Appendix C

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: Carplay

Trade Mark: HXDOTECFIN

Test Model: HX-901

Environmental Conditions

Temperature:	25.3℃
Relative Humidity:	52.2%
ATM Pressure:	101Kpa
Test Engineer:	Emiya lin
Supervised by:	Simba Haung

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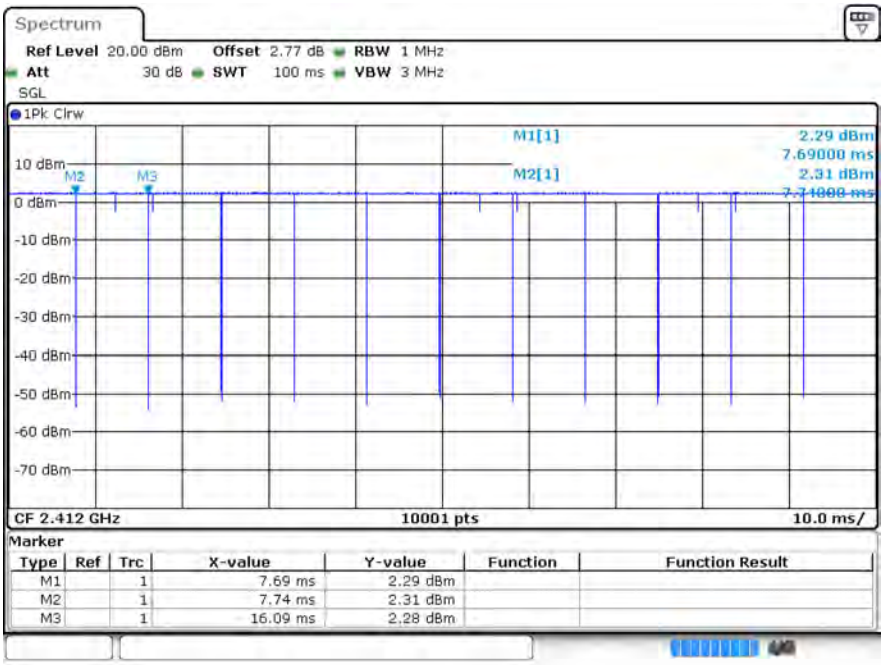
1 Duty Cycle

1.1 Test Result

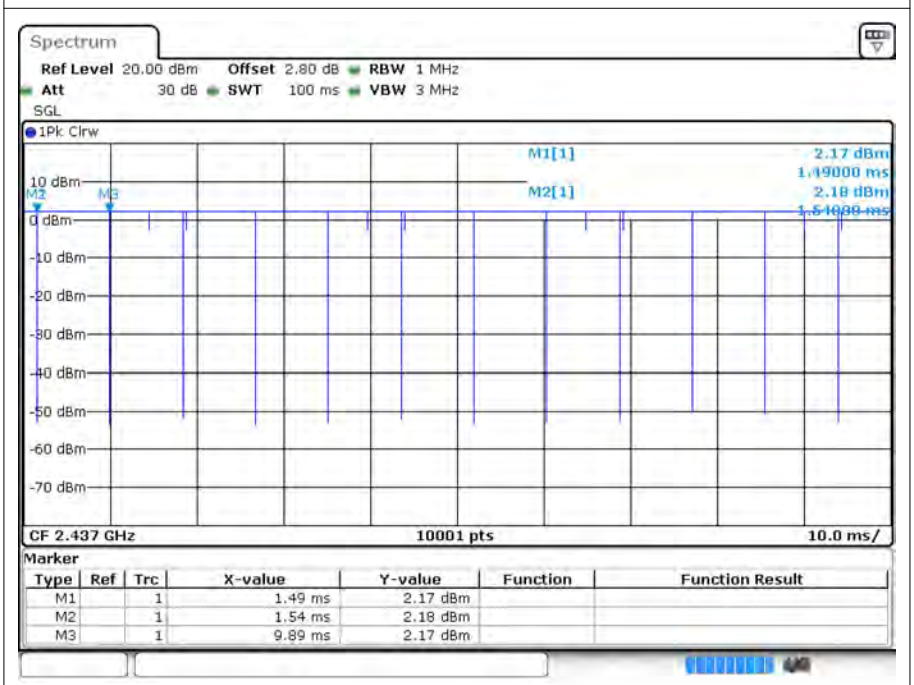
Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor	1/T (kHz)
b	2412	Ant1	99.62	0.02	0.12
b	2437	Ant1	99.58	0.02	0.12
b	2462	Ant1	99.61	0.02	0.12
g	2412	Ant1	86.91	0.61	4.76
g	2437	Ant1	86.9	0.61	4.76
g	2462	Ant1	86.95	0.61	4.76
n20	2412	Ant1	87.56	0.58	4.35
n20	2437	Ant1	87.57	0.58	4.35
n20	2462	Ant1	87.57	0.58	4.35
n40	2422	Ant1	88.02	0.55	4
n40	2437	Ant1	88.03	0.55	4.17
n40	2452	Ant1	88.01	0.55	4.17

1.2 Test Graphs

Test Graphs
b 2412MHz Ant1

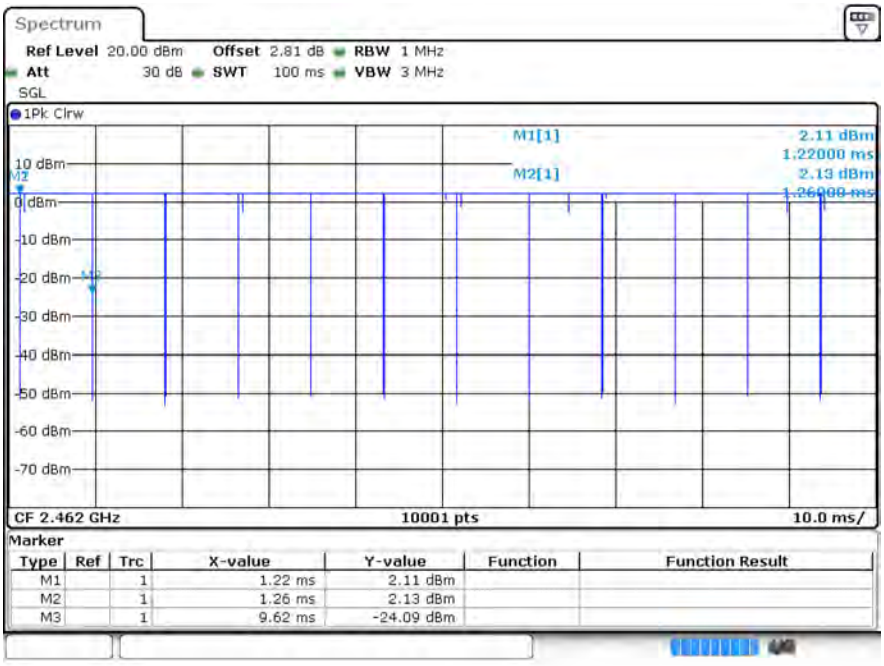


b 2437MHz Ant1



Test Graphs

b 2462MHz Ant1

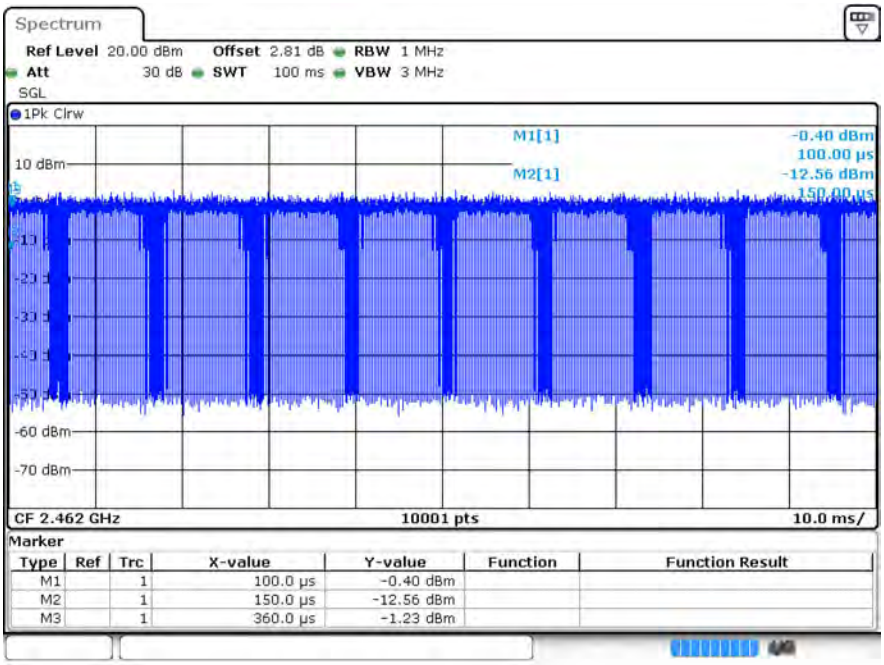


g 2412MHz Ant1

Test Graphs

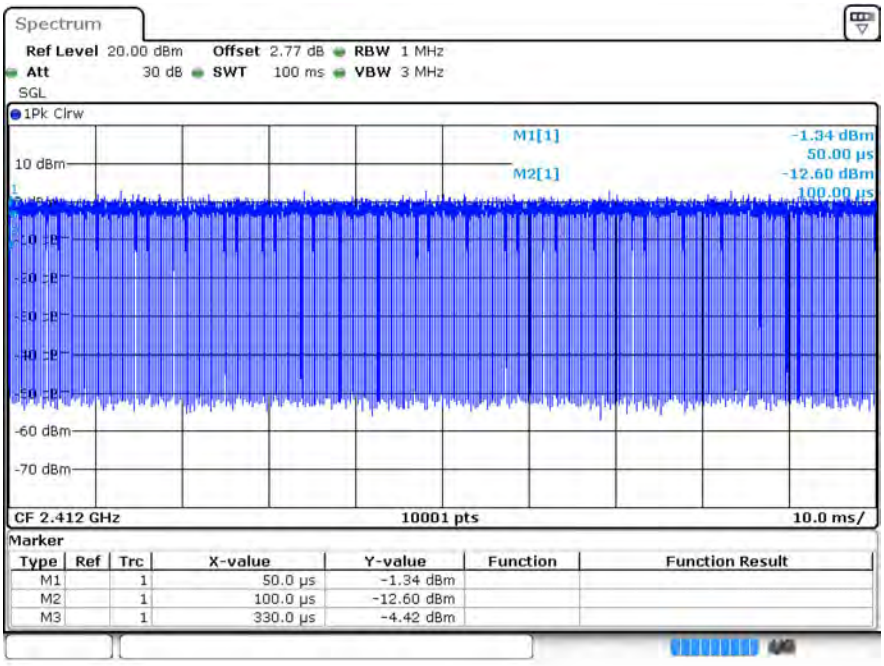
g 2437MHz Ant1

g 2462MHz Ant1

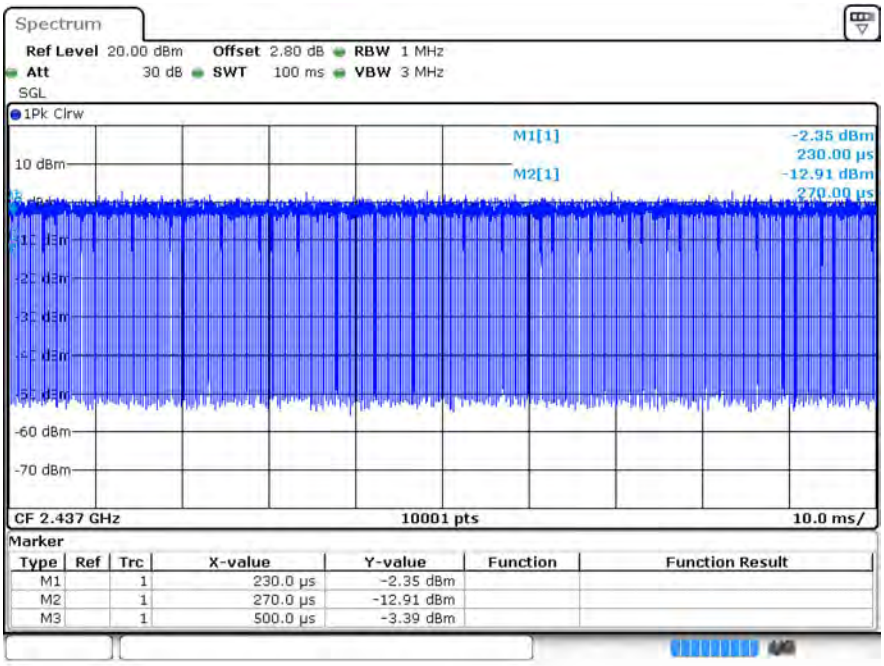


Test Graphs

n20 2412MHz Ant1

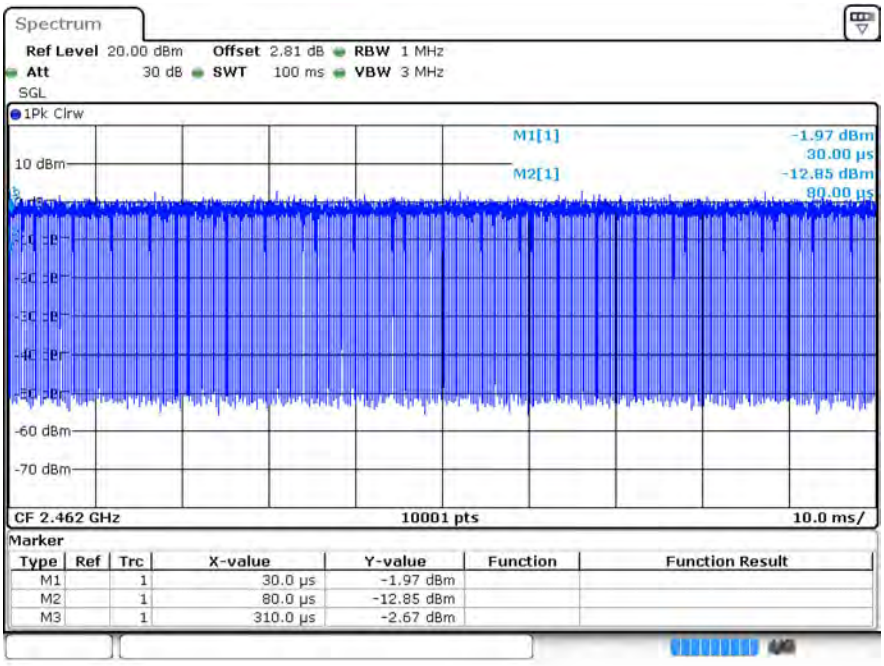


n20 2437MHz Ant1

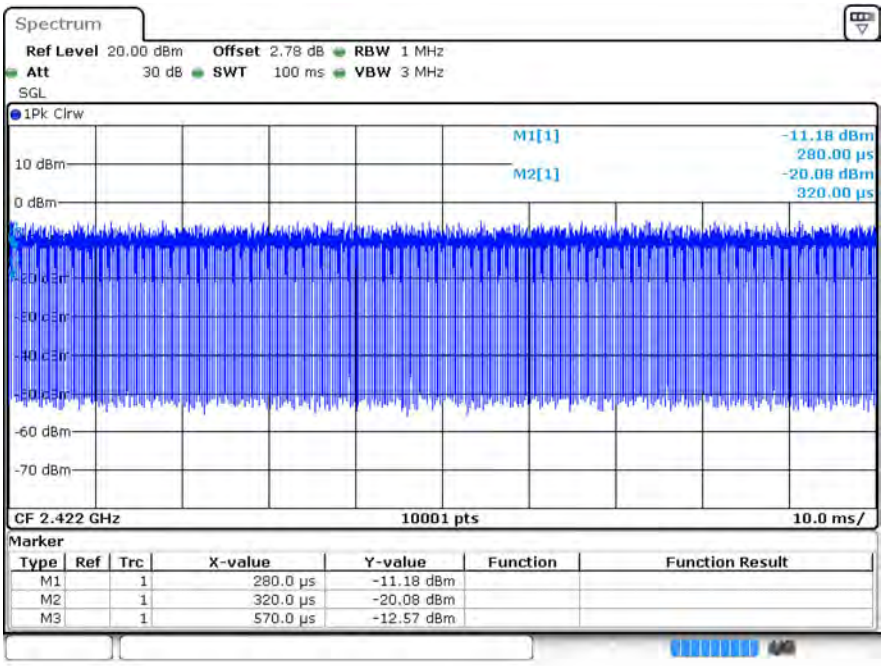


Test Graphs

n20 2462MHz Ant1

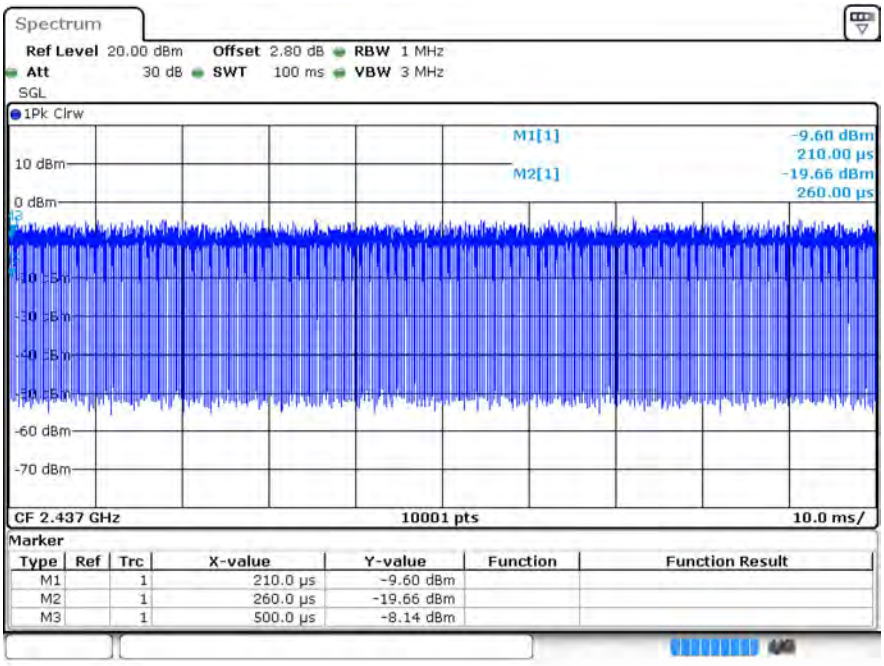


n40 2422MHz Ant1

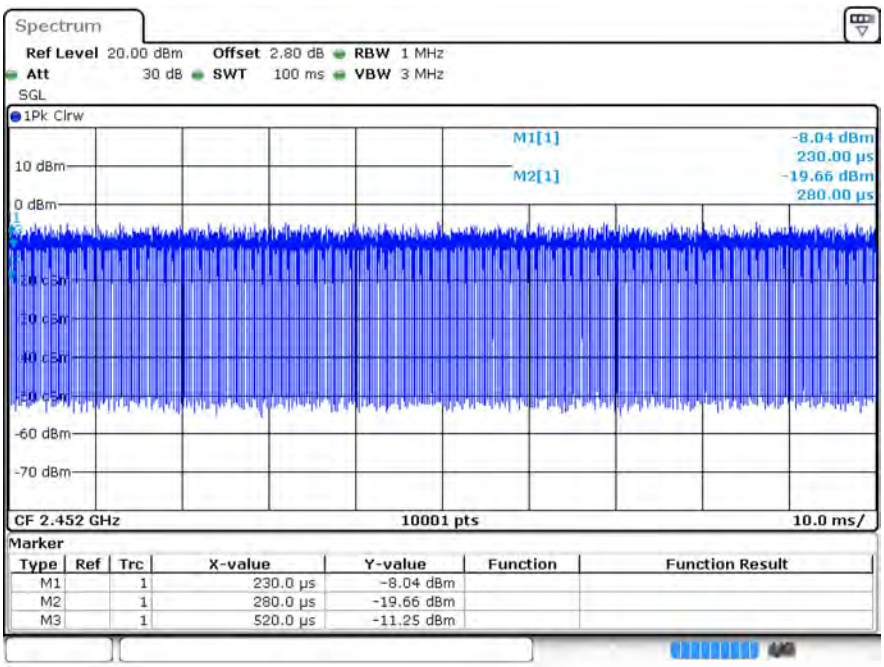


Test Graphs

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	12.8	30	Pass
b	2437	Ant1	12.66	30	Pass
b	2462	Ant1	12.66	30	Pass
g	2412	Ant1	12.38	30	Pass
g	2437	Ant1	12.24	30	Pass
g	2462	Ant1	12.23	30	Pass
n20	2412	Ant1	11.94	30	Pass
n20	2437	Ant1	11.67	30	Pass
n20	2462	Ant1	11.63	30	Pass
n40	2422	Ant1	11.63	30	Pass
n40	2437	Ant1	11.68	30	Pass
n40	2452	Ant1	11.6	30	Pass

3 -6dB Bandwidth

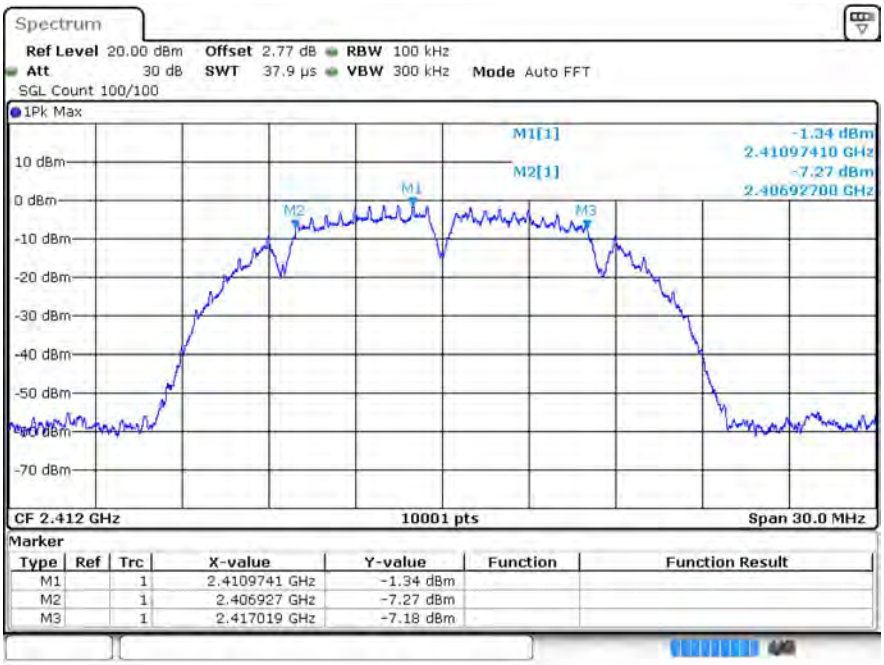
3.1 Test Result

Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
b	2412	Ant1	10.092	0.5	Pass
b	2437	Ant1	10.08	0.5	Pass
b	2462	Ant1	9.834	0.5	Pass
g	2412	Ant1	15.117	0.5	Pass
g	2437	Ant1	15.093	0.5	Pass
g	2462	Ant1	12.6	0.5	Pass
n20	2412	Ant1	15.111	0.5	Pass
n20	2437	Ant1	15.081	0.5	Pass
n20	2462	Ant1	15.045	0.5	Pass
n40	2422	Ant1	33.846	0.5	Pass
n40	2437	Ant1	35.076	0.5	Pass
n40	2452	Ant1	31.344	0.5	Pass

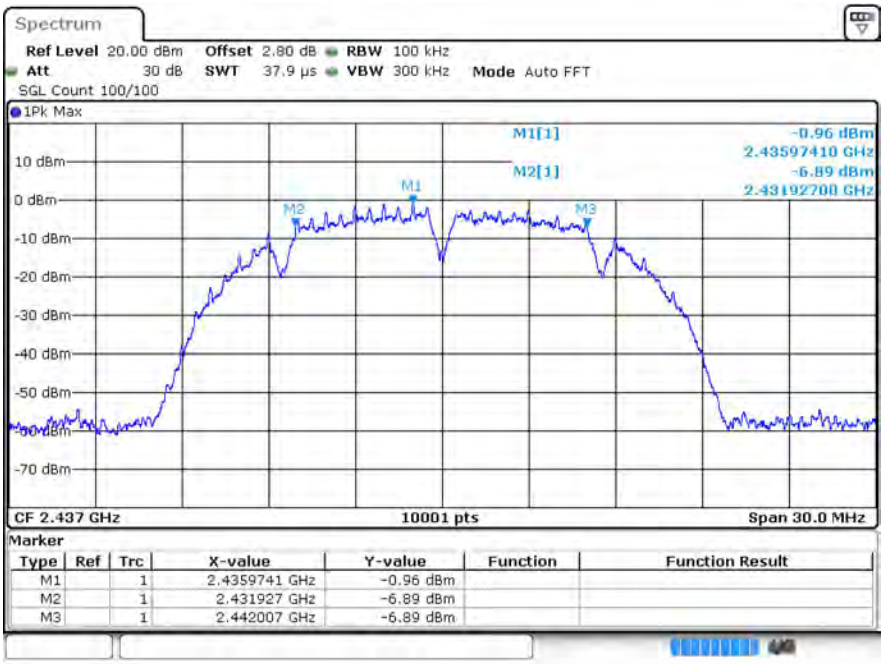
3.2 Test Graphs

Test Graphs

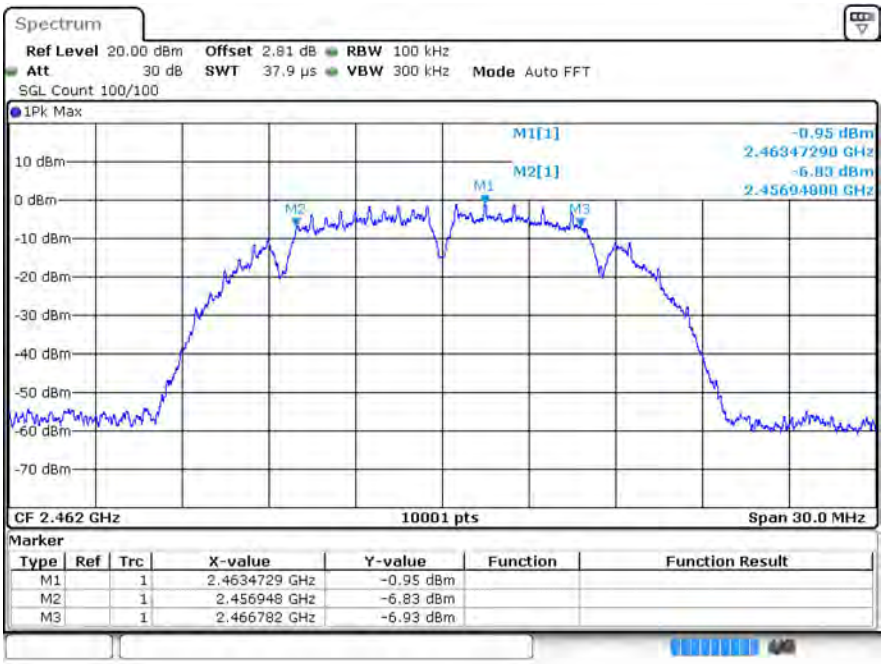
b 2412MHz Ant1



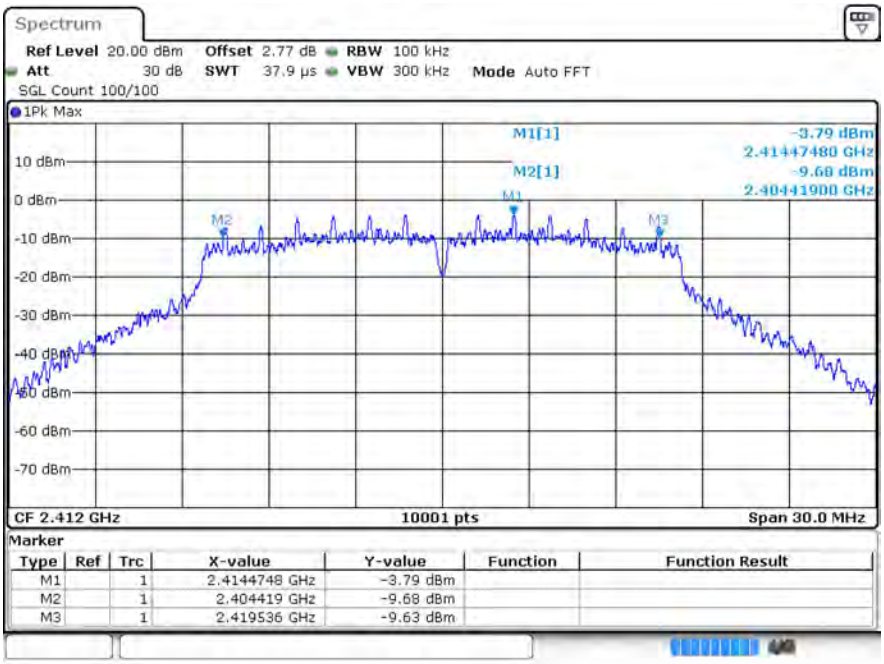
b 2437MHz Ant1



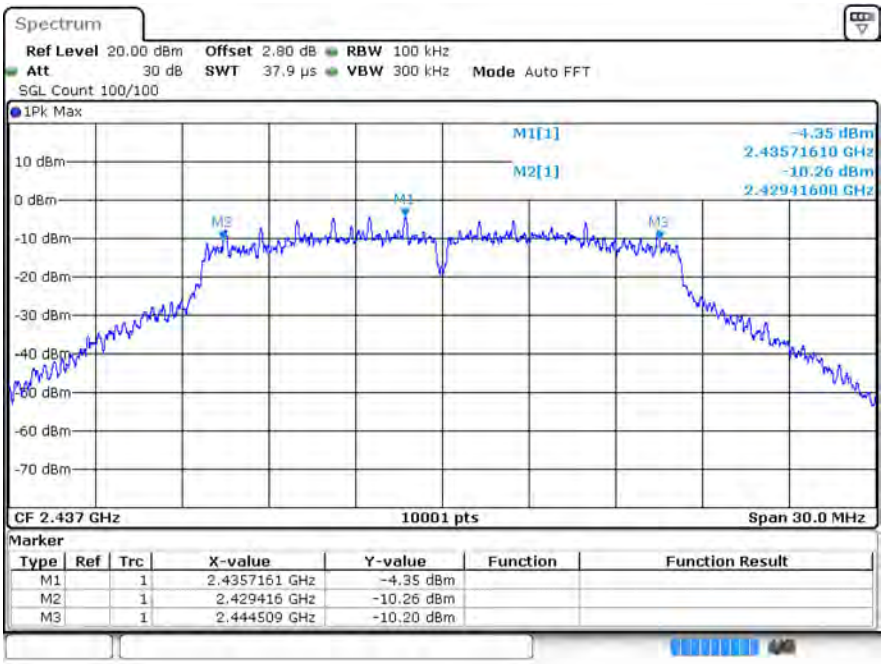
b 2462MHz Ant1



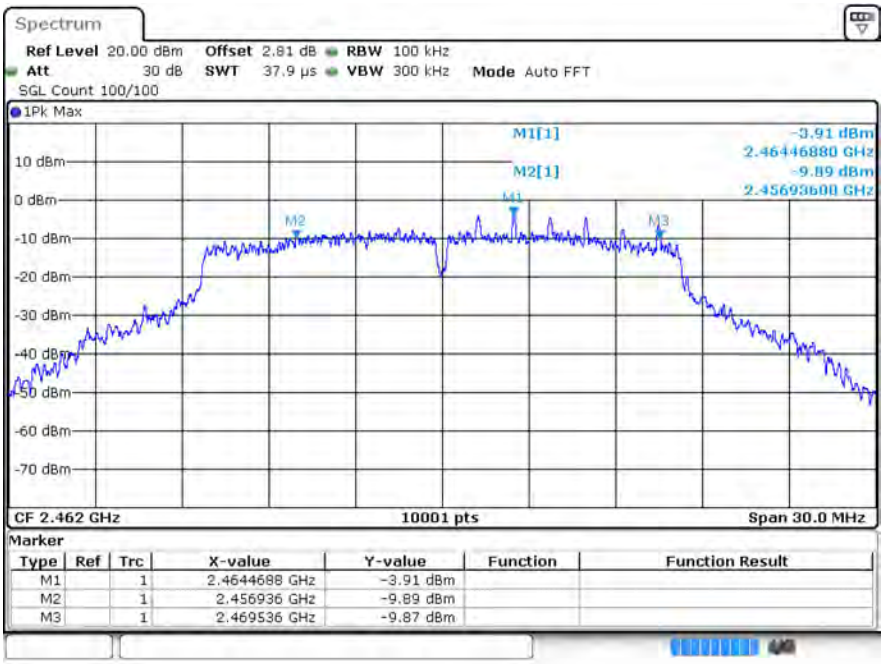
g 2412MHz Ant1



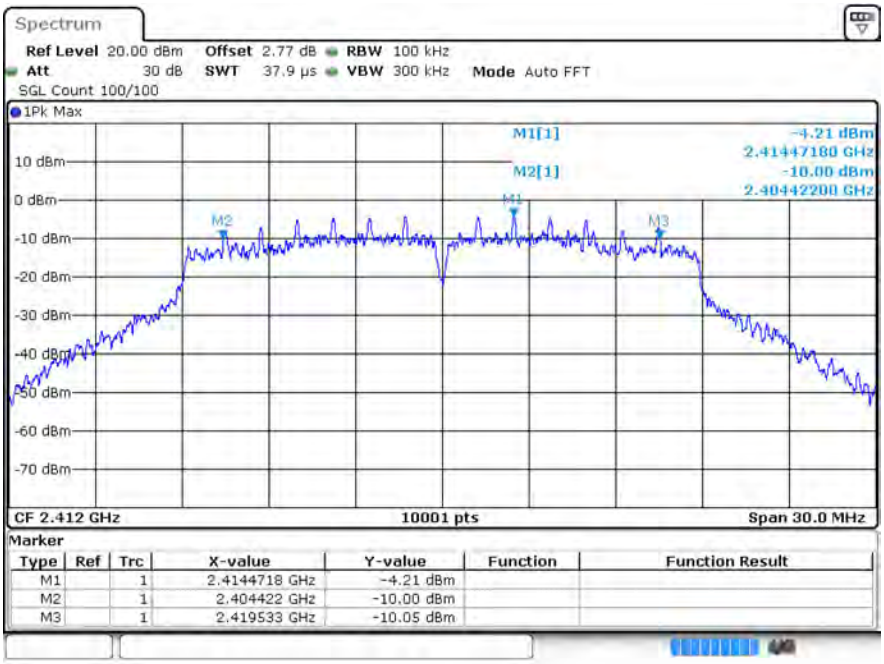
g 2437MHz Ant1



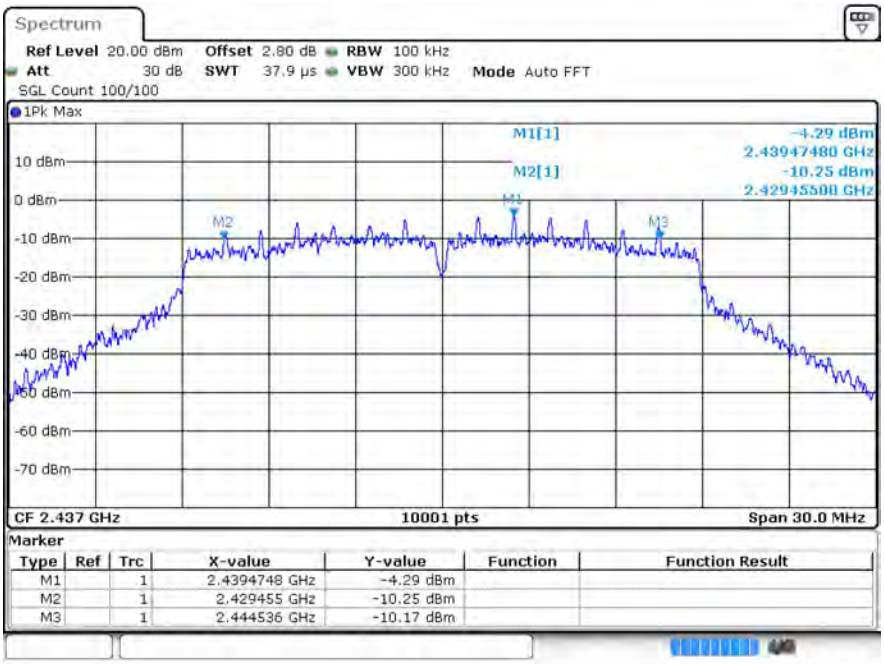
g 2462MHz Ant1



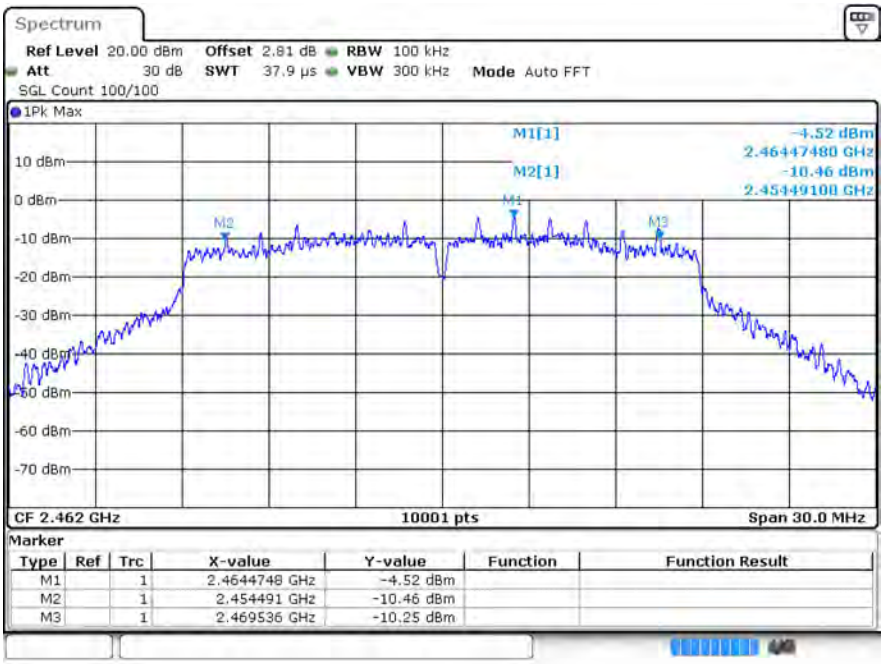
n20 2412MHz Ant1



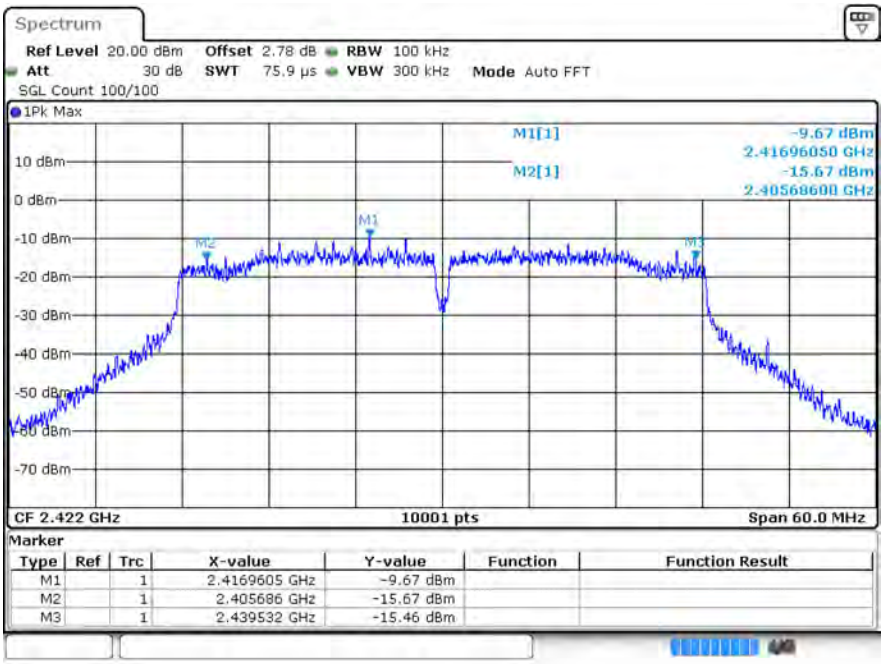
n20 2437MHz Ant1



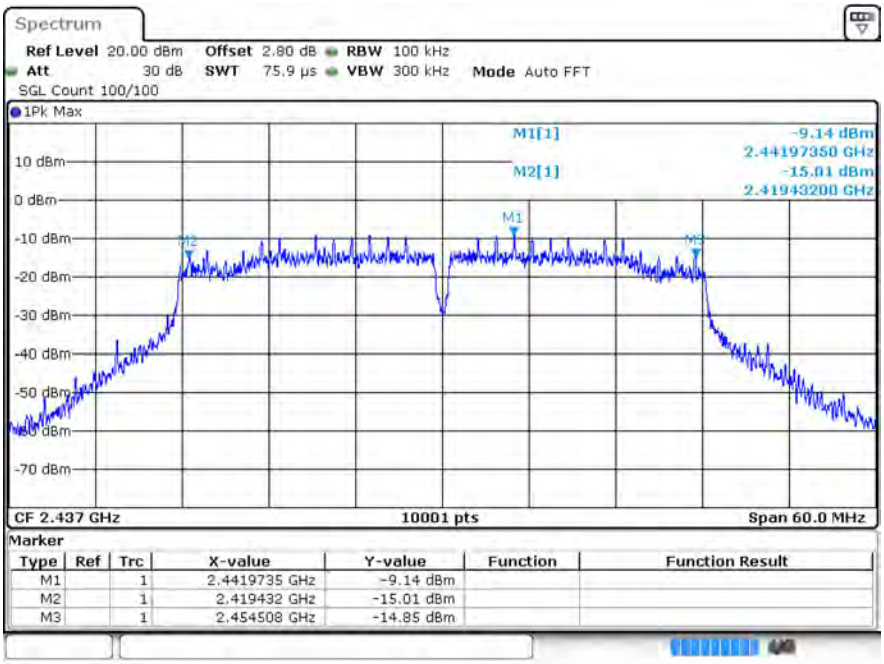
n20 2462MHz Ant1



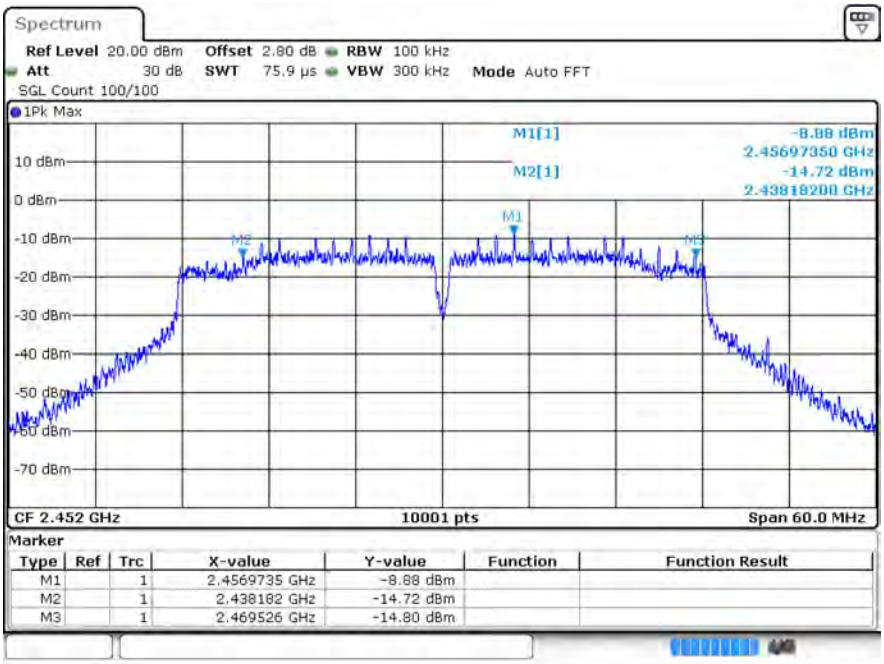
n40 2422MHz Ant1



n40 2437MHz Ant1



n40 2452MHz Ant1

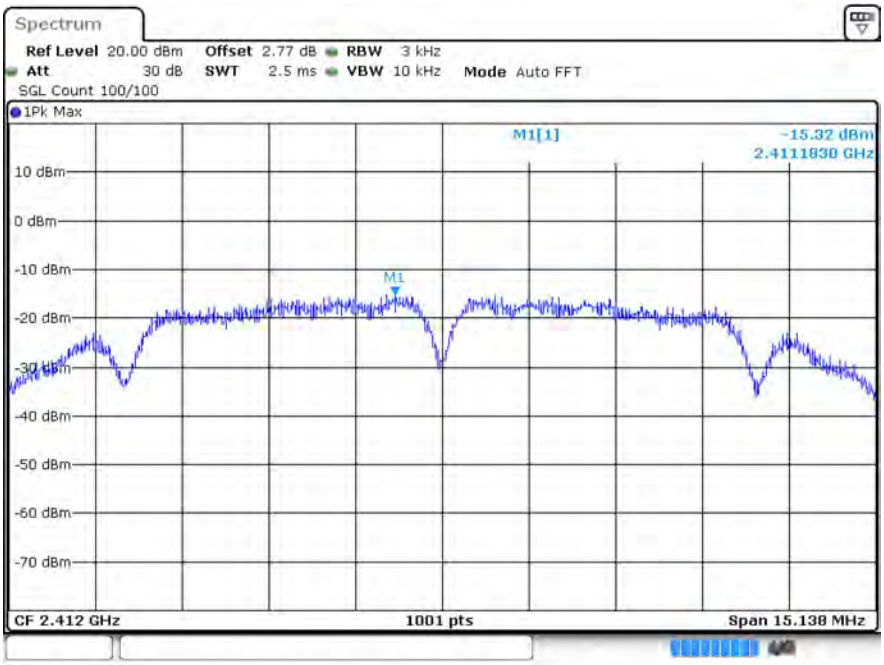
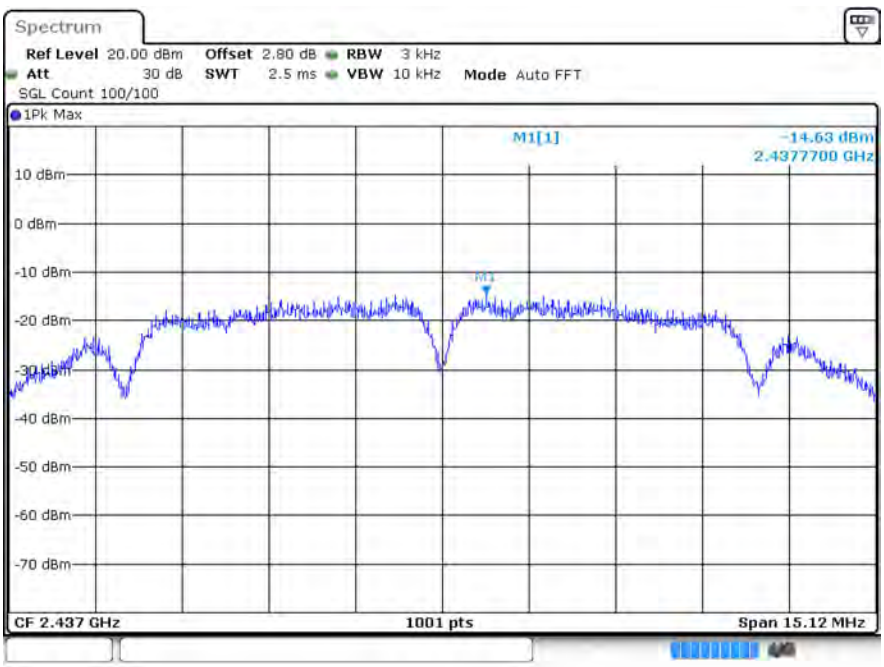


4 Maximum Power Spectral Density Level

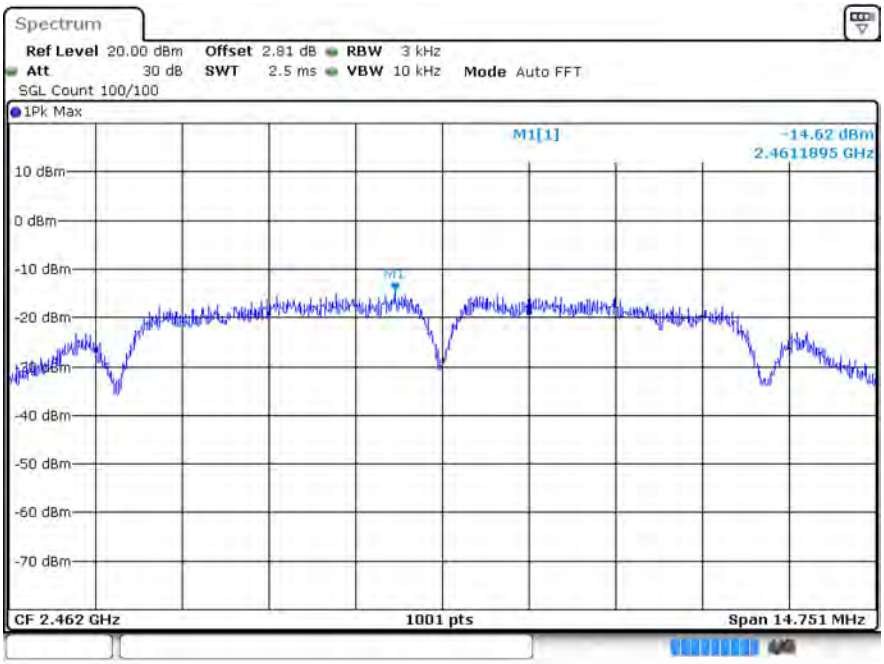
4.1 Test Result

Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3-100kHz)	Limit (dBm/3kHz)	Verdict
b	2412	Ant1	-15.32	≤8	Pass
b	2437	Ant1	-14.63	≤8	Pass
b	2462	Ant1	-14.62	≤8	Pass
g	2412	Ant1	-18.06	≤8	Pass
g	2437	Ant1	-17.31	≤8	Pass
g	2462	Ant1	-19.19	≤8	Pass
n20	2412	Ant1	-18.11	≤8	Pass
n20	2437	Ant1	-18.94	≤8	Pass
n20	2462	Ant1	-18.88	≤8	Pass
n40	2422	Ant1	-22.81	≤8	Pass
n40	2437	Ant1	-22.19	≤8	Pass
n40	2452	Ant1	-23.39	≤8	Pass

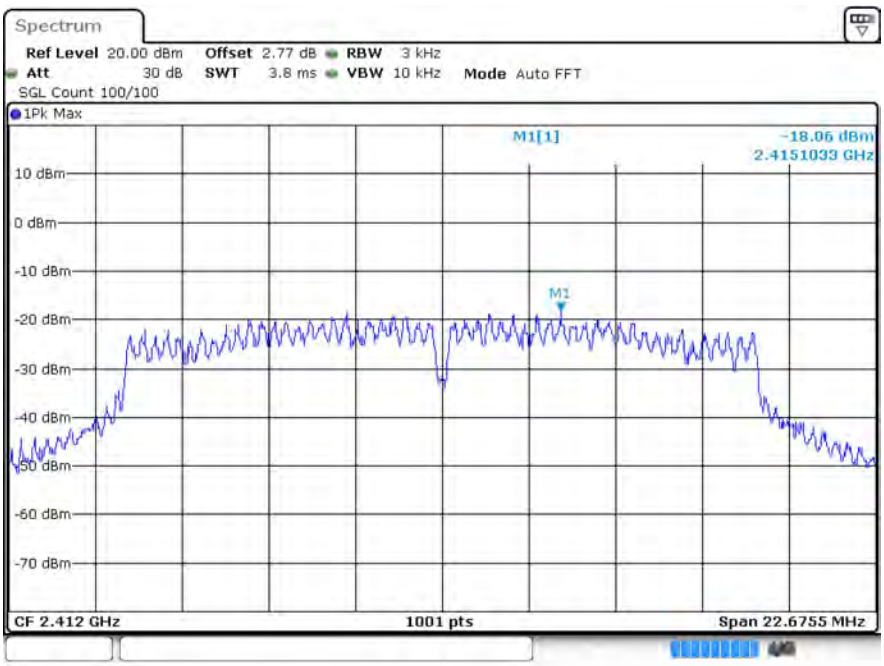
4.2 Test Graphs

Test Graphs
b 2412MHz Ant1

b 2437MHz Ant1


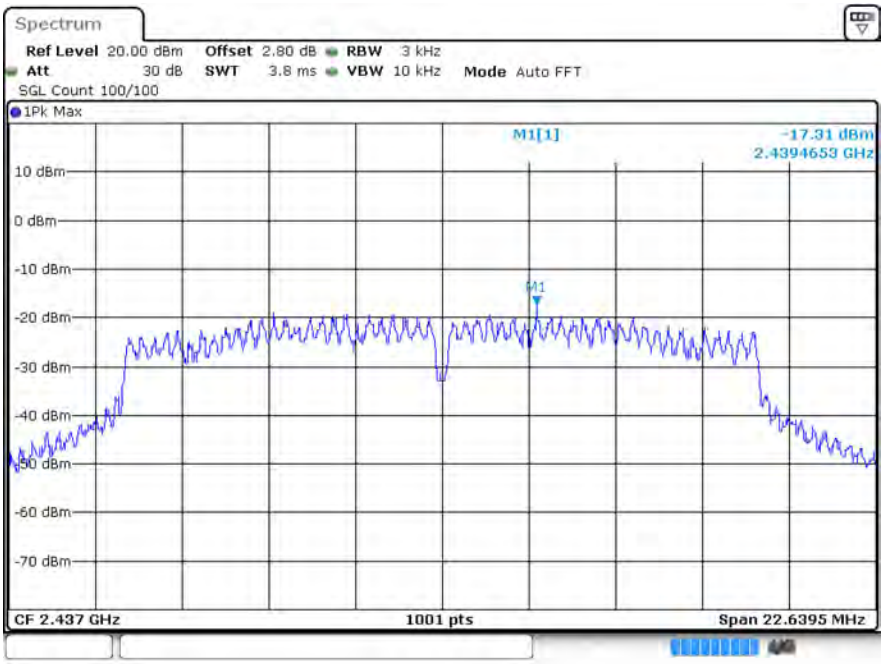
b 2462MHz Ant1



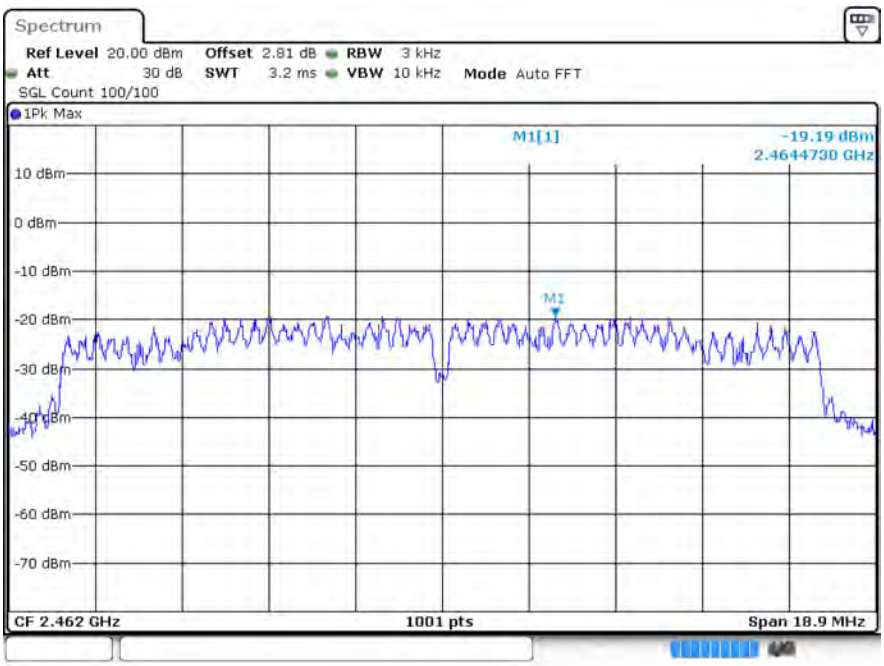
g 2412MHz Ant1



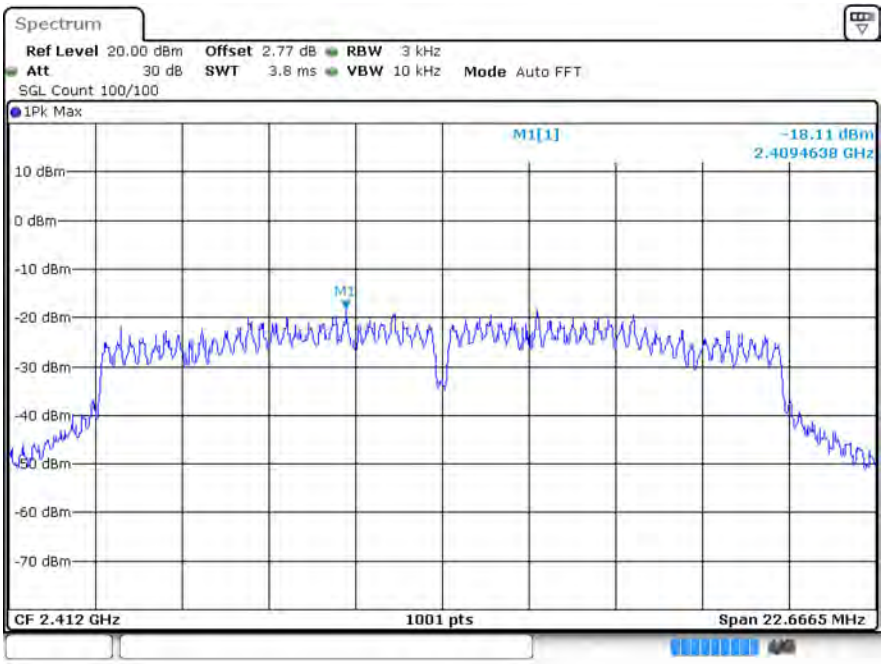
g 2437MHz Ant1



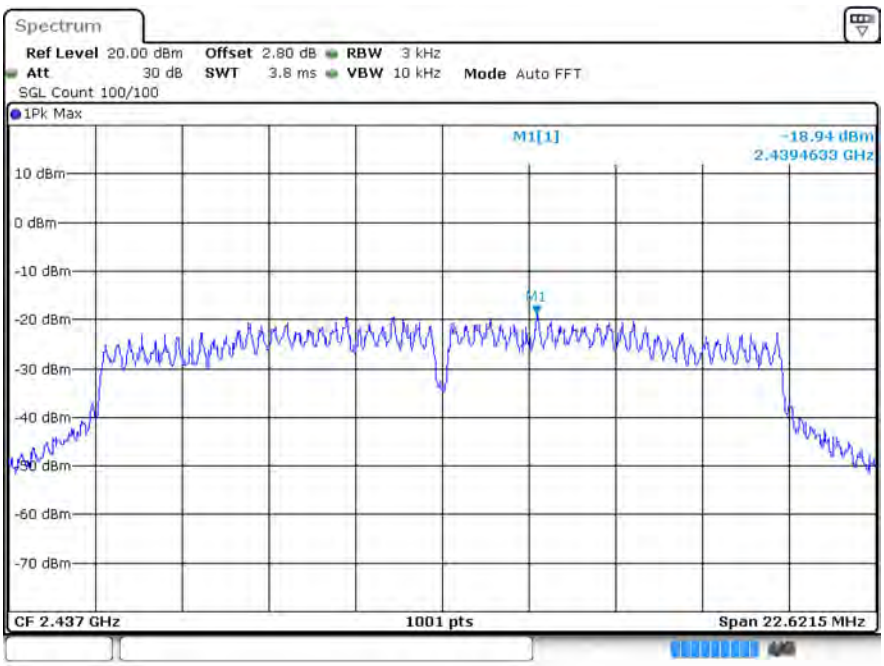
g 2462MHz Ant1



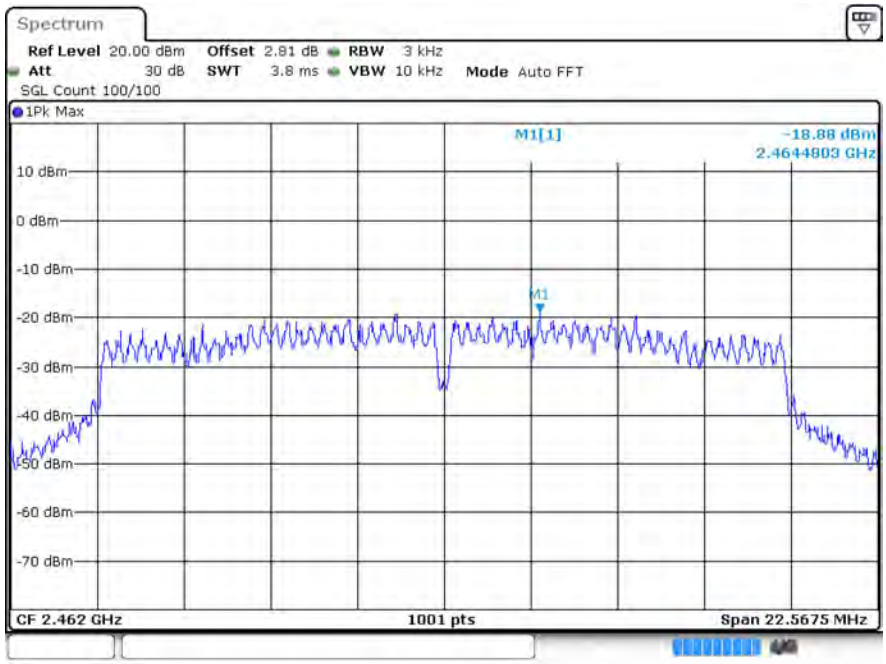
n20 2412MHz Ant1



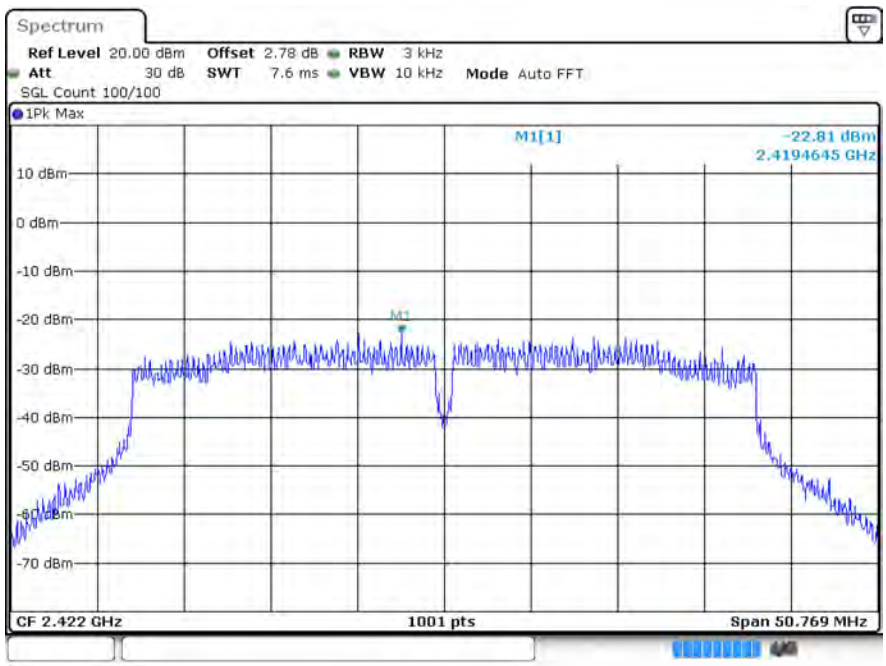
n20 2437MHz Ant1



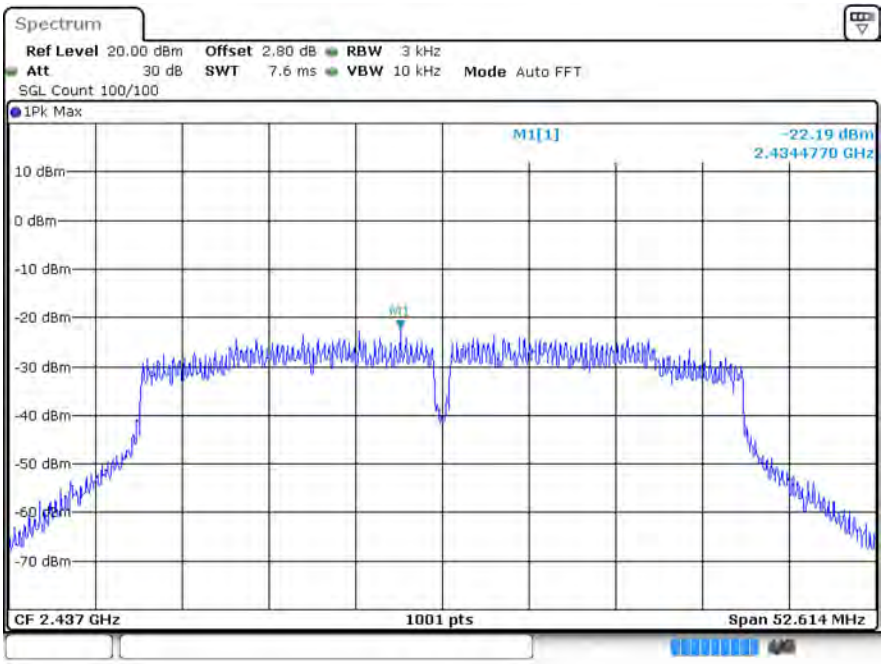
n20 2462MHz Ant1



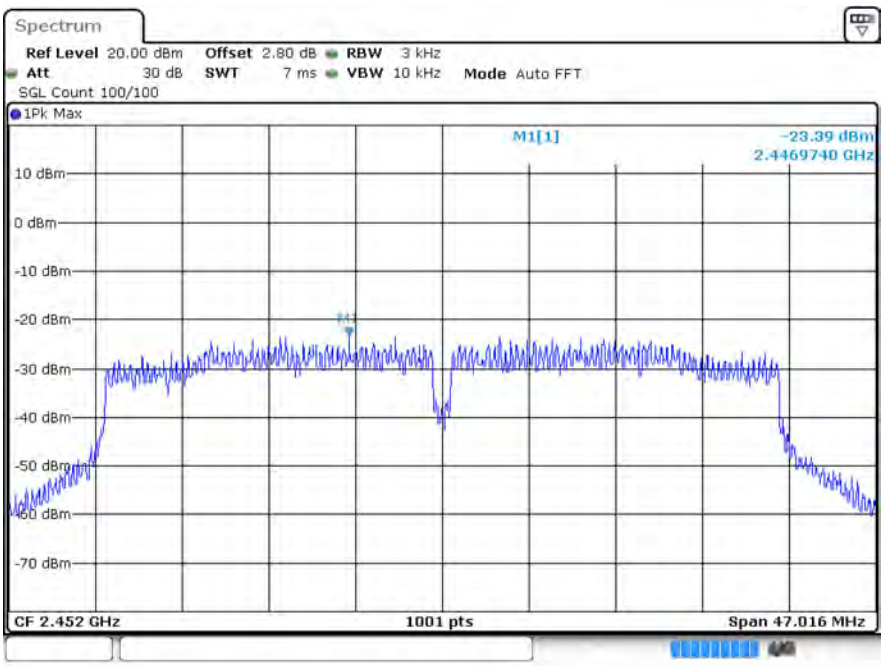
n40 2422MHz Ant1



n40 2437MHz Ant1



n40 2452MHz Ant1



5 Band Edge

5.1 Test Result

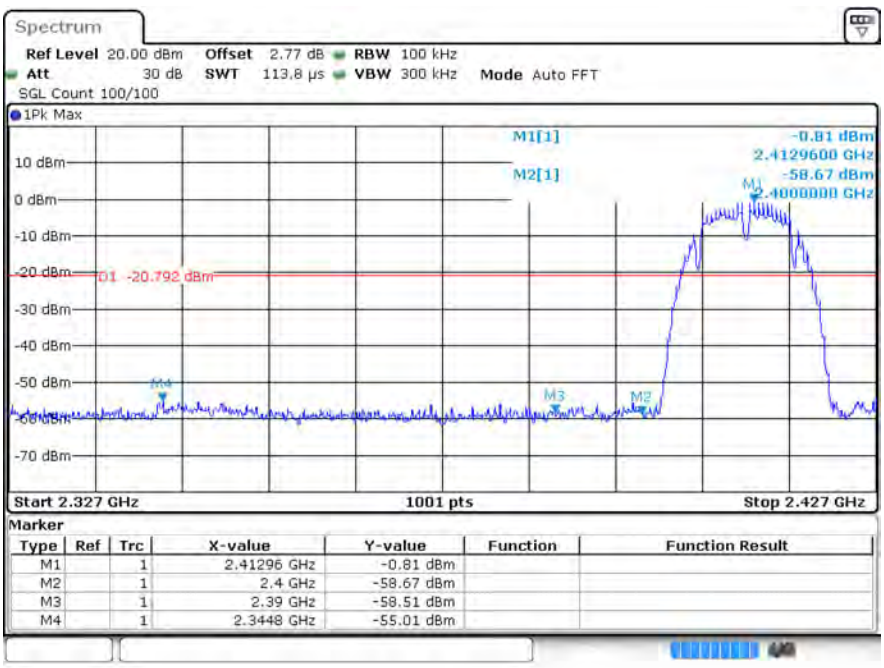
Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
b	2412	Ant1	-54.21	-20	Pass
b	2462	Ant1	-54.53	-20	Pass
g	2412	Ant1	-49.93	-20	Pass
g	2462	Ant1	-51.4	-20	Pass
n20	2412	Ant1	-50.74	-20	Pass
n20	2462	Ant1	-51.12	-20	Pass
n40	2422	Ant1	-45.77	-20	Pass
n40	2452	Ant1	-46.77	-20	Pass

5.2 Test Graphs

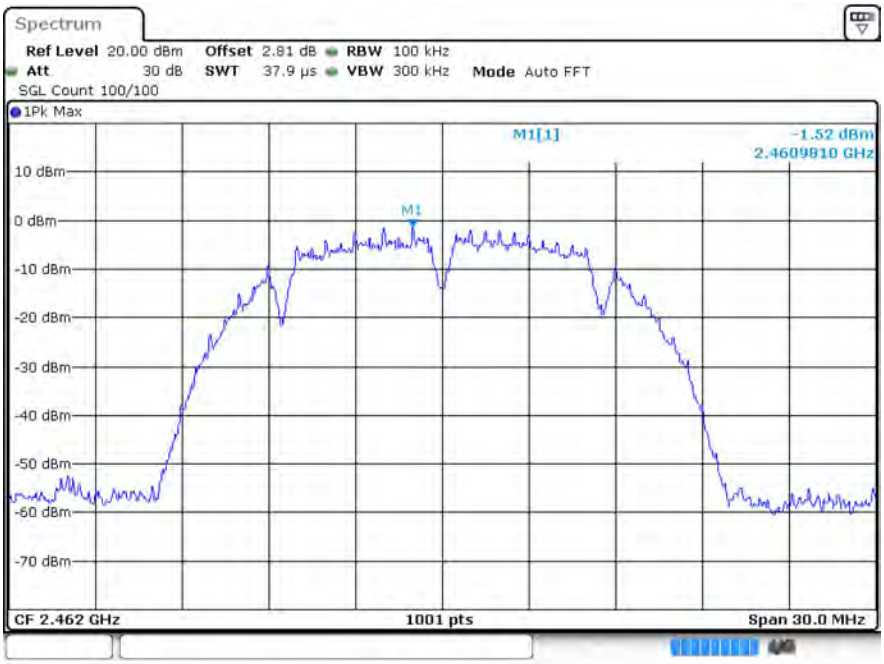
Test Graphs

b 2412MHz Ant1 Ref

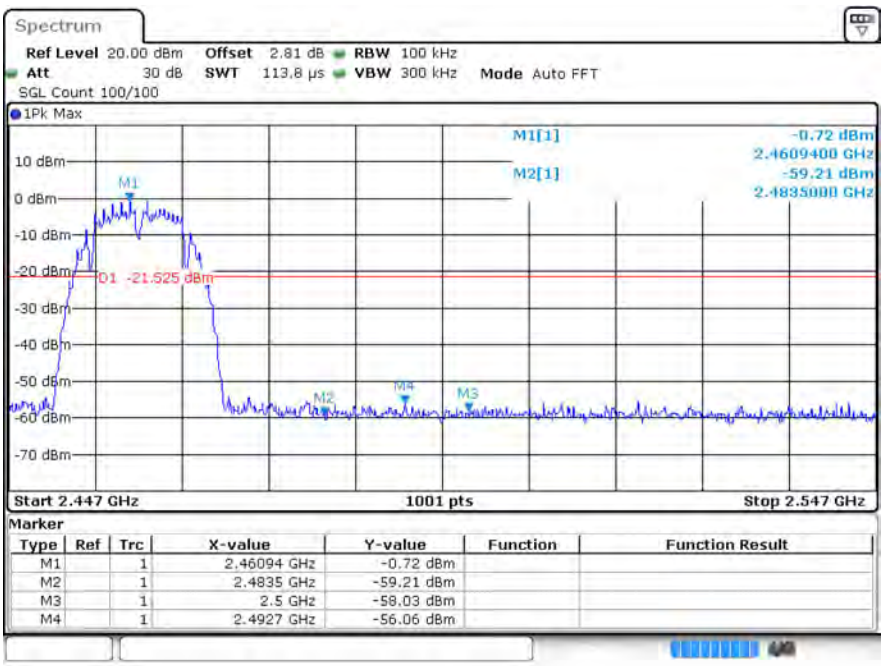
b 2412MHz Ant1 Emission



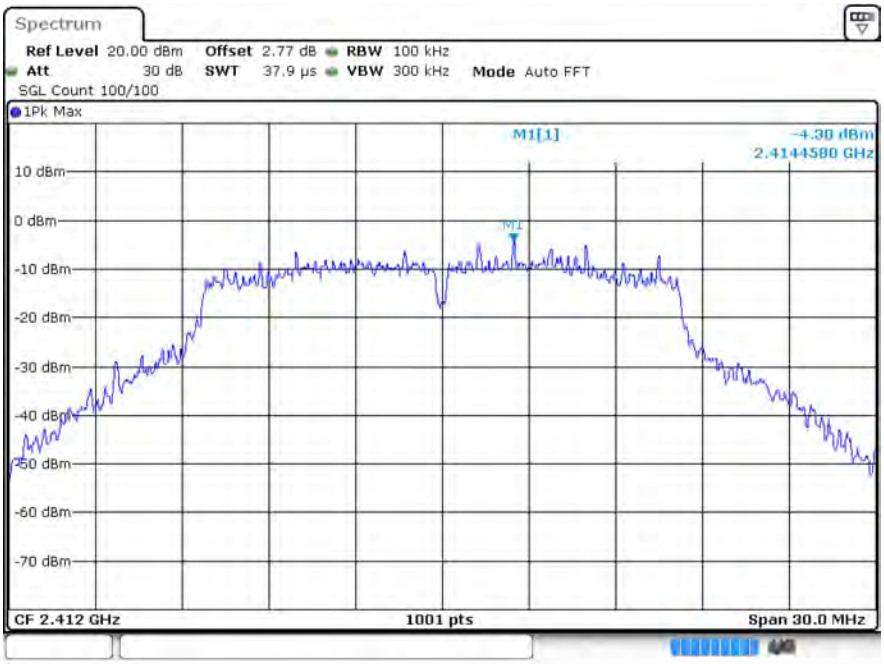
b 2462MHz Ant1 Ref



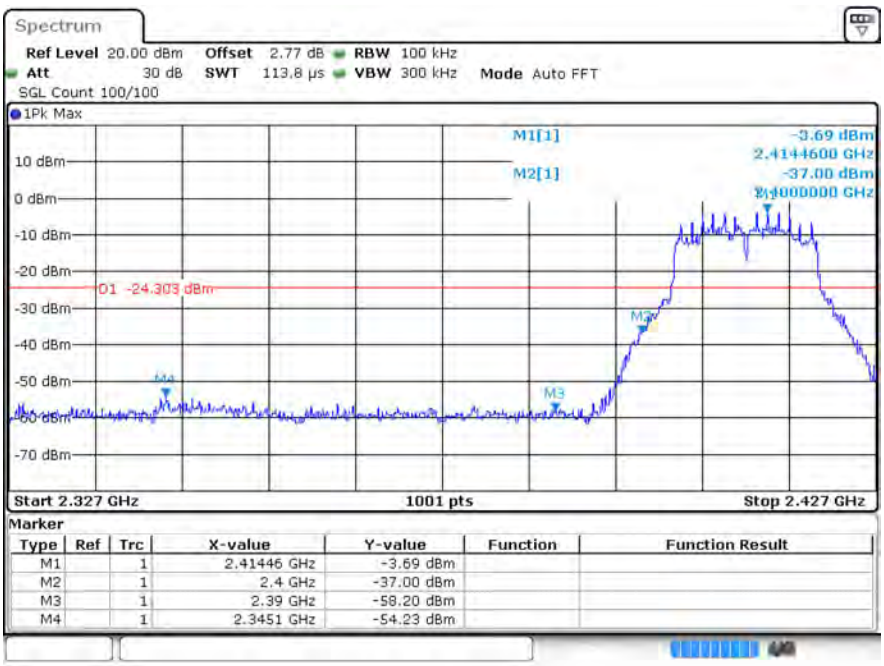
b 2462MHz Ant1 Emission



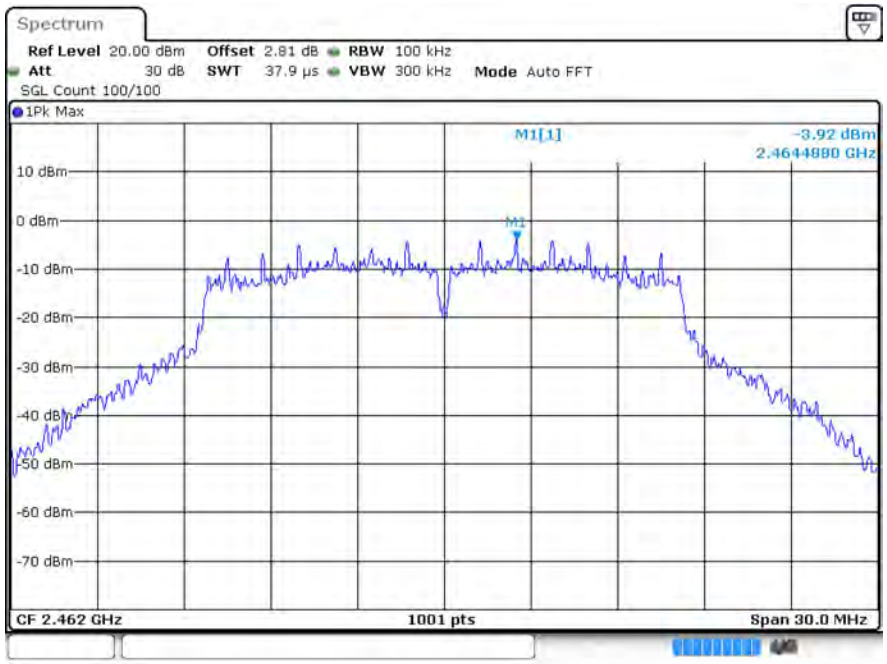
g 2412MHz Ant1 Ref



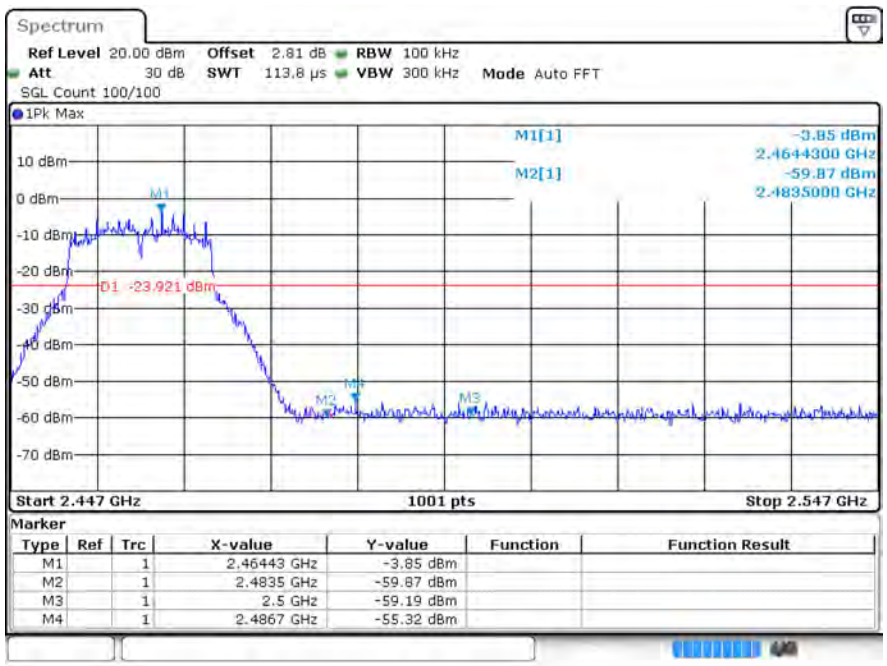
g 2412MHz Ant1 Emission



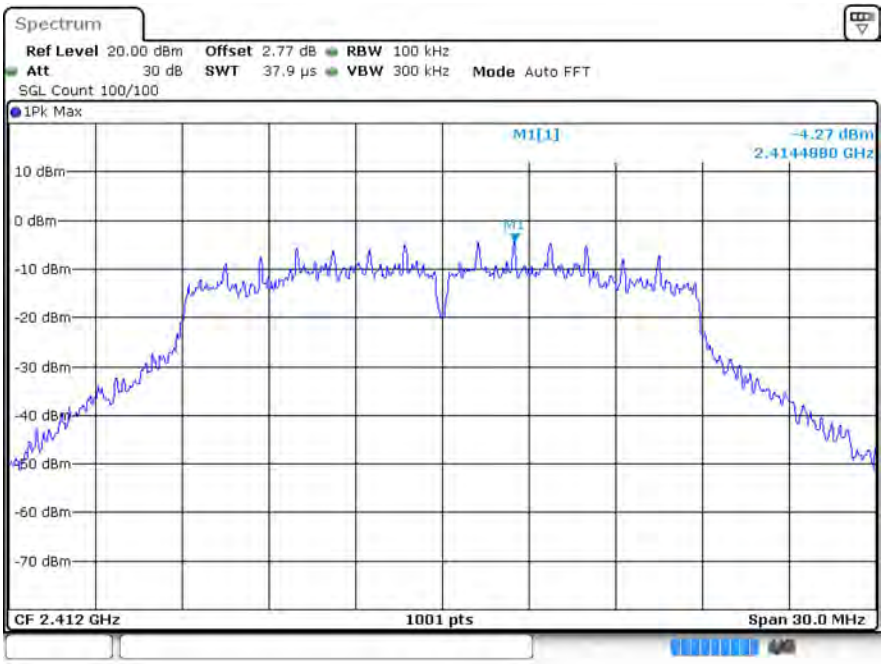
g 2462MHz Ant1 Ref



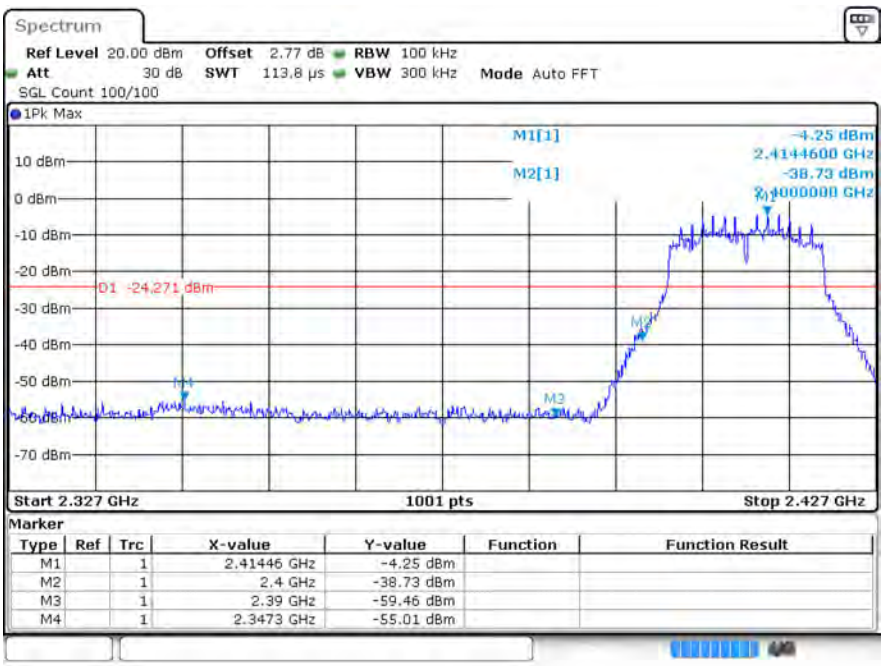
g 2462MHz Ant1 Emission



n20 2412MHz Ant1 Ref



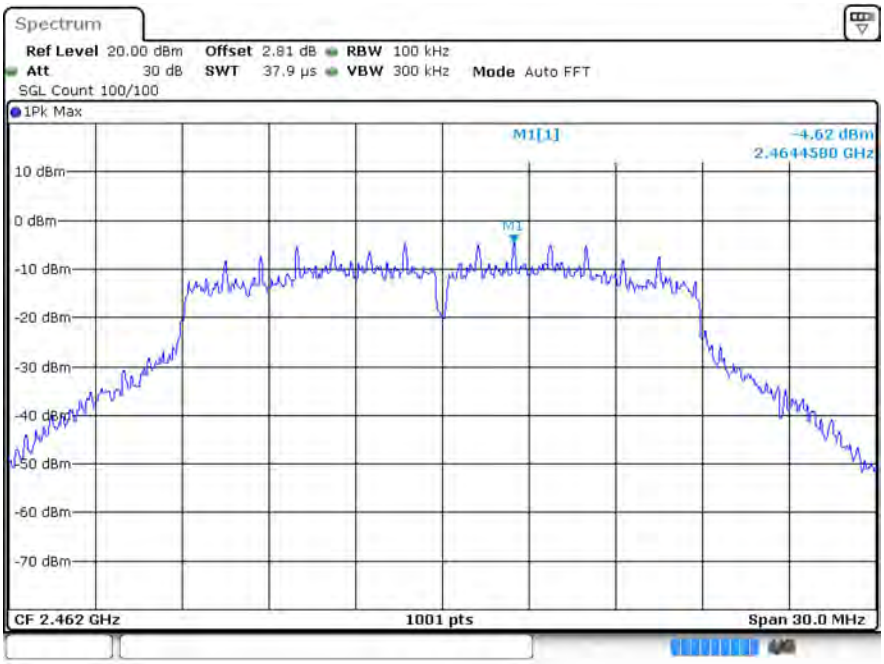
n20 2412MHz Ant1 Emission



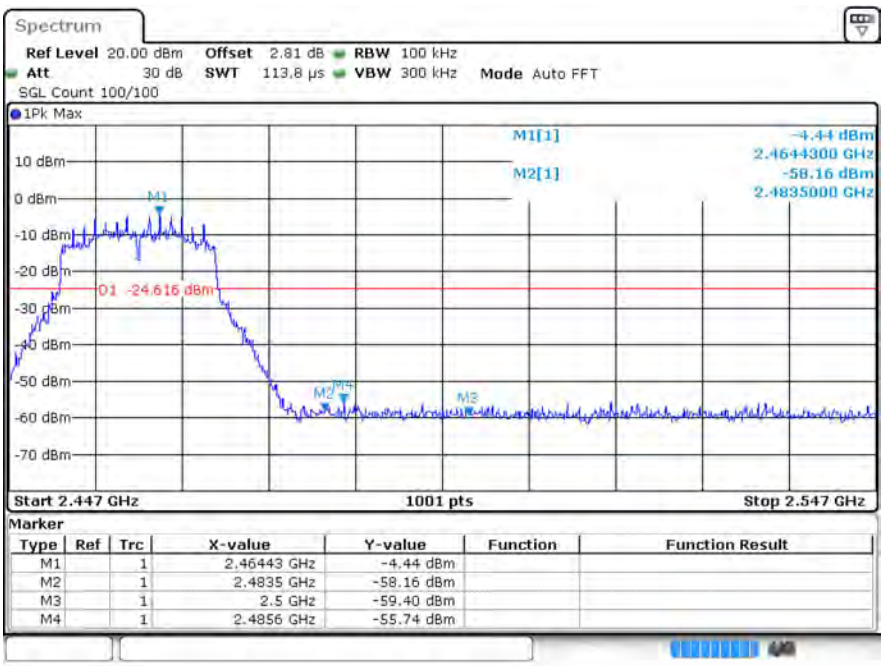
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.41446 GHz	-4.25 dBm		
M2		1	2.4 GHz	-38.73 dBm		
M3		1	2.39 GHz	-59.46 dBm		
M4		1	2.3473 GHz	-55.01 dBm		

n20 2462MHz Ant1 Ref



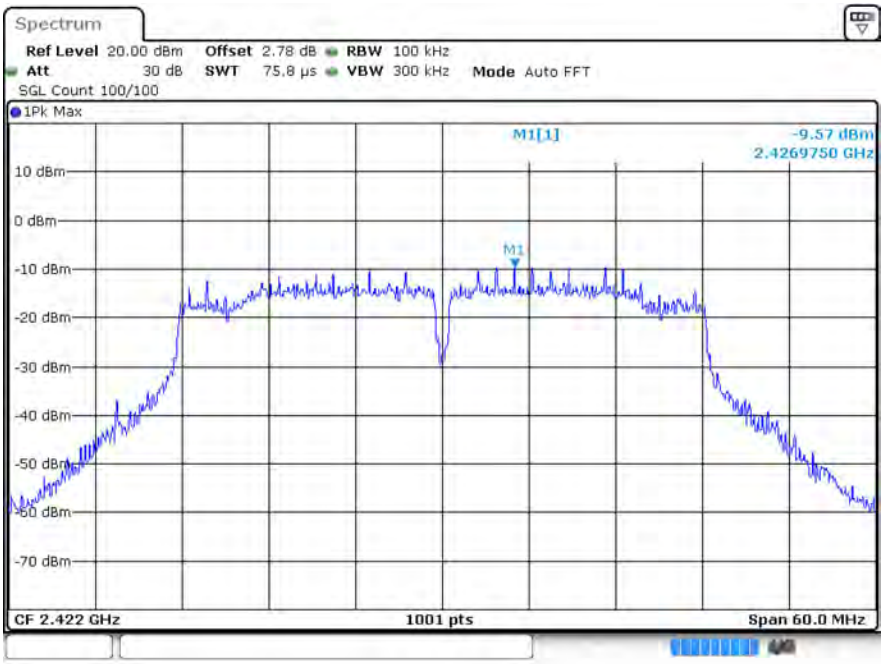
n20 2462MHz Ant1 Emission



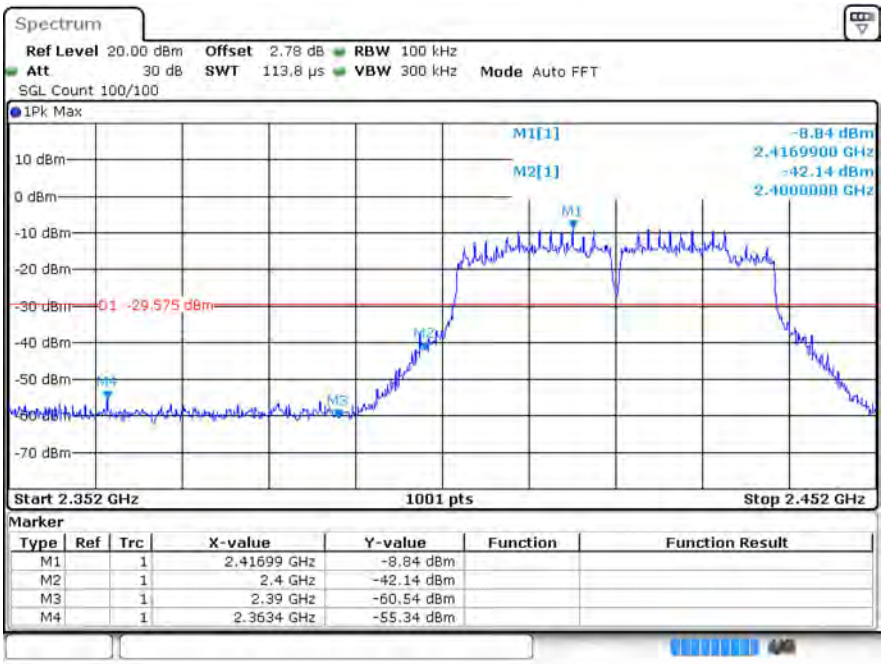
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.46443 GHz	-4.44 dBm		
M2		1	2.4835 GHz	-58.16 dBm		
M3		1	2.5 GHz	-59.40 dBm		
M4		1	2.4856 GHz	-55.74 dBm		

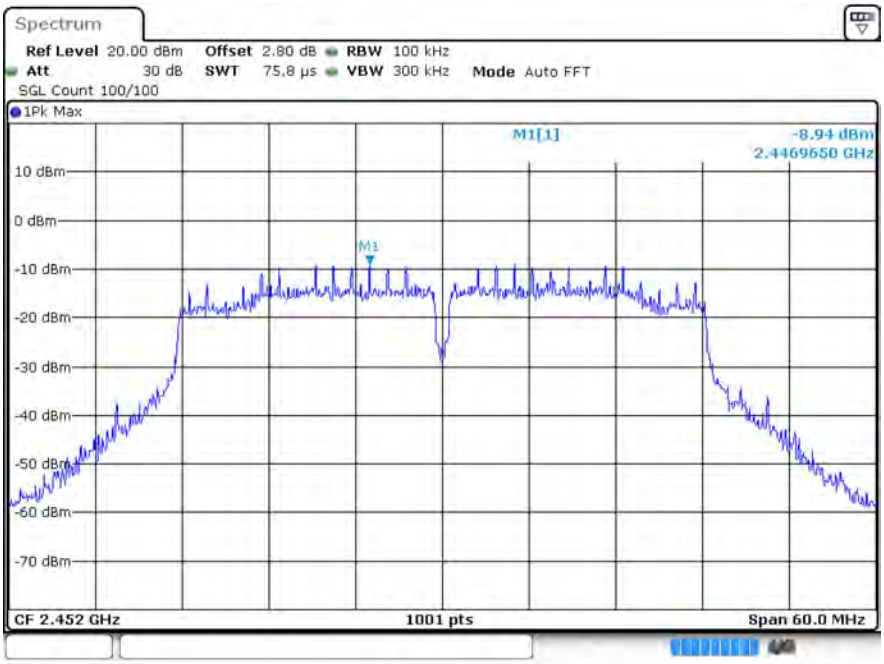
n40 2422MHz Ant1 Ref



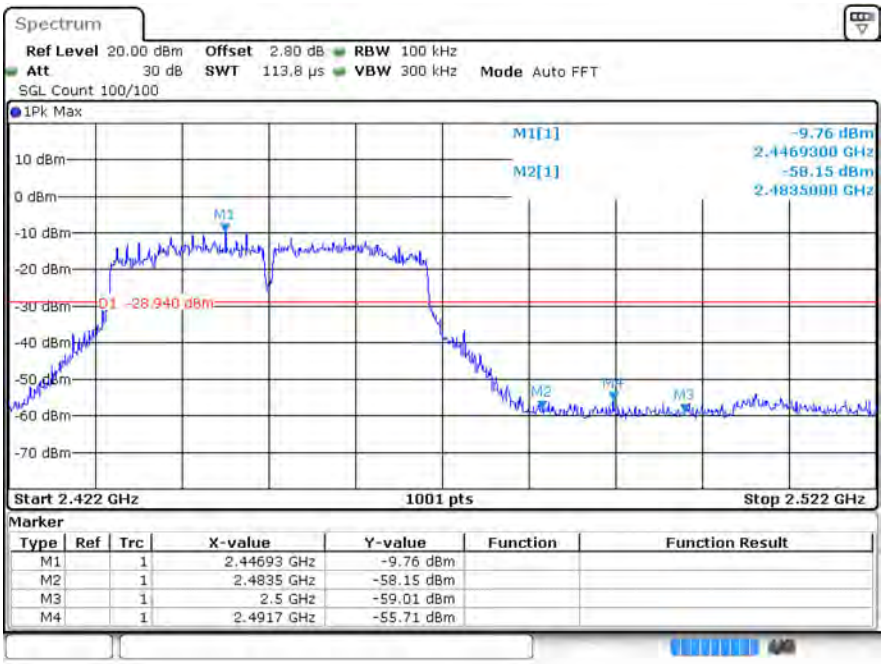
n40 2422MHz Ant1 Emission



n40 2452MHz Ant1 Ref



n40 2452MHz Ant1 Emission



6 Conducted RF Spurious Emission

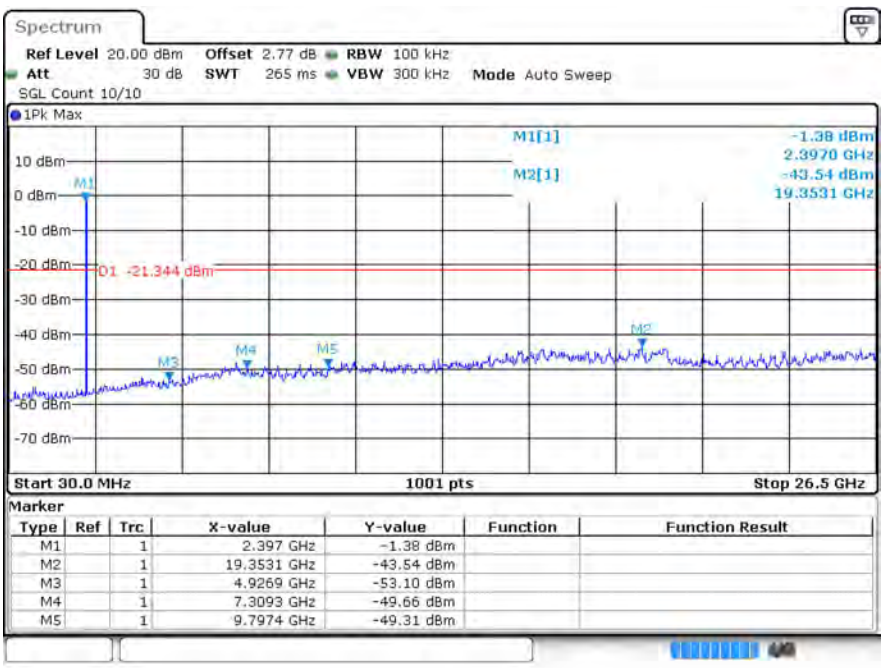
6.1 Test Result

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
b	2412	Ant1	-42.19	-20	Pass
b	2437	Ant1	-41.35	-20	Pass
b	2462	Ant1	-41.78	-20	Pass
g	2412	Ant1	-40.04	-20	Pass
g	2437	Ant1	-38.88	-20	Pass
g	2462	Ant1	-37.85	-20	Pass
n20	2412	Ant1	-39.03	-20	Pass
n20	2437	Ant1	-38.56	-20	Pass
n20	2462	Ant1	-38.44	-20	Pass
n40	2422	Ant1	-33.93	-20	Pass
n40	2437	Ant1	-34.25	-20	Pass
n40	2452	Ant1	-34.97	-20	Pass

6.2 Test Graphs

Test Graphs
b 2412MHz Ant1 Ref

b 2412MHz Ant1 Emission

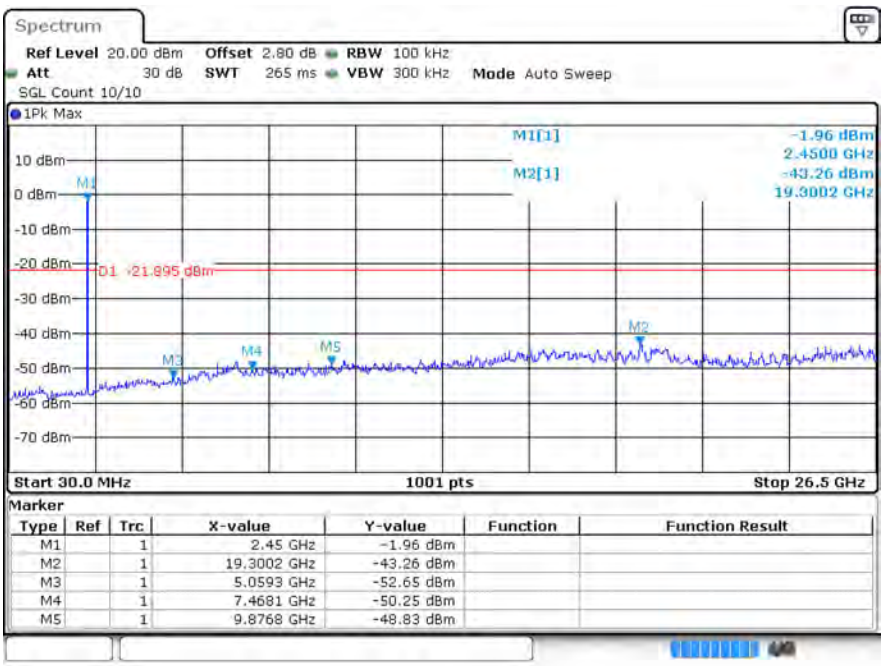


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.397 GHz	-1.38 dBm		
M2		1	19.3531 GHz	-43.54 dBm		
M3		1	4.9269 GHz	-53.10 dBm		
M4		1	7.3093 GHz	-49.66 dBm		
M5		1	9.7974 GHz	-49.31 dBm		

b 2437MHz Ant1 Ref

b 2437MHz Ant1 Emission

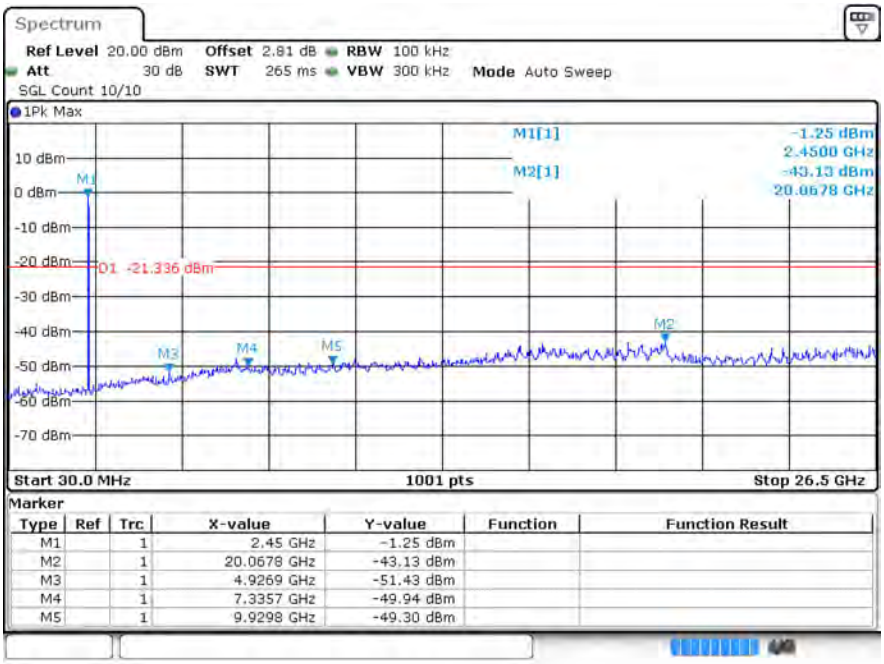


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-1.96 dBm		
M2		1	19.3002 GHz	-43.26 dBm		
M3		1	5.0593 GHz	-52.65 dBm		
M4		1	7.4681 GHz	-50.25 dBm		
M5		1	9.8768 GHz	-48.83 dBm		

b 2462MHz Ant1 Ref

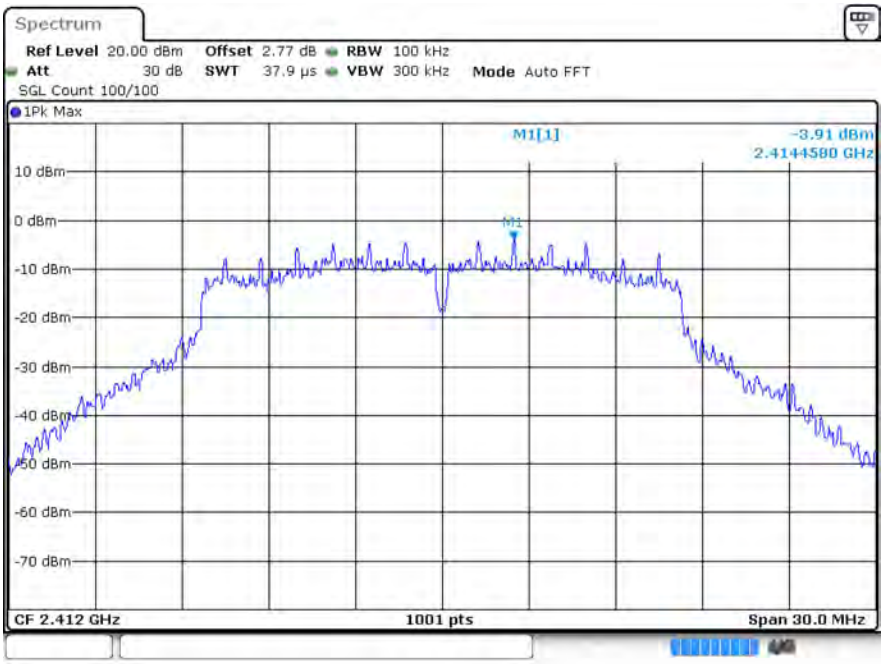
b 2462MHz Ant1 Emission



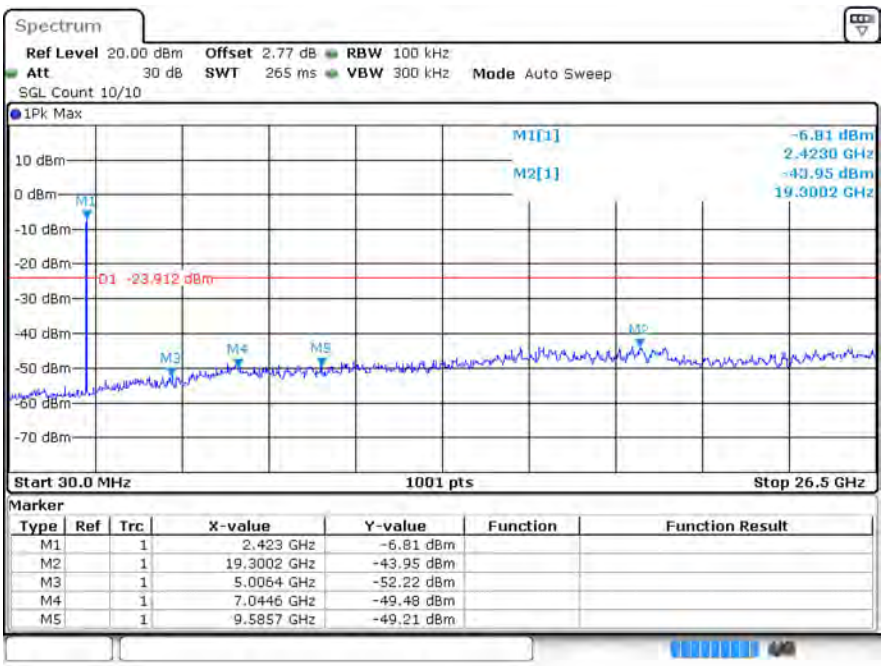
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-1.25 dBm		
M2		1	20.0678 GHz	-43.13 dBm		
M3		1	4.9269 GHz	-51.43 dBm		
M4		1	7.3357 GHz	-49.94 dBm		
M5		1	9.9298 GHz	-49.30 dBm		

g 2412MHz Ant1 Ref



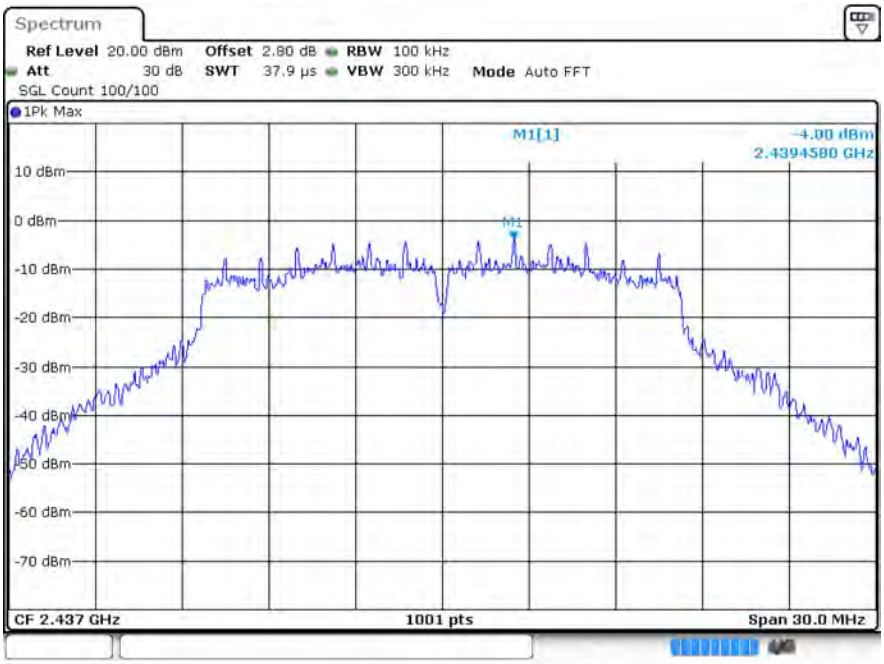
g 2412MHz Ant1 Emission



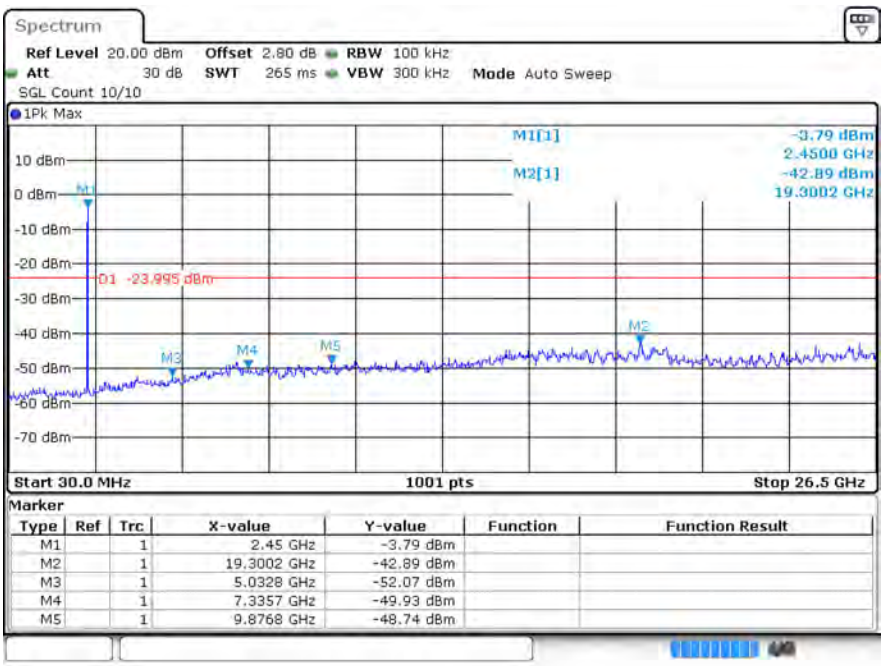
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-6.81 dBm		
M2		1	19.3002 GHz	-43.95 dBm		
M3		1	5.0064 GHz	-52.22 dBm		
M4		1	7.0446 GHz	-49.48 dBm		
M5		1	9.5857 GHz	-49.21 dBm		

g 2437MHz Ant1 Ref



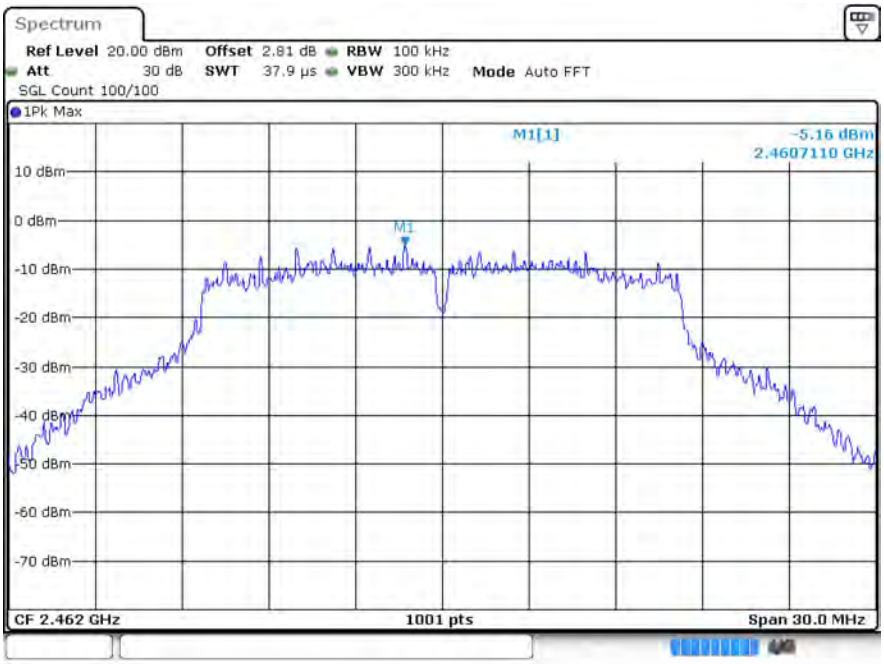
g 2437MHz Ant1 Emission



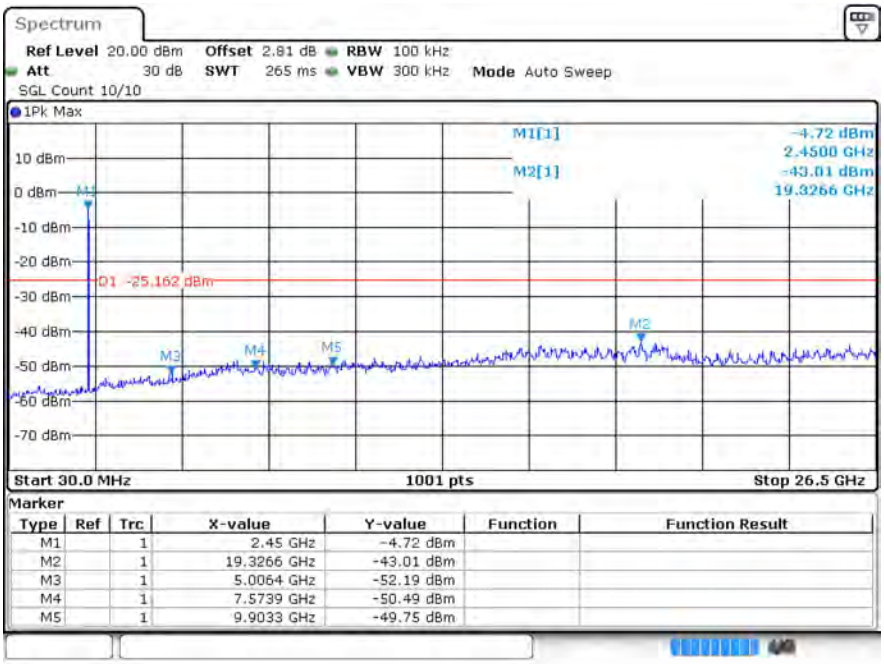
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-3.79 dBm		
M2		1	19.3002 GHz	-42.89 dBm		
M3		1	5.0328 GHz	-52.07 dBm		
M4		1	7.3357 GHz	-49.93 dBm		
M5		1	9.8768 GHz	-48.74 dBm		

g 2462MHz Ant1 Ref



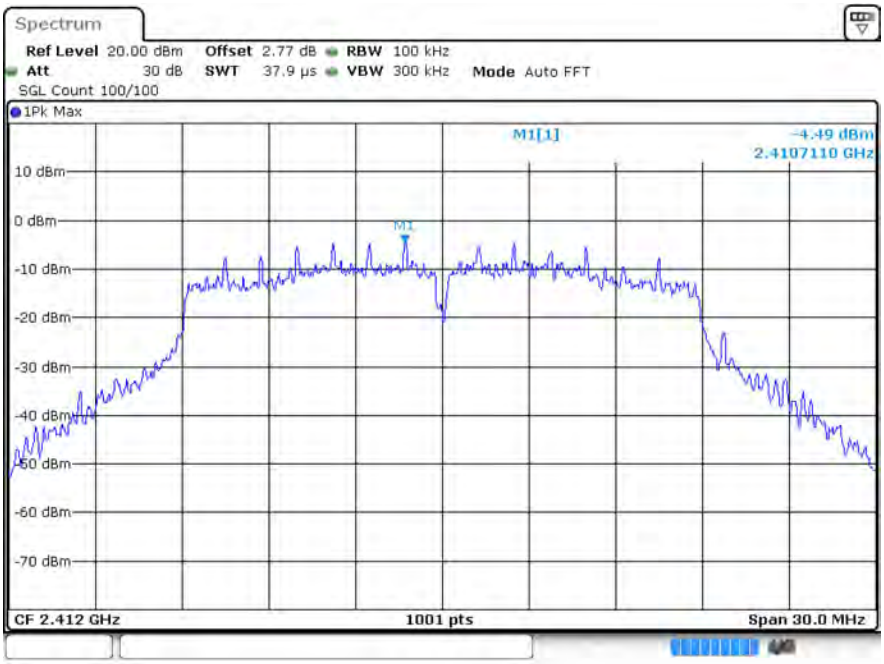
g 2462MHz Ant1 Emission



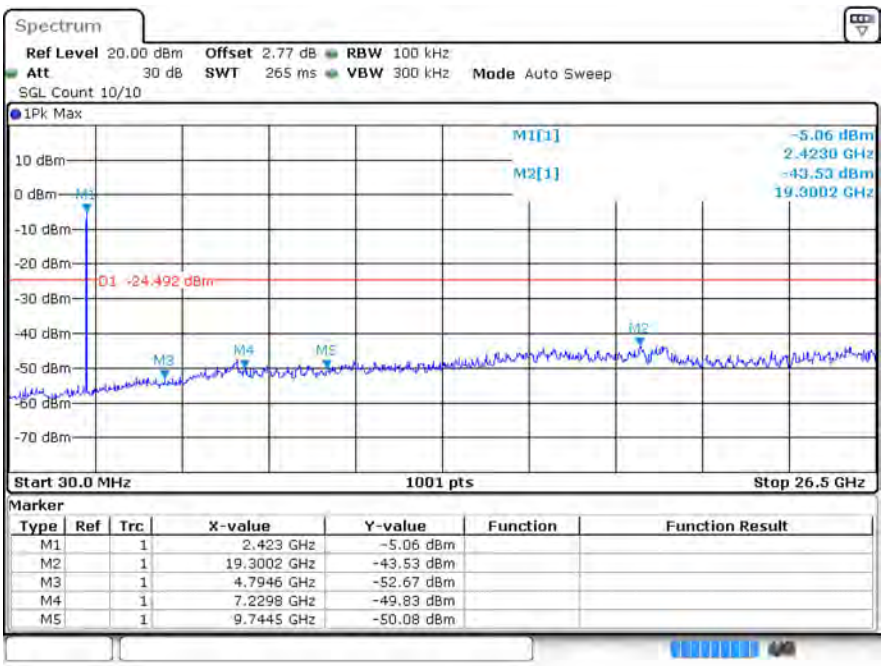
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-4.72 dBm		
M2		1	19.3266 GHz	-43.01 dBm		
M3		1	5.0064 GHz	-52.19 dBm		
M4		1	7.5739 GHz	-50.49 dBm		
M5		1	9.9033 GHz	-49.75 dBm		

n20 2412MHz Ant1 Ref



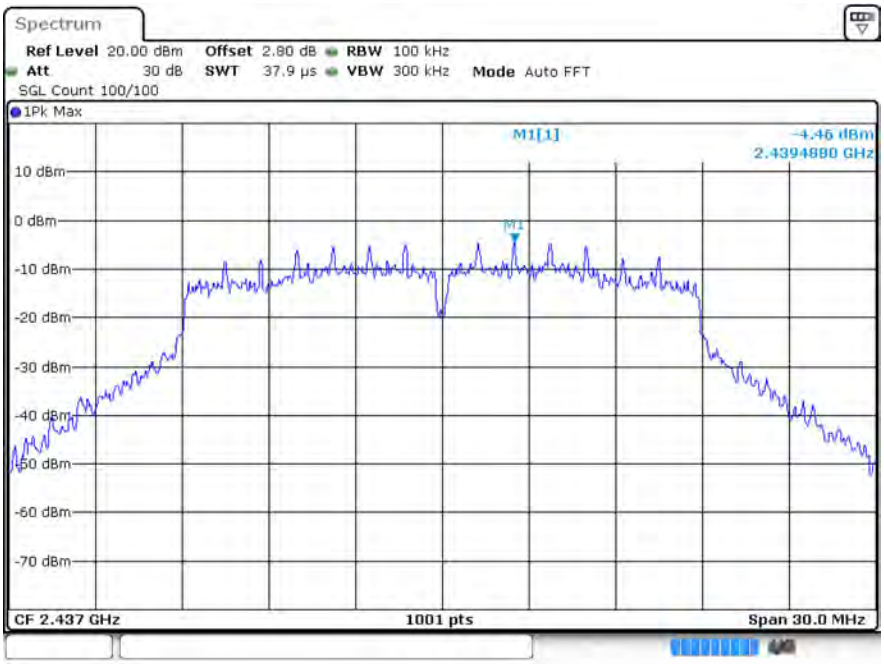
n20 2412MHz Ant1 Emission



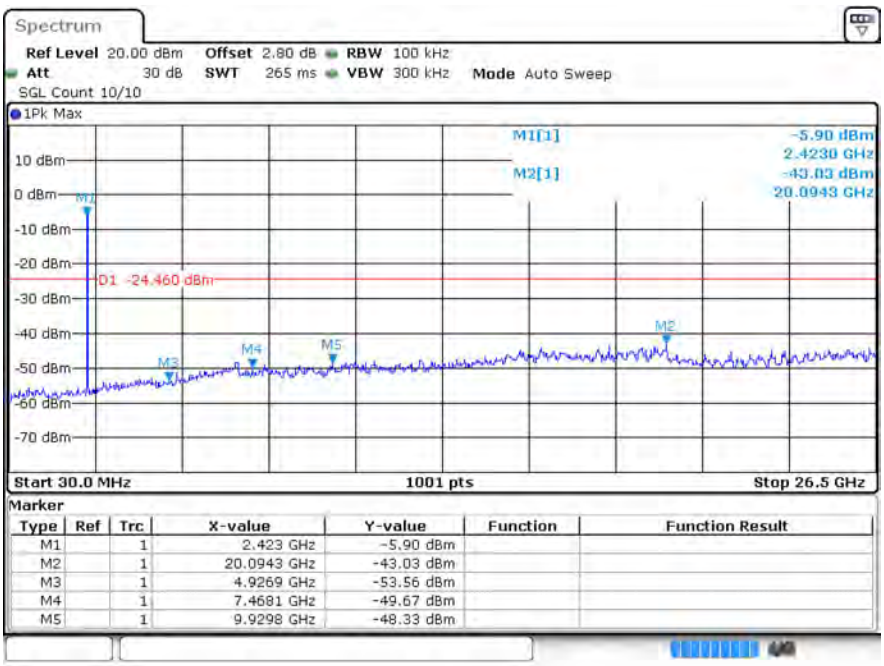
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-5.06 dBm		
M2		1	19.3002 GHz	-43.53 dBm		
M3		1	4.7946 GHz	-52.67 dBm		
M4		1	7.2298 GHz	-49.83 dBm		
M5		1	9.7445 GHz	-50.08 dBm		

n20 2437MHz Ant1 Ref



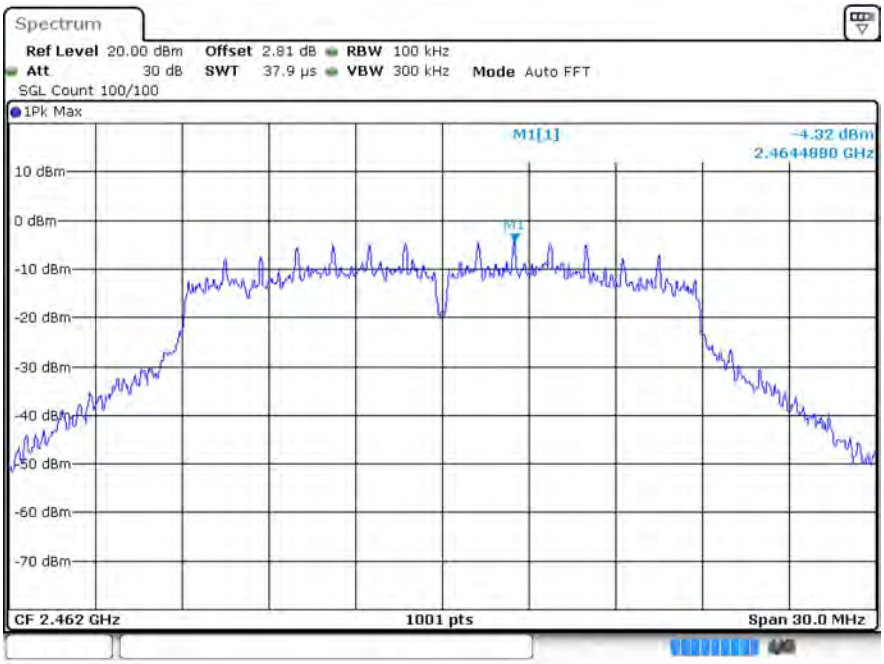
n20 2437MHz Ant1 Emission



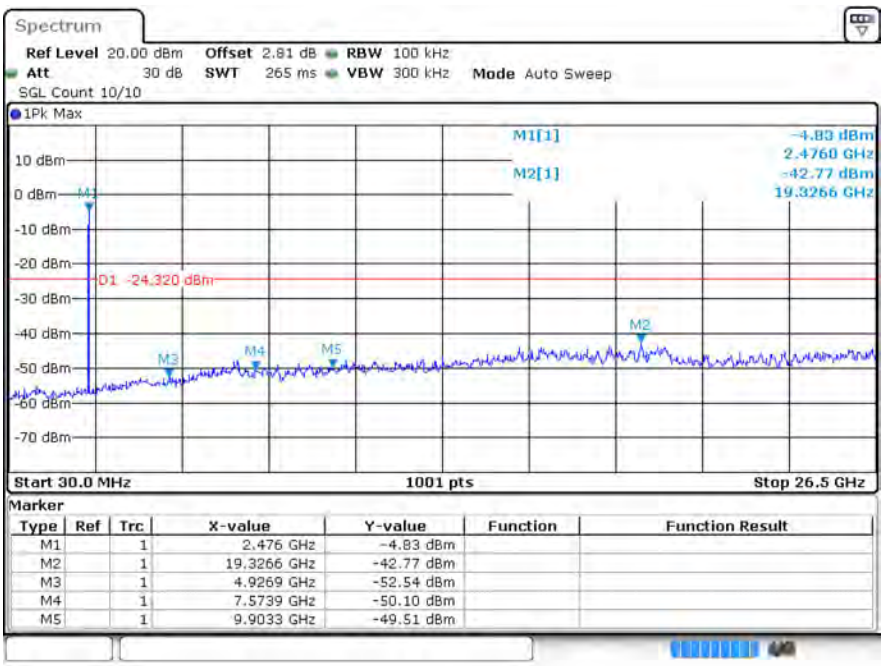
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-5.90 dBm		
M2		1	20.0943 GHz	-43.03 dBm		
M3		1	4.9269 GHz	-53.56 dBm		
M4		1	7.4681 GHz	-49.67 dBm		
M5		1	9.9298 GHz	-48.33 dBm		

n20 2462MHz Ant1 Ref



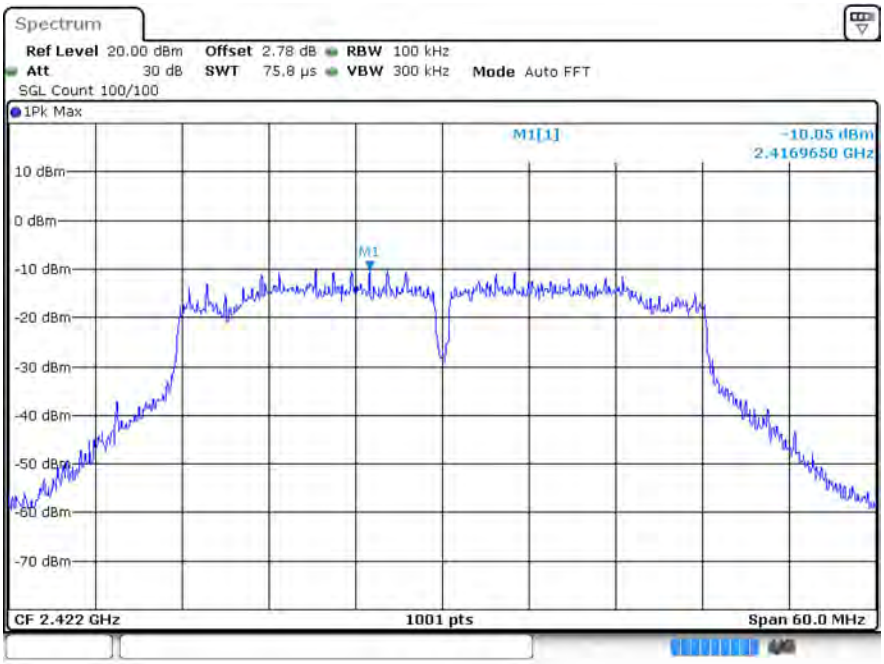
n20 2462MHz Ant1 Emission



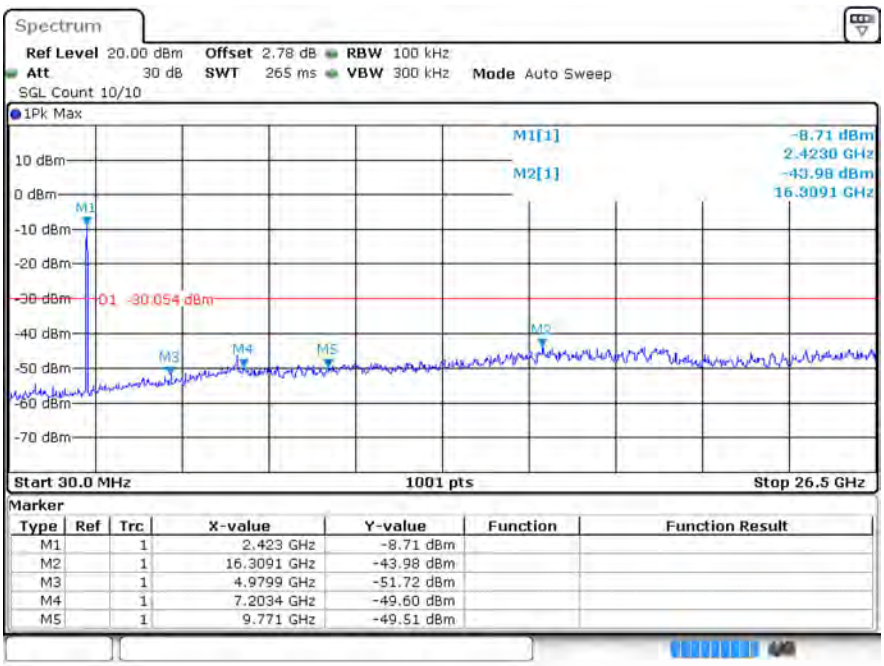
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.476 GHz	-4.83 dBm		
M2		1	19.3266 GHz	-42.77 dBm		
M3		1	4.9269 GHz	-52.54 dBm		
M4		1	7.5739 GHz	-50.10 dBm		
M5		1	9.9033 GHz	-49.51 dBm		

n40 2422MHz Ant1 Ref



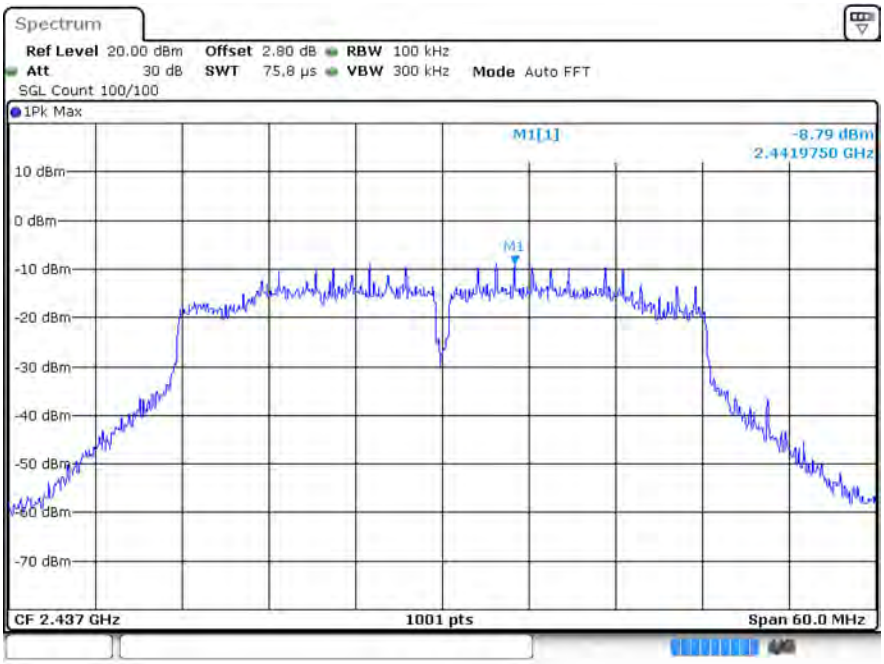
n40 2422MHz Ant1 Emission



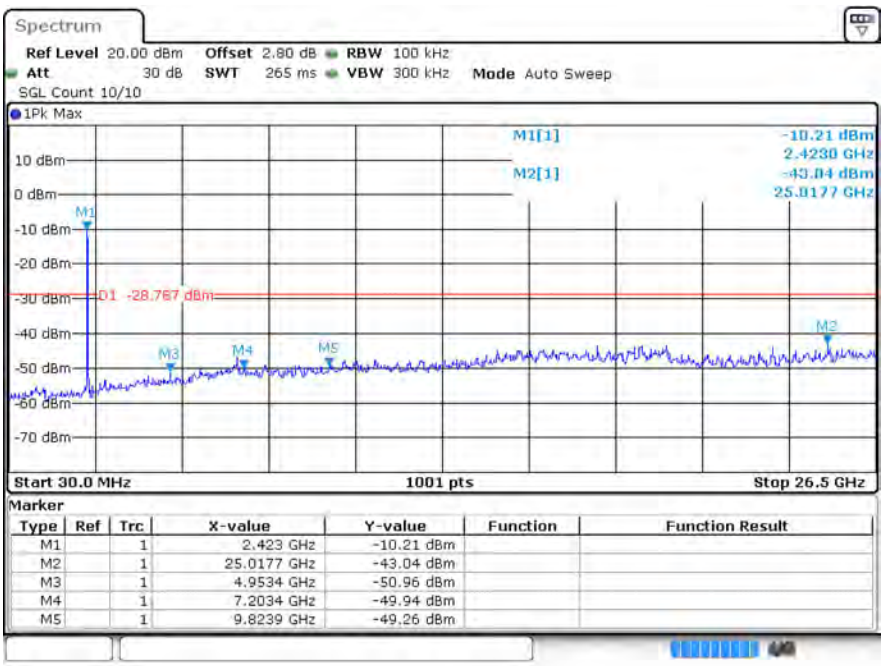
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-8.71 dBm		
M2		1	16.3091 GHz	-43.98 dBm		
M3		1	4.9799 GHz	-51.72 dBm		
M4		1	7.2034 GHz	-49.60 dBm		
M5		1	9.771 GHz	-49.51 dBm		

n40 2437MHz Ant1 Ref



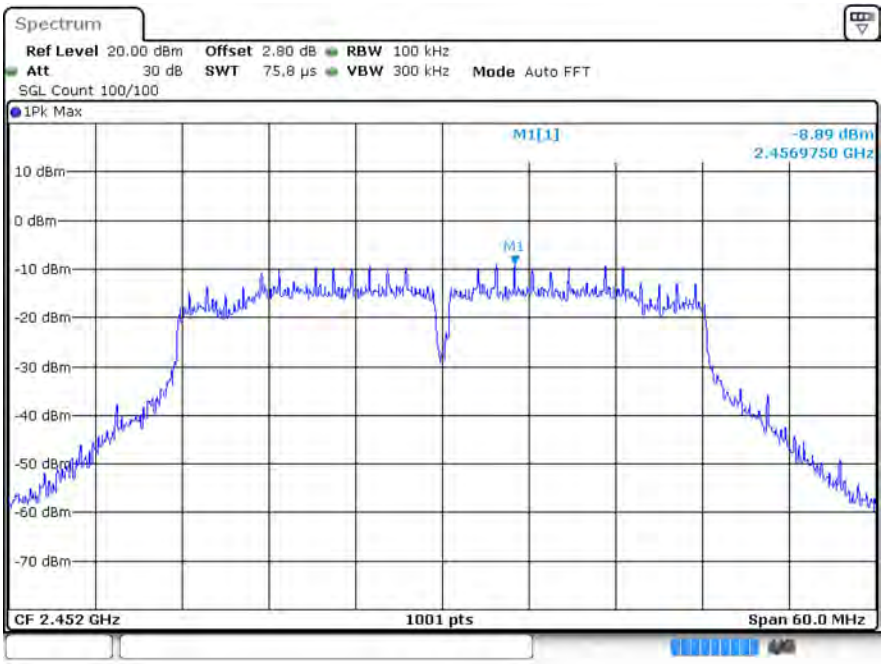
n40 2437MHz Ant1 Emission



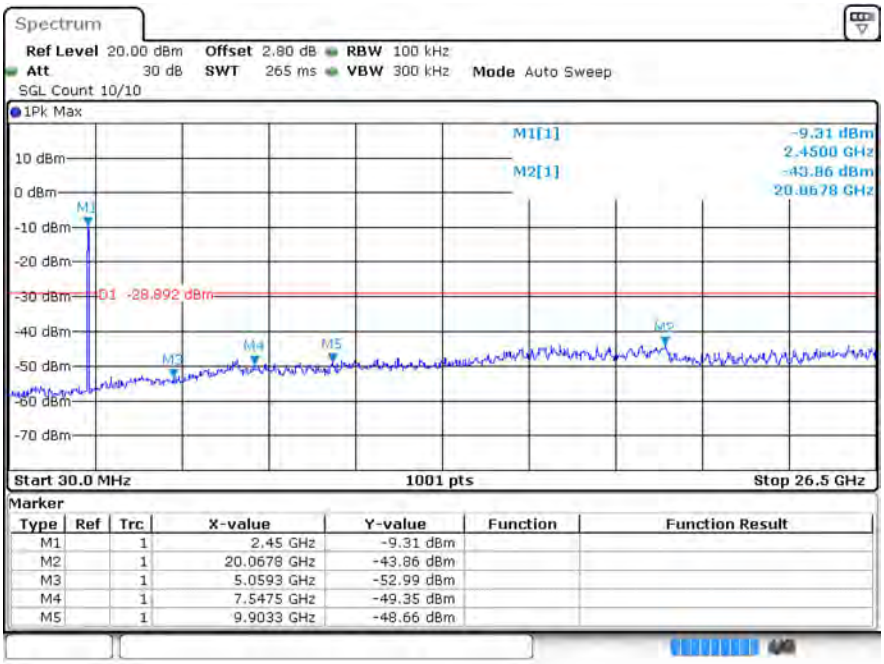
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.423 GHz	-10.21 dBm		
M2		1	25.0177 GHz	-43.04 dBm		
M3		1	4.9534 GHz	-50.96 dBm		
M4		1	7.2034 GHz	-49.94 dBm		
M5		1	9.8239 GHz	-49.26 dBm		

n40 2452MHz Ant1 Ref



n40 2452MHz Ant1 Emission



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45 GHz	-9.31 dBm		
M2		1	20.0678 GHz	-43.86 dBm		
M3		1	5.0593 GHz	-52.99 dBm		
M4		1	7.5475 GHz	-49.35 dBm		
M5		1	9.9033 GHz	-48.66 dBm		

7 Restrict Band

7.1 Test Result

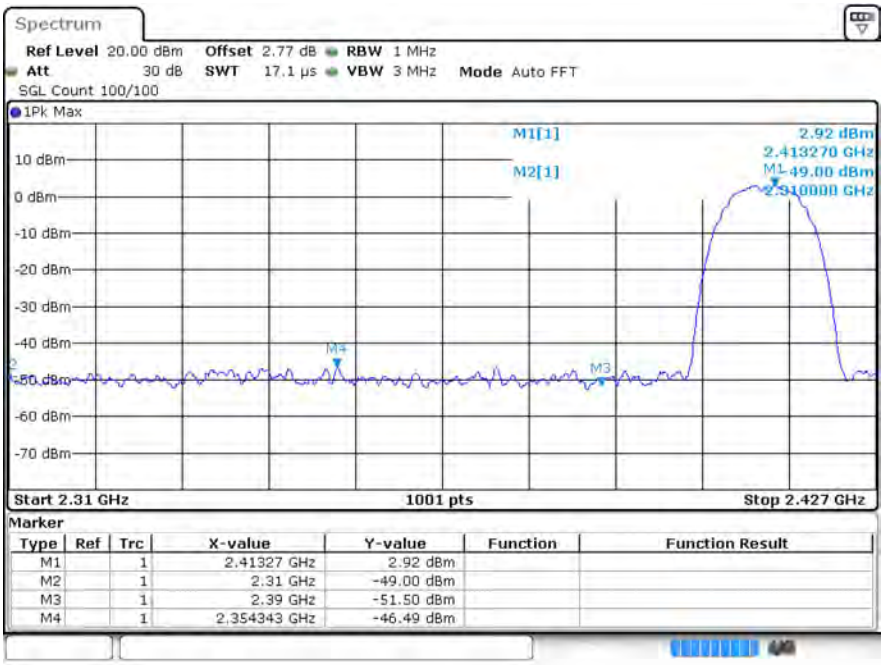
Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
b	2412	Ant1	2310	-49	4.2	-	50.43	Peak	74	Pass
b	2412	Ant1	2310	-56.56	4.2	0	42.87	Average	54	Pass
b	2412	Ant1	2354.343	-46.49	4.2	-	52.94	Peak	74	Pass
b	2412	Ant1	2337.963	-54.02	4.2	0	45.41	Average	54	Pass
b	2412	Ant1	2390	-51.5	4.2	-	47.93	Peak	74	Pass
b	2412	Ant1	2390	-55.62	4.2	0	43.81	Average	54	Pass
b	2462	Ant1	2483.5	-48.62	4.2	-	50.81	Peak	74	Pass
b	2462	Ant1	2483.5	-55.59	4.2	0	43.84	Average	54	Pass
b	2462	Ant1	2485.319	-47.97	4.2	-	51.46	Peak	74	Pass
b	2462	Ant1	2483.888	-55.53	4.2	0	43.9	Average	54	Pass
b	2462	Ant1	2500	-48.8	4.2	-	50.63	Peak	74	Pass
b	2462	Ant1	2500	-55.94	4.2	0	43.49	Average	54	Pass
g	2412	Ant1	2310	-50.07	4.2	-	49.36	Peak	74	Pass
g	2412	Ant1	2310	-56.6	4.2	0.61	43.44	Average	54	Pass
g	2412	Ant1	2342.994	-45.4	4.2	-	54.03	Peak	74	Pass
g	2412	Ant1	2337.612	-54.21	4.2	0.61	45.83	Average	54	Pass
g	2412	Ant1	2390	-50.36	4.2	-	49.07	Peak	74	Pass
g	2412	Ant1	2390	-56.65	4.2	0.61	43.39	Average	54	Pass
g	2462	Ant1	2483.5	-47.08	4.2	-	52.35	Peak	74	Pass
g	2462	Ant1	2483.5	-55.71	4.2	0.61	44.33	Average	54	Pass
g	2462	Ant1	2485.319	-46.69	4.2	-	52.74	Peak	74	Pass
g	2462	Ant1	2483.888	-55.5	4.2	0.61	44.54	Average	54	Pass
g	2462	Ant1	2500	-48.84	4.2	-	50.59	Peak	74	Pass
g	2462	Ant1	2500	-56.86	4.2	0.61	43.18	Average	54	Pass
n20	2412	Ant1	2310	-47.41	4.2	-	52.02	Peak	74	Pass
n20	2412	Ant1	2310	-56.78	4.2	0.58	43.23	Average	54	Pass
n20	2412	Ant1	2342.409	-46.78	4.2	-	52.65	Peak	74	Pass
n20	2412	Ant1	2337.261	-54.62	4.2	0.58	45.39	Average	54	Pass
n20	2412	Ant1	2390	-48.72	4.2	-	50.71	Peak	74	Pass
n20	2412	Ant1	2390	-57.04	4.2	0.58	42.97	Average	54	Pass
n20	2462	Ant1	2483.5	-50.45	4.2	-	48.98	Peak	74	Pass
n20	2462	Ant1	2483.5	-55.65	4.2	0.58	44.36	Average	54	Pass
n20	2462	Ant1	2485.425	-46.88	4.2	-	52.55	Peak	74	Pass
n20	2462	Ant1	2483.517	-55.64	4.2	0.58	44.37	Average	54	Pass

n20	2462	Ant1	2500	-49.21	4.2	-	50.22	Peak	74	Pass
n20	2462	Ant1	2500	-55.99	4.2	0.58	44.02	Average	54	Pass
n40	2422	Ant1	2310	-50.41	4.2	-	49.02	Peak	74	Pass
n40	2422	Ant1	2310	-56.77	4.2	0.55	43.21	Average	54	Pass
n40	2422	Ant1	2343.512	-45.59	4.2	-	53.84	Peak	74	Pass
n40	2422	Ant1	2340.814	-54.26	4.2	0.55	45.72	Average	54	Pass
n40	2422	Ant1	2390	-50.25	4.2	-	49.18	Peak	74	Pass
n40	2422	Ant1	2390	-57.13	4.2	0.55	42.85	Average	54	Pass
n40	2452	Ant1	2483.5	-49.69	4.2	-	49.74	Peak	74	Pass
n40	2452	Ant1	2483.5	-55.87	4.2	0.55	44.11	Average	54	Pass
n40	2452	Ant1	2494.228	-48	4.2	-	51.43	Peak	74	Pass
n40	2452	Ant1	2483.542	-55.87	4.2	0.55	44.11	Average	54	Pass
n40	2452	Ant1	2500	-49.98	4.2	-	49.45	Peak	74	Pass
n40	2452	Ant1	2500	-56.78	4.2	0.55	43.2	Average	54	Pass

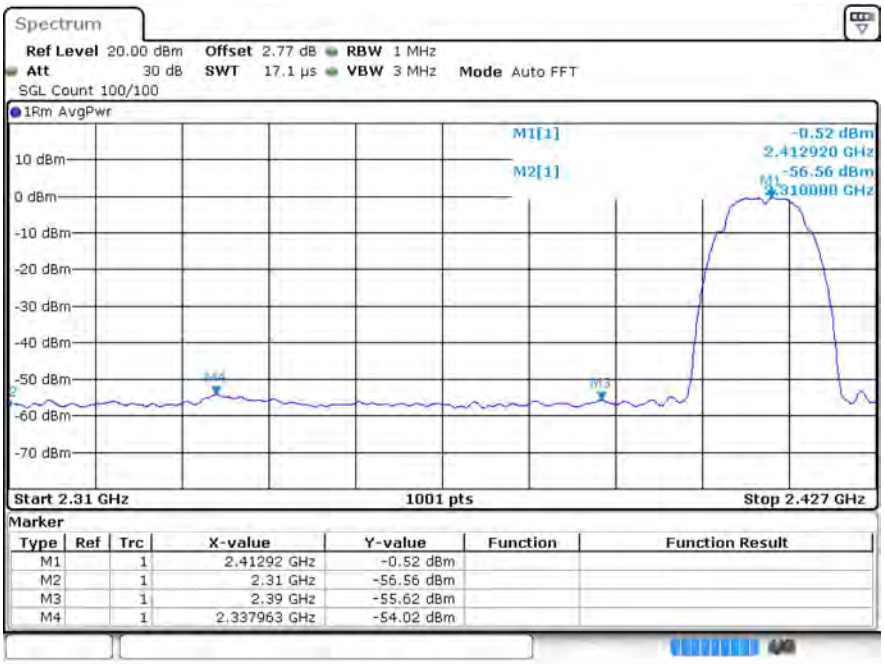
7.2 Test Graphs

Test Graphs

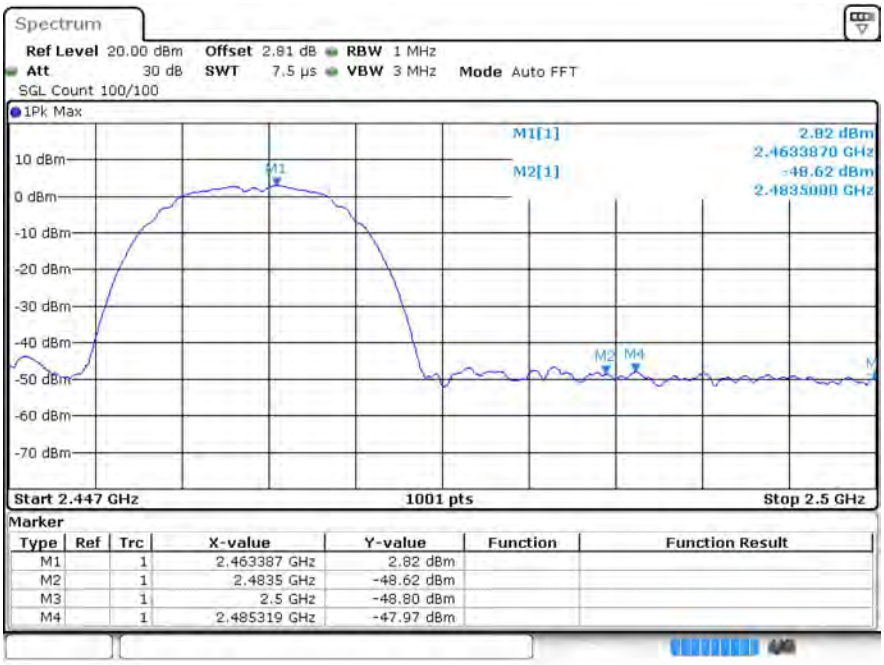
b 2412MHz Ant1 Peak



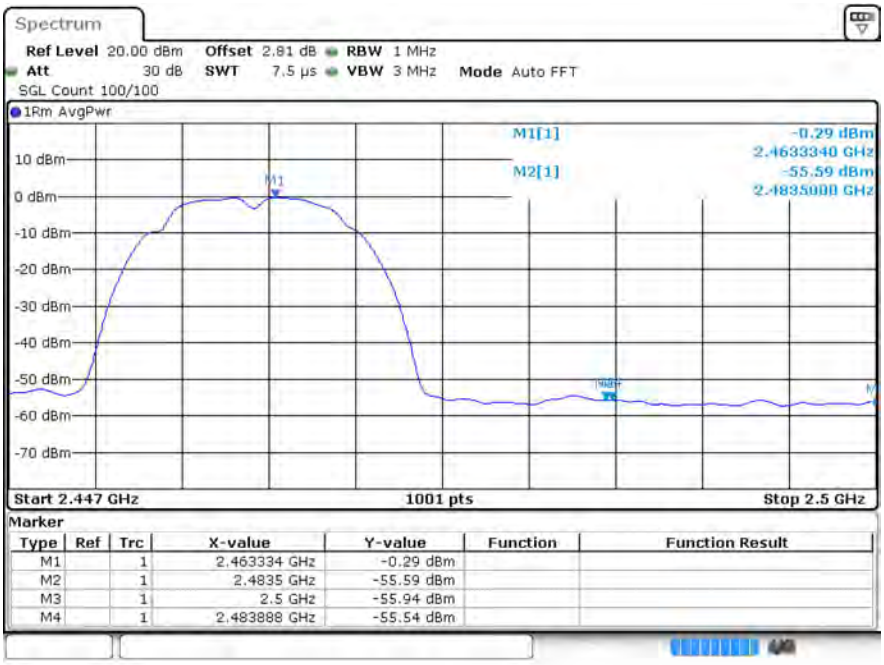
b 2412MHz Ant1 Average



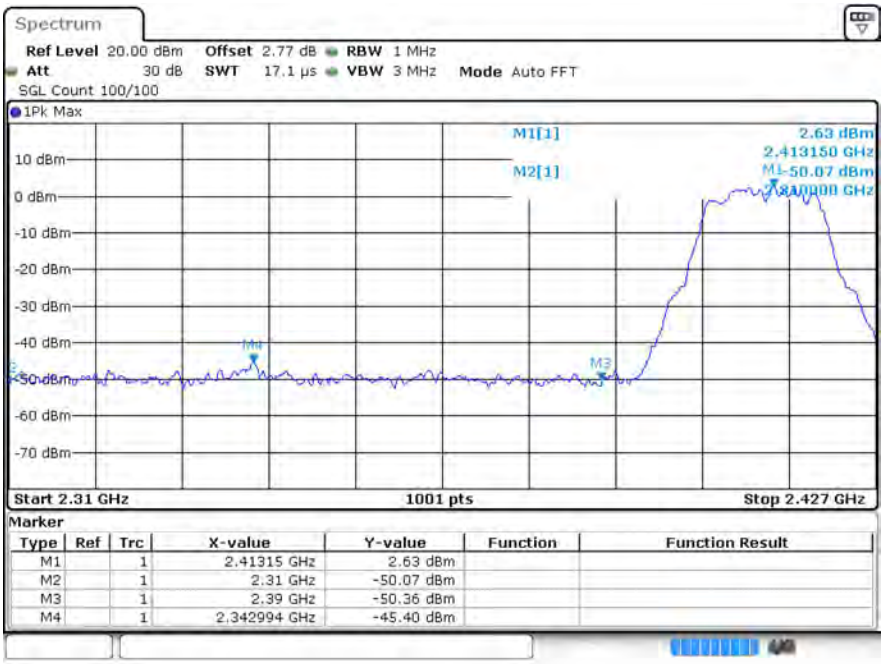
b 2462MHz Ant1 Peak



b 2462MHz Ant1 Average



g 2412MHz Ant1 Peak



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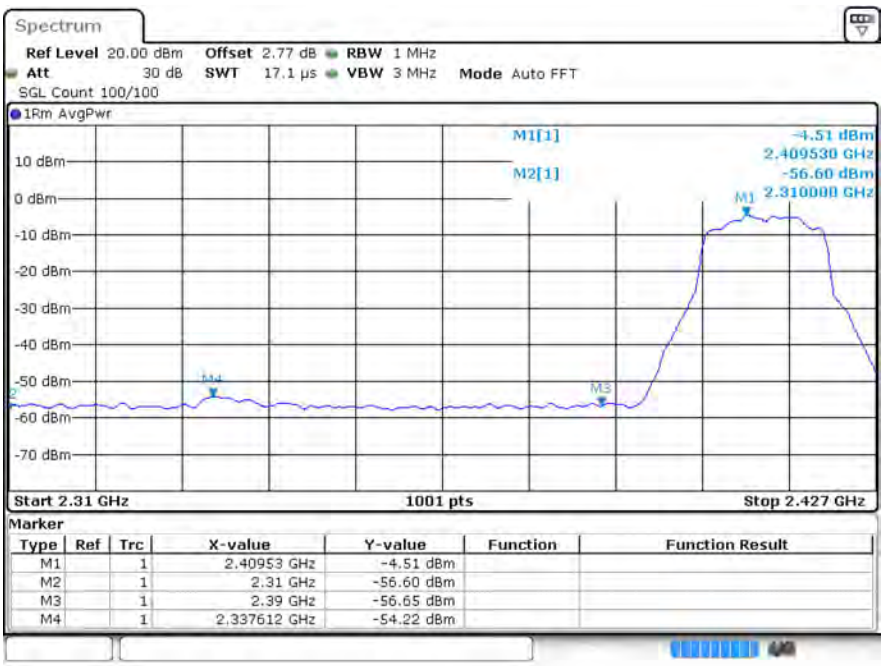
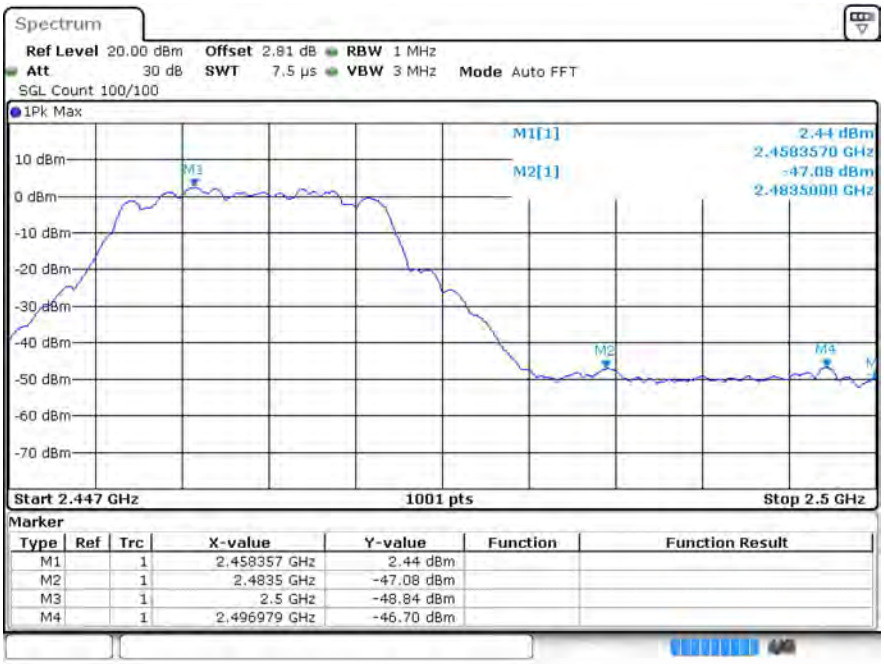
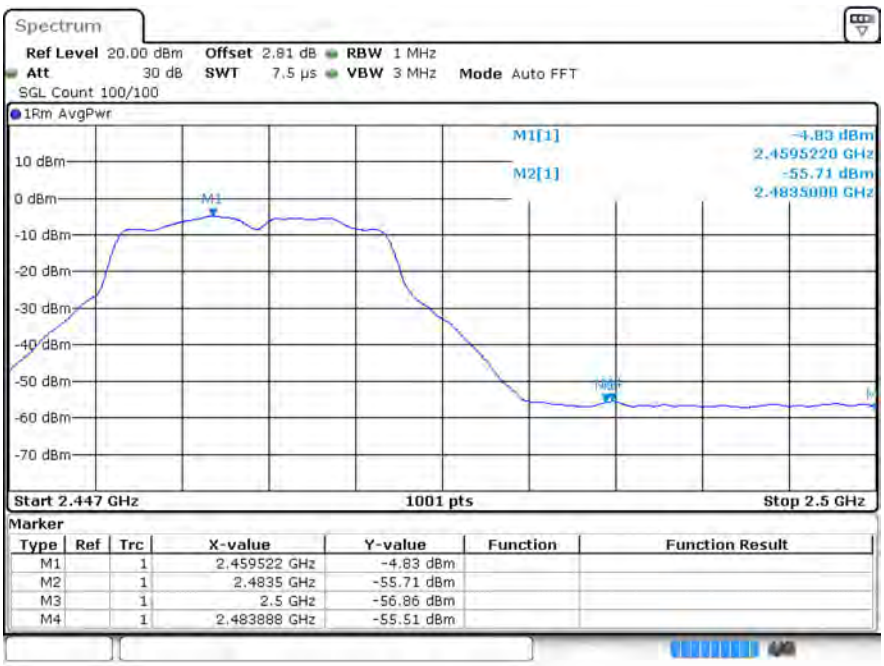


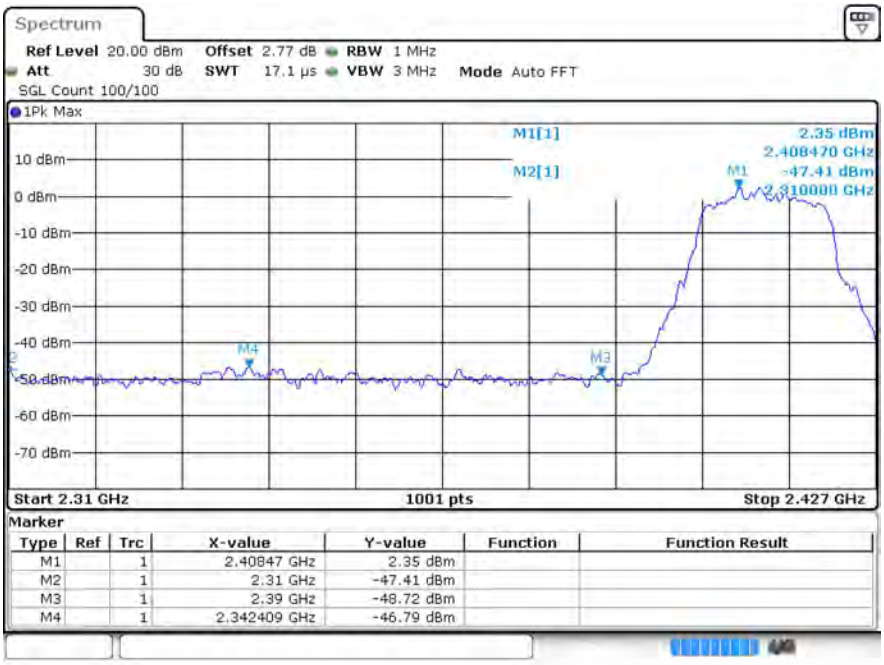
g 2462MHz Ant1 Peak



g 2462MHz Ant1 Average



n20 2412MHz Ant1 Peak



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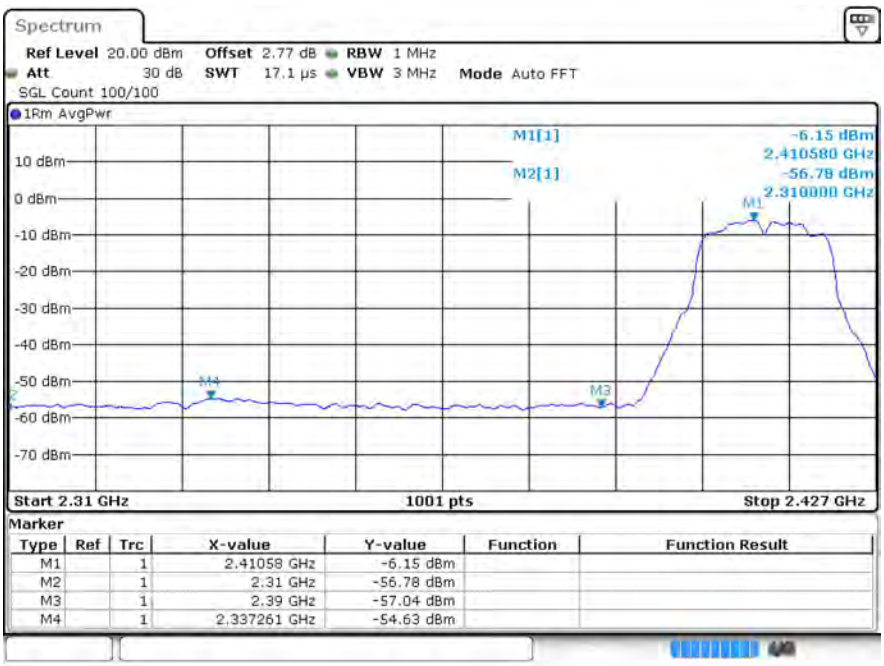
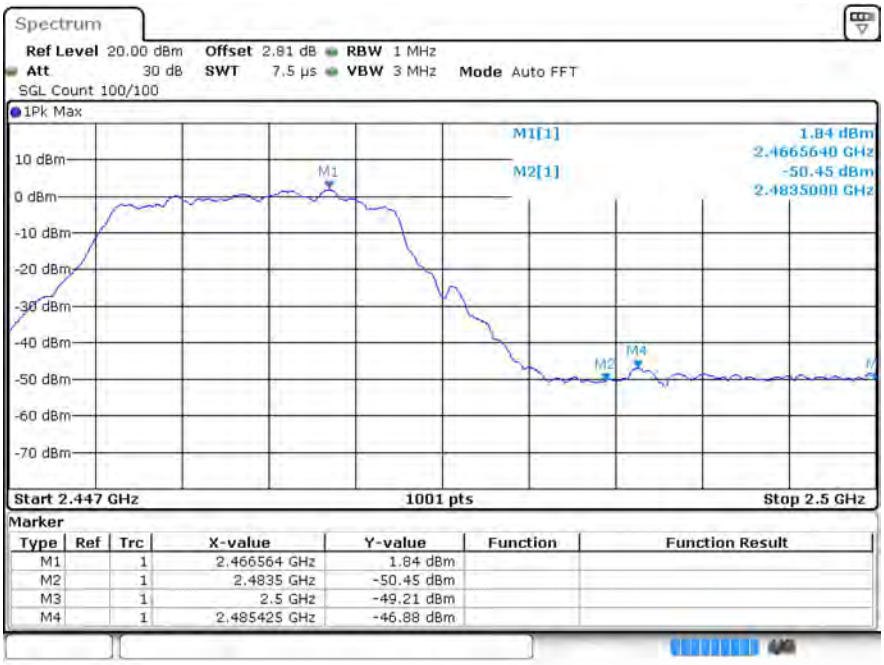


n20 2462MHz Ant1 Peak



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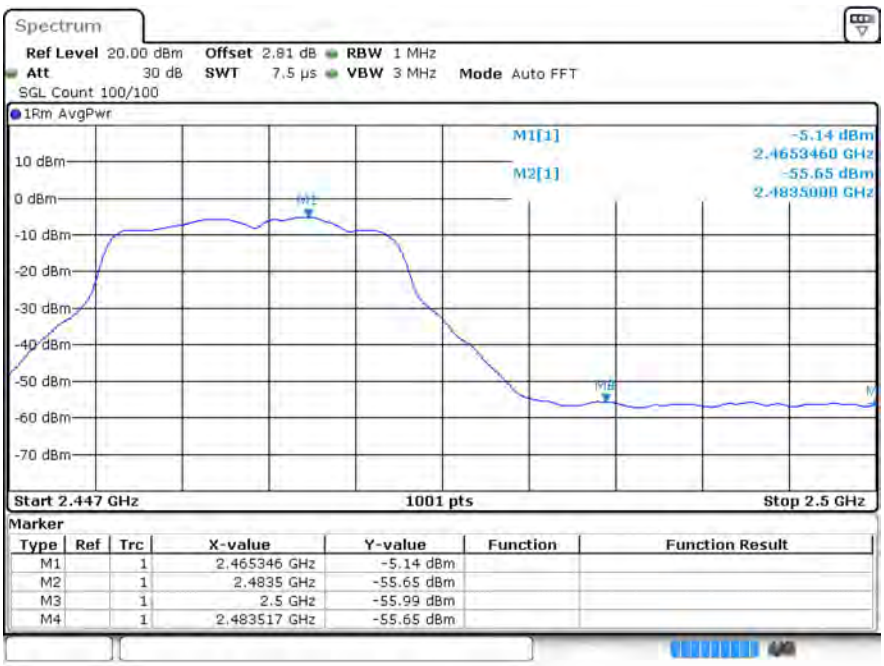
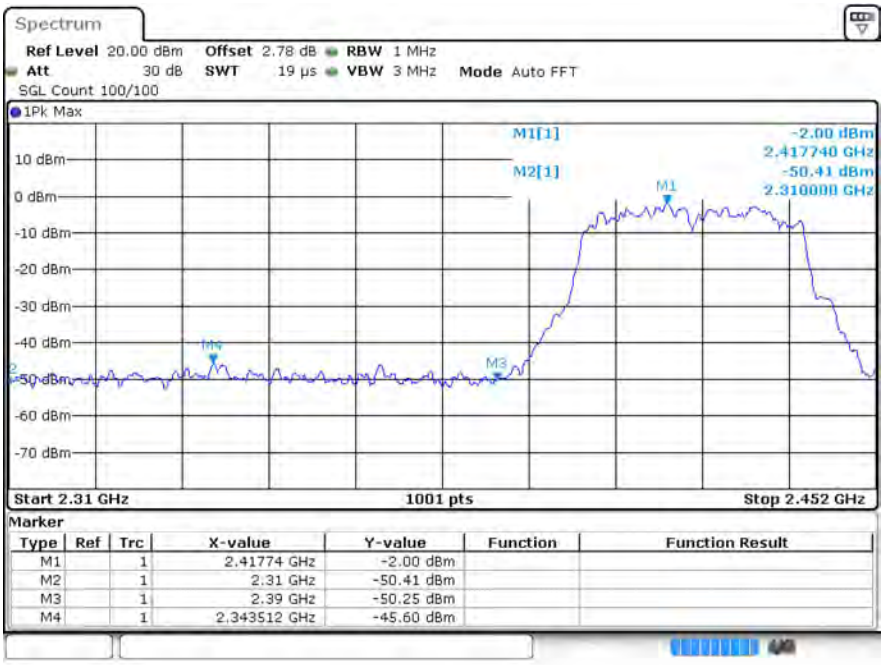
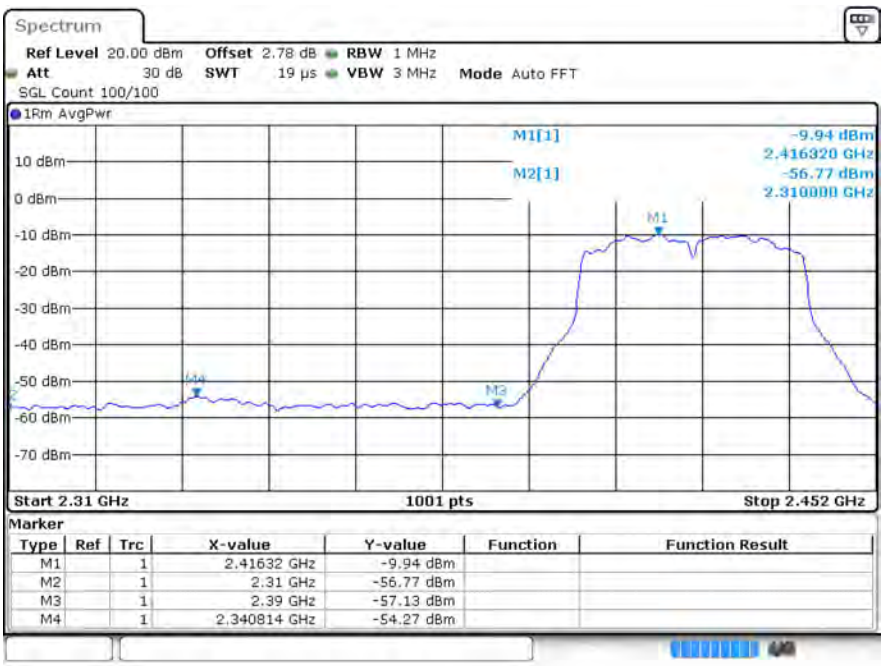


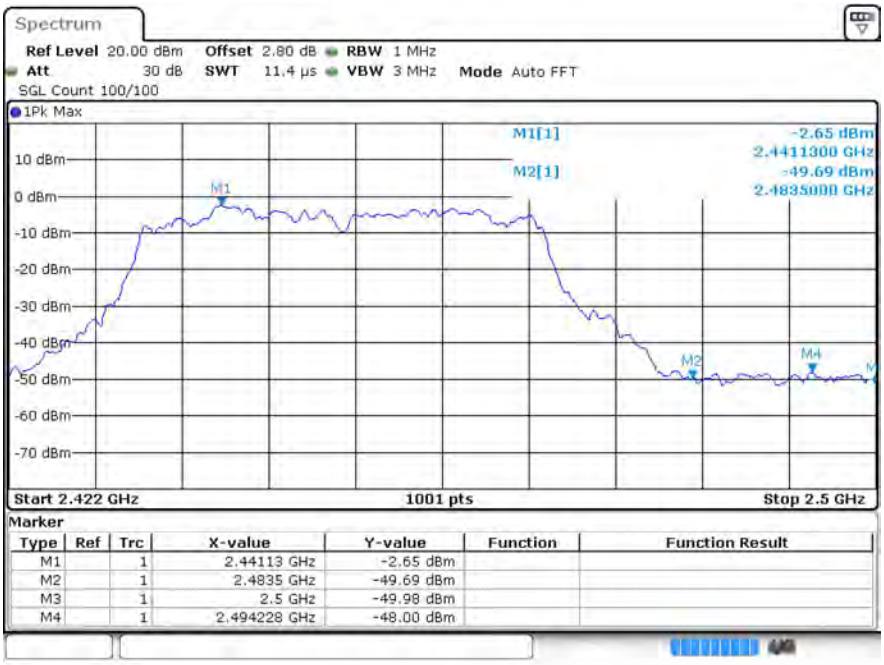
n40 2422MHz Ant1 Peak



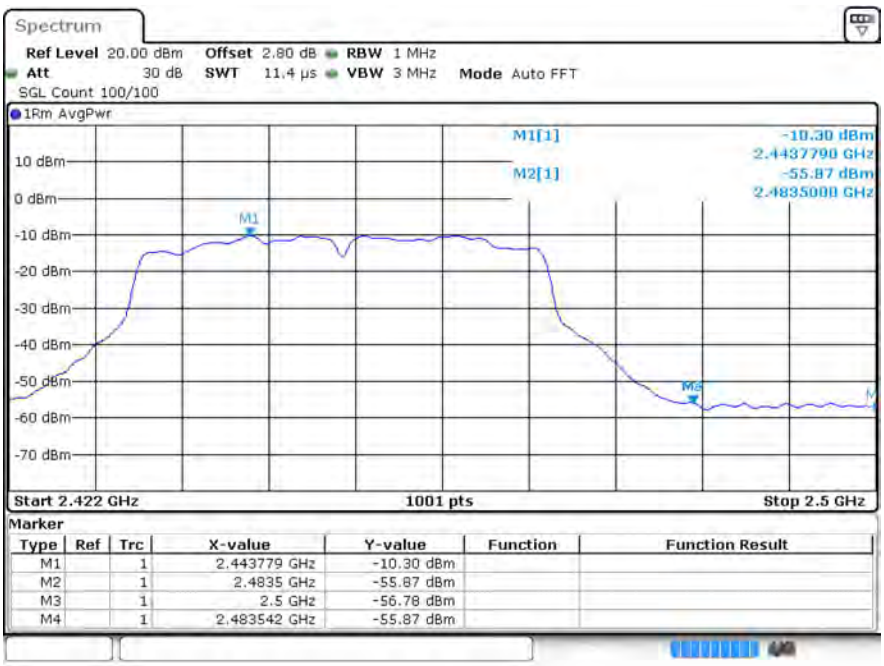
n40 2422MHz Ant1 Average



n40 2452MHz Ant1 Peak



n40 2452MHz Ant1 Average



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