



HCT. CO., LTD.

CERTIFICATION DIVISION

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CERTIFICATE OF COMPLIANCE (ERM EVALUATION)

Manufacture: Advanced RF Technologies, Inc.

3116 West VANOWEN STREET, BURBANK, CA 91505

Date of Issue:

April 28, 2014

Location:

HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

Test Report No.: HCT-R-1404-F020-1

FCC ID:

S2O-AXM1900-9543I

APPLICANT:

Advanced RF Technologies, Inc.

EUT Type:

REPEATER

Model:

AXM1900-9543-ICS

Frequency Ranges:

DL : 1930 MHz ~ 1995 MHz

UL : 1850 MHz ~ 1915 MHz

Conducted Output Power:

DL : 20 W(43 dBm)

UL : 1 W(30 dBm)

FCC Rules Part(s):

CFR 47, Part 24

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 24 of the FCC Rules under normal use and maintenance.

Report prepared by
: Yong Hyun Lee
Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1404-F020	April 22, 2014	- First Approval Report
HCT-R-1404-F020-1	April 28, 2014	- Revised the RF output power watt value.

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1. CLIENT INFORMATION

The EUT has been tested by request of

Company	Advanced RF Technologies, Inc. 3116 West VANOWEN STREET, BURBANK, CA 91505
Contact Point	Attention/ E-Mail: HK Song/ hk4464@adrfttech.com Tel./ H.P. : +82-31-637-4435/ +82-10-3191-4773

- **FCC ID:** S2O-AXM1900-9543I
- **APPLICANT:** Advanced RF Technologies, Inc.
- **EUT Type:** REPEATER
- **Model:** AXM1900-9543-ICS
- **Frequency Ranges:** DL : 1930 MHz ~ 1995 MHz
UL : 1850 MHz ~ 1915 MHz
- **Conducted Output Power:** DL : 20 W(43 dBm)
UL : 1 W(30 dBm)
- **Antenna Gain(s) :** 18 dBi
- **Date(s) of Tests:** 2014. 03. 31. ~ 2014. 04. 18
- **FCC Rules Part(s):** CFR Title 47 Part 24
- **Measurement standard(s):** ANSI/TIA-603-C-2004, KDB 971168 D01 v02r01,
KDB 935210 D02 v01r01
- **Place of Tests:** 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do,
Korea. (IC Recognition No. : 5944A-3)

2. FACILITIES AND ACCREDITATIONS

2.1. FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 21, 2011 (Registration Number: 90661).

2.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

3. TEST SUMMARY

3.1. STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 24.

Description	Reference	Results
Conducted RF Output Power	§2.1046; §24.232	Compliant
Occupied Bandwidth	§2.1049	Compliant
Spurious Emissions at Antenna Terminals	§2.1051, §24.238	Compliant
Out of Band Rejection	KDB 935210 D02 v01r01	Compliant
Radiated Spurious Emissions	§2.1053, §24.238	Compliant
Frequency Stability	§2.1055, §22.235	Compliant

3.2. MODE OF OPERATION DURING THE TEST

The EUT was operated in a manner representative of the typical usage of the equipment.

During all testing, system components were manipulated within the confines of typical usage to maximize each emission.

The device does not supply antenna(s) with the system, so the dummy loads were connected to the RF output ports for radiated spurious emission testing.

QPSK was only selected and tested since it's the worst case configuration among all here modulations (QPSK, 16QAM, 64QAM).

4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

Temperature :	+ 15 °C to + 35 °C
Relative humidity:	30 % to 60 %
Air pressure	860 mbar to 1 060 mbar

5. TEST EQUIPMENT

Manufacturer	Model / Equipment	Cal Interval	Calibration Due	Serial No.
Agilent	E4438C /Signal Generator	Annual	09/05/2014	MY42082646
Agilent	N5182A /Signal Generator	Annual	09/30/2014	MY50141649
Agilent	E4416A /Power Meter	Annual	10/16/2014	GB41291412
Agilent	E9327A/ Power Sensor	Annual	03/31/2015	MY4442009
NANGYEUL CO., LTD.	NY-THR18750/ Temperature and Humidity Chamber	Annual	10/30/2014	NY-2009012201A
Agilent	N9020A /Signal Analyzer	Annual	04/16/2015	US46220219
WEINSCHTEL	67-30-33 / Fixed Attenuator	Annual	11/05/2014	BU5347
MCE / Weinschel	2-10 / Fixed Attenuator	Annual	10/28/2014	BR0554
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
MITEQ	AMF-6D-001180-35-20P/AMP	Annual	09/12/2014	1081666
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	07/05/2015	1151
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	07/05/2015	1151
Schwarzbeck	VULB 9168/TRILOG Antenna	Biennial	07/02/2014	9168-255

6. RF OUTPUT POWER

Test Requirements:

§ 2.1046 Measurements required: RF power output:

§ 2.1046 (a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

§ 2.1046 (b) For single sideband, independent sideband, and single channel, controlled carrier radiotelephone transmitters, the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and as applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.

§ 2.1046 (c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

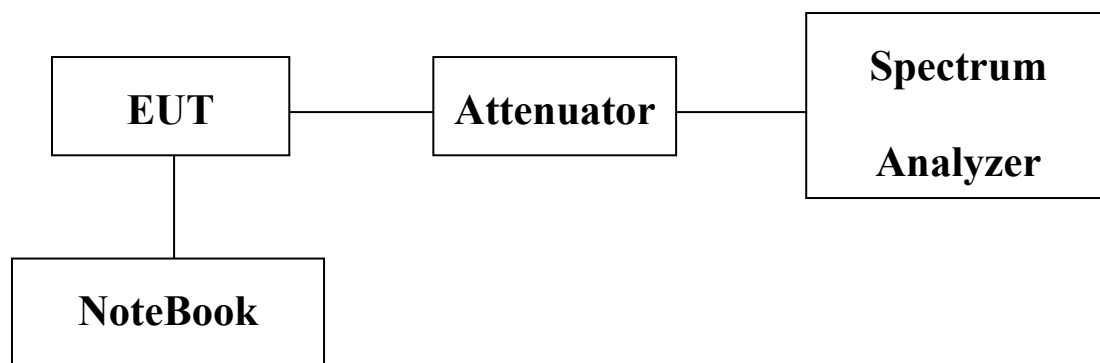
§ 24.232 **Power and antenna height limits.** (a) Base stations are limited to 1640 watts peak equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below. See §24.53 for HAAT calculation method.

Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 1 of this section.

The service area boundary limit and microwave protection criteria specified in §24.236 and §24.237 apply.

Test Procedures:

As required by 47 CFR 2.1046, RF power output measurements were made at the RF output terminals using an attenuator and spectrum analyzer or power meter. This test was performed in all applicable modulations.



Block Diagram 1. RF Power Output Test Setup

Test Results:

Input Signal	Input Level (dBm)	Maximum Amp Gain
CDMA	DL : -52 dBm UL : -65 dBm	DL : 95 dB UL : 95 dB
WCDMA		
LTE		

[Downlink]

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
CDMA	Low	1931.25	43.06	20.230
	Middle	1962.50	42.94	19.679
	High	1993.75	42.82	19.143
WCDMA	Low	1932.50	43.05	20.184
	Middle	1962.50	43.02	20.045
	High	1992.50	43.02	20.045

[Downlink]

	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
LTE 5 MHz	Low	1932.50	43.02	20.045
	Middle	1962.50	43.04	20.137
	High	1992.50	43.05	20.184
LTE 10 MHz	Low	1935.00	43.01	19.999
	Middle	1962.50	43.01	19.999
	High	1990.00	43.02	20.045
LTE 15 MHz	Low	1937.50	43.03	20.091
	Middle	1962.50	43.00	19.953
	High	1987.50	43.06	20.230

[Uplink]

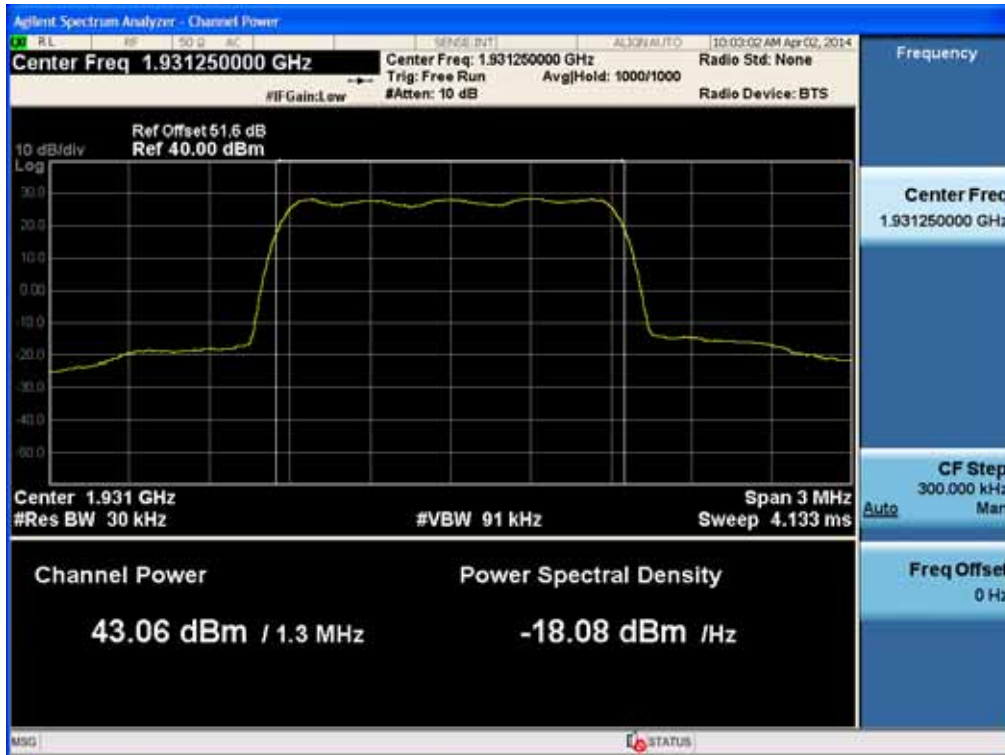
	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
CDMA	Low	1851.25	29.98	0.995
	Middle	1882.50	30.06	1.014
	High	1913.75	29.53	0.897
WCDMA	Low	1852.50	29.99	0.998
	Middle	1882.50	30.09	1.021
	High	1912.50	30.01	1.002

[Uplink]

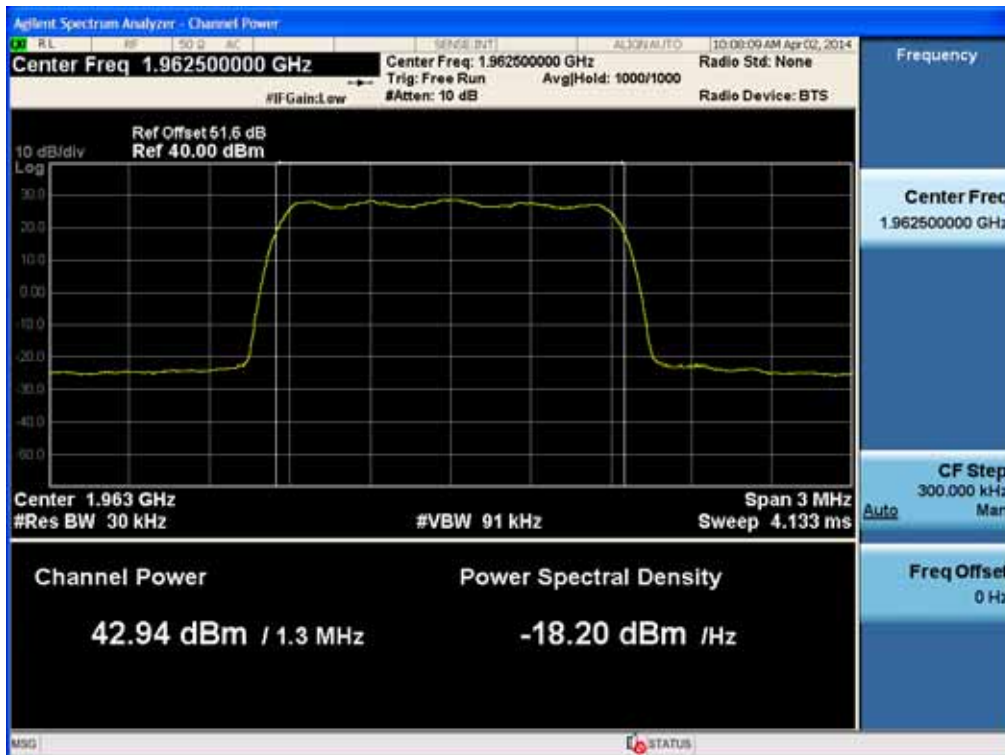
	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
LTE 5 MHz	Low	1852.50	30.06	1.014
	Middle	1882.50	30.05	1.012
	High	1912.50	29.99	0.998
LTE 10 MHz	Low	1855.00	30.06	1.014
	Middle	1882.50	29.99	0.998
	High	1910.00	29.99	0.998
LTE 15 MHz	Low	1857.50	30.07	1.016
	Middle	1882.50	30.03	1.007
	High	1907.50	30.05	1.012

Plots of RF Output Power

[CDMA Downlink Low]



[CDMA Downlink Middle]



[CDMA Downlink High]



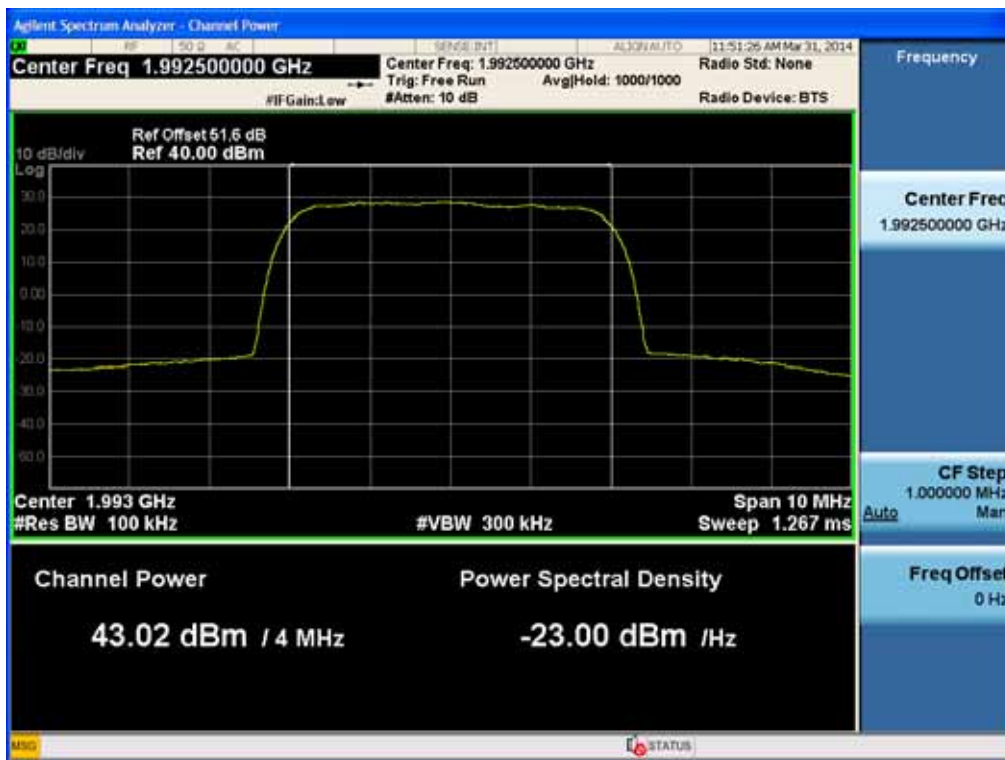
[WCDMA Downlink Low]



[WCDMA Downlink Middle]



[WCDMA Downlink High]



[LTE Downlink 5 MHz Low]



[LTE Downlink 5 MHz Middle]



[LTE Downlink 5 MHz High]



[LTE Downlink 10 MHz Low]



[LTE Downlink 10 MHz Middle]



[LTE Downlink 10 MHz High]



[LTE Downlink 15 MHz Low]



[LTE Downlink 15 MHz Middle]



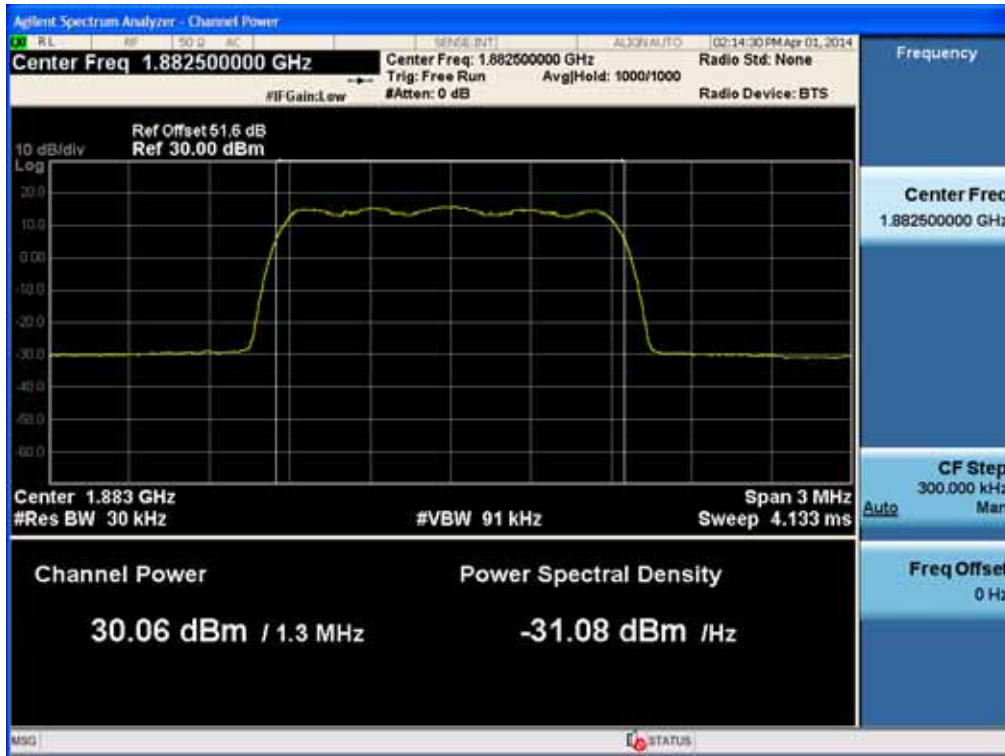
[LTE Downlink 15 MHz High]



[CDMA Uplink Low]



[CDMA Uplink Middle]



[CDMA Uplink High]



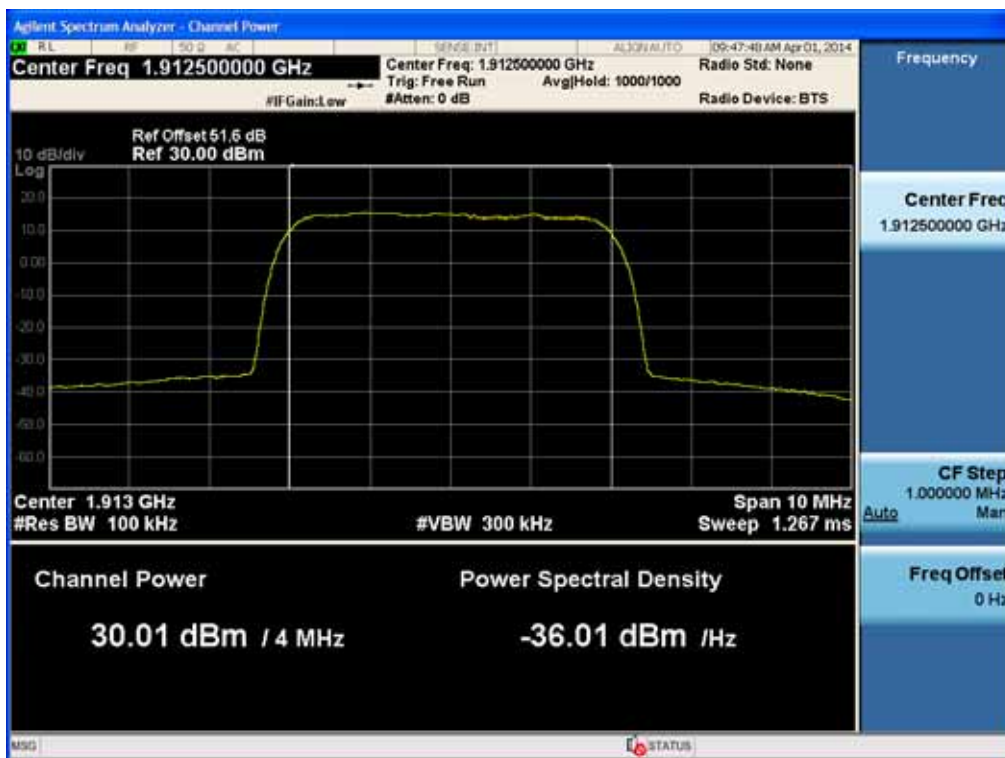
[WCDMA Uplink Low]



[WCDMA Uplink Middle]



[WCDMA Uplink High]



[LTE Uplink 5 MHz Low]



[LTE Uplink 5 MHz Middle]



[LTE Uplink 5 MHz High]



[LTE Uplink 10 MHz Low]



[LTE Uplink 10 MHz Middle]



[LTE Uplink 10 MHz High]



[LTE Uplink 15 MHz Low]



[LTE Uplink 15 MHz Middle]



[LTE Uplink 15 MHz High]



7. OCCUPIED BANDWIDTH

Test Requirement(s): § 2.1049 Measurements required: Occupied bandwidth:

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the specified conditions of § 2.1049 (a) through (i) as applicable.

Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made with a Spectrum Analyzer connected to the RF ports for both Uplink and Downlink. The modulation characteristics of signal generator's carrier was measured first at a maximum RF level prescribed by the OEM. The signal generator was then connected to either the Uplink or Downlink input at the appropriate RF level. The resulting modulated signal through the EUT was measured and compared against the original signal.

Test Results: The EUT complies with the requirements of this section.

Input Signal	Input Level (dBm)	Maximum Amp Gain
CDMA	DL : -52 dBm UL : -65 dBm	DL : 95 dB UL : 95 dB
WCDMA		
LTE		

[Downlink Output]

	Channel	Frequency (MHz)	OBW (MHz)
CDMA	Low	1931.25	1.2622
	Middle	1962.50	1.2629
	High	1993.75	1.2630
WCDMA	Low	1932.50	4.0559
	Middle	1962.50	4.0544
	High	1992.50	4.0470

[Downlink Input]

	Channel	Frequency (MHz)	OBW (MHz)
CDMA	Low	1931.25	1.2675
	Middle	1962.50	1.2650
	High	1993.75	1.2638
WCDMA	Low	1932.50	4.1719
	Middle	1962.50	4.1585
	High	1992.50	4.1651

[Downlink Output]

	Channel	Frequency (MHz)	OBW (MHz)
LTE 5 MHz	Low	1932.50	4.5103
	Middle	1962.50	4.5101
	High	1992.50	4.5085
LTE 10 MHz	Low	1935.00	8.9420
	Middle	1962.50	8.9536
	High	1990.00	8.9447
LTE 15 MHz	Low	1937.50	13.443
	Middle	1962.50	13.473
	High	1987.50	13.480

[Downlink Input]

	Channel	Frequency (MHz)	OBW (MHz)
LTE 5 MHz	Low	1932.50	4.5321
	Middle	1962.50	4.5370
	High	1992.50	4.5256
LTE 10 MHz	Low	1935.00	8.9760
	Middle	1962.50	8.9683
	High	1990.00	8.9761
LTE 15 MHz	Low	1937.50	13.533
	Middle	1962.50	13.503
	High	1987.50	13.557

[Uplink Output]

	Channel	Frequency (MHz)	OBW (MHz)
CDMA	Low	1851.25	1.2599
	Middle	1882.50	1.2638
	High	1913.75	1.2605
WCDMA	Low	1852.50	4.0845
	Middle	1882.50	4.0828
	High	1912.50	4.0931

[Uplink Input]

	Channel	Frequency (MHz)	OBW (MHz)
CDMA	Low	1851.25	1.2667
	Middle	1882.50	1.2630
	High	1913.75	1.2669
WCDMA	Low	1852.50	4.1373
	Middle	1882.50	4.1564
	High	1912.50	4.1629

[Uplink Output]

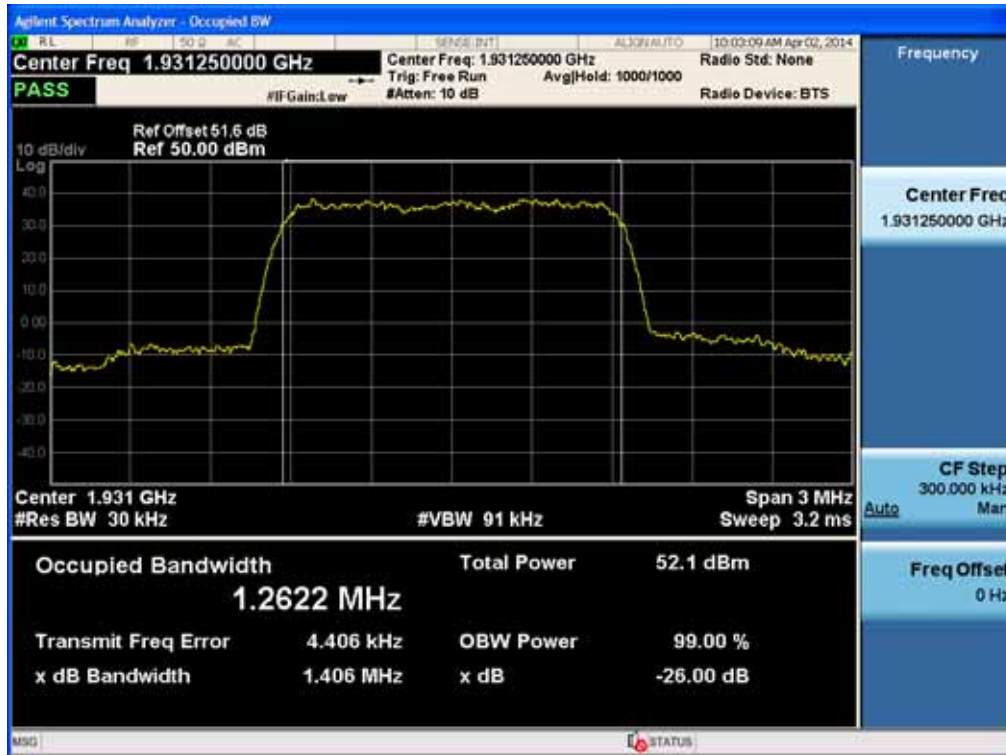
	Channel	Frequency (MHz)	OBW (MHz)
LTE 5 MHz	Low	1852.50	4.5138
	Middle	1882.50	4.5160
	High	1912.50	4.5145
LTE 10 MHz	Low	1855.00	8.9458
	Middle	1882.50	8.9483
	High	1910.00	8.9499
LTE 15 MHz	Low	1857.50	13.456
	Middle	1882.50	13.475
	High	1907.50	13.441

[Uplink Input]

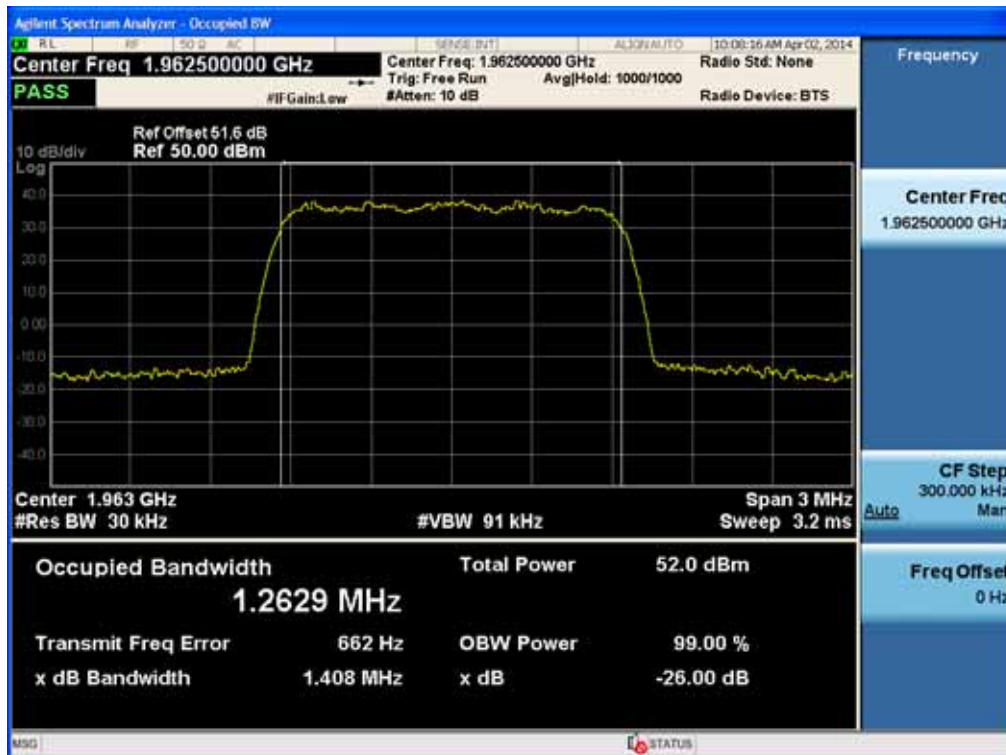
	Channel	Frequency (MHz)	OBW (MHz)
LTE 5 MHz	Low	1852.50	4.5310
	Middle	1882.50	4.5183
	High	1912.50	4.5327
LTE 10 MHz	Low	1855.00	8.9676
	Middle	1882.50	8.9715
	High	1910.00	8.9728
LTE 15 MHz	Low	1857.50	13.543
	Middle	1882.50	13.557
	High	1907.50	13.530

Plots of Occupied Bandwidth

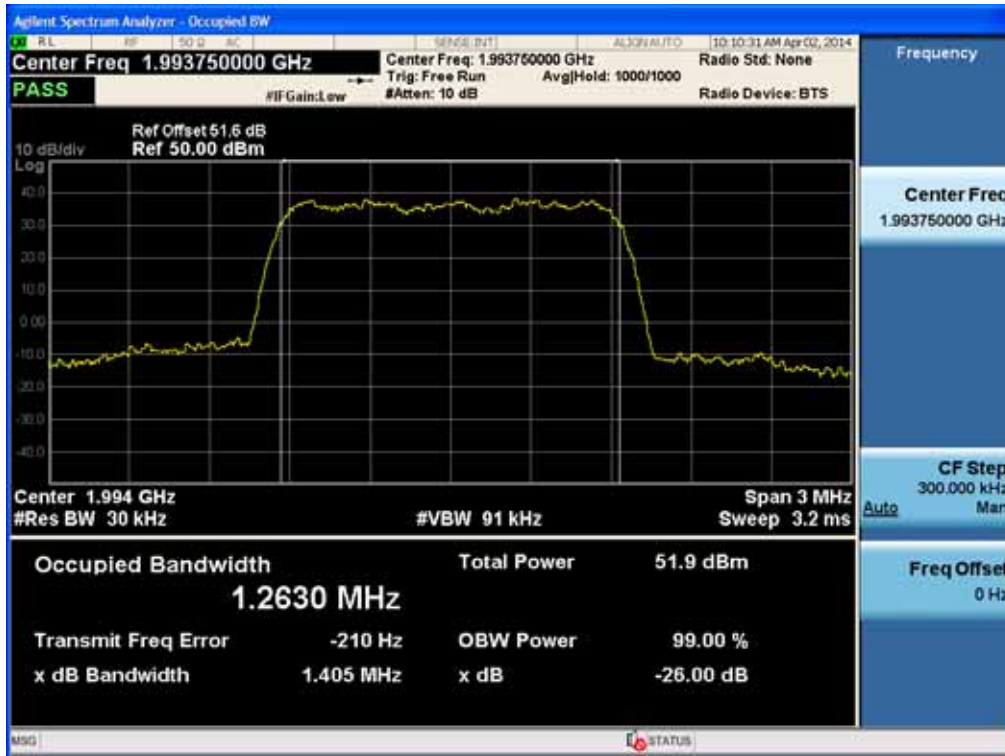
[Output CDMA Downlink Low]



[Output CDMA Downlink Middle]



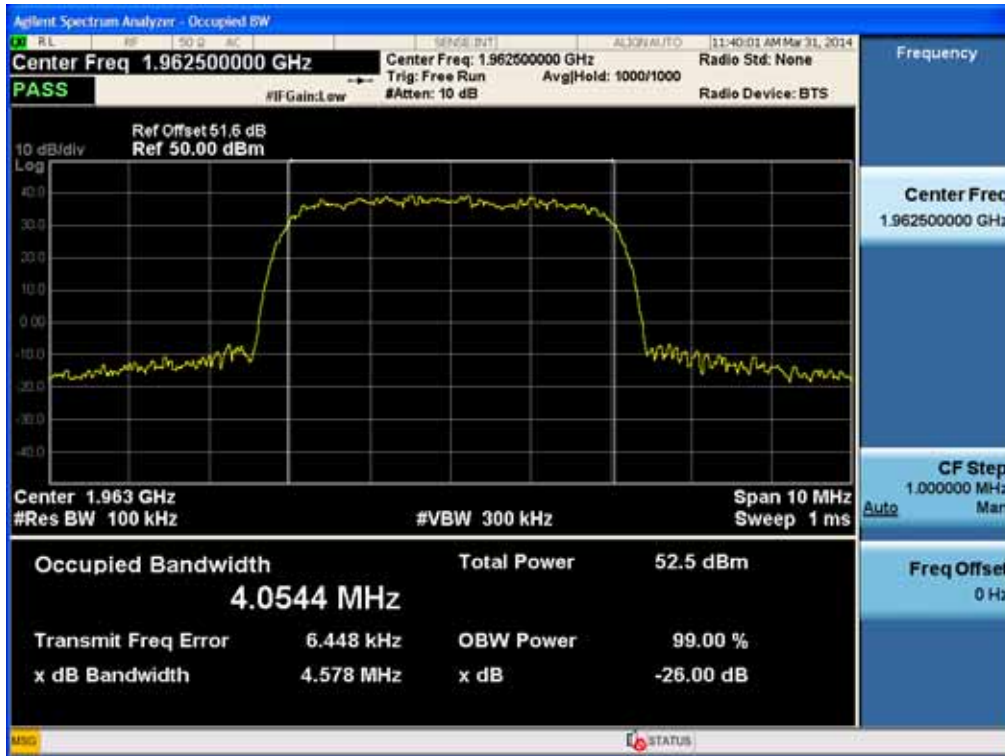
[Output CDMA Downlink High]



[Output WCDMA Downlink Low]



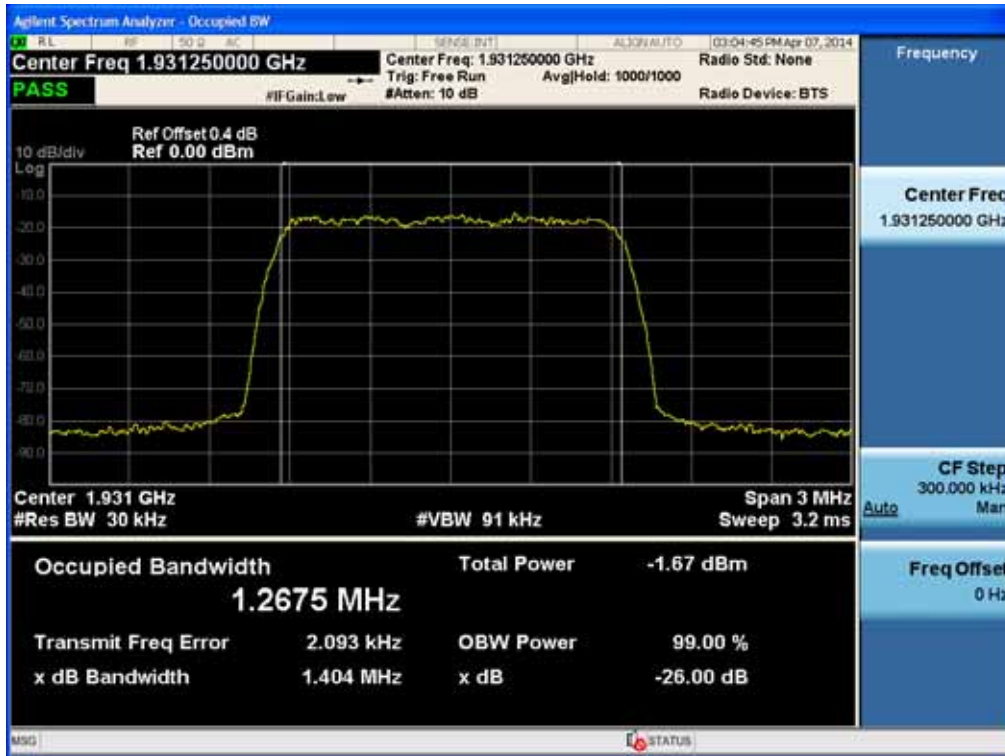
[Output WCDMA Downlink Middle]



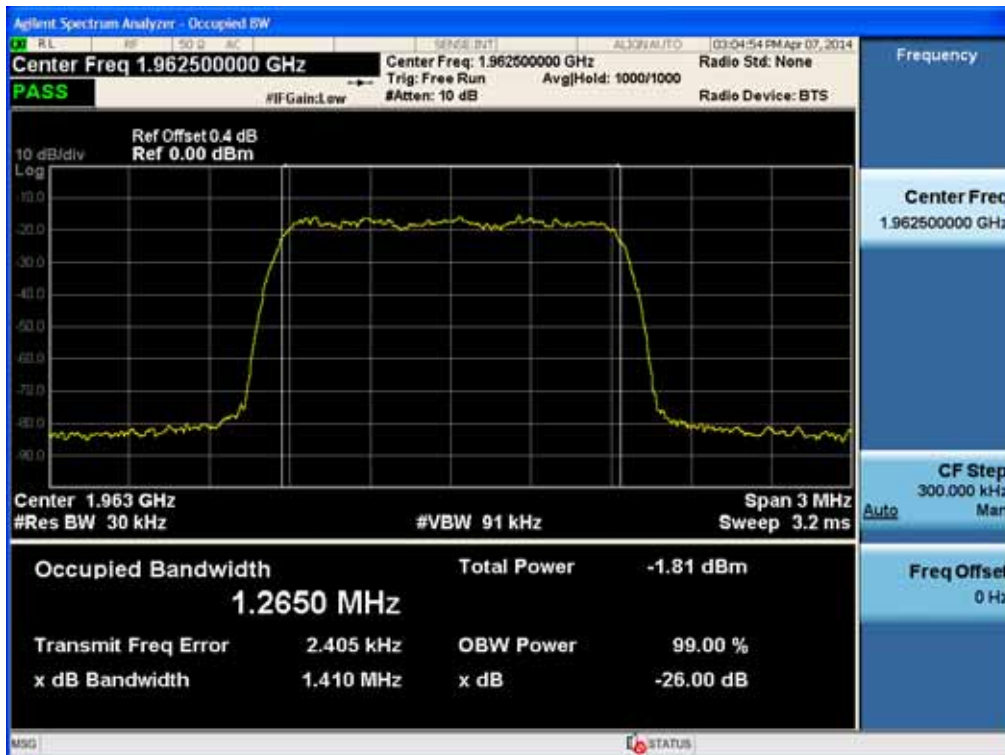
[Output WCDMA Downlink High]



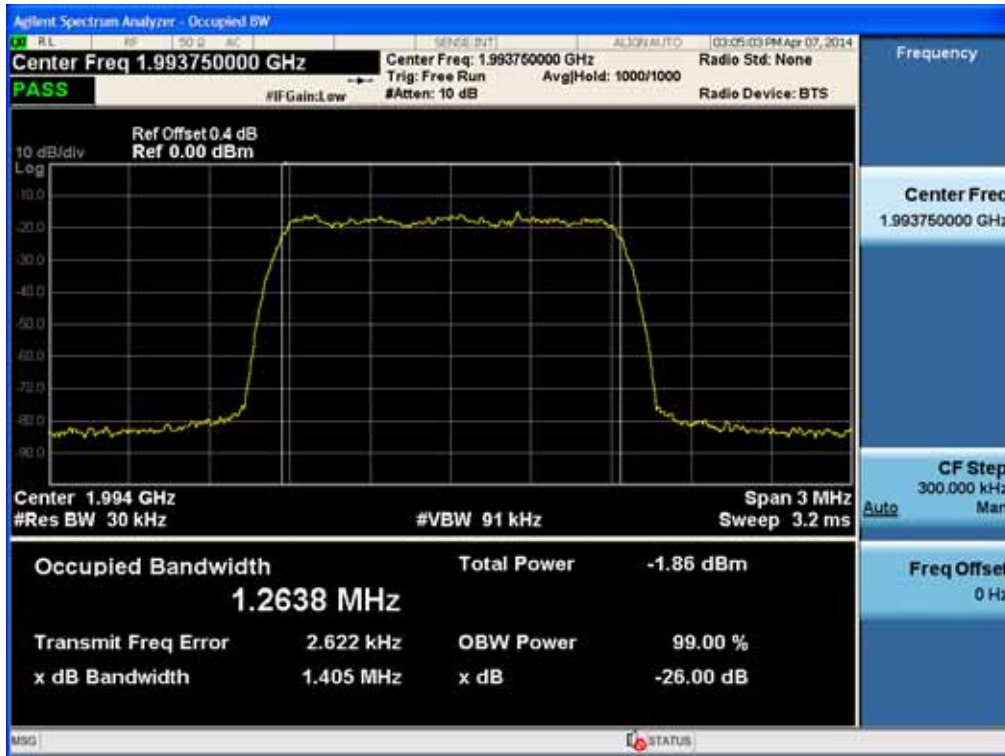
[Input CDMA Downlink Low]



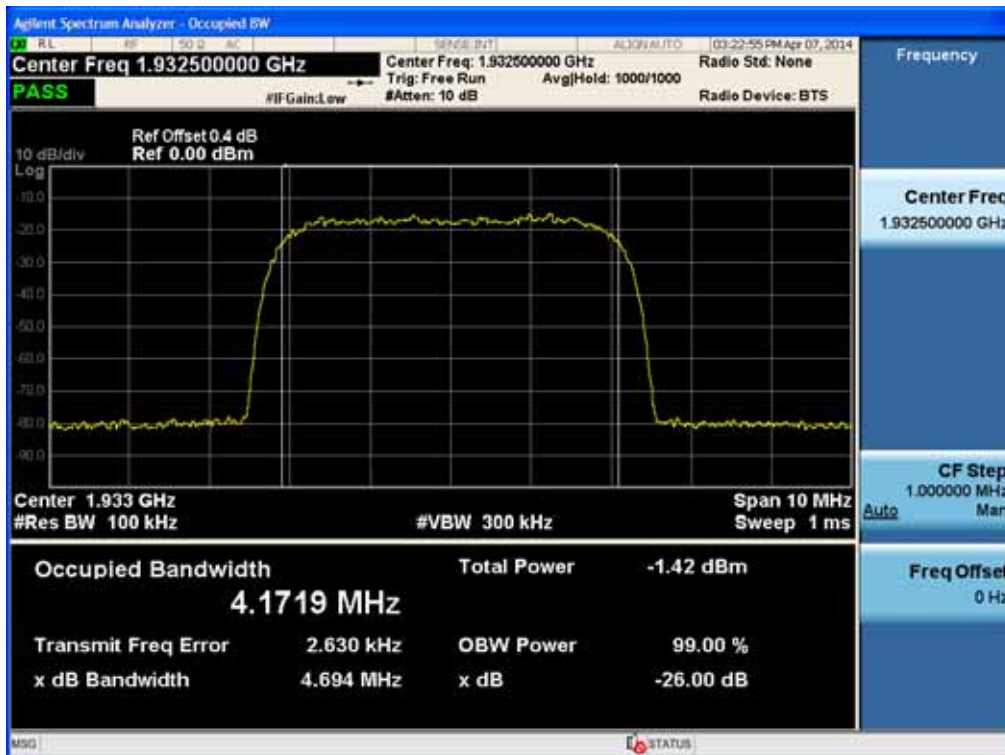
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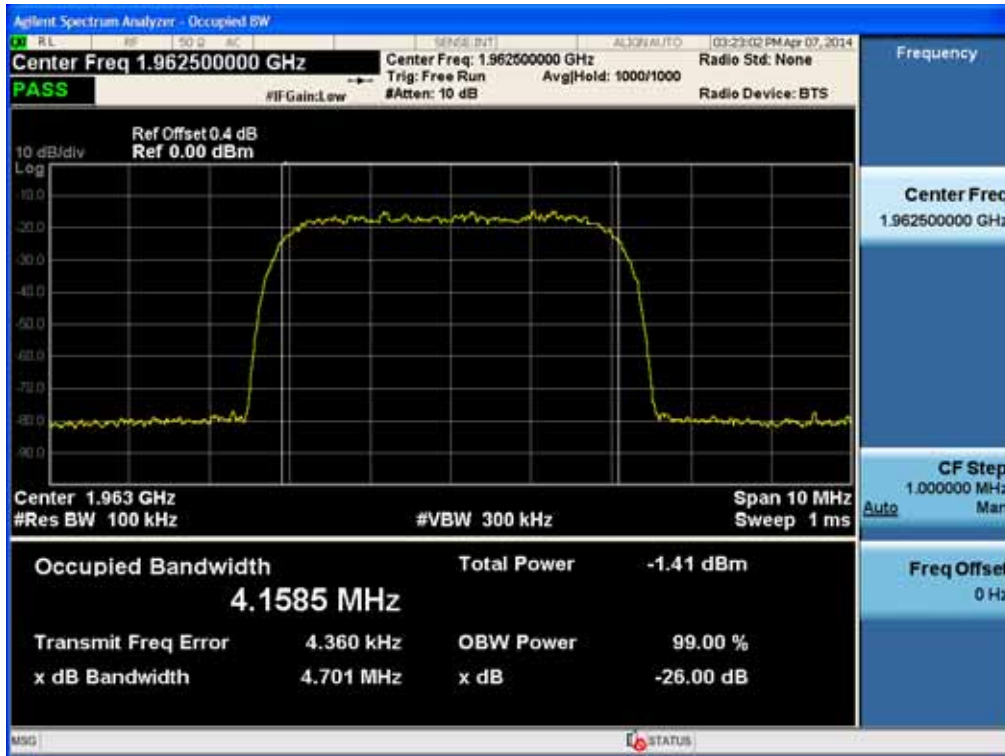
[Input CDMA Downlink High]



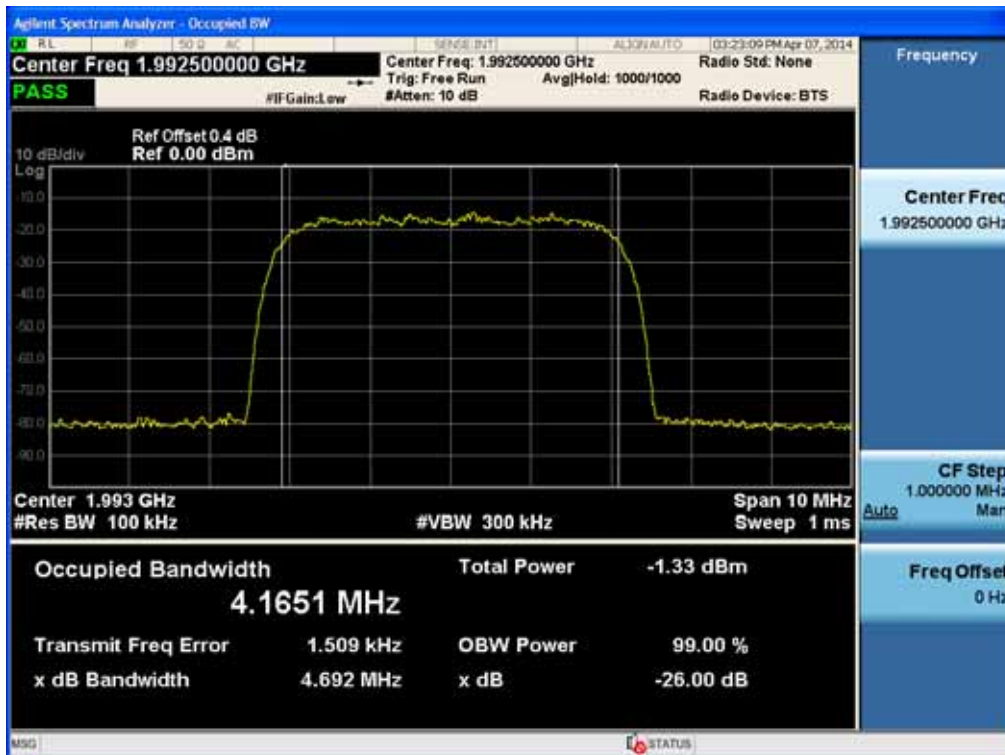
[Input WCDMA Downlink Low]



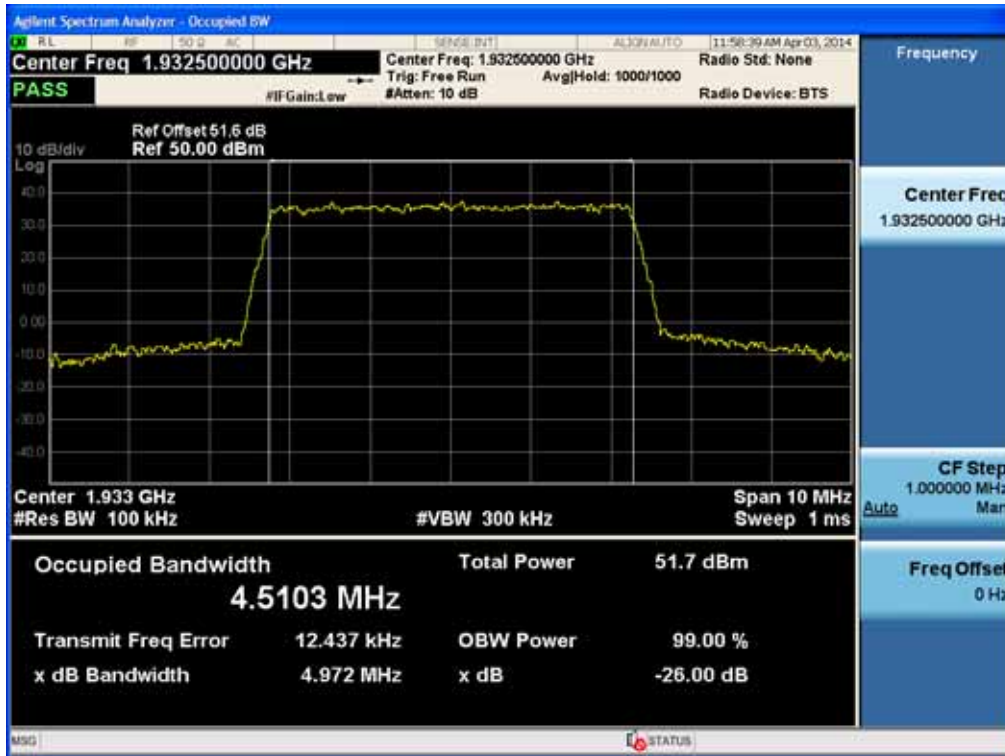
[Input WCDMA Downlink Middle]



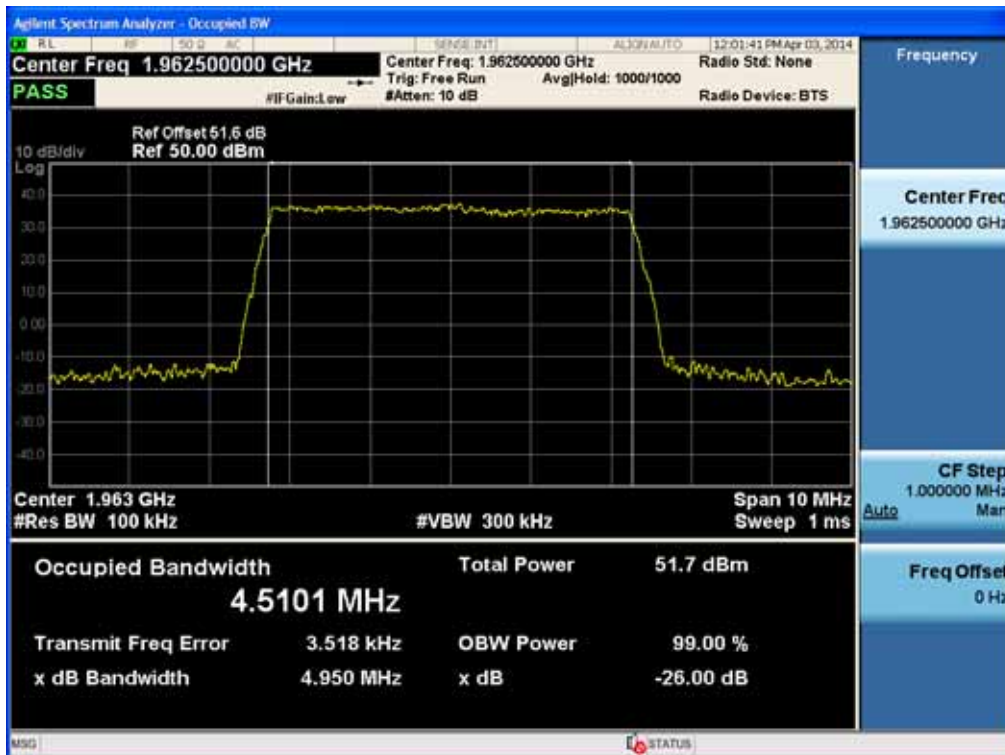
[Input WCDMA Downlink High]



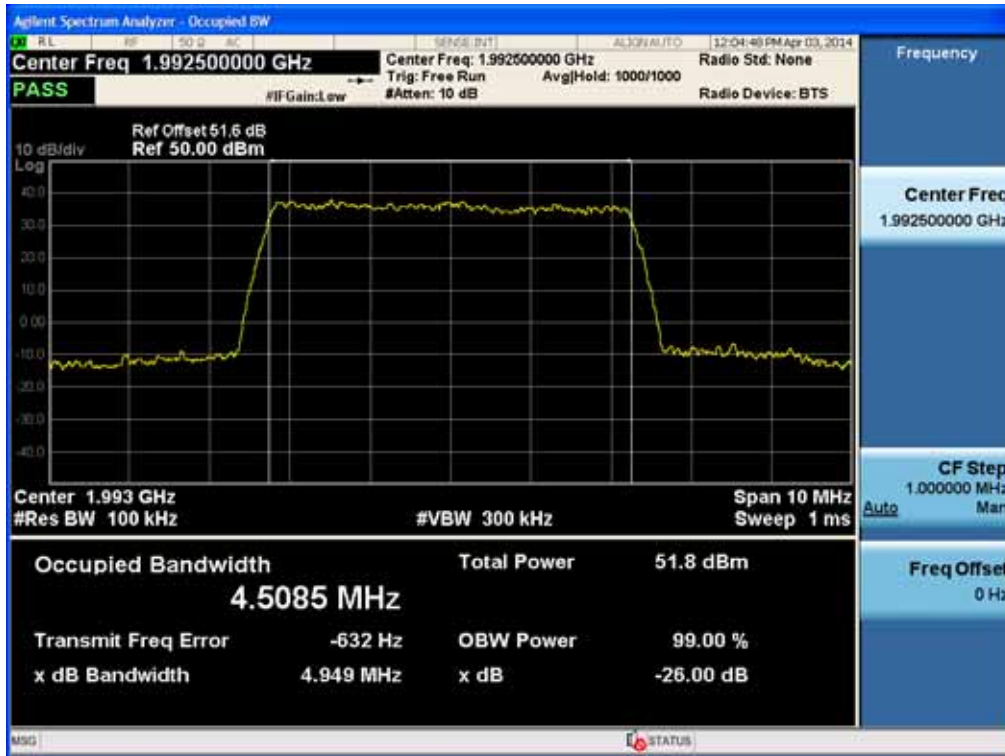
[Output LTE Downlink 5 MHz Low]



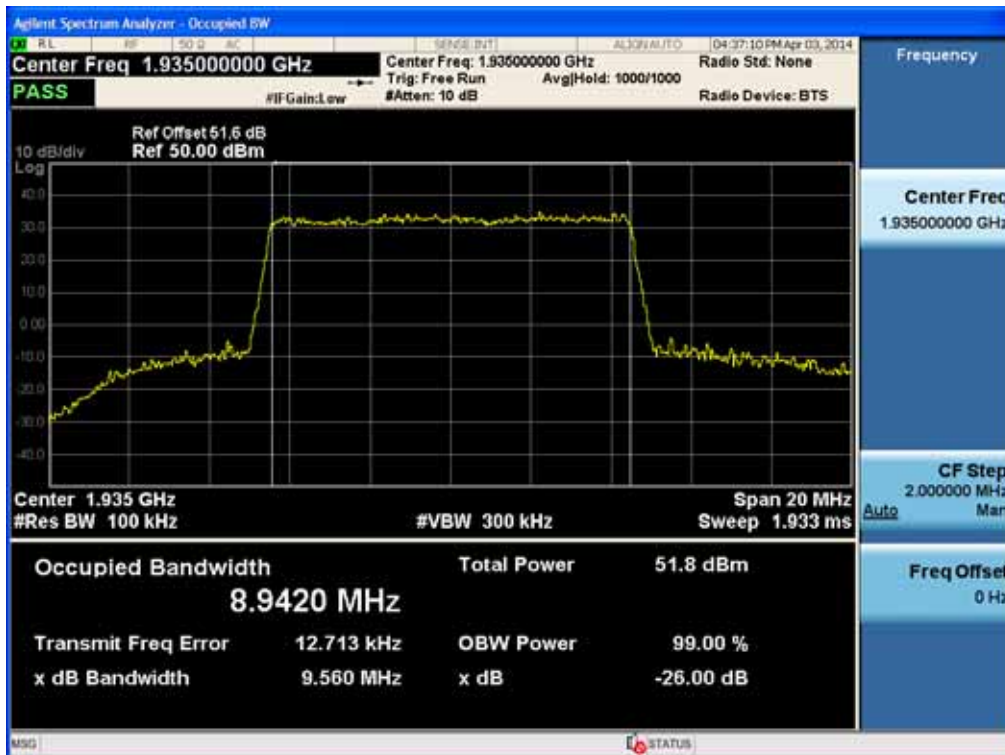
[Output LTE Downlink 5 MHz Middle]



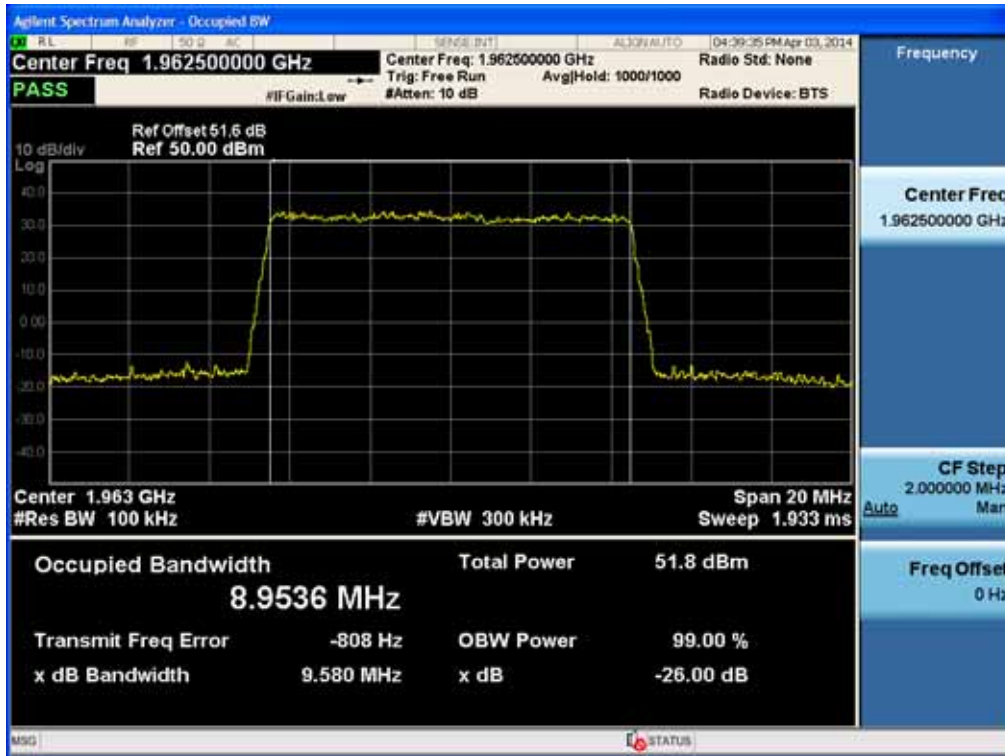
[Output LTE Downlink 5 MHz High]



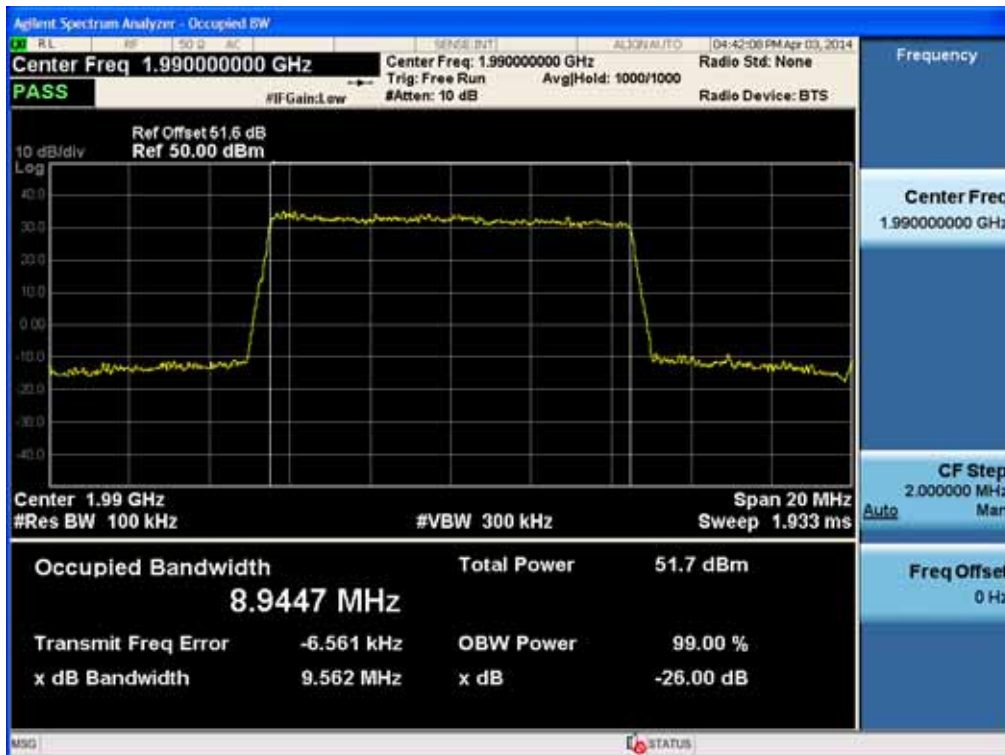
[Output LTE Downlink 10 MHz Low]



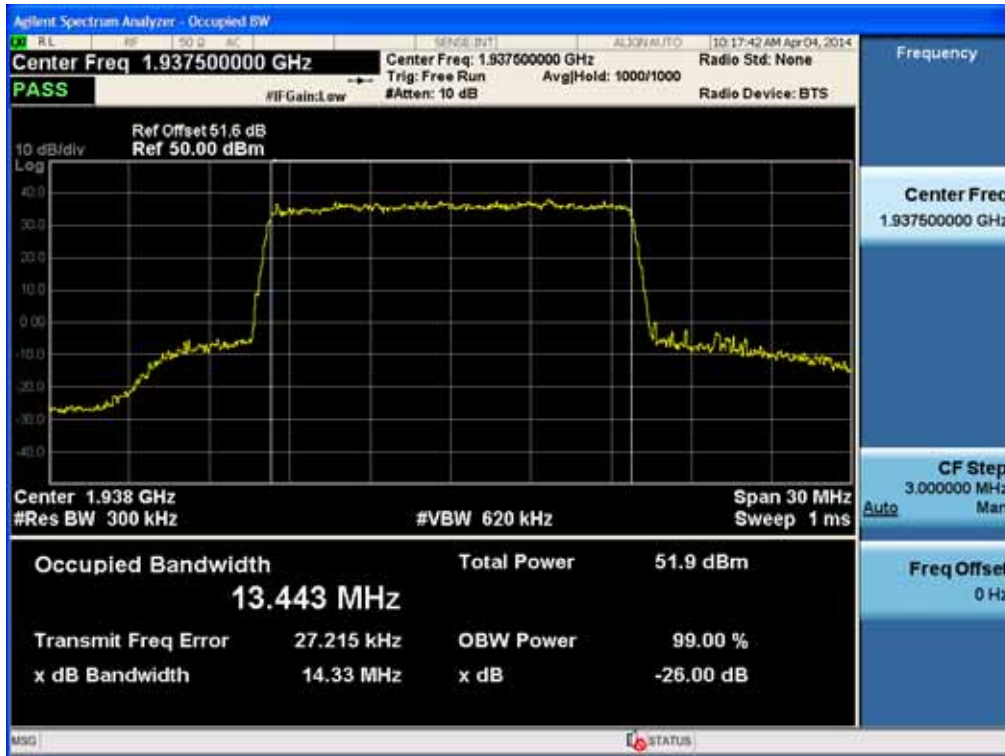
[Output LTE Downlink 10 MHz Middle]



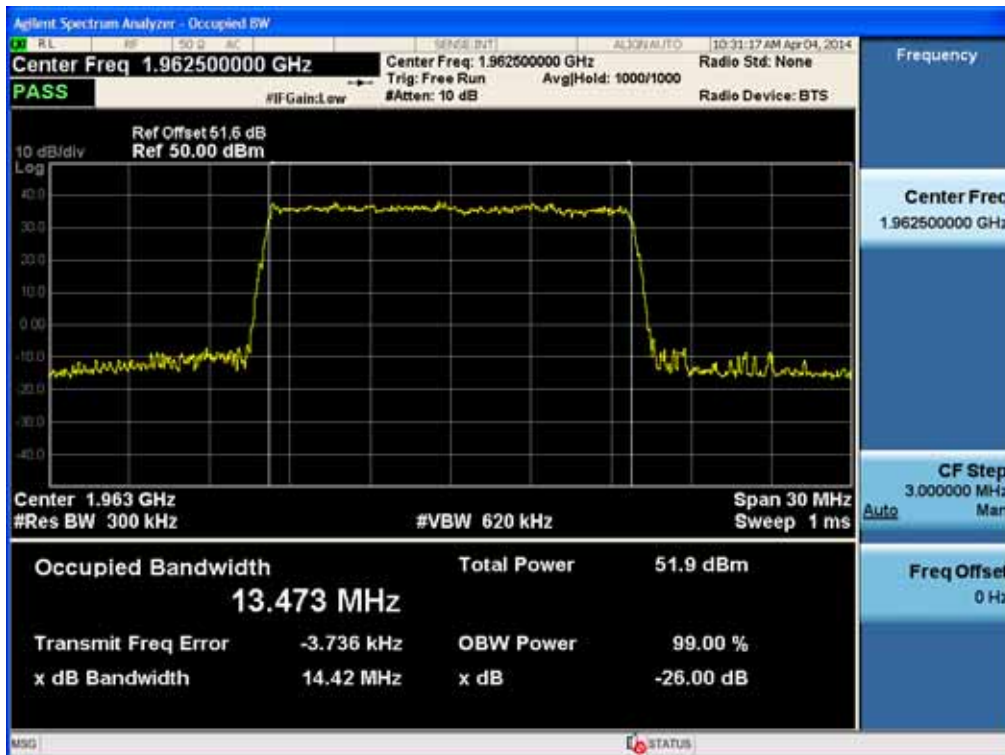
[Output LTE Downlink 10 MHz High]



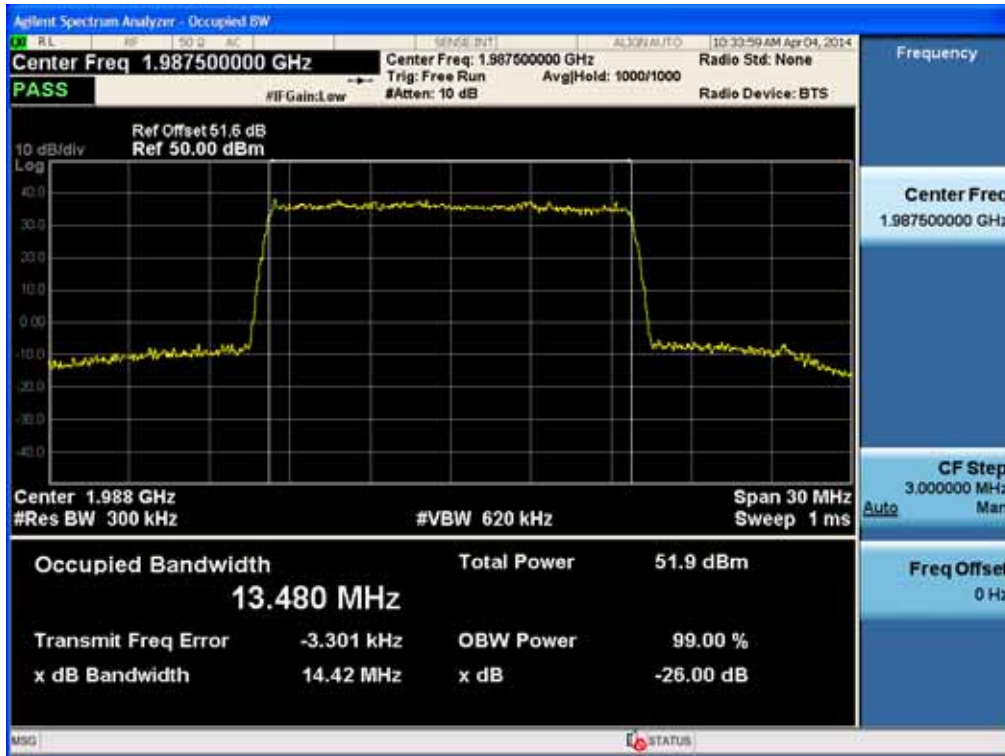
[Output LTE Downlink 15 MHz Low]



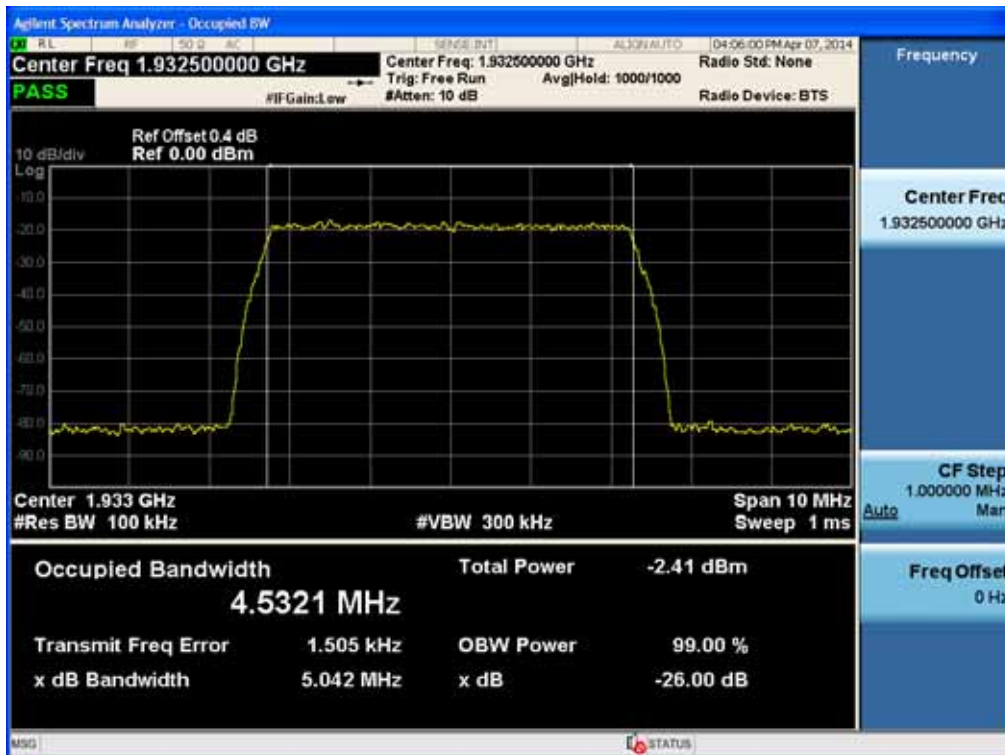
[Output LTE Downlink 15 MHz Middle]



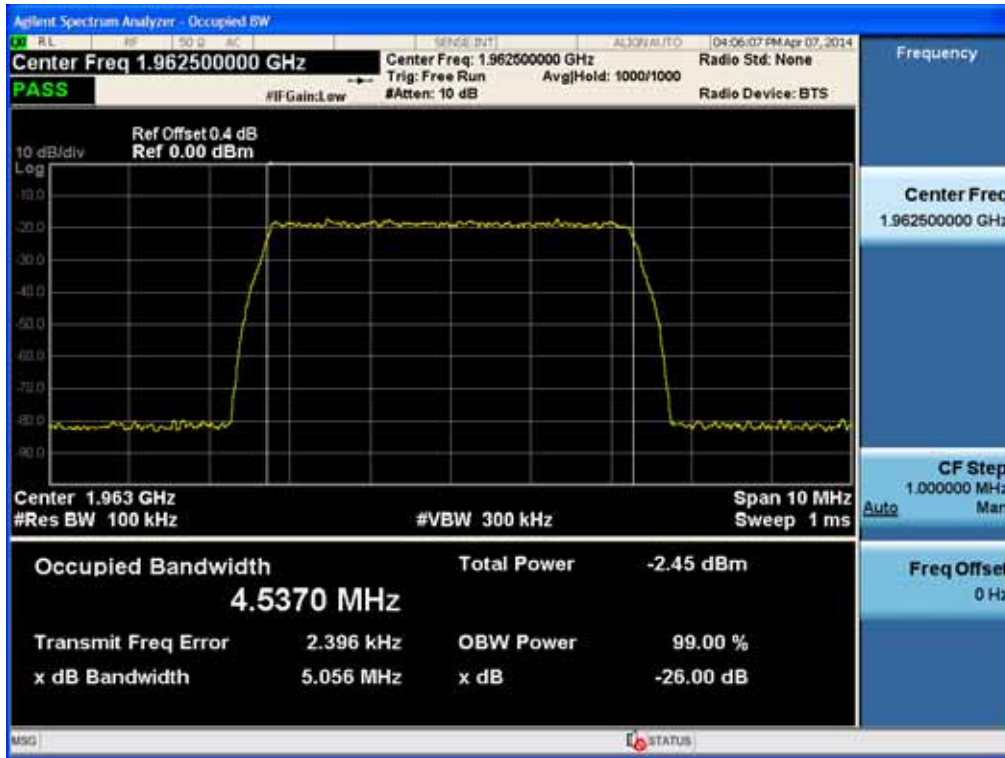
[Output LTE Downlink 15 MHz High]



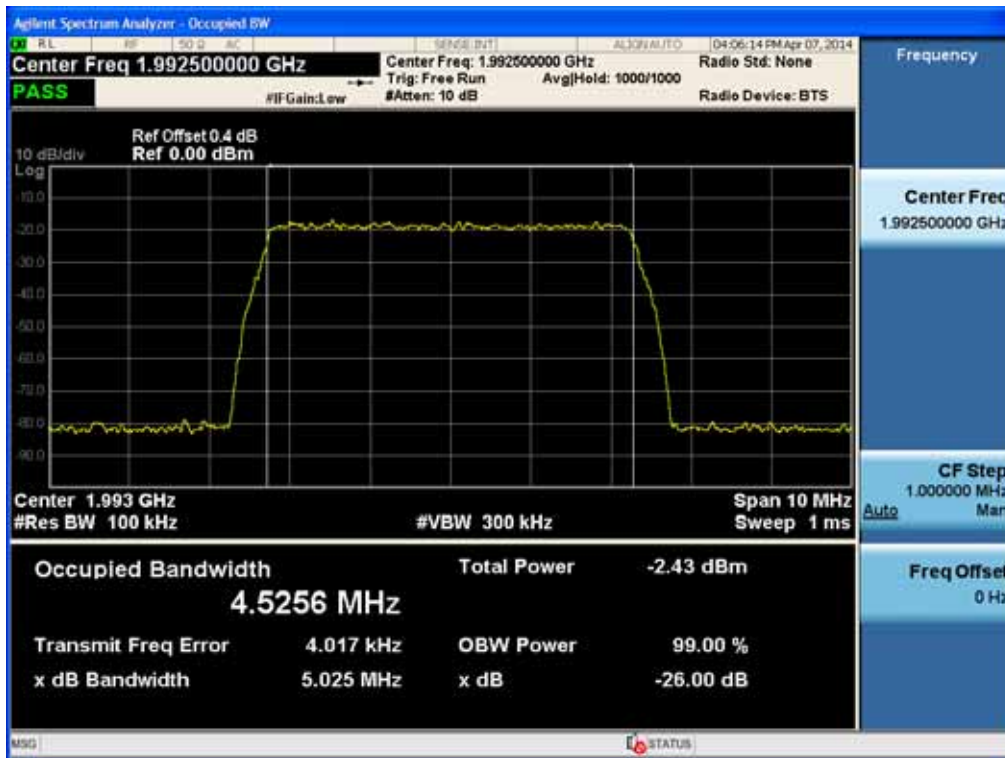
[Input LTE Downlink 5 MHz Low]



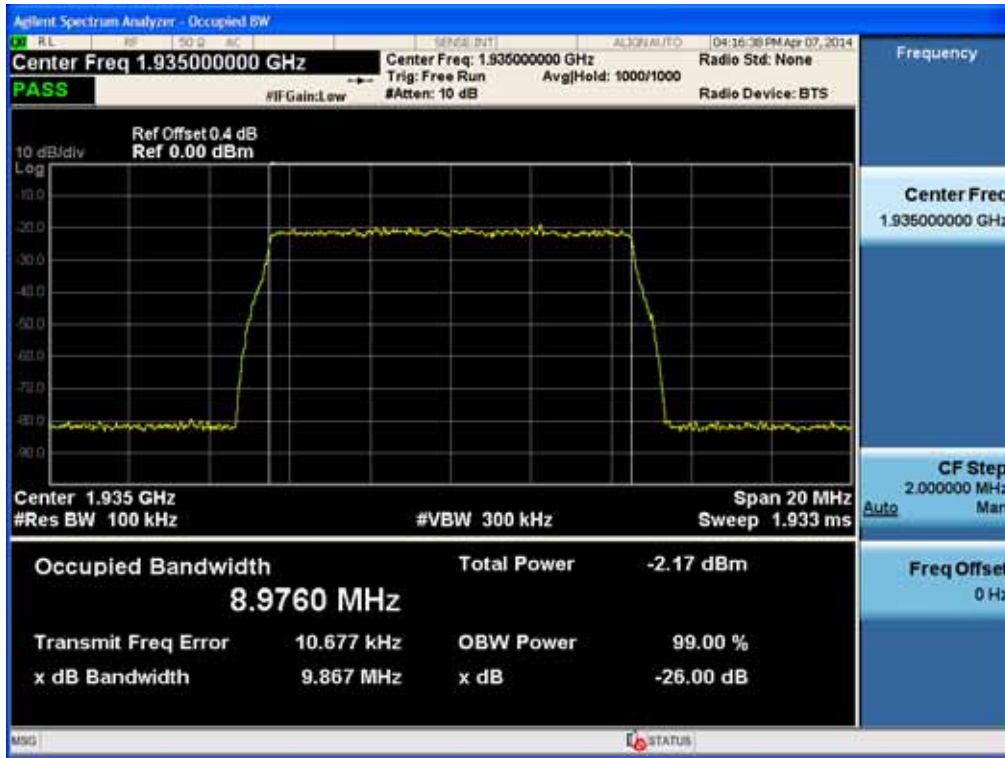
[Input LTE Downlink 5 MHz Middle]



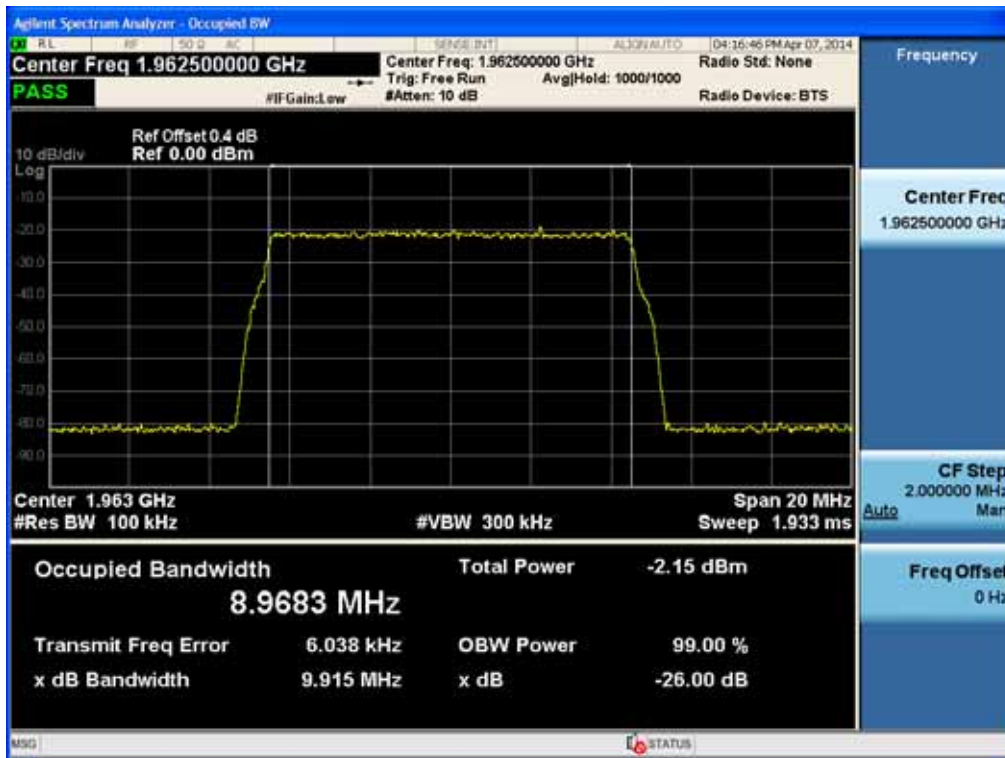
[Input LTE Downlink 5 MHz High]



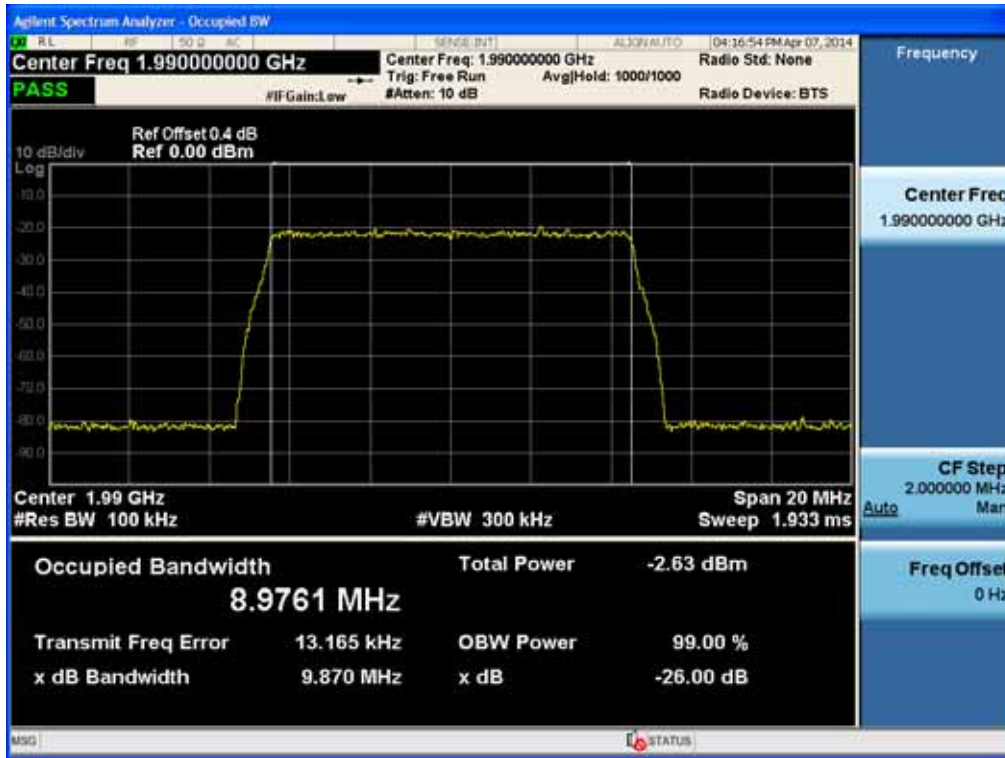
[Input LTE Downlink 10 MHz Low]



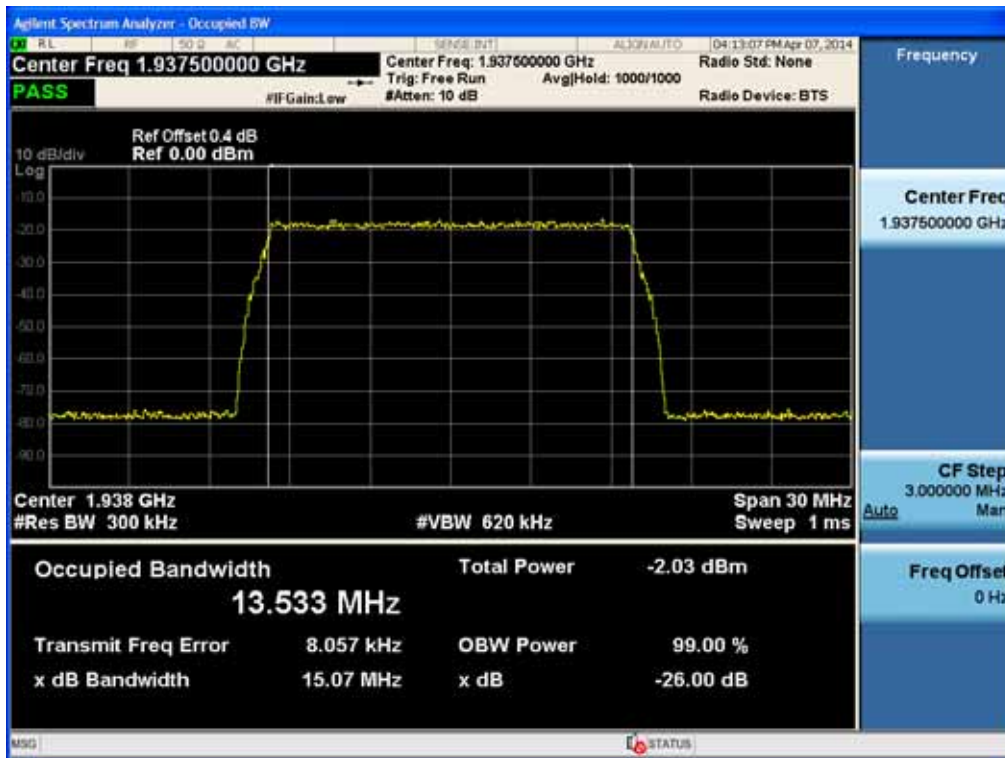
[Input LTE Downlink 10 MHz Middle]



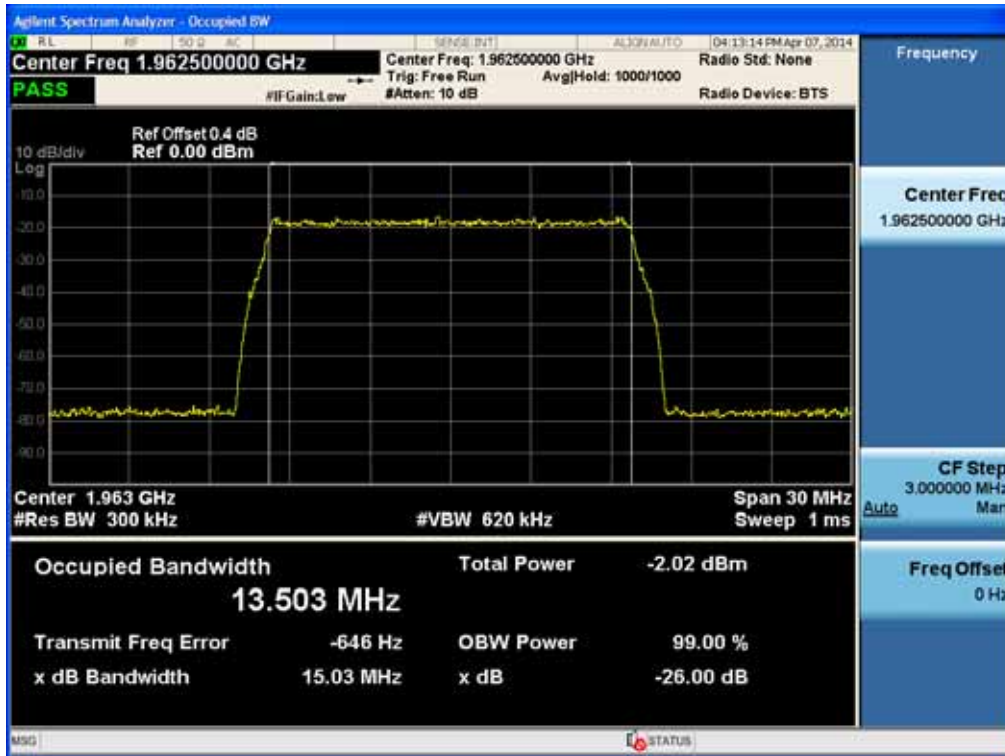
[Input LTE Downlink 10 MHz High]



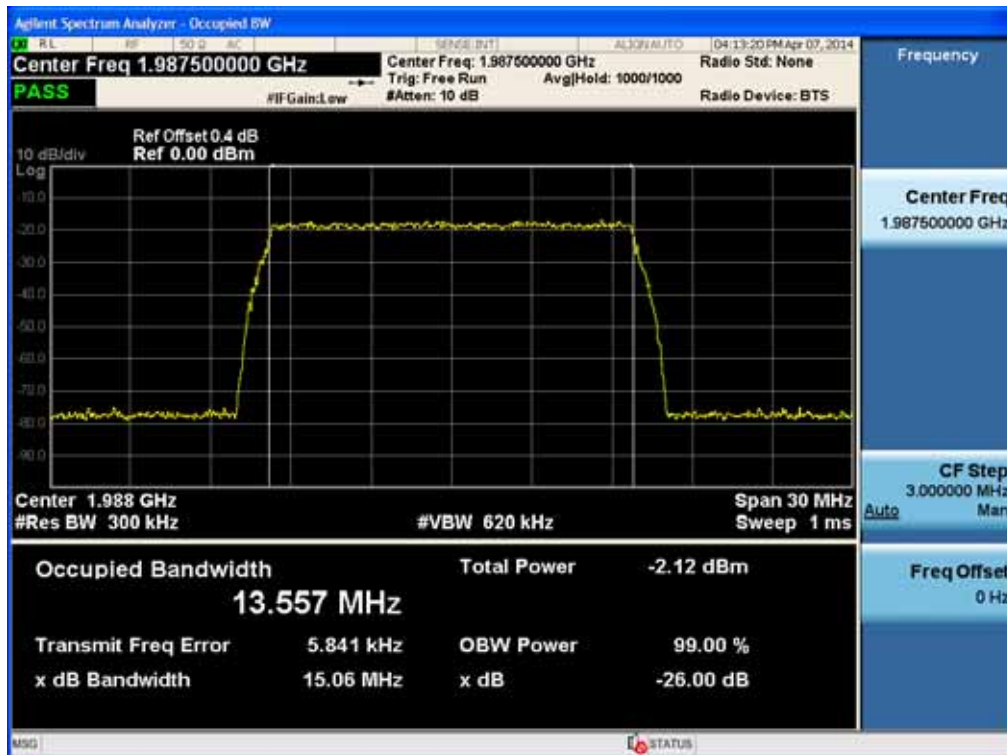
[Input LTE Downlink 15 MHz Low]



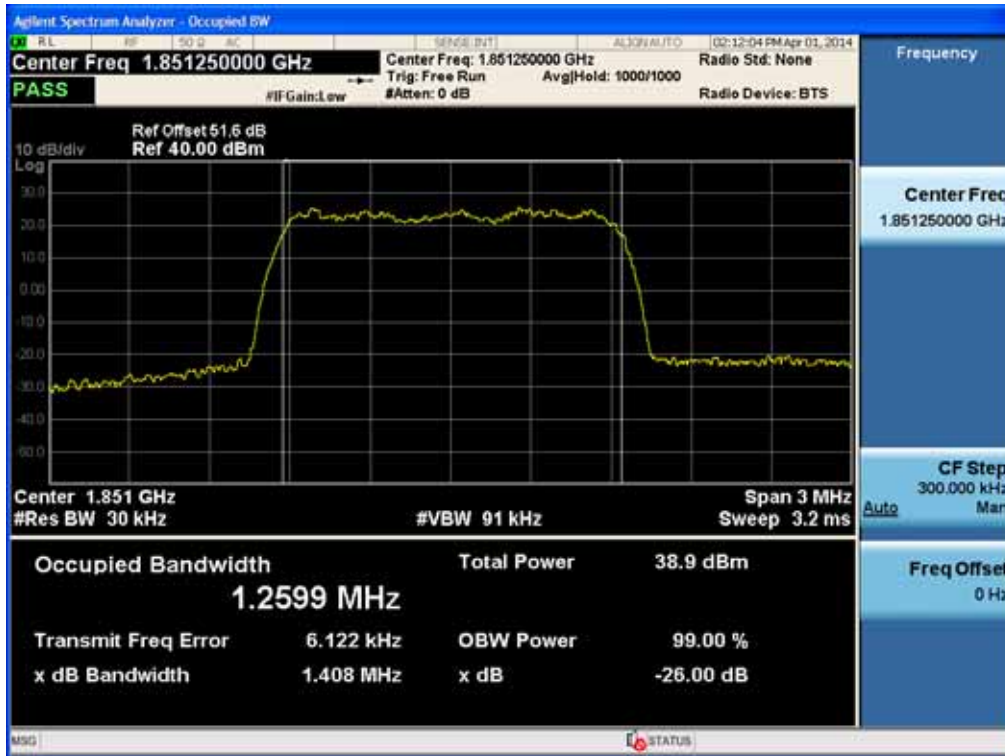
[Input LTE Downlink 15 MHz Middle]



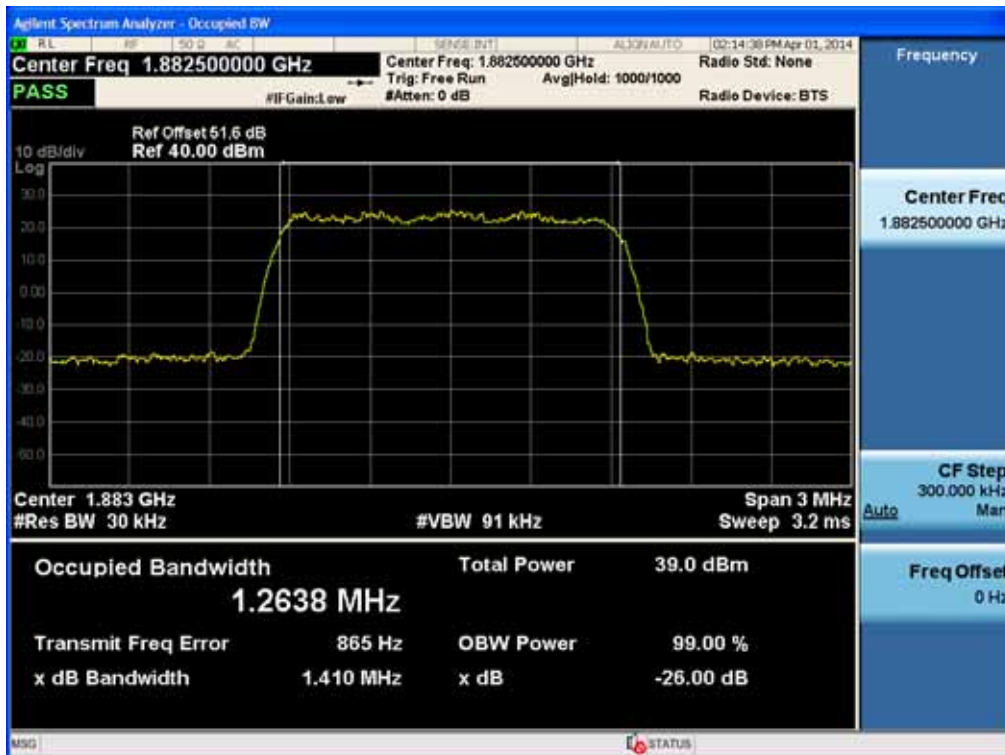
[Input LTE Downlink 15 MHz High]



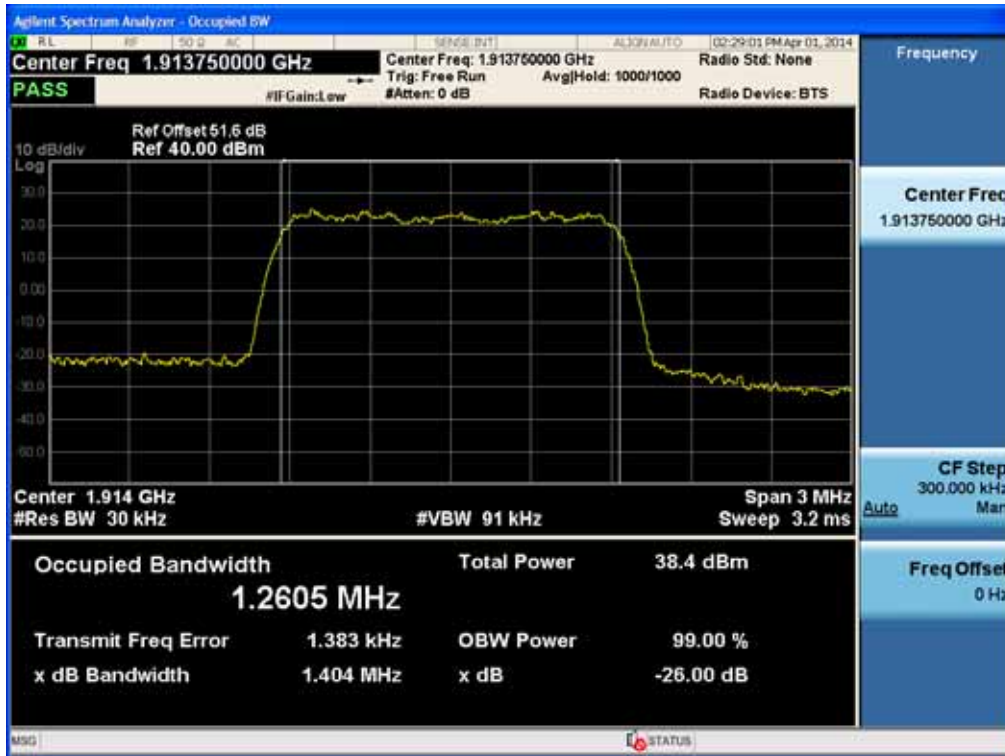
[Output CDMA Uplink Low]



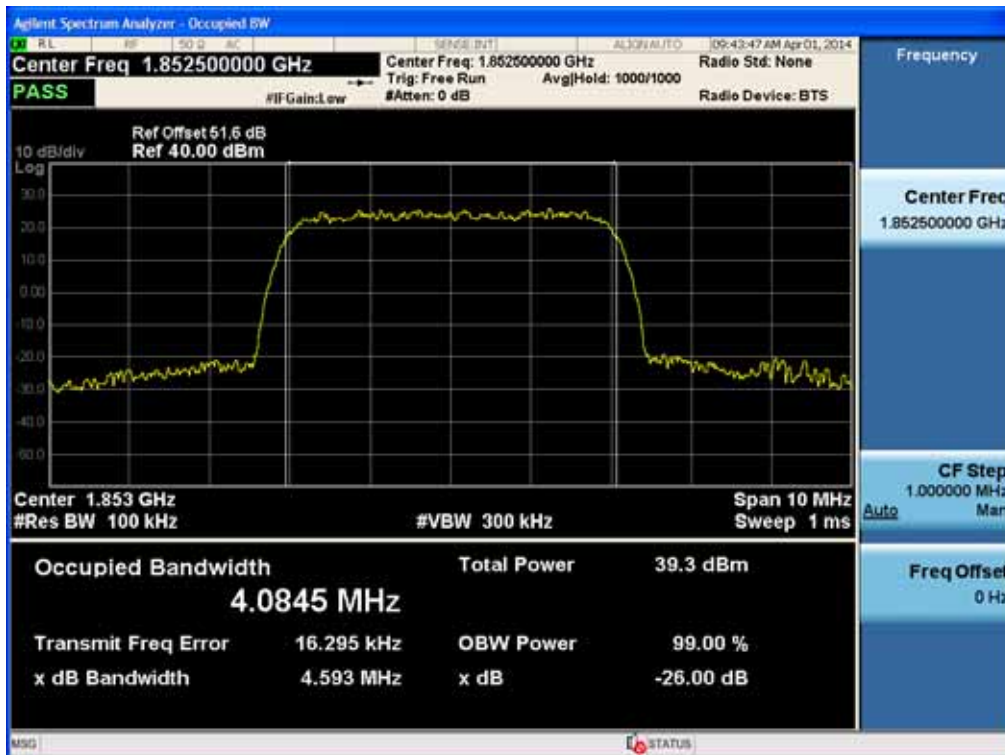
[Output CDMA Uplink Middle]



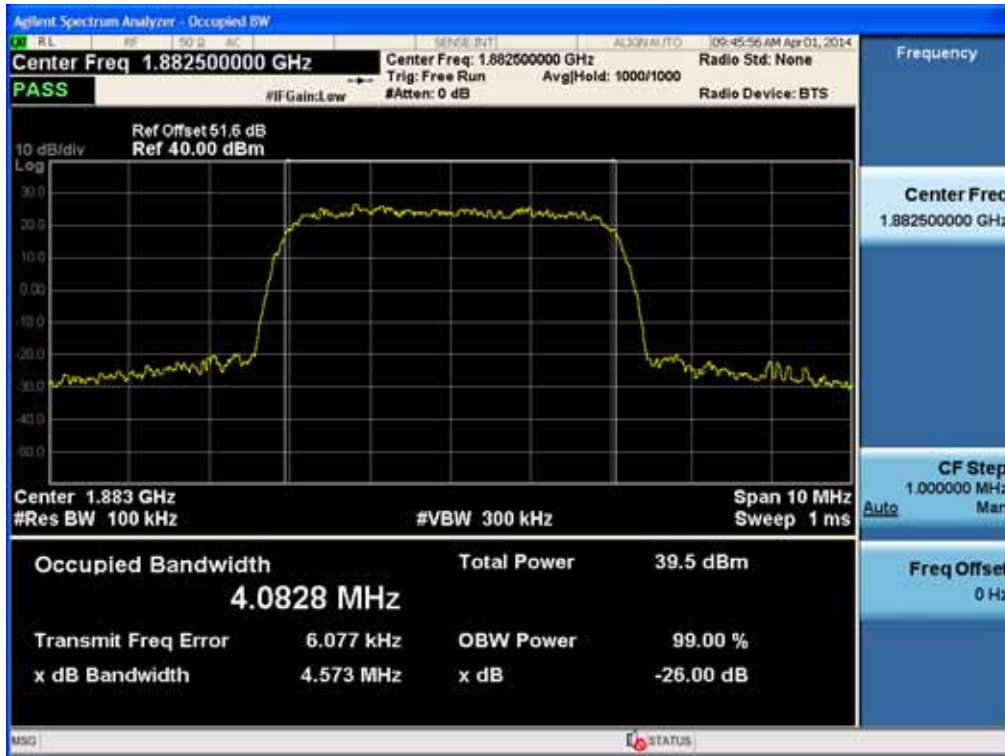
[Output CDMA Uplink High]



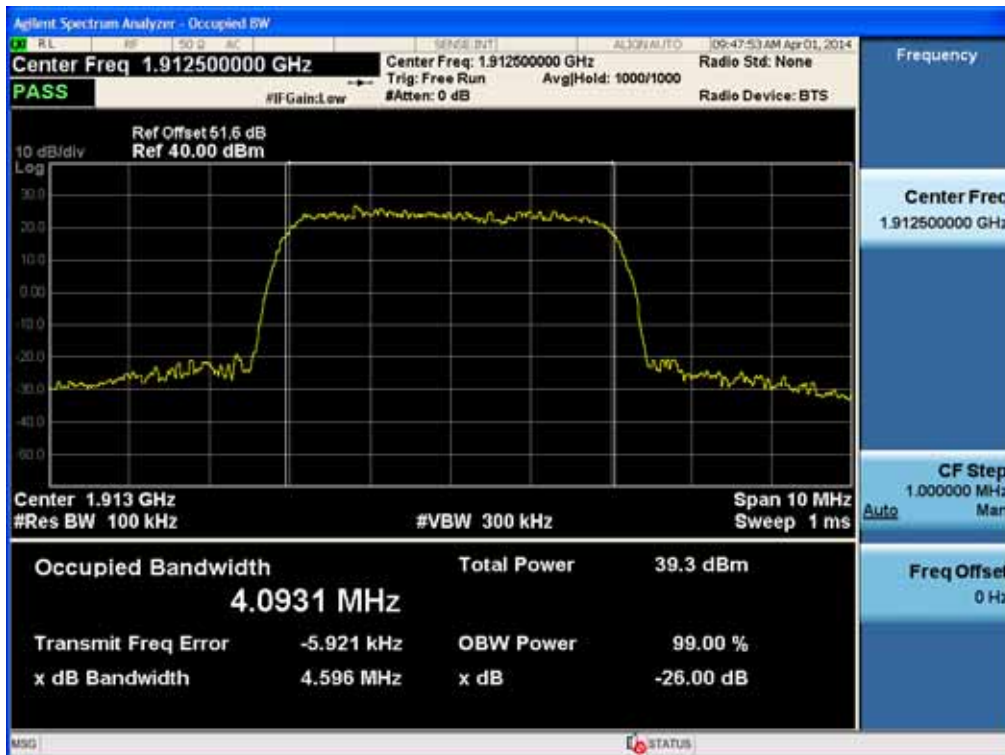
[Output WCDMA Uplink Low]



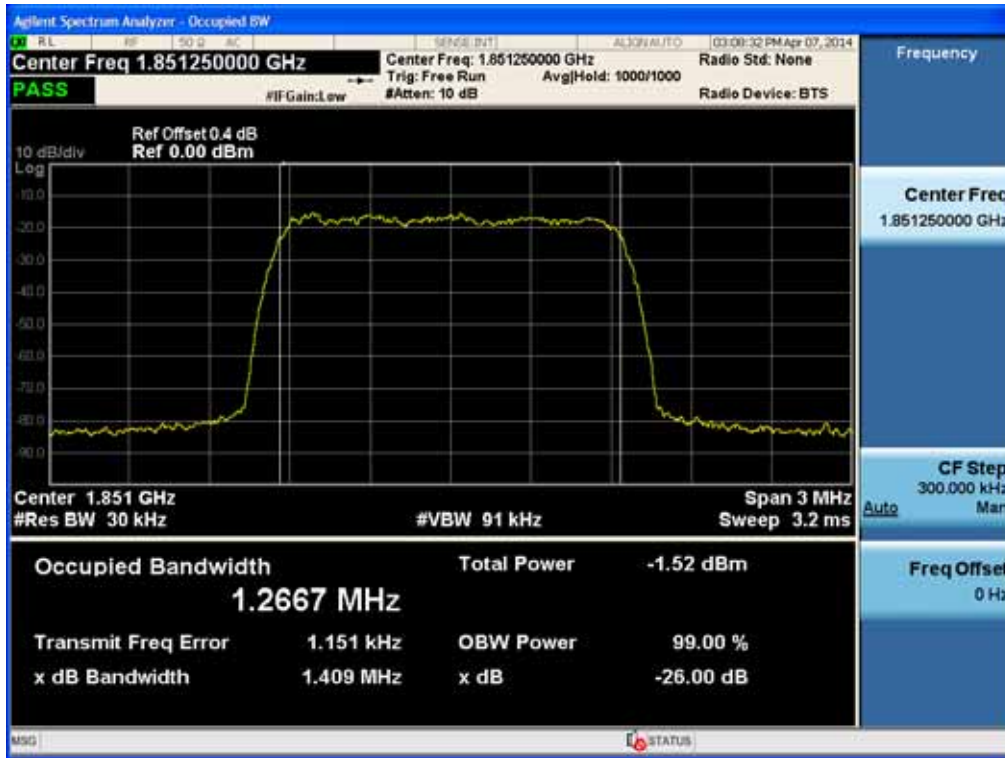
[Output WCDMA Uplink Middle]



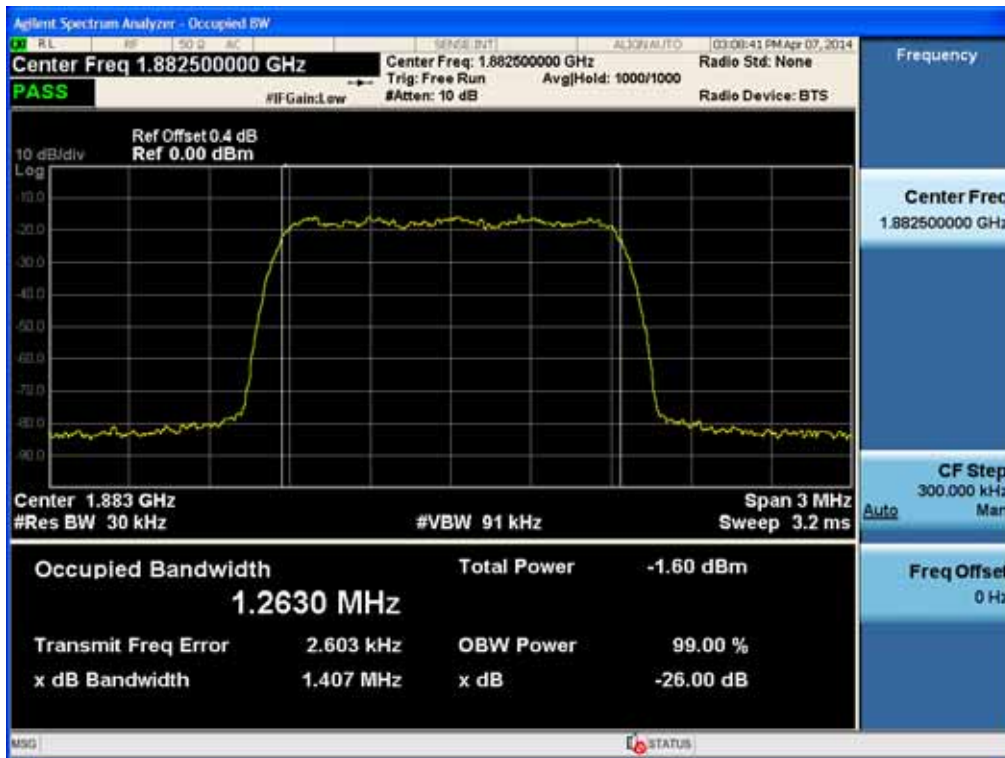
[Output WCDMA Uplink High]



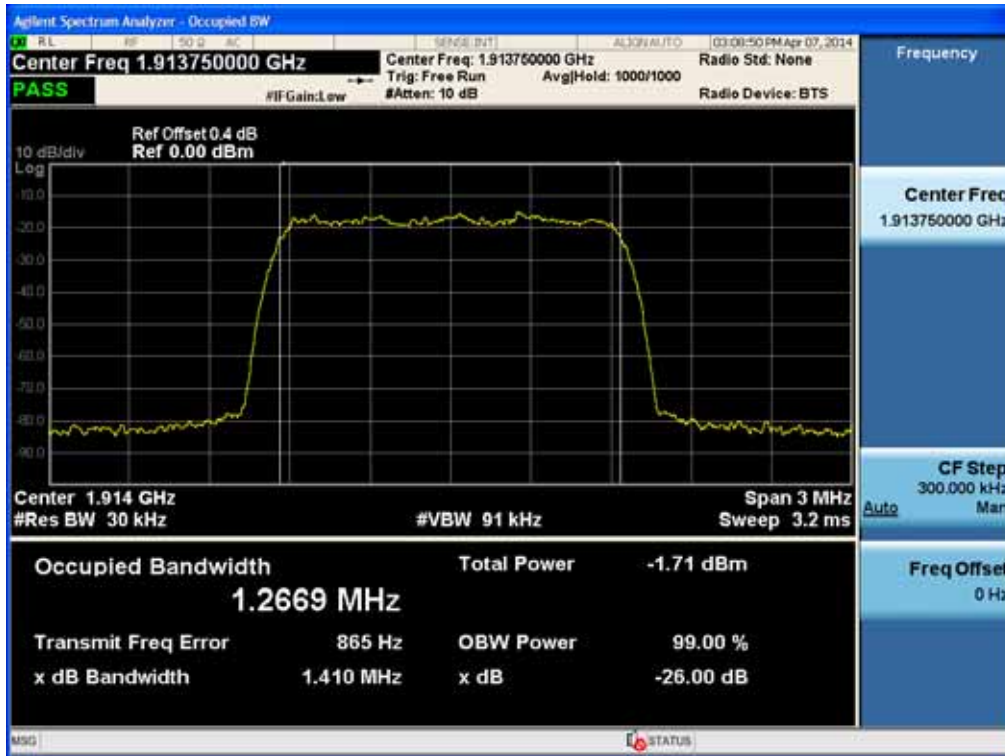
[Input CDMA Uplink Low]



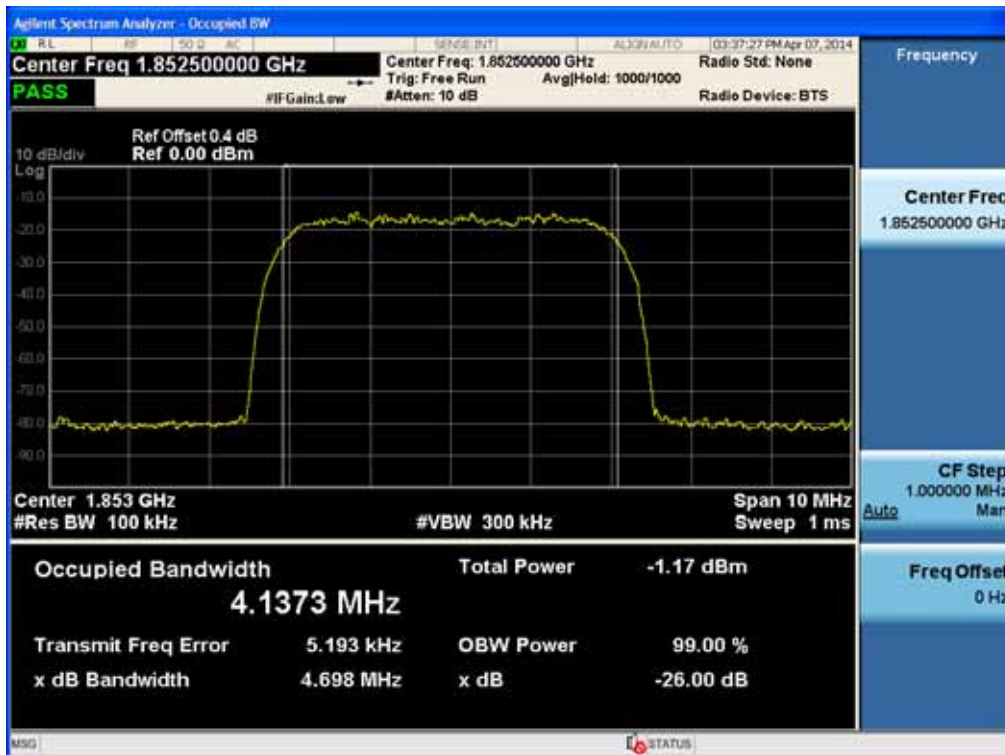
[Input CDMA Uplink Middle]



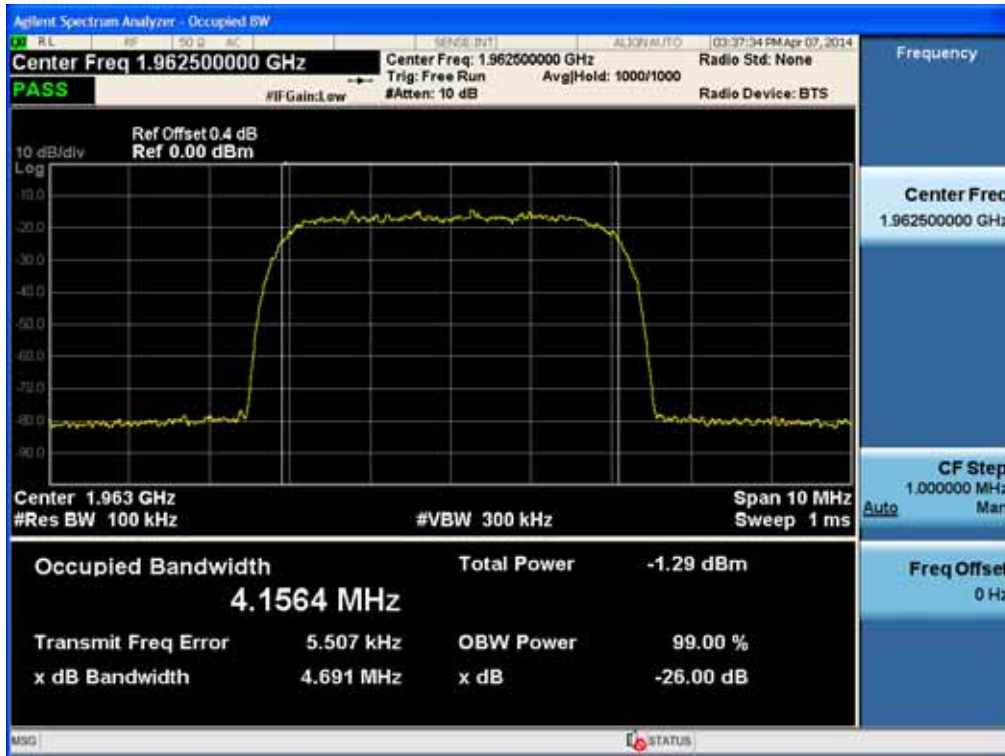
[Input CDMA Uplink High]



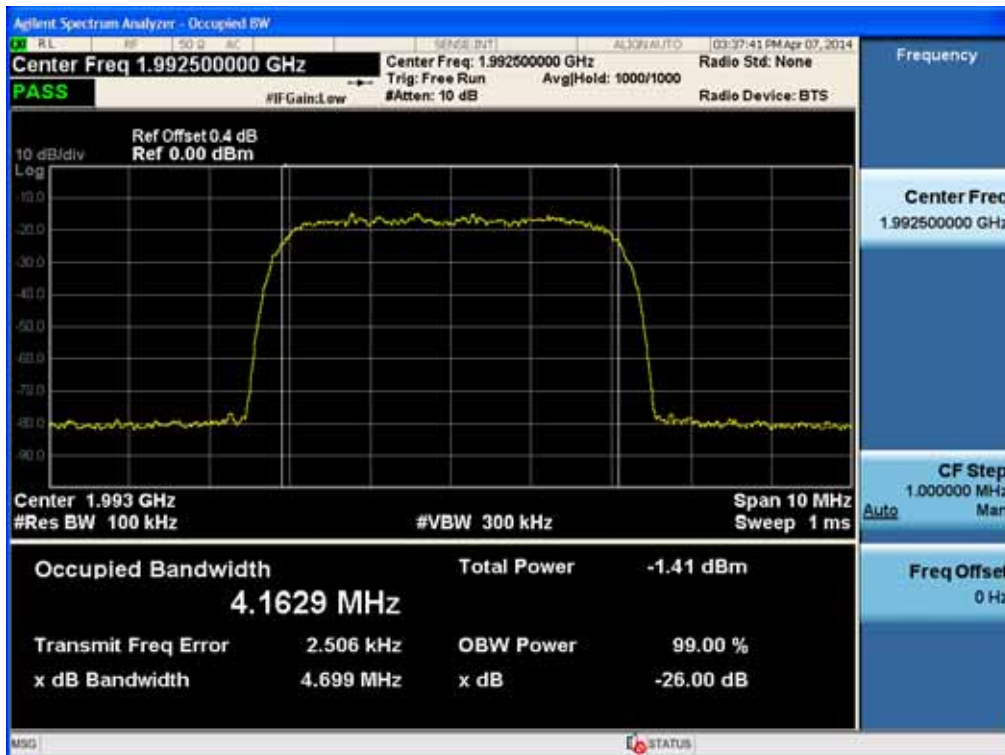
[Input WCDMA Uplink Low]



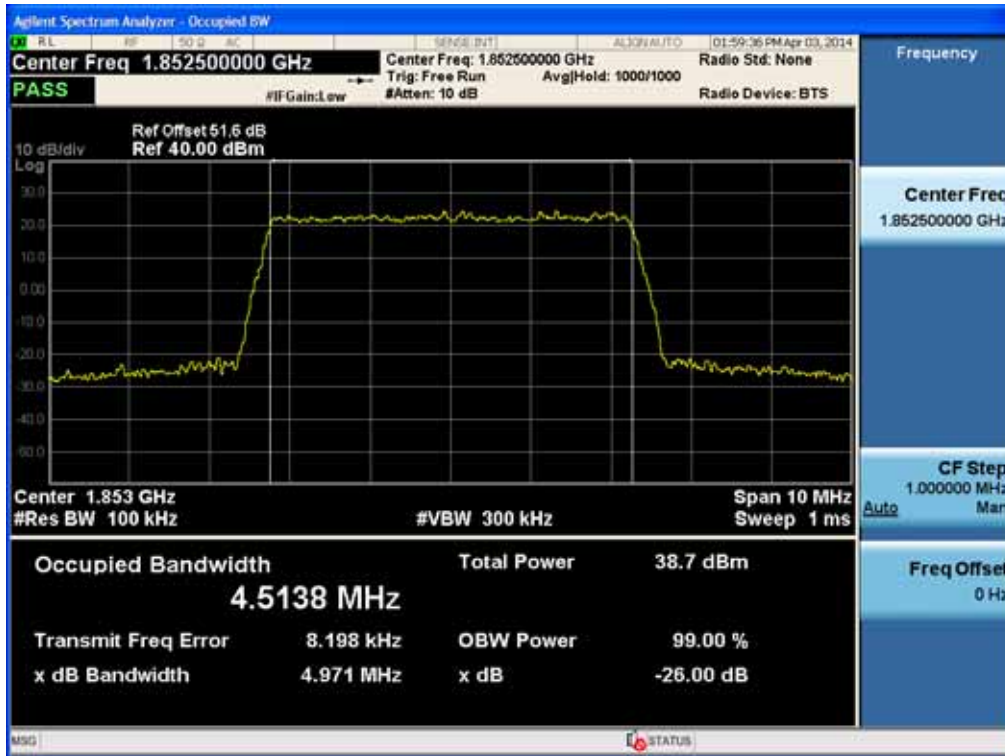
[Input WCDMA Uplink Middle]



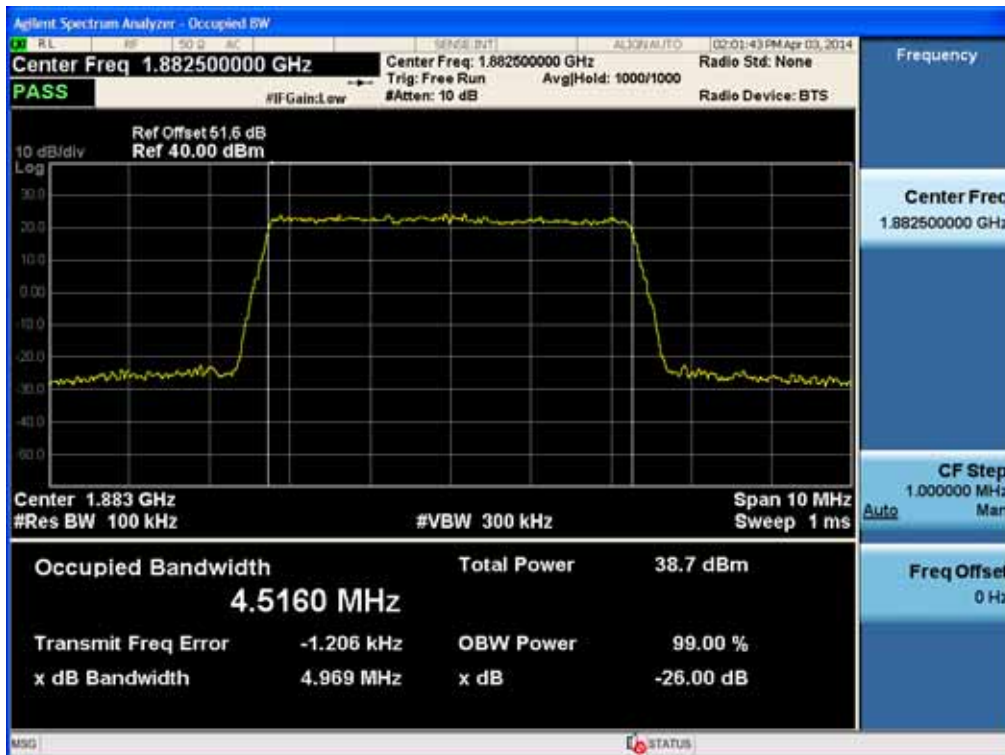
[Input WCDMA Uplink High]



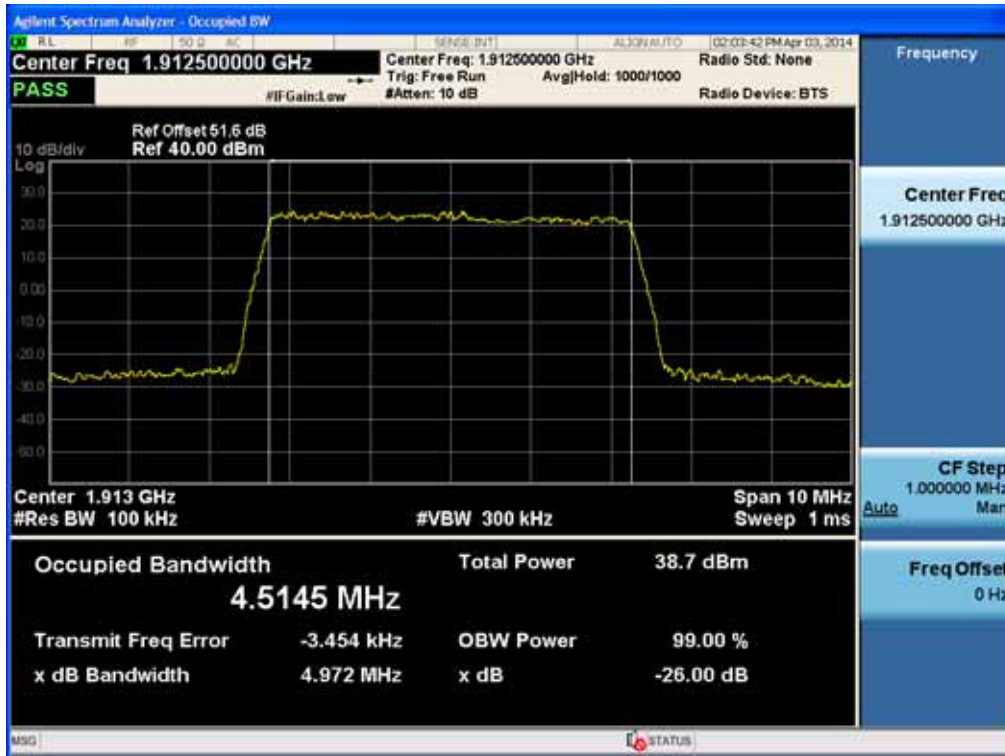
[Output LTE Uplink 5 MHz Low]



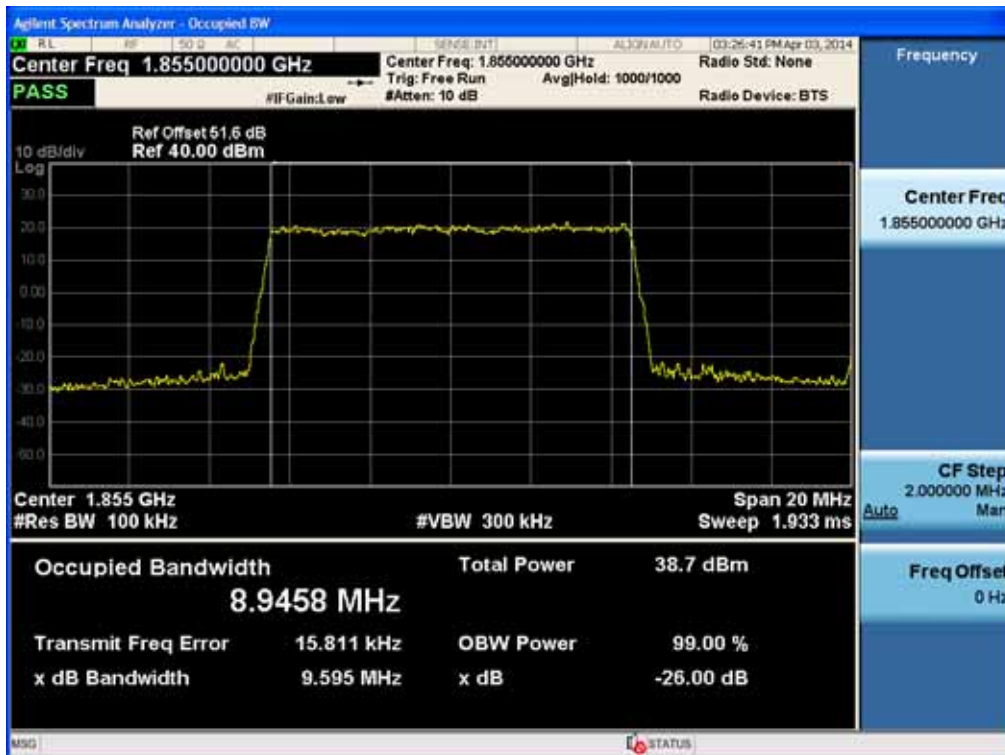
[Output LTE Uplink 5 MHz Middle]



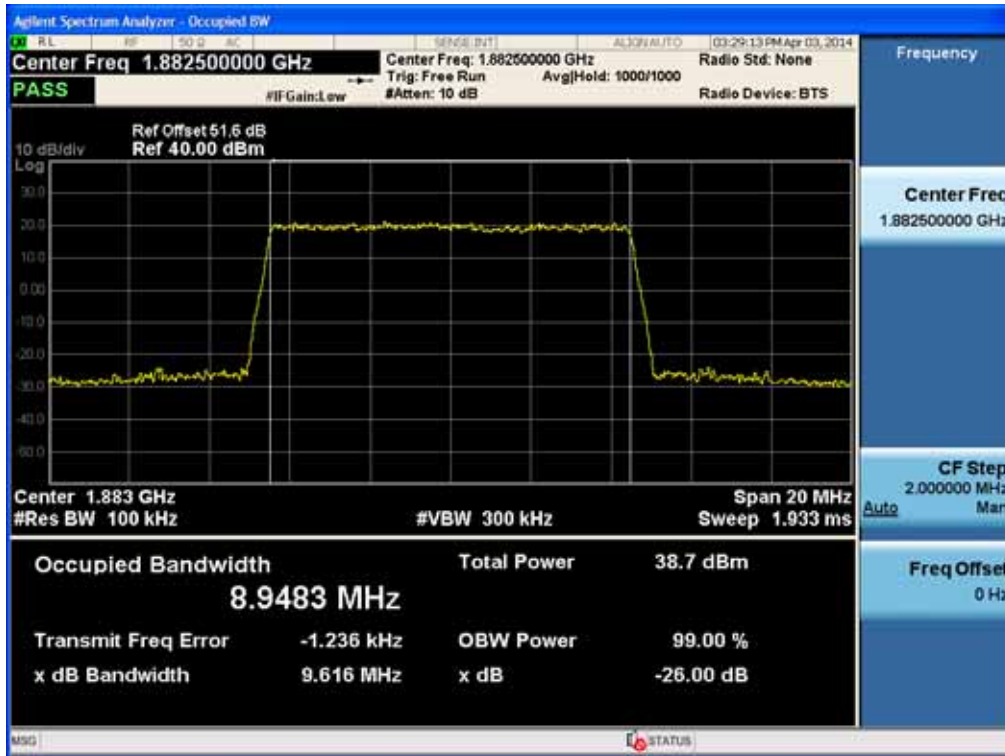
[Output LTE Uplink 5 MHz High]



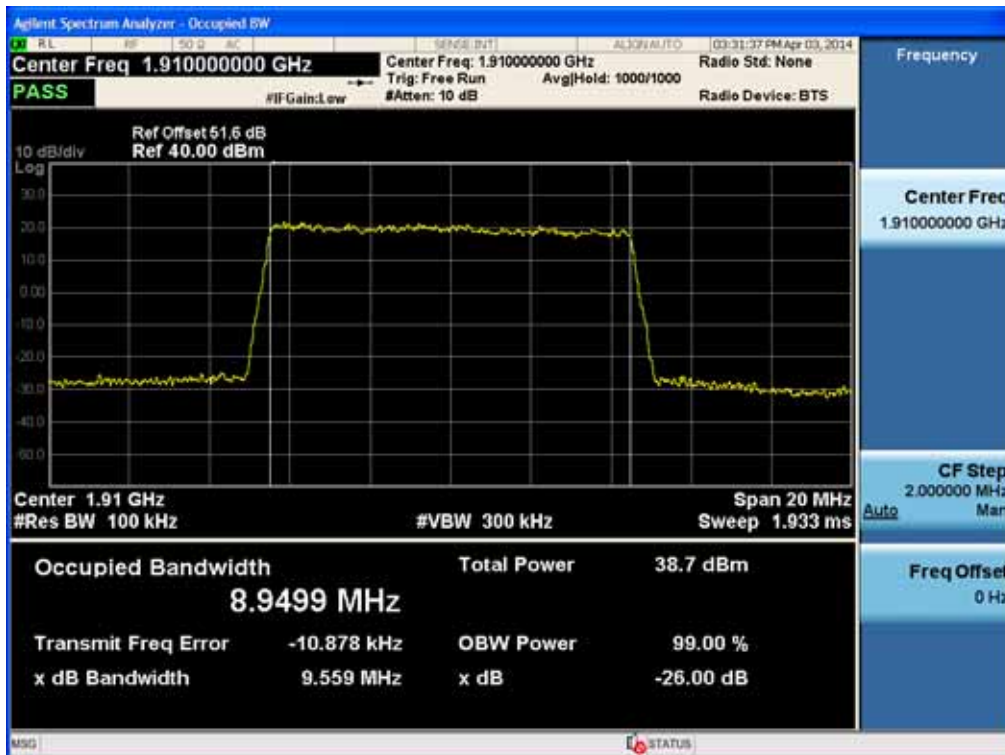
[Output LTE Uplink 10 MHz Low]



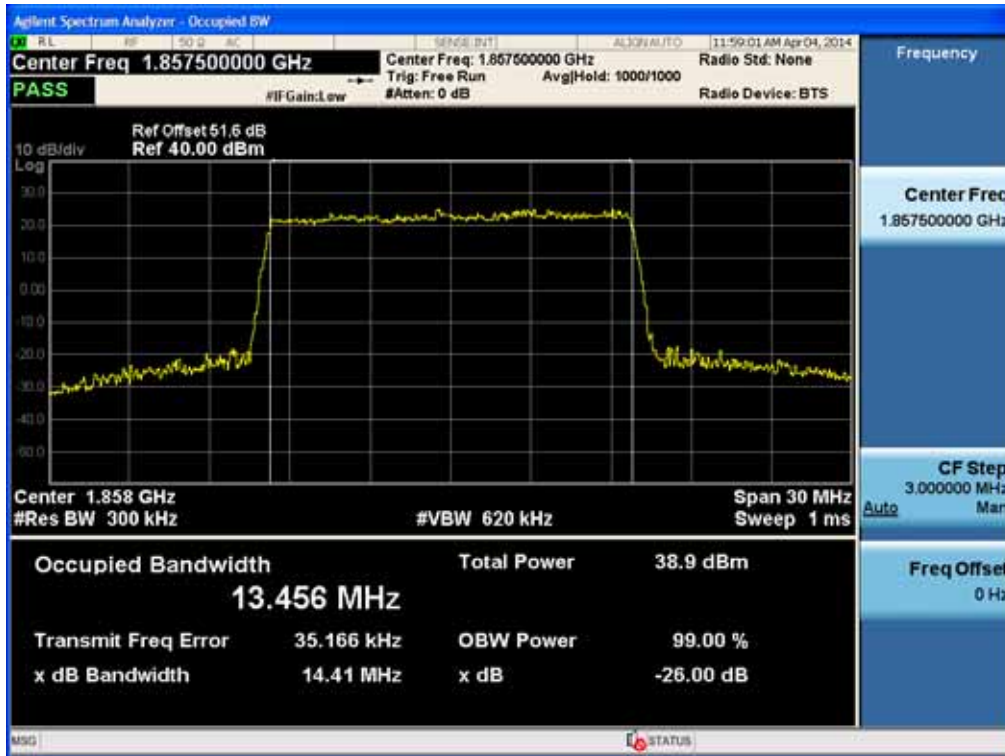
[Output LTE Uplink 10 MHz Middle]



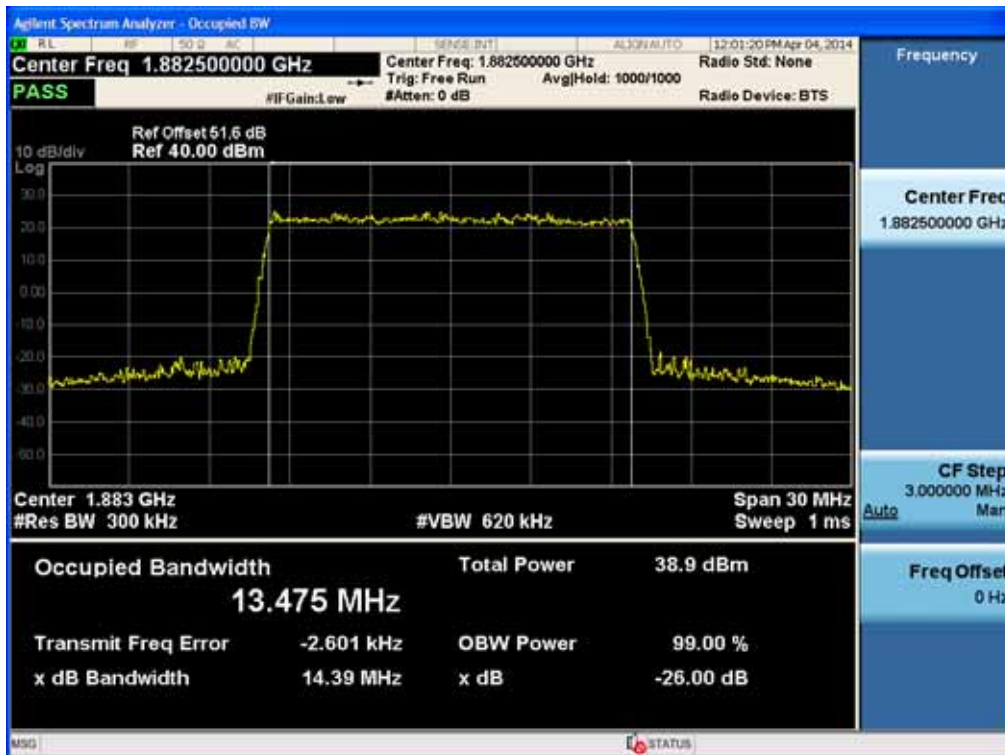
[Output LTE Uplink 10 MHz High]



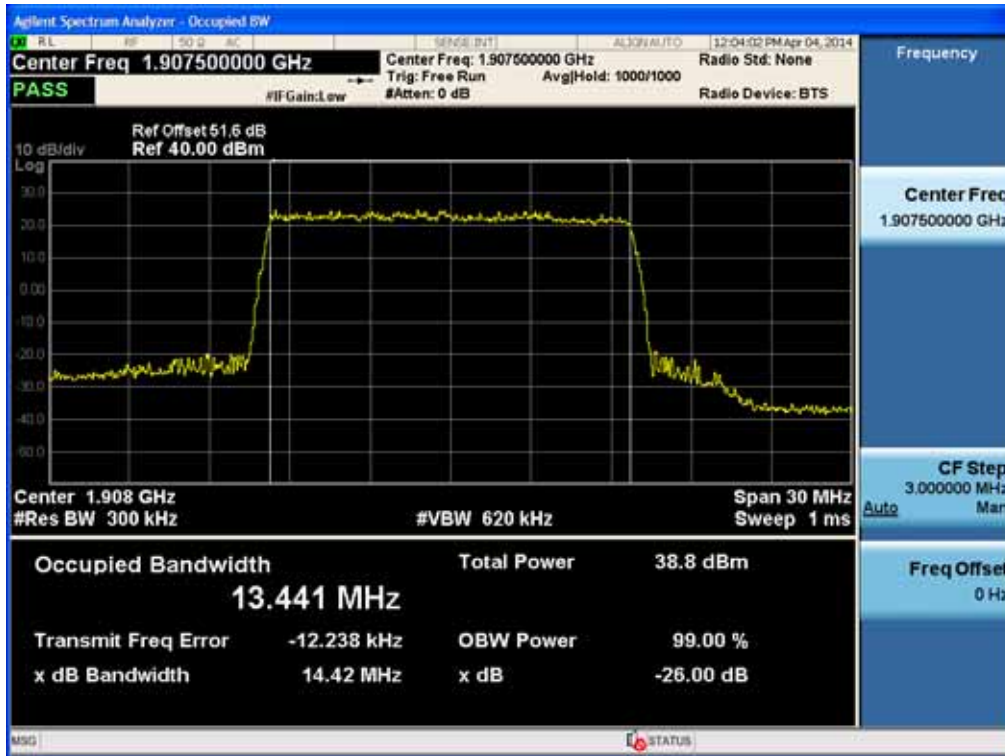
[Output LTE Uplink 15 MHz Low]



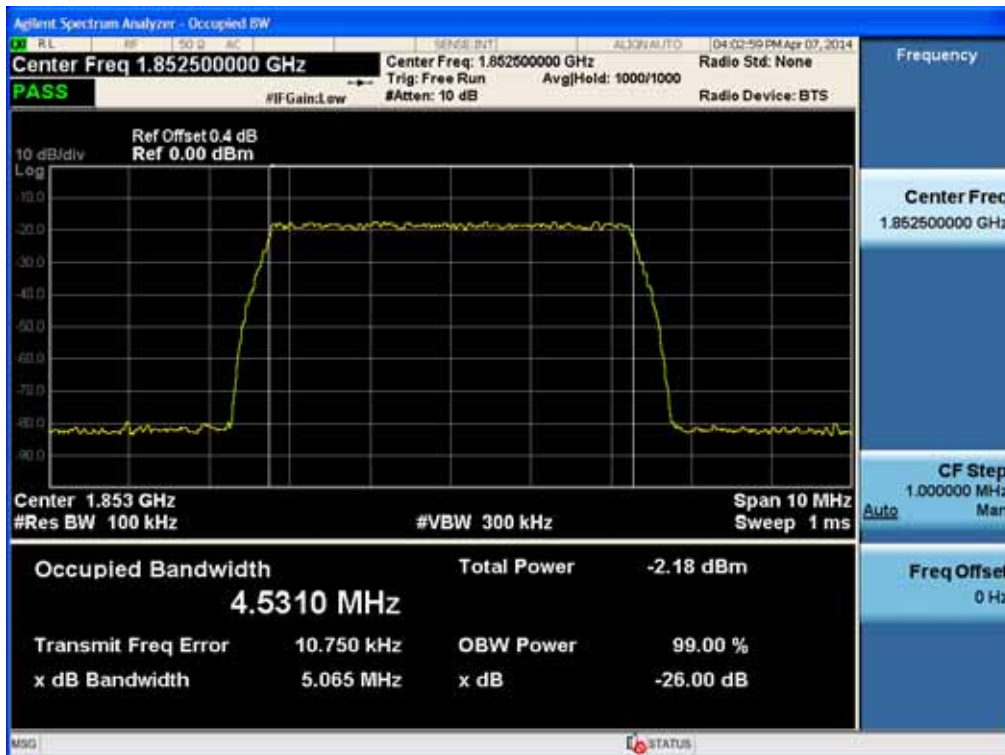
[Output LTE Uplink 15 MHz Middle]



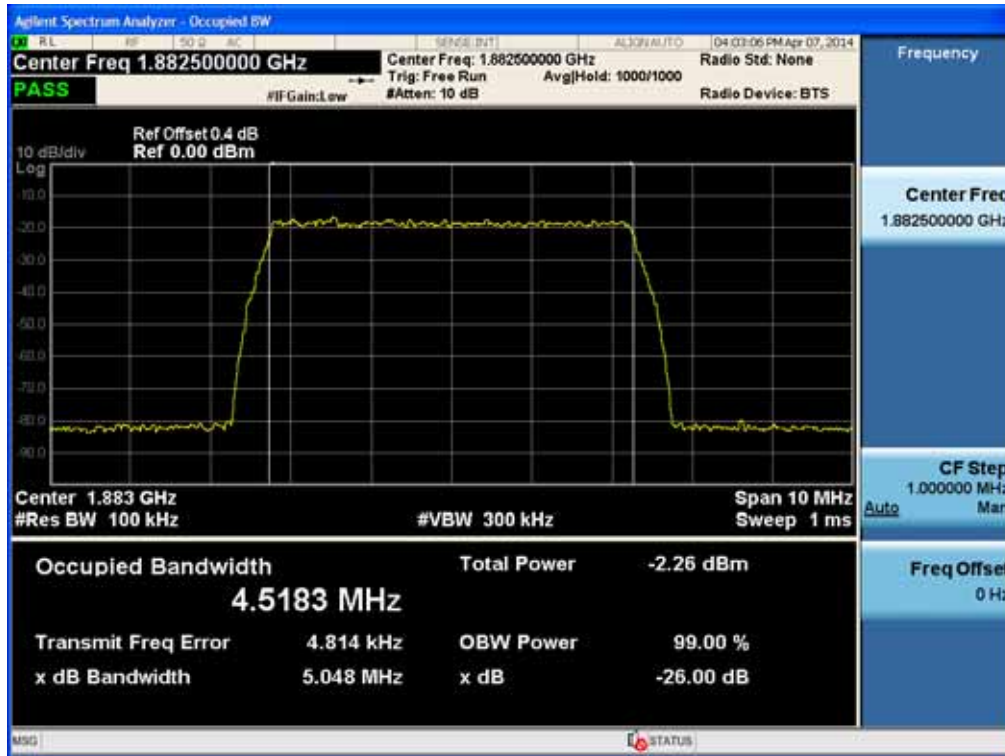
[Output LTE Uplink 15 MHz High]



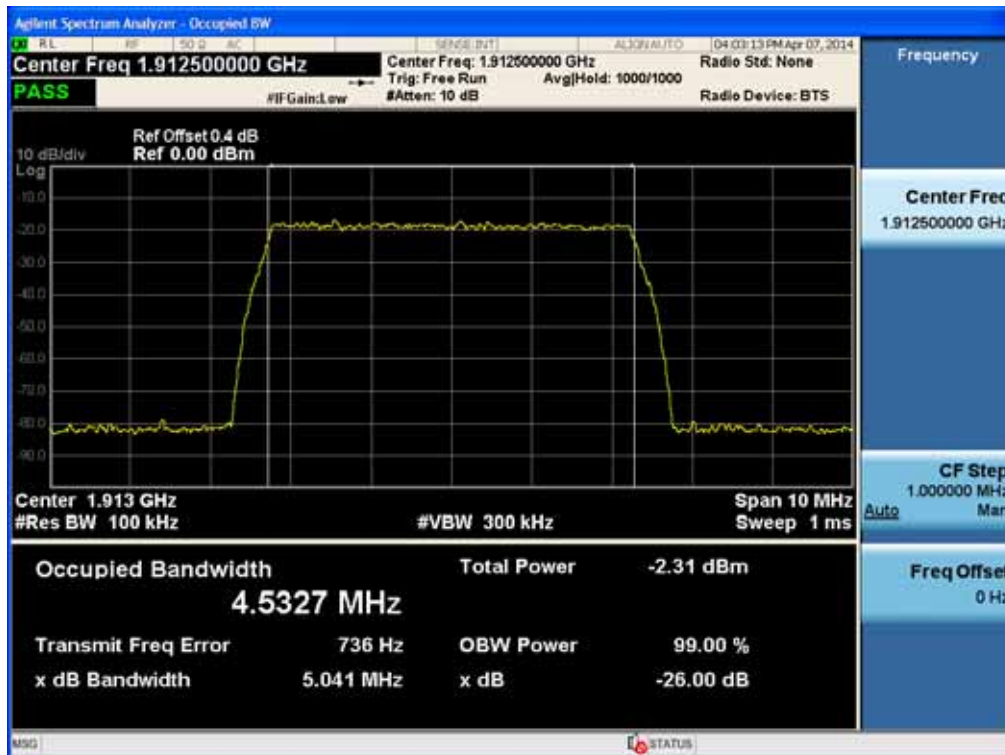
[Input LTE Uplink 5 MHz Low]



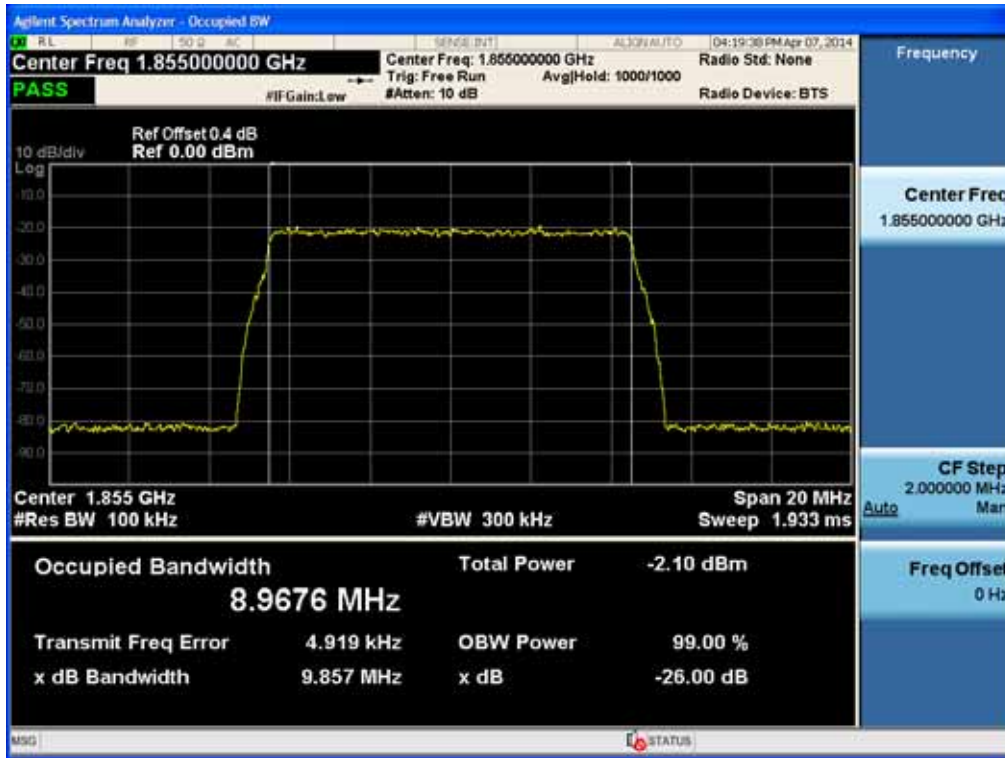
[Input LTE Uplink 5 MHz Middle]



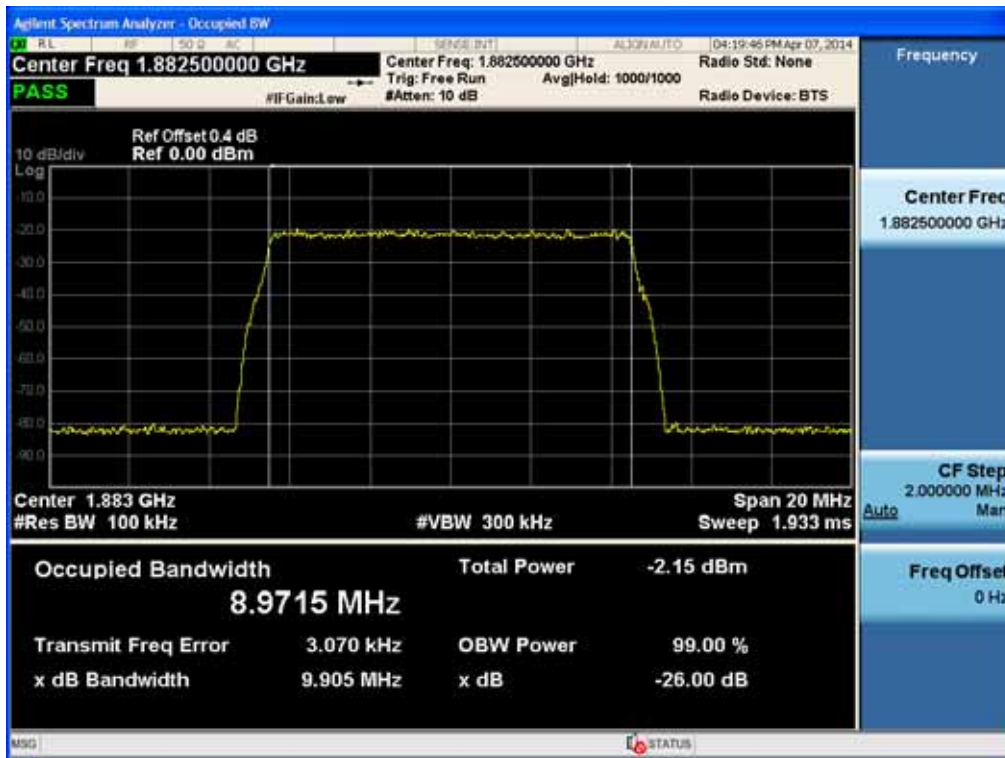
[Input LTE Uplink 5 MHz High]



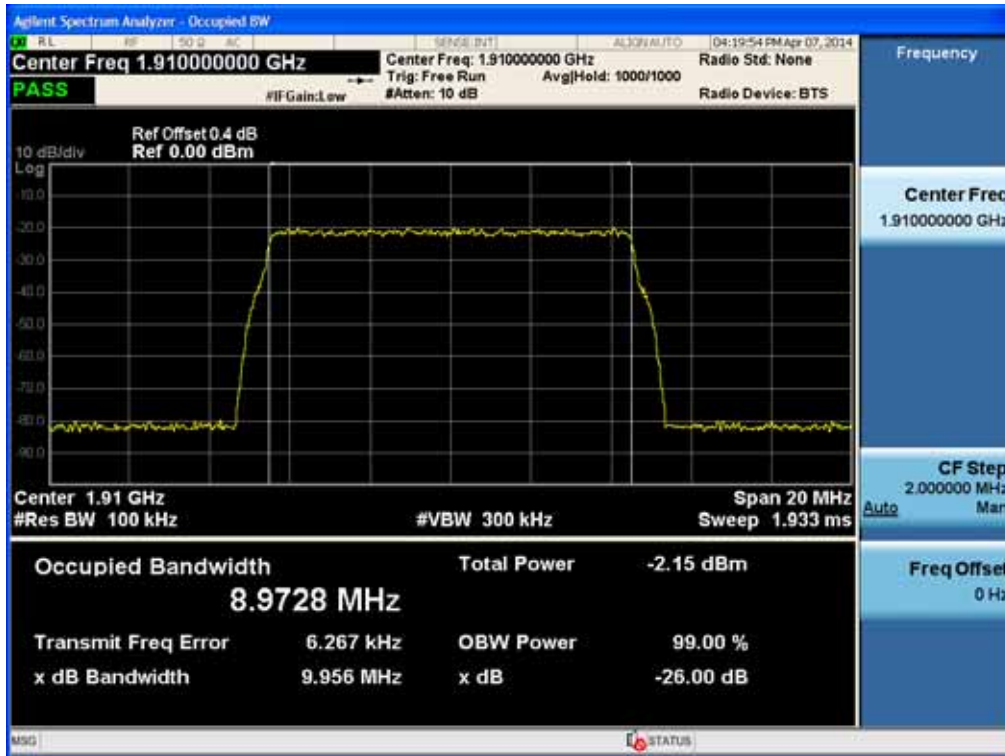
[Input LTE Uplink 10 MHz Low]



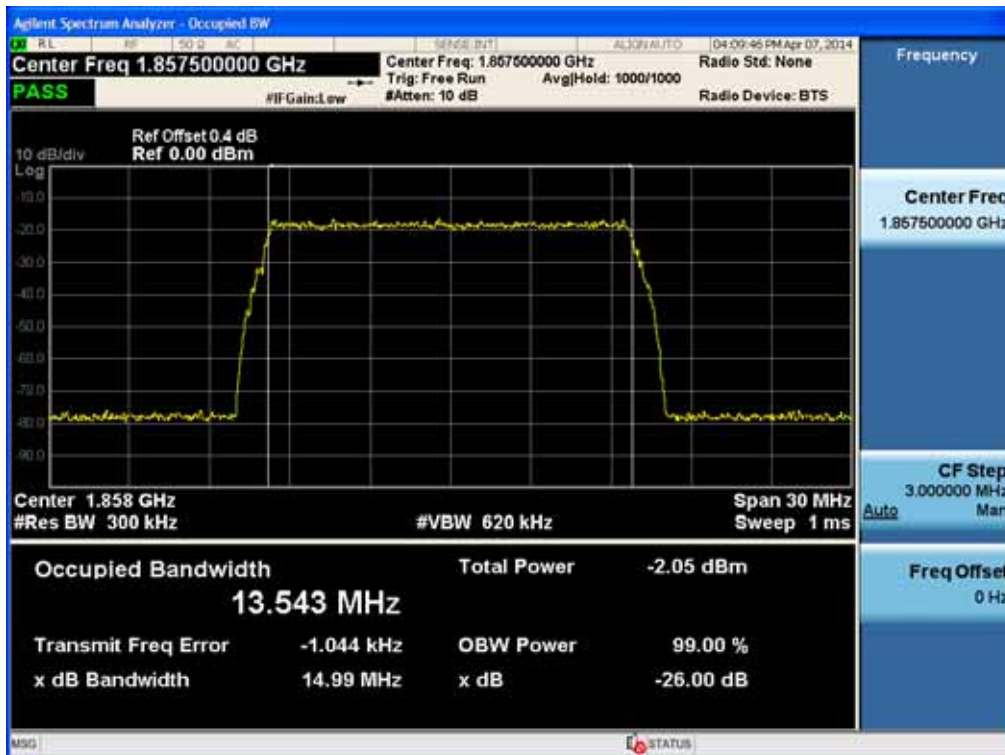
[Input LTE Uplink 10 MHz Middle]



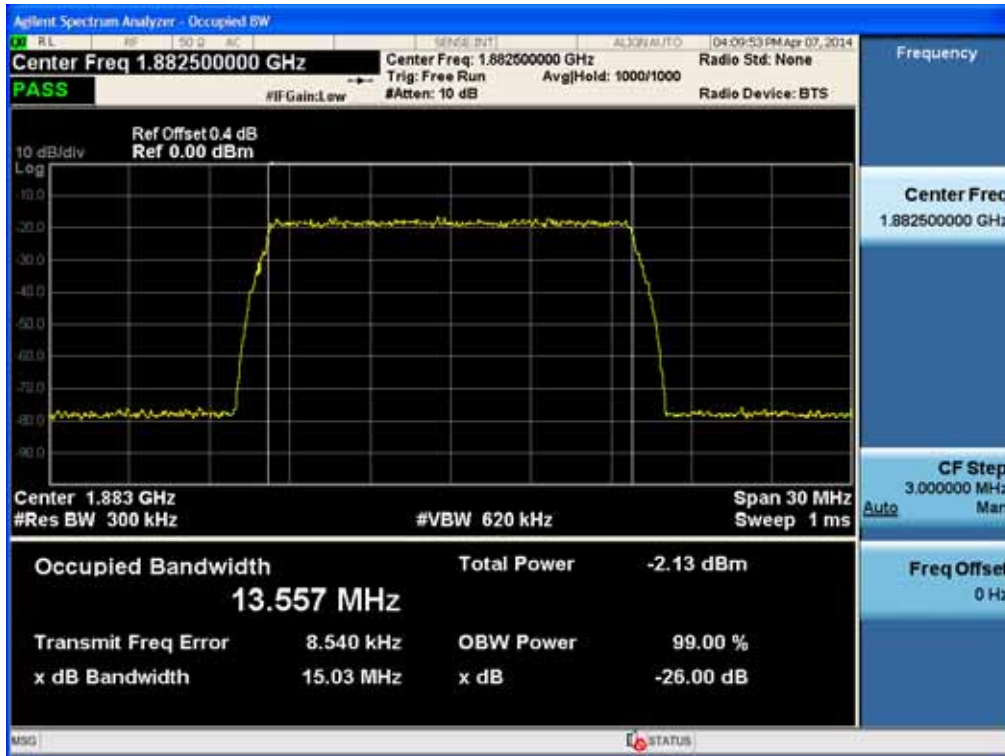
[Input LTE Uplink 10 MHz High]



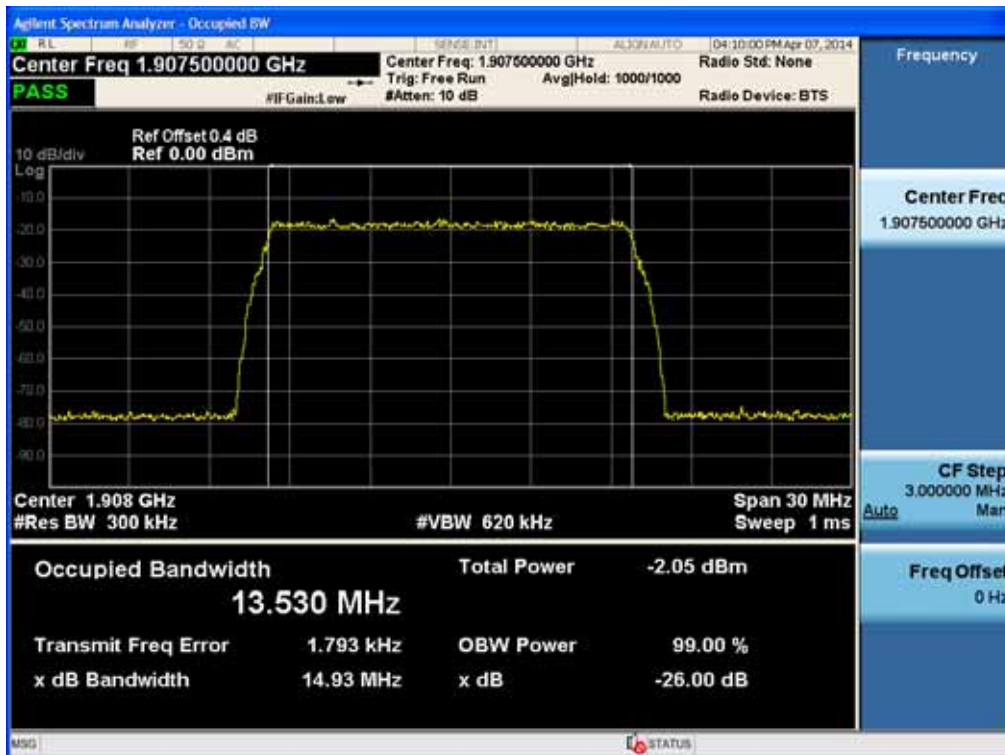
[Input LTE Uplink 15 MHz Low]



[Input LTE Uplink 15 MHz Middle]



[Input LTE Uplink 15 MHz High]



8. SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINAL

Test Requirement(s): § 2.1051 Measurements required: Spurious emissions at antenna terminals:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) Out of band emissions. 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 $43 + 10 \log(P)$ dB.

(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(c) Alternative out of band emission limit. Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas, in lieu of that set forth in this section, pursuant to a private contractual arrangement of all affected licensees and applicants. In this event, each party to such contract shall maintain a copy of the contract in their station files and disclose it to prospective assignees or transferees and, upon request, to the FCC.

(d) Interference caused by out of band emissions. If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC

may require a greater attenuation of that emission than specified in this section.

Test Procedures: A modulated carrier generated by the signal generator carrier was connected to either the Uplink or Downlink RF port at a maximum level as determined by the spectrum analyzer was connected to either the Uplink or Downlink port depending on the circuitry being measured.

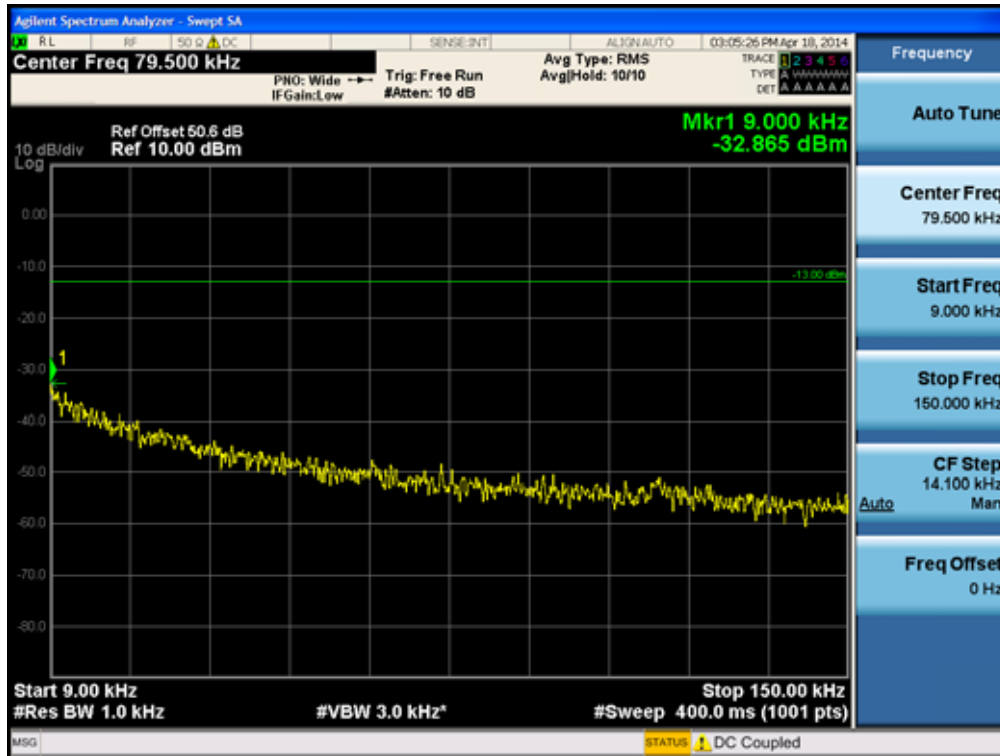
The spectrum was investigated from 9 kHz to the 26.5 GHz of the carrier.

Test Results: The EUT complies with the requirements of this section. There were no detectable Spurious emissions for this EUT

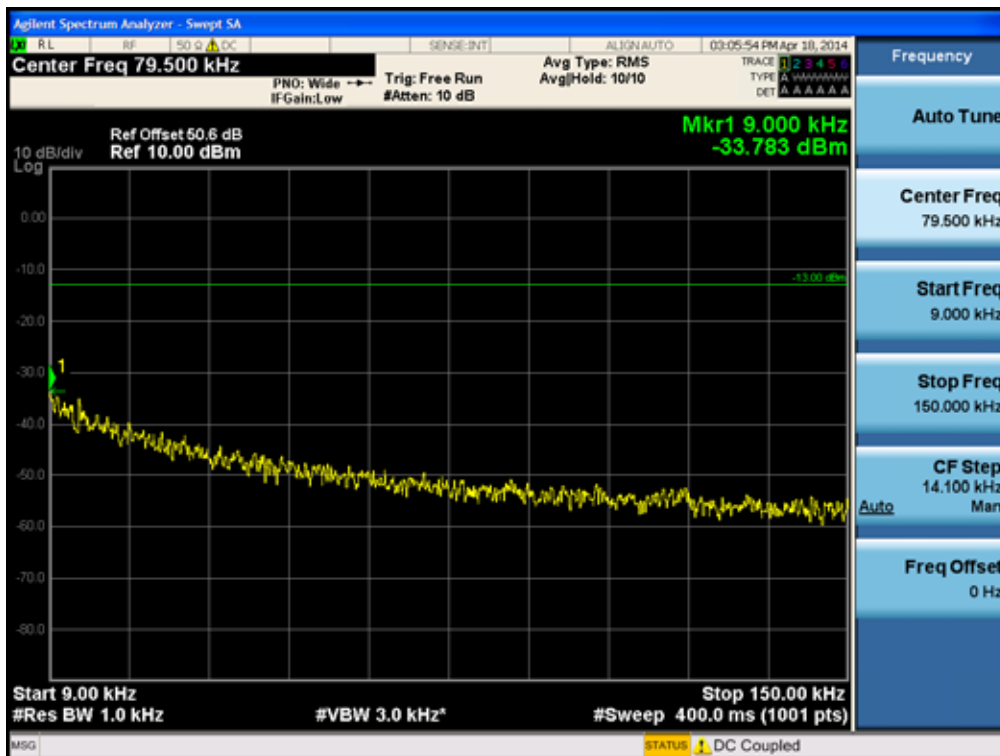
Plots of Spurious Emission

Conducted Spurious Emissions (9 kHz – 150 kHz)

[CDMA Downlink Low]



[CDMA Downlink Middle]



HCT Co., Ltd.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

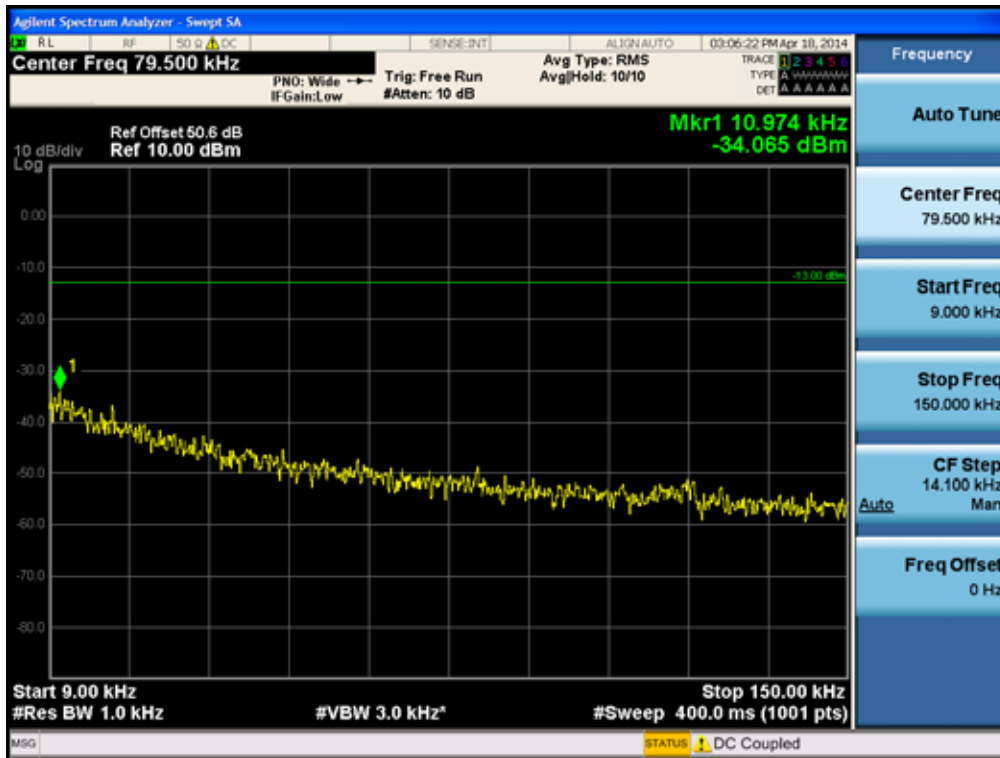
TEL : +82 31 645 6300

FAX : +82 31 645 6401

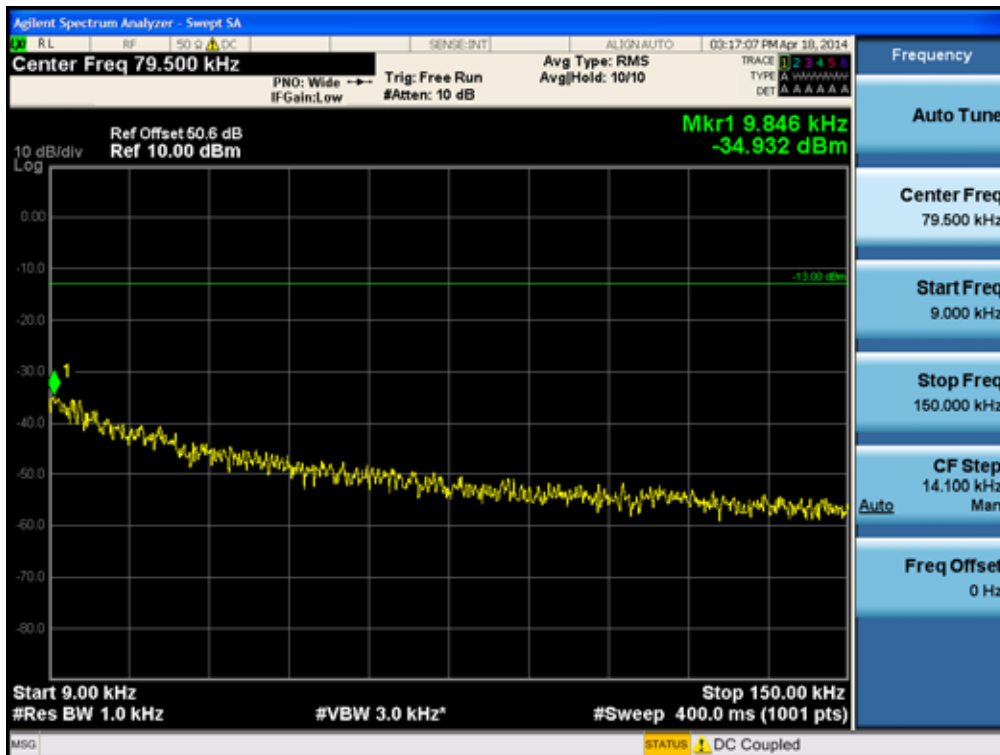
www.hct.co.kr

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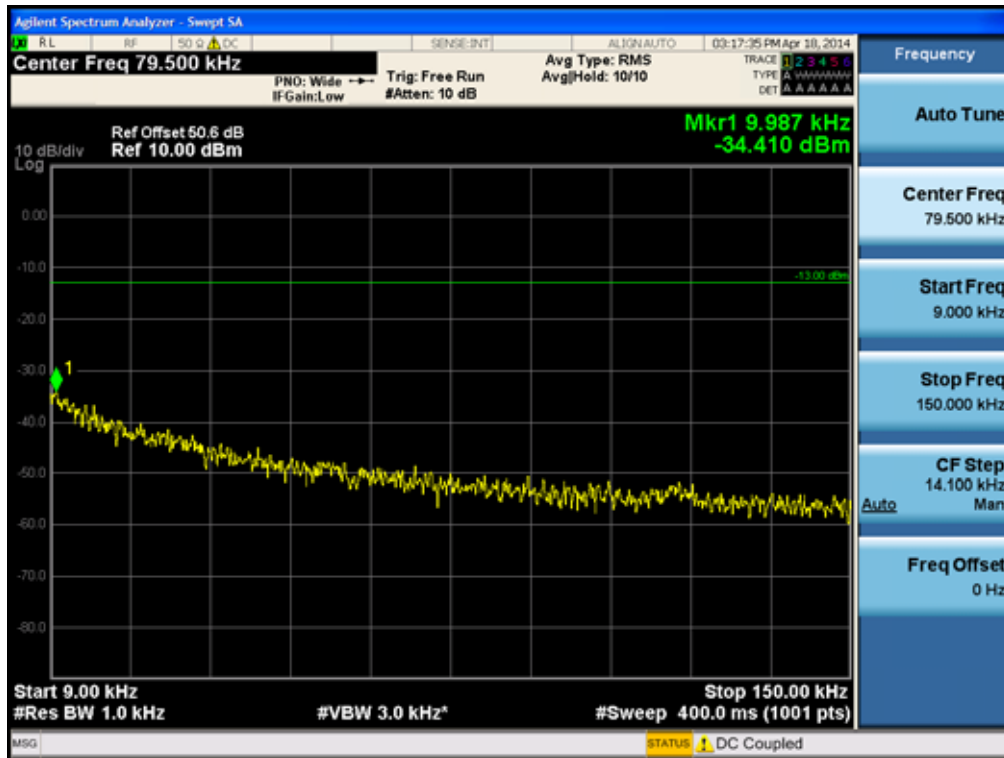
[CDMA Downlink High]



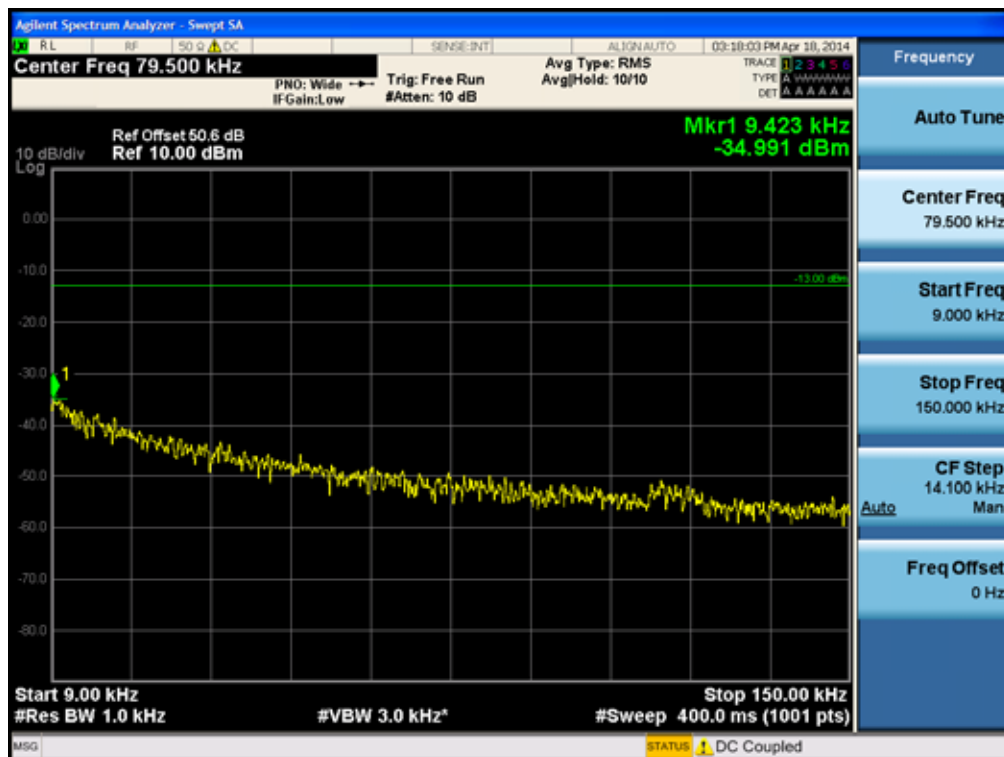
[WCDMA Downlink Low]



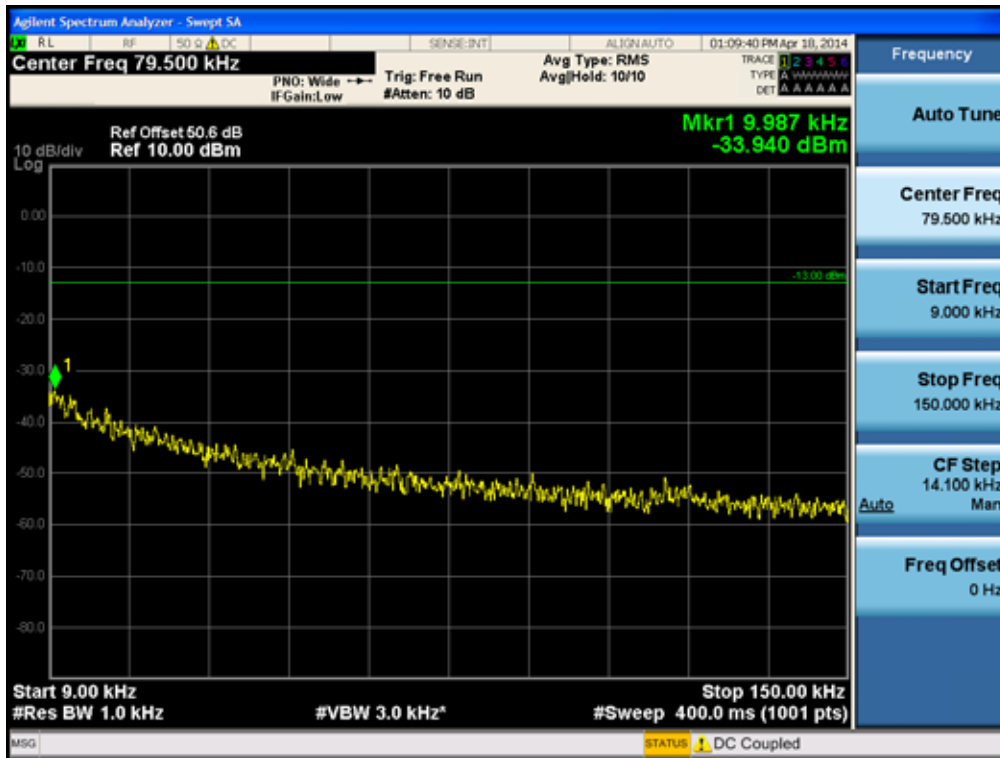
[WCDMA Downlink Middle]



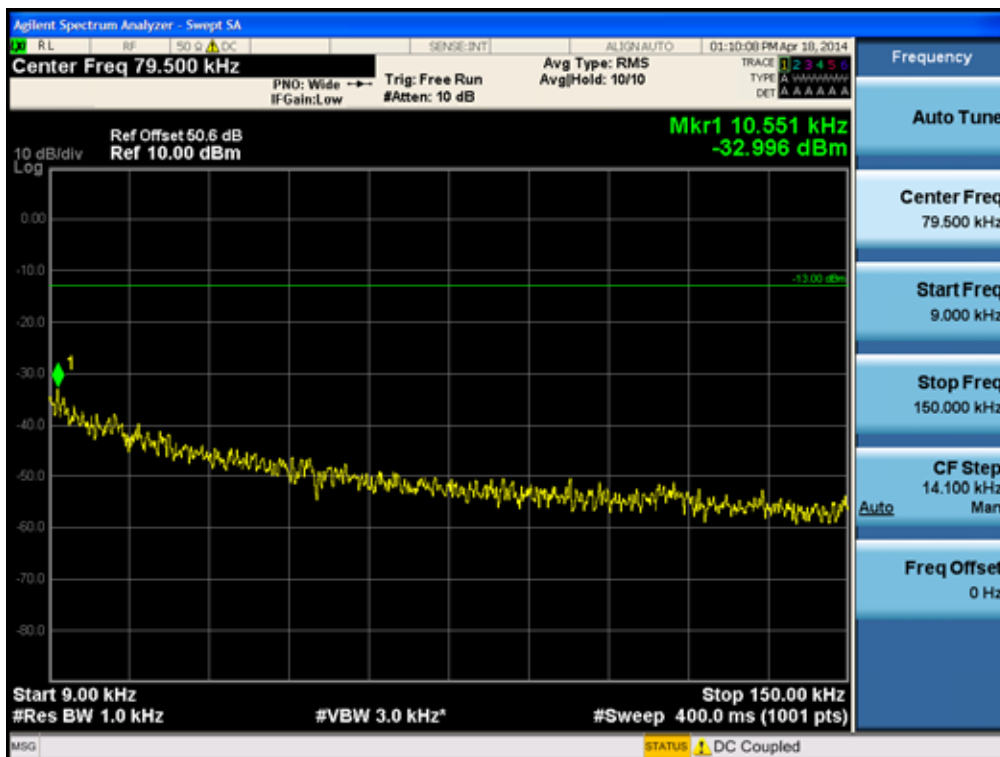
[WCDMA Downlink High]



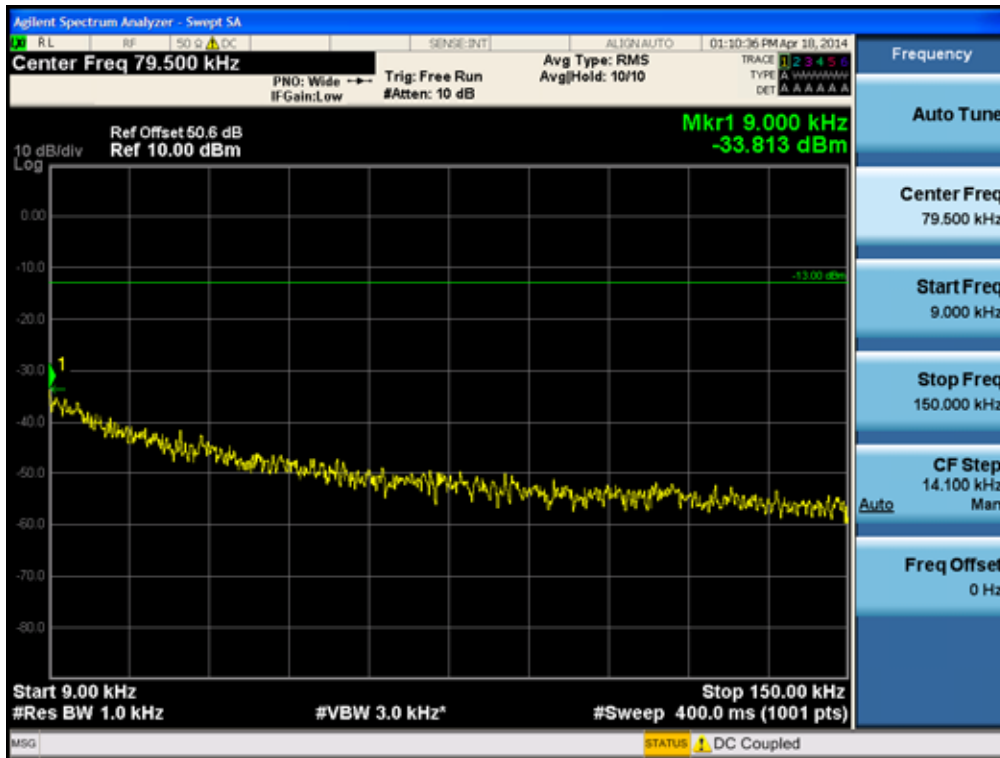
[LTE Downlink 5 MHz Low]



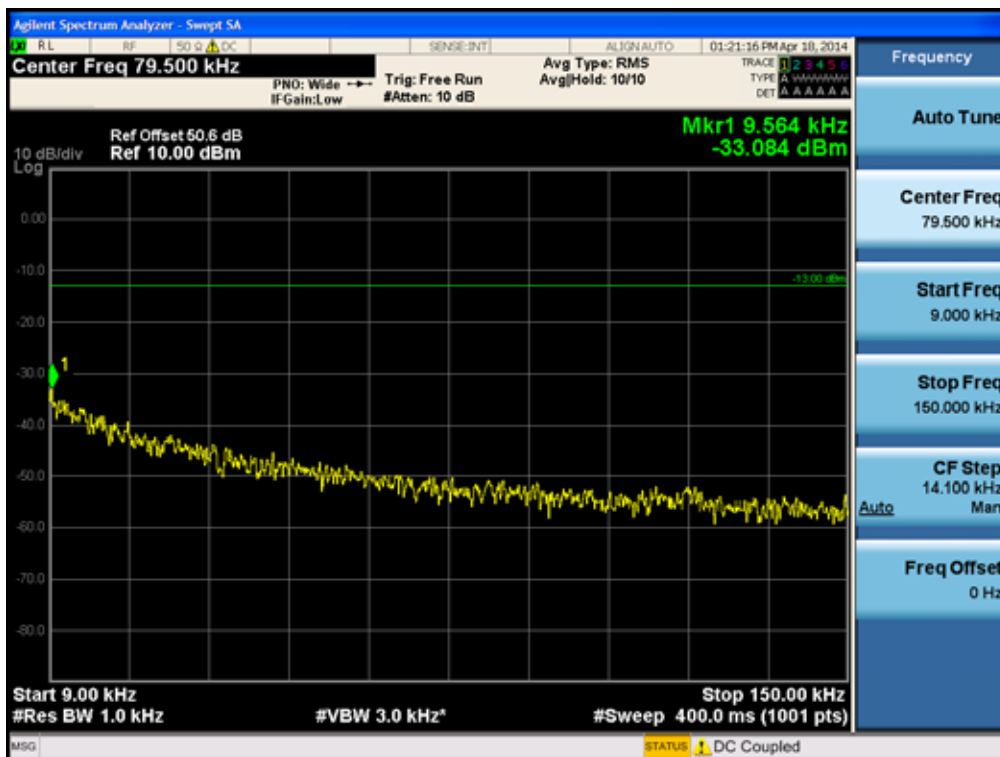
[LTE Downlink 5 MHz Middle]



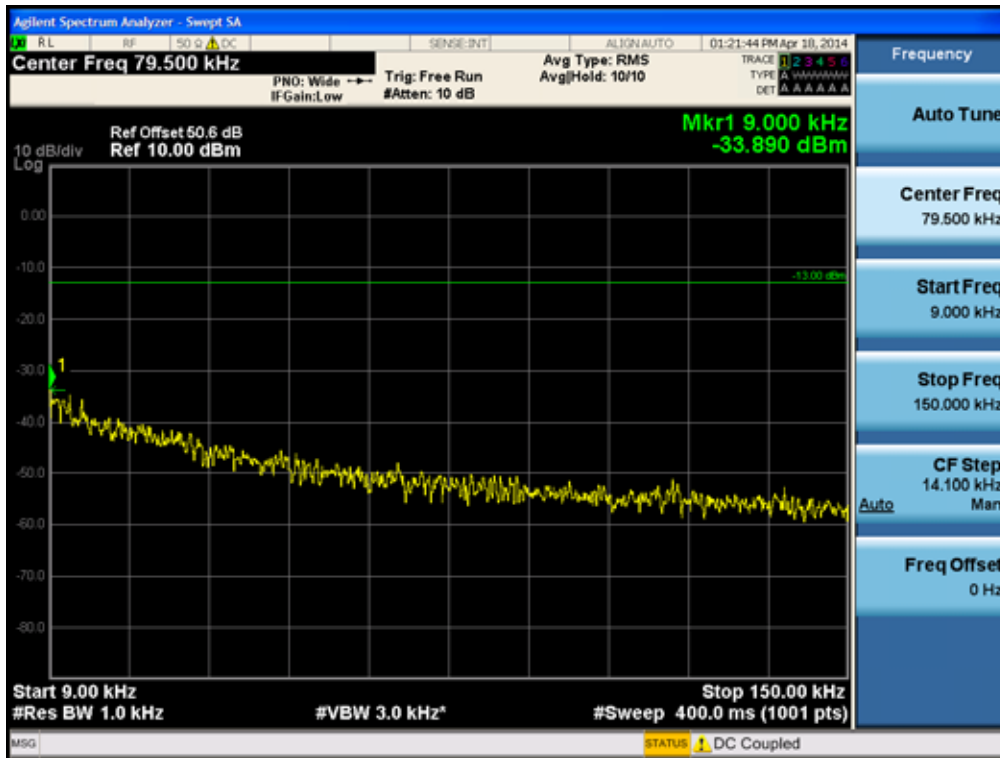
[LTE Downlink 5 MHz High]



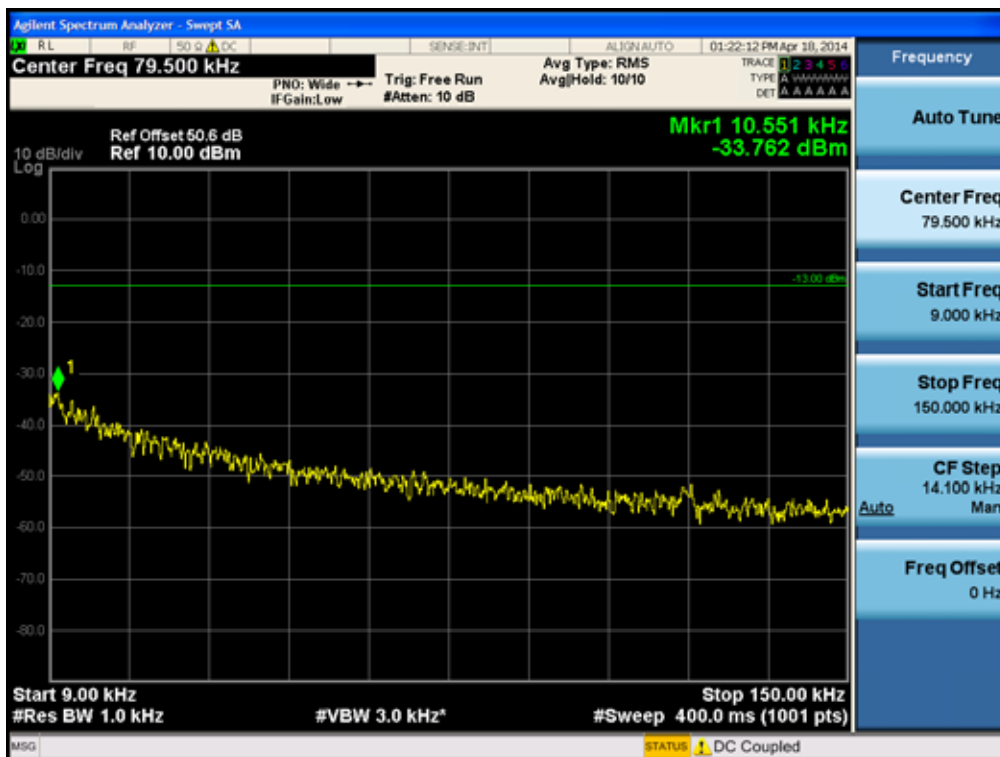
[LTE Downlink 10 MHz Low]



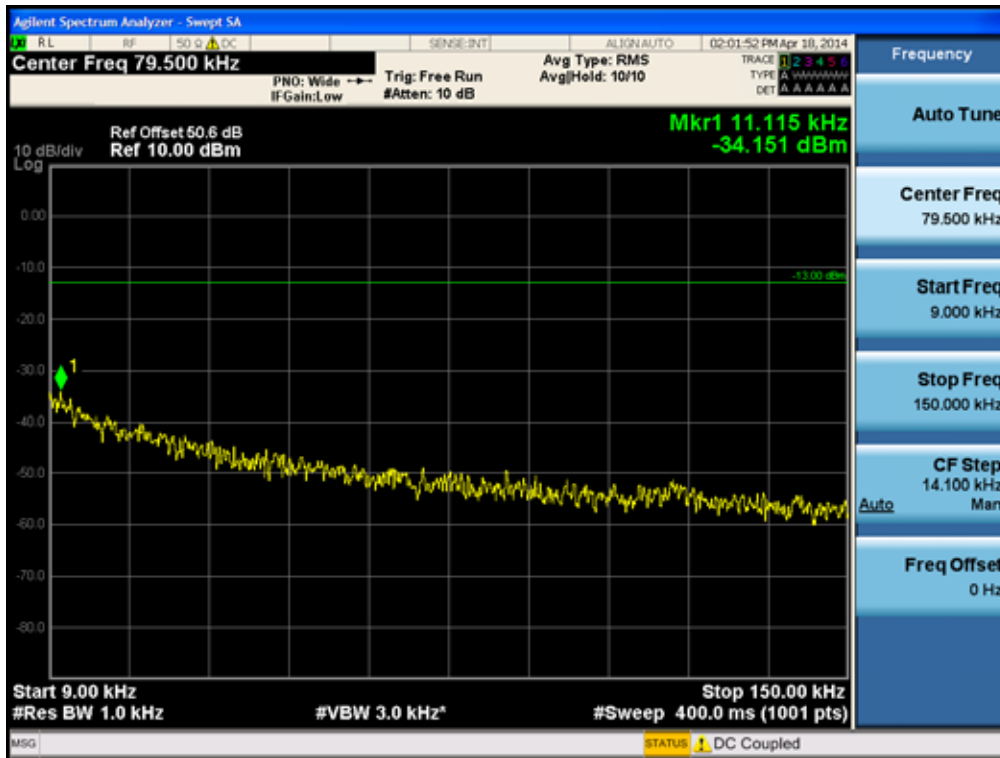
[LTE Downlink 10 MHz Middle]



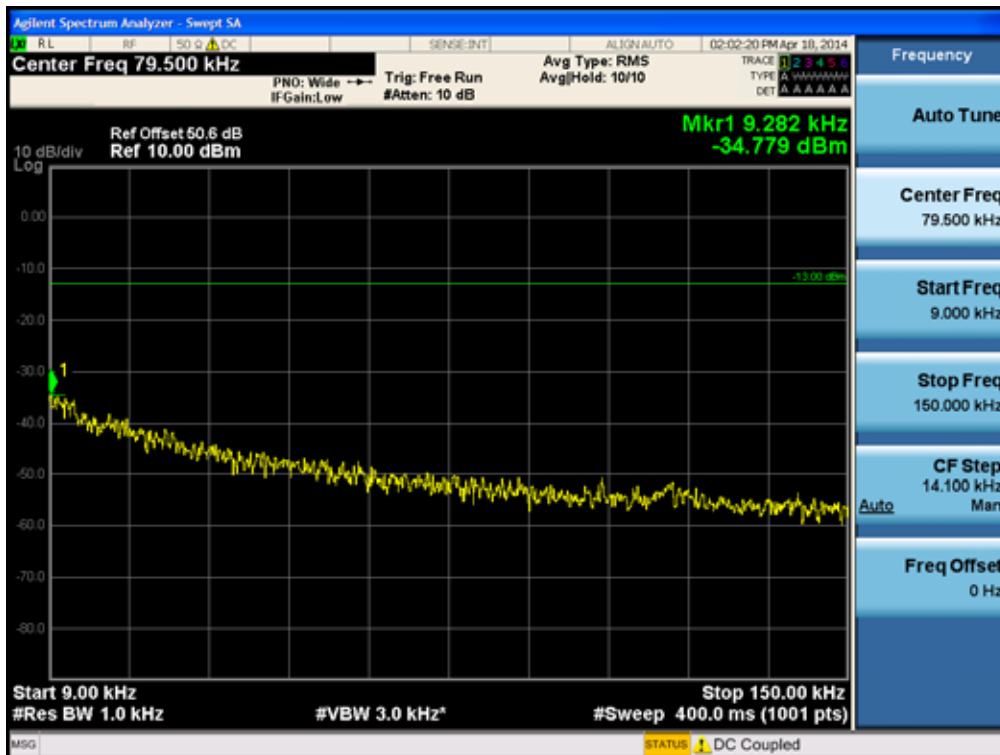
[LTE Downlink 10 MHz High]



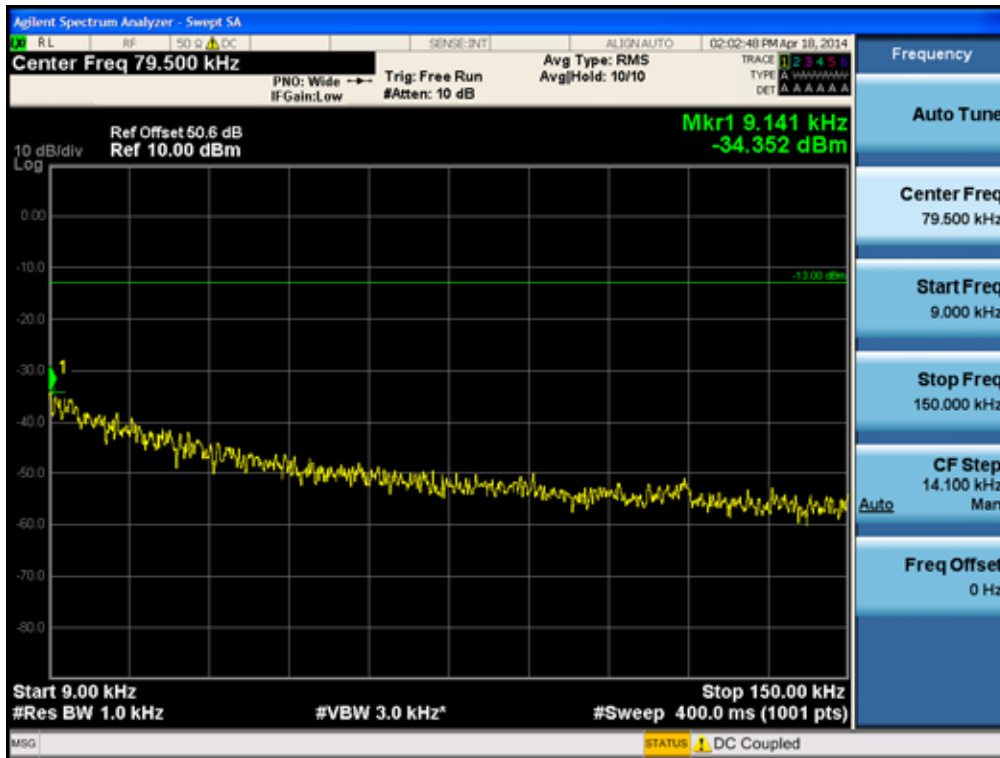
[LTE Downlink 15 MHz Low]



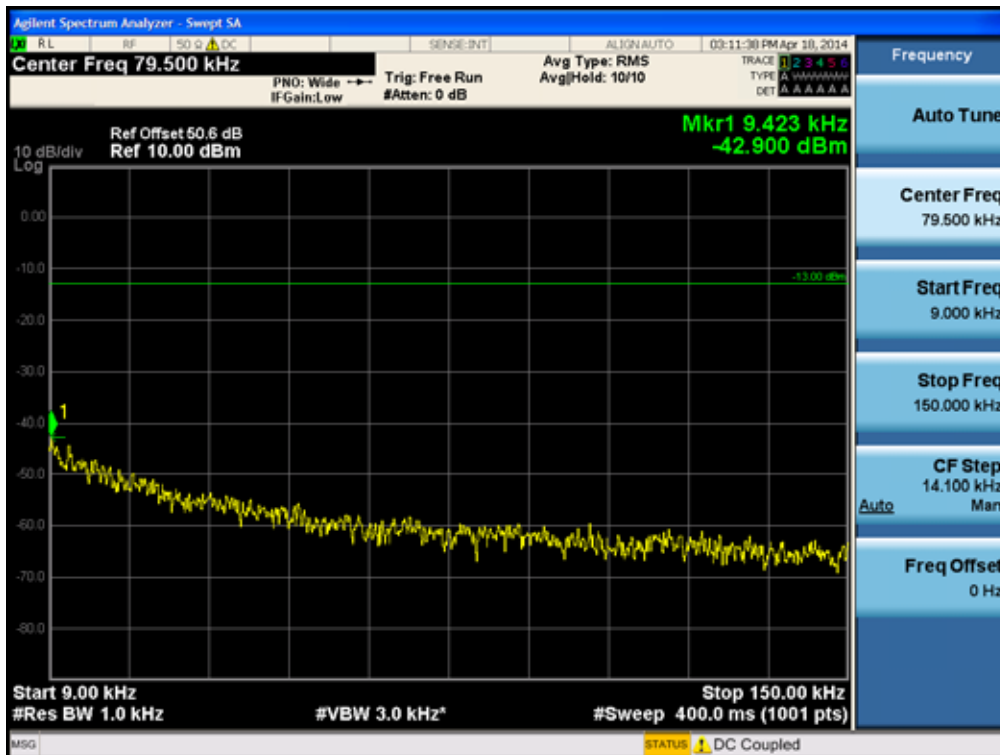
[LTE Downlink 15 MHz Middle]



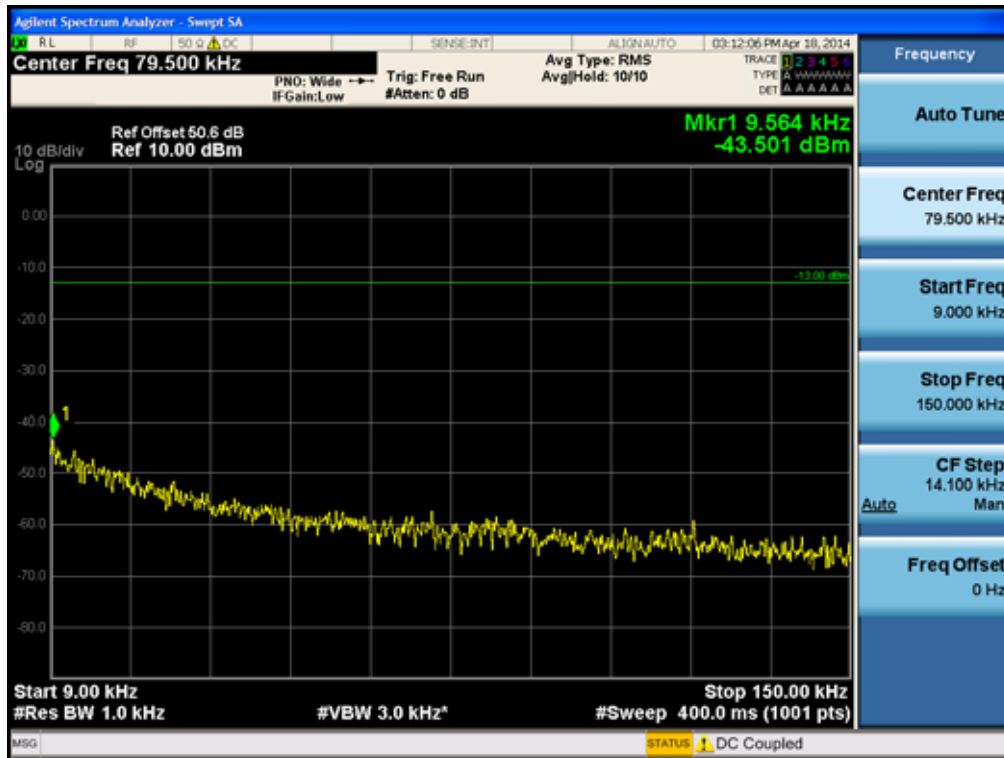
[LTE Downlink 15 MHz High]



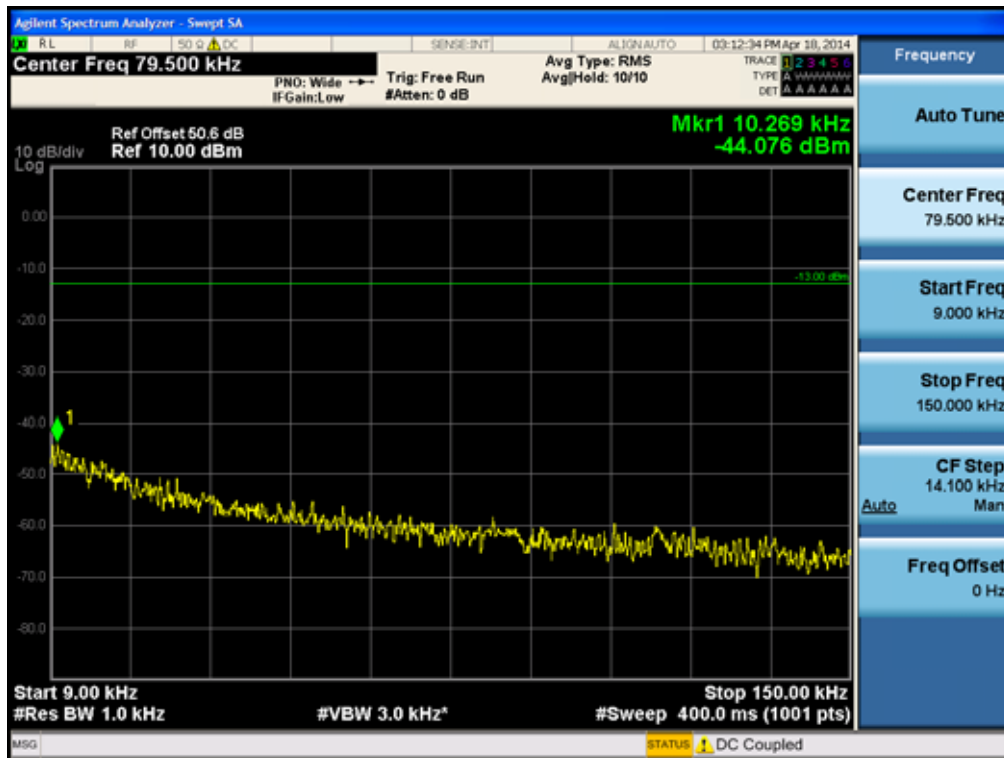
[CDMA Uplink Low]



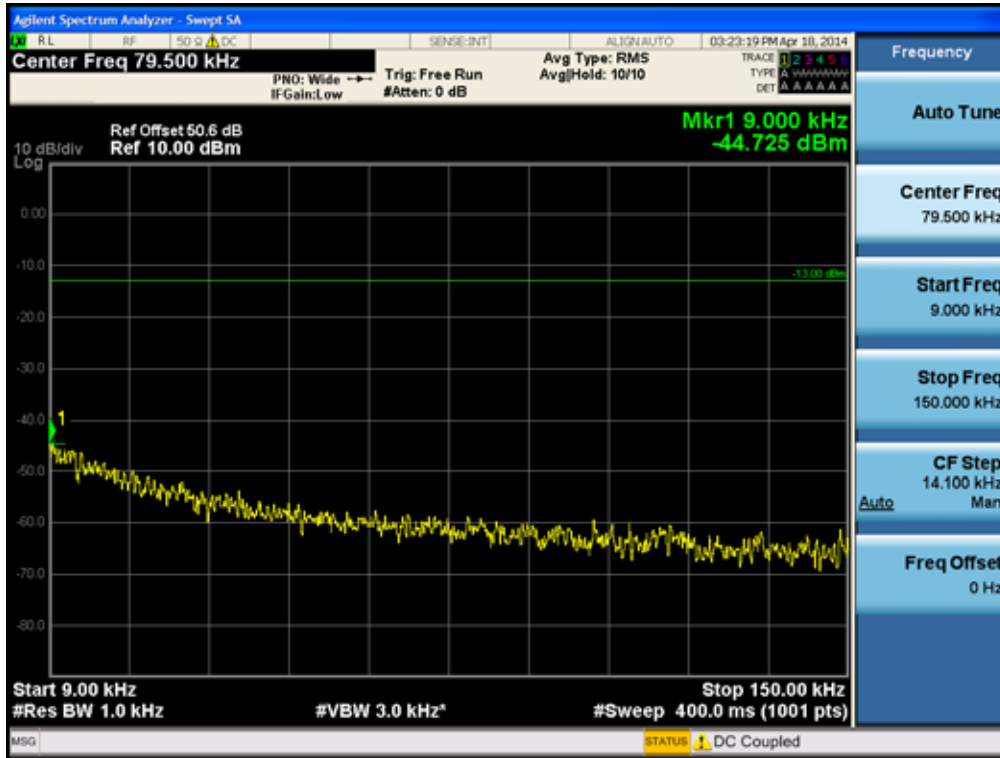
[CDMA Uplink Middle]



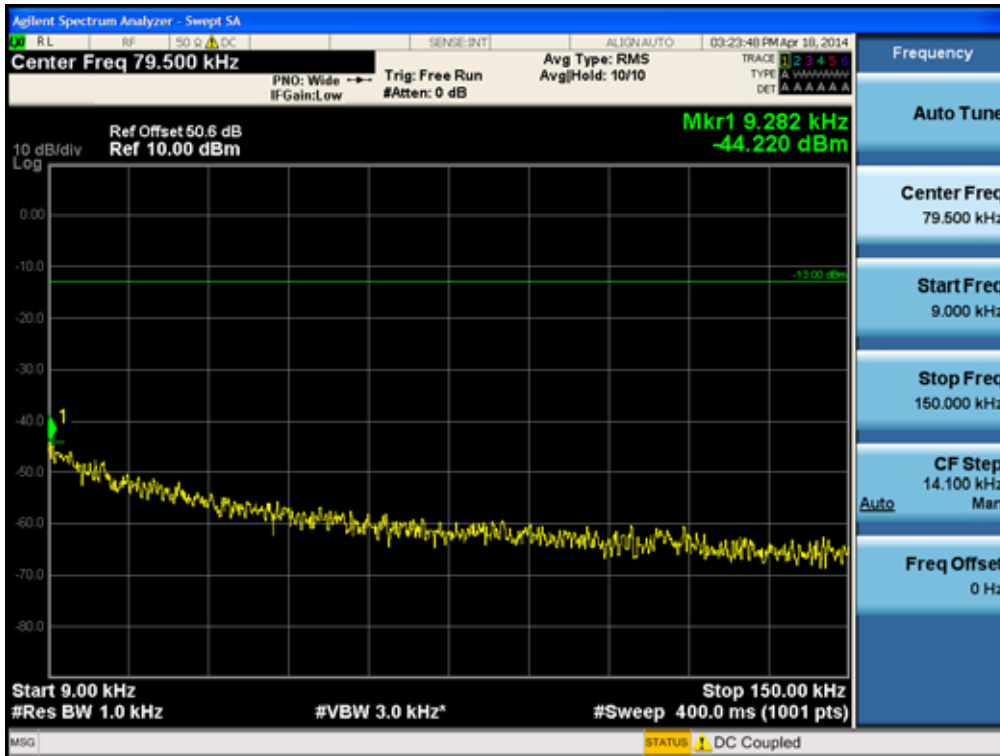
[CDMA Uplink High]



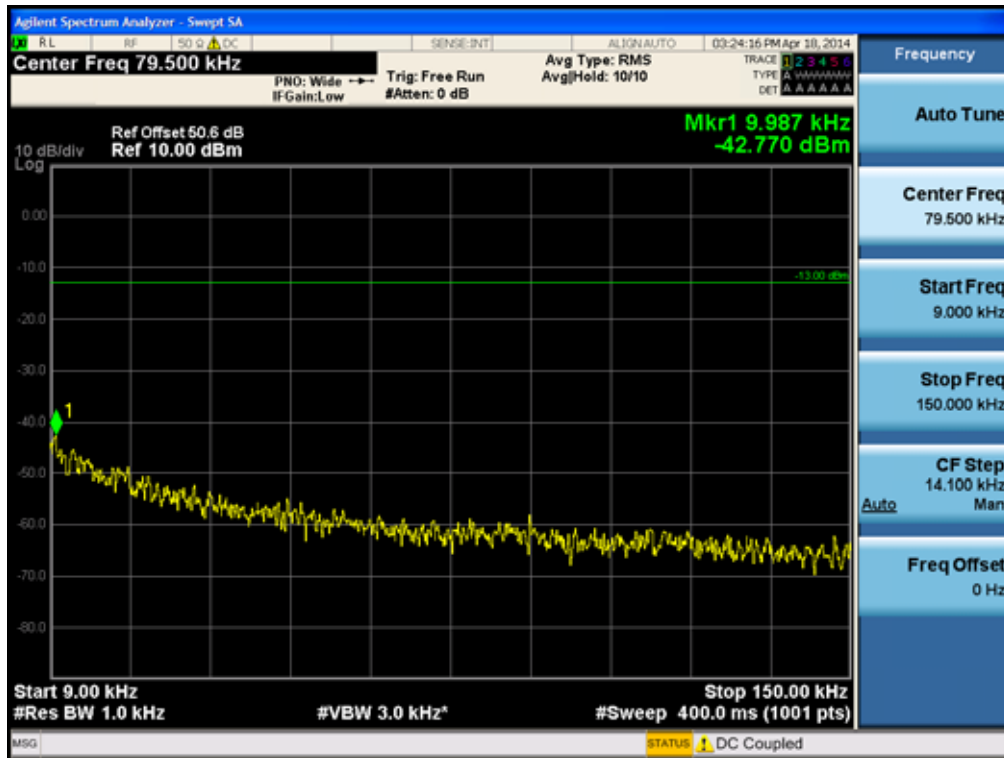
[WCDMA Uplink Low]



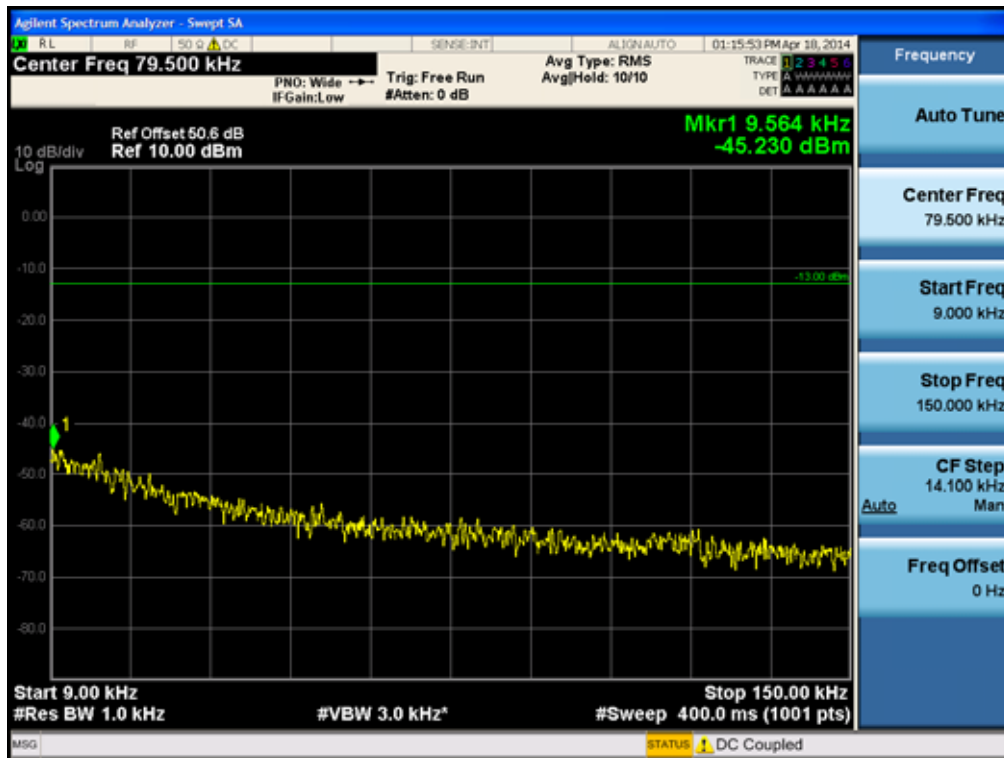
[WCDMA Uplink Middle]



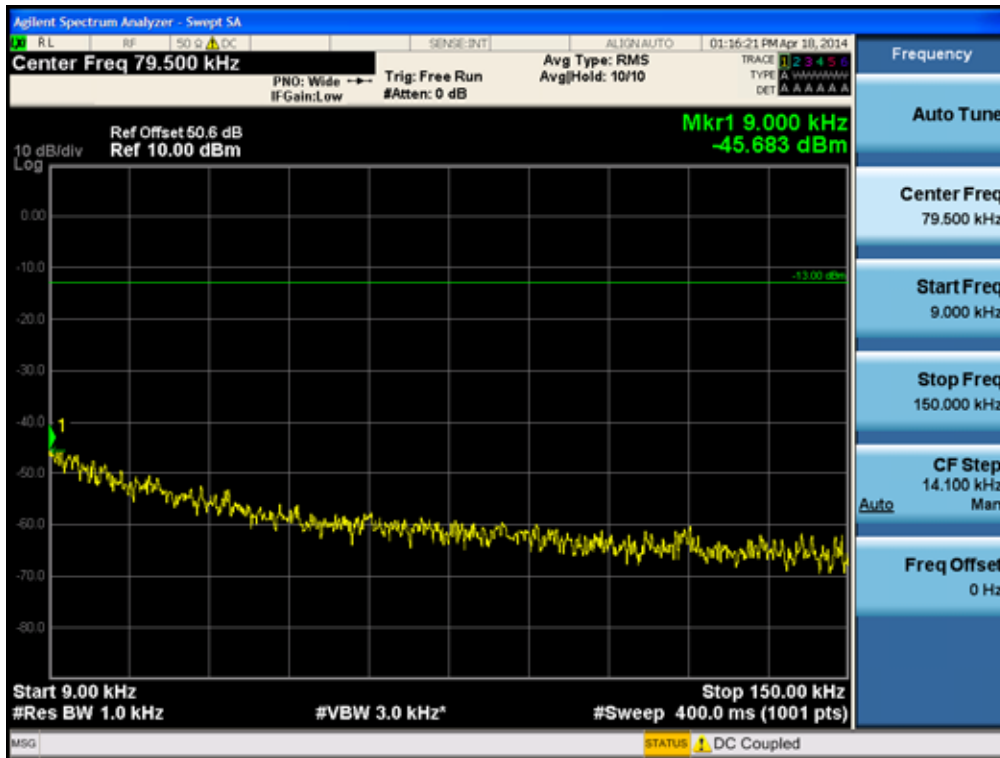
[WCDMA Uplink High]



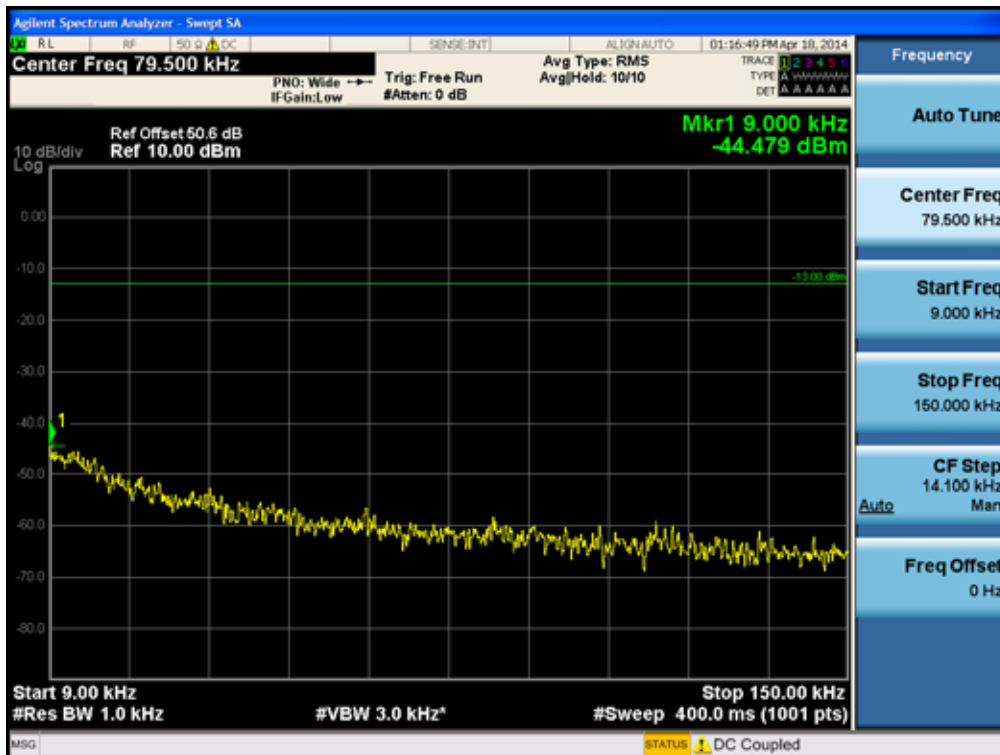
[LTE Uplink 5 MHz Low]



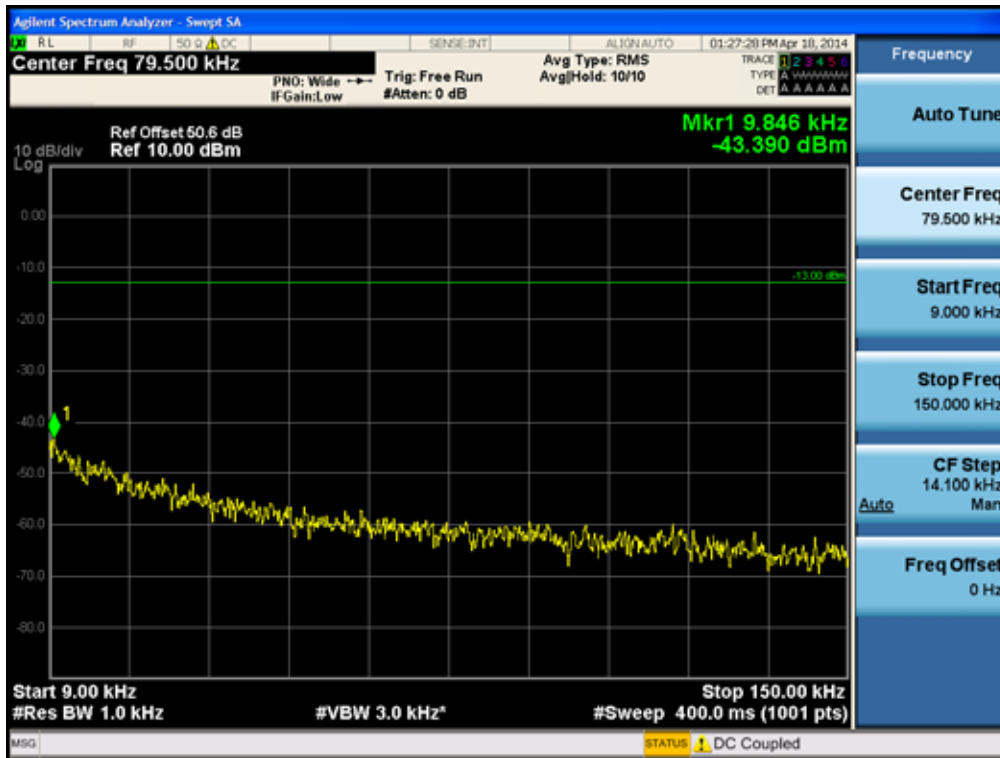
[LTE Uplink 5 MHz Middle]



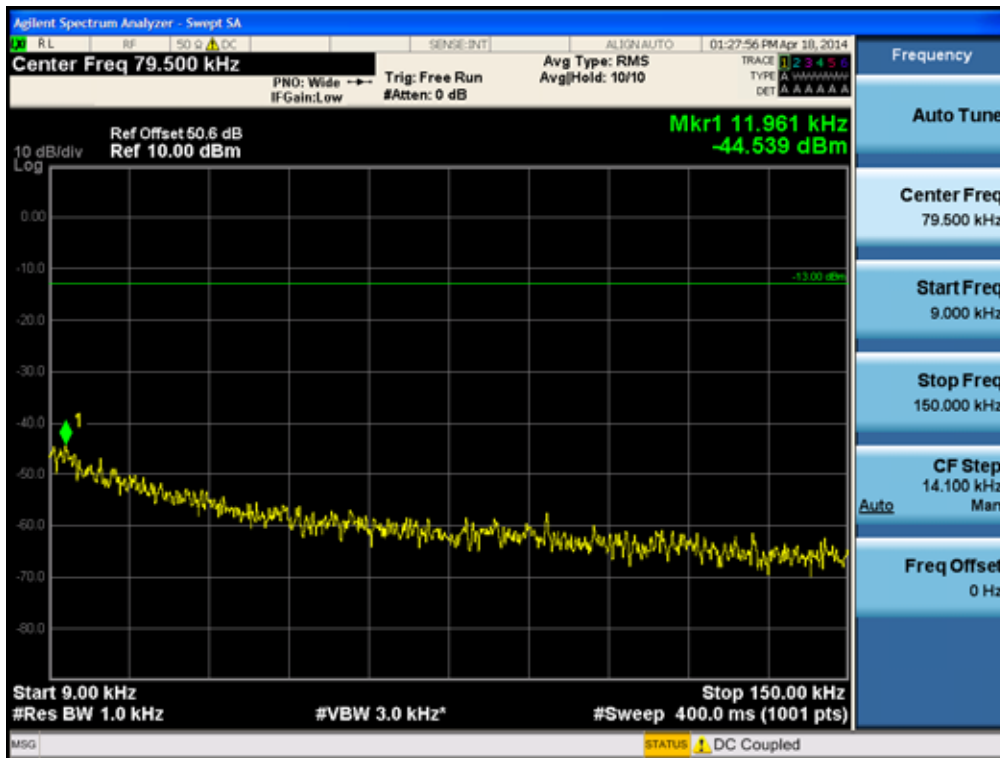
[LTE Uplink 5 MHz High]



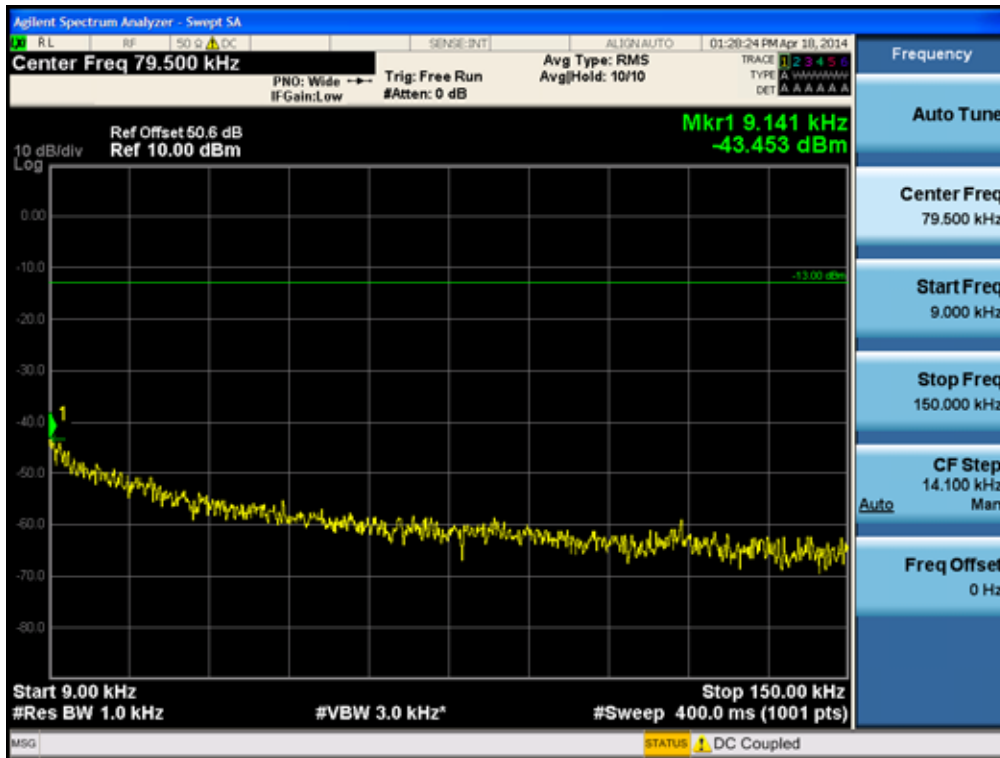
[LTE Uplink 10 MHz Low]



[LTE Uplink 10 MHz Middle]



[LTE Uplink 10 MHz High]



[LTE Uplink 15 MHz Low]

