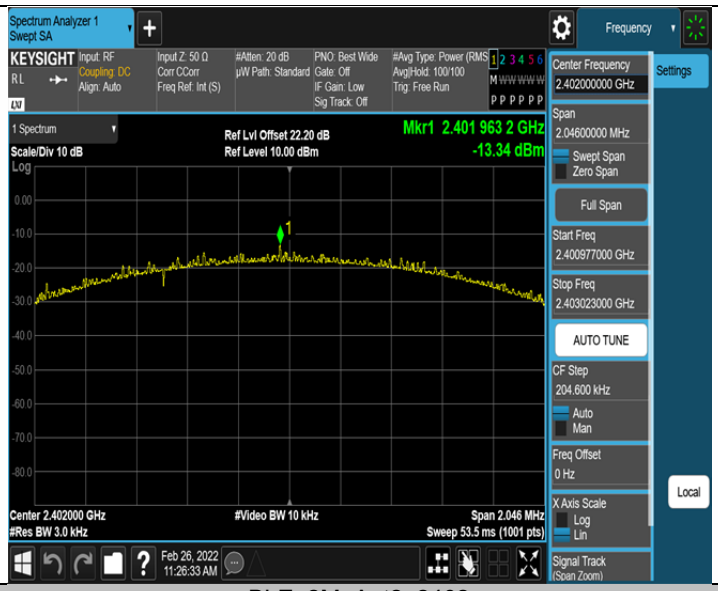
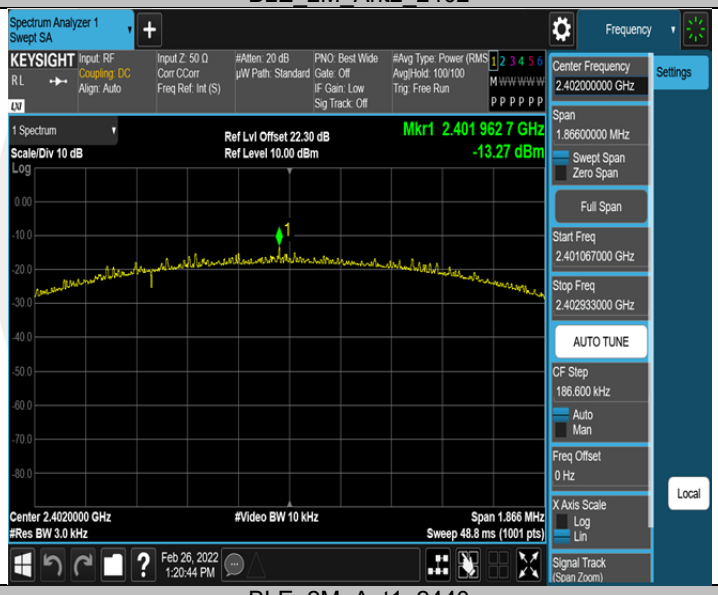
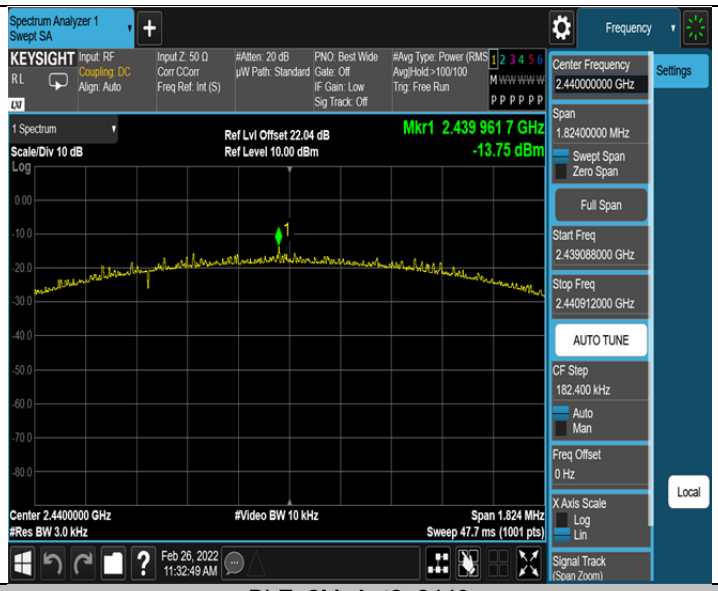


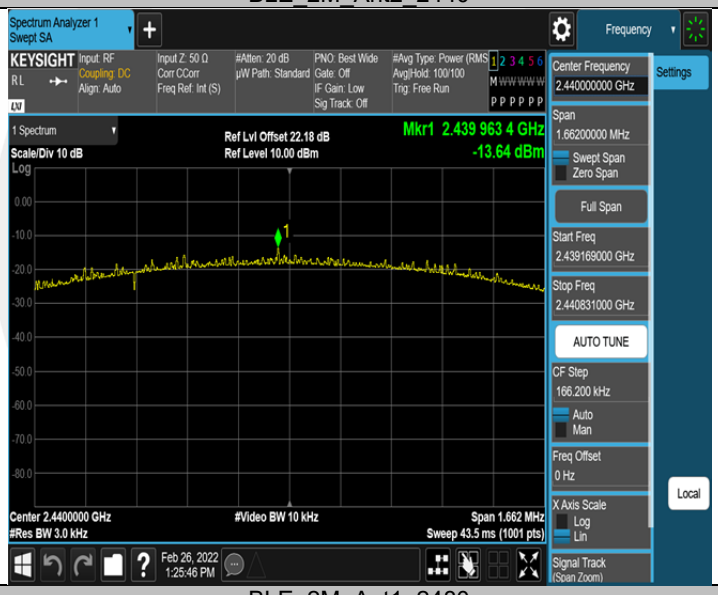
BLE_2M_Ant2_2402



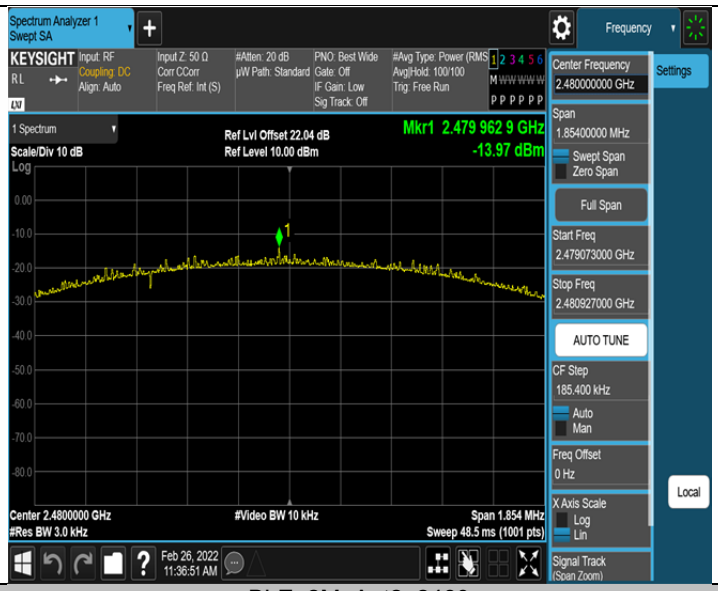
BLE_2M_Ant1_2440



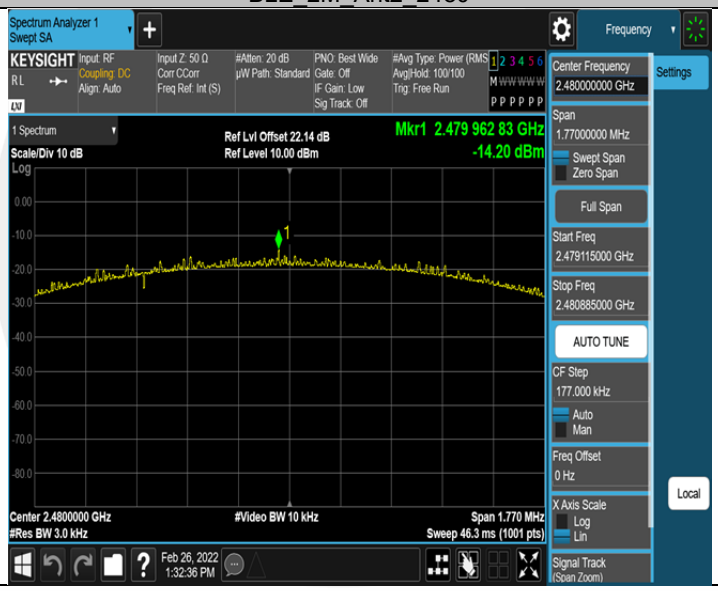
BLE_2M_Ant2_2440



BLE_2M_Ant1_2480



BLE_2M_Ant2_2480



8.5 UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

8.5.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02
According to RSS-247 5.5

8.5.2 Conformance Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

8.5.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.5.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

- **Reference level measurement**

Establish a reference level by using the following procedure:
Set instrument center frequency to DTS channel center frequency.
Set the span to = 1.5 times the DTS bandwidth.
Set the RBW = 100 kHz.
Set the VBW ≥ 3 x RBW.
Set Detector = peak.
Set Sweep time = auto couple.
Set Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum PSD level.
Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

- **Band-edge measurement**

Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation
Set RBW ≥ 1% of the span=100kHz Set VBW ≥ 3 x RBW
Set Sweep = auto Set Detector function = peak Set Trace = max hold
Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

- **Emission level measurement**

Set the center frequency and span to encompass frequency range to be measured.
Set the RBW = 100 kHz.
Set the VBW =300 kHz.
Set Detector = peak
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.

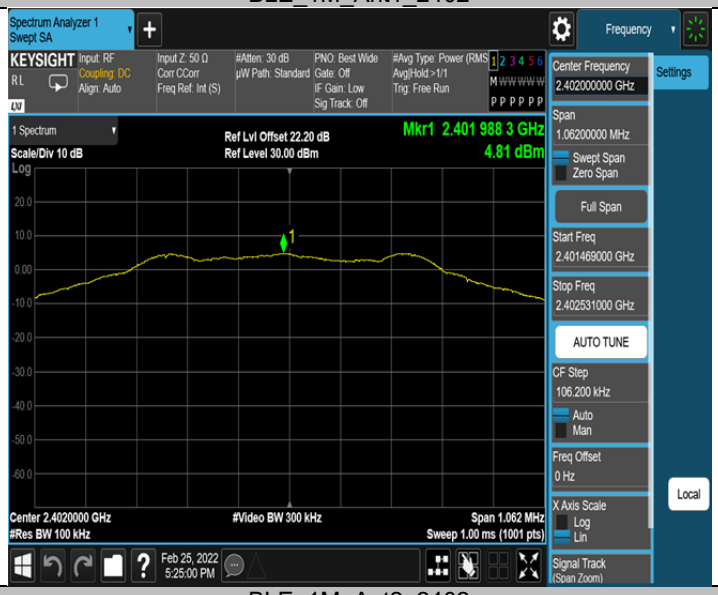
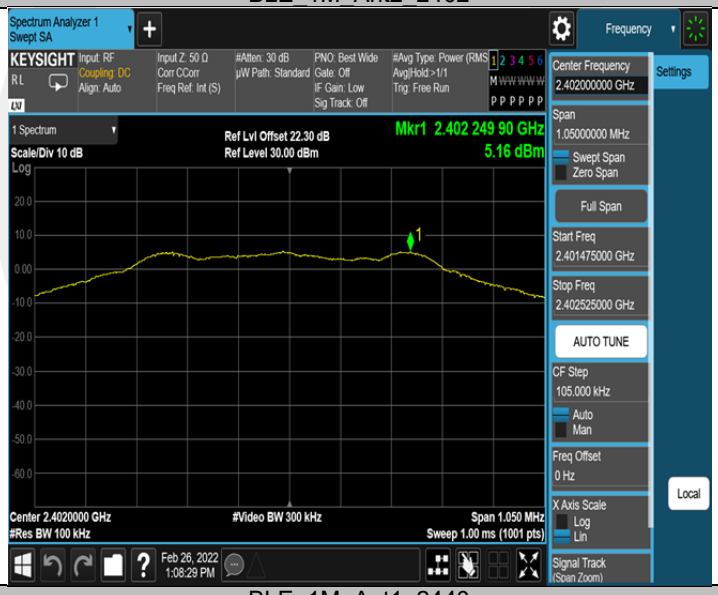
Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements . Report the three highest emissions relative to the limit.

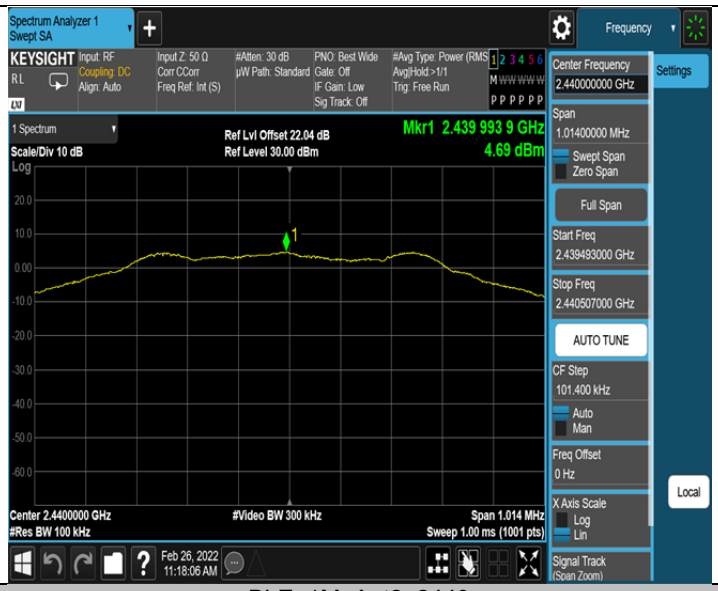
8.5.5 Test Results

Temperature:	25 ˚C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

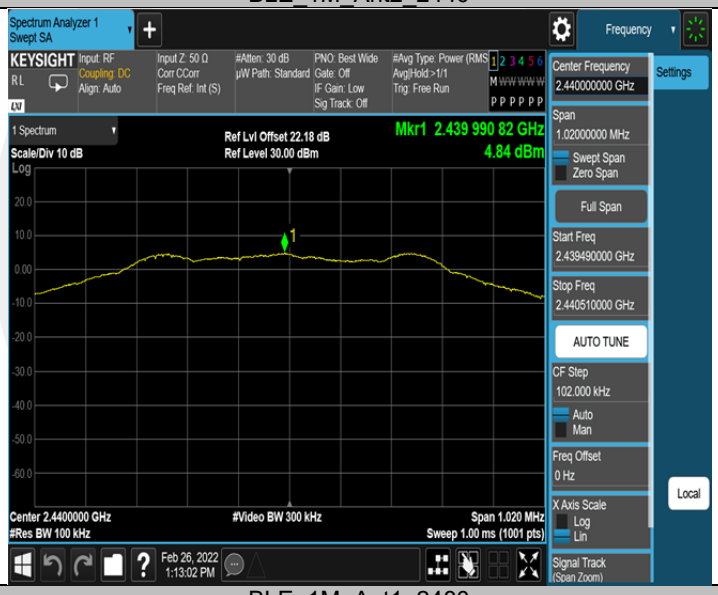
Note: N/A

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
BLE_1M	Ant1	2402	2401.99	4.81
	Ant2	2402	2402.25	5.16
	Ant1	2440	2439.99	4.69
	Ant2	2440	2439.99	4.84
	Ant1	2480	2479.99	4.25
	Ant2	2480	2479.98	4.30
BLE_2M	Ant1	2402	2401.99	4.77
	Ant2	2402	2401.99	4.86
	Ant1	2440	2439.98	4.31
	Ant2	2440	2439.98	4.43
	Ant1	2480	2479.99	4.11
	Ant2	2480	2479.98	4.23

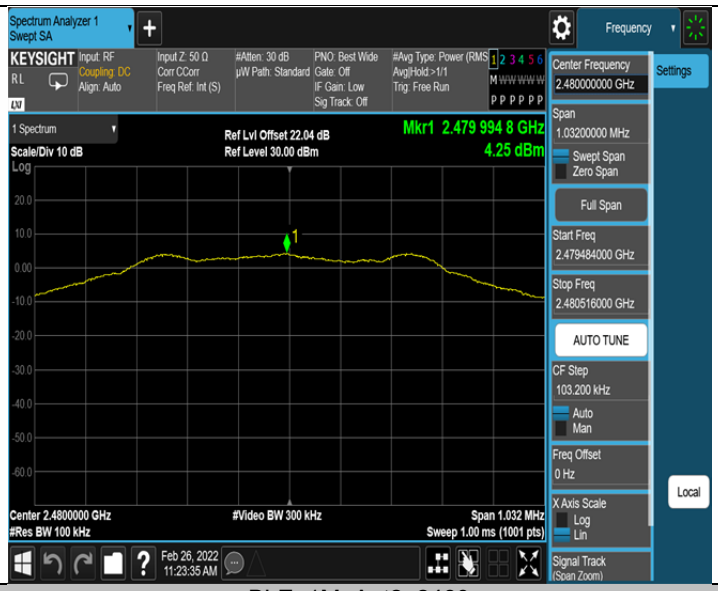
BLE_1M_Ant1_2402

BLE_1M_Ant2_2402

BLE_1M_Ant1_2440



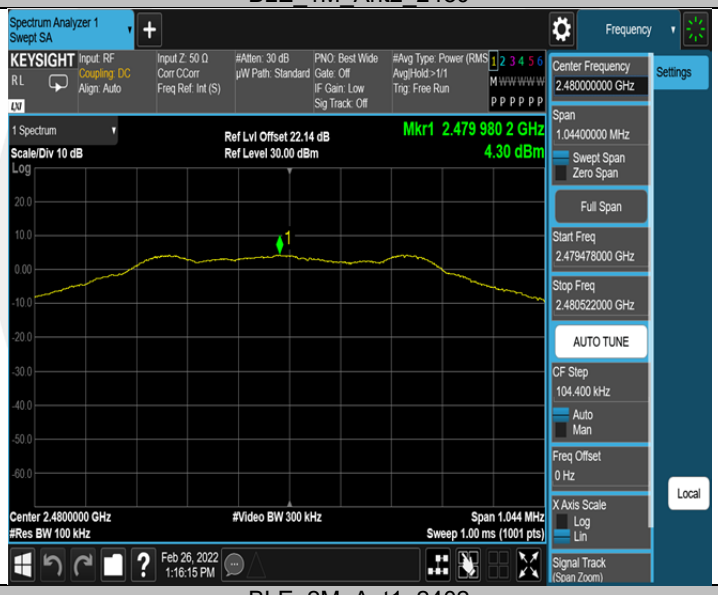
BLE_1M_Ant2_2440



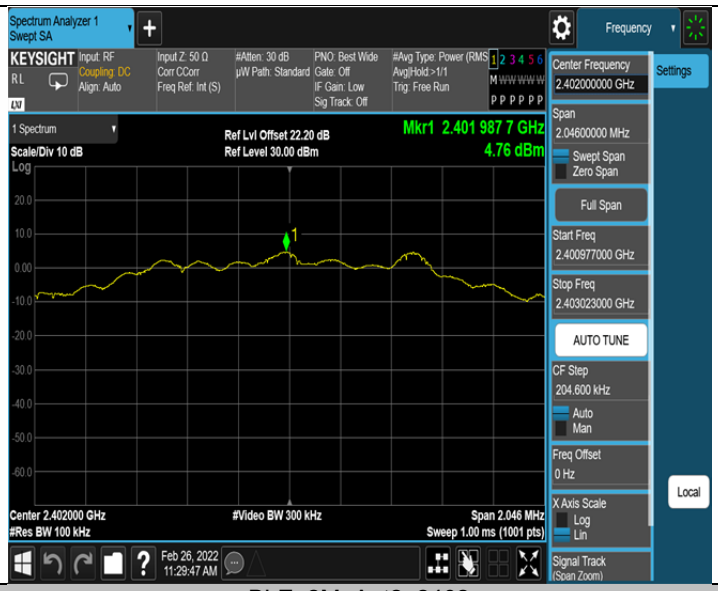
BLE_1M_Ant1_2480



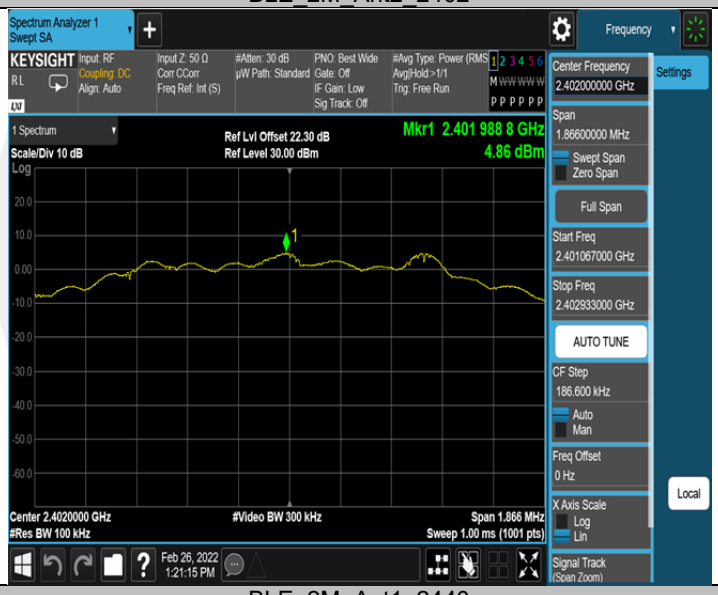
BLE_1M_Ant2_2480



BLE_2M_Ant1_2402



BLE_2M_Ant2_2402



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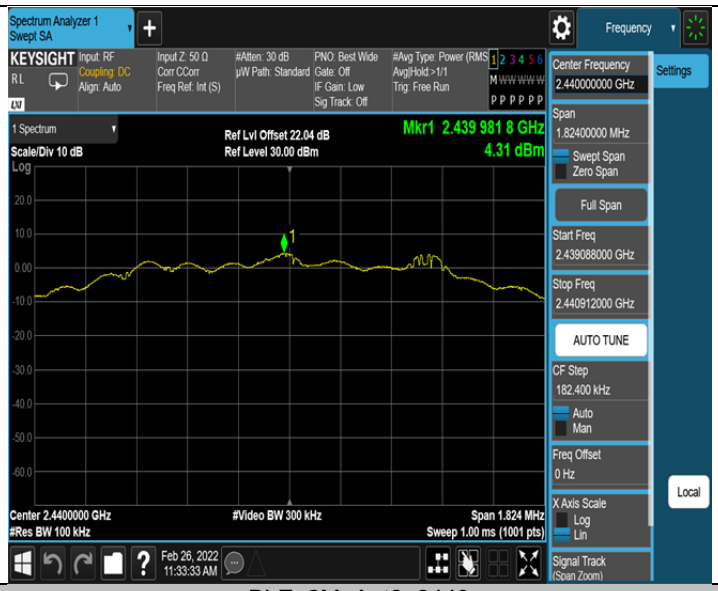
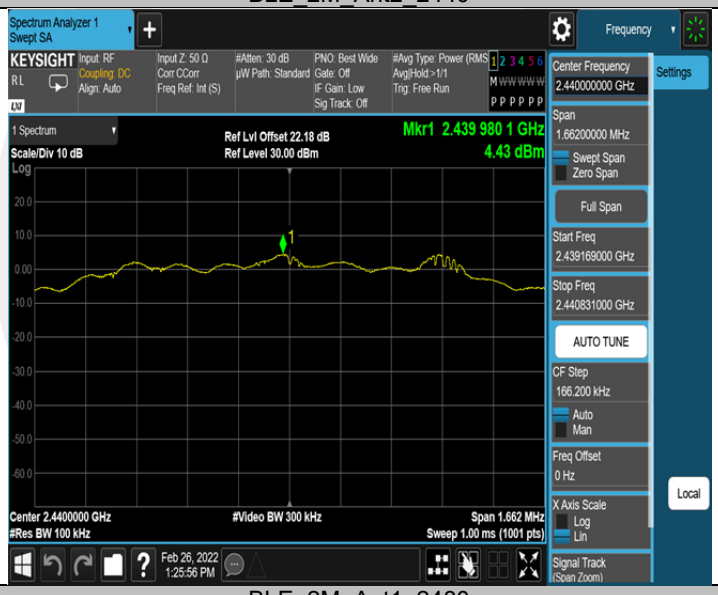
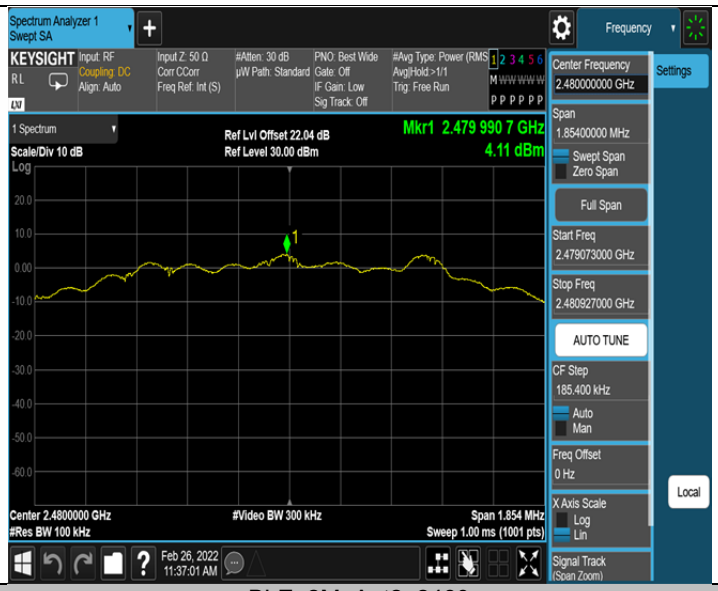


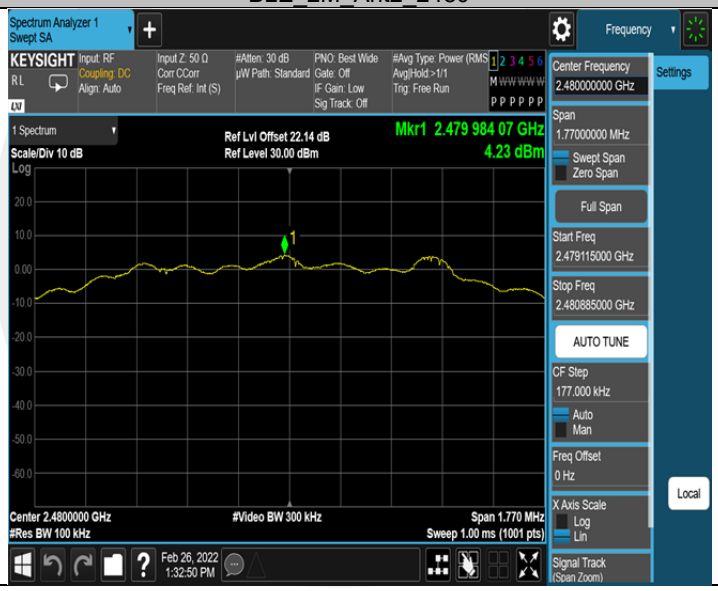
BLE_2M_Ant2_2440



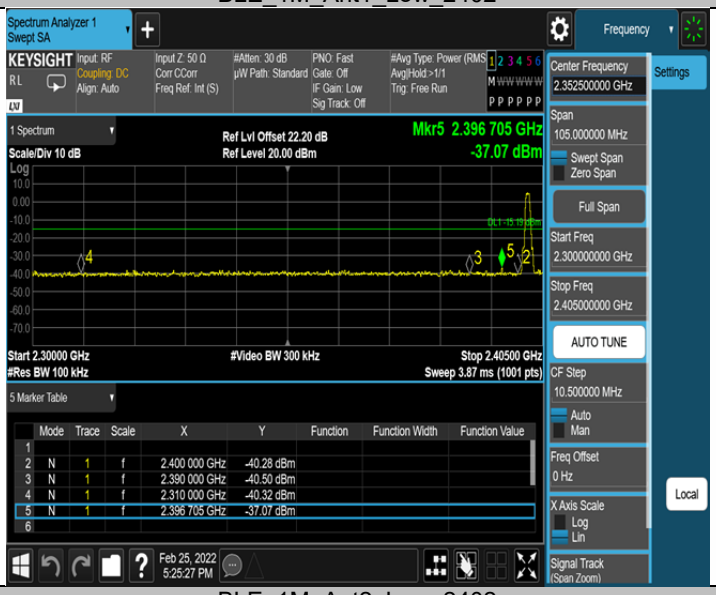
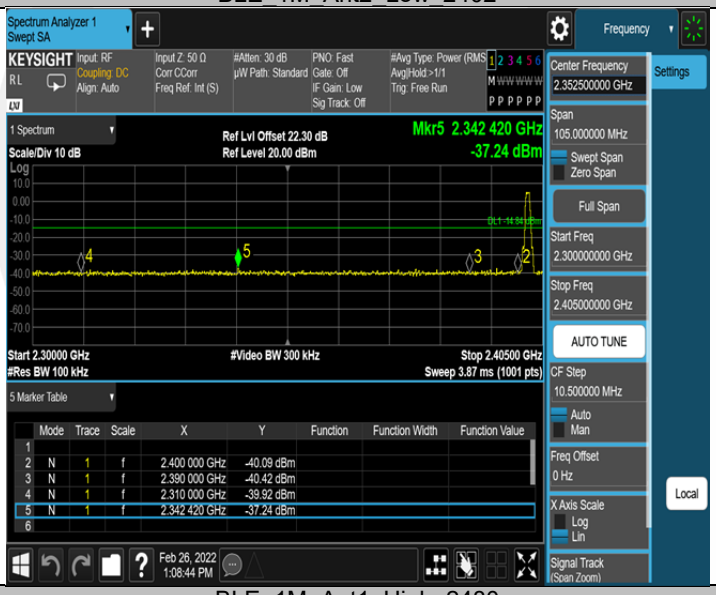
BLE_2M_Ant1_2480

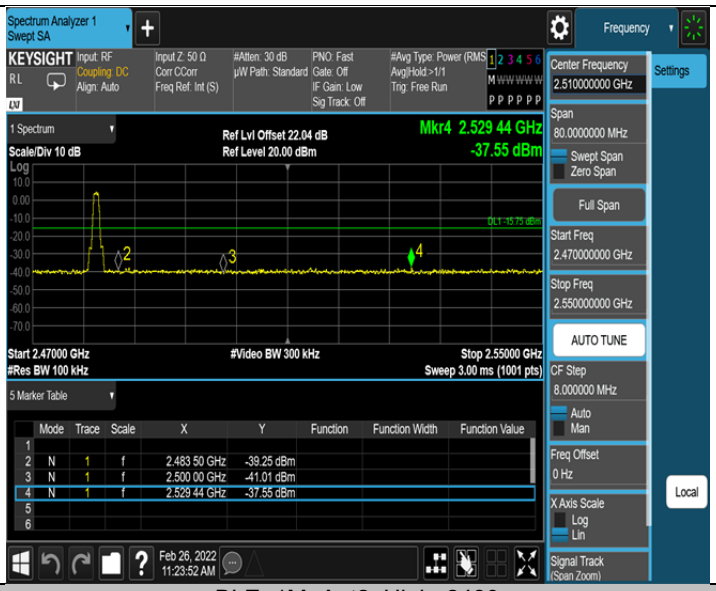


BLE_2M_Ant2_2480

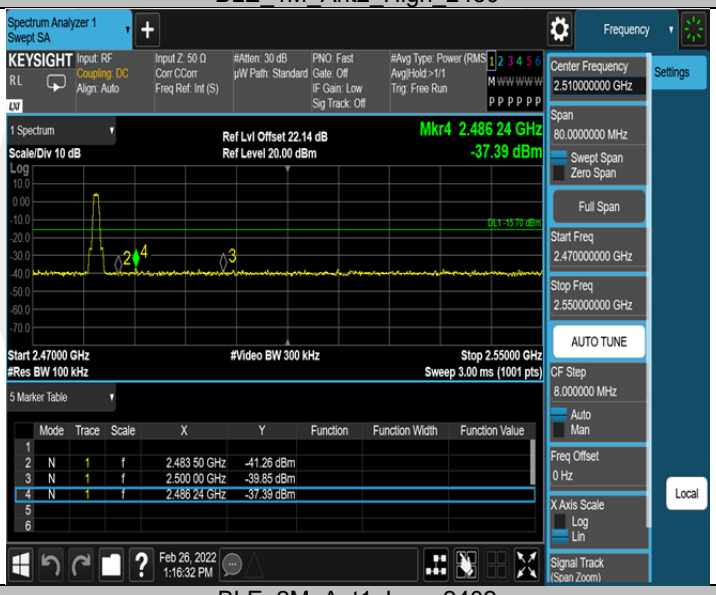


TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.81	-37.07	≤-15.19	PASS
	Ant2	Low	2402	5.16	-37.24	≤-14.84	PASS
	Ant1	High	2480	4.25	-37.55	≤-15.75	PASS
	Ant2	High	2480	4.30	-37.39	≤-15.7	PASS
BLE_2M	Ant1	Low	2402	1.60	-26.18	≤-18.4	PASS
	Ant2	Low	2402	4.86	-27.01	≤-15.14	PASS
	Ant1	High	2480	4.11	-37.66	≤-15.89	PASS
	Ant2	High	2480	4.23	-37.46	≤-15.77	PASS

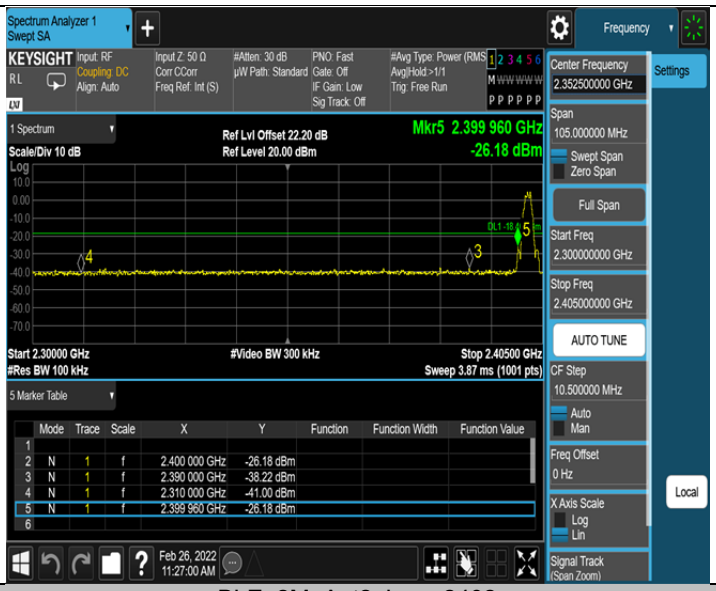
BLE_1M_Ant1_Low_2402

BLE_1M_Ant2_Low_2402

BLE_1M_Ant1_High_2480



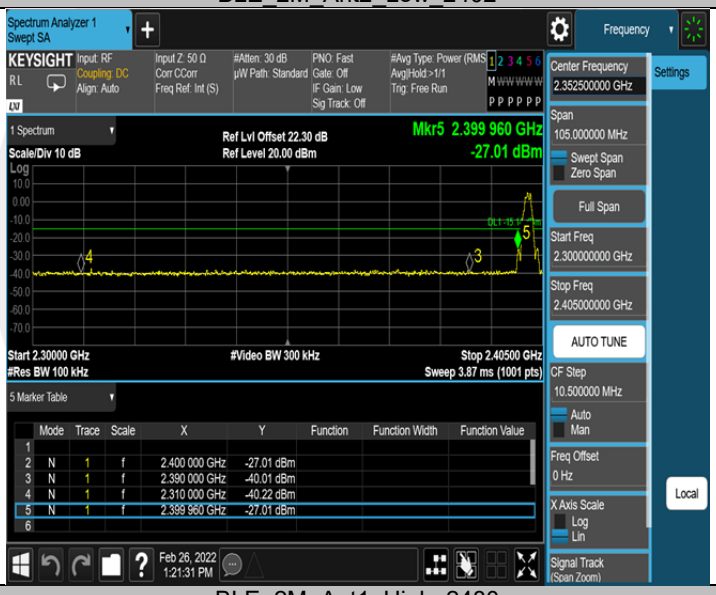
BLE_1M_Ant2_High_2480



BLE_2M_Ant1_Low_2402



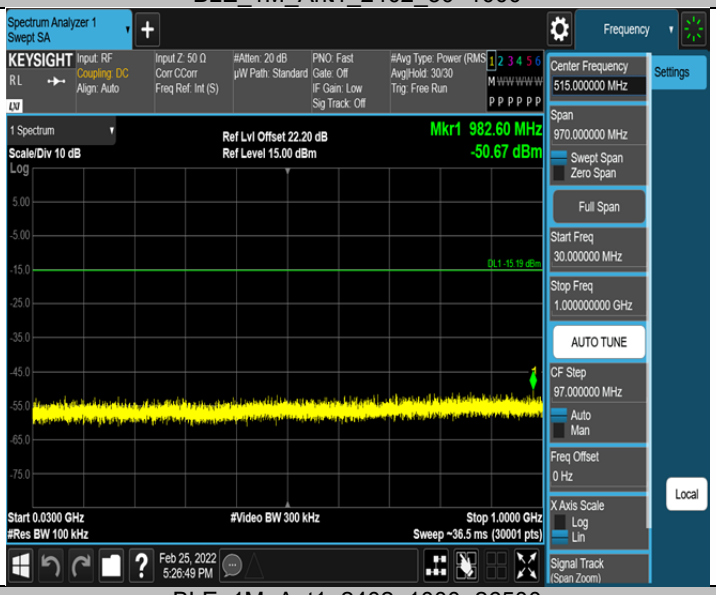
BLE_2M_Ant2_Low_2402



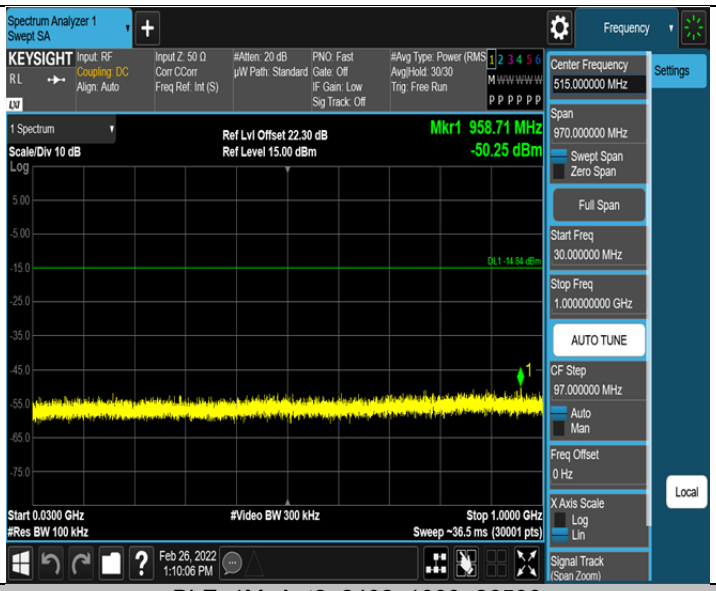
BLE_2M_Ant1_High_2480

BLE_2M_Ant2_High_2480

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	30~1000	4.81	-50.67	≤-15.19	PASS
			1000~26500	4.81	-39.52	≤-15.19	PASS
	Ant2	2402	30~1000	5.16	-50.25	≤-14.84	PASS
			1000~26500	5.16	-39.88	≤-14.84	PASS
	Ant1	2440	30~1000	4.11	-51.09	≤-15.89	PASS
			1000~26500	4.11	-39.81	≤-15.89	PASS
	Ant2	2440	30~1000	4.84	-50.58	≤-15.16	PASS
			1000~26500	4.84	-39.62	≤-15.16	PASS
	Ant1	2480	30~1000	2.17	-51.13	≤-17.83	PASS
			1000~26500	2.17	-39.89	≤-17.83	PASS
	Ant2	2480	30~1000	4.30	-51.16	≤-15.7	PASS
			1000~26500	4.30	-39.12	≤-15.7	PASS
BLE_2M	Ant1	2402	30~1000	1.60	-50.59	≤-18.4	PASS
			1000~26500	1.60	-39.7	≤-18.4	PASS
	Ant2	2402	30~1000	4.86	-50.26	≤-15.14	PASS
			1000~26500	4.86	-39.3	≤-15.14	PASS
	Ant1	2440	30~1000	4.31	-51.05	≤-15.69	PASS
			1000~26500	4.31	-39.4	≤-15.69	PASS
	Ant2	2440	30~1000	4.43	-50.6	≤-15.57	PASS
			1000~26500	4.43	-39.13	≤-15.57	PASS
	Ant1	2480	30~1000	4.11	-50.97	≤-15.89	PASS
			1000~26500	4.11	-39.79	≤-15.89	PASS
	Ant2	2480	30~1000	4.23	-50.19	≤-15.77	PASS
			1000~26500	4.23	-39.61	≤-15.77	PASS

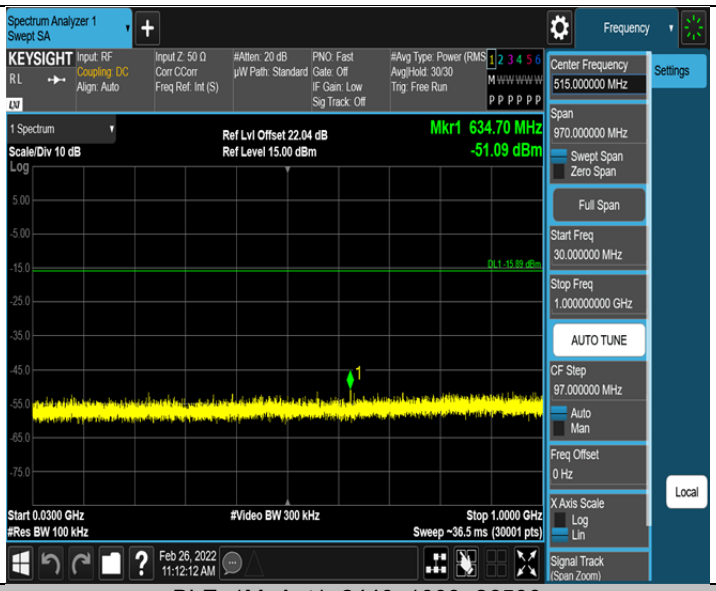
BLE_1M_Ant1_2402_30~1000

BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant2_2402_30~1000



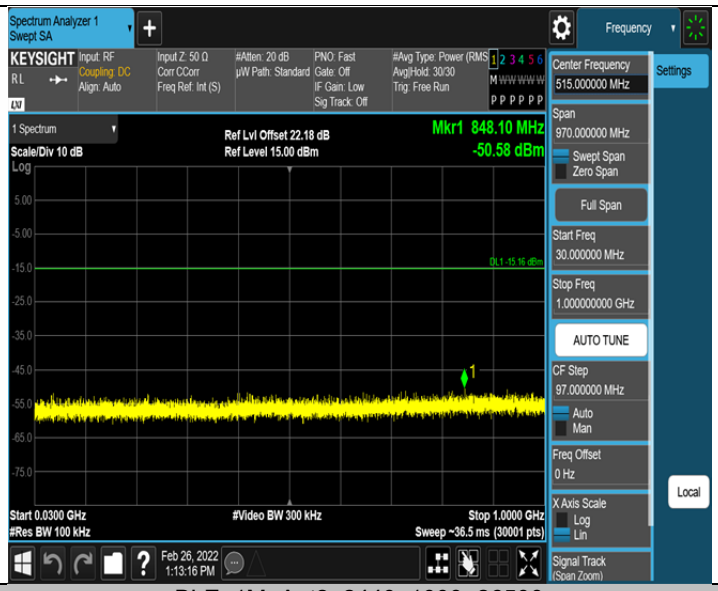
BLE_1M_Ant2_2402_1000~26500

BLE_1M_Ant1_2440_30~1000



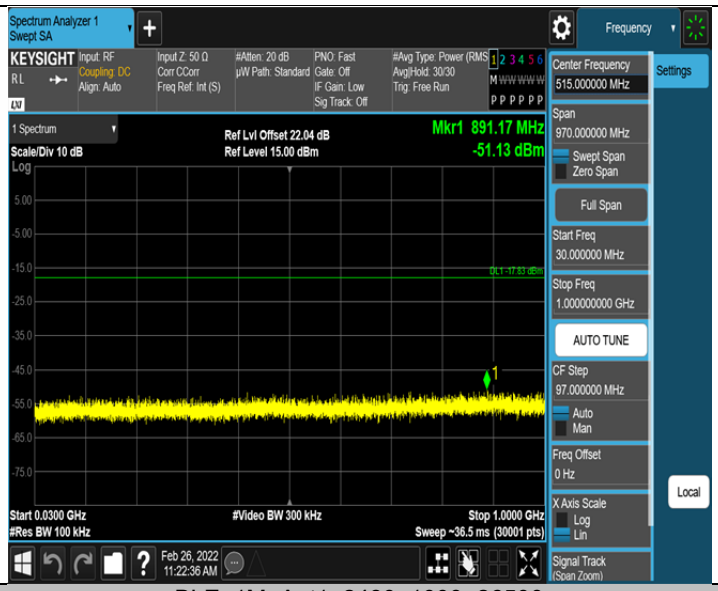
BLE_1M_Ant1_2440_1000~26500

BLE_1M_Ant2_2440_30~1000



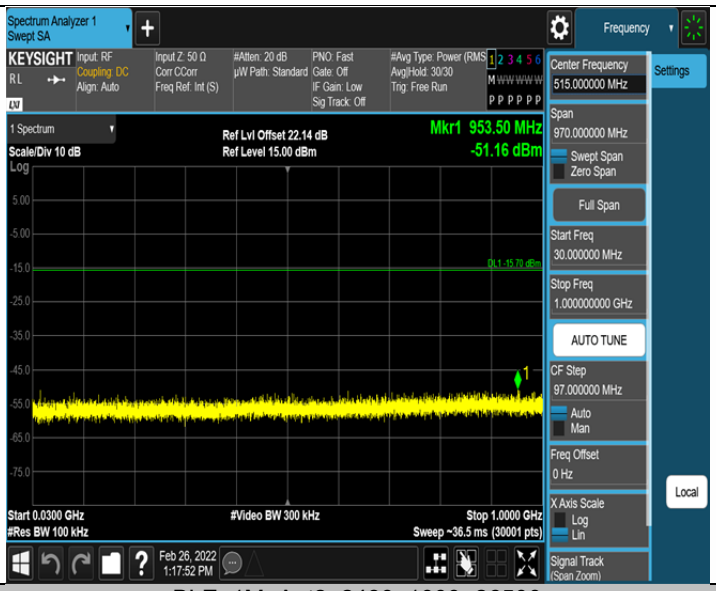
BLE_1M_Ant2_2440_1000~26500

BLE_1M_Ant1_2480_30~1000



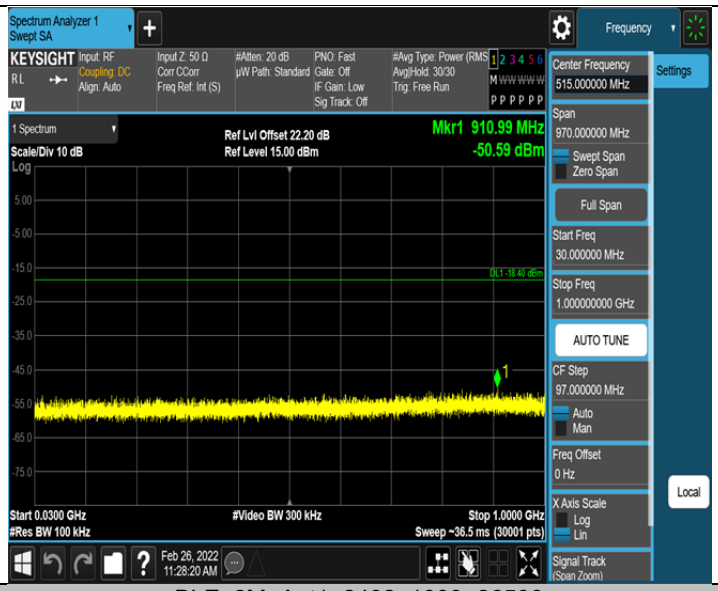
BLE_1M_Ant1_2480_1000~26500

BLE_1M_Ant2_2480_30~1000



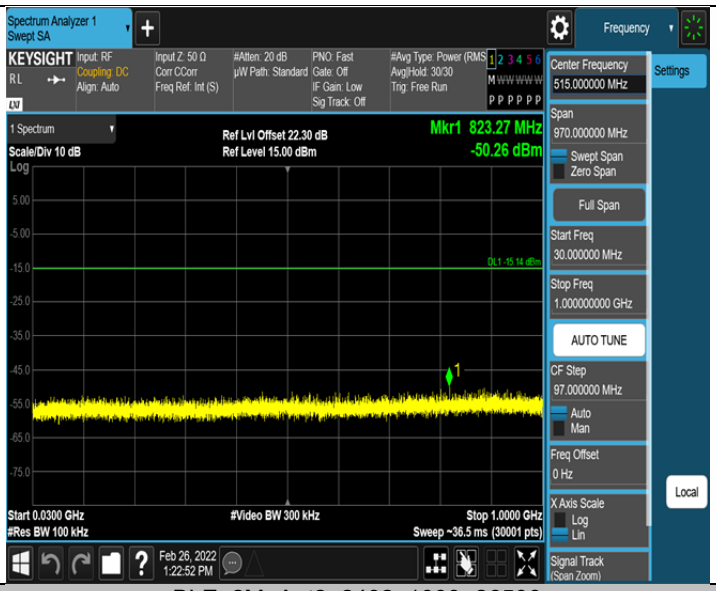
BLE_1M_Ant2_2480_1000~26500

BLE_2M_Ant1_2402_30~1000



BLE_2M_Ant1_2402_1000~26500

BLE_2M_Ant2_2402_30~1000



BLE_2M_Ant2_2402_1000~26500

BLE_2M_Ant1_2440_30~1000