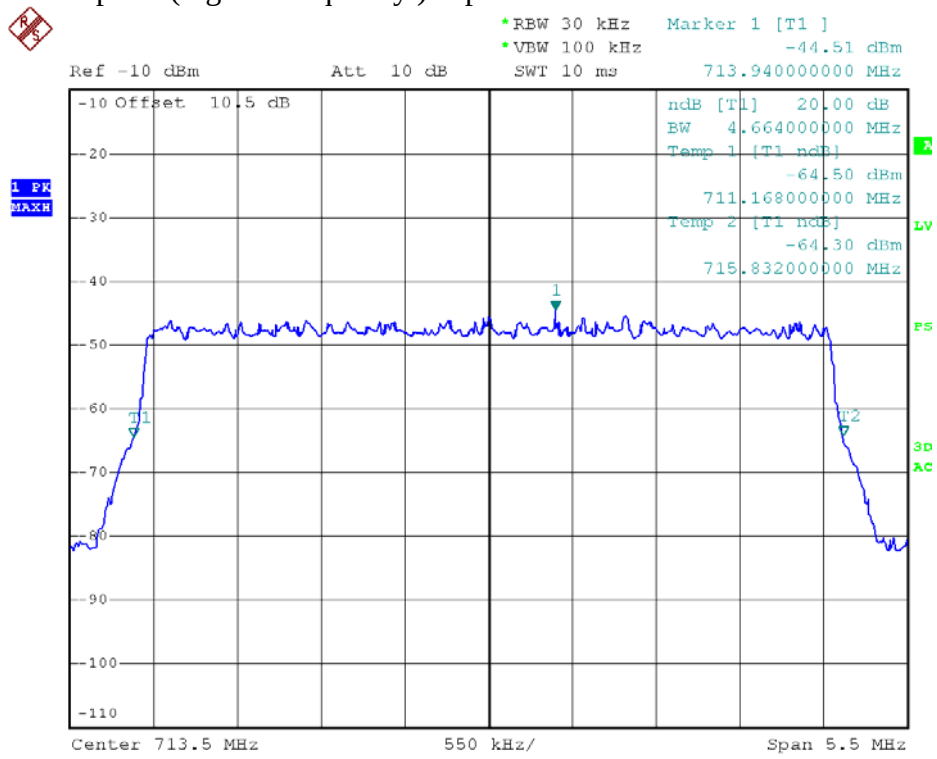
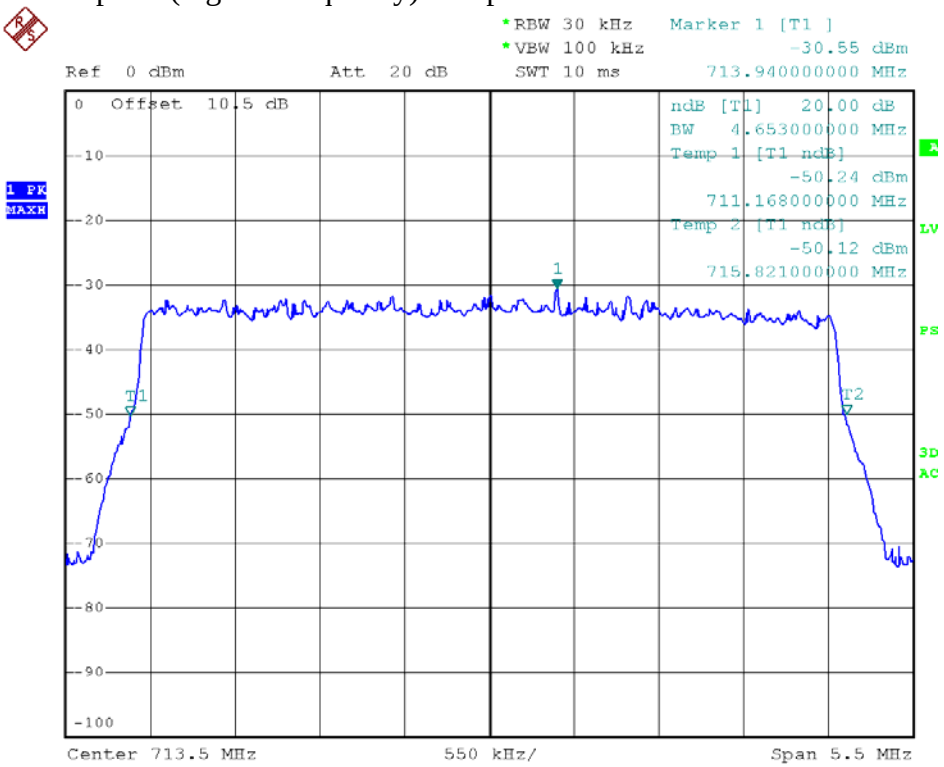
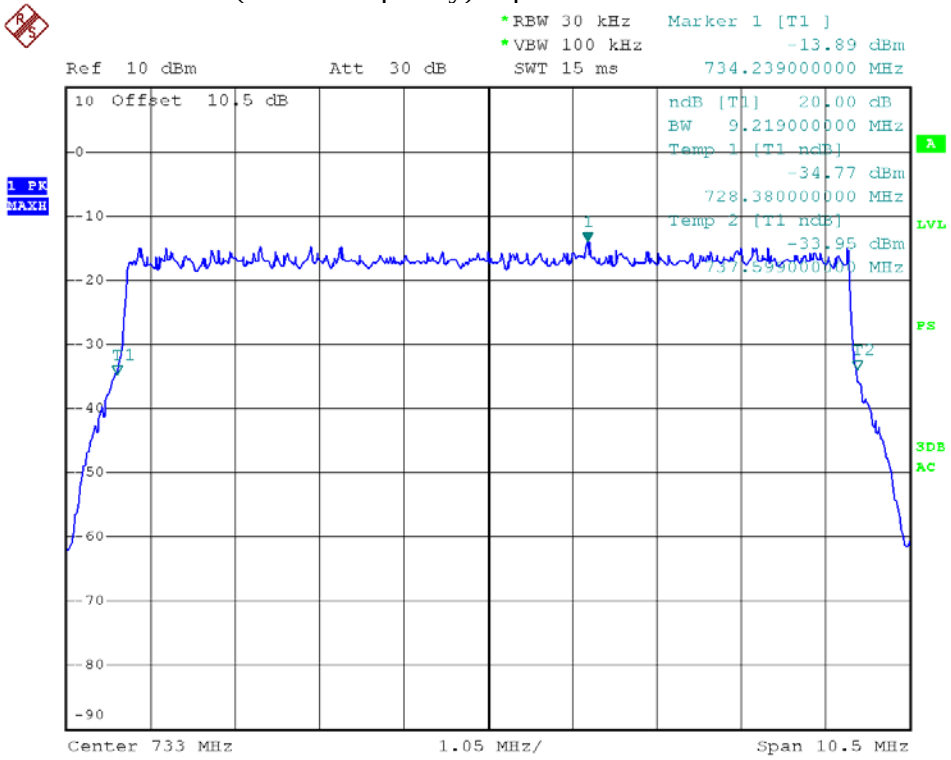
700MHz-LTE-5M uplink (highest frequency)-Input



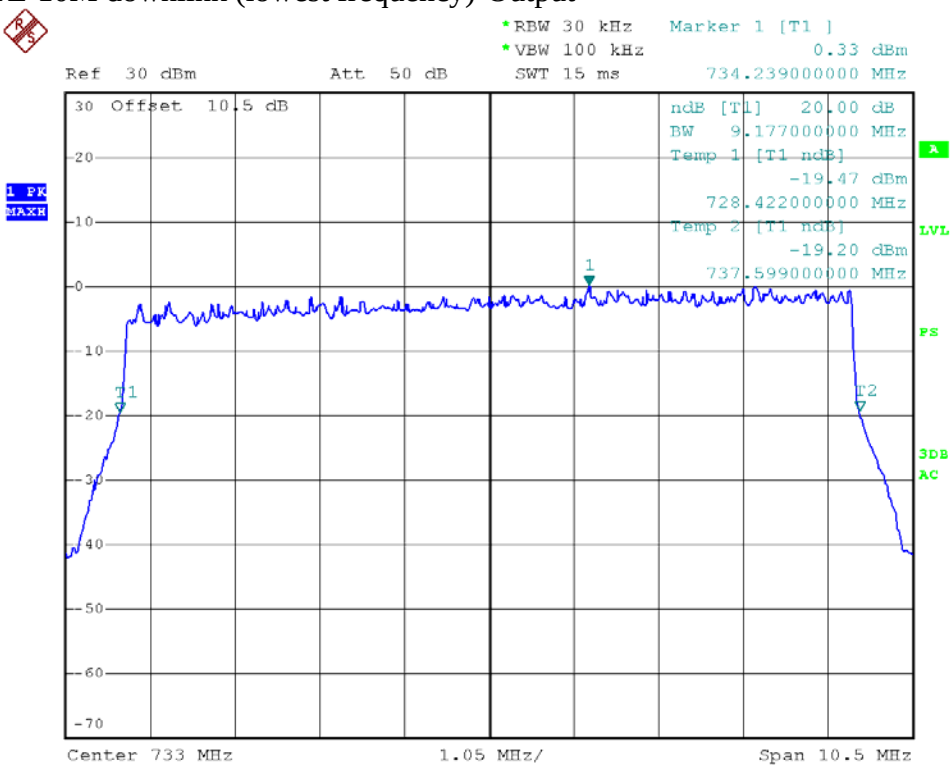
700MHz-LTE-5M uplink (highest frequency)- Output



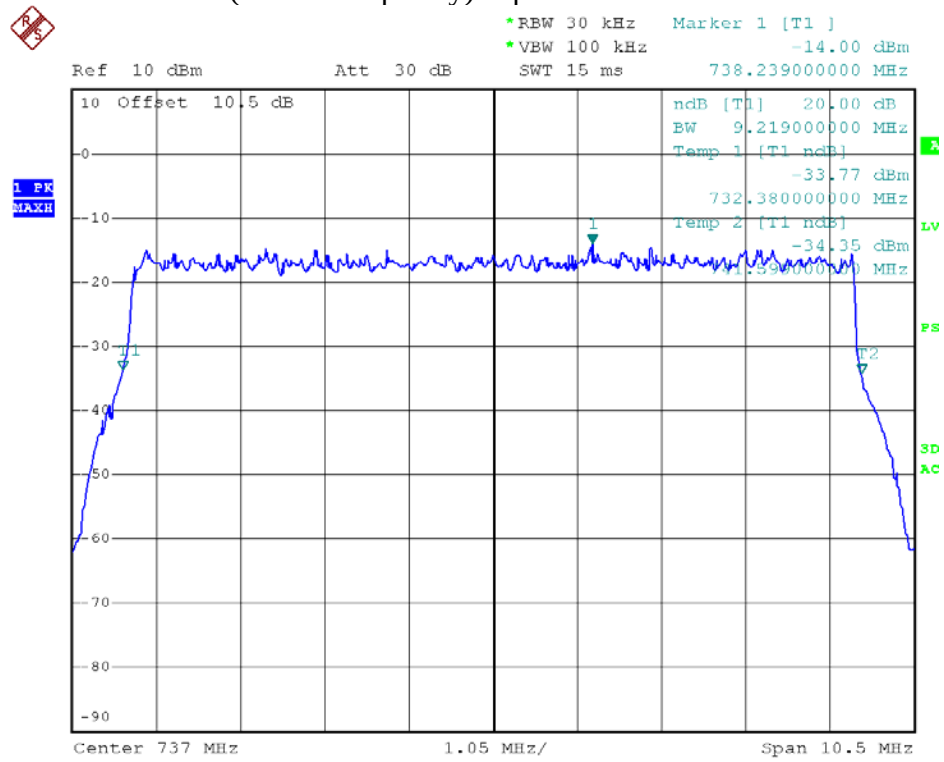
700MHz-LTE-10M downlink (lowest frequency)-Input



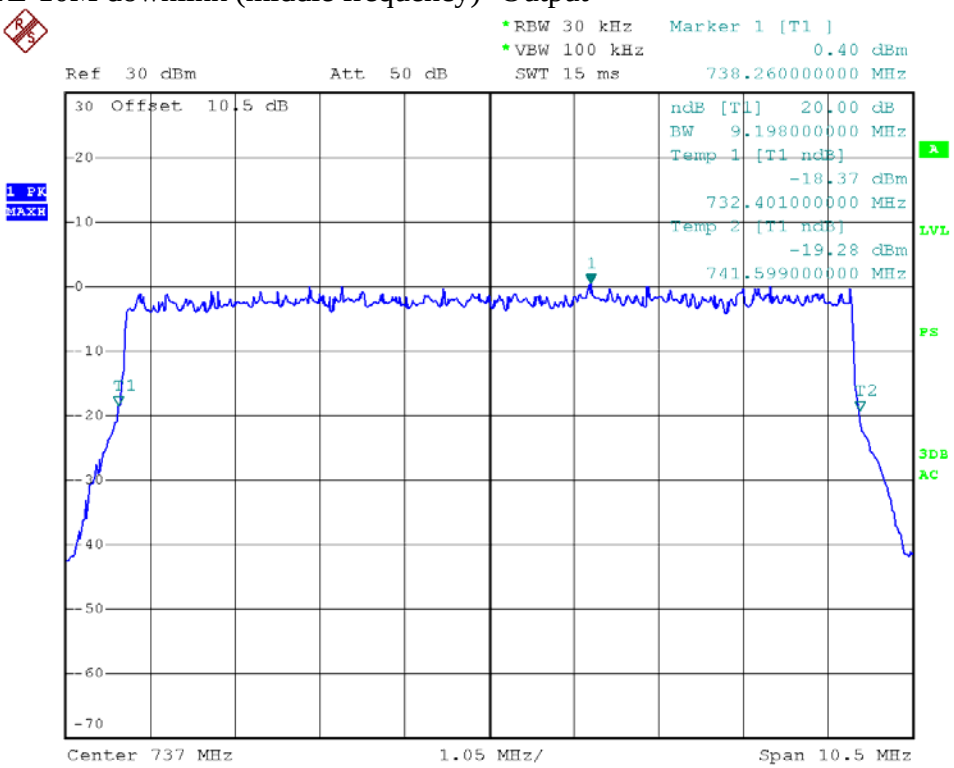
700MHz-LTE-10M downlink (lowest frequency)-Output



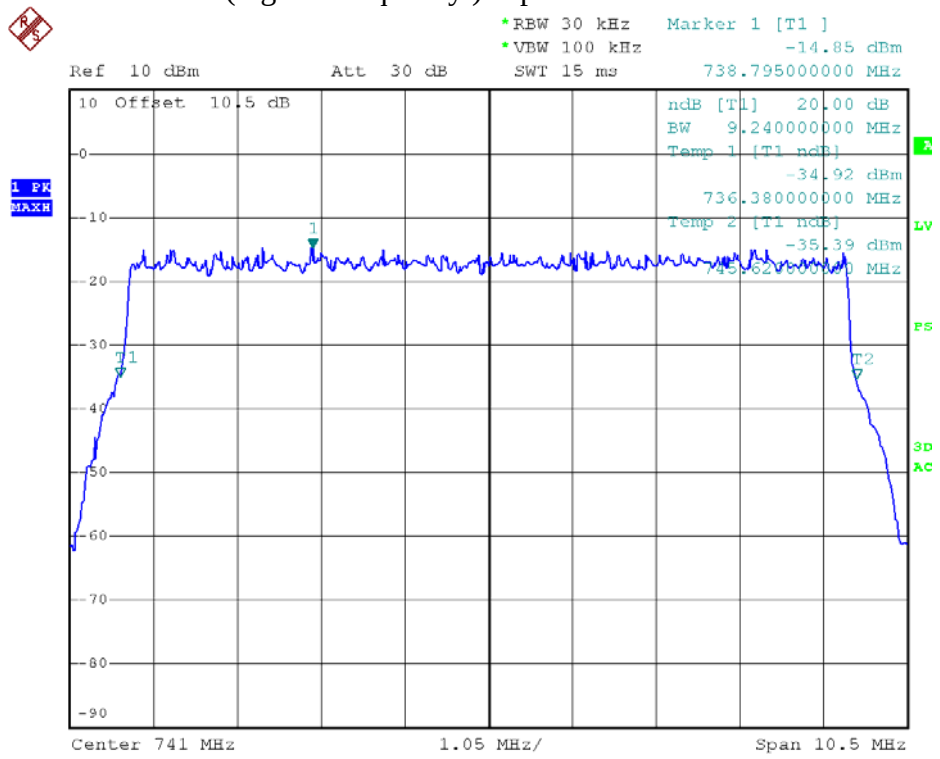
700MHz-LTE-10M downlink (middle frequency)-Input



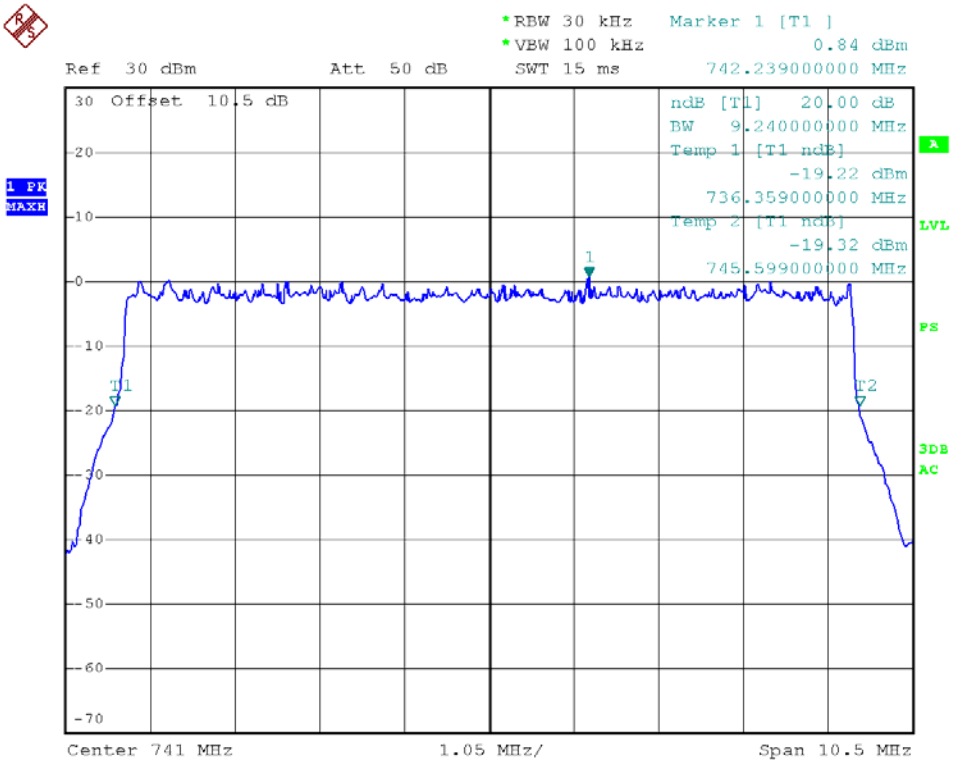
700MHz-LTE-10M downlink (middle frequency)- Output



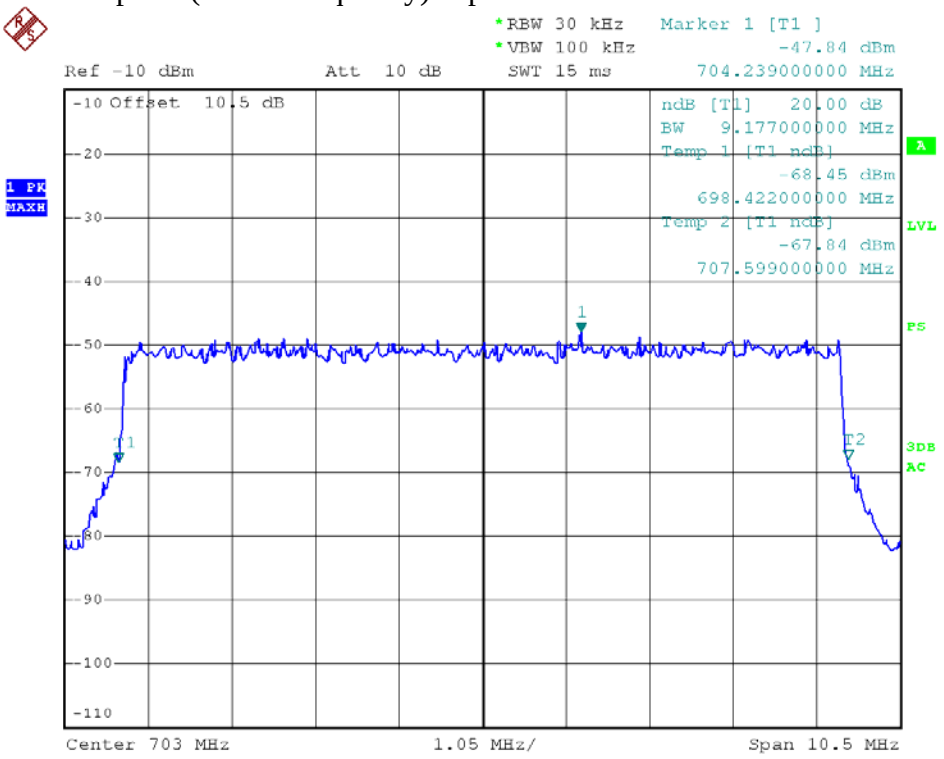
700MHz-LTE-10M downlink (highest frequency)-Input



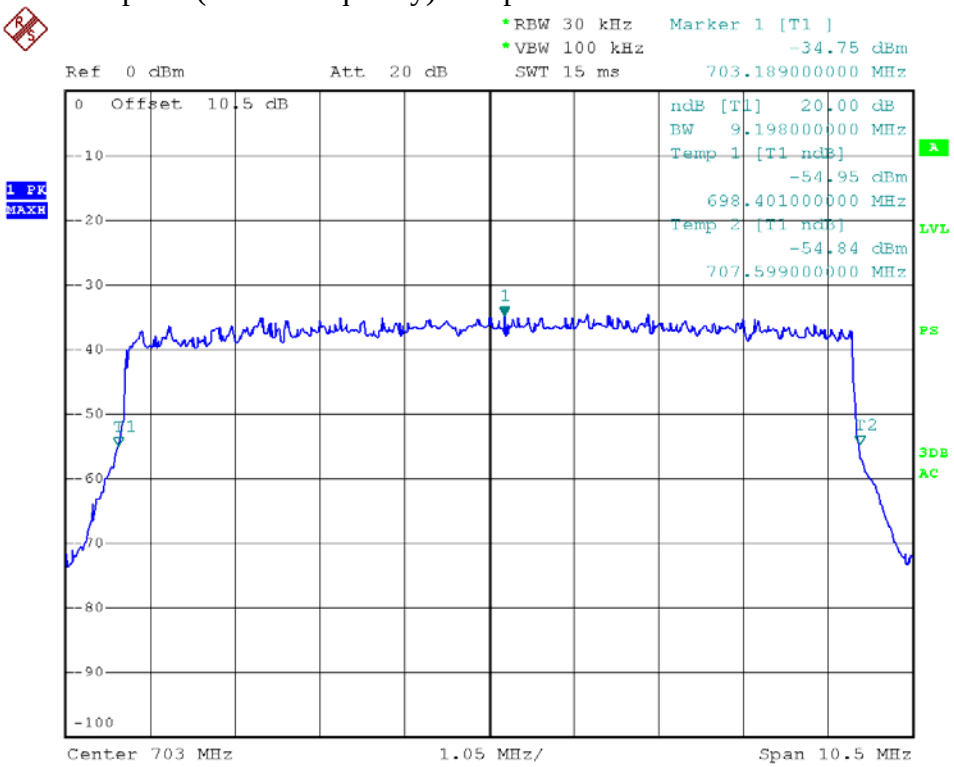
700MHz-LTE-10M downlink (highest frequency)- Output



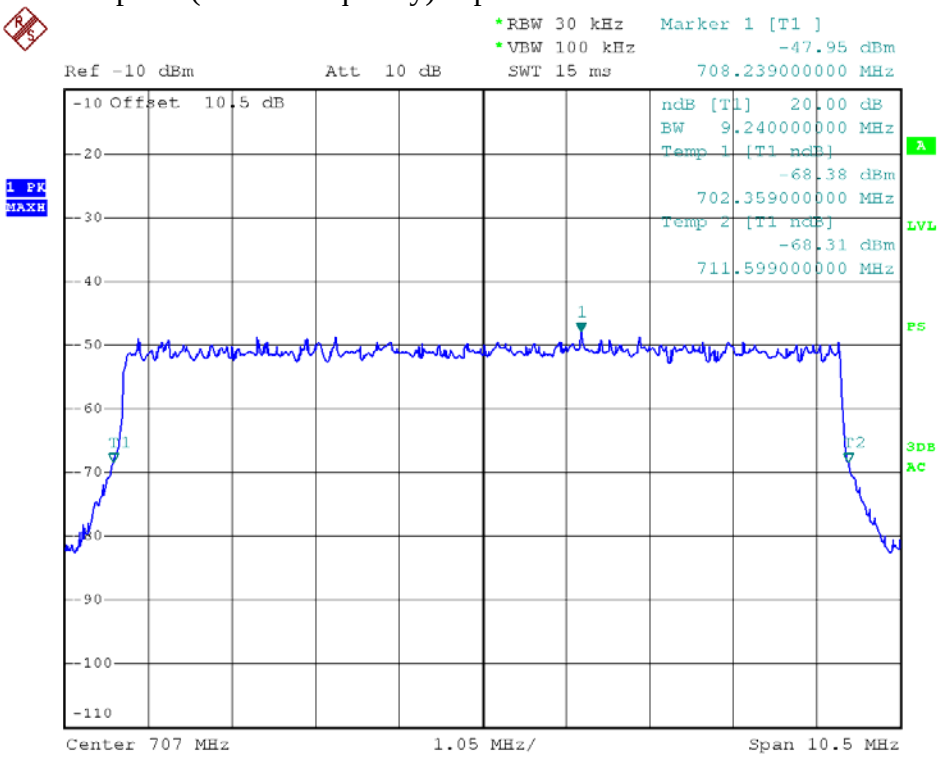
700MHz-LTE-10M uplink (lowest frequency)-Input



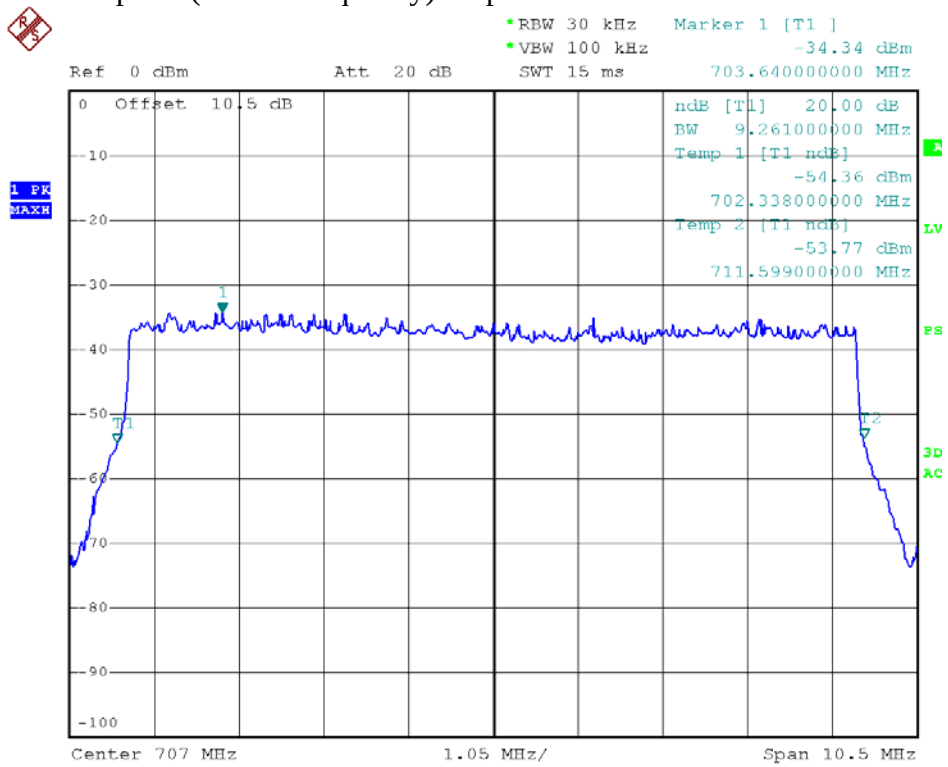
700MHz-LTE-10M uplink (lowest frequency)- Output



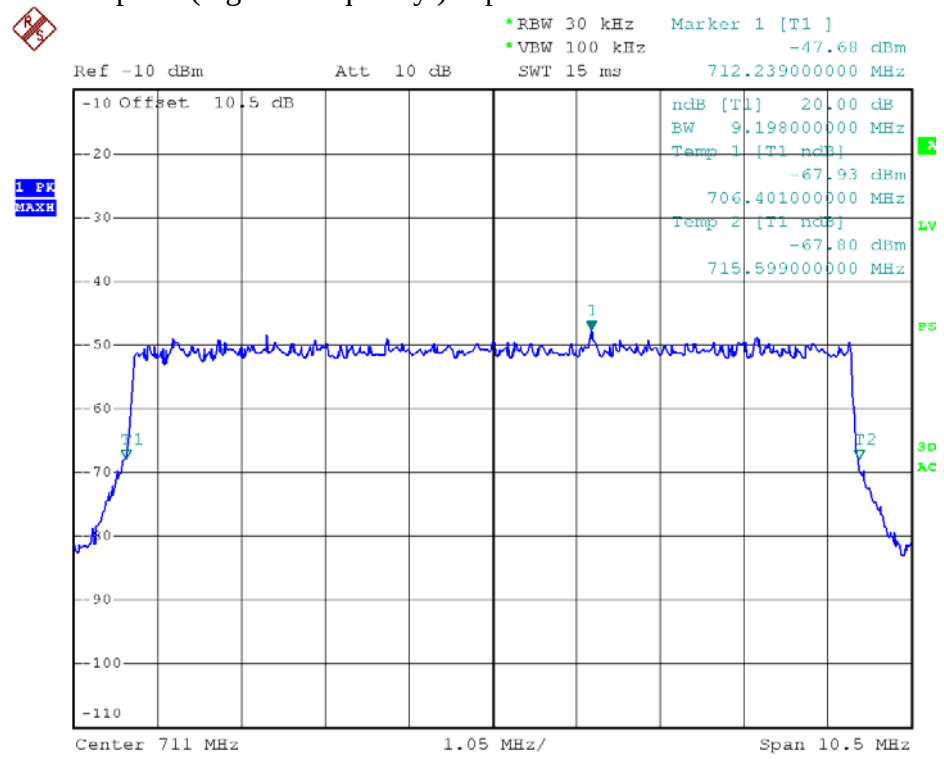
700MHz-LTE-10M uplink (middle frequency)-Input



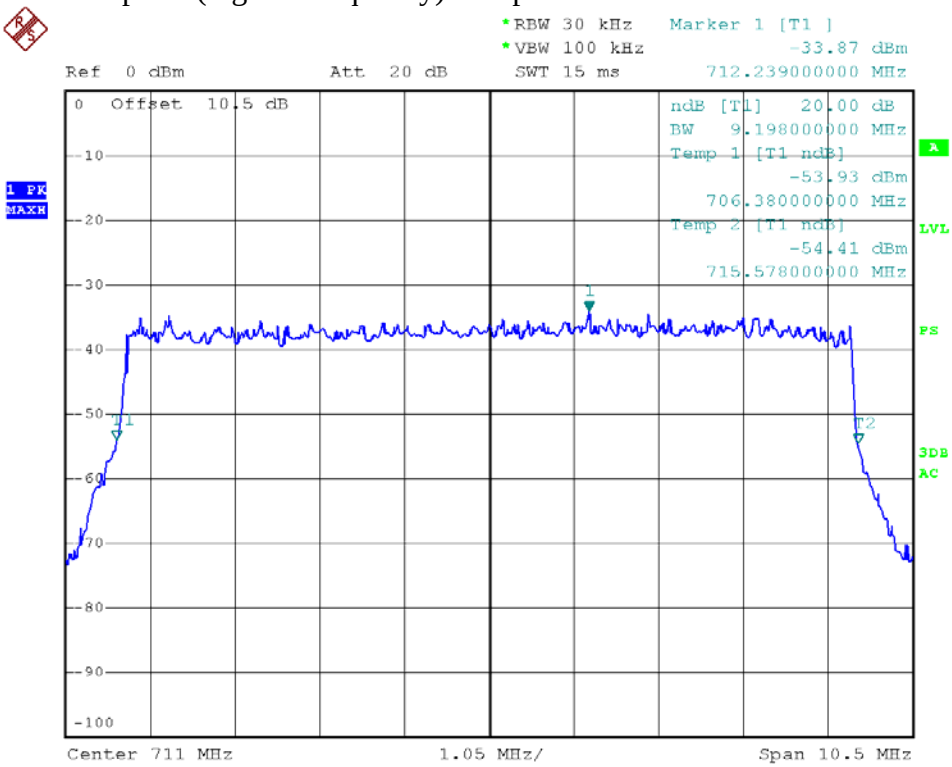
700MHz-LTE-10M uplink (middle frequency)-Ouput



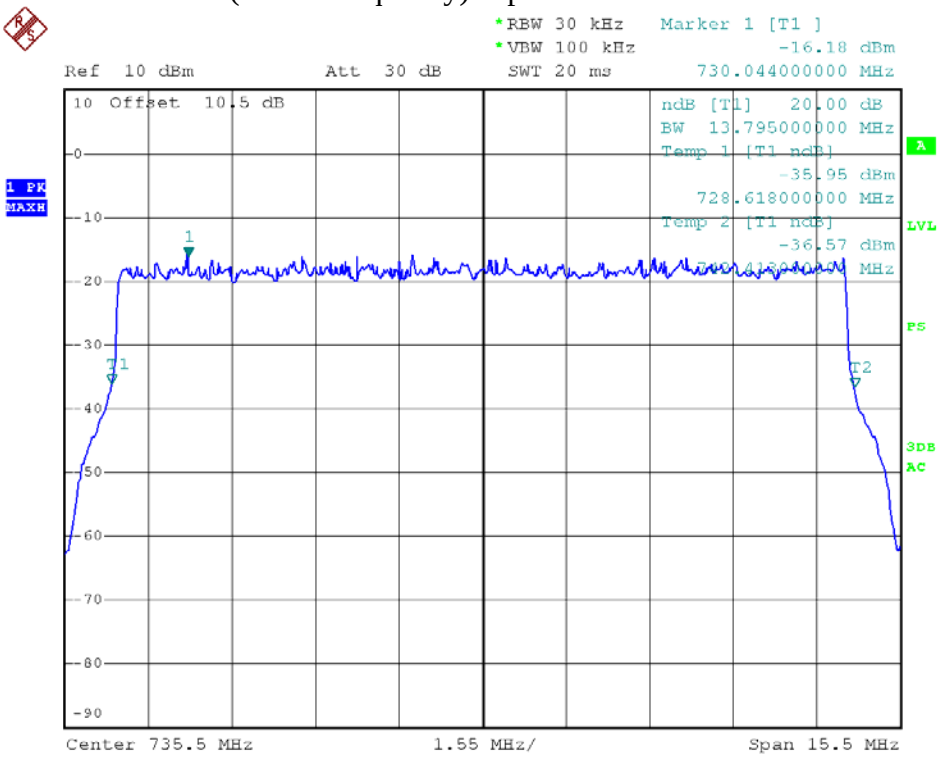
700MHz-LTE-10M uplink (highest frequency)-Input



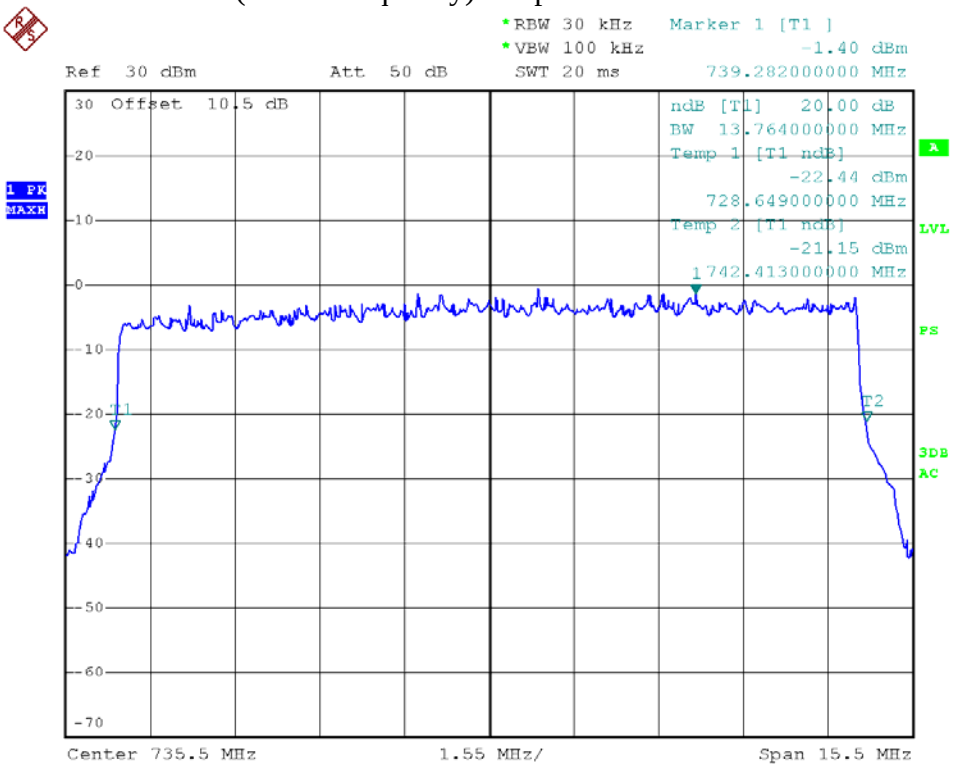
700MHz-LTE-10M uplink (highest frequency)- Output



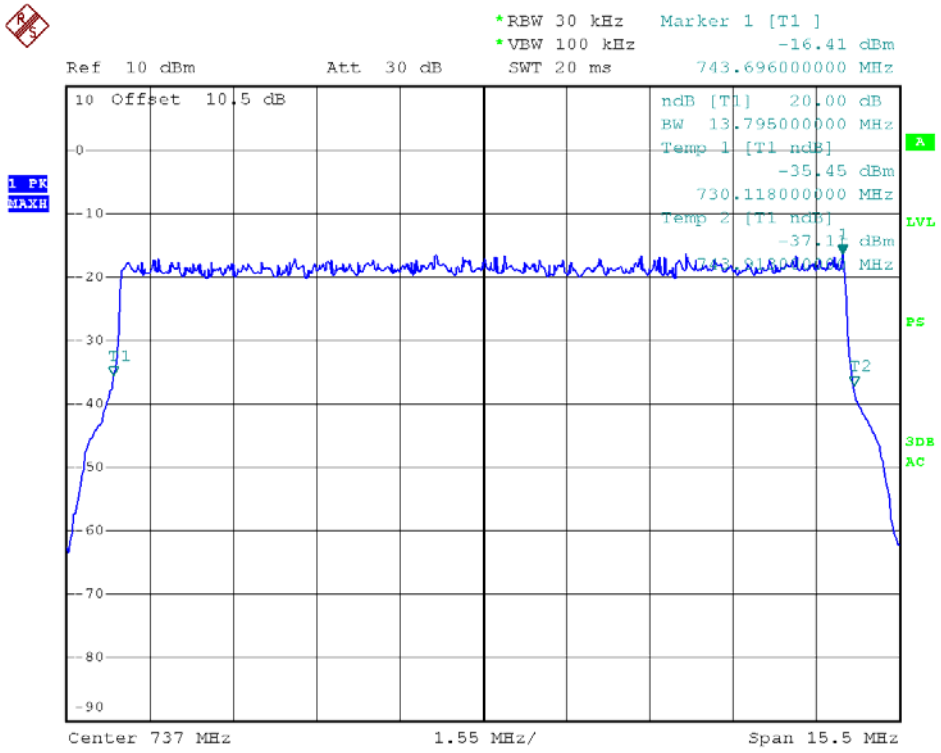
700MHz-LTE-15M downlink (lowest frequency)-Input



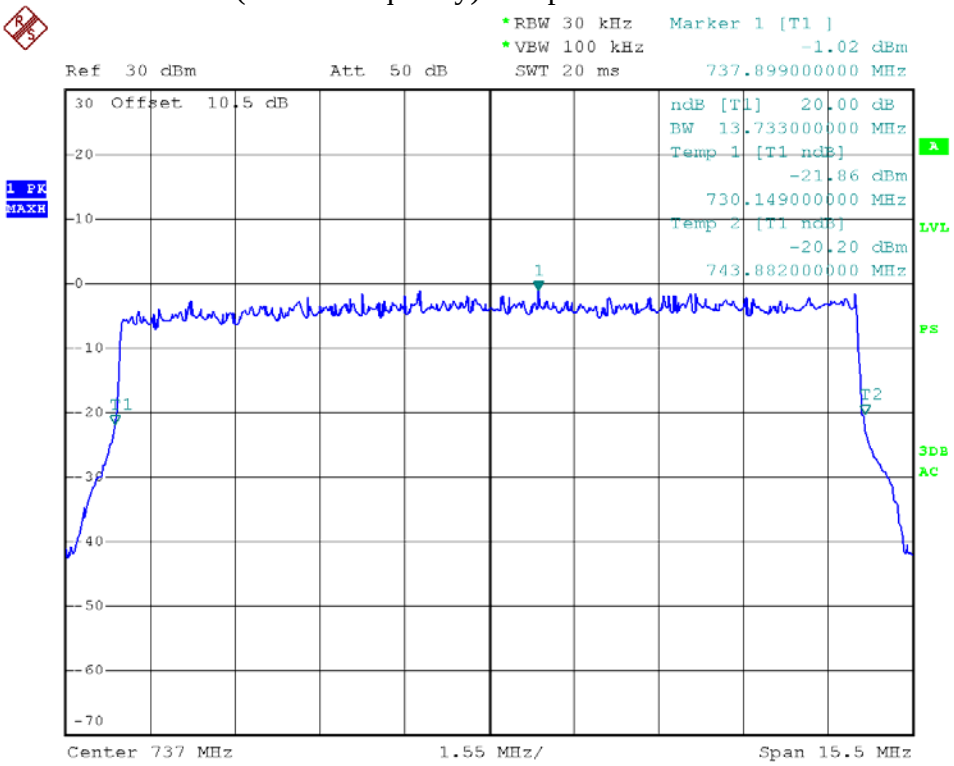
700MHz-LTE-15M downlink (lowest frequency)-Output



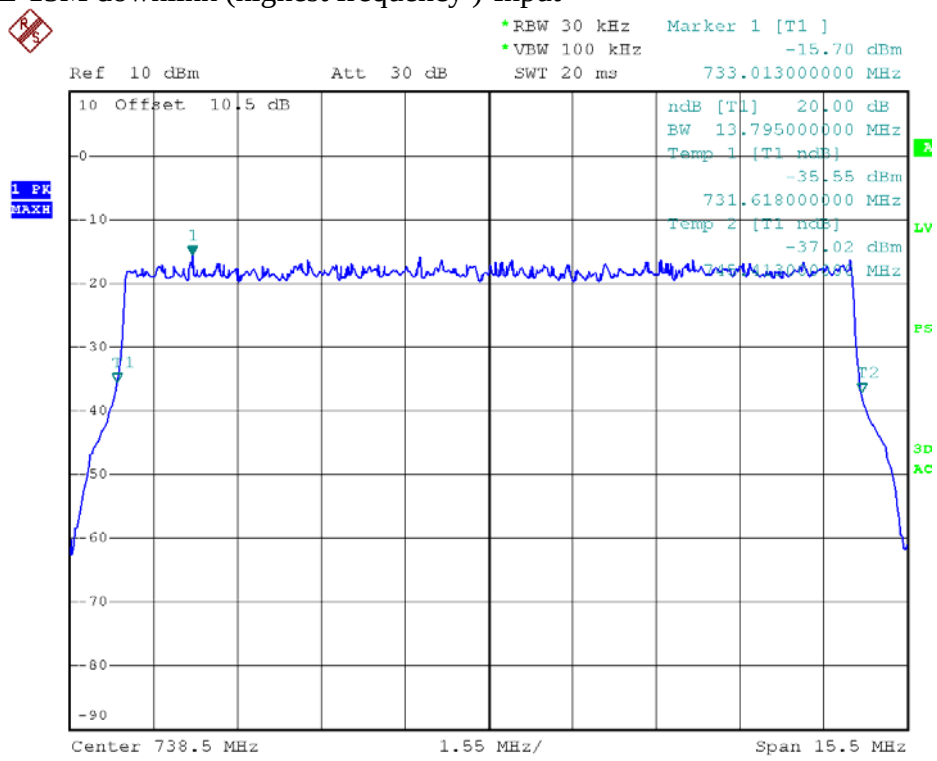
700MHz-LTE-15M downlink (middle frequency)-Input



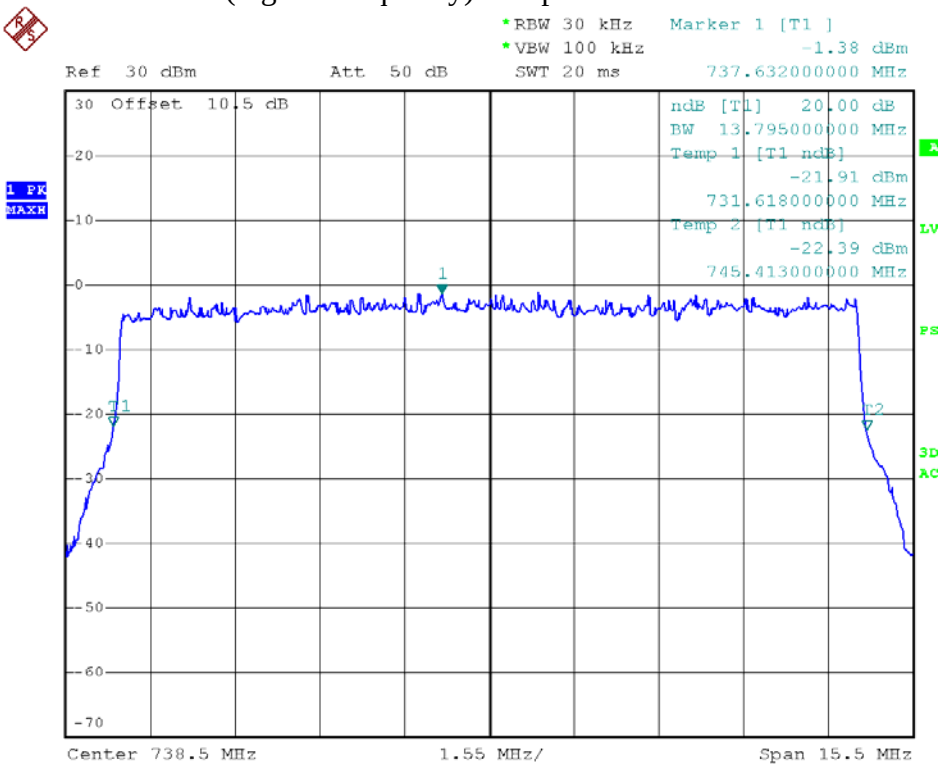
700MHz-LTE-15M downlink (middle frequency)- Output



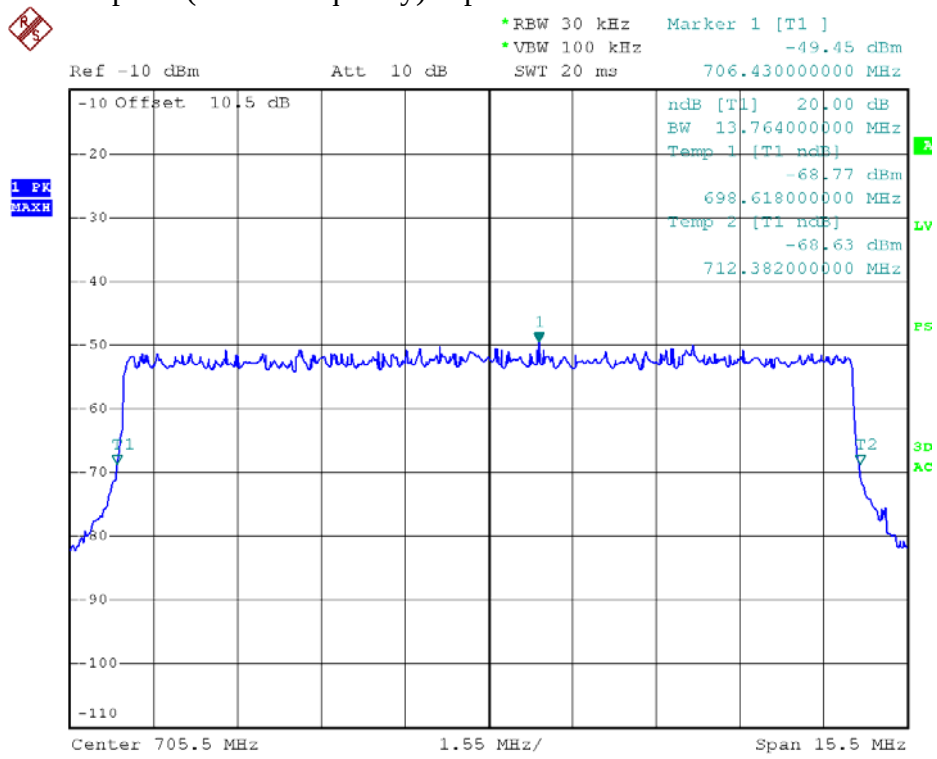
700MHz-LTE-15M downlink (highest frequency)-Input



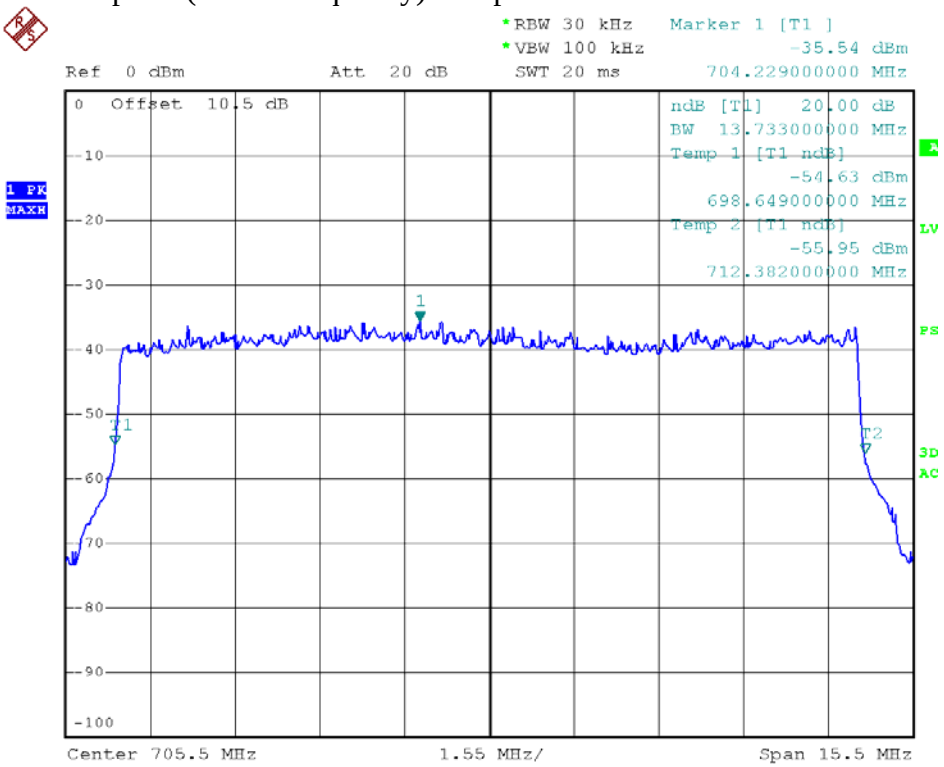
700MHz-LTE-15M downlink (highest frequency)- Output



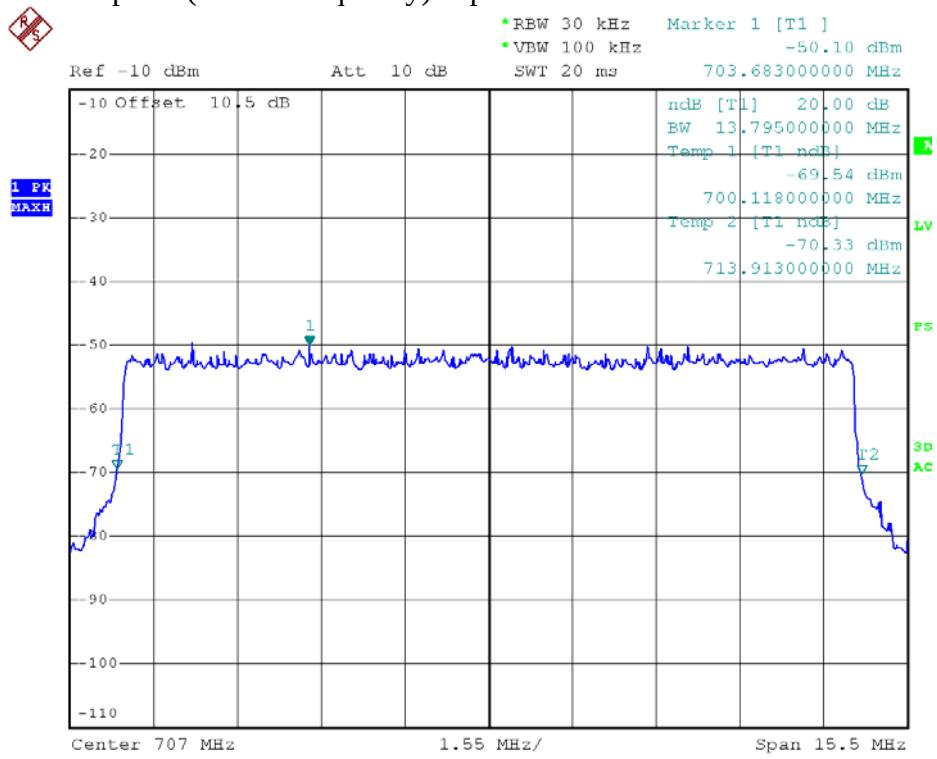
700MHz-LTE-15M uplink (lowest frequency)-Input



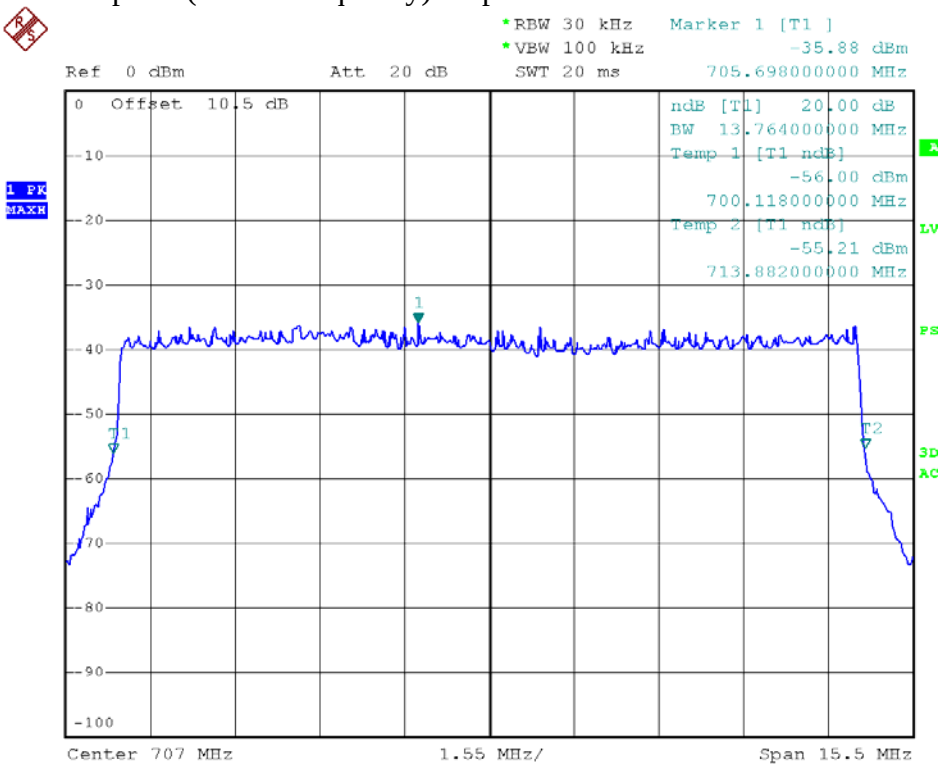
700MHz-LTE-15M uplink (lowest frequency)- Output



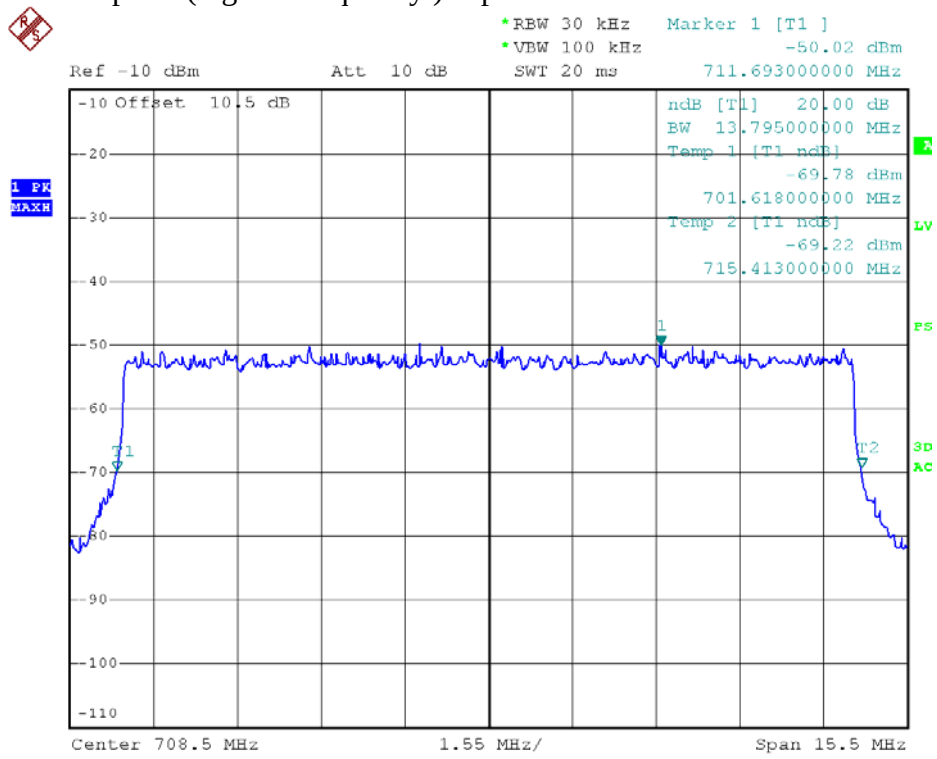
700MHz-LTE-15M uplink (middle frequency)-Input



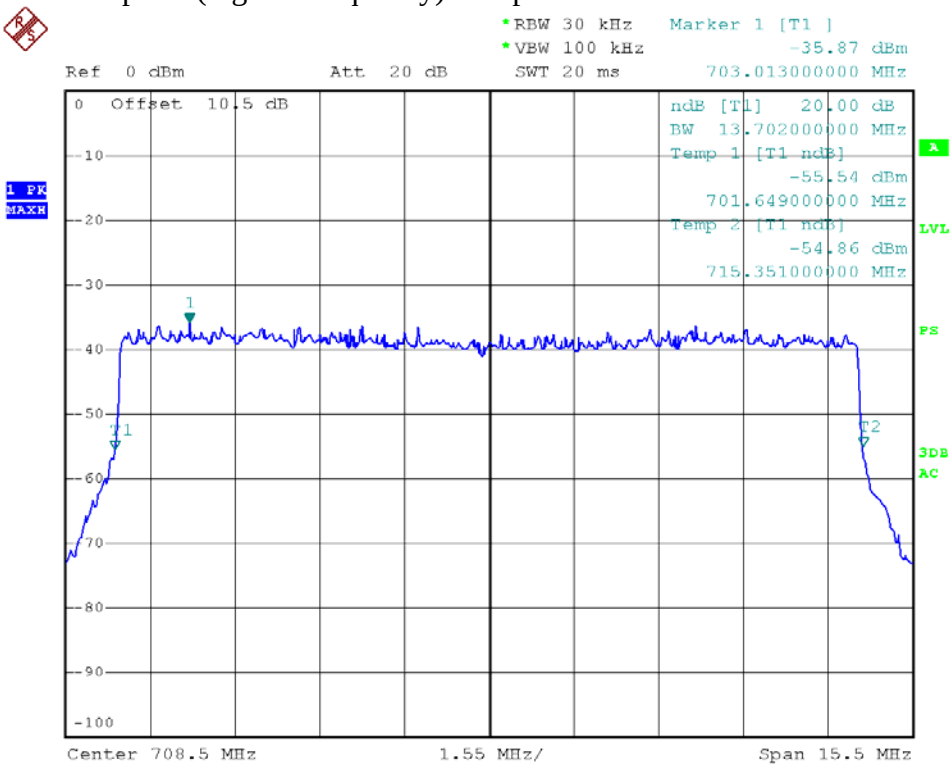
700MHz-LTE-15M uplink (middle frequency)-Ouput



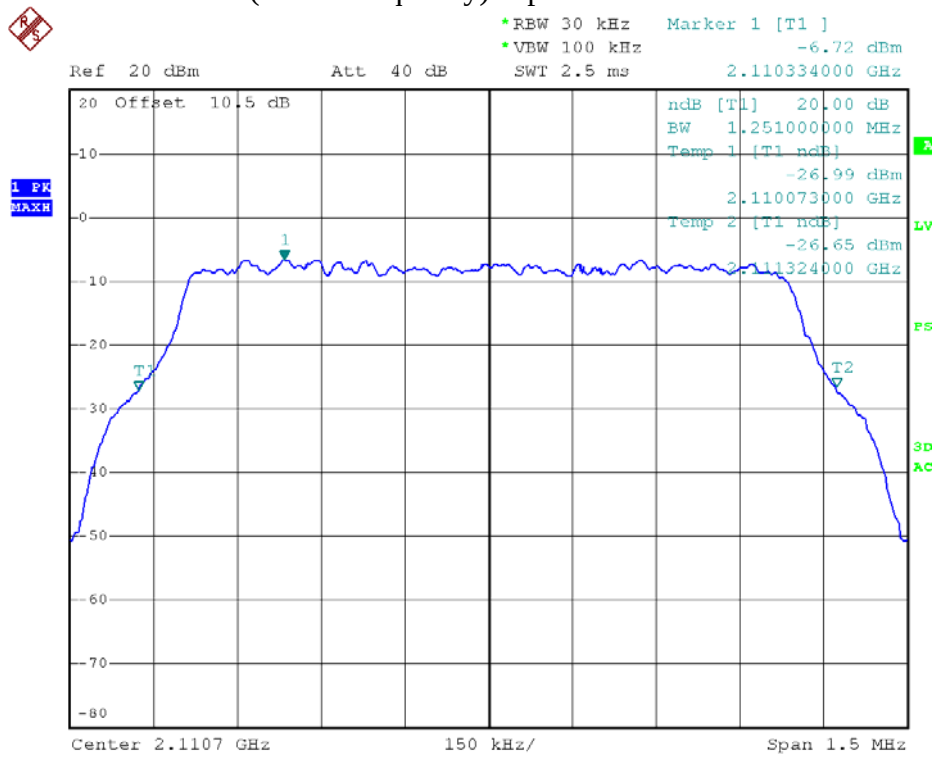
700MHz-LTE-15M uplink (highest frequency)-Input



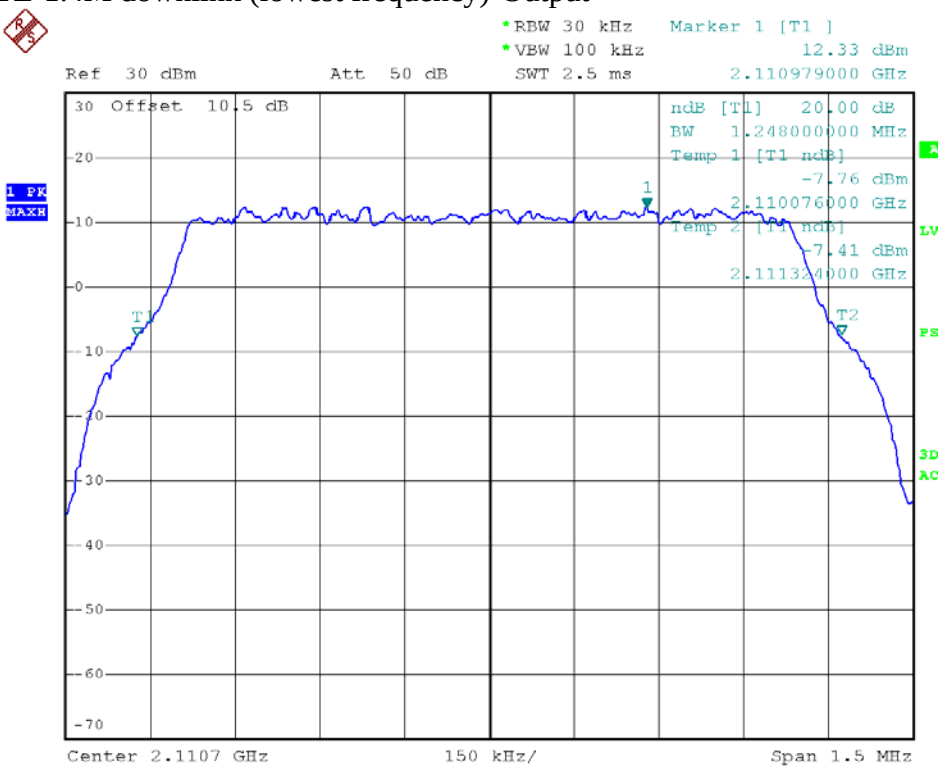
700MHz-LTE-15M uplink (highest frequency)- Output



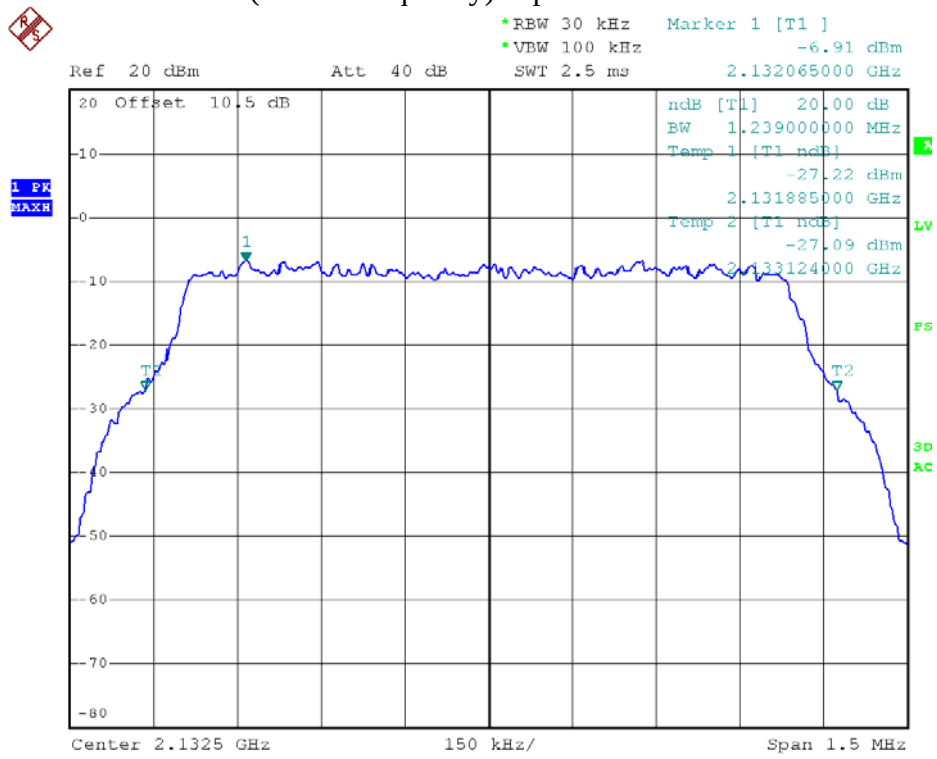
2100MHz-LTE-1.4M downlink (lowest frequency)-Input



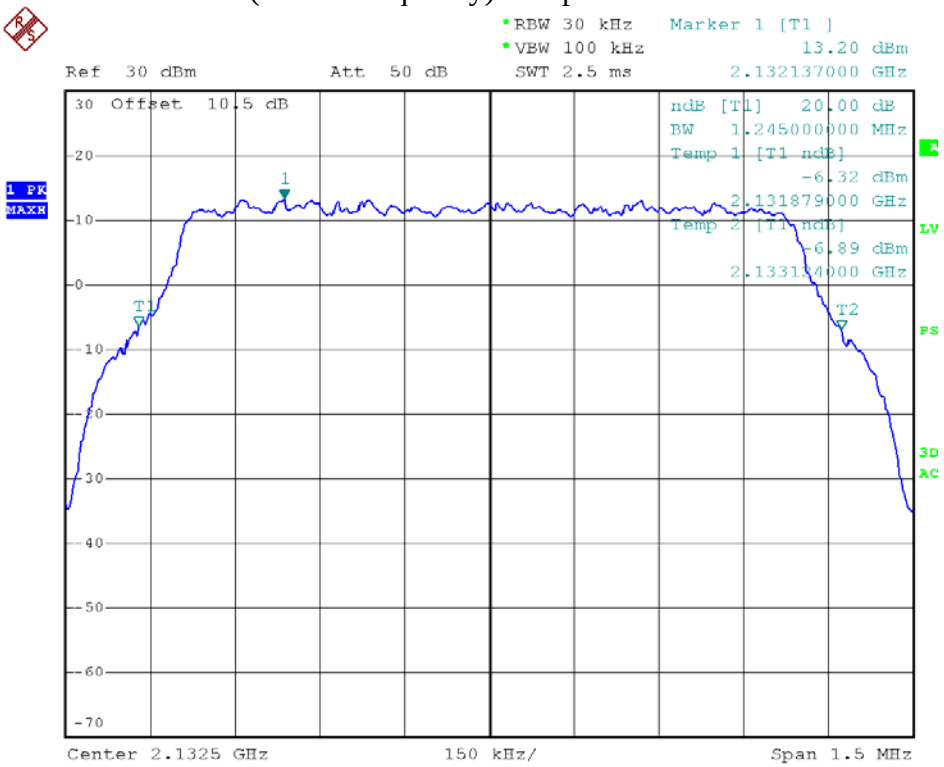
2100MHz-LTE-1.4M downlink (lowest frequency)-Output



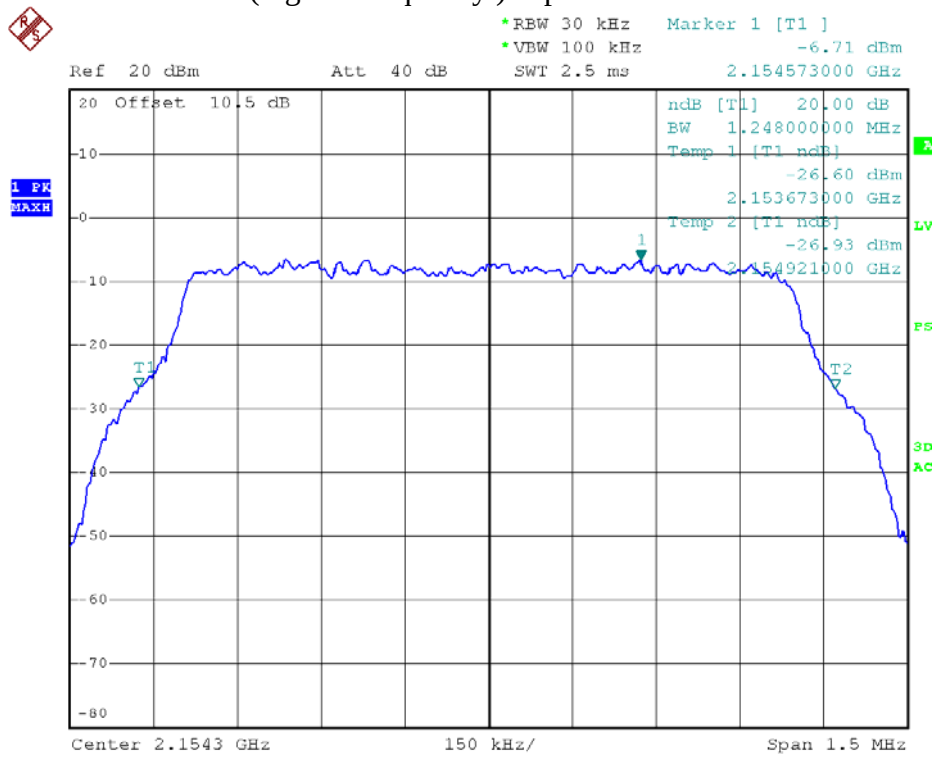
2100MHz-LTE-1.4M downlink (middle frequency)-Input



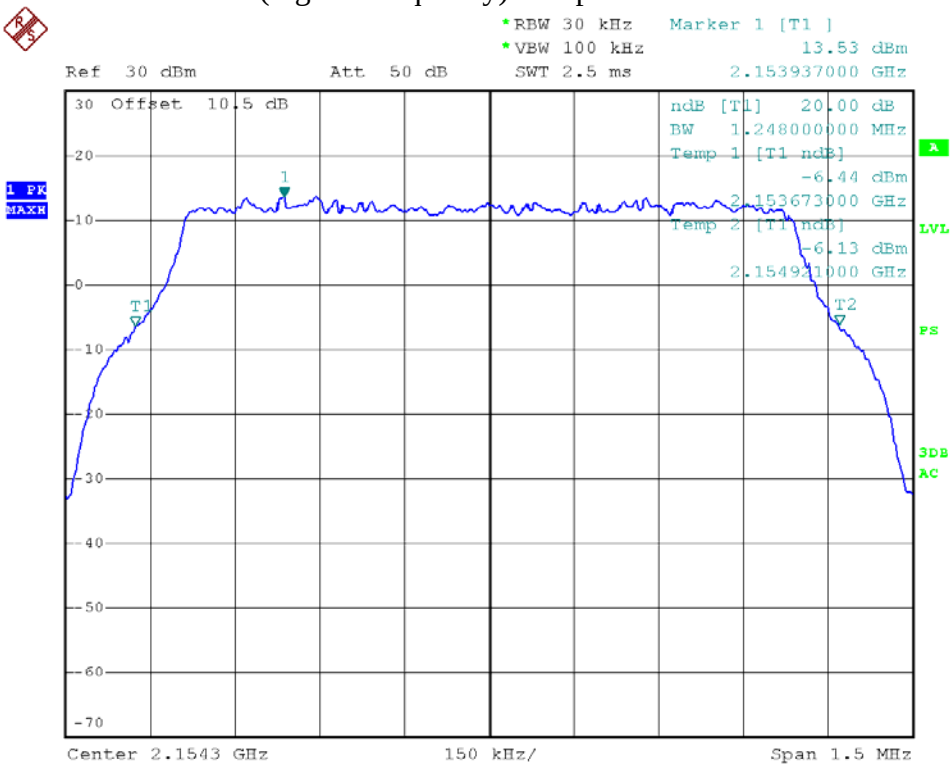
2100MHz-LTE-1.4M downlink (middle frequency)- Output



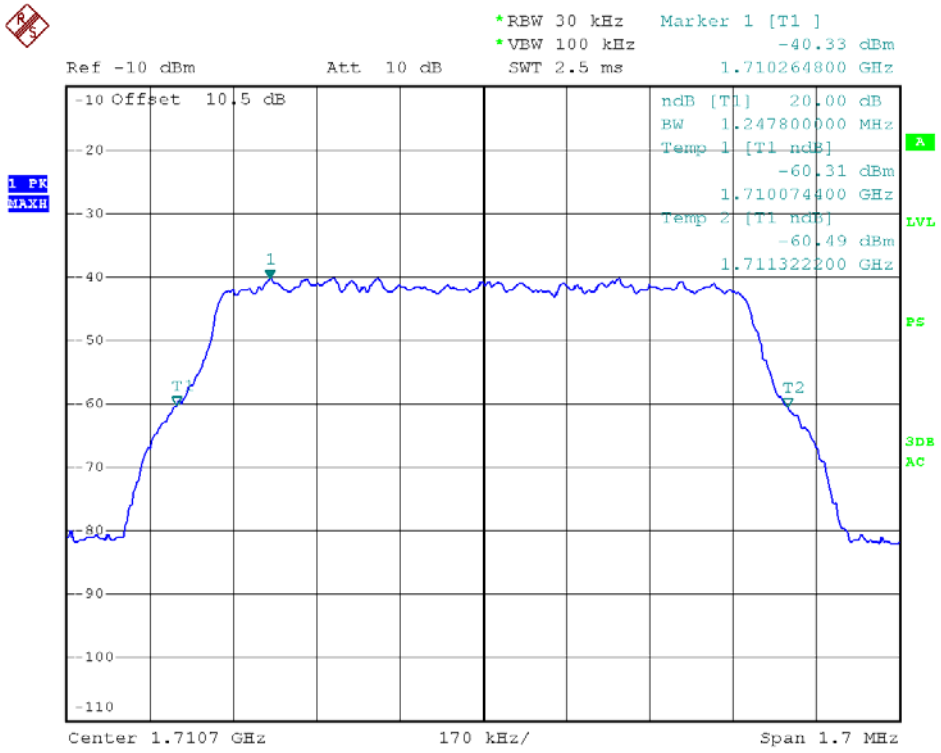
2100MHz-LTE-1.4M downlink (highest frequency)-Input



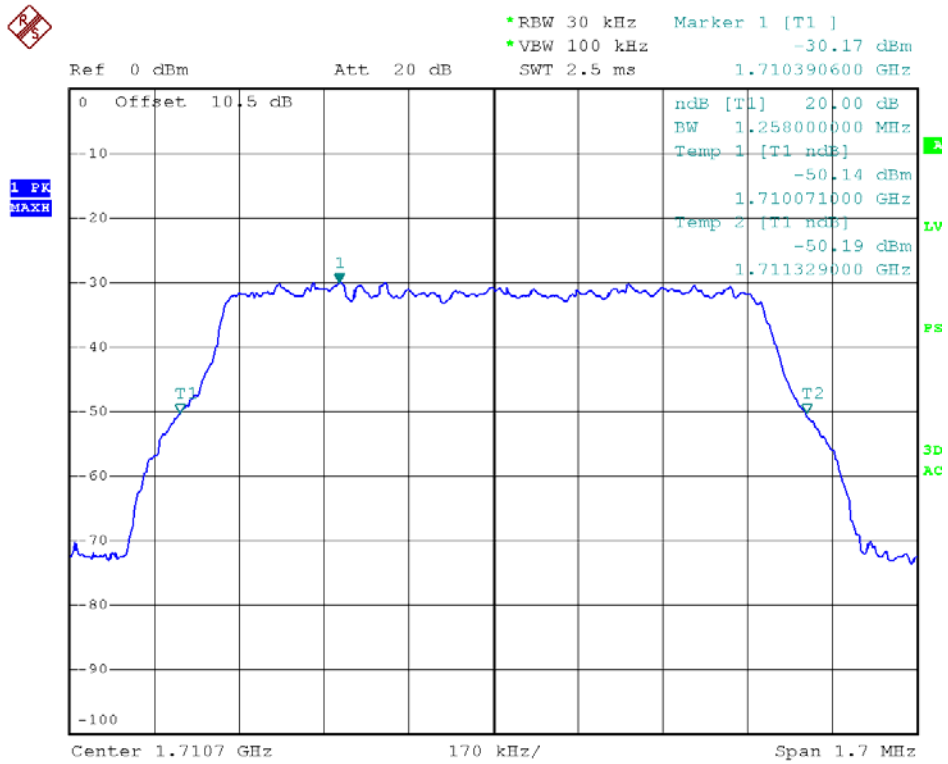
2100MHz-LTE-1.4M downlink (highest frequency)- Output



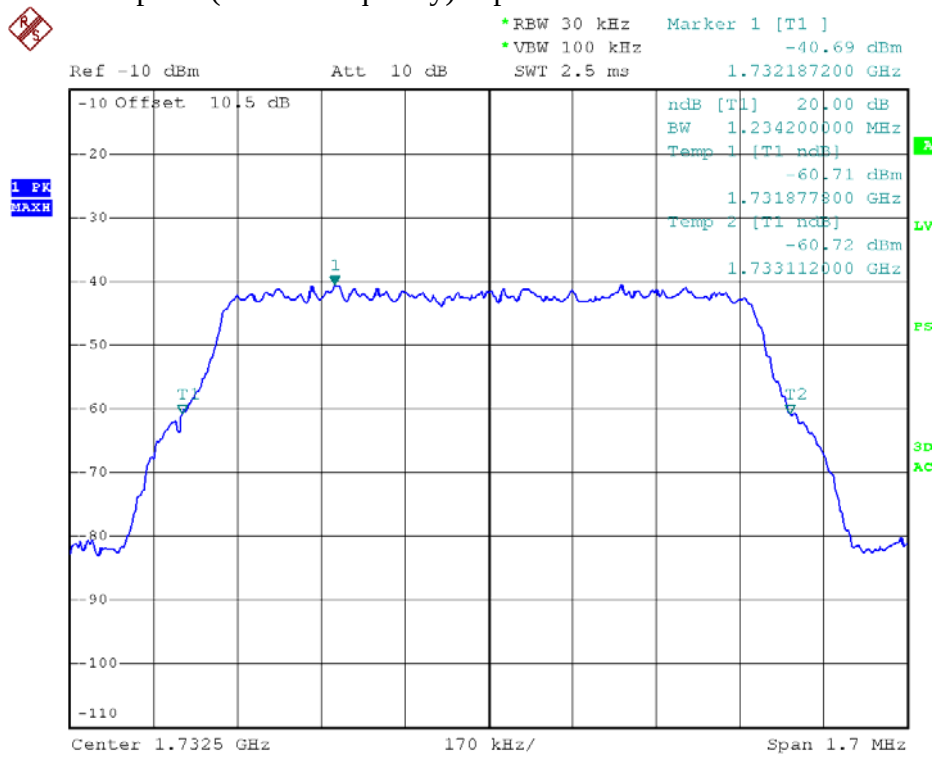
2100MHz-LTE-1.4M uplink (lowest frequency)-Input



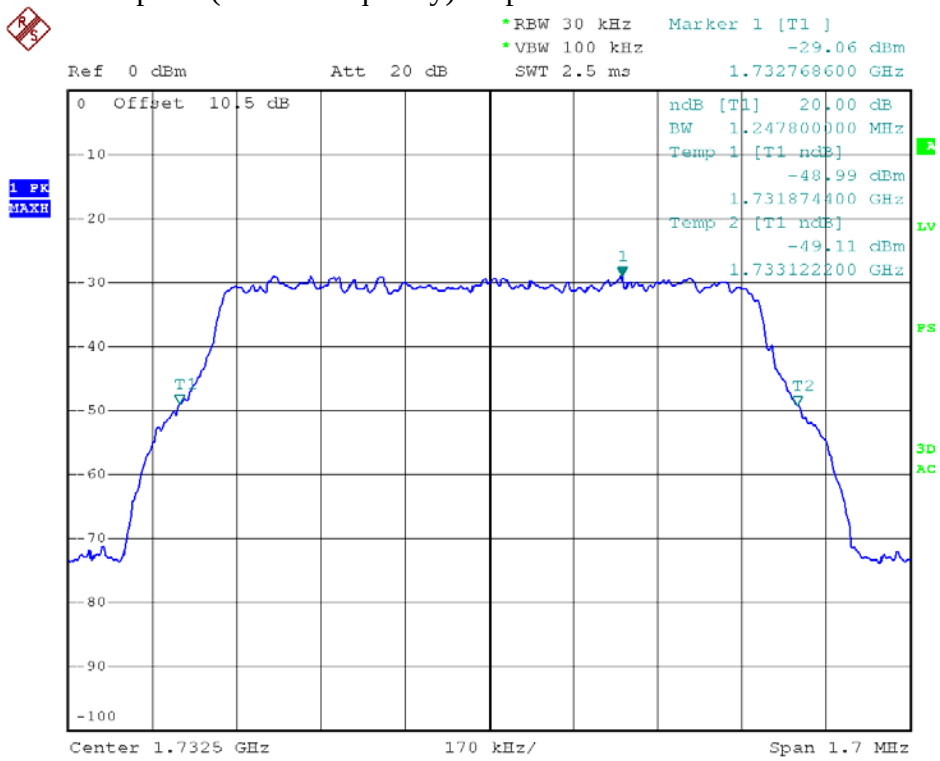
2100MHz-LTE-1.4M uplink (lowest frequency)- Output



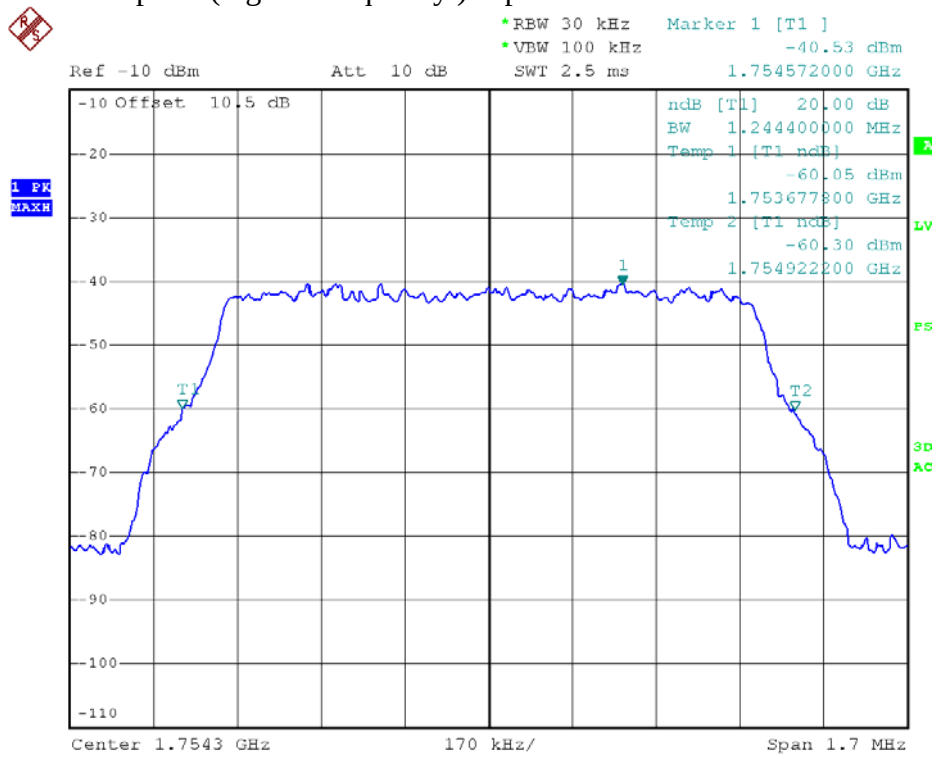
2100MHz-LTE-1.4M uplink (middle frequency)-Input



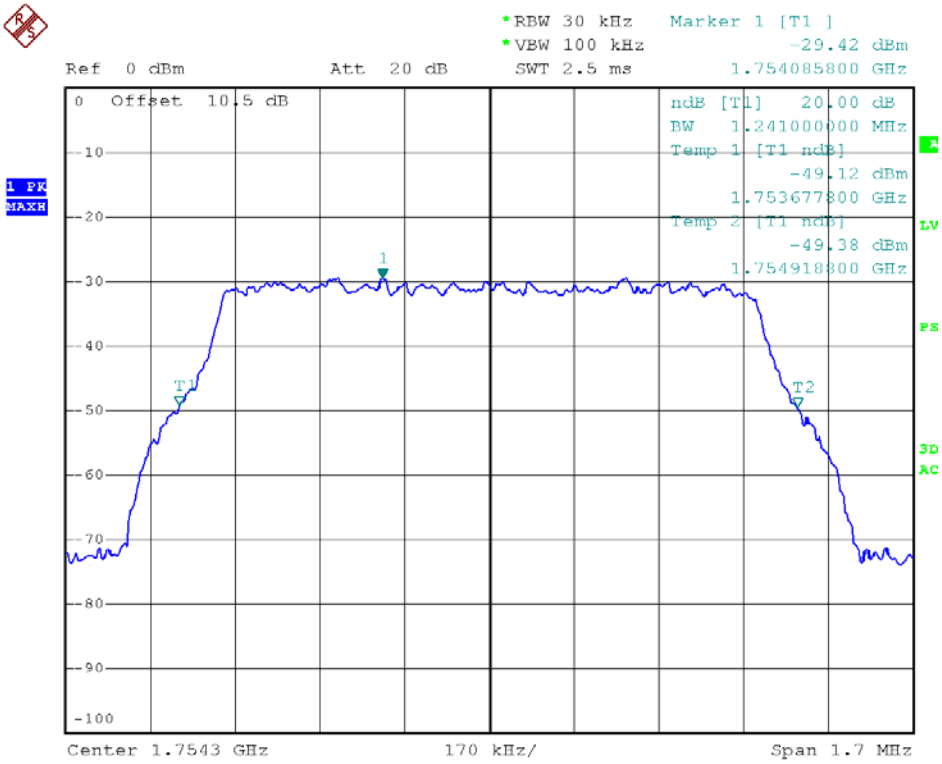
2100MHz-LTE-1.4M uplink (middle frequency)-Ouput



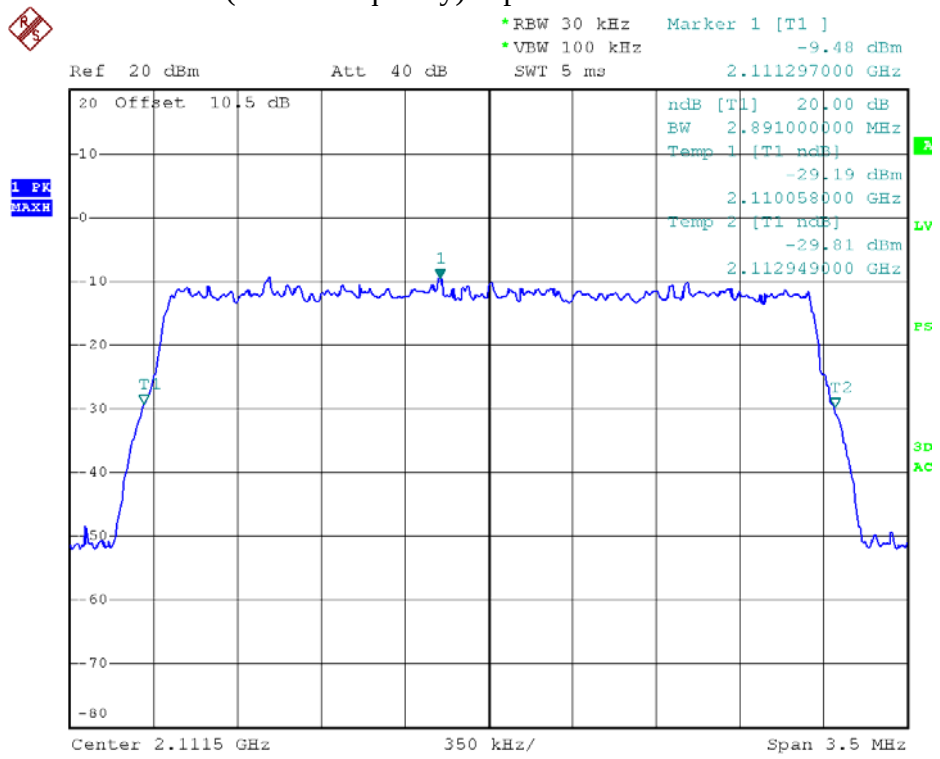
2100MHz-LTE-1.4M uplink (highest frequency)-Input



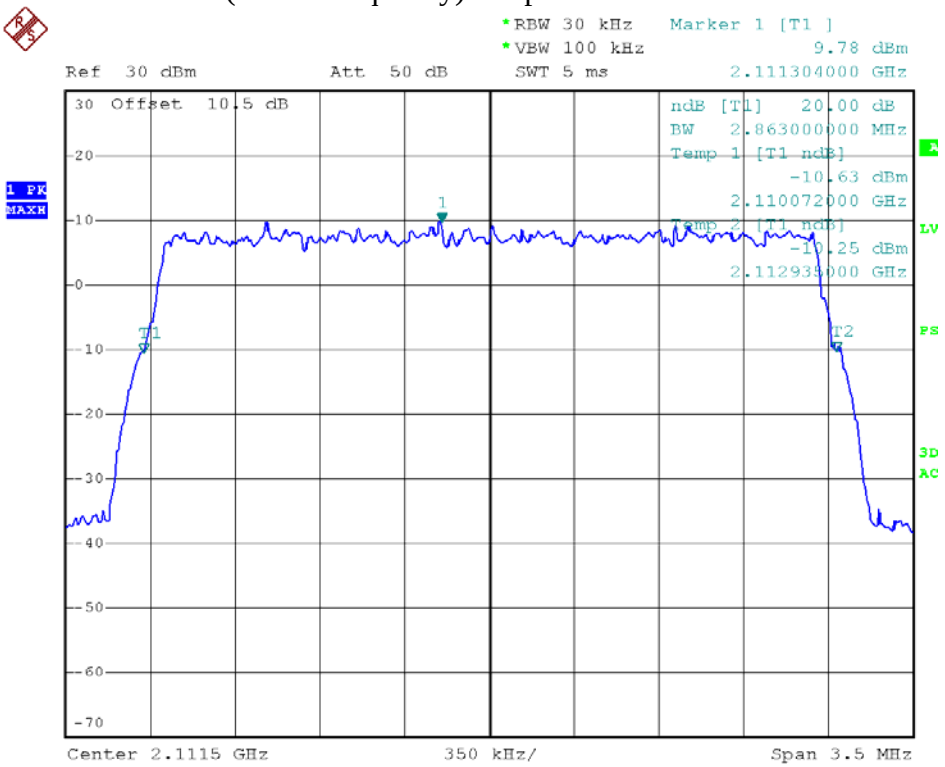
2100MHz-LTE-1.4M uplink (highest frequency)- Output



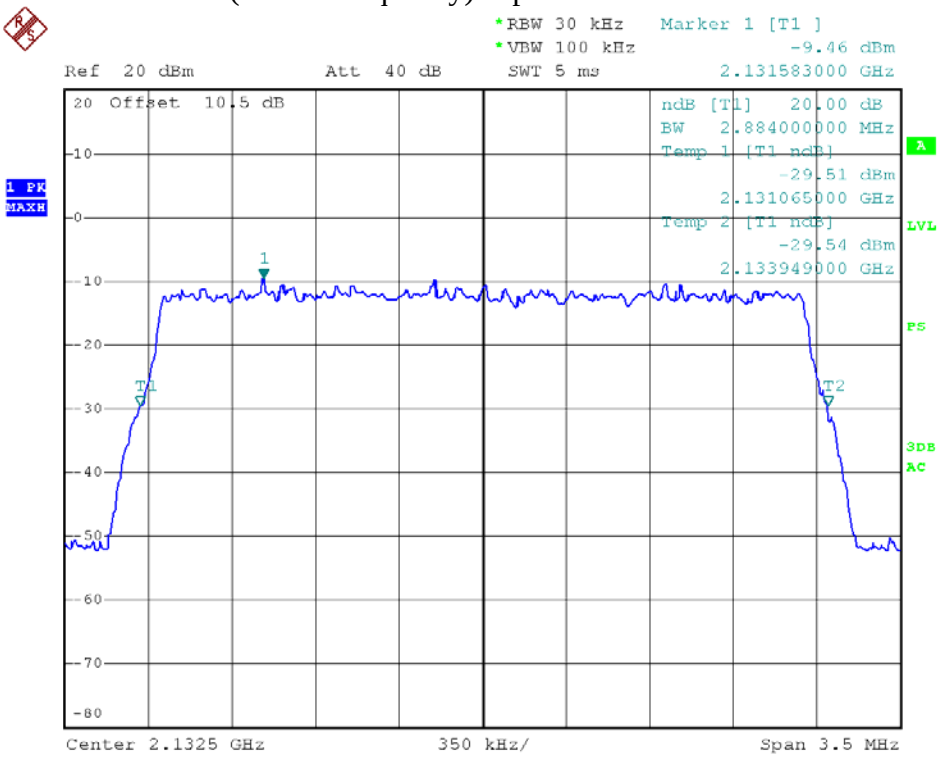
2100MHz-LTE-3M downlink (lowest frequency)-Input



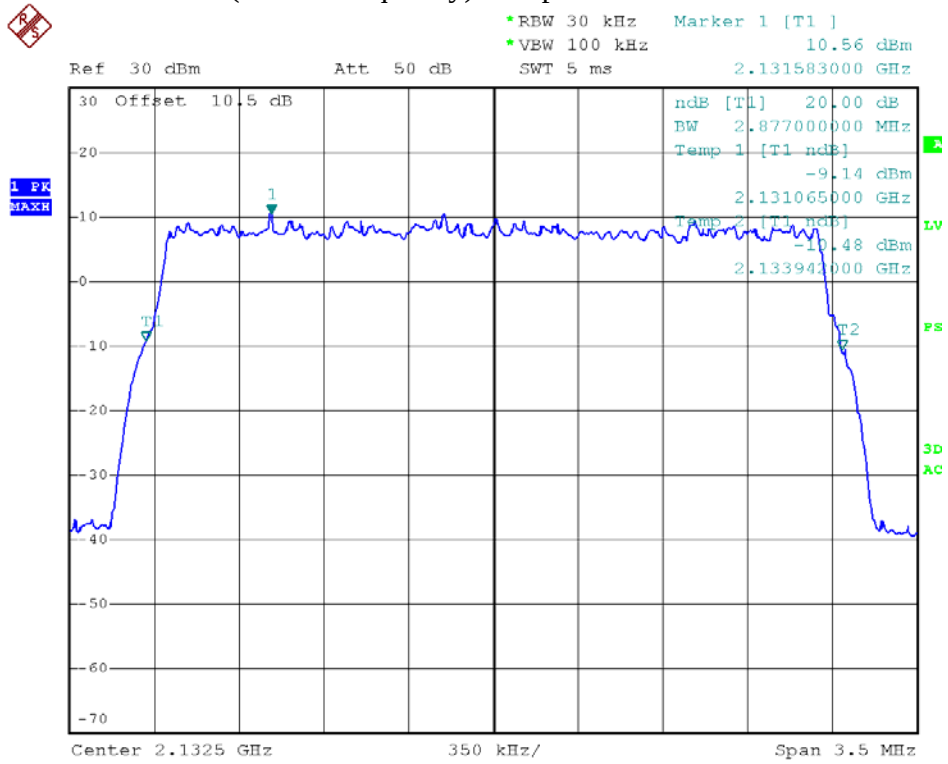
2100MHz-LTE-3M downlink (lowest frequency)-Output



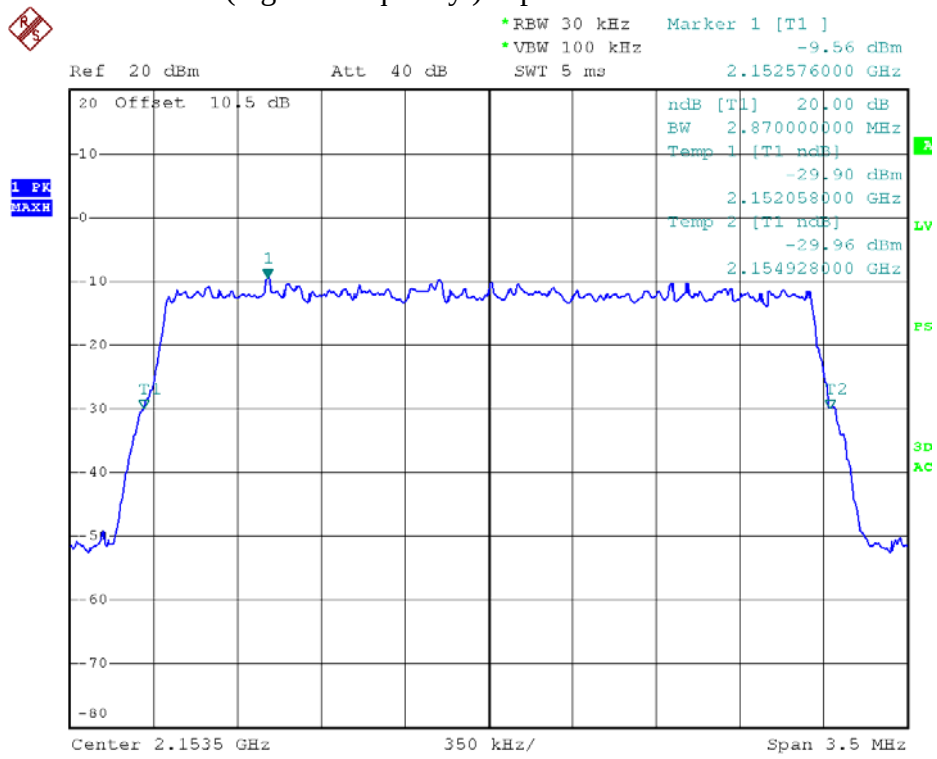
2100MHz-LTE-3M downlink (middle frequency)-Input



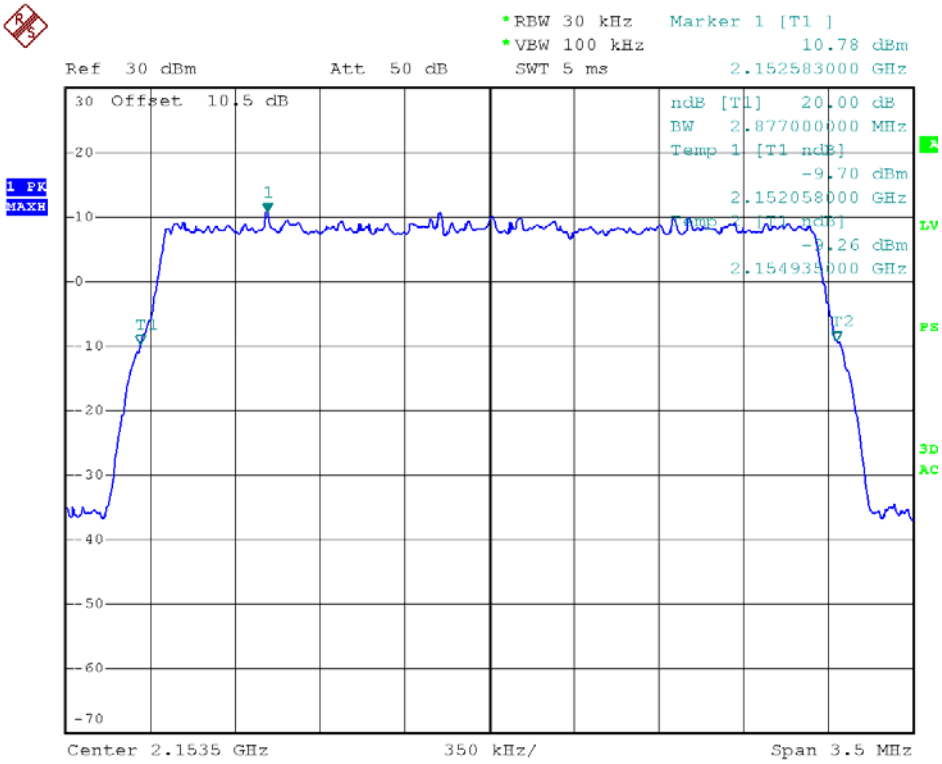
2100MHz-LTE-3M downlink (middle frequency)- Output



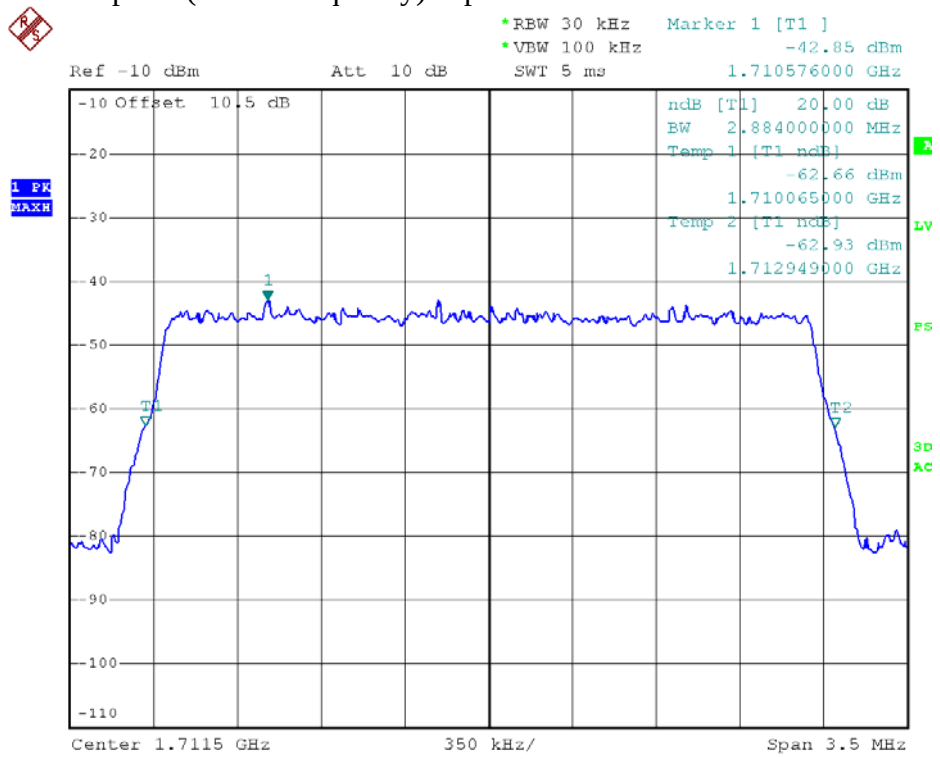
2100MHz-LTE-3M downlink (highest frequency)-Input



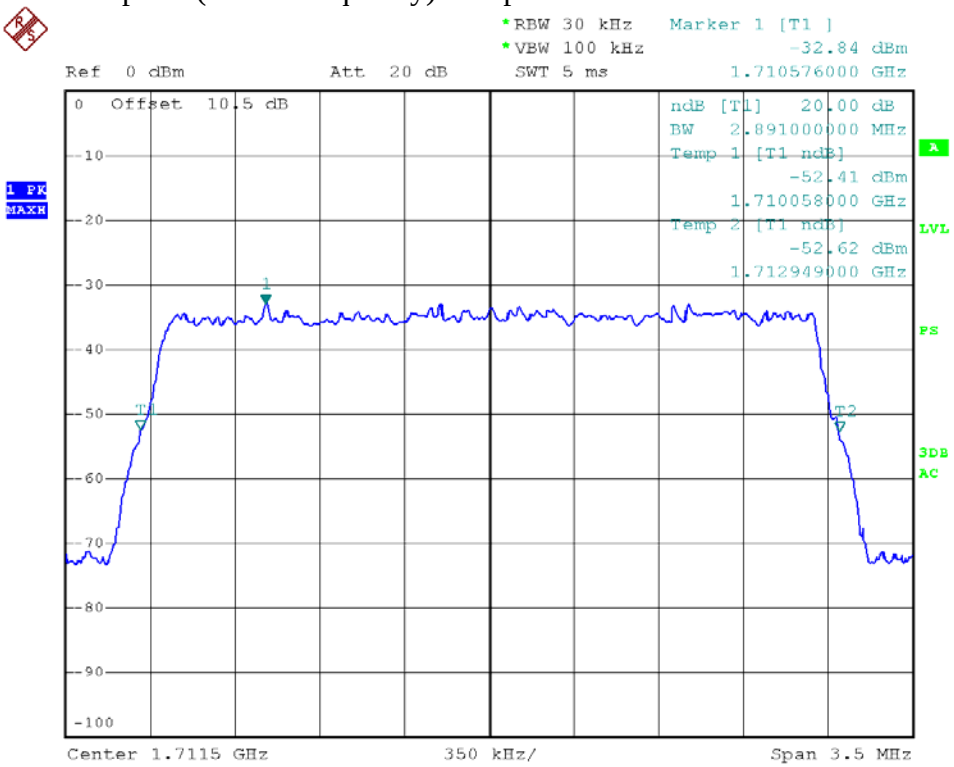
2100MHz-LTE-3M downlink (highest frequency)- Output



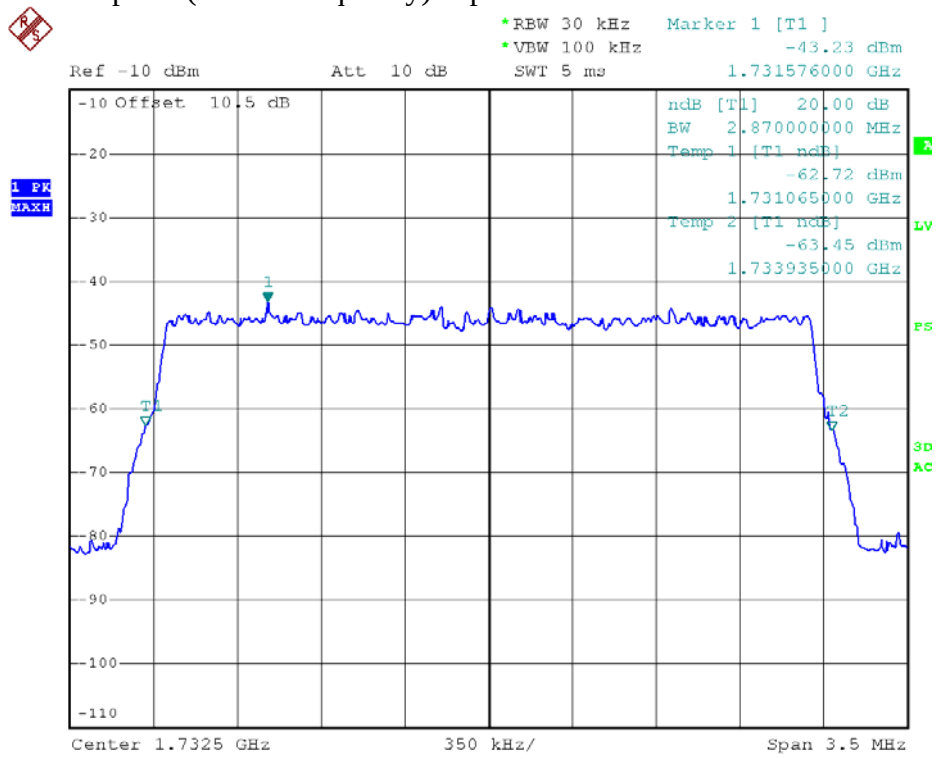
2100MHz-LTE-3M uplink (lowest frequency)-Input



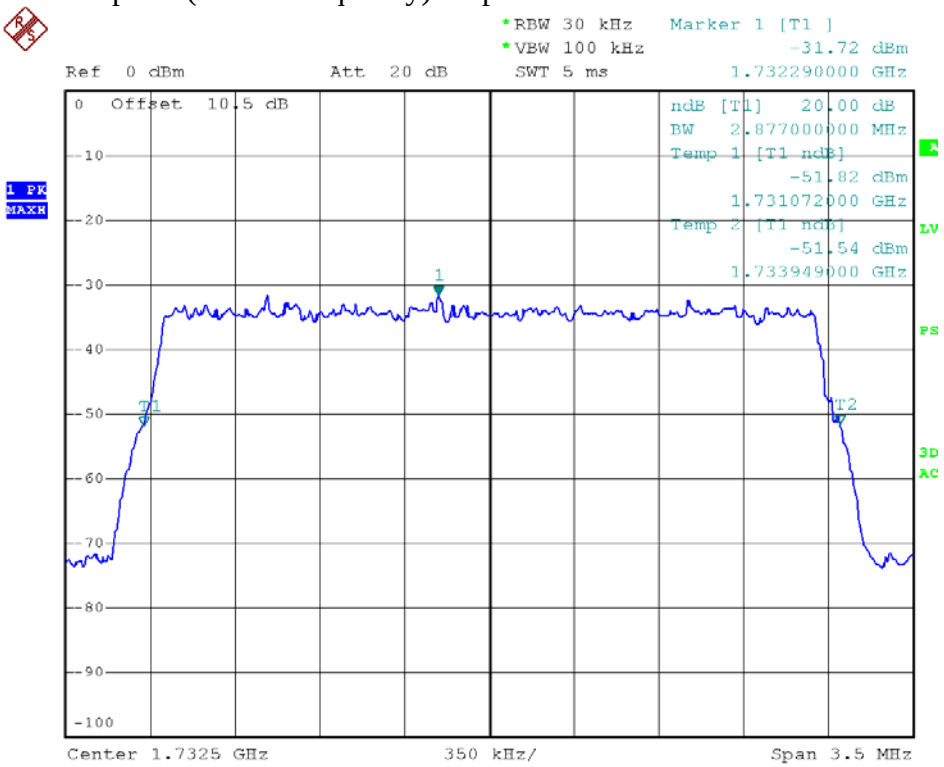
2100MHz-LTE-3M uplink (lowest frequency)- Output



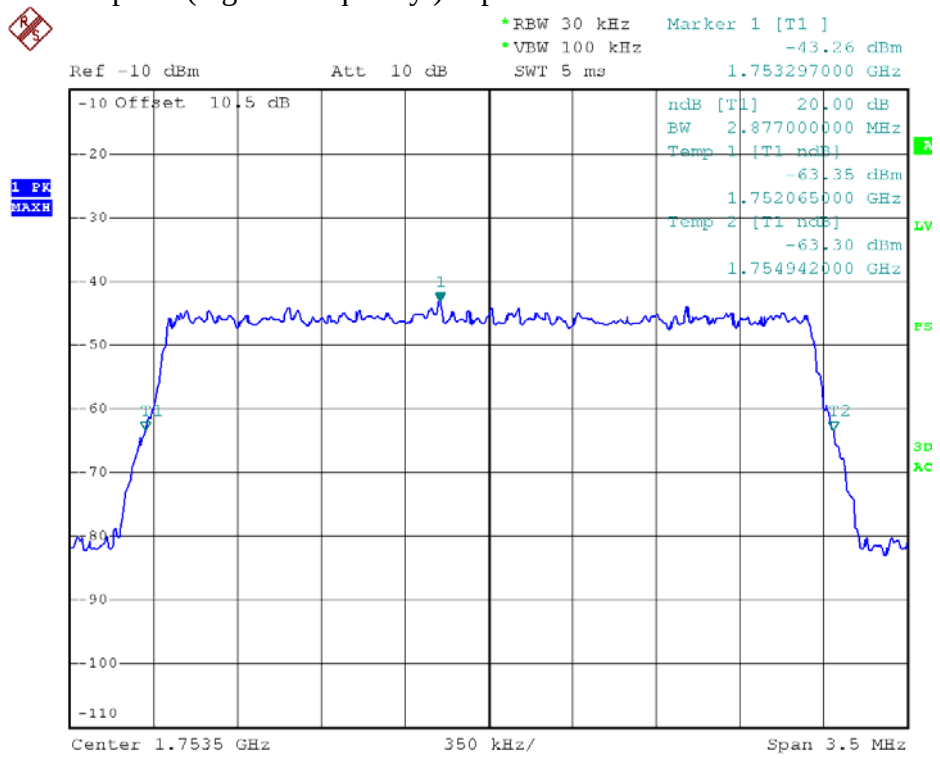
2100MHz-LTE-3M uplink (middle frequency)-Input



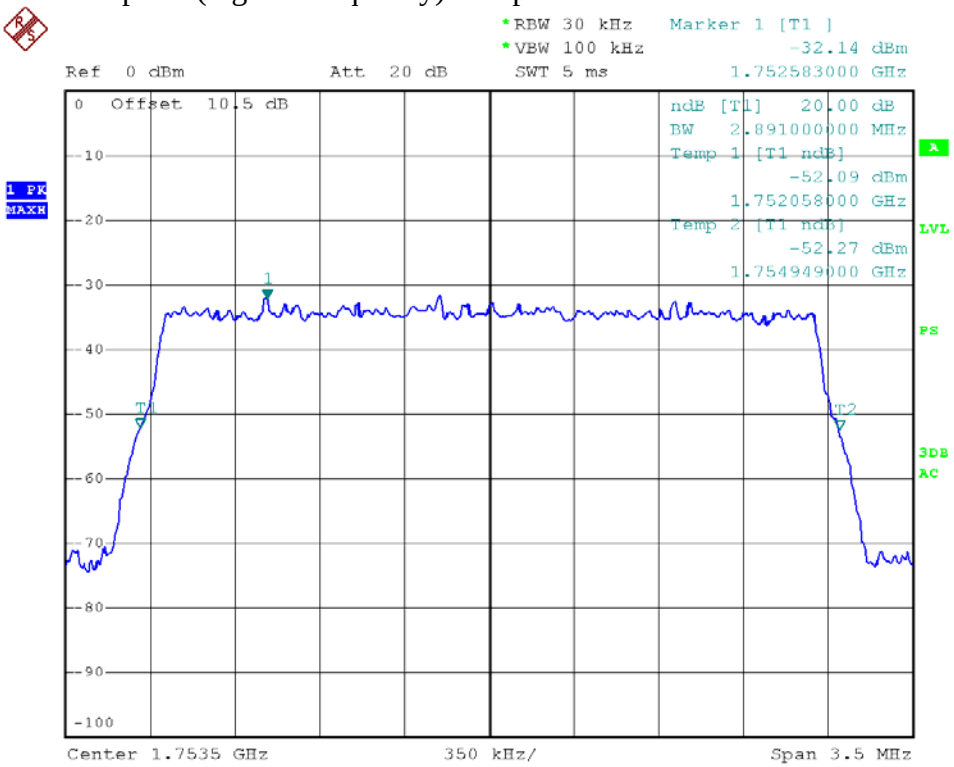
2100MHz-LTE-3M uplink (middle frequency)-Ouput



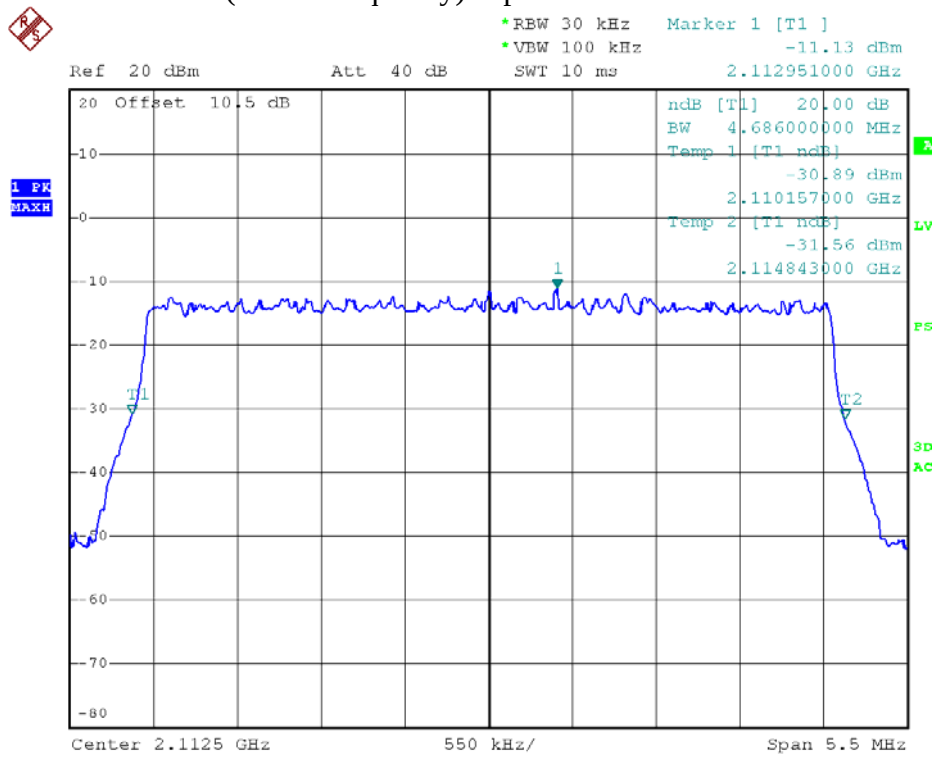
2100MHz-LTE-3M uplink (highest frequency)-Input



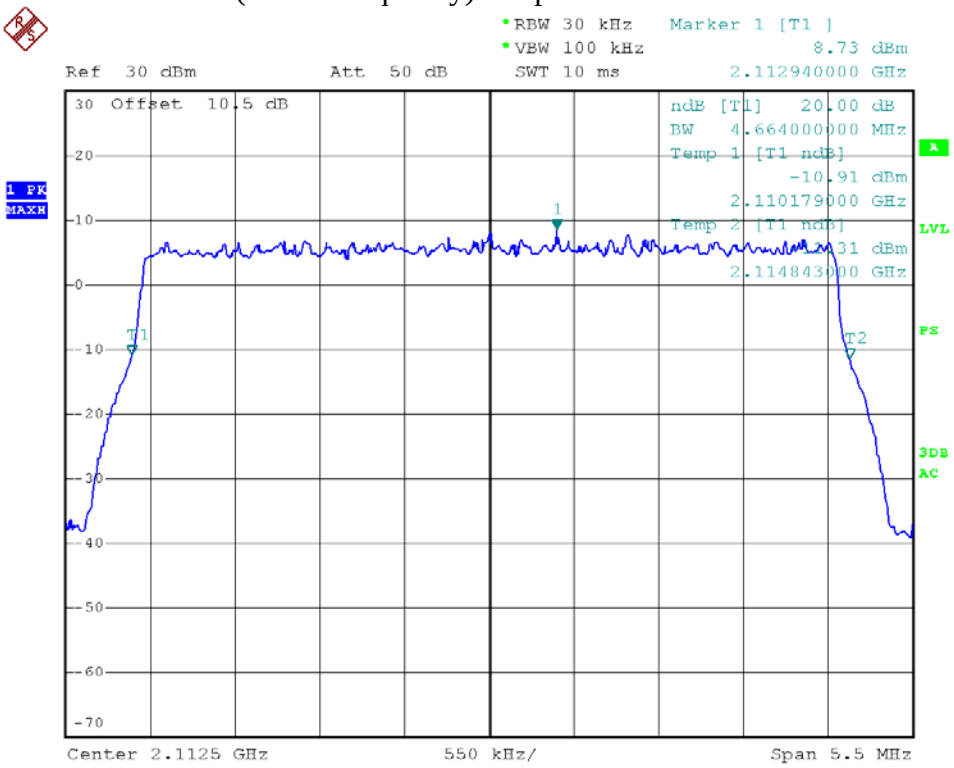
2100MHz-LTE-3M uplink (highest frequency)- Output



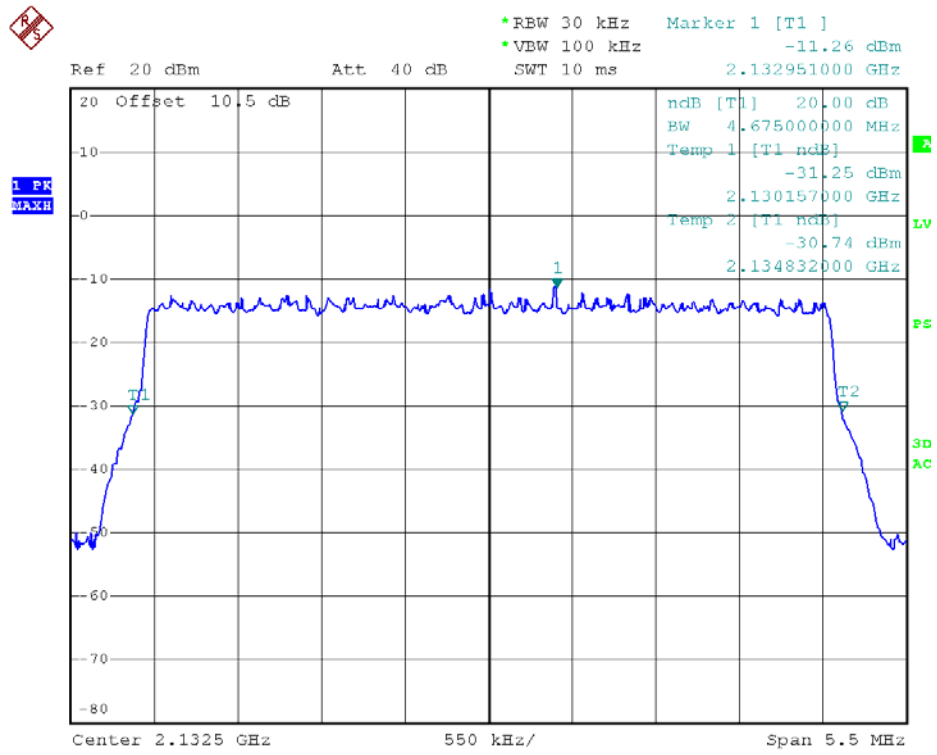
2100MHz-LTE-5M downlink (lowest frequency)-Input



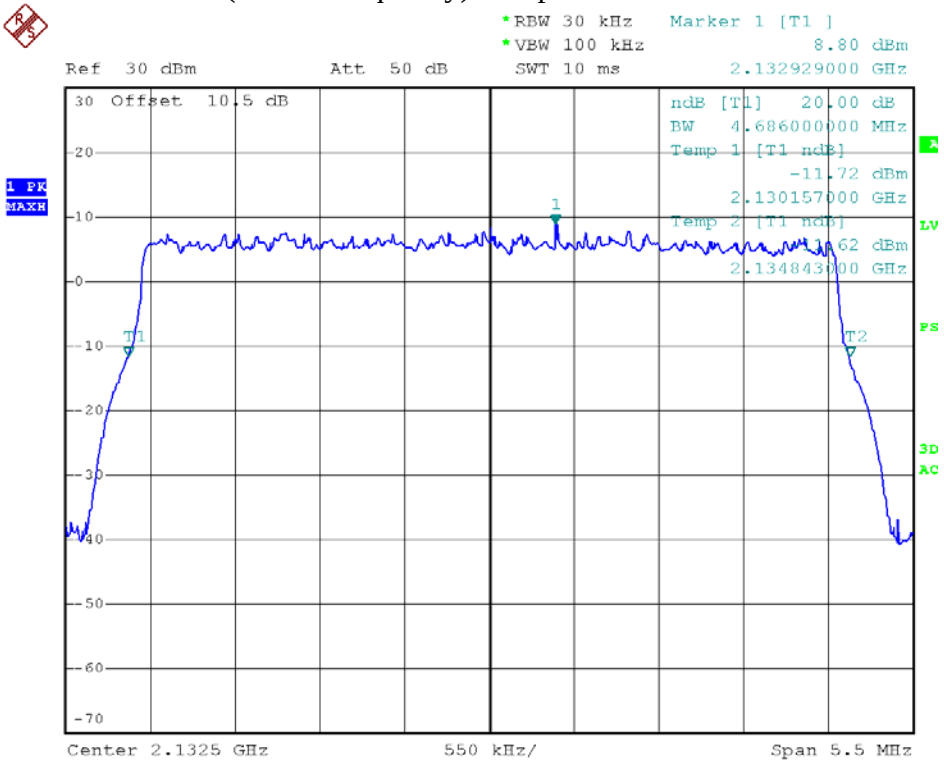
2100MHz-LTE-5M downlink (lowest frequency)-Output



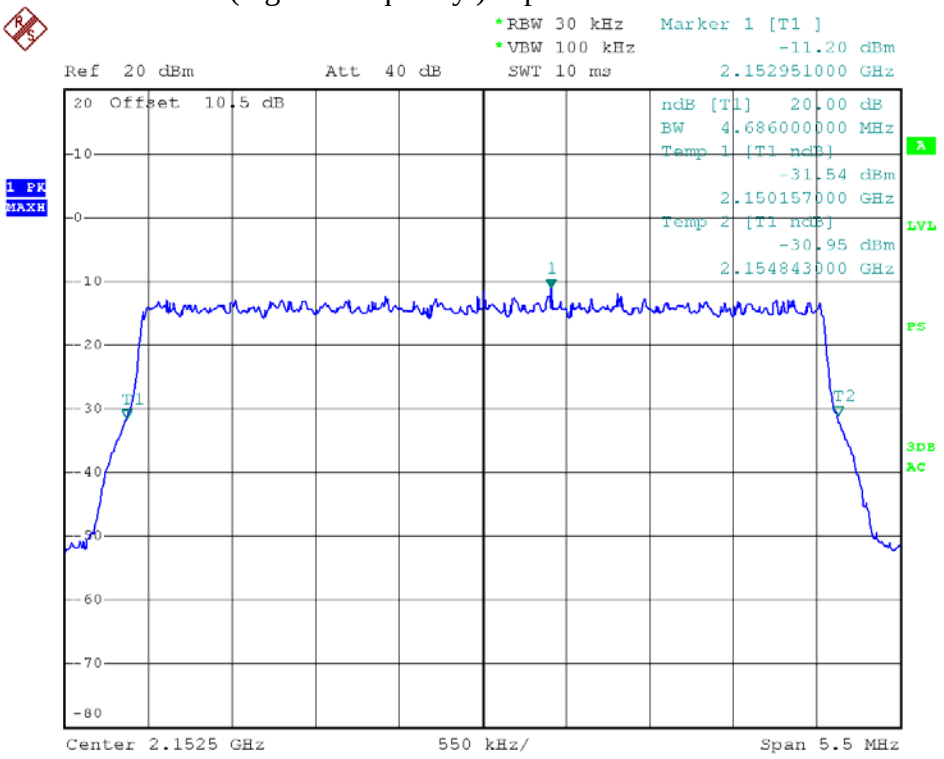
2100MHz-LTE-5M downlink (middle frequency)-Input



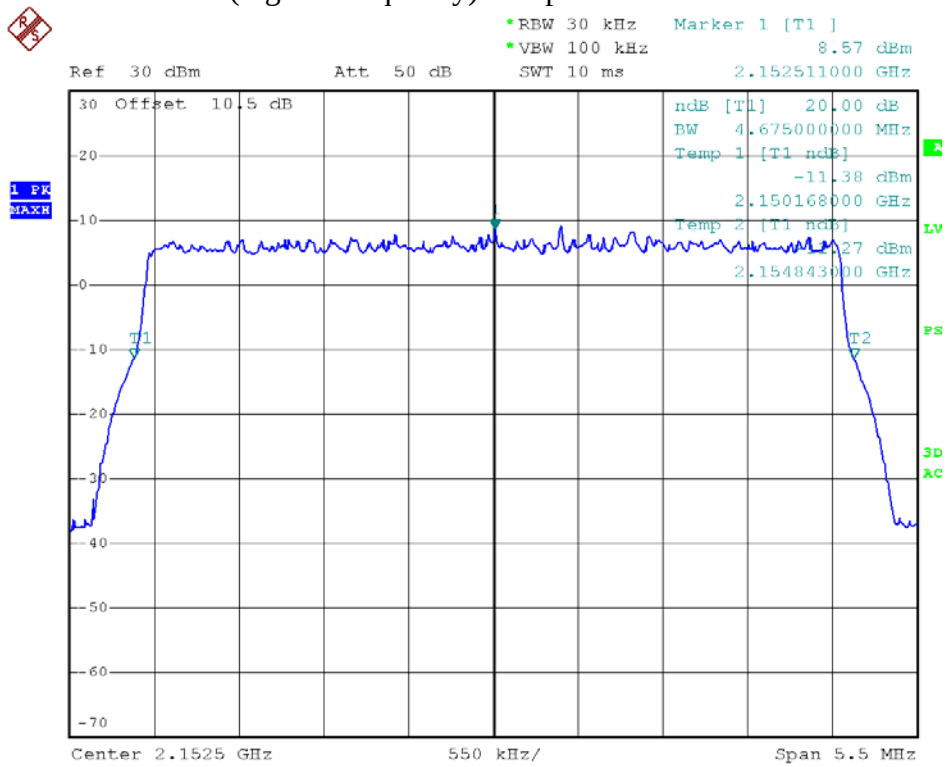
2100MHz-LTE-5M downlink (middle frequency)- Output



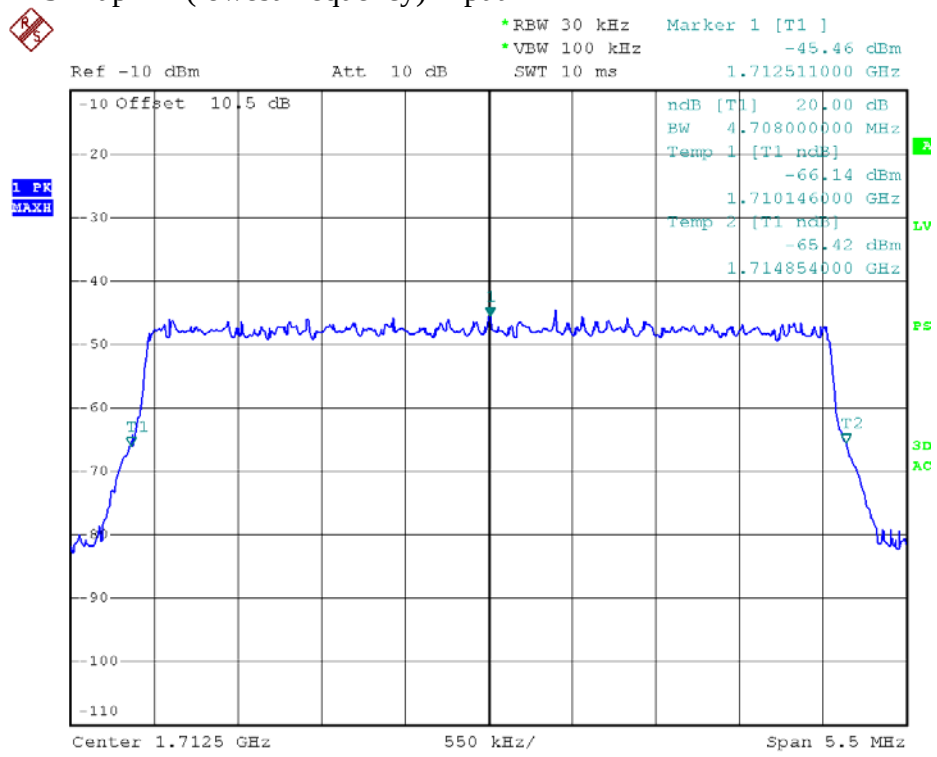
2100MHz-LTE-5M downlink (highest frequency)-Input



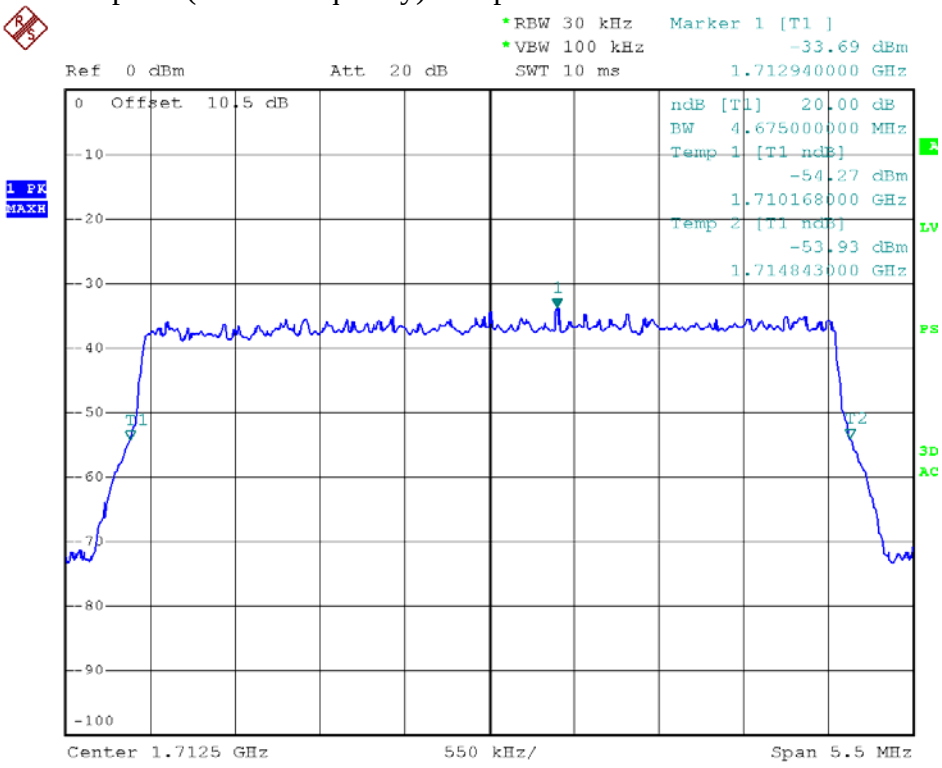
2100MHz-LTE-5M downlink (highest frequency)- Output



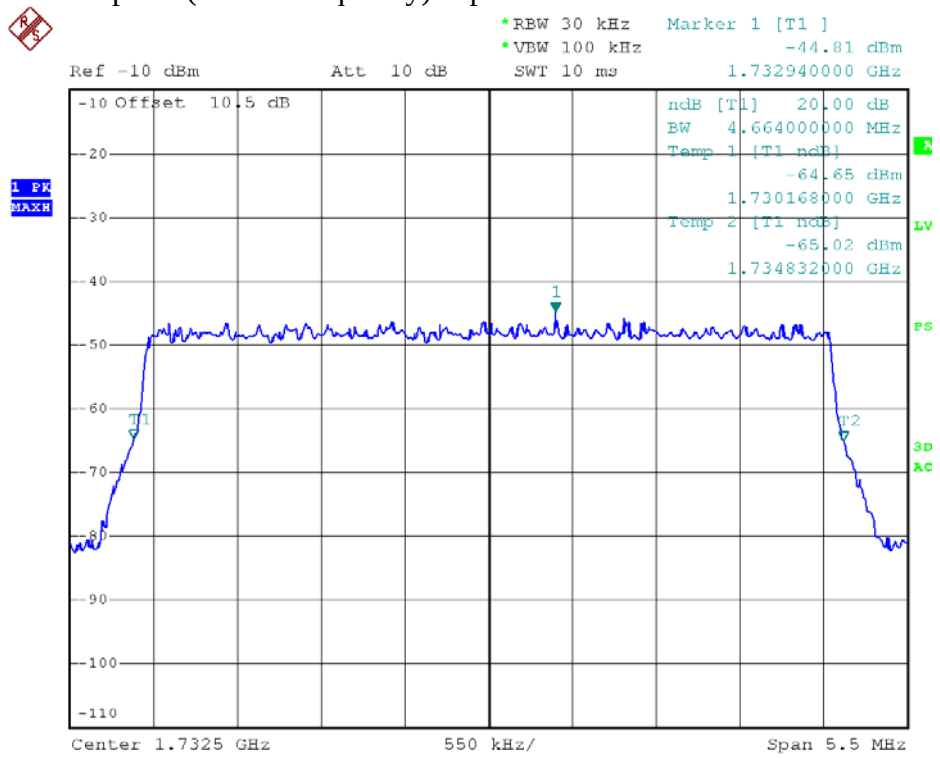
2100MHz-LTE-5M uplink (lowest frequency)-Input



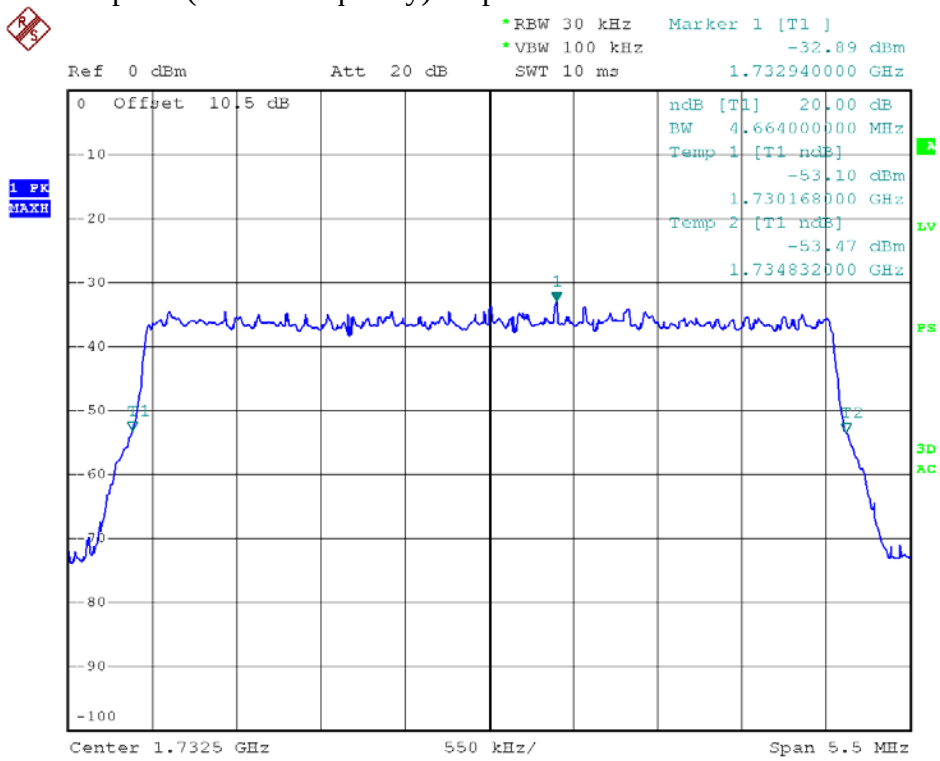
2100MHz-LTE-5M uplink (lowest frequency)- Output



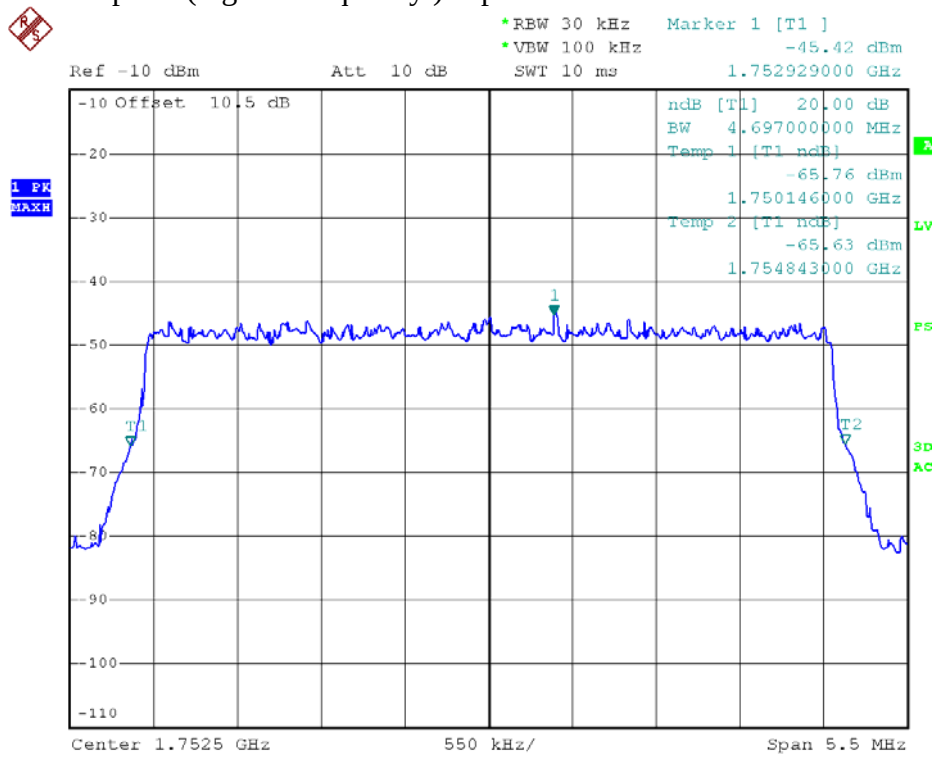
2100MHz-LTE-5M uplink (middle frequency)-Input



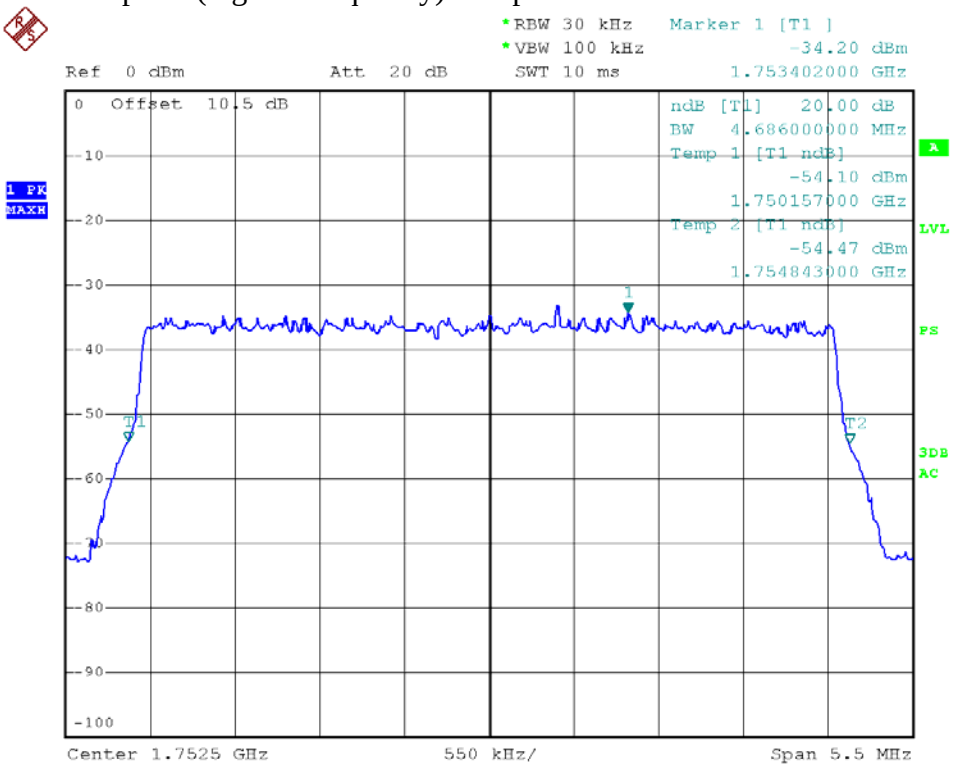
2100MHz-LTE-5M uplink (middle frequency)-Ouput



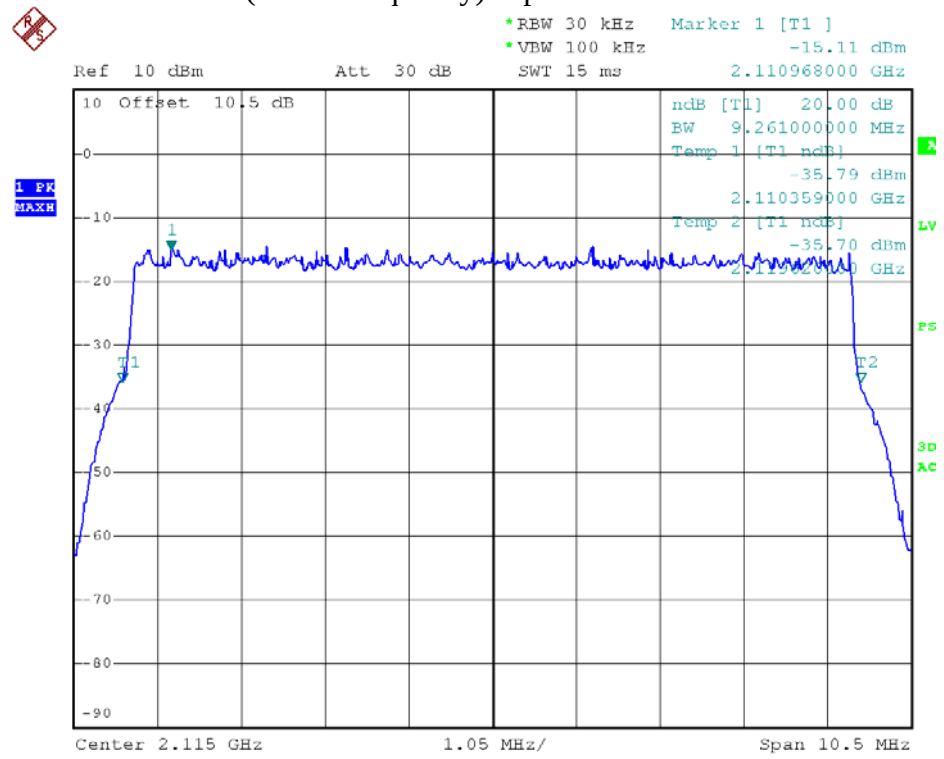
2100MHz-LTE-5M uplink (highest frequency)-Input



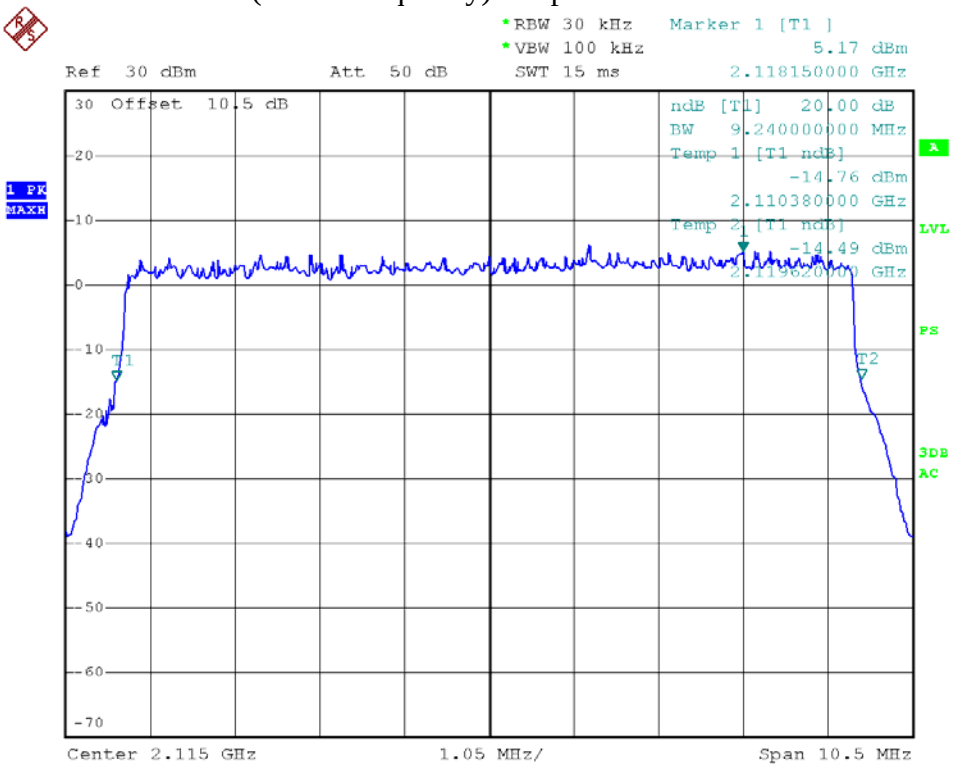
2100MHz-LTE-5M uplink (highest frequency)- Output



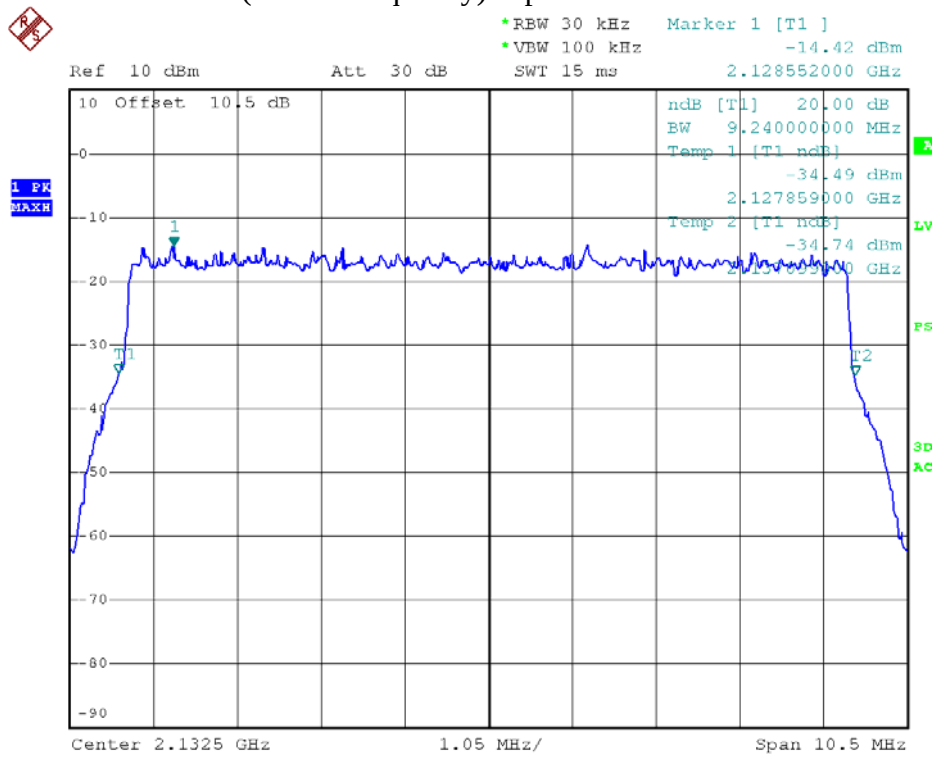
2100MHz-LTE-10M downlink (lowest frequency)-Input



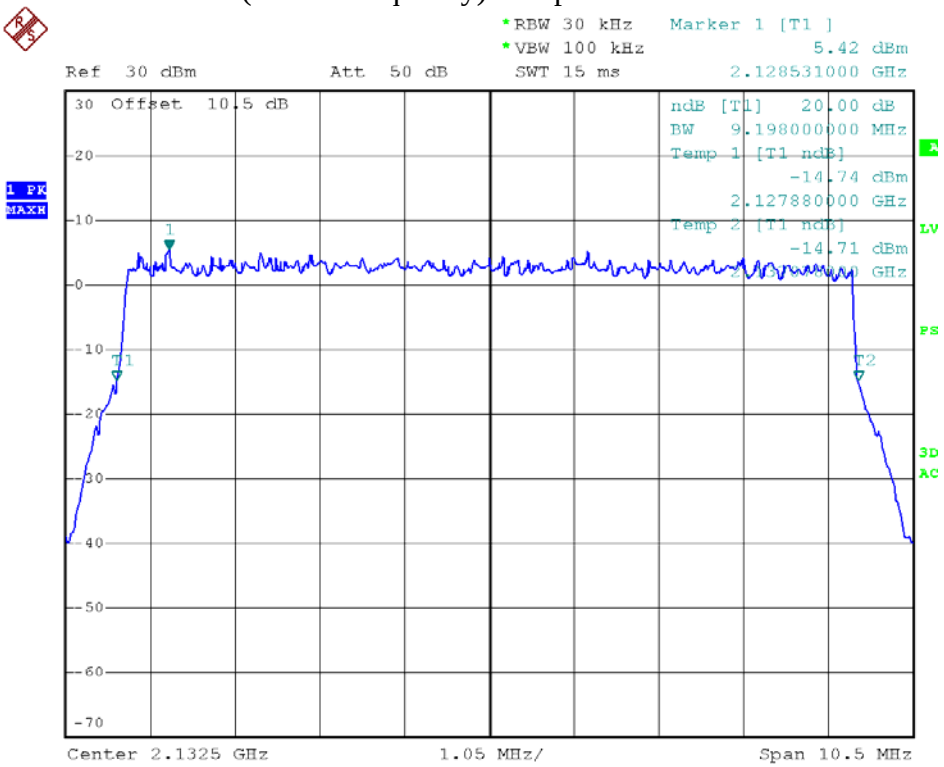
2100MHz-LTE-10M downlink (lowest frequency)-Output



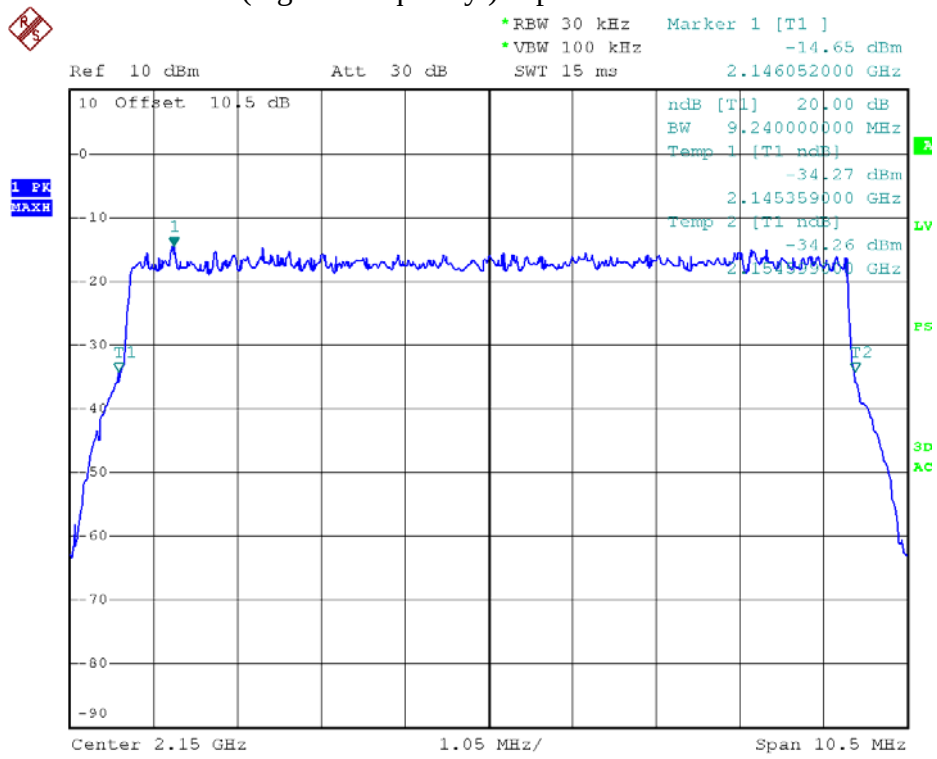
2100MHz-LTE-10M downlink (middle frequency)-Input



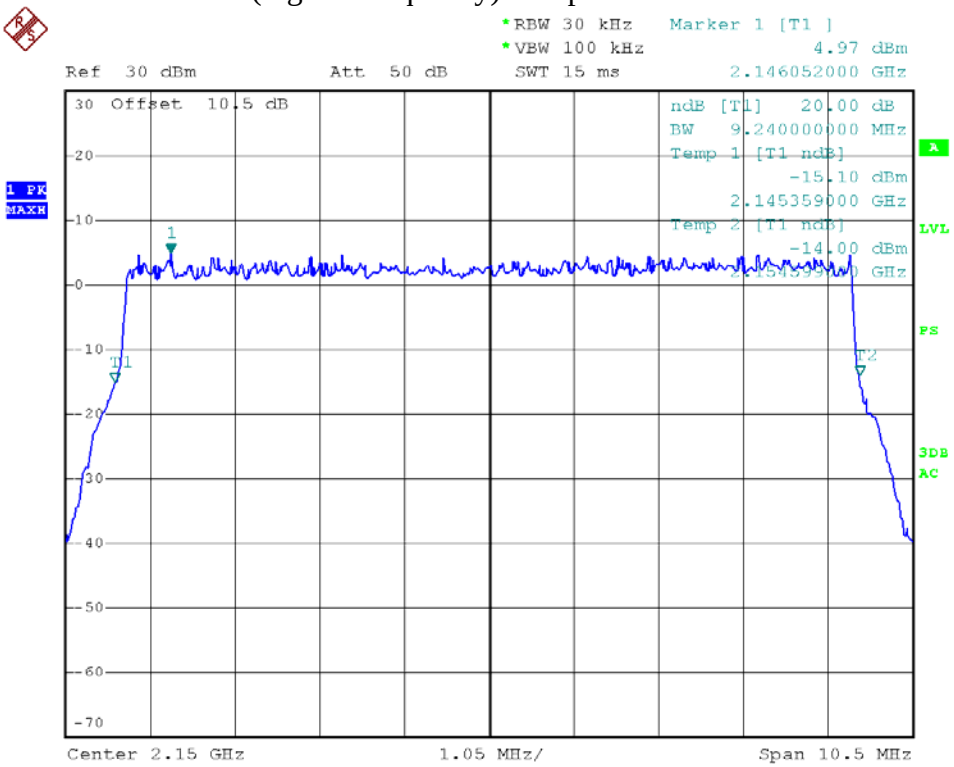
2100MHz-LTE-10M downlink (middle frequency)- Output



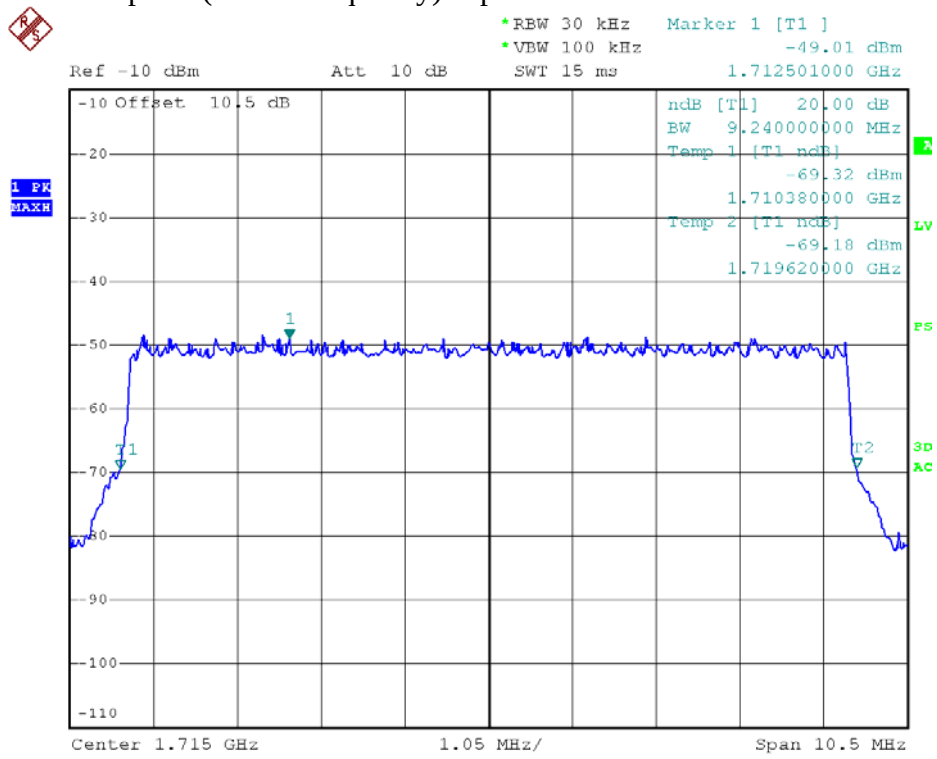
2100MHz-LTE-10M downlink (highest frequency)-Input



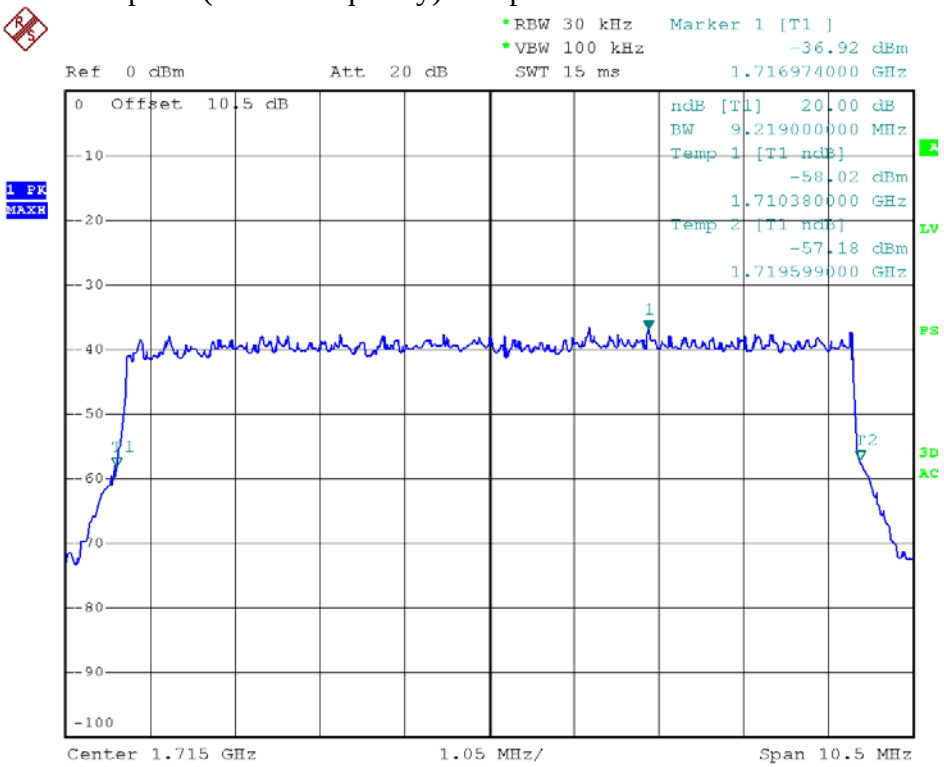
2100MHz-LTE-10M downlink (highest frequency)- Output



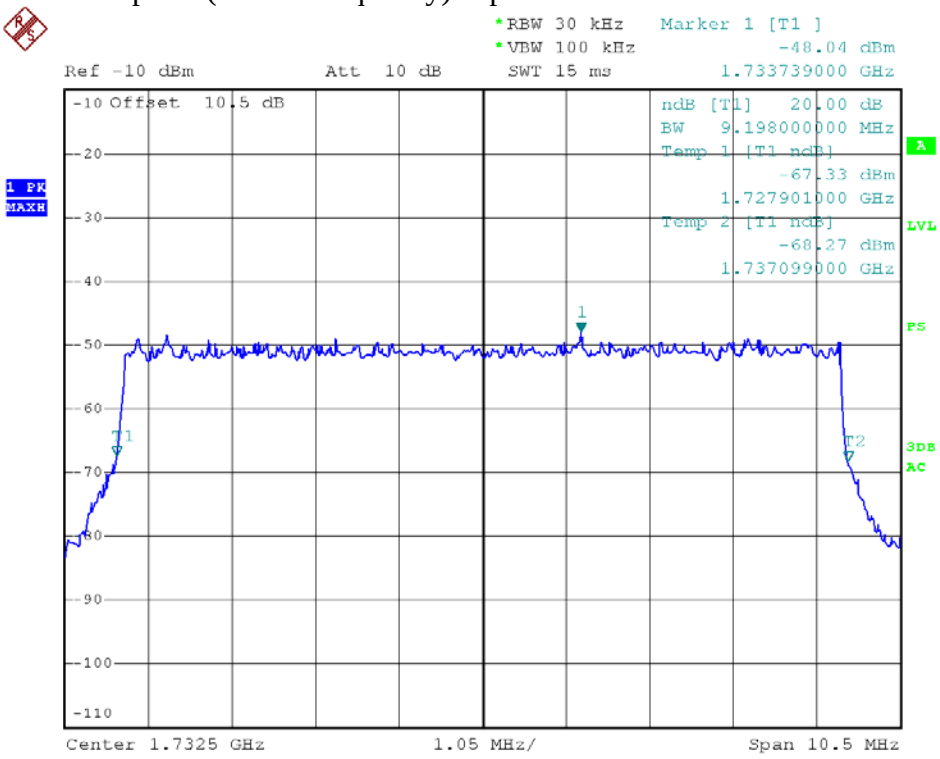
2100MHz-LTE-10M uplink (lowest frequency)-Input



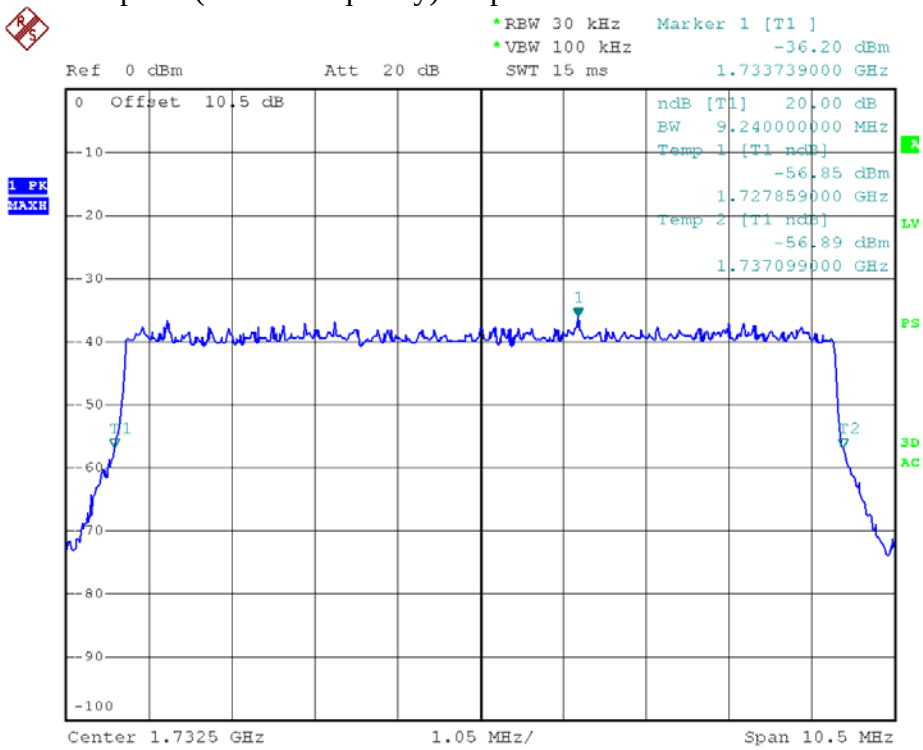
2100MHz-LTE-10M uplink (lowest frequency)- Output



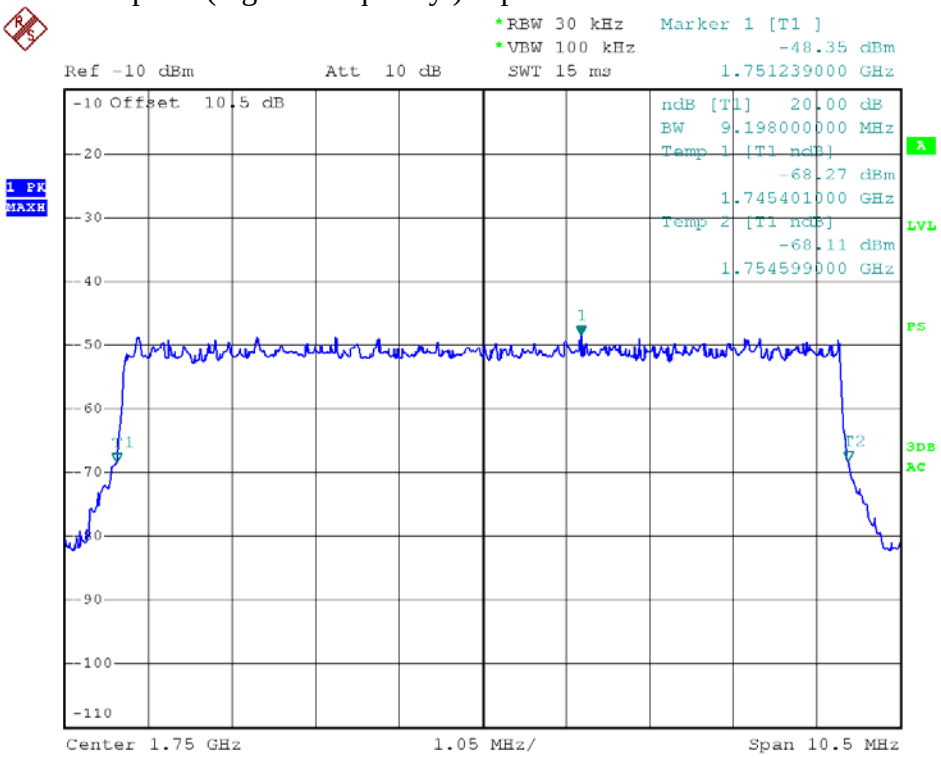
2100MHz-LTE-10M uplink (middle frequency)-Input



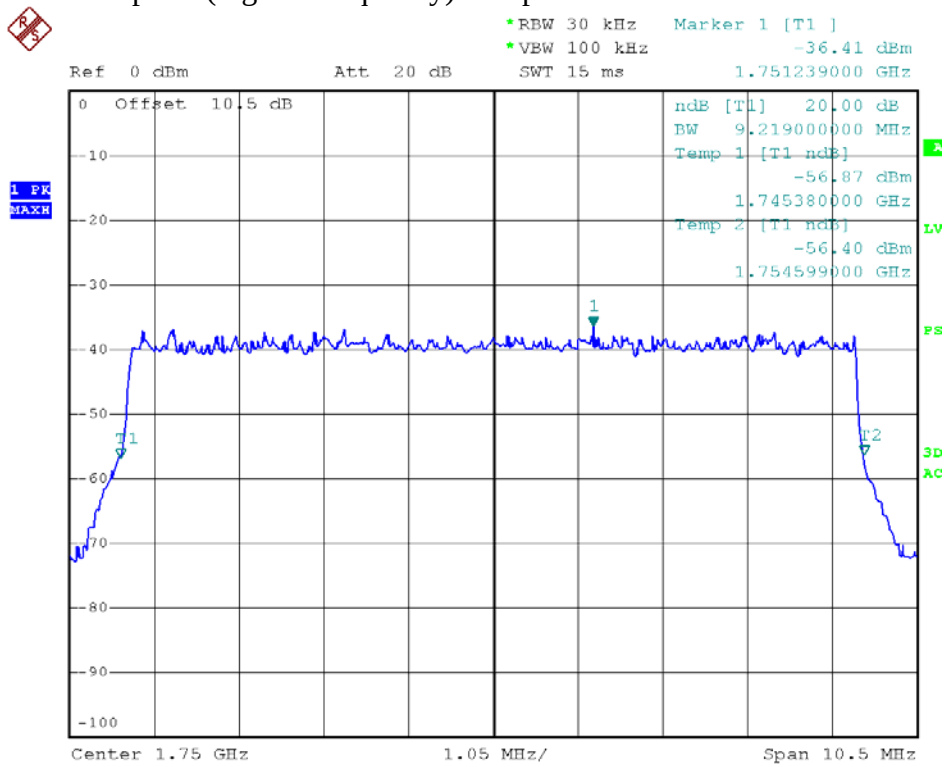
2100MHz-LTE-10M uplink (middle frequency)-Ouput



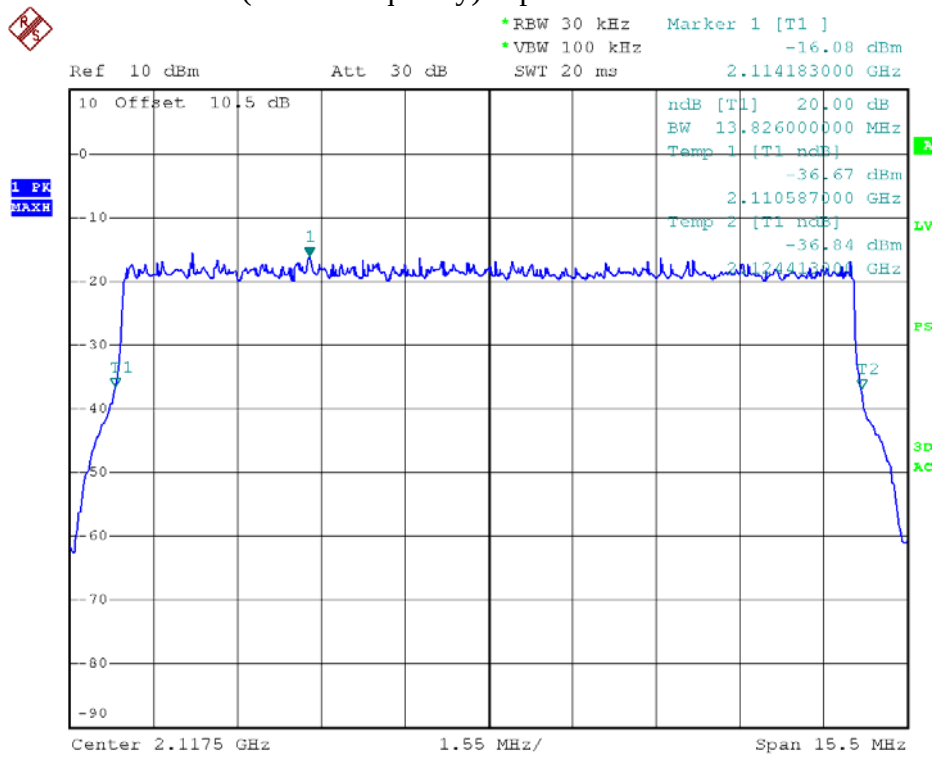
2100MHz-LTE-10M uplink (highest frequency)-Input



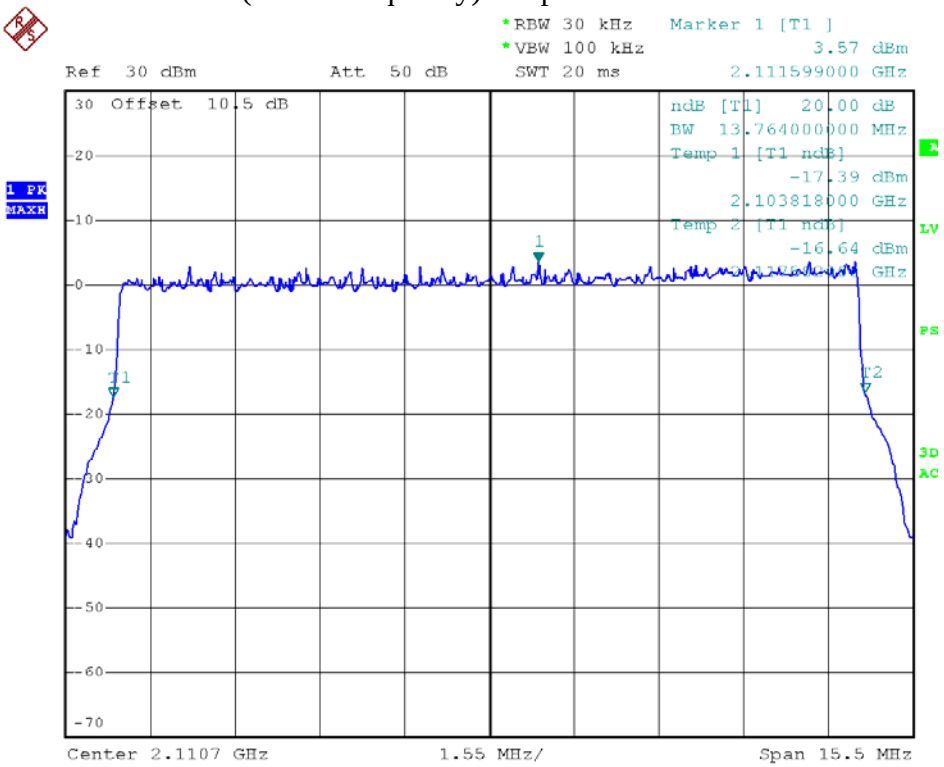
2100MHz-LTE-10M uplink (highest frequency)- Output



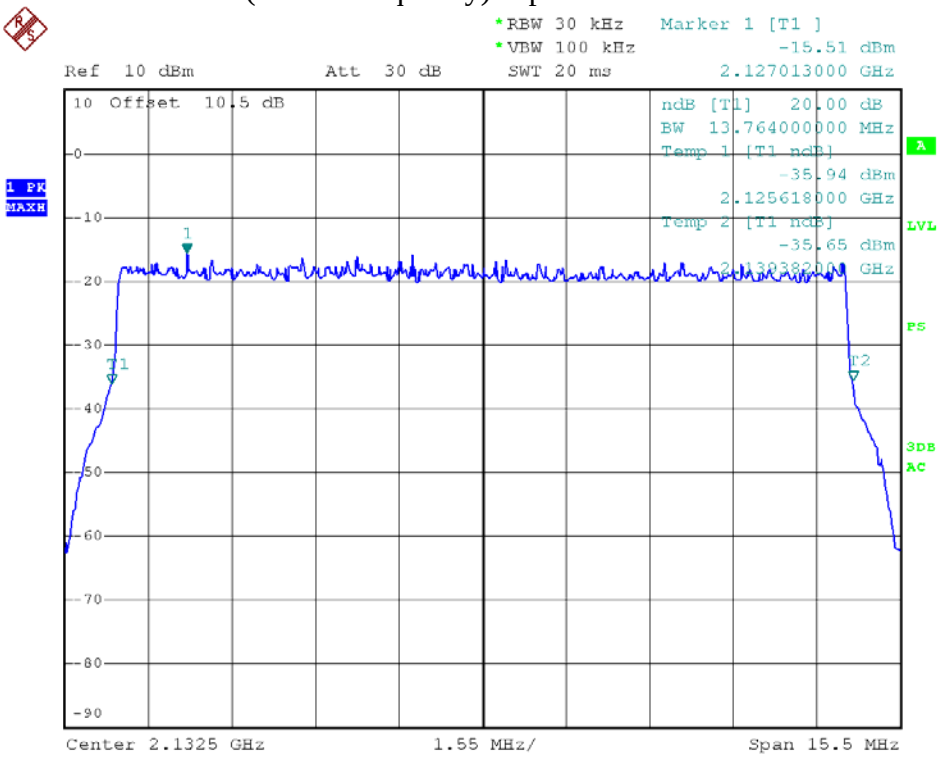
2100MHz-LTE-15M downlink (lowest frequency)-Input



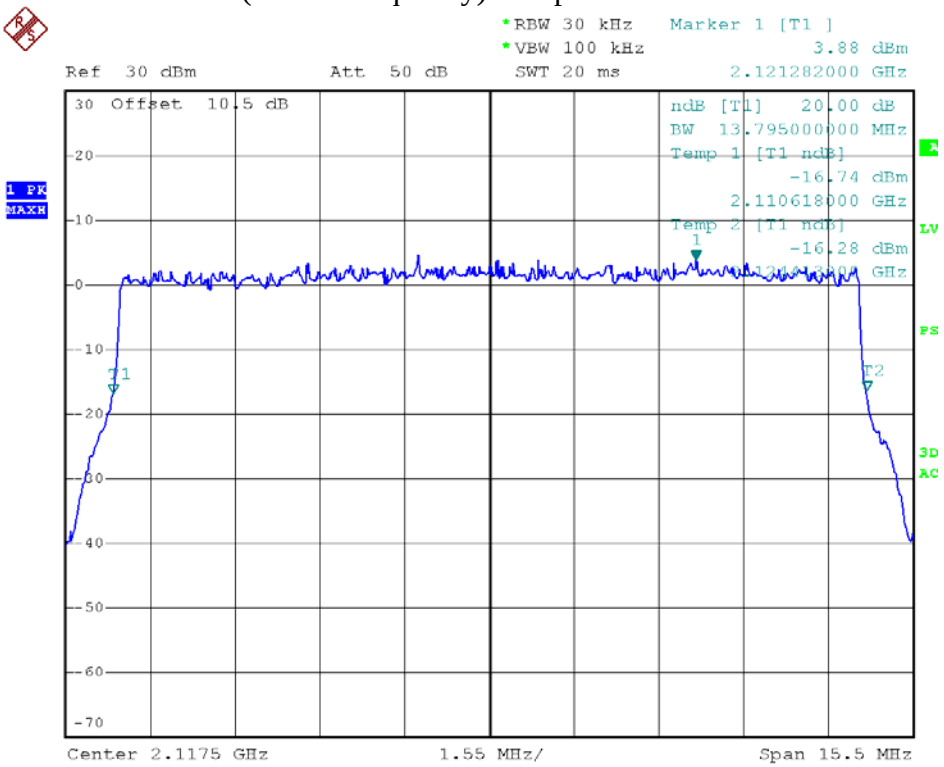
2100MHz-LTE-15M downlink (lowest frequency)-Output



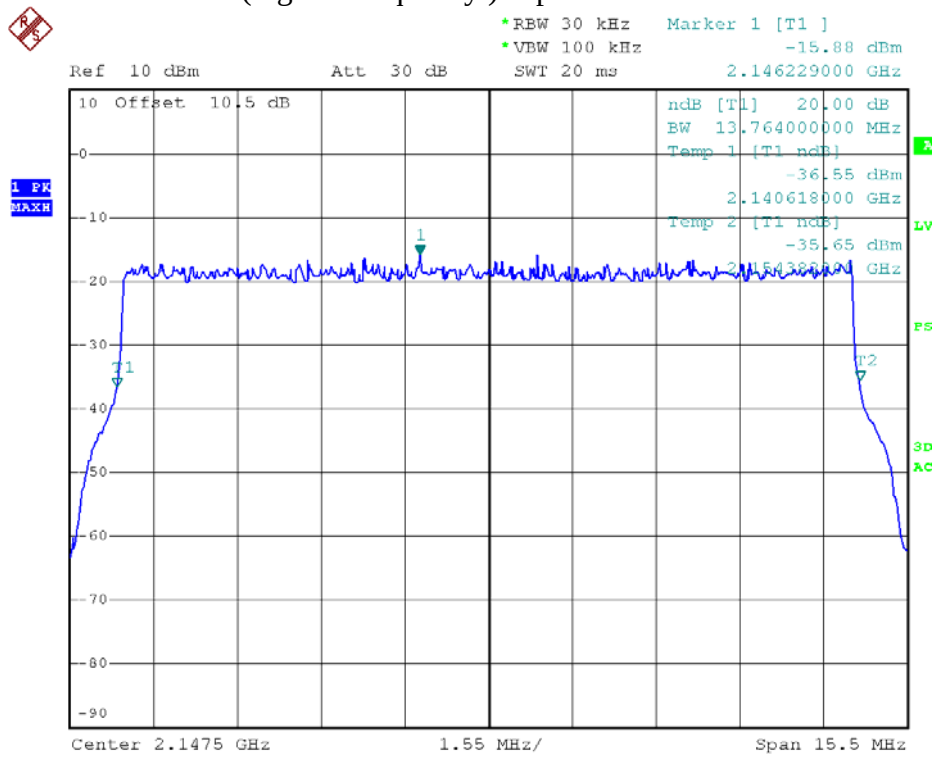
2100MHz-LTE-15M downlink (middle frequency)-Input



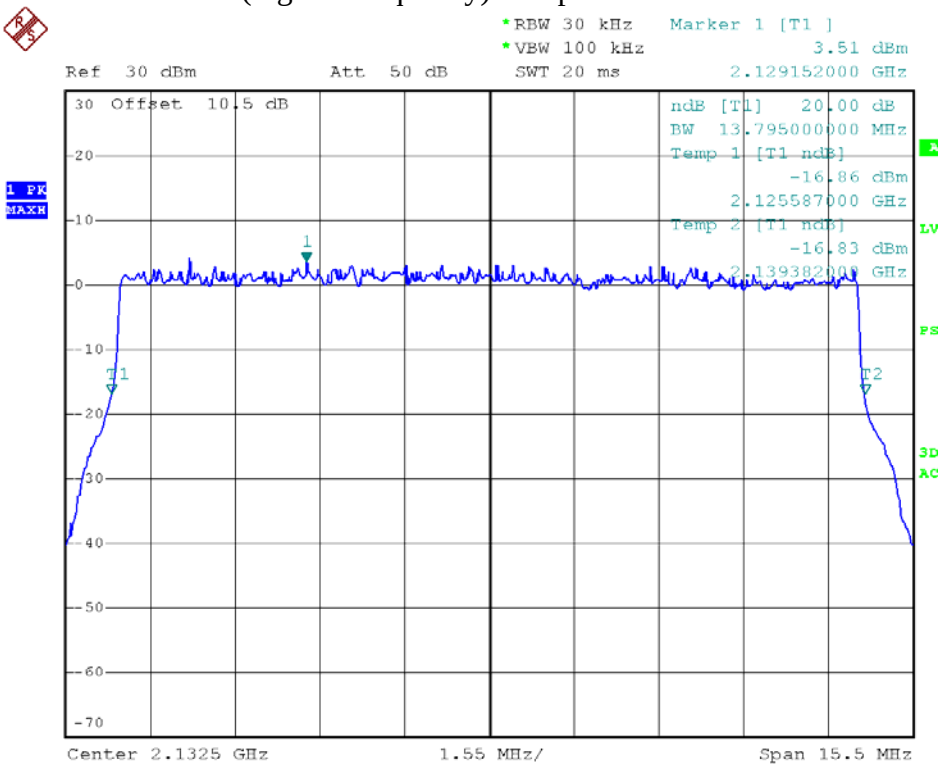
2100MHz-LTE-15M downlink (middle frequency)- Output



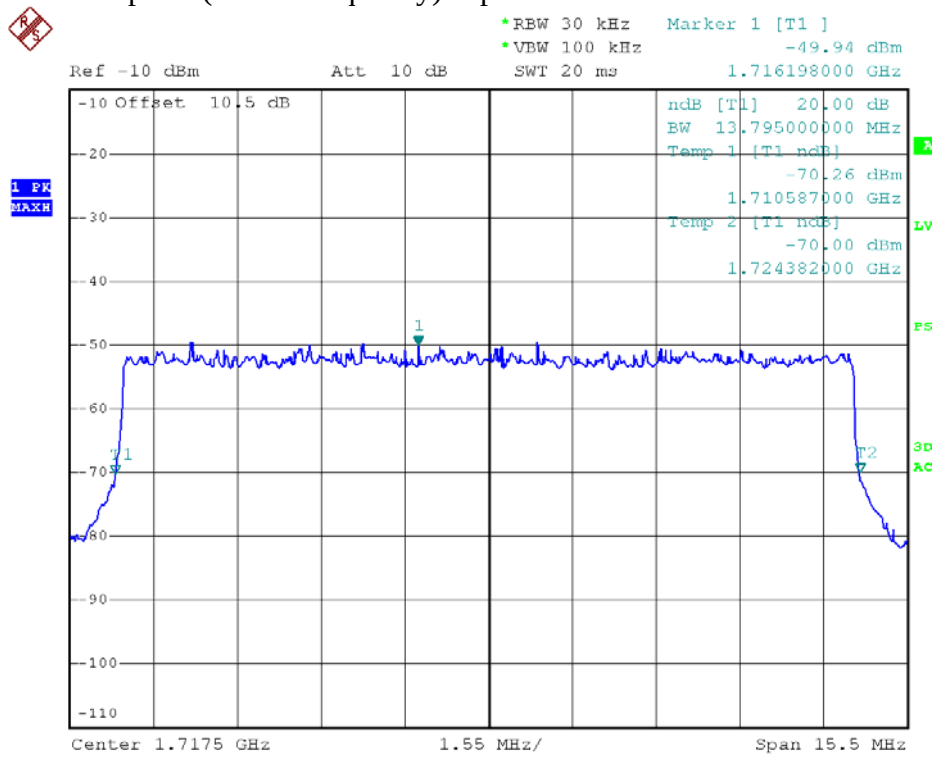
2100MHz-LTE-15M downlink (highest frequency)-Input



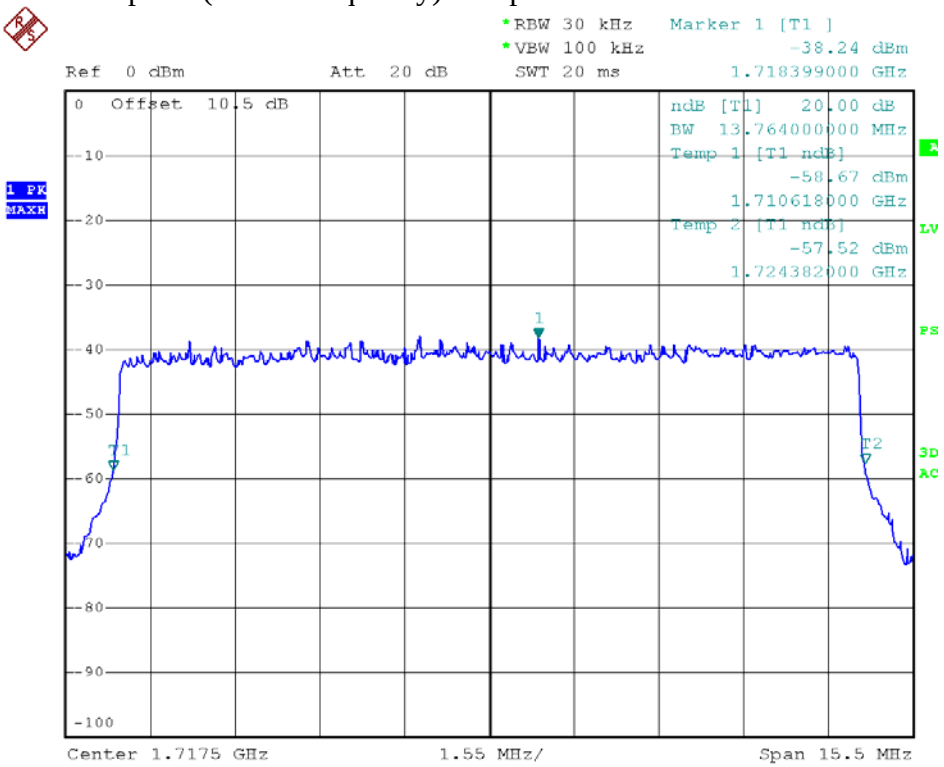
2100MHz-LTE-15M downlink (highest frequency)- Output



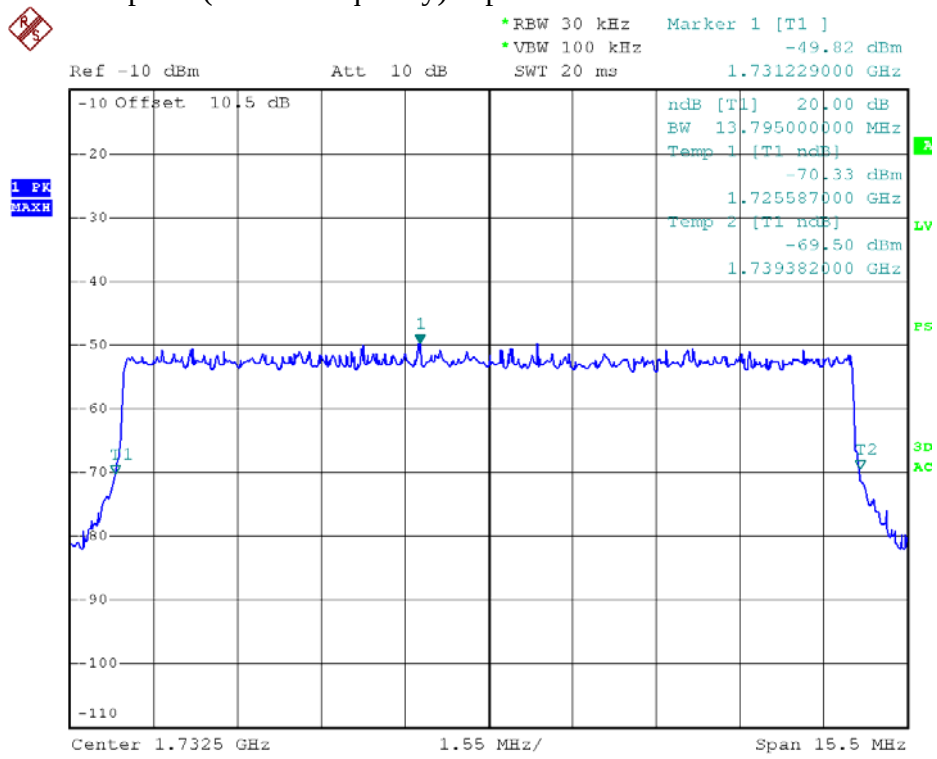
2100MHz-LTE-15M uplink (lowest frequency)-Input



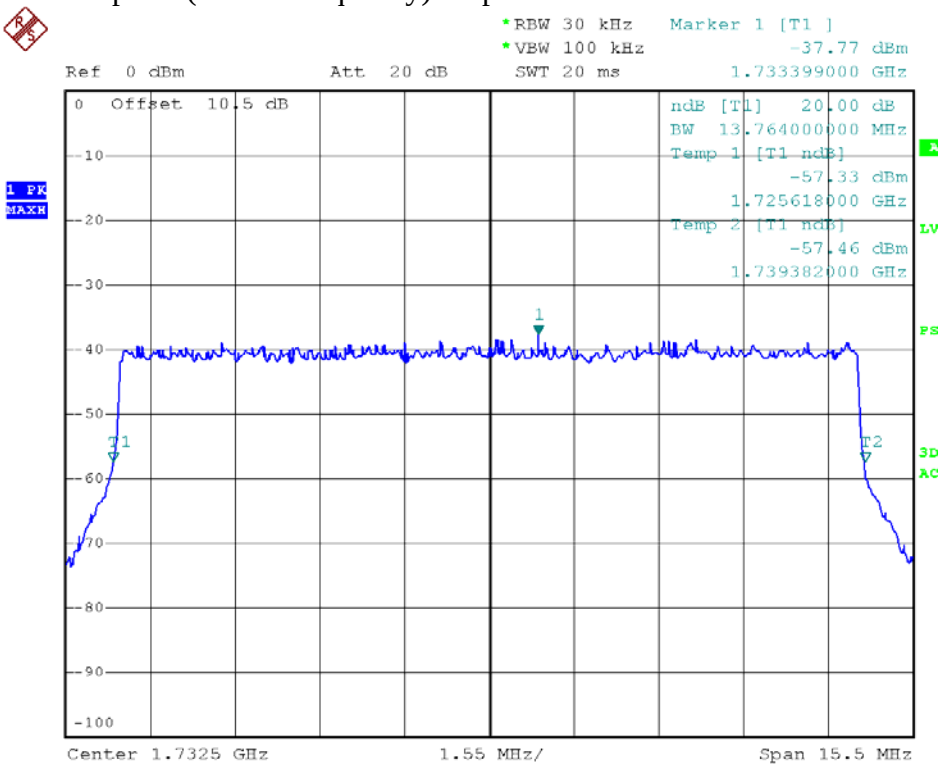
2100MHz-LTE-15M uplink (lowest frequency)- Output



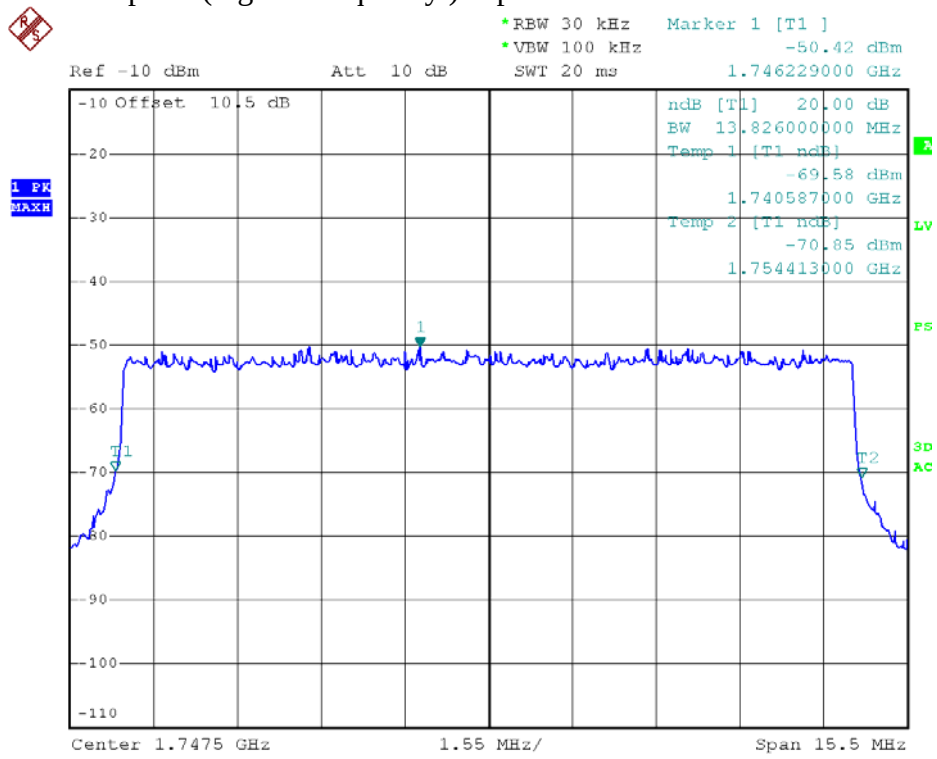
2100MHz-LTE-15M uplink (middle frequency)-Input



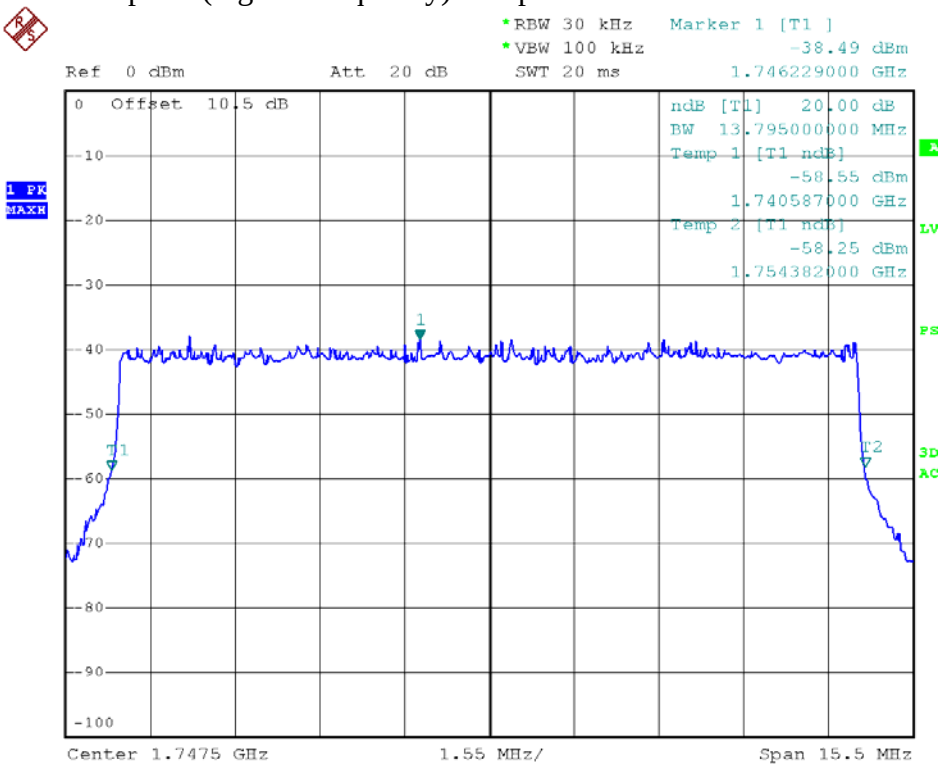
2100MHz-LTE-15M plink (middle frequency)-Ouput



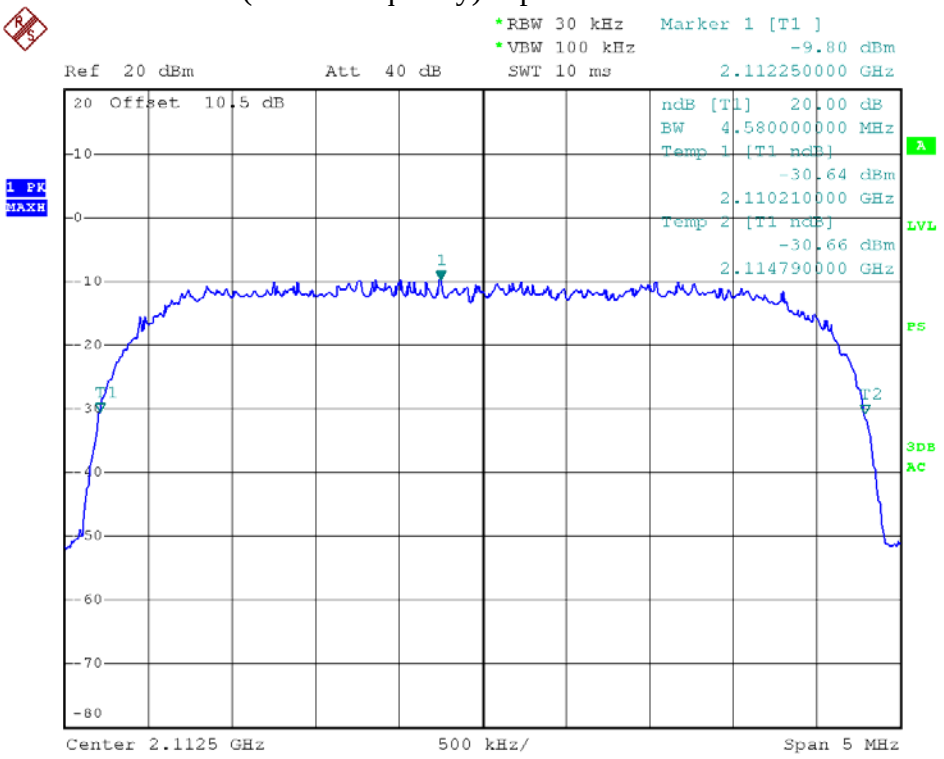
2100MHz-LTE-15M uplink (highest frequency)-Input



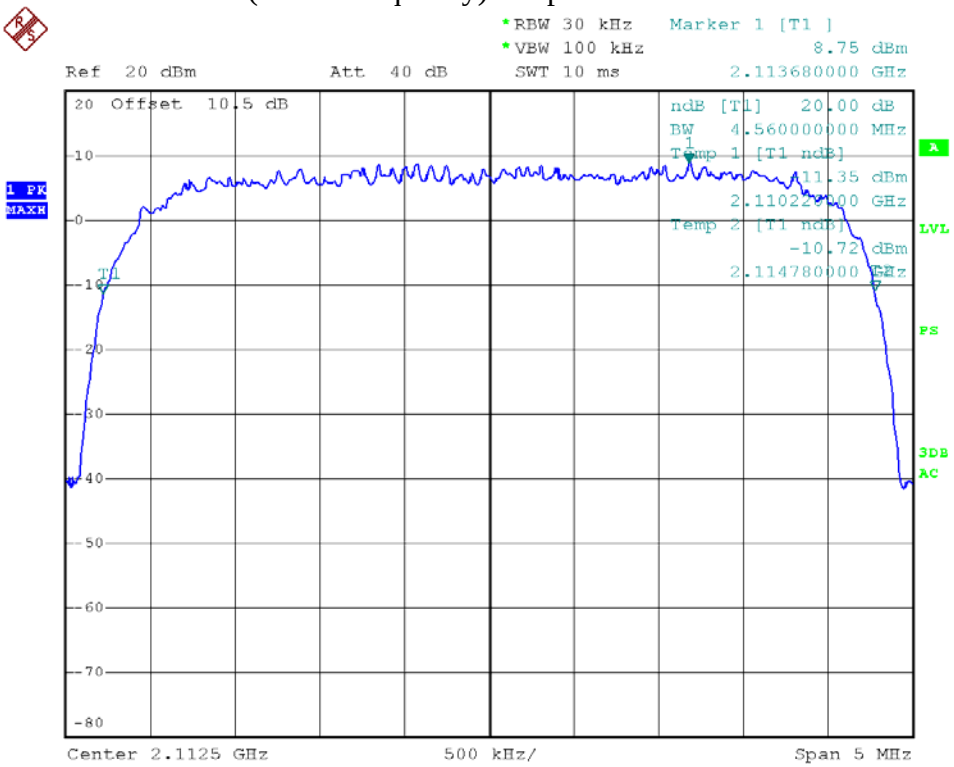
2100MHz-LTE-15M uplink (highest frequency)- Output



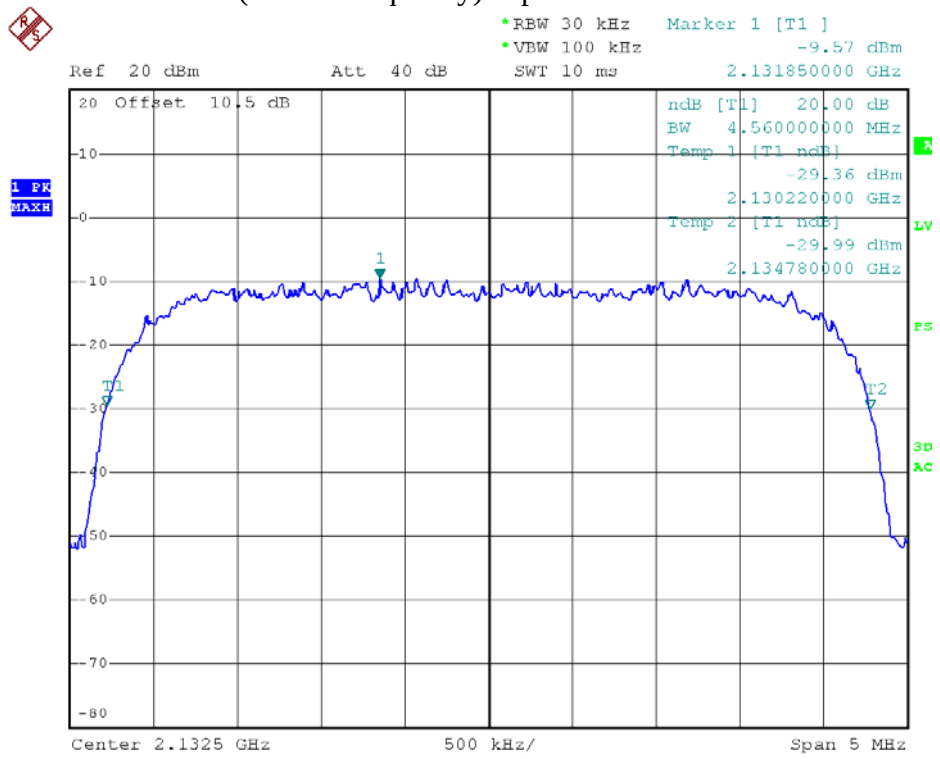
2100MHz-WCDMA downlink (lowest frequency)-Input



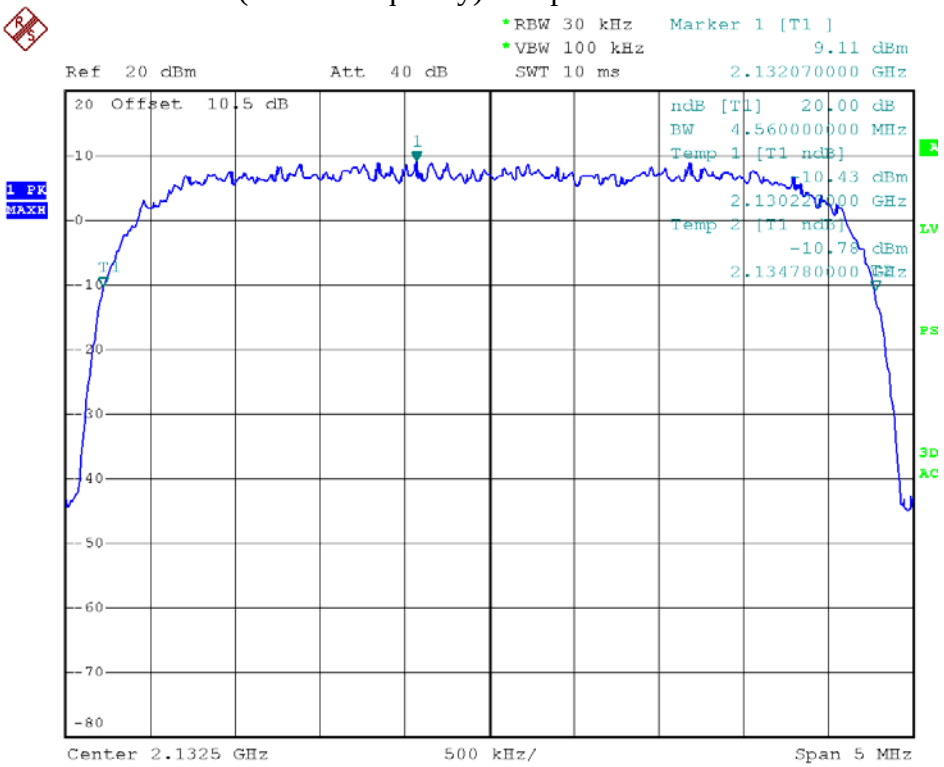
2100MHz-WCDMA downlink (lowest frequency)-Output



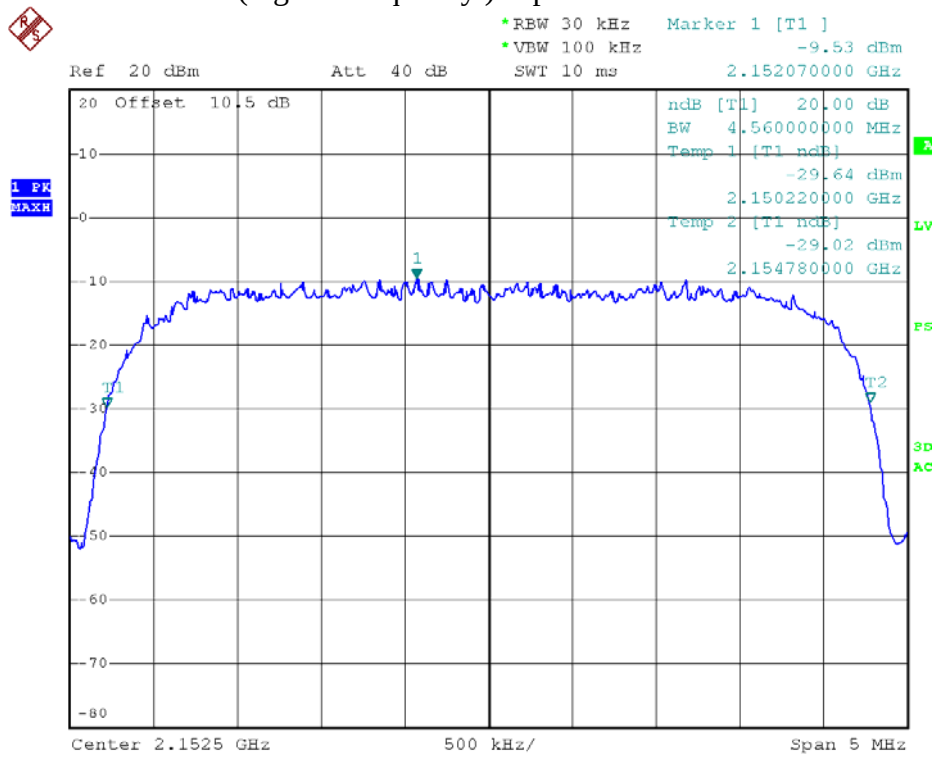
2100MHz-WCDMA downlink (middle frequency)-Input



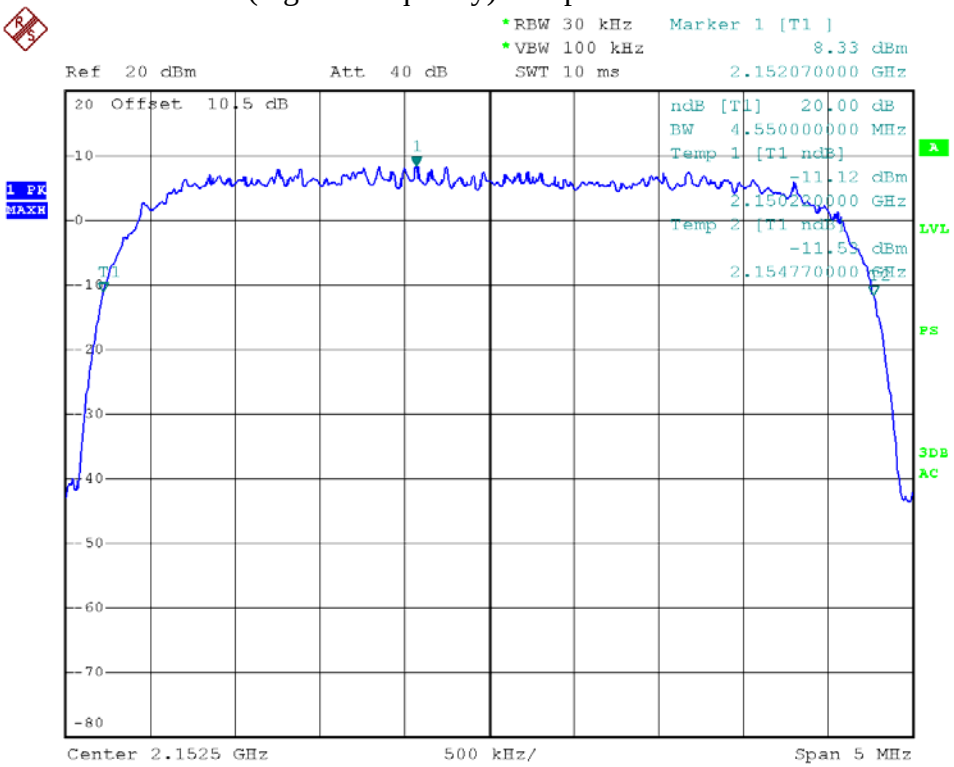
2100MHz-WCDMA downlink (middle frequency)- Output



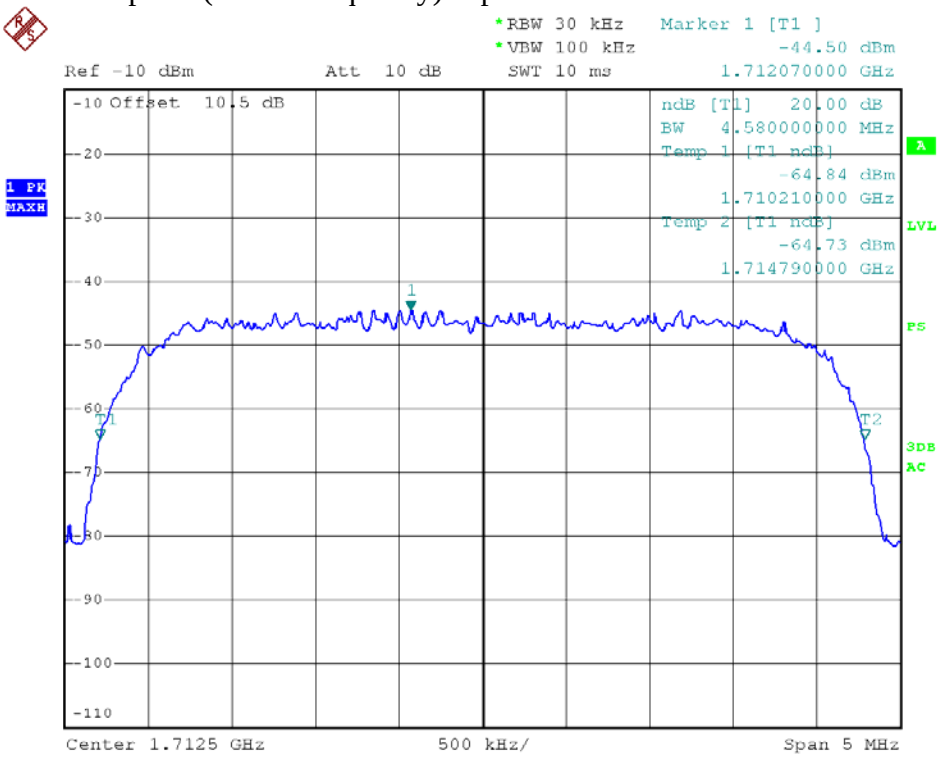
2100MHz-WCDMA downlink (highest frequency)-Input



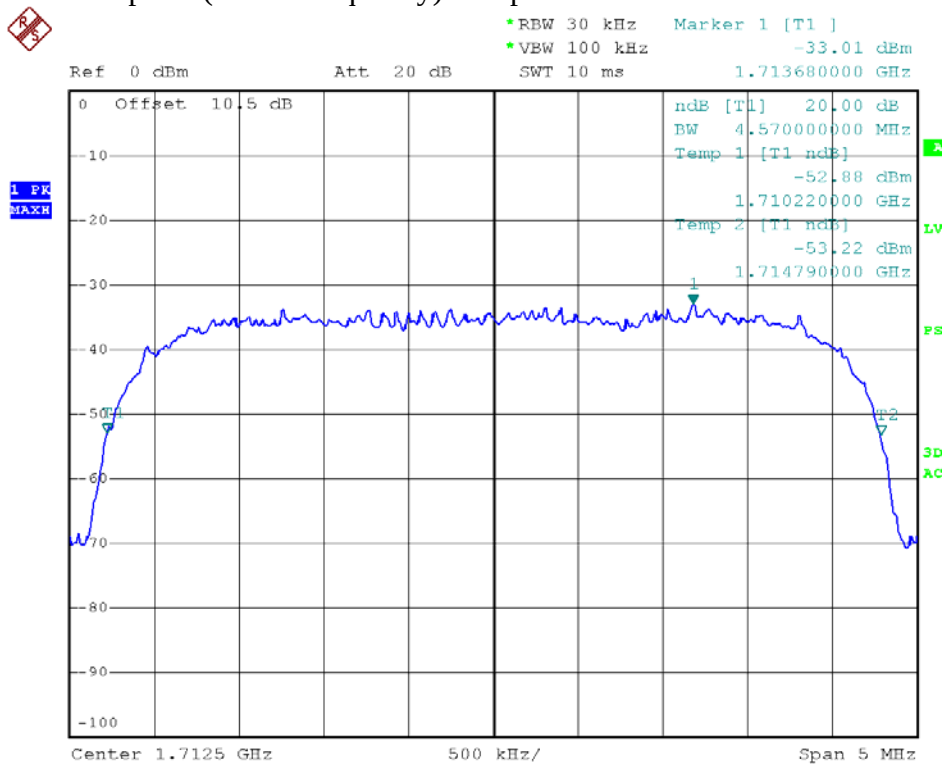
2100MHz-WCDMA downlink (highest frequency)- Output



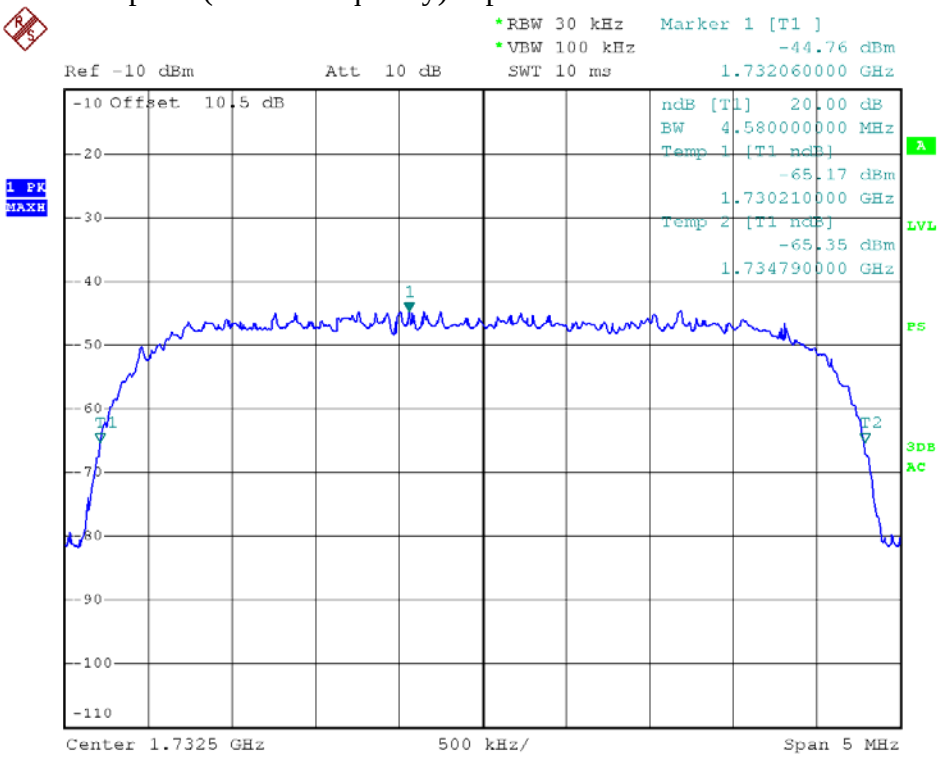
2100MHz-WCDMA uplink (lowest frequency)-Input



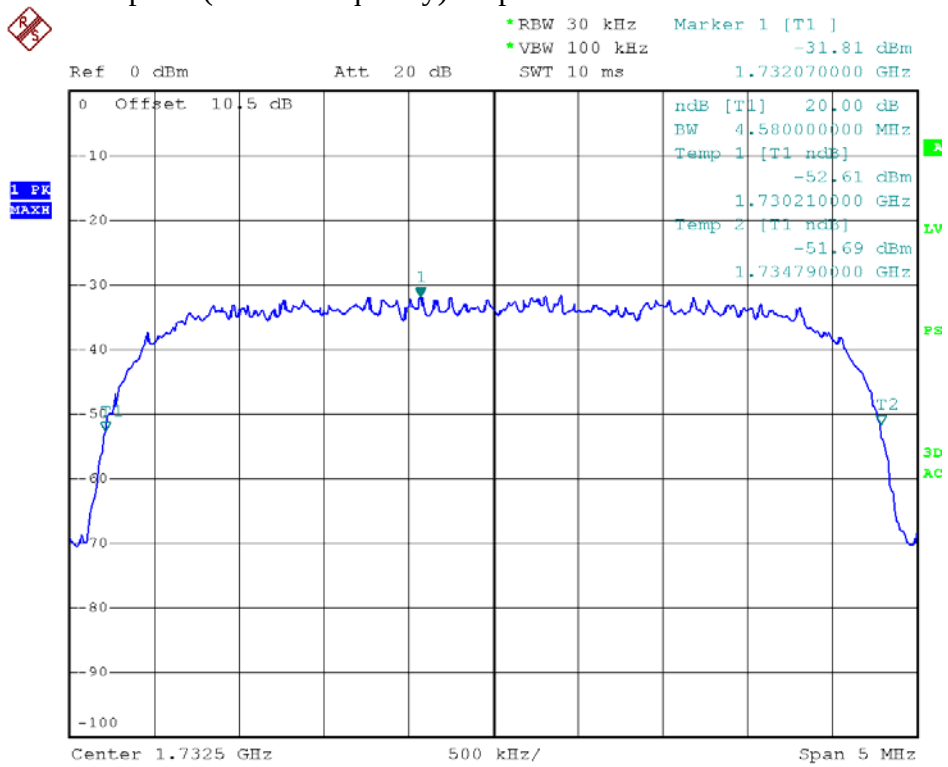
2100MHz-WCDMA uplink (lowest frequency)- Output



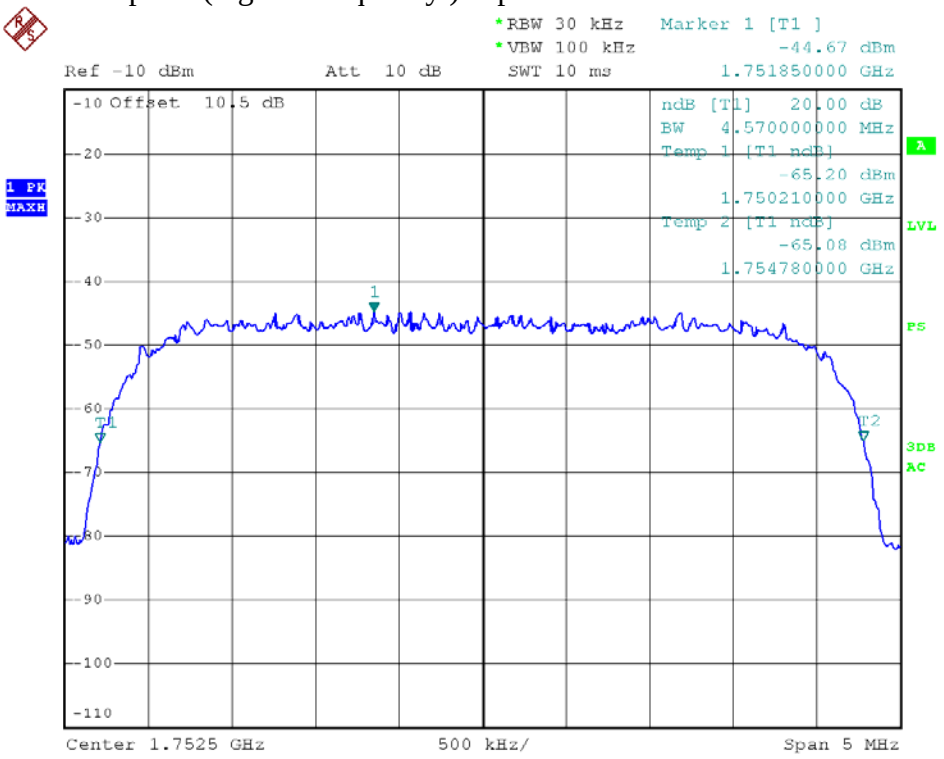
2100MHz-WCDMA uplink (middle frequency)-Input



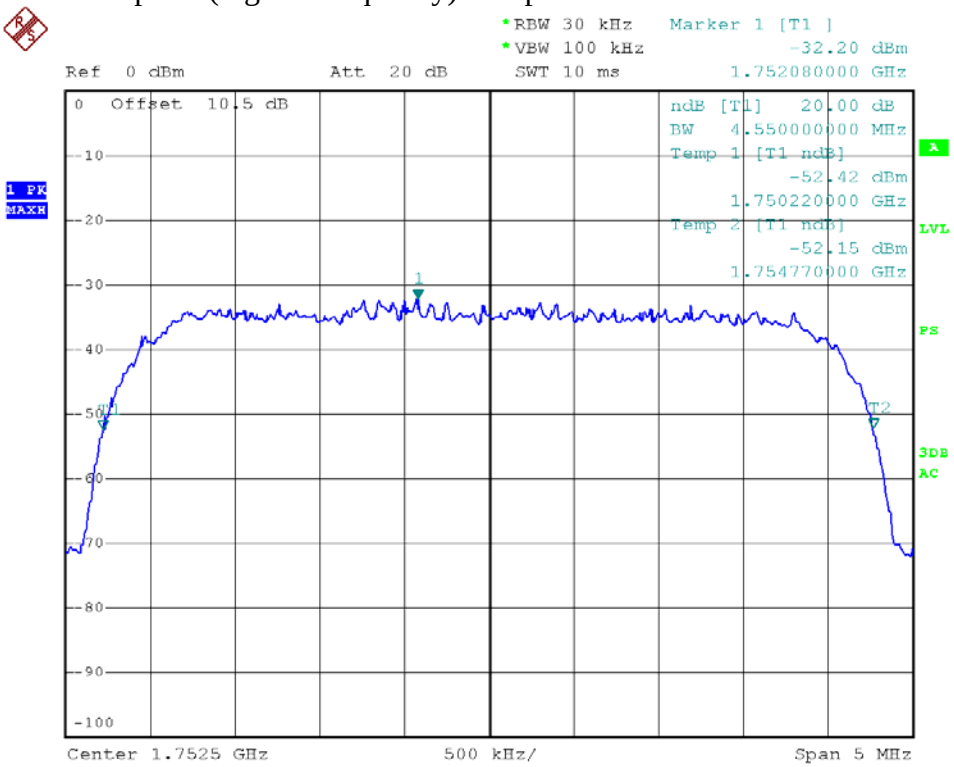
2100MHz-WCDMA uplink (middle frequency)-Ouput



2100MHz-WCDMA uplink (highest frequency)-Input



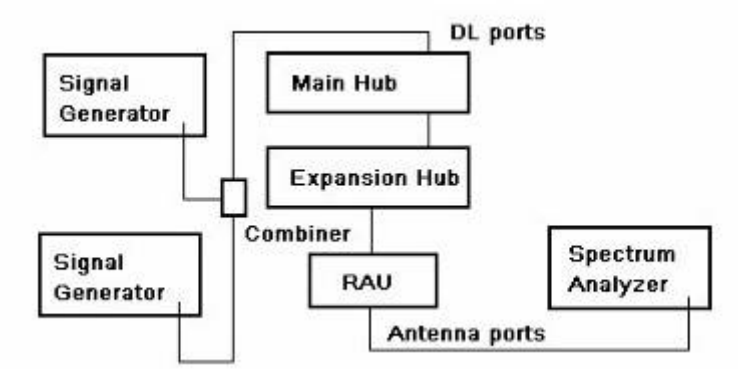
2100MHz-WCDMA uplink (highest frequency)- Output

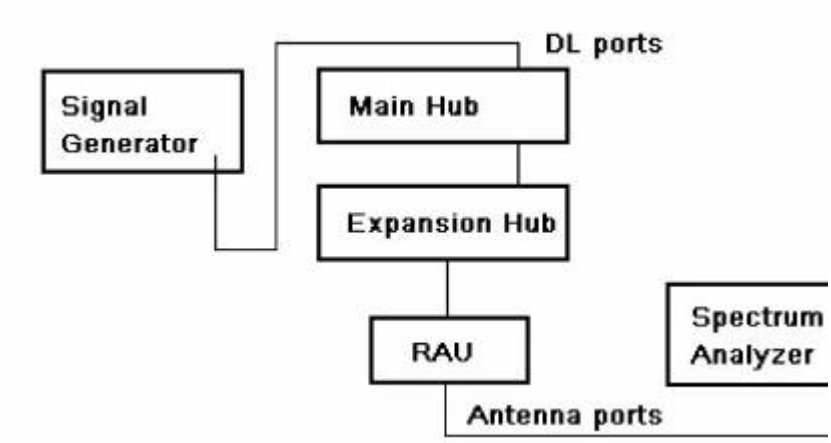


4.2.6 INTERMODULATION

Test Date:	12 November, 2012
Test Method:	2-11-04/EAB/RF
Test Requirement:	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.
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

Test configuration





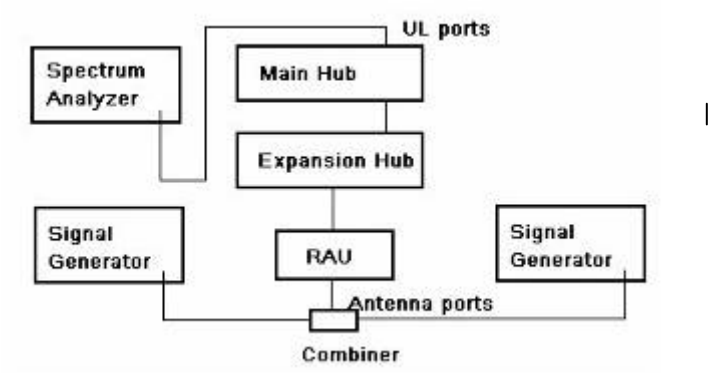


Fig.2 Up Link Intermodulation

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

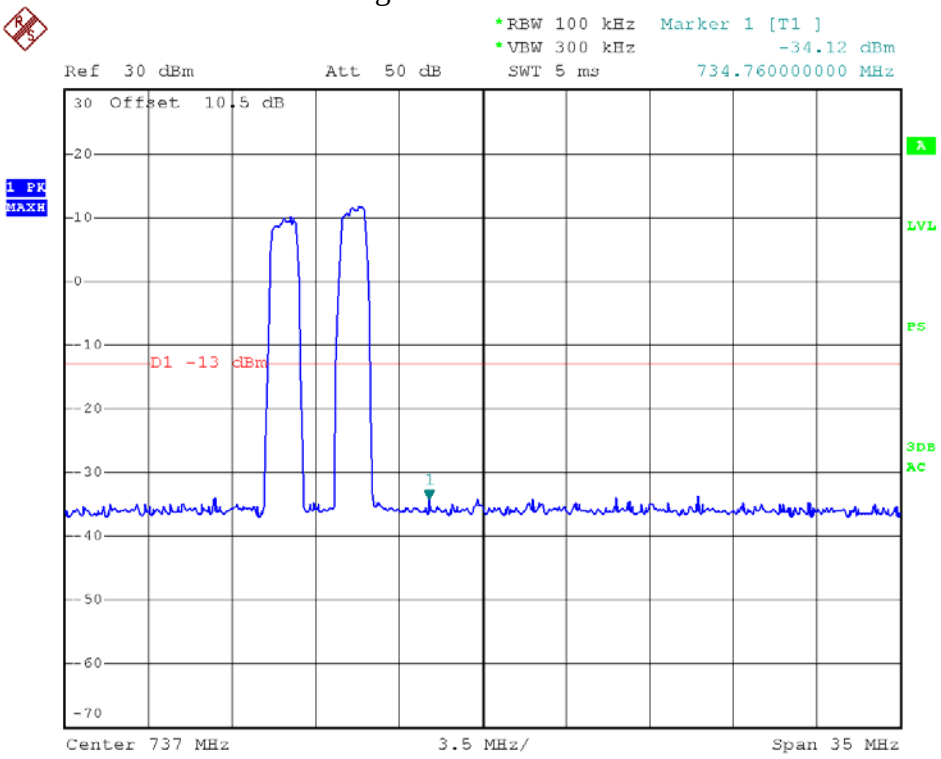
(the sum of the two unwanted signal should be rated power)

8. Correct for all losses in the RF path
9. Read the conducted spurious emission of the EUT antenna port.

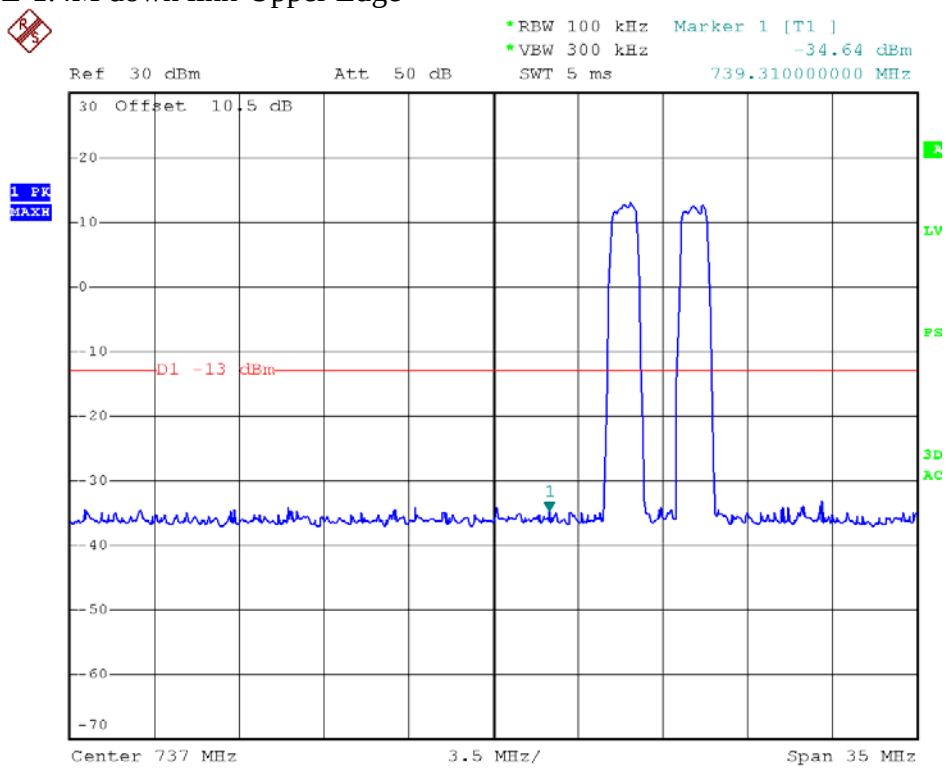
CW signal rather than typical signal is acceptable(for FM)
At maximum drive level, for each modulation :one test with three tones, or two tests(high, low-band edge)with two tones
Limit usually is -13dBm conducted
Not need for signal channel systems
Combination of modulation types not needed

4.2.6.1 MEASUREMENT RECORD

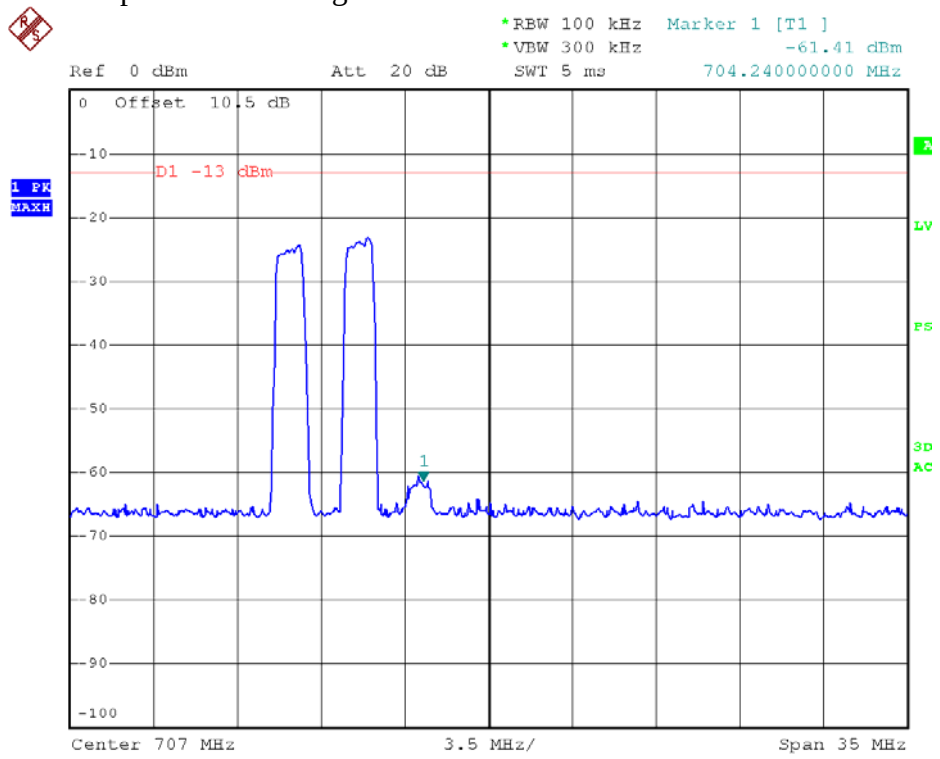
700MHz-LTE-1.4M down link-Lower Edge



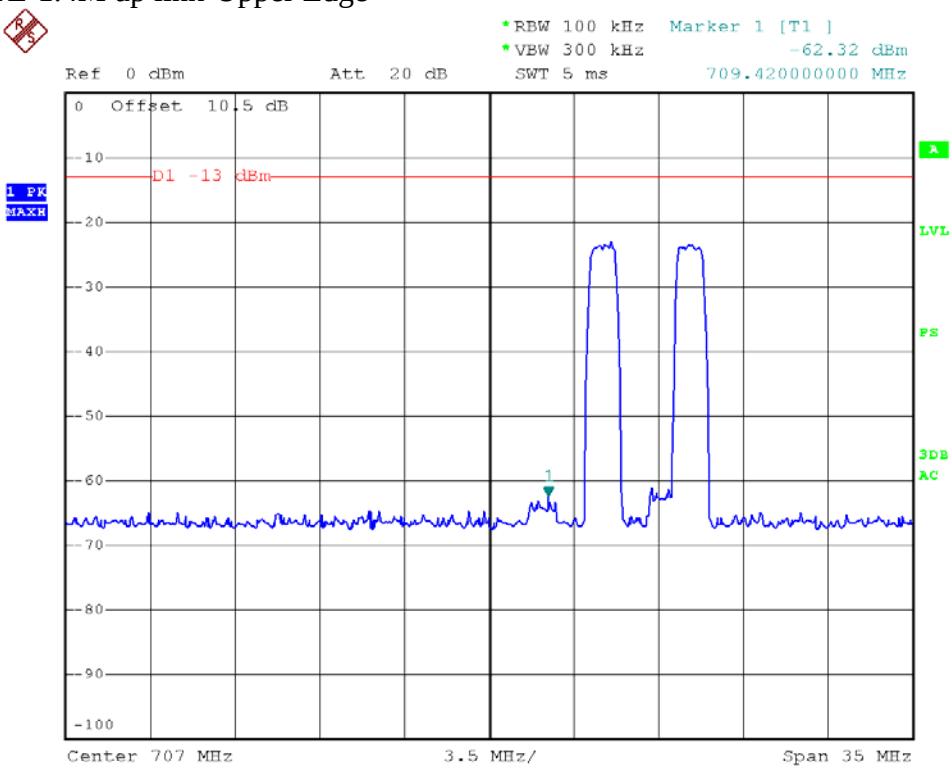
700MHz-LTE-1.4M down link-Upper Edge



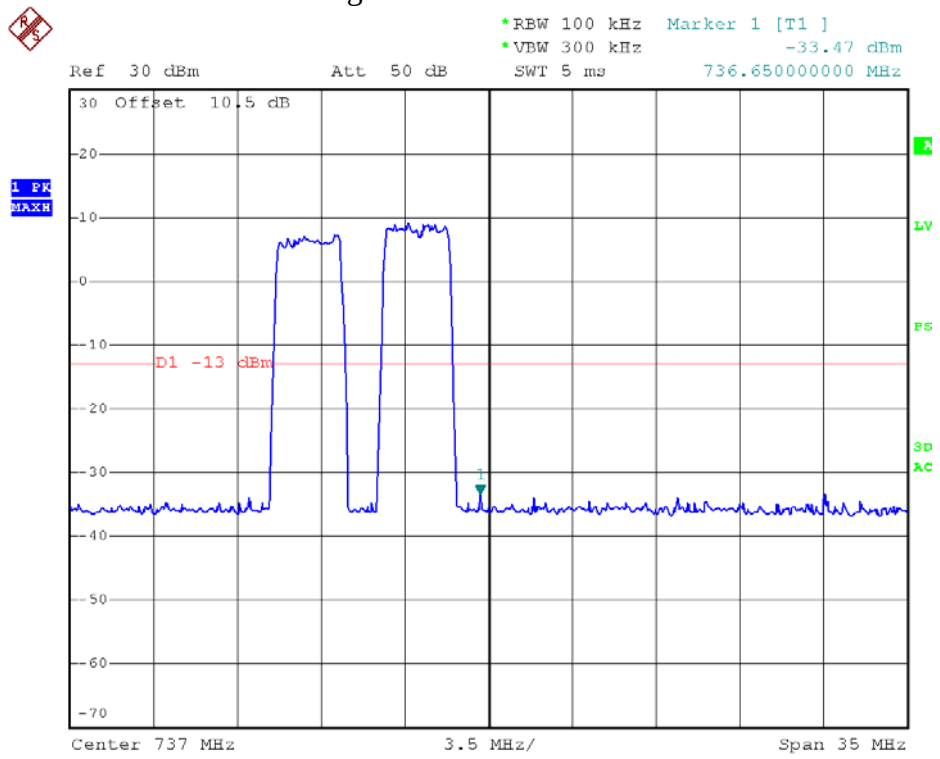
700MHz-LTE-1.4M up link-Lower Edge



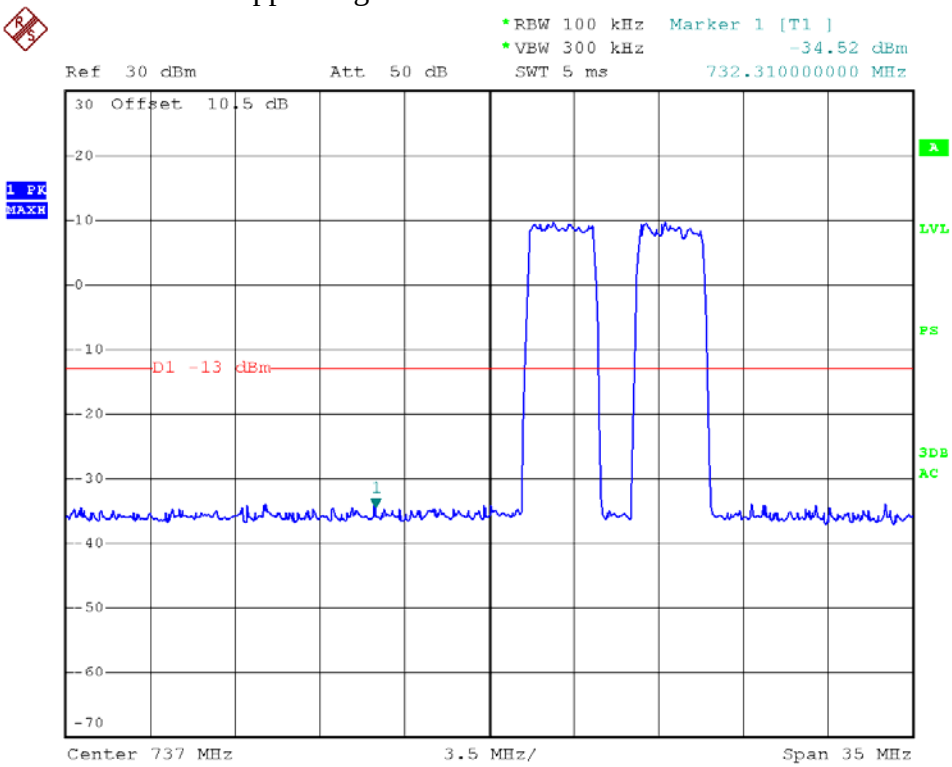
700MHz-LTE-1.4M up link-Upper Edge



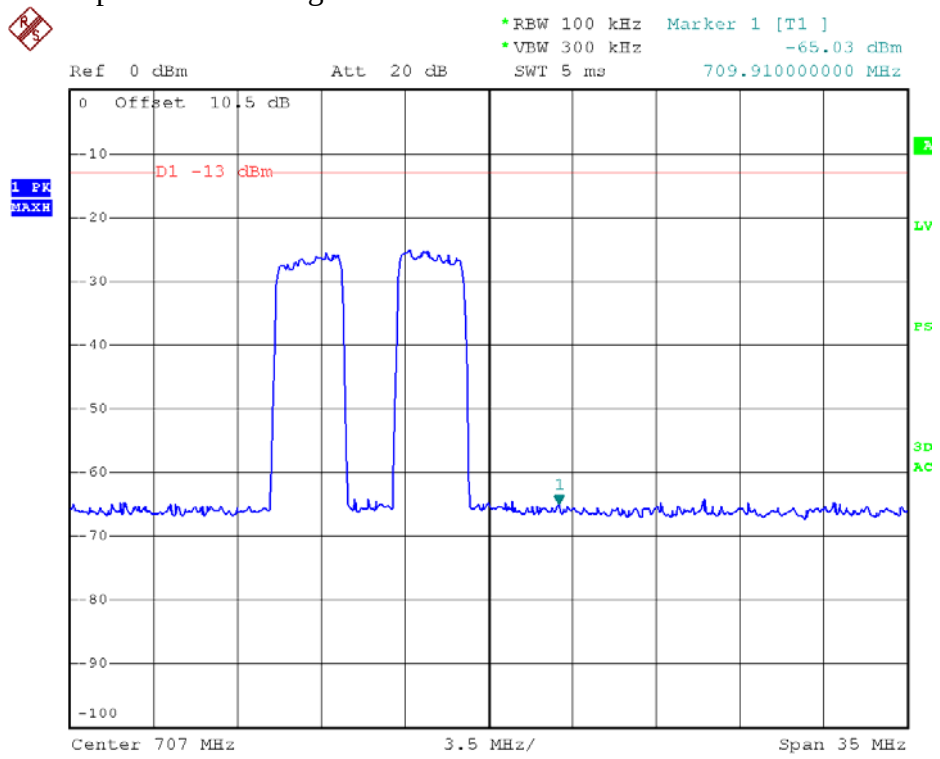
700MHz-LTE-3M down link-Lower Edge



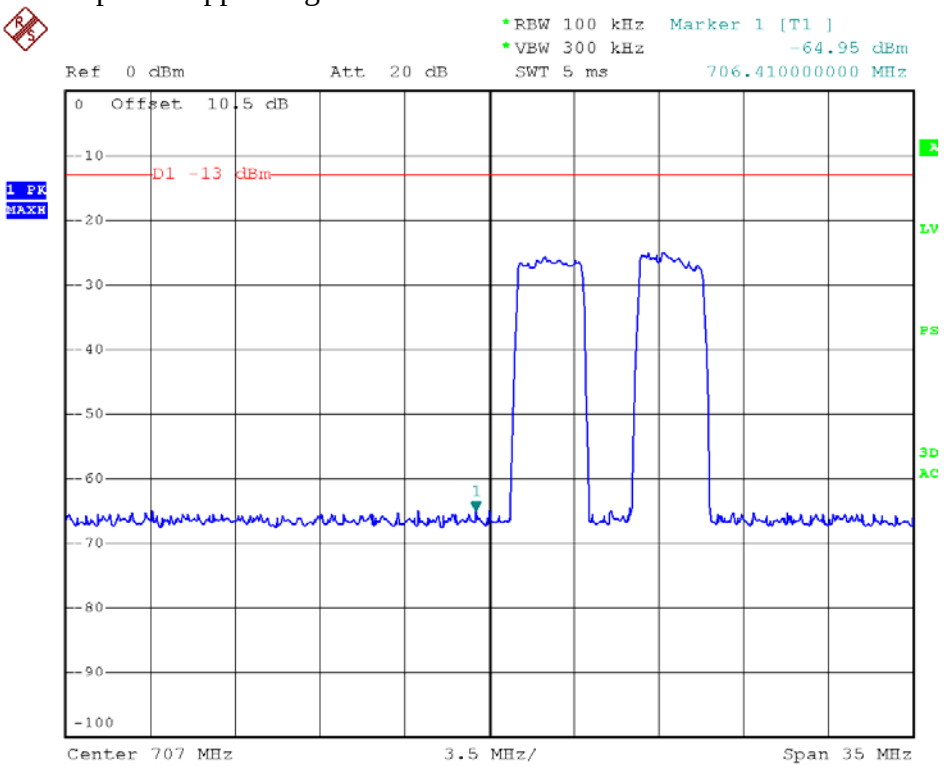
700MHz-LTE-3M down link-Upper Edge



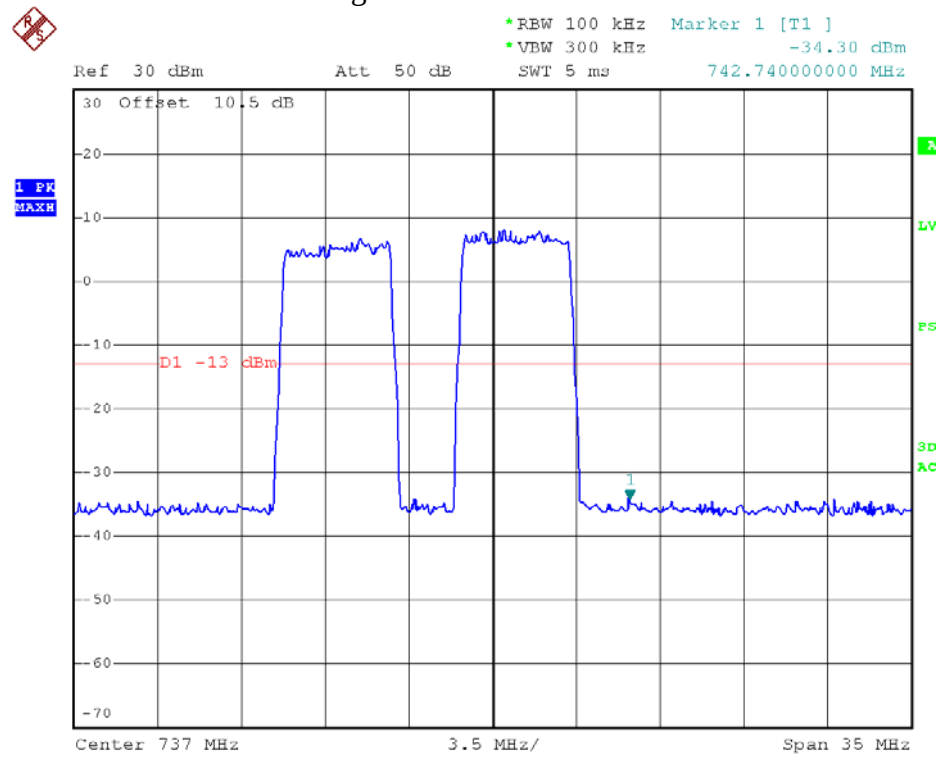
700MHz-LTE-3M up link-Lower Edge



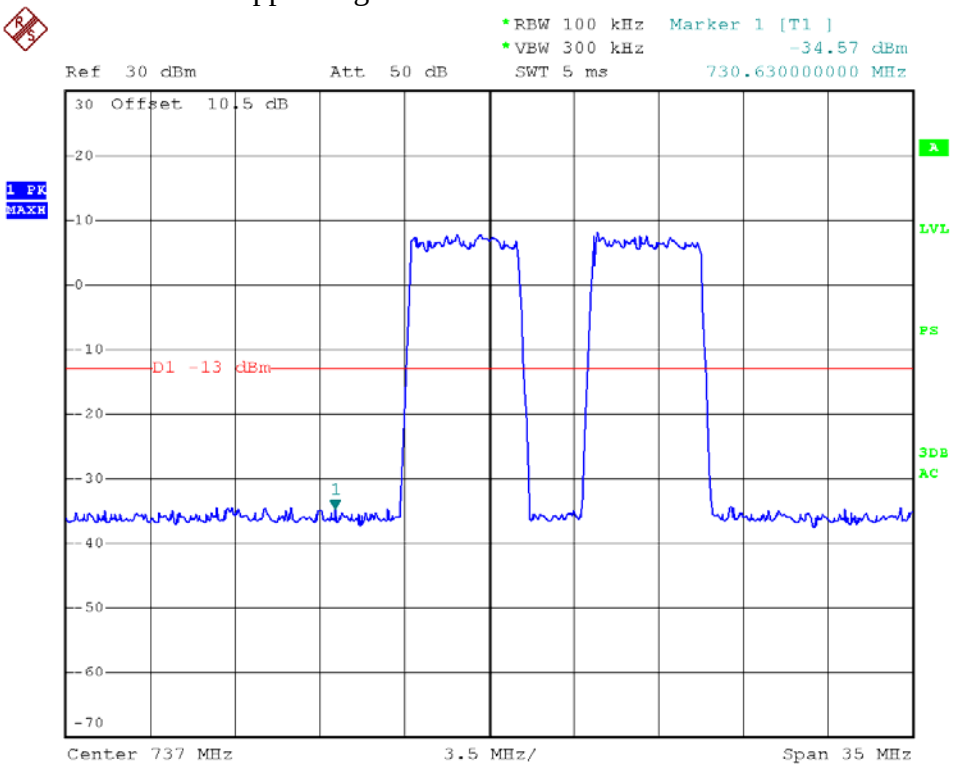
700MHz-LTE-3M up link-Upper Edge



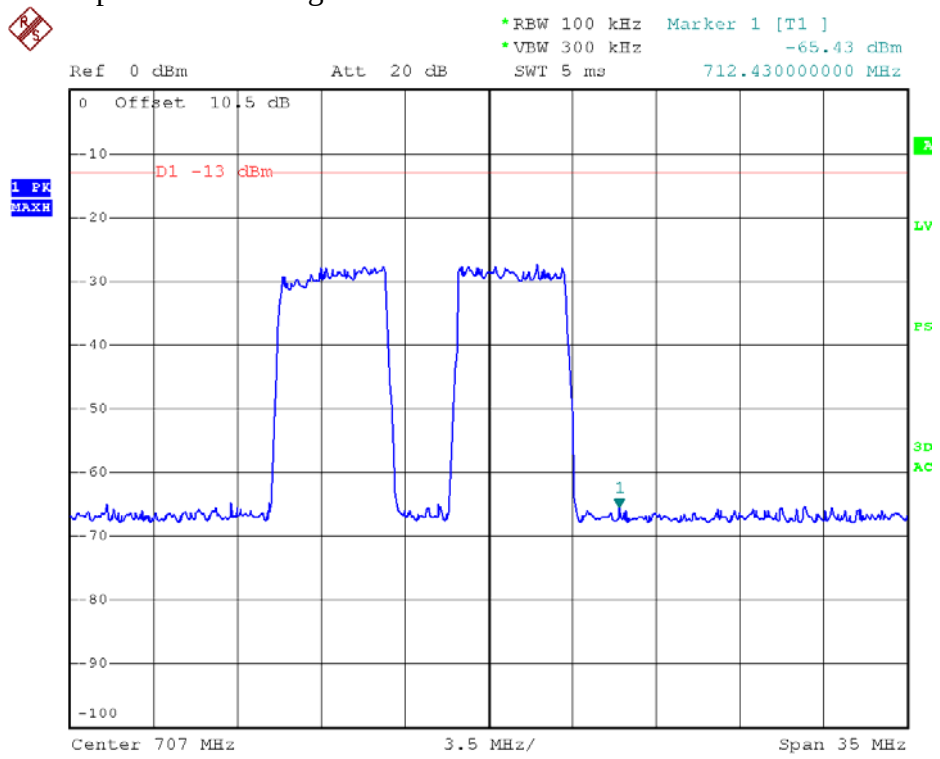
700MHz-LTE-5M down link-Lower Edge



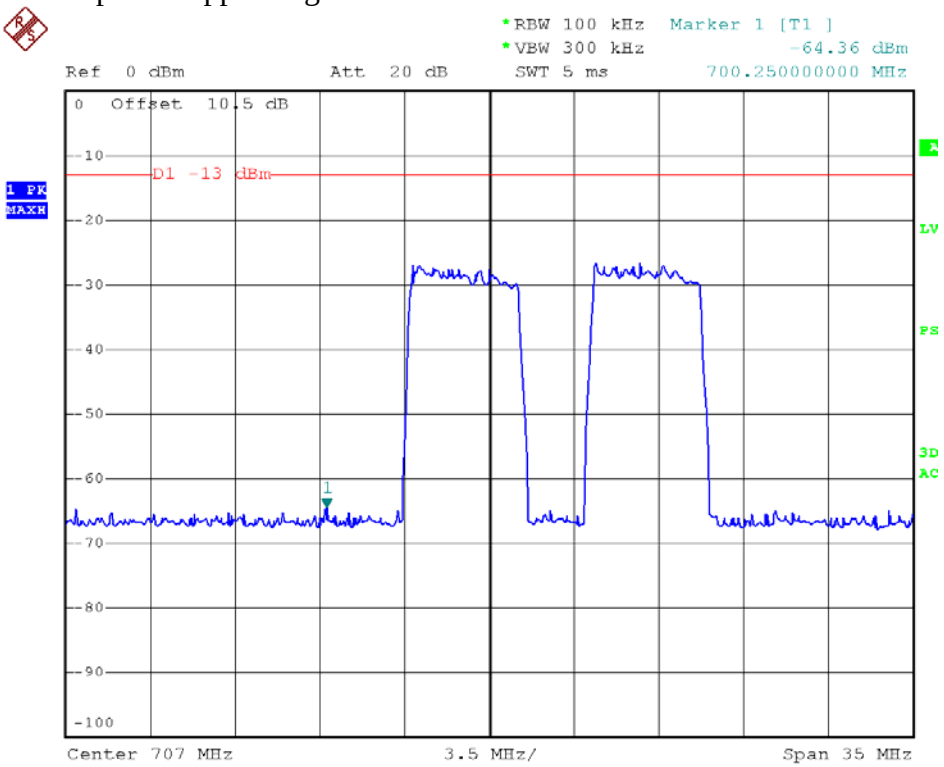
700MHz-LTE-5M down link-Upper Edge



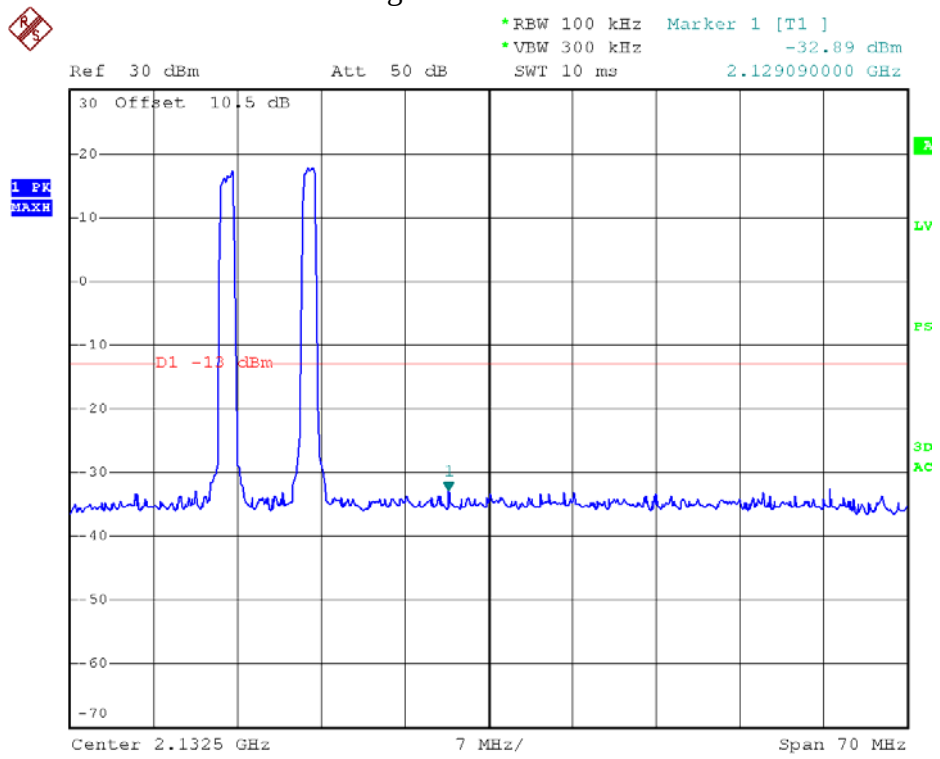
700MHz-LTE-5M up link-Lower Edge



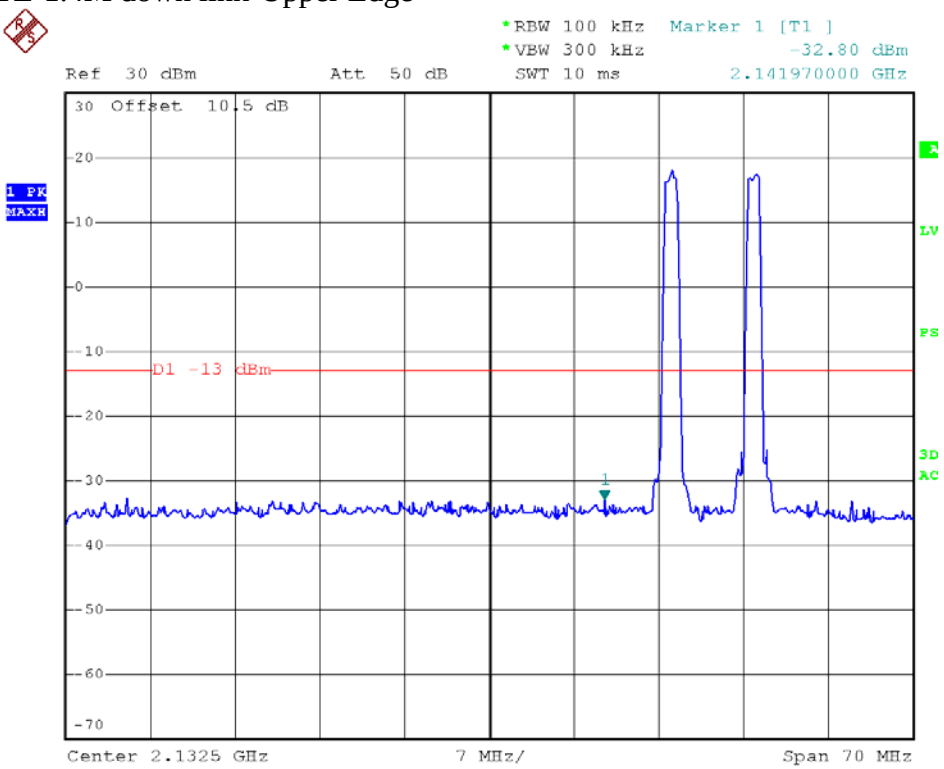
700MHz-LTE-5M up link-Upper Edge



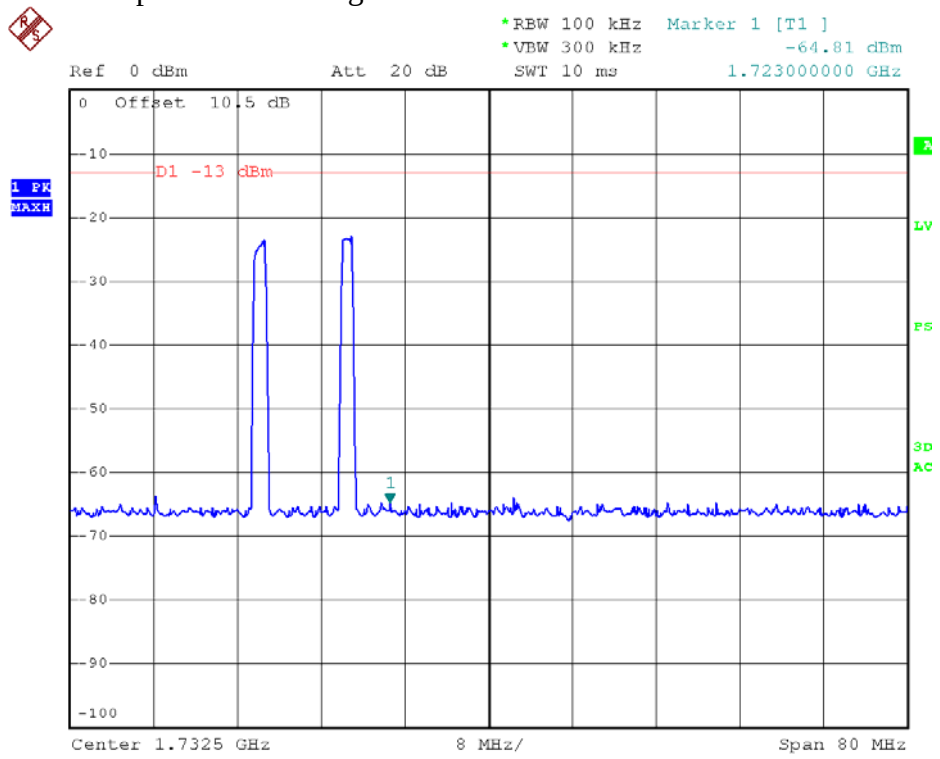
2100MHz-LTE-1.4M down link-Lower Edge



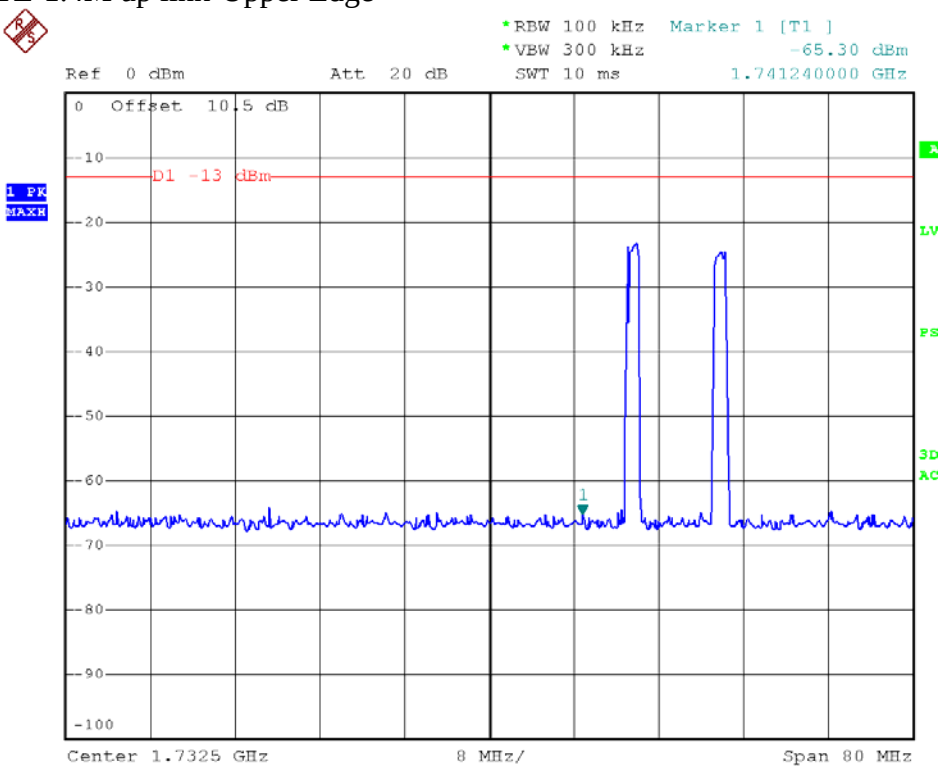
2100MHz-LTE-1.4M down link-Upper Edge



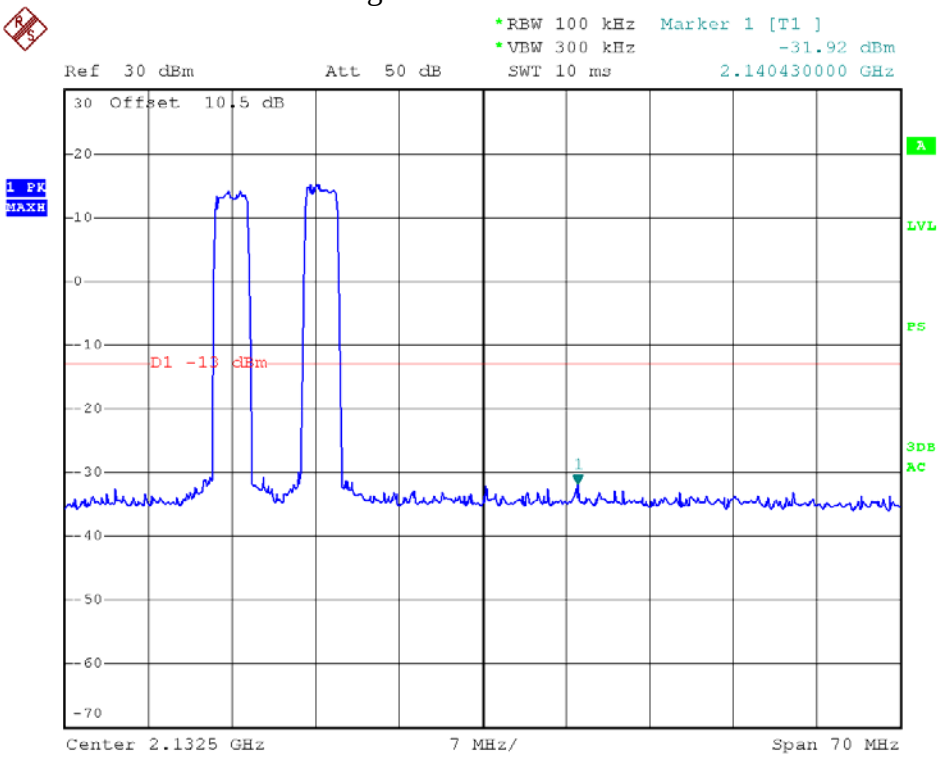
2100MHz-LTE-1.4M up link-Lower Edge



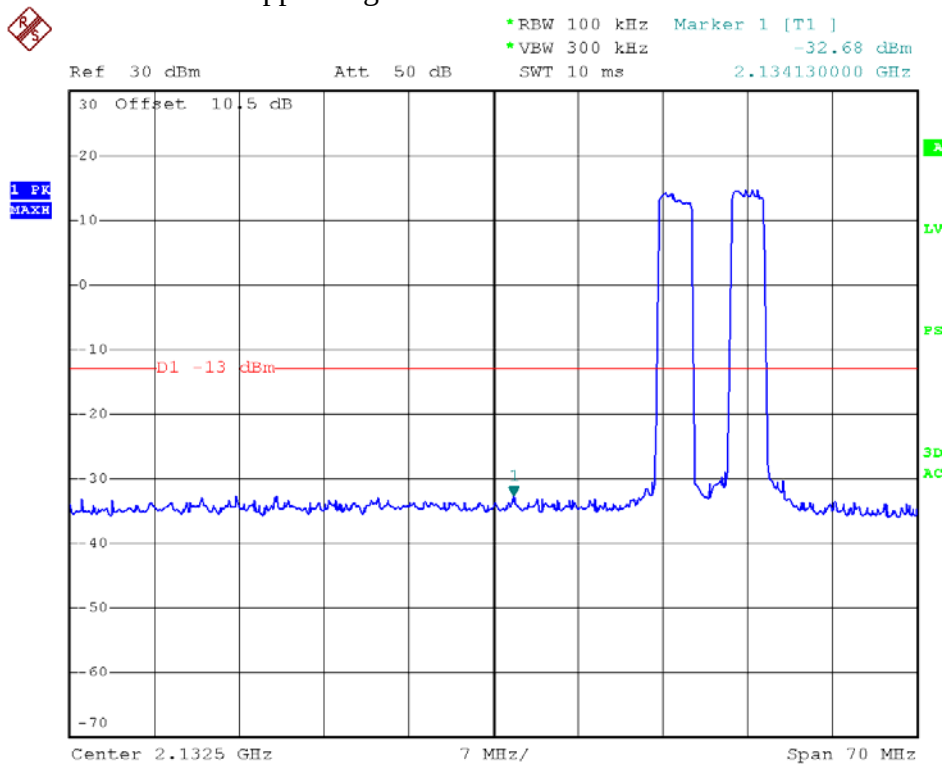
2100MHz-LTE-1.4M up link-Upper Edge



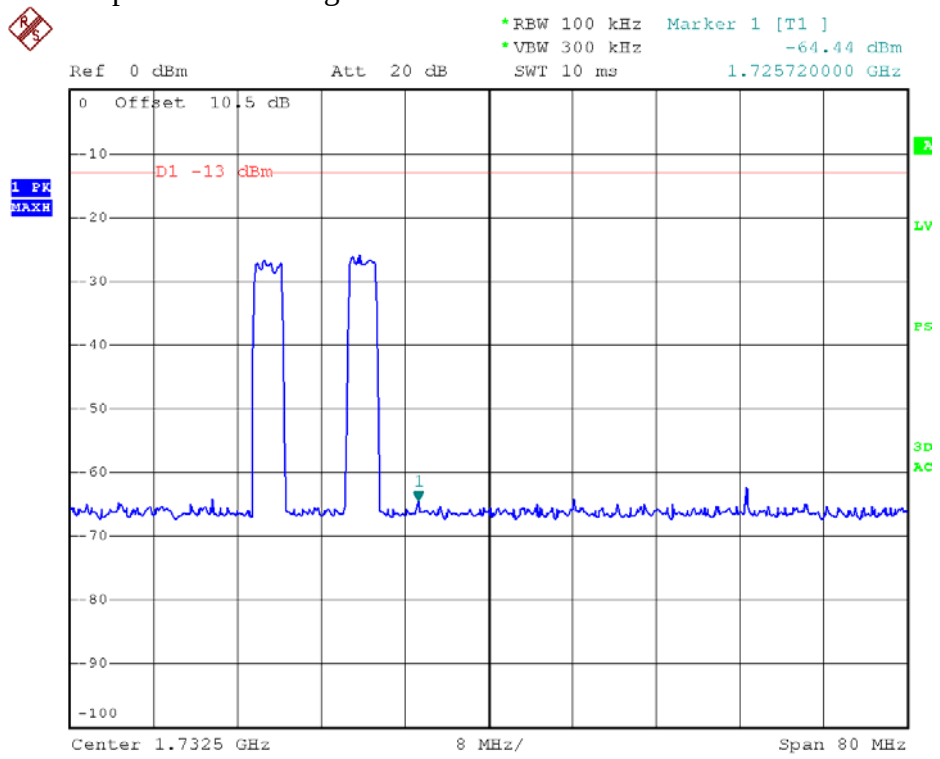
2100MHz-LTE-3M down link-Lower Edge



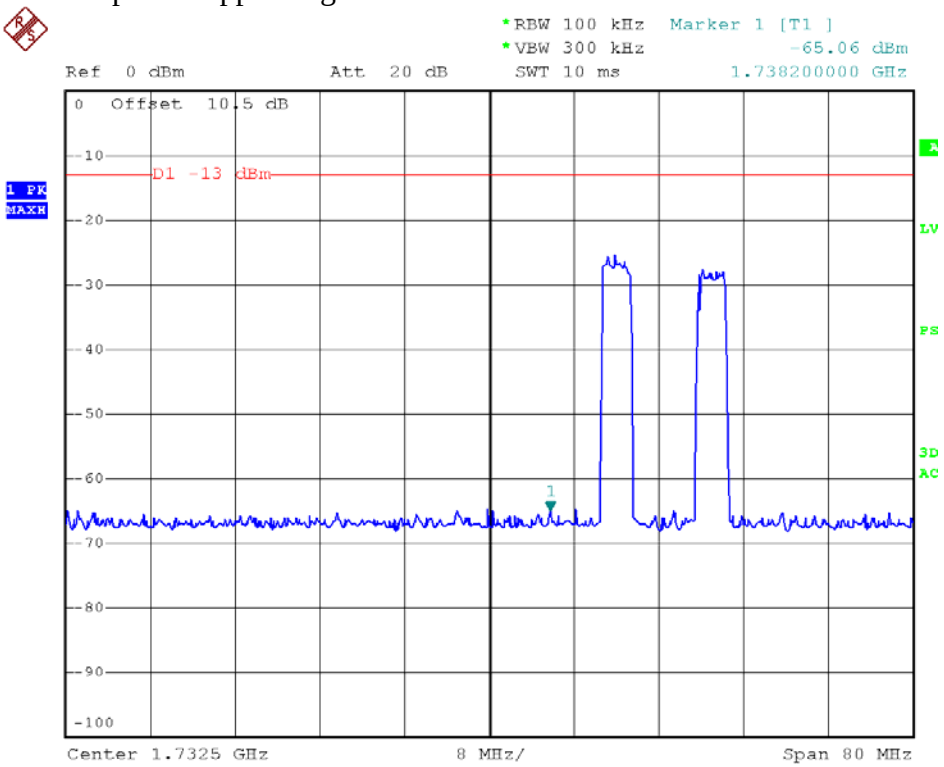
2100MHz-LTE-3M down link-Upper Edge



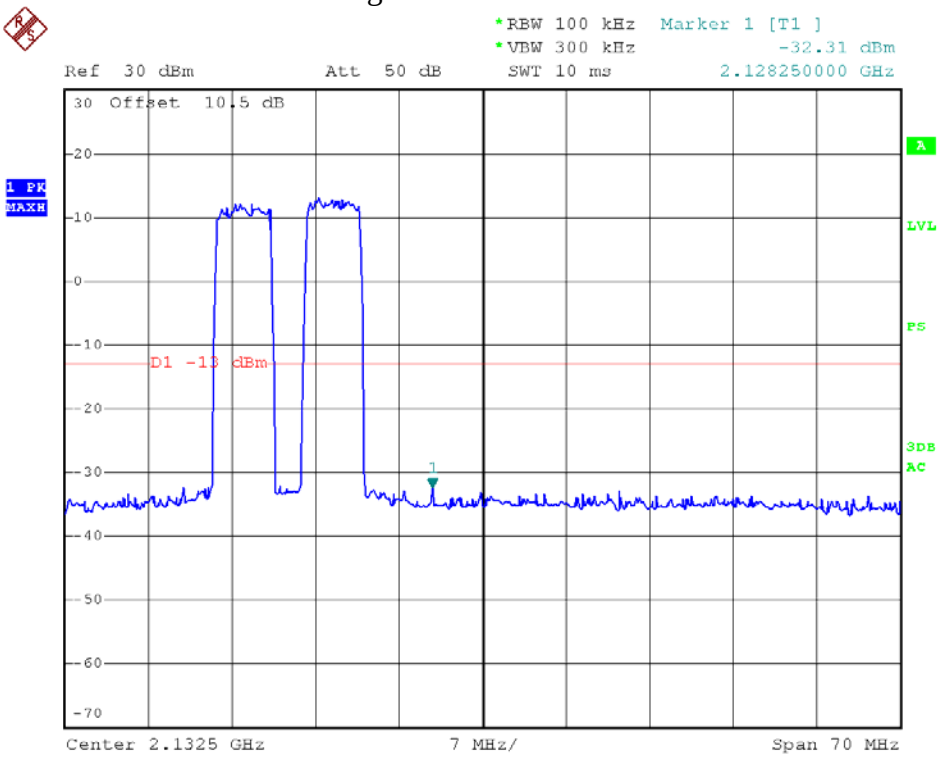
2100MHz-LTE-3M up link-Lower Edge



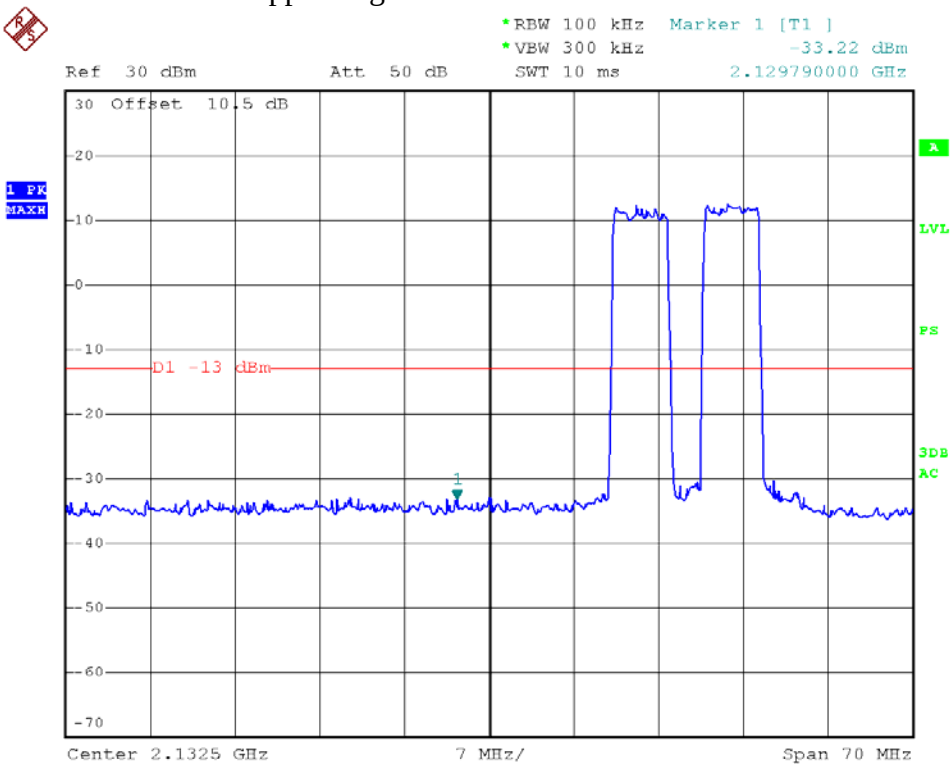
2100MHz-LTE-3M up link-Upper Edge



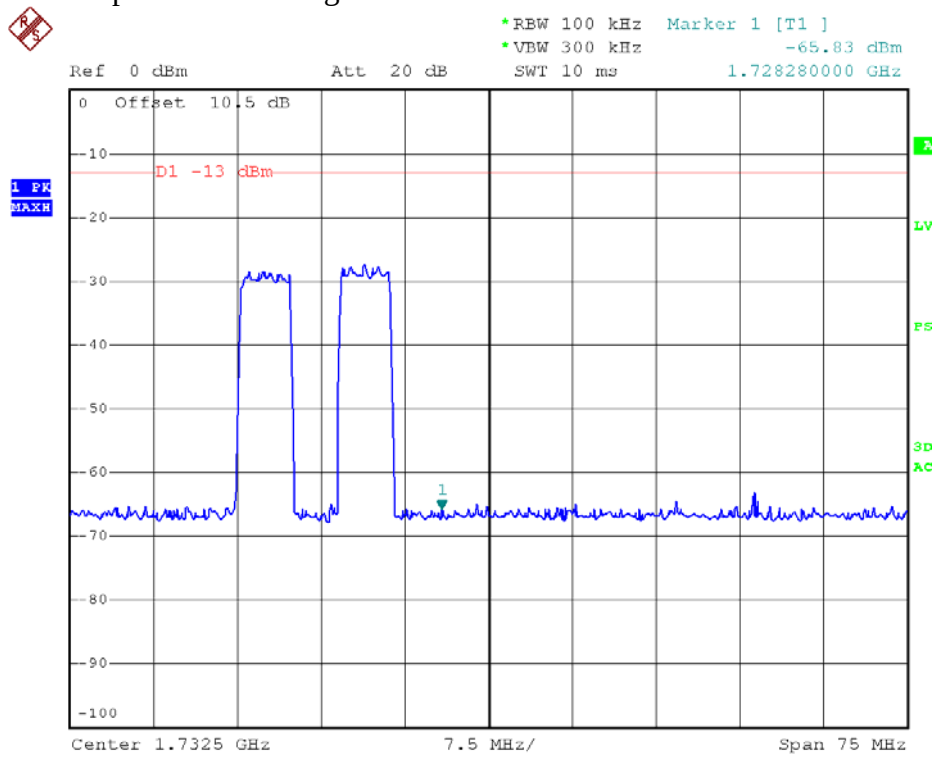
2100MHz-LTE-5M down link-Lower Edge



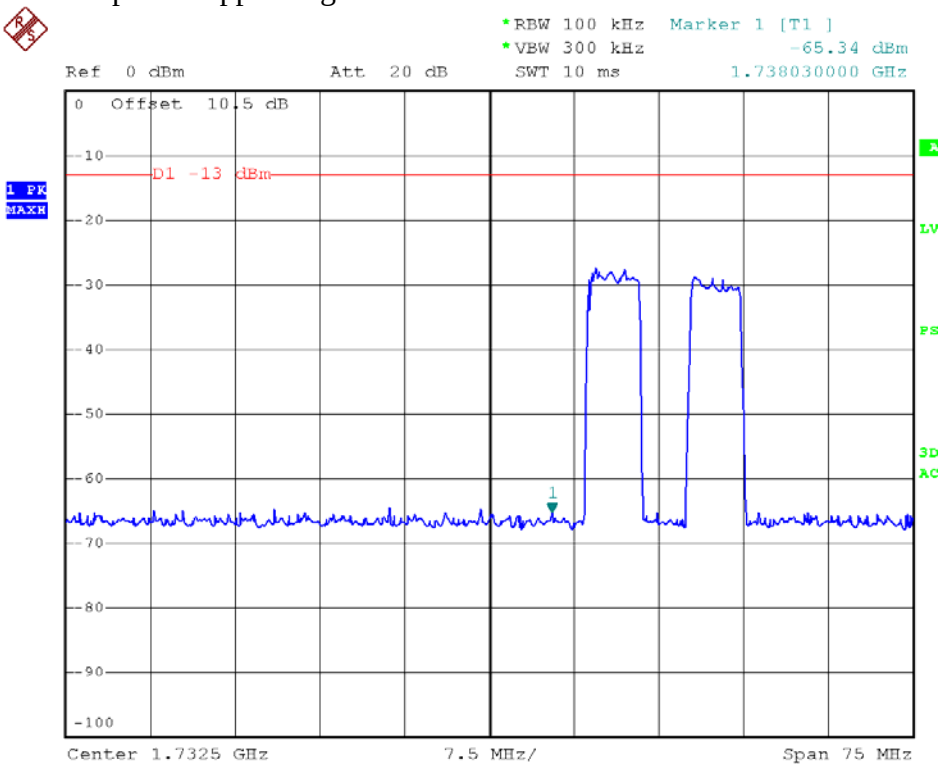
2100MHz-LTE-5M down link-Upper Edge



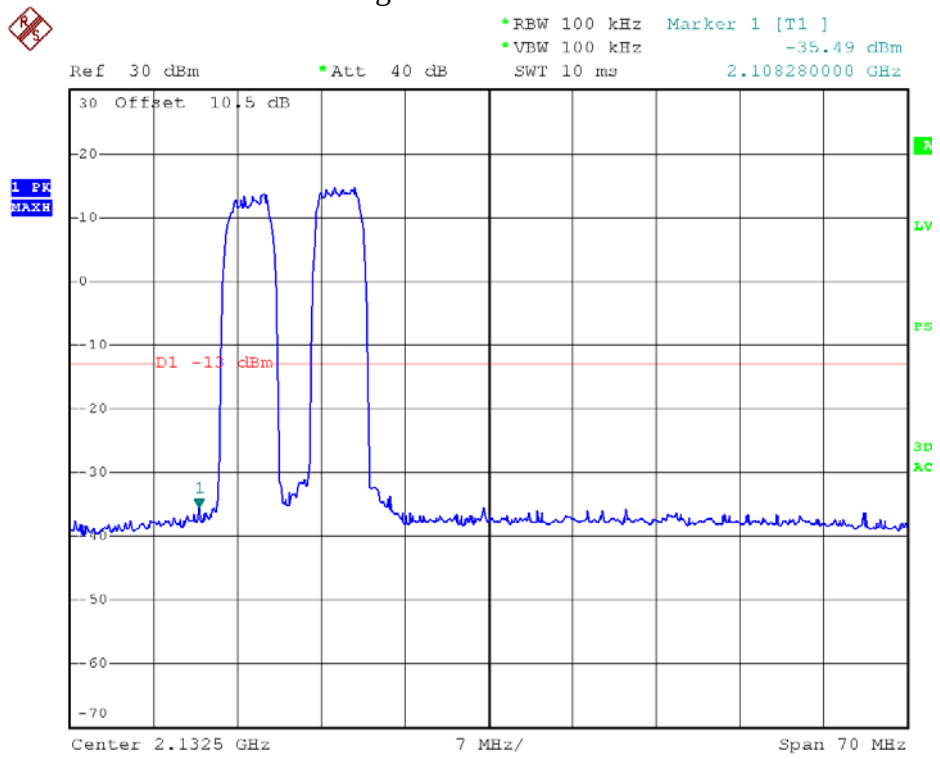
2100MHz-LTE-5M up link-Lower Edge



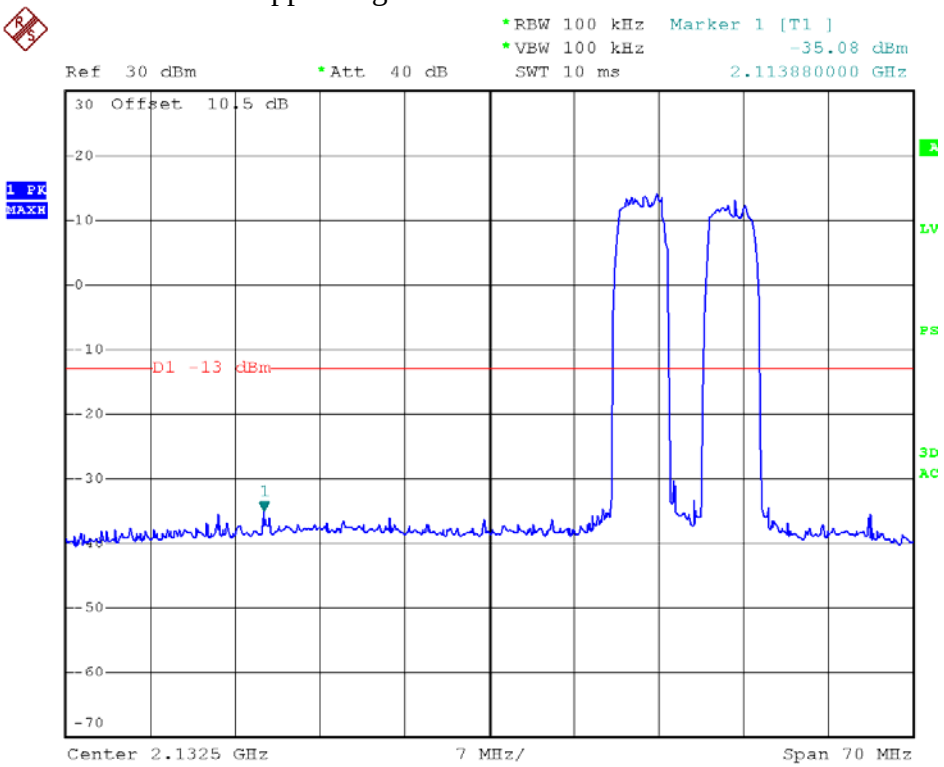
2100MHz-LTE-5M up link-Upper Edge



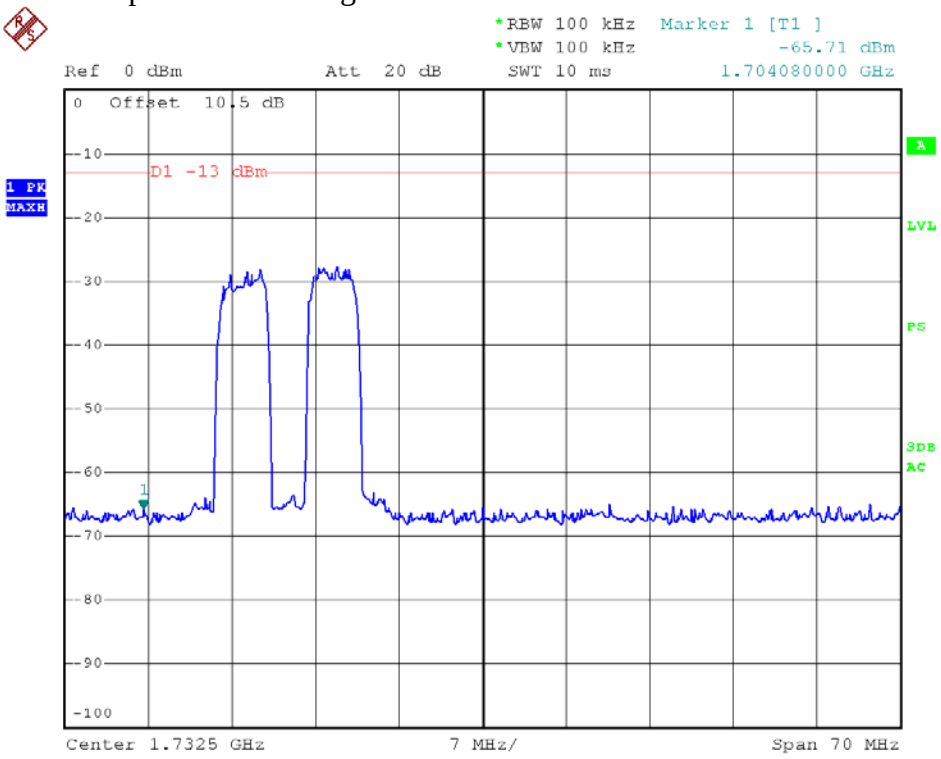
2100MHz-WCDMA down link-Lower Edge



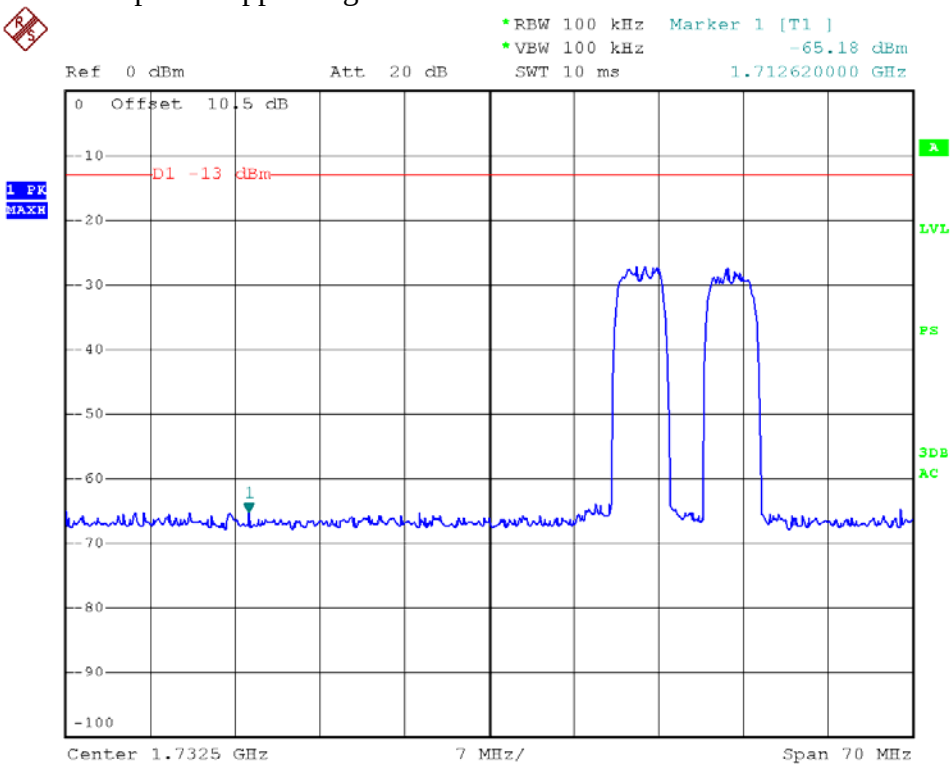
2100MHz-WCDMA down link-Upper Edge



2100MHz-WCDMA up link-Lower Edge



2100MHz-WCDMA up link-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 higher ,△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 FREQUENCY STABILITY

Test Date:	12 November, 2012
Test Method:	FCC part 2.1055
Test Requirement:	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 ±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
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.

4.2.7.1 MEASUREMENT RECORD

1.Frequency Stability vs temperature

700MHz

Temperature(℃)	Frequency(MHz)	Tolerance(ppm)
60	737.000490	0.011
50	737.000478	-0.054
40	737.000465	0.023
30	737.000446	-0.022
20	737.000482	Reference
10	737.000467	-0.020
0	737.000449	-0.045
-10	737.000487	0.068
-20	737.000456	-0.066
-30	737.000468	-0.065

2100MHz

Temperature(℃)	Frequency(MHz)	Tolerance(ppm)
60	2132.500483	0.016
50	2132.500465	0.006
40	2132.500472	0.009
30	2132.500462	0.004
20	2132.500454	Reference
10	2132.500501	0.024
0	2132.500489	0.018
-10	2132.500287	-0.085
-20	2132.500398	-0.029
-30	2132.500380	-0.038

2.Frequency Stability vs voltage

700MHz

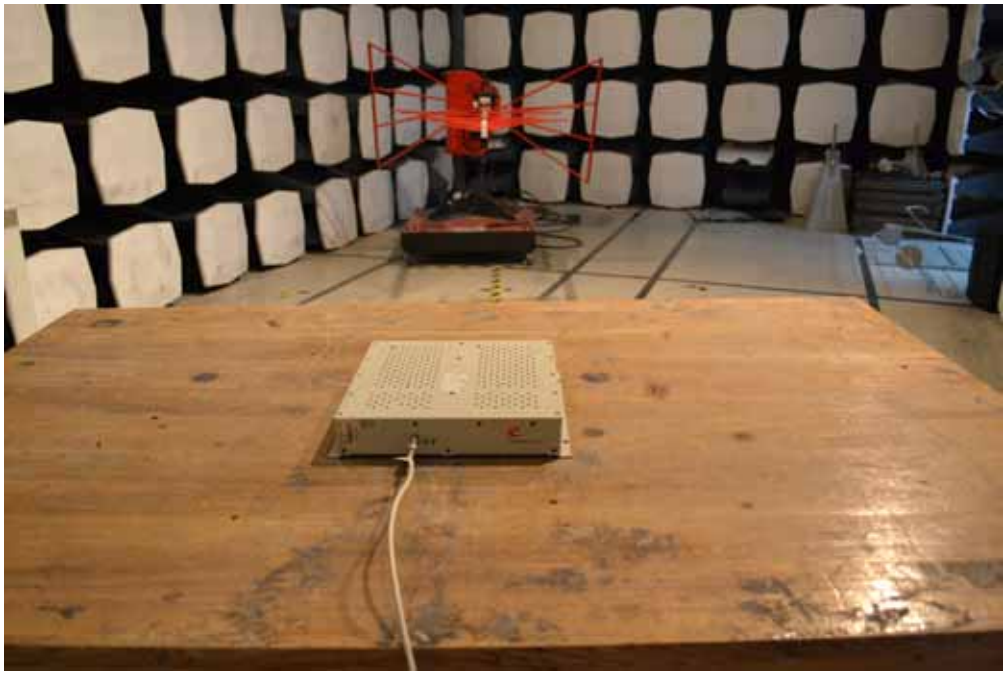
Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	737.000468	0.018
120	737.000455	Reference
138(120*1.15)	737.000433	-0.029

1900MHz

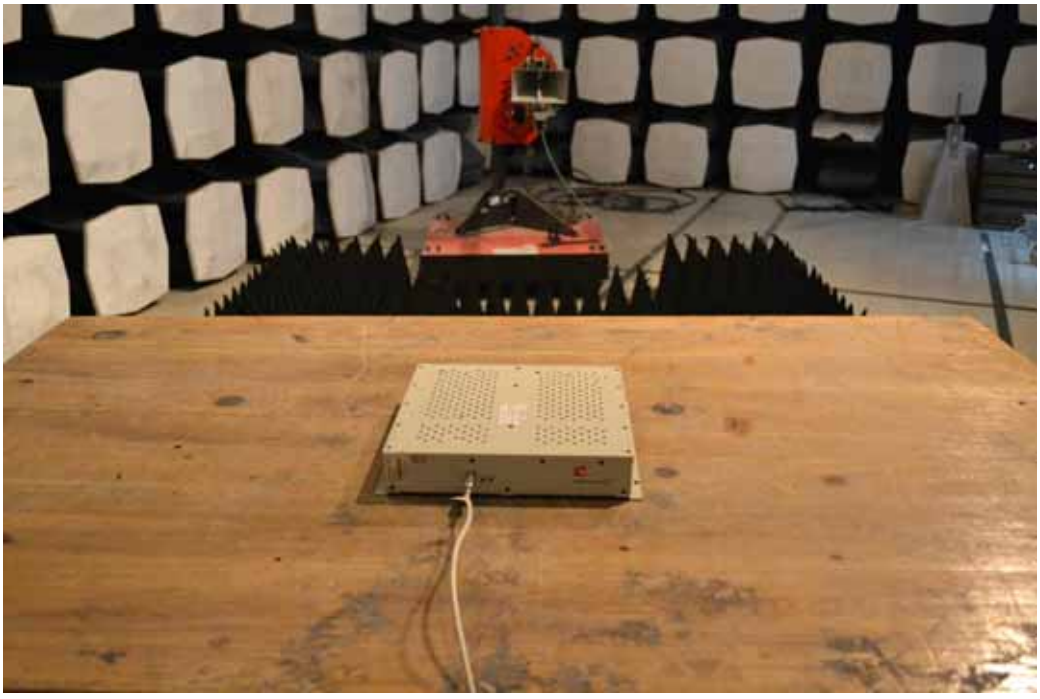
Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	2132.500477	0.012
120	2132.500454	Reference
138(120*1.15)	2132.500469	0.008

APPENDIX A:PHOTOGRAPH OF THE TEST CONFIGURATION

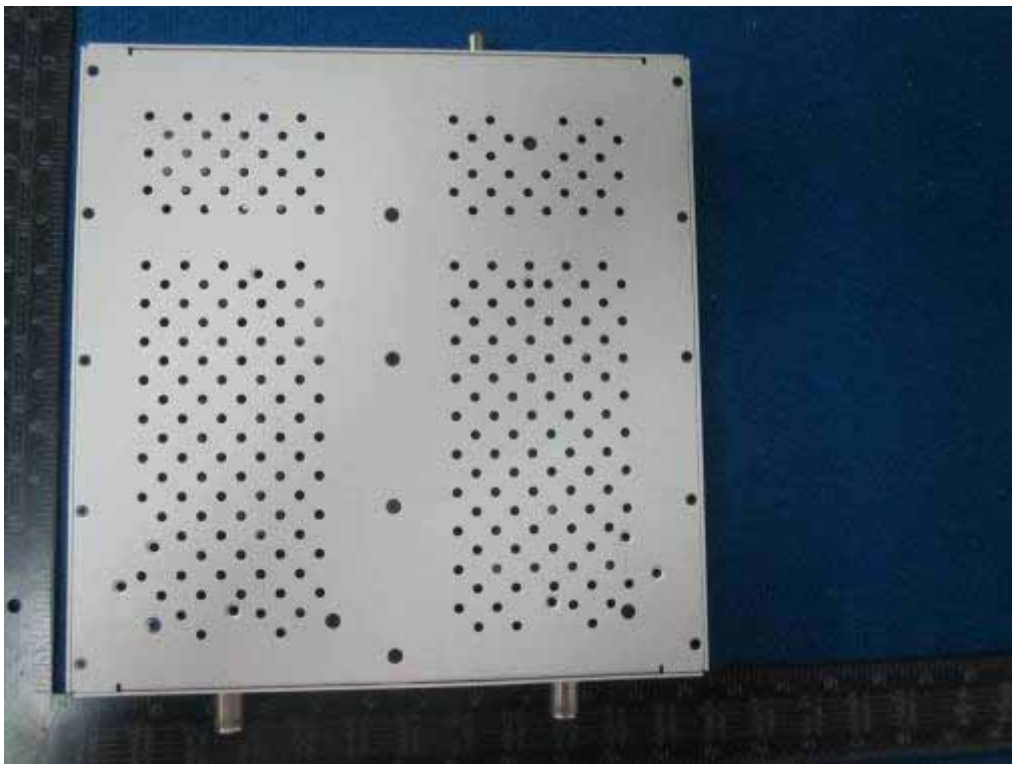
RE (Below 1GHz)

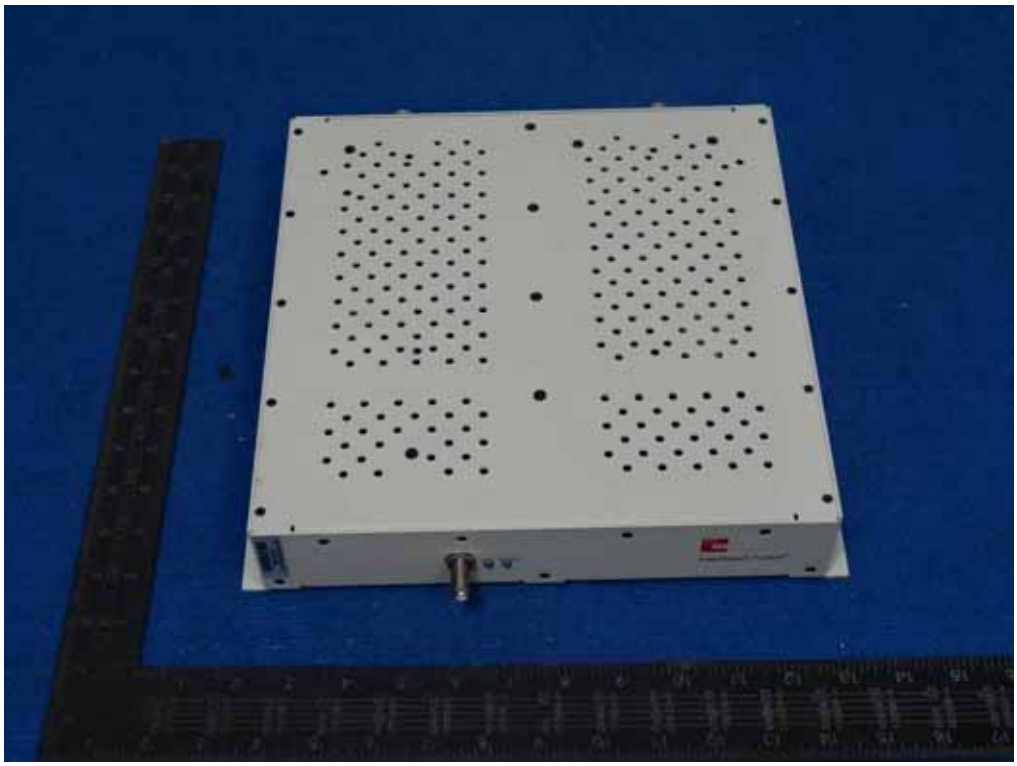


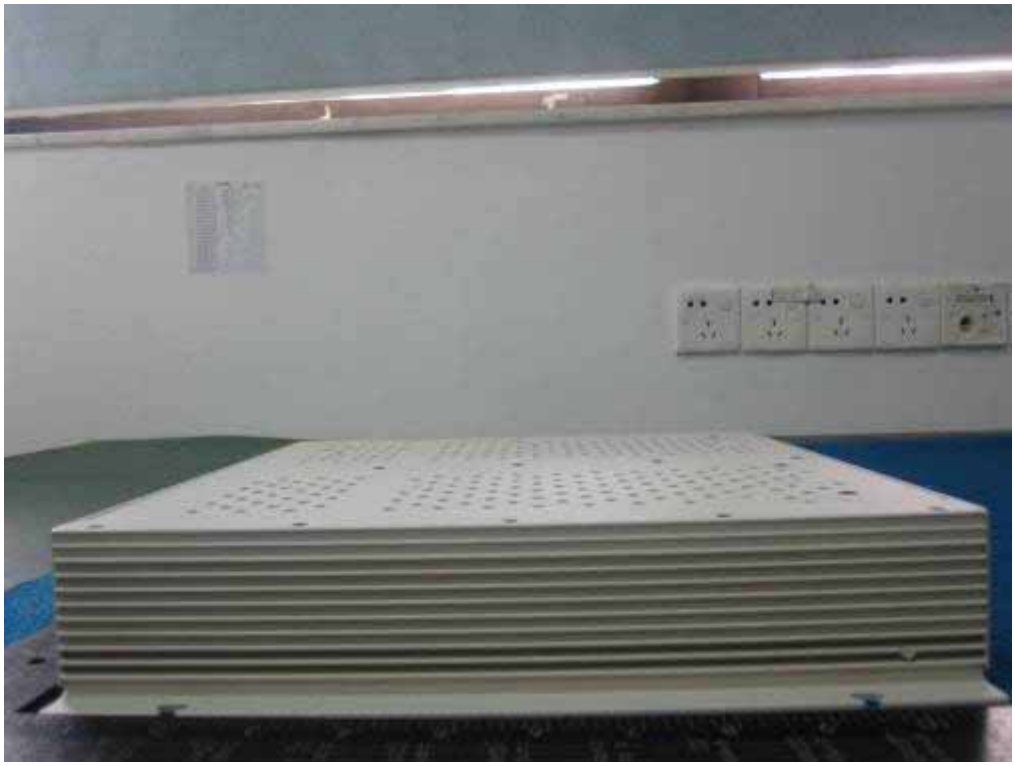
RE (Above 1GHz)



APPENDIX B: PHOTOGRAPHS OF EUT

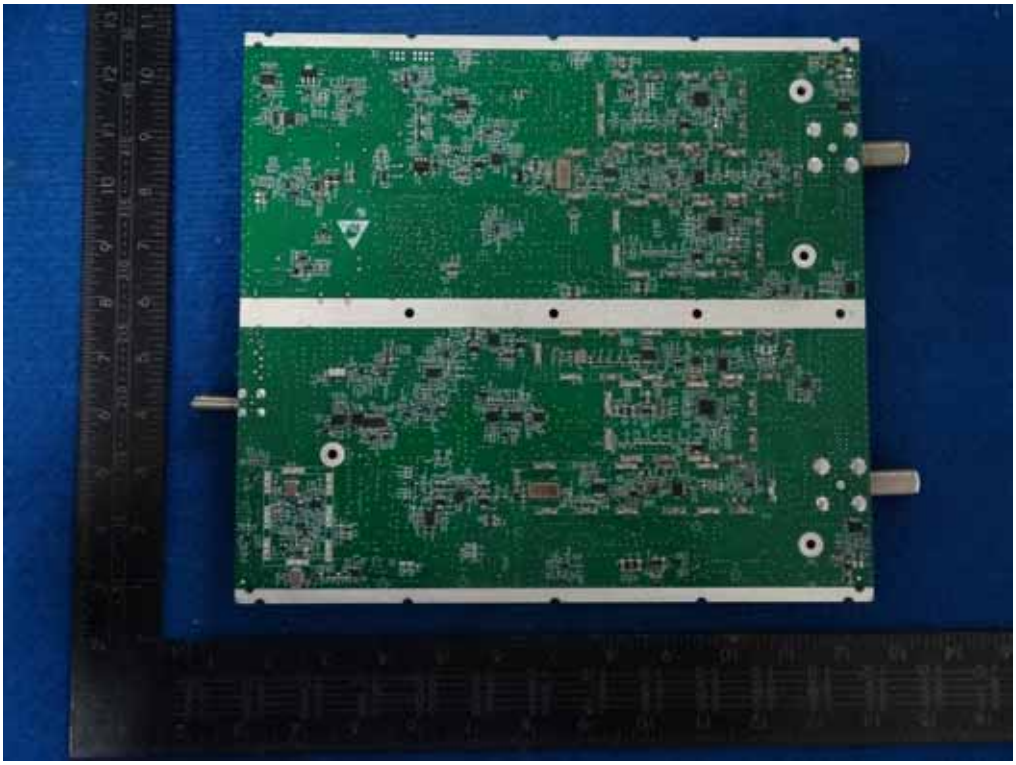






Front side

Rear side



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