



Appendix A

RF Test Data for BT LE V5.0 (DTS) (Conducted Measurement)

Product Name: Wireless Remote Control Electric Tripod

Test Model: Master m20

Environmental Conditions

Temperature:	22.8℃
Relative Humidity:	53.1%
ATM Pressure:	100.0 kPa
Test Engineer:	 Bill Zhu
Supervised by:	 Li Huan



A.1 DTS Bandwidth

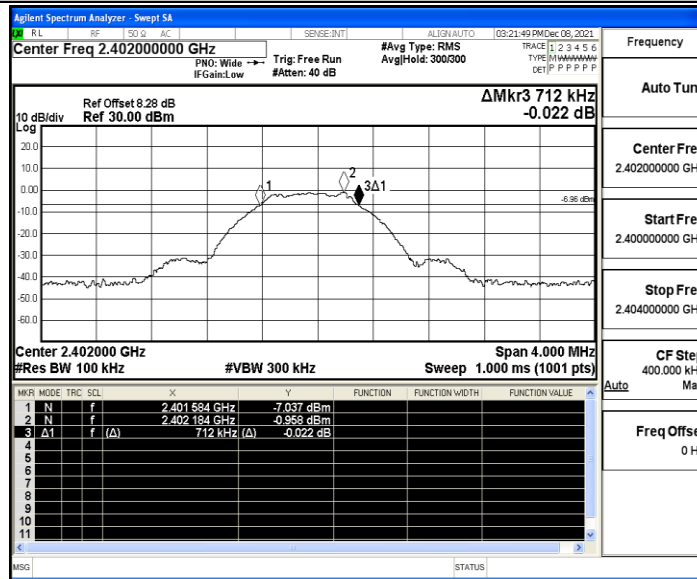
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.712	2401.584	2402.296	≥ 0.5	PASS
		2440	0.724	2439.580	2440.304	≥ 0.5	PASS
		2480	0.716	2479.580	2480.296	≥ 0.5	PASS
BLE_2M	Ant1	2402	1.248	2401.296	2402.544	≥ 0.5	PASS
		2440	1.172	2439.372	2440.544	≥ 0.5	PASS
		2480	1.276	2479.268	2480.544	≥ 0.5	PASS

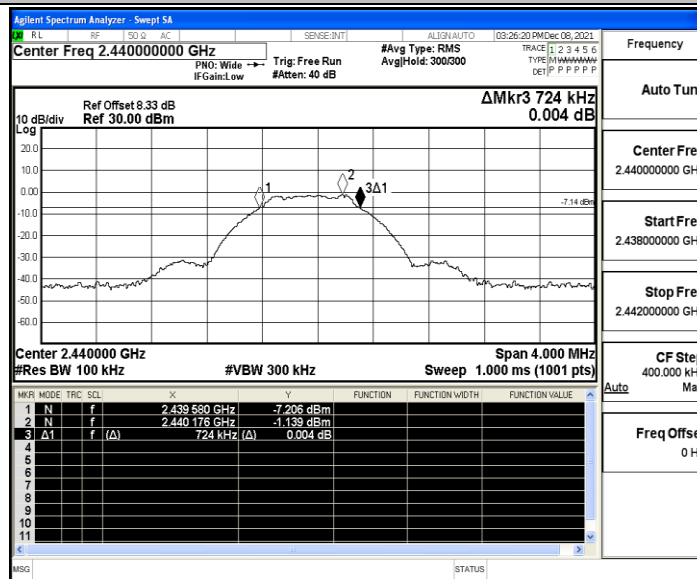


Test Graphs

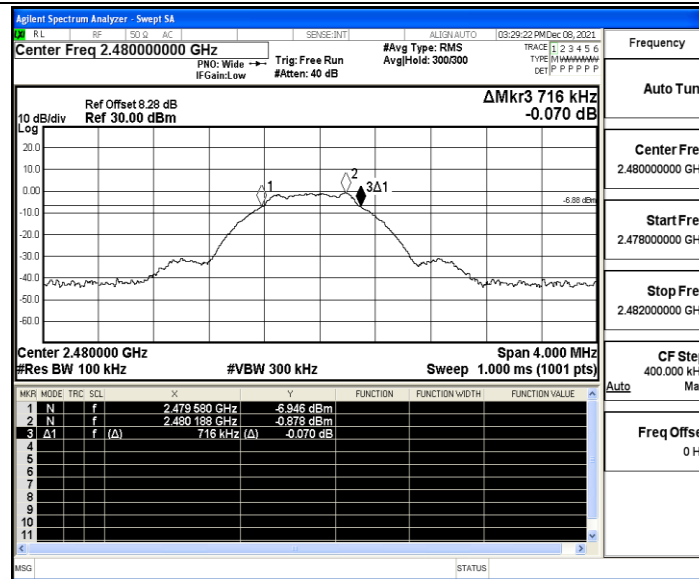
BLE_1M_Ant1_2402



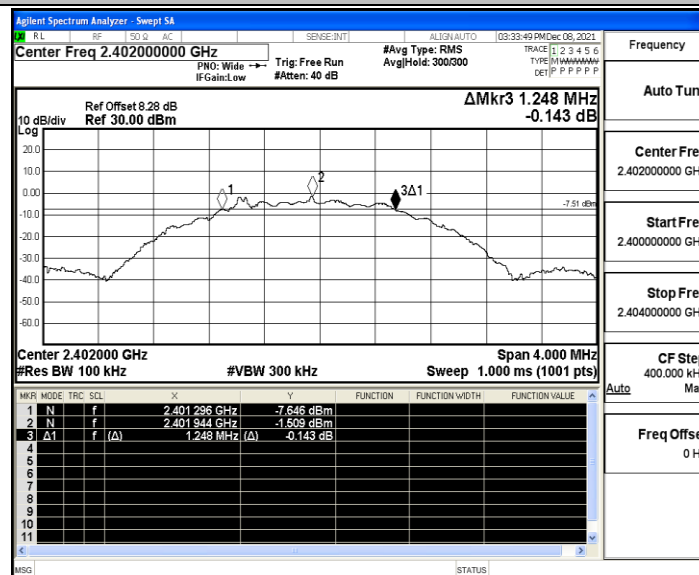
BLE_1M_Ant1_2440



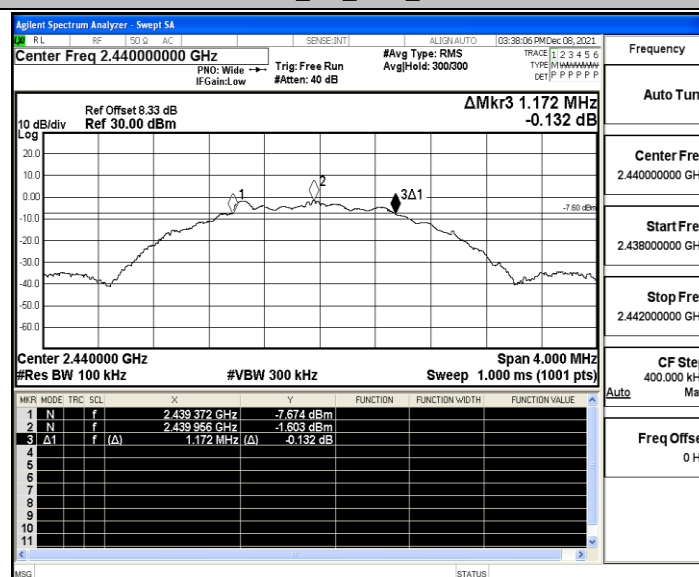
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402

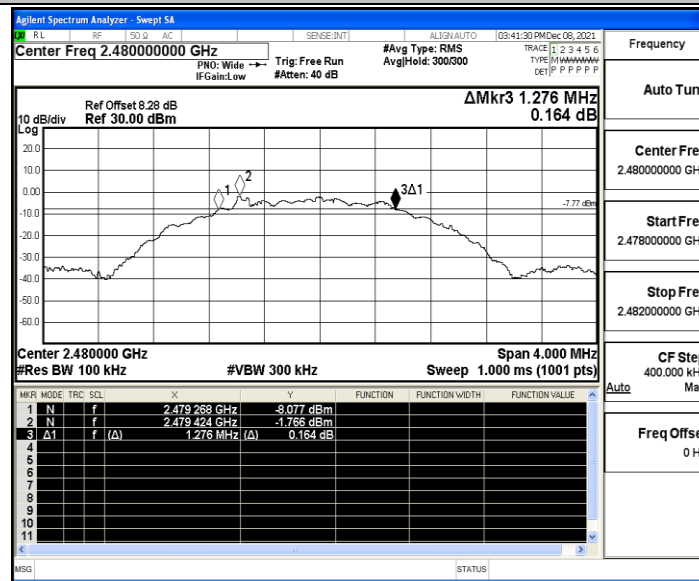


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





A.2 Maximum peak conducted output power

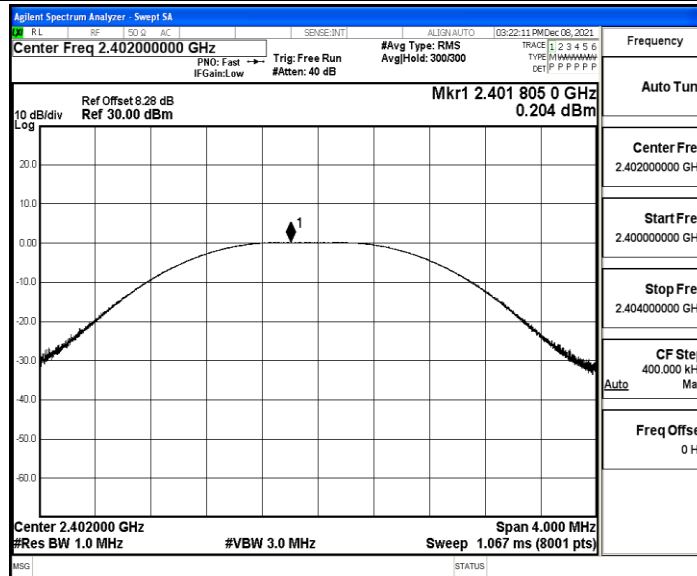
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.2	≤30	PASS
		2440	0.17	≤30	PASS
		2480	0.33	≤30	PASS
BLE_2M	Ant1	2402	0.25	≤30	PASS
		2440	0.19	≤30	PASS
		2480	0.37	≤30	PASS

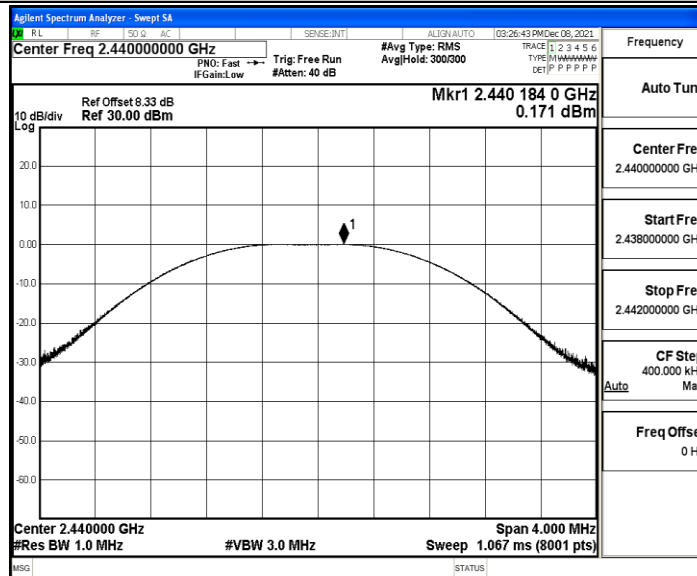


Test Graphs

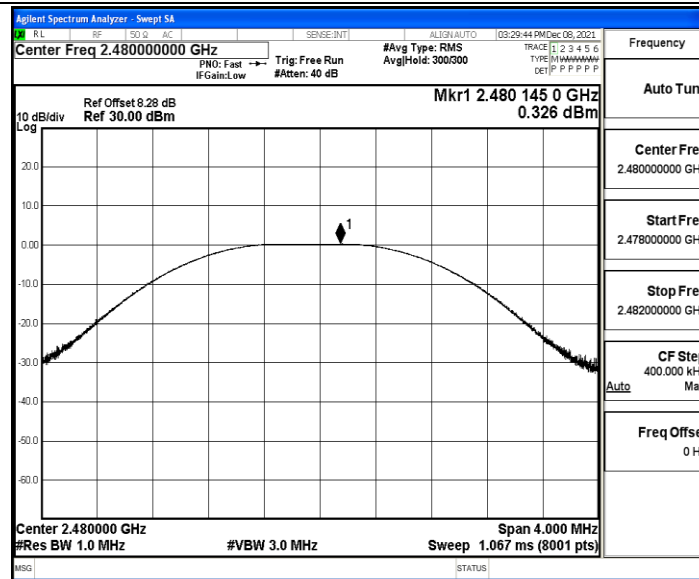
BLE_1M_Ant1_2402



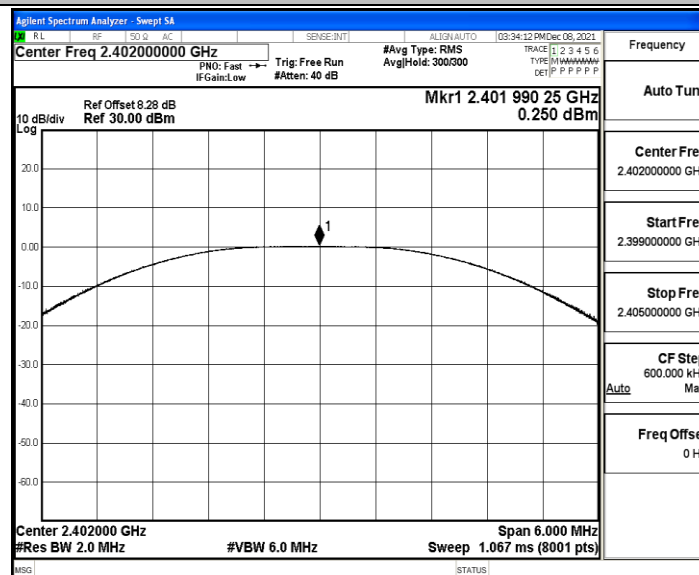
BLE_1M_Ant1_2440



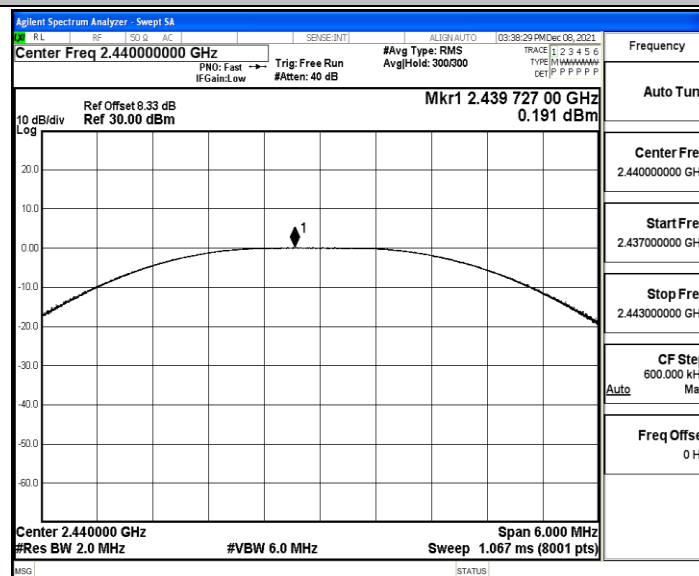
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402

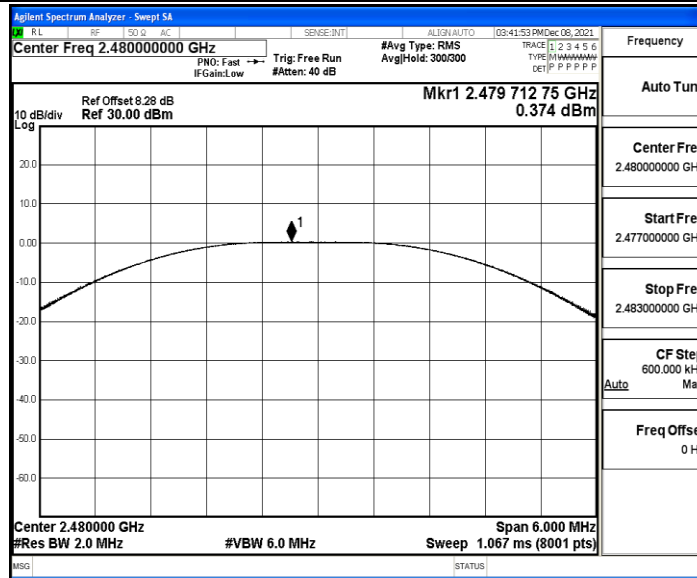


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





A.3 Maximum power spectral density

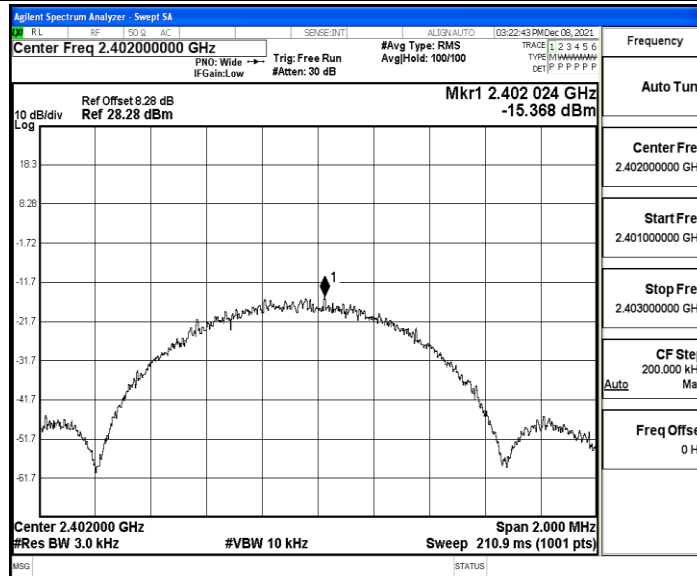
Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.37	≤8	PASS
		2440	-15.52	≤8	PASS
		2480	-15.25	≤8	PASS
BLE_2M	Ant1	2402	-18.57	≤8	PASS
		2440	-18.88	≤8	PASS
		2480	-18.54	≤8	PASS

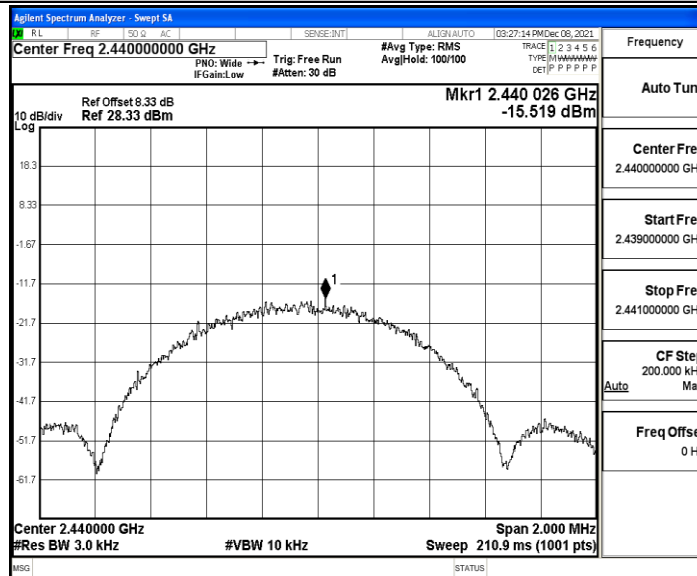


Test Graphs

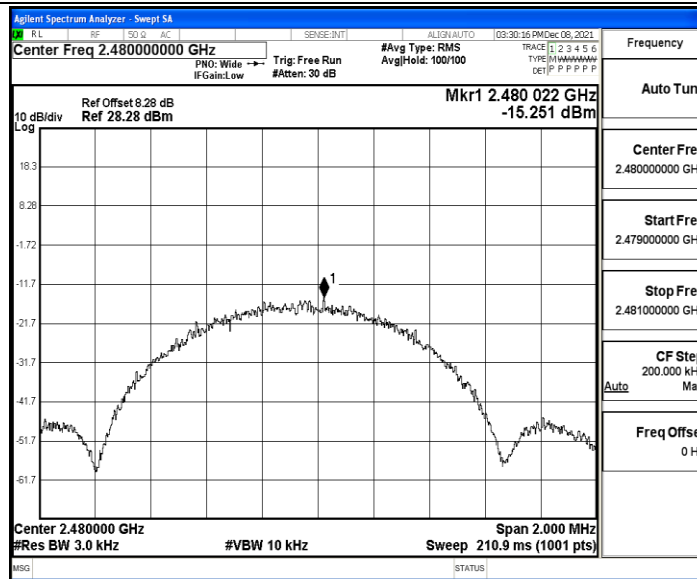
BLE_1M_Ant1_2402



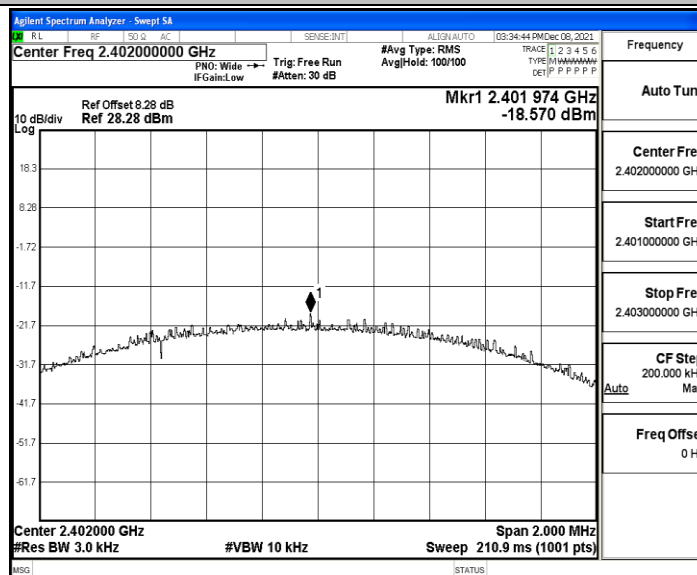
BLE_1M_Ant1_2440



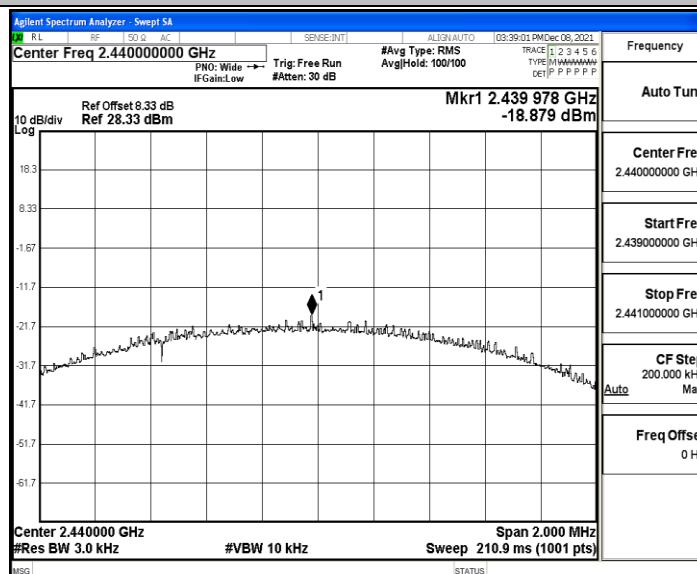
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402

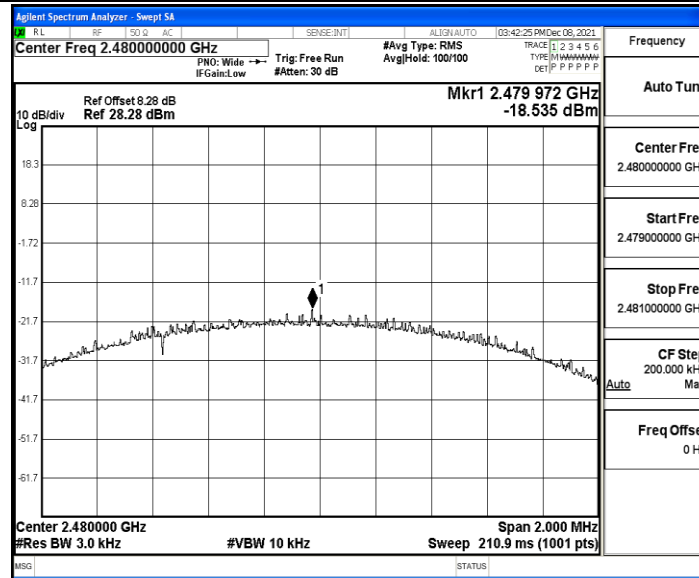


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





A.4 Band edge measurements

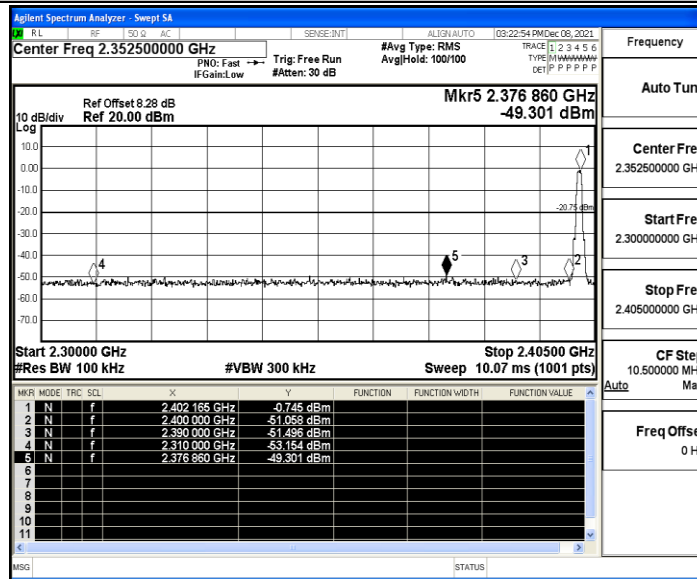
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-0.75	-49.3	≤ -20.75	PASS
		High	2480	-0.69	-48.83	≤ -20.69	PASS
BLE_2M	Ant1	Low	2402	-2.56	-37.06	≤ -22.56	PASS
		High	2480	-2.40	-48.99	≤ -22.4	PASS

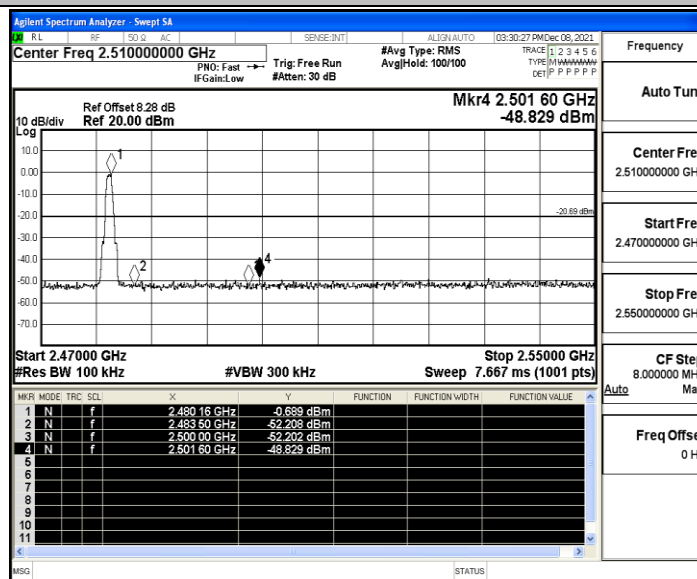


Test Graphs

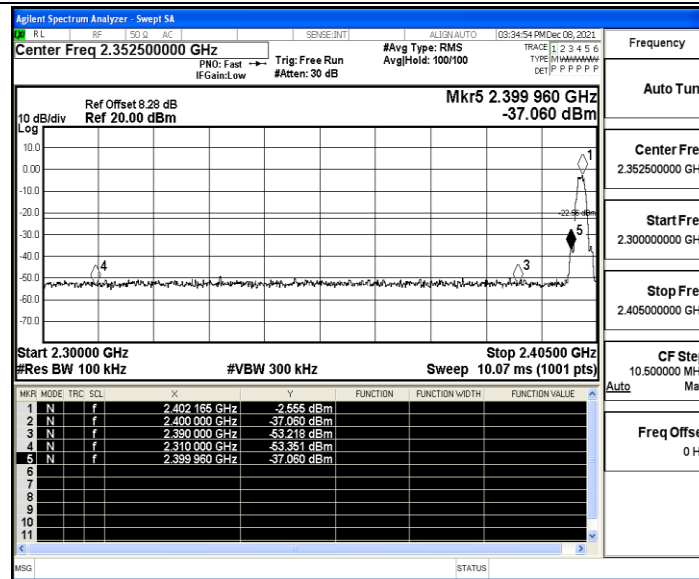
BLE_1M_Ant1_Low_2402



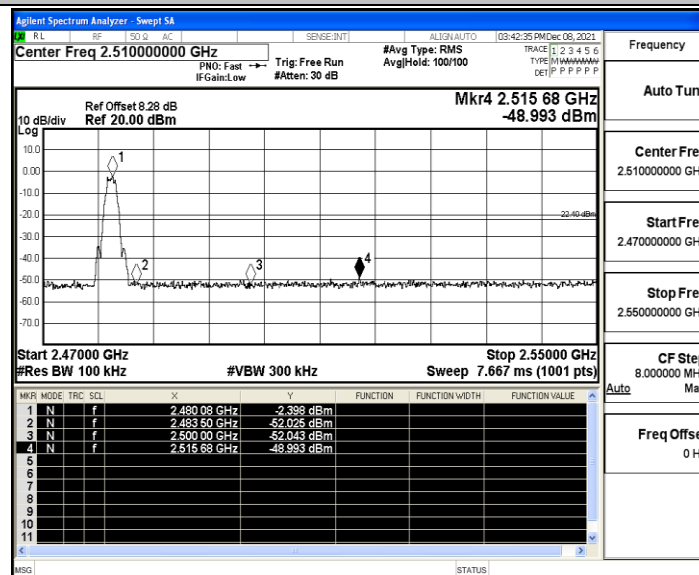
BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480





A.5 Conducted Spurious Emission

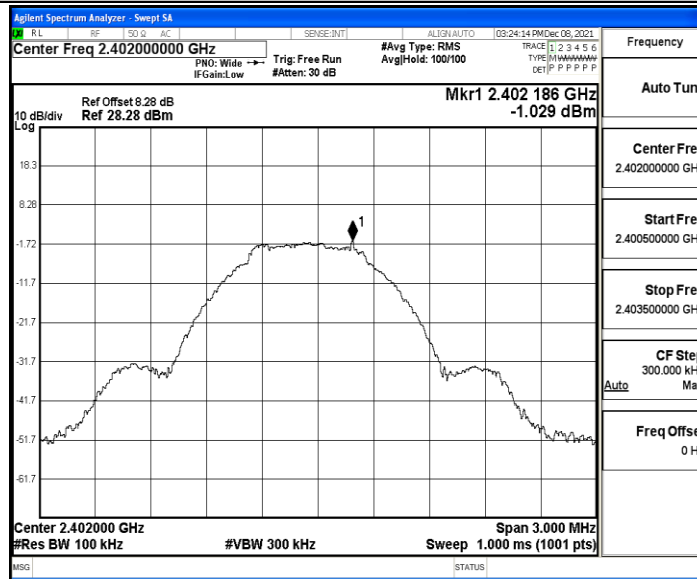
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-1.03	-1.03	---	PASS
			30~1000	-1.03	-60.55	≤ -21.03	PASS
			1000~26500	-1.03	-46.25	≤ -21.03	PASS
		2440	Reference	-1.21	-1.21	---	PASS
			30~1000	-1.21	-60.62	≤ -21.21	PASS
			1000~26500	-1.21	-46.82	≤ -21.21	PASS
		2480	Reference	-0.92	-0.92	---	PASS
			30~1000	-0.92	-61.24	≤ -20.92	PASS
			1000~26500	-0.92	-46.83	≤ -20.92	PASS
BLE_2M	Ant1	2402	Reference	-3.12	-3.12	---	PASS
			30~1000	-3.12	-61.58	≤ -23.12	PASS
			1000~26500	-3.12	-46.33	≤ -23.12	PASS
		2440	Reference	-1.77	-1.77	---	PASS
			30~1000	-1.77	-61.68	≤ -21.77	PASS
			1000~26500	-1.77	-46.53	≤ -21.77	PASS
		2480	Reference	-3.04	-3.04	---	PASS
			30~1000	-3.04	-61.34	≤ -23.04	PASS
			1000~26500	-3.04	-46.07	≤ -23.04	PASS

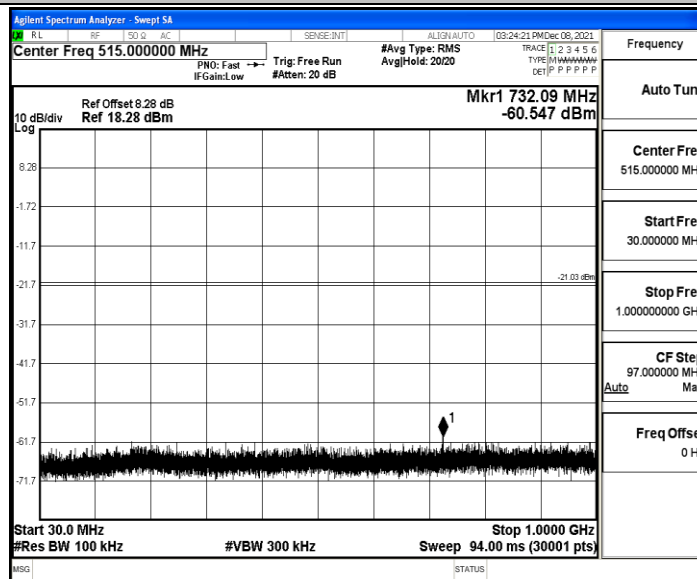


Test Graphs

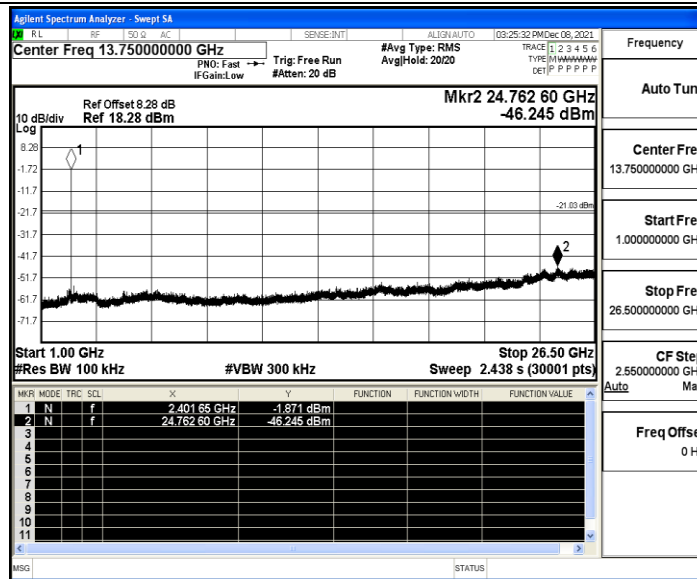
BLE_1M_Ant1_2402_0~Reference



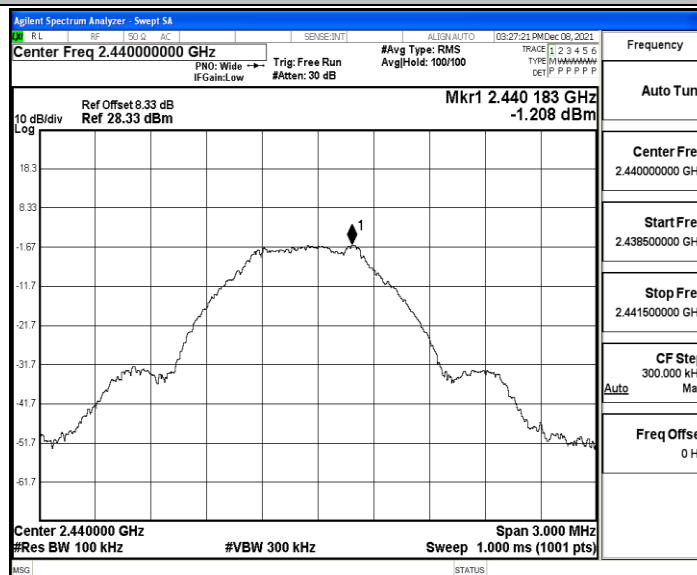
BLE_1M_Ant1_2402_30~1000



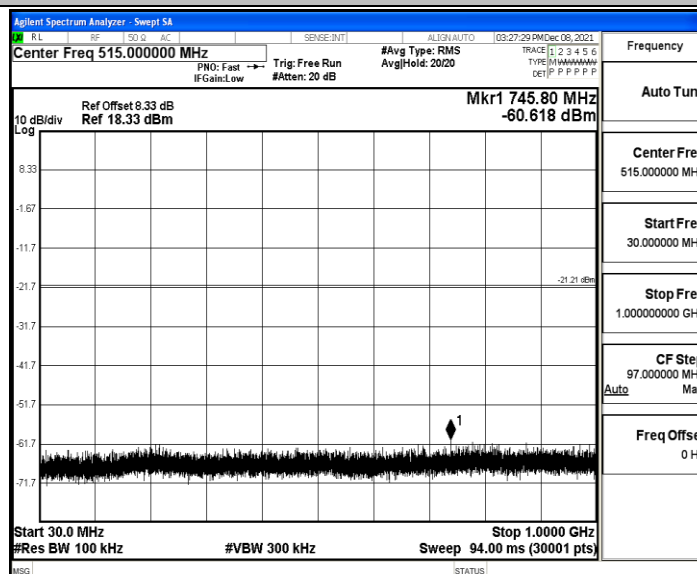
BLE_1M_Ant1_2402_1000~26500

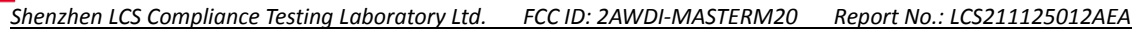


BLE_1M_Ant1_2440_0~Reference



BLE_1M_Ant1_2440_30~1000





Agent Spectrum Analyzer - Sweep SA

F L	R F	S O D	A C	SENSE [INT]	ALGN AUTO	(G3-28:39 PM) Dec 08, 2021
Center Freq 13.75000000 GHz				#Avg Type: RMS	Avg/Hold: 20/20	Trace 1 2 3 4 5 TYPE [H] WMMWMMW DET [P P P P P P P]
PNO: Fast → IF Gain: low	Trig: Free Run	#Att: 20 dB				

Mkr2 24.824 65 GHz
-46.821 dBm

Ref Offset 8.33 db
Ref 18.33 dBm

Start 1.00 GHz Stop 26.50 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.438 s (30001 pts)

MIR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.439 90 GHz	-1.575 dBm			
2	N		f	24.824 65 GHz	-46.821 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Freq Offs...
0 Hz

Agilent Spectrum Analyzer - Sweep SA

RL RF SFG AC SENSE: INT AL32N/AUTO 03:31:42 PM Dec 06, 2021

Center Freq 2.480000000 GHz

PRF: Wide → IF Gain: Low Trig: Free Run #Avg Type: RMS Avg/Hold: 100/100

Mkr1 2.480 183 GHz -0.916 dBm

10 dB/div Ref Offset 8.28 dB Ref 28.28 dBm

Center 2.480000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts)

Auto

Frequency

Auto Tun

Center Freq 2.480000000 GHz

Start Freq 2.478500000 GHz

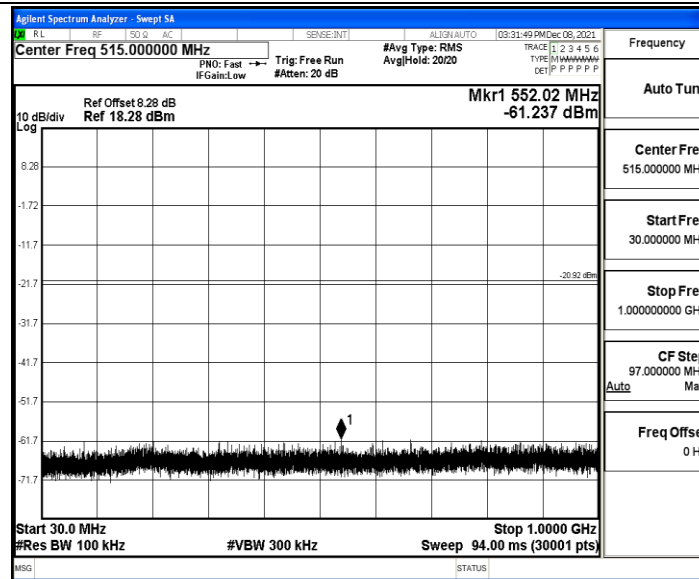
Stop Freq 2.481500000 GHz

CF Stop 300.000 kHz

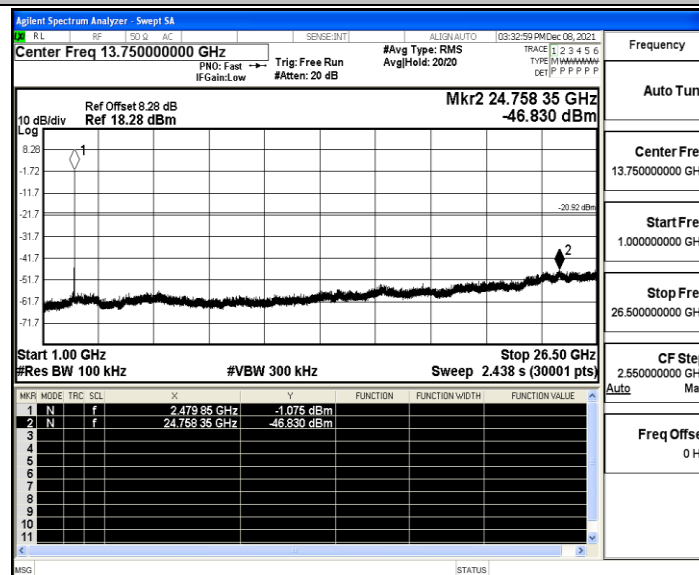
Auto

Freq Offset 0 Hz

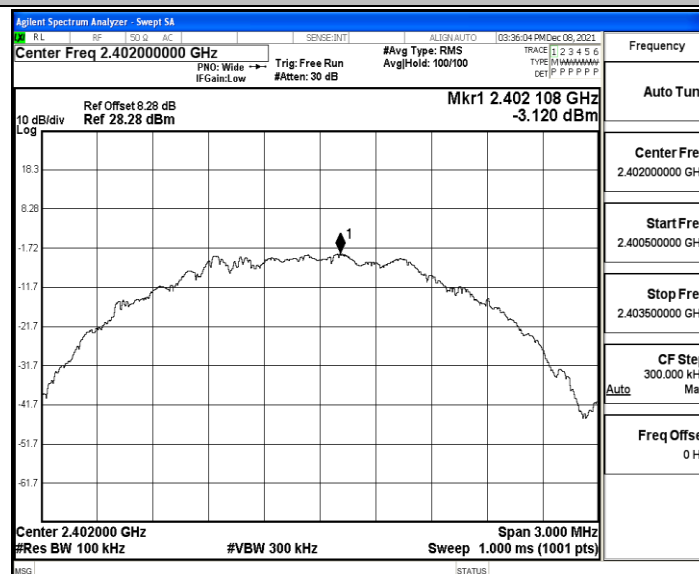
20 / 34



BLE_1M_Ant1_2480_1000~26500

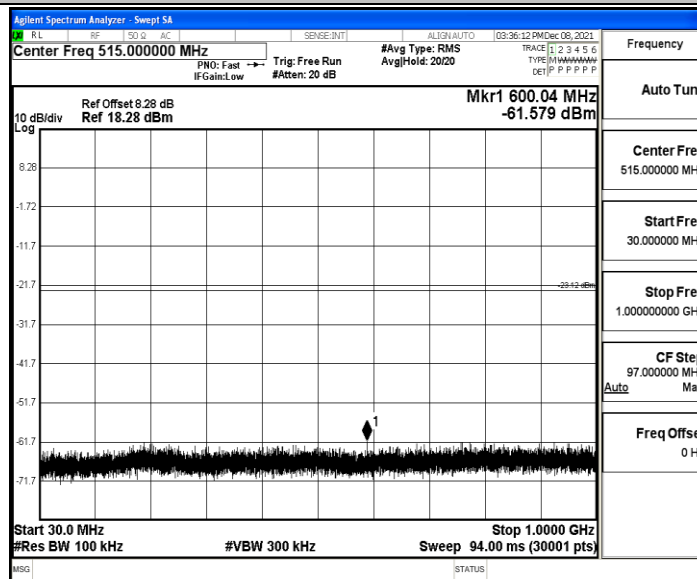


BLE_2M_Ant1_2402_0~Reference

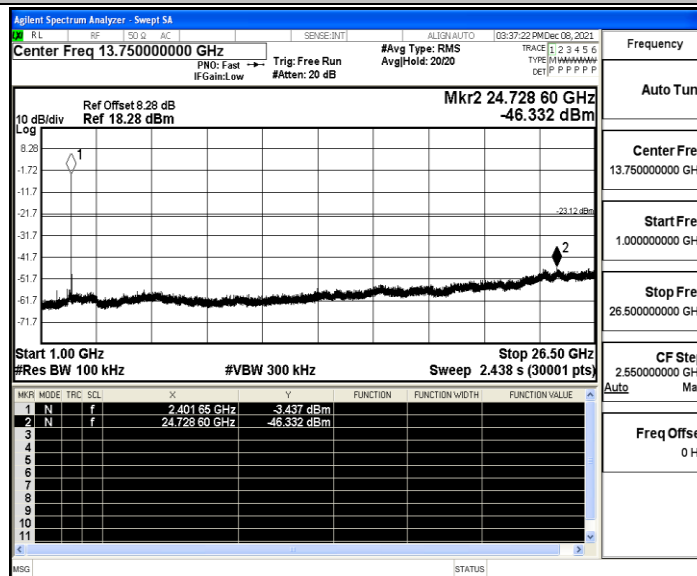




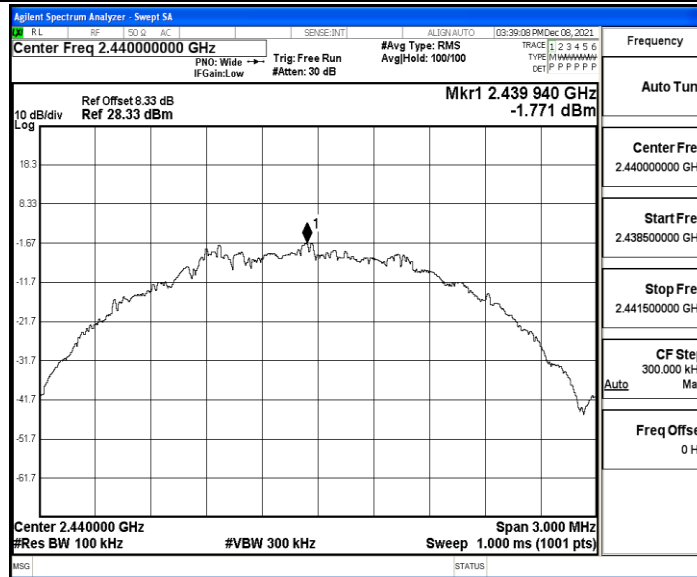
BLE_2M_Ant1_2402_30~1000



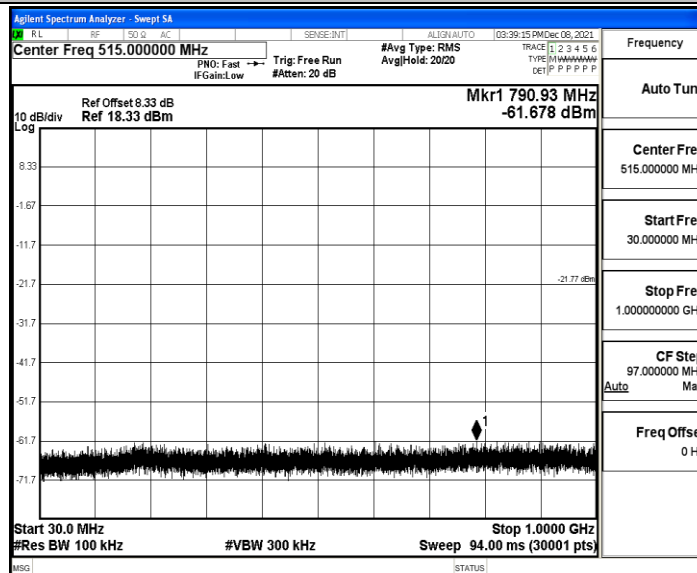
BLE_2M_Ant1_2402_1000~26500



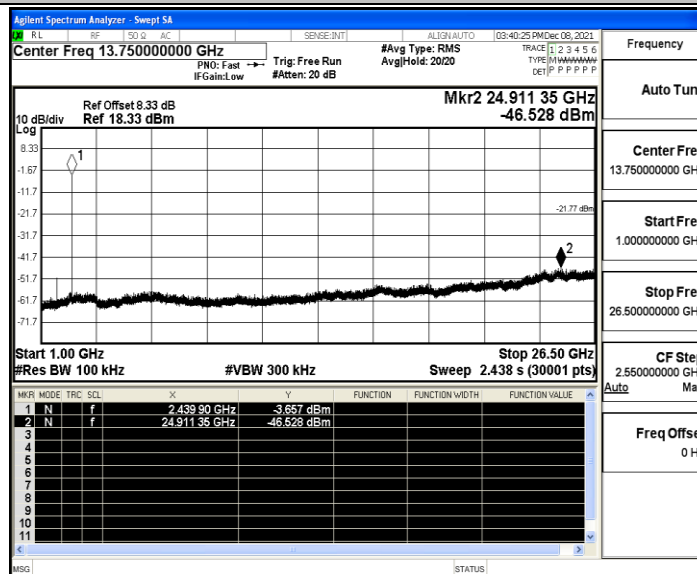
BLE_2M_Ant1_2440_0~Reference



BLE_2M_Ant1_2440_30~1000

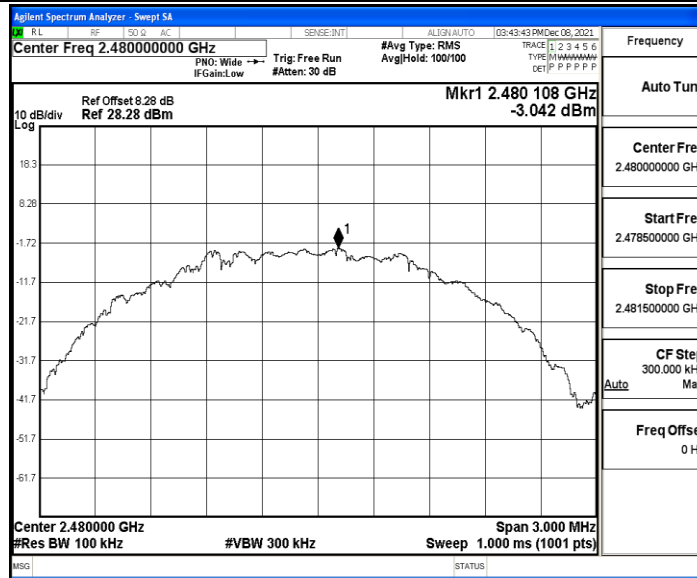


BLE_2M_Ant1_2440_1000~26500

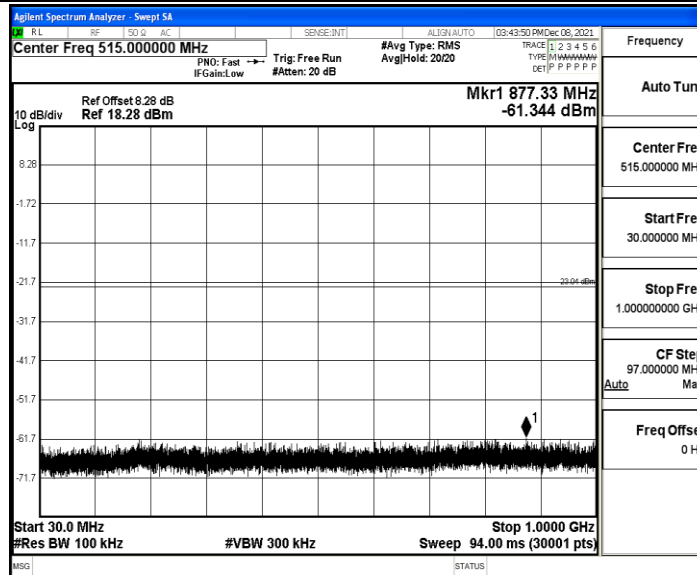




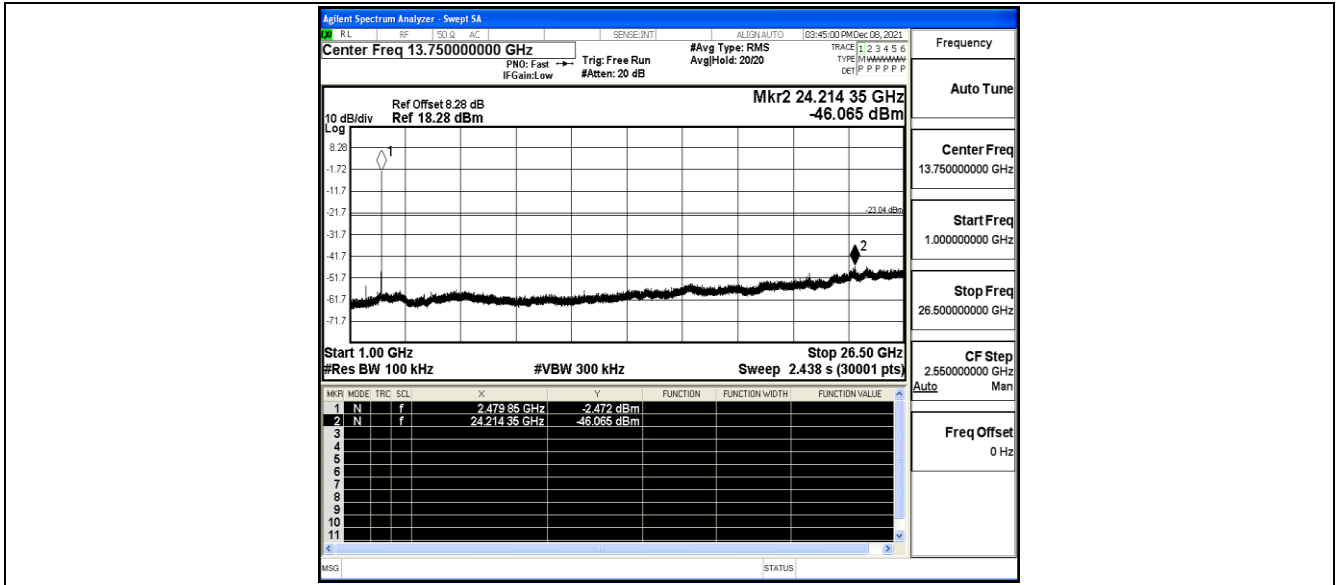
BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500

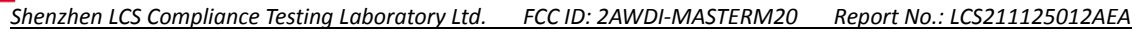




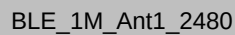
A.6 Duty Cycle

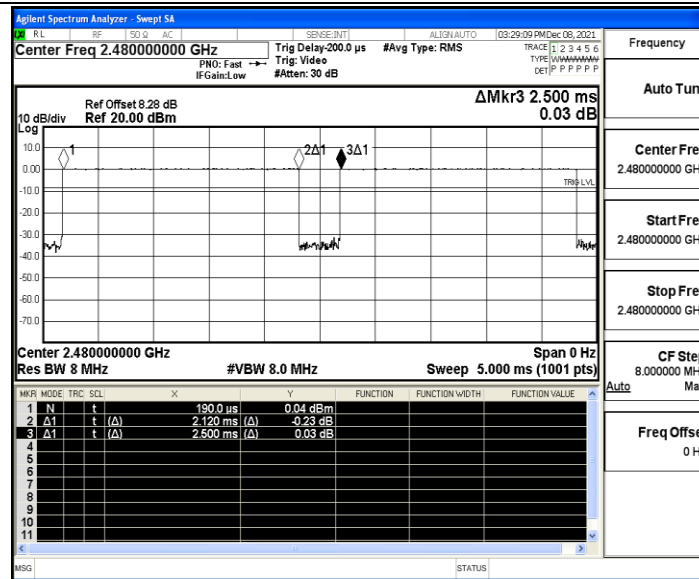
Test Result

TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	2.13	2.50	0.8520	85.20	0.70	---	PASS
		2440	2.13	2.50	0.8520	85.20	0.70	---	PASS
		2480	2.12	2.50	0.8480	84.80	0.72	---	PASS
BLE_2M	Ant1	2402	1.08	1.25	0.8640	86.40	0.63	---	PASS
		2440	1.08	1.25	0.8640	86.40	0.63	---	PASS
		2480	1.07	1.25	0.8560	85.60	0.68	---	PASS

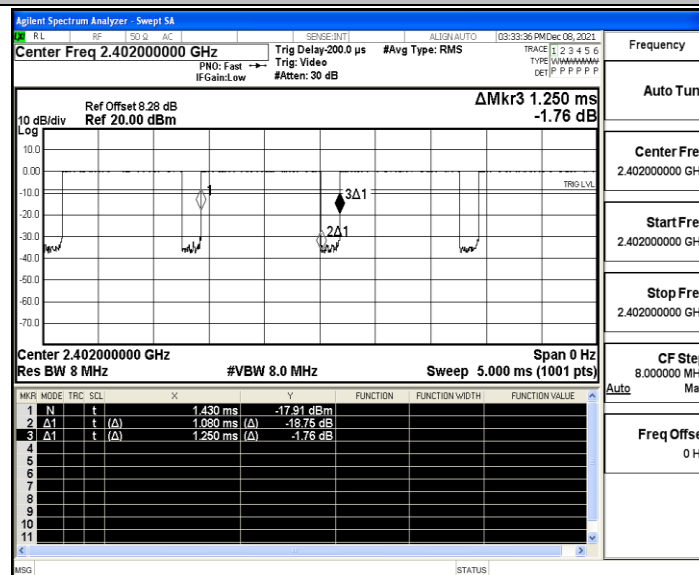


BLE_1M_Ant1_2402

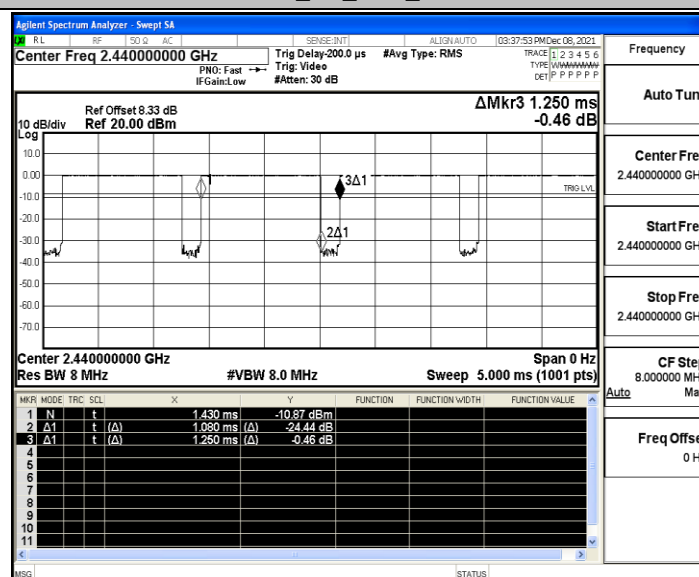




BLE_2M_Ant1_2402

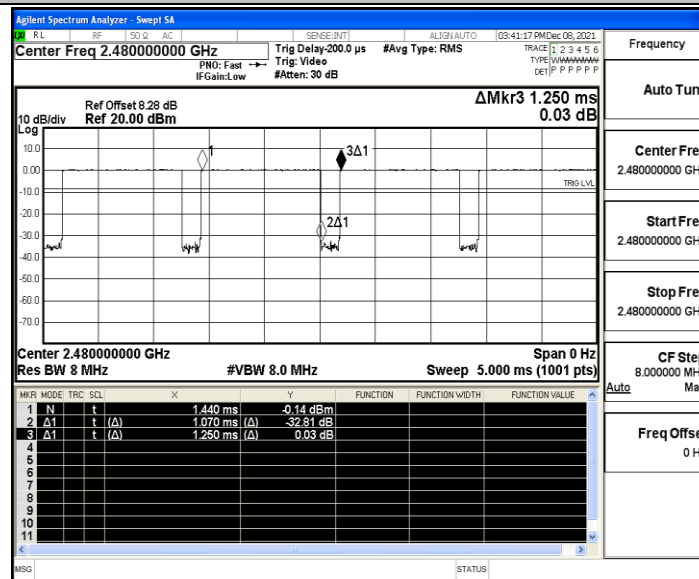


BLE_2M_Ant1_2440





BLE_2M_Ant1_2480





A.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-48.38	≤-41.20	46.82	≤54	PASS
				AV	2357.330	-47.79	≤-41.20	47.41	≤54	PASS
				AV	2390.000	-48.23	≤-41.20	46.97	≤54	PASS
				Peak	2310.000	-41.79	≤-21.20	53.41	≤74	PASS
				Peak	2359.325	-38.32	≤-21.20	56.88	≤74	PASS
				Peak	2390.000	-41.64	≤-21.20	53.56	≤74	PASS
		High	2480	AV	2483.500	-47.43	≤-41.20	47.77	≤54	PASS
				AV	2483.520	-47.43	≤-41.20	47.77	≤54	PASS
				AV	2500.000	-47.8	≤-41.20	47.40	≤54	PASS
				Peak	2483.500	-41.57	≤-21.20	53.63	≤74	PASS
				Peak	2497.760	-38.42	≤-21.20	56.78	≤74	PASS
				Peak	2500.000	-39.97	≤-21.20	55.23	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-48.32	≤-41.20	46.88	≤54	PASS
				AV	2352.605	-47.41	≤-41.20	47.79	≤54	PASS
				AV	2390.000	-47.98	≤-41.20	47.22	≤54	PASS
				Peak	2310.000	-40.6	≤-21.20	54.60	≤74	PASS
				Peak	2349.665	-38.69	≤-21.20	56.51	≤74	PASS
				Peak	2390.000	-41.92	≤-21.20	53.28	≤74	PASS
		High	2480	AV	2483.500	-46.43	≤-41.20	48.77	≤54	PASS
				AV	2483.520	-46.43	≤-41.20	48.77	≤54	PASS
				AV	2500.000	-47.49	≤-41.20	47.71	≤54	PASS
				Peak	2483.500	-40.41	≤-21.20	54.79	≤74	PASS
				Peak	2489.120	-38.31	≤-21.20	56.89	≤74	PASS
				Peak	2500.000	-40.99	≤-21.20	54.21	≤74	PASS

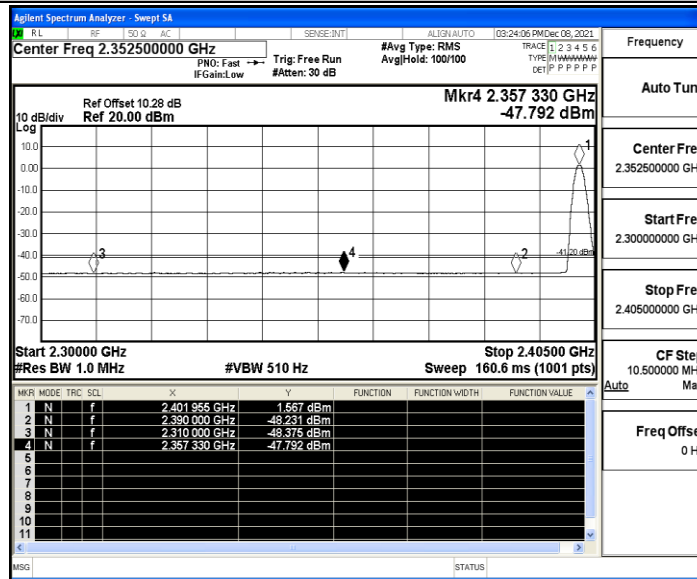
Note:

1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

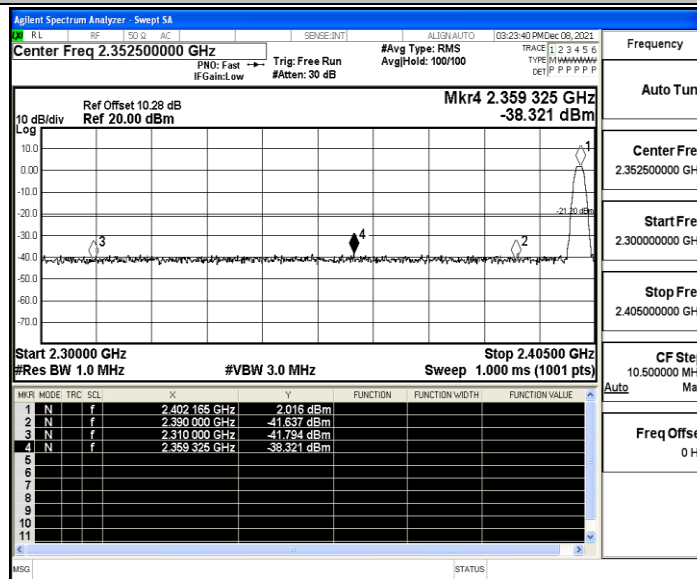


Test Graphs

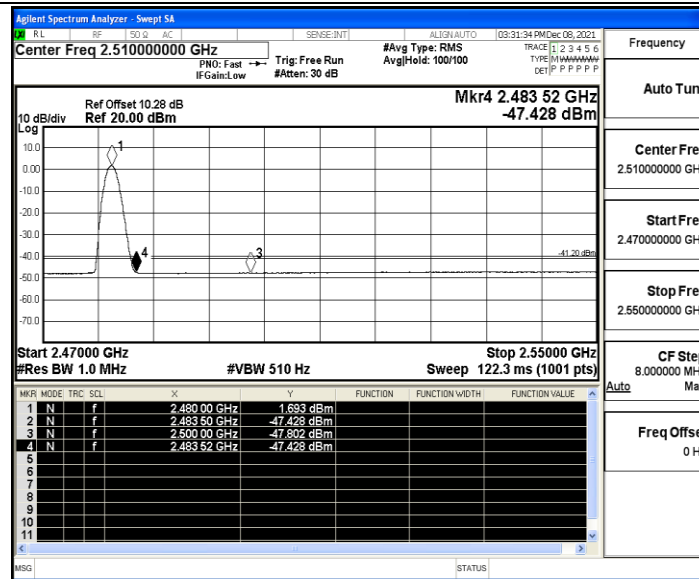
BLE_1M_Ant1_Low_2402_AV



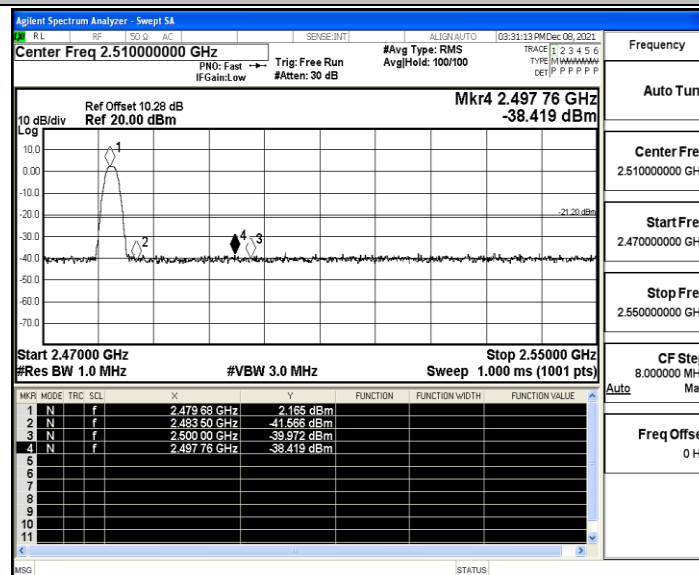
BLE_1M_Ant1_Low_2402_Peak



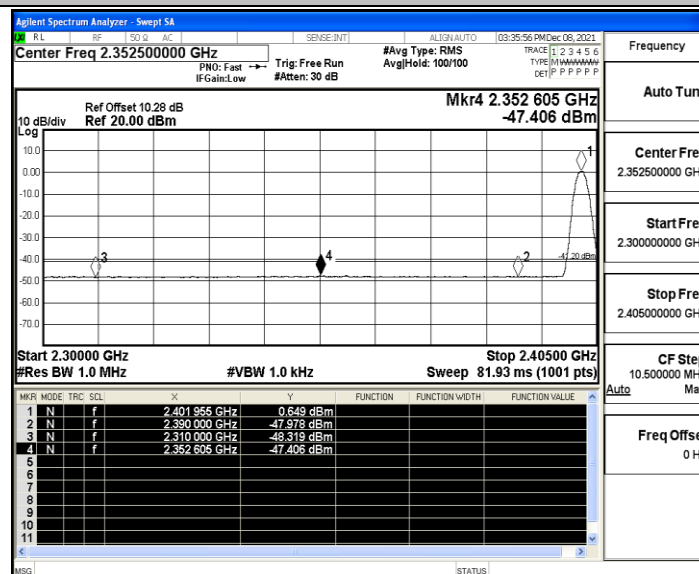
BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak

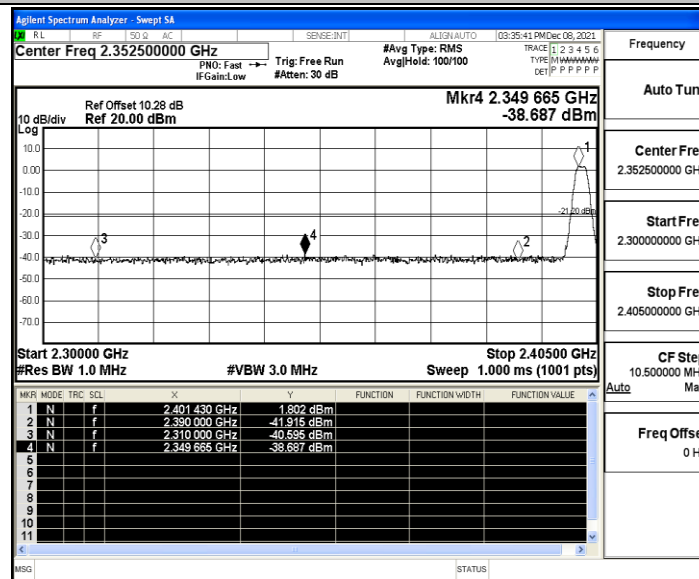


BLE_2M_Ant1_Low_2402_AV

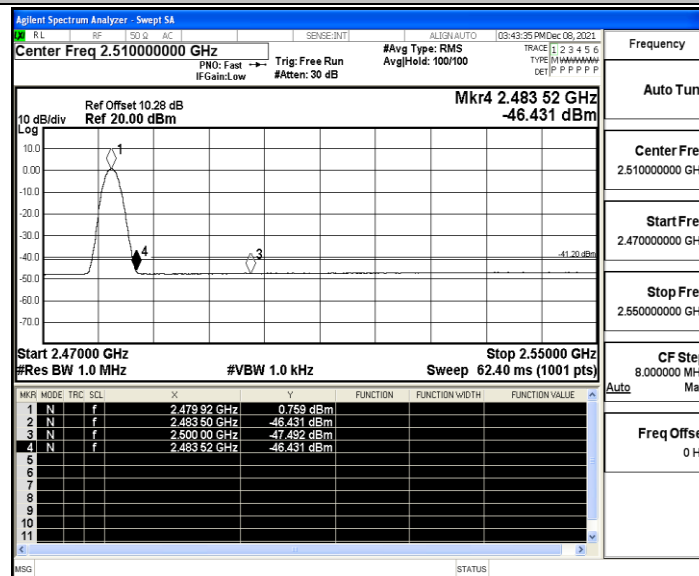




BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak

