Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: 6inch Wifi-BLE recessed down light

Test Model: LJD006SMWH

Environmental Conditions

Temperature:	22.6° C
Relative Humidity:	53.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

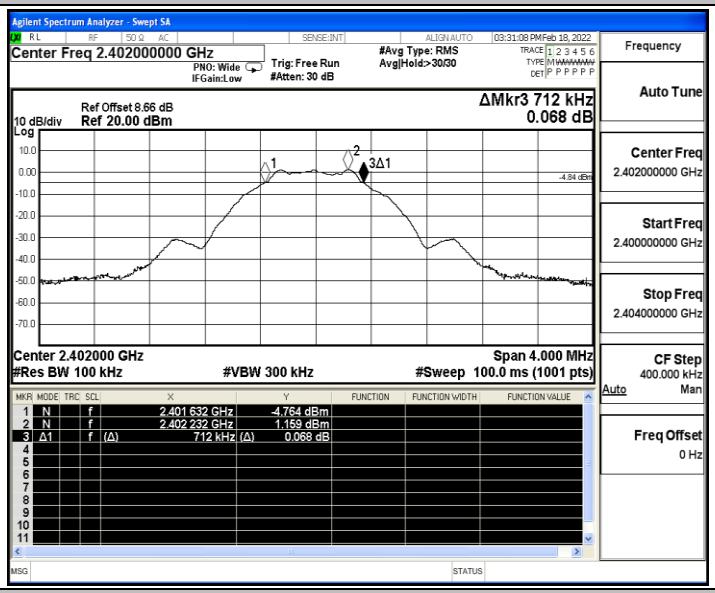
A.1 6dB Bandwidth

Test Result

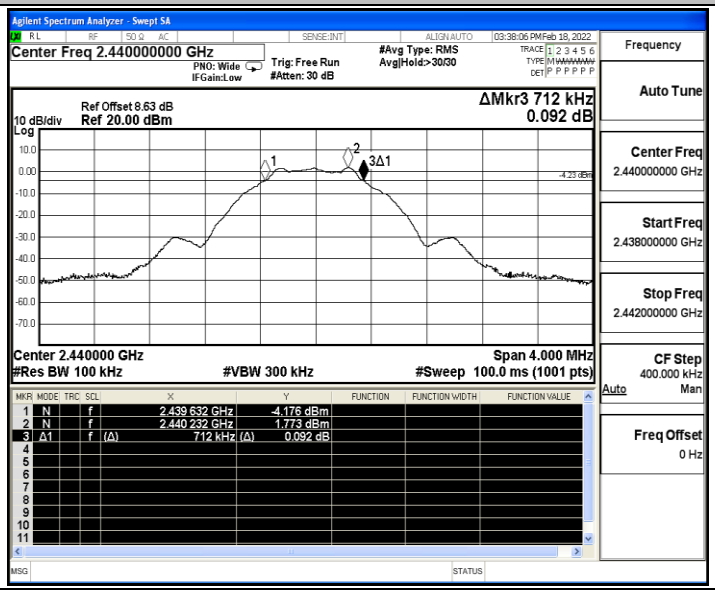
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.712	2401.632	2402.344	0.5	PASS
		2440	0.712	2439.632	2440.344	0.5	PASS
		2480	0.712	2479.632	2480.344	0.5	PASS

Test Graphs

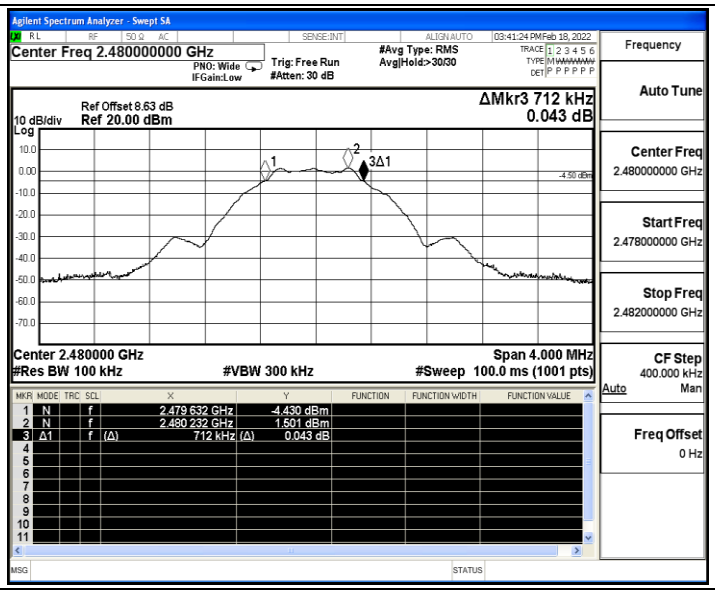
BLE_1M_Ant1_2402



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
03:41:24 PM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 20.00 dBm
ΔMkr3 712 kHz
0.043 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 -4.430 dBm
2 N 1 f 2.480 232 GHz 1.501 dBm
3 Δ1 1 f (Δ) 712 kHz (Δ) 0.043 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

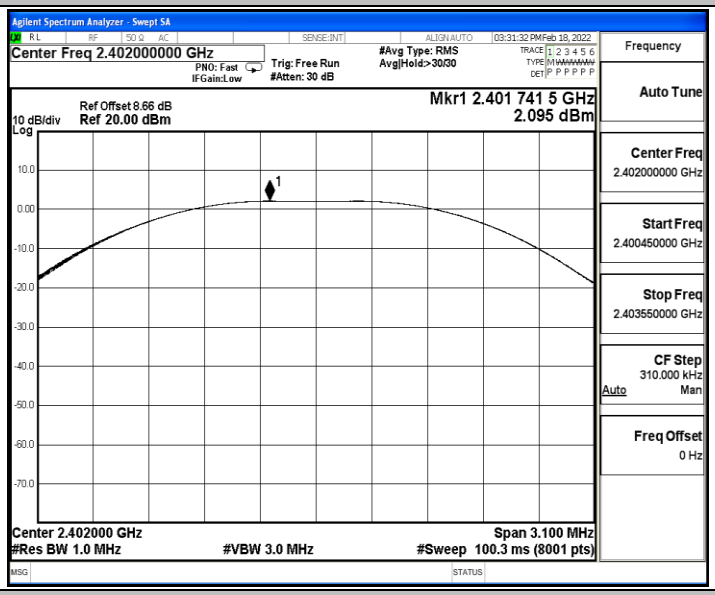
A.2 Maximum conducted output power

Test Result

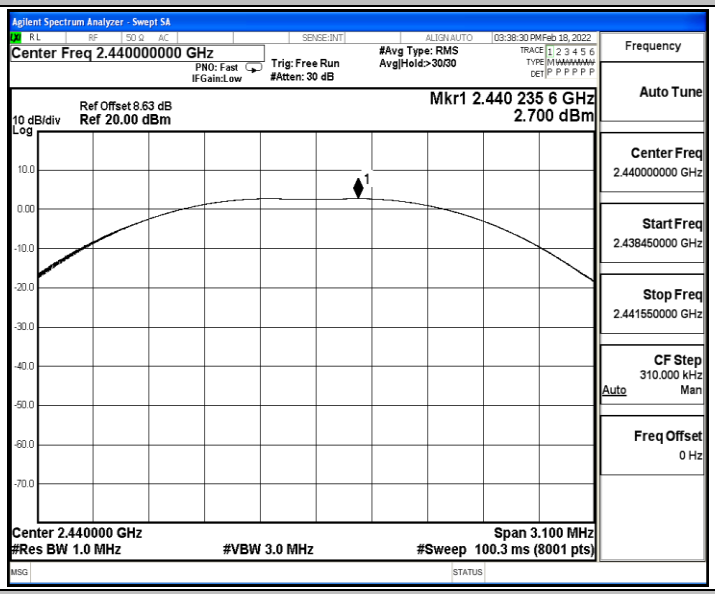
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	2.1	≤30	PASS
		2440	2.7	≤30	PASS
		2480	2.43	≤30	PASS

Test Graphs

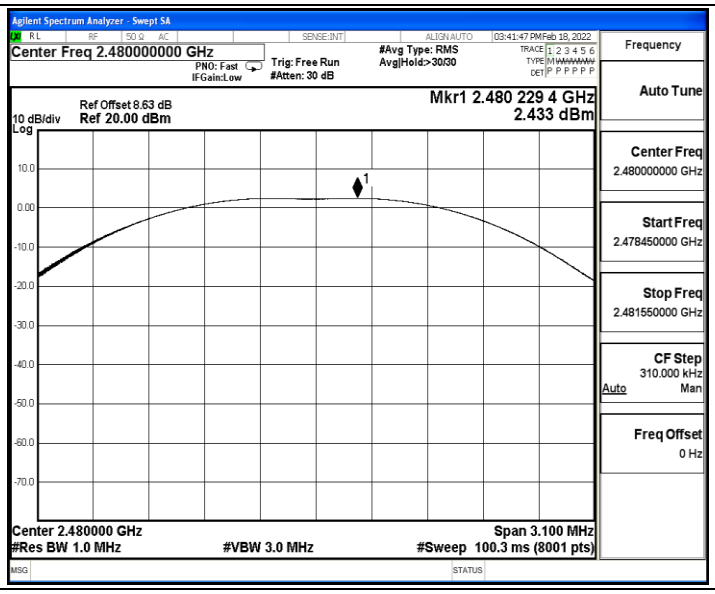
BLE_1M_Ant1_2402



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
03:41:47 PM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 229 4 GHz
2.433 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
MSG
STATUS

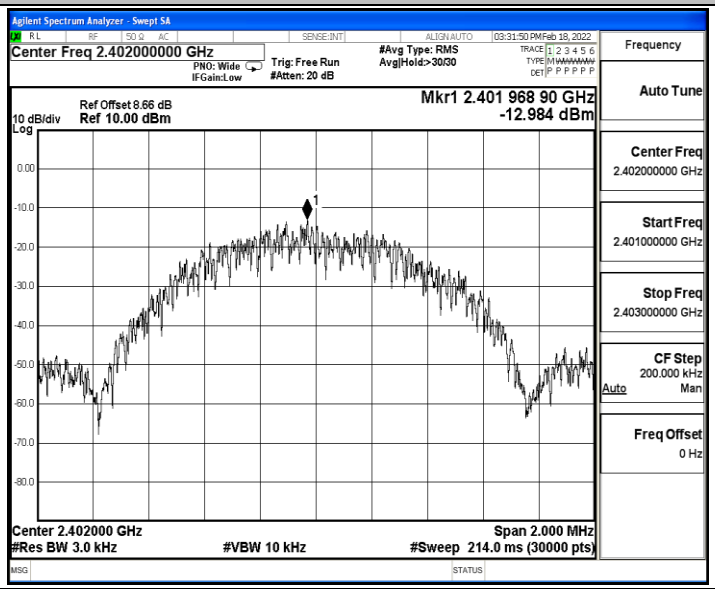
A.3 Maximum power spectral density

Test Result

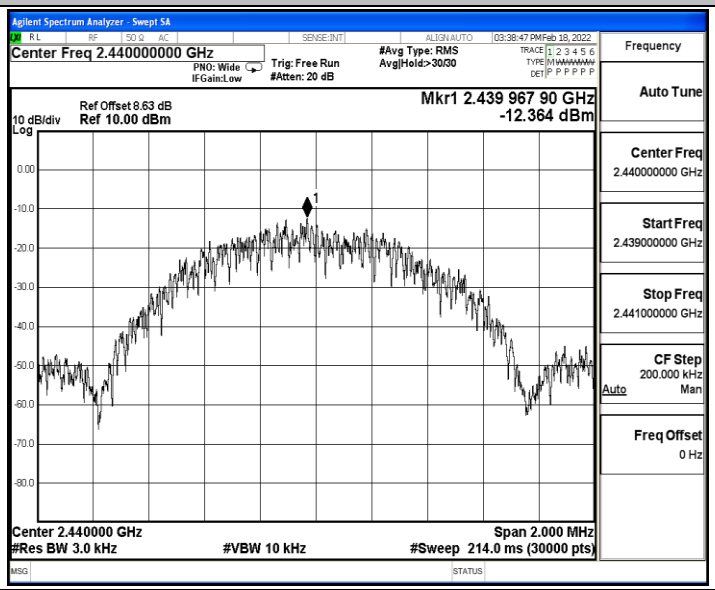
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-12.98	≤8.00	PASS
		2440	-12.36	≤8.00	PASS
		2480	-12.73	≤8.00	PASS

Test Graphs

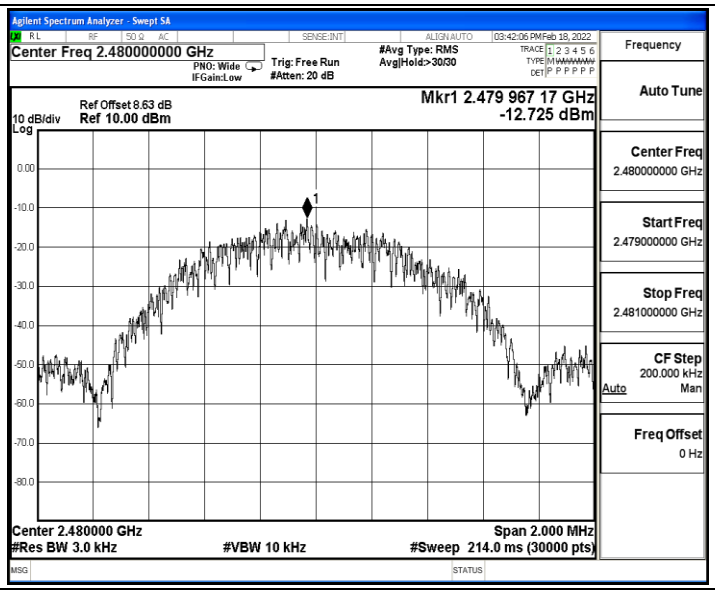
BLE_1M_Ant1_2402



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
03:42:06 PM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 2.479 967 17 GHz
-12.725 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
MSG
STATUS

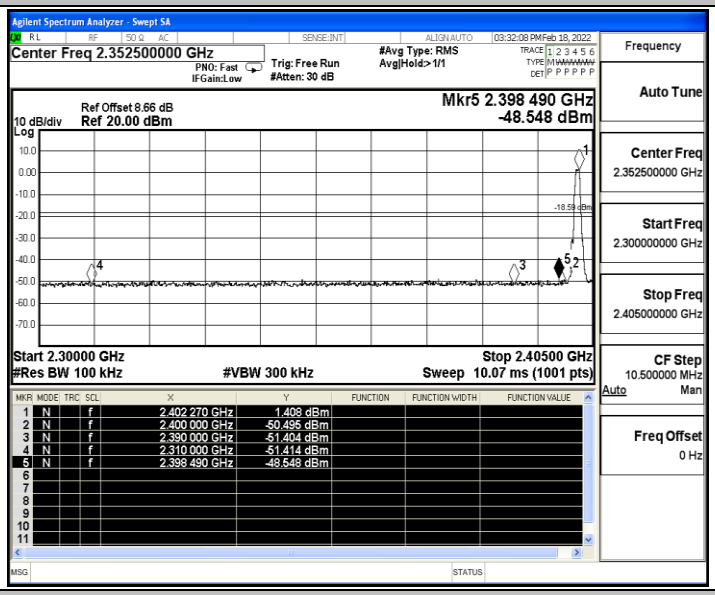
A.4 Band edge measurements

Test Result

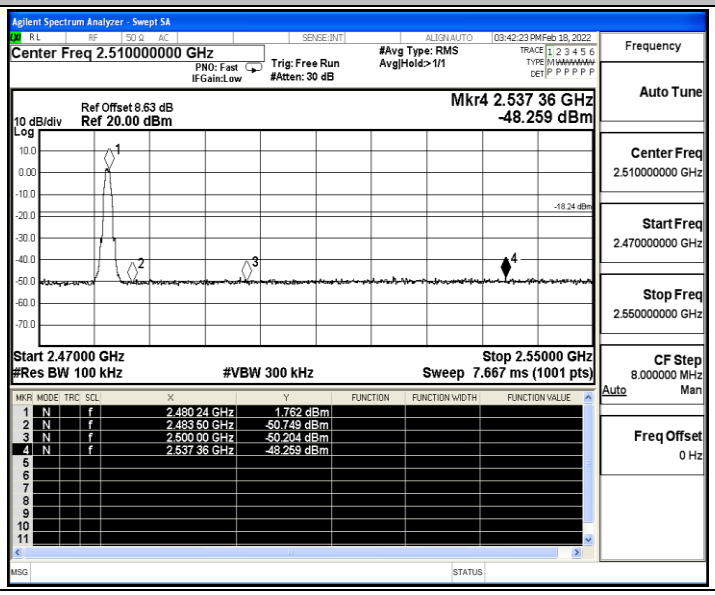
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	1.41	-48.55	≤-18.59	PASS
		High	2480	1.76	-48.26	≤-18.24	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



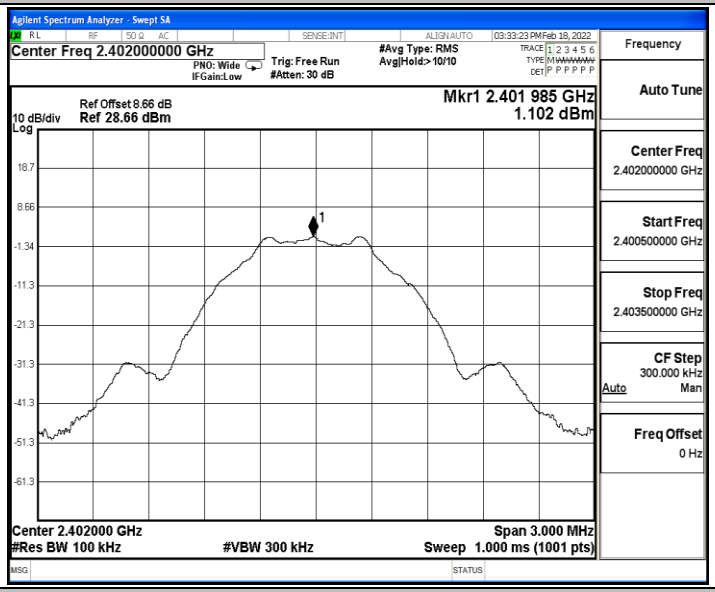
A.5 Conducted Spurious Emission

Test Result

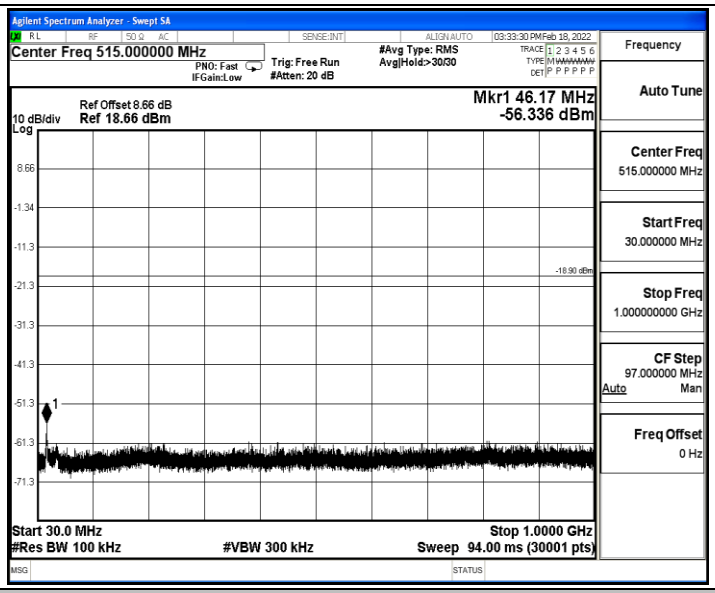
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	1.10	1.10	---	PASS
			30~1000	1.10	-56.93	≤-18.9	PASS
			1000~26500	1.10	-40.76	≤-18.9	PASS
		2440	Reference	1.79	1.79	---	PASS
			30~1000	1.79	-56.26	≤-18.21	PASS
			1000~26500	1.79	-46.35	≤-18.21	PASS
		2480	Reference	1.51	1.51	---	PASS
			30~1000	1.51	-55.33	≤-18.49	PASS
			1000~26500	1.51	-46.12	≤-18.49	PASS

Test Graphs

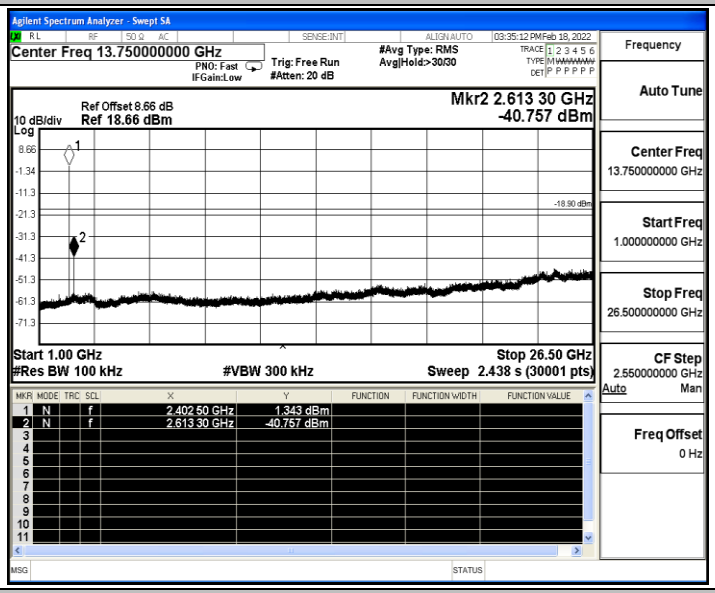
BLE_1M_Ant1_2402_0~Reference



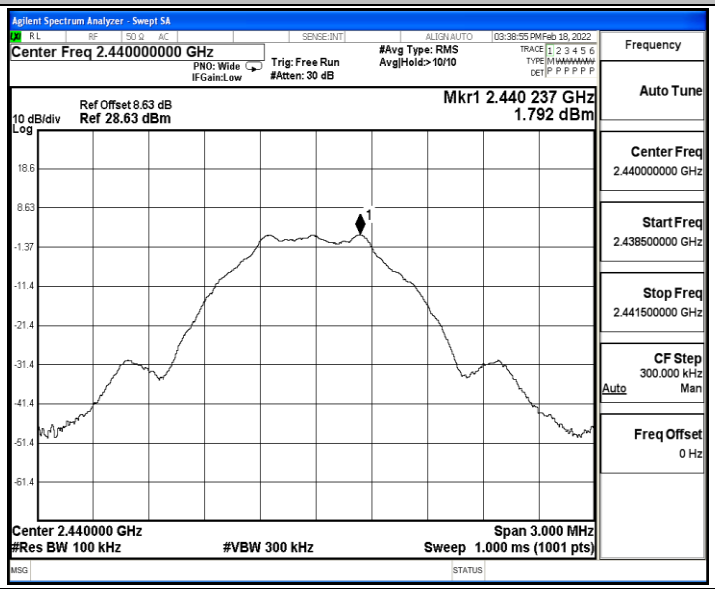
BLE_1M_Ant1_2402_30~1000



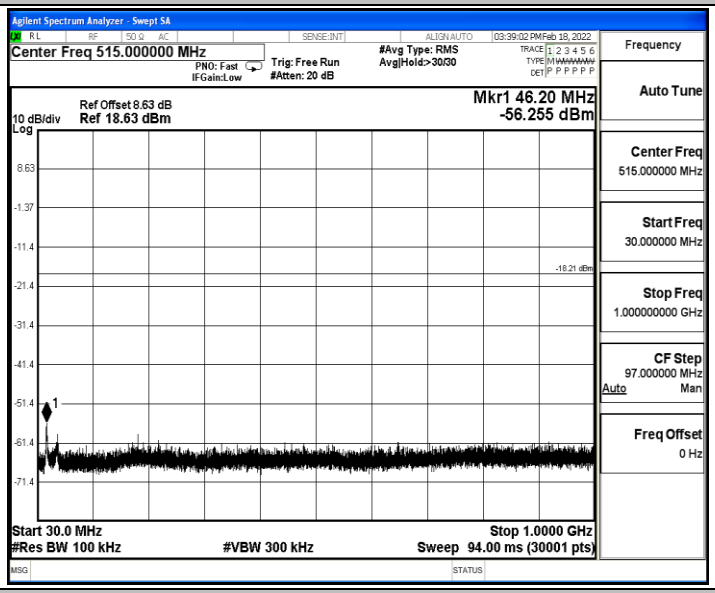
BLE_1M_Ant1_2402_1000~26500



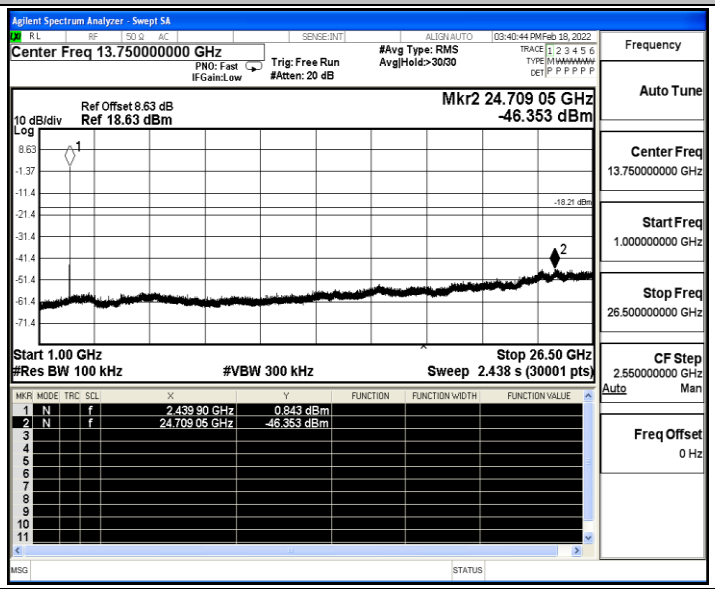
BLE_1M_Ant1_2440_0~Reference



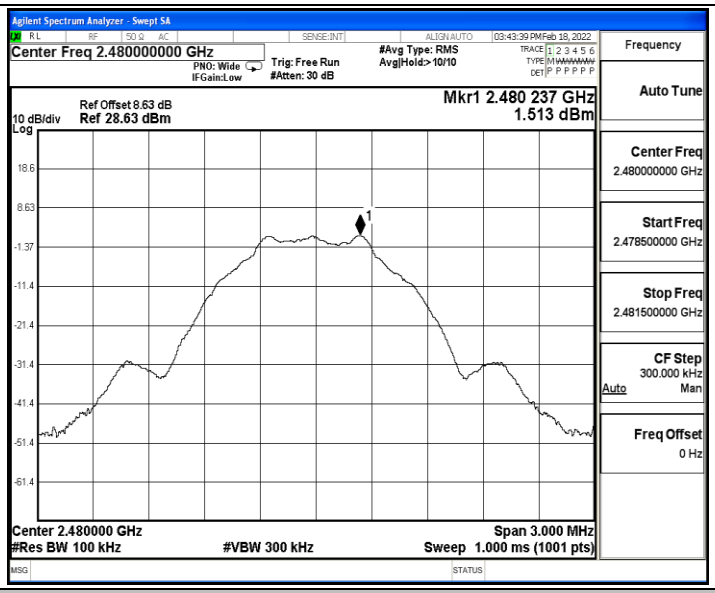
BLE_1M_Ant1_2440_30~1000



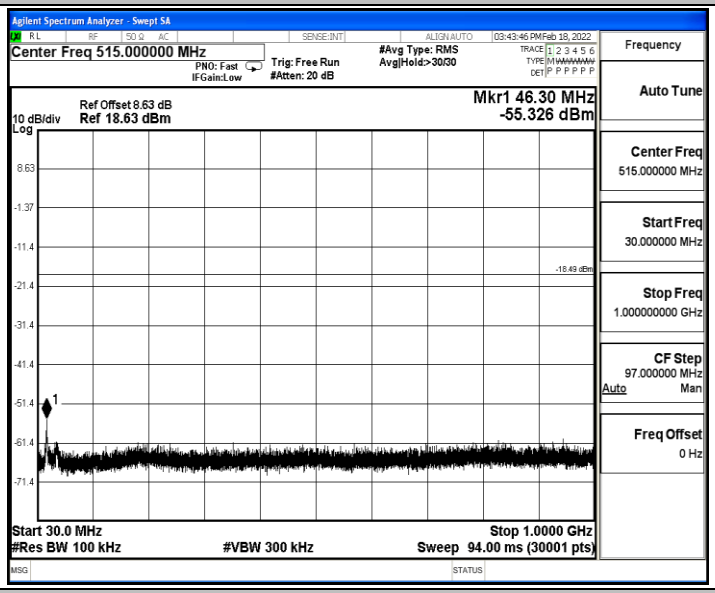
BLE_1M_Ant1_2440_1000~26500



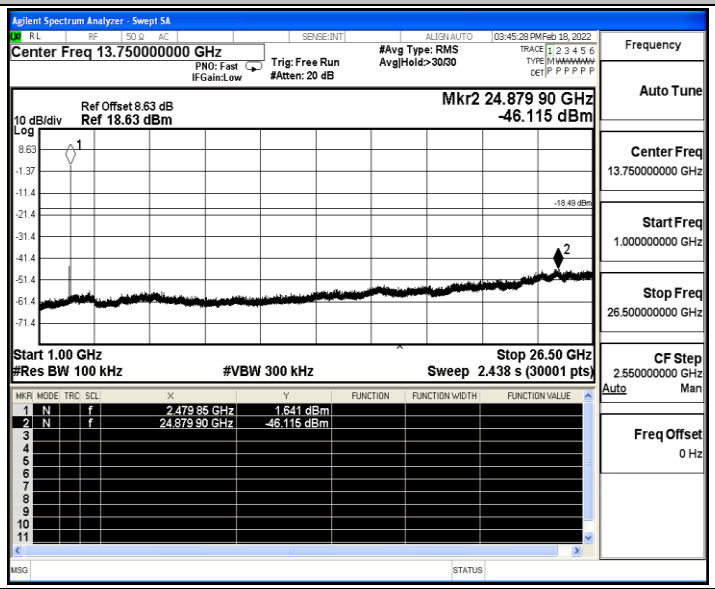
BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500



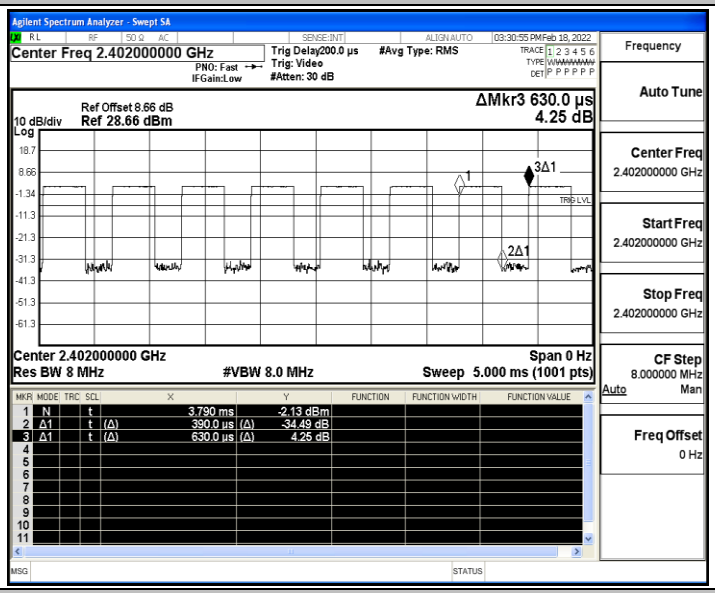
A.6 Duty Cycle

Test Result

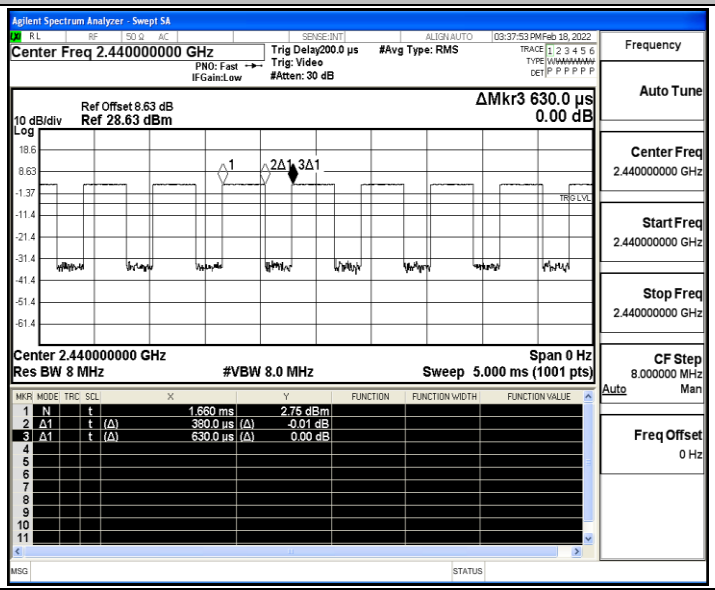
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	0.39	0.63	0.6190	61.90	2.08	---	---
		2440	0.38	0.63	0.6032	60.32	2.20	---	---
		2480	0.39	0.63	0.6190	61.90	2.08	---	---

Test Graphs

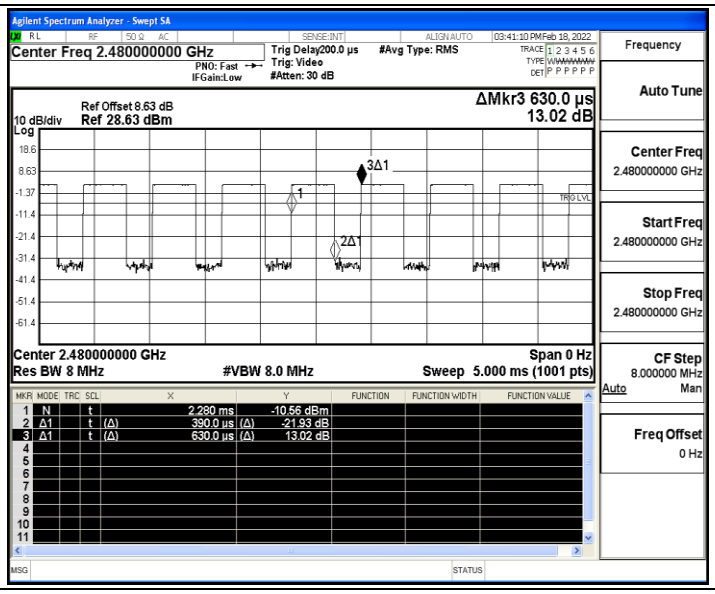
BLE_1M_Ant1_2402



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
03:41:10 PM Feb 18, 2022
Ref Offset 8.63 dB
10 dB/div
Ref 28.63 dBm
ΔMkr3 630.0 µs
13.02 dB
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 2.280 ms -10.56 dBm
2 Δ1 1 t (Δ) 390.0 µs (Δ) -21.93 dB
3 Δ1 1 t (Δ) 630.0 µs (Δ) 13.02 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

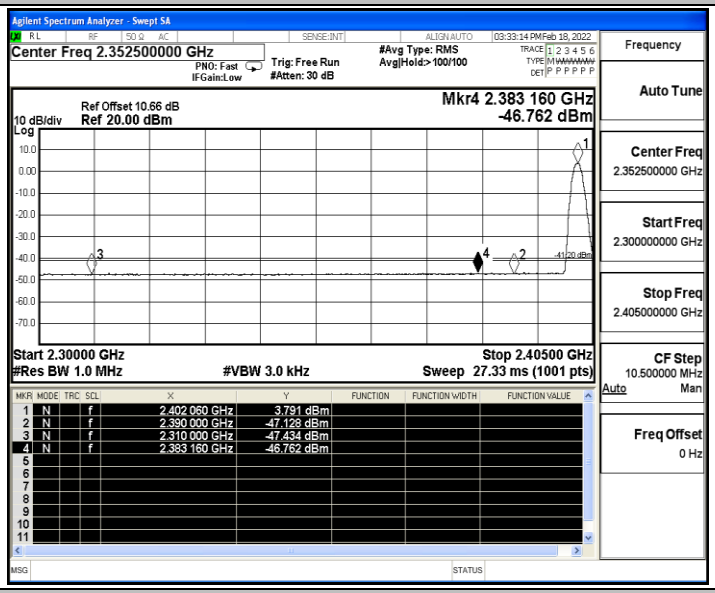
TestMode	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	2402	AV	2310.000	-47.43	≤-41.20	47.77	≤54	PASS
		AV	2383.160	-46.76	≤-41.20	48.44	≤54	PASS
		AV	2390.000	-47.13	≤-41.20	48.07	≤54	PASS
		Peak	2310.000	-38.41	≤-21.20	56.79	≤74	PASS
		Peak	2383.475	-36.74	≤-21.20	58.46	≤74	PASS
		Peak	2390.000	-39	≤-21.20	56.20	≤74	PASS
	2480	AV	2483.500	-46.04	≤-41.20	49.16	≤54	PASS
		AV	2483.520	-46.04	≤-41.20	49.16	≤54	PASS
		AV	2500.000	-46.68	≤-41.20	48.52	≤54	PASS
		Peak	2483.500	-38.6	≤-21.20	56.60	≤74	PASS
		Peak	2484.640	-35.91	≤-21.20	59.29	≤74	PASS
		Peak	2500.000	-37.91	≤-21.20	57.29	≤74	PASS

Note：

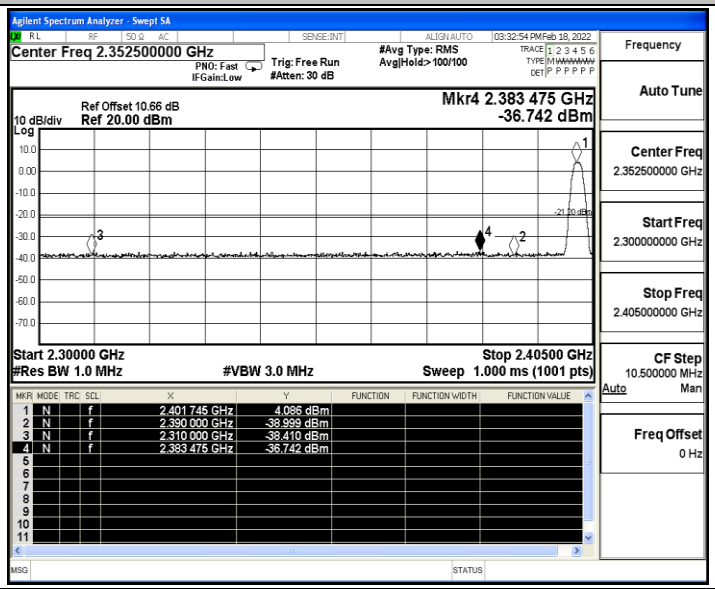
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

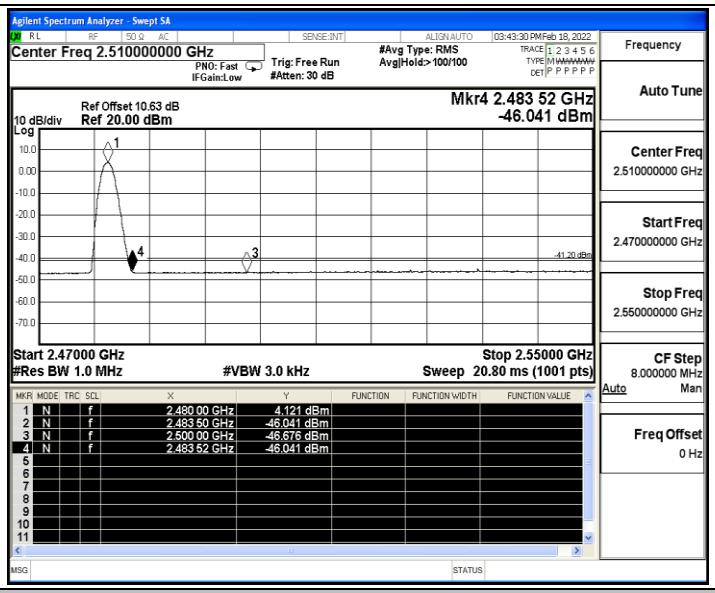
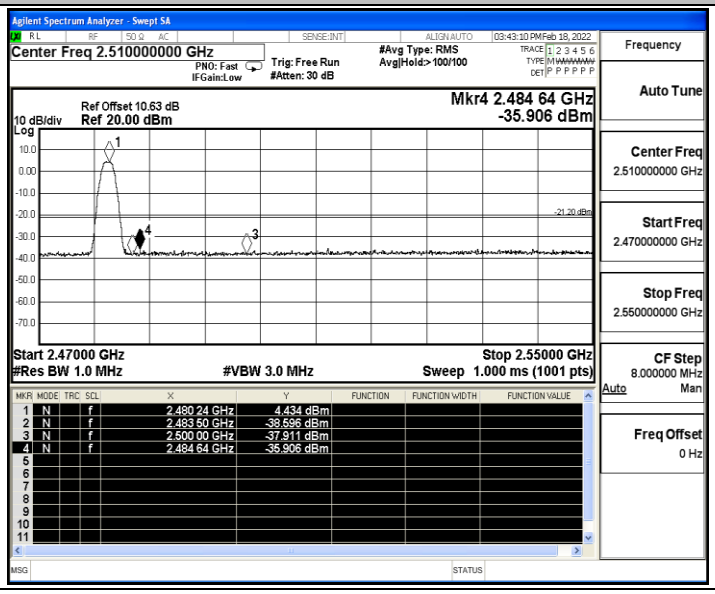
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak