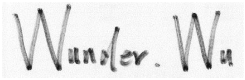
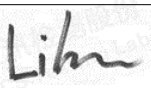
Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Projector

Test Model: Pro V8

Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	 Wunder Wu
Supervised by:	 Li Huan

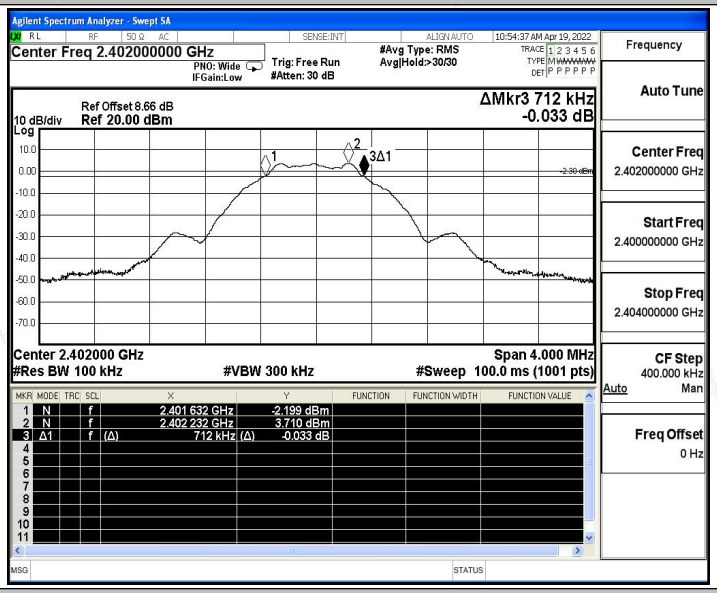
B.1 DTS Bandwidth

Test Result

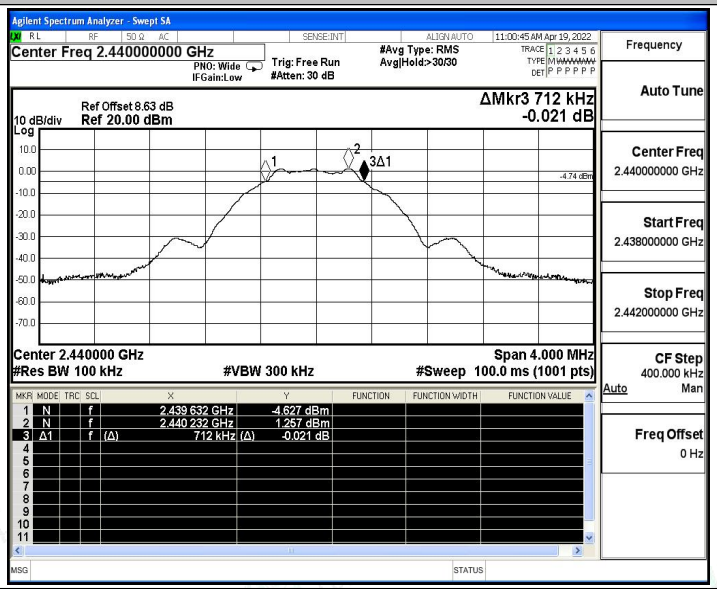
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.712	2401.632	2402.344	0.5	PASS
		2440	0.712	2439.632	2440.344	0.5	PASS
		2480	0.712	2479.632	2480.344	0.5	PASS

Test Graphs

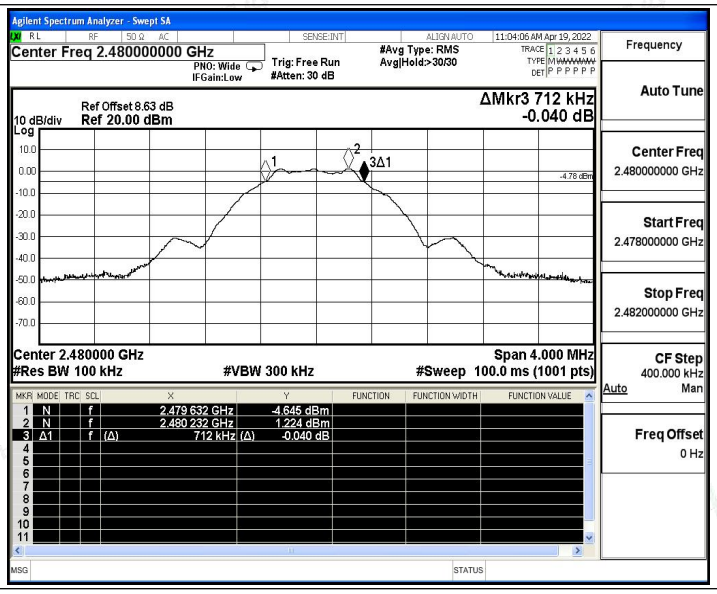
BLE_1M_Ant1_2402



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
11:04:06 AM Apr 19, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
ΔMkr3 712 kHz
-0.040 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 2.479 632 GHz -4.645 dBm
2 N 1 f 2.480 232 GHz 1.224 dBm
3 Δ1 f (Δ) 712 kHz (Δ) -0.040 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

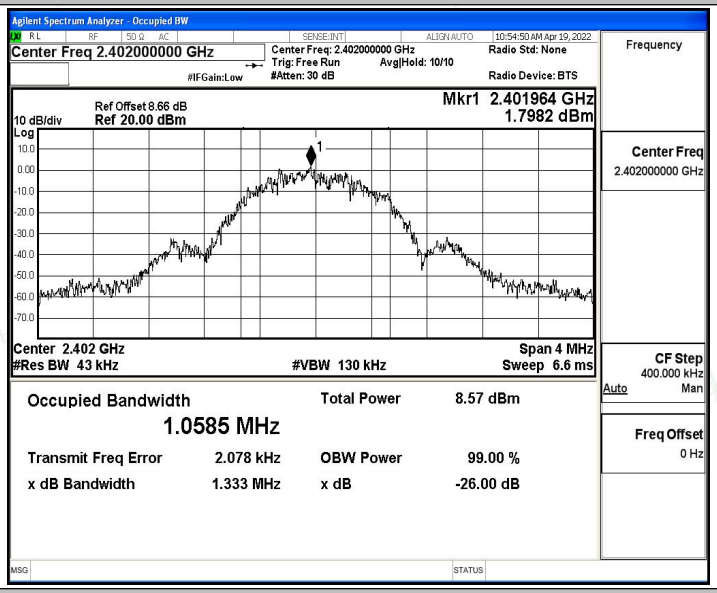
B.2 Occupied Channel Bandwidth

Test Result

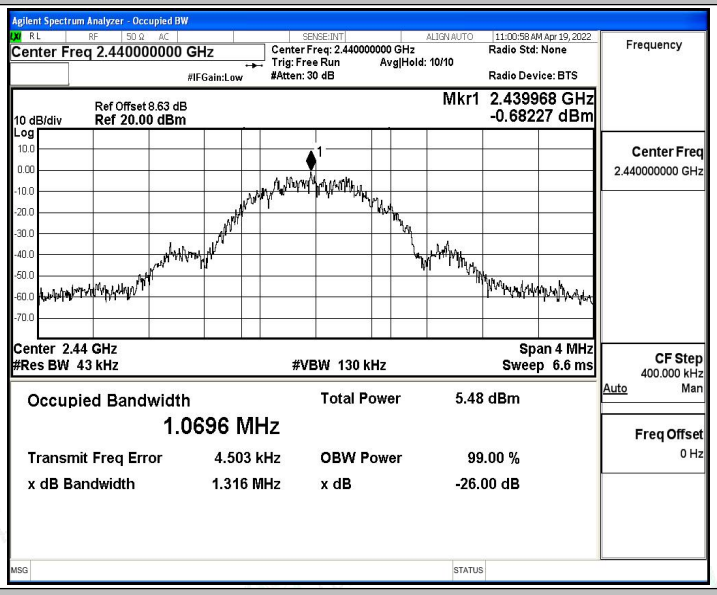
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0585	2401.473	2402.531	---	---
		2440	1.0696	2439.470	2440.539	---	---
		2480	1.0512	2479.479	2480.531	---	---

Test Graphs

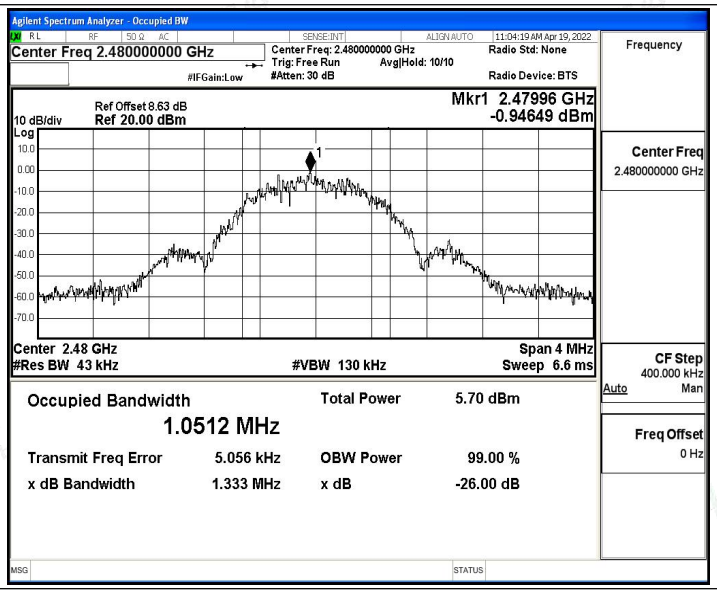
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
11:04:19 AM Apr 19, 2022
Frequency
Mkr1 2.47996 GHz
-0.94649 dBm
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
Log
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 43 kHz
#VBW 130 kHz
Span 4 MHz
Sweep 6.6 ms
CF Step
400.000 kHz
Auto
Man
Freq Offset
0 Hz
Occupied Bandwidth
1.0512 MHz
Total Power 5.70 dBm
Transmit Freq Error 5.056 kHz
OBW Power 99.00 %
x dB Bandwidth 1.333 MHz
x dB -26.00 dB
MSG
STATUS

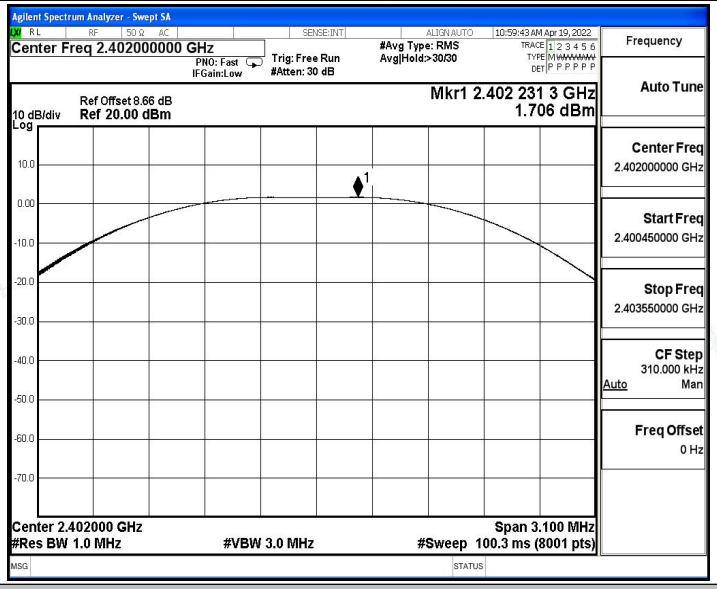
B.3 Maximum peak conducted output power

Test Result

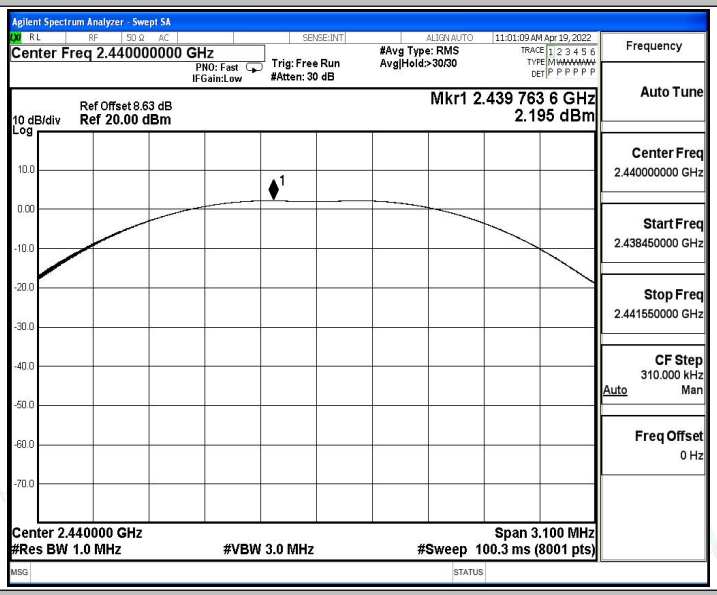
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	1.71	≤30	PASS
		2440	2.2	≤30	PASS
		2480	2.17	≤30	PASS

Test Graphs

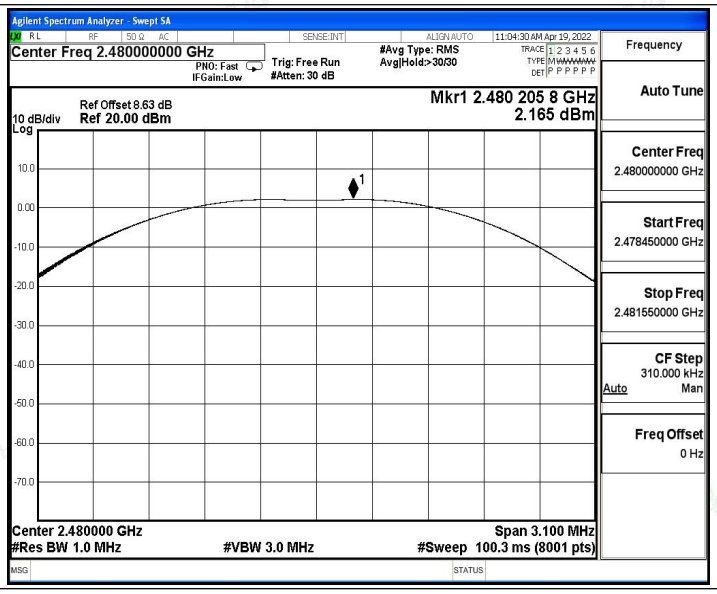
BLE_1M_Ant1_2402



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
11:04:30 AM Apr 19, 2022
Ref Offset 8.63 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 205 8 GHz
2.165 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
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

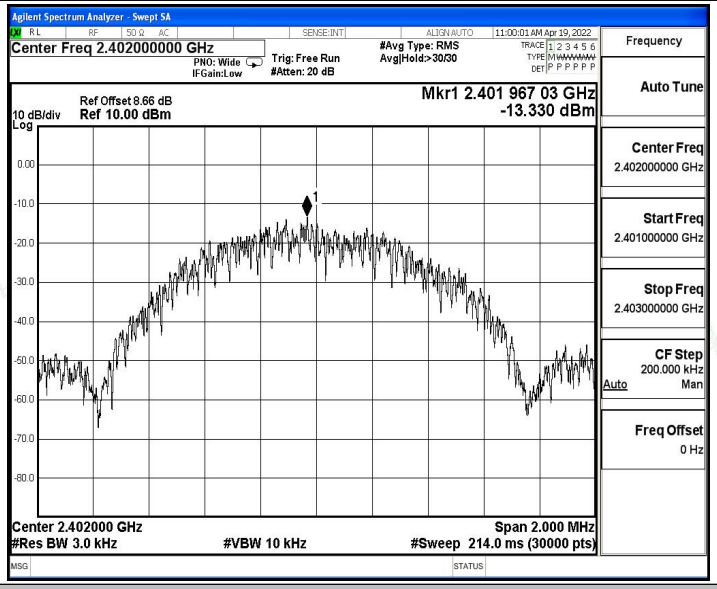
B.4 Maximum power spectral density

Test Result

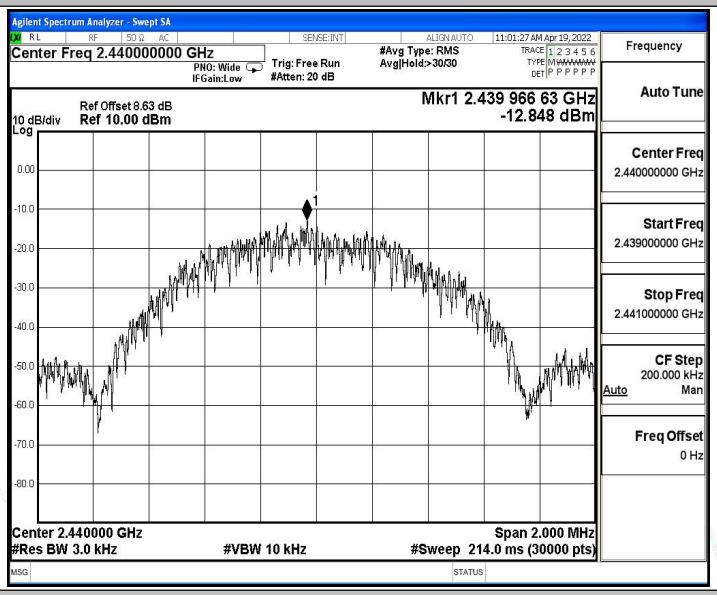
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.33	≤8.00	PASS
		2440	-12.85	≤8.00	PASS
		2480	-12.94	≤8.00	PASS

Test Graphs

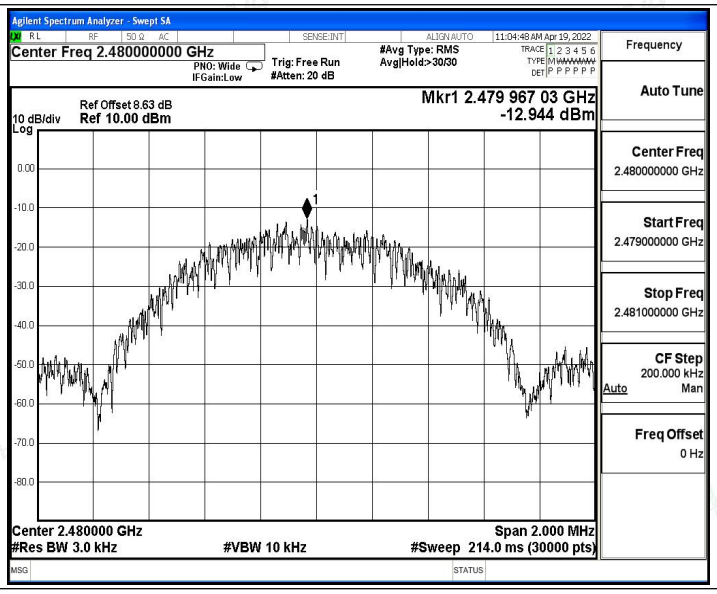
BLE_1M_Ant1_2402



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
11:04:48 AM Apr 19, 2022
Ref Offset 8.63 dB
10 dB/div Ref 10.00 dBm
Log
Mkr1 2.479 967 03 GHz
-12.944 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

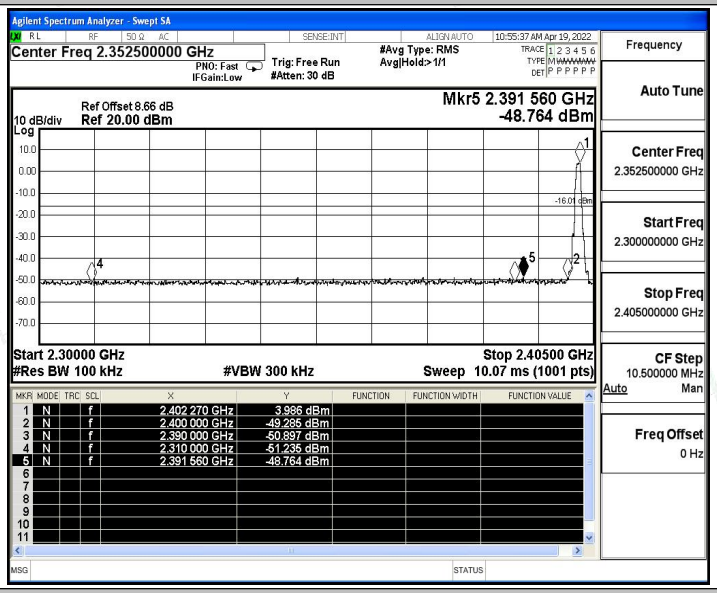
B.5 Band edge measurements

Test Result

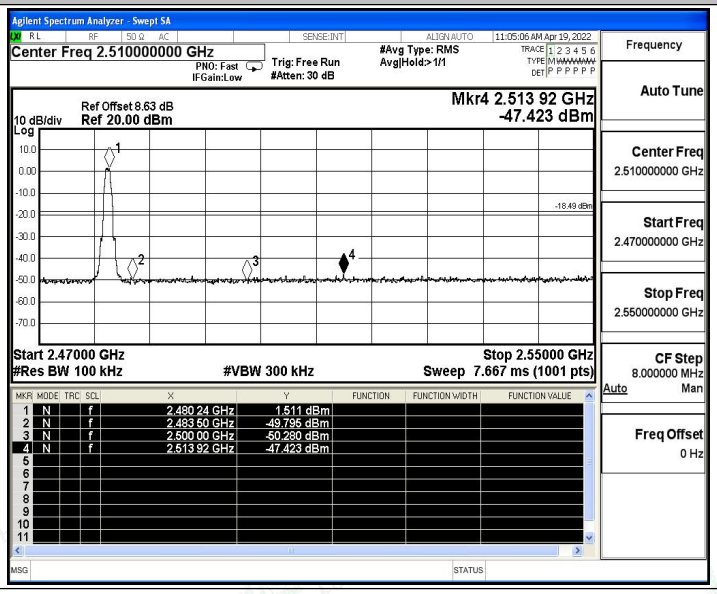
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	3.99	-48.76	≤-16.01	PASS
		High	2480	1.51	-47.42	≤-18.49	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



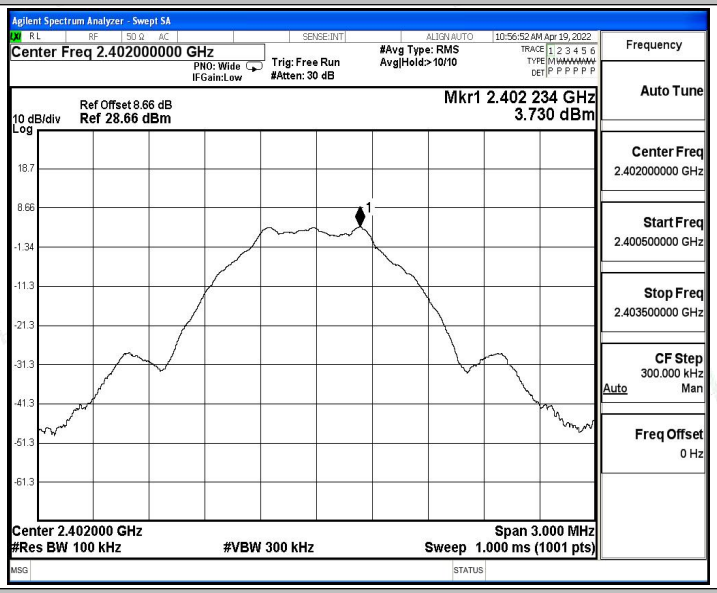
B.6 Conducted Spurious Emission

Test Result

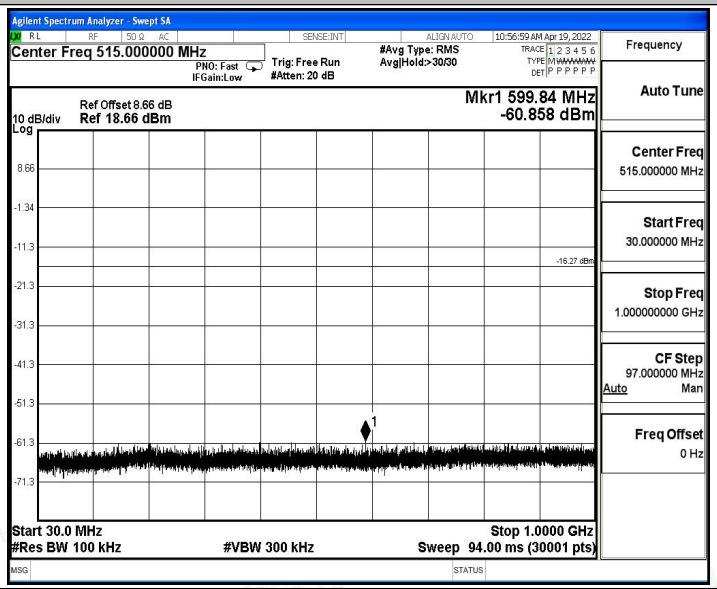
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	3.73	3.73	---	PASS
			30~1000	3.73	-60.86	≤-16.27	PASS
			1000~26500	3.73	-46.09	≤-16.27	PASS
		2440	Reference	1.28	1.28	---	PASS
			30~1000	1.28	-35.26	≤-18.72	PASS
			1000~26500	1.28	-46.49	≤-18.72	PASS
		2480	Reference	1.25	1.25	---	PASS
			30~1000	1.25	-60.87	≤-18.75	PASS
			1000~26500	1.25	-45.52	≤-18.75	PASS

Test Graphs

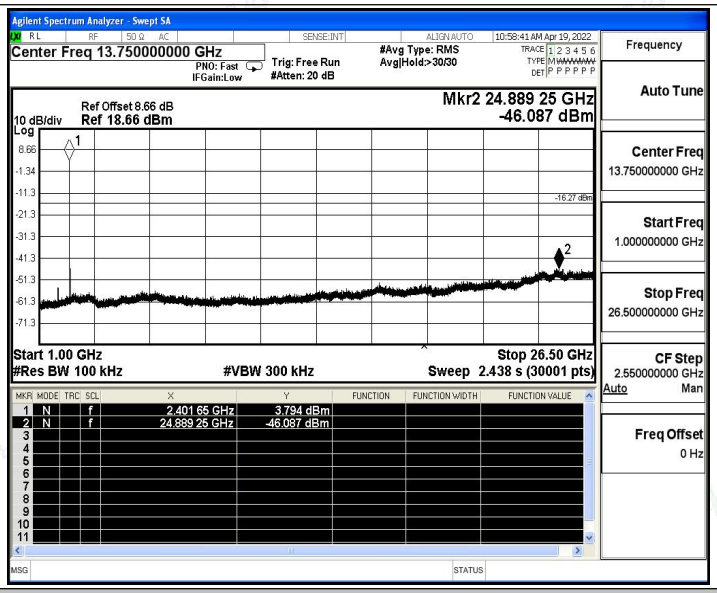
BLE_1M_Ant1_2402_0~Reference



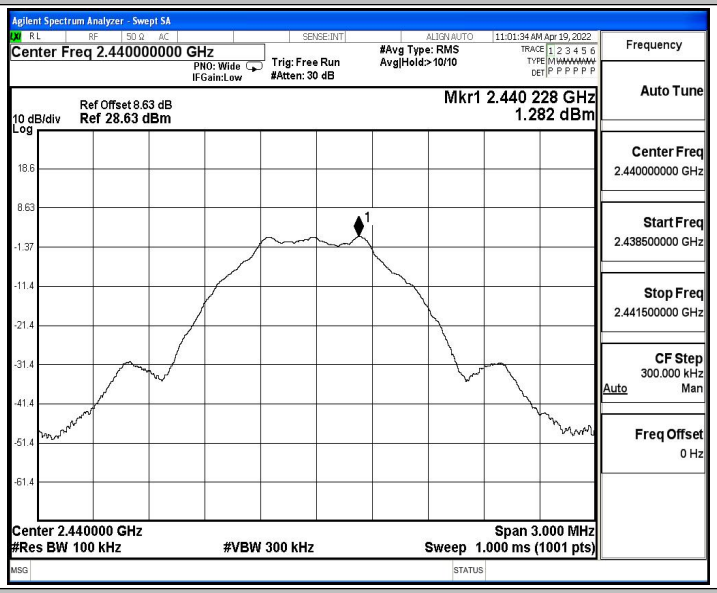
BLE_1M_Ant1_2402_30~1000



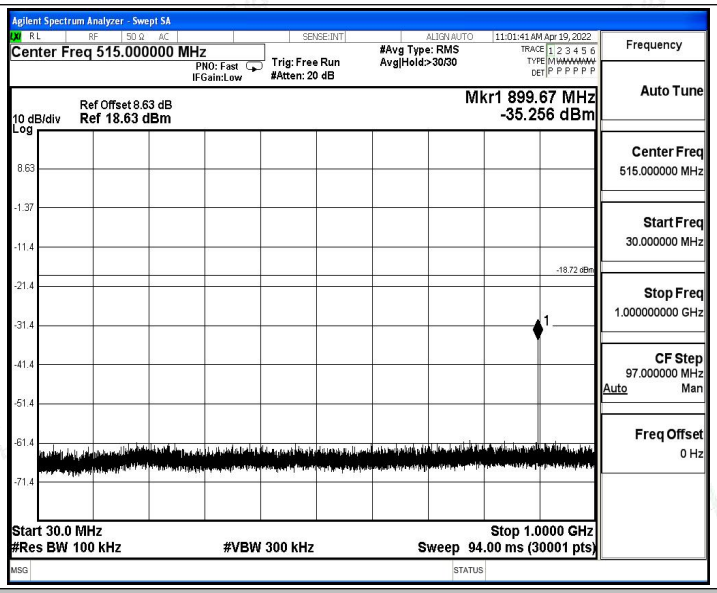
BLE_1M_Ant1_2402_1000~26500



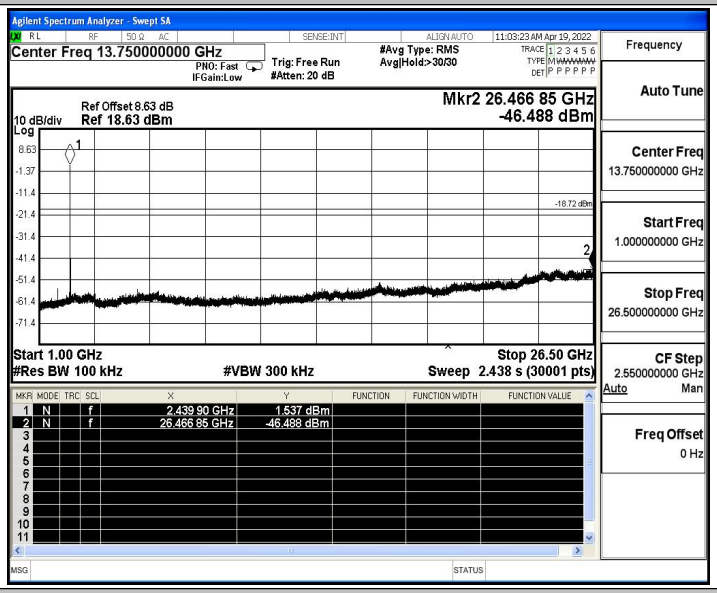
BLE_1M_Ant1_2440_0~Reference



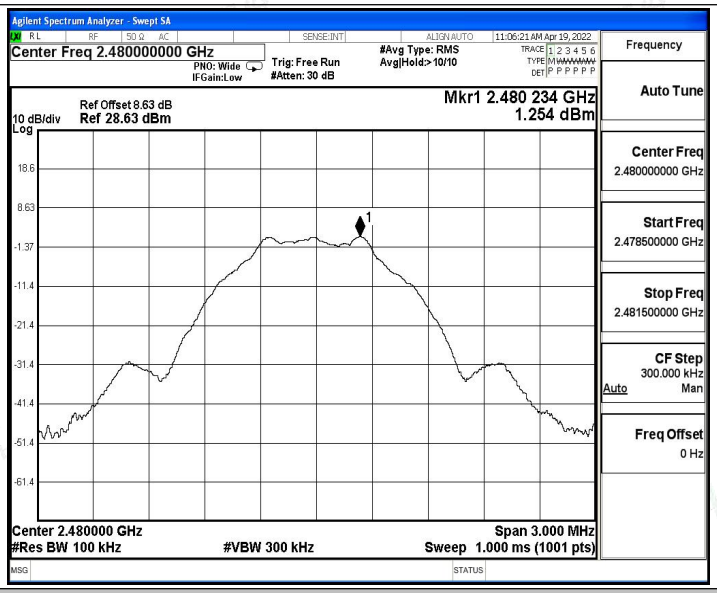
BLE_1M_Ant1_2440_30~1000



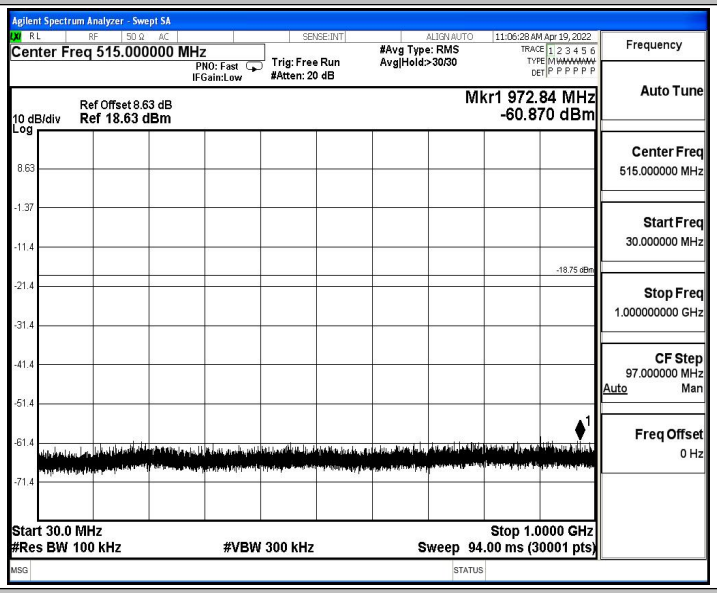
BLE_1M_Ant1_2440_1000~26500



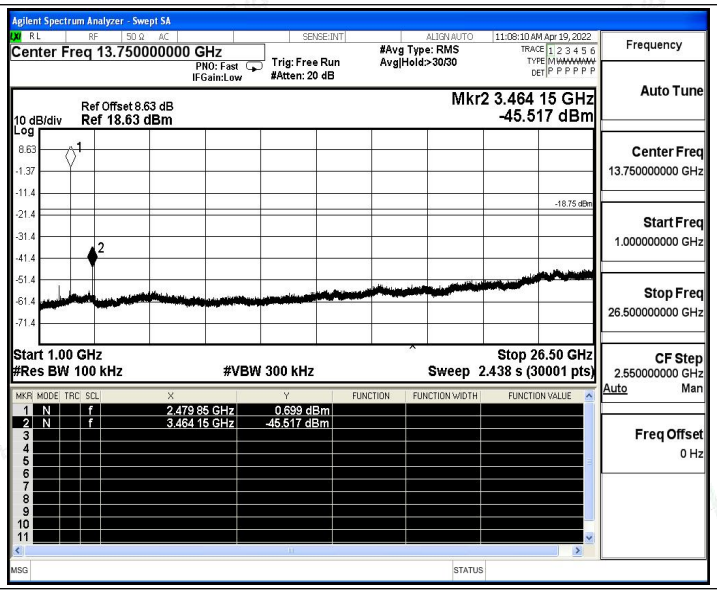
BLE_1M_Ant1_2480_0~Reference



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
11:08:10 AM Apr 19, 2022
Ref Offset 8.63 dB
10 dB/div
Log
Ref 18.63 dBm
Mkr2 3.464 15 GHz
-45.517 dBm
-18.75 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 0.699 dBm
2 N 1 f 3.464 15 GHz -45.517 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

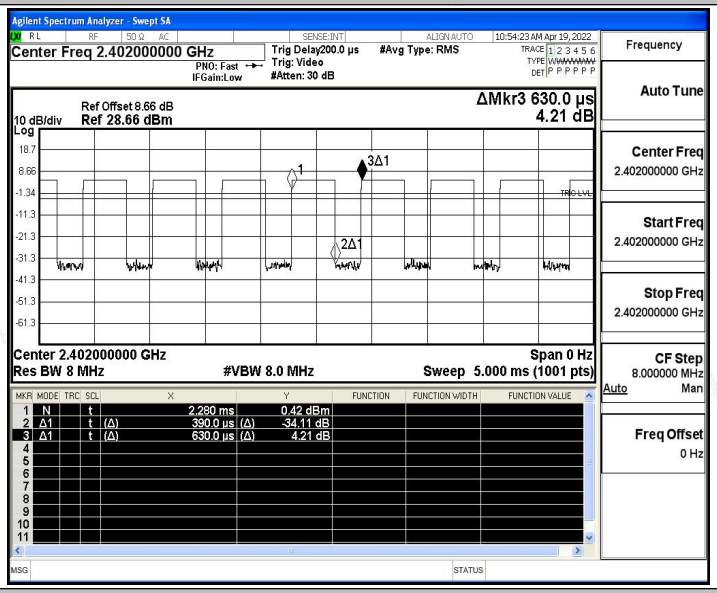
B.7 Duty Cycle

Test Result

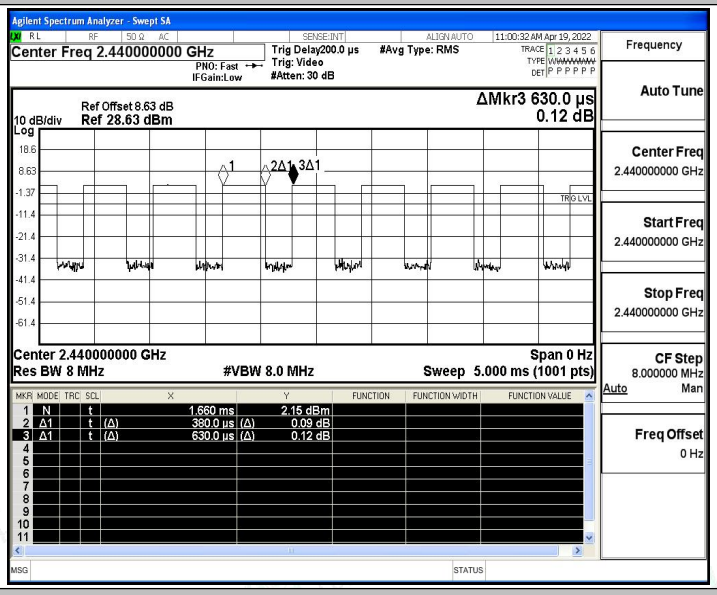
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.39	0.63	0.6190	61.90	2.08	---	---
		2440	0.38	0.63	0.6032	60.32	2.20	---	---
		2480	0.38	0.63	0.6032	60.32	2.20	---	---

Test Graphs

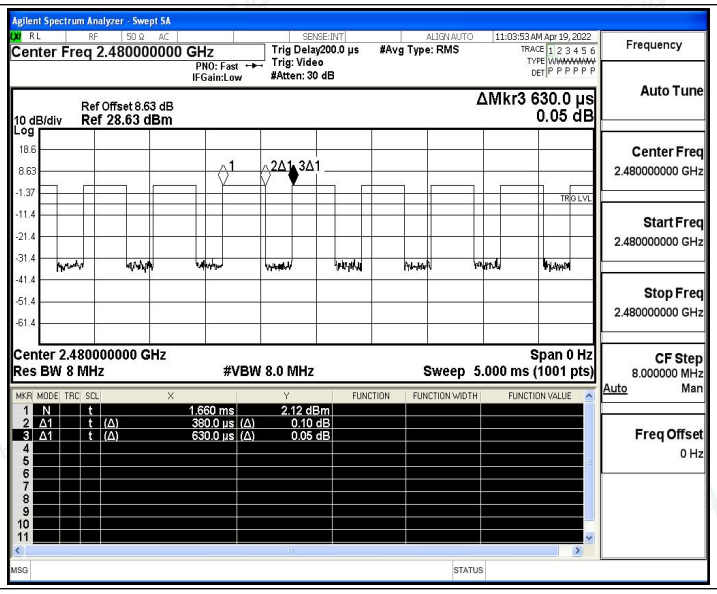
BLE_1M_Ant1_2402



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
11:03:53 AM Apr 19, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 28.63 dBm
ΔMkr3 630.0 µs
0.05 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 2.12 dBm
2 Δ1 t (Δ) 380.0 µs (Δ) 0.10 dB
3 Δ1 t (Δ) 630.0 µs (Δ) 0.05 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.8 Emissions in Restricted Bands

Test Result

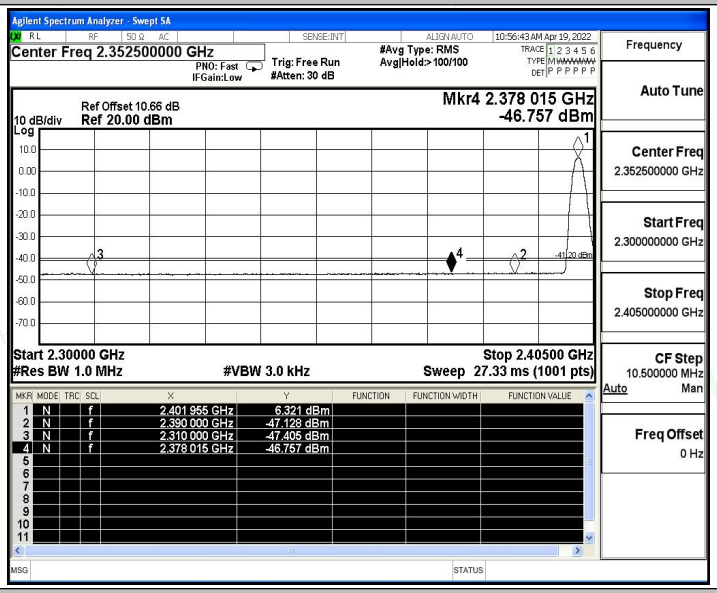
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-47.41	≤-41.20	47.79	≤54	PASS
				AV	2378.015	-46.76	≤-41.20	48.44	≤54	PASS
				AV	2390.000	-47.13	≤-41.20	48.07	≤54	PASS
				Peak	2310.000	-39.37	≤-21.20	55.83	≤74	PASS
				Peak	2384.420	-36.55	≤-21.20	58.65	≤74	PASS
				Peak	2390.000	-39.1	≤-21.20	56.10	≤74	PASS
		High	2480	AV	2483.500	-46.13	≤-41.20	49.07	≤54	PASS
				AV	2483.520	-46.13	≤-41.20	49.07	≤54	PASS
				AV	2500.000	-46.56	≤-41.20	48.64	≤54	PASS
				Peak	2483.500	-37.61	≤-21.20	57.59	≤74	PASS
				Peak	2484.320	-36.24	≤-21.20	58.96	≤74	PASS
				Peak	2500.000	-37.37	≤-21.20	57.83	≤74	PASS

Note：

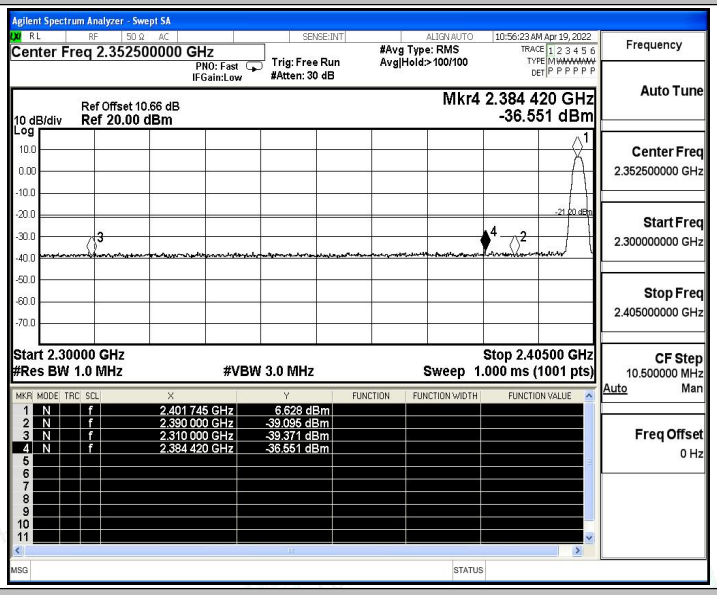
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

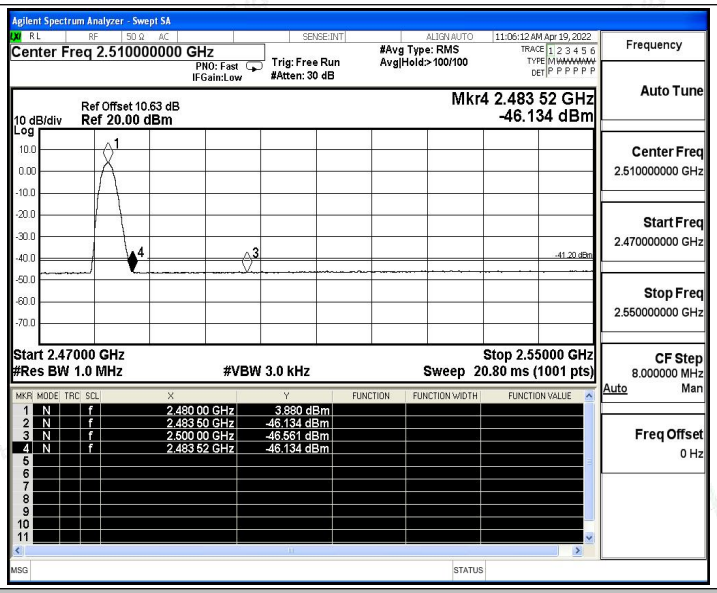
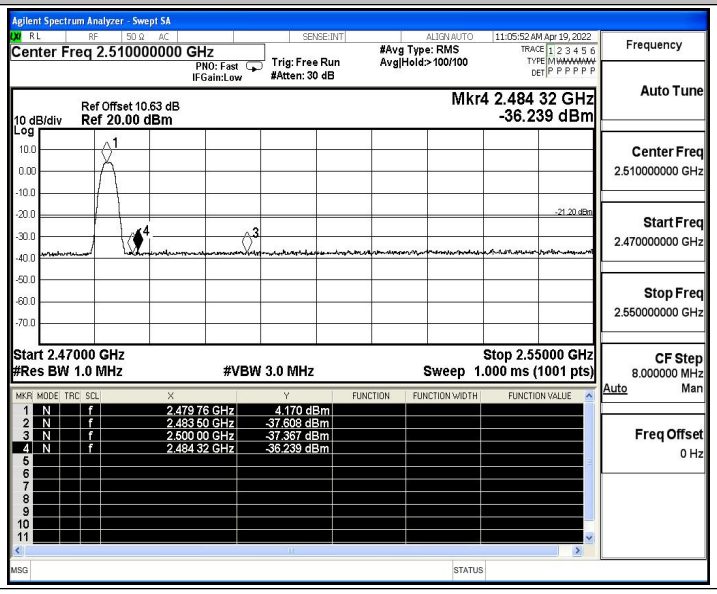
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV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