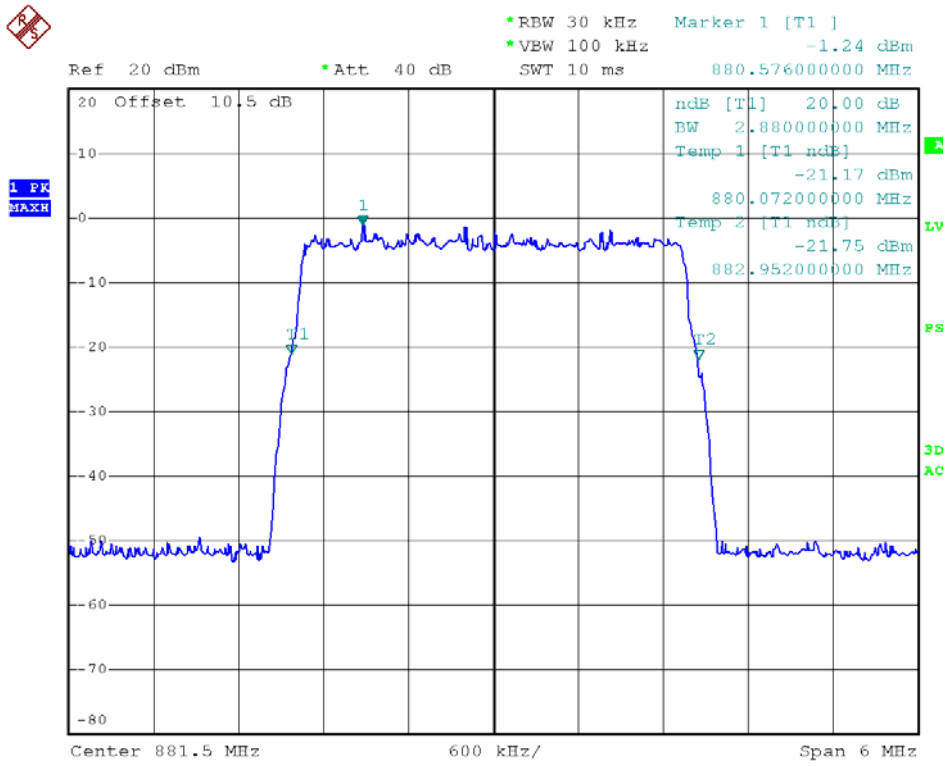
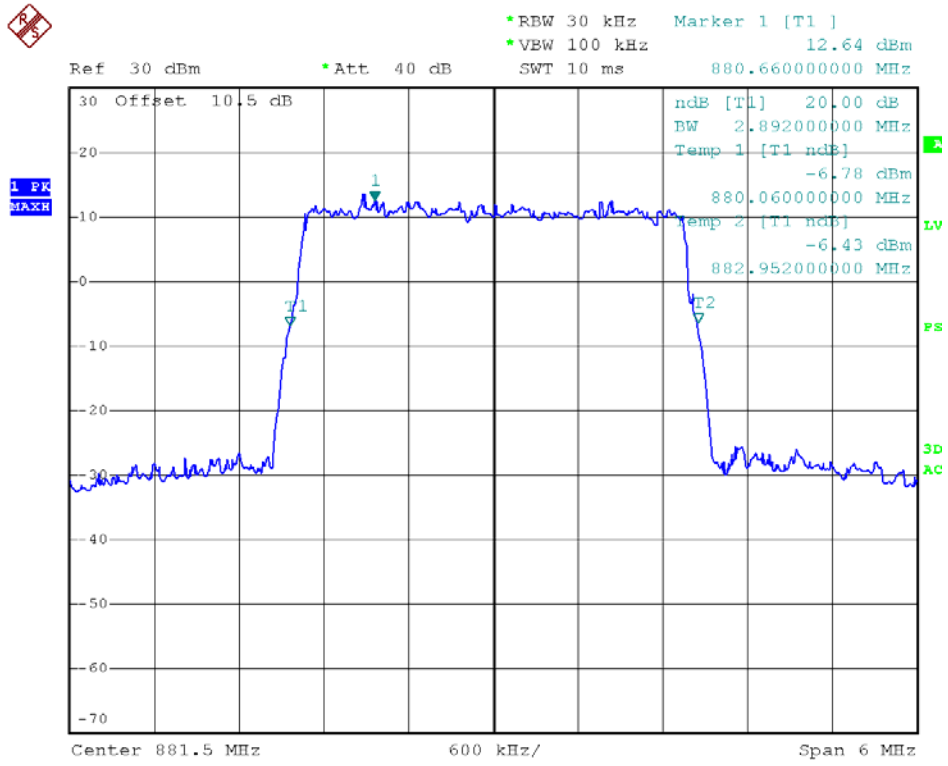
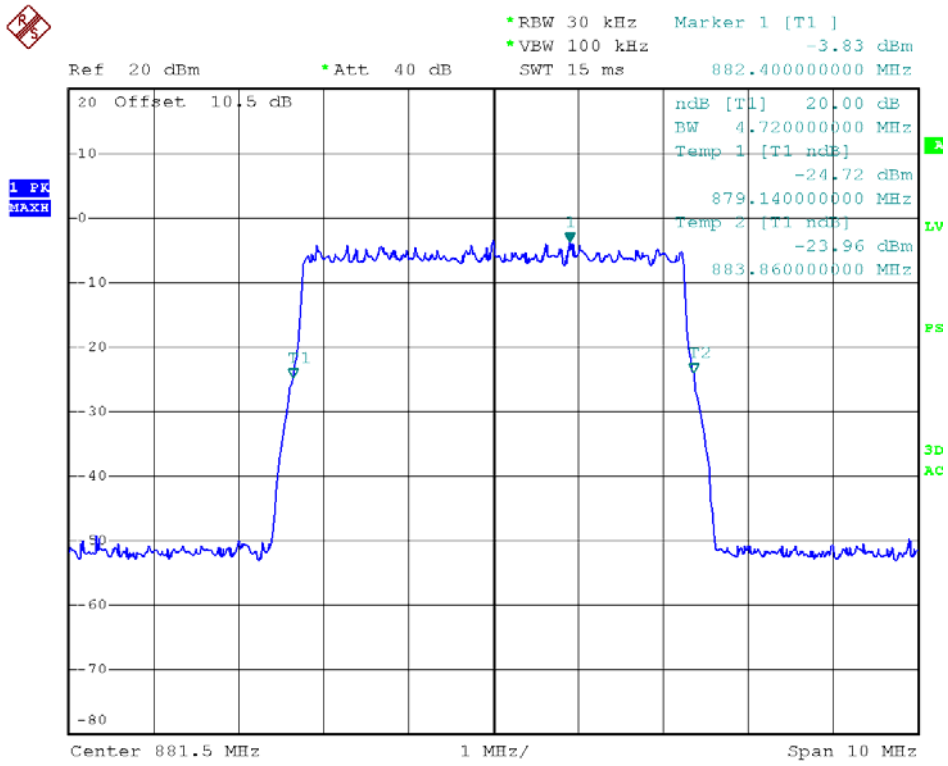
850MHz-LTE –3M downlink (middle frequency)-Input



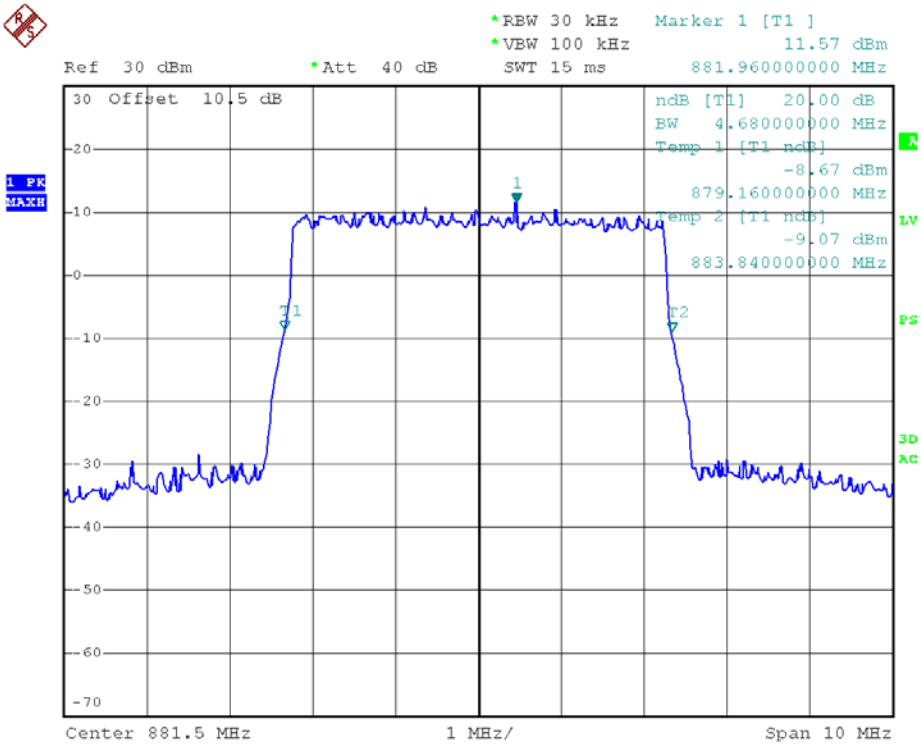
850MHz-LTE –3M downlink (middle frequency)- Output



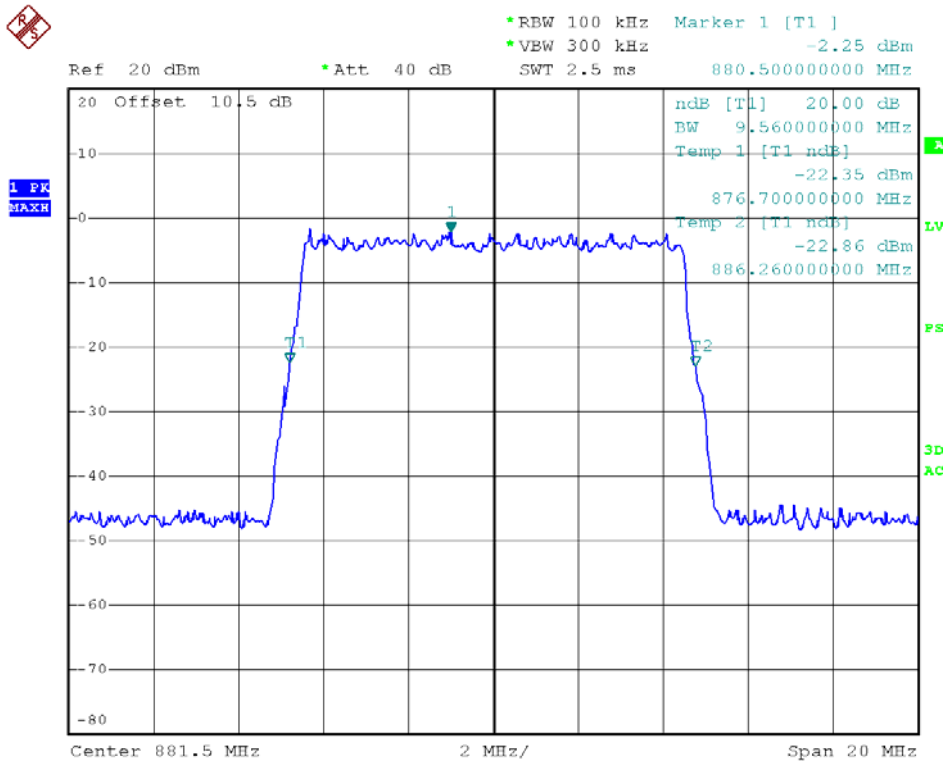
850MHz-LTE-5M downlink (middle frequency)-Input



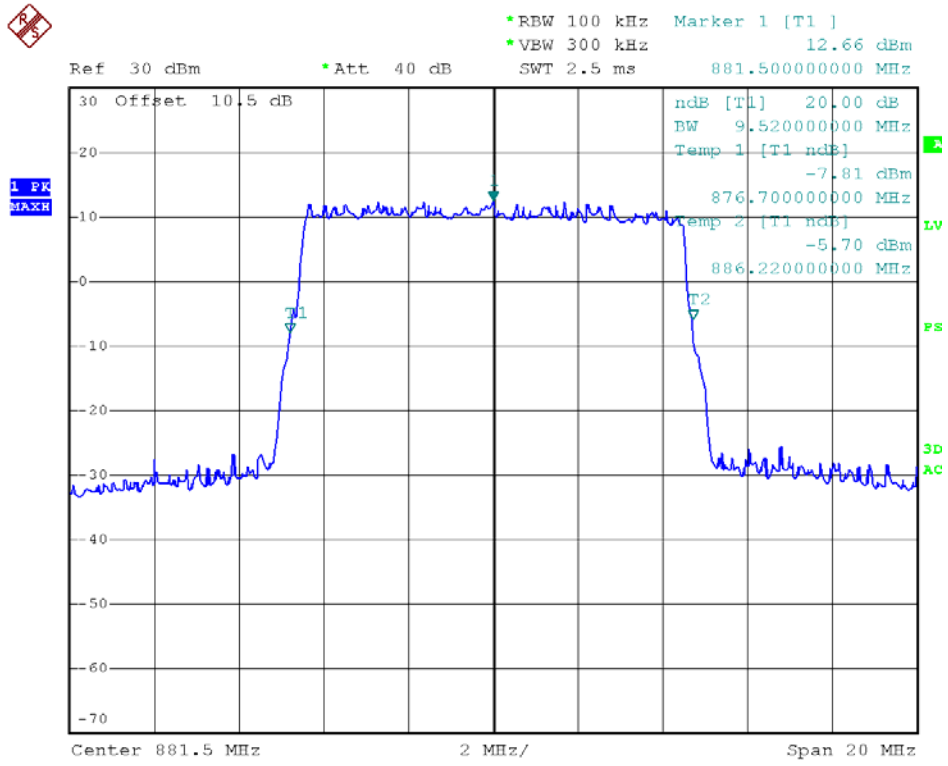
850MHz-LTE-5M downlink (middle frequency)-Output



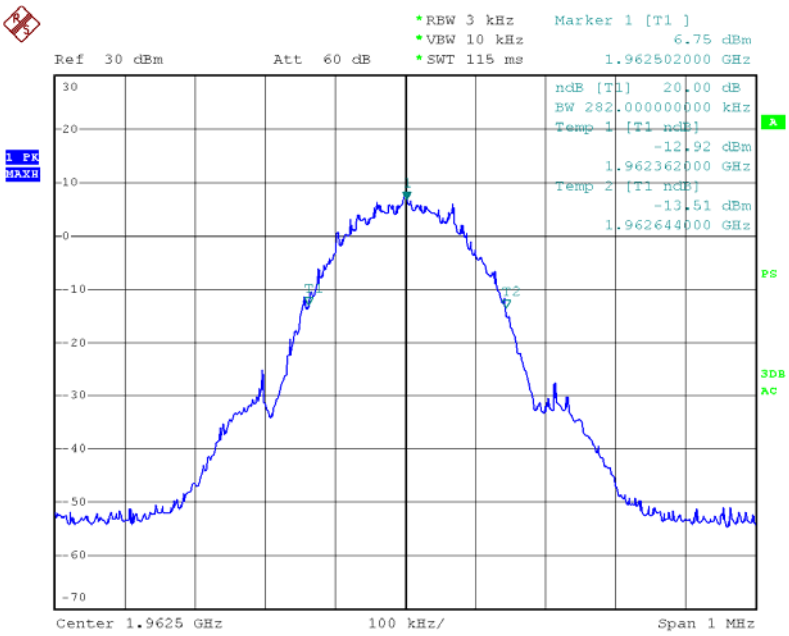
850MHz-LTE-10M downlink (middle frequency)-Input



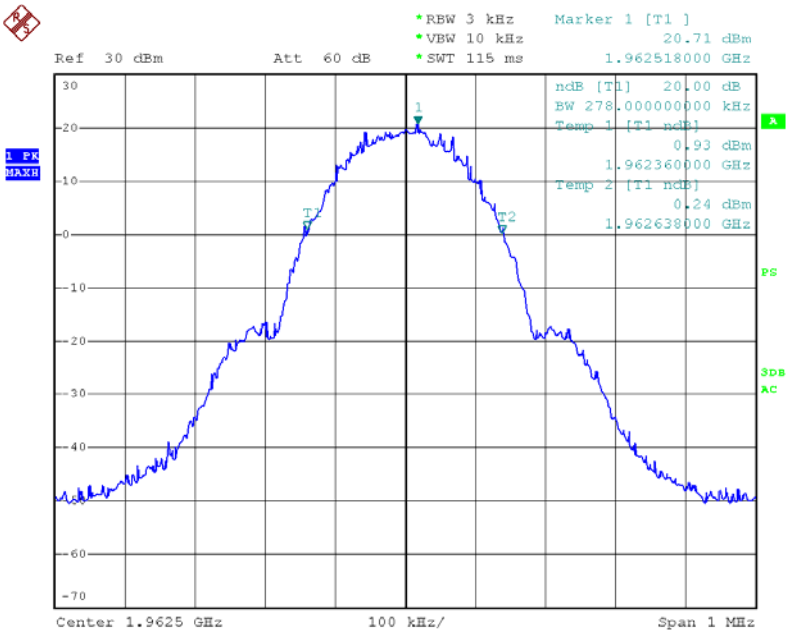
850MHz-LTE -10M downlink (middle frequency)- Output



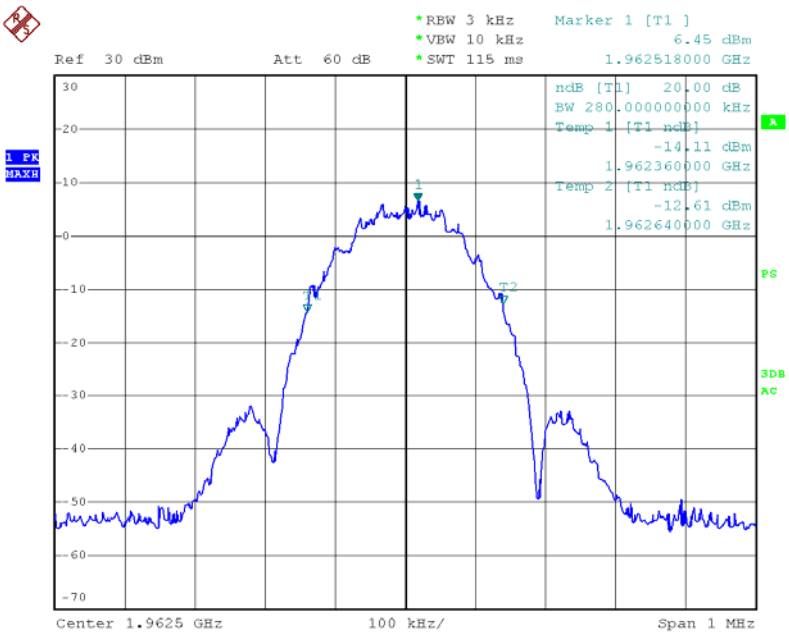
1900MHz-GSM downlink (middle frequency)-Input



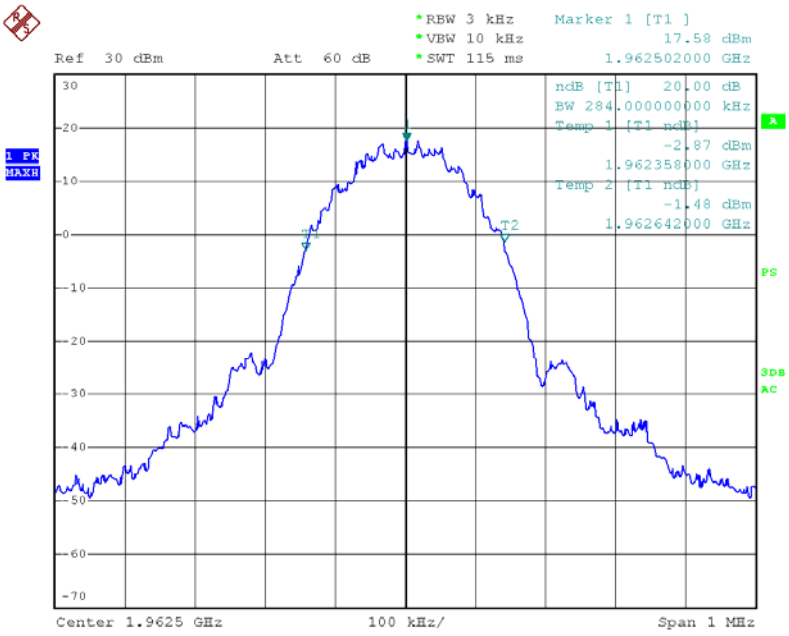
1900MHz-GSM downlink (middle frequency)- Output



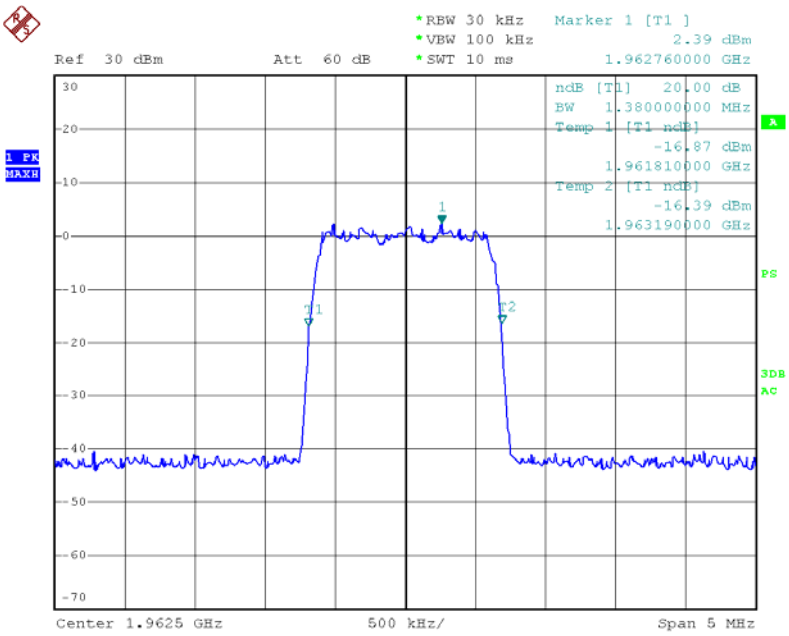
1900MHz-EDGE downlink (middle frequency)-Input



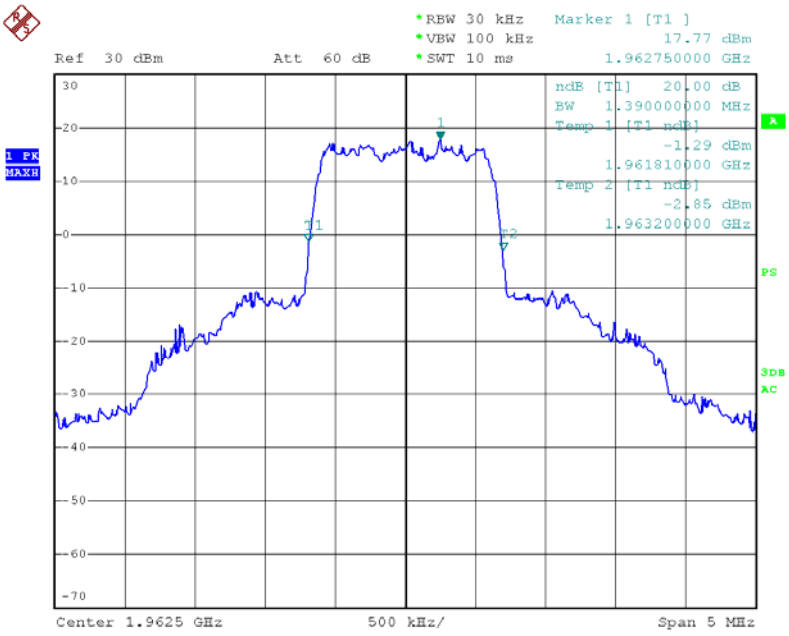
1900MHz-EDGE downlink (middle frequency)- Output



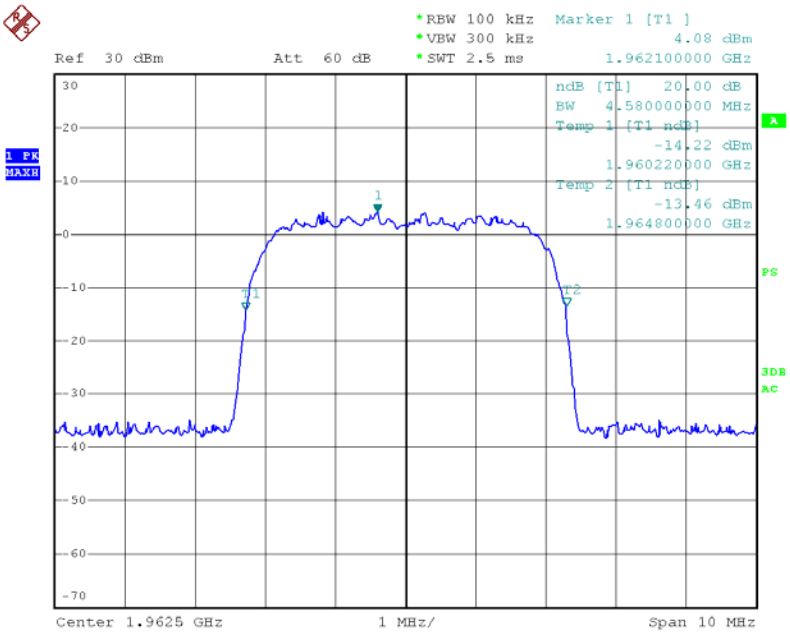
1900MHz-CDMA2000 downlink (middle frequency)-Input



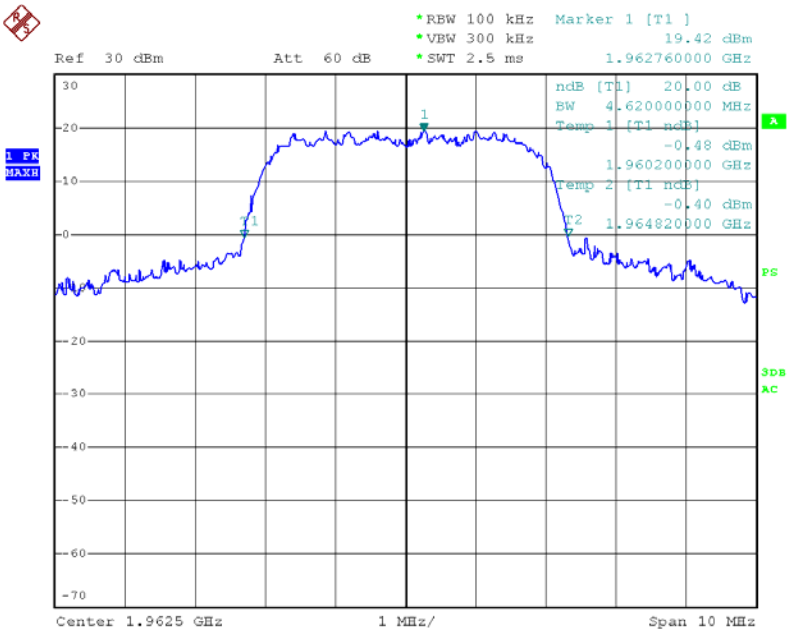
1900MHz-CDMA2000 downlink (middle frequency)- Output



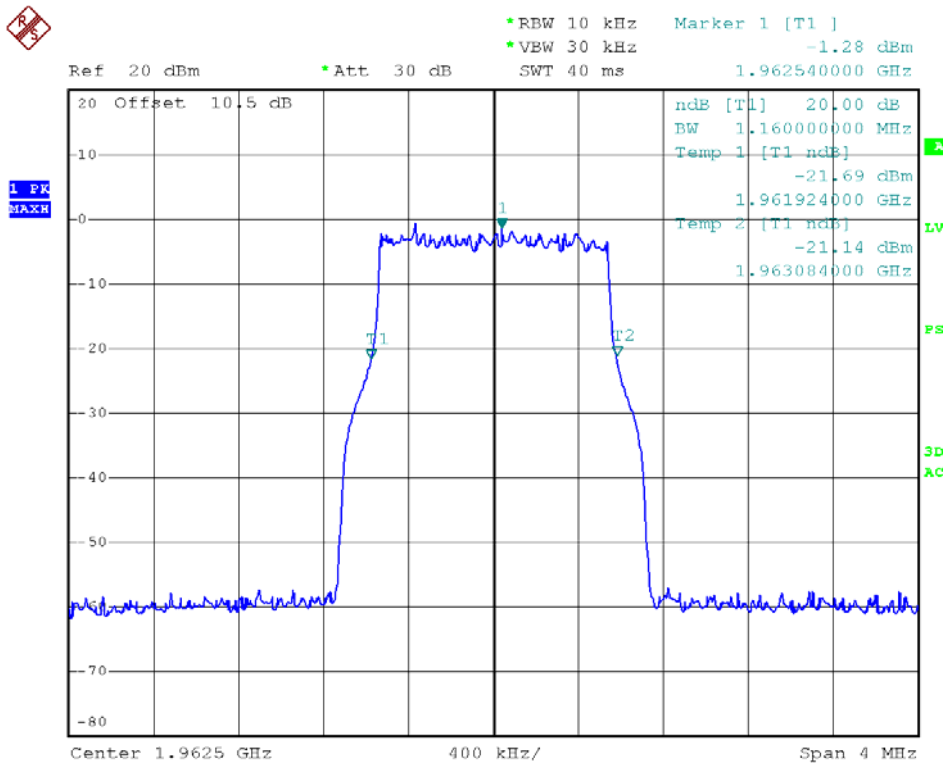
1900MHz-WCDMA downlink (middle frequency)-Input



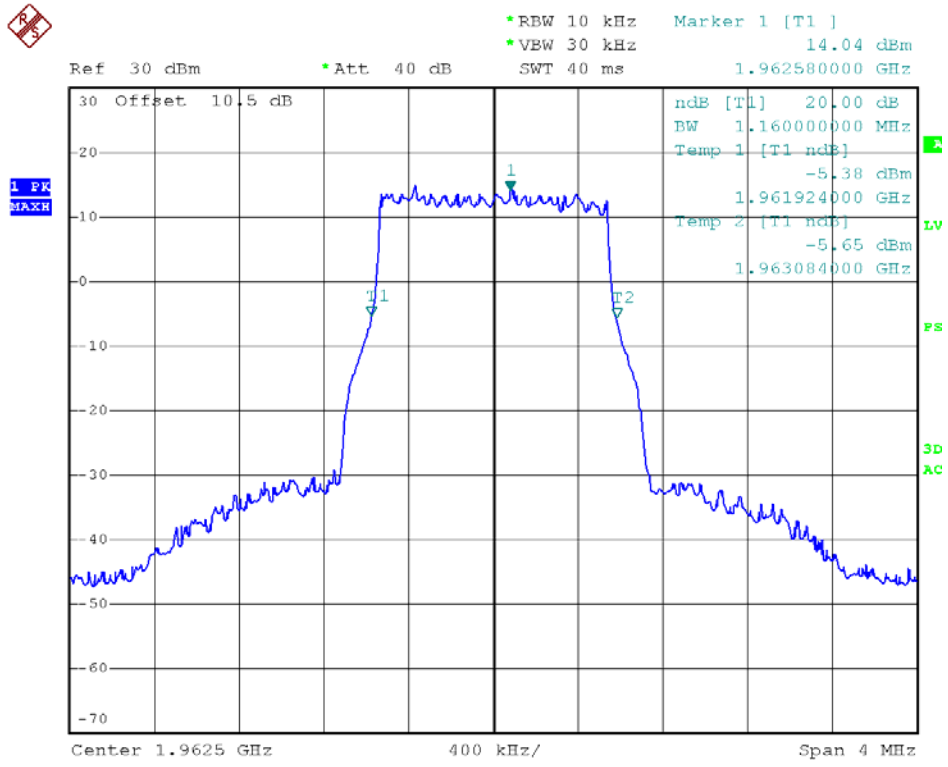
1900MHz-WCDMA downlink (middle frequency)- Output



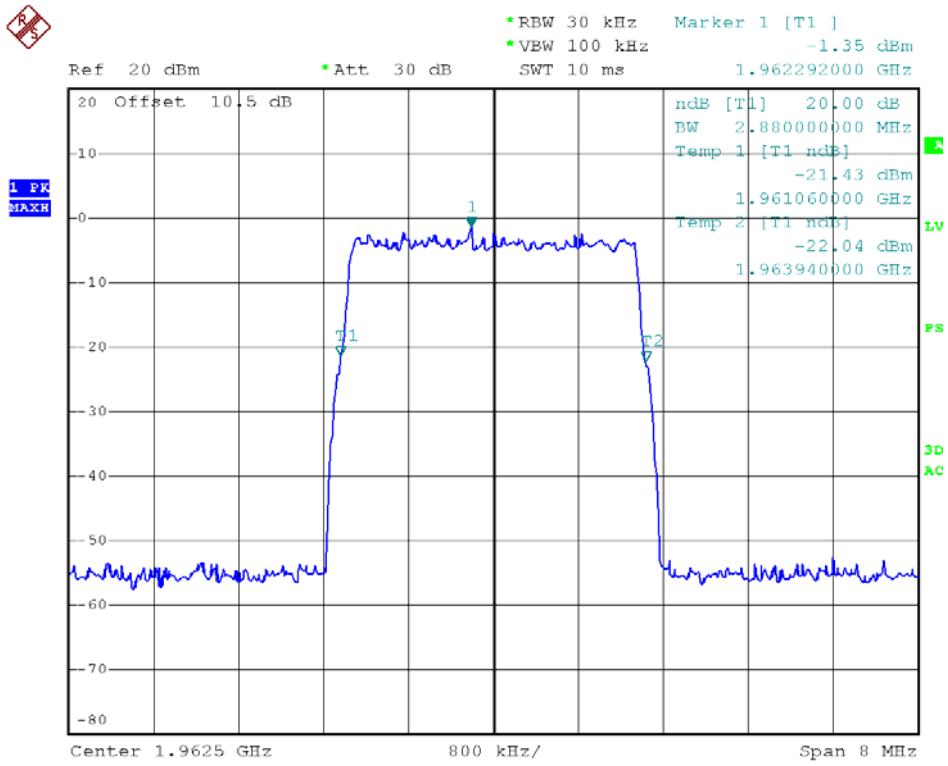
1900MHz-LTE-1.4M downlink (middle frequency)-Input



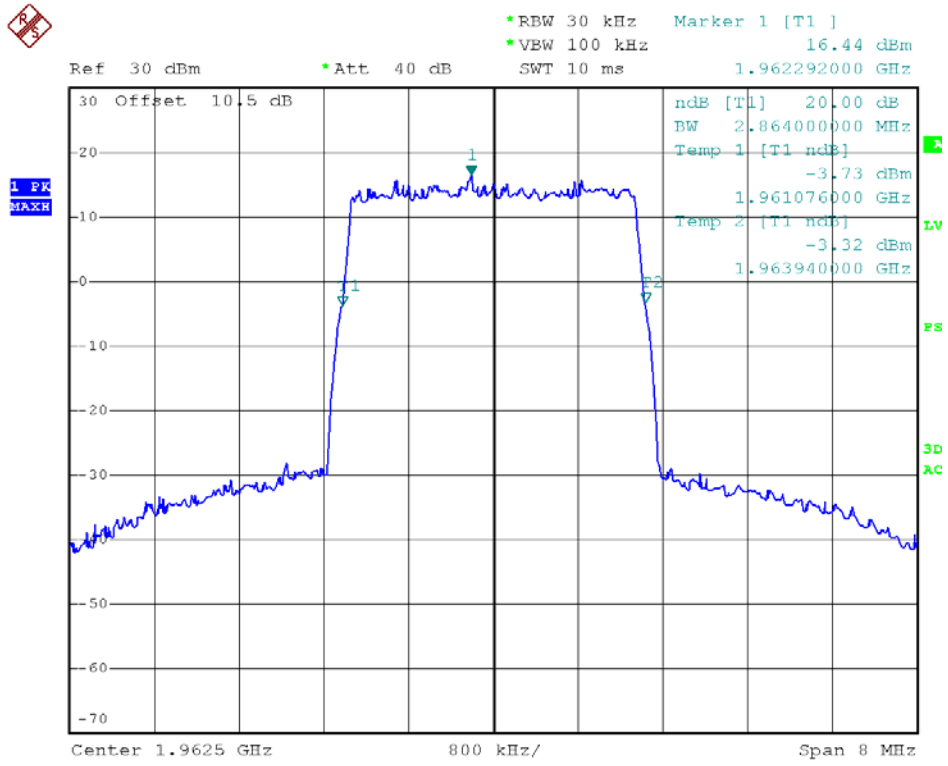
1900MHz-LTE -1.4M downlink (middle frequency)-Output



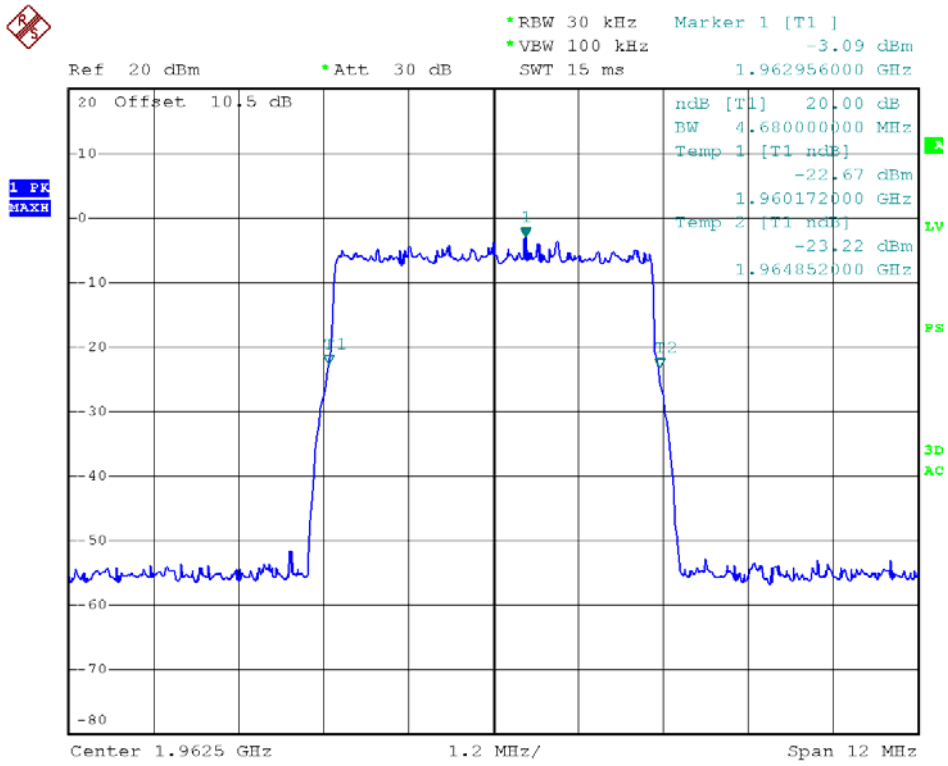
1900MHz-LTE-3M downlink (middle frequency)-Input



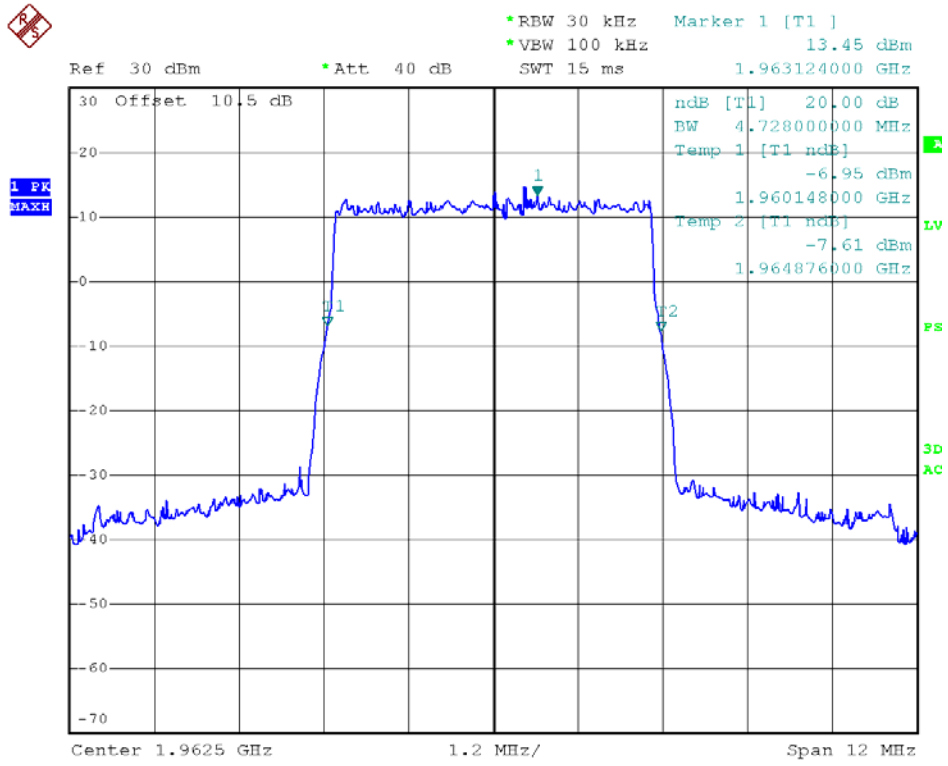
1900MHz-LTE-3M downlink (middle frequency)- Output



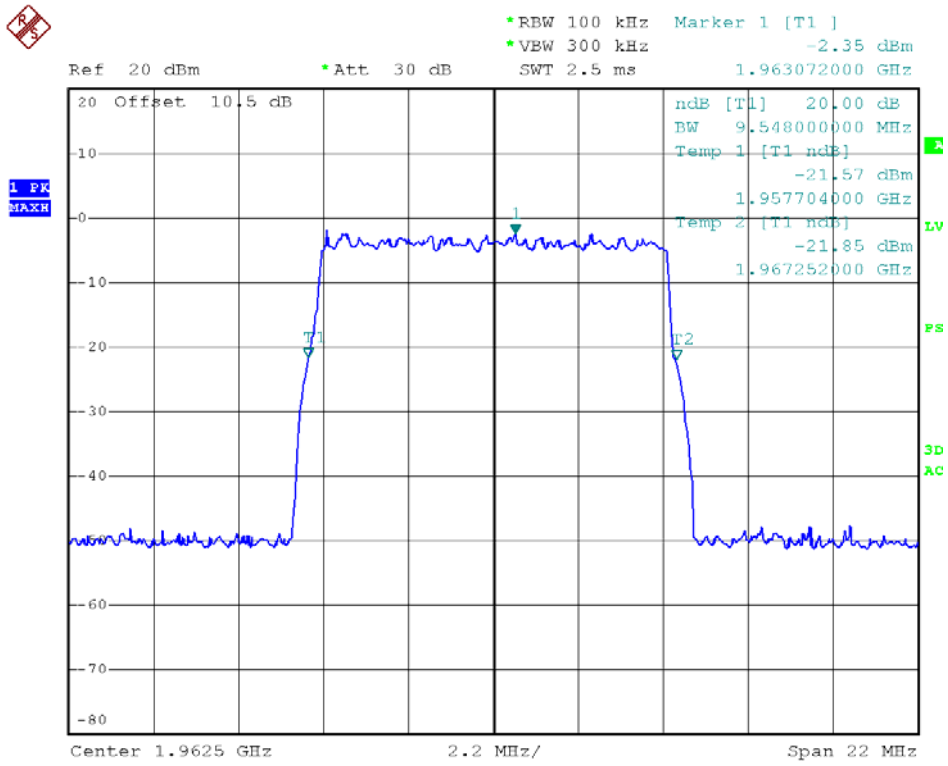
1900MHz-LTE-5M downlink (middle frequency)-Input



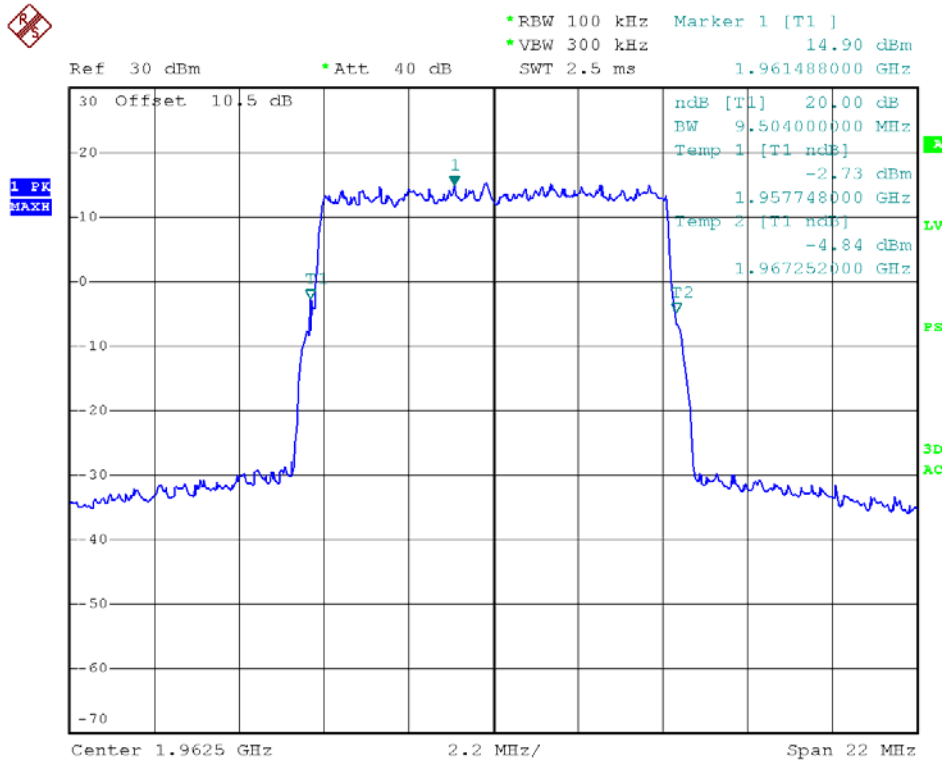
1900MHz-LTE-5M downlink (middle frequency)- Output



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



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



4.2.6 INTERMODULATION

Test Date:	10 December, 2012
Test Method:	2-11-04/EAB/RF
Test Requirement:	FCC part 22.917(a)& FCC part 24.238(a) 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 + 10log (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 + 10log(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	850MHz Downlink and Uplink ports 1900MHz Downlink and Uplink ports
Test configuration	

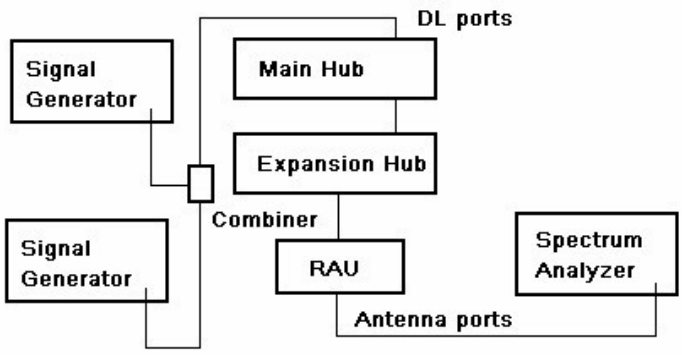


Fig.1 Down Link Intermodulation

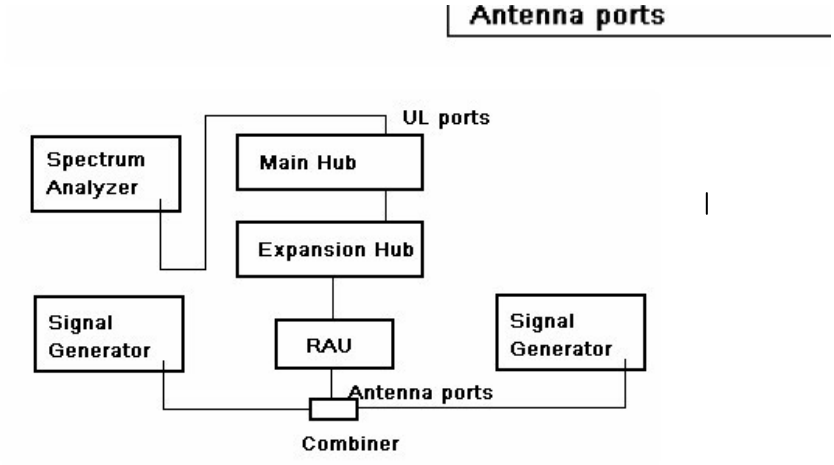


Fig.2 Up Link Intermodulation

Test Procedure:

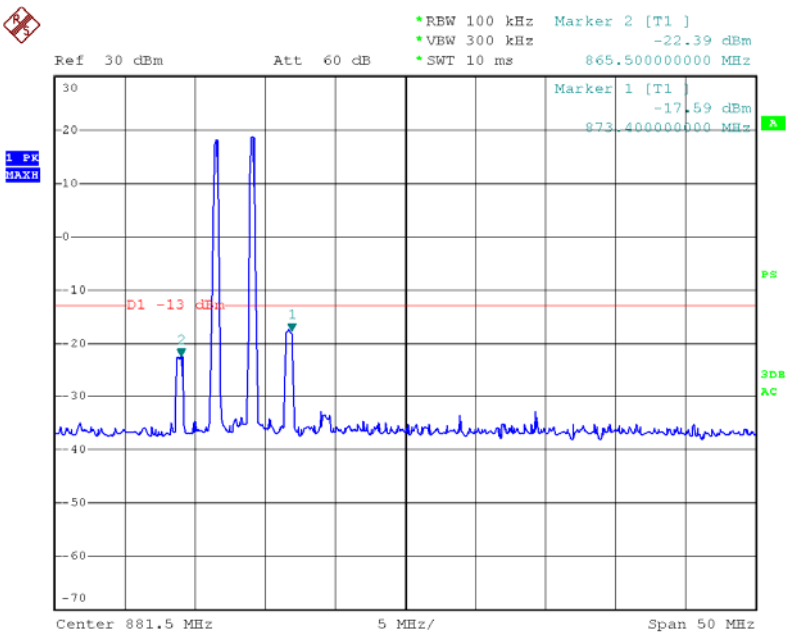
1. Connect the equipment as illustrated,
2. Test the background noise level with all the test facilities
3. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads
4. Select the attenuator to avoid the test receiver or spectrum analyzer being destroyed
5. Keep 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

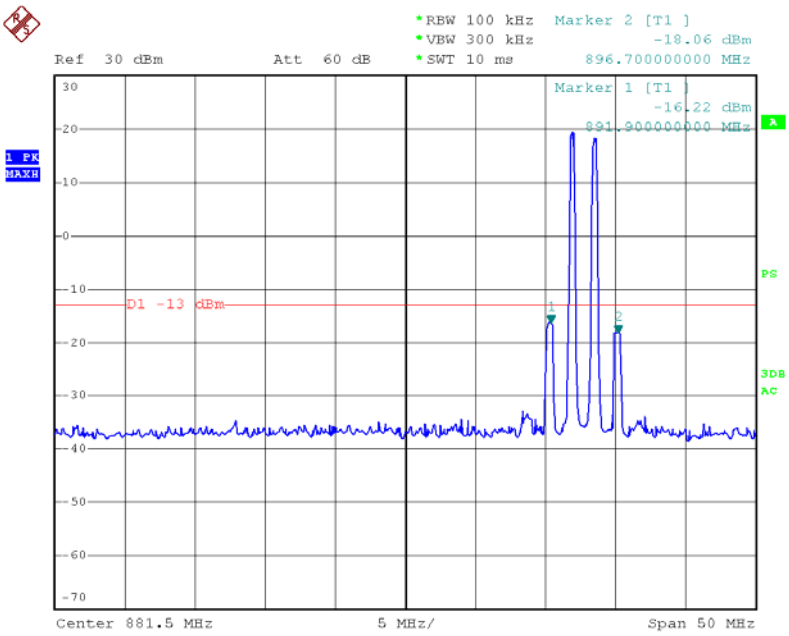
4.2.6.1 MEASUREMENT RECORD

850MHz

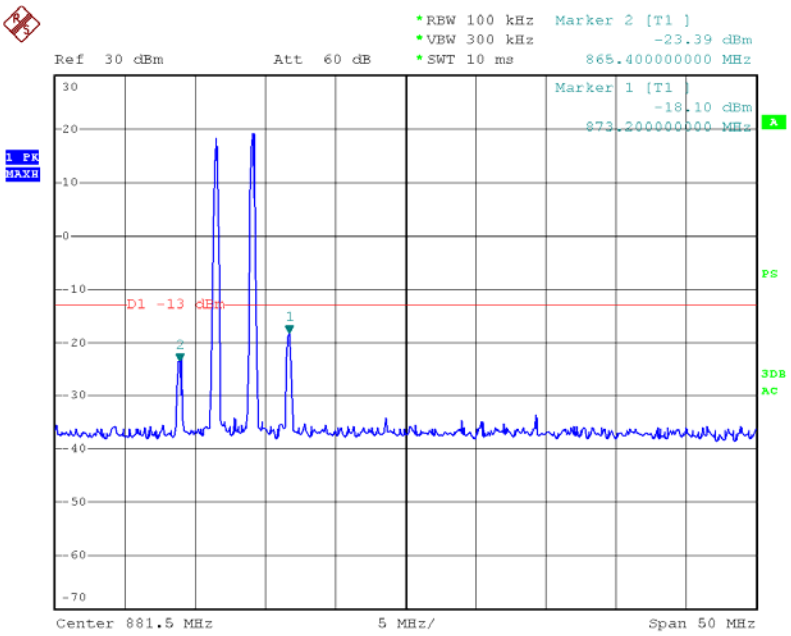
850MHz-GSM downlink-Lower Edge



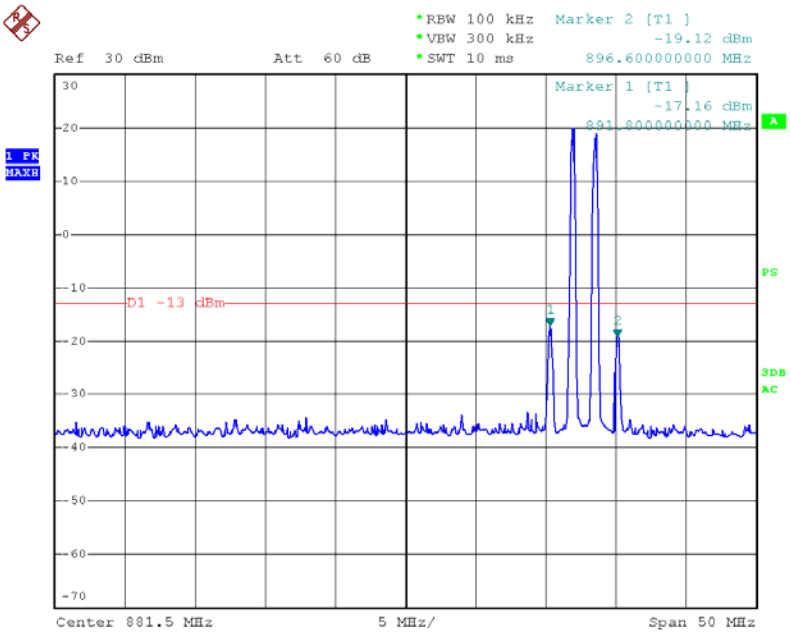
850MHz-GSM downlink-Upper Edge



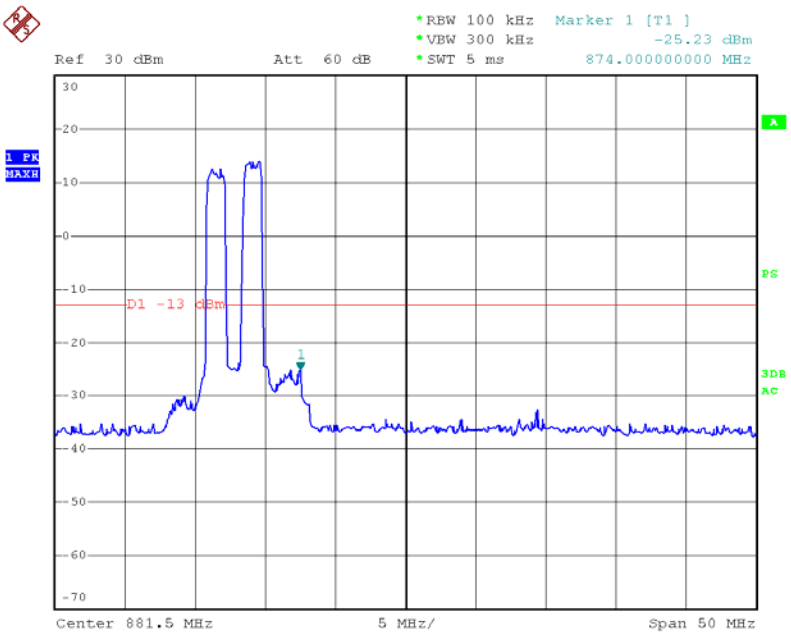
850MHz-EDGE downlink-Lower Edge



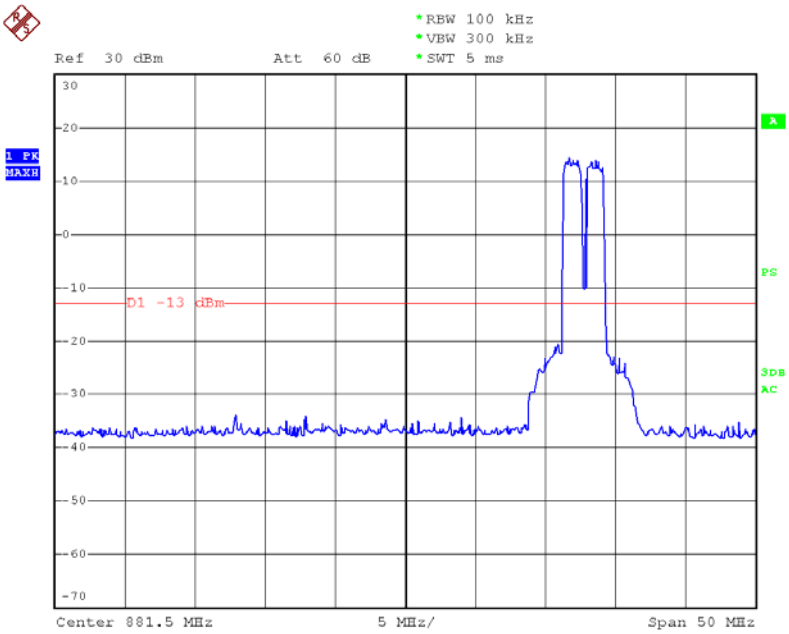
850MHz-EDGE downlink-Upper Edge



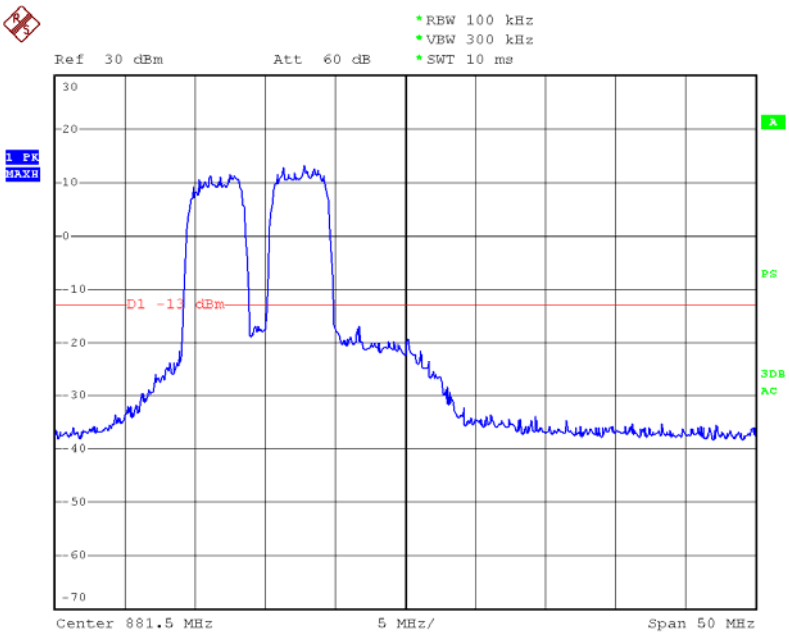
850MHz-CDMA2000 downlink-Lower Edge



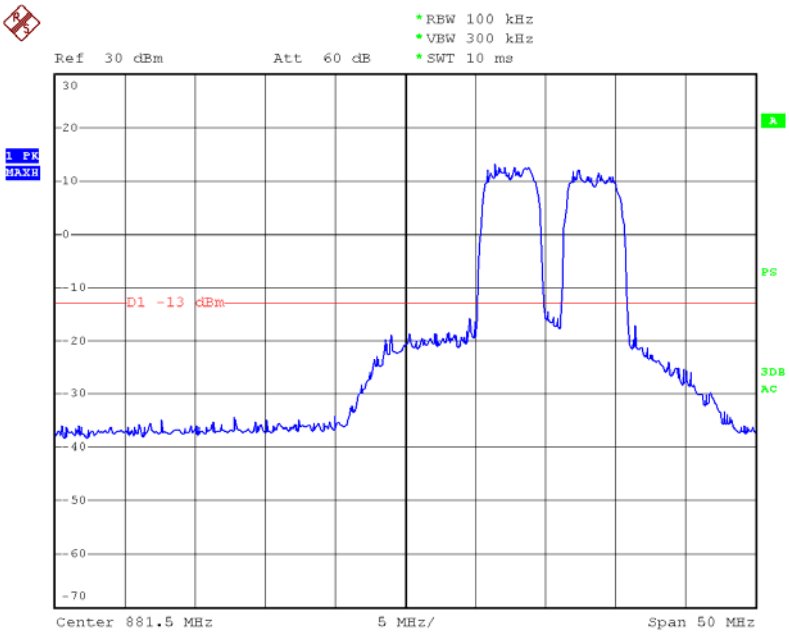
850MHz-CDMA2000 downlink-Upper Edge



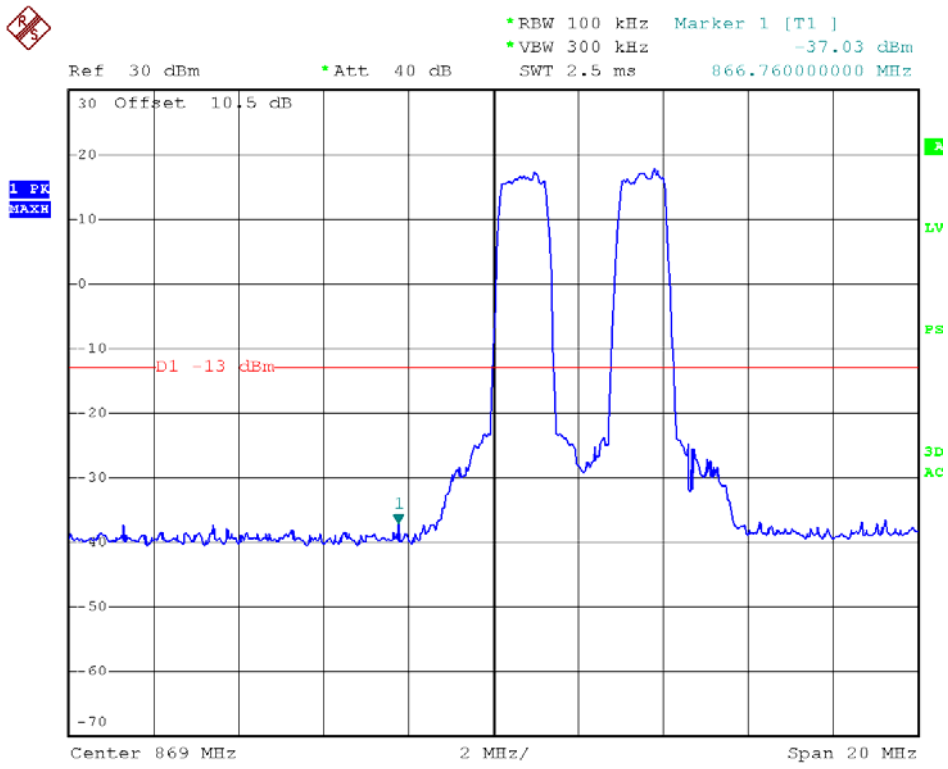
850MHz-WCDMA downlink-Lower Edge



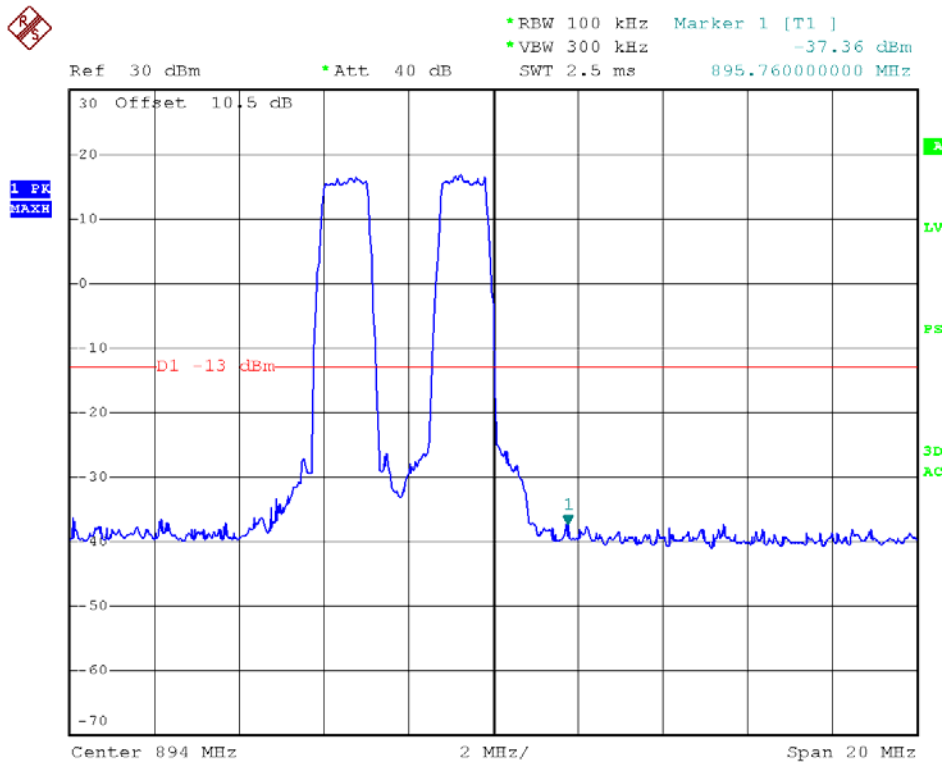
850MHz-WCDMA downlink-Upper Edge



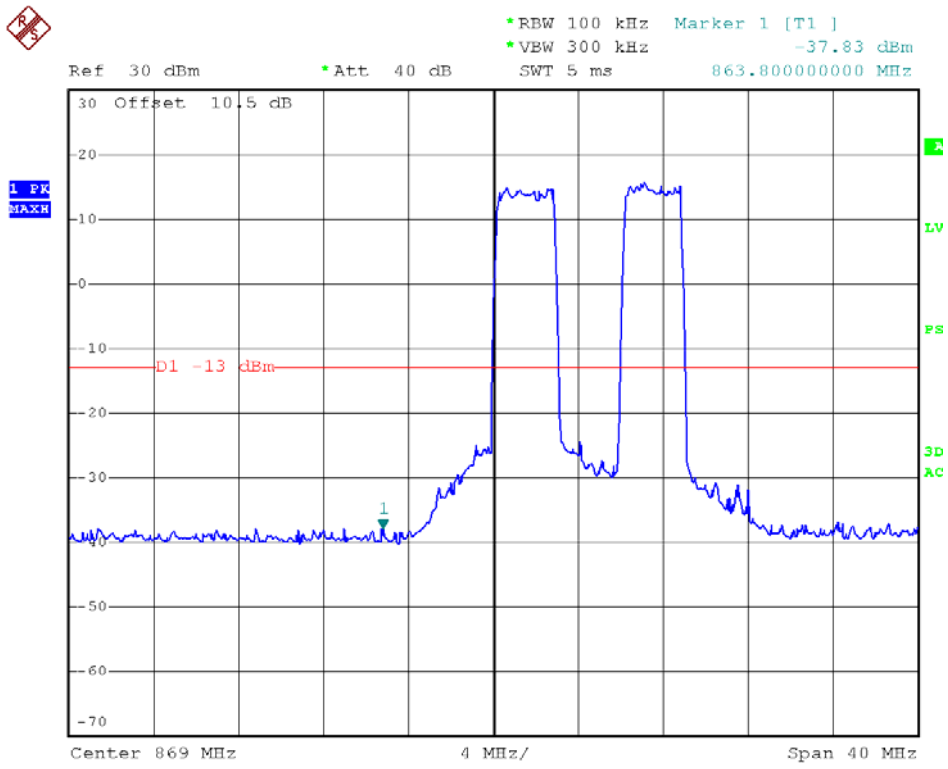
850MHz-LTE-1.4M downlink-Lower Edge



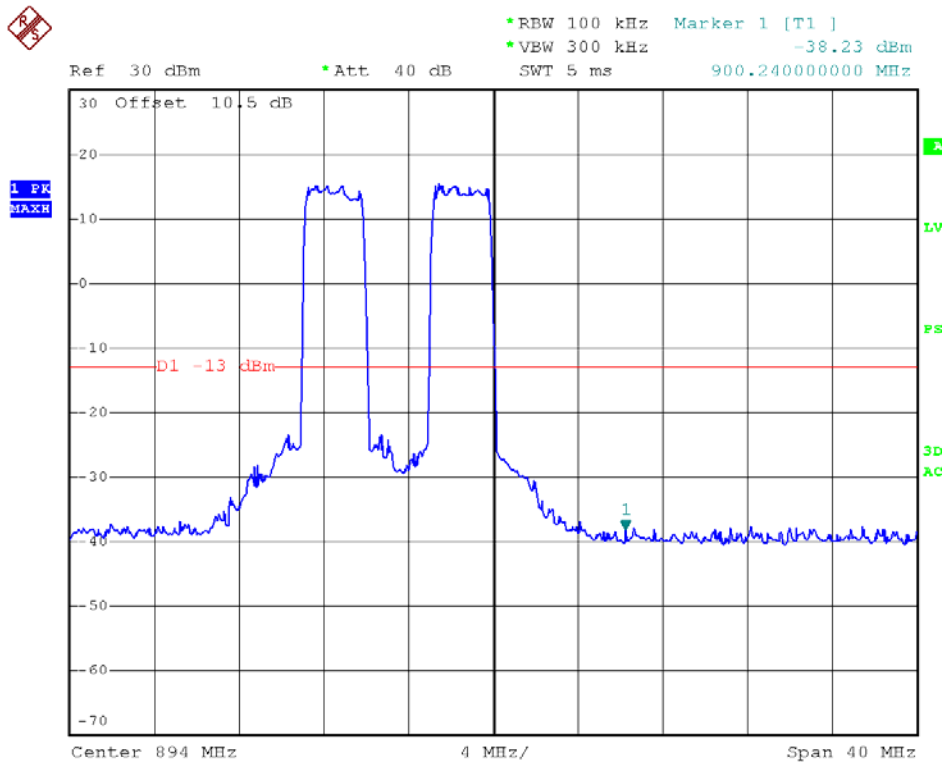
850MHz-LTE-1.4M downlink-Upper Edge



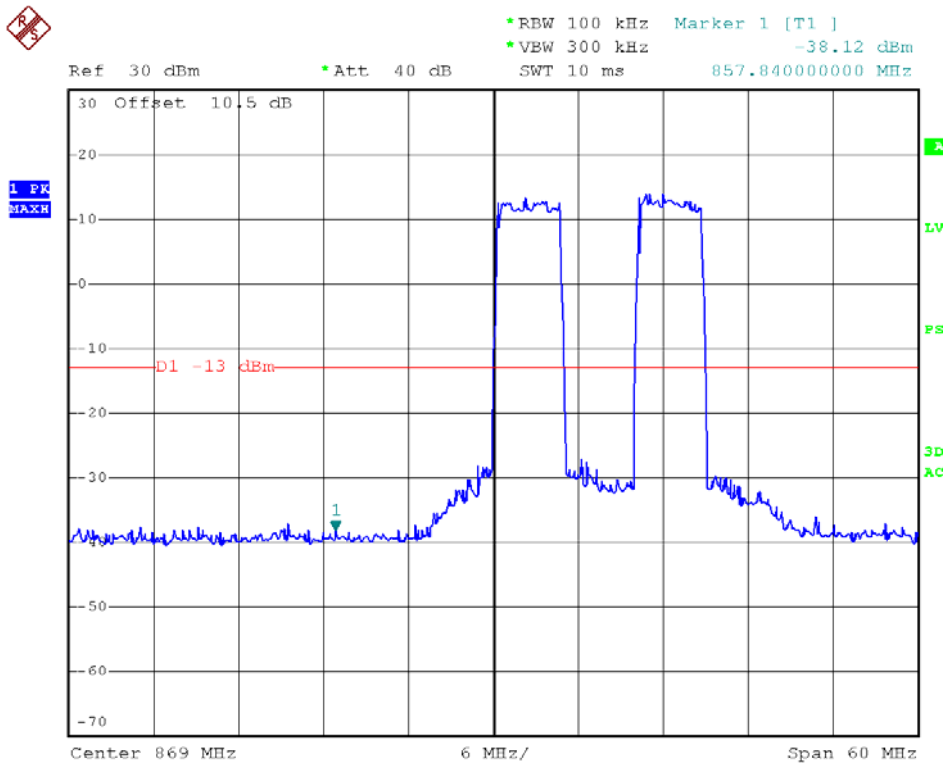
850MHz-LTE-3M downlink-Lower Edge



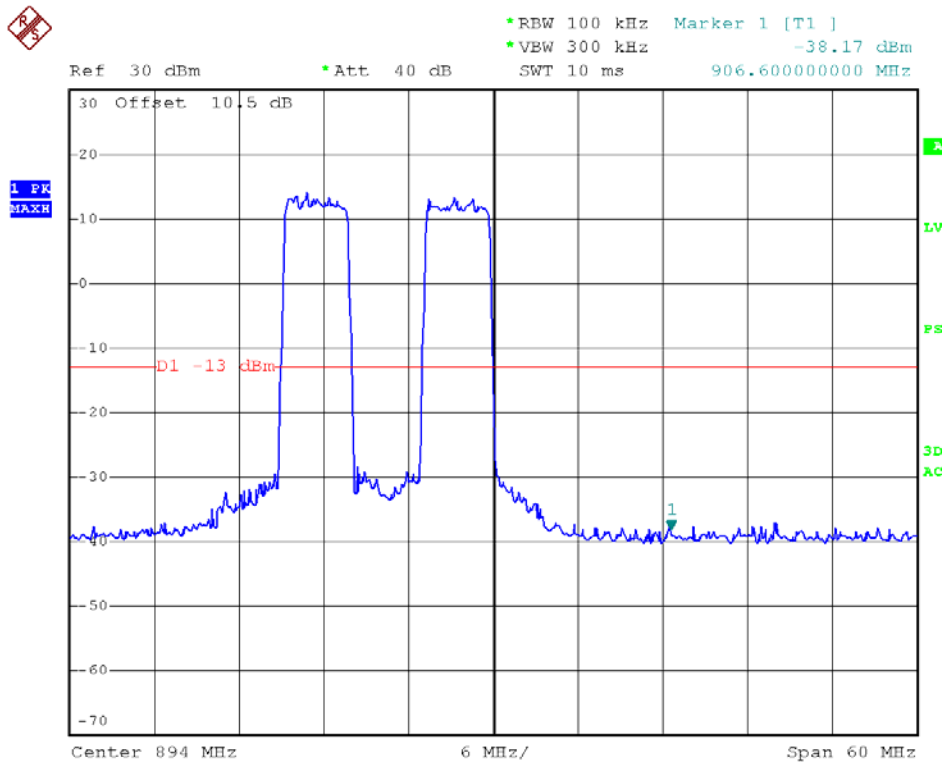
850MHz-LTE-3M downlink-Upper Edge



850MHz-LTE-5M downlink-Lower Edge

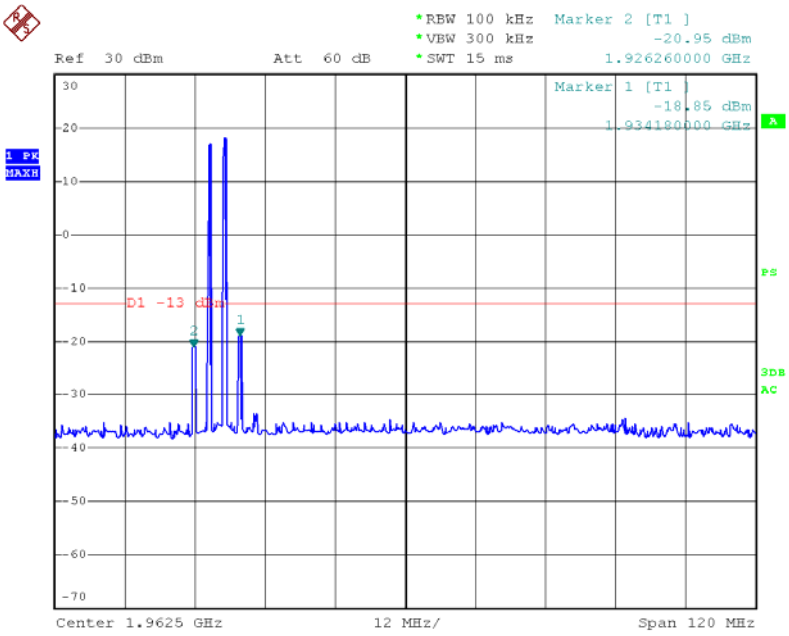


850MHz-LTE-5M downlink-Upper Edge

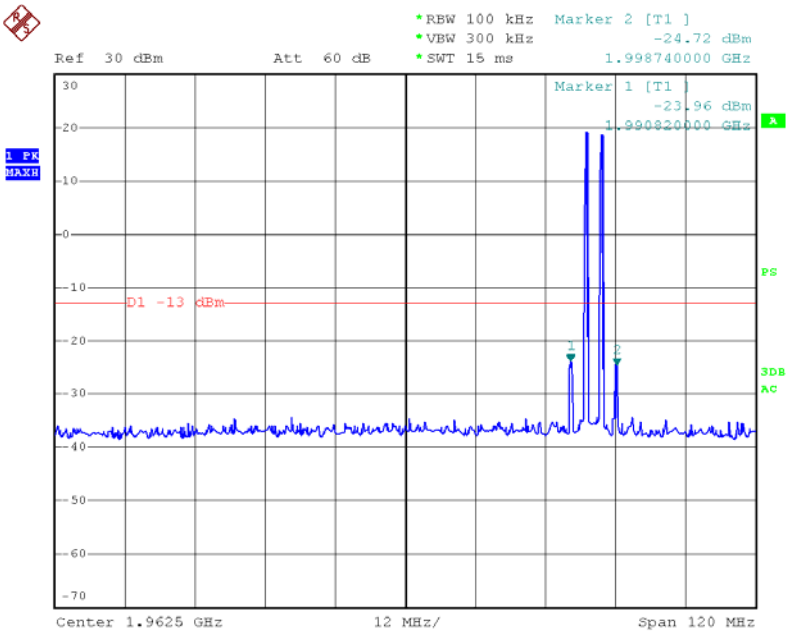


1900MHz

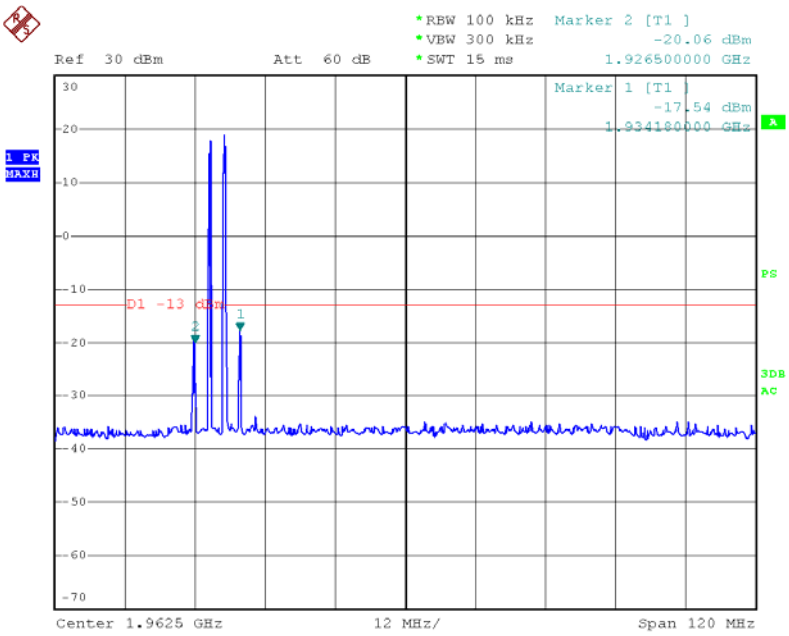
1900MHz-GSM downlink-Lower Edge



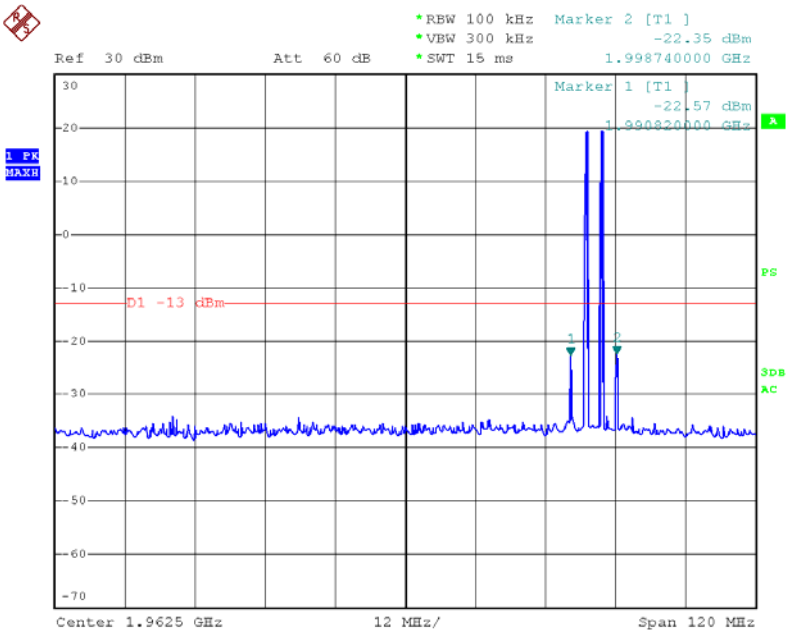
1900MHz-GSM downlink-Upper Edge



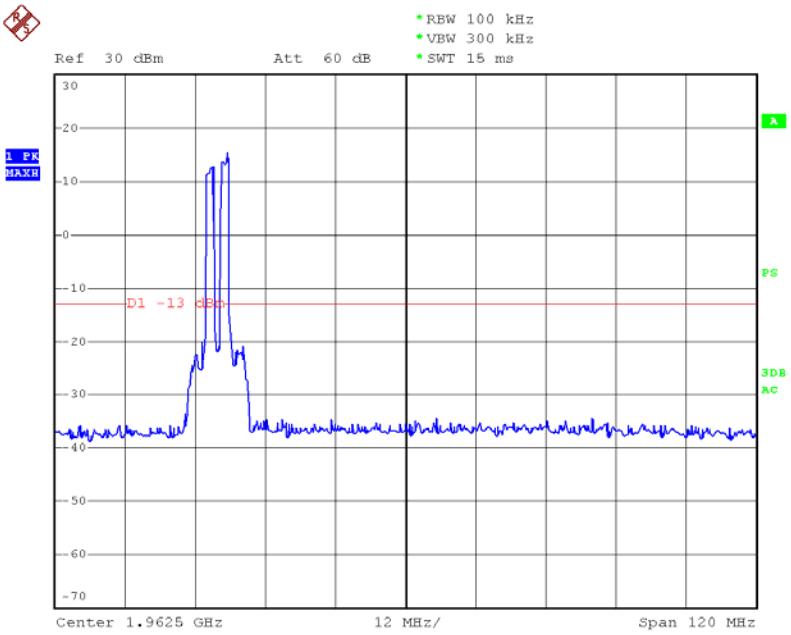
1900MHz-EDGE downlink-Lower Edge



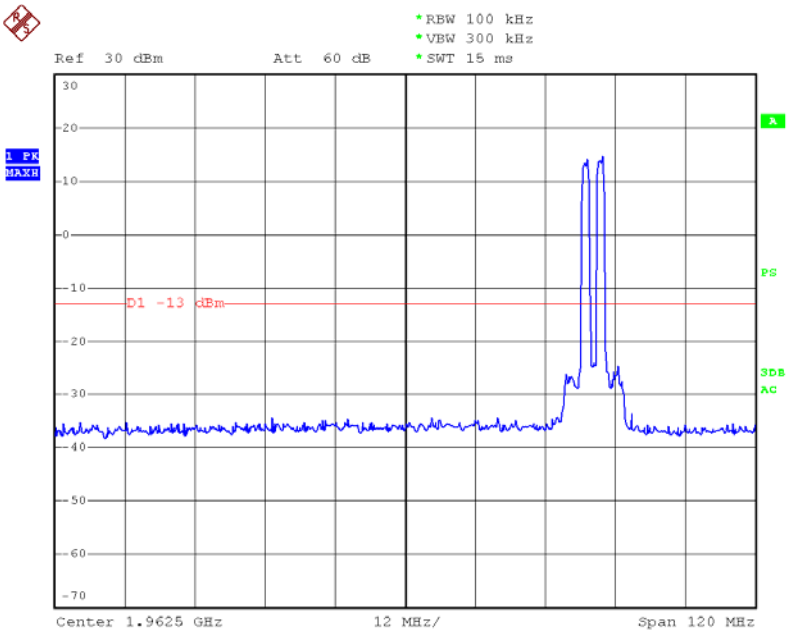
1900MHz-EDGE downlink-Upper Edge



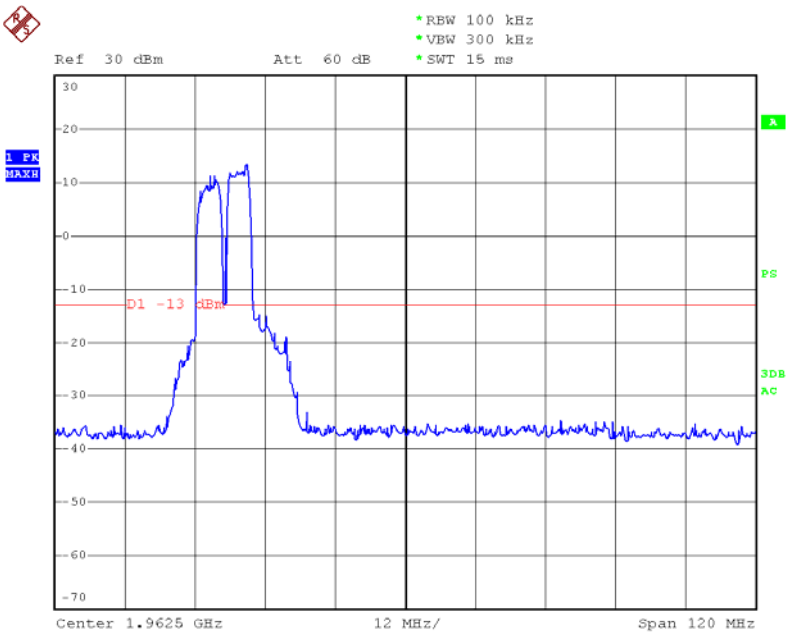
1900MHz-CDMA2000 downlink-Lower Edge



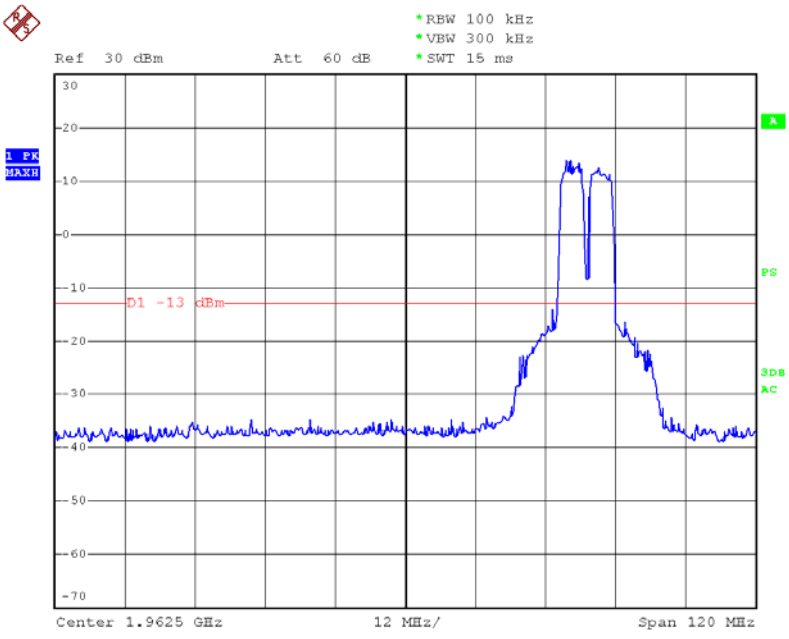
1900MHz-CDMA2000 downlink-Upper Edge



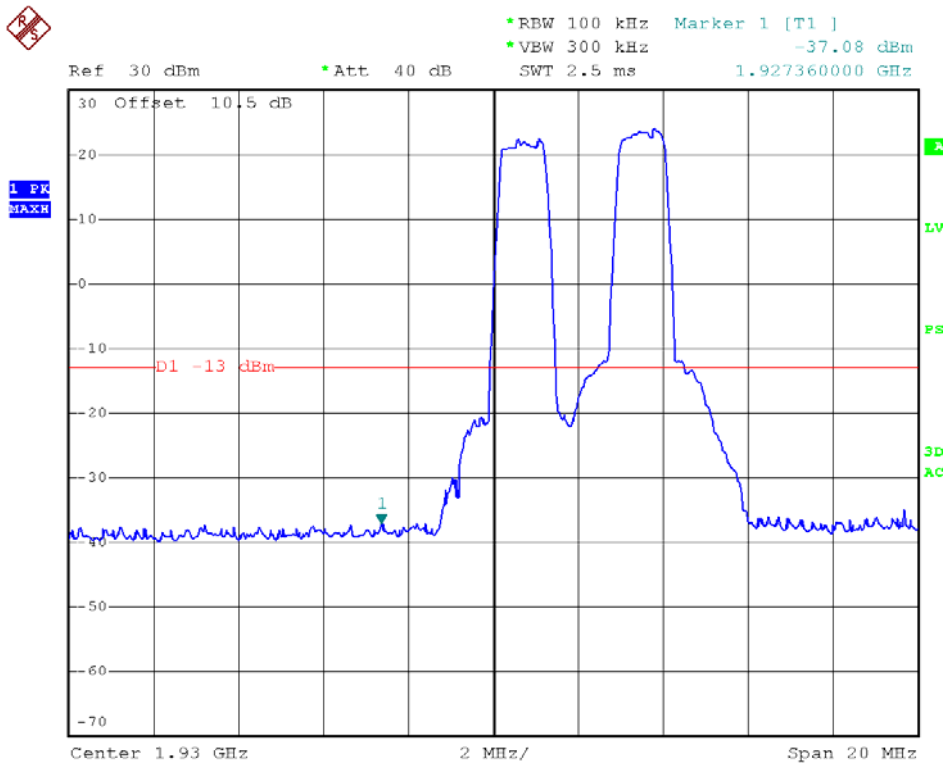
1900MHz-WCDMA downlink-Lower Edge



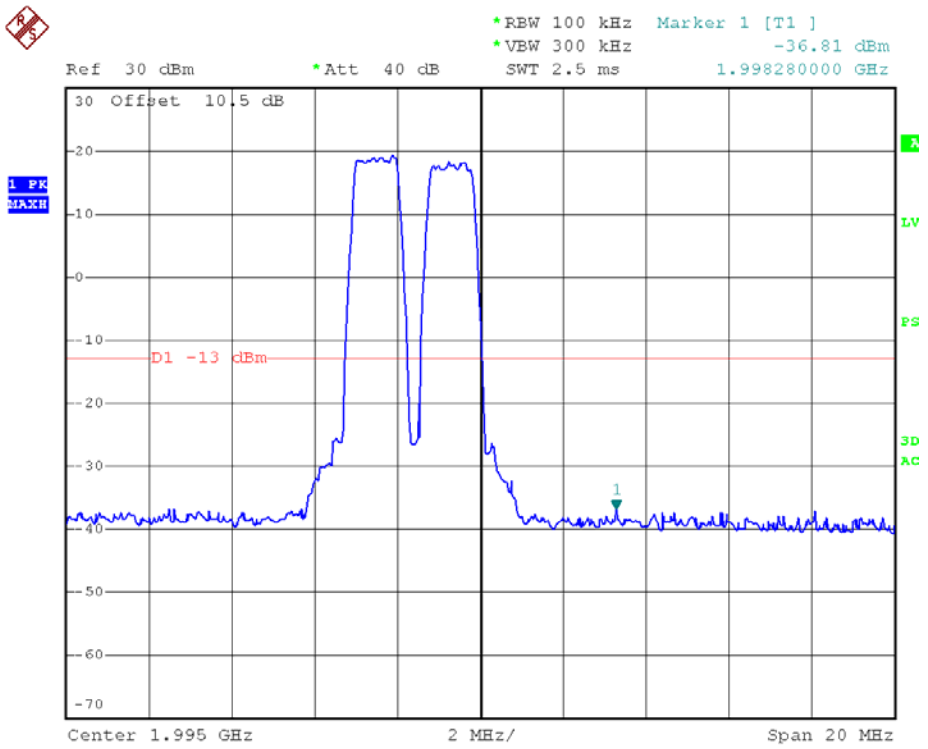
1900MHz-WCDMA downlink-Upper Edge



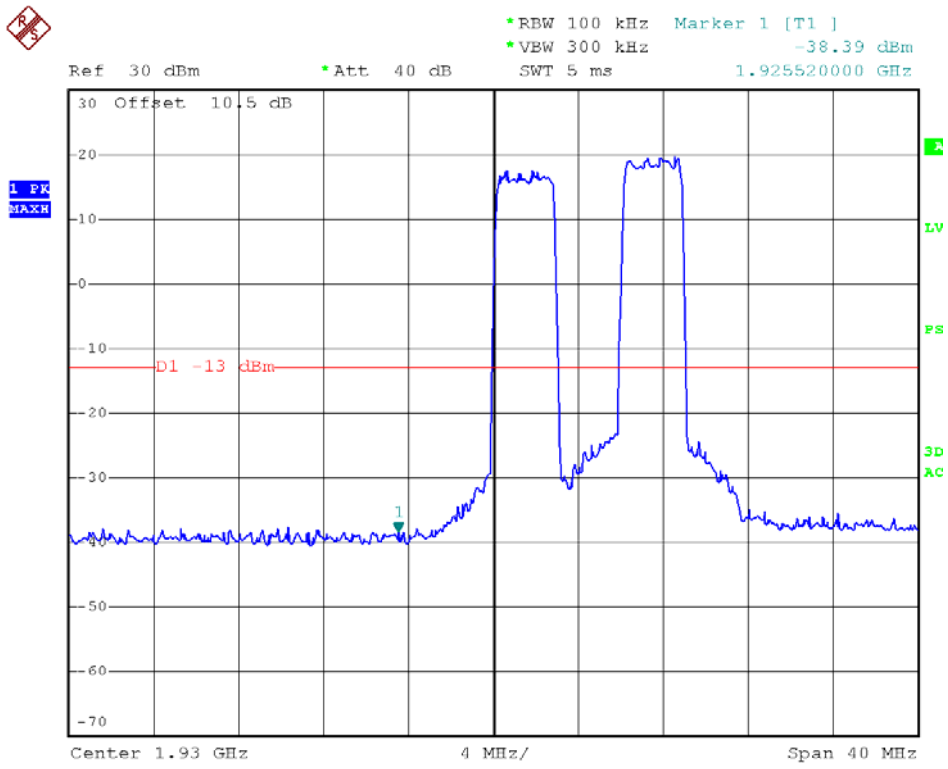
190MHz-LTE-1.4M downlink-Lower Edge



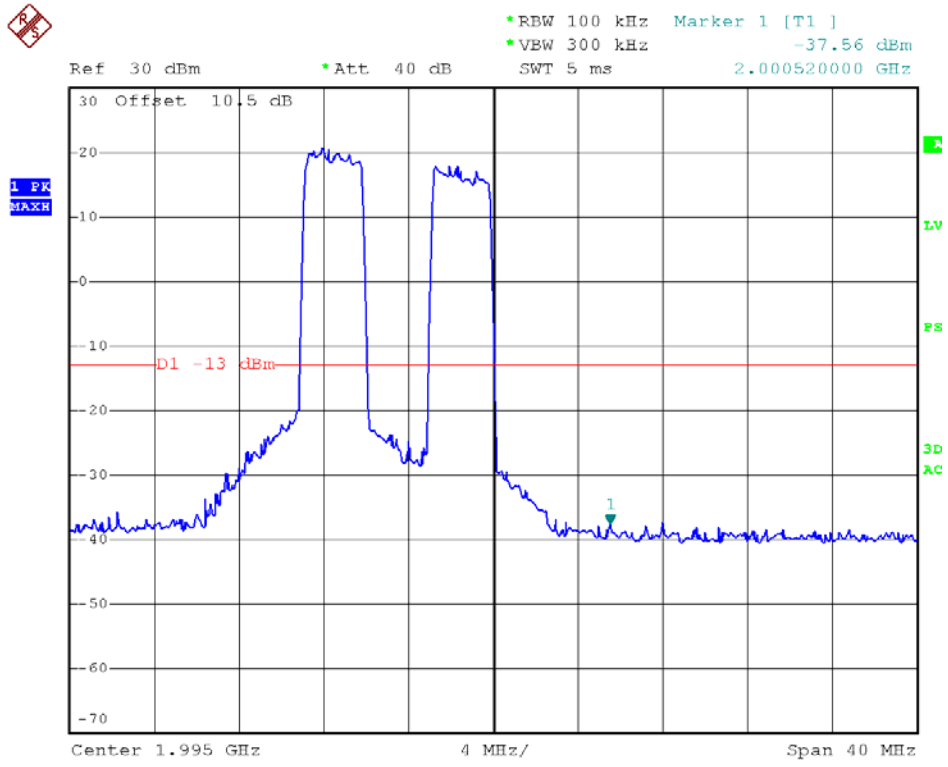
1900MHz-LTE-1.4M downlink-Upper Edge



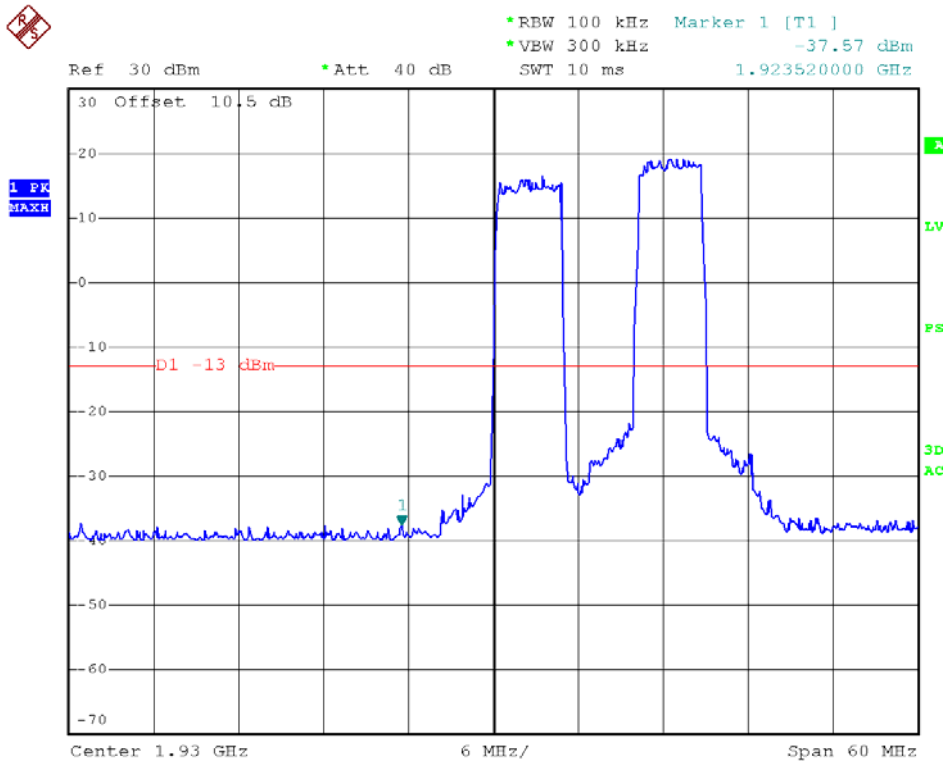
1900MHz-LTE-3M downlink-Lower Edge



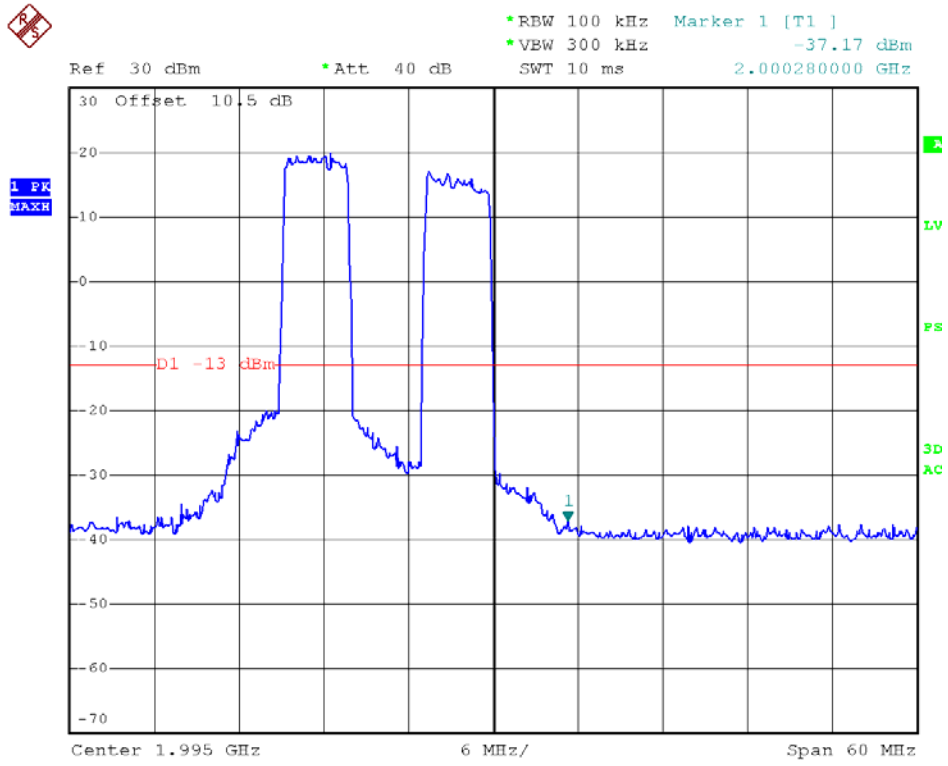
1900MHz-LTE-3M downlink-Upper Edge



1900MHz-LTE-5M downlink-Lower Edge



1900MHz-LTE-5M downlink-Upper Edge



Remark:

For the test in two signal input or intermodulation,test input signal f1 and f2 will consider as follows conditions:

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

8)f1 is the frequency lower,f2 is the frequency highter,△f is the channel spacing;

9)in lower edge test, f1 is the lower frequency+1 channel frequency,and f2 is+2 channel frequency;

10) in higher edge test, f1 is the higher frequency-2 channel frequency,and f2 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 F1=2F1-F2,and F2=2f2-f1,when the f1 and f2 frequency select above,

a)in lower edge test ,F1=2f1-(f1+△f)=f1-△f=lower dege frequency;

b) in higher edge test ,F2=2f2-(f1-△f)=f1+△f=higher dege frequency

4.2.7 OUT OF BAND REJECTION

Test Date:	11 December, 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 ±0.00025%(±2.5ppm)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	850MHz Downlink and Uplink ports 1900MHz Downlink and Uplink ports

Test configuration

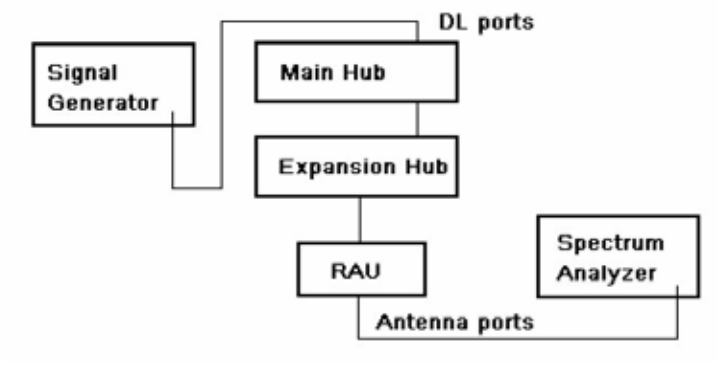


Fig.1 Down Link Configuration

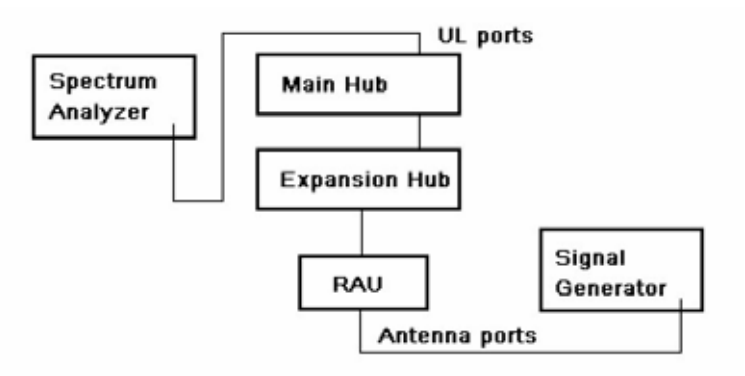


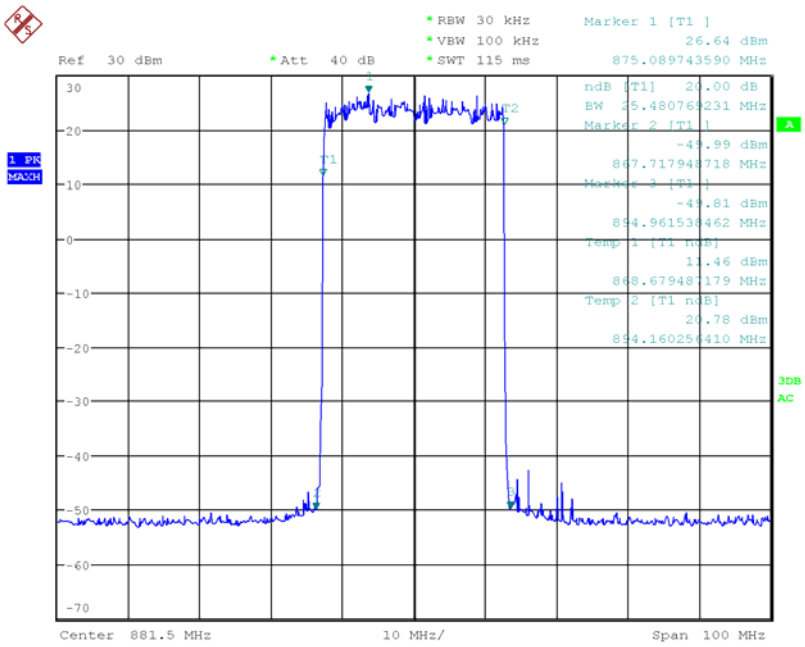
Fig.2 Up Link Configuration

Test procedure	1.Connecet 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; 6Signal 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

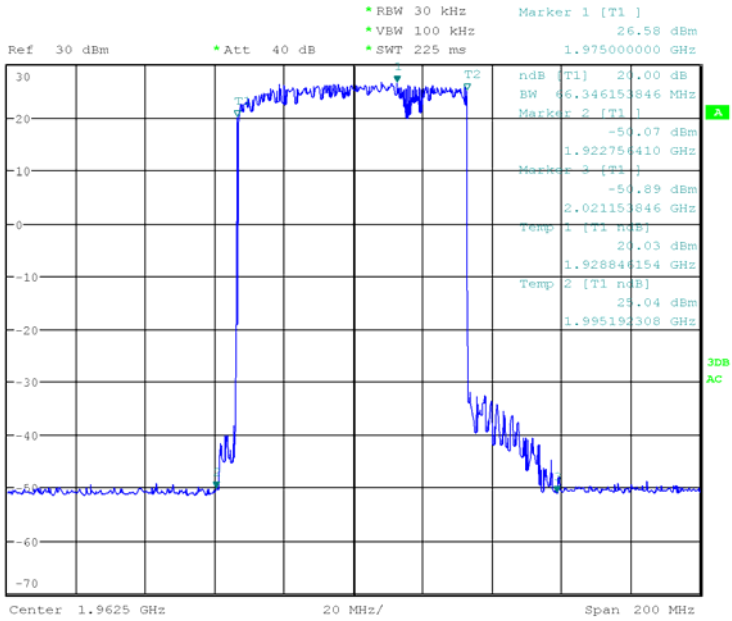
850MHz Band

850MHz-down link



1900MHz Band

1900MHz-down link



4.2.8 FREQUENCY STABILITY

Test Date:	11 December, 2012
Test Method:	FCC part 2.1055
Test Requirement:	FCC part 22.355& FCC part 24.235
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 ±0.00025%(±2.5ppm)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	850MHz Downlink and Uplink ports 1900MHz Downlink and Uplink ports
Test procedure	1. Temperature conditions: a)record the 20℃ and normal voltage frequency value as reference point; b)vary the temperature from -30℃ to 60℃ with step 10℃ c)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 : a)record the 20℃ and normal voltage frequency value as reference point; b)vary the voltage from -15% norminal voltage to +15% voltage c)read the frequency at the relative voltage.

4.2.8.1 MEASUREMENT RECORD

1.Frequency Stability vs temperature

850MHz

Temperature(℃)	Frequency(MHz)	Tolerance(ppm)
60	881.500479	0.543
50	881.500466	0.529
40	881.500513	0.582
30	881.500482	0.547
20	881.500471	0.534
10	881.500458	0.519
0	881.500419	0.475
-10	881.500421	0.478
-20	881.500409	0.464
-30	881.500415	0.471

1900MHz

Temperature(℃)	Frequency(MHz)	Tolerance(ppm)
60	1962.500473	0.241
50	1962.500455	0.232
40	1962.500462	0.235
30	1962.500422	0.215
20	1962.500464	0.236
10	1962.500515	0.262
0	1962.500479	0.244
-10	1962.500277	0.141
-20	1962.500388	0.198
-30	1962.500385	0.196

2.Frequency Stability vs voltage

850MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	881.500476	0.540
120	881.500478	0.542
138(120*1.15)	881.500466	0.529

1900MHz

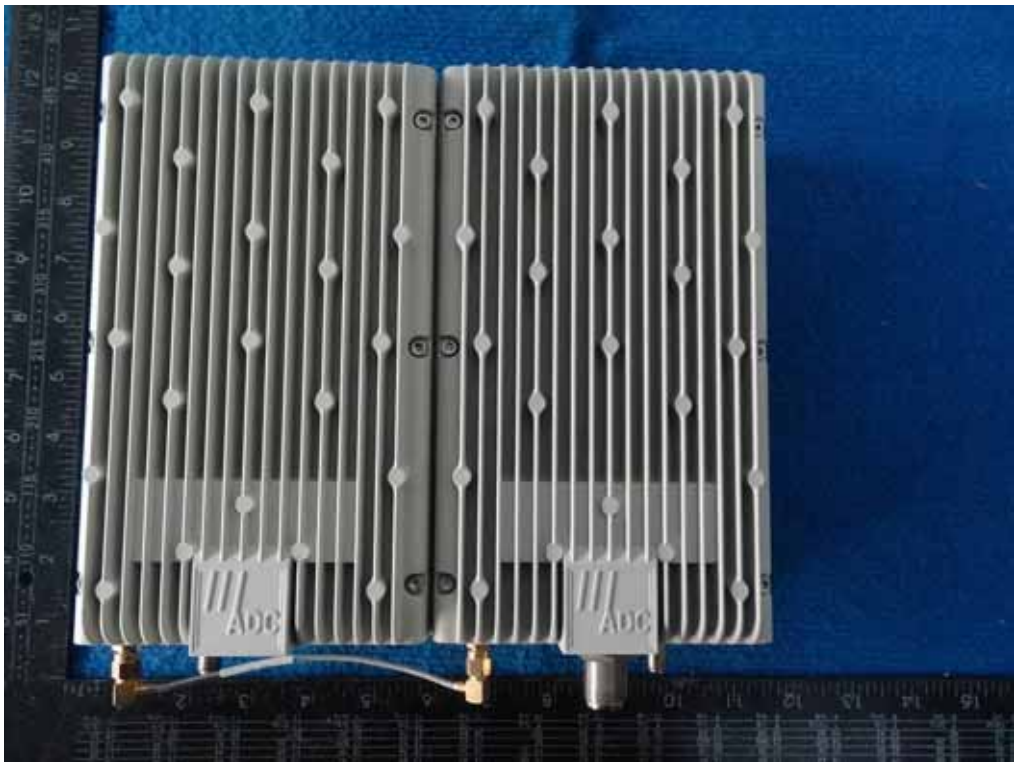
Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	1962.500467	0.238
120	1962.500464	0.236
138(120*1.15)	1962.500479	0.244

APPENDIX A:PHOTOGRAPH OF THE TEST CONFIGURATION

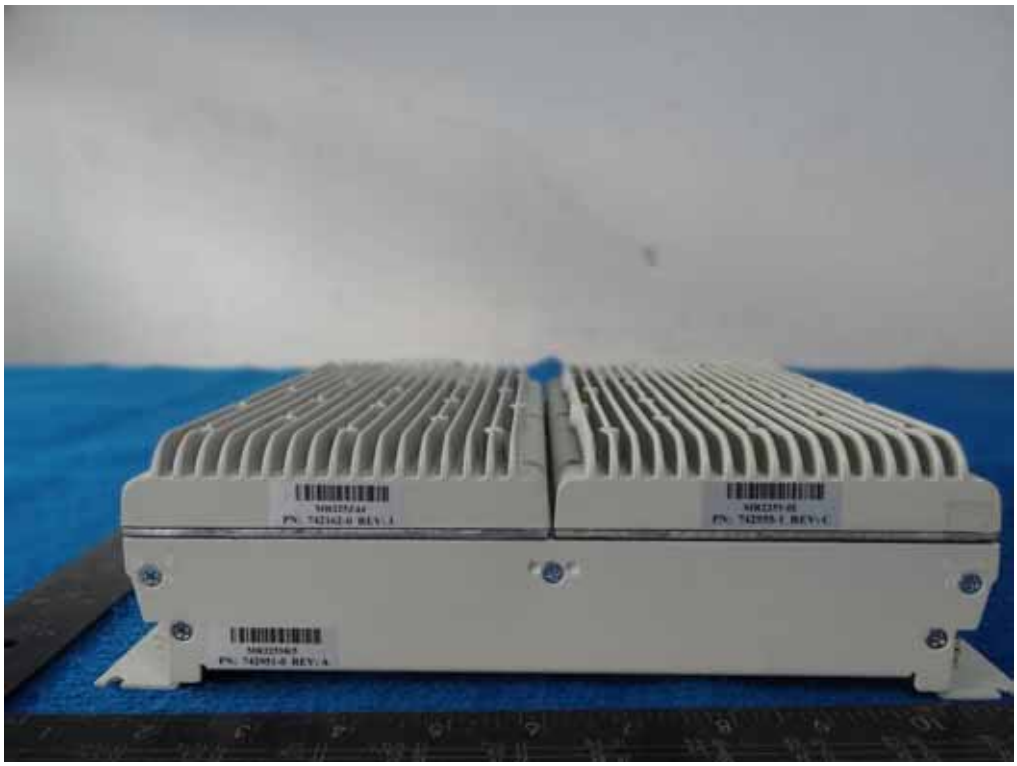
RE (Blowe 1GHz)

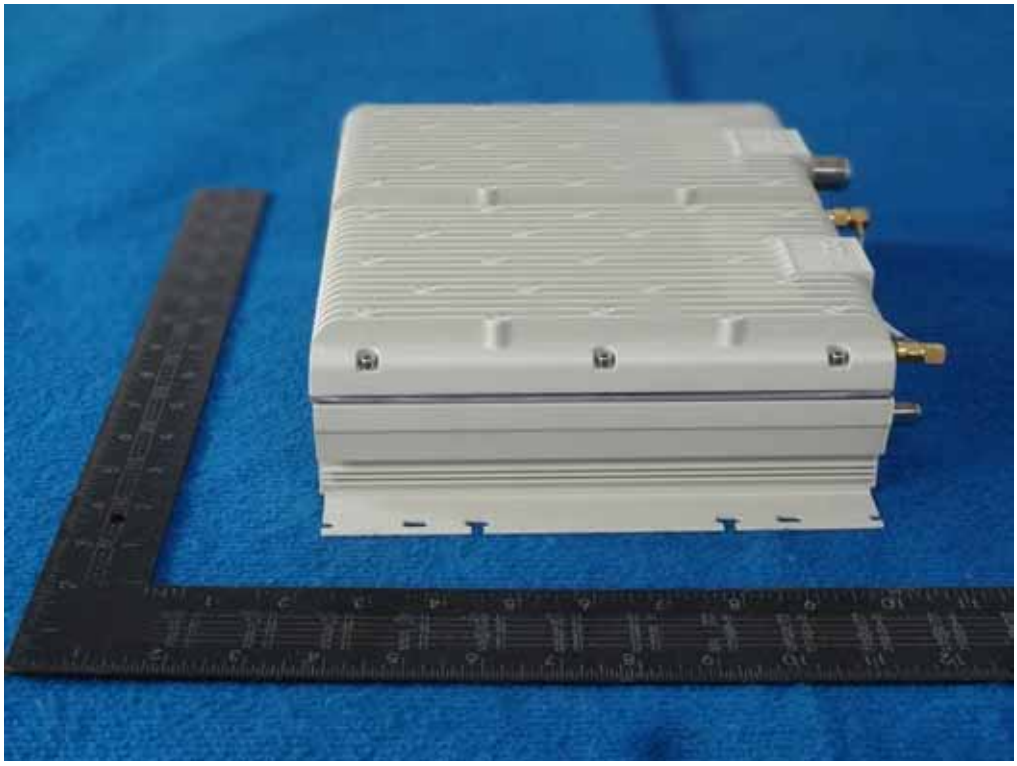
RE (Above 1GHz)

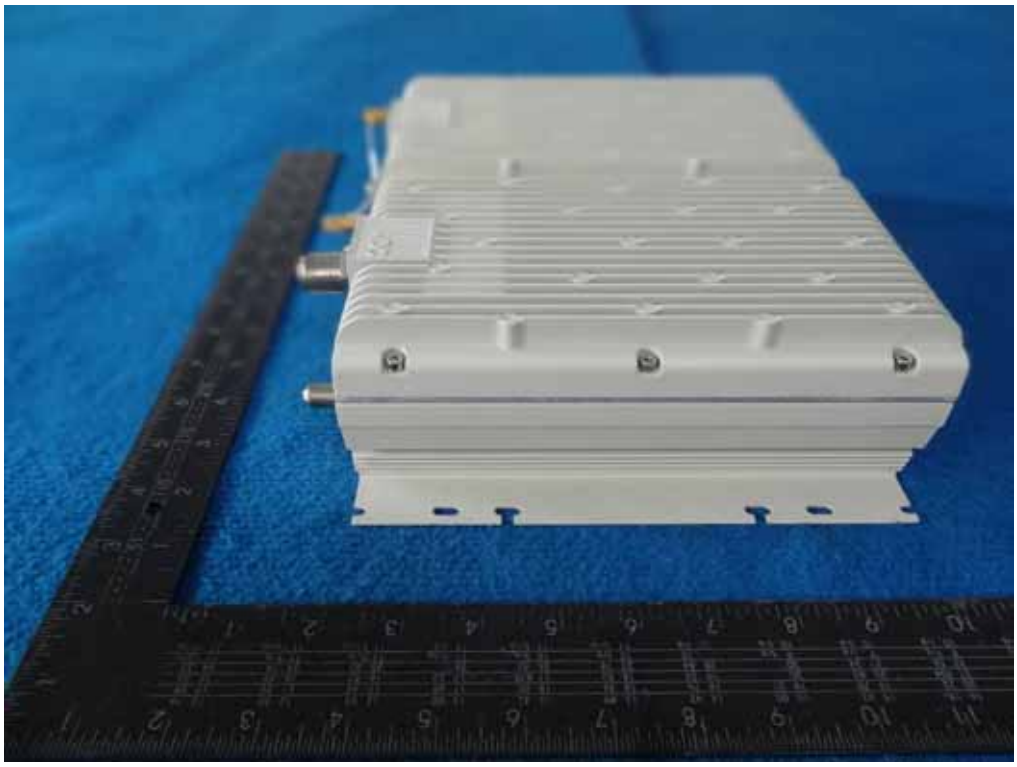
APPENDIX B: PHOTOGRAPHS OF EUT

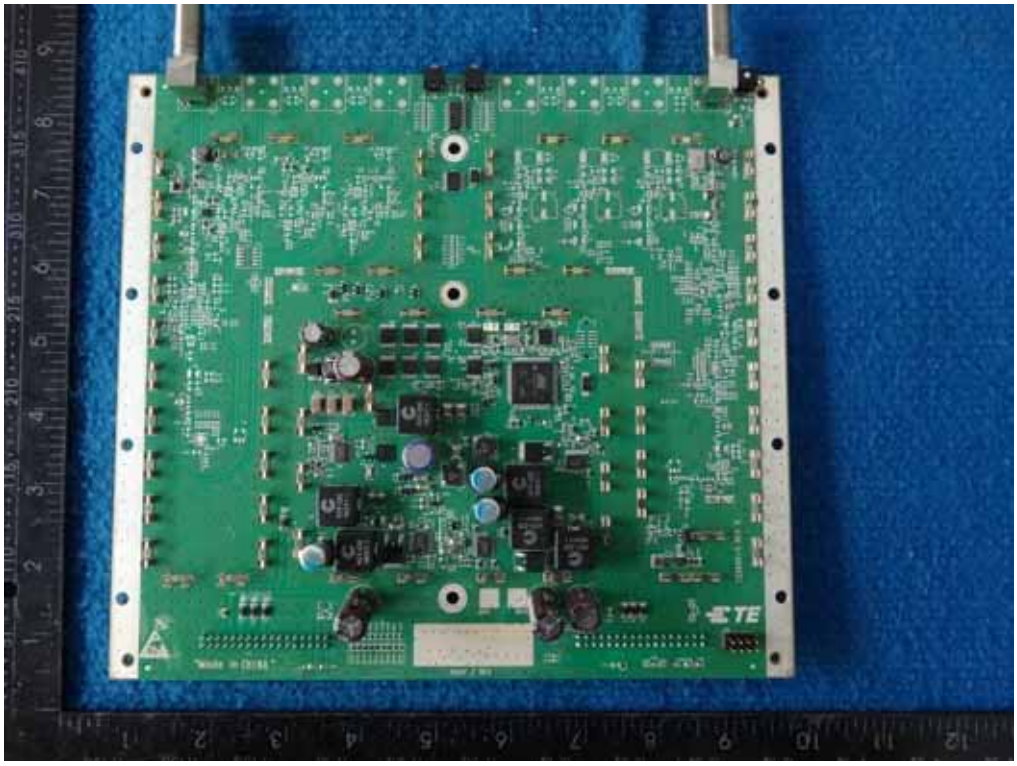



Finmware Ver
07.02.00.12
SECONDARY
REV
LINK
STATUS
SECONDARY
FWD









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