

Appendix A

RF Test Data for BLE(Conducted Measurement)

Product Name: LoRa+BLE module

Trade Mark: RAK

Test Model: RAK4600(H)

FCC ID: 2AF6B- RAK4600H

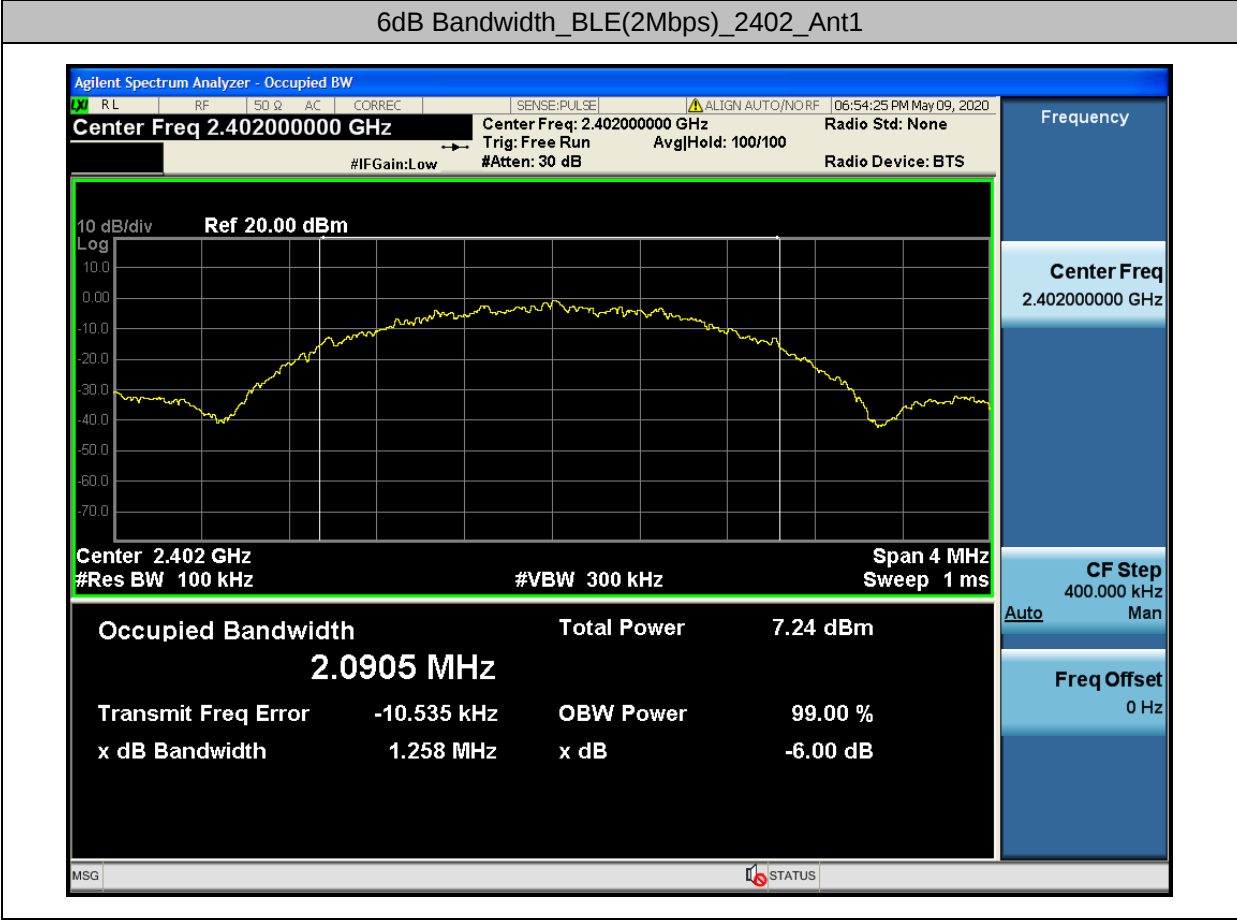
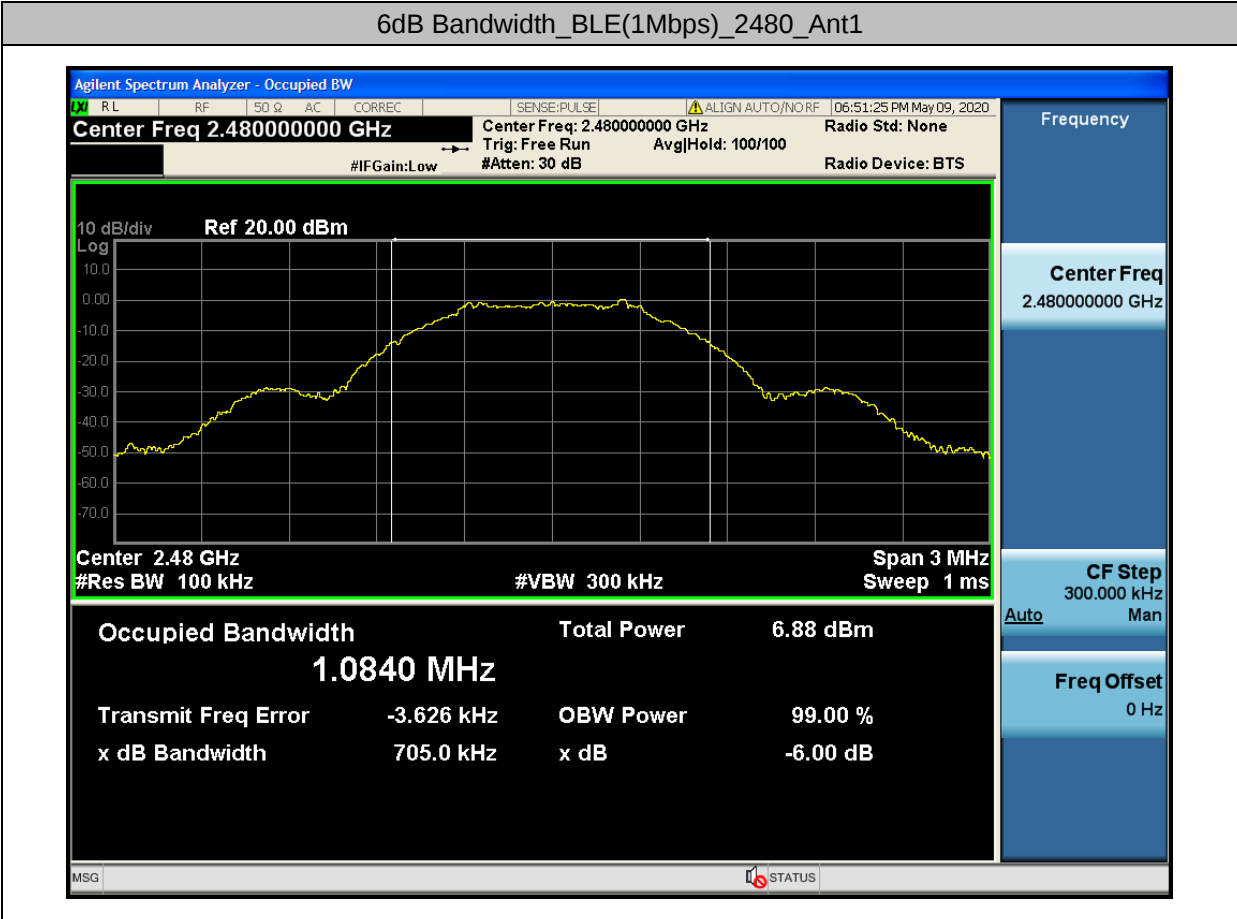
Environmental Conditions

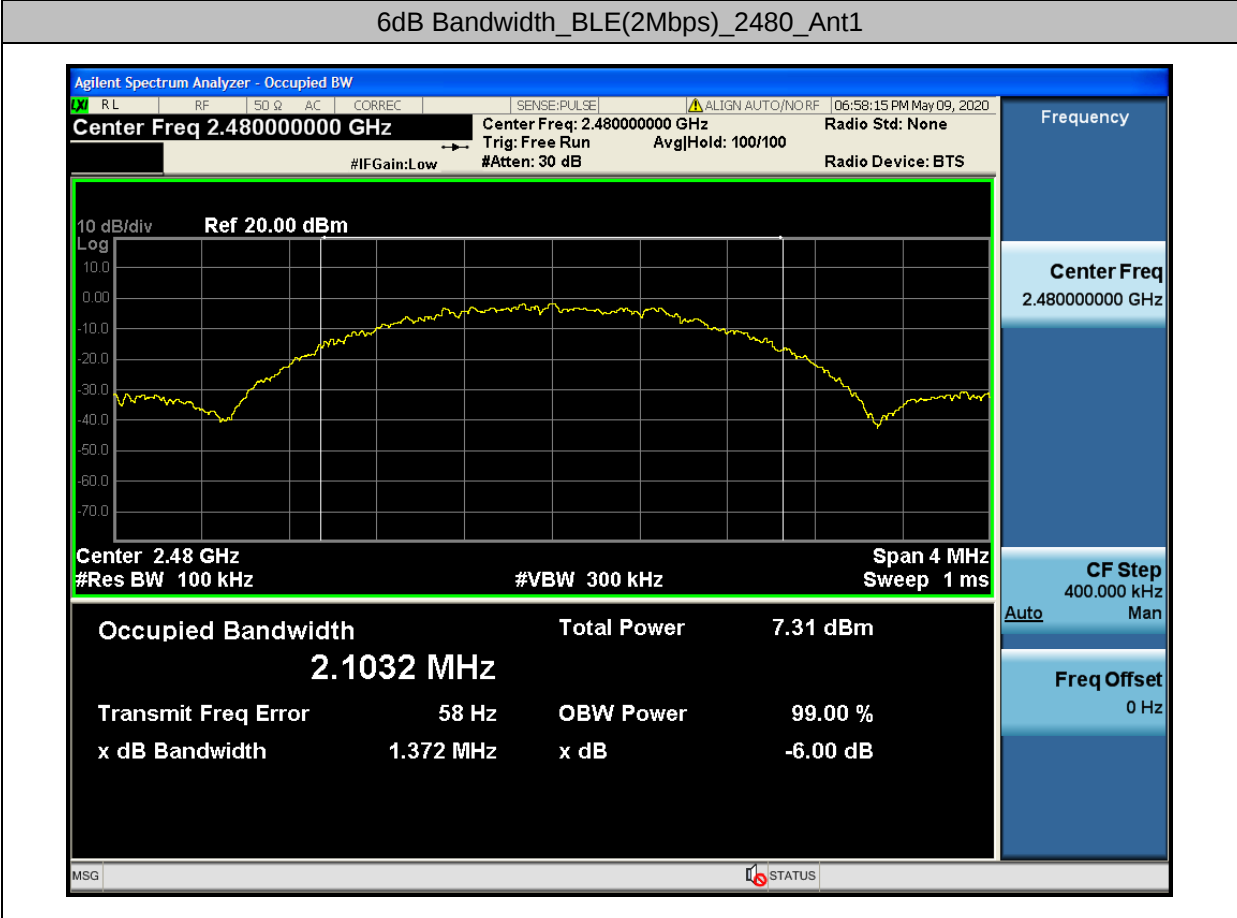
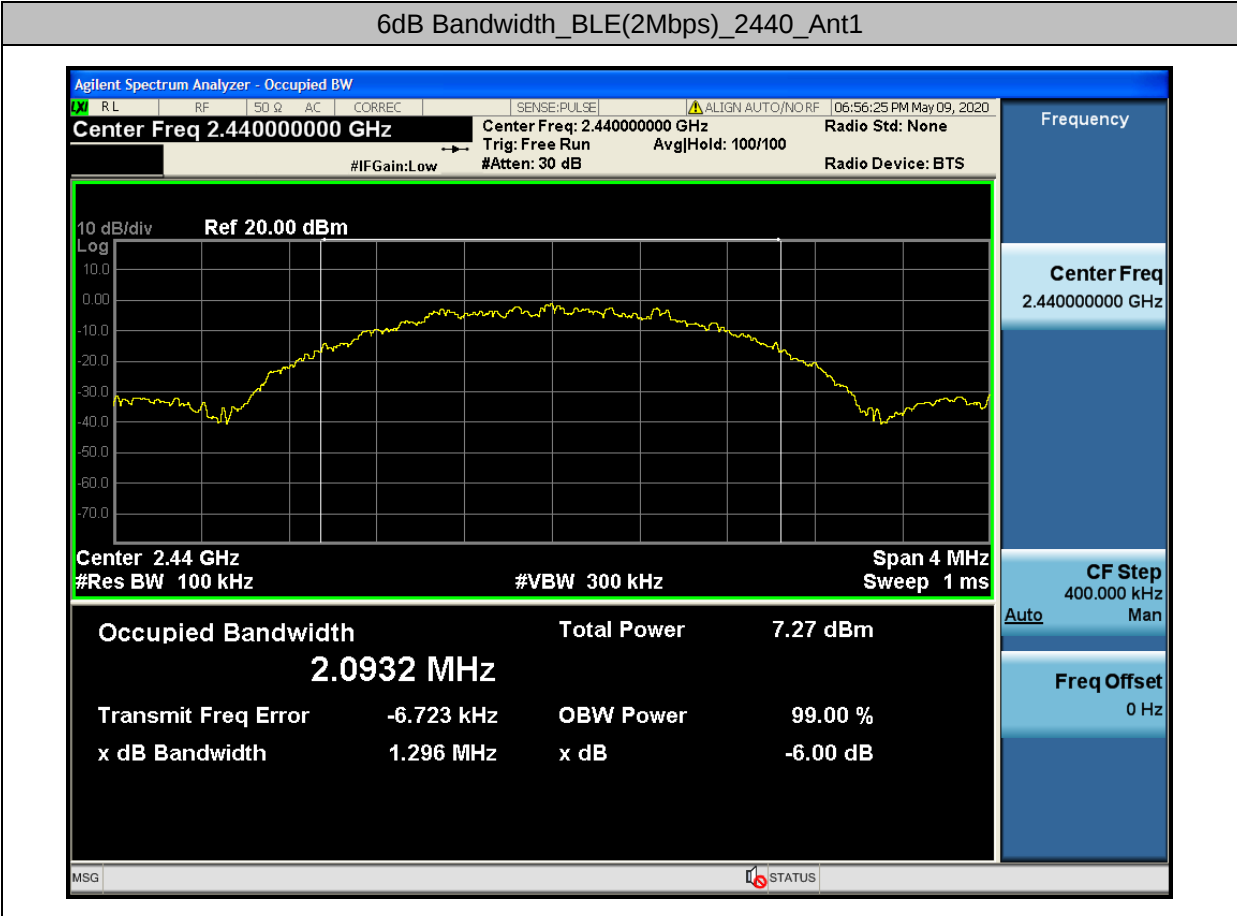
Temperature:	22.8° C
Relative Humidity:	60%
ATM Pressure:	100.0 kPa
Test Engineer:	Anna Hu
Supervised by:	Hugo Chen
NOTE	N/A

A.1. 6dB Bandwidth

Test Mode	Test Channel	Ant	EBW[MHz]	Limit	Verdict
BLE(1Mbps)	2402	Ant1	0.701	0.5	PASS
BLE(1Mbps)	2440	Ant1	0.756	0.5	PASS
BLE(1Mbps)	2480	Ant1	0.705	0.5	PASS
BLE(2Mbps)	2402	Ant1	1.258	0.5	PASS
BLE(2Mbps)	2440	Ant1	1.296	0.5	PASS
BLE(2Mbps)	2480	Ant1	1.372	0.5	PASS





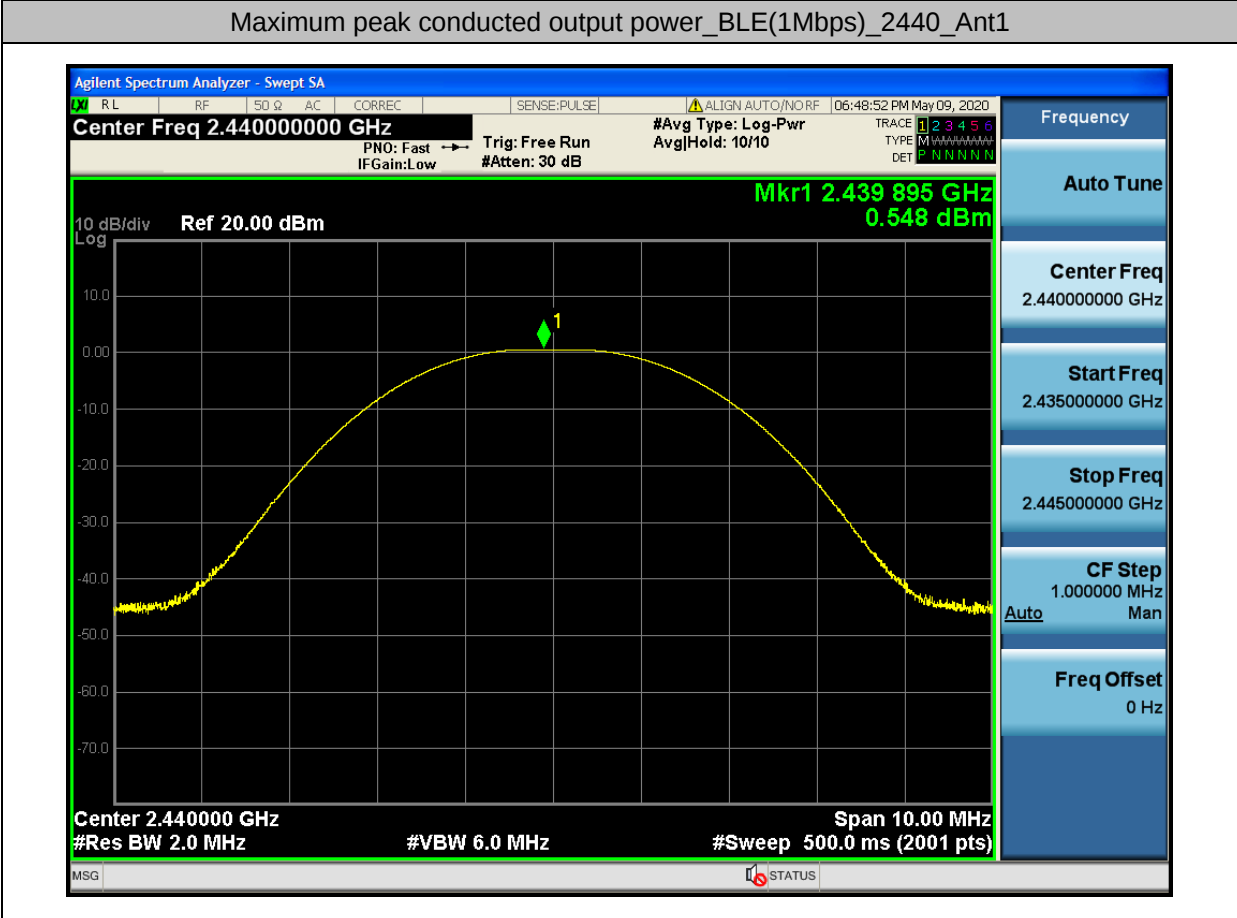
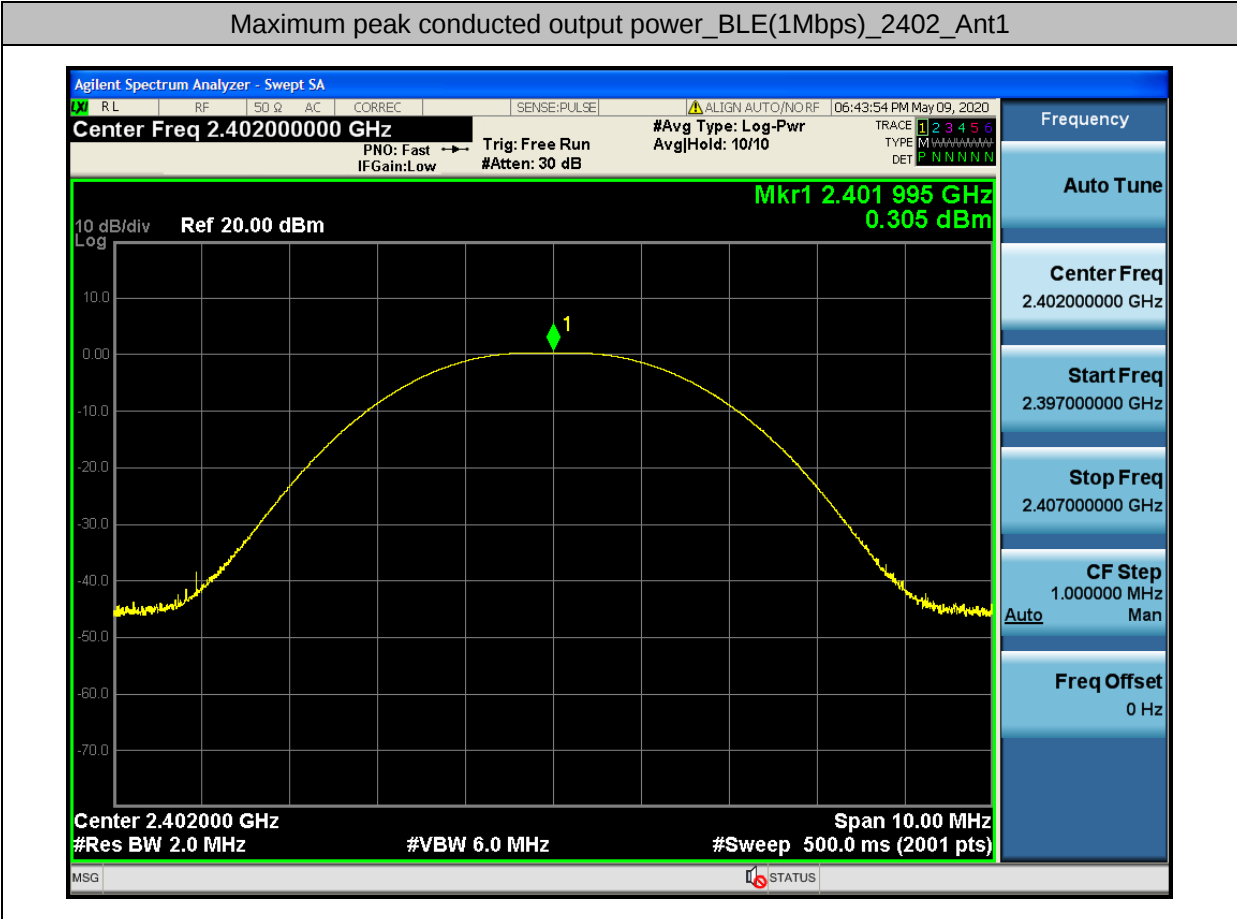


A.2. Occupied Bandwidth

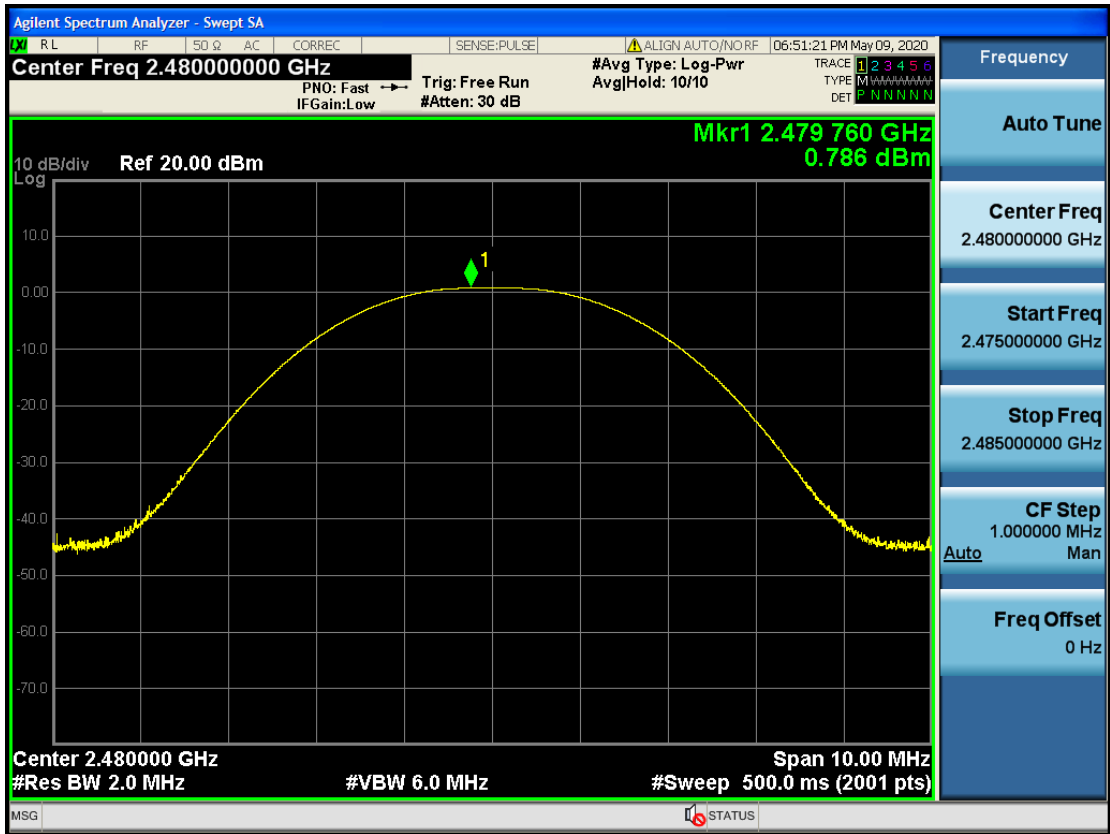
Test Mode	Test Channel	Ant	OBW[MHz]	Limit[MHz]	Verdict
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A.3. Maximum peak conducted output power

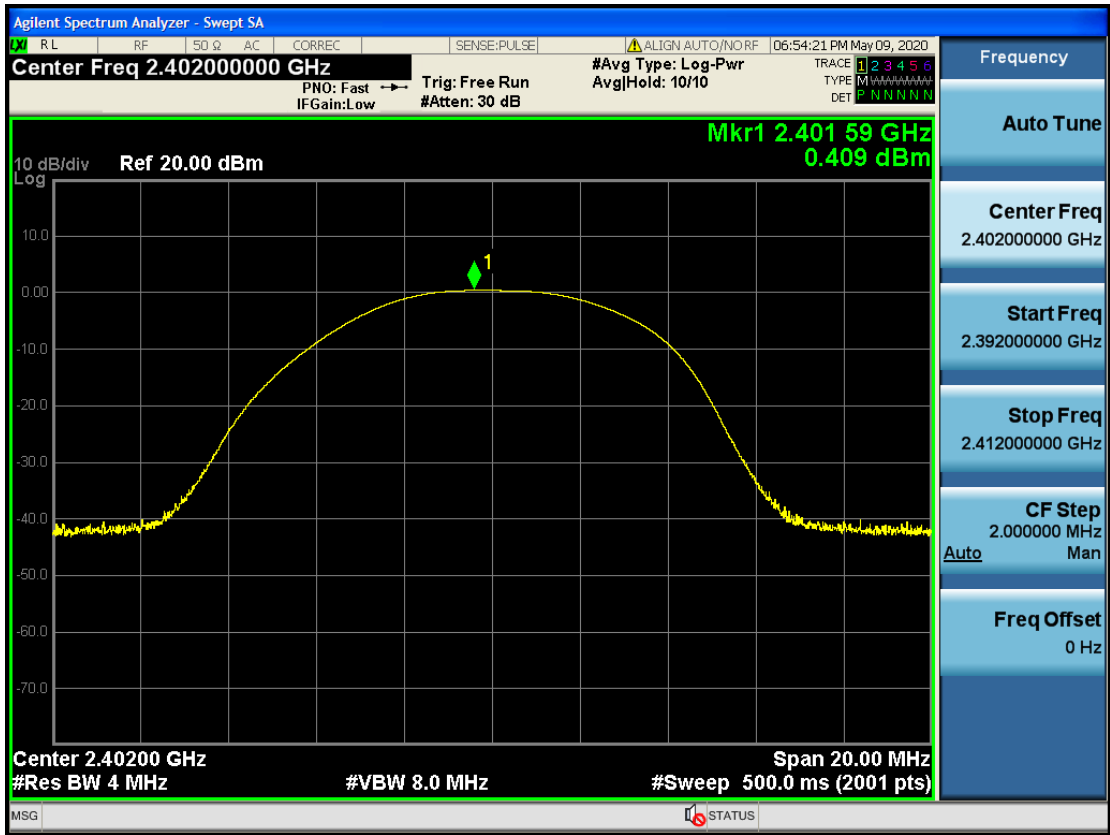
Test Mode	Test	Ant	Power[dBm]	Limit[dBm]	Verdict
BLE	2402	Ant1	0.305	30	PASS
BLE	2440	Ant1	0.548	30	PASS
BLE	2480	Ant1	0.786	30	PASS
BLE	2402	Ant1	0.409	30	PASS
BLE	2440	Ant1	0.620	30	PASS
BLE	2480	Ant1	0.844	30	PASS



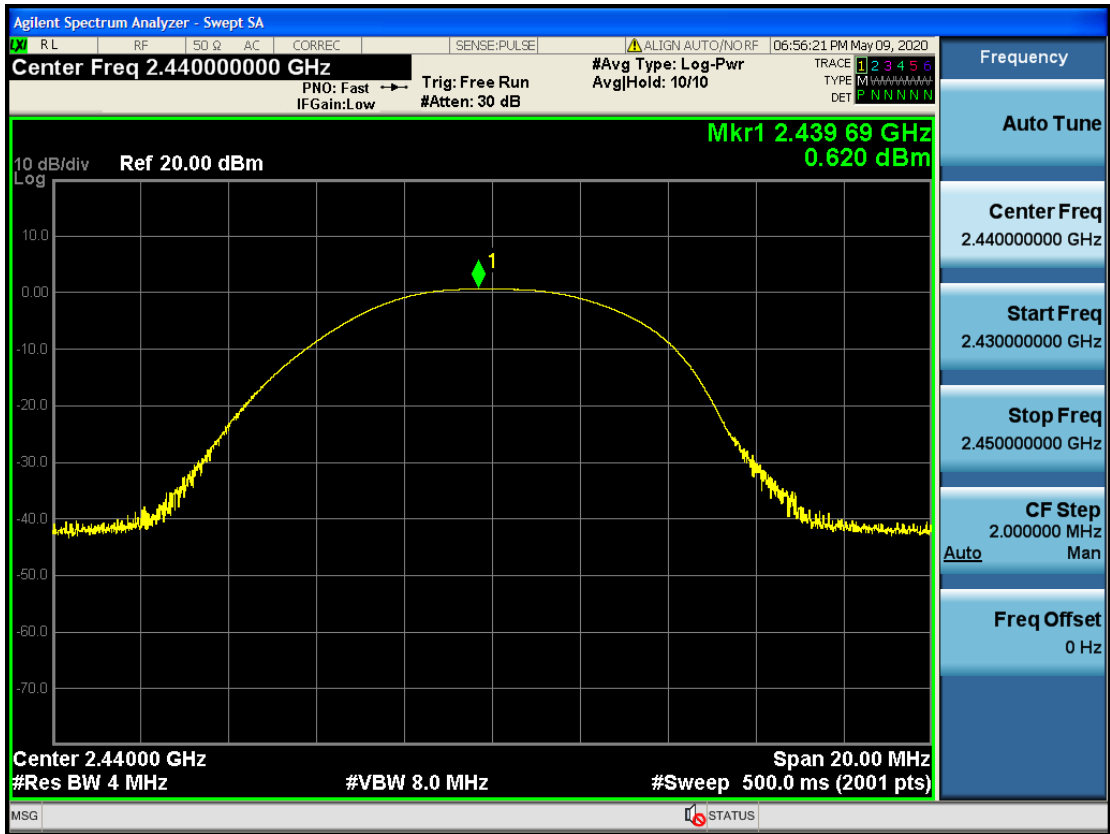
Maximum peak conducted output power_BLE(1Mbps)_2480_Ant1



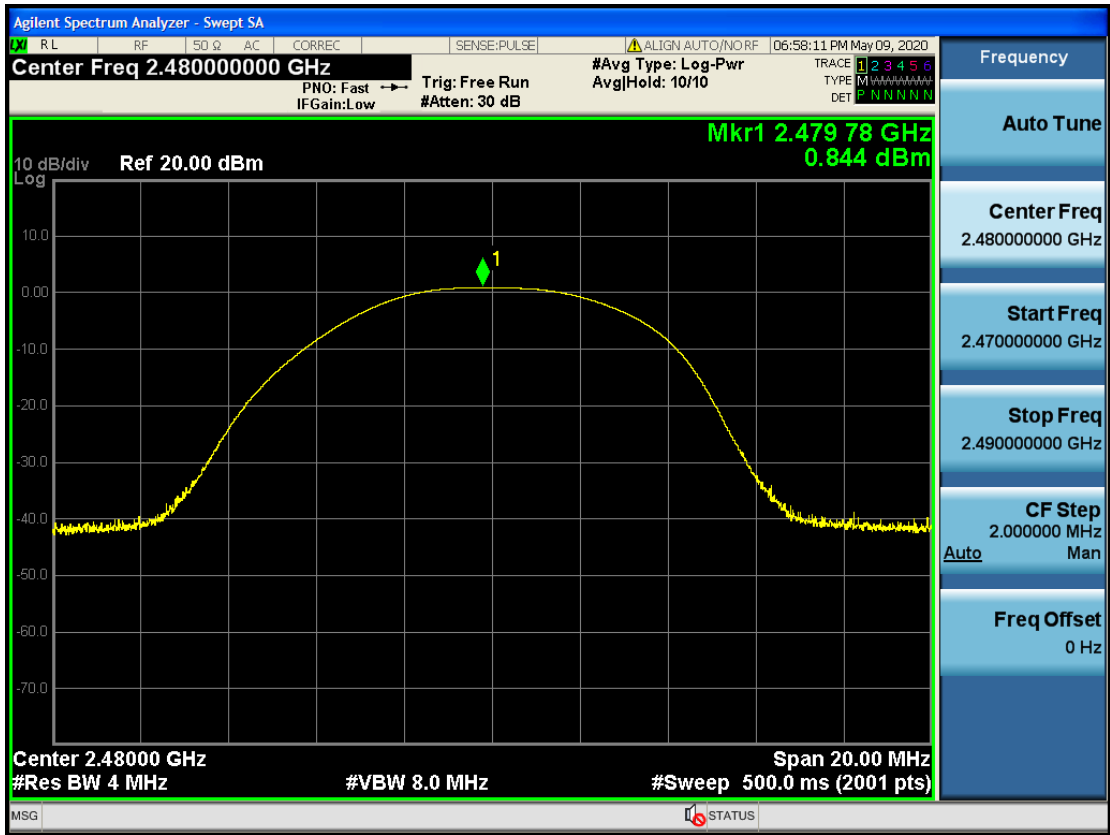
Maximum peak conducted output power_BLE_2402(2Mbps)_Ant1



Maximum peak conducted output power_BLE(2Mbps)_2440_Ant1



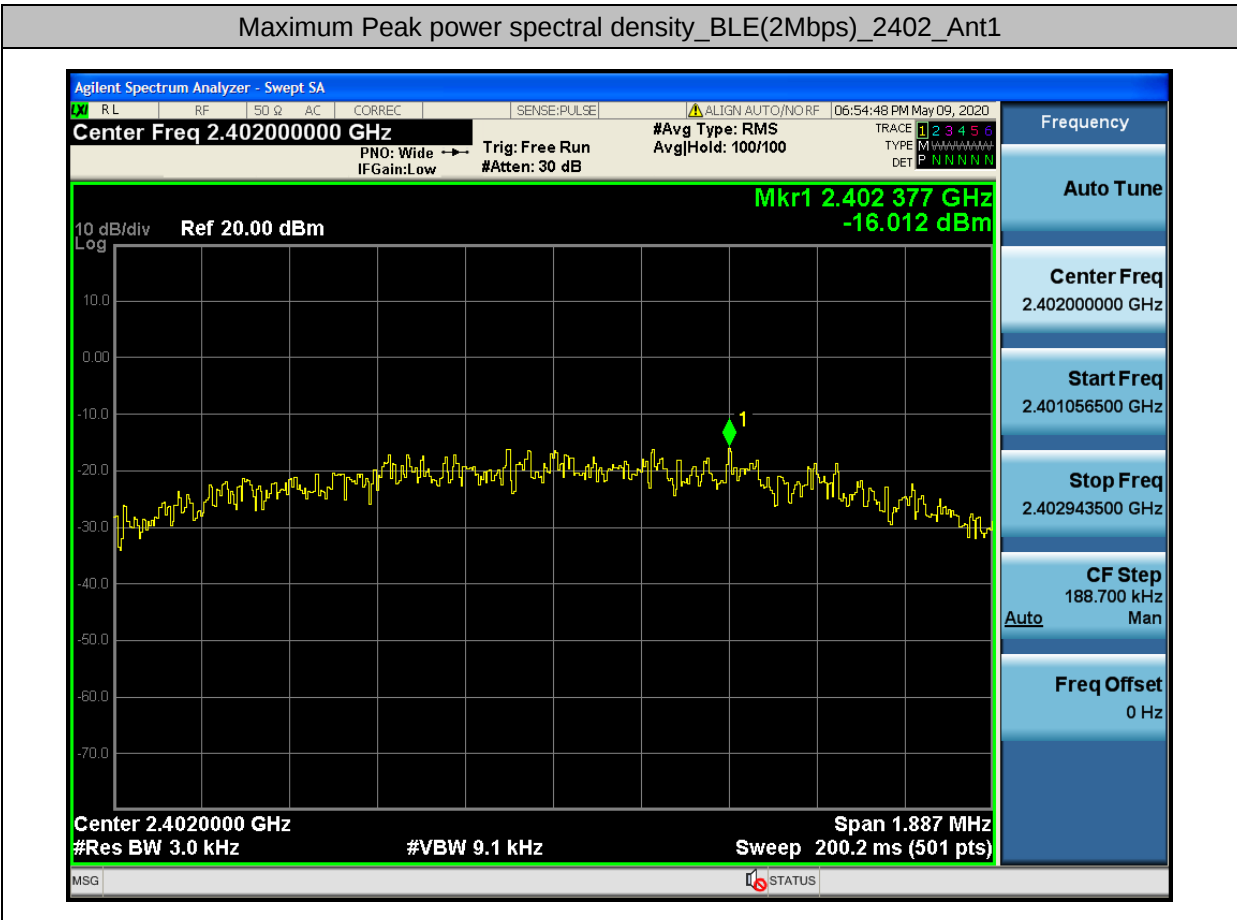
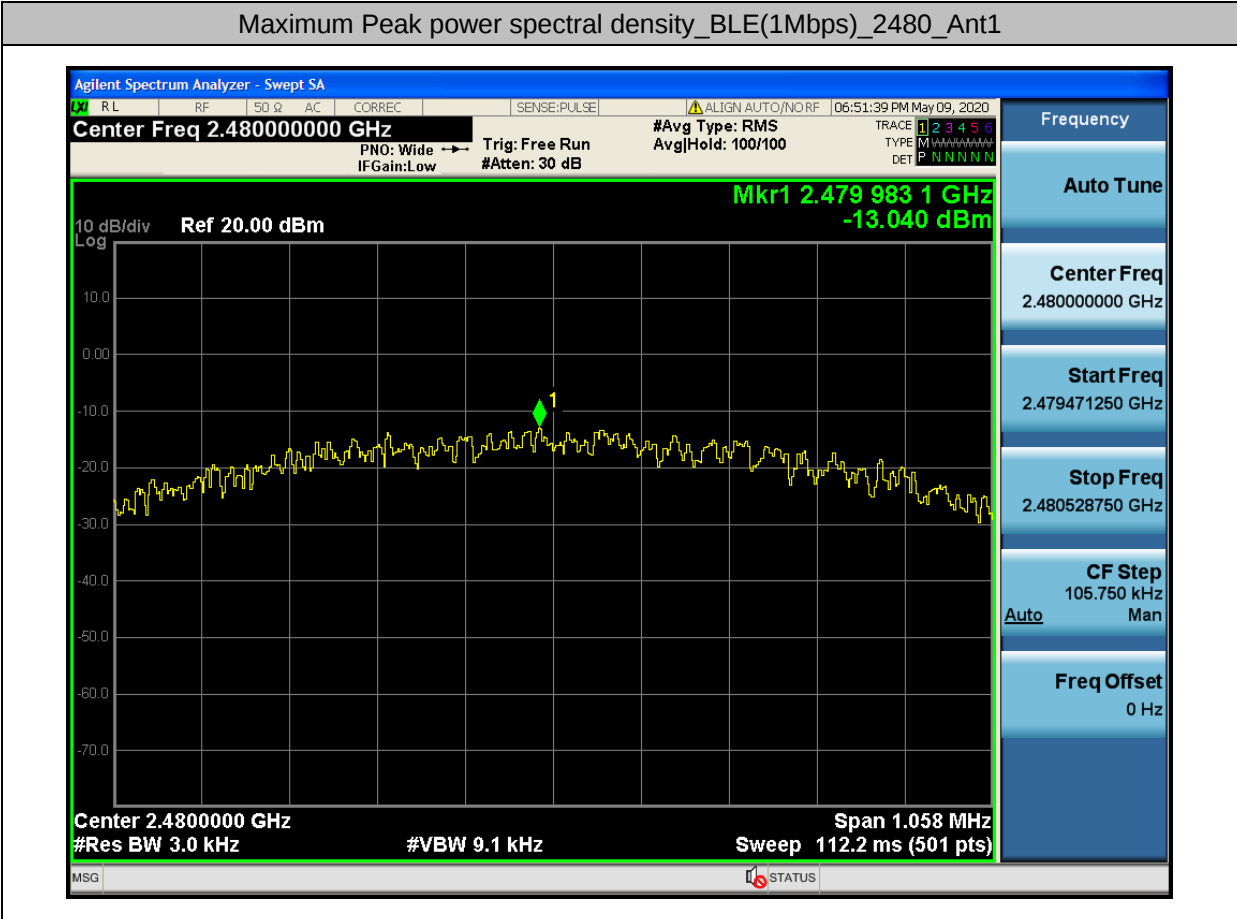
Maximum peak conducted output power_BLE(2Mbps)_2480_Ant1

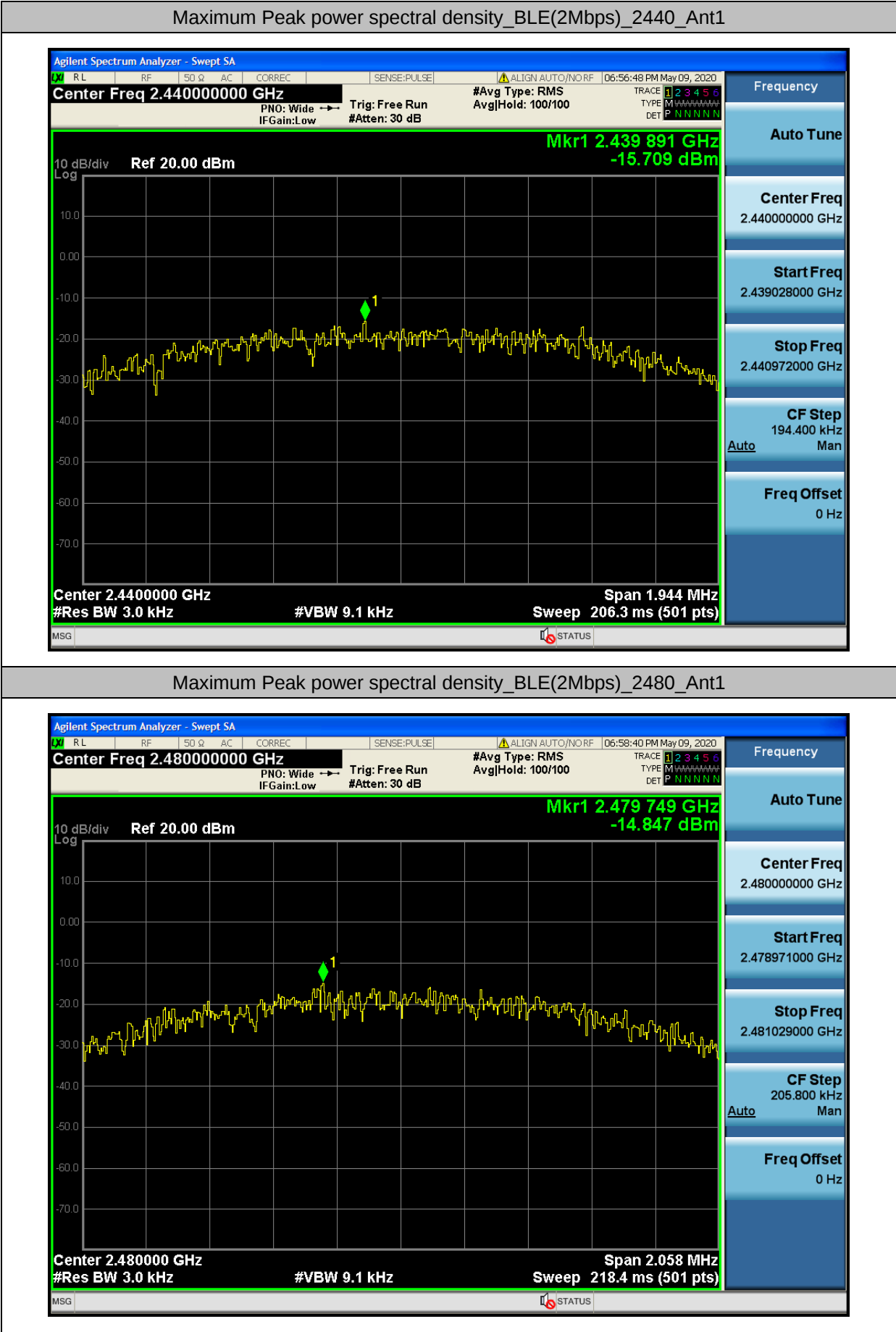


A.4. Maximum Peak power spectral density

Test Mode	Test	Ant	PSD[dBm/3KHz]	Limit[dBm/3KHz]	Verdict
BLE(1Mbps)	2402	Ant1	-12.513	8.00	PASS
BLE(1Mbps)	2440	Ant1	-12.402	8.00	PASS
BLE(1Mbps)	2480	Ant1	-13.04	8.00	PASS
BLE(2Mbps)	2402	Ant1	-16.012	8.00	PASS
BLE(2Mbps)	2440	Ant1	-15.709	8.00	PASS
BLE(2Mbps)	2480	Ant1	-14.847	8.00	PASS



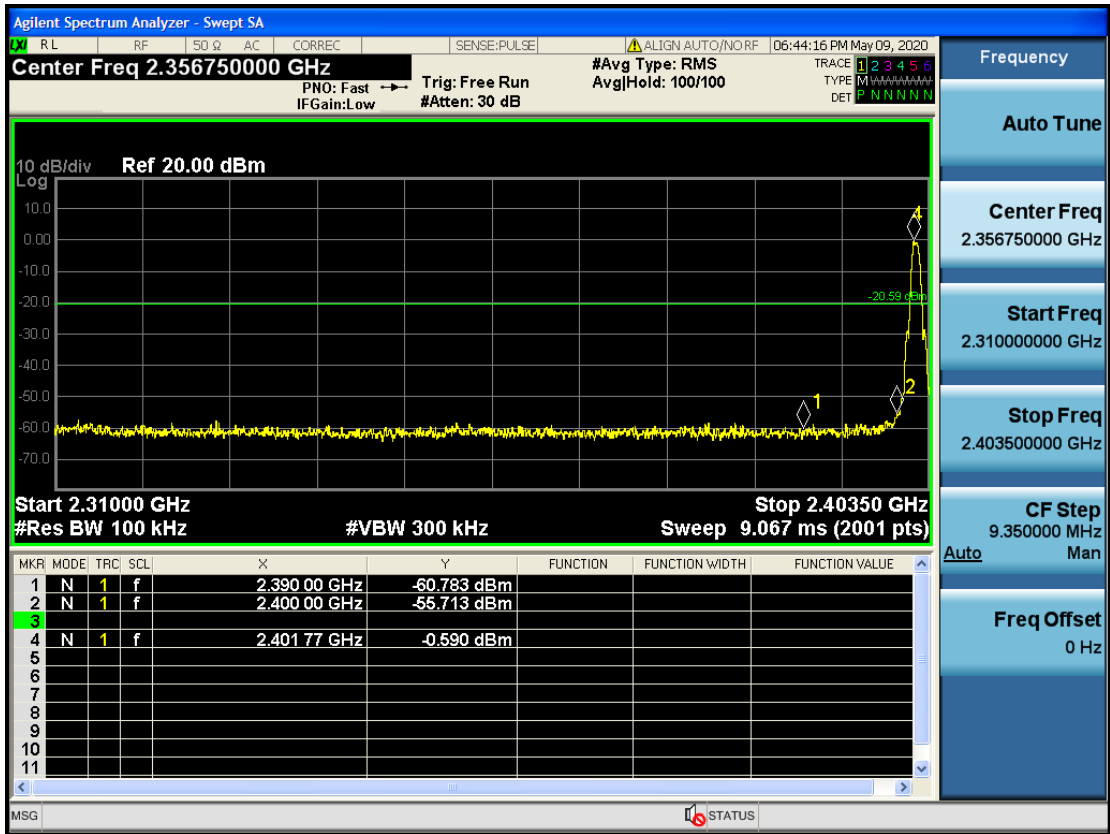




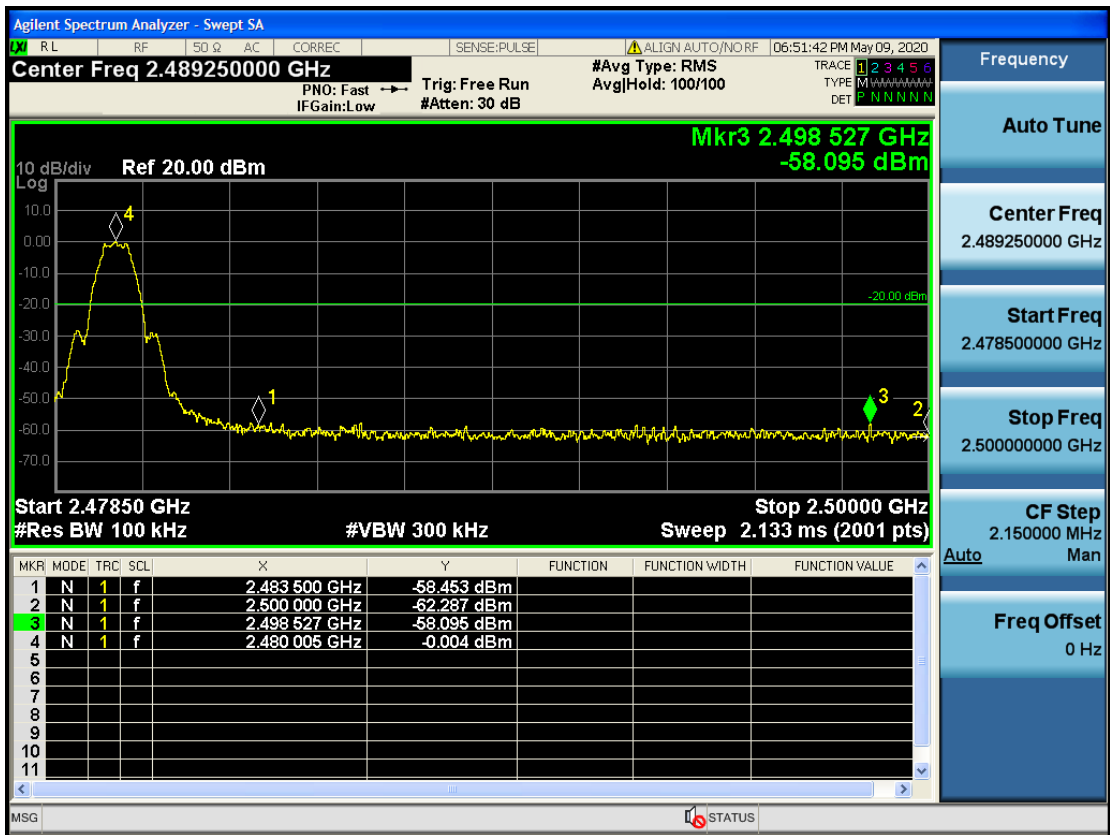
A.5. Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
BLE(1Mbps)	2402	2400	-0.59	-55.71	-20.59	Pass
BLE(1Mbps)	2480	2498.527	-0.004	-58.095	-20.004	Pass
BLE(2Mbps)	2402	2400	-0.423	-34.16	-20.423	Pass
BLE(2Mbps)	2480	2483.5	-2.158	-56.85	-22.158	Pass

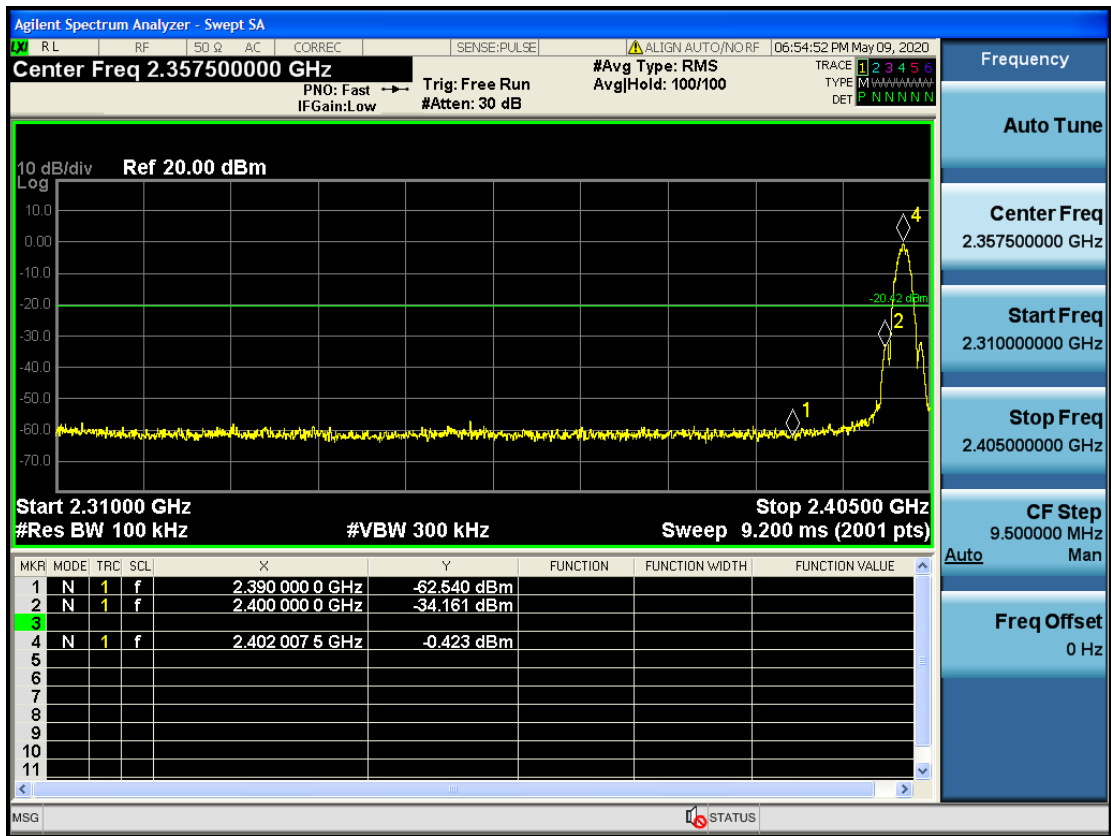
Band-edge for RF Conducted Emissions_BLE(1Mbps)_2402_Ant1



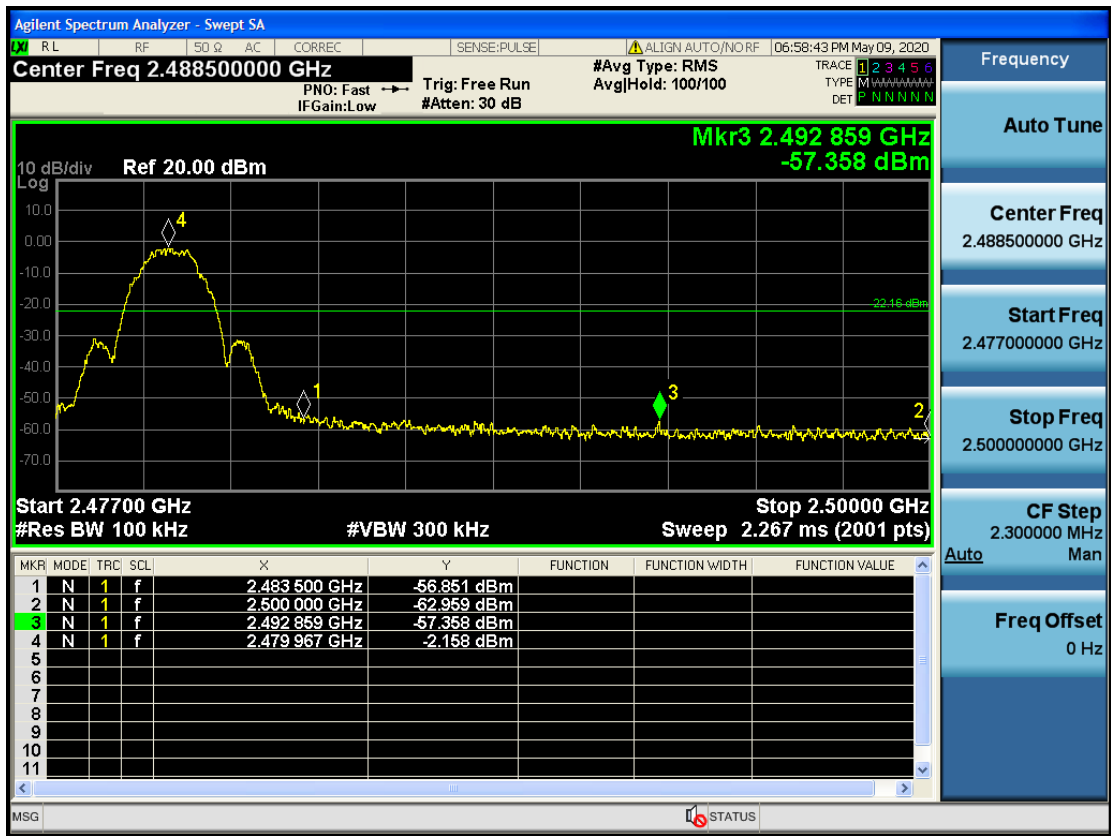
Band-edge for RF Conducted Emissions_BLE(1Mbps)_2480_Ant1

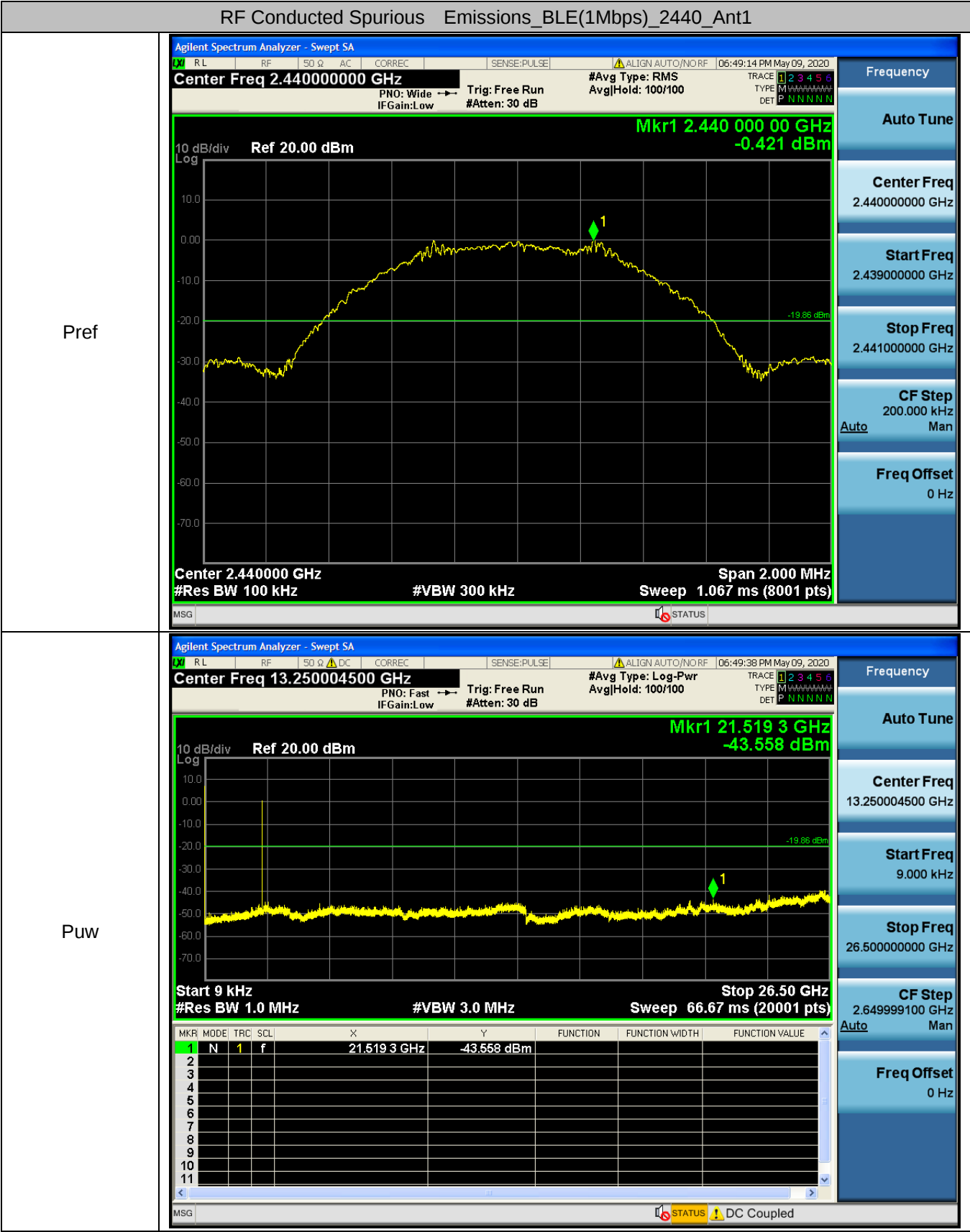


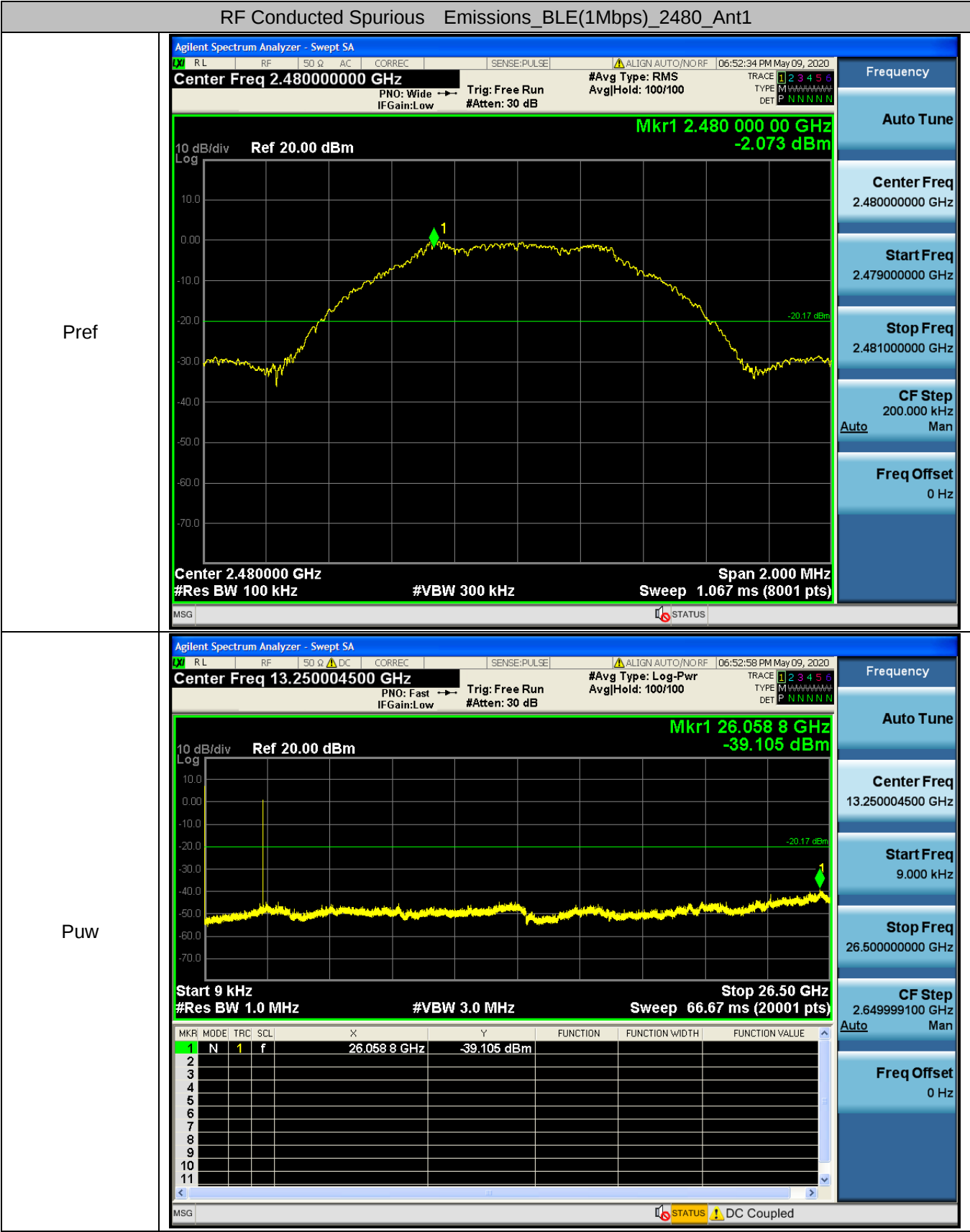
Band-edge for RF Conducted Emissions_BLE(2Mbps)_2402_Ant1



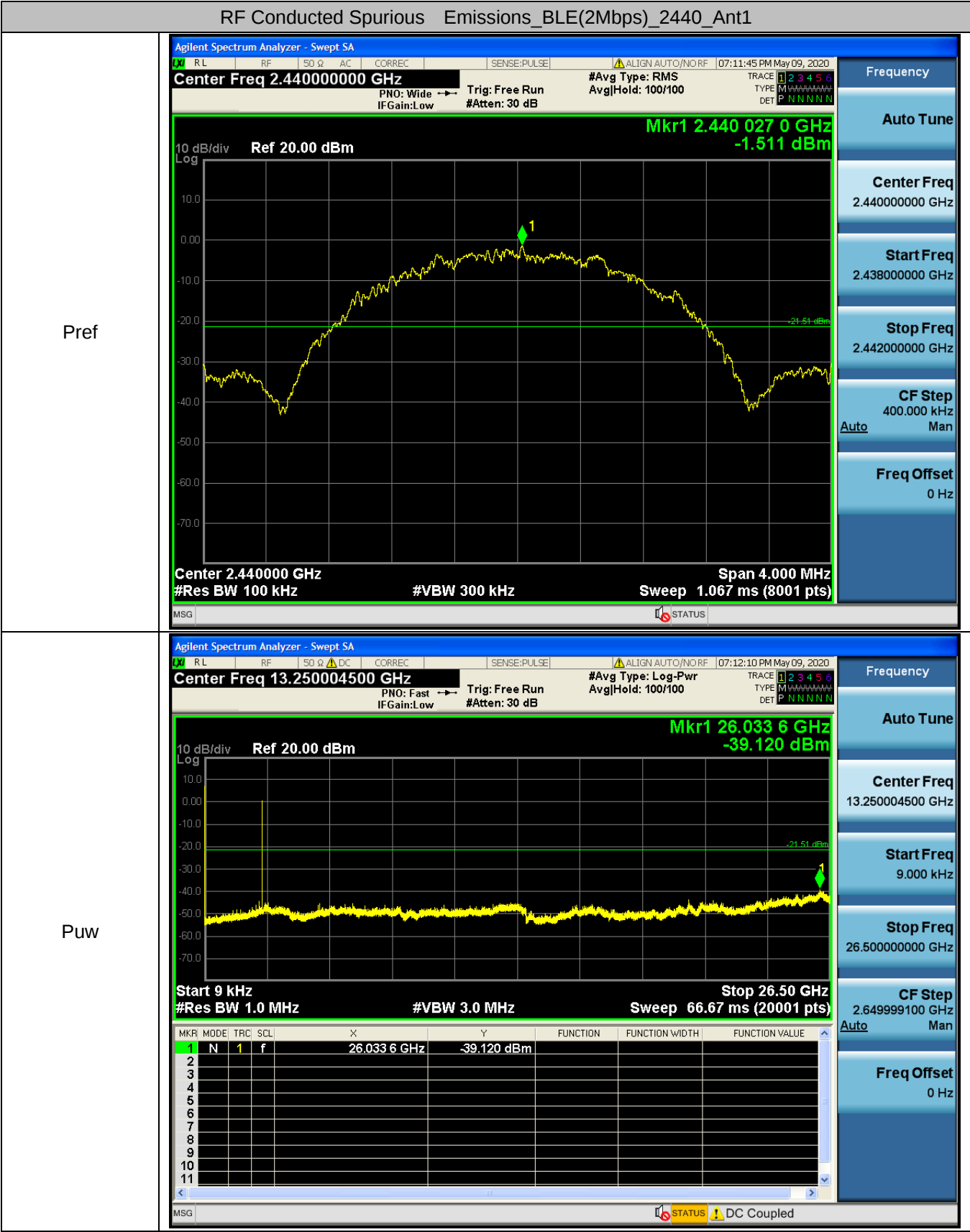
Band-edge for RF Conducted Emissions_BLE(2Mbps)_2480_Ant1

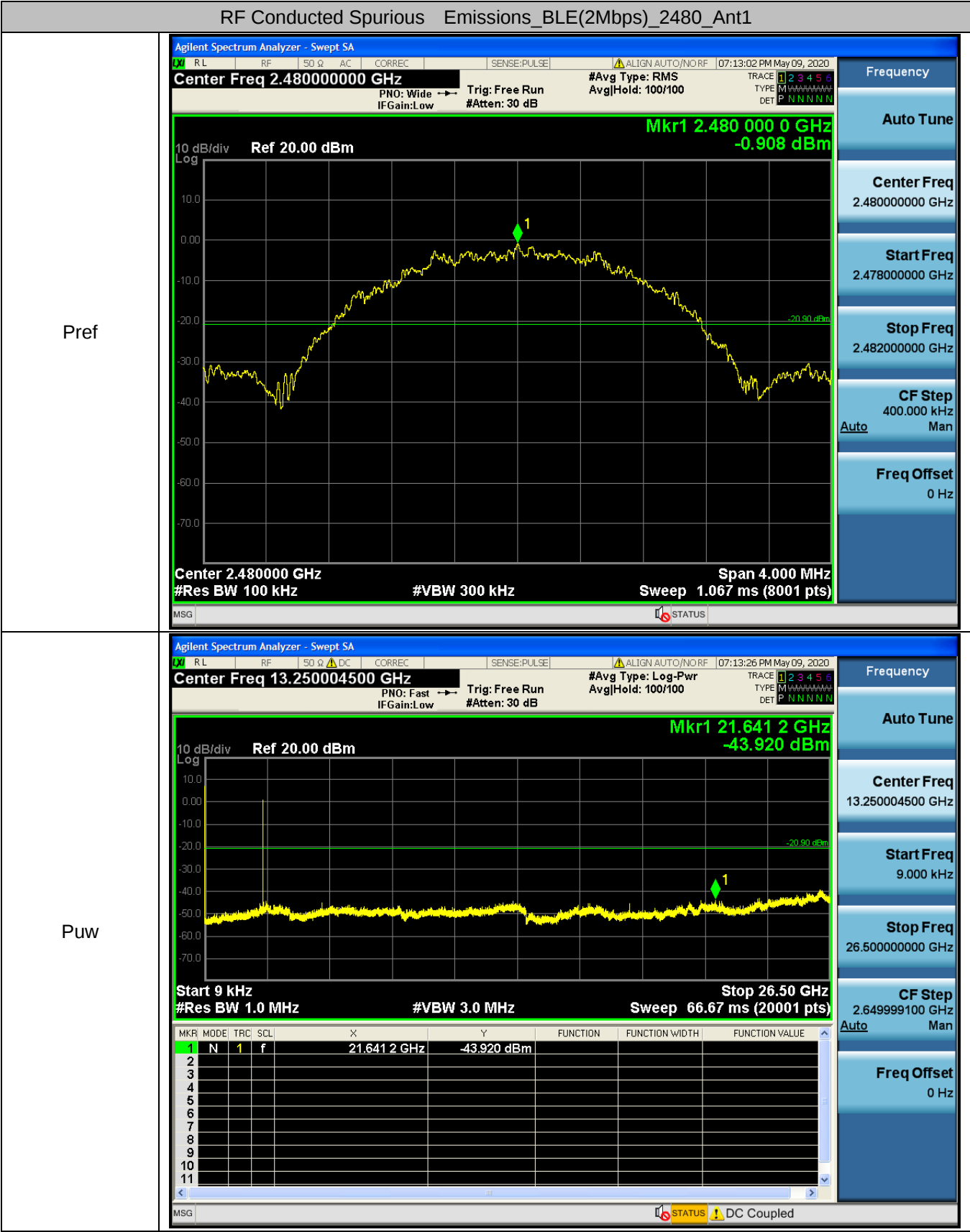








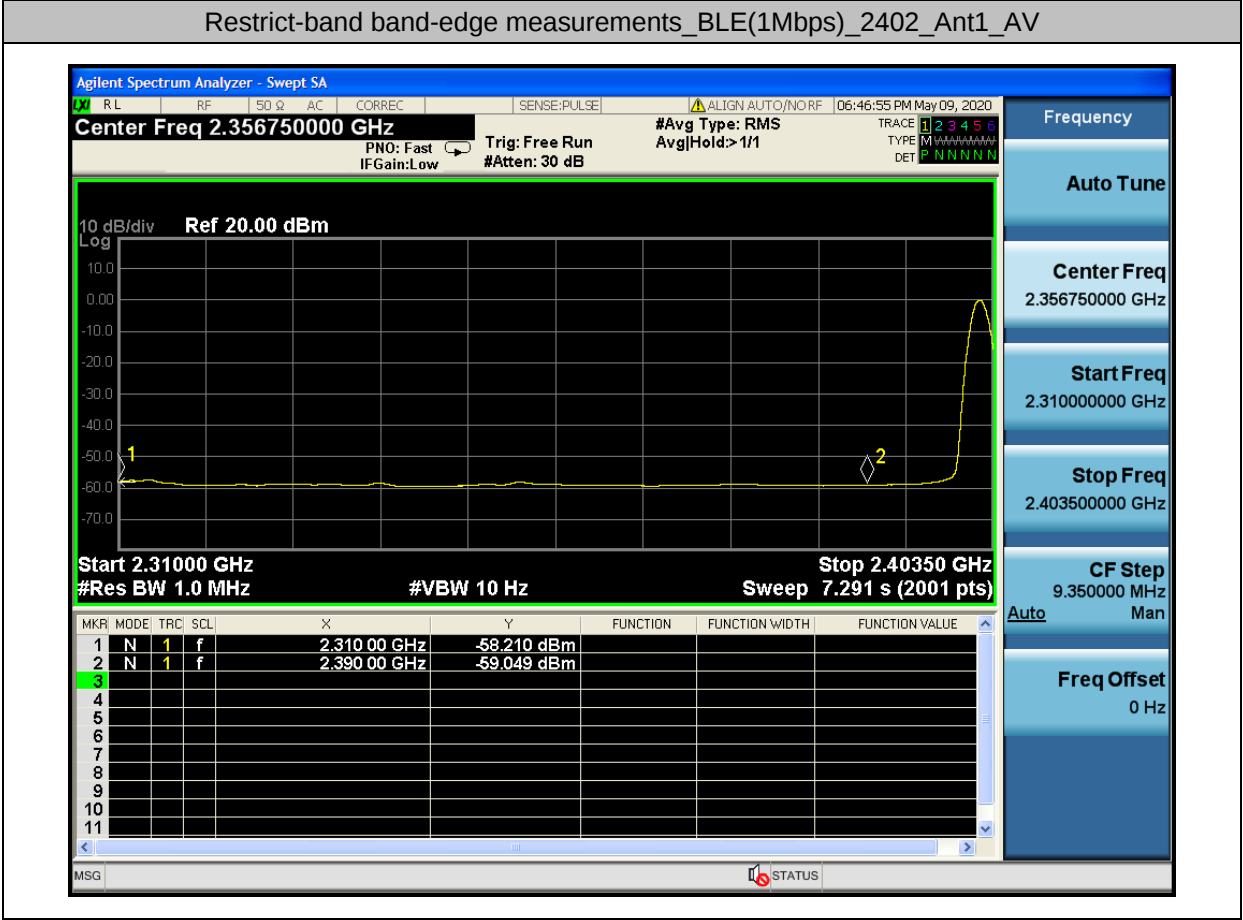
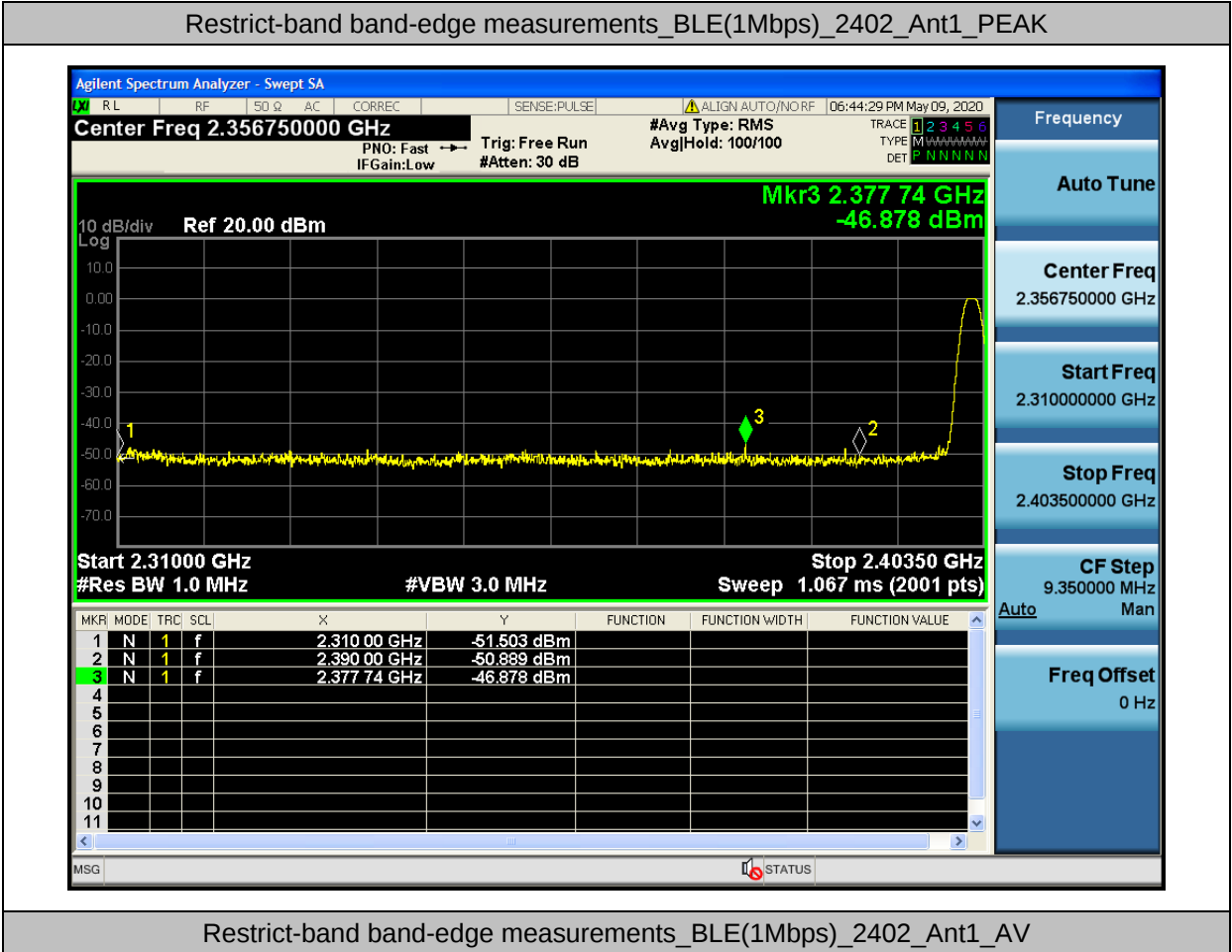


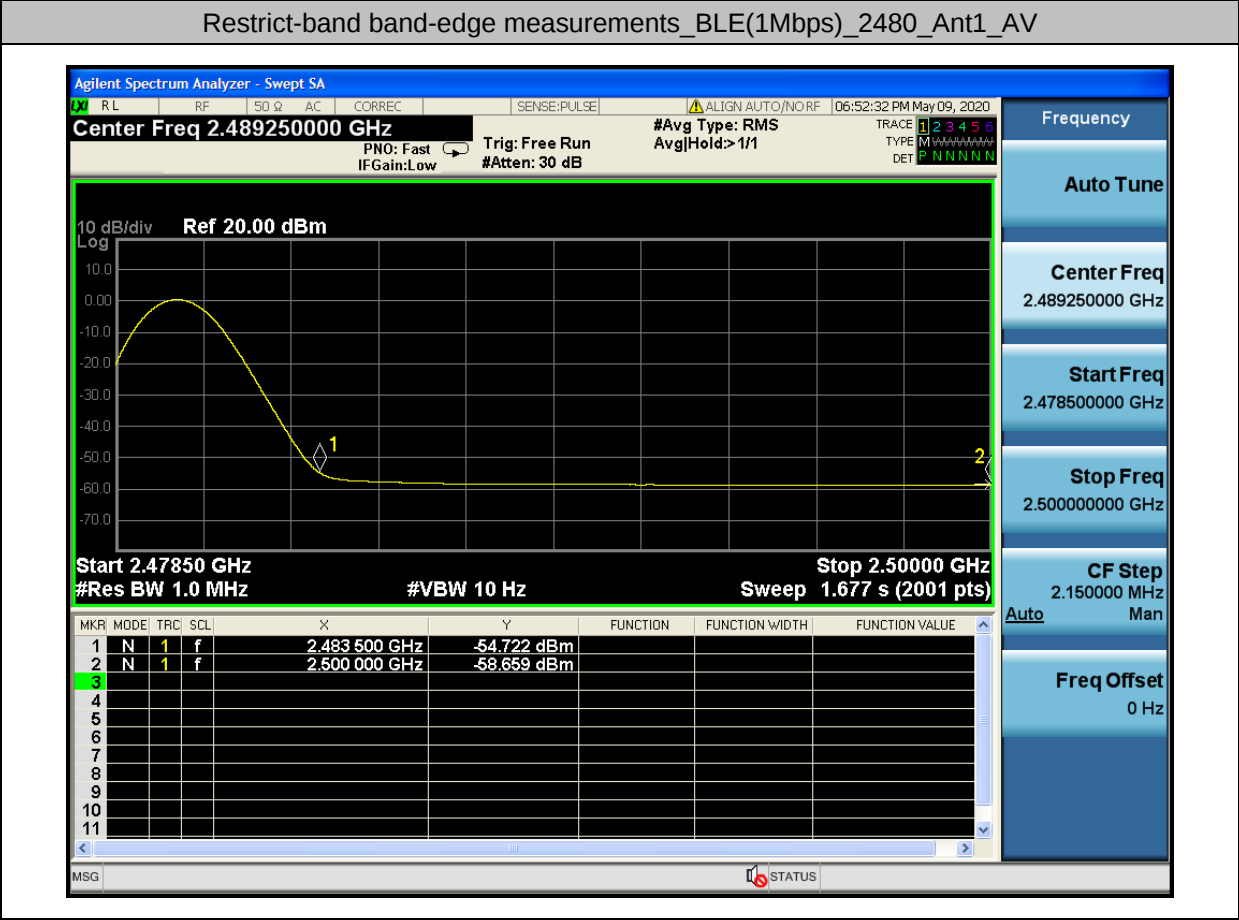
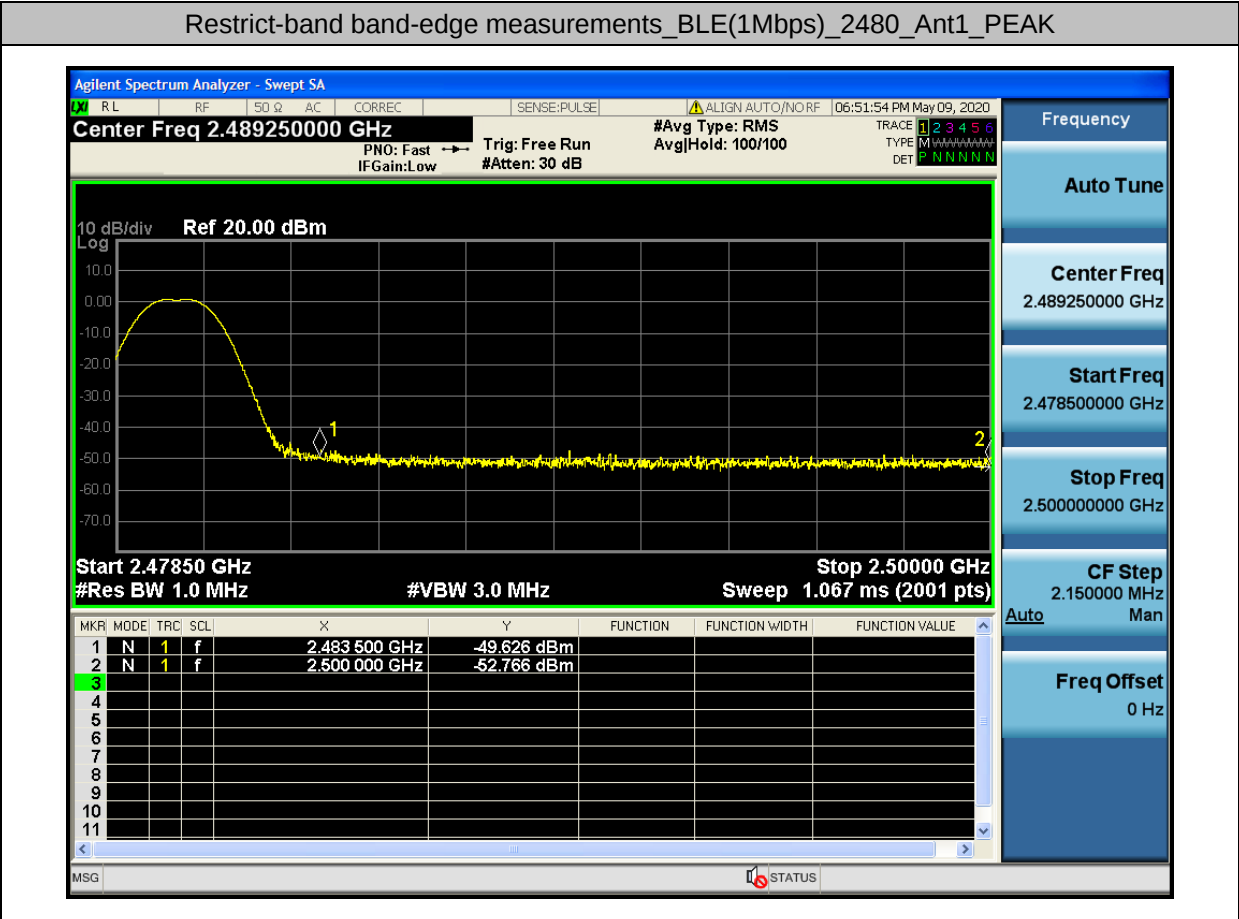


A.7. Restrict-band band-edge measurements

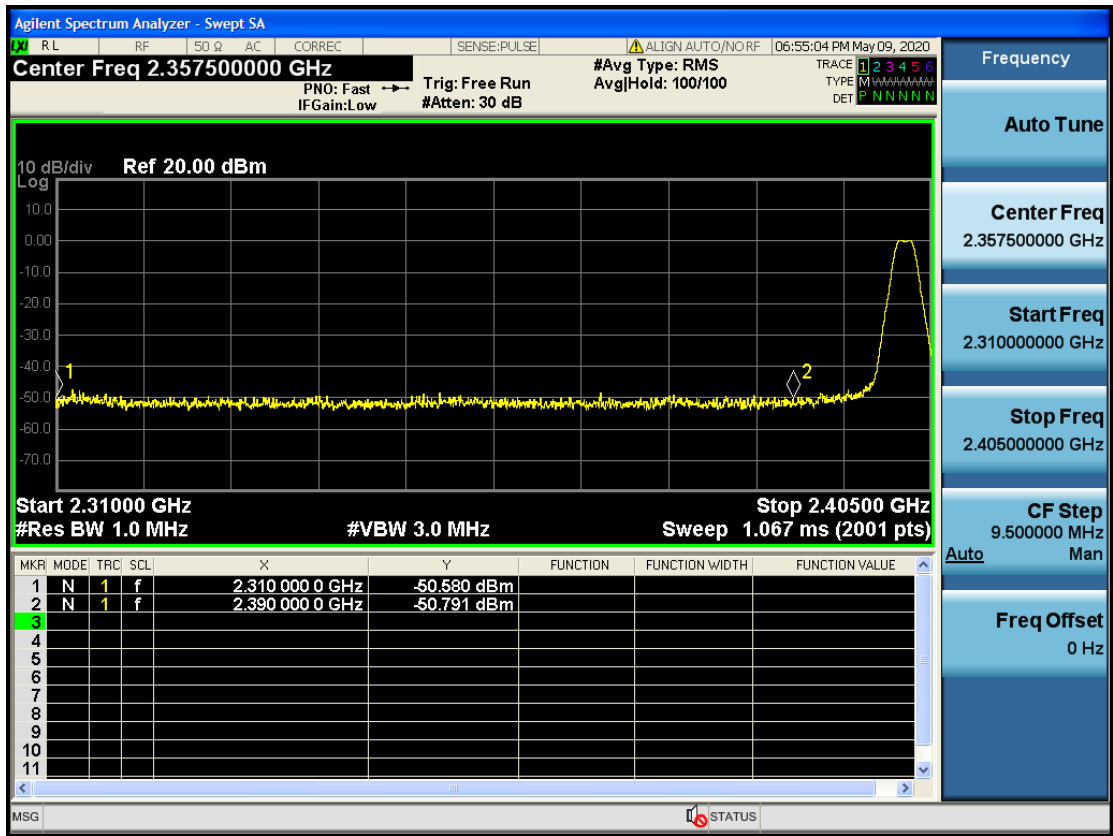
Type	Carrier Frequency (MHz)	Frequency(MHz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
BLE(1Mbps)	2402	2377.741	3.00	0.00	-46.878	51.322	74	Pass
BLE(1Mbps)	2480	2483.5	3.00	0.00	-49.626	48.574	74	Pass
BLE(2Mbps)	2402	2310	3.00	0.00	-50.58	47.62	74	Pass
BLE(2Mbps)	2480	2483.5	3.00	0.00	-44.843	53.357	74	Pass

Type	Carrier Frequency (MHz)	Frequency(MHz)	Gain	Ground Factor	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
BLE(1Mbps)	2402	2377.741	3.00	0.00	-58.21	39.99	54	Pass
BLE(1Mbps)	2480	2483.5	3.00	0.00	-54.722	43.478	54	Pass
BLE(2Mbps)	2402	2310	3.00	0.00	-58.212	39.988	54	Pass
BLE(2Mbps)	2480	2483.5	3.00	0.00	-47.996	50.204	54	Pass

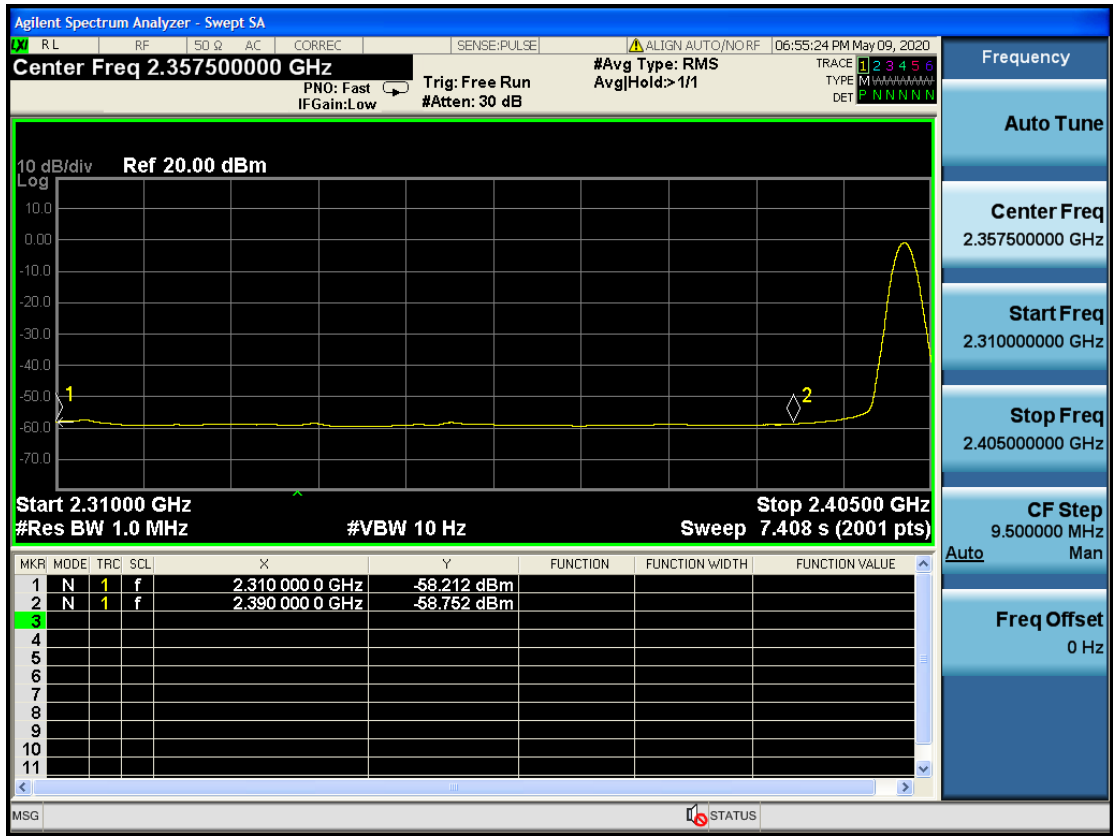




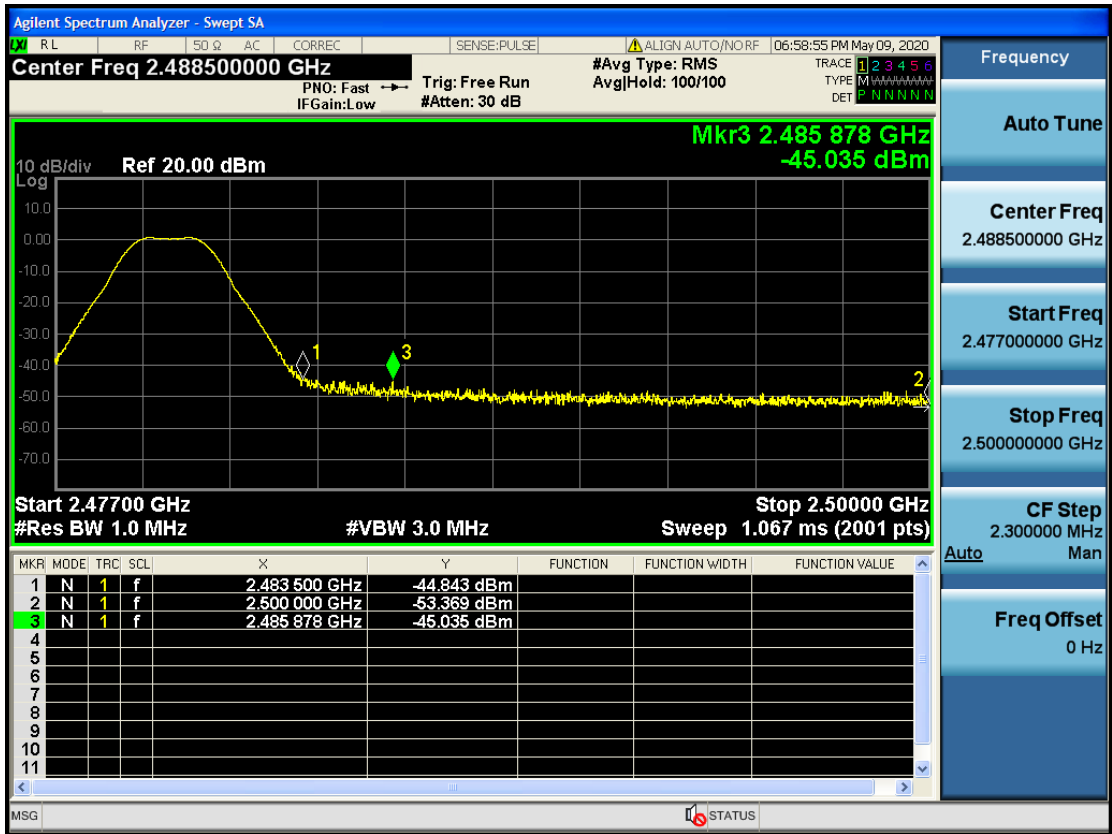
Restrict-band band-edge measurements_BLE(2Mbps)_2402_Ant1_PEAK



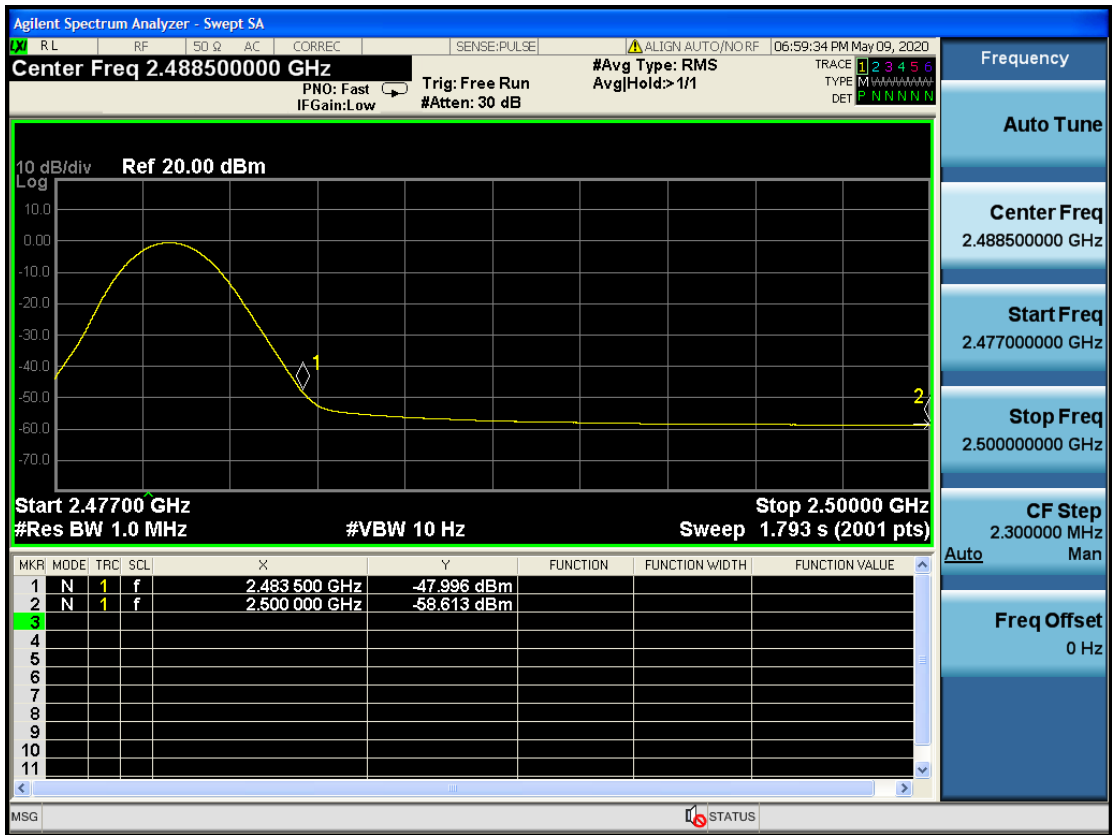
Restrict-band band-edge measurements_BLE(2Mbps)_2402_Ant1_AV



Restrict-band band-edge measurements_BLE(2Mbps)_2480_Ant1_PEAK



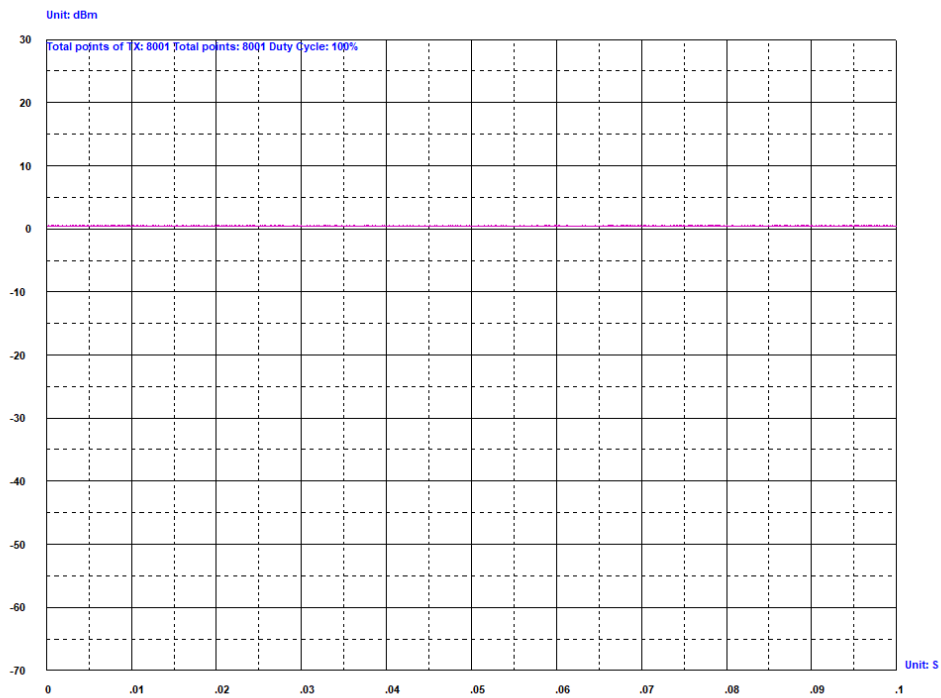
Restrict-band band-edge measurements_BLE(2Mbps)_2480_Ant1_AV



A.8. Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
BLE(1Mbps)	2440	Ant1	100.00	PASS
BLE(2Mbps)	2440	Ant1	100.00	PASS

Duty Cycle_BLE(1Mbps)_2440_Ant1



Duty Cycle_BLE(2Mbps)_2440_Ant1

