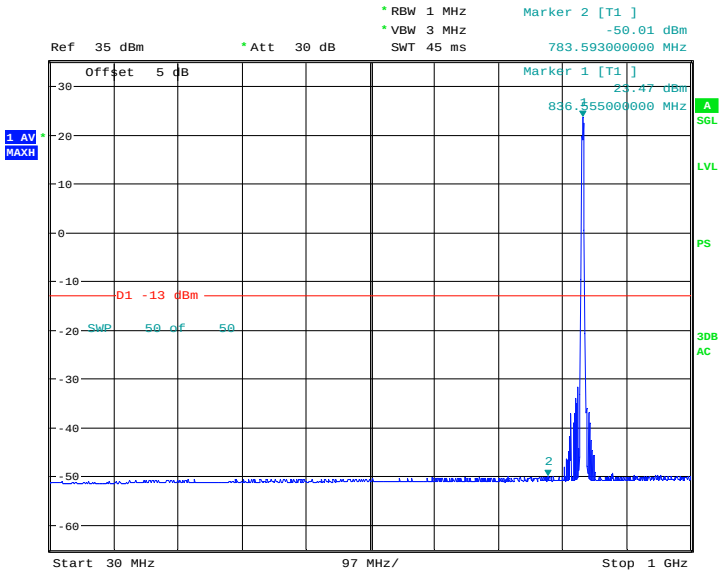
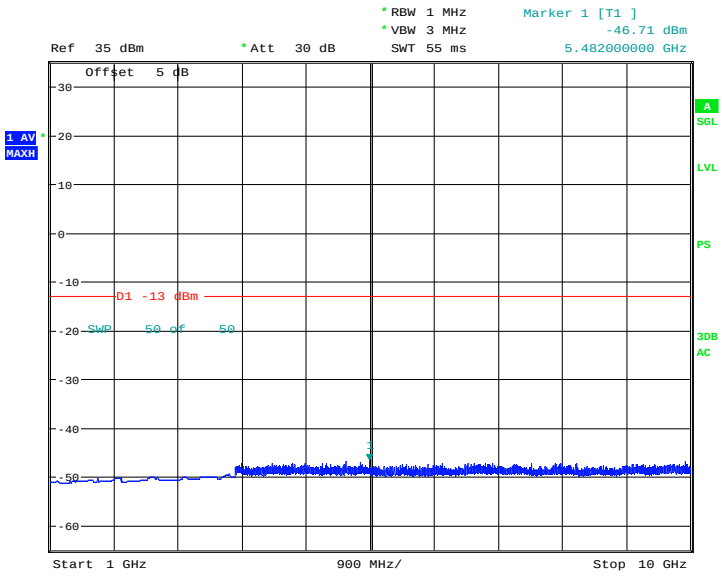
5.3.6 CDMA/EVDO BC0 Conducted Spurious Emission Results



Date: 24.MAR.2017 11:22:54

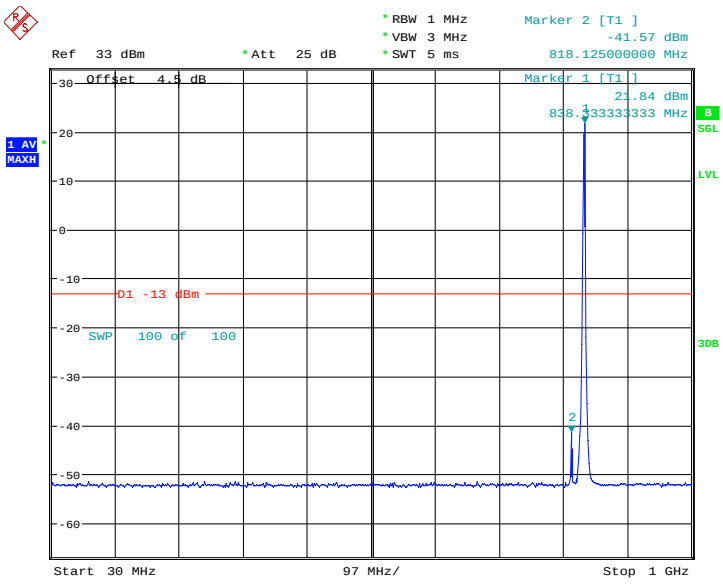
CDMA BC0, Middle channel, 836.52 MHz, 30 MHz to 1 GHz

Note: The strong emission shown in each case is the carrier signal.



Date: 24.MAR.2017 11:24:01

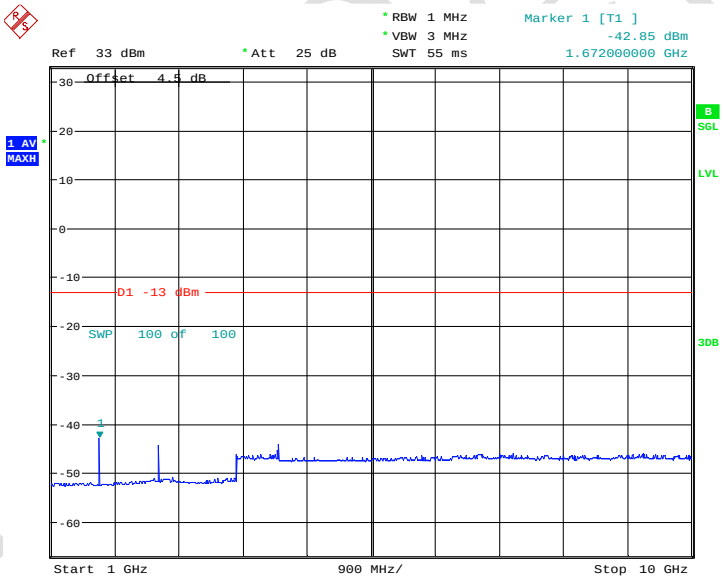
CDMA BC0, Middle channel, 836.52 MHz, 1 GHz to 10 GHz



Date: 27.APR.2017 11:20:48

1x EVDO BC0, Middle channel, 836.52 MHz, 30 MHz to 1 GHz

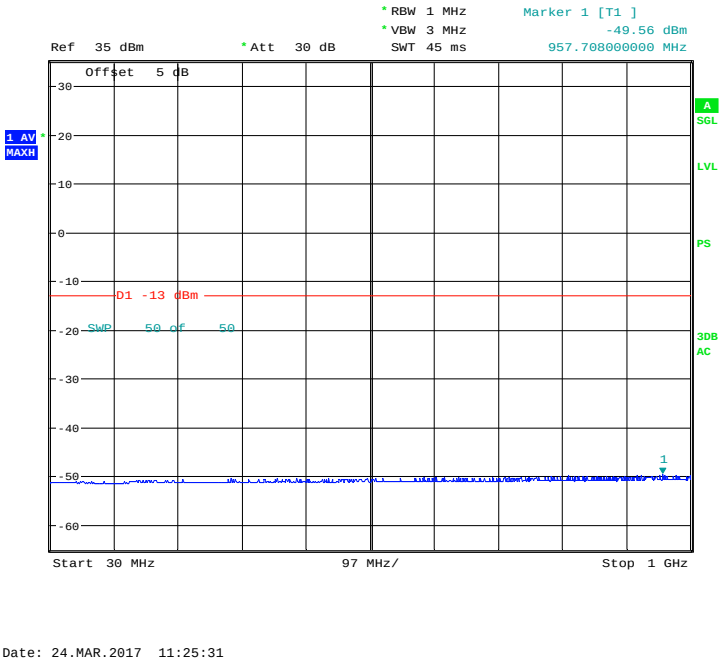
Note: The strong emission shown in each case is the carrier signal.



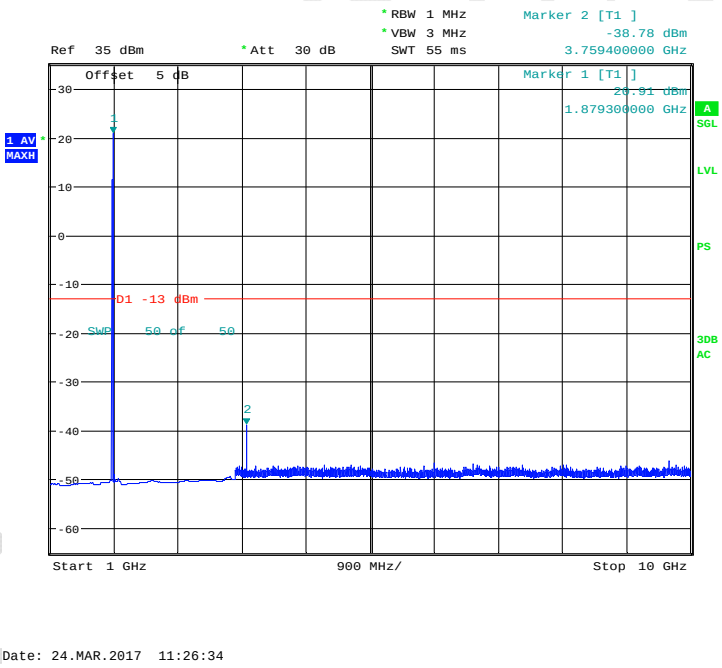
Date: 27.APR.2017 11:23:08

1x EVDO BC0, Middle channel, 836.52 MHz, 1 GHz to 10 GHz

5.3.7 CDMA/EVDO BC1 Conducted Spurious Emission Results

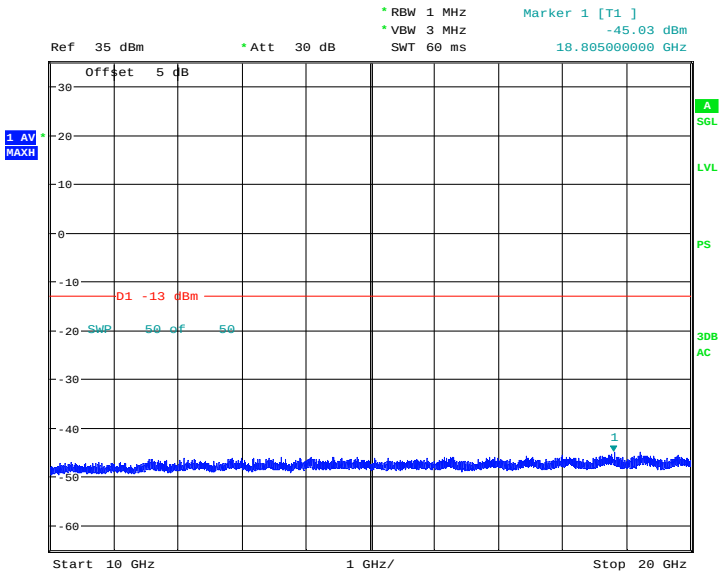


CDMA BC1, Middle channel, 1880.0 MHz, 30 MHz to 1 GHz

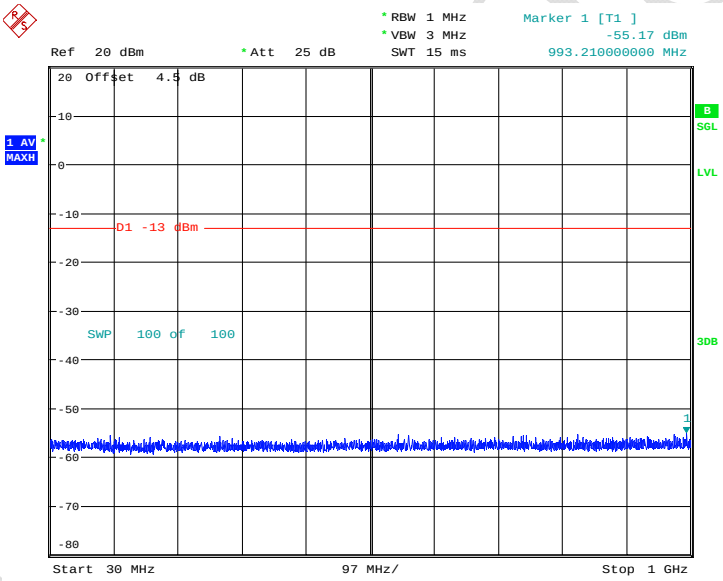


CDMA BC1, Middle channel, 1880.0 MHz, 1 GHz to 10 GHz

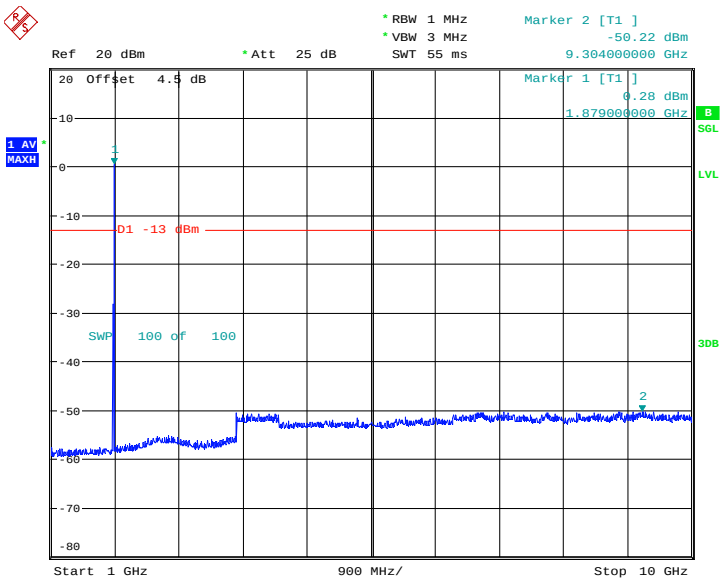
Note: The strong emission shown in each case is the carrier signal.



CDMA BC1, Middle channel, 1880.0 MHz, 10 GHz to 20 GHz

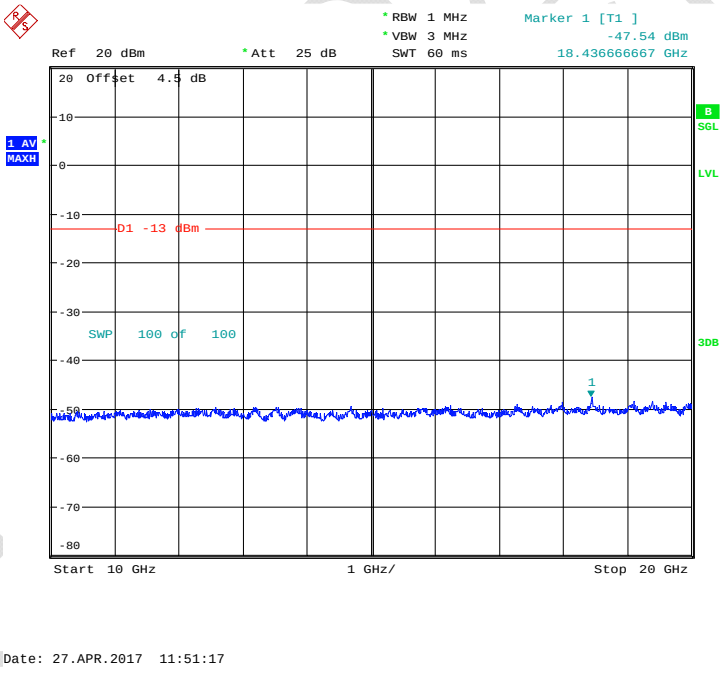


1x EVDO BC1, Middle channel, 1880.0 MHz, 30 MHz to 1 GHz



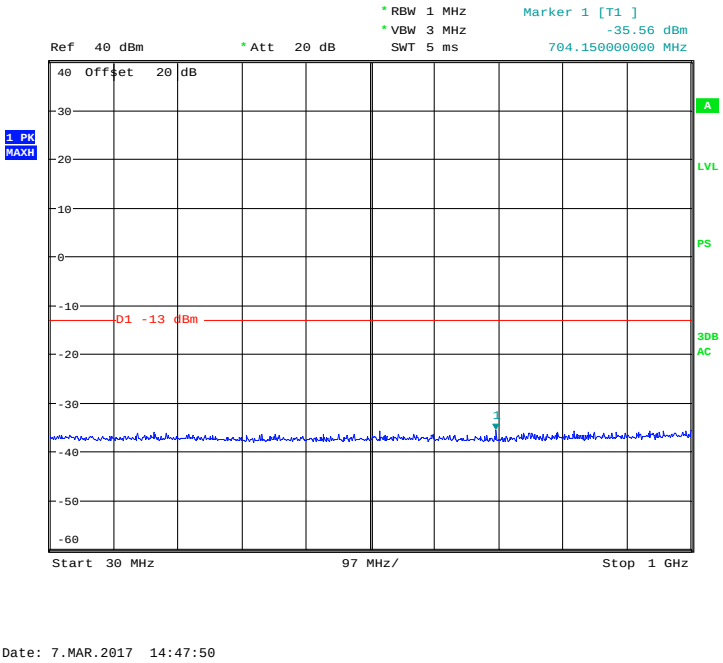
1x EVDO BC1, Middle channel, 1880.0 MHz, 1 GHz to 10 GHz

Note: The strong emission shown in each case is the carrier signal.

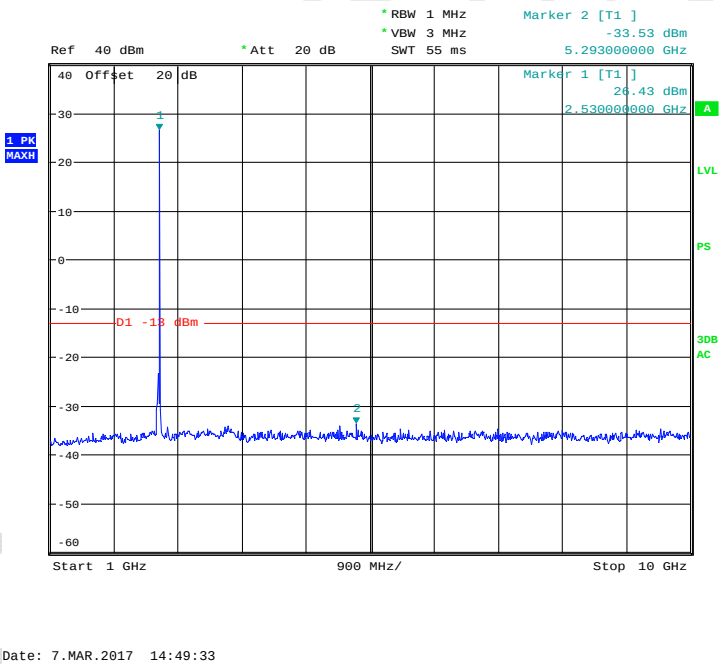


1x EVDO BC1, Middle channel, 1880.0 MHz, 10 GHz to 20 GHz

5.3.8 LTE B7 Conducted Spurious Emission Results

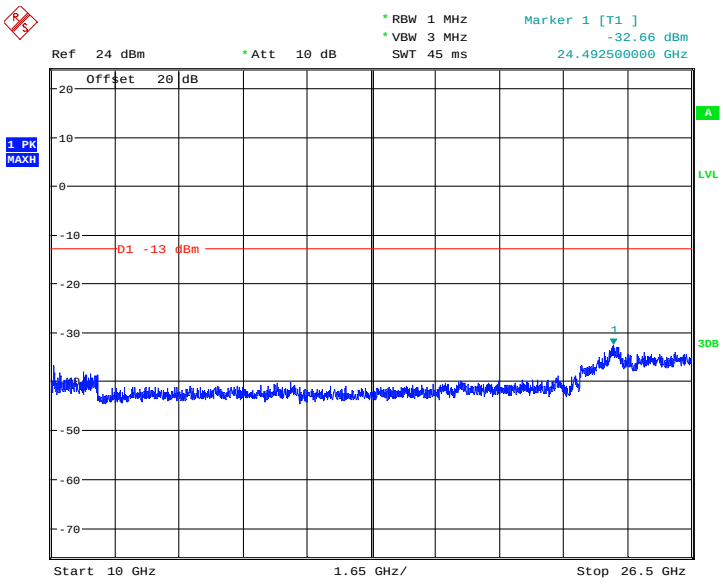


5MHz bandwidth QPSK Mode Middle channel, 2535 MHz, 30MHz to 1GHz

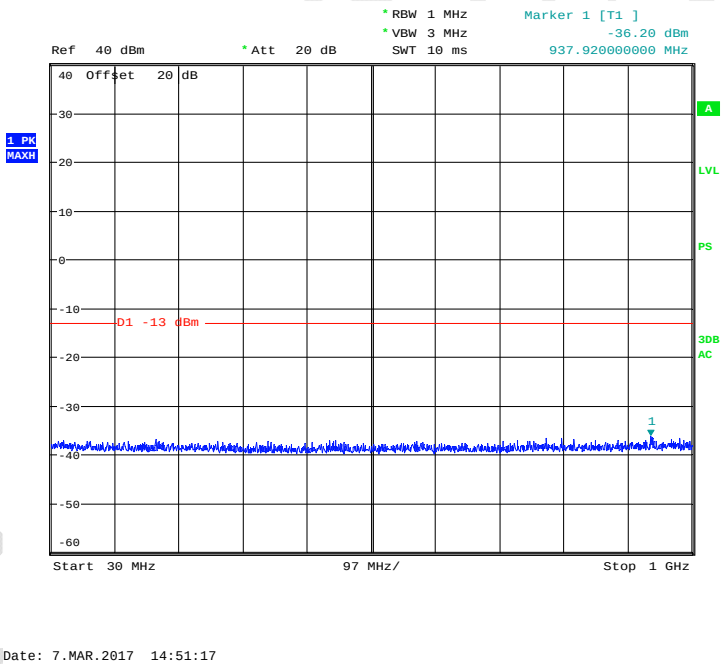


5MHz bandwidth QPSK Mode Middle channel, 2535 MHz, 1GHz to 10GHz

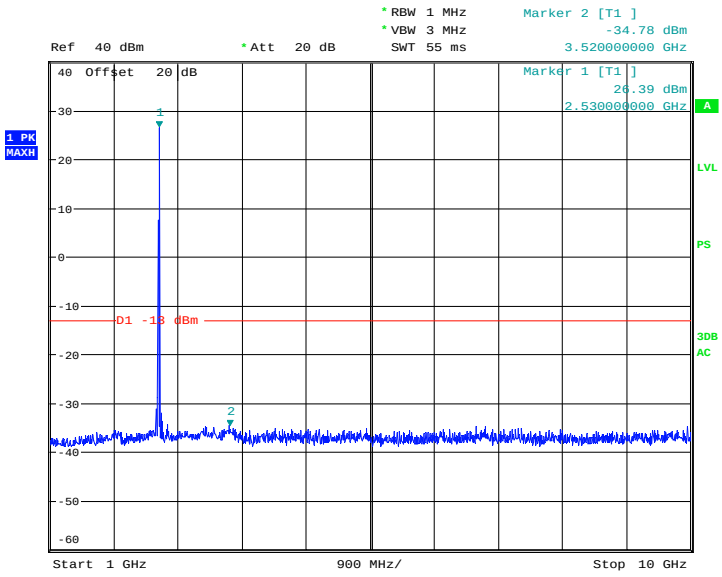
Note: The strong emission shown in each case is the carrier signal.



5MHz bandwidth QPSK Mode Middle channel, 2535 MHz, 10GHz to 26.5GHz



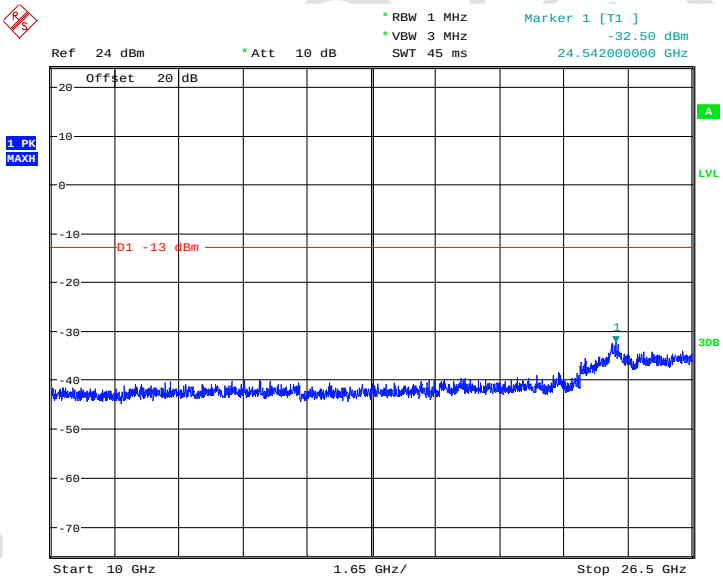
10MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 30MHz to 1GHz



Date: 7.MAR.2017 14:51:46

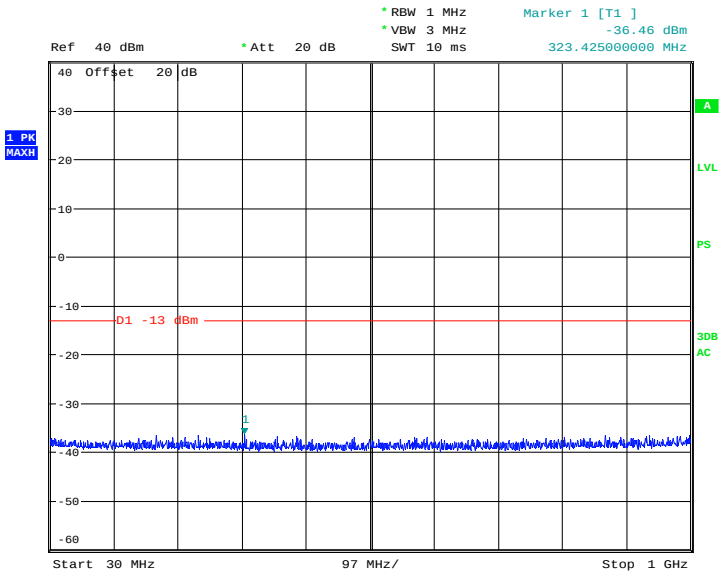
10MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 1GHz to 10GHz

Note: The strong emission shown in each case is the carrier signal.

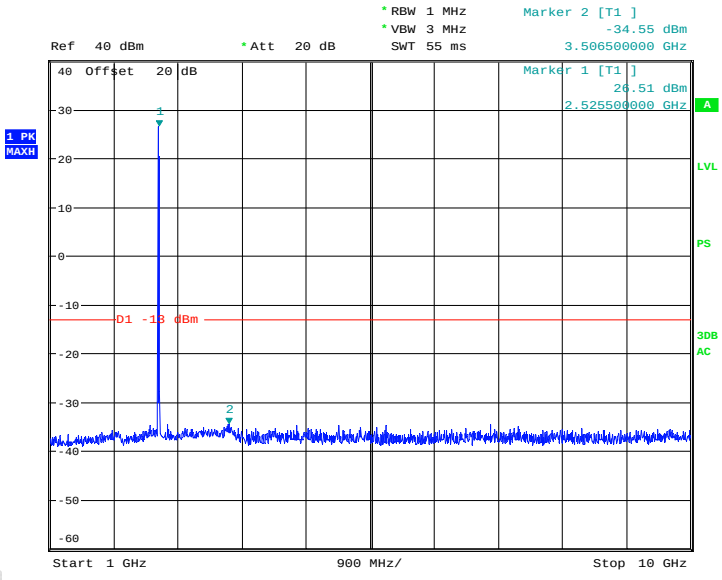


Date: 28.APR.2017 17:25:51

10MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 10GHz to 26.5GHz

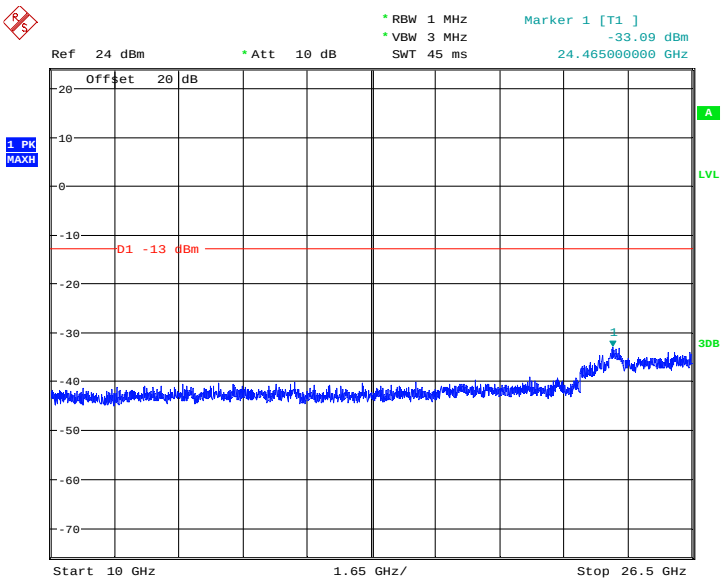


15MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 30MHz to 1GHz



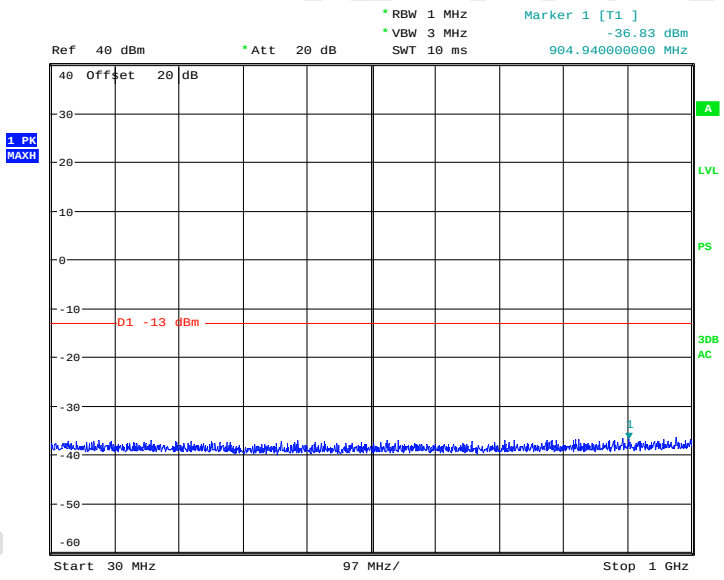
15MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 1GHz to 10GHz

Note: The strong emission shown in each case is the carrier signal.



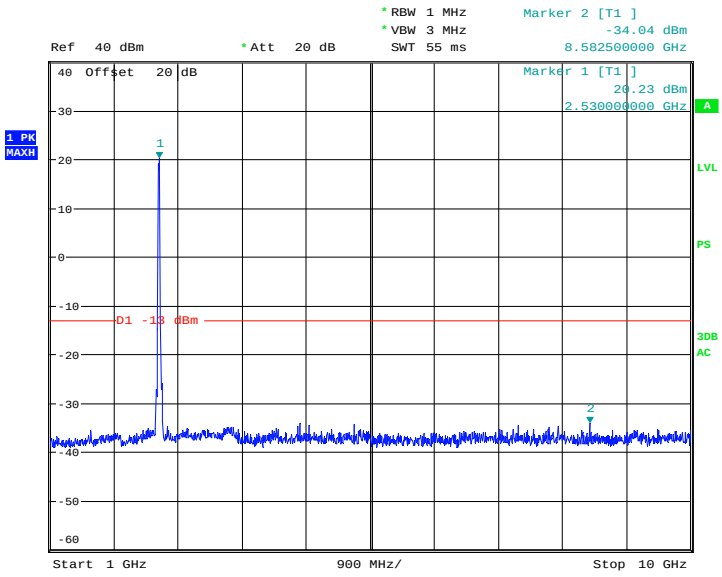
Date: 28.APR.2017 17:26:01

15MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 10GHz to 26.5GHz



Date: 7.MAR.2017 14:54:54

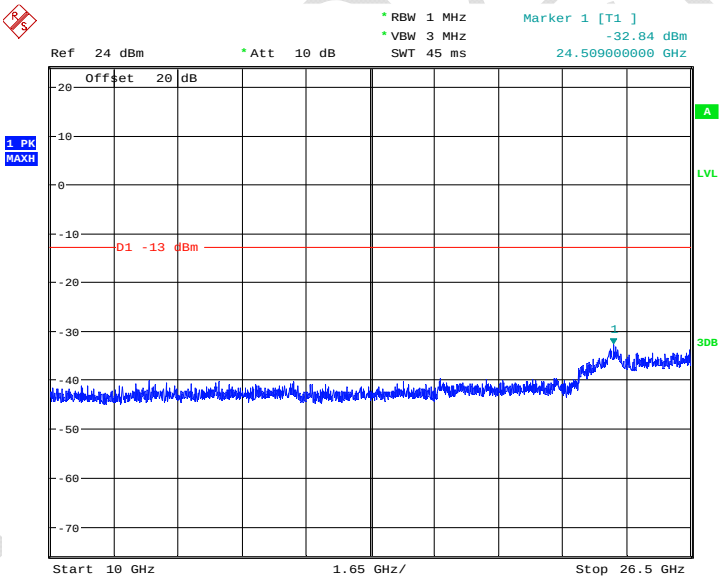
20MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 30MHz to 1GHz



Date: 7.MAR.2017 14:55:16

20MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 1GHz to 10GHz

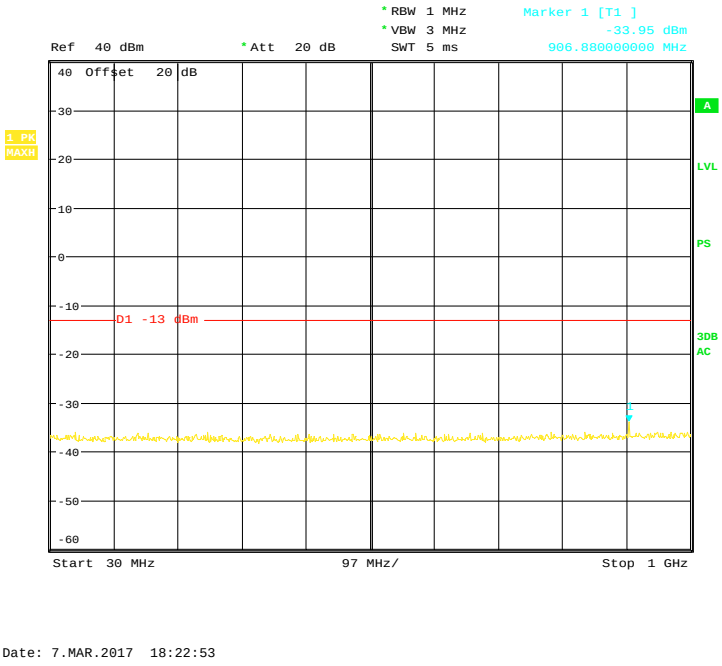
Note: The strong emission shown in each case is the carrier signal.



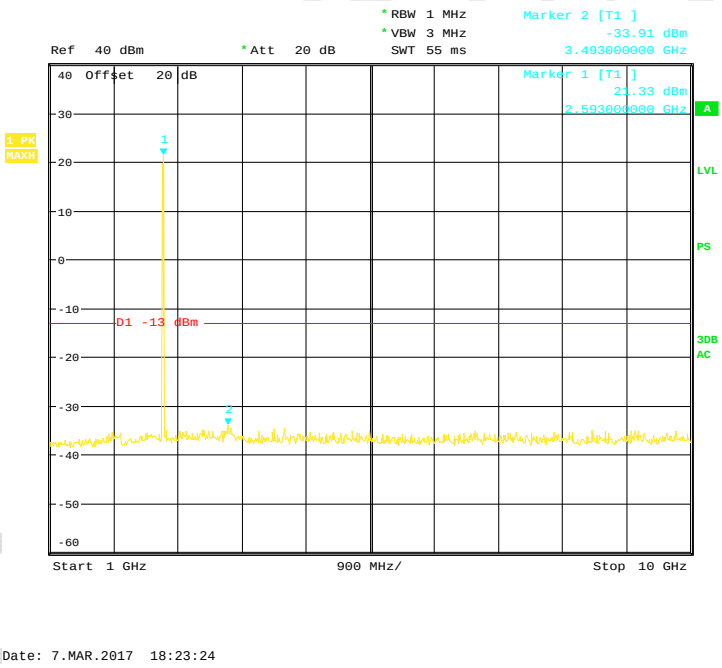
Date: 28.APR.2017 17:26:10

20MHz bandwidth QPSK Mode Middle Channel, 2535 MHz, 10GHz to 26.5GHz

5.3.9 LTE B41 Conducted Spurious Emission Results

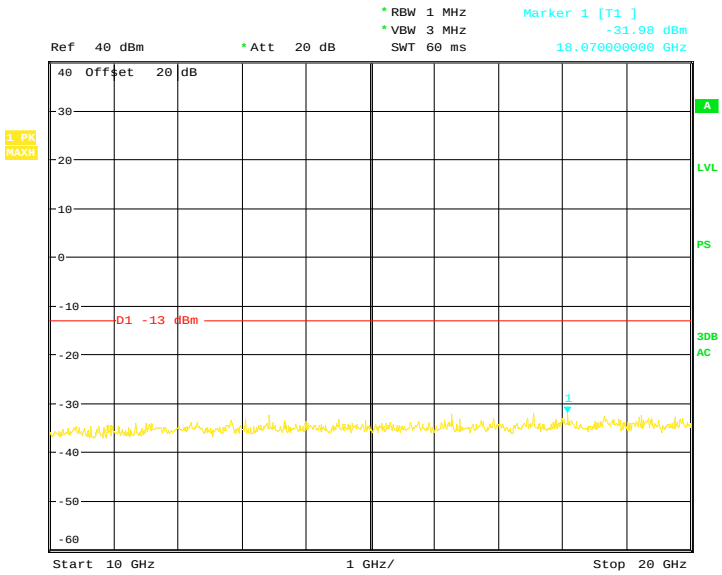


5MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 30MHz to 1GHz

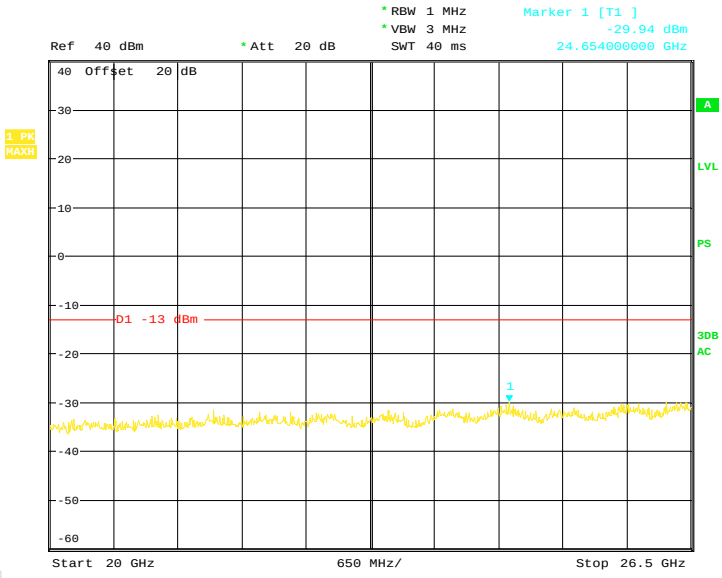


5MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 1GHz to 10GHz

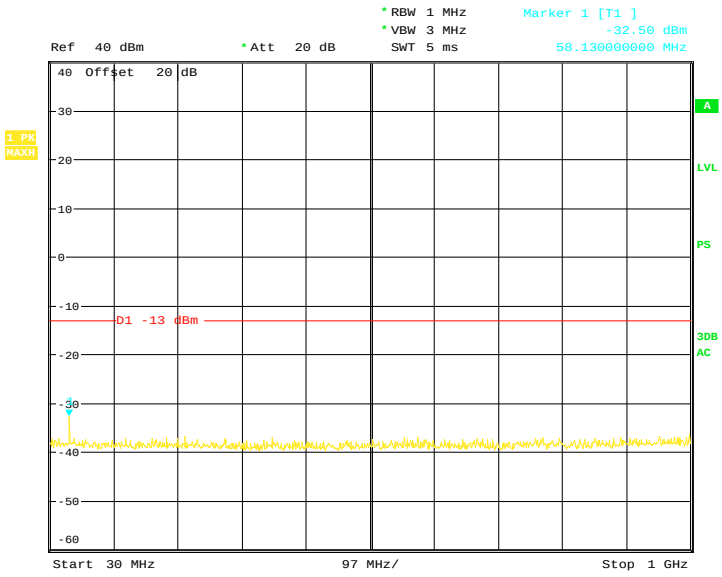
Note: The strong emission shown in each case is the carrier signal.



5MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 10GHz to 20GHz

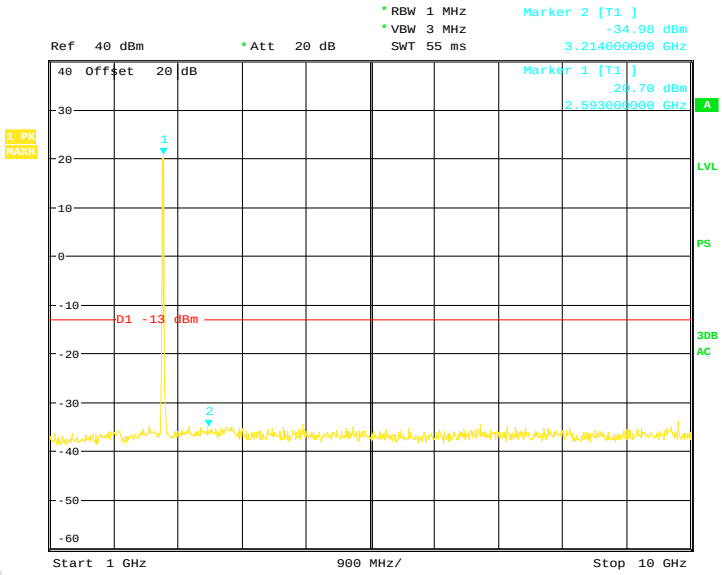


5MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 20GHz to 26.5GHz



Date: 7.MAR.2017 18:28:22

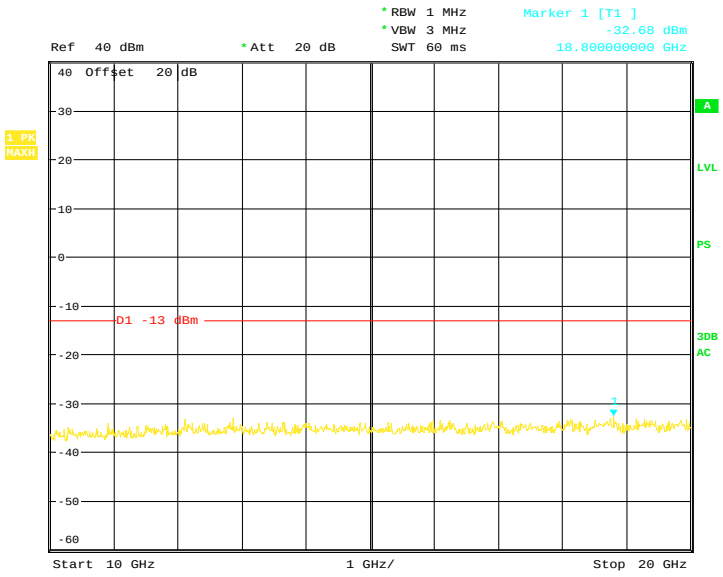
10MHz bandwidth QPSK Mode Middle Channel, 2593 MHz, 30MHz to 1GHz



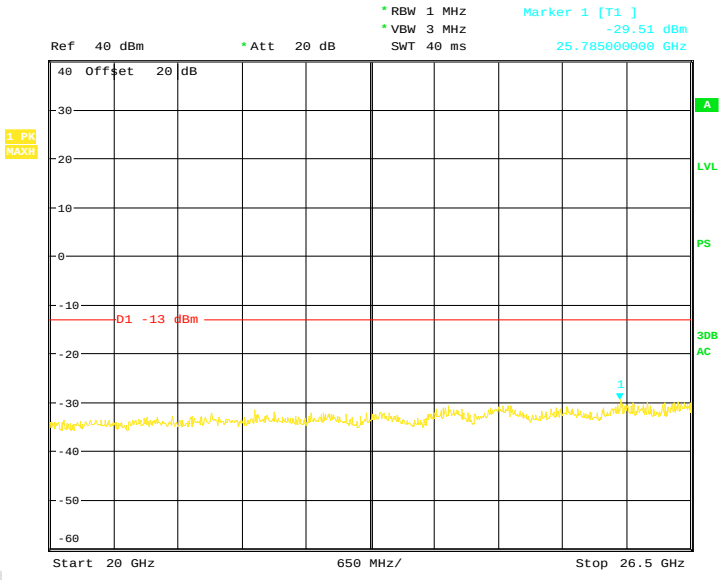
Date: 7.MAR.2017 18:28:50

10MHz bandwidth QPSK Mode Middle Channel, 2593 MHz, 1GHz to 10GHz

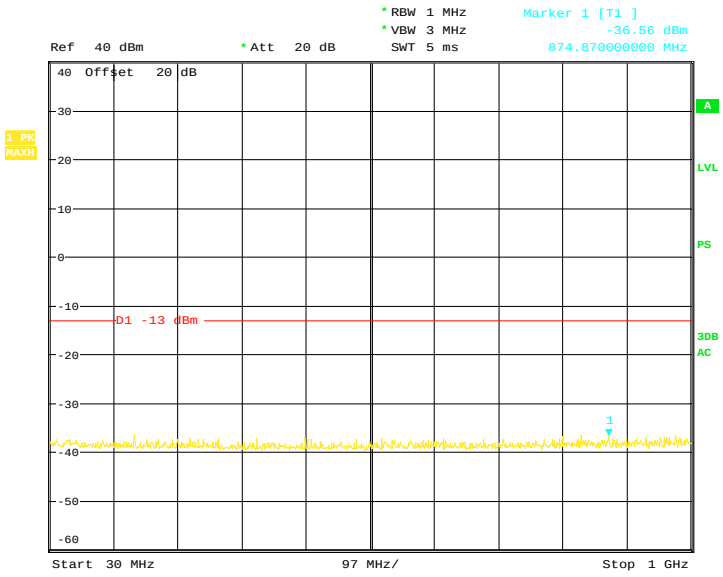
Note: The strong emission shown in each case is the carrier signal.



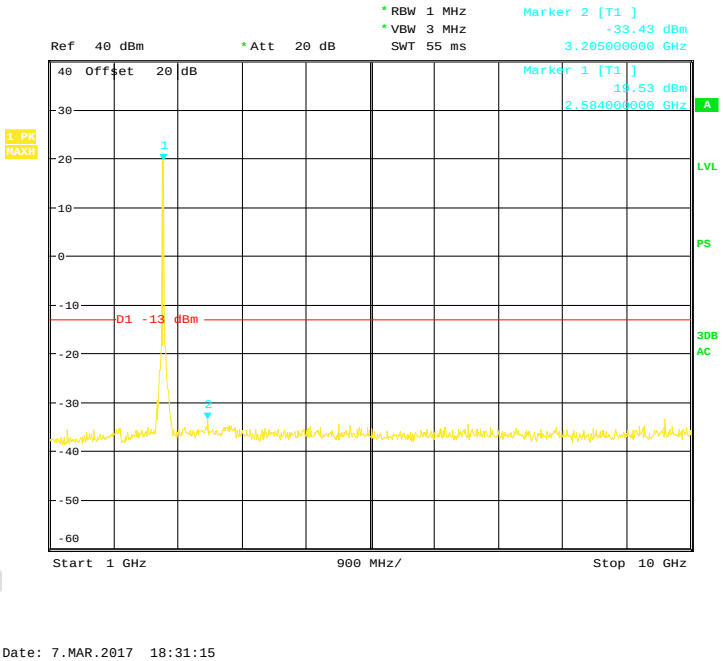
10MHz bandwidth QPSK Mode Middle Channel, 2593 MHz, 10GHz to 20GHz



10MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 20GHz to 26.5GHz

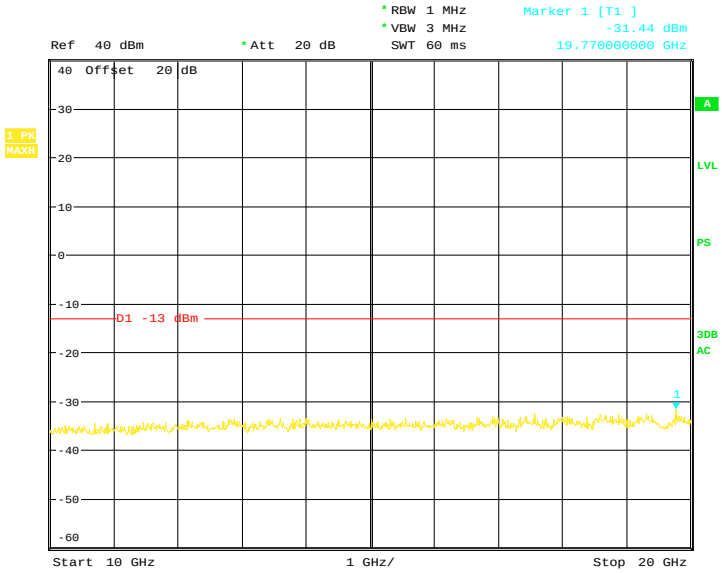


15MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 30MHz to 1GHz

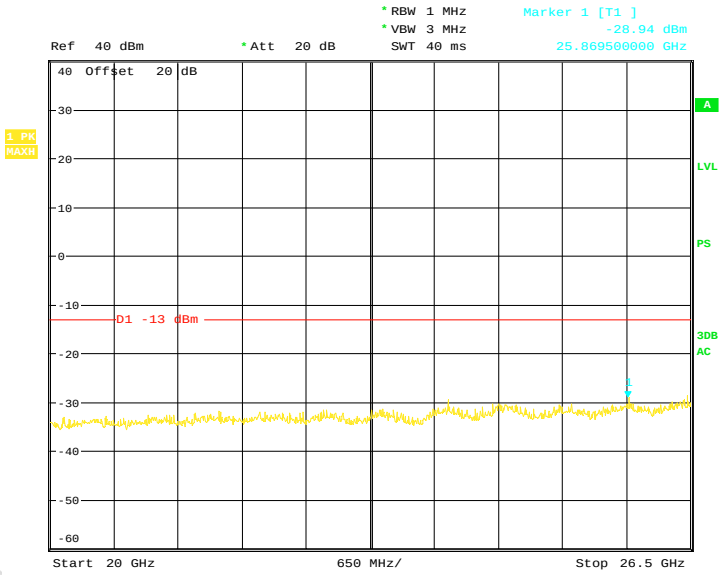


15MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 1GHz to 10GHz

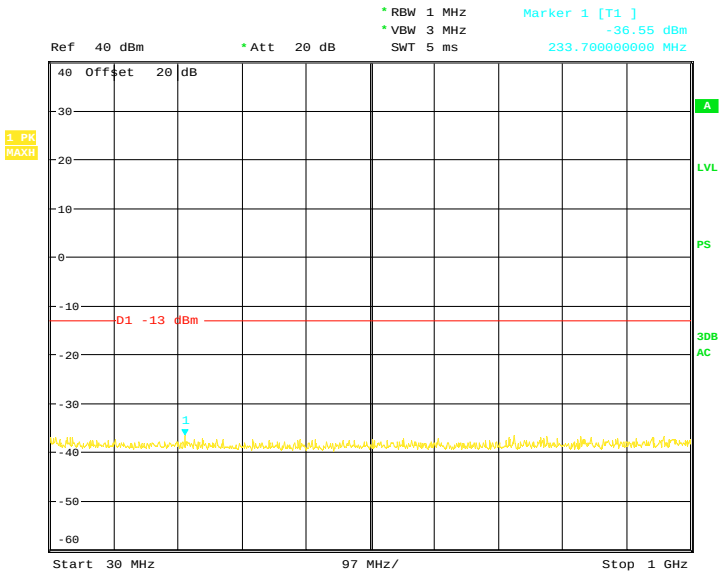
Note: The strong emission shown in each case is the carrier signal.



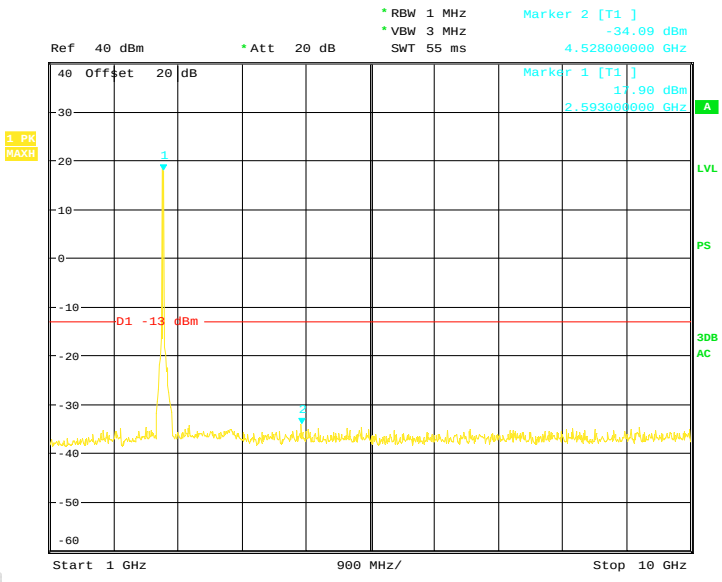
15MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 10GHz to 20GHz



15MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 20GHz to 26.5GHz

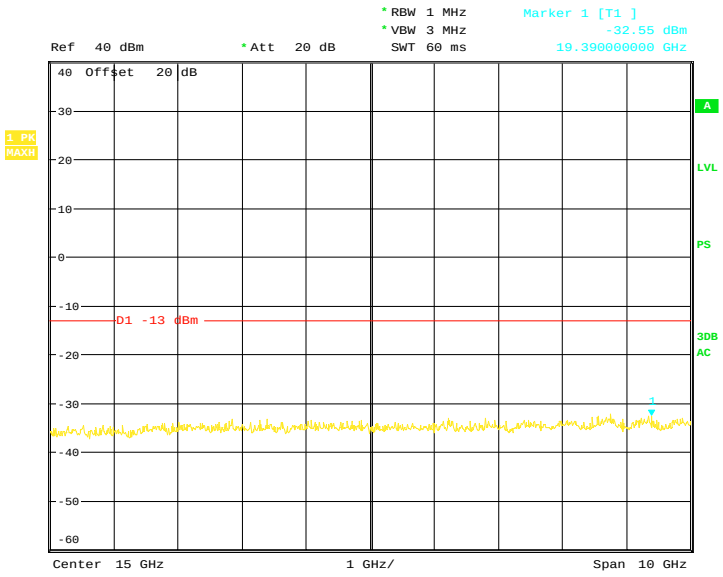


20MHz bandwidth QPSK Mode Middle Channel, 2593 MHz, 30MHz to 1GHz

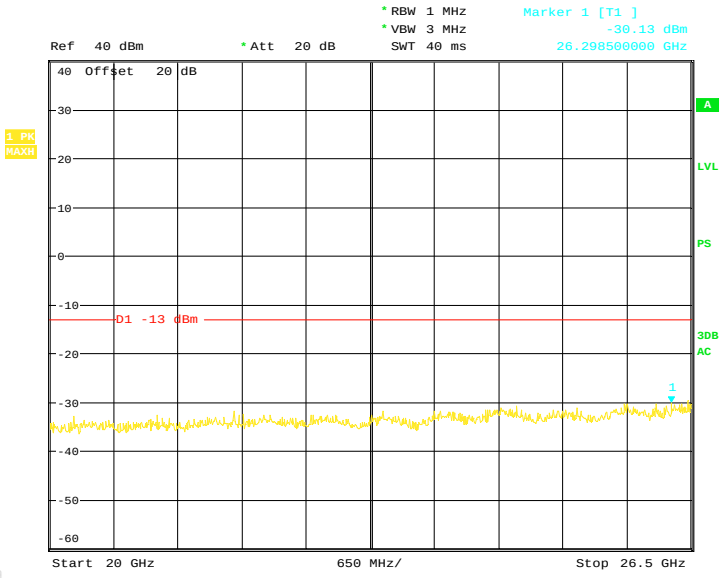


20MHz bandwidth QPSK Mode Middle Channel, 2593 MHz, 1GHz to 10GHz

Note: The strong emission shown in each case is the carrier signal.



20MHz bandwidth QPSK Mode Middle Channel, 2593 MHz, 10GHz to 20GHz



20MHz bandwidth QPSK Mode Middle channel, 2593 MHz, 20GHz to 26.5GHz

5.4 Radiated Spurious Emission

Specifications:	FCC Part 2.1051, 24.238, 2.1053, 22.917, 27.53
DUT Serial Number:	S7/18: 862851030000163/862851030020161
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit Level Construction:

According to Part 22.917 (a), i.e., Out of band emissions. 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.

According to Part 24.238 (a), i.e., Out of band emissions. 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, so the limit level is:

P(dBm) – (43 + 10 log(P)) dB= -13dBm.

According to Part 27.53(h):

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10(P) dB

According to Part 27.53(m):

For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB.

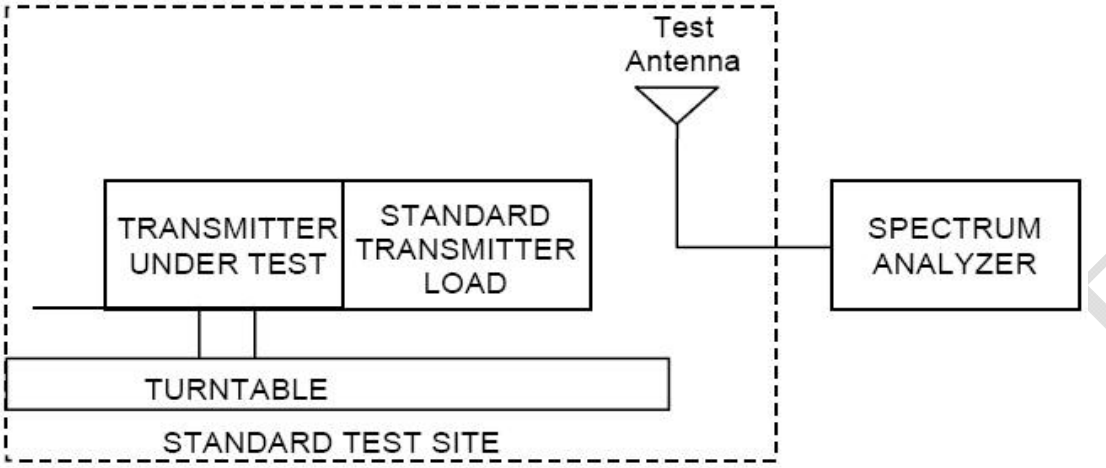
Test Setup:

The EUT was placed in an anechoic chamber. The Wireless Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

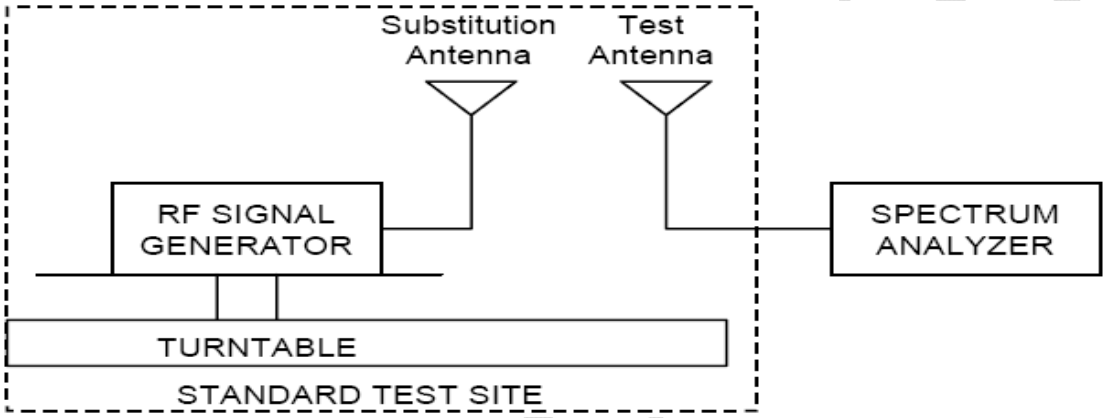
Test Method:

The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-C: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above.



(b) Reconnect the equipment as illustrated.



(c) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter.

(d) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

(e) Repeat step d) with both antennas vertically polarized for each spurious frequency.

(f) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps d) and e) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

P_d(dBm) = P_g(dBm) – cable loss (dB) + antenna gain (dB)

where:

Pd is the dipole equivalent power and

Pg is the generator output power into the substitution antenna.

5.4.1 GSM850 GMSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1673.2	-36.95	4.7	9.4	-31.75	V
2509.8	-43.75	5.9	10.6	-32.45	V
3346.4	-50.78	6.9	12.6	-39.98	V
4183.0	-52.45	7.8	12.6	-41.35	V
5019.6	-51.93	7.1	12.7	-40.73	V
1673.2	-39.15	4.7	9.4	-33.95	H
2509.8	-46.08	5.9	10.6	-34.78	H
3346.4	-55.26	6.9	12.6	-44.46	H
4183.0	-57.74	7.8	12.6	-46.64	H
5019.6	-56.54	7.1	12.7	-45.34	H

5.4.2 GSM850 8PSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1673.2	-37.95	4.7	9.4	-32.75	V
2509.8	-44.86	5.9	10.6	-33.56	V
3346.4	-50.59	6.9	12.6	-39.79	V
4183.0	-52.17	7.8	12.6	-41.07	V
5019.6	-51.95	7.1	12.7	-40.75	V
1673.2	-40.28	4.7	9.4	-35.08	H
2509.8	-46.72	5.9	10.6	-35.42	H
3346.4	-55.76	6.9	12.6	-44.96	H
4183.0	-57.86	7.8	12.6	-46.76	H
5019.6	-56.09	7.1	12.7	-44.89	H

5.4.3 PCS1900 GMSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3760.0	-50.45	7.4	12.6	-45.25	V
5640.0	-50.78	1.8	13.1	-39.48	V
7520.0	-51.36	0.9	11.7	-40.56	V
9400.0	-51.48	0.8	11.9	-40.38	V
11280.0	-53.00	0.3	11.5	-41.80	V
3760.0	-51.48	7.4	12.6	-46.28	H
5640.0	-51.98	1.8	13.1	-40.68	H
7520.0	-52.16	0.9	11.7	-41.36	H
9400.0	-51.36	0.8	11.9	-40.26	H
11280.0	-52.66	0.3	11.5	-41.46	H

5.4.4 PCS1900 8PSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3760.0	-50.51	7.4	12.6	-45.31	V
5640.0	-50.32	1.8	13.1	-39.02	V
7520.0	-51.13	0.9	11.7	-40.33	V
9400.0	-53.68	0.8	11.9	-42.58	V
11280.0	-52.66	0.3	11.5	-41.46	V
3760.0	-50.48	7.4	12.6	-45.28	H
5640.0	-51.69	1.8	13.1	-40.39	H
7520.0	-52.78	0.9	11.7	-41.98	H
9400.0	-54.66	0.8	11.9	-43.56	H
11280.0	-55.78	0.3	11.5	-44.58	H

5.4.5 WCDMA B2 QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
3760.0	-49.36	7.4	12.6	-44.16	V
5640.0	-51.26	1.8	13.1	-39.96	V
7520.0	-51.64	0.9	11.7	-40.84	V
9400.0	-52.22	0.8	11.9	-41.12	V
11280.0	-51.87	0.3	11.5	-40.67	V
3760.0	-50.35	7.4	12.6	-45.15	H
5640.0	-50.77	1.8	13.1	-39.47	H
7520.0	-51.69	0.9	11.7	-40.89	H
9400.0	-52.48	0.8	11.9	-41.38	H
11280.0	-52.49	0.3	11.5	-41.29	H

5.4.6 WCDMA B5 QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
1673.2	-50.34	4.7	9.4	-45.64	V
2509.8	-50.48	5.9	10.6	-45.78	V
3346.4	-51.56	6.9	12.6	-45.86	V
4183.0	-52.45	7.8	12.6	-47.65	V
5019.6	-52.67	7.1	12.7	-47.07	V
1673.2	-50.48	4.7	9.4	-45.78	H
2509.8	-50.48	5.9	10.6	-45.78	H
3346.4	-51.69	6.9	12.6	-45.99	H
4183.0	-52.49	7.8	12.6	-47.69	H
5019.6	-52.79	7.1	12.7	-47.19	H

5.4.7 CDMA/EVDO BC0 Radiated Spurious Emission Results

Test Data （SO2）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
1664.04	-33.25	4.7	9.4	-28.55	V
2496.06	-34.75	5.9	10.6	-30.05	V
3328.08	-46.32	6.8	12.6	-40.52	V
4160.10	-47.81	7.8	12.6	-43.01	V
4992.12	-46.36	7.5	12.7	-41.16	V
1664.04	-34.58	4.7	9.4	-29.88	H
2496.06	-35.62	5.9	10.6	-30.92	H
3328.08	-46.22	6.8	12.6	-40.42	H
4160.10	-48.59	7.8	12.6	-43.79	H
4992.12	-50.56	7.5	12.7	-45.36	H

Test Data （1x EvDo）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
1664.04	-34.12	4.7	9.4	-29.42	V
2496.06	-34.58	5.9	10.6	-29.88	V
3328.08	-48.55	6.8	12.6	-42.75	V
4160.10	-47.25	7.8	12.6	-42.45	V
4992.12	-50.03	7.5	12.7	-44.83	V
1664.04	-35.46	4.7	9.4	-30.76	H
2496.06	-33.25	5.9	10.6	-28.55	H
3328.08	-46.32	6.8	12.6	-40.52	H
4160.10	-47.99	7.8	12.6	-43.19	H
4992.12	-46.58	7.5	12.7	-41.38	H

5.4.8 CDMA/EVDO BC1 Radiated Spurious Emission Results

Test Data （SO2）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3760.00	-50.23	7.3	12.6	-44.93	V
5640.00	-50.56	1.8	13.1	-39.26	V
7520.00	-50.48	0.8	11.7	-39.58	V
9400.00	-51.23	0.8	11.9	-40.13	V
11280.00	-51.48	0.3	11.5	-40.28	V
3760.00	-49.66	7.3	12.6	-44.36	H
5640.00	-49.20	1.8	13.1	-37.90	H
7520.00	-50.46	0.8	11.7	-39.56	H
9400.00	-50.33	0.8	11.9	-39.23	H
11280.00	-50.48	0.3	11.5	-39.28	H

Test Data （1x EvDo）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
3760.00	-50.36	7.3	12.6	-45.06	V
5640.00	-50.48	1.8	13.1	-39.18	V
7520.00	-51.33	0.8	11.7	-40.43	V
9400.00	-51.48	0.8	11.9	-40.38	V
11280.00	-52.32	0.3	11.5	-41.12	V
3760.00	-49.84	7.3	12.6	-44.54	H
5640.00	-49.68	1.8	13.1	-38.38	H
7520.00	-50.15	0.8	11.7	-39.25	H
9400.00	-50.47	0.8	11.9	-39.37	H
11280.00	-50.66	0.3	11.5	-39.46	H

5.4.9 LTE B7 5M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-50.39	7.5	12.7	-45.19	V
7605.00	-52.36	1.1	11.3	-42.16	V
10140.00	-52.04	0.4	12.1	-40.34	V
12675.00	-52.83	0.5	13.2	-40.13	V
15210.00	-50.33	0.4	13.6	-37.13	V
5070.00	-54.23	7.5	12.7	-49.03	H
7605.00	-53.38	1.1	11.3	-43.18	H
10140.00	-52.31	0.4	12.1	-40.61	H
12675.00	-50.11	0.5	13.2	-37.41	H
15210.00	-50.52	0.4	13.6	-37.32	H

5.4.10 LTE B7 5M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-54.41	7.5	12.7	-49.21	V
7605.00	-54.80	1.1	11.3	-44.60	V
10140.00	-52.35	0.4	12.1	-40.65	V
12675.00	-51.91	0.5	13.2	-39.21	V
15210.00	-52.78	0.4	13.6	-39.58	V
5070.00	-51.98	7.5	12.7	-46.78	H
7605.00	-53.42	1.1	11.3	-43.22	H
10140.00	-54.68	0.4	12.1	-42.98	H
12675.00	-51.32	0.5	13.2	-38.62	H
15210.00	-54.83	0.4	13.6	-41.63	H

5.4.11 LTE B7 10M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-51.19	7.5	12.7	-45.99	V
7605.00	-50.90	1.1	11.3	-40.70	V
10140.00	-50.73	0.4	12.1	-39.03	V
12675.00	-50.27	0.5	13.2	-37.57	V
15210.00	-50.88	0.4	13.6	-37.68	V
5070.00	-52.35	7.5	12.7	-47.15	H
7605.00	-50.74	1.1	11.3	-40.54	H
10140.00	-54.47	0.4	12.1	-42.77	H
12675.00	-51.25	0.5	13.2	-38.55	H
15210.00	-54.22	0.4	13.6	-41.02	H

5.4.12 LTE B7 10M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-53.17	7.5	12.7	-47.97	V
7605.00	-54.53	1.1	11.3	-44.33	V
10140.00	-51.60	0.4	12.1	-39.90	V
12675.00	-51.10	0.5	13.2	-38.40	V
15210.00	-50.57	0.4	13.6	-37.37	V
5070.00	-52.68	7.5	12.7	-47.48	H
7605.00	-52.71	1.1	11.3	-42.51	H
10140.00	-52.47	0.4	12.1	-40.77	H
12675.00	-50.37	0.5	13.2	-37.67	H
15210.00	-53.71	0.4	13.6	-40.51	H

5.4.13 LTE B7 15M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-51.54	7.5	12.7	-46.34	V
7605.00	-50.31	1.1	11.3	-40.11	V
10140.00	-52.92	0.4	12.1	-41.22	V
12675.00	-51.39	0.5	13.2	-38.69	V
15210.00	-54.49	0.4	13.6	-41.29	V
5070.00	-51.83	7.5	12.7	-46.63	H
7605.00	-53.18	1.1	11.3	-42.98	H
10140.00	-51.01	0.4	12.1	-39.31	H
12675.00	-52.54	0.5	13.2	-39.84	H
15210.00	-50.69	0.4	13.6	-37.49	H

5.4.14 LTE B7 15M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-52.58	7.5	12.7	-47.38	V
7605.00	-52.01	1.1	11.3	-41.81	V
10140.00	-53.15	0.4	12.1	-41.45	V
12675.00	-51.30	0.5	13.2	-38.60	V
15210.00	-54.98	0.4	13.6	-41.78	V
5070.00	-51.33	7.5	12.7	-46.13	H
7605.00	-51.36	1.1	11.3	-41.16	H
10140.00	-53.30	0.4	12.1	-41.60	H
12675.00	-51.21	0.5	13.2	-38.51	H
15210.00	-53.05	0.4	13.6	-39.85	H

5.4.15 LTE B7 20M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-50.31	7.5	12.7	-45.11	V
7605.00	-51.15	1.1	11.3	-40.95	V
10140.00	-51.24	0.4	12.1	-39.54	V
12675.00	-51.33	0.5	13.2	-38.63	V
15210.00	-51.47	0.4	13.6	-38.27	V
5070.00	-51.49	7.5	12.7	-46.29	H
7605.00	-52.23	1.1	11.3	-42.03	H
10140.00	-50.87	0.4	12.1	-39.17	H
12675.00	-50.63	0.5	13.2	-37.93	H
15210.00	-53.63	0.4	13.6	-40.43	H

5.4.16 LTE B7 20M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5070.00	-50.14	7.5	12.7	-44.94	V
7605.00	-53.78	1.1	11.3	-43.58	V
10140.00	-53.41	0.4	12.1	-41.71	V
12675.00	-52.94	0.5	13.2	-40.24	V
15210.00	-50.38	0.4	13.6	-37.18	V
5070.00	-53.58	7.5	12.7	-48.38	H
7605.00	-51.02	1.1	11.3	-40.82	H
10140.00	-52.50	0.4	12.1	-40.80	H
12675.00	-51.75	0.5	13.2	-39.05	H
15210.00	-51.64	0.4	13.6	-38.44	H

5.4.17 LTE B41 5M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-54.42	5.8	12.7	-47.52	V
7779.00	-53.23	0.7	11.3	-42.63	V
10372.00	-54.07	0.7	12.1	-42.67	V
12965.00	-52.27	0.4	13.6	-39.07	V
15558.00	-51.10	0.3	13.6	-37.80	V
5186.00	-52.01	5.8	12.7	-45.11	H
7779.00	-52.76	0.7	11.3	-42.16	H
10372.00	-50.46	0.7	12.1	-39.06	H
12965.00	-51.47	0.4	13.6	-38.27	H
15558.00	-54.20	0.3	13.6	-40.90	H

5.4.18 LTE B41 5M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-52.51	5.8	12.7	-45.61	V
7779.00	-53.57	0.7	11.3	-42.97	V
10372.00	-50.40	0.7	12.1	-39.00	V
12965.00	-54.89	0.4	13.6	-41.69	V
15558.00	-50.70	0.3	13.6	-37.40	V
5186.00	-53.91	5.8	12.7	-47.01	H
7779.00	-53.32	0.7	11.3	-42.72	H
10372.00	-54.10	0.7	12.1	-42.70	H
12965.00	-54.02	0.4	13.6	-40.82	H
15558.00	-51.76	0.3	13.6	-38.46	H

5.4.19 LTE B41 10M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-53.65	5.8	12.7	-46.75	V
7779.00	-51.53	0.7	11.3	-40.93	V
10372.00	-50.23	0.7	12.1	-38.83	V
12965.00	-52.51	0.4	13.6	-39.31	V
15558.00	-54.44	0.3	13.6	-41.14	V
5186.00	-51.43	5.8	12.7	-44.53	H
7779.00	-54.32	0.7	11.3	-43.72	H
10372.00	-53.28	0.7	12.1	-41.88	H
12965.00	-52.09	0.4	13.6	-38.89	H
15558.00	-50.60	0.3	13.6	-37.30	H

5.4.20 LTE B41 10M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-54.08	5.8	12.7	-47.18	V
7779.00	-54.13	0.7	11.3	-43.53	V
10372.00	-50.60	0.7	12.1	-39.20	V
12965.00	-51.72	0.4	13.6	-38.52	V
15558.00	-50.34	0.3	13.6	-37.04	V
5186.00	-54.23	5.8	12.7	-47.33	H
7779.00	-52.86	0.7	11.3	-42.26	H
10372.00	-52.97	0.7	12.1	-41.57	H
12965.00	-53.73	0.4	13.6	-40.53	H
15558.00	-53.08	0.3	13.6	-39.78	H

5.4.21 LTE B41 15M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-51.62	5.8	12.7	-44.72	V
7779.00	-50.37	0.7	11.3	-39.77	V
10372.00	-53.60	0.7	12.1	-42.20	V
12965.00	-54.33	0.4	13.6	-41.13	V
15558.00	-51.67	0.3	13.6	-38.37	V
5186.00	-52.80	5.8	12.7	-45.90	H
7779.00	-53.67	0.7	11.3	-43.07	H
10372.00	-50.16	0.7	12.1	-38.76	H
12965.00	-50.04	0.4	13.6	-36.84	H
15558.00	-53.82	0.3	13.6	-40.52	H

5.4.22 LTE B41 15M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-54.83	5.8	12.7	-47.93	V
7779.00	-51.25	0.7	11.3	-40.65	V
10372.00	-51.03	0.7	12.1	-39.63	V
12965.00	-53.28	0.4	13.6	-40.08	V
15558.00	-54.70	0.3	13.6	-41.40	V
5186.00	-52.97	5.8	12.7	-46.07	H
7779.00	-51.62	0.7	11.3	-41.02	H
10372.00	-50.23	0.7	12.1	-38.83	H
12965.00	-54.87	0.4	13.6	-41.67	H
15558.00	-51.14	0.3	13.6	-37.84	H

5.4.23 LTE B41 20M Bandwidth QPSK Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-54.04	5.8	12.7	-47.14	V
7779.00	-52.99	0.7	11.3	-42.39	V
10372.00	-51.05	0.7	12.1	-39.65	V
12965.00	-53.98	0.4	13.6	-40.78	V
15558.00	-51.16	0.3	13.6	-37.86	V
5186.00	-52.31	5.8	12.7	-45.41	H
7779.00	-54.51	0.7	11.3	-43.91	H
10372.00	-54.99	0.7	12.1	-43.59	H
12965.00	-51.02	0.4	13.6	-37.82	H
15558.00	-53.66	0.3	13.6	-40.36	H

5.4.24 LTE B41 20M Bandwidth 16QAM Radiated Spurious Emission Results

Test Data

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
5186.00	-50.07	5.8	12.7	-43.17	V
7779.00	-51.81	0.7	11.3	-41.21	V
10372.00	-50.69	0.7	12.1	-39.29	V
12965.00	-53.94	0.4	13.6	-40.74	V
15558.00	-50.20	0.3	13.6	-36.90	V
5186.00	-53.89	5.8	12.7	-46.99	H
7779.00	-54.25	0.7	11.3	-43.65	H
10372.00	-54.87	0.7	12.1	-43.47	H
12965.00	-51.98	0.4	13.6	-38.78	H
15558.00	-50.55	0.3	13.6	-37.25	H

5.5 Band Edge

Specifications:	FCC Part 2.1051, 24.238, 2.1053, 22.917, 27.53
DUT Serial Number:	S5/18: 862851030000874/862851030020872
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit Level Construction:

According to Part 22.917 and 24.238:

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.

According to Part 27.53(h):

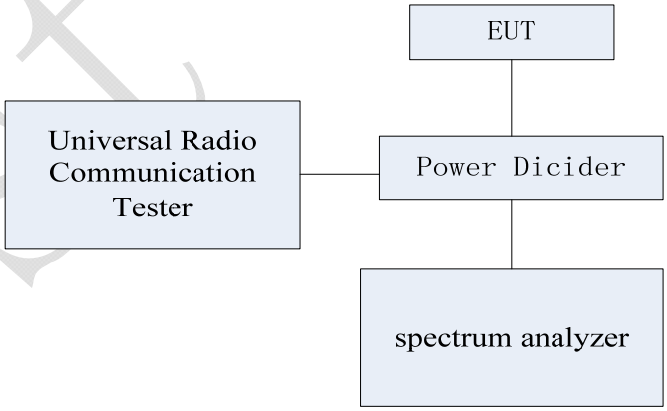
Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10(P) dB.

According to Part 27.53(m):

For digital base stations, the attenuation shall be not less than 43 + 10 log (P) dB.

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method:

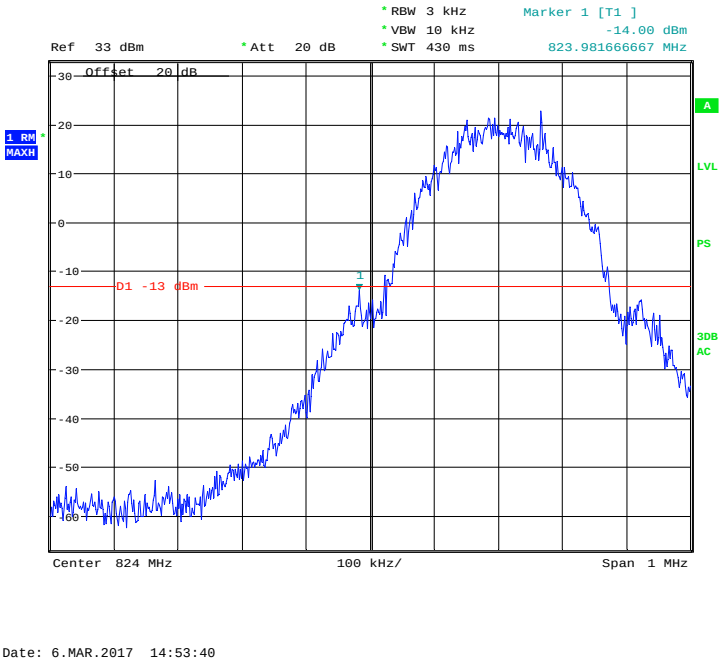
1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The lost of the cables the test system is calibrated to correct the readings.

2) The spectrum analyzer was set to Maxpeak Detector function and Maximum hold mode.

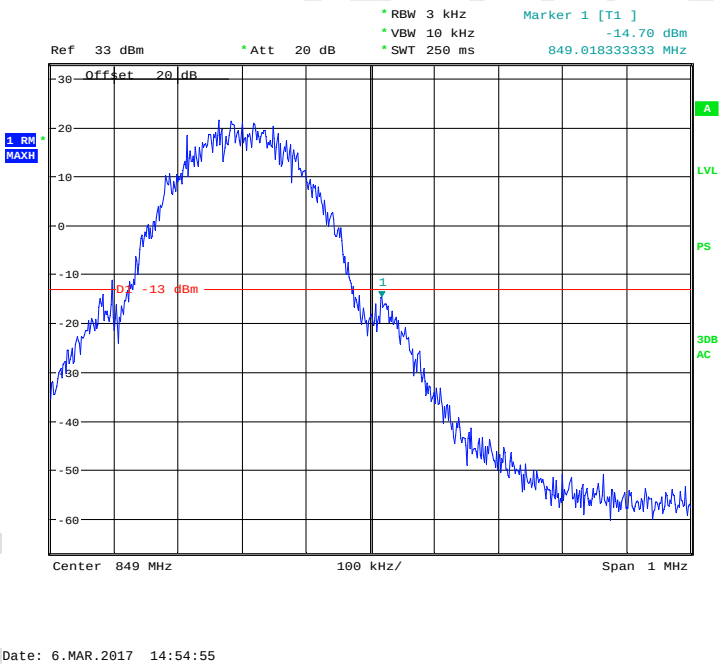
3) The resolution bandwidth of the spectrum analyzer was a little greater than 1% of the 26dB emission bandwidth.

Note: --

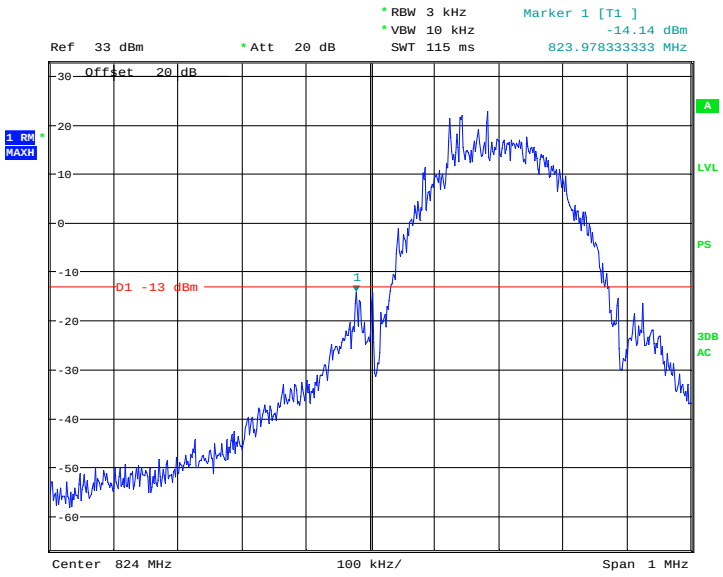
5.5.1 GSM850 Band Edge Results



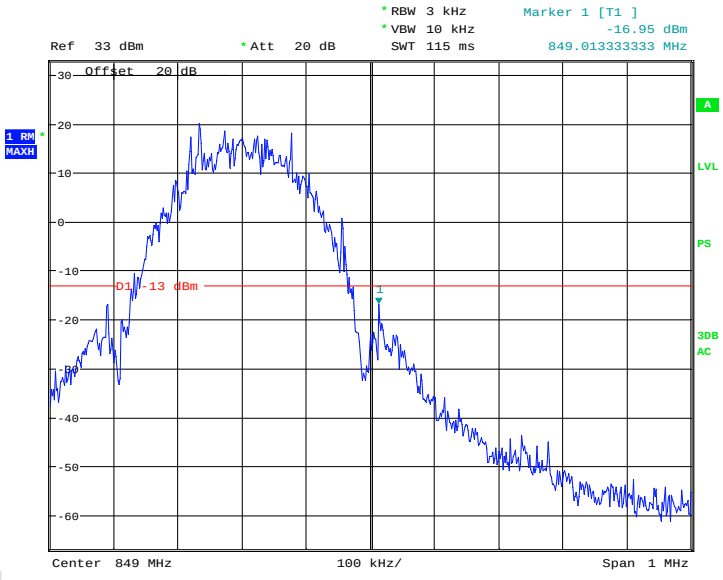
GSMK; Cellular low channel, below 824 MHz



GMSK; Cellular high channel, above 849 MHz

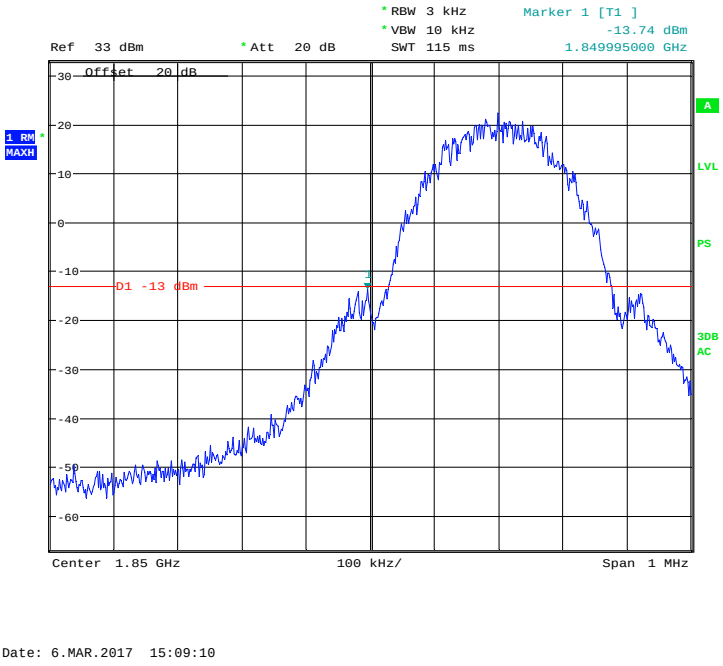


8PSK; Cellular low channel, below 824 MHz

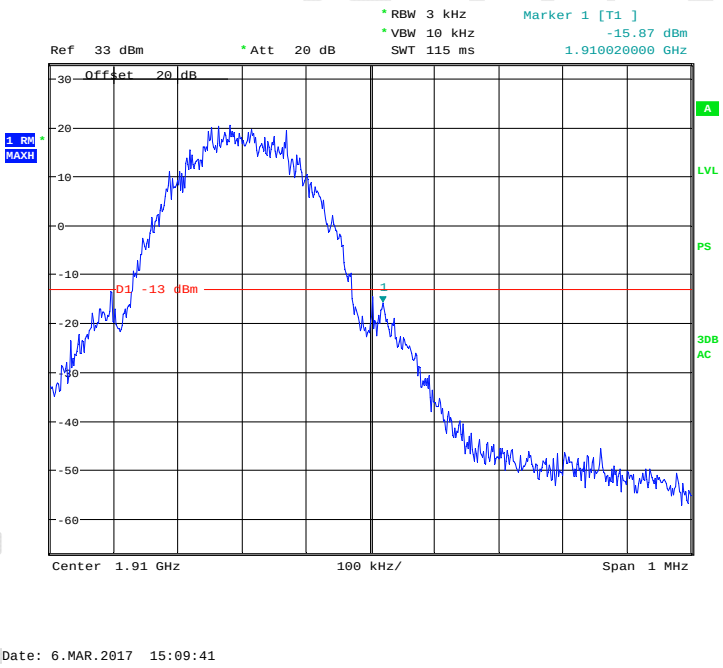


8PSK; Cellular high channel, above 849 MHz

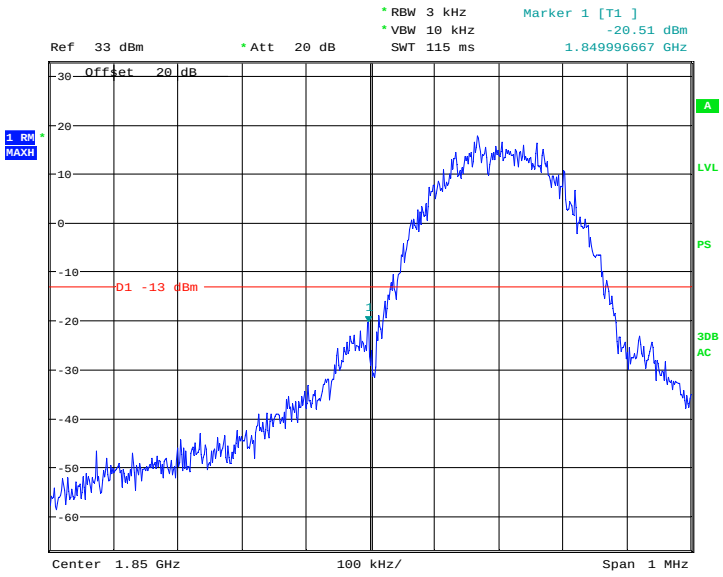
5.5.2 PCS1900 Band Edge Results



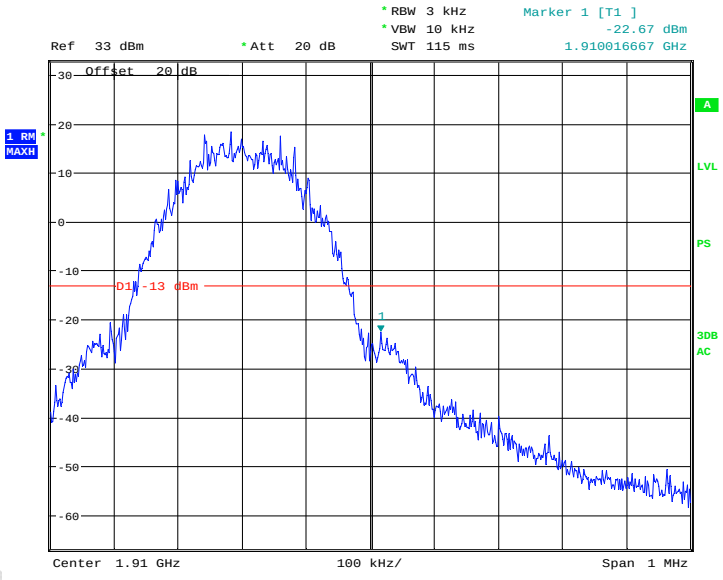
GMSK; PCS low channel, below 1850 MHz



GMSK; PCS high channel, above 1910 MHz

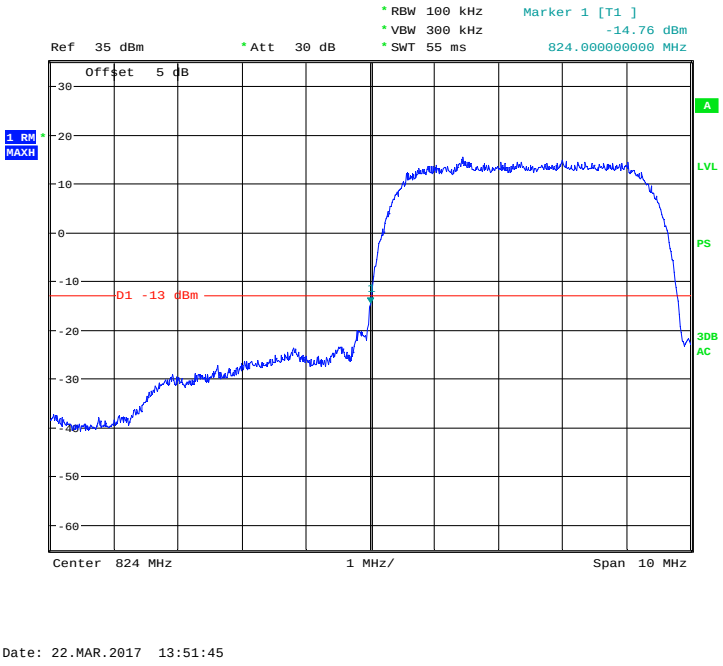


8PSK; PCS low channel, below 1850 MHz

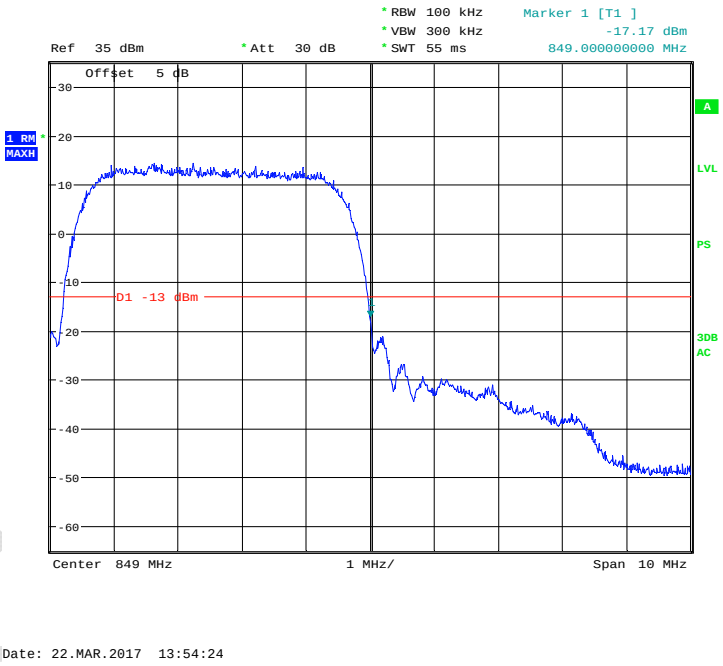


8PSK; PCS high channel, above 1910 MHz

5.5.3 WCDMA B2 Band Edge Results

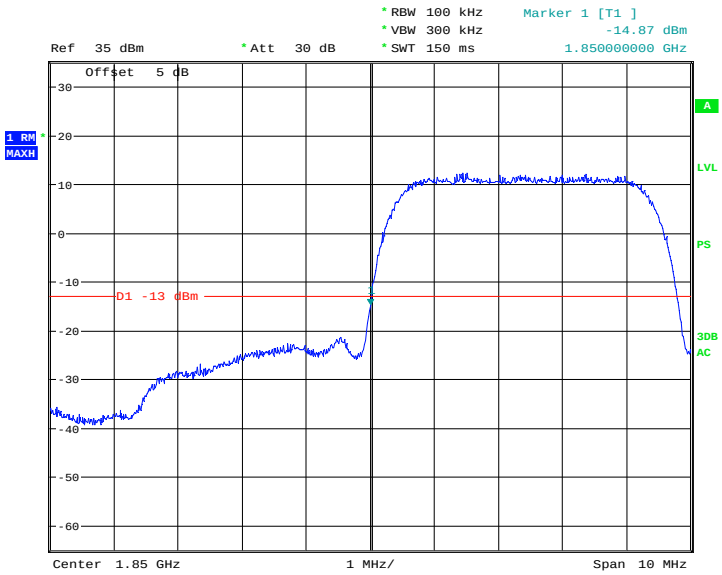


WCDMA Band 2 QPSK, Low Channel , Below 1850MHz

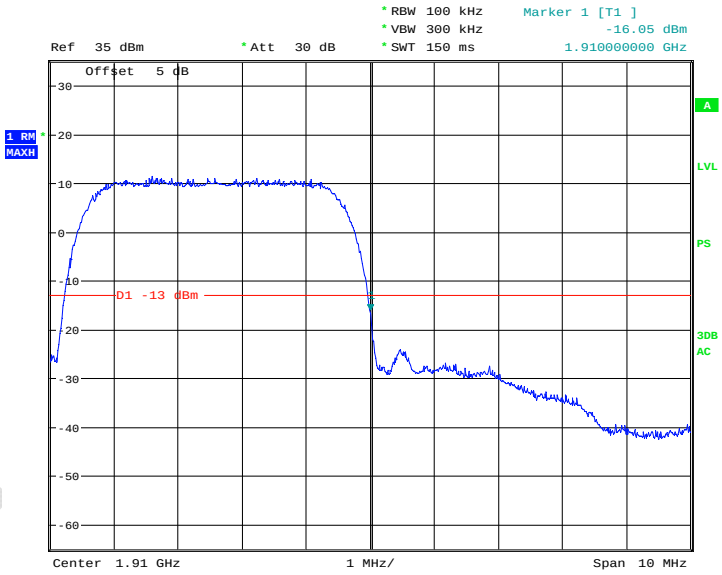


WCDMA Band 2 QPSK, High Channel , Above 1910MHz

5.5.4 WCDMA B5 Band Edge Results

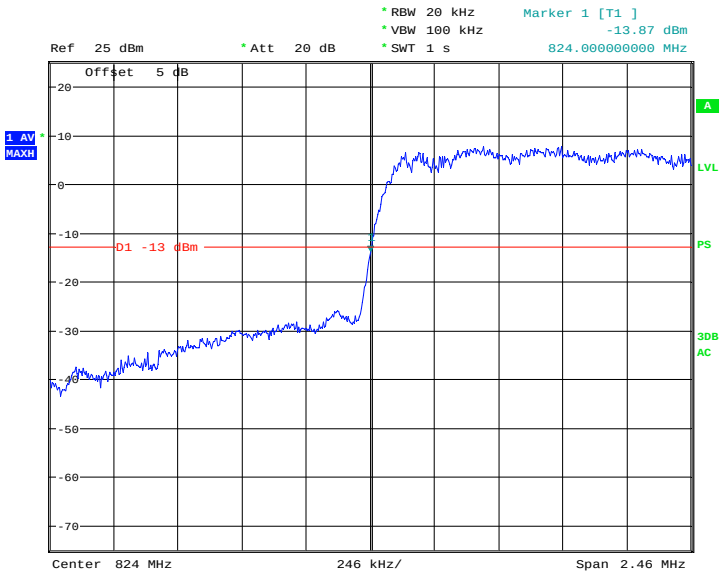


WCDMA Band 5 QPSK, Low Channel , Below 824MHz



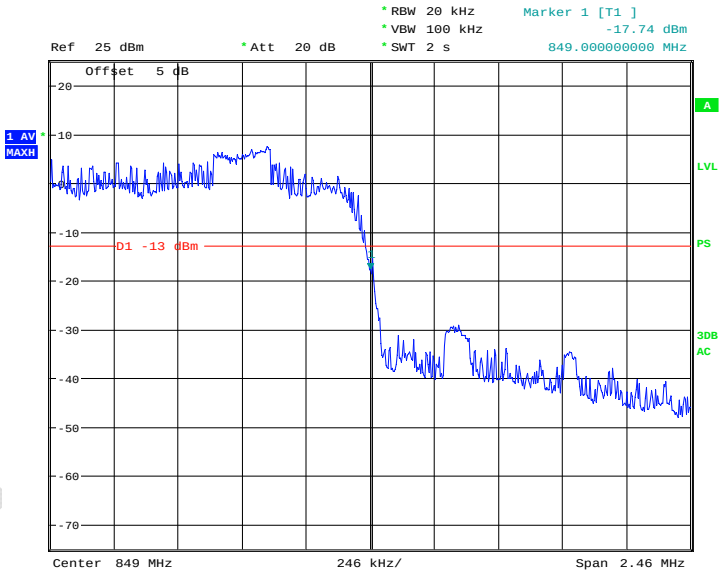
WCDMA Band 5 QPSK, High Channel , Above 849MHz

5.5.5 CDMA BC0 Band Edge Results



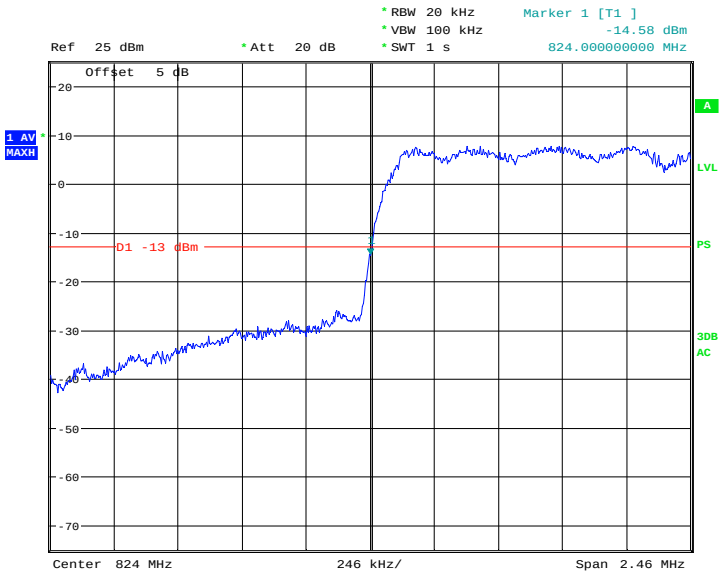
Date: 24.MAR.2017 16:31:36

CDMA BC0, RC1, low channel, Below 824 MHz

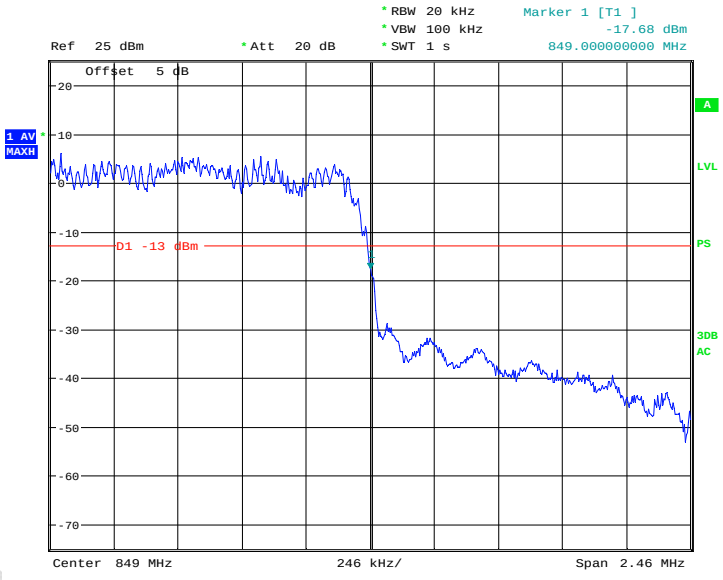


Date: 24.MAR.2017 16:37:33

CDMA BC0, RC1, high channel, Above 849 MHz

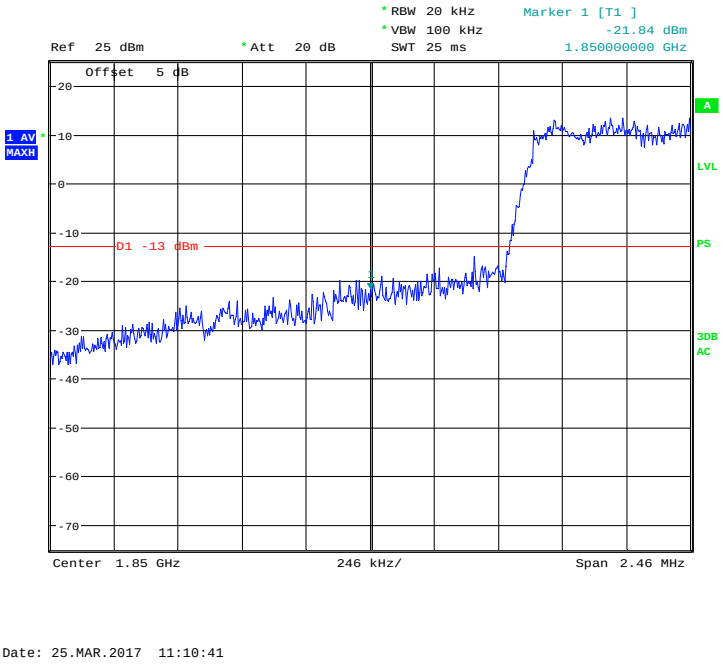


CDMA BC0, RC3, low channel, Below 824 MHz

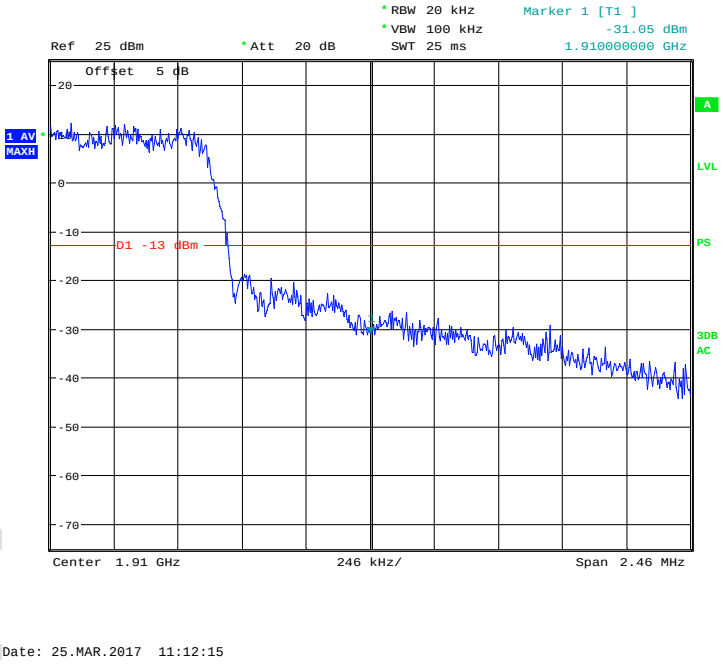


CDMA BC0, RC3, high channel, Above 849 MHz

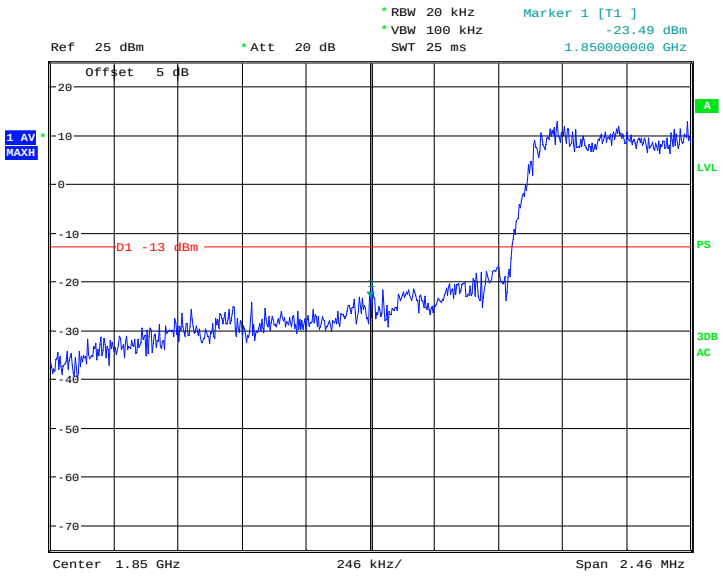
5.5.6 CDMA BC1 Band Edge Results



CDMA BC1,RC1, low channel, Below 1850 MHz

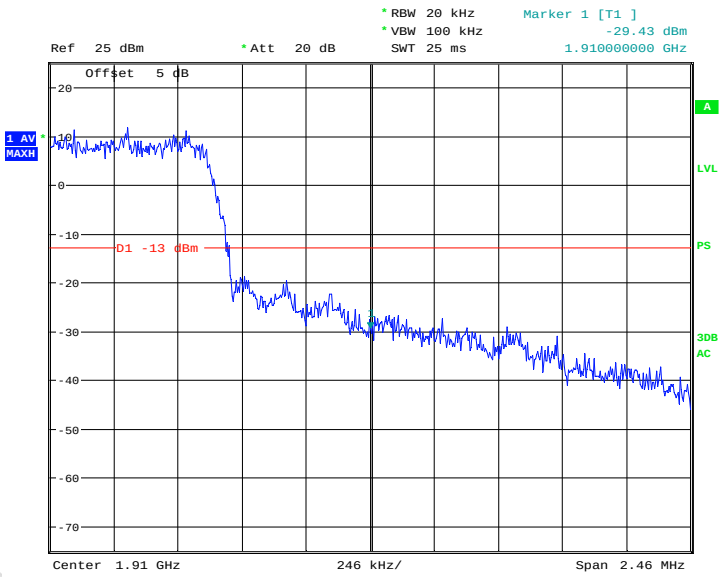


CDMA BC1, RC1, high channel, Above 1910 MHz



Date: 25.MAR.2017 11:11:09

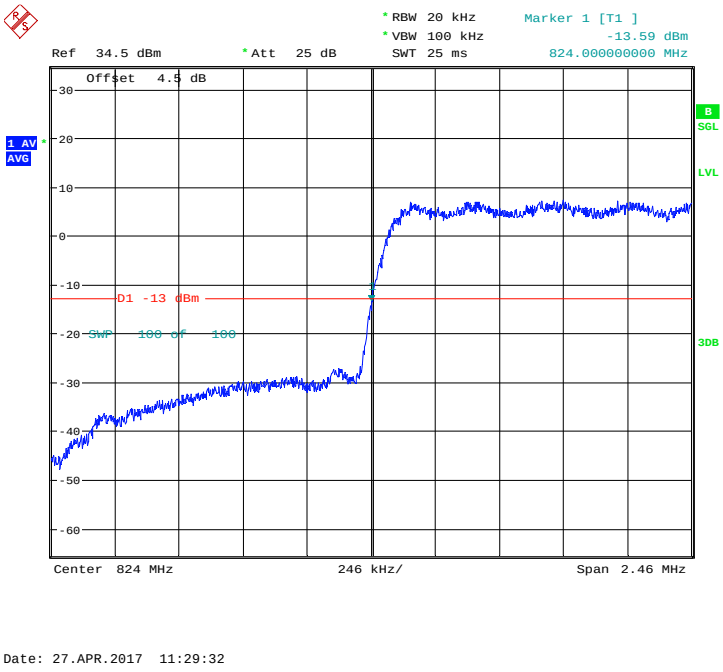
CDMA BC1,RC3, low channel, Below 1850 MHz



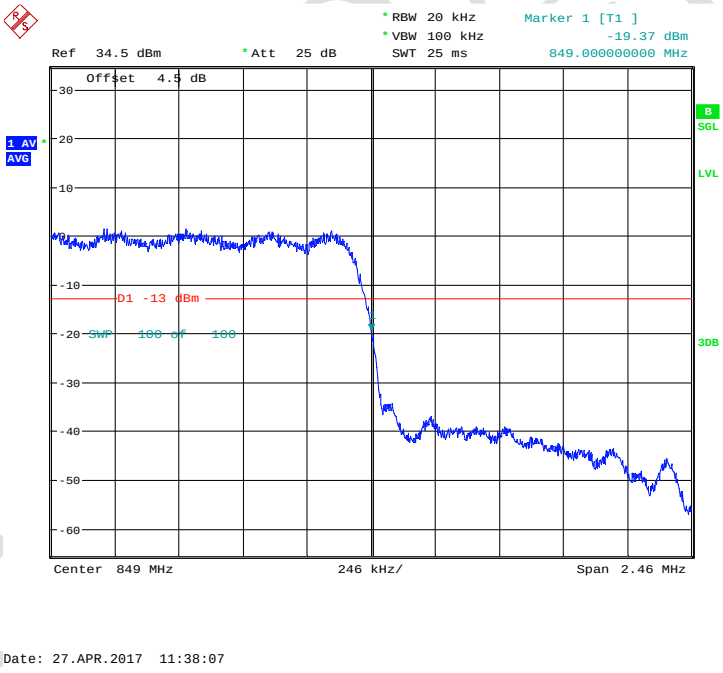
Date: 25.MAR.2017 11:12:46

CDMA BC1, RC3, high channel, Above 1910 MHz

5.5.7 EVDO BC0 Band Edge Results

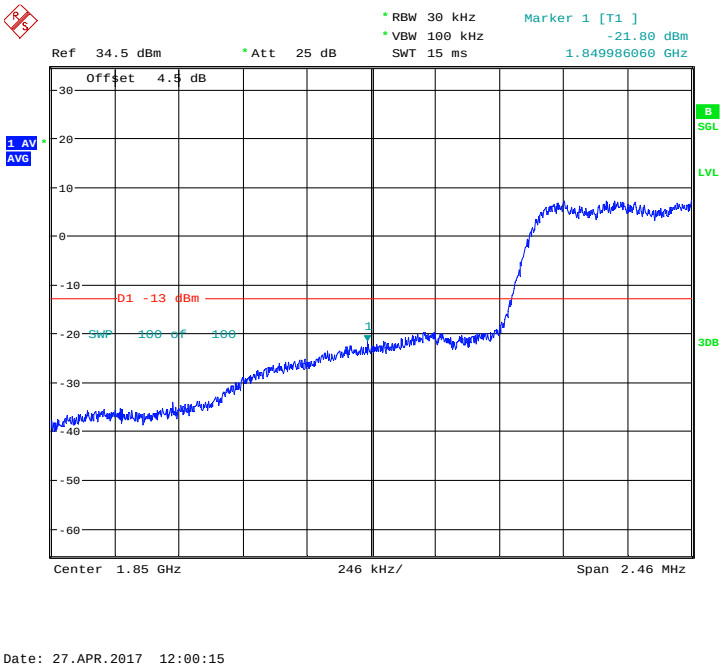


1x EvDO BC0, Rel. A, low channel, Below 824 MHz

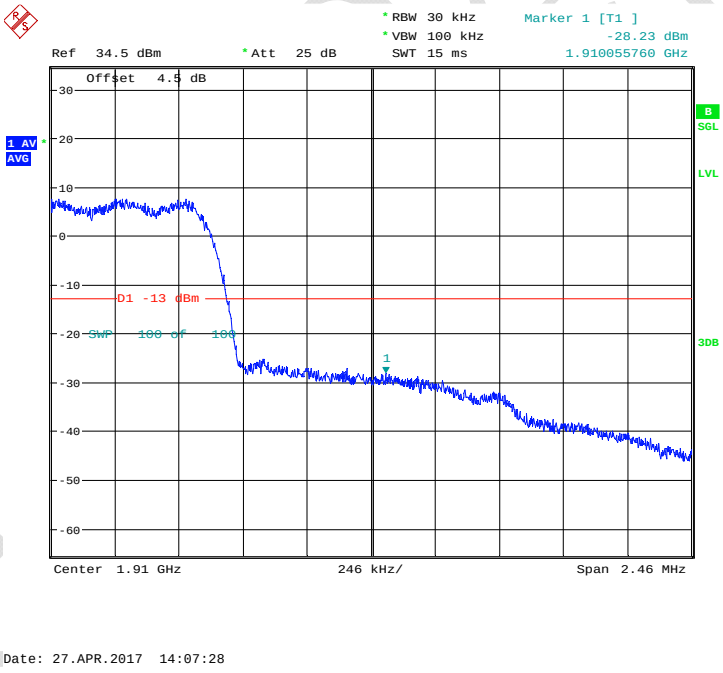


1x EvDO BC0, Rel. A, high channel, Above 849 MHz

5.5.8 EVDO BC1 Band Edge Results

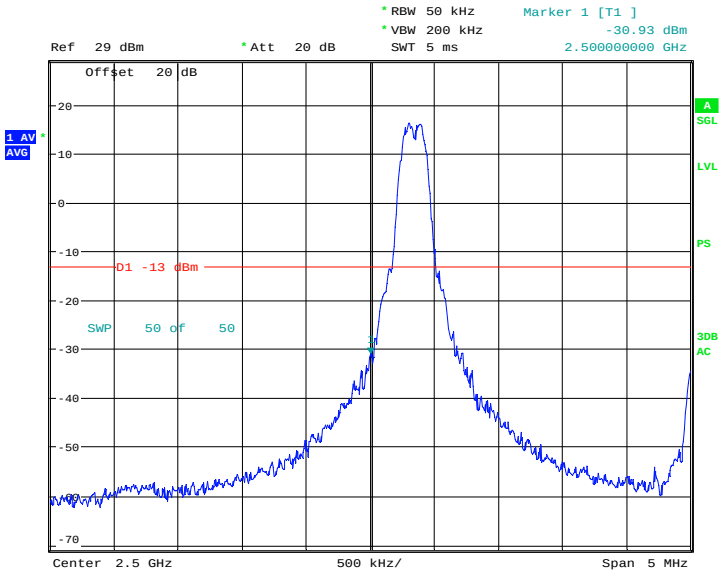


1x EvDO BC1,Rel. A, low channel, Below 1850 MHz



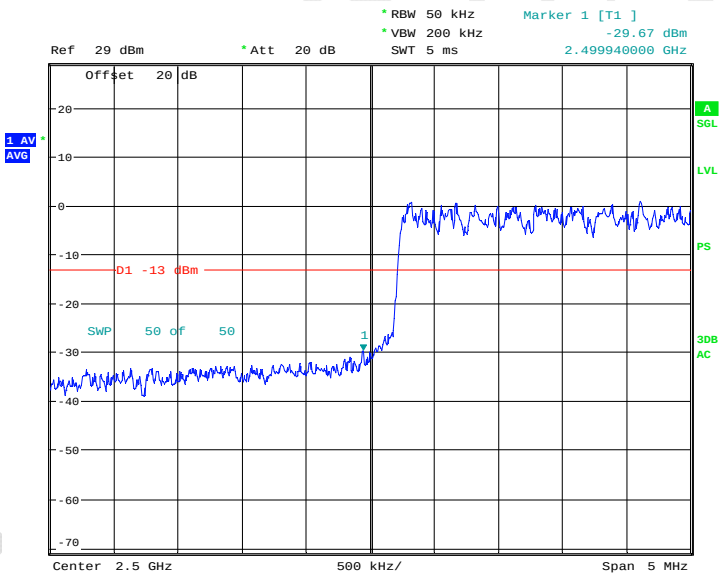
1x EvDO BC1, Rel. A, high channel, Above 1910 MHz

5.5.9 LTE B7 Band Edge Results



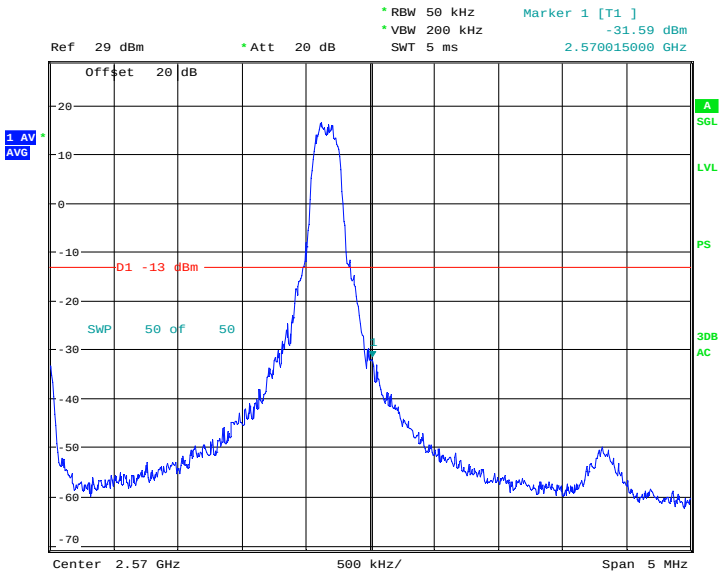
Date: 7.MAR.2017 15:07:47

LTE Band7, 5MHz bandwidth, QPSK,(1,0) Mode , Below 2500MHz

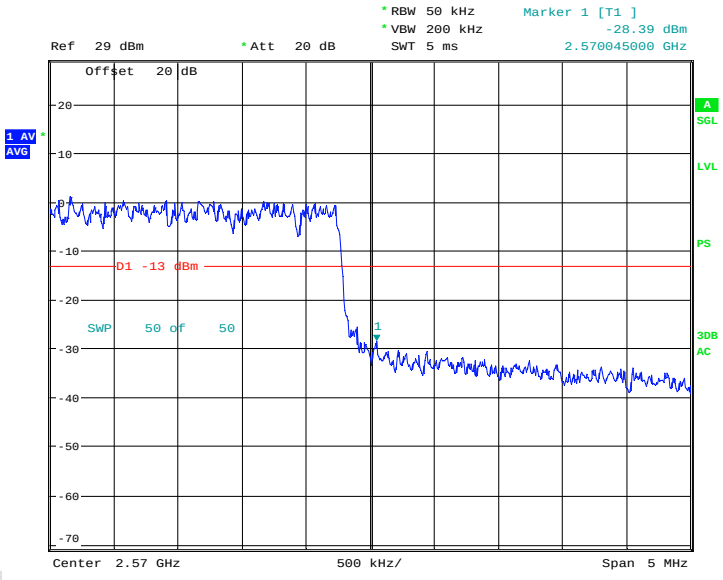


Date: 7.MAR.2017 15:08:37

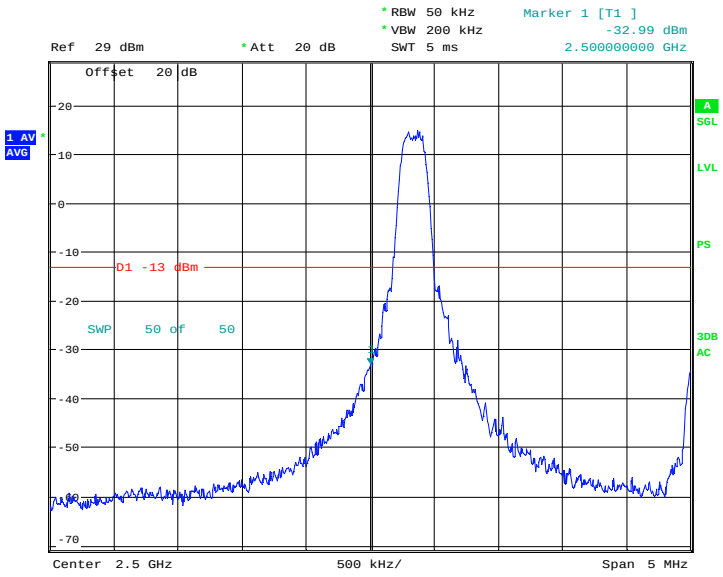
LTE Band7, 5MHz bandwidth, QPSK,(25,0) Mode , Below 2500MHz



LTE Band7, 5MHz bandwidth, QPSK,(1,25) Mode, Above 2570MHz

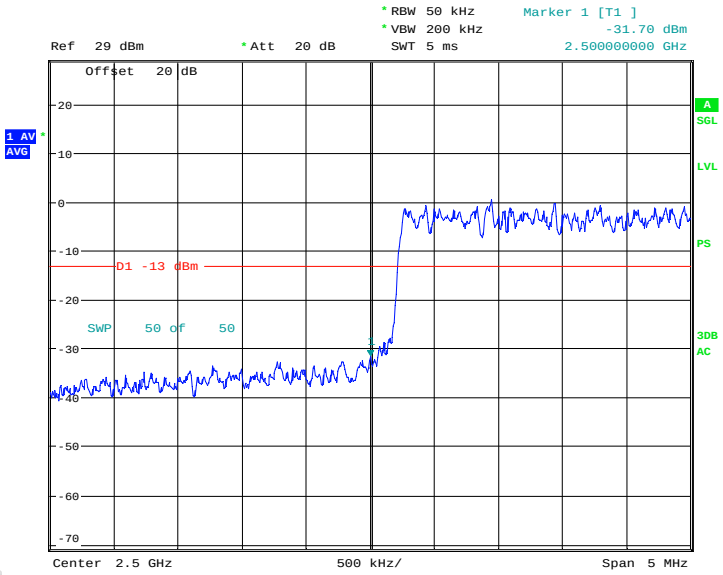


LTE Band7, 5MHz bandwidth, QPSK,(25,0) Mode, Above 2570MHz



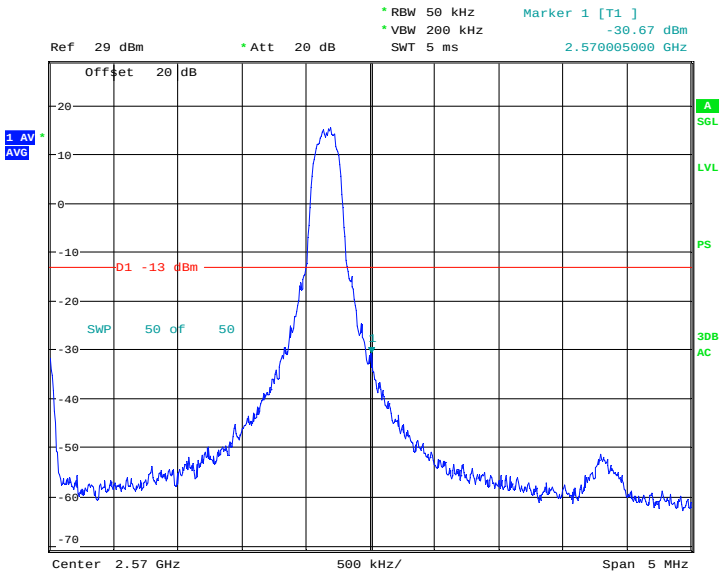
Date: 7.MAR.2017 15:13:10

LTE Band7, 5MHz bandwidth, 16QAM,(1,0) Mode , Below 2500MHz



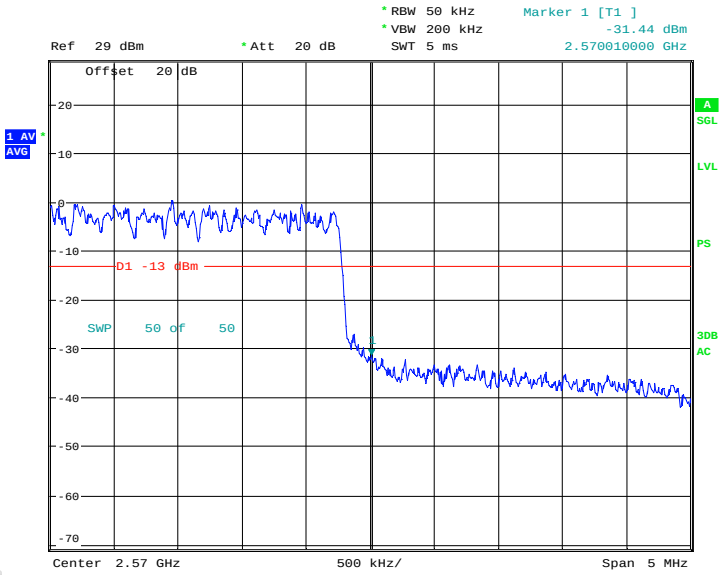
Date: 7.MAR.2017 15:13:42

LTE Band7, 5MHz bandwidth, 16QAM,(25,0) Mode , Below 2500MHz



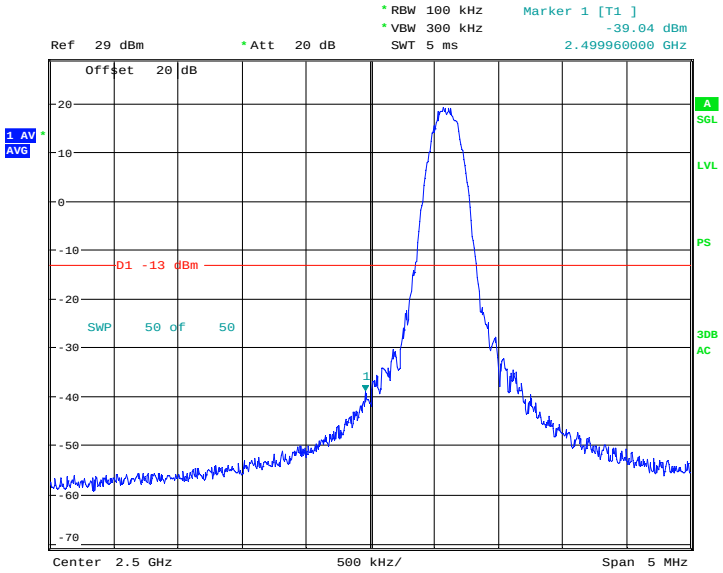
Date: 7.MAR.2017 15:16:40

LTE Band7, 5MHz bandwidth, 16QAM,(1,25) Mode, Above 2570MHz



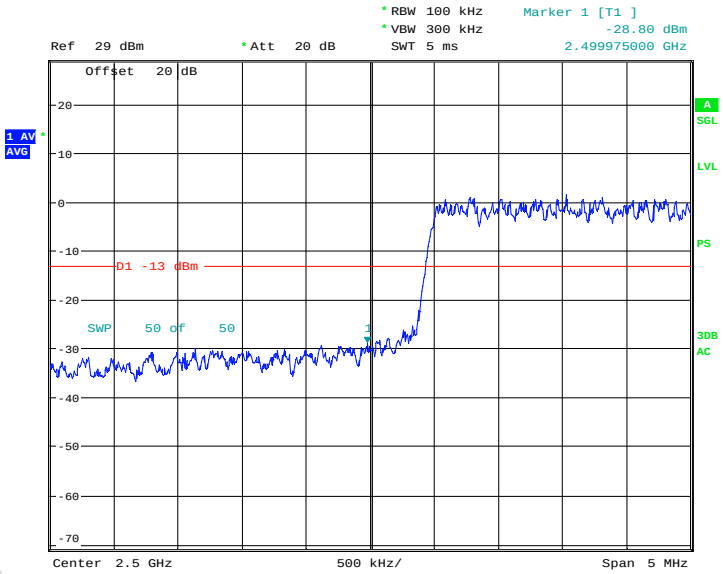
Date: 7.MAR.2017 15:17:02

LTE Band7, 5MHz bandwidth, 16QAM,(25,0) Mode, Above 2570MHz



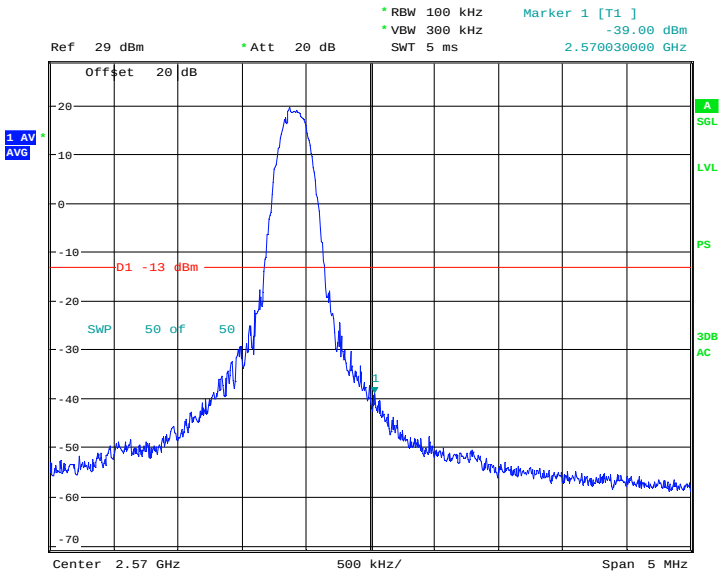
Date: 7.MAR.2017 15:20:58

LTE Band7, 10MHz bandwidth, QPSK,(1,0) Mode , Below 2500MHz

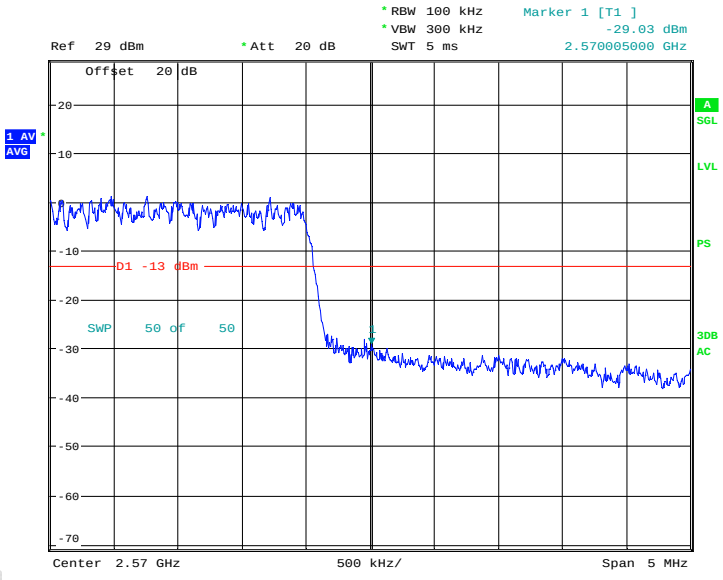


Date: 7.MAR.2017 15:50:26

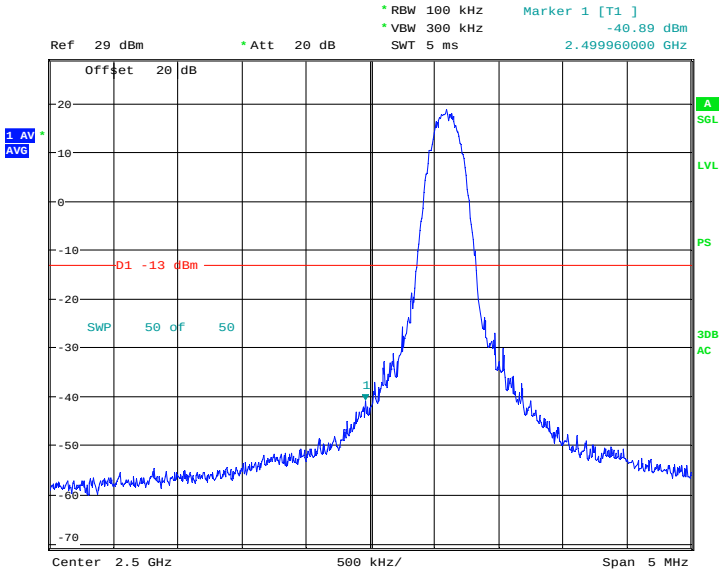
LTE Band7, 10MHz bandwidth, QPSK,(50,0) Mode , Below 2500MHz



LTE Band7, 10MHz bandwidth, QPSK,(1,50) Mode, Above 2570MHz

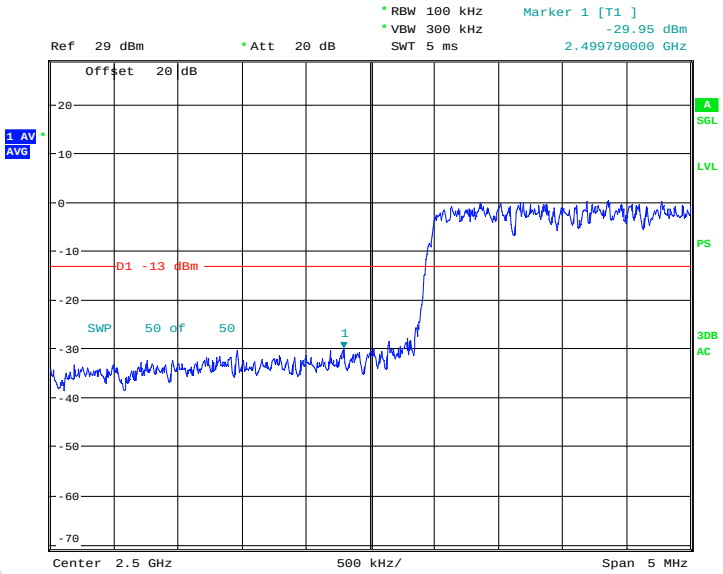


LTE Band7, 10MHz bandwidth, QPSK,(50,0) Mode, Above 2570MHz



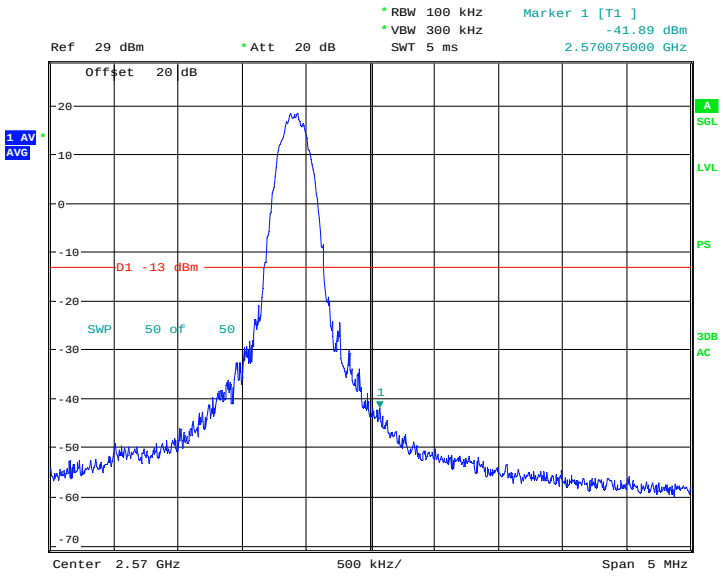
Date: 7.MAR.2017 15:54:01

LTE Band7, 10MHz bandwidth, 16QAM,(1,0) Mode , Below 2500MHz



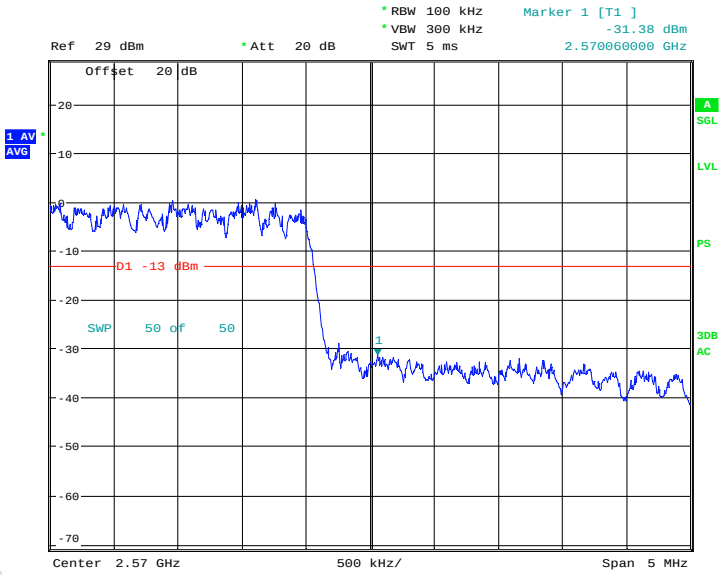
Date: 7.MAR.2017 15:54:30

LTE Band7, 10MHz bandwidth, 16QAM,(50,0) Mode , Below 2500MHz



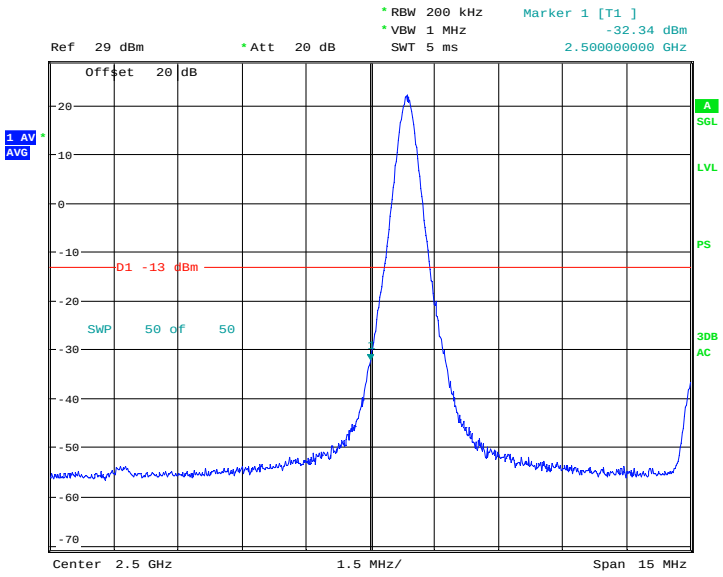
Date: 7.MAR.2017 15:58:52

LTE Band7, 10MHz bandwidth, 16QAM,(1,50) Mode, Above 2570MHz



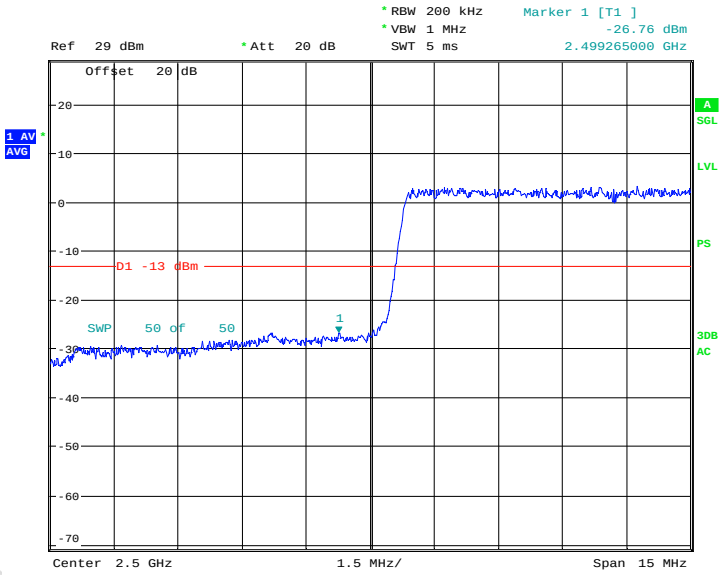
Date: 7.MAR.2017 15:59:14

LTE Band7, 10MHz bandwidth, 16QAM,(50,0) Mode, Above 2570MHz



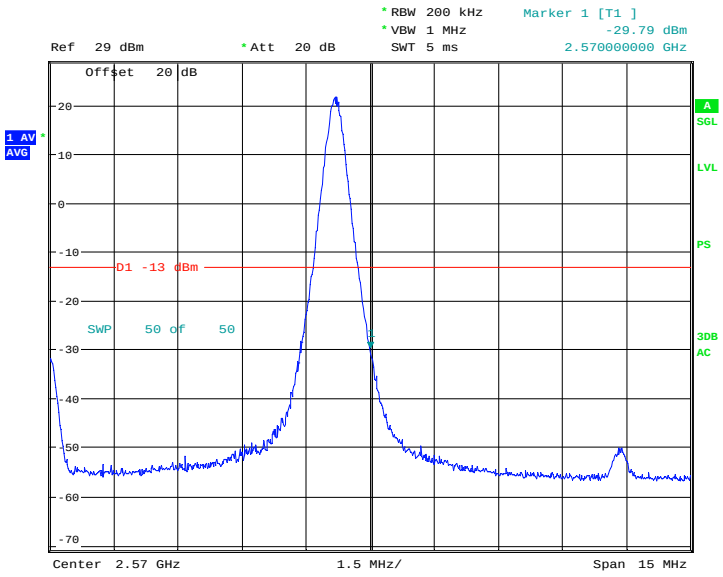
Date: 7.MAR.2017 16:01:42

LTE Band7, 15MHz bandwidth, QPSK,(1,0) Mode , Below 2500MHz

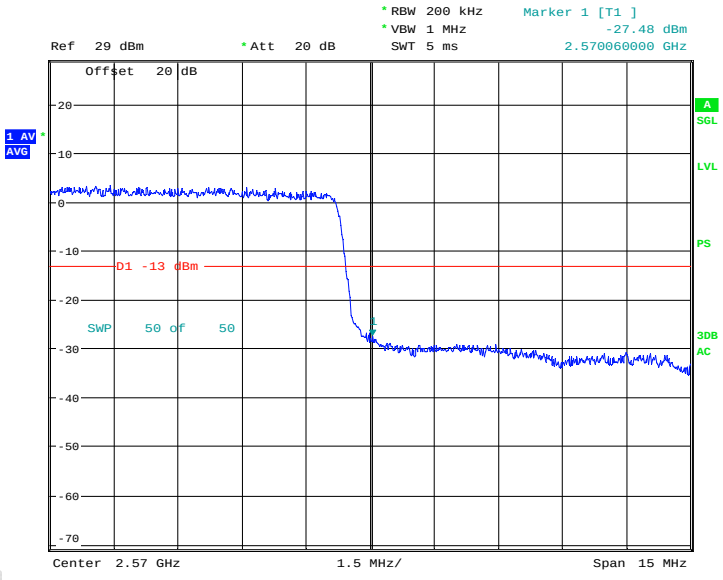


Date: 7.MAR.2017 16:02:00

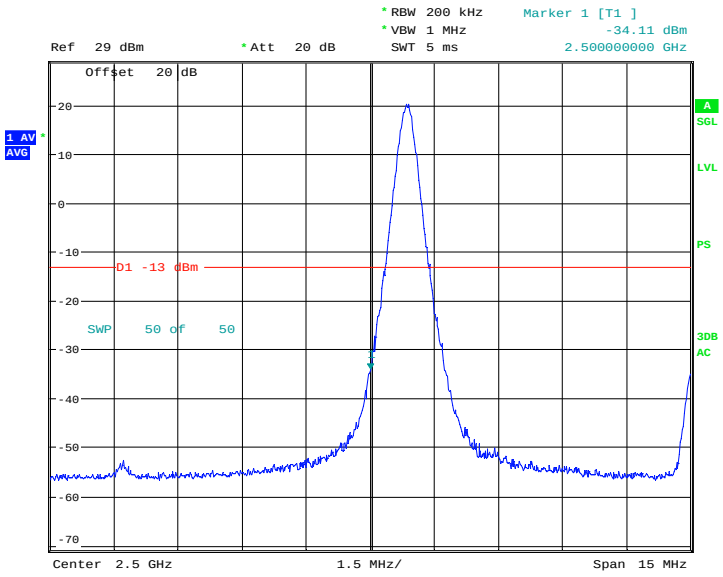
LTE Band7, 15MHz bandwidth, QPSK,(75,0) Mode , Below 2500MHz



LTE Band7, 15MHz bandwidth, QPSK,(1,75) Mode, Above 2570MHz

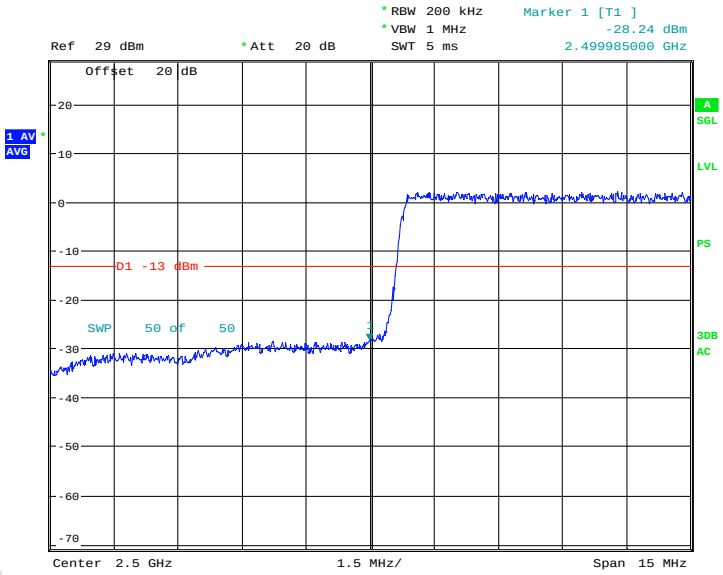


LTE Band7, 15MHz bandwidth, QPSK,(75,0) Mode, Above 2570MHz



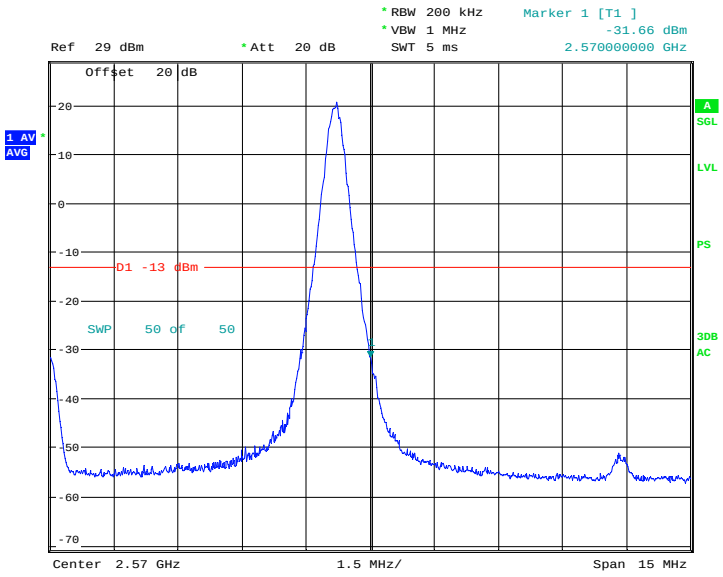
Date: 7.MAR.2017 16:17:01

LTE Band7, 15MHz bandwidth, 16QAM,(1,0) Mode , Below 2500MHz



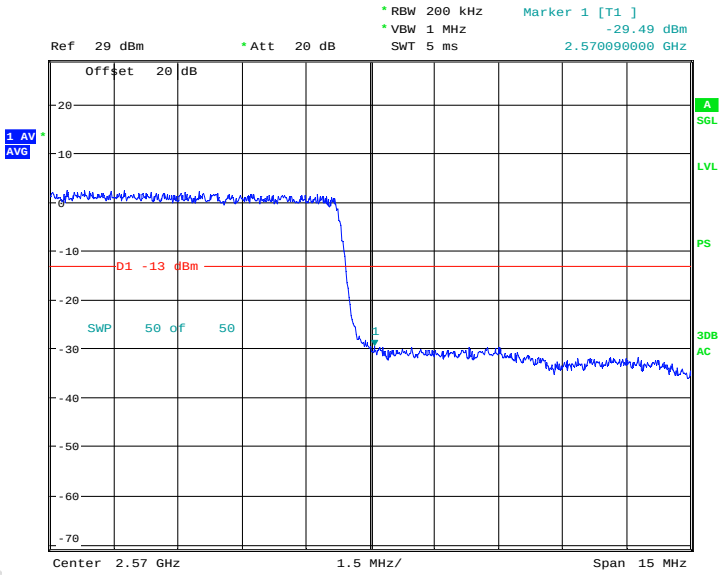
Date: 7.MAR.2017 16:17:18

LTE Band7, 15MHz bandwidth, 16QAM,(75,0) Mode , Below 2500MHz



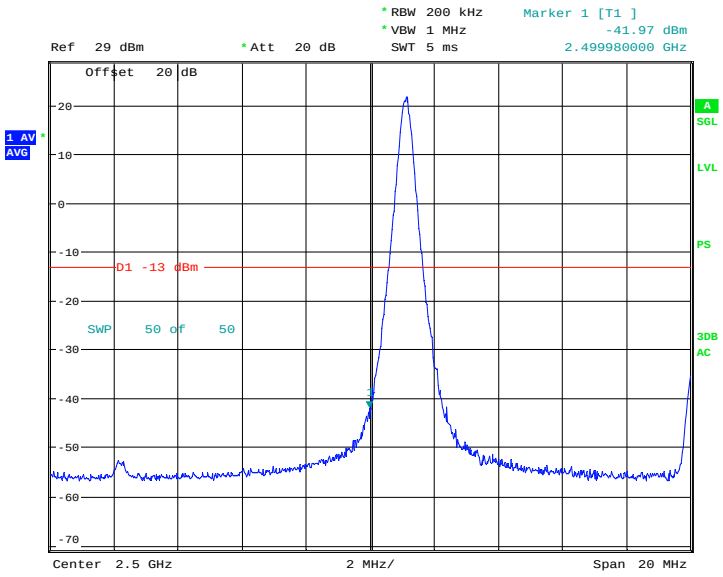
Date: 7.MAR.2017 16:03:44

LTE Band7, 15MHz bandwidth, 16QAM,(1,75) Mode, Above 2570MHz

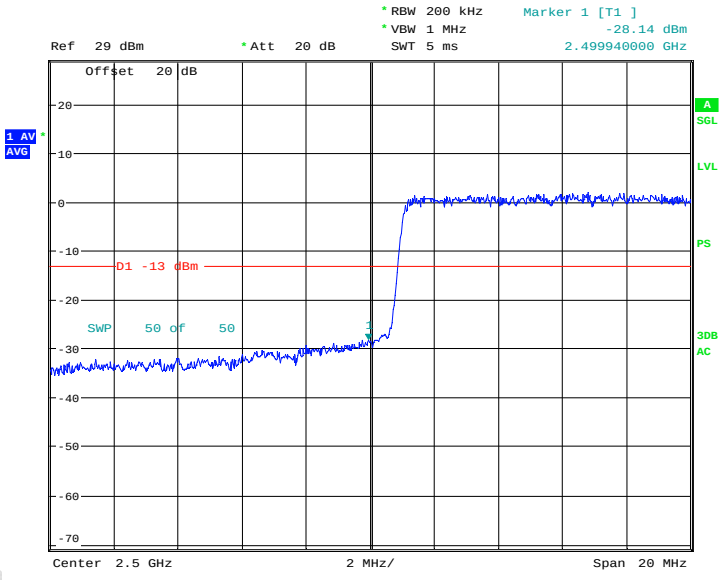


Date: 7.MAR.2017 16:04:00

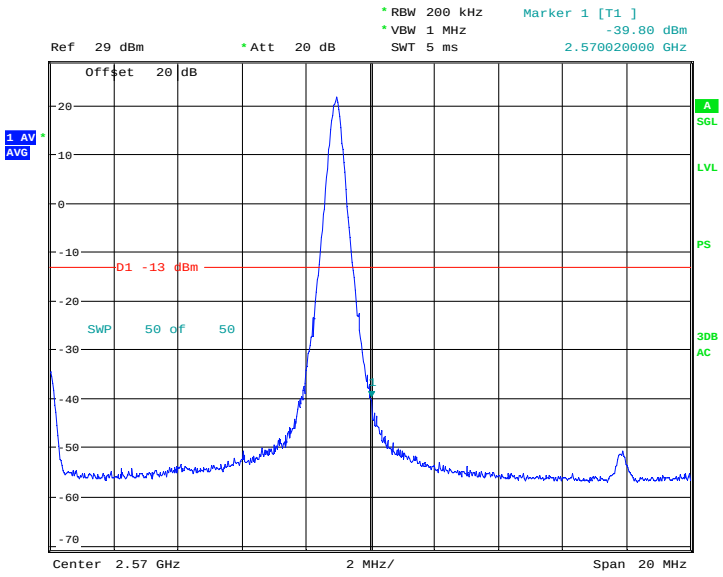
LTE Band7, 15MHz bandwidth, 16QAM,(75,0) Mode, Above 2570MHz



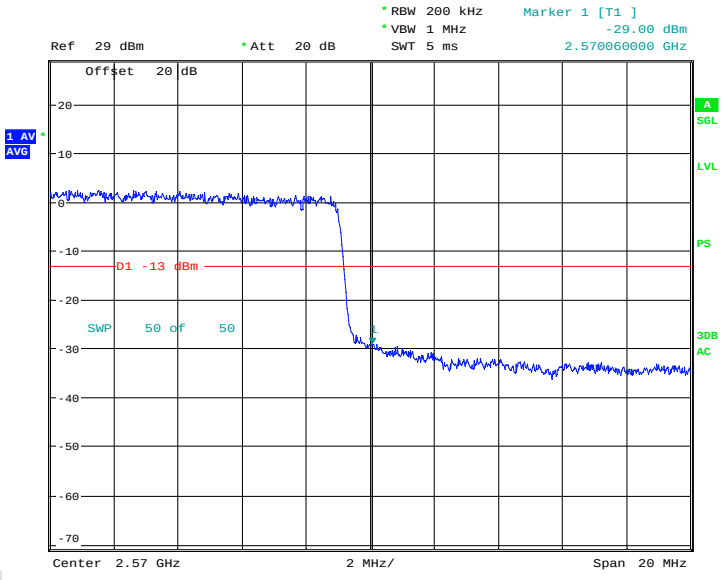
LTE Band7, 20MHz bandwidth, QPSK,(1,0) Mode , Below 2500MHz



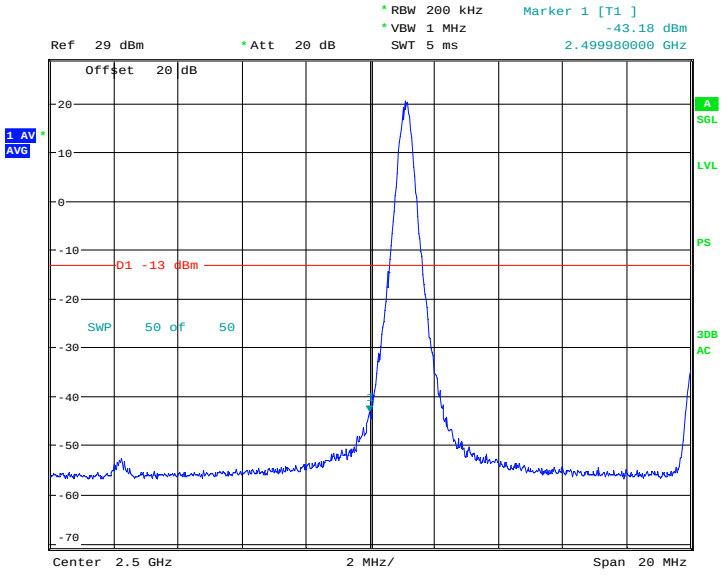
LTE Band7, 20MHz bandwidth, QPSK,(100,0) Mode , Below 2500MHz



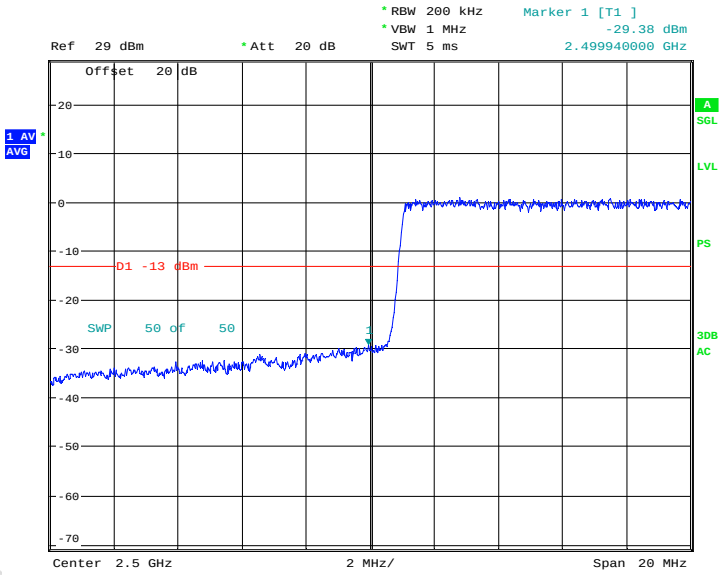
LTE Band7, 20MHz bandwidth, QPSK,(1,100) Mode, Above 2570MHz



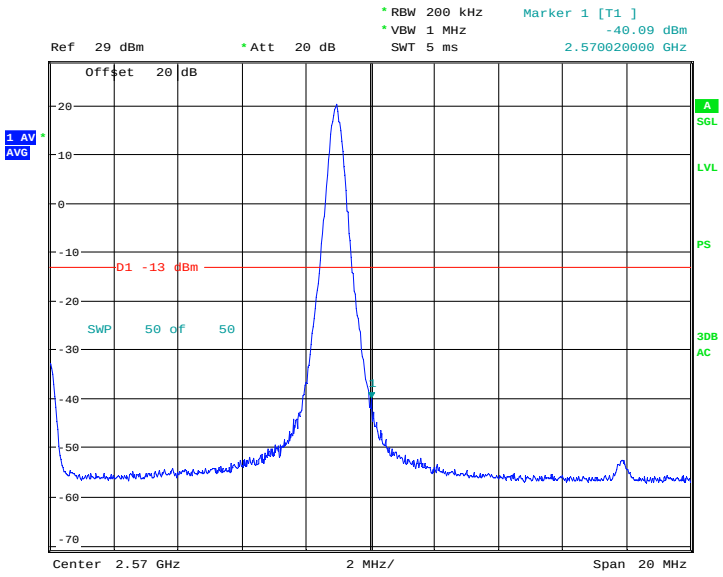
LTE Band7, 20MHz bandwidth, QPSK,(100,0) Mode, Above 2570MHz



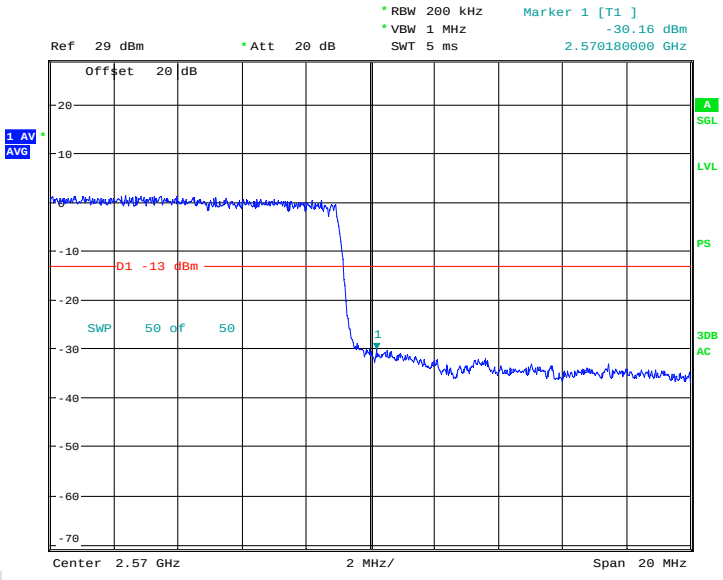
LTE Band7, 20MHz bandwidth, 16QAM,(1,0) Mode , Below 2500MHz



LTE Band7, 20MHz bandwidth, 16QAM,(100,0) Mode , Below 2500MHz

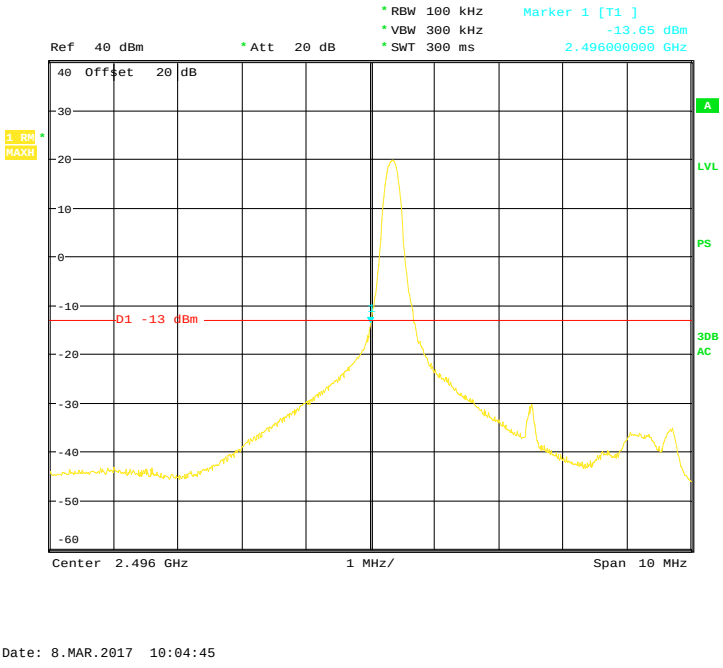


LTE Band7, 20MHz bandwidth, 16QAM,(1,100) Mode, Above 2570MHz

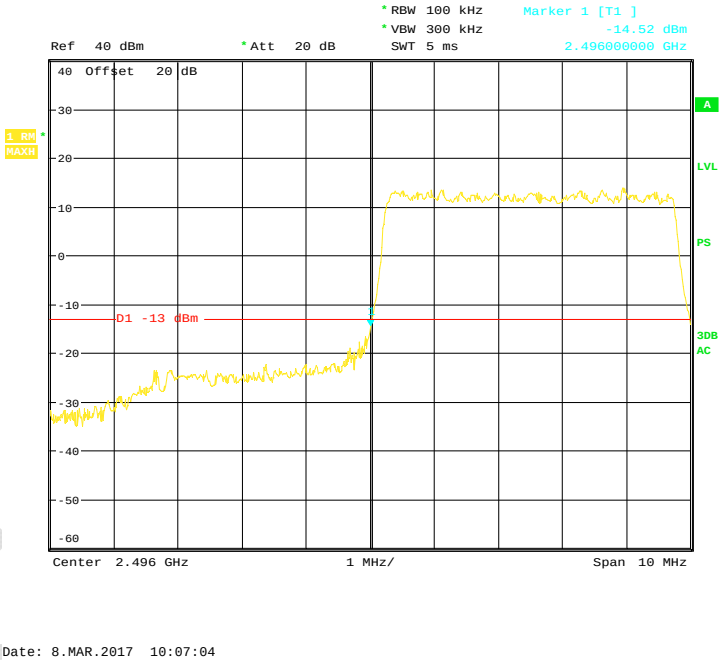


LTE Band7, 20MHz bandwidth, 16QAM,100,0) Mode, Above 2570MHz

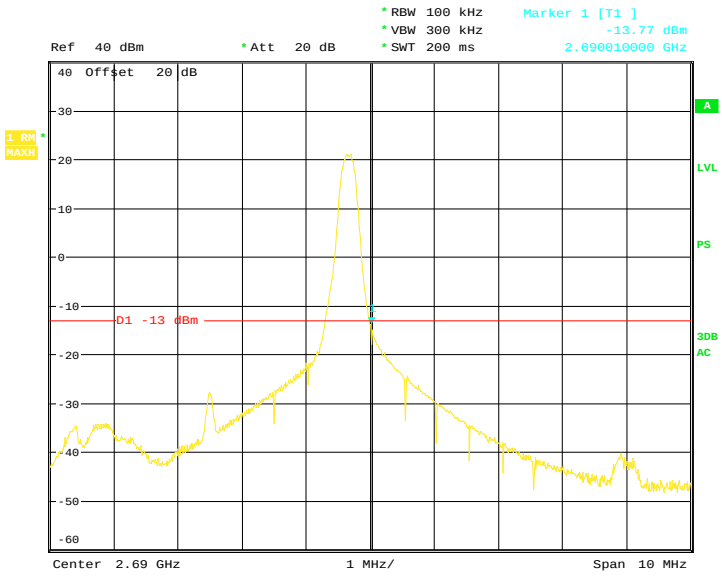
5.5.10 LTE B41 Band Edge Results



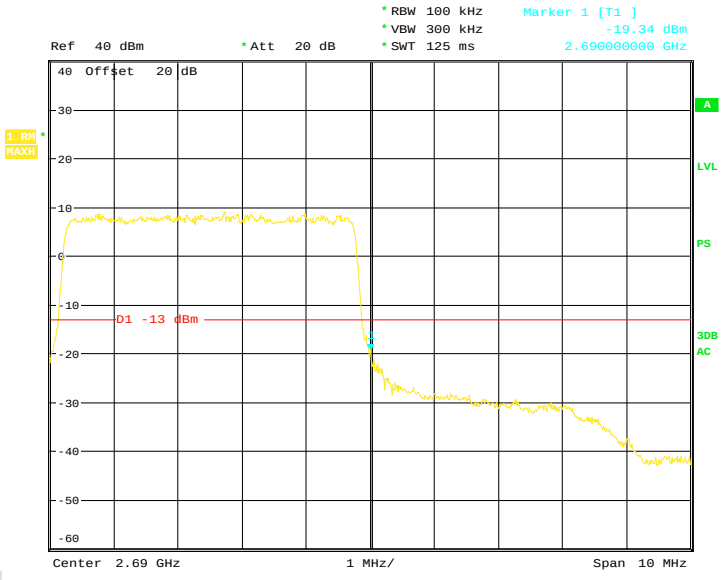
LTE Band41, 5MHz bandwidth, QPSK,(1,0) Mode , Below 2496MHz



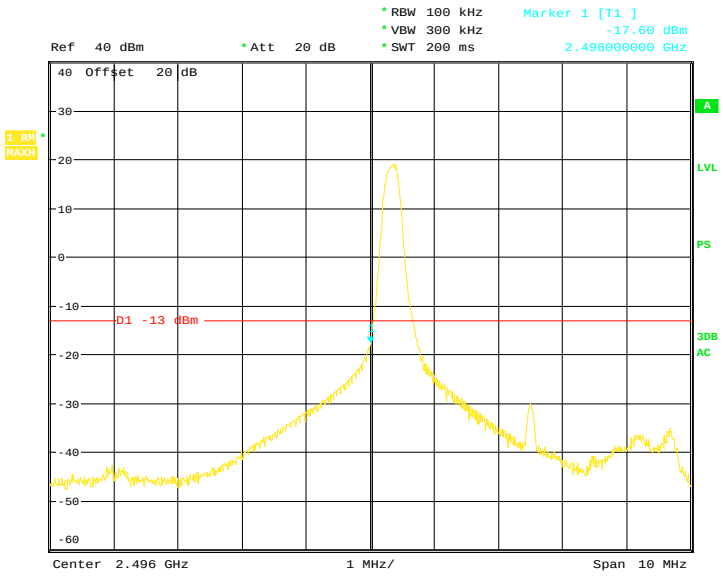
LTE Band41, 5MHz bandwidth, QPSK,(25,0) Mode , Below 2496MHz



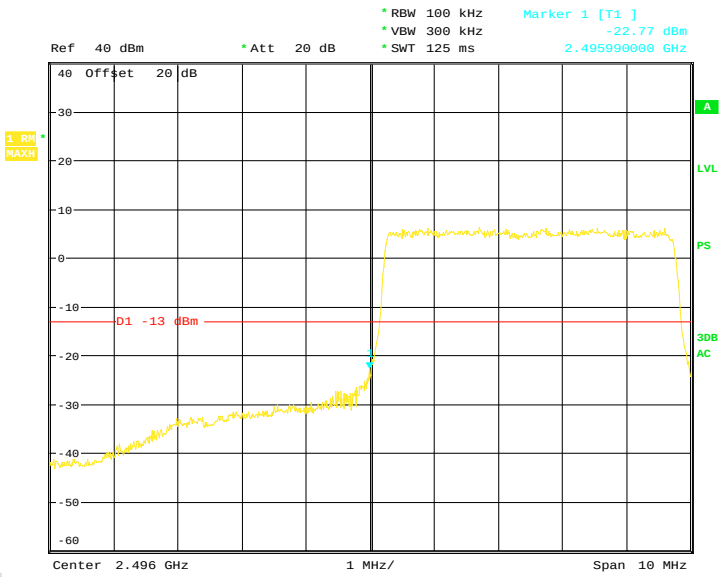
LTE Band41, 5MHz bandwidth, QPSK,(1,25) Mode, Above 2690MHz



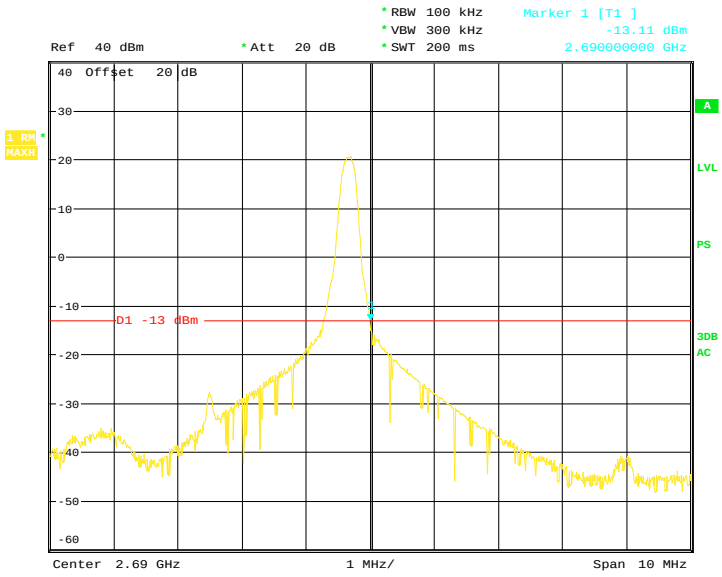
LTE Band41, 5MHz bandwidth, QPSK,(25,0) Mode, Above 2690MHz



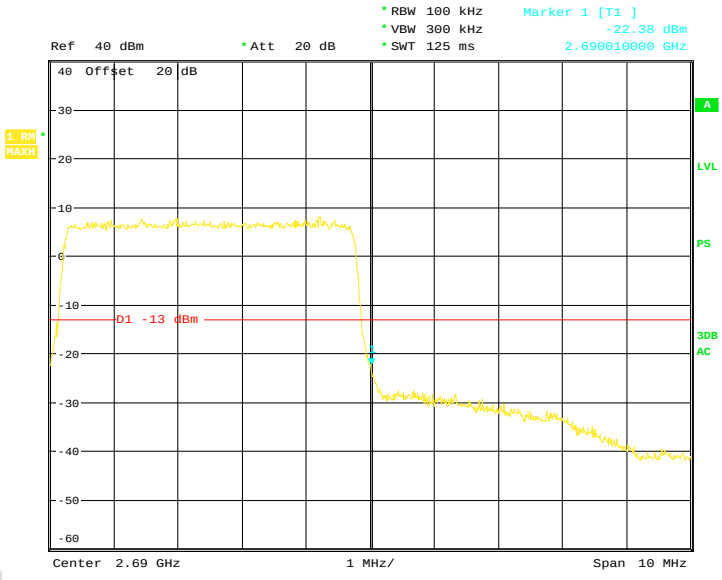
LTE Band41, 5MHz bandwidth, 16QAM,(1,0) Mode , Below 2496MHz



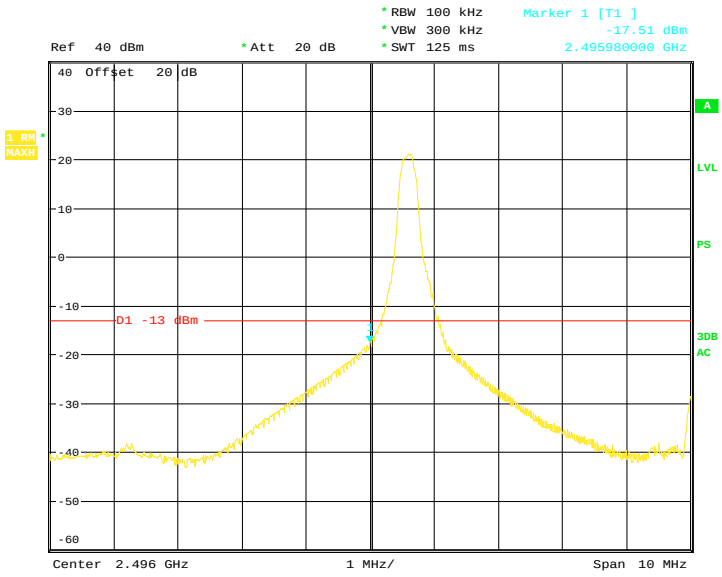
LTE Band41, 5MHz bandwidth, 16QAM,(25,0) Mode , Below 2496MHz



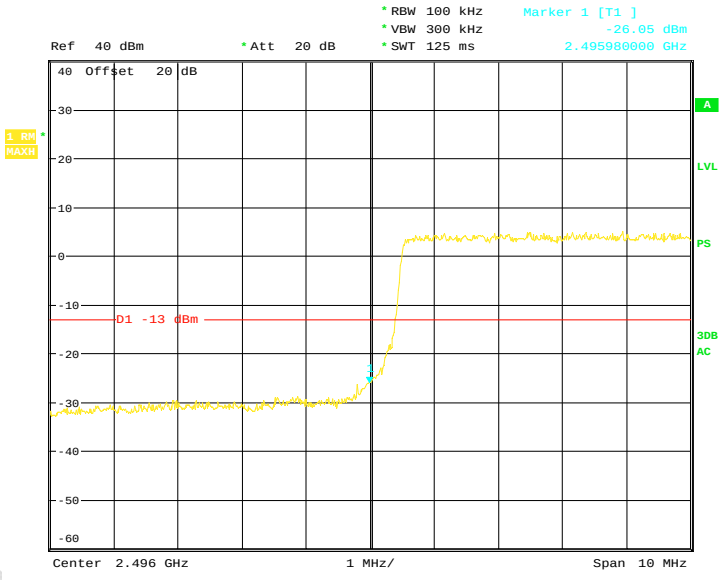
LTE Band41, 5MHz bandwidth, 16QAM,(1,25) Mode, Above 2690MHz



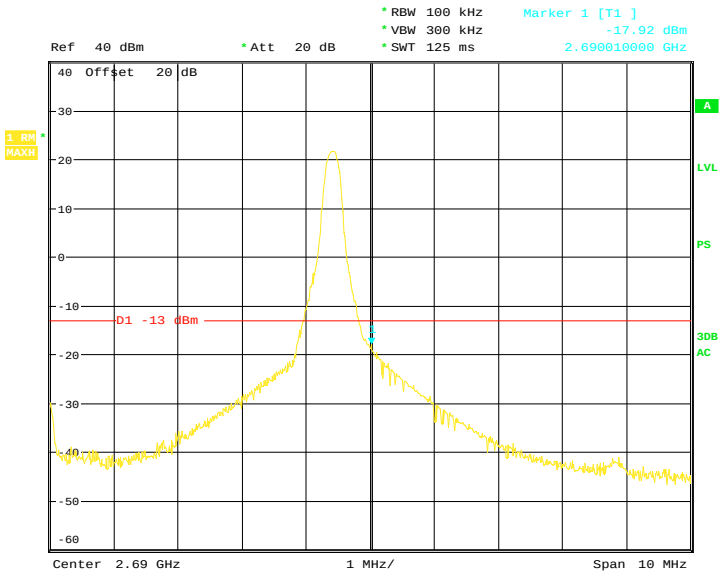
LTE Band41, 5MHz bandwidth, 16QAM,(25,0) Mode, Above 2690MHz



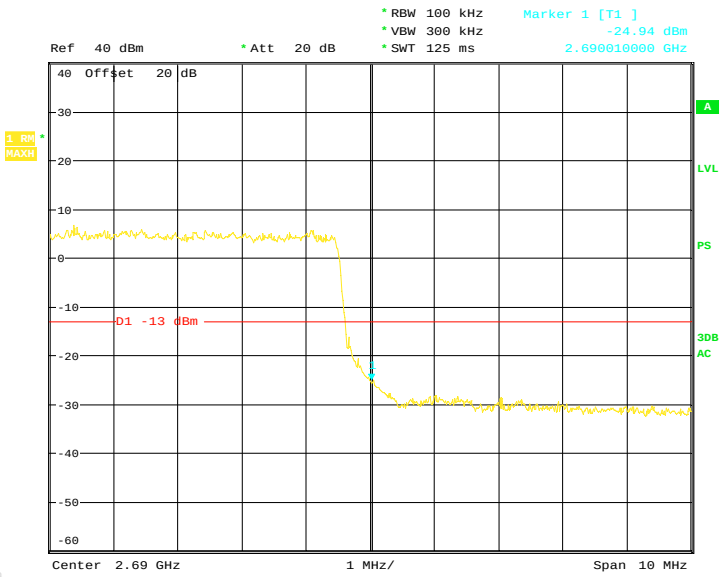
LTE Band41, 10MHz bandwidth, QPSK,(1,0) Mode , Below 2496MHz



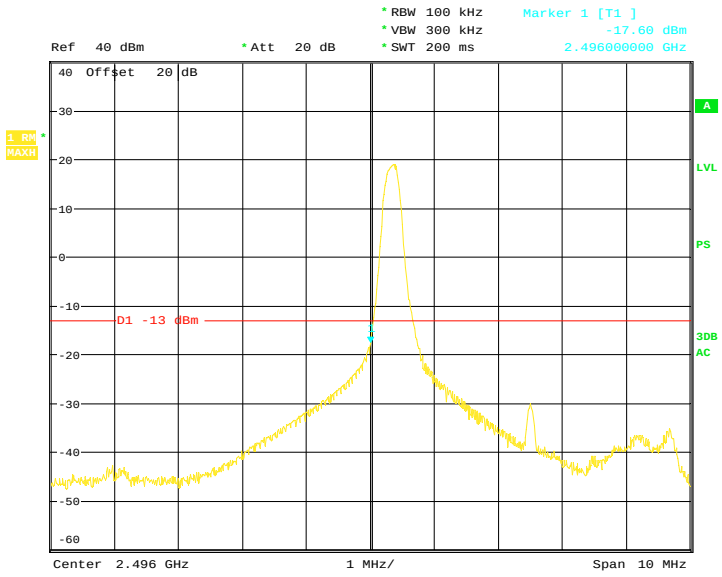
LTE Band41, 10MHz bandwidth, QPSK,(50,0) Mode , Below 2496MHz



LTE Band41, 10MHz bandwidth, QPSK,(1,50) Mode, Above 2690MHz

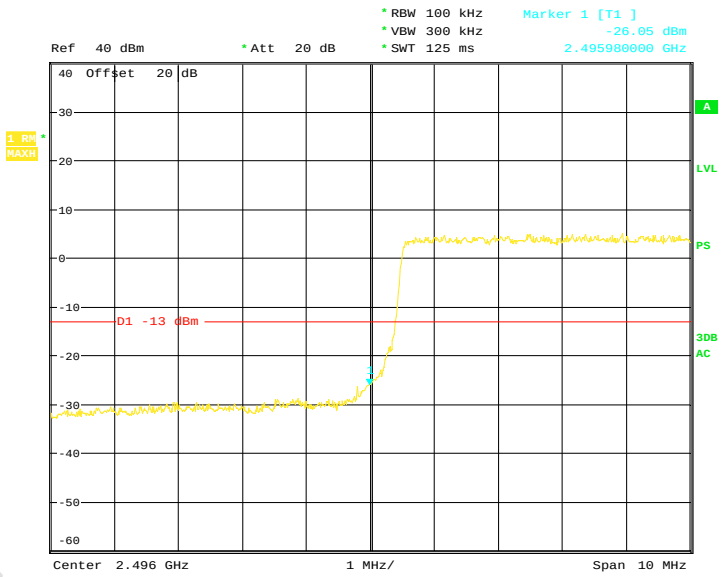


LTE Band41, 10MHz bandwidth, QPSK,(50,0) Mode, Above 2690MHz



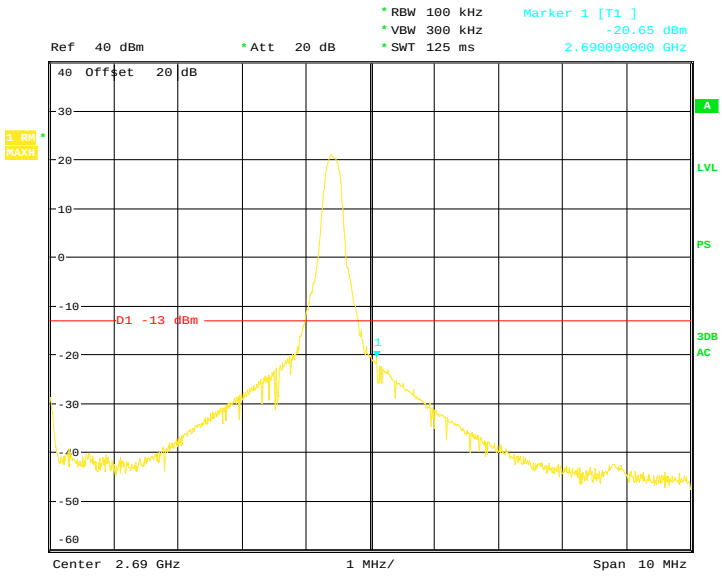
Date: 8.MAR.2017 10:14:01

LTE Band41, 10MHz bandwidth, 16QAM,(1,0) Mode , Below 2496MHz

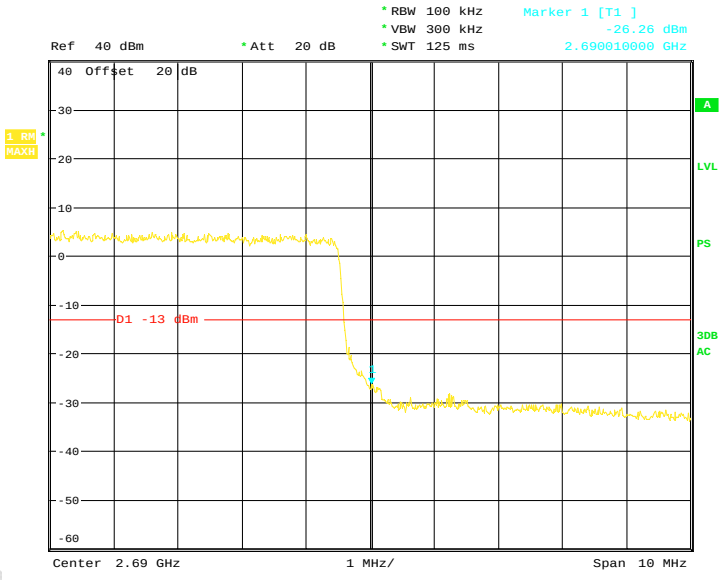


Date: 8.MAR.2017 10:36:28

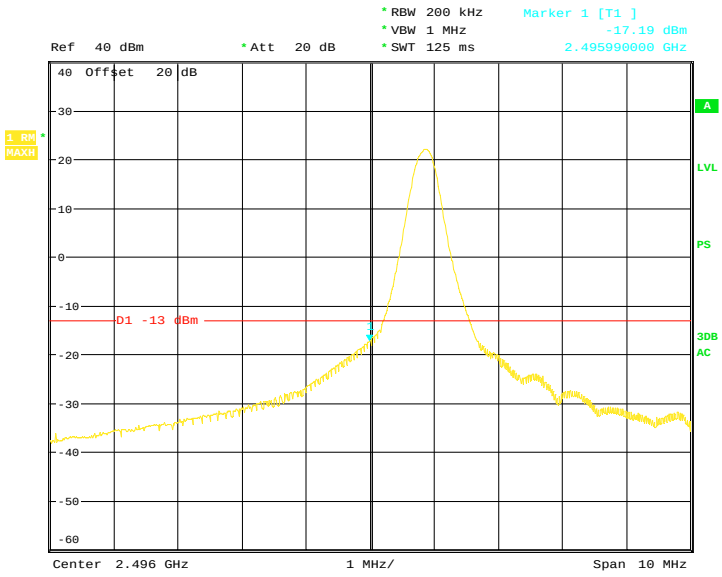
LTE Band41, 10MHz bandwidth, 16QAM,(50,0) Mode , Below 2496MHz



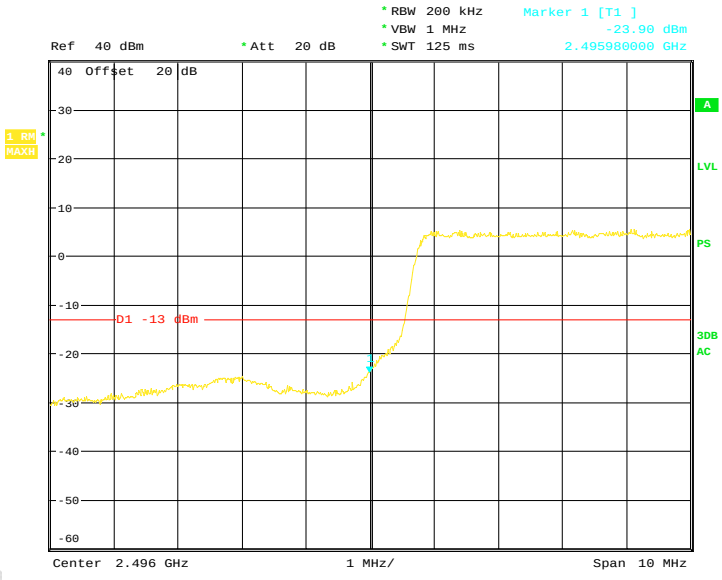
LTE Band41, 10MHz bandwidth, 16QAM,(1,50) Mode, Above 2690MHz



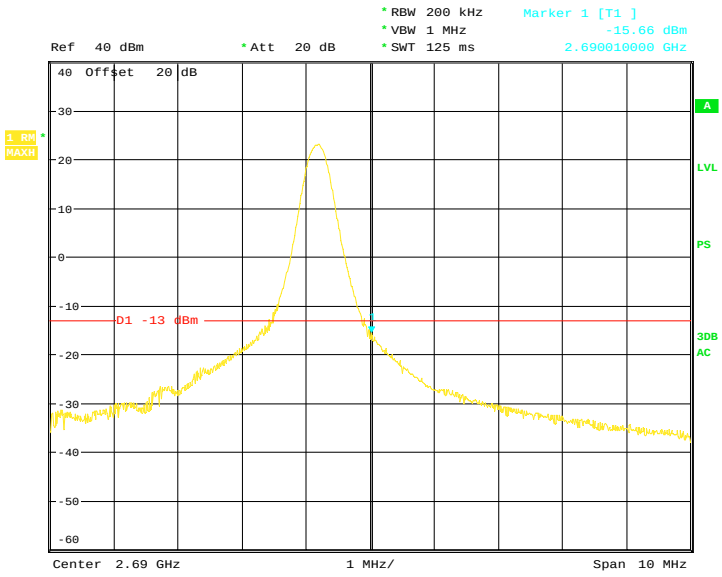
LTE Band41, 10MHz bandwidth, 16QAM,(50,0) Mode, Above 2690MHz



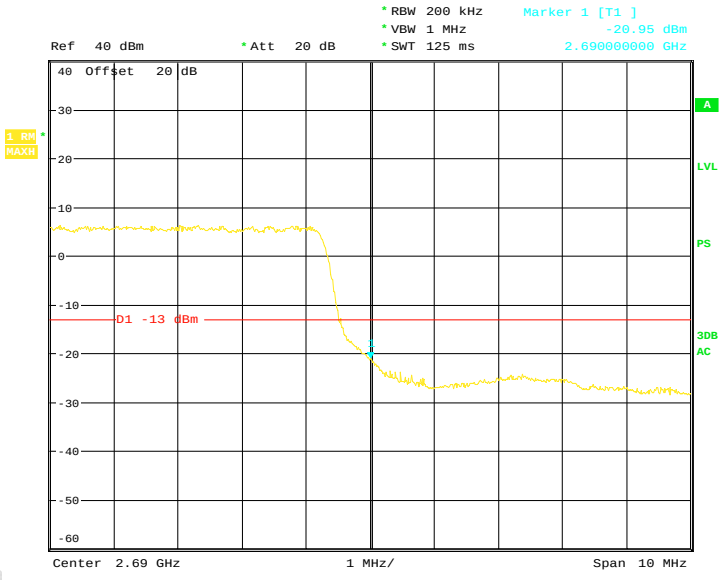
LTE Band7, 15MHz bandwidth, QPSK,(1,0) Mode , Below 2496MHz



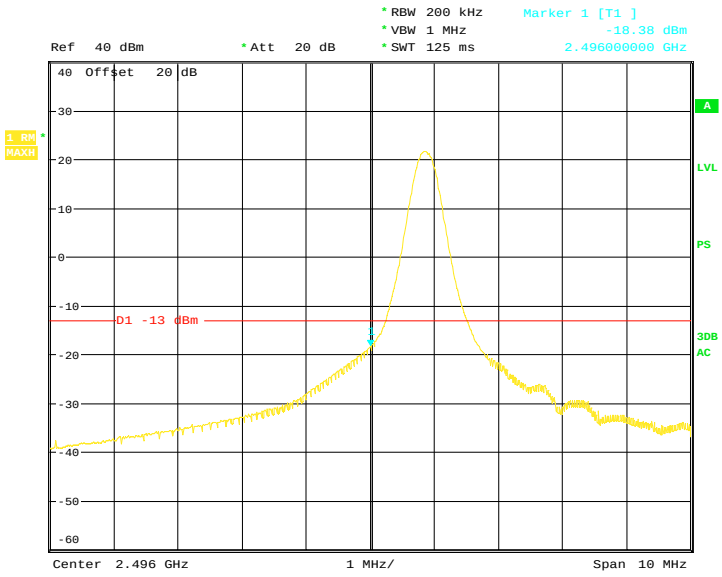
LTE Band7, 15MHz bandwidth, QPSK,(75,0) Mode , Below 2496MHz



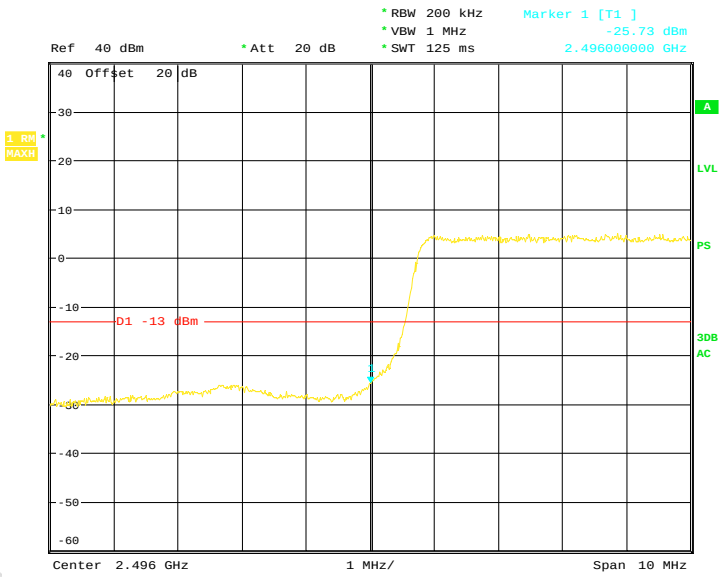
LTE Band7, 15MHz bandwidth, QPSK,(1,75) Mode, Above 2690MHz



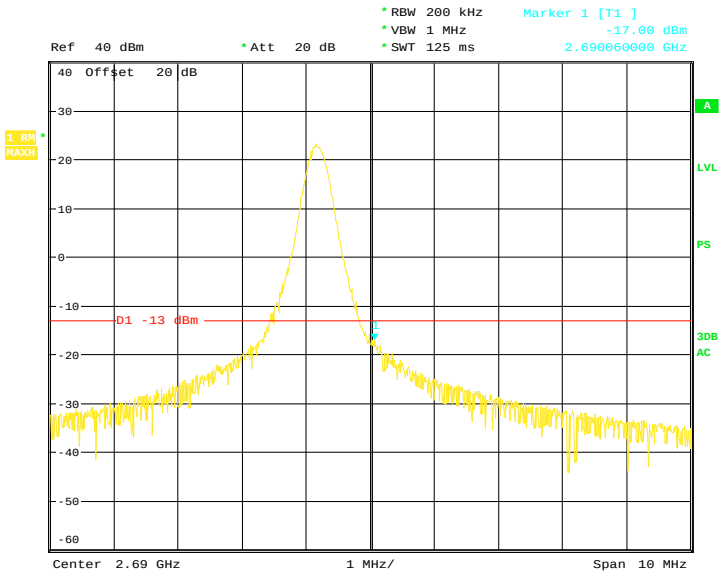
LTE Band7, 15MHz bandwidth, QPSK,(75,0) Mode, Above 2690MHz



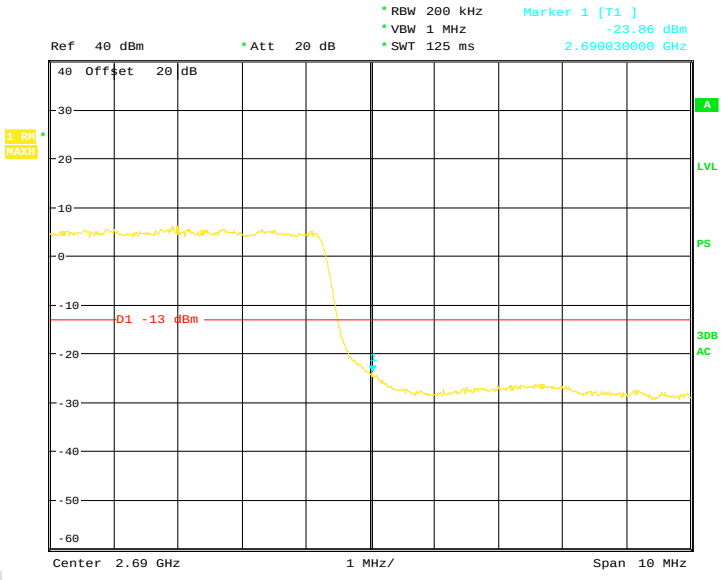
LTE Band7, 15MHz bandwidth, 16QAM,(1,0) Mode , Below 2496MHz



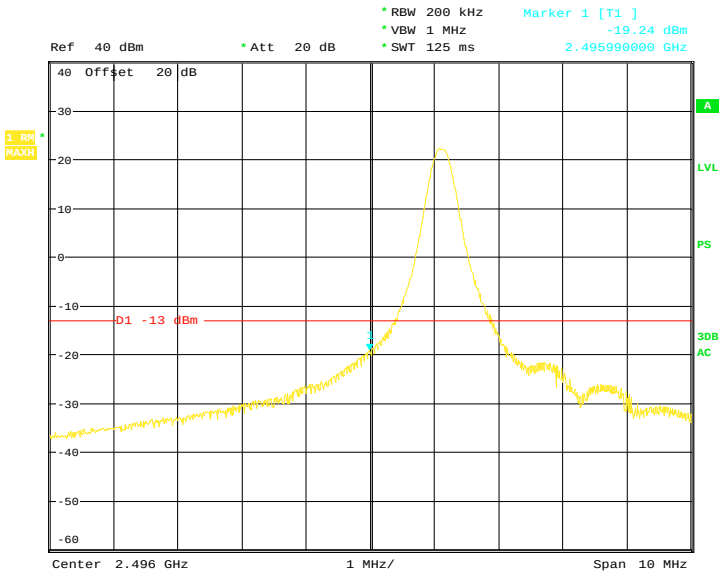
LTE Band7, 15MHz bandwidth, 16QAM,(75,0) Mode , Below 2496MHz



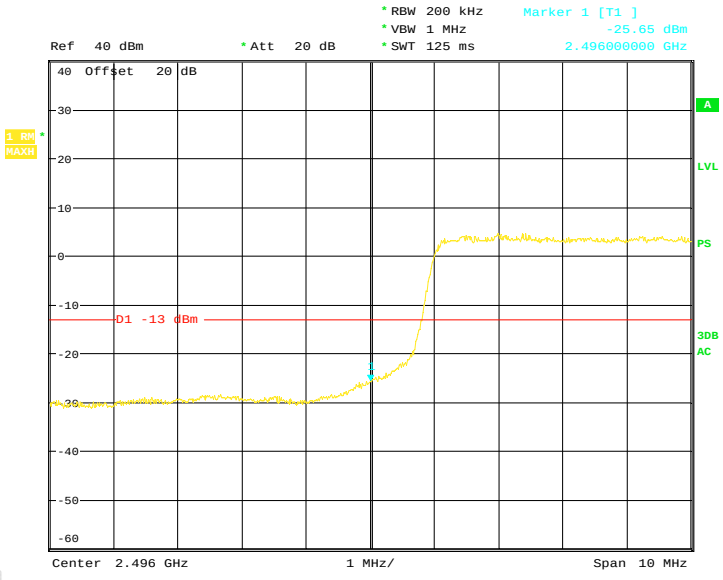
LTE Band7, 15MHz bandwidth, 16QAM,(1,75) Mode, Above 2690MHz



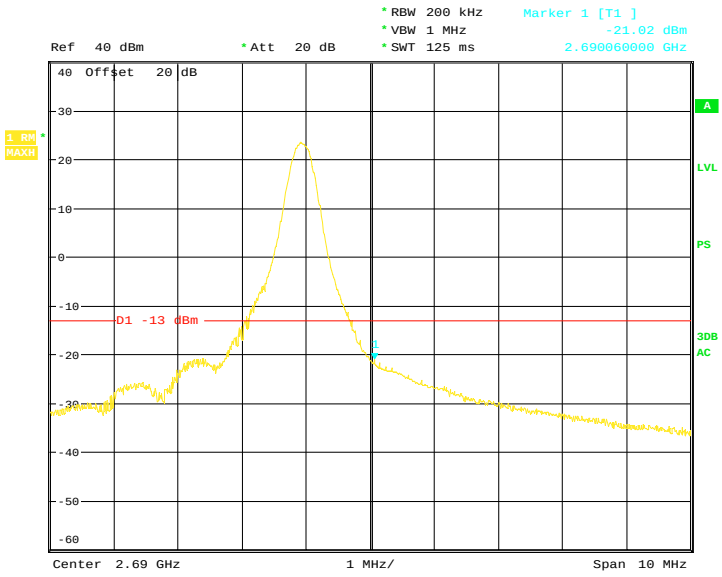
LTE Band7, 15MHz bandwidth, 16QAM,(75,0) Mode, Above 2690MHz



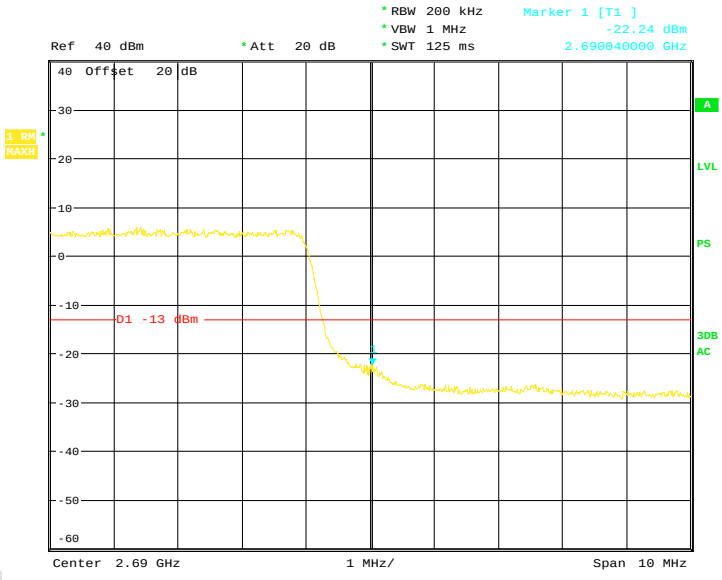
LTE Band7, 20MHz bandwidth, QPSK,(1,0) Mode , Below 2496MHz



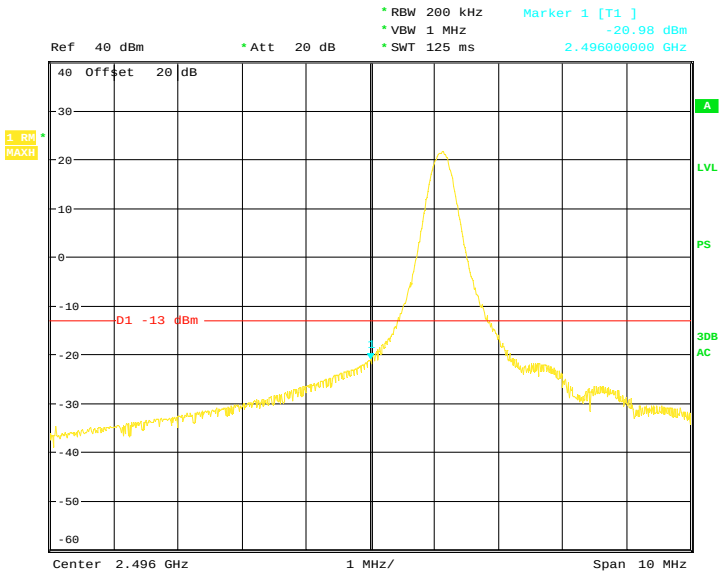
LTE Band7, 20MHz bandwidth, QPSK,(100,0) Mode , Below 2496MHz



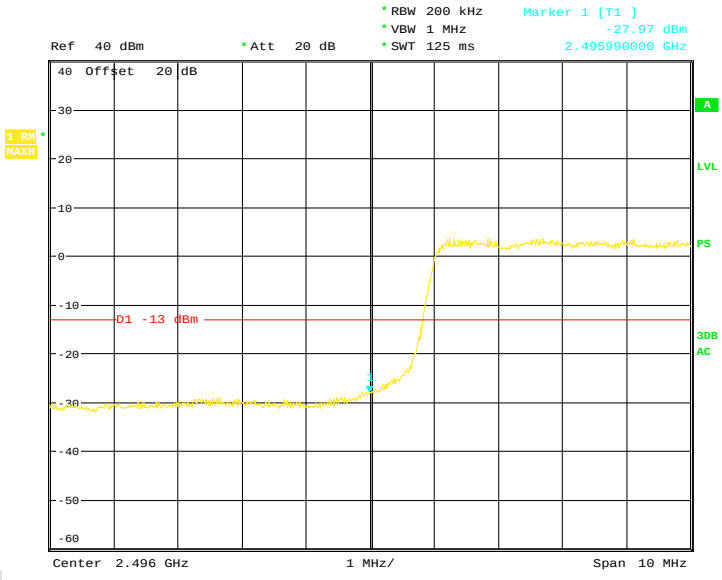
LTE Band7, 20MHz bandwidth, QPSK,(1,100) Mode, Above 2690MHz



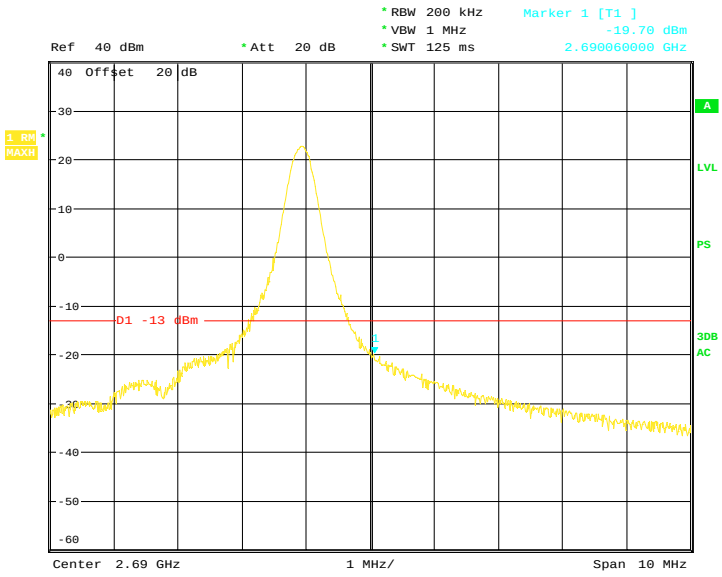
LTE Band7, 20MHz bandwidth, QPSK,(100,0) Mode, Above 2690MHz



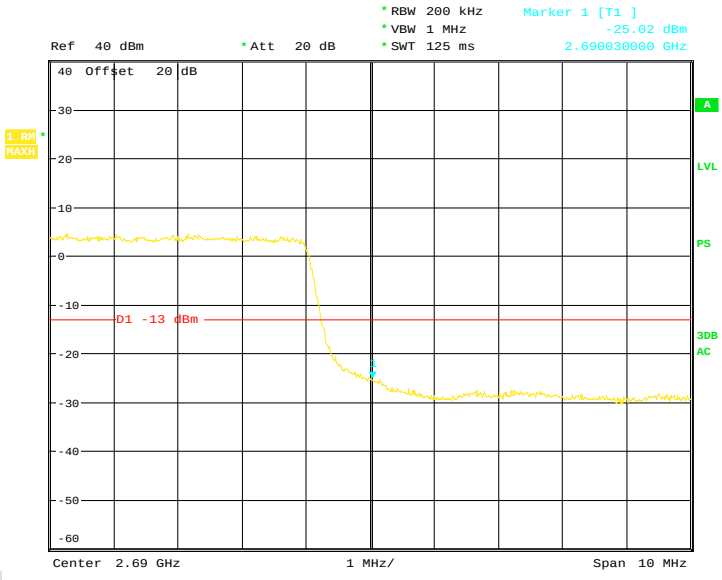
LTE Band7, 20MHz bandwidth, 16QAM,(1,0) Mode , Below 2496MHz



LTE Band7, 20MHz bandwidth, 16QAM,(100,0) Mode , Below 2496MHz



LTE Band7, 20MHz bandwidth, 16QAM,(1,100) Mode, Above 2690MHz



LTE Band7, 20MHz bandwidth, 16QAM,100,0) Mode, Above 2690MHz

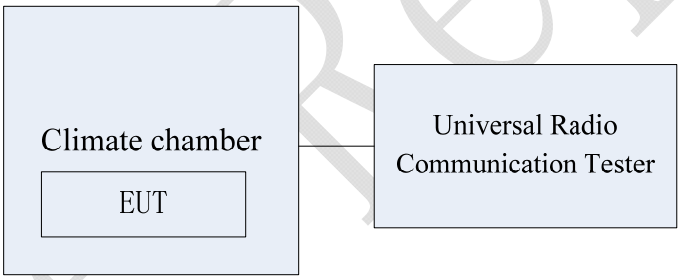
5.6 Frequency Stability over Temperature Variation

Specifications:	FCC Part 2.1055, 22.355, 24.235, 27.54
DUT Serial Number:	S5/18: 862851030000874/862851030020872
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit	
Frequency deviation [ppm]	±2.5

Test Setup

The EUT was placed in a temperature chamber, demonstrated as figure T. The Wireless Telecommunications Test Set was used to set the Tx channel and power level, modulate the TX signal with different bit patterns and measure the frequency of Tx.



Test Method

1、 The EUT was turned off and placed in the temperature chamber.

2、 The temperature of the chamber was set to -30℃ and allowed to stabilize.

3、 The EUT temperature was allowed to stabilize for 45 minutes.

4、 The EUT was turned on and set to transmit with Wireless Telecommunications Test Set.

5、 The maximum transmit frequency deviation during one minute period was measured by Wireless Communications Test Set.

6、 The steps 3-5 were repeated for -30℃,-20℃, -10℃, 0℃, 10℃, 20℃, 30℃, 40℃ and 50℃.

5.6.1 GSM Band Frequency Stability over Temperature Variation Results

Band	Offset	Temperature[℃]								
		-30	-20	-10	0	10	20	30	40	50
GSM850 GMSK	Hz	21.17	18.53	23.15	12.57	-14.15	10.52	-23.21	-17.05	-13.28
	ppm	0.025	0.022	0.027	0.015	-0.016	0.012	-0.027	-0.020	-0.015
GSM850 8PSK	Hz	18.08	-15.14	-18.92	27.51	-17.82	-23.17	12.57	26.18	20.42
	ppm	0.021	-0.018	-0.022	0.032	-0.021	-0.027	0.015	0.031	0.024
PCS1900 GMSK	Hz	14.82	-28.17	20.73	17.25	26.33	-14.52	-18.45	27.31	25.16
	ppm	0.007	-0.014	0.011	0.009	0.014	-0.007	-0.009	0.014	0.013
PCS1900 8PSK	Hz	29.55	20.51	-14.92	23.47	11.65	-12.56	-19.08	-30.16	27.03
	ppm	0.015	0.010	-0.007	0.012	0.006	-0.006	-0.010	-0.016	0.014

5.6.2 WCDMA Band Frequency Stability over Temperature Variation Results

Band	Offset	Temperature[℃]								
		-30	-20	-10	0	10	20	30	40	50
2	Hz	13.85	-21.26	17.45	12.11	-17.26	-24.53	-18.14	-25.38	21.05
	ppm	0.007	-0.011	0.009	0.006	-0.009	-0.013	-0.009	-0.013	0.011
5	Hz	-11.57	18.14	22.45	-10.17	-18.42	15.79	22.56	-12.10	-18.27
	ppm	-0.013	0.021	0.026	-0.012	-0.022	0.018	0.026	-0.014	-0.021

5.6.3 CDMA Band Frequency Stability over Temperature Variation Results

Band	Offset	Temperature[℃]								
		-30	-20	-10	0	10	20	30	40	50
BC0	Hz	12.25	13.62	-5.86	-10.27	20.59	24.61	-8.96	15.27	18.95
	ppm	0.015	0.016	-0.007	-0.012	0.025	0.029	-0.011	0.018	0.023
BC1	Hz	20.54	26.35	-12.58	-20.34	5.36	10.52	10.34	17.55	-21.58
	ppm	0.011	0.014	-0.007	-0.011	0.003	0.006	0.006	0.009	-0.011

5.6.4 LTE Band Frequency Stability over Temperature Variation Results

Band	Offset	Temperature[℃]								
		-30	-20	-10	0	10	20	30	40	50
7	Hz	15.21	-20.19	-12.73	11.25	8.55	-14.96	13.62	-18.75	-17.32
	ppm	0.006	-0.007	-0.005	0.004	0.003	-0.005	0.005	-0.007	-0.006
41	Hz	-16.27	-23.42	10.53	16.25	-17.61	-23.17	9.45	15.17	19.03
	ppm	-0.006	-0.009	0.004	0.006	-0.006	-0.008	0.003	0.005	0.007

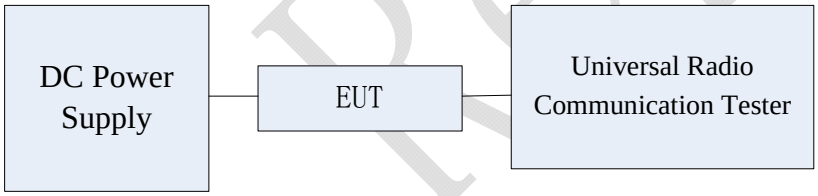
5.7 Frequency Stability over Voltage Variation

Specifications:	FCC Part 2.1055, 22.355, 24.235, 27.54
DUT Serial Number:	S5/18: 862851030000874/862851030020872
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit	
Frequency deviation [ppm]	±2.5

Test Setup

The EUT was placed in a shielding chamber and powered by an adjustable power supply, demonstrated as figure V. A Wireless Telecommunications Test Set was used to set the TX channel and power level, modulate the TX signal with different bit patterns and measure the frequency of TX.



Test Method

The EUT was powered by the adjustable power supply. The frequency stability is measured by the Wireless Telecommunications Test Set.

5.7.1 GSM Band Frequency Stability over Voltage Variation Results

Test data:

Band	**Offset**	**Voltage (V)**		
		3.50	**3.80**	**4.35**
GSM850 GMSK	Hz	29.12	32.09	16.27
	ppm	0.034	0.038	0.019
GSM850 8PSK	Hz	16.61	12.07	24.57
	ppm	0.019	0.014	0.029
PCS1900 GMSK	Hz	20.08	-27.21	16.08
	ppm	0.010	-0.014	0.008
PCS1900 8PSK	Hz	30.42	25.17	-17.42
	ppm	0.016	0.013	-0.009

5.7.2 WCDMA Band Frequency Stability over Voltage Variation Results

Test data:

Band	Offset	Voltage (V)		
		3.50	3.80	4.35
2	Hz	14.18	-12.13	20.19
	ppm	0.007	-0.006	0.010
5	Hz	-18.19	-10.23	20.51
	ppm	-0.021	-0.012	0.024

5.7.3 CDMA Band Frequency Stability over Voltage Variation Results

Test data:

Band	Offset	Voltage (V)		
		3.50	3.80	4.35
BC0	Hz	14.27	19.56	-11.81
	ppm	0.017	0.023	-0.014
BC1	Hz	-15.26	7.26	17.17
	ppm	-0.008	0.004	0.009

5.7.4 LTE Band Frequency Stability over Voltage Variation Results

Test data:

Band	Offset	Voltage (V)		
		3.50	3.80	4.35
7	Hz	-15.31	-19.45	16.27
	ppm	-0.006	-0.007	0.006
41	Hz	20.76	17.27	12.19
	ppm	0.008	0.006	0.004

5.8 Peak to Average Ratio

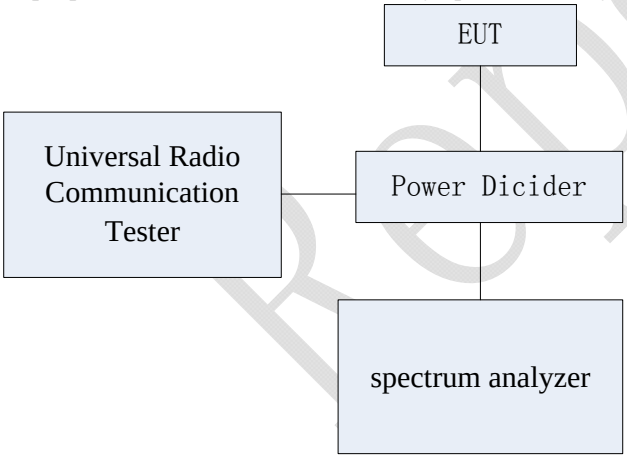
Specifications:	FCC Part 24.232, 27.50
DUT Serial Number:	S5/18: 862851030000874/862851030020872
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method

The transmitter output was connected to a CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each band on the Spectrum Analyzer.

5.8.1 GSM850 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
836.6	190	GMSK	3.68
		8PSK	9.56

5.8.2 GSM1900 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
1880	661	GMSK	3.72
		8PSK	3.74

5.8.3 WCDMA B2 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
1880.0	9400	QPSK	2.91

5.8.4 WCDMA B5 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
836.4	4182	QPSK	3.55

5.8.5 CDMA BC0 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
836.52	384	RC1(OQPSK)	5.49
		RC3(HPSK)	5.63

5.8.6 CDMA BC1 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	Modulation	Peak to Average Ratio
1880.00	600	RC1(OQPSK)	4.69
		RC3(HPSK)	5.26

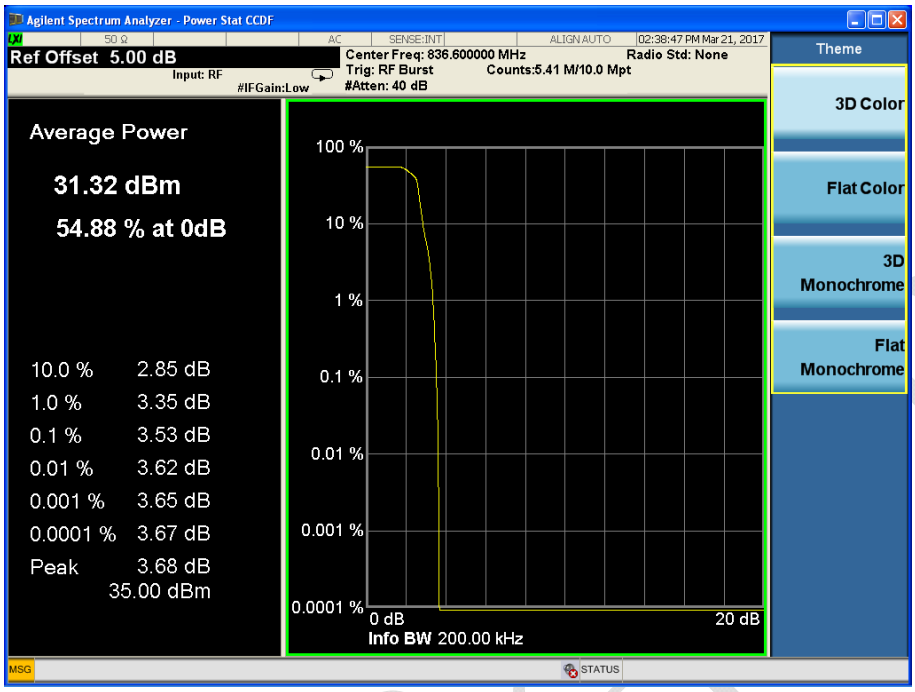
5.8.7 LTE B7 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	bandwidth	Modulation	Peak to Average Ratio
2535	21100	10MHz	QPSK	4.67
			16QAM	3.98

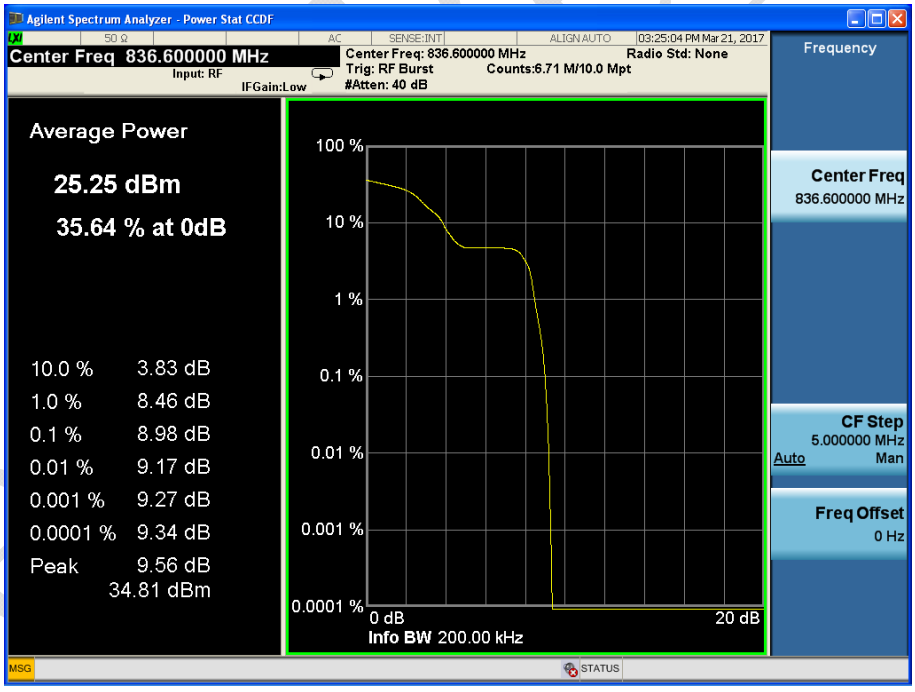
5.8.8 LTE B41 Peak to Average Ratio Results

Frequency (MHz)	EUT channel No.	bandwidth	Modulation	Peak to Average Ratio
2593	40620	10MHz	QPSK	5.28
			16QAM	9.68

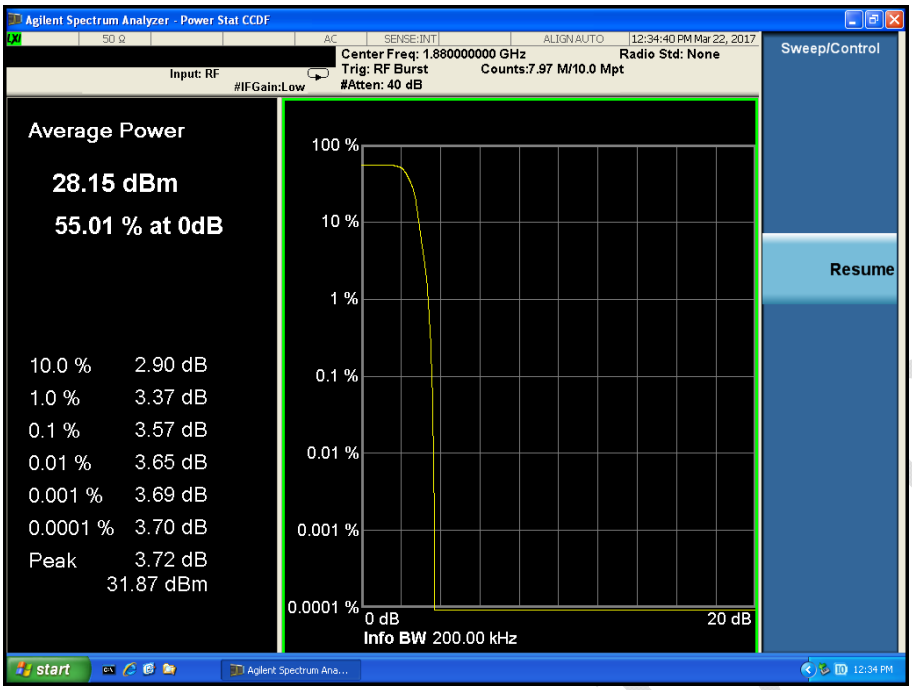
Graphical for Peak to Average Ratio Results



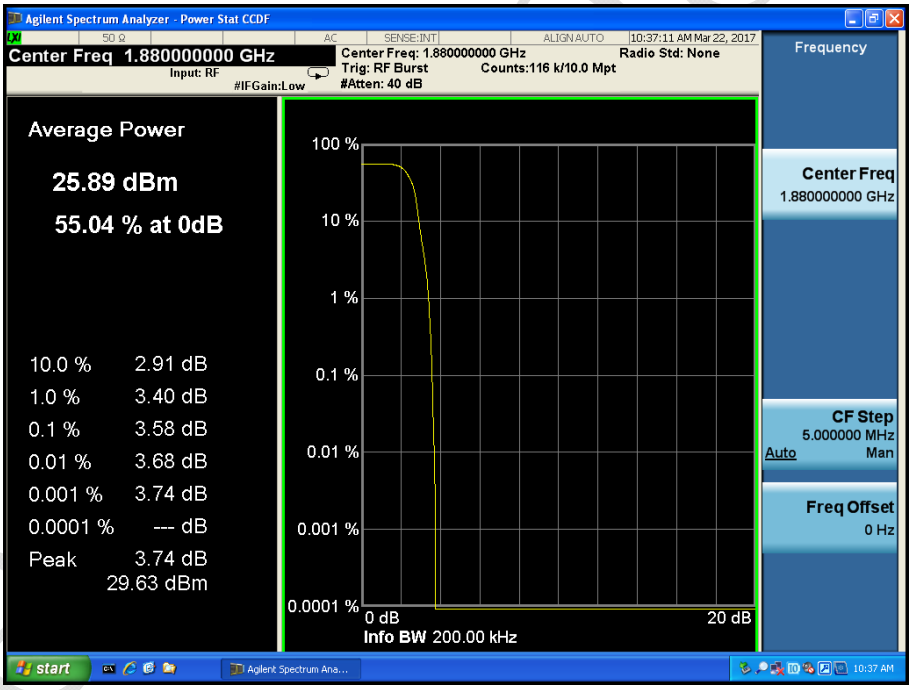
GSM850, GMSK



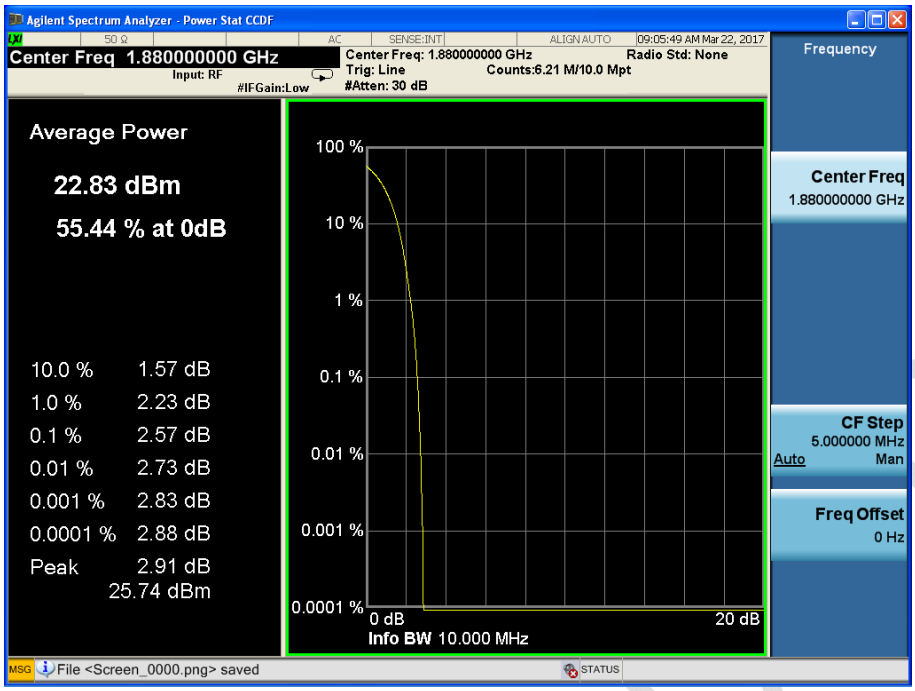
GSM850,8PSK



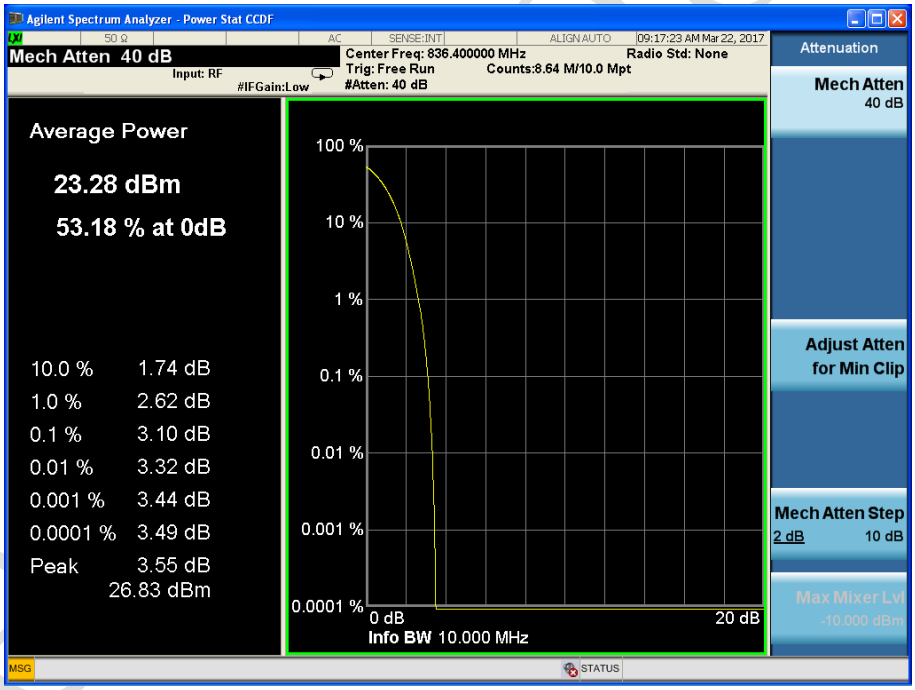
PCS1900, GMSK



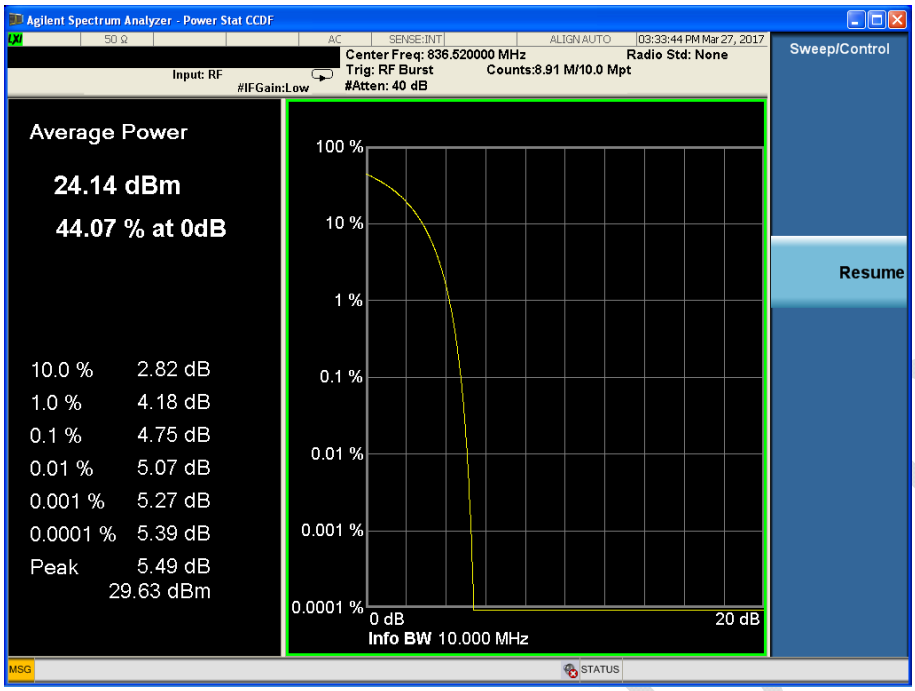
PCS1900, 8PSK



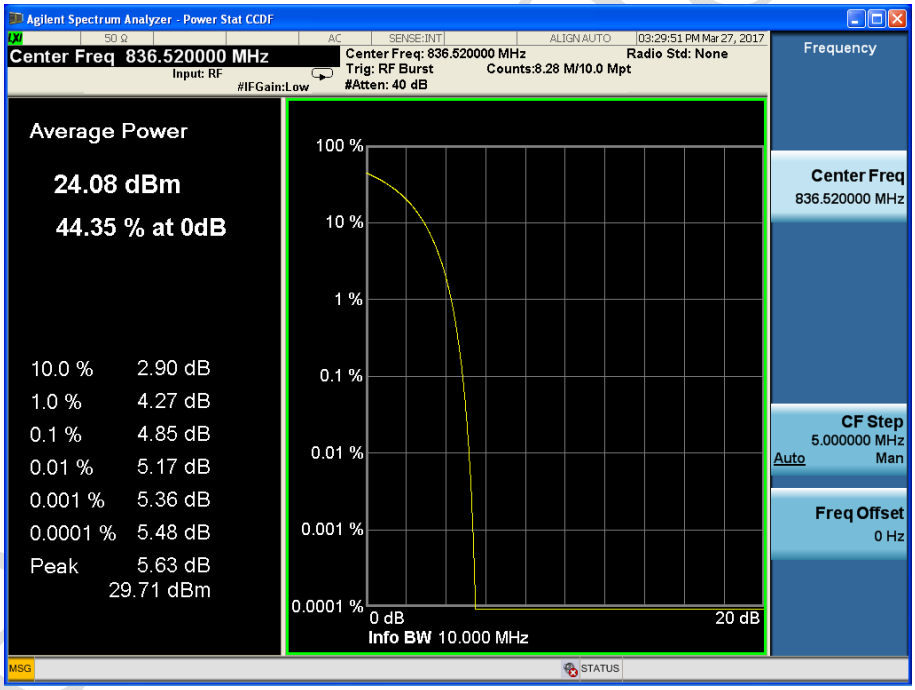
WCDMA Band2, QPSK



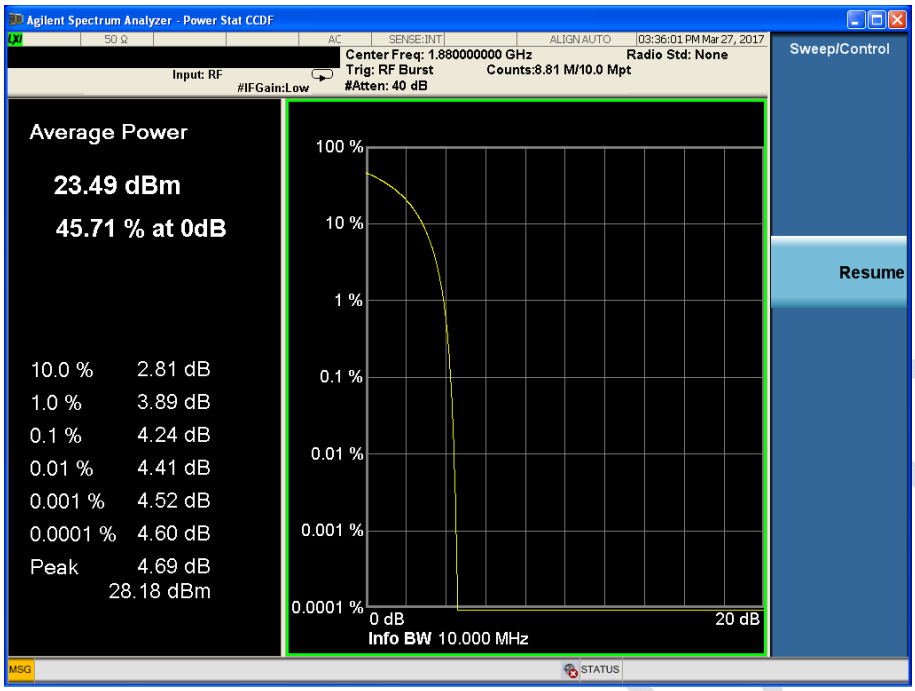
WCDMA Band5, QPSK



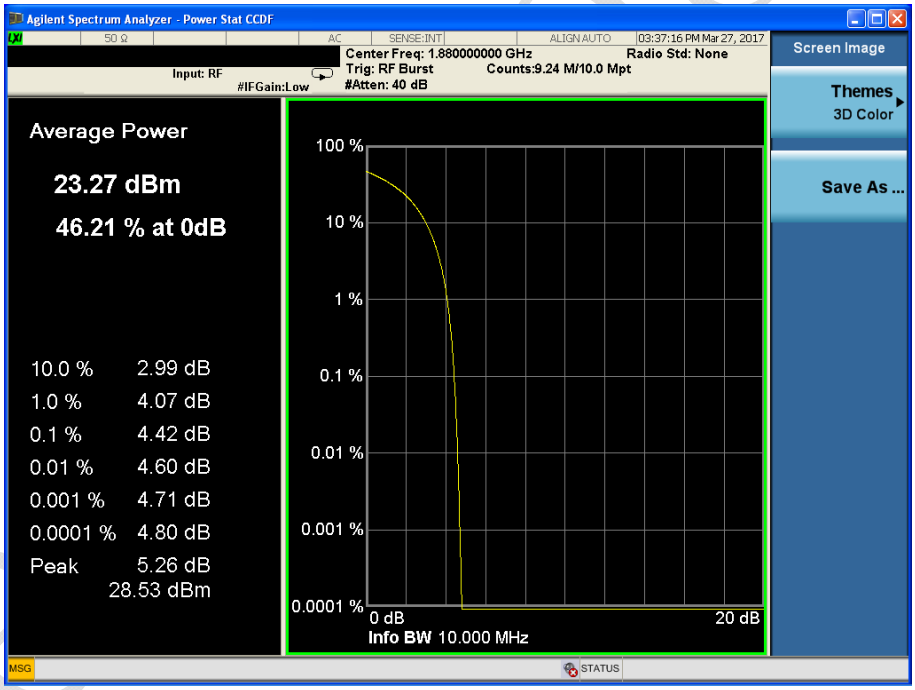
CDMA BC0, OQPSK



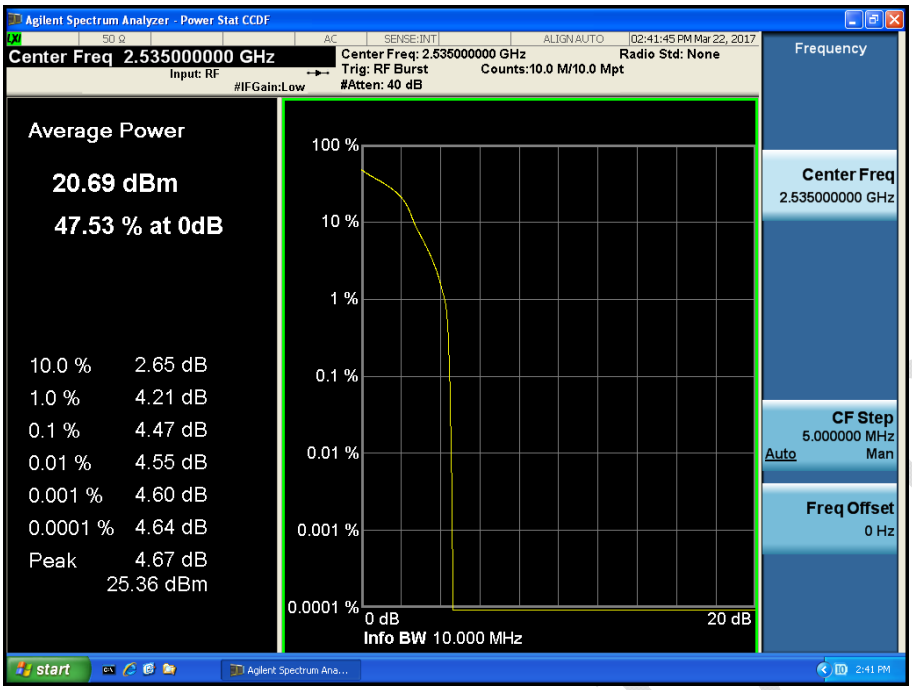
CDMA BC0, HPSK



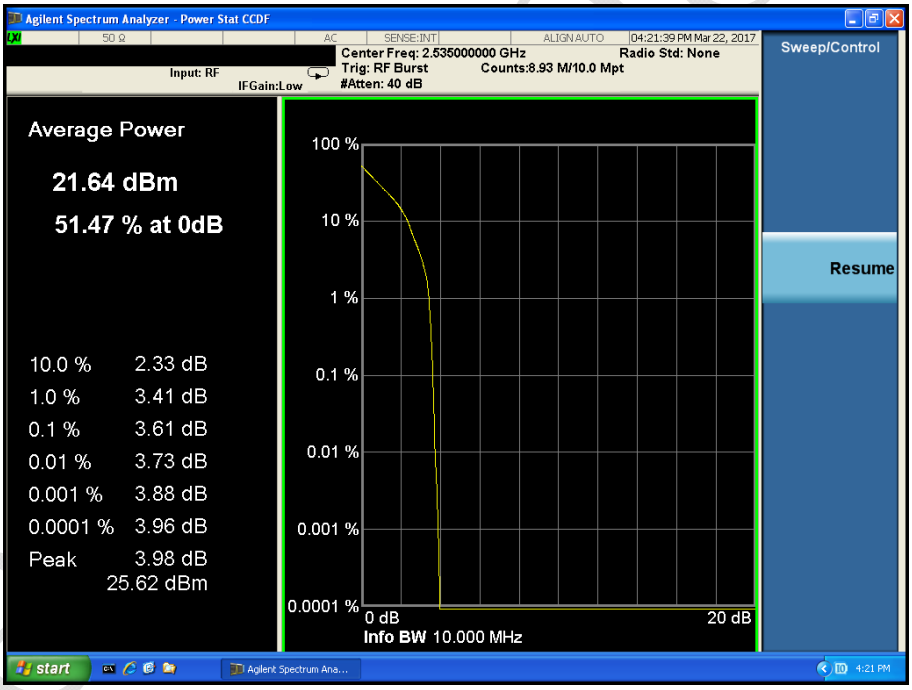
CDMA BC1, OQPSK



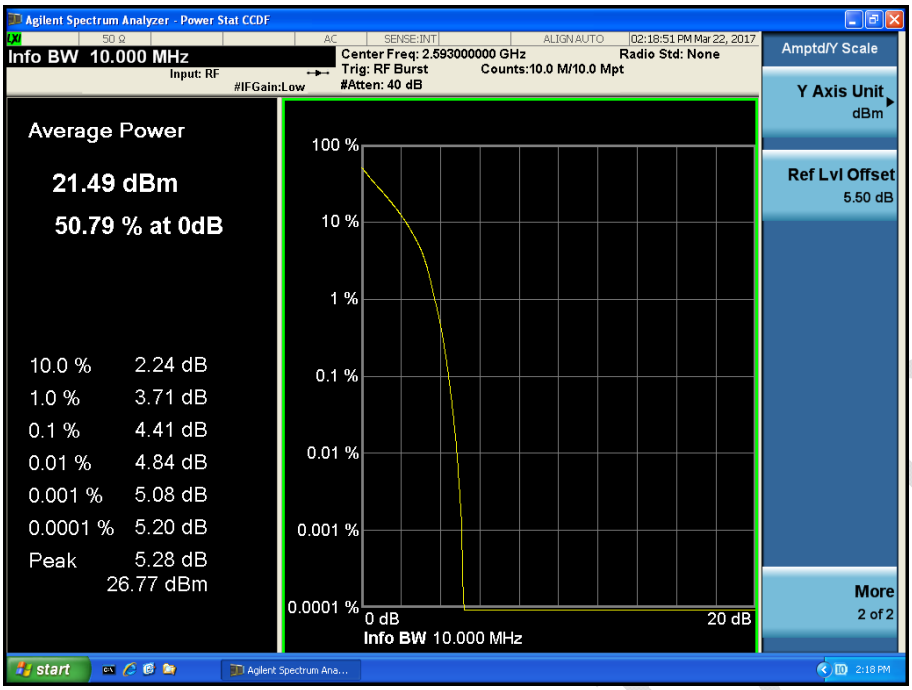
CDMA BC1, HPSK



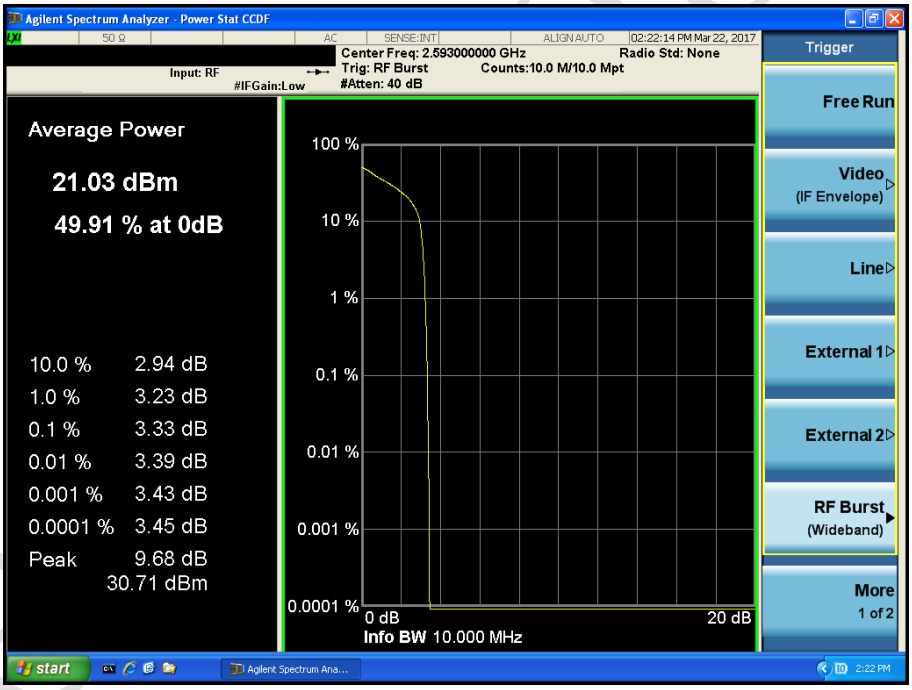
LTE Band7, QPSK



LTE Band7, 16QAM



LTE Band41, QPSK



LTE Band41, 16QAM

5.9 ERP and EIRP

Specifications:	FCC Part 22.913(a), 24.232(b)
DUT Serial Number:	S7/18: 862851030000163/862851030020161
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit

Part 22:

According to Part 22.913(a)(2):The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Part 24:

According to Part 24.232(b)):The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

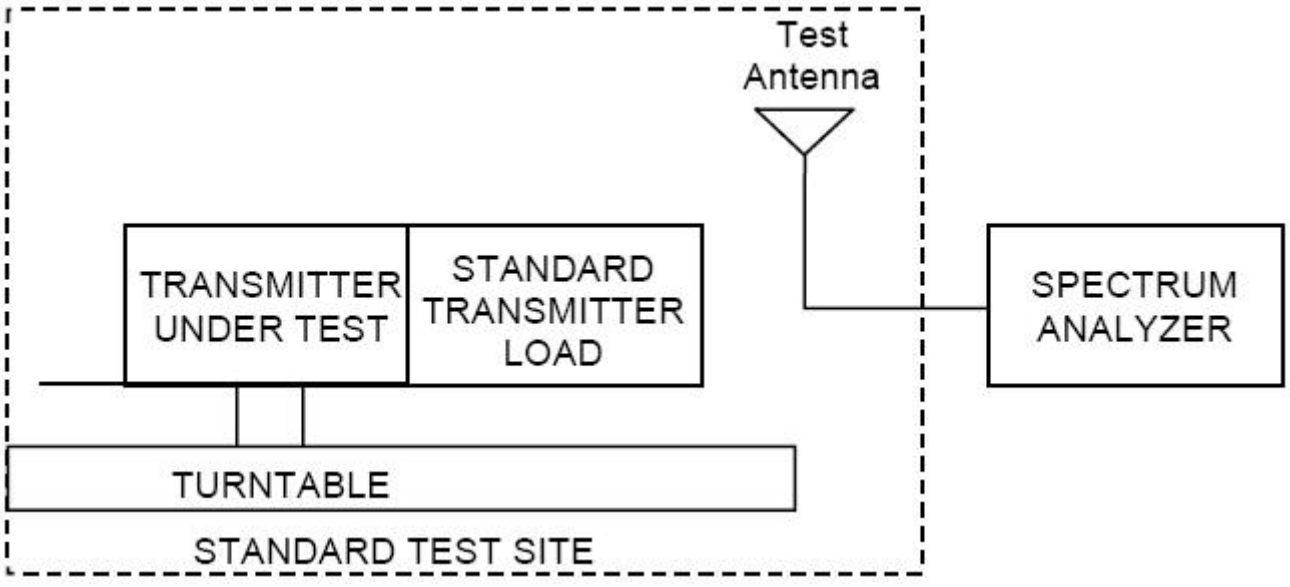
Test Setup

The EUT was placed in an anechoic chamber. The Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

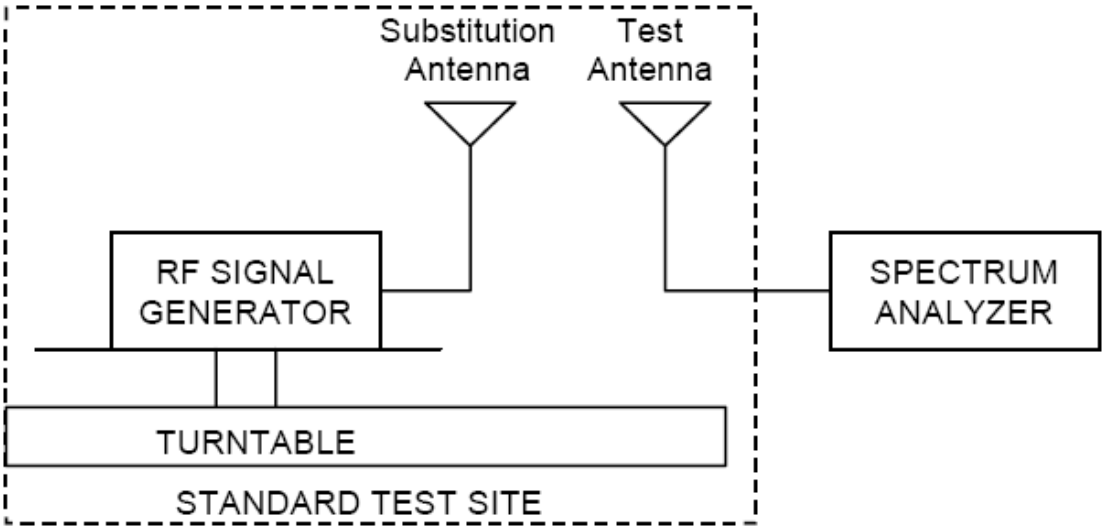
Test Method:

The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-C: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above.



(b) Reconnect the equipment as illustrated.



(c) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter.

(d) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

(e) Repeat step d) with both antennas vertically polarized for each spurious frequency.

(f) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps d) and e) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

ERP=S.G output(dBM)-cable loss (dB) + antenna gain (dBd)

EIRP=S.G output(dBM)-cable loss (dB) + antenna gain (dBi)

5.9.1 GSM850 GSM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.2	37.27	3.4	-2.87	31.00
836.6	37.84	3.4	-3.11	31.33
848.8	37.34	3.4	-3.11	30.83

5.9.2 GSM850 GPRS Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.2	37.28	3.4	-2.87	31.01
836.6	37.90	3.4	-3.11	31.39
848.8	37.73	3.4	-3.11	31.22

5.9.3 GSM850 EGPRS GMSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.2	37.25	3.4	-2.87	30.98
836.6	37.56	3.4	-3.11	31.05
848.8	37.34	3.4	-3.11	30.83

5.9.4 GSM850 EGPRS 8PSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.2	34.99	3.4	-2.87	28.72
836.6	35.09	3.4	-3.11	28.58
848.8	35.04	3.4	-3.11	28.53

5.9.5 PCS1900 GSM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.2	22.86	5.0	10.4	28.26
1880.0	22.49	5.0	10.4	27.89
1909.8	22.62	5.1	10.4	27.92

5.9.6 PCS1900 GPRS Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.2	22.29	5.0	10.4	27.69
1880.0	22.53	5.0	10.4	27.93
1909.8	22.15	5.1	10.4	27.45

5.9.7 PCS1900 EGPRS GMSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.2	22.11	5.0	10.4	27.51
1880.0	22.12	5.0	10.4	27.52
1909.8	21.96	5.1	10.4	27.26

5.9.8 PCS1900 EGPRS 8PSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.2	20.92	5.0	10.4	26.32
1880.0	21.09	5.0	10.4	26.49
1909.8	20.98	5.1	10.4	26.28

5.9.9 WCDMA B2 RMC Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1852.4	18.33	5.0	10.4	23.73
1880.0	18.66	5.0	10.4	24.06
1907.6	18.67	5.1	10.4	23.97

5.9.10 WCDMA B2 HSDPA Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1852.4	18.05	5.0	10.4	23.45
1880.0	18.51	5.0	10.4	23.91
1907.6	18.65	5.1	10.4	23.95

5.9.11 WCDMA B2 HSUPA QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1852.4	18.55	5.0	10.4	23.95
1880.0	18.91	5.0	10.4	24.31
1907.6	18.88	5.1	10.4	24.18

5.9.12 WCDMA B5 RMC Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
826.4	30.35	3.4	-2.87	24.08
836.4	30.56	3.4	-3.11	24.05
846.6	30.32	3.4	-3.11	23.81

5.9.13 WCDMA B5 HSDPA Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
826.4	29.99	3.4	-2.87	23.72
836.4	30.34	3.4	-3.11	23.83
846.6	29.93	3.4	-3.11	23.42

5.9.14 WCDMA B5 HSUPA QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
826.4	30.90	3.4	-2.87	24.63
836.4	31.22	3.4	-3.11	24.71
846.6	30.77	3.4	-3.11	24.26

5.9.15 CDMA BC0 OQPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.04	29.01	3.3	-2.87	22.74
832.00	29.10	3.4	-3.11	22.59
848.97	28.92	3.4	-3.11	22.41

5.9.16 CDMA BC0 HPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	ERP (P_d) [dBm]
824.04	29.05	3.3	-2.87	22.78
832.00	29.34	3.4	-3.11	22.83
848.97	29.09	3.4	-3.11	22.58

5.9.17 CDMA BC1 OQPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.0	16.75	5.0	10.4	22.15
1880.0	16.87	5.0	10.4	22.27
1909.95	16.88	5.1	10.4	22.18

5.9.18 CDMA BC1 HPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
1850.0	16.67	5.0	10.4	22.07
1880.0	16.85	5.0	10.4	22.25
1909.95	16.81	5.1	10.4	22.11

5.9.19 LTE B7 Bandwidth 5M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2502.5	16.41	5.9	10.6	21.11
2535.0	16.34	5.9	10.6	21.04
2567.5	16.37	5.9	10.6	21.07

5.9.20 LTE B7 Bandwidth 10M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2505.0	16.64	5.9	10.6	21.34
2535.0	16.82	5.9	10.6	21.52
2565.0	16.87	5.9	10.6	21.57

5.9.21 LTE B7 Bandwidth 15M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2507.5	17.37	5.9	10.6	22.07
2535.0	17.23	5.9	10.6	21.93
2562.5	17.31	5.9	10.6	22.01

5.9.22 LTE B7 Bandwidth 20M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2510.0	17.48	5.9	10.6	22.18
2535.0	17.22	5.9	10.6	21.92
2560.0	17.55	5.9	10.6	22.25

5.9.23 LTE B7 Bandwidth 5M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2502.5	16.17	5.9	10.6	20.87
2535.0	15.93	5.9	10.6	20.63
2567.5	16.02	5.9	10.6	20.72

5.9.24 LTE B7 Bandwidth 10M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2505.0	16.17	5.9	10.6	20.87
2535.0	15.99	5.9	10.6	20.69
2565.0	16.02	5.9	10.6	20.72

5.9.25 LTE B7 Bandwidth 15M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2507.5	16.92	5.9	10.6	21.62
2535.0	16.68	5.9	10.6	21.38
2562.5	16.85	5.9	10.6	21.55

5.9.26 LTE B7 Bandwidth 20M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2510.0	16.95	5.9	10.6	21.65
2535.0	16.88	5.9	10.6	21.58
2560.0	17.00	5.9	10.6	21.70

5.9.27 LTE B41 Bandwidth 5M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2498.5	16.42	5.9	10.6	21.12
2593.0	17.17	6.0	10.6	21.77
2687.5	17.63	6.1	10.6	22.13

5.9.28 LTE B41 Bandwidth 10M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2501.0	16.41	5.9	10.6	21.11
2593.0	16.88	6.0	10.6	21.48
2685.0	17.45	6.1	10.6	21.95

5.9.29 LTE B41 Bandwidth 15M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2503.5	16.39	5.9	10.6	21.09
2593.0	16.85	6.0	10.6	21.45
2682.5	17.36	6.1	10.6	21.86

5.9.30 LTE B41 Bandwidth 20M QPSK Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2506.0	16.59	5.9	10.6	21.29
2593.0	17.11	6.0	10.6	21.71
2680.0	17.66	6.1	10.6	22.16

5.9.31 LTE B41 Bandwidth 5M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2498.5	16.38	5.9	10.6	21.08
2593.0	16.55	6.0	10.6	21.15
2687.5	17.04	6.1	10.6	21.54

5.9.28 LTE B41 Bandwidth 10M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2501.0	16.27	5.9	10.6	20.97
2593.0	16.65	6.0	10.6	21.25
2685.0	17.18	6.1	10.6	21.68

5.9.29 LTE B41 Bandwidth 15M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2503.5	16.13	5.9	10.6	20.83
2593.0	16.59	6.0	10.6	21.19
2682.5	16.94	6.1	10.6	21.44

5.9.30 LTE B41 Bandwidth 20M 16QAM Results

Frequency [MHz]	S.G output [dBm]	Cable loss [dB]	Antenna Gain [dB]	EIRP (P_d) [dBm]
2506.0	16.19	5.9	10.6	20.89
2593.0	16.67	6.0	10.6	21.27
2680.0	17.23	6.1	10.6	21.73

Annex A EUT Photos

See the document”A1-901-External Photos”.
See the document”A1-901-Internal Photos”.

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

*****End Of Report*****