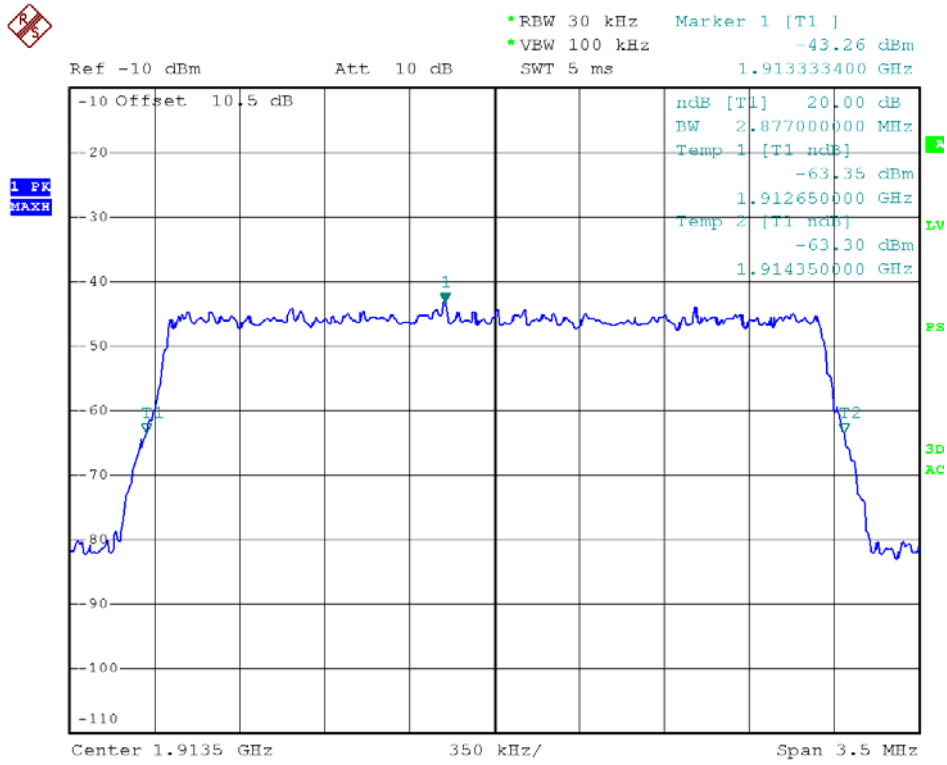
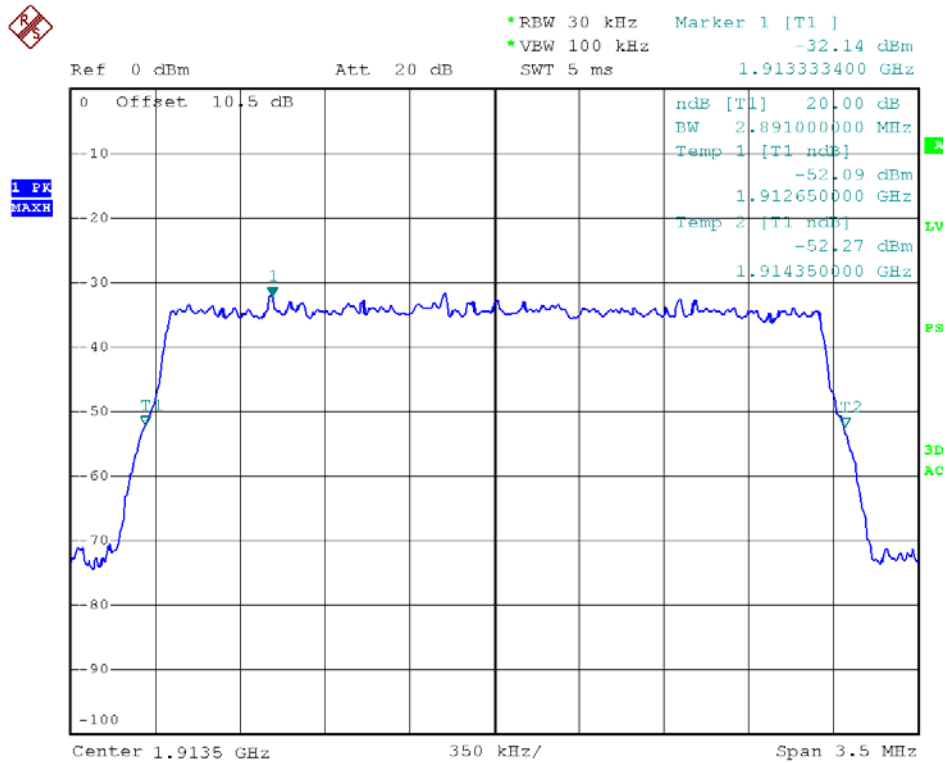


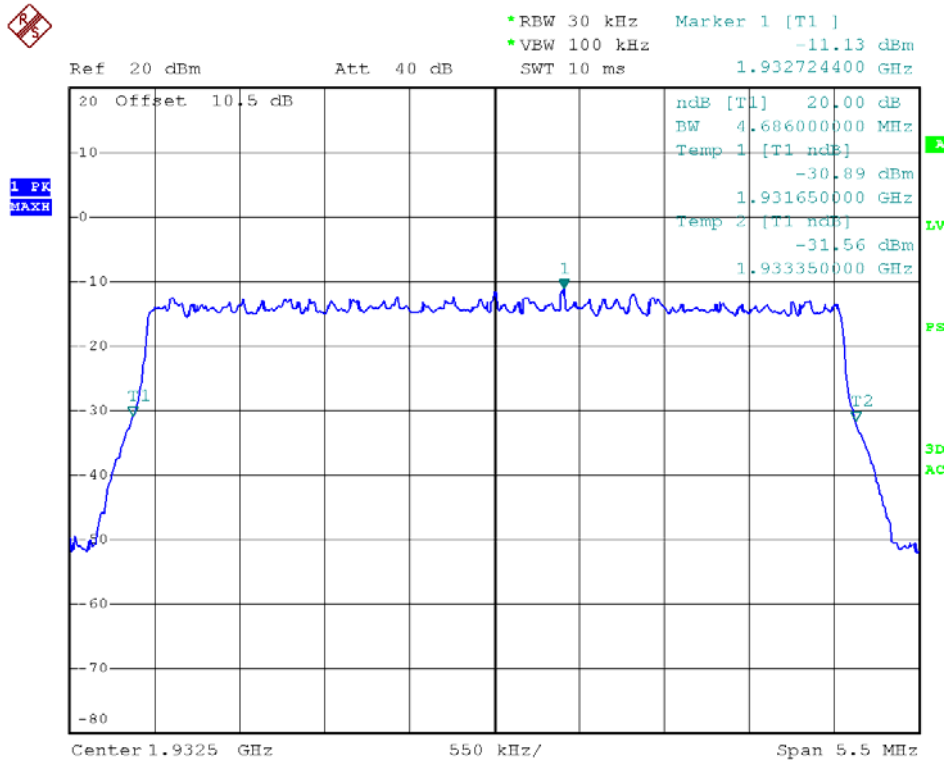
1900MHz-LTE-3M uplink (highest frequency)-Input



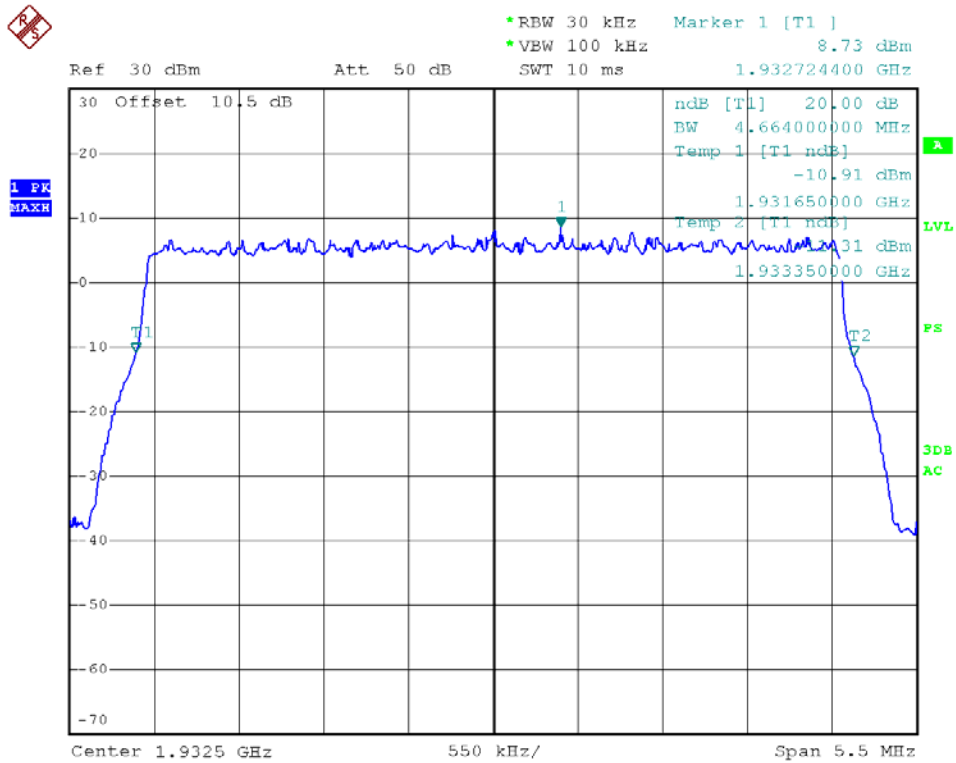
1900MHz-LTE -3M uplink (highest frequency)- Output



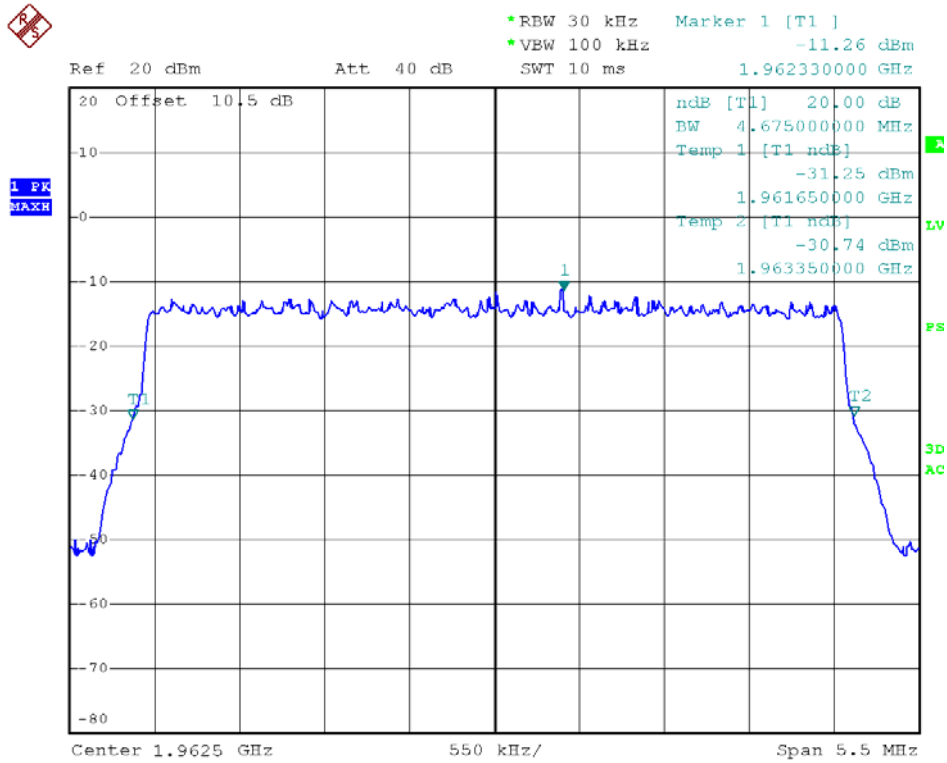
1900MHz-LTE-5M downlink (lowest frequency)-Input



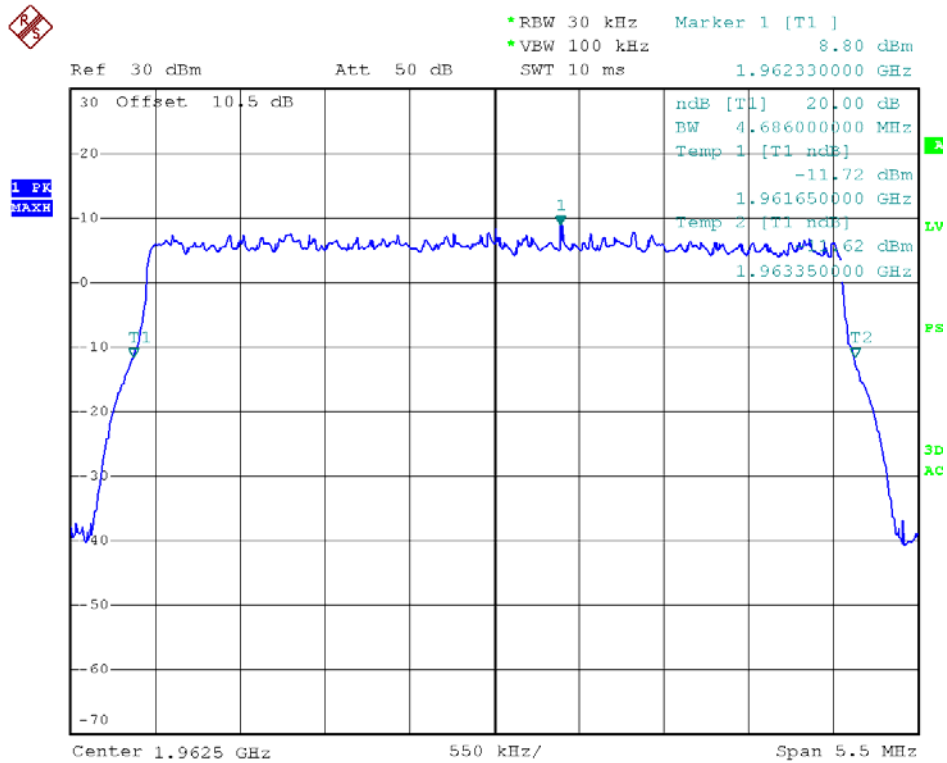
1900MHz-LTE -5M downlink (lowest frequency)-Output



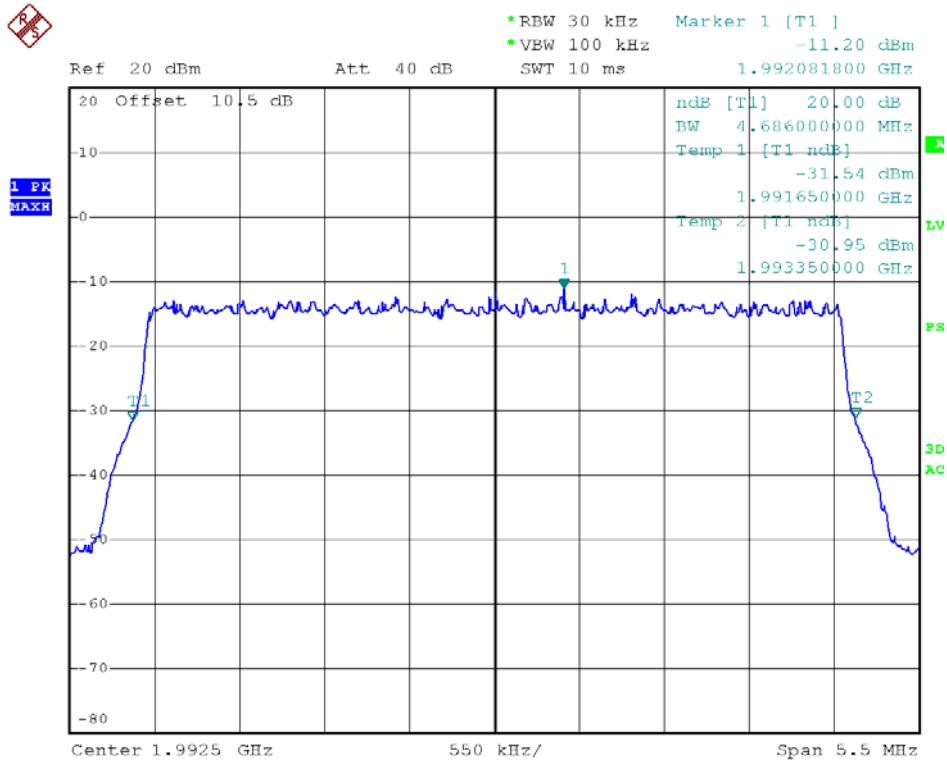
1900MHz-LTE-5M downlink (middle frequency)-Input



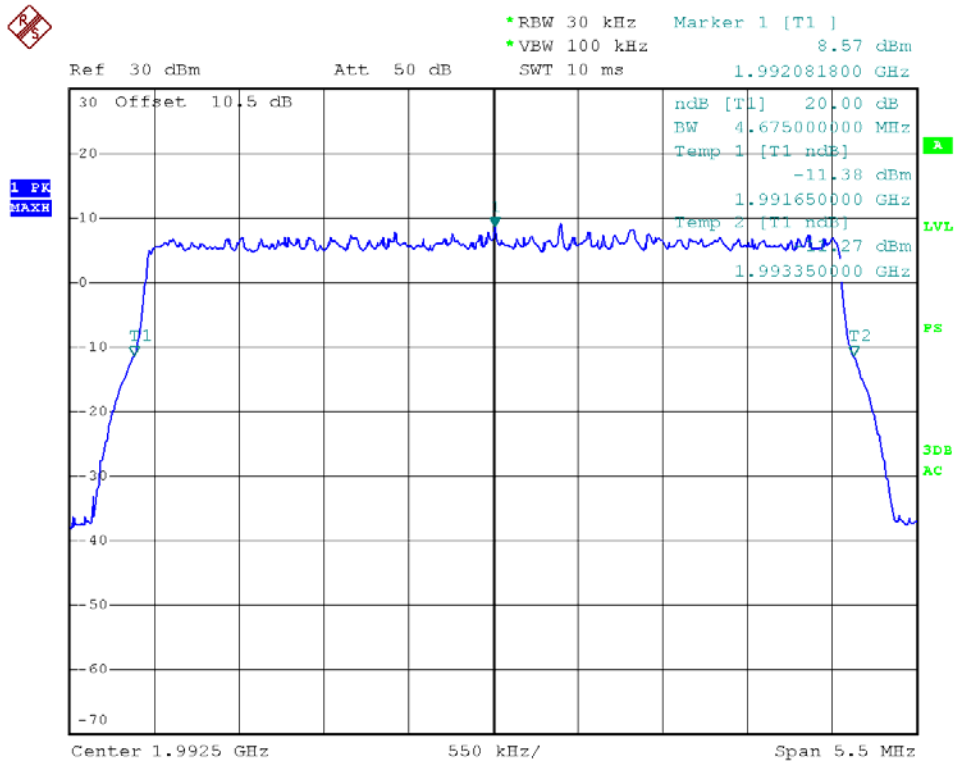
1900MHz-LTE-5M downlink (middle frequency)- Output



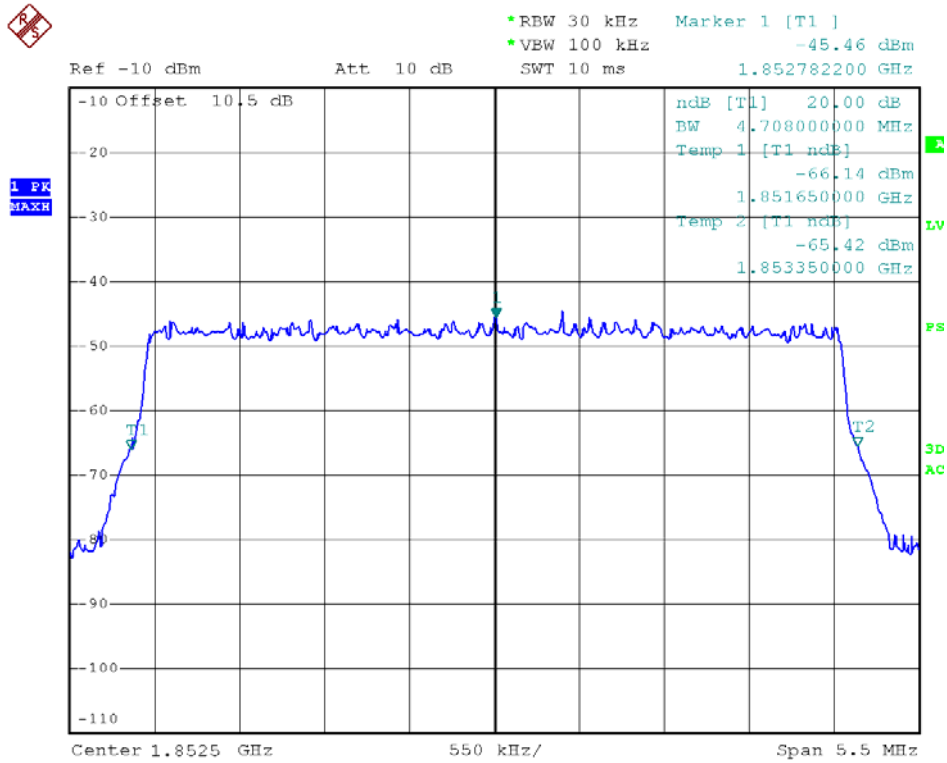
1900MHz-LTE-5M downlink (highest frequency) -Input



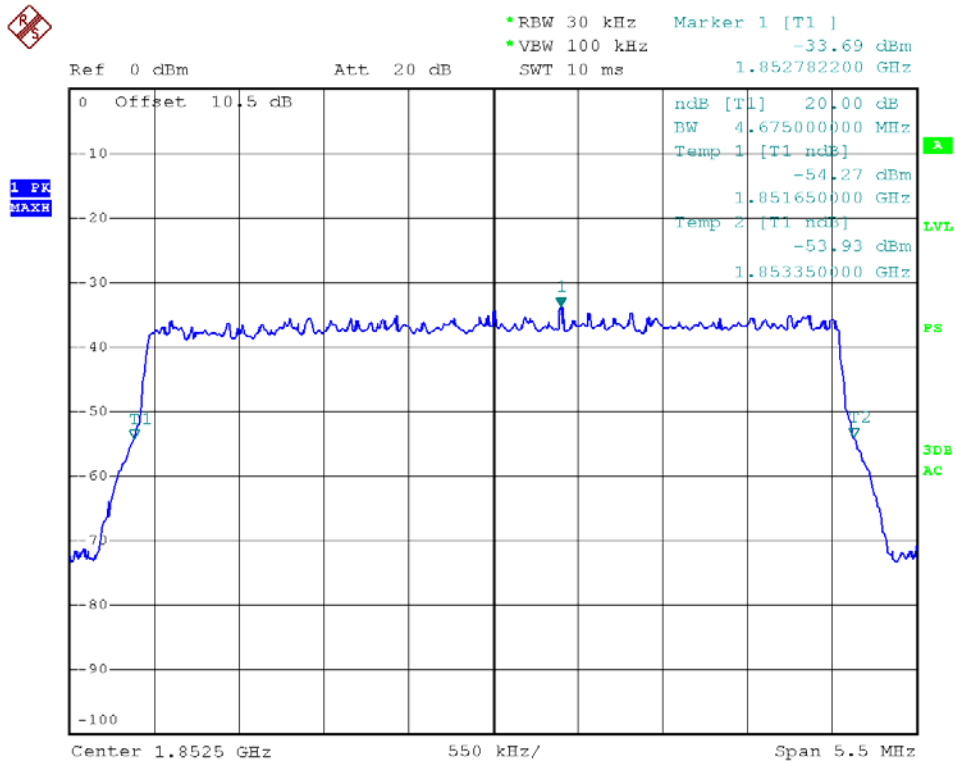
1900MHz-LTE-5M downlink (highest frequency)- Output



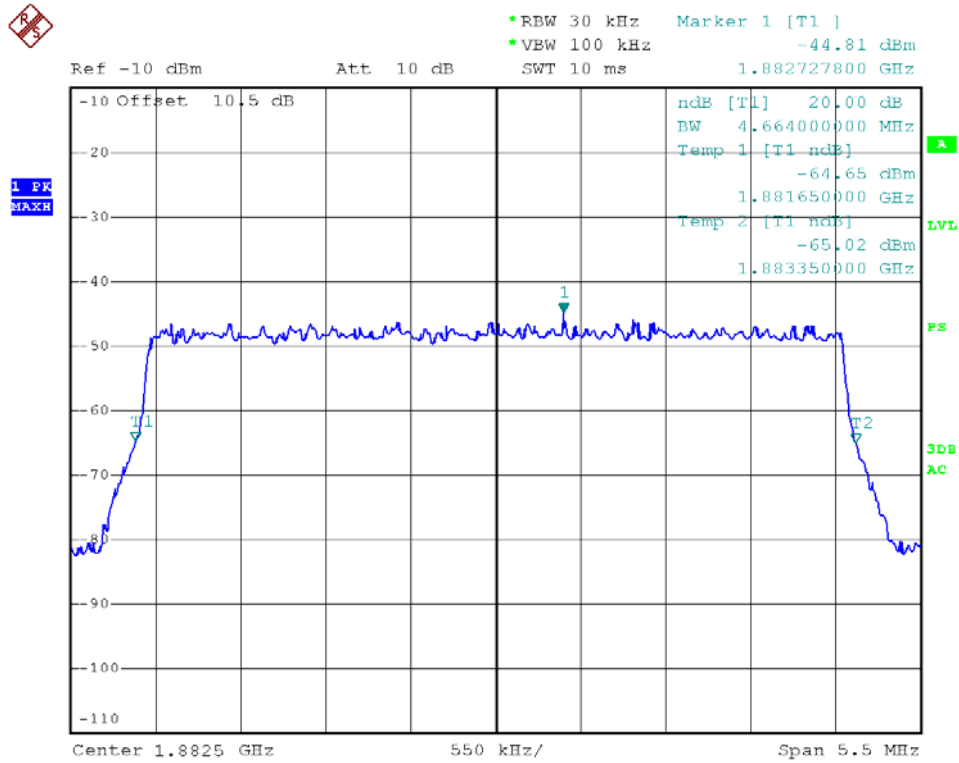
1900MHz-LTE-5M uplink (lowest frequency)-Input



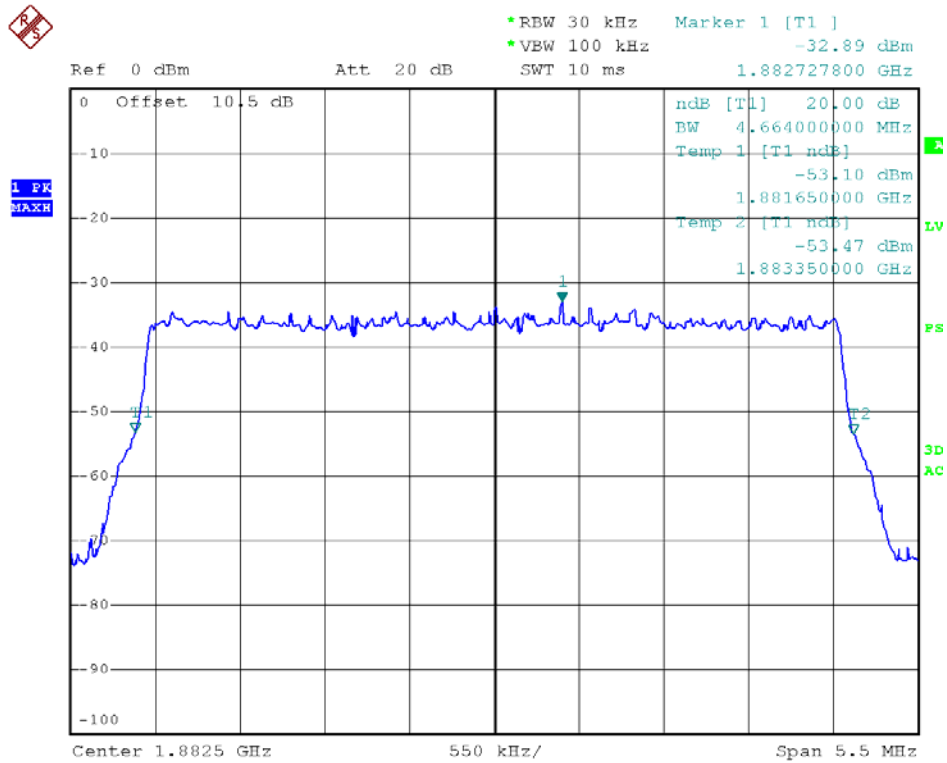
1900MHz-LTE-5M uplink (lowest frequency)- Output



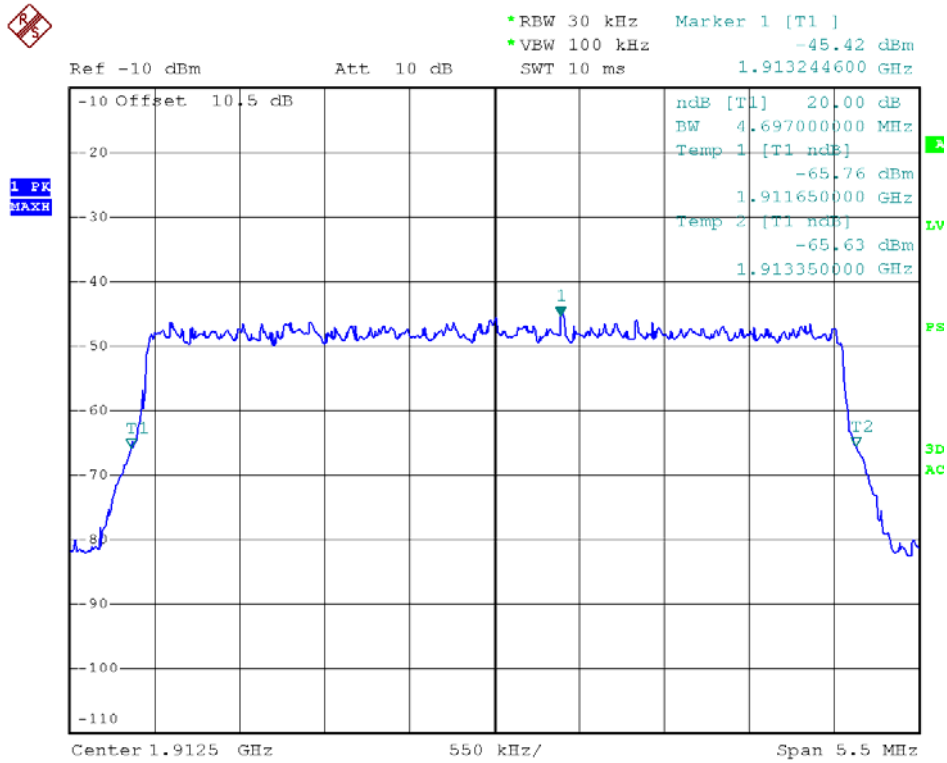
1900MHz-LTE -5M uplink (middle frequency)-Input



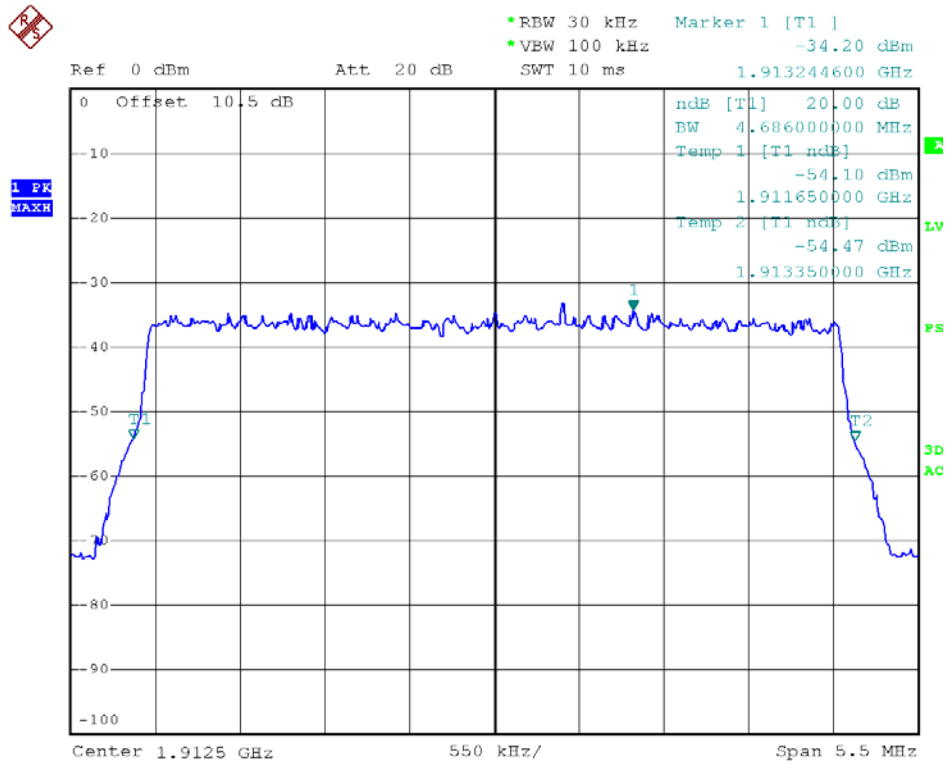
1900MHz-LTE-5M uplink (middle frequency)-Output



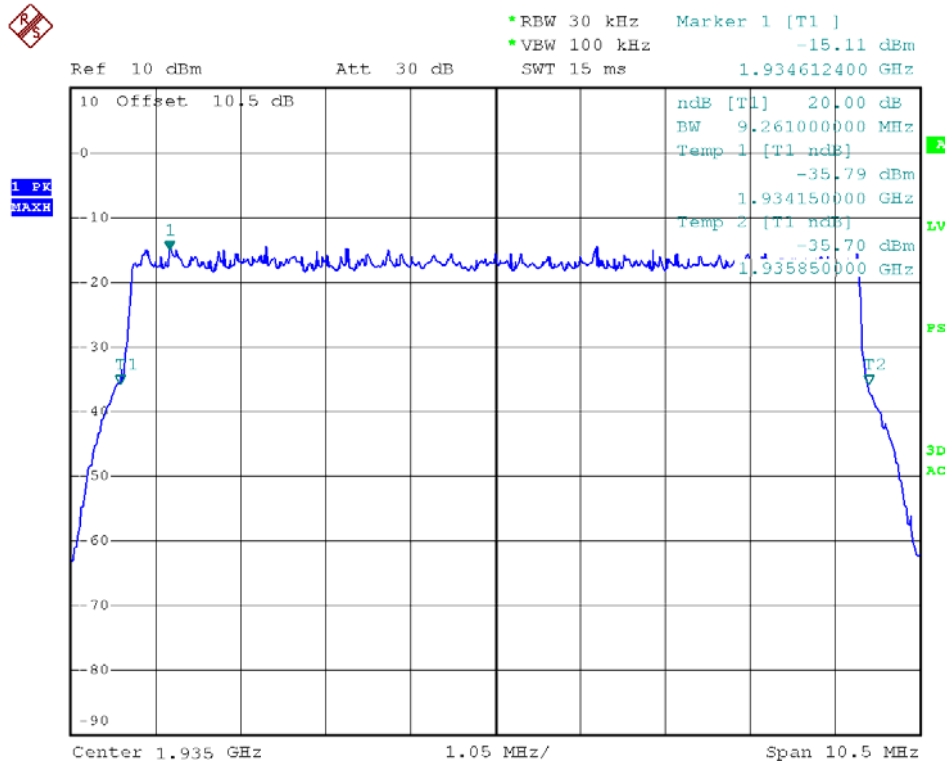
1900MHz-LTE-5M uplink (highest frequency)-Input



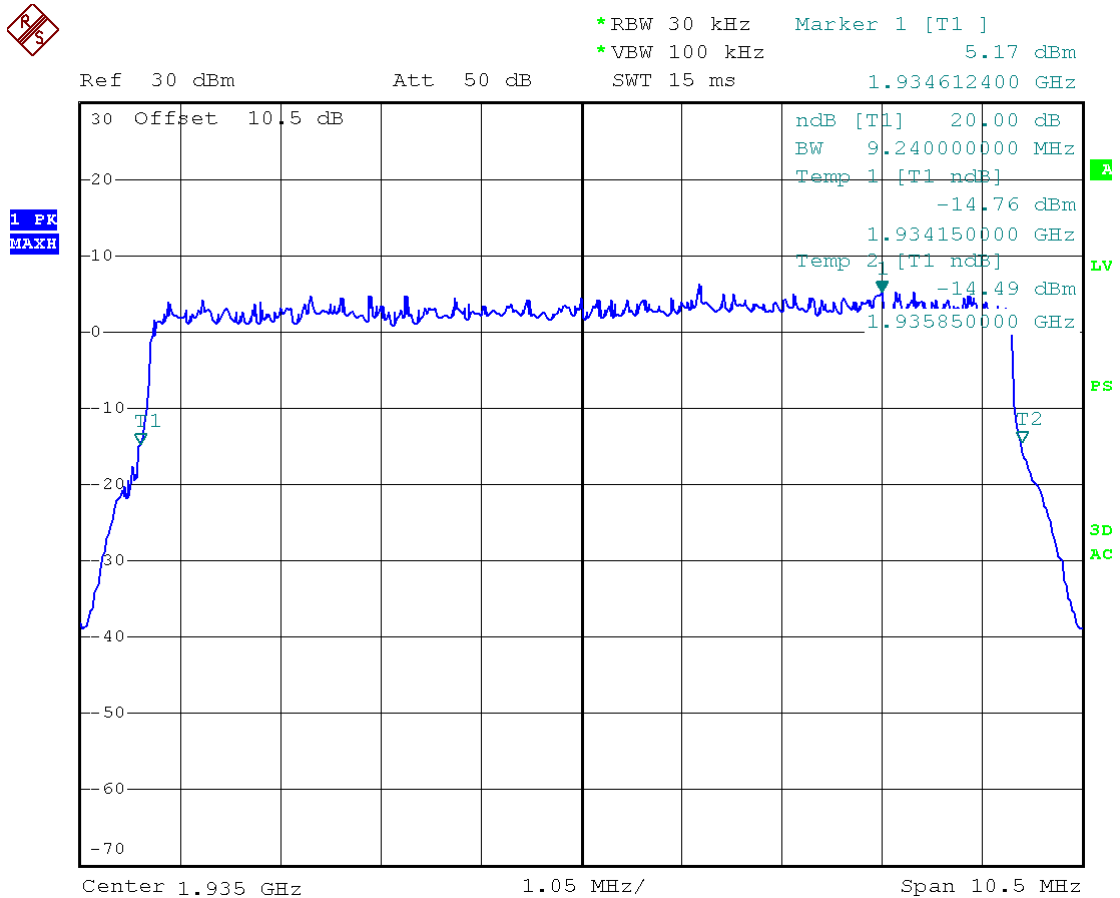
1900MHz-LTE -5M uplink (highest frequency)- Output



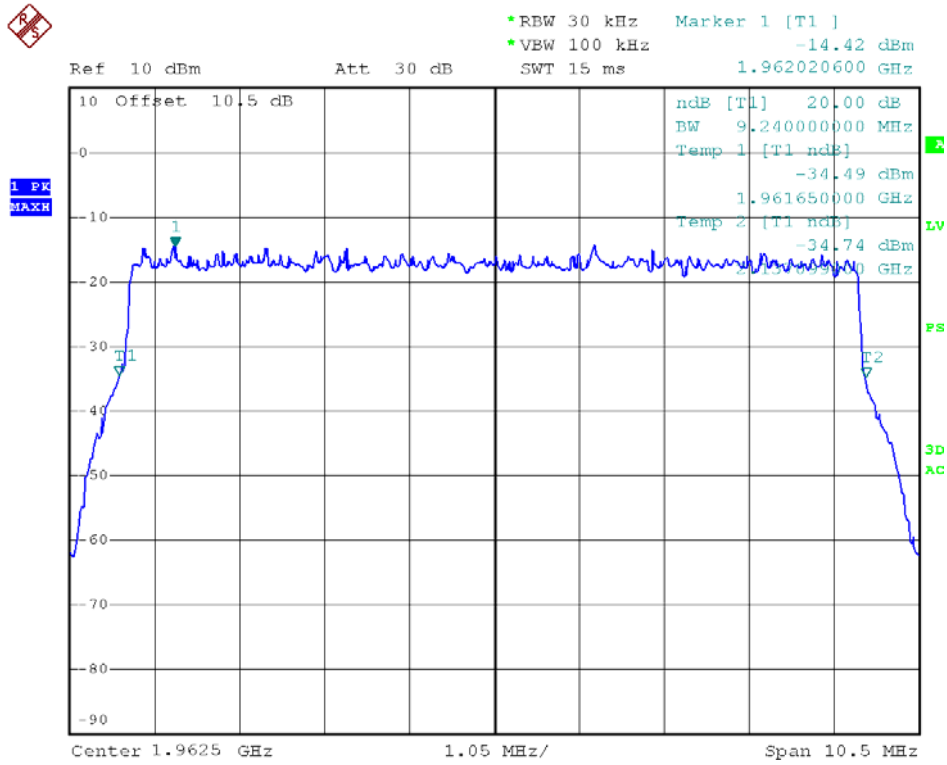
1900MHz-LTE-10M downlink (lowest frequency)-Input



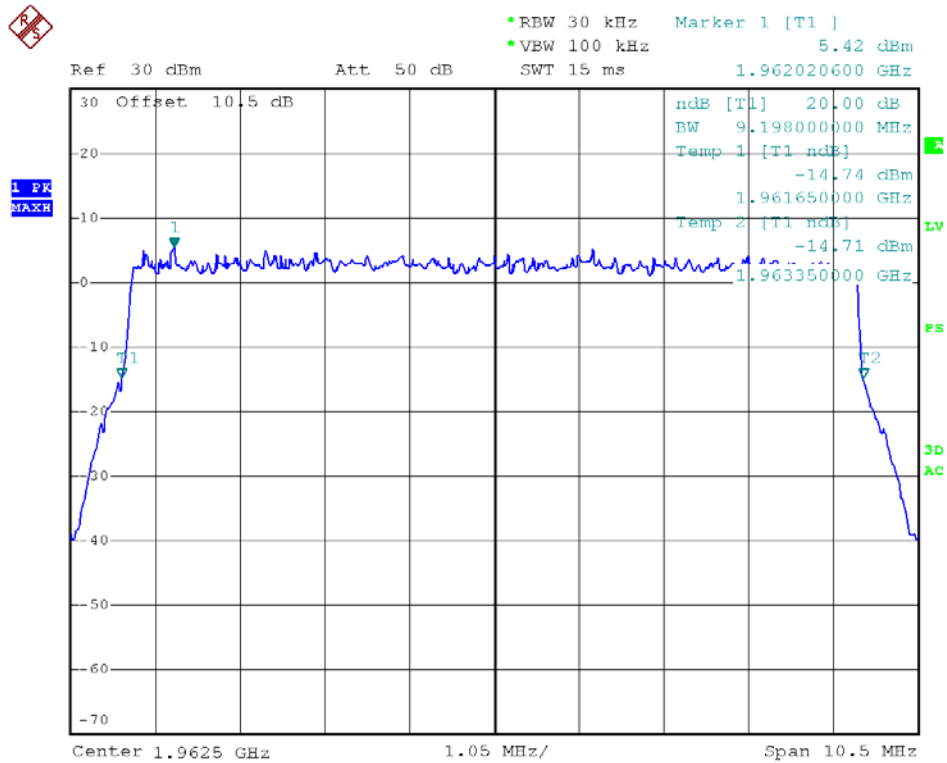
1900MHz-LTE -10M downlink (lowest frequency)-Output



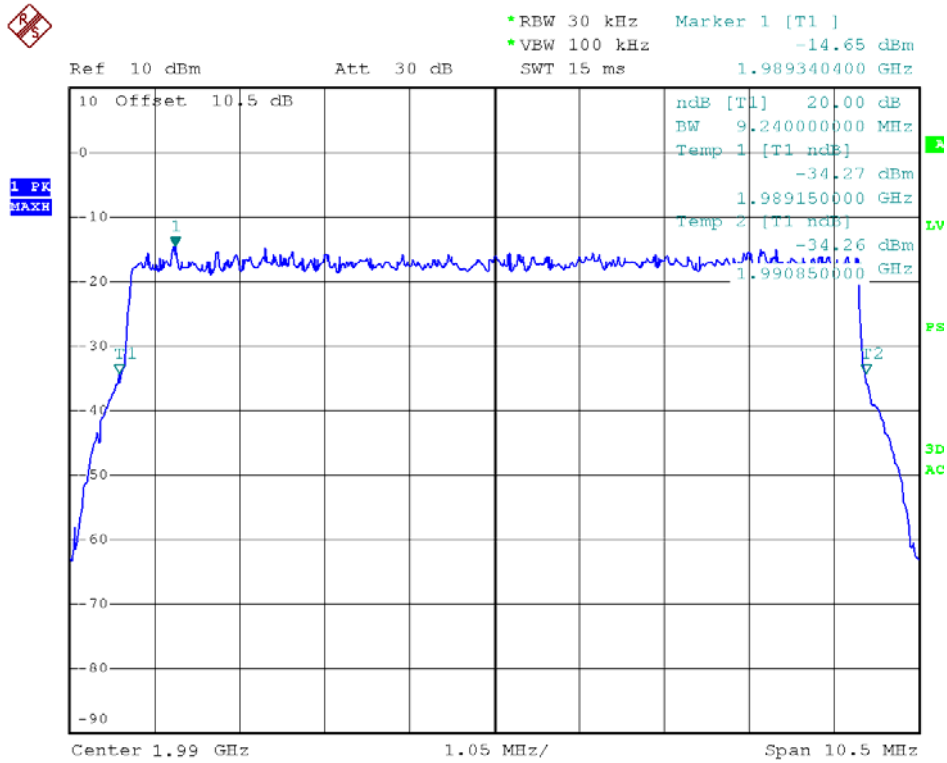
1900MHz-LTE-10M downlink (middle frequency)-Input



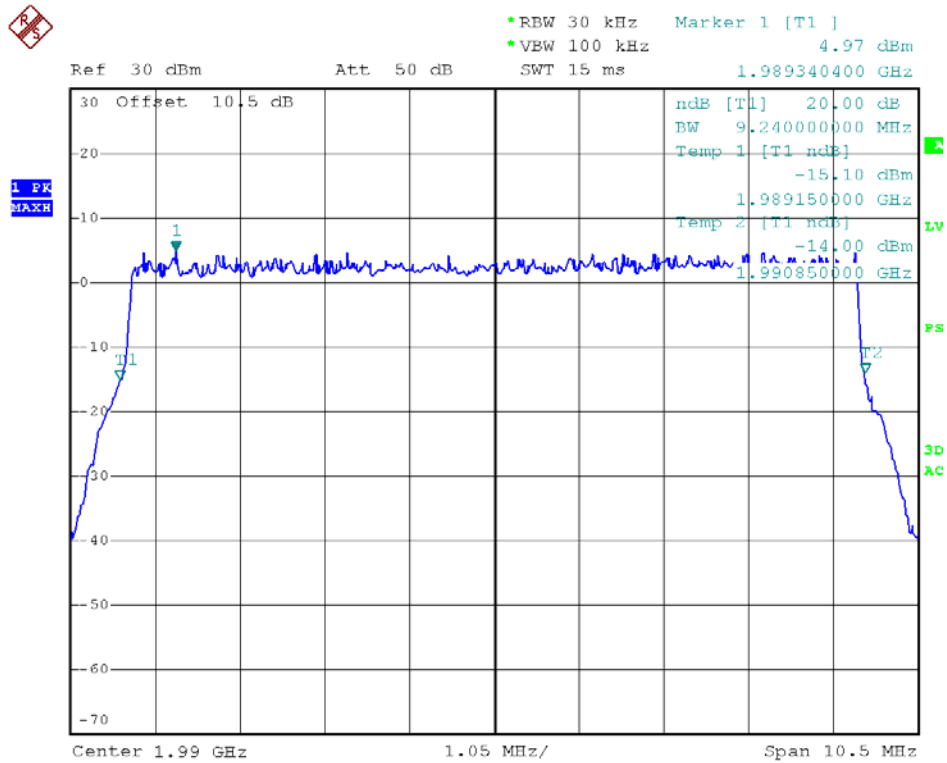
1900MHz-LTE-10M downlink (middle frequency)- Output



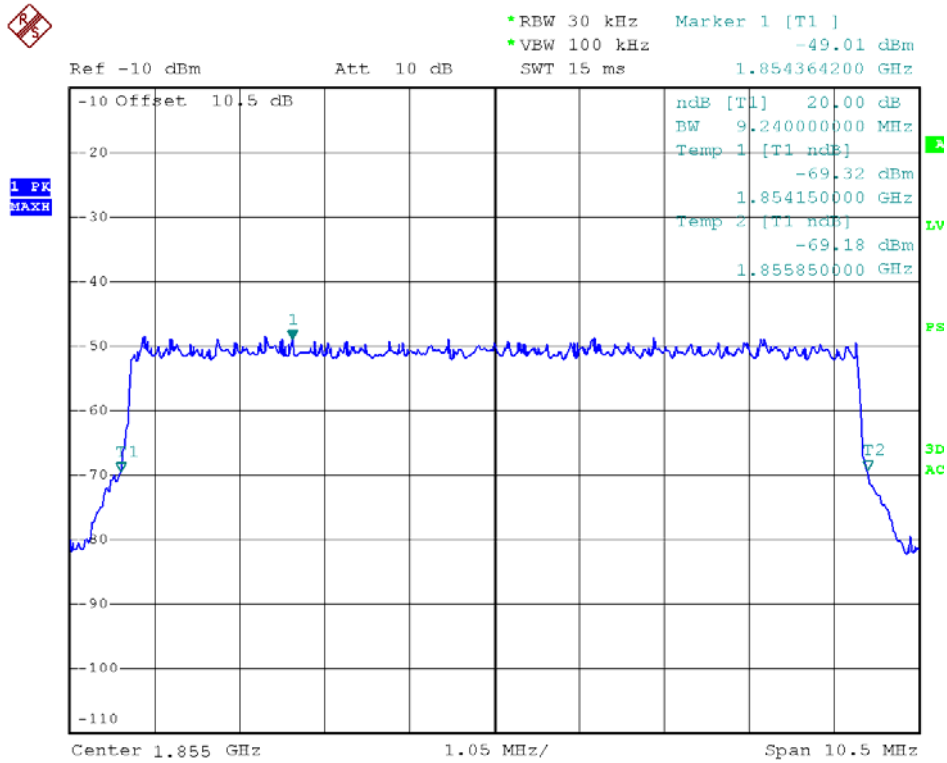
1900MHz-LTE-10M downlink (highest frequency)-Input



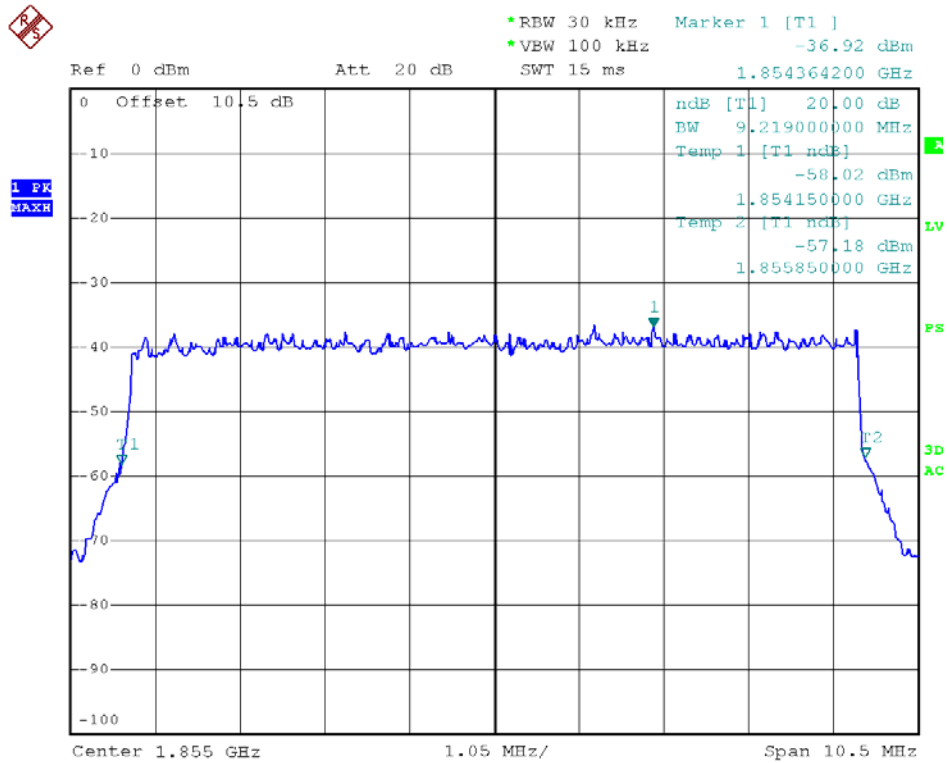
1900MHz-LTE-10M downlink (highest frequency)- Output



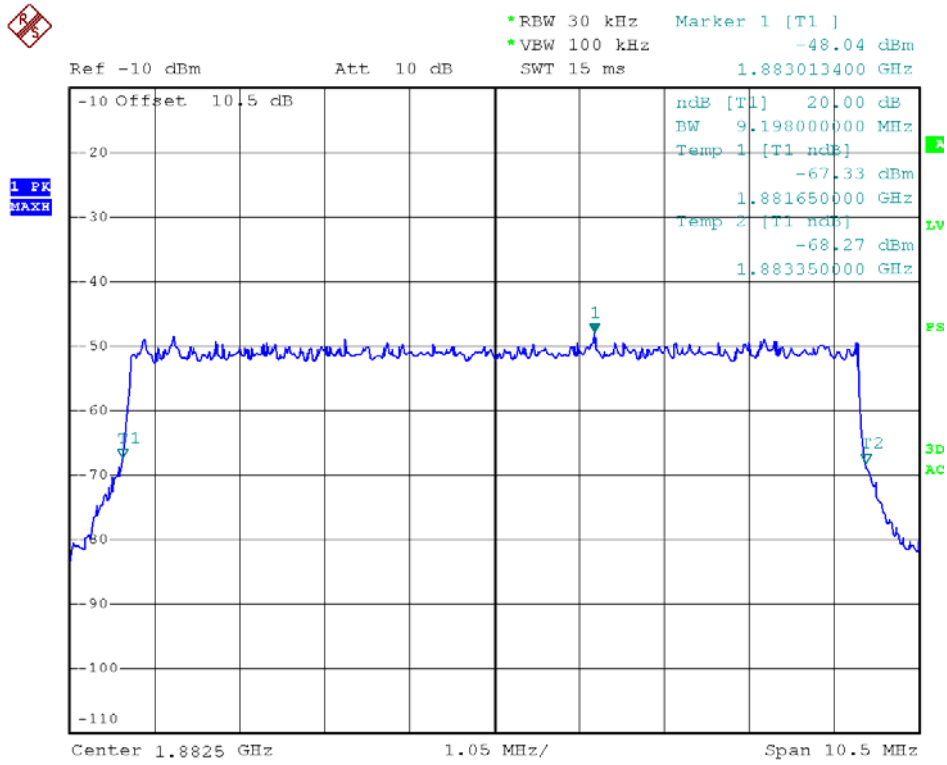
1900MHz-LTE-10M uplink (lowest frequency)-Input



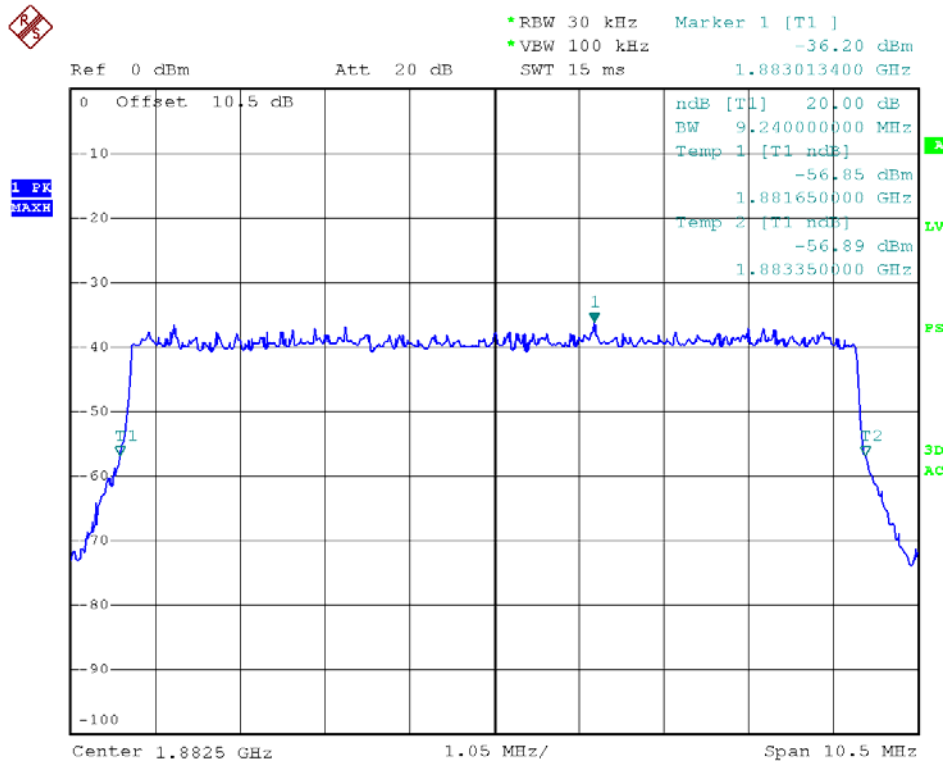
1900MHz-LTE-10M uplink (lowest frequency)- Output



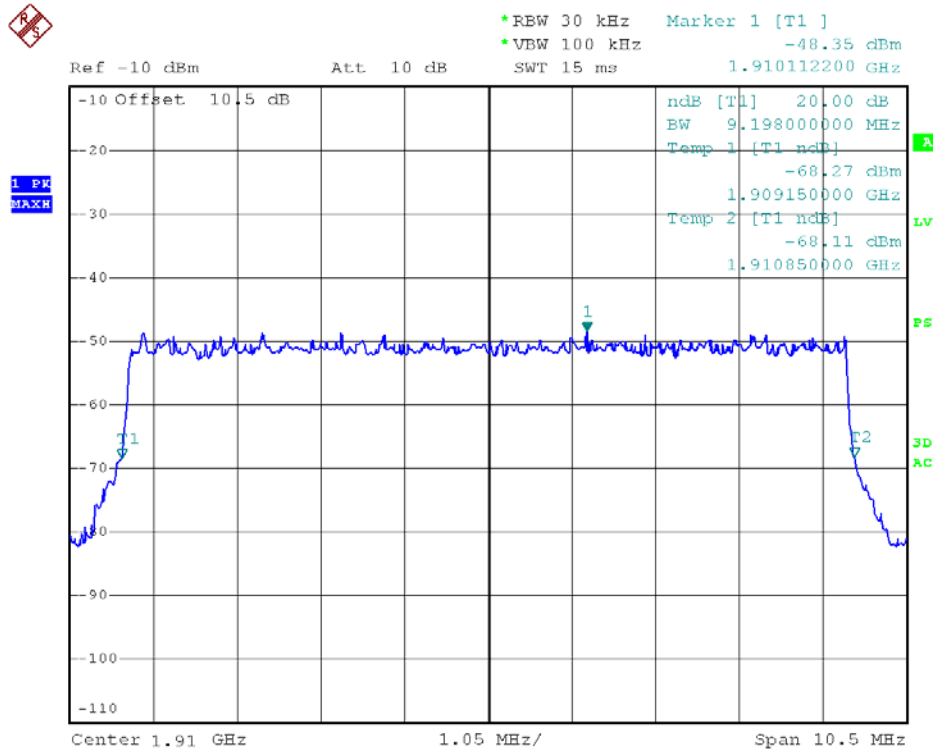
1900MHz-LTE -10M uplink (middle frequency)-Input



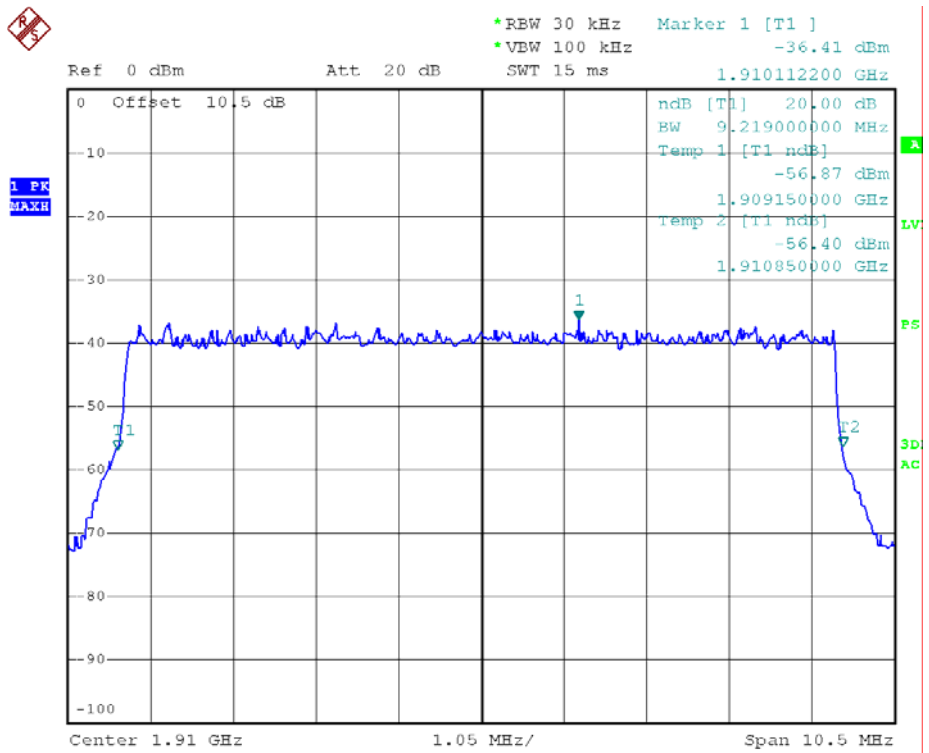
1900MHz-LTE-10M uplink (middle frequency)-Output



1900MHz-LTE-10M uplink (highest frequency)-Input



1900MHz-LTE -10M uplink (highest frequency)- Output



4.2.6 INTERMODULATION

Test Date: 16 October, 2012
 Test Method: 2-11-04/EAB/RF

Test Requirement: FCC part 22.917(a)& FCC part 24.238(a)&FCC 27.53
 22.917(a): 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.
 24.238(a) 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.

EUT Operation: Status
 The output power of EUT be set to maximum value,the gain of EUT be set to maximum value by software through the manufacture

Conditions Normal

Application 700MHz DL and UL ports,850MHz DL and UL ports, 1900MHz DL and UL ports

Test configuration

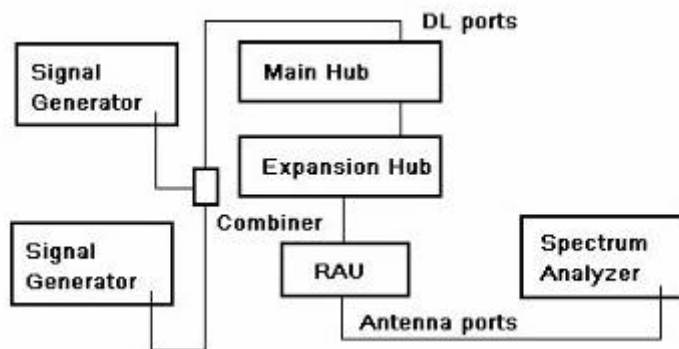


Fig.1 Down Link Intermodulation

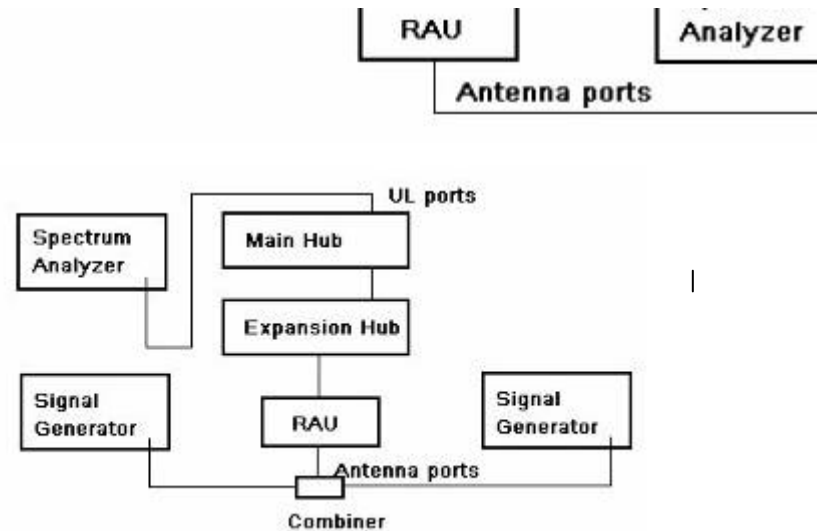


Fig.2 Up Link Intermodulation

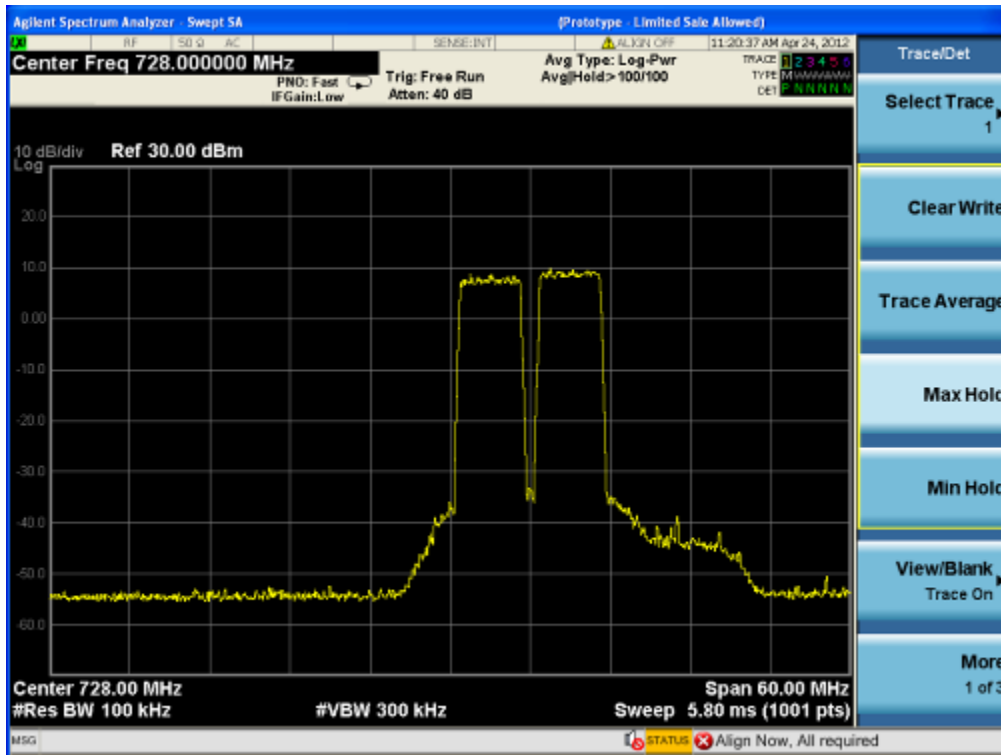
Test Procedure:

1. Connect the equipment as illustrated,
 2. Test the background noise level with all the test facilities
 3. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads
 4. Select the attenuator to avoid the test receiver or spectrum analyzer being destroyed
 5. Keep the EUT continuously transmitting in max power
 6. Keep two signal generator produce two signal are same in modulation type and level
 7. Measurement the 3 order intermodulated produced by the EUT (the sum of the two unwanted signal should be rated power)
 8. Correct for all losses in the RF path
 9. Read the conducted spurious emission of the EUT antenna port. CW signal rather than typical signal is acceptable(for FM)
- At maximum drive level, for each modulation:one test with three tones, or two tests(high, low-band edge)with two tones
Limit usually is -13dBm conducted
Not need for signal channel systems
Combination of modulation types not needed

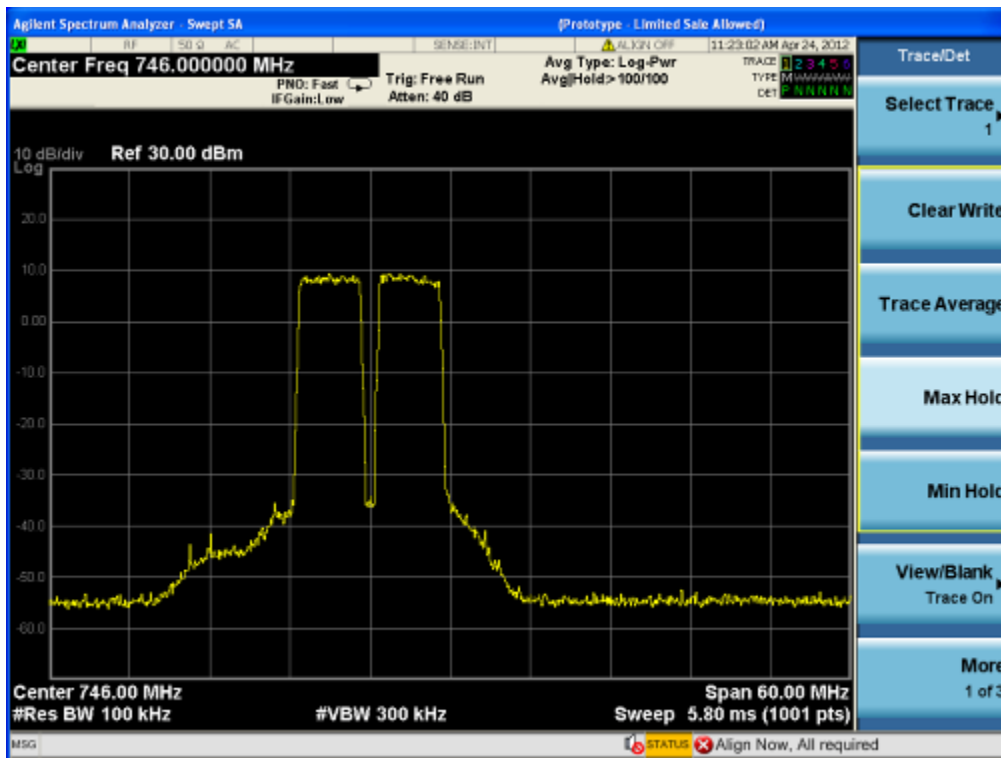
4.2.6.1 MEASUREMENT RECORD

700MHz

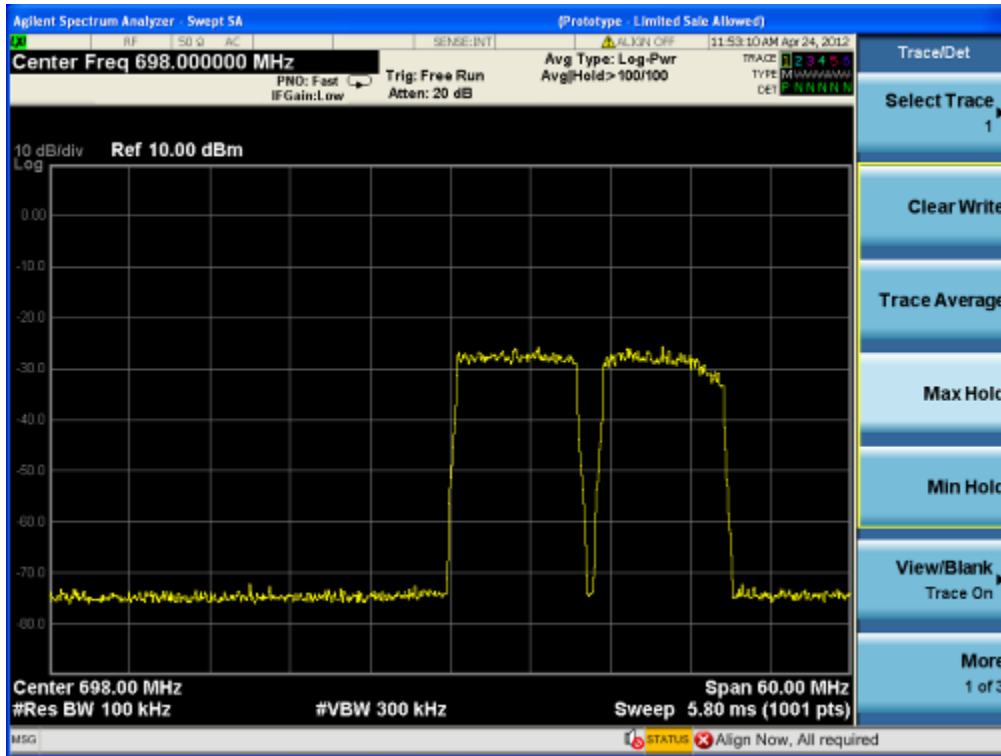
700MHz-LTE-QPSK down link-Lower Edge



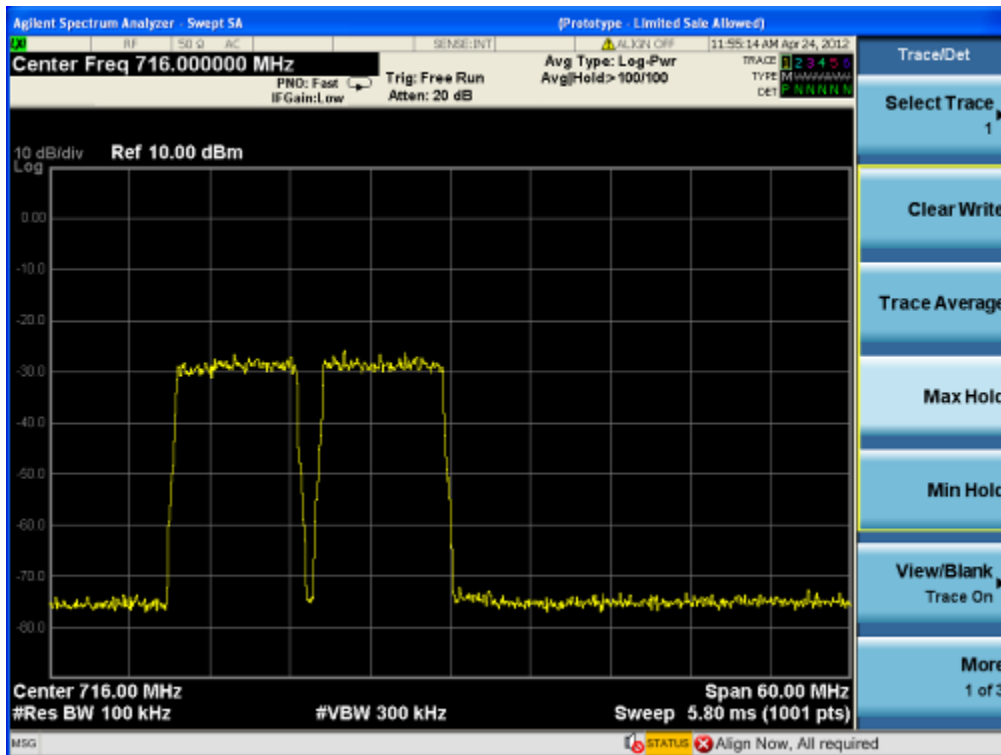
700MHz-LTE-QPSK down link-Upper Edge



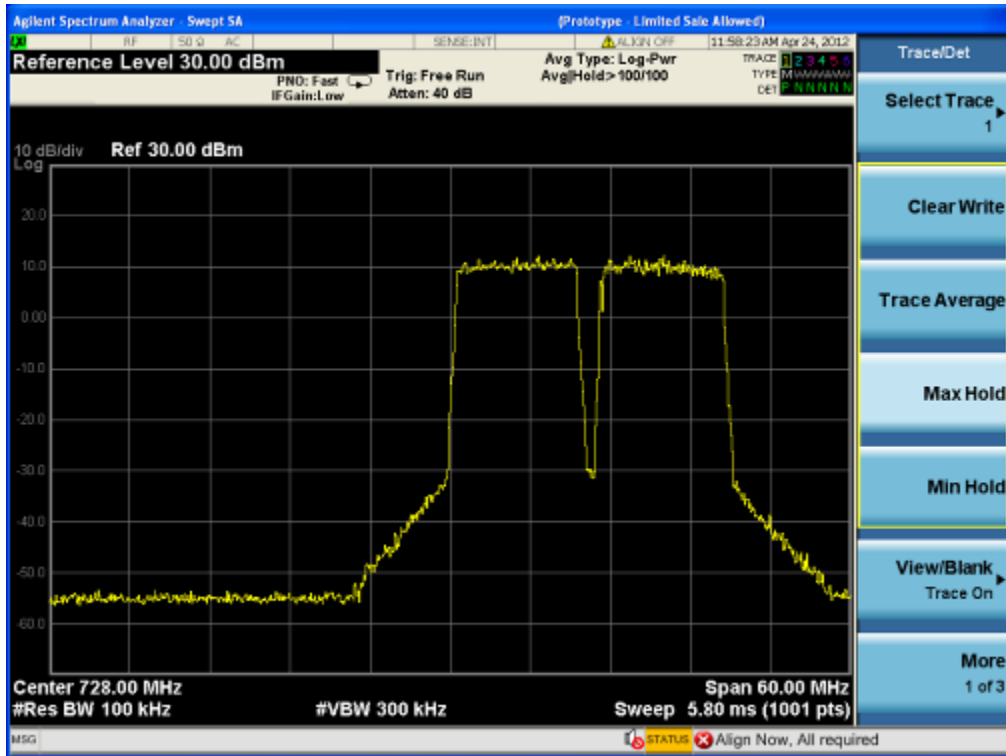
700MHz-LTE-QPSK up link-Lower Edge



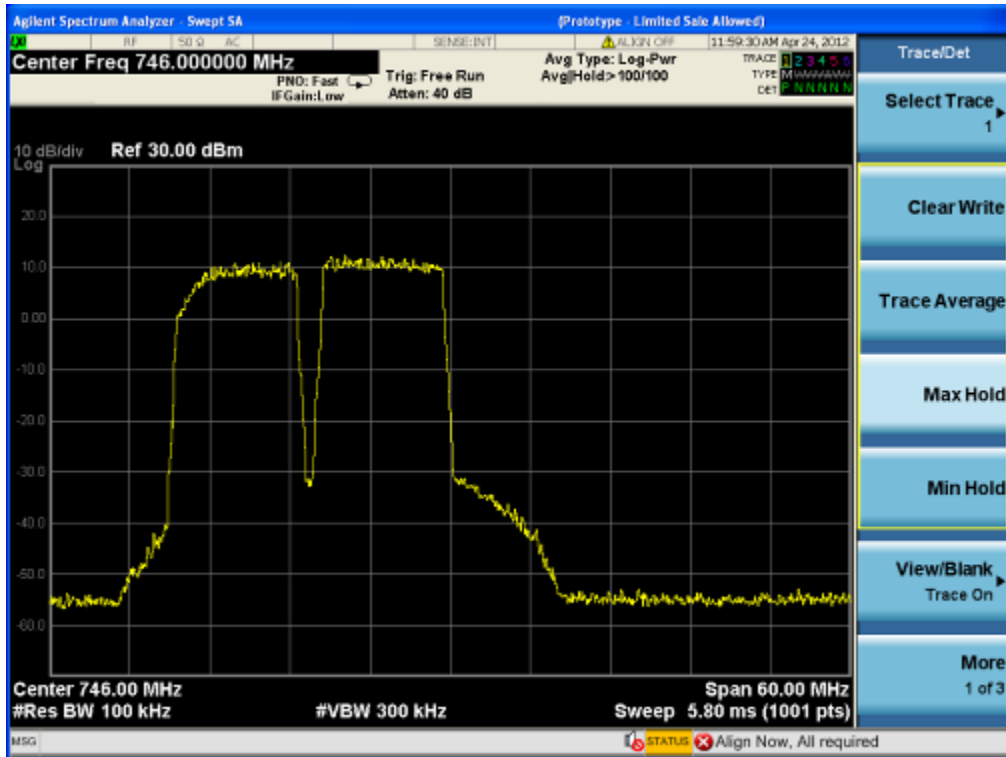
700MHz-LTE-QPSK up link-Upper Edge



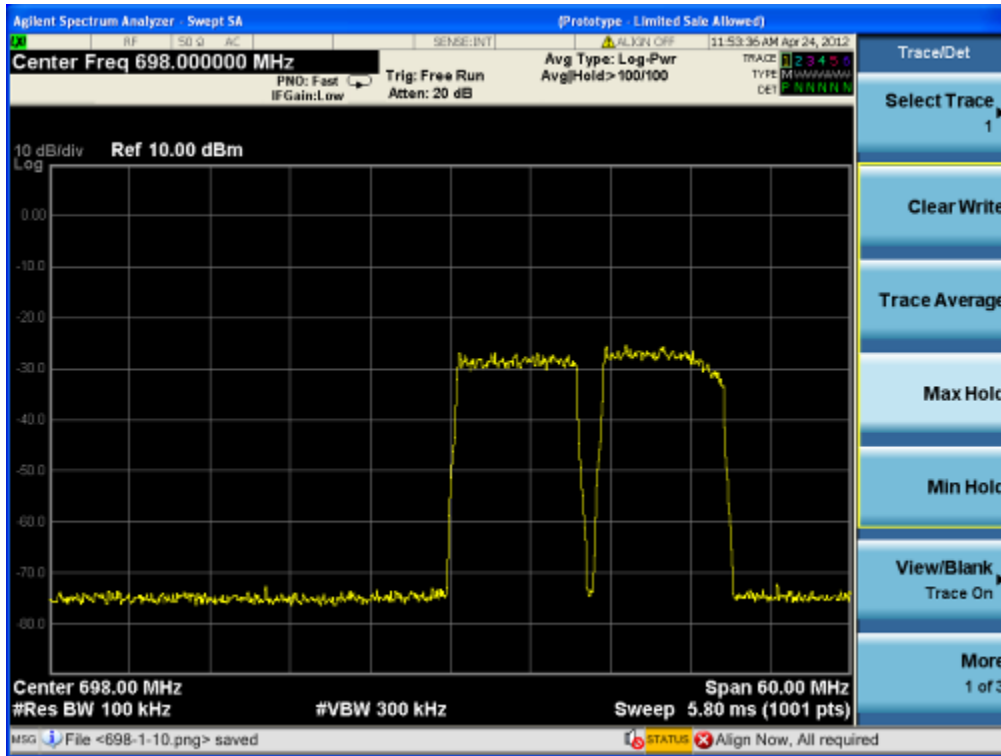
700MHz-LTE-16QAM down link-Lower Edge



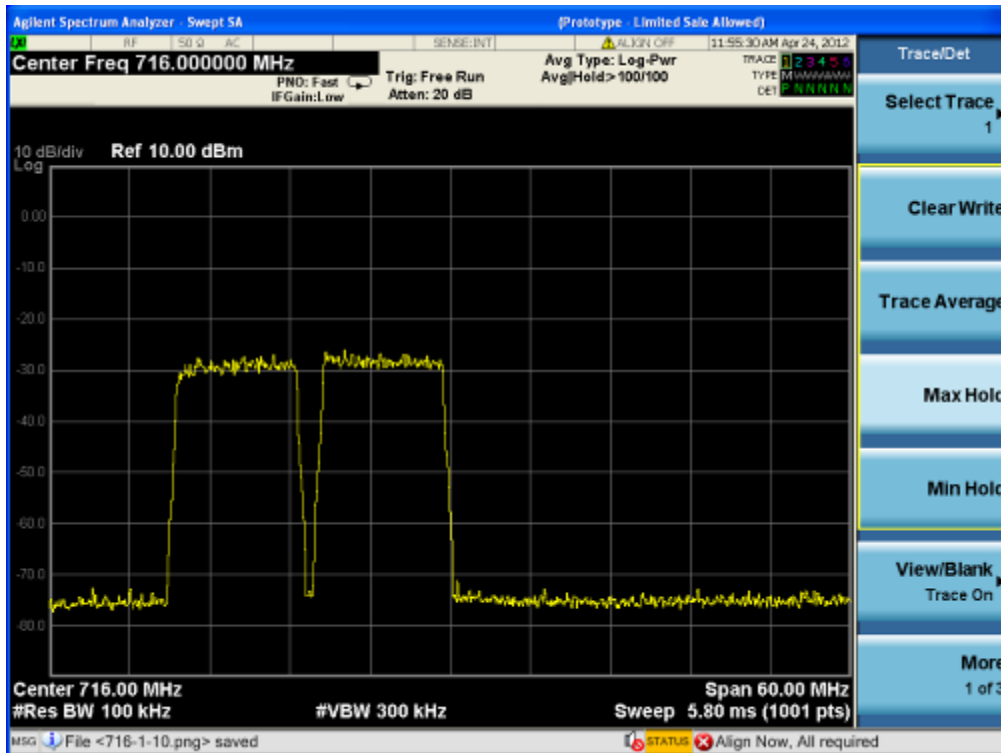
700MHz-LTE-16QAM down link-Upper Edge



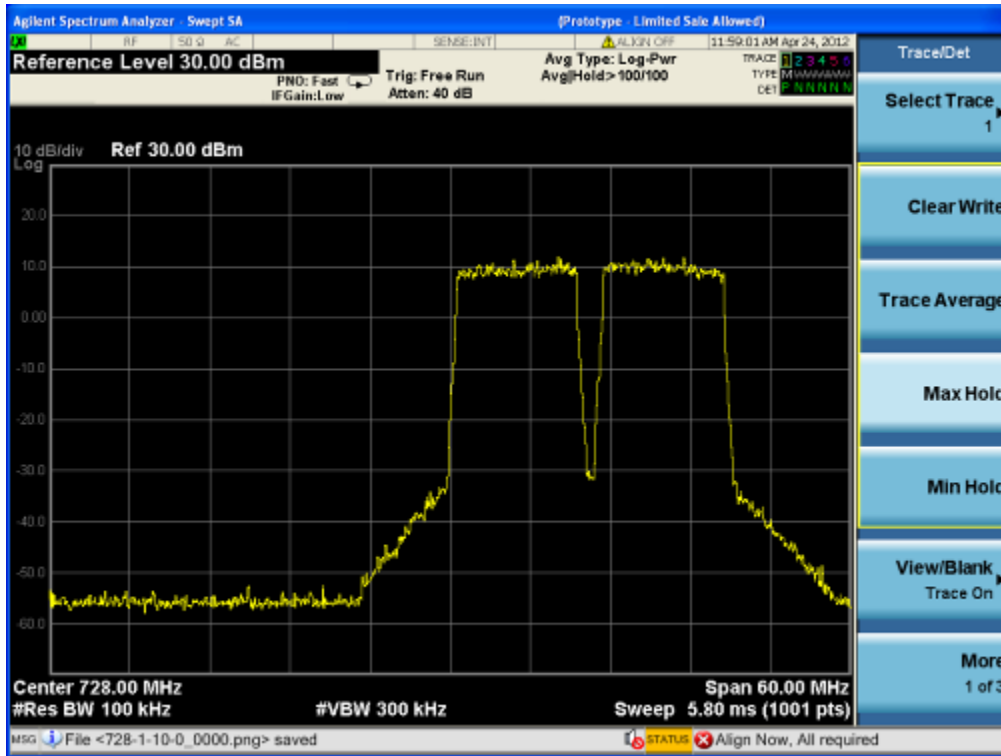
700MHz-LTE-16QAM up link-Lower Edge



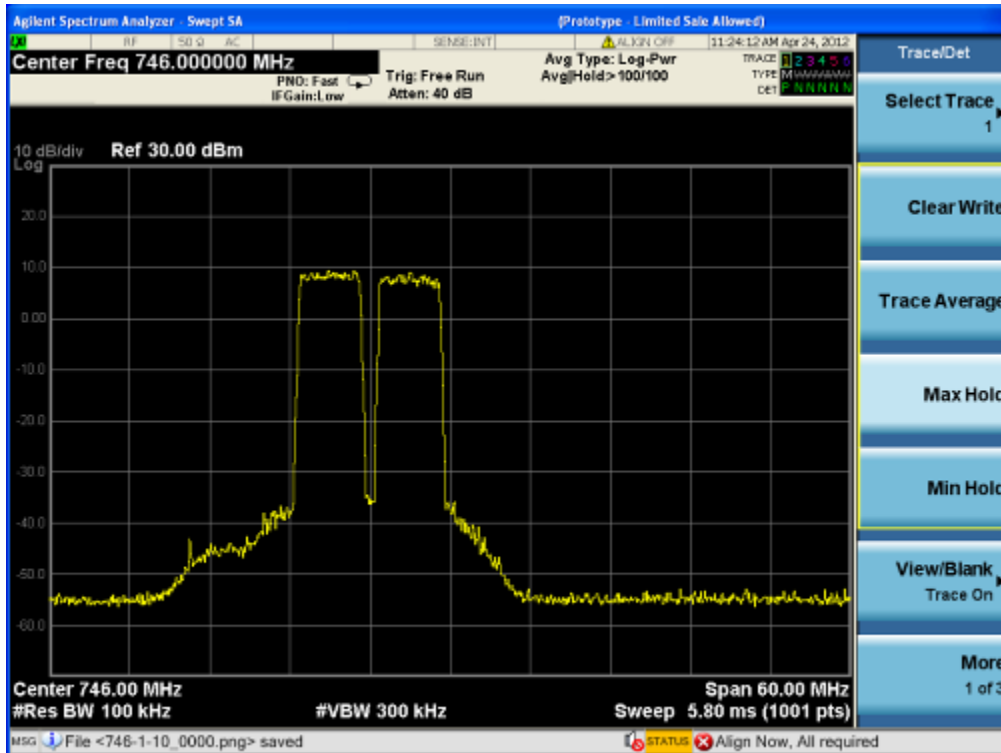
700MHz-LTE-16QAM up link-Upper Edge



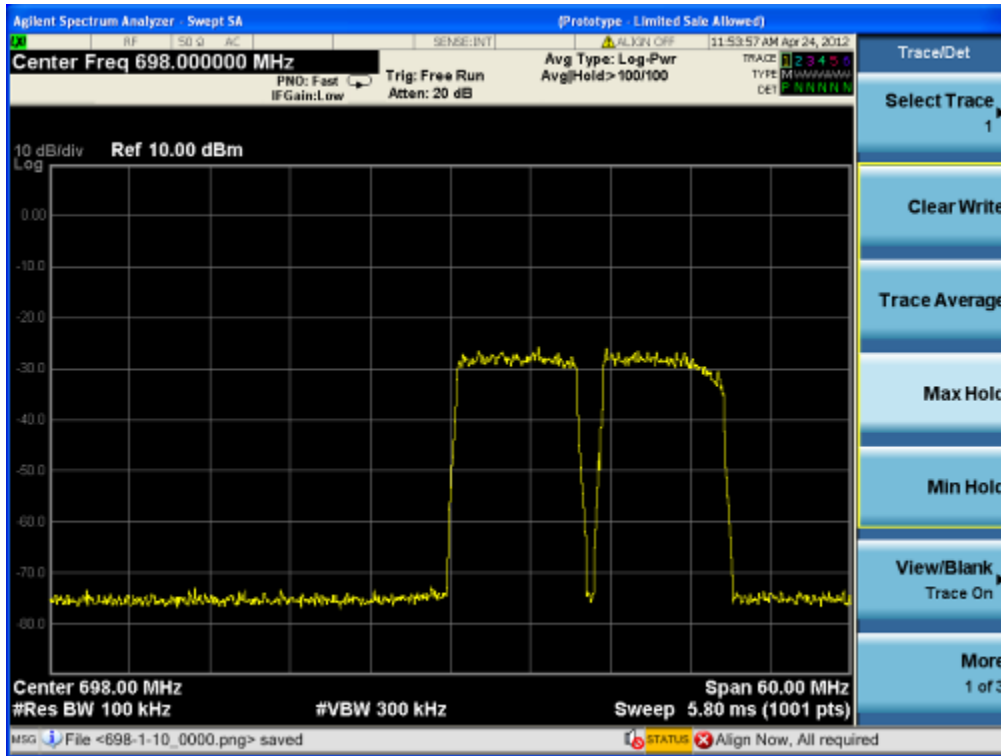
700MHz-LTE-64QAM down link-Lower Edge



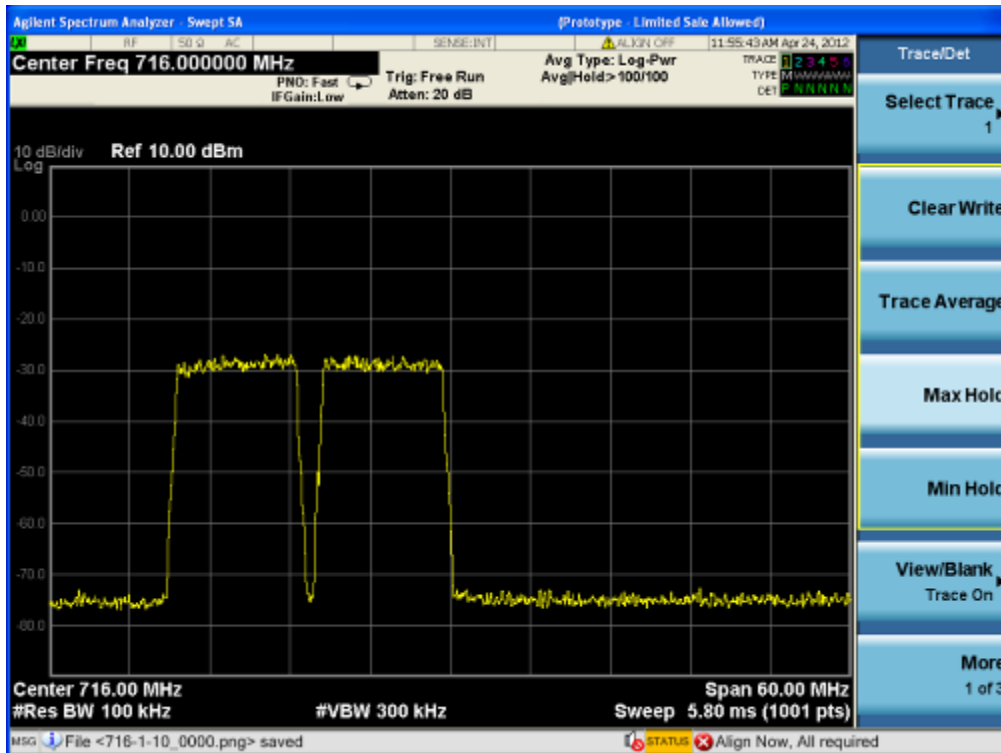
700MHz-LTE-64QAM down link-Upper Edge



700MHz-LTE-64QAM up link-Lower Edge

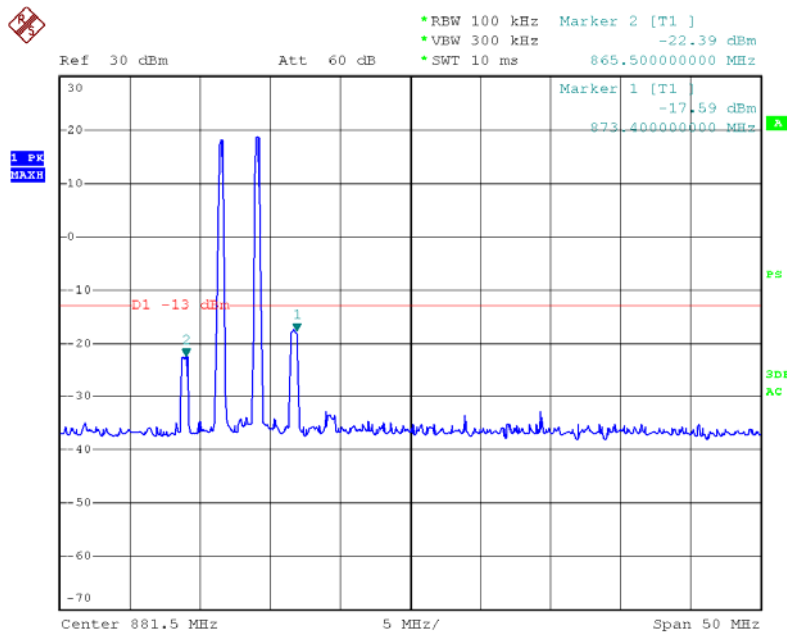


700MHz-LTE-64QAM up link-Upper Edge

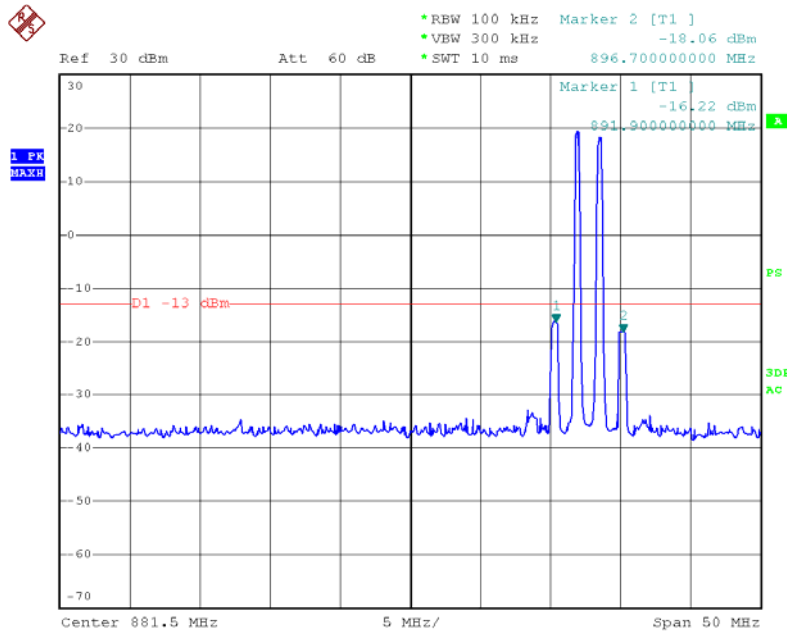


850MHz

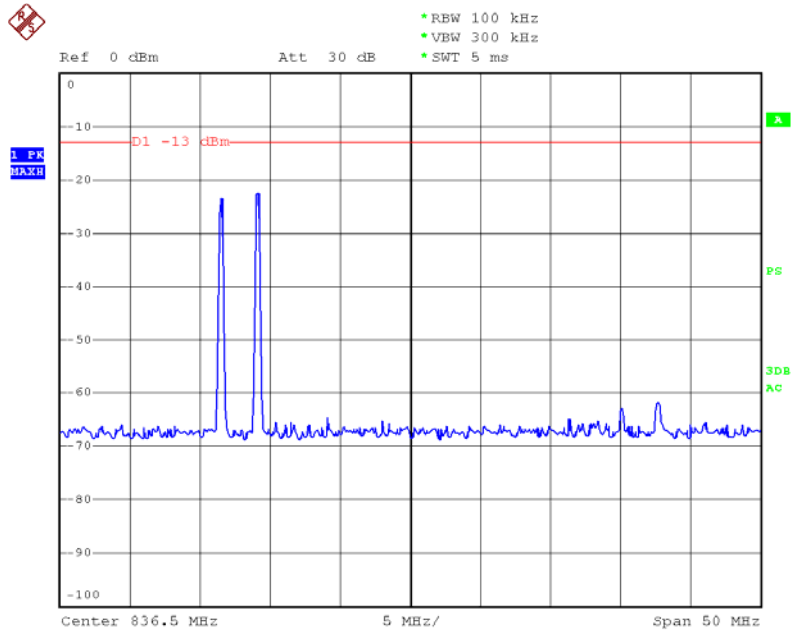
850MHz-GSM down link-Lower Edge



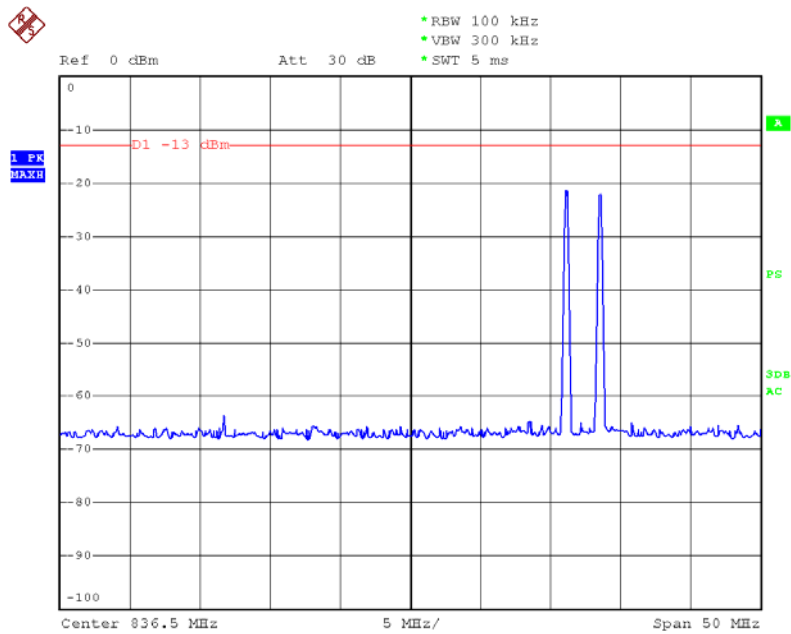
850MHz-GSM down link-Upper Edge



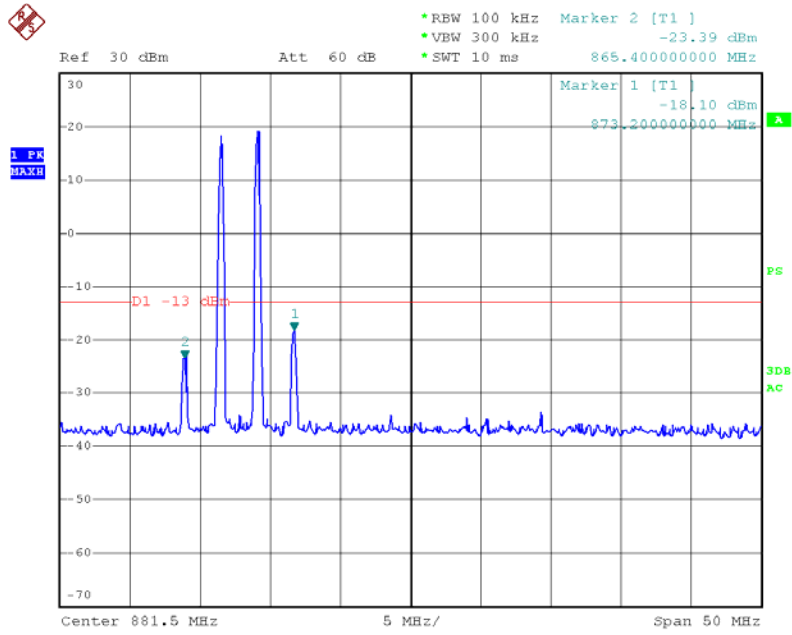
850MHz-GSM up link-Lower Edge



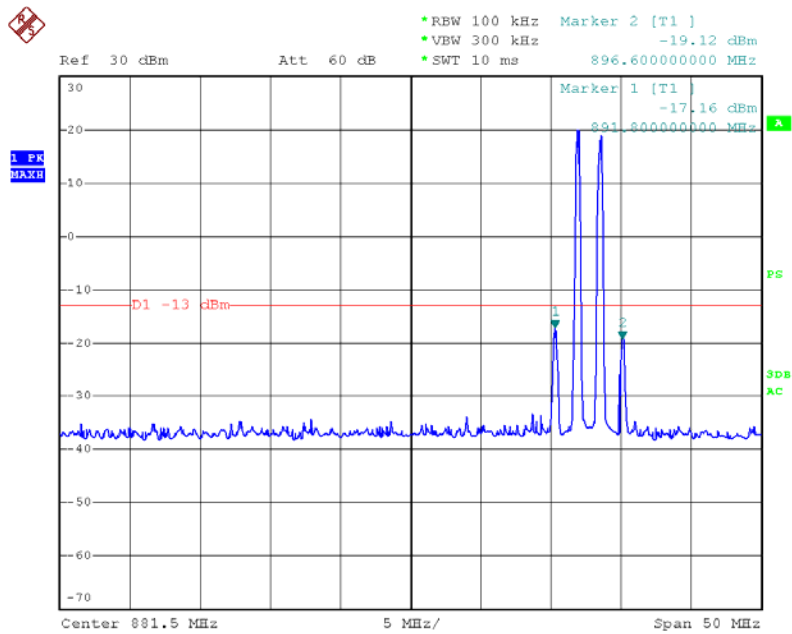
850MHz-GSM up link-Upper Edge



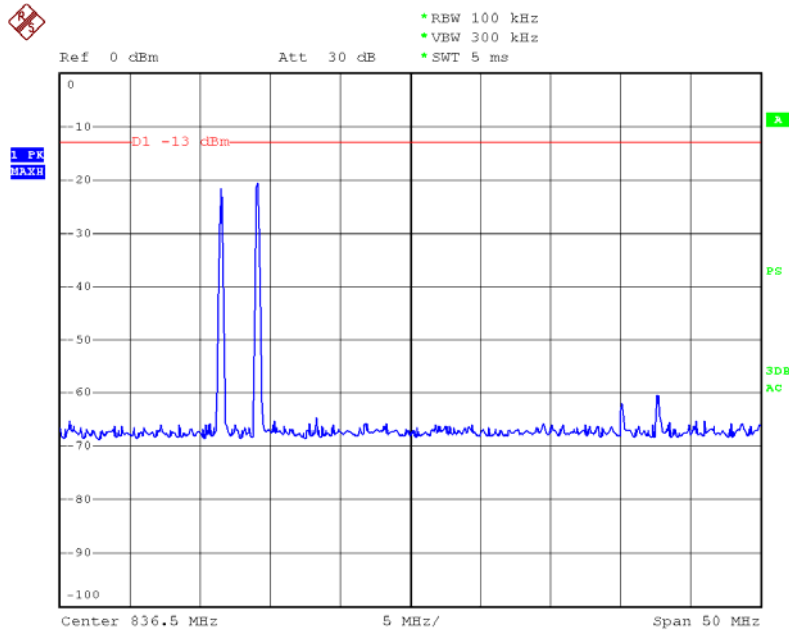
850MHz-EDGE down link-Lower Edge



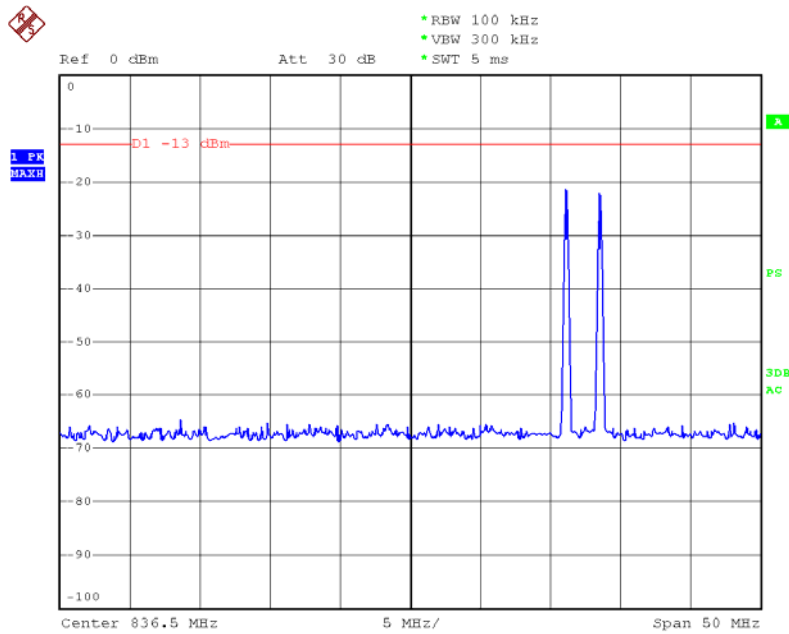
850MHz-EDGE down link-Upper Edge



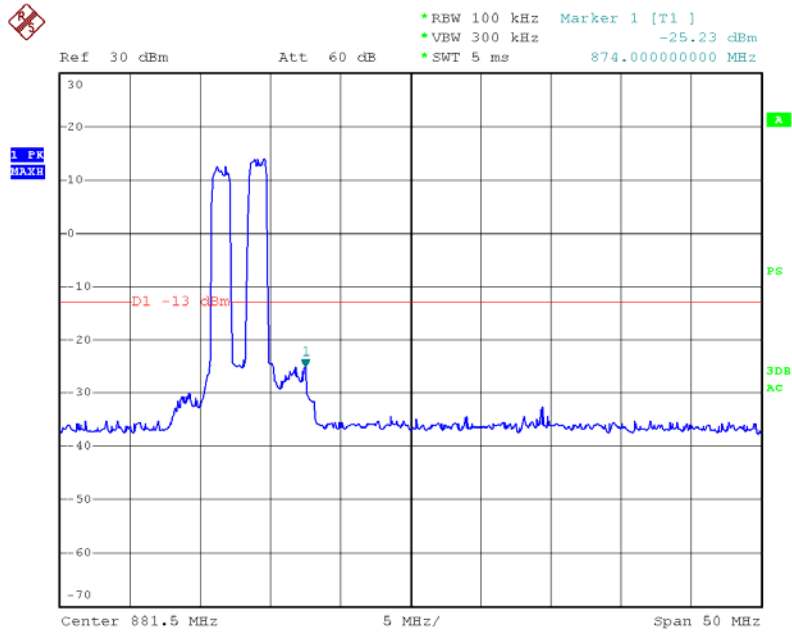
850MHz-EDGE up link-Lower Edge



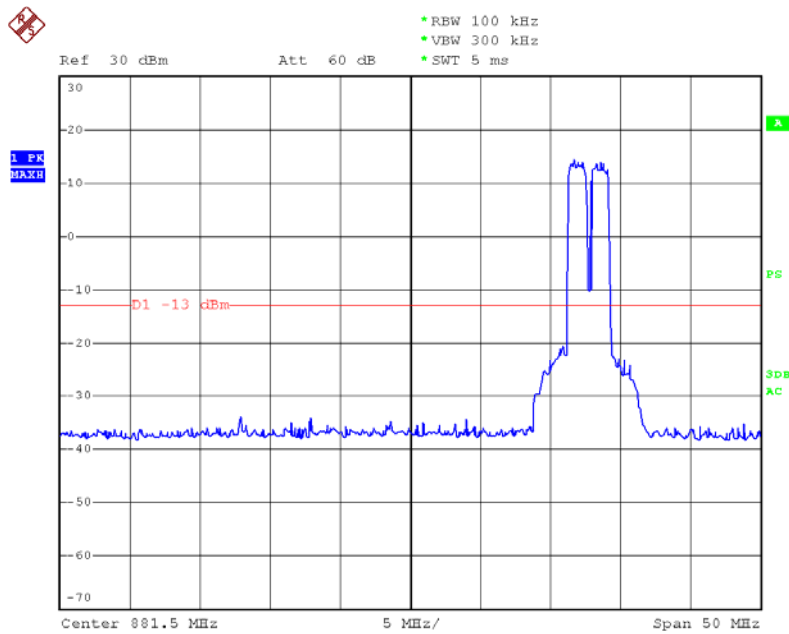
850MHz-EDGE up link-Upper Edge



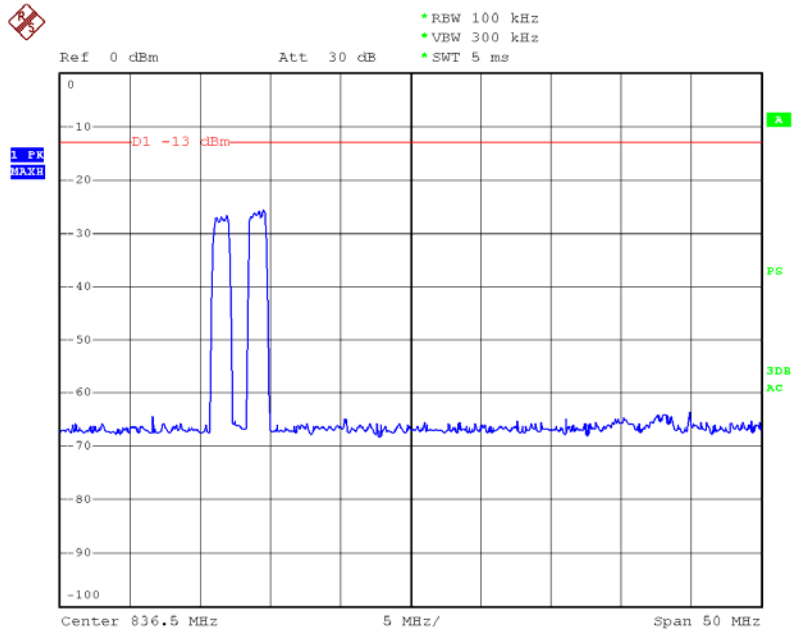
850MHz-CDMA2000 down link-Lower Edge



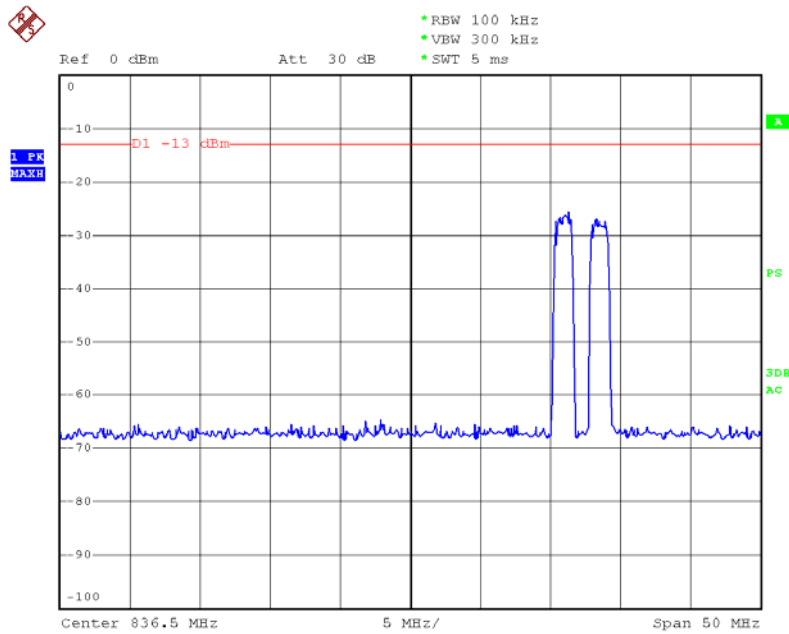
850MHz-CDMA2000 down link-Upper Edge



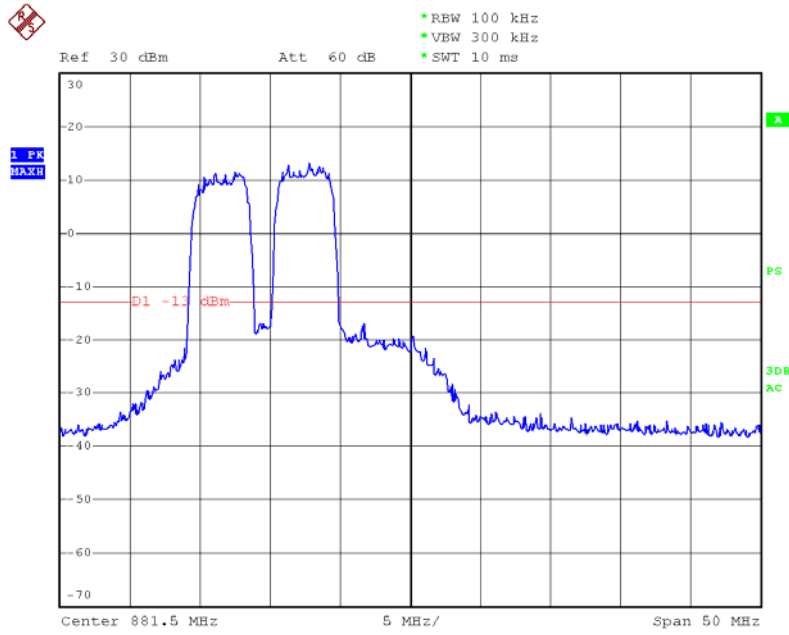
850MHz-CDMA2000 up link-Lower Edge



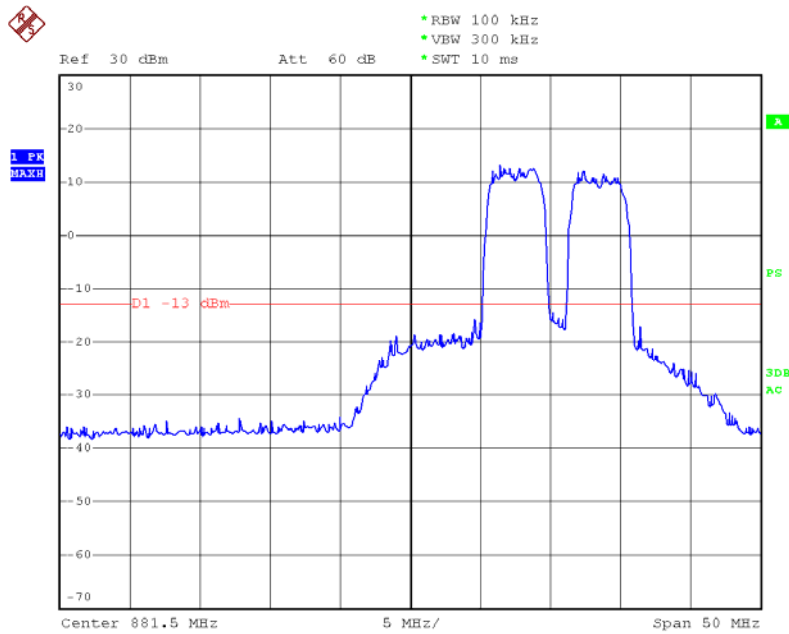
850MHz-CDMA2000 up link-Upper Edge



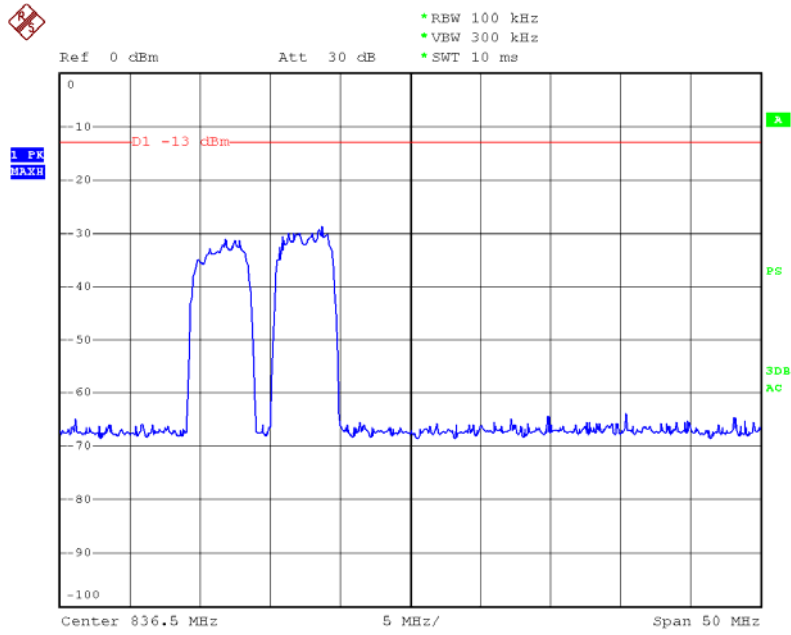
850MHz-WCDMA down link-Lower Edge



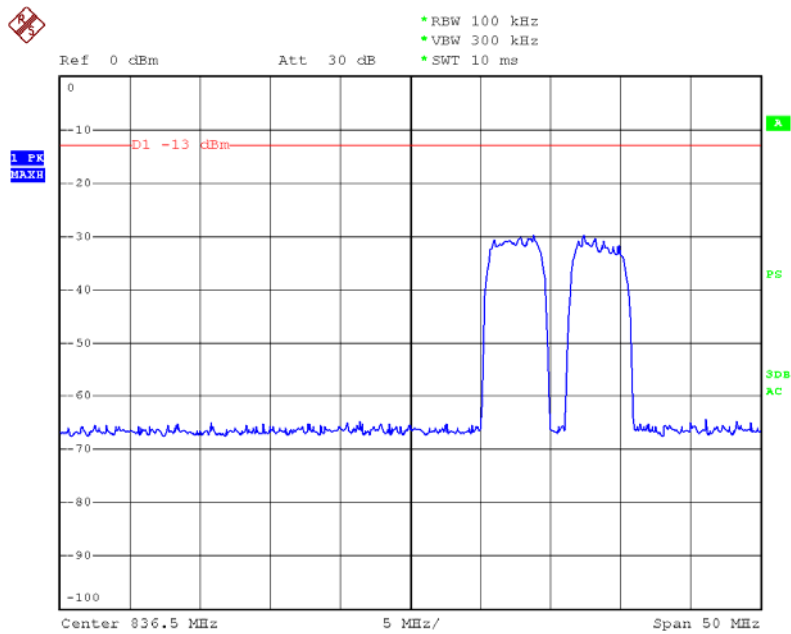
850MHz-WCDMA down link-Upper Edge



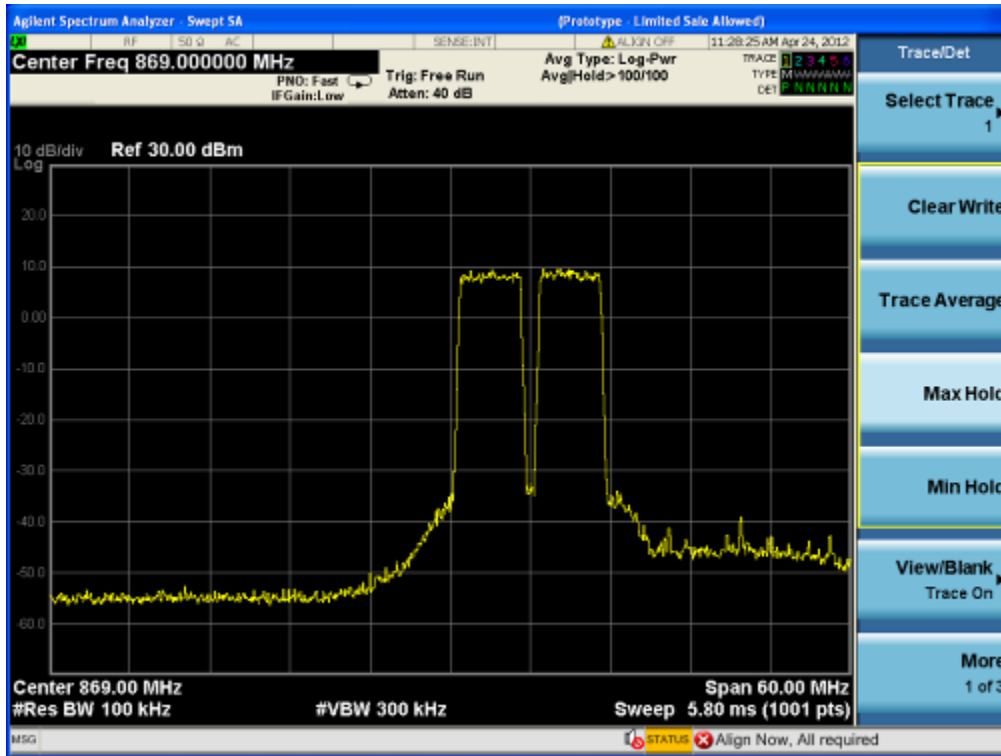
850MHz-WCDMA up link-Lower Edge



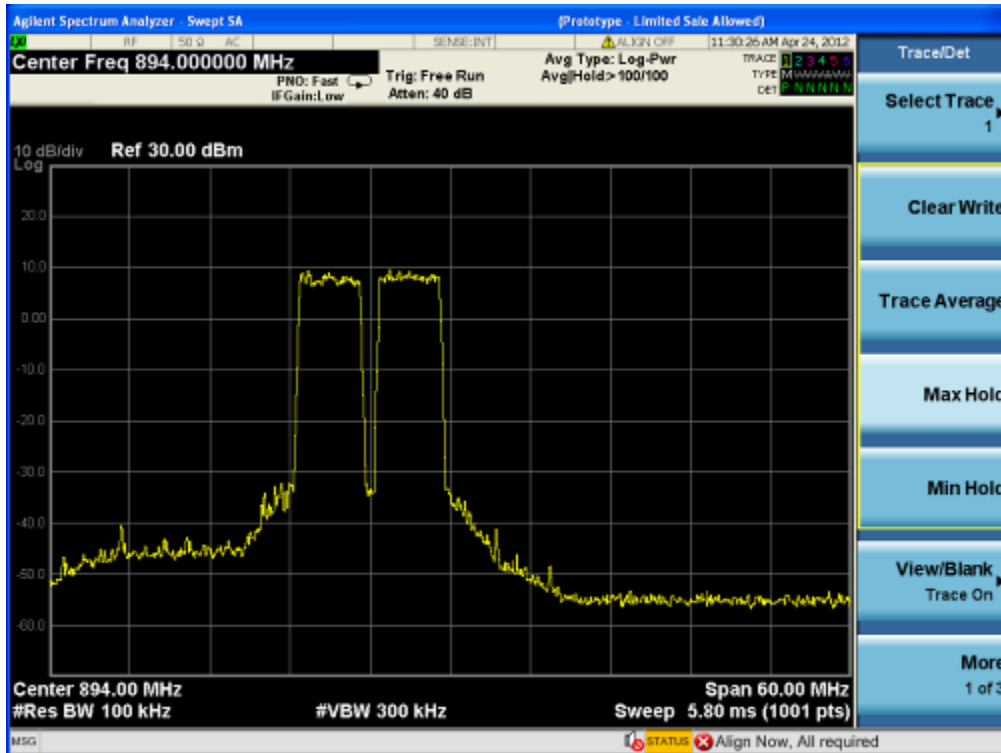
850MHz-WCDMA up link-Upper Edge



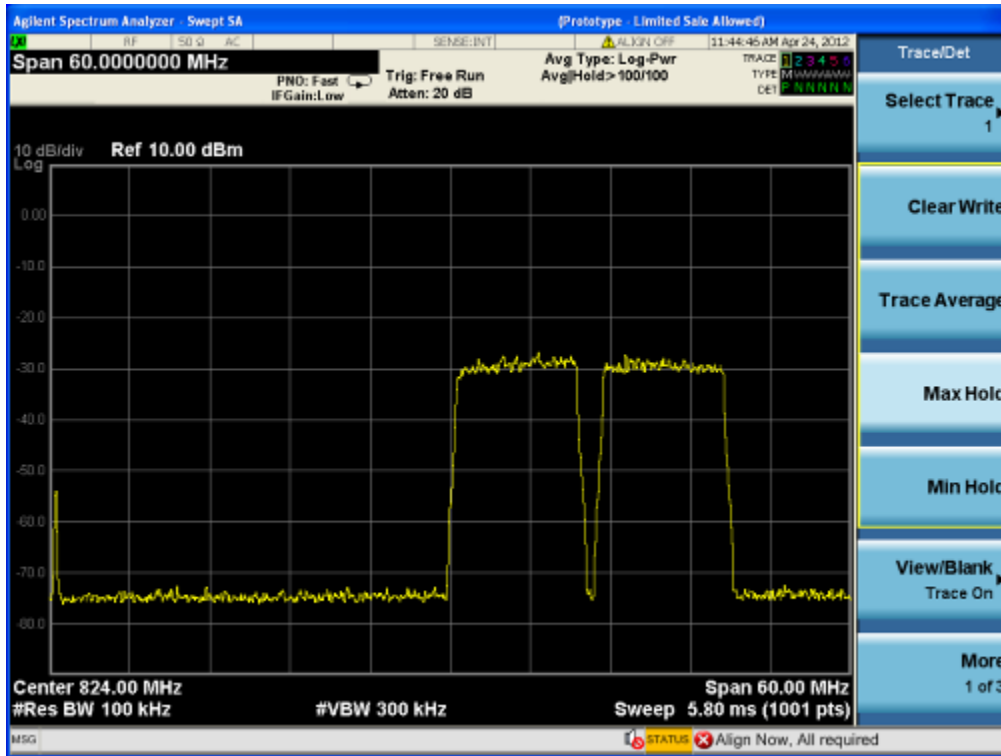
850MHz-LTE-QPSK down link-Lower Edge



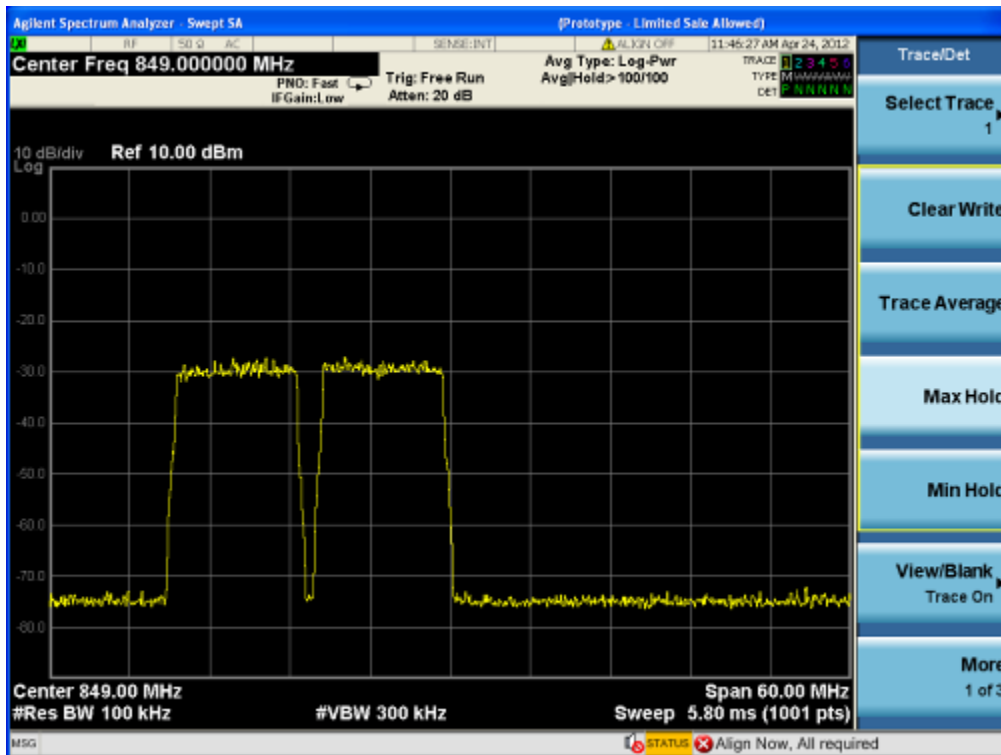
850MHz-LTE-QPSK down link-Upper Edge



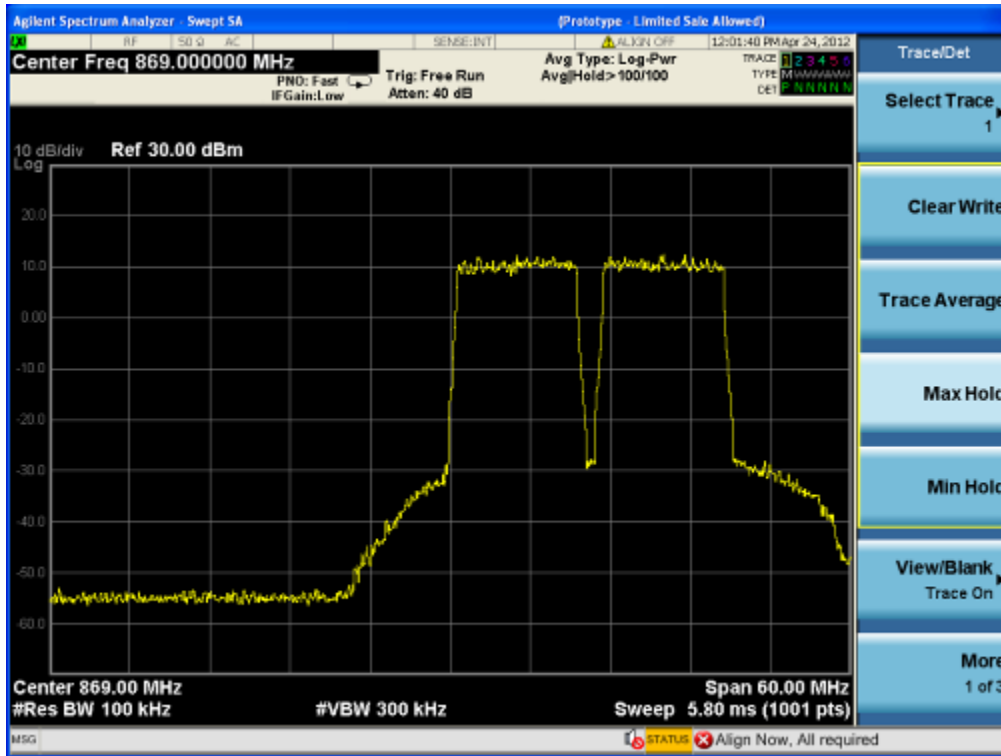
850MHz-LTE-QPSK up link-Lower Edge



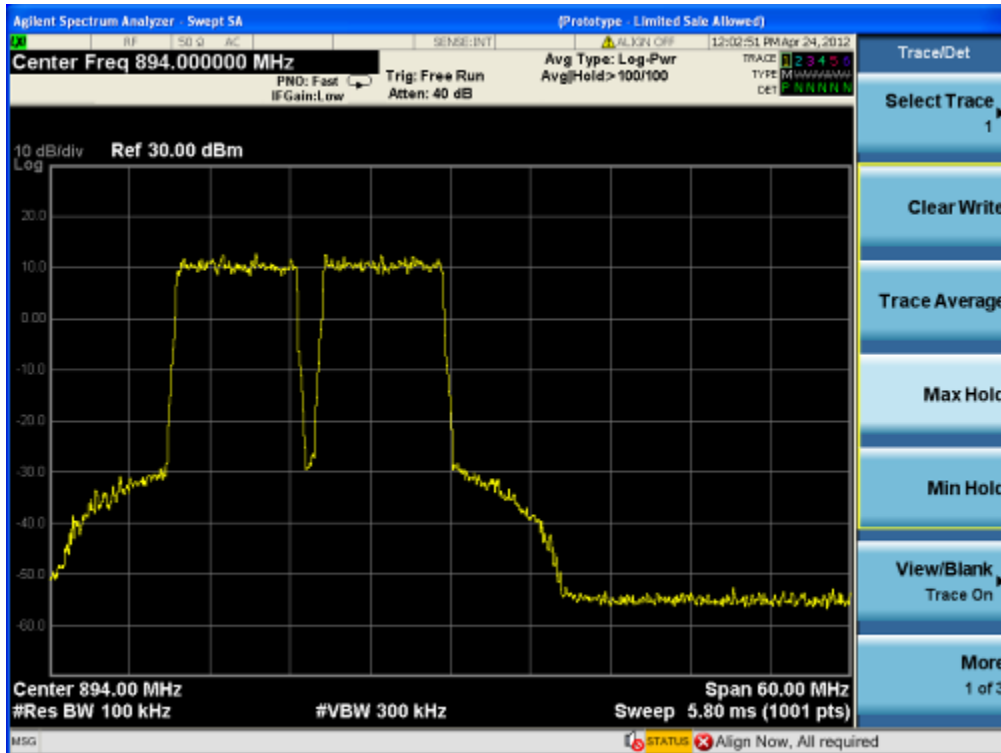
850MHz-LTE-QPSK up link-Upper Edge



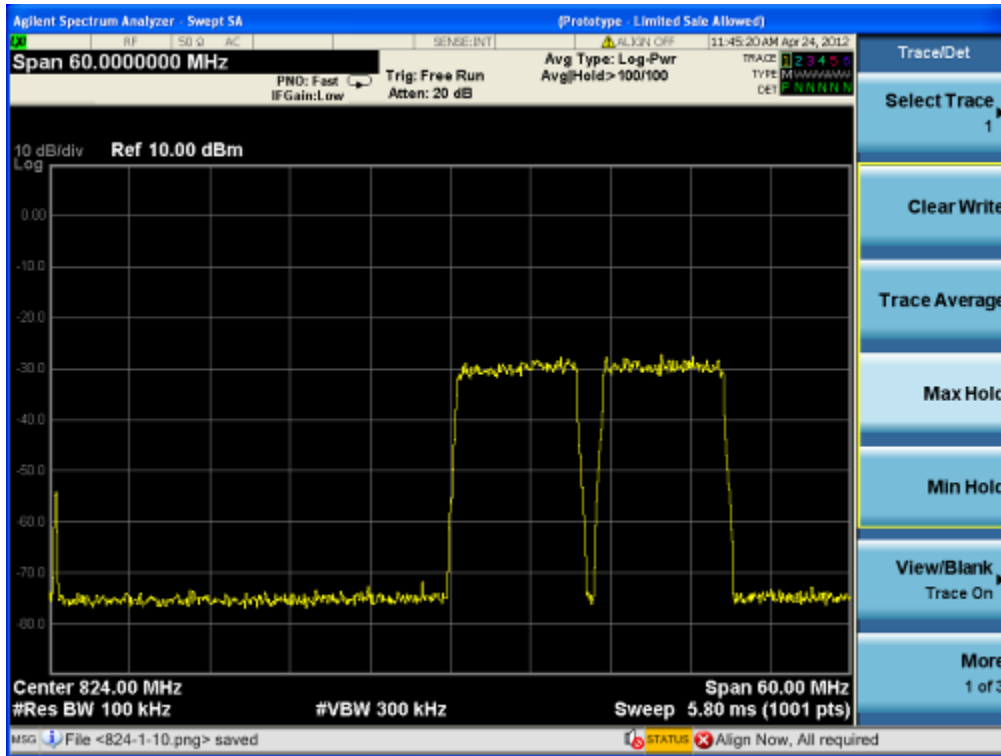
850MHz-LTE-16QAM down link-Lower Edge



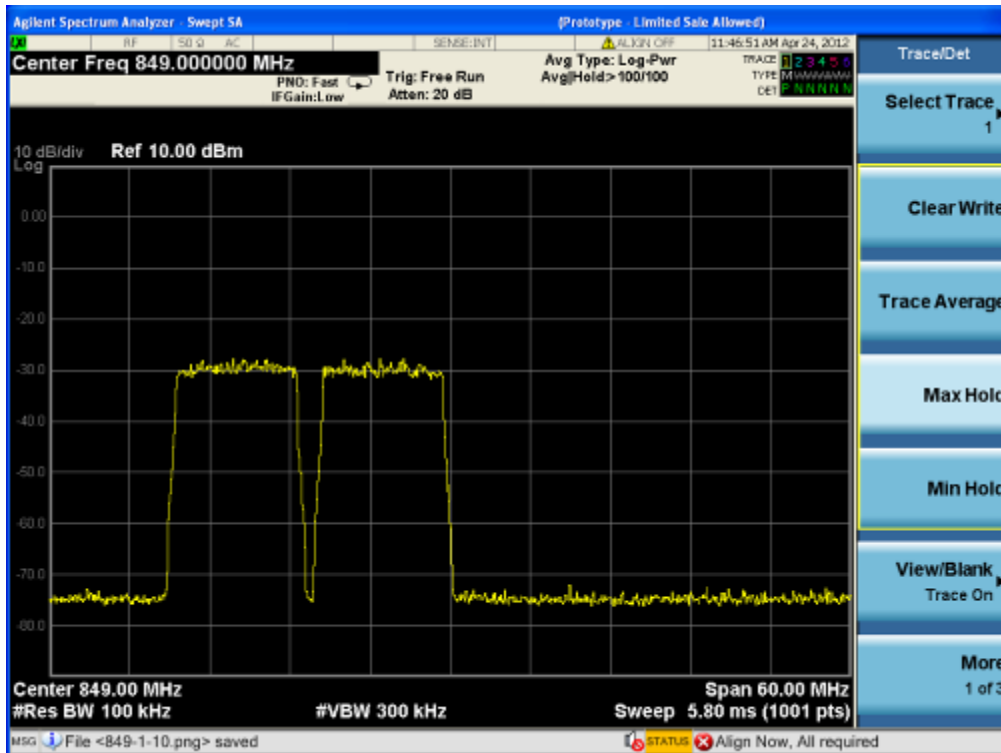
850MHz-LTE-16QAM down link-Upper Edge



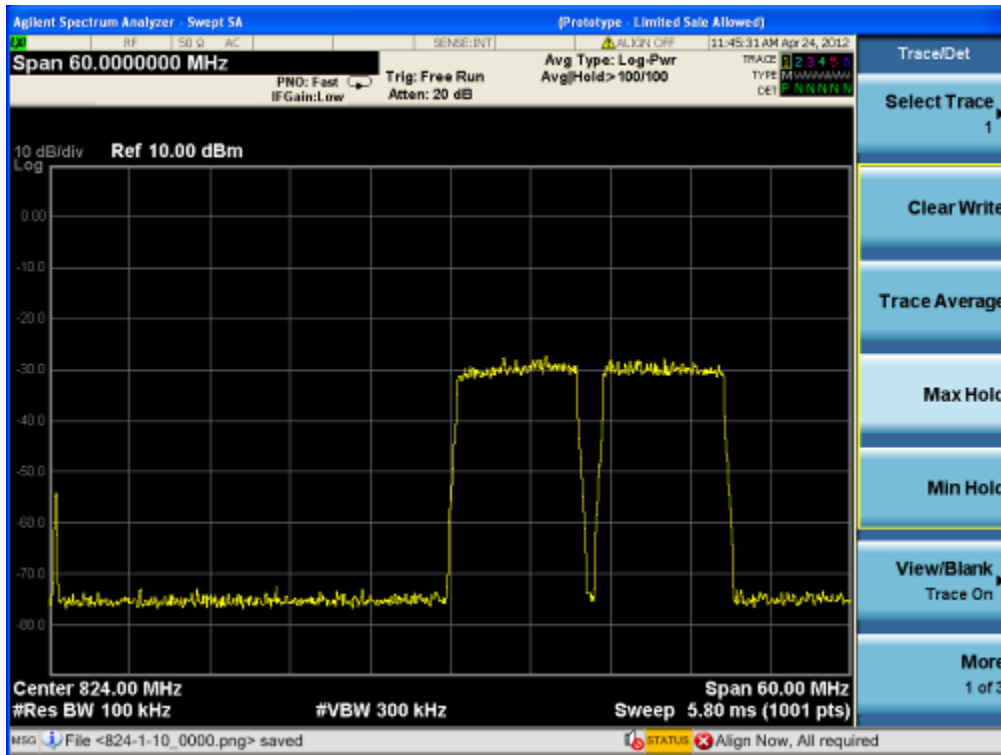
850MHz-LTE-16QAM up link-Lower Edge



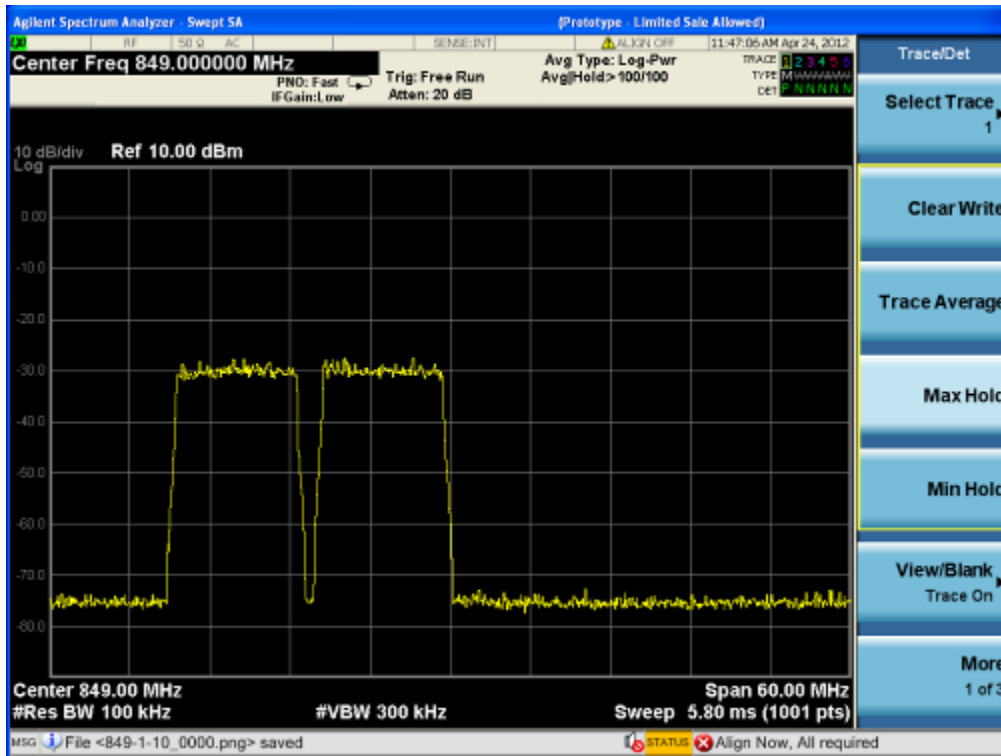
850MHz-LTE-16QAM up link-Upper Edge



850MHz-LTE-64QAM up link-Lower Edge

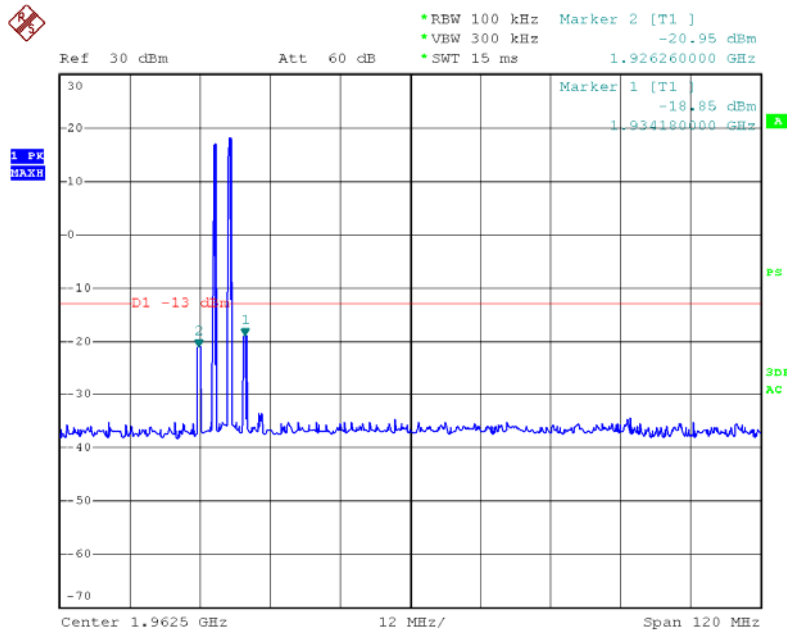


850MHz-LTE-64QAM up link-Upper Edge

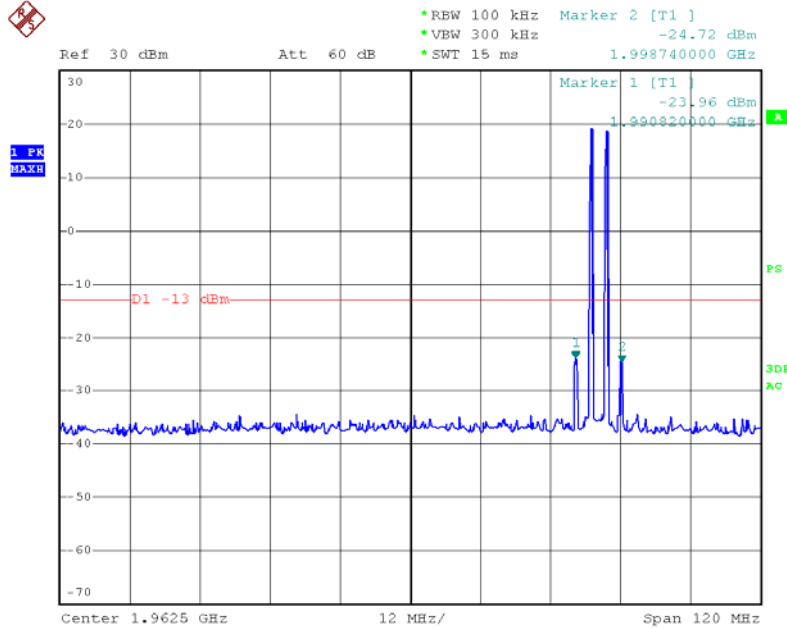


1900MHz

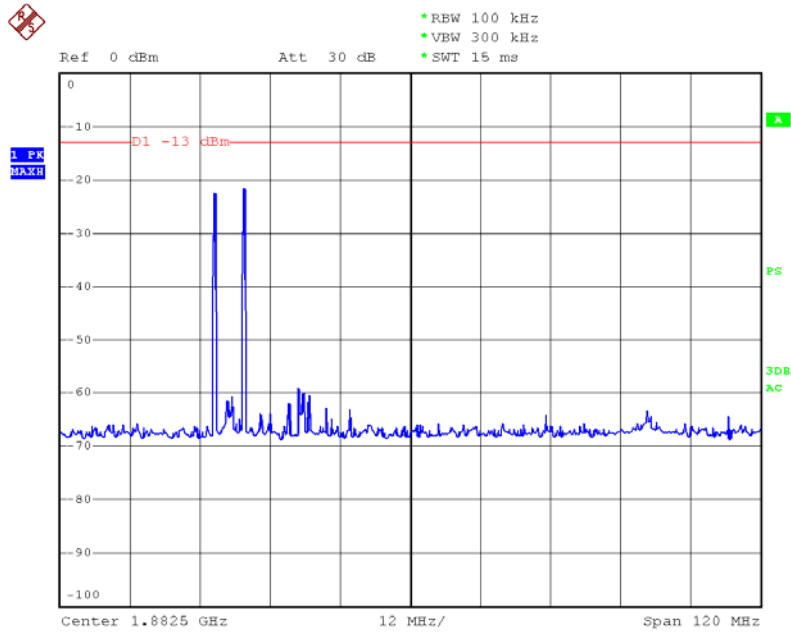
1900MHz-GSM down link-Lower Edge



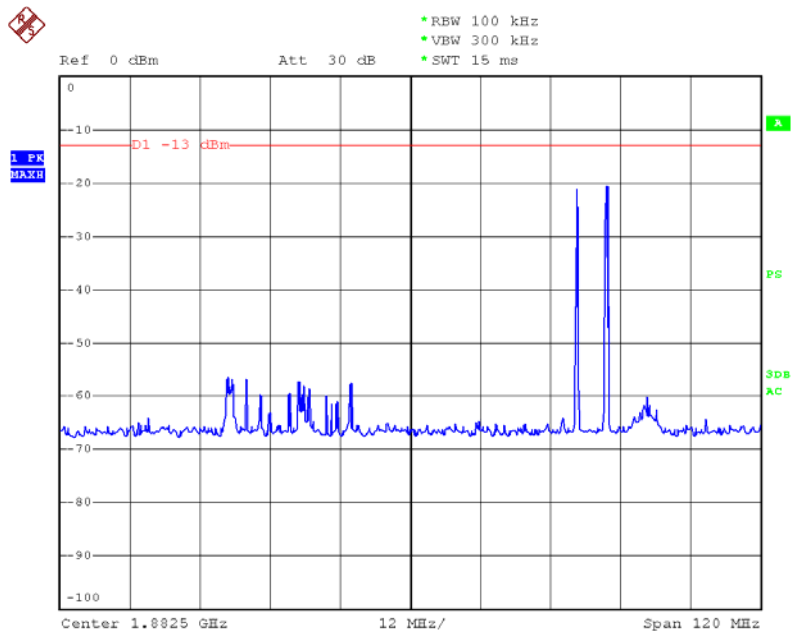
1900MHz-GSM down link-Upper Edge



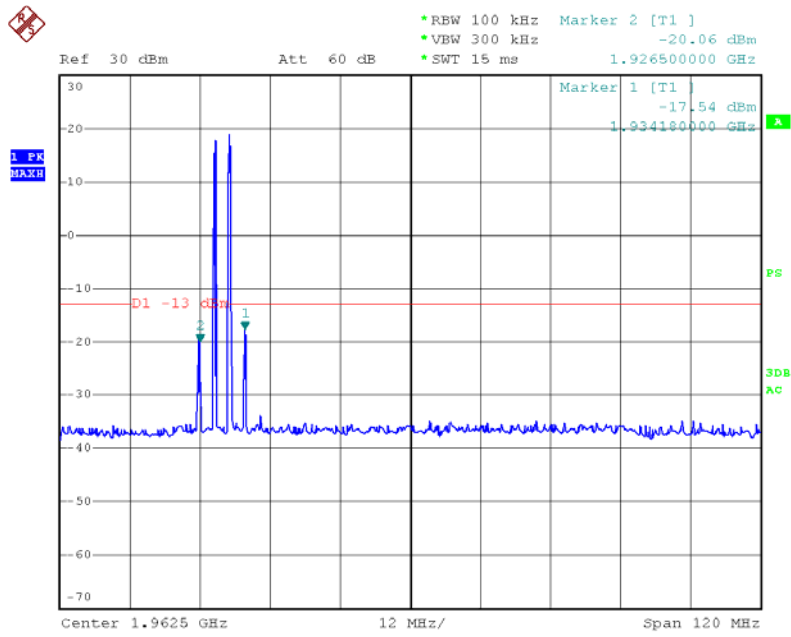
1900MHz-GSM up link-Lower Edge



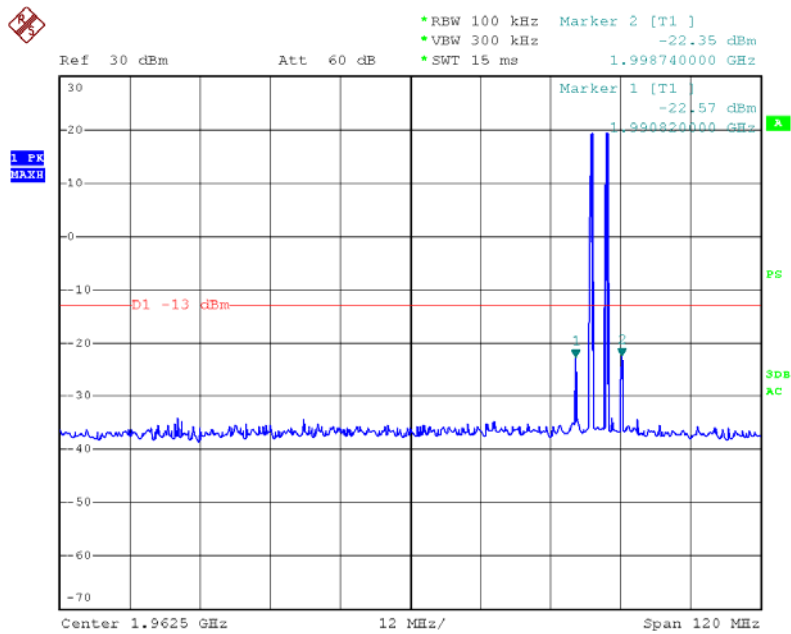
1900MHz-GSM up link-Upper Edge



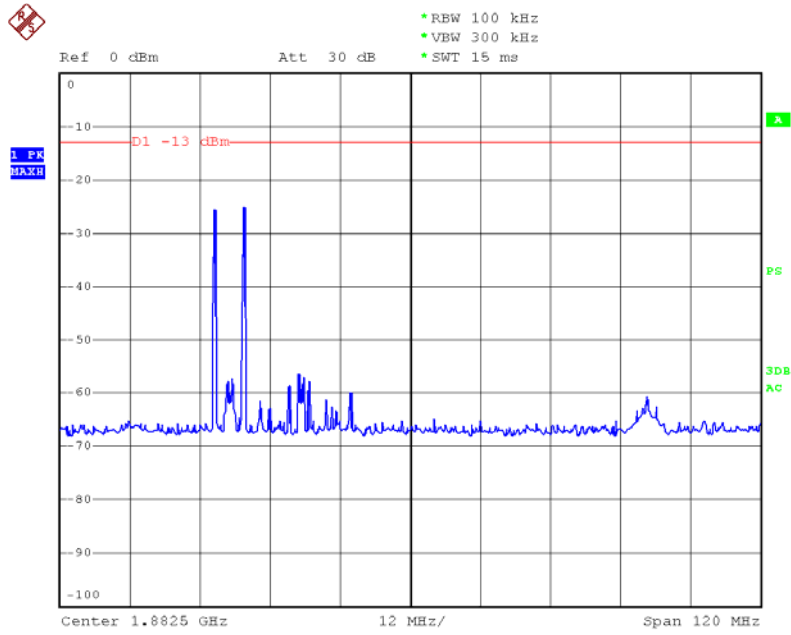
1900MHz-EDGE down link-Lower Edge



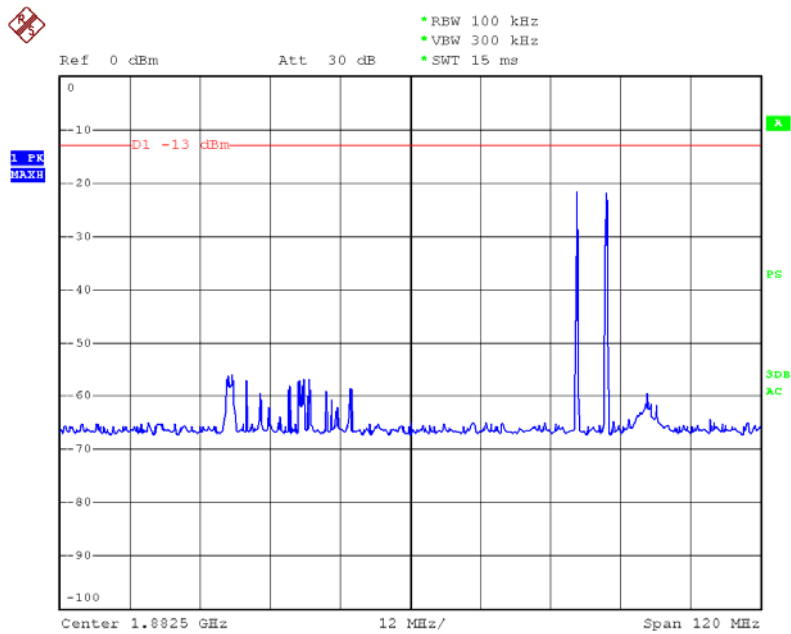
1900MHz-EDGE down link-Upper Edge



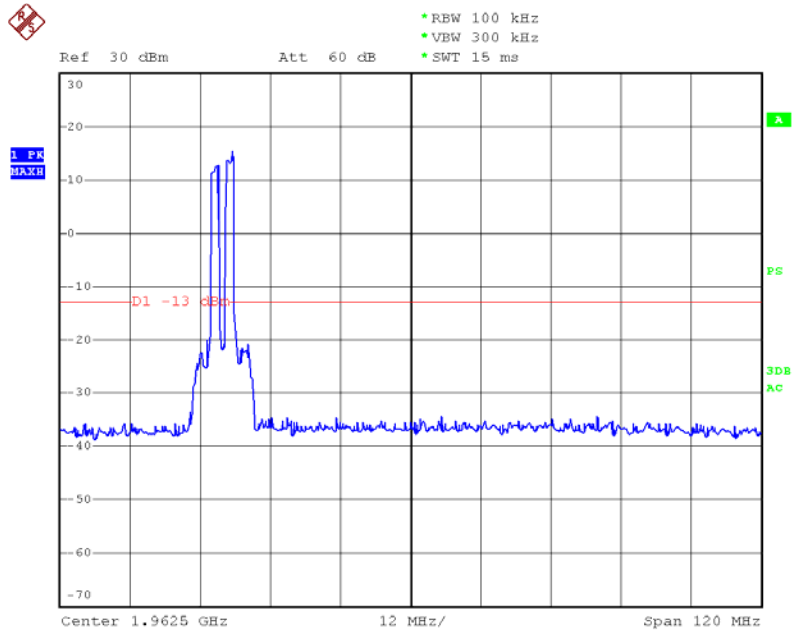
1900MHz-EDGE up link-Lower Edge



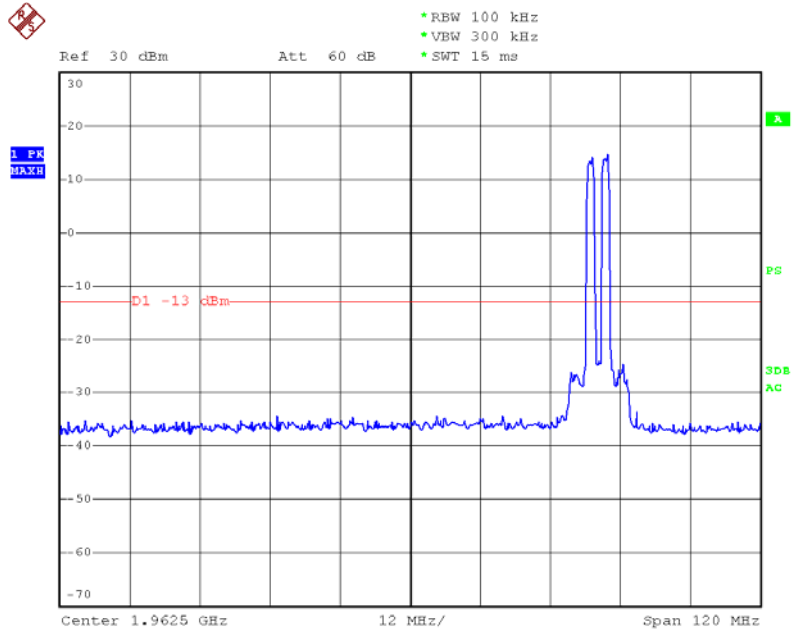
1900MHz-EDGE up link-Upper Edge



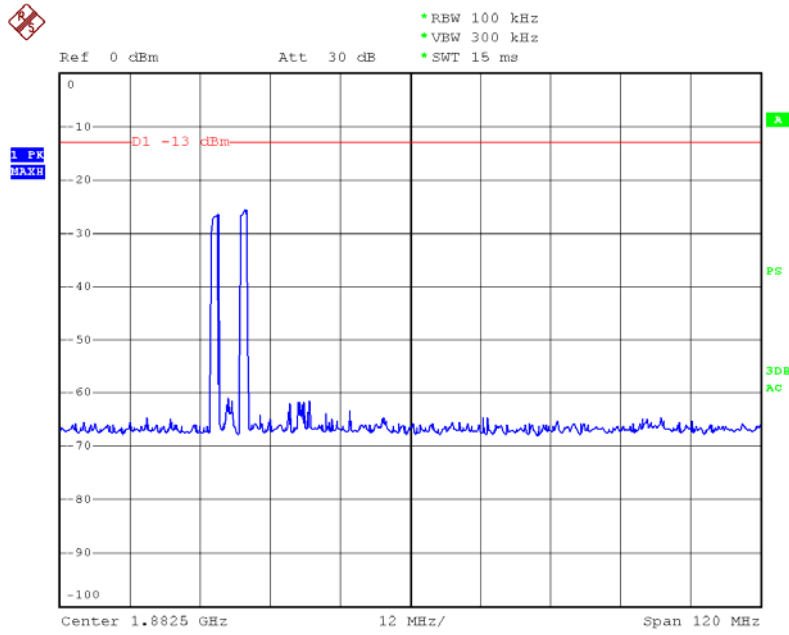
1900MHz-CDMA2000 down link-Lower Edge



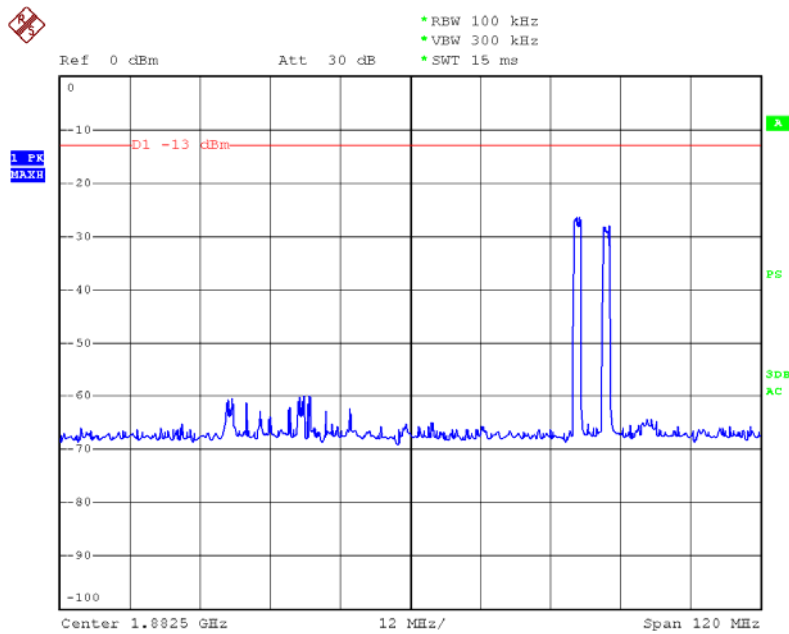
1900MHz-CDMA2000 down link-Upper Edge



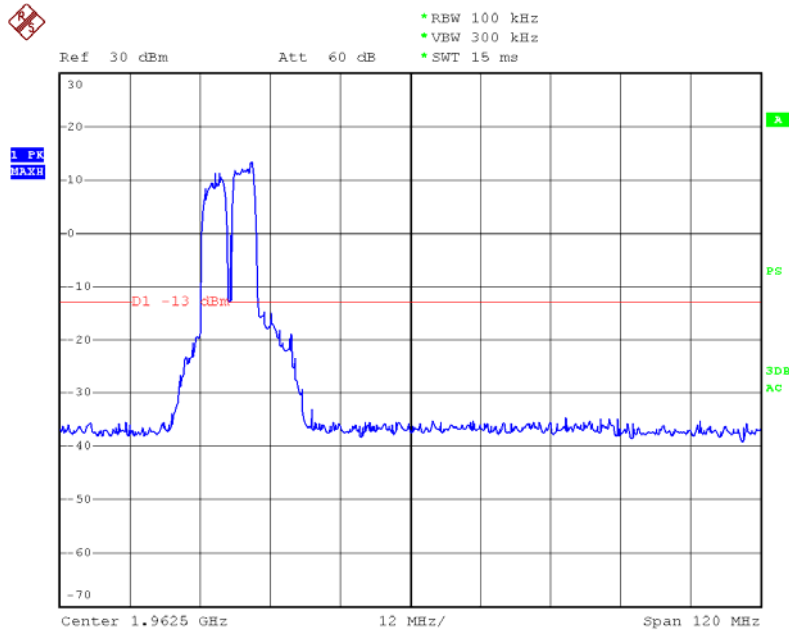
1900MHz-CDMA2000 up link-Lower Edge



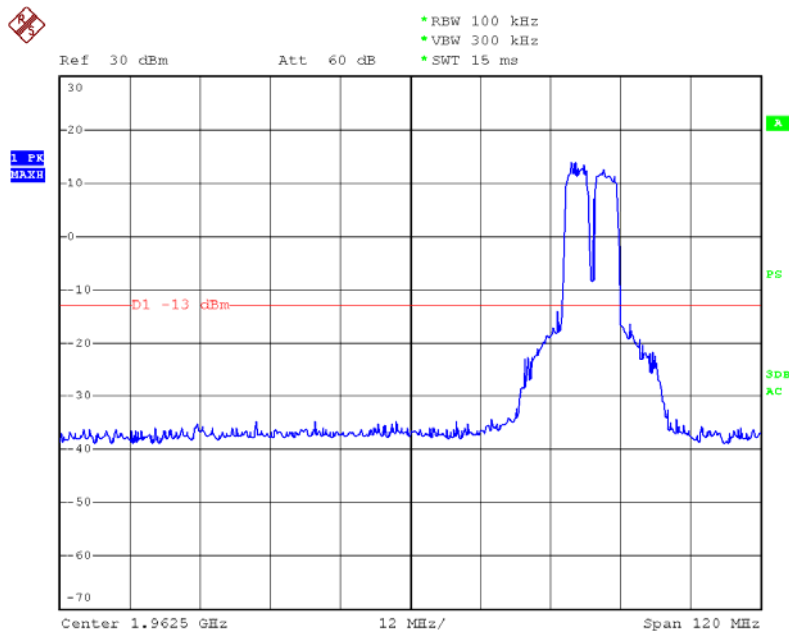
1900MHz-CDMA2000 up link-Upper Edge



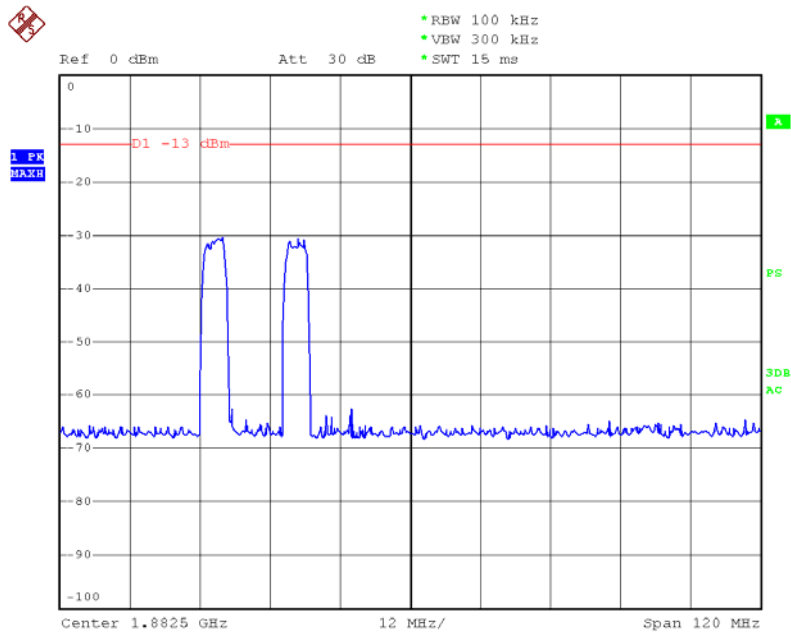
1900MHz-WCDMA down link-Lower Edge



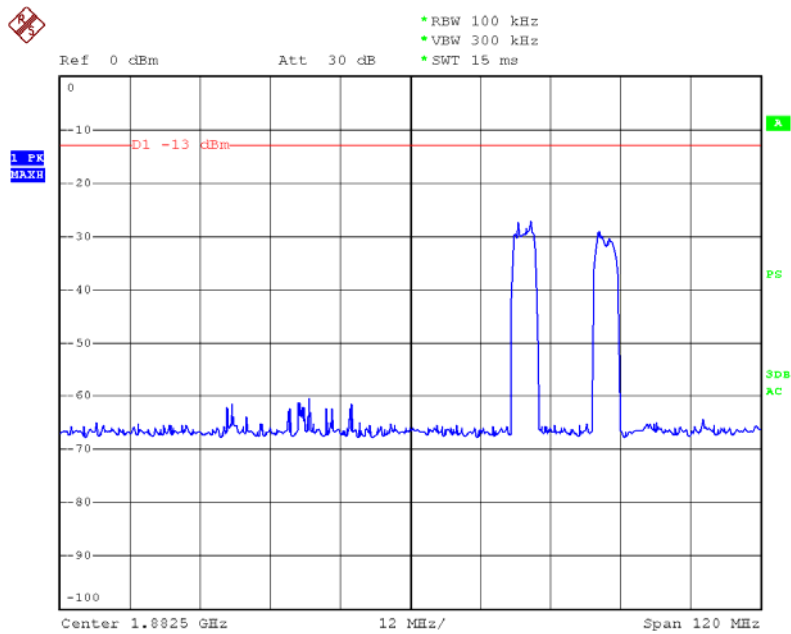
1900MHz-WCDMA down link-Upper Edge



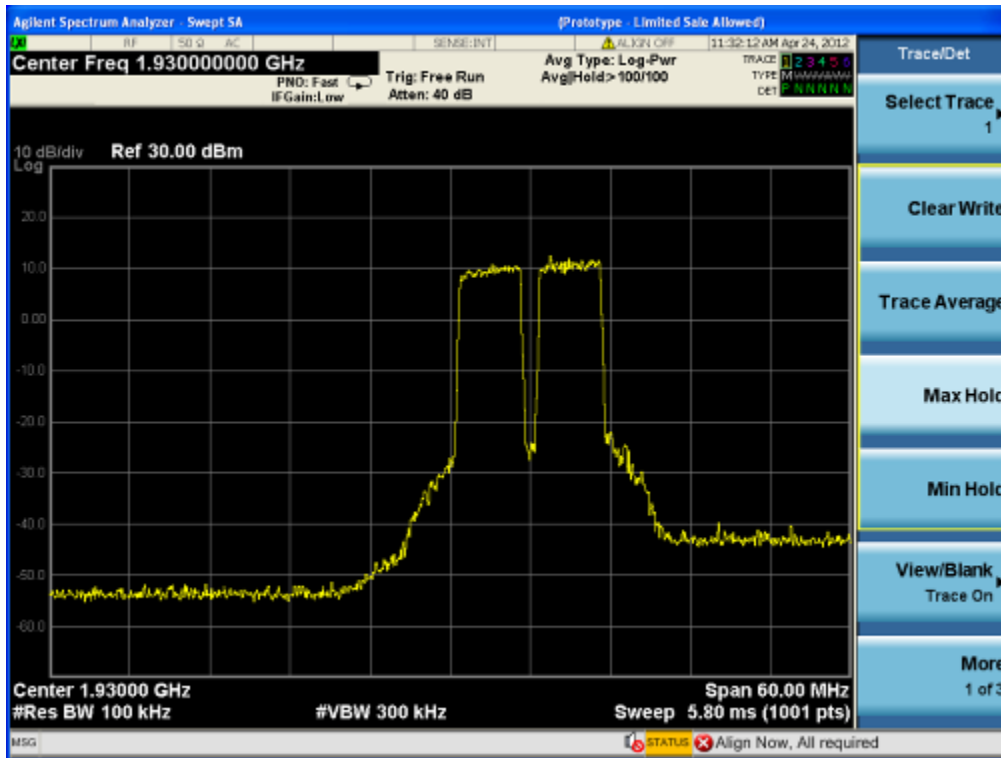
1900MHz-WCDMA up link-Lower Edge



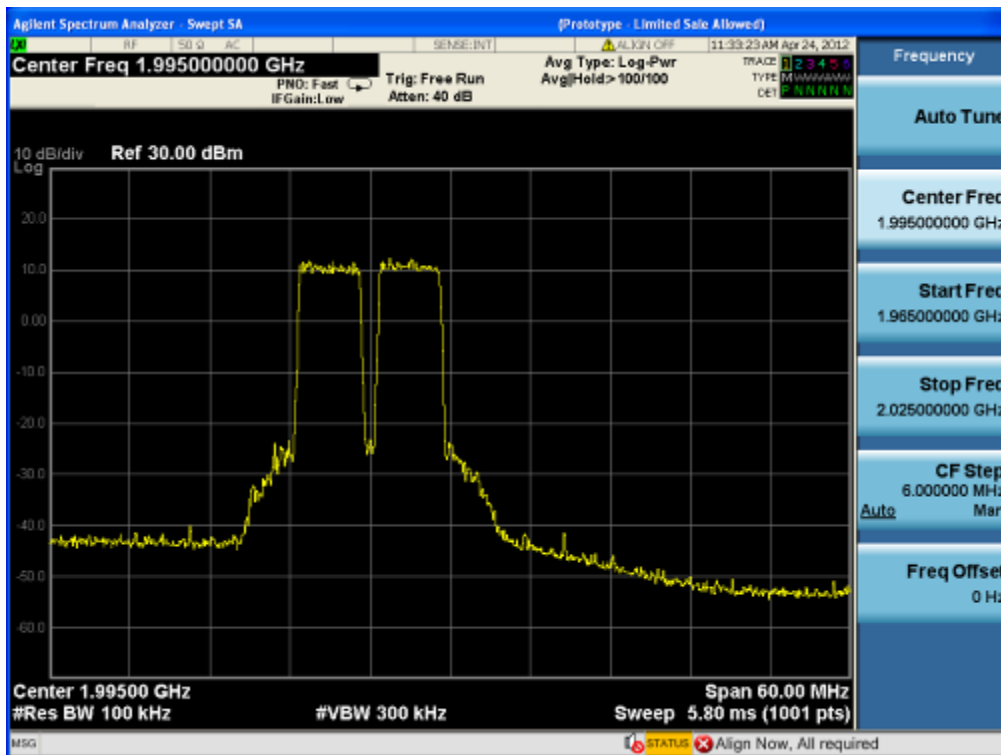
1900MHz-WCDMA up link-Upper Edge



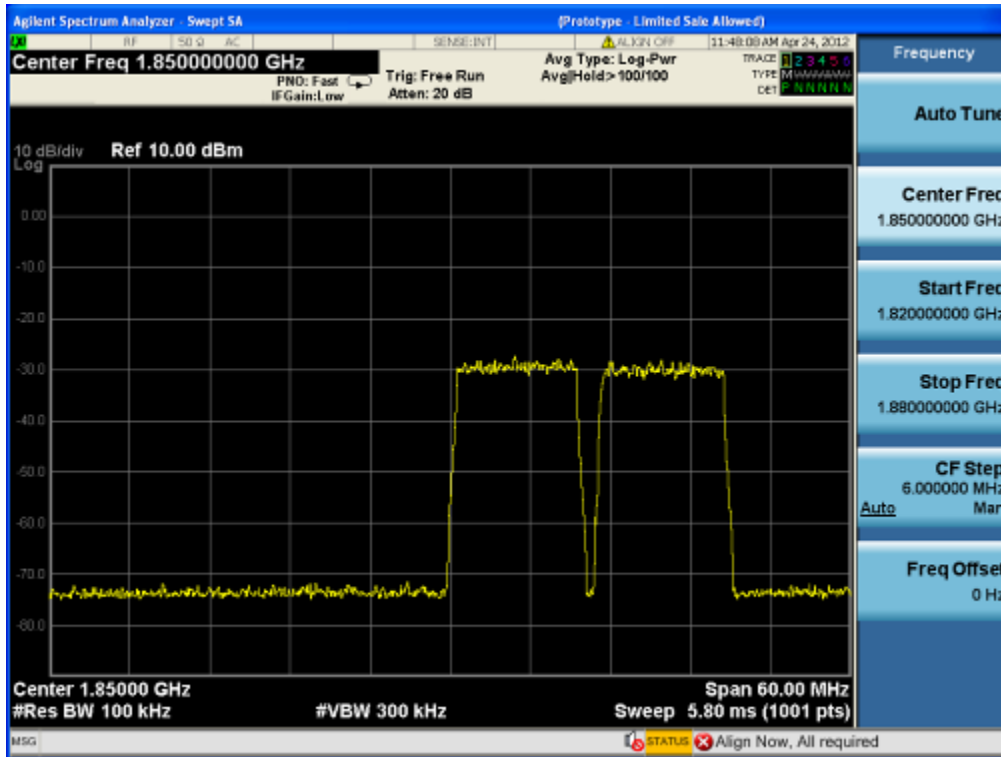
190MHz-LTE-QPSK down link-Lower Edge



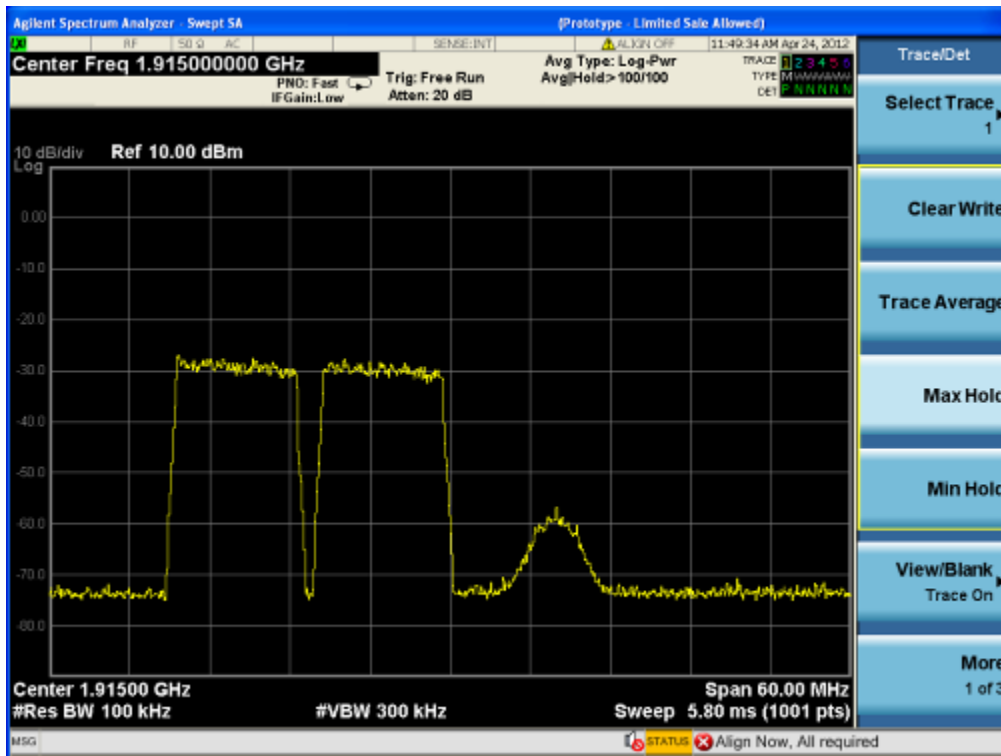
1900MHz-LTE-QPSK down link-Upper Edge



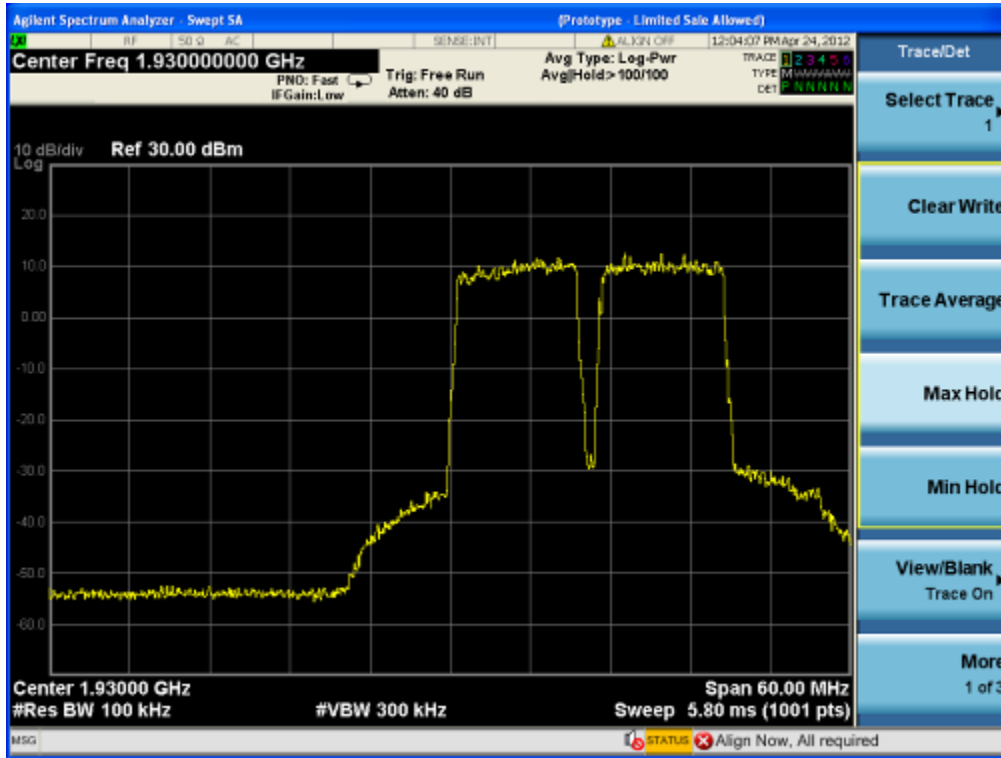
1900MHz-LTE-QPSK up link-Lower Edge



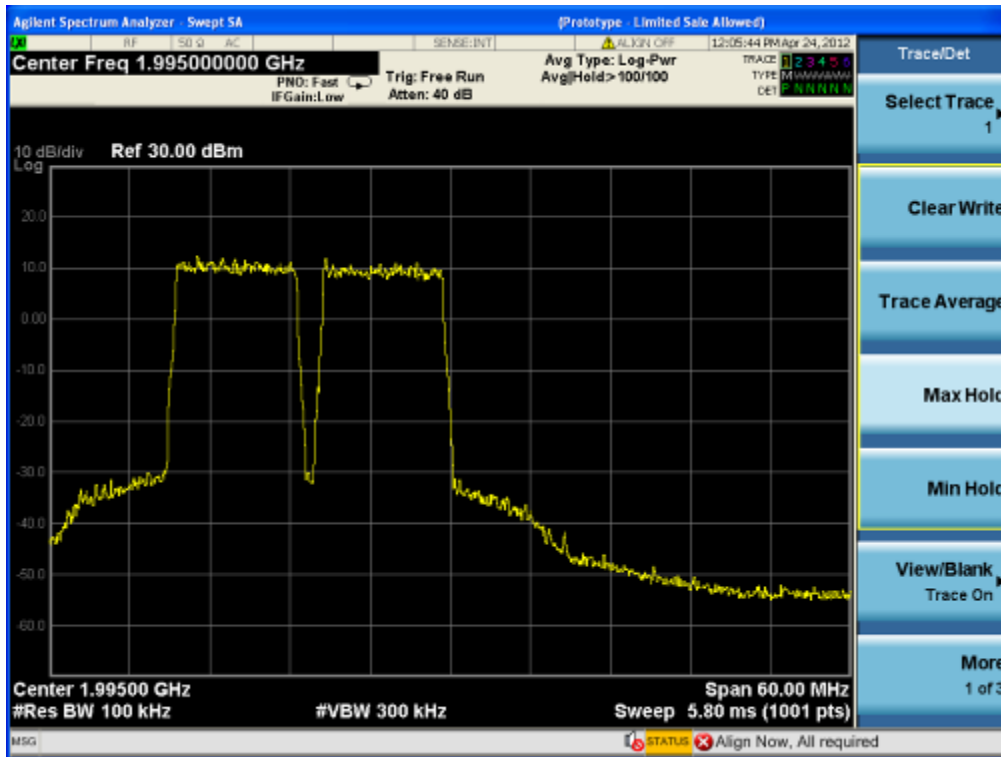
1900MHz-LTE-QPSK up link-Upper Edge



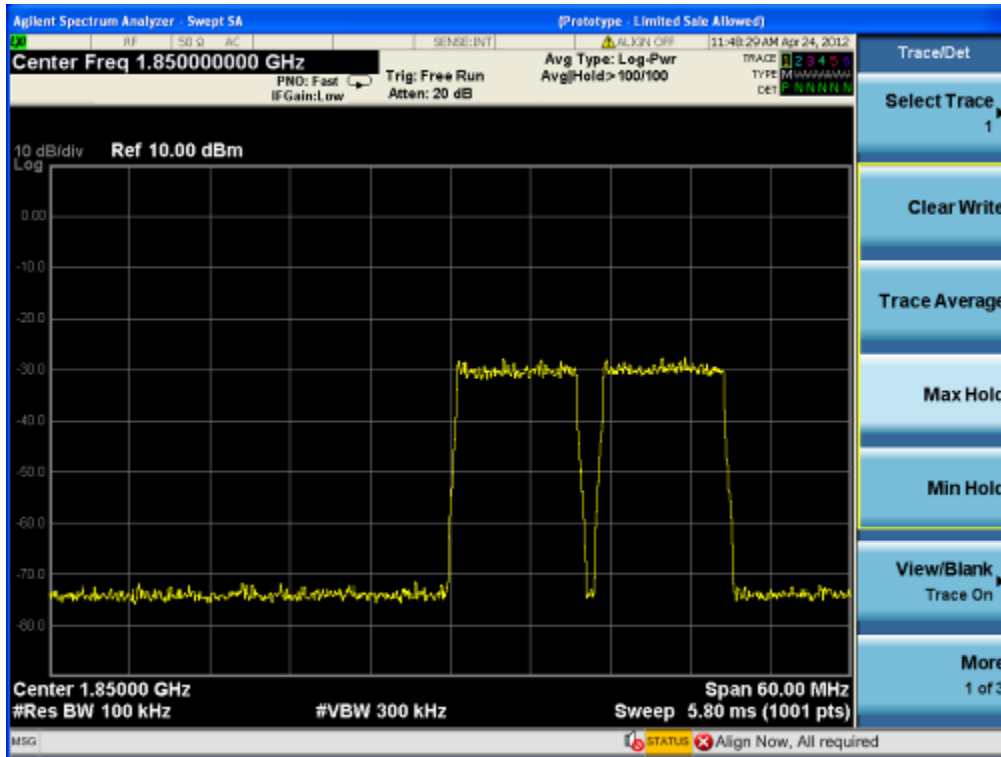
1900MHz-LTE-16QAM down link-Lower Edge



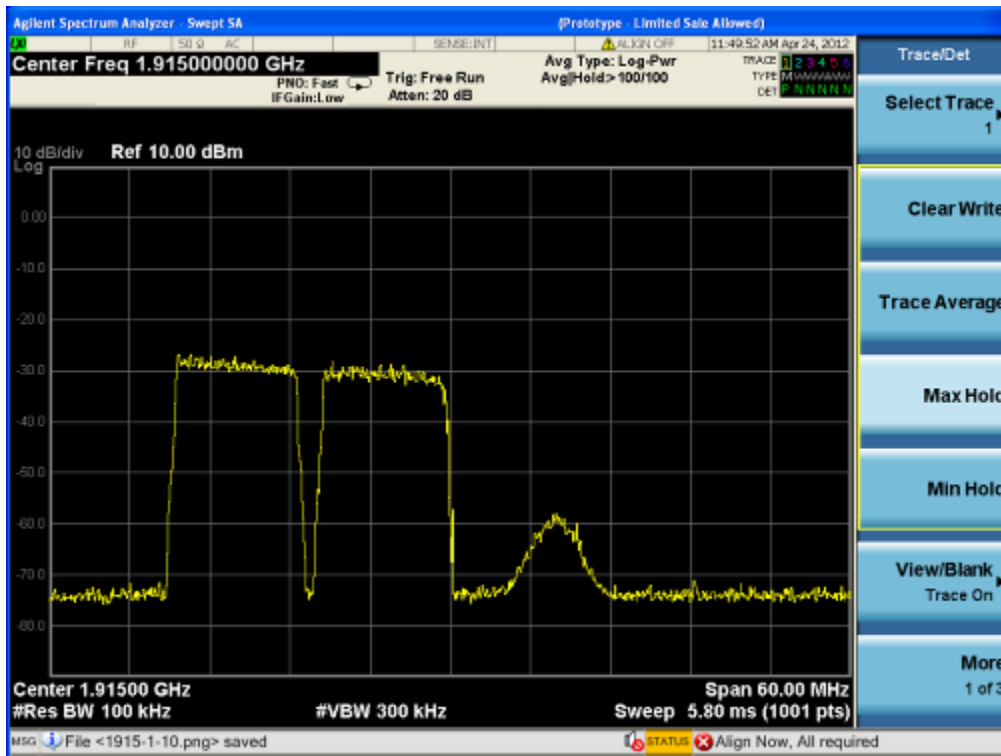
1900MHz-LTE-16QAM down link-Upper Edge



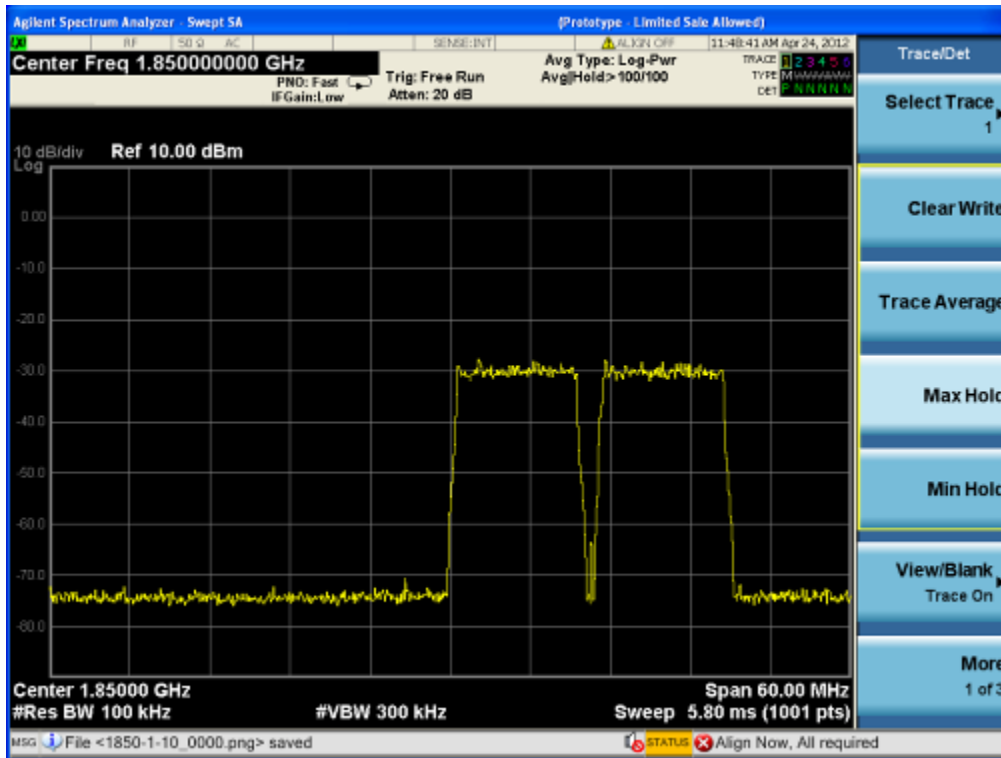
1900MHz-LTE-16QAM up link-Lower Edge



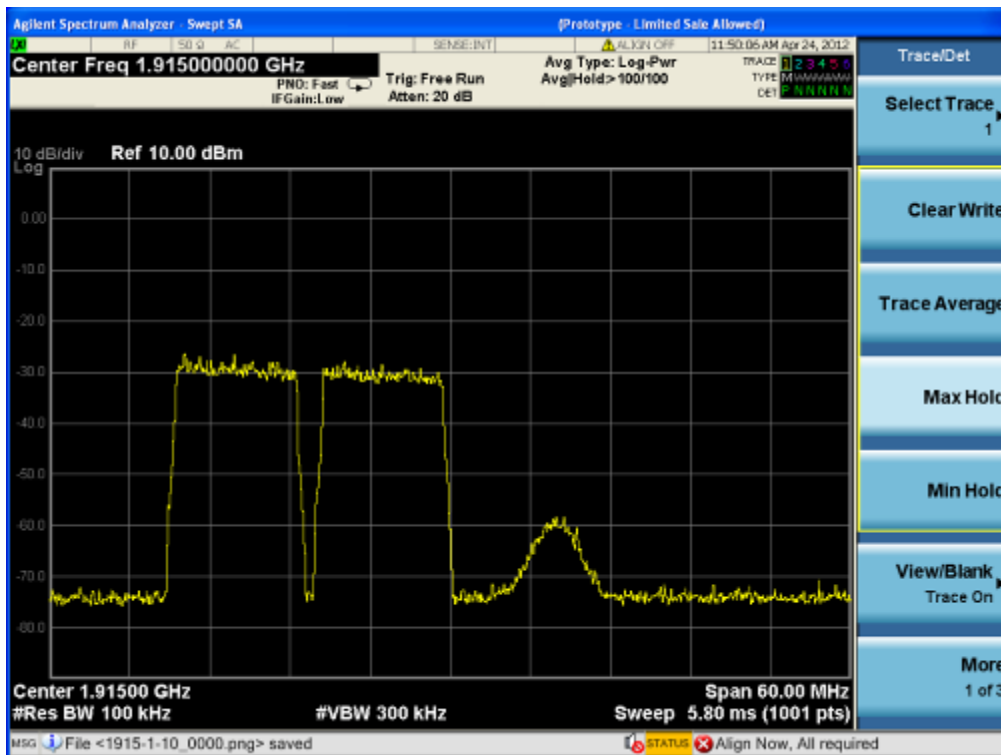
1900MHz-LTE-16QAM up link-Upper Edge



1900MHz-LTE-64QAM up link-Lower Edge



1900MHz-LTE-64QAM up link-Upper Edge



Remark:

For the test in two signal input or intermodulation, test input signal f_1 and f_2 will consider as follows conditions:

7) EUT frequency band span and the amount of channels;

8) f_1 is the frequency lower, f_2 is the frequency higher, f is the channel spacing;

9) in lower edge test, f_1 is the lower frequency +1 channel frequency, and f_2 is +2 channel frequency;

10) in higher edge test, f_1 is the higher frequency -2 channel frequency, and f_2 is -1 channel frequency;

11) according to the amplifier characteristic, the 3rd product will appear when two signals input;

12) base the 3rd product frequency $F_1 = 2f_1 - f_2$, and $F_2 = 2f_2 - f_1$, when the f_1 and f_2 frequency select above,

a) in lower edge test, $F_1 = 2f_1 - (f_1 + f) = f_1 - f$, f = lower dege frequency;

b) in higher edge test, $F_2 = 2f_2 - (f_1 - f) = f_1 + f$, f = higher dege frequency

4.2.7 OUT OF BAND REJECTION

Test Date: 16 October, 2012
 Test Method: 2-11-04/EAB/RF

Test Requirement: 2-11-04/EAB/RF
 Test for rejection of out of band signals, Filter freq, response plots are acceptable

Specification The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block, The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency

Status The output power of EUT be set to maximum value, the gain of EUT be set to maximum value by software through the manufacture

Conditions Normal conditions

Application 700MHz DL and UL ports,
 850MHz DL and UL ports,
 1900MHz DL and UL ports

Test configuration

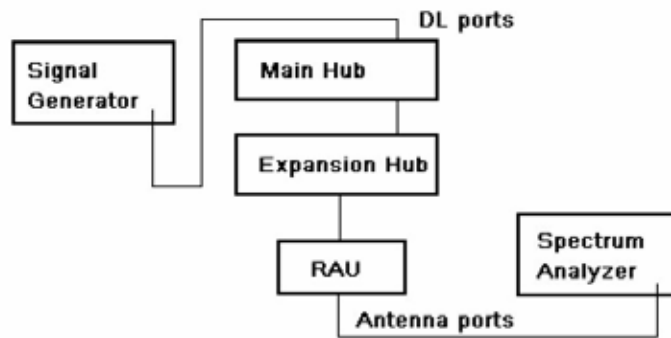


Fig.1 Down Link Configuration

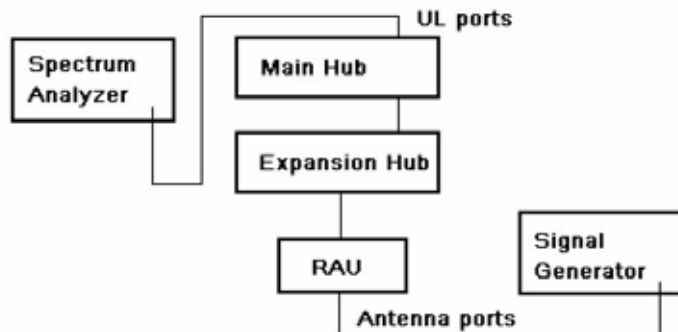


Fig.2 Up Link Configuration

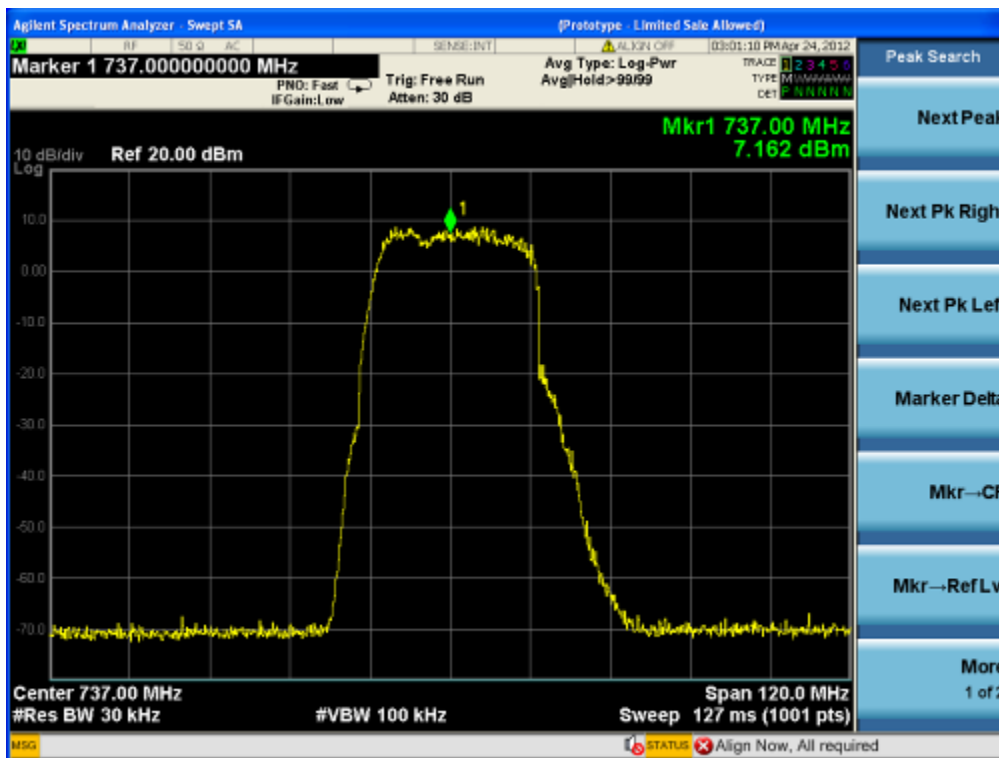
Test procedure

1. Connect the equipment as illustrated;
 2. Test the background noise level with all the test facilities;
 3. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads;
 4. Select the attenuator to avoid the test receiver or spectrum analyzer being destroyed ;
 5. Keep the EUT continuously transmitting in max power;
 6. Signal generator sweep from the frequency more lower than the product frequency to the frequency more higher than it, find the product band filter characteristic.
- CW signal rather than typical signal is acceptable (for FM)
Multiple band filter will need test each other

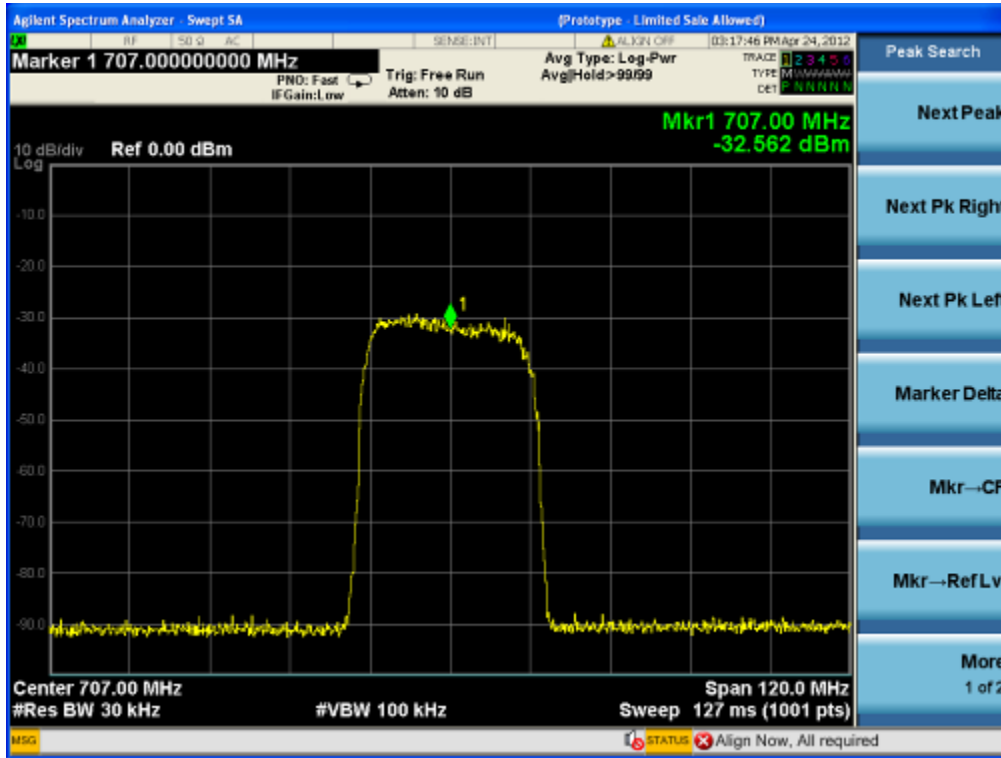
4.2.7.1 MEASUREMENT RECORD

700MHz Band

700MHz-down link

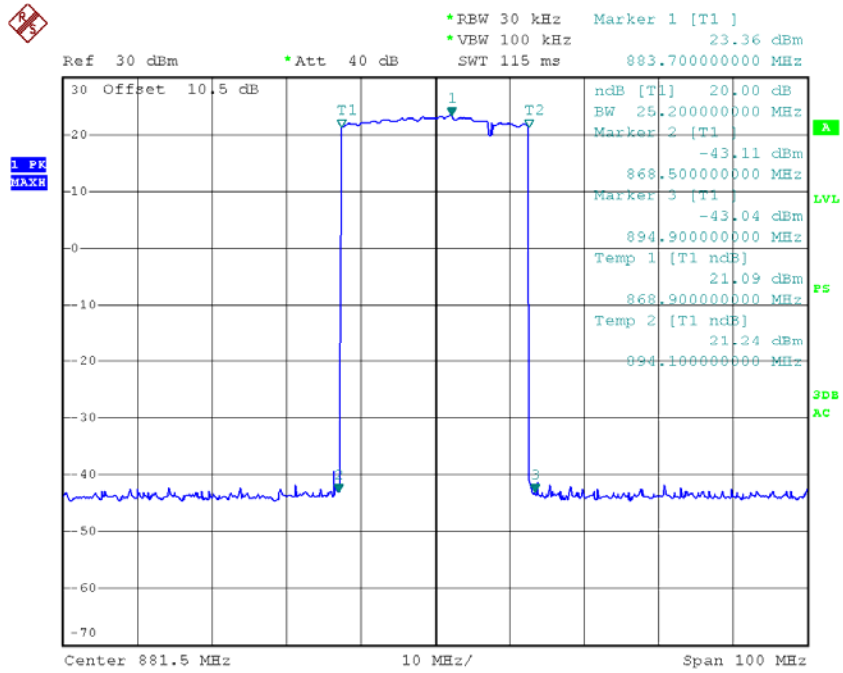


700MHz-up link

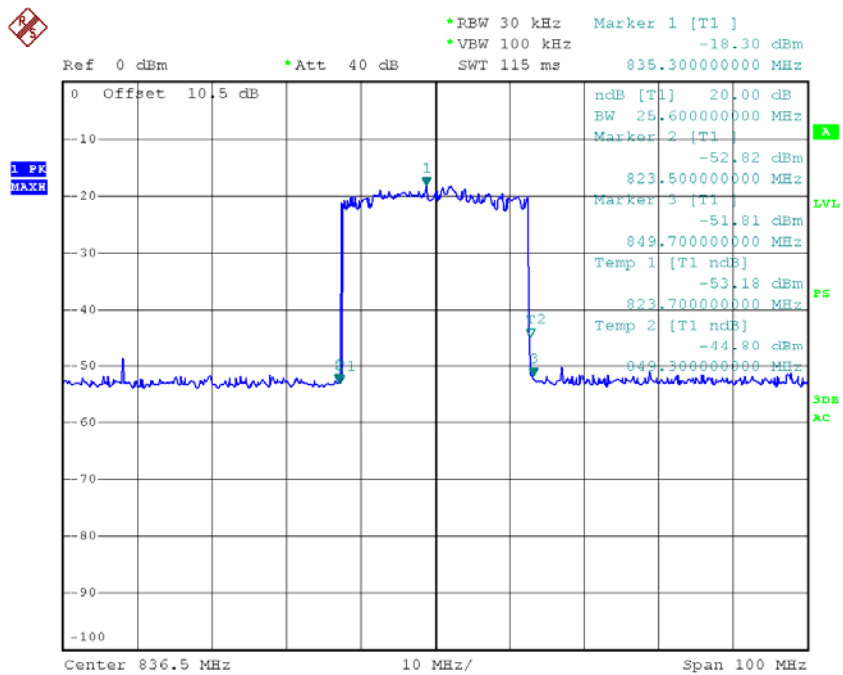


850MHz Band

850MHz-down link

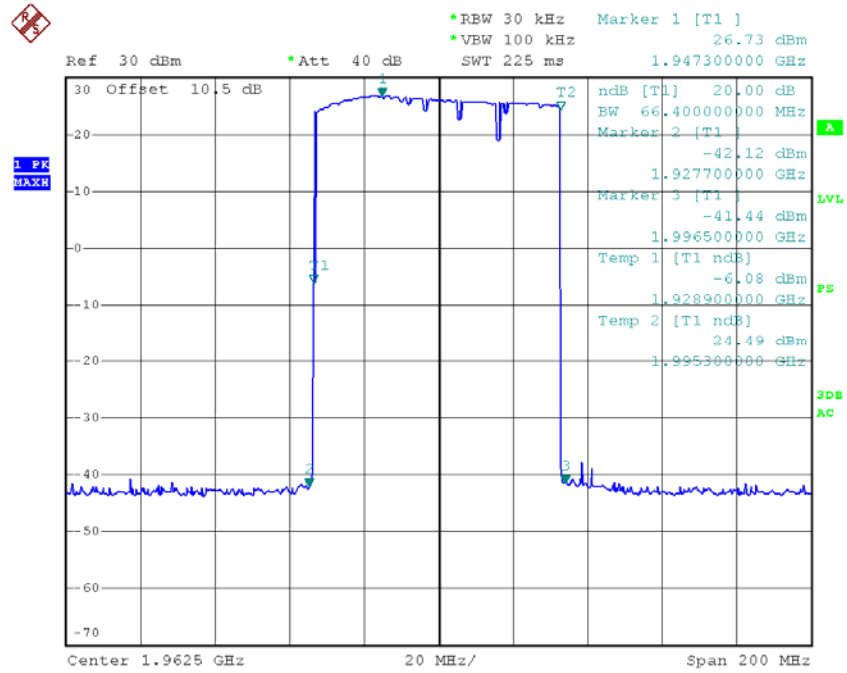


850MHz-up link

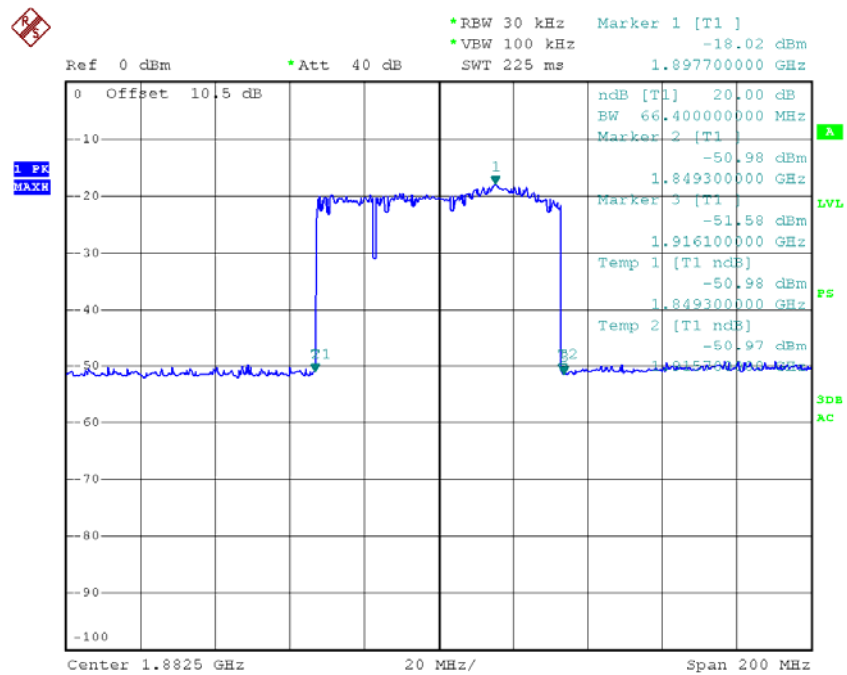


1900MHz Band

1900MHz-down link



1900MHz-up link



4.2.8 FREQUENCY STABILITY

Test Date:	16 October, 2012
Test Method:	FCC part 2.1055
Test Requirement:	FCC part 22.355& FCC part 24.235&FCC 27.54
Specification	The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block ,The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$)of the center frequency
Status	The output power of EUT be set to maximum value,the gain of EUT be set to maximum value by software through the manufacture
Conditions	Temperature condition, Voltage condition
Application	700MHz DL and UL ports,850MHz DL and UL ports, 1900MHz DL and UL ports
Test procedure	<ol style="list-style-type: none">1. Temperature conditions:<ol style="list-style-type: none">a)record the 20 and normal voltage frequency value as reference point;b)vary the temperature from -30 to 60 with step 10c)when reach a temperature point ,keep the temperature banlance at least 1 hour to make the product working in this status;d)record the frequency at the relative temperature.2. Voltage condition :<ol style="list-style-type: none">a)record the 20 and normal voltage frequency value as reference point;b)vary the voltage from -15% norminal voltage to +15% voltagec)read the frequency at the relative voltage.

4.2.8.1 MEASUREMENT RECORD

1.Frequency Stability vs temperature

700MHz

Temperature()	Frequency(MHz)	Tolerance(ppm)
60	737.000490	0.665
50	737.000478	0.649
40	737.000465	0.631
30	737.000446	0.605
20	737.000482	0.654
10	737.000467	0.634
0	737.000449	0.609
-10	737.000487	0.661
-20	737.000456	0.619
-30	737.000468	0.635

850MHz

Temperature()	Frequency(MHz)	Tolerance(ppm)
60	881.500489	0.554
50	881.500476	0.540
40	881.500503	0.571
30	881.500492	0.558
20	881.500481	0.546
10	881.500468	0.531
0	881.500429	0.487
-10	881.500431	0.489
-20	881.500410	0.465
-30	881.500417	0.473

1900MHz

Temperature()	Frequency(MHz)	Tolerance(ppm)
60	1962.500483	0.246
50	1962.500465	0.237
40	1962.500472	0.241
30	1962.500462	0.235
20	1962.500454	0.231
10	1962.500501	0.255
0	1962.500489	0.249
-10	1962.500287	0.146
-20	1962.500398	0.203
-30	1962.500380	0.194

2.Frequency Stability vs voltage

700MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	737.000468	0.635
120	737.000455	0.617
138(120*1.15)	737.000433	0.588

850MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	881.500466	0.529
120	881.500481	0.546
138(120*1.15)	881.500456	0.517

1900MHz

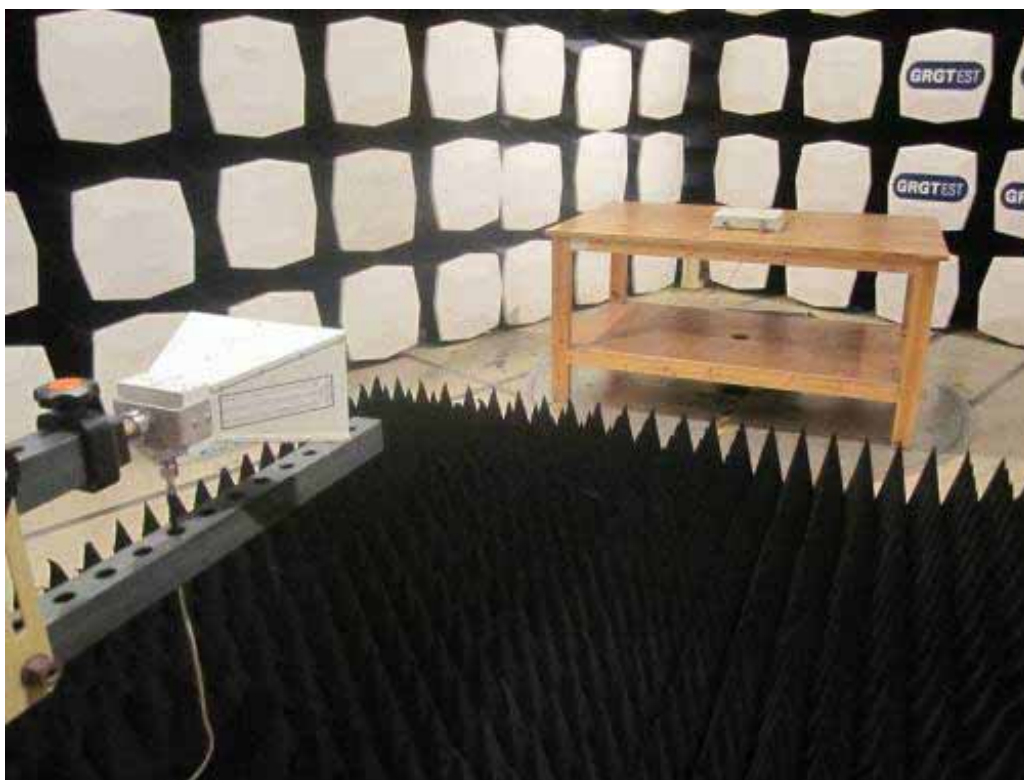
Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	1962.500477	0.243
120	1962.500454	0.231
138(120*1.15)	1962.500469	0.239

APPENDIX A: PHOTOGRAPH OF THE TEST CONFIGURATION

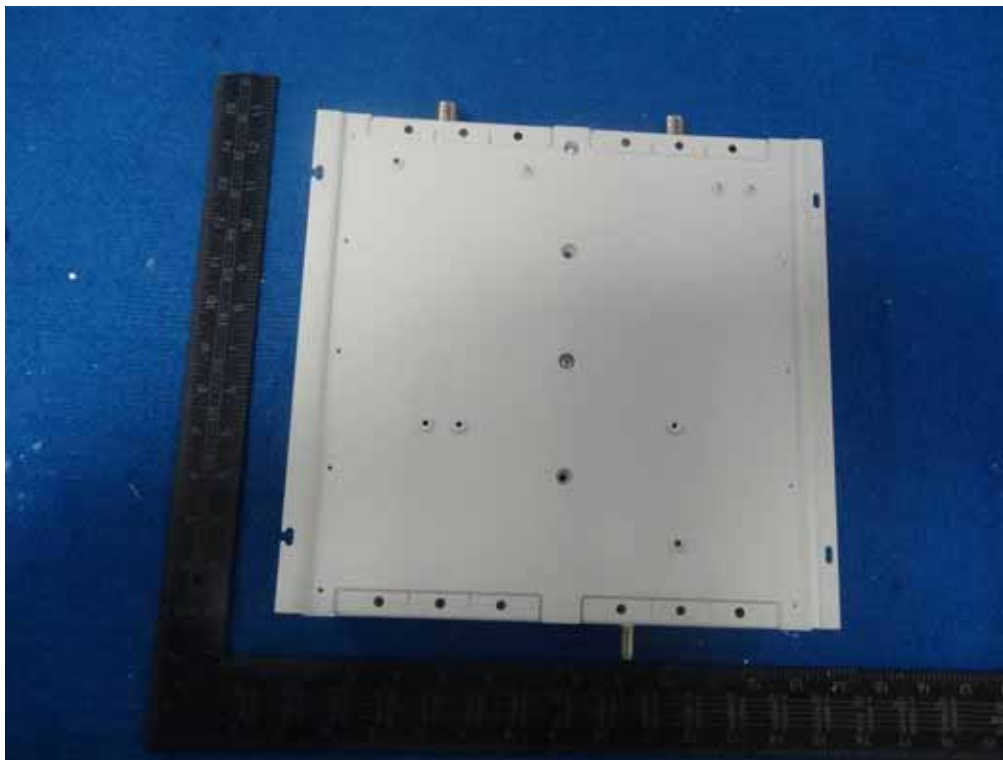
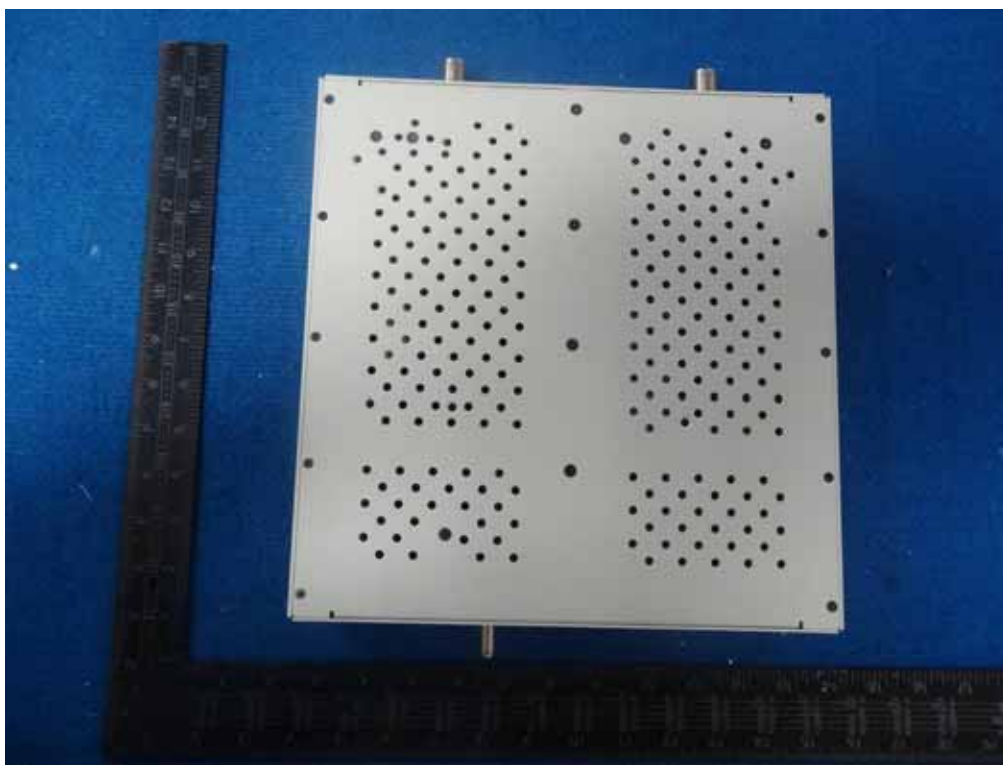
RE (Blowe 1GHz)

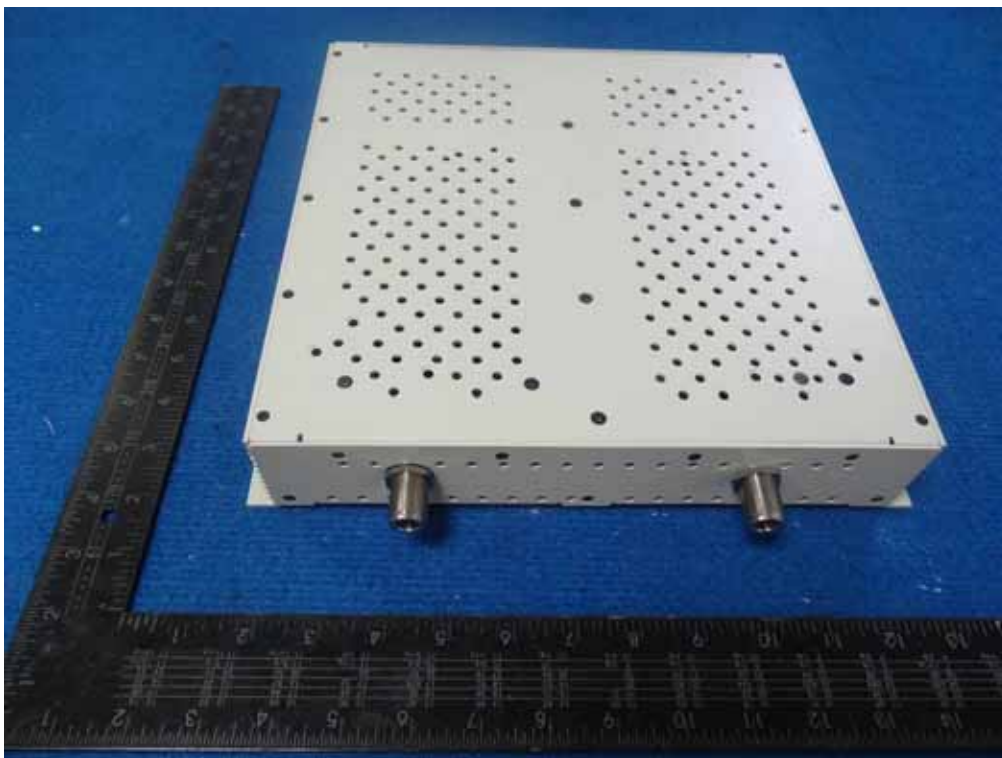


RE (Above 1GHz)



APPENDIX B: PHOTOGRAPHS OF EUT









-----This is the last page of the report. -----