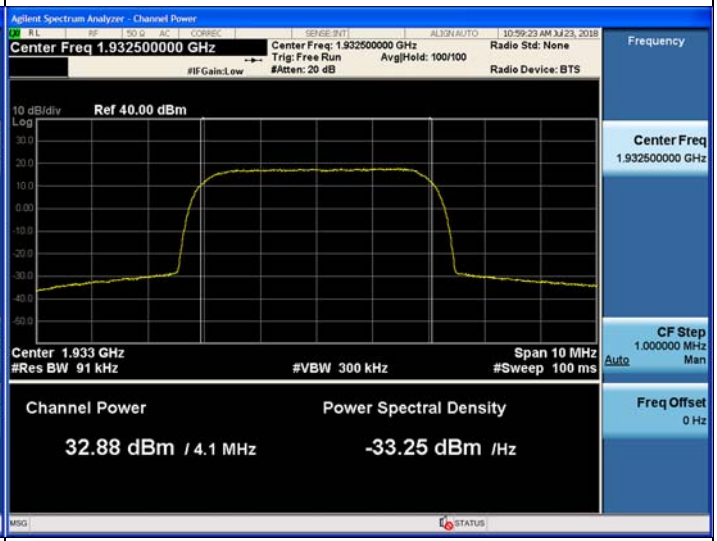
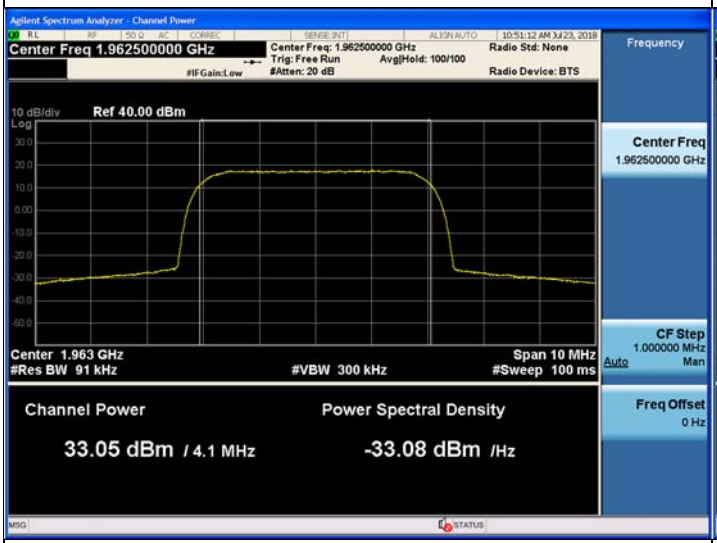
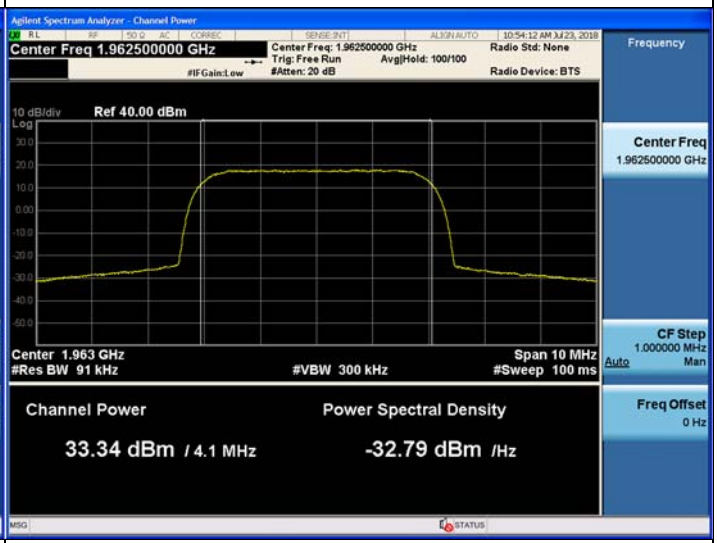
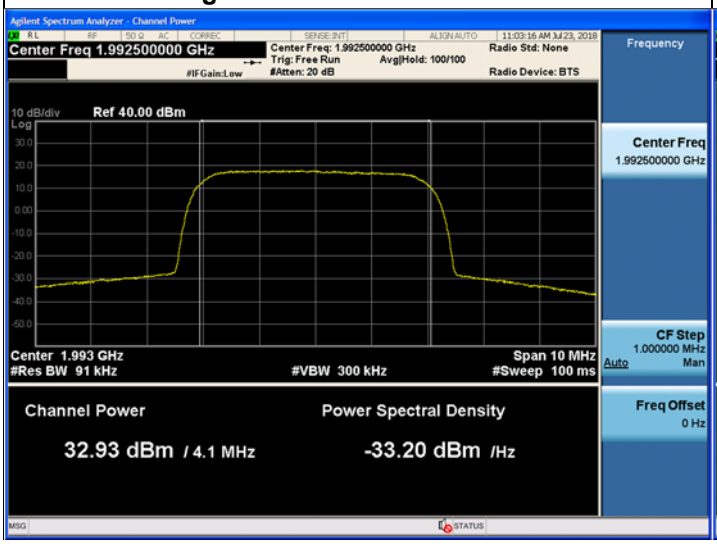
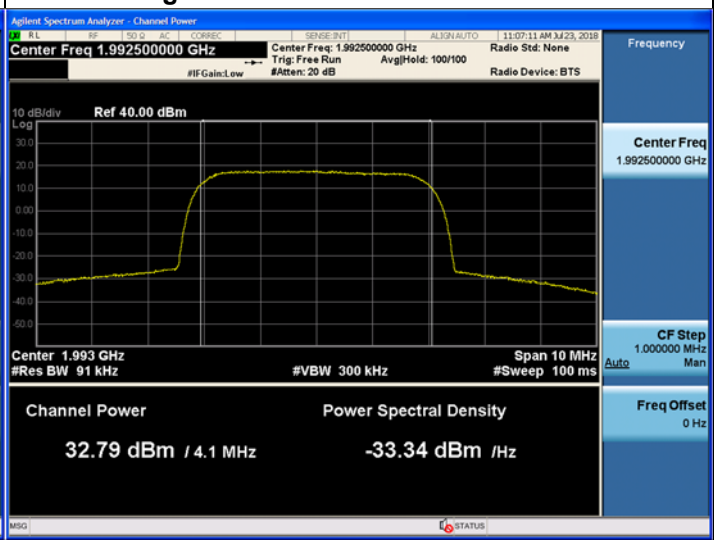
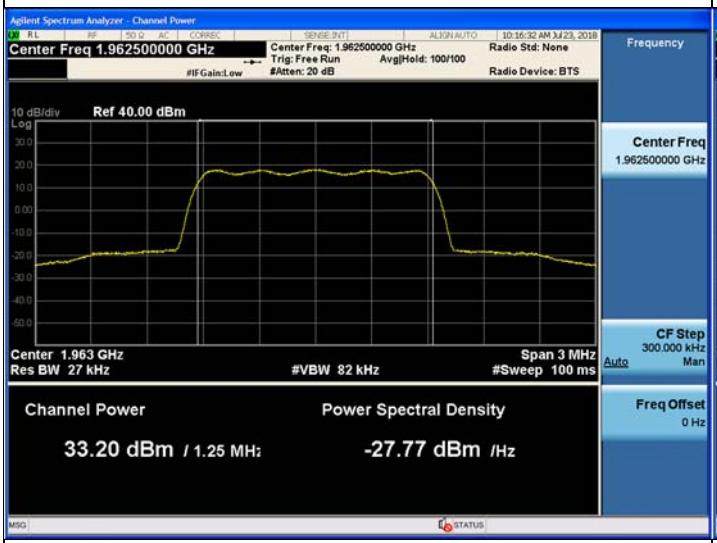
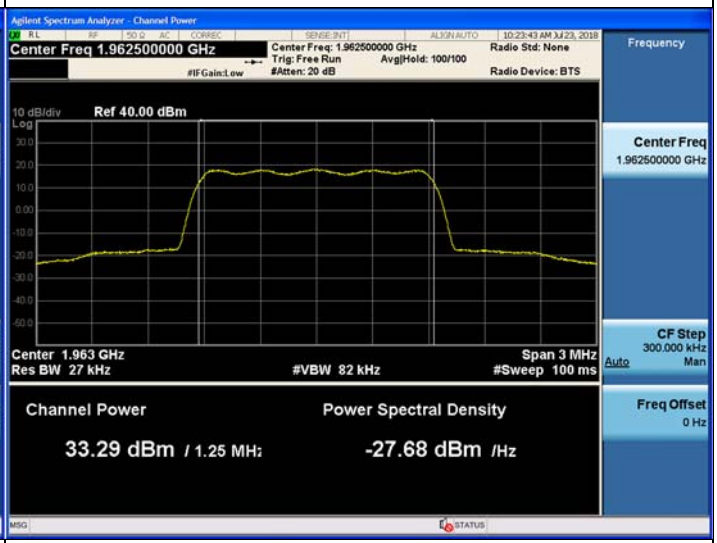
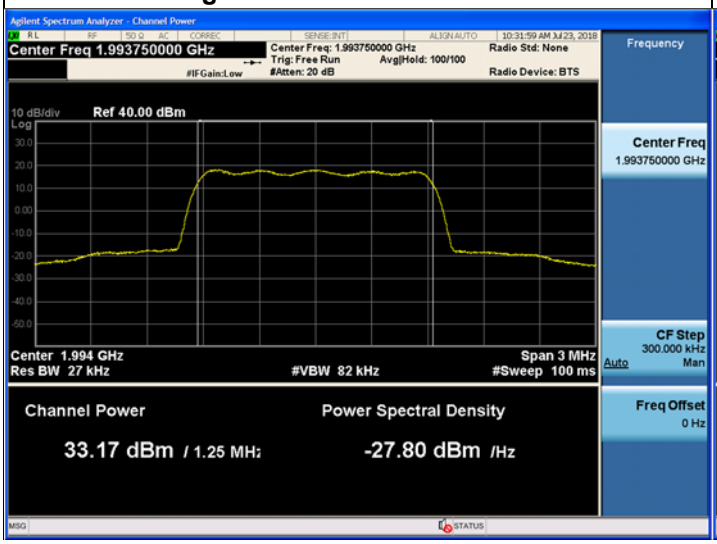
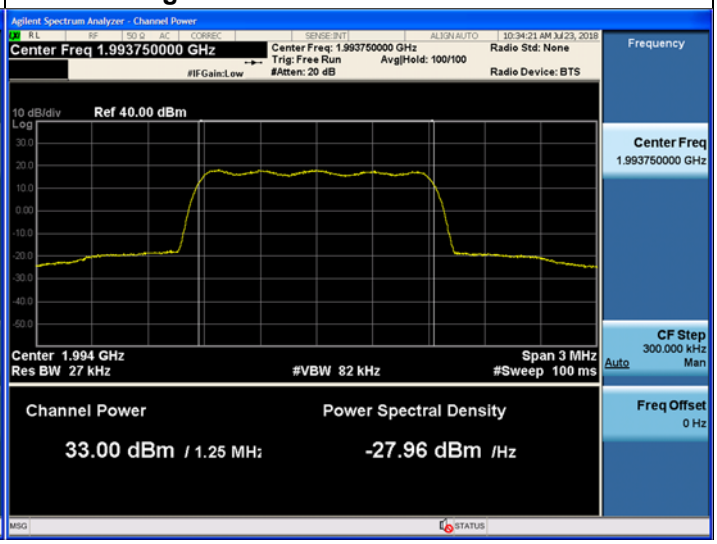
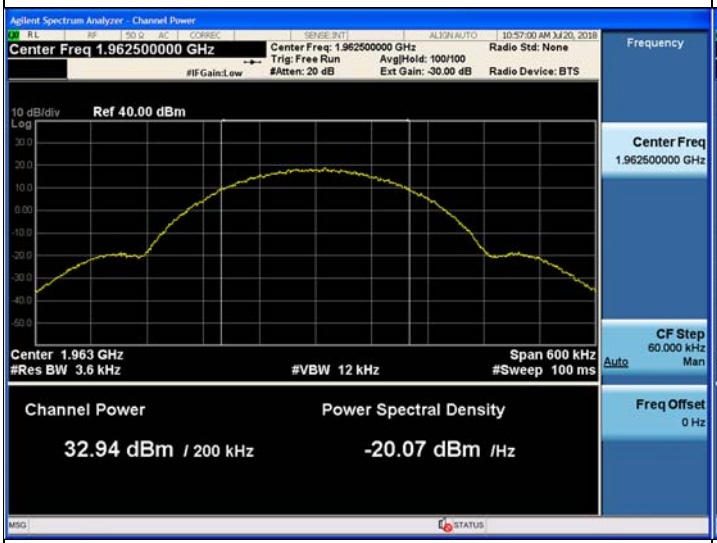
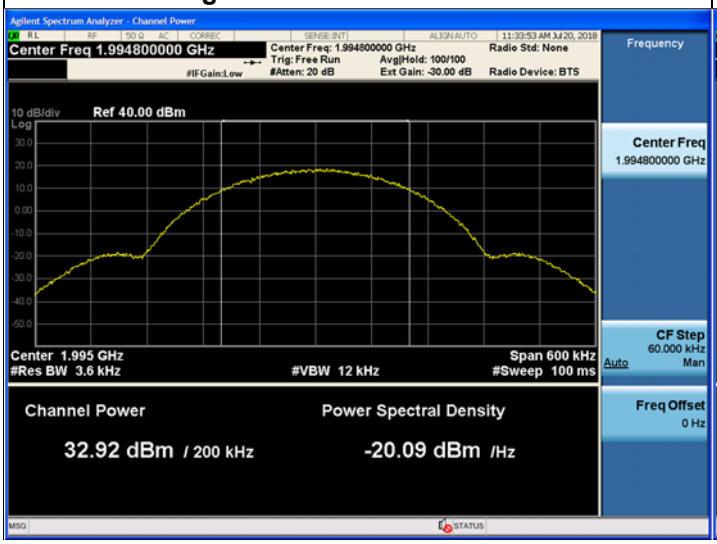
Plots of RF Output Power for 1900 PCS Band WCDMA

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**
	

Plots of RF Output Power for 1900 PCS Band CDMA

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**
	

Plots of RF Output Power for 1900 PCS Band GSM

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**
	

Peak-to-Average Ratio (PAR)

1900 PCS Band	Channel	Frequency (MHz)	PAR (dB)
LTE 5 MHz AGC threshold	Middle	1962.50	8.42
LTE 10 MHz AGC threshold	Middle	1962.50	8.36
LTE 20 MHz AGC threshold	Middle	1962.50	8.44
WCDMA AGC threshold	Middle	1962.50	4.80
CDMA AGC threshold	Middle	1962.50	8.16
GSM AGC threshold	Middle	1962.50	0.33

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

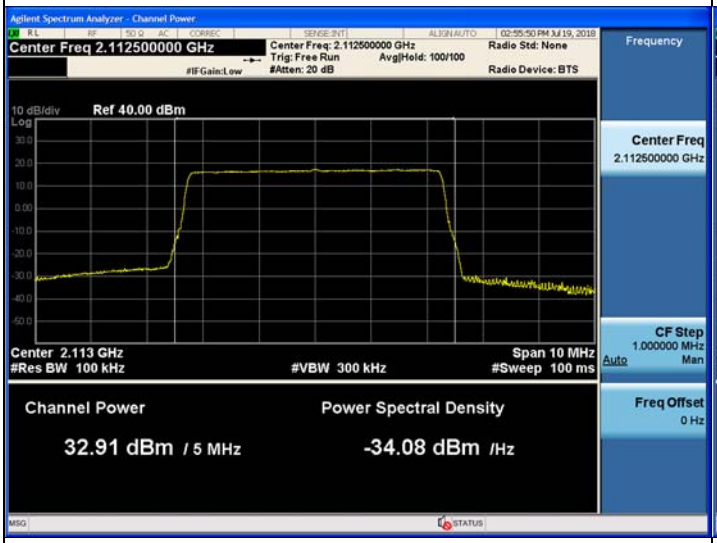
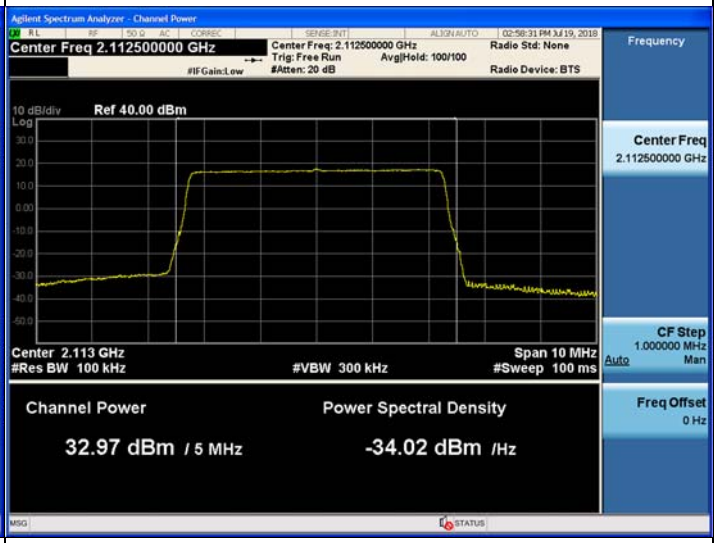
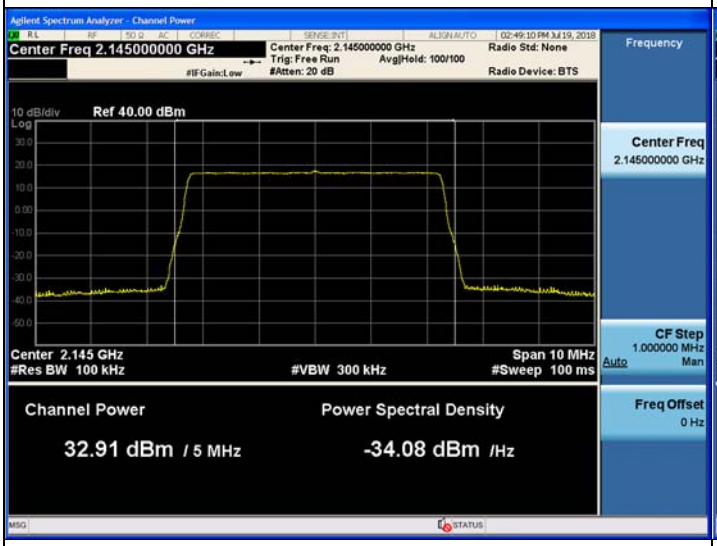
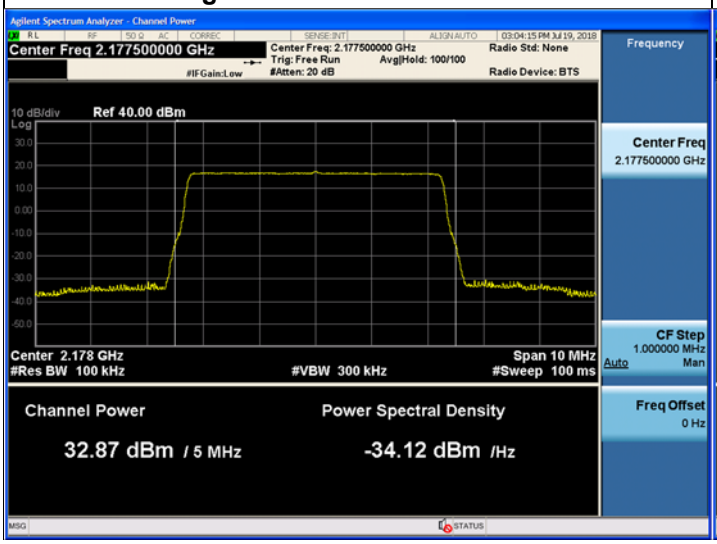
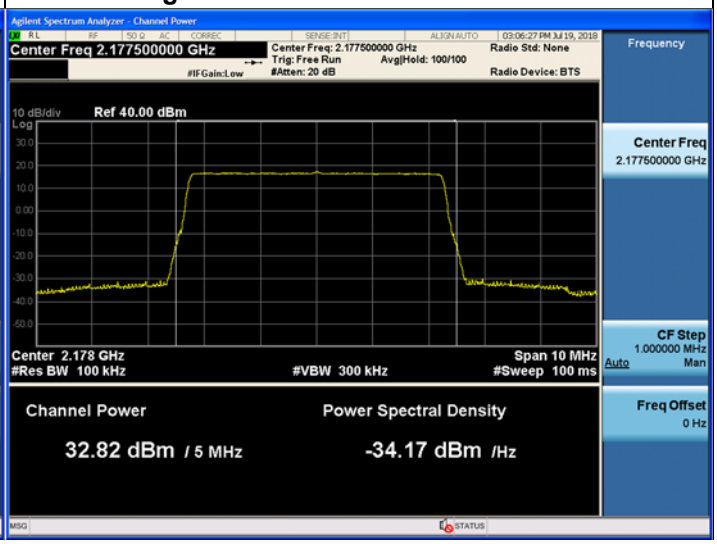
Plots of Peak-to-Average Ratio for 1900 PCS Band

LTE 5 MHz	LTE 10 MHz
Middle Channel AGC threshold	Middle Channel AGC threshold
	
LTE 20 MHz	**WCDMA**
Middle Channel AGC threshold	Middle Channel AGC threshold
	
CDMA	**GSM**
Middle Channel AGC threshold	Middle Channel AGC threshold
	

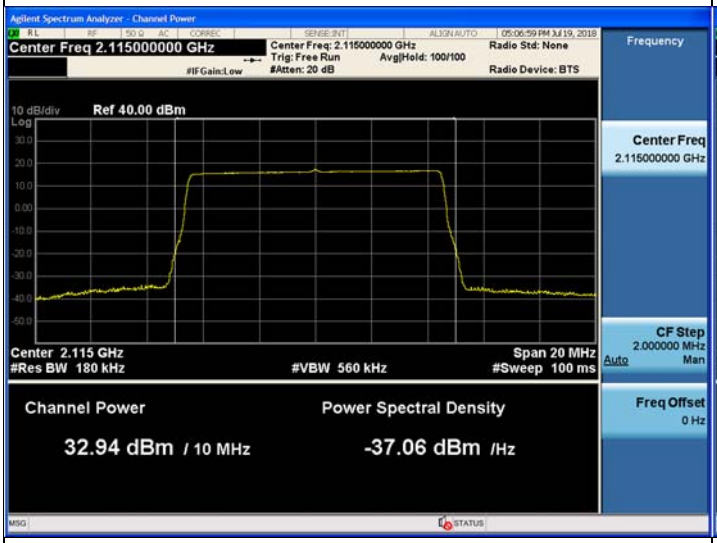
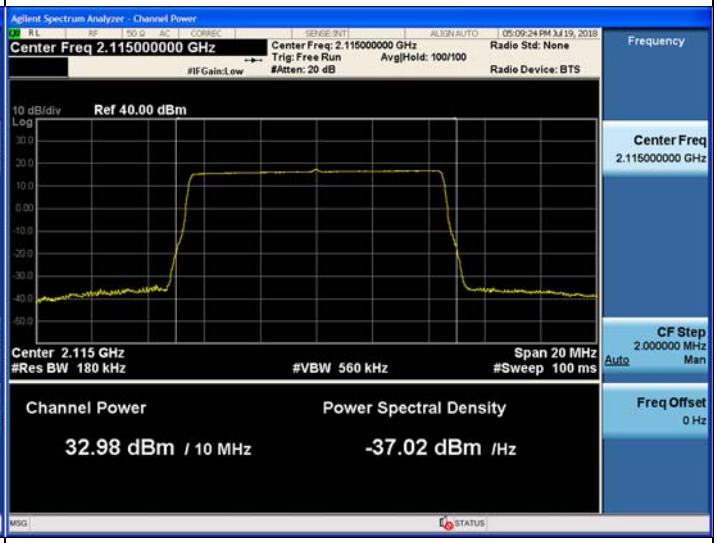
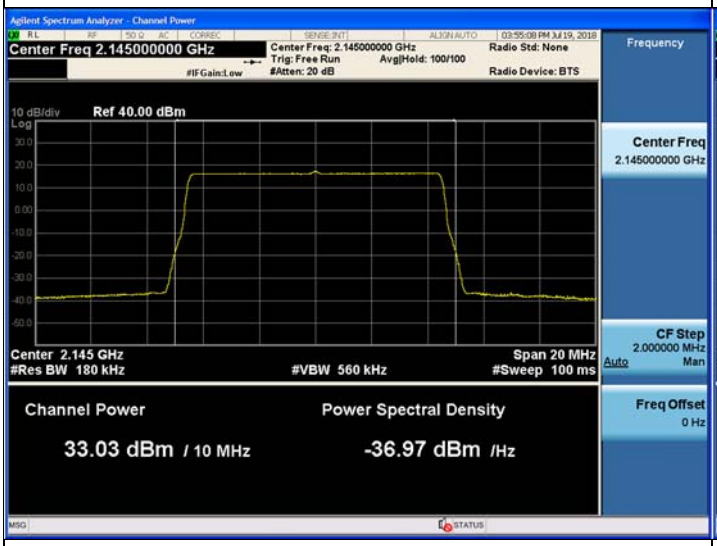
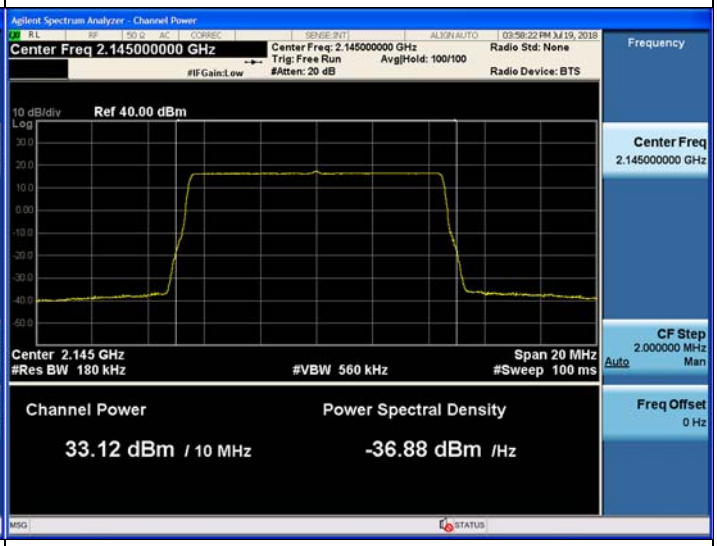
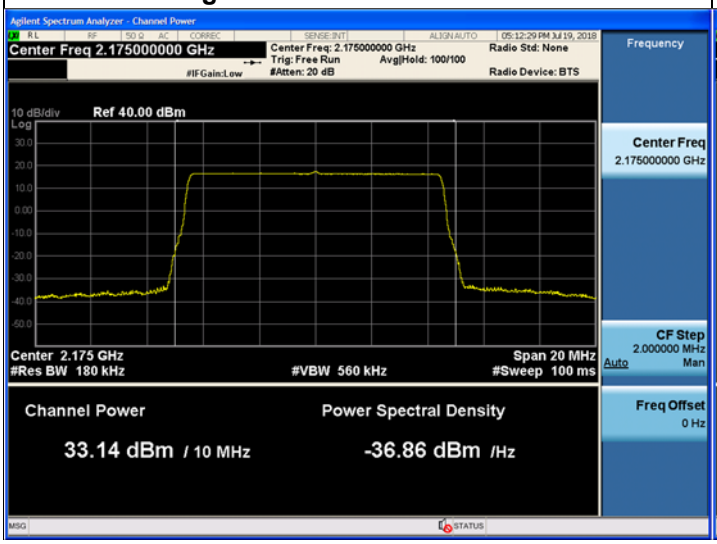
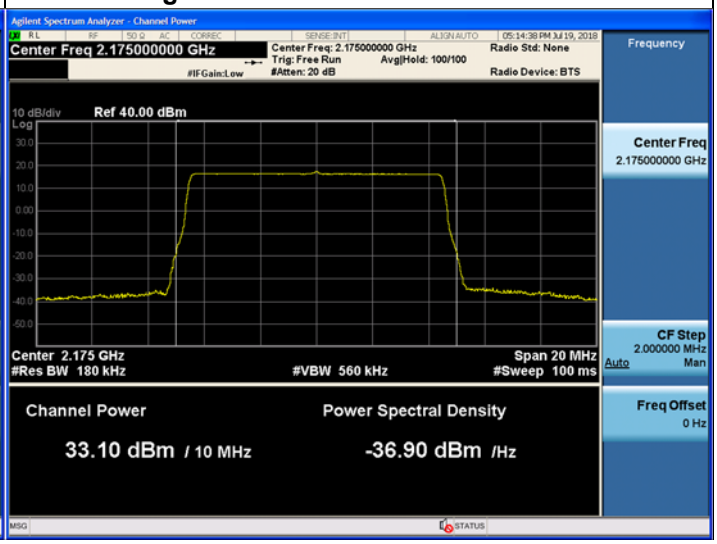
[Downlink_AWS 2100 Band]

AWS 2100 Band	Channel	Frequency (MHz)	Output Power	
			(dBm)	(W)
LTE 5 MHz AGC threshold	Low	2112.50	32.91	1.954
	Middle	2145.00	32.91	1.954
	High	2177.50	32.87	1.936
LTE 5 MHz +3 dB above the AGC threshold	Low	2112.50	32.97	1.982
	Middle	2145.00	32.99	1.991
	High	2177.50	32.82	1.914
LTE 10 MHz AGC threshold	Low	2115.00	32.94	1.968
	Middle	2145.00	33.03	2.009
	High	2175.00	33.14	2.061
LTE 10 MHz +3 dB above the AGC threshold	Low	2115.00	32.98	1.986
	Middle	2145.00	33.12	2.051
	High	2175.00	33.10	2.042
LTE 20 MHz AGC threshold	Low	2120.00	32.95	1.972
	Middle	2145.00	33.01	2.000
	High	2170.00	32.81	1.910
LTE 20 MHz +3 dB above the AGC threshold	Low	2120.00	33.03	2.009
	Middle	2145.00	33.07	2.028
	High	2170.00	32.73	1.875
WCDMA AGC threshold	Low	2112.50	32.86	1.932
	Middle	2145.00	32.81	1.910
	High	2177.50	32.82	1.914
WCDMA +3 dB above the AGC threshold	Low	2112.50	32.90	1.950
	Middle	2145.00	32.89	1.945
	High	2177.50	32.79	1.901
CDMA AGC threshold	Low	2111.25	33.13	2.056
	Middle	2145.00	32.92	1.959
	High	2178.75	33.24	2.109
CDMA +3 dB above the AGC threshold	Low	2111.25	33.11	2.046
	Middle	2145.00	32.99	1.991
	High	2178.75	33.22	2.099

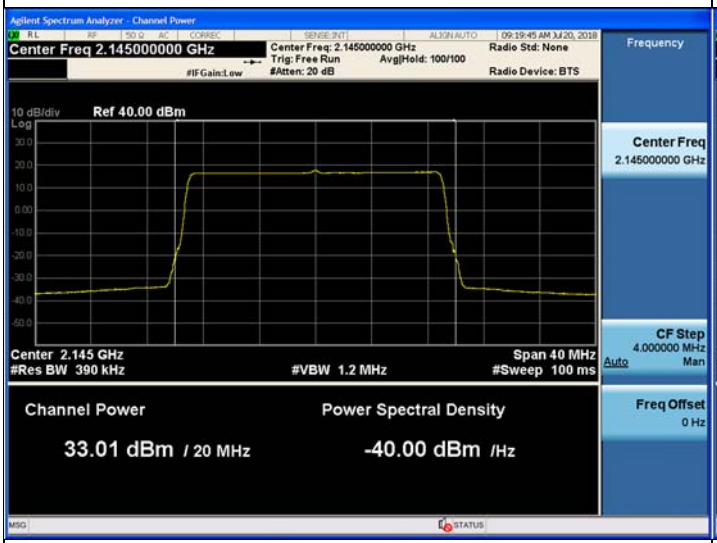
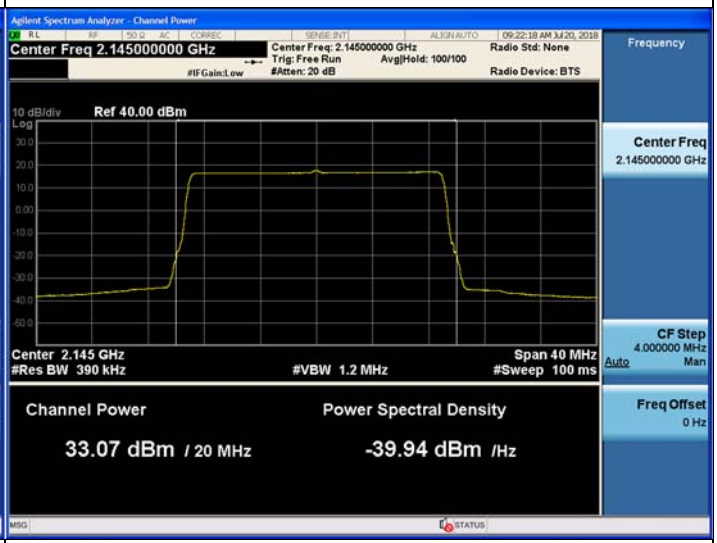
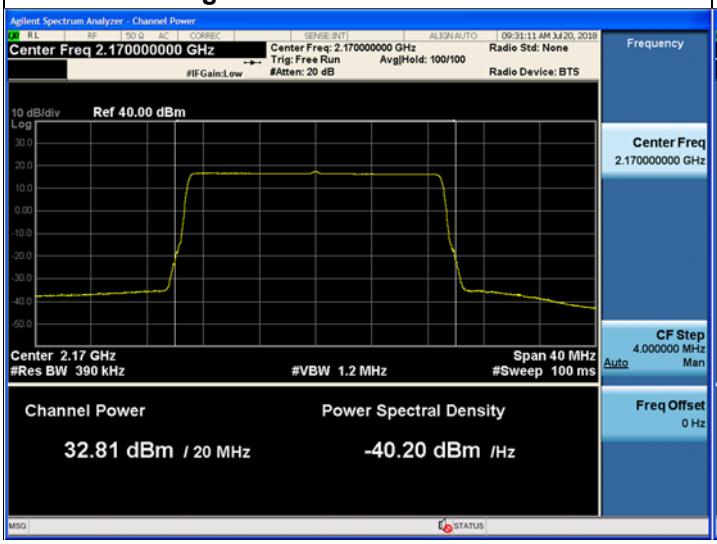
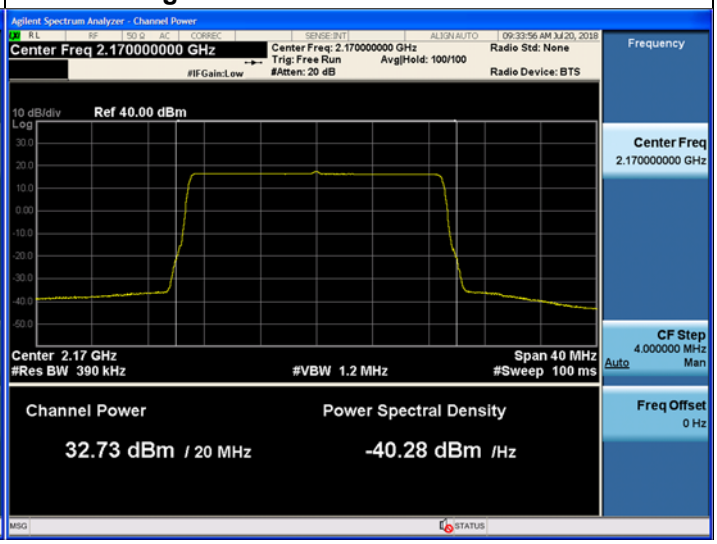
Plots of RF Output Power for AWS 2100 Band LTE 5 MHz

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**
	

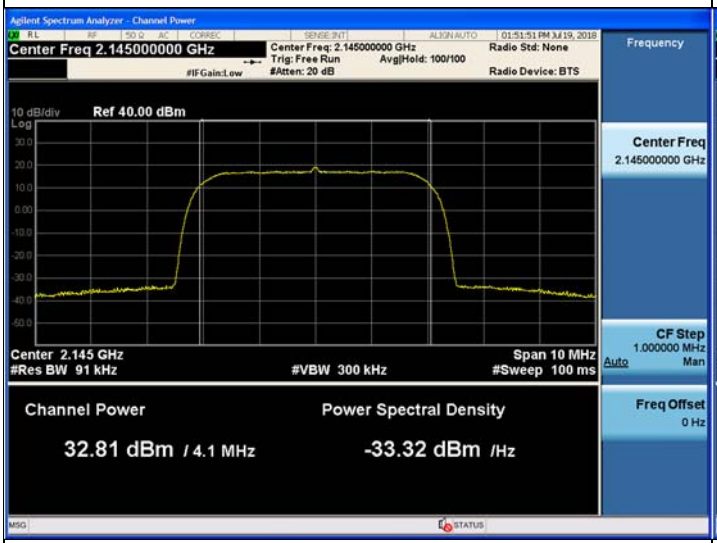
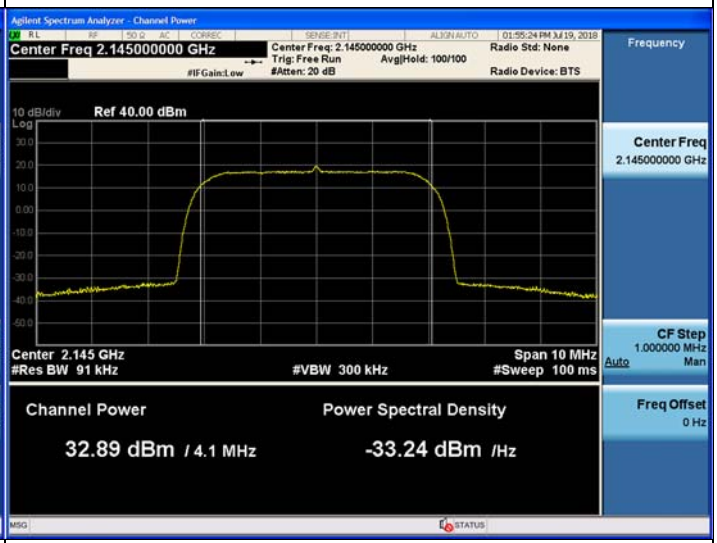
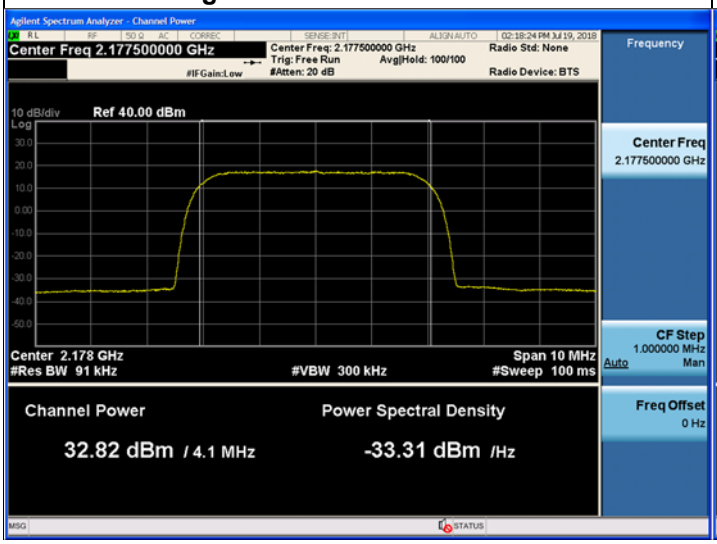
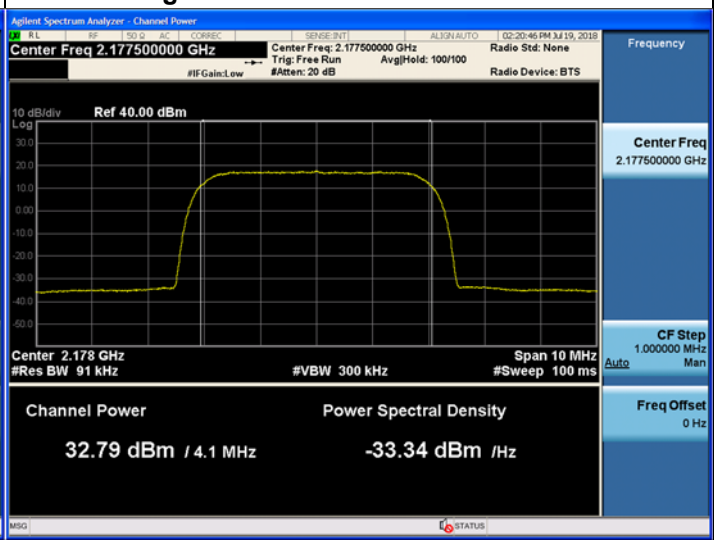
Plots of RF Output Power for AWS 2100 Band LTE 10 MHz

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**
	

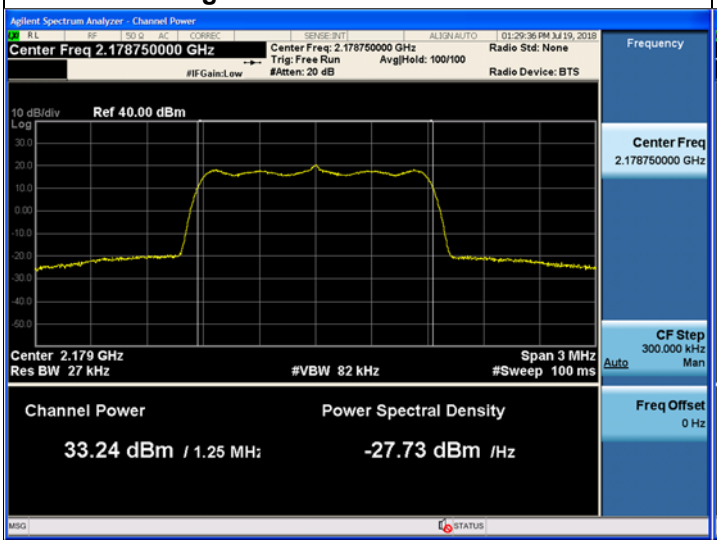
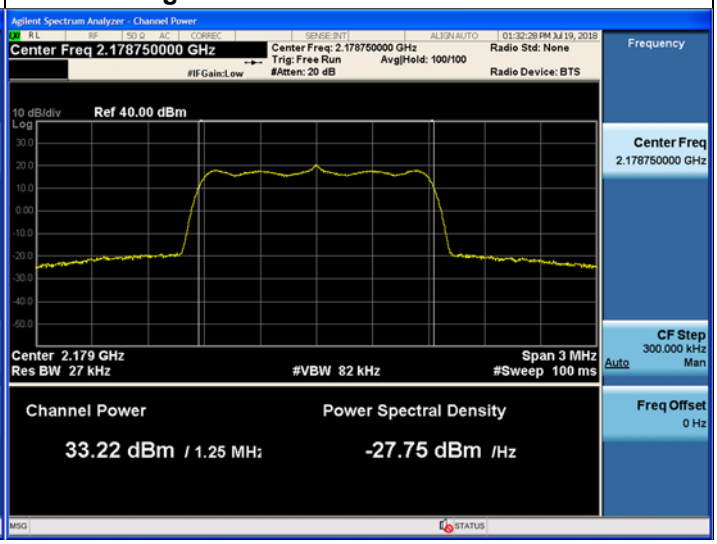
Plots of RF Output Power for AWS 2100 Band LTE 20 MHz

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**
	

Plots of RF Output Power for AWS 2100 Band WCDMA

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**
	

Plots of RF Output Power for AWS 2100 Band CDMA

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**
	

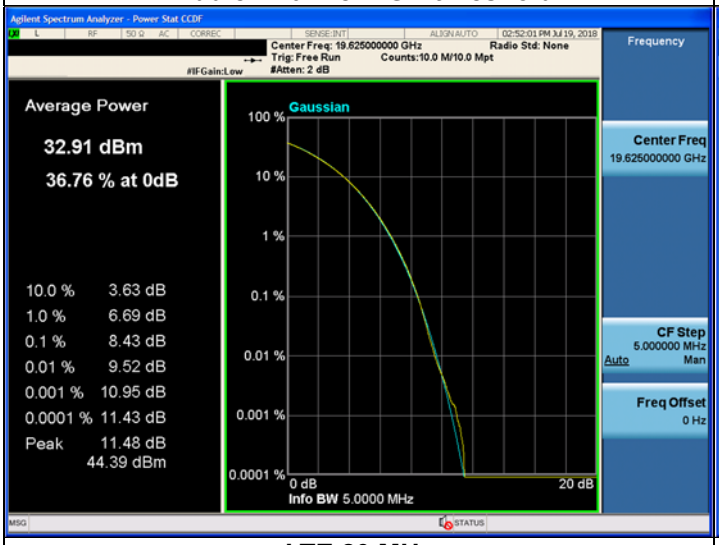
Peak-to-Average Ratio (PAR)

AWS 2100 Band	Channel	Frequency (MHz)	PAR (dB)
LTE 5 MHz AGC threshold	Middle	2145.00	8.43
LTE 10 MHz AGC threshold	Middle	2145.00	8.34
LTE 20 MHz AGC threshold	Middle	2145.00	8.49
WCDMA AGC threshold	Middle	2145.00	8.67
CDMA AGC threshold	Middle	2145.00	8.34

Plots of Peak-to-Average Ratio for AWS 2100

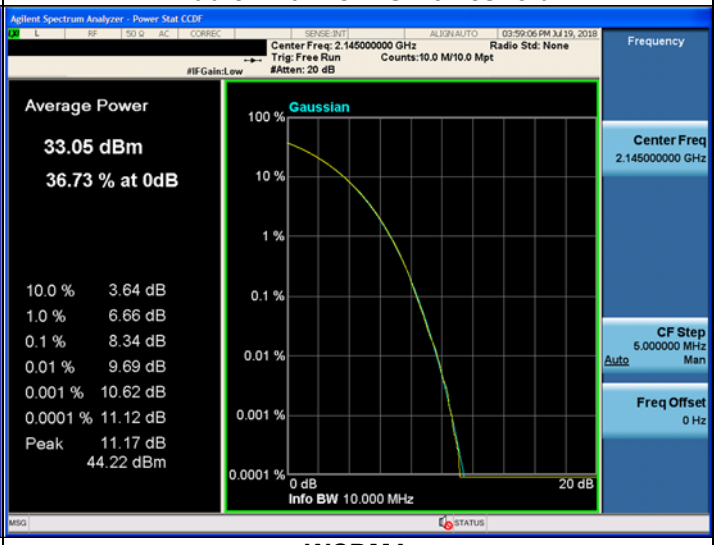
LTE 5 MHz

Middle Channel AGC threshold



LTE 10 MHz

Middle Channel AGC threshold



LTE 20 MHz

Middle Channel AGC threshold

WCDMA

Middle Channel AGC threshold

CDMA

Middle Channel 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.

ISED Rules

Test Requirements:

RSS-Gen

6 General administrative and technical requirements

6.7 Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

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.

RSS-Gen

6 General administrative and technical requirements

6.7 Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

Test Results:

[Downlink Output_700 LTE]

700 LTE Band	Channel	Frequency (MHz)	OBW (MHz)
LTE 5 MHz AGC threshold	Low	731.50	4.5073
	Middle	742.00	4.5146
	High	753.50	4.5121
LTE 5 MHz +3dBm above the AGC threshold	Low	731.50	4.5123
	Middle	742.00	4.5189
	High	753.50	4.5169
LTE 10 MHz AGC threshold	Low	734.00	8.9891
	Middle	741.00	9.0064
	High	751.00	8.9788
LTE 10 MHz +3dBm above the AGC threshold	Low	734.00	8.9847
	Middle	741.00	9.0069
	High	751.00	8.9735

[Downlink Input_700 LTE]

700 LTE Band	Channel	Frequency (MHz)	OBW (MHz)
LTE 5 MHz AGC threshold	Low	731.50	4.5130
	Middle	742.00	4.5110
	High	753.50	4.5072
LTE 10 MHz AGC threshold	Low	734.00	8.9981
	Middle	741.00	8.9992
	High	751.00	8.9924