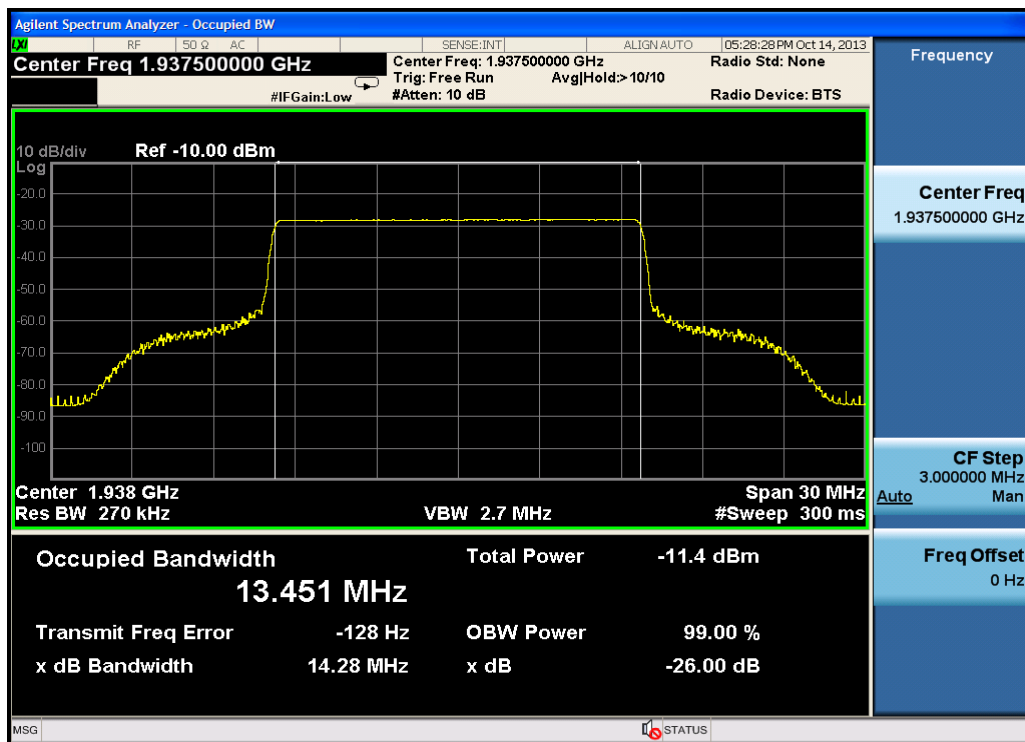


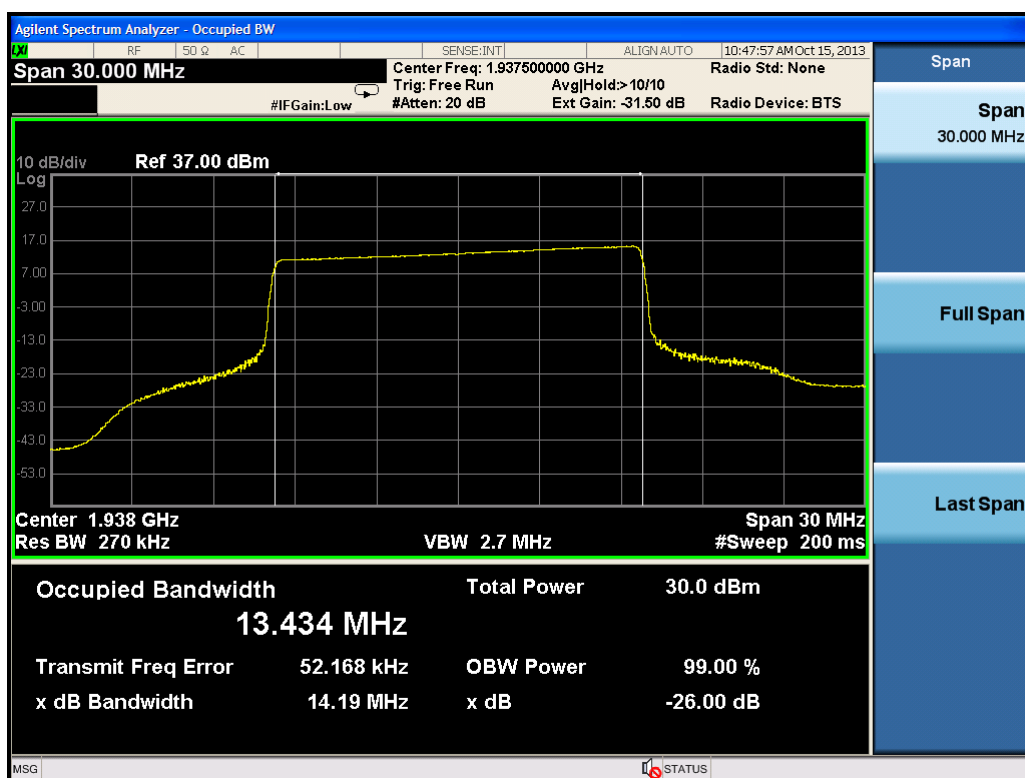
1.5) Test for LTE 15 MHz

1.5.1) Lowest frequency

a) Input signal

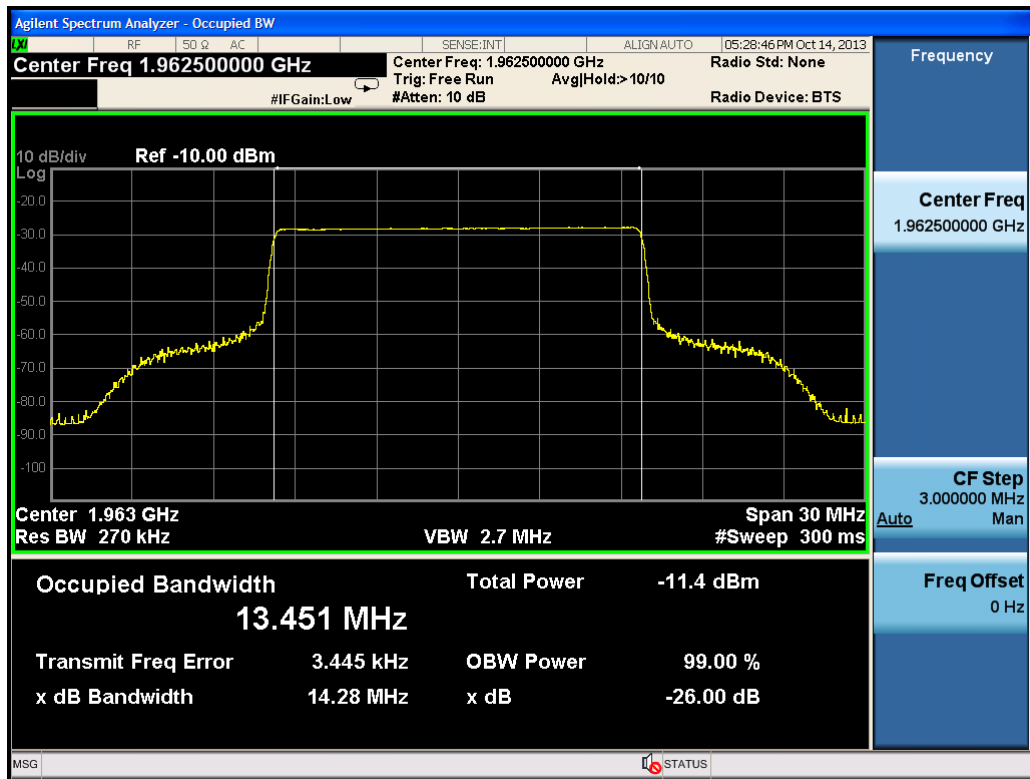


b) Output signal

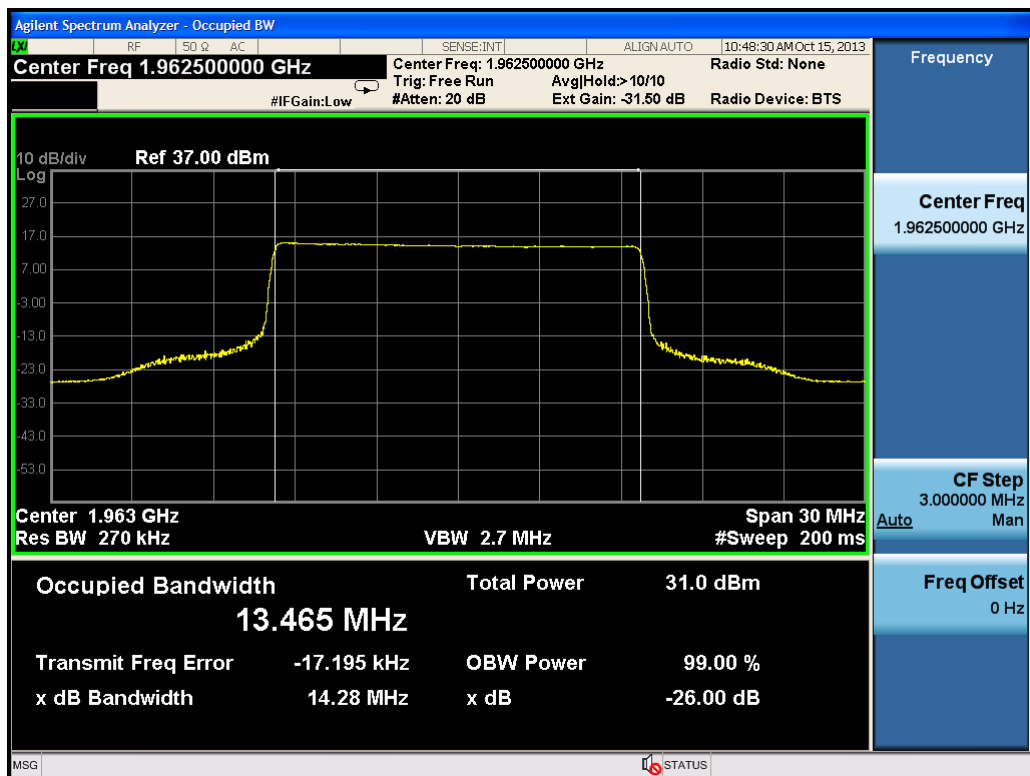


1.5.2) Middle frequency

a) Input signal

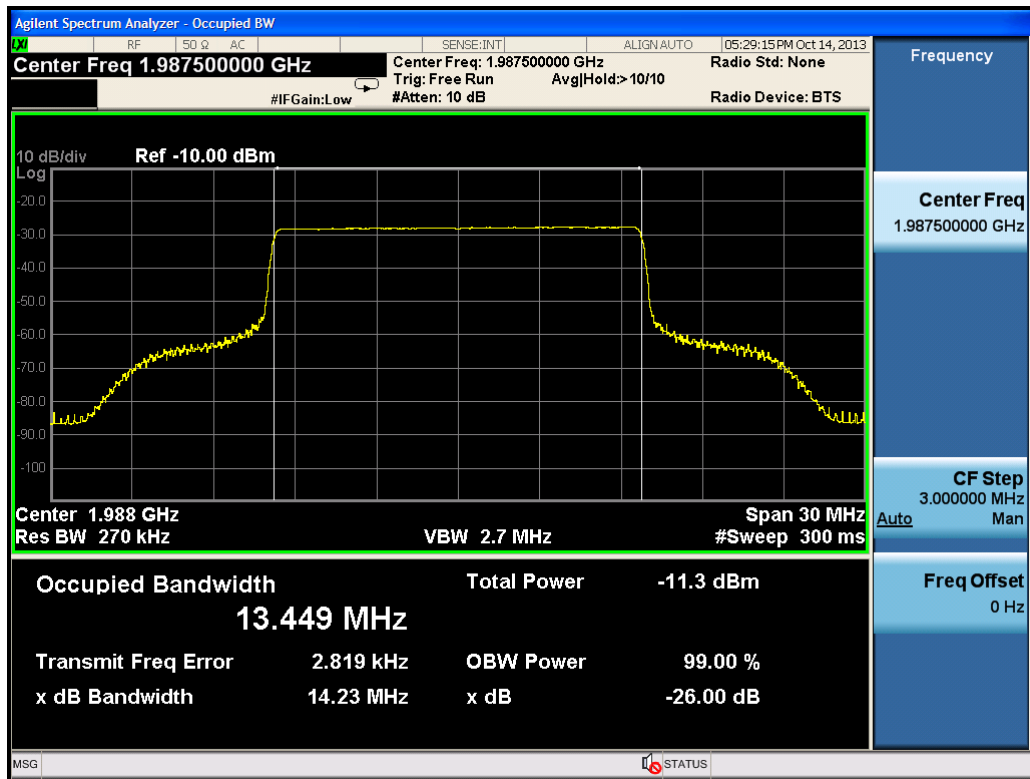


b) Output signal

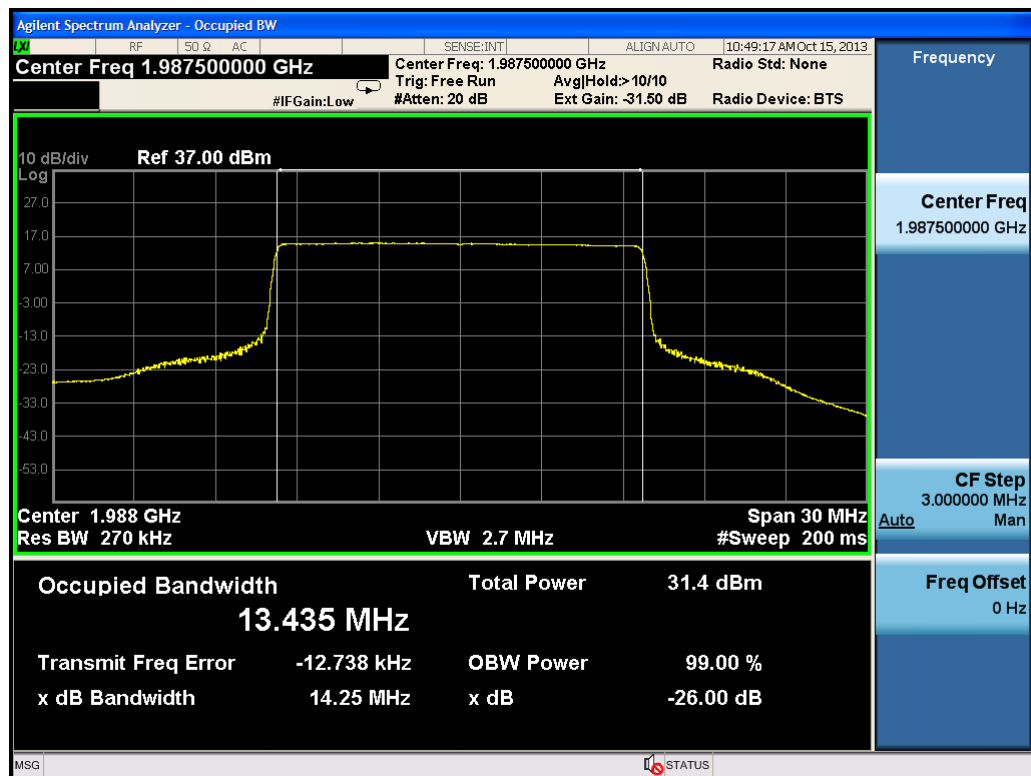


1.5.3) Highest frequency

a) Input signal



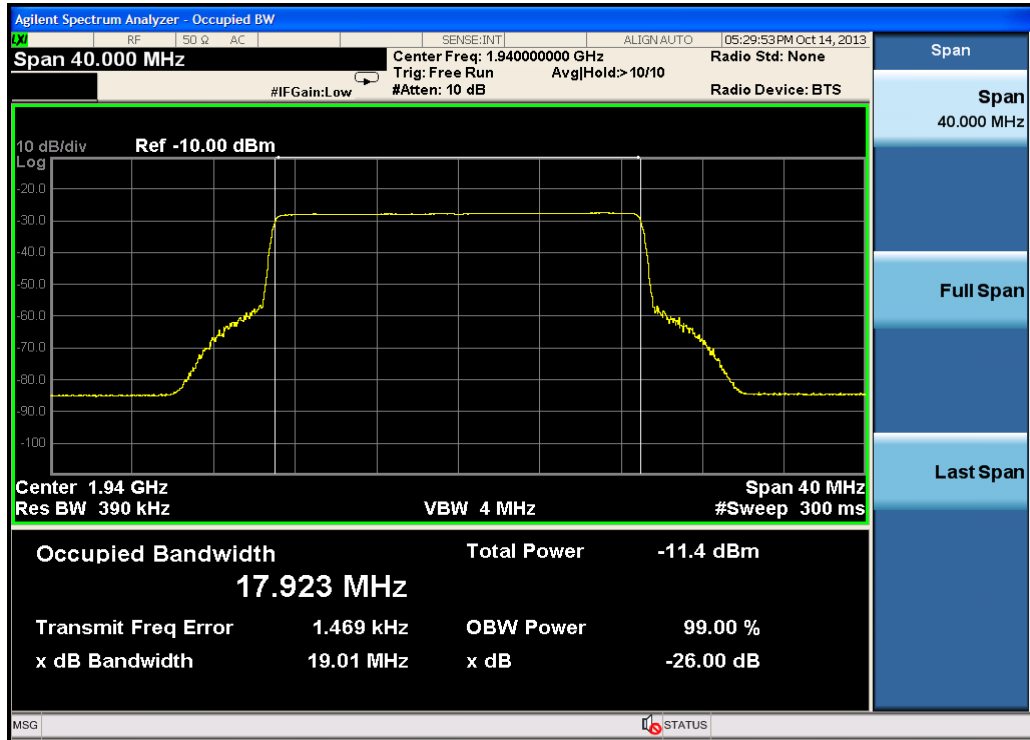
b) Output signal



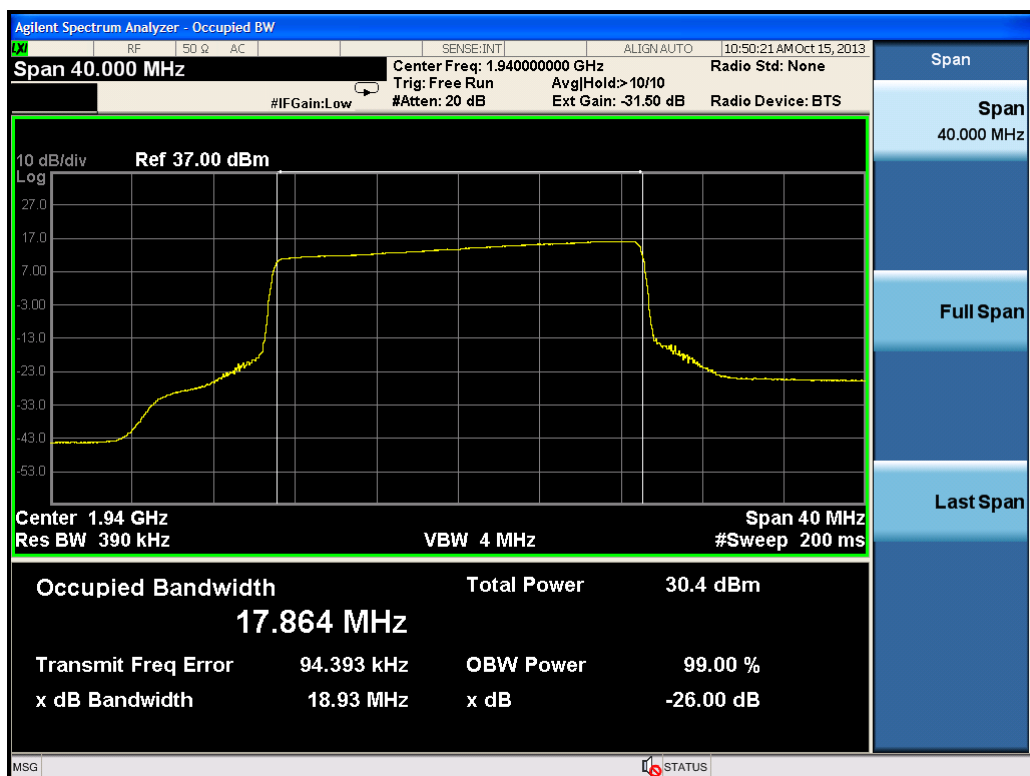
1.6) Test for LTE 20 MHz

1.6.1) Lowest frequency

a) Input signal

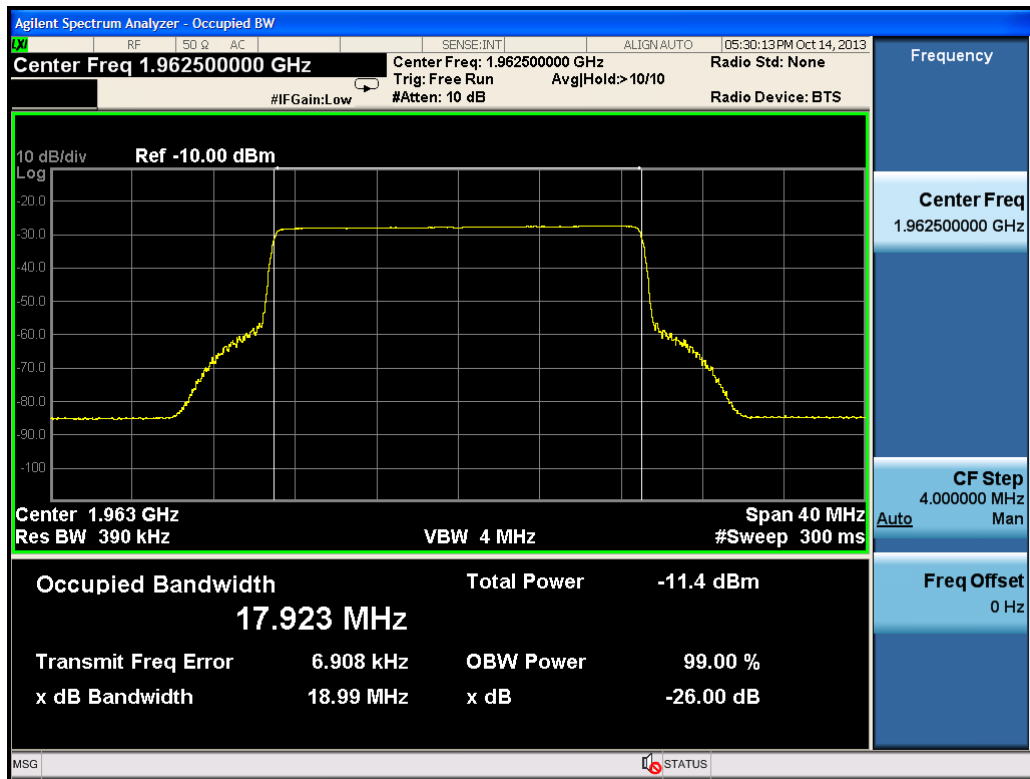


b) Output signal

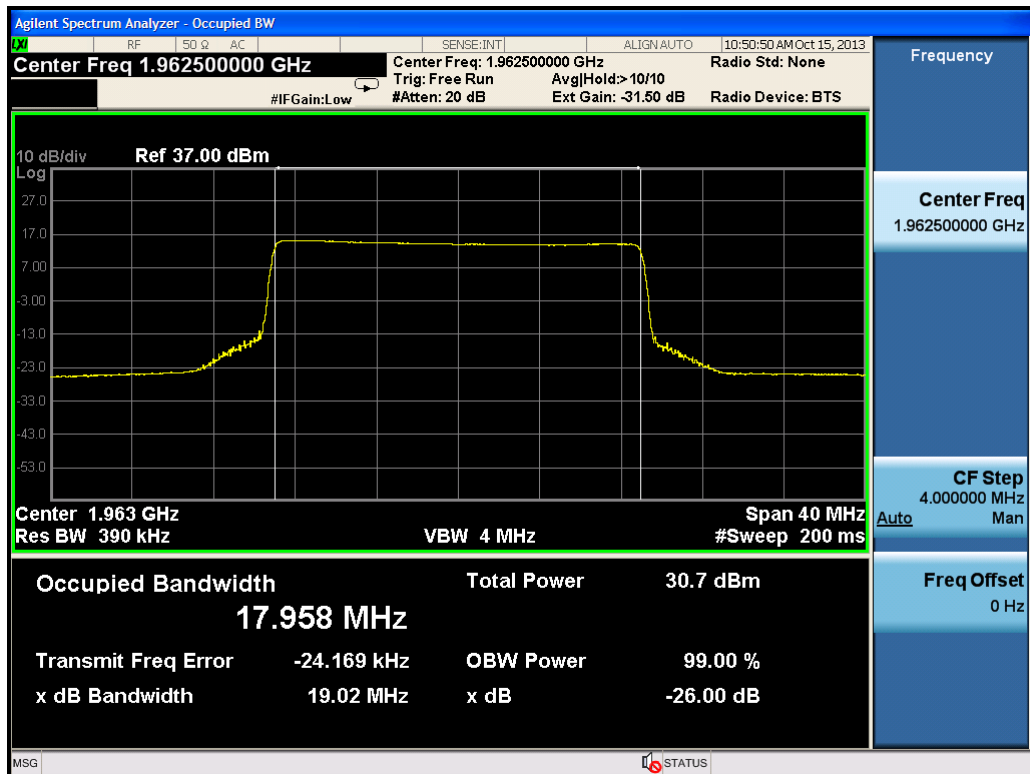


1.6.2) Middle frequency

a) Input signal

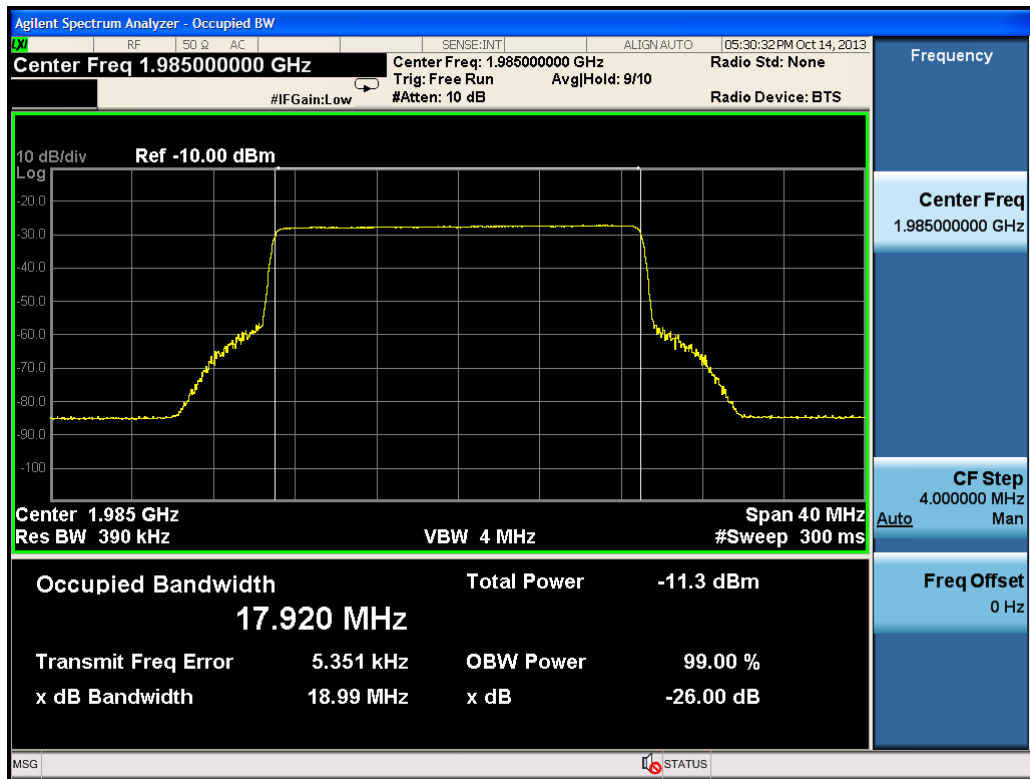


b) Output signal

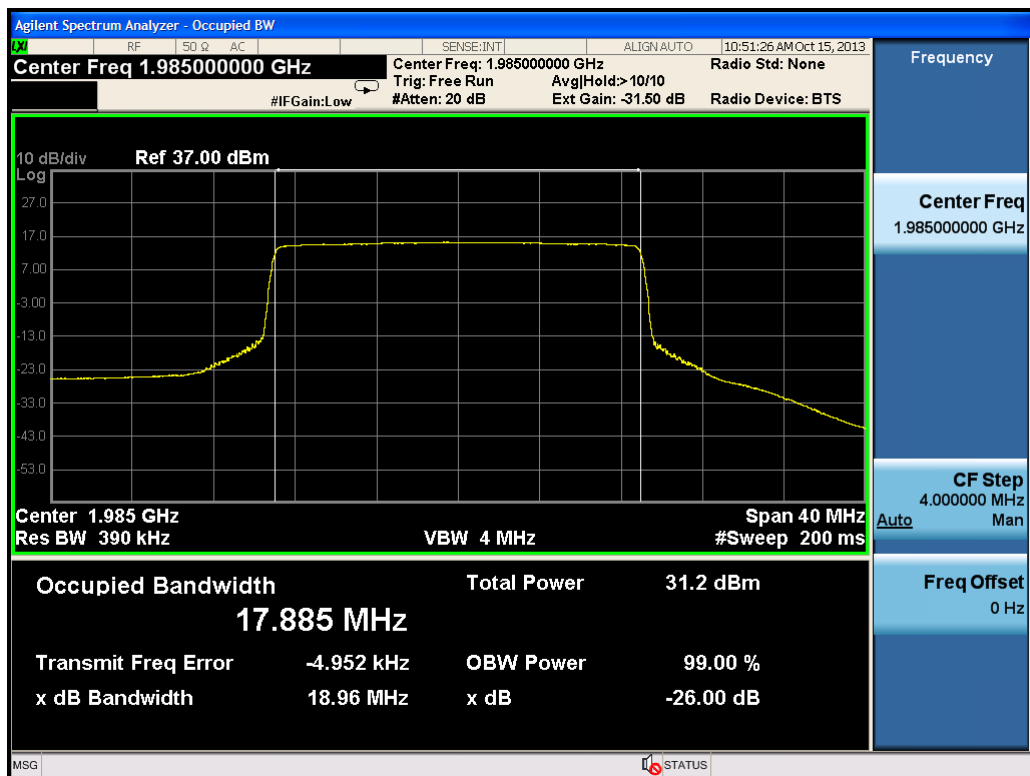


1.6.3) Highest frequency

a) Input signal



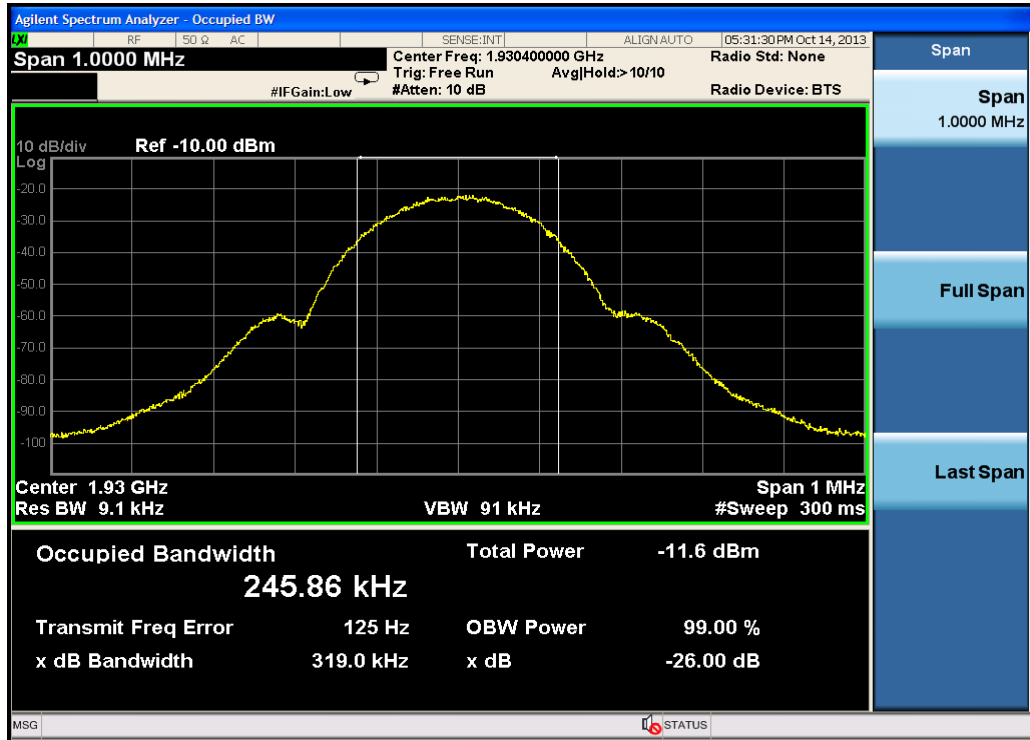
b) Output signal



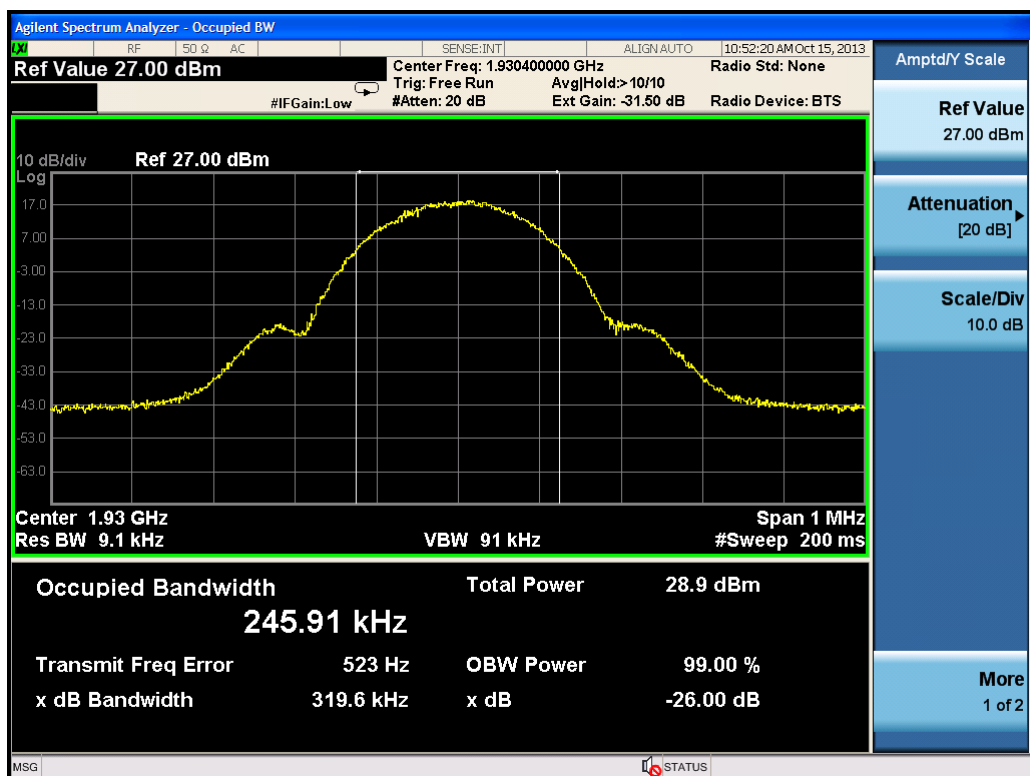
2) GSM modulation for Downlink

2.1) Lowest frequency

a) Input signal

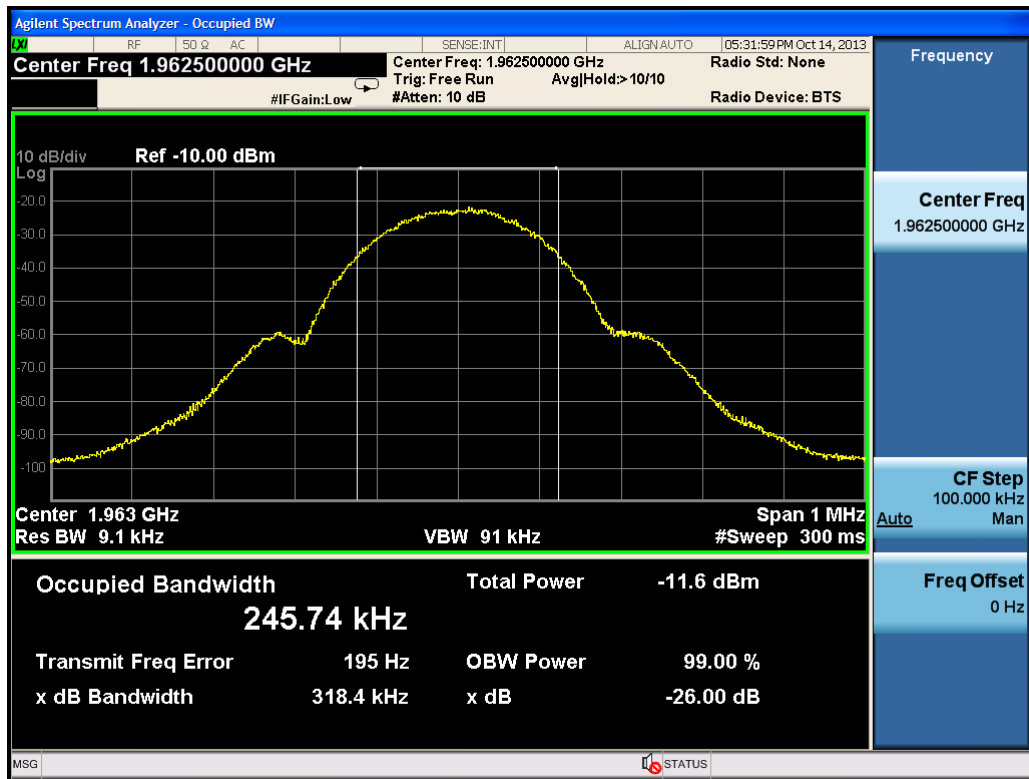


b) Output signal

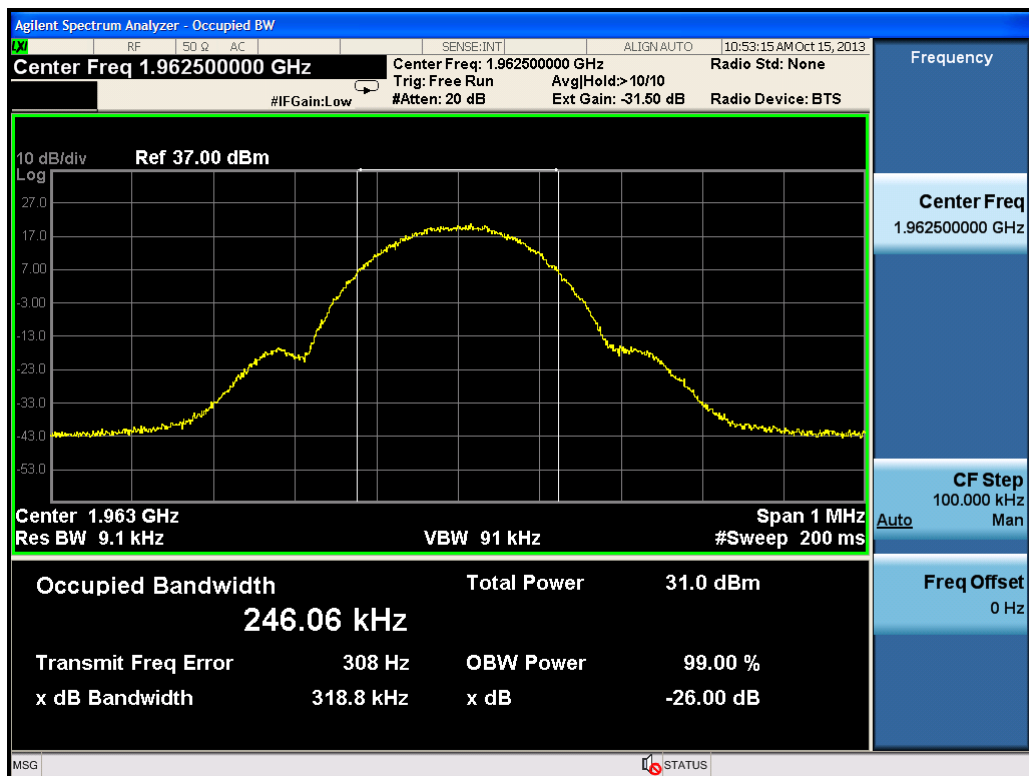


2.2) Middle frequency

a) Input signal

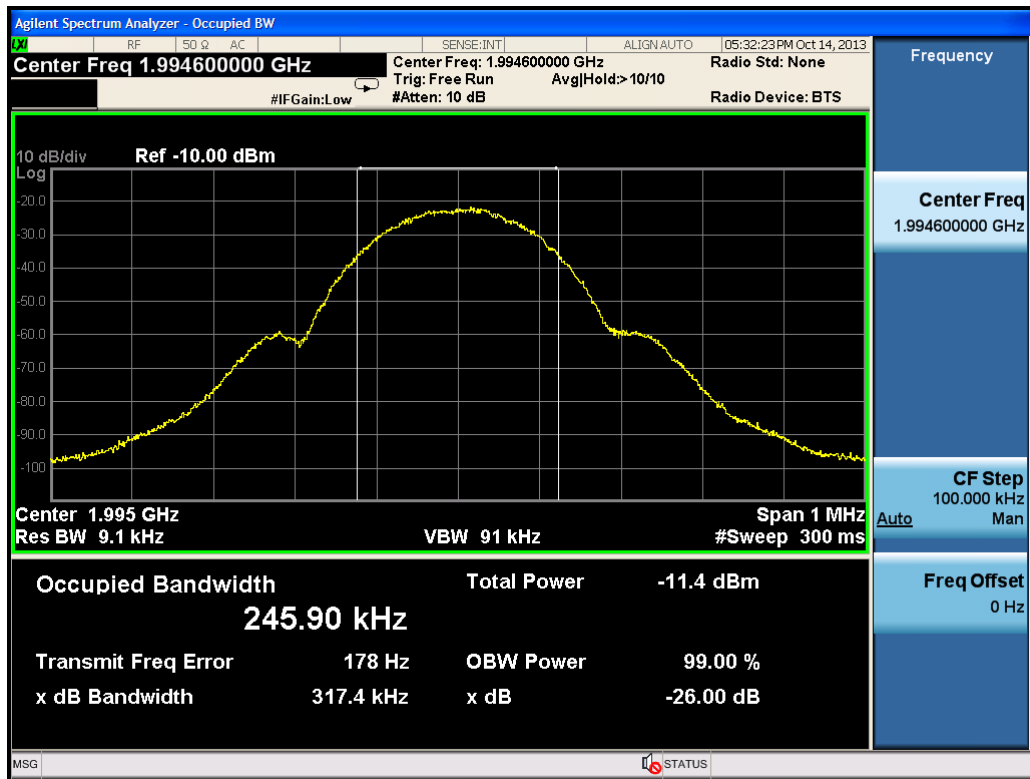


b) Output signal

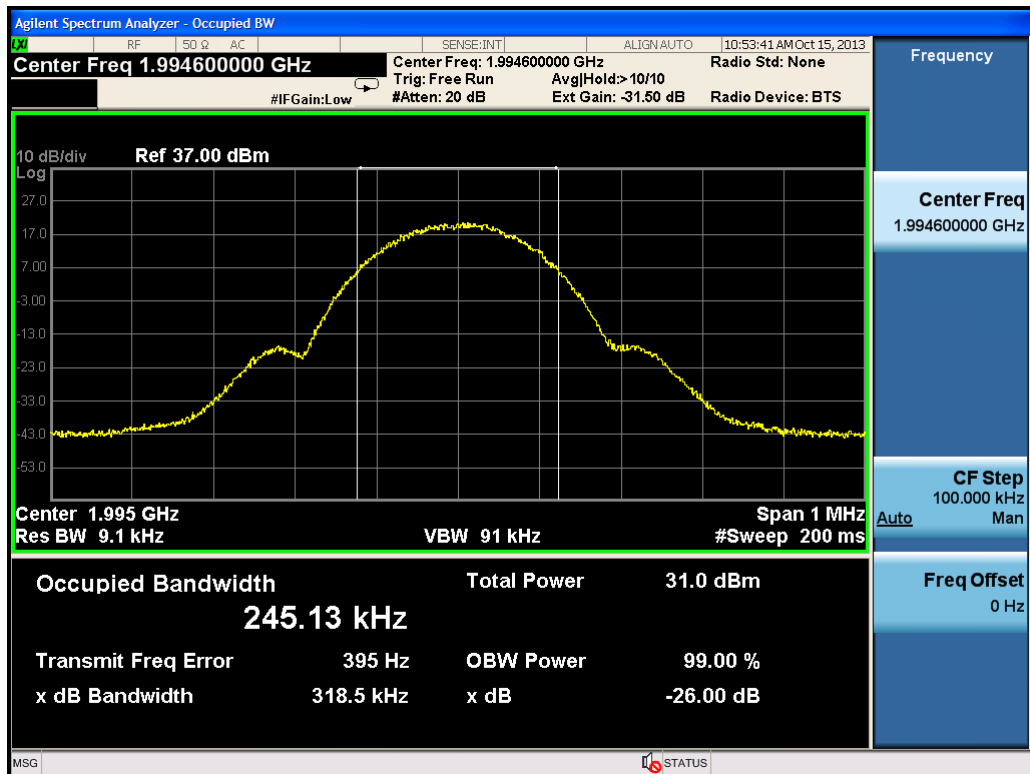


2.3) Highest frequency

a) Input signal



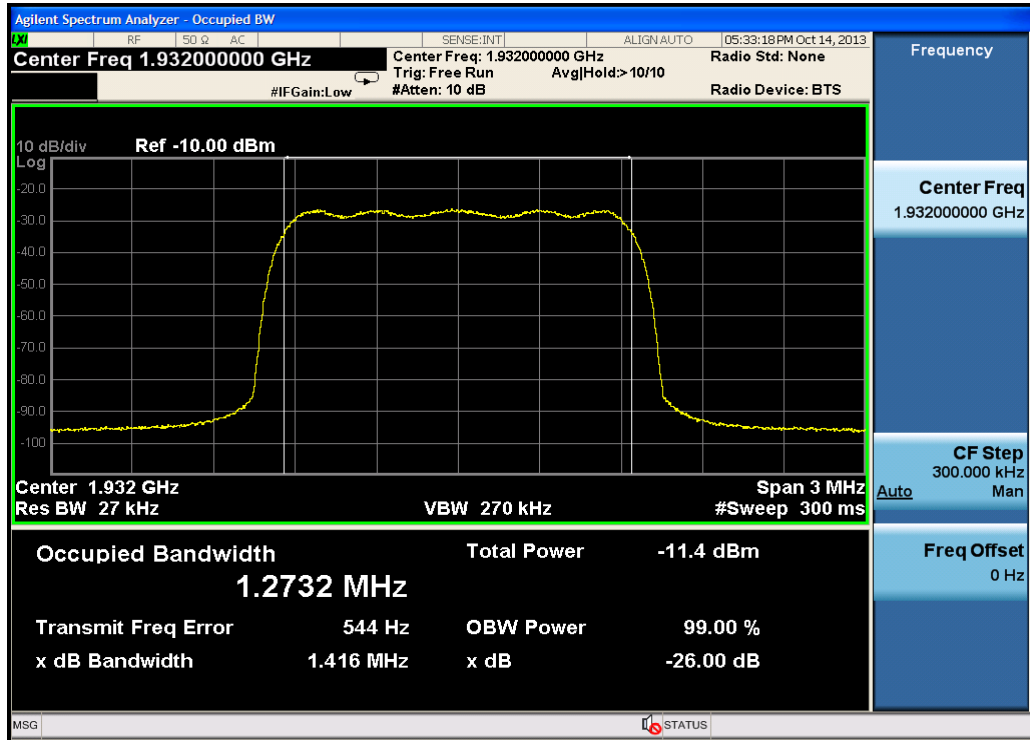
b) Output signal



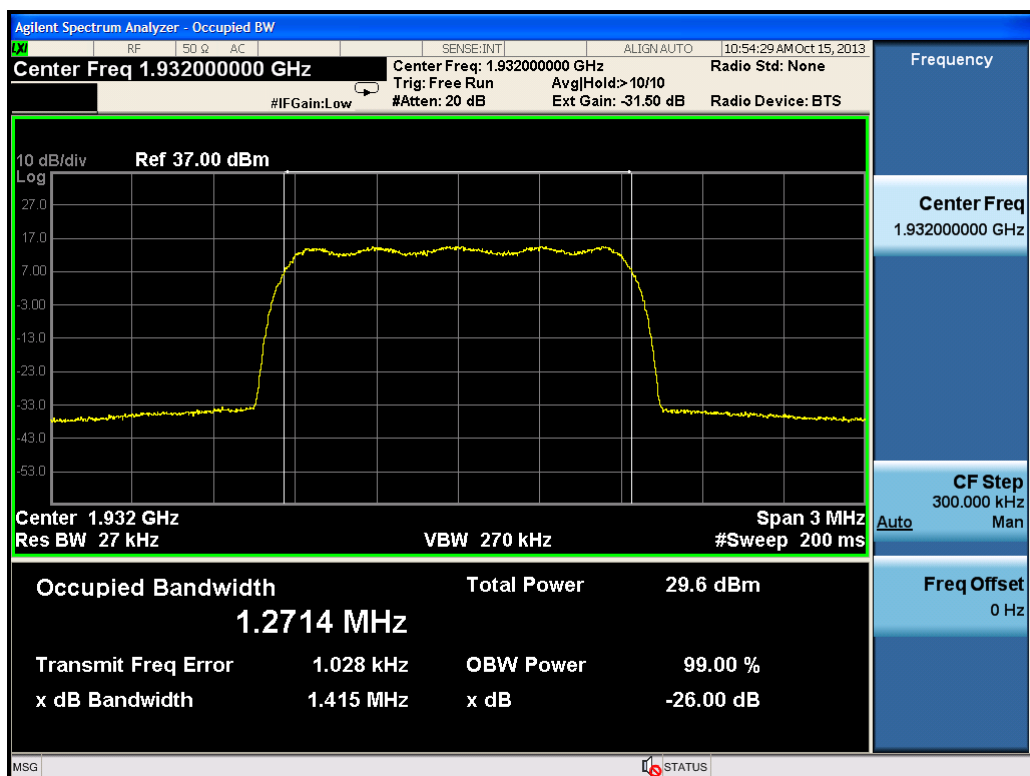
3) CDMA modulation for Downlink

3.1) Lowest frequency

a) Input signal

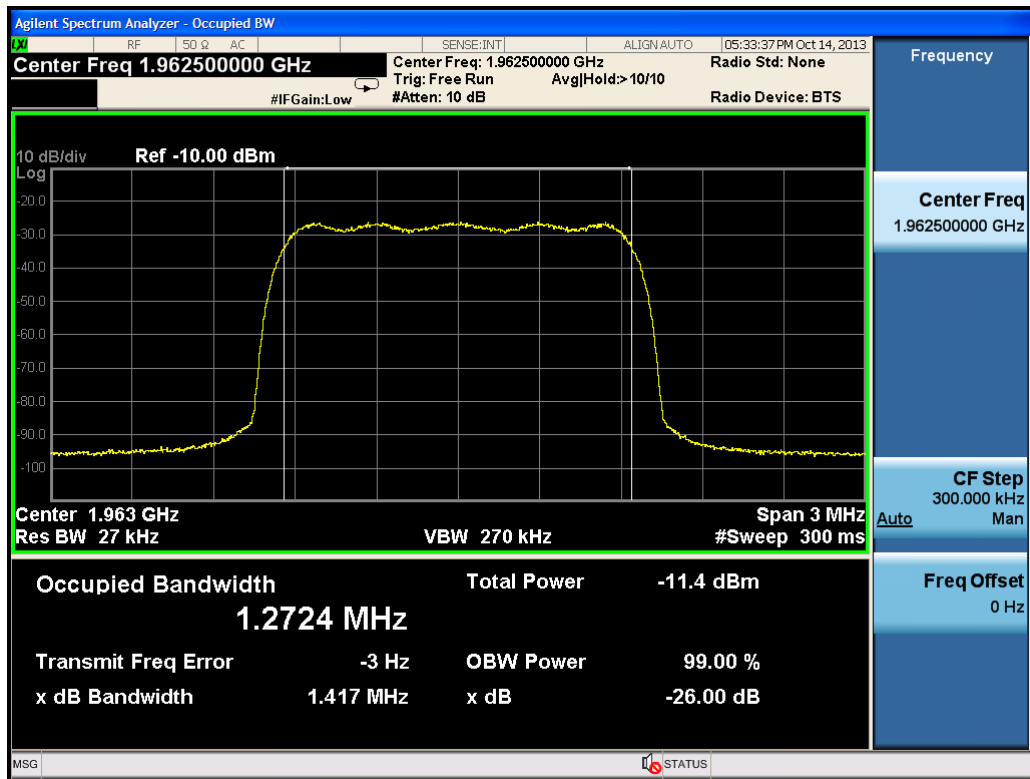


b) Output signal

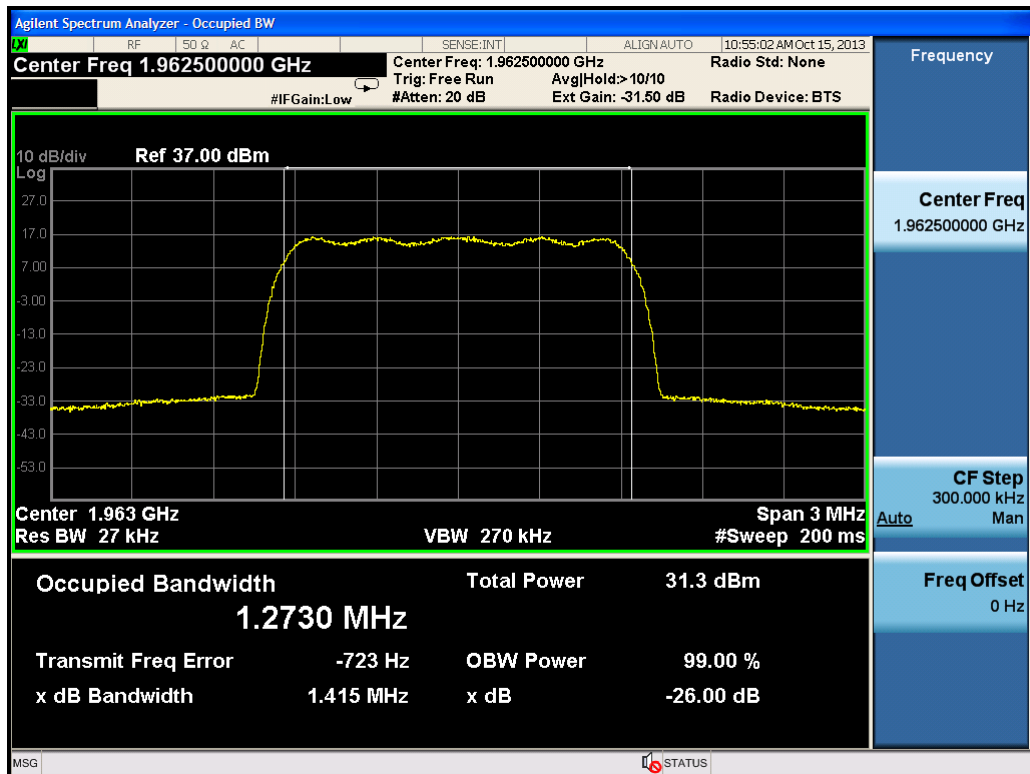


3.2) Middle frequency

a) Input signal

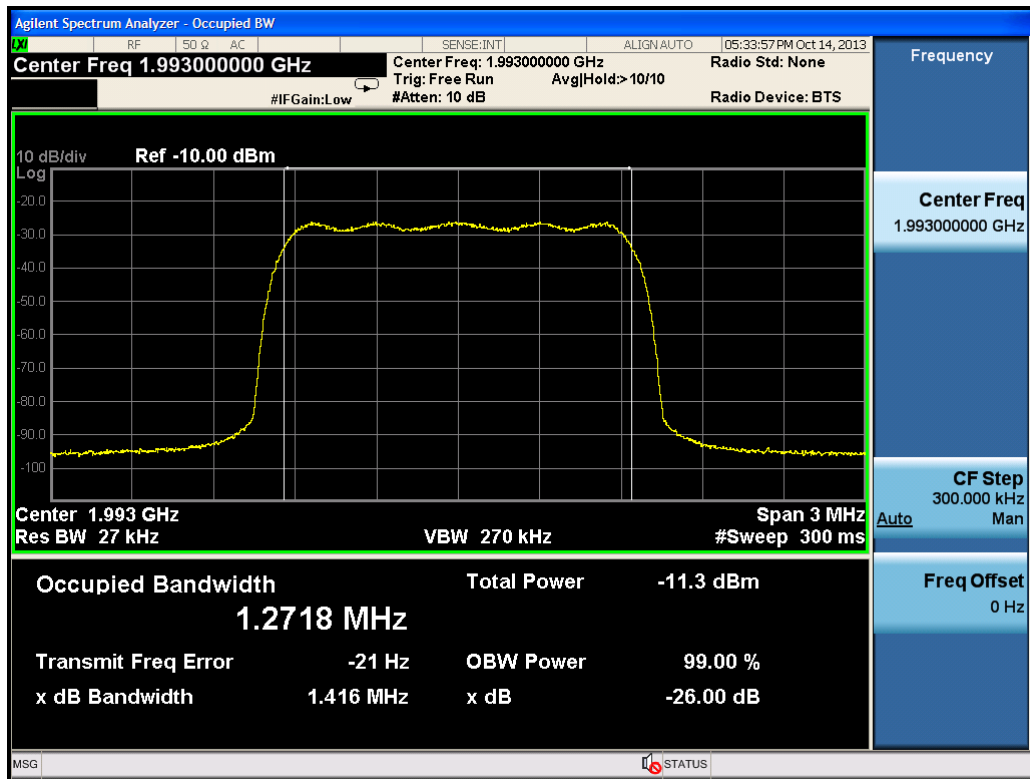


b) Output signal

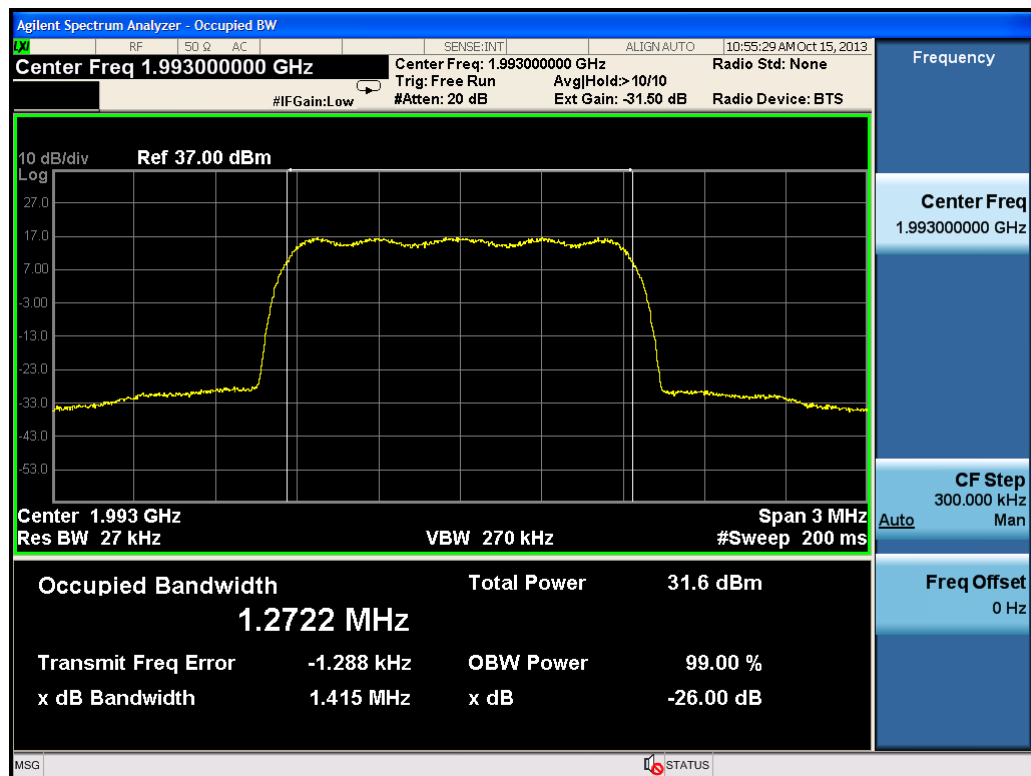


3.3) Highest frequency

a) Input signal



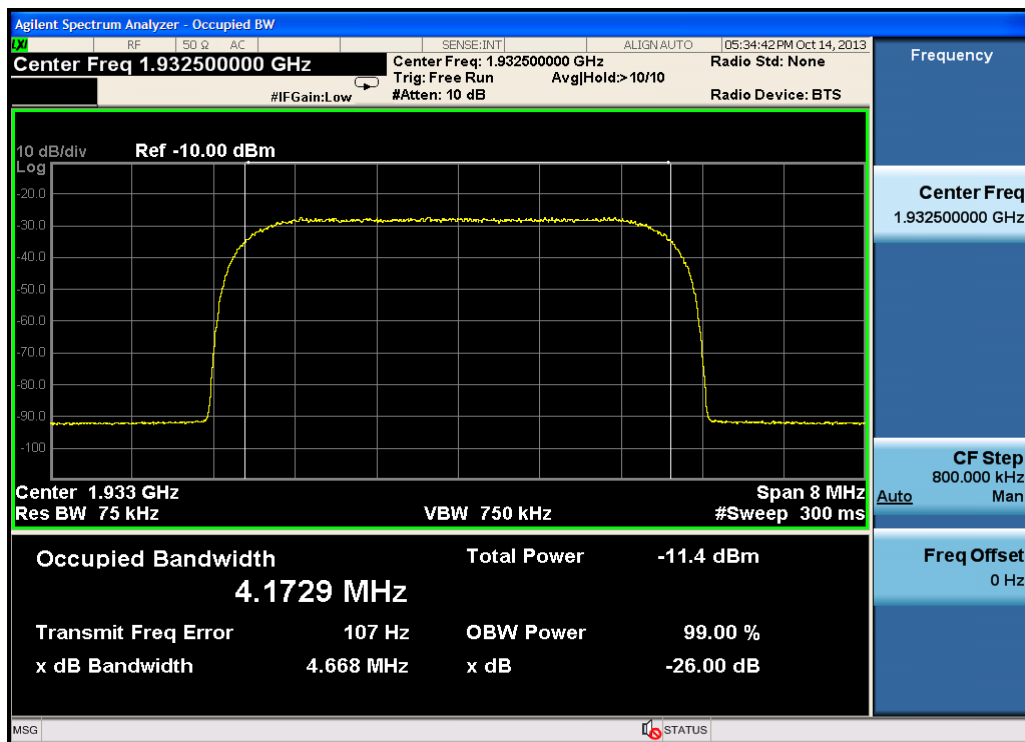
b) Output signal



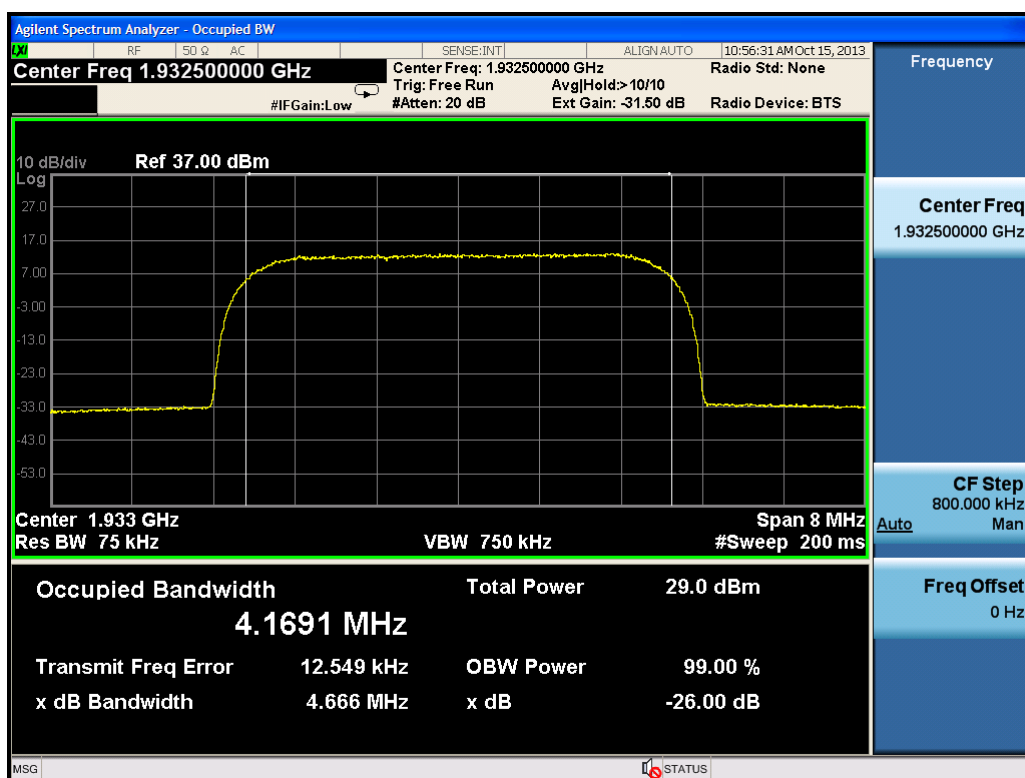
4) WCDMA modulation for Downlink

4.1) Lowest frequency

a) Input signal

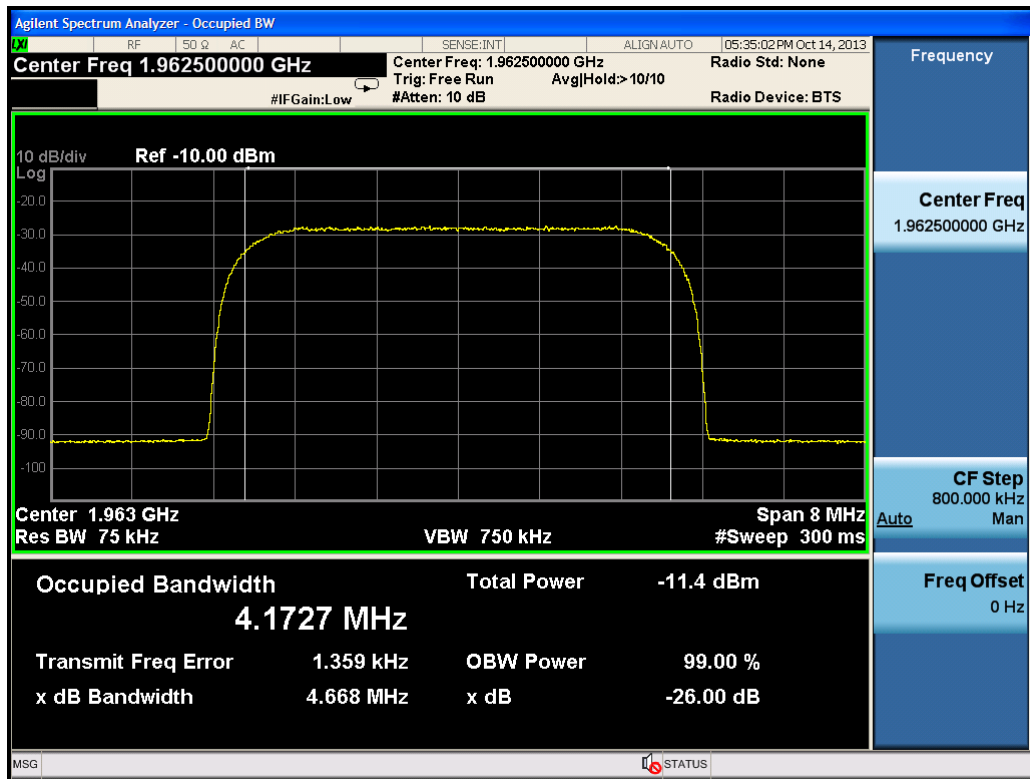


b) Output signal

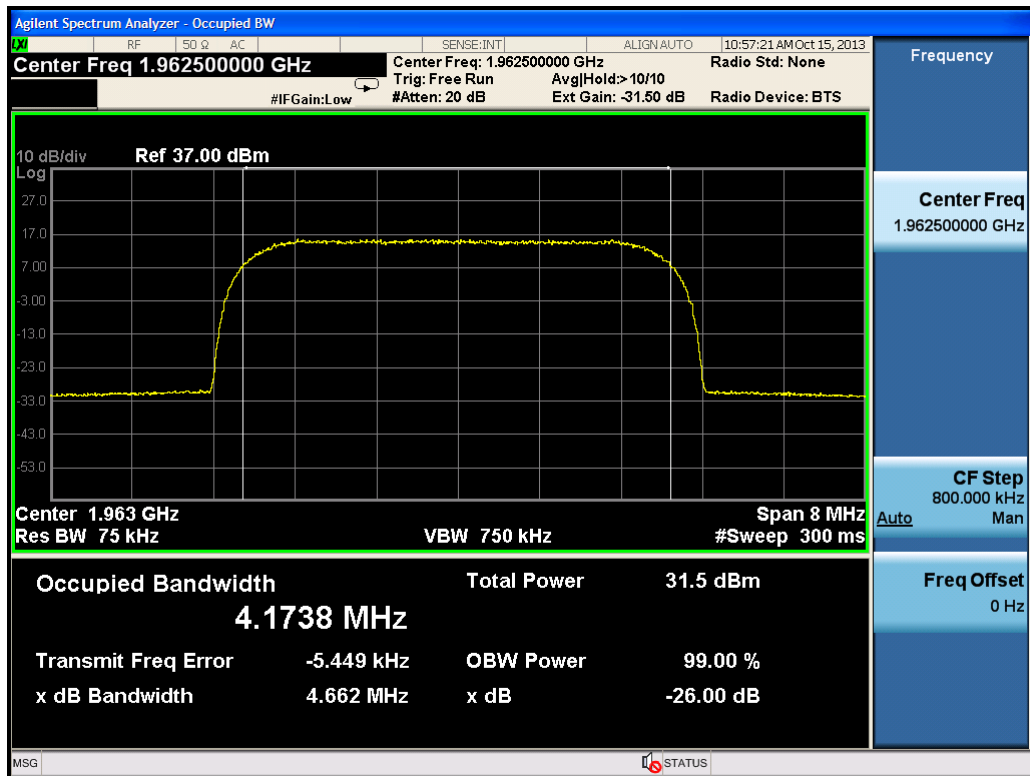


4.2) Middle frequency

a) Input signal

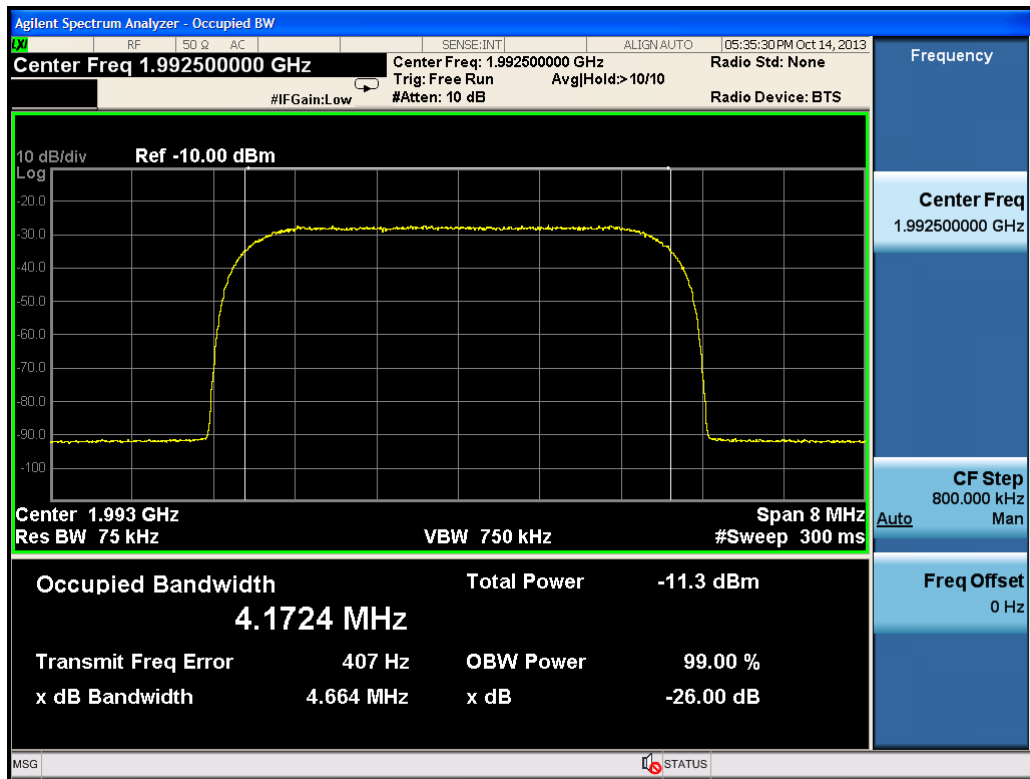


b) Output signal

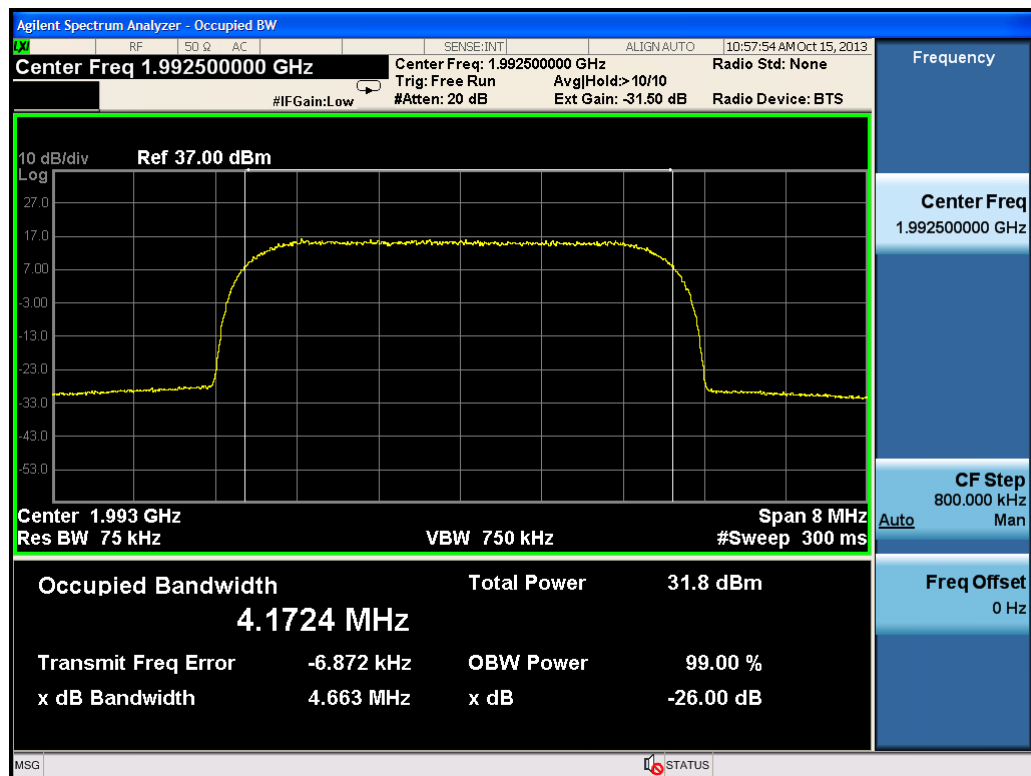


4.3) Highest frequency

a) Input signal



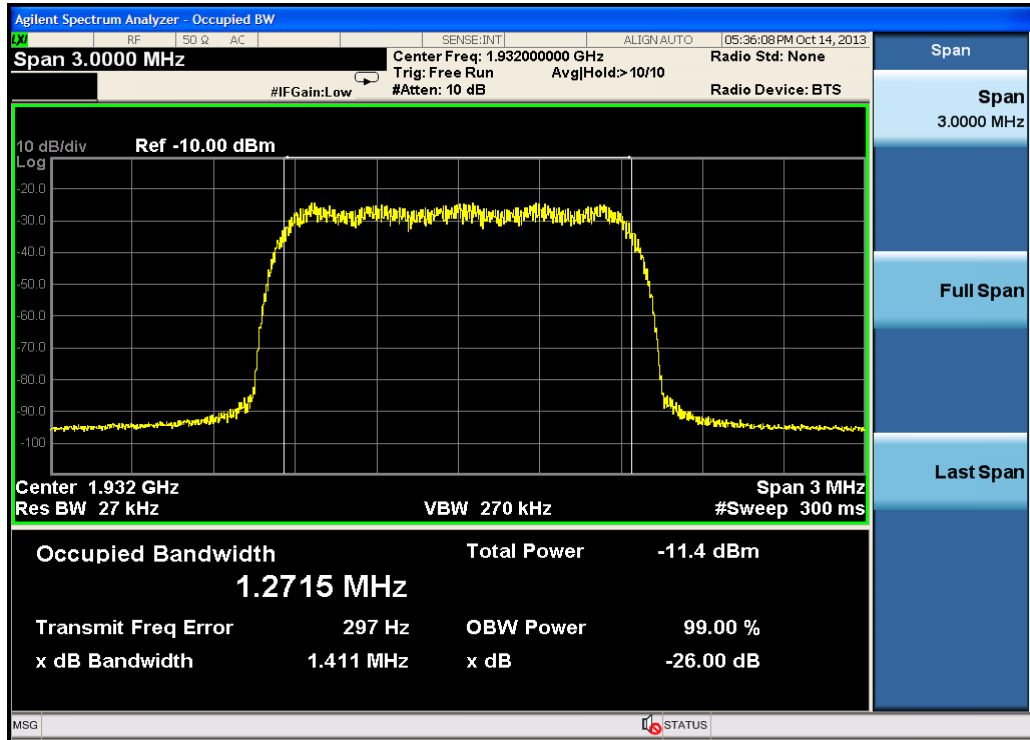
b) Output signal



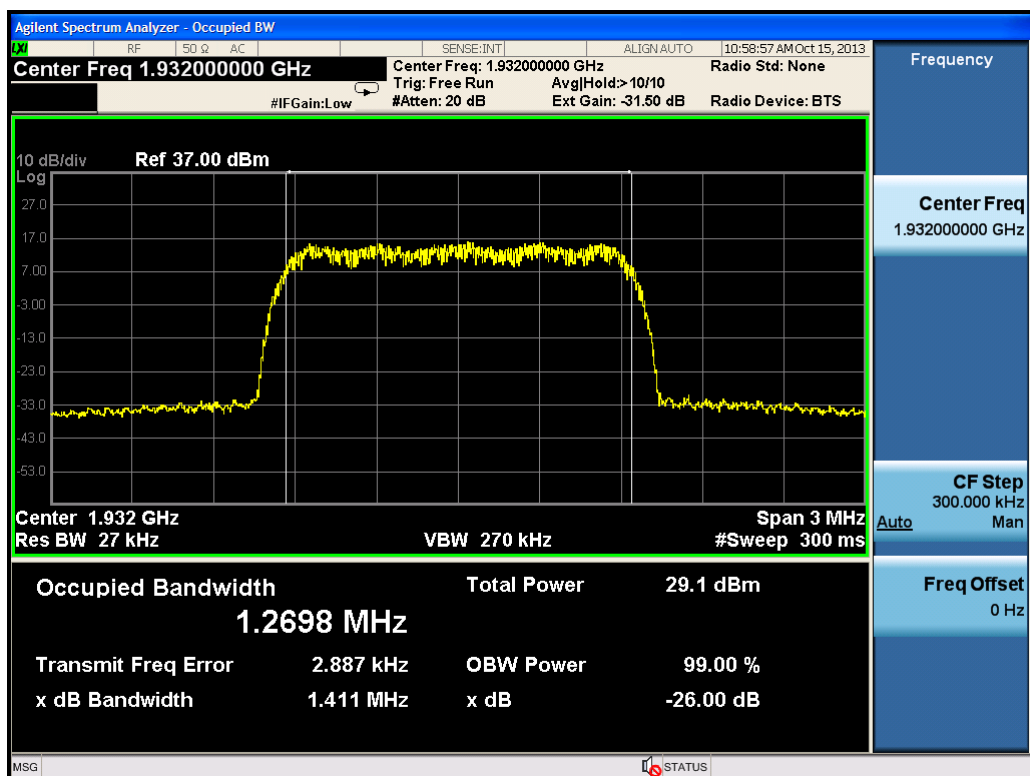
5) 1x EV-DO modulation for Downlink

5.1) Lowest frequency

a) Input signal

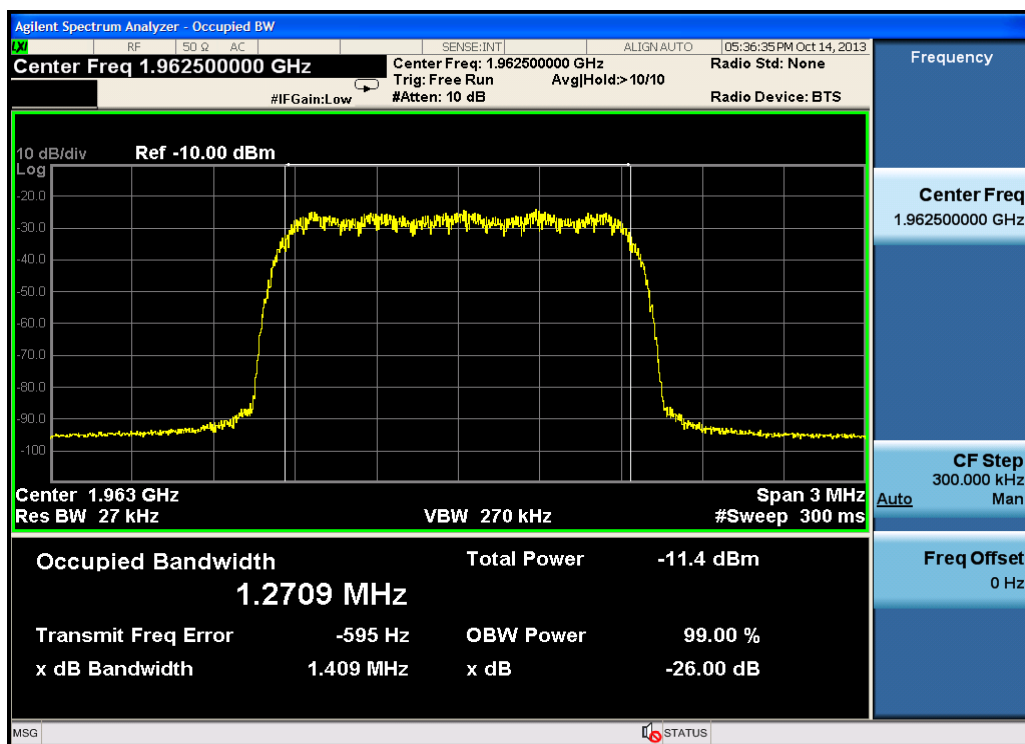


b) Output signal

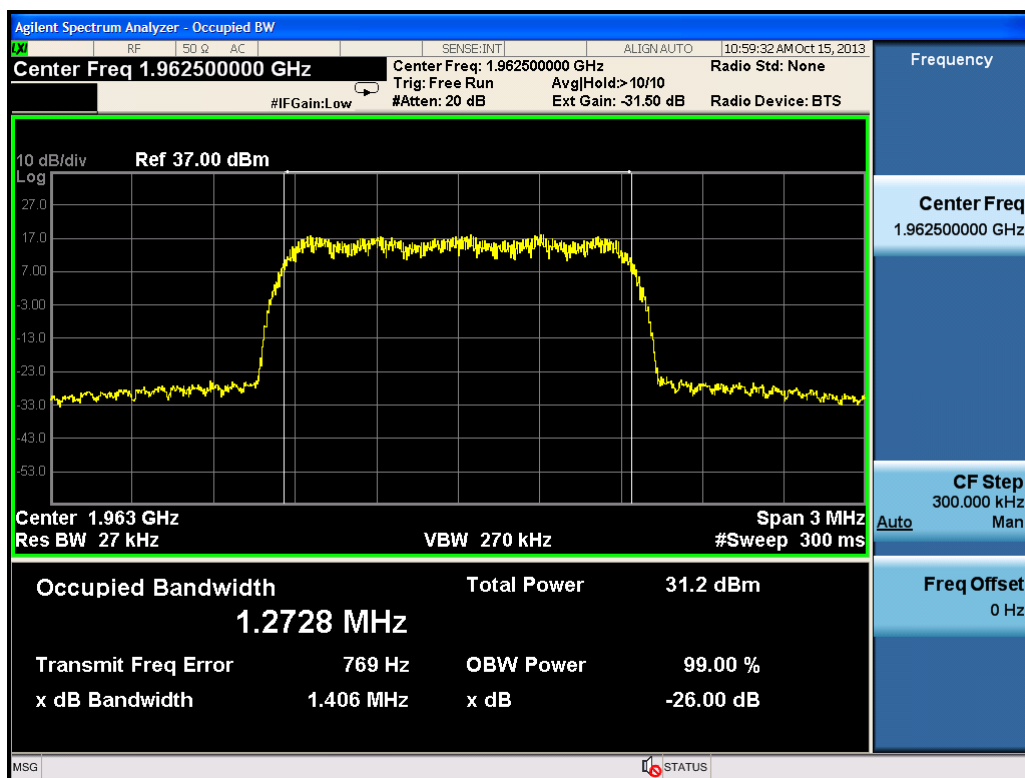


5.2) Middle frequency

a) Input signal

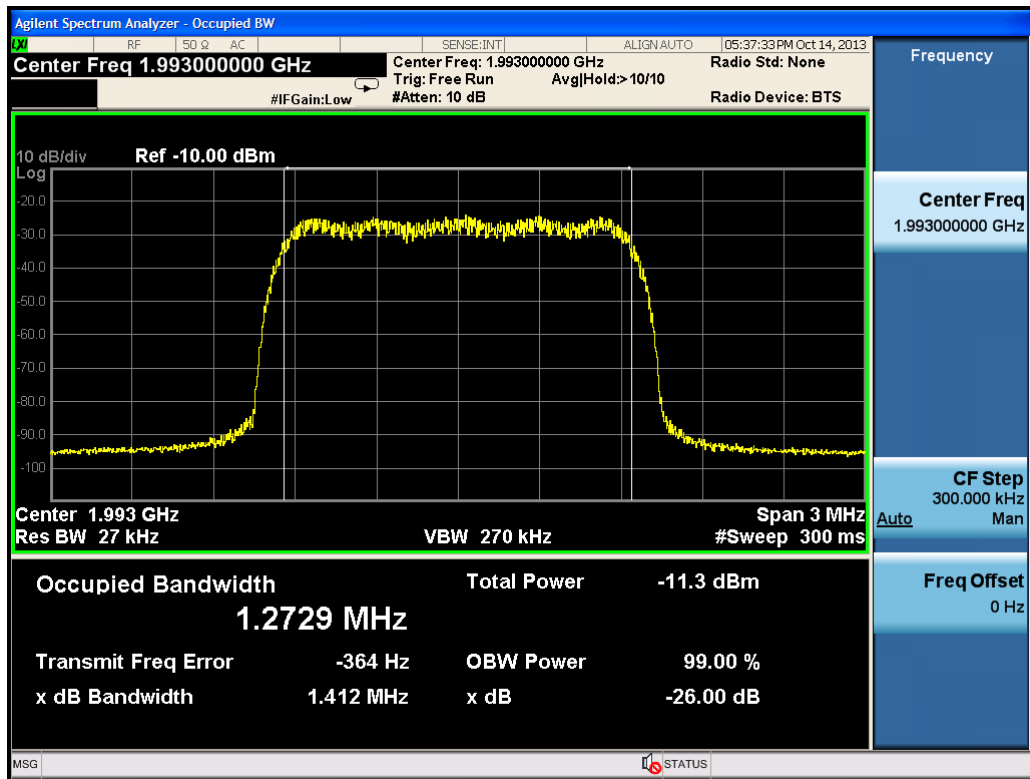


b) Output signal

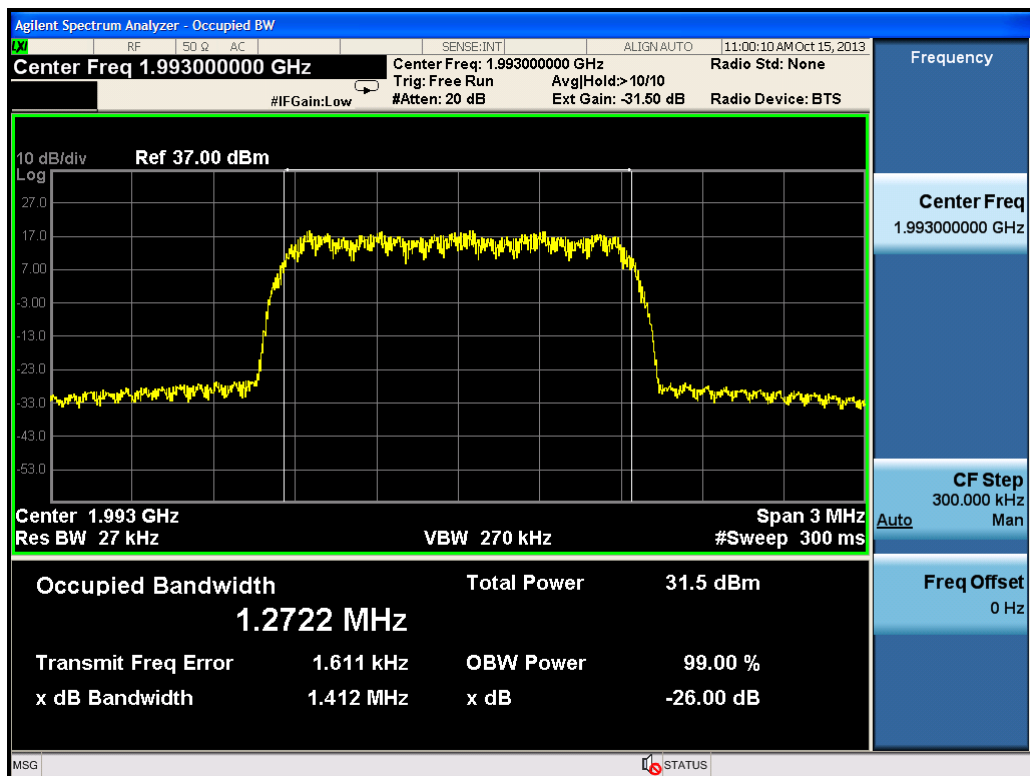


5.3) Highest frequency

a) Input signal



b) Output signal



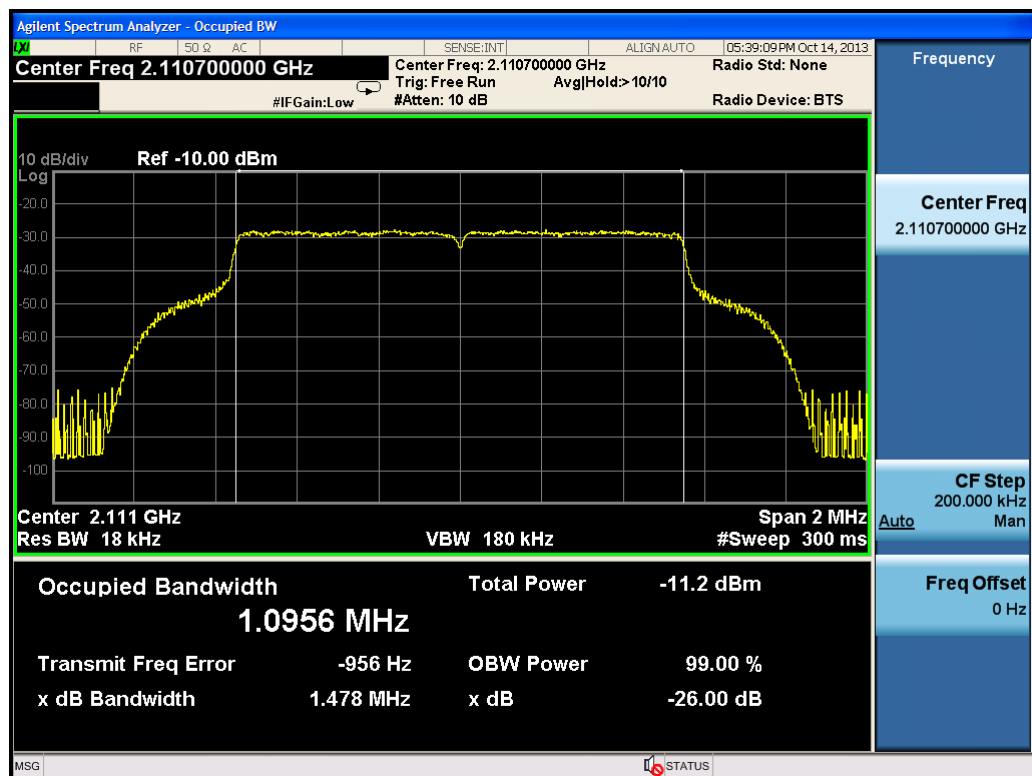
5.3.6.1.5 AWS-1 Band

1) LTE modulation for Downlink

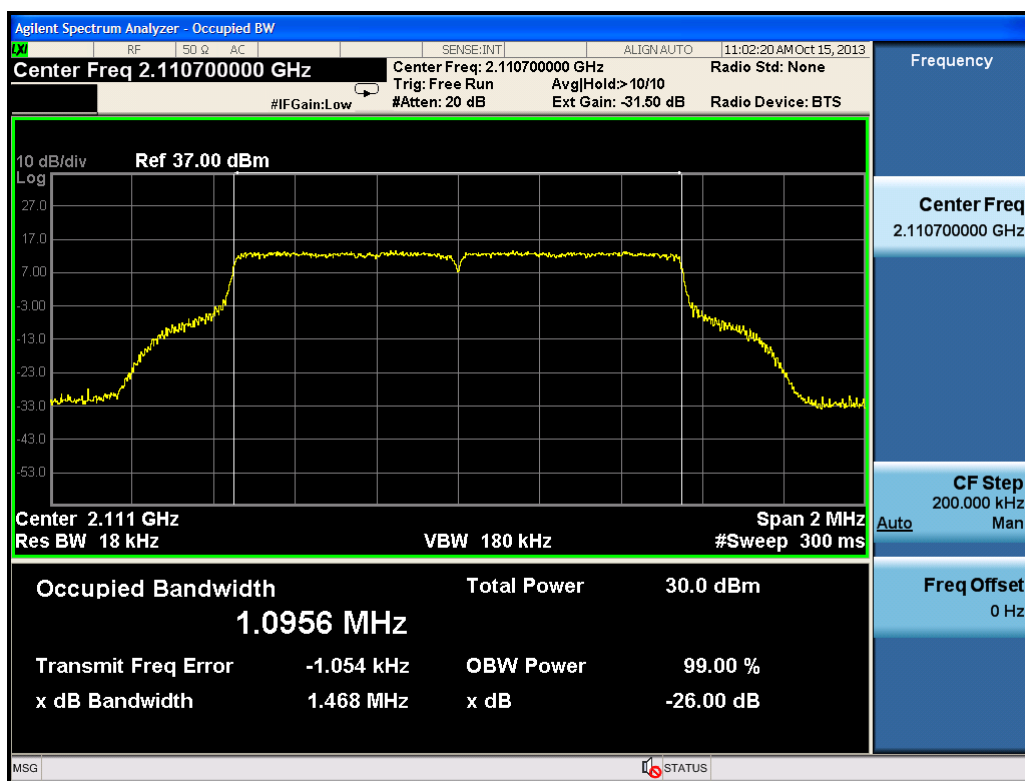
1.1) Test for LTE 1.4MHz

1.1.1) Lowest frequency

a) Input signal

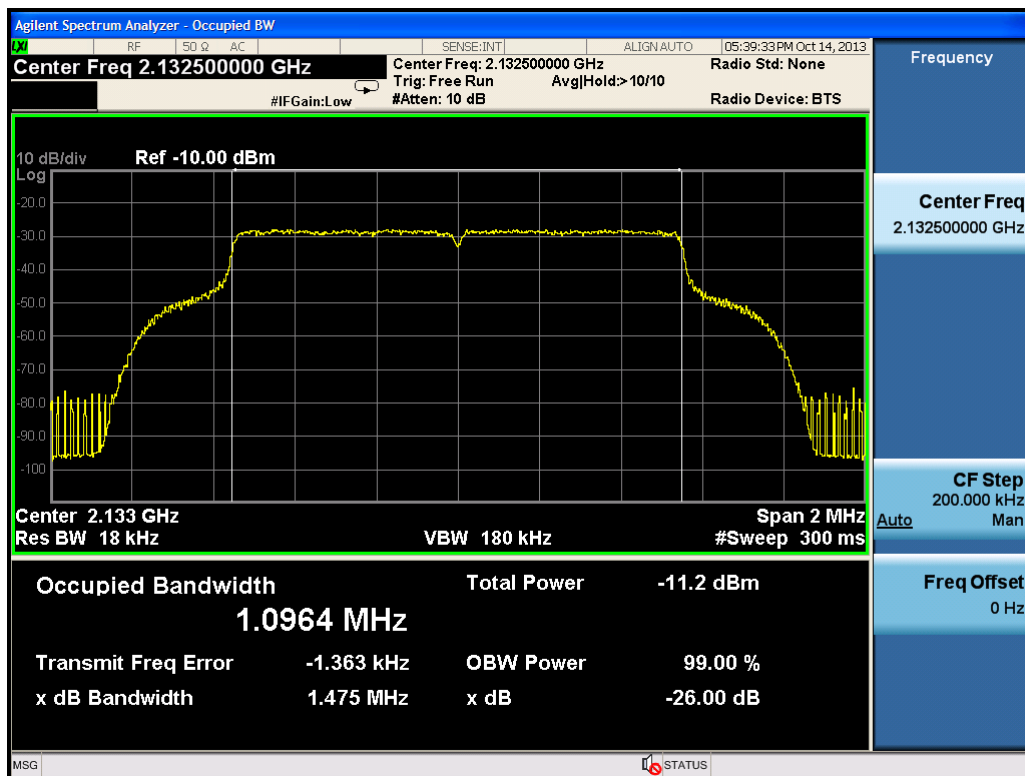


b) Output signal

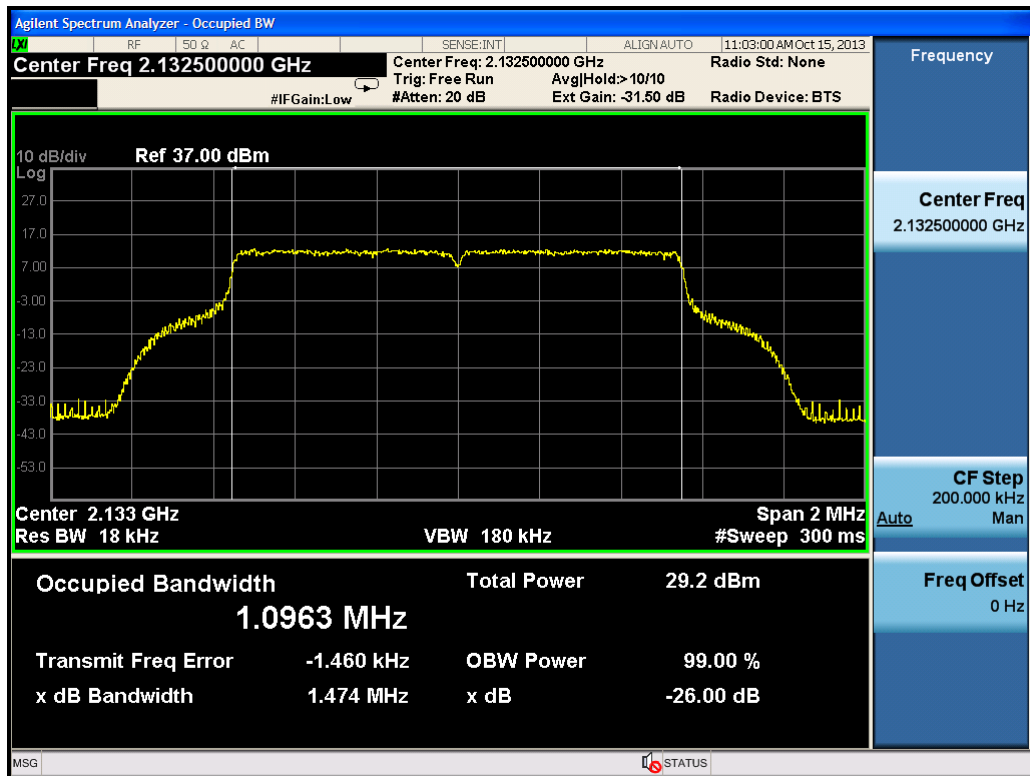


1.1.2) Middle frequency

a) Input signal

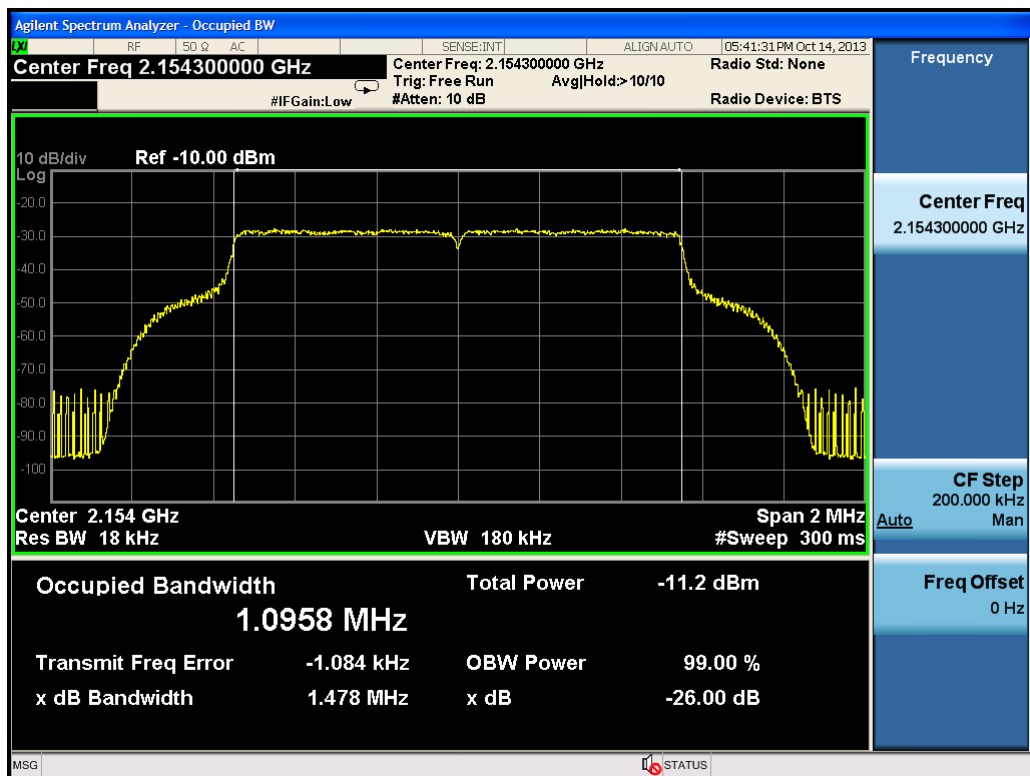


b) Output signal

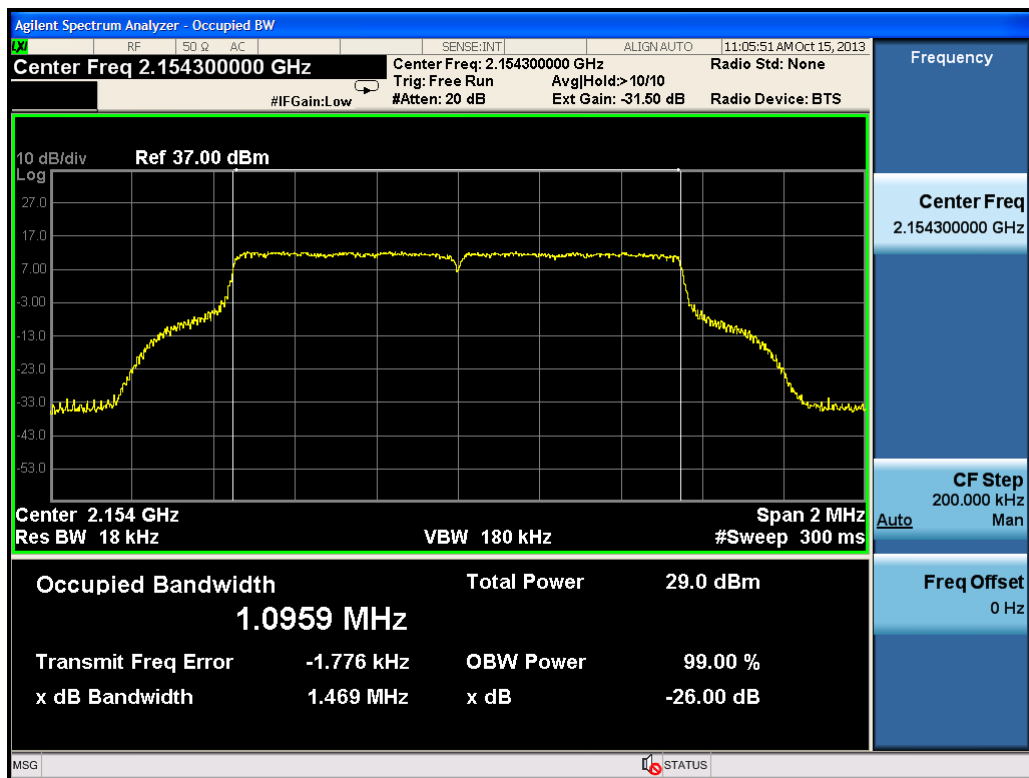


1.1.3) Highest frequency

a) Input signal



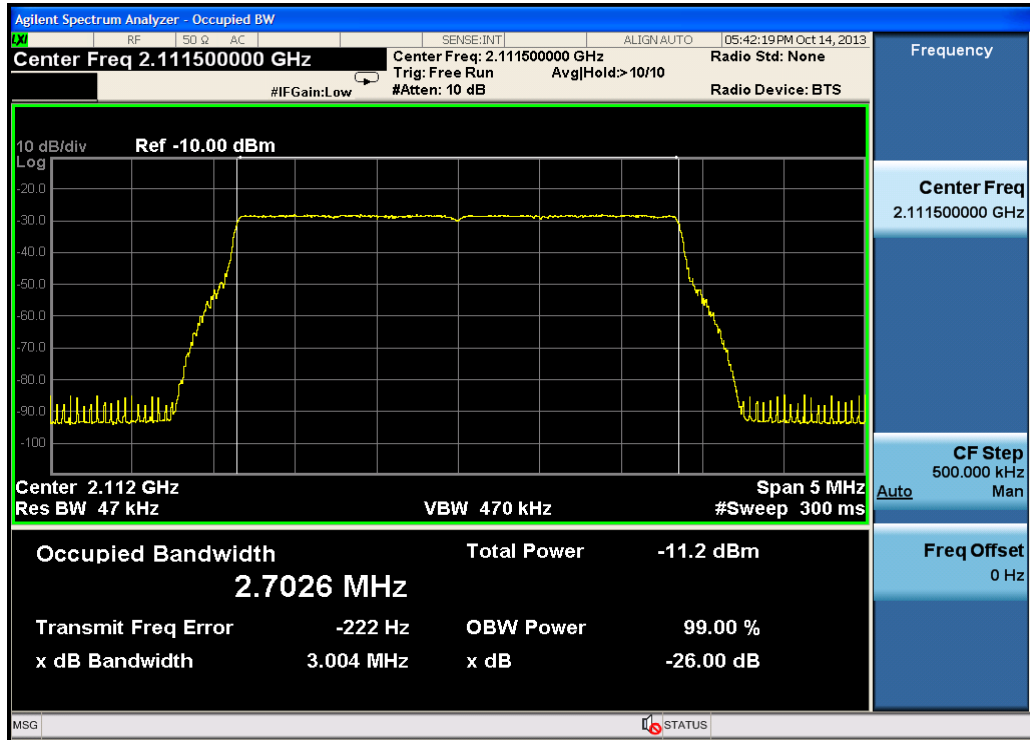
b) Output signal



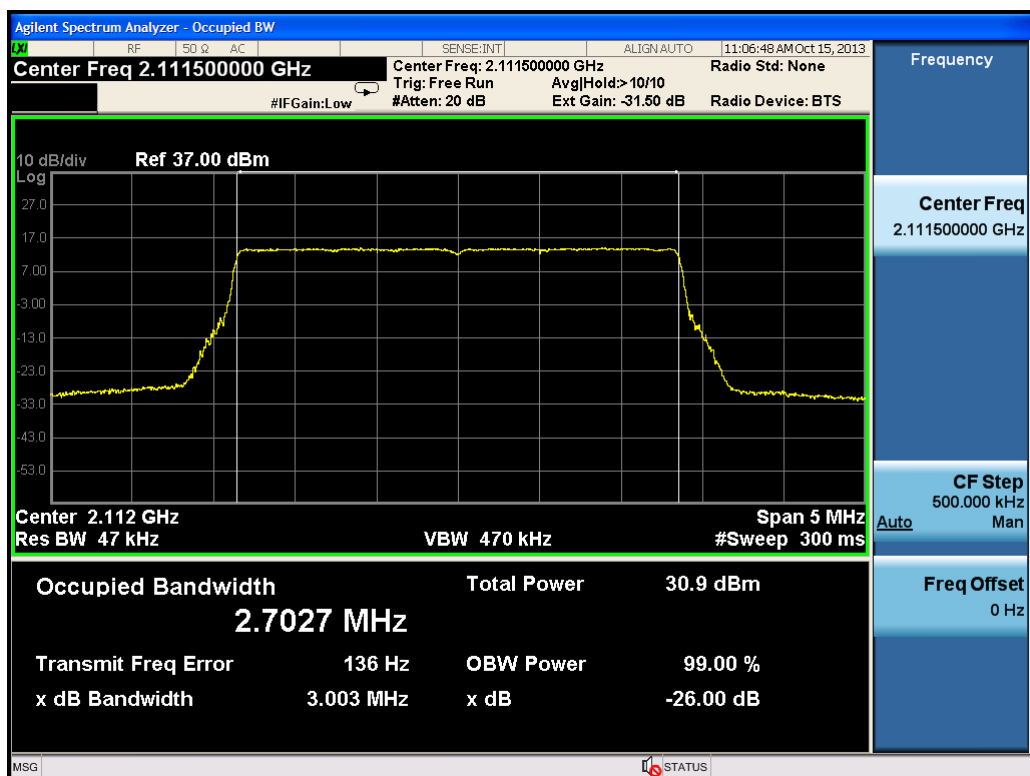
1.2) Test for LTE 3 MHz

1.2.1) Lowest frequency

a) Input signal

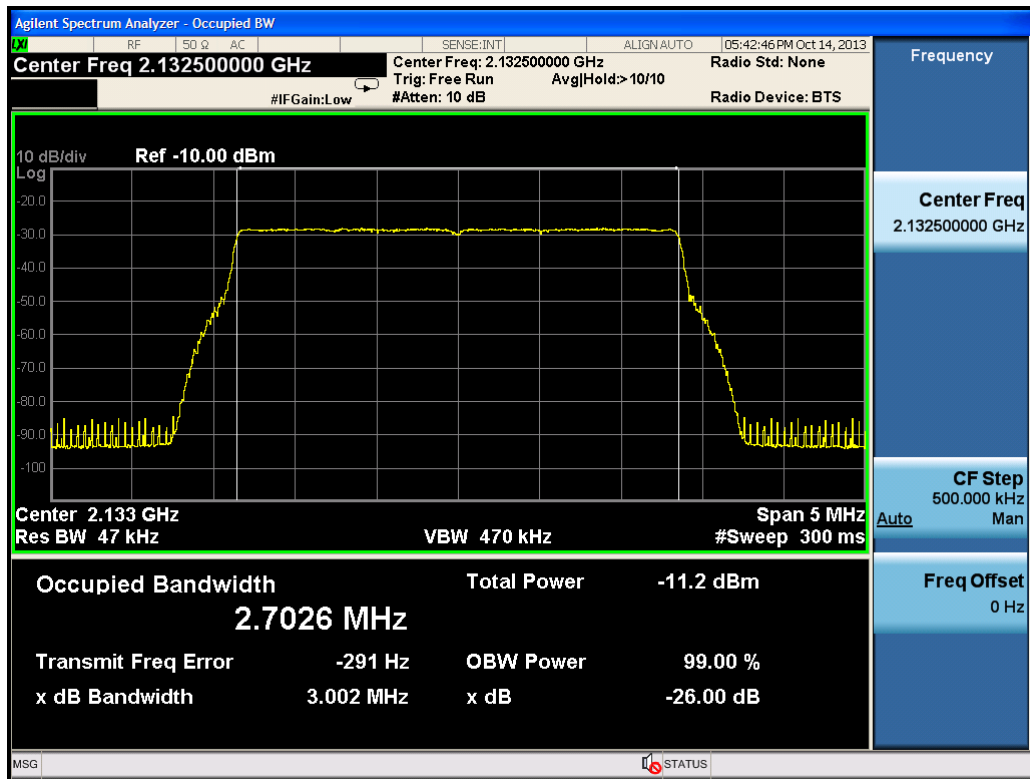


b) Output signal

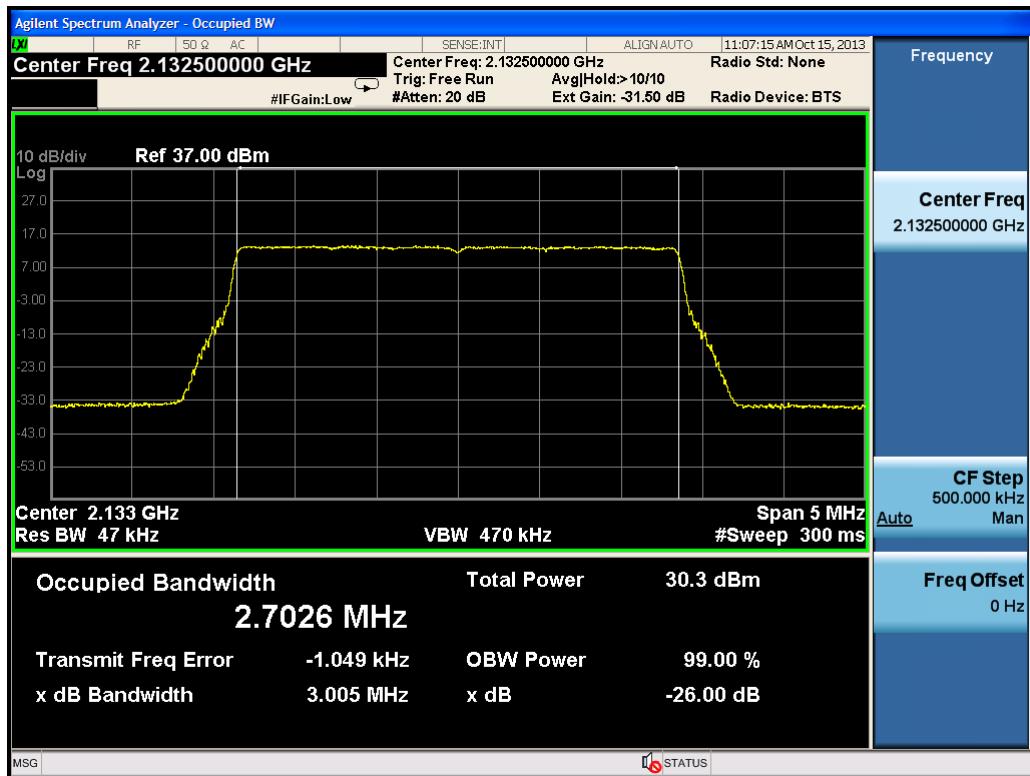


1.2.2) Middle frequency

a) Input signal

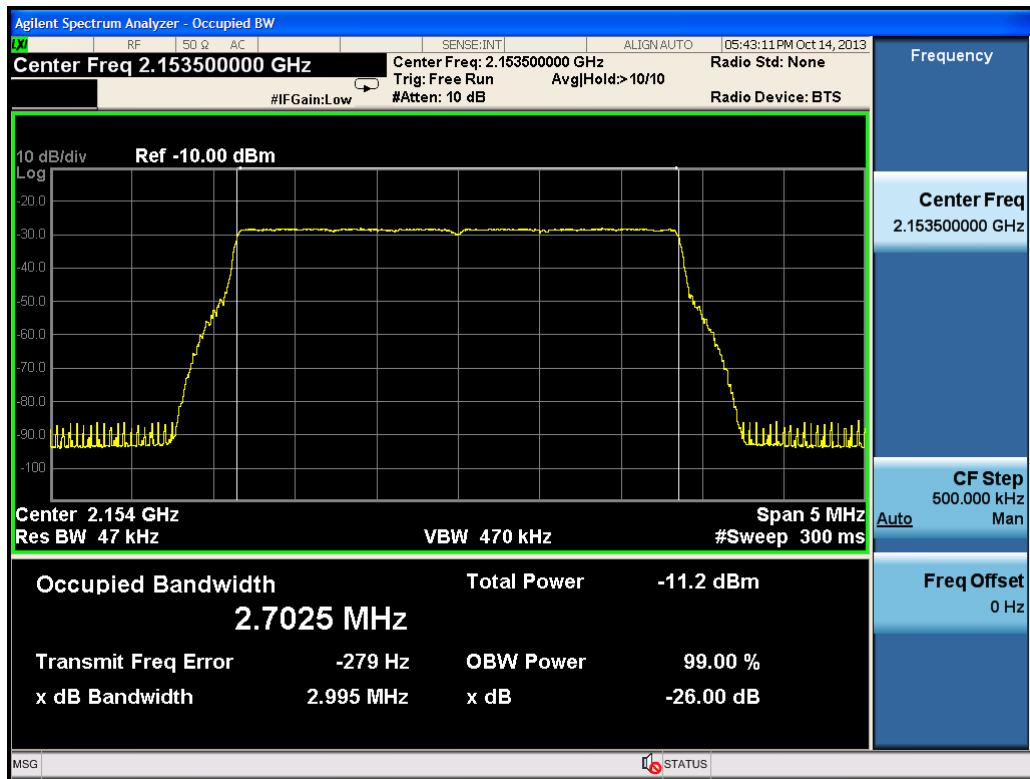


b) Output signal

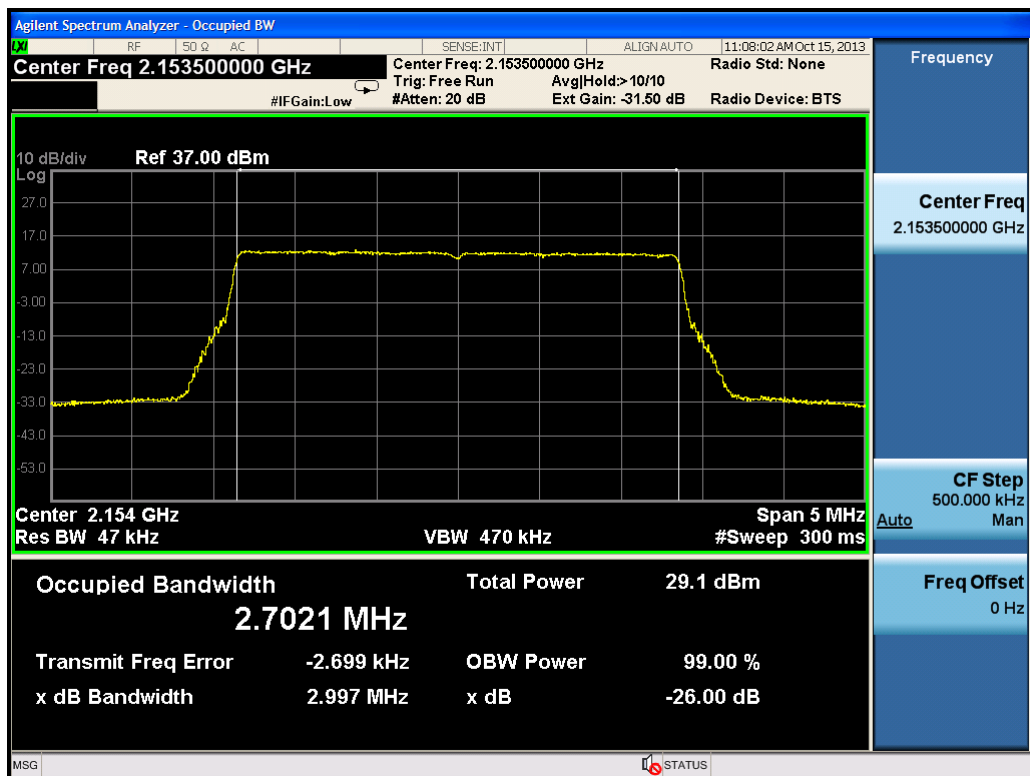


1.2.3) Highest frequency

a) Input signal



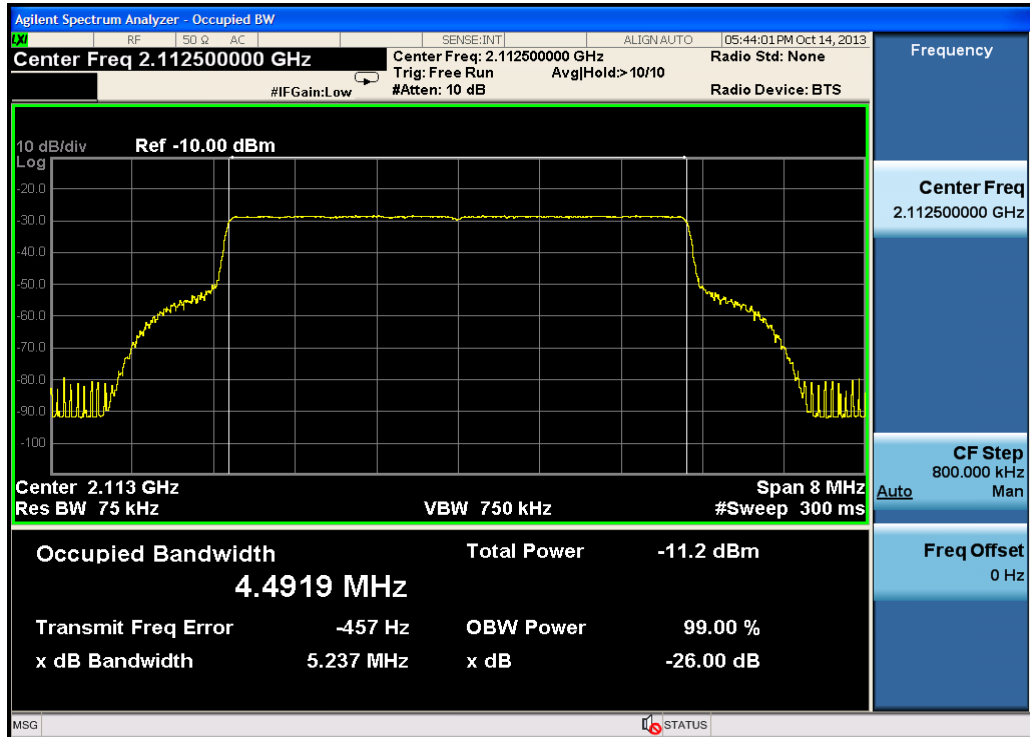
b) Output signal



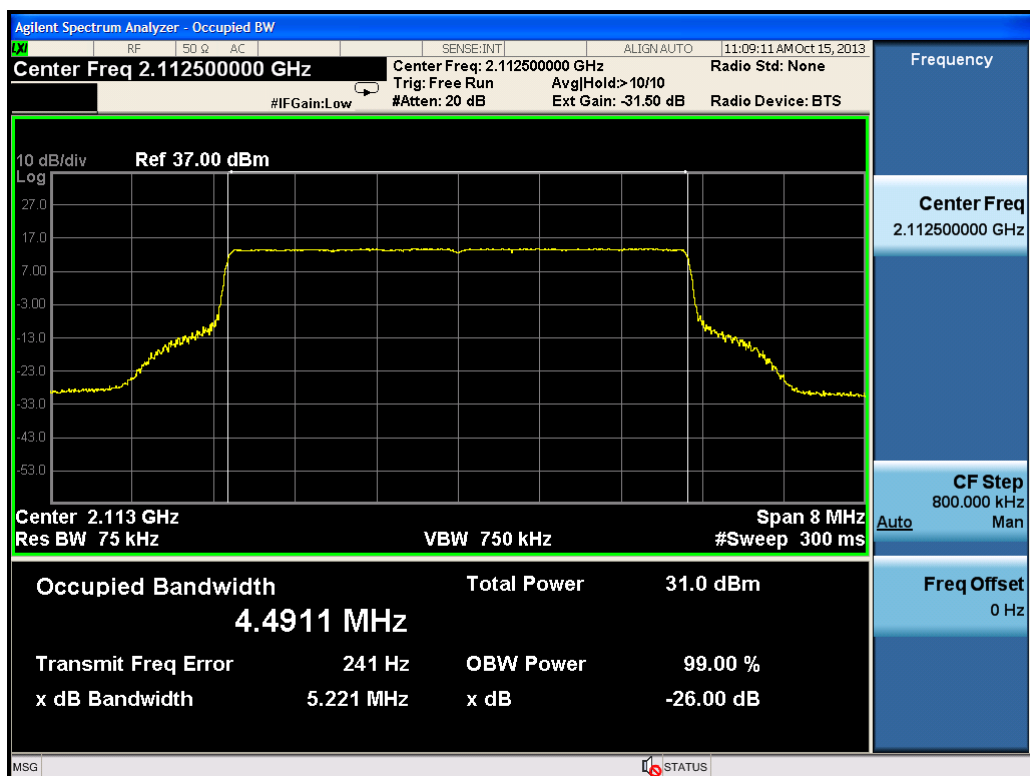
1.3) Test for LTE 5 MHz

1.3.1) Lowest frequency

a) Input signal

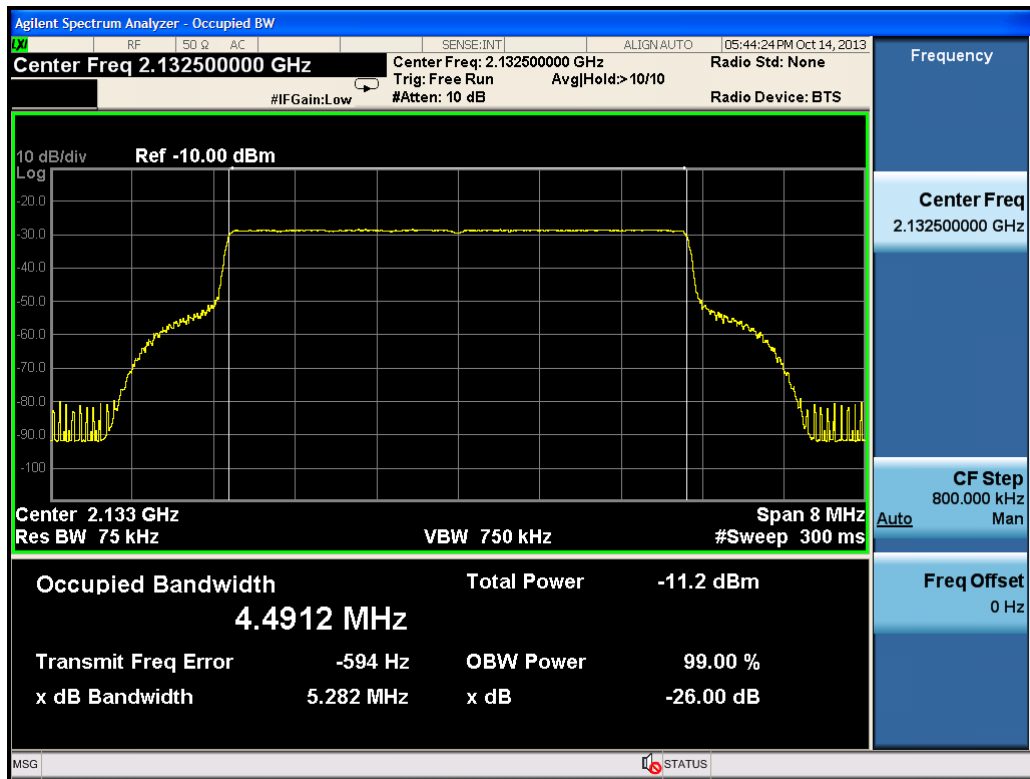


b) Output signal

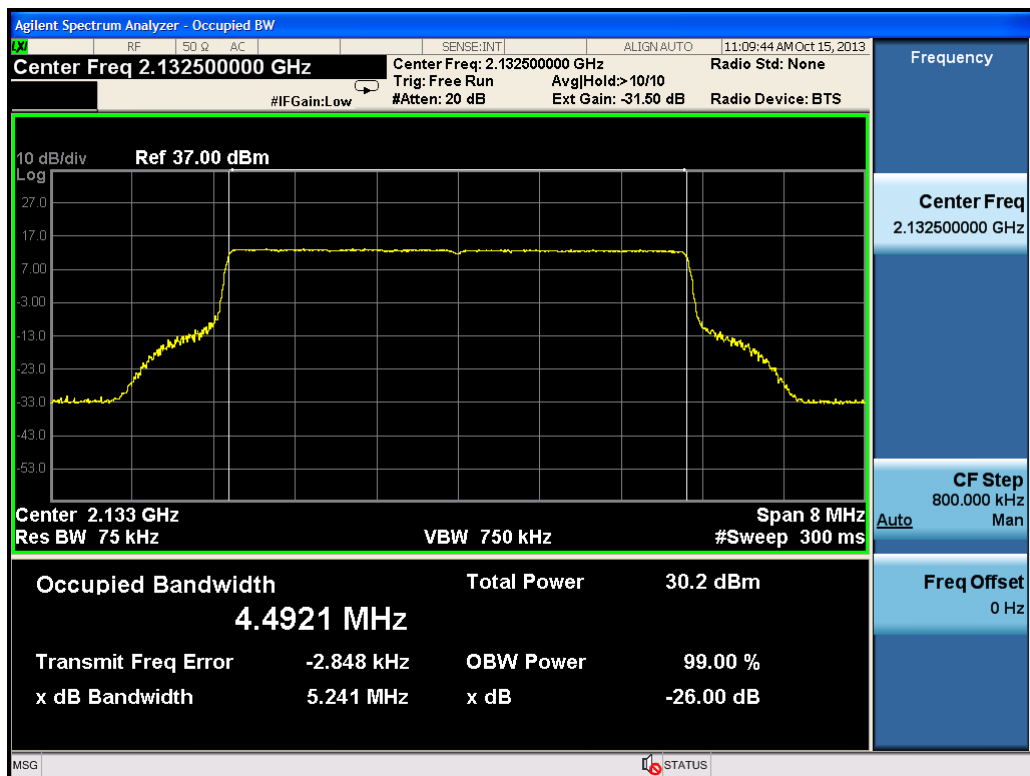


1.3.2) Middle frequency

a) Input signal

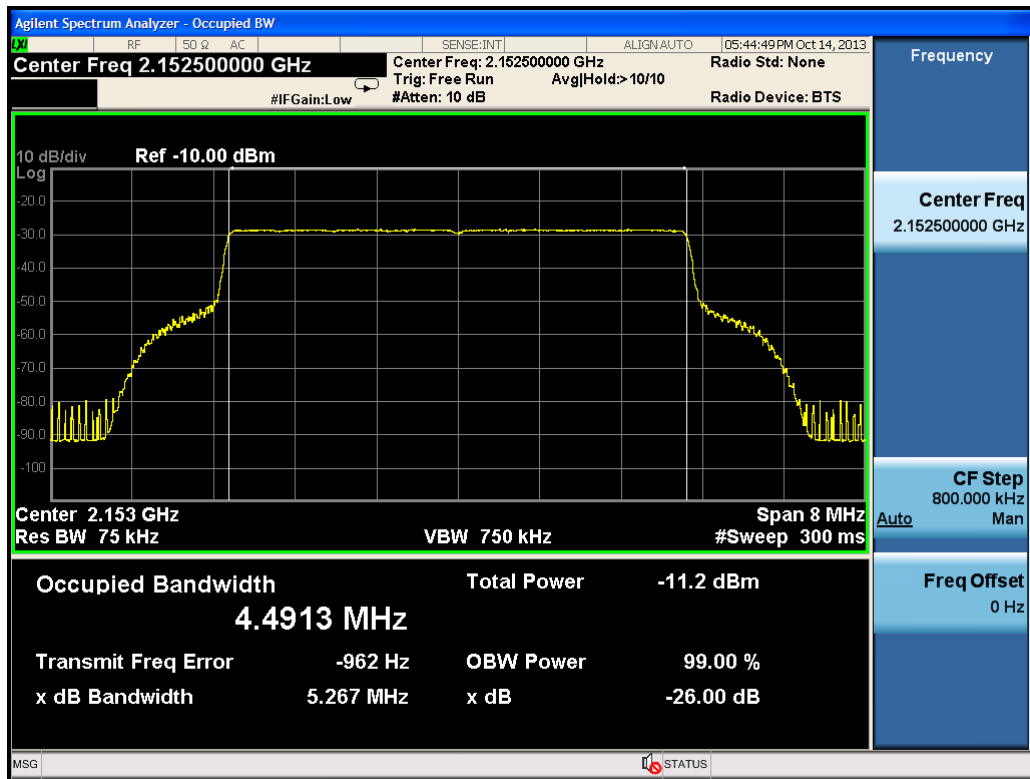


b) Output signal

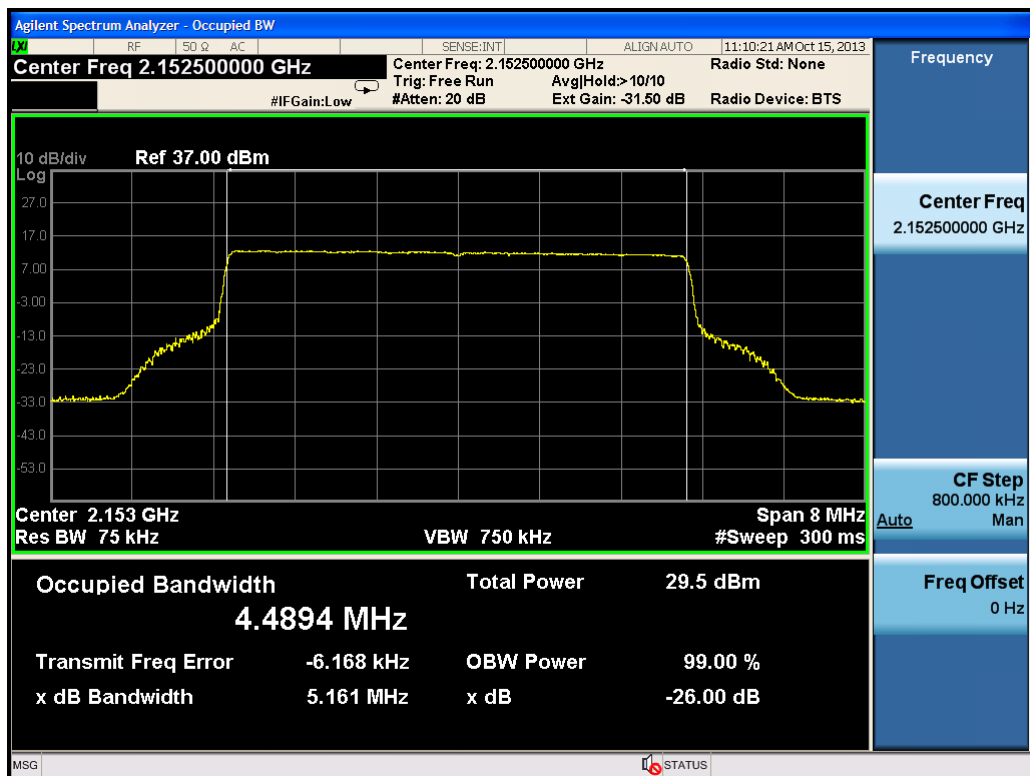


1.3.3) Highest frequency

a) Input signal



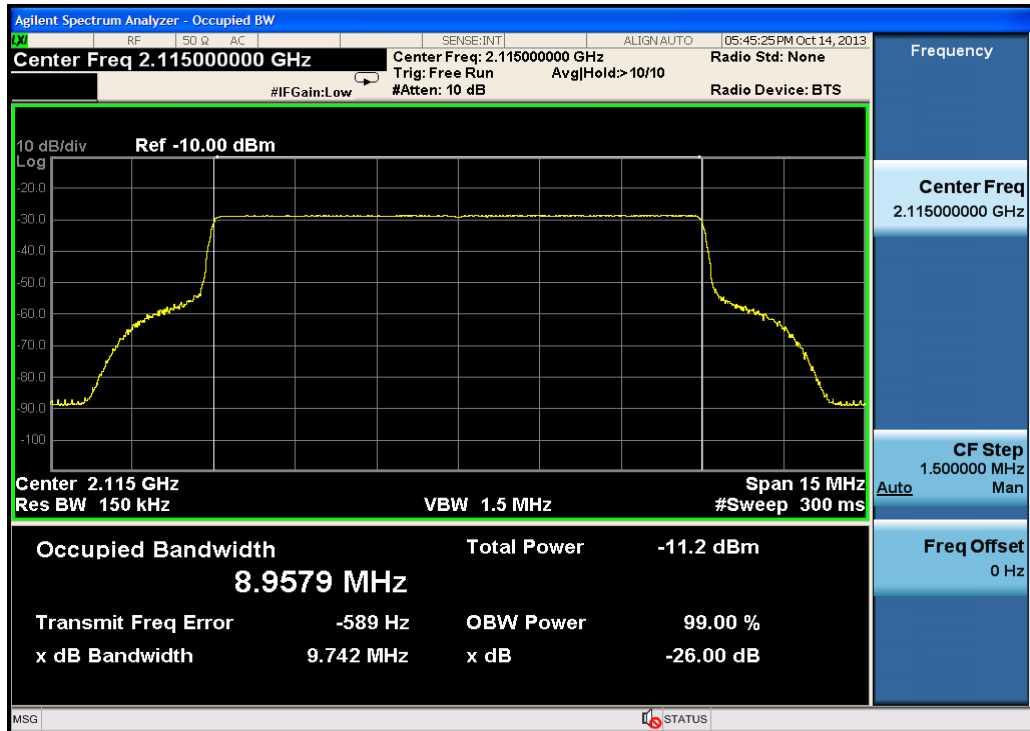
b) Output signal



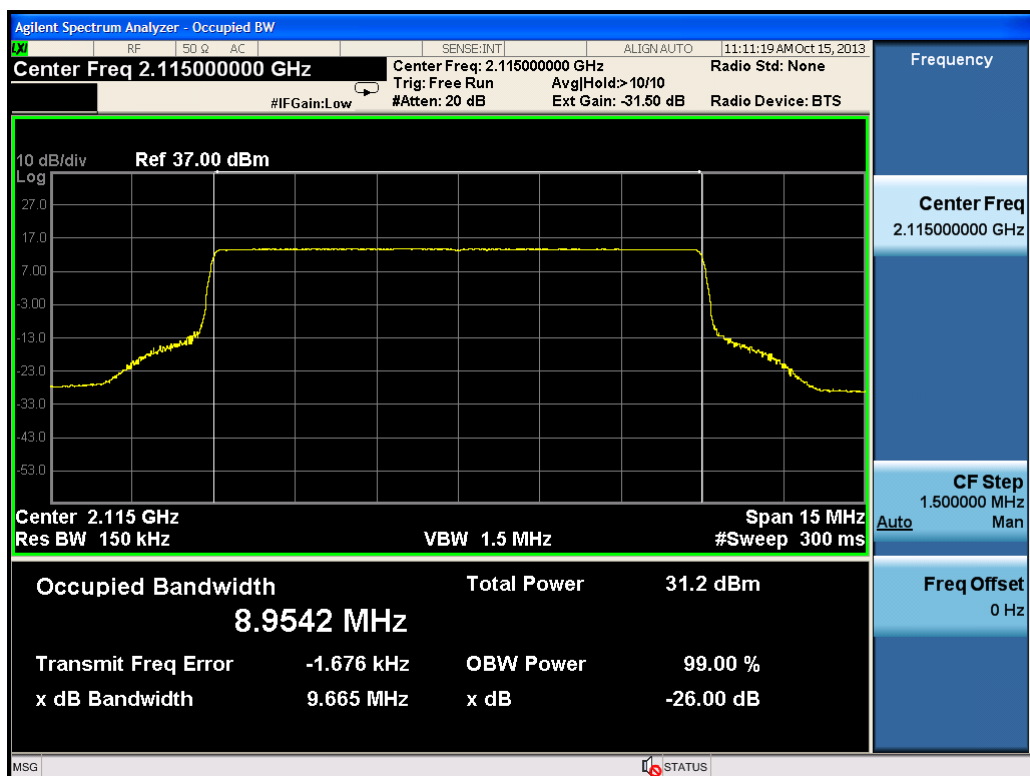
1.4) Test for LTE 10 MHz

1.4.1) Lowest frequency

a) Input signal

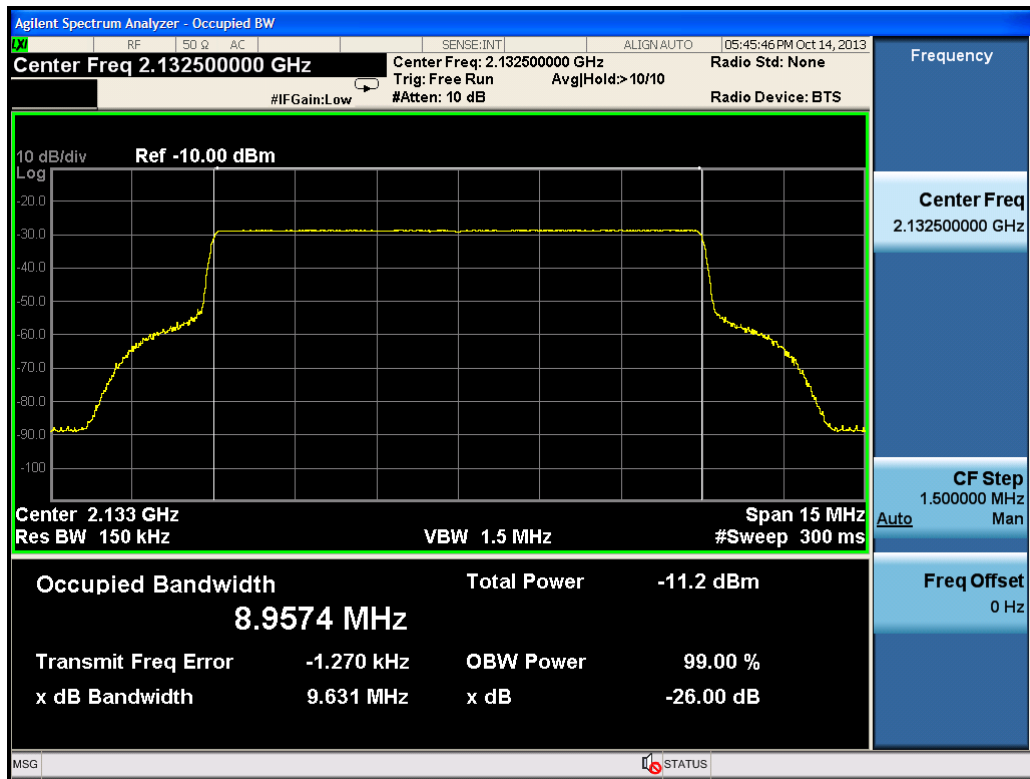


b) Output signal

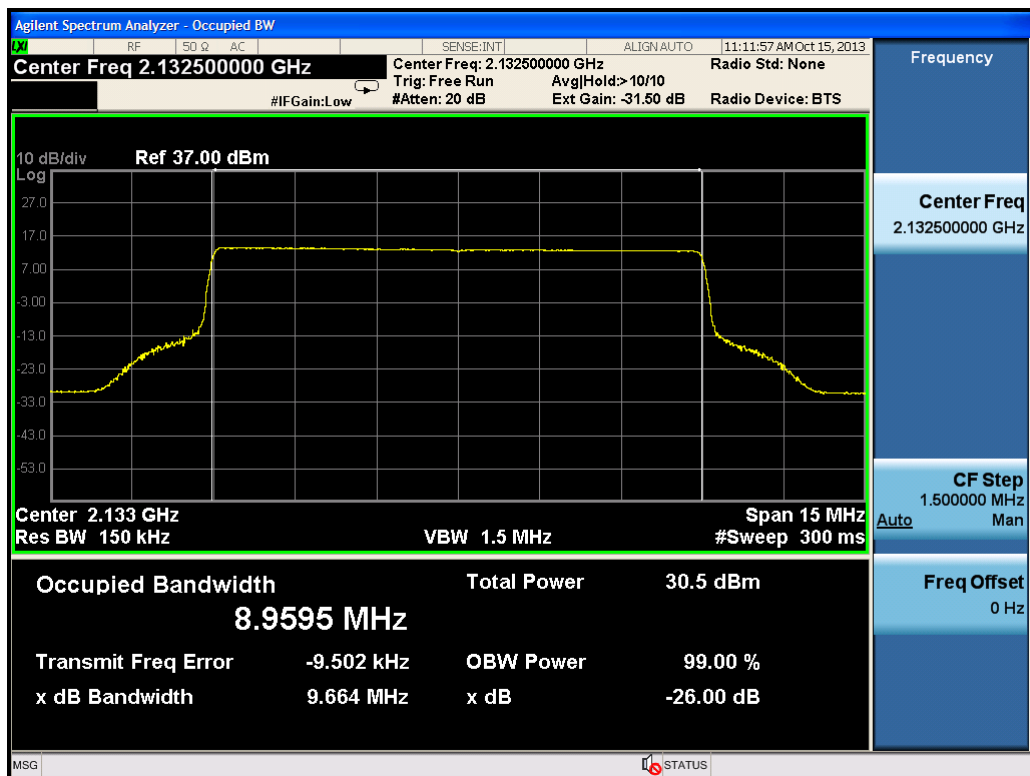


1.4.2) Middle frequency

a) Input signal

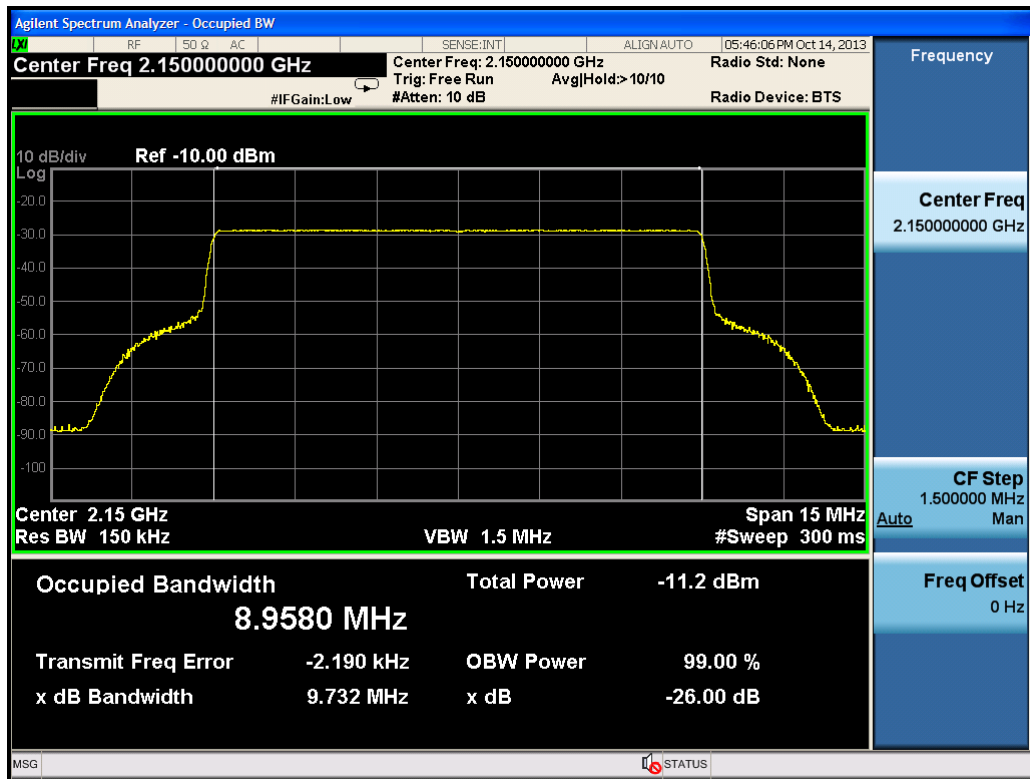


b) Output signal

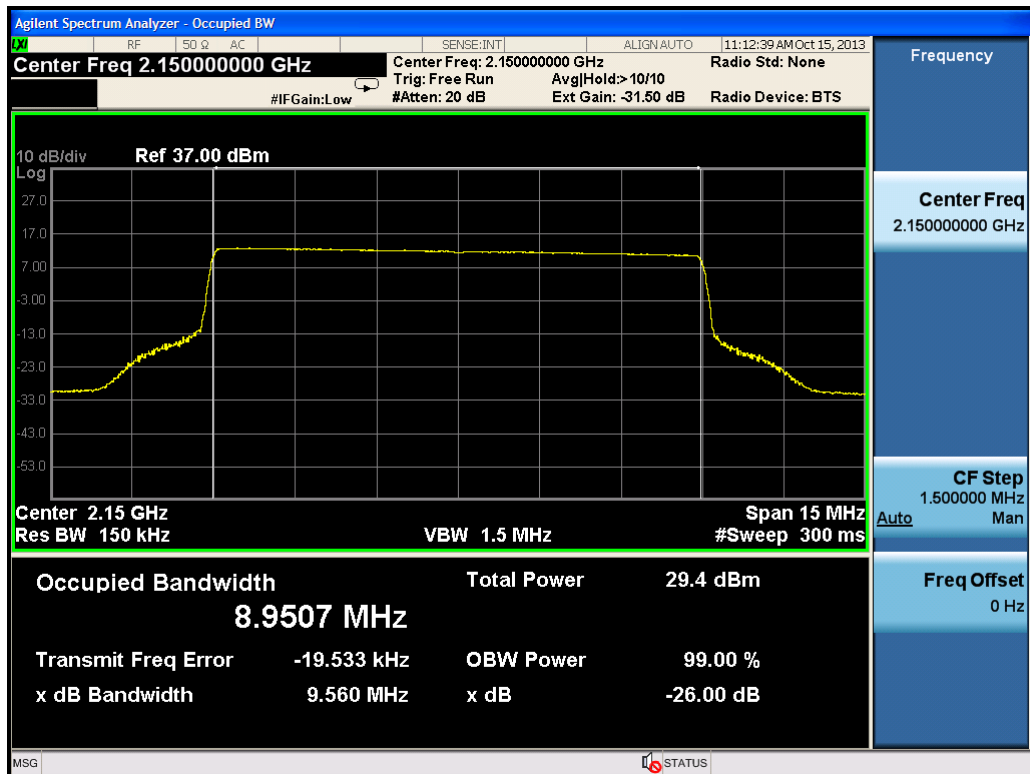


1.4.3) Highest frequency

a) Input signal



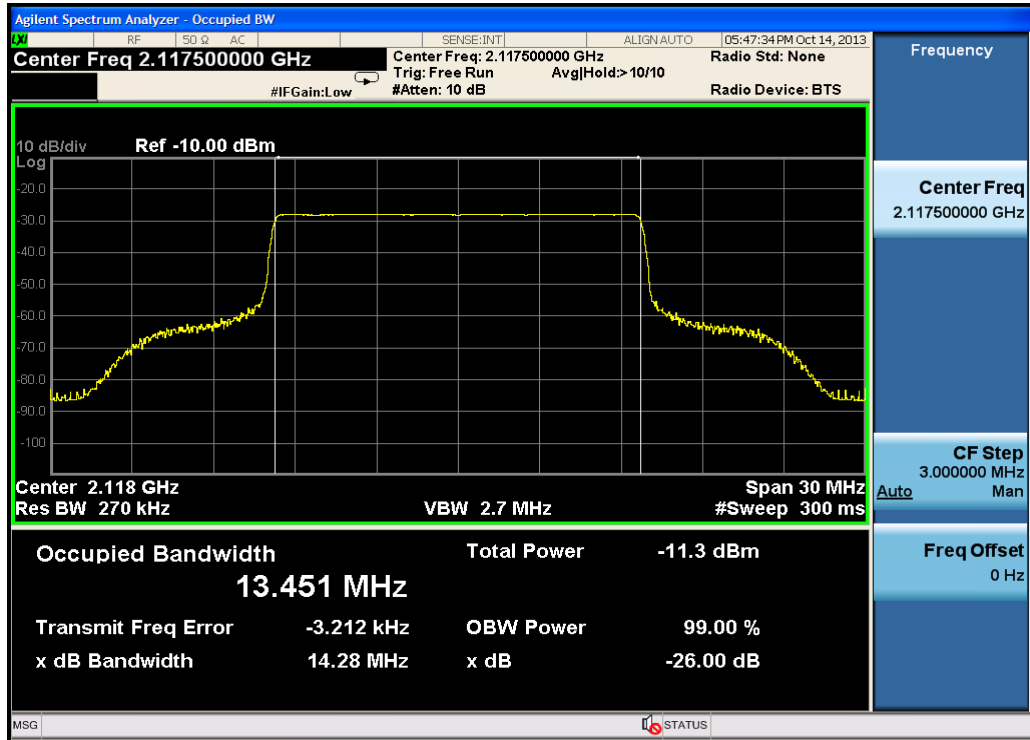
b) Output signal



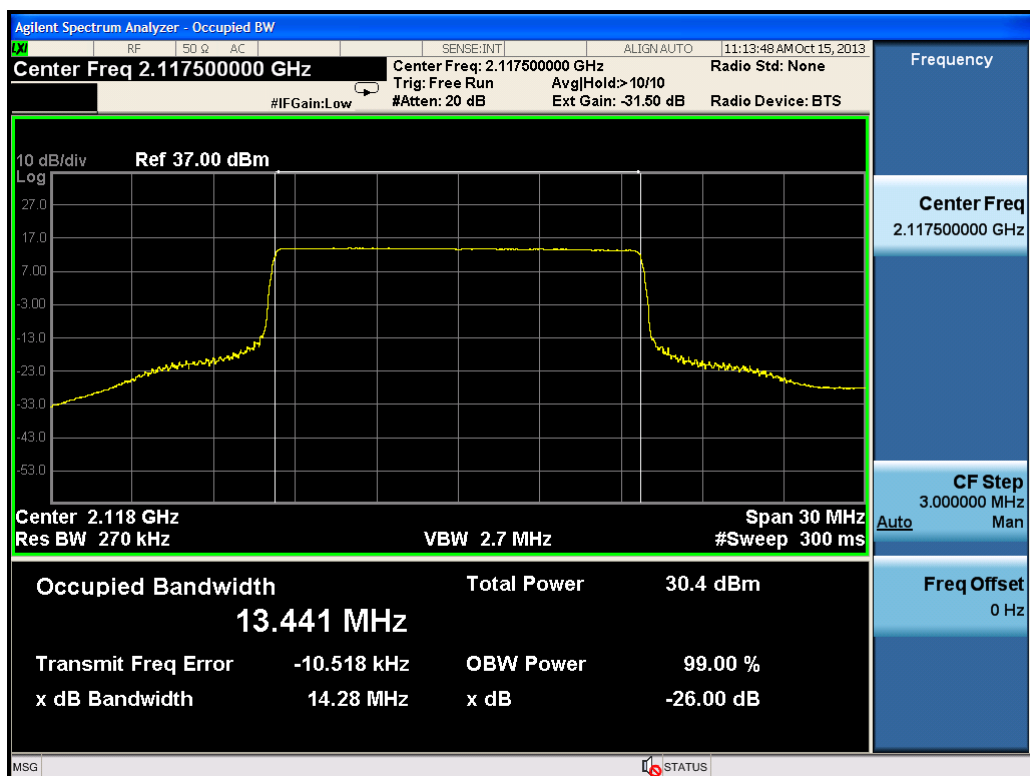
1.5) Test for LTE 15 MHz

1.5.1) Lowest frequency

a) Input signal

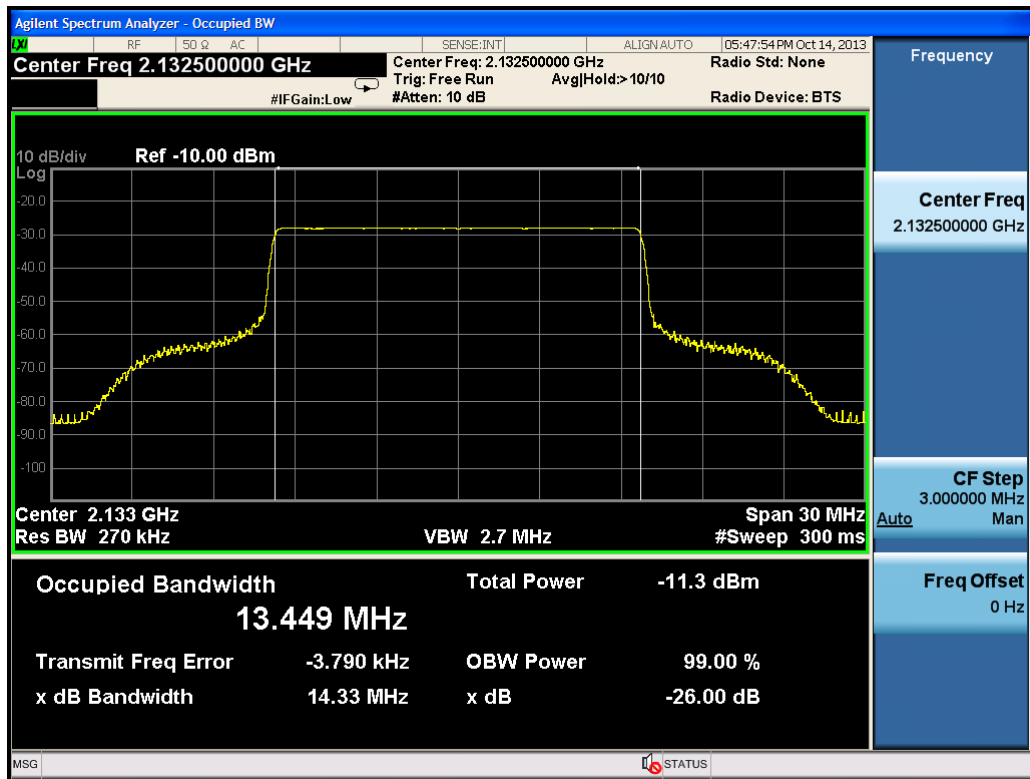


b) Output signal

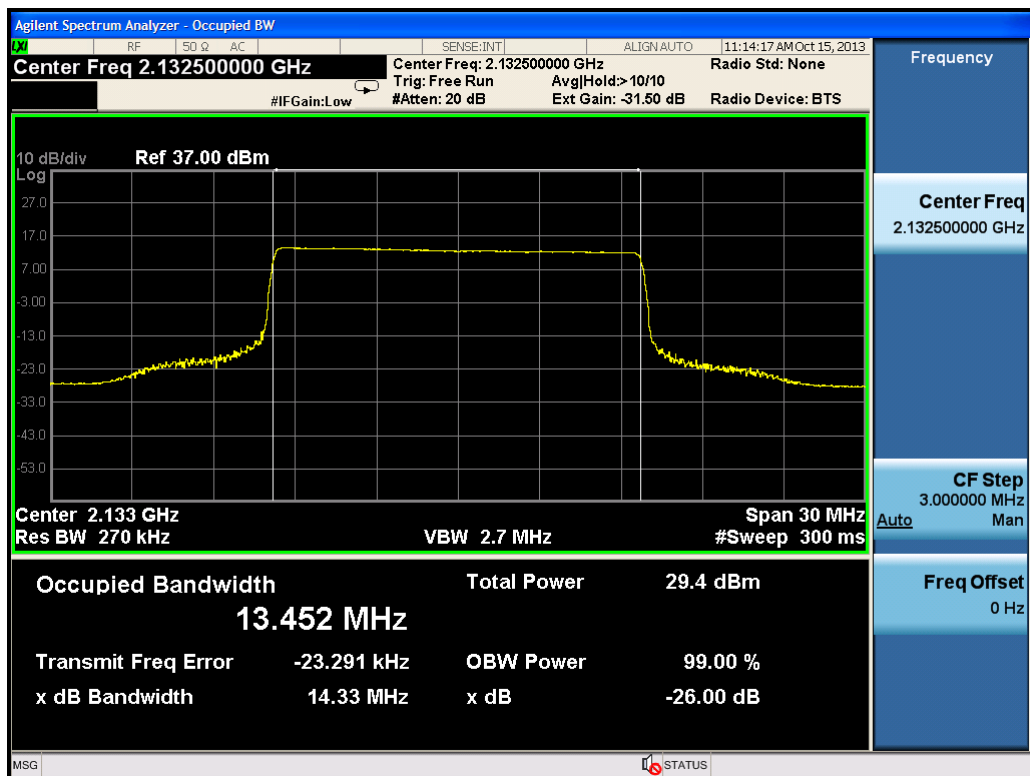


1.5.2) Middle frequency

a) Input signal

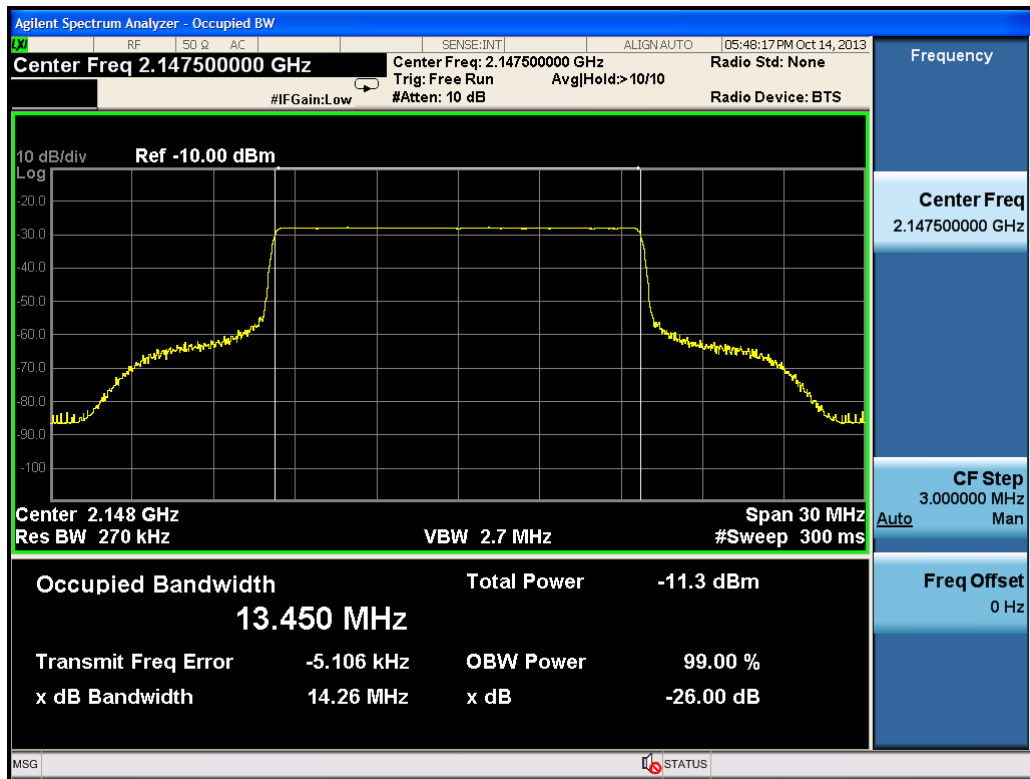


b) Output signal

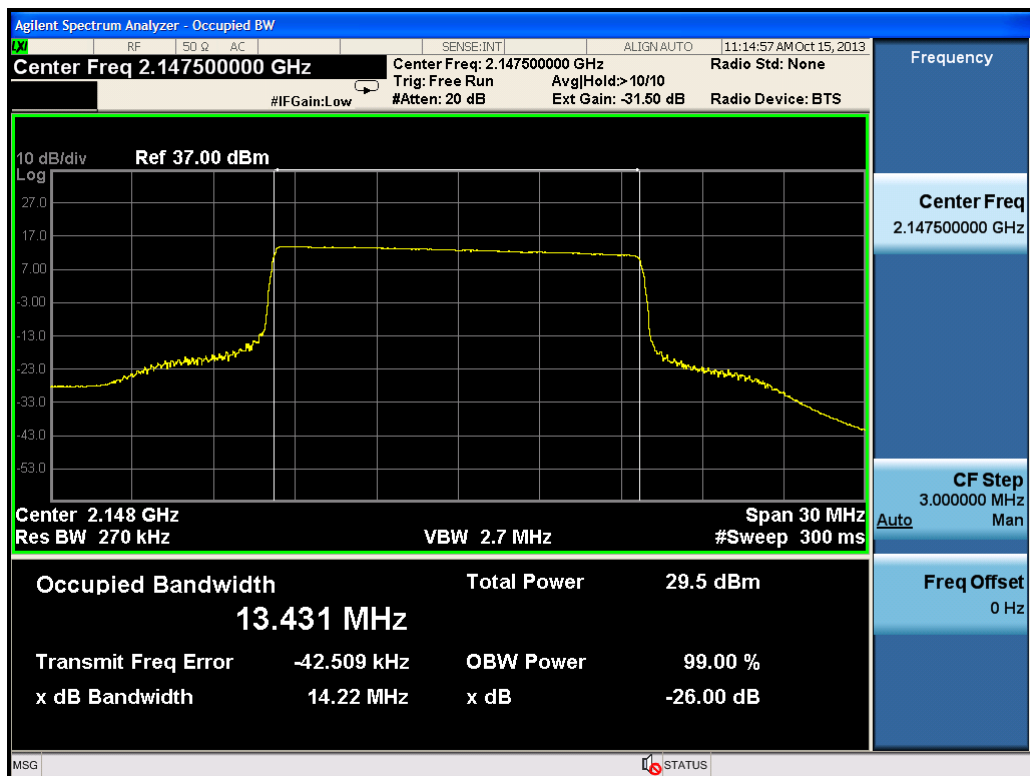


1.5.3) Highest frequency

a) Input signal



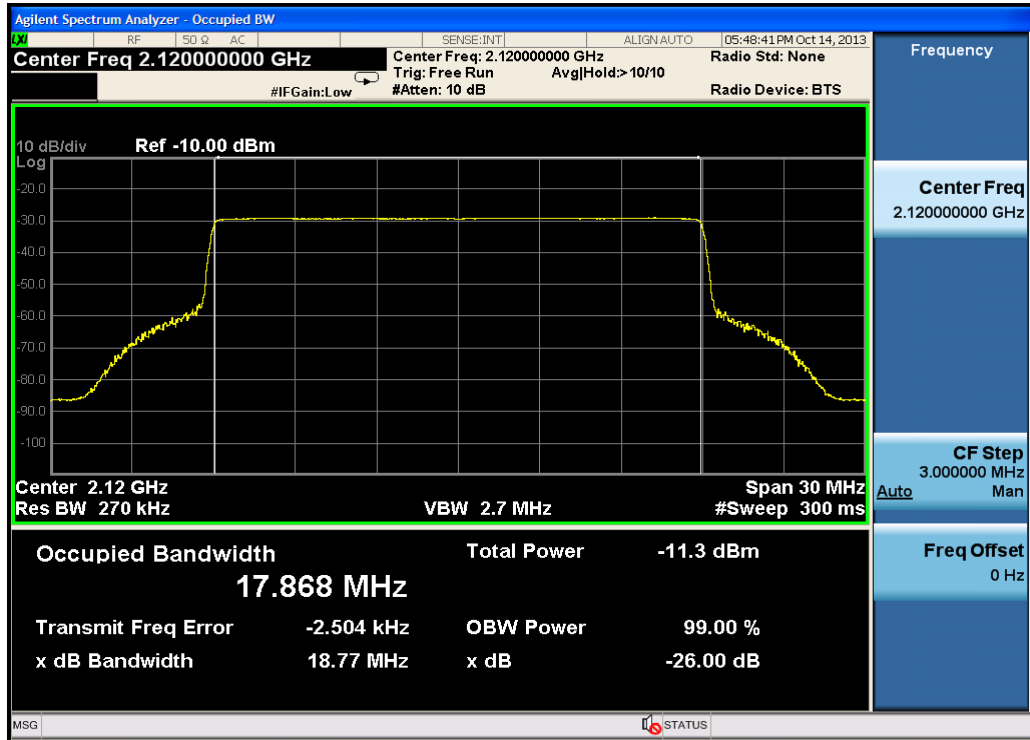
b) Output signal



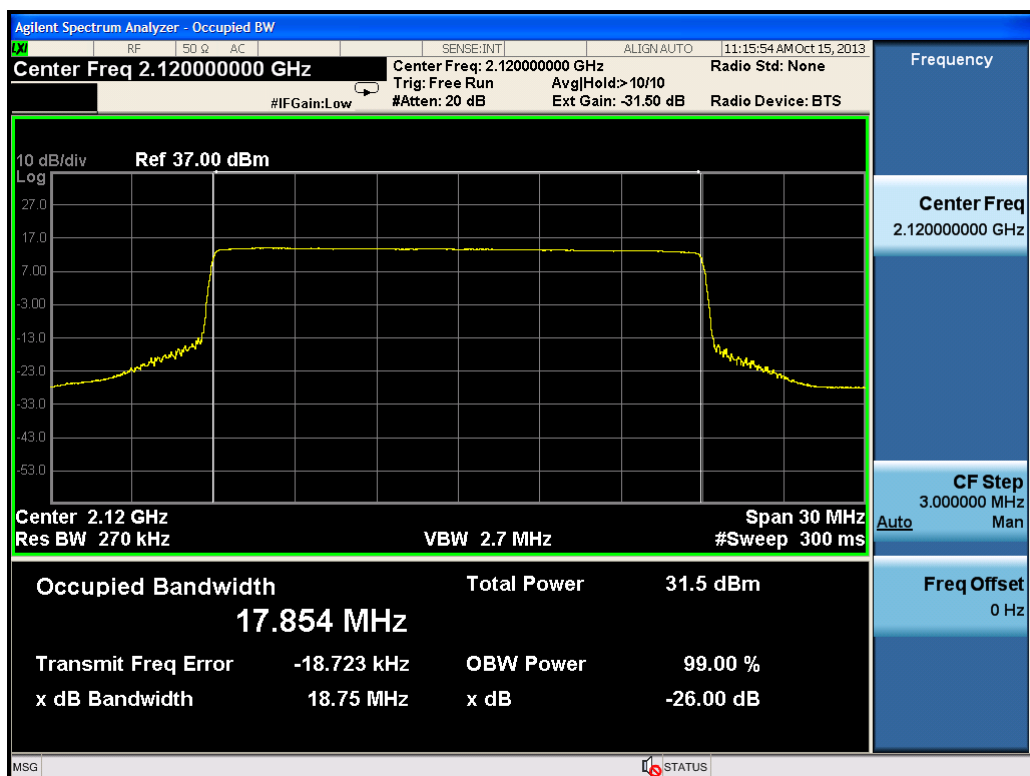
1.6) Test for LTE 20 MHz

1.6.1) Lowest frequency

a) Input signal

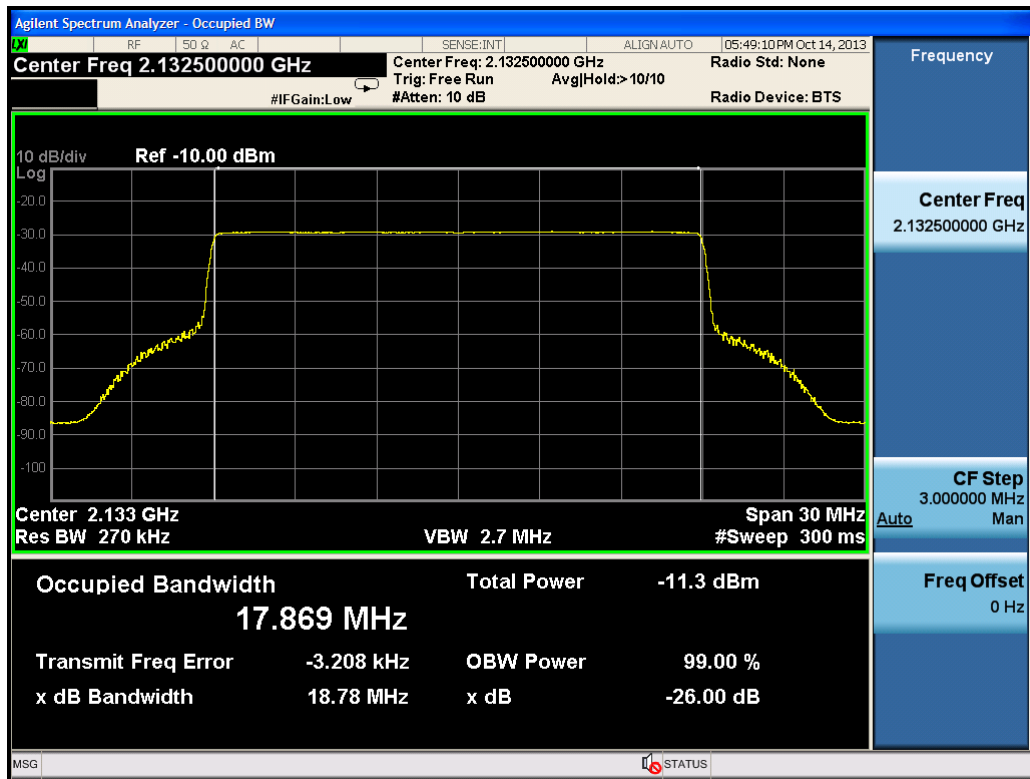


b) Output signal

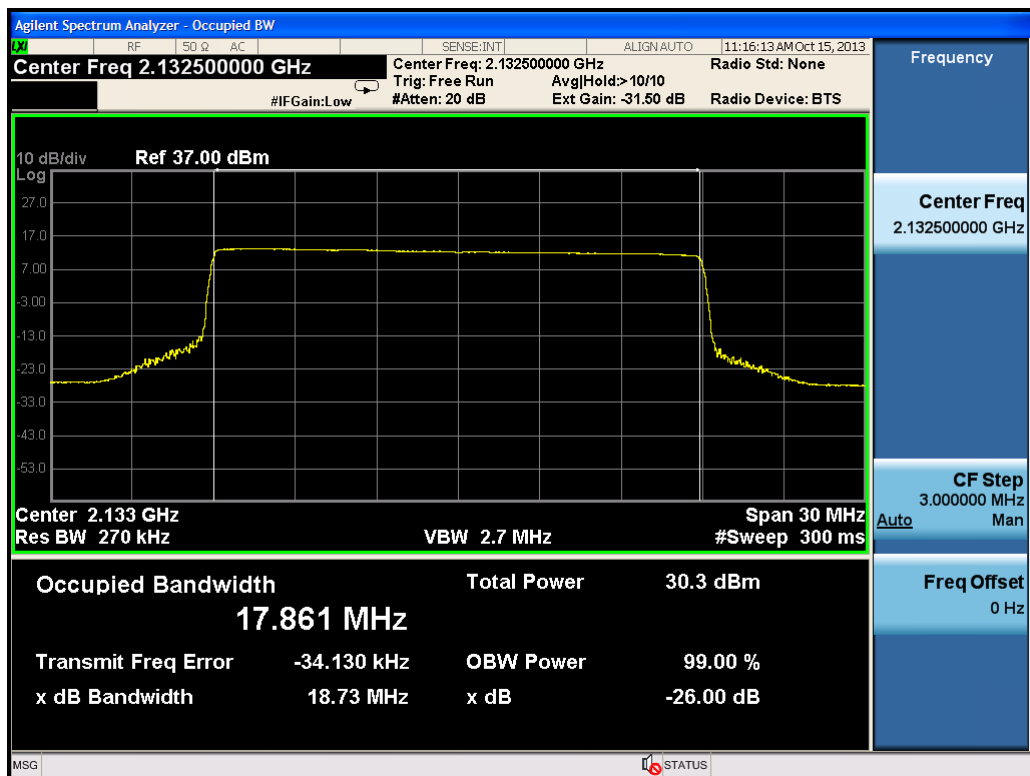


1.6.2) Middle frequency

a) Input signal

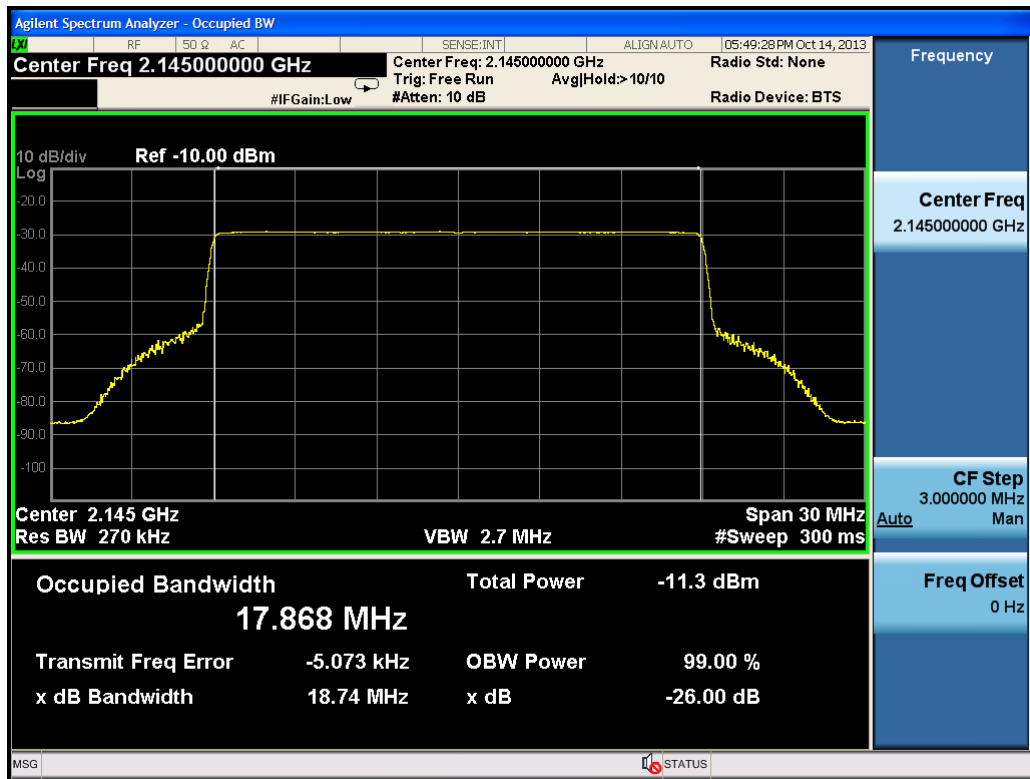


b) Output signal

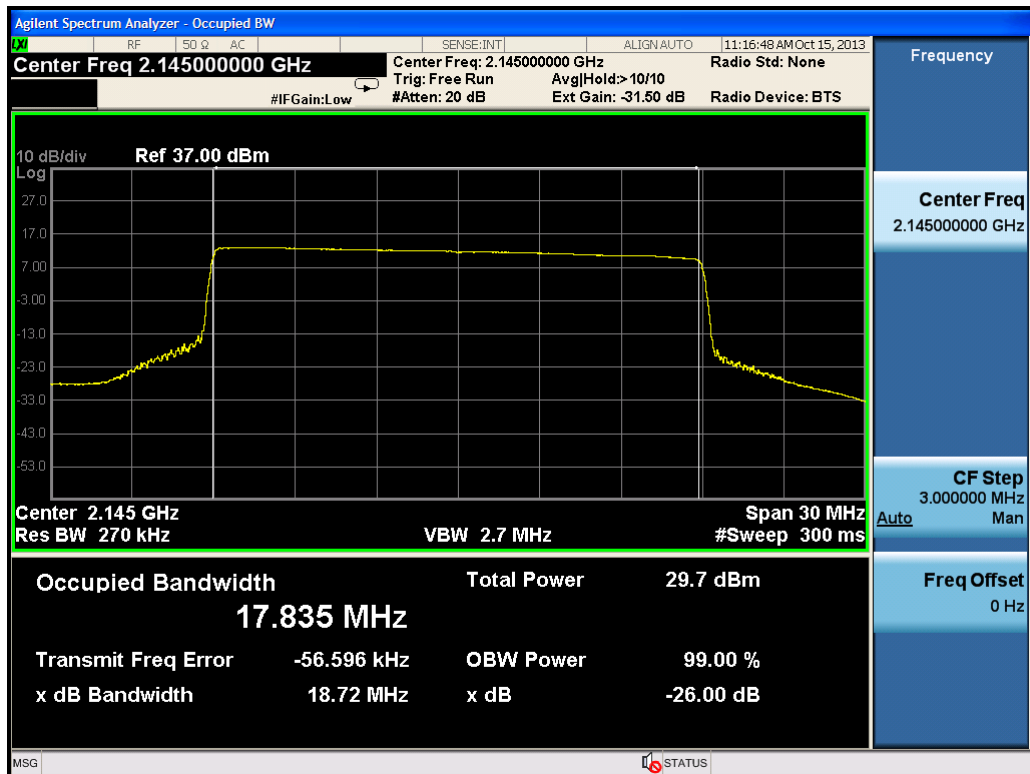


1.6.3) Highest frequency

a) Input signal



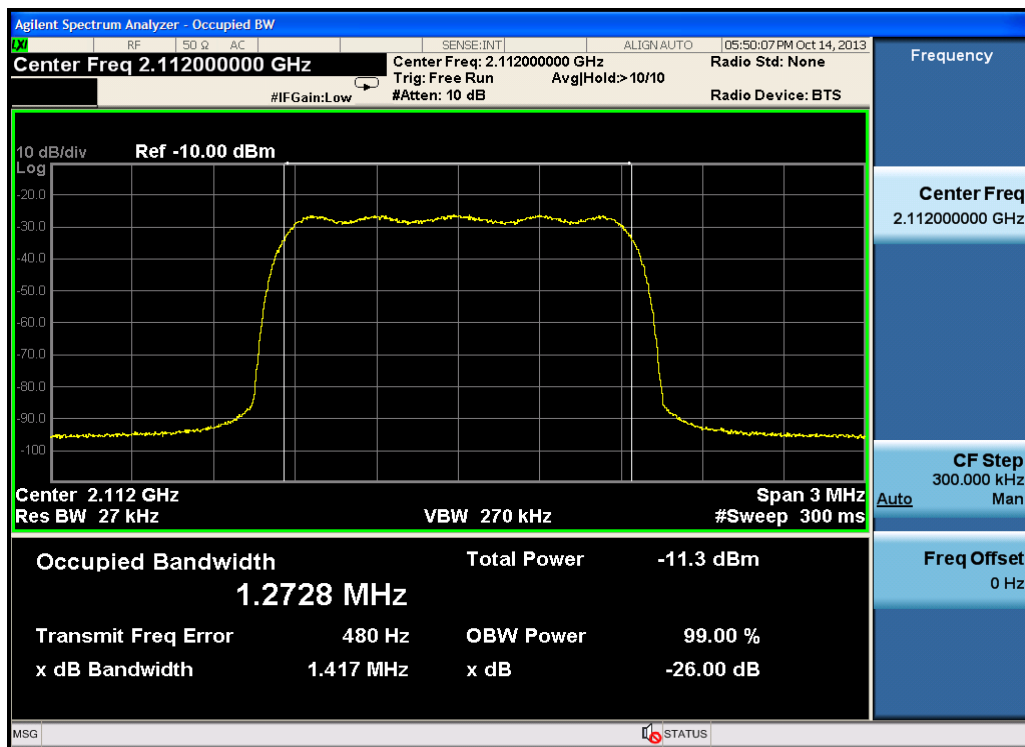
b) Output signal



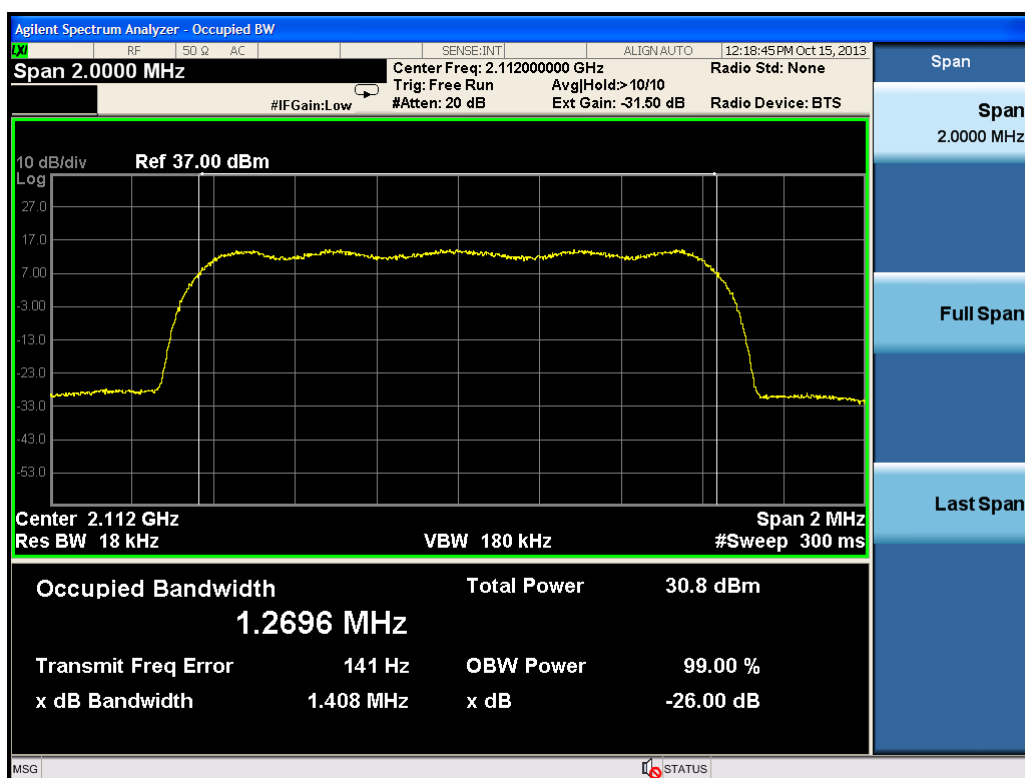
2) CDMA modulation for Downlink

2.1) Lowest frequency

a) Input signal

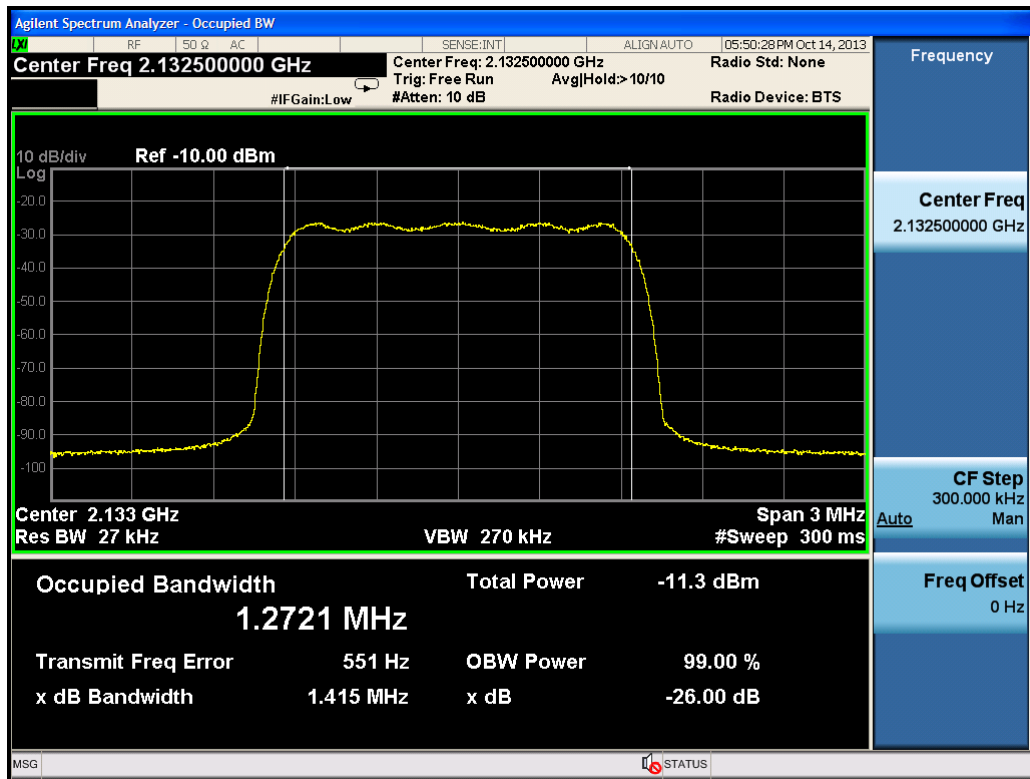


b) Output signal

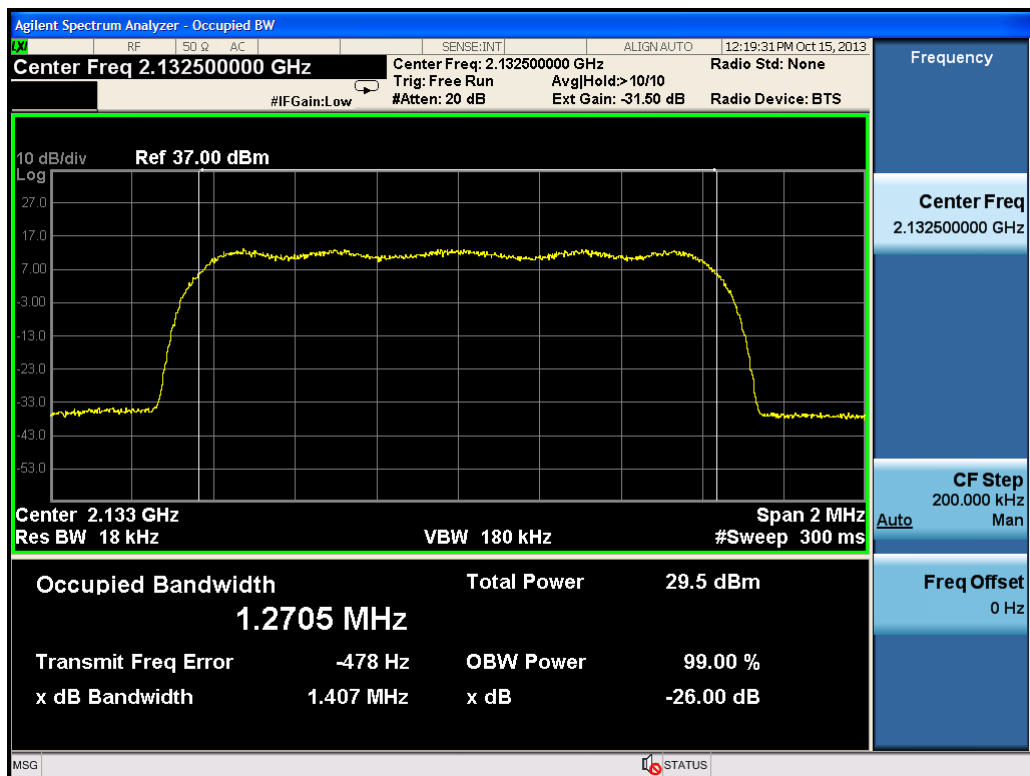


2.2) Middle frequency

a) Input signal

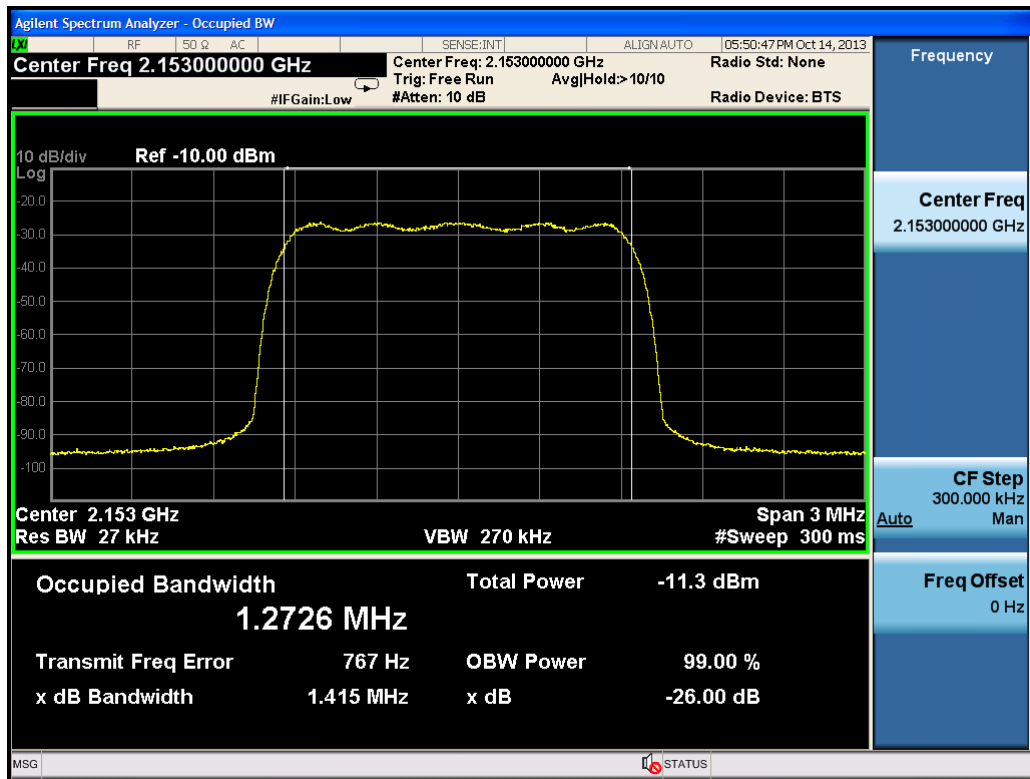


b) Output signal

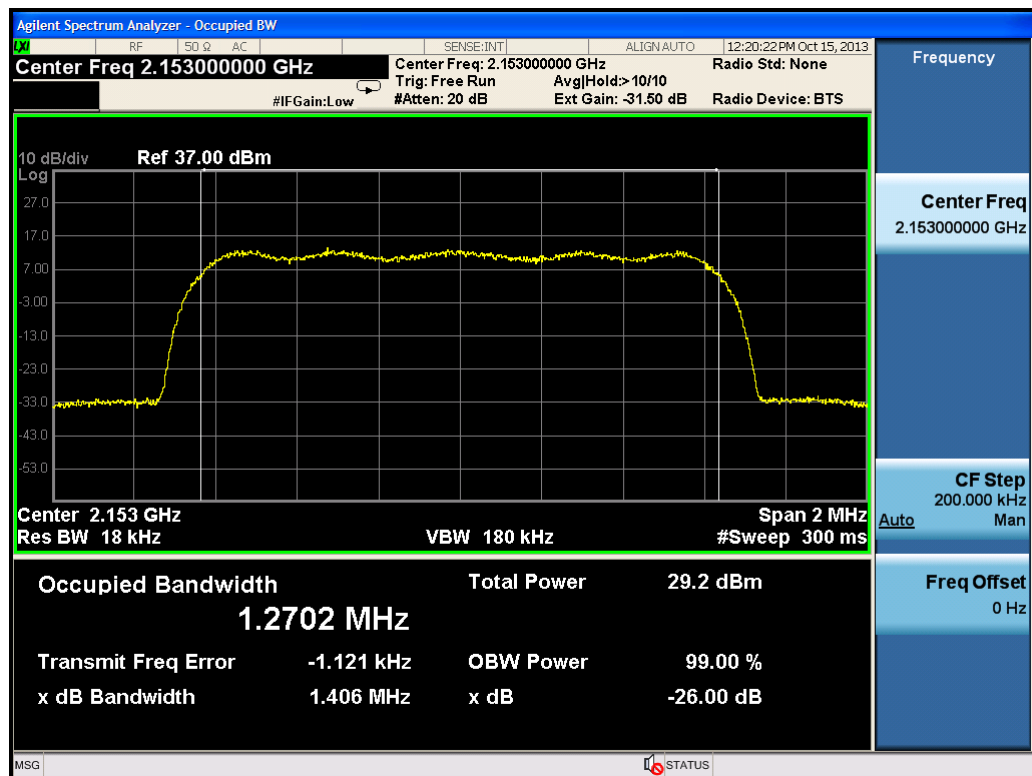


2.3) Highest frequency

a) Input signal



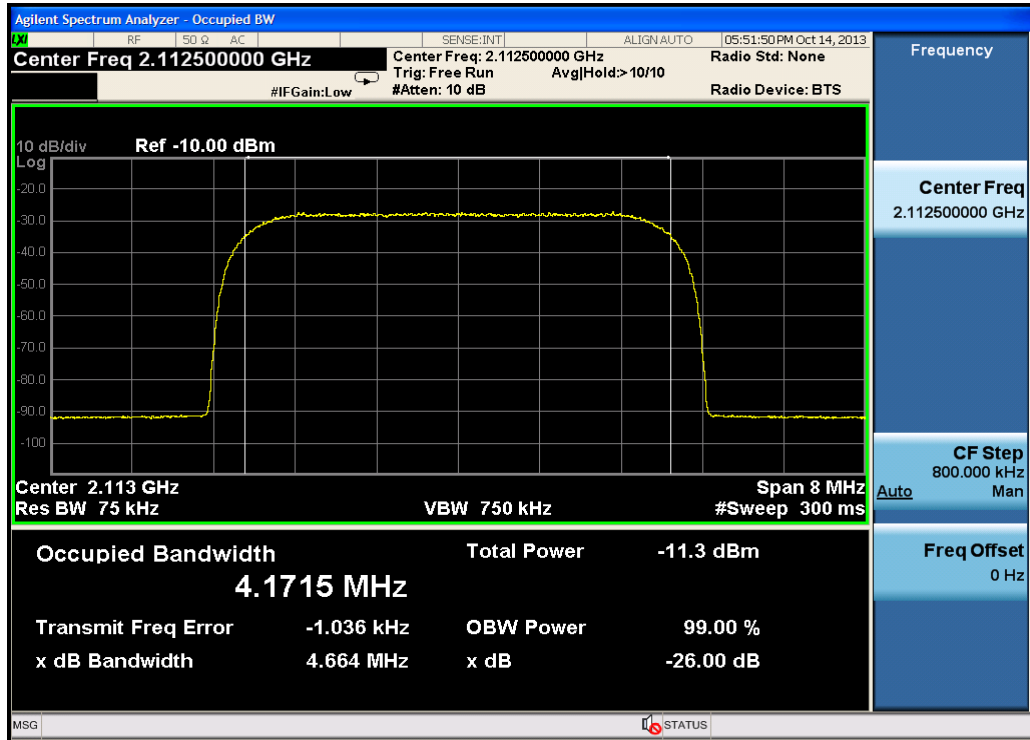
b) Output signal



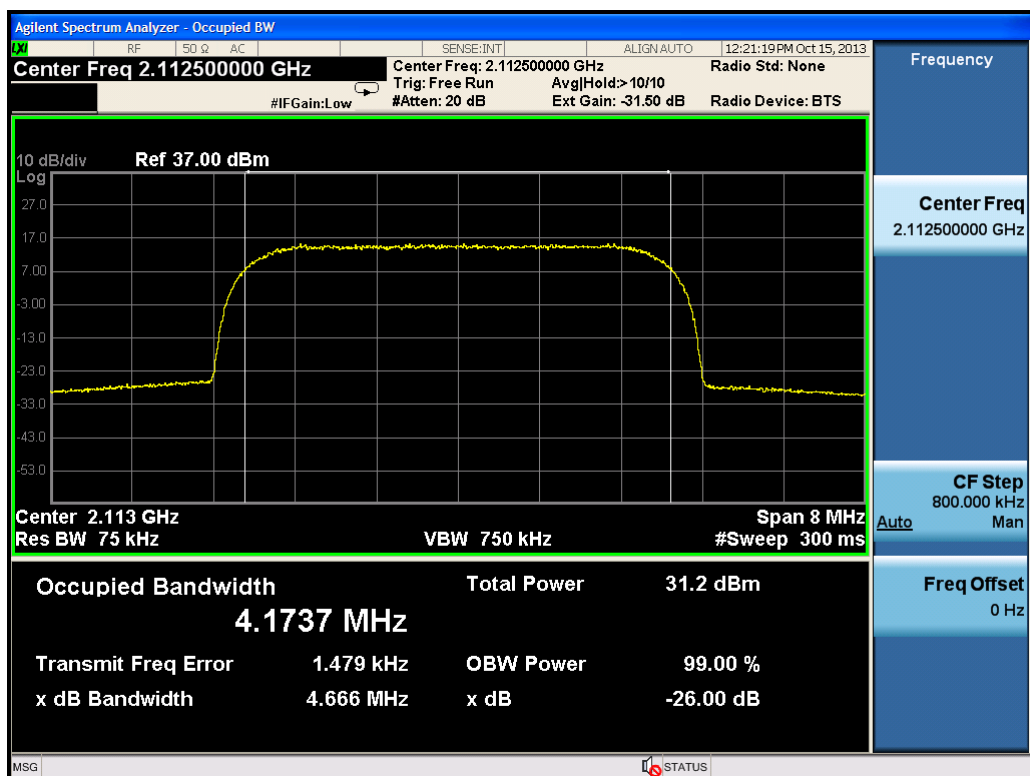
3) WCDMA modulation for Downlink

3.1) Lowest frequency

a) Input signal

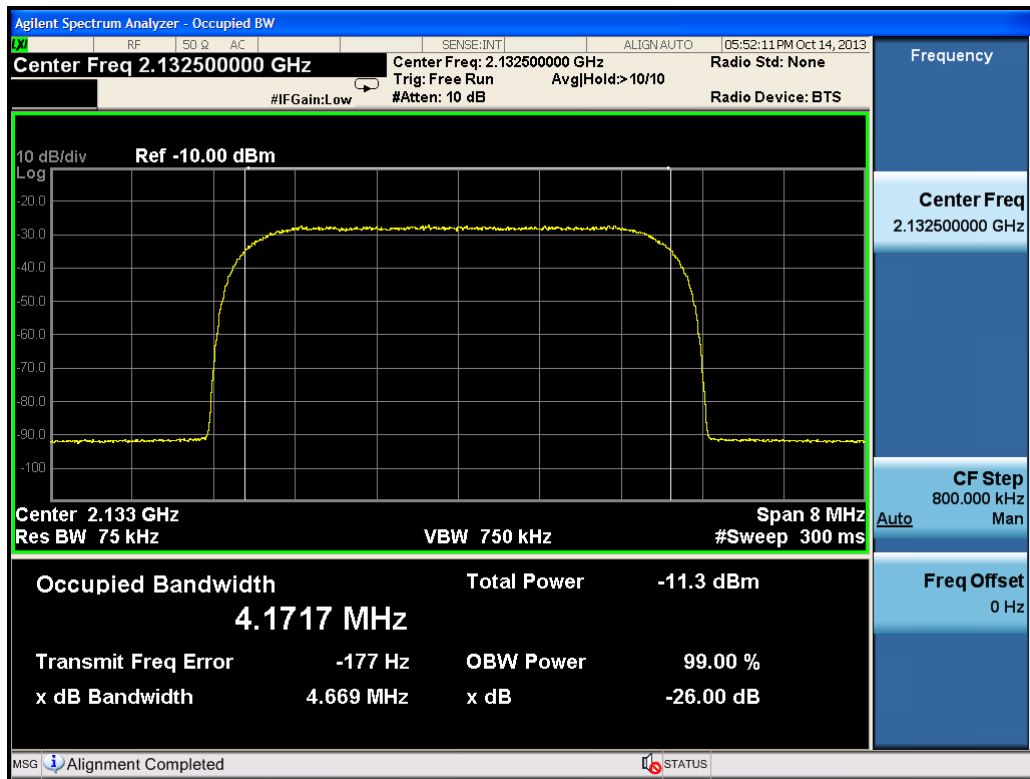


b) Output signal

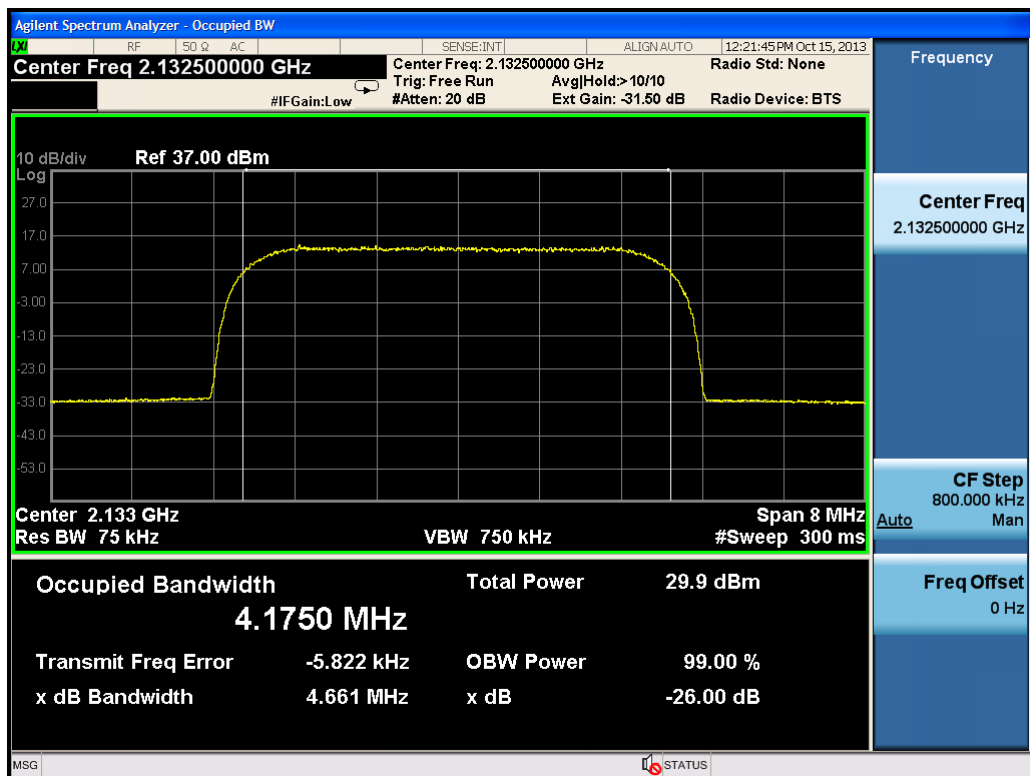


3.2) Middle frequency

a) Input signal

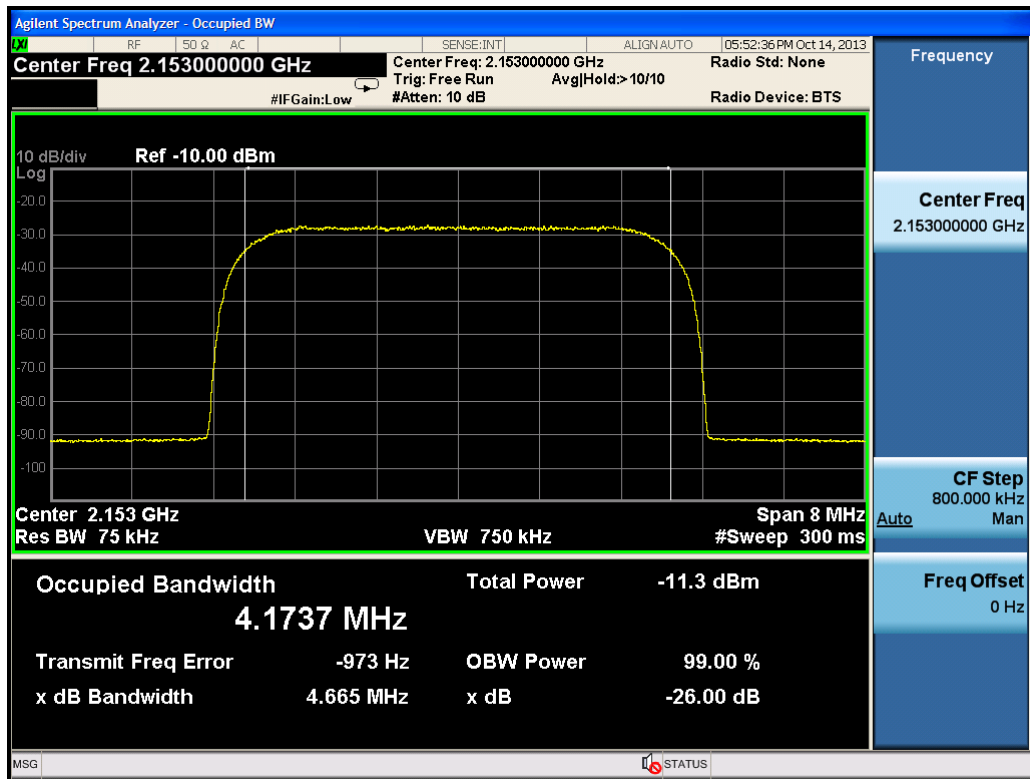


b) Output signal

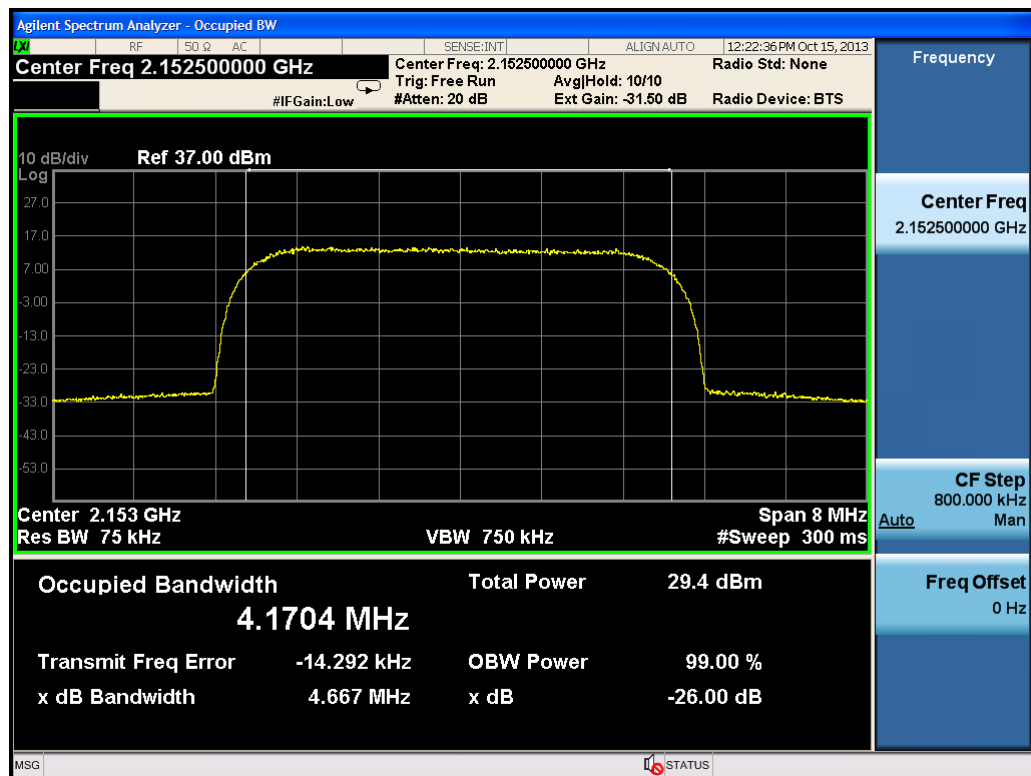


3.3) Highest frequency

a) Input signal



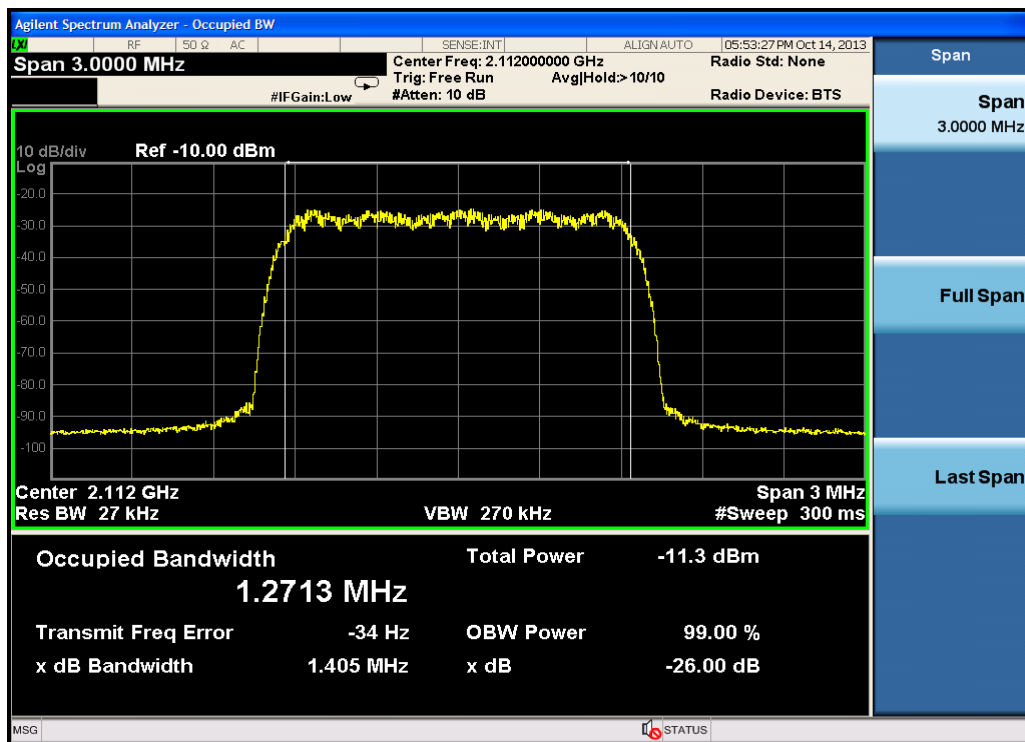
b) Output signal



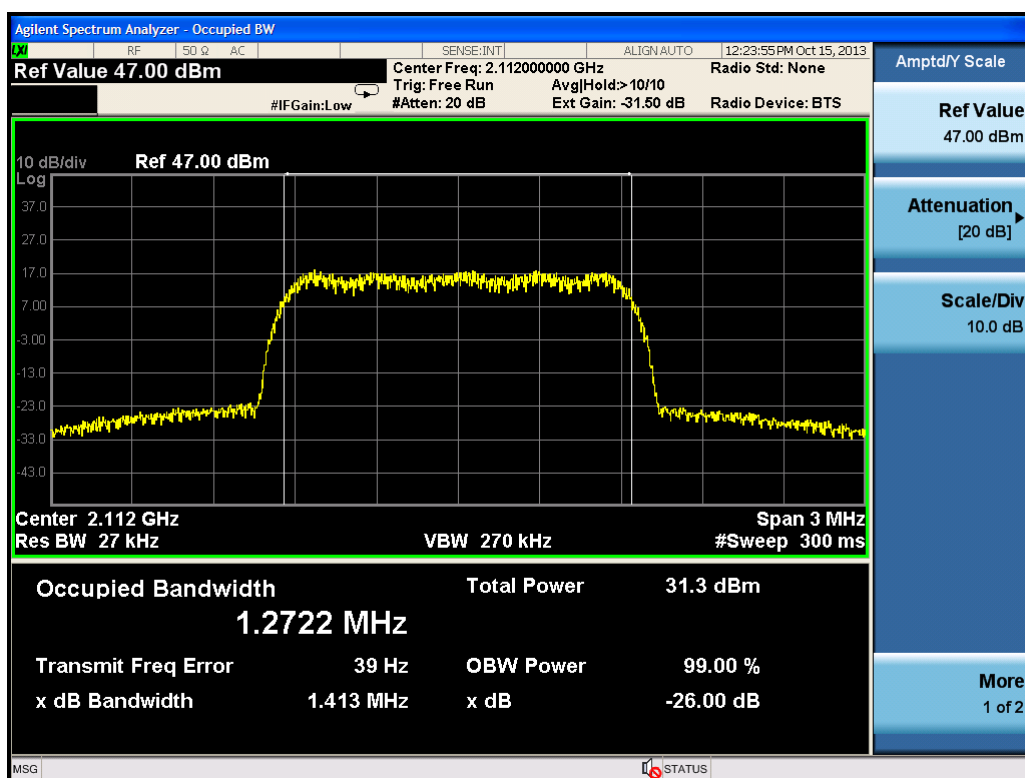
4) 1x EV-DO modulation for Downlink

4.1) Lowest frequency

a) Input signal

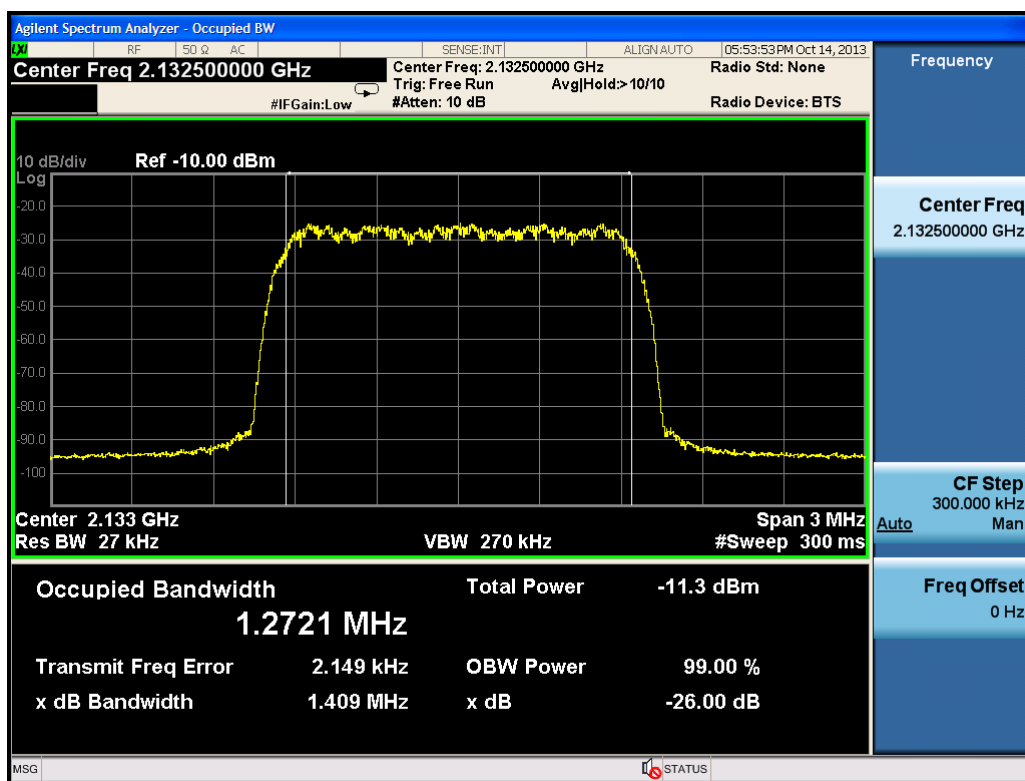


b) Output signal

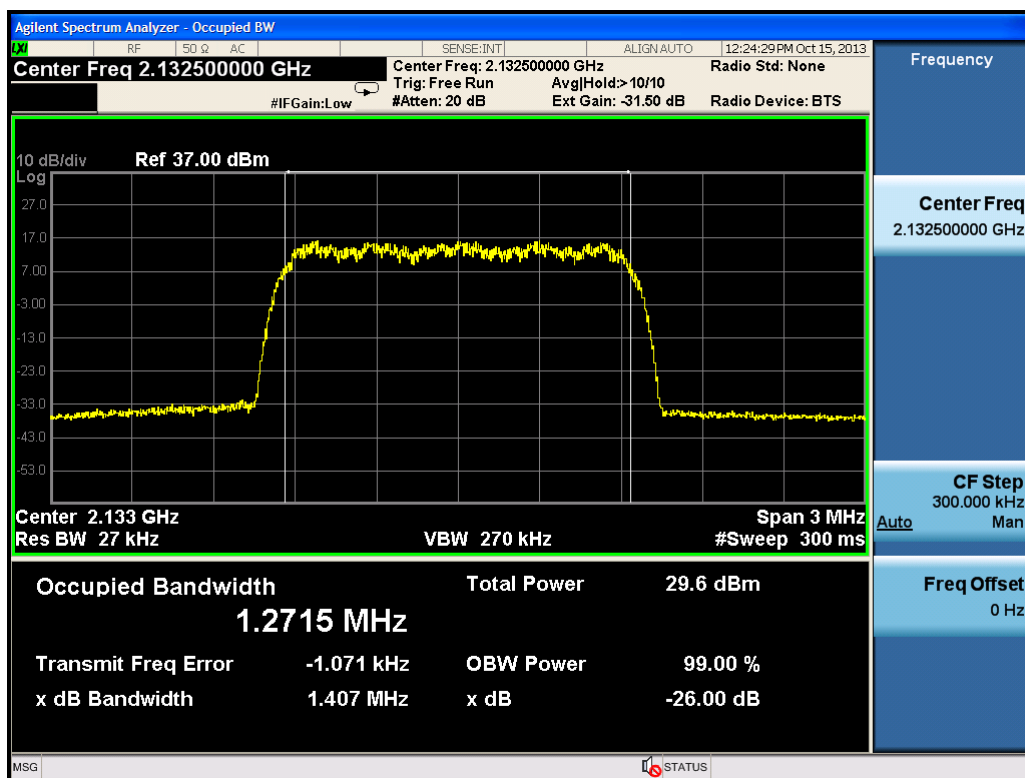


4.2) Middle frequency

a) Input signal

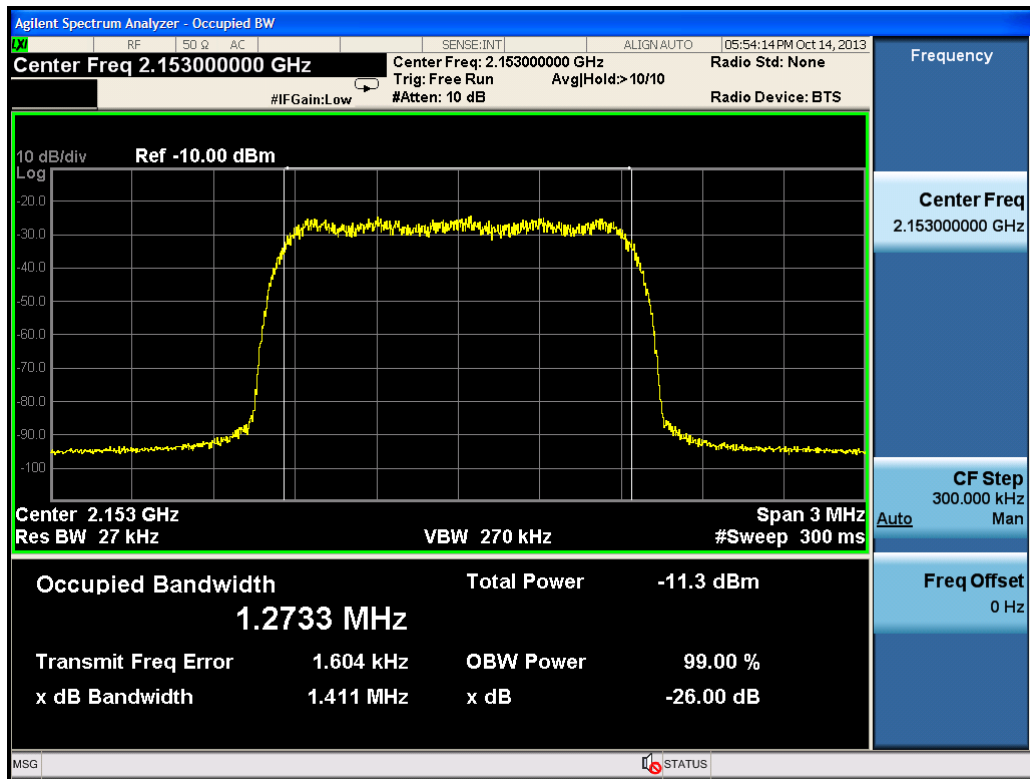


b) Output signal

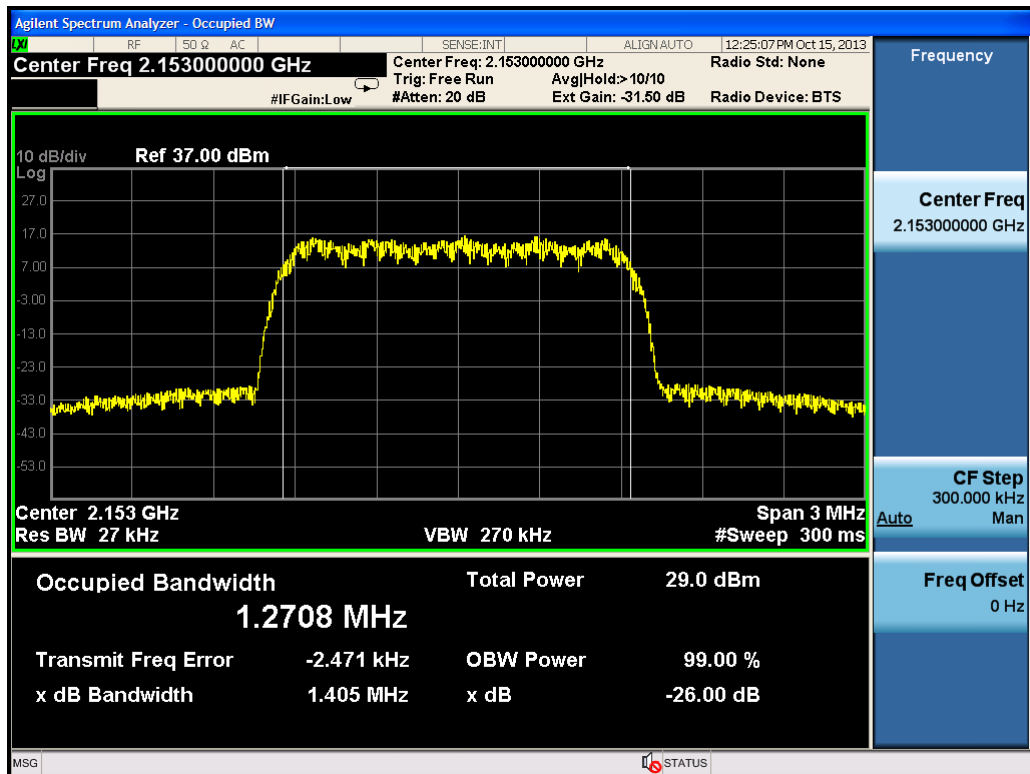


4.3) Highest frequency

a) Input signal



b) Output signal



5.3.7 Out of Band Rejection

Test Date: 10 Oct, 2013

Ambient Temp: 20.0°C

Humid : 67%

Atmospheric Pressure: 101kPa

Power supply: AC 120V 60Hz

Test Method: 935210 D02 Signal Boosters Certification v01r01

Test Requirement:

700MHz(Lower ABC)Band 935210 D02 Signal Boosters Certification v01r01

Test for rejection of out of band signals. Filter freq. response plots are acceptable.

700MHz(Upper C) Band 935210 D02 Signal Boosters Certification v01r01

Test for rejection of out of band signals. Filter freq. response plots are acceptable.

850MHz Band 935210 D02 Signal Boosters Certification v01r01

Test for rejection of out of band signals. Filter freq. response plots are acceptable.

1900MHz Broadband PCS 935210 D02 Signal Boosters Certification v01r01

Test for rejection of out of band signals. Filter freq. response plots are acceptable.

AWS Band 935210 D02 Signal Boosters Certification v01r01

Test for rejection of out of band signals. Filter freq. response plots are acceptable.

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

Test conditions: Normal conditions

Test configuration:

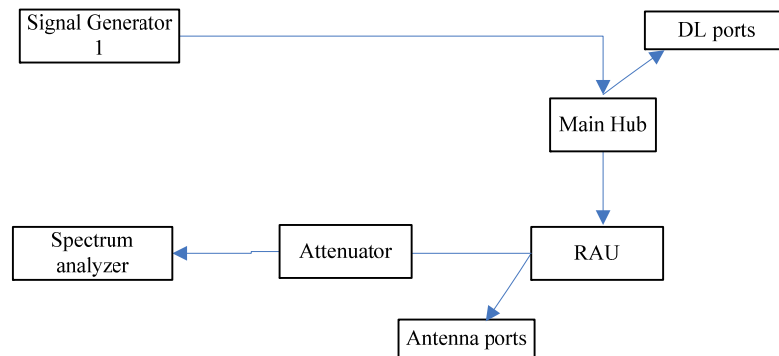


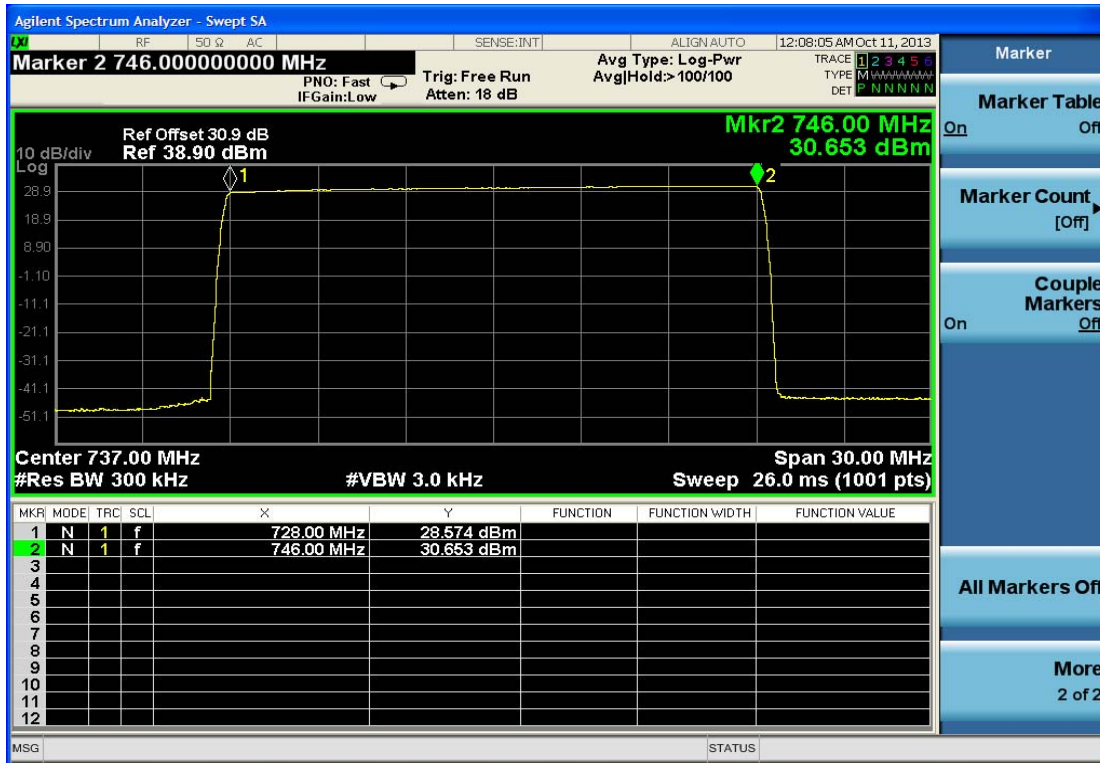
Figure 7: Downlink Out of Band Rejection Configuration

Test Procedure:

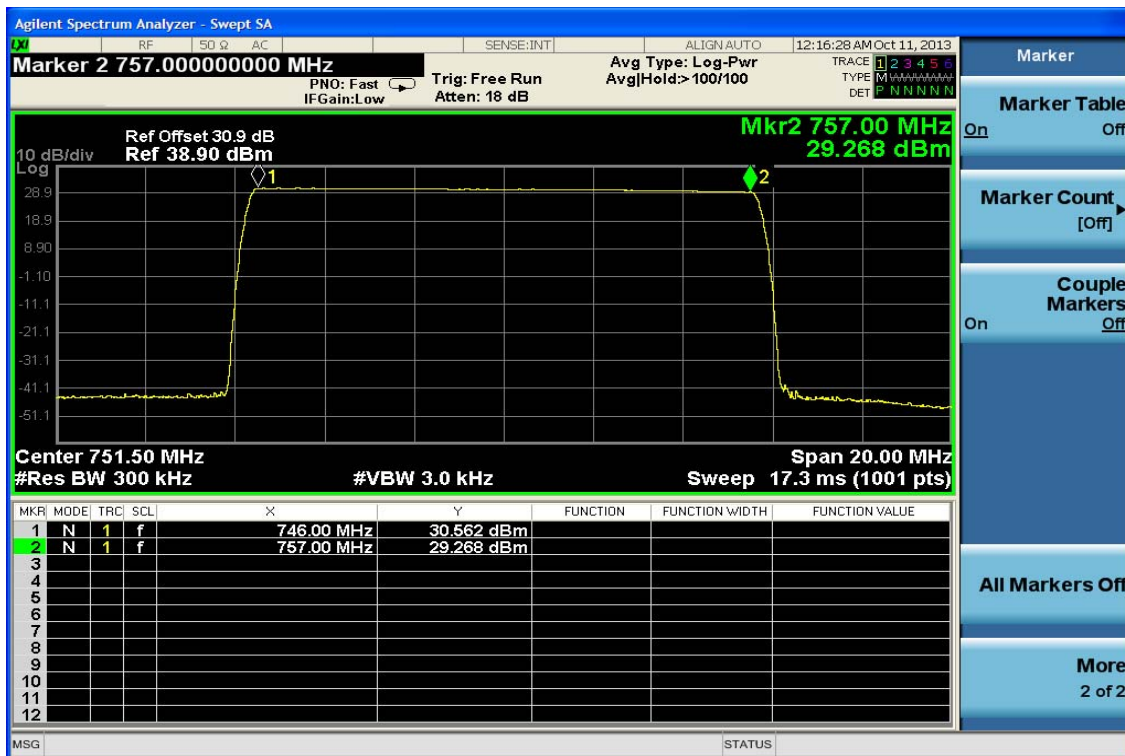
- 1) Connect the equipment as illustrated;
 - 2) Test the background noise level with all the test facilities;
 - 3) Keep one transmitting path, all other connectors shall be connected by normal power or RF leads;
 - 4) Select the attenuator to avoid the test receiver or spectrum analyzer being destroyed;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

5.3.7.1 Measurement Record

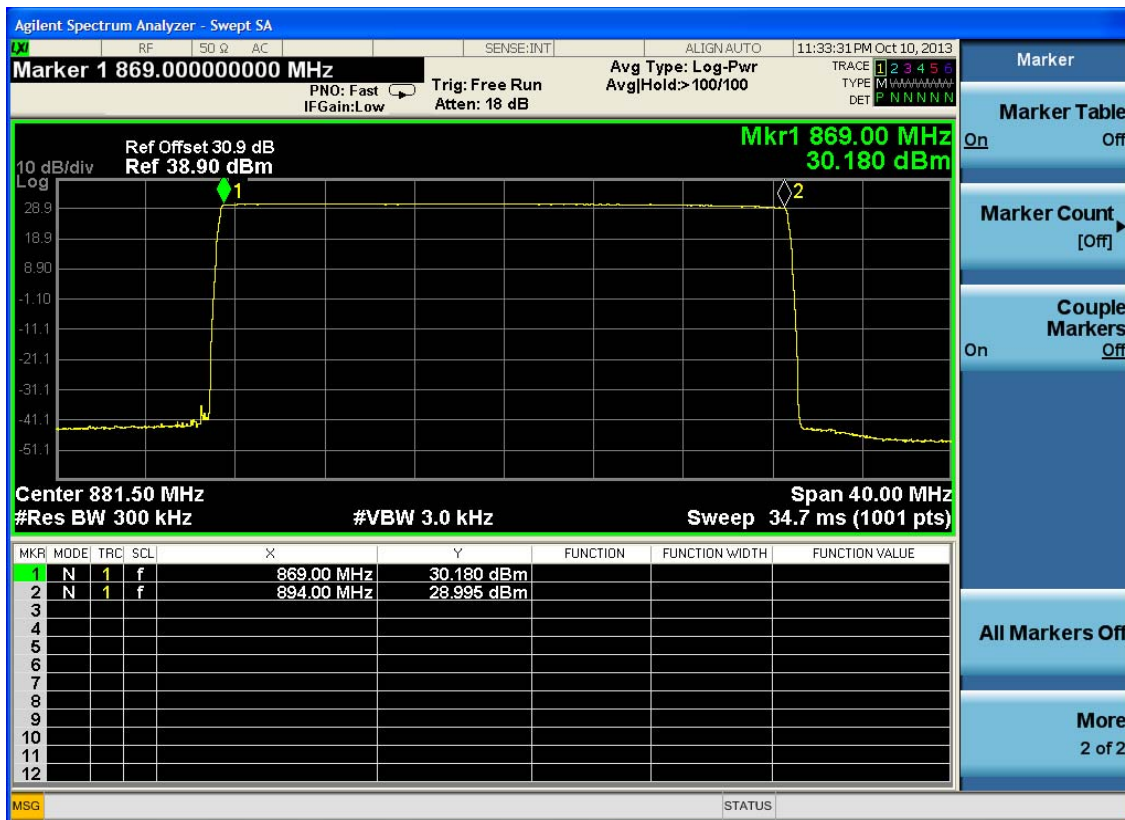
5.3.7.1.1 700MHz Lower ABC Band



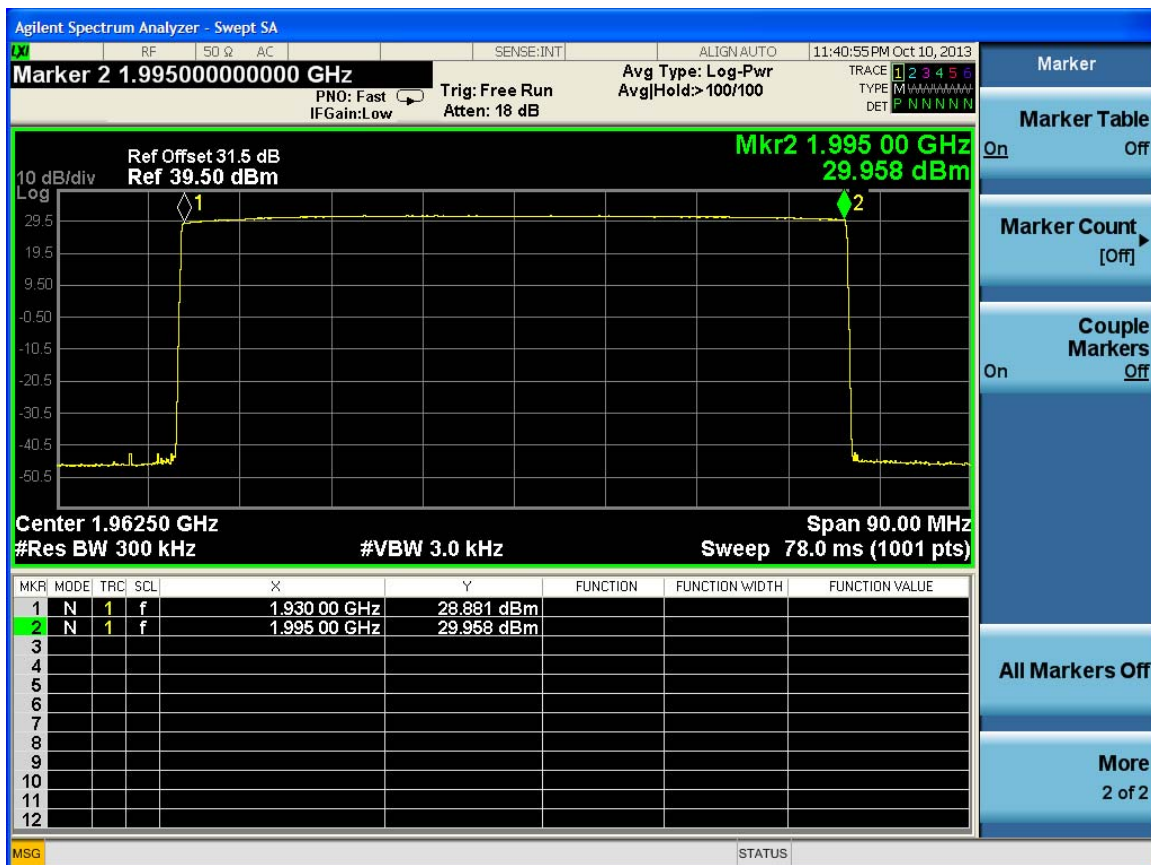
5.3.7.1.2 700MHz Upper C Band



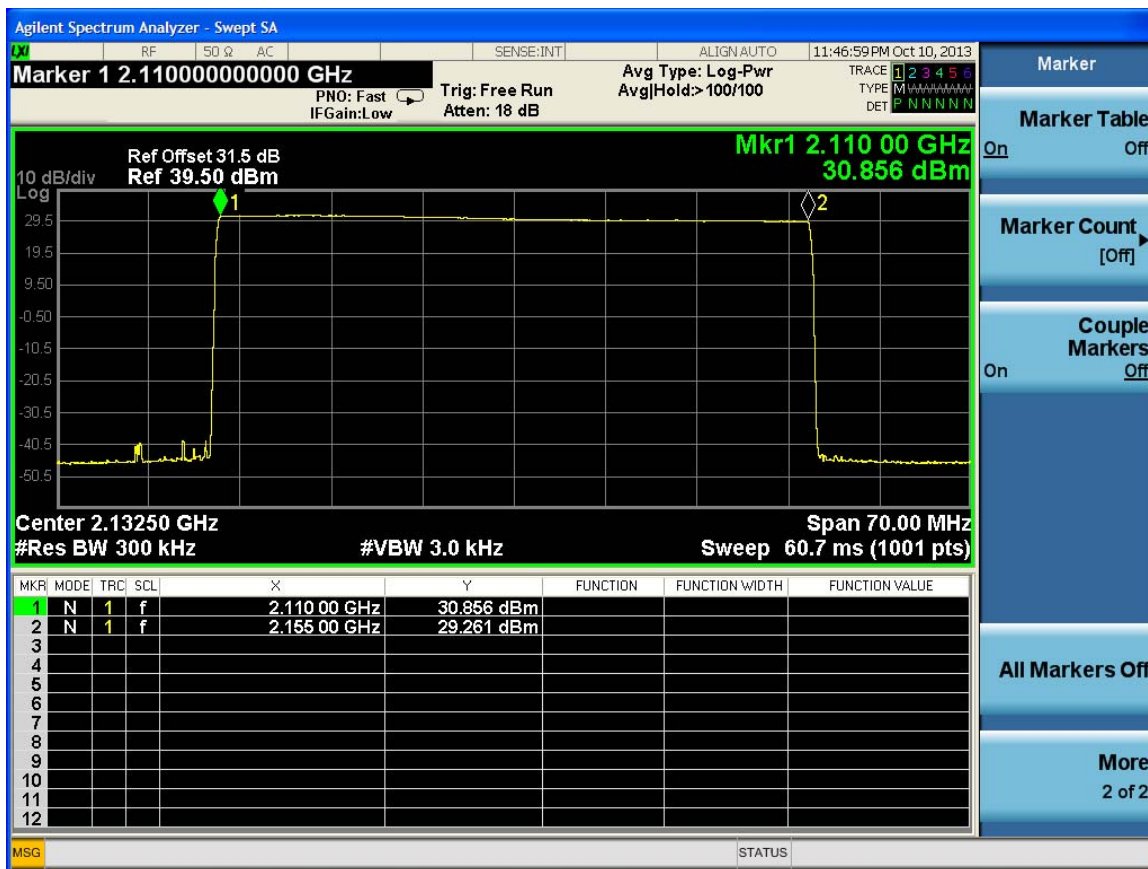
5.3.7.1.3 850MHz Band



5.3.7.1.4 1900MHz Broadband PCS



5.3.7.1.5 AWS-1 Band



5.3.8 Radiated Spurious Emissions

Test Date:	15 Oct, 2013 to 16 Oct, 2013
Ambient Temp:	21.0°C
Humid :	71%
Atmospheric Pressure:	101kPa
Power supply:	AC 120V 60Hz
Test Method:	FCC part 2.1053
Test Requirement:	FCC part 27. 53
700MHz(Lower ABC) Band	The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, or -13 dBm.
700MHz(Upper C) Band	FCC part 27. 53 The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, or -13 dBm.
850MHz Band	FCC part 22. 359 The power of any emission outside a licensee's frequency block shall be attenuated below the transmitting power (P) by at least $43 + 10 \log (P)$ dB, or -13 dBm.
1900MHz Broadband PCS	FCC part 24. 238 The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB, or -13 dBm.
AWS Band	FCC part 27. 53 The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, or -13 dBm.
EUT Operation:	The output power of EUT be set to maximum value, the gain of EUT be set to maximum value by software through the manufacture
Test conditions:	Normal conditions
Test configuration:	

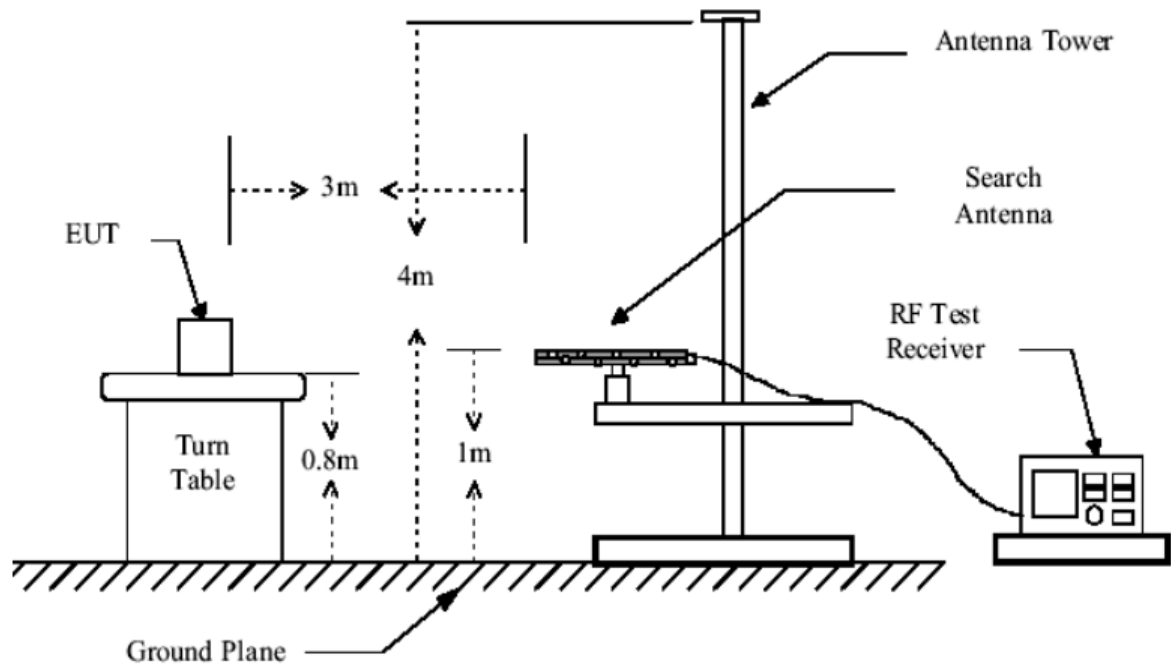


Figure 1: 30 MHz to 1 GHz radiated emissions test configuration

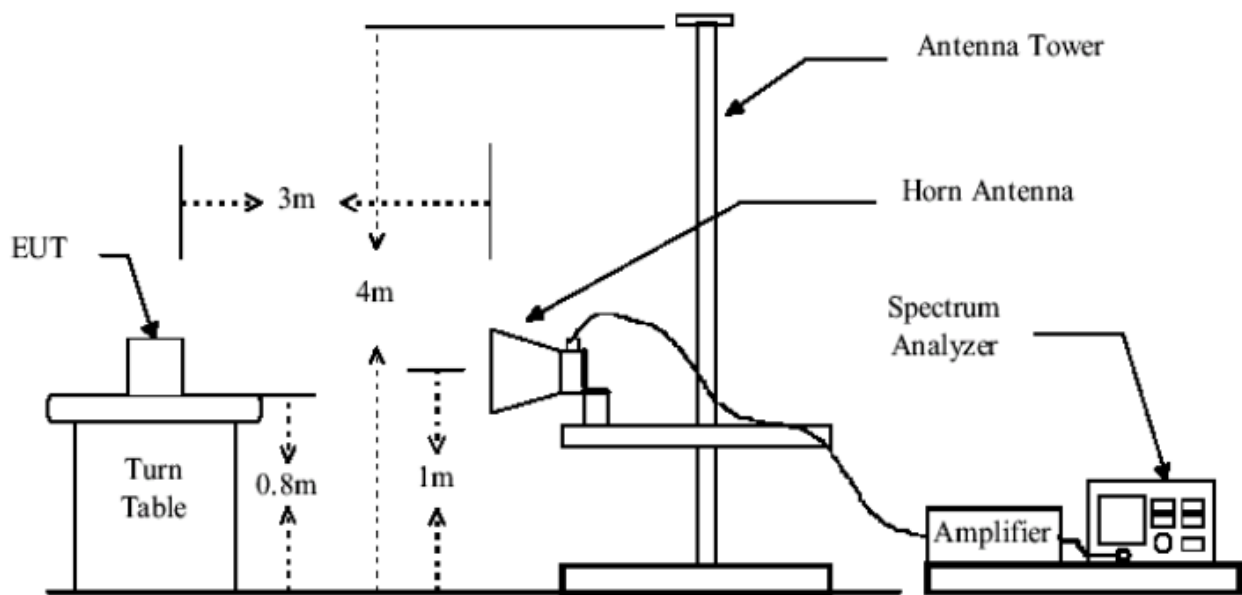


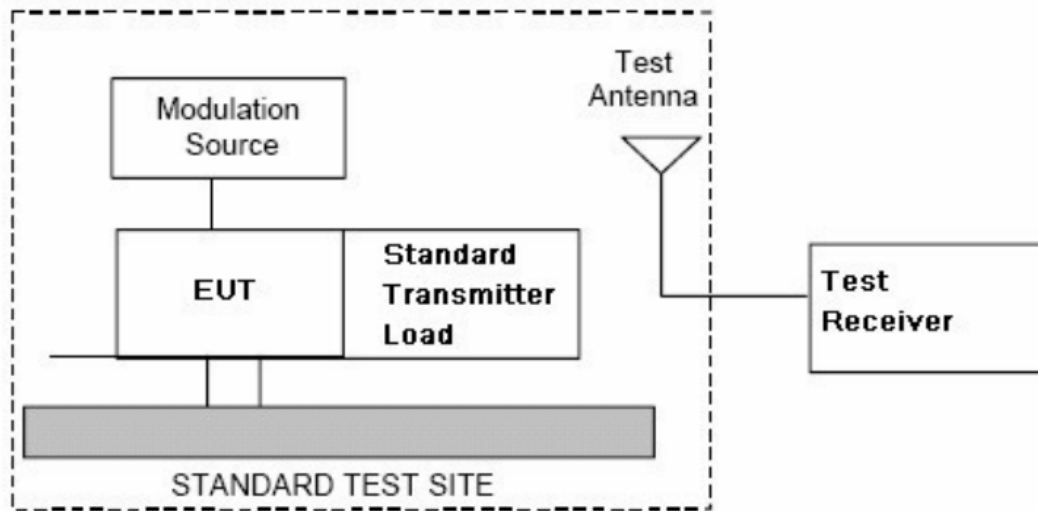
Figure 2: Above 1 GHz radiated emissions test configuration

Test Procedure:

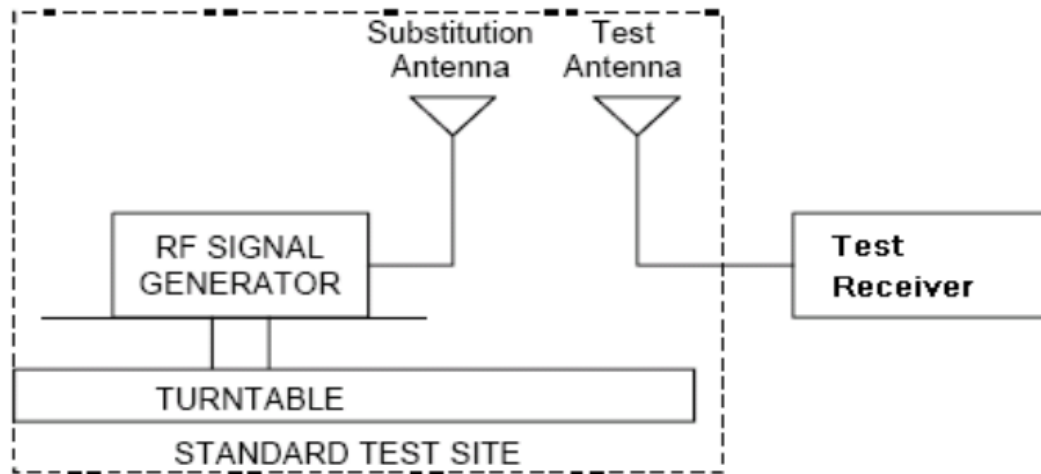
- 1) Test the background noise level with all the facilities;
- 2) Keep one transmitting path, all other connectors shall be connected by normal power or RF leads;
- 3) Select the suitable RF notch filter to avoid the test receiver or spectrum analyzer produce unwanted spurious emissions;

- 4) Keep the EUT continuously transmitting in max power;
Read the radiated emissions of the EUT enclosure;

Radiated spurious emissions test procedure:



- a) Connect the equipment as illustrated;
- b) Adjust the spectrum analyzer for the following setting;
 - 1) RBW=100kHz for spurious emission below 1 GHz, and 1MHz for spurious emission above 1GHz;
 - 2) VBW=300k for spurious emission below 1GHz, and 3MHz for spurious emission above 1GHz;
 - 3) Sweep speed slow enough to maintain measurement calibration;
 - 4) Detector Mode= Positive Peak;
- c) Place the transmitter to be tested on the turntable in the standard test site, The transmitter is transmitting into a nonradiating load that is placed on the turntable, the RF cable to this load should be of minimum length.
- d) Measurements shall be made from 30MHz to 10 times of fundamental carrier, except for the region close to the carrier equal to $\pm$ the carrier bandwidth.
- e) Key the transmitter without modulation or normal modulation base the standard.
- f) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360° to determine the maximum reading. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- g) Repeat step f) for each spurious frequency with the test antenna polarized vertically.



- h) Reconnect the equipment as illustrated.
- i) Keep the spectrum analyzer adjusted as in step b).
- j) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3m above the ground.
- k) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading or this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- l) Repeat step k) with both antennas vertically polarized for each spurious frequency.
- m) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in step k) and i) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{cable loss}(\text{dB}) + \text{antenna gain}(\text{dB})$$

Where:

P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

NOTE: It is permissible to use other antennas provided they can be referenced to a dipole.

NOTE: Effective radiated power (e.r.p) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2.15 dB between e.i.r.p and e.r.p.

$$\text{e.r.p}(\text{dBm}) = \text{e.i.r.p}(\text{dB}) - 2.15$$

5.38.1 Measurement Record

5.3.8.1.1 700MHz Lower ABC Band

Test Frequency (MHz)	Measuring level(dBm)		Limit(dBm)	Margin(dB)	
	Vertical	Horizontal		Vertical	Horizontal
30	-51.93	-59.80	$\leq -13\text{dBm}$	38.93	36.80
500	-50.87	-58.12		37.87	35.12
1000	-58.39	-62.31		45.39	49.31
2000	-52.48	-60.14		39.48	47.14
5000	-48.44	-55.68		35.44	42.68
10000	-46.28	-52.31		33.28	39.31
15000	-40.89	-45.38		27.89	32.38
20000	-40.22	-44.67		27.22	31.67

5.3.8.1.2 700MHz Upper C Band

Test Frequency (MHz)	Measuring level(dBm)		Limit(dBm)	Margin(dB)	
	Vertical	Horizontal		Vertical	Horizontal
30	-50.68	-57.43	$\leq -13\text{dBm}$	37.68	44.43
500	-60.25	-64.65		47.25	51.65
1000	-61.30	-61.30		48.30	48.30
2000	-52.38	-60.37		39.38	47.37
5000	-53.45	-60.18		40.45	47.18
10000	-49.14	-55.27		36.14	42.27
15000	-44.38	-48.35		31.38	35.35
20000	-43.58	-46.66		30.58	33.66

5.3.8.1.3 850MHz Band

Test Frequency (MHz)	Measuring level(dBm)		Limit(dBm)	Margin(dB)	
	Vertical	Horizontal		Vertical	Horizontal
30	-50.77	-65.45	≤-13dBm	37.77	52.45
500	-57.90	-60.16		44.90	47.16
1000	-54.70	-63.39		41.70	50.39
2000	-48.78	-55.47		35.78	42.47
5000	-47.38	-53.24		34.38	40.24
10000	-44.57	-50.29		31.57	37.29
15000	-42.38	-48.64		29.38	35.64
20000	-43.06	-47.74		30.06	34.74

5.3.8.1.4 1900MHz Broadband PCS

Test Frequency (MHz)	Measuring level(dBm)		Limit(dBm)	Margin(dB)	
	Vertical	Horizontal		Vertical	Horizontal
30	-52.34	-66.60	≤-13dBm	39.34	53.60
500	-59.88	-59.83		46.88	46.83
1000	-51.62	-60.95		38.62	47.95
2000	-50.57	-58.36		37.57	45.36
5000	-48.59	-55.83		35.59	42.83
10000	-44.71	-50.28		31.71	37.28
15000	-42.34	-49.32		29.34	36.32
20000	-40.65	-46.49		27.65	33.49

5.3.8.1.5 AWS-1 Band

Test Frequency (MHz)	Measuring level(dBm)		Limit(dBm)	Margin(dB)	
	Vertical	Horizontal		Vertical	Horizontal
30	-51.71	-66.73	$\leq -13\text{dBm}$	38.71	53.73
500	-61.08	-59.87		48.08	46.87
1000	-61.06	-60.87		48.06	47.87
2000	-55.69	-57.88		42.69	44.88
5000	-52.46	-55.38		39.46	42.38
10000	-50.36	-54.29		37.36	41.29
15000	-45.87	-50.77		32.87	37.77
20000	-42.68	-46.48		29.68	33.48

Remark:

Sweep all the modulation types emissions in 700MHz Lower ABC and Upper C band & 850MHz Band & 1900MHz Broadband PCS & AWS-1 band , find the worse case to report it.

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