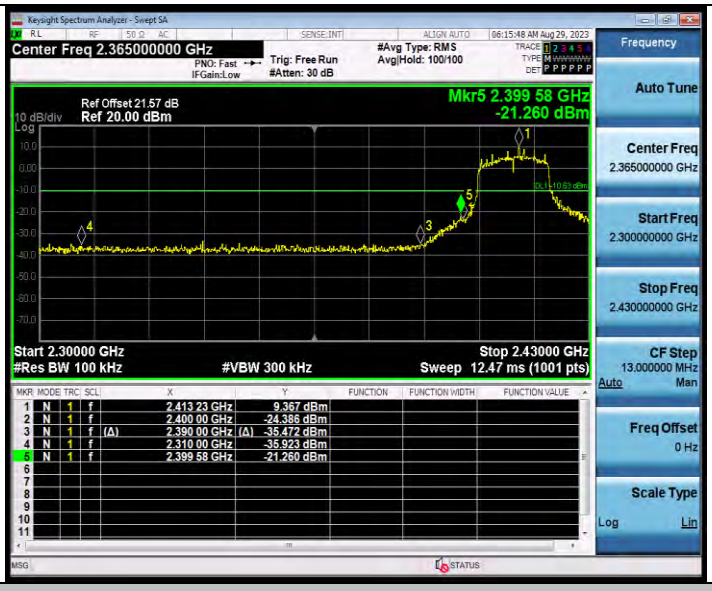
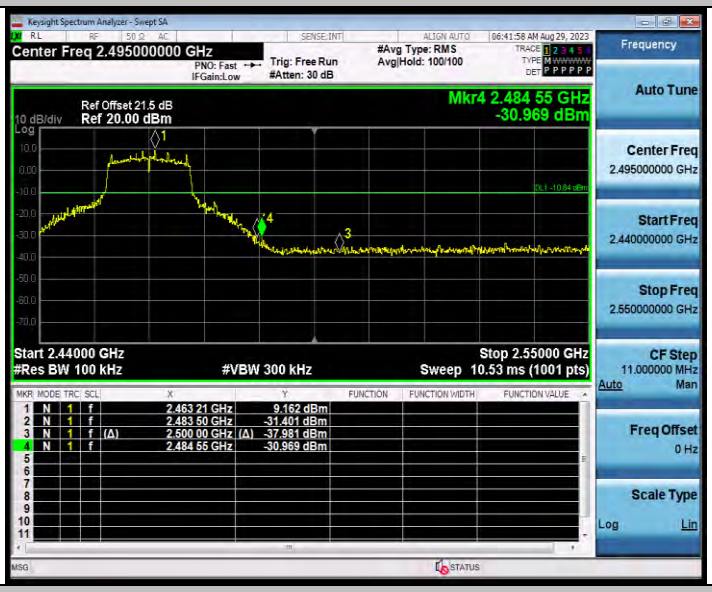
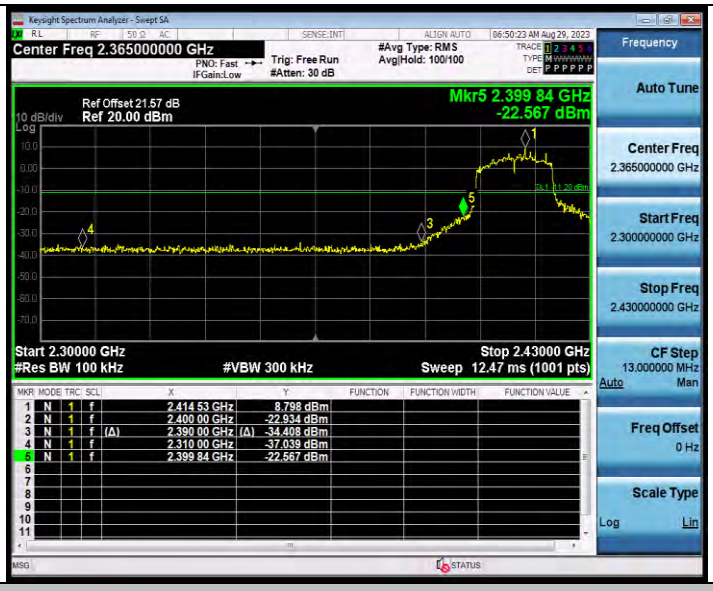


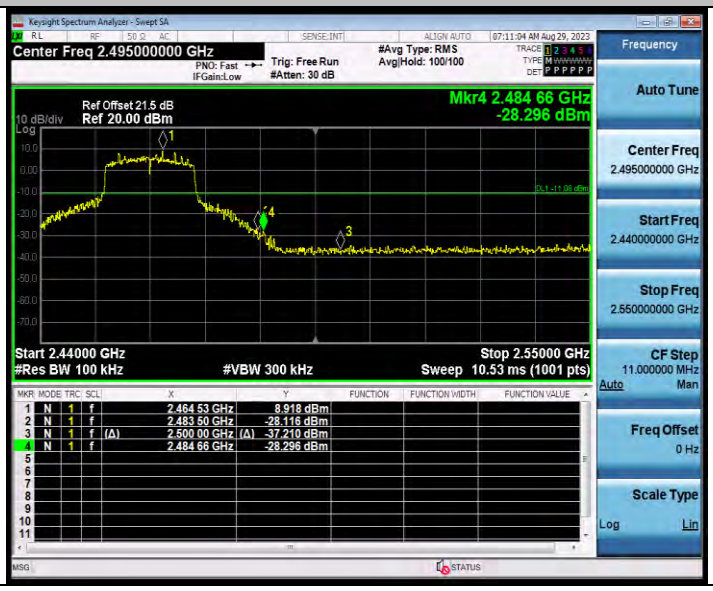
11G_Ant1_High_2462



11N20SISO_Ant1_Low_2412



11N20SISO_Ant1_High_2462



CONDUCTED SPURIOUS EMISSION

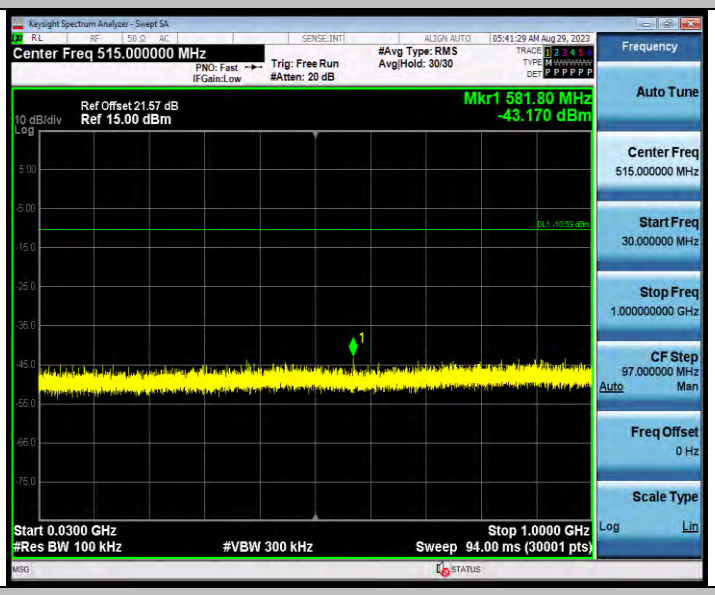
TEST RESULT

Test Mode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	9.41	9.41	---	PASS
			30~1000	9.41	-43.17	≤-10.59	PASS
			1000~26500	9.41	-23.82	≤-10.59	PASS
		2437	Reference	10.65	10.65	---	PASS
			30~1000	10.65	-42.66	≤-9.35	PASS
			1000~26500	10.65	-24.44	≤-9.35	PASS
		2462	Reference	11.22	11.22	---	PASS
			30~1000	11.22	-43.29	≤-8.78	PASS
			1000~26500	11.22	-23.94	≤-8.78	PASS
11G	Ant1	2412	Reference	8.83	8.83	---	PASS
			30~1000	8.83	-43.67	≤-11.17	PASS
			1000~26500	8.83	-24.47	≤-11.17	PASS
		2437	Reference	9.07	9.07	---	PASS
			30~1000	9.07	-43.34	≤-10.93	PASS
			1000~26500	9.07	-23.78	≤-10.93	PASS
		2462	Reference	6.03	6.03	---	PASS
			30~1000	6.03	-43.88	≤-13.97	PASS
			1000~26500	6.03	-23.64	≤-13.97	PASS
11N20SISO	Ant1	2412	Reference	7.38	7.38	---	PASS
			30~1000	7.38	-42.59	≤-12.62	PASS
			1000~26500	7.38	-23.52	≤-12.62	PASS
		2437	Reference	5.33	5.33	---	PASS
			30~1000	5.33	-44.13	≤-14.67	PASS
			1000~26500	5.33	-25.1	≤-14.67	PASS
		2462	Reference	8.60	8.60	---	PASS
			30~1000	8.60	-43.85	≤-11.4	PASS
			1000~26500	8.60	-24.23	≤-11.4	PASS

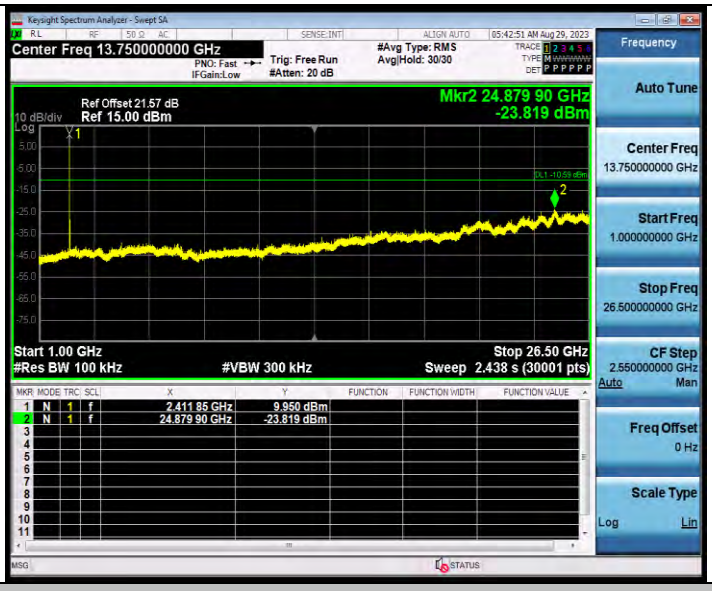
TEST GRAPHS

11B_Ant1_2412_0~Reference

11B_Ant1_2412_30~1000



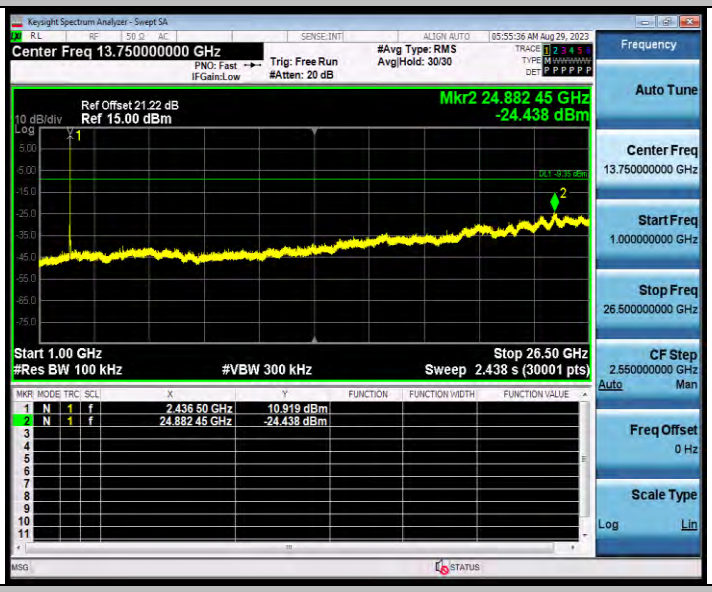
11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference

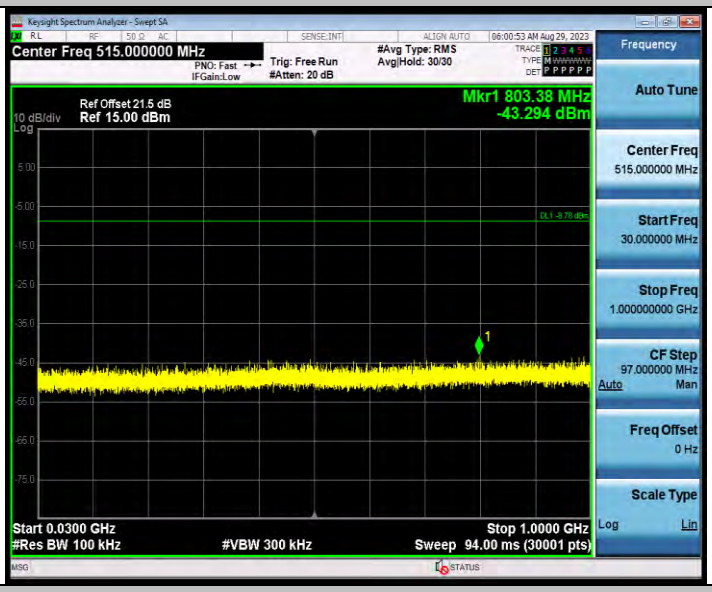
11B_Ant1_2437_30~1000

11B_Ant1_2437_1000~26500

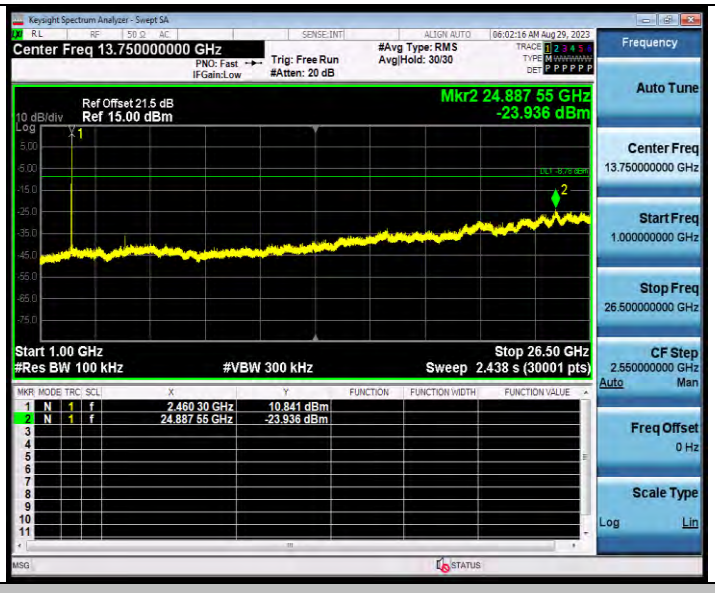


11B_Ant1_2462_0~Reference

11B_Ant1_2462_30~1000

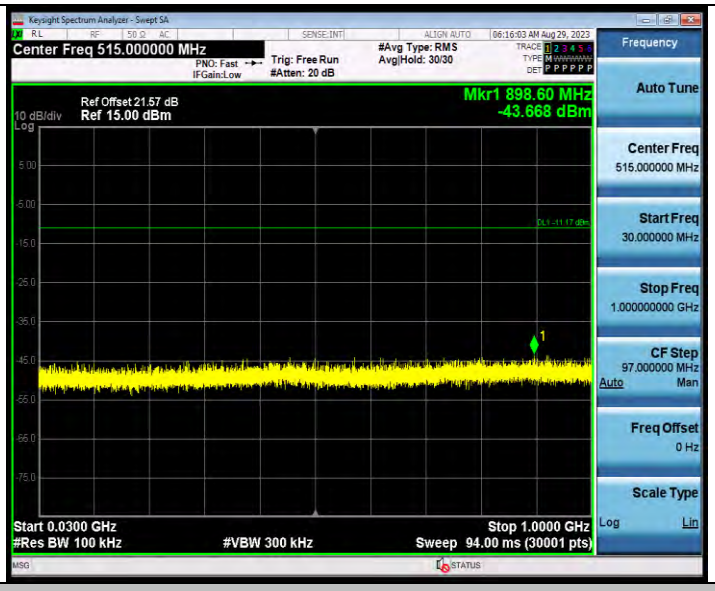


11B_Ant1_2462_1000~26500

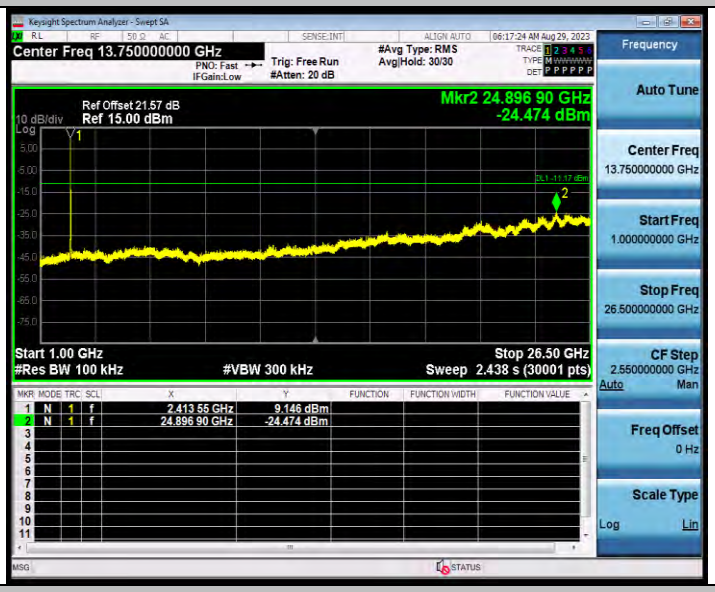


11G_Ant1_2412_0~Reference

11G_Ant1_2412_30~1000

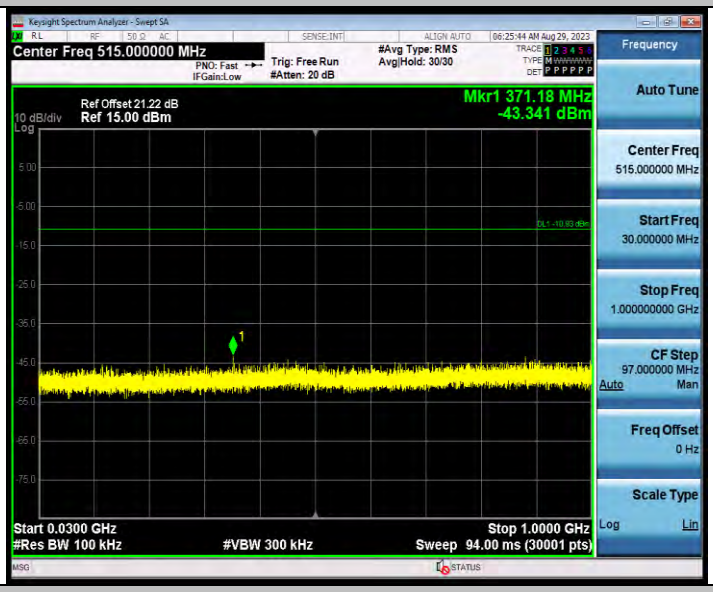


11G_Ant1_2412_1000~26500

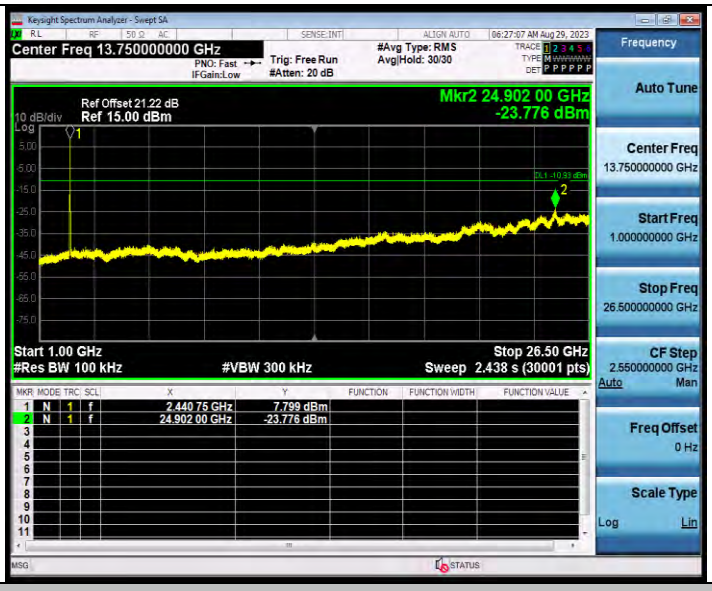


11G_Ant1_2437_0~Reference

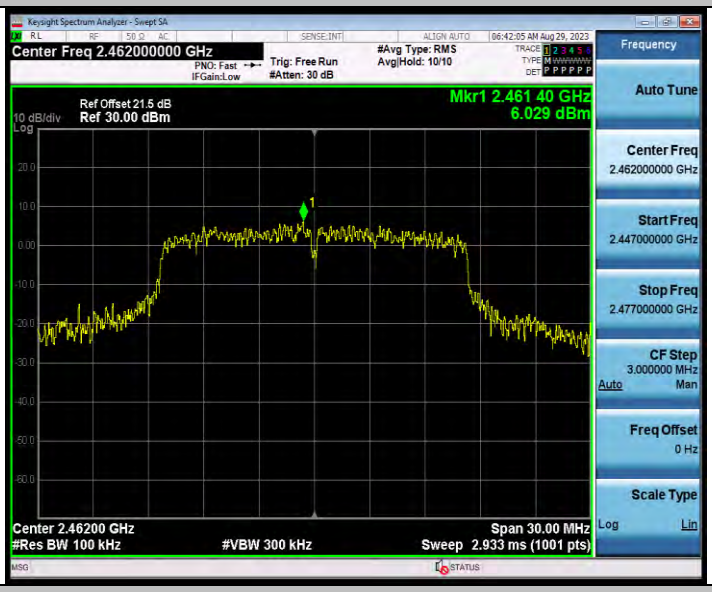
11G_Ant1_2437_30~1000



11G_Ant1_2437_1000~26500

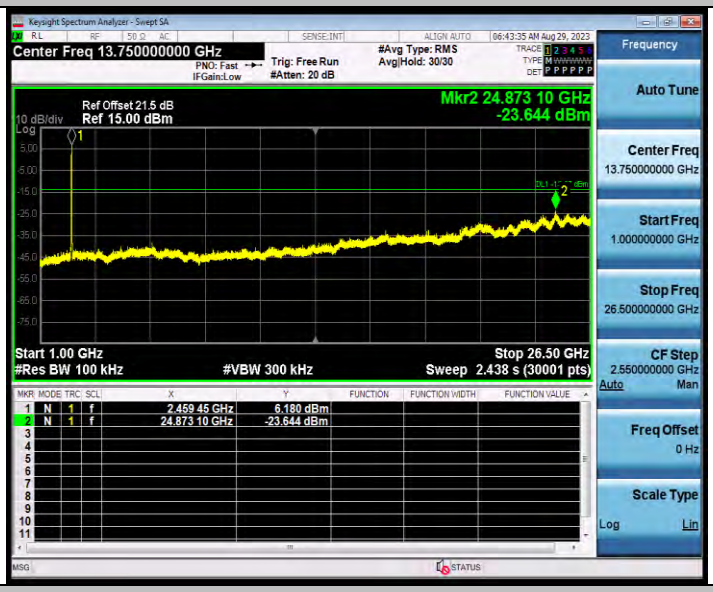


11G_Ant1_2462_0~Reference



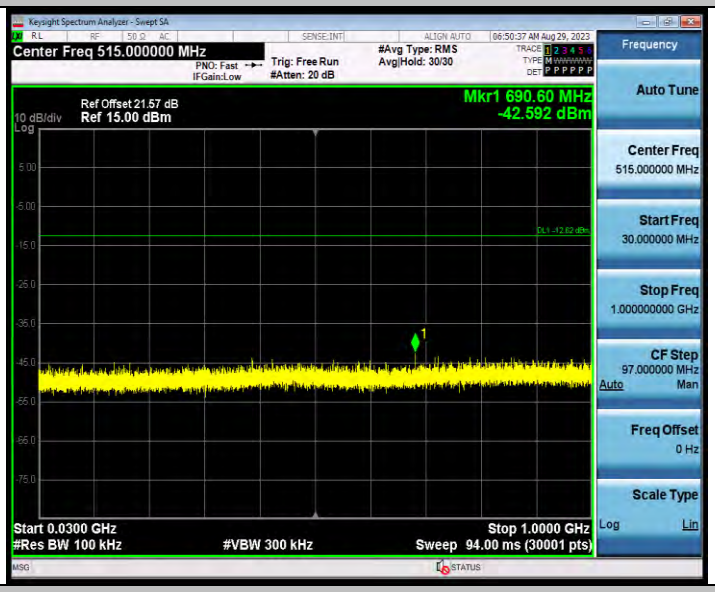
11G_Ant1_2462_30~1000

11G_Ant1_2462_1000~26500



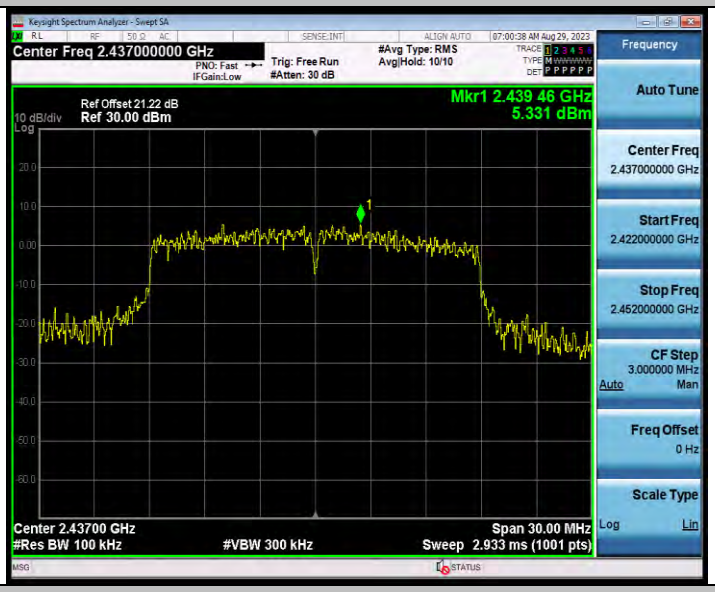
11N20SISO_Ant1_2412_0~Reference

11N20SISO_Ant1_2412_30~1000

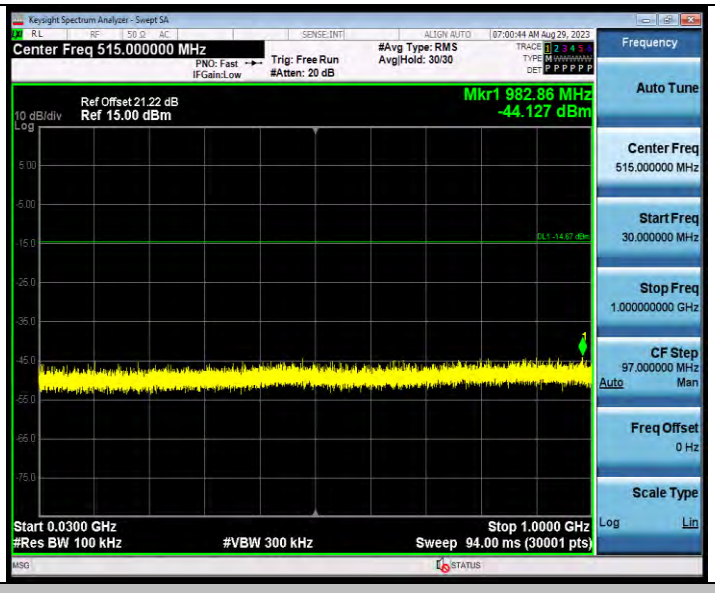


11N20SISO_Ant1_2412_1000~26500

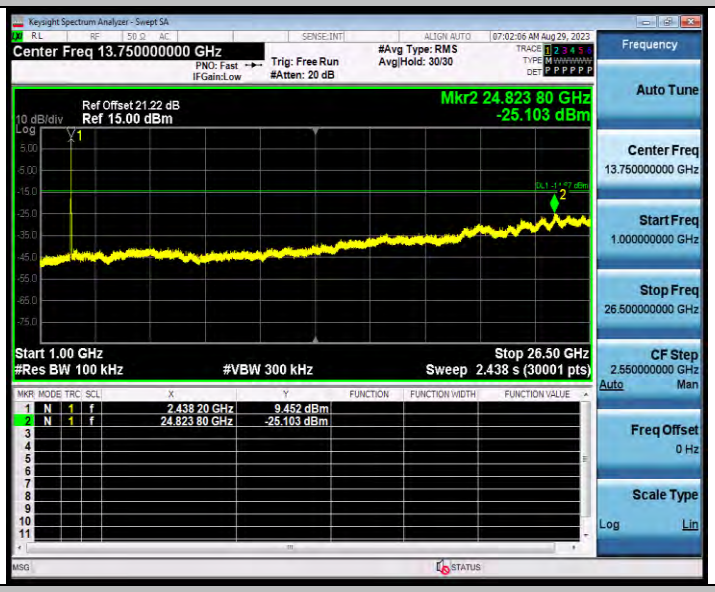
11N20SISO_Ant1_2437_0~Reference



11N20SISO_Ant1_2437_30~1000

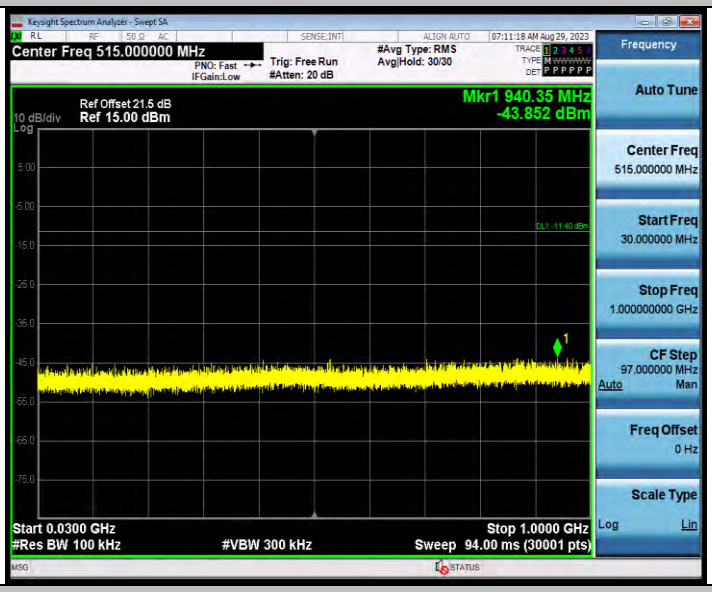


11N20SISO_Ant1_2437_1000~26500



11N20SISO_Ant1_2462_0~Reference

11N20SISO_Ant1_2462_30~1000



11N20SISO_Ant1_2462_1000~26500

Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 30/30
07:12:41 AM Aug 29, 2023
Ref Offset 21.5 dB
10 dB/div
Ref 15.00 dBm
Log
Mkr2 24.953 00 GHz
-24.230 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
1 N 1 f 2.458 60 GHz 8.124 dBm
2 N 1 f 24.953 00 GHz -24.230 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

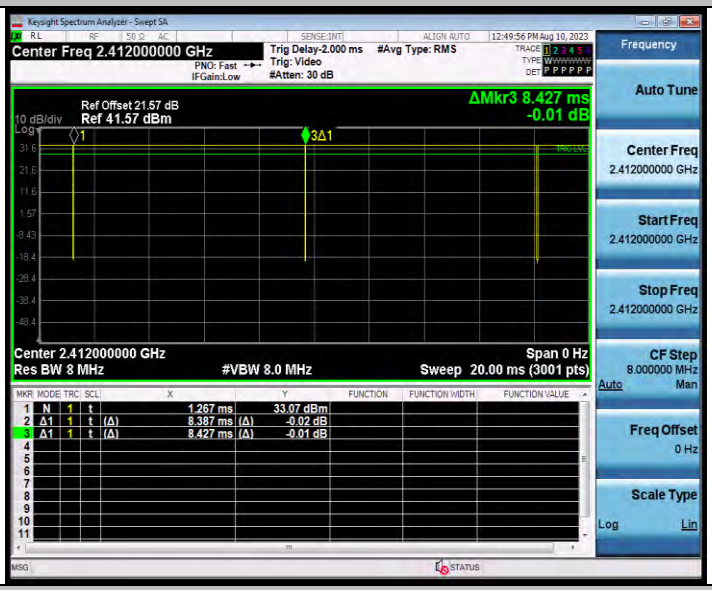
DUTY CYCLE

TEST RESULT

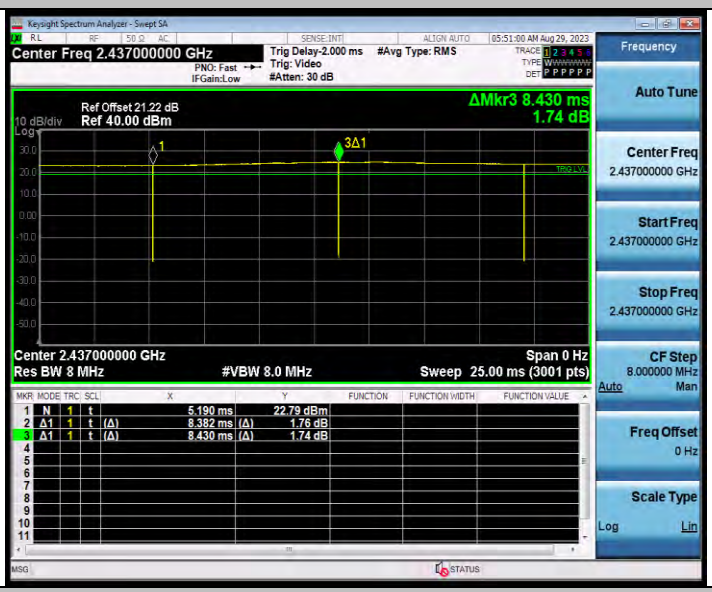
Test Mode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11B	Ant1	2412	8.38	8.42	99.52	0.02
		2437	8.39	8.43	99.53	0.02
		2462	8.38	8.42	99.52	0.02
11G	Ant1	2412	1.40	1.44	97.22	0.12
		2437	1.39	1.43	97.20	0.12
		2462	1.39	1.44	96.53	0.15
11N20SISO	Ant1	2412	1.30	1.35	96.30	0.16
		2437	1.30	1.35	96.30	0.16
		2462	1.30	1.35	96.30	0.16

TEST GRAPHS

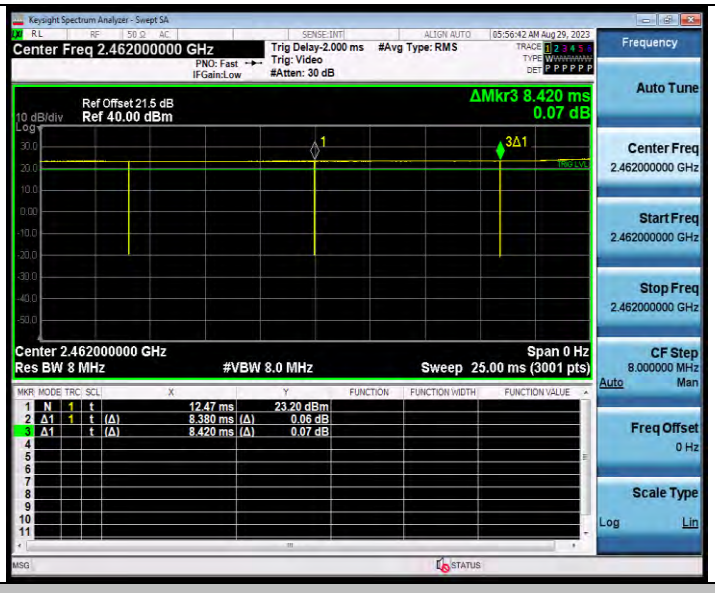
11B_Ant1_2412



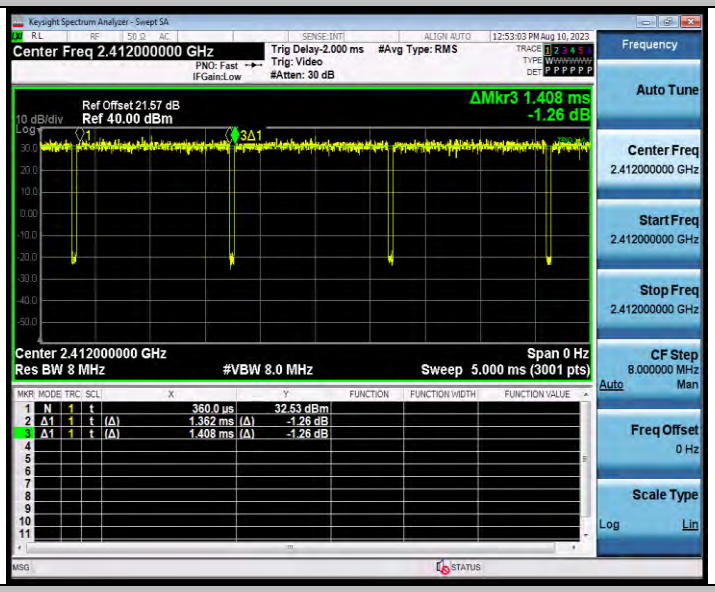
11B_Ant1_2437



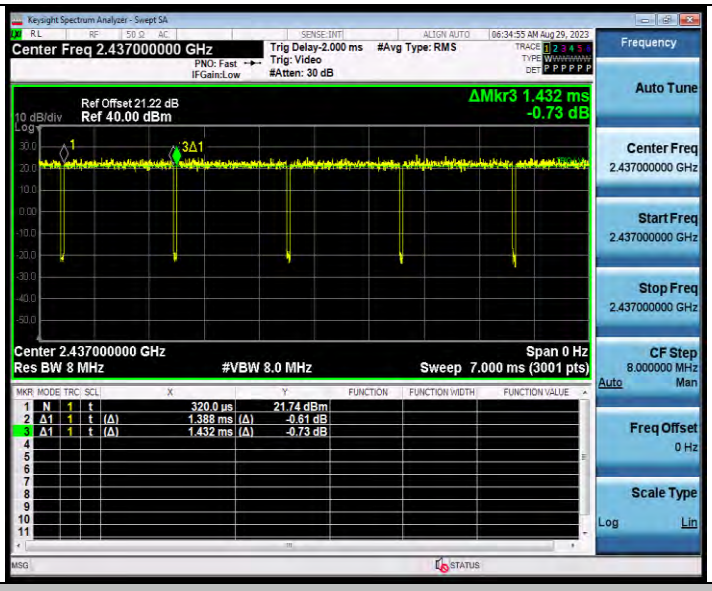
11B_Ant1_2462



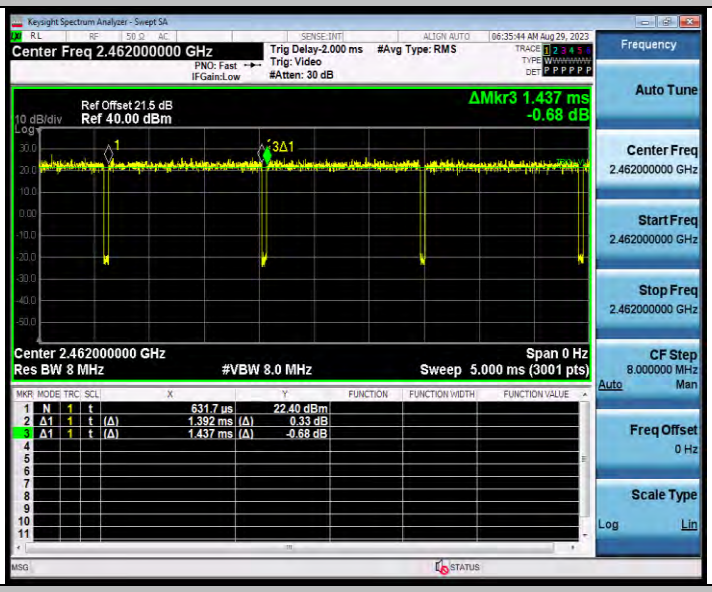
11G_Ant1_2412



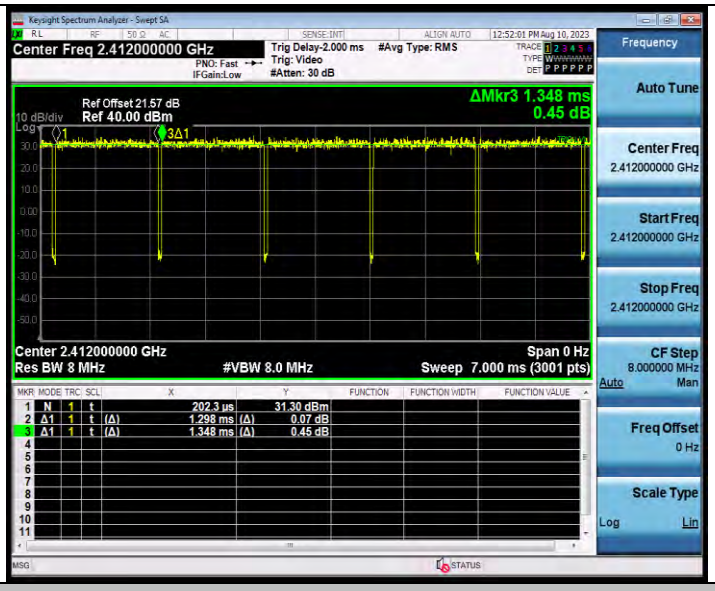
11G_Ant1_2437



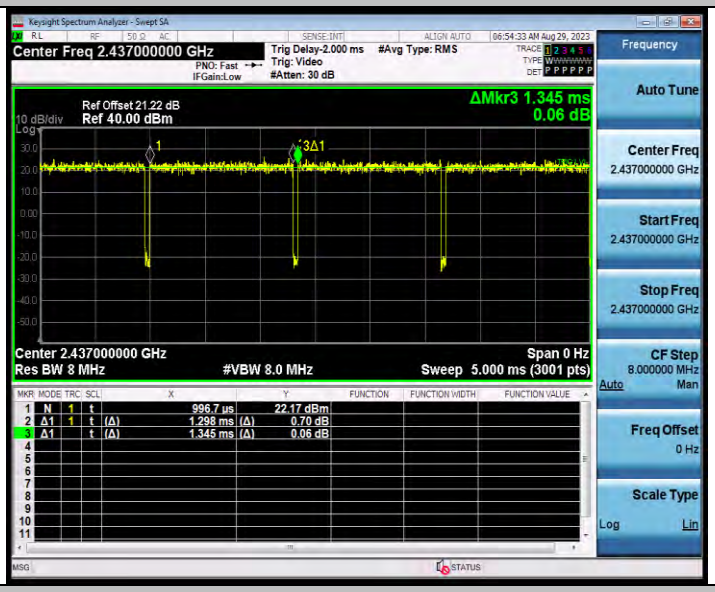
11G_Ant1_2462



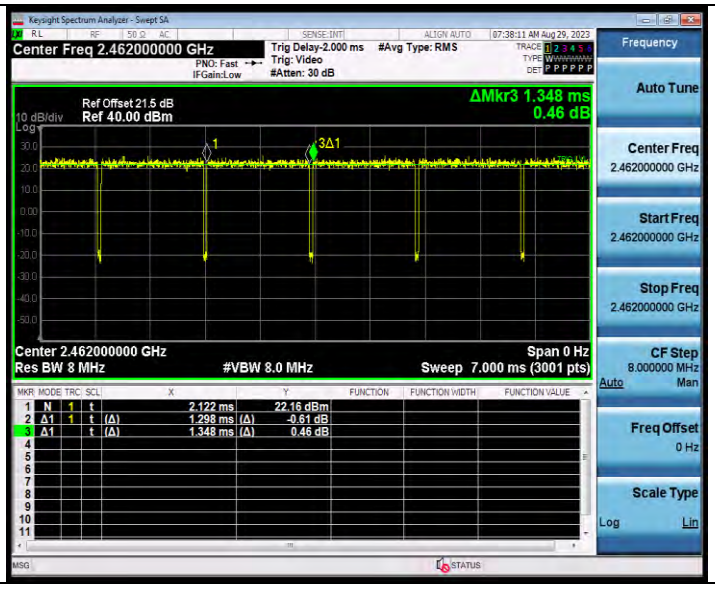
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.462000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 30 dB
Ref Offset 21.5 dB
10 dB/div
Ref 40.00 dBm
ΔMkr3 1.348 ms
0.46 dB
Center 2.462000000 GHz
Span 0 Hz
Res BW 8 MHz
#VBW 8.0 MHz
Sweep 7.000 ms (3001 pts)
1 N 1 t 2.122 ms 22.16 dBm
2 Δ1 1 t (Δ) 1.298 ms (Δ) -0.61 dB
3 Δ1 t (Δ) 1.348 ms (Δ) 0.46 dB
Frequency
Auto Tune
Center Freq
2.462000000 GHz
Start Freq
2.462000000 GHz
Stop Freq
2.462000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

7 APPENDIX 2 :BLE

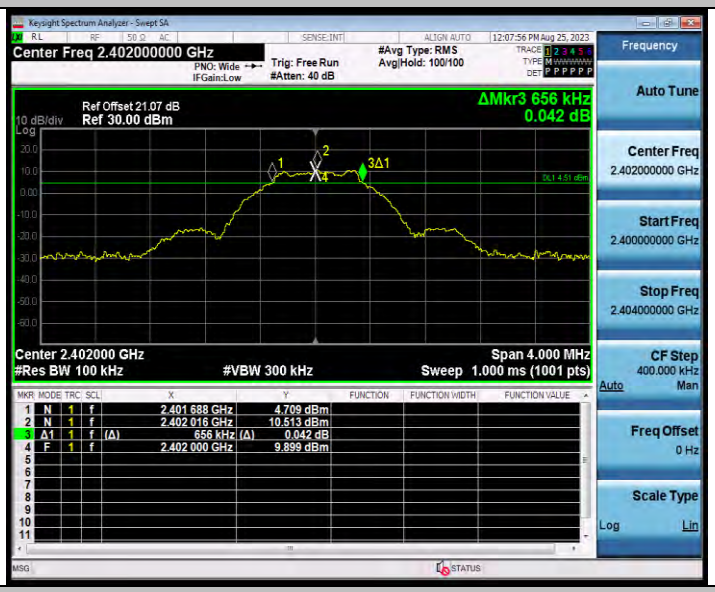
DTS BANDWIDTH

TEST RESULT

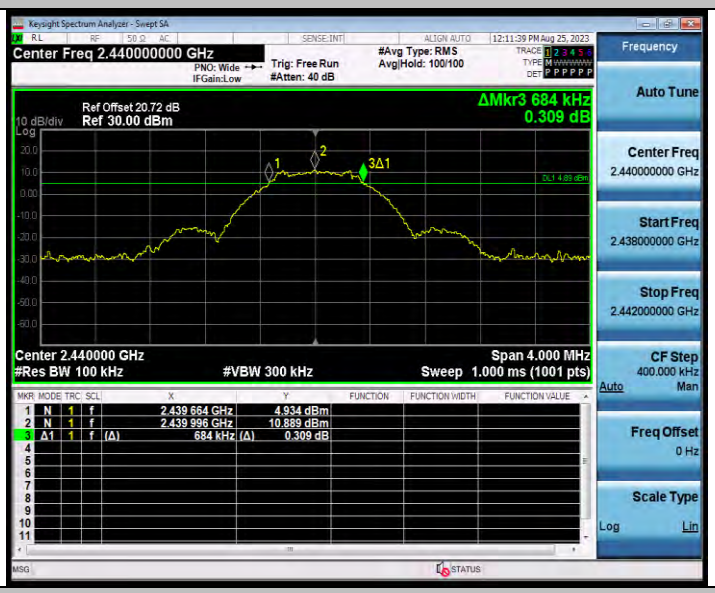
Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.656	2401.688	2402.344	0.5	PASS
		2440	0.684	2439.664	2440.348	0.5	PASS
		2480	0.652	2479.676	2480.328	0.5	PASS
BLE_2M	Ant1	2404	1.136	2403.464	2404.600	0.5	PASS
		2440	1.220	2439.372	2440.592	0.5	PASS
		2478	1.136	2477.452	2478.588	0.5	PASS
BLE_125K	Ant1	2402	0.680	2401.672	2402.352	0.5	PASS
		2440	0.680	2439.672	2440.352	0.5	PASS
		2480	0.684	2479.668	2480.352	0.5	PASS
BLE_500K	Ant1	2402	0.664	2401.684	2402.348	0.5	PASS
		2440	0.660	2439.684	2440.344	0.5	PASS
		2480	0.708	2479.656	2480.364	0.5	PASS

TEST GRAPHS

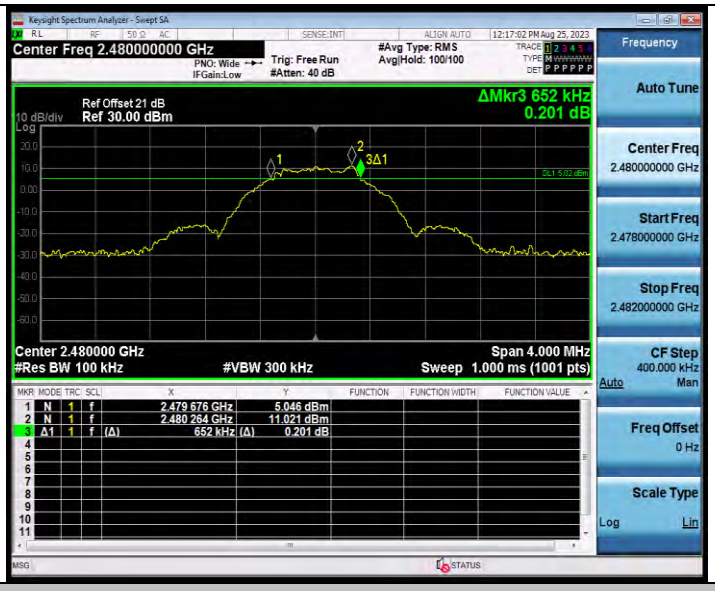
BLE_1M_Ant1_2402



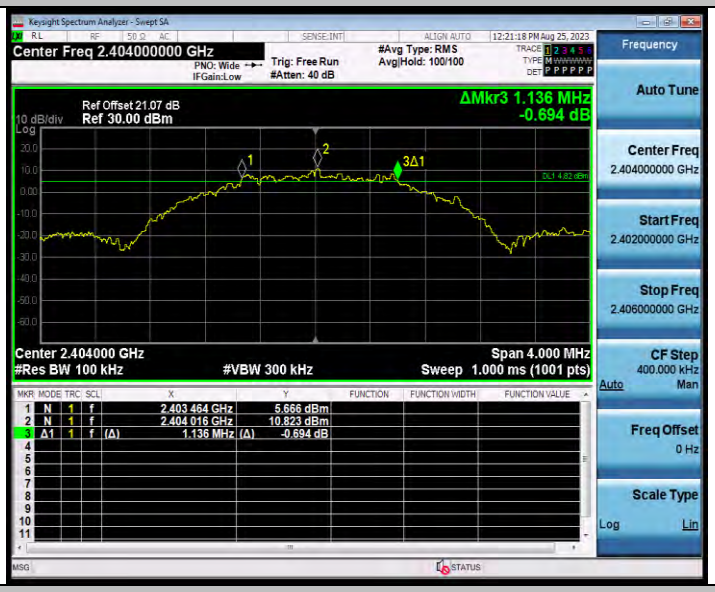
BLE_1M_Ant1_2440



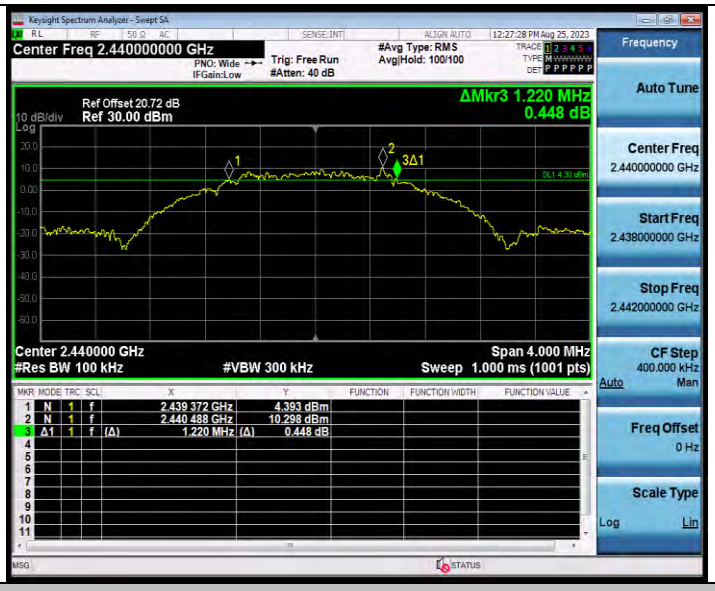
BLE_1M_Ant1_2480



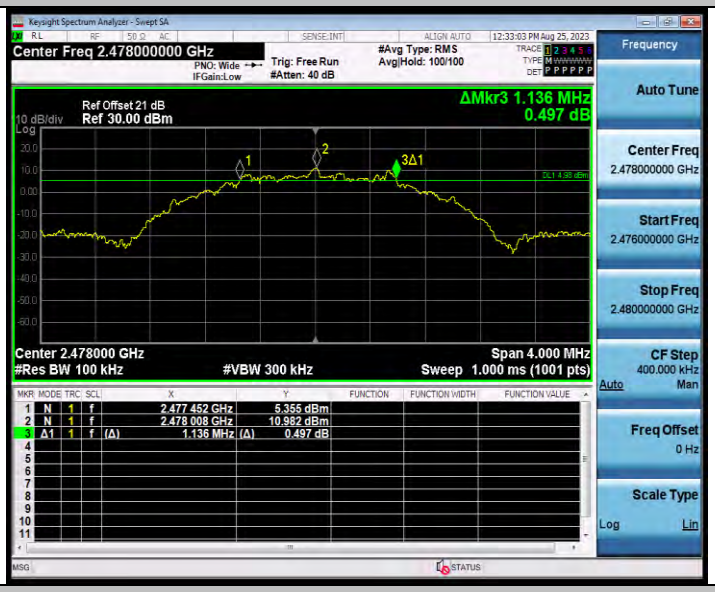
BLE_2M_Ant1_2404



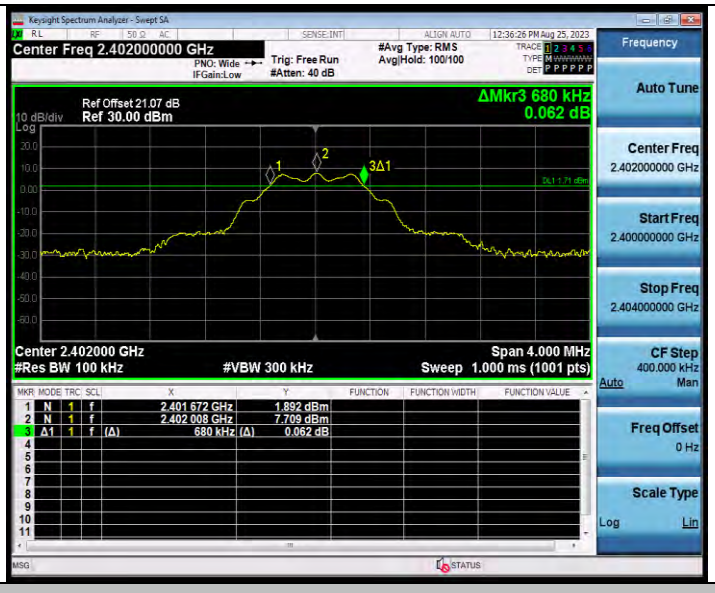
BLE_2M_Ant1_2440



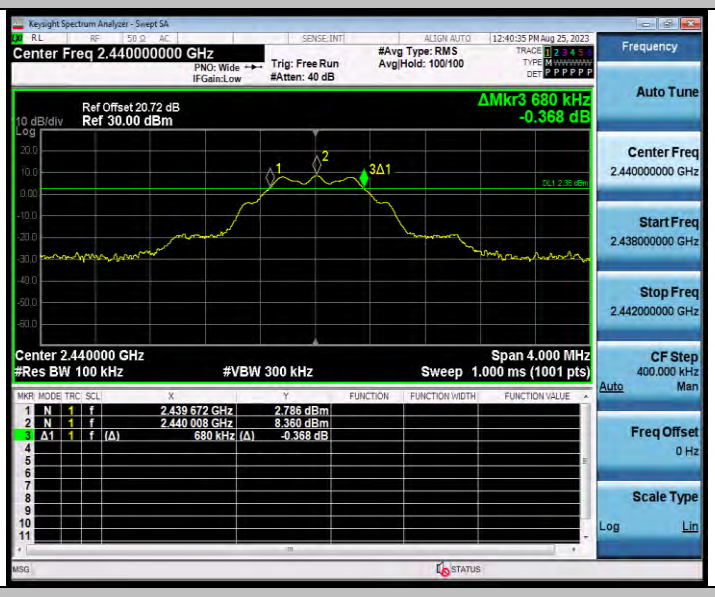
BLE_2M_Ant1_2478



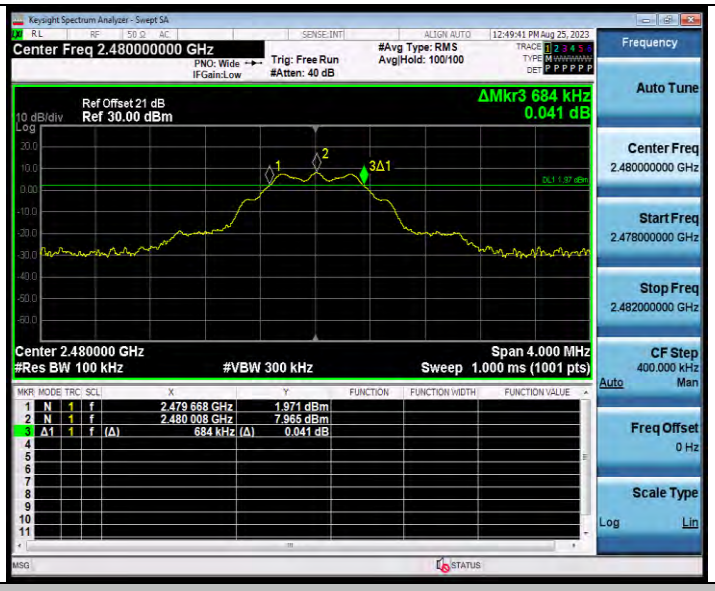
BLE_125K_Ant1_2402



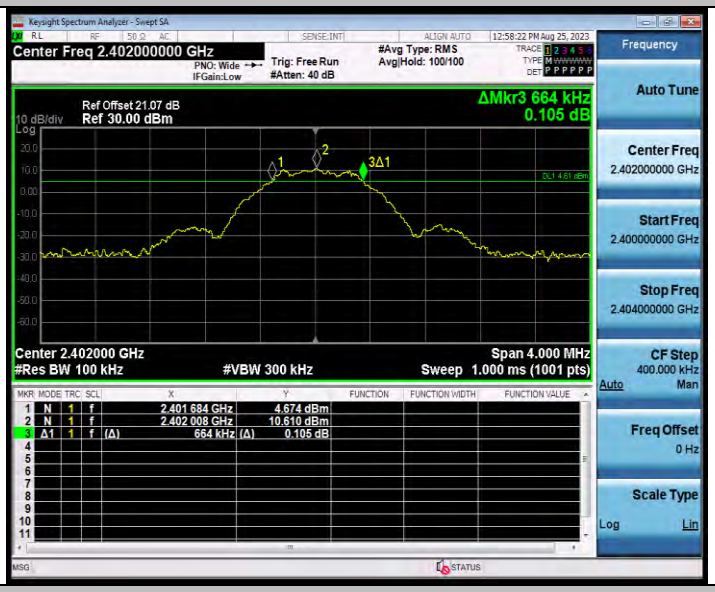
BLE_125K_Ant1_2440



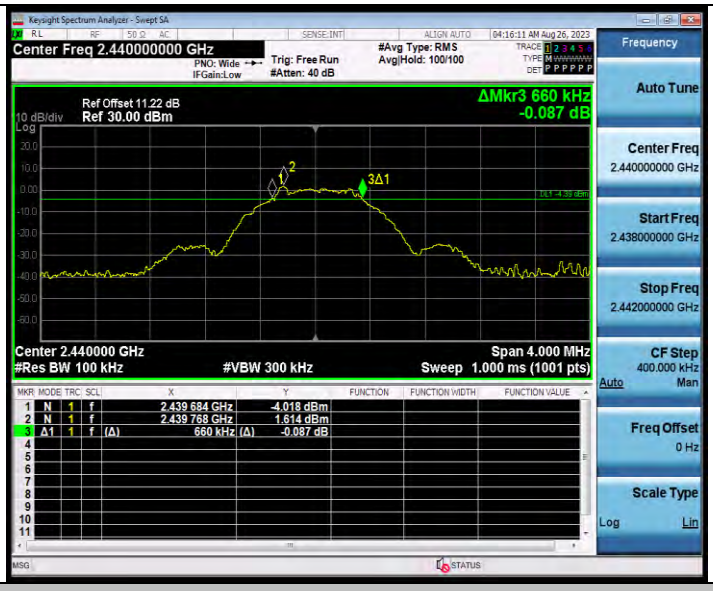
BLE_125K_Ant1_2480



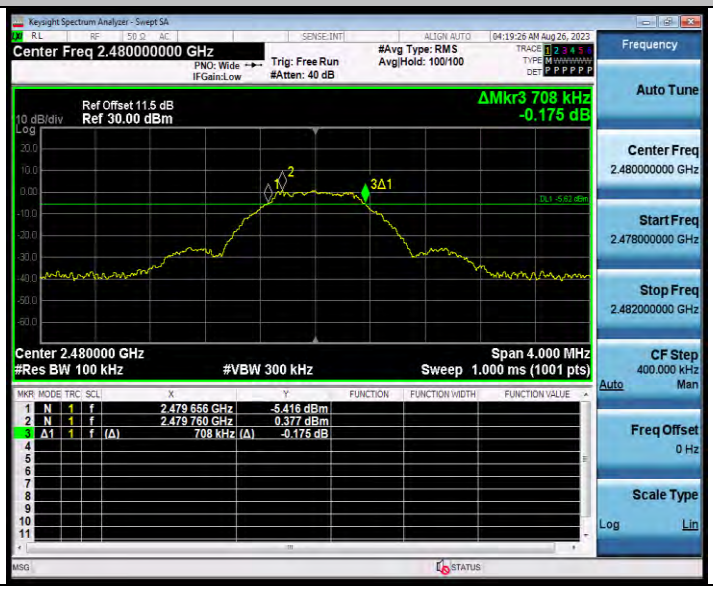
BLE_500K_Ant1_2402



BLE_500K_Ant1_2440



BLE_500K_Ant1_2480



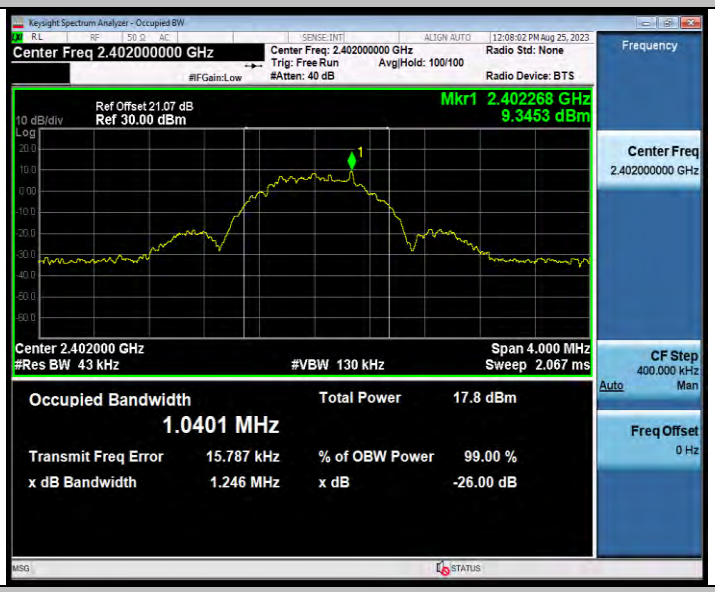
OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0401	2401.4957	2402.5358	---	---
		2440	1.0383	2439.4934	2440.5317	---	---
		2480	1.0422	2479.4954	2480.5376	---	---
BLE_2M	Ant1	2404	2.0713	2402.9987	2405.0700	---	---
		2440	2.0738	2438.9922	2441.0660	---	---
		2478	2.0779	2476.9865	2479.0644	---	---
BLE_125K	Ant1	2402	1.0650	2401.4793	2402.5443	---	---
		2440	1.0635	2439.4785	2440.5420	---	---
		2480	1.0638	2479.4752	2480.5390	---	---
BLE_500K	Ant1	2402	1.0273	2401.4956	2402.5229	---	---
		2440	1.0209	2439.5011	2440.5220	---	---
		2480	1.0207	2479.4890	2480.5097	---	---

TEST GRAPHS

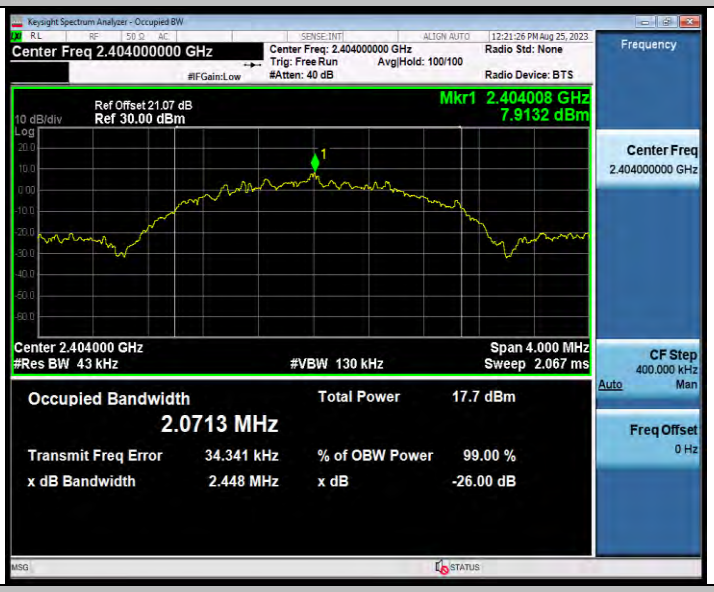
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2404



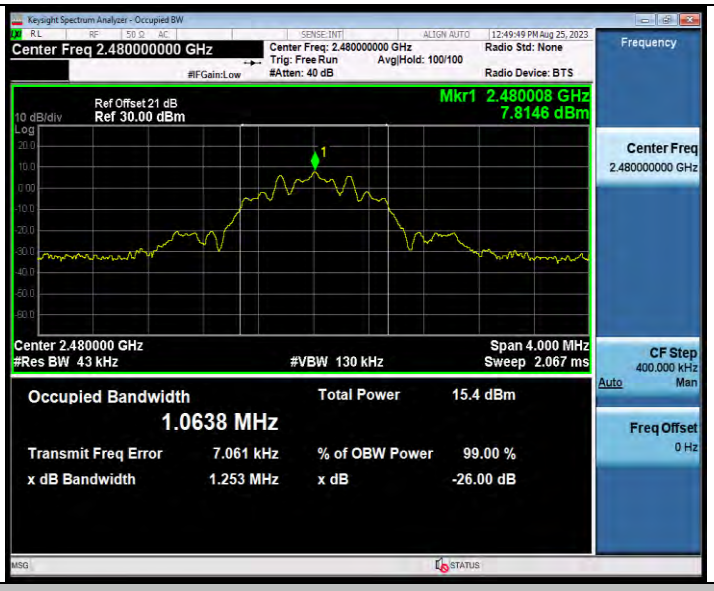
BLE_2M_Ant1_2440

BLE_2M_Ant1_2478

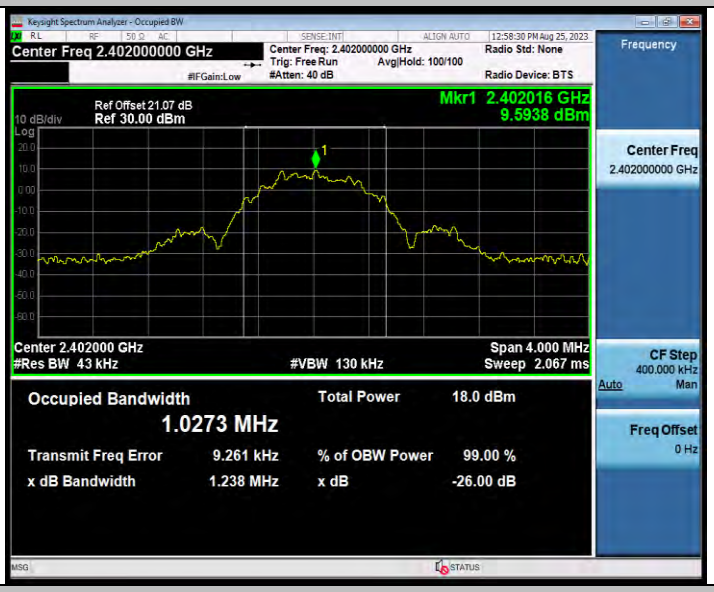
BLE_125K_Ant1_2402

BLE_125K_Ant1_2440

BLE_125K_Ant1_2480



BLE_500K_Ant1_2402



BLE_500K_Ant1_2440

BLE_500K_Ant1_2480

MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT

Test Mode	Antenna	Channel	Average power [dBm]	Peak power [dBm]	Peak power [mw]	Conducted Limit [dBm]	EIRP [dBm]	EIRP [mw]	EIRP Limit [dBm]	Verdict	Power Setting
BLE_1M	Ant1	2402	0.41	1.00	1.26	≤30	0.00	1.00	≤36	PASS	Default
		2440	1.40	1.90	1.55	≤30	0.90	1.23	≤36	PASS	Default
		2480	0.16	0.75	1.19	≤30	-0.25	0.94	≤36	PASS	Default
BLE_2M	Ant1	2404	1.45	1.38	1.37	≤30	0.38	1.09	≤36	PASS	Default
		2440	2.05	1.94	**1.56**	≤30	0.94	1.24	≤36	PASS	Default
		2478	0.86	1.12	1.29	≤30	0.12	1.03	≤36	PASS	Default
BLE_125k	Ant1	2402	0.58	1.00	1.26	≤30	0.00	1.00	≤36	PASS	Default
		2440	1.58	1.92	1.56	≤30	0.92	1.24	≤36	PASS	Default
		2480	0.34	0.79	1.20	≤30	-0.21	0.95	≤36	PASS	Default
BLE_500K	Ant1	2402	0.45	1.02	1.26	≤30	0.02	1.00	≤36	PASS	Default
		2440	1.45	1.92	1.56	≤30	0.92	1.24	≤36	PASS	Default
		2480	0.20	0.75	1.19	≤30	-0.25	0.94	≤36	PASS	Default
Note: EIRP = Peak Power + Gain											

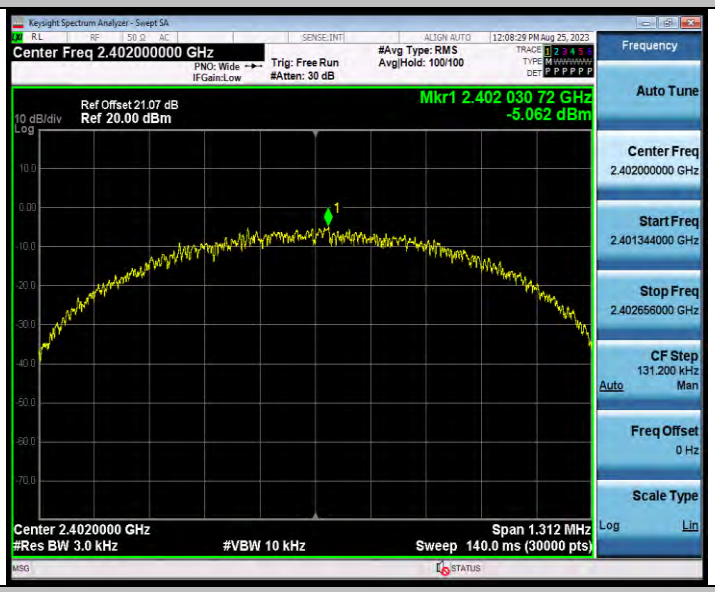
MAXIMUM POWER SPECTRAL DENSITY

TEST RESULT

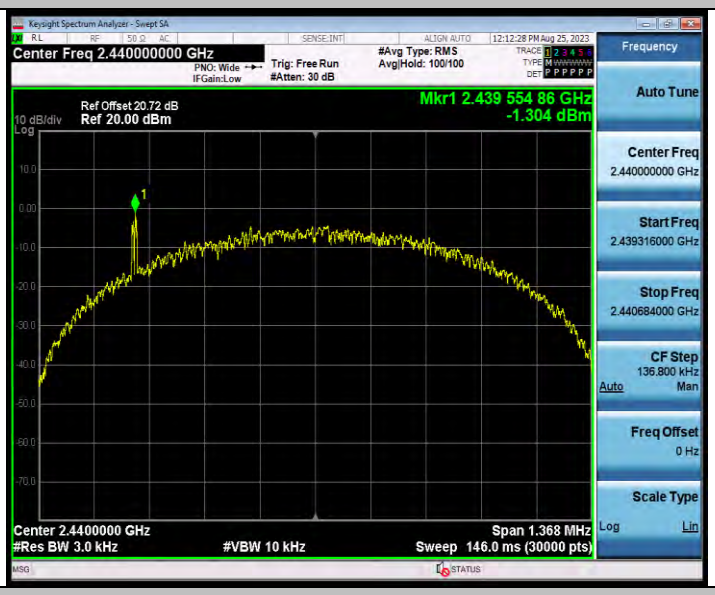
Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-5.06	≤8.00	PASS
		2440	-1.3	≤8.00	PASS
		2480	-4.83	≤8.00	PASS
BLE_2M	Ant1	2404	-6.99	≤8.00	PASS
		2440	-0.3	≤8.00	PASS
		2478	-6.96	≤8.00	PASS
BLE_125K	Ant1	2402	-4.55	≤8.00	PASS
		2440	-4.04	≤8.00	PASS
		2480	-4.59	≤8.00	PASS
BLE_500K	Ant1	2402	-4.67	≤8.00	PASS
		2440	-4.3	≤8.00	PASS
		2480	-4.93	≤8.00	PASS

TEST GRAPHS

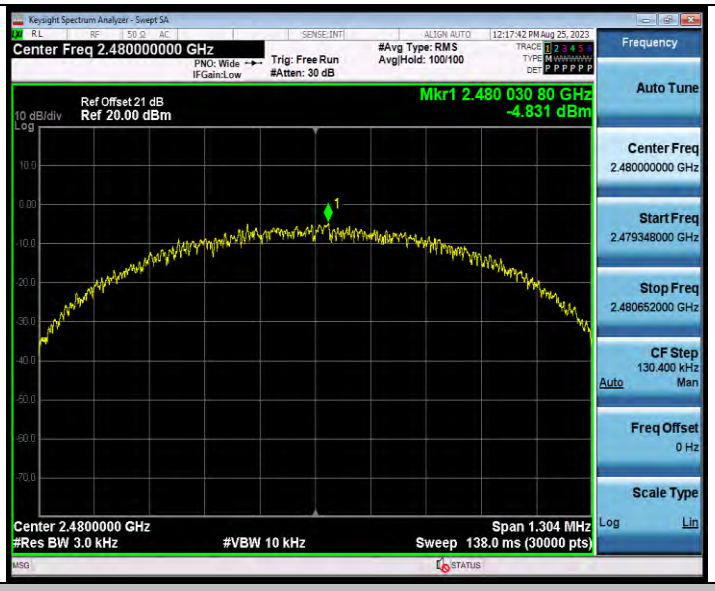
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



BLE_2M_Ant1_2404

BLE_2M_Ant1_2440

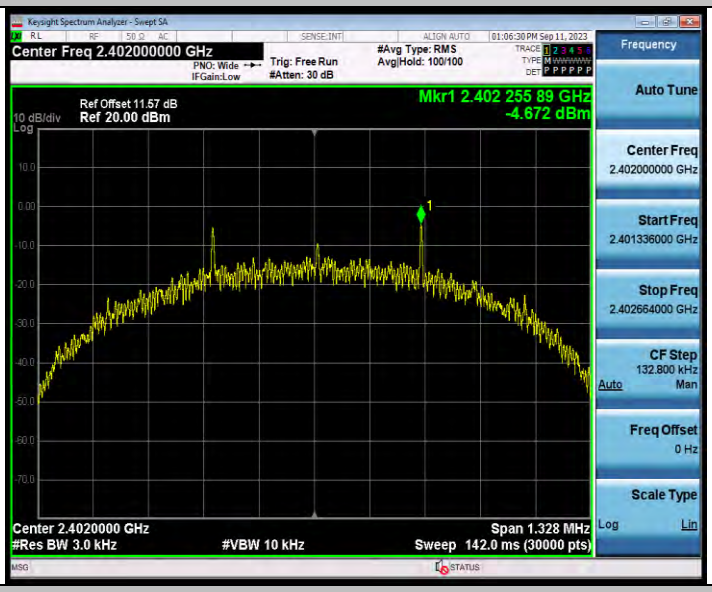
BLE_2M_Ant1_2478

BLE_125K_Ant1_2402

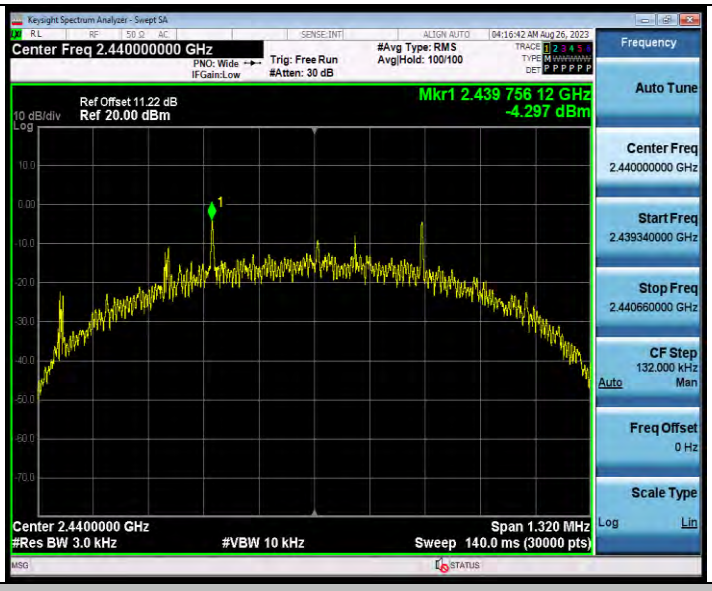
BLE_125K_Ant1_2440

BLE_125K_Ant1_2480

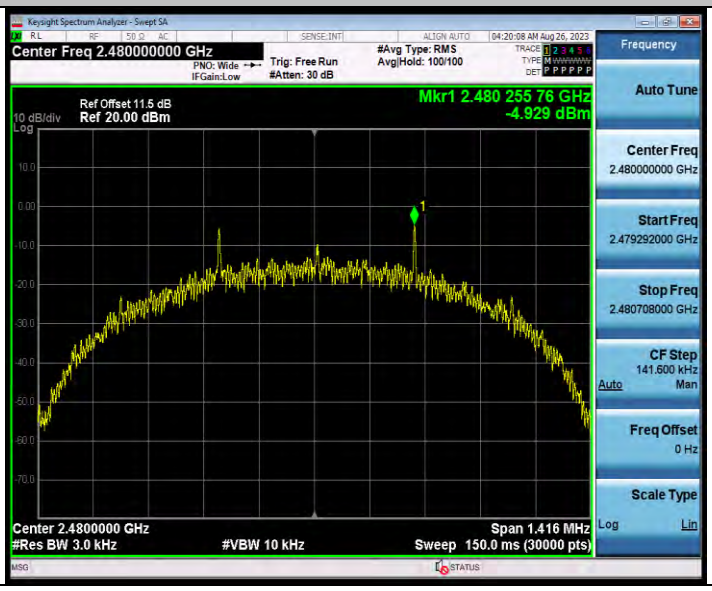
BLE_500K_Ant1_2402



BLE_500K_Ant1_2440



BLE_500K_Ant1_2480



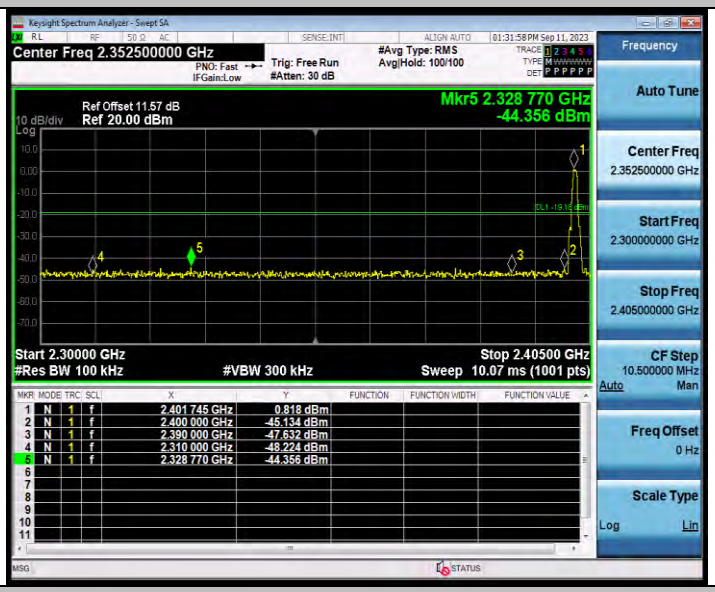
BAND EDGE MEASUREMENTS

TEST RESULT

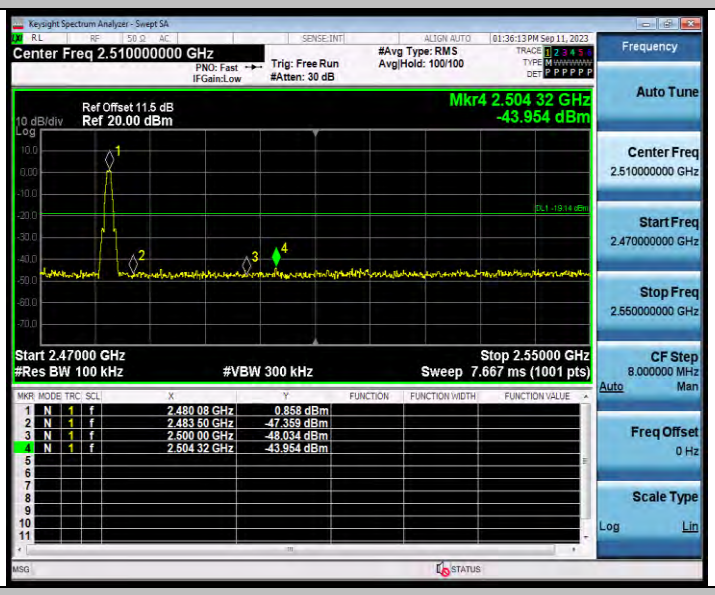
Test Mode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.82	-44.36	≤-19.18	PASS
		High	2480	0.86	-43.95	≤-19.14	PASS
BLE_2M	Ant1	Low	2404	-0.27	-44.22	≤-20.27	PASS
		High	2478	0.85	-44.1	≤-19.15	PASS
BLE_125K	Ant1	Low	2402	-1.84	-44.7	≤-21.84	PASS
		High	2480	-1.63	-43.46	≤-21.63	PASS
BLE_500K	Ant1	Low	2402	0.69	-43.1	≤-19.31	PASS
		High	2480	1.38	-43.95	≤-18.62	PASS

TEST GRAPHS

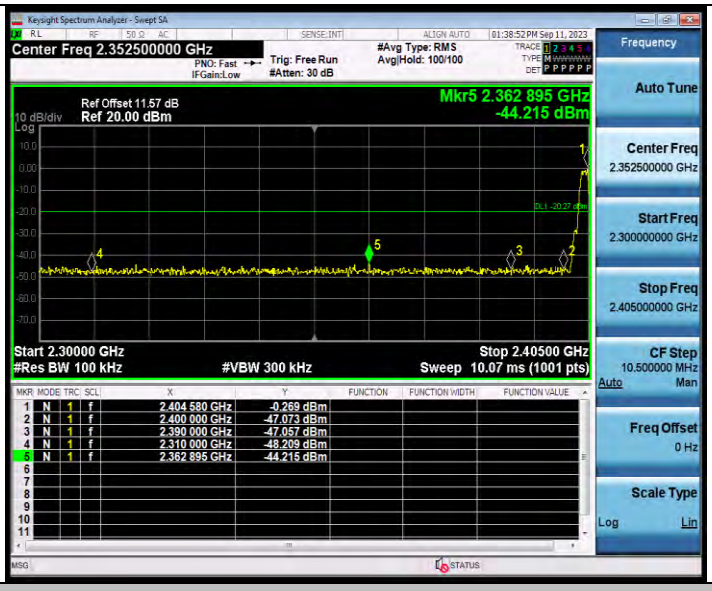
BLE_1M_Ant1_Low_2402



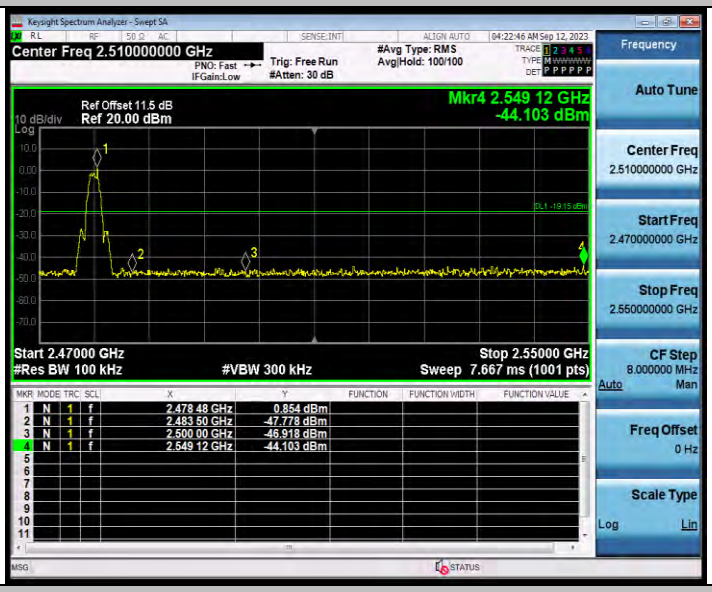
BLE_1M_Ant1_High_2480



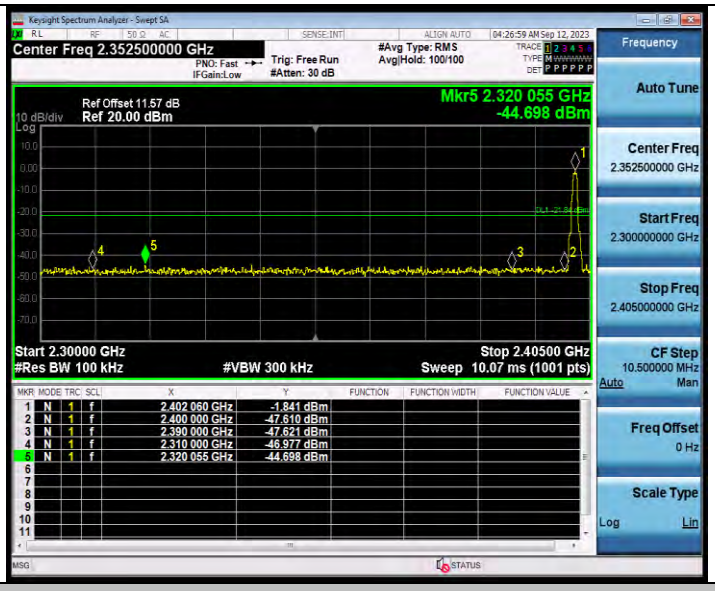
BLE_2M_Ant1_Low_2404



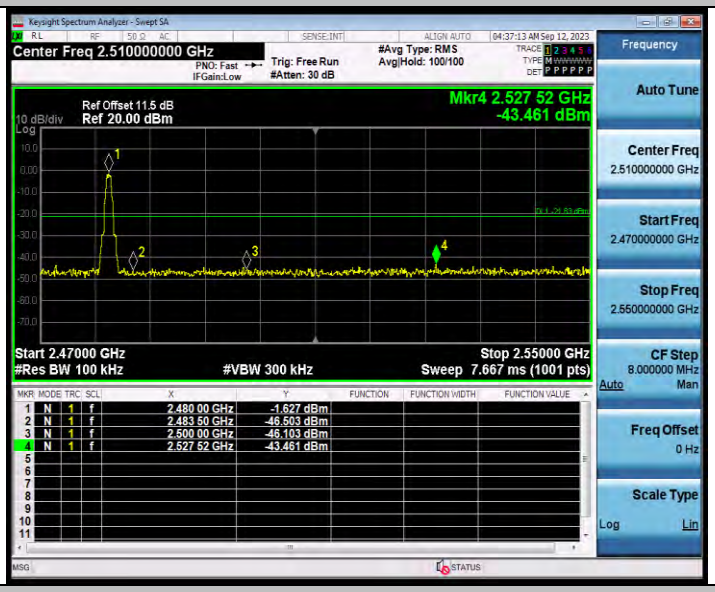
BLE_2M_Ant1_High_2478



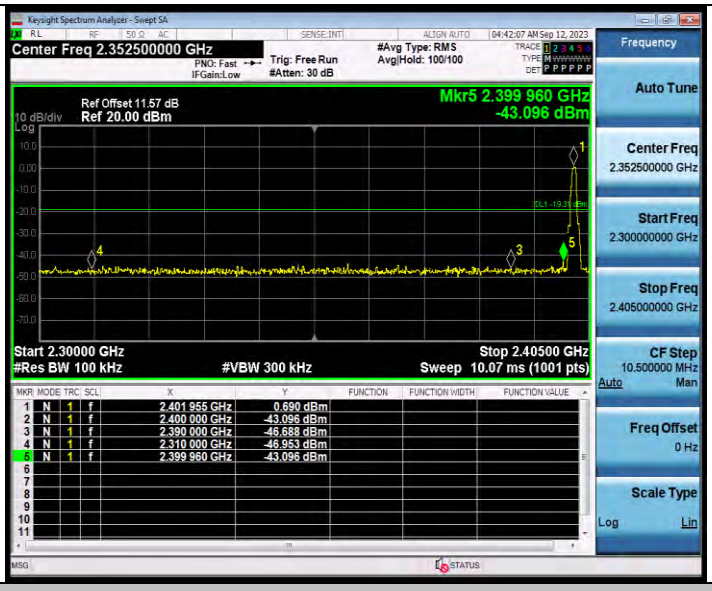
BLE_125K_Ant1_Low_2402



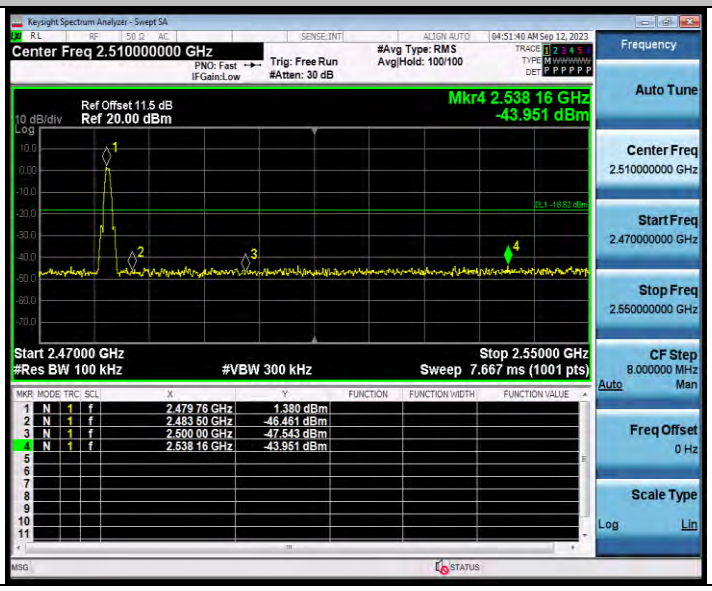
BLE_125K_Ant1_High_2480



BLE_500K_Ant1_Low_2402



BLE_500K_Ant1_High_2480



CONDUCTED SPURIOUS EMISSION

TEST RESULT

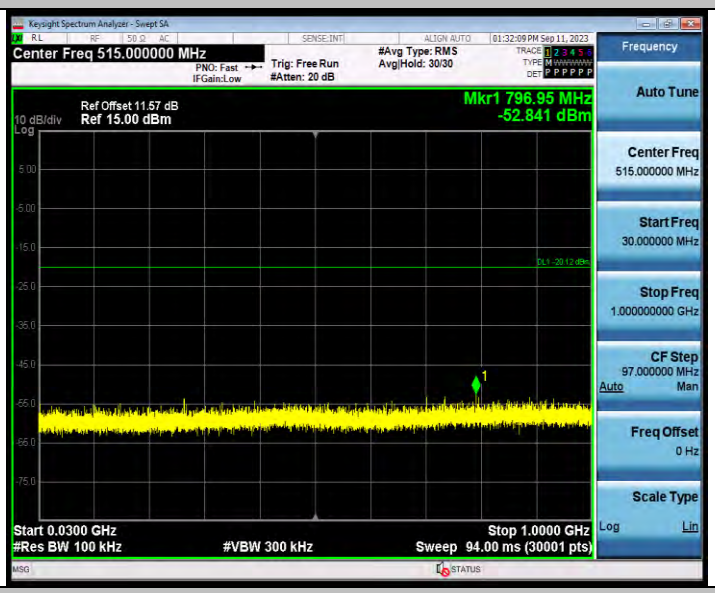
Test Mode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-0.12	-0.12	---	PASS
			30~1000	-0.12	-52.84	≤-20.12	PASS
			1000~26500	-0.12	-33.7	≤-20.12	PASS
		2440	Reference	0.97	0.97	---	PASS
			30~1000	0.97	-53.71	≤-19.03	PASS
			1000~26500	0.97	-33.85	≤-19.03	PASS
		2480	Reference	1.25	1.25	---	PASS
			30~1000	1.25	-54.03	≤-18.75	PASS
			1000~26500	1.25	-34.22	≤-18.75	PASS
BLE_2M	Ant1	2404	Reference	-1.18	-1.18	---	PASS
			30~1000	-1.18	-52.47	≤-21.18	PASS
			1000~26500	-1.18	-34.6	≤-21.18	PASS
		2440	Reference	-0.97	-0.97	---	PASS
			30~1000	-0.97	-53.3	≤-20.97	PASS
			1000~26500	-0.97	-35.25	≤-20.97	PASS
		2478	Reference	-2.09	-2.09	---	PASS
			30~1000	-2.09	-53.13	≤-22.09	PASS
			1000~26500	-2.09	-34.99	≤-22.09	PASS
BLE_125K	Ant1	2402	Reference	-1.86	-1.86	---	PASS
			30~1000	-1.86	-52.86	≤-21.86	PASS
			1000~26500	-1.86	-33.83	≤-21.86	PASS
		2440	Reference	-1.21	-1.21	---	PASS
			30~1000	-1.21	-53.6	≤-21.21	PASS
			1000~26500	-1.21	-33.86	≤-21.21	PASS
		2480	Reference	-1.69	-1.69	---	PASS
			30~1000	-1.69	-53.38	≤-21.69	PASS
			1000~26500	-1.69	-34.49	≤-21.69	PASS
BLE_500K	Ant1	2402	Reference	1.02	1.02	---	PASS
			30~1000	1.02	-52.58	≤-18.98	PASS

			1000~26500	1.02	-33.8	≤-18.98	PASS
		2440	Reference	1.14	1.14	---	PASS
			30~1000	1.14	-53.32	≤-18.86	PASS
			1000~26500	1.14	-34.68	≤-18.86	PASS
		2480	Reference	0.42	0.42	---	PASS
			30~1000	0.42	-53.79	≤-19.58	PASS
			1000~26500	0.42	-33.04	≤-19.58	PASS

TEST GRAPHS

BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000

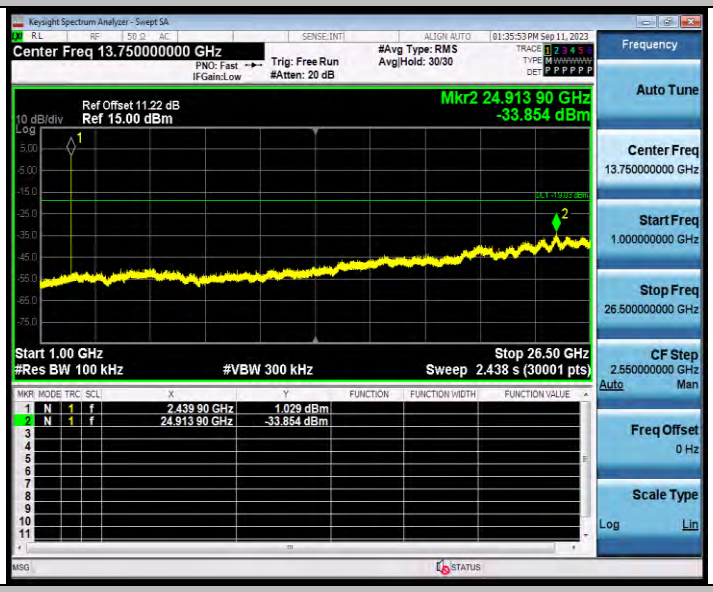


BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant1_2440_0~Reference

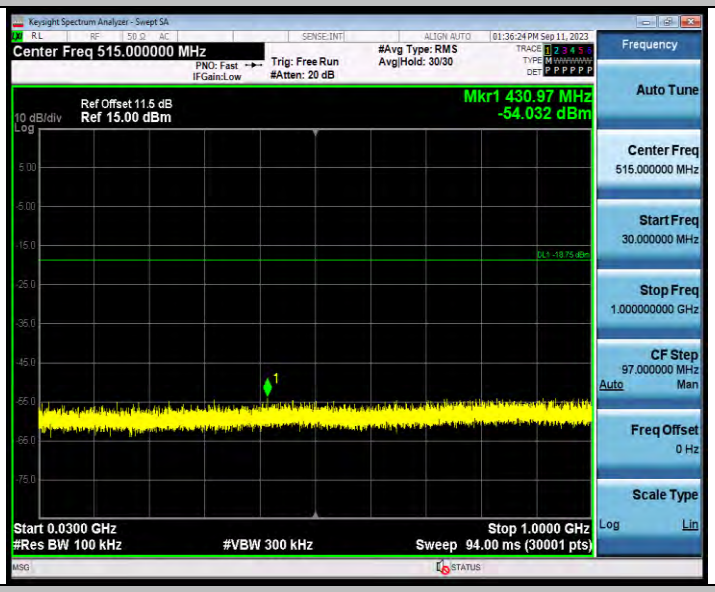
BLE_1M_Ant1_2440_30~1000

BLE_1M_Ant1_2440_1000~26500

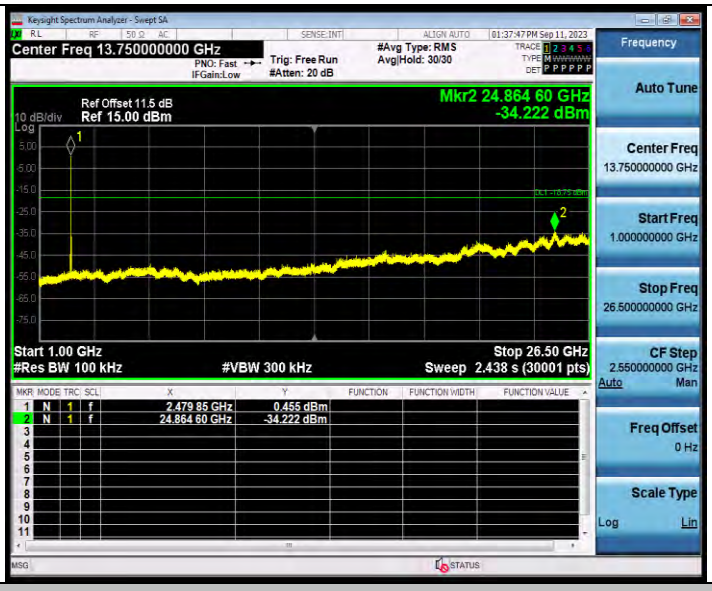


BLE_1M_Ant1_2480_0~Reference

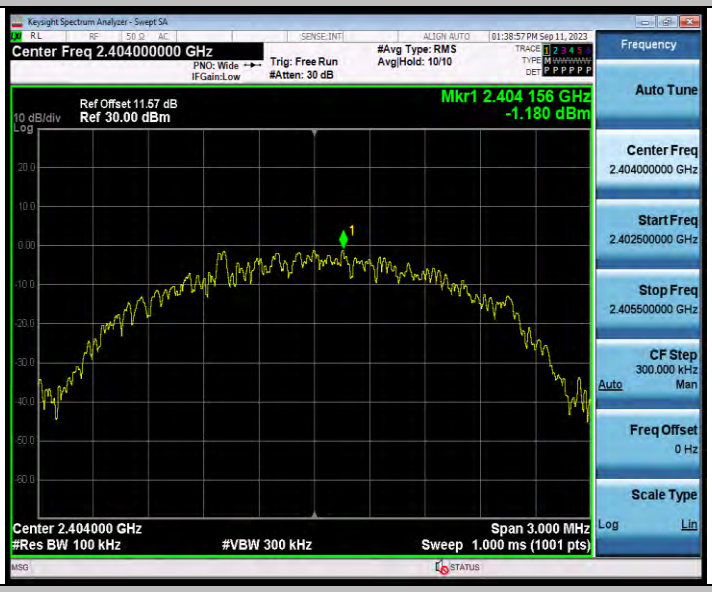
BLE_1M_Ant1_2480_30~1000



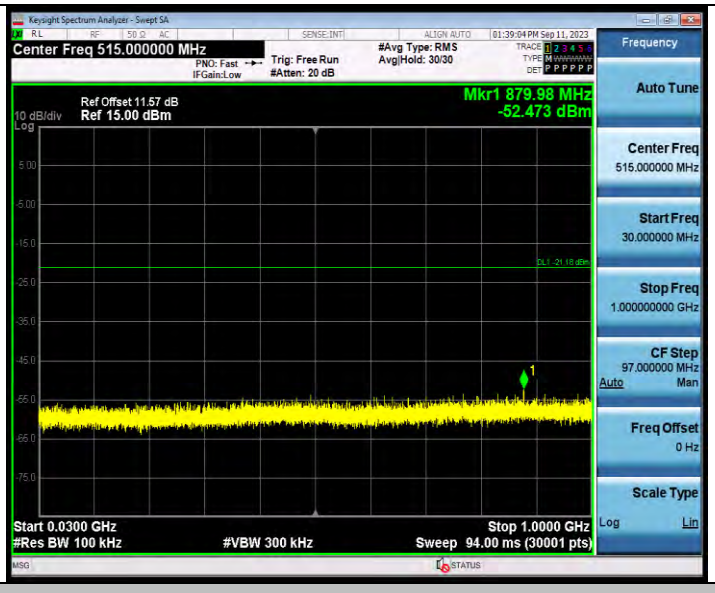
BLE_1M_Ant1_2480_1000~26500



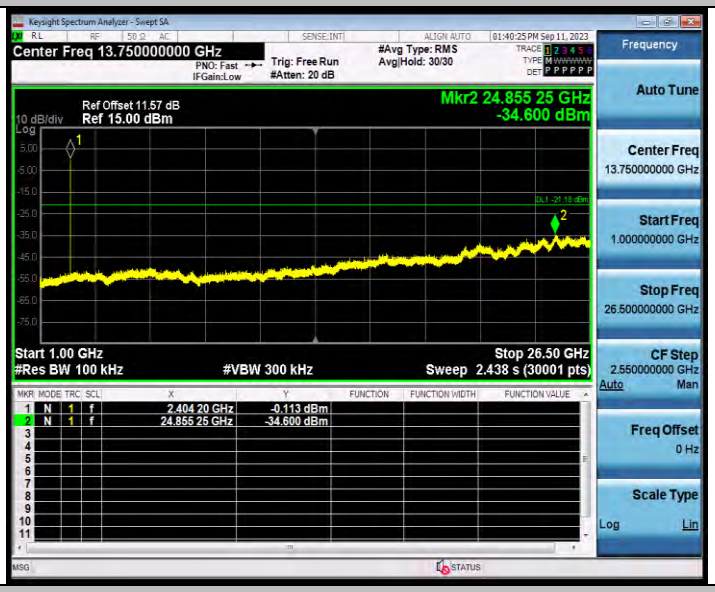
BLE_2M_Ant1_2404_0~Reference



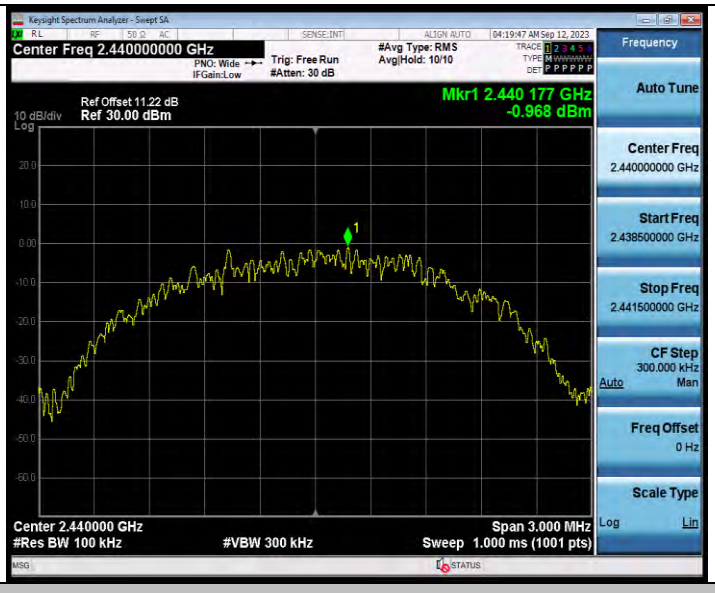
BLE_2M_Ant1_2404_30~1000



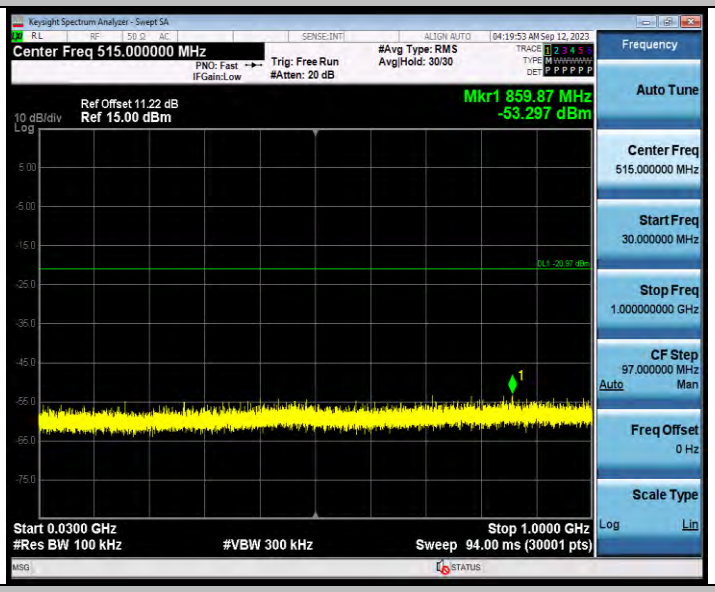
BLE_2M_Ant1_2404_1000~26500



BLE_2M_Ant1_2440_0~Reference



BLE_2M_Ant1_2440_30~1000



BLE_2M_Ant1_2440_1000~26500