Appendix A

RF Test Data for BT LE (Conducted Measurement)

Product Name: 12 inch LED Ceiling Light

Test Model: DCO1220SMBN

Environmental Conditions

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

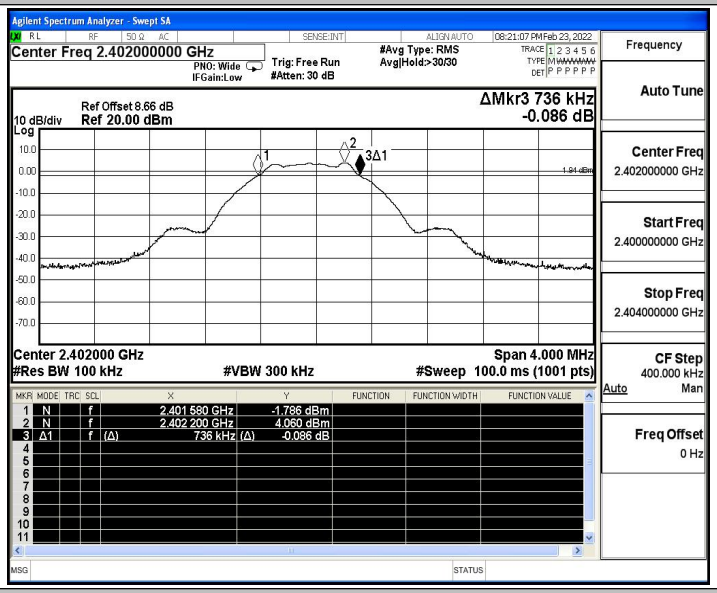
A.1 DTS Bandwidth

Test Result

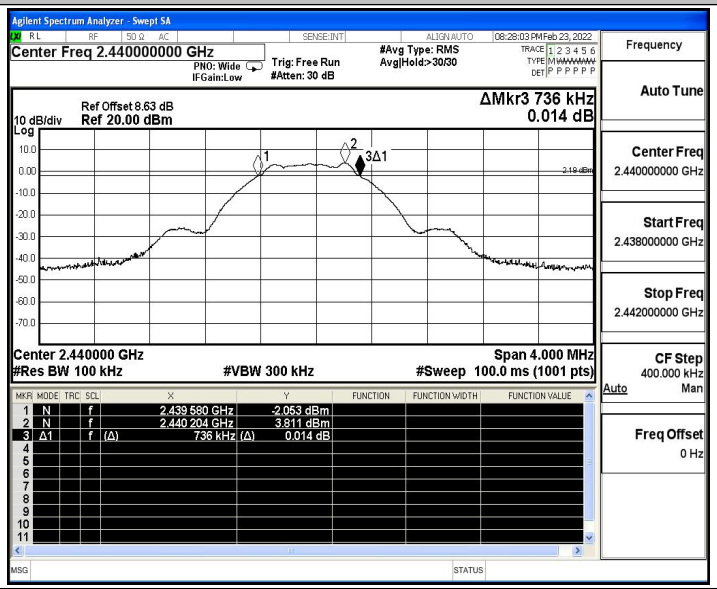
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.736	2401.580	2402.316	0.5	PASS
		2440	0.736	2439.580	2440.316	0.5	PASS
		2480	0.736	2479.576	2480.312	0.5	PASS

Test Graphs

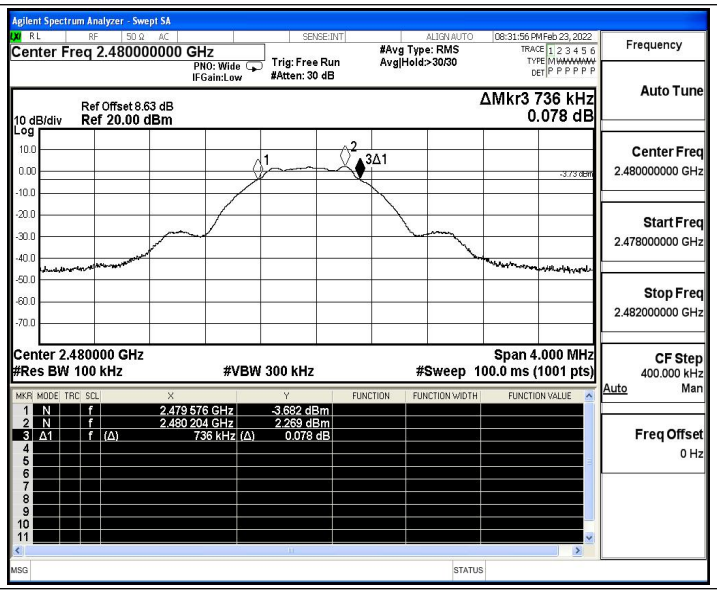
BLE_1M_Ant1_2402



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
08:31:56 PM Feb 23, 2022
Ref Offset 8.63 dB
10 dB/div Ref 20.00 dBm
Log
ΔMkr3 736 kHz
0.078 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 2.479 576 GHz -3.682 dBm
2 N f 2.480 204 GHz 2.269 dBm
3 Δ1 f (Δ) 736 kHz (Δ) 0.078 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

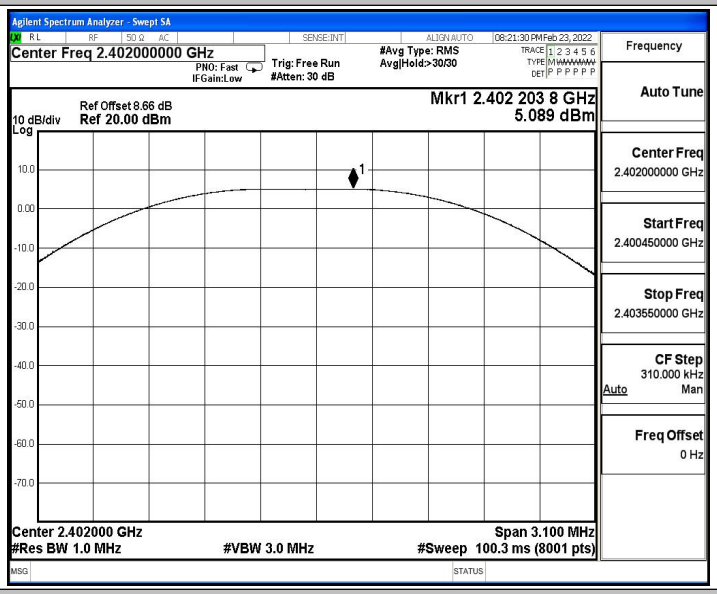
A.2 Maximum peak conducted output power

Test Result

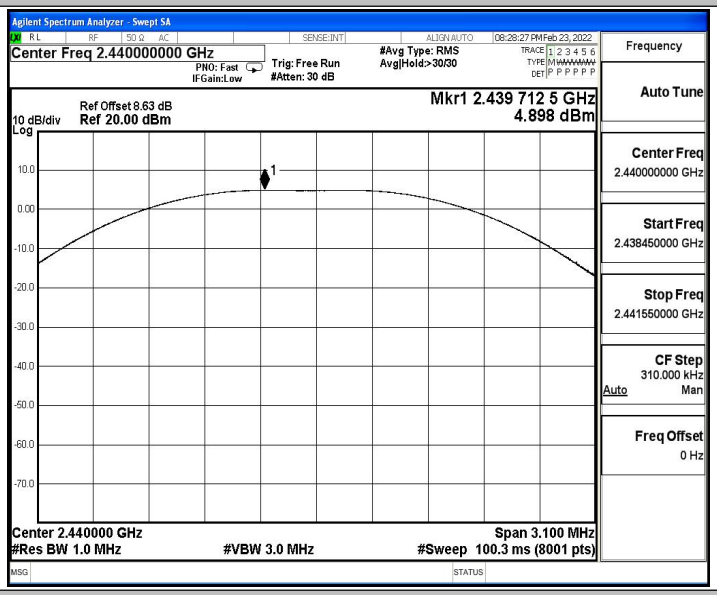
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	5.09	≤30	PASS
		2440	4.9	≤30	PASS
		2480	3.36	≤30	PASS

Test Graphs

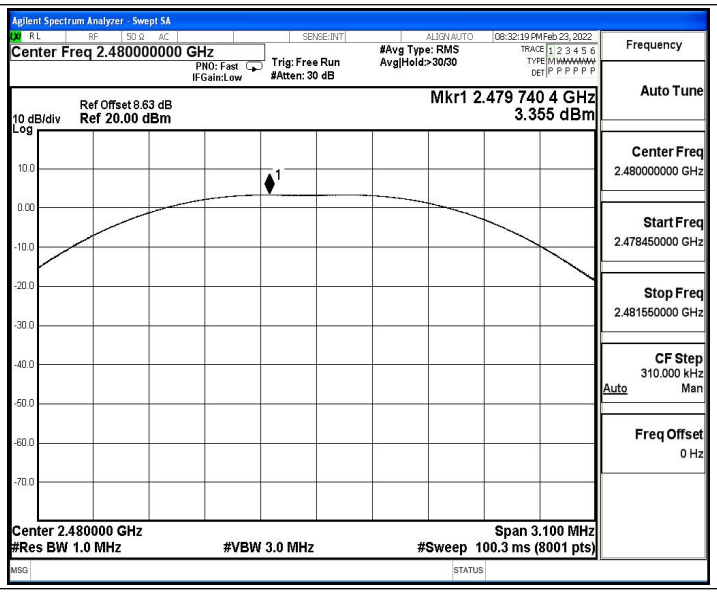
BLE_1M_Ant1_2402



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
08:32:19 PM Feb 23, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 740 4 GHz
3.355 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

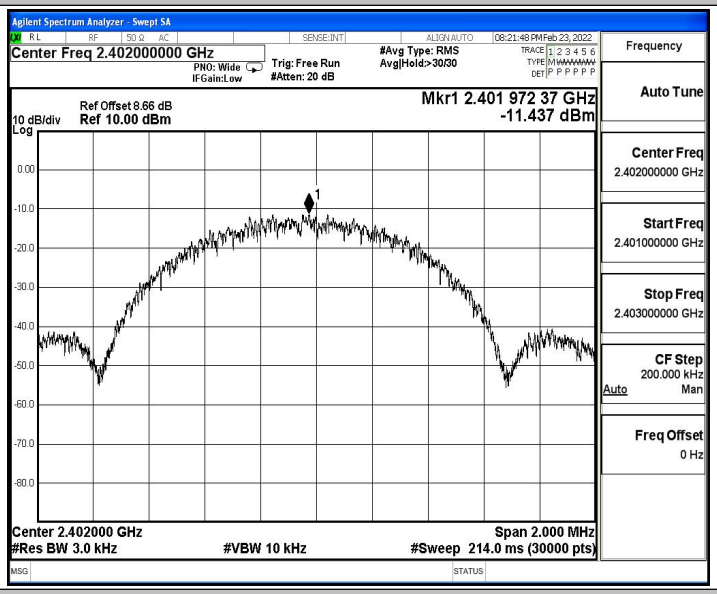
A.3 Maximum power spectral density

Test Result

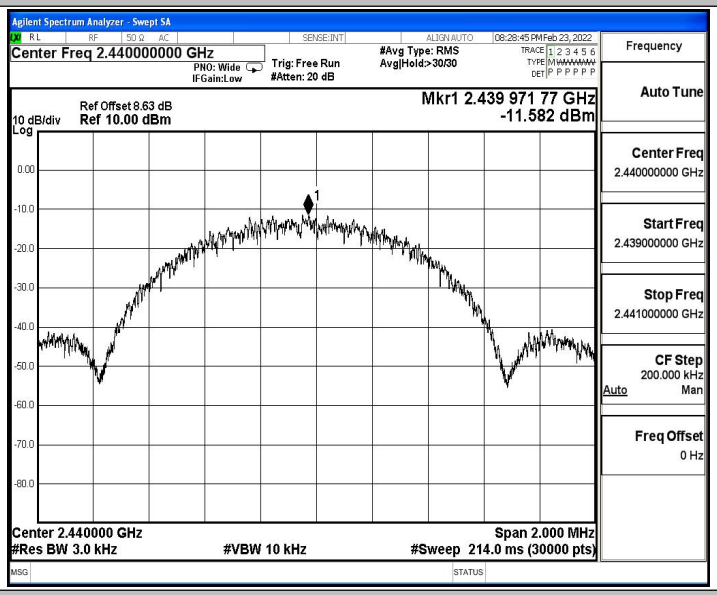
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-11.44	≤8.00	PASS
		2440	-11.58	≤8.00	PASS
		2480	-13.22	≤8.00	PASS

Test Graphs

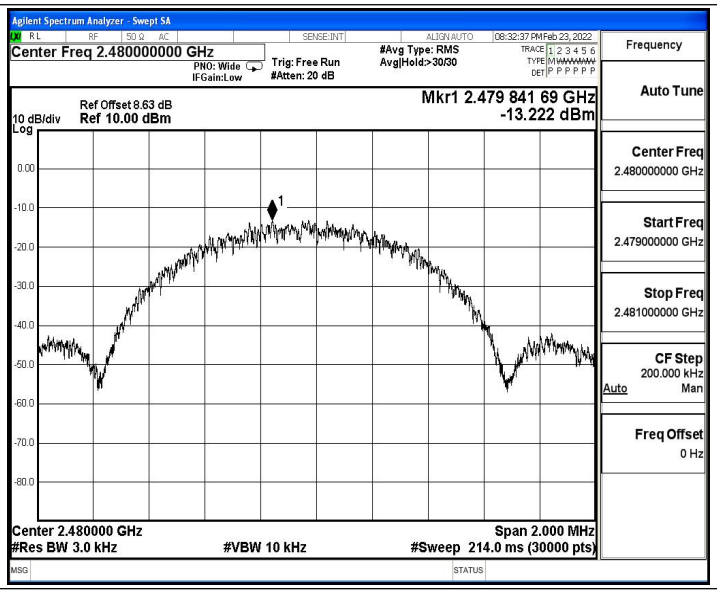
BLE_1M_Ant1_2402



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
08:32:37 PM Feb 23, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr1 2.479 841 69 GHz
-13.222 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

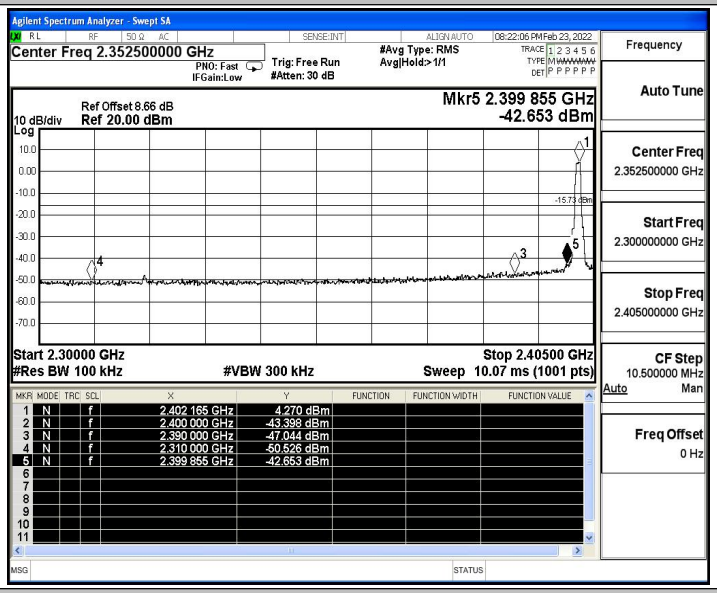
A.4 Band edge measurements

Test Result

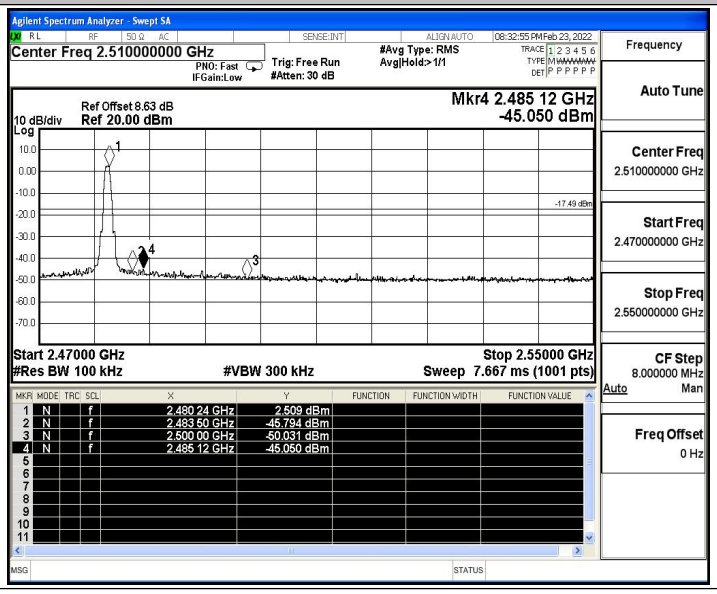
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.27	-42.65	≤-15.73	PASS
		High	2480	2.51	-45.05	≤-17.49	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



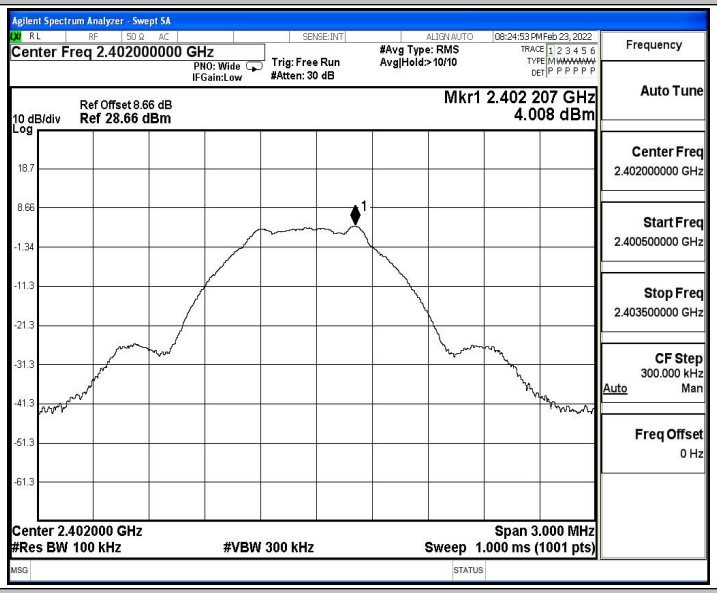
A.5 Conducted Spurious Emission

Test Result

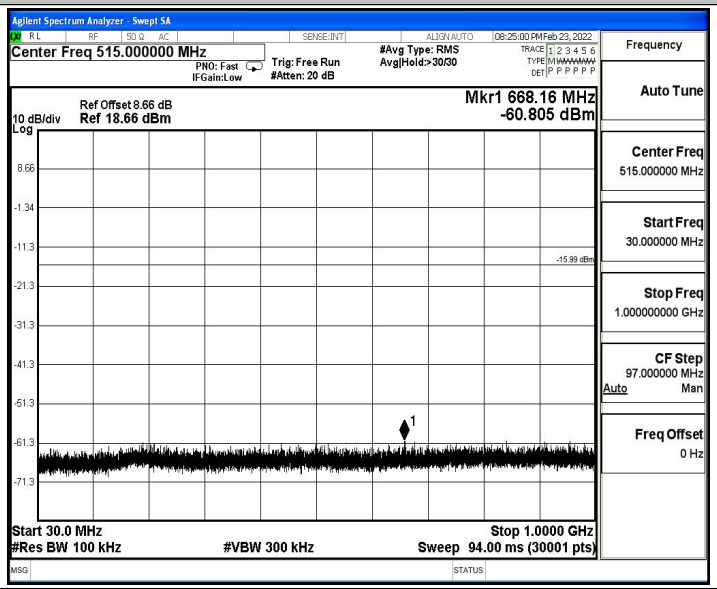
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	4.01	4.01	---	PASS
			30~1000	4.01	-60.81	≤-15.99	PASS
			1000~26500	4.01	-46.26	≤-15.99	PASS
		2440	Reference	3.82	3.82	---	PASS
			30~1000	3.82	-59.77	≤-16.18	PASS
			1000~26500	3.82	-46.29	≤-16.18	PASS
		2480	Reference	2.32	2.32	---	PASS
			30~1000	2.32	-60.21	≤-17.68	PASS
			1000~26500	2.32	-46.69	≤-17.68	PASS

Test Graphs

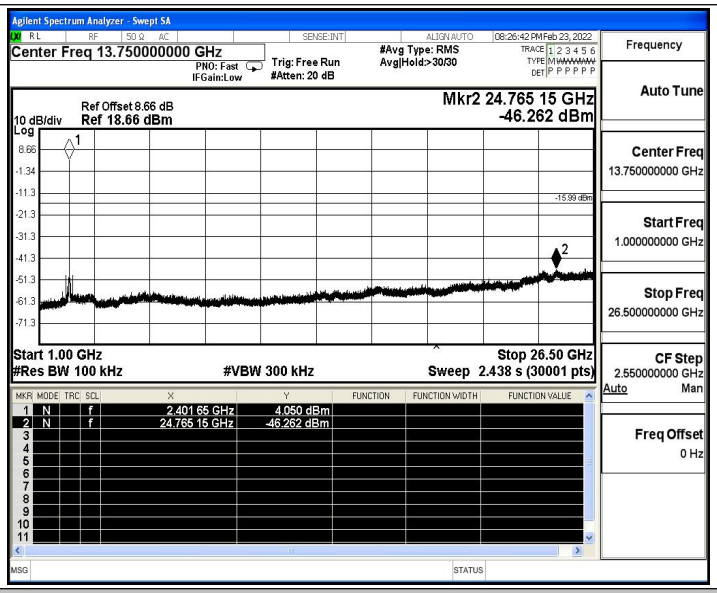
BLE_1M_Ant1_2402_0~Reference



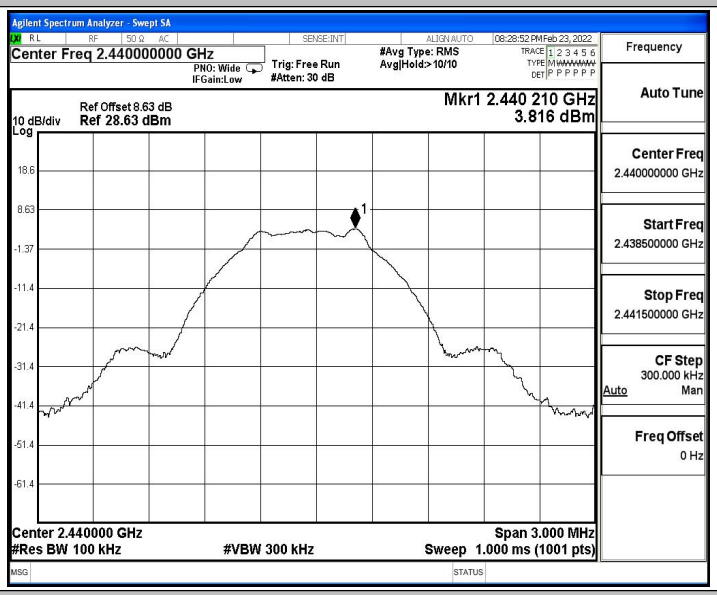
BLE_1M_Ant1_2402_30~1000



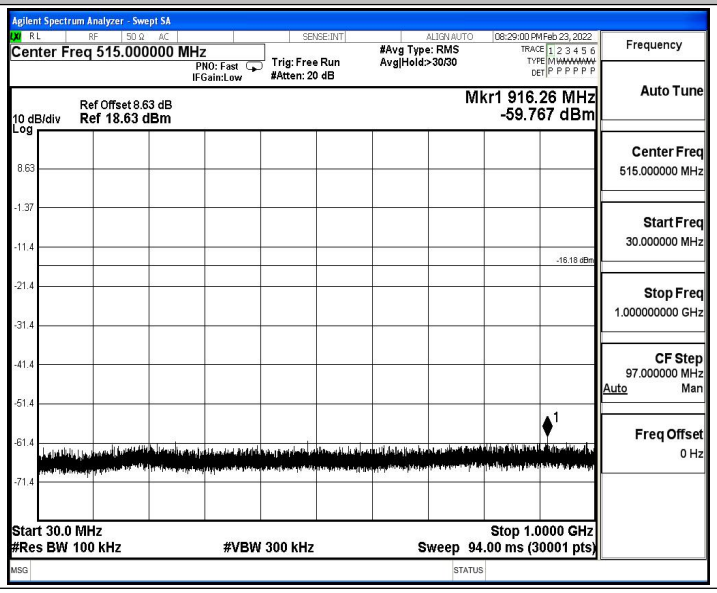
BLE_1M_Ant1_2402_1000~26500



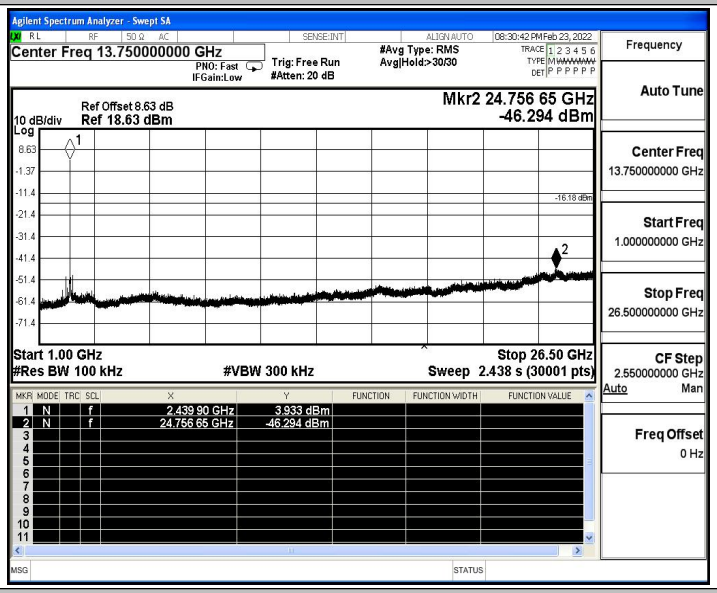
BLE_1M_Ant1_2440_0~Reference



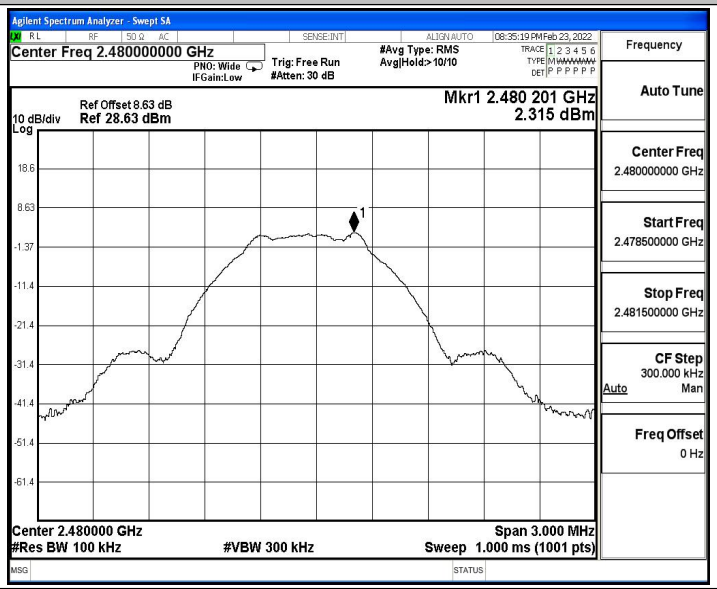
BLE_1M_Ant1_2440_30~1000



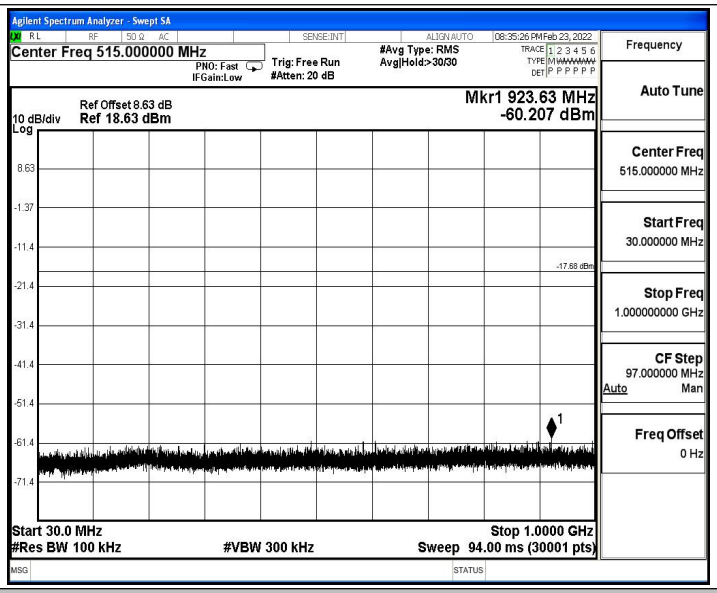
BLE_1M_Ant1_2440_1000~26500



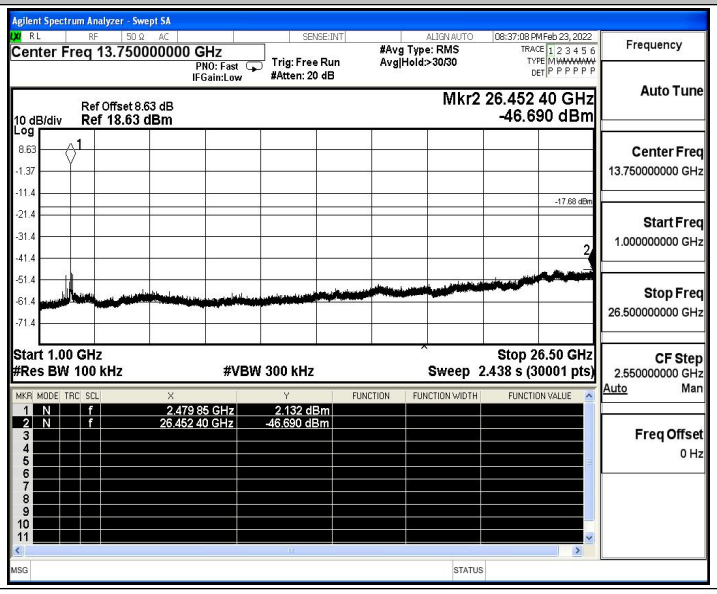
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500



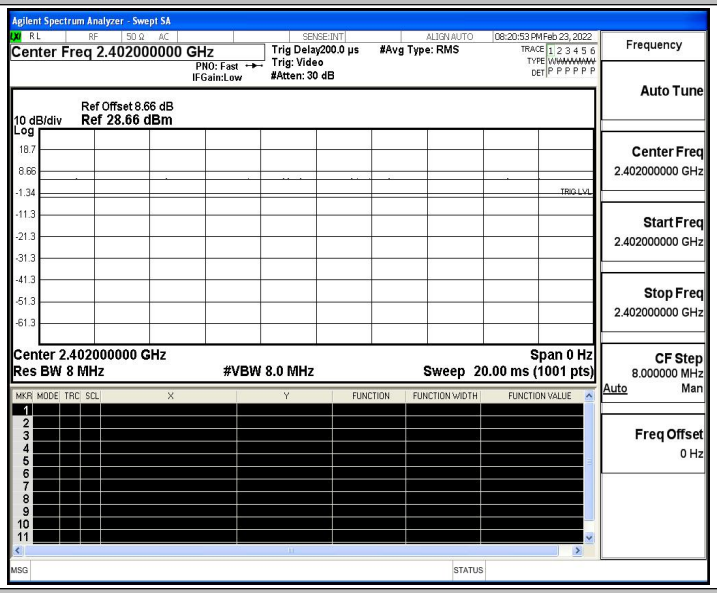
A.6 Duty Cycle

Test Result

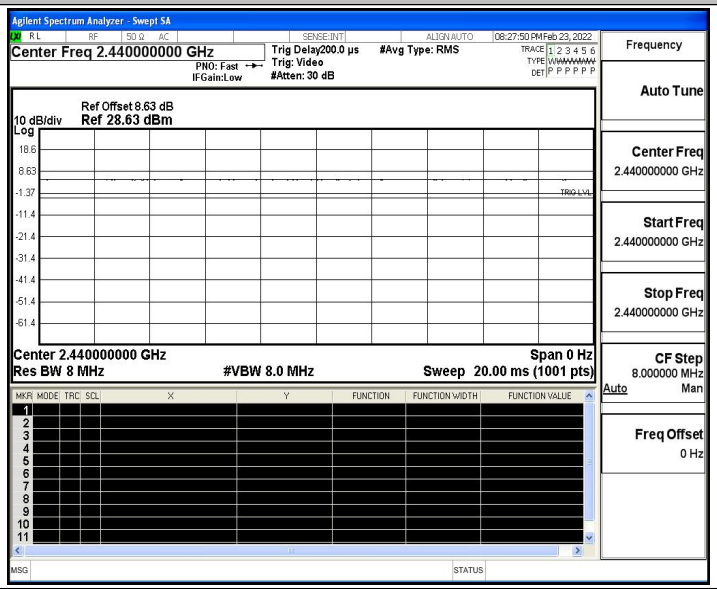
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	20.00	20.00	1.0000	100.00	0.00	---	---
		2440	20.00	20.00	1.0000	100.00	0.00	---	---
		2480	20.00	20.00	1.0000	100.00	0.00	---	---

Test Graphs

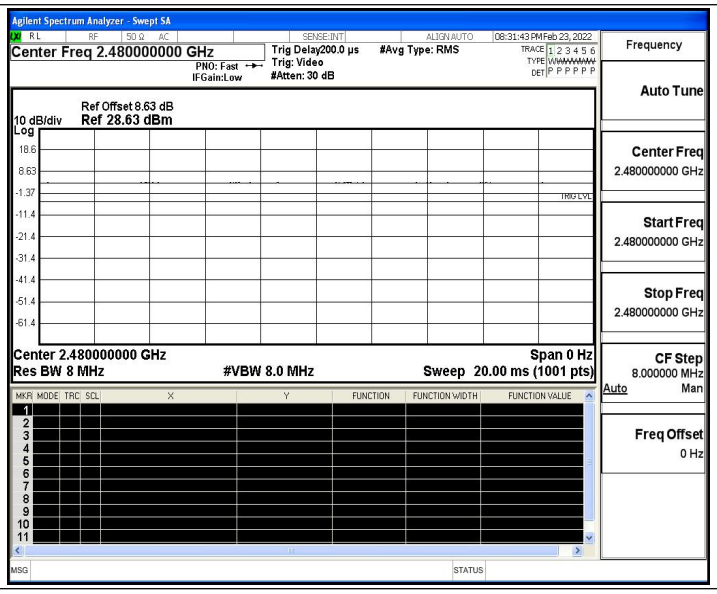
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
Trig Delay200.0 µs
#Avg Type: RMS
Trig: Video
PNO: Fast
IFGain:Low
#Atten: 30 dB
08:31:43 PM Feb 23, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 28.63 dBm
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
Span 0 Hz
Res BW 8 MHz
#VBW 8.0 MHz
Sweep 20.00 ms (1001 pts)
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
MSG
STATUS

A.7 Emissions in Restricted Bands

Test Result

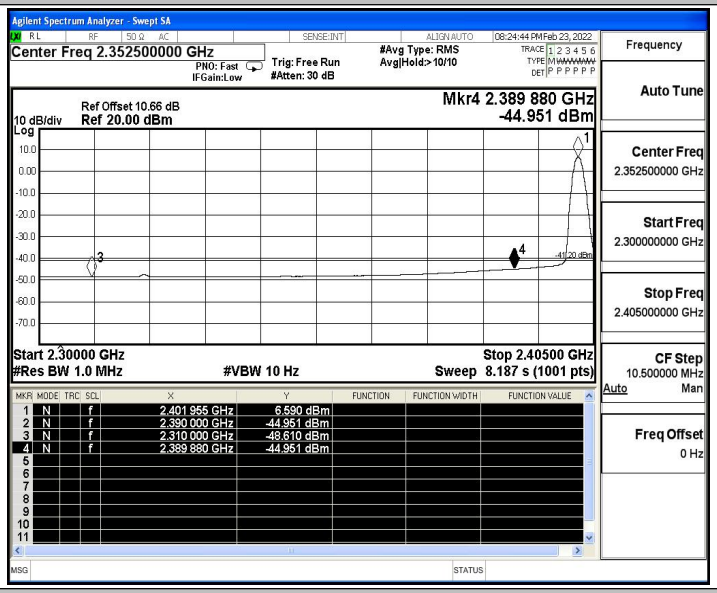
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-48.61	≤-41.20	46.59	≤54	PASS
				AV	2389.880	-44.95	≤-41.20	50.25	≤54	PASS
				AV	2390.000	-44.95	≤-41.20	50.25	≤54	PASS
				Peak	2310.000	-39.36	≤-21.20	55.84	≤74	PASS
				Peak	2389.565	-33.88	≤-21.20	61.32	≤74	PASS
				Peak	2390.000	-34.84	≤-21.20	60.36	≤74	PASS
		High	2480	AV	2483.500	-43.64	≤-41.20	51.56	≤54	PASS
				AV	2483.520	-43.64	≤-41.20	51.56	≤54	PASS
				AV	2500.000	-46.18	≤-41.20	49.02	≤54	PASS
				Peak	2483.500	-33.91	≤-21.20	61.29	≤74	PASS
				Peak	2483.680	-32.26	≤-21.20	62.94	≤74	PASS
				Peak	2500.000	-36.11	≤-21.20	59.09	≤74	PASS

Note：

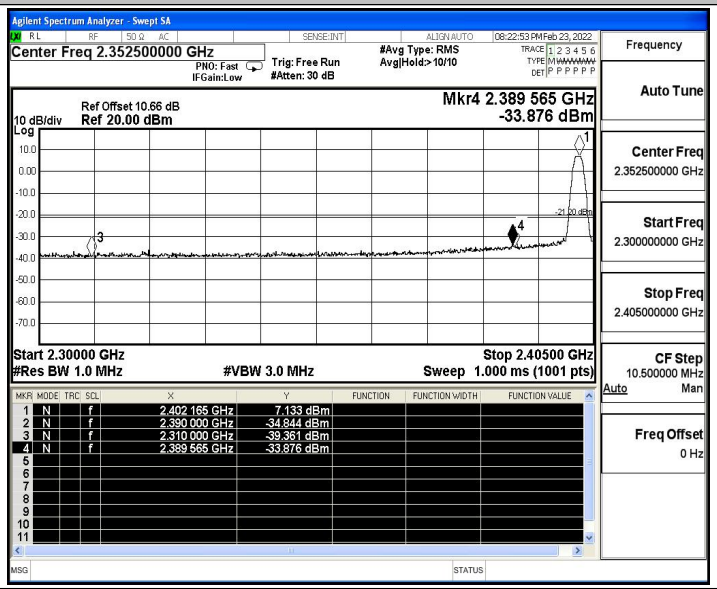
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

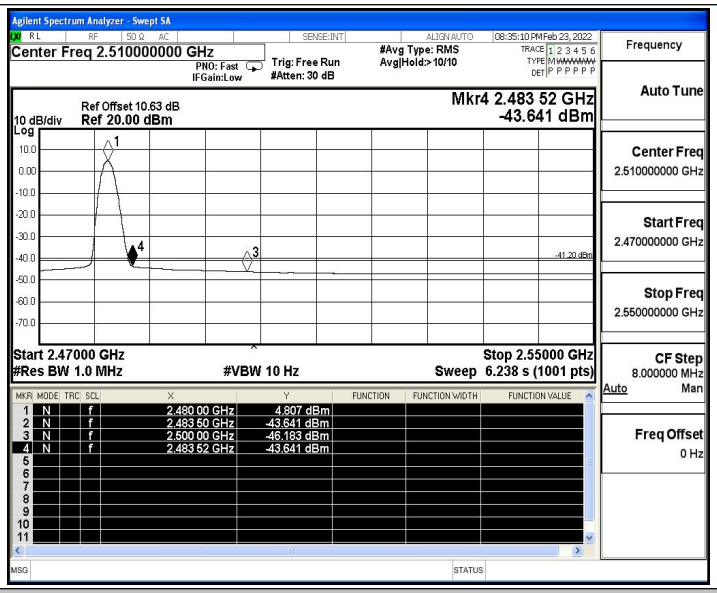
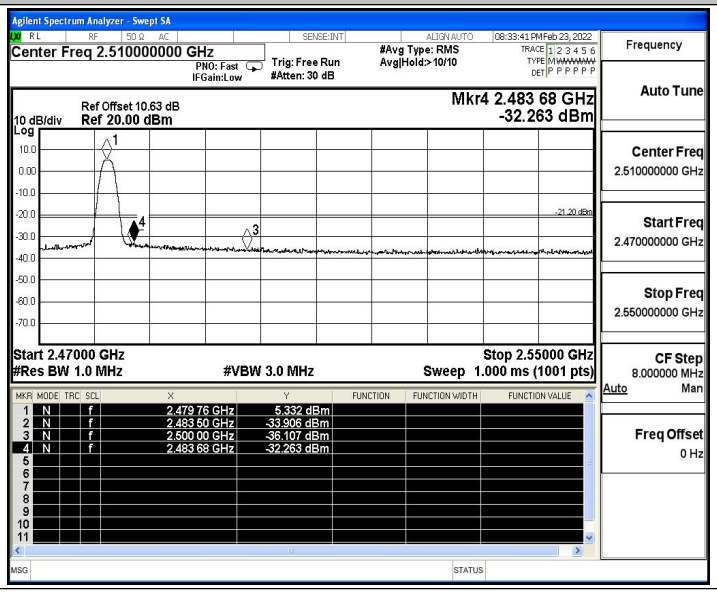
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak