HCT CO.,LTD
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

FCC REPORT

Certification

Applicant Name:
GS Instech Co., Ltd.

Address:
70, Gilpa-ro 71beon-gil, Nam-gu, Inchen, Korea

Date of Issue:
September 06, 2018

Location of test lab:
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

Report No.: HCT-RF-1809-FC019

FCC ID:	**U88CC-P18**
APPLICANT:	**GS Instech Co., Ltd.**

Model:	CC-P18
EUT Type:	Industrial RF Repeater
Frequency Range:	1 930 MHz ~ 1 995 MHz (DL) / 1 850 MHz ~ 1 915 MHz (UL)
Output Power:	DL : 18 dBm (0.06 W) UL : 18 dBm (0.06 W)
Date of Test:	July 23, 2018 ~ August 08, 2018
FCC Rule Part(s):	CFR 47 Part 2, Part 24

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 the FCC Rules under normal use and maintenance.

Report prepared by : Kwang Il Yoon
Engineer of telecommunication testing center

Approved by : Jong Seok Lee
Manager of telecommunication testing center

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1809-FC019	September 06, 2018	- First Approval Report

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1. GENERAL INFORMATION

1.1. APPLICANT INFORMATION

Company Name	GS Instech Co., Ltd.
Company Address	70, Gilpa-ro 71beon-gil, Nam-gu, Inchen, Korea

1.2. PRODUCT INFORMATION

EUT Type	Industrial RF Repeater
Power Supply	AC-DC Adapter (Input : AC 90 ~ 264V, Output : DC 12V)
Frequency Range	1 930 MHz ~ 1 995 MHz (DL) / 1 850 MHz ~ 1 915 MHz (UL)
Output Power	DL : 18 dBm (0.06 W) UL : 18 dBm (0.06 W)
Supporting Technologies	LTE 20 MHz, CDMA, 1xEVDO
Antenna Specification	Manufacturer does not provide an antenna.

1.3. TEST INFORMATION

FCC Rule Parts	CFR 47 Part 2, Part 24
Measurement standards	ANSI C63.26-2015, KDB 971168 D01 v03r01, KDB 935210 D05 v01r02
Place of Test	HCT CO., LTD. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

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, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version: 2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

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 SPECIFICATIONS

3.1. STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 2, Part 24

Description	Reference	Results
RF Output Power	§2.1046, §24.232	Compliant
Occupied Bandwidth	§2.1049	Compliant
Out of Band Rejection	KDB 935210 D05 v01r02	Compliant
Unwanted Conducted Emissions	§2.1051, §24.238	Compliant
Radiated Emissions	§2.1053, §24.238	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.
* Since EUT does not alter the input signal, frequency stability test did not proceed according to section 4.8 of KDB935210 D05 v01r02.
* The tests results in plots are already including the actual value of loss for the attenuator and cable combination. Please check correction factors below table.

▣ Correction Factor

Freq(MHz)	Factor(dB)
50	20.014
100	19.929
200	20.130
300	20.199
400	20.327
500	20.119
600	20.254
700	20.373
800	20.397
900	20.397
1000	20.414
2000	20.836
3000	20.743
4000	21.265
5000	21.408
6000	21.558
7000	21.863
8000	22.118
9000	21.590
10000	21.884
20000	23.124
26000	24.212

3.3. MAXIMUM MEASUREMENTUNCERTAINTY

The value of the measurement uncertainty for the measurement of each parameter.

Coverage factor *k* = 2, Confidence levels of 95 %

Description	Condition	Uncertainty
RF Output Power	-	± 0.72 dB
Occupied Bandwidth	OBW ≤ 20 MHz	± 52 kHz
Out of Band Rejection	Gain 20 dB bandwidth	± 0.89 dB ± 0.58 MHz
Unwanted Conducted Emissions	-	± 1.08 dB
Radiated Emissions	f ≤ 1 GHz f > 1 GHz	± 4.80 dB ± 6.07 dB

3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

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

4. TEST EQUIPMENTS

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Agilent	N9020A / Spectrum Analyzer	09/15/2017	Annual	MY46471250
Agilent	N5128A / Signal Generator	03/05/2018	Annual	MY50141649
Agilent	N5128A / Signal Generator	02/17/2018	Annual	MY46240523
Agilent	11636A / Power Divider	07/26/2018	Annual	09109
Changwoo	18N-20dB / Attenuator	02/22/2018	Annual	4
DEAYOUNG ENT	DFSS60 / AC Power Supply	04/05/2018	Annual	1003030-1
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	06/30/2017	Biennial	9120D-1300
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	04/25/2017	Biennial	BBHA9170124
Rohde & Schwarz	FSP30 / Spectrum Analyzer	09/06/2017	Annual	100688
Wainwright Instruments	WHKX10-900-1000-15000-40SS	07/20/2018	Annual	5
Wainwright Instruments	WHKX10-2700-3000-18000-40SS / High Pass Filter	07/16/2018	Annual	4
CERNEX	CBLU1183540 / Power Amplifier	01/03/2018	Annual	24613
CERNEX	CBL06185030 / Power Amplifier	01/03/2018	Annual	24615
CERNEX	CBL18265035 / Power Amplifier	01/10/2018	Annual	22966

5. RF OUTPUT POWER

FCC Rules

Test Requirements:

§ 2.1046 Measurements required: RF power output.

(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.

(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 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.

(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)(1) Base stations with an emission bandwidth of 1 MHz or less are limited to 1640 watts equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below.

(2) Base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below.

(3) Base station antenna heights may exceed 300 meters HAAT with a corresponding reduction in power; see Tables 1 and 2 of this section.

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

Table 1—Reduced Power for Base Station Antenna Heights Over 300 Meters, With Emission Bandwidth of 1 MHz or Less

HAAT in meters	Maximum EIRP (watts)
≤300	1 640
≤500	1 070

≤1000	490
≤1500	270
≤2000	160

Table 2—Reduced Power for Base Station Antenna Heights Over 300 Meters, With Emission Bandwidth Greater Than 1 MHz

HAAT in meters	Maximum EIRP (watts/MHz)
≤300	1 640
≤500	1 070
≤1000	490
≤1500	270
≤2000	160

(b)(1) Base stations that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, with an emission bandwidth of 1 MHz or less are limited to 3280 watts equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT.

(2) Base stations that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, with an emission bandwidth greater than 1 MHz are limited to 3280 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT.

(3) Base station antenna heights may exceed 300 meters HAAT with a corresponding reduction in power; see Tables 3 and 4 of this section.

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

(5) Operation under this paragraph (b) at power limits greater than permitted under paragraph (a) of this section must be coordinated in advance with all broadband PCS licensees authorized to operate on adjacent frequency blocks within 120 kilometers (75 miles) of the base station and is limited to base stations located more than 120 kilometers (75 miles) from the Canadian border and more than 75 kilometers (45 miles) from the Mexican border.

Table 3—Reduced Power for Base Station Antenna Heights Over 300 Meters, With Emission Bandwidth of 1 MHz or Less

HAAT in meters	Maximum EIRP (watts)
≤300	3 280
≤500	2 140
≤1000	980
≤1500	540
≤2000	320

Table 4—Reduced Power for Base Station Antenna Heights Over 300 Meters, With Emission Bandwidth Greater Than 1 MHz

HAAT in meters	Maximum EIRP (watts/MHz)
≤300	3 280

≤500	2 140
≤1000	980
≤1500	540
≤2000	320

(c) Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

(d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

Note to §24.232: Height above average terrain (HAAT) is to be calculated using the method set forth in §24.53 of this part.

Test Procedures:

Measurements were in accordance with the test methods section 3.5.2 of KDB 935210 D05 v01r02.

a) Connect a signal generator to the input of the EUT.

b) Configure to generate the AWGN (broadband) test signal.

c) The frequency of the signal generator shall be set to the frequency f_0 as determined from 3.3.

d) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.

e) Set the signal generator output power to a level that produces an EUT output level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.

f) Measure and record the output power of the EUT; use 3.5.3 or 3.5.4 for power measurement.

g) Remove the EUT from the measurement setup. Using the same signal generator settings, repeat the power measurement at the signal generator port, which was used as the input signal to the EUT, and record as the input power. EUT gain may be calculated as described in 3.5.5.

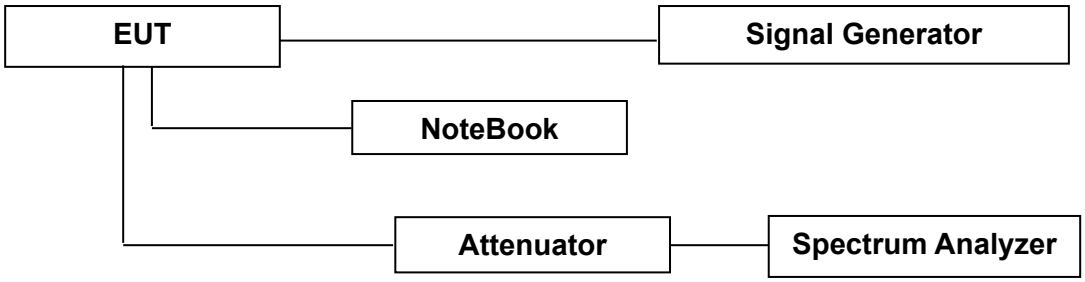
h) Repeat steps f) and g) with input signal amplitude set to 3 dB above the AGC threshold level.

i) Repeat steps e) to h) with the narrowband test signal.

j) Repeat steps e) to i) for all frequency bands authorized for use by the EUT.

Power measurement Method:

Guidance for performing input/output power measurements using a spectrum or signal analyzer is provided in 5.2 of KDB Publication 971168 D01 v03r01.



Block Diagram 1. RF Power Output Test Setup

Test Results:

Input Signal	Link	Input Level (dBm)	Maximum Amp Gain (dB)
Broadband PCS	Downlink & Uplink	-62	80

* Due to EUT's ALC function (Auto Level Control), even if input signal is increased, the same output power is transmit.

Data of Output Power

Downlink	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
LTE 20 MHz AGC threshold	Low	1940.00	18.36	0.069
	Middle	1962.50	18.10	0.065
	High	1985.00	18.21	0.066
LTE 20 MHz +3 dB above the AGC threshold	Low	1940.00	18.44	0.070
	Middle	1962.50	17.73	0.059
	High	1985.00	18.16	0.065
CDMA AGC threshold	Low	1931.25	18.31	0.068
	Middle	1962.50	17.88	0.061
	High	1993.75	18.00	0.063
CDMA +3 dB above the AGC threshold	Low	1931.25	18.25	0.067
	Middle	1962.50	17.78	0.060
	High	1993.75	17.94	0.062

Uplink	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
LTE 20 MHz AGC threshold	Low	1860.00	17.66	0.058
	Middle	1882.50	18.10	0.065
	High	1905.00	17.94	0.062
LTE 20 MHz +3 dB above the AGC threshold	Low	1860.00	17.80	0.060
	Middle	1882.50	18.34	0.068
	High	1905.00	18.31	0.068
CDMA AGC threshold	Low	1851.25	18.15	0.065
	Middle	1882.50	18.14	0.065
	High	1913.75	17.97	0.063
CDMA +3 dB above the AGC threshold	Low	1851.25	18.33	0.068
	Middle	1882.50	18.42	0.070
	High	1913.75	18.18	0.066

*Note: We have done CDMA and 1xEVDO modulation test in technology. Test results are only attached worst cases.

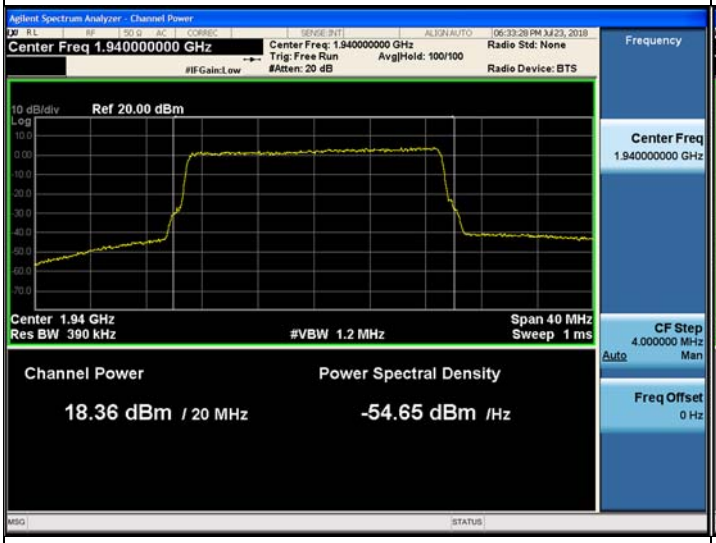
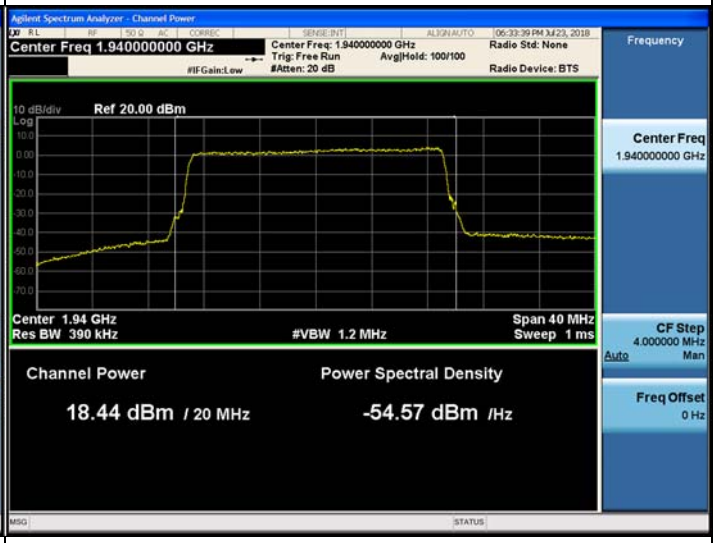
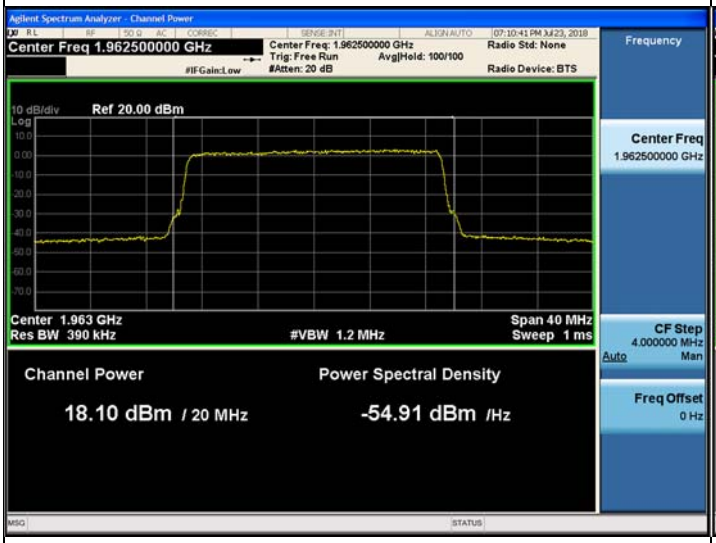
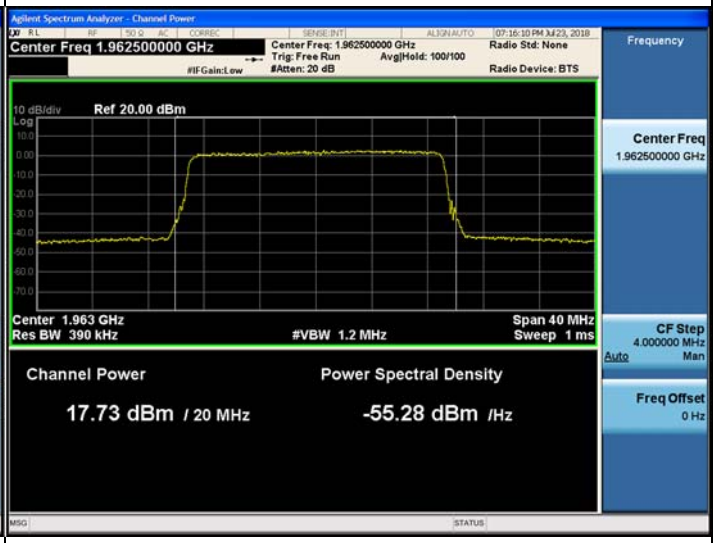
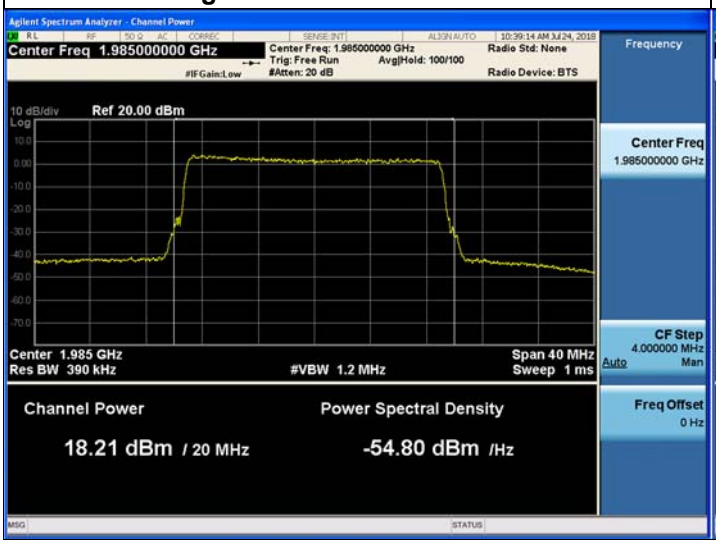
Data of Peak-to-Average Ratio (PAR)

Downlink	Channel	Frequency (MHz)	Measured PAR (dB)
LTE 20 MHz AGC threshold	Middle	1 962.50	8.53
LTE 20 MHz +3 dB above the AGC threshold			8.53
CDMA AGC threshold			8.04
CDMA +3 dB above the AGC threshold			8.07

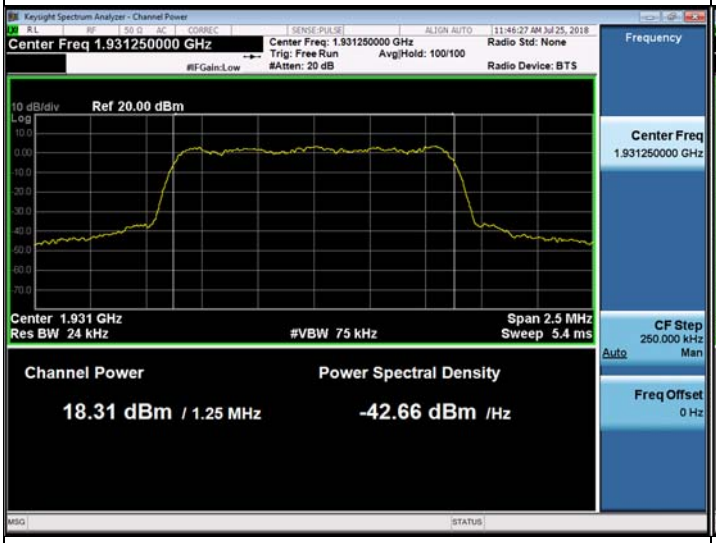
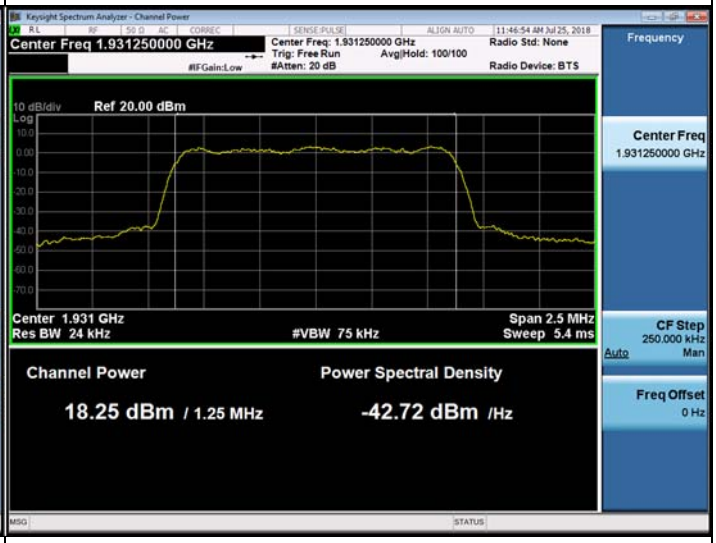
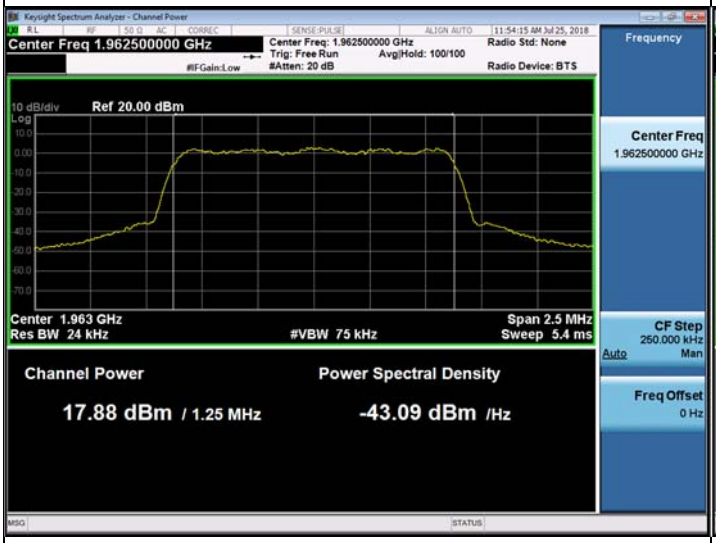
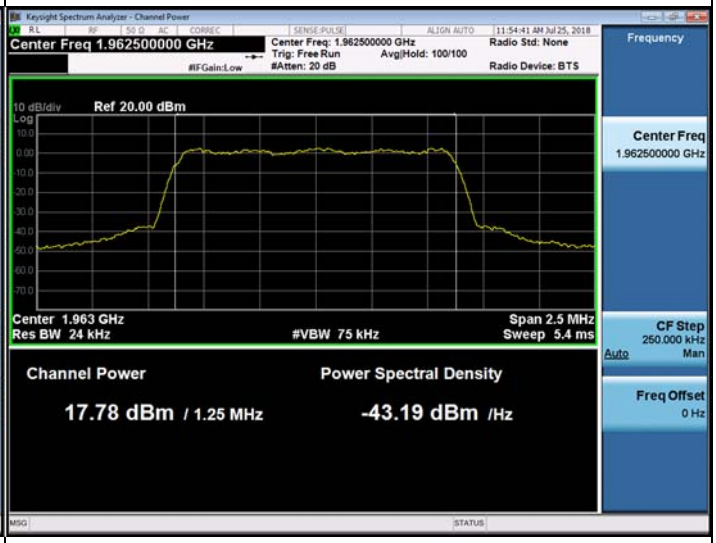
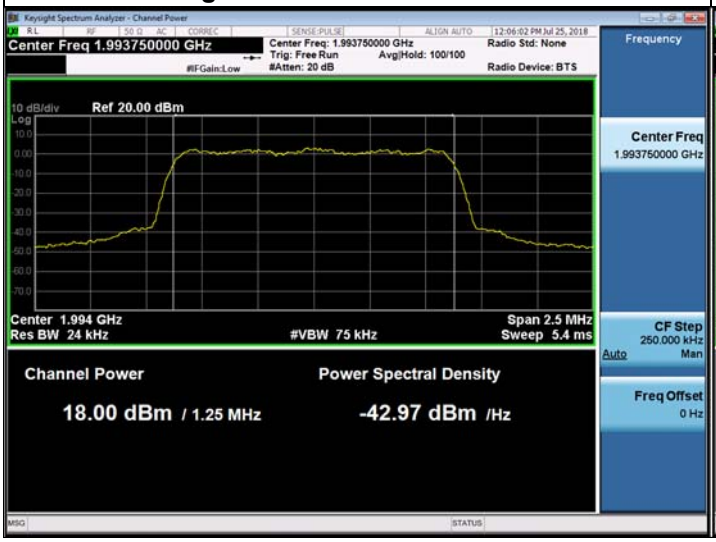
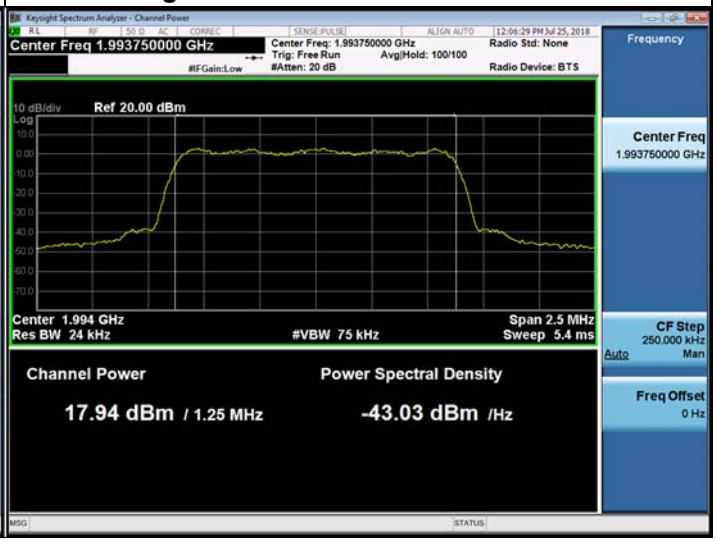
Uplink	Channel	Frequency (MHz)	Measured PAR (dB)
LTE 20 MHz AGC threshold	Middle	1 882.50	8.55
LTE 20 MHz +3 dB above the AGC threshold			8.55
CDMA AGC threshold			8.08
CDMA +3 dB above the AGC threshold			8.10

*Note: We have done CDMA and 1xEVDO modulation test in technology. Test results are only attached worst cases.

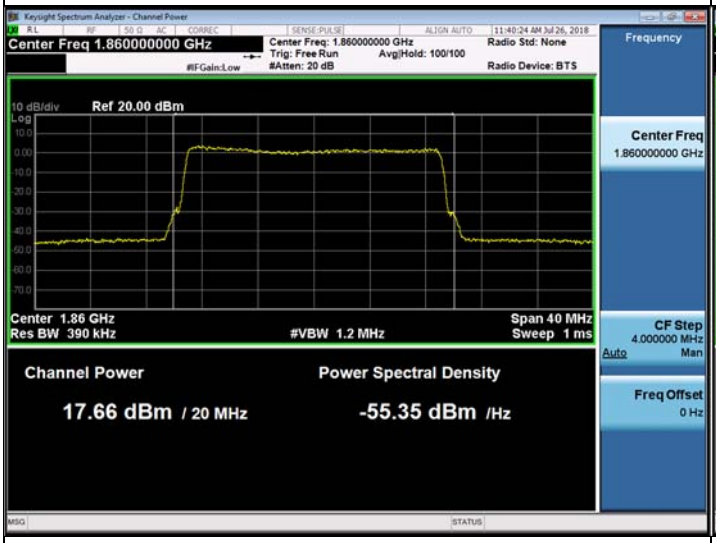
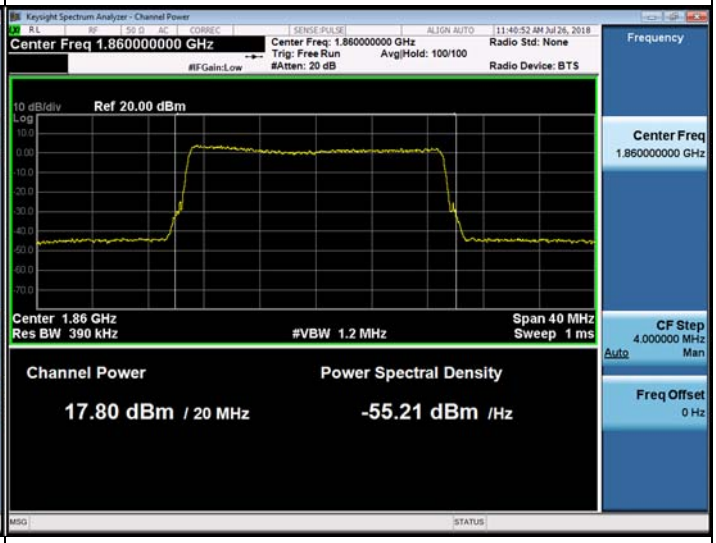
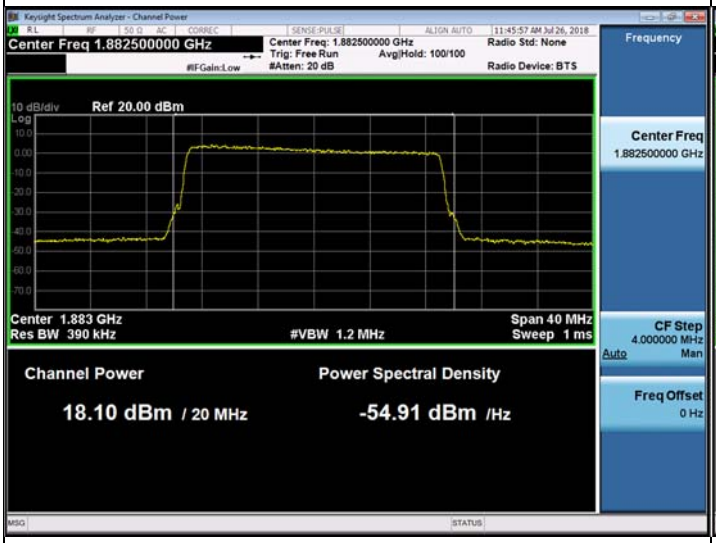
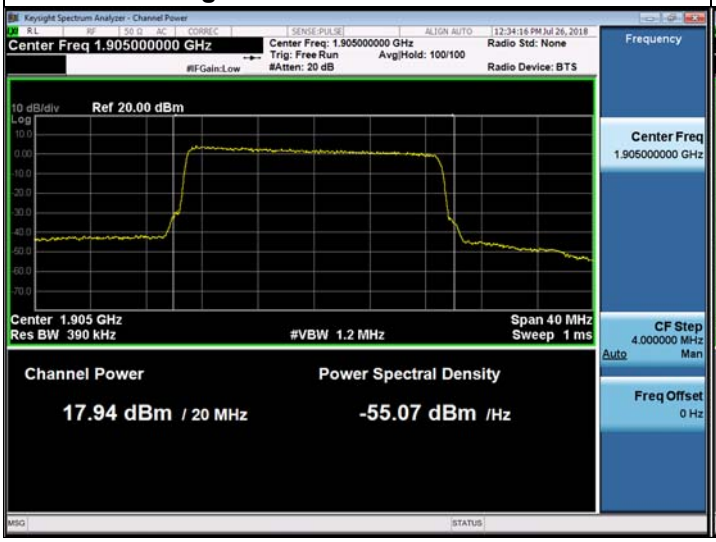
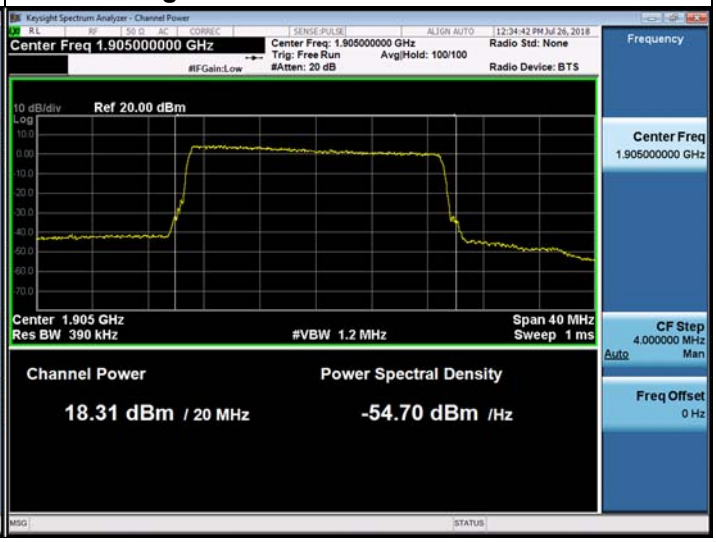
Plot of Output Power for LTE 20 MHz_Downlink

Low Channel AGC threshold	Low Channel +3 dB AGC threshold
	
Middle Channel AGC threshold	**Middle Channel +3 dB AGC threshold**
	
High Channel AGC threshold	**High Channel +3 dB AGC threshold**
	

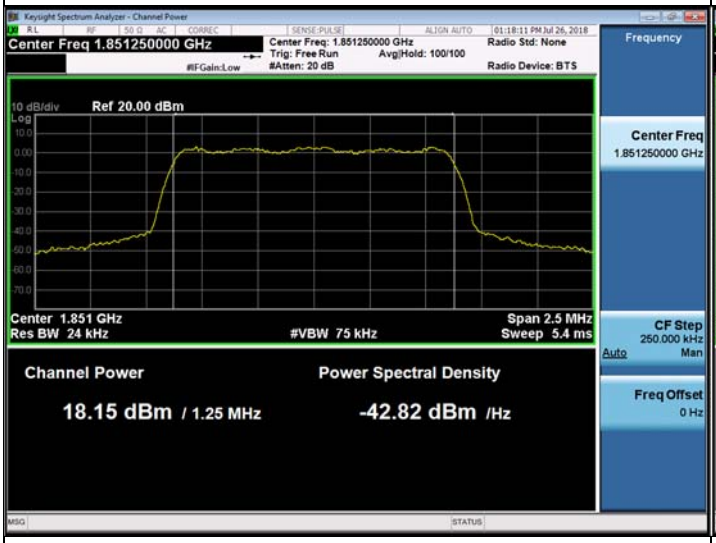
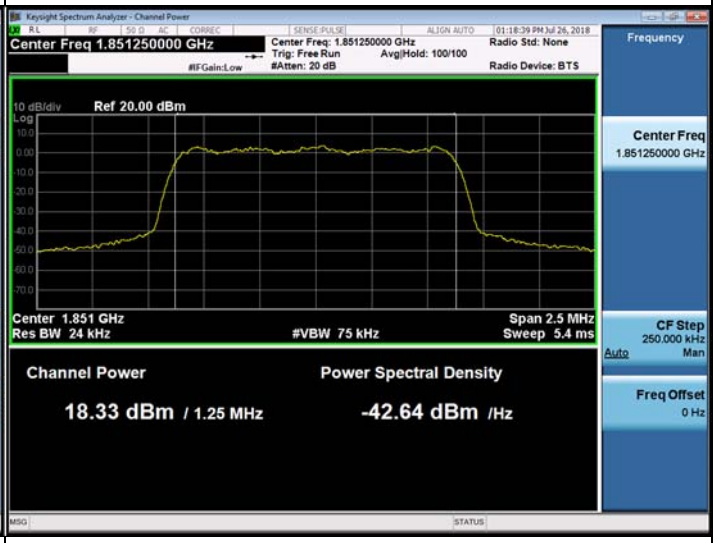
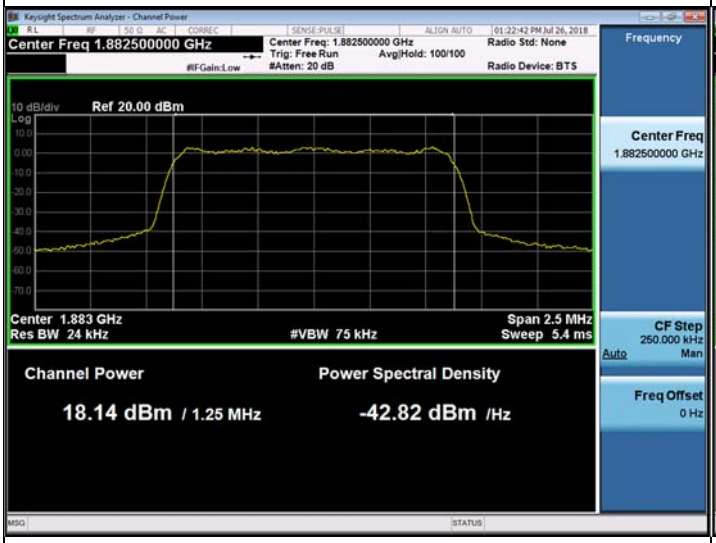
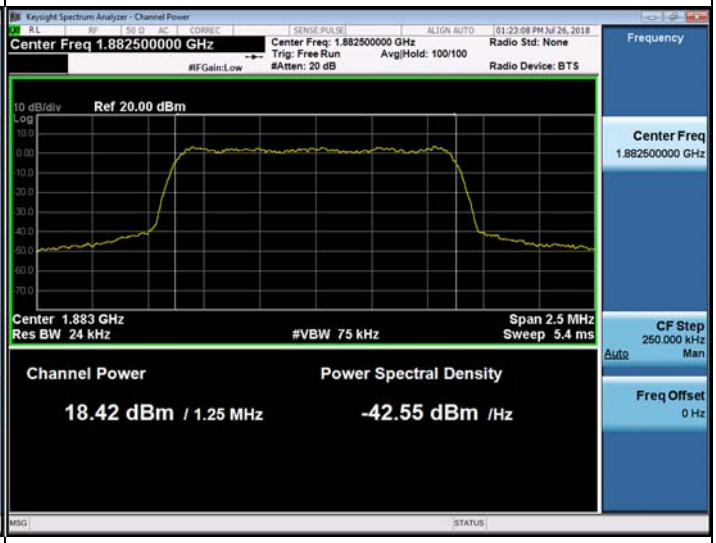
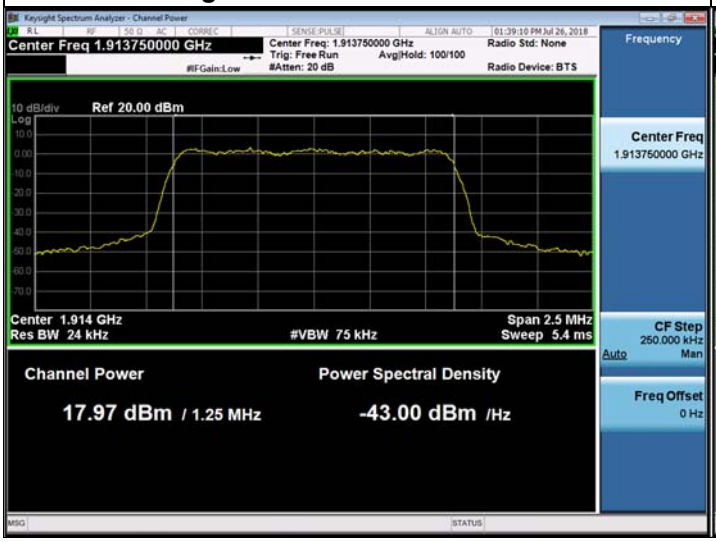
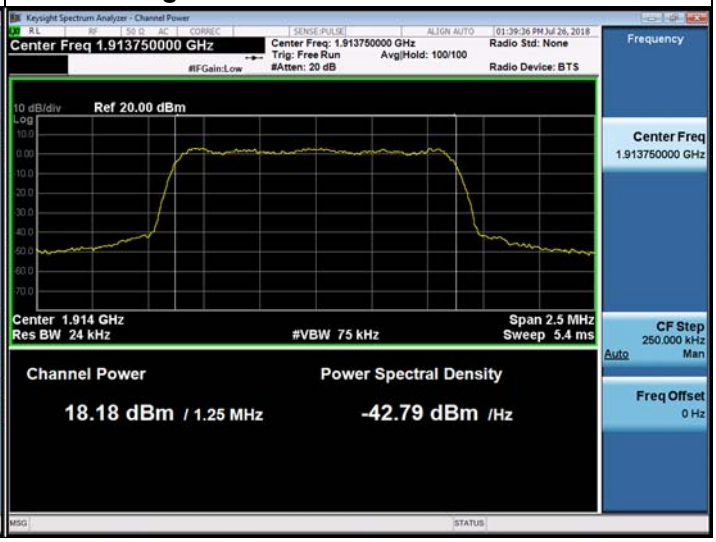
Plot of Output Power for CDMA_Downlink

Low Channel AGC threshold	Low Channel +3 dB AGC threshold
	
Middle Channel AGC threshold	**Middle Channel +3 dB AGC threshold**
	
High Channel AGC threshold	**High Channel +3 dB AGC threshold**
	

Plot of Output Power for LTE 20 MHz_Uplink

Low Channel AGC threshold	Low Channel +3 dB AGC threshold
	
Middle Channel AGC threshold	**Middle Channel +3 dB AGC threshold**
	
High Channel AGC threshold	**High Channel +3 dB AGC threshold**
	

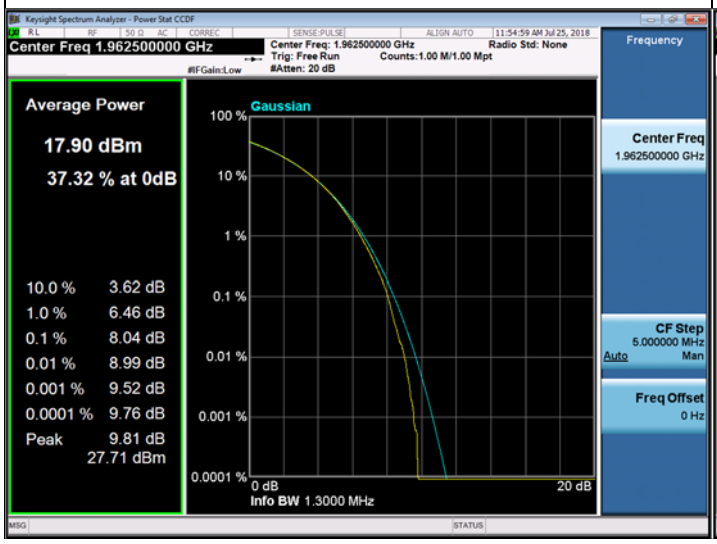
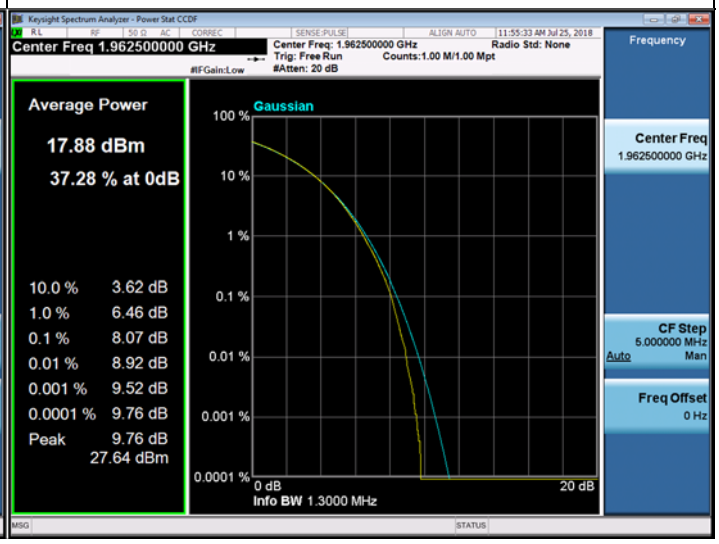
Plot of Output Power for CDMA_Uplink

Low Channel AGC threshold	Low Channel +3 dB AGC threshold
	
Middle Channel AGC threshold	**Middle Channel +3 dB AGC threshold**
	
High Channel AGC threshold	**High Channel +3 dB AGC threshold**
	

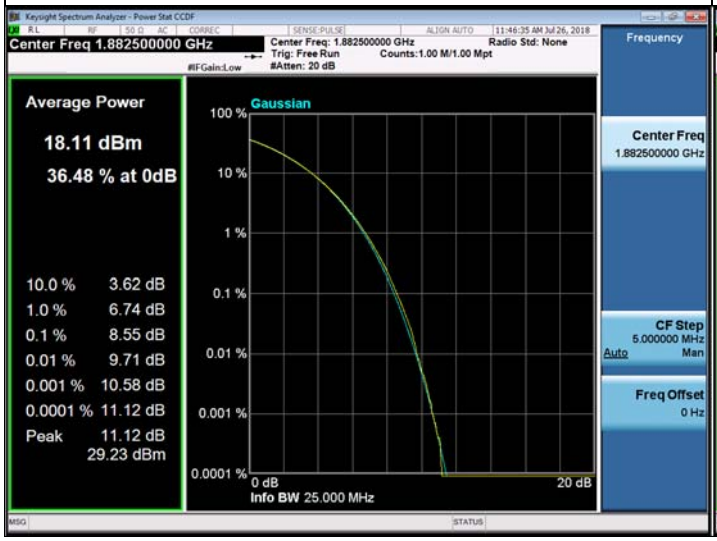
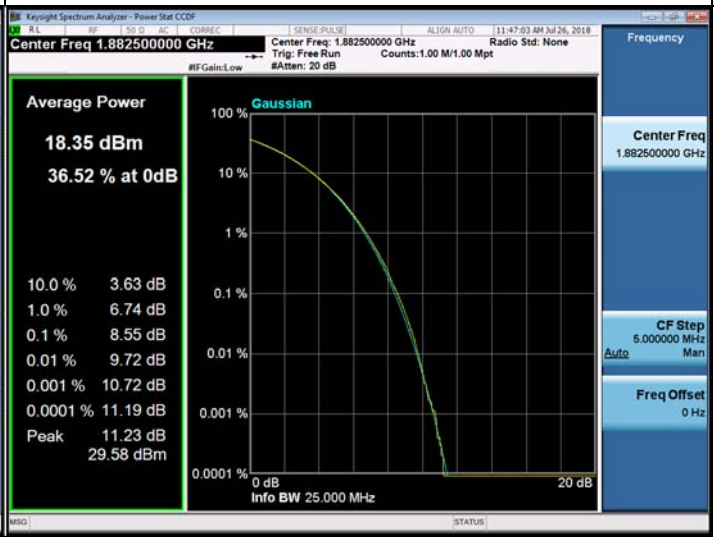
Plot of PAR for LTE 20 MHz_Downlink

Middle Channel AGC threshold	Middle Channel +3 dB AGC threshold
	

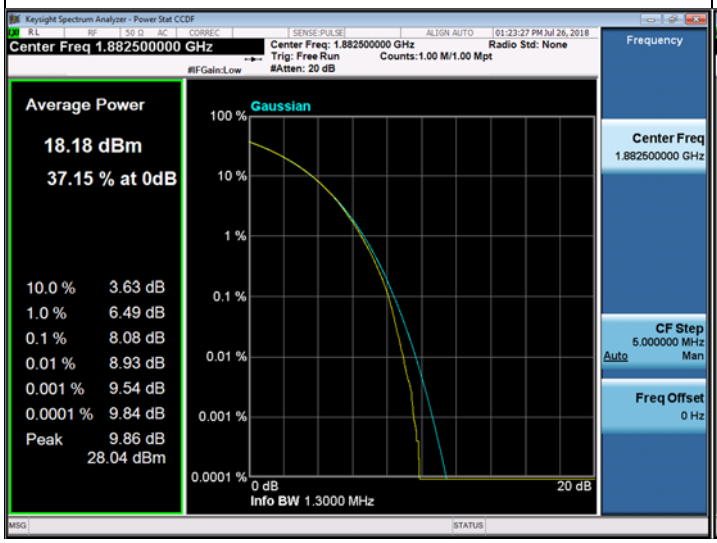
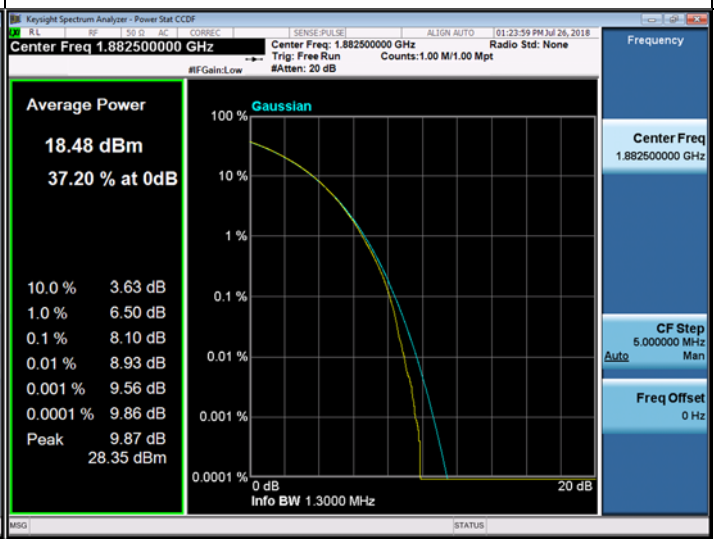
Plot of PAR for CDMA_Downlink

Middle Channel AGC threshold	Middle Channel +3 dB AGC threshold
	

Plot of PAR for LTE 20 MHz_Uplink

Middle Channel AGC threshold	Middle Channel +3 dB AGC threshold
	

Plot of PAR for CDMA_Uplink

Middle Channel AGC threshold	Middle Channel +3 dB AGC threshold
	

6. OCCUPIED BANDWIDTH

FCC Rules

Test Requirements:

§ 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:

Measurements were in accordance with the test methods section 3.4 of KDB 935210 D05 v01r02 and section 4.2 of KDB 971168 D01 v03r01.

Test is 99% OBW measured and used.

a) Connect a signal generator to the input of the EUT.

b) Configure the signal generator to transmit the AWGN signal.

c) Configure the signal amplitude to be just below the AGC threshold level (see 3.2), but not more than 0.5 dB below.

d) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.

e) Set the spectrum analyzer center frequency to the center frequency of the operational band under test. The span range of the spectrum analyzer shall be between 2 times to 5 times the emission bandwidth (EBW) or alternatively, the OBW.

f) The nominal RBW shall be in the range of 1 % to 5 % of the anticipated OBW, and the VBW shall be $\geq 3 \times$ RBW.

g) Set the reference level of the instrument as required to preclude the signal from exceeding the maximum spectrum analyzer input mixer level for linear operation. In general, the peak of the spectral envelope must be more than [10 log (OBW / RBW)] below the reference level.

Steps f) and g) may require iteration to enable adjustments within the specified tolerances.

h) The noise floor of the spectrum analyzer at the selected RBW shall be at least 36 dB below the reference level.

i) Set spectrum analyzer detection function to positive peak.

j) Set the trace mode to max hold.

k) Determine the reference value: Allow the trace to stabilize. Set the spectrum analyzer marker to the highest amplitude level of the displayed trace (this is the reference value) and record the associated frequency as f_0.

l) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the −26 dB down amplitude. The 26 dB EBW (alternatively OBW) is the positive frequency difference between the two

markers. If the spectral envelope crosses the −26 dB down amplitude at multiple points, the lowest or highest frequency shall be selected as the frequencies that are the furthest removed from the center frequency at which the spectral envelope crosses the −26 dB down amplitude point.

m) Repeat steps e) to l) with the input signal connected directly to the spectrum analyzer (i.e., input signal measurement).

n) Compare the spectral plot of the input signal (determined from step m) to the output signal (determined from step l) to affirm that they are similar (in passband and rolloff characteristic features and relative spectral locations), and include plot(s) and descriptions in test report.

o) Repeat the procedure [steps e) to n)] with the input signal amplitude set to 3 dB above the AGC threshold.

p) Repeat steps e) to o) with the signal generator set to the narrowband signal.

q) Repeat steps e) to p) for all frequency bands authorized for use by the EUT.

Test Results:

Data of Output Occupied bandwidth

Downlink	Channel	Frequency (MHz)	Measured OBW (MHz)
LTE 20 MHz AGC threshold	Low	1940.00	17.975
	Middle	1962.50	17.925
	High	1985.00	17.986
LTE 20 MHz +3 dB above the AGC threshold	Low	1940.00	18.001
	Middle	1962.50	17.940
	High	1985.00	17.977
CDMA AGC threshold	Low	1931.25	1.2398
	Middle	1962.50	1.2414
	High	1993.75	1.2336
CDMA +3 dB above the AGC threshold	Low	1931.25	1.2384
	Middle	1962.50	1.2392
	High	1993.75	1.2388

Uplink	Channel	Frequency (MHz)	Measured OBW (MHz)
LTE 20 MHz AGC threshold	Low	1860.00	18.099
	Middle	1882.50	17.980
	High	1905.00	17.954
LTE 20 MHz +3 dB above the AGC threshold	Low	1860.00	18.088
	Middle	1882.50	17.938
	High	1905.00	17.948
CDMA AGC threshold	Low	1851.25	1.2373
	Middle	1882.50	1.2392
	High	1913.75	1.2329
CDMA +3 dB above the AGC threshold	Low	1851.25	1.2414
	Middle	1882.50	1.2396
	High	1913.75	1.2361

*Note: We have done CDMA and 1xEVDO modulation test in technology. Test results are only attached worst cases.

Data of Input Occupied bandwidth

Downlink	Channel	Frequency (MHz)	Measured OBW (MHz)
LTE 20 MHz AGC threshold	Low	1940.00	18.003
	Middle	1962.50	18.010
	High	1985.00	17.984
CDMA AGC threshold	Low	1931.25	1.2364
	Middle	1962.50	1.2380
	High	1993.75	1.2430

Uplink	Channel	Frequency (MHz)	Measured OBW (MHz)
LTE 20 MHz AGC threshold	Low	1860.00	18.054
	Middle	1882.50	17.977
	High	1905.00	18.003
CDMA AGC threshold	Low	1851.25	1.2454
	Middle	1882.50	1.2393
	High	1913.75	1.2371

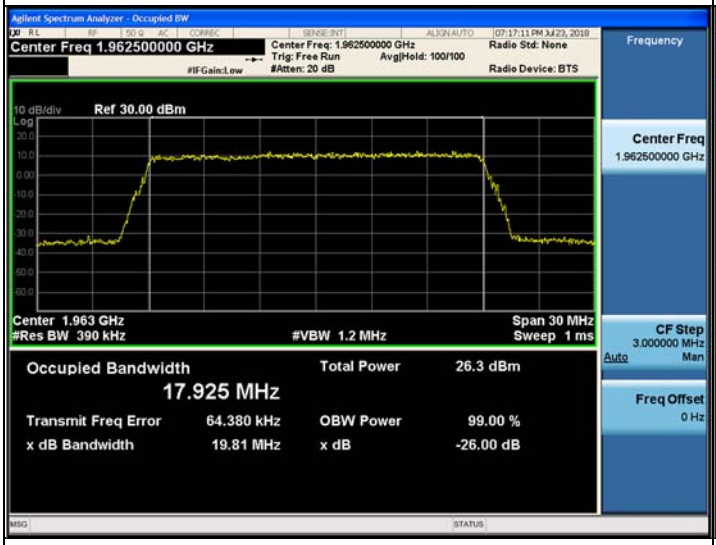
*Note: We have done CDMA and 1xEVDO modulation test in technology. Test results are only attached worst cases.

Plot of Output Occupied Bandwidth for LTE 20 MHz_Downlink

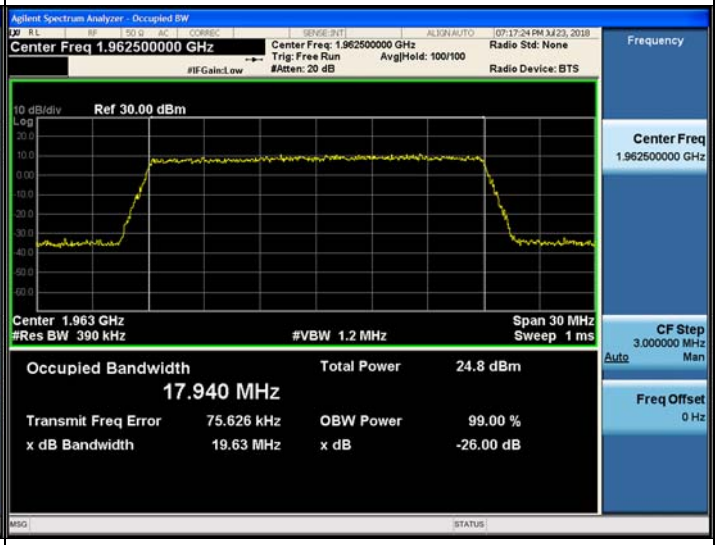
Low Channel AGC threshold

Low Channel +3 dB AGC threshold

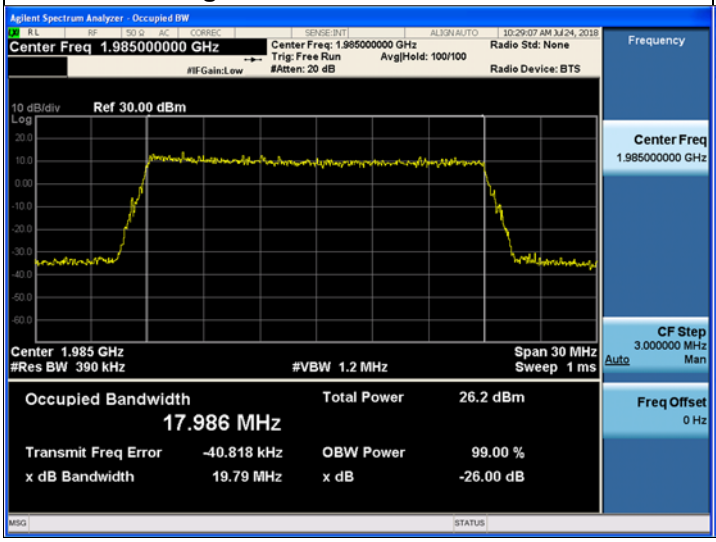
Middle Channel AGC threshold



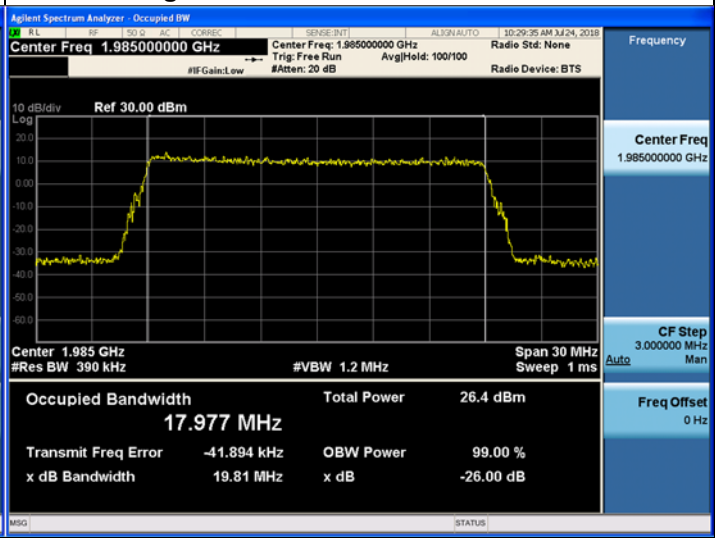
Middle Channel +3 dB AGC threshold



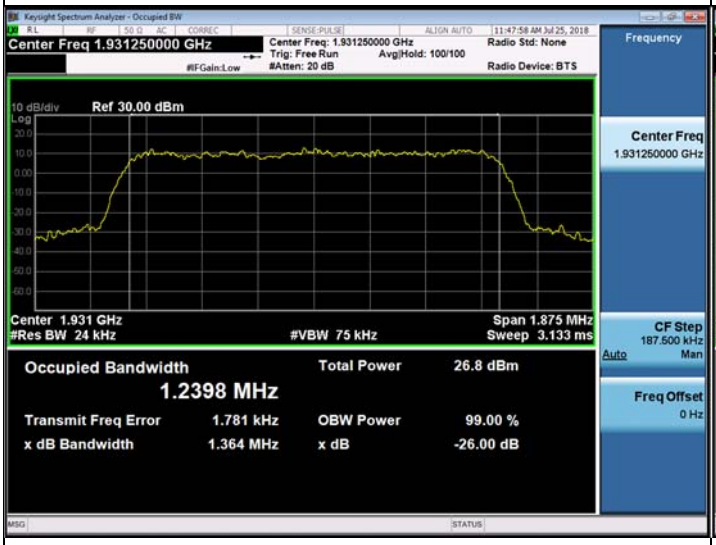
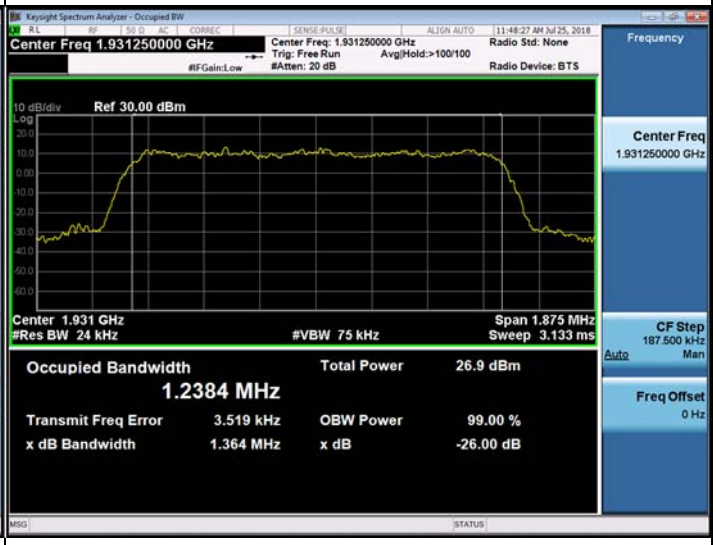
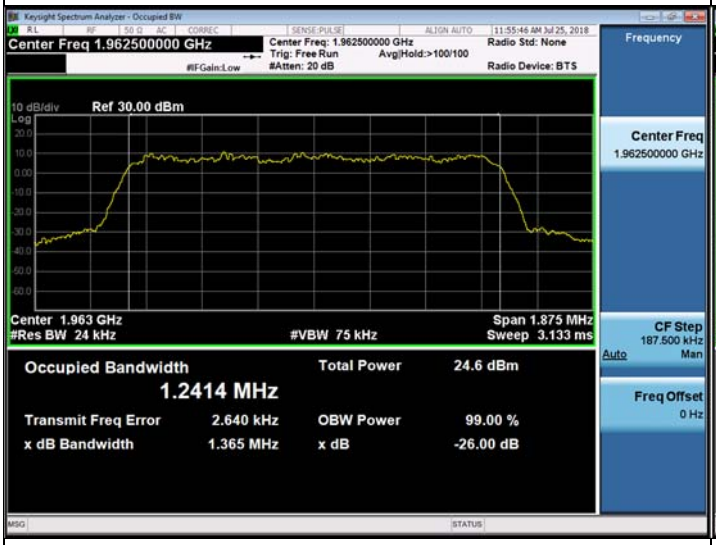
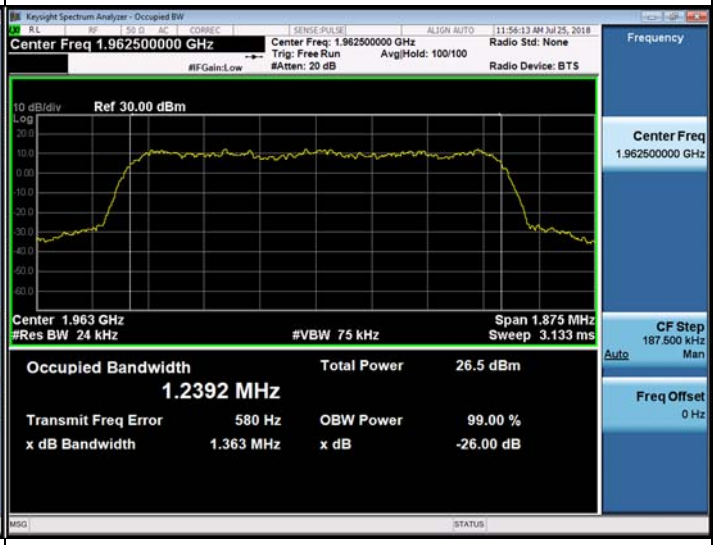
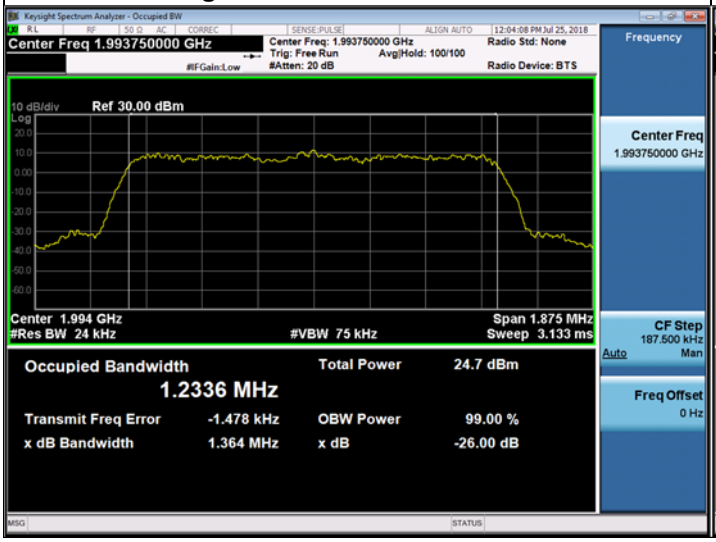
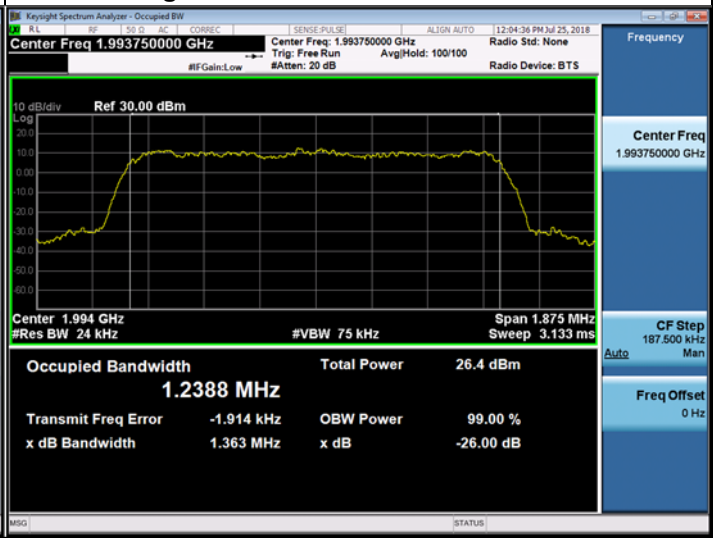
High Channel AGC threshold



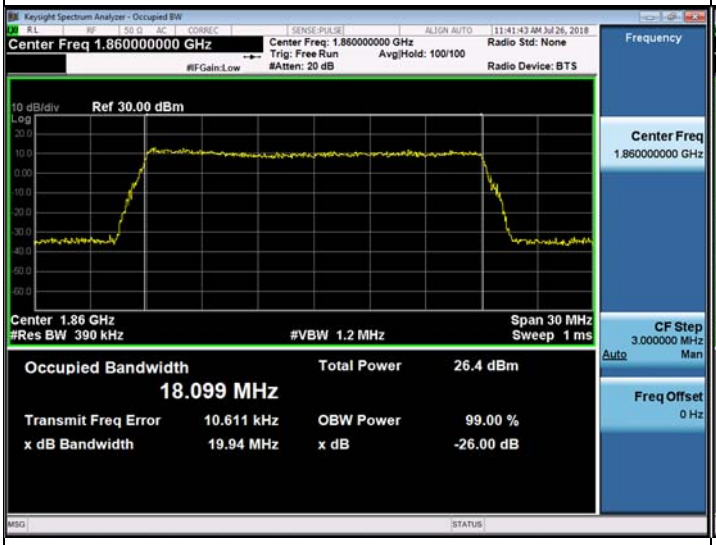
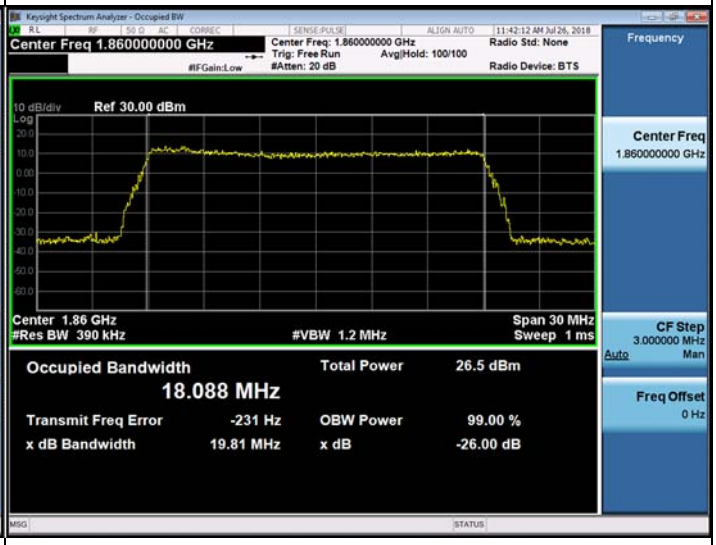
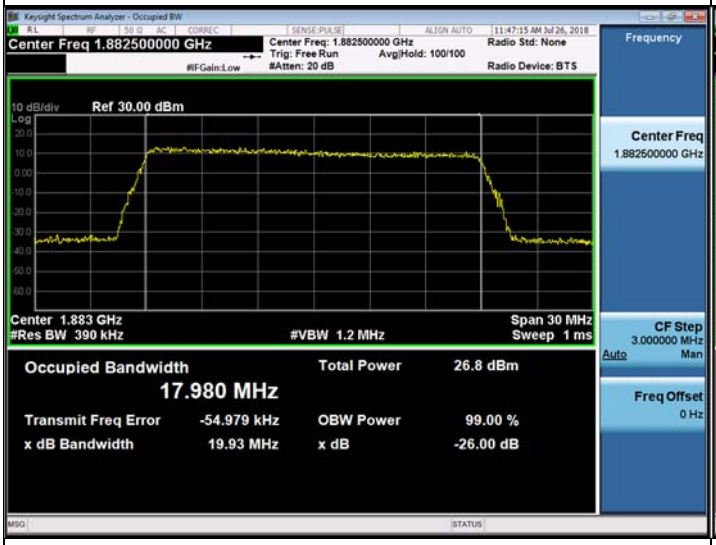
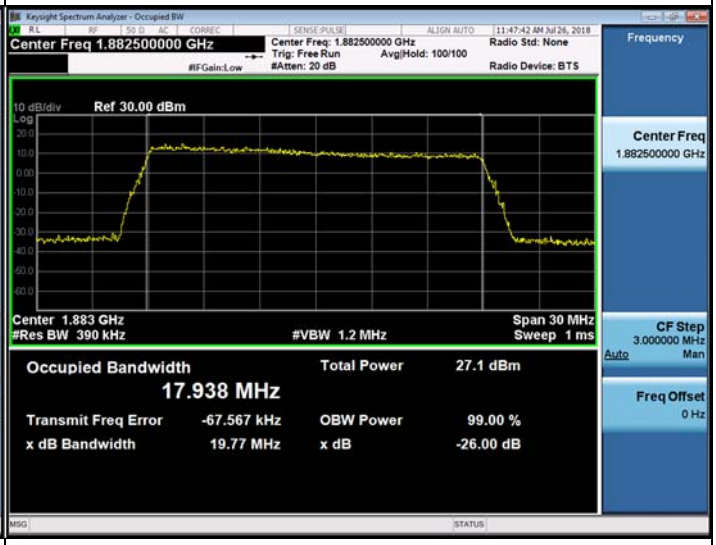
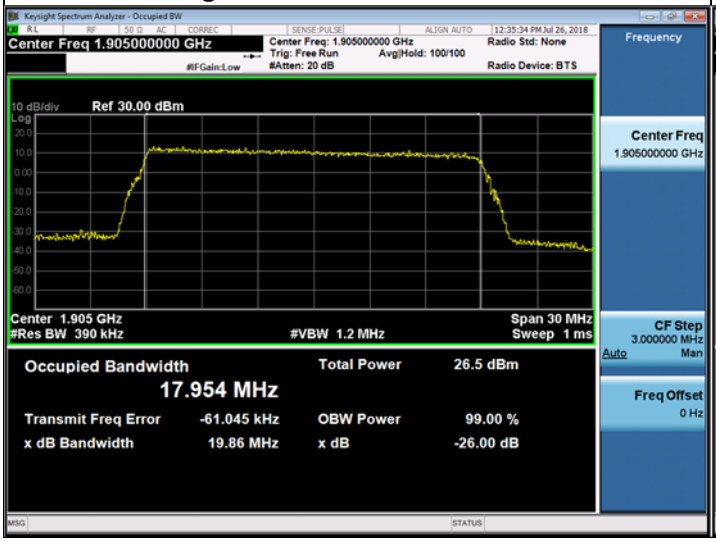
High Channel +3 dB AGC threshold



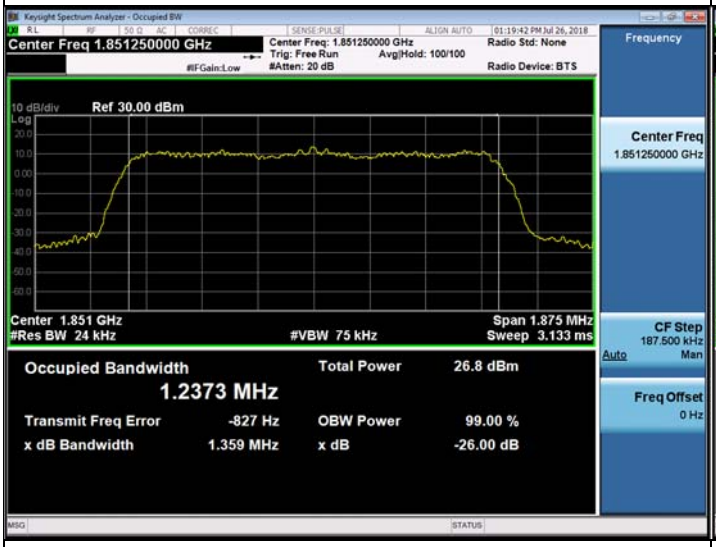
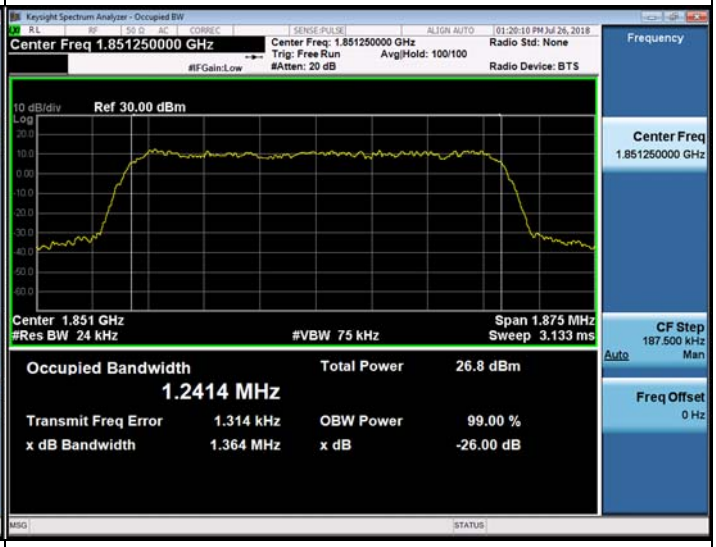
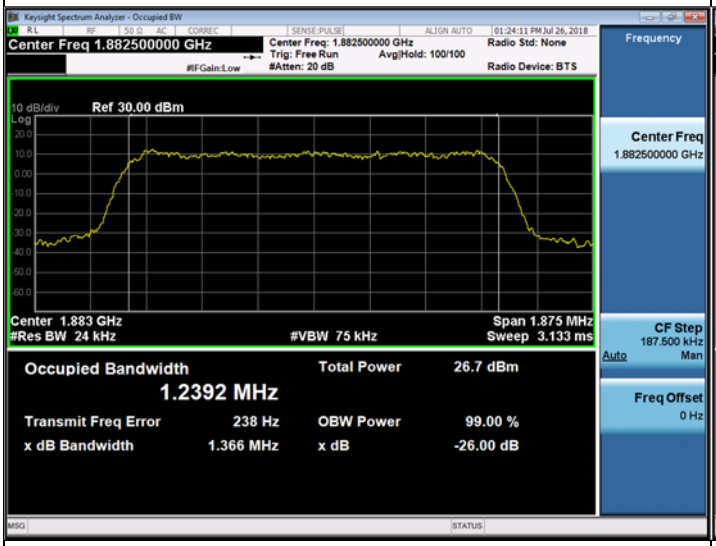
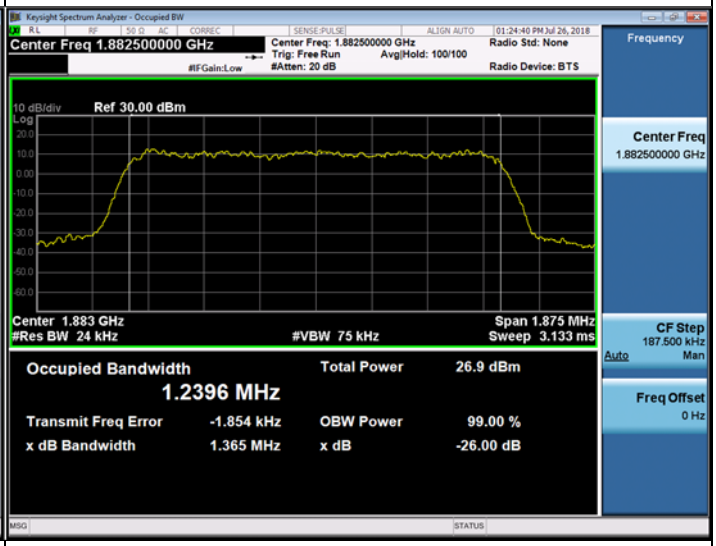
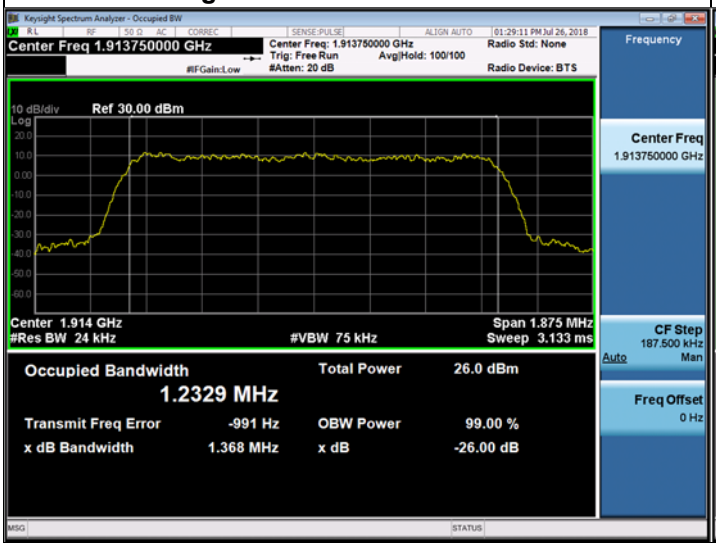
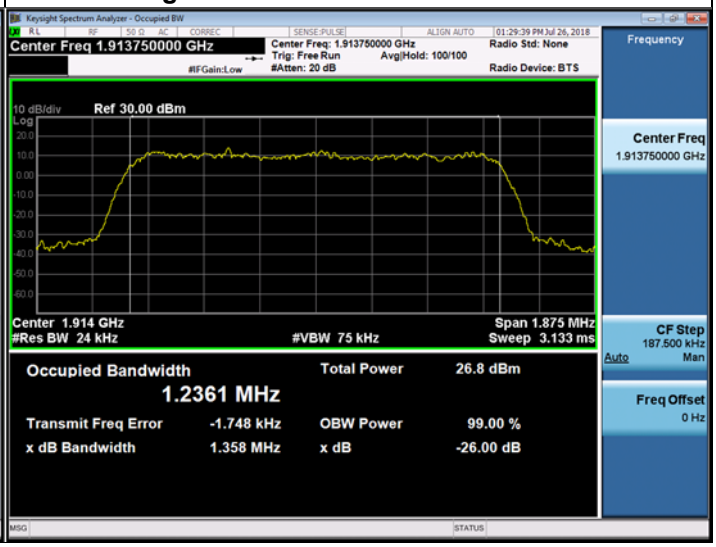
Plot of Output Occupied Bandwidth for CDMA_Downlink

Low Channel AGC threshold	Low Channel +3 dB AGC threshold
	
Middle Channel AGC threshold	**Middle Channel +3 dB AGC threshold**
	
High Channel AGC threshold	**High Channel +3 dB AGC threshold**
	

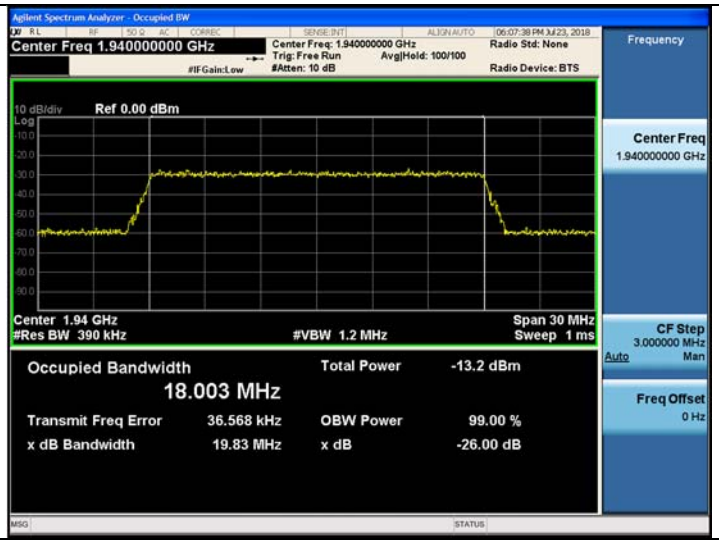
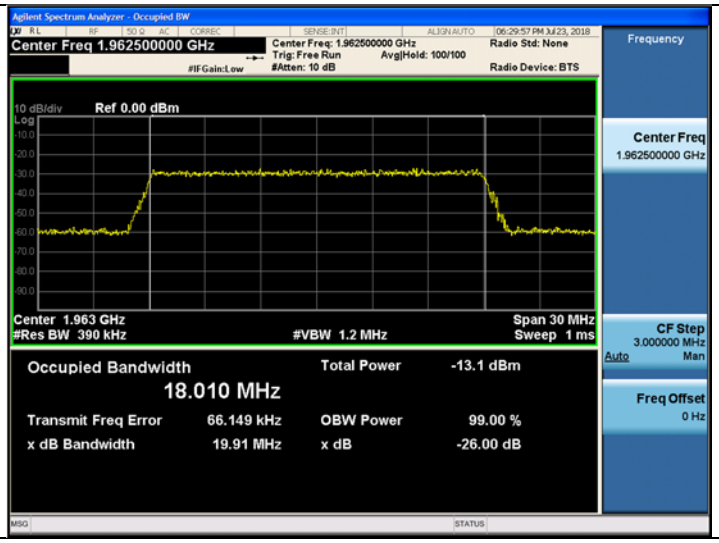
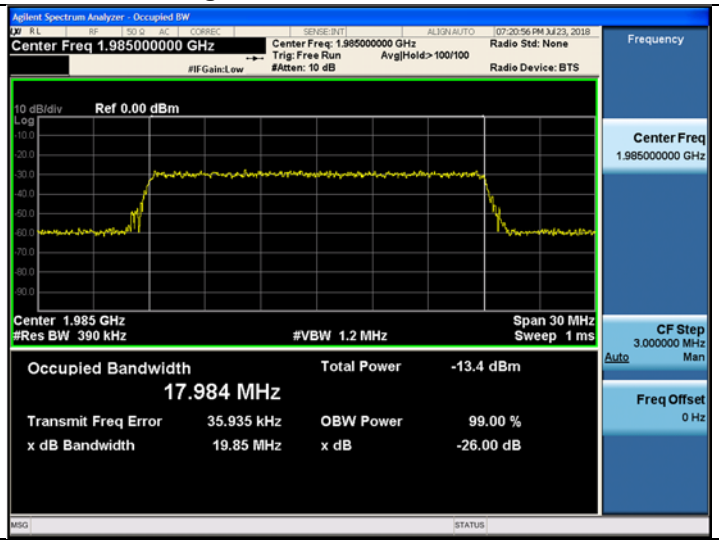
Plot of Output Occupied Bandwidth for LTE 20 MHz_Uplink

Low Channel AGC threshold	Low Channel +3 dB AGC threshold
	
Middle Channel AGC threshold	**Middle Channel +3 dB AGC threshold**
	
High Channel AGC threshold	**High Channel +3 dB AGC threshold**
	

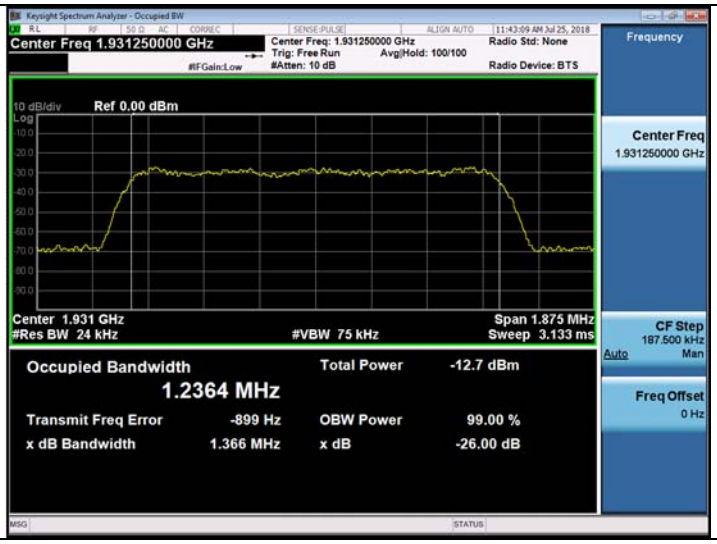
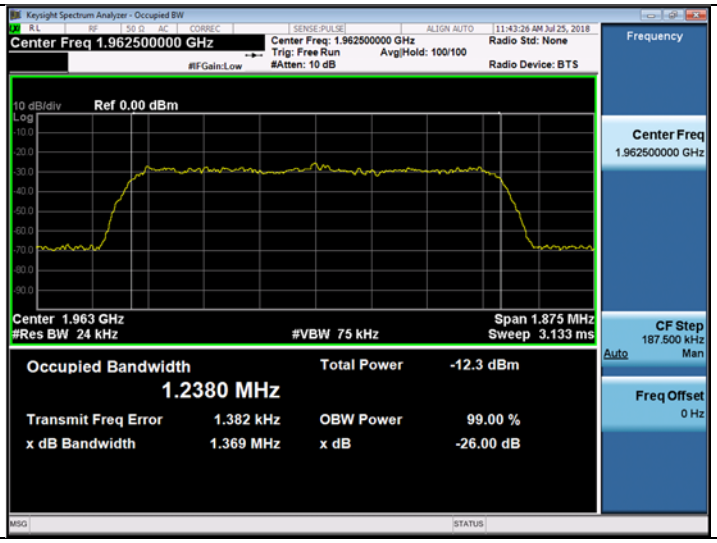
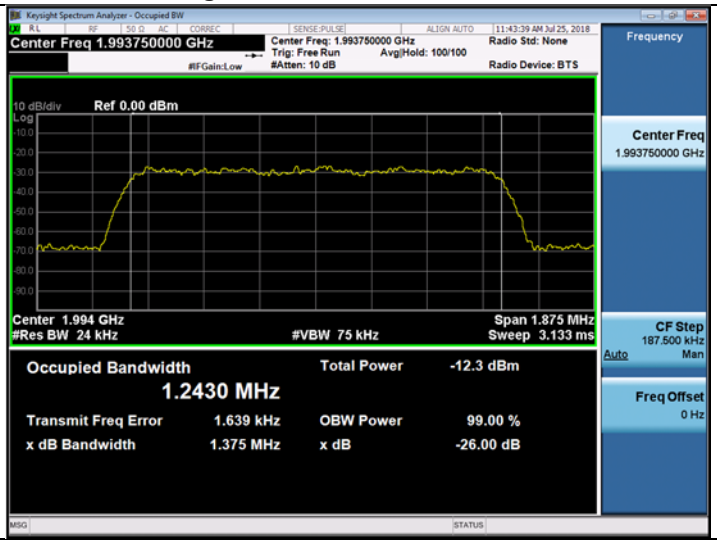
Plot of Output Occupied Bandwidth for CDMA_Uplink

Low Channel AGC threshold	Low Channel +3 dB AGC threshold
	
Middle Channel AGC threshold	**Middle Channel +3 dB AGC threshold**
	
High Channel AGC threshold	**High Channel +3 dB AGC threshold**
	

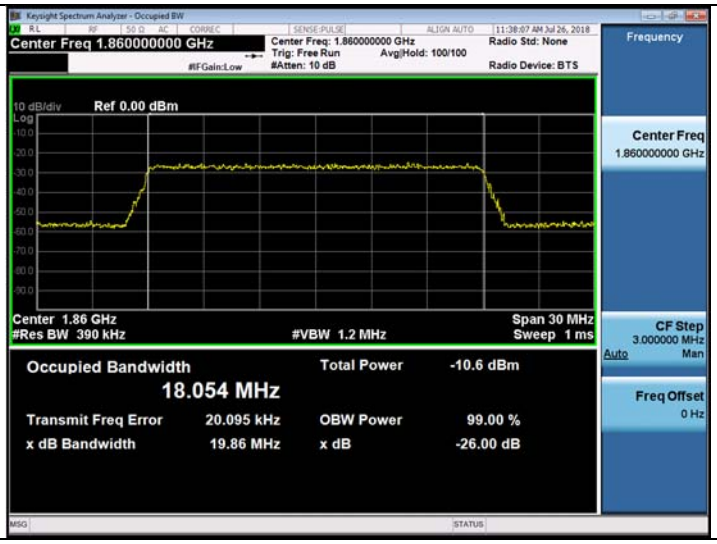
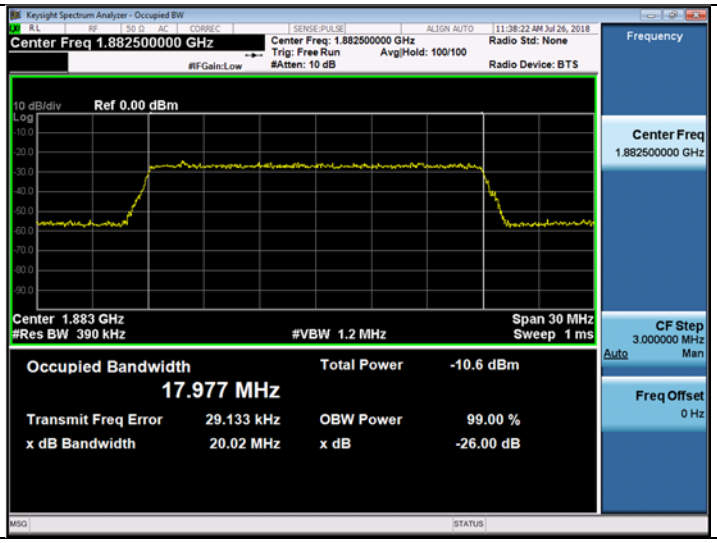
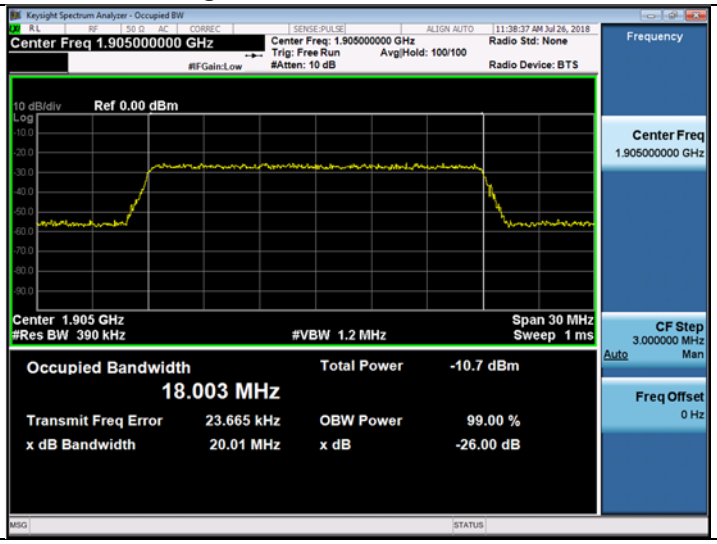
Plot of Input Occupied Bandwidth for LTE 20 MHz_Downlink

Low Channel AGC threshold

Middle Channel AGC threshold

High Channel AGC threshold


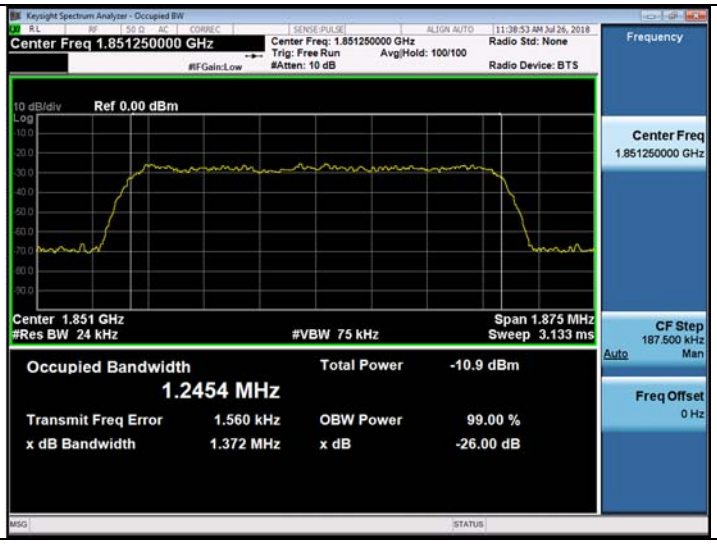
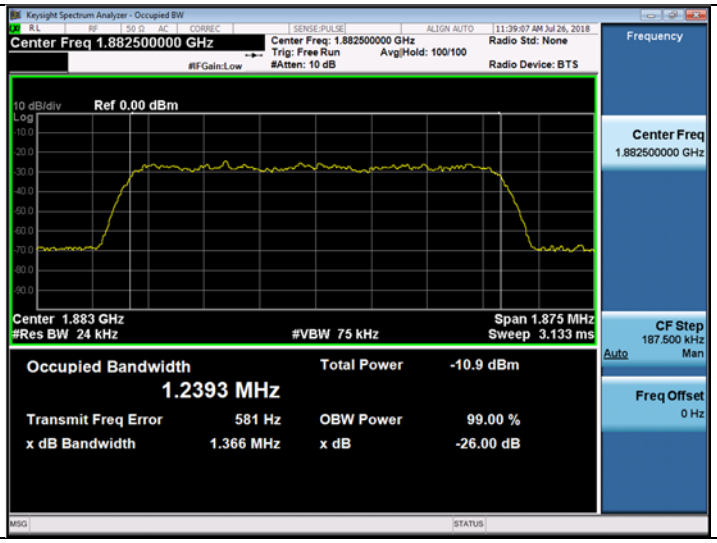
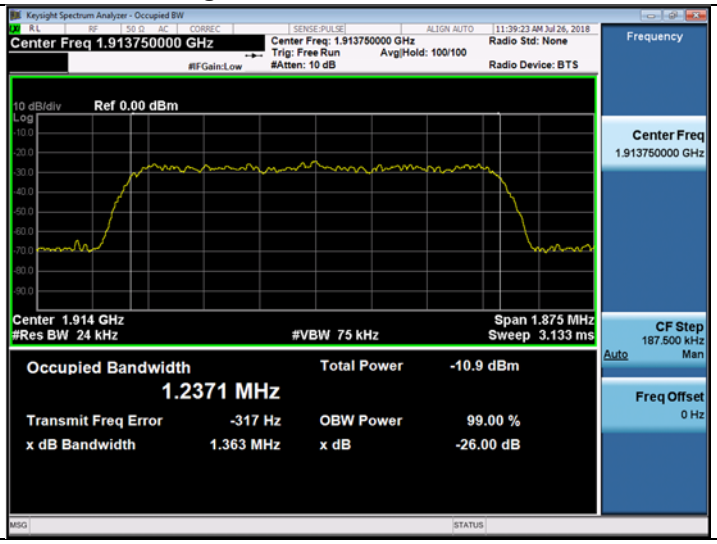
Plot of Input Occupied Bandwidth for CDMA_Downlink

Low Channel AGC threshold

Middle Channel AGC threshold

High Channel AGC threshold


Plot of Input Occupied Bandwidth for LTE 20 MHz_Uplink

Low Channel AGC threshold

Middle Channel AGC threshold

High Channel AGC threshold


Plot of Input Occupied Bandwidth for CDMA_Uplink

Low Channel AGC threshold

Middle Channel AGC threshold

High Channel AGC threshold


7. OUT OF BAND REJECTION

FCC Rules

Test Requirement(s):

KDB 935210 D05 v01r02

Out of Band Rejection – Test for rejection of out of band signals. Filter freq. response plots are acceptable.

Test Procedures:

Measurements were in accordance with the test methods section 3.3 of KDB 935210 D05 v01r02.

3.3 EUT out-of-band rejection

a) Connect a signal generator to the input of the EUT.

b) Configure a swept CW signal with the following parameters:

1) Frequency range = ± 250 % of the passband from the center of the passband.

2) Level = a sufficient level to affirm that the out-of-band rejection is > 20 dB above the noise floor and will not engage the AGC during the entire sweep.

3) Dwell time = approx. 10 ms.

4) Number of points = SPAN/(RBW/2).

c) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.

d) Set the span of the spectrum analyzer to the same as the frequency range of the signal generator.

e) Set the resolution bandwidth of the spectrum analyzer to be 1 % to 5 % of the passband and the video bandwidth shall be set to ≥ 3 × RBW.

f) Set the detector to Peak Max-Hold and wait for the spectrum analyzer's spectral display to fill.

g) Place a marker to the peak of the frequency response and record this frequency as f0.

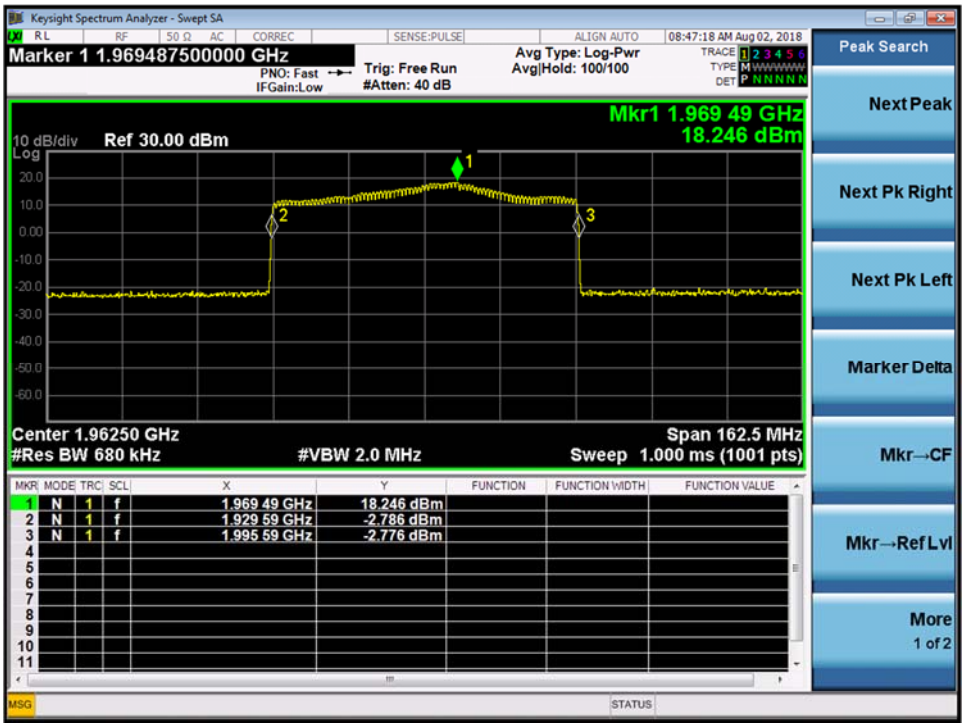
h) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the −20 dB down amplitude to determine the 20 dB bandwidth. Capture the frequency response of the EUT.

Test Results:

Input Signal	Link	Input Level (dBm)	Maximum Amp Gain (dB)
CW	Downlink & Uplink	-62	80

* Due to EUT's ALC function (Auto Level Control), even if input signal is increased, the same output power is transmit.

Plot of Out of Band Rejection

Downlink

Uplink