Appendix A

RF Test Data for BT V5.0 (BLE) (Conducted Measurement)

Product Name: H2O Interval

Trade Mark: H2O Audio

Test Model: INT5-AW-BCH

Environmental Conditions

Temperature:	24.2 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

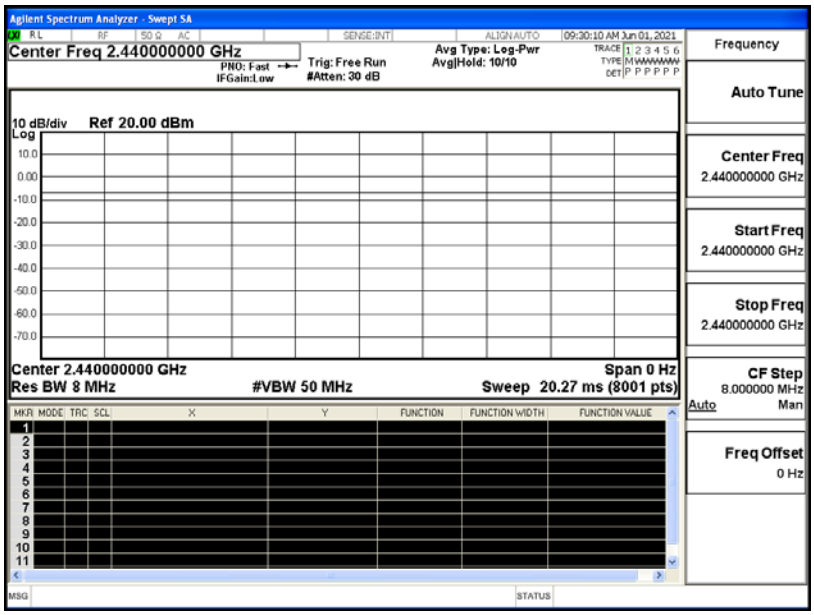
A.1 Duty Cycle

Test Result

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BT LE	2440	Ant1	100	PASS

Test Graphs

BLE_1M_Ant1_2402



BLE_1M_Ant1_2440

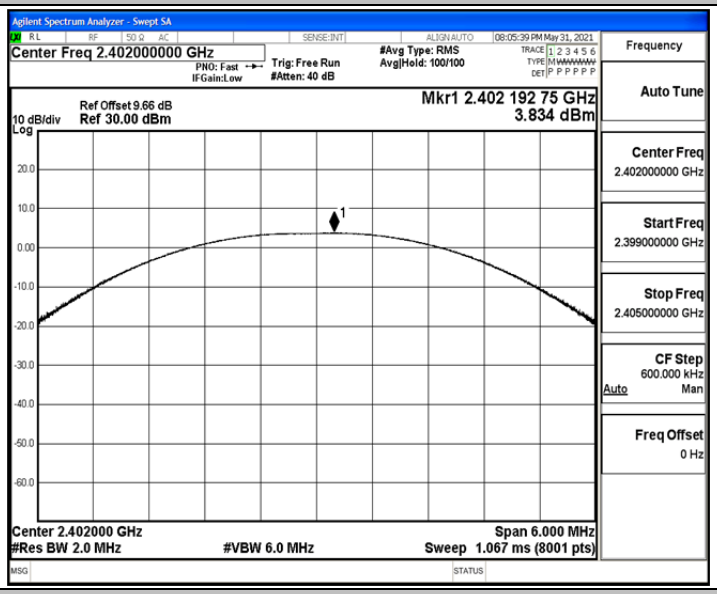
A.2 Maximum conducted output power

Test Result

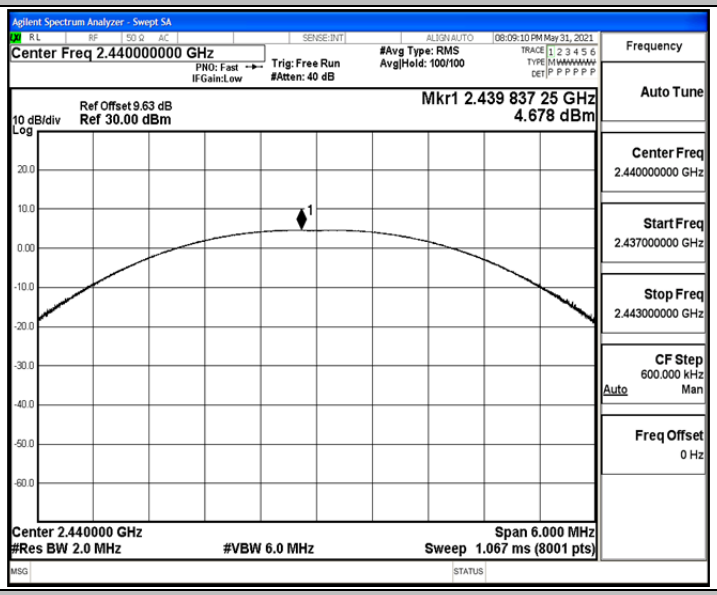
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	3.83	<=30	PASS
		2440	4.68	<=30	PASS
		2480	3.4	<=30	PASS

Test Graphs

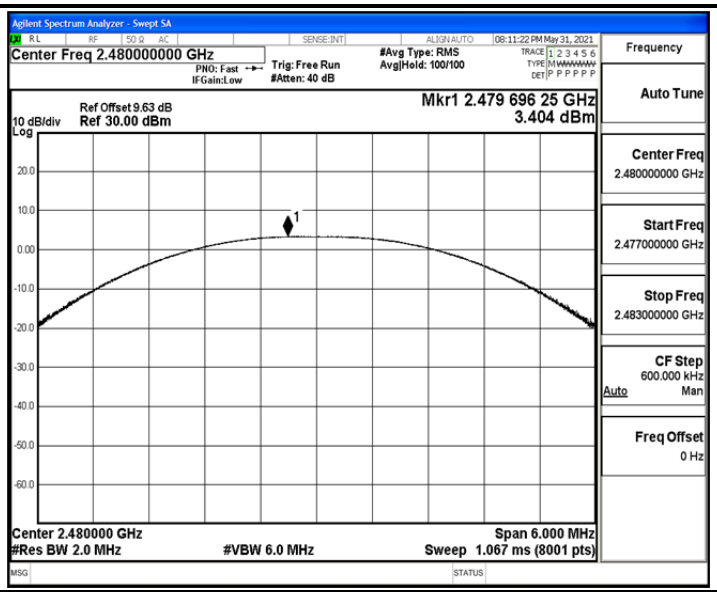
BLE_1M_Ant1_2402



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: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
08:11:22 PM May 31, 2021
Ref Offset 9.63 dB
10 dB/div Ref 30.00 dBm
Log
Mkr1 2.479 696 25 GHz
3.404 dBm
Center 2.480000 GHz
#Res BW 2.0 MHz
#VBW 6.0 MHz
Span 6.000 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.477000000 GHz
Stop Freq
2.483000000 GHz
CF Step
600.000 kHz
Auto
Man
Freq Offset
0 Hz

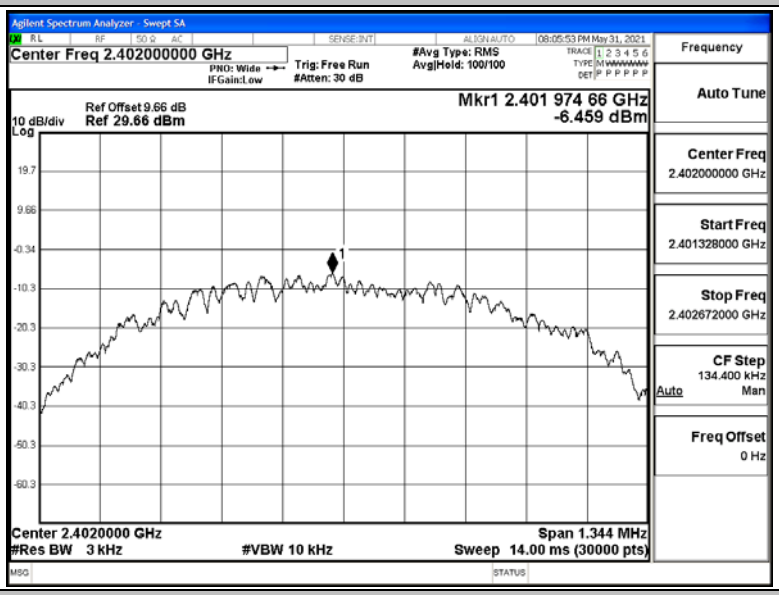
A.3 Maximum power spectral density

Test Result

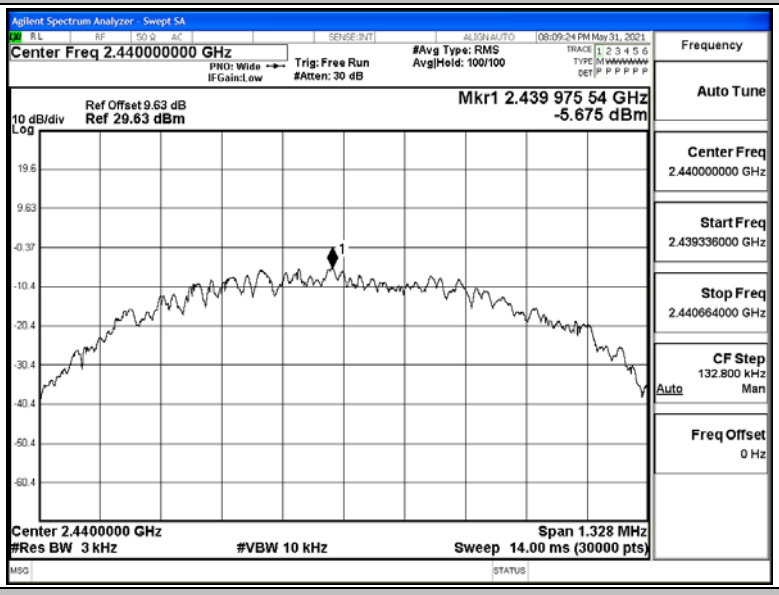
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-6.46	<=8	PASS
		2440	-5.68	<=8	PASS
		2480	-6.83	<=8	PASS

Test Graphs

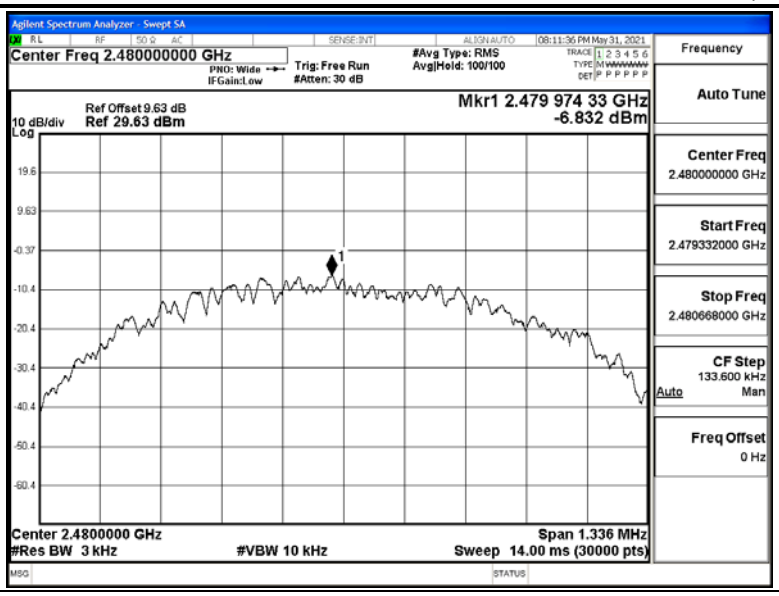
BLE_1M_Ant1_2402



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
08:11:36 PM May 31, 2021
Ref Offset 9.63 dB
10 dB/div
Ref 29.63 dBm
Log
Mkr1 2.479 974 33 GHz
-6.832 dBm
Center 2.4800000 GHz
#Res BW 3 kHz
#VBW 10 kHz
Span 1.336 MHz
Sweep 14.00 ms (30000 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479332000 GHz
Stop Freq
2.480668000 GHz
CF Step
133.600 kHz
Auto
Man
Freq Offset
0 Hz

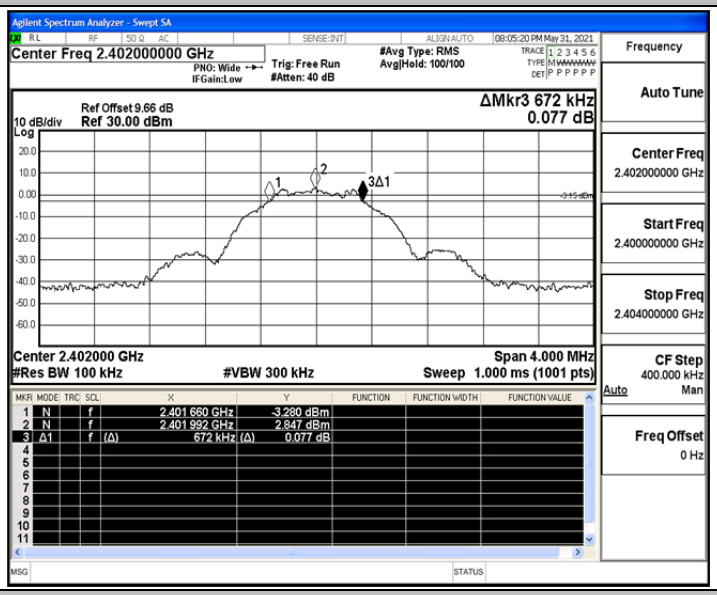
A.4. 6dB Bandwidth

Test Result

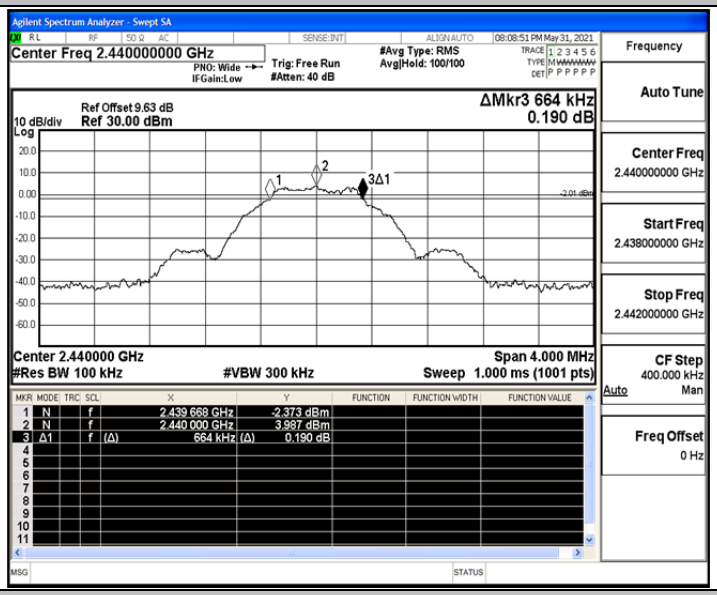
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.672	2401.660	2402.332	0.5	PASS
		2440	0.664	2439.668	2440.332	0.5	PASS
		2480	0.668	2479.664	2480.332	0.5	PASS

Test Graphs

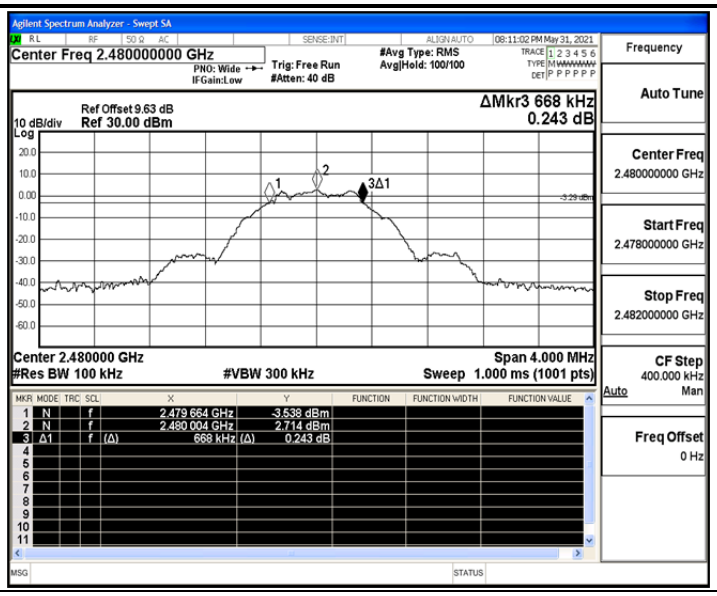
BLE_1M_Ant1_2402



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: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
08:11:02 PM May 31, 2021
Ref Offset 9.63 dB
10 dB/div Ref 30.00 dBm
ΔMkr3 668 kHz
0.243 dB
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
Sweep 1.000 ms (1001 pts)
1 N f 2.479 664 GHz -3.538 dBm
2 N f 2.480 004 GHz 2.714 dBm
3 Δ1 f (Δ) 668 kHz (Δ) 0.243 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

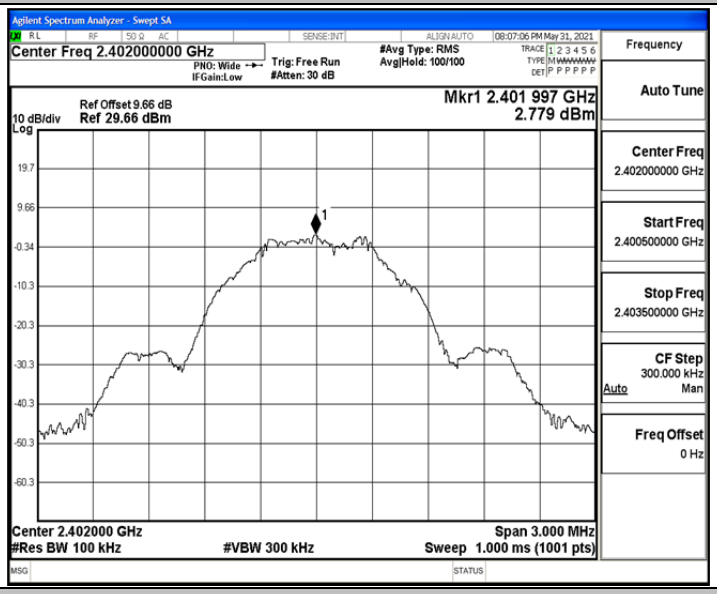
A.6 Conducted Spurious Emission

Test Result

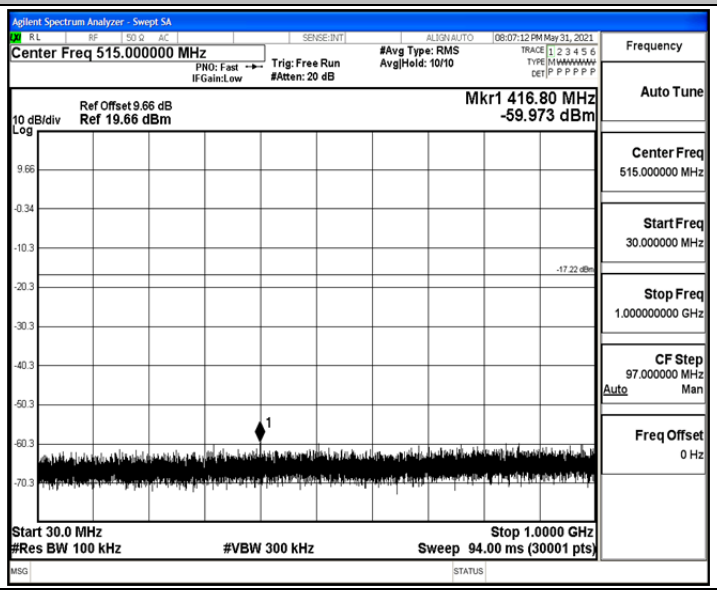
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	2.78	2.78	---	PASS
			30~1000	2.78	-59.97	<=-17.22	PASS
			1000~26500	2.78	-48.53	<=-17.22	PASS
		2440	Reference	3.69	3.69	---	PASS
			30~1000	3.69	-60.27	<=-16.31	PASS
			1000~26500	3.69	-49.09	<=-16.31	PASS
		2480	Reference	2.52	2.52	---	PASS
			30~1000	2.52	-59.88	<=-17.48	PASS
			1000~26500	2.52	-49.14	<=-17.48	PASS

Test Graphs

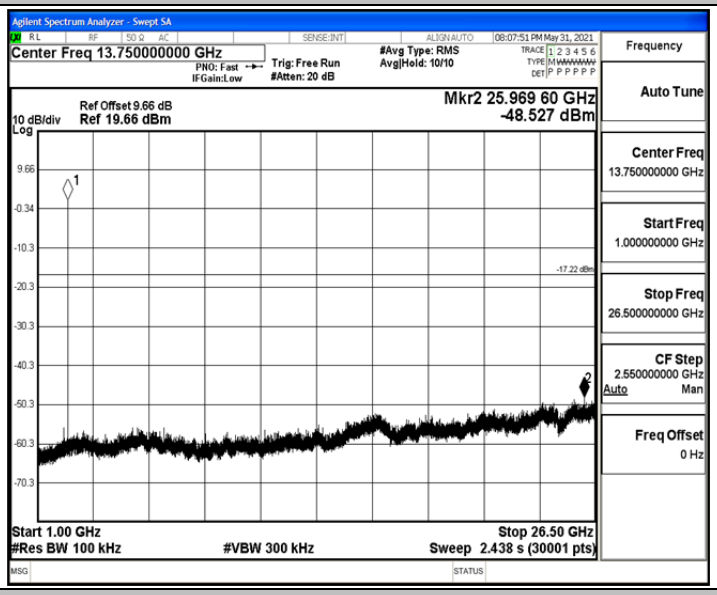
BLE_1M_Ant1_2402_0~Reference



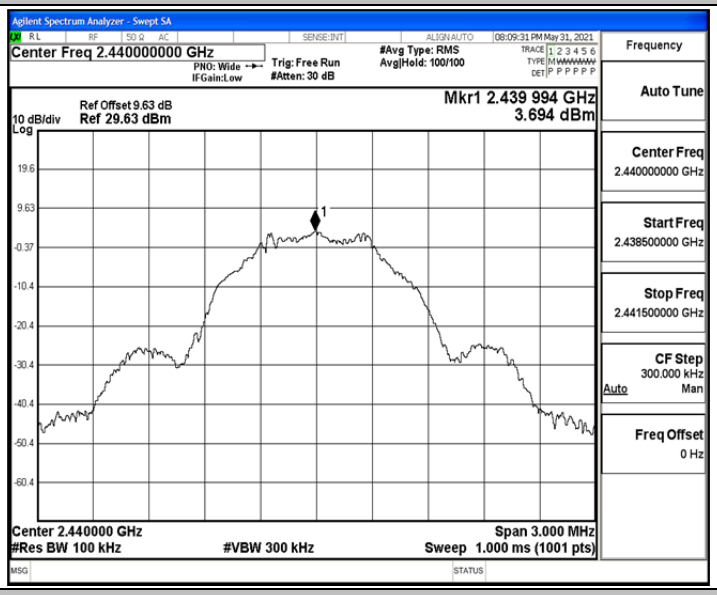
BLE_1M_Ant1_2402_30~1000



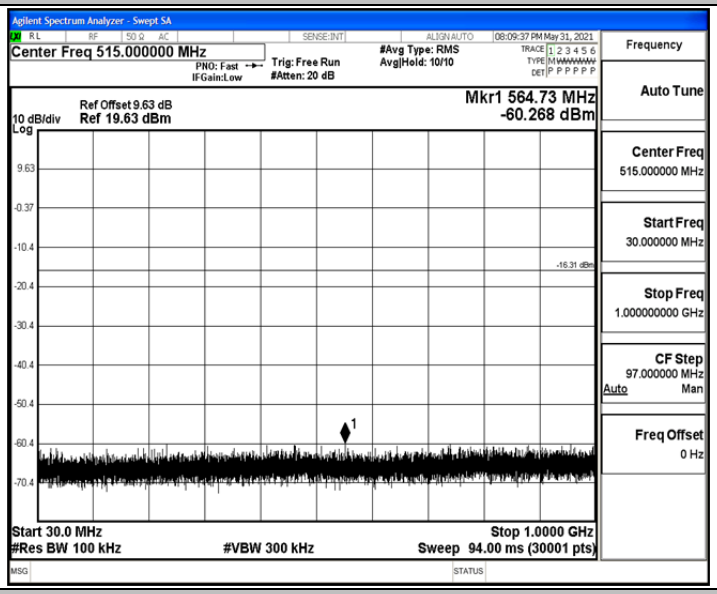
BLE_1M_Ant1_2402_1000~26500



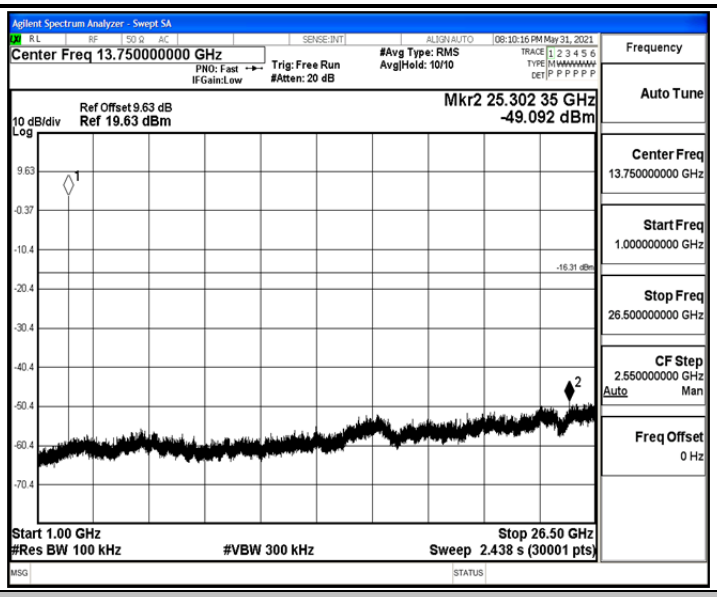
BLE_1M_Ant1_2440_0~Reference



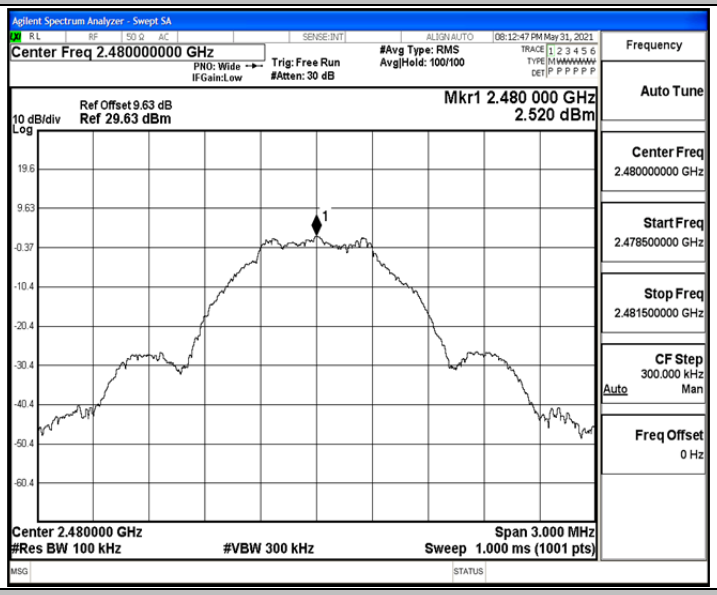
BLE_1M_Ant1_2440_30~1000



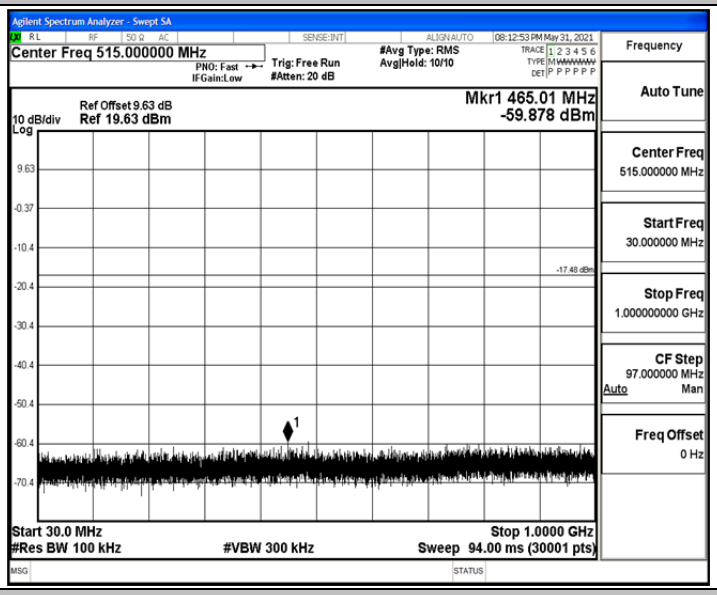
BLE_1M_Ant1_2440_1000~26500



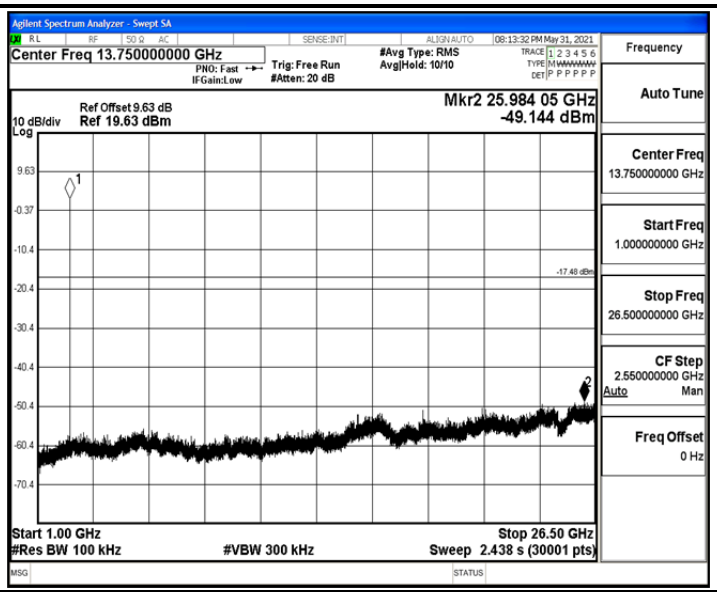
BLE_1M_Ant1_2480_0~Reference



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
08:13:32 PM May 31, 2021
Ref Offset 9.63 dB
10 dB/div Ref 19.63 dBm
Log
Mkr2 25.984 05 GHz
-49.144 dBm
-17.48 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
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

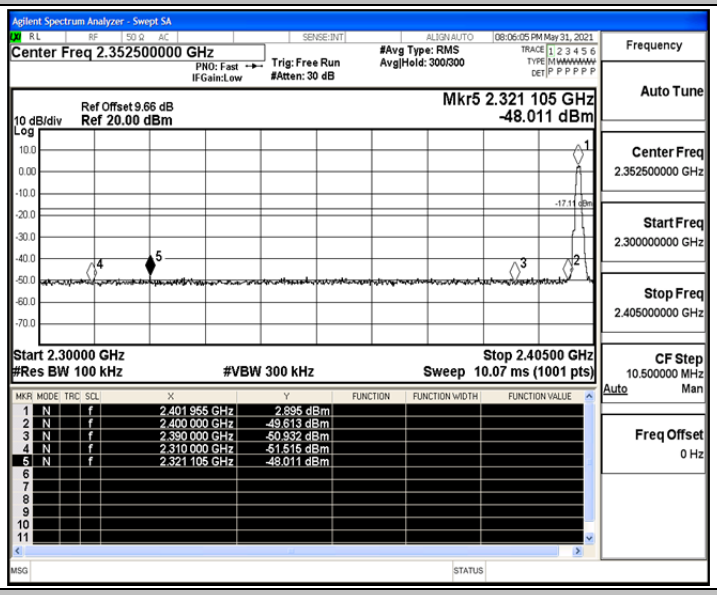
A.7 Band edge measurements

Test Result

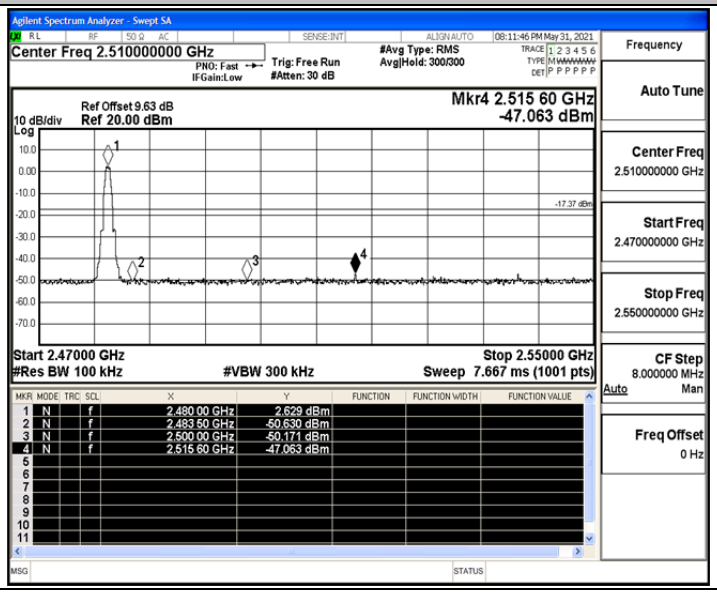
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	2.90	-48.01	<=-17.11	PASS
		High	2480	2.63	-47.06	<=-17.37	PASS

Test Graphs

BLE_1M_Ant1_Low_2402



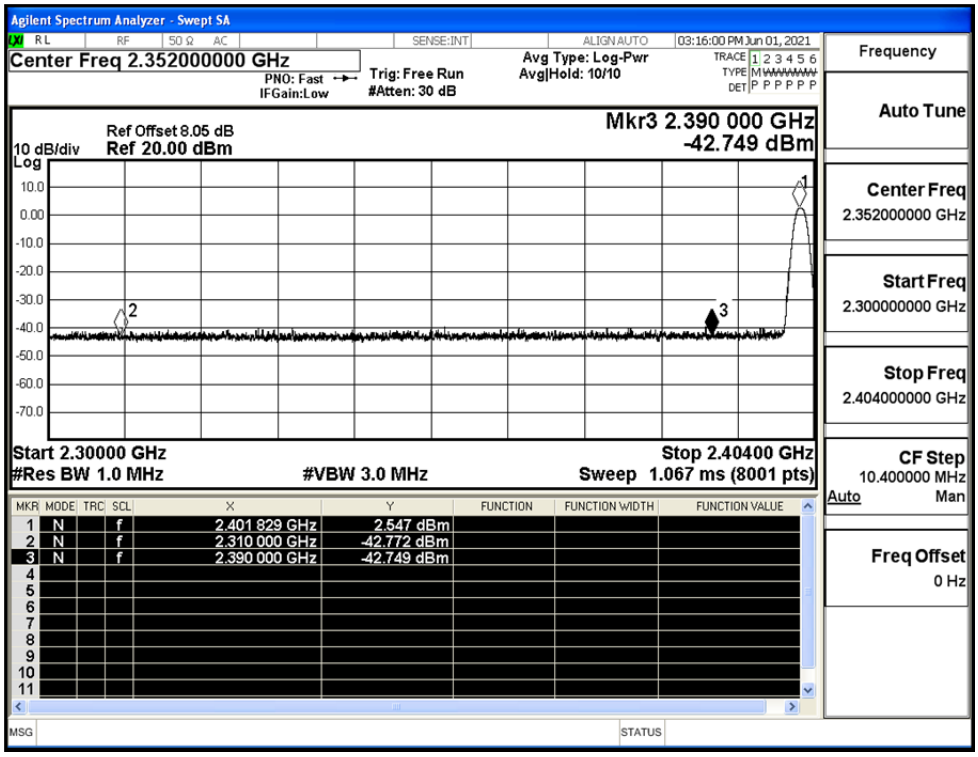
BLE_1M_Ant1_High_2480



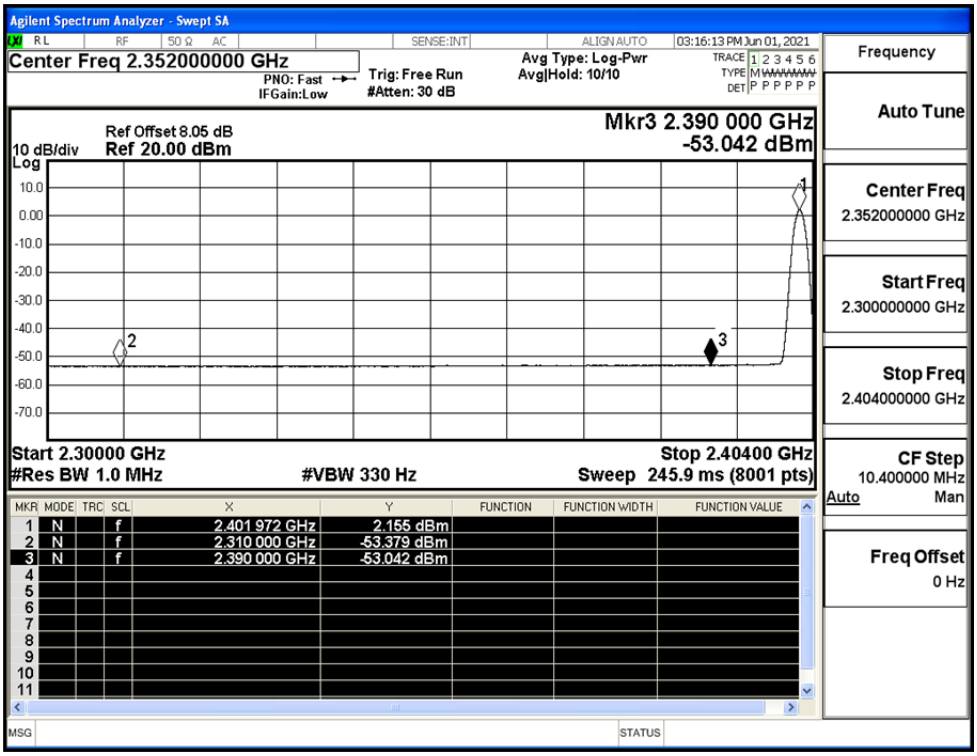
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.77	2.0	0	54.46	PEAK	74	PASS
	Off	2310.0	-53.38	2.0	0	43.85	AV	54	PASS
	Off	2390.0	-42.75	2.0	0	54.48	PEAK	74	PASS
	Off	2390.0	-53.04	2.0	0	44.19	AV	54	PASS
	Off	2483.5	-42.04	2.0	0	55.19	PEAK	74	PASS
	Off	2483.5	-52.50	2.0	0	44.73	AV	54	PASS
	Off	2500.0	-42.18	2.0	0	55.05	PEAK	74	PASS
	Off	2500.0	-52.41	2.0	0	44.82	AV	54	PASS

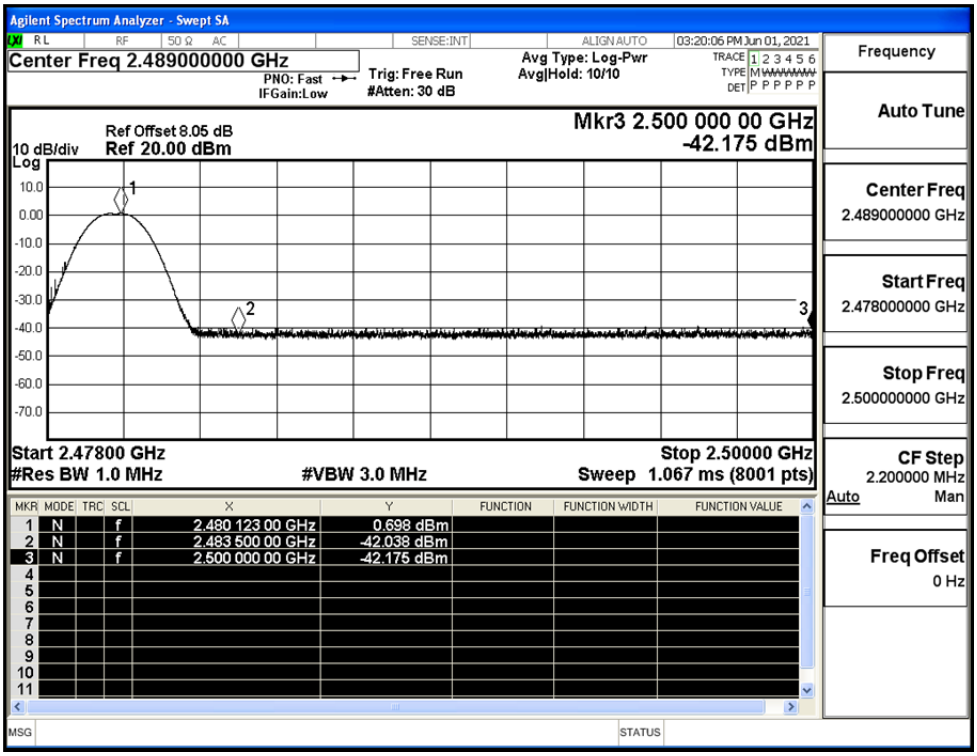
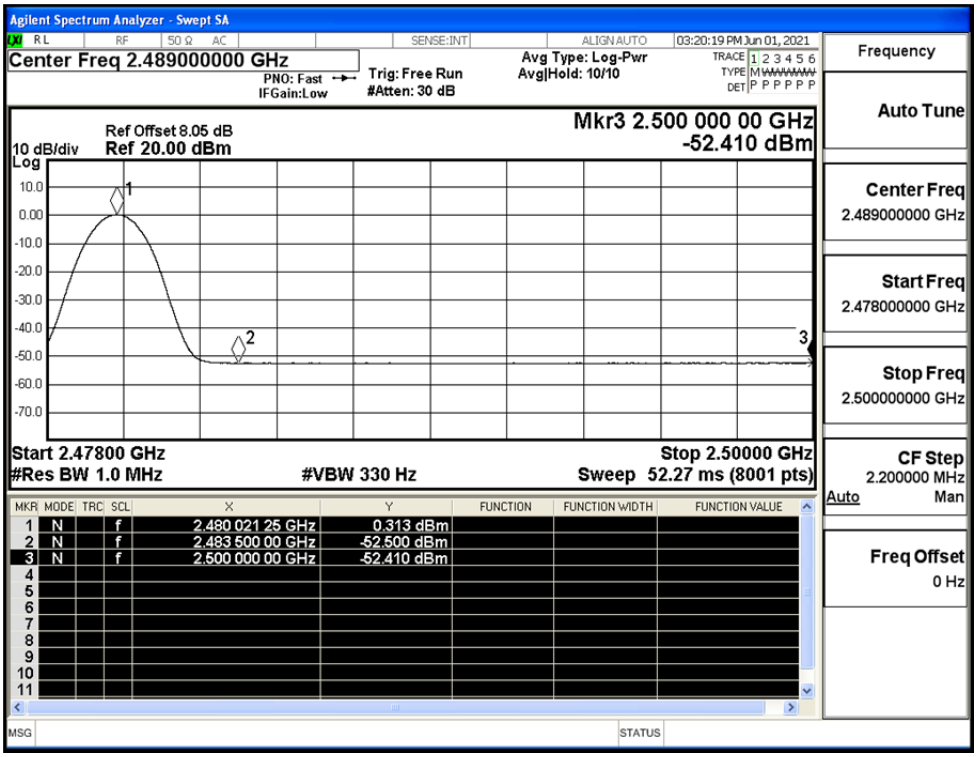
Restrict-band band-edge measurements_BT LE_PEAK (Low Channel)



Restrict-band band-edge measurements_BT LE_Average (Low Channel)



Restrict-band band-edge measurements_BT LE_PEAK (High Channel)



Restrict-band band-edge measurements_BT LE_Average (High Channel)