Appendix C-1

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: Smart Electronic Blackboard

Trade Mark: INDOTA

Test Model: IN-TVH4K

Environmental Conditions

Temperature:	25.2° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Simba Huang
Supervised by:	Seal Chen

Contents

Page

COVER PAGE

1 Duty Cycle....3
1.1 Test Result....3
1.2 Test Graphs....4
2 Maximum Conducted Output Power....10
2.1 Test Result....10
3 -6dB Bandwidth....11
3.1 Test Result....11
3.2 Test Graphs....12
4 Maximum Power Spectral Density Level....18
4.1 Test Result....18
4.2 Test Graphs....19
5 Band Edge....25
5.1 Test Result....25
5.2 Test Graphs....26
6 Conducted RF Spurious Emission....34
6.1 Test Result....34
6.2 Test Graphs....35
7 Restrict Band....47
7.1 Test Result....47
7.2 Test Graphs....49

1 Duty Cycle

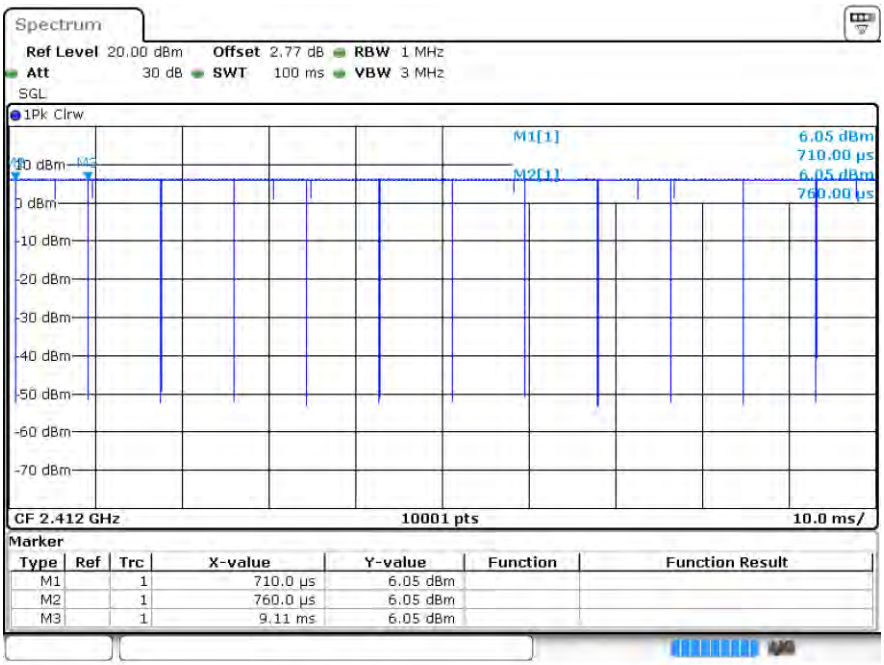
1.1 Test Result

Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	1/T (kHz)
b	2412	Ant1	99.59	0.12
b	2437	Ant1	99.58	0
b	2462	Ant1	99.61	0.12
g	2412	Ant1	86.91	4.76
g	2437	Ant1	87.2	4.76
g	2462	Ant1	86.9	4.76
n20	2412	Ant1	92.9	2.22
n20	2437	Ant1	92.97	2.22
n20	2462	Ant1	92.99	2.22
n40	2422	Ant1	92.93	2.27
n40	2437	Ant1	93.03	2.27
n40	2452	Ant1	92.93	2.27

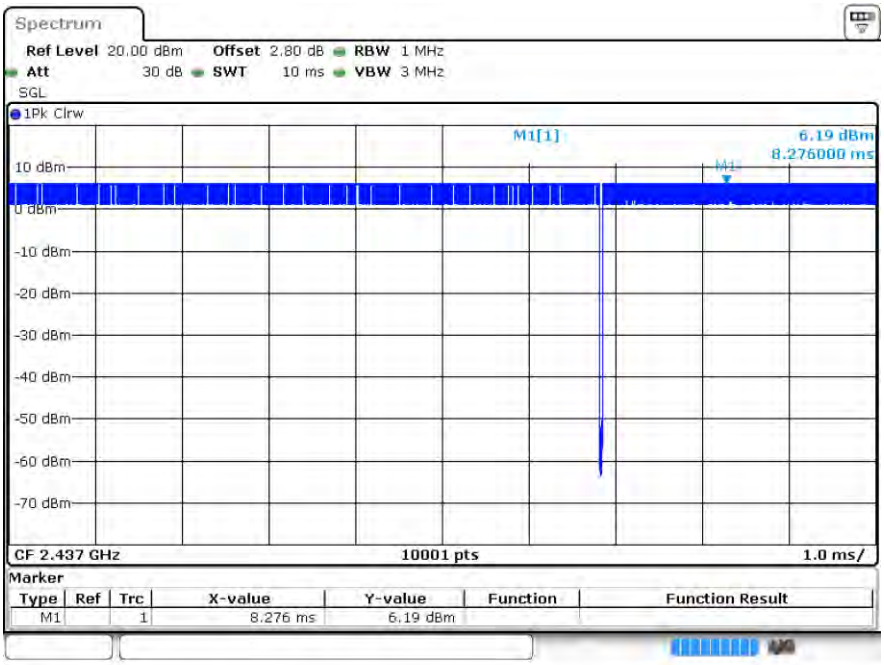
1.2 Test Graphs

Test Graphs

b 2412MHz Ant1

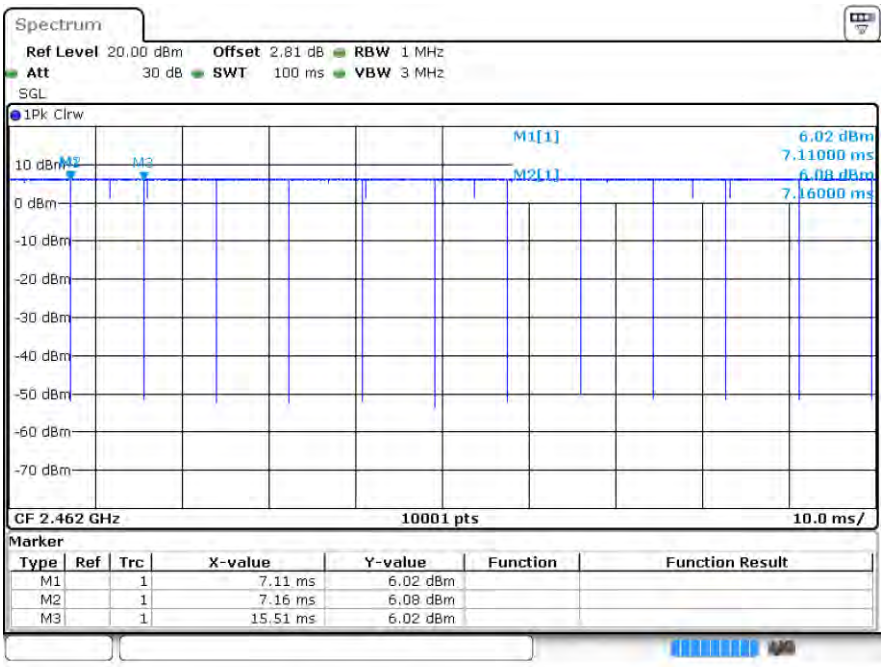


b 2437MHz Ant1

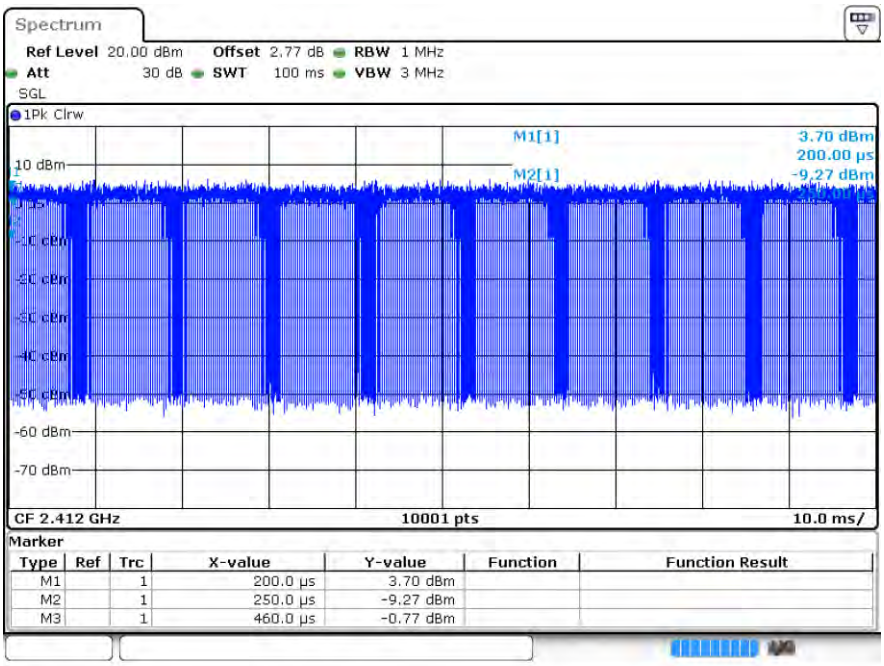


Test Graphs

b 2462MHz Ant1

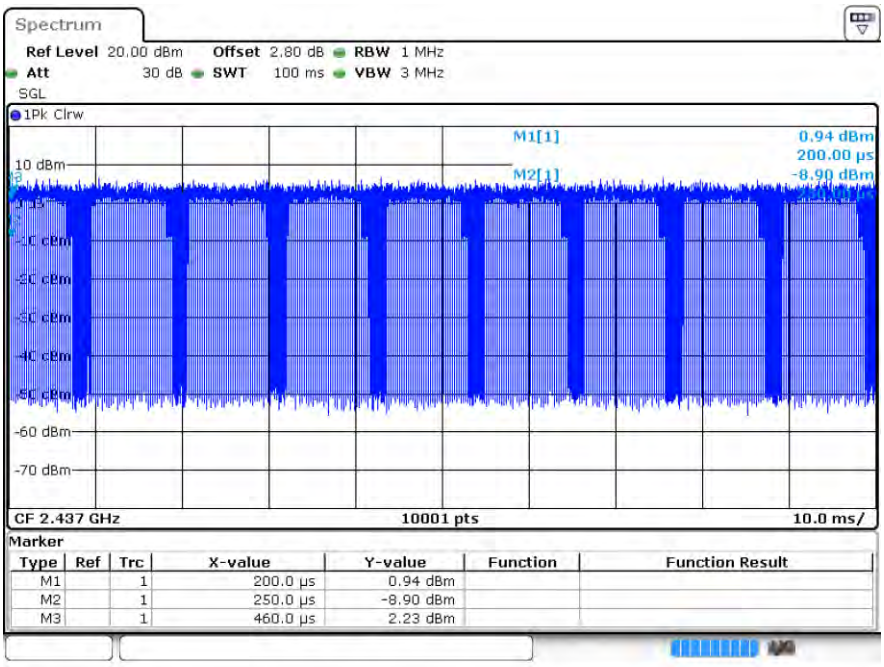


g 2412MHz Ant1

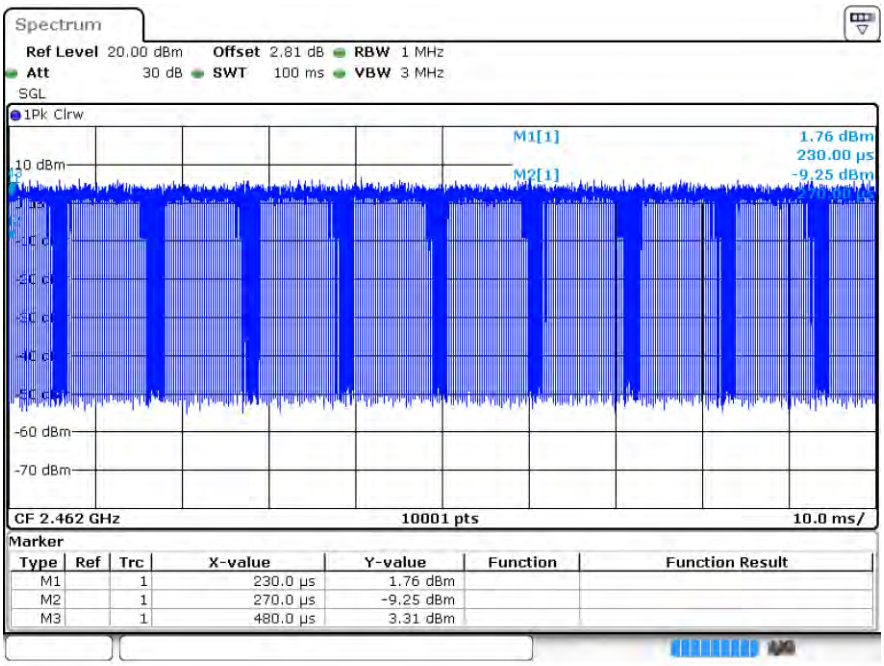


Test Graphs

g 2437MHz Ant1

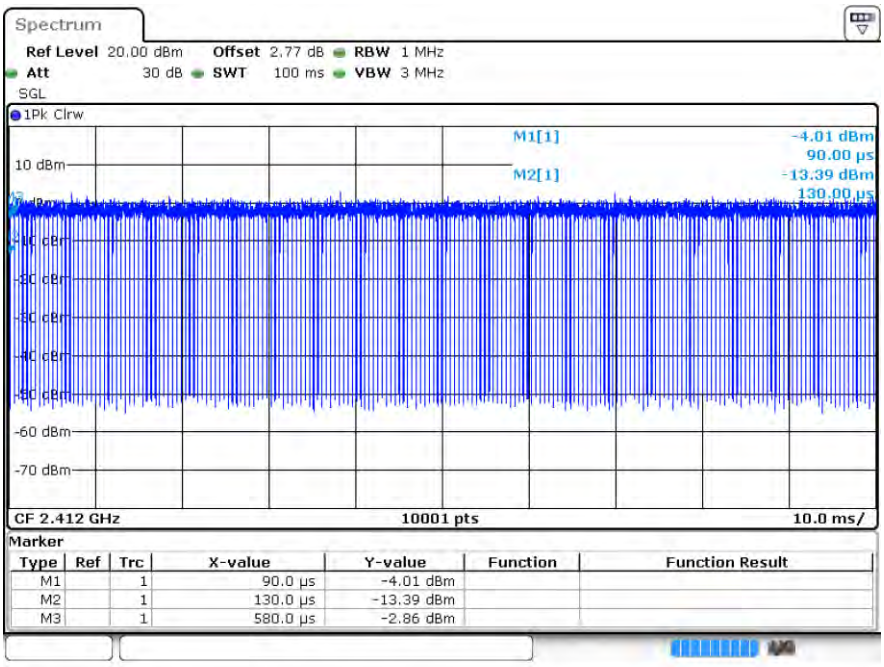


g 2462MHz Ant1

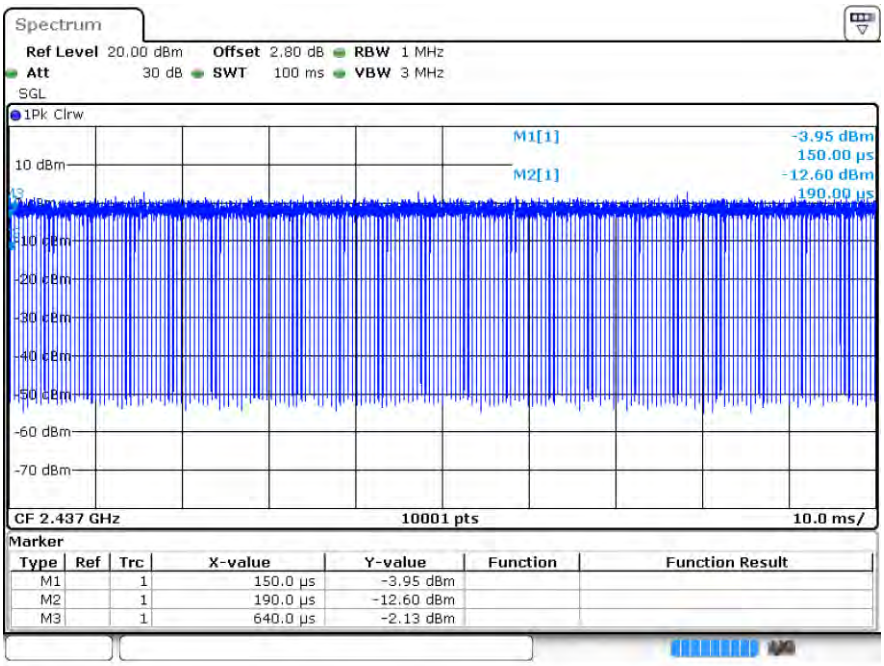


Test Graphs

n20 2412MHz Ant1

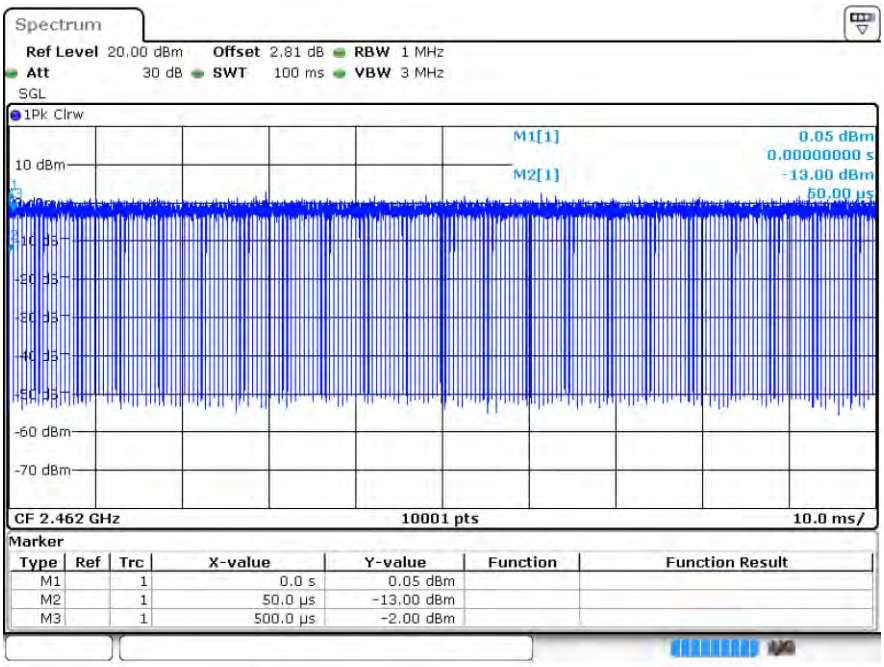


n20 2437MHz Ant1

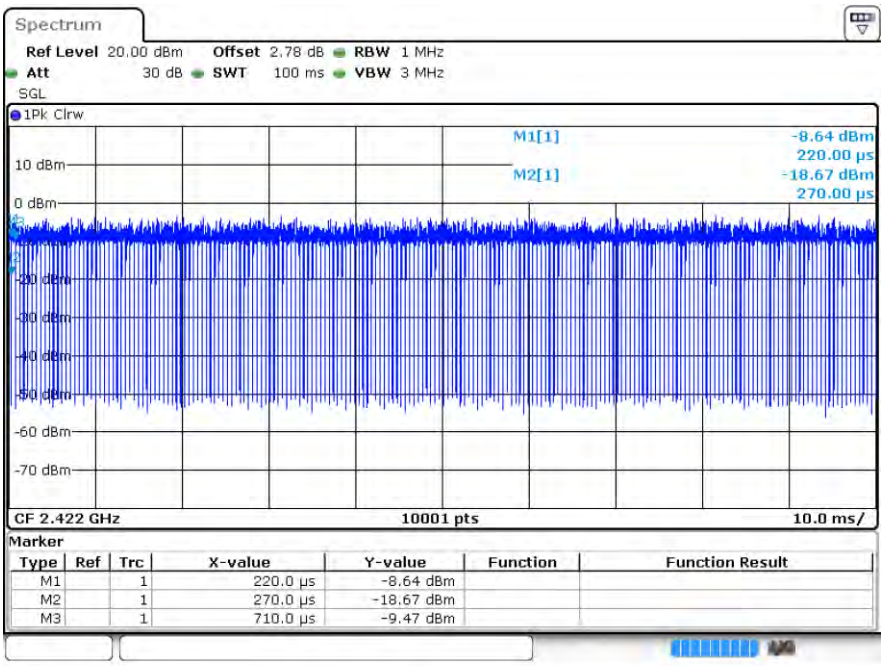


Test Graphs

n20 2462MHz Ant1

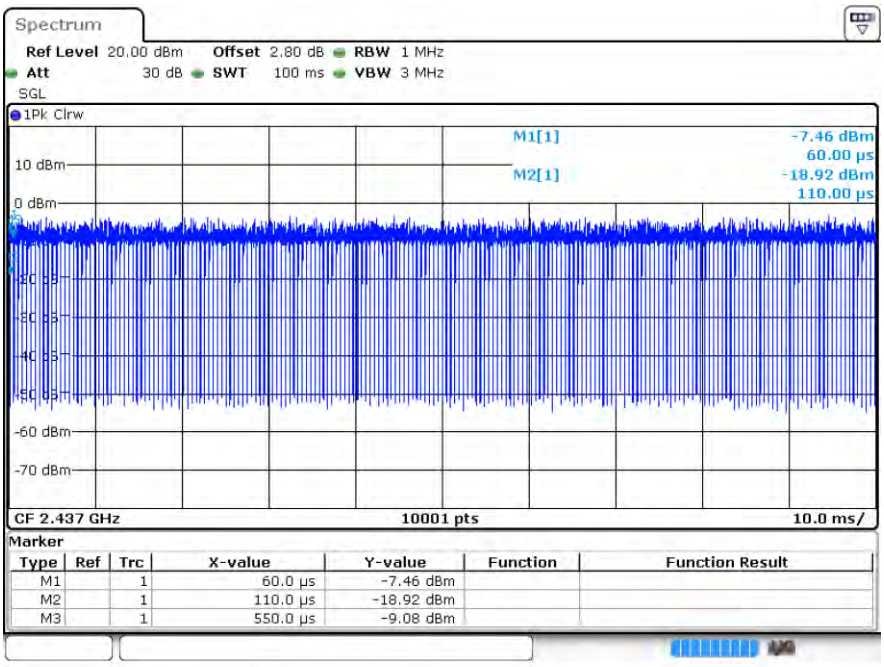


n40 2422MHz Ant1

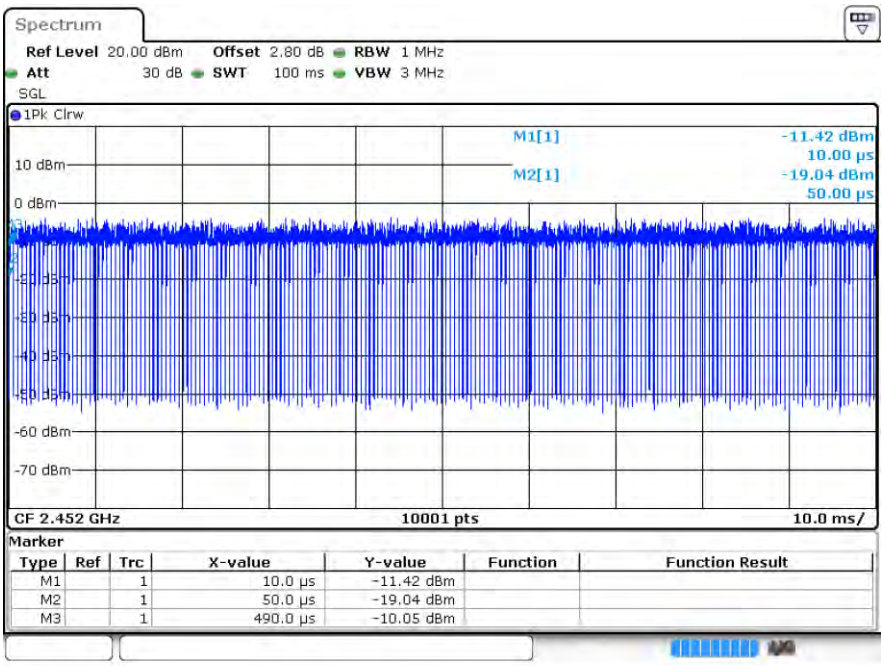


Test Graphs

n40 2437MHz Ant1



n40 2452MHz Ant1



2 Maximum Conducted Output Power

2.1 Test Result

Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
b	2412	Ant1	16.55	30	Pass
b	2437	Ant1	16.65	30	Pass
b	2462	Ant1	16.57	30	Pass
g	2412	Ant1	15.69	30	Pass
g	2437	Ant1	15.71	30	Pass
g	2462	Ant1	15.49	30	Pass
n20	2412	Ant1	11.8	30	Pass
n20	2437	Ant1	11.86	30	Pass
n20	2462	Ant1	11.67	30	Pass
n40	2422	Ant1	12.94	30	Pass
n40	2437	Ant1	12.83	30	Pass
n40	2452	Ant1	12.83	30	Pass

3 -6dB Bandwidth

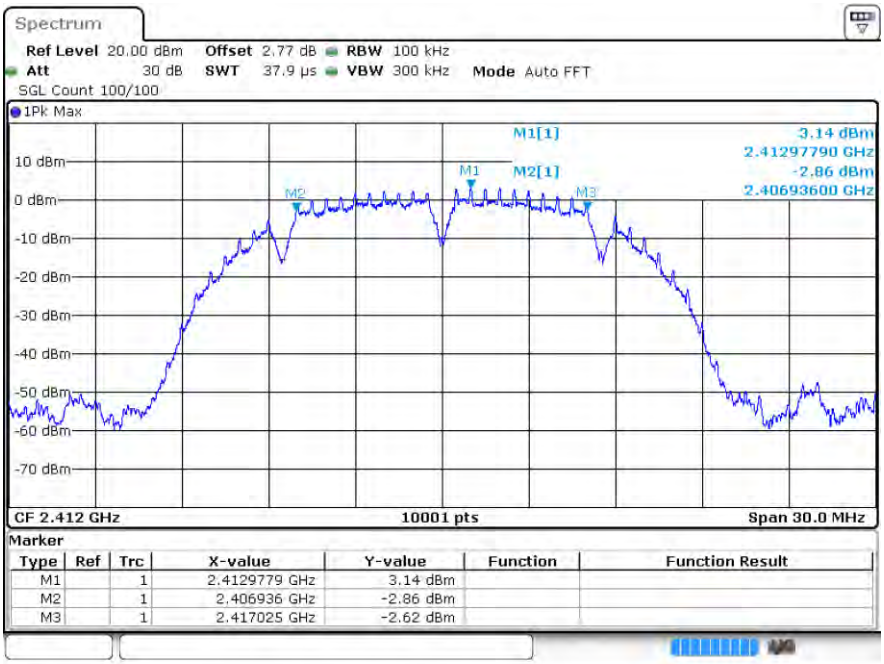
3.1 Test Result

Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
b	2412	Ant1	10.089	0.5	Pass
b	2437	Ant1	10.083	0.5	Pass
b	2462	Ant1	10.092	0.5	Pass
g	2412	Ant1	15.117	0.5	Pass
g	2437	Ant1	15.102	0.5	Pass
g	2462	Ant1	15.111	0.5	Pass
n20	2412	Ant1	17.529	0.5	Pass
n20	2437	Ant1	15.105	0.5	Pass
n20	2462	Ant1	12.837	0.5	Pass
n40	2422	Ant1	35.112	0.5	Pass
n40	2437	Ant1	30.702	0.5	Pass
n40	2452	Ant1	35.022	0.5	Pass

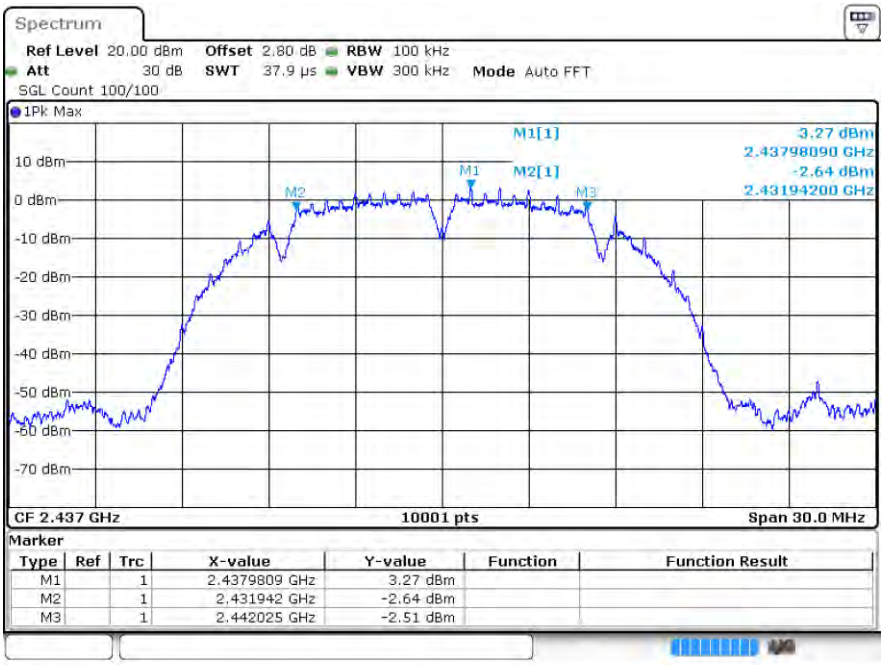
3.2 Test Graphs

Test Graphs

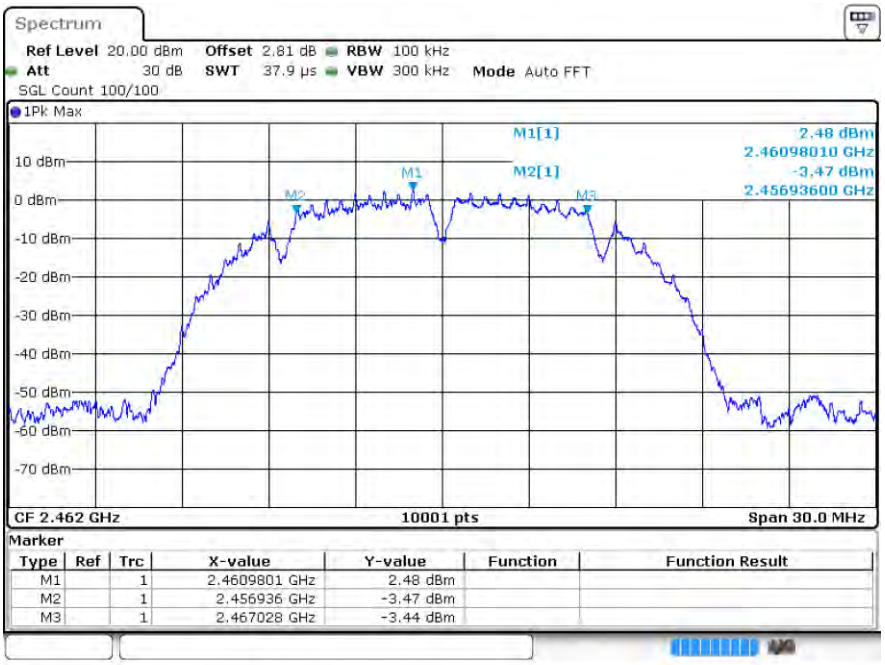
b 2412MHz Ant1



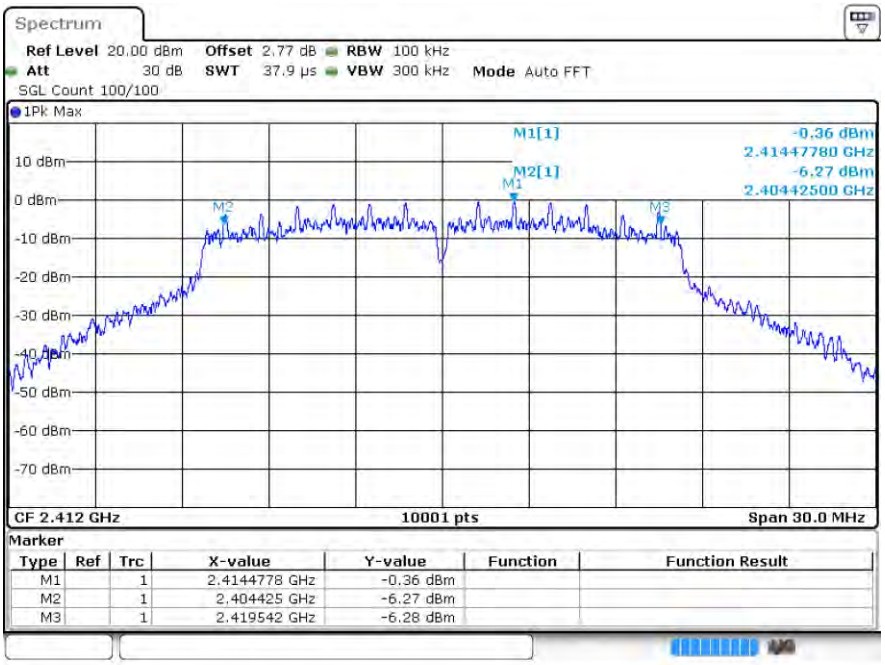
b 2437MHz Ant1



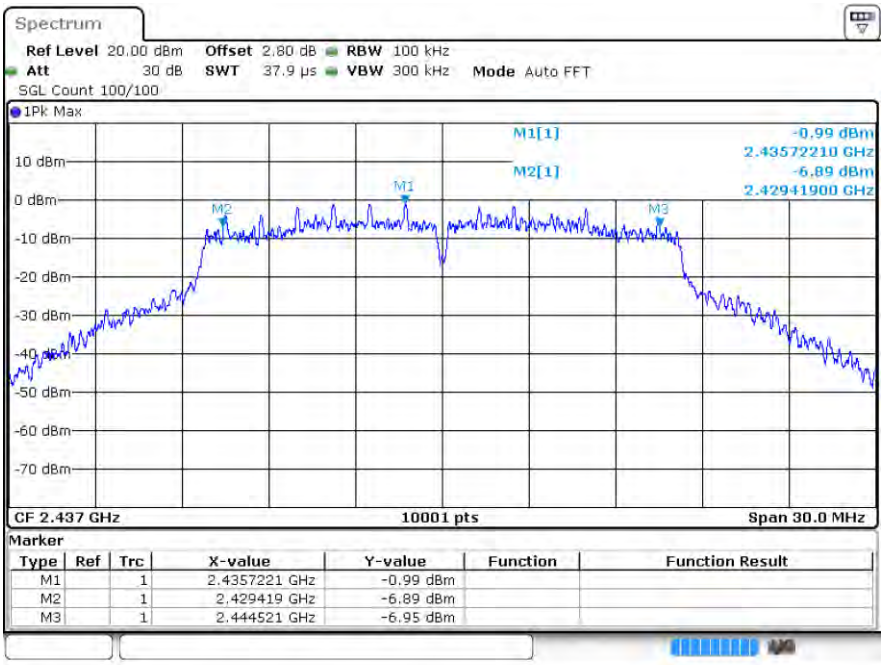
b 2462MHz Ant1



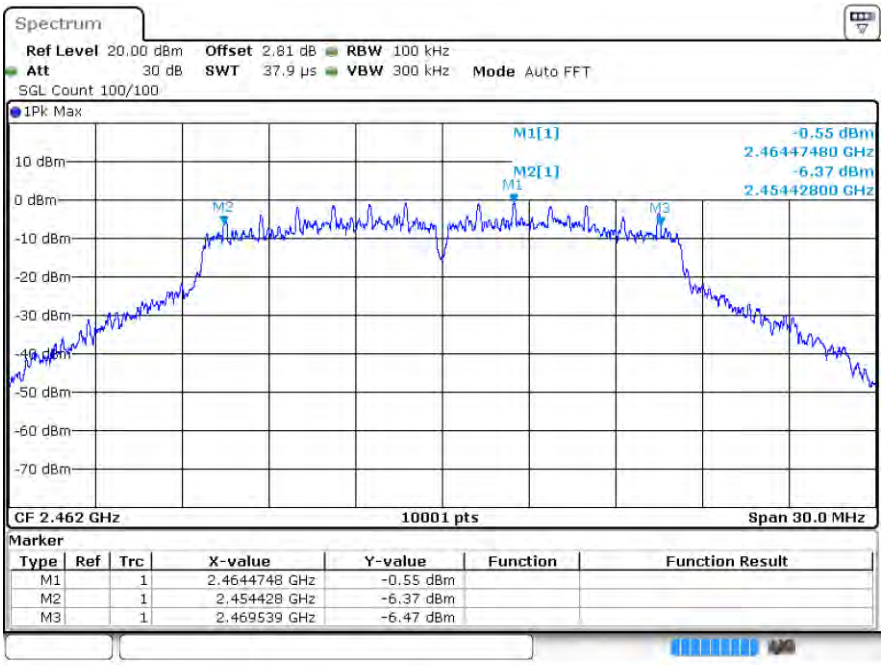
g 2412MHz Ant1



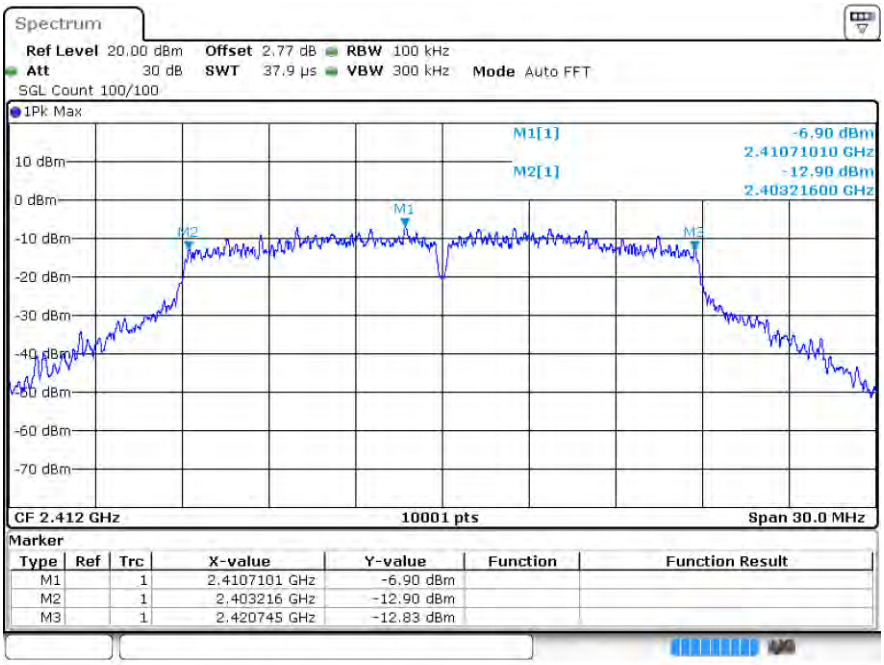
g 2437MHz Ant1



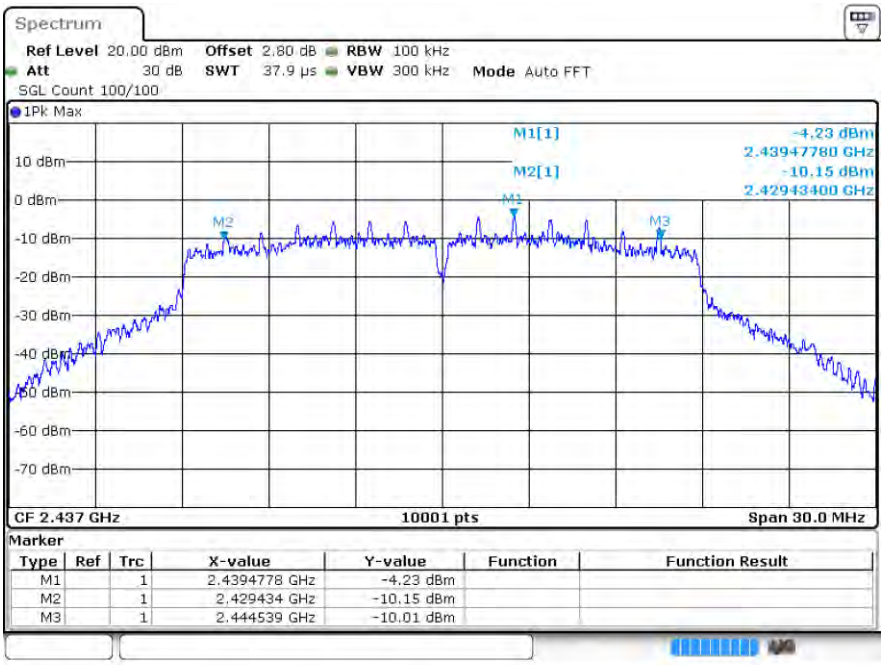
g 2462MHz Ant1



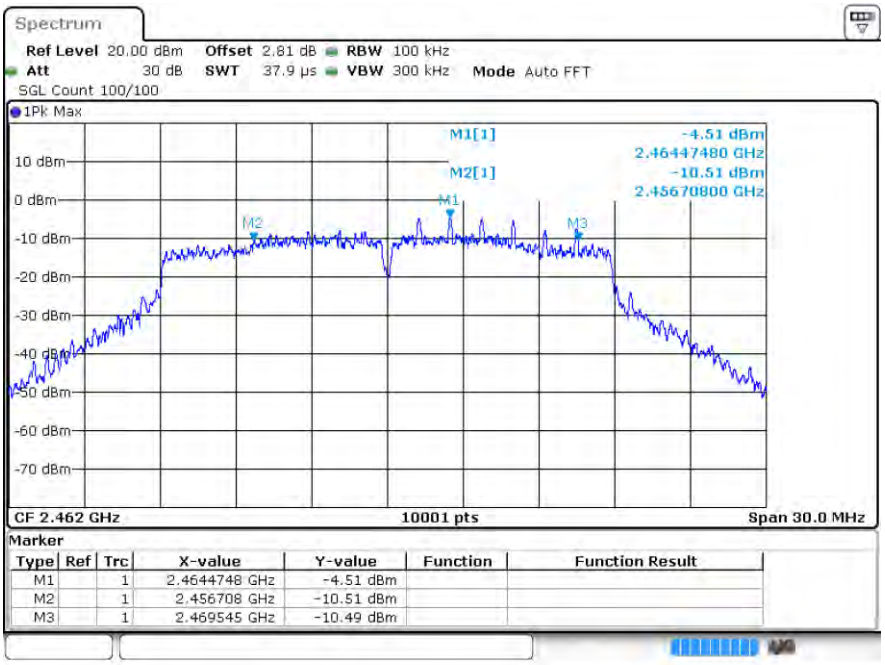
n20 2412MHz Ant1



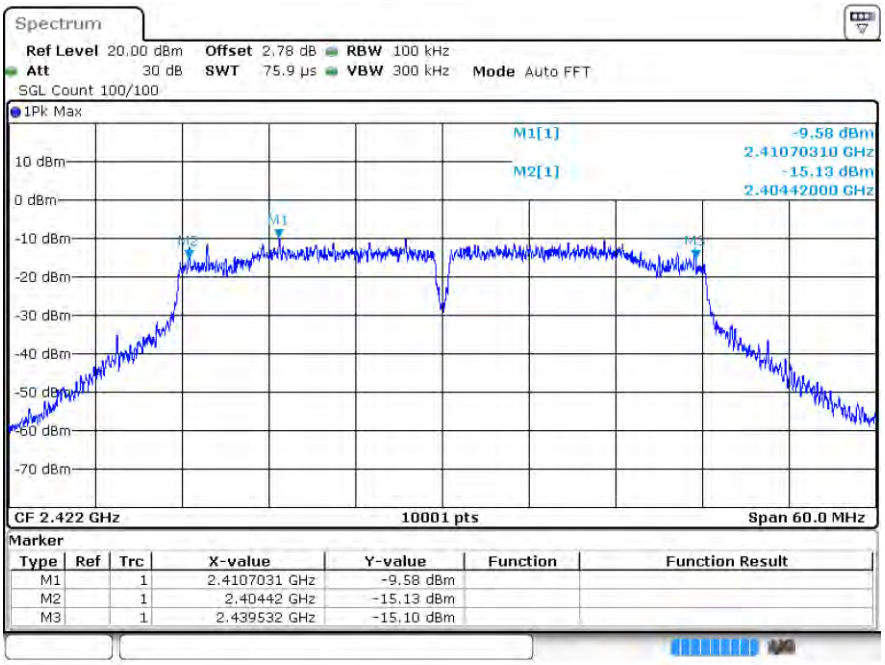
n20 2437MHz Ant1



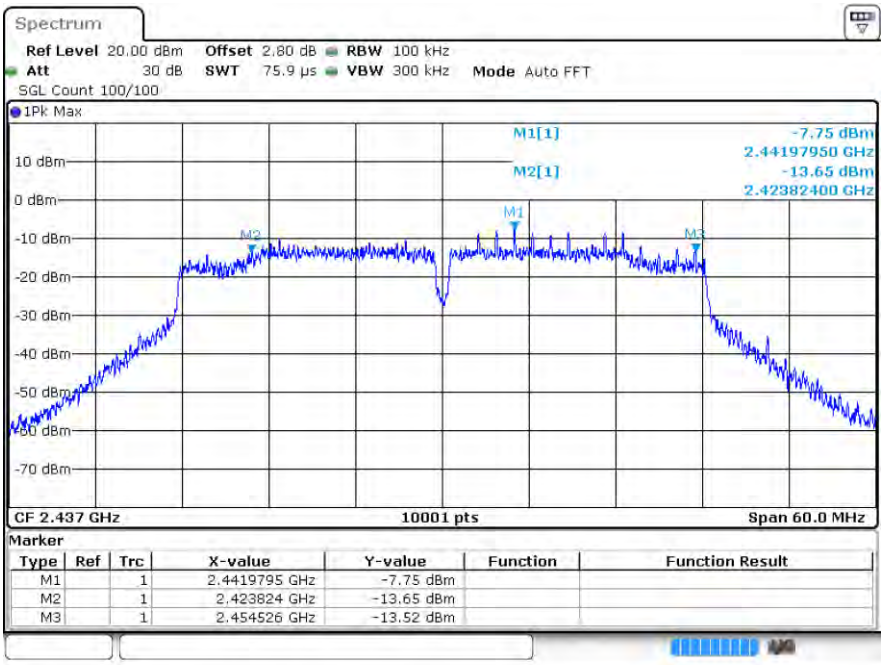
n20 2462MHz Ant1



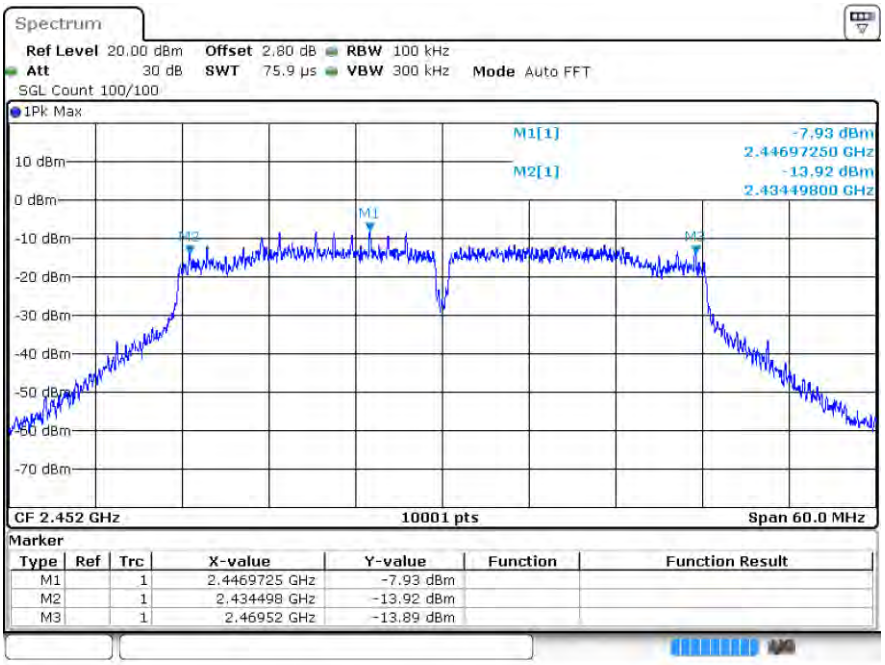
n40 2422MHz Ant1



n40 2437MHz Ant1



n40 2452MHz Ant1

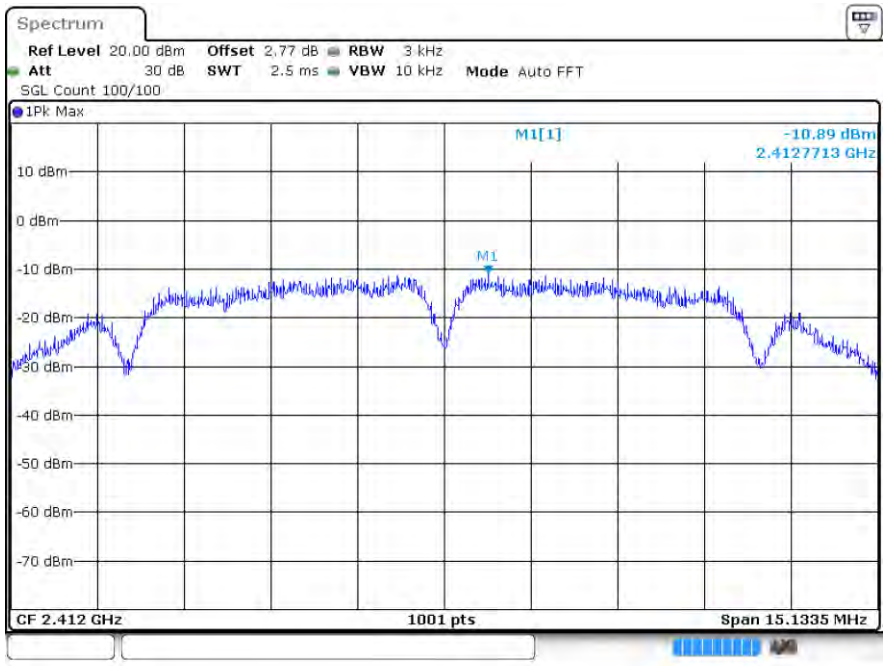
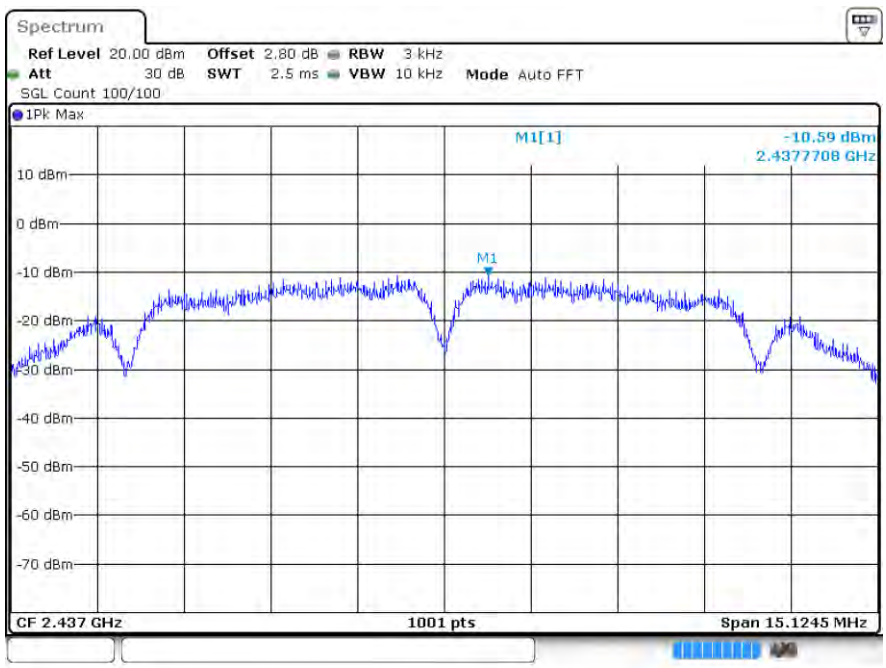


4 Maximum Power Spectral Density Level

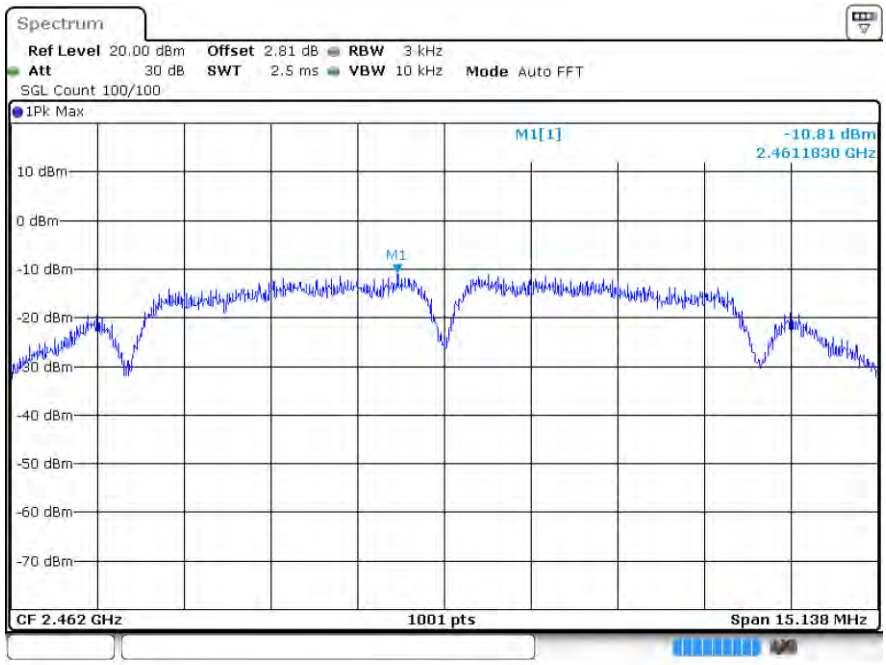
4.1 Test Result

Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3-100kHz)	Limit (dBm/3kHz)	Verdict
b	2412	Ant1	-10.89	≤8	Pass
b	2437	Ant1	-10.59	≤8	Pass
b	2462	Ant1	-10.81	≤8	Pass
g	2412	Ant1	-14.27	≤8	Pass
g	2437	Ant1	-14.72	≤8	Pass
g	2462	Ant1	-15.24	≤8	Pass
n20	2412	Ant1	-18.64	≤8	Pass
n20	2437	Ant1	-18.66	≤8	Pass
n20	2462	Ant1	-18.38	≤8	Pass
n40	2422	Ant1	-21.41	≤8	Pass
n40	2437	Ant1	-21.57	≤8	Pass
n40	2452	Ant1	-21.5	≤8	Pass

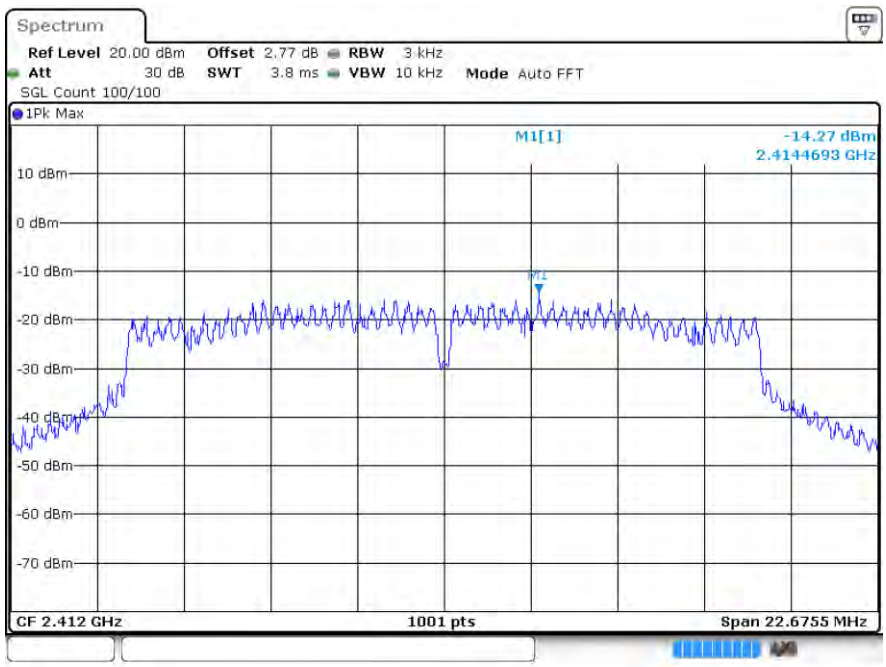
4.2 Test Graphs

Test Graphs
b 2412MHz Ant1

b 2437MHz Ant1


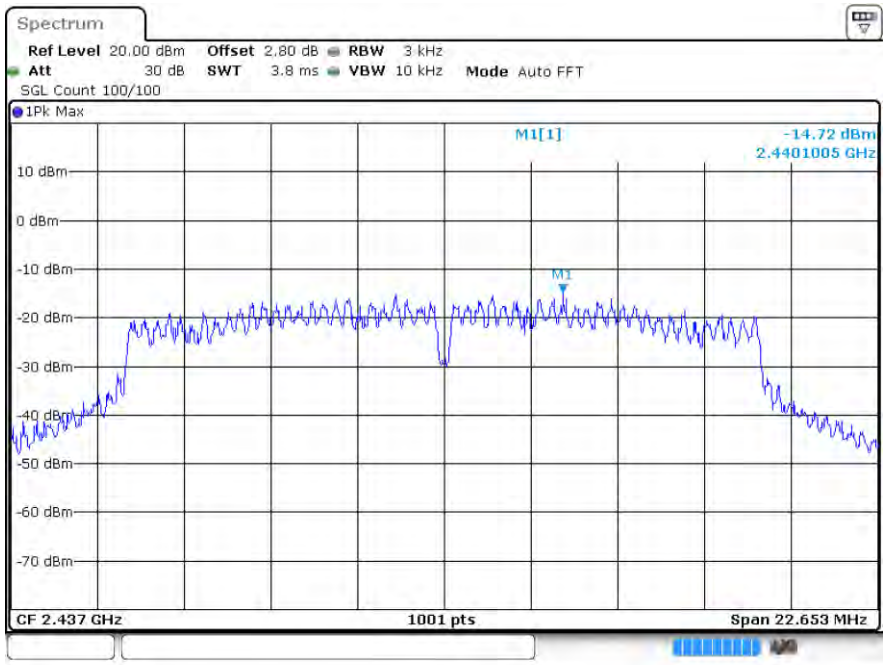
b 2462MHz Ant1



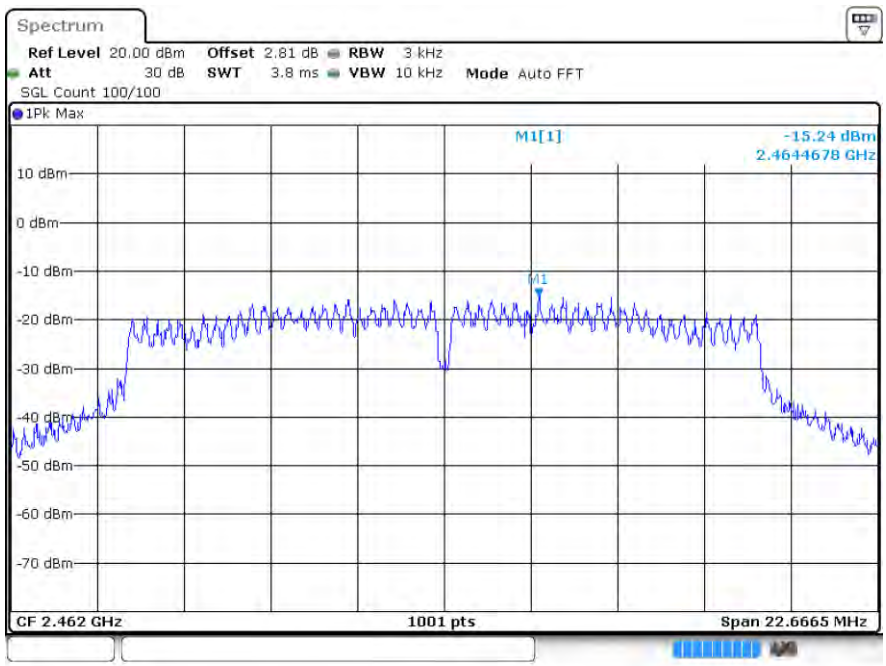
g 2412MHz Ant1



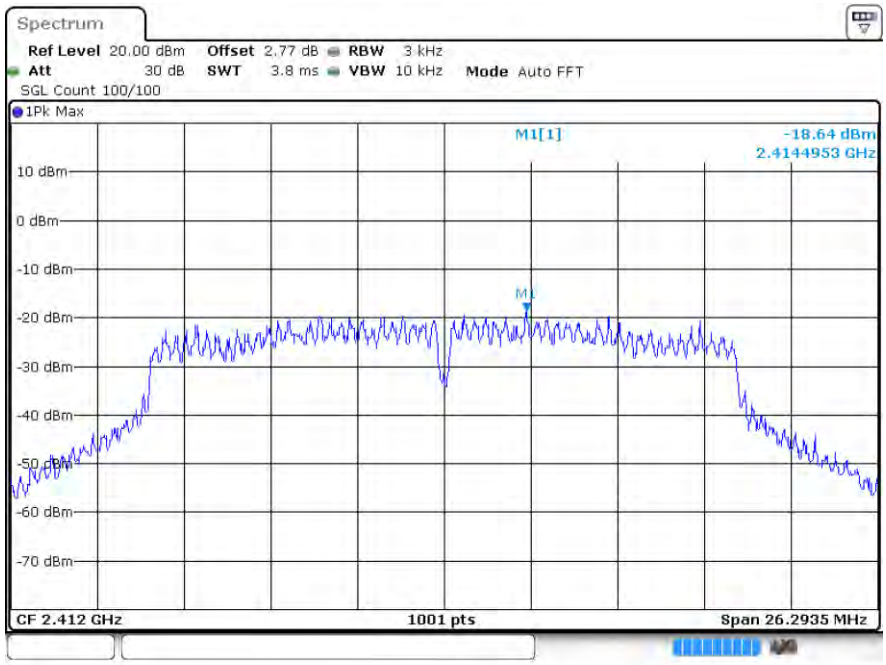
g 2437MHz Ant1



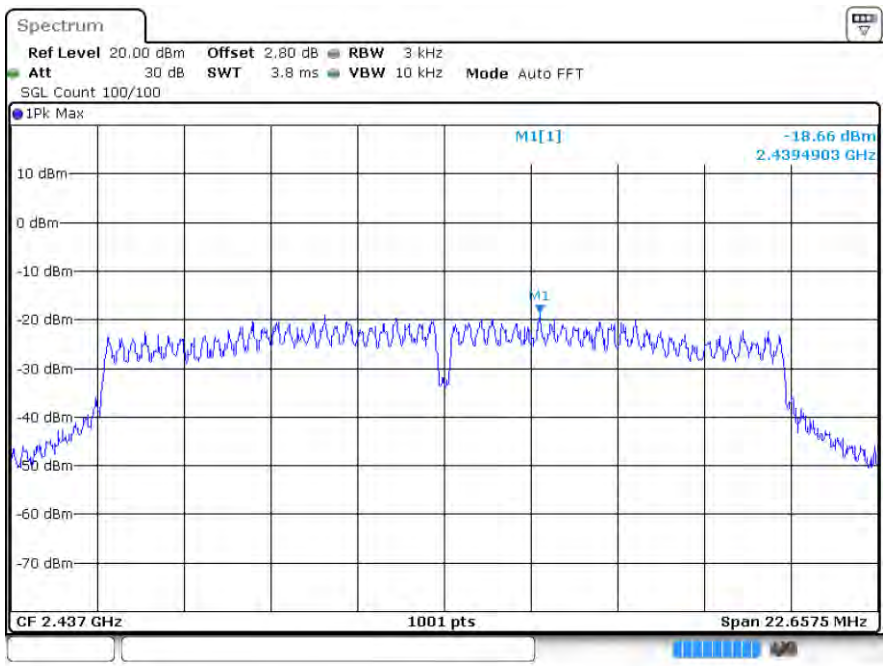
g 2462MHz Ant1



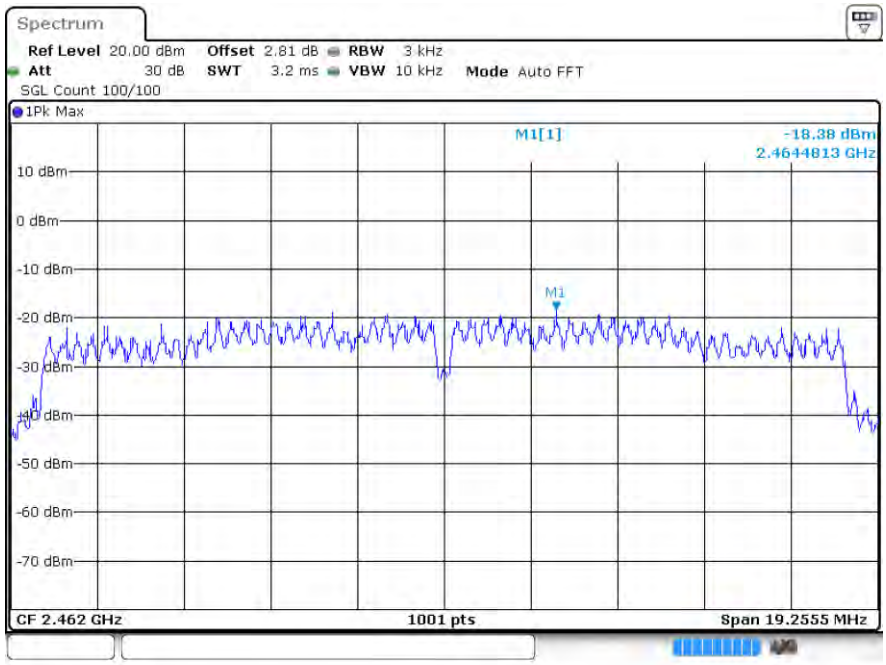
n20 2412MHz Ant1



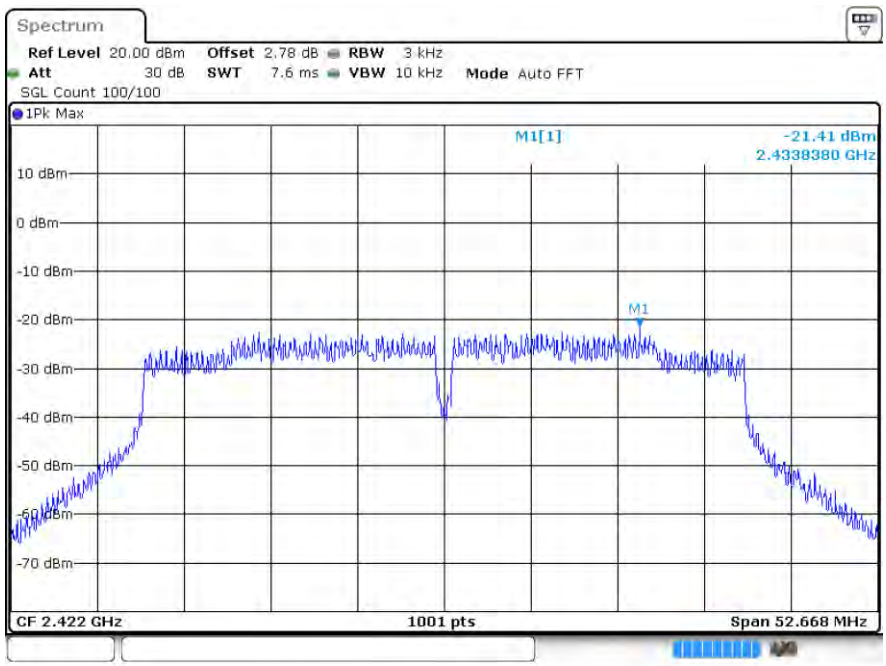
n20 2437MHz Ant1



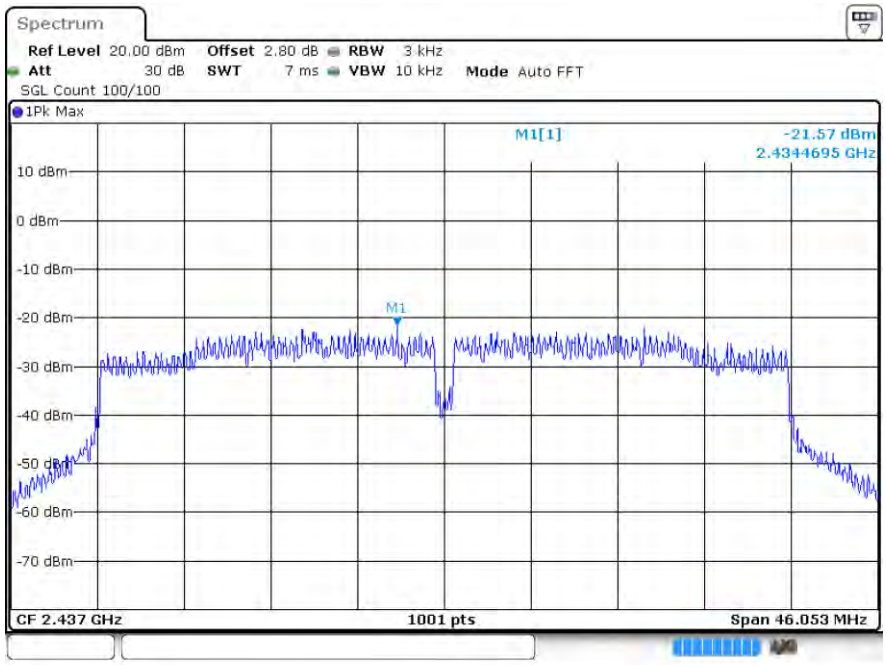
n20 2462MHz Ant1



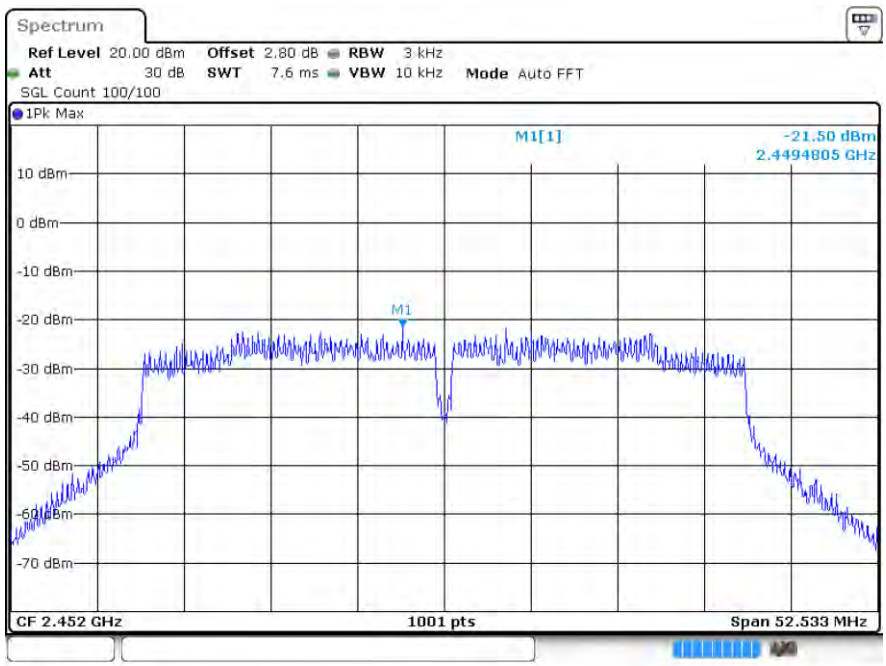
n40 2422MHz Ant1



n40 2437MHz Ant1



n40 2452MHz Ant1



5 Band Edge

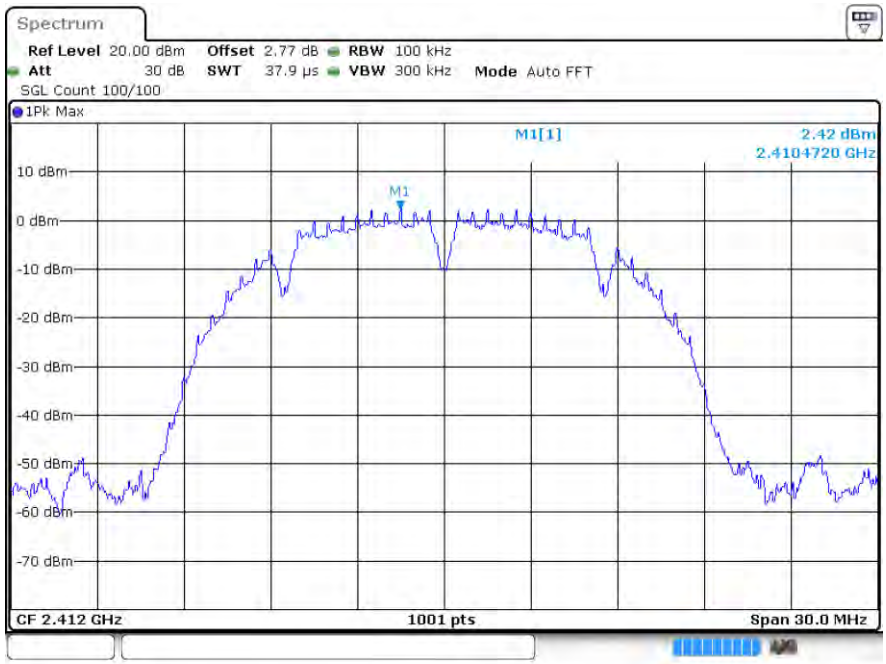
5.1 Test Result

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
b	2412	Ant1	-55.07	-20	-55.07
b	2462	Ant1	-56.73	-20	Pass
g	2412	Ant1	-54.26	-20	Pass
g	2462	Ant1	-54.16	-20	Pass
n20	2412	Ant1	-49.51	-20	Pass
n20	2462	Ant1	-51.49	-20	Pass
n40	2422	Ant1	-48.61	-20	Pass
n40	2452	Ant1	-47.06	-20	Pass

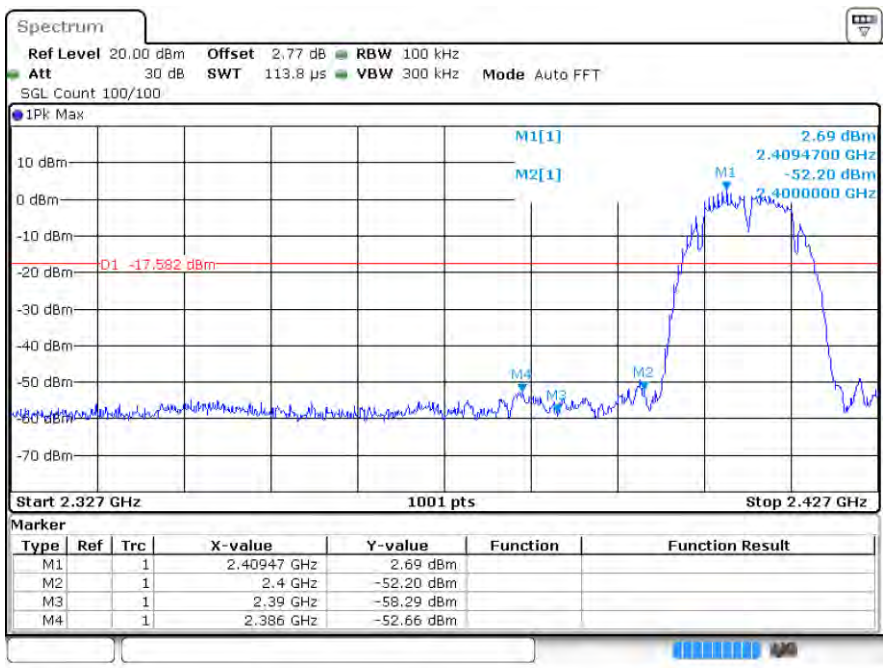
5.2 Test Graphs

Test Graphs

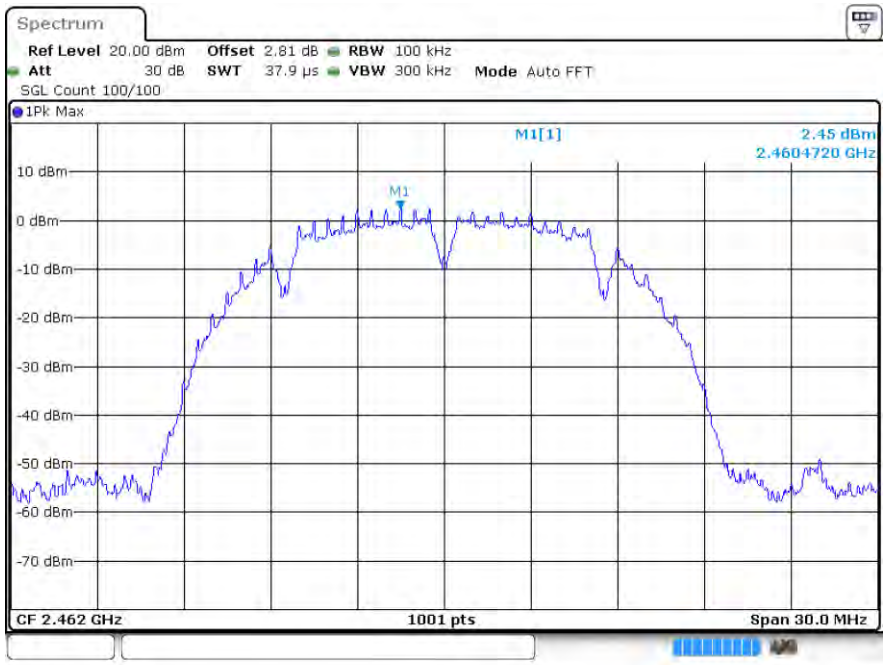
b 2412MHz Ant1 Ref



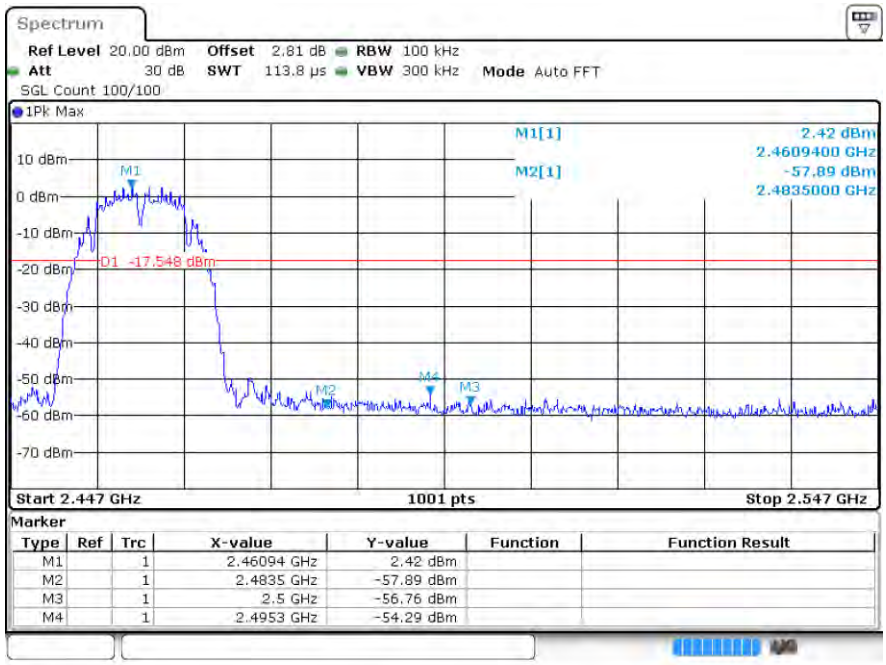
b 2412MHz Ant1 Emission



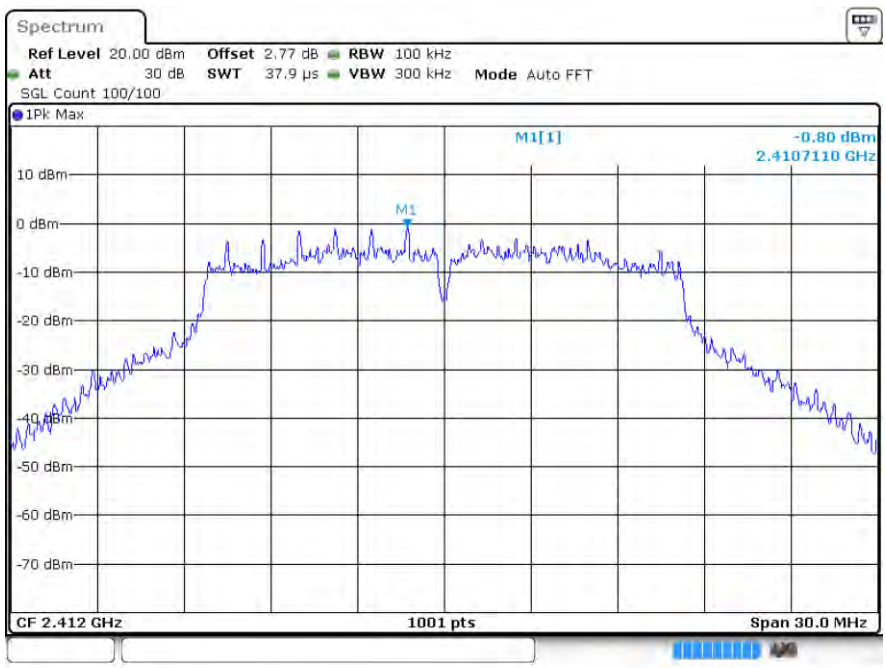
b 2462MHz Ant1 Ref



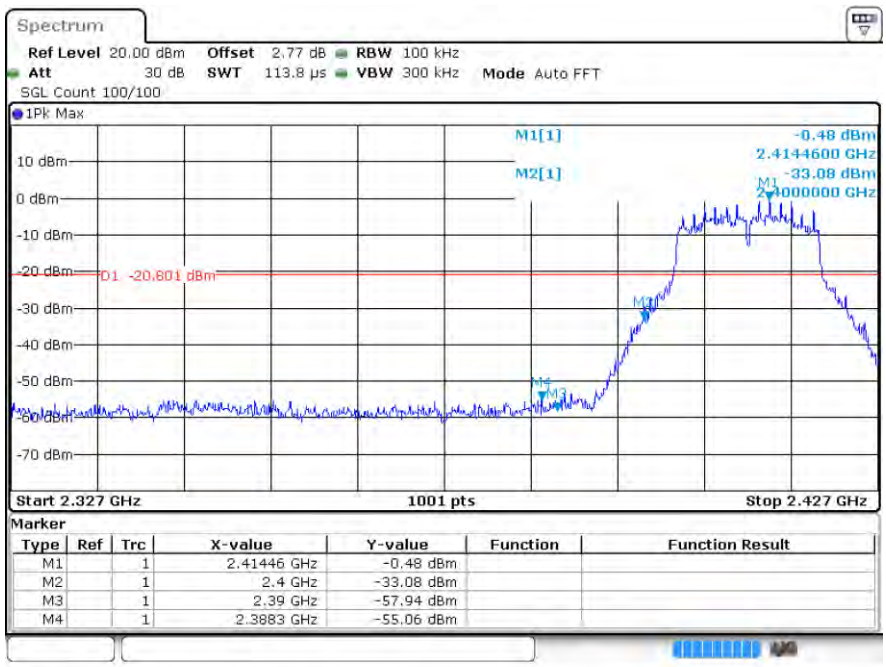
b 2462MHz Ant1 Emission



g 2412MHz Ant1 Ref



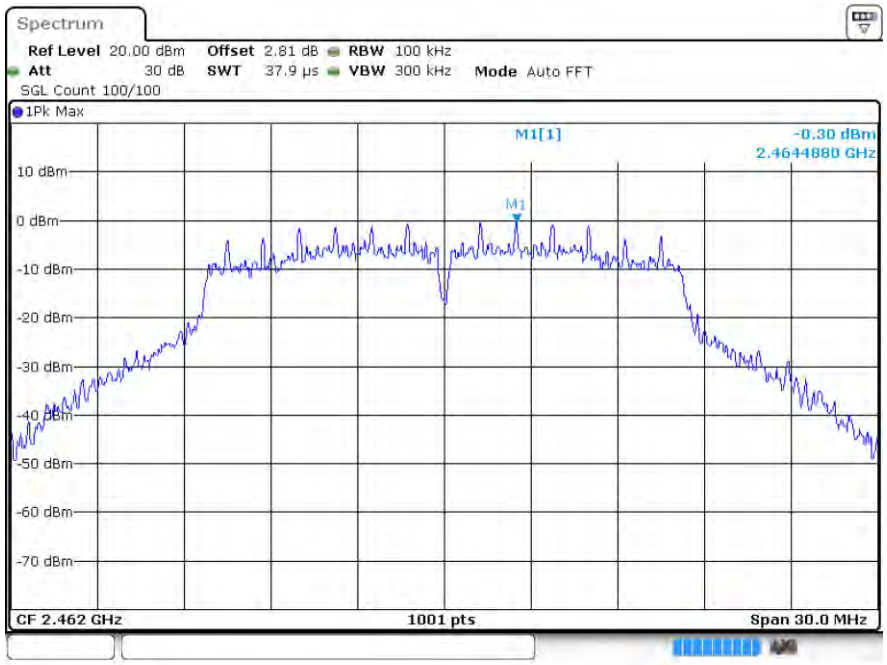
g 2412MHz Ant1 Emission



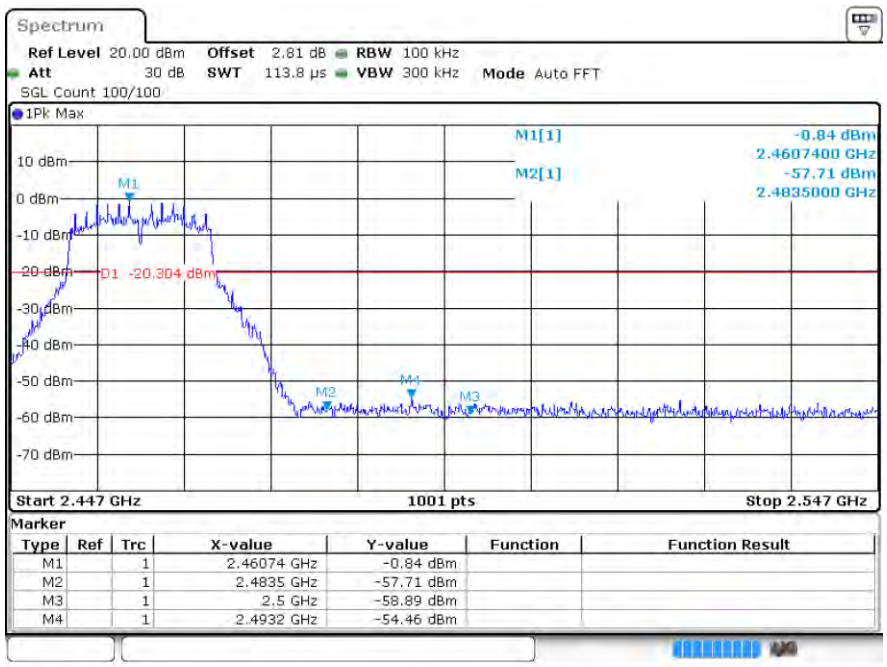
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.41446 GHz	-0.48 dBm		
M2		1	2.4 GHz	-33.08 dBm		
M3		1	2.39 GHz	-57.94 dBm		
M4		1	2.3883 GHz	-55.06 dBm		

g 2462MHz Ant1 Ref



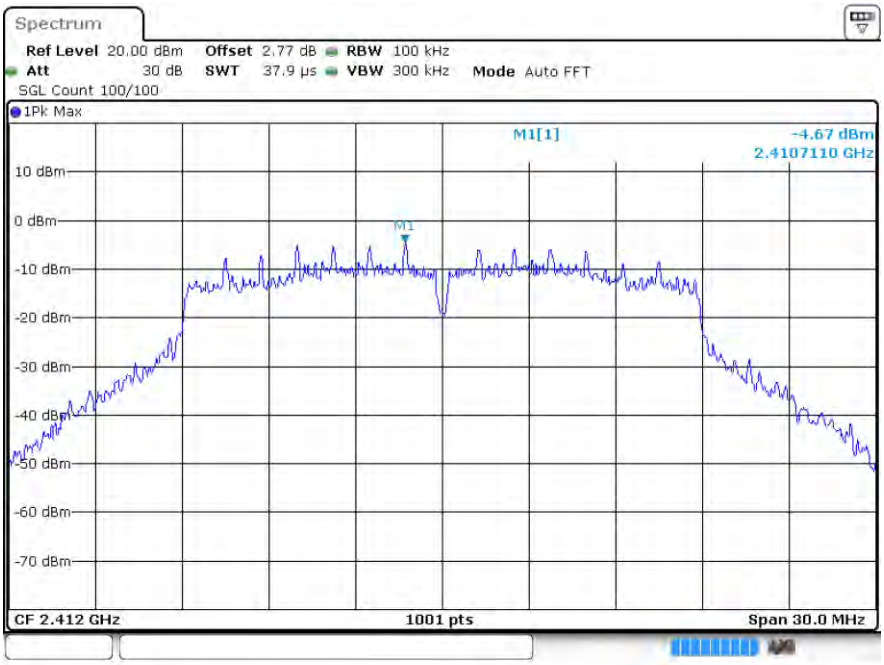
g 2462MHz Ant1 Emission



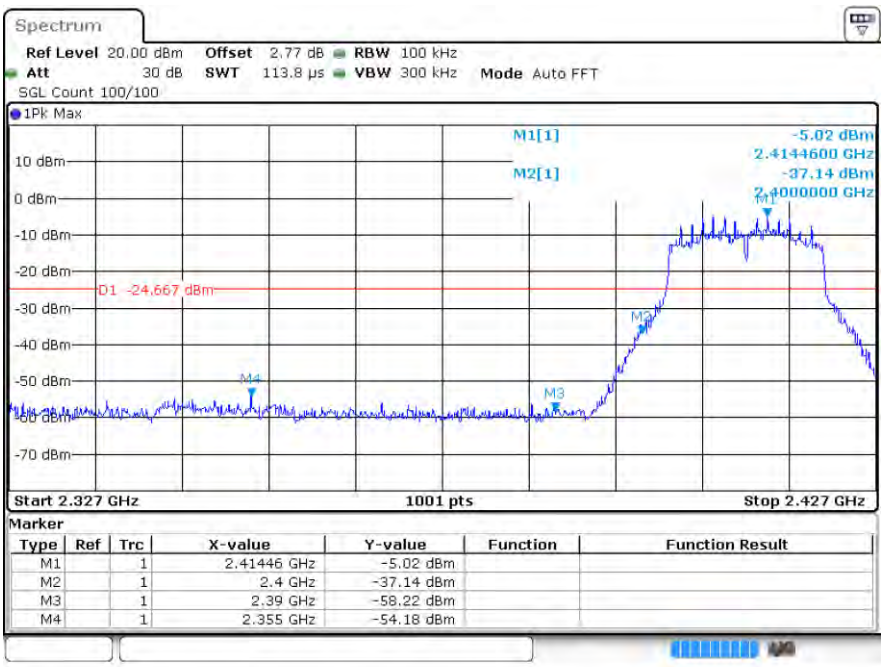
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.46074 GHz	-0.84 dBm		
M2		1	2.4835 GHz	-57.71 dBm		
M3		1	2.5 GHz	-58.89 dBm		
M4		1	2.4932 GHz	-54.46 dBm		

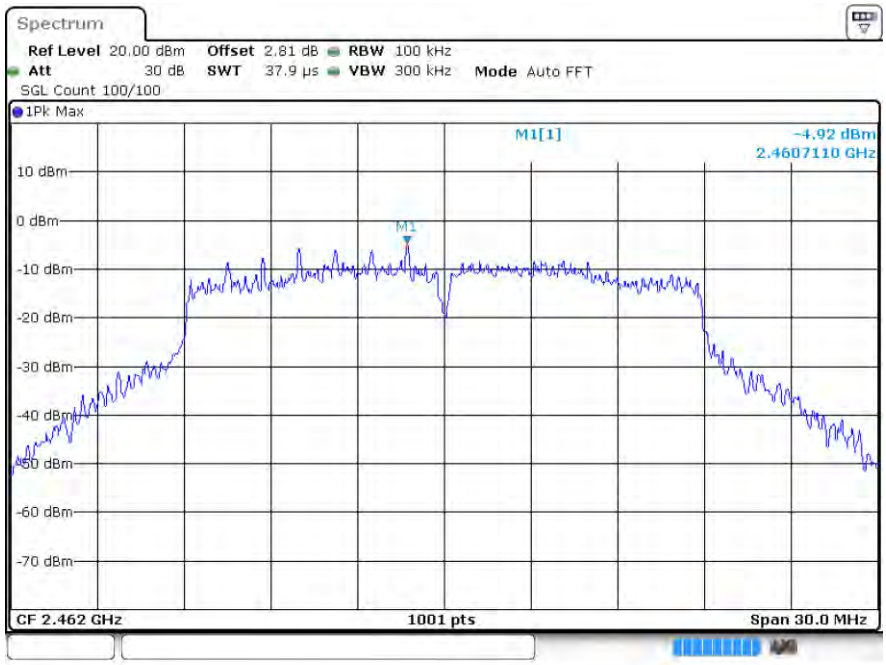
n20 2412MHz Ant1 Ref



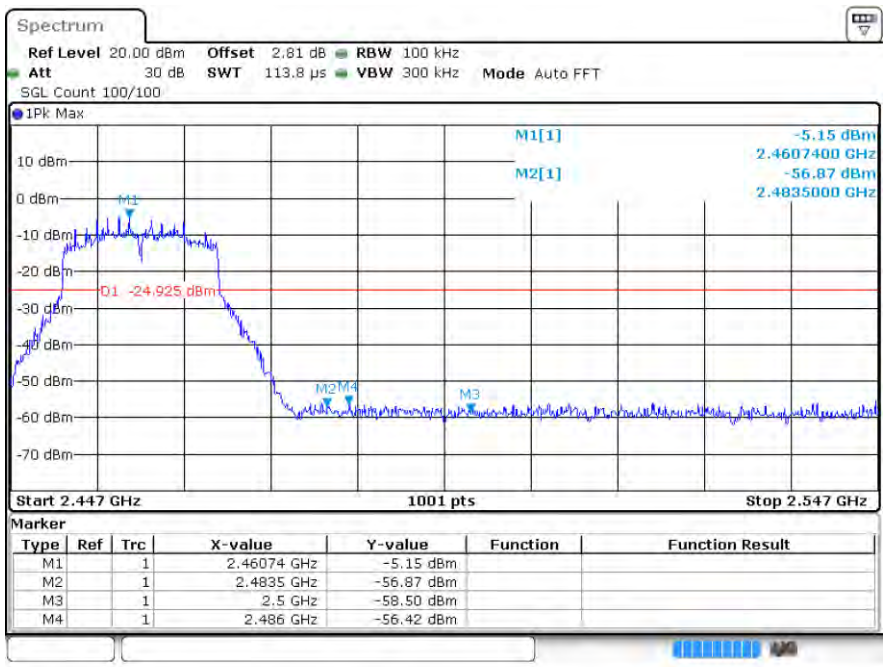
n20 2412MHz Ant1 Emission



n20 2462MHz Ant1 Ref

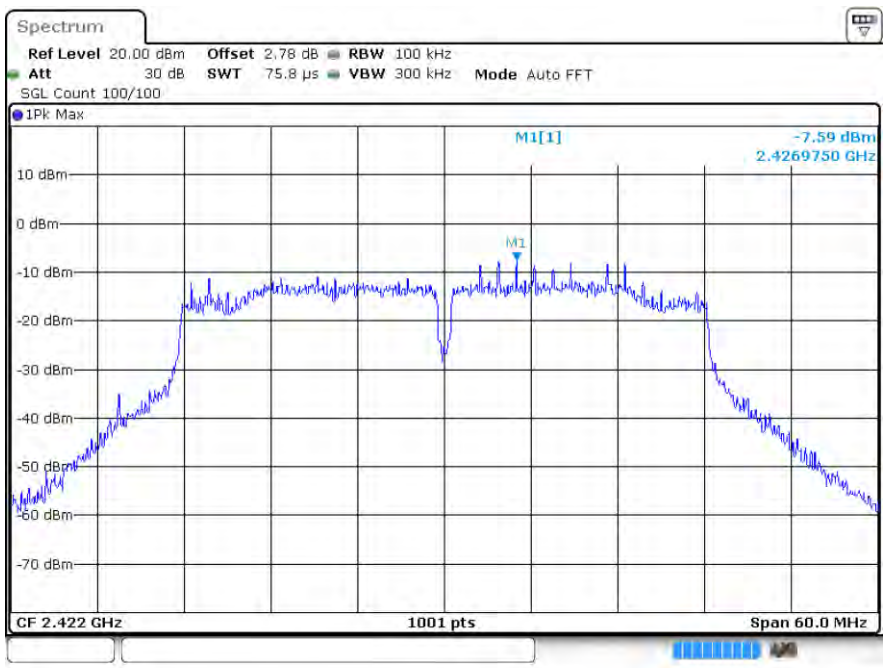


n20 2462MHz Ant1 Emission

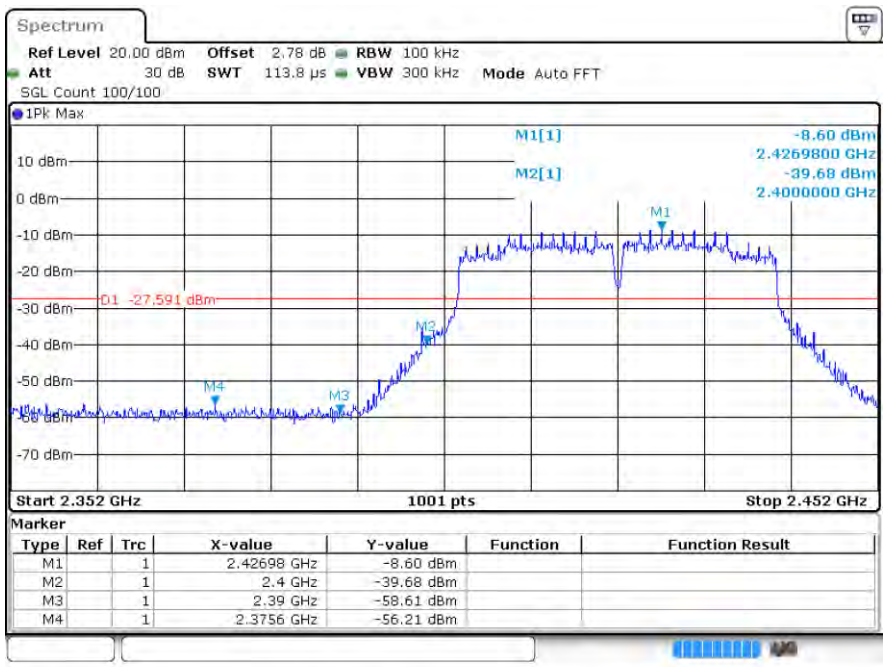


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.46074 GHz	-5.15 dBm		
M2		1	2.4835 GHz	-56.87 dBm		
M3		1	2.5 GHz	-58.50 dBm		
M4		1	2.486 GHz	-56.42 dBm		

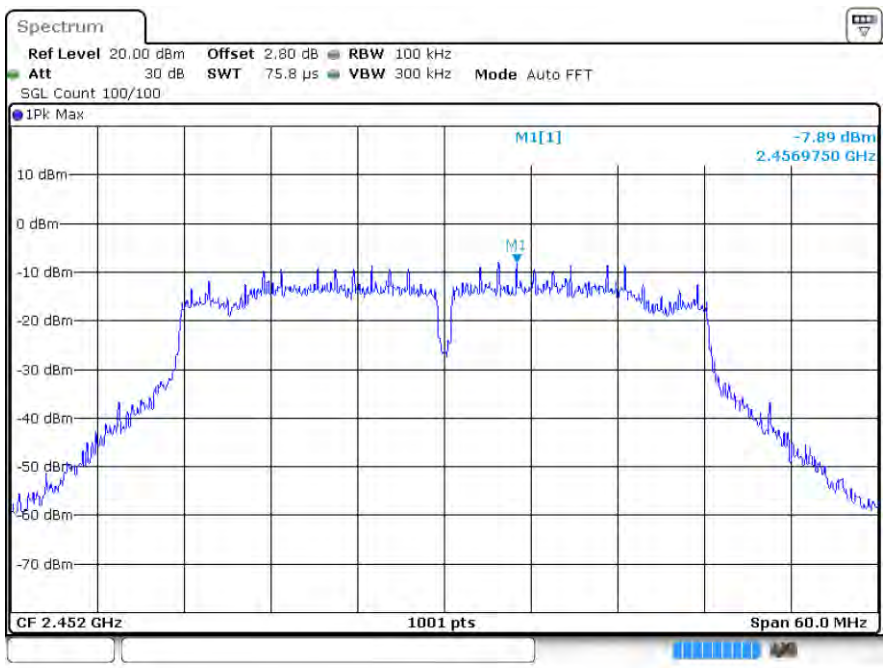
n40 2422MHz Ant1 Ref



n40 2422MHz Ant1 Emission



n40 2452MHz Ant1 Ref



n40 2452MHz Ant1 Emission

6 Conducted RF Spurious Emission

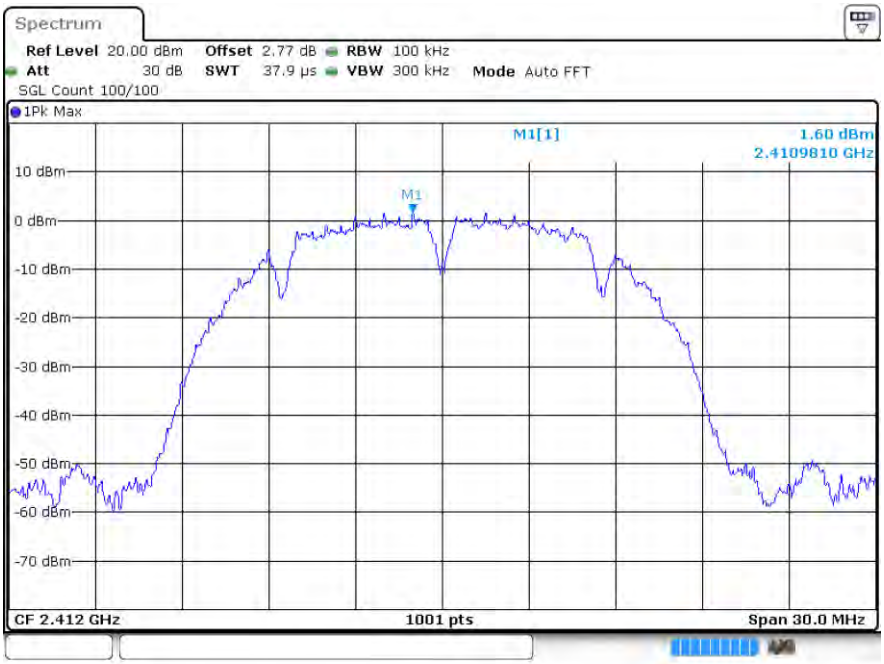
6.1 Test Result

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
b	2412	Ant1	-46.86	-20	Pass
b	2437	Ant1	-48.34	-20	Pass
b	2462	Ant1	-48.2	-20	Pass
g	2412	Ant1	-44.78	-20	Pass
g	2437	Ant1	-45.25	-20	Pass
g	2462	Ant1	-44.26	-20	Pass
n20	2412	Ant1	-40.84	-20	Pass
n20	2437	Ant1	-40.69	-20	Pass
n20	2462	Ant1	-41.33	-20	Pass
n40	2422	Ant1	-37.01	-20	Pass
n40	2437	Ant1	-37.57	-20	Pass
n40	2452	Ant1	-34.87	-20	Pass

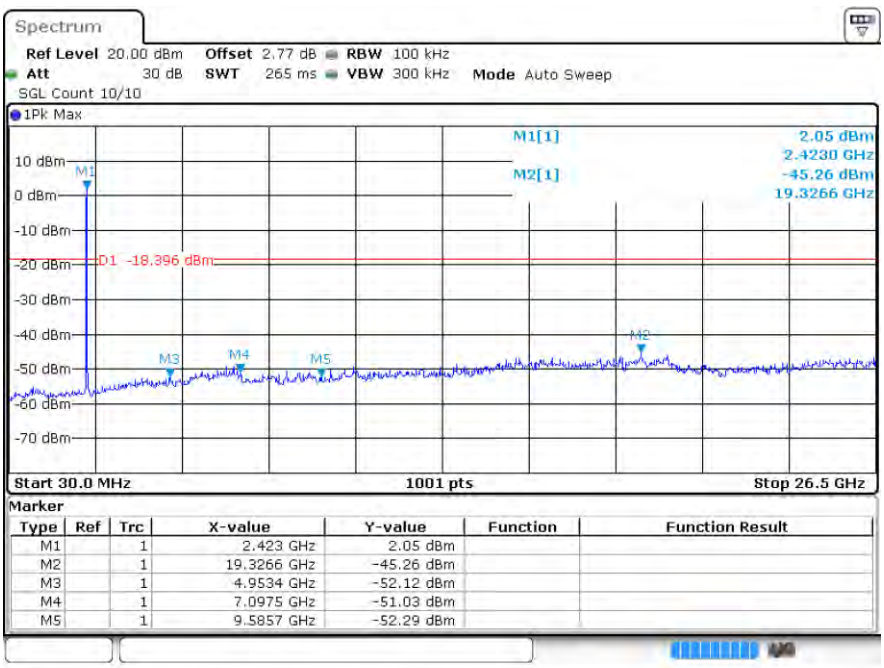
6.2 Test Graphs

Test Graphs

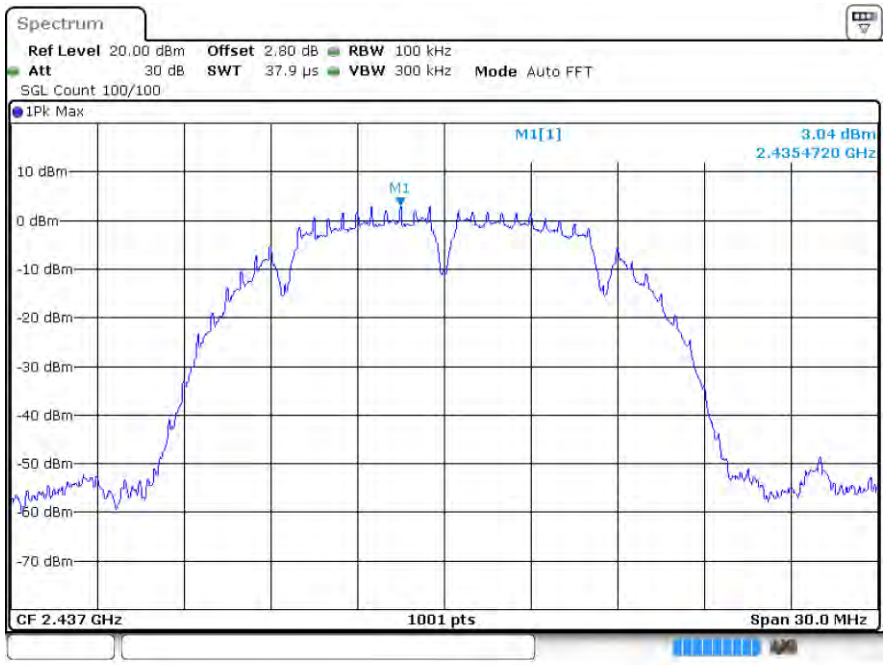
b 2412MHz Ant1 Ref



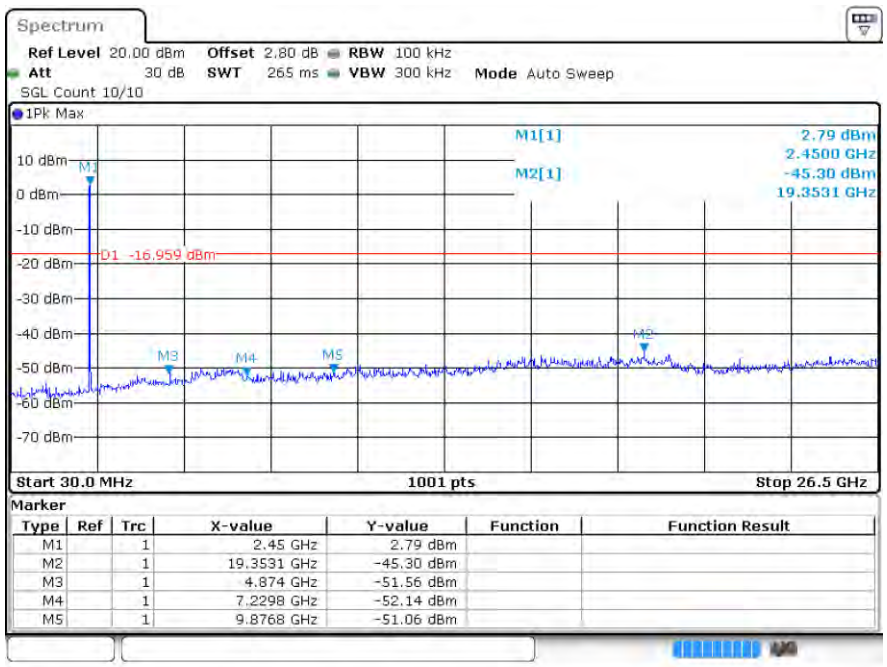
b 2412MHz Ant1 Emission



b 2437MHz Ant1 Ref



b 2437MHz Ant1 Emission

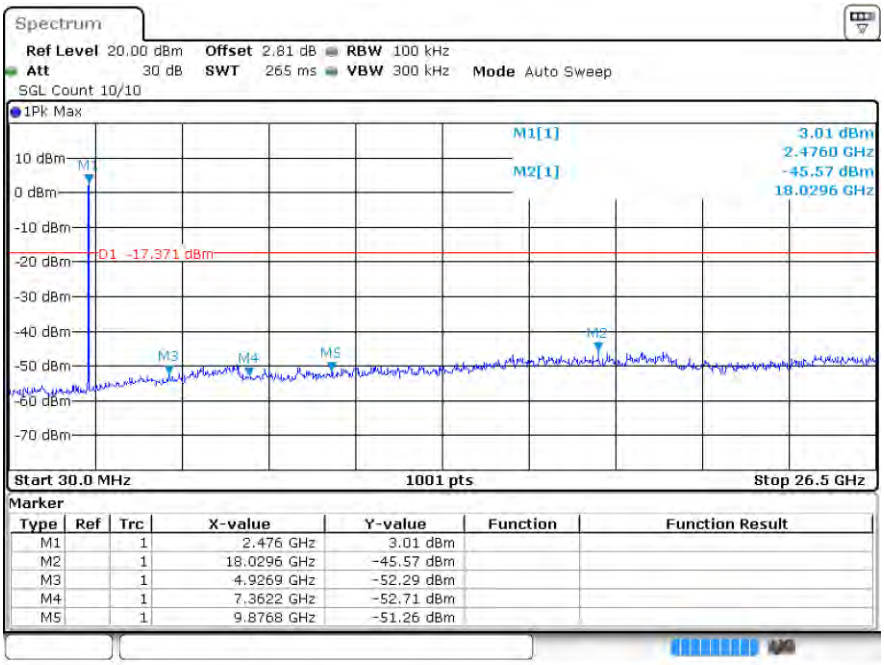


Marker

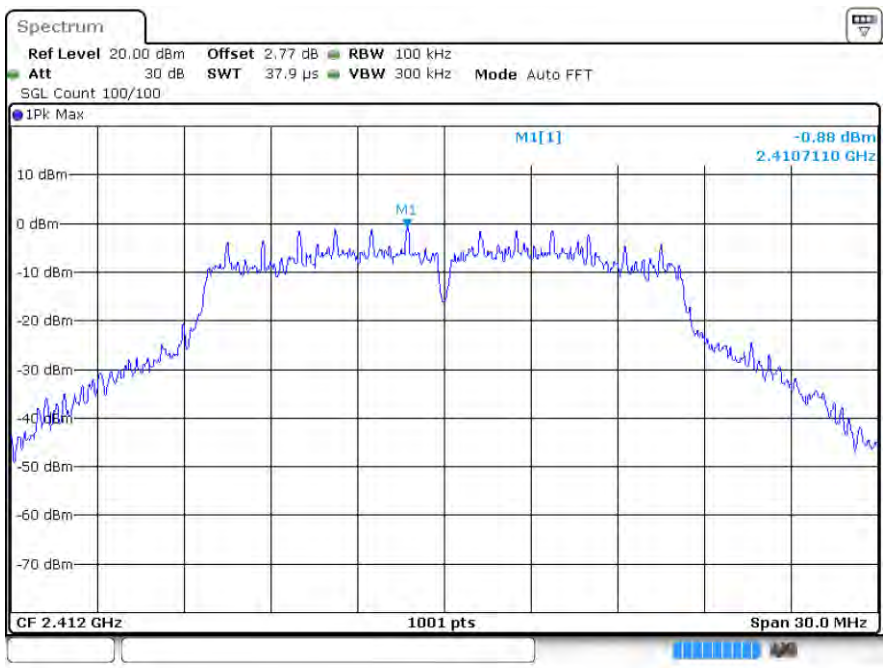
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	2.79 dBm		
M2		1	19.3531 GHz	-45.30 dBm		
M3		1	4.874 GHz	-51.56 dBm		
M4		1	7.2298 GHz	-52.14 dBm		
M5		1	9.8768 GHz	-51.06 dBm		

b 2462MHz Ant1 Ref

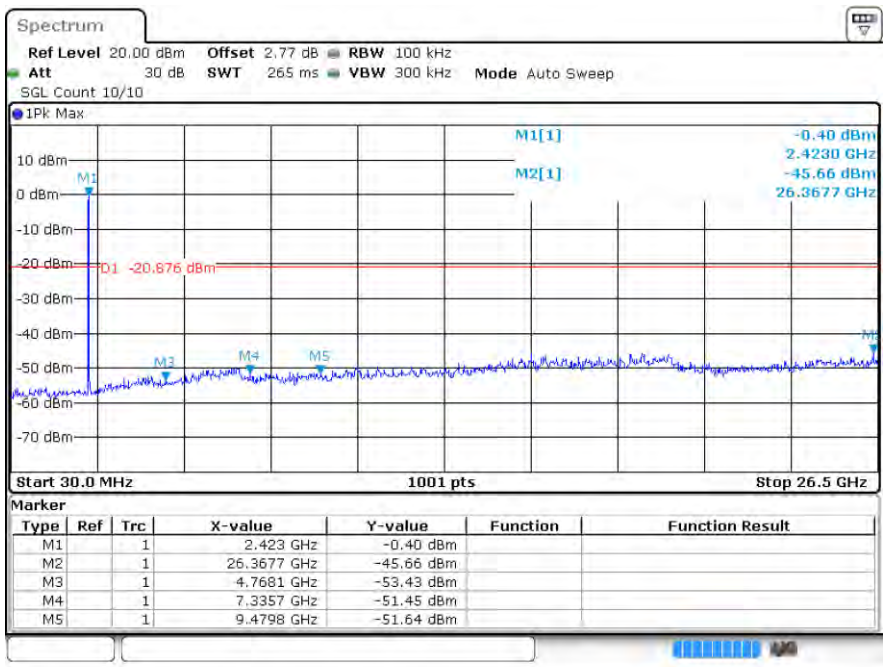
b 2462MHz Ant1 Emission



g 2412MHz Ant1 Ref



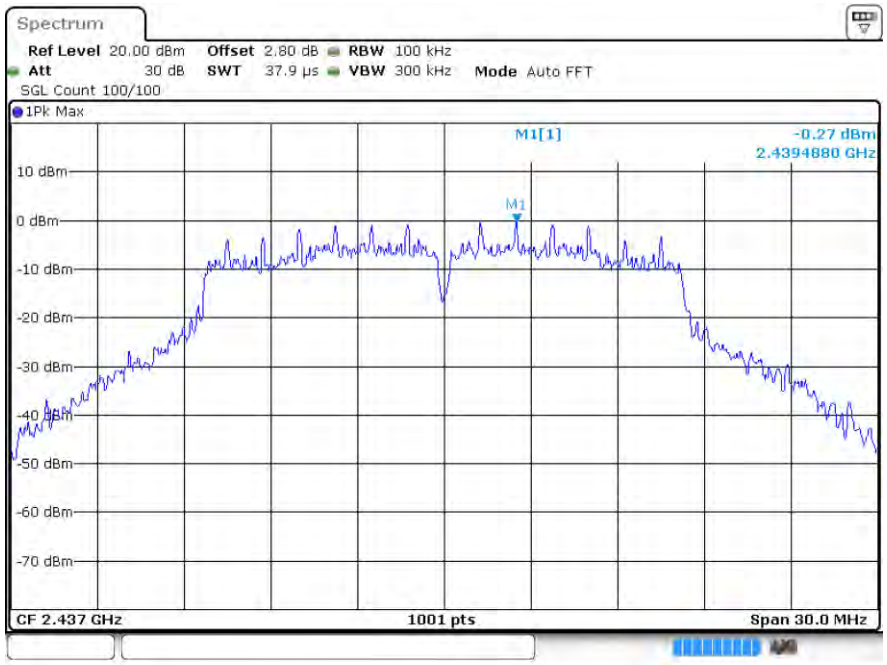
g 2412MHz Ant1 Emission



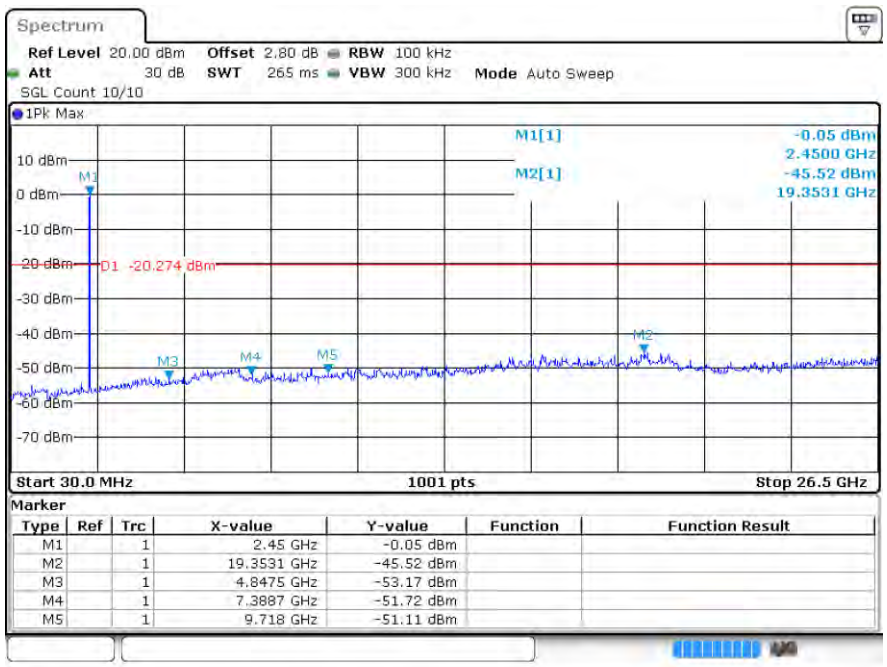
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-0.40 dBm		
M2		1	26.3677 GHz	-45.66 dBm		
M3		1	4.7681 GHz	-53.43 dBm		
M4		1	7.3357 GHz	-51.45 dBm		
M5		1	9.4798 GHz	-51.64 dBm		

g 2437MHz Ant1 Ref



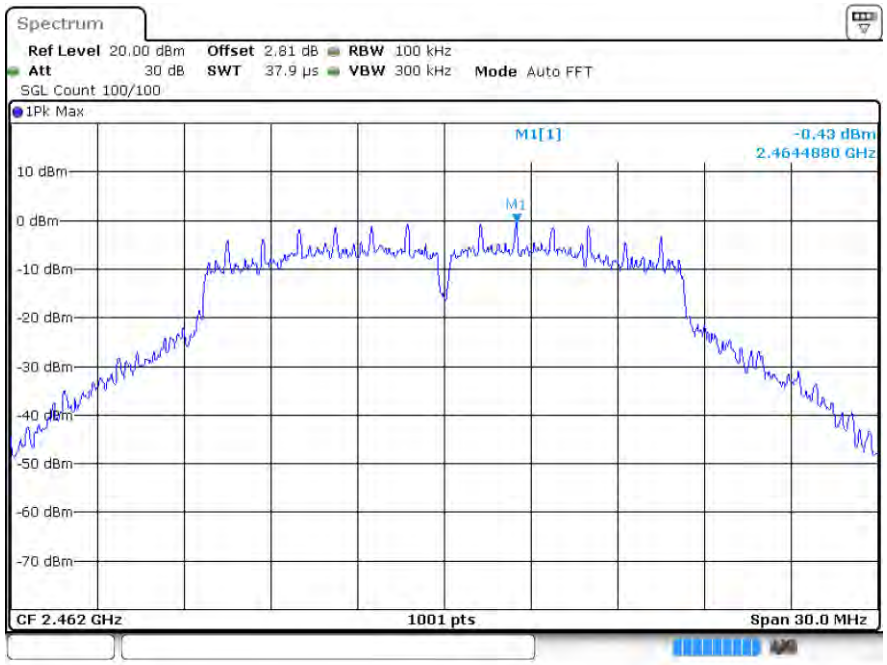
g 2437MHz Ant1 Emission



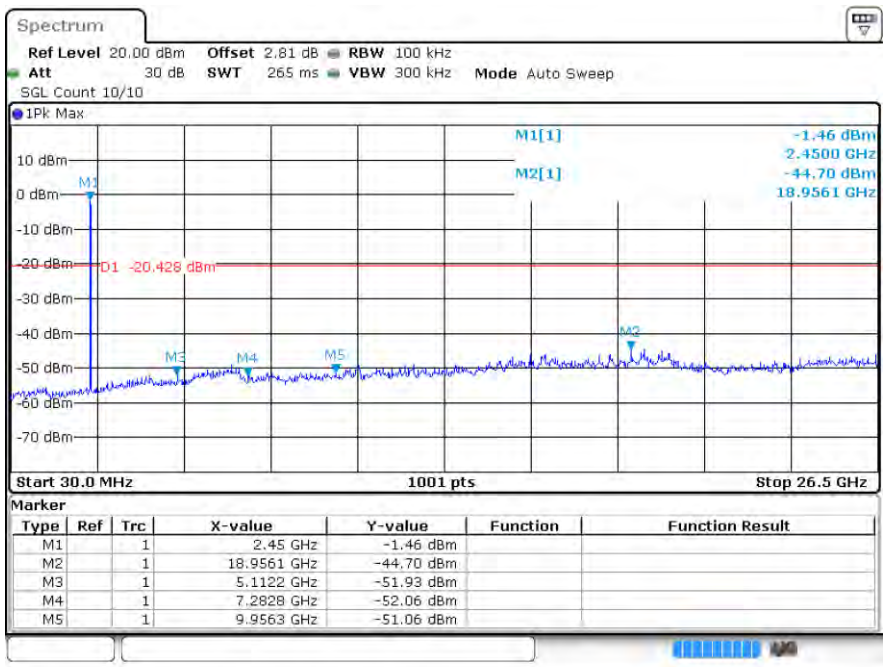
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-0.05 dBm		
M2		1	19.3531 GHz	-45.52 dBm		
M3		1	4.8475 GHz	-53.17 dBm		
M4		1	7.3887 GHz	-51.72 dBm		
M5		1	9.718 GHz	-51.11 dBm		

g 2462MHz Ant1 Ref



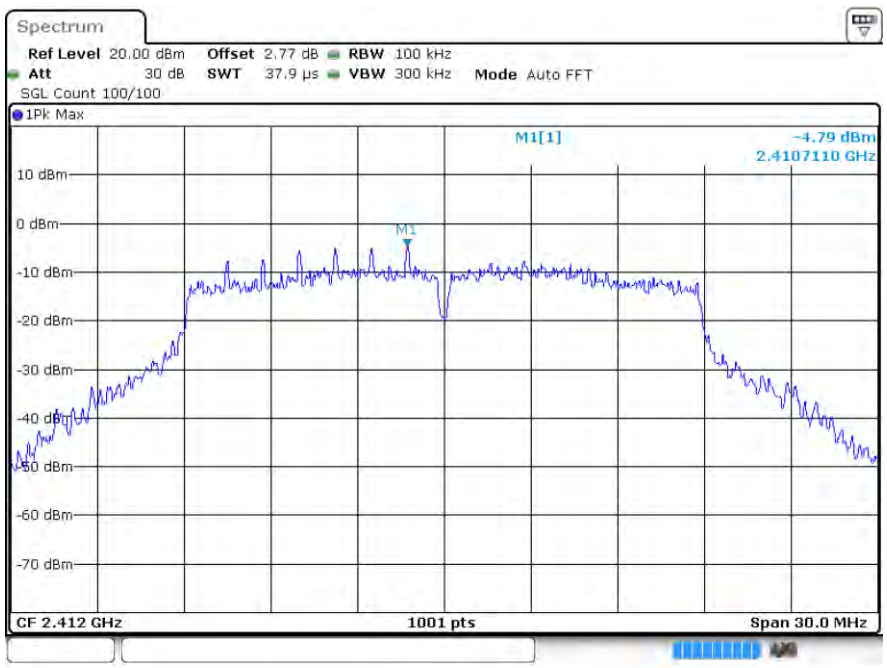
g 2462MHz Ant1 Emission



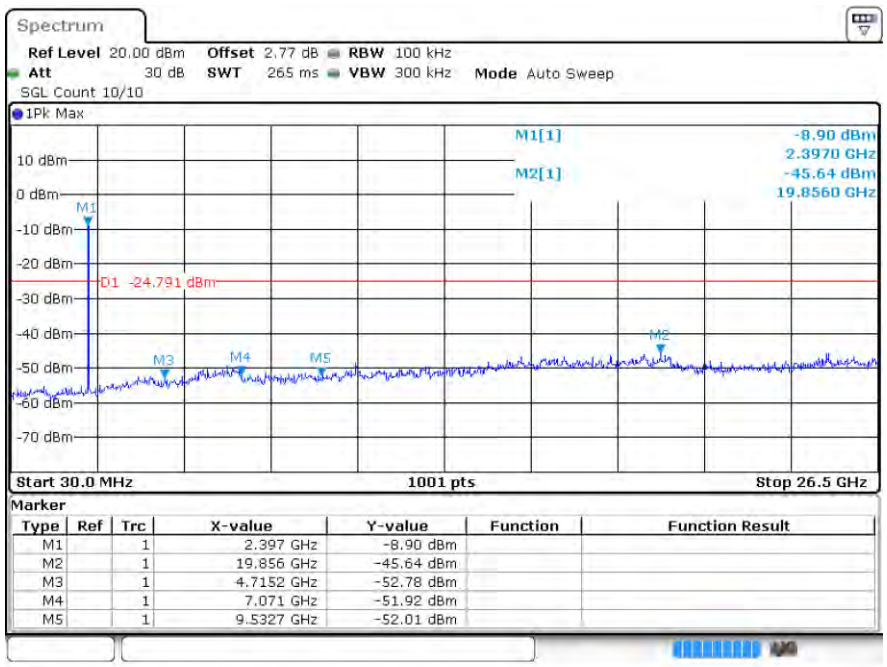
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-1.46 dBm		
M2		1	18.9561 GHz	-44.70 dBm		
M3		1	5.1122 GHz	-51.93 dBm		
M4		1	7.2828 GHz	-52.06 dBm		
M5		1	9.9563 GHz	-51.06 dBm		

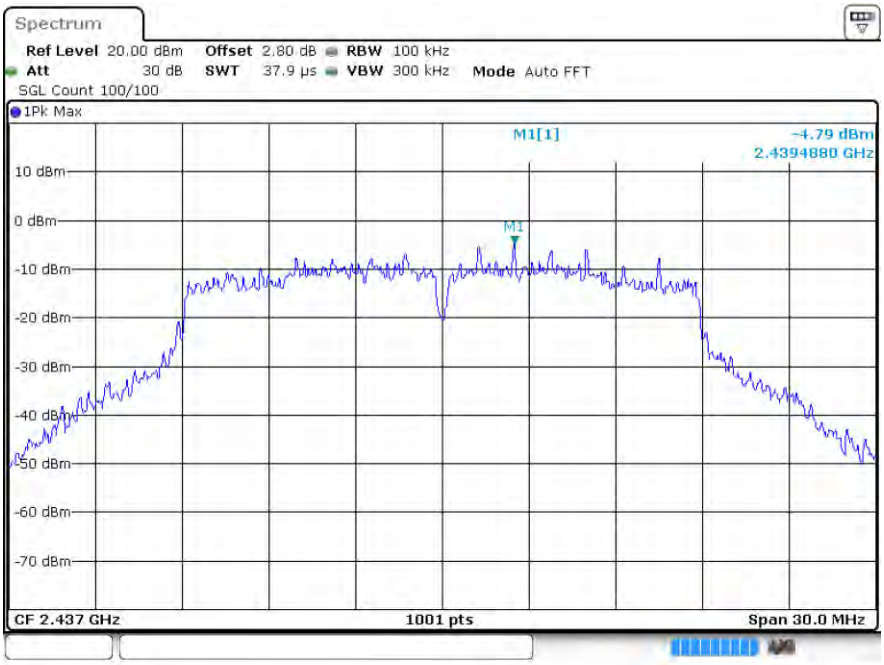
n20 2412MHz Ant1 Ref



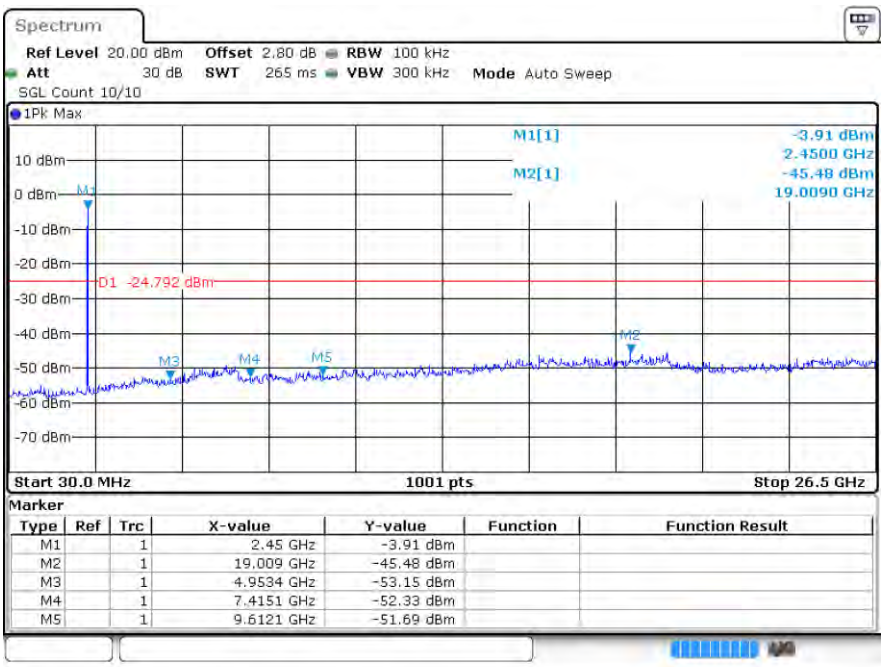
n20 2412MHz Ant1 Emission



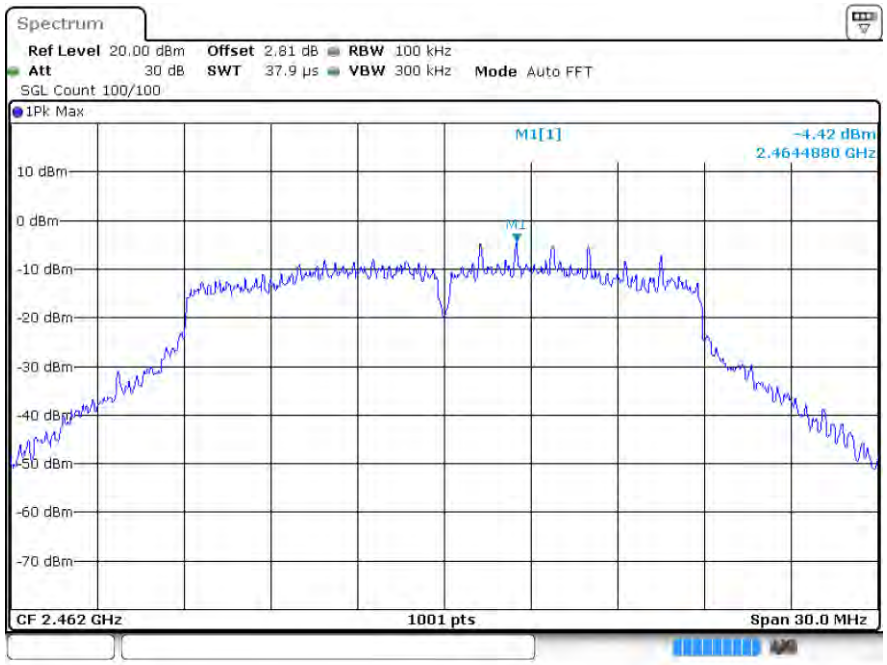
n20 2437MHz Ant1 Ref



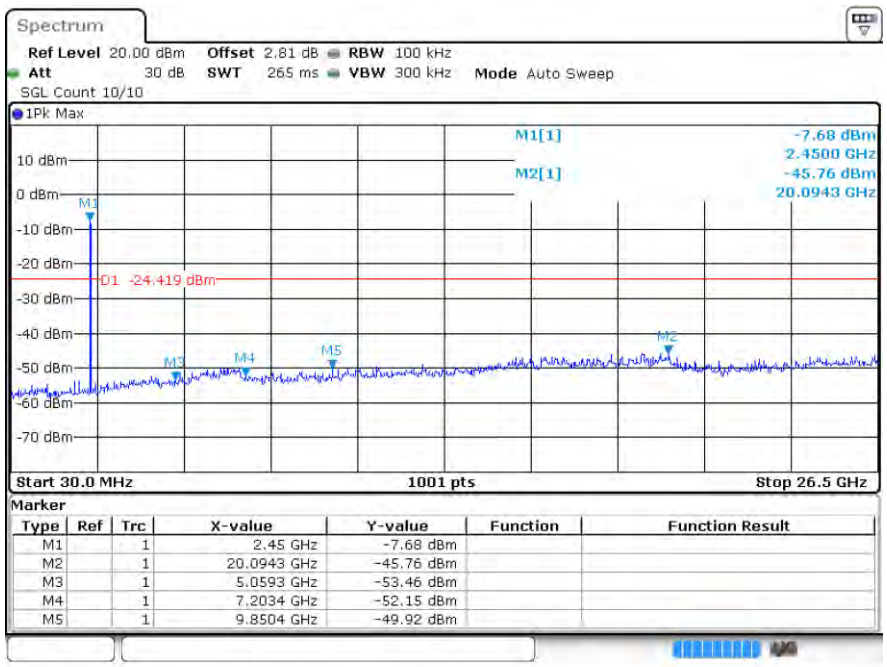
n20 2437MHz Ant1 Emission



n20 2462MHz Ant1 Ref



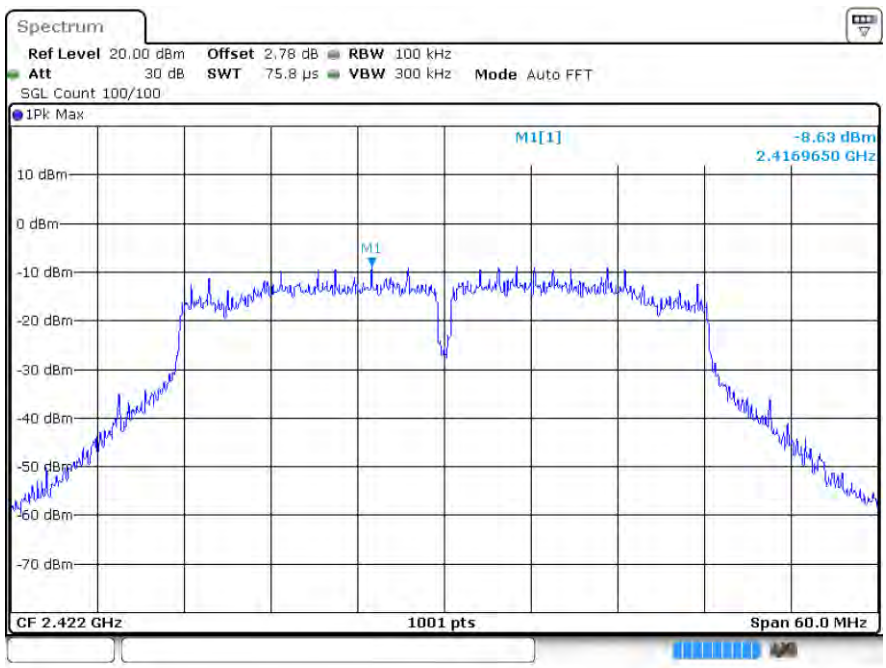
n20 2462MHz Ant1 Emission



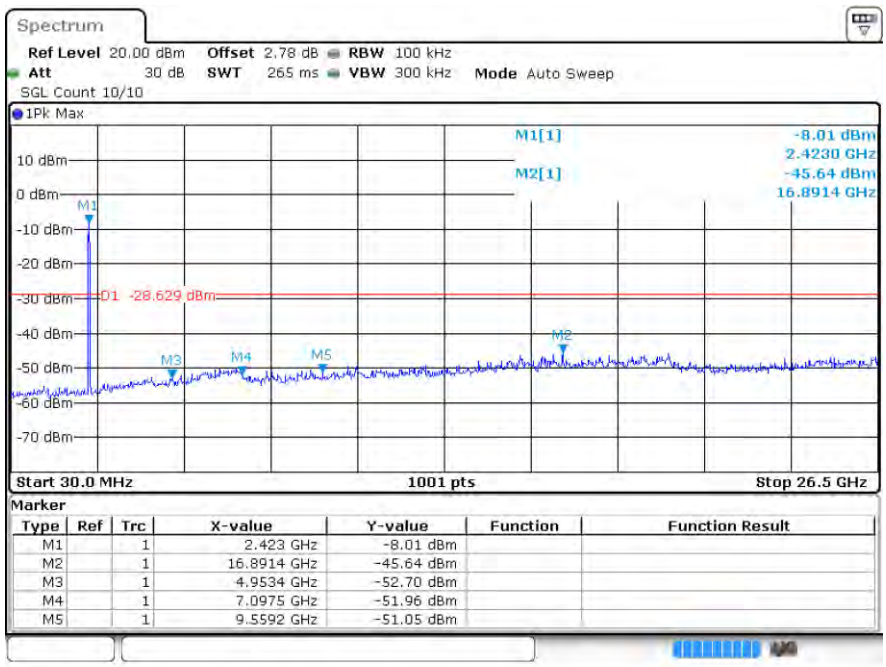
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-7.68 dBm		
M2		1	20.0943 GHz	-45.76 dBm		
M3		1	5.0593 GHz	-53.46 dBm		
M4		1	7.2034 GHz	-52.15 dBm		
M5		1	9.8504 GHz	-49.92 dBm		

n40 2422MHz Ant1 Ref



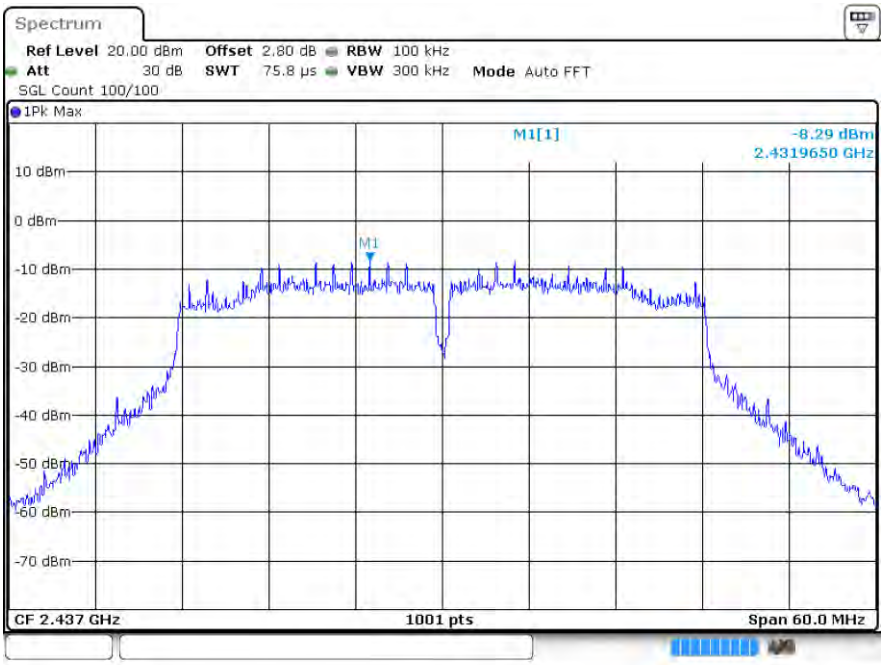
n40 2422MHz Ant1 Emission



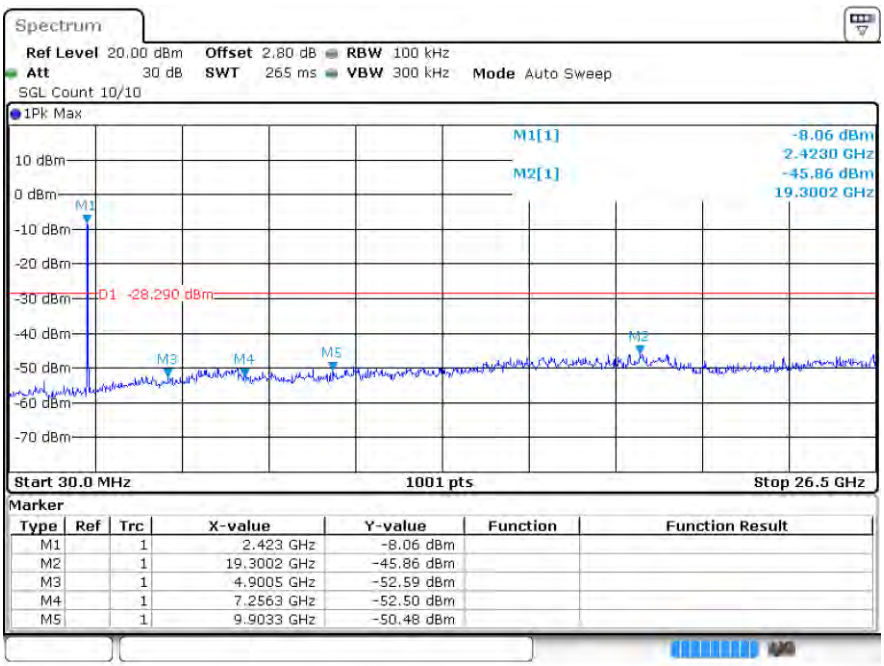
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-8.01 dBm		
M2		1	16.8914 GHz	-45.64 dBm		
M3		1	4.9534 GHz	-52.70 dBm		
M4		1	7.0975 GHz	-51.96 dBm		
M5		1	9.5592 GHz	-51.05 dBm		

n40 2437MHz Ant1 Ref



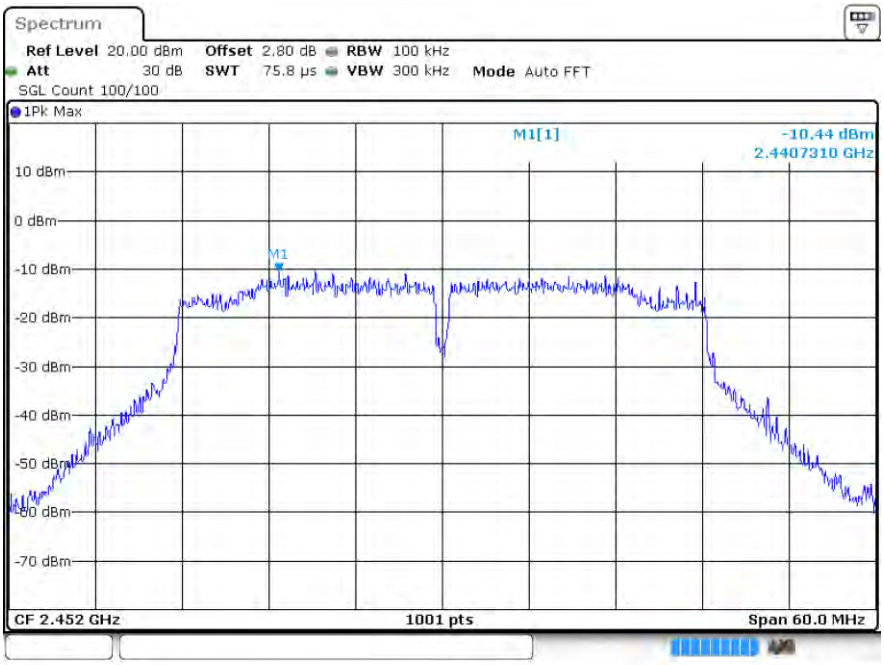
n40 2437MHz Ant1 Emission



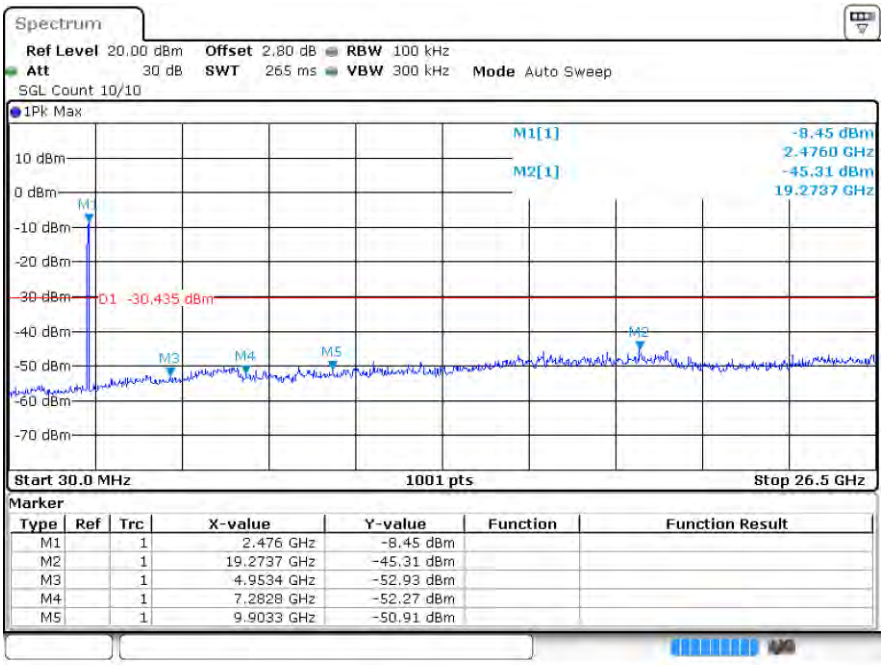
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-8.06 dBm		
M2		1	19.3002 GHz	-45.86 dBm		
M3		1	4.9005 GHz	-52.59 dBm		
M4		1	7.2563 GHz	-52.50 dBm		
M5		1	9.9033 GHz	-50.48 dBm		

n40 2452MHz Ant1 Ref



n40 2452MHz Ant1 Emission



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.476 GHz	-8.45 dBm		
M2		1	19.2737 GHz	-45.31 dBm		
M3		1	4.9534 GHz	-52.93 dBm		
M4		1	7.2828 GHz	-52.27 dBm		
M5		1	9.9033 GHz	-50.91 dBm		

7 Restrict Band

7.1 Test Result

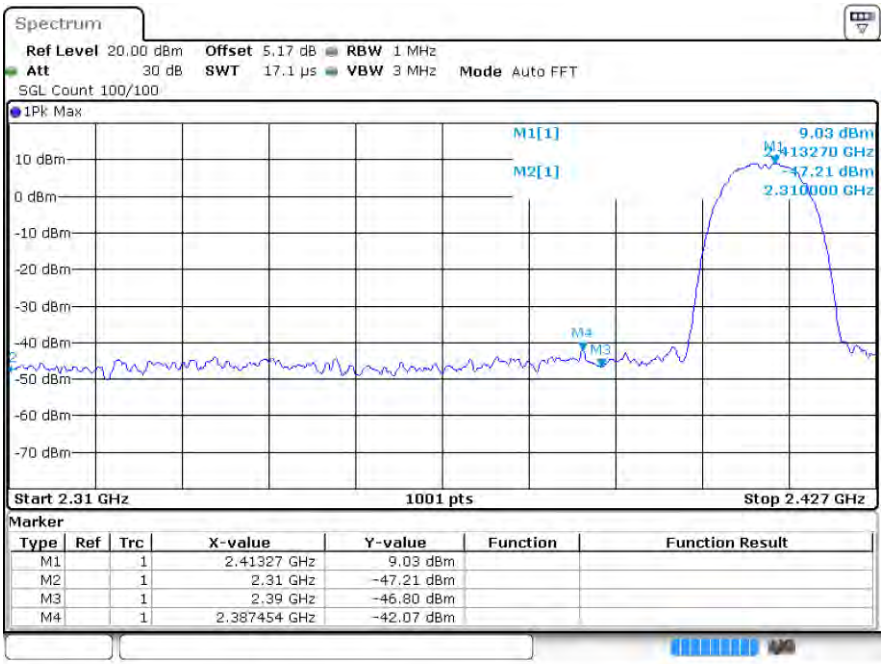
Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
b	2412	Ant1	2310	-47.21	4.5	52.52	Peak	74	Pass
b	2412	Ant1	2310	-56.48	4.5	43.25	Average	54	Pass
b	2412	Ant1	2387.454	-42.07	4.5	57.66	Peak	74	Pass
b	2412	Ant1	2385.699	-50.14	4.5	49.59	Average	54	Pass
b	2412	Ant1	2390	-46.79	4.5	52.94	Peak	74	Pass
b	2412	Ant1	2390	-54.2	4.5	45.53	Average	54	Pass
b	2462	Ant1	2483.5	-45.29	4.5	54.44	Peak	74	Pass
b	2462	Ant1	2483.5	-47.11	4.5	52.62	Average	54	Pass
b	2462	Ant1	2489.241	-44.09	4.5	55.64	Peak	74	Pass
b	2462	Ant1	2488.234	-45.96	4.5	53.77	Average	54	Pass
b	2462	Ant1	2500	-47.44	4.5	52.29	Peak	74	Pass
b	2462	Ant1	2500	-48.44	4.5	51.29	Average	54	Pass
g	2412	Ant1	2310	-46.23	4.5	53.50	Peak	74	Pass
g	2412	Ant1	2310	-54.44	4.5	45.29	Average	54	Pass
g	2412	Ant1	2339.718	-43.7	4.5	56.03	Peak	74	Pass
g	2412	Ant1	2337.378	-53	4.5	46.73	Average	54	Pass
g	2412	Ant1	2390	-45.68	4.5	54.05	Peak	74	Pass
g	2412	Ant1	2390	-53.25	4.5	46.48	Average	54	Pass
g	2462	Ant1	2483.5	-46.97	4.5	52.76	Peak	74	Pass
g	2462	Ant1	2483.5	-53.9	4.5	45.83	Average	54	Pass
g	2462	Ant1	2489.241	-42.71	4.5	57.02	Peak	74	Pass
g	2462	Ant1	2485.743	-53.61	4.5	46.12	Average	54	Pass
g	2462	Ant1	2500	-47.58	4.5	52.15	Peak	74	Pass
g	2462	Ant1	2500	-54.46	4.5	45.27	Average	54	Pass
n20	2412	Ant1	2310	-48.97	4.5	50.76	Peak	74	Pass
n20	2412	Ant1	2310	-55.29	4.5	44.44	Average	54	Pass
n20	2412	Ant1	2346.27	-44.23	4.5	55.50	Peak	74	Pass
n20	2412	Ant1	2339.133	-53.43	4.5	46.30	Average	54	Pass
n20	2412	Ant1	2390	-48.41	4.5	51.32	Peak	74	Pass
n20	2412	Ant1	2390	-55.22	4.5	44.51	Average	54	Pass
n20	2462	Ant1	2483.5	-48.15	4.5	51.58	Peak	74	Pass
n20	2462	Ant1	2483.5	-54.81	4.5	44.92	Average	54	Pass
n20	2462	Ant1	2490.566	-45.14	4.5	54.59	Peak	74	Pass
n20	2462	Ant1	2491.202	-54.24	4.5	45.49	Average	54	Pass

n20	2462	Ant1	2500	-48.13	4.5	51.60	Peak	74	Pass
n20	2462	Ant1	2500	-54.58	4.5	45.15	Average	54	Pass
n40	2422	Ant1	2310	-48.01	4.5	51.72	Peak	74	Pass
n40	2422	Ant1	2310	-55.37	4.5	44.36	Average	54	Pass
n40	2422	Ant1	2343.512	-43.53	4.5	56.20	Peak	74	Pass
n40	2422	Ant1	2339.252	-53.23	4.5	46.50	Average	54	Pass
n40	2422	Ant1	2390	-48.11	4.5	51.62	Peak	74	Pass
n40	2422	Ant1	2390	-54.88	4.5	44.85	Average	54	Pass
n40	2452	Ant1	2483.5	-46.84	4.5	52.89	Peak	74	Pass
n40	2452	Ant1	2483.5	-54.54	4.5	45.19	Average	54	Pass
n40	2452	Ant1	2487.832	-44.11	4.5	55.62	Peak	74	Pass
n40	2452	Ant1	2497.66	-54.39	4.5	45.34	Average	54	Pass
n40	2452	Ant1	2500	-46.83	4.5	52.90	Peak	74	Pass
n40	2452	Ant1	2500	-54.62	4.5	45.11	Average	54	Pass

7.2 Test Graphs

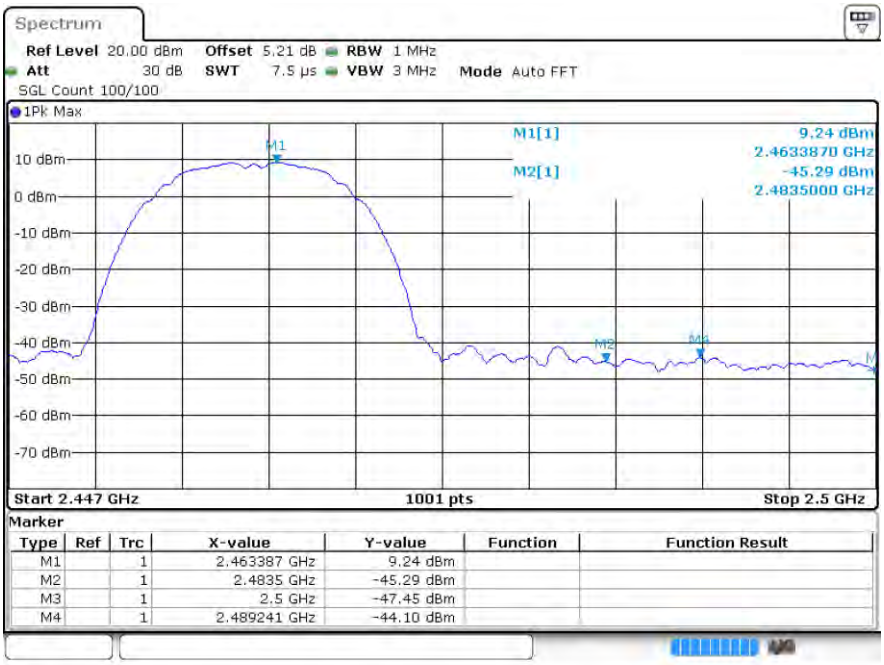
Test Graphs

b 2412MHz Ant1 Peak

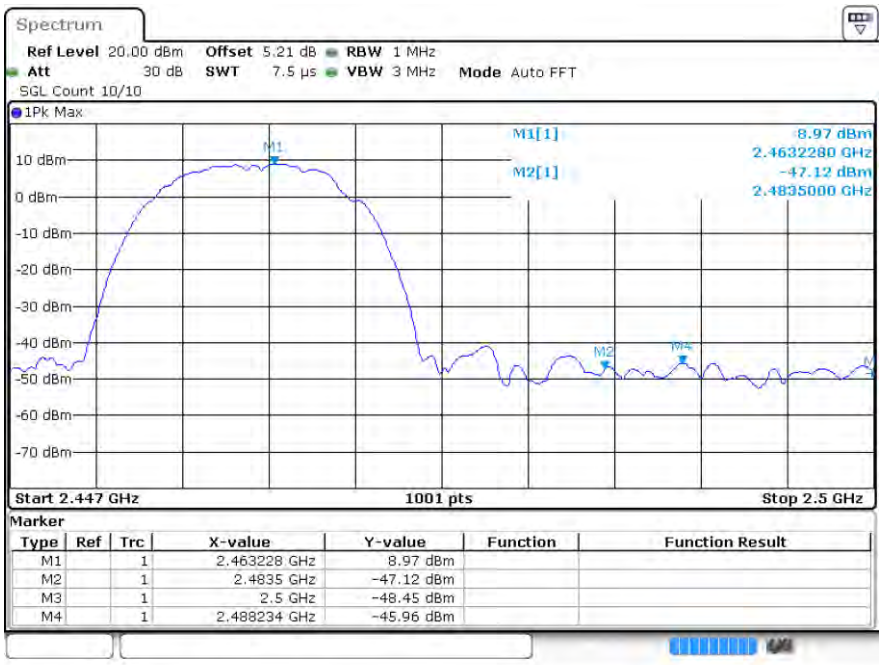


b 2412MHz Ant1 Average

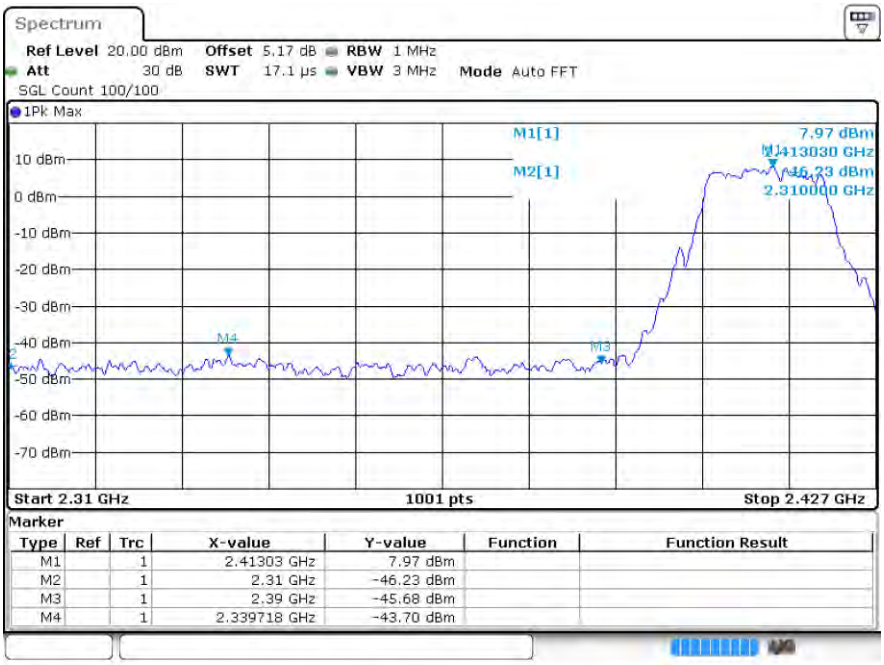
b 2462MHz Ant1 Peak



b 2462MHz Ant1 Average

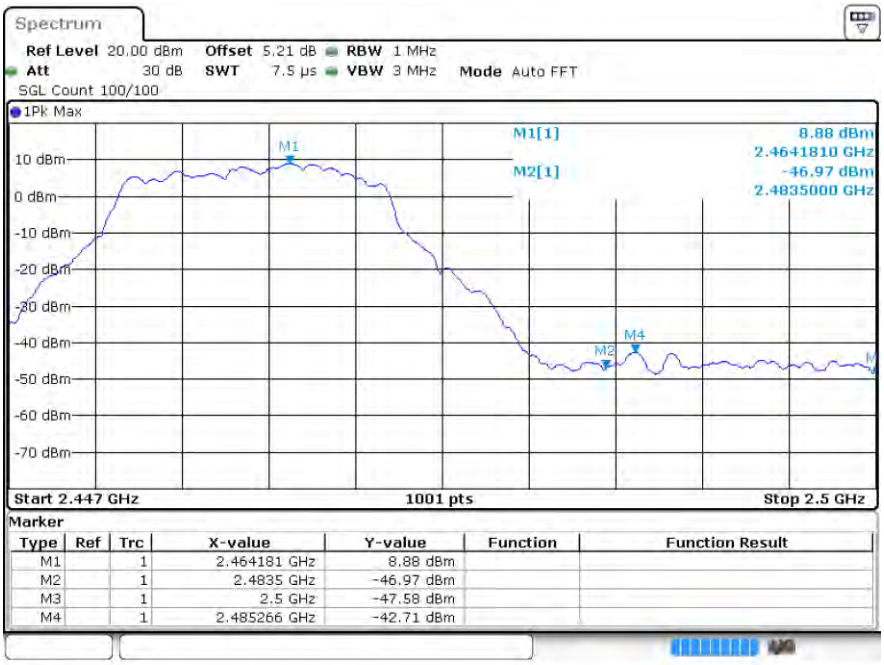


g 2412MHz Ant1 Peak

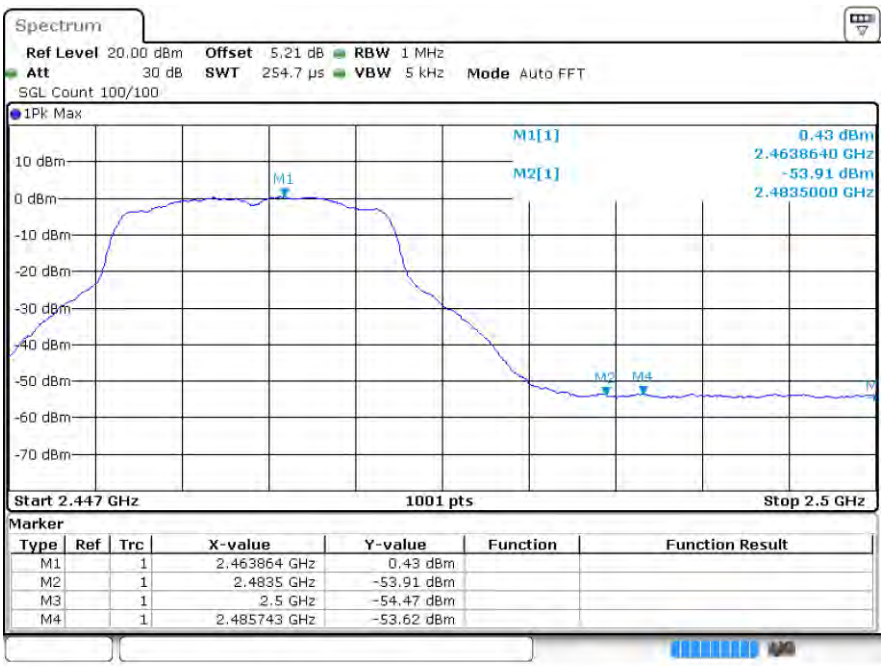


g 2412MHz Ant1 Average

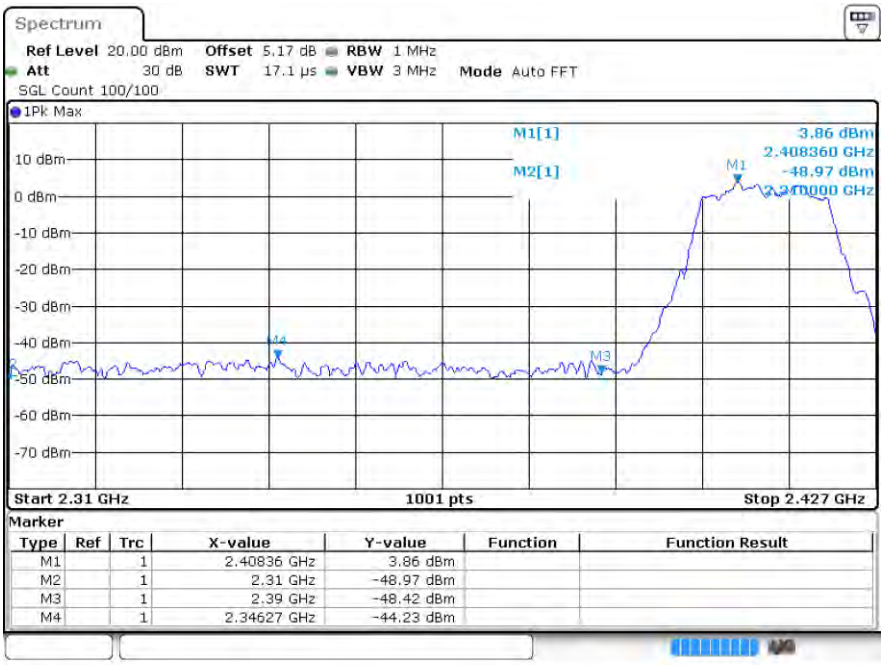
g 2462MHz Ant1 Peak



g 2462MHz Ant1 Average

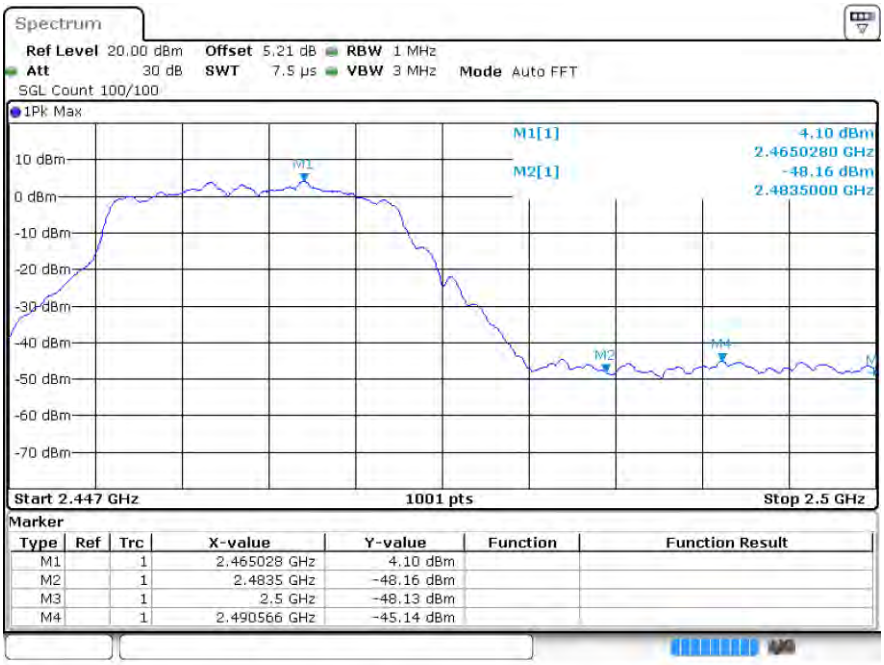


n20 2412MHz Ant1 Peak

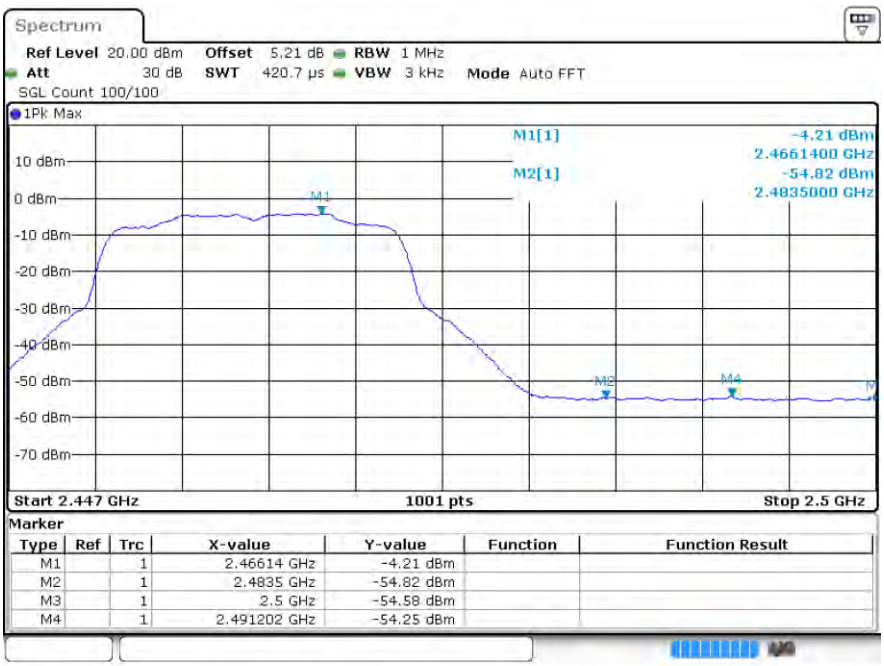


n20 2412MHz Ant1 Average

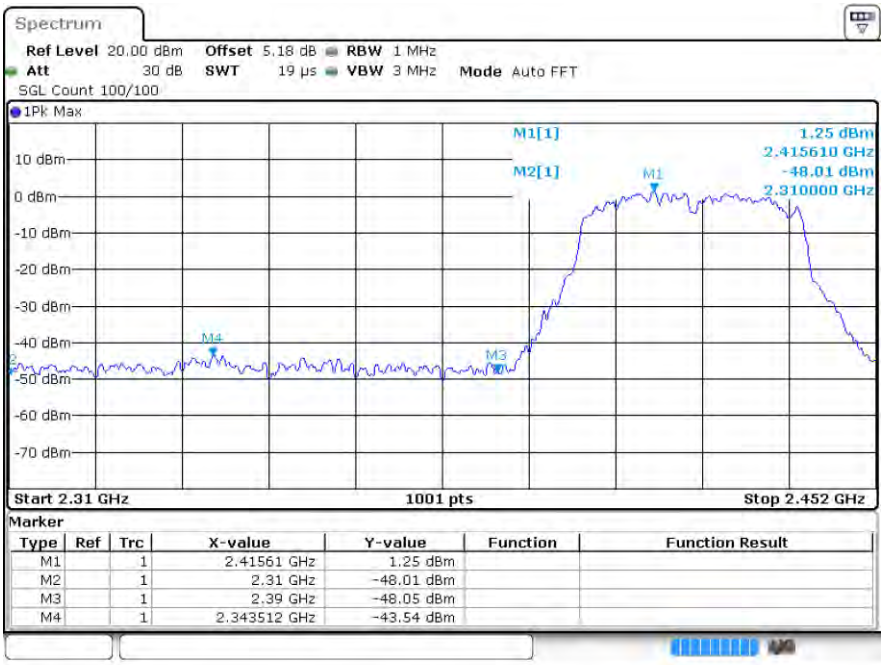
n20 2462MHz Ant1 Peak



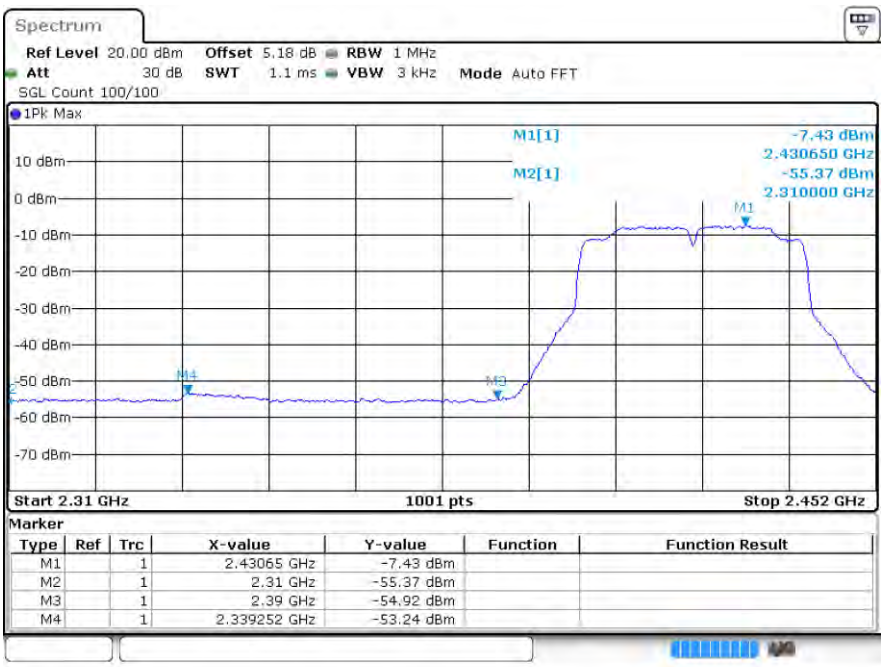
n20 2462MHz Ant1 Average



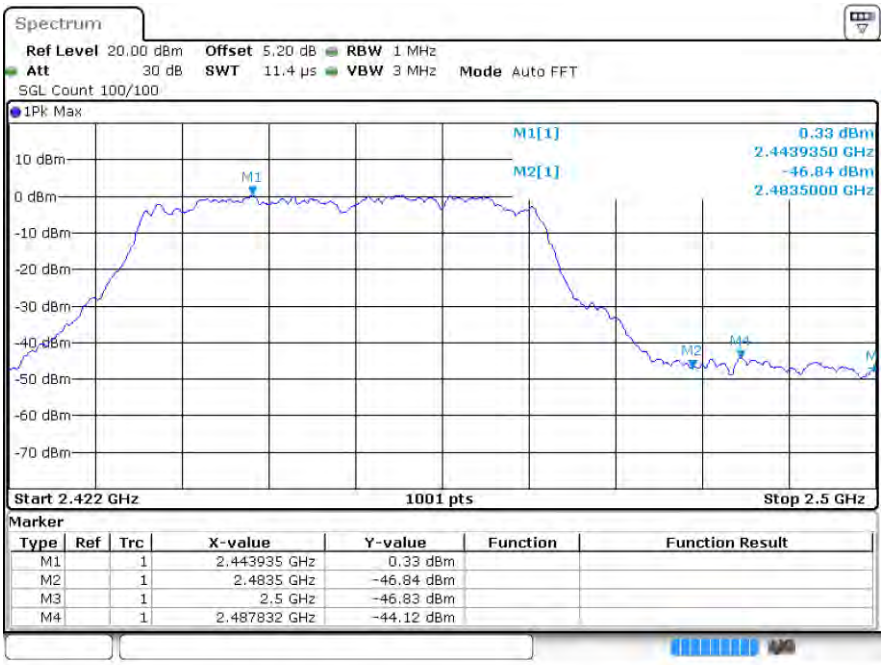
n40 2422MHz Ant1 Peak



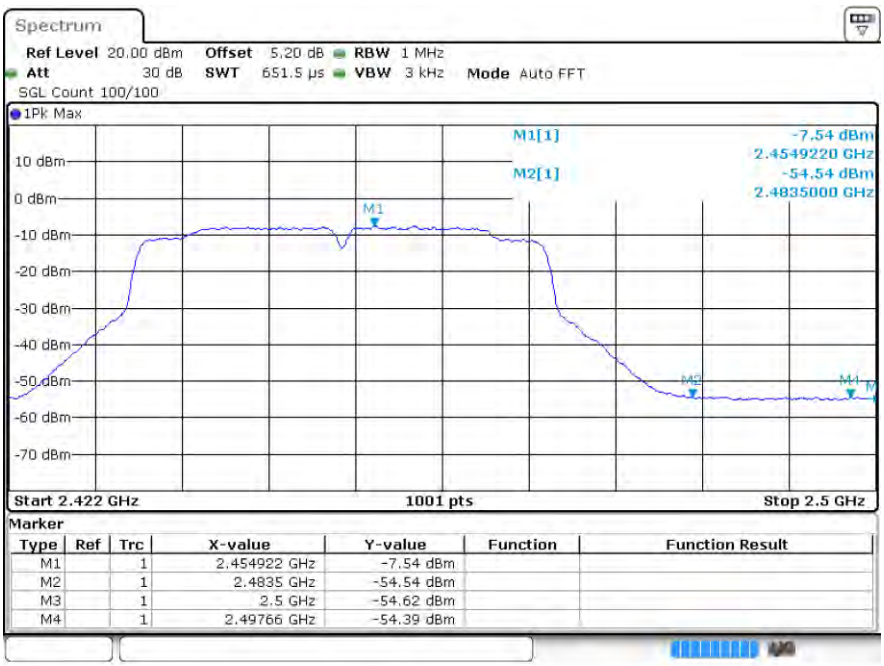
n40 2422MHz Ant1 Average



n40 2452MHz Ant1 Peak



n40 2452MHz Ant1 Average



---The End---