Appendix B

RF Test Data for BLE (Conducted Measurement)

Product Name: Tablet PC

Test Model: MBW100

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Joker Hu
	Joker.Hu
Supervised by:	Ling Zhu
	Ling.Zhu

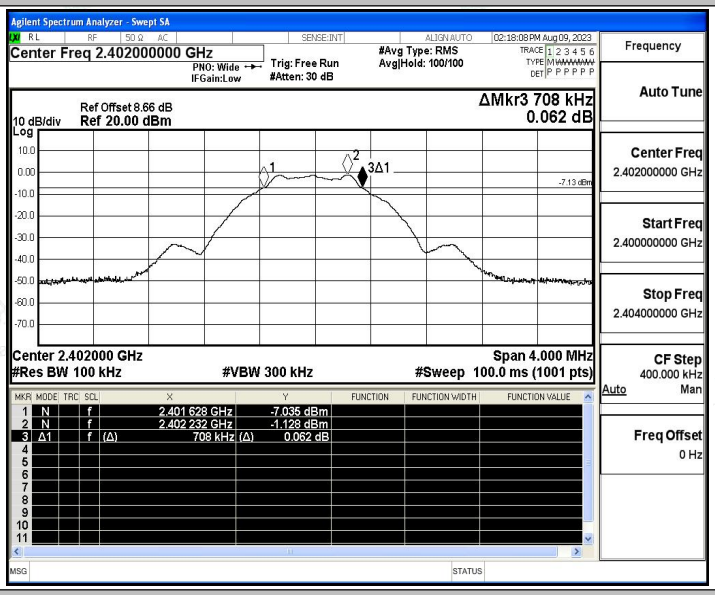
B.1 DTS Bandwidth

Test Result

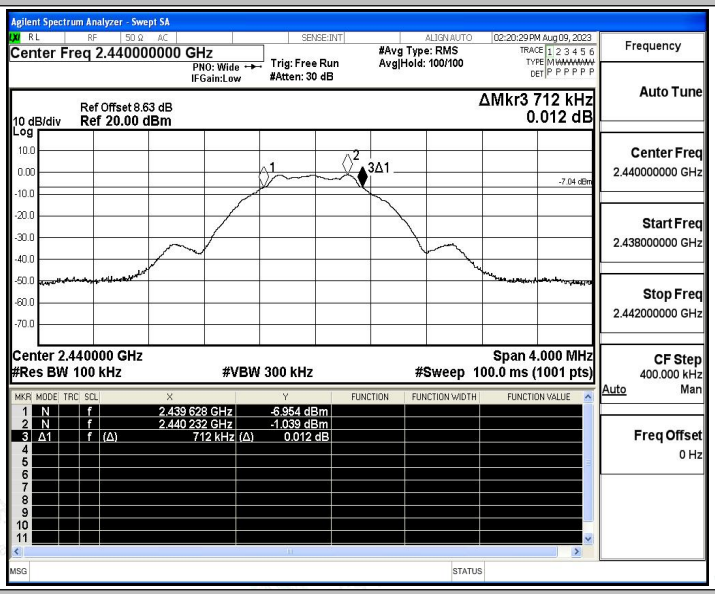
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.708	2401.628	2402.336	0.5	PASS
		2440	0.712	2439.628	2440.340	0.5	PASS
		2480	0.712	2479.628	2480.340	0.5	PASS

Test Graphs

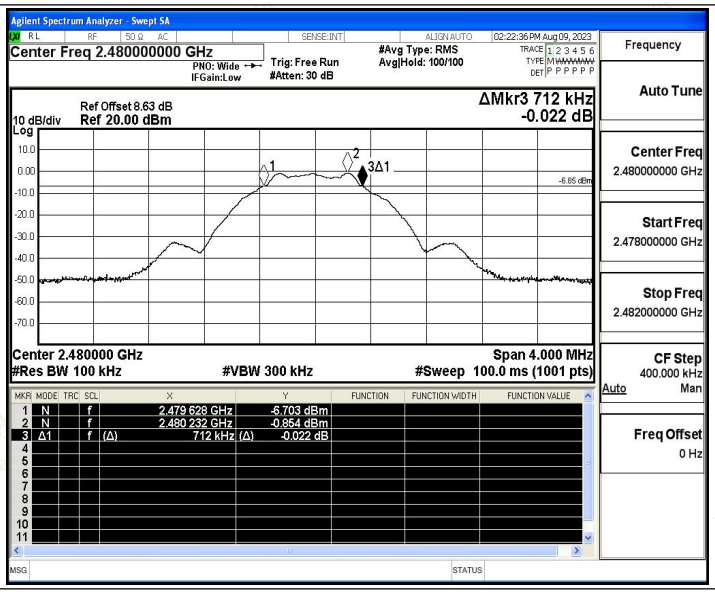
BLE_1M_Ant1_2402



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: 100/100
02:22:36 PM Aug 09, 2023
Ref Offset 8.63 dB
10 dB/div Ref 20.00 dBm
ΔMkr3 712 kHz
-0.022 dB
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
#Sweep 100.0 ms (1001 pts)
1 N f 2.479 628 GHz -6.703 dBm
2 N f 2.480 232 GHz -0.854 dBm
3 Δ1 f (Δ) 712 kHz (Δ) -0.022 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

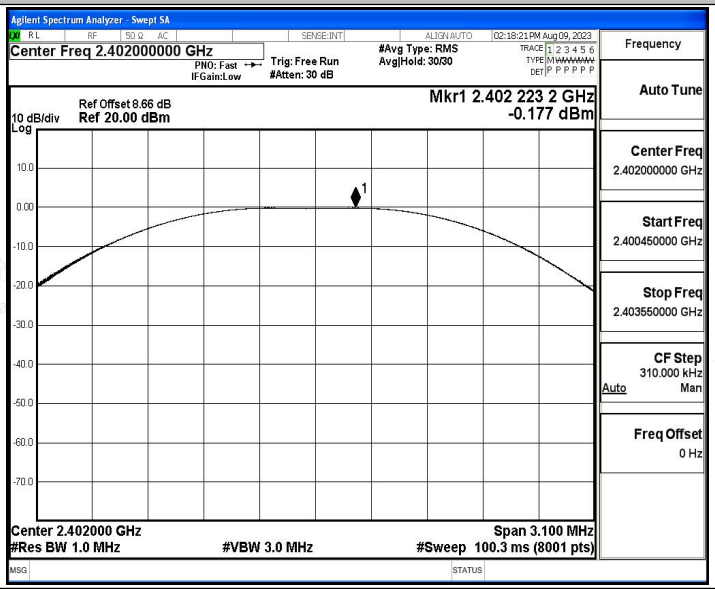
B.2 Maximum conducted output power

Test Result

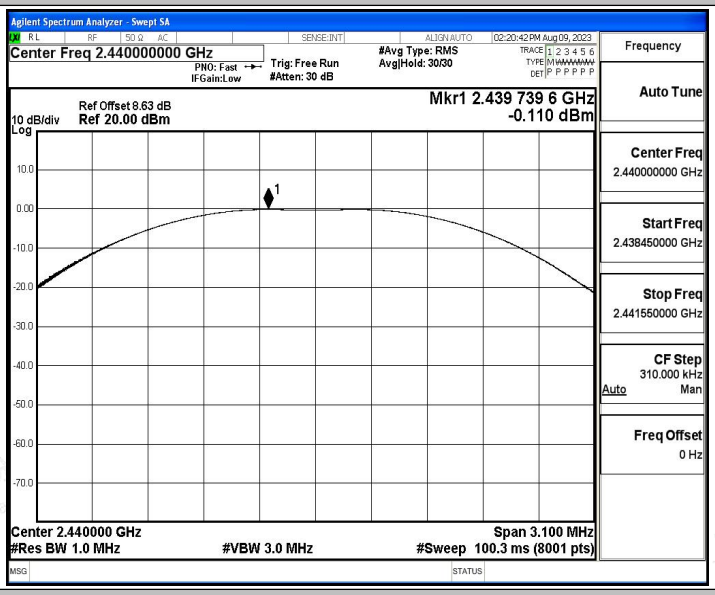
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-0.18	≤30	PASS
		2440	-0.11	≤30	PASS
		2480	0.08	≤30	PASS

Test Graphs

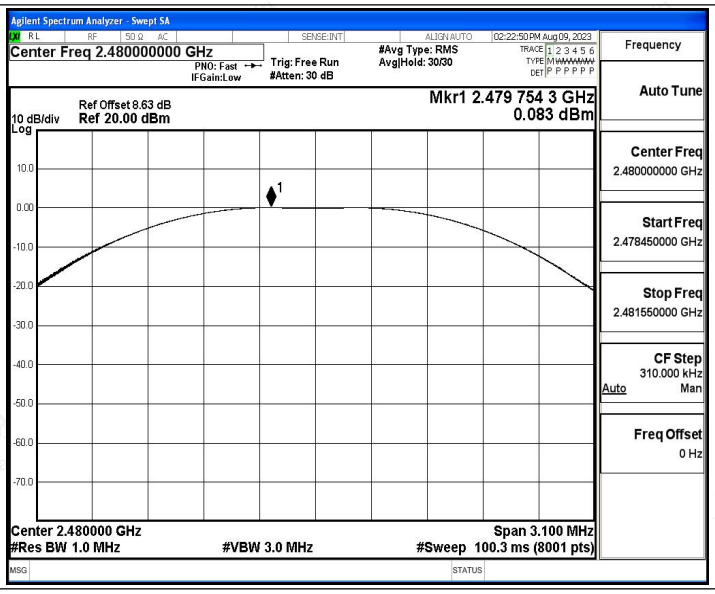
BLE_1M_Ant1_2402



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
02:22:50 PM Aug 09, 2023
Frequency
Auto Tune
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 754 3 GHz
0.083 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)

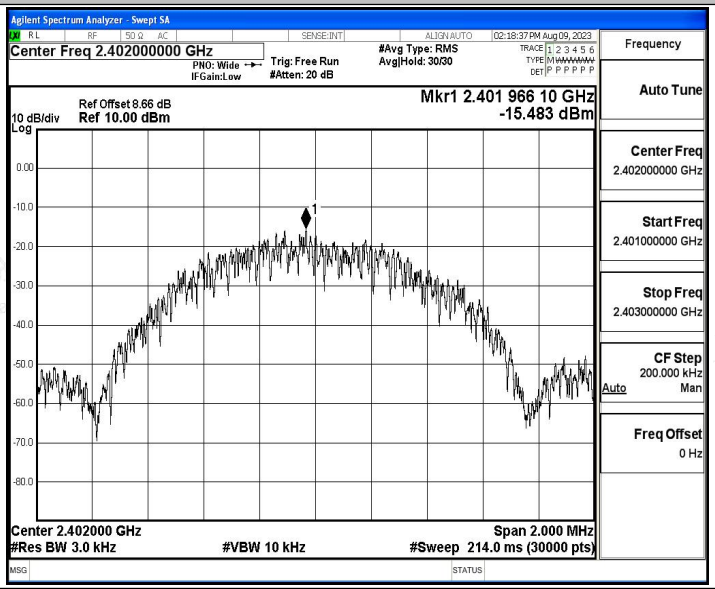
B.3 Maximum power spectral density

Test Result

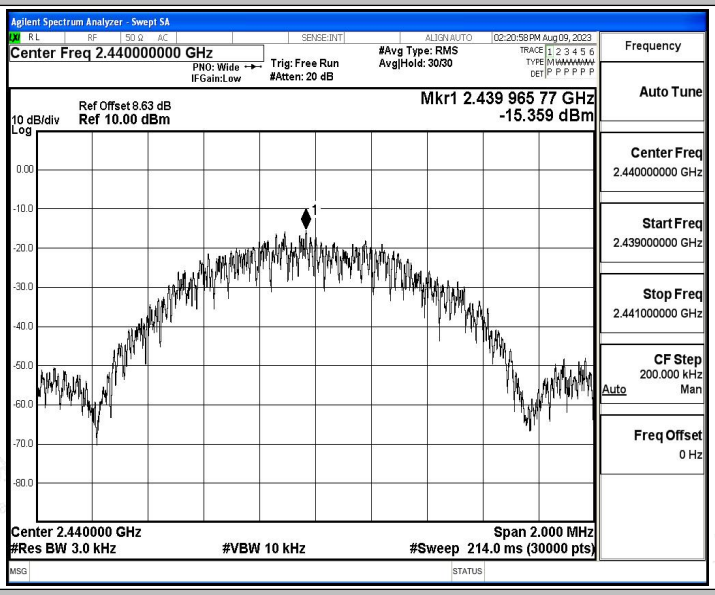
TestMode	Antenna	Channel	Result[dBm/3KHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-15.48	≤8.00	PASS
		2440	-15.36	≤8.00	PASS
		2480	-15.21	≤8.00	PASS

Test Graphs

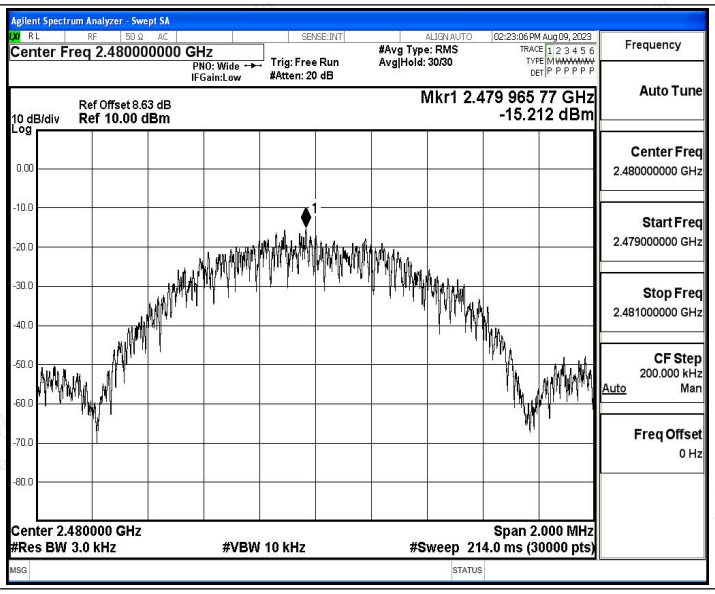
BLE_1M_Ant1_2402



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
02:23:06 PM Aug 09, 2023
Ref Offset 8.63 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.479 965 77 GHz
-15.212 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

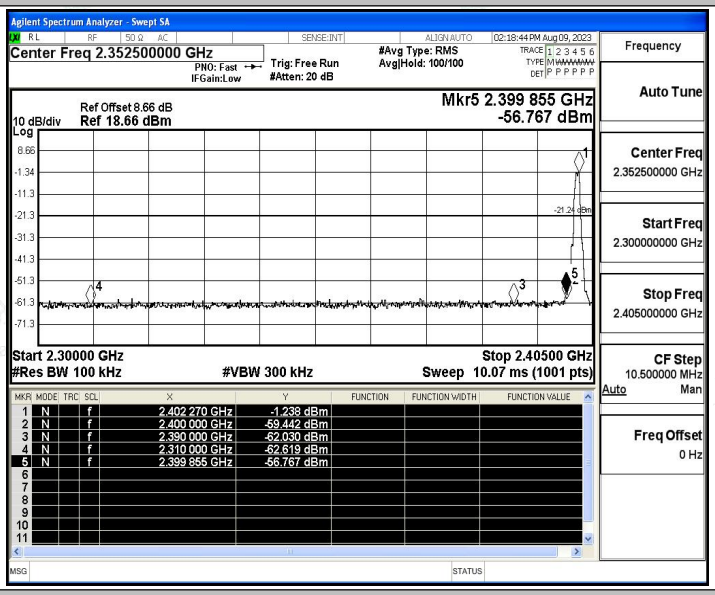
B.4 Band edge measurements

Test Result

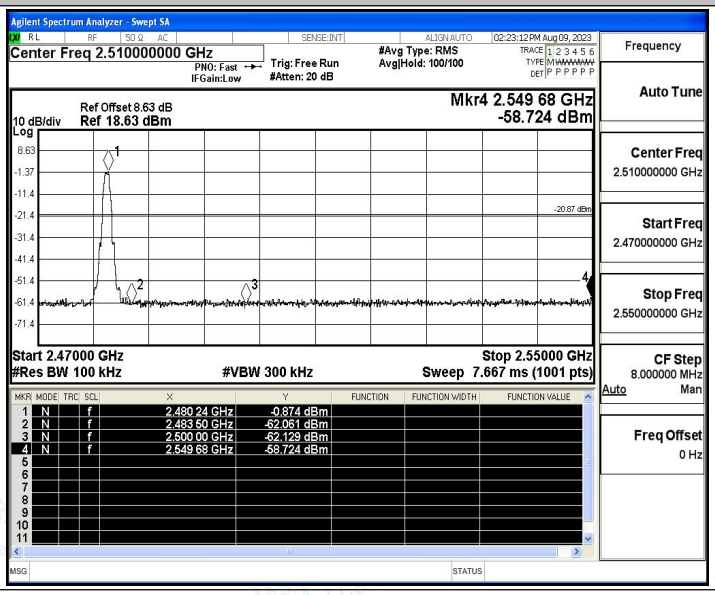
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-1.24	-56.77	≤-21.24	PASS
		High	2480	-0.87	-58.72	≤-20.87	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



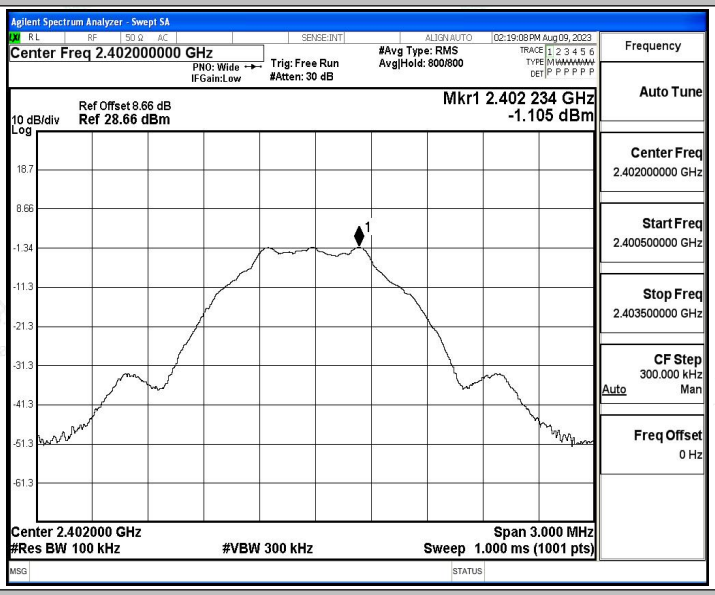
B.5 Conducted Spurious Emission

Test Result

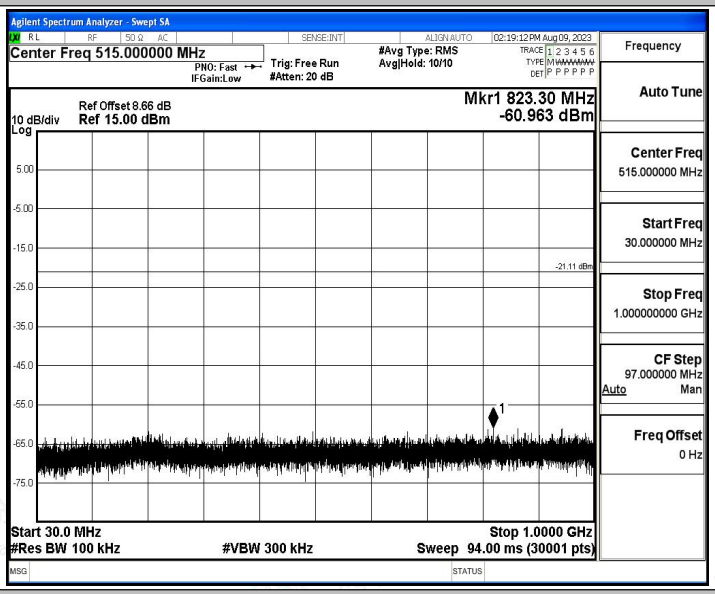
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-1.11	-1.11	---	PASS
			30~1000	-1.11	-60.96	≤-21.11	PASS
			1000~26500	-1.11	-47.16	≤-21.11	PASS
		2440	Reference	-1.03	-1.03	---	PASS
			30~1000	-1.03	-60.39	≤-21.03	PASS
			1000~26500	-1.03	-46.14	≤-21.03	PASS
		2480	Reference	-0.84	-0.84	---	PASS
			30~1000	-0.84	-61.27	≤-20.84	PASS
			1000~26500	-0.84	-47.19	≤-20.84	PASS

Test Graphs

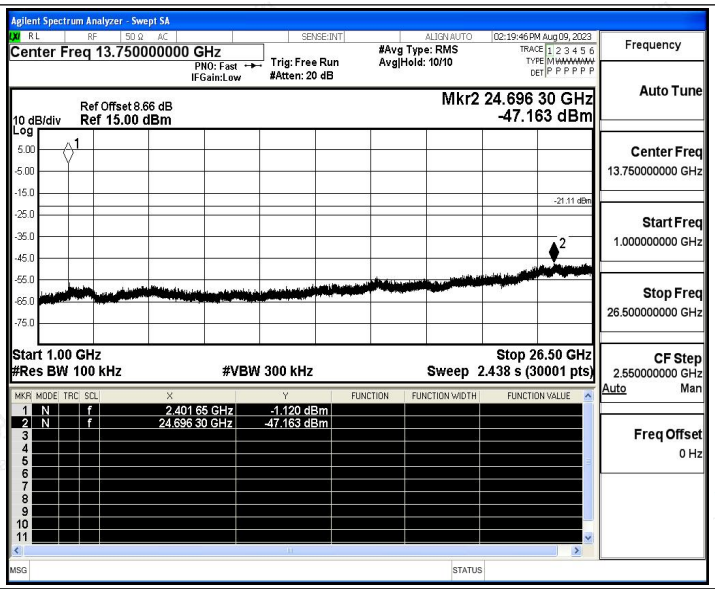
BLE_1M_Ant1_2402_0~Reference



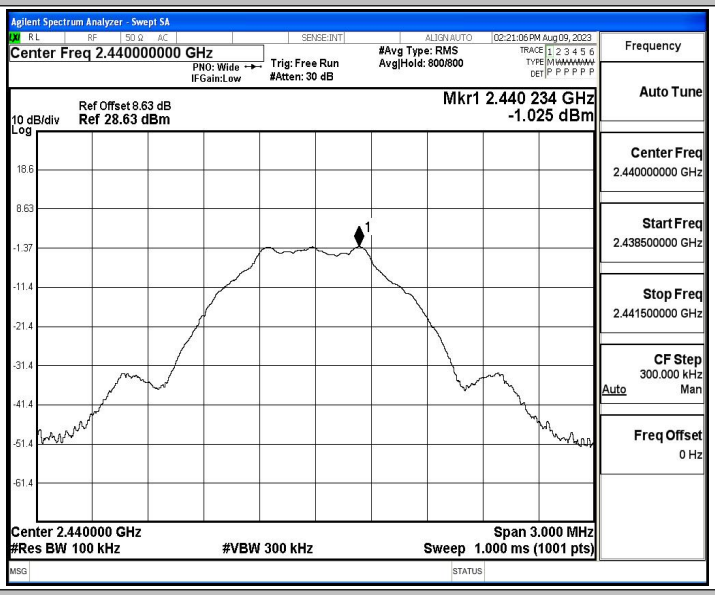
BLE_1M_Ant1_2402_30~1000



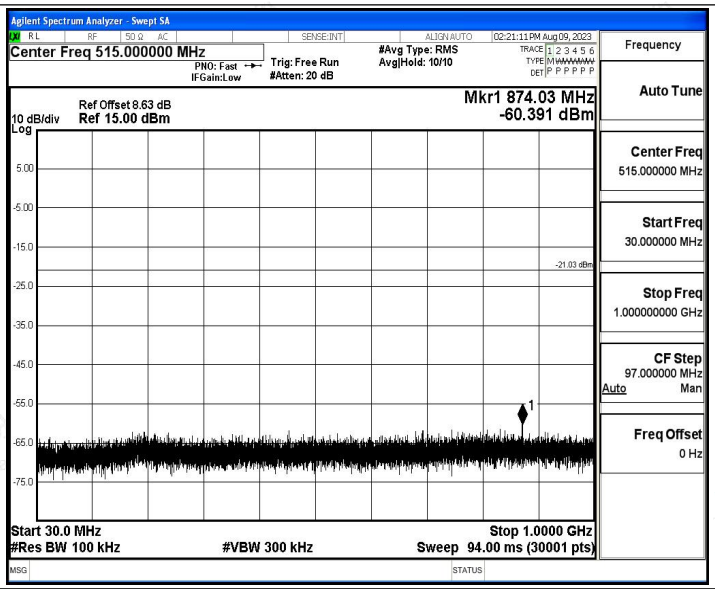
BLE_1M_Ant1_2402_1000~26500



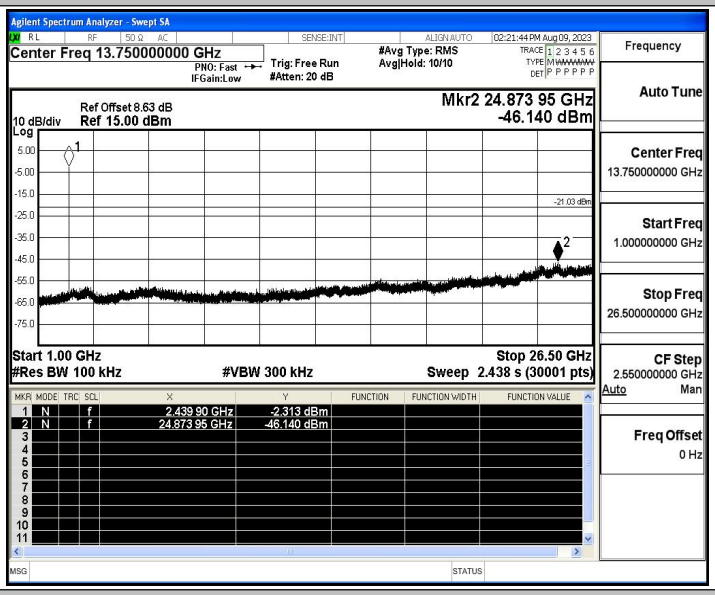
BLE_1M_Ant1_2440_0~Reference



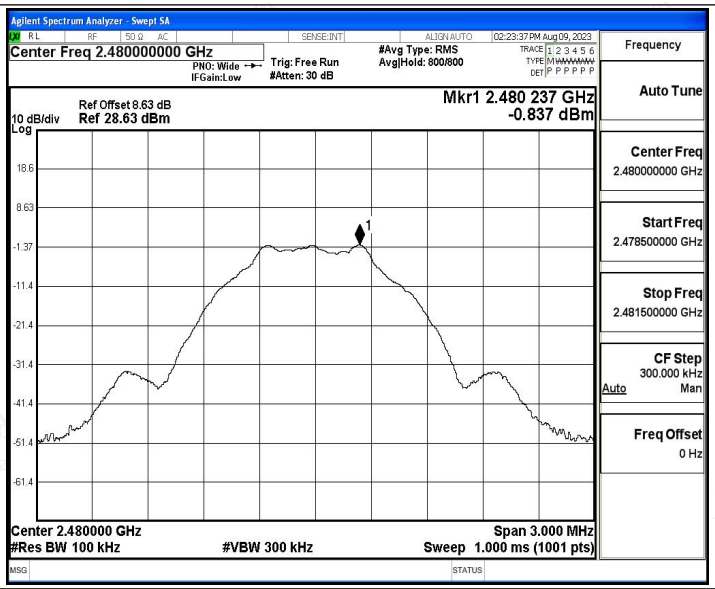
BLE_1M_Ant1_2440_30~1000



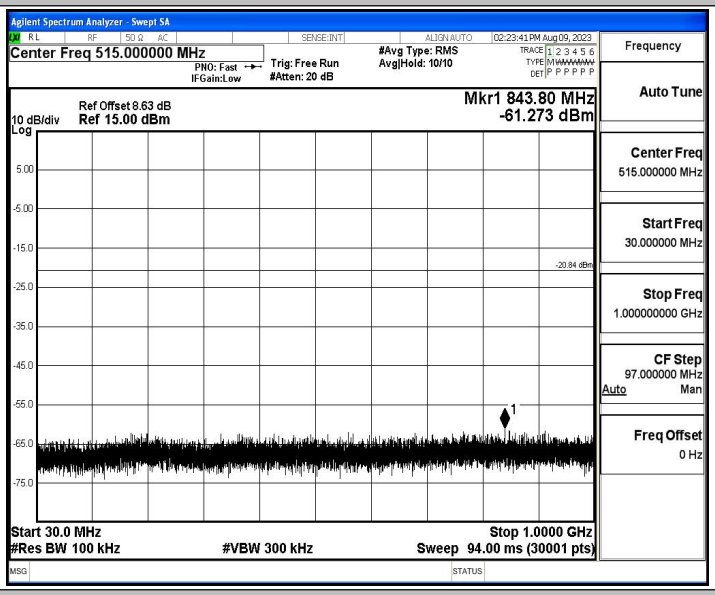
BLE_1M_Ant1_2440_1000~26500



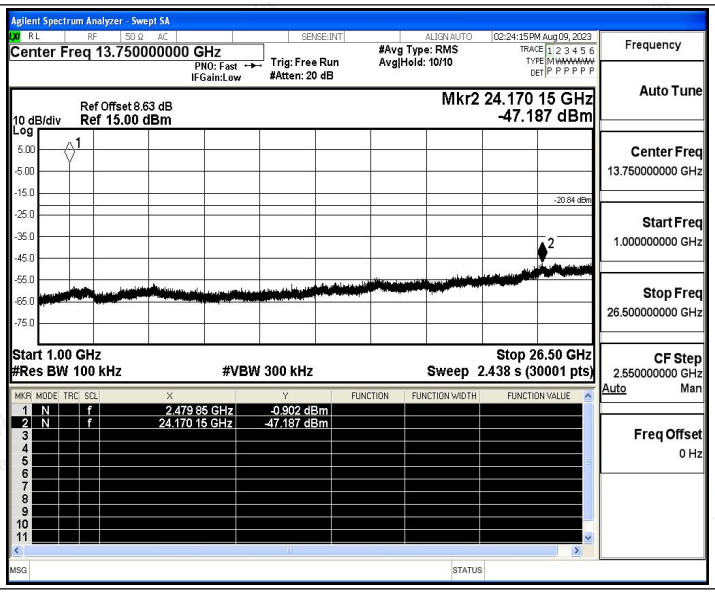
BLE_1M_Ant1_2480_0~Reference



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: 10/10
02:24:15 PM Aug 09, 2023
Ref Offset 8.63 dB
10 dB/div Ref 15.00 dBm
Log
Mkr2 24.170 15 GHz
-47.187 dBm
-20.84 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
1 N f 2.479 85 GHz -0.902 dBm
2 N f 24.170 15 GHz -47.187 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

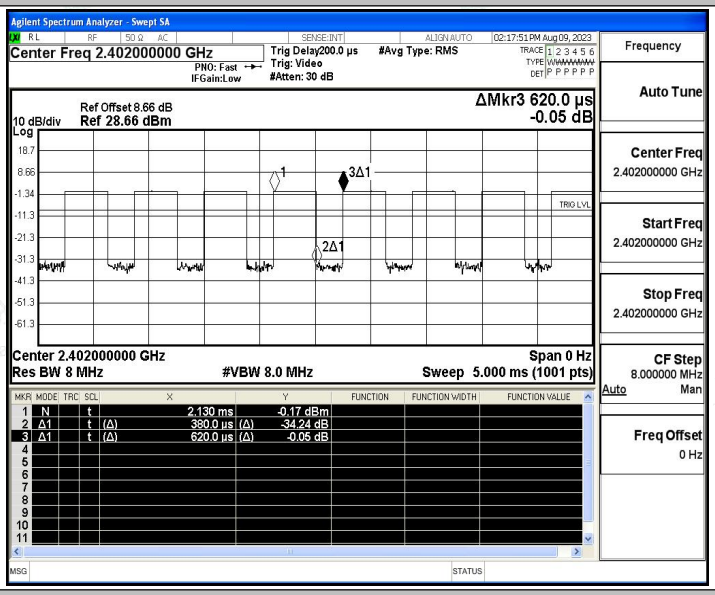
B.6 Duty Cycle

Test Result

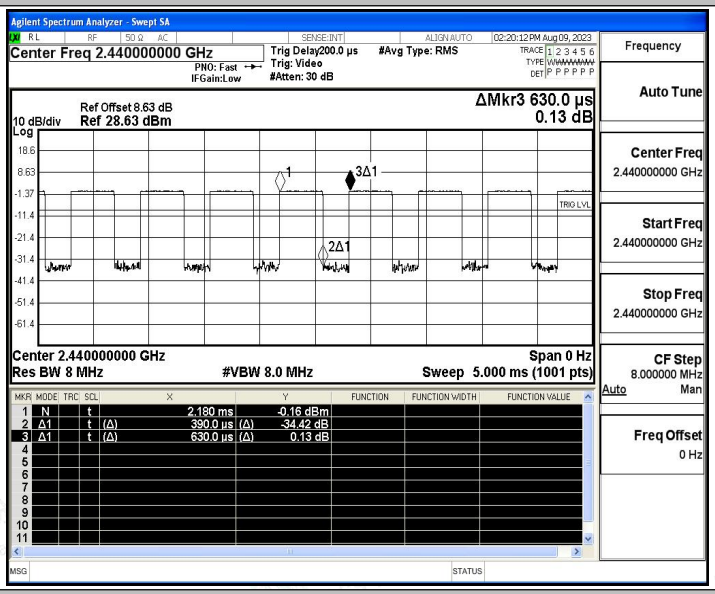
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	1/T
BLE_1M	Ant1	2402	0.38	0.62	0.6129	61.29	2.13	2.63
		2440	0.39	0.63	0.6190	61.90	2.08	2.56
		2480	0.39	0.63	0.6190	61.90	2.08	2.56

Test Graphs

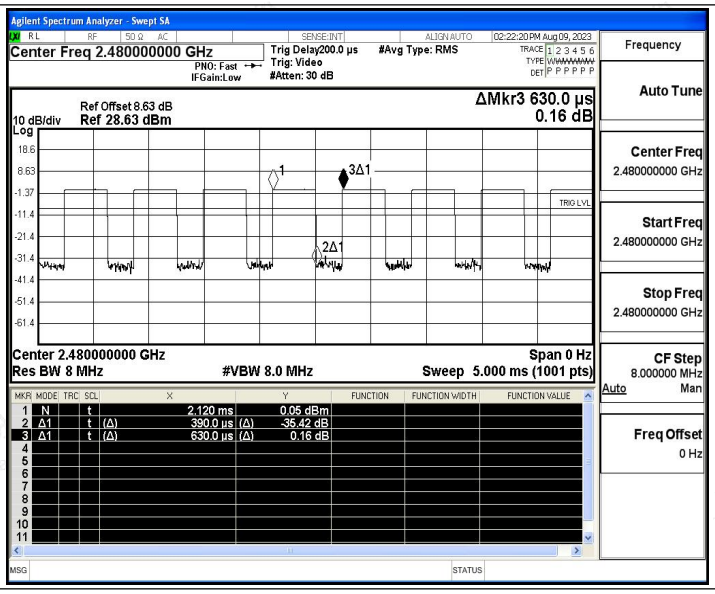
BLE_1M_Ant1_2402



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
#Atten: 30 dB
#Avg Type: RMS
02:22:20 PM Aug 09, 2023
Ref Offset 8.63 dB
10 dB/div Ref 28.63 dBm
ΔMkr3 630.0 µs
0.16 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 2.120 ms 0.05 dBm
2 Δ1 t (Δ) 390.0 µs (Δ) -35.42 dB
3 Δ1 t (Δ) 630.0 µs (Δ) 0.16 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

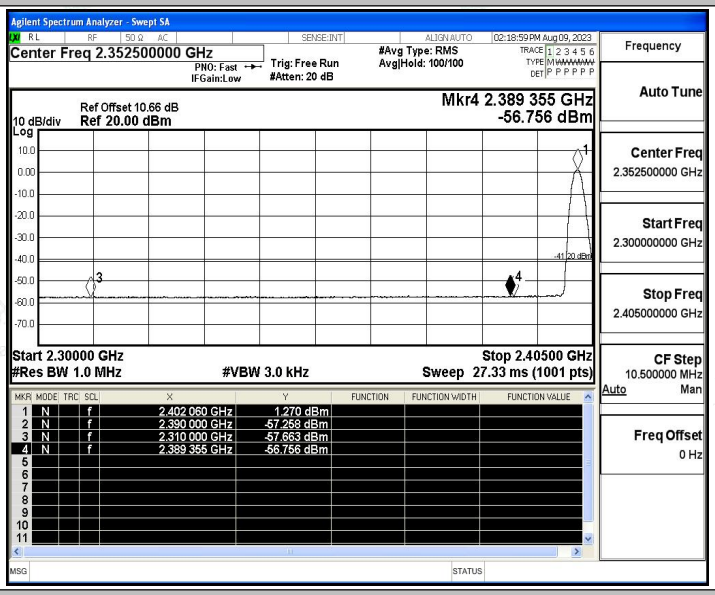
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Gain (dBi)	E (dBuV/m)	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-57.66	2.60	39.81	≤54	PASS
				AV	2389.355	-56.76	2.60	40.71	≤54	PASS
				AV	2390.000	-57.26	2.60	40.21	≤54	PASS
				Peak	2310.000	-50.93	2.60	46.54	≤74	PASS
				Peak	2315.855	-47.97	2.60	49.50	≤74	PASS
				Peak	2390.000	-50.58	2.60	46.89	≤74	PASS
		High	2480	AV	2483.500	-53.68	2.60	43.79	≤54	PASS
				AV	2483.520	-53.68	2.60	43.79	≤54	PASS
				AV	2500.000	-56.68	2.60	40.79	≤54	PASS
				Peak	2483.500	-50.83	2.60	46.64	≤74	PASS
				Peak	2498.560	-47.64	2.60	49.83	≤74	PASS
				Peak	2500.000	-49.22	2.60	48.25	≤74	PASS

Note:

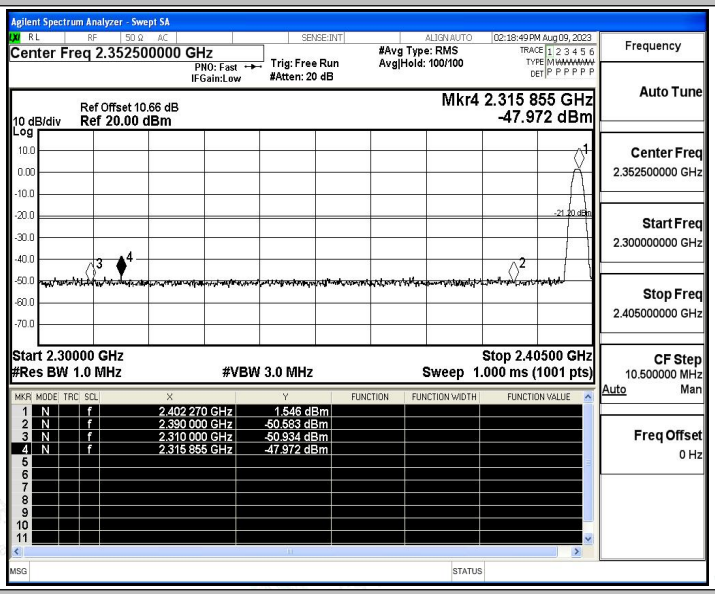
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

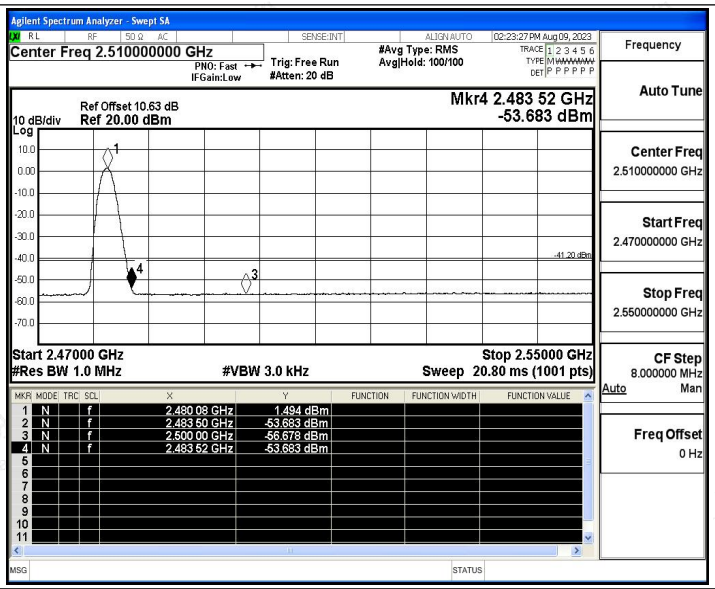
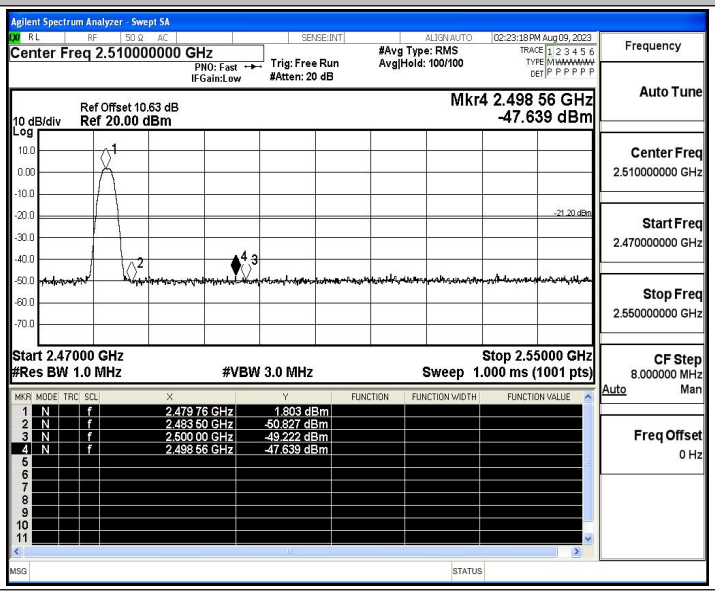
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak