Appendix C

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: Smart Sprinkler Controller

Trade Mark: Imolaza

Test Model: PRO_8Z

Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung

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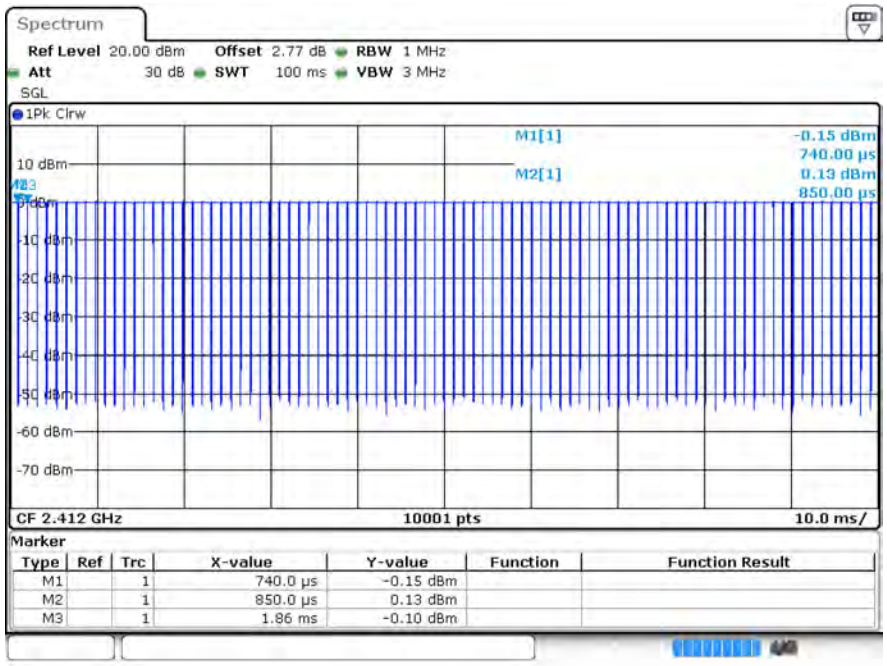
1 Duty Cycle

1.1 Test Result

Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor	1/T (kHz)
b	2412	Ant1	91.27	0.4	0.99
b	2437	Ant1	91.22	0.4	0.99
b	2462	Ant1	91.28	0.4	0.99
g	2412	Ant1	92.08	0.36	1.61
g	2437	Ant1	92.09	0.36	1.61
g	2462	Ant1	92.07	0.36	1.64
n20	2412	Ant1	91.94	0.36	1.61
n20	2437	Ant1	91.95	0.36	1.64
n20	2462	Ant1	91.94	0.36	1.64
n40	2422	Ant1	90.69	0.42	1.67
n40	2437	Ant1	90.63	0.43	1.67
n40	2452	Ant1	90.65	0.43	1.67

1.2 Test Graphs

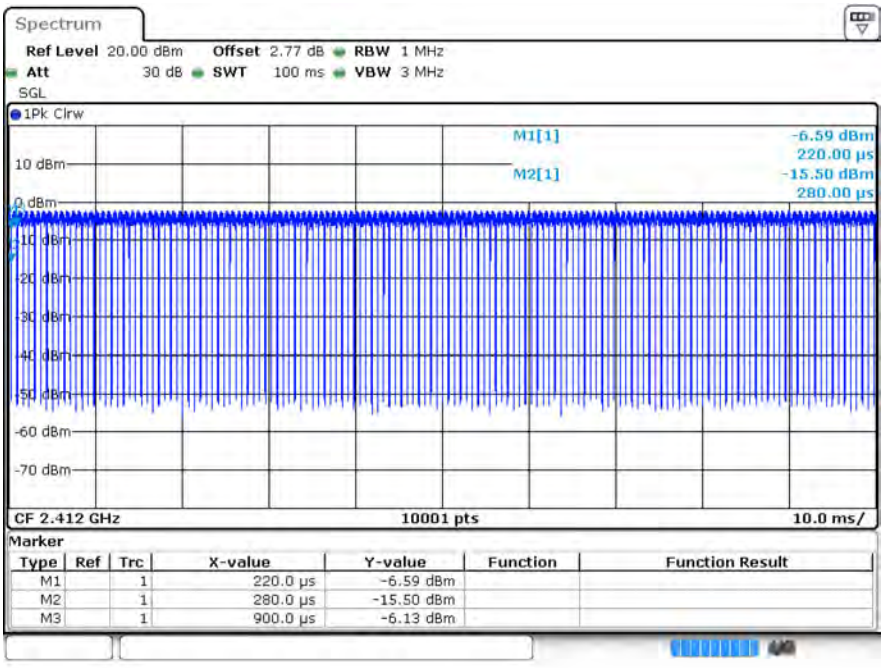
Test Graphs
b 2412MHz Ant1



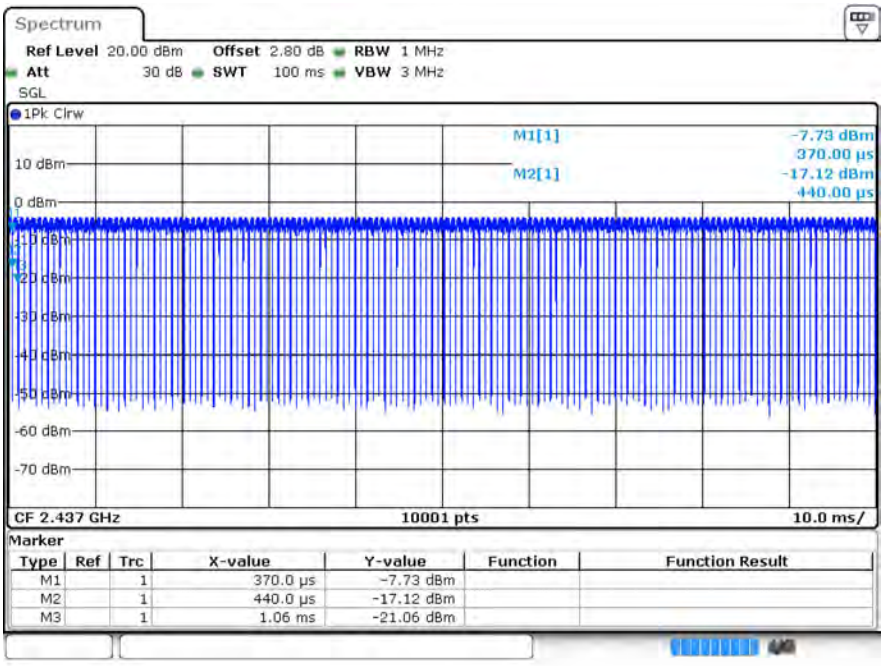
b 2437MHz Ant1

Test Graphs
b 2462MHz Ant1

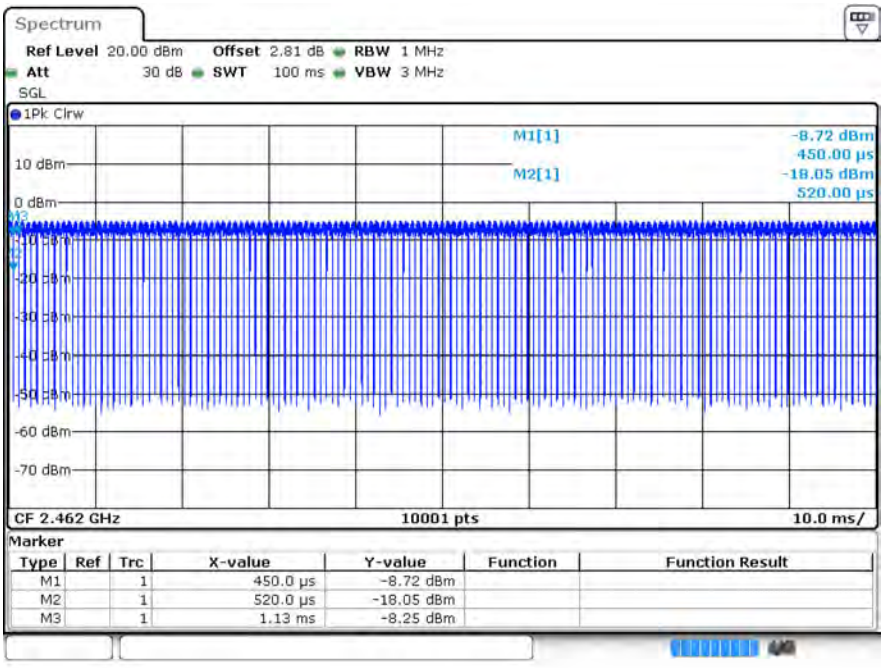
g 2412MHz Ant1



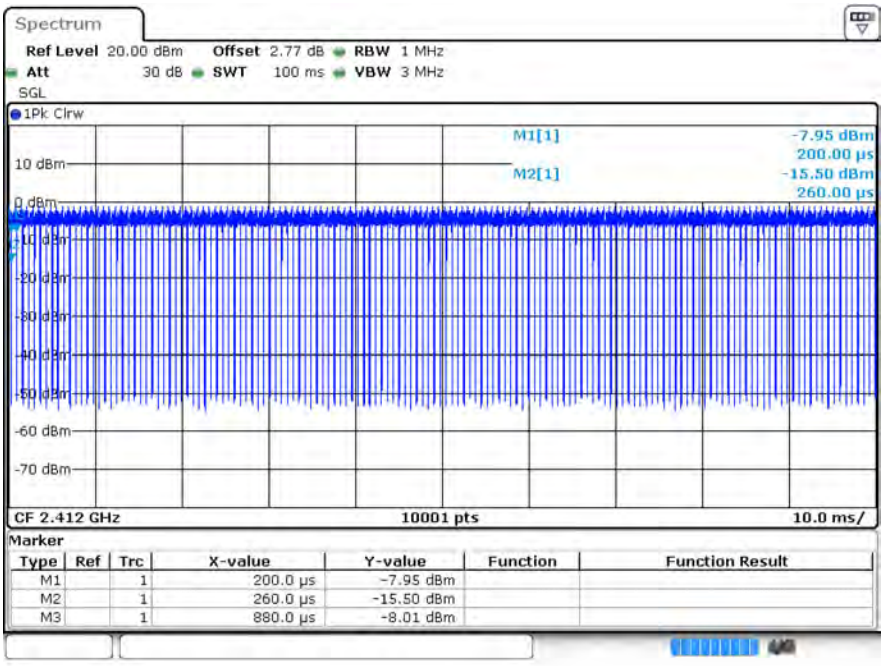
Test Graphs
g 2437MHz Ant1



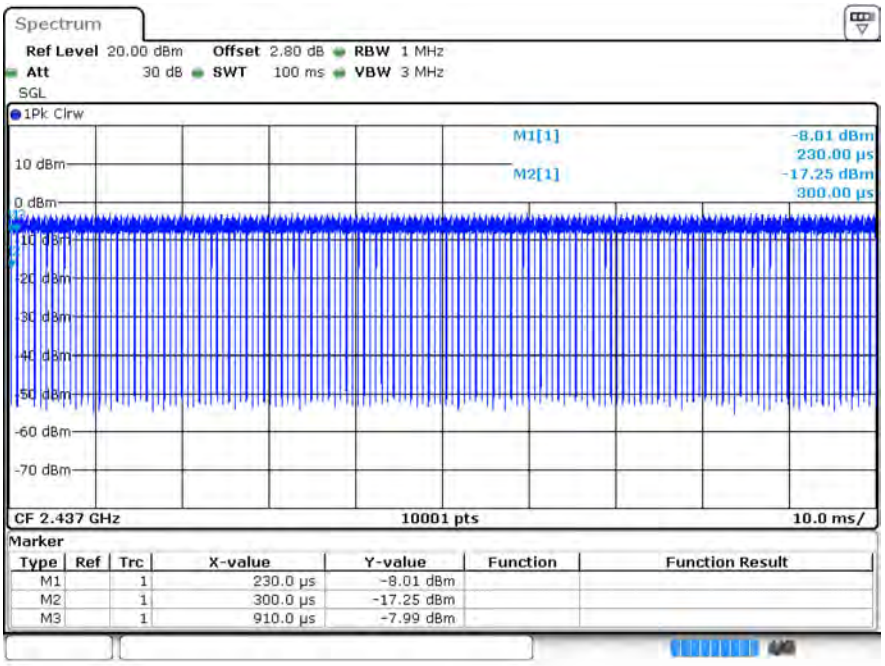
g 2462MHz Ant1



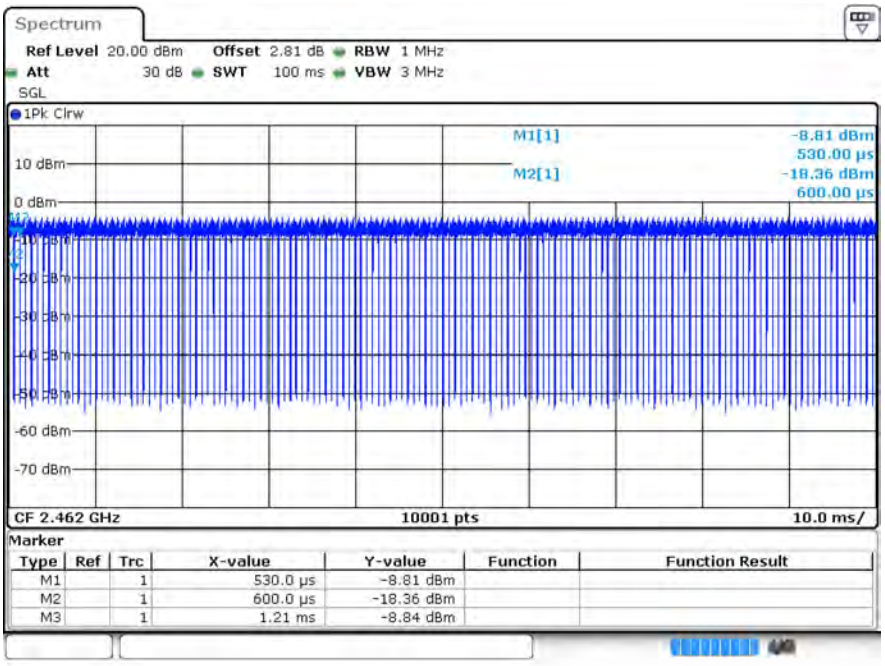
Test Graphs
n20 2412MHz Ant1



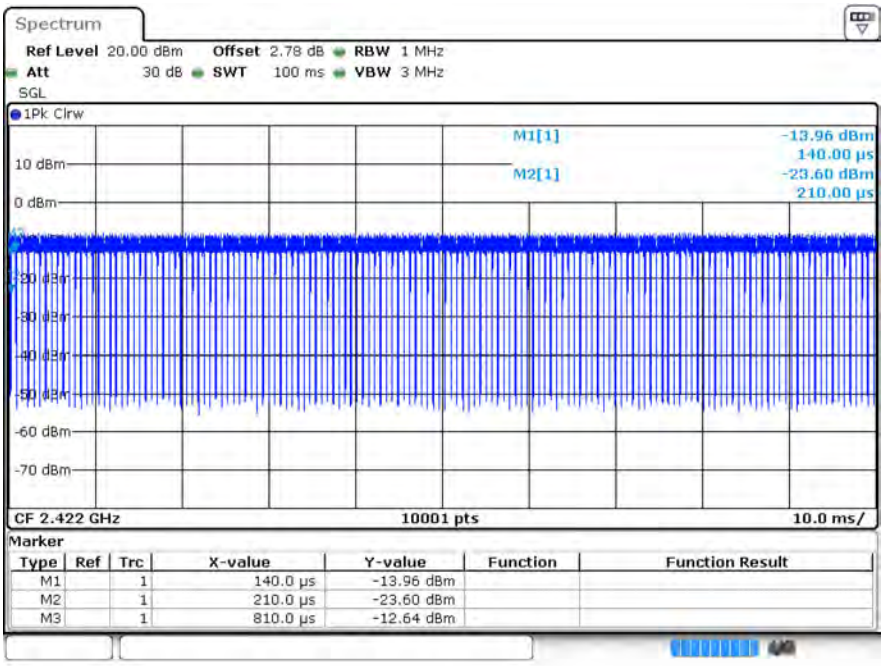
n20 2437MHz Ant1



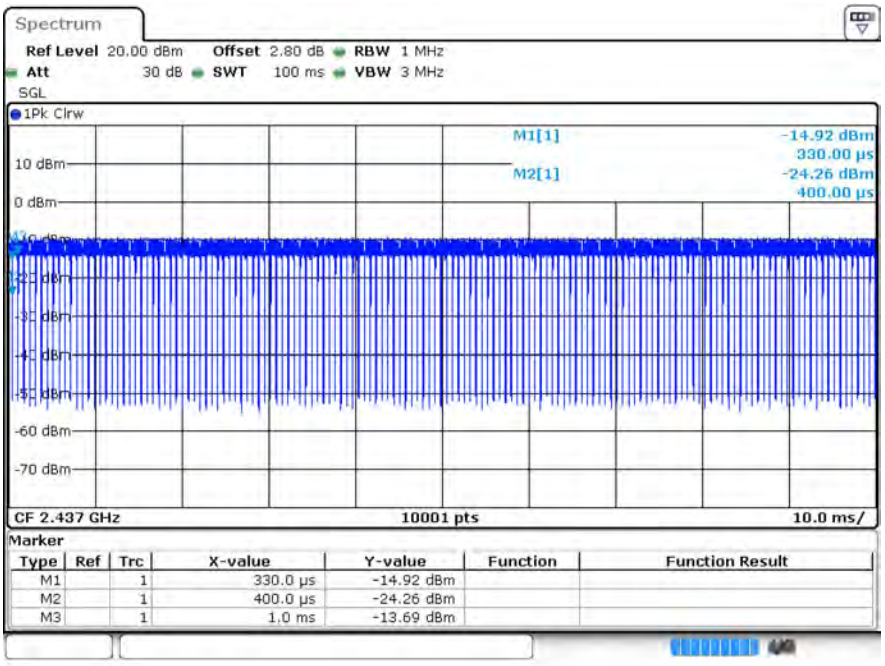
Test Graphs
n20 2462MHz Ant1



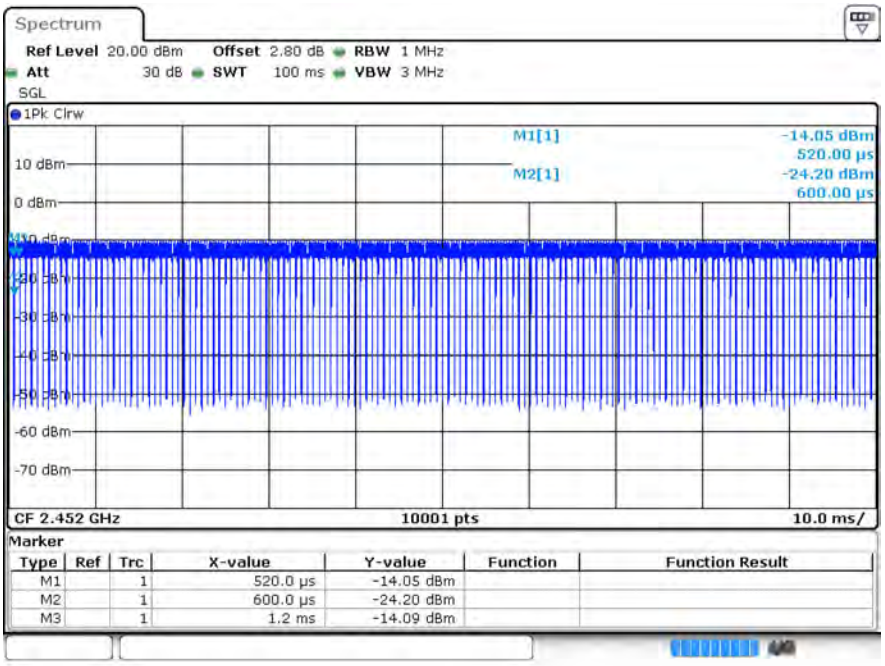
n40 2422MHz Ant1



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	12	30	Pass
b	2437	Ant1	10.14	30	Pass
b	2462	Ant1	8.99	30	Pass
g	2412	Ant1	9.26	30	Pass
g	2437	Ant1	7.74	30	Pass
g	2462	Ant1	6.68	30	Pass
n20	2412	Ant1	9.2	30	Pass
n20	2437	Ant1	7.49	30	Pass
n20	2462	Ant1	6.49	30	Pass
n40	2422	Ant1	9.23	30	Pass
n40	2437	Ant1	8.33	30	Pass
n40	2452	Ant1	7.72	30	Pass

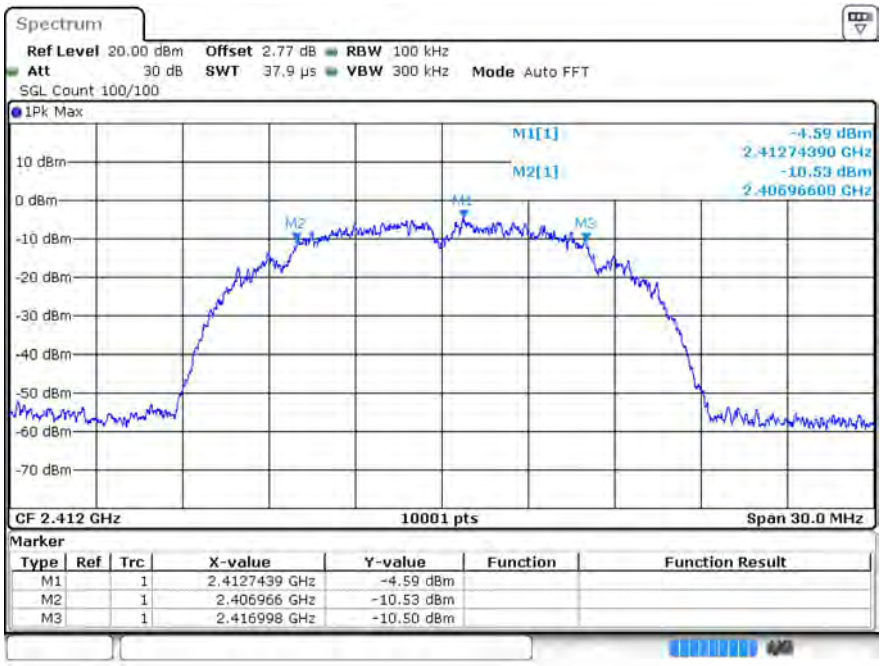
3 -6dB Bandwidth

3.1 Test Result

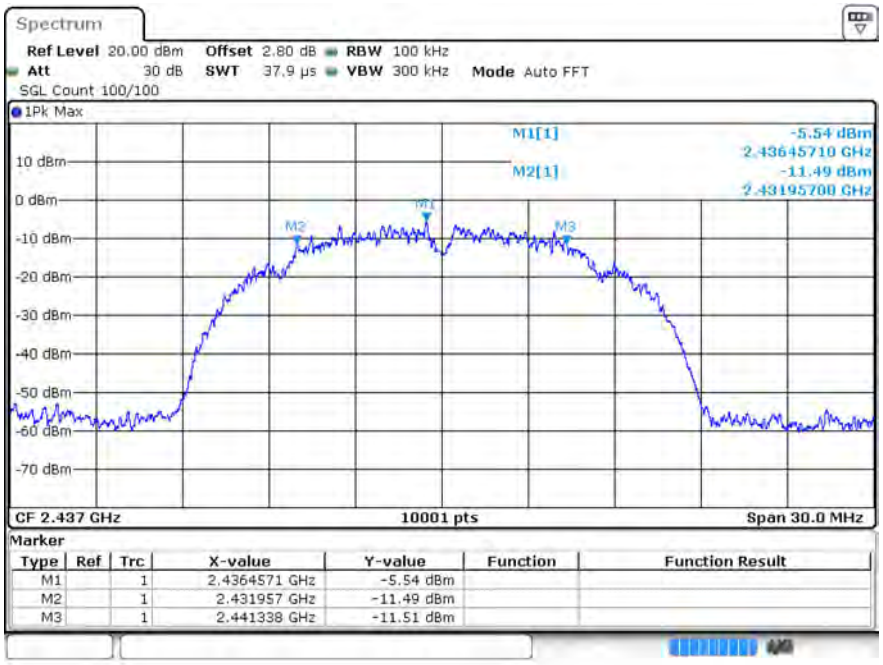
Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
b	2412	Ant1	10.032	0.5	Pass
b	2437	Ant1	9.381	0.5	Pass
b	2462	Ant1	9.663	0.5	Pass
g	2412	Ant1	16.38	0.5	Pass
g	2437	Ant1	16.422	0.5	Pass
g	2462	Ant1	16.392	0.5	Pass
n20	2412	Ant1	16.944	0.5	Pass
n20	2437	Ant1	16.938	0.5	Pass
n20	2462	Ant1	16.917	0.5	Pass
n40	2422	Ant1	33.156	0.5	Pass
n40	2437	Ant1	32.904	0.5	Pass
n40	2452	Ant1	32.886	0.5	Pass

3.2 Test Graphs

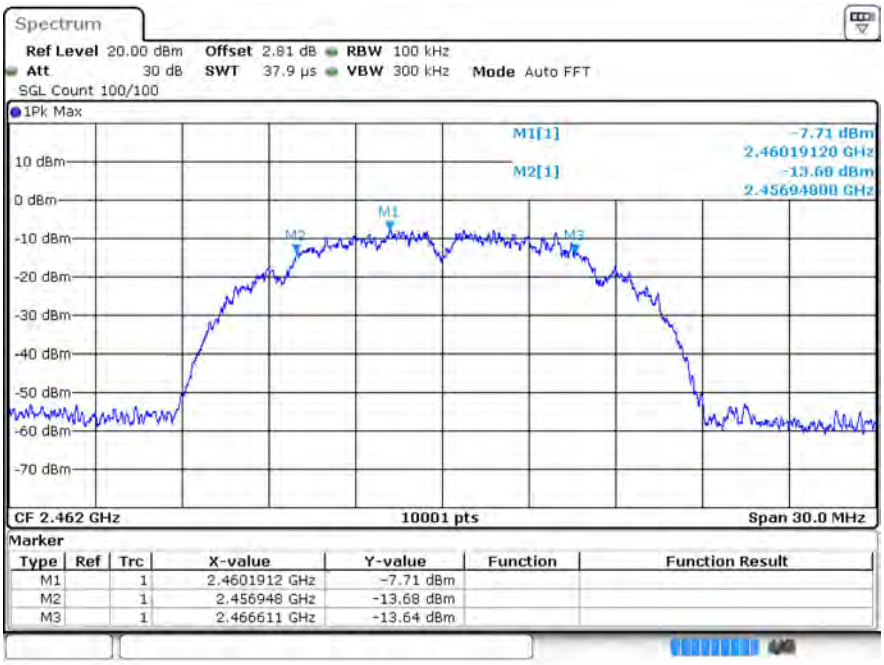
Test Graphs
b 2412MHz Ant1



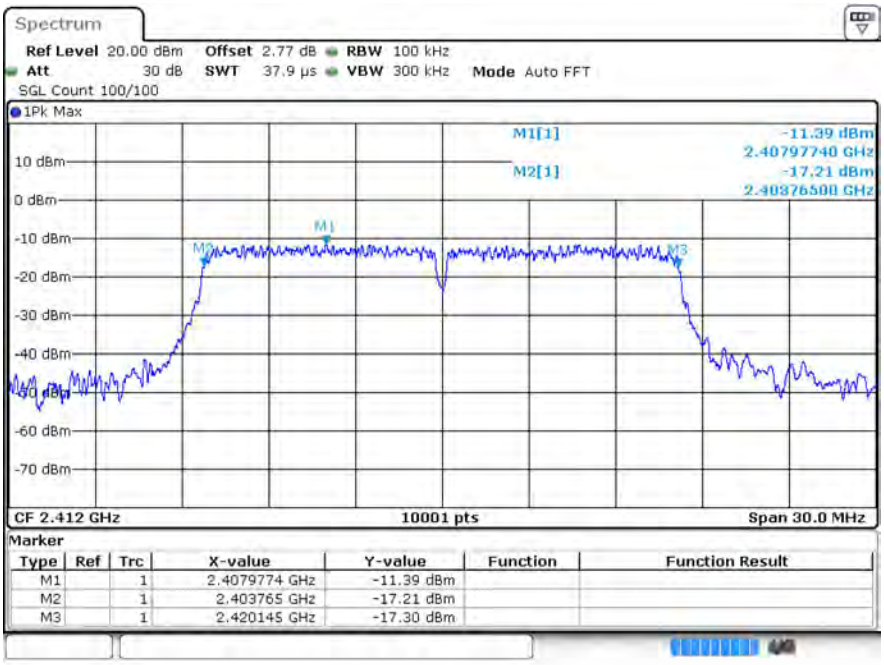
b 2437MHz Ant1



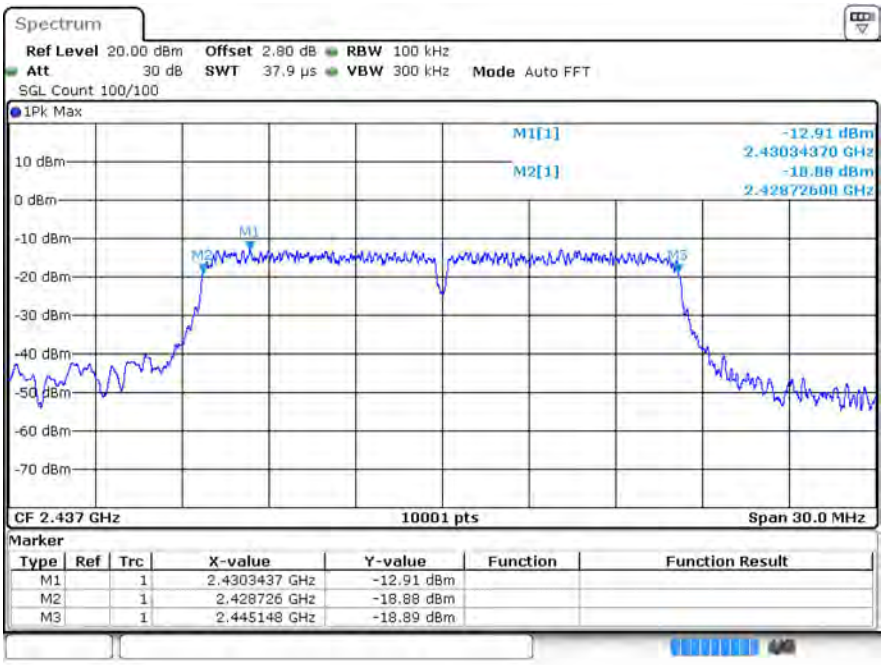
b 2462MHz Ant1



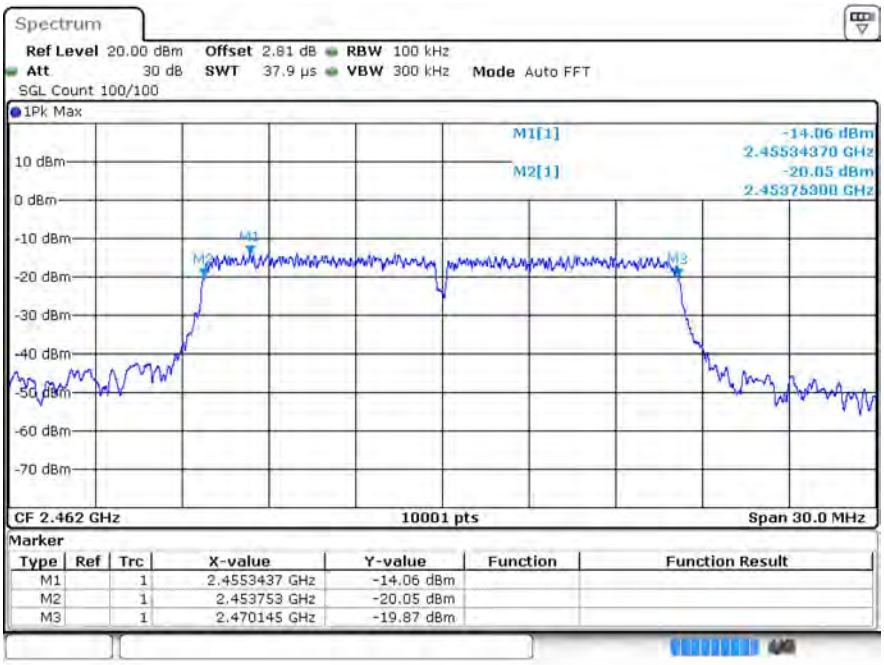
g 2412MHz Ant1



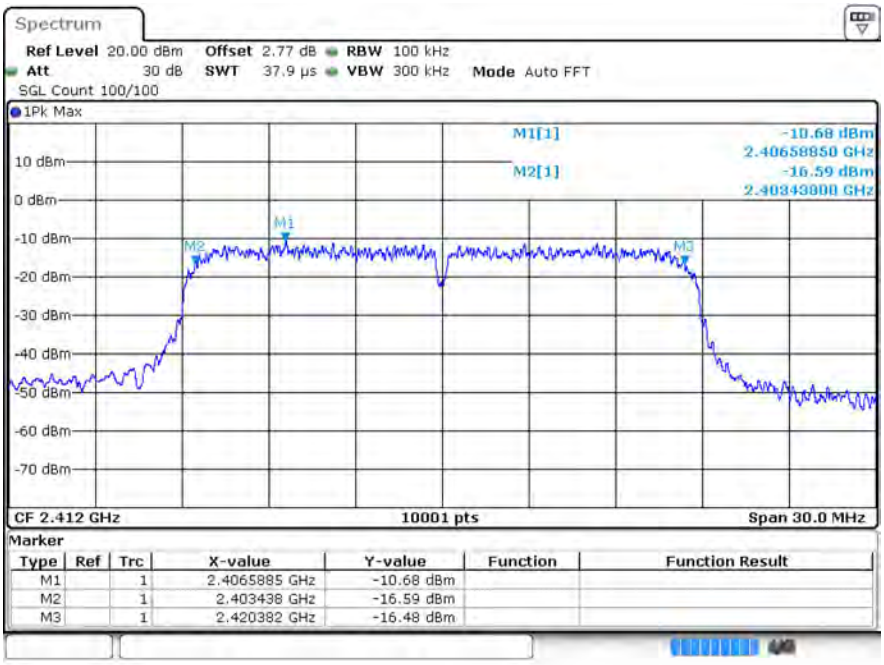
g 2437MHz Ant1



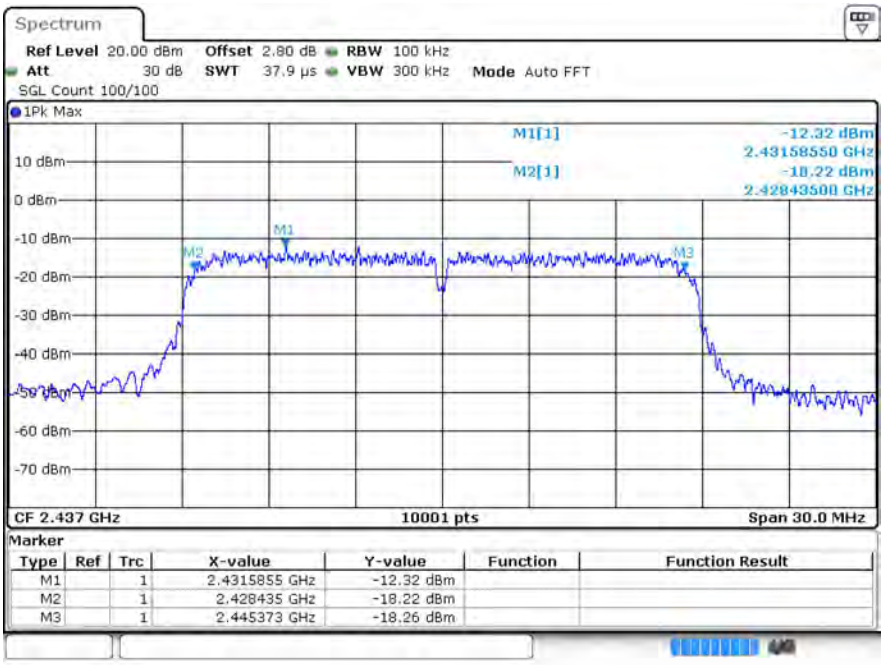
g 2462MHz Ant1



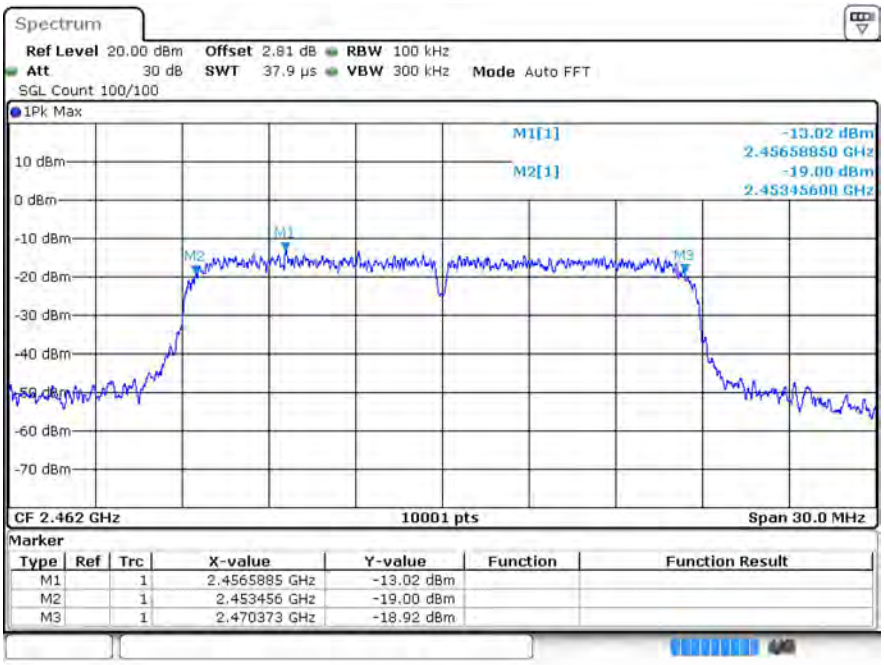
n20 2412MHz Ant1



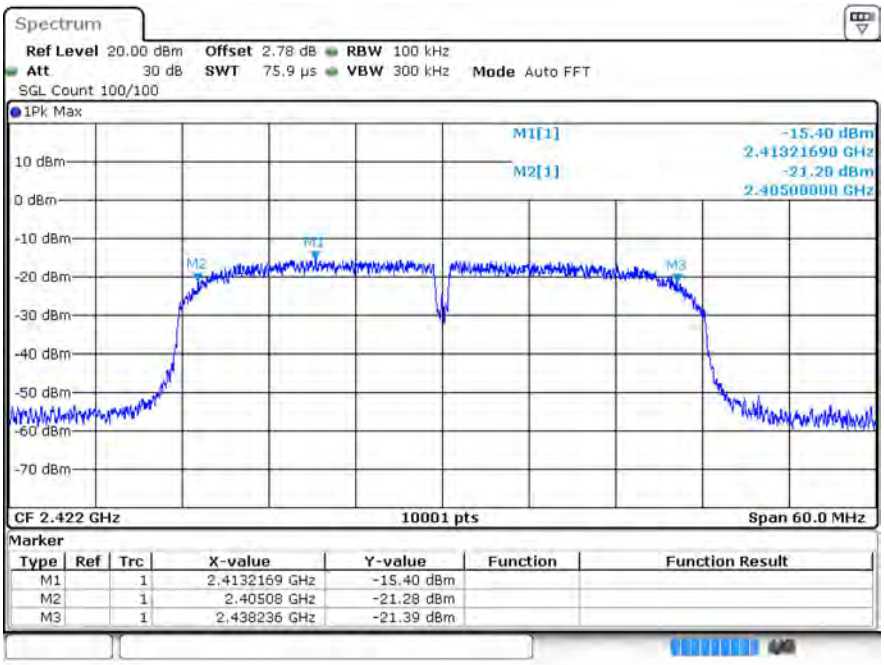
n20 2437MHz Ant1



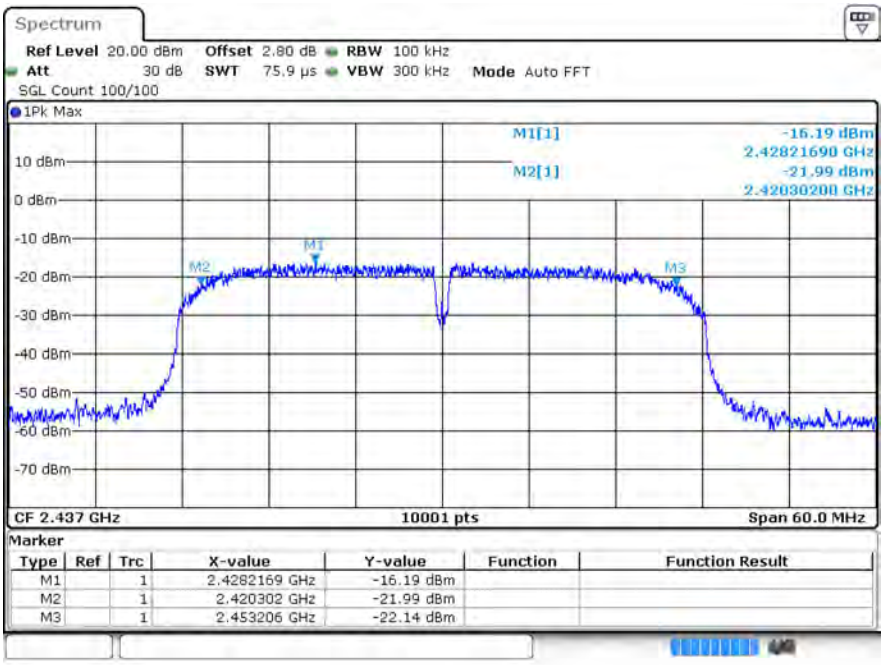
n20 2462MHz Ant1



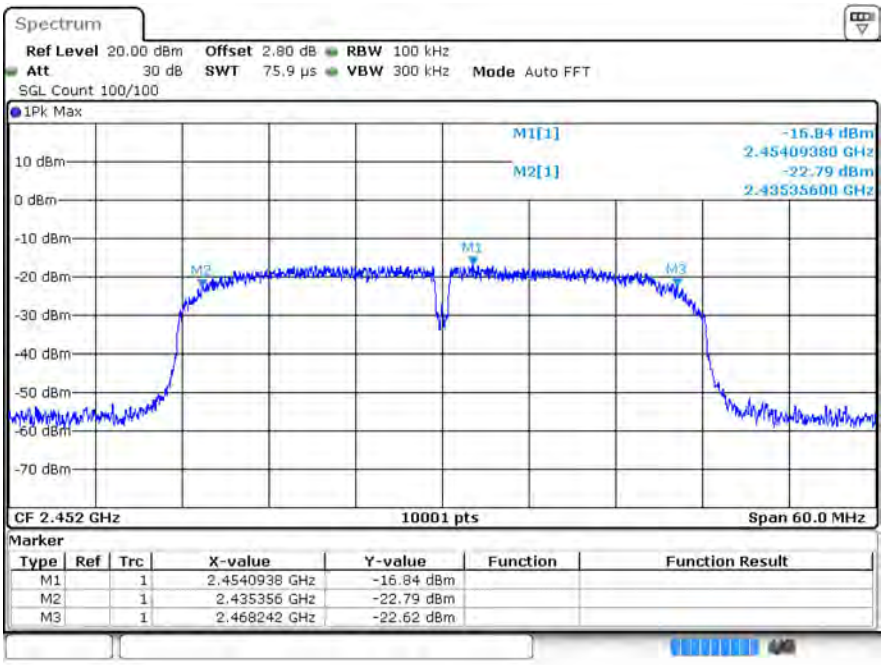
n40 2422MHz Ant1



n40 2437MHz Ant1



n40 2452MHz Ant1

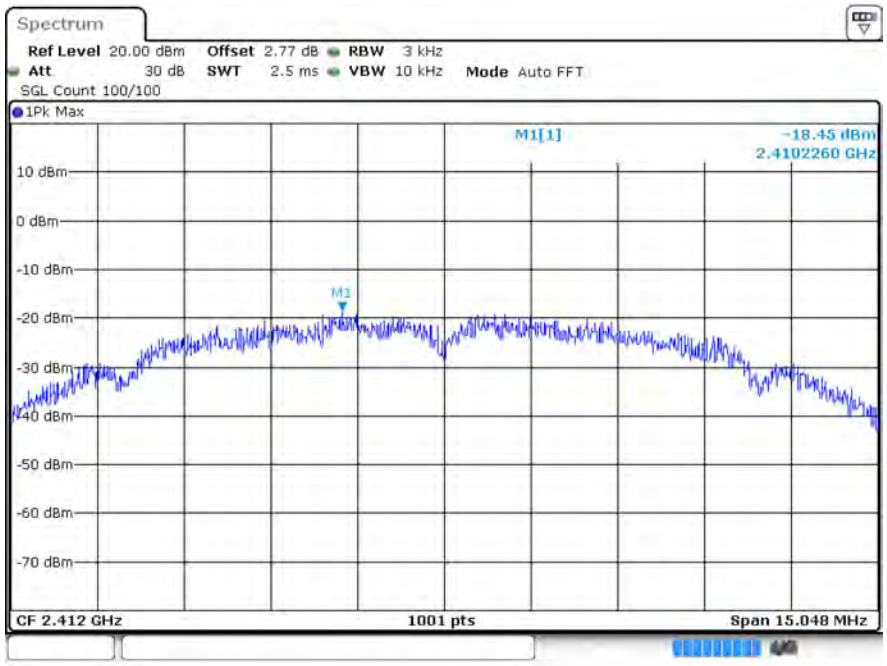
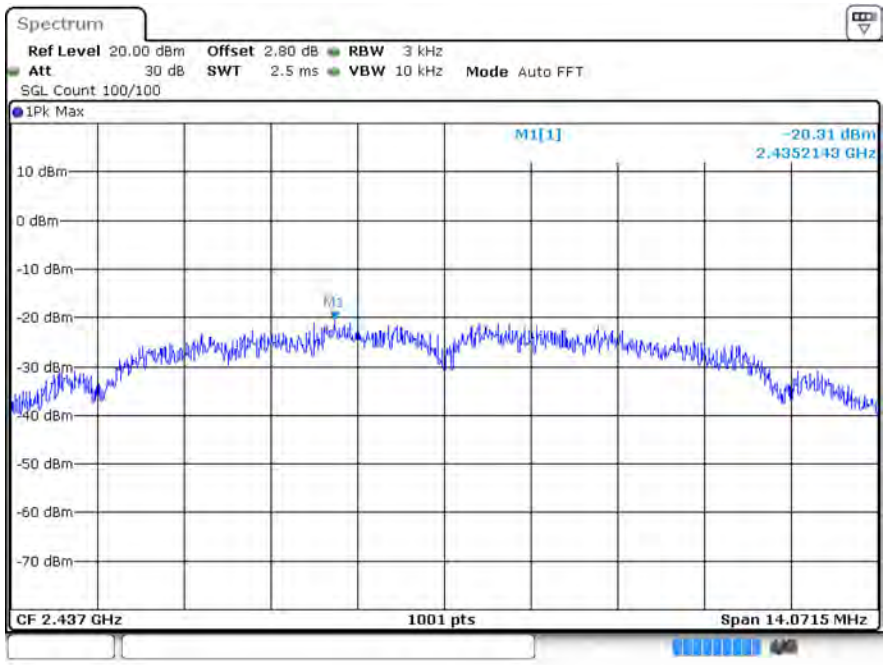


4 Maximum Power Spectral Density Level

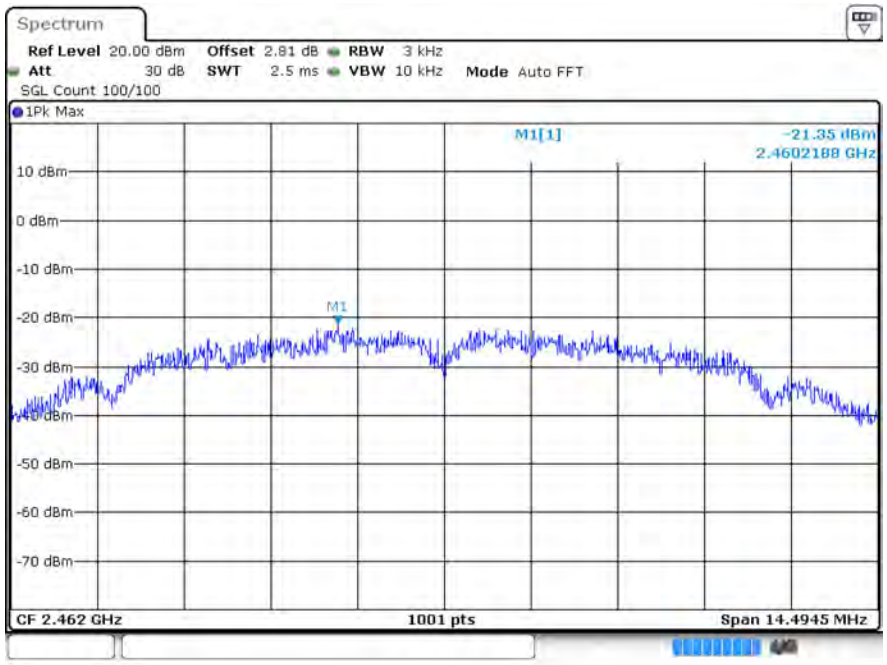
4.1 Test Result

Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3-100kHz)	Limit (dBm/3kHz)	Verdict
b	2412	Ant1	-18.45	≤8	Pass
b	2437	Ant1	-20.31	≤8	Pass
b	2462	Ant1	-21.35	≤8	Pass
g	2412	Ant1	-25.71	≤8	Pass
g	2437	Ant1	-27.15	≤8	Pass
g	2462	Ant1	-28.12	≤8	Pass
n20	2412	Ant1	-24.37	≤8	Pass
n20	2437	Ant1	-25.97	≤8	Pass
n20	2462	Ant1	-26.97	≤8	Pass
n40	2422	Ant1	-27.15	≤8	Pass
n40	2437	Ant1	-28.21	≤8	Pass
n40	2452	Ant1	-28.59	≤8	Pass

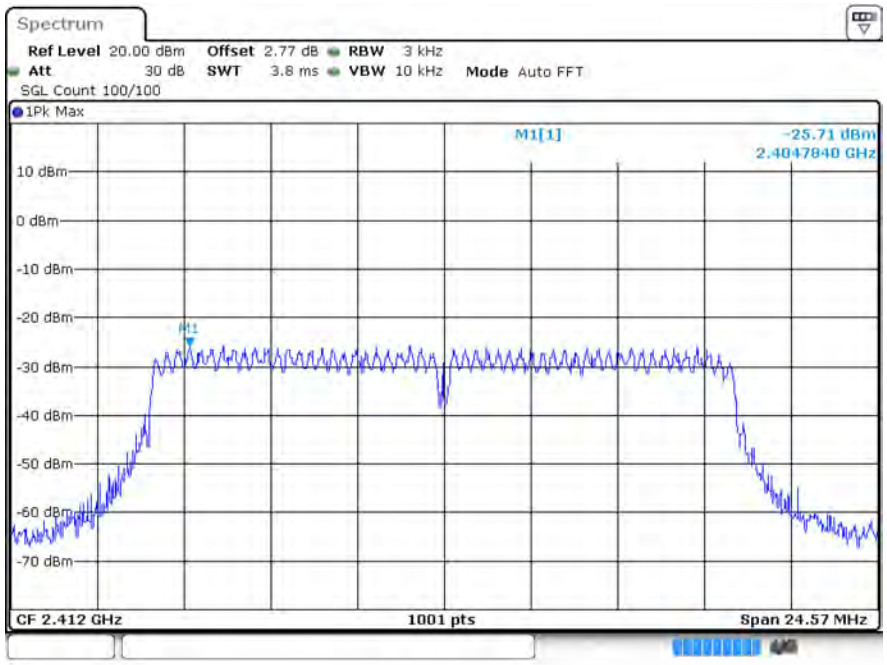
4.2 Test Graphs

Test Graphs
b 2412MHz Ant1

b 2437MHz Ant1


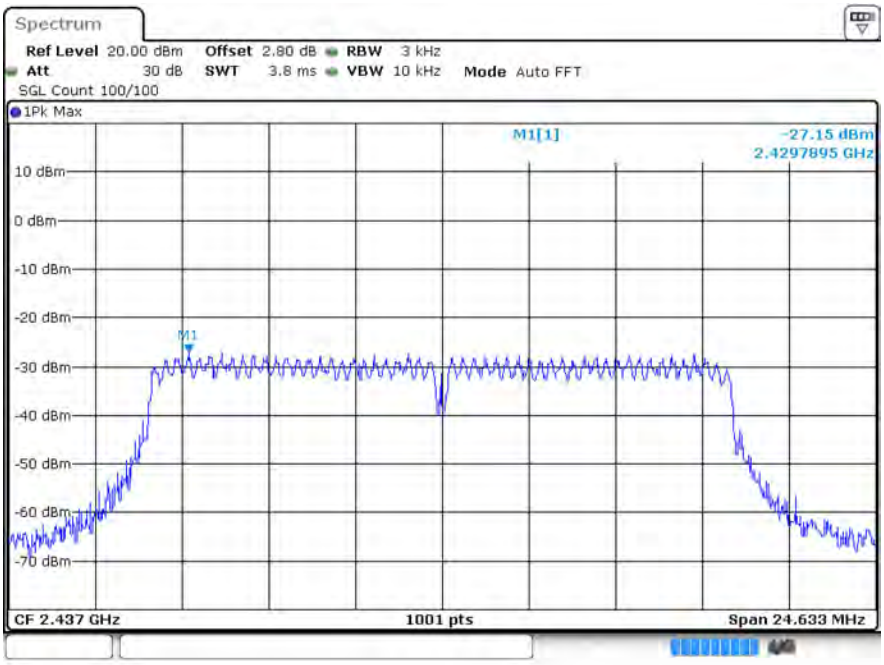
b 2462MHz Ant1



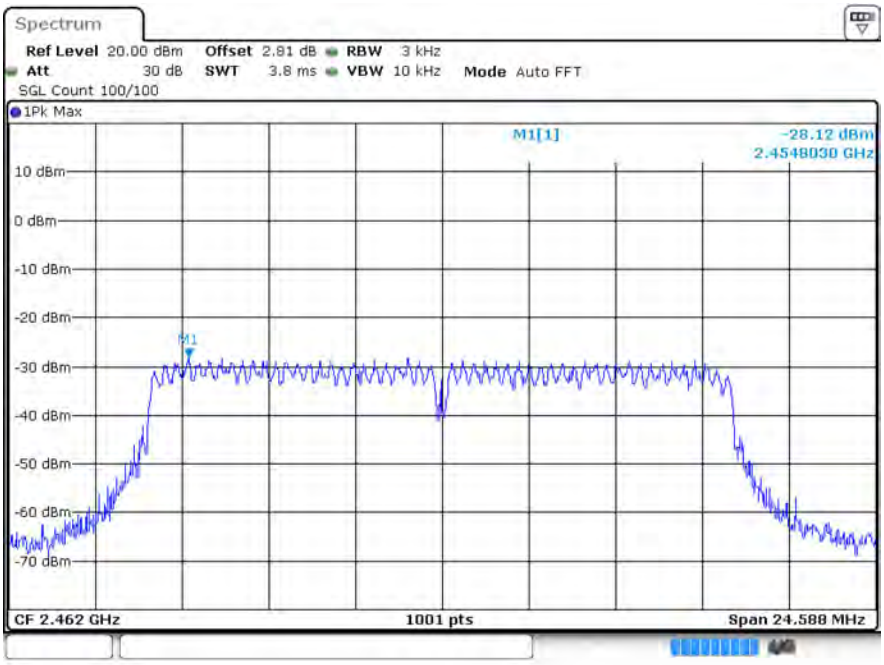
g 2412MHz Ant1



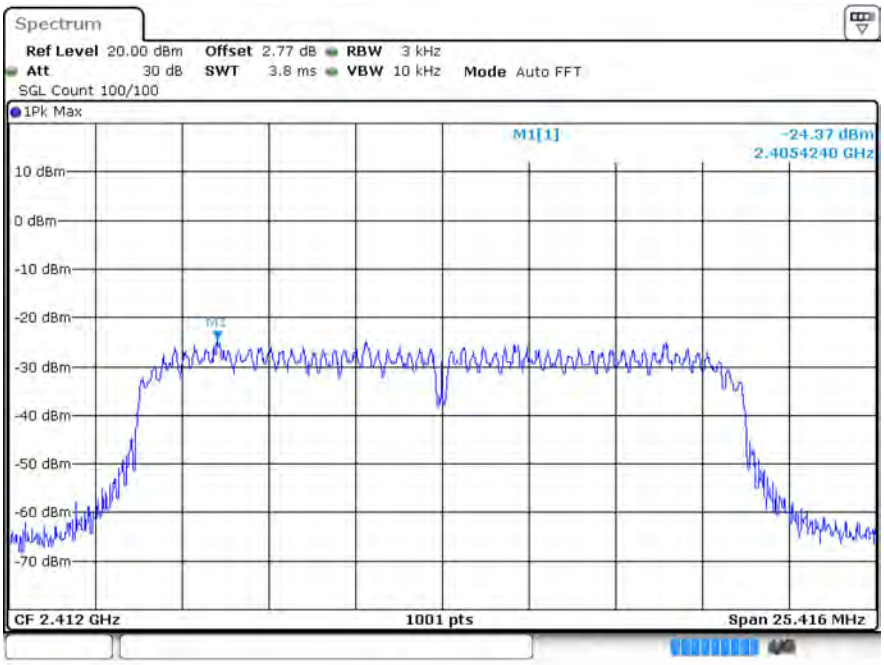
g 2437MHz Ant1



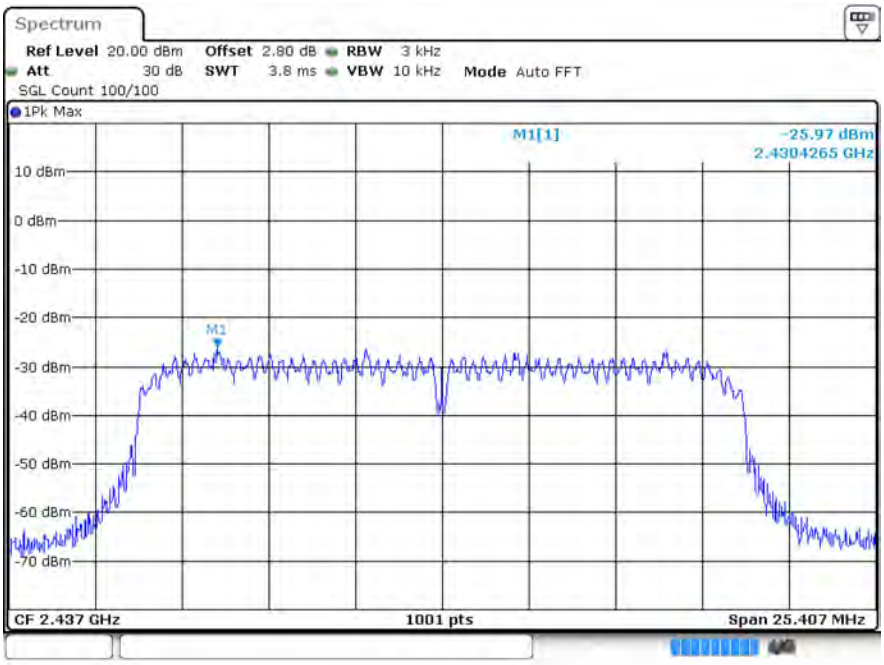
g 2462MHz Ant1



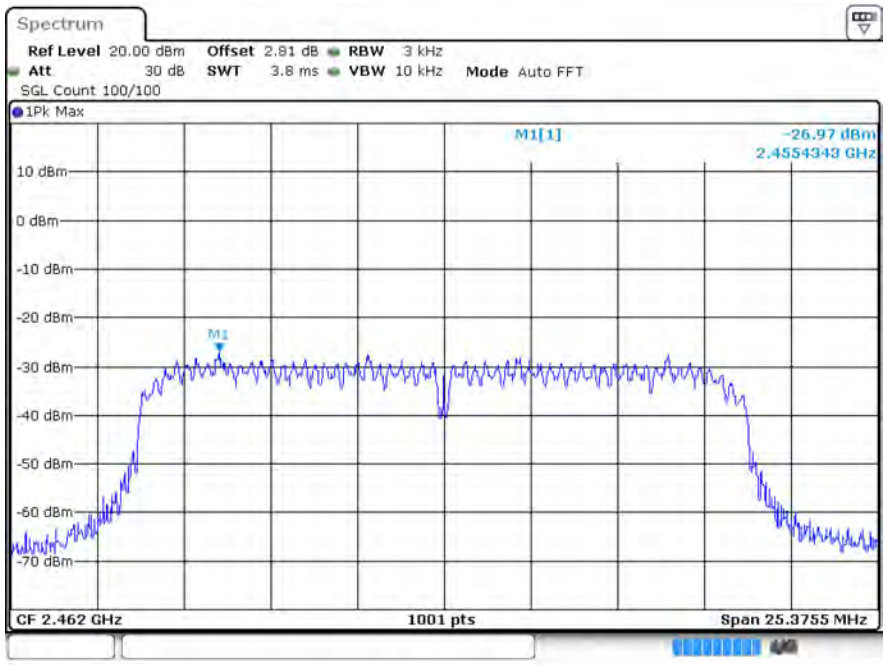
n20 2412MHz Ant1



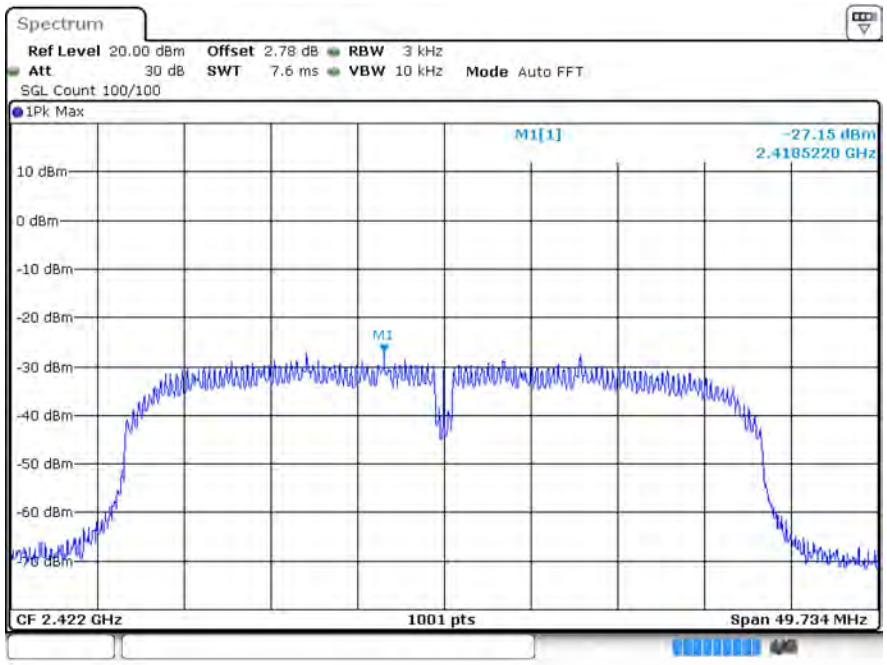
n20 2437MHz Ant1



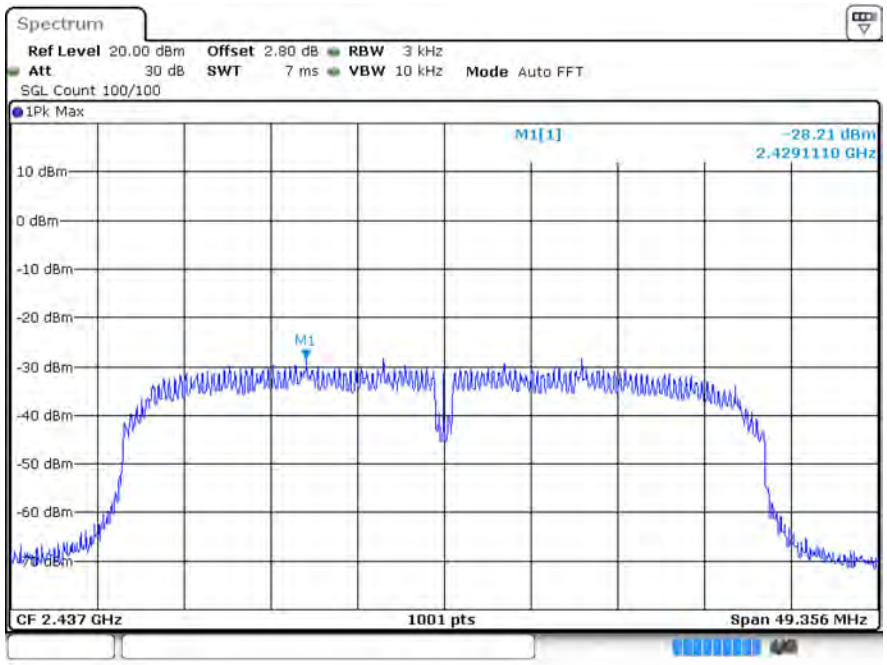
n20 2462MHz Ant1



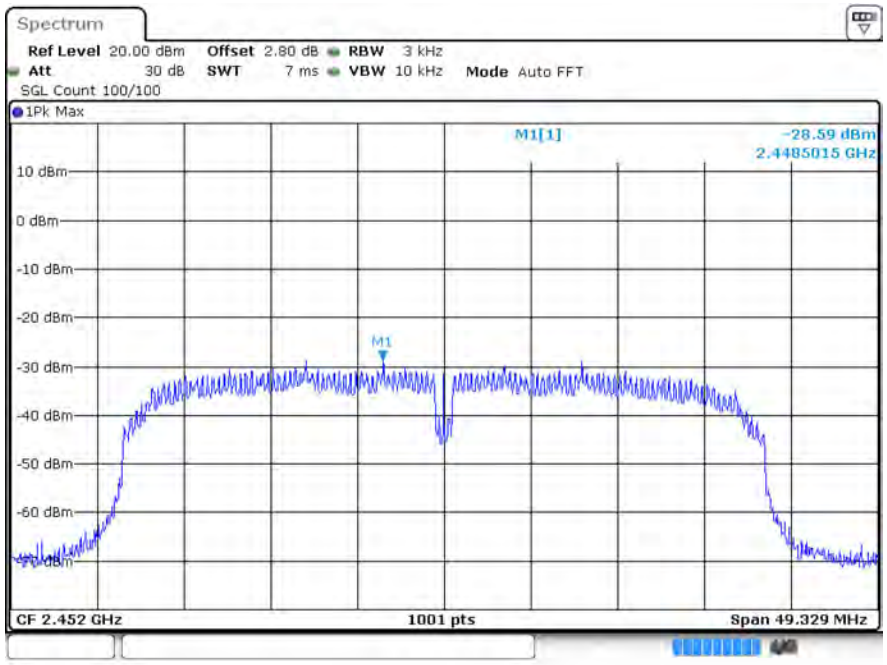
n40 2422MHz Ant1



n40 2437MHz Ant1



n40 2452MHz Ant1



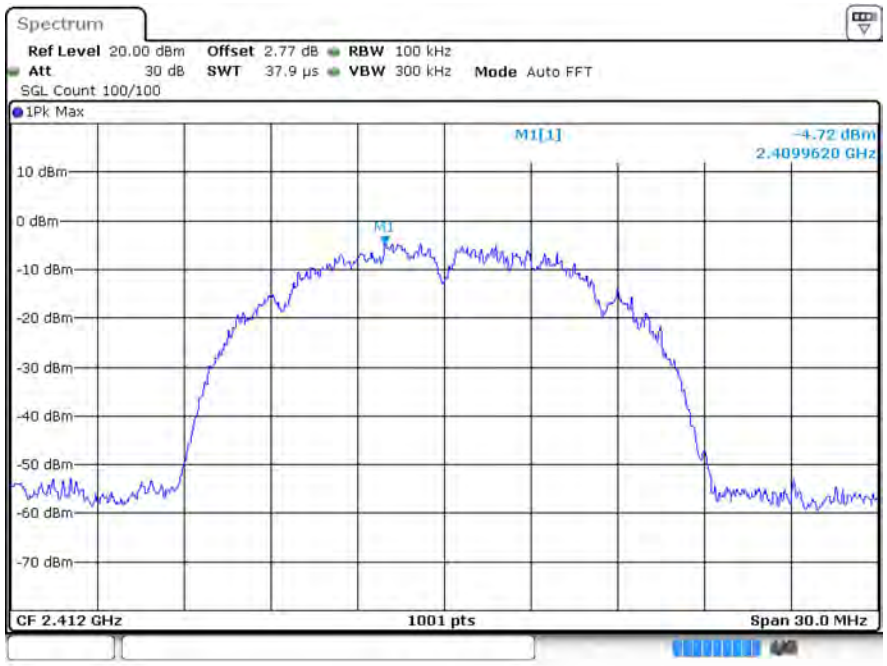
5 Band Edge

5.1 Test Result

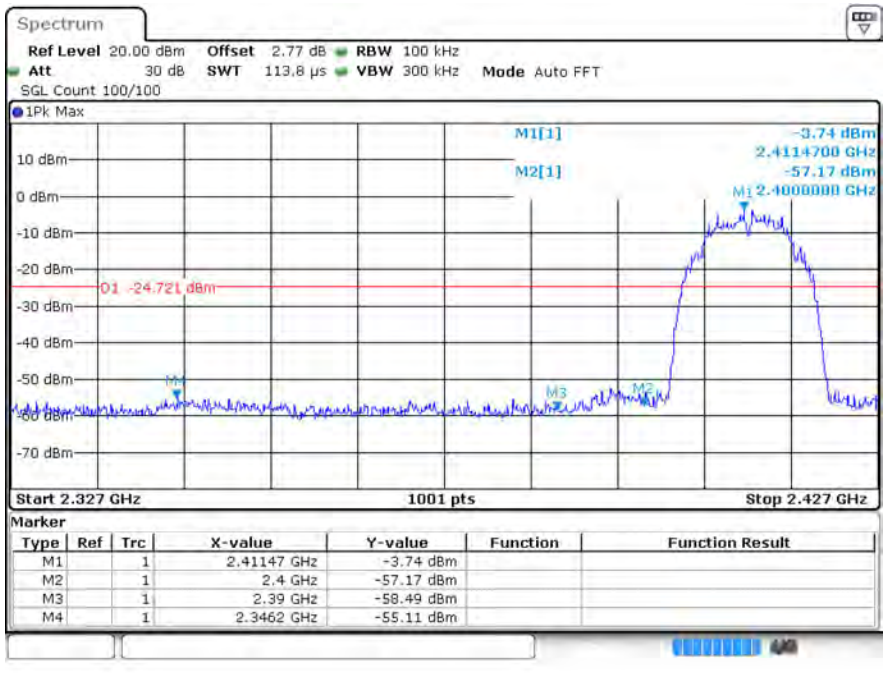
Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
b	2412	Ant1	-50.38	-20	Pass
b	2462	Ant1	-48.52	-20	Pass
g	2412	Ant1	-41.52	-20	Pass
g	2462	Ant1	-41.25	-20	Pass
n20	2412	Ant1	-42.86	-20	Pass
n20	2462	Ant1	-41.52	-20	Pass
n40	2422	Ant1	-38	-20	Pass
n40	2452	Ant1	-39.26	-20	Pass

5.2 Test Graphs

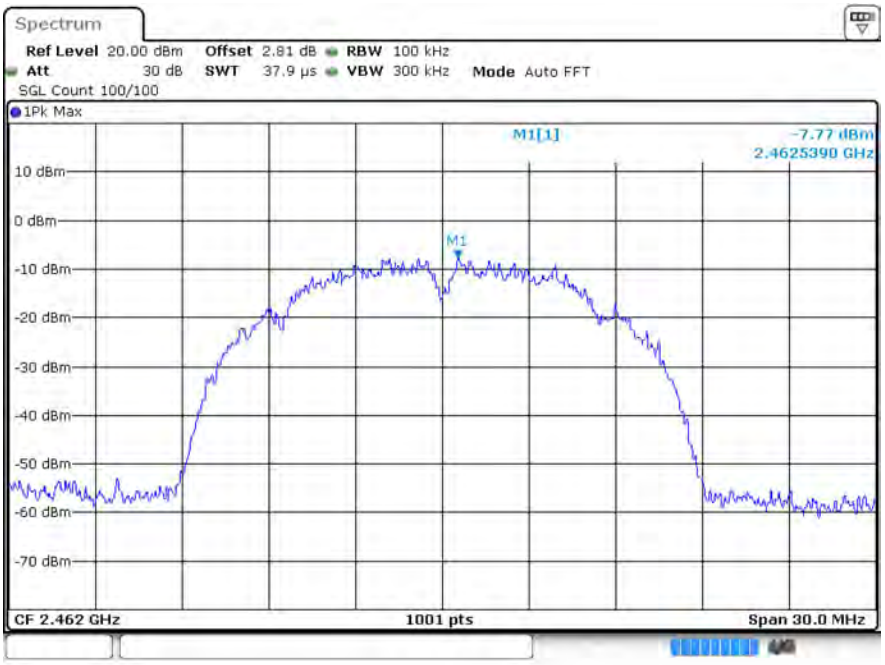
Test Graphs
b 2412MHz Ant1 Ref



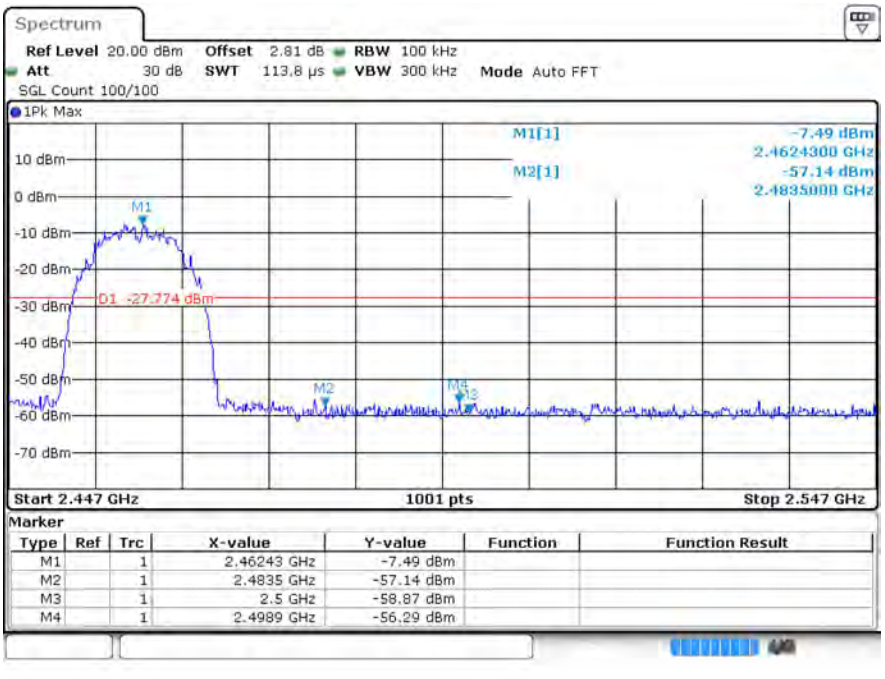
b 2412MHz Ant1 Emission



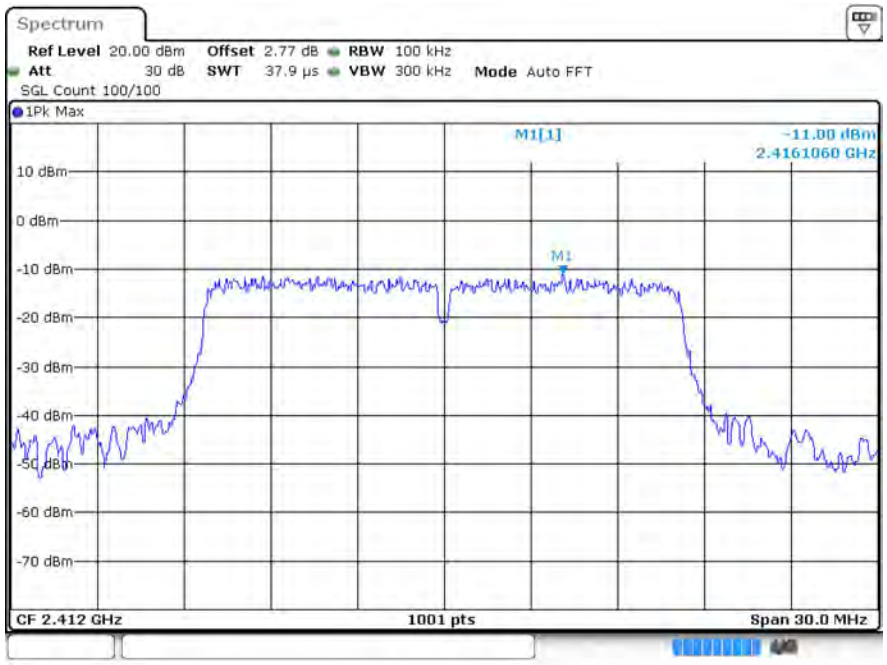
b 2462MHz Ant1 Ref



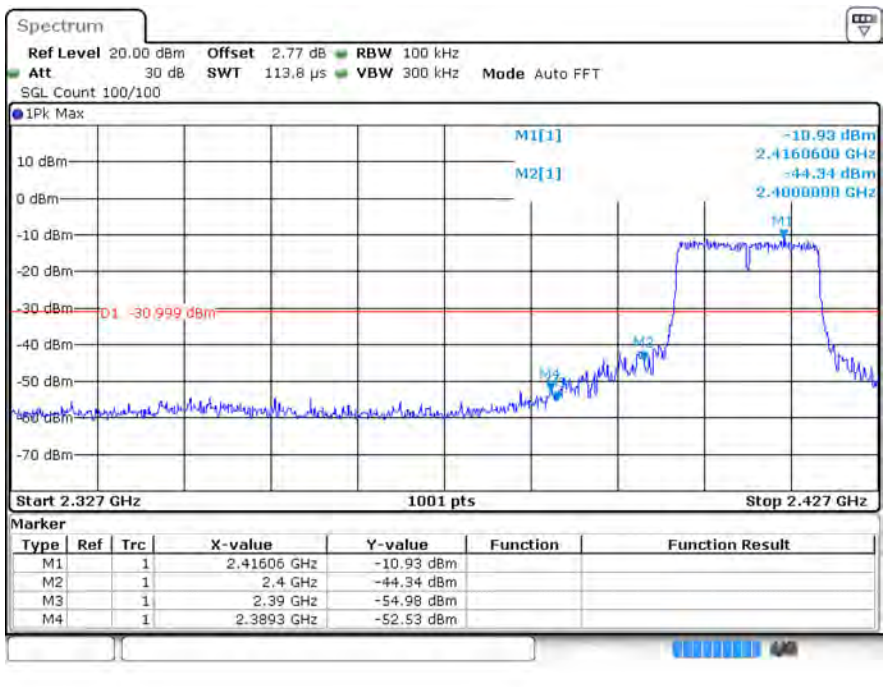
b 2462MHz Ant1 Emission



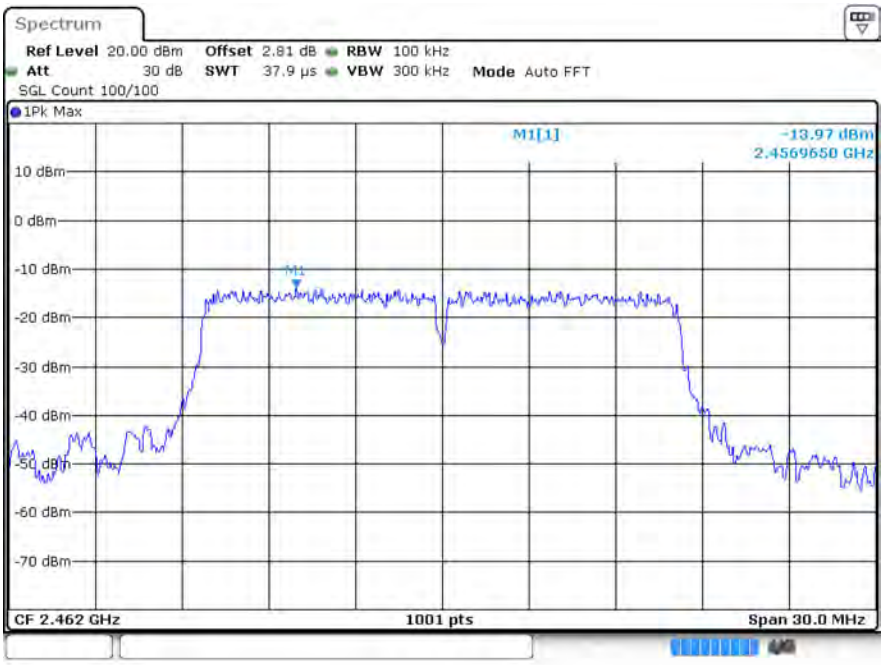
g 2412MHz Ant1 Ref



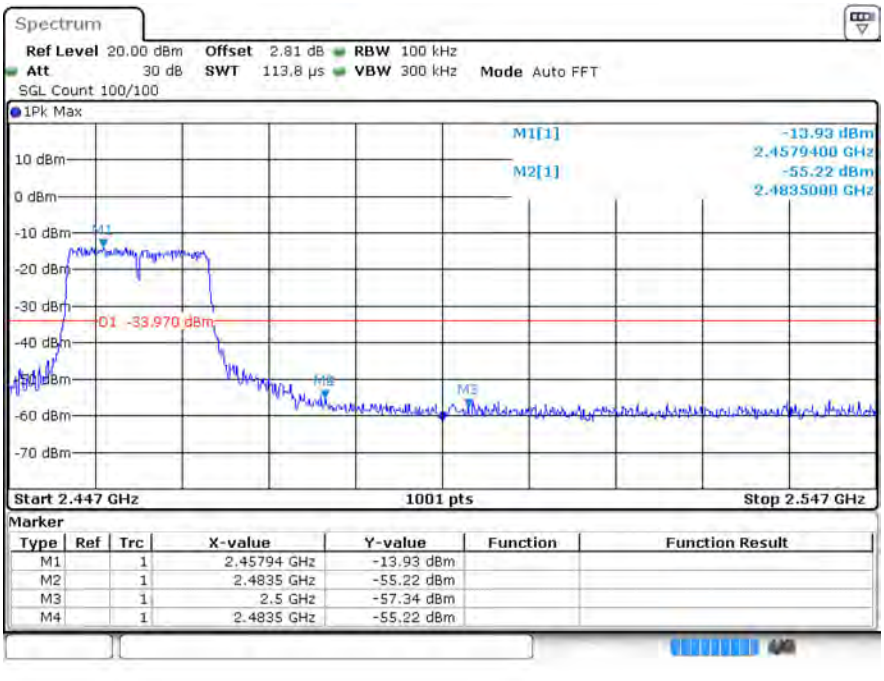
g 2412MHz Ant1 Emission



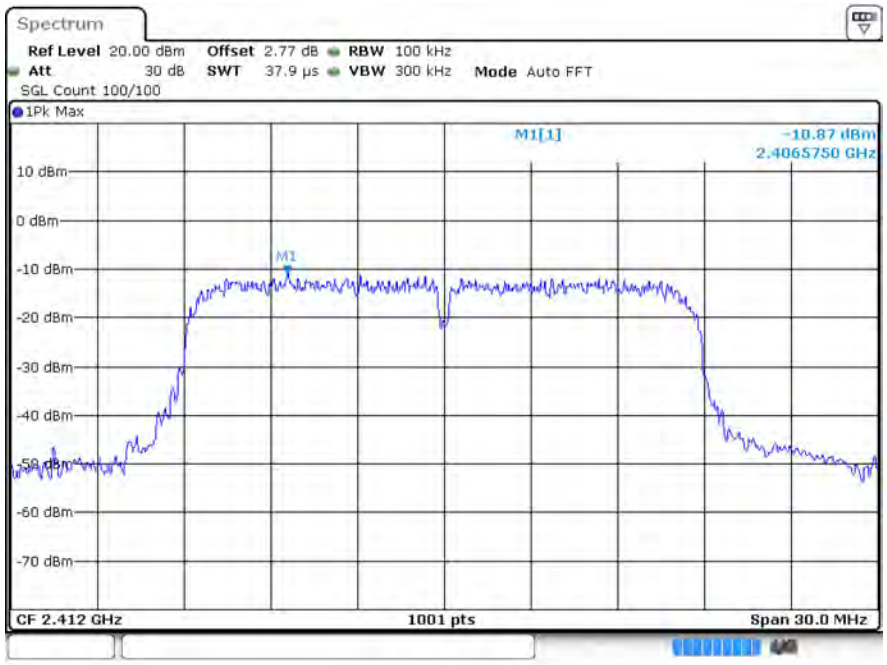
g 2462MHz Ant1 Ref



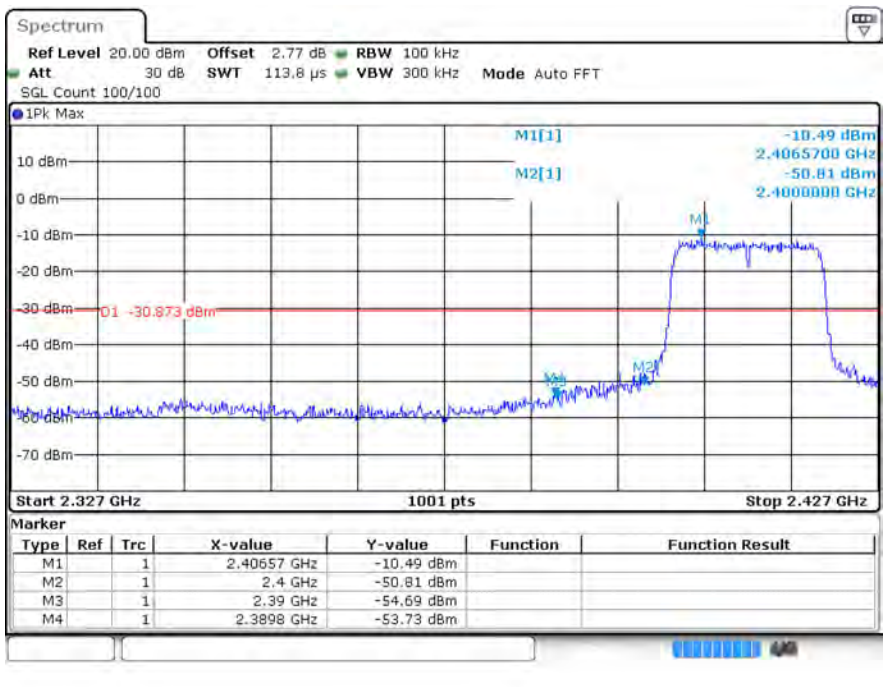
g 2462MHz Ant1 Emission



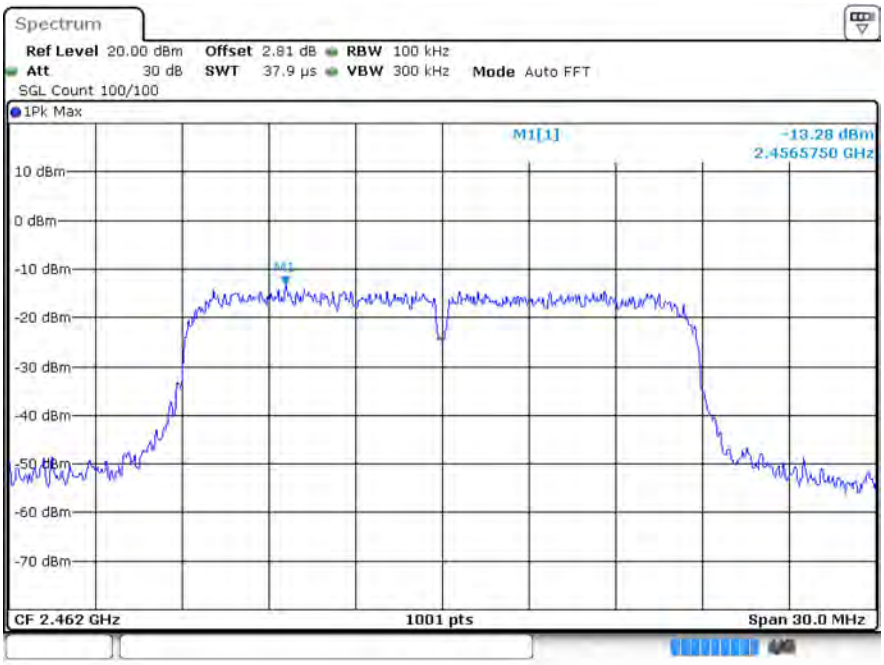
n20 2412MHz Ant1 Ref



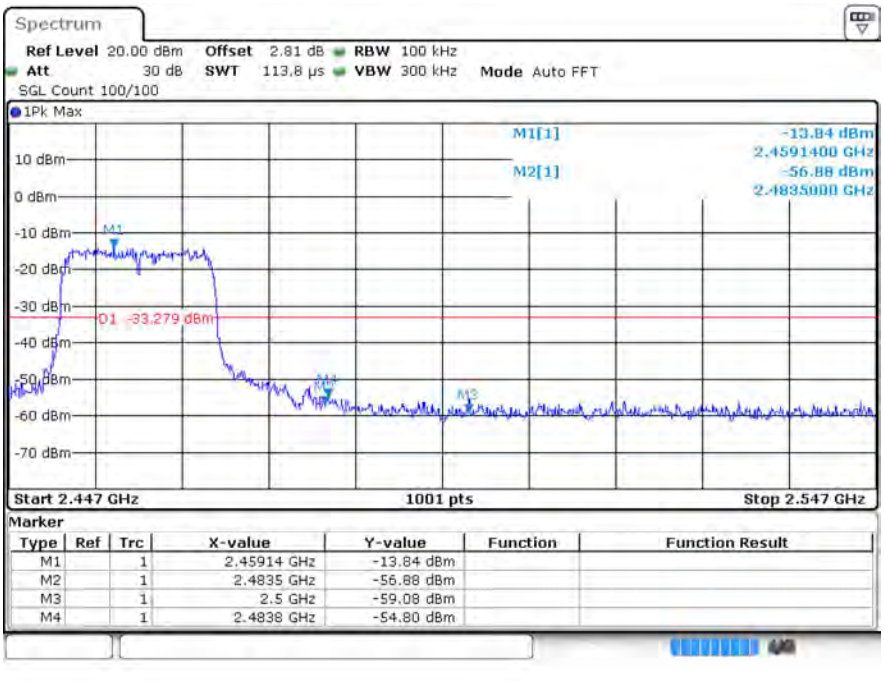
n20 2412MHz Ant1 Emission



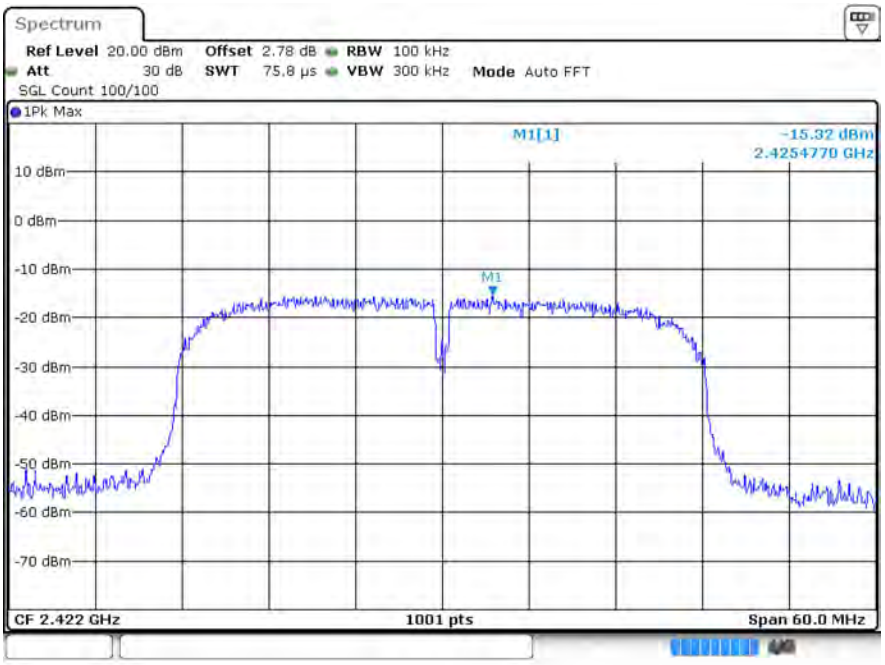
n20 2462MHz Ant1 Ref



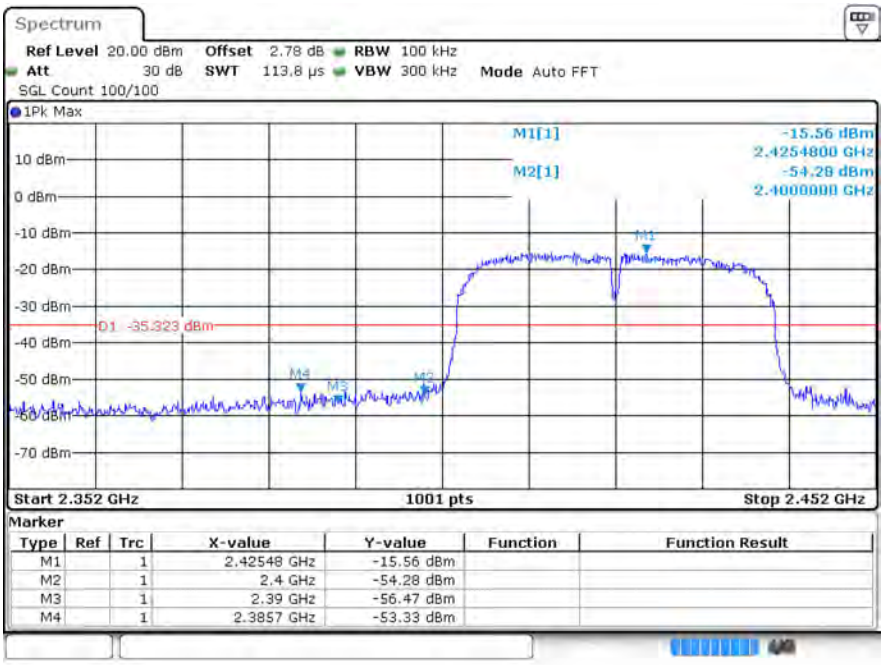
n20 2462MHz Ant1 Emission



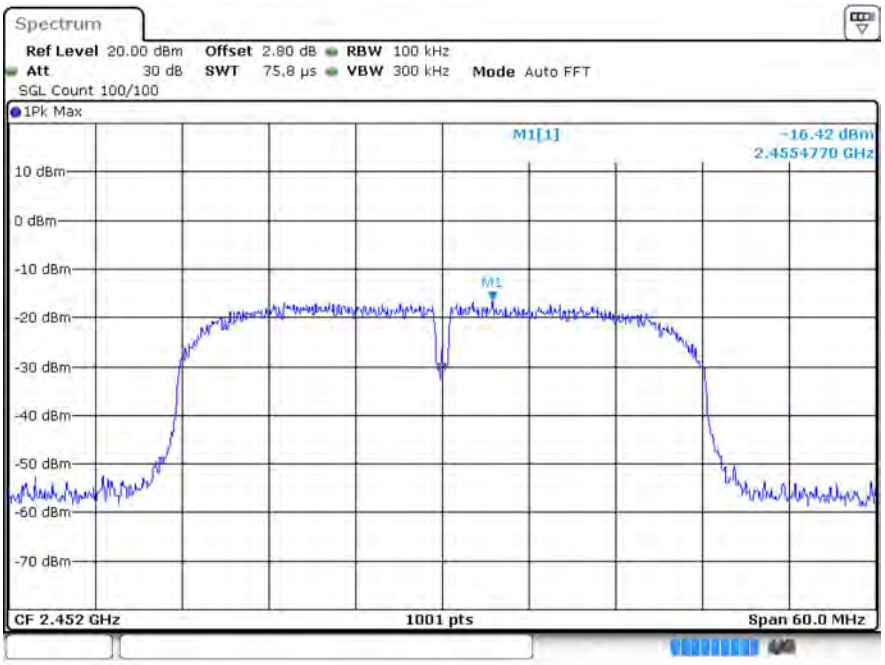
n40 2422MHz Ant1 Ref



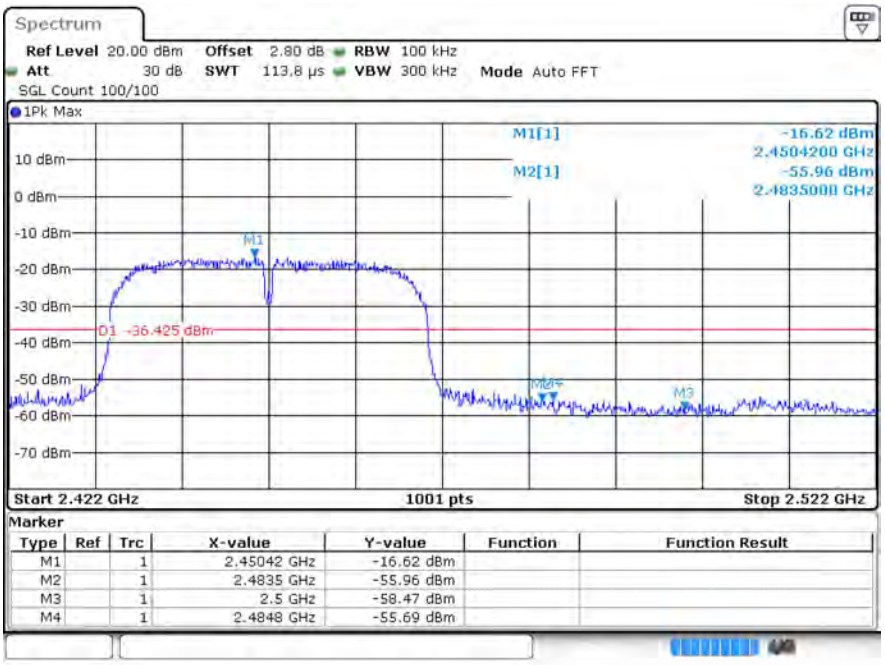
n40 2422MHz Ant1 Emission



n40 2452MHz Ant1 Ref



n40 2452MHz Ant1 Emission



6 Conducted RF Spurious Emission

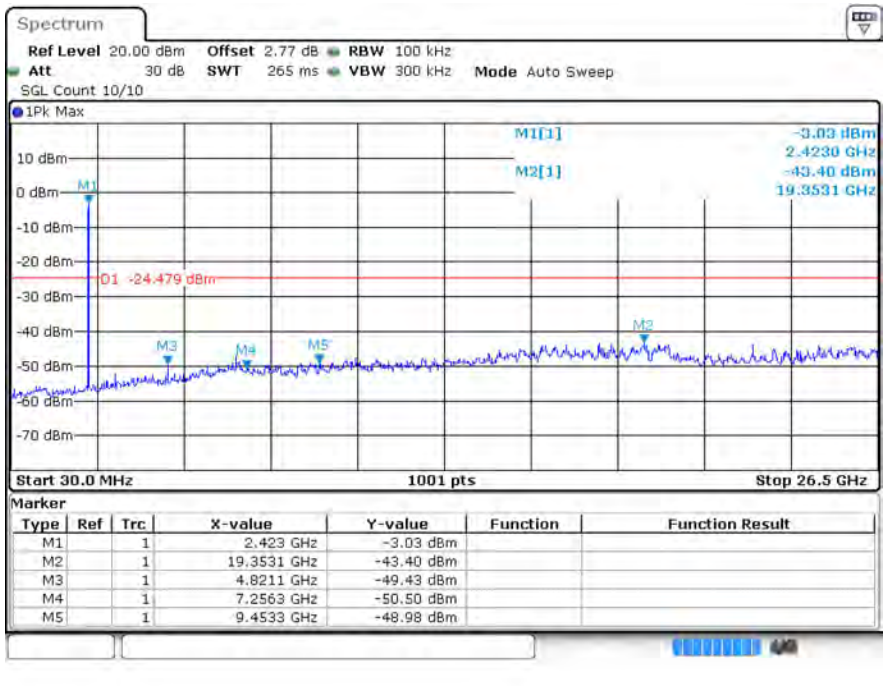
6.1 Test Result

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
b	2412	Ant1	-38.91	-20	Pass
b	2437	Ant1	-36.96	-20	Pass
b	2462	Ant1	-35.76	-20	Pass
g	2412	Ant1	-32.08	-20	Pass
g	2437	Ant1	-30.56	-20	Pass
g	2462	Ant1	-29.21	-20	Pass
n20	2412	Ant1	-31.38	-20	Pass
n20	2437	Ant1	-30.24	-20	Pass
n20	2462	Ant1	-29.62	-20	Pass
n40	2422	Ant1	-27.79	-20	Pass
n40	2437	Ant1	-27.08	-20	Pass
n40	2452	Ant1	-26	-20	Pass

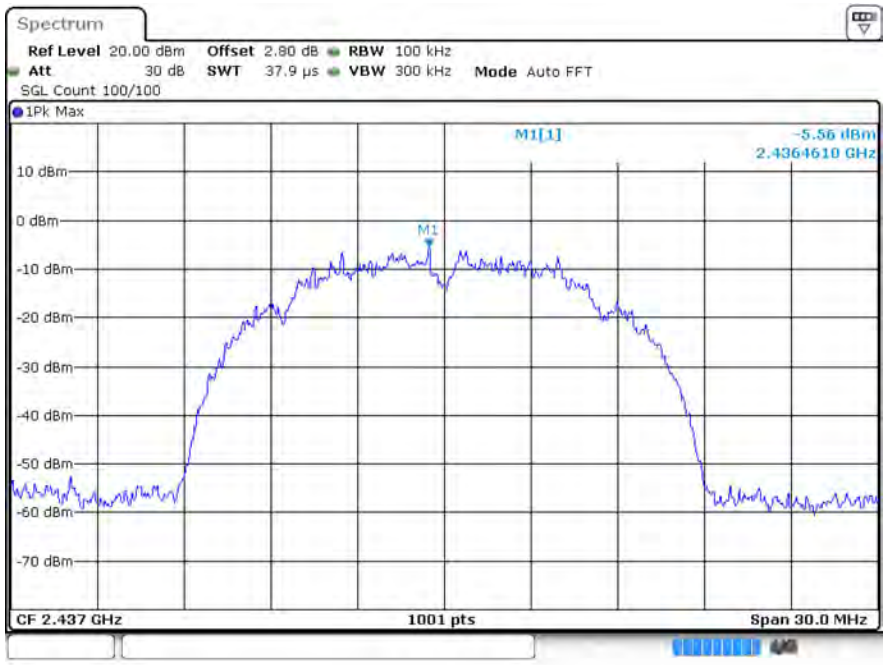
6.2 Test Graphs

Test Graphs
b 2412MHz Ant1 Ref

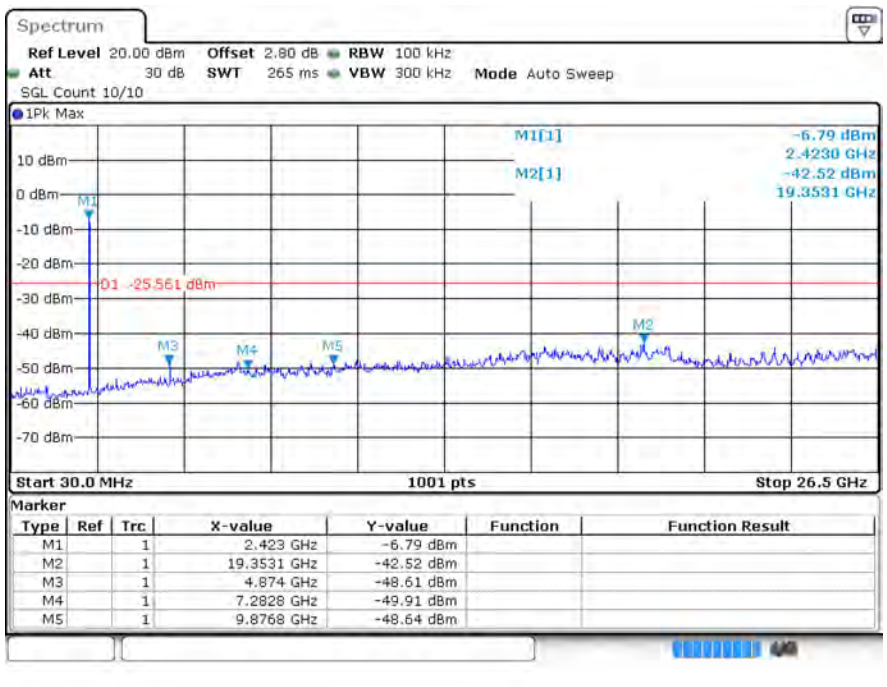
b 2412MHz Ant1 Emission



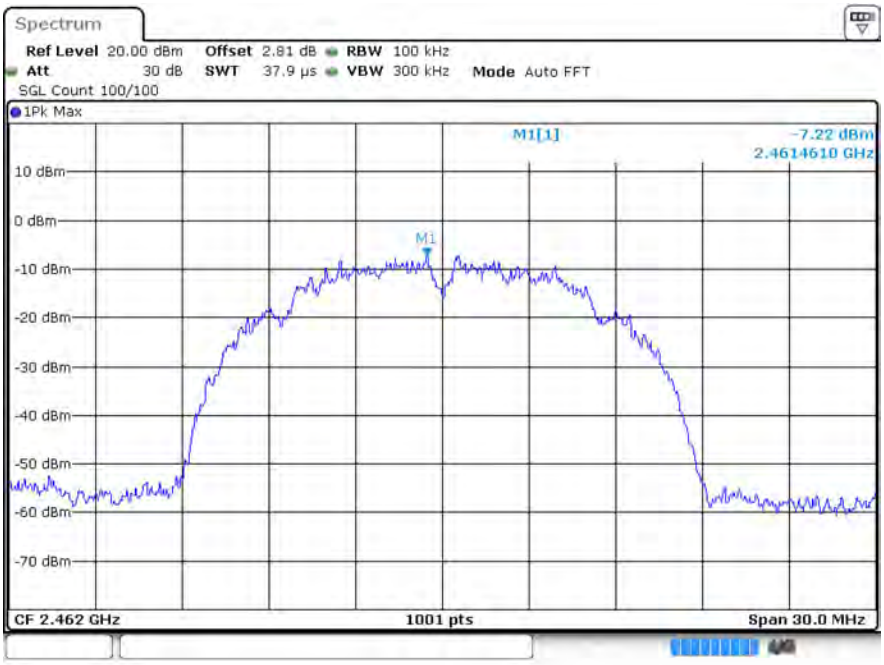
b 2437MHz Ant1 Ref



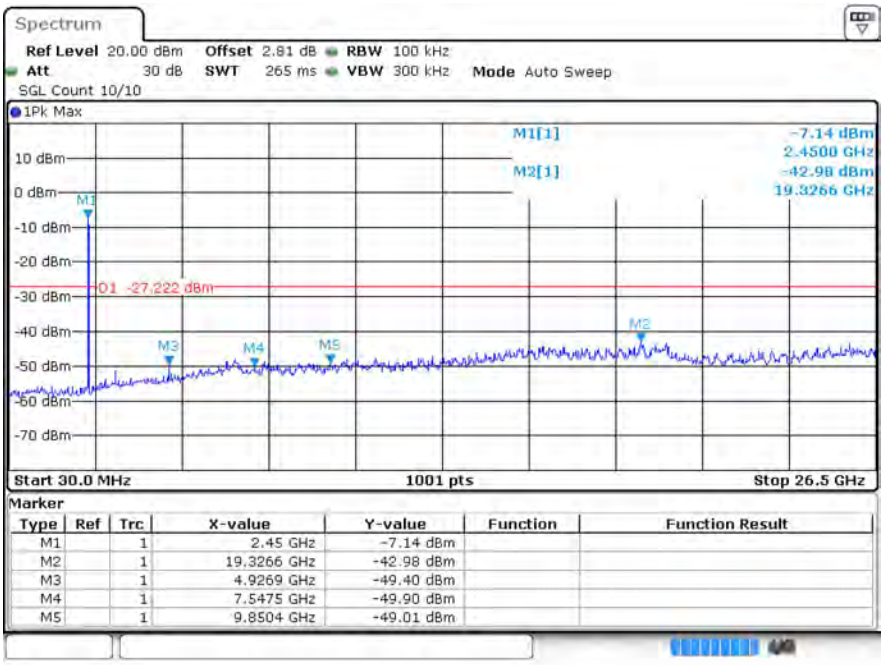
b 2437MHz Ant1 Emission



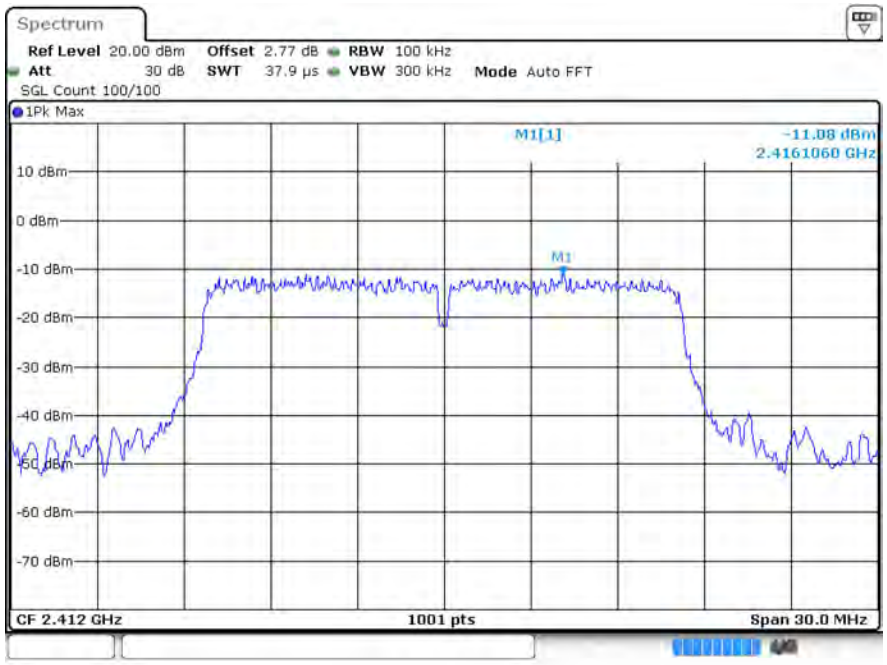
b 2462MHz Ant1 Ref



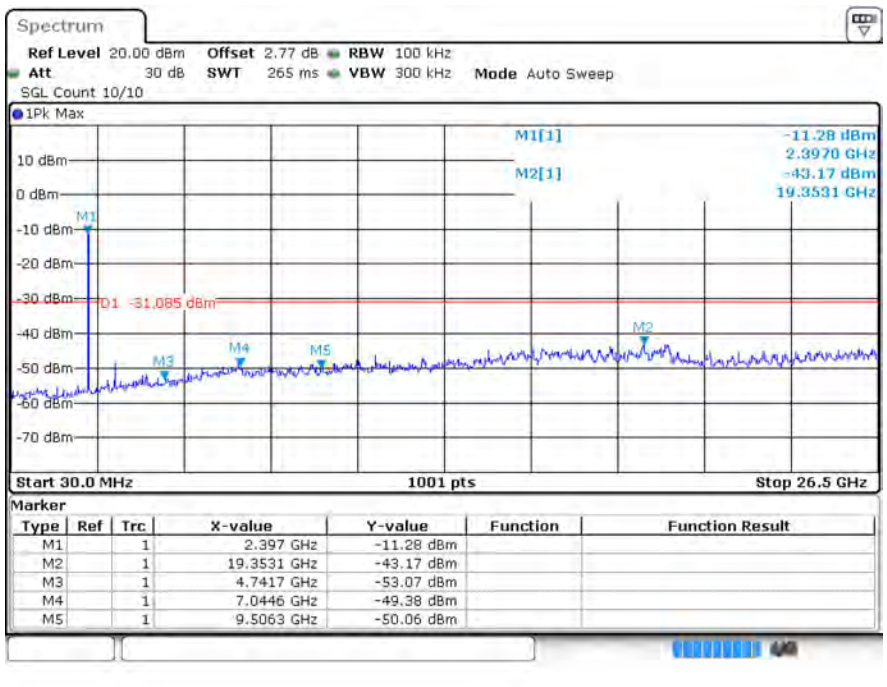
b 2462MHz Ant1 Emission



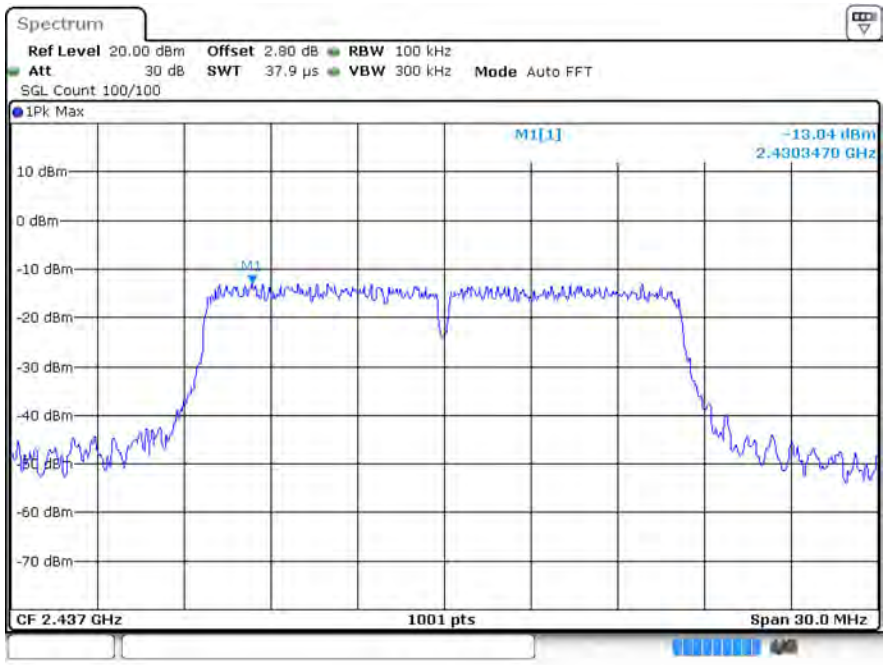
g 2412MHz Ant1 Ref



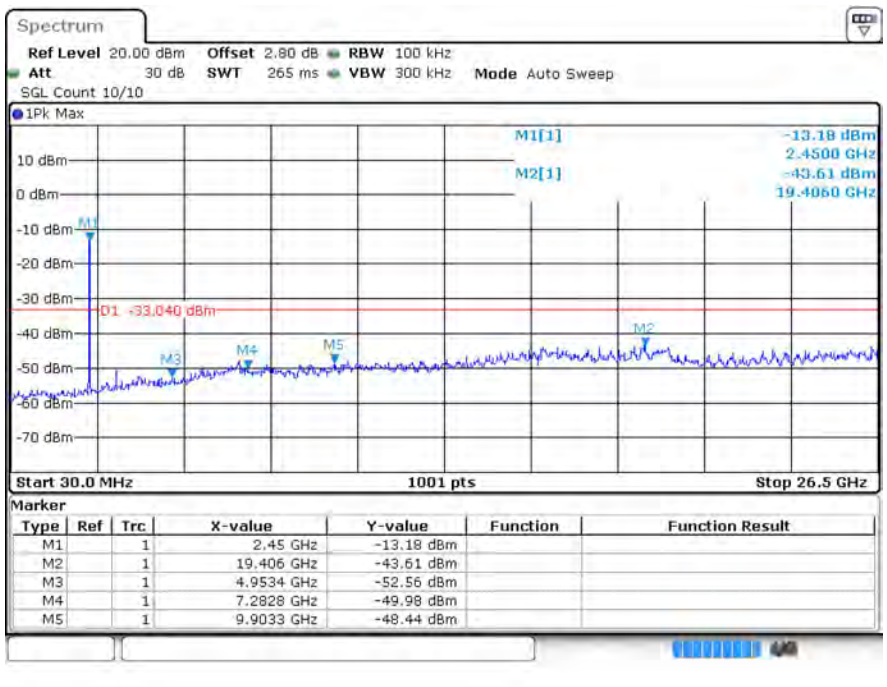
g 2412MHz Ant1 Emission



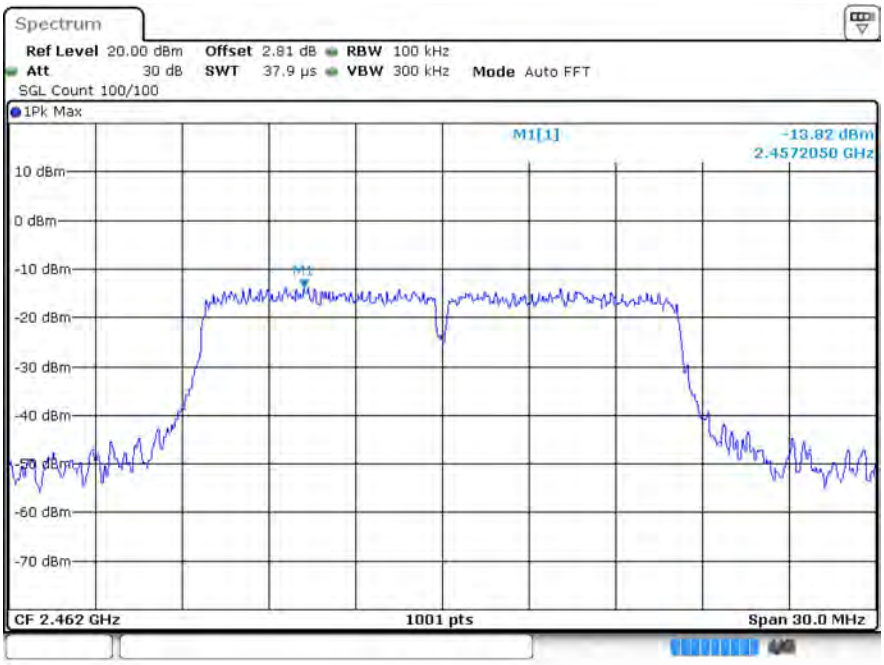
g 2437MHz Ant1 Ref



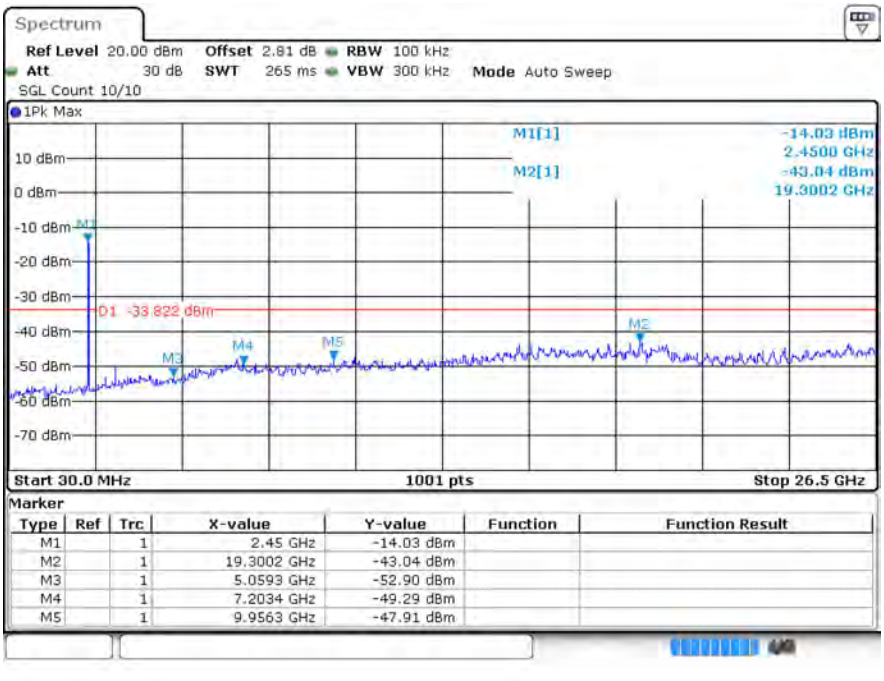
g 2437MHz Ant1 Emission



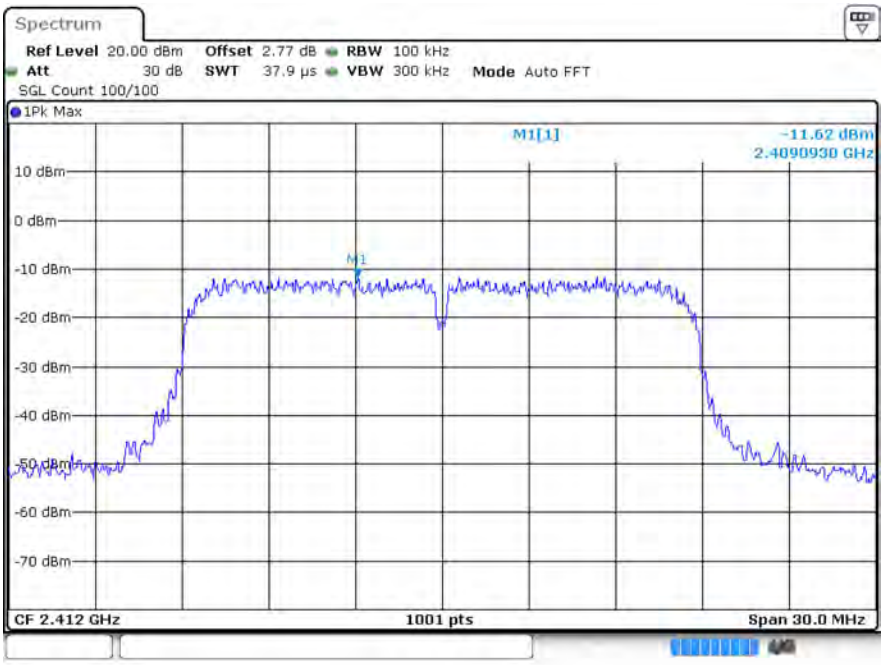
g 2462MHz Ant1 Ref



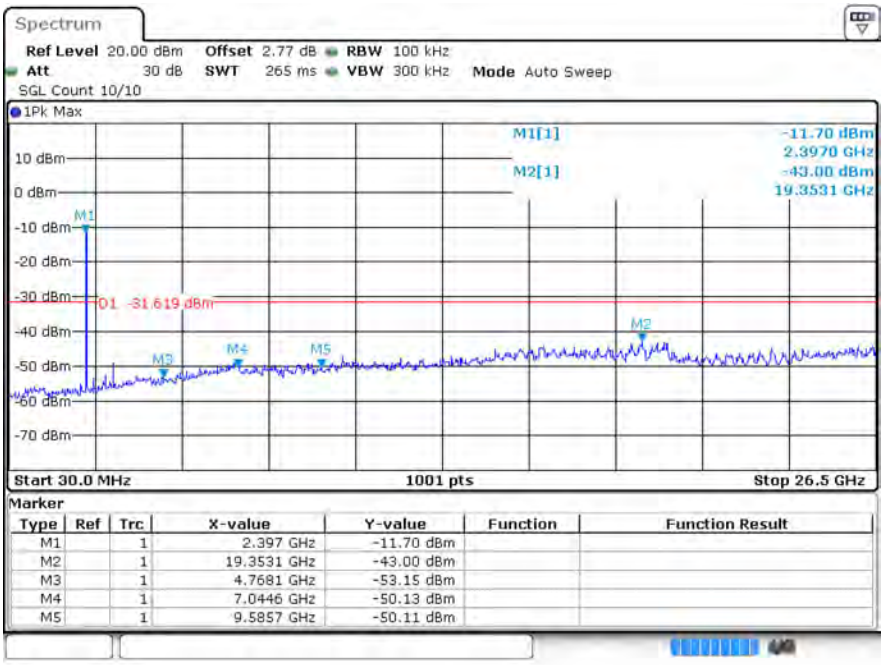
g 2462MHz Ant1 Emission



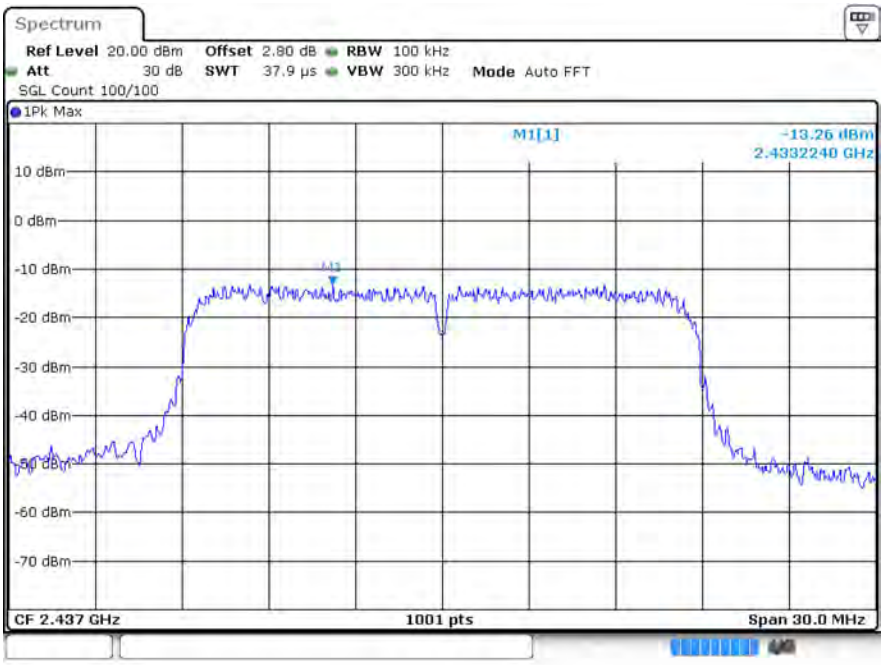
n20 2412MHz Ant1 Ref



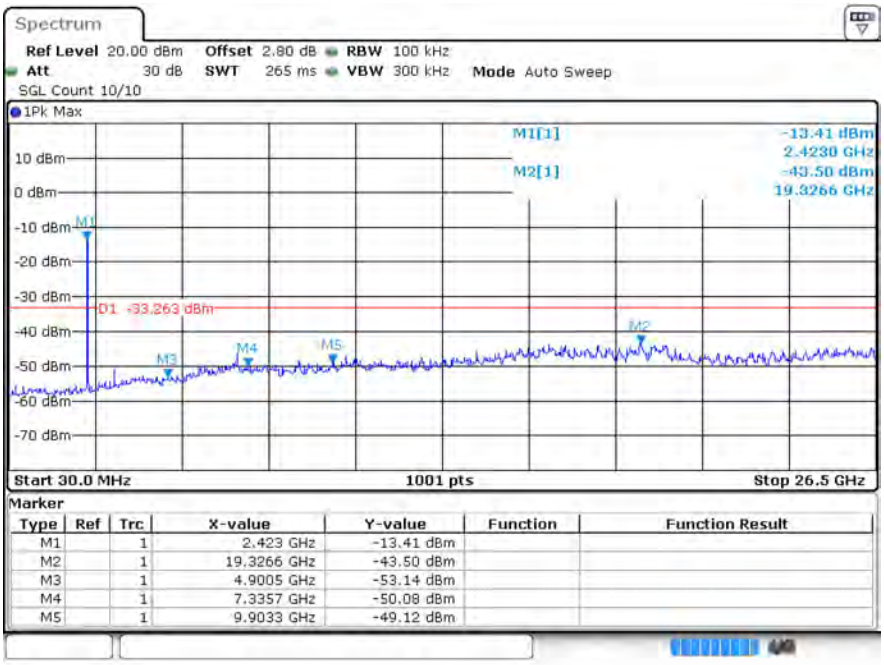
n20 2412MHz Ant1 Emission



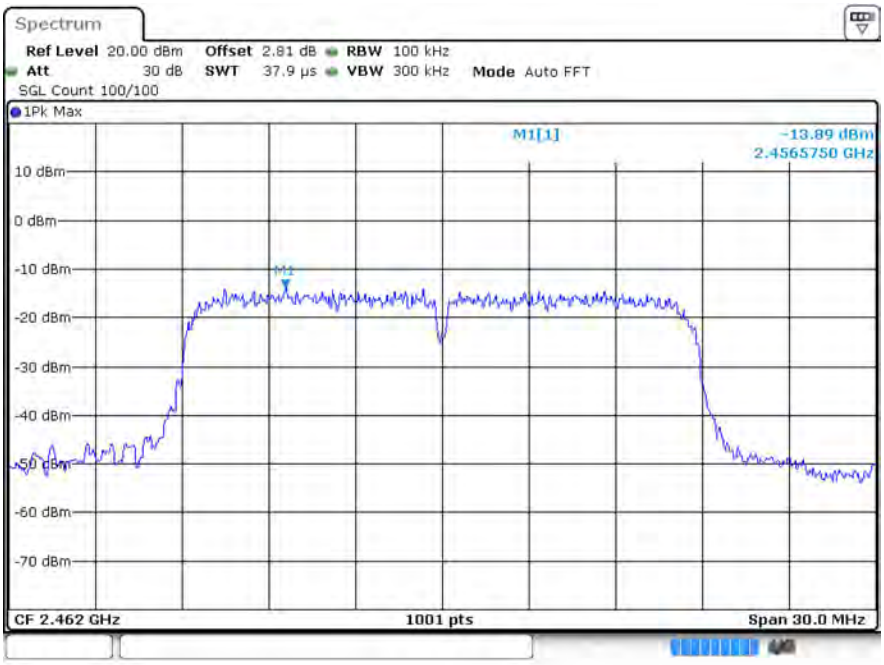
n20 2437MHz Ant1 Ref



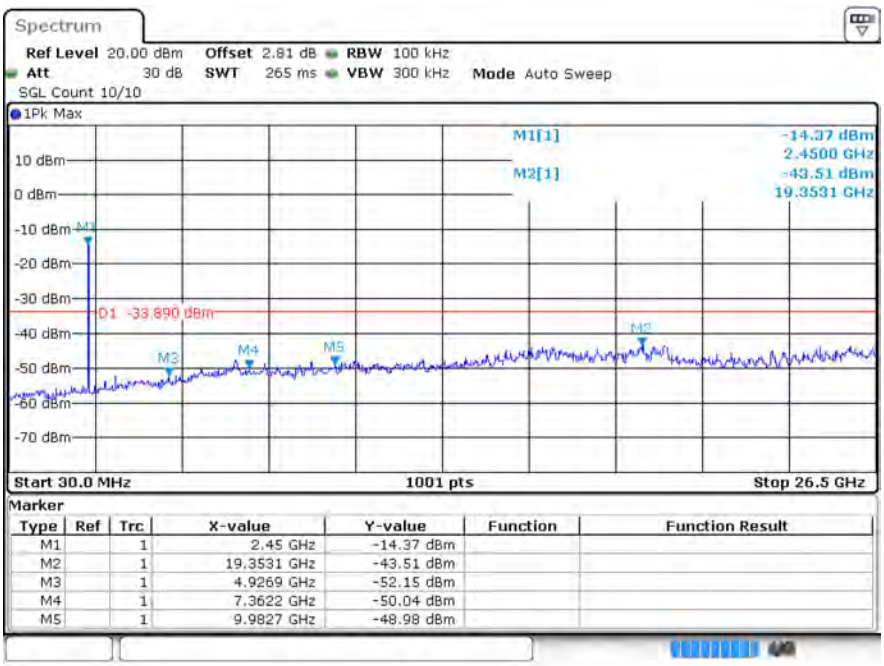
n20 2437MHz Ant1 Emission



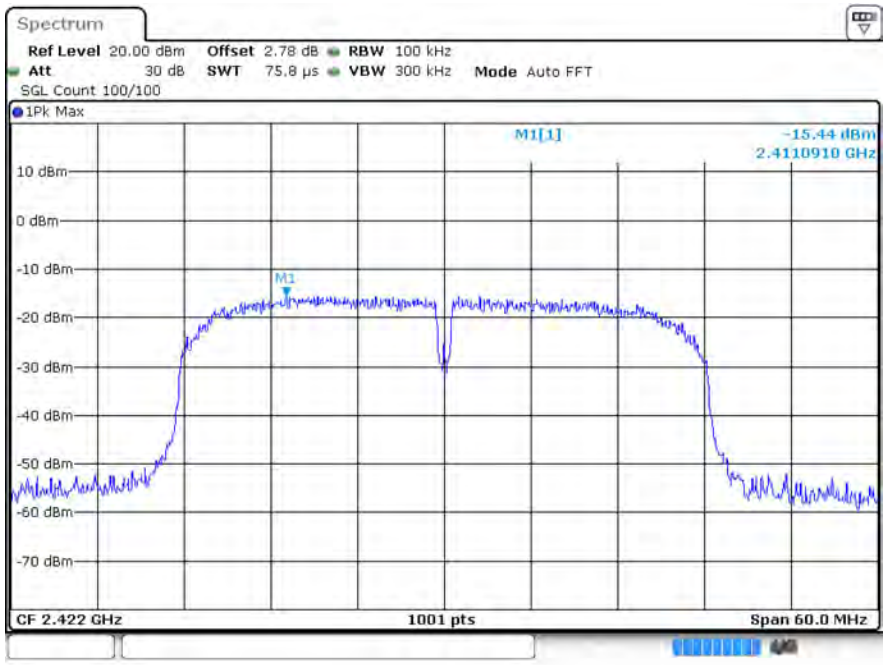
n20 2462MHz Ant1 Ref



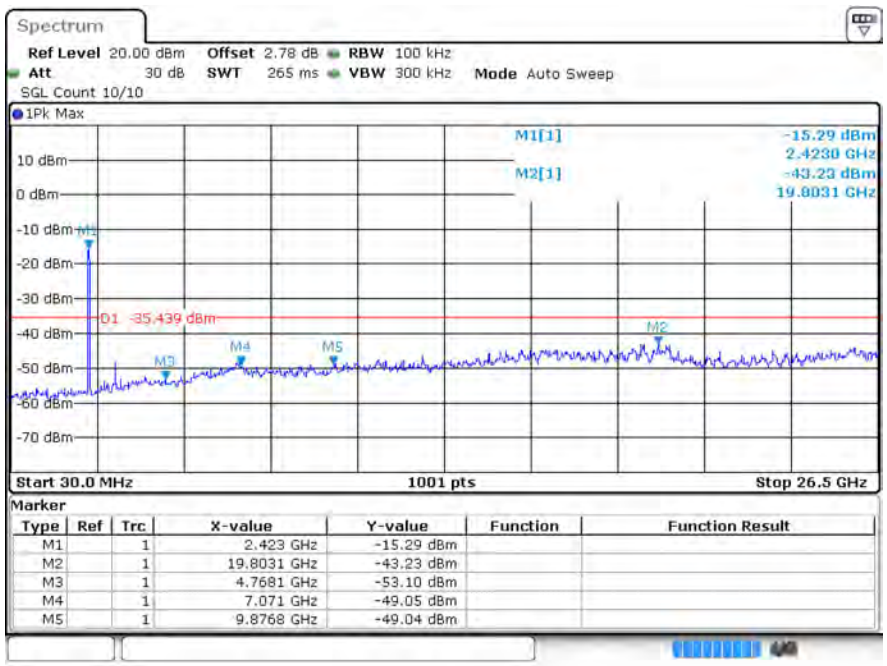
n20 2462MHz Ant1 Emission



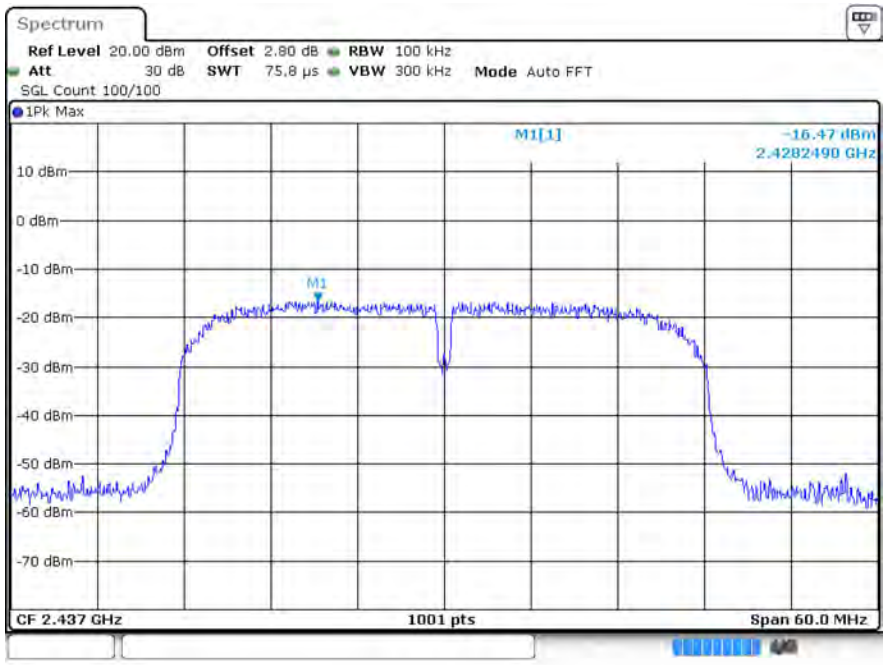
n40 2422MHz Ant1 Ref



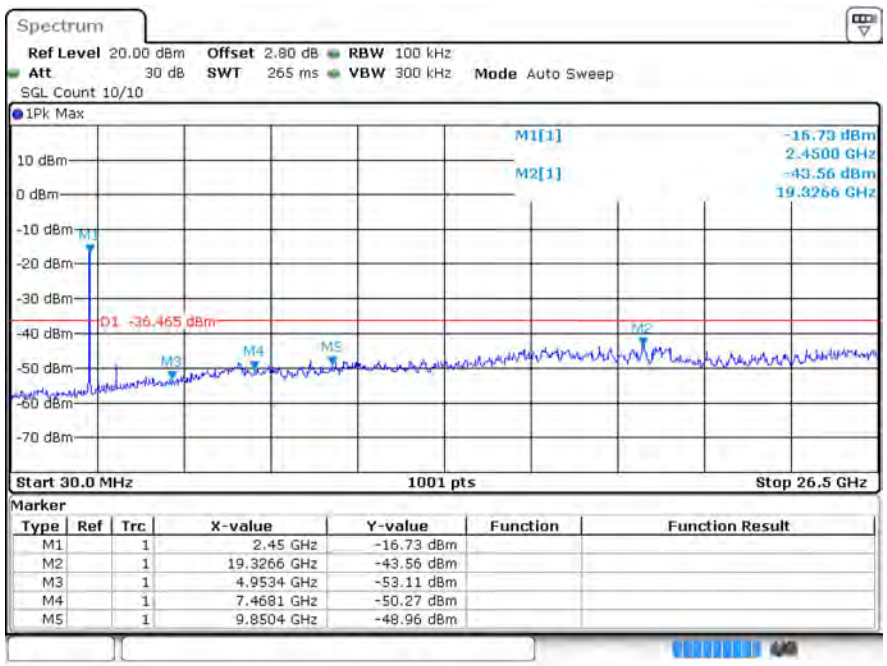
n40 2422MHz Ant1 Emission



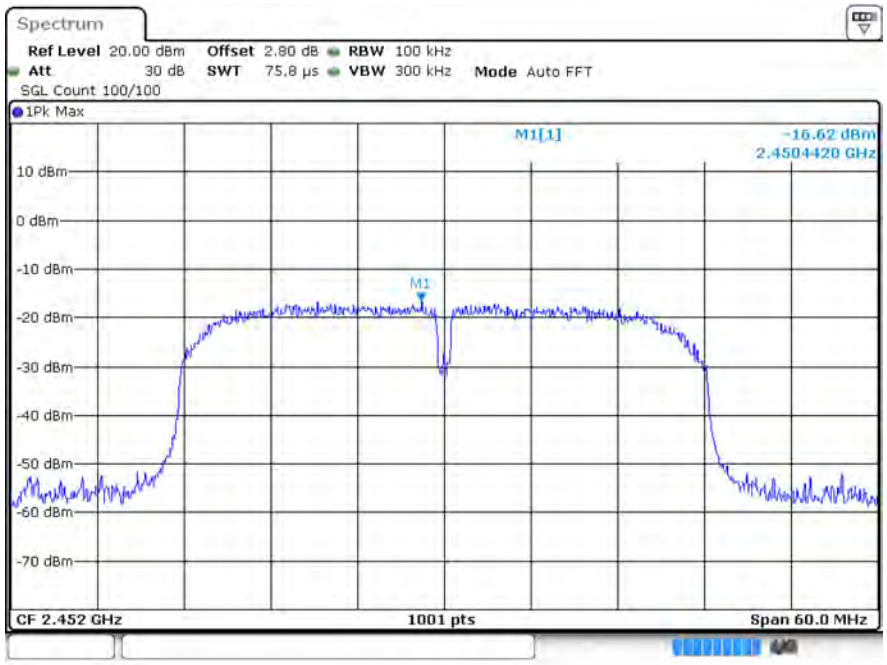
n40 2437MHz Ant1 Ref



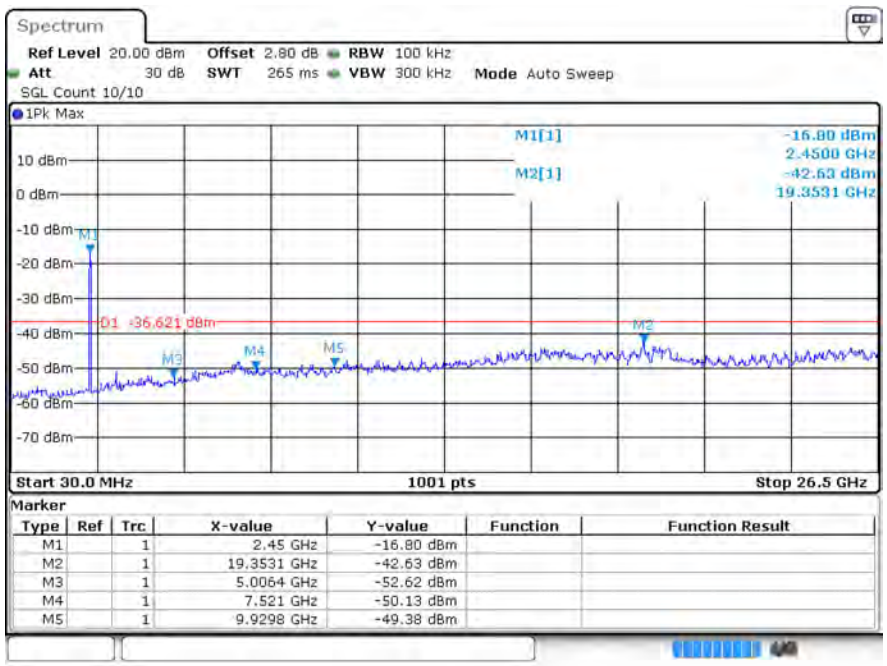
n40 2437MHz Ant1 Emission



n40 2452MHz Ant1 Ref



n40 2452MHz Ant1 Emission



7 Restrict Band

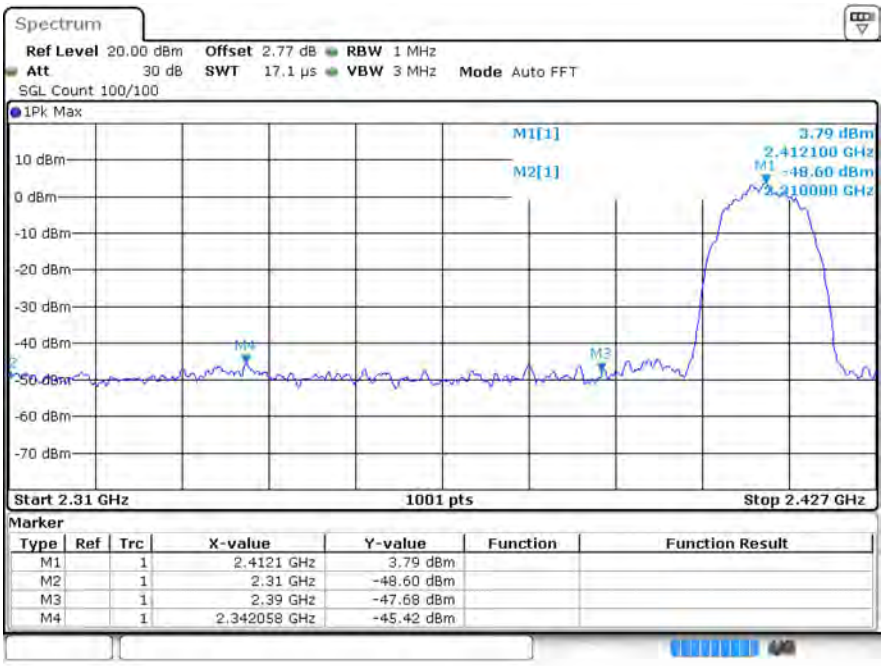
7.1 Test Result

Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
b	2412	Ant1	2310	-48.6	2	-	48.66	Peak	74	Pass
b	2412	Ant1	2310	-56.21	2	0.4	41.45	Average	54	Pass
b	2412	Ant1	2342.058	-45.42	2	-	51.84	Peak	74	Pass
b	2412	Ant1	2337.495	-54.15	2	0.4	43.51	Average	54	Pass
b	2412	Ant1	2390	-47.68	2	-	49.58	Peak	74	Pass
b	2412	Ant1	2390	-56.48	2	0.4	41.18	Average	54	Pass
b	2462	Ant1	2483.5	-50.53	2	-	46.73	Peak	74	Pass
b	2462	Ant1	2483.5	-56.2	2	0.4	41.46	Average	54	Pass
b	2462	Ant1	2490.778	-47.82	2	-	49.44	Peak	74	Pass
b	2462	Ant1	2486.061	-55.52	2	0.4	42.14	Average	54	Pass
b	2462	Ant1	2500	-50.02	2	-	47.24	Peak	74	Pass
b	2462	Ant1	2500	-56.15	2	0.4	41.51	Average	54	Pass
g	2412	Ant1	2310	-50.33	2	-	46.93	Peak	74	Pass
g	2412	Ant1	2310	-56.66	2	0.36	40.96	Average	54	Pass
g	2412	Ant1	2389.911	-42.72	2	-	54.54	Peak	74	Pass
g	2412	Ant1	2389.911	-52.29	2	0.36	45.33	Average	54	Pass
g	2412	Ant1	2390	-42.7	2	-	49.58	Peak	74	Pass
g	2412	Ant1	2390	-52.3	2	0.36	45.32	Average	54	Pass
g	2462	Ant1	2483.5	-46	2	-	51.26	Peak	74	Pass
g	2462	Ant1	2483.5	-54.4	2	0.36	43.22	Average	54	Pass
g	2462	Ant1	2490.778	-45.52	2	-	51.74	Peak	74	Pass
g	2462	Ant1	2484.206	-54.03	2	0.36	43.59	Average	54	Pass
g	2462	Ant1	2500	-49.37	2	-	47.24	Peak	74	Pass
g	2462	Ant1	2500	-56.03	2	0.36	41.59	Average	54	Pass
n20	2412	Ant1	2310	-48.25	2	-	49.01	Peak	74	Pass
n20	2412	Ant1	2310	-56.27	2	0.36	41.35	Average	54	Pass
n20	2412	Ant1	2388.741	-43.09	2	-	54.17	Peak	74	Pass
n20	2412	Ant1	2389.911	-52.67	2	0.36	44.95	Average	54	Pass
n20	2412	Ant1	2390	-44.08	2	-	53.18	Peak	74	Pass
n20	2412	Ant1	2390	-52.62	2	0.36	45	Average	54	Pass
n20	2462	Ant1	2483.5	-43.18	2	-	54.08	Peak	74	Pass
n20	2462	Ant1	2483.5	-54.39	2	0.36	43.23	Average	54	Pass
n20	2462	Ant1	2483.517	-43.18	2	-	54.08	Peak	74	Pass
n20	2462	Ant1	2483.517	-54.39	2	0.36	43.23	Average	54	Pass

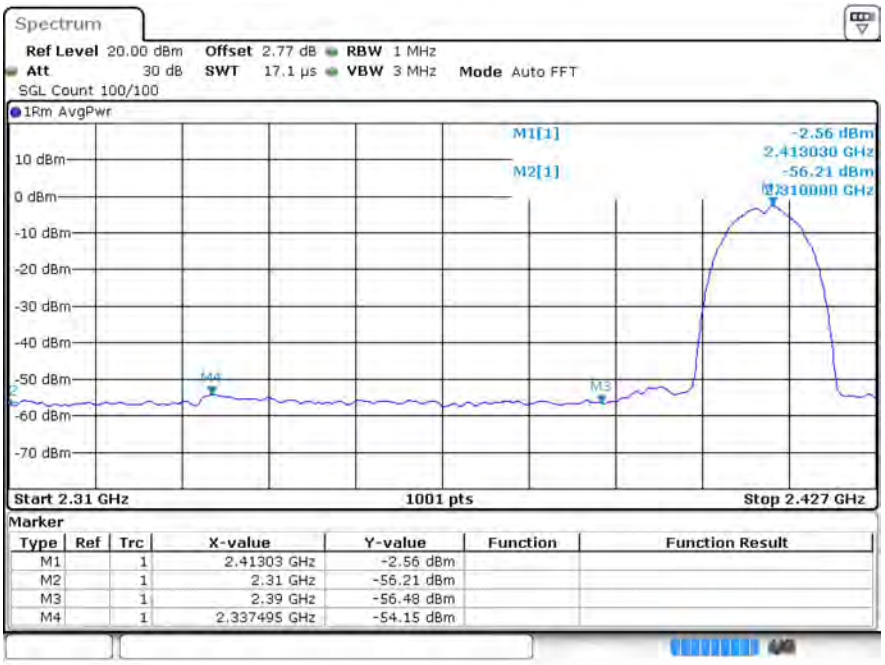
n20	2462	Ant1	2500	-48.34	2	-	48.92	Peak	74	Pass
n20	2462	Ant1	2500	-56.7	2	0.36	40.92	Average	54	Pass
n40	2422	Ant1	2310	-50.09	2	-	47.17	Peak	74	Pass
n40	2422	Ant1	2310	-56.24	2	0.42	41.44	Average	54	Pass
n40	2422	Ant1	2382.704	-42.05	2	-	55.21	Peak	74	Pass
n40	2422	Ant1	2387.532	-53.41	2	0.42	44.27	Average	54	Pass
n40	2422	Ant1	2390	-44.81	2	-	52.45	Peak	74	Pass
n40	2422	Ant1	2390	-53.8	2	0.42	43.88	Average	54	Pass
n40	2452	Ant1	2483.5	-45.28	2	-	51.98	Peak	74	Pass
n40	2452	Ant1	2483.5	-54.97	2	0.43	42.72	Average	54	Pass
n40	2452	Ant1	2483.854	-45.14	2	-	52.12	Peak	74	Pass
n40	2452	Ant1	2499.454	-54.87	2	0.43	42.82	Average	54	Pass
n40	2452	Ant1	2500	-47.7	2	-	49.56	Peak	74	Pass
n40	2452	Ant1	2500	-55.16	2	0.43	42.53	Average	54	Pass

7.2 Test Graphs

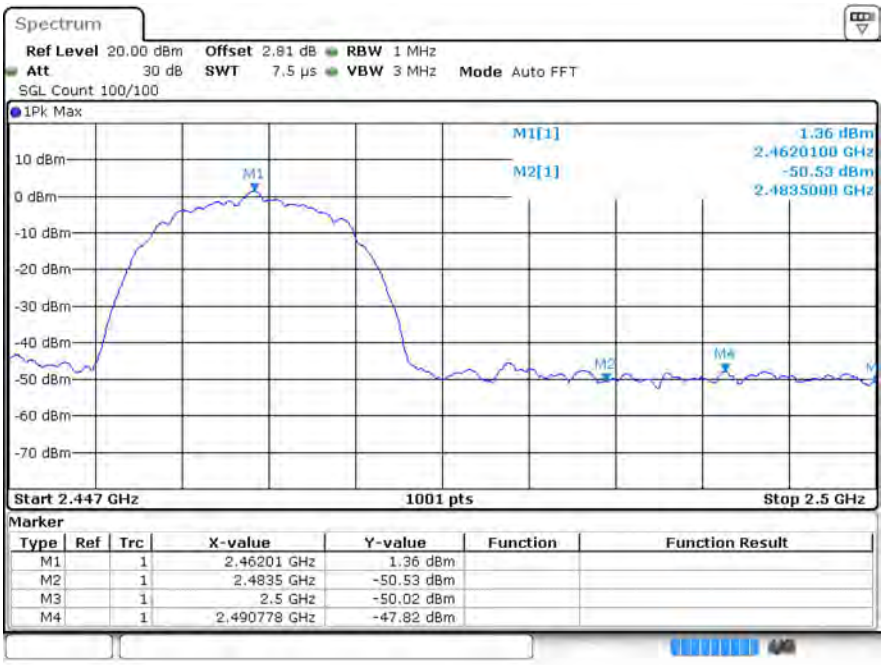
Test Graphs
b 2412MHz Ant1 Peak



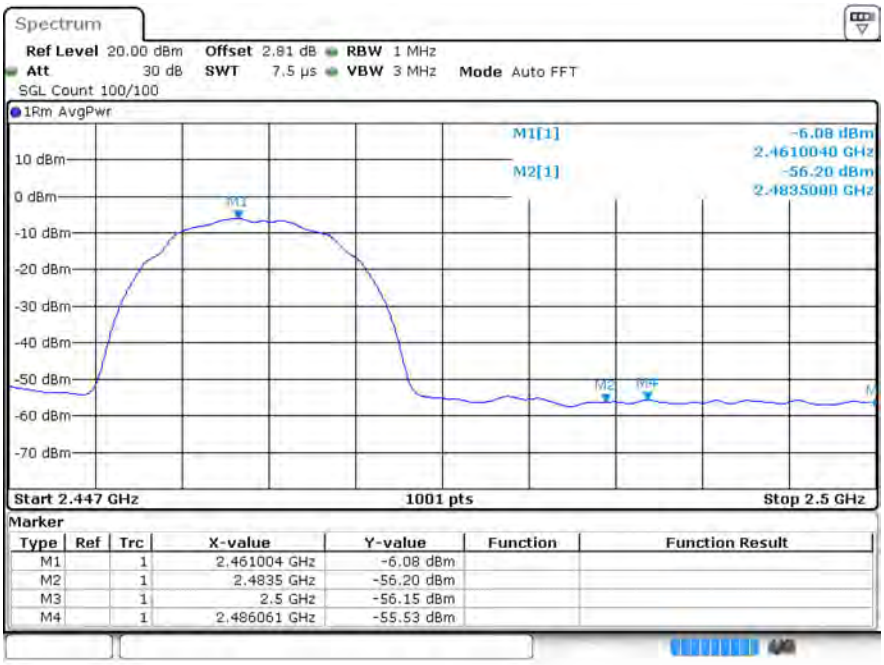
b 2412MHz Ant1 Average



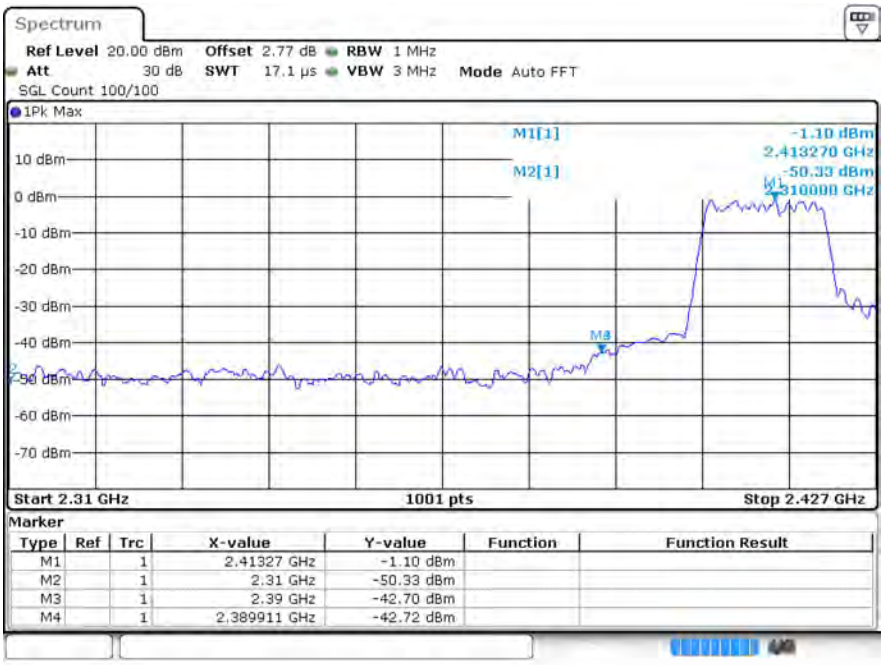
b 2462MHz Ant1 Peak



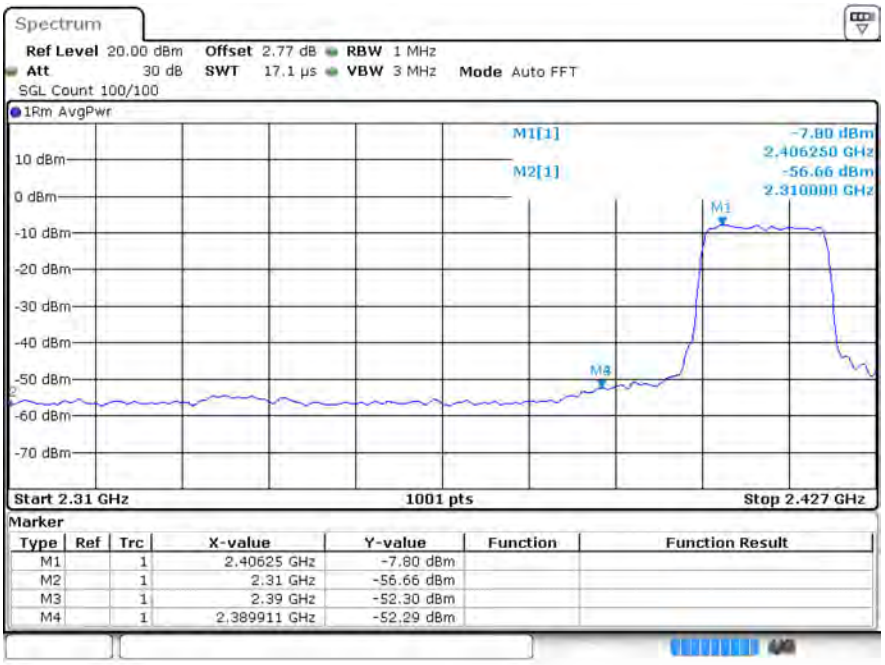
b 2462MHz Ant1 Average



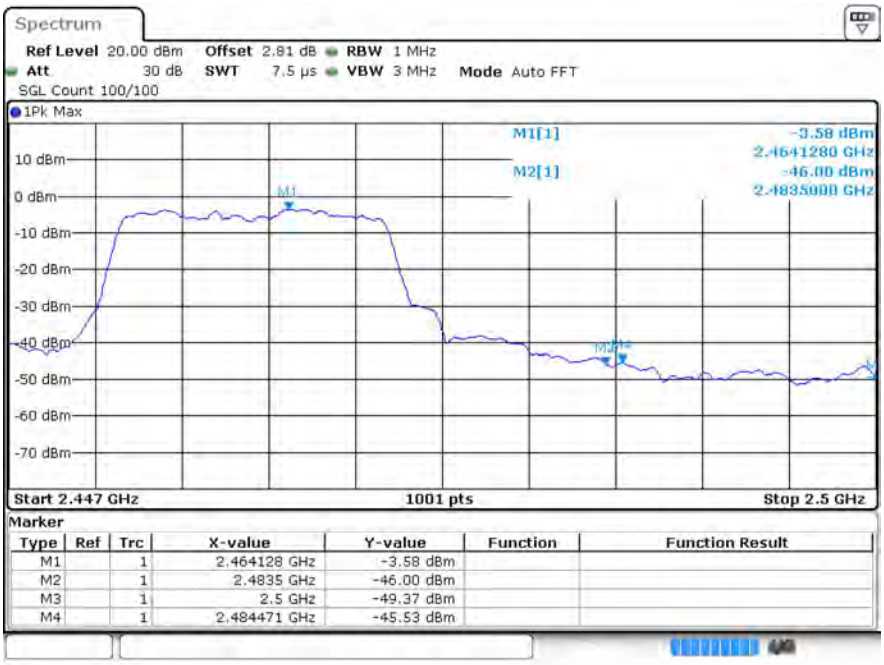
g 2412MHz Ant1 Peak



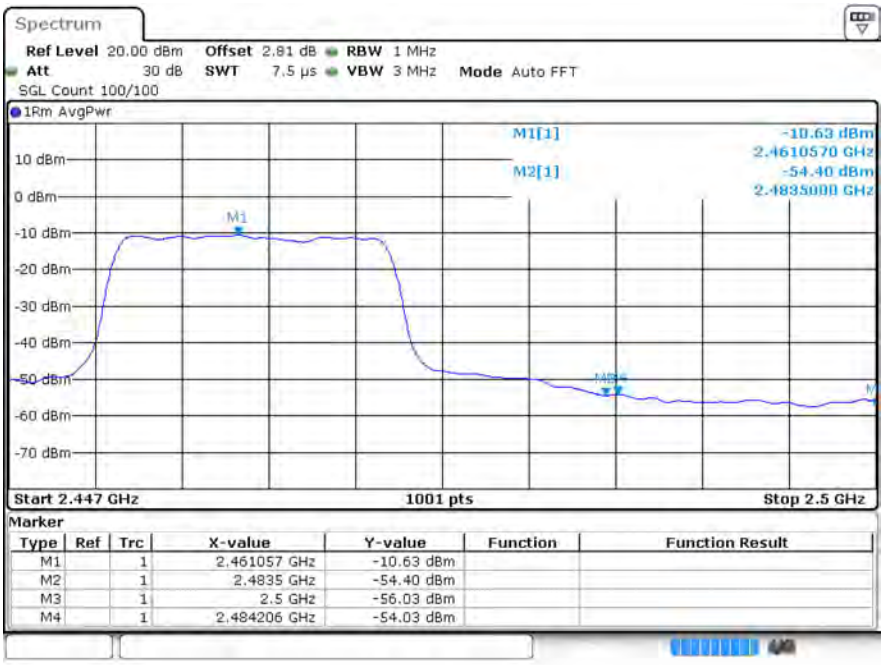
g 2412MHz Ant1 Average



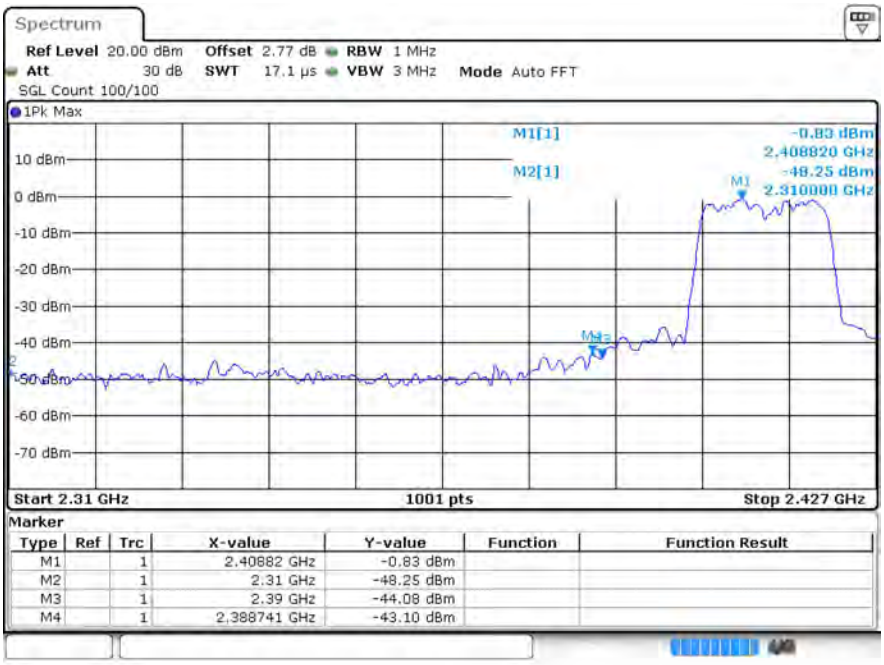
g 2462MHz Ant1 Peak



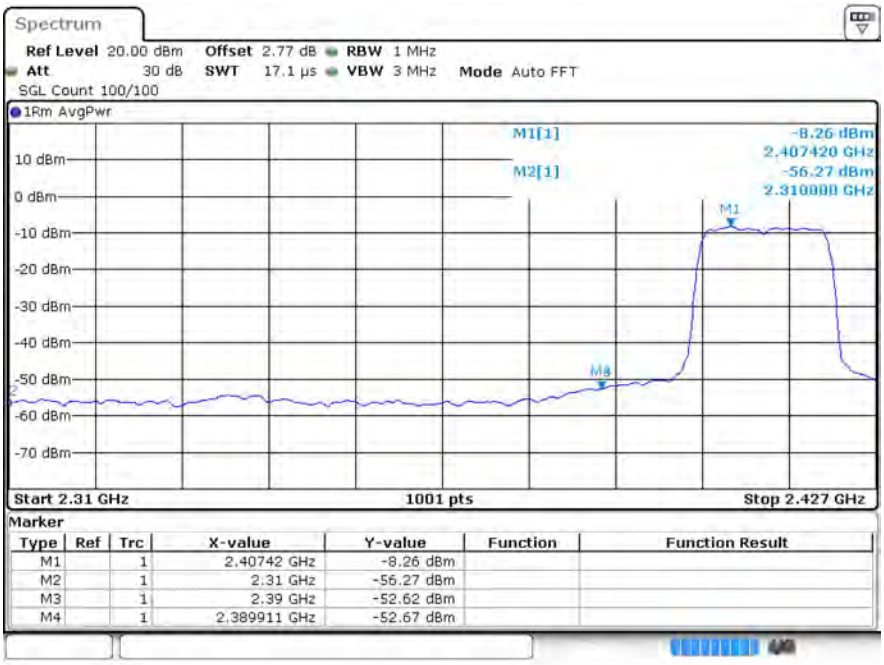
g 2462MHz Ant1 Average



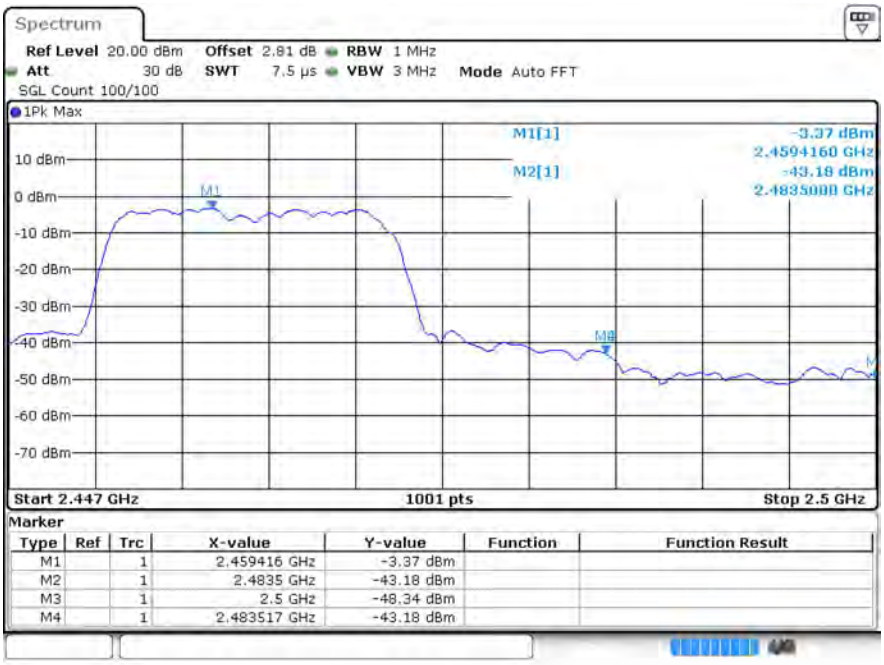
n20 2412MHz Ant1 Peak



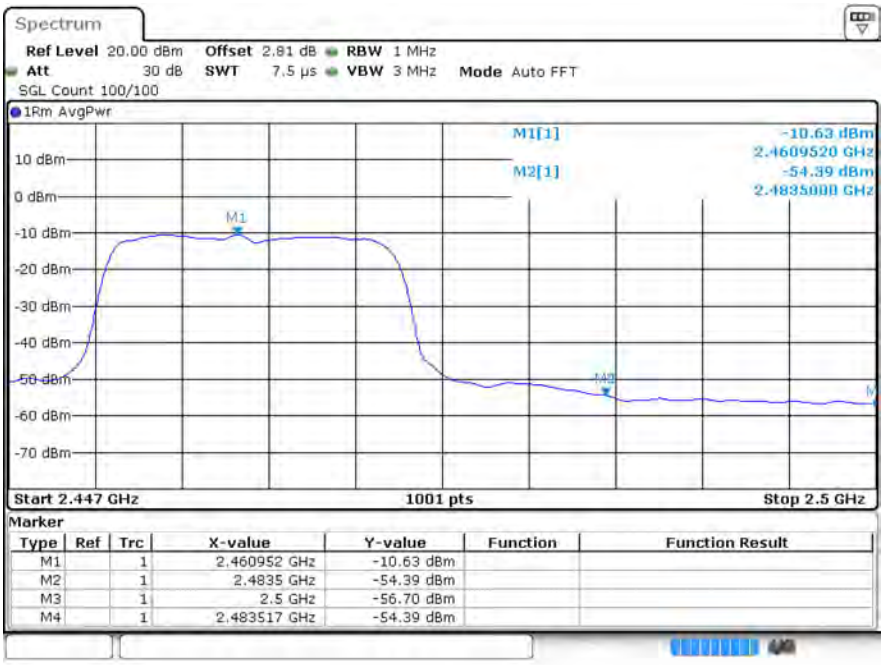
n20 2412MHz Ant1 Average



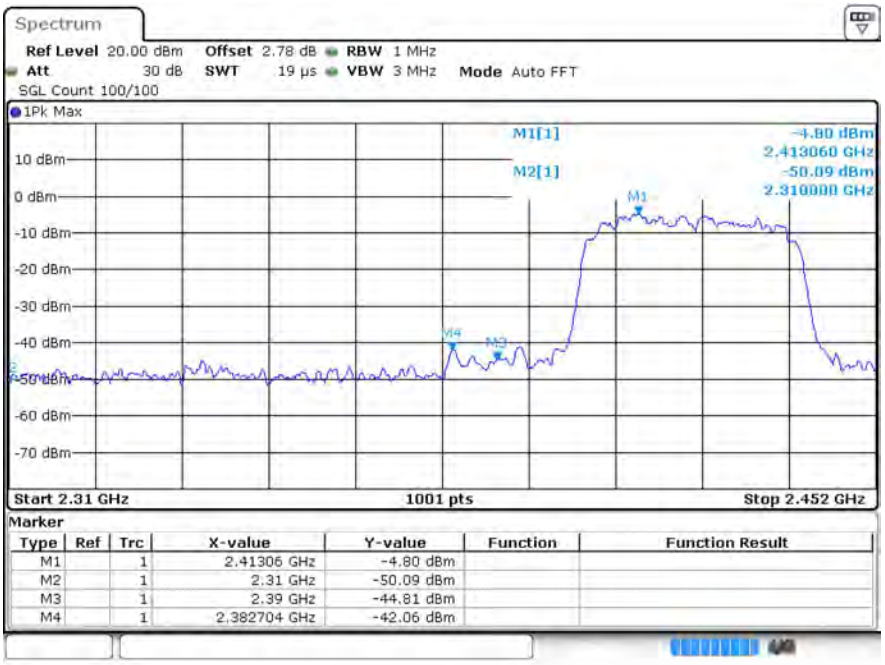
n20 2462MHz Ant1 Peak



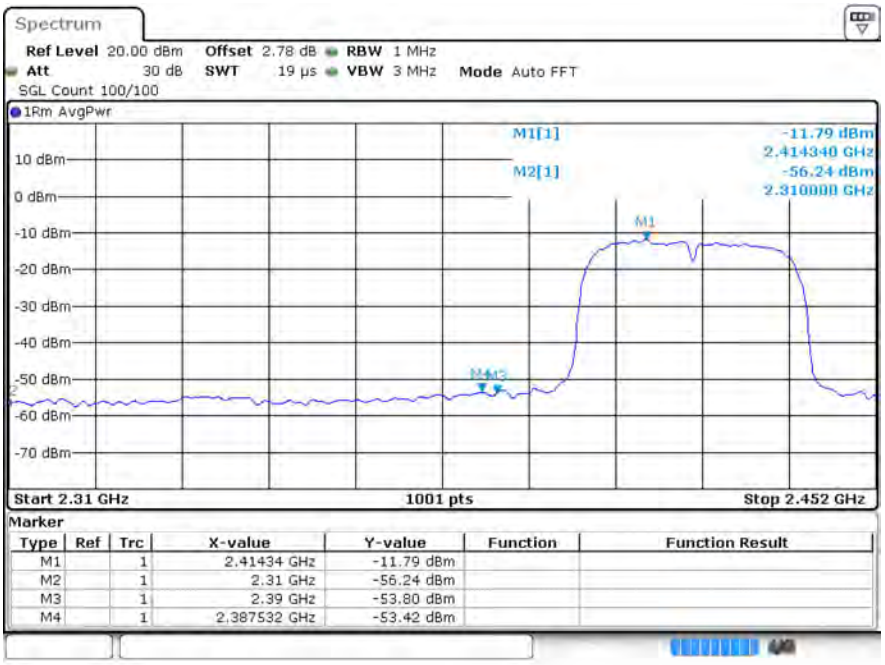
n20 2462MHz Ant1 Average



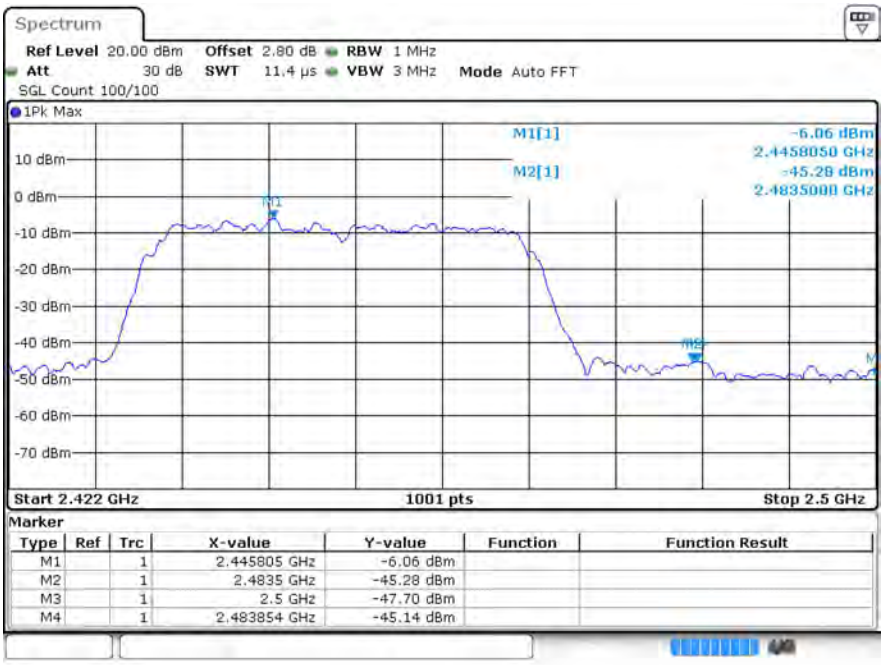
n40 2422MHz Ant1 Peak



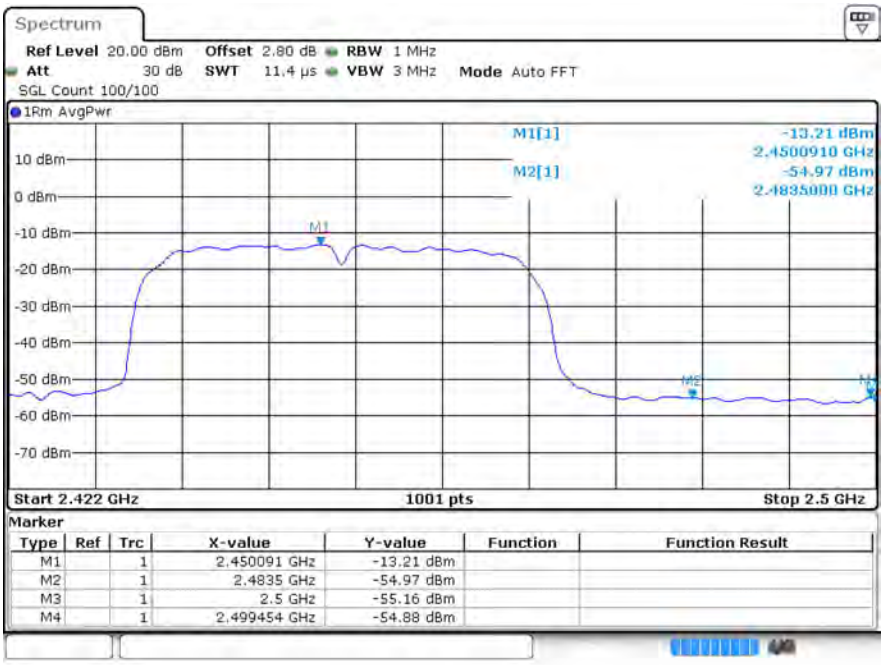
n40 2422MHz Ant1 Average



n40 2452MHz Ant1 Peak



n40 2452MHz Ant1 Average



---The End---