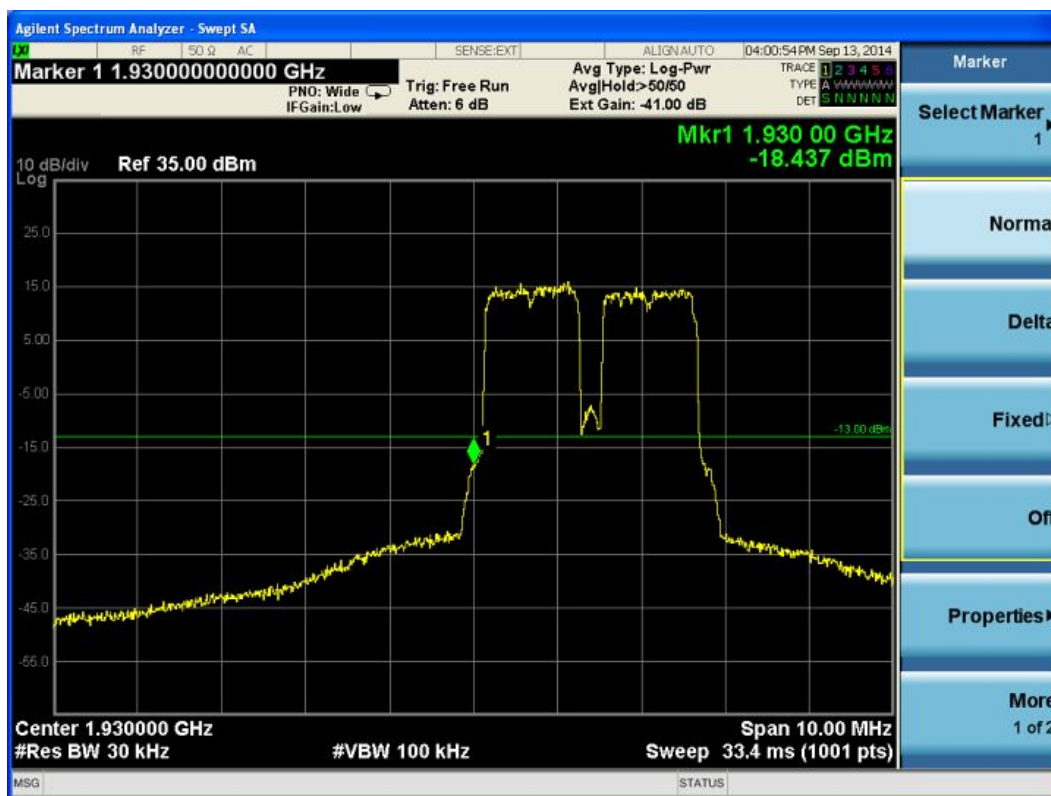


5.2.4.1.5 1900MHz Band for Downlink

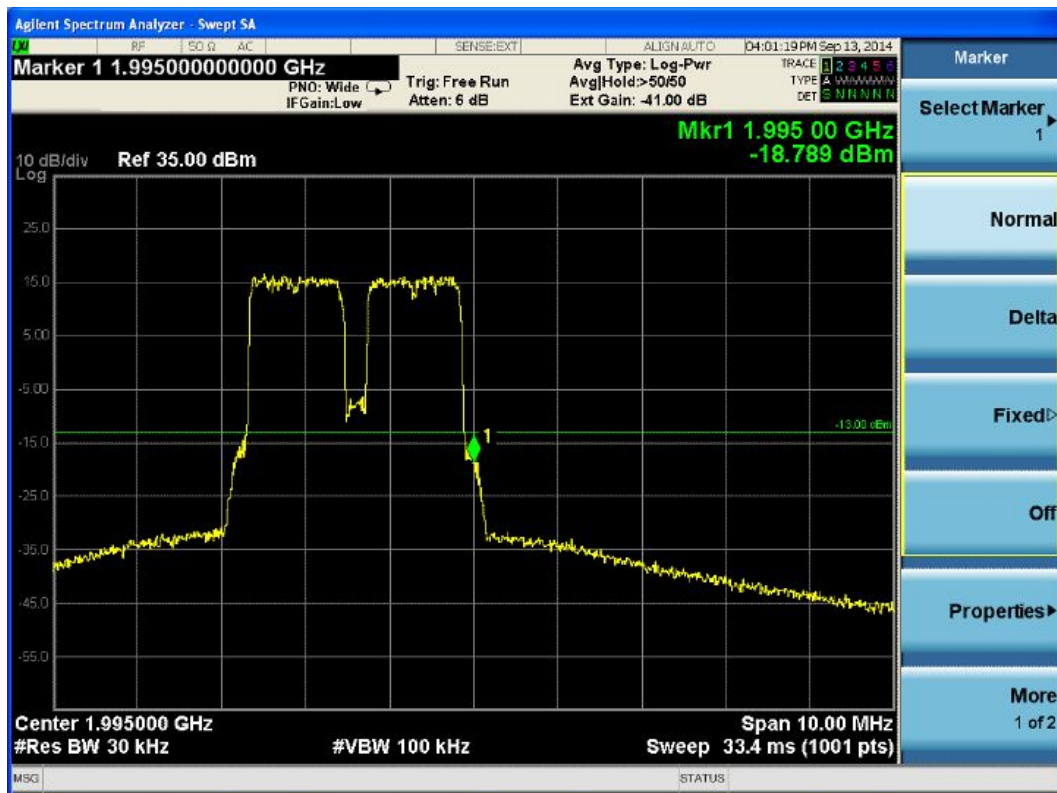
(1) LTE modulation

(1.1) Test for LTE 1.4MHz

(1.1.1) Lower Edge



(1.1.2) Upper Edge

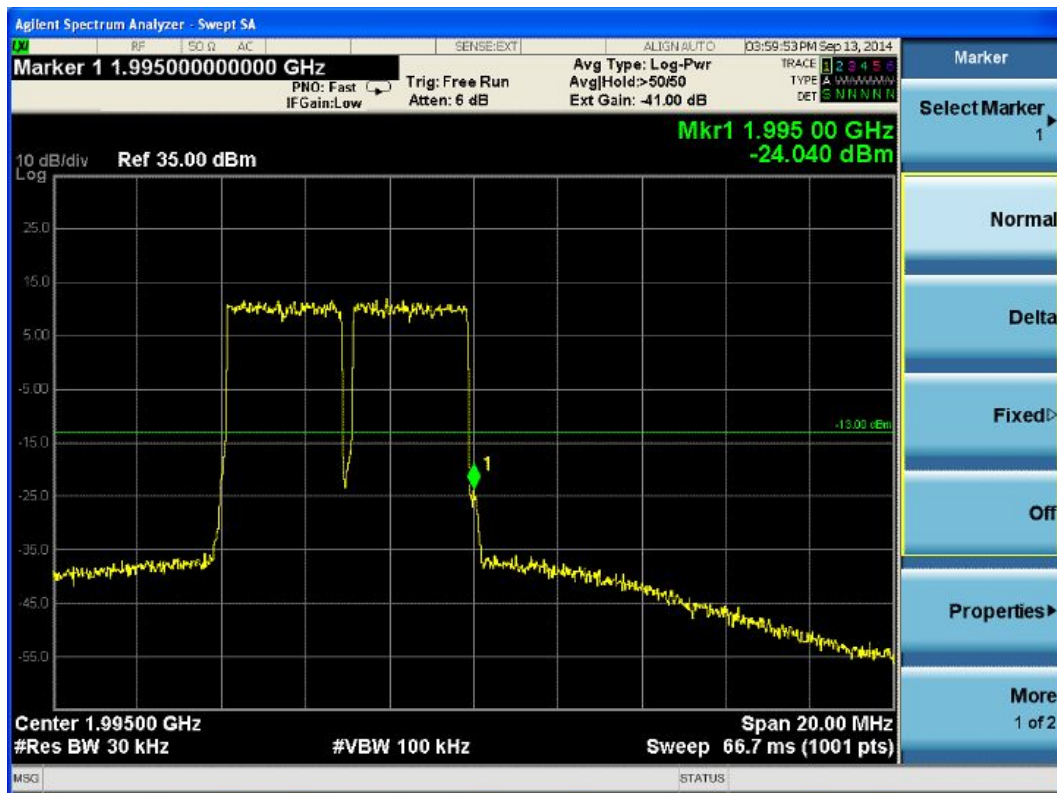


(1.2) Test for LTE 3MHz

(1.2.1) Lower Edge



(1.2.2) Upper Edge

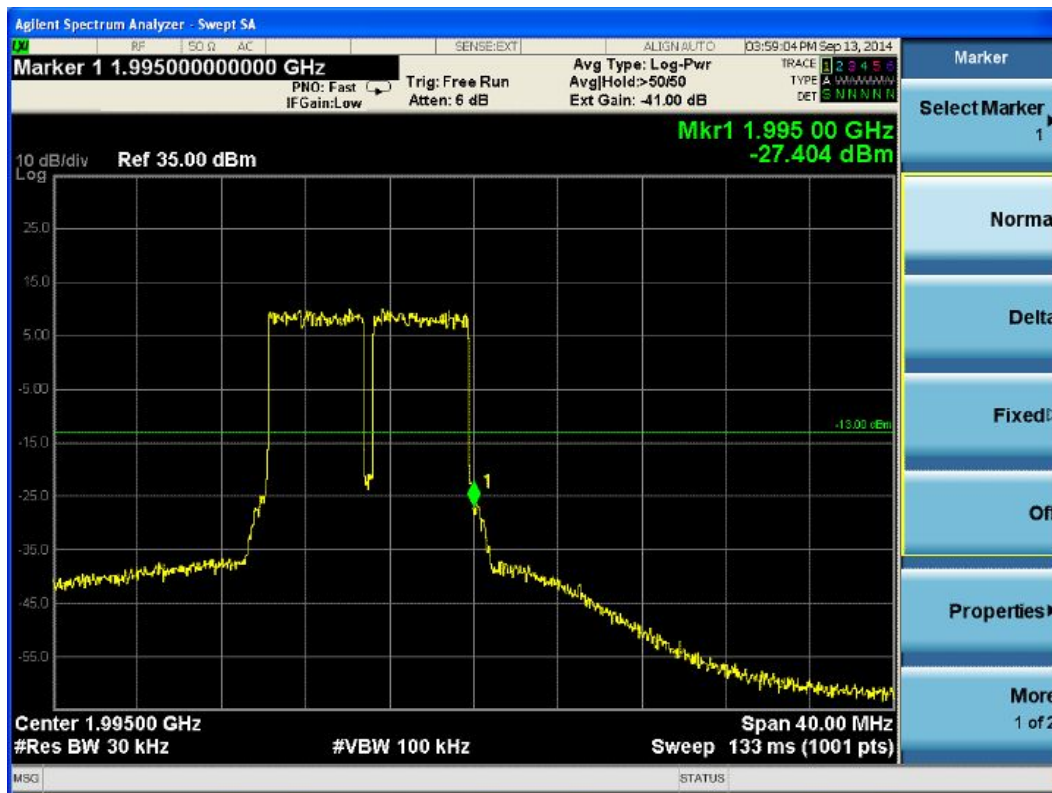


(1.3) Test for LTE 5MHz

(1.3.1) Lower Edge



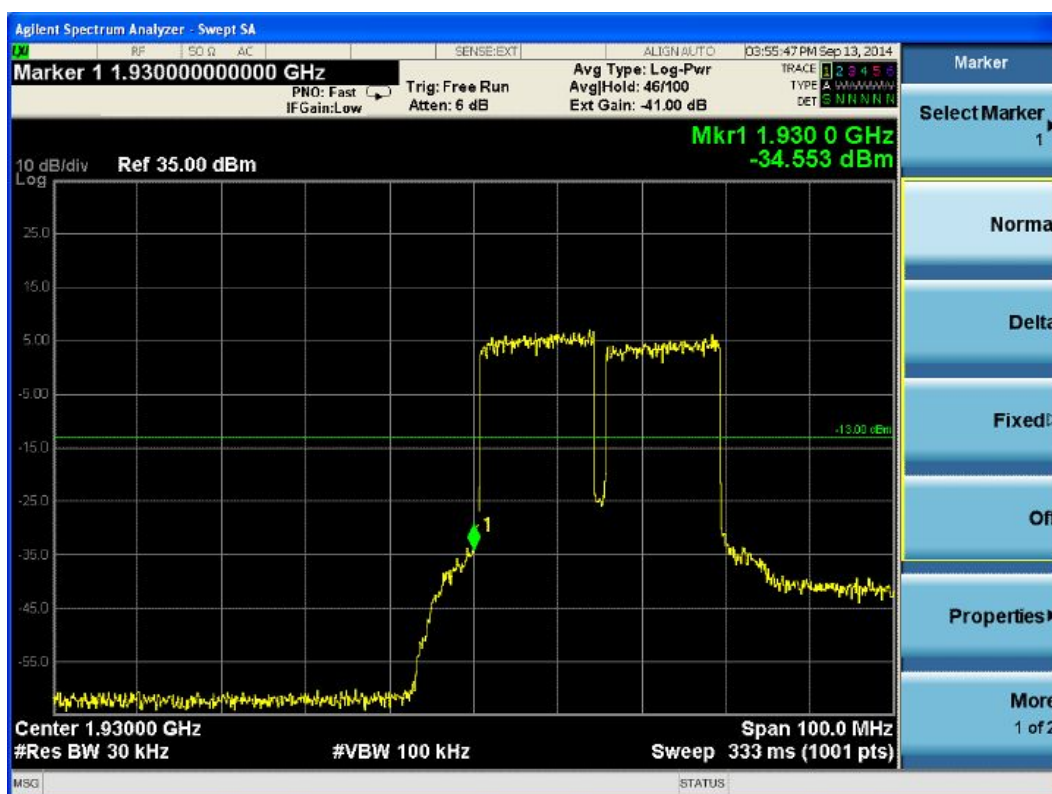
(1.3.2) Upper Edge



(1.4) Test for LTE 10MHz

(1.4.1) Lower Edge





(1.5.2) Upper Edge

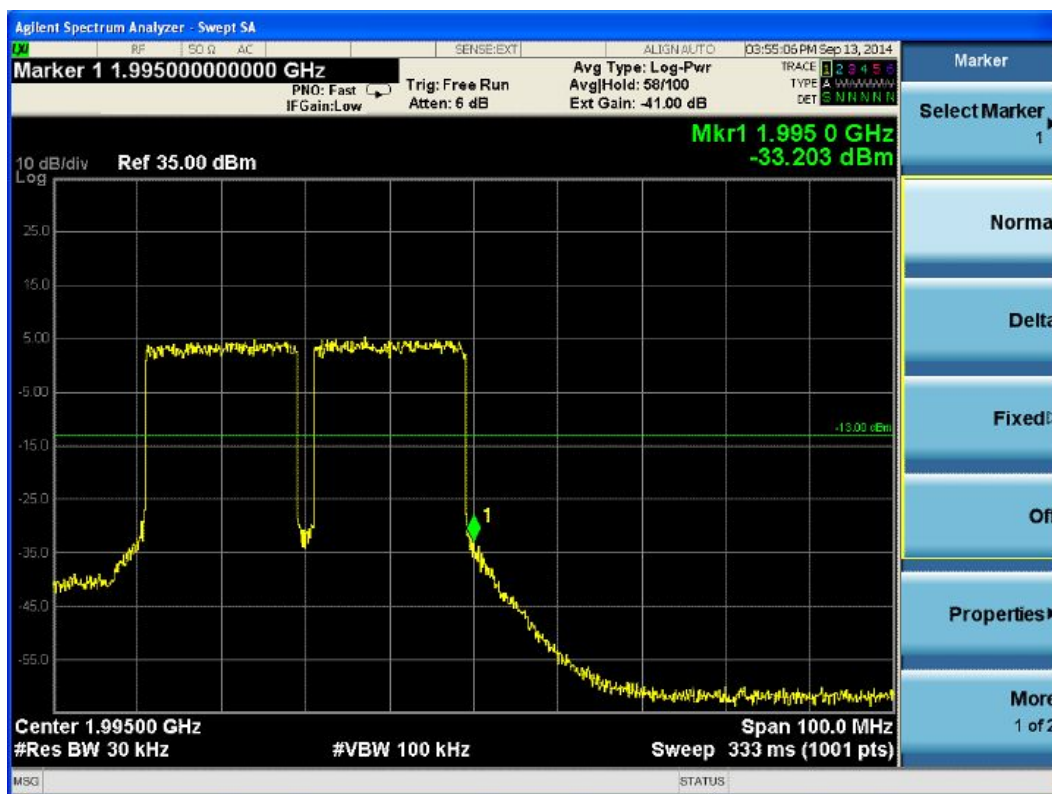


(1.6) Test for LTE 20MHz

(1.6.1) Lower Edge

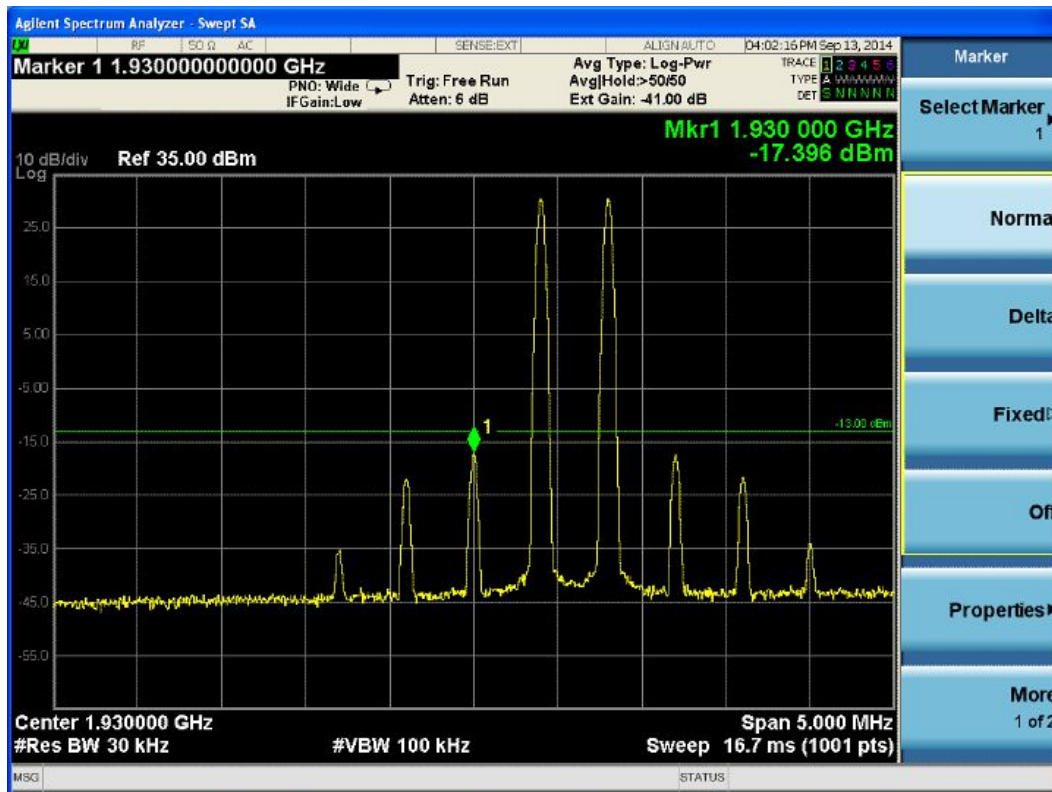


(1.6.2) Upper Edge

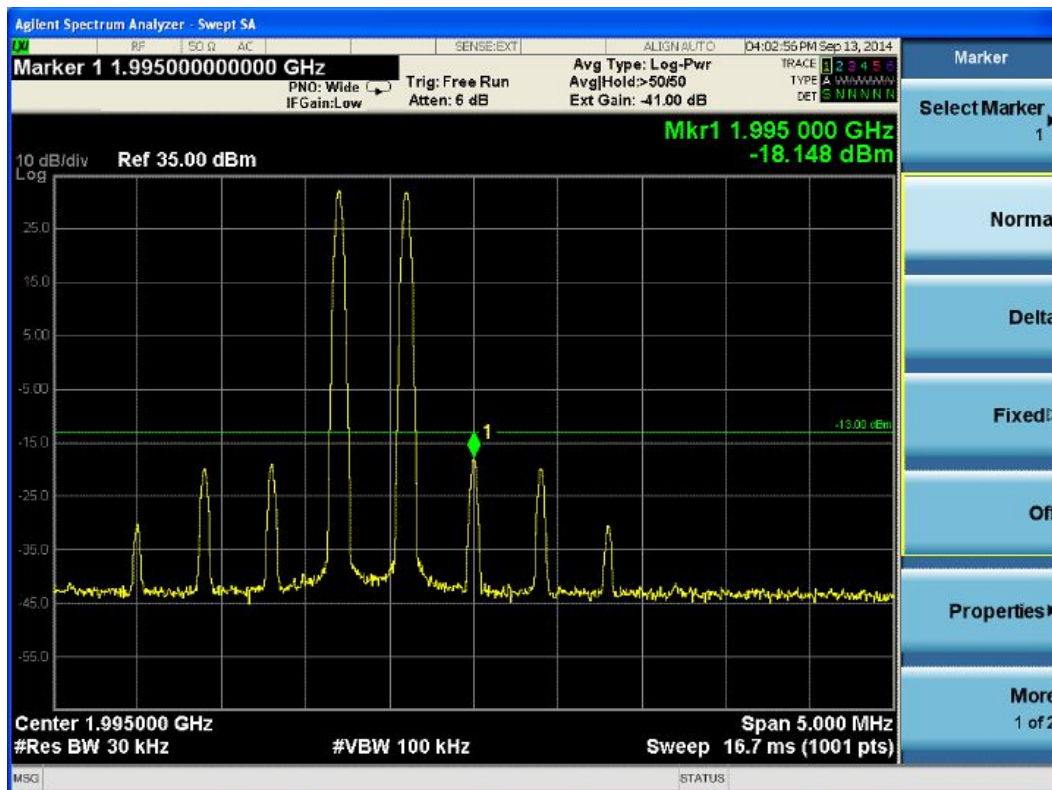


(2) GSM modulation

(2.1) Lower Edge

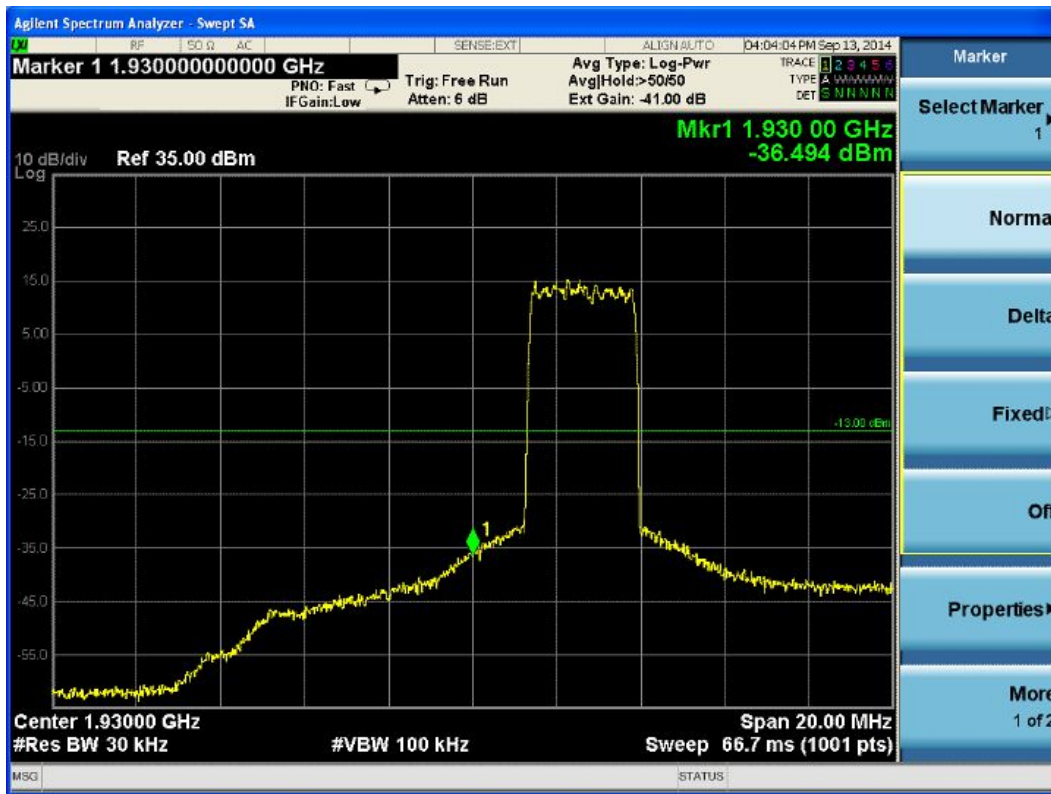


(2.2) Upper Edge

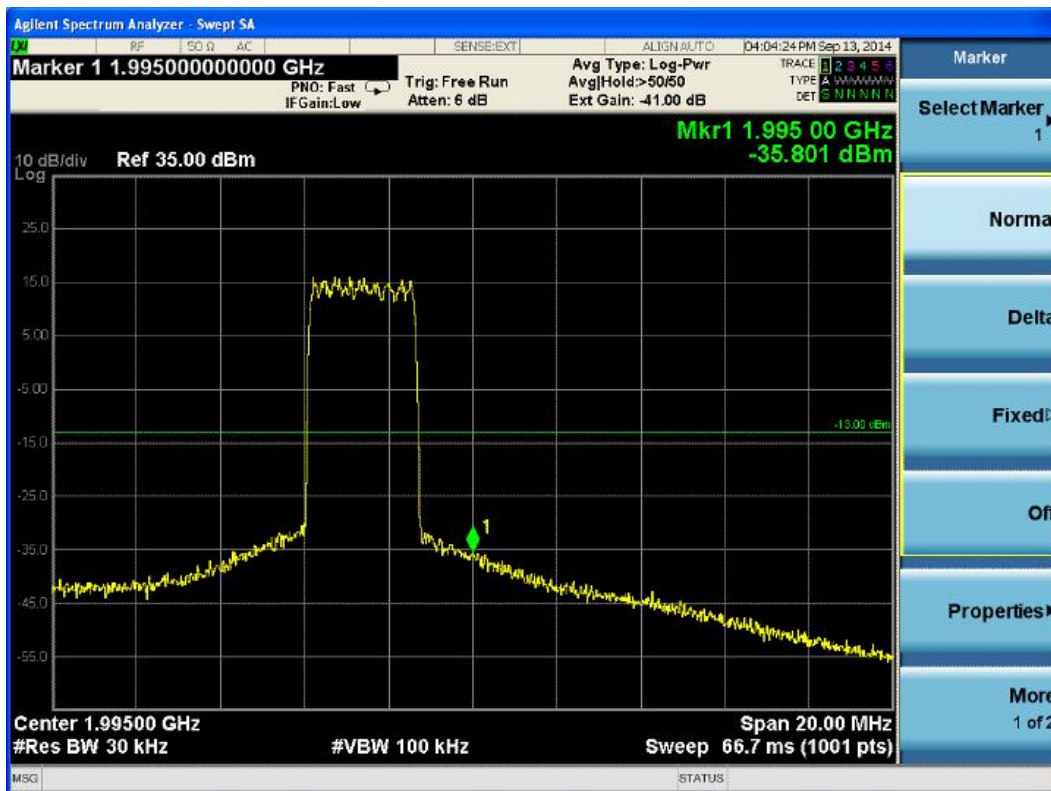


(3) CDMA modulation

(3.1) Lower Edge

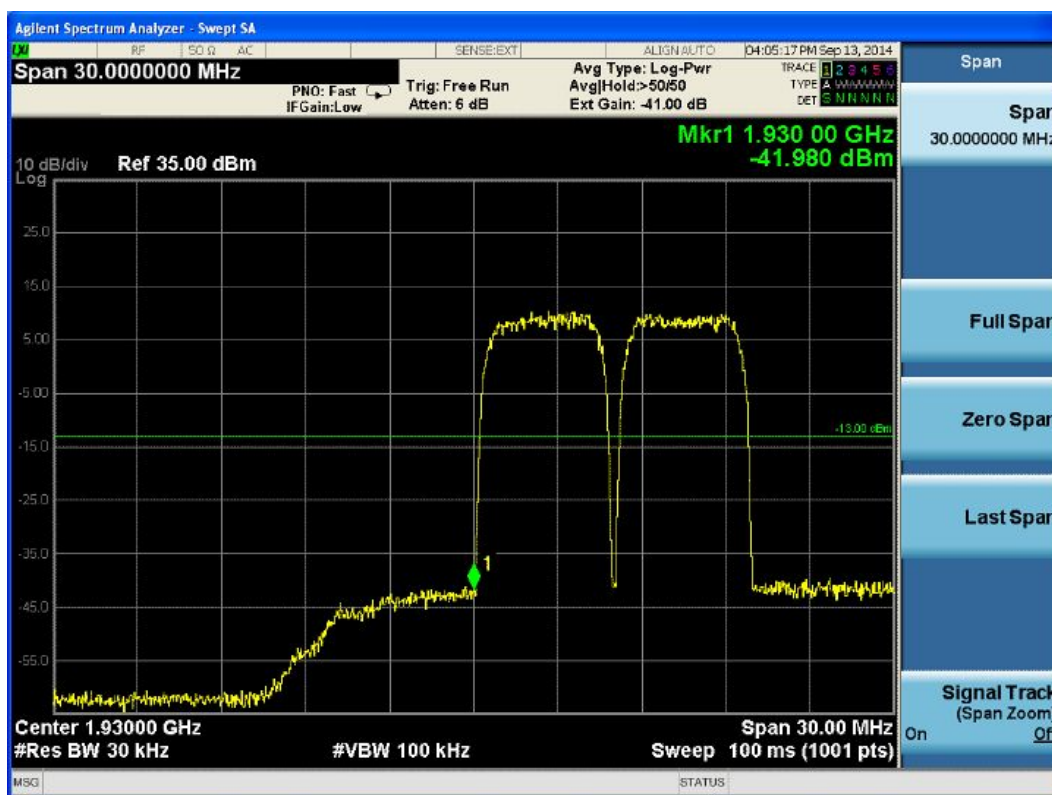


(3.2) Upper Edge

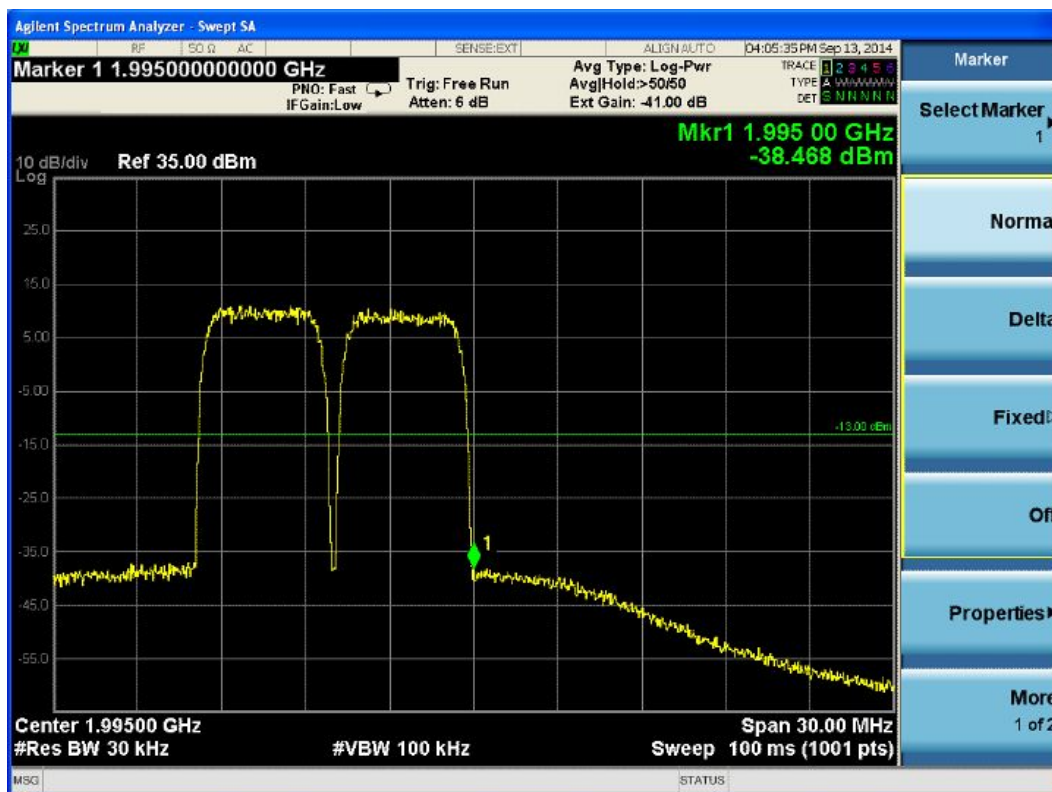


(4) WCDMA modulation

(4.1) Lower Edge



(4.2) Upper Edge

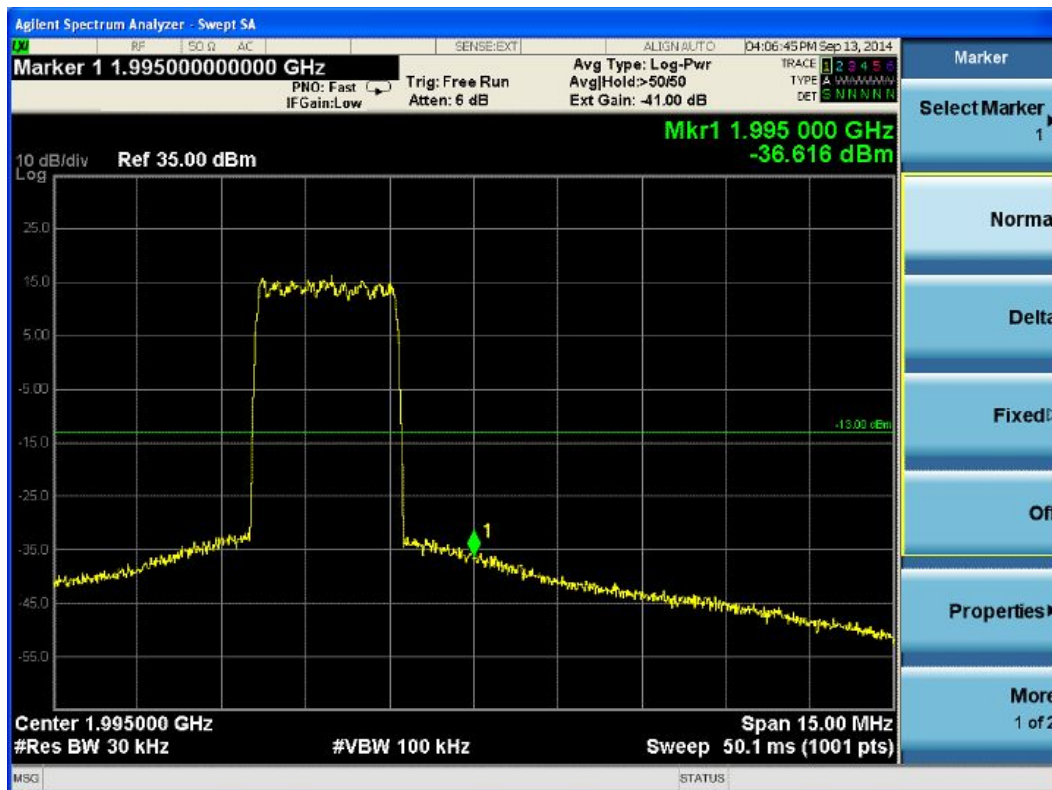


(5) 1x EV-DO modulation

(5.1) Lower Edge



(5.2) Upper Edge

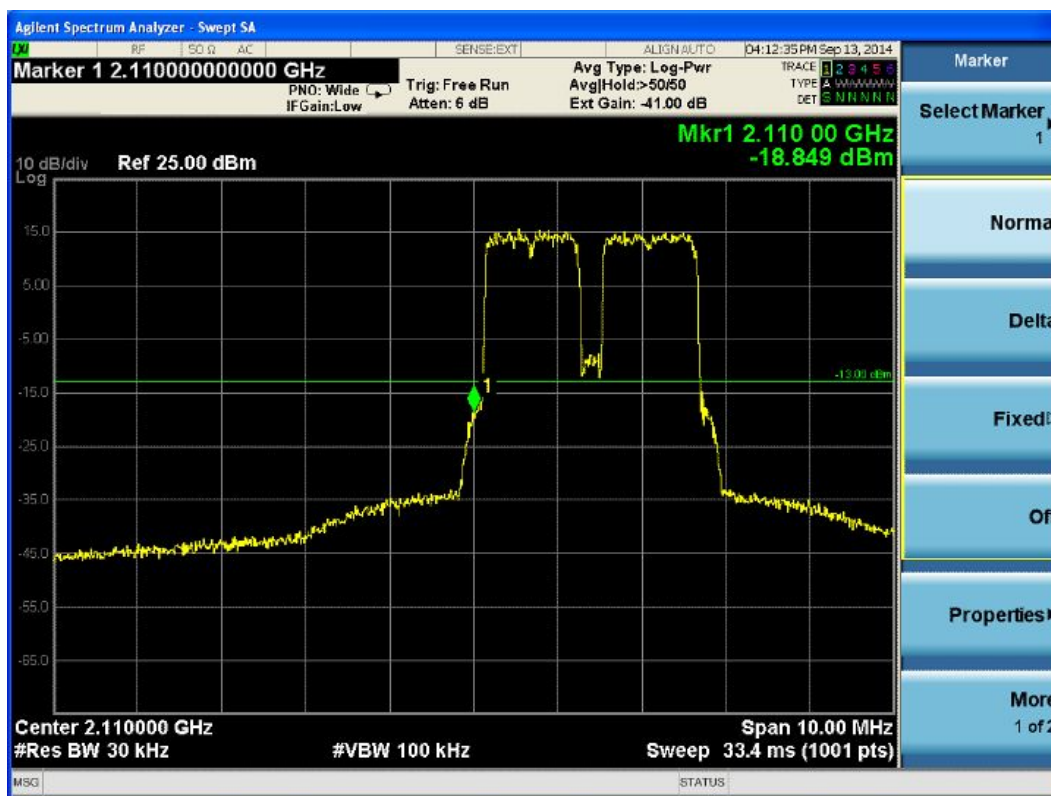


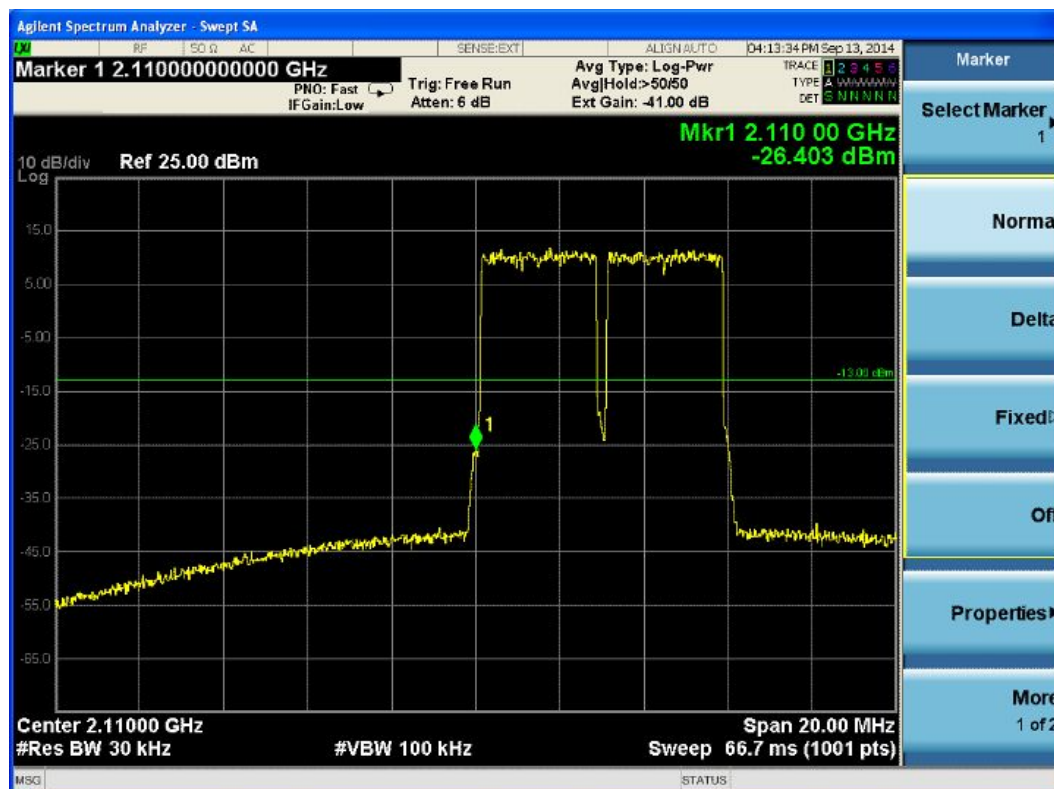
5.3.4.1.6 AWS-1 Band for Downlink

(1) LTE modulation

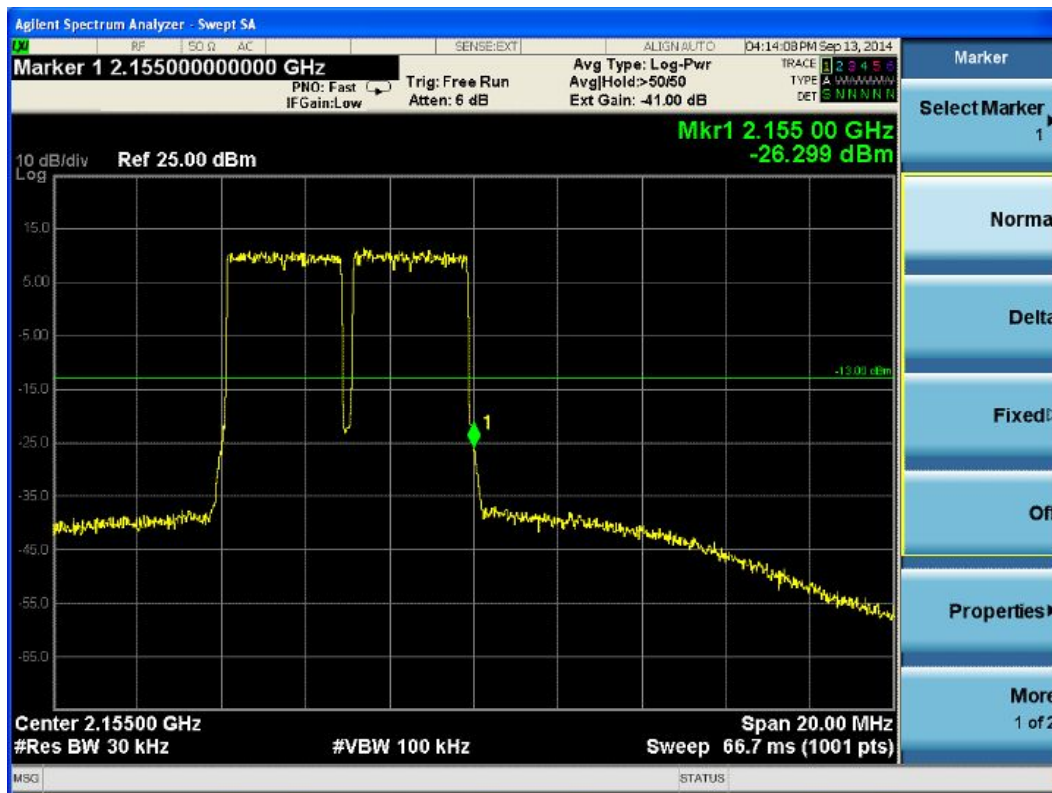
(1.1) Test for LTE 1.4MHz

(1.1.1) Lower Edge





(1.2.2) Upper Edge



(1.3) Test for LTE 5MHz

(1.3.1) Lower Edge

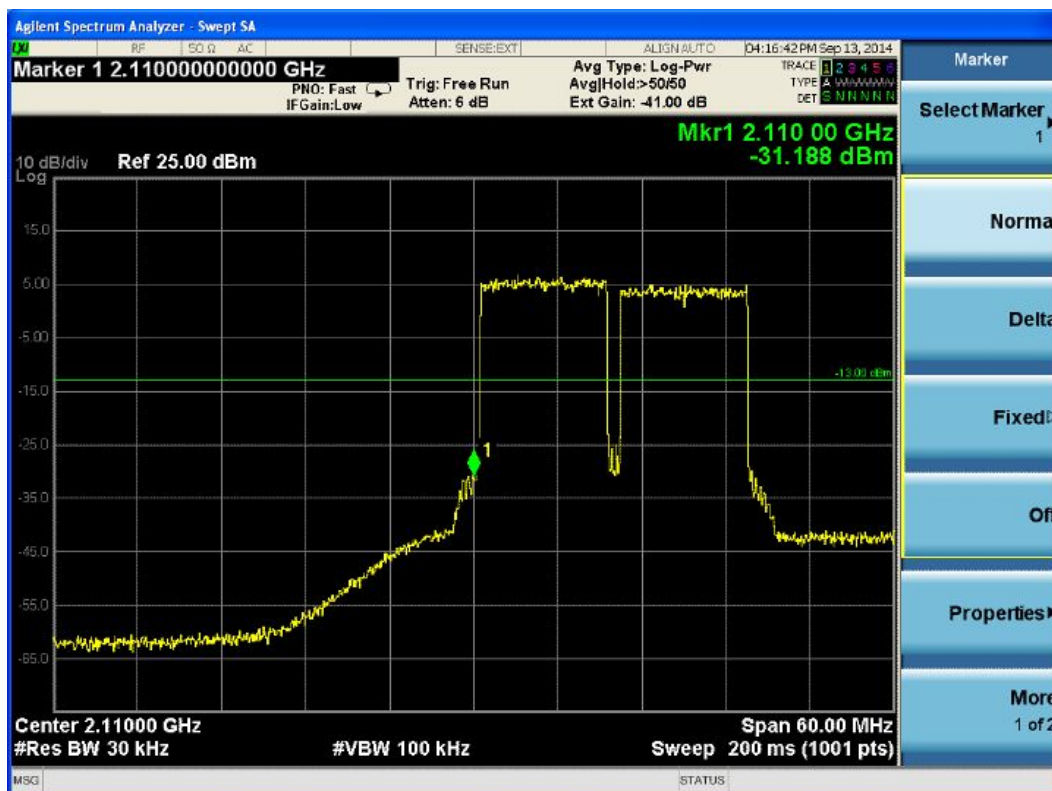


(1.3.2) Upper Edge



(1.4) Test for LTE 10MHz

(1.4.1) Lower Edge

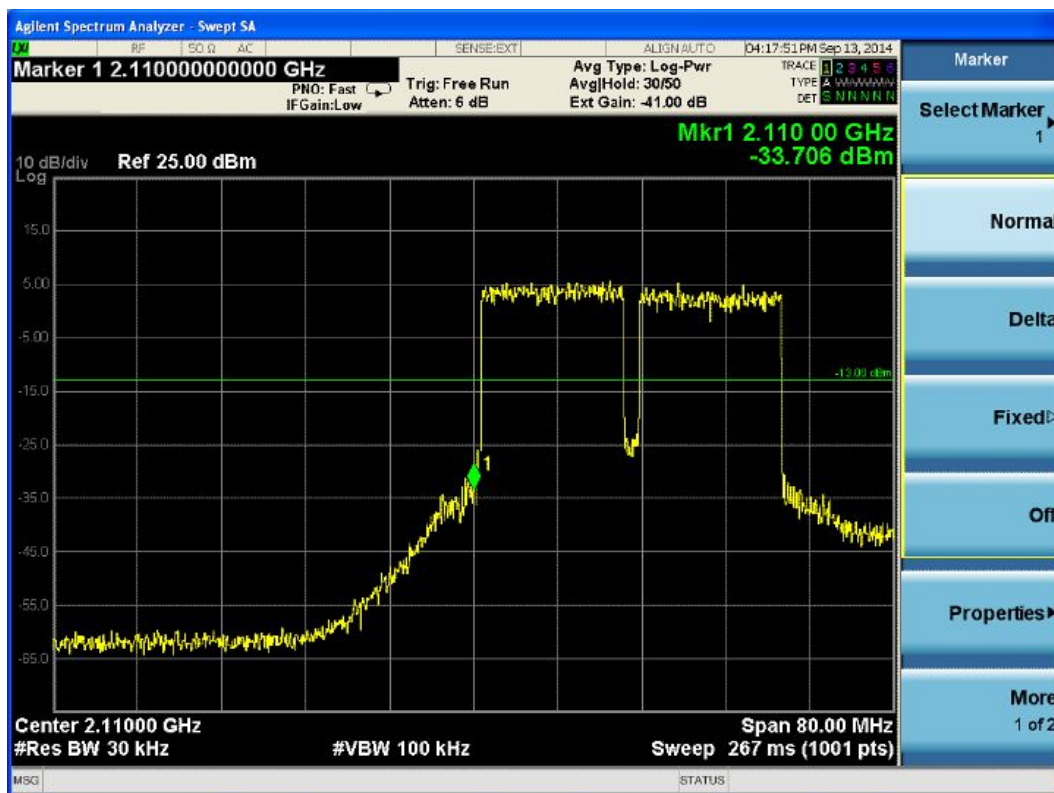


(1.4.2) Upper Edge

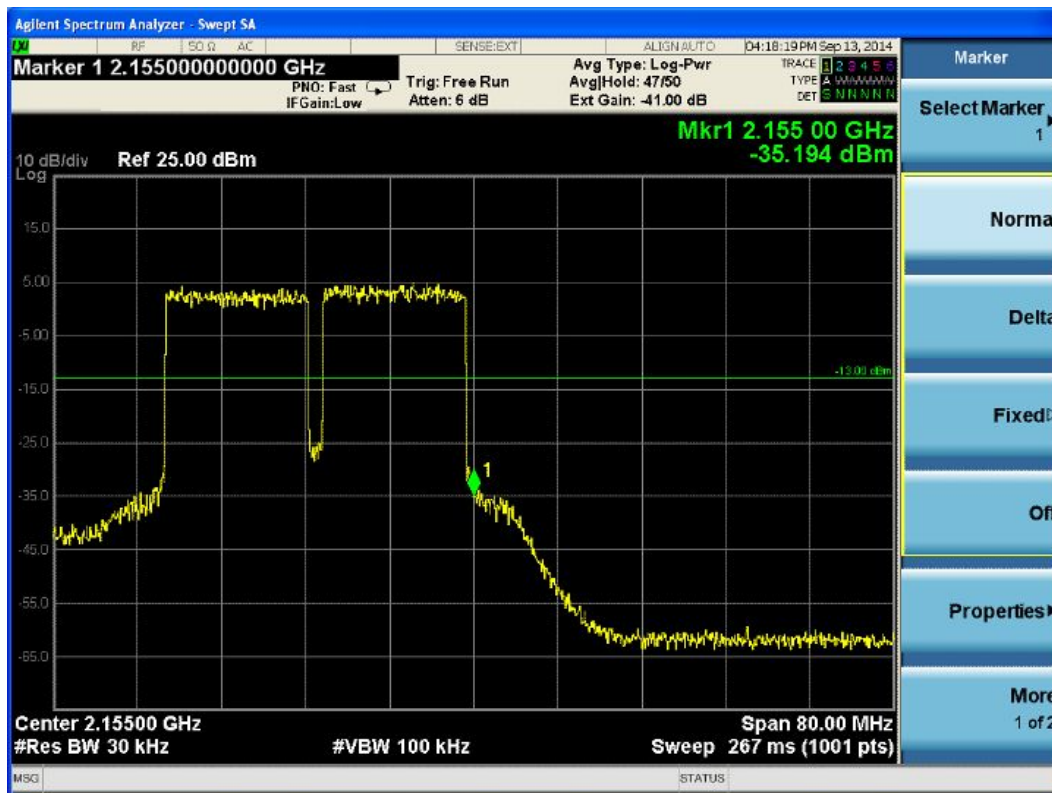


(1.5) Test for LTE 15MHz

(1.5.1) Lower Edge



(1.5.2) Upper Edge



(1.6) Test for LTE 20MHz

(1.6.1) Lower Edge

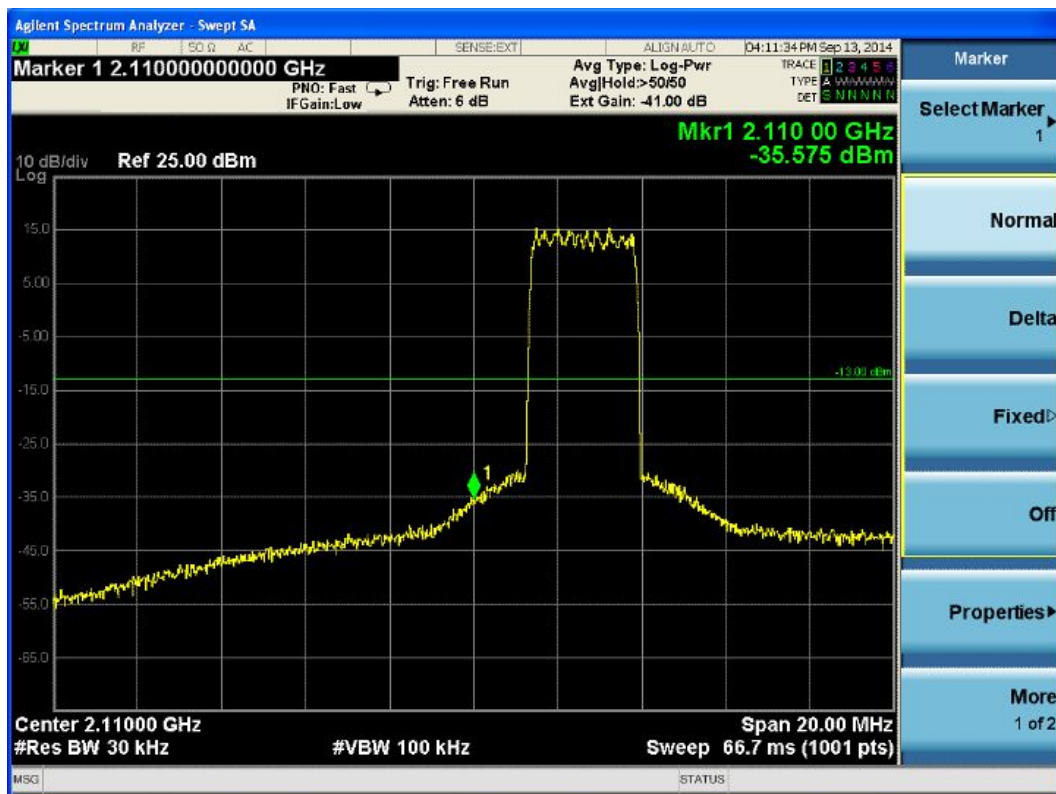


(1.6.2) Upper Edge

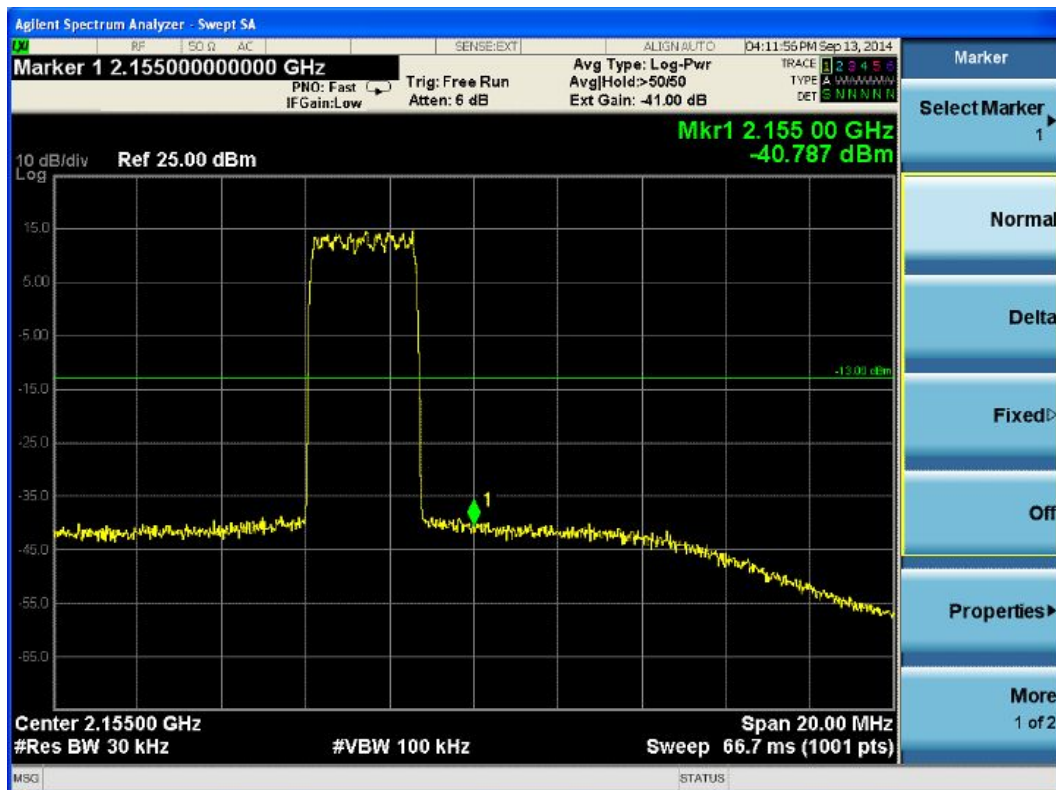


(2) CDMA modulation

(2.1) Lower Edge



(2.2) Upper Edge

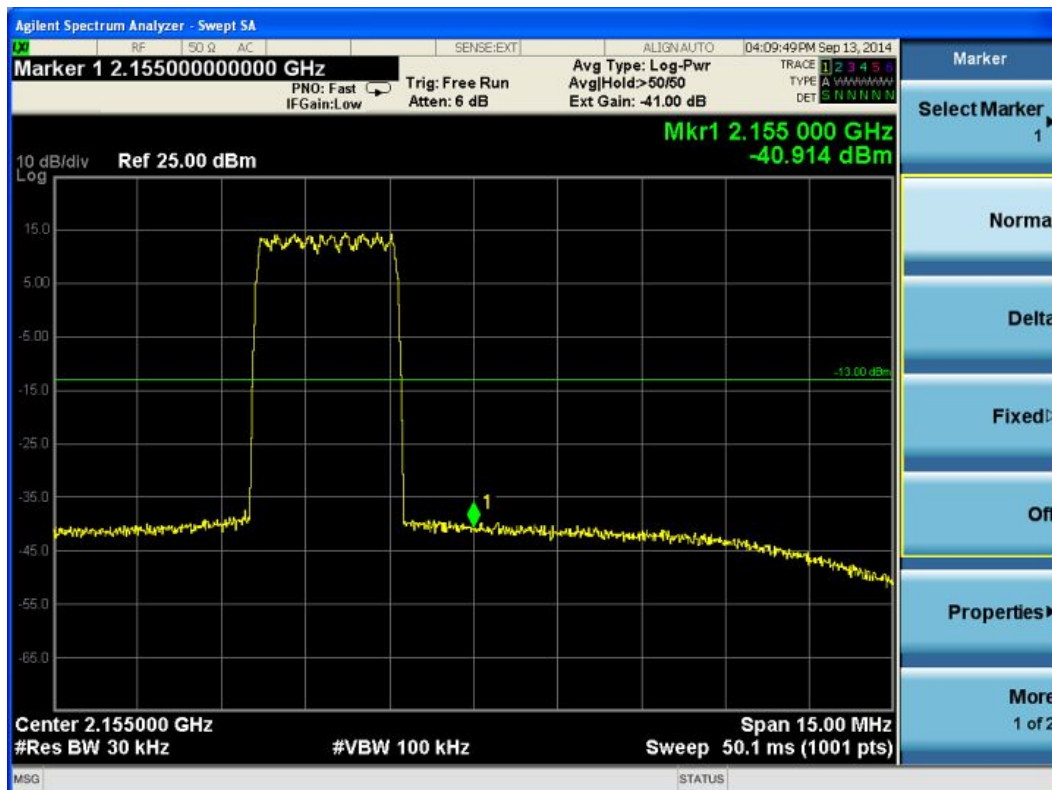


(4) 1x EV-DO modulation

(4.1) Lower Edge



(4.2) Upper Edge



5.2.5 Frequency Stability

Test Date: Sep 12, 2014 to Sep 15, 2014

Ambient Temp: 28.3°C

Humid : 61%

Atmospheric Pressure: 101kPa

Test Method: FCC part 2.1055

Test Requirement:

700MHz Lower ABC Band FCC part 27. 54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation, The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

700MHz Upper C Band FCC part 27. 54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation, The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency

800MHz Band FCC part 90. 213

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation, The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency

850MHz Band FCC part 22. 355

The frequency stability of the transmitter shall be maintained within ± 0.00025 percent (± 2.5 ppm) of the center frequency over a temperature variation of -30° Celsius to $+50^{\circ}$ Celsius at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20° Celsius.

1900MHz Band FCC part 24. 135

The frequency stability of the transmitter shall be maintained within ± 0.0001 percent (± 1 ppm) of the center frequency over a temperature variation of -30° Celsius to $+50^{\circ}$ Celsius at normal supply voltage, and over a variation in the primary supply voltage of 85 percent to 115 percent of the rated supply voltage at a temperature of 20° Celsius.

AWS-1 Band FCC part 27. 54

The frequency stability shall be sufficient to ensure that the

fundamental emissions stay within the authorized bands of operation, The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency

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:

Temperature conditions, Voltage condition

Test configuration:

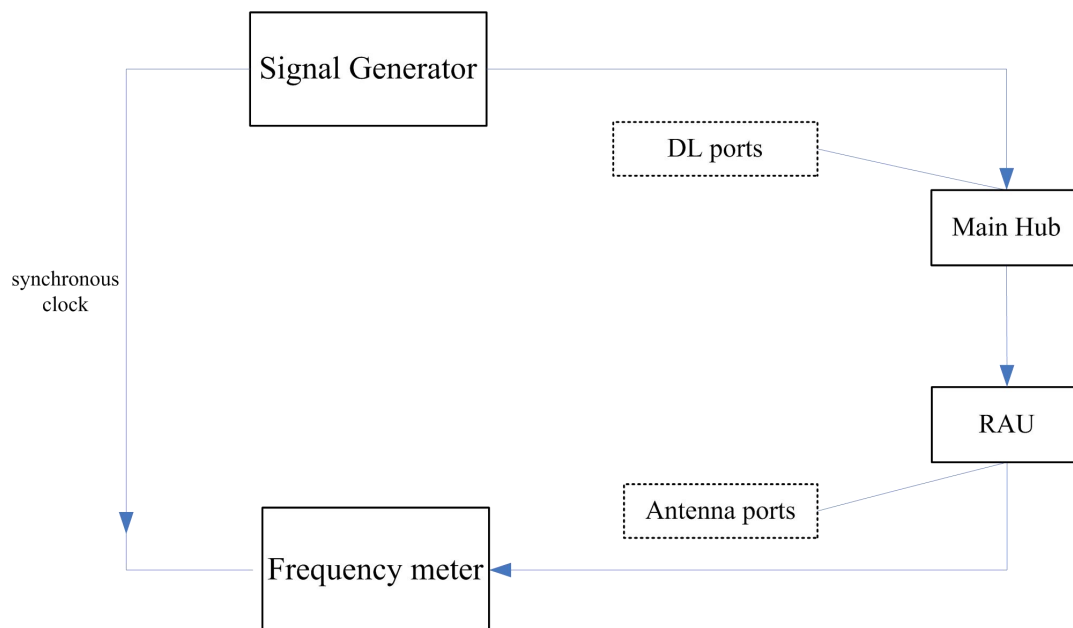


Figure 5: Downlink Frequency Stability Configuration

Test Procedure:

Frequency Stability test procedure:

- 1) Temperature condition:
 - a) Connect the equipment as illustrated
 - b) The RF output port of the EUT was connected to frequency meter;
 - c) Set the working frequency in the middle channel;
 - d) Record the 20°C and nominal voltage frequency value as reference point;
 - e) Vary the temperature from -30°C to 50°C with step 10°C;
 - f) When reach a temperature point, keep the temperature banlance at least 1 hour to make the product working in this status;
 - g) Read the frequency at the relative temperature;
- 2) Correct for all losses in the RF path
 - a) Record the 20°C and nominal voltage frequency value as reference point;
 - b) Vary the voltage from -15% nominal voltage to +15%

voltage;

Read the frequency at the relative voltage;

5.2.5.1 Measurement Record

5.2.5.1.1 Frequency Stability vs temperature

(1) 700MHz Lower ABC Band

(1.1) Test Lower A, The center frequency is 731MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	730.9999979	-0.00286
40	730.9999983	-0.00232
30	730.9999996	-0.00054
20	730.9999996	-0.00054
10	731.0000004	+0.00054
0	731.0000002	+0.00027
-10	731.0000011	+0.00150
-20	731.0000034	+0.00465
-30	731.0000058	+0.00793

(1.2) Test Lower B, The center frequency is 737MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	736.999983	-0.00231
40	736.9999990	-0.00136
30	736.9999997	-0.00041
20	736.9999994	-0.00081
10	736.9999995	-0.00679
0	737.0000004	+0.00542
-10	737.0000008	+0.00108
-20	737.0000016	+0.00217
-30	737.0000025	+0.00339

(1.3) Test Lower C, The center frequency is 743MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	742.9999991	-0.00121
40	742.9999998	-0.00027
30	743.0000004	+0.00054
20	743.0000003	+0.00040
10	743.0000006	+0.00081
0	743.0000009	+0.00121
-10	743.0000011	+0.00148
-20	743.0000019	+0.00256
-30	743.0000028	+0.00377

(2) 700MHz Upper C Band, The center frequency is 751.5MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	751.4999983	-0.00226
40	751.4999991	-0.00120
30	751.4999997	-0.00040
20	751.4999995	-0.00068
10	751.4999999	-0.00013
0	751.5000005	+0.00066
-10	751.5000010	+0.00133
-20	751.5000021	+0.00279
-30	751.5000036	+0.00479

(3) 800MHz Band, The center frequency is 865.5MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	865.4999983	-0.00196
40	865.4999991	-0.00104
30	865.4999997	-0.00034
20	865.4999995	-0.00058
10	865.4999999	-0.00011
0	865.5000006	+0.00069
-10	865.5000011	+0.00127
-20	865.5000023	+0.00266
-30	865.5000031	+0.00358

(4) 850MHz Band, The center frequency is 881.5MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	881.4999995	-0.00057
40	881.4999998	-0.00023

30	881.5000002	+0.00023
20	881.4999999	+0.00011
10	881.5000006	+0.00068
0	881.5000009	+0.00102
-10	881.5000015	+0.00170
-20	881.5000022	+0.00250
-30	881.5000036	+0.00408

(5) 1900MHz Band, The center frequency is 1962.5MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	1962.499994	-0.00306
40	1962.500004	+0.00204
30	1962.499999	-0.00051
20	1962.499996	-0.00204
10	1962.500003	+0.00153
0	1962.500004	+0.00204
-10	1962.500006	+0.00306
-20	1962.500008	+0.00408
-30	1962.500010	+0.00510

(6) AWS-1 Band, The center frequency is 2132.5MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	2132.500002	+0.00094
40	2132.500003	+0.00141
30	2132.499999	-0.00047
20	2132.499997	-0.00141
10	2132.500001	+0.00047
0	2132.500003	+0.00141
-10	2132.500006	+0.00281

-20	2132.500008	+0.00375
-30	2132.500011	+0.00516

5.2.5.1.2 Frequency Stability vs voltage**(1) 700MHz Lower ABC Band**

(1.1) Test Lower A, The center frequency is 731MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	730.9999996	0.00054
120	730.9999996	0.00054
138 (120*1.15)	730.9999996	0.00054

(1.2) Test Lower B, The center frequency is 737MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	736.9999997	0.00041
120	736.9999997	0.00041
138 (120*1.15)	736.9999997	0.00041

(1.3) Test Lower C, The center frequency is 743MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	743.0000004	0.00054
120	743.0000004	0.00054
138 (120*1.15)	743.0000004	0.00054

(2) 700MHz (Upper C) Band, The center frequency is 781.5MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	751.4999997	-0.00040
120	751.4999997	-0.00040
138 (120*1.15)	751.4999997	-0.00040

(3) 800MHz Band, The center frequency is 820.5MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	865.4999997	-0.00034
120	865.4999997	-0.00034
138 (120*1.15)	865.4999997	-0.00034

(4) 850MHz Band, The center frequency is 836.5MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	881.5000002	+0.00023
120	881.5000002	+0.00023
138 (120*1.15)	881.5000002	+0.00023

(5) 1900MHz Band, The center frequency is 1882.5MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	1962.499999	-0.00051
120	1962.499999	-0.00051
138 (120*1.15)	1962.499999	-0.00051

(6) AWS-1 Band, The center frequency is 1732.5MHz

Voltage(V)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	2132.499999	-0.00047
120	2132.499999	-0.00047
138 (120*1.15)	2132.499999	-0.00047

5.2.6 Occupied Bandwidth

Test Date: Sep 12, 2014 to Sep 15, 2014
Ambient Temp: 28.3°C
Humid : 61%
Atmospheric Pressure: 101kPa
Power supply: AC 120V 60Hz
Test Method: FCC part 2.1049& 935210 D02 Signal Boosters Certification v02r01

Test Requirement:

700MHz Lower ABC Band	935210 D02 Signal Boosters Certification v02r01
700MHz Upper C Band	935210 D02 Signal Boosters Certification v02r01
800MHz Band	935210 D02 Signal Boosters Certification v02r01
850MHz Band	935210 D02 Signal Boosters Certification v02r01
1900MHz Band	935210 D02 Signal Boosters Certification v02r01
AWS-1 Band	935210 D02 Signal Boosters Certification v02r01

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:

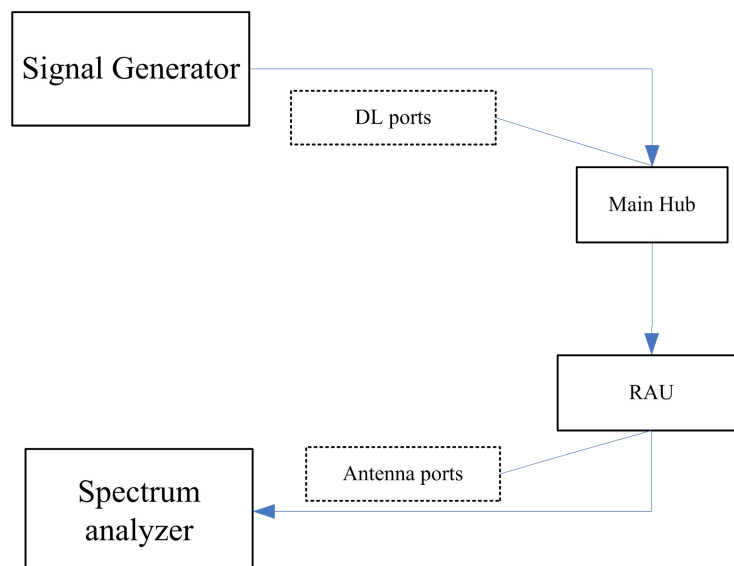


Figure 6: Downlink Occupied Bandwidth Configuration

Test Procedure: Occupied bandwidth test procedure:

- Set the spectrum analyzer RBW 300Hz >1%&<2% bandwidth of carrier;

- b) Capture the trace of input signal;
- c) Connect the equipment as illustrated;
- d) Capture the trace of output signal

5.2.6.1 Measurement Record

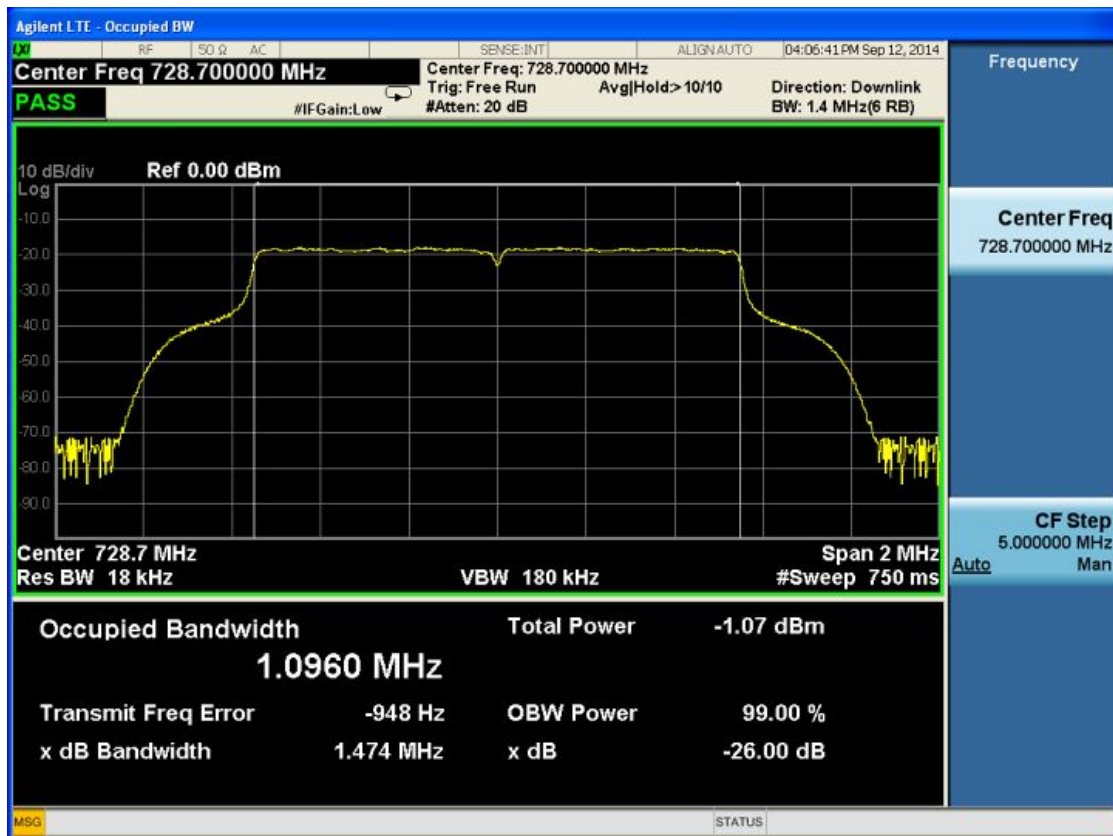
5.2.6.1.1 700MHz Lower ABC Band

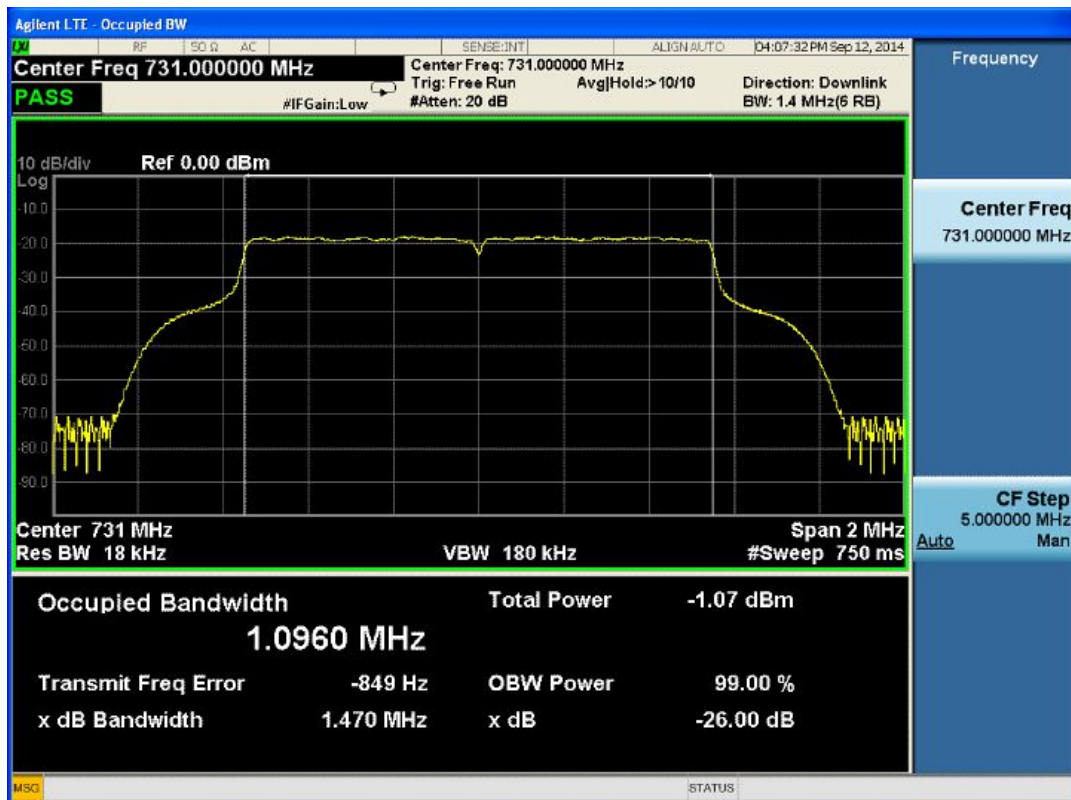
(1) Test Lower A

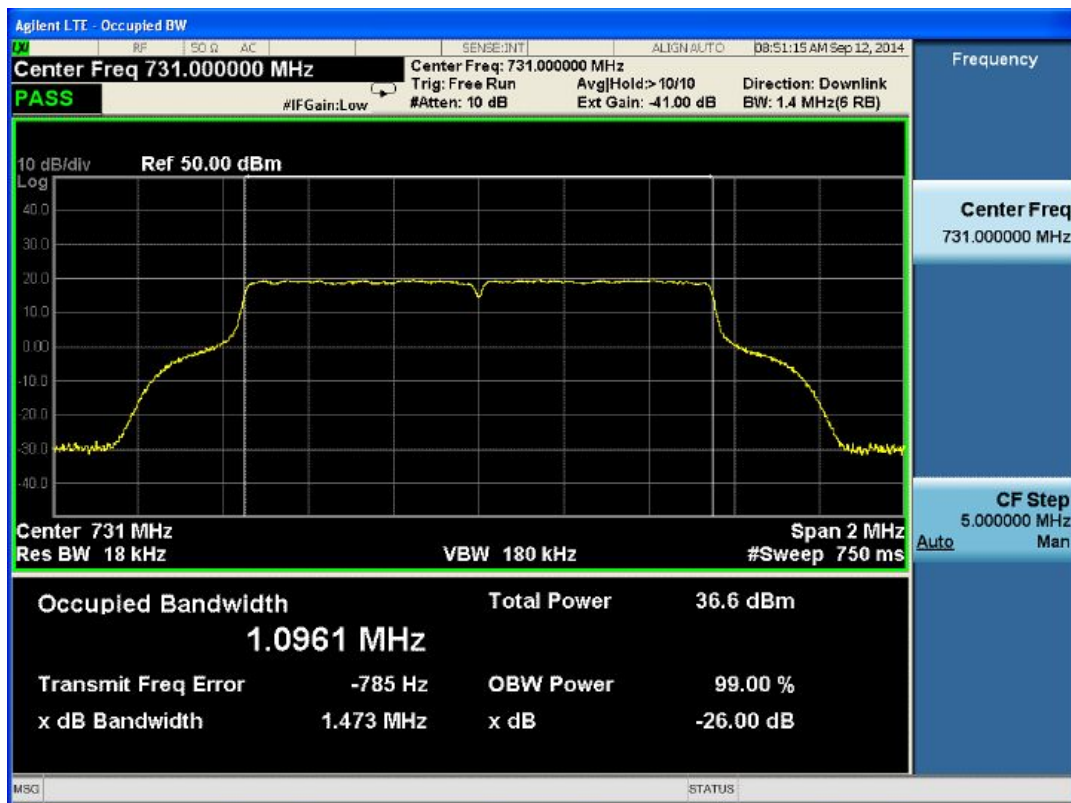
(1.1) Test for LTE 1.4MHz

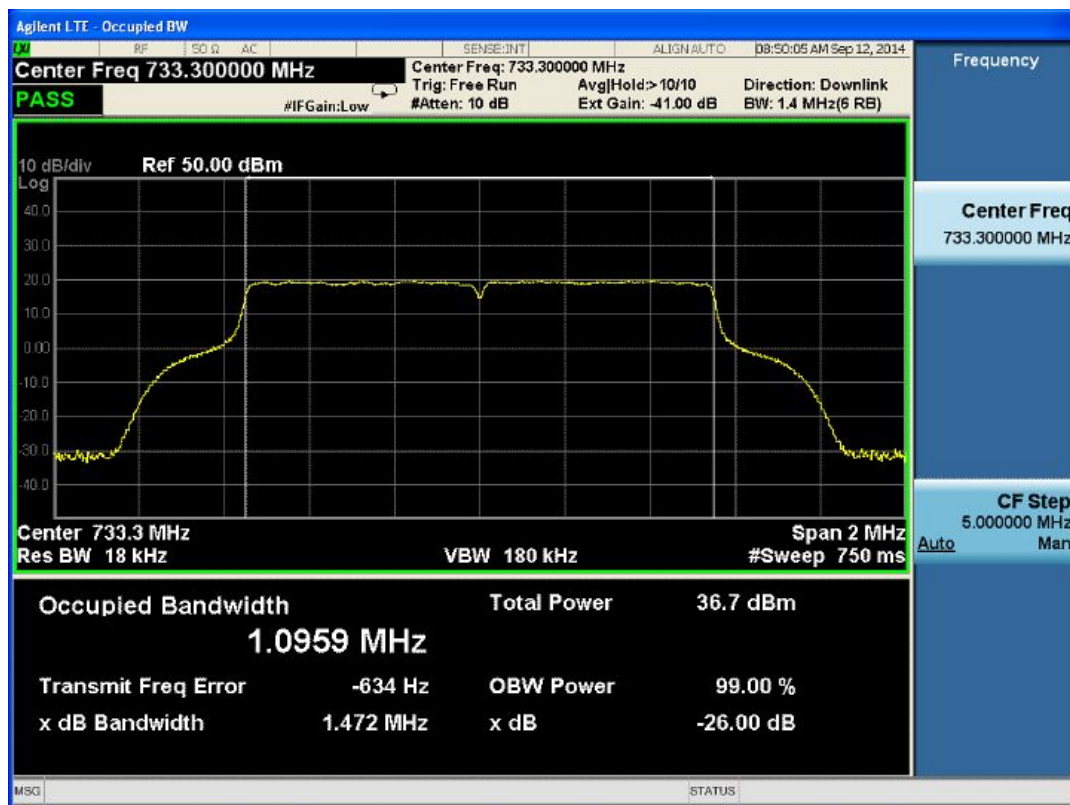
(1.1.1) Lowest frequency

(a) Input signal



(b) Output signal**(1.1.2) Middle frequency****(a) Input signal**

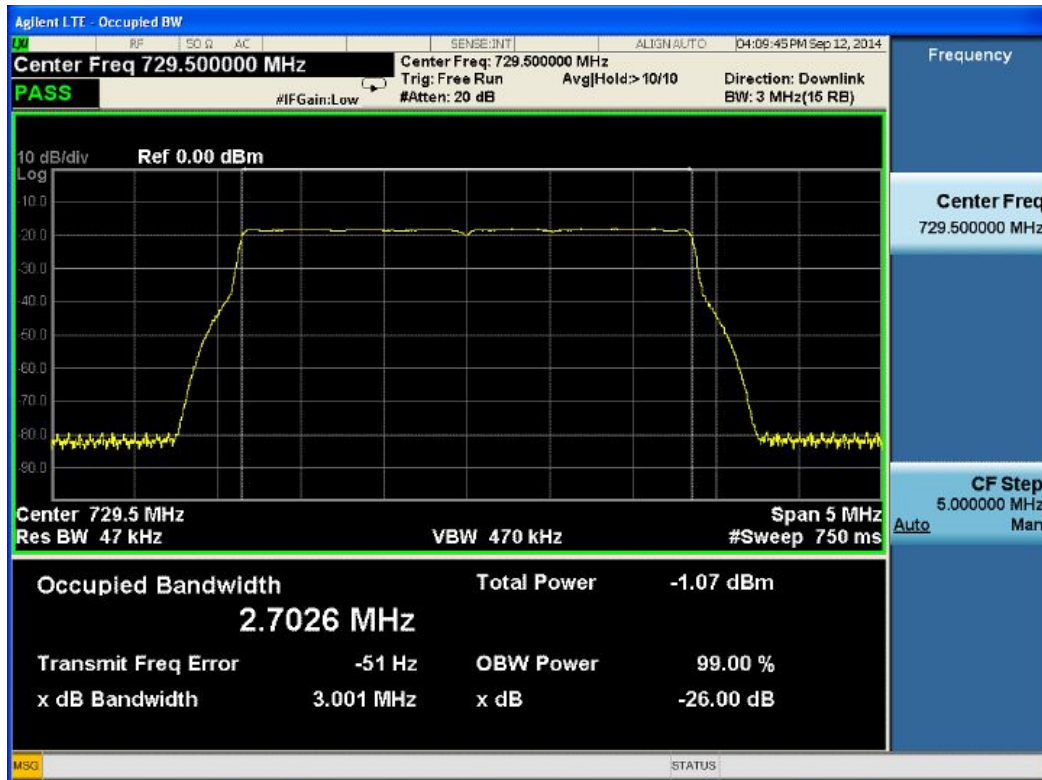
(b) Output signal**(1.1.3) Highest frequency****(a) Input signal**

(b) Output signal

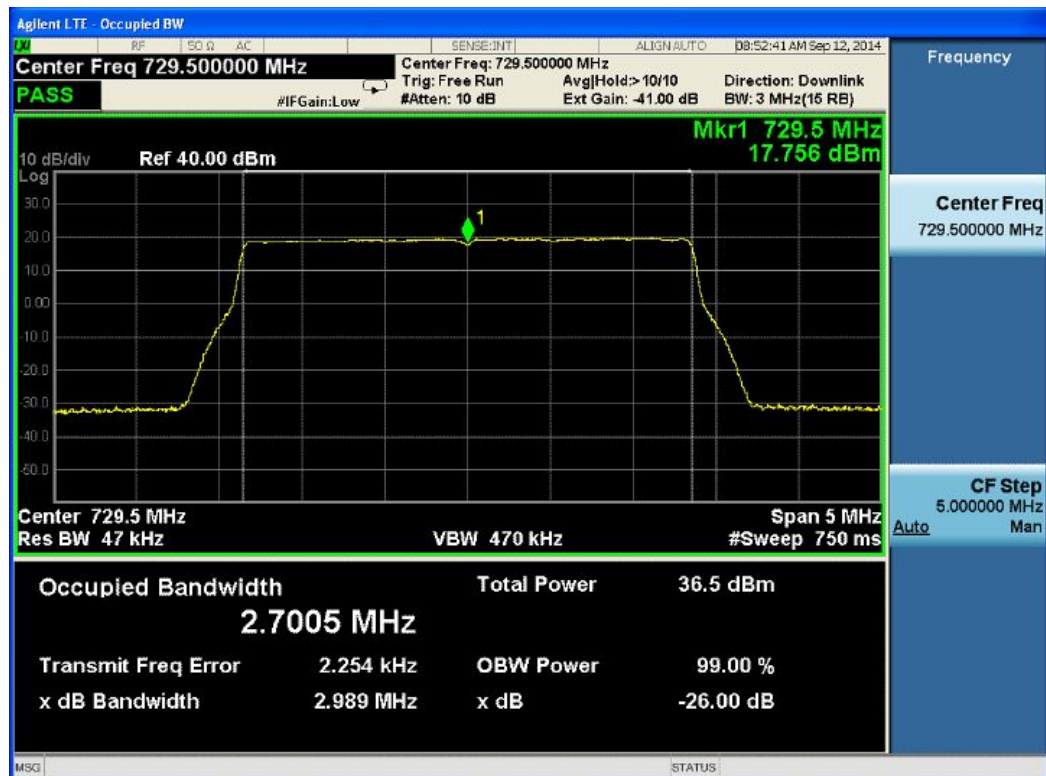
(1.2) Test for LTE 3 MHz

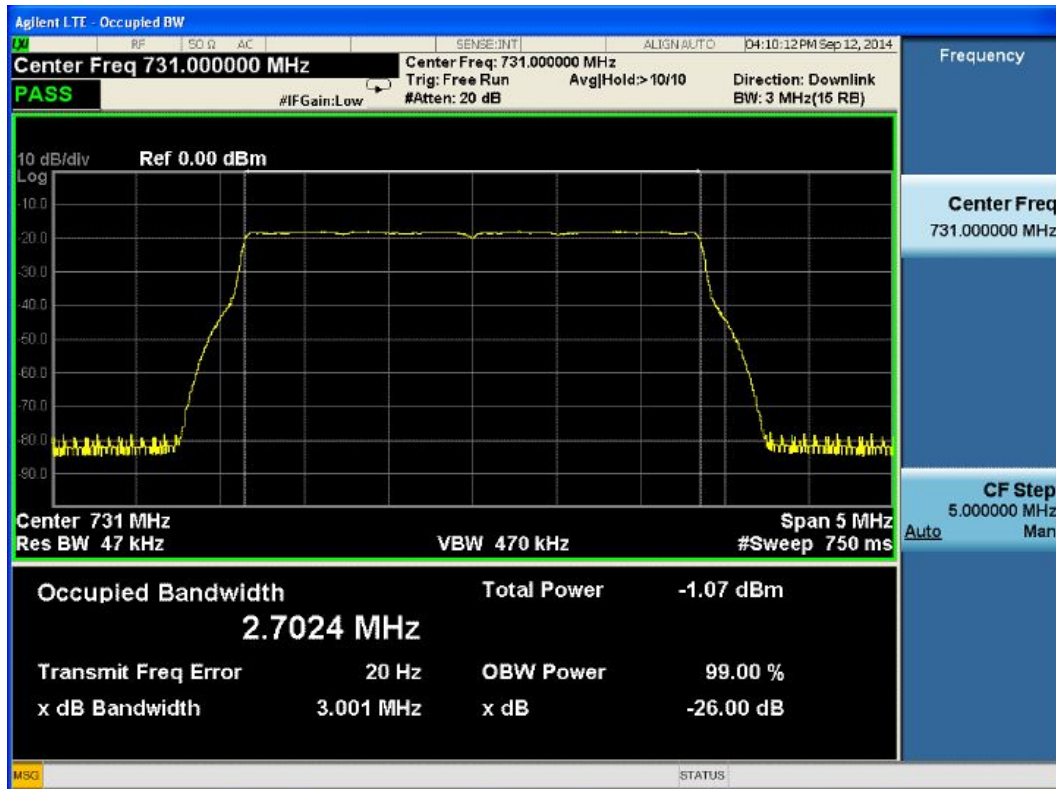
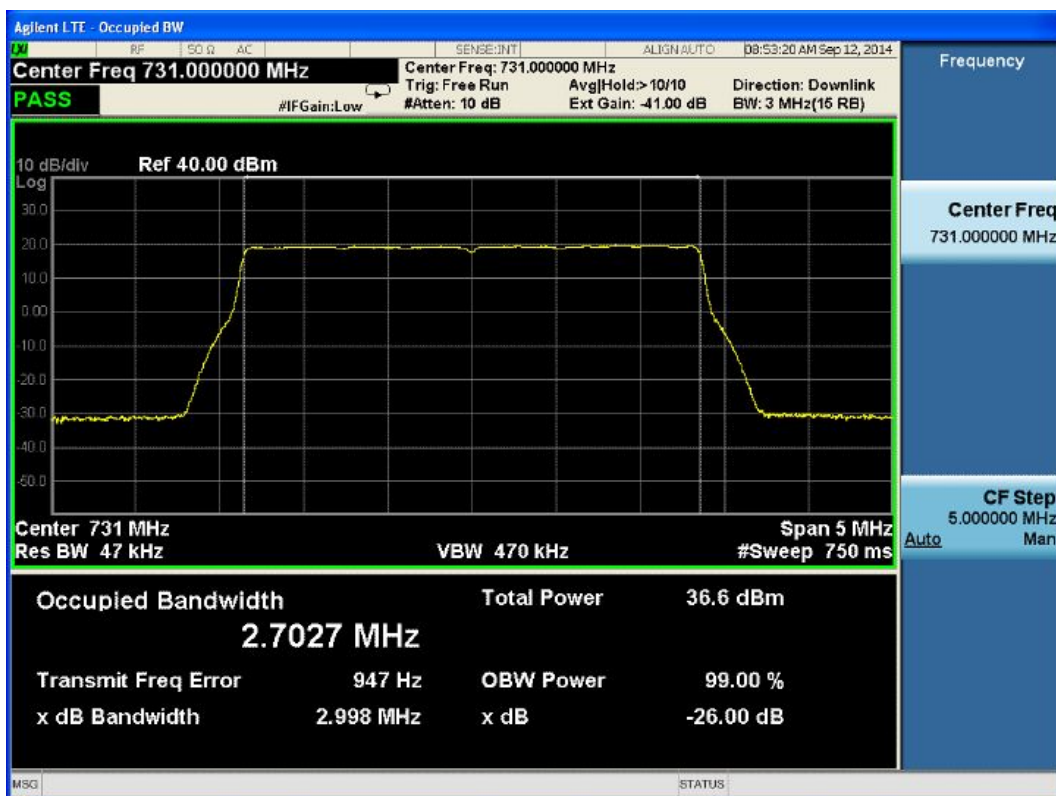
(1.2.1) Lowest frequency

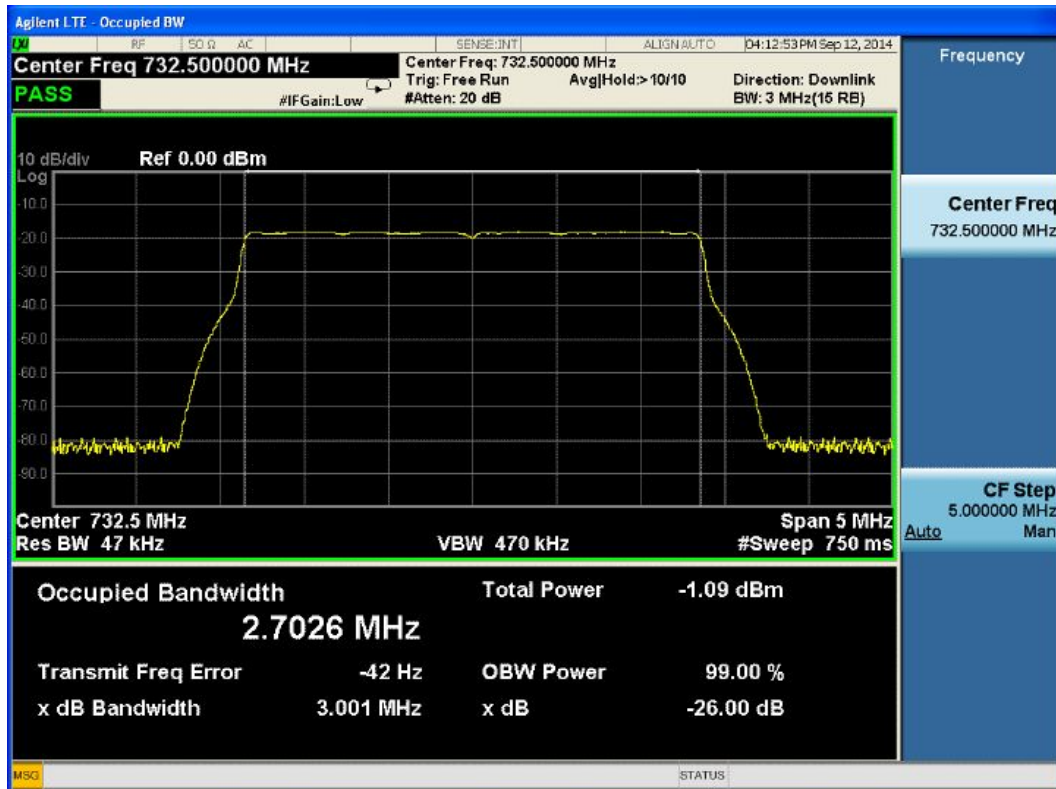
(a) Input signal



(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**