



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM170200089407

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Highest Channel					
Frequency	Spurious Emission Level			Limit	Over limit
(MHz)	(Deg)	Polaxis	(dBm)	dBm	(dB)
63.6	0.0	H	-80.02	-13.0	-67.02
109.8	54.0	H	-79.10	-13.0	-66.10
185.4	107.0	H	-73.53	-13.0	-60.53
1045.0	142.0	H	-66.11	-13.0	-53.11
1716.0	0.0	H	-64.07	-13.0	-51.07
2408.0	128.0	H	-58.75	-13.0	-45.75
4950.0	0.0	H	-66.99	-13.0	-53.99
7950.0	0.0	H	-65.16	-13.0	-52.16
9150.0	111.0	H	-64.35	-13.0	-51.35

Highest Channel					
Frequency	Spurious Emission Level			Limit	Over limit
(MHz)	(Deg)	Polaxis	(dBm)	dBm	(dB)
67.8	190.0	V	-82.51	-13.0	-69.51
118.2	0.0	V	-79.42	-13.0	-66.42
499.5	317.0	V	-82.72	-13.0	-69.72
1031.0	144.0	V	-63.00	-13.0	-50.00
1617.0	276.0	V	-65.73	-13.0	-52.73
2464.0	130.0	V	-58.79	-13.0	-45.79
4200.0	0.0	V	-67.65	-13.0	-54.65
6150.0	112.0	V	-66.06	-13.0	-53.06
7800.0	112.0	V	-64.71	-13.0	-51.71

Remark:

The cabinet radiation was measured with the equipment transmitting a CW signal into a non-radiating 50 Ohm load at maximum output power on a signal frequency .

Measured were performed in the lowest, middle and highest frequency for the Downlink.

The spectrum was searched from 30MHz to 26GHz (10th Harmonic) for downlink.

7.2.5 Occupied Bandwidth

Test Requirement:

FCC part 2.1049

The spectral shape of the output should look similar to input for all modulations.

EUT Operation:

Status:

Drive the EUT to maximum output power. .

Conditions:

Normal conditions

Application:

Cellular Band RF output ports

Test Configuration:

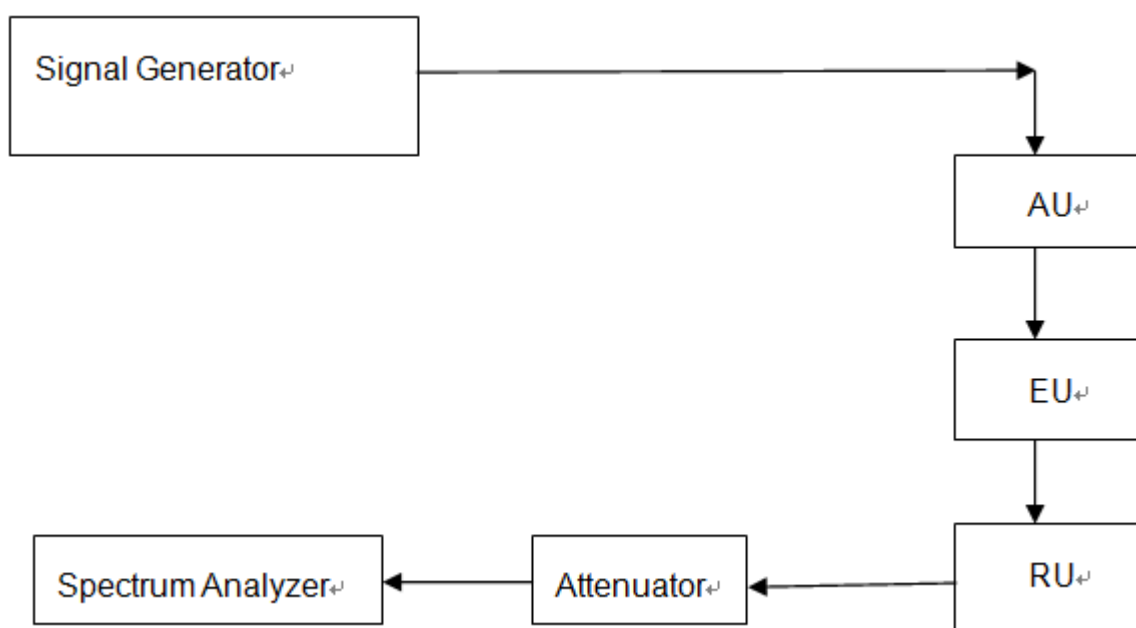


Fig.2. Conducted Spurious Emissions test configuration

Test Procedure:

- Set the spectrum analyzer RBW 300 Hz or $>1\%$ & $<2\%$ emission bandwidth of carrier.
- Capture the trace of input signal;
- Connect the equipment as illustrated;
- Capture the trace of output signal;
- Set the signal power level of the Signal Generator to 0dBm, and the modulation of the signal are LTE(64QAM), CDMA and WCDMA



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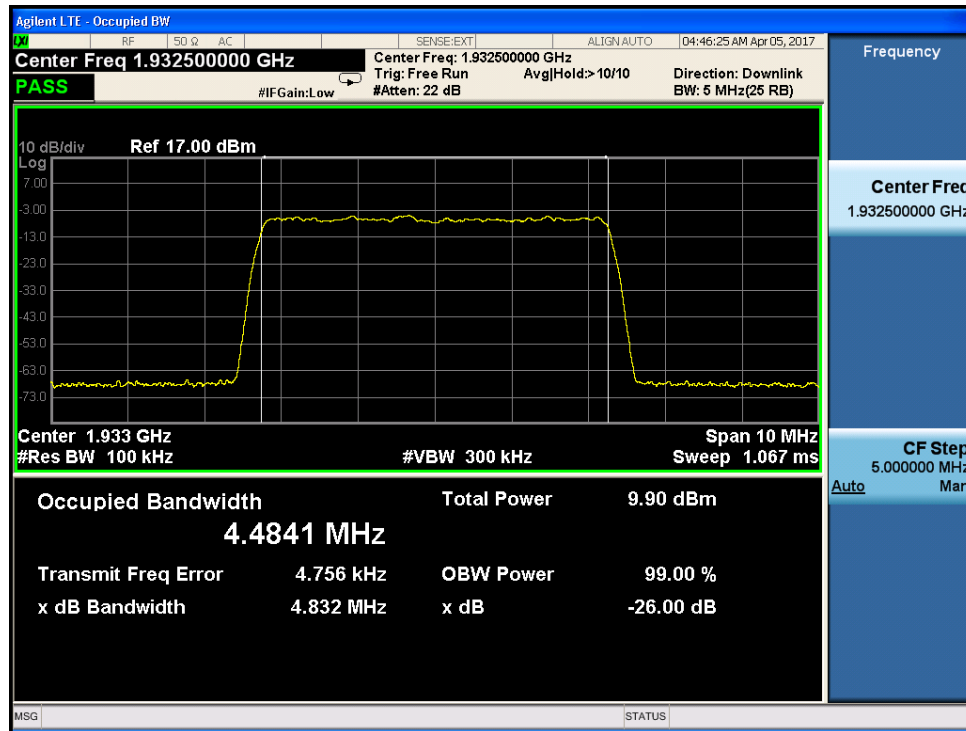
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7.2.5.1 Measurement Record:

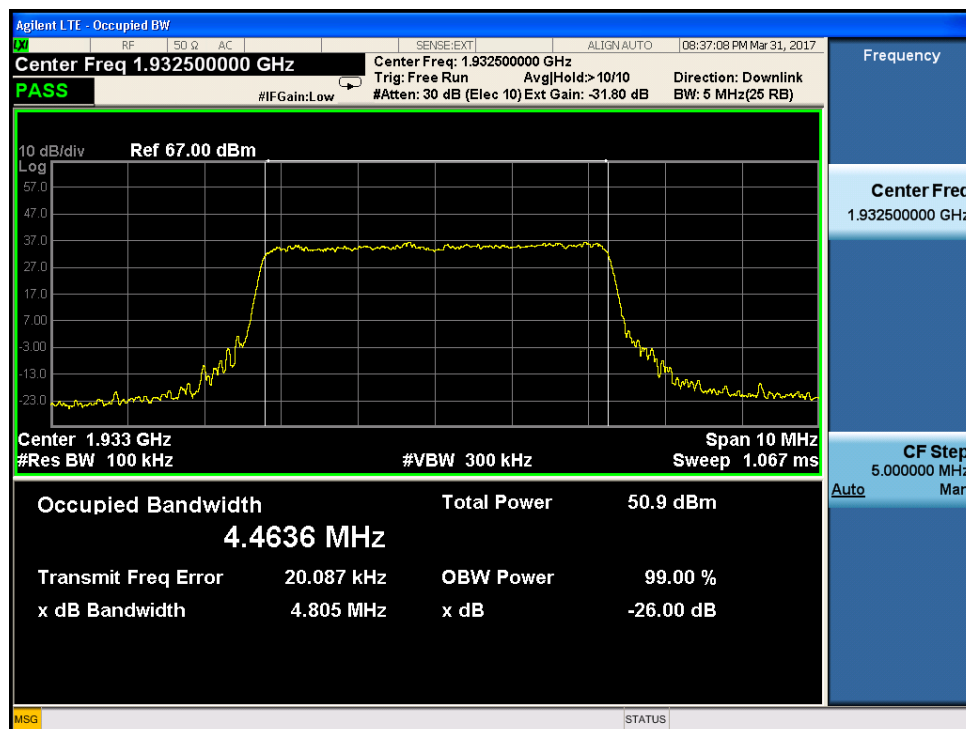
1.Downlink: 1930MHz to 1995MHz (LTE mode)

1.1 lowest frequency – 5MHz bandwidth

Input:



Output:





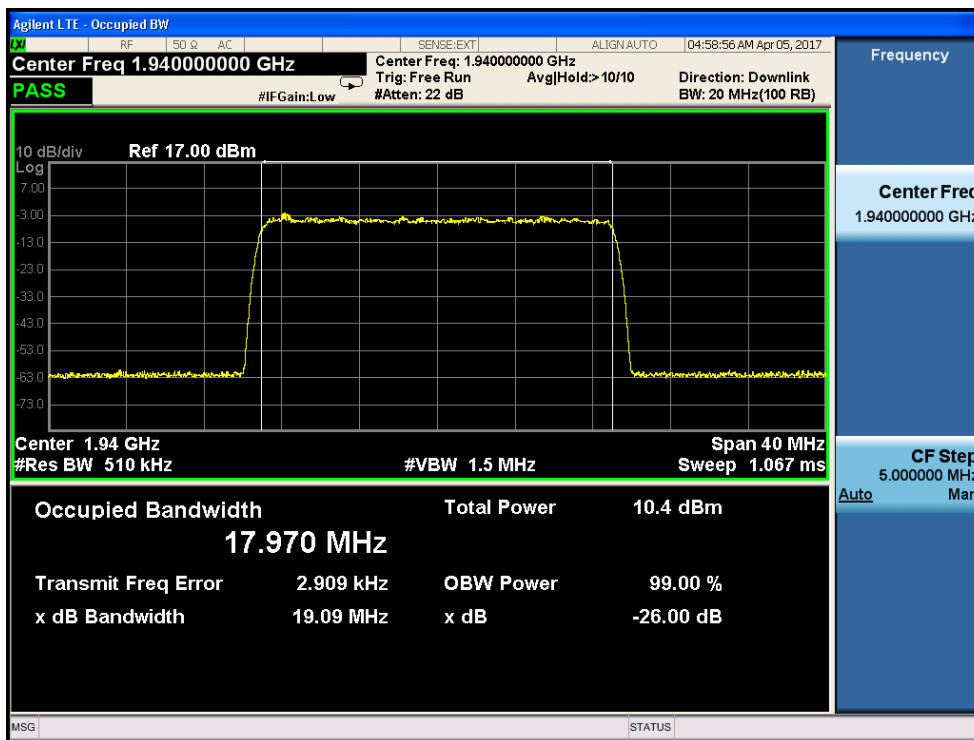
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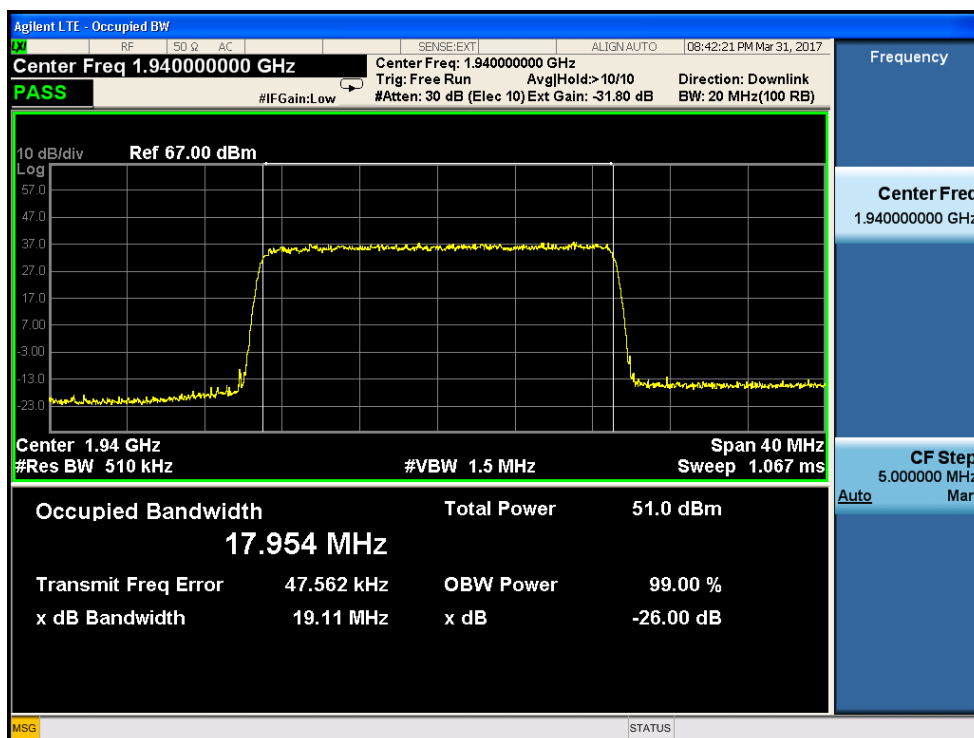
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1.2 lowest frequency-- 20MHz bandwidth

Input:



Output:





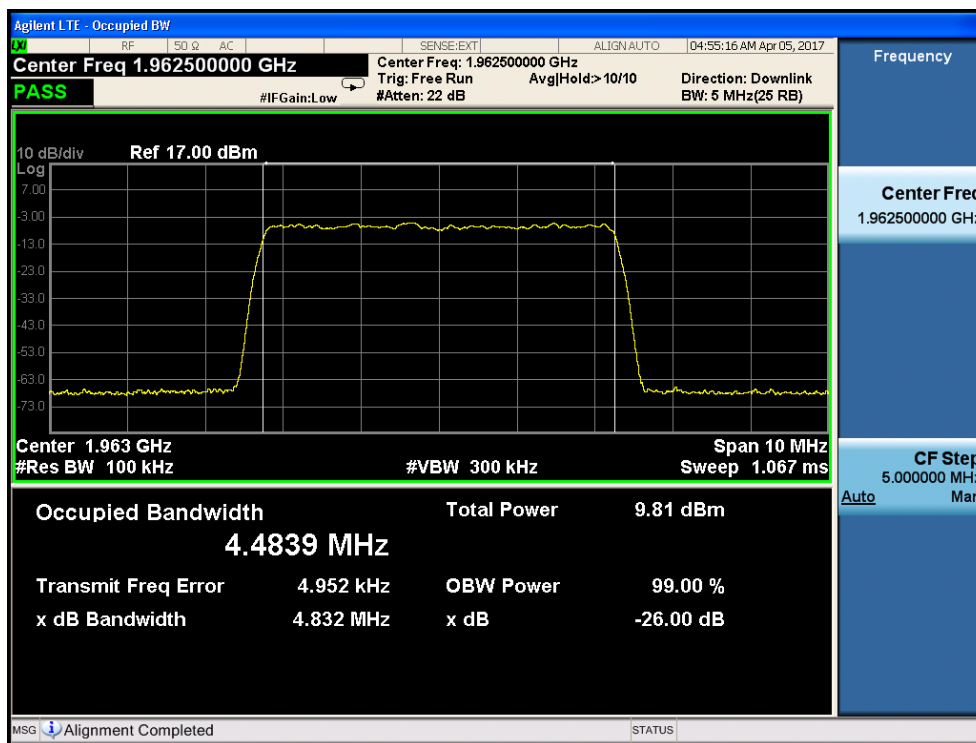
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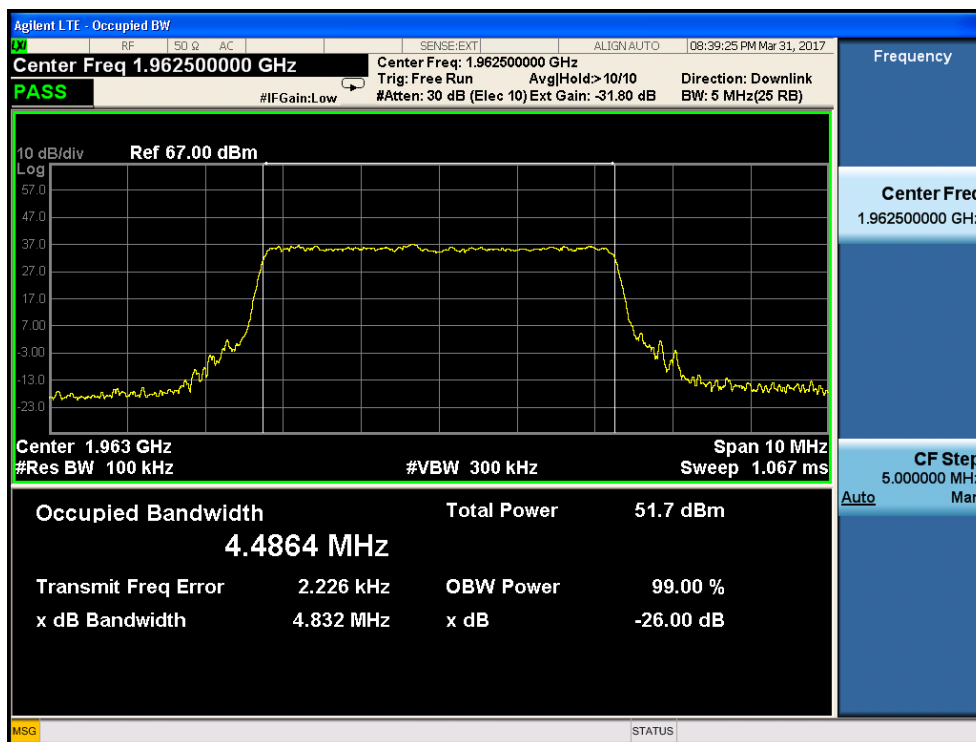
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1.3 middle frequency-- 5MHz bandwidth

Input:



Output:





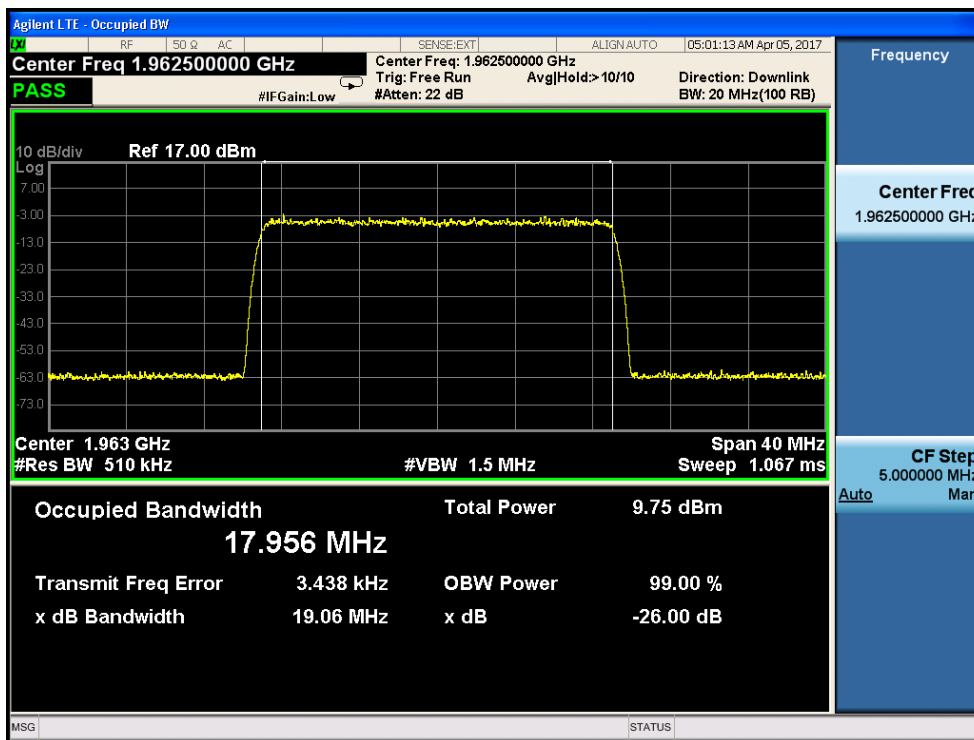
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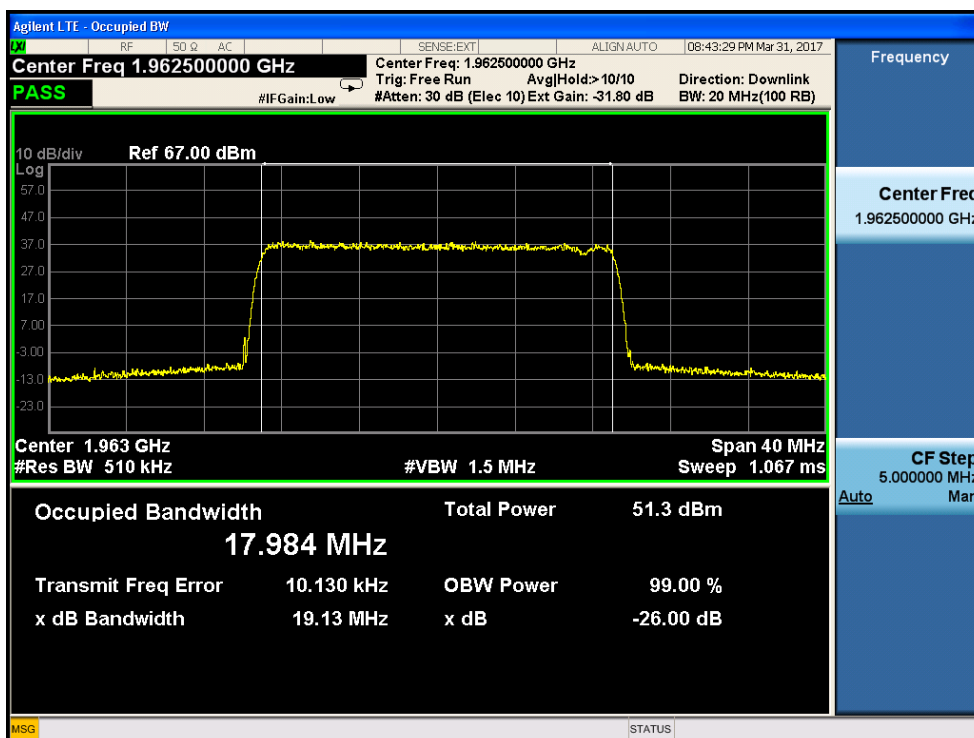
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1.4 middle frequency-- 20MHz bandwidth

Input:



Output:





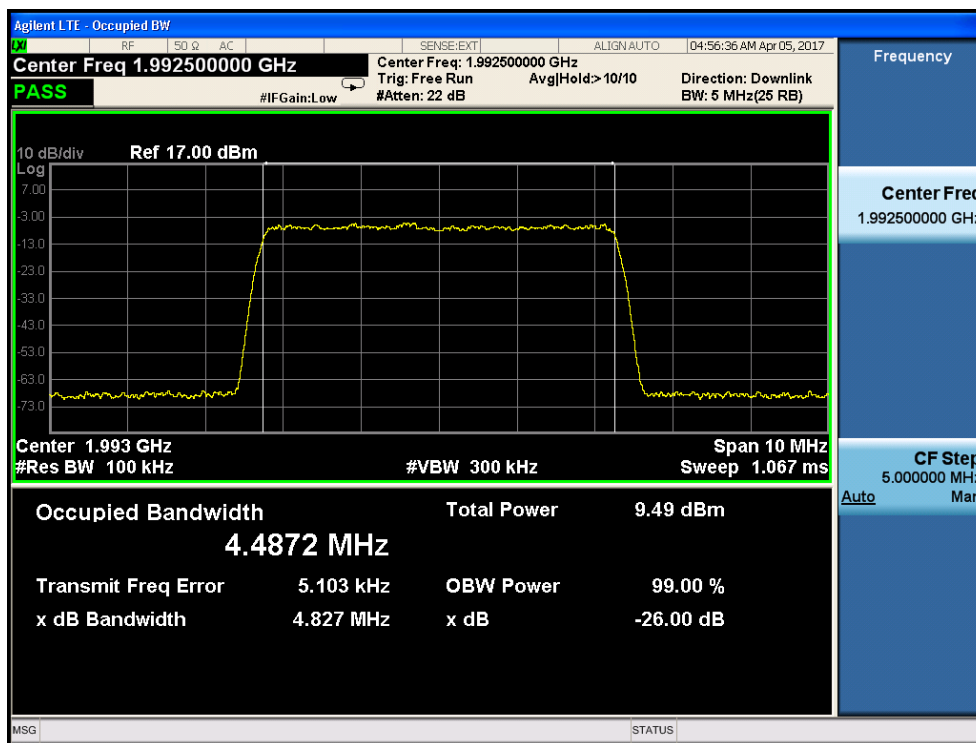
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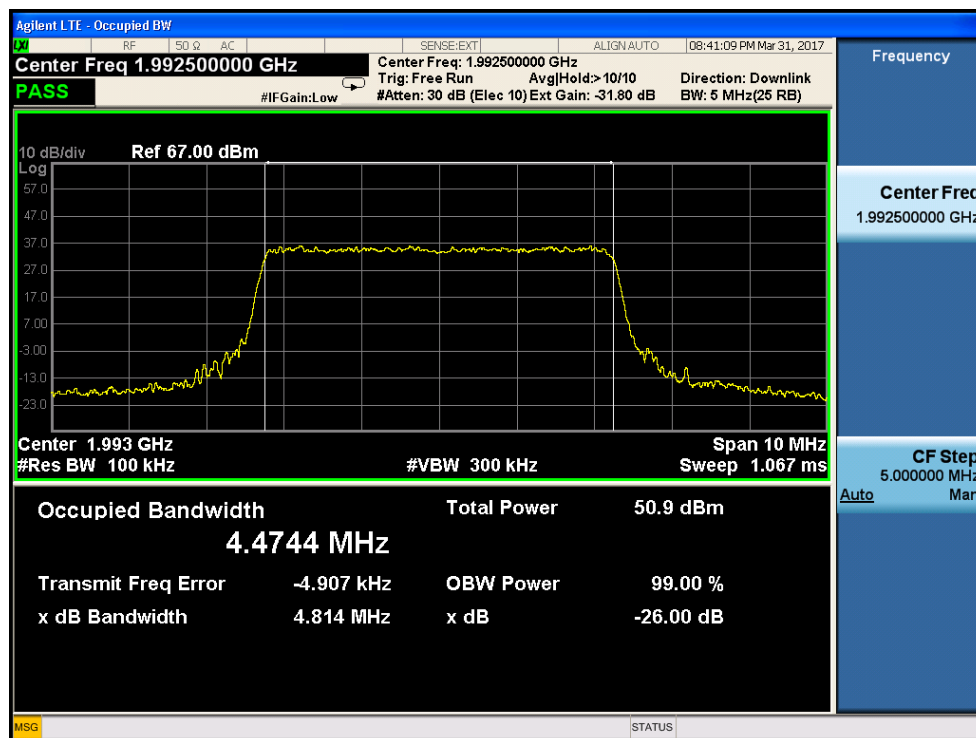
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1.5 highest frequency—5MHz bandwidth

Input:



Output:





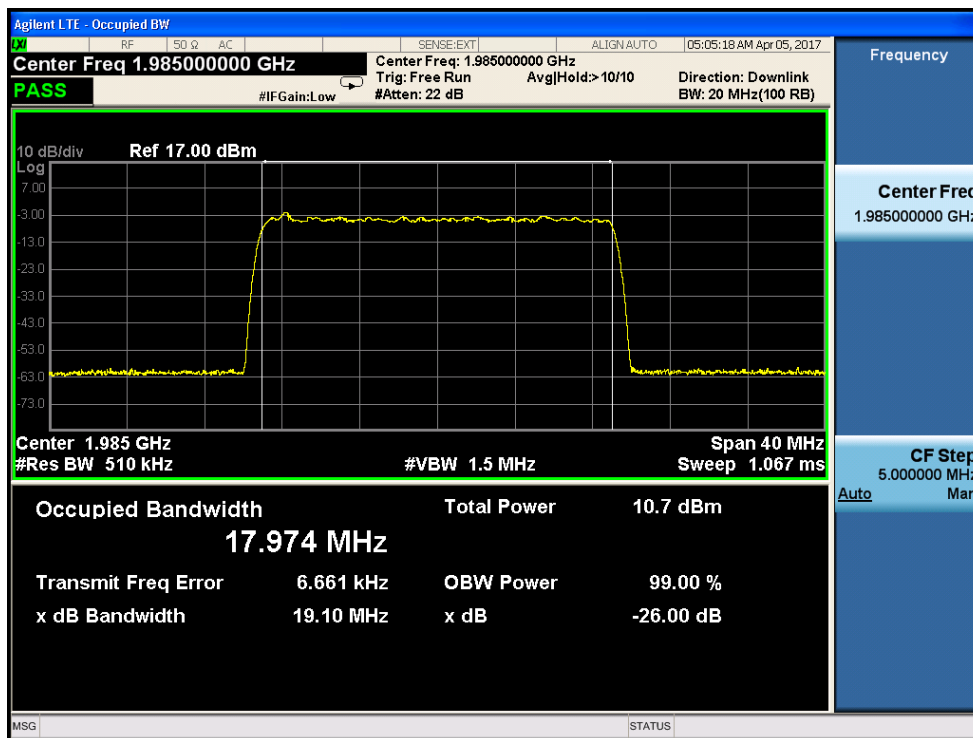
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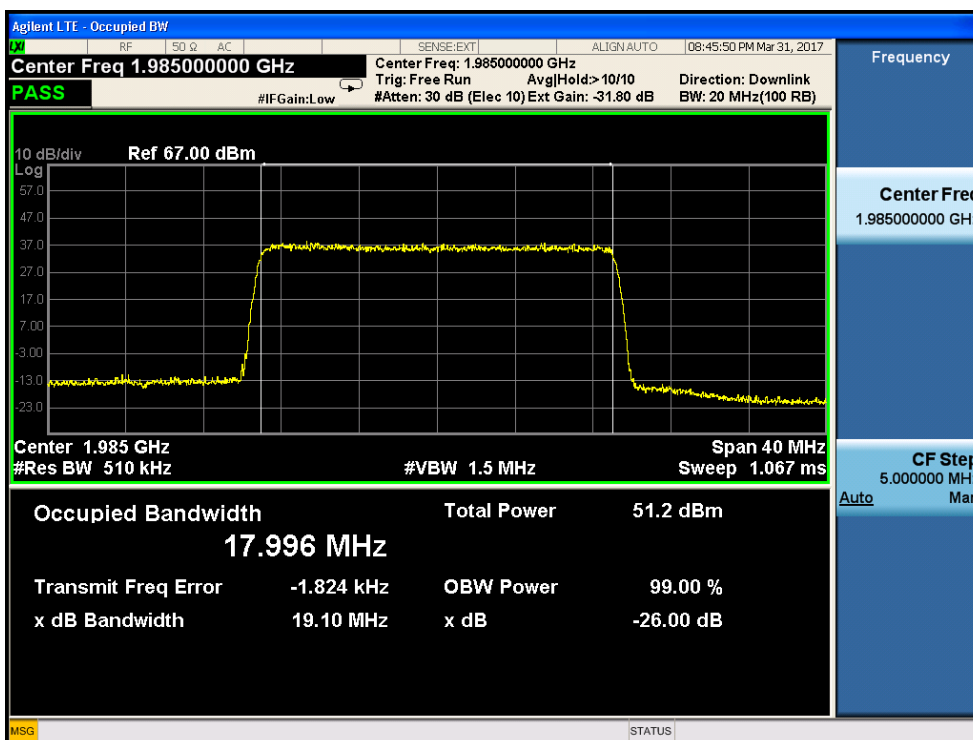
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1.6 highest frequency--20MHz bandwidth

Input:



Output:





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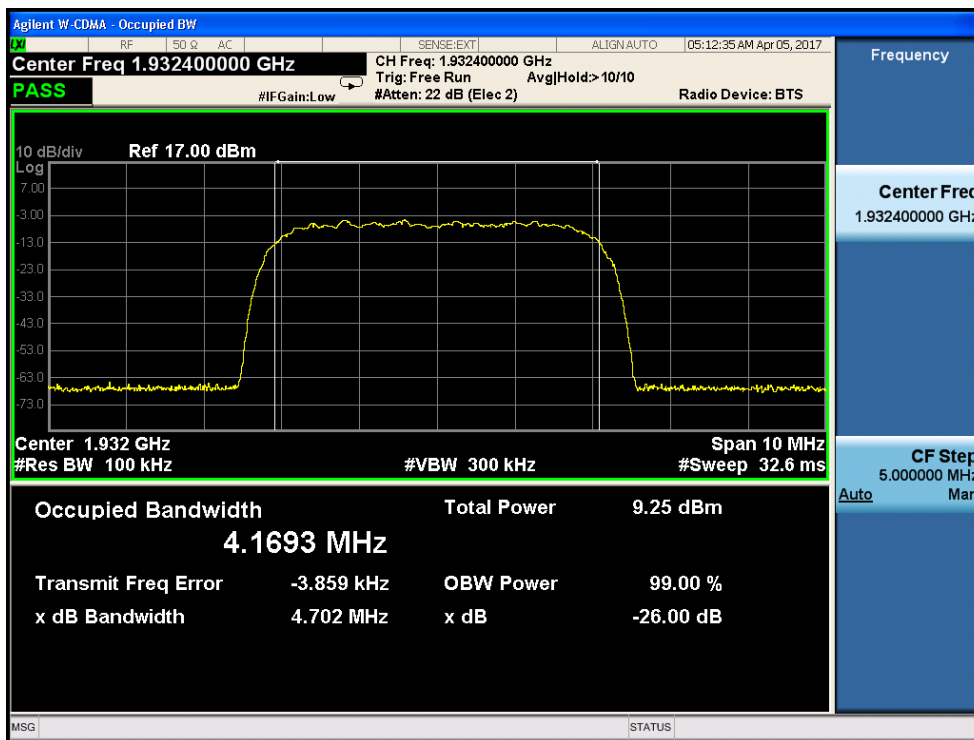
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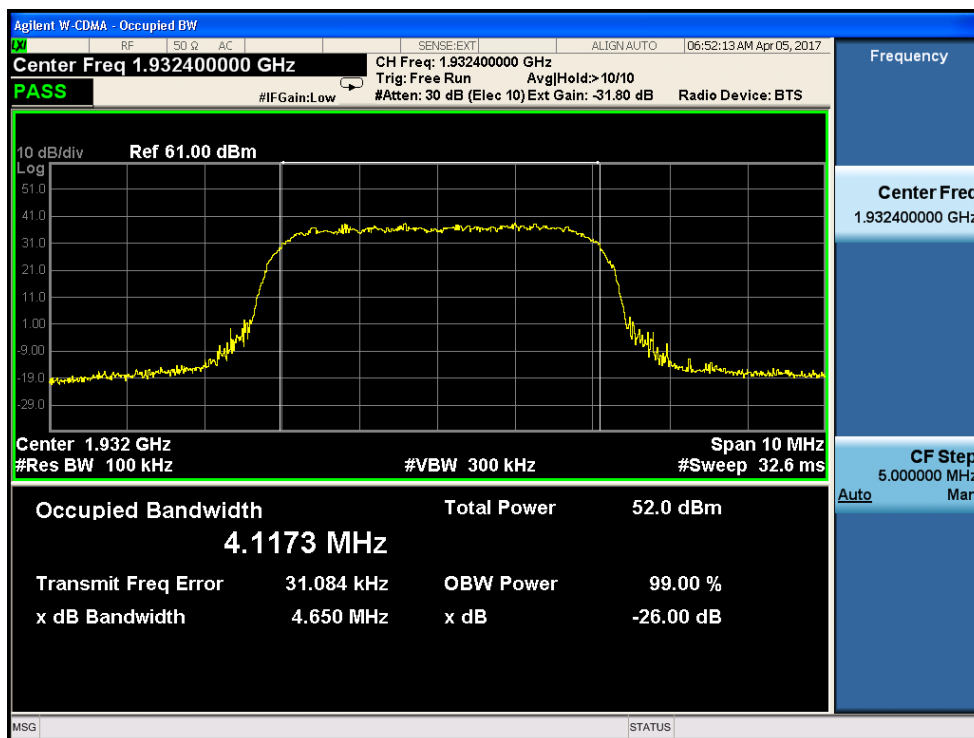
2. Downlink: 1930 MHz to 1995 MHz (WCDMA mode)

2.1 lowest frequency

Input:



Output:





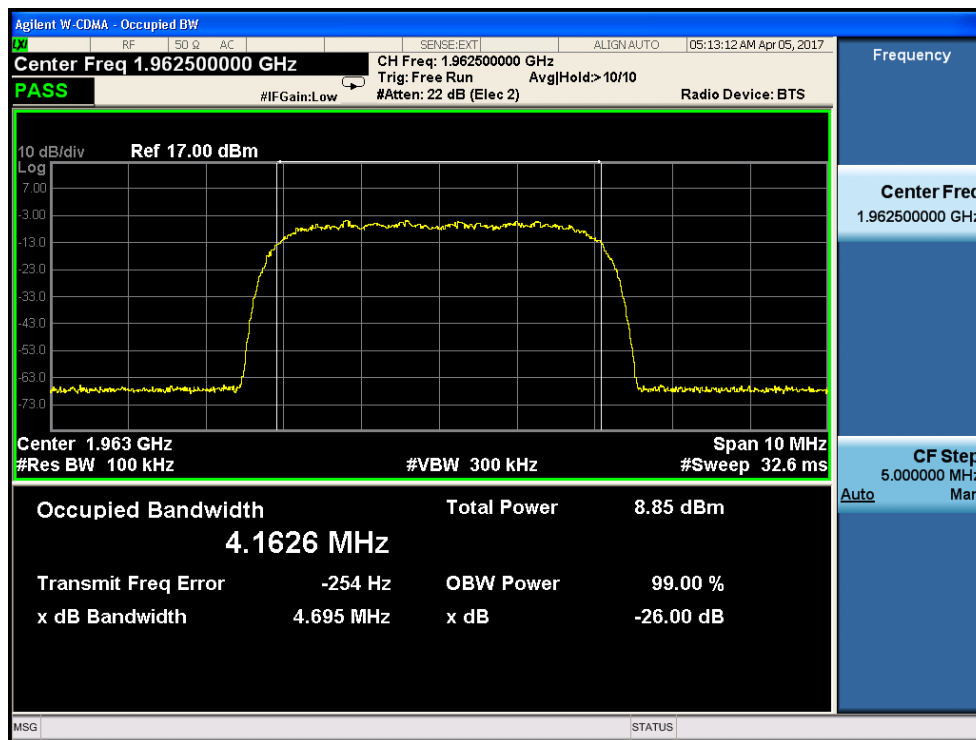
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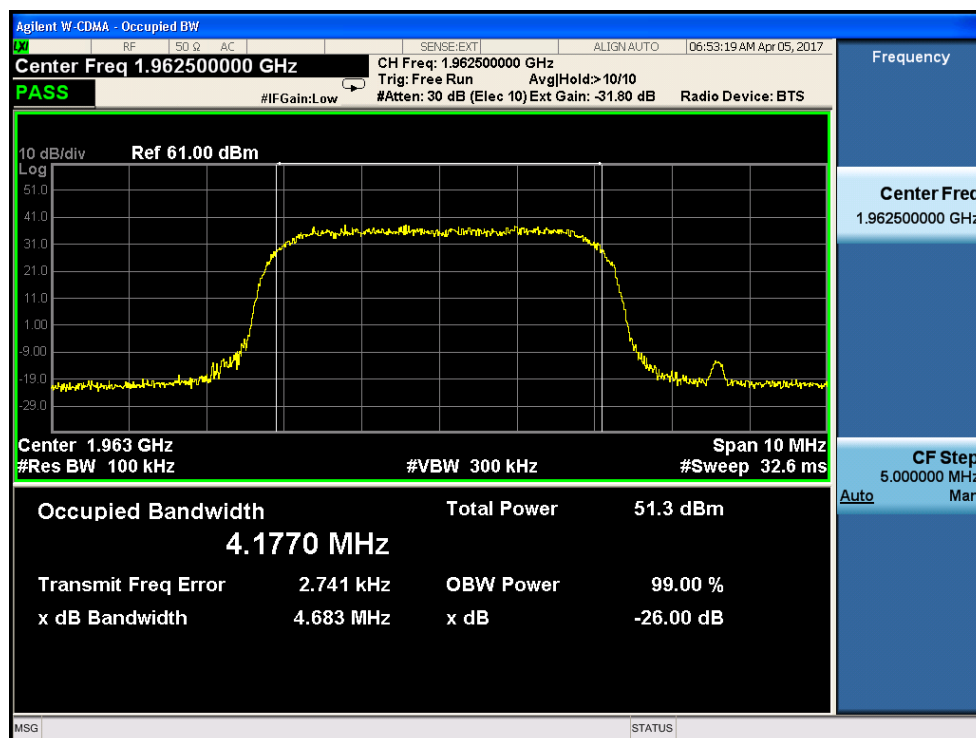
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2.2 Middle frequency

Input:



Output:





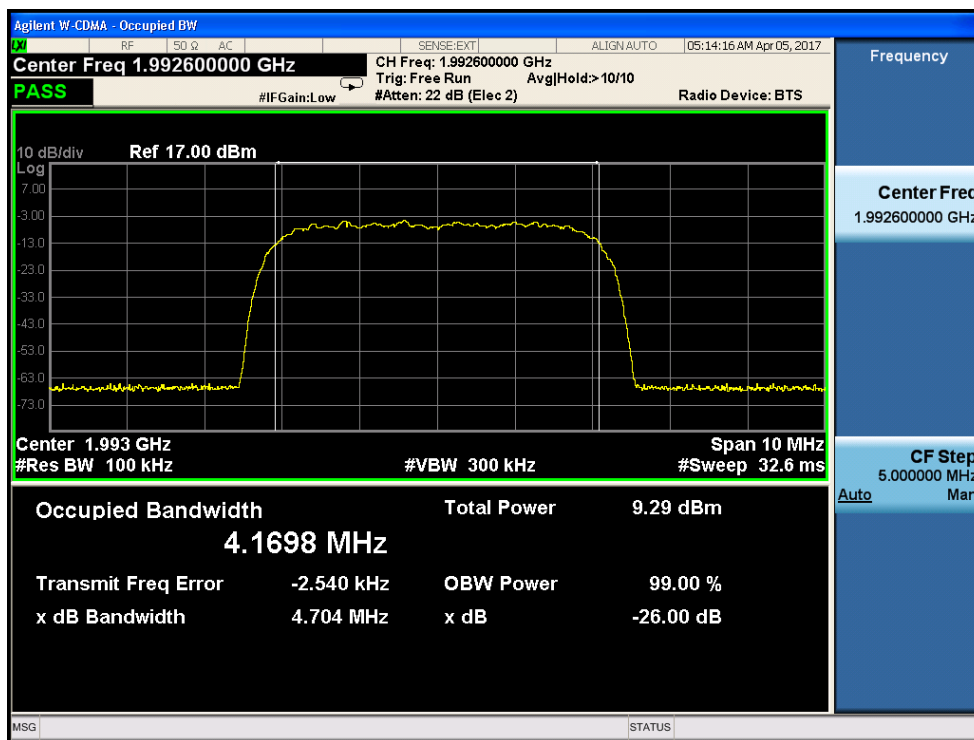
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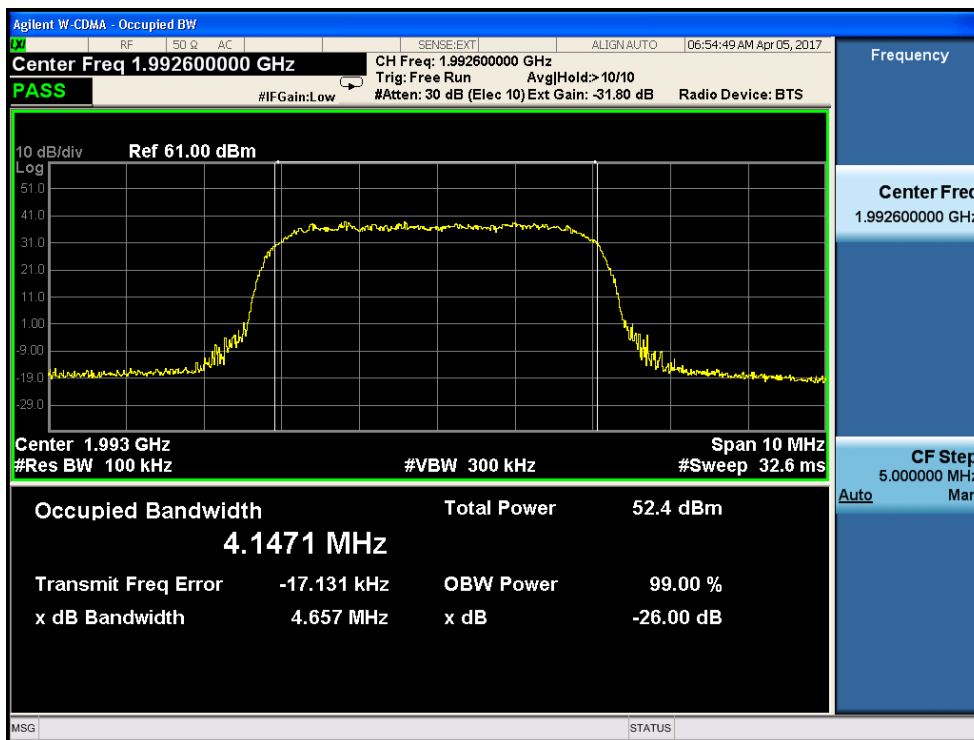
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2.3 Highest frequency

Input:



Output:





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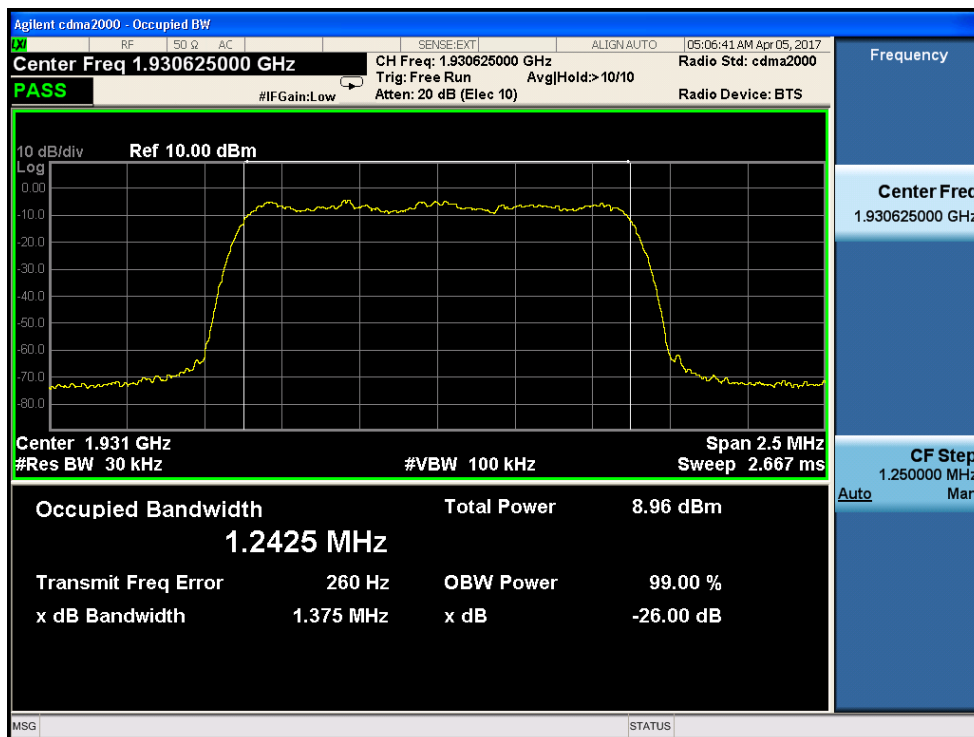
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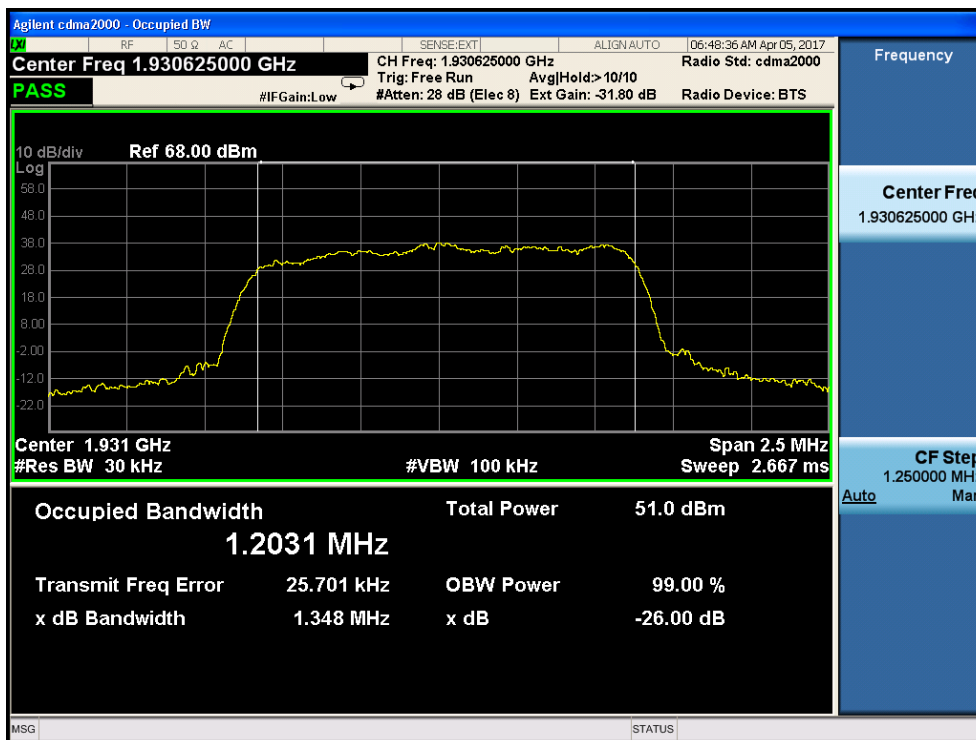
3.Downlink: 1930MHz to 1995MHz (CDMA mode)

3.1 lowest frequency

Input:



Output:





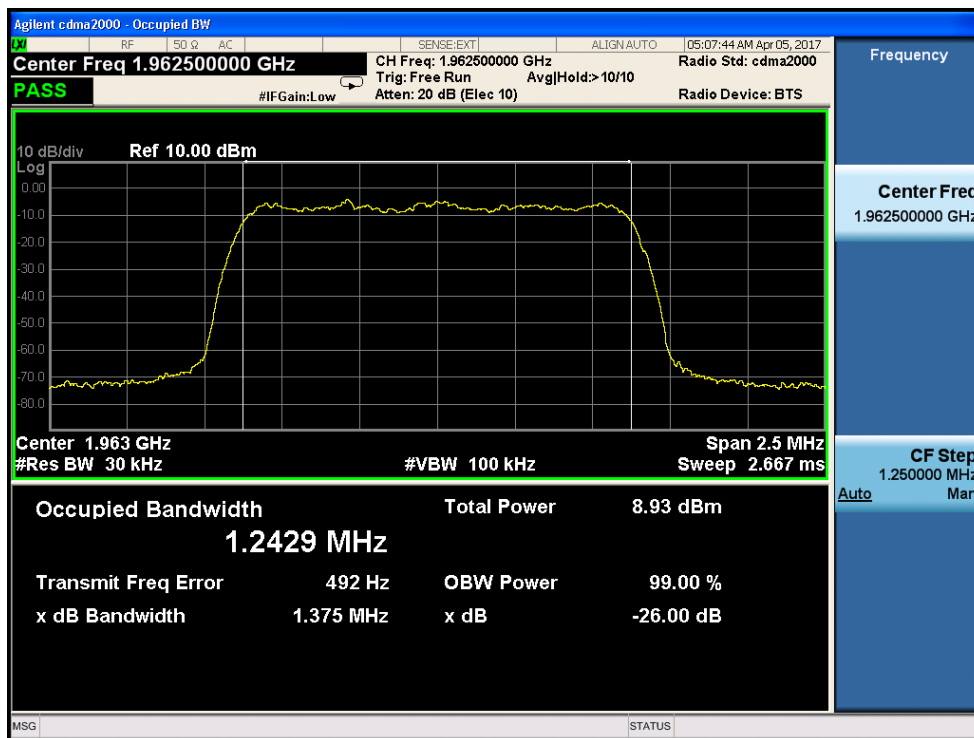
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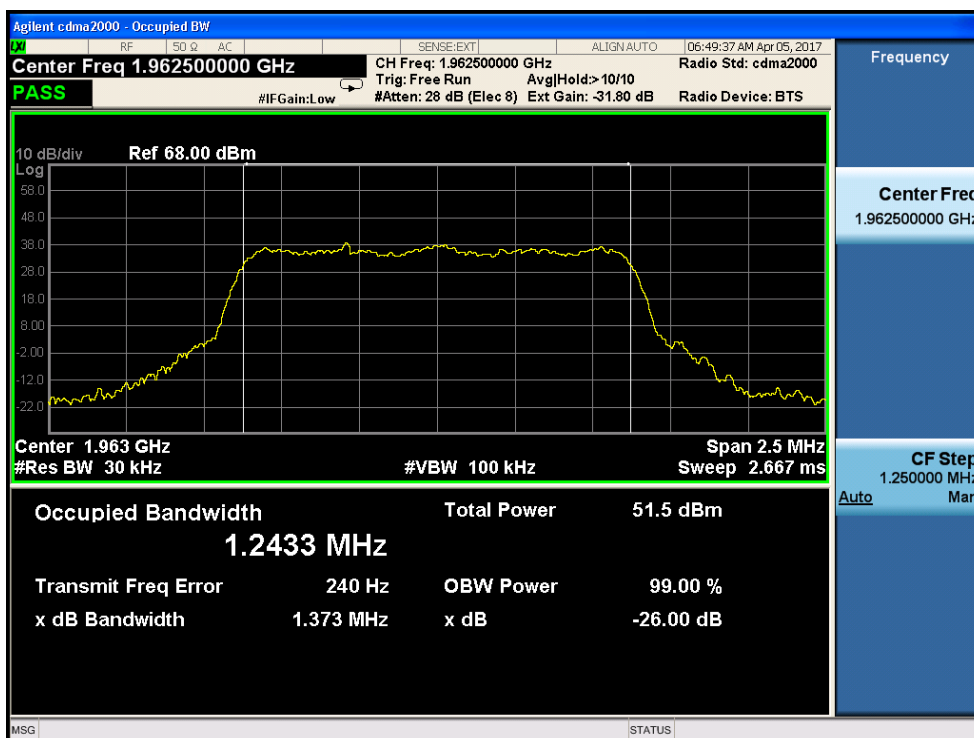
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3.2 Middle frequency

Input:



Output:





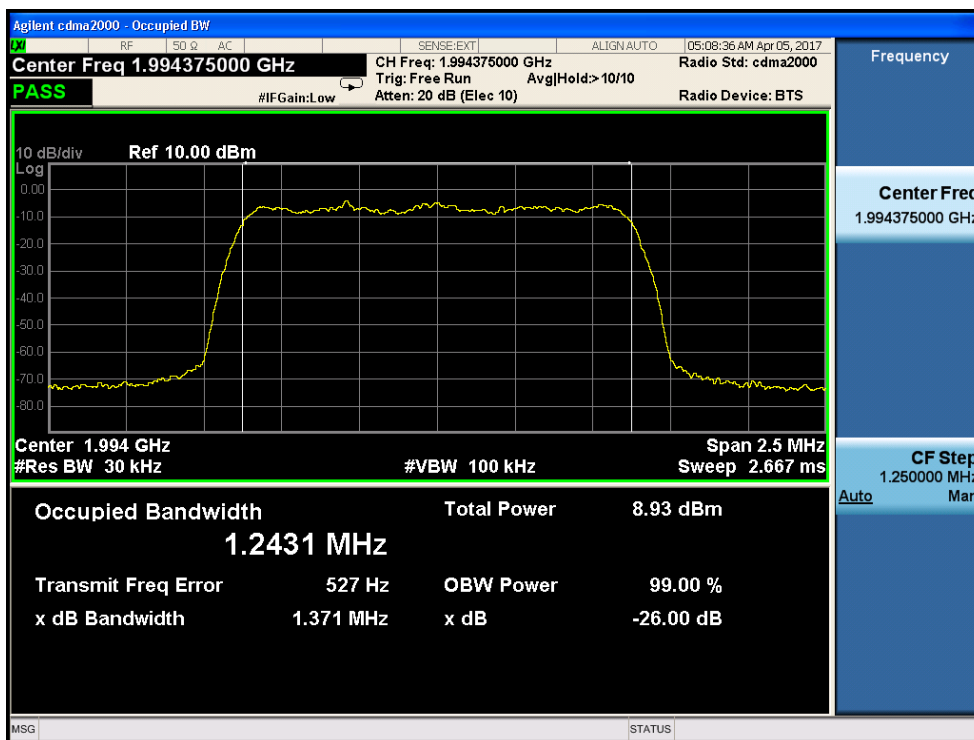
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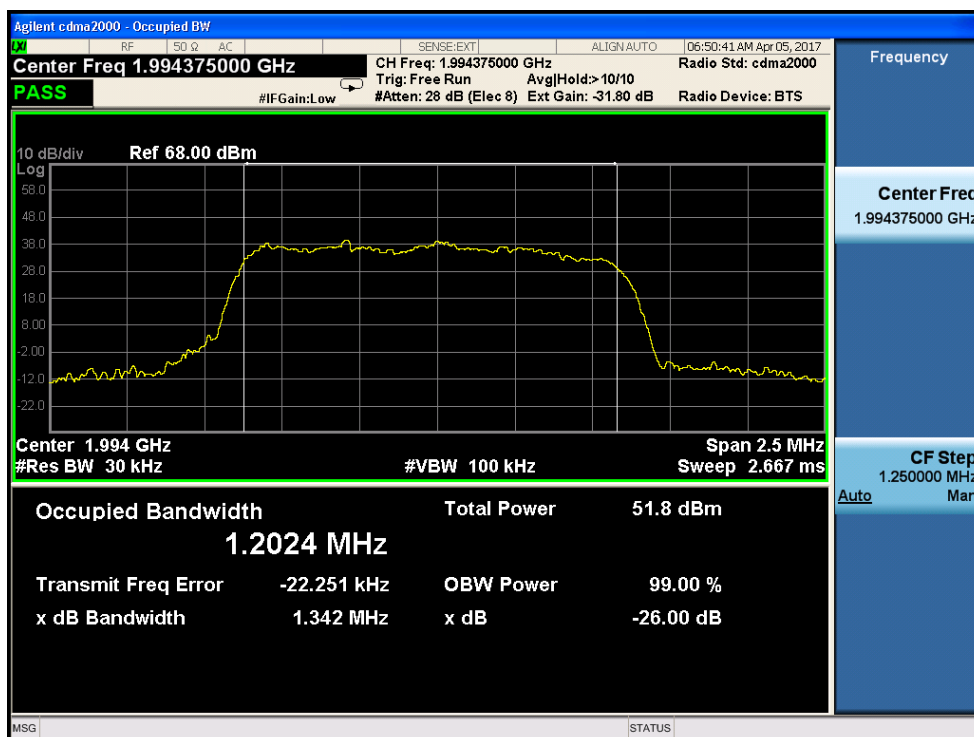
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3.3 Highest frequency

Input:



Output:



7.2.6 Out of Band Rejection

Test Requirement:	Section D.3(I) of KDB 935210 D02 Signal Booster Certification v03r2 Test for rejection of out of band signals. Filter freq. response plots are acceptable.
Test Method:	KDB 935210 D05 Indus Booster Basic Meas v01r01
EUT Operation:	
Status:	Drive the EUT to maximum output power. .
Conditions:	Normal conditions
Application:	Cellular Band RF output ports
Test Configuration:	

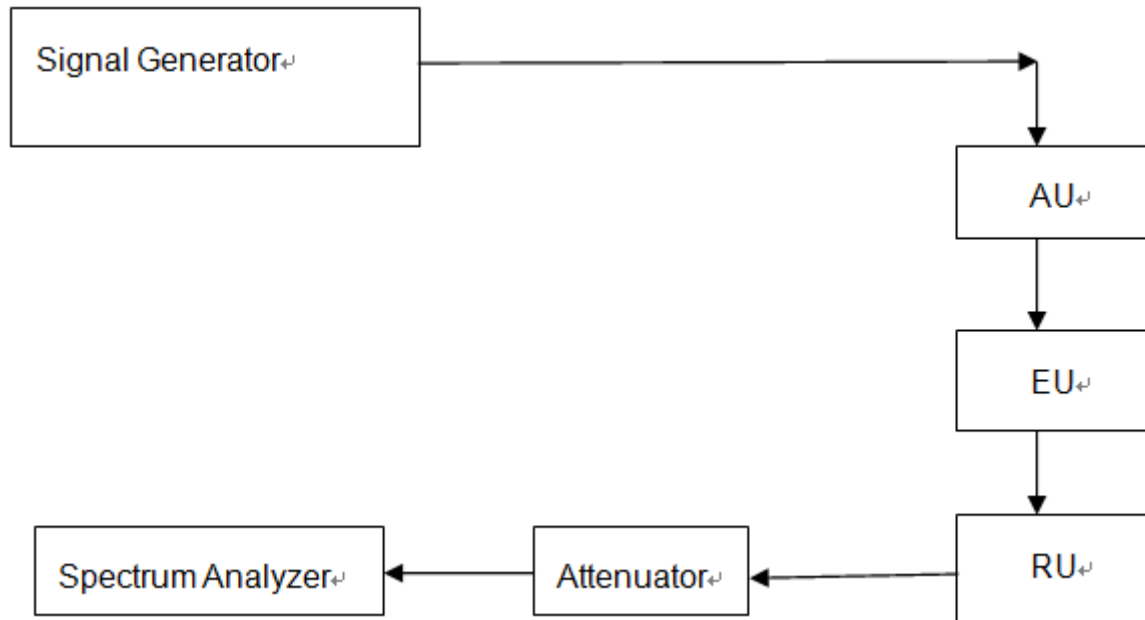


Fig.4. Out of Band rejection test configuration

Test Procedure:	<ol style="list-style-type: none"> 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; <ul style="list-style-type: none"> · CW signal rather than typical signal is acceptable (for FM). · Multiple band filter will need test each other.
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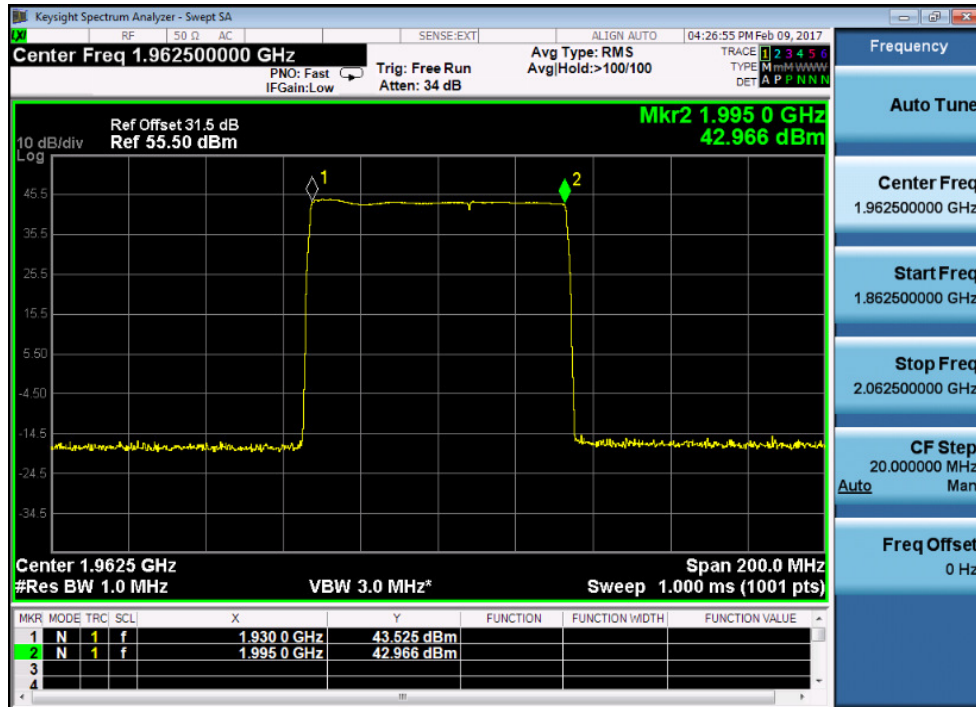
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7.2.6.1 Measurement Record:

Downlink: 1930MHz to 1995MHz





7.2.7 Frequency Stability

Test Requirement: FCC part 24

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

EUT Operation:

Status: Drive the EUT to maximum output power.

Conditions: Temperature conditions, voltage conditions

Application: Cellular Band RF output ports

Test Procedure:

1. Temperature conditions:

- a) The RF output port of the EUT was connected to Frequency Meter;
- b) Set the working Frequency in the middle channel;
- c) record the 20 °C and nominal voltage frequency value as reference point;
- d) vary the temperature from -40 °C to 50 °C with step 10 °C
- e) when reach a temperature point, keep the temperature balance at least 1 hour to make the product working in this status;
- f) read the frequency at the relative temperature.

2. Voltage conditions:

- a) record the 20 °C and nominal voltage frequency value as reference point;
- b) vary the voltage from -15% nominal voltage to +15% voltage;
- c) read the frequency at the relative voltage.



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7.2.7.1 Measurement Record:

Frequency Stability vs temperature:

1. Test for Downlink: 1930MHz to 1995MHz (middle channel=1962.5MHz)

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	1962.500004	0.002038
40	1962.500004	0.002038
30	1962.500004	0.002038
20	1962.500004	0.002038
10	1962.500004	0.002038
0	1962.500004	0.002038
-10	1962.500004	0.002038
-20	1962.500004	0.002038
-30	1962.500004	0.002038
-40	1962.500004	0.002038

Frequency Stability vs voltage:

1. Test for Downlink: 1930MHz to 1995MHz (middle channel=1962.5MHz)

Voltage(V ac)	Frequency(MHz)	Tolerance(ppm)
102	1962.500004	0.002038
120	1962.500004	0.002038
138	1962.500004	0.002038

8 Photographs - Test Setup

Above 1GHz Radiated Emission



30MHz ~ 1GHz Radiated Emission



9 Photographs - EUT Constructional Details

Test Model No.: REU





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