RF Test Data for BT(BLE) (Conducted Measurement)

Product Name: Remote control

Trade Mark: N/A

Test Model: L13

FCC ID: 2ASXW-L13

Environmental Conditions

Temperature:	25.5°C
Relative Humidity:	55%
ATM Pressure:	100.0 kPa
Test Engineer:	Anna Hu
Supervised by:	Hugo Chen
NOTE	N/A

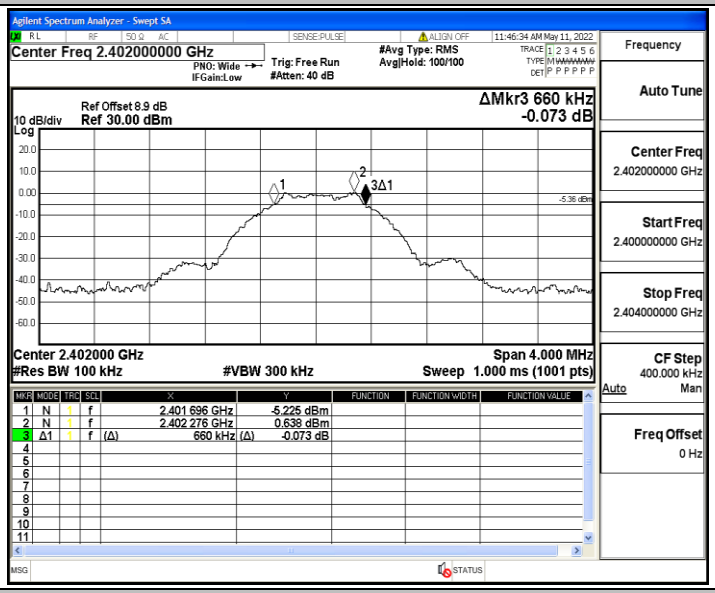
Appendix A: DTS Bandwidth

Test Result

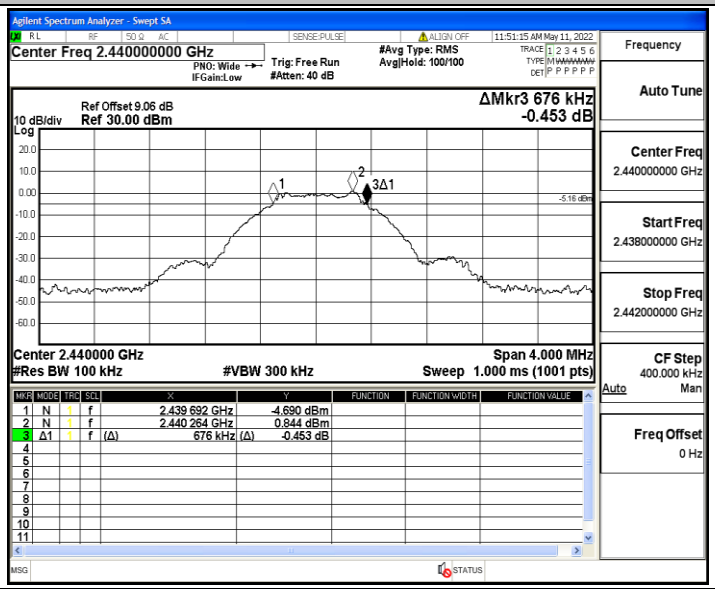
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.660	2401.696	2402.356	0.5	PASS
		2440	0.676	2439.692	2440.368	0.5	PASS
		2480	0.664	2479.696	2480.360	0.5	PASS

Test Graphs

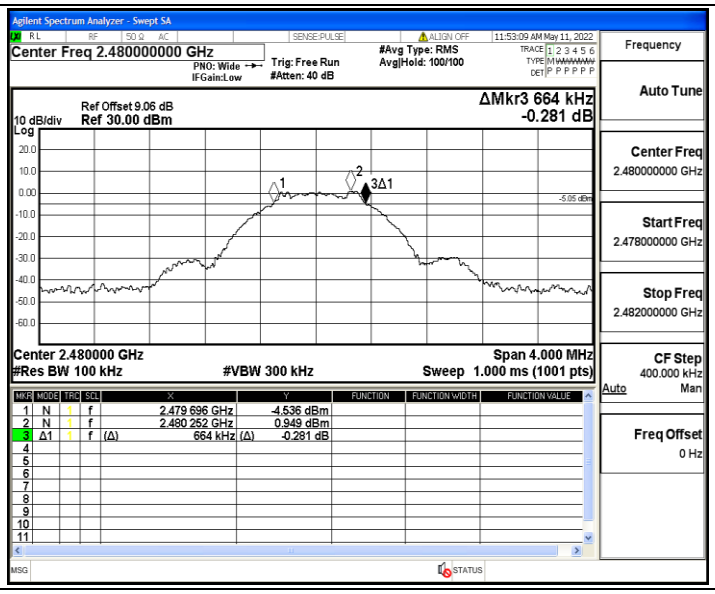
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
11:53:09 AM May 11, 2022
Frequency
Auto Tune
Ref Offset 9.06 dB
10 dB/div
Ref 30.00 dBm
ΔMkr3 664 kHz
-0.281 dB
Center Freq
2.480000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.482000000 GHz
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
Sweep 1.000 ms (1001 pts)
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
1 N 1 f 2.479 696 GHz -4.536 dBm
2 N 1 f 2.480 252 GHz 0.949 dBm
3 Δ1 1 f (Δ) 664 kHz (Δ) -0.281 dB
MSG
STATUS

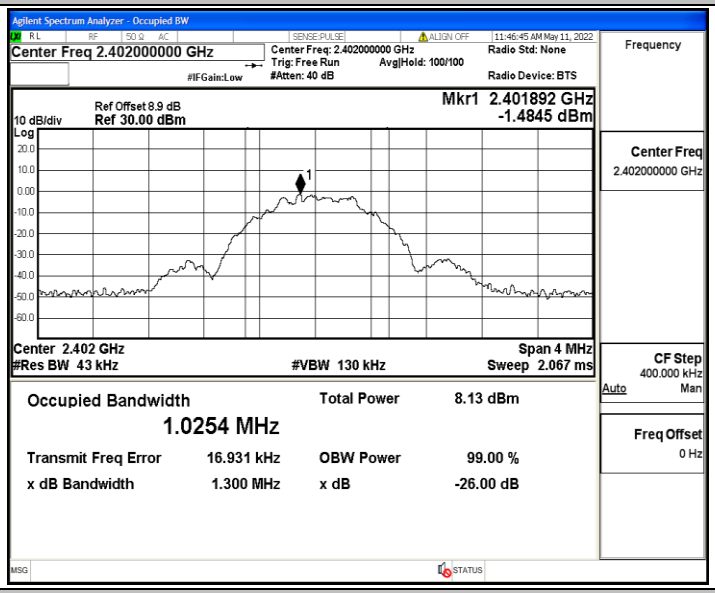
Appendix B: Occupied Channel Bandwidth

Test Result

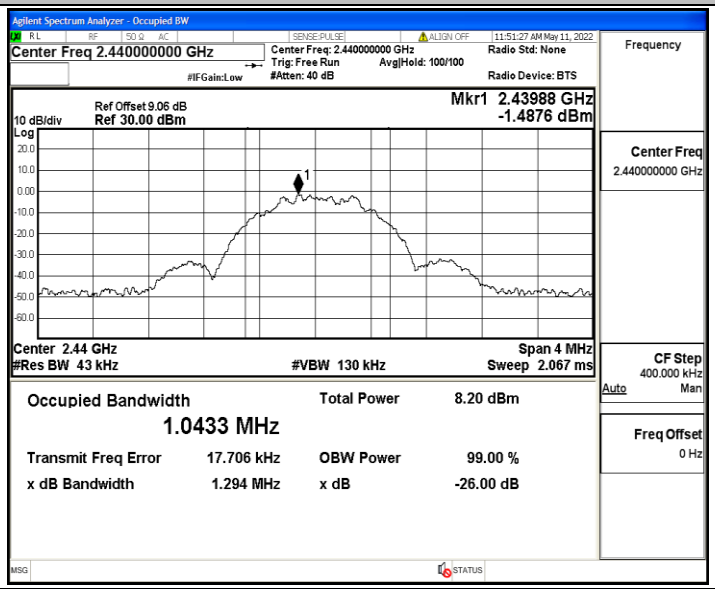
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0254	2401.504	2402.530	---	---
		2440	1.0433	2439.496	2440.539	---	---
		2480	1.0433	2479.502	2480.545	---	---

Test Graphs

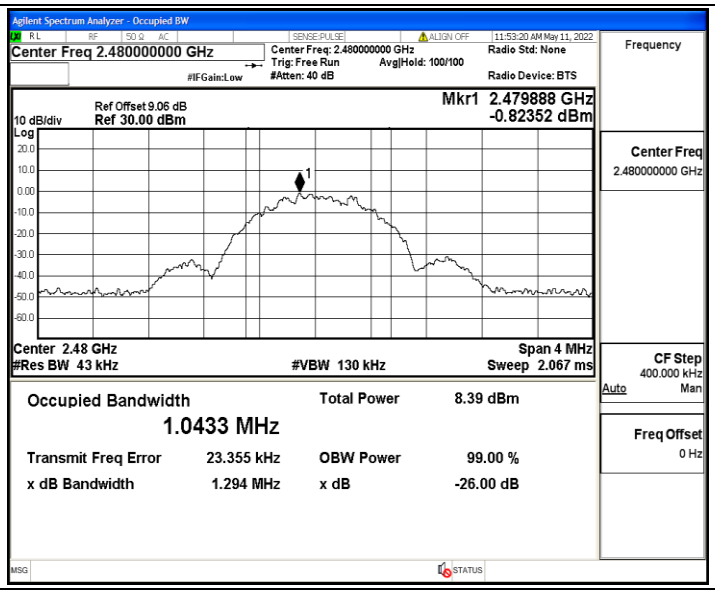
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
11:53:20 AM May 11, 2022
Frequency
Ref Offset 9.06 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.479888 GHz
-0.82352 dBm
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 43 kHz
#VBW 130 kHz
Span 4 MHz
Sweep 2.067 ms
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
Occupied Bandwidth
1.0433 MHz
Total Power 8.39 dBm
Transmit Freq Error 23.355 kHz
OBW Power 99.00 %
x dB Bandwidth 1.294 MHz
x dB -26.00 dB
MSG
STATUS

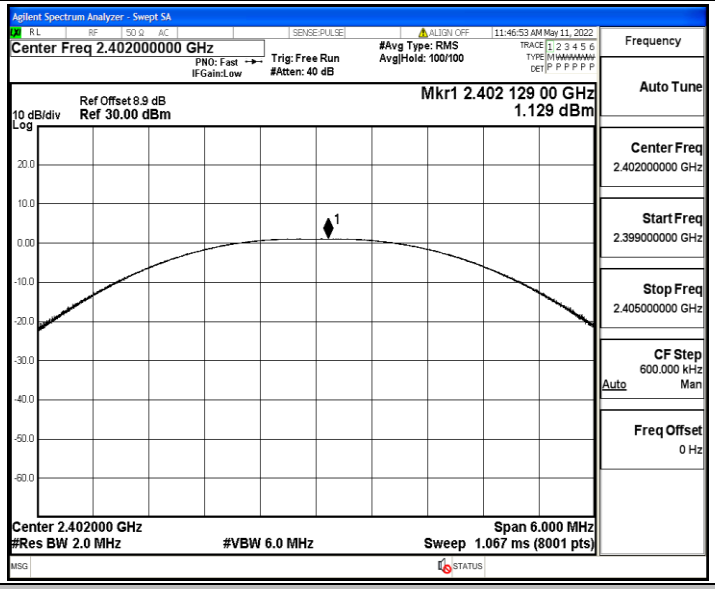
Appendix C: Maximum conducted output power

Test Result

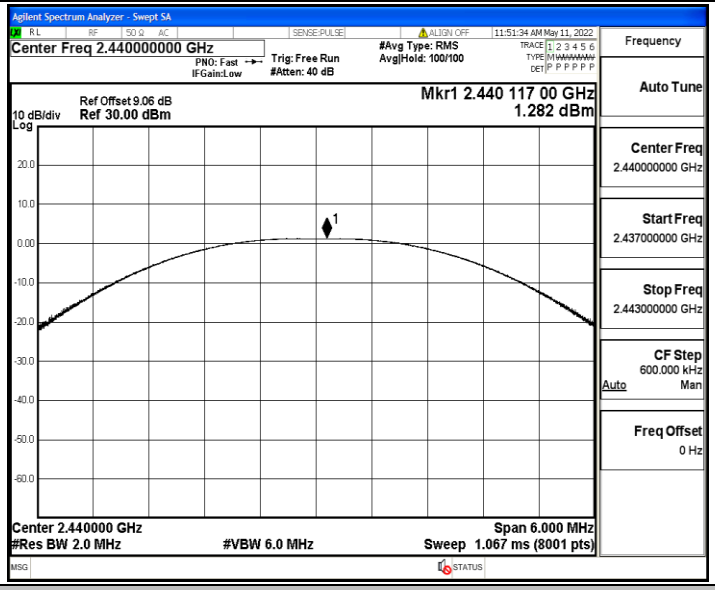
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	1.13	≤30	PASS
		2440	1.28	≤30	PASS
		2480	1.7	≤30	PASS

Test Graphs

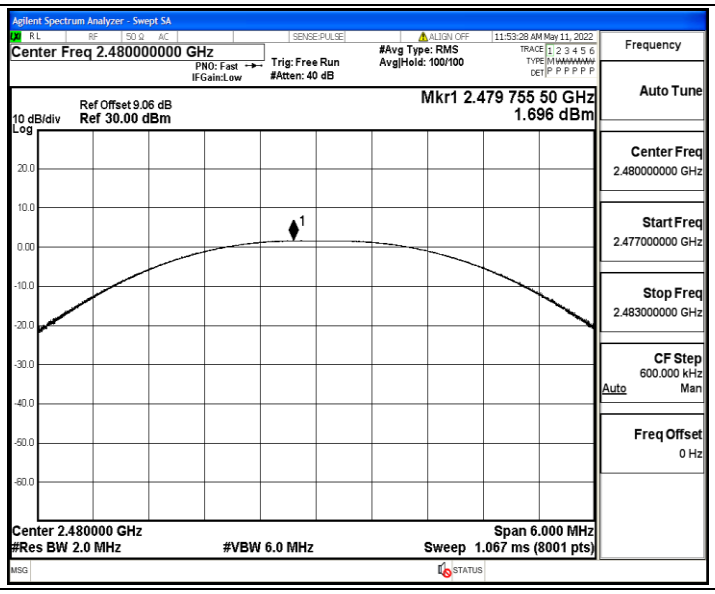
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
11:53:28 AM May 11, 2022
Frequency
Auto Tune
Ref Offset 9.06 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 2.479 755 50 GHz
1.696 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center Freq
2.480000000 GHz
Start Freq
2.477000000 GHz
Stop Freq
2.483000000 GHz
CF Step
600.000 kHz
Auto
Man
Freq Offset
0 Hz
Center 2.480000 GHz
#Res BW 2.0 MHz
#VBW 6.0 MHz
Span 6.000 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS

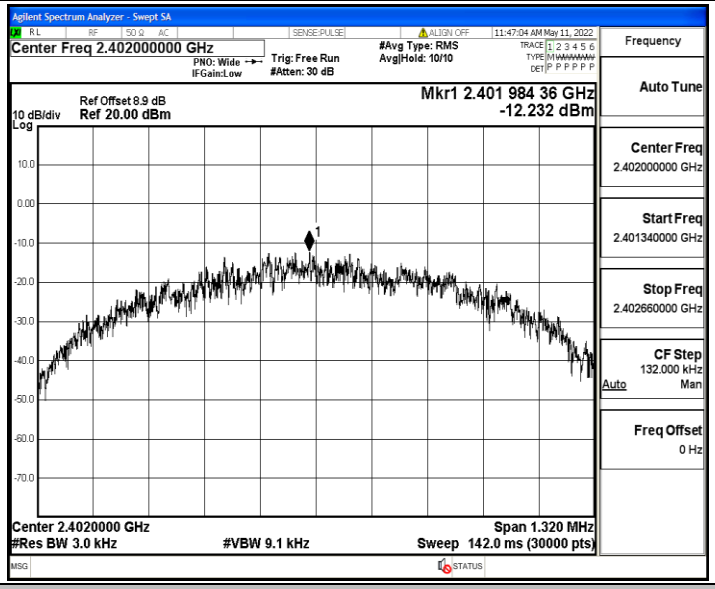
Appendix D: Maximum power spectral density

Test Result

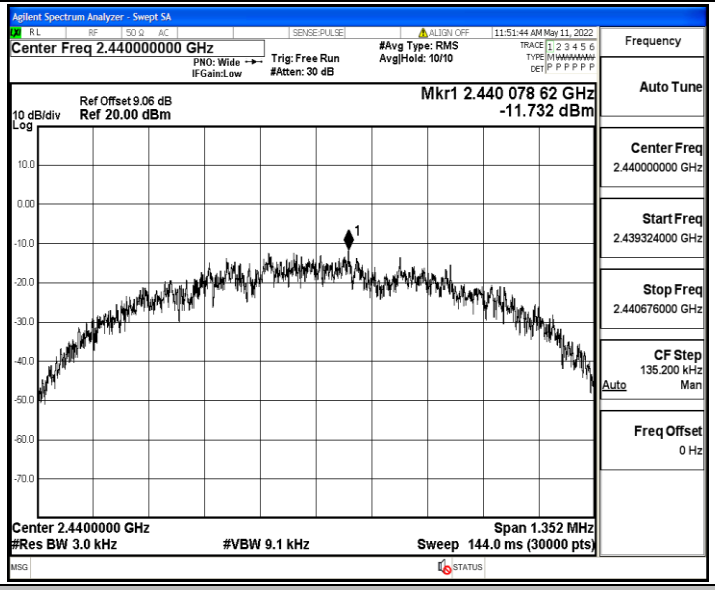
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-12.23	≤8.00	PASS
		2440	-11.73	≤8.00	PASS
		2480	-11.37	≤8.00	PASS

Test Graphs

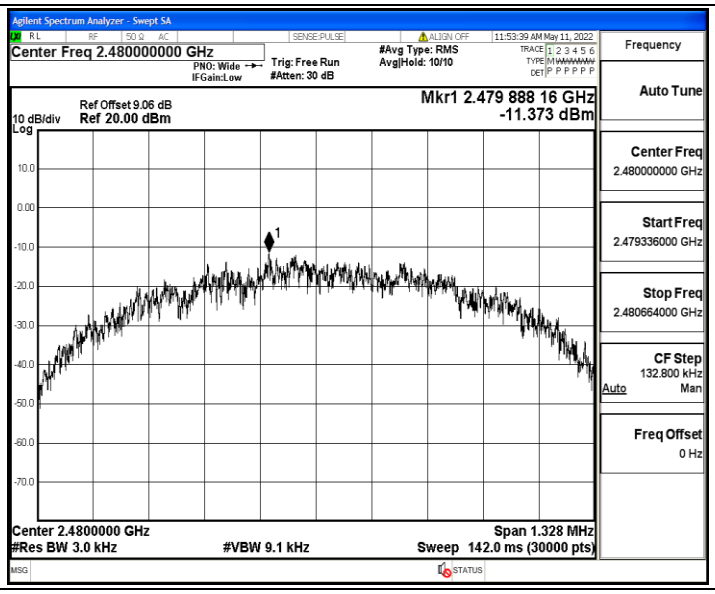
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
11:53:39 AM May 11, 2022
Frequency
Auto Tune
Ref Offset 9.06 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 888 16 GHz
-11.373 dBm
Center Freq
2.480000000 GHz
Start Freq
2.479336000 GHz
Stop Freq
2.480664000 GHz
CF Step
132.800 kHz
Auto
Man
Freq Offset
0 Hz
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 9.1 kHz
Span 1.328 MHz
Sweep 142.0 ms (30000 pts)

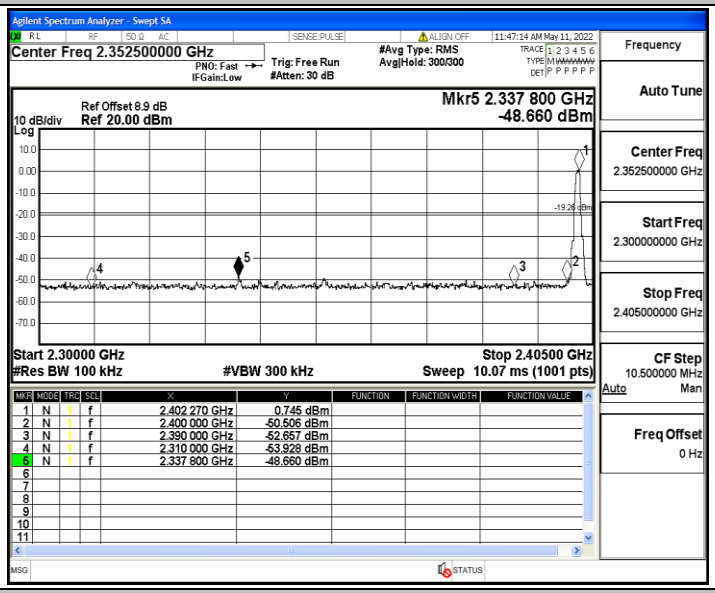
Appendix E: Band edge measurements

Test Result

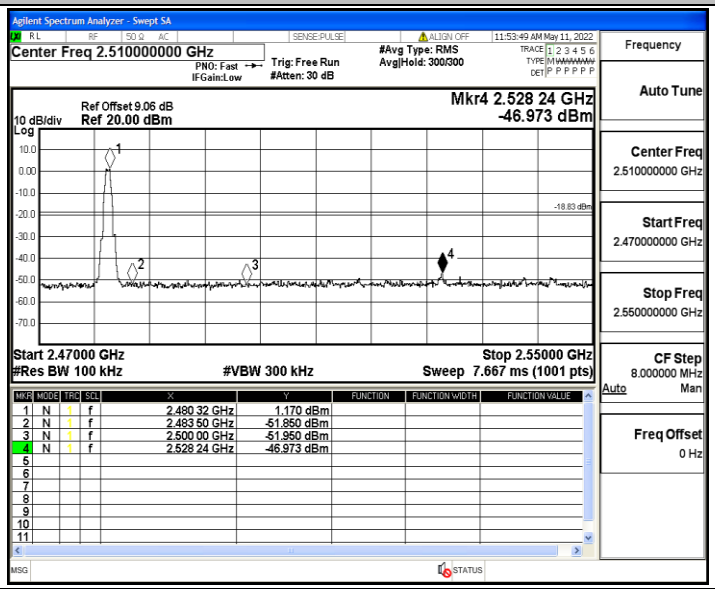
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.75	-48.66	≤-19.26	PASS
		High	2480	1.17	-46.97	≤-18.83	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



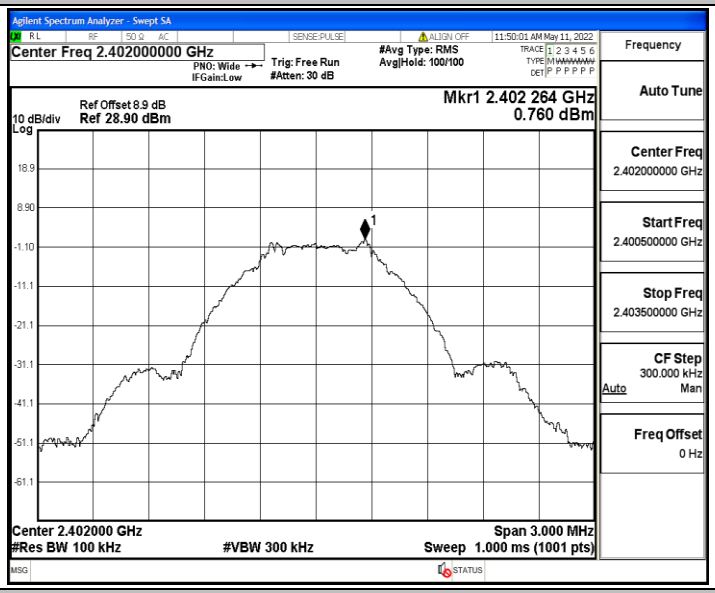
Appendix F: Conducted Spurious Emission

Test Result

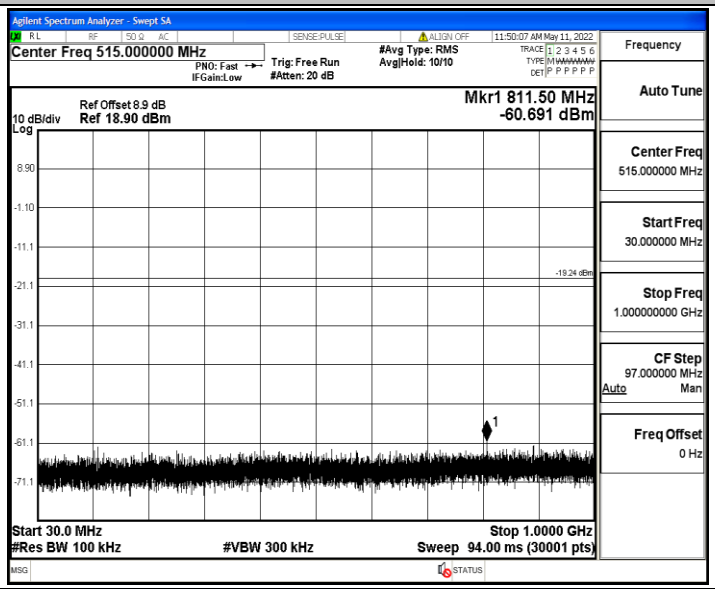
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	0.76	0.76	---	PASS
			30~1000	0.76	-60.69	≤-19.24	PASS
			1000~26500	0.76	-33.49	≤-19.24	PASS
		2440	Reference	0.84	0.84	---	PASS
			30~1000	0.84	-60.95	≤-19.16	PASS
			1000~26500	0.84	-34.09	≤-19.16	PASS
		2480	Reference	1.18	1.18	---	PASS
			30~1000	1.18	-61.42	≤-18.82	PASS
			1000~26500	1.18	-36.04	≤-18.82	PASS

Test Graphs

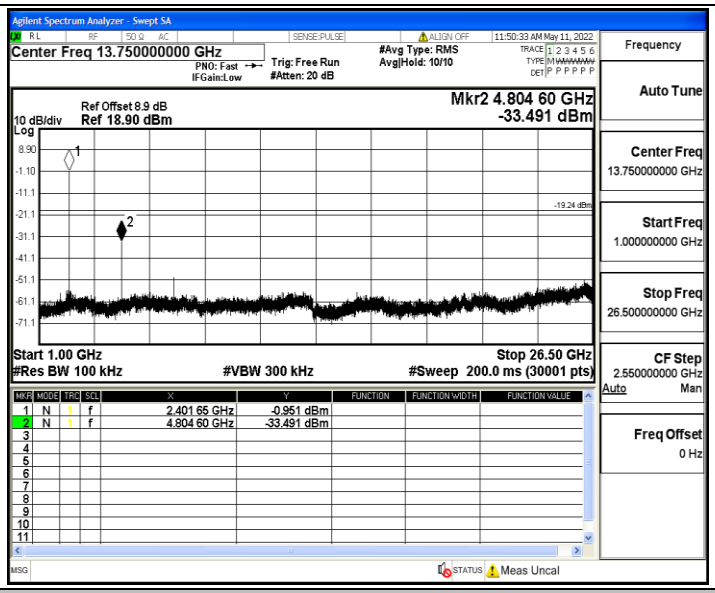
BLE_1M_Ant1_2402_0~Reference



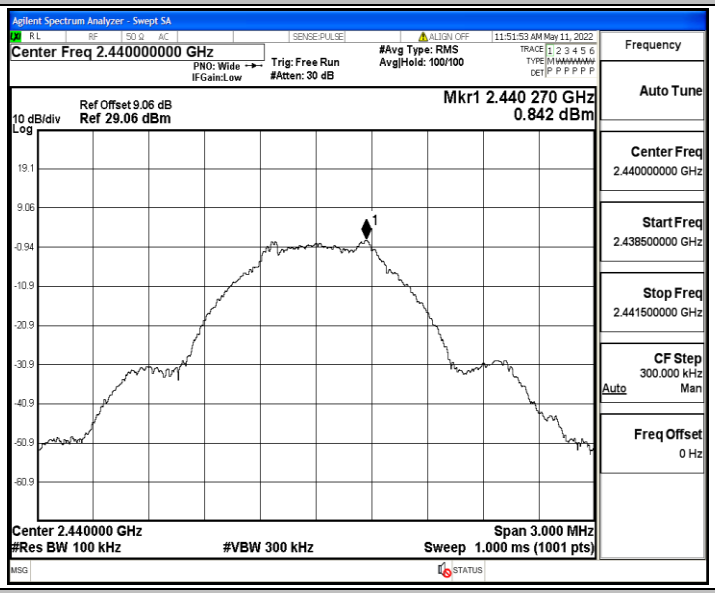
BLE_1M_Ant1_2402_30~1000



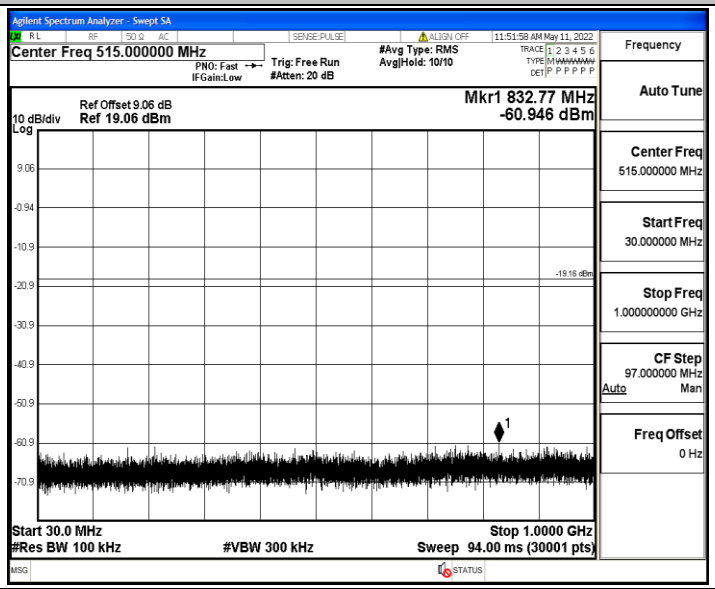
BLE_1M_Ant1_2402_1000~26500



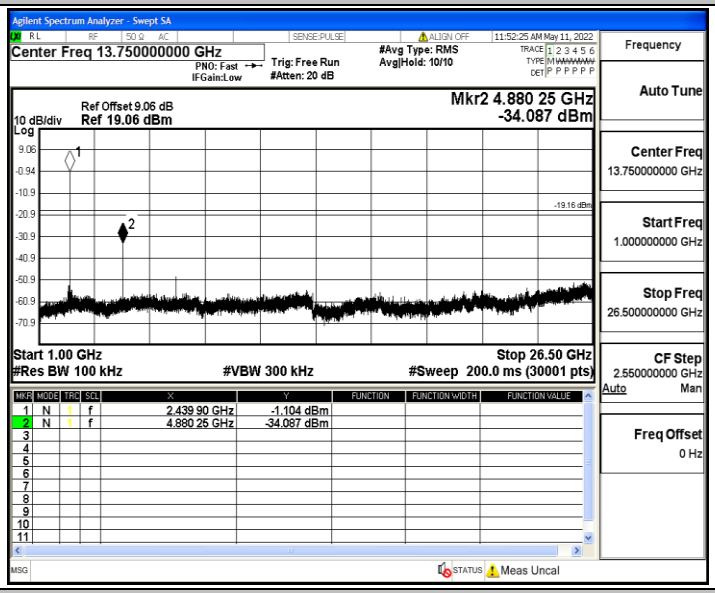
BLE_1M_Ant1_2440_0~Reference



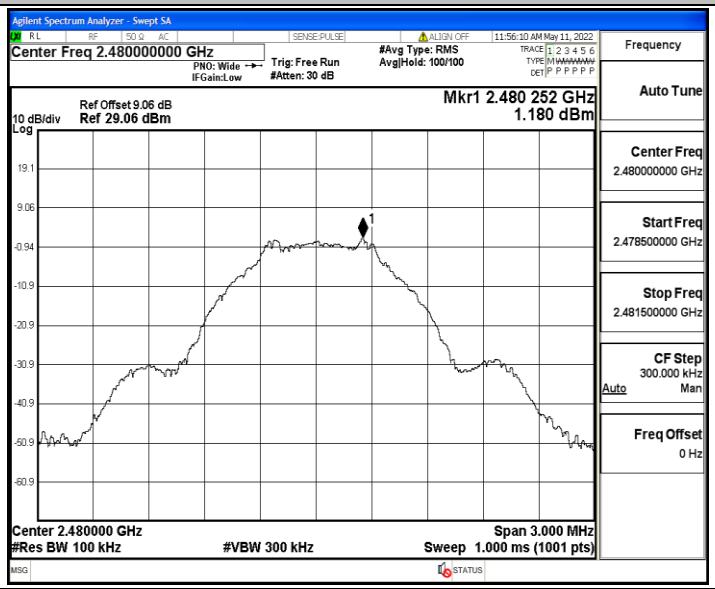
BLE_1M_Ant1_2440_30~1000



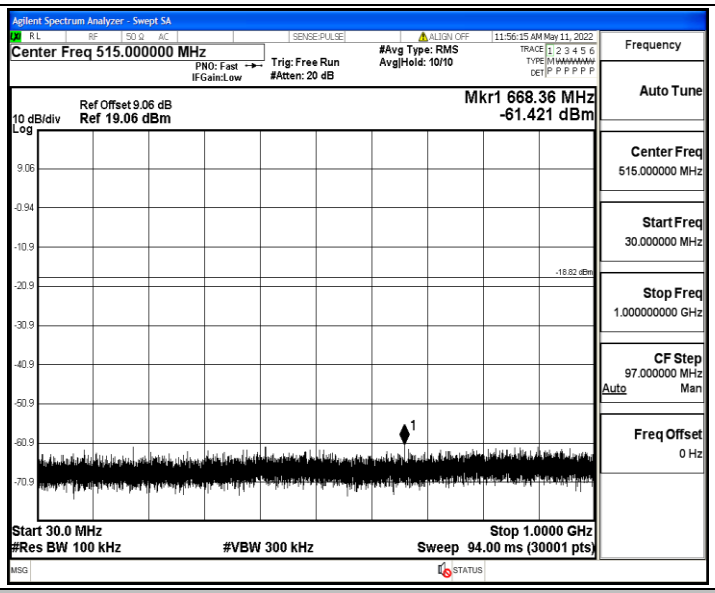
BLE_1M_Ant1_2440_1000~26500



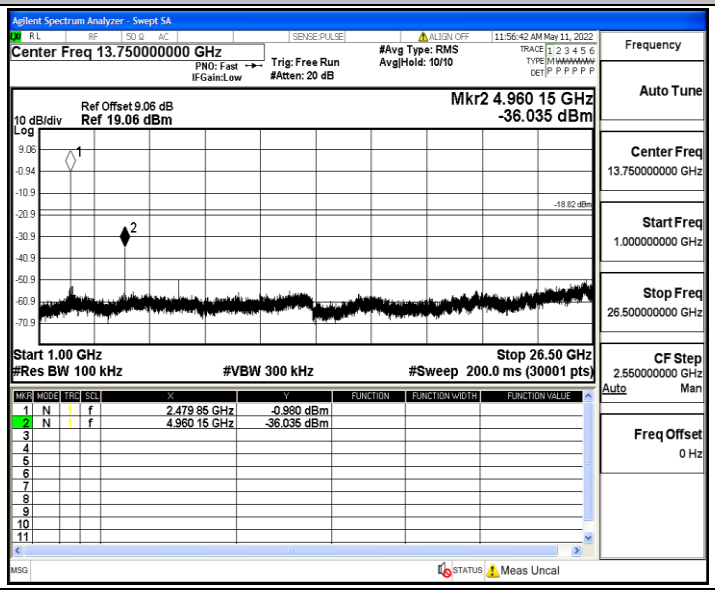
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500



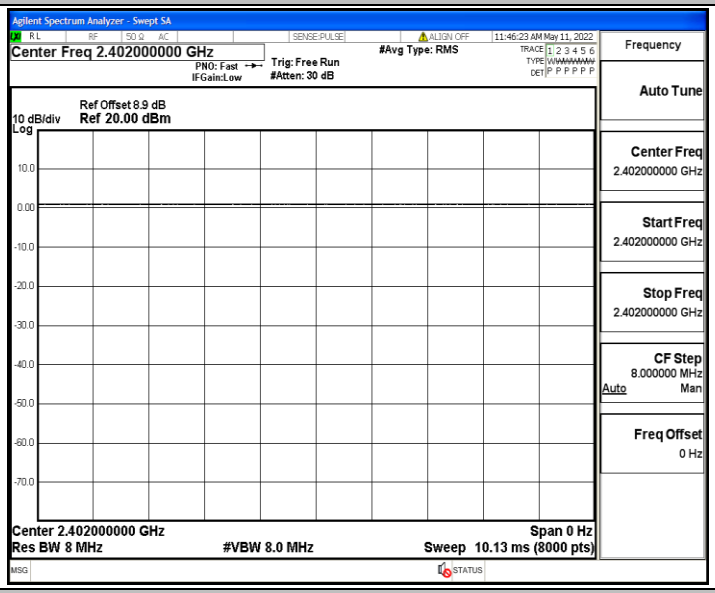
Appendix G: Duty Cycle

Test Result

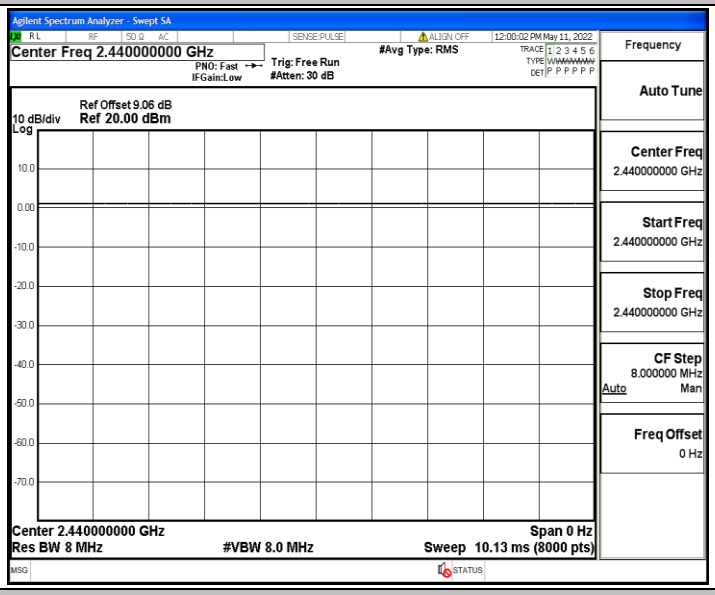
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T
BLE_1M	Ant1	2402	0.00	0.00	100	∞
		2440	0.00	0.00	100	∞
		2480	0.00	0.00	100	∞

Test Graphs

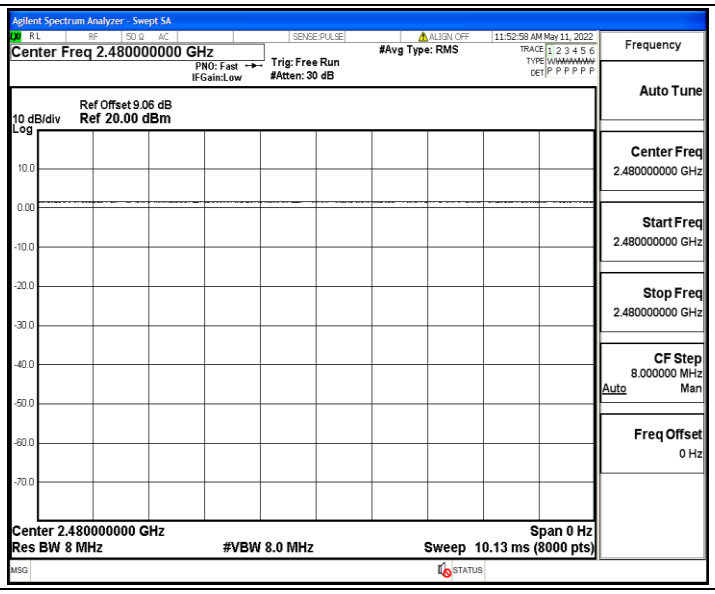
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
11:52:58 AM May 11, 2022
Ref Offset 9.06 dB
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.480000000 GHz
Stop Freq
2.480000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Appendix H: Emissions in Restricted Bands

Test Result

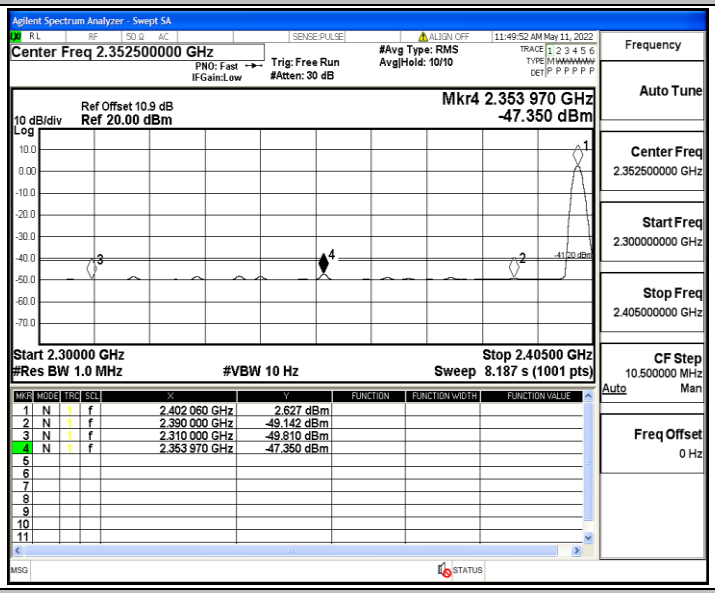
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-49.81	≤-41.20	PASS
				AV	2353.970	-47.35	≤-41.20	PASS
				AV	2390.000	-49.14	≤-41.20	PASS
				Peak	2310.000	-43.49	≤-21.20	PASS
				Peak	2337.275	-39.87	≤-21.20	PASS
				Peak	2390.000	-42.86	≤-21.20	PASS
		High	2480	AV	2483.500	-48.15	≤-41.20	PASS
				AV	2483.520	-48.15	≤-41.20	PASS
				AV	2500.000	-48.91	≤-41.20	PASS
				Peak	2483.500	-44.13	≤-21.20	PASS
				Peak	2491.440	-40.84	≤-21.20	PASS
				Peak	2500.000	-44.16	≤-21.20	PASS

Note：

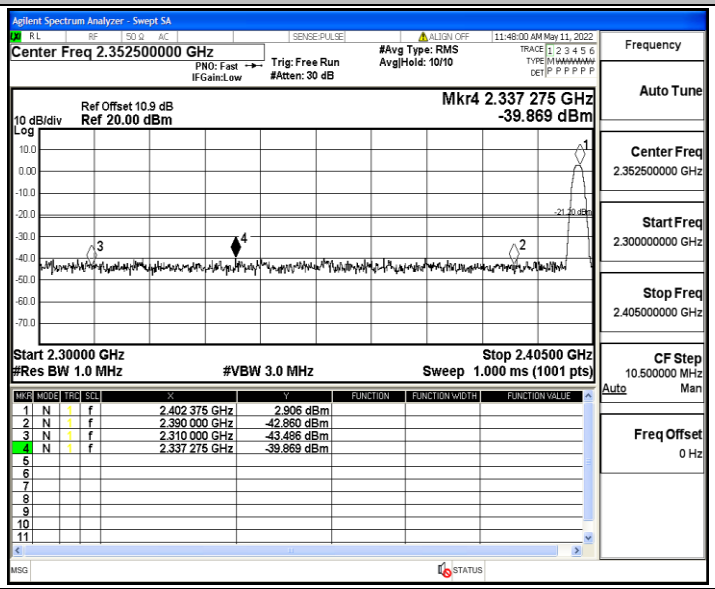
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

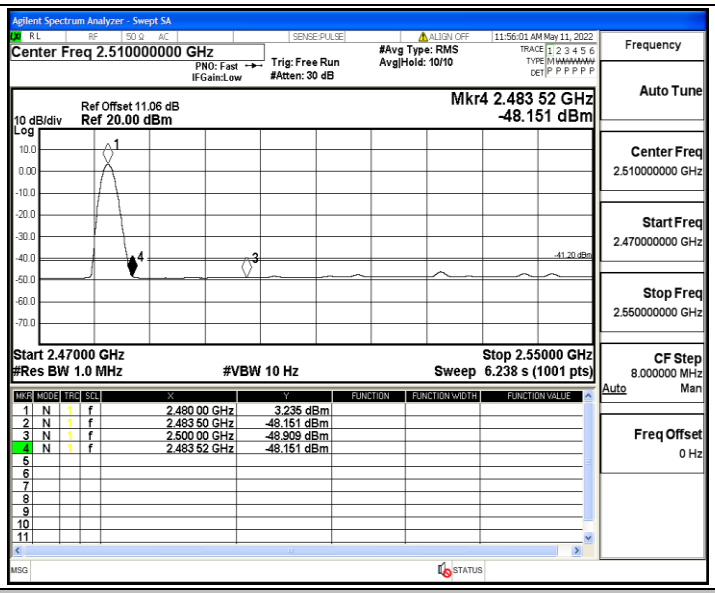
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak