

RF Test Data for BT(BLE) (Conducted Measurement)

Product Name: OTT+speaker

Trade Mark: N/A

Test Model: SK410A

FCC ID: 2AOVU-SK410AX

Environmental Conditions

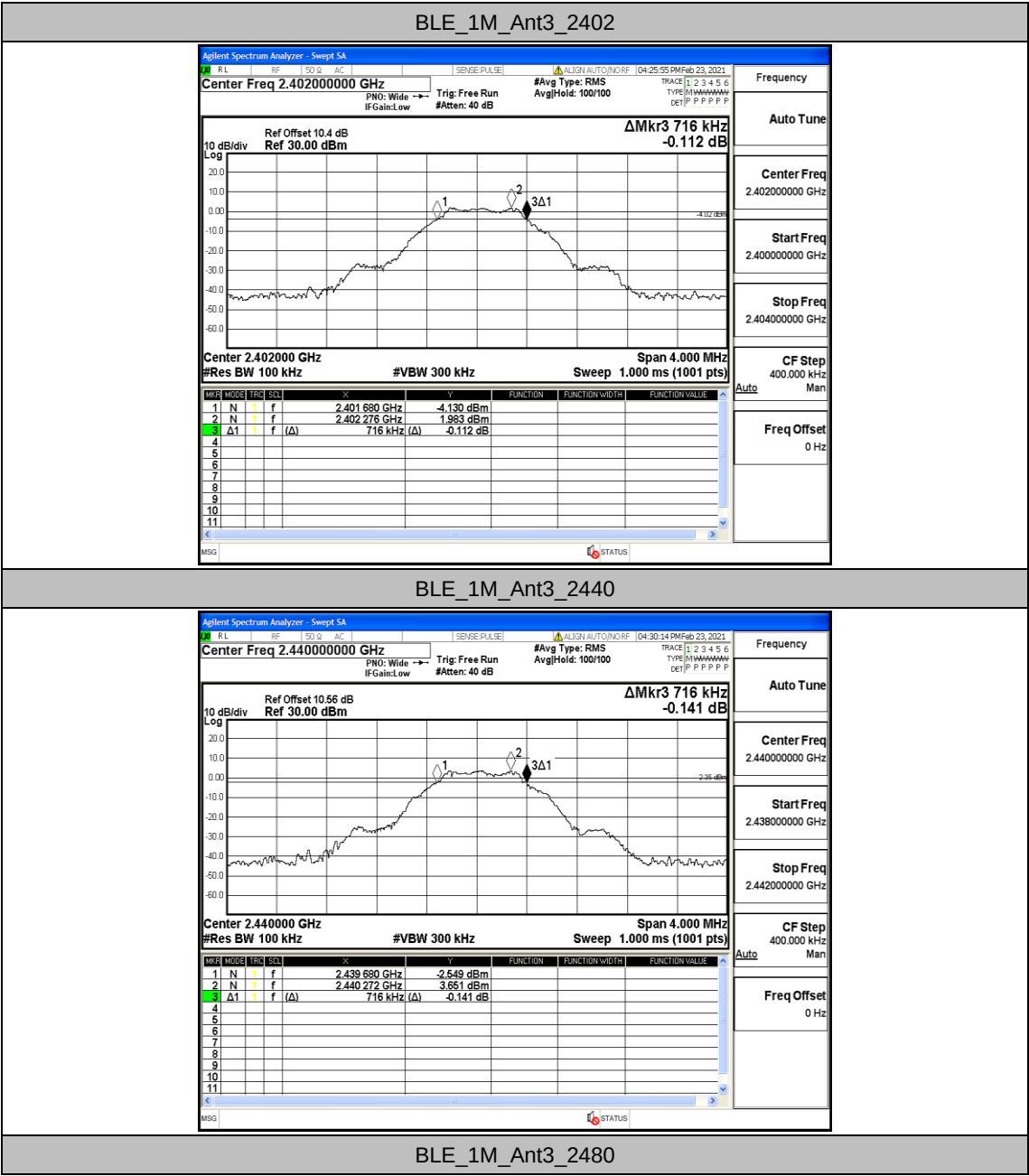
Temperature:	25.5°C
Relative Humidity:	55%
ATM Pressure:	100.0 kPa
Test Engineer:	Anna Hu
Supervised by:	Hugo Chen
NOTE	N/A

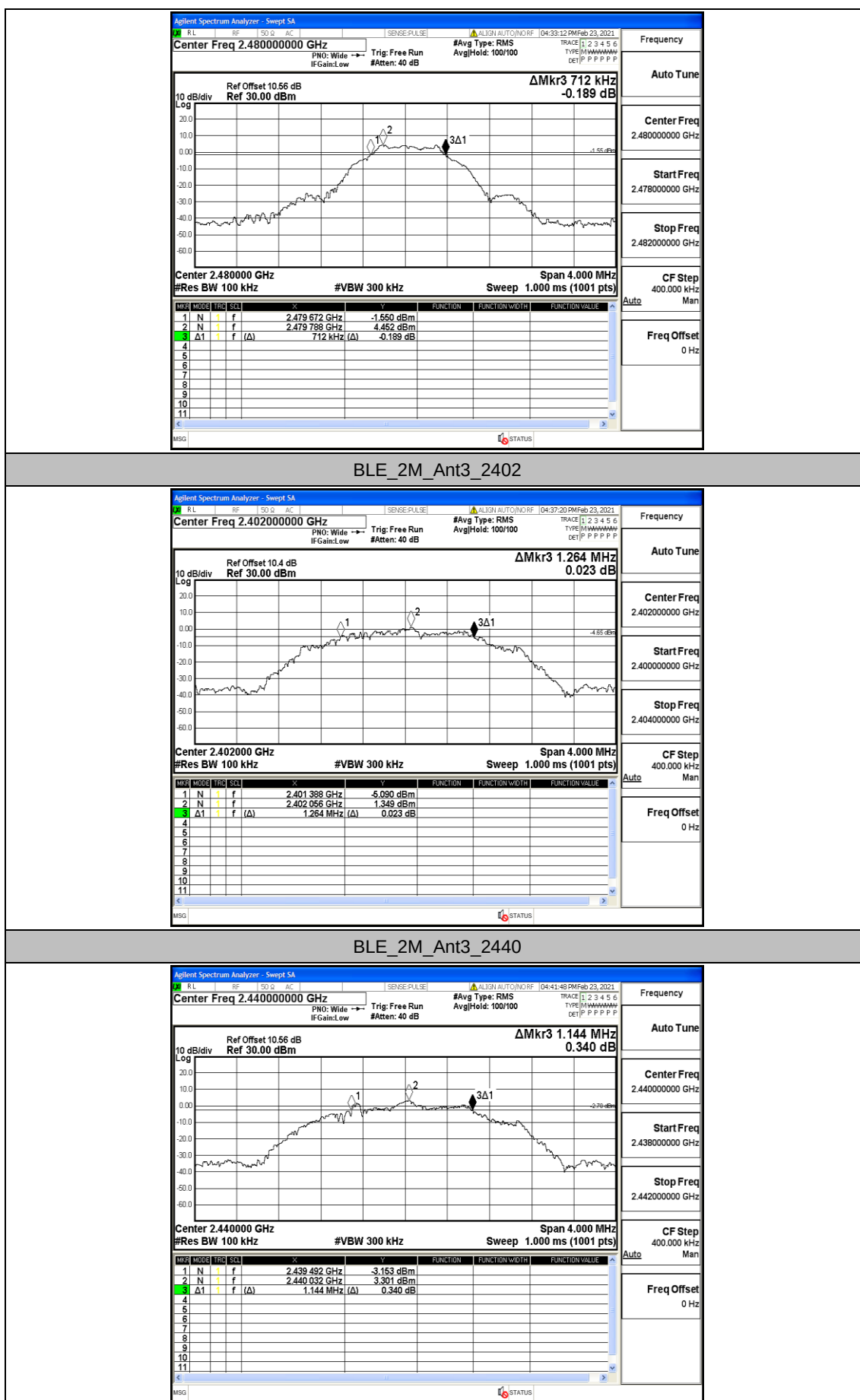
Appendix A: DTS Bandwidth

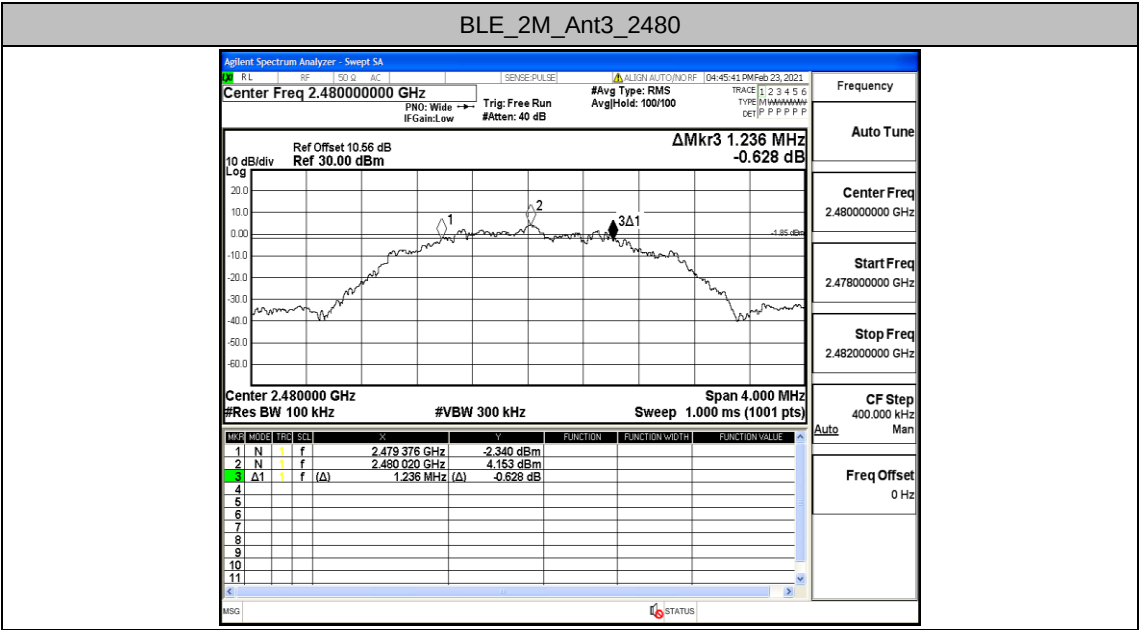
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant3	2402	0.716	2401.680	2402.396	0.5	PASS
		2440	0.716	2439.680	2440.396	0.5	PASS
		2480	0.712	2479.672	2480.384	0.5	PASS
BLE_2M	Ant3	2402	1.264	2401.388	2402.652	0.5	PASS
		2440	1.144	2439.492	2440.636	0.5	PASS
		2480	1.236	2479.376	2480.612	0.5	PASS

Test Graphs





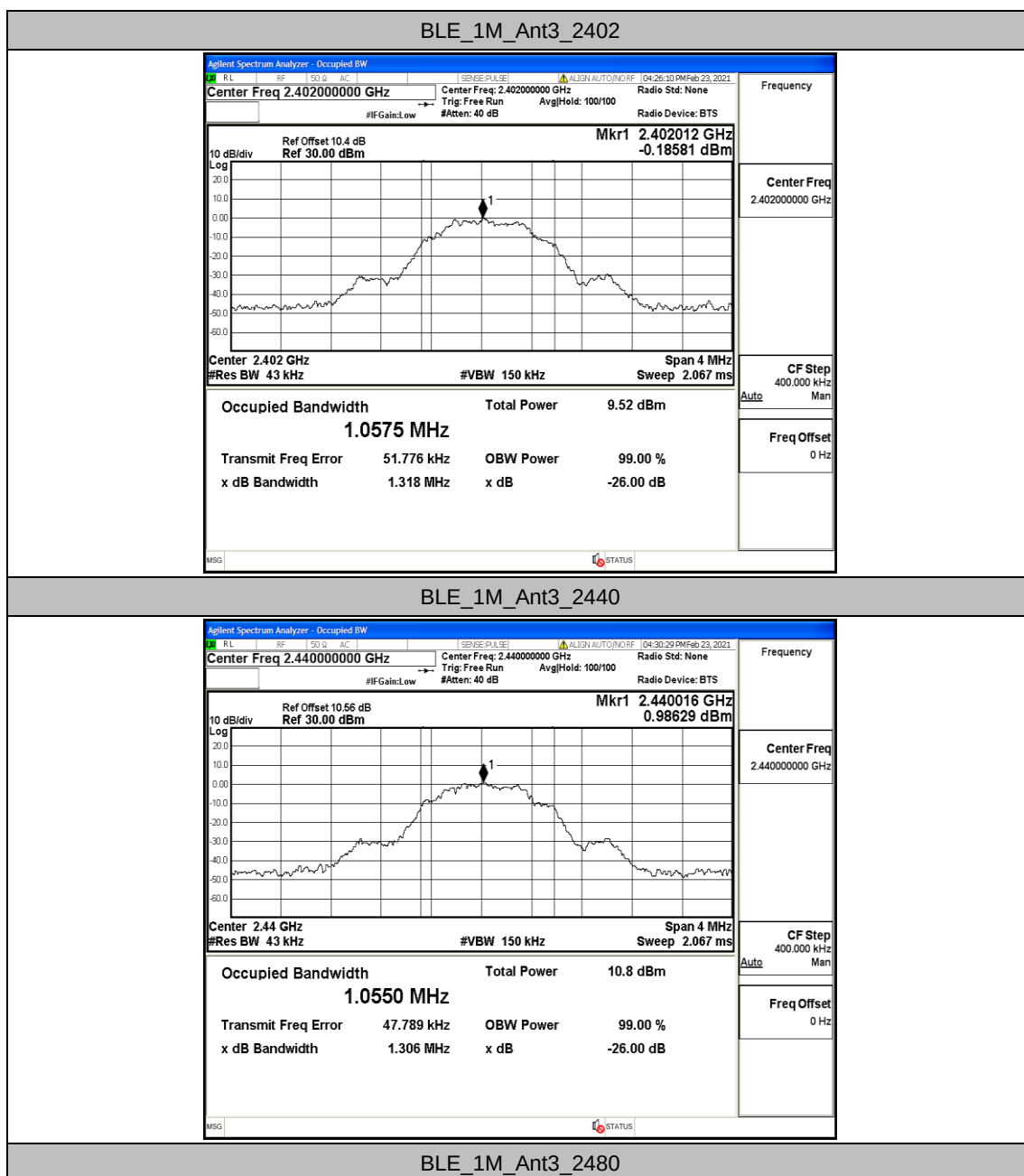


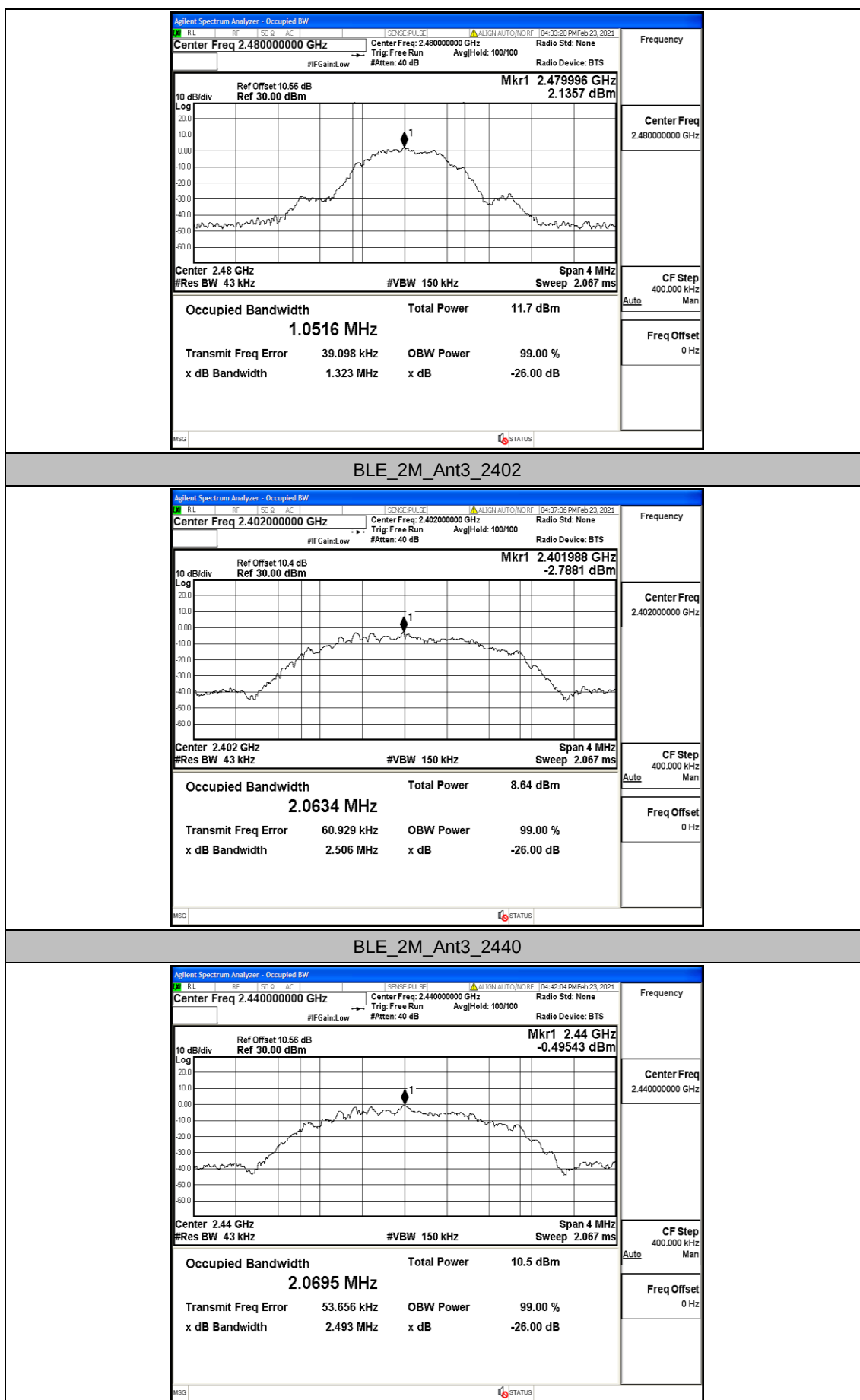
Appendix B: Occupied Channel Bandwidth

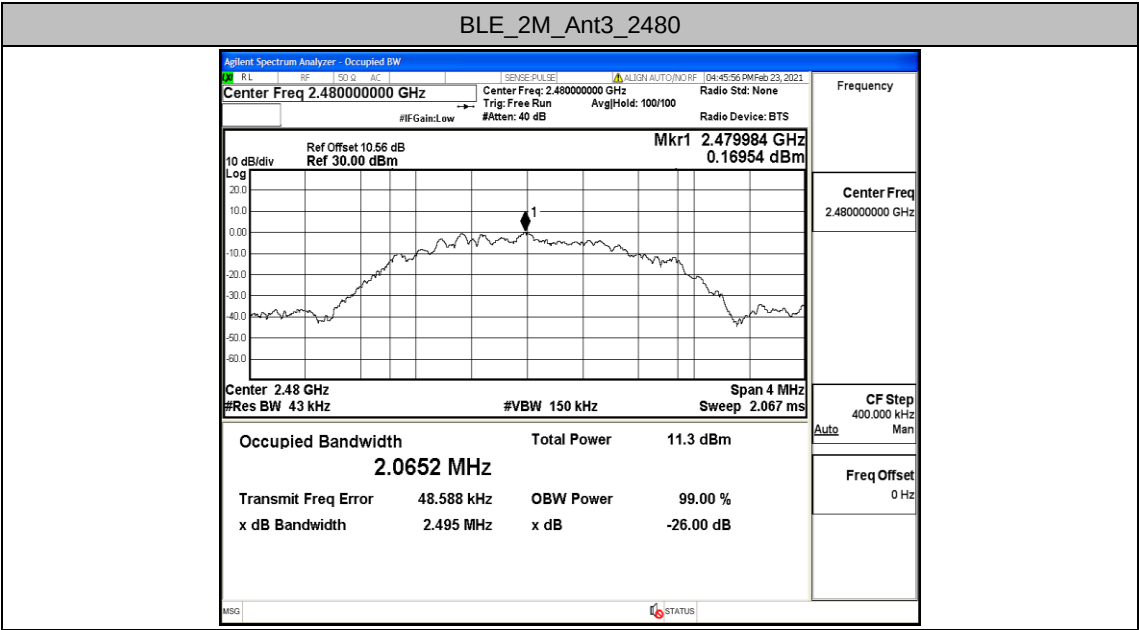
Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant3	2402	1.0575	2401.523	2402.581	---	PASS
		2440	1.0550	2439.520	2440.575	---	PASS
		2480	1.0516	2479.513	2480.565	---	PASS
BLE_2M	Ant3	2402	2.0634	2401.029	2403.093	---	PASS
		2440	2.0695	2439.019	2441.088	---	PASS
		2480	2.0652	2479.016	2481.081	---	PASS

Test Graphs





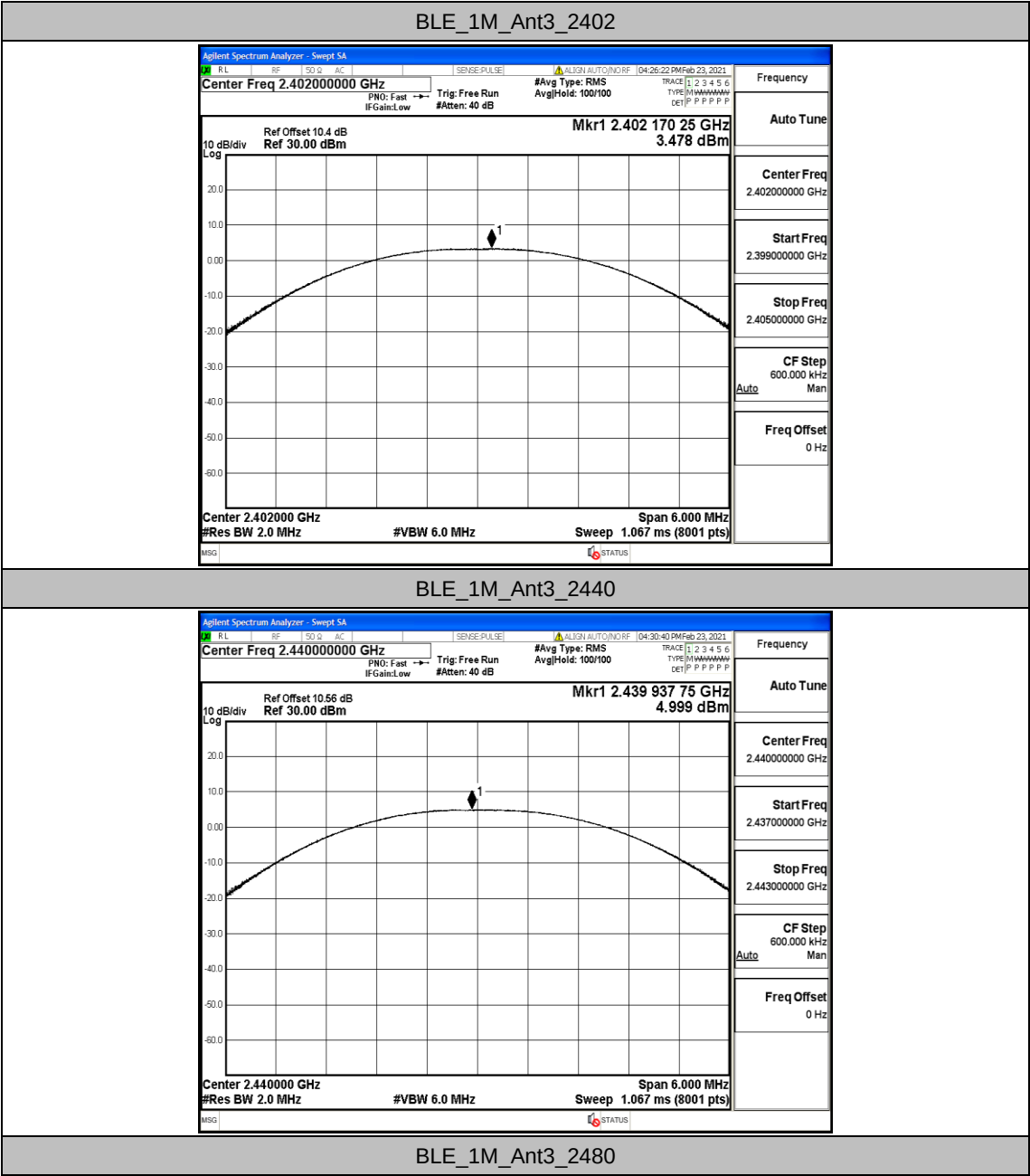


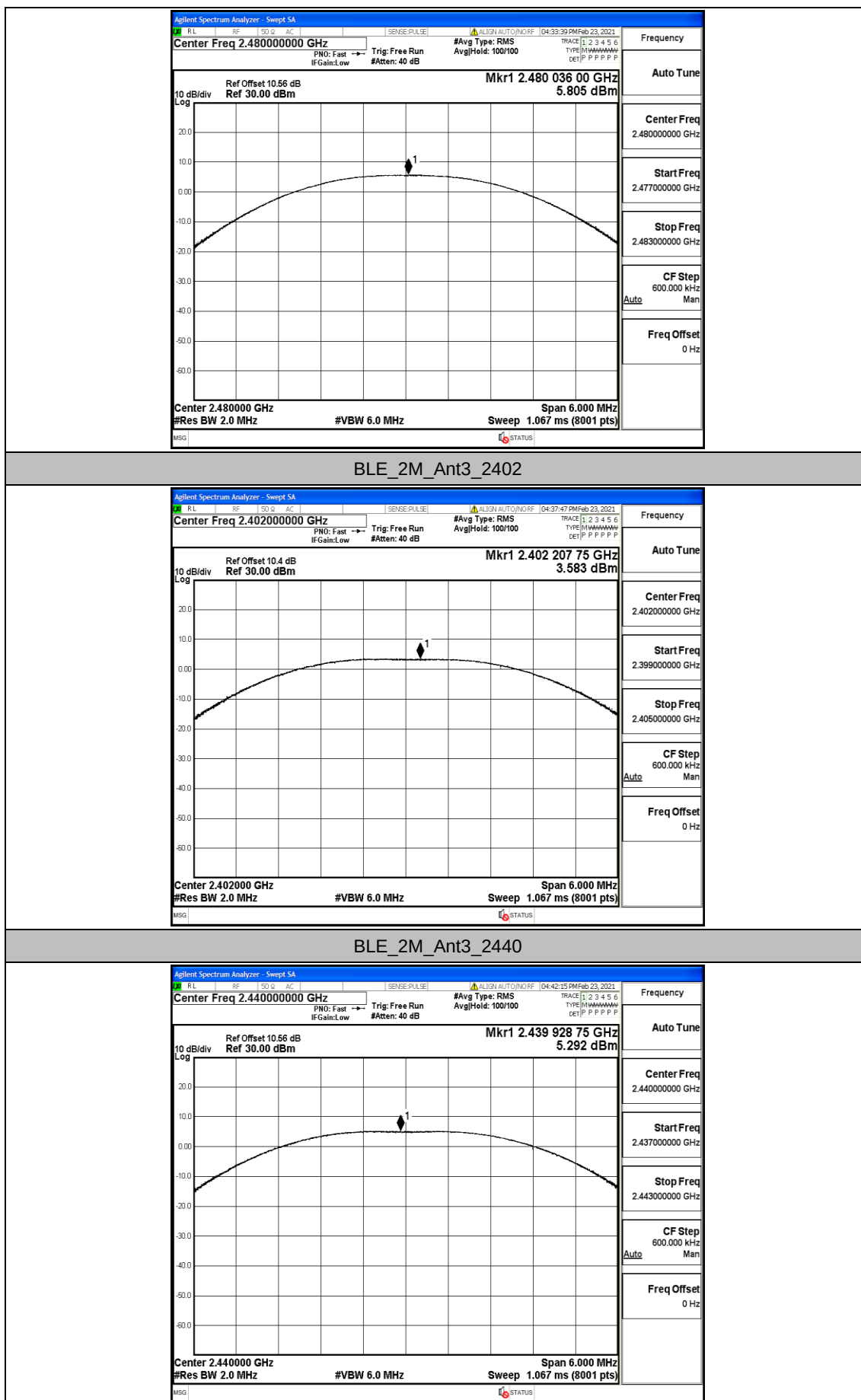
Appendix C: Maximum conducted output power

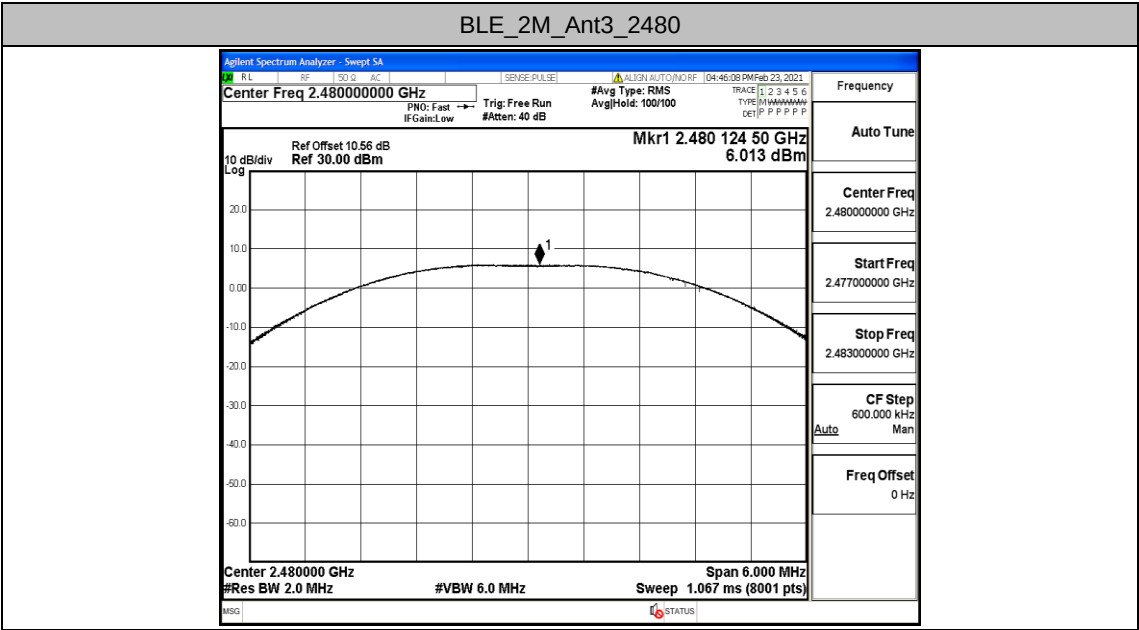
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant3	2402	3.48	<=30	PASS
		2440	5.00	<=30	PASS
		2480	5.81	<=30	PASS
BLE_2M	Ant3	2402	3.58	<=30	PASS
		2440	5.29	<=30	PASS
		2480	6.01	<=30	PASS

Test Graphs







Appendix D: Maximum power spectral density

Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant3	2402	-12.23	<=8	PASS
		2440	-10.71	<=8	PASS
		2480	-9.86	<=8	PASS
BLE_2M	Ant3	2402	-14.41	<=8	PASS
		2440	-12.81	<=8	PASS
		2480	-11.92	<=8	PASS

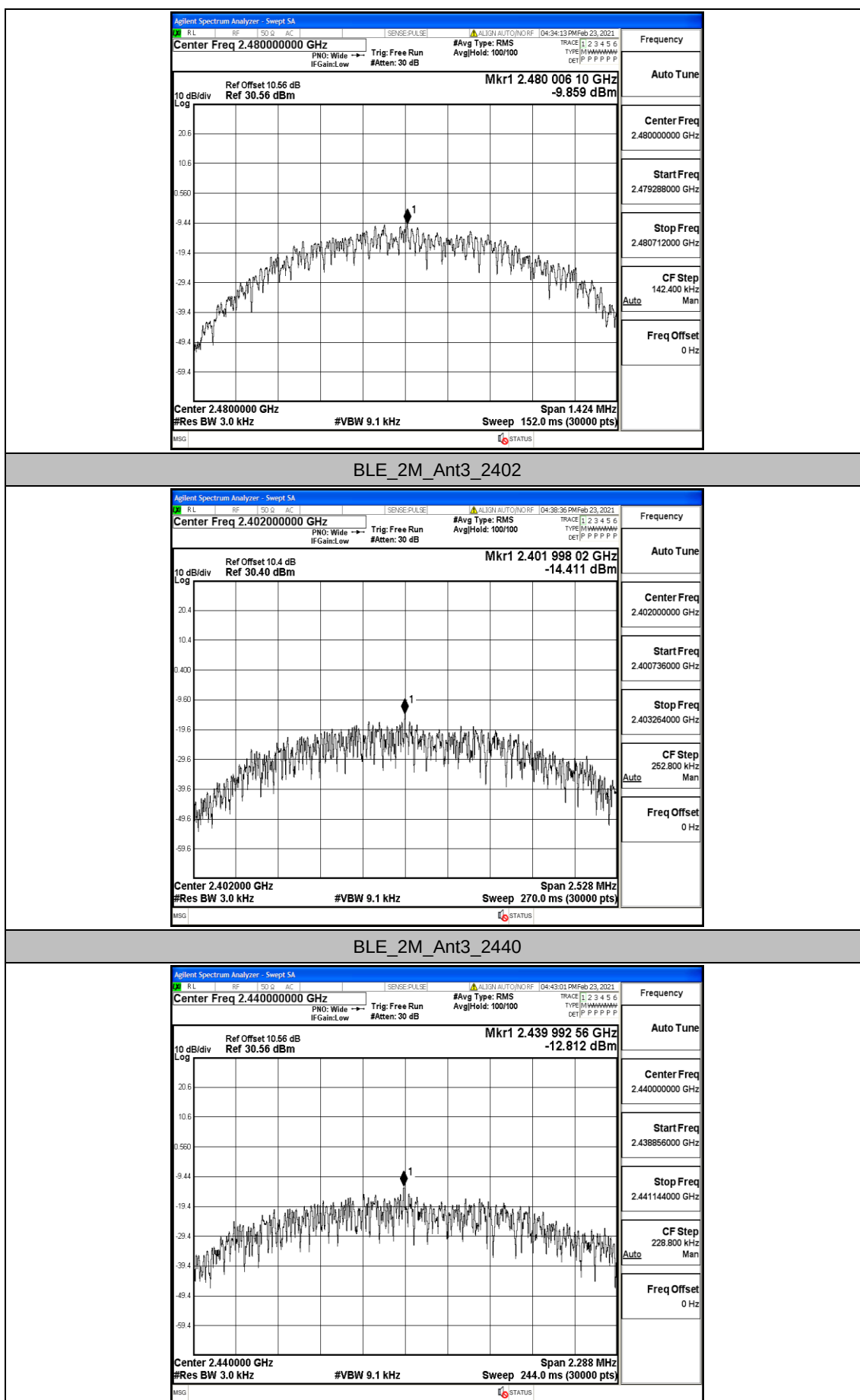
The figure displays two screenshots of an Agilent Spectrum Analyzer (Swept SA) showing BLE signal measurements. Both plots are in a log scale with a 10 dB/div vertical axis and a 1.432 MHz span.

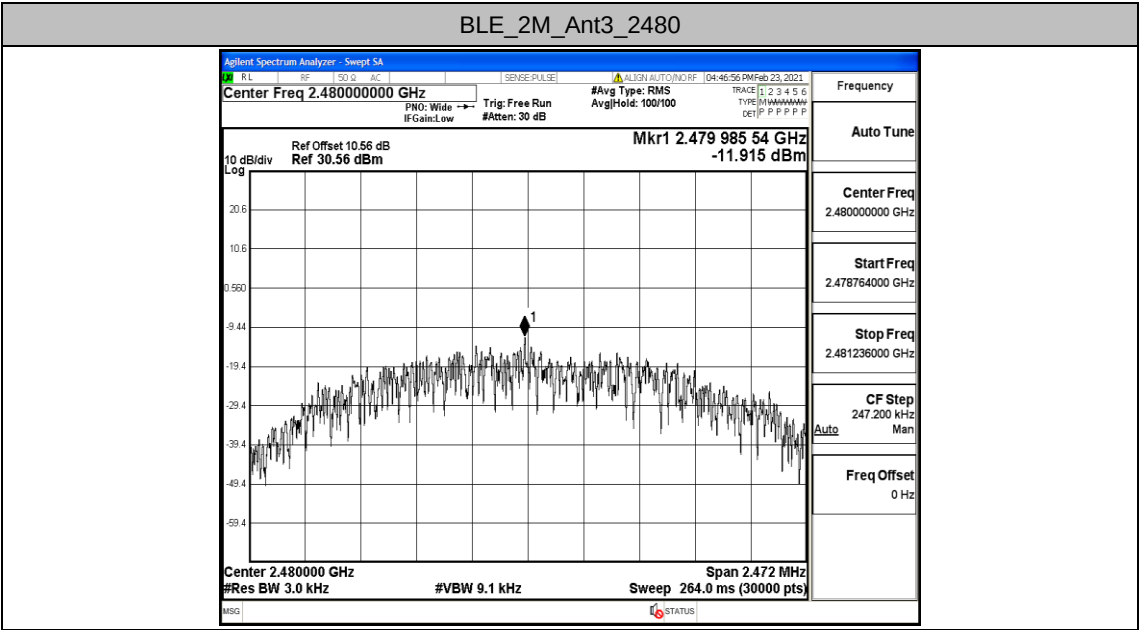
Top Screenshot (2.402 GHz):

- Center Freq:** 2.40200000 GHz
- Ref Offset:** 10.4 dB
- Ref:** 30.40 dBm
- Mkr1:** 2.402 018 16 GHz, -12.233 dBm
- Span:** 1.432 MHz
- Res BW:** 3.0 kHz
- #VBW:** 9.1 kHz
- Sweep:** 152.0 ms (30000 pts)
- Trig:** Free Run
- #Attenu:** 30 dB
- Avg Type:** RMS
- Avg Hold:** 100/100
- Frequency Table:**
 - Auto Tune
 - Center Freq: 2.40200000 GHz
 - Start Freq: 2.401284000 GHz
 - Stop Freq: 2.402716000 GHz
 - CF Step: 143.200 kHz (Man)
 - Freq Offset: 0 Hz

Bottom Screenshot (2.440 GHz):

- Center Freq:** 2.440000000 GHz
- Ref Offset:** 10.56 dB
- Ref:** 30.56 dBm
- Mkr1:** 2.440 011 96 GHz, -10.705 dBm
- Span:** 1.432 MHz
- Res BW:** 3.0 kHz
- #VBW:** 9.1 kHz
- Sweep:** 152.0 ms (30000 pts)
- Trig:** Free Run
- #Attenu:** 30 dB
- Avg Type:** RMS
- Avg Hold:** 100/100
- Frequency Table:**
 - Auto Tune
 - Center Freq: 2.440000000 GHz
 - Start Freq: 2.439284000 GHz
 - Stop Freq: 2.440716000 GHz
 - CF Step: 143.200 kHz (Man)
 - Freq Offset: 0 Hz



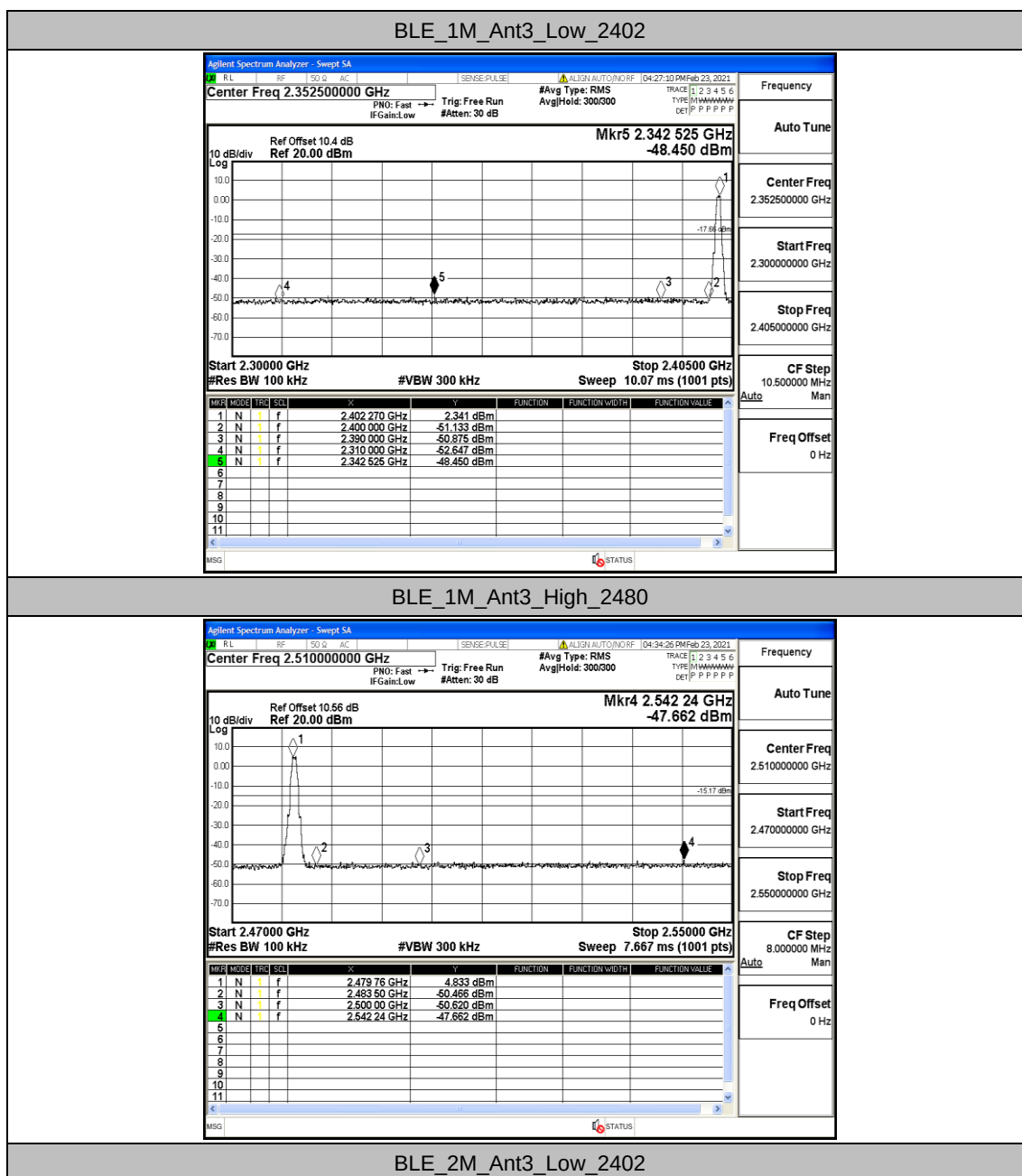


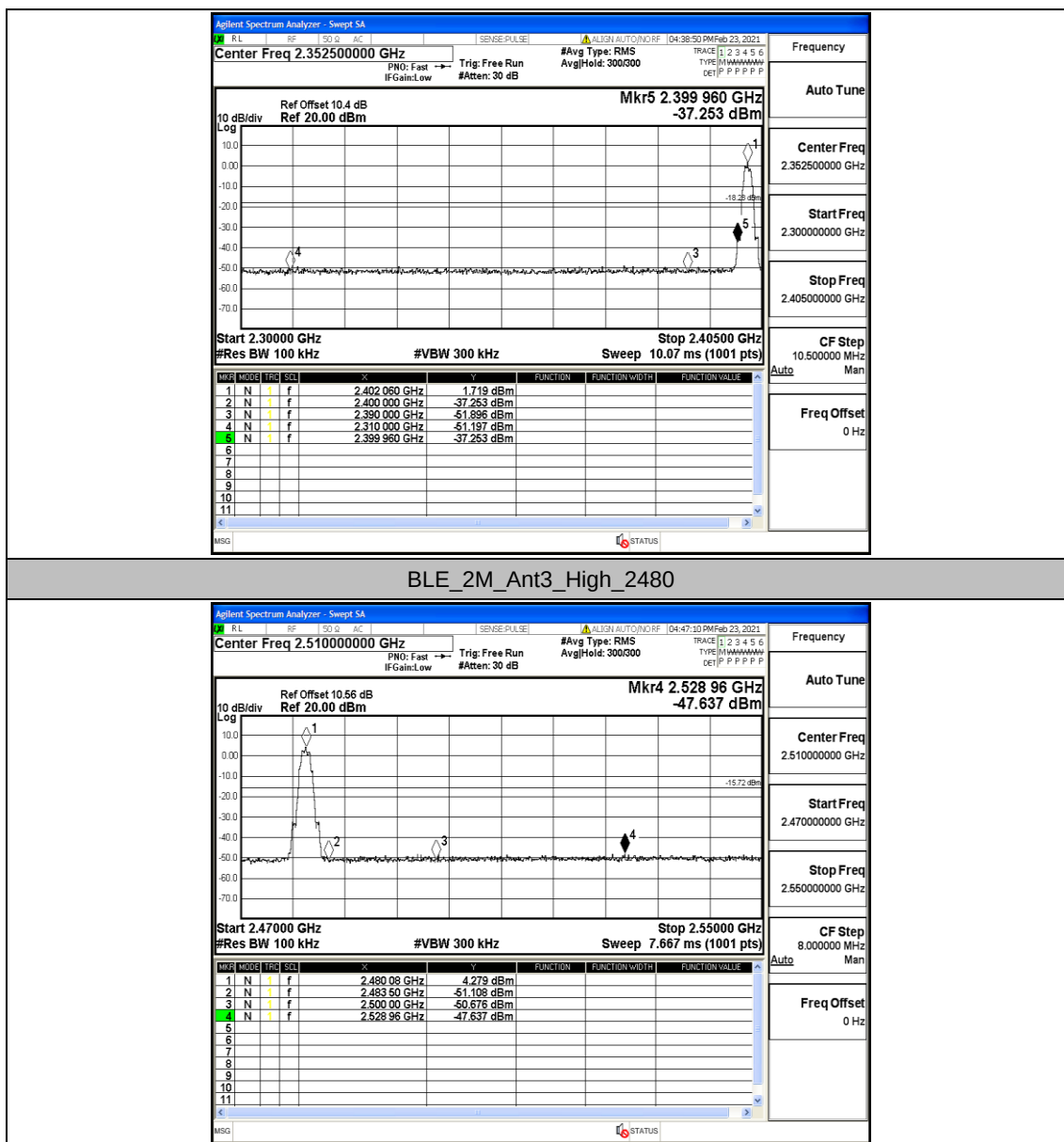
Appendix E: Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant3	Low	2402	2.34	-48.45	<=-17.66	PASS
		High	2480	4.83	-47.66	<=-15.17	PASS
BLE_2M	Ant3	Low	2402	1.72	-37.25	<=-18.28	PASS
		High	2480	4.28	-47.64	<=-15.72	PASS

Test Graphs



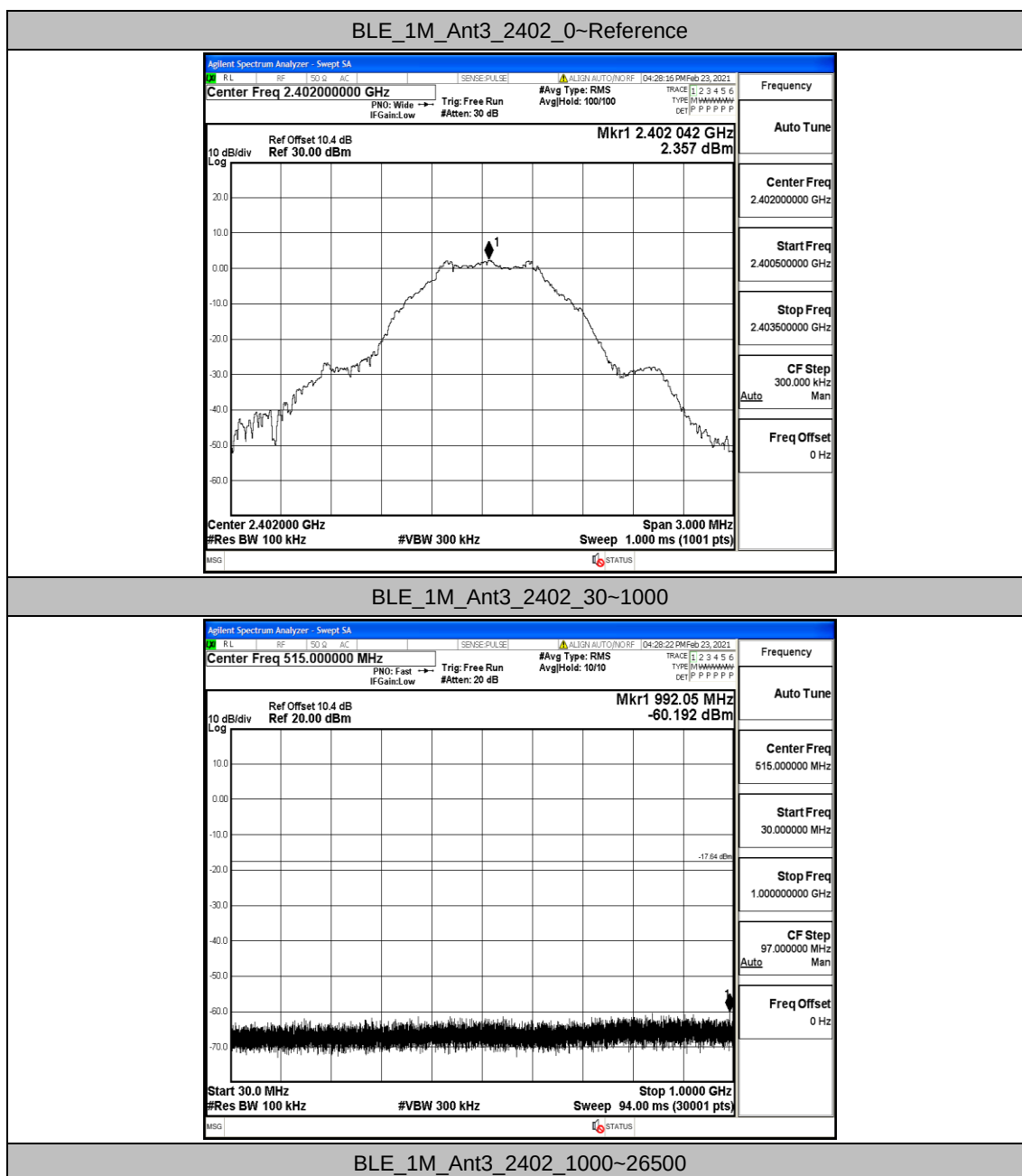


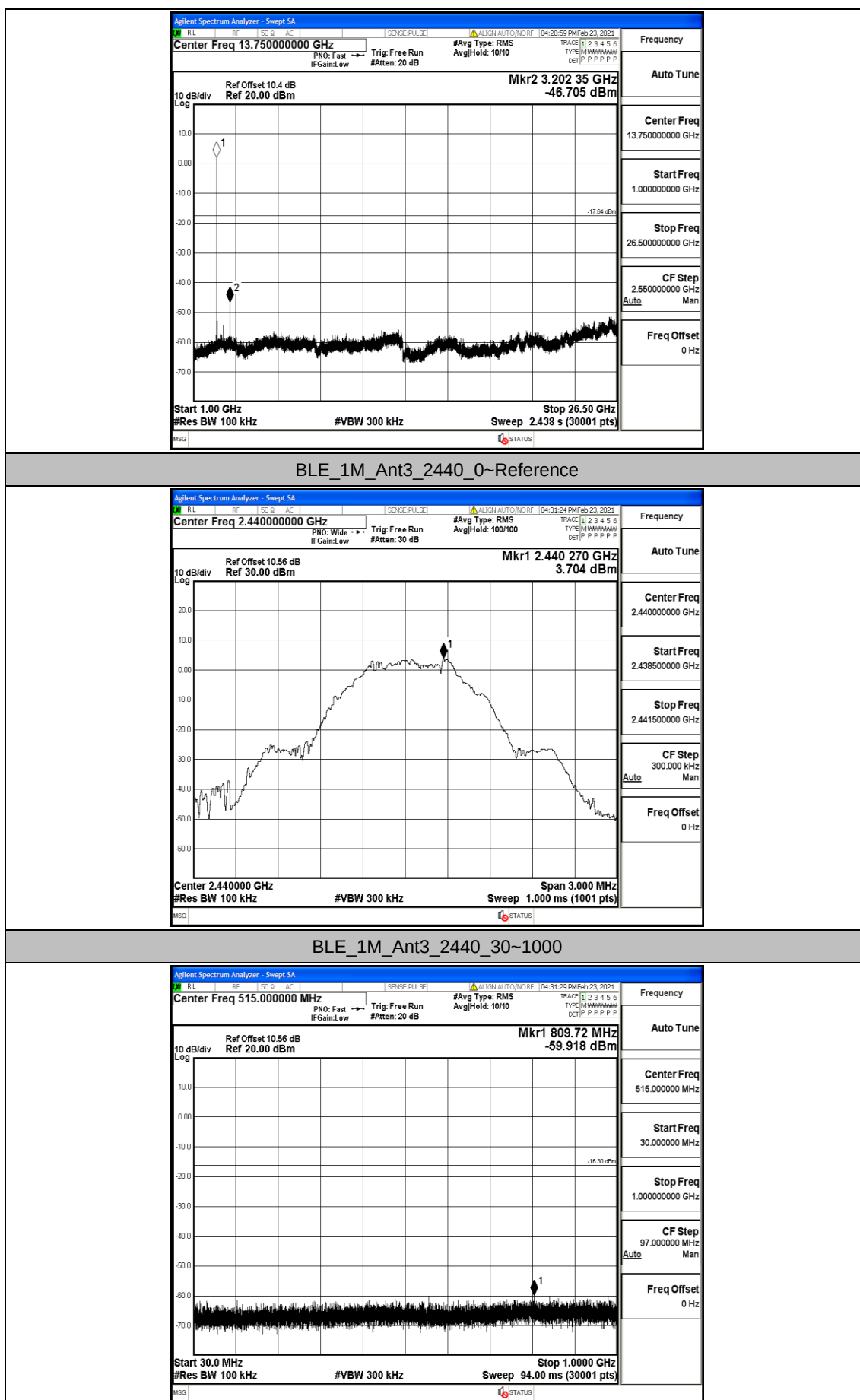
Appendix F: Conducted Spurious Emission

Test Result

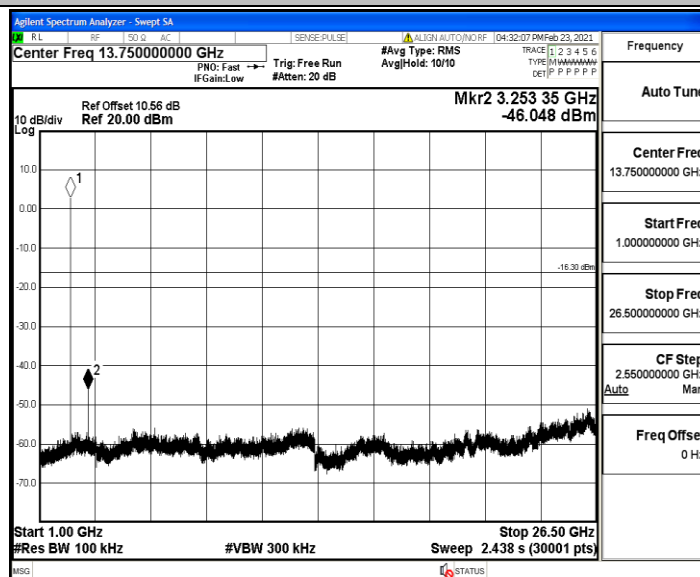
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant3	2402	Reference	2.36	2.36	---	PASS
			30~1000	2.36	-60.19	<=-17.64	PASS
			1000~26500	2.36	-46.71	<=-17.64	PASS
		2440	Reference	3.70	3.70	---	PASS
			30~1000	3.70	-59.92	<=-16.3	PASS
			1000~26500	3.70	-46.05	<=-16.3	PASS
		2480	Reference	4.70	4.70	---	PASS
			30~1000	4.70	-60.35	<=-15.3	PASS
			1000~26500	4.70	-46.38	<=-15.3	PASS
BLE_2M	Ant3	2402	Reference	1.15	1.15	---	PASS
			30~1000	1.15	-60.31	<=-18.85	PASS
			1000~26500	1.15	-47.73	<=-18.85	PASS
		2440	Reference	3.33	3.33	---	PASS
			30~1000	3.33	-60.05	<=-16.67	PASS
			1000~26500	3.33	-46.61	<=-16.67	PASS
		2480	Reference	4.21	4.21	---	PASS
			30~1000	4.21	-59.34	<=-15.79	PASS
			1000~26500	4.21	-48.45	<=-15.79	PASS

Test Graphs

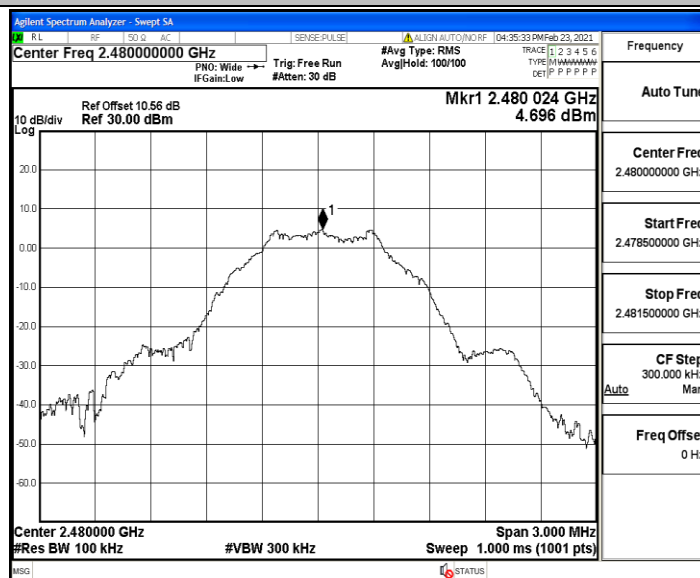




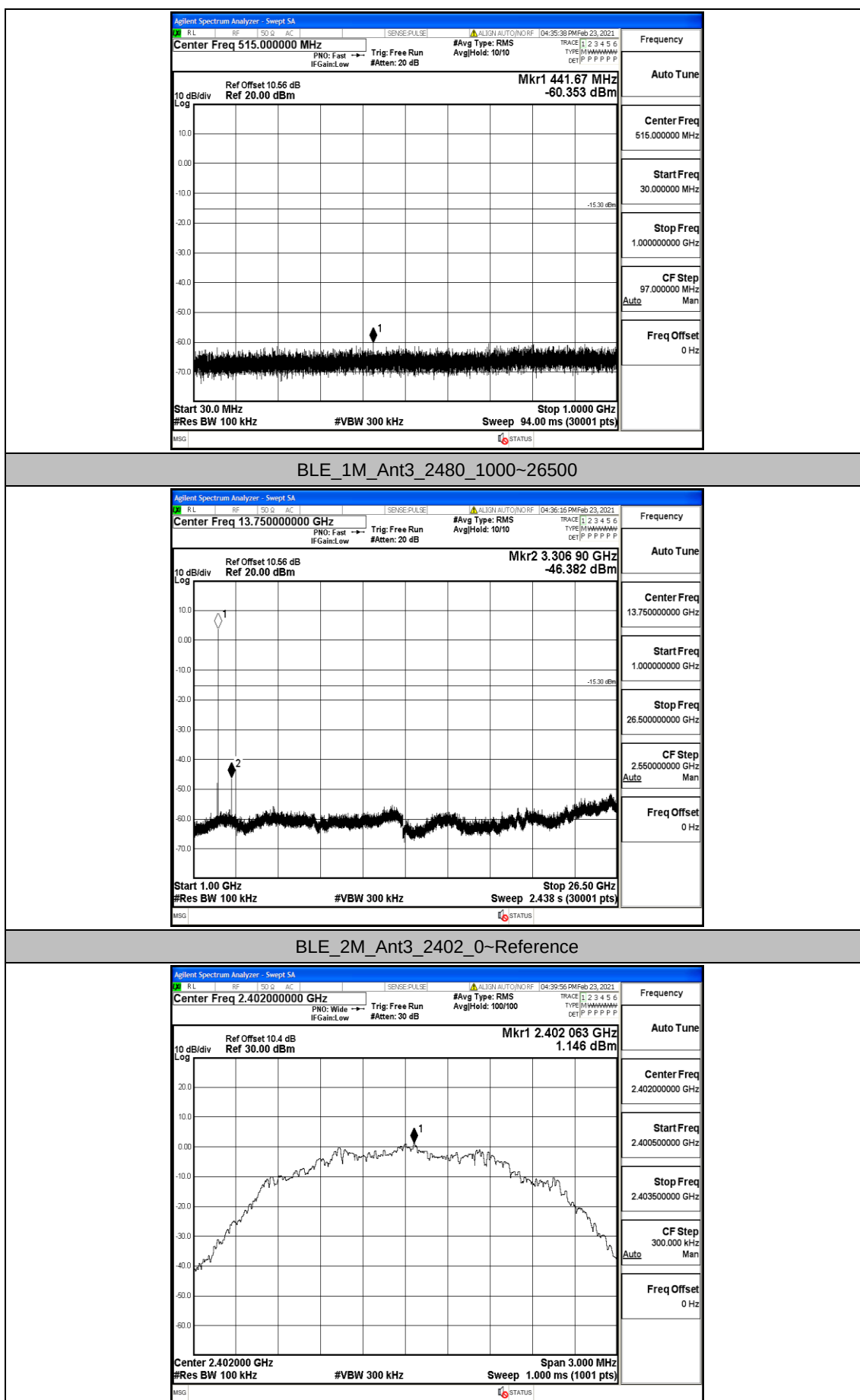
BLE_1M_Ant3_2440_1000~26500



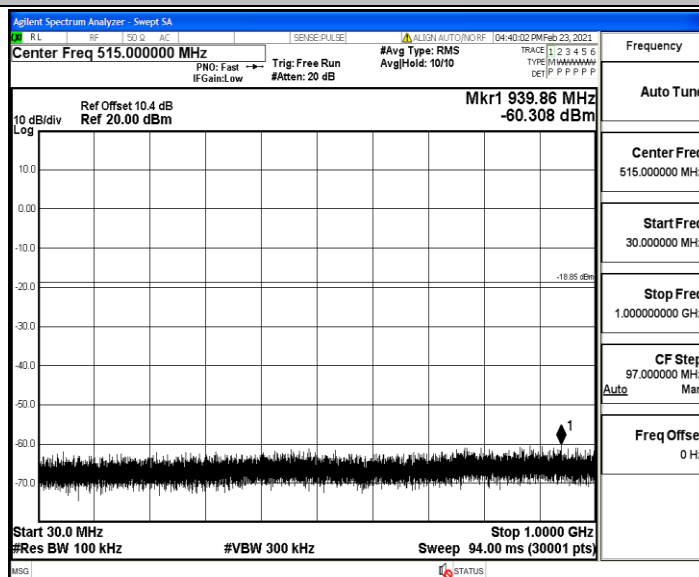
BLE_1M_Ant3_2480_0~Reference



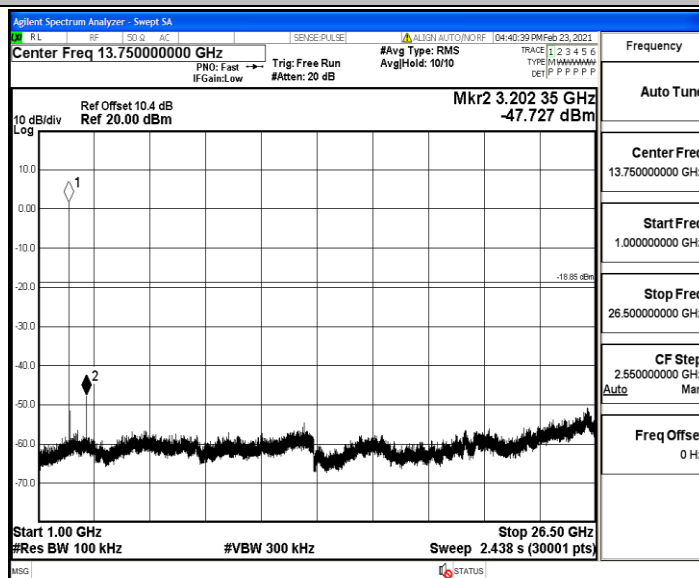
BLE_1M_Ant3_2480_30~1000



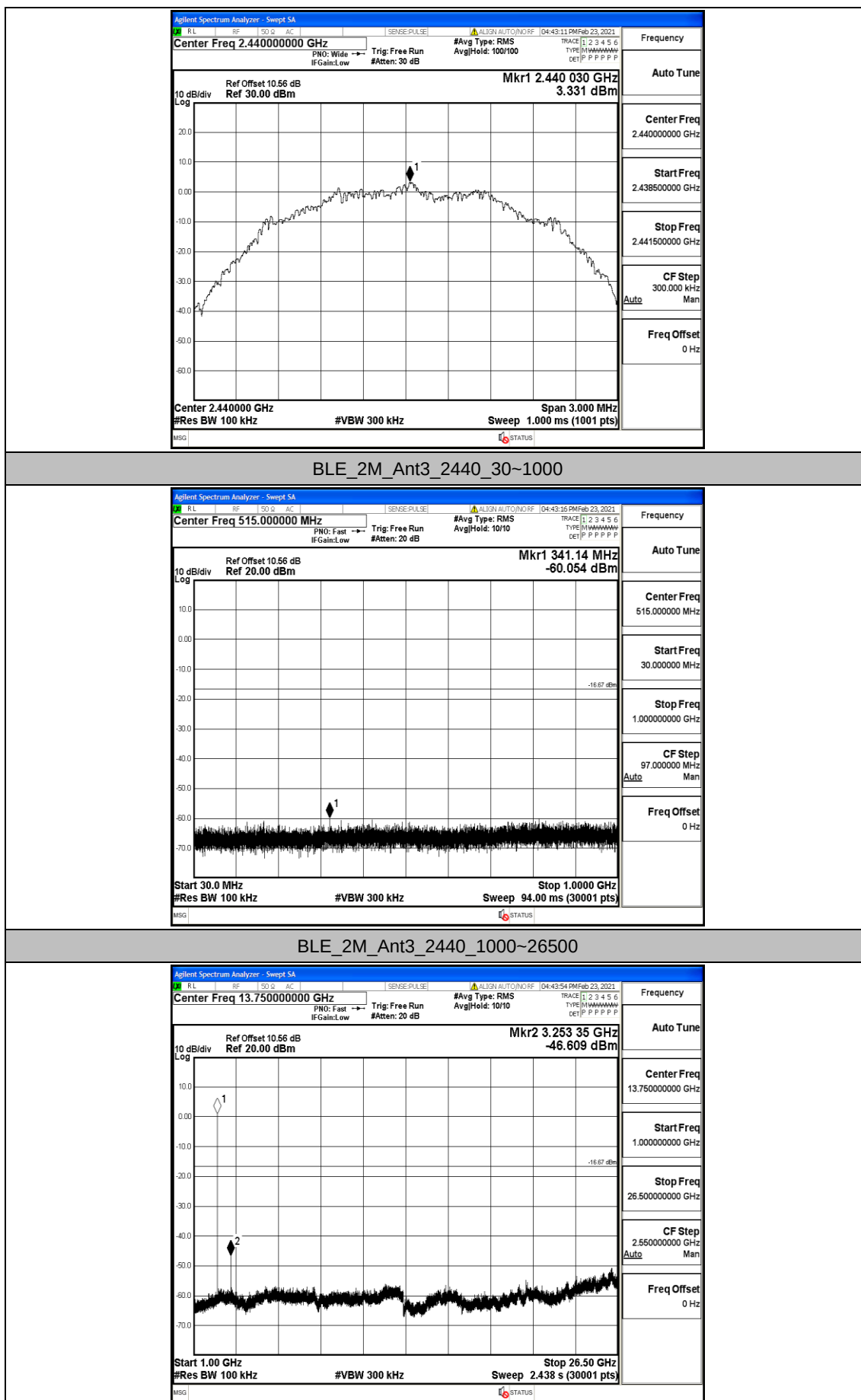
BLE_2M_Ant3_2402_30~1000



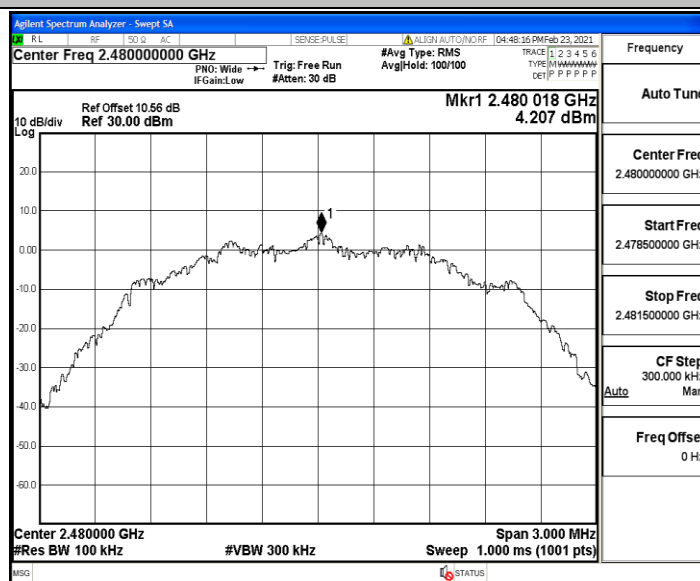
BLE_2M_Ant3_2402_1000~26500



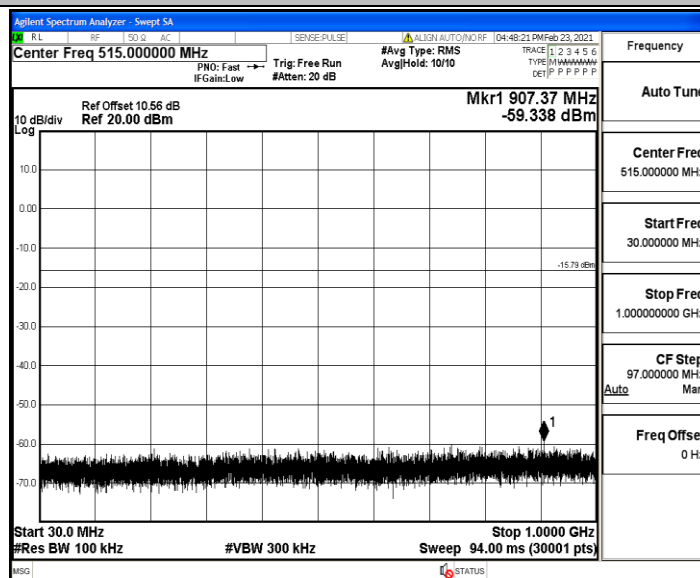
BLE_2M_Ant3_2440_0~Reference



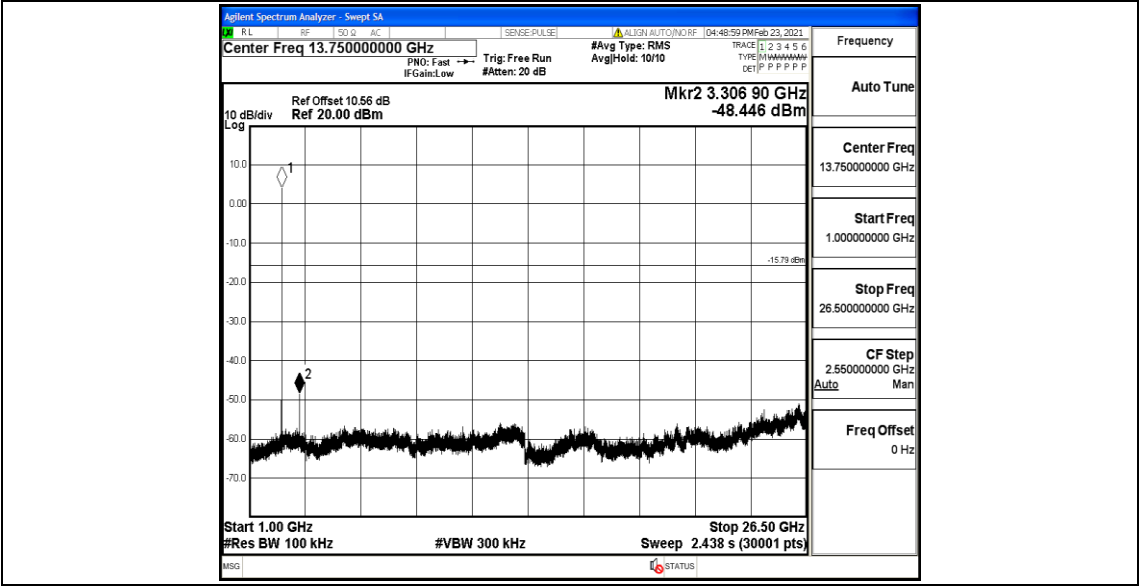
BLE_2M_Ant3_2480_0~Reference



BLE_2M_Ant3_2480_30~1000



BLE_2M_Ant3_2480_1000~26500



Appendix G: Duty Cycle

Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
BLE_1M	Ant3	2402	0.38	0.63	60.32
		2440	0.38	0.62	61.29
		2480	0.38	0.62	61.29
BLE_2M	Ant3	2402	0.19	0.63	30.16
		2440	0.19	0.62	30.65
		2480	0.19	0.62	30.65

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.402000000 GHz

Ref Offset 10.4 dB

Ref 20.00 dBm

ΔMkr3 625.7 μs

22.33 dB

Center 2.402000000 GHz

Res BW 8 MHz

#VBW 8.0 MHz

Sweep 10.13 ms (8000 pts)

Span 0 Hz

MkR	MODE	TRIG	SEL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	t	t	196.3 μs	-19.22 dBm			
2	Δ1	t	(Δ)	376.2 μs	22.37 dB			
3	Δ1	t	(Δ)	625.7 μs	22.33 dB			

Frequency

Auto Tune

Center Freq 2.402000000 GHz

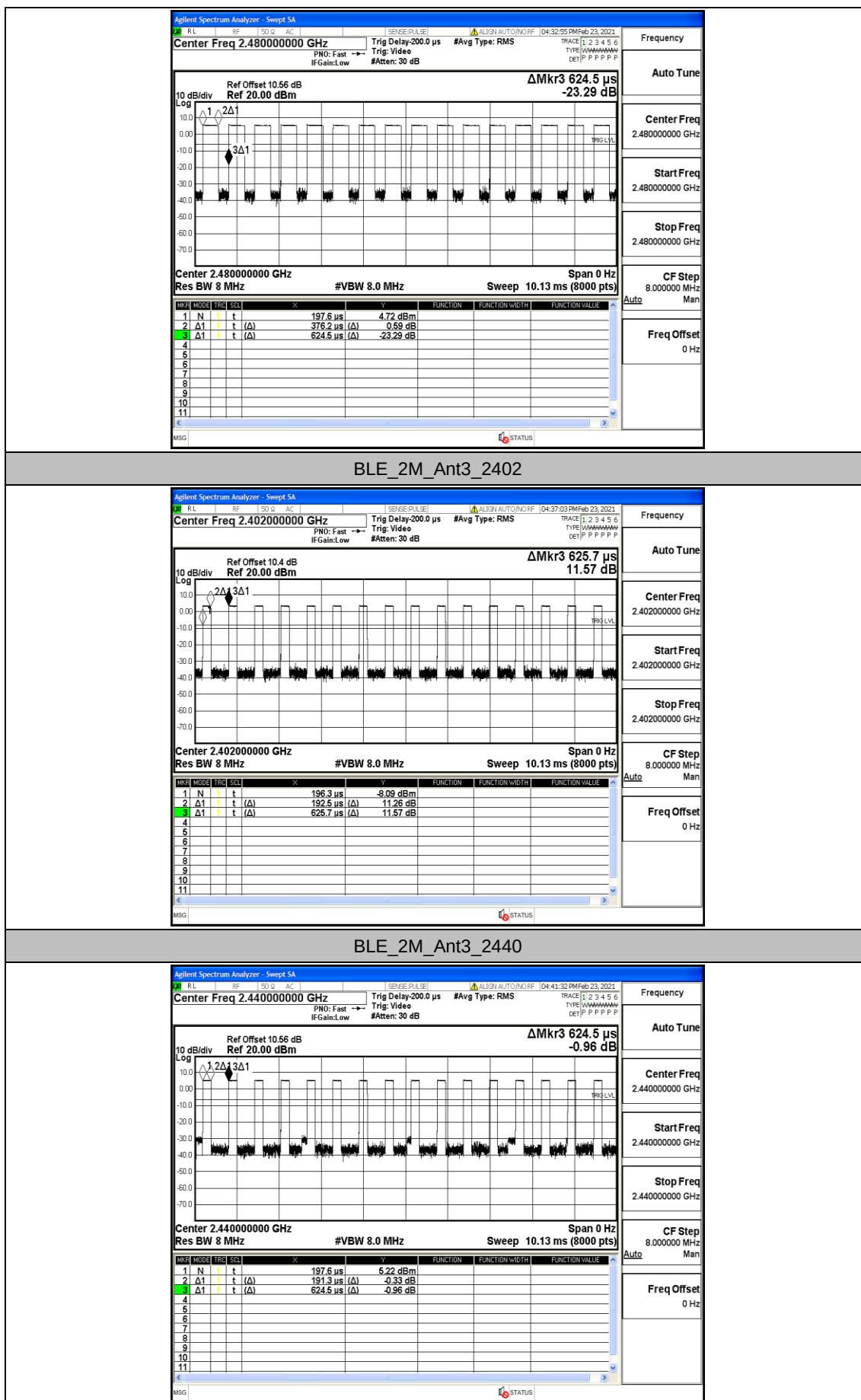
Start Freq 2.402000000 GHz

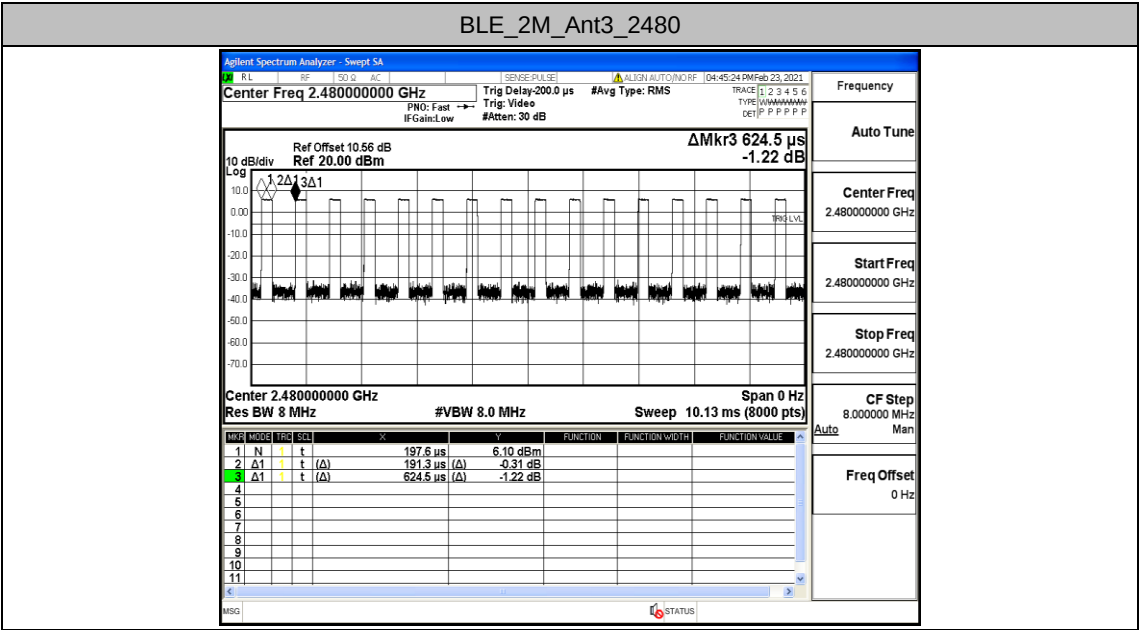
Stop Freq 2.402000000 GHz

CF Step 8.000000 MHz

Auto

Freq Offset 0 Hz





Appendix H: Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant3	Low	2402	AV	2310.000	-47.75	<=-41.20	PASS
				AV	2390.000	-47.37	<=-41.20	PASS
				Peak	2310.000	-41.23	<=-21.20	PASS
				Peak	2390.000	-41.5	<=-21.20	PASS
		High	2480	AV	2483.500	-45.25	<=-41.20	PASS
				AV	2500.000	-46.54	<=-41.20	PASS
				Peak	2483.500	-39.66	<=-21.20	PASS
				Peak	2500.000	-39.35	<=-21.20	PASS
BLE_2M	Ant3	Low	2402	AV	2310.000	-46.75	<=-41.20	PASS
				AV	2390.000	-47.01	<=-41.20	PASS
				Peak	2310.000	-39.25	<=-21.20	PASS
				Peak	2390.000	-40.86	<=-21.20	PASS
		High	2480	AV	2483.500	-43.81	<=-41.20	PASS
				AV	2500.000	-45.88	<=-41.20	PASS
				Peak	2483.500	-40.16	<=-21.20	PASS
				Peak	2500.000	-39.9	<=-21.20	PASS

Note:

1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
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

