Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: Body Composition Scale

Test Model: SignosT2

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Nick Peng
Supervised by:	Ling Zhu

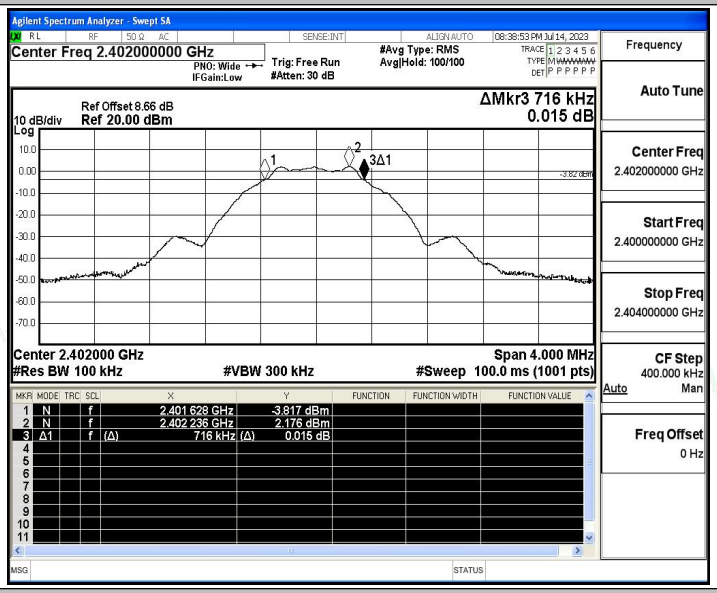
A.1 6dB Bandwidth

Test Result

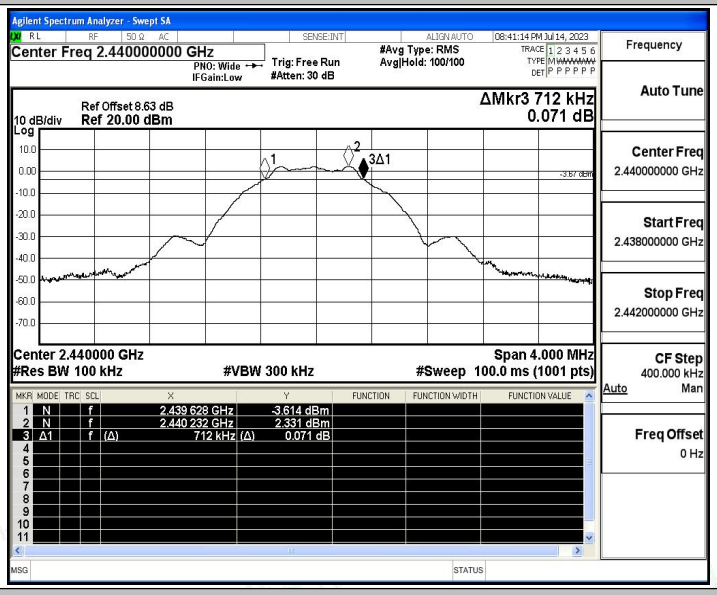
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.716	2401.628	2402.344	0.5	PASS
		2440	0.712	2439.628	2440.340	0.5	PASS
		2480	0.716	2479.624	2480.340	0.5	PASS

Test Graphs

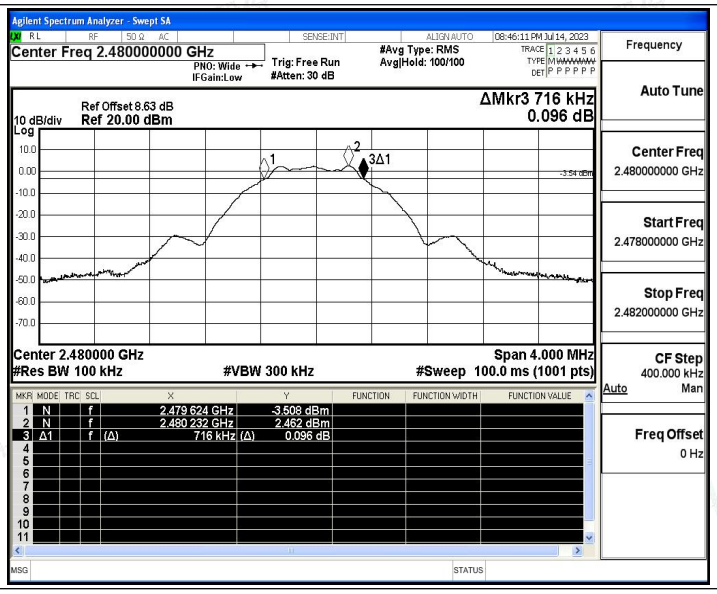
BLE_1M_Ant1_2402



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
08:46:11 PM Jul 14, 2023
Ref Offset 8.63 dB
10 dB/div Ref 20.00 dBm
Log
ΔMkr3 716 kHz
0.096 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 2.479 624 GHz -3.508 dBm
2 N f 2.480 232 GHz 2.462 dBm
3 Δ1 f (Δ) 716 kHz (Δ) 0.096 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

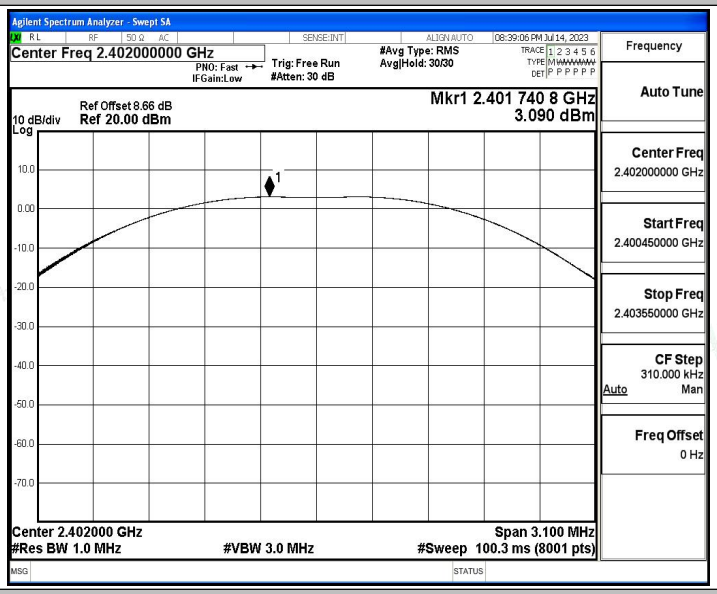
A.2 Maximum conducted output power

Test Result

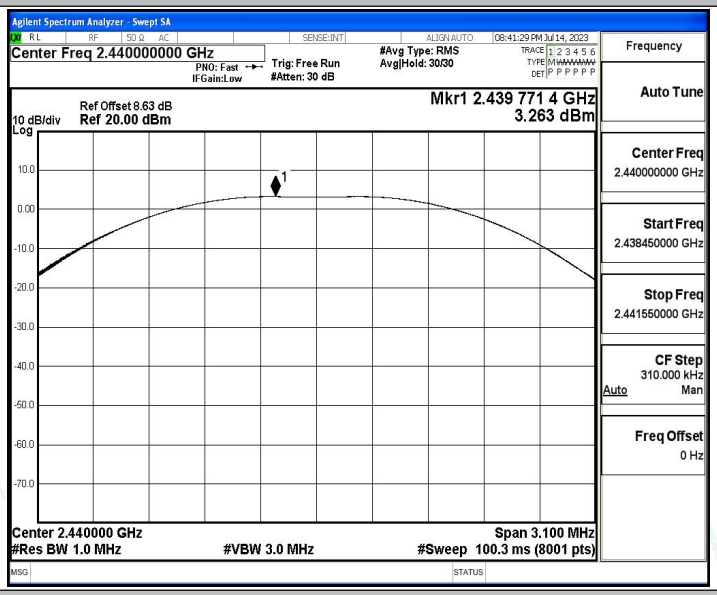
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	3.09	≤30	PASS
		2440	3.26	≤30	PASS
		2480	3.39	≤30	PASS

Test Graphs

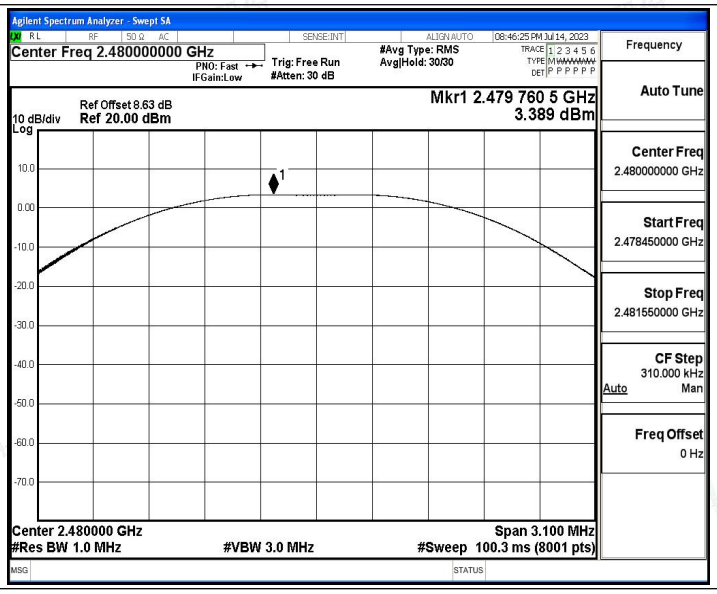
BLE_1M_Ant1_2402



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
08:46:25 PM Jul 14, 2023
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 760 5 GHz
3.389 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

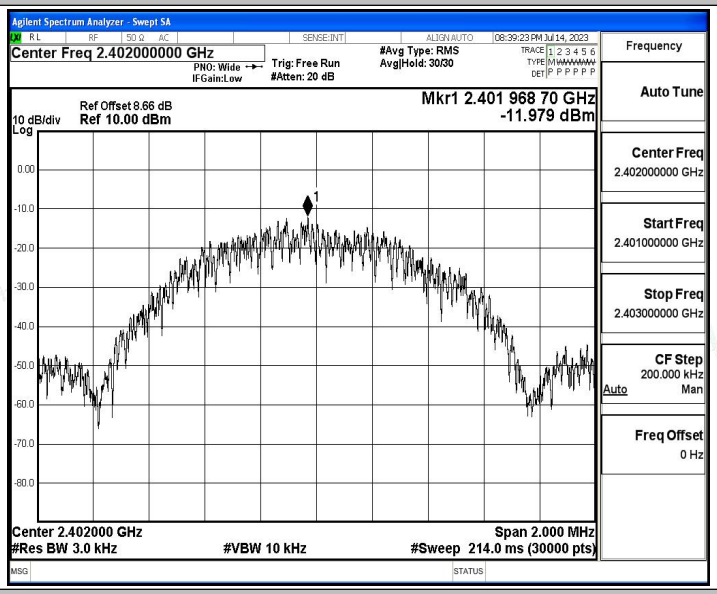
A.3 Maximum power spectral density

Test Result

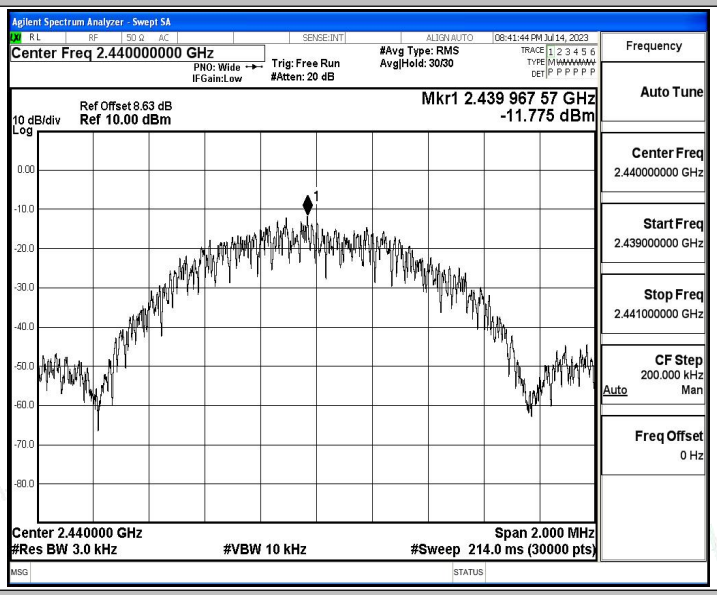
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-11.98	≤8.00	PASS
		2440	-11.78	≤8.00	PASS
		2480	-11.69	≤8.00	PASS

Test Graphs

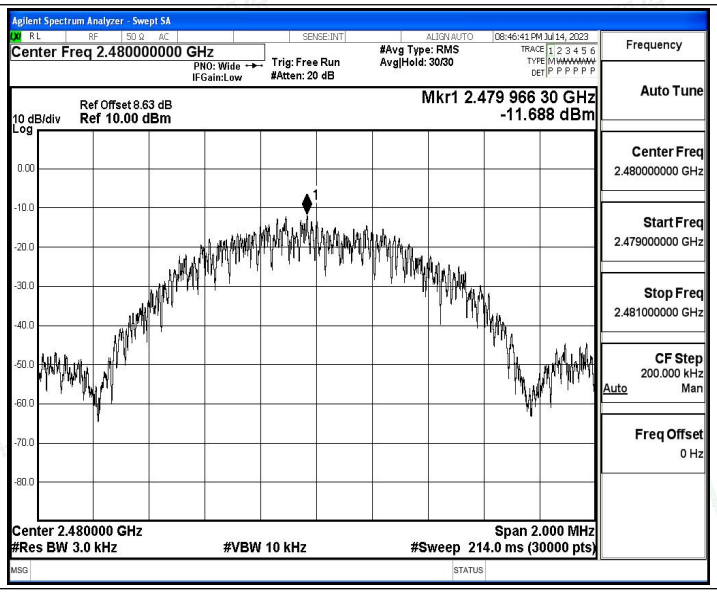
BLE_1M_Ant1_2402



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
08:46:41 PM Jul 14, 2023
Ref Offset 8.63 dB
10 dB/div Ref 10.00 dBm
Log
Mkr1 2.479 966 30 GHz
-11.688 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

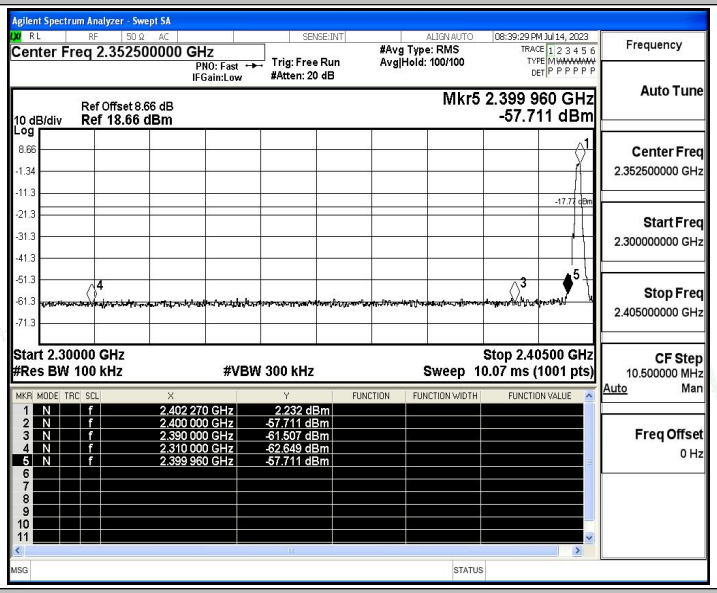
A.4 Band edge measurements

Test Result

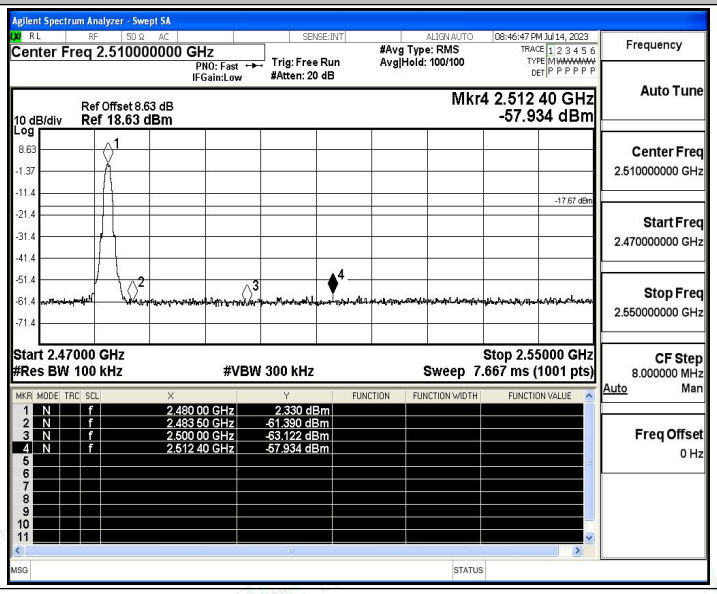
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	2.23	-57.71	≤-17.77	PASS
		High	2480	2.33	-57.93	≤-17.67	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



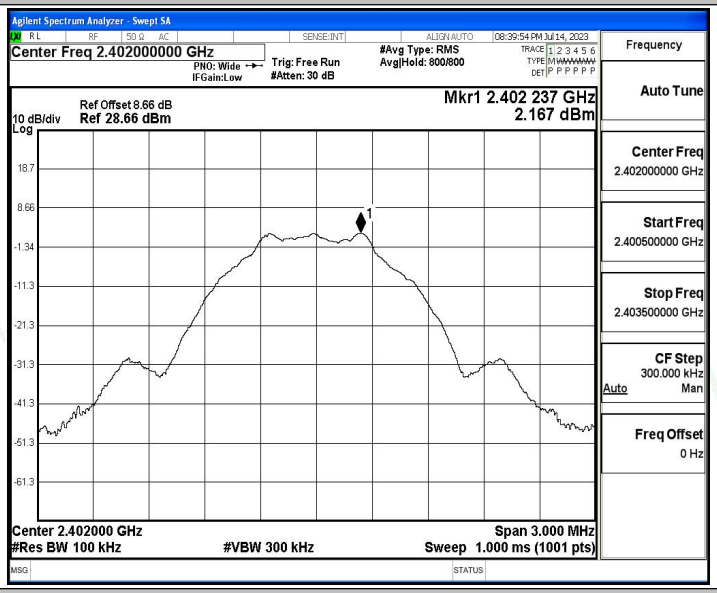
A.5 Conducted Spurious Emission

Test Result

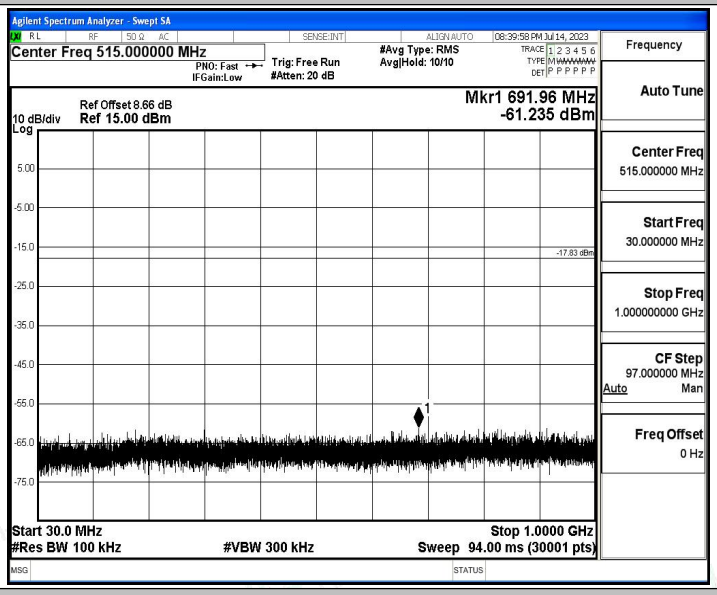
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	2.17	2.17	---	PASS
			30~1000	2.17	-61.24	≤-17.83	PASS
			1000~26500	2.17	-46.97	≤-17.83	PASS
		2440	Reference	2.33	2.33	---	PASS
			30~1000	2.33	-61.39	≤-17.67	PASS
			1000~26500	2.33	-46.08	≤-17.67	PASS
		2480	Reference	2.46	2.46	---	PASS
			30~1000	2.46	-60.75	≤-17.54	PASS
			1000~26500	2.46	-43.77	≤-17.54	PASS

Test Graphs

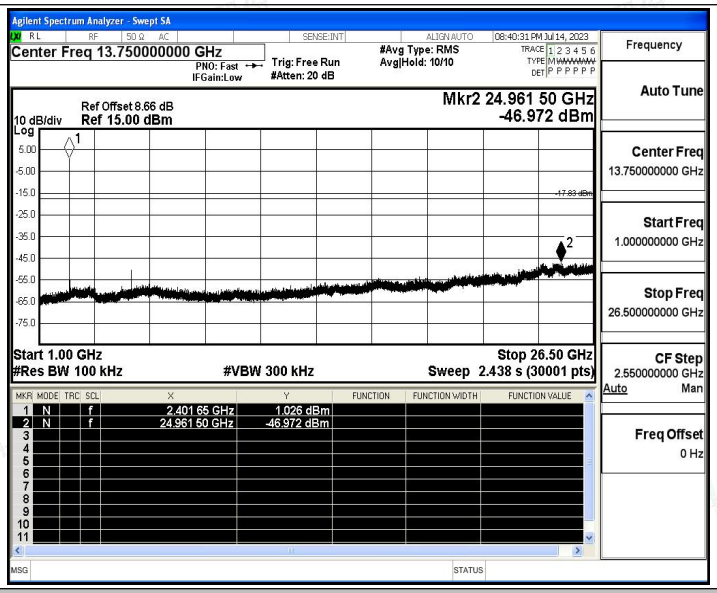
BLE_1M_Ant1_2402_0~Reference



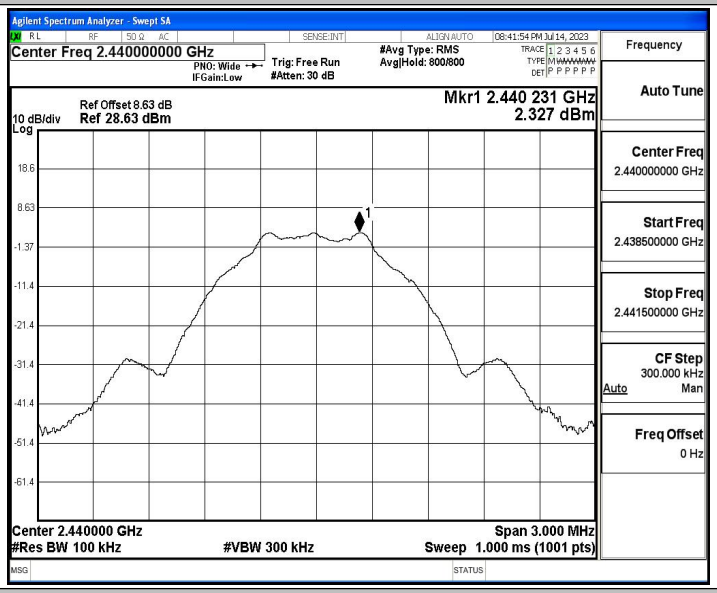
BLE_1M_Ant1_2402_30~1000



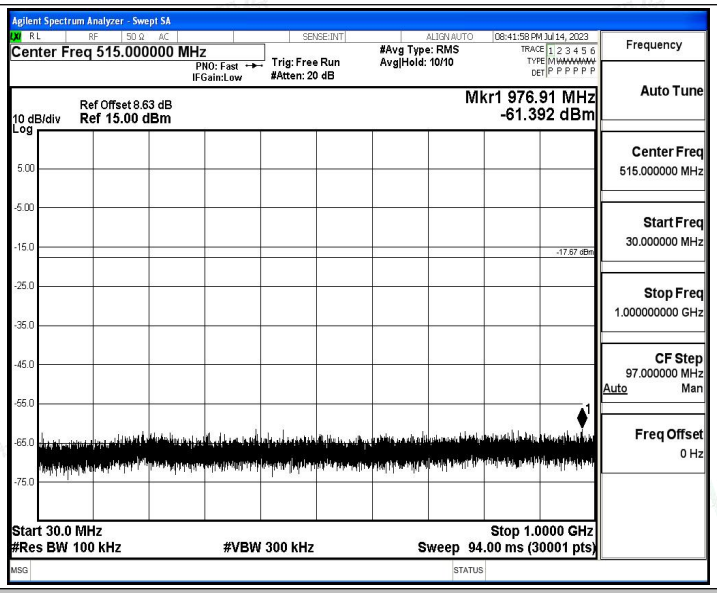
BLE_1M_Ant1_2402_1000~26500



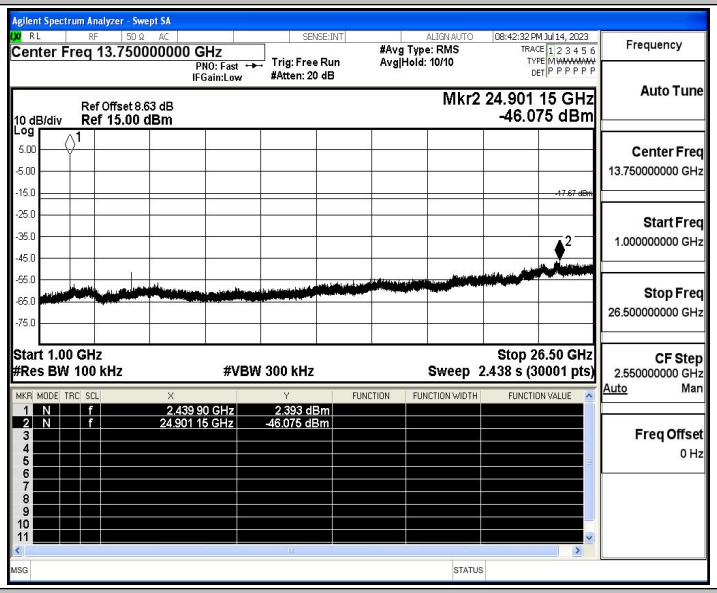
BLE_1M_Ant1_2440_0~Reference



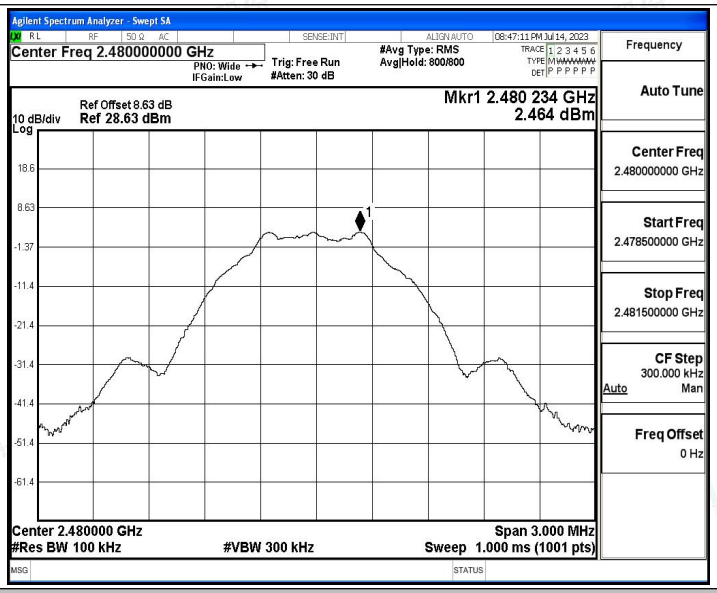
BLE_1M_Ant1_2440_30~1000



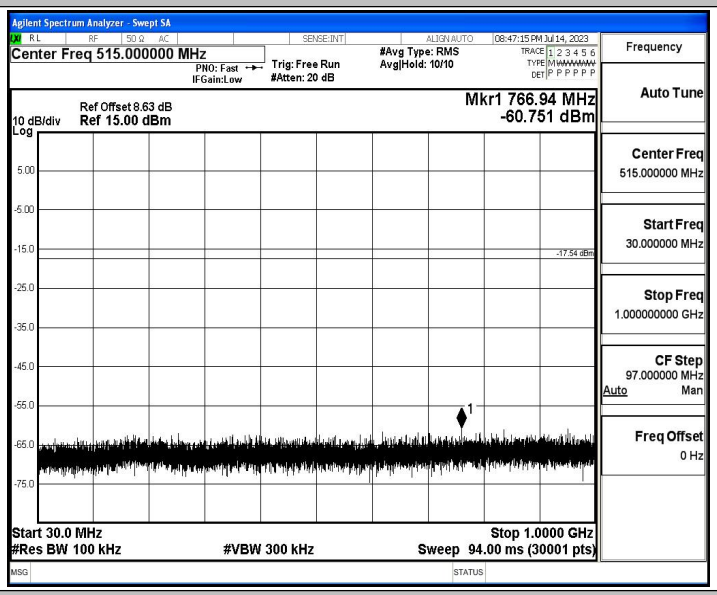
BLE_1M_Ant1_2440_1000~26500



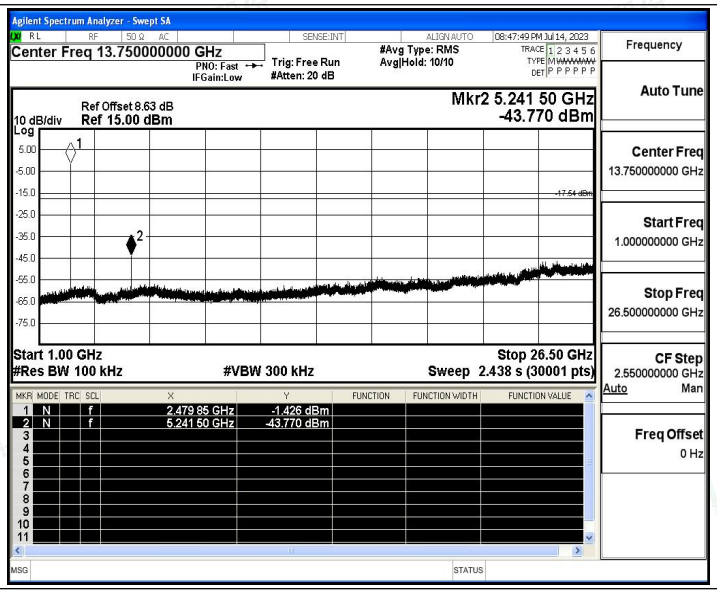
BLE_1M_Ant1_2480_0~Reference



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
08:47:49 PM Jul 14, 2023
Ref Offset 8.63 dB
10 dB/div Ref 15.00 dBm
Log
Mkr2 5.241 50 GHz
-43.770 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 -1.426 dBm
2 N f 5.241 50 GHz -43.770 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

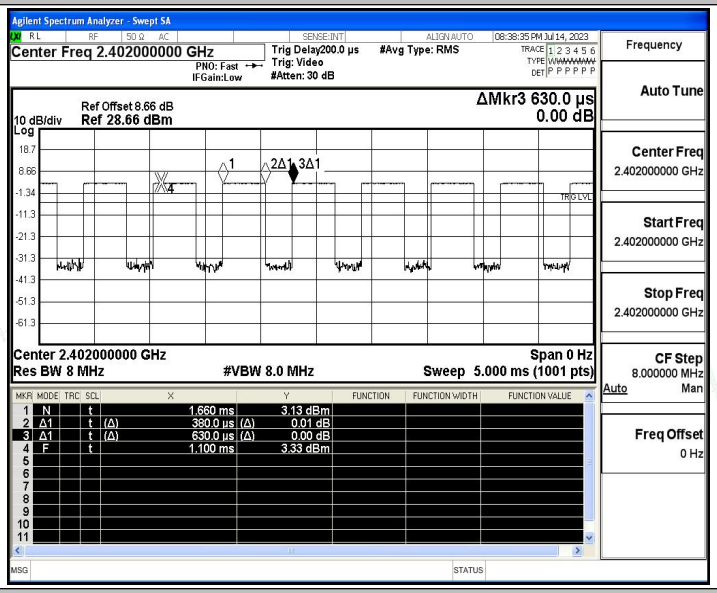
A.6 Duty Cycle

Test Result

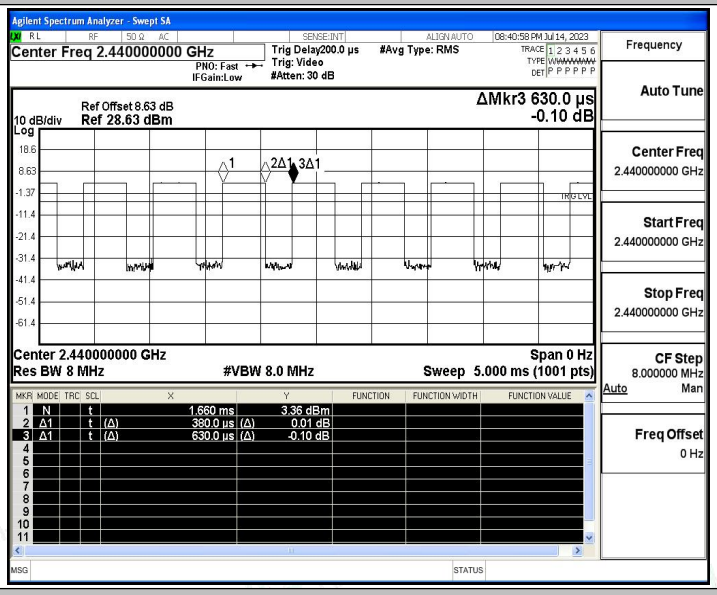
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	1/T
BLE_1M	Ant1	2402	0.38	0.63	0.6032	60.32	2.20	2.63
		2440	0.38	0.63	0.6032	60.32	2.20	2.63
		2480	0.39	0.63	0.6190	61.90	2.08	2.56

Test Graphs

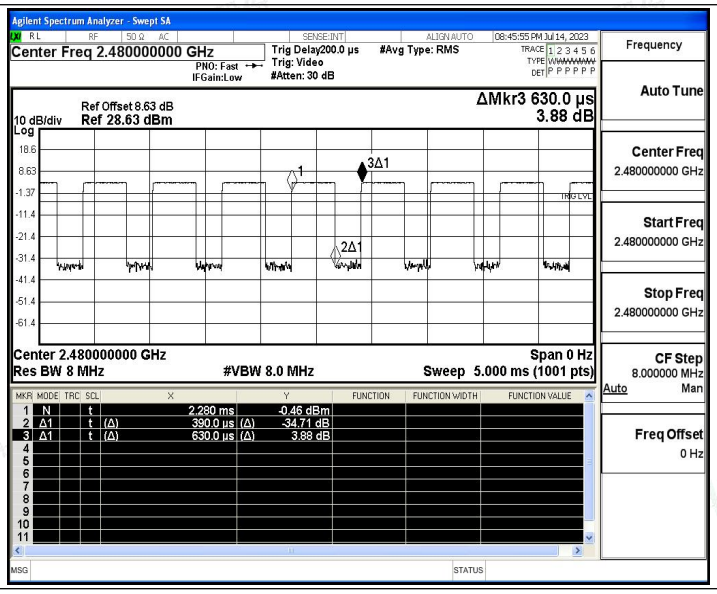
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
Trig Delay200.0 µs
Trig: Video
#Atten: 30 dB
#Avg Type: RMS
08:45:55 PM Jul 14, 2023
Ref Offset 8.63 dB
10 dB/div Ref 28.63 dBm
Log
ΔMkr3 630.0 µs
3.88 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 2.280 ms -0.46 dBm
2 Δ1 t (Δ) 390.0 µs (Δ) -34.71 dB
3 Δ1 t (Δ) 630.0 µs (Δ) 3.88 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

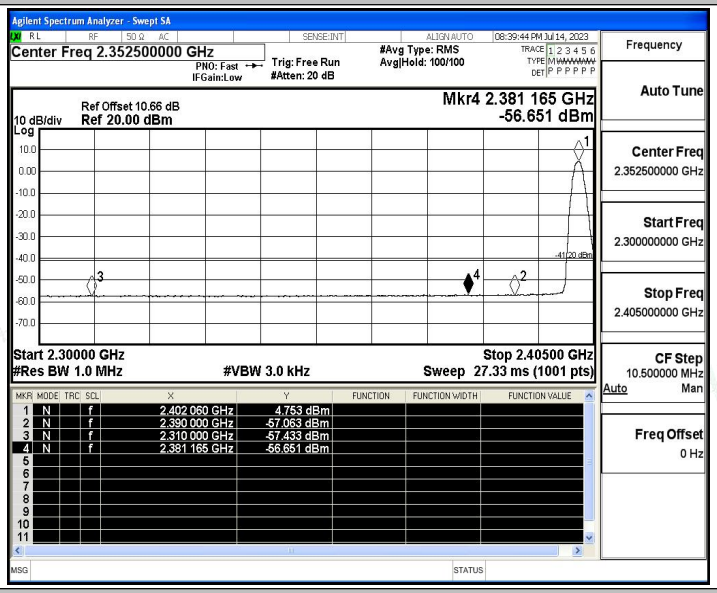
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-57.43	≤-41.20	37.77	≤54	PASS
				AV	2381.165	-56.65	≤-41.20	38.55	≤54	PASS
				AV	2390.000	-57.06	≤-41.20	38.14	≤54	PASS
				Peak	2310.000	-51.3	≤-21.20	43.90	≤74	PASS
				Peak	2373.500	-47.91	≤-21.20	47.29	≤74	PASS
				Peak	2390.000	-50.64	≤-21.20	44.56	≤74	PASS
		High	2480	AV	2483.500	-51.23	≤-41.20	43.97	≤54	PASS
				AV	2483.520	-51.23	≤-41.20	43.97	≤54	PASS
				AV	2500.000	-56.42	≤-41.20	38.78	≤54	PASS
				Peak	2483.500	-48.46	≤-21.20	46.74	≤74	PASS
				Peak	2491.760	-47.48	≤-21.20	47.72	≤74	PASS
				Peak	2500.000	-49.83	≤-21.20	45.37	≤74	PASS

Note:

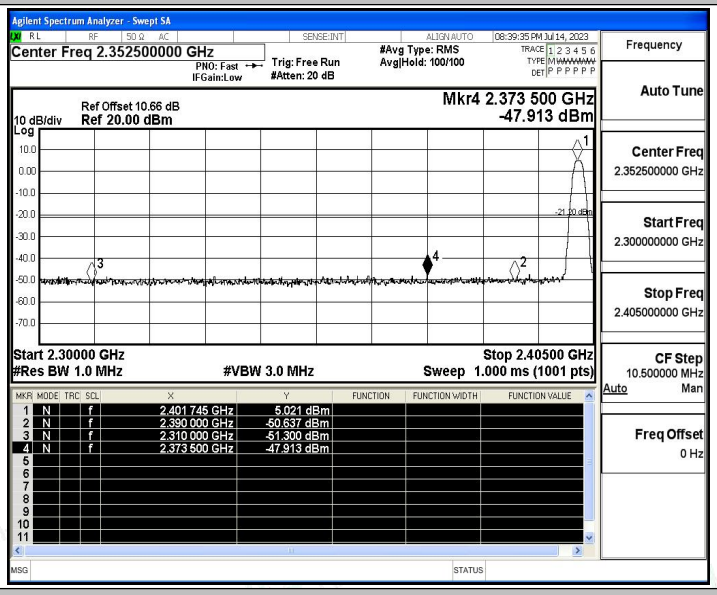
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

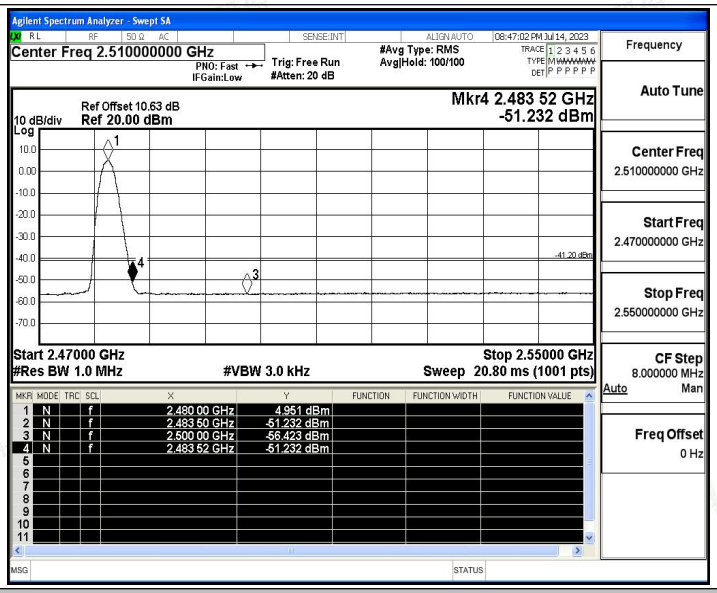
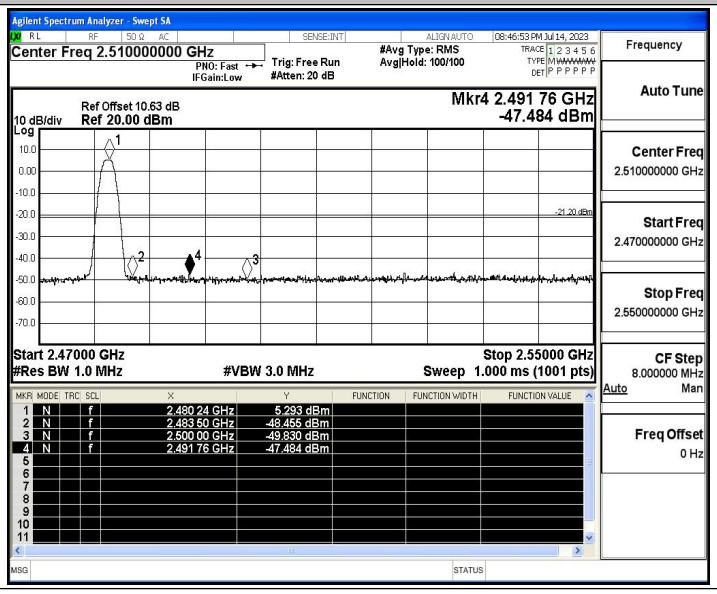
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak