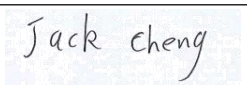
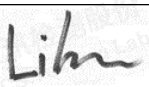
Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Bluetooth Speaker

Test Model: OS-825

Environmental Conditions

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

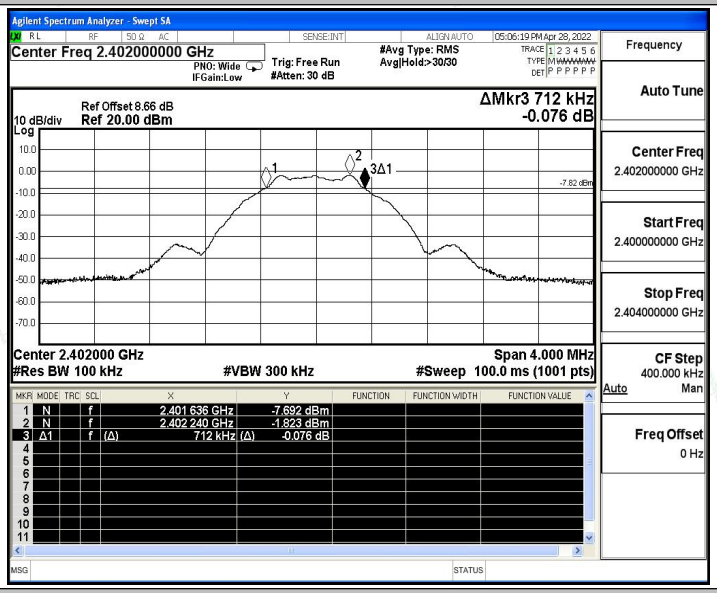
B.1 DTS Bandwidth

Test Result

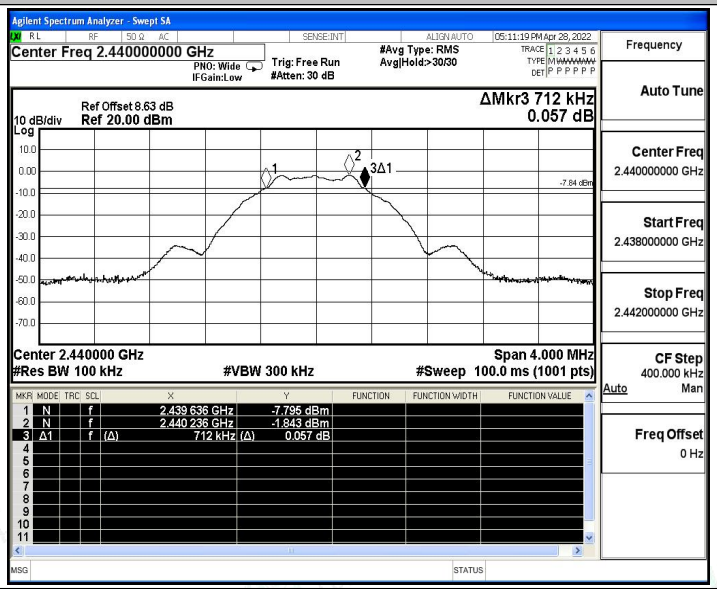
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.712	2401.636	2402.348	0.5	PASS
		2440	0.712	2439.636	2440.348	0.5	PASS
		2480	0.716	2479.636	2480.352	0.5	PASS

Test Graphs

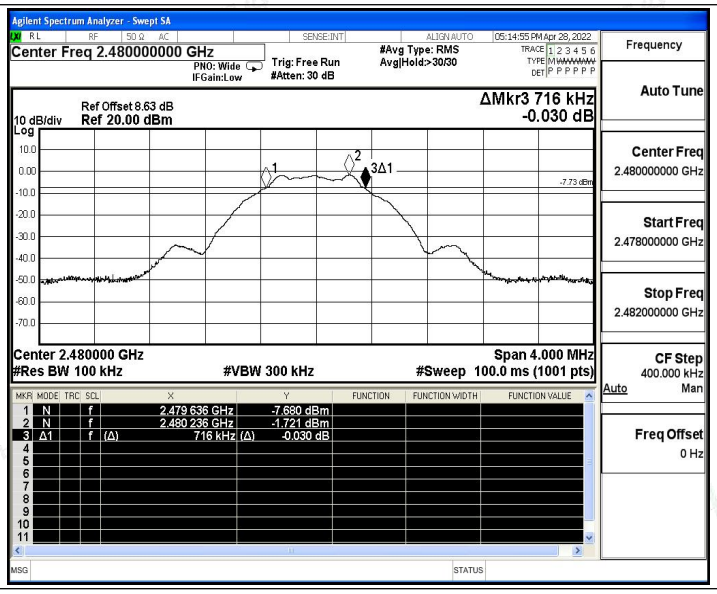
BLE_1M_Ant1_2402



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
05:14:55 PM Apr 28, 2022
Frequency
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
ΔMkr3 716 kHz
-0.030 dB
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 2.479 636 GHz -7.680 dBm
2 N 1 f 2.480 236 GHz -1.721 dBm
3 Δ1 f (Δ) 716 kHz (Δ) -0.030 dB
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

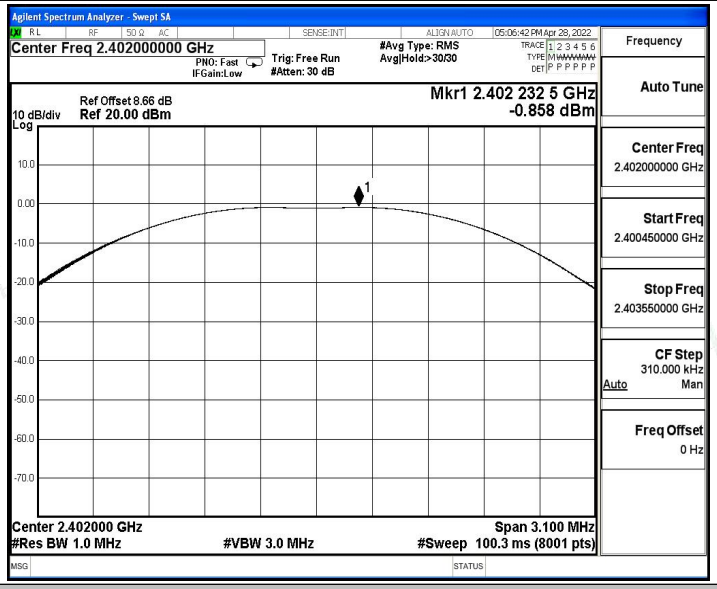
B.2 Maximum conducted output power

Test Result

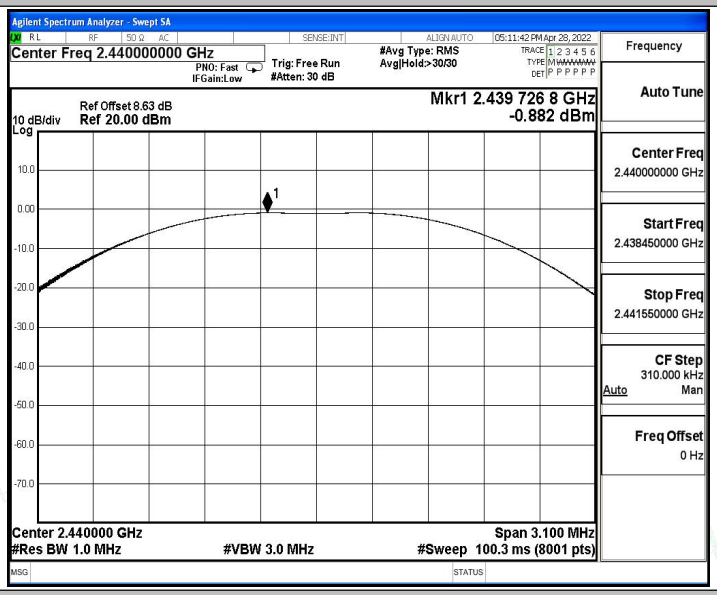
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-0.86	≤30	PASS
		2440	-0.88	≤30	PASS
		2480	-0.71	≤30	PASS

Test Graphs

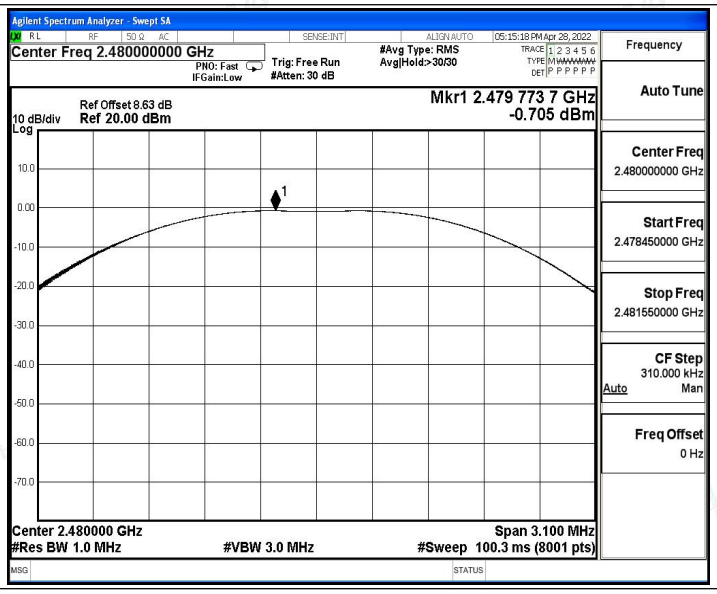
BLE_1M_Ant1_2402



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
05:15:18 PM Apr 28, 2022
Frequency
Auto Tune
Ref Offset 8.63 dB
10 dB/div Ref 20.00 dBm
Log
Mkr1 2.479 773 7 GHz
-0.705 dBm
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
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 3.100 MHz
#Sweep 100.3 ms (8001 pts)
MSG
STATUS

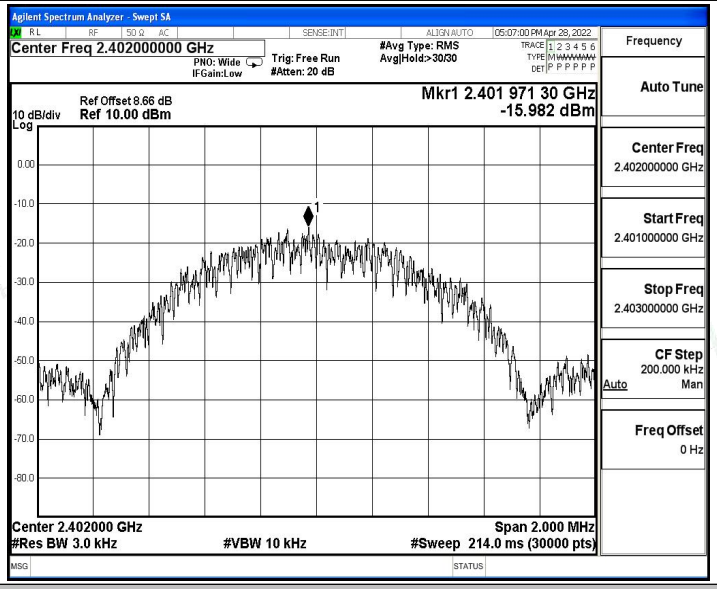
B.3 Maximum power spectral density

Test Result

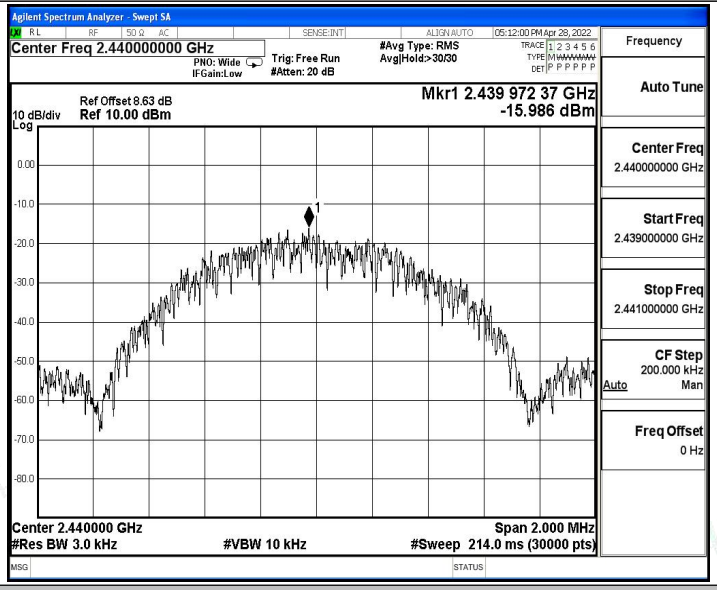
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.98	≤8.00	PASS
		2440	-15.99	≤8.00	PASS
		2480	-15.83	≤8.00	PASS

Test Graphs

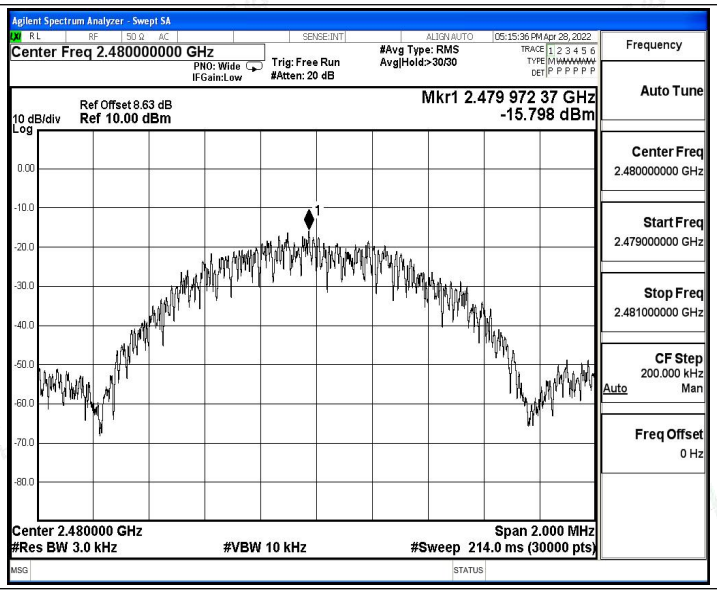
BLE_1M_Ant1_2402



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
05:15:36 PM Apr 28, 2022
Ref Offset 8.63 dB
10 dB/div Ref 10.00 dBm
Log
Mkr1 2.479 972 37 GHz
-15.798 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

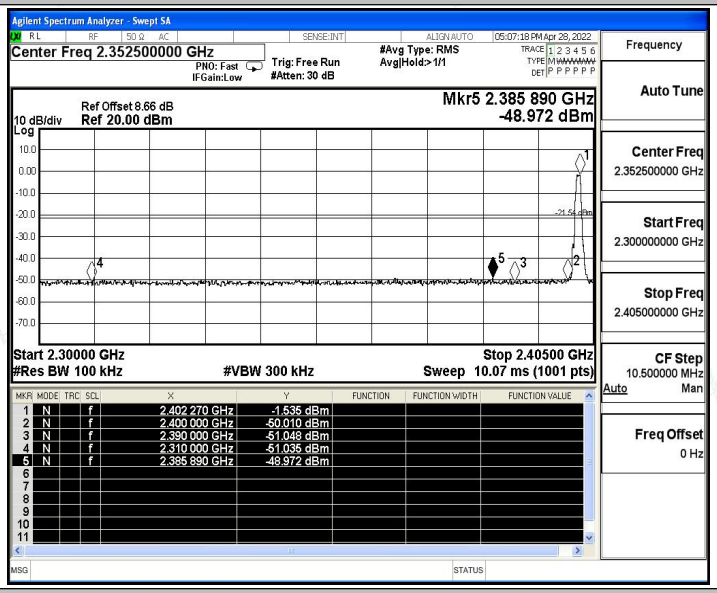
B.4 Band edge measurements

Test Result

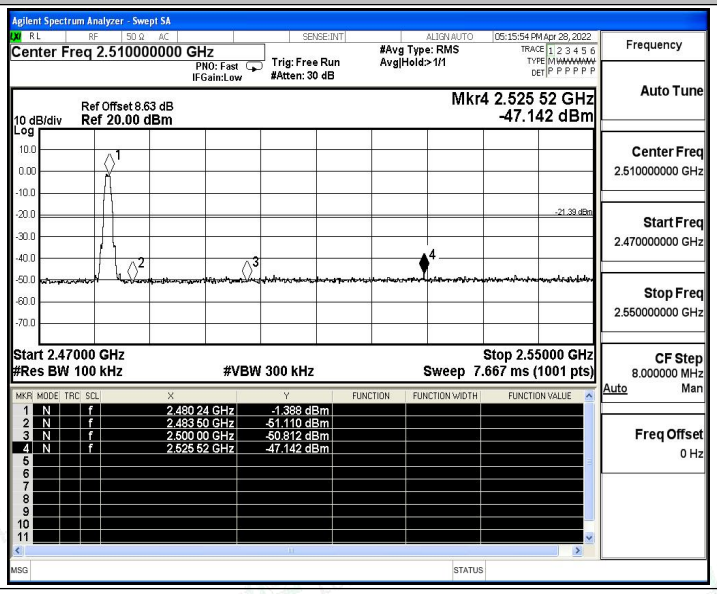
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-1.54	-48.97	≤-21.54	PASS
		High	2480	-1.39	-47.14	≤-21.39	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



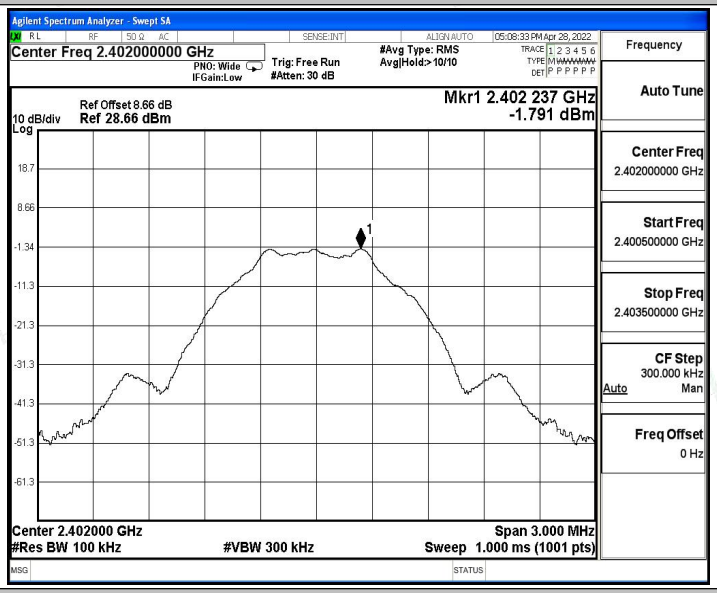
B.5 Conducted Spurious Emission

Test Result

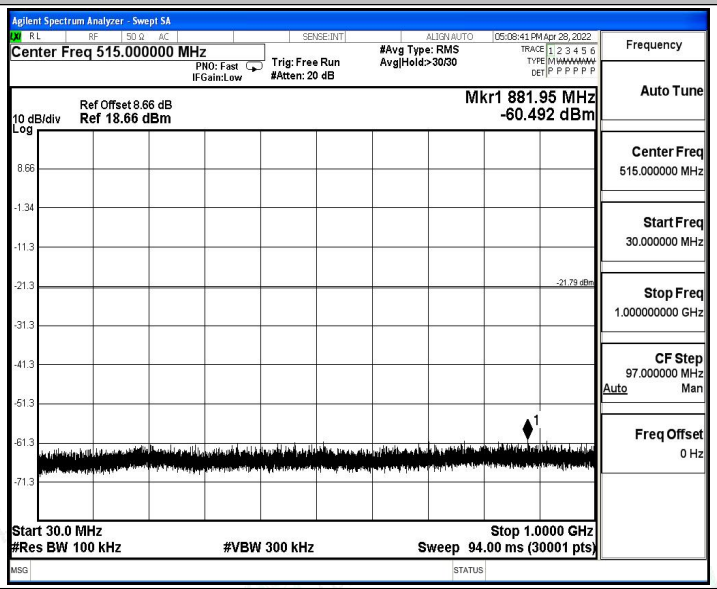
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-1.79	-1.79	---	PASS
			30~1000	-1.79	-60.49	≤-21.79	PASS
			1000~26500	-1.79	-46.23	≤-21.79	PASS
		2440	Reference	-1.81	-1.81	---	PASS
			30~1000	-1.81	-60.5	≤-21.81	PASS
			1000~26500	-1.81	-46.14	≤-21.81	PASS
		2480	Reference	-1.65	-1.65	---	PASS
			30~1000	-1.65	-60.39	≤-21.65	PASS
			1000~26500	-1.65	-46.09	≤-21.65	PASS

Test Graphs

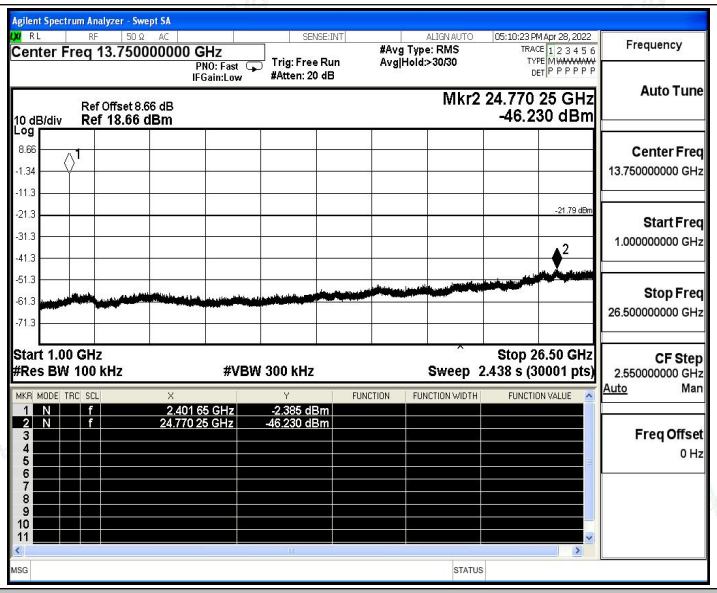
BLE_1M_Ant1_2402_0~Reference



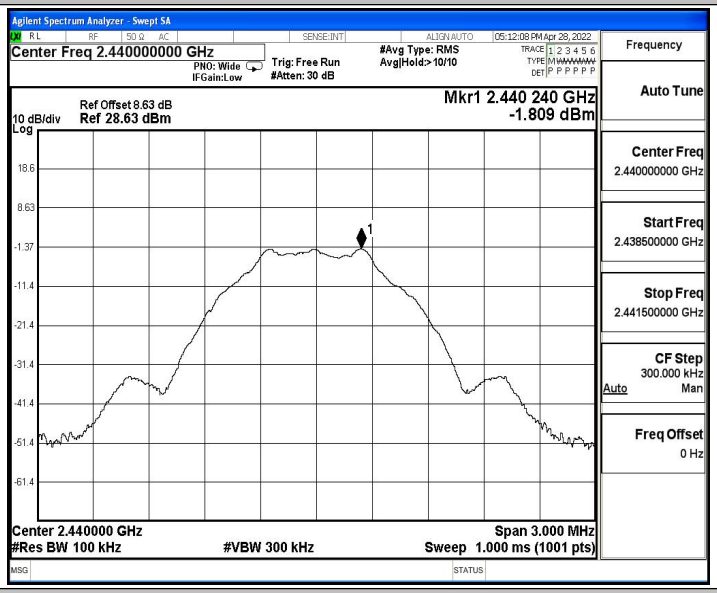
BLE_1M_Ant1_2402_30~1000



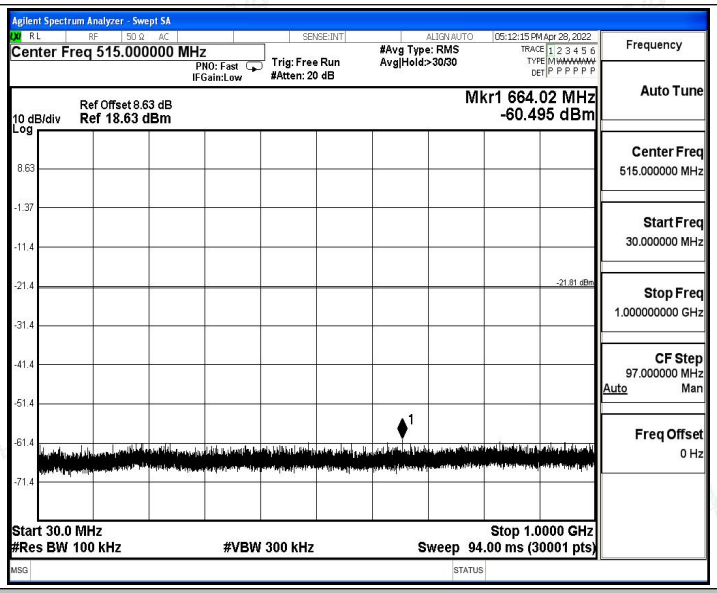
BLE_1M_Ant1_2402_1000~26500



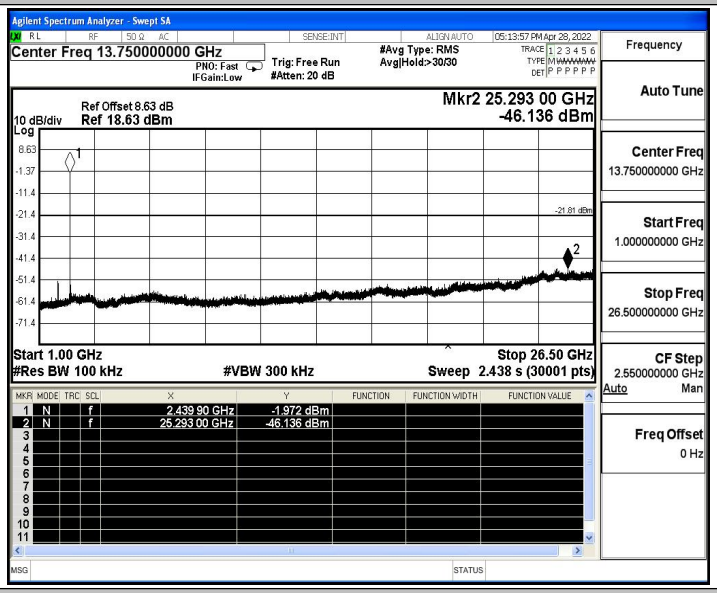
BLE_1M_Ant1_2440_0~Reference



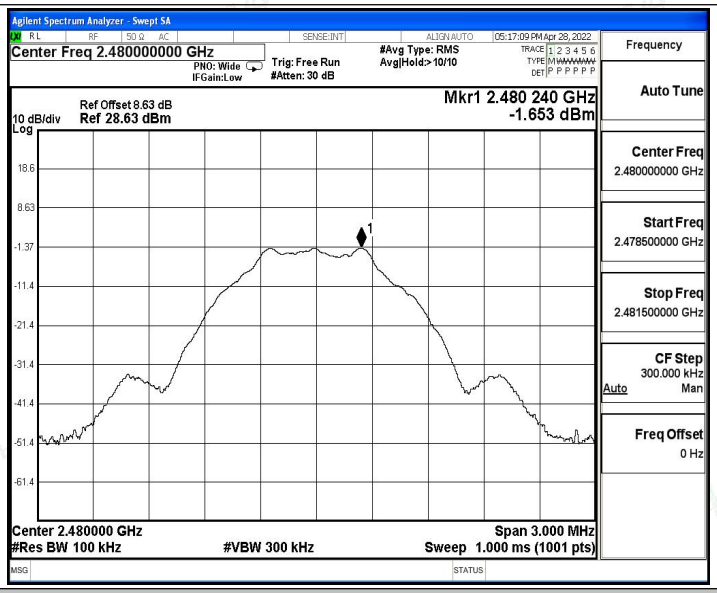
BLE_1M_Ant1_2440_30~1000



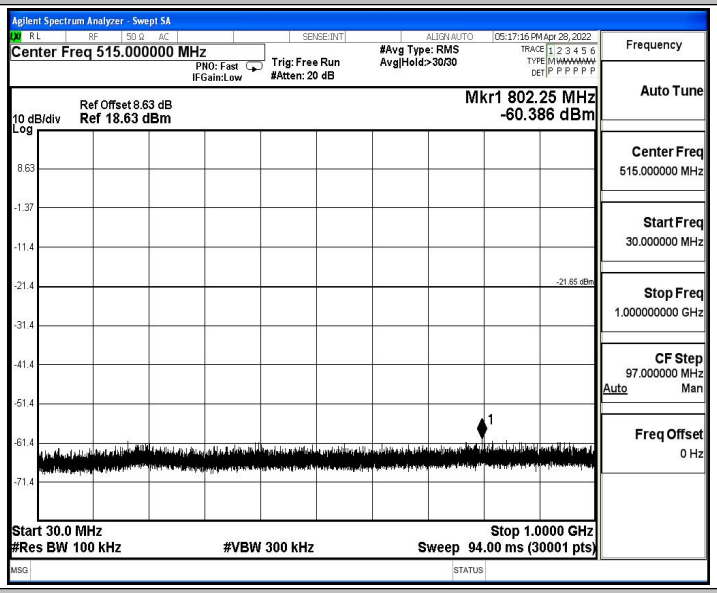
BLE_1M_Ant1_2440_1000~26500



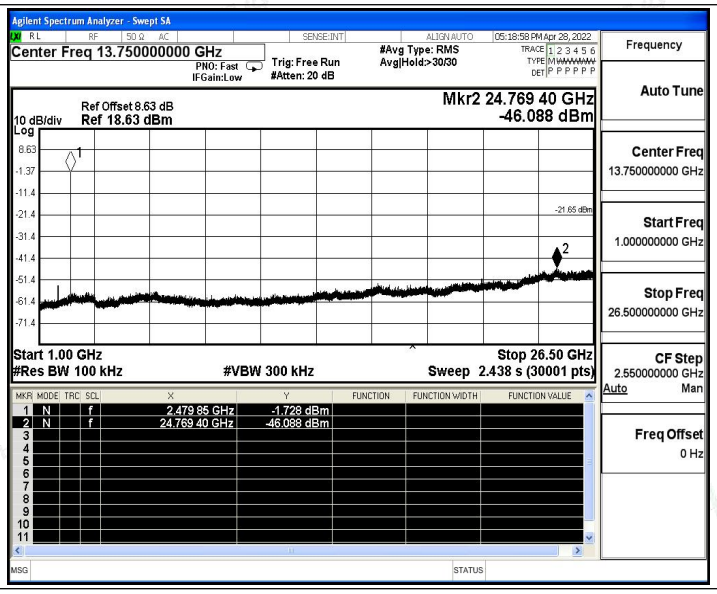
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500


Agilent 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
05:18:58 PM Apr 28, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 18.63 dBm
Log
Mkr2 24.769 40 GHz
-46.088 dBm
-21.65 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 2.479 85 GHz -1.728 dBm
2 N 1 f 24.769 40 GHz -46.088 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

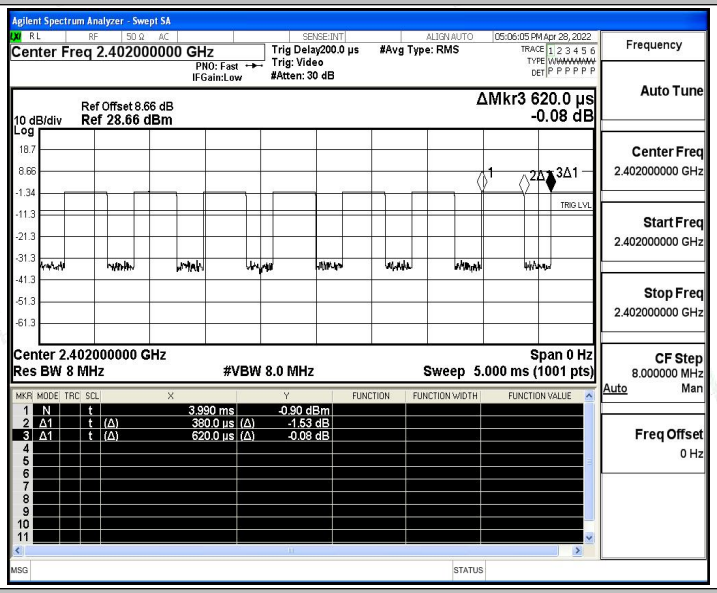
B.6 Duty Cycle

Test Result

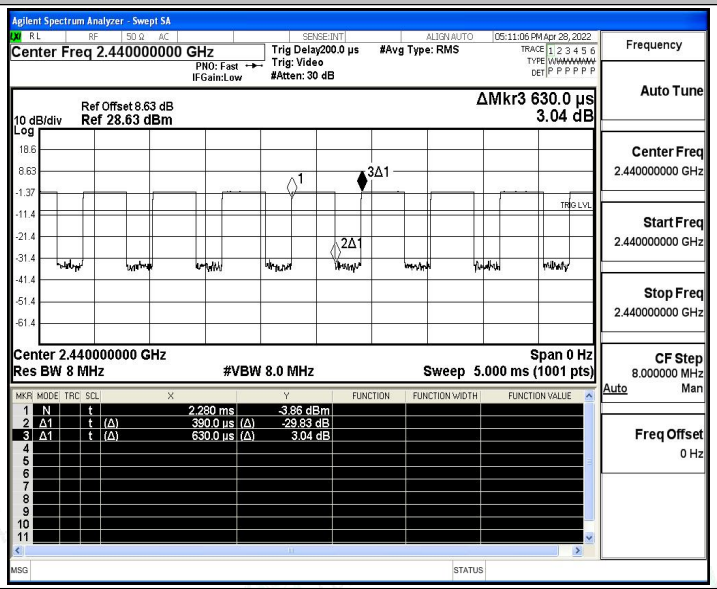
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	1/T (kHz)
BLE_1M	Ant1	2402	0.38	0.62	0.6129	61.29	2.13	2.63
		2440	0.39	0.63	0.6190	61.90	2.08	2.56
		2480	0.38	0.63	0.6032	60.32	2.20	2.63

Test Graphs

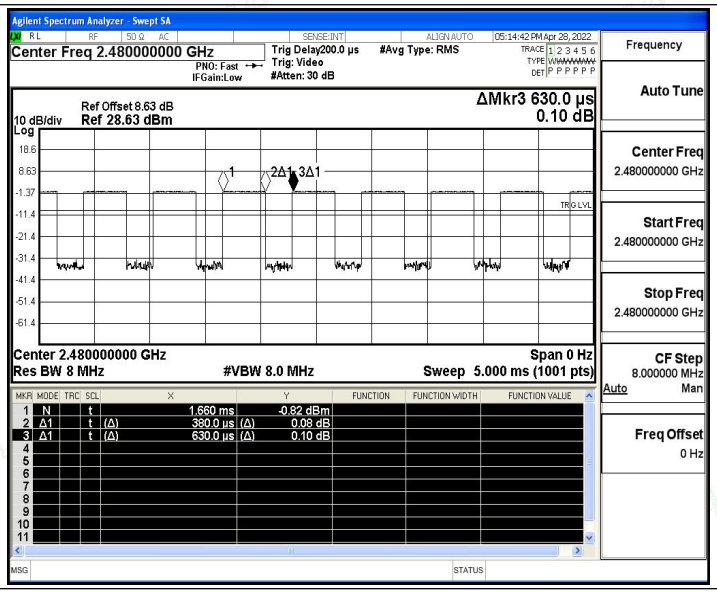
BLE_1M_Ant1_2402



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
05:14:42 PM Apr 28, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 28.63 dBm
ΔMkr3 630.0 µs
0.10 dB
Log
18.6
8.63
-1.37
-11.4
-21.4
-31.4
-41.4
-51.4
-61.4
TRIG LVL
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 1.660 ms -0.82 dBm
2 Δ1 1 t (Δ) 380.0 µs (Δ) 0.08 dB
3 Δ1 1 t (Δ) 630.0 µs (Δ) 0.10 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

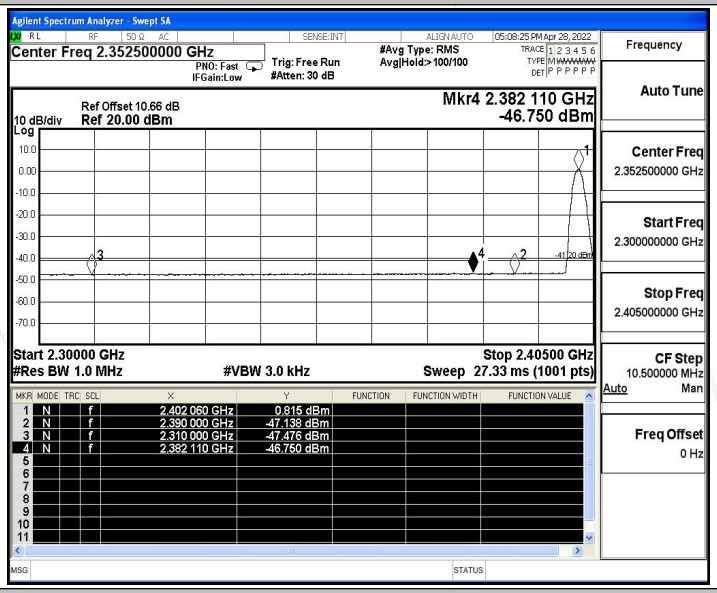
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-47.48	≤-41.20	47.72	≤54	PASS
				AV	2382.110	-46.75	≤-41.20	48.45	≤54	PASS
				AV	2390.000	-47.3	≤-41.20	47.90	≤54	PASS
				Peak	2310.000	-38.48	≤-21.20	56.72	≤74	PASS
				Peak	2340.950	-36.73	≤-21.20	58.47	≤74	PASS
				Peak	2390.000	-38.47	≤-21.20	56.73	≤74	PASS
		High	2480	AV	2483.500	-46.31	≤-41.20	48.89	≤54	PASS
				AV	2499.920	-46.1	≤-41.20	49.10	≤54	PASS
				AV	2500.000	-46.37	≤-41.20	48.83	≤54	PASS
				Peak	2483.500	-37.53	≤-21.20	57.67	≤74	PASS
				Peak	2488.000	-36.64	≤-21.20	58.56	≤74	PASS
				Peak	2500.000	-37.54	≤-21.20	57.66	≤74	PASS

Note：

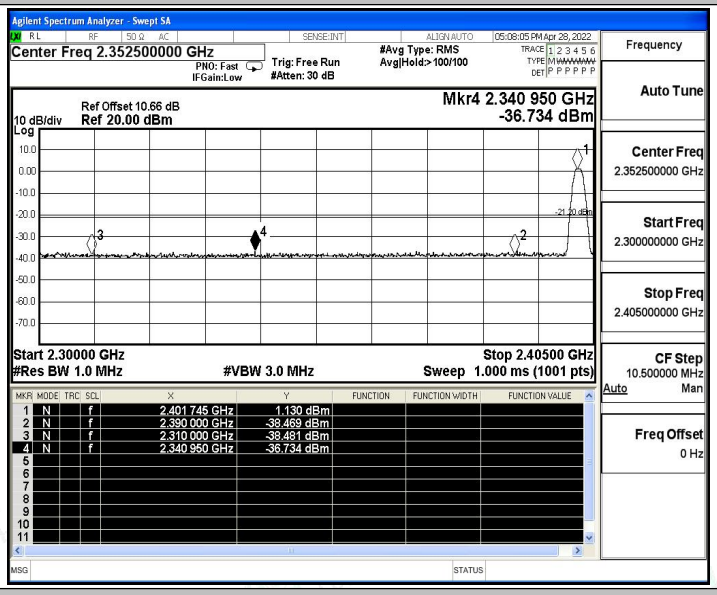
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

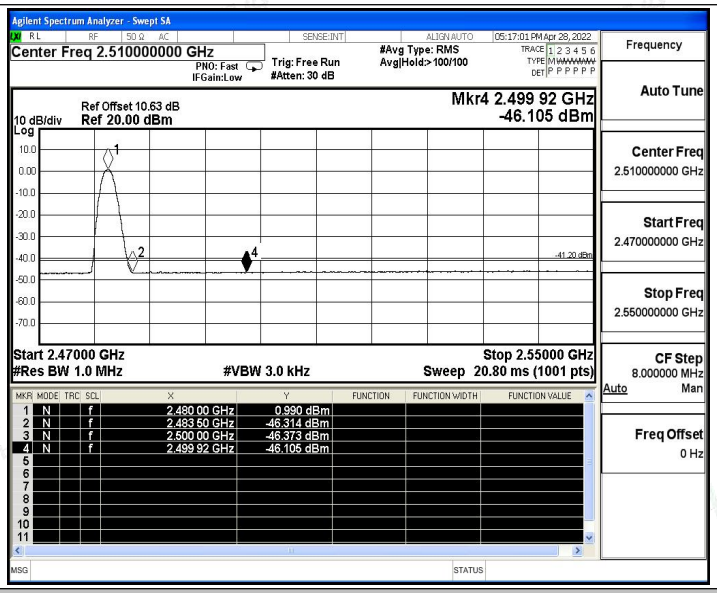
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak