2° C
Relative Humidity:	51.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

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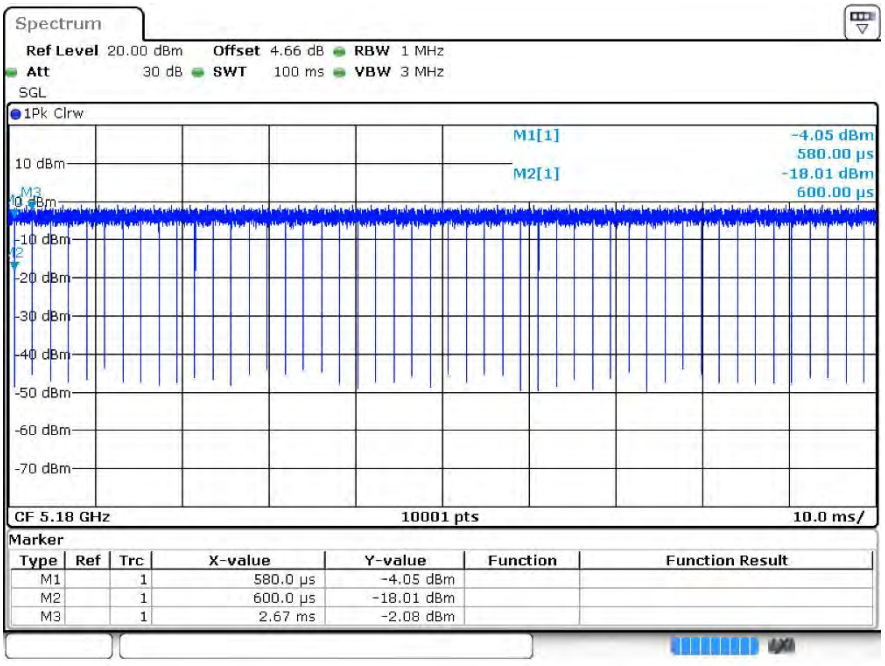
1 Duty Cycle

1.1 Test Result

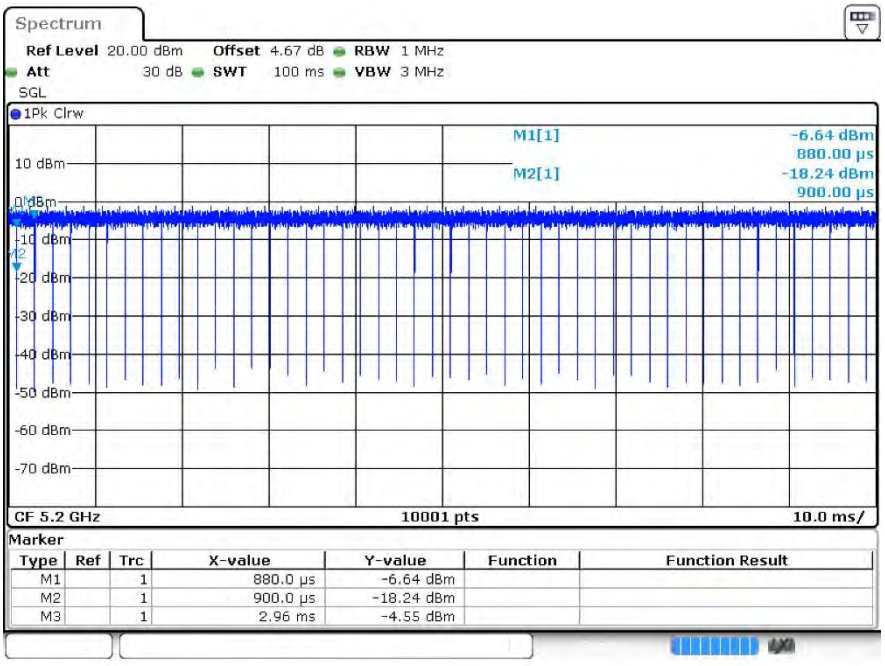
Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
a	5180	Ant1	99.48	0.02	0.48
a	5200	Ant1	99.47	0.02	0.49
a	5240	Ant1	99.47	0.02	0.49
n20	5180	Ant1	99.43	0.02	0.52
n20	5200	Ant1	99.43	0.02	0.52
n20	5240	Ant1	99.43	0.02	0.52
n40	5190	Ant1	98.03	0.09	1.06
n40	5230	Ant1	98.01	0.09	1.06
ac80	5210	Ant1	94.33	0.25	2.27

1.2 Test Graphs

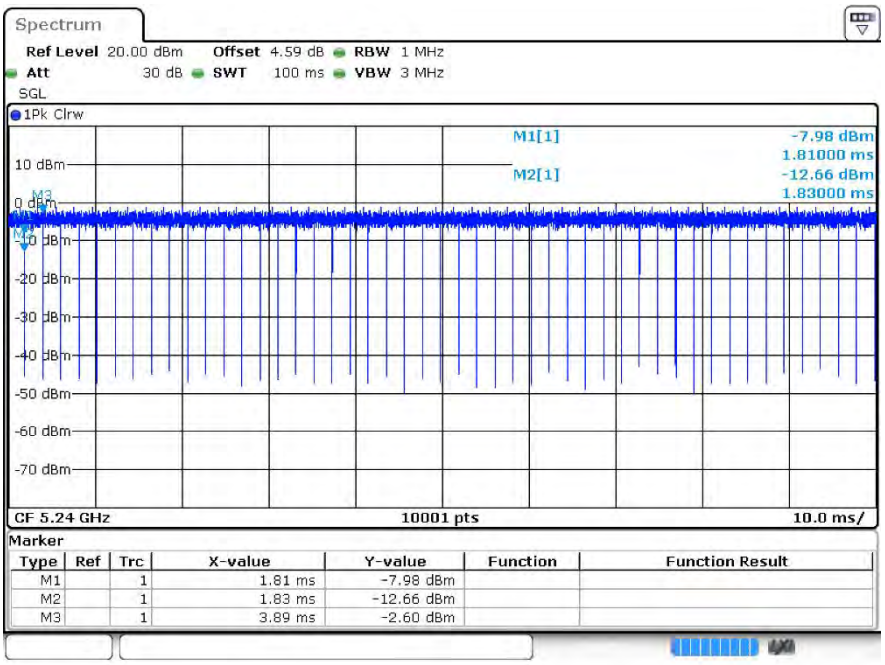
Test Graphs
Duty Cyclea 5180MHz Ant1



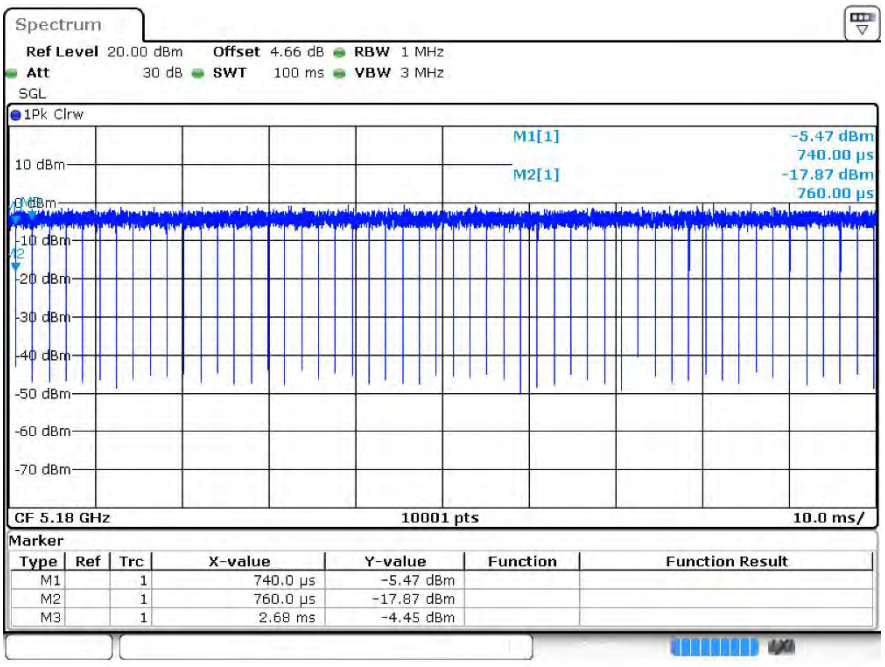
Duty Cycle a 5200MHz Ant1



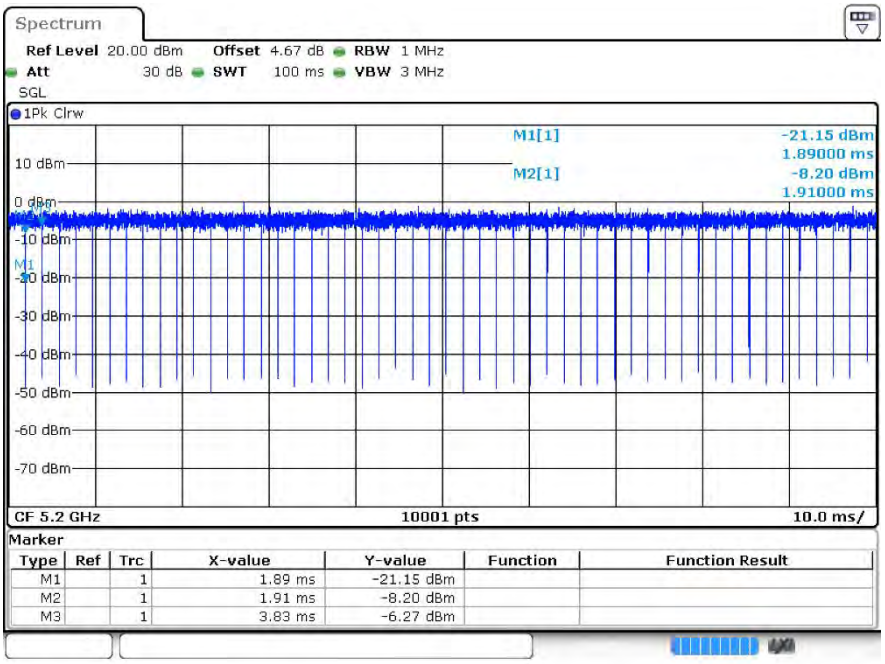
Duty Cyclea 5240MHz Ant1



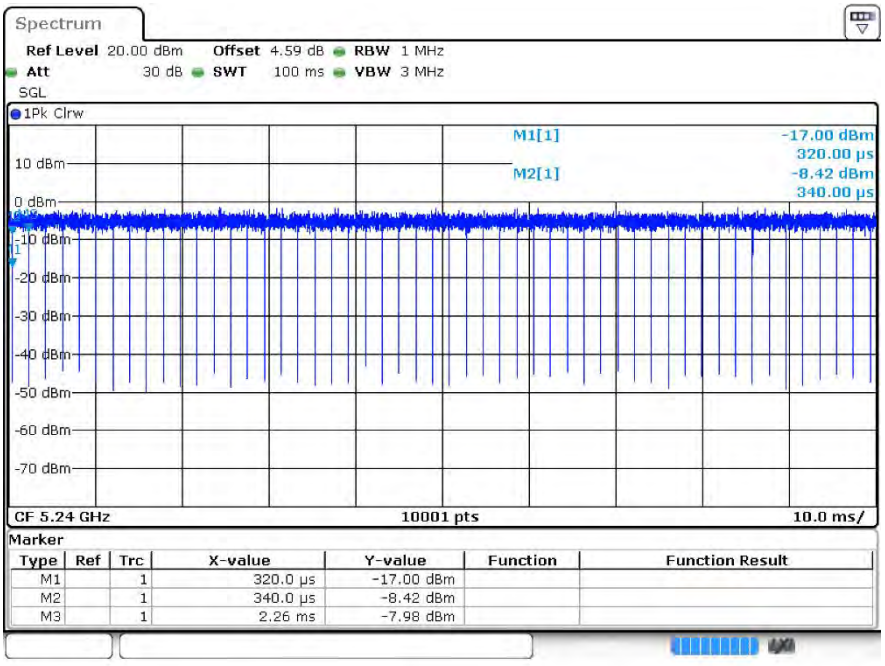
Duty Cycle n20 5180MHz Ant1



Duty Cycle n20 5200MHz Ant1

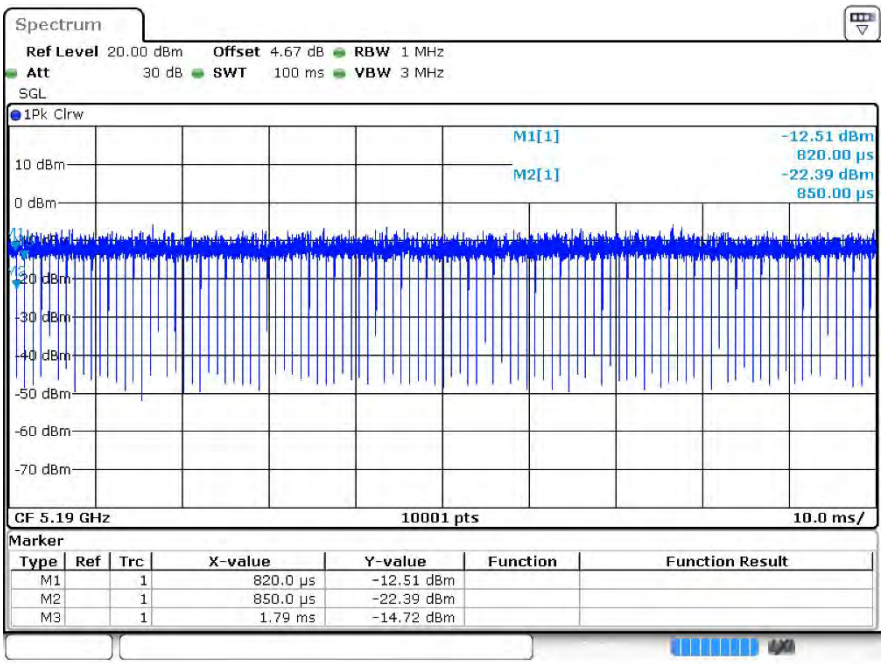


Duty Cycle n20 5240MHz Ant1

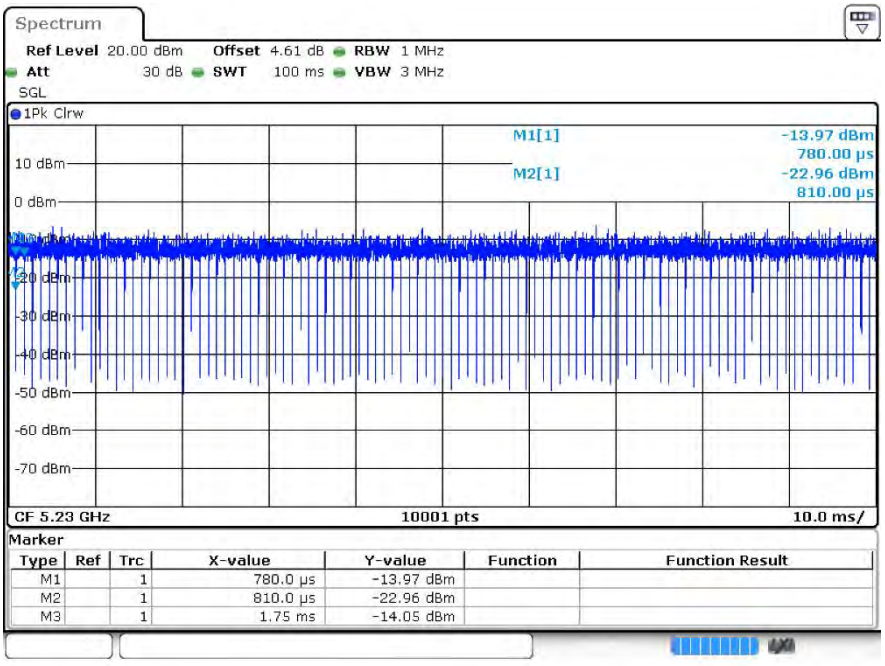


Duty Cycle n20 5260MHz Ant1

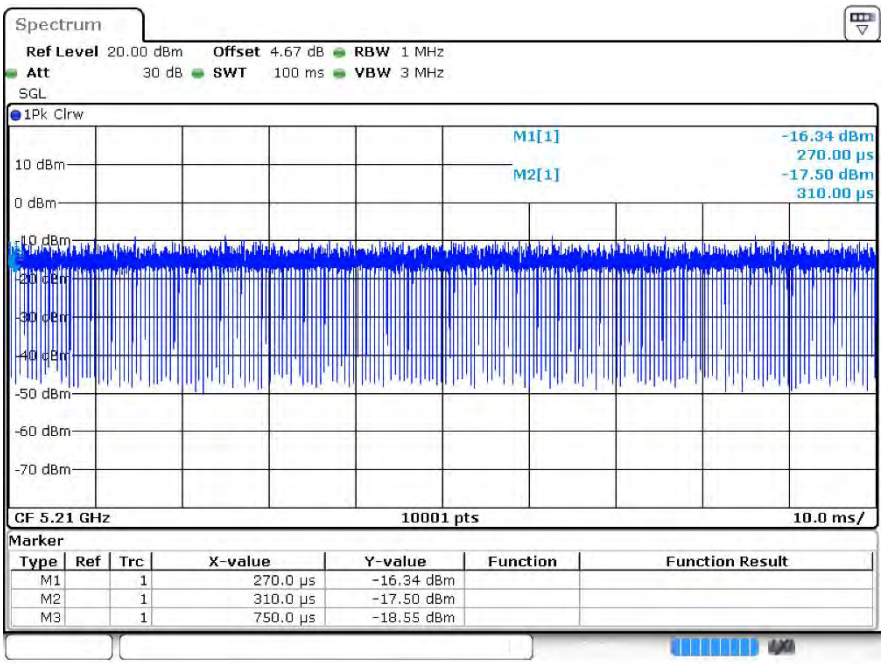
Duty Cyclen40 5190MHz Ant1



Duty Cyclen40 5230MHz Ant1



Duty Cycleac80 5210MHz Ant1



Duty Cycleac80 5290MHz Ant1

2 Maximum Conducted Output Power

2.1 Test Result

Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
a	5180	Ant1	15.2	0.02	15.22	30	Pass
a	5200	Ant1	14.61	0.02	14.63	30	Pass
a	5240	Ant1	14.71	0.02	14.73	30	Pass
n20	5180	Ant1	15.02	0.02	15.04	30	Pass
n20	5200	Ant1	14.35	0.02	14.37	30	Pass
n20	5240	Ant1	14.14	0.02	14.16	30	Pass
n40	5190	Ant1	13.87	0.02	13.89	30	Pass
n40	5230	Ant1	13.52	0.02	13.54	30	Pass
ac80	5210	Ant1	13.49	0.02	13.51	30	Pass

3 -26dB Bandwidth

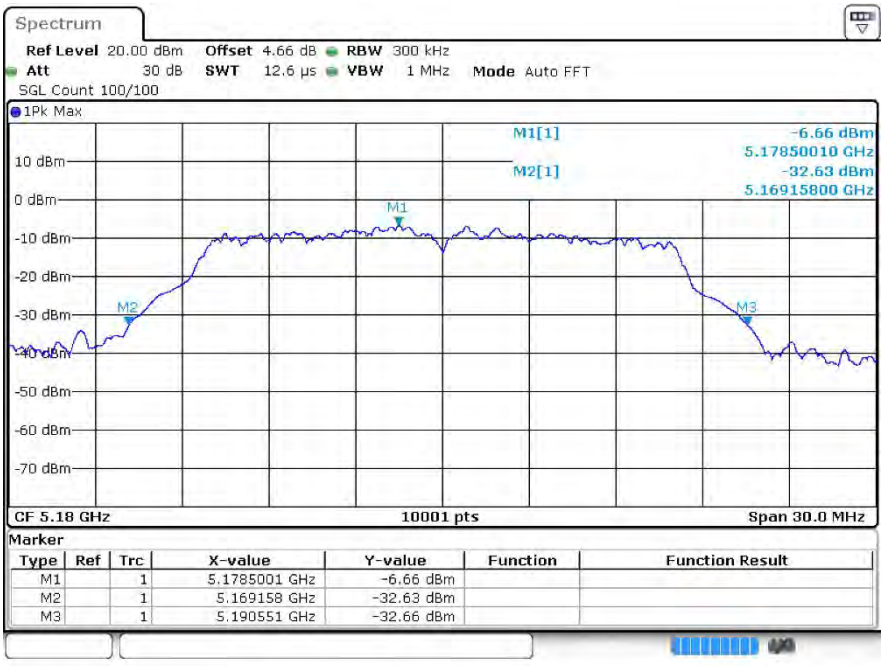
3.1 Test Result

Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Limit -26 dB Bandwidth (MHz)	Verdict
a	5180	Ant1	21.393	0.5	Pass
a	5200	Ant1	20.715	0.5	Pass
a	5240	Ant1	21.339	0.5	Pass
n20	5180	Ant1	21.381	0.5	Pass
n20	5200	Ant1	21.615	0.5	Pass
n20	5240	Ant1	21.579	0.5	Pass
n40	5190	Ant1	39.216	0.5	Pass
n40	5230	Ant1	39.012	0.5	Pass
ac80	5210	Ant1	79.56	0.5	Pass

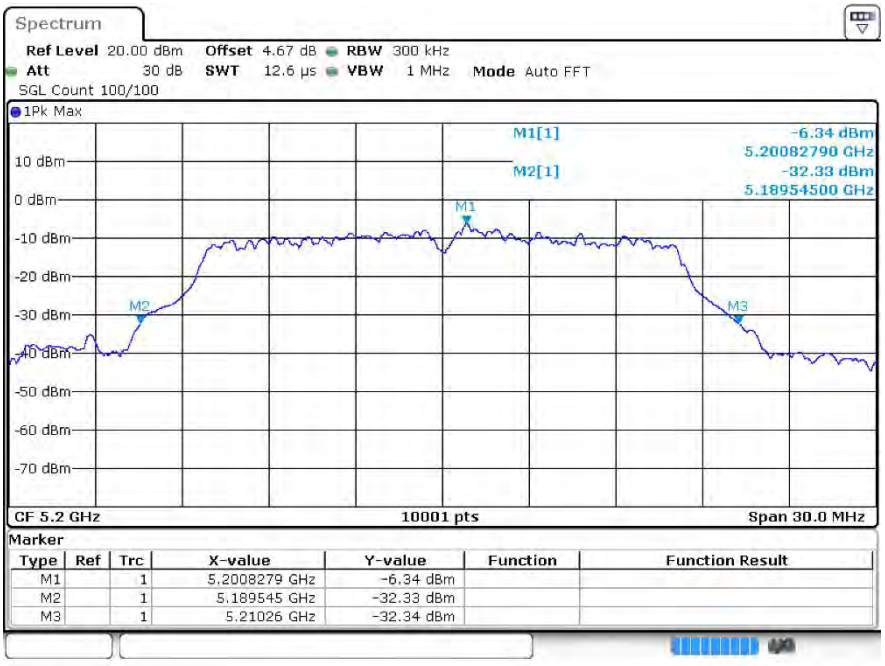
3.2 Test Graphs

Test Graphs

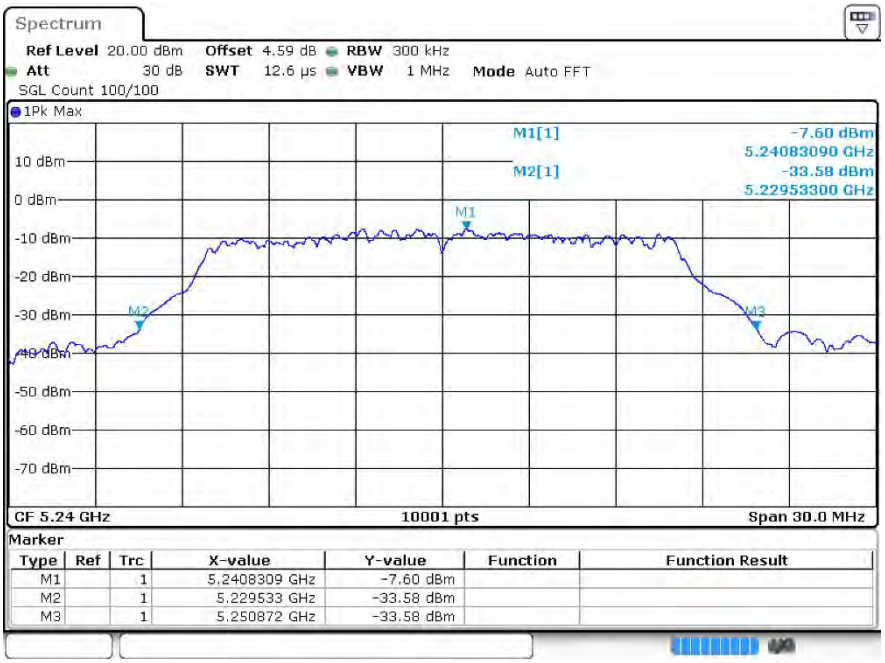
-26dB Bandwidtha 5180MHz Ant1



-26dB Bandwidtha 5200MHz Ant1

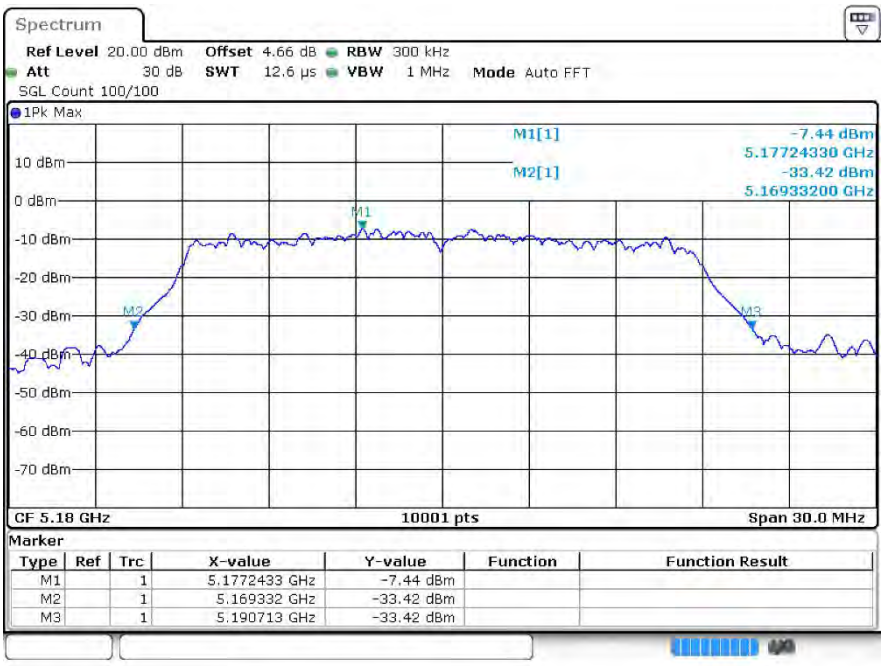


-26dB Bandwidtha 5240MHz Ant1

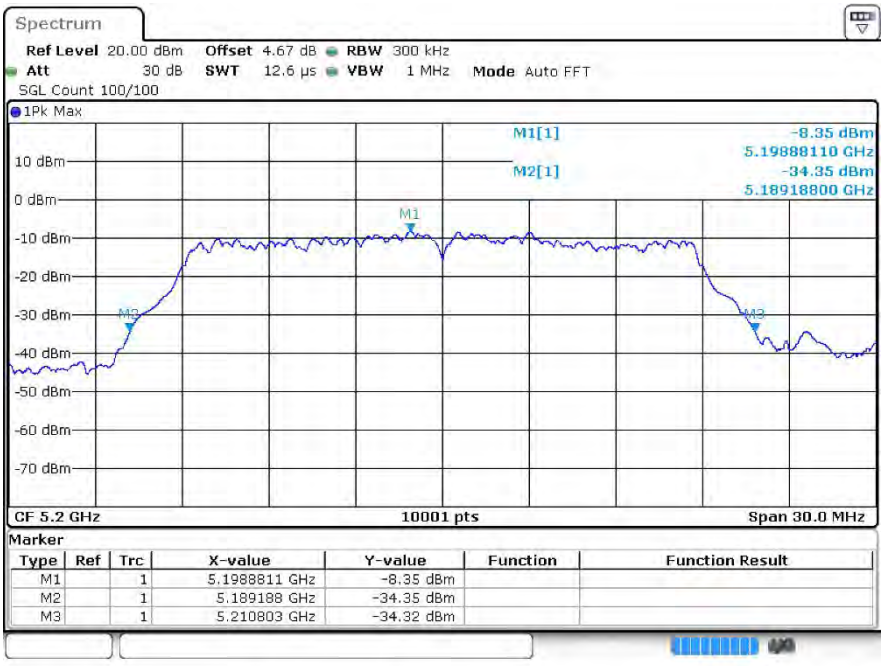


-26dB Bandwidtha 5260MHz Ant1

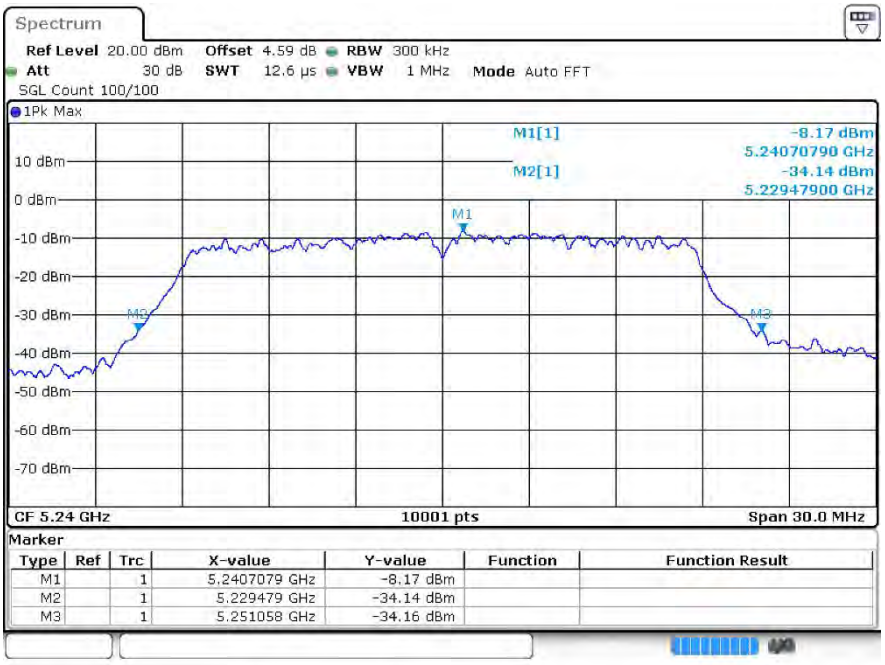
-26dB Bandwidth n20 5180MHz Ant1



-26dB Bandwidth n20 5200MHz Ant1

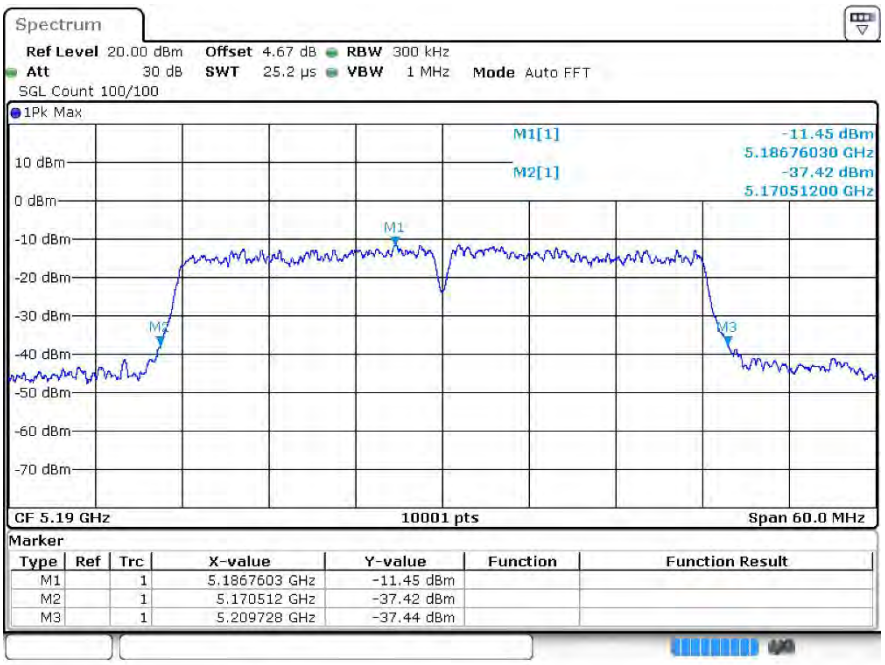


-26dB Bandwidth n20 5240MHz Ant1

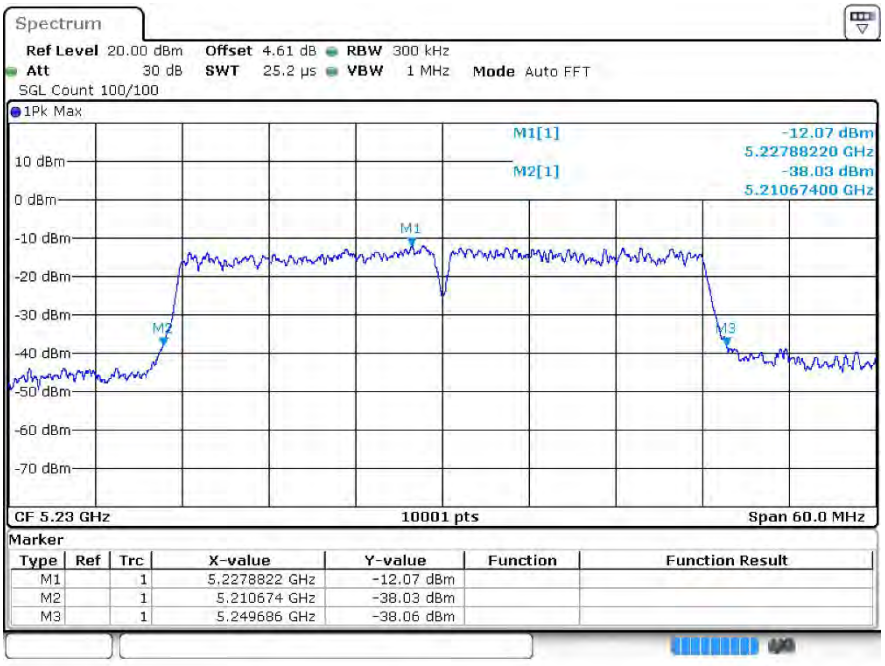


-26dB Bandwidth n20 5260MHz Ant1

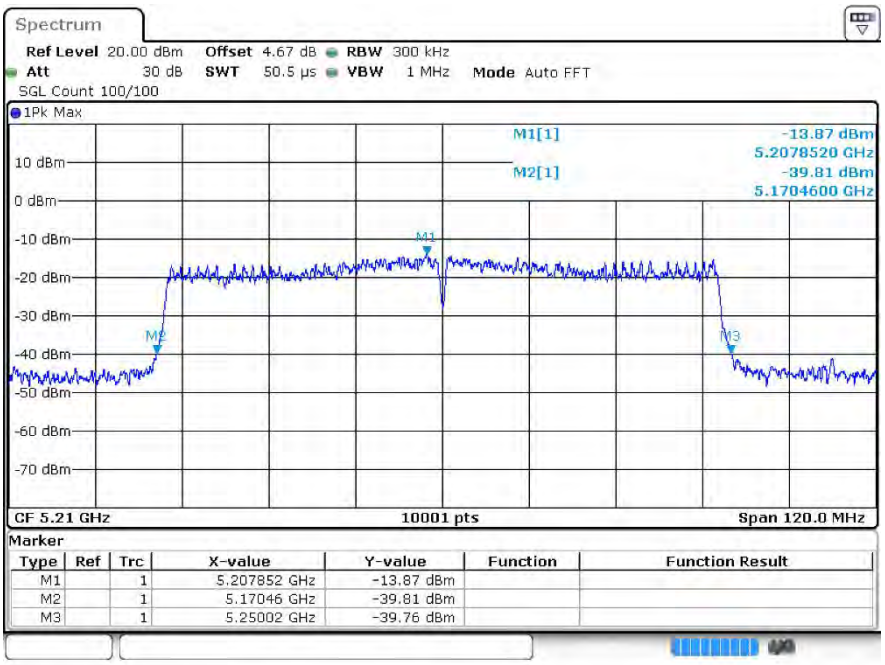
-26dB Bandwidthn40 5190MHz Ant1



-26dB Bandwidthn40 5230MHz Ant1



-26dB Bandwidthac80 5210MHz Ant1

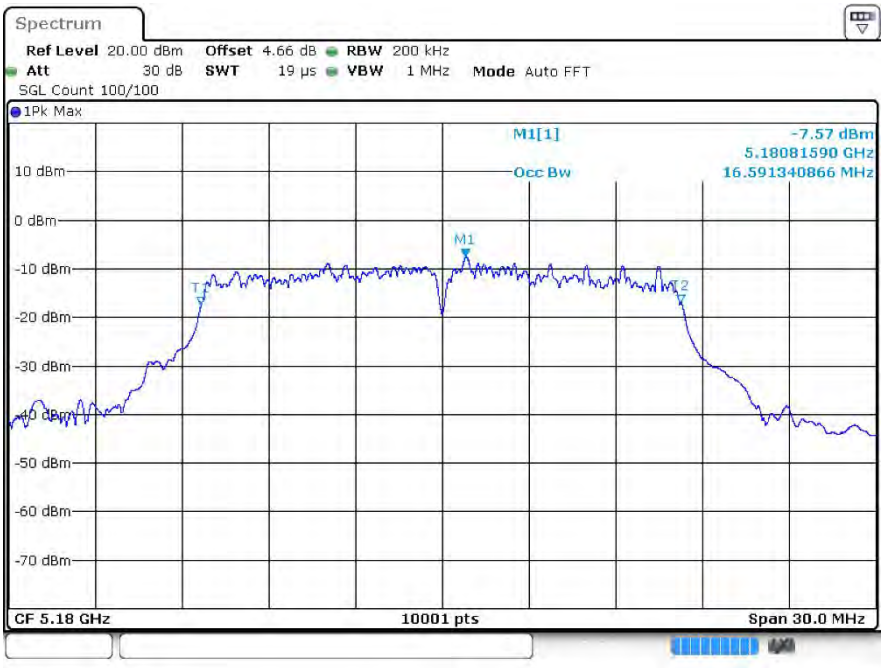
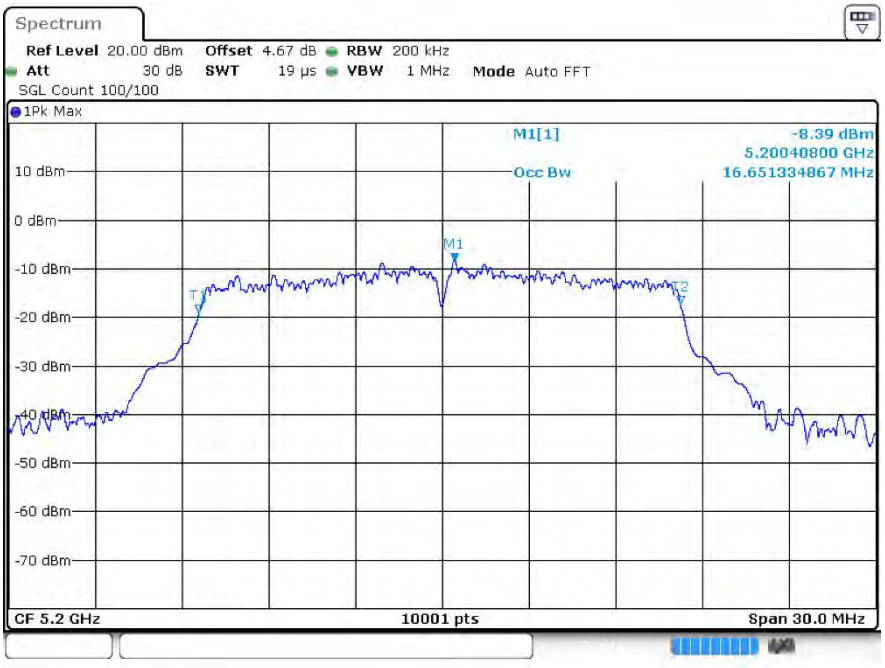


4 Occupied Channel Bandwidth

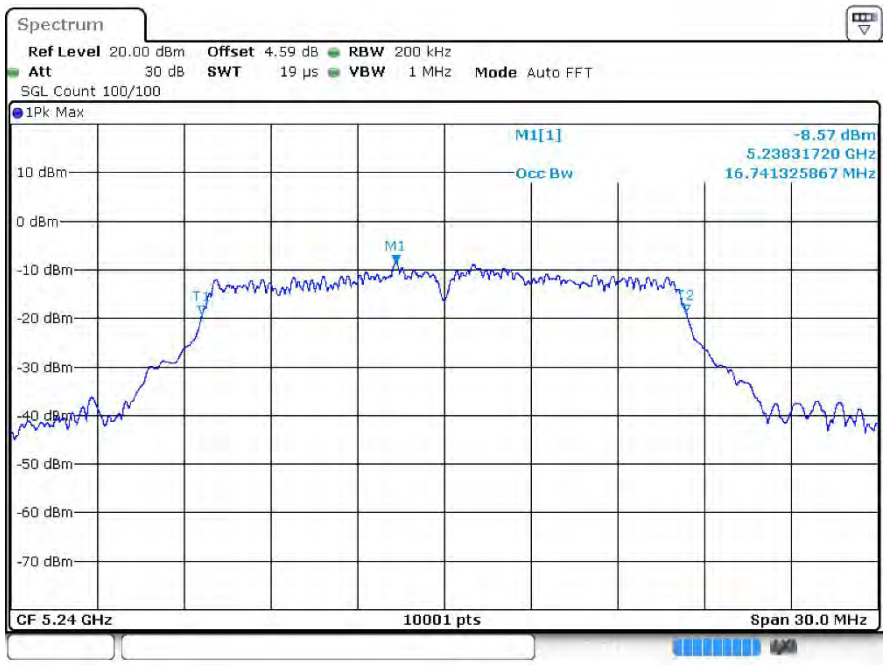
4.1 Test Result

Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
a	5180	Ant1	16.591
a	5200	Ant1	16.651
a	5240	Ant1	16.741
n20	5180	Ant1	17.677
n20	5200	Ant1	17.794
n20	5240	Ant1	17.824
n40	5190	Ant1	36.242
n40	5230	Ant1	36.446
ac80	5210	Ant1	75.604

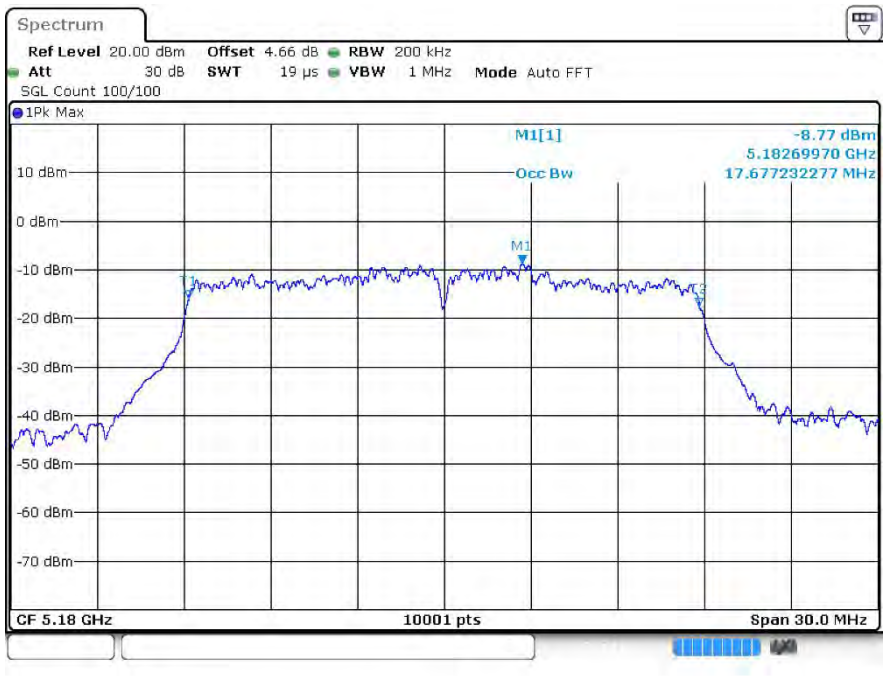
4.2 Test Graphs

Test Graphs
OBWa 5180MHz Ant1

OBWa 5200MHz Ant1


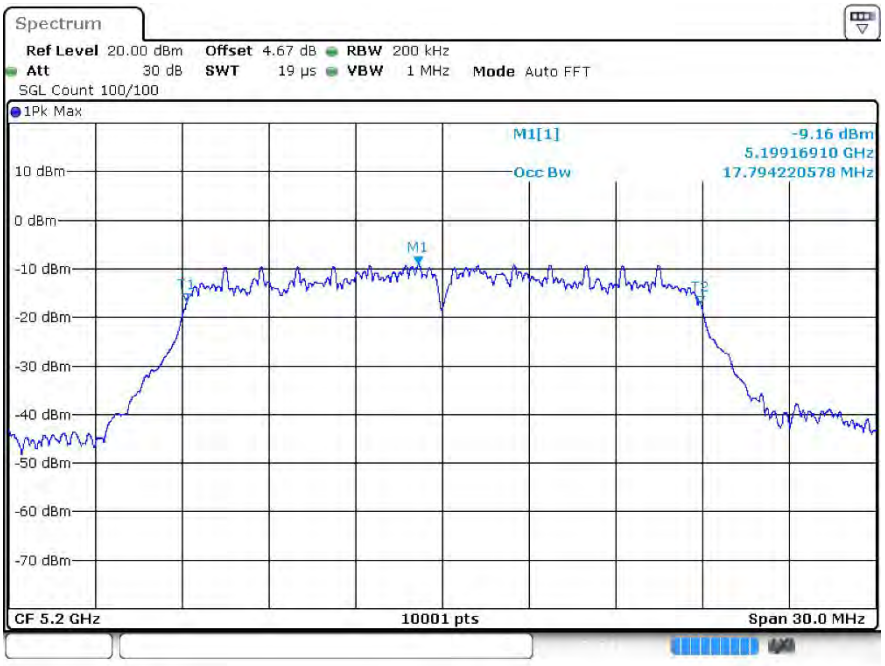
OBWa 5240MHz Ant1



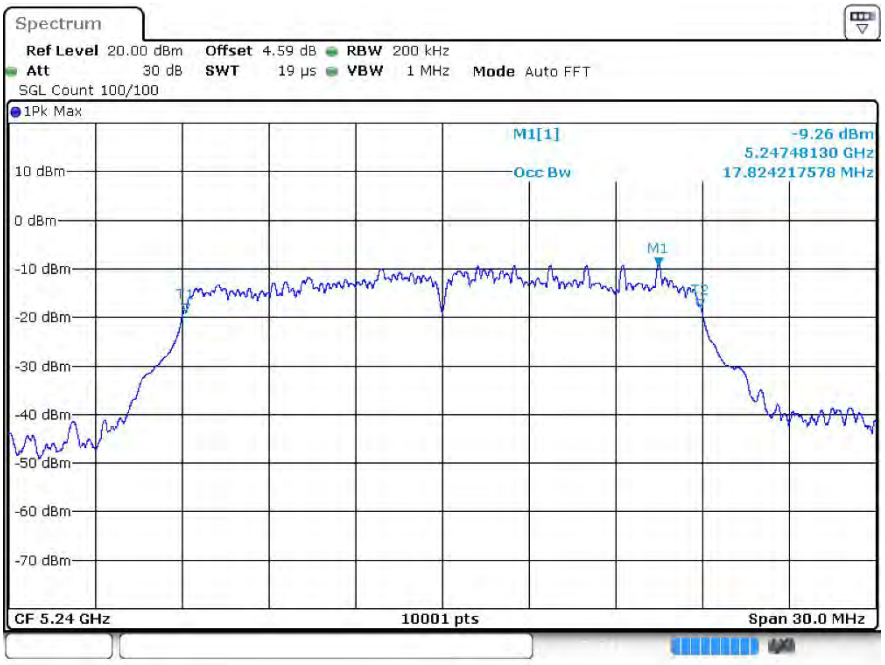
OBW n20 5180MHz Ant1



OBW n20 5200MHz Ant1

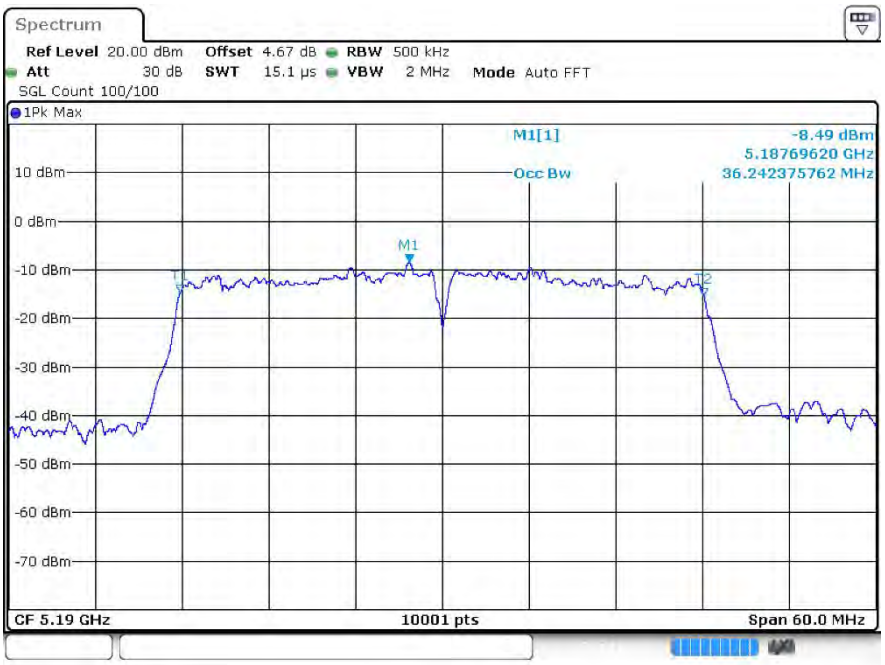


OBW n20 5240MHz Ant1

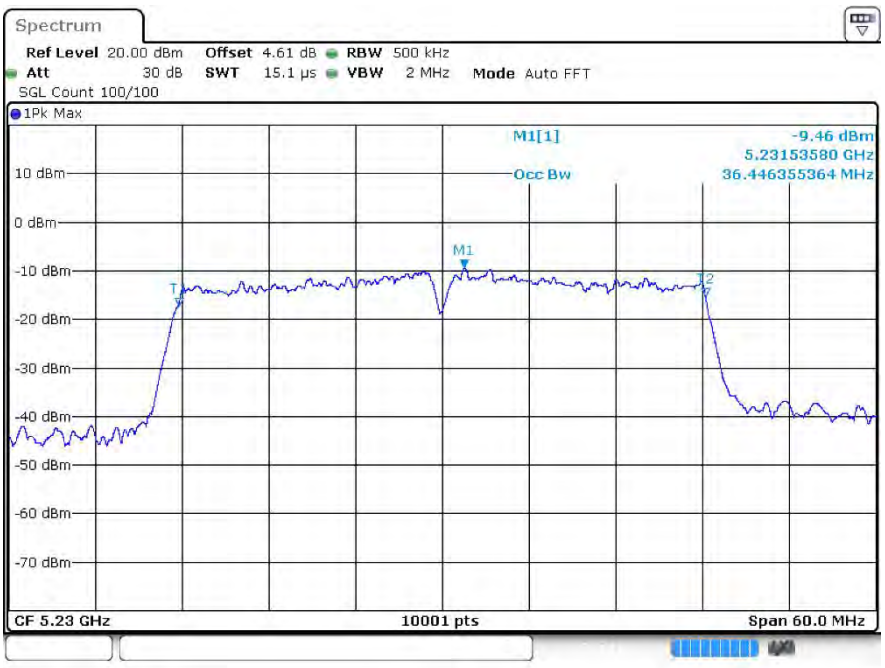


OBW n20 5260MHz Ant1

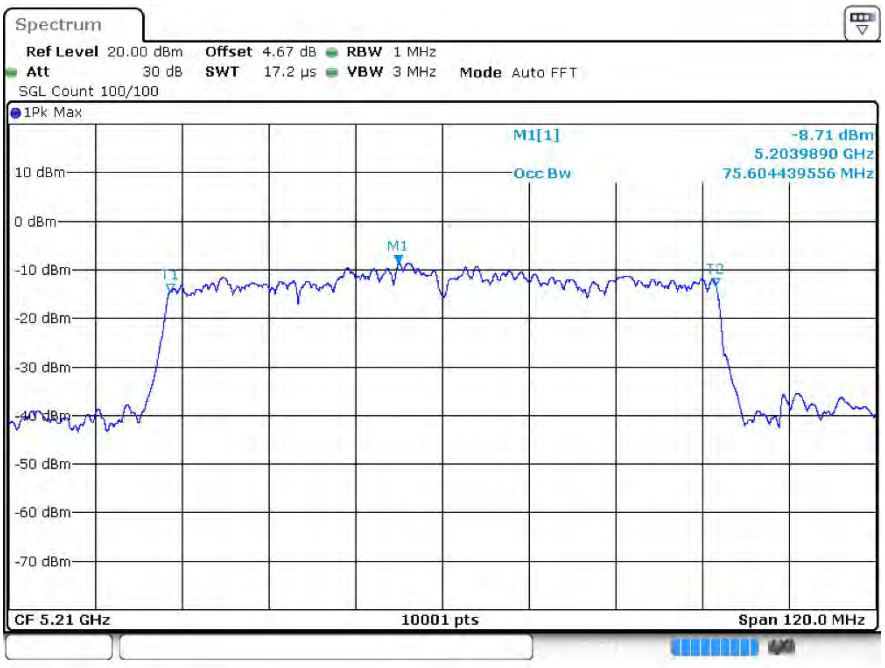
OBWn40 5190MHz Ant1



OBWn40 5230MHz Ant1



OBWac80 5210MHz Ant1



5 Maximum Power Spectral Density Level

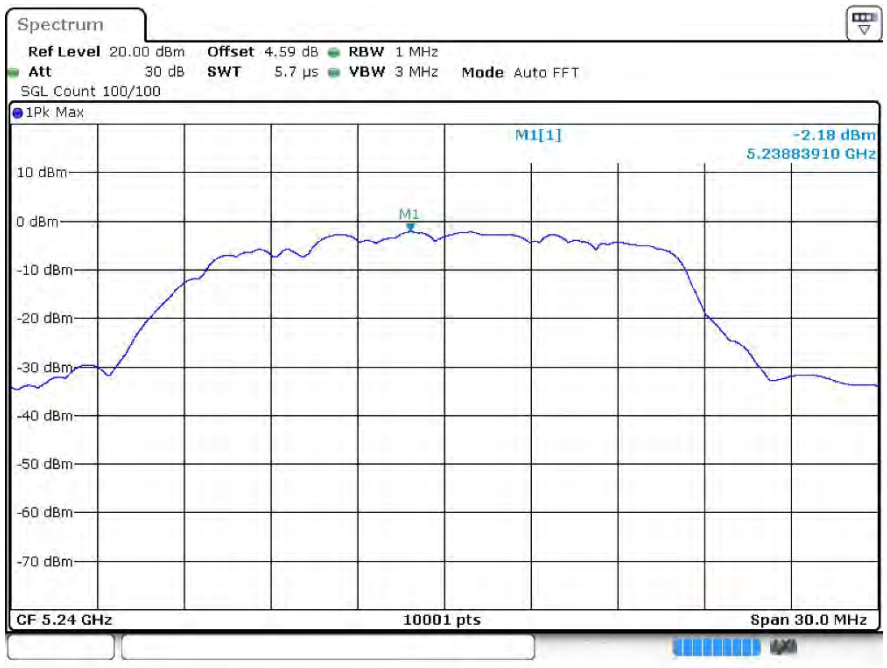
5.1 Test Result

Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
a	5180	Ant1	-1.04	0.02	-1.02	17	Pass
a	5200	Ant1	-1.71	0.02	-1.69	17	Pass
a	5240	Ant1	-2.2	0.02	-2.18	17	Pass
n20	5180	Ant1	-1.37	0.02	-1.35	17	Pass
n20	5200	Ant1	-2.45	0.02	-2.43	17	Pass
n20	5240	Ant1	-3.02	0.02	-3	17	Pass
n40	5190	Ant1	-5.61	0.09	-5.52	17	Pass
n40	5230	Ant1	-7.09	0.09	-7	17	Pass
ac80	5210	Ant1	-8.48	0.25	-8.23	17	Pass

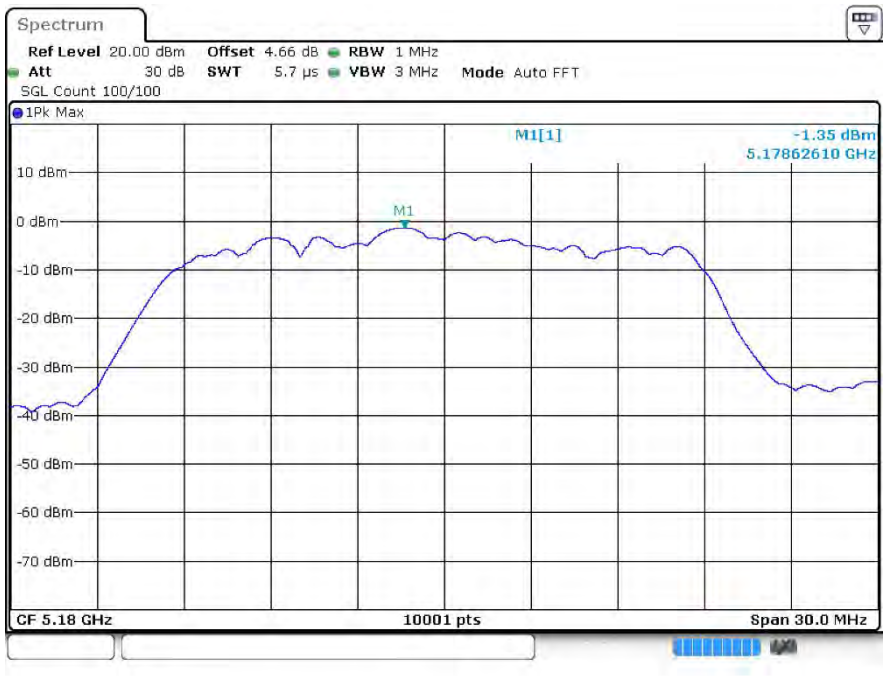
5.2 Test Graphs

Test Graphs
PSDa 5180MHz Ant1
PSD a 5200MHz Ant1

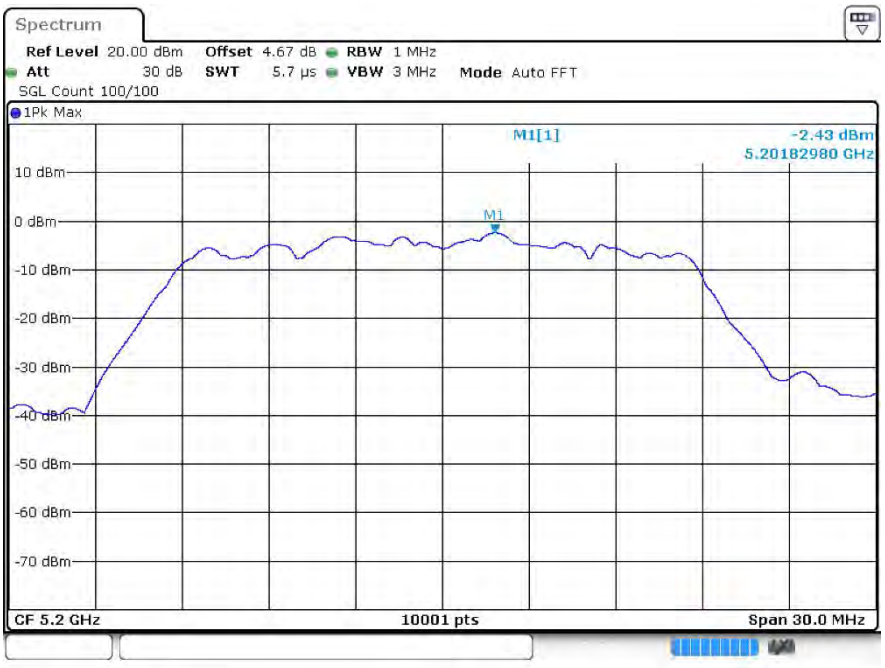
PSDa 5240MHz Ant1



PSD n20 5180MHz Ant1



PSD n20 5200MHz Ant1

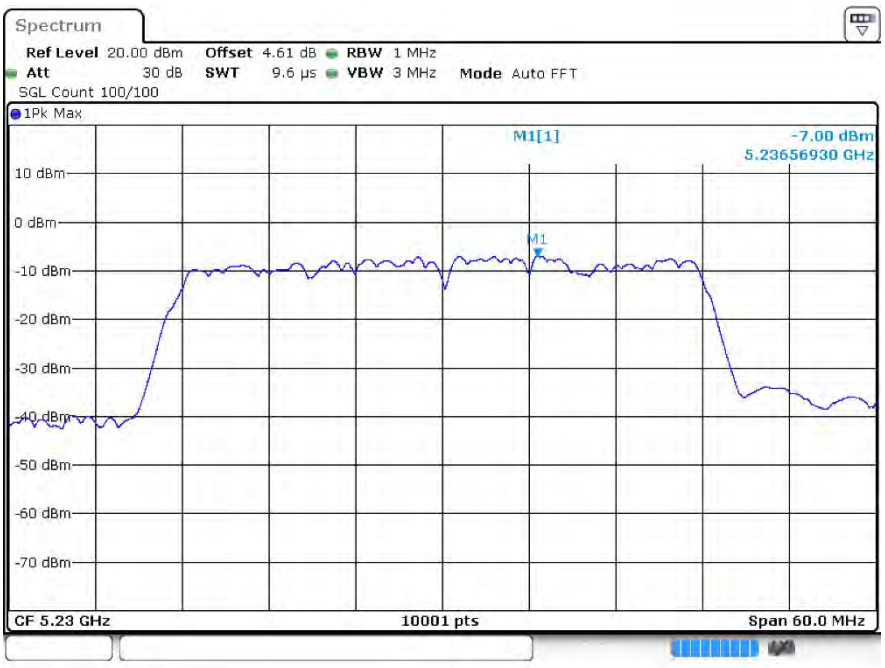


PSD n20 5240MHz Ant1

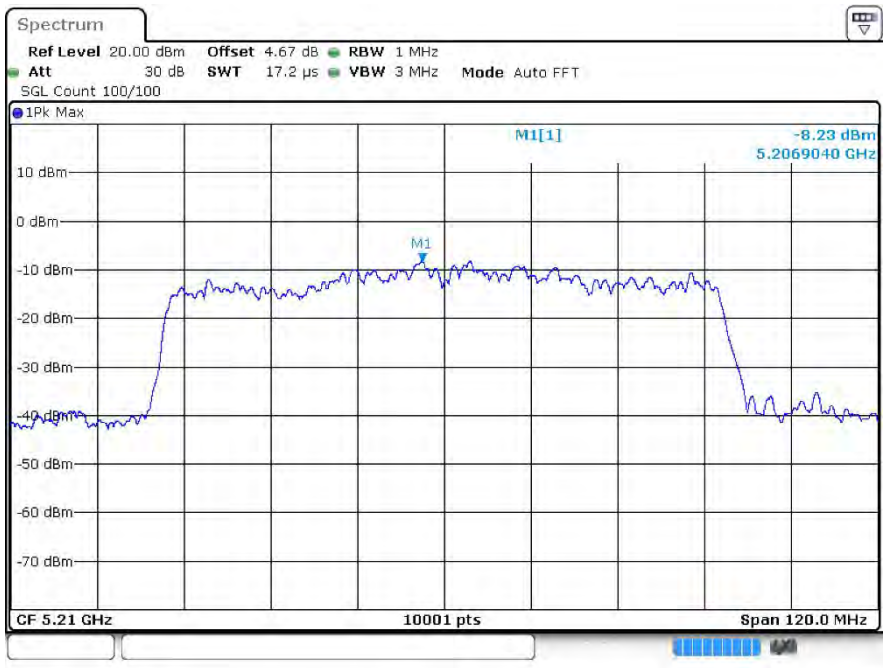
PSD n20 5260MHz Ant1

PSDn40 5190MHz Ant1

PSDn40 5230MHz Ant1



PSDac80 5210MHz Ant1



6 Frequency Stability

6.1 Test Result

Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20C 102V	a	5180	Ant1	5179.96	-40000	-7.72	25	Pass
20C 120V	a	5180	Ant1	5179.98	-20000	-3.86	25	Pass
20C 138V	a	5180	Ant1	5179.98	-20000	-3.86	25	Pass
-20C 120V	a	5180	Ant1	5180	0	0	25	Pass
-10C 120V	a	5180	Ant1	5179.98	-20000	-3.86	25	Pass
0C 120V	a	5180	Ant1	5179.98	-20000	-3.86	25	Pass
10C 120V	a	5180	Ant1	5179.96	-40000	-7.72	25	Pass
30C 120V	a	5180	Ant1	5179.98	-20000	-3.86	25	Pass
40C 120V	a	5180	Ant1	5179.98	-20000	-3.86	25	Pass
50C 120V	a	5180	Ant1	5179.96	-40000	-7.72	25	Pass
20C 102V	a	5200	Ant1	5199.98	-20000	-3.85	25	Pass
20C 120V	a	5200	Ant1	5200	0	0	25	Pass
20C 138V	a	5200	Ant1	5199.98	-20000	-3.85	25	Pass
-20C 120V	a	5200	Ant1	5199.98	-20000	-3.85	25	Pass
-10C 120V	a	5200	Ant1	5200	0	0	25	Pass
0C 120V	a	5200	Ant1	5200	0	0	25	Pass
10C 120V	a	5200	Ant1	5199.96	-40000	-7.69	25	Pass
30C 120V	a	5200	Ant1	5199.98	-20000	-3.85	25	Pass
40C 120V	a	5200	Ant1	5199.98	-20000	-3.85	25	Pass
20C 102V	a	5200	Ant1	5199.98	-20000	-3.85	25	Pass
20C 102V	a	5240	Ant1	5240	0	0	25	Pass
20C 120V	a	5240	Ant1	5240	0	0	25	Pass
20C 138V	a	5240	Ant1	5239.96	-40000	-7.63	25	Pass
-20C 120V	a	5240	Ant1	5239.98	-20000	-3.82	25	Pass
-10C 120V	a	5240	Ant1	5240	0	0	25	Pass
0C 120V	a	5240	Ant1	5239.98	-20000	-3.82	25	Pass
10C 120V	a	5240	Ant1	5240.02	20000	3.82	25	Pass
30C 120V	a	5240	Ant1	5240	0	0	25	Pass
40C 120V	a	5240	Ant1	5240	0	0	25	Pass
50C 120V	a	5240	Ant1	5240	0	0	25	Pass
20C 102V	n20	5180	Ant1	5179.98	-20000	-3.86	25	Pass
20C 120V	n20	5180	Ant1	5180	0	0	25	Pass
20C 138V	n20	5180	Ant1	5179.96	-40000	-7.72	25	Pass
-20C 120V	n20	5180	Ant1	5179.96	-40000	-7.72	25	Pass
-10C 120V	n20	5180	Ant1	5180	0	0	25	Pass
0C 120V	n20	5180	Ant1	5179.96	-40000	-7.72	25	Pass

10C 120V	n20	5180	Ant1	5179.98	-20000	-3.86	25	Pass
30C 120V	n20	5180	Ant1	5179.98	-20000	-3.86	25	Pass
40C 120V	n20	5180	Ant1	5179.98	-20000	-3.86	25	Pass
50C 120V	n20	5180	Ant1	5179.96	-40000	-7.72	25	Pass
20C 102V	n20	5200	Ant1	5200	0	0	25	Pass
20C 120V	n20	5200	Ant1	5200	0	0	25	Pass
20C 138V	n20	5200	Ant1	5199.98	-20000	-3.85	25	Pass
-20C 120V	n20	5200	Ant1	5199.98	-20000	-3.85	25	Pass
-10C 120V	n20	5200	Ant1	5199.98	-20000	-3.85	25	Pass
0C 120V	n20	5200	Ant1	5199.98	-20000	-3.85	25	Pass
10C 120V	n20	5200	Ant1	5200	0	0	25	Pass
30C 120V	n20	5200	Ant1	5199.98	-20000	-3.85	25	Pass
40C 120V	n20	5200	Ant1	5199.98	-20000	-3.85	25	Pass
50C 120V	n20	5200	Ant1	5199.98	-20000	-3.85	25	Pass
20C 102V	n20	5240	Ant1	5239.96	-40000	-7.63	25	Pass
20C 120V	n20	5240	Ant1	5240	0	0	25	Pass
20C 138V	n20	5240	Ant1	5240	0	0	25	Pass
-20C 120V	n20	5240	Ant1	5240	0	0	25	Pass
-10C 120V	n20	5240	Ant1	5239.98	-20000	-3.82	25	Pass
0C 120V	n20	5240	Ant1	5239.98	-20000	-3.82	25	Pass
10C 120V	n20	5240	Ant1	5239.98	-20000	-3.82	25	Pass
30C 120V	n20	5240	Ant1	5240	0	0	25	Pass
40C 120V	n20	5240	Ant1	5239.96	-40000	-7.63	25	Pass
50C 120V	n20	5240	Ant1	5239.98	-20000	-3.82	25	Pass
20C 102V	n40	5190	Ant1	5189.96	-40000	-7.71	25	Pass
20C 120V	n40	5190	Ant1	5190	0	0	25	Pass
20C 138V	n40	5190	Ant1	5189.96	-40000	-7.71	25	Pass
-20C 120V	n40	5190	Ant1	5189.96	-40000	-7.71	25	Pass
-10C 120V	n40	5190	Ant1	5190	0	0	25	Pass
0C 120V	n40	5190	Ant1	5190	0	0	25	Pass
10C 120V	n40	5190	Ant1	5190	0	0	25	Pass
30C 120V	n40	5190	Ant1	5190	0	0	25	Pass
40C 120V	n40	5190	Ant1	5189.96	-40000	-7.71	25	Pass
50C 120V	n40	5190	Ant1	5189.96	-40000	-7.71	25	Pass
20C 102V	n40	5230	Ant1	5230	0	0	25	Pass
20C 120V	n40	5230	Ant1	5230	0	0	25	Pass
20C 138V	n40	5230	Ant1	5229.96	-40000	-7.65	25	Pass
-20C 120V	n40	5230	Ant1	5229.96	-40000	-7.65	25	Pass
-10C 120V	n40	5230	Ant1	5230	0	0	25	Pass
0C 120V	n40	5230	Ant1	5230	0	0	25	Pass
10C 120V	n40	5230	Ant1	5230	0	0	25	Pass
30C 120V	n40	5230	Ant1	5230	0	0	25	Pass
40C 120V	n40	5230	Ant1	5230	0	0	25	Pass

50C 120V	n40	5230	Ant1	5230	0	0	25	Pass
20C 138V	ac80	5210	Ant1	5210	0	0	25	Pass
-20C 120V	ac80	5210	Ant1	5210	0	0	25	Pass
-10C 120V	ac80	5210	Ant1	5210	0	0	25	Pass
0C 120V	ac80	5210	Ant1	5210	0	0	25	Pass
10C 120V	ac80	5210	Ant1	5210	0	0	25	Pass
30C 120V	ac80	5210	Ant1	5210	0	0	25	Pass
40C 120V	ac80	5210	Ant1	5210	0	0	25	Pass
50C 120V	ac80	5210	Ant1	5210	0	0	25	Pass

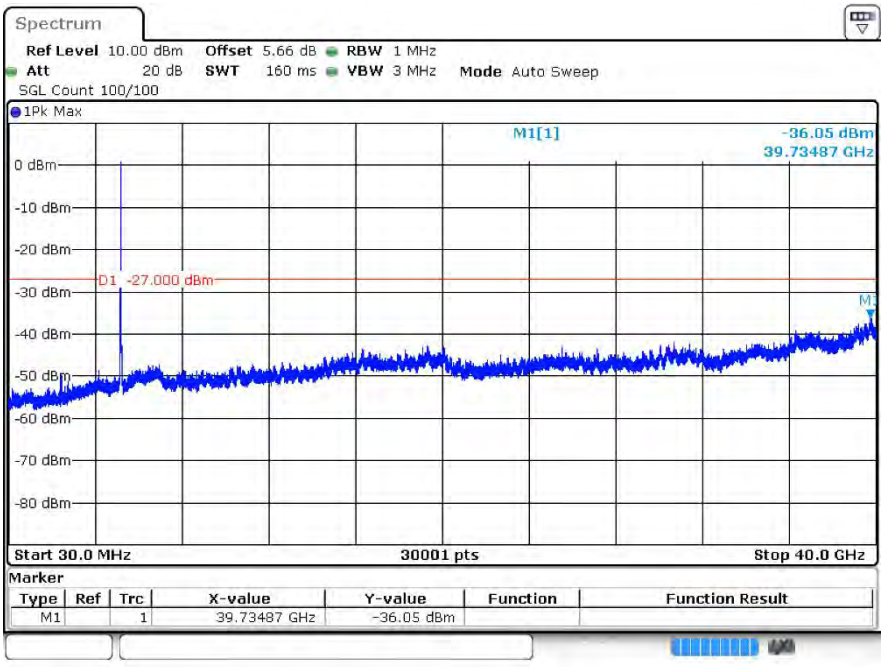
7 Conducted RF Spurious Emission

7.1 Test Result

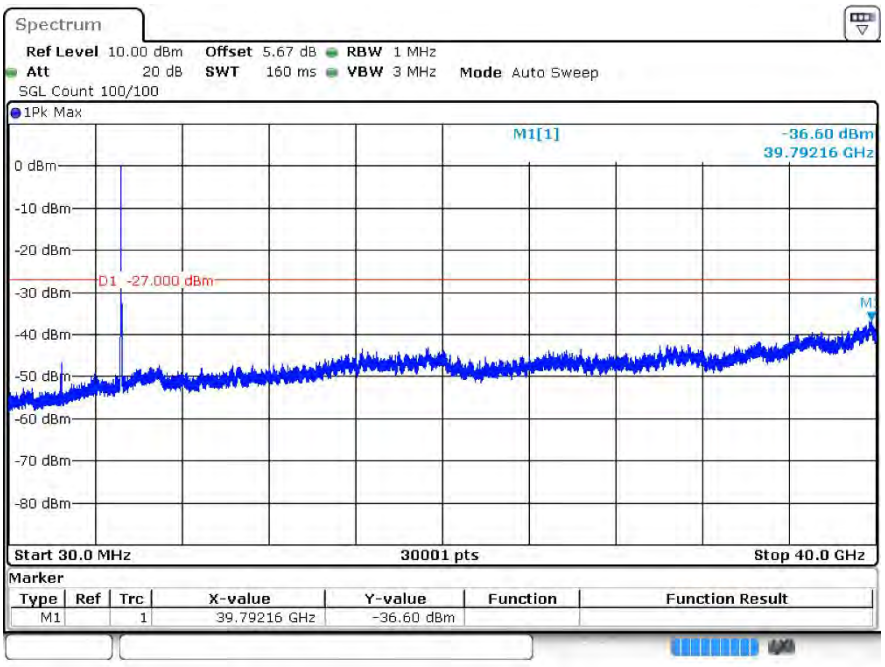
Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
a	5180	Ant1	-36.05	-27	Pass
a	5200	Ant1	-36.59	-27	Pass
a	5240	Ant1	-36.5	-27	Pass
n20	5180	Ant1	-35.64	-27	Pass
n20	5200	Ant1	-36.29	-27	Pass
n20	5240	Ant1	-35.82	-27	Pass
n40	5190	Ant1	-35.75	-27	Pass
n40	5230	Ant1	-37.02	-27	Pass
ac80	5210	Ant1	-36.38	-27	Pass

7.2 Test Graphs

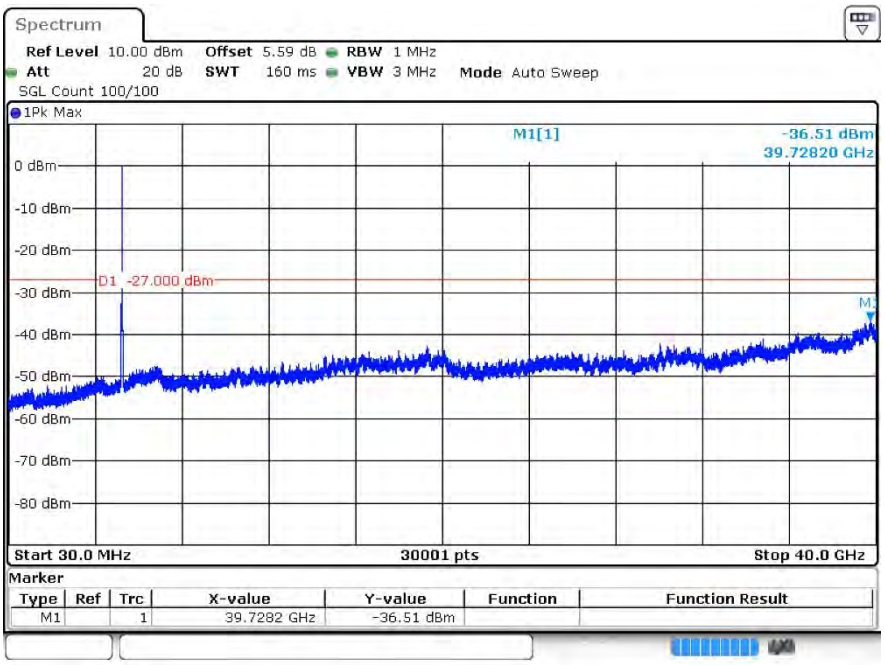
Test Graphs
Tx. Spuriousa 5180MHz Ant1



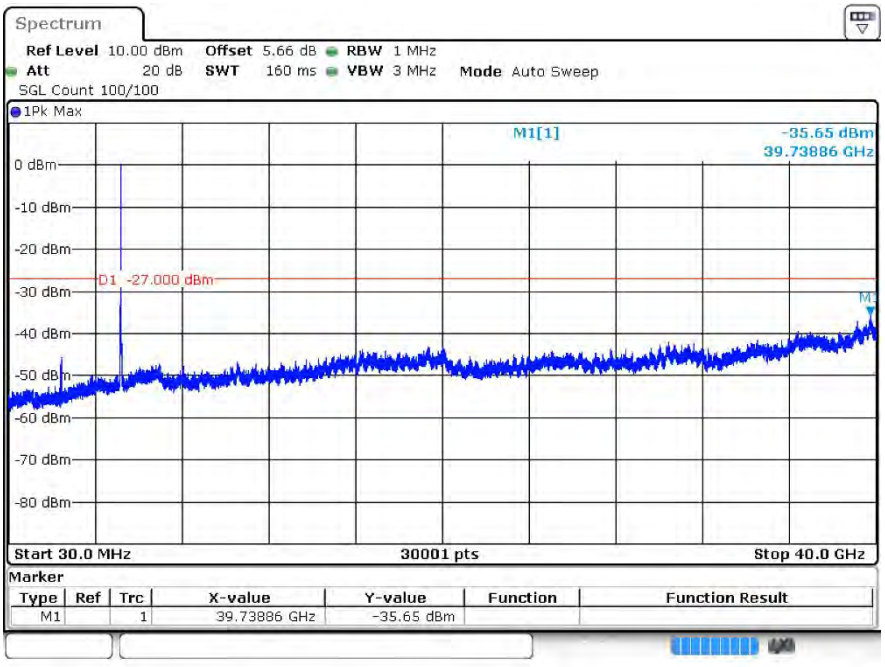
Tx. Spuriousa 5200MHz Ant1



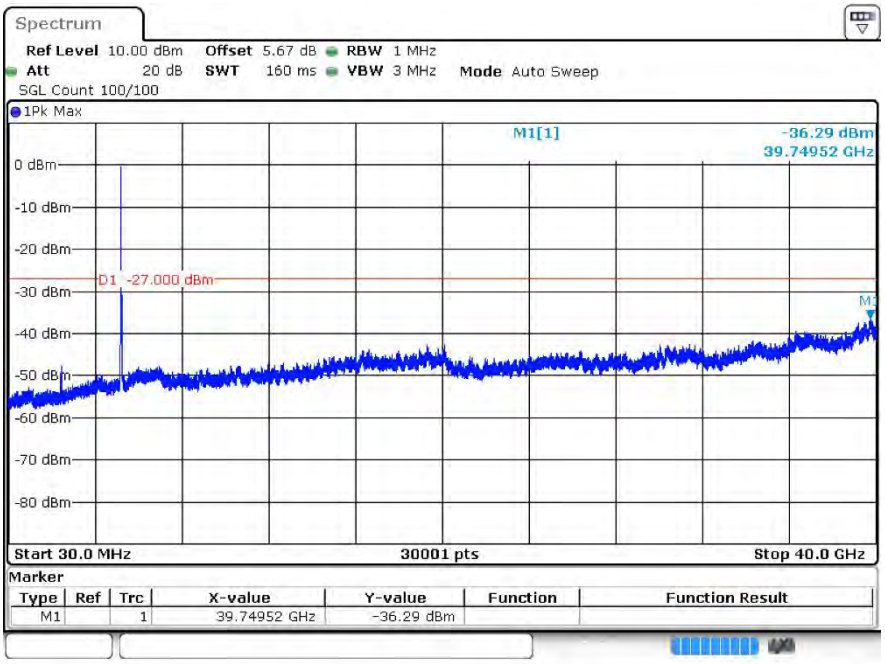
Tx. Spuriousa 5240MHz Ant1



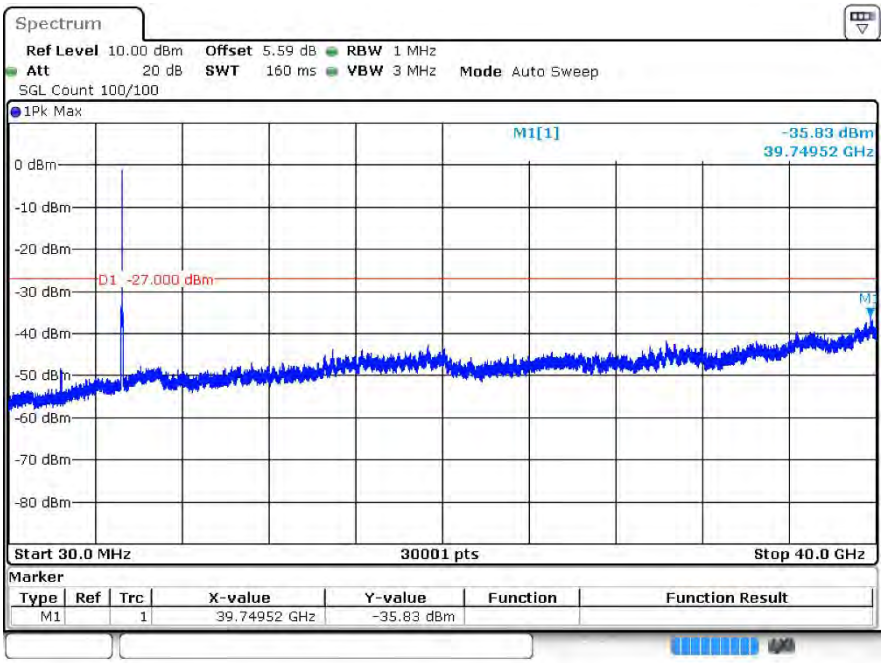
Tx. Spurious n20 5180MHz Ant1



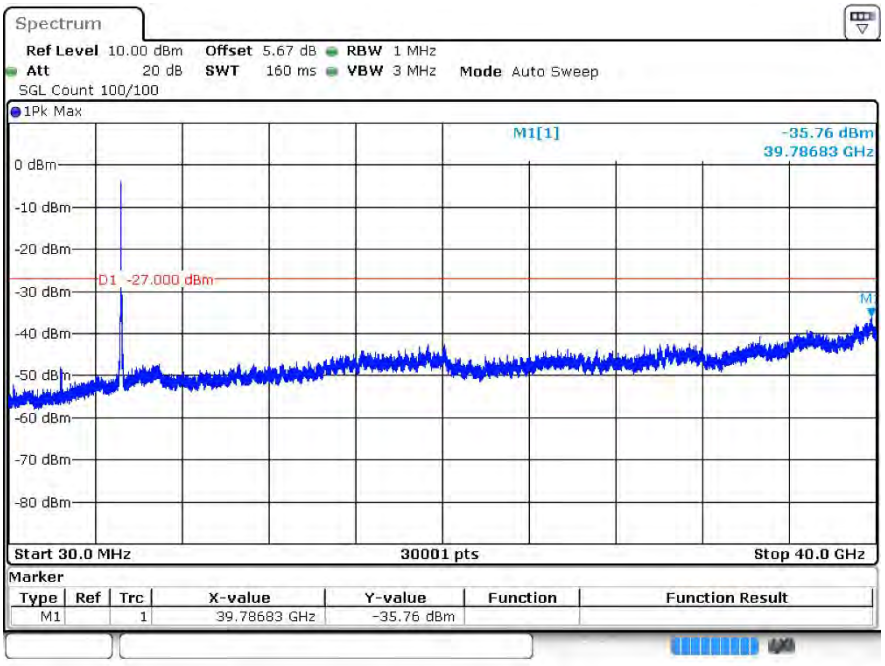
Tx. Spurious n20 5200MHz Ant1



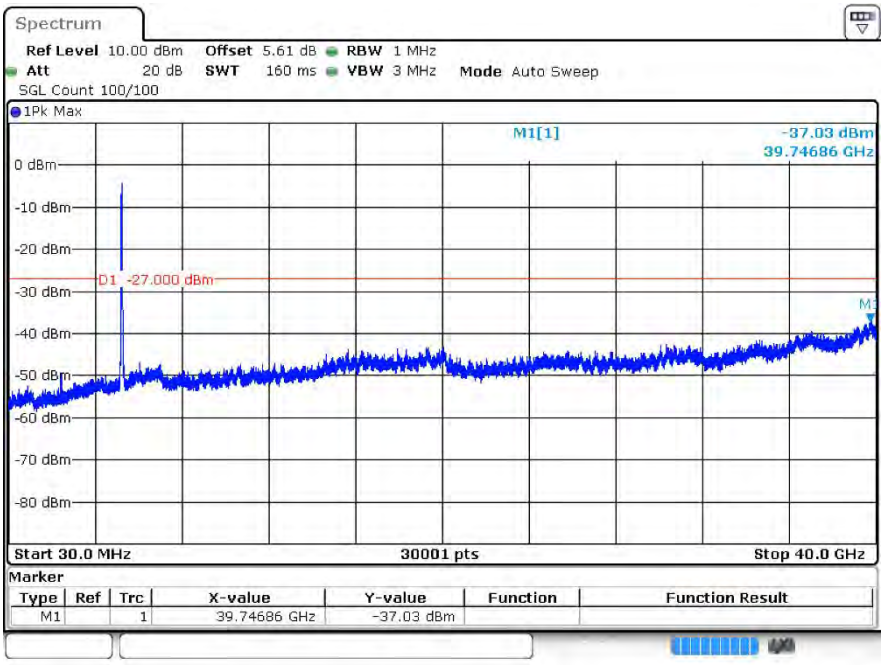
Tx. Spurious n20 5240MHz Ant1



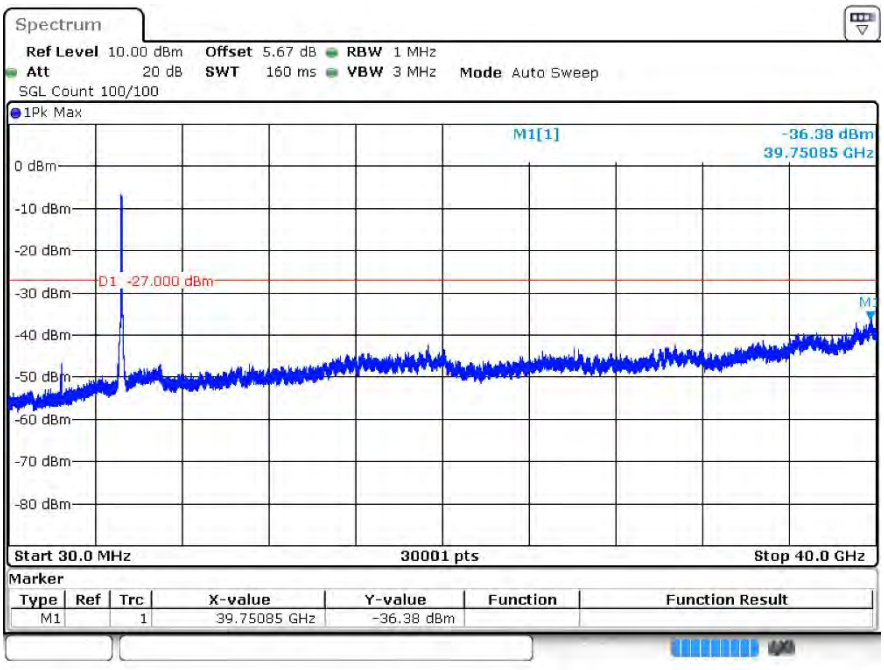
Tx. Spuriousn40 5190MHz Ant1



Tx. Spuriousn40 5230MHz Ant1



Tx. Spuriousac80 5210MHz Ant1



8 Restrict Band

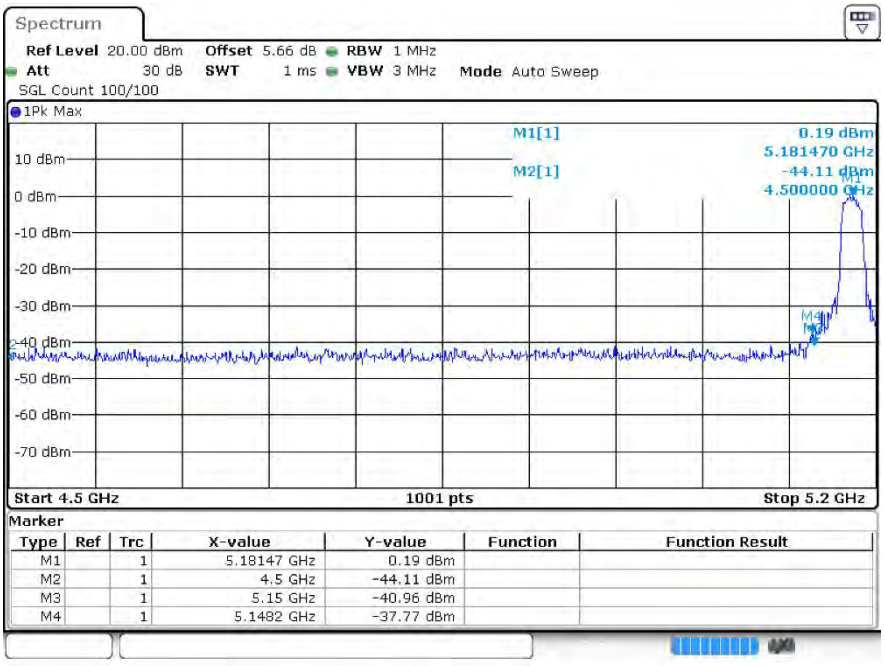
8.1 Test Result

Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
a	5180	Ant1	4500	-44.11	3.21	54.33	Peak	68.2	Pass
a	5180	Ant1	4500	-52.64	3.21	45.8	Average	54	Pass
a	5180	Ant1	5148.2	-37.77	3.21	60.67	Peak	68.2	Pass
a	5180	Ant1	4967.6	-50.37	3.21	48.07	Average	54	Pass
a	5180	Ant1	5150	-40.95	3.21	57.49	Peak	68.2	Pass
a	5180	Ant1	5150	-51.5	3.21	46.94	Average	54	Pass
a	5240	Ant1	5350	-44.43	3.21	54.01	Peak	68.2	Pass
a	5240	Ant1	5350	-54.23	3.21	44.21	Average	54	Pass
a	5240	Ant1	5359.92	-41.83	3.21	56.61	Peak	68.2	Pass
a	5240	Ant1	5446.56	-52.26	3.21	46.18	Average	54	Pass
a	5240	Ant1	5460	-45.3	3.21	53.14	Peak	68.2	Pass
a	5240	Ant1	5460	-53.72	3.21	44.72	Average	54	Pass
n20	5180	Ant1	4500	-43.13	3.21	55.31	Peak	68.2	Pass
n20	5180	Ant1	4500	-54.37	3.21	44.07	Average	54	Pass
n20	5180	Ant1	5148.2	-40.38	3.21	58.06	Peak	68.2	Pass
n20	5180	Ant1	4962.7	-51.87	3.21	46.57	Average	54	Pass
n20	5180	Ant1	5150	-42	3.21	56.44	Peak	68.2	Pass
n20	5180	Ant1	5150	-52.36	3.21	46.08	Average	54	Pass
n20	5240	Ant1	5350	-45.26	3.21	53.18	Peak	68.2	Pass
n20	5240	Ant1	5350	-54.23	3.21	44.21	Average	54	Pass
n20	5240	Ant1	5448.24	-41.62	3.21	56.82	Peak	68.2	Pass
n20	5240	Ant1	5446.8	-52.25	3.21	46.19	Average	54	Pass
n20	5240	Ant1	5460	-44.08	3.21	54.36	Peak	68.2	Pass
n20	5240	Ant1	5460	-53.7	3.21	44.74	Average	54	Pass
n40	5190	Ant1	4500	-43.32	3.21	55.12	Peak	68.2	Pass
n40	5190	Ant1	4500	-54.34	3.21	44.1	Average	54	Pass
n40	5190	Ant1	5149.7	-39	3.21	59.44	Peak	68.2	Pass
n40	5190	Ant1	5149.7	-51.06	3.21	47.38	Average	54	Pass
n40	5190	Ant1	5150	-38.68	3.21	59.76	Peak	68.2	Pass
n40	5190	Ant1	5150	-50.95	3.21	47.49	Average	54	Pass
n40	5230	Ant1	5350	-45.42	3.21	53.02	Peak	68.2	Pass
n40	5230	Ant1	5350	-54.02	3.21	44.42	Average	54	Pass
n40	5230	Ant1	5451.09	-40.02	3.21	58.42	Peak	68.2	Pass
n40	5230	Ant1	5447.31	-52.24	3.21	46.2	Average	54	Pass
n40	5230	Ant1	5460	-43.69	3.21	54.75	Peak	68.2	Pass

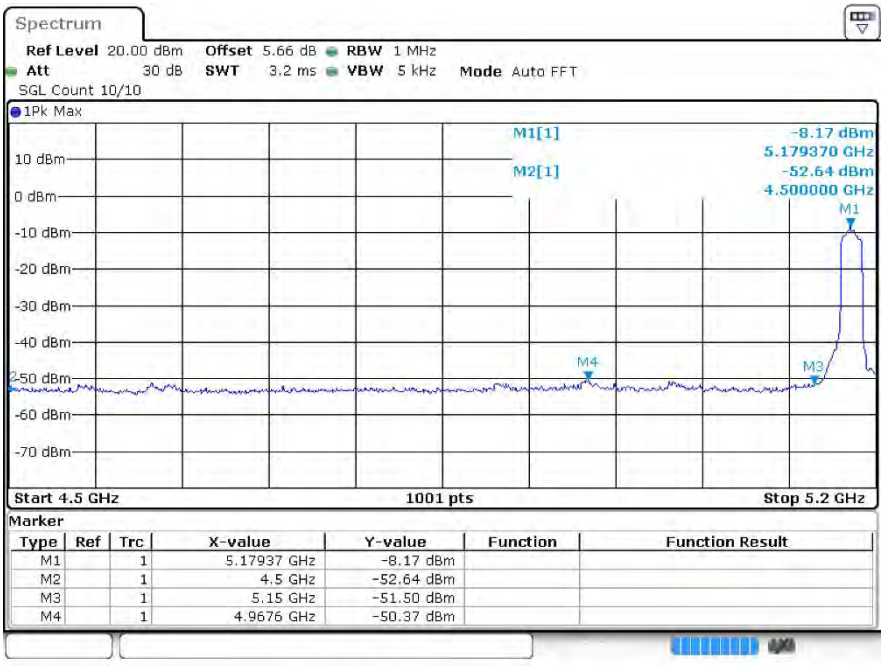
n40	5230	Ant1	5460	-53.65	3.21	44.79	Average	54	Pass
ac80	5210	Ant1	4500	-45.55	3.21	52.89	Peak	68.2	Pass
ac80	5210	Ant1	4500	-53.25	3.21	45.19	Average	54	Pass
ac80	5210	Ant1	5147.01	-37.97	3.21	60.47	Peak	68.2	Pass
ac80	5210	Ant1	5147.8	-48.05	3.21	50.39	Average	54	Pass
ac80	5210	Ant1	5150	-37.05	3.21	61.39	Peak	68.2	Pass
ac80	5210	Ant1	5150	-48.22	3.21	50.22	Average	54	Pass

8.2 Test Graphs

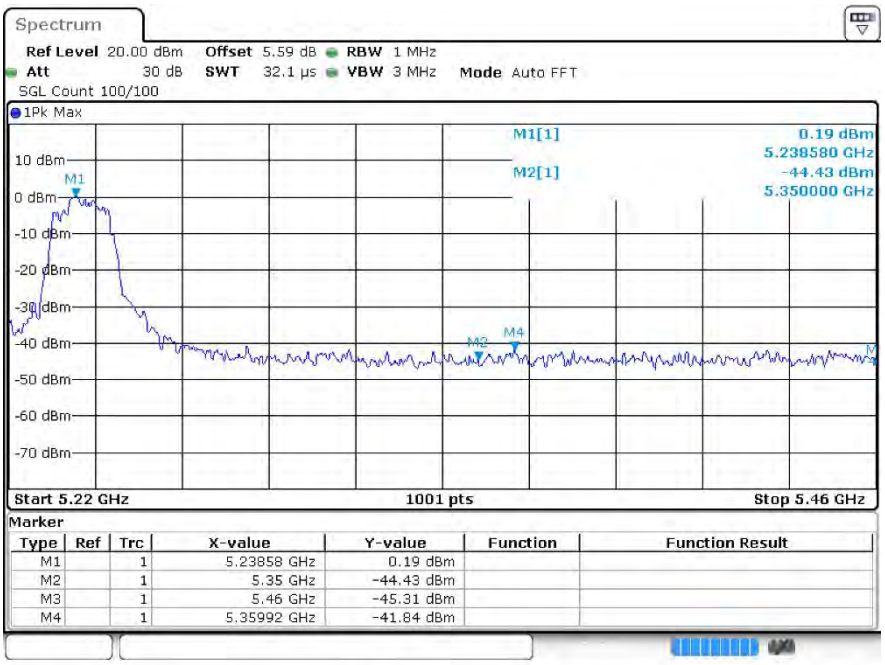
Test Graphs
Restrict Banda 5180MHz Ant1 Peak



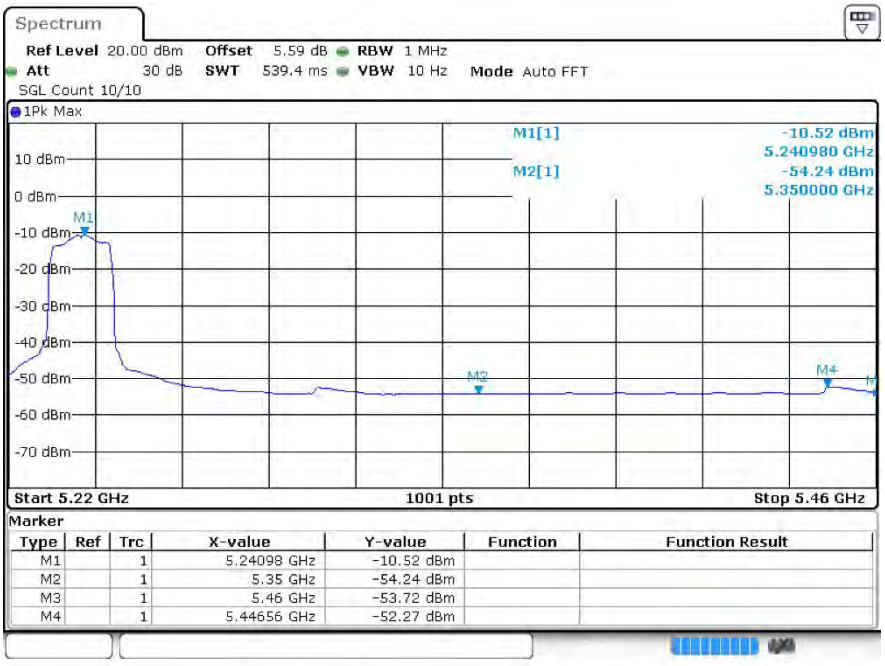
Restrict Band a 5180MHz Ant1 Average



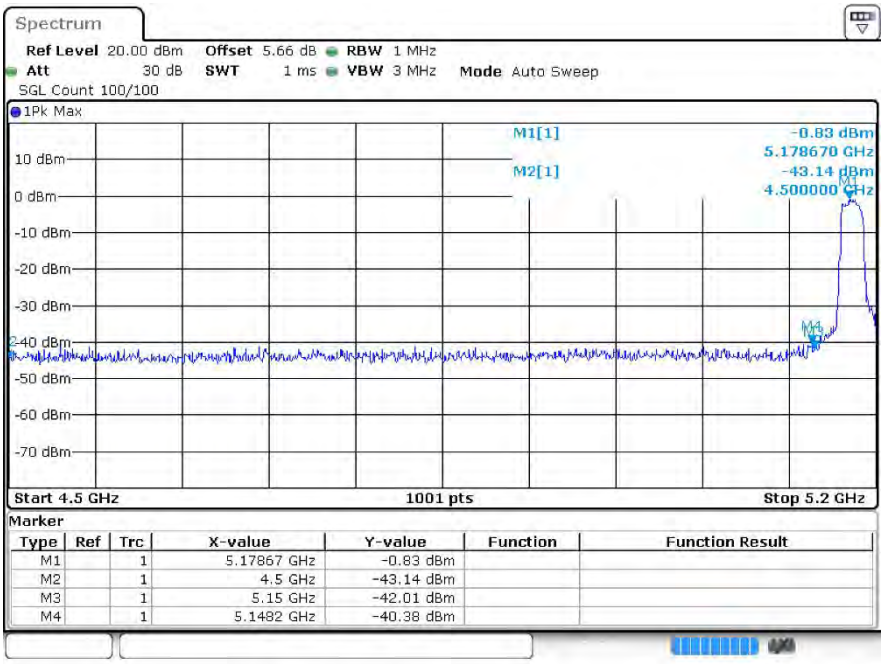
Restrict Banda 5240MHz Ant1 Peak



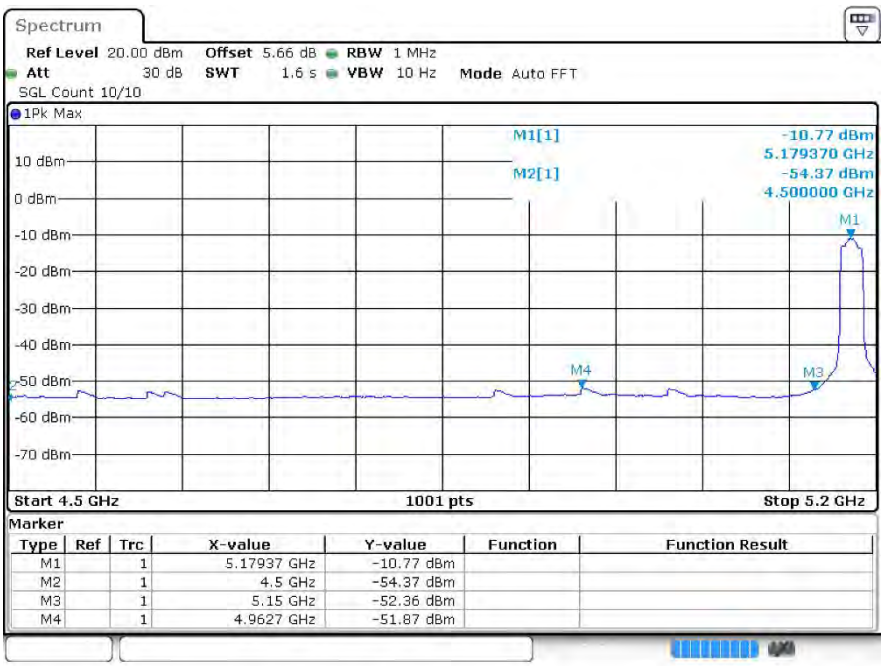
Restrict Band a 5240MHz Ant1 Average



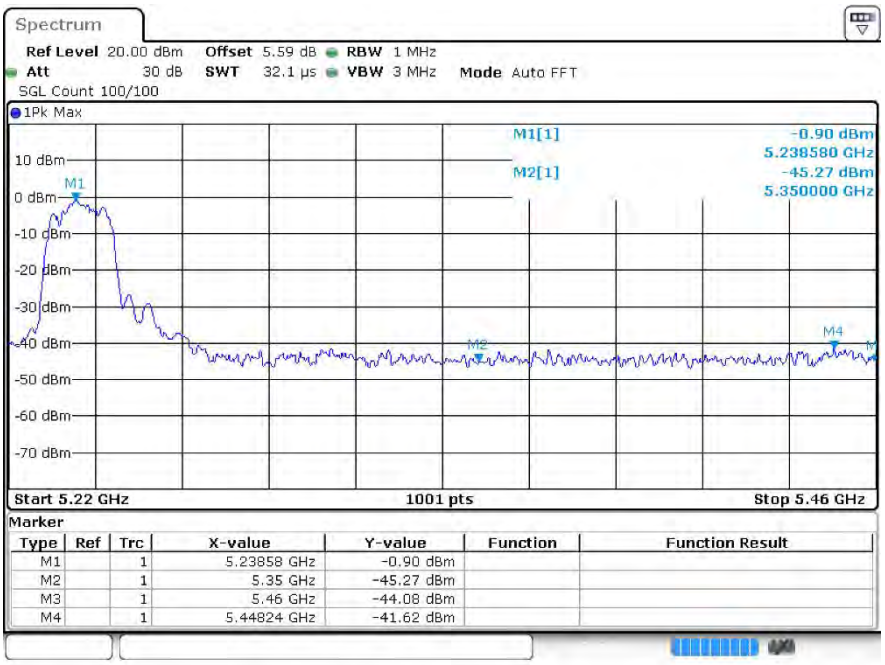
Restrict Bandn20 5180MHz Ant1 Peak



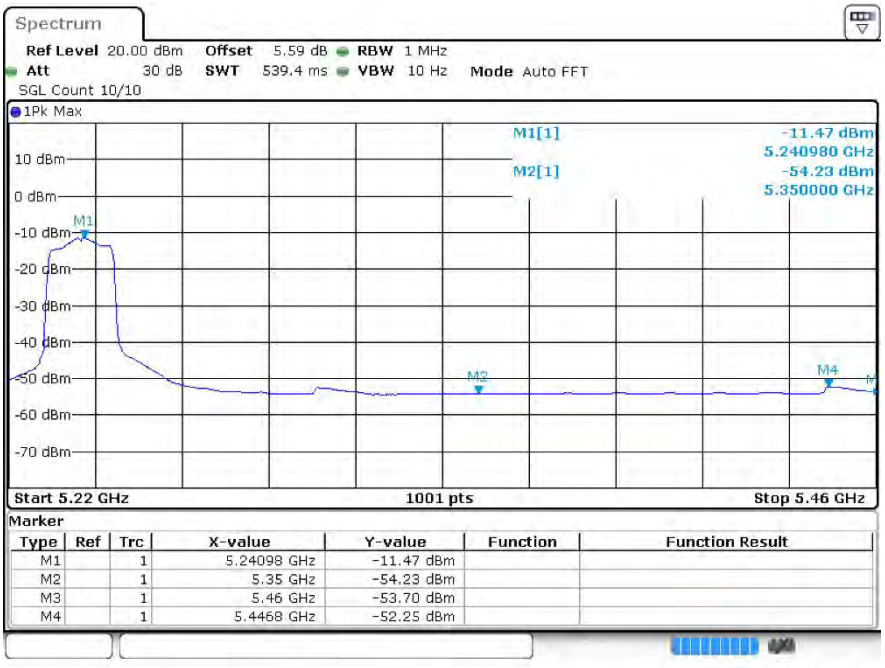
Restrict Band n20 5180MHz Ant1 Average



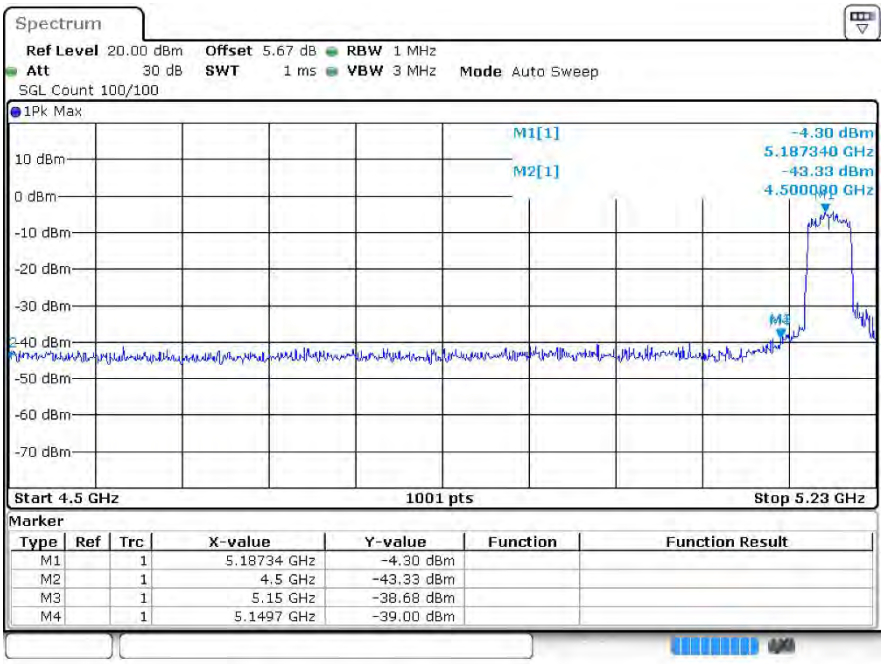
Restrict Bandn20 5240MHz Ant1 Peak



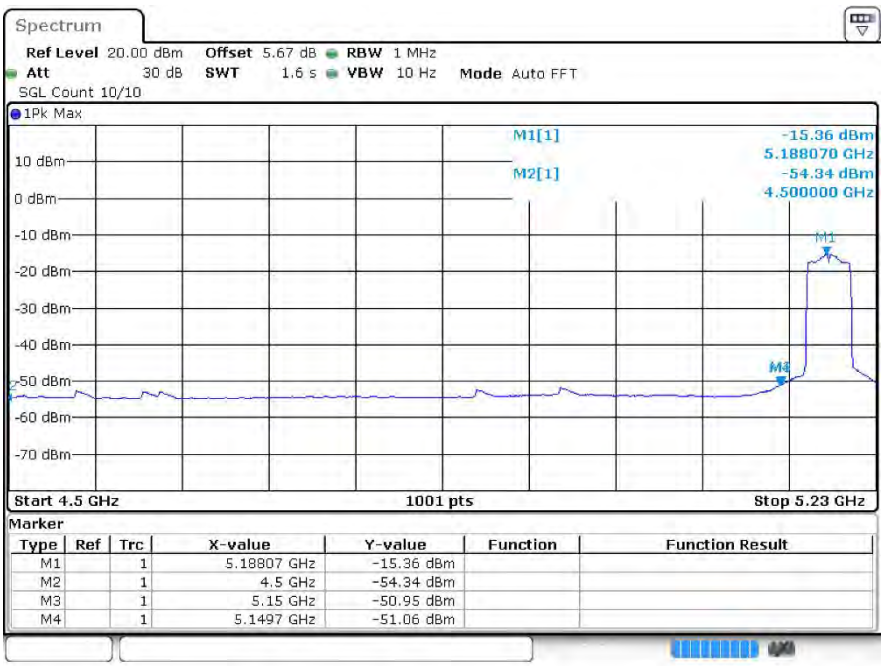
Restrict Band n20 5240MHz Ant1 Average



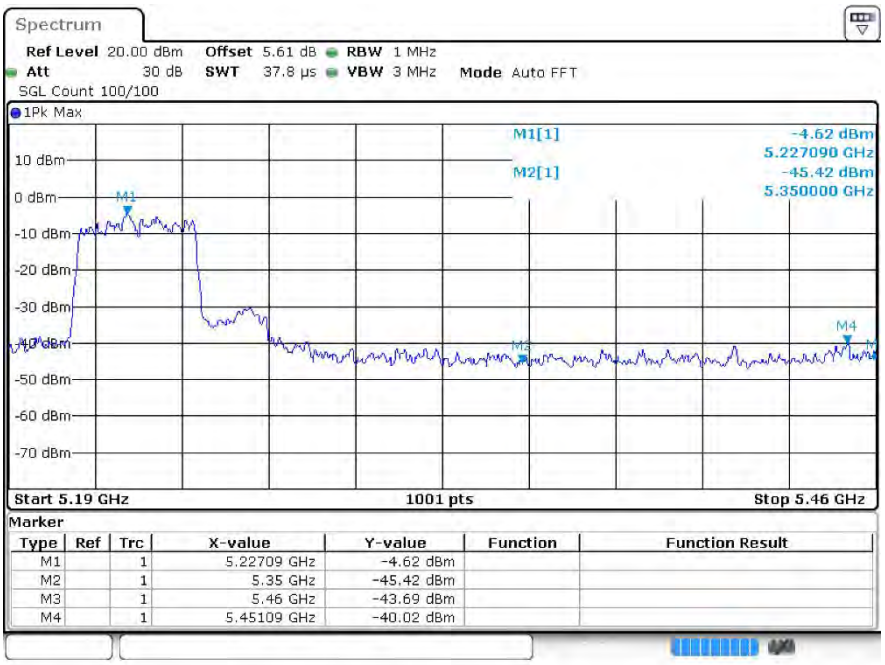
Restrict Bandn40 5190MHz Ant1 Peak



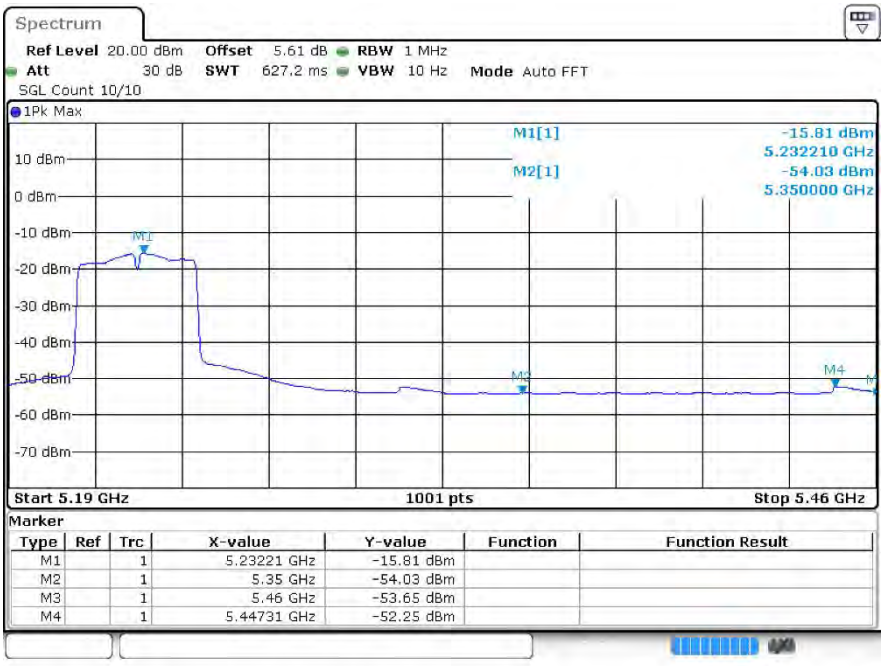
Restrict Band n40 5190MHz Ant1 Average



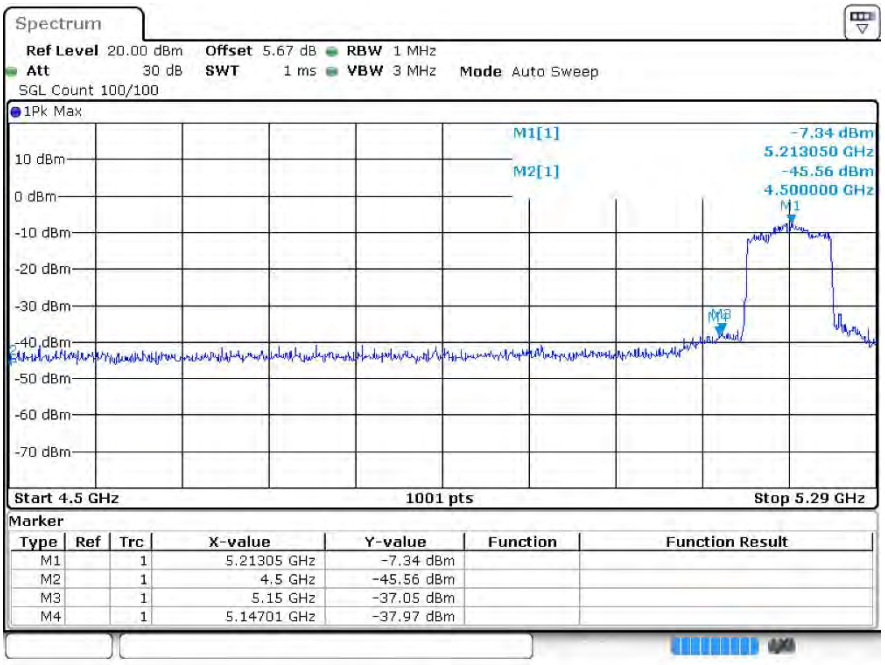
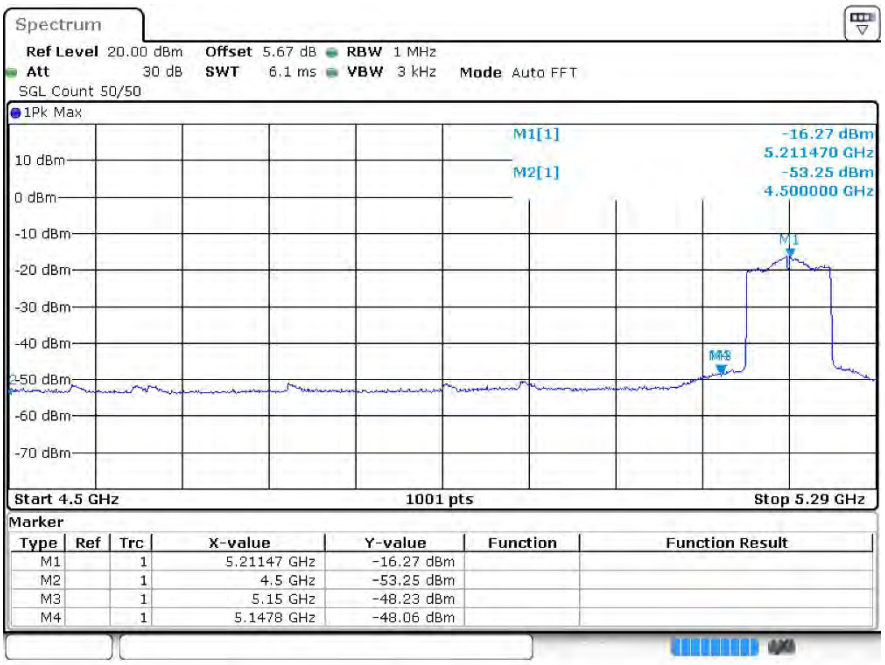
Restrict Bandn40 5230MHz Ant1 Peak



Restrict Band n40 5230MHz Ant1 Average



Restrict Bandac80 5210MHz Ant1 Peak



Restrict Band ac80 5210MHz Ant1 Average