Appendix B

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

Product Name: Bluetooth Speaker

Test Model: CF10

Environmental Conditions

Temperature:	23.7℃
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	 Mark Chen
Supervised by:	 Li Huan

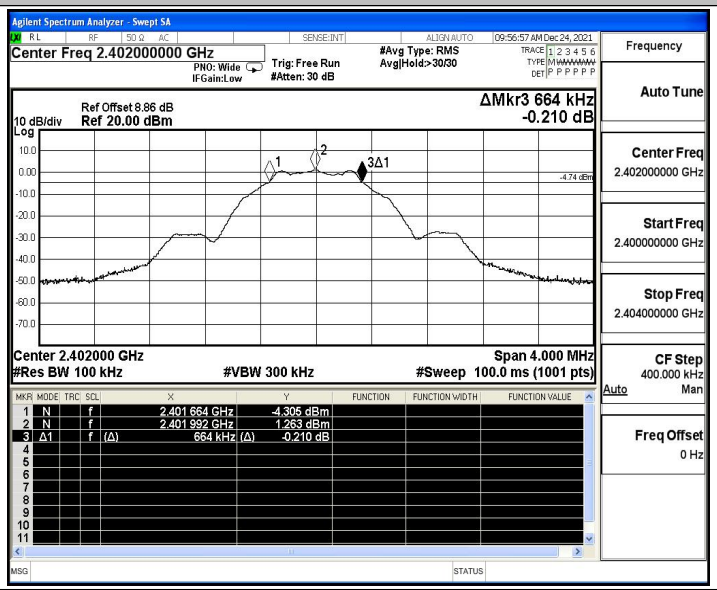
B.1 DTS Bandwidth

Test Result

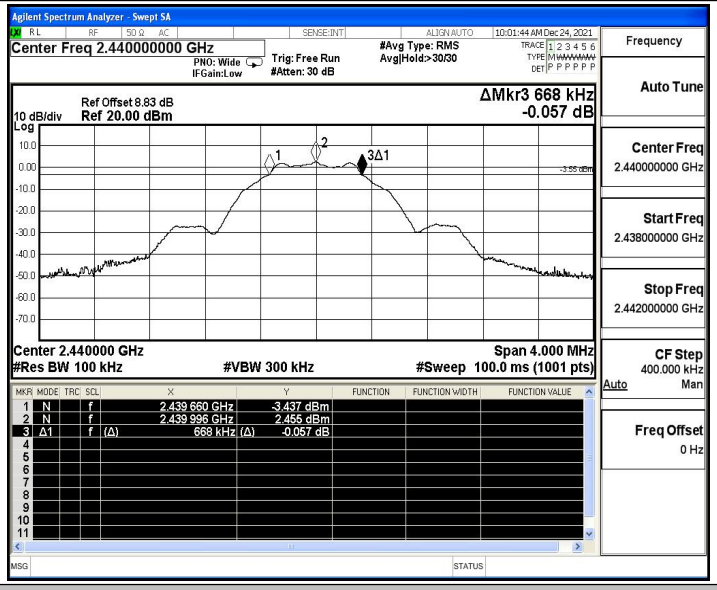
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.664	2401.664	2402.328	0.5	PASS
		2440	0.668	2439.660	2440.328	0.5	PASS
		2480	0.668	2479.660	2480.328	0.5	PASS

Test Graphs

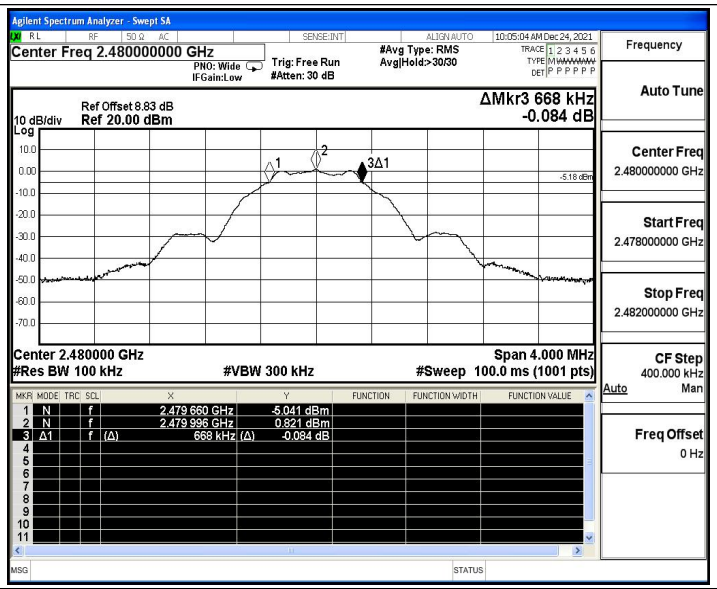
BLE_1M_Ant1_2402



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
10:05:04 AM Dec 24, 2021
Ref Offset 8.83 dB
10 dB/div
Ref 20.00 dBm
Log
ΔMkr3 668 kHz
-0.084 dB
-5.16 dBm
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
#Sweep 100.0 ms (1001 pts)
1 N 1 f 2.479 660 GHz -5.041 dBm
2 N 1 f 2.479 996 GHz 0.821 dBm
3 Δ1 f (Δ) 668 kHz (Δ) -0.084 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

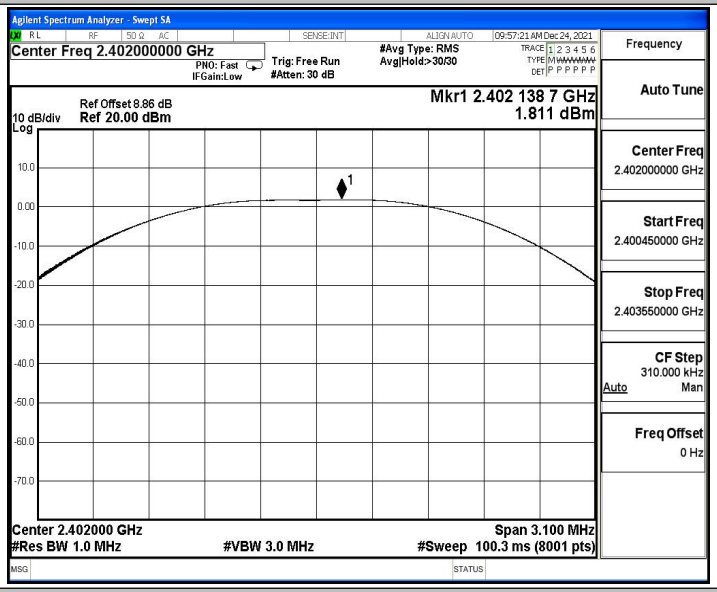
B.2 Maximum peak conducted output power

Test Result

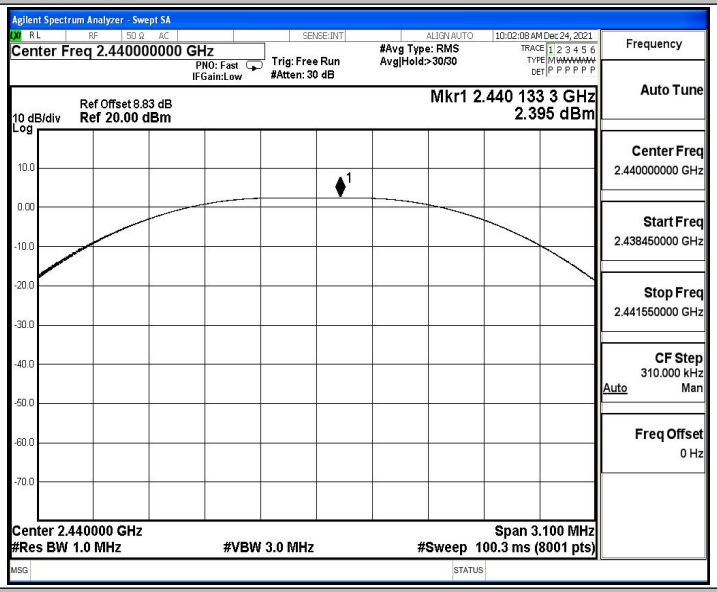
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	1.81	≤30	PASS
		2440	2.4	≤30	PASS
		2480	1.06	≤30	PASS

Test Graphs

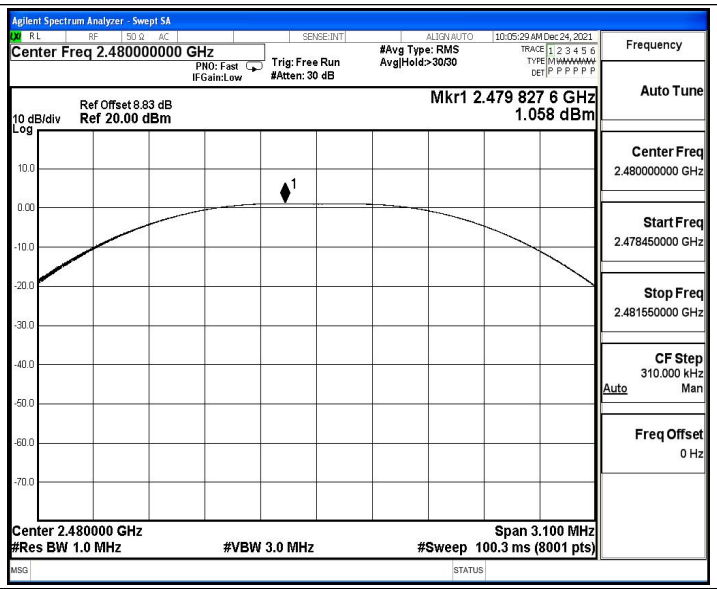
BLE_1M_Ant1_2402



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
10:05:29 AM Dec 24, 2021
Ref Offset 8.83 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 827 6 GHz
1.058 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

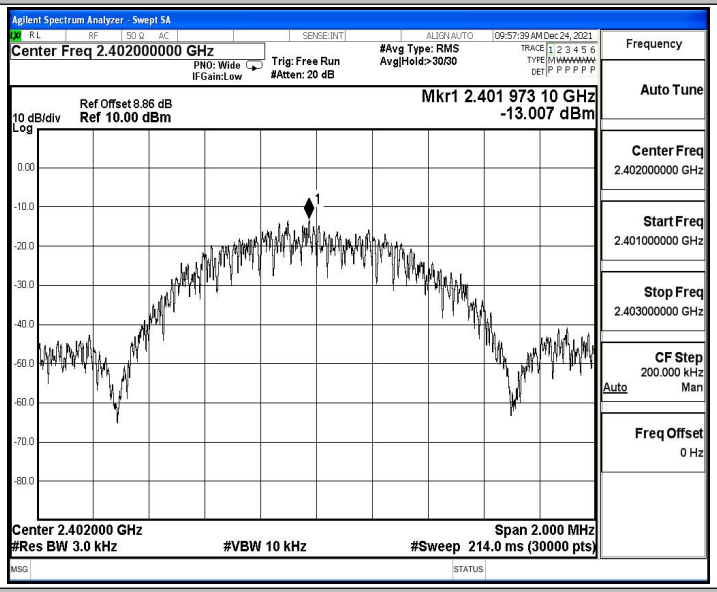
B.3 Maximum power spectral density

Test Result

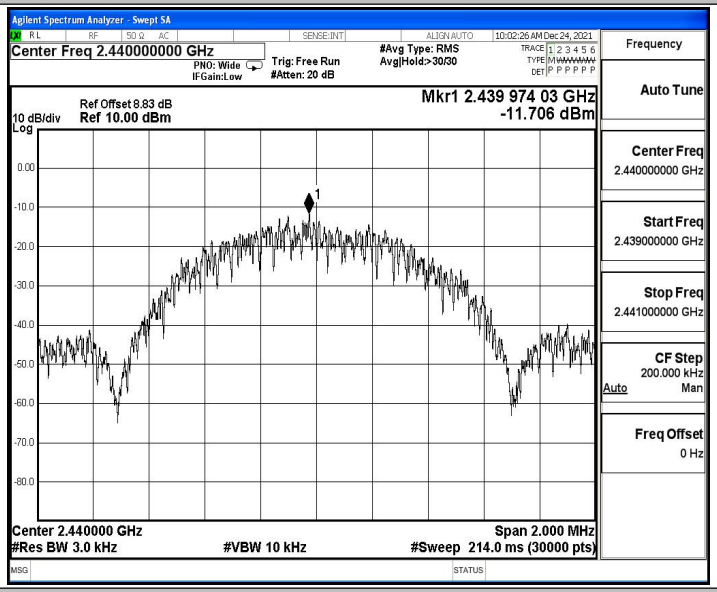
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.01	≤8.00	PASS
		2440	-11.71	≤8.00	PASS
		2480	-13.43	≤8.00	PASS

Test Graphs

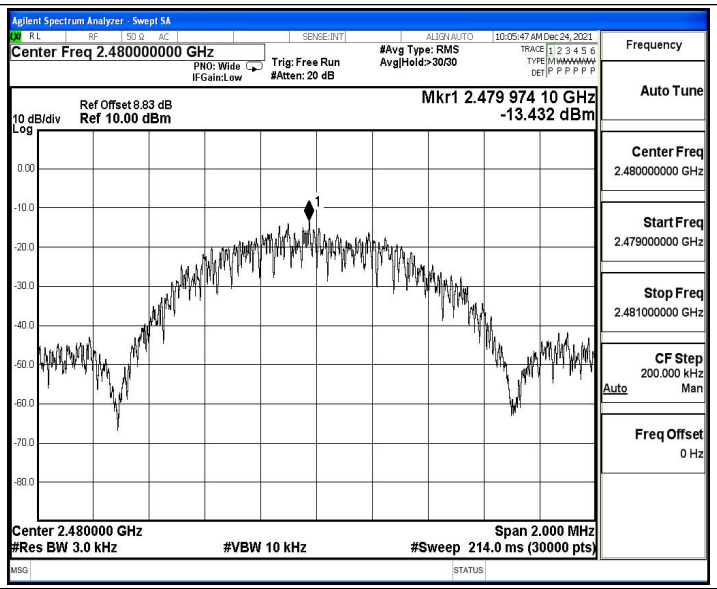
BLE_1M_Ant1_2402



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
10:05:47 AM Dec 24, 2021
Ref Offset 8.83 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.479 974 10 GHz
-13.432 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
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

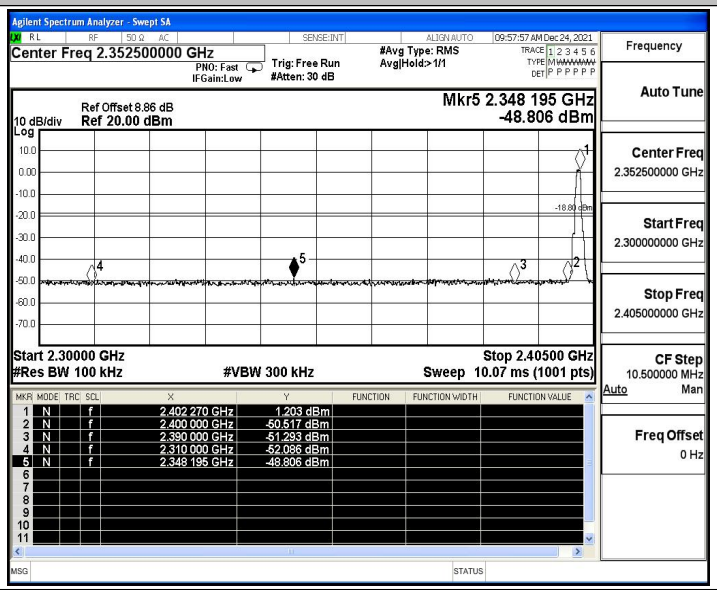
B.4 Band edge measurements

Test Result

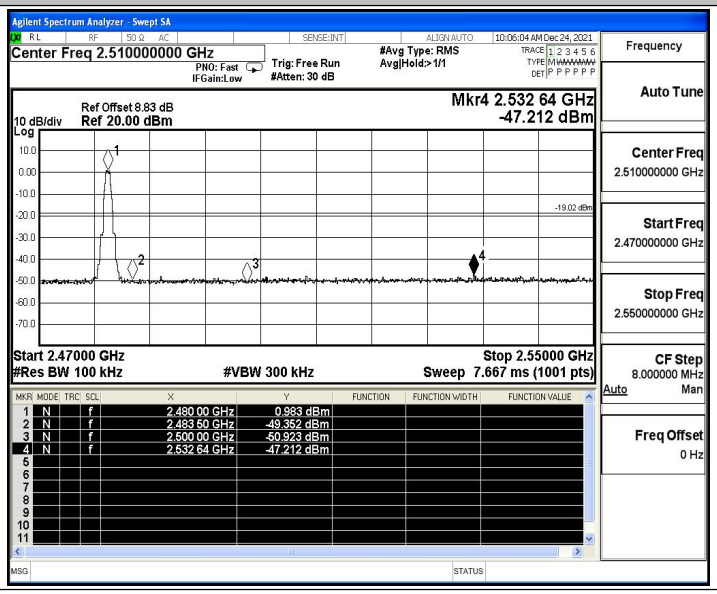
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	1.20	-48.81	≤-18.8	PASS
		High	2480	0.98	-47.21	≤-19.02	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



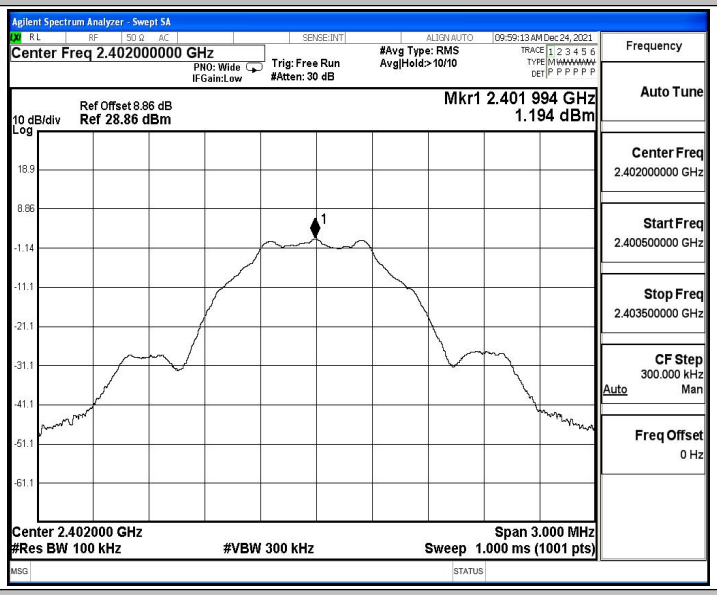
B.5 Conducted Spurious Emission

Test Result

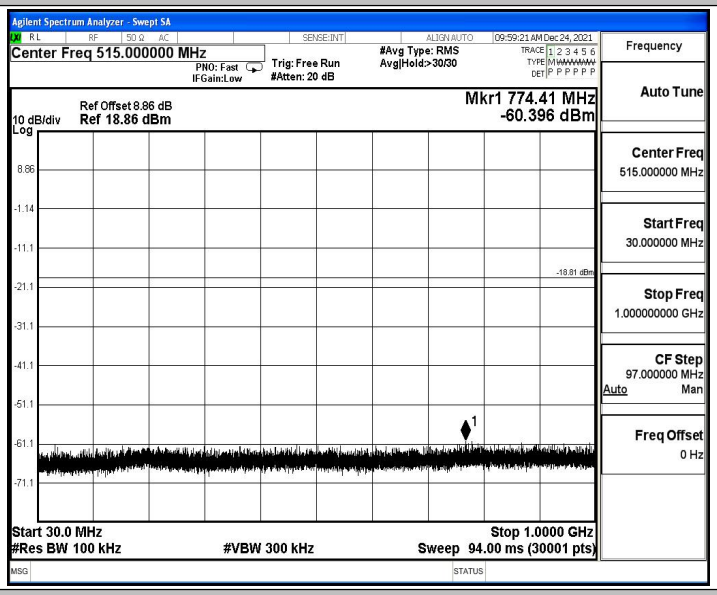
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	1.19	1.19	---	PASS
			30~1000	1.19	-60.4	≤-18.81	PASS
			1000~26500	1.19	-46.2	≤-18.81	PASS
		2440	Reference	2.52	2.52	---	PASS
			30~1000	2.52	-40.26	≤-17.48	PASS
			1000~26500	2.52	-45.75	≤-17.48	PASS
		2480	Reference	0.71	0.71	---	PASS
			30~1000	0.71	-59.88	≤-19.29	PASS
			1000~26500	0.71	-46	≤-19.29	PASS

Test Graphs

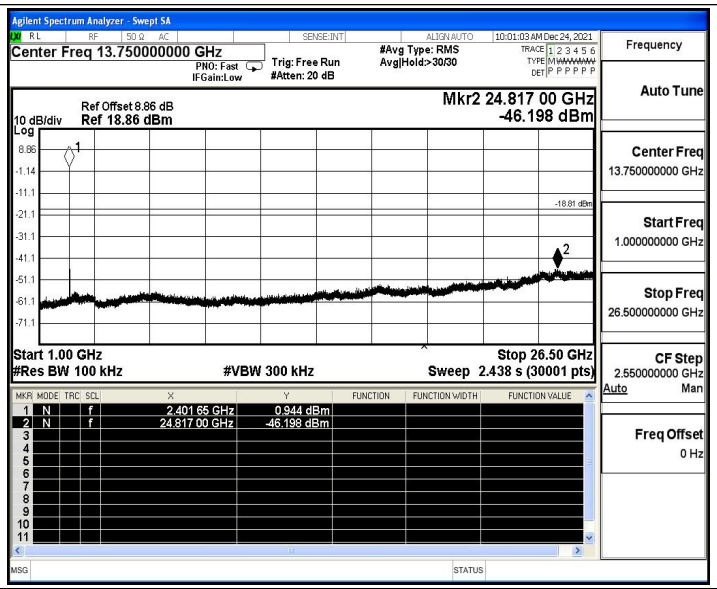
BLE_1M_Ant1_2402_0~Reference



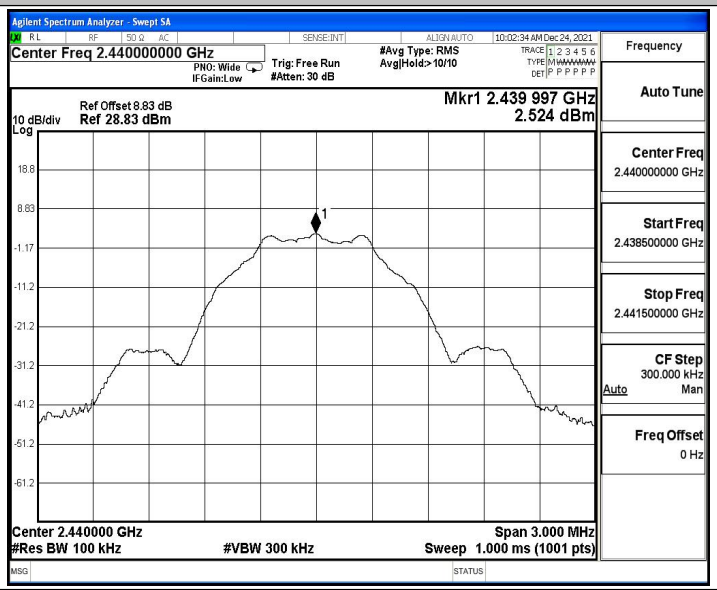
BLE_1M_Ant1_2402_30~1000



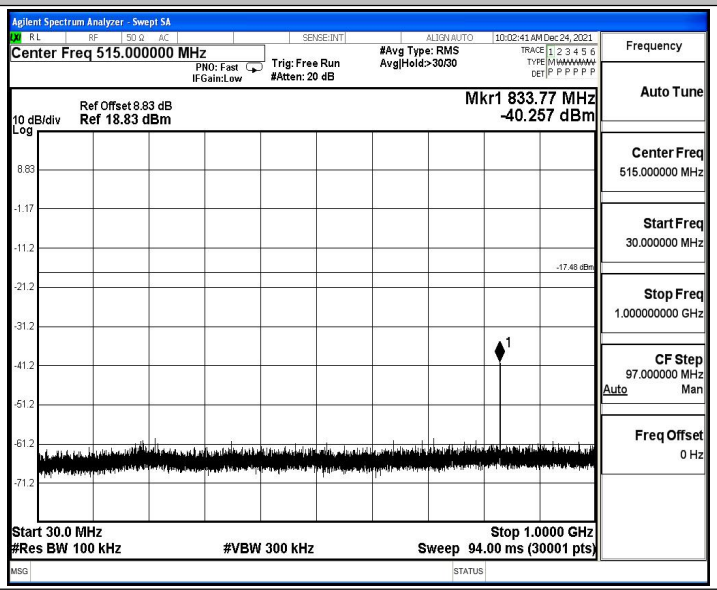
BLE_1M_Ant1_2402_1000~26500



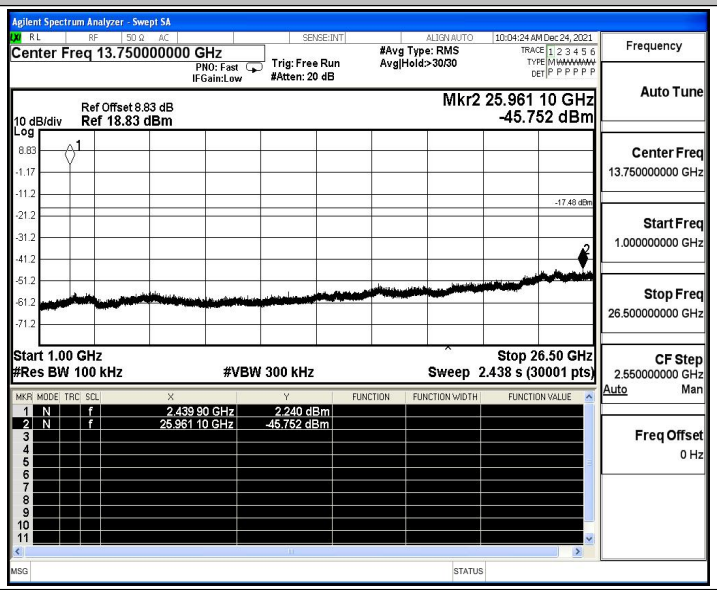
BLE_1M_Ant1_2440_0~Reference



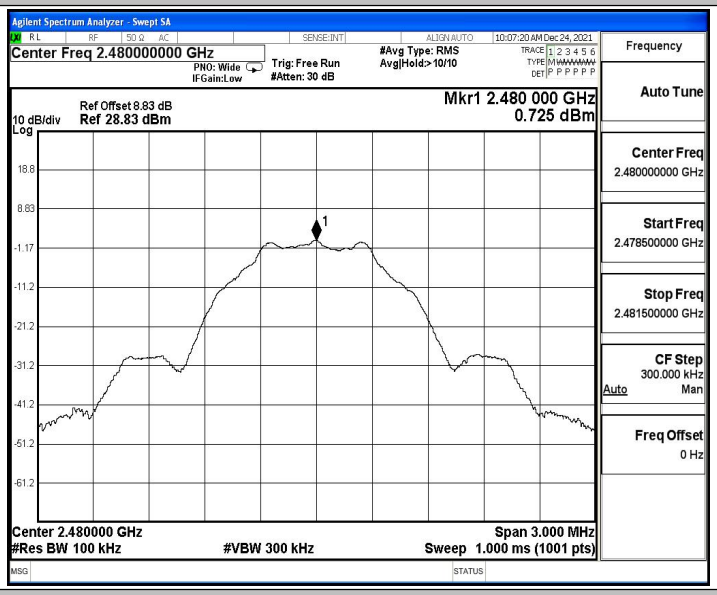
BLE_1M_Ant1_2440_30~1000



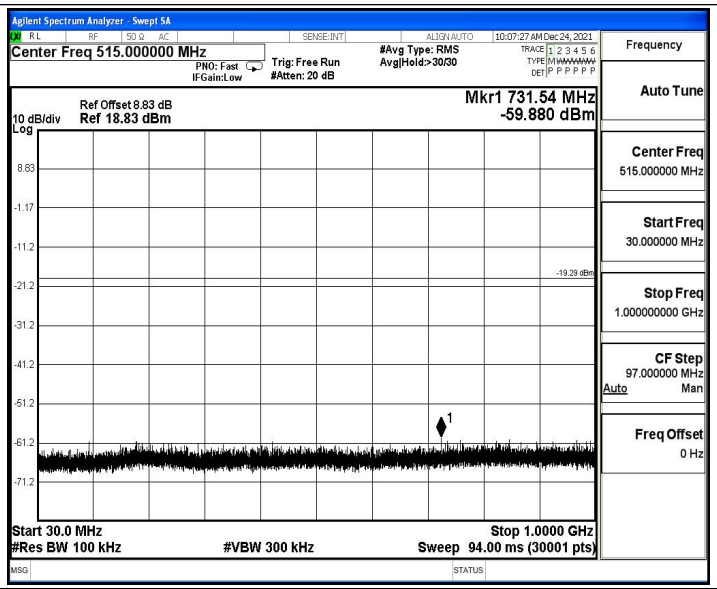
BLE_1M_Ant1_2440_1000~26500



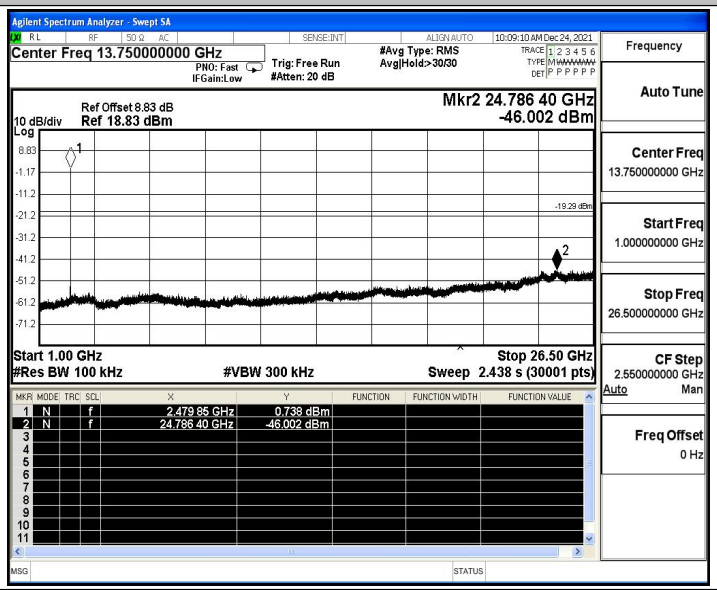
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500



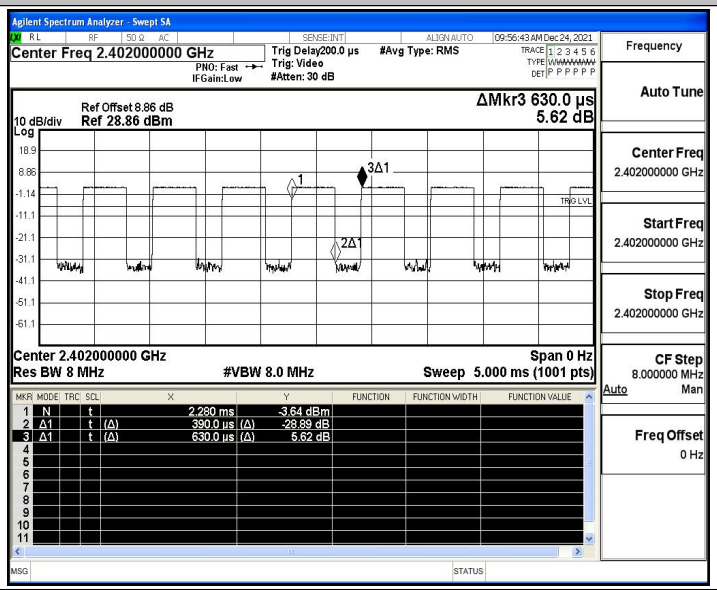
B.6 Duty Cycle

Test Result

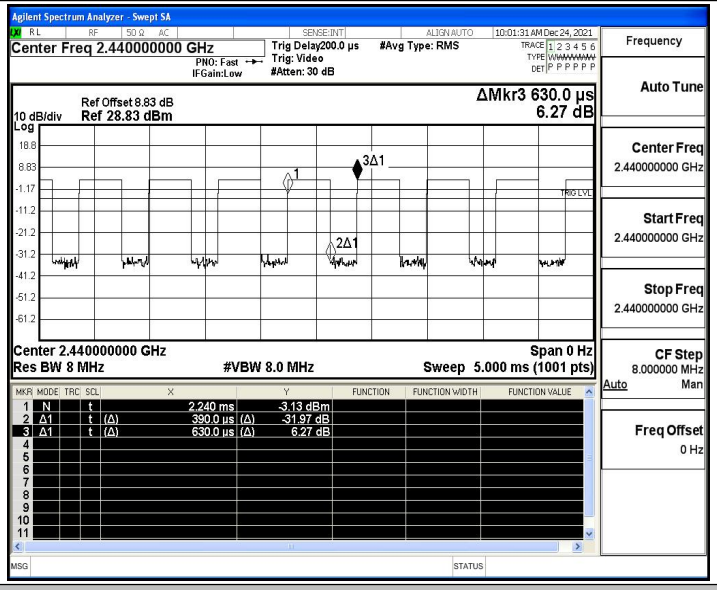
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Minimum VBW(KHz)	Limit	Verdict
BLE_1M	Ant1	2402	0.39	0.63	0.6190	61.90	2.08	2.56	---	---
		2440	0.39	0.63	0.6190	61.90	2.08	2.56	---	---
		2480	0.39	0.63	0.6190	61.90	2.08	2.56	---	---

Test Graphs

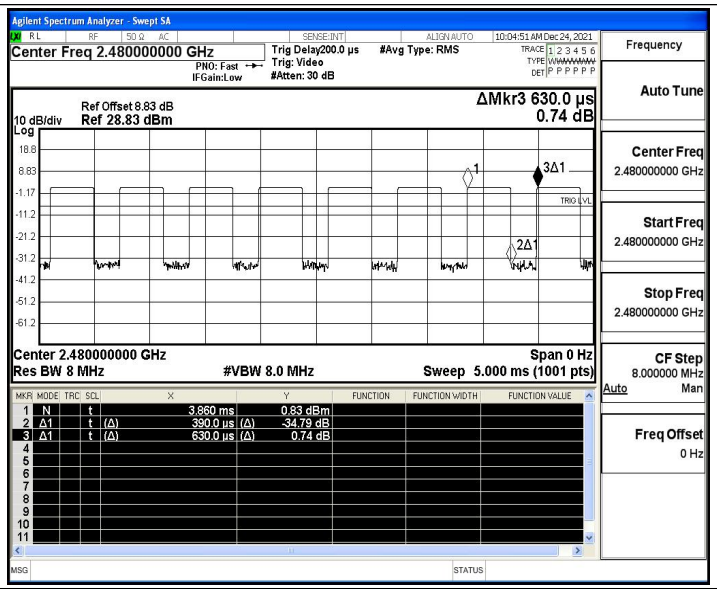
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig Delay200.0 µs
Trig: Video
#Avg Type: RMS
#Atten: 30 dB
10:04:51 AM Dec 24, 2021
Ref Offset 8.83 dB
10 dB/div
Ref 28.83 dBm
ΔMkr3 630.0 µs
0.74 dB
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
1 N 1 t 3.860 ms 0.83 dBm
2 Δ1 t (Δ) 390.0 µs (Δ) -34.79 dB
3 Δ1 t (Δ) 630.0 µs (Δ) 0.74 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

B.7 Emissions in Restricted Bands

Test Result

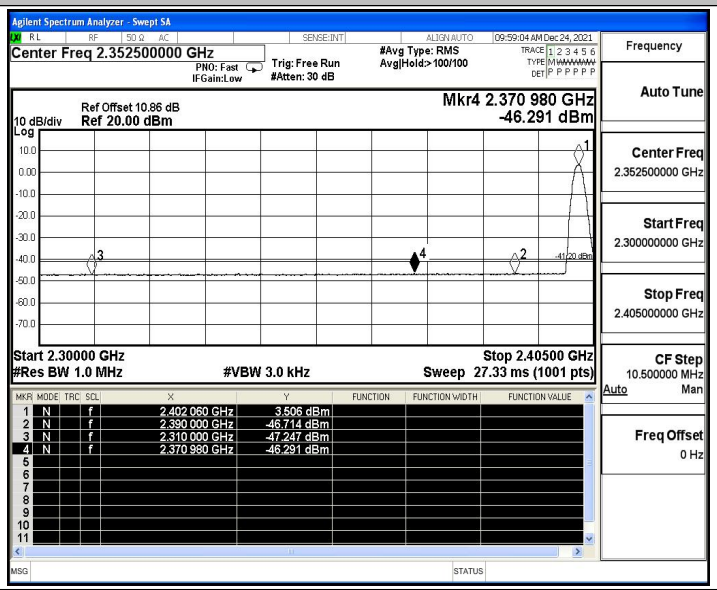
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-47.25	≤-41.20	47.95	≤54	PASS
				AV	2370.980	-46.29	≤-41.20	48.91	≤54	PASS
				AV	2390.000	-46.71	≤-41.20	48.49	≤54	PASS
				Peak	2310.000	-38.83	≤-21.20	56.37	≤74	PASS
				Peak	2330.765	-36.01	≤-21.20	59.19	≤74	PASS
				Peak	2390.000	-37.34	≤-21.20	57.86	≤74	PASS
		High	2480	AV	2483.500	-46.17	≤-41.20	49.03	≤54	PASS
				AV	2499.680	-45.97	≤-41.20	49.23	≤54	PASS
				AV	2500.000	-46.28	≤-41.20	48.92	≤54	PASS
				Peak	2483.500	-37.99	≤-21.20	57.21	≤74	PASS
				Peak	2485.440	-35.15	≤-21.20	60.05	≤74	PASS
				Peak	2500.000	-37.32	≤-21.20	57.88	≤74	PASS

Note：

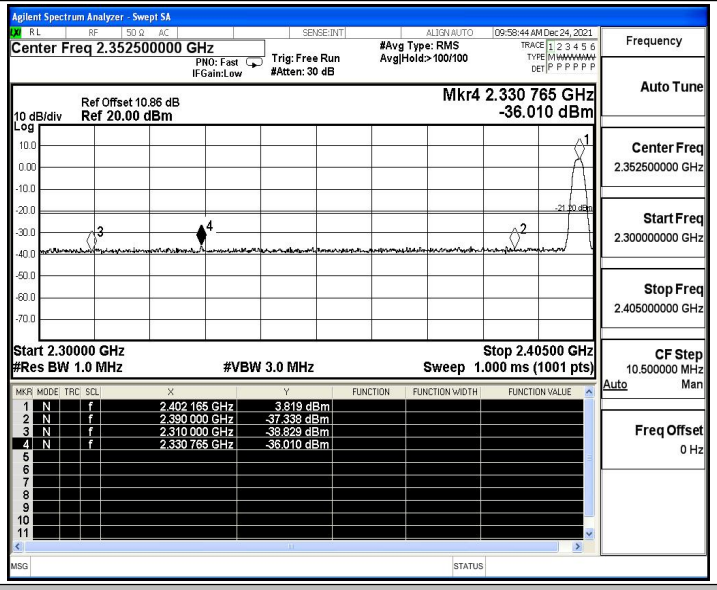
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

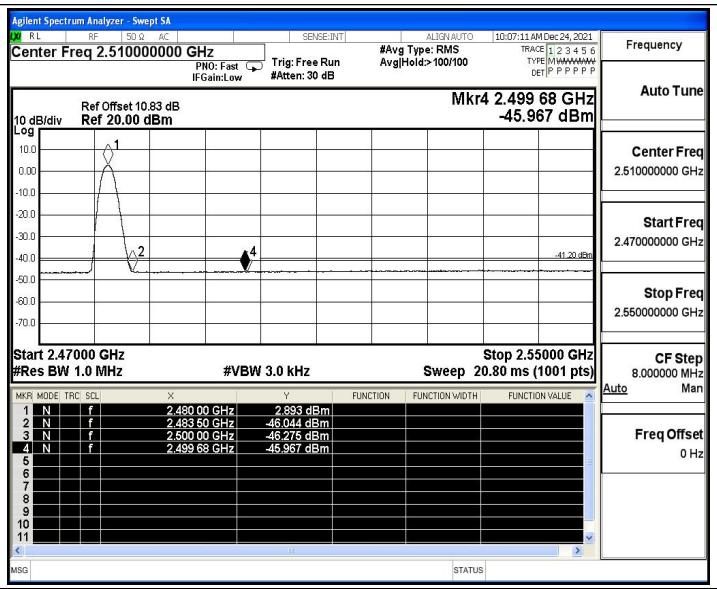
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak