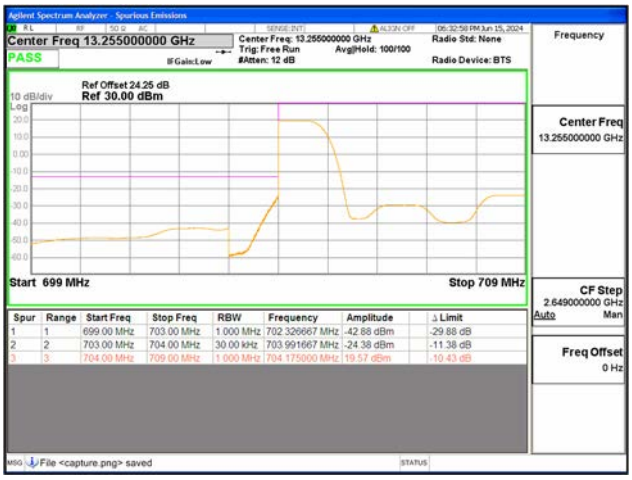
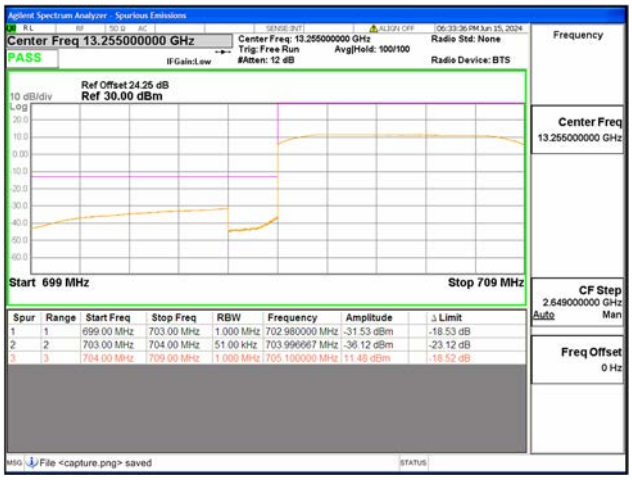
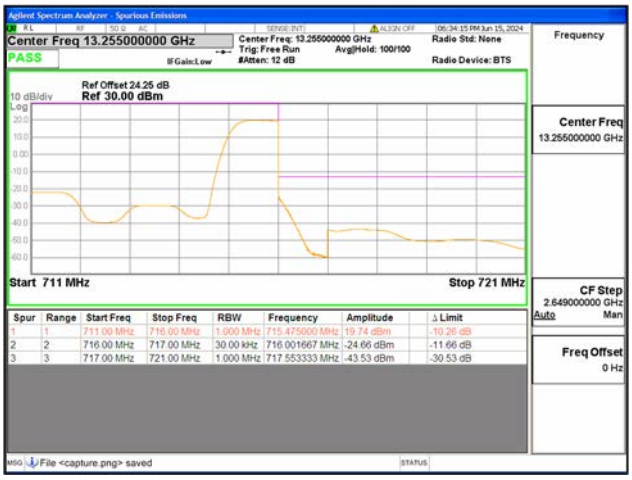


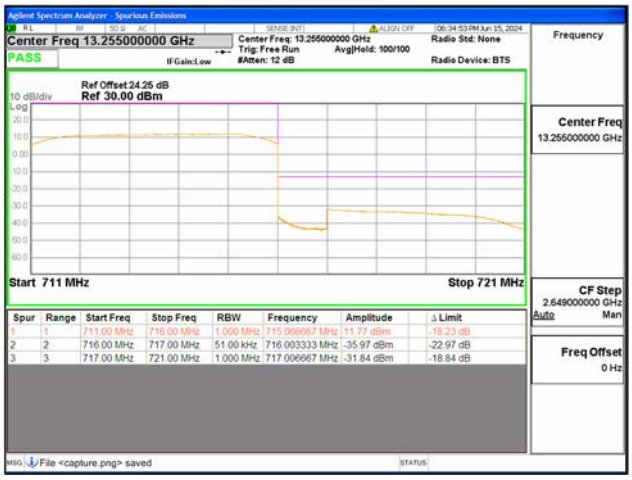
B17 / 5MHz / Low CH / QPSK / 1 RB



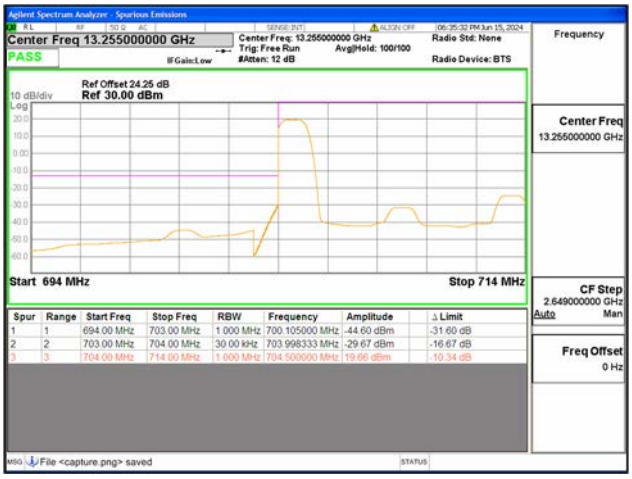
B17 / 5MHz / Low CH / QPSK / FULL RB



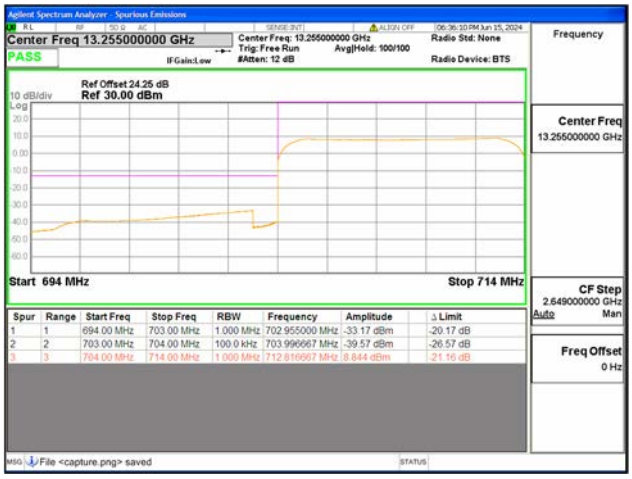
B17 / 5MHz / High CH / QPSK / 1 RB



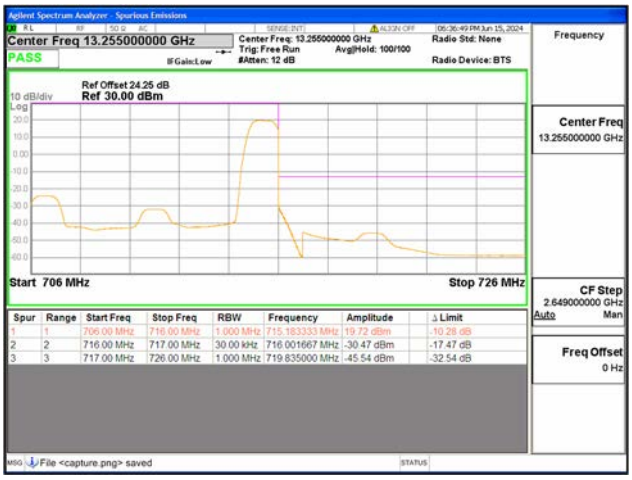
B17 / 5MHz / High CH / QPSK / FULL RB



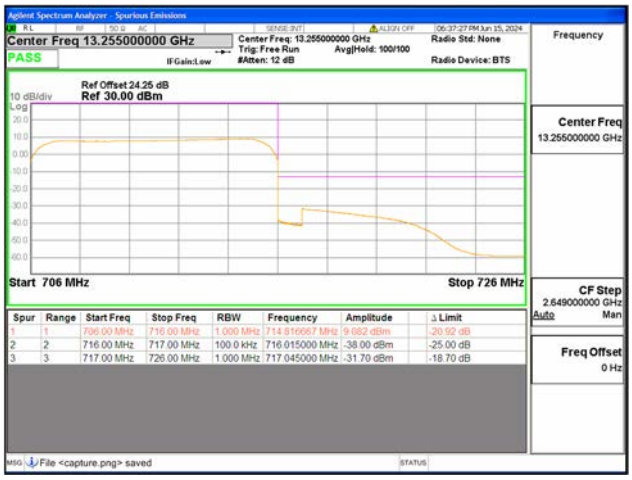
B17 / 10MHz / Low CH / QPSK / 1 RB



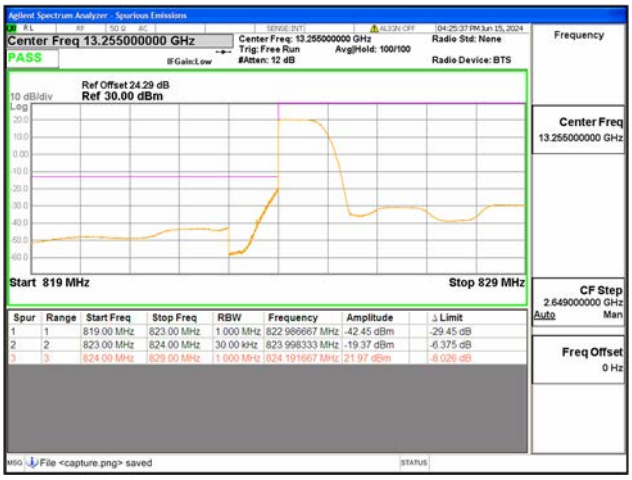
B17 / 10MHz / Low CH / QPSK / FULL RB



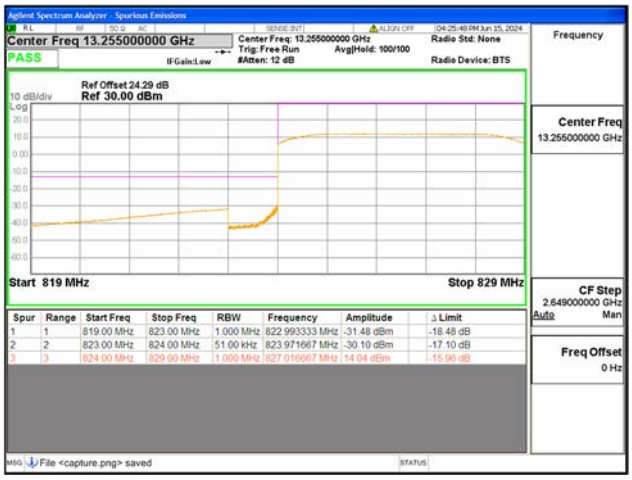
B17 / 10MHz / High CH / QPSK / 1 RB



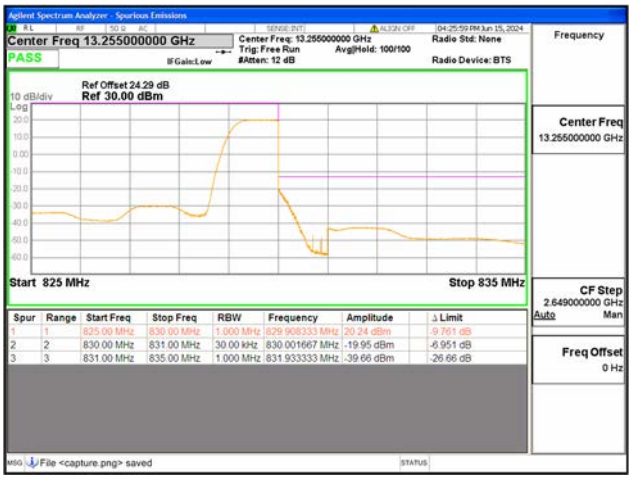
B17 / 10MHz / High CH / QPSK / FULL RB



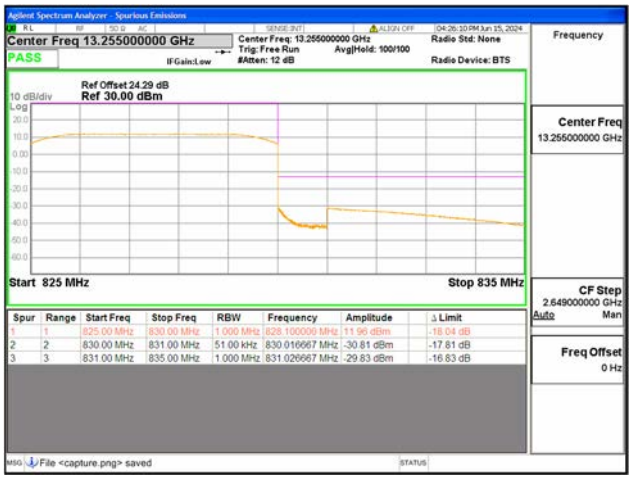
B18 part22 / 5MHz / Low CH / QPSK / 1 RB



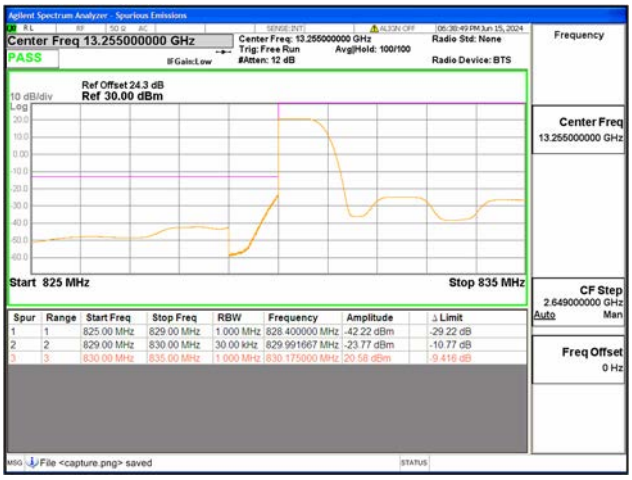
B18 part22 / 5MHz / Low CH / QPSK / FULL RB



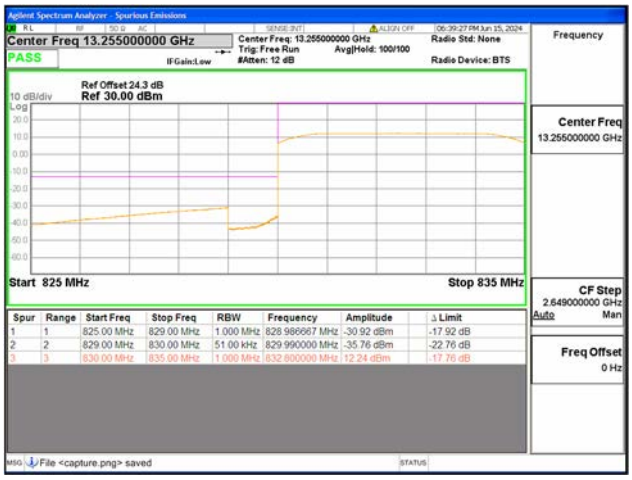
B18 part22 / 5MHz / High CH / QPSK / 1 RB



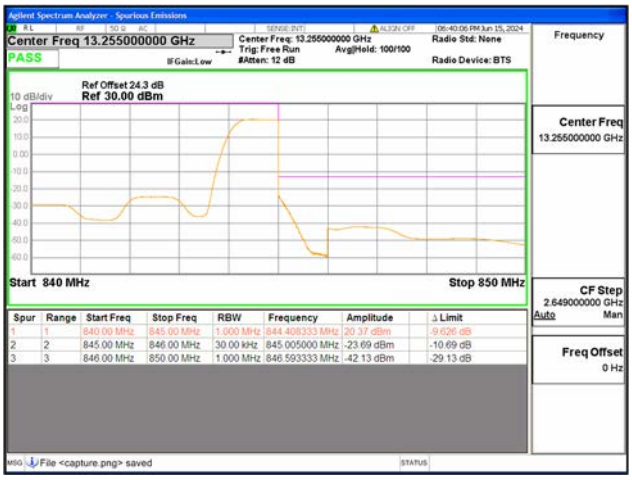
B18 part22 / 5MHz / High CH / QPSK / FULL RB



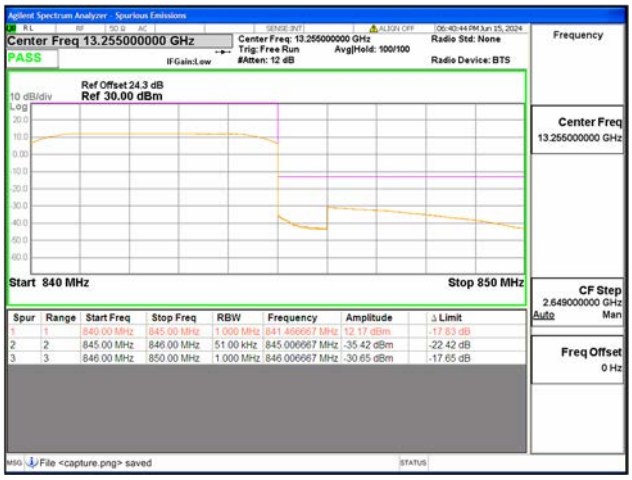
B19 / 5MHz / Low CH / QPSK / 1 RB



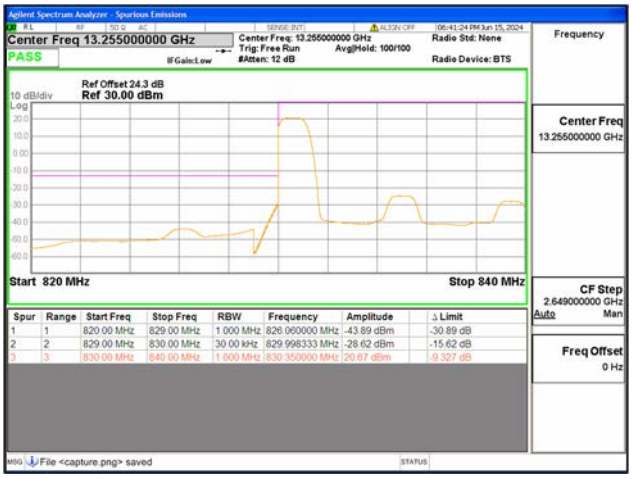
B19 / 5MHz / Low CH / QPSK / FULL RB



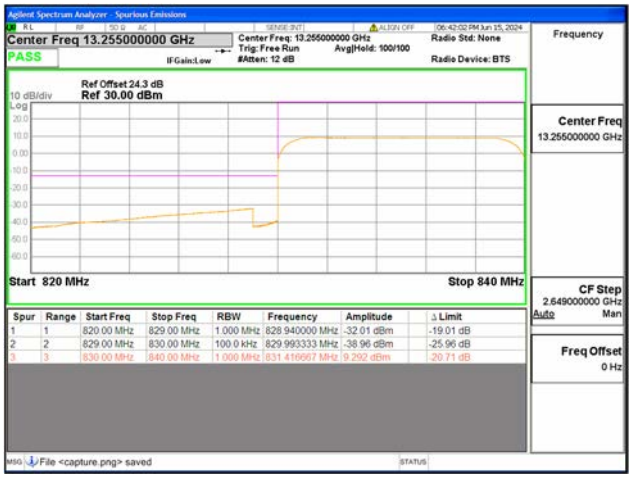
B19 / 5MHz / High CH / QPSK / 1 RB



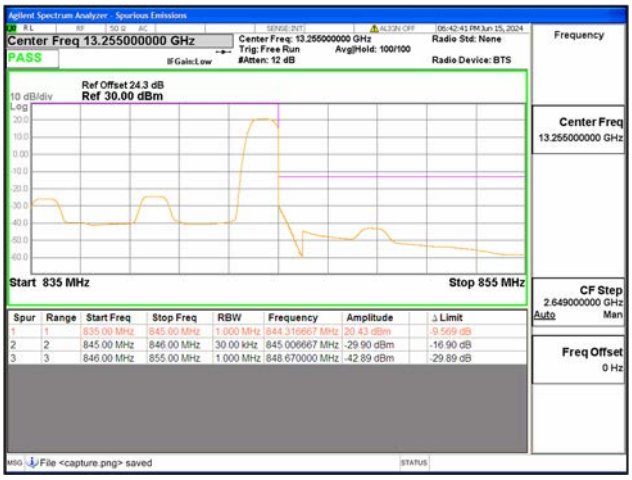
B19 / 5MHz / High CH / QPSK / FULL RB



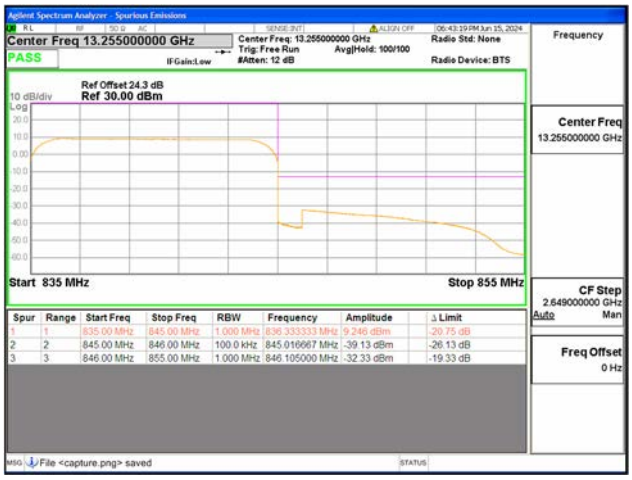
B19 / 10MHz / Low CH / QPSK / 1 RB



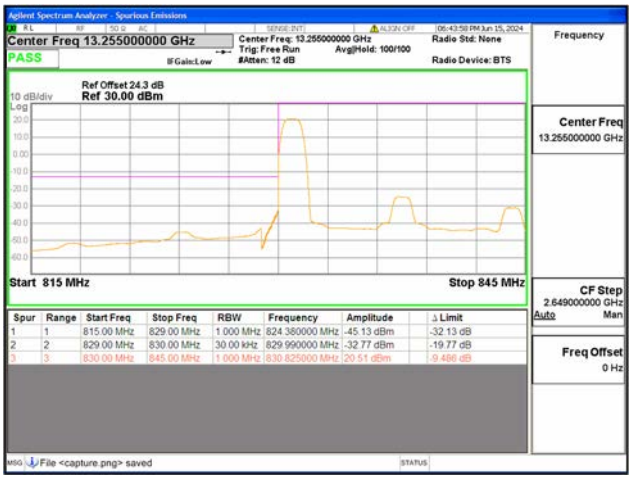
B19 / 10MHz / Low CH / QPSK / FULL RB



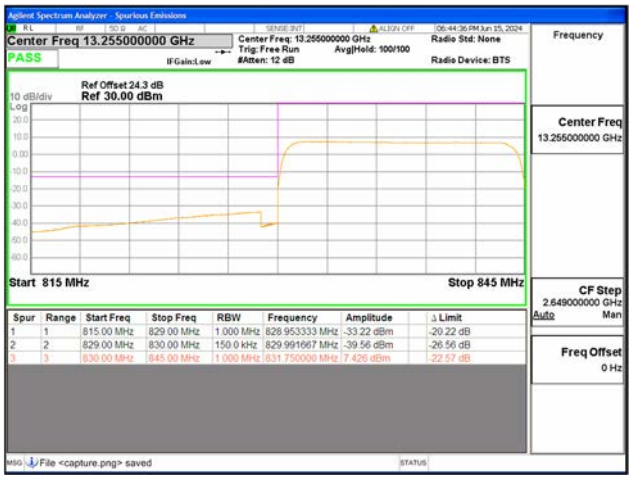
B19 / 10MHz / High CH / QPSK / 1 RB



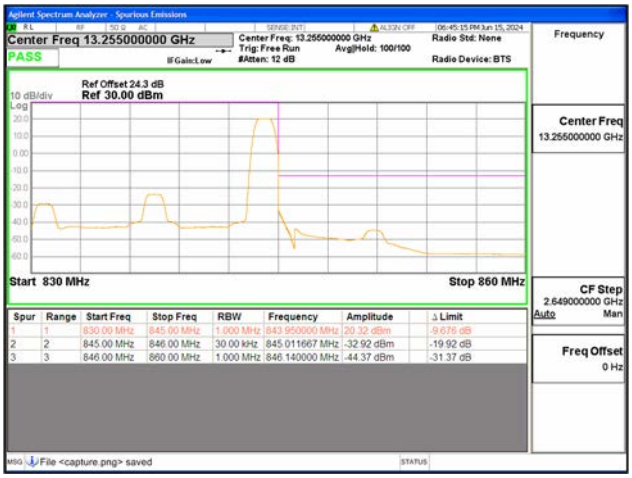
B19 / 10MHz / High CH / QPSK / FULL RB



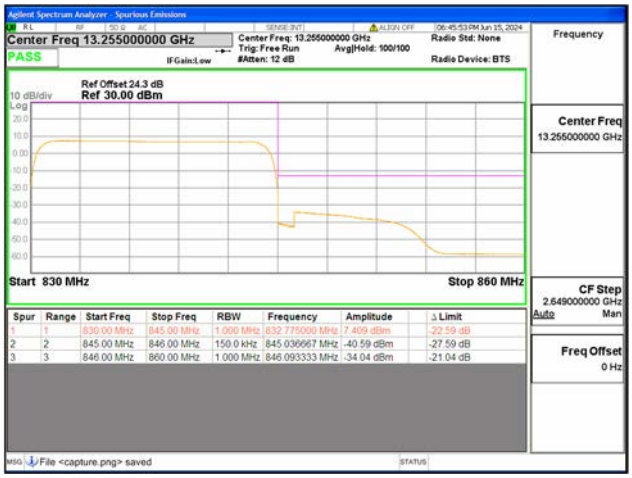
B19 / 15MHz / Low CH / QPSK / 1 RB



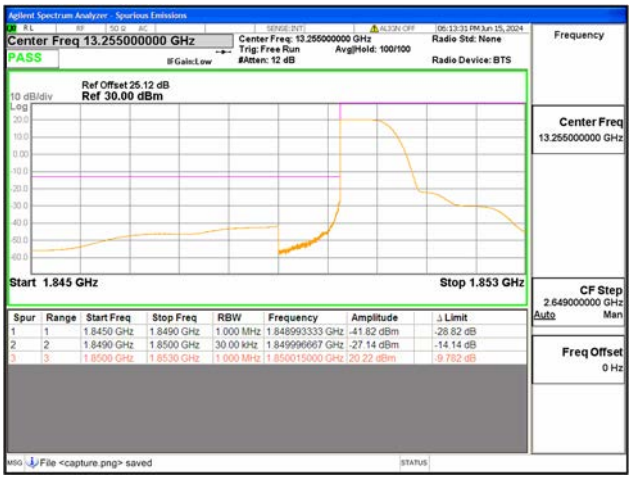
B19 / 15MHz / Low CH / QPSK / FULL RB



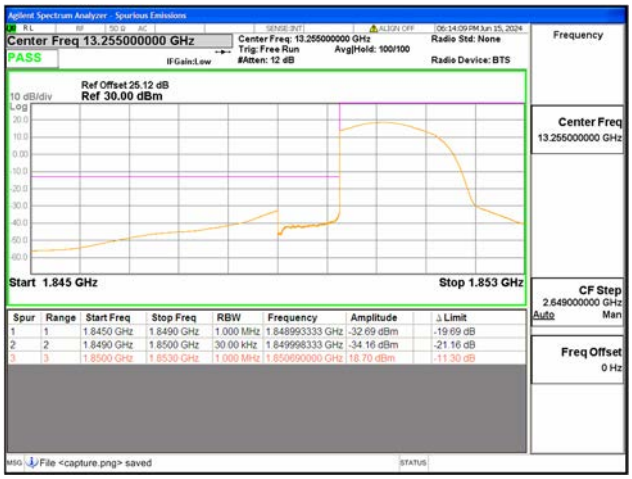
B19 / 15MHz / High CH / QPSK / 1 RB



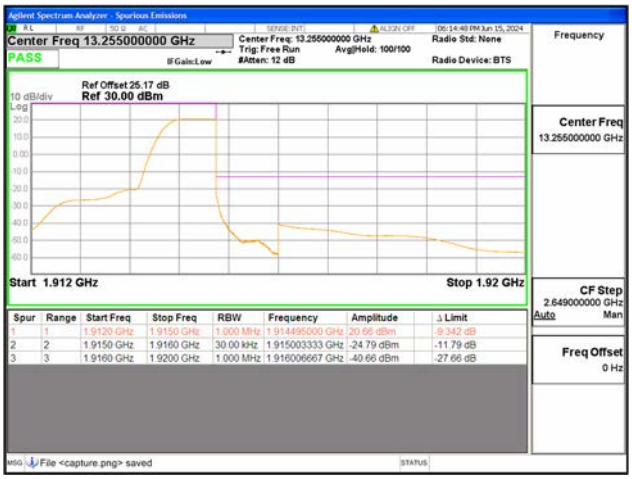
B19 / 15MHz / High CH / QPSK / FULL RB



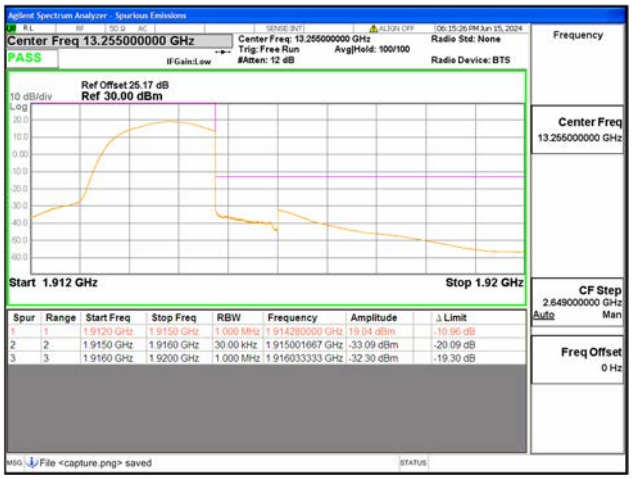
B25 / 1.4MHz / Low CH / QPSK / 1 RB



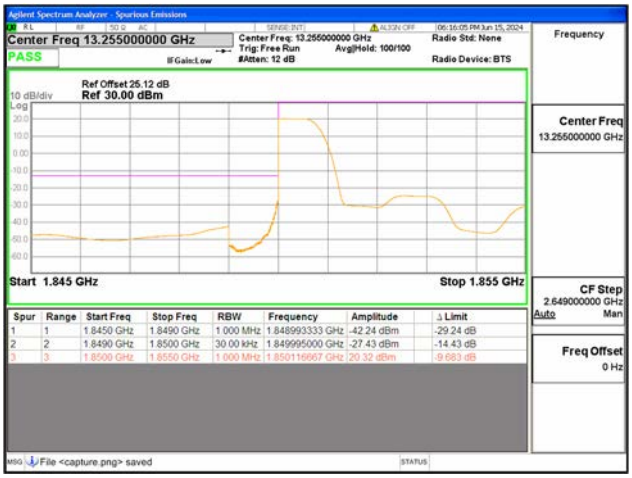
B25 / 1.4MHz / Low CH / QPSK / FULL RB



B25 / 1.4MHz / High CH / QPSK / 1 RB

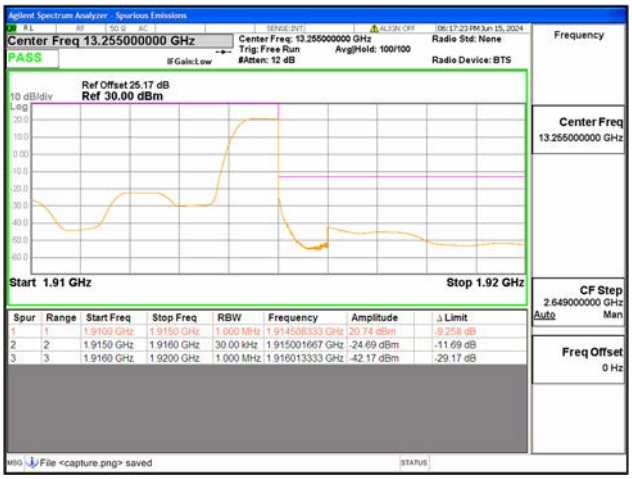


B25 / 1.4MHz / High CH / QPSK / FULL RB



B25 / 3MHz / Low CH / QPSK / 1 RB

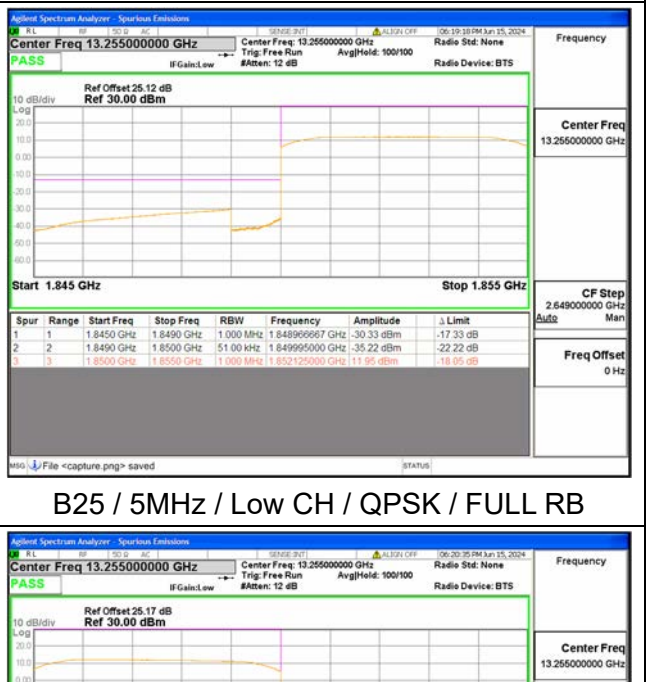
B25 / 3MHz / Low CH / QPSK / FULL RB



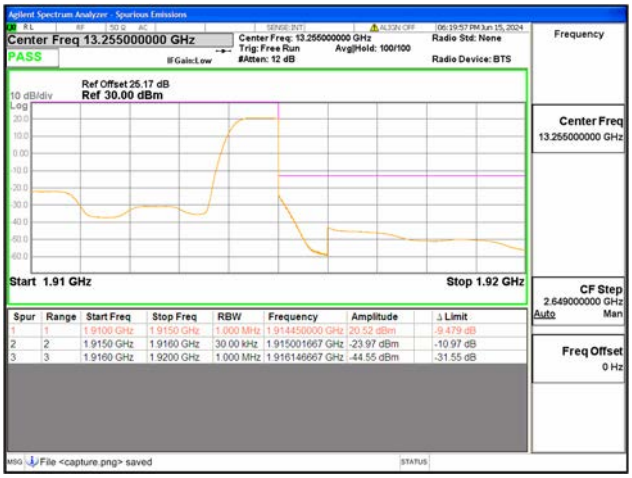
B25 / 3MHz / High CH / QPSK / 1 RB

B25 / 3MHz / High CH / QPSK / FULL RB

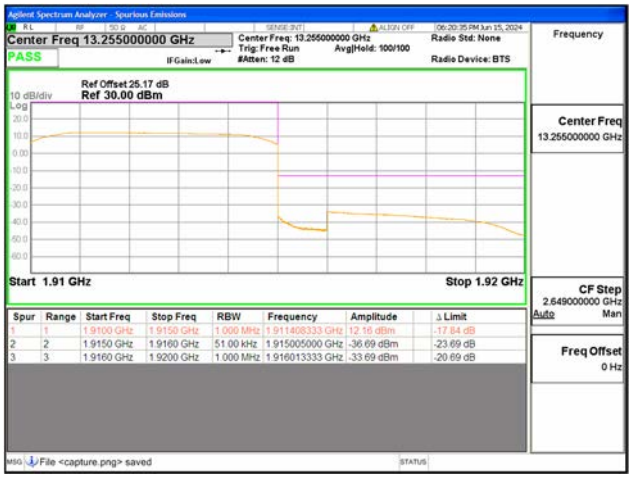
B25 / 5MHz / Low CH / QPSK / 1 RB



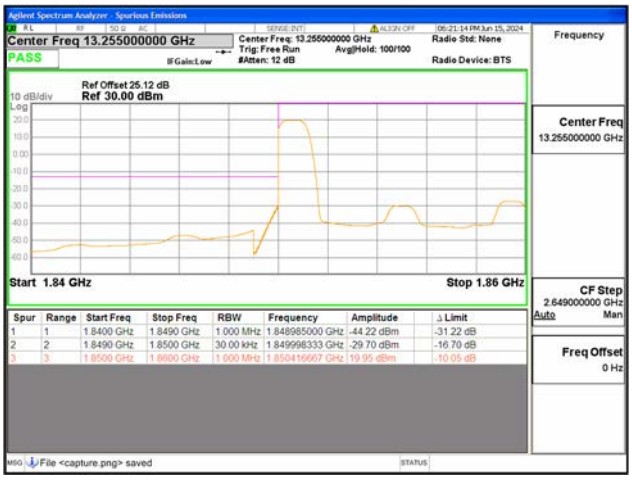
B25 / 5MHz / Low CH / QPSK / FULL RB



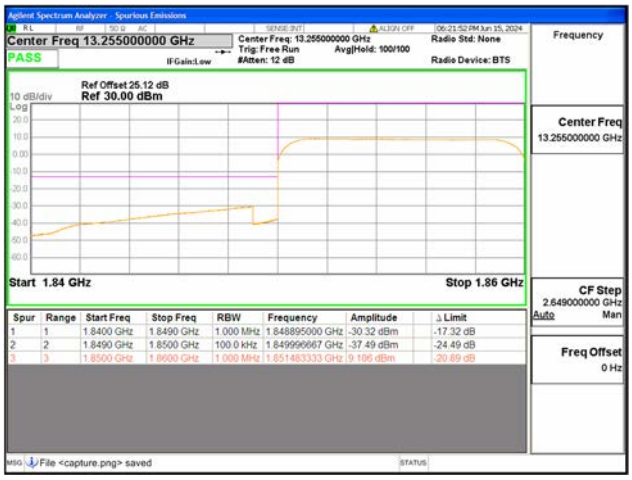
B25 / 5MHz / High CH / QPSK / 1 RB



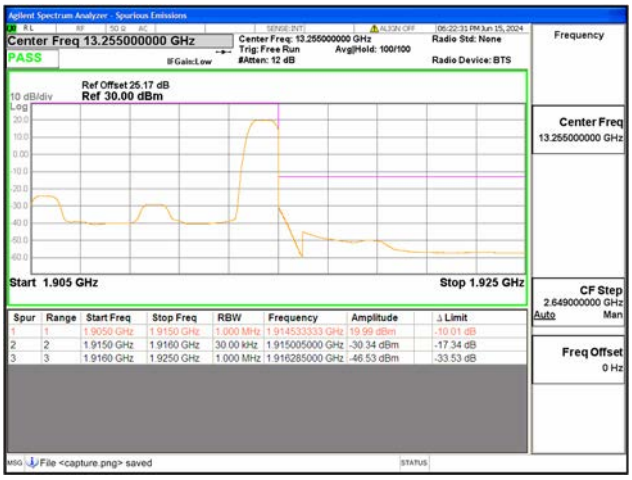
B25 / 5MHz / High CH / QPSK / FULL RB



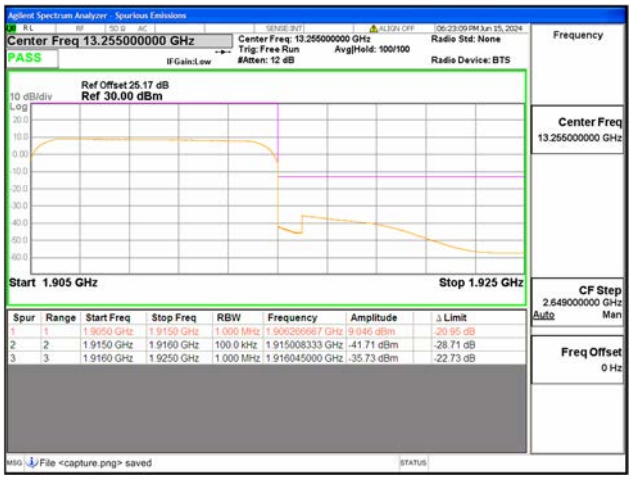
B25 / 10MHz / Low CH / QPSK / 1 RB



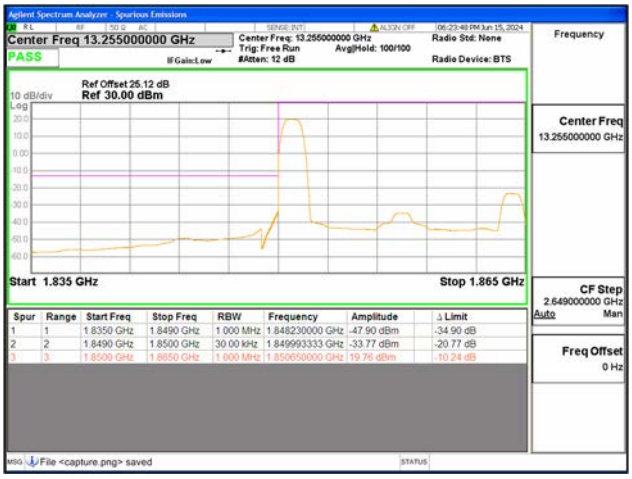
B25 / 10MHz / Low CH / QPSK / FULL RB



B25 / 10MHz / High CH / QPSK / 1 RB

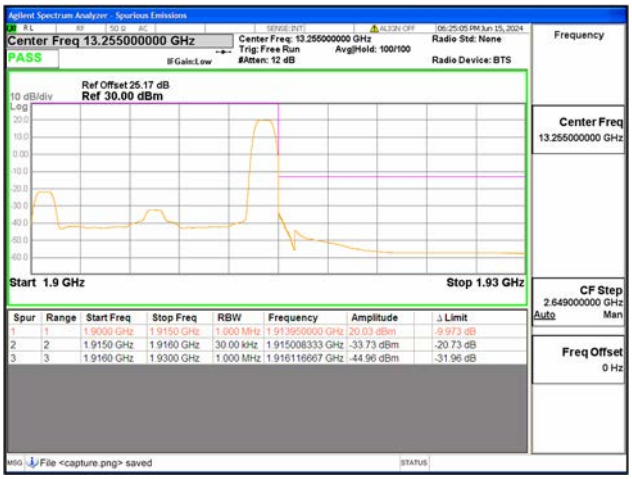


B25 / 10MHz / High CH / QPSK / FULL RB

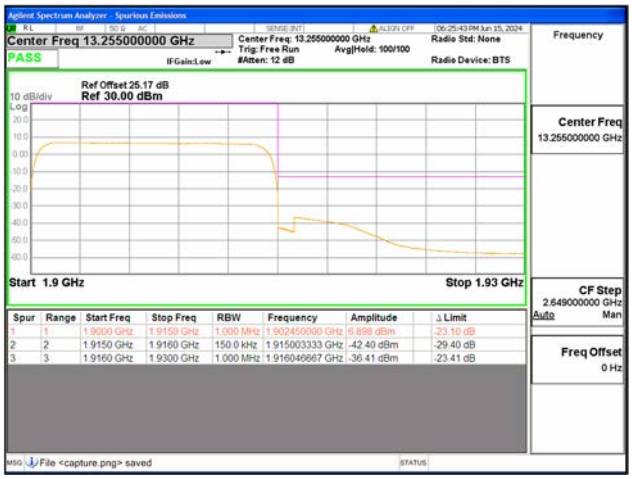


B25 / 15MHz / Low CH / QPSK / 1 RB

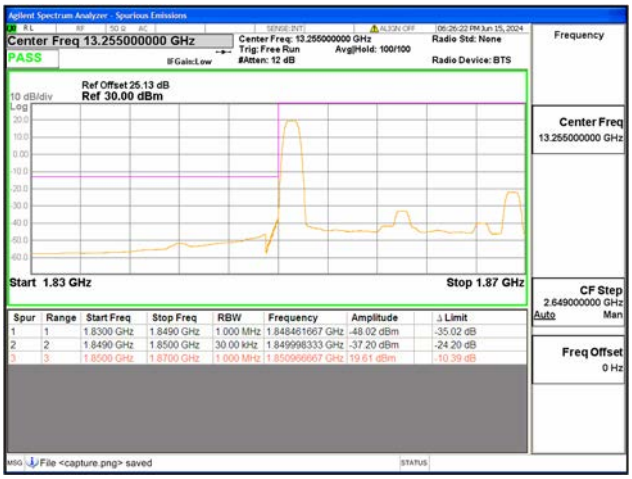
B25 / 15MHz / Low CH / QPSK / FULL RB



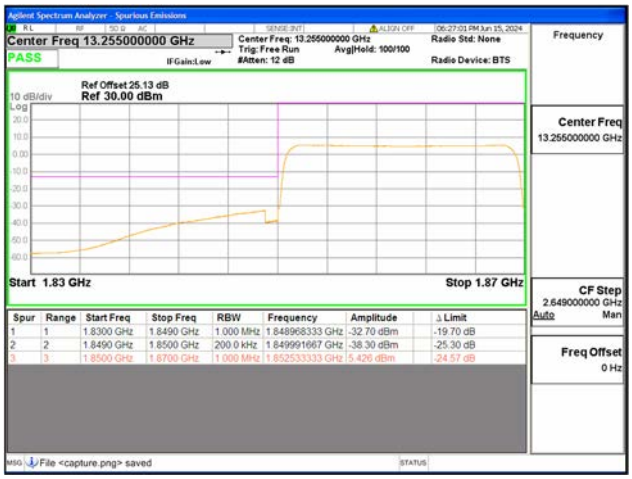
B25 / 15MHz / High CH / QPSK / 1 RB



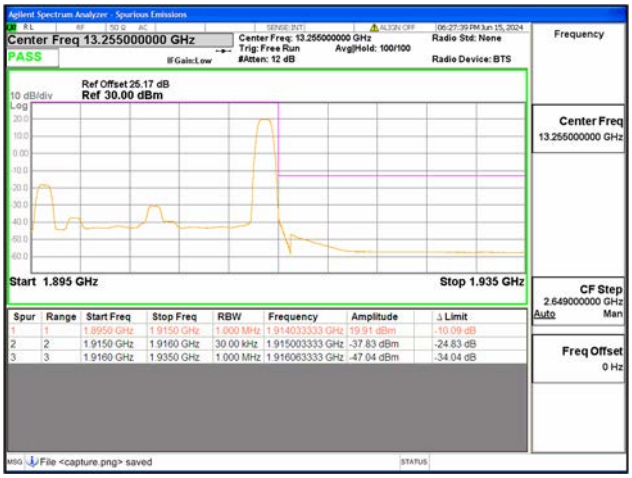
B25 / 15MHz / High CH / QPSK / FULL RB



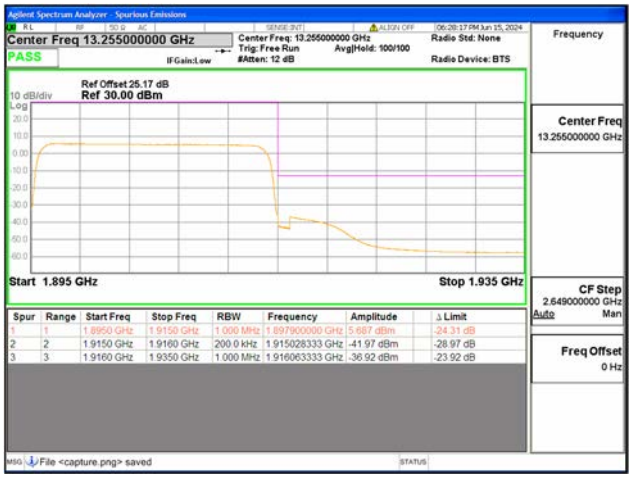
B25 / 20MHz / Low CH / QPSK / 1 RB



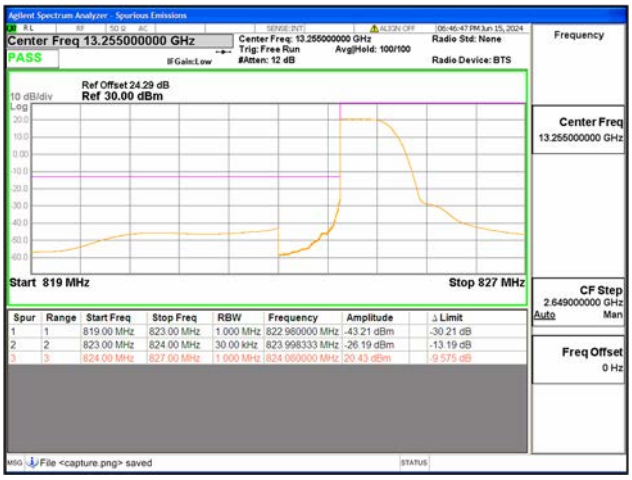
B25 / 20MHz / Low CH / QPSK / FULL RB



B25 / 20MHz / High CH / QPSK / 1 RB

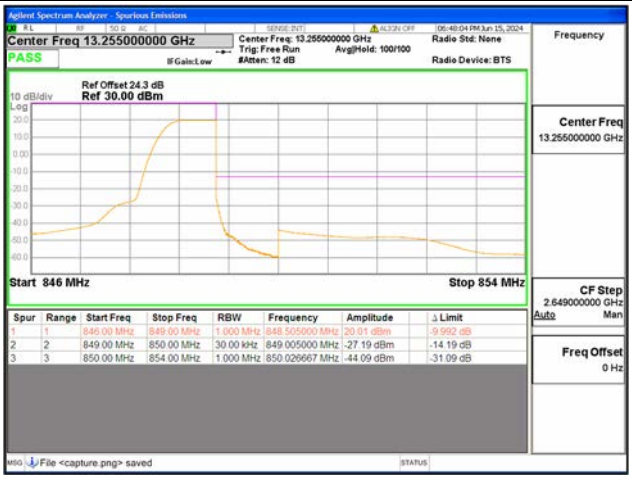


B25 / 20MHz / High CH / QPSK / FULL RB

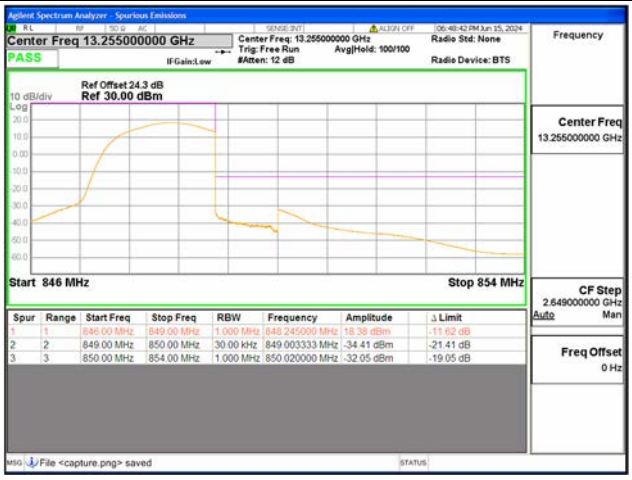


B26 Part22 / 1.4MHz / Low CH / QPSK / 1 RB

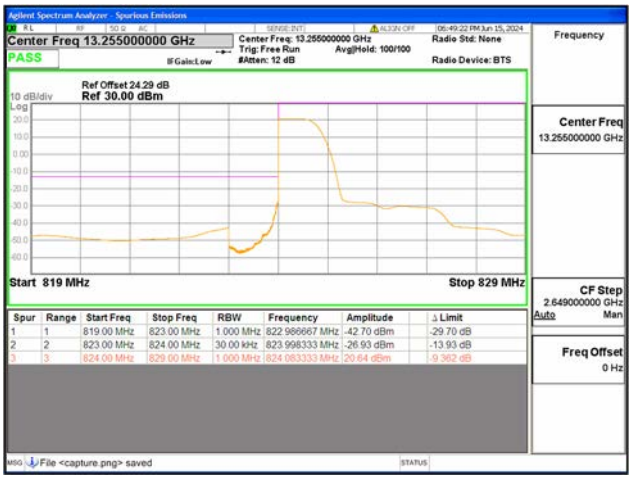
B26 Part22 / 1.4MHz / Low CH / QPSK / FULL RB



B26 Part22 / 1.4MHz / High CH / QPSK / 1 RB

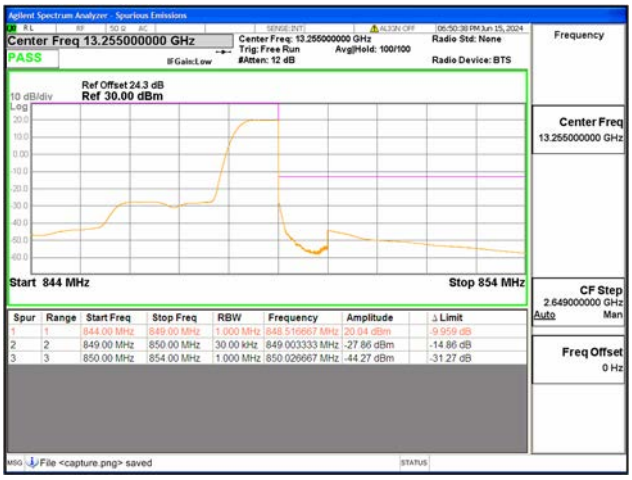


B26 Part22 / 1.4MHz / High CH / QPSK / FULL RB



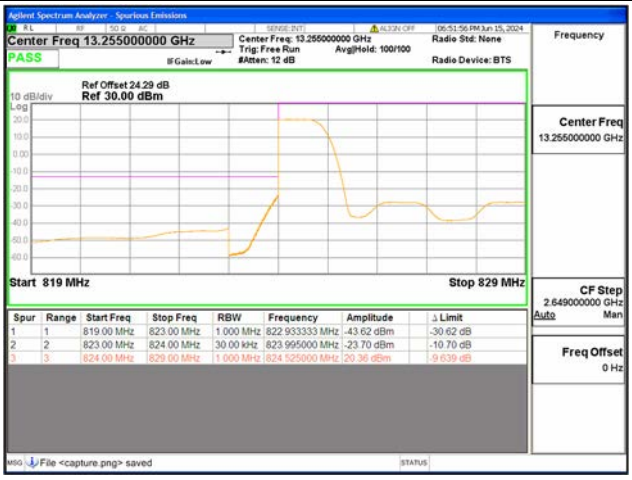
B26 Part22 / 3MHz / Low CH / QPSK / 1 RB

B26 Part22 / 3MHz / Low CH / QPSK / FULL RB

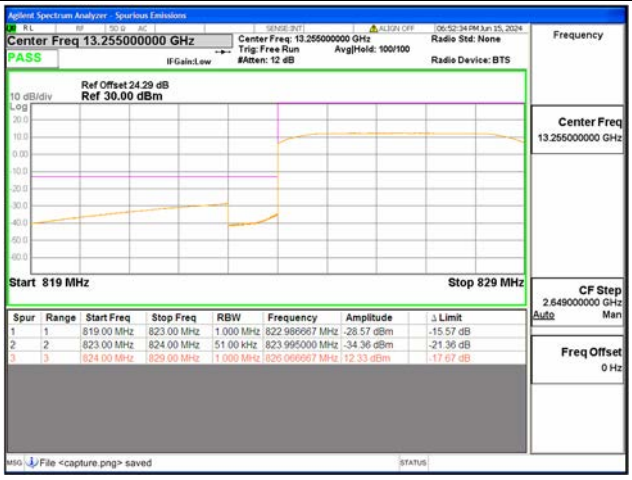


B26 Part22 / 3MHz / High CH / QPSK / 1 RB

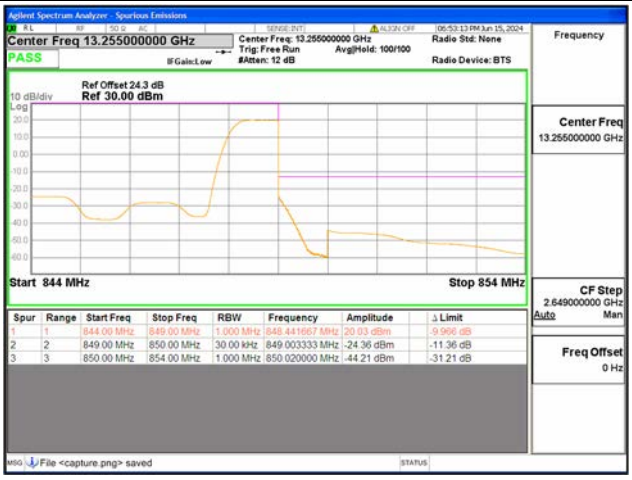
B26 Part22 / 3MHz / High CH / QPSK / FULL RB



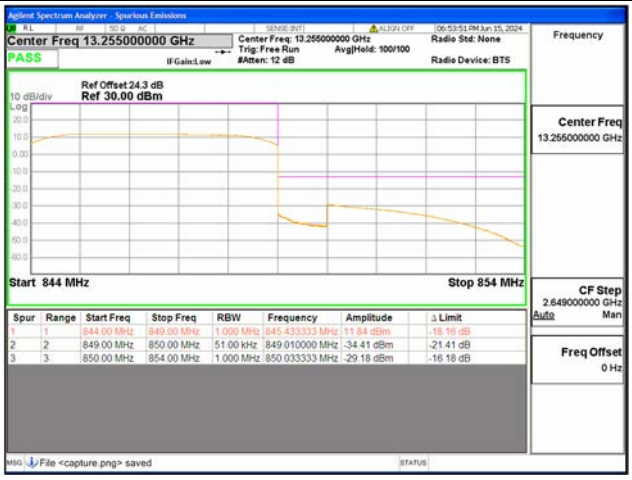
B26 Part22 / 5MHz / Low CH / QPSK / 1 RB



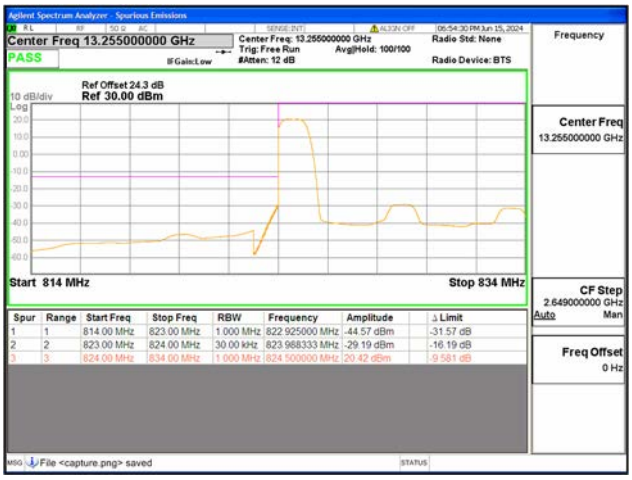
B26 Part22 / 5MHz / Low CH / QPSK / FULL RB



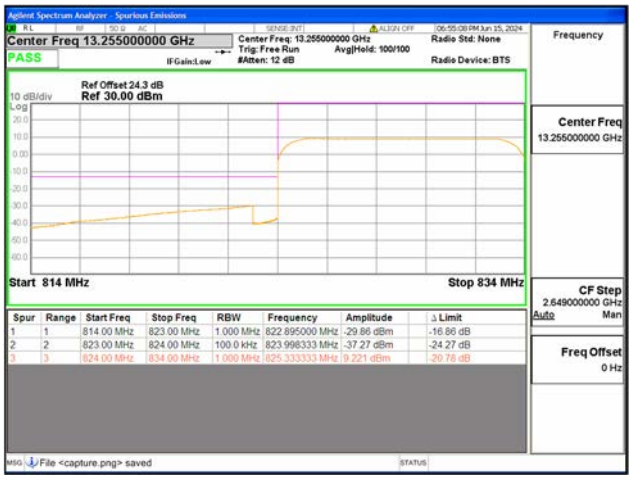
B26 Part22 / 5MHz / High CH / QPSK / 1 RB



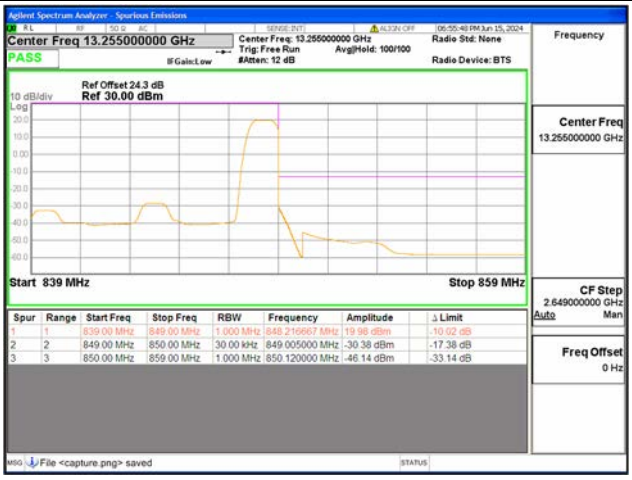
B26 Part22 / 5MHz / High CH / QPSK / FULL RB



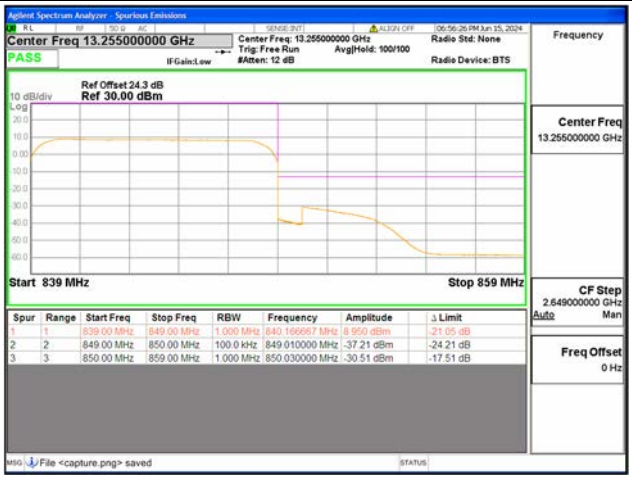
B26 Part22 / 10MHz / Low CH / QPSK / 1 RB



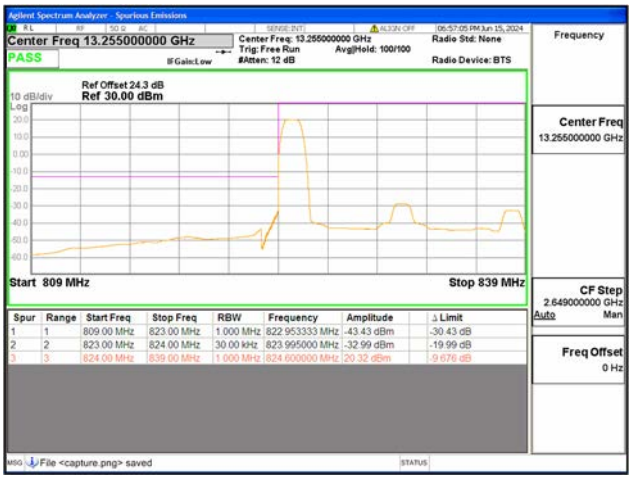
B26 Part22 / 10MHz / Low CH / QPSK / FULL RB



B26 Part22 / 10MHz / High CH / QPSK / 1 RB

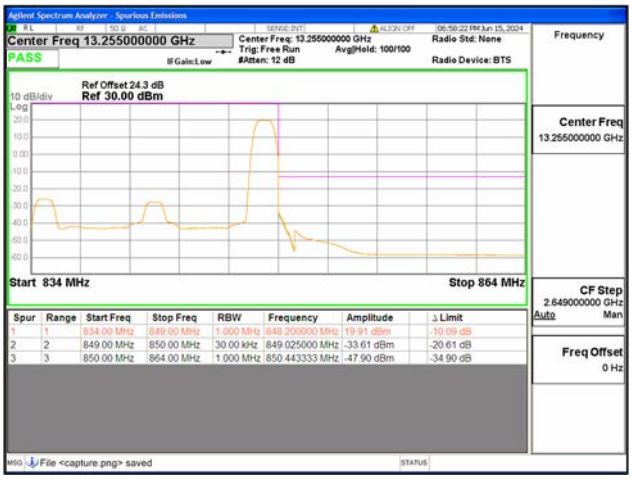


B26 Part22 / 10MHz / High CH / QPSK / FULL RB

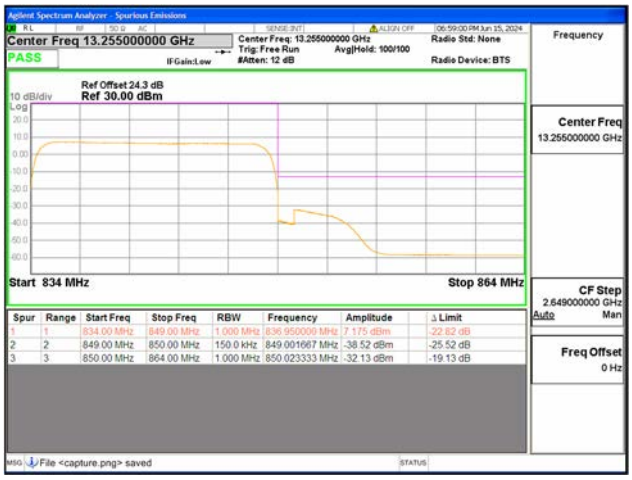


B26 Part22 / 15MHz / Low CH / QPSK / 1 RB

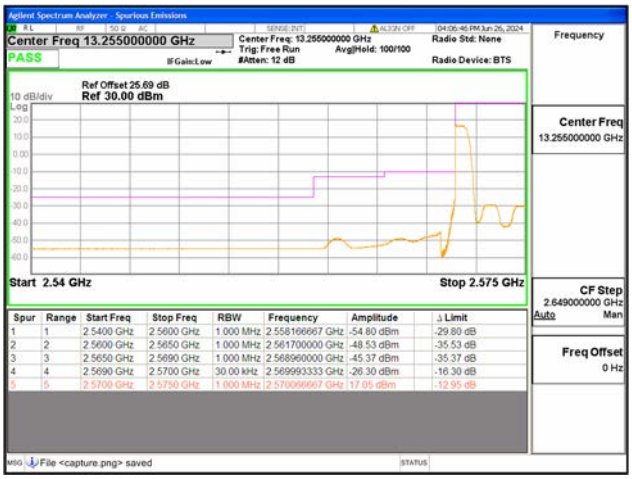
B26 Part22 / 15MHz / Low CH / QPSK / FULL RB



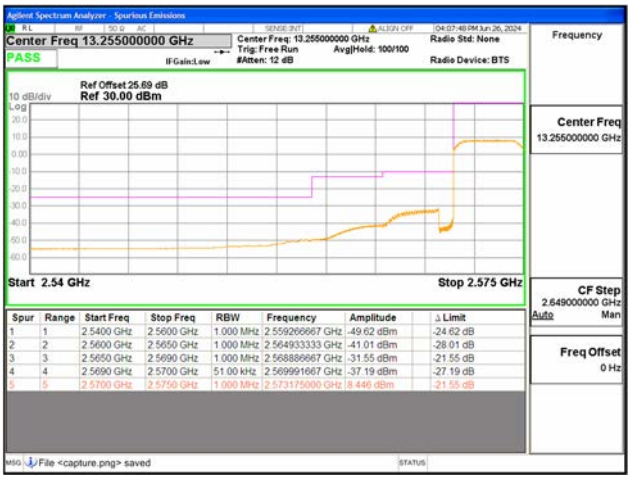
B26 Part22 / 15MHz / High CH / QPSK / 1 RB



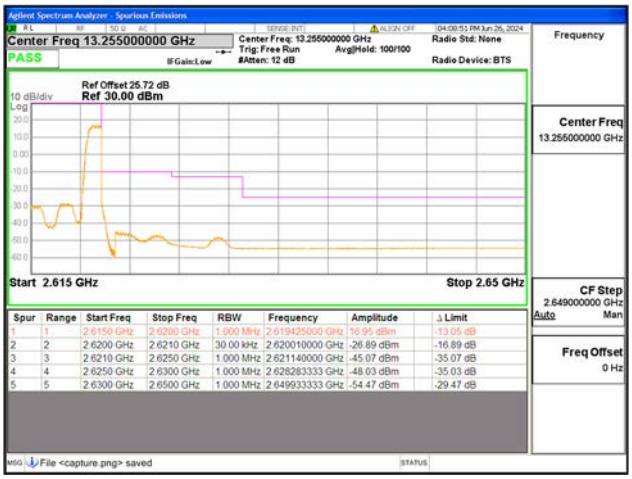
B26 Part22 / 15MHz / High CH / QPSK / FULL RB



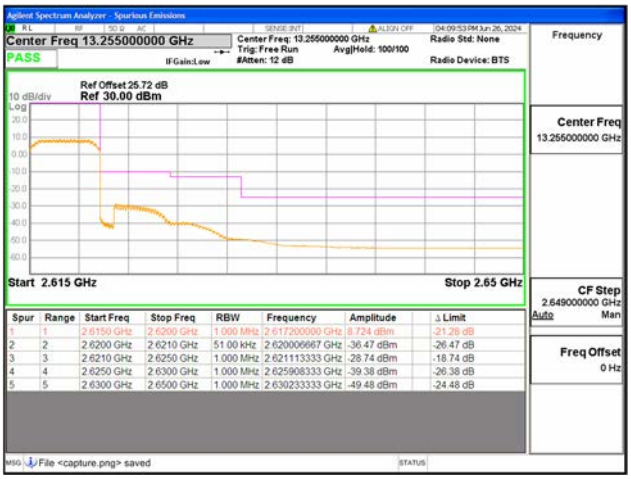
B38 / 5MHz / Low CH / QPSK / 1 RB



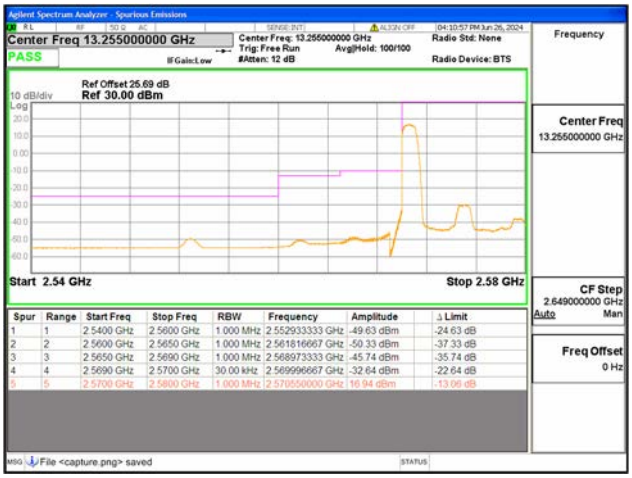
B38 / 5MHz / Low CH / QPSK / FULL RB



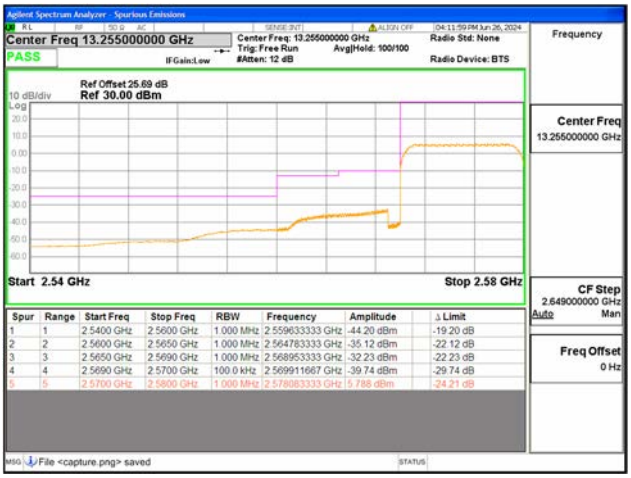
B38 / 5MHz / High CH / QPSK / 1 RB



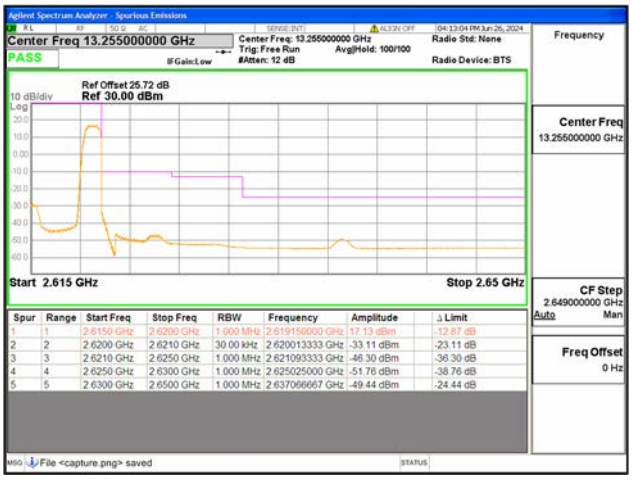
B38 / 5MHz / High CH / QPSK / FULL RB



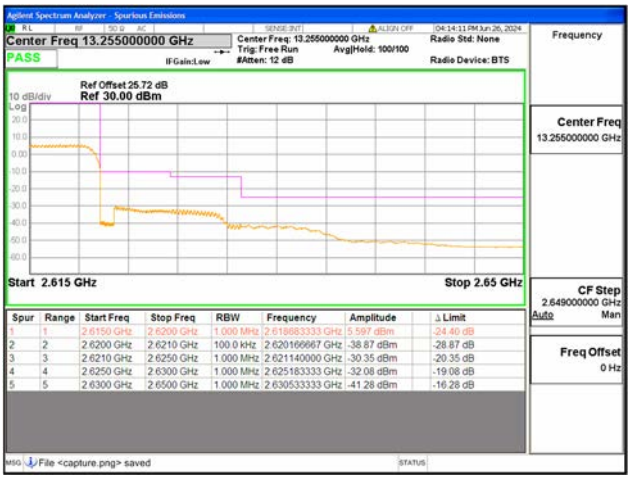
B38 / 10MHz / Low CH / QPSK / 1 RB



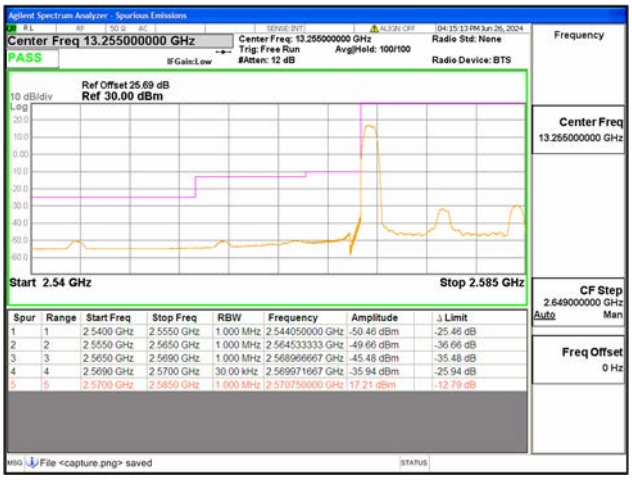
B38 / 10MHz / Low CH / QPSK / FULL RB



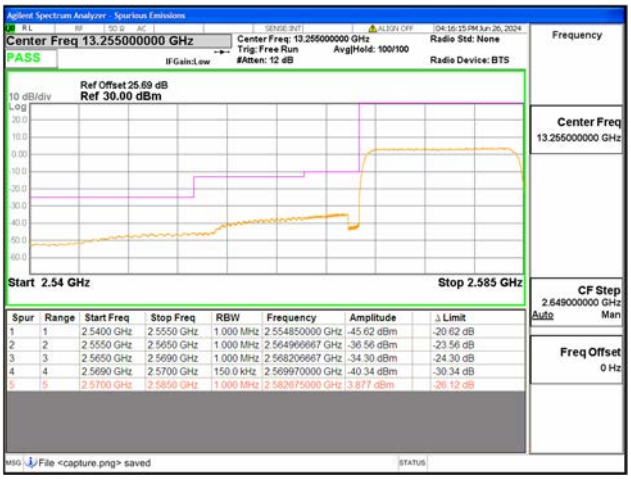
B38 / 10MHz / High CH / QPSK / 1 RB



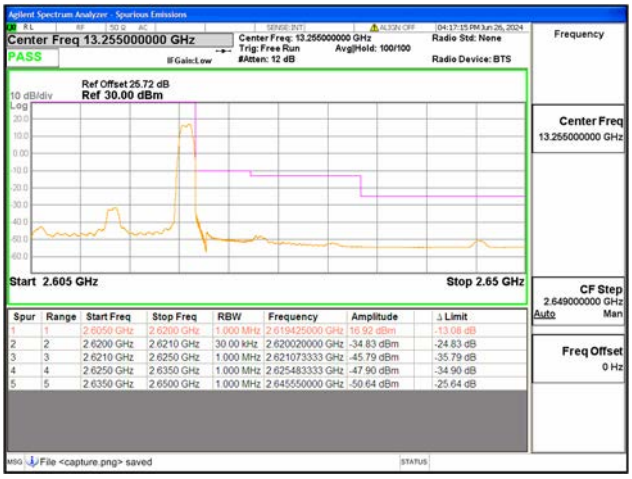
B38 / 10MHz / High CH / QPSK / FULL RB



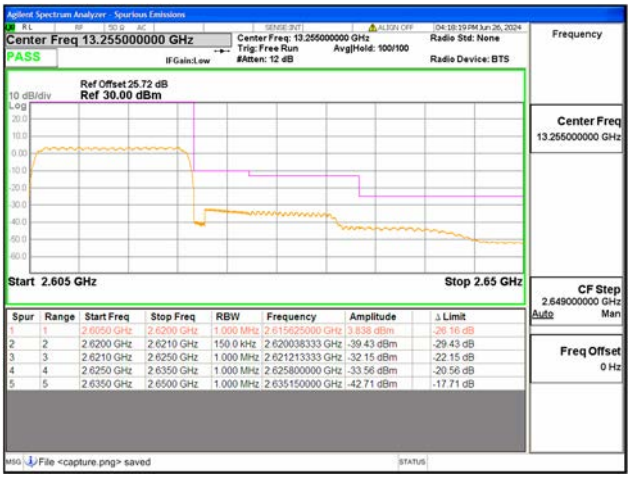
B38 / 15MHz / Low CH / QPSK / 1 RB



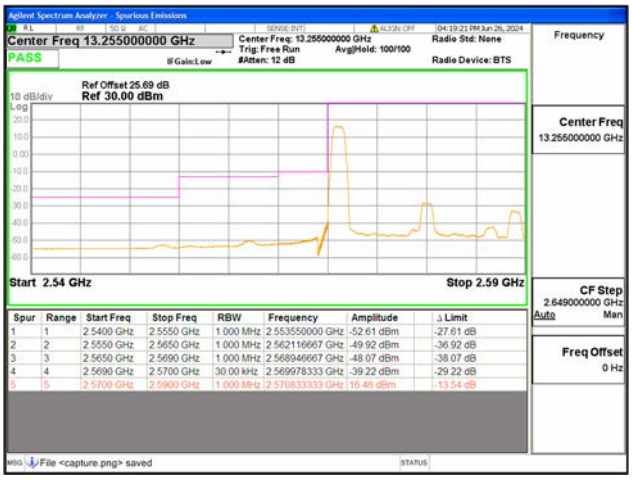
B38 / 15MHz / Low CH / QPSK / FULL RB



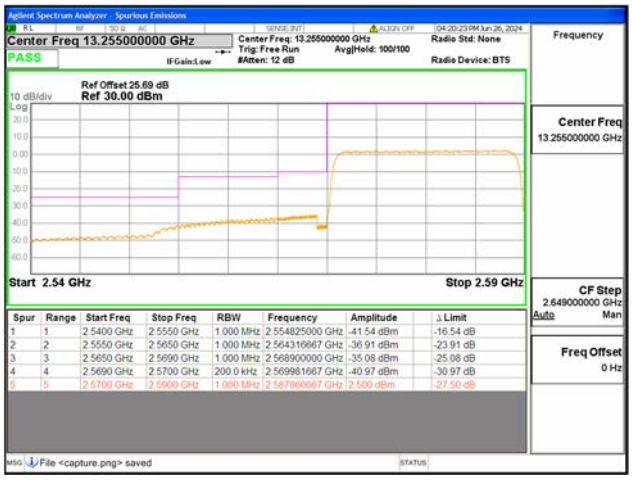
B38 / 15MHz / High CH / QPSK / 1 RB



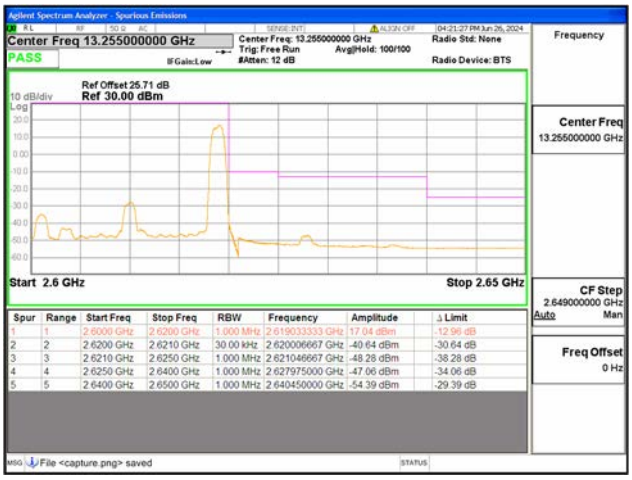
B38 / 15MHz / High CH / QPSK / FULL RB



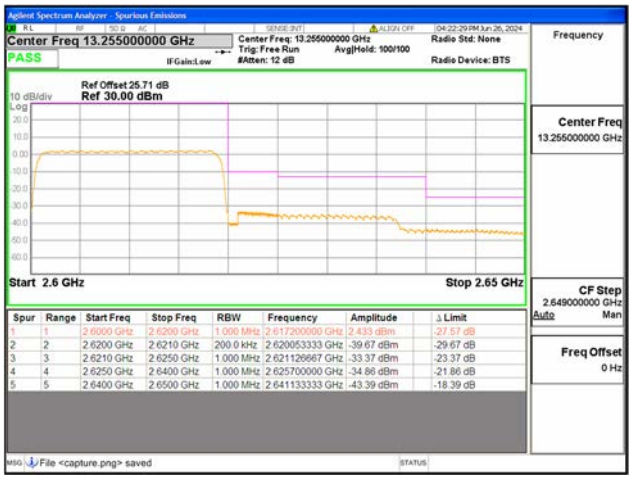
B38 / 20MHz / Low CH / QPSK / 1 RB



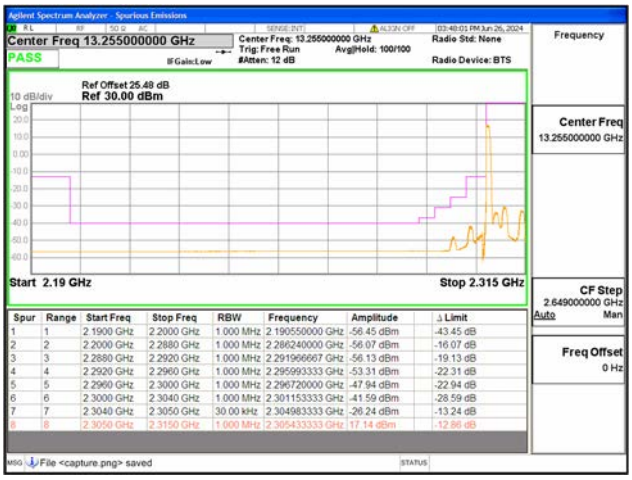
B38 / 20MHz / Low CH / QPSK / FULL RB



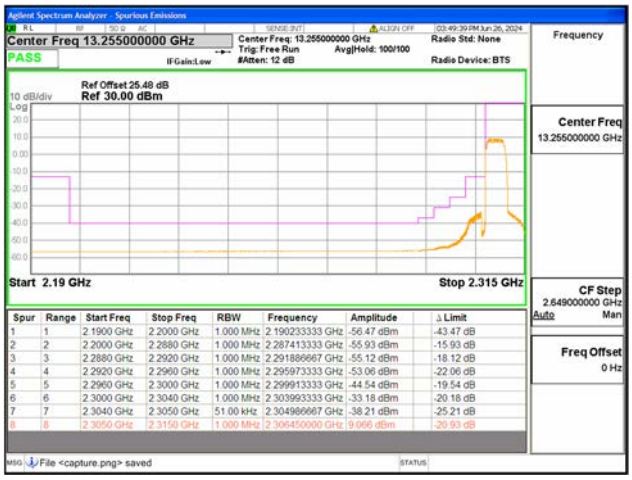
B38 / 20MHz / High CH / QPSK / 1 RB



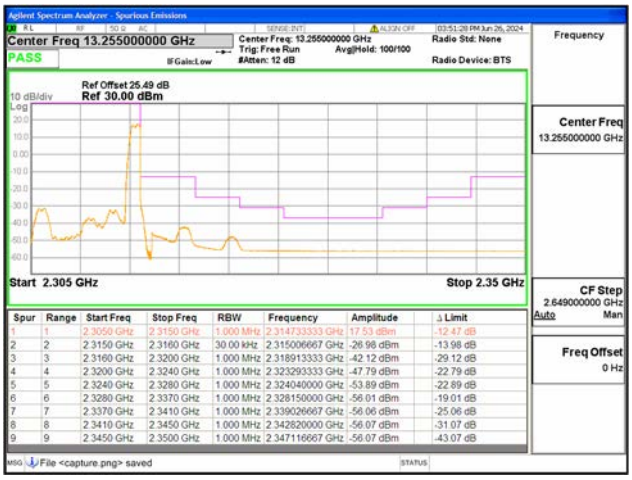
B38 / 20MHz / High CH / QPSK / FULL RB



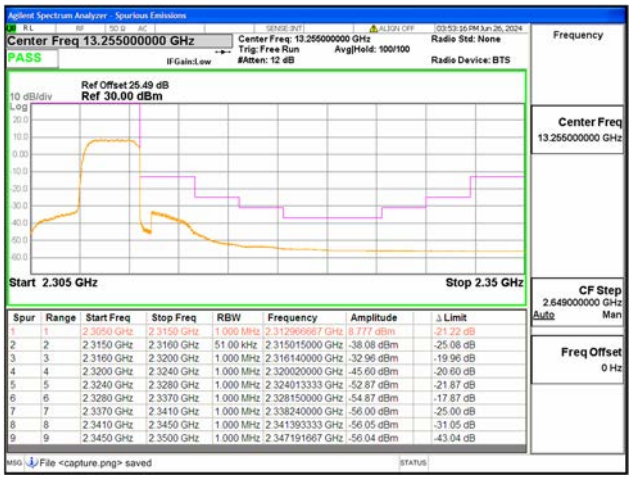
B40-1 / 5MHz / Low CH / QPSK / 1 RB



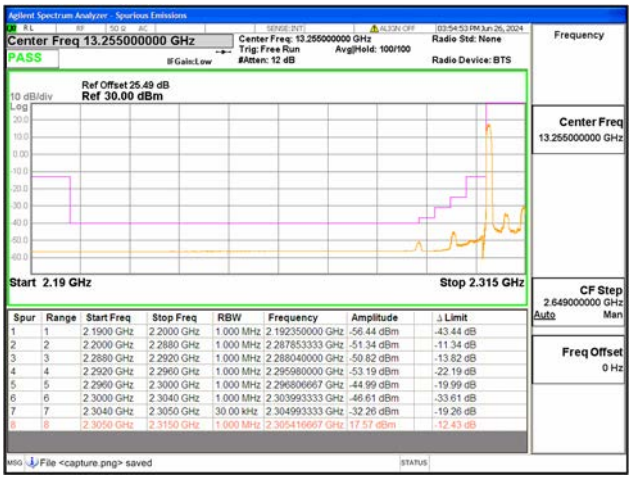
B40-1 / 5MHz / Low CH / QPSK / FULL RB



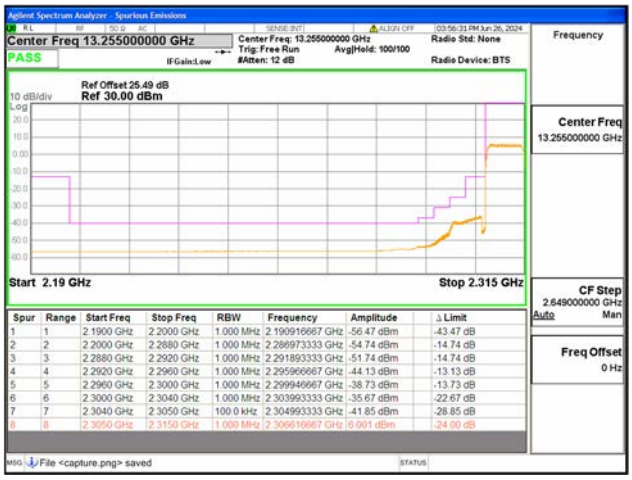
B40-1 / 5MHz / High CH / QPSK / 1 RB



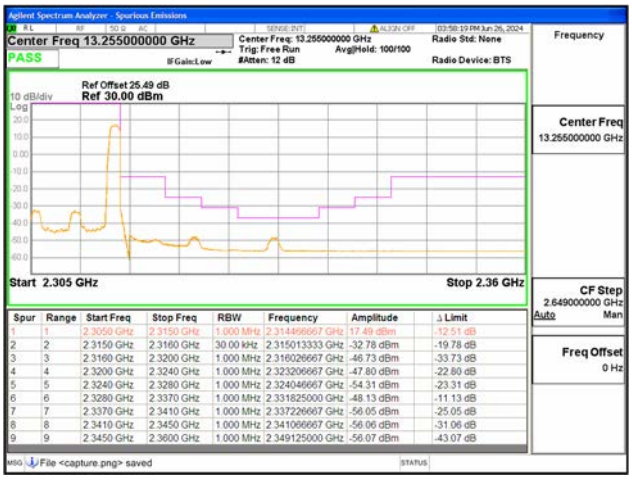
B40-1 / 5MHz / High CH / QPSK / FULL RB



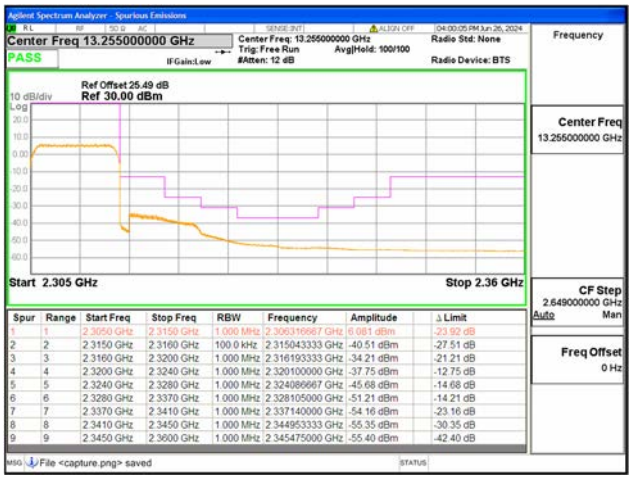
B40-1 / 10MHz / Low CH / QPSK / 1 RB



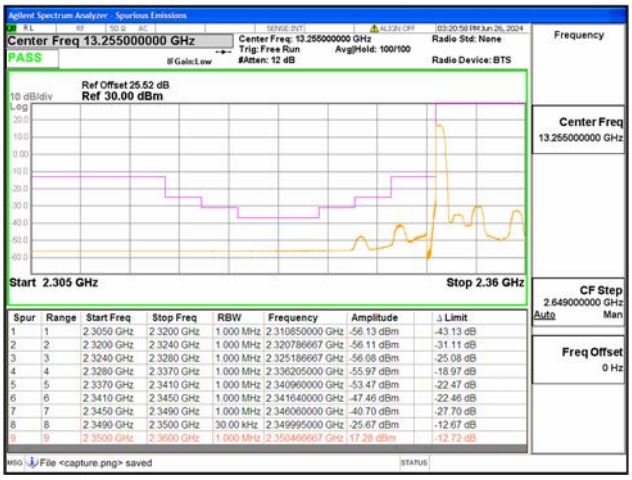
B40-1 / 10MHz / Low CH / QPSK / FULL RB



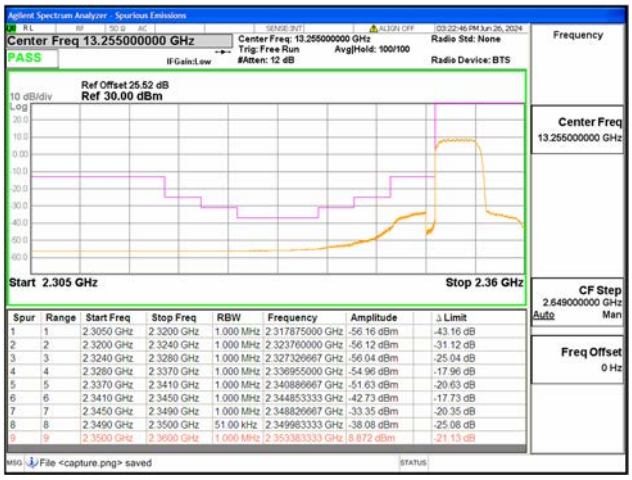
B40-1 / 10MHz / High CH / QPSK / 1 RB



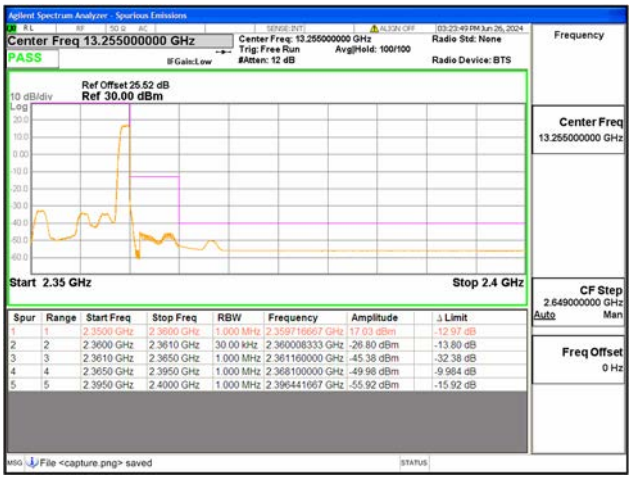
B40-1 / 10MHz / High CH / QPSK / FULL RB



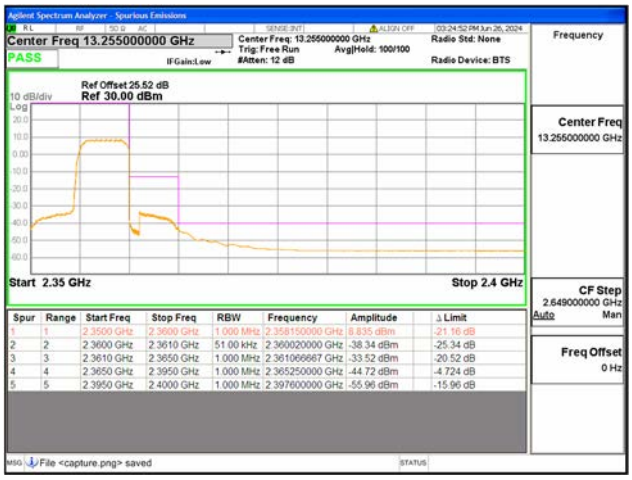
B40-2 / 5MHz / Low CH / QPSK / 1 RB



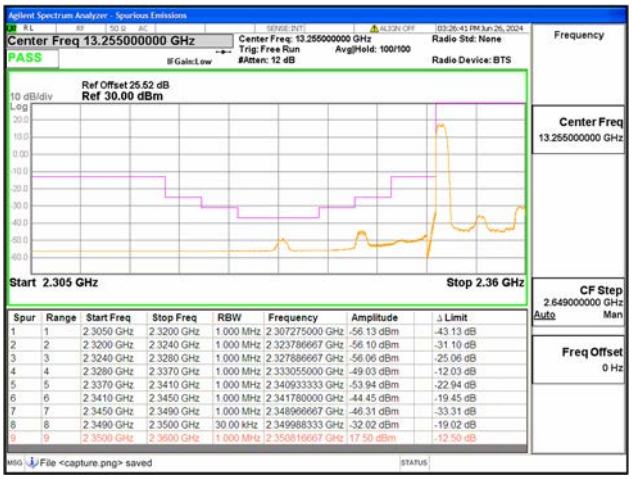
B40-2 / 5MHz / Low CH / QPSK / FULL RB



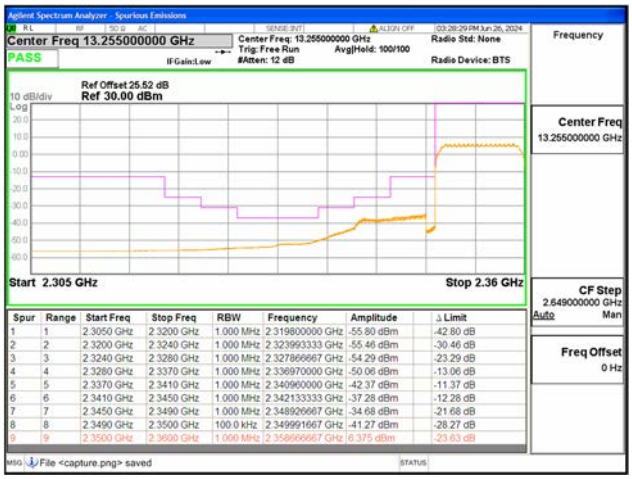
B40-2 / 5MHz / High CH / QPSK / 1 RB



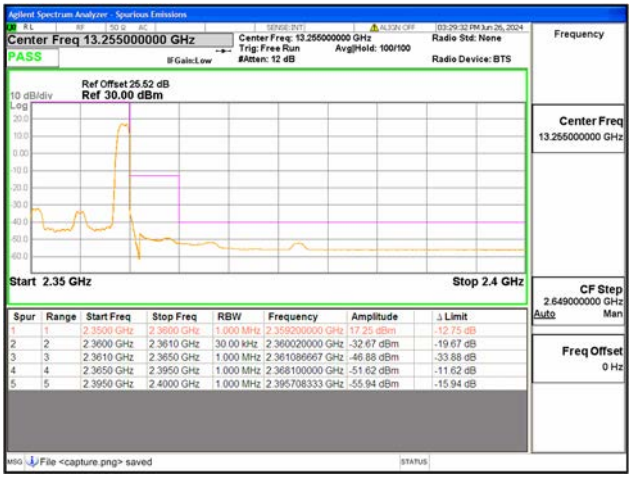
B40-2 / 5MHz / High CH / QPSK / FULL RB



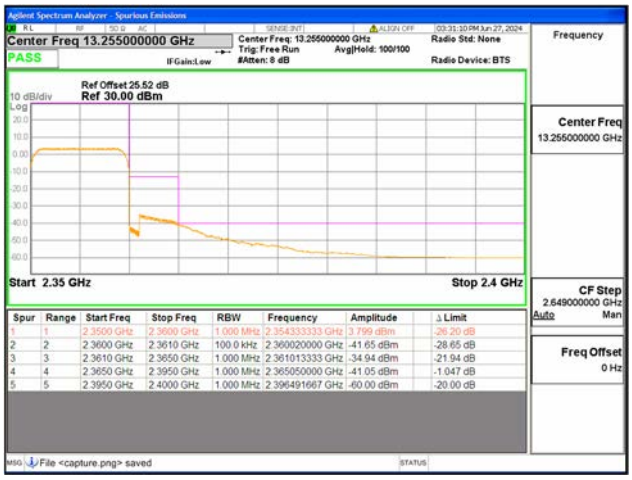
B40-2 / 10MHz / Low CH / QPSK / 1 RB



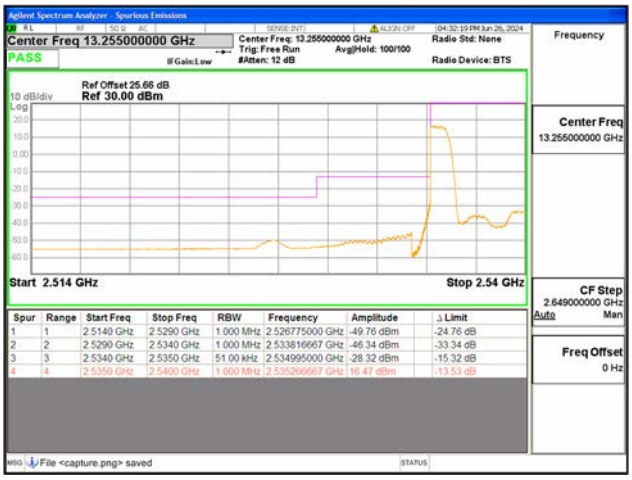
B40-2 / 10MHz / Low CH / QPSK / FULL RB



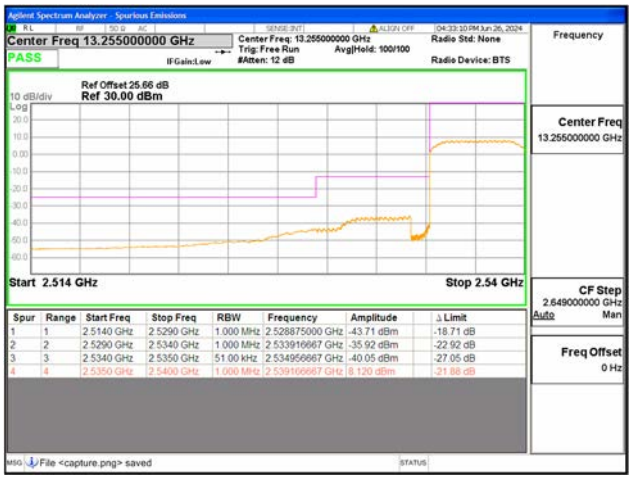
B40-2 / 10MHz / High CH / QPSK / 1 RB



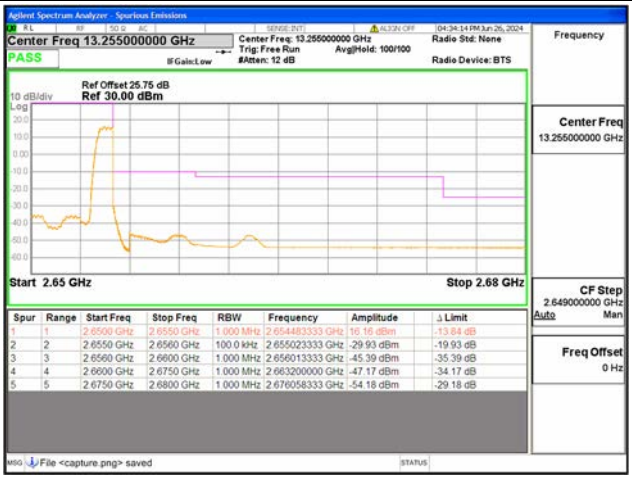
B40-2 / 10MHz / High CH / QPSK / FULL RB



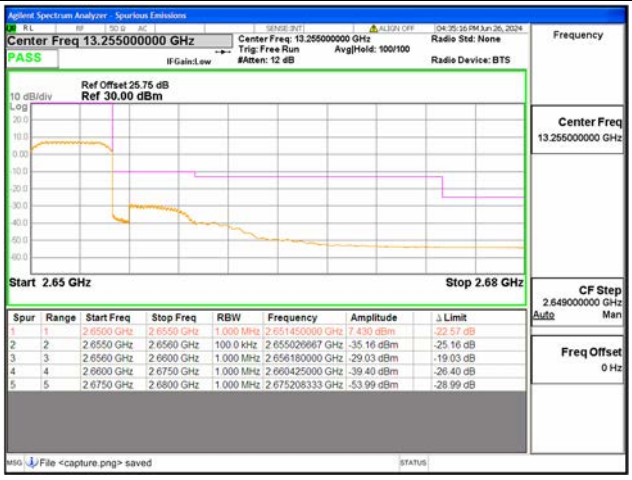
B41(2535-2655) / 5MHz / Low CH / QPSK / 1 RB



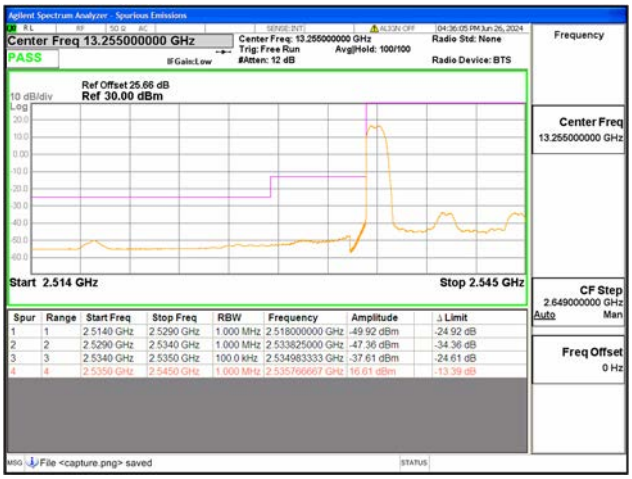
B41(2535-2655) / 5MHz / Low CH / QPSK / FULL RB



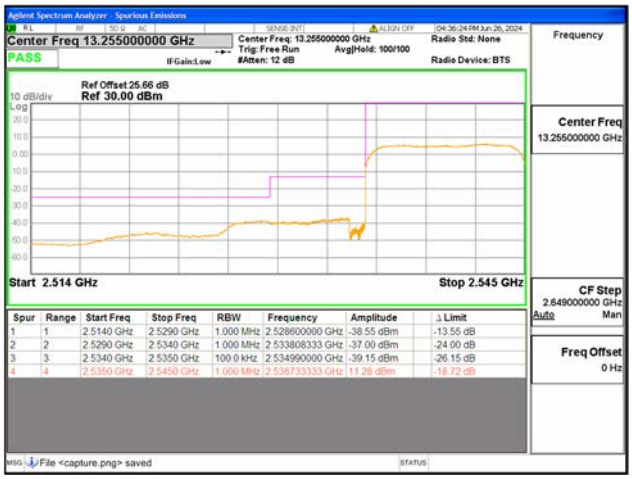
B41(2535-2655) / 5MHz / High CH / QPSK / 1 RB



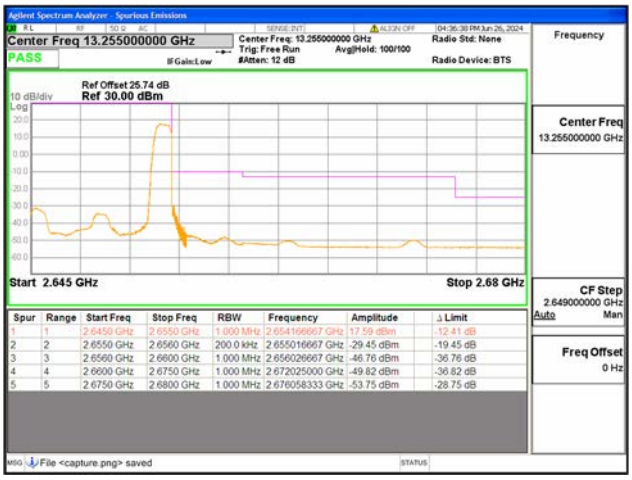
B41(2535-2655) / 5MHz / High CH / QPSK / FULL RB



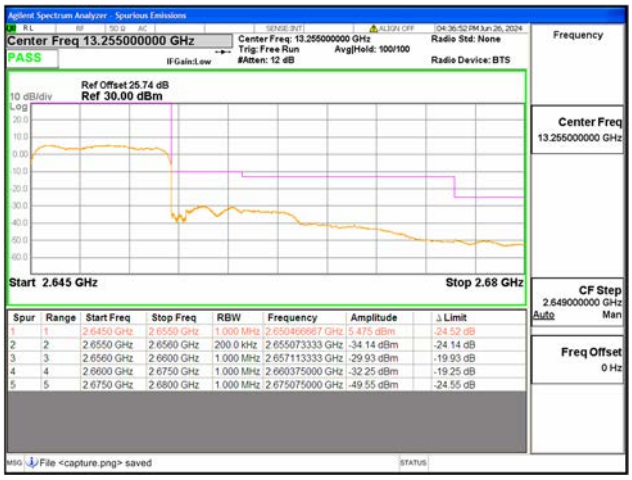
B41(2535-2655) / 10MHz / Low CH / QPSK / 1 RB



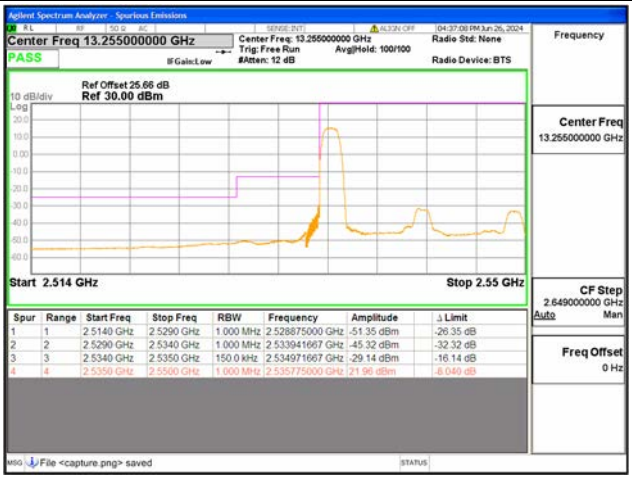
B41(2535-2655) / 10MHz / Low CH / QPSK / FULL RB



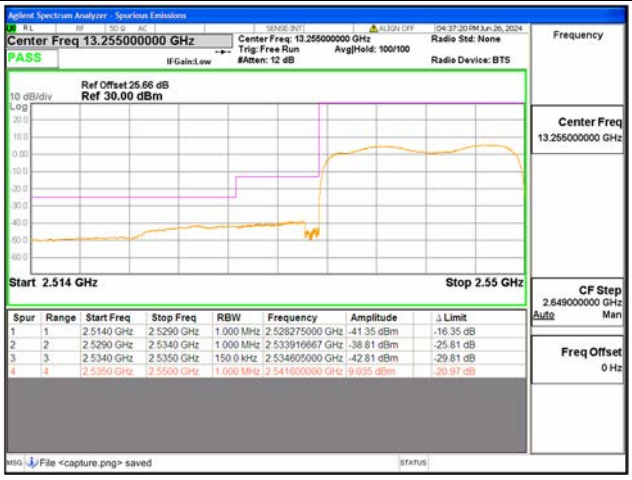
B41(2535-2655) / 10MHz / High CH / QPSK / 1 RB



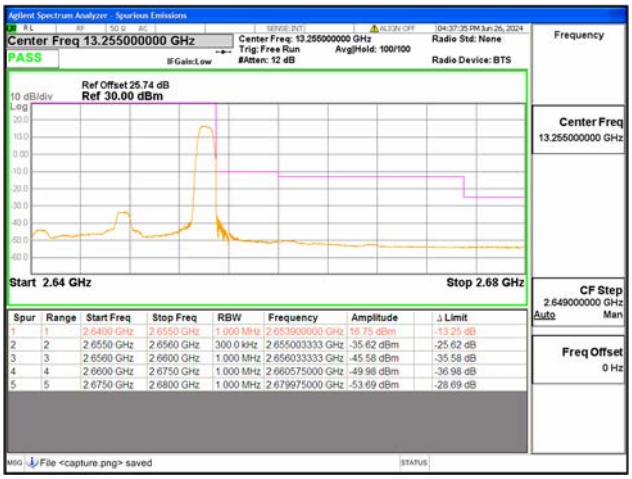
B41(2535-2655) / 10MHz / High CH / QPSK / FULL RB



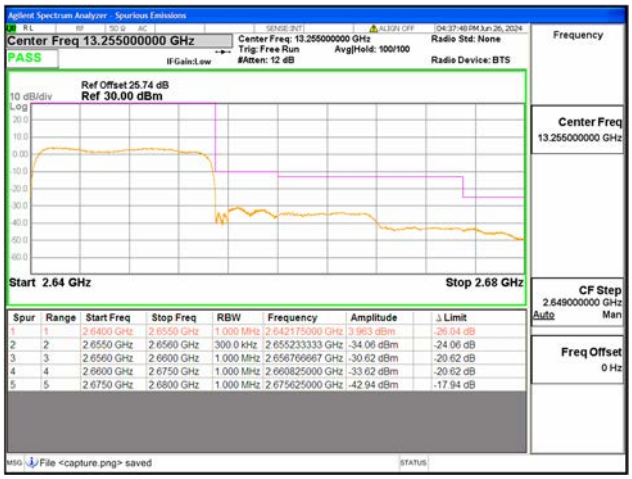
B41(2535-2655) / 15MHz / Low CH / QPSK / 1 RB



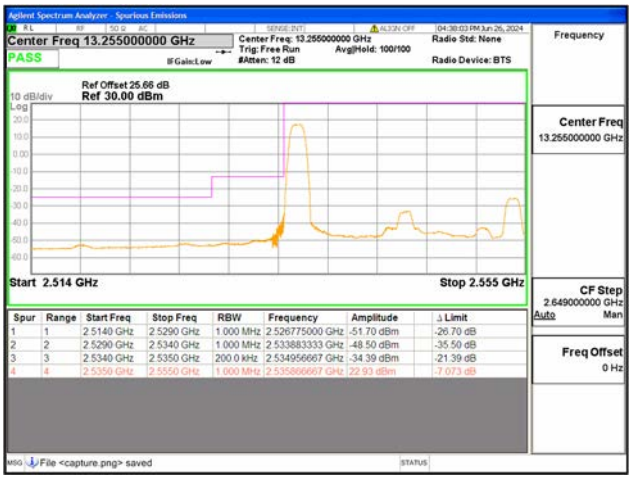
B41(2535-2655) / 15MHz / Low CH / QPSK / FULL RB



B41(2535-2655) / 15MHz / High CH / QPSK / 1 RB

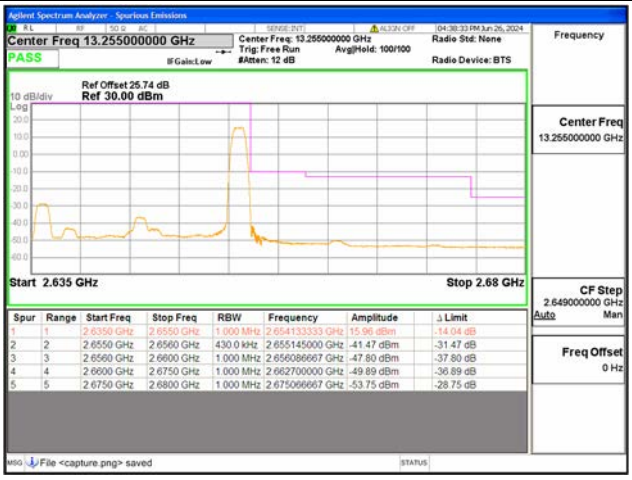


B41(2535-2655) / 15MHz / High CH / QPSK / FULL RB

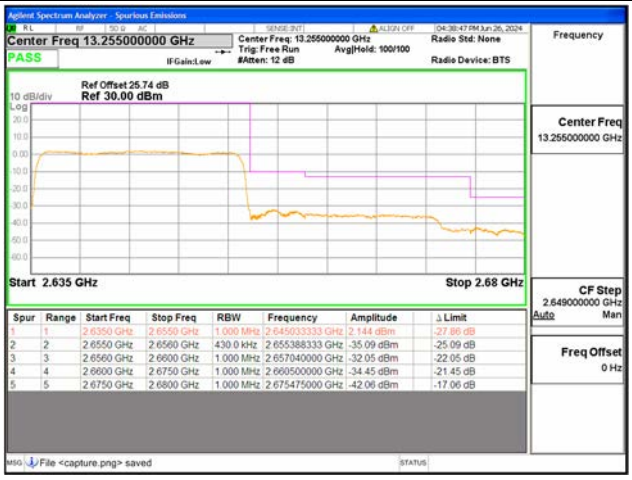


B41(2535-2655) / 20MHz / Low CH / QPSK / 1 RB

B41(2535-2655) / 20MHz / Low CH / QPSK / FULL RB



B41(2535-2655) / 20MHz / High CH / QPSK / 1 RB



B41(2535-2655) / 20MHz / High CH / QPSK / FULL RB

2.7. Radiated Spurious Emissions

2.7.1. Requirement

According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

Additional requirement for LTE Band 7, 38, 41

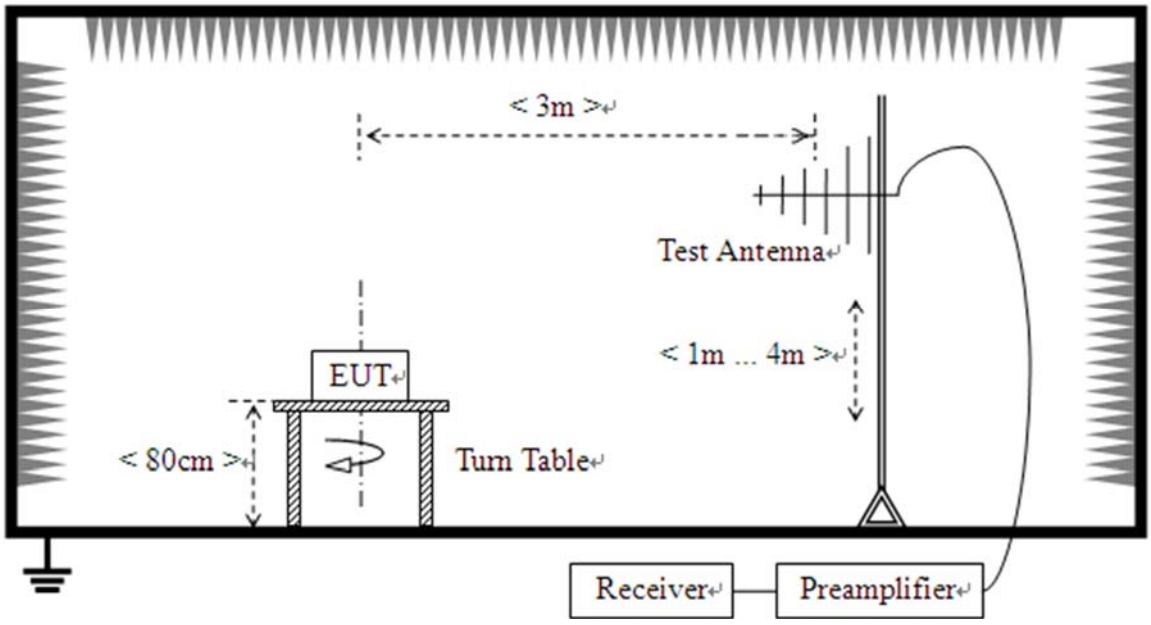
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 55 + 10 log(P) dB. This calculated to be -25dBm.

Additional requirement for Band 13

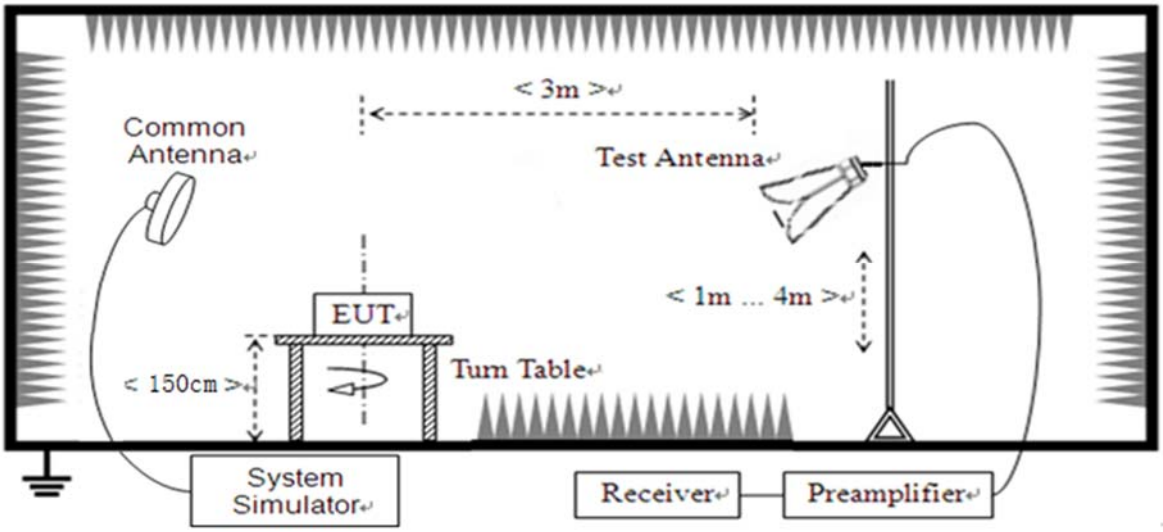
For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (E.I.R.P.) for wideband signals, and −80 dBW E.I.R.P. for discrete emissions of less than 700 Hz bandwidth. This calculated to be -40dBm.

Additional requirement for LTE Band 40
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 70 + 10 log (P) dB. This calculated to be -40dBm.

2.7.2. Test Description



(For the test frequency from 30MHz to1GHz)



(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test

Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360°to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

Note: When doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

2.7.3. Test Procedure

KDB 971168 D01v03 Section 5.8 and ANSI/TIA-603-E-2016.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements.

For measurements above 1GHz (exclude 1559-1610 MHz) the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements.

2.7.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

The substitution corrections are obtained as described below:

$A_{SUBST} = P_{SUBST_TX} - P_{SUBST_RX} - L_{SUBST_CABLES} + G_{SUBST_TX_ANT}$

$A_{TOT} = L_{CABLES} + A_{SUBST}$

Where A_{SUBST} is the final substitution correction including receive antenna gain.

P_{SUBST_TX} is signal generator level,

P_{SUBST_RX} is receiver level,

L_{SUBST_CABLES} is cable losses including TX cable,

$G_{SUBST_TX_ANT}$ is substitution antenna gain.

A_{TOT} is total correction factor including cable loss and substitution correction

During the test, the data of A_{TOT} was added in the test spectrum analyze, so spectrum analyze reading is the final values which contain the data of A_{TOT}.

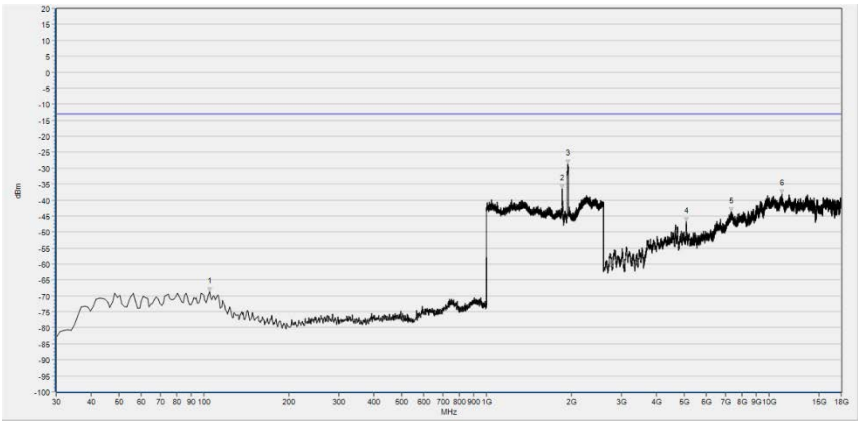
Note1: The power of the EUT transmitting frequency should be ignored.

Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

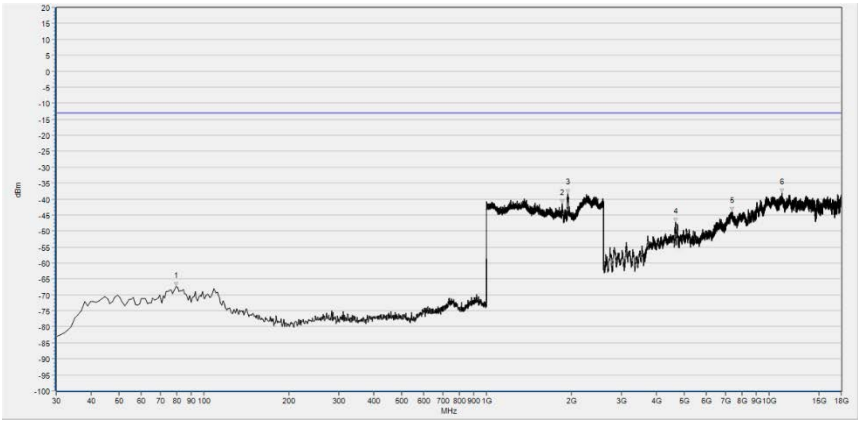
Note3: All bandwidth and modulation were considered and evaluated respectively by performing full test for each band, only the worst cases (Max Bandwidth and QPSK mode) were recorded in this test report.

Note 4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

LTE Band 2, 20MHz BW, Low Channel, QPSK

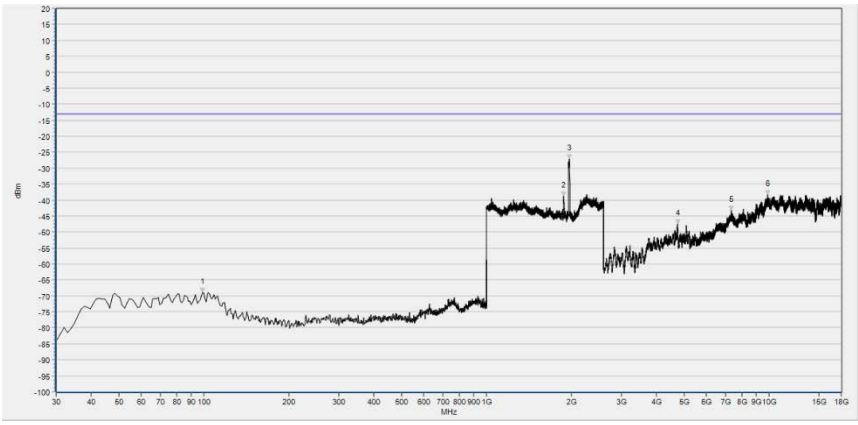


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	104.690	-68.74	-13.00	Horizontal	PASS
2	1851.541	-36.61	-13.00	Horizontal	N/A
3	1941.176	-28.70	-13.00	Horizontal	N/A
4	5092.453	-46.74	-13.00	Horizontal	PASS
5	7330.060	-43.75	-13.00	Horizontal	PASS
6	11085.543	-38.04	-13.00	Horizontal	PASS

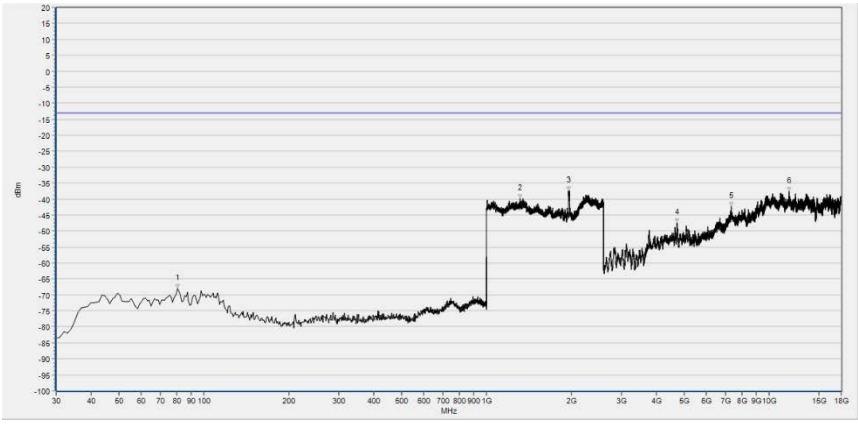


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	79.470	-67.31	-13.00	Vertical	PASS
2	1854.742	-41.53	-13.00	Vertical	N/A
3	1945.018	-38.22	-13.00	Vertical	N/A
4	4658.374	-47.21	-13.00	Vertical	PASS
5	7400.073	-44.01	-13.00	Vertical	PASS
6	11093.944	-38.02	-13.00	Vertical	PASS

LTE Band 2, 20MHz BW, Mid Channel, QPSK

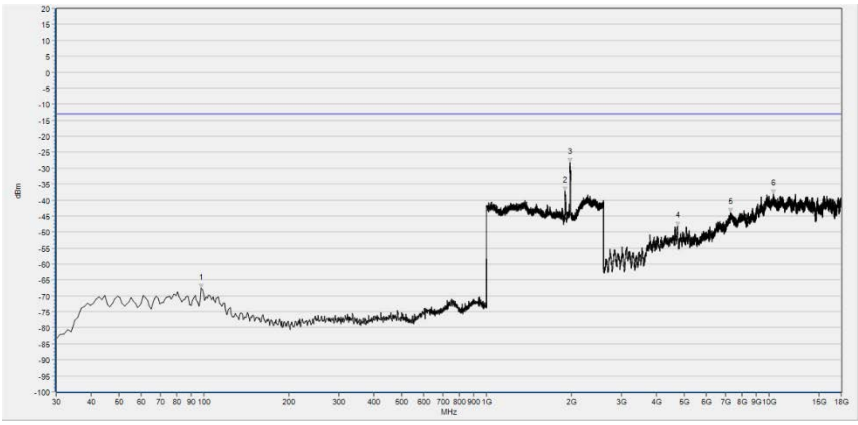


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	98.870	-69.04	-13.00	Horizontal	PASS
2	1876.511	-38.68	-13.00	Horizontal	N/A
3	1962.305	-27.24	-13.00	Horizontal	N/A
4	4739.589	-47.58	-13.00	Horizontal	PASS
5	7366.467	-43.29	-13.00	Horizontal	PASS
6	9909.329	-38.25	-13.00	Horizontal	PASS

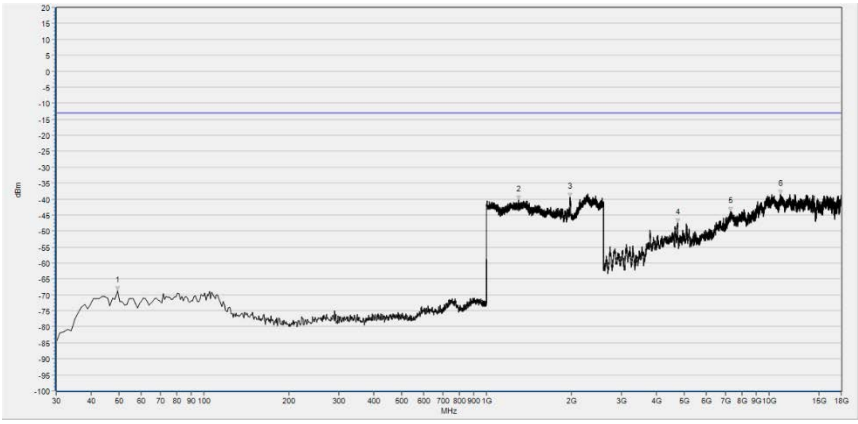


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-68.04	-13.00	Vertical	PASS
2	1314.366	-39.81	-13.00	Vertical	PASS
3	1952.061	-37.33	-13.00	Vertical	N/A
4	4728.387	-47.45	-13.00	Vertical	PASS
5	7352.464	-42.33	-13.00	Vertical	PASS
6	11777.269	-37.71	-13.00	Vertical	PASS

LTE Band 2, 20MHz BW, High Channel, QPSK

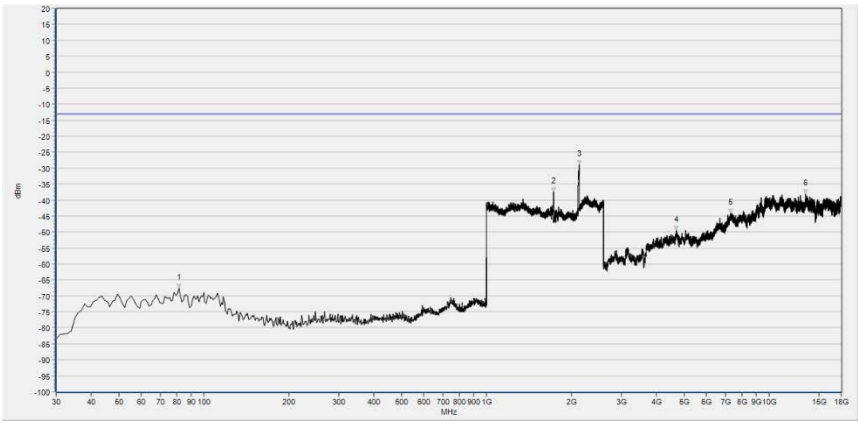


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	97.900	-67.63	-13.00	Horizontal	PASS
2	1899.560	-37.17	-13.00	Horizontal	N/A
3	1971.269	-28.23	-13.00	Horizontal	N/A
4	4739.589	-48.25	-13.00	Horizontal	PASS
5	7307.656	-43.92	-13.00	Horizontal	PASS
6	10349.009	-38.00	-13.00	Horizontal	PASS

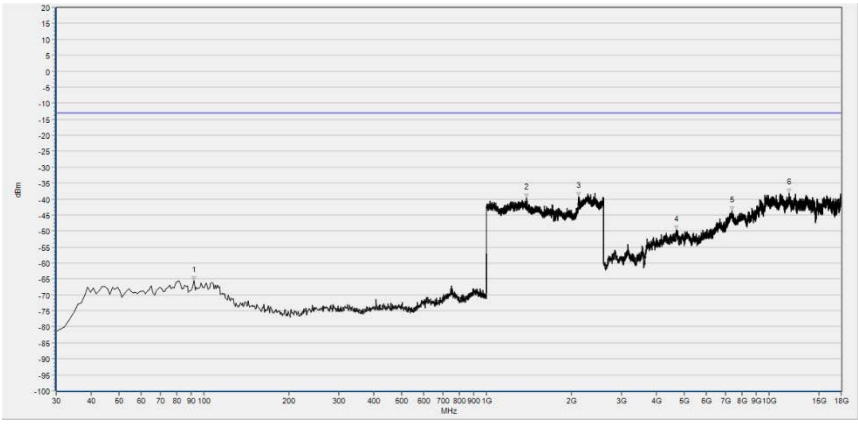


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	49.400	-68.82	-13.00	Vertical	PASS
2	1297.719	-40.30	-13.00	Vertical	PASS
3	1974.470	-39.53	-13.00	Vertical	N/A
4	4739.589	-47.45	-13.00	Vertical	PASS
5	7324.459	-43.91	-13.00	Vertical	PASS
6	10984.724	-38.61	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, Low Channel, QPSK

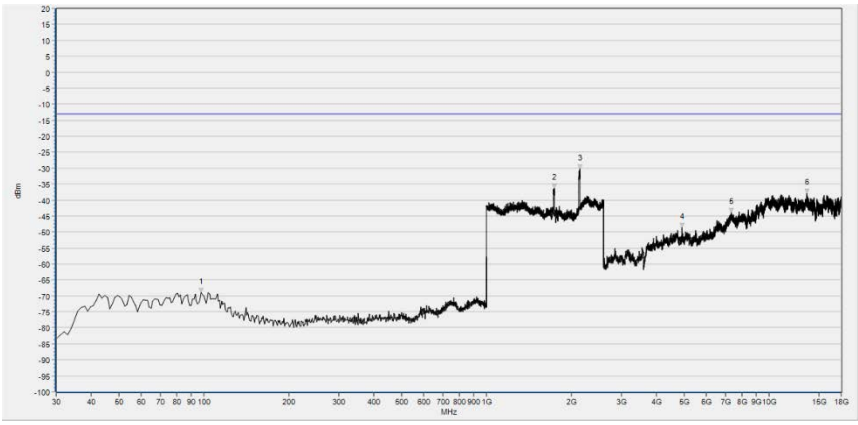


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	81.410	-67.68	-13.00	Horizontal	PASS
2	1727.971	-37.33	-13.00	Horizontal	N/A
3	2127.491	-29.02	-13.00	Horizontal	N/A
4	4703.182	-49.51	-13.00	Horizontal	PASS
5	7290.853	-44.14	-13.00	Horizontal	PASS
6	13482.779	-38.19	-13.00	Horizontal	PASS

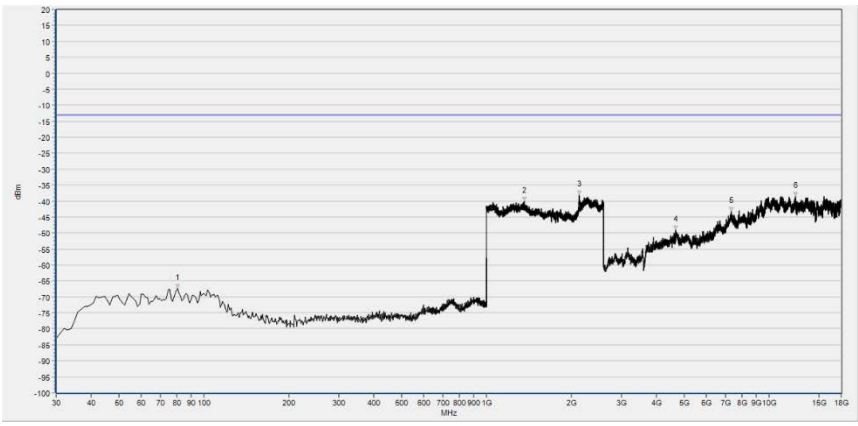


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	92.080	-65.61	-13.00	Vertical	PASS
2	1386.715	-39.73	-13.00	Vertical	PASS
3	2116.607	-39.17	-13.00	Vertical	N/A
4	4697.581	-49.64	-13.00	Vertical	PASS
5	7377.669	-43.58	-13.00	Vertical	PASS
6	11768.867	-38.20	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, Mid Channel, QPSK

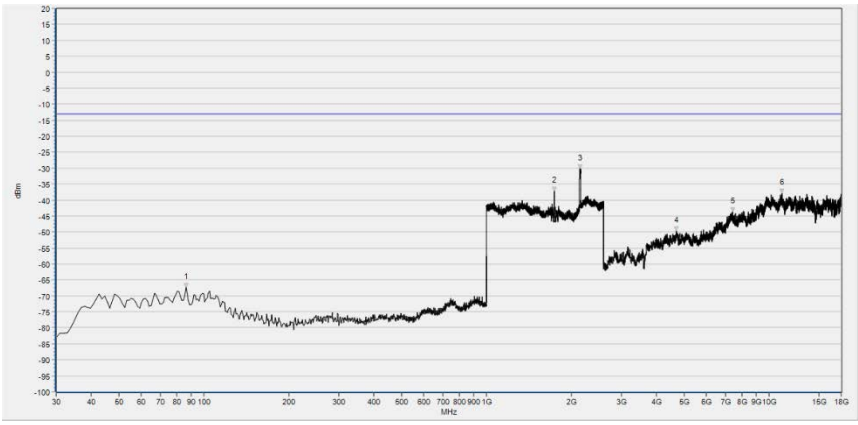


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	97.900	-69.02	-13.00	Horizontal	PASS
2	1734.374	-36.42	-13.00	Horizontal	N/A
3	2137.735	-30.32	-13.00	Horizontal	N/A
4	4916.021	-48.59	-13.00	Horizontal	PASS
5	7341.262	-43.91	-13.00	Horizontal	PASS
6	13594.799	-37.97	-13.00	Horizontal	PASS

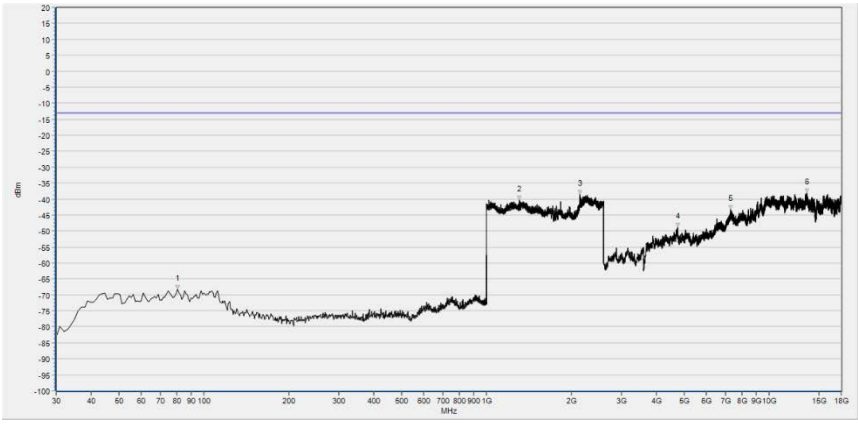


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-67.38	-13.00	Vertical	PASS
2	1359.184	-40.21	-13.00	Vertical	PASS
3	2125.570	-38.21	-13.00	Vertical	N/A
4	4680.778	-49.03	-13.00	Vertical	PASS
5	7341.262	-43.14	-13.00	Vertical	PASS
6	12412.984	-38.58	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, High Channel, QPSK

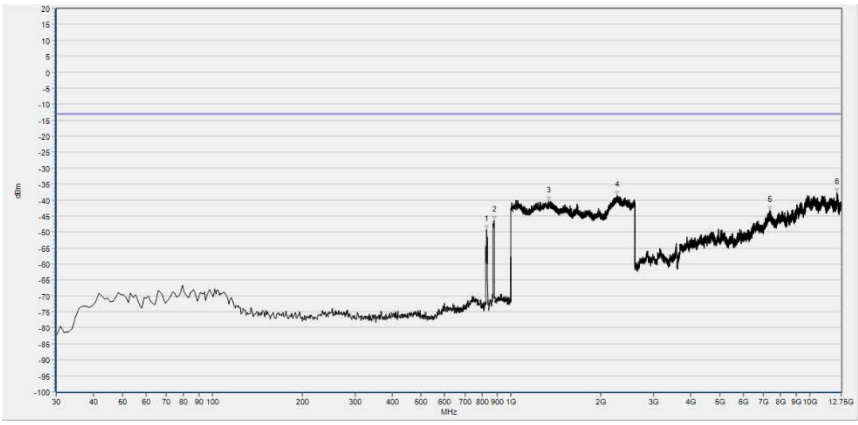


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	86.260	-67.30	-13.00	Horizontal	PASS
2	1736.295	-37.20	-13.00	Horizontal	N/A
3	2147.339	-30.29	-13.00	Horizontal	N/A
4	4708.783	-49.68	-13.00	Horizontal	PASS
5	7425.277	-43.73	-13.00	Horizontal	PASS
6	11121.949	-37.95	-13.00	Horizontal	PASS

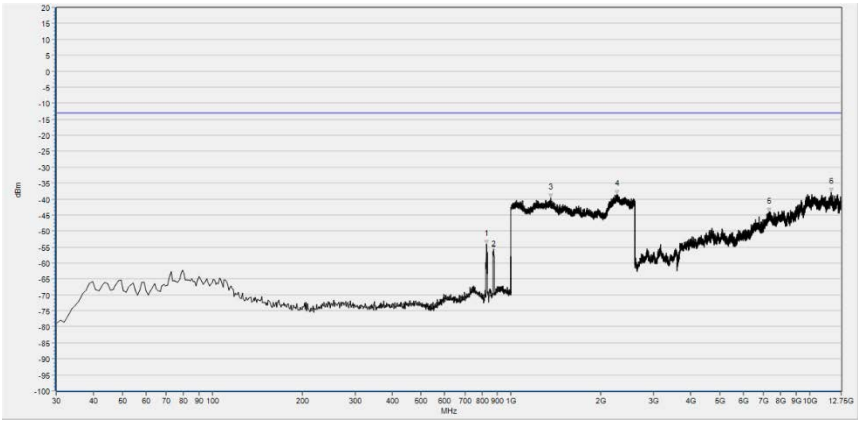


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.440	-68.32	-13.00	Vertical	PASS
2	1309.244	-40.35	-13.00	Vertical	PASS
3	2146.058	-38.57	-13.00	Vertical	N/A
4	4753.592	-48.86	-13.00	Vertical	PASS
5	7316.057	-43.32	-13.00	Vertical	PASS
6	13594.799	-38.07	-13.00	Vertical	PASS

LTE Band 5, 10MHz BW, Low Channel, QPSK

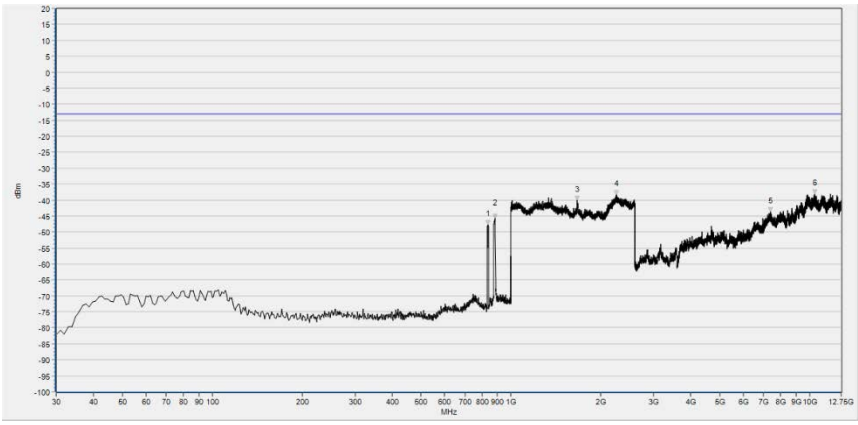


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	827.340	-49.16	-13.00	Horizontal	N/A
2	877.780	-46.40	-13.00	Horizontal	N/A
3	1332.933	-40.23	-13.00	Horizontal	PASS
4	2271.549	-38.53	-13.00	Horizontal	PASS
5	7371.368	-43.22	-13.00	Horizontal	PASS
6	12340.235	-37.73	-13.00	Horizontal	PASS

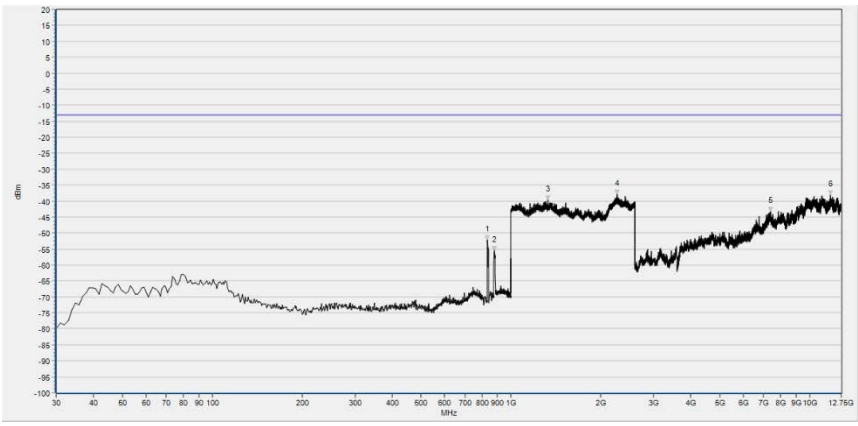


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	827.340	-54.30	-13.00	Vertical	N/A
2	873.900	-55.72	-13.00	Vertical	N/A
3	1360.464	-39.77	-13.00	Vertical	PASS
4	2261.305	-38.52	-13.00	Vertical	PASS
5	7323.377	-44.20	-13.00	Vertical	PASS
6	11777.269	-37.80	-13.00	Vertical	PASS

LTE Band 5, 10MHz BW, Mid Channel, QPSK

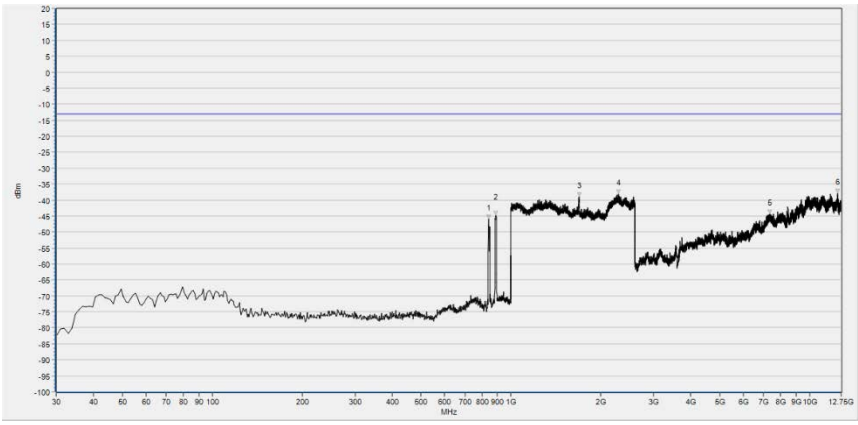


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	838.980	-47.79	-13.00	Horizontal	N/A
2	882.630	-45.72	-13.00	Horizontal	N/A
3	1666.507	-40.08	-13.00	Horizontal	PASS
4	2250.420	-38.33	-13.00	Horizontal	PASS
5	7397.209	-43.79	-13.00	Horizontal	PASS
6	10400.309	-38.00	-13.00	Horizontal	PASS

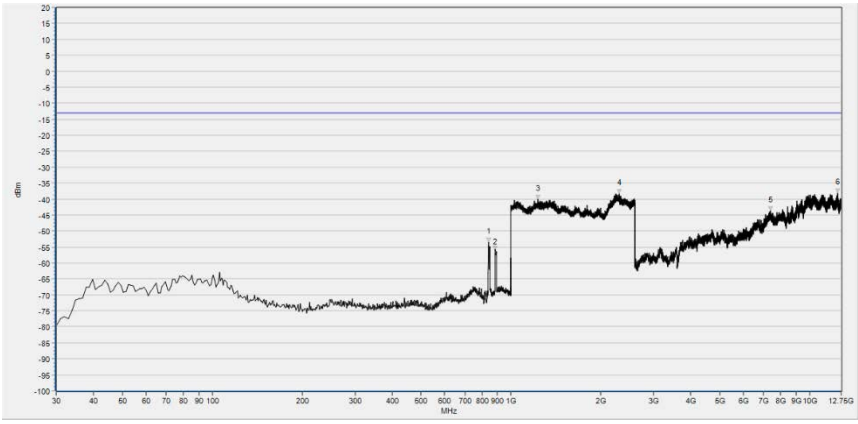


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	834.130	-52.11	-13.00	Vertical	N/A
2	879.720	-55.49	-13.00	Vertical	N/A
3	1332.293	-39.64	-13.00	Vertical	PASS
4	2260.024	-37.94	-13.00	Vertical	PASS
5	7408.283	-43.26	-13.00	Vertical	PASS
6	11725.586	-38.18	-13.00	Vertical	PASS

LTE Band 5, 10MHz BW, High Channel, QPSK



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	839.950	-45.82	-13.00	Horizontal	N/A
2	891.360	-44.81	-13.00	Horizontal	N/A
3	1688.275	-38.95	-13.00	Horizontal	PASS
4	2297.159	-38.00	-13.00	Horizontal	PASS
5	7365.830	-44.32	-13.00	Horizontal	PASS
6	12378.996	-37.88	-13.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	842.860	-53.42	-13.00	Vertical	N/A
2	885.540	-55.99	-13.00	Vertical	N/A
3	1232.413	-40.21	-13.00	Vertical	PASS
4	2304.202	-38.27	-13.00	Vertical	PASS
5	7376.905	-43.76	-13.00	Vertical	PASS
6	12406.683	-38.17	-13.00	Vertical	PASS