Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: LED Bluetooth Floodlight

Test Model: E50BL

Environmental Conditions

Temperature:	23.5° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

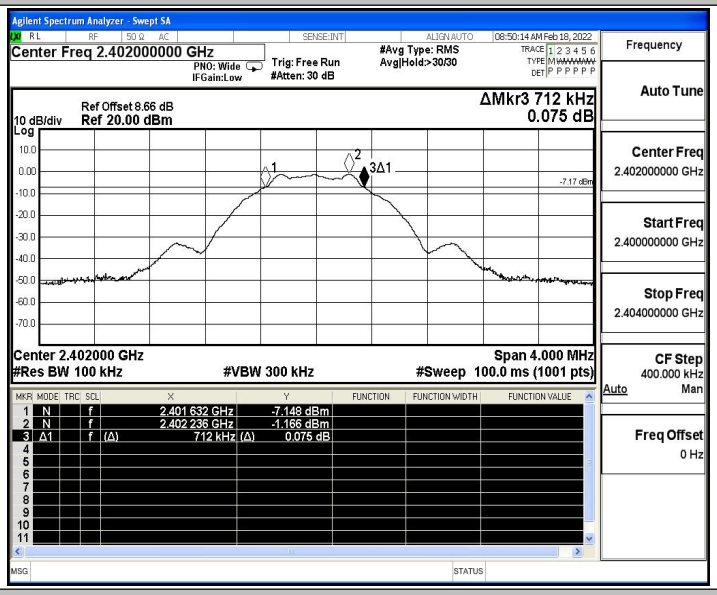
A.1 6dB Bandwidth

Test Result

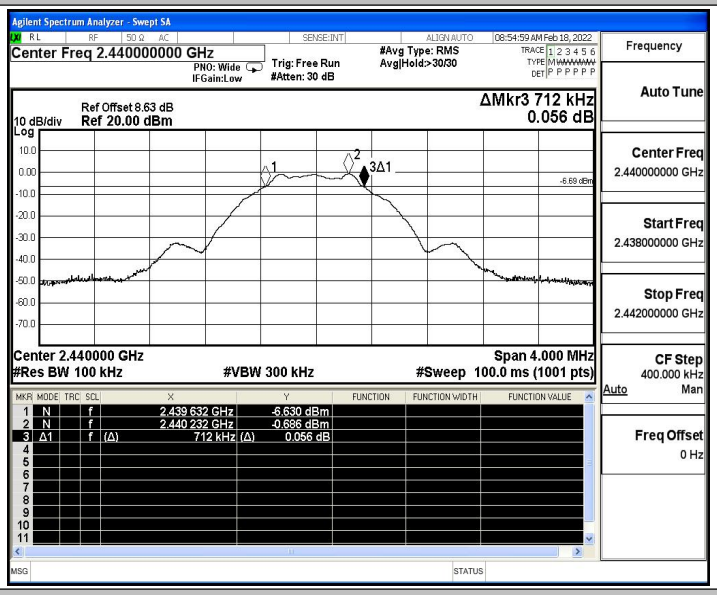
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.712	2401.632	2402.344	0.5	PASS
		2440	0.712	2439.632	2440.344	0.5	PASS
		2480	0.712	2479.632	2480.344	0.5	PASS

Test Graphs

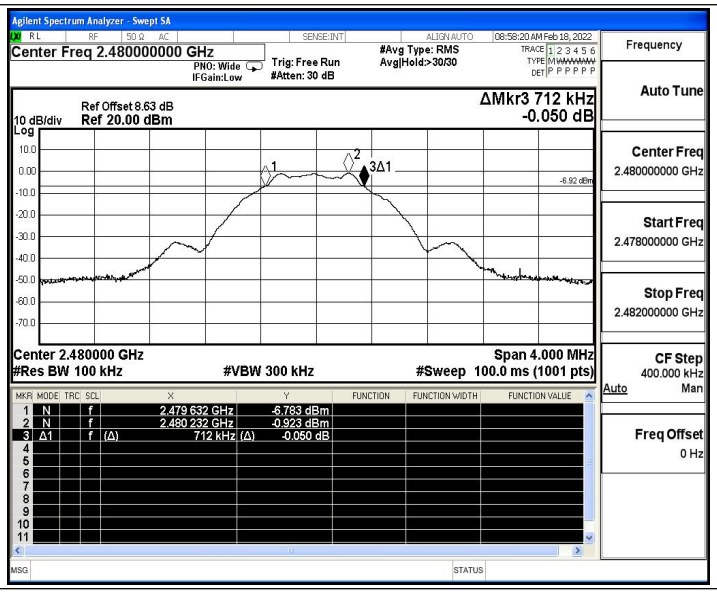
BLE_1M_Ant1_2402



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: 30 dB
#Avg Type: RMS
Avg|Hold:>30/30
08:58:20 AM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
Log
ΔMkr3 712 kHz
-0.050 dB
-6.92 dBm
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
#Sweep 100.0 ms (1001 pts)
1 N f 2.479 632 GHz -6.783 dBm
2 N f 2.480 232 GHz -0.923 dBm
3 Δ1 f (Δ) 712 kHz (Δ) -0.050 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.482000000 GHz
CF Step
400.000 kHz
Auto Man
Freq Offset
0 Hz

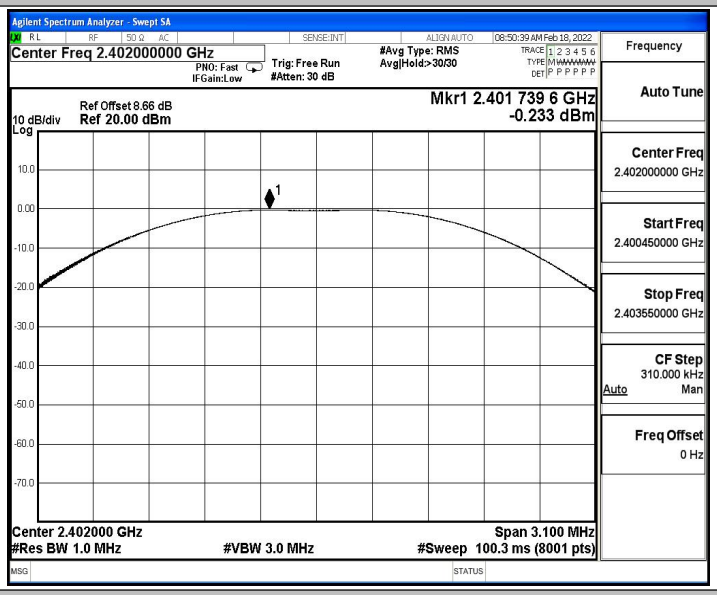
A.2 Maximum conducted output power

Test Result

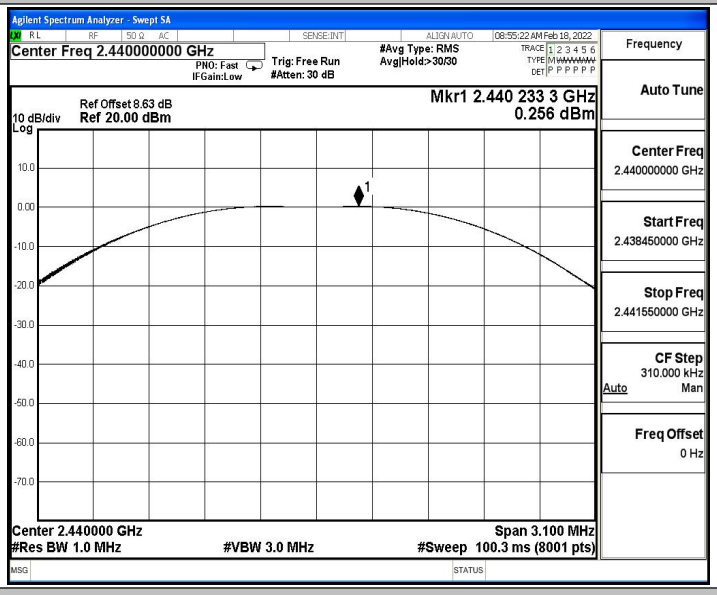
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-0.23	≤30	PASS
		2440	0.26	≤30	PASS
		2480	0.02	≤30	PASS

Test Graphs

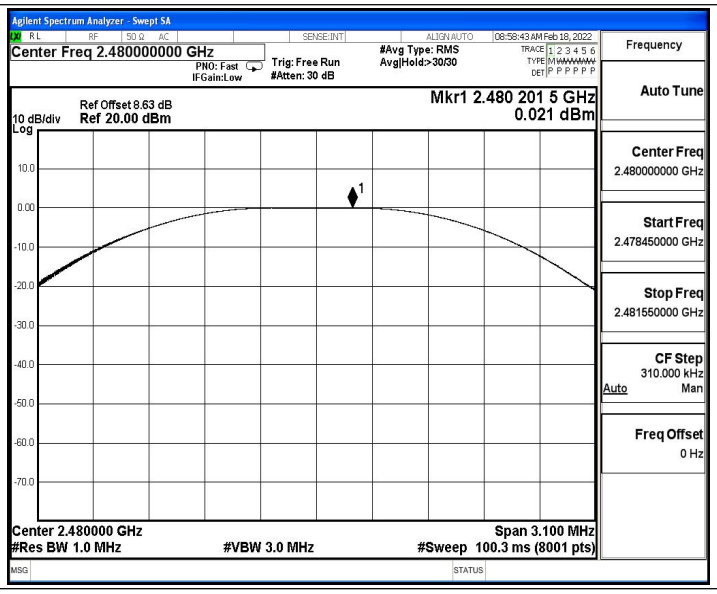
BLE_1M_Ant1_2402



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: 30 dB
#Avg Type: RMS
Avg|Hold:>30/30
08:58:43 AM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.480 201 5 GHz
0.021 dBm
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.100 MHz
#Sweep 100.3 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478450000 GHz
Stop Freq
2.481550000 GHz
CF Step
310.000 kHz
Auto
Man
Freq Offset
0 Hz

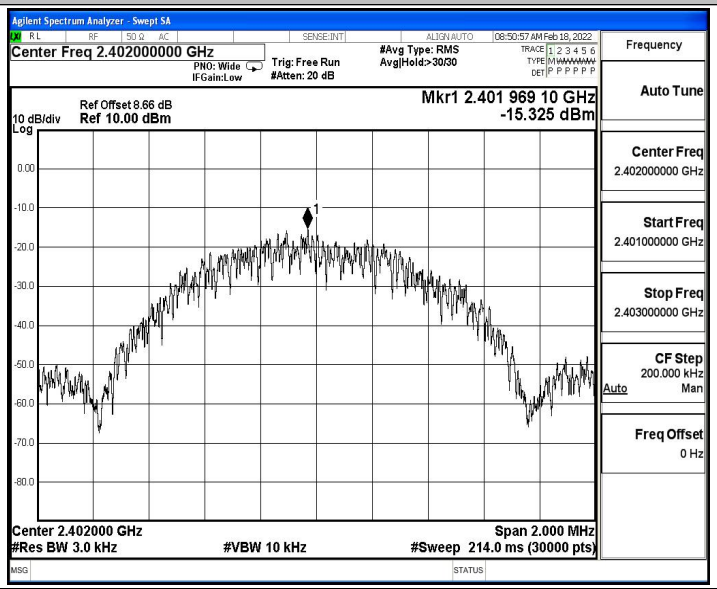
A.3 Maximum power spectral density

Test Result

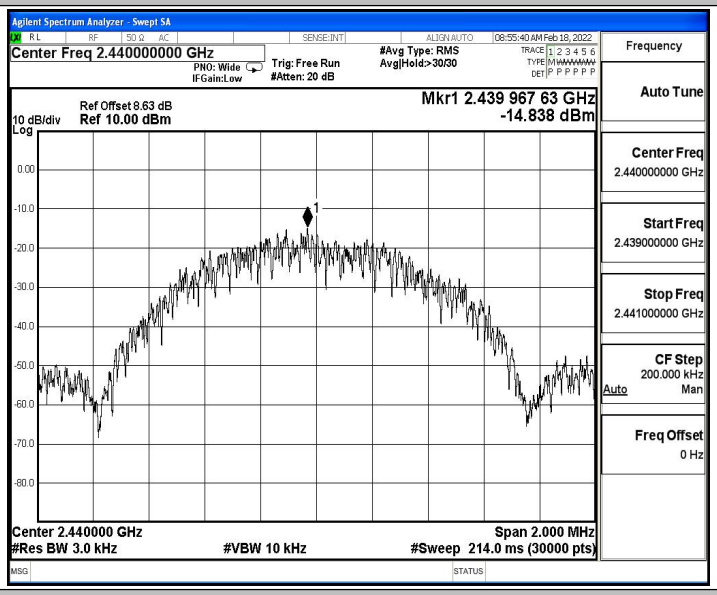
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.33	≤8.00	PASS
		2440	-14.84	≤8.00	PASS
		2480	-15.17	≤8.00	PASS

Test Graphs

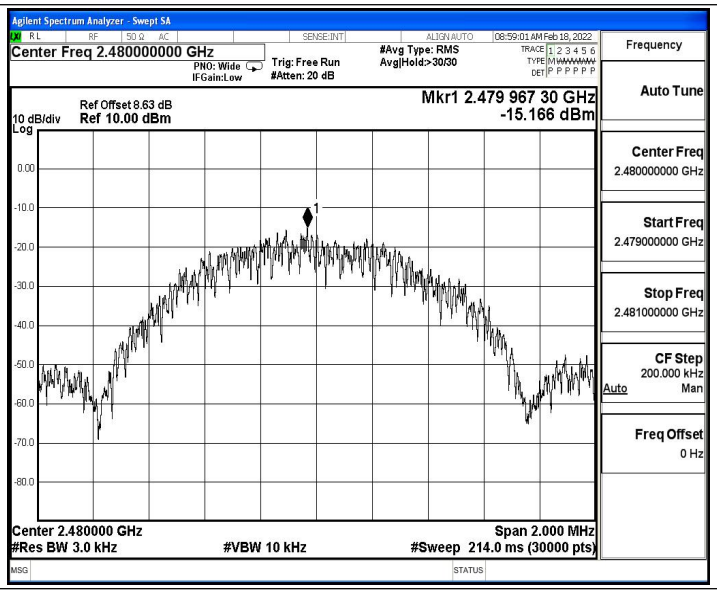
BLE_1M_Ant1_2402



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: 20 dB
#Avg Type: RMS
Avg|Hold:>30/30
08:59:01 AM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div Ref 10.00 dBm
Log
Mkr1 2.479 967 30 GHz
-15.166 dBm
Center 2.480000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 2.000 MHz
#Sweep 214.0 ms (30000 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479000000 GHz
Stop Freq
2.481000000 GHz
CF Step
200.000 kHz
Auto Man
Freq Offset
0 Hz

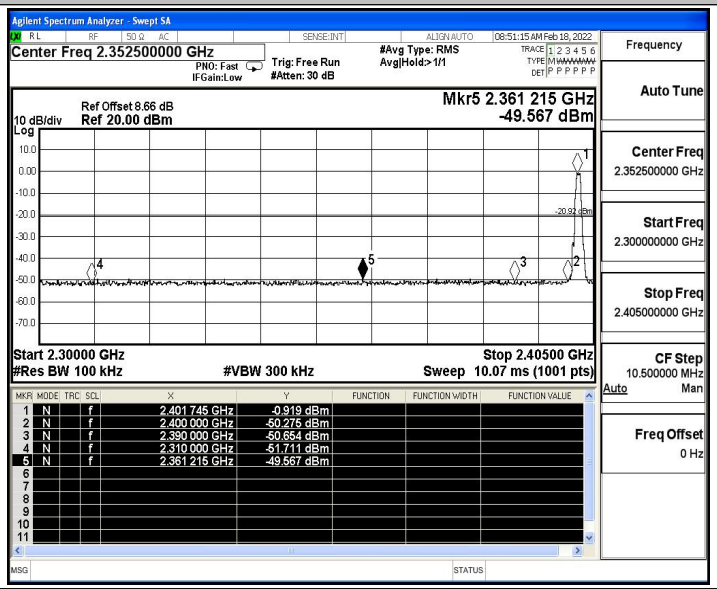
A.4 Band edge measurements

Test Result

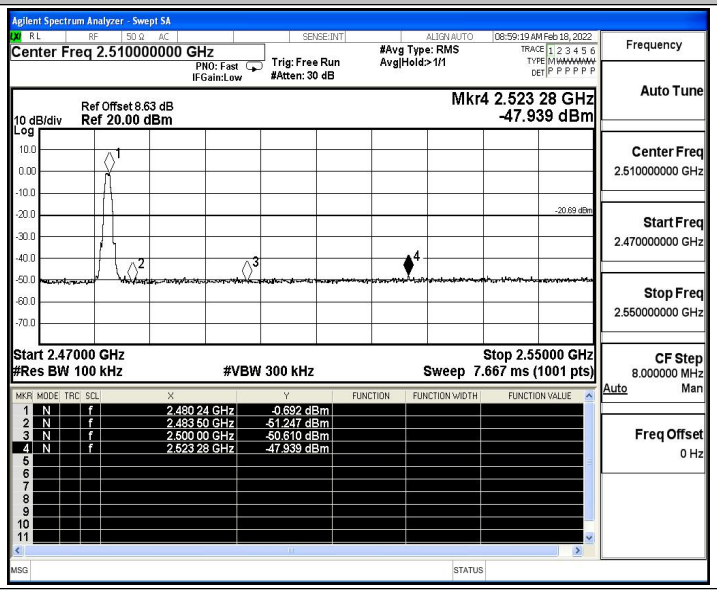
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-0.92	-49.57	≤-20.92	PASS
		High	2480	-0.69	-47.94	≤-20.69	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



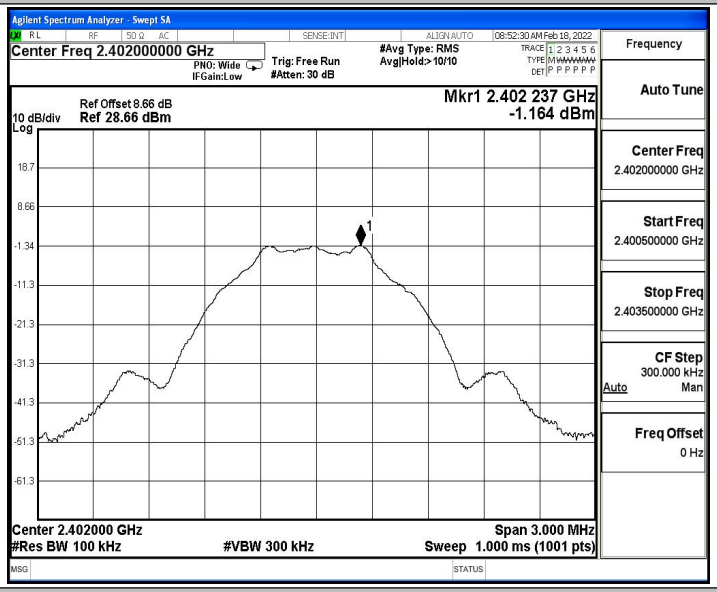
A.5 Conducted Spurious Emission

Test Result

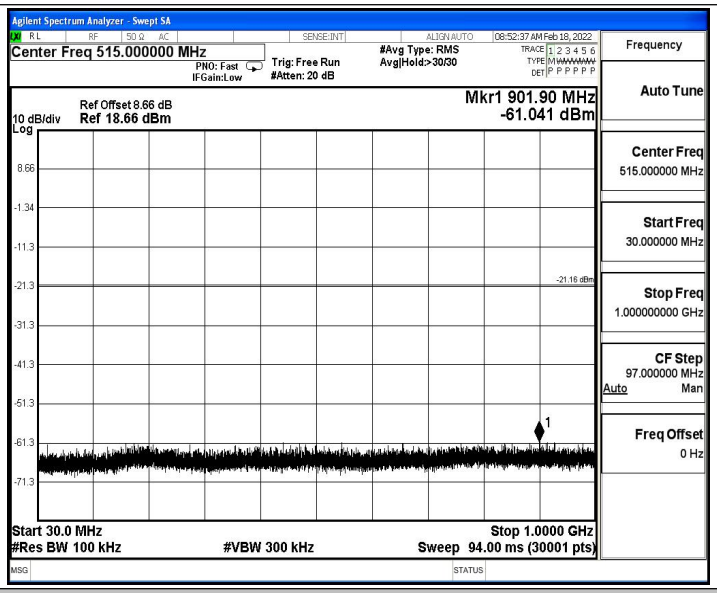
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-1.16	-1.16	---	PASS
			30~1000	-1.16	-61.04	≤-21.16	PASS
			1000~26500	-1.16	-46.43	≤-21.16	PASS
		2440	Reference	-0.67	-0.67	---	PASS
			30~1000	-0.67	-60.6	≤-20.67	PASS
			1000~26500	-0.67	-46.16	≤-20.67	PASS
		2480	Reference	-0.94	-0.94	---	PASS
			30~1000	-0.94	-60.43	≤-20.94	PASS
			1000~26500	-0.94	-46.5	≤-20.94	PASS

Test Graphs

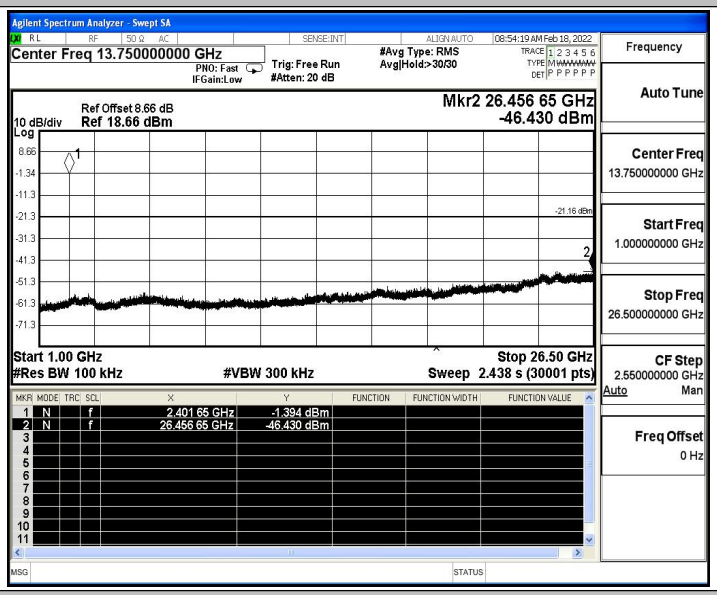
BLE_1M_Ant1_2402_0~Reference



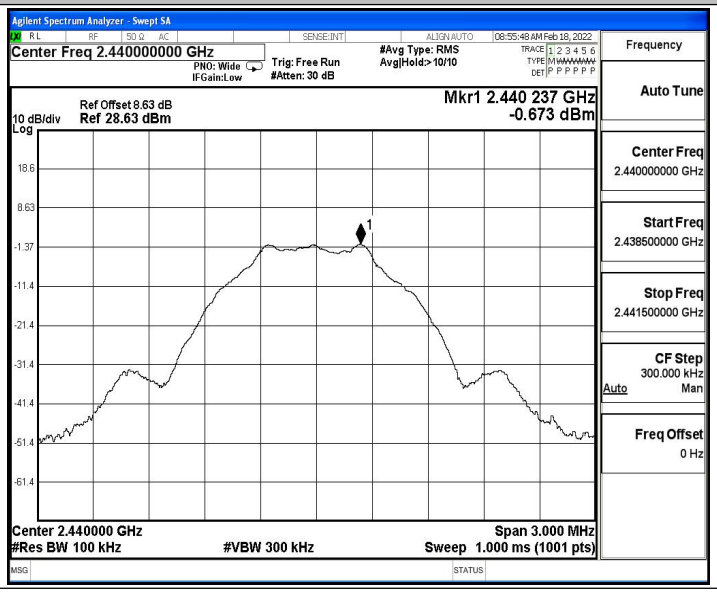
BLE_1M_Ant1_2402_30~1000



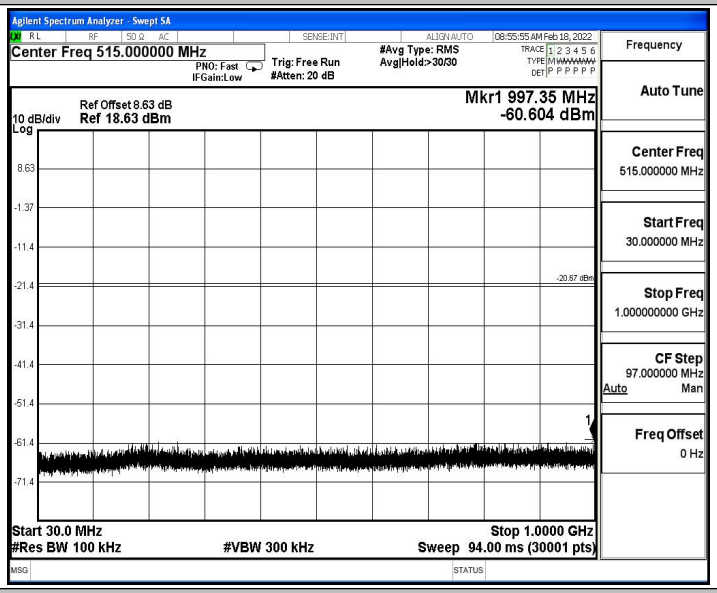
BLE_1M_Ant1_2402_1000~26500



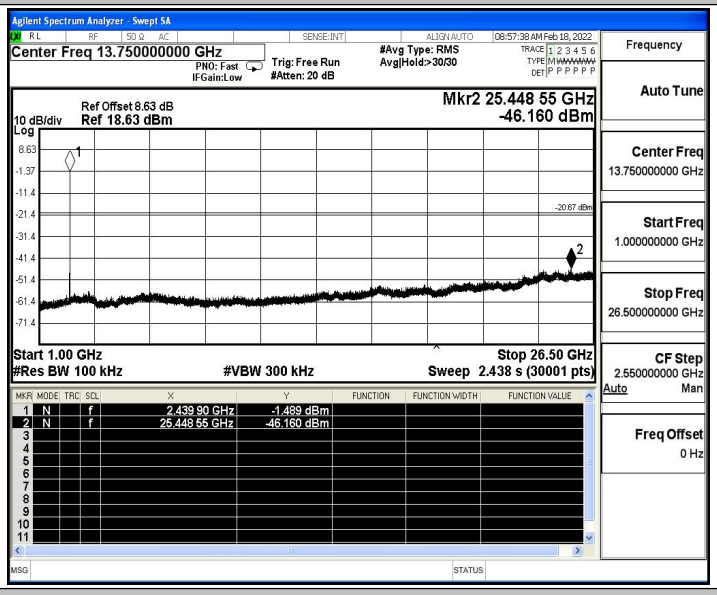
BLE_1M_Ant1_2440_0~Reference



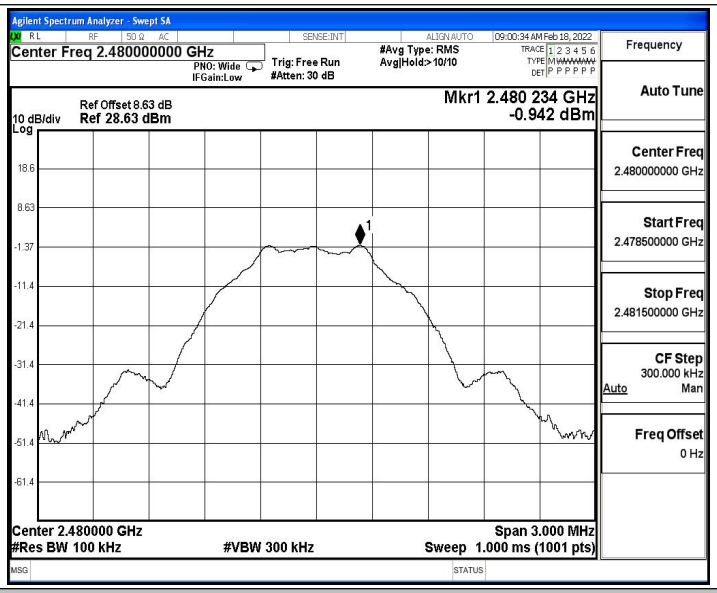
BLE_1M_Ant1_2440_30~1000



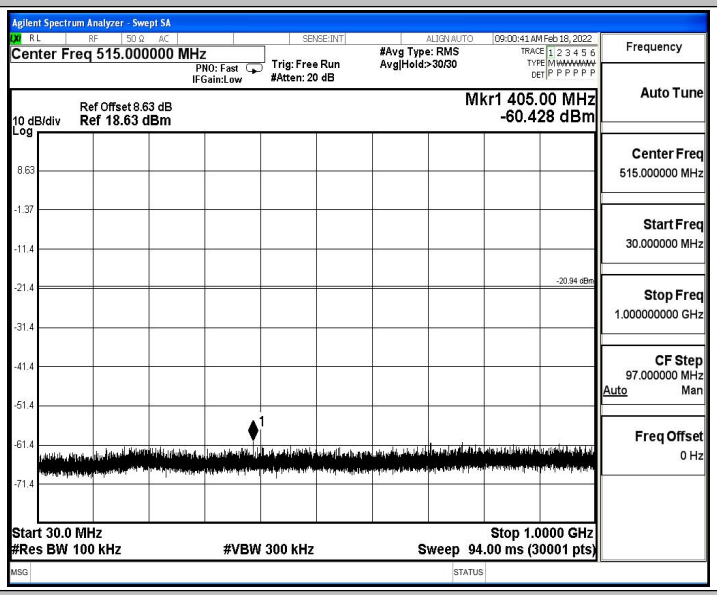
BLE_1M_Ant1_2440_1000~26500



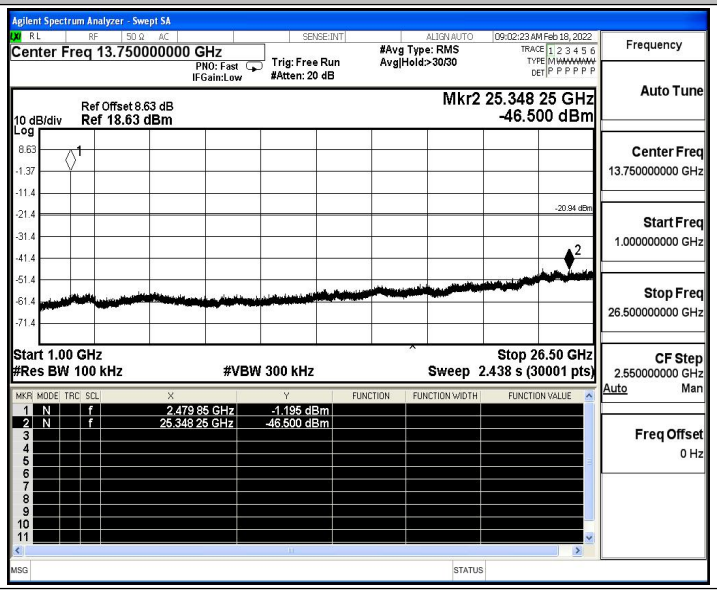
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500



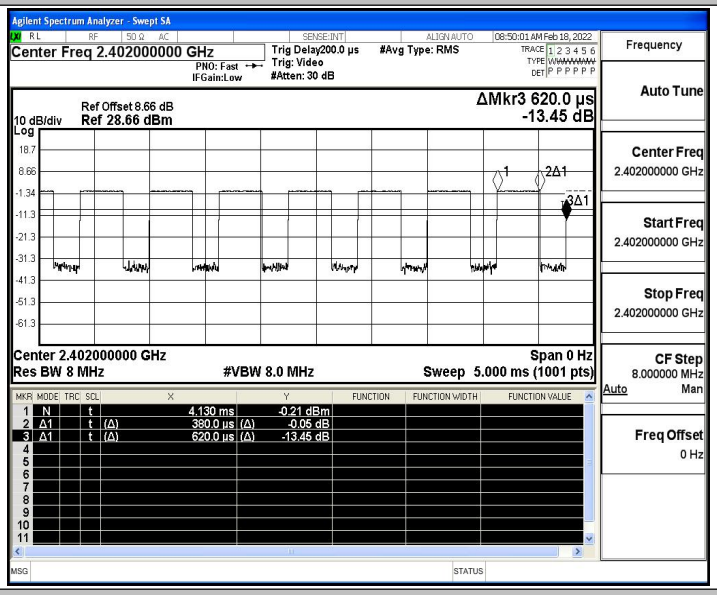
A.6 Duty Cycle

Test Result

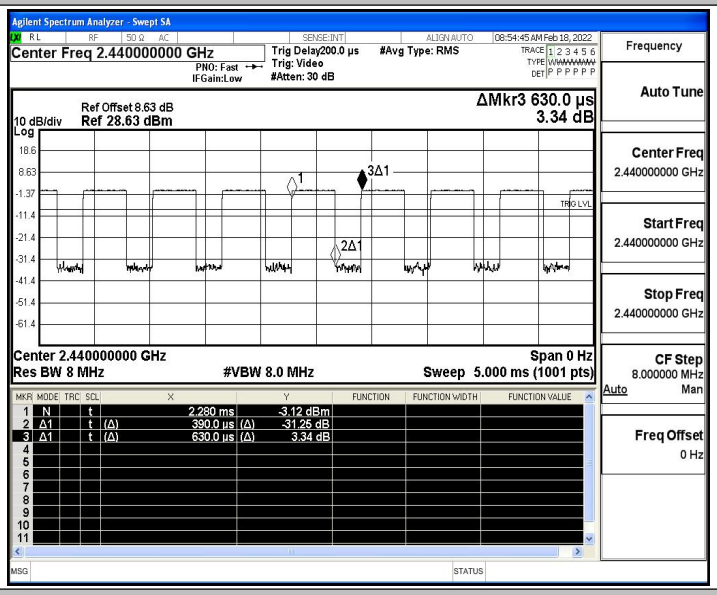
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.38	0.62	0.6129	61.29	2.13	---	---
		2440	0.39	0.63	0.6190	61.90	2.08	---	---
		2480	0.38	0.62	0.6129	61.29	2.13	---	---

Test Graphs

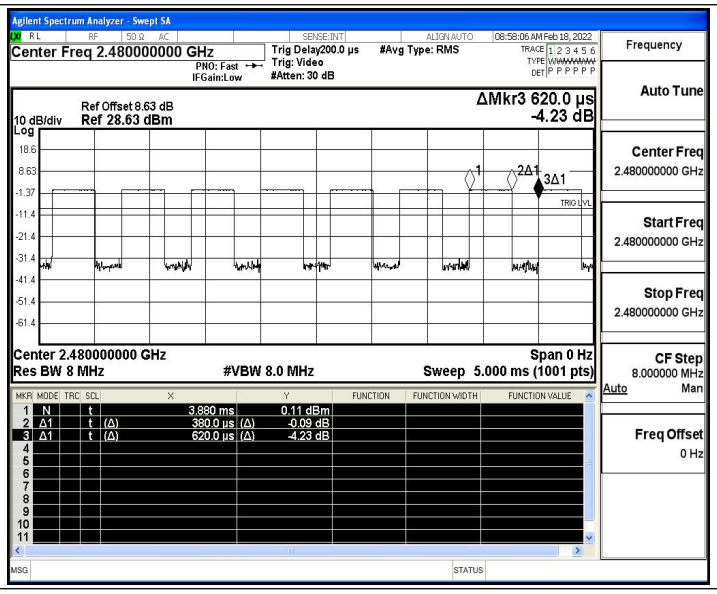
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
Trig Delay200.0 µs
Trig: Video
#Atten: 30 dB
#Avg Type: RMS
08:58:06 AM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 28.63 dBm
Log
ΔMkr3 620.0 µs
-4.23 dB
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
1 N t 3.880 ms 0.11 dBm
2 Δ1 t (Δ) 380.0 µs (Δ) -0.09 dB
3 Δ1 t (Δ) 620.0 µs (Δ) -4.23 dB
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

A.7 Emissions in Restricted Bands

Test Result

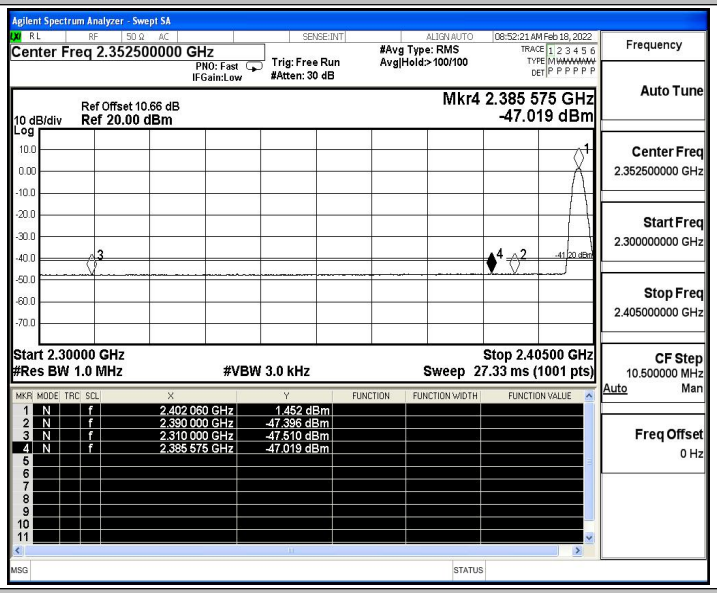
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-47.51	≤-41.20	47.69	≤54	PASS
				AV	2385.575	-47.02	≤-41.20	48.18	≤54	PASS
				AV	2390.000	-47.4	≤-41.20	47.80	≤54	PASS
				Peak	2310.000	-39.35	≤-21.20	55.85	≤74	PASS
				Peak	2323.625	-37.02	≤-21.20	58.18	≤74	PASS
				Peak	2390.000	-37.37	≤-21.20	57.83	≤74	PASS
		High	2480	AV	2483.500	-46.71	≤-41.20	48.49	≤54	PASS
				AV	2499.600	-46.39	≤-41.20	48.81	≤54	PASS
				AV	2500.000	-46.71	≤-41.20	48.49	≤54	PASS
				Peak	2483.500	-38.4	≤-21.20	56.80	≤74	PASS
				Peak	2495.200	-36.36	≤-21.20	58.84	≤74	PASS
				Peak	2500.000	-37.73	≤-21.20	57.47	≤74	PASS

Note：

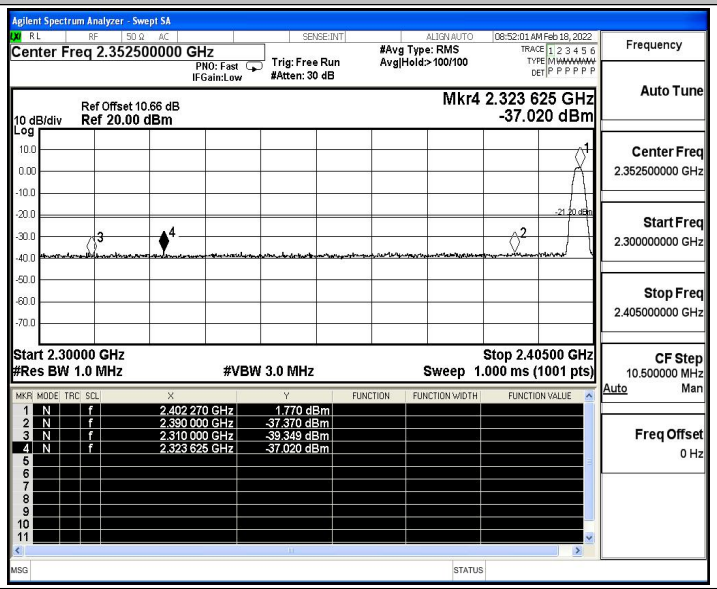
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

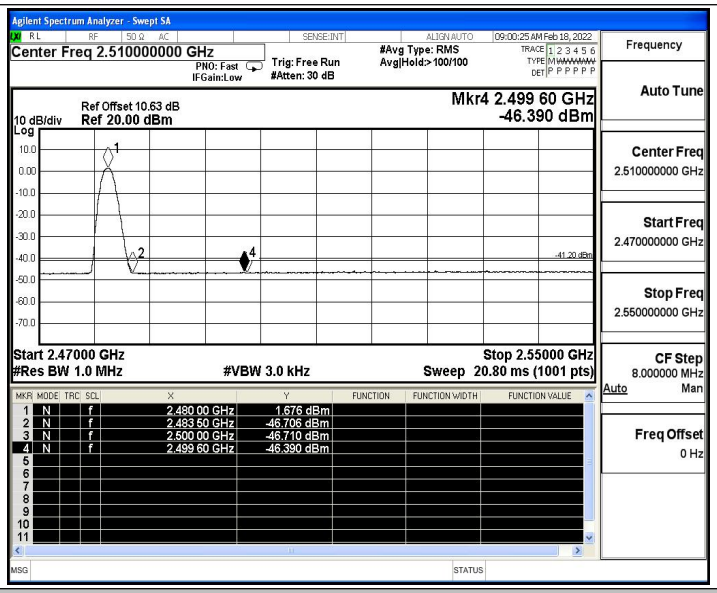
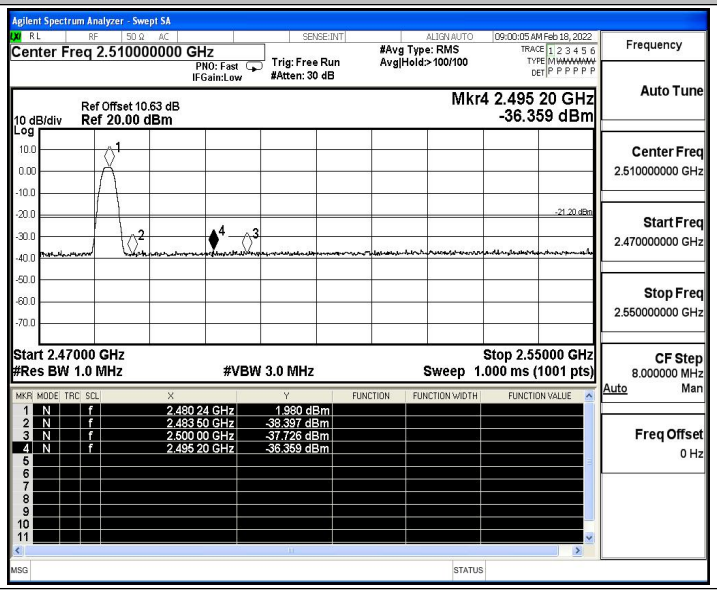
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak