TEST REPORT

DT&C Co., Ltd.
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Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC1901-0007(1)
2. Customer
   - Name : LG Electronics USA, Inc.
   - Address : 1000 Sylvan Ave. Englewood Cliffs, New Jersey, United States 07632
3. Use of Report : FCC Original Grant
4. Product Name / Model Name : Mobile Phone / LM-X420HM
   FCC ID : ZNFX420HM
5. Test Method Used : KDB971168 D01v03, ANSI/TIA-603-E-2016, ANSI C63.26-2015
   Test Specification : §2, §22, §24(E), §27
6. Date of Test : 2018.12.17 ~ 2019.01.17
7. Testing Environment : Refer to appended test report.
8. Test Result : Refer to the attached test result.

Affirmation	Tested by Name : SunGeun Lee (Signature)	Reviewed by Name : Geunki Son (Signature)

2019 . 01 . 17 .

DT&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description
DRTFCC1901-0007	Jan. 15, 2019	Initial issue
DRTFCC1901-0007(1)	Jan. 17, 2019	Updated the section 6, 7

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1. GENERAL INFORMATION

Applicant Name : LG Electronics USA, Inc.

Address : 1000 Sylvan Ave. Englewood Cliffs, New Jersey, United States 07632

FCC ID : ZNFX420HM

FCC Classification : PCS Licensed Transmitter held to ear (PCE)

EUT Type : Mobile Phone

Model Name : LM-X420HM

Add Model Name : LMX420HM, X420HM, LM-X420BMW, LMX420BMW, X420BMW

Supplying power : DC 3.85 V

Antenna Information : PIFA Antenna

Mode	TX Frequency (MHz)	Emission Designator	Modulation	ERP	
				Max power (dBm)	Max power (W)
LTE Band 12, 17	704 ~ 711	8M96G7D	QPSK	21.51	0.142
LTE Band 12, 17	704 ~ 711	8M95W7D	16QAM	20.77	0.119
LTE Band 12, 17	704 ~ 711	8M96W7D	64QAM	19.55	0.090
LTE Band 12, 17	701.5 ~ 713.5	4M49G7D	QPSK	21.75	0.150
LTE Band 12, 17	701.5 ~ 713.5	4M49W7D	16QAM	20.88	0.122
LTE Band 12, 17	701.5 ~ 713.5	4M50W7D	64QAM	19.81	0.096
LTE Band 12	700.5 ~ 714.5	2M70G7D	QPSK	21.81	0.152
LTE Band 12	700.5 ~ 714.5	2M68W7D	16QAM	20.85	0.122
LTE Band 12	700.5 ~ 714.5	2M68W7D	64QAM	19.70	0.093
LTE Band 12	699.7 ~ 715.3	1M09G7D	QPSK	21.47	0.140
LTE Band 12	699.7 ~ 715.3	1M09W7D	16QAM	20.63	0.116
LTE Band 12	699.7 ~ 715.3	1M09W7D	64QAM	19.79	0.095
LTE Band 5	829 ~ 844	8M97G7D	QPSK	22.67	0.185
LTE Band 5	829 ~ 844	8M94W7D	16QAM	21.83	0.152
LTE Band 5	829 ~ 844	8M95W7D	64QAM	20.67	0.117
LTE Band 5	826.5 ~ 846.5	4M49G7D	QPSK	23.05	0.202
LTE Band 5	826.5 ~ 846.5	4M48W7D	16QAM	22.18	0.165
LTE Band 5	826.5 ~ 846.5	4M50W7D	64QAM	20.99	0.126
LTE Band 5	825.5 ~ 847.5	2M68G7D	QPSK	23.34	0.216
LTE Band 5	825.5 ~ 847.5	2M68W7D	16QAM	22.68	0.185
LTE Band 5	825.5 ~ 847.5	2M69W7D	64QAM	21.55	0.143
LTE Band 5	824.7 ~ 848.3	1M09G7D	QPSK	23.57	0.228
LTE Band 5	824.7 ~ 848.3	1M09W7D	16QAM	22.54	0.179
LTE Band 5	824.7 ~ 848.3	1M09W7D	64QAM0	21.59	0.144

Mode	TX Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max power(dBm)	Max power(W)
LTE Band 66, 4	1720 ~ 1770	17M9G7D	QPSK	23.81	0.240
LTE Band 66, 4	1720 ~ 1770	17M9W7D	16QAM	23.04	0.201
LTE Band 66, 4	1720 ~ 1770	17M9W7D	64QAM	21.98	0.158
LTE Band 66, 4	1717.5 ~ 1772.5	13M4G7D	QPSK	23.92	0.247
LTE Band 66, 4	1717.5 ~ 1772.5	13M4W7D	16QAM	23.35	0.216
LTE Band 66, 4	1717.5 ~ 1772.5	13M4W7D	64QAM	22.33	0.171
LTE Band 66, 4	1715 ~ 1775	8M96G7D	QPSK	24.17	0.261
LTE Band 66, 4	1715 ~ 1775	8M97W7D	16QAM	23.43	0.220
LTE Band 66, 4	1715 ~ 1775	8M96W7D	64QAM	22.34	0.171
LTE Band 66, 4	1712.5 ~ 1777.5	4M50G7D	QPSK	24.11	0.258
LTE Band 66, 4	1712.5 ~ 1777.5	4M49W7D	16QAM	23.25	0.211
LTE Band 66, 4	1712.5 ~ 1777.5	4M51W7D	64QAM	22.18	0.165
LTE Band 66, 4	1711.5 ~ 1778.5	2M69G7D	QPSK	24.42	0.277
LTE Band 66, 4	1711.5 ~ 1778.5	2M68W7D	16QAM	23.63	0.231
LTE Band 66, 4	1711.5 ~ 1778.5	2M69W7D	64QAM	22.55	0.180
LTE Band 66, 4	1710.7 ~ 1779.3	1M08G7D	QPSK	24.29	0.269
LTE Band 66, 4	1710.7 ~ 1779.3	1M09W7D	16QAM	23.59	0.229
LTE Band 66, 4	1710.7 ~ 1779.3	1M09W7D	64QAM	22.65	0.184
LTE Band 2	1860 ~ 1900	17M9G7D	QPSK	25.62	0.365
LTE Band 2	1860 ~ 1900	17M9W7D	16QAM	24.68	0.294
LTE Band 2	1860 ~ 1900	17M9W7D	64QAM	23.40	0.219
LTE Band 2	1857.5 ~ 1902.5	13M4G7D	QPSK	24.13	0.259
LTE Band 2	1857.5 ~ 1902.5	13M5W7D	16QAM	23.56	0.227
LTE Band 2	1857.5 ~ 1902.5	13M4W7D	64QAM	22.62	0.183
LTE Band 2	1855 ~ 1905	8M95G7D	QPSK	24.42	0.277
LTE Band 2	1855 ~ 1905	8M97W7D	16QAM	23.77	0.238
LTE Band 2	1855 ~ 1905	8M96W7D	64QAM	22.83	0.192
LTE Band 2	1852.5 ~ 1907.5	4M49G7D	QPSK	24.57	0.286
LTE Band 2	1852.5 ~ 1907.5	4M49W7D	16QAM	23.49	0.223
LTE Band 2	1852.5 ~ 1907.5	4M48W7D	64QAM	22.59	0.182
LTE Band 2	1851.5 ~ 1908.5	2M70G7D	QPSK	23.93	0.247
LTE Band 2	1851.5 ~ 1908.5	2M68W7D	16QAM	23.19	0.208
LTE Band 2	1851.5 ~ 1908.5	2M69W7D	64QAM	22.20	0.166
LTE Band 2	1850.7 ~ 1909.3	1M08G7D	QPSK	24.16	0.261
LTE Band 2	1850.7 ~ 1909.3	1M09W7D	16QAM	23.38	0.218
LTE Band 2	1850.7 ~ 1909.3	1M09W7D	64QAM	22.61	0.182
LTE Band 7	2510 ~ 2560	17M9G7D	QPSK	19.65	0.092
LTE Band 7	2510 ~ 2560	17M9W7D	16QAM	18.72	0.074
LTE Band 7	2510 ~ 2560	17M9W7D	64QAM	17.79	0.060
LTE Band 7	2507.5 ~ 2562.5	13M4G7D	QPSK	19.66	0.092
LTE Band 7	2507.5 ~ 2562.5	13M4W7D	16QAM	18.72	0.074
LTE Band 7	2507.5 ~ 2562.5	13M4W7D	64QAM	17.80	0.060
LTE Band 7	2505 ~ 2565	8M96G7D	QPSK	19.89	0.097
LTE Band 7	2505 ~ 2565	8M96W7D	16QAM	19.17	0.083
LTE Band 7	2505 ~ 2565	8M96W7D	64QAM	18.02	0.063
LTE Band 7	2502.5 ~ 2567.5	4M49G7D	QPSK	19.73	0.094
LTE Band 7	2502.5 ~ 2567.5	4M49W7D	16QAM	18.93	0.078
LTE Band 7	2502.5 ~ 2567.5	4M49W7D	64QAM	17.88	0.061

2. INTRODUCTION

2.1 EUT DESCRIPTION

The Equipment Under Test (EUT) supports GSM/WCDMA/LTE Phone with Bluetooth, WLAN.

2.2. EUT CAPABILITIES

This EUT contains the following capabilities:
850/1900 GSM/EDGE, 850/1700/1900 WCDMA/HSUPA, Multi-band LTE, 802.11b/g/n WLAN(2.4GHz)
802.11a/n/ac WLAN(5GHz), Bluetooth(BDR, EDR, LE).

2.3. TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+20 ℃ ~ +26 ℃
▪ Relative Humidity	40 % ~ 47 %

2.4 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014. All measurement uncertainty values are shown with a coverage factor of *k* = 2 to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated Disturbance (Below 1 GHz)	5.1 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.4 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (Above 18 GHz)	5.3 dB (The confidence level is about 95 %, k = 2)

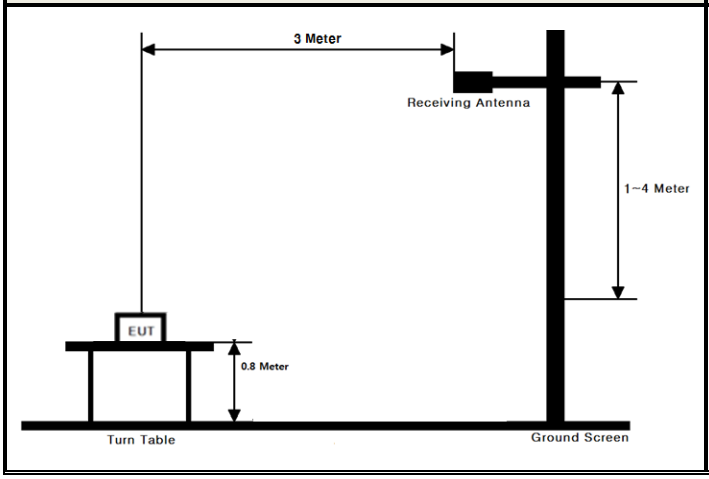
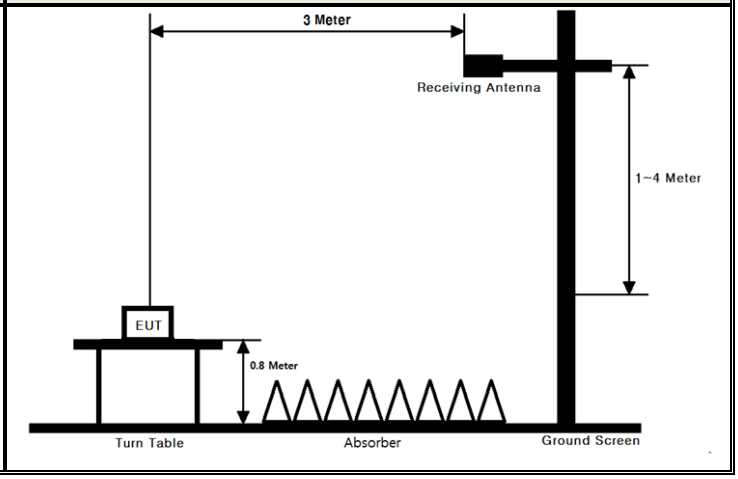
2.6. TEST FACILITY

DT&C Co., Ltd.		
The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042. The test site comply with the requirements of § 2.948 according to ANSI 63.4-2014. **- FCC MRA Accredited Test Firm No. : KR0034**		
www.dtnc.net		
Telephone	:	+ 82-31-321-2664
FAX	:	+ 82-31-321-1664

3. DESCRIPTION OF TESTS

3.1 ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.17**
- **KDB971168 D01v03 - Section 5.2.2**
- **ANSI C63.26-2015 – Section 5.2.4.4.1**

Test setting

1. Set span to 2 x to 3 x the OBW.
2. Set RBW = 1% to 5% of the OBW.
3. Set VBW ≥ 3 x RBW.
4. Set number of points in sweep ≥ 2 × span / RBW.
5. Sweep time:
   1) Set = auto-couple, or
   2) Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6. Detector = power averaging (rms).
7. If the EUT can be configured to transmit continuously, then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-power transmissions).
9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.

10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

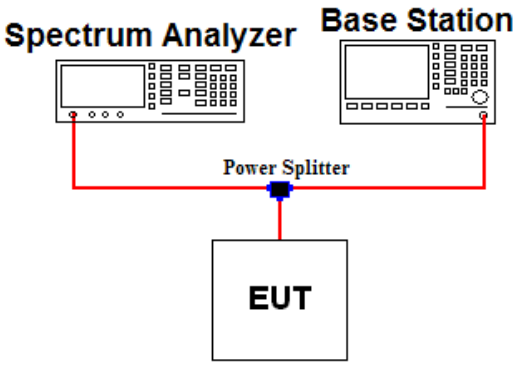
The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna`s terminal [dBm] + Substitute Antenna gain [dBd for ERP , dBi for EIRP]

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference
Between the gain of the horn antenna and an isotropic antenna are taken into consideration.

3.2 PEAK TO AVERAGE RATIO

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 5.7.2**
- **ANSI C63.26-2015 – Section 5.2.3.4**

A peak to average ratio measurement is performed at the conducted port of the EUT.
The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The present of time the signal spends at or above the level defines the probability for that particular power level.

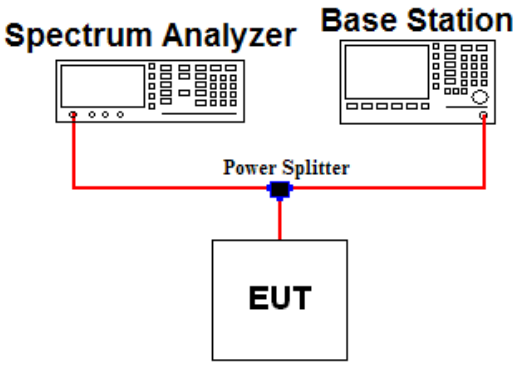
Test setting

The spectrum Analyzer`s CCDF measurement function is enabled.

1. Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Set the measurement interval as follows:
   1) For continuous transmissions, set to the greater of [10 × (number of points in sweep) × (transmission symbol period)] or 1 ms.
   2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
   3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
4. Record the maximum PAPR level associated with a probability of 0.1%.
5. The peak power level is calculated form the sum of the PAPR value from step d) to the measured average power.

3.3 OCCUPIED BANDWIDTH.

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 4.3**
- **ANSI C63.26-2015 – Section 5.4.4**

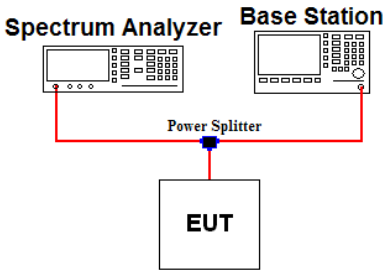
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

Test setting

1. The signal analyzer`s automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 ~ 5 % of the expected OBW & VBW ≥ 3 X RBW
3. Detector = Peak
4. Trance mode = Max hold
5. Sweep = Auto couple
6. The trace was allowed to stabilize
7. If necessary, step 2 ~ 6 were repeated after changing the RBW such that it would be within 1 ~ 5 % of the 99 % occupied bandwidth observed in step 6.

3.4 BAND EDGE EMISSIONS AT ANTENNA TERMINAL

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 6**
- **ANSI C63.26-2015 – Section 5.7**

All out of band emissions are measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its lowest and highest channel with all bandwidths, modulations and RB configurations.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

Test setting

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1 % of the emission bandwidth
4. VBW ≥ 3 X RBW
5. Detector = RMS & Trace mode = Max hold
6. Sweep time = Auto couple or 1 s for band edge
7. Number of sweep point ≥ 2 X span / RBW
8. The trace was allowed to stabilize

Note 1: Per Part 22.917(b)(1) / 24.238(b) / 27.53(h) 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 to demonstrate compliance with the out-of-band emissions limit. 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 emission are attenuated at least 26 dB below the transmitter power.

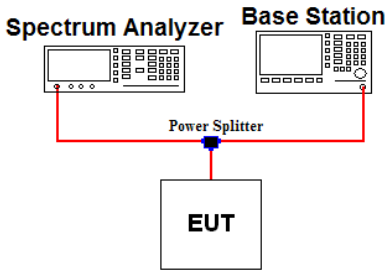
Note 2: Per Part 27(g) for operations in the 600 MHz band and the 698-746 MHz band, compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Note 3: For part 27.53(m)(4) the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

Note 4: Per part 27.53(m)(6) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 MHz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

Test set-up



Test Procedure

- **KDB971168 D01v03 - Section 6**
- **ANSI C63.26-2015 – Section 5.7**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The EUT was setup to maximum output power at its low, middle, high channel with all bandwidths, modulations and RB configurations. The spectrum is scanned from 9 kHz up to a frequency including its 10th harmonic.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

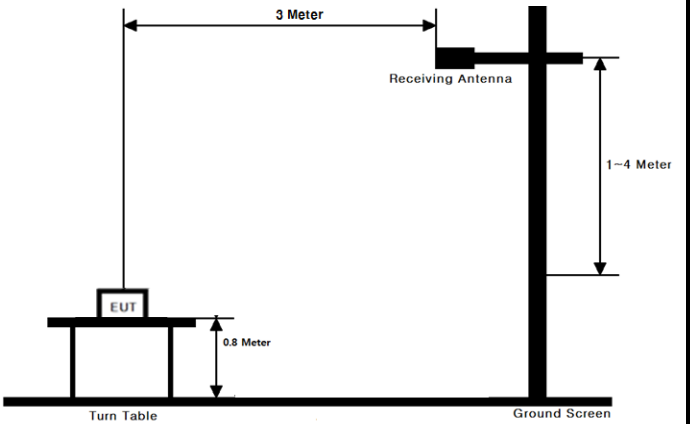
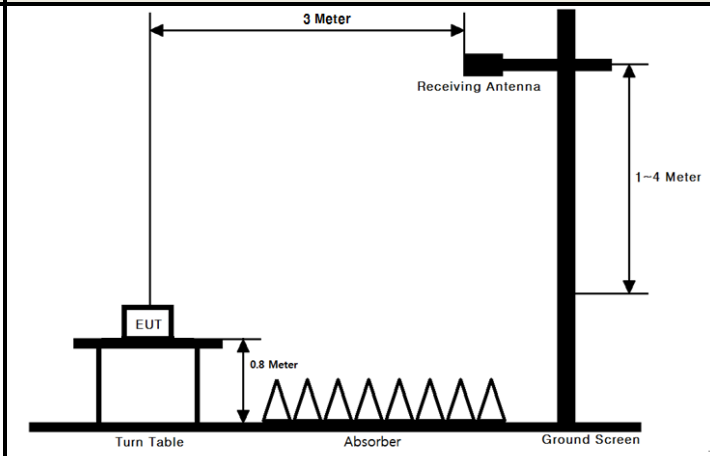
Test setting

1. RBW = 100 kHz(Below 1 GHz) or 1 MHz(Above 1 GHz) & VBW ≥ 3 X RBW (Refer to Note 1)
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

Note 1: Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1GHz and 1MHz or greater for frequencies greater than 1GHz.

3.6 UNDESIRABLE EMISSIONS

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 0.8-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.12**
- **KDB971168 D01v03 - Section 5.8**
- **ANSI C63.26-2015 – Section 5.5**

Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

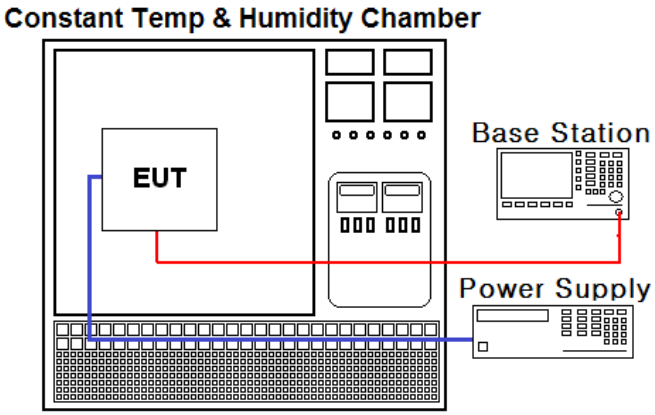
For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

3.7 FREQUENCY STABILITY

Test Set-up



Test Procedure

- **ANSI/TIA-603-E-2016**
- **KDB971168 D01v03 - Section 9**

The frequency stability of the transmitter is measured by:

a.) **Temperature:**
The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:**
The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block for Part 24, 27. The frequency stability of the transmitter shall be maintained within ± 0.000 25 % (± 2.5 ppm) of the center frequency for Part 22.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature.
(20 °C to provide a reference)

2. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C.
A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	18/07/09	19/07/09	MY46471251
Spectrum Analyzer	Agilent Technologies	N9020A	18/07/09	19/07/09	MY50410163
Spectrum Analyzer	Agilent Technologies	N9020A	17/12/28 18/12/19	18/12/28 19/12/19	MY49060056
Spectrum Analyzer	Agilent Technologies	N9030A	18/07/09	19/07/09	MY53310140
DC power supply	Agilent Technologies	66332A	18/07/02	19/07/02	MY43001172
Multimeter	FLUKE	17B	17/12/26 18/12/18	18/12/26 19/12/18	26030065WS
Power Splitter	Anritsu	K240B	18/07/04	19/07/04	1701099
Temp & Humi	SJ Science	SJ-TH-S50	18/07/06	19/07/06	U5542113
Radio Communication Analyzer	Anritsu	MT8820C	18/07/03	19/07/03	6200978101
Thermohygrometer	BODYCOM	BJ5478	18/01/03	19/01/03	120612-2
Thermohygrometer	BODYCOM	BJ5478	18/01/03 18/12/27	19/01/03 19/12/27	120612-2
Thermohygrometer	BODYCOM	BJ5478	18/01/03 18/12/27	19/01/03 19/12/27	120612-1
Signal Generator	Rohde Schwarz	SMBV100A	17/12/27 18/12/19	18/12/27 19/12/19	255571
Signal Generator	Rohde Schwarz	SMF100A	18/06/07	19/06/07	102341
Loop Antenna	Schwarzbeck	FMZB1513	18/01/30	20/01/30	1513-128
Bilog Antenna	Schwarzbeck	VULB 9160	18/07/13	20/07/13	3359
Dipole Antenna	Schwarzbeck	VHA9103	17/03/14	19/03/14	2116
Dipole Antenna	Schwarzbeck	VHA9103	18/04/13	20/04/13	2117
Dipole Antenna	Schwarzbeck	UHA9105	17/03/14	19/03/14	2261
Dipole Antenna	Schwarzbeck	UHA9105	18/04/13	20/04/13	2262
HORN ANT	ETS	3117	18/05/10	20/05/10	00140394
HORN ANT	ETS	3117	18/03/26	20/03/26	00152145
HORN ANT	A.H.Systems	SAS-574	17/04/25	19/04/25	154
HORN ANT	A.H.Systems	SAS-574	17/07/31	19/07/31	155
Amplifier	RF Bay Inc	MPA-40-40	17/12/28 18/12/20	18/12/28 19/12/20	21151801
Amplifier	EMPOWER	BBS3Q7ELU	18/07/10	19/07/10	1020
PreAmplifier	H.P	8447D	17/12/26 18/12/18	18/12/26 19/12/18	2944A07774
PreAmplifier	Agilent	8449B	18/07/05	19/07/05	3008A02108
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	18/07/05	19/07/05	7
High-pass filter	Wainwright	WHKX12-2580-3000-18000-80SS	18/07/05	19/07/05	3
High-pass filter	Wainwright	WHNX8.5/26.5G-6SS	18/07/03	19/07/03	1
Cable	DTNC	Cable	18/07/06	19/07/06	M-01
Cable	DTNC	Cable	18/07/06	19/07/06	M-02
Cable	Junkosha	MWX315	18/11/19	19/11/19	M-05
Cable	Junkosha	MWX221	18/11/19	19/11/19	M-06
Cable	DTNC	Cable	18/07/05	19/07/05	RF-84
Cable	DTNC	Cable	18/07/06	19/07/06	RF-10

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.
Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
2.1046	Conducted Output Power	N/A	Conducted	C Note2
2.1049	Occupied Bandwidth	N/A		C
24.232(d) 27.50(d.5)	Peak to Average Ratio	< 13 dB		C
2.1051 22.917(a) 24.238(a) 27.53(g) 27.53(h)	Band Edge / Conducted Spurious Emissions	> 43 + 10log$_{10}$(P) dB at Band edge and for all out-of-band emissions		C
27.53(m)	Band Edge / Conducted Spurious Emissions	> 40 + 10log10 (P) dB at channel edge and 5 MHz from the channel edge > 43 + 10log10 (P) dB at 5 MHz and X MHz from the channel edge > 55 + 10log10 (P) dB at all frequencies more than X MHz from the channel edge		C
2.1055 22.355 24.235 27.54	Frequency Stability	< 2.5 ppm (Part 22) Fundamental emissions must stay within Authorized frequency block (Part 24, 27)		C
27.50(c.10)	Radiated Output Power (B12, 17)	< 3 Watts max. ERP	Radiated	C
22.913(a.5)	Radiated Output Power (B5)	< 7 Watts max. ERP		C
27.50(d.4)	Radiated Output Power (B66, 4)	< 1 Watts max. EIRP		C
24.232(c) 27.50(h.2)	Radiated Output Power(B2, 7)	< 2 Watts max. EIRP		C
2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	Undesirable Emissions	> 43 + 10log$_{10}$(P) dB for all out-of-band emissions		C
27.53(m)	Undesirable Emissions(B7)	> 55 + 10log$_{10}$(P) dB for all out-of-band emissions		C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable
Note 2: Refer to RF Exposure Report (Test Report SAR)

6. SAMPLE CALCULATION

A. Emission Designator

LTE Band 12, 17(QPSK)

Emission Designator = **8M96G7D**
LTE OBW = 8.957 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 12, 17(16QAM)

Emission Designator = **8M95W7D**
LTE OBW = 8.951 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 12, 17(64QAM)

Emission Designator = **8M96W7D**
LTE OBW = 8.958 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5(QPSK)

Emission Designator = **8M97G7D**
LTE OBW = 8.968 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5(16QAM)

Emission Designator = **8M94W7D**
LTE OBW = 8.941 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 5(64QAM)

Emission Designator = **8M95W7D**
LTE OBW = 8.951 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 66, 4(QPSK)

Emission Designator = **17M9G7D**
LTE OBW = 17.898 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 66, 4(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.914 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 66, 4(64QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.907 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 2(QPSK)

Emission Designator = **17M9G7D**
LTE OBW = 17.854 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 2(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.866 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 2(64QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.899 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 7(QPSK)

Emission Designator = **17M9G7D**
LTE OBW = 17.890 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 7(16QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.916 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

LTE Band 7(64QAM)

Emission Designator = **17M9W7D**
LTE OBW = 17.903 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data Transmission

B. For substitution method

EIRP for Band 2

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Spectrum Reading Value(dBm)	EUT Axis	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1800	QPSK	1/0	-21.38	X	H	20.82	4.80	25.62	0.365

ERP or EIRP = Level @ Ant Terminal LEVEL(dBm) + Tx Ant. Gain

1) The EUT mounted on a non-conductive turntable is 0.8 meter above test site ground level.
2) During the test, the turn table is rotated until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with substituted antenna gain is the rating of ERP, EIRP or Radiated spurious emission.

7.TEST DATA

7.1 OCCUPIED BANDWIDTH

- Plots of the EUT's Occupied Bandwidth are shown in Clause 8.1

7.2 PEAK TO AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.2

7.3 BAND EDEG EMISSIONS (Conducted)

- Plots of the EUT's Band Edge Emissions are shown in Clause 8.3

7.4 SPURIOUS AND HARMONICS EMISSIONS (Conducted)

- Plots of the EUT's Spurious Emissions are shown in Clause 8.4

7.5 ERP & EIRP

7.5.1 LTE Band 12, 17

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	704	QPSK	1/49	H	20.23	1.28	21.51	0.142
		16QAM	1/49	H	19.49	1.28	20.77	0.119
		64QAM	1/49	H	18.27	1.28	19.55	0.090
	711	QPSK	1/49	H	20.15	1.28	21.43	0.139
		16QAM	1/49	H	19.42	1.28	20.70	0.117
		64QAM	1/49	H	18.24	1.28	19.52	0.090
5	701.5	QPSK	1/12	H	19.83	1.28	21.11	0.129
		16QAM	1/12	H	18.99	1.28	20.27	0.106
		64QAM	1/12	H	18.03	1.28	19.31	0.085
	707.5	QPSK	1/12	H	20.47	1.28	21.75	0.150
		16QAM	1/12	H	19.60	1.28	20.88	0.122
		64QAM	1/12	H	18.53	1.28	19.81	0.096
	713.5	QPSK	1/12	H	19.76	1.28	21.04	0.127
		16QAM	1/12	H	18.91	1.28	20.19	0.104
		64QAM	1/12	H	17.79	1.28	19.07	0.081

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.5.2 LTE Band 12

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
3	700.5	QPSK	1/7	H	19.26	1.28	20.54	0.113
		16QAM	1/7	H	18.52	1.28	19.80	0.095
		64QAM	1/7	H	17.65	1.28	18.93	0.078
	707.5	QPSK	1/7	H	20.53	1.28	21.81	0.152
		16QAM	1/7	H	19.57	1.28	20.85	0.122
		64QAM	1/7	H	18.42	1.28	19.70	0.093
	714.5	QPSK	1/7	H	19.64	1.28	20.92	0.124
		16QAM	1/7	H	18.76	1.28	20.04	0.101
		64QAM	1/7	H	17.93	1.28	19.21	0.083
1.4	699.7	QPSK	1/2	H	19.72	1.28	21.00	0.126
		16QAM	1/2	H	18.88	1.28	20.16	0.104
		64QAM	1/2	H	17.76	1.28	19.04	0.080
	707.5	QPSK	1/2	H	20.19	1.28	21.47	0.140
		16QAM	1/2	H	19.35	1.28	20.63	0.116
		64QAM	1/2	H	18.51	1.28	19.79	0.095
	715.3	QPSK	1/2	H	19.42	1.28	20.70	0.117
		16QAM	1/2	H	18.69	1.28	19.97	0.099
		64QAM	1/2	H	17.54	1.28	18.82	0.076

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.5.3 LTE Band 5

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	829	QPSK	1/25	H	21.44	1.23	22.67	0.185
		16QAM	1/25	H	20.60	1.23	21.83	0.152
		64QAM	1/25	H	19.44	1.23	20.67	0.117
	836.5	QPSK	1/25	H	20.88	1.22	22.10	0.162
		16QAM	1/25	H	20.08	1.22	21.30	0.135
		64QAM	1/25	H	19.00	1.22	20.22	0.105
	844	QPSK	1/25	H	20.77	1.21	21.98	0.158
		16QAM	1/25	H	20.18	1.21	21.39	0.138
		64QAM	1/25	H	19.20	1.21	20.41	0.110
5	826.5	QPSK	1/12	H	21.82	1.23	23.05	0.202
		16QAM	1/12	H	20.95	1.23	22.18	0.165
		64QAM	1/12	H	19.76	1.23	20.99	0.126
	836.5	QPSK	1/12	H	21.40	1.22	22.62	0.183
		16QAM	1/12	H	20.70	1.22	21.92	0.156
		64QAM	1/12	H	19.58	1.22	20.80	0.120
	846.5	QPSK	1/12	H	21.30	1.21	22.51	0.178
		16QAM	1/12	H	20.52	1.21	21.73	0.149
		64QAM	1/12	H	19.34	1.21	20.55	0.114
3	825.5	QPSK	1/7	H	22.11	1.23	23.34	0.216
		16QAM	1/7	H	21.45	1.23	22.68	0.185
		64QAM	1/7	H	20.32	1.23	21.55	0.143
	836.5	QPSK	1/7	H	21.44	1.22	22.66	0.185
		16QAM	1/7	H	20.60	1.22	21.82	0.152
		64QAM	1/7	H	19.49	1.22	20.71	0.118
	847.5	QPSK	1/7	H	21.03	1.21	22.24	0.167
		16QAM	1/7	H	20.21	1.21	21.42	0.139
		64QAM	1/7	H	19.07	1.21	20.28	0.107
1.4	824.7	QPSK	1/2	H	22.34	1.23	23.57	0.228
		16QAM	1/2	H	21.31	1.23	22.54	0.179
		64QAM	1/2	H	20.36	1.23	21.59	0.144
	836.5	QPSK	1/2	H	21.39	1.22	22.61	0.182
		16QAM	1/2	H	20.73	1.22	21.95	0.157
		64QAM	1/2	H	19.72	1.22	20.94	0.124
	848.3	QPSK	1/2	H	21.03	1.21	22.24	0.167
		16QAM	1/2	H	20.29	1.21	21.50	0.141
		64QAM	1/2	H	19.25	1.21	20.46	0.111

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.5.4 LTE Band 66, 4

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1720	QPSK	1/50	H	16.94	5.95	22.89	0.195
		16QAM	1/50	H	16.33	5.95	22.28	0.169
		64QAM	1/50	H	15.30	5.95	21.25	0.133
	1745	QPSK	1/50	H	18.08	5.73	23.81	0.240
		16QAM	1/50	H	17.29	5.73	23.02	0.200
		64QAM	1/50	H	16.16	5.73	21.89	0.155
	1770	QPSK	1/50	H	18.26	5.42	23.68	0.233
		16QAM	1/50	H	17.62	5.42	23.04	0.201
		64QAM	1/50	H	16.56	5.42	21.98	0.158
15	1717.5	QPSK	1/36	H	17.66	5.97	23.63	0.231
		16QAM	1/36	H	17.04	5.97	23.01	0.200
		64QAM	1/36	H	16.10	5.97	22.07	0.161
	1745	QPSK	1/36	H	18.19	5.73	23.92	0.247
		16QAM	1/36	H	17.62	5.73	23.35	0.216
		64QAM	1/36	H	16.60	5.73	22.33	0.171
	1772.5	QPSK	1/36	H	17.93	5.39	23.32	0.215
		16QAM	1/36	H	17.11	5.39	22.50	0.178
		64QAM	1/36	H	16.16	5.39	21.55	0.143
10	1715	QPSK	1/25	H	18.11	6.00	24.11	0.258
		16QAM	1/25	H	17.43	6.00	23.43	0.220
		64QAM	1/25	H	16.34	6.00	22.34	0.171
	1745	QPSK	1/25	H	18.44	5.73	24.17	0.261
		16QAM	1/25	H	17.46	5.73	23.19	0.208
		64QAM	1/25	H	16.53	5.73	22.26	0.168
	1775	QPSK	1/25	H	18.01	5.36	23.37	0.217
		16QAM	1/25	H	17.11	5.36	22.47	0.177
		64QAM	1/25	H	16.06	5.36	21.42	0.139

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
5	1712.5	QPSK	1/12	H	17.60	6.02	23.62	0.230
		16QAM	1/12	H	17.02	6.02	23.04	0.201
		64QAM	1/12	H	15.96	6.02	21.98	0.158
	1745	QPSK	1/12	H	18.38	5.73	24.11	0.258
		16QAM	1/12	H	17.52	5.73	23.25	0.211
		64QAM	1/12	H	16.45	5.73	22.18	0.165
	1777.5	QPSK	1/12	H	17.83	5.32	23.15	0.207
		16QAM	1/12	H	17.10	5.32	22.42	0.175
		64QAM	1/12	H	16.21	5.32	21.53	0.142
3	1711.5	QPSK	1/7	H	16.82	6.03	22.85	0.193
		16QAM	1/7	H	16.14	6.03	22.17	0.165
		64QAM	1/7	H	15.06	6.03	21.09	0.129
	1745	QPSK	1/7	H	18.69	5.73	24.42	0.277
		16QAM	1/7	H	17.90	5.73	23.63	0.231
		64QAM	1/7	H	16.82	5.73	22.55	0.180
	1778.5	QPSK	1/7	H	17.62	5.31	22.93	0.196
		16QAM	1/7	H	16.72	5.31	22.03	0.160
		64QAM	1/7	H	15.73	5.31	21.04	0.127
1.4	1710.7	QPSK	1/2	H	17.33	6.03	23.36	0.217
		16QAM	1/2	H	16.80	6.03	22.83	0.192
		64QAM	1/2	H	15.87	6.03	21.90	0.155
	1745	QPSK	1/2	H	18.56	5.73	24.29	0.269
		16QAM	1/2	H	17.86	5.73	23.59	0.229
		64QAM	1/2	H	16.92	5.73	22.65	0.184
	1779.3	QPSK	1/2	H	17.58	5.30	22.88	0.194
		16QAM	1/2	H	16.82	5.30	22.12	0.163
		64QAM	1/2	H	15.71	5.30	21.01	0.126

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.5.5 LTE Band 2

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1860	QPSK	1/0	H	18.89	4.91	23.80	0.240
		16QAM	1/0	H	18.11	4.91	23.02	0.200
		64QAM	1/0	H	17.23	4.91	22.14	0.164
	1880	QPSK	1/0	H	20.82	4.80	25.62	0.365
		16QAM	1/0	H	19.88	4.80	24.68	0.294
		64QAM	1/0	H	18.60	4.80	23.40	0.219
	1900	QPSK	1/0	H	19.75	4.69	24.44	0.278
		16QAM	1/0	H	18.92	4.69	23.61	0.230
		64QAM	1/0	H	17.94	4.69	22.63	0.183
15	1857.5	QPSK	1/36	H	19.21	4.92	24.13	0.259
		16QAM	1/36	H	18.19	4.92	23.11	0.205
		64QAM	1/36	H	17.40	4.92	22.32	0.171
	1880	QPSK	1/36	H	19.26	4.80	24.06	0.255
		16QAM	1/36	H	18.76	4.80	23.56	0.227
		64QAM	1/36	H	17.82	4.80	22.62	0.183
	1902.5	QPSK	1/36	H	19.35	4.68	24.03	0.253
		16QAM	1/36	H	18.80	4.68	23.48	0.223
		64QAM	1/36	H	17.84	4.68	22.52	0.179
10	1855	QPSK	1/0	H	19.17	4.94	24.11	0.258
		16QAM	1/0	H	18.55	4.94	23.49	0.223
		64QAM	1/0	H	17.63	4.94	22.57	0.181
	1880	QPSK	1/0	H	19.62	4.80	24.42	0.277
		16QAM	1/0	H	18.97	4.80	23.77	0.238
		64QAM	1/0	H	17.77	4.80	22.57	0.181
	1905	QPSK	1/0	H	19.74	4.67	24.41	0.276
		16QAM	1/0	H	19.07	4.67	23.74	0.237
		64QAM	1/0	H	18.16	4.67	22.83	0.192

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
5	1852.5	QPSK	1/12	H	19.11	4.95	24.06	0.255
		16QAM	1/12	H	18.23	4.95	23.18	0.208
		64QAM	1/12	H	17.39	4.95	22.34	0.171
	1880	QPSK	1/12	H	19.77	4.80	24.57	0.286
		16QAM	1/12	H	18.69	4.80	23.49	0.223
		64QAM	1/12	H	17.79	4.80	22.59	0.182
	1907.5	QPSK	1/12	H	19.47	4.65	24.12	0.258
		16QAM	1/12	H	18.78	4.65	23.43	0.220
		64QAM	1/12	H	17.83	4.65	22.48	0.177
3	1851.5	QPSK	1/7	H	18.64	4.95	23.59	0.229
		16QAM	1/7	H	17.86	4.95	22.81	0.191
		64QAM	1/7	H	17.07	4.95	22.02	0.159
	1880	QPSK	1/7	H	19.13	4.80	23.93	0.247
		16QAM	1/7	H	18.39	4.80	23.19	0.208
		64QAM	1/7	H	17.40	4.80	22.20	0.166
	1908.5	QPSK	1/7	H	19.15	4.65	23.80	0.240
		16QAM	1/7	H	18.37	4.65	23.02	0.200
		64QAM	1/7	H	17.52	4.65	22.17	0.165
1.4	1850.7	QPSK	1/2	H	18.81	4.96	23.77	0.238
		16QAM	1/2	H	18.01	4.96	22.97	0.198
		64QAM	1/2	H	17.19	4.96	22.15	0.164
	1880	QPSK	1/2	H	19.36	4.80	24.16	0.261
		16QAM	1/2	H	18.58	4.80	23.38	0.218
		64QAM	1/2	H	17.81	4.80	22.61	0.182
	1909.3	QPSK	1/2	H	19.20	4.64	23.84	0.242
		16QAM	1/2	H	18.48	4.64	23.12	0.205
		64QAM	1/2	H	17.69	4.64	22.33	0.171

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.5.6 LTE Band 7

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	2510	QPSK	1/50	H	13.08	5.95	19.03	0.080
		16QAM	1/50	H	12.32	5.95	18.27	0.067
		64QAM	1/50	H	11.37	5.95	17.32	0.054
	2535	QPSK	1/50	H	13.11	5.89	19.00	0.079
		16QAM	1/50	H	12.40	5.89	18.29	0.067
		64QAM	1/50	H	11.54	5.89	17.43	0.055
	2560	QPSK	1/50	H	13.79	5.86	19.65	0.092
		16QAM	1/50	H	12.86	5.86	18.72	0.074
		64QAM	1/50	H	11.93	5.86	17.79	0.060
15	2507.5	QPSK	1/74	H	11.86	5.96	17.82	0.061
		16QAM	1/74	H	11.17	5.96	17.13	0.052
		64QAM	1/74	H	9.81	5.96	15.77	0.038
	2535	QPSK	1/74	H	13.35	5.89	19.24	0.084
		16QAM	1/74	H	12.45	5.89	18.34	0.068
		64QAM	1/74	H	11.32	5.89	17.21	0.053
	2562.5	QPSK	1/74	H	13.79	5.87	19.66	0.092
		16QAM	1/74	H	12.85	5.87	18.72	0.074
		64QAM	1/74	H	11.93	5.87	17.80	0.060
10	2505	QPSK	1/25	H	12.88	5.97	18.85	0.077
		16QAM	1/25	H	11.90	5.97	17.87	0.061
		64QAM	1/25	H	10.93	5.97	16.90	0.049
	2535	QPSK	1/25	H	12.91	5.89	18.80	0.076
		16QAM	1/25	H	12.02	5.89	17.91	0.062
		64QAM	1/25	H	11.09	5.89	16.98	0.050
	2565	QPSK	1/25	H	14.02	5.87	19.89	0.097
		16QAM	1/25	H	13.30	5.87	19.17	0.083
		64QAM	1/25	H	12.15	5.87	18.02	0.063
5	2502.5	QPSK	1/12	H	12.52	5.97	18.49	0.071
		16QAM	1/12	H	11.71	5.97	17.68	0.059
		64QAM	1/12	H	10.62	5.97	16.59	0.046
	2535	QPSK	1/12	H	12.90	5.89	18.79	0.076
		16QAM	1/12	H	12.14	5.89	18.03	0.064
		64QAM	1/12	H	11.07	5.89	16.96	0.050
	2567.5	QPSK	1/12	H	13.85	5.88	19.73	0.094
		16QAM	1/12	H	13.05	5.88	18.93	0.078
		64QAM	1/12	H	12.00	5.88	17.88	0.061

Note: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

7.6 UNDESIRABLE EMISSIONS (Radiated)

7.6.1 LTE Band 12, 17

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	704	1/49	QPSK	1416.86	V	-54.60	2.86	-51.74	73.25	34.51
				2125.22	V	-52.43	3.12	-49.31	70.82	
			16QAM	1416.93	V	-54.25	2.86	-51.39	72.16	33.77
				2125.29	V	-52.25	3.12	-49.13	69.90	
			64QAM	1416.80	V	-54.75	2.86	-51.89	71.44	32.55
				2125.11	V	-52.52	3.12	-49.40	68.95	
	711	1/49	QPSK	1430.84	V	-57.05	3.00	-54.05	75.48	34.43
				2145.68	V	-53.58	3.20	-50.38	71.81	
			16QAM	1431.34	V	-56.71	3.01	-53.70	74.40	33.70
				2146.19	V	-53.50	3.20	-50.30	71.00	
			64QAM	1430.51	V	-57.41	3.00	-54.41	73.93	32.52
				2146.28	V	-53.63	3.20	-50.43	69.95	
5	701.5	1/12	QPSK	1402.56	V	-56.74	2.72	-54.02	75.13	34.11
				2105.48	V	-53.00	3.03	-49.97	71.08	
			16QAM	1402.81	V	-56.36	2.72	-53.64	73.91	33.27
				2104.16	V	-52.68	3.03	-49.65	69.92	
			64QAM	1403.15	V	-57.52	2.72	-54.80	74.11	32.31
				2104.26	V	-53.09	3.03	-50.06	69.37	
	707.5	1/12	QPSK	1414.97	V	-58.60	2.84	-55.76	77.51	34.75
				2122.87	V	-52.76	3.11	-49.65	71.40	
			16QAM	1414.83	V	-58.42	2.84	-55.58	76.46	33.88
				2122.64	V	-52.65	3.11	-49.54	70.42	
			64QAM	1415.07	V	-58.26	2.84	-55.42	75.23	32.81
				2122.75	V	-52.78	3.11	-49.67	69.48	
	713.5	1/12	QPSK	1427.08	V	-54.60	2.97	-51.63	72.67	34.04
				2140.10	V	-52.82	3.18	-49.64	70.68	
			16QAM	1427.16	V	-54.37	2.97	-51.40	71.59	33.19
				2140.11	V	-52.61	3.18	-49.43	69.62	
			64QAM	1427.33	V	-55.23	2.97	-52.26	71.33	32.07
				2140.34	V	-52.92	3.18	-49.74	68.81	

Note 1: Limit Calculation = 43 + 10log$_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.6.2 LTE Band 12

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
3	700.5	1/7	QPSK	1401.12	V	-56.62	2.70	-53.92	74.46	33.54
				2101.40	V	-53.42	3.02	-50.40	70.94	
			16QAM	1401.26	V	-56.30	2.70	-53.60	73.40	32.80
				2102.16	V	-52.96	3.02	-49.94	69.74	
			64QAM	1401.08	V	-56.38	2.70	-53.68	72.61	31.93
				2102.03	V	-53.57	3.02	-50.55	69.48	
	707.5	1/7	QPSK	1414.95	V	-57.12	2.84	-54.28	76.09	34.81
				2123.30	V	-52.87	3.11	-49.76	71.57	
			16QAM	1415.11	V	-56.74	2.84	-53.90	74.75	33.85
				2123.32	V	-53.16	3.11	-50.05	70.90	
			64QAM	1415.05	V	-57.22	2.84	-54.38	74.08	32.70
				2123.27	V	-53.44	3.11	-50.33	70.03	
	714.5	1/7	QPSK	1429.04	V	-55.00	2.99	-52.01	72.93	33.92
				2143.62	V	-53.13	3.19	-49.94	70.86	
			16QAM	1429.33	V	-54.77	2.99	-51.78	71.82	33.04
				2144.86	V	-53.01	3.20	-49.81	69.85	
			64QAM	1429.24	V	-55.12	2.99	-52.13	71.34	32.21
				2143.50	V	-53.27	3.19	-50.08	69.29	
1.4	699.7	1/2	QPSK	1399.08	V	-57.00	2.69	-54.31	75.31	34.00
				2098.49	V	-53.82	3.00	-50.82	71.82	
			16QAM	1399.11	V	-56.66	2.69	-53.97	74.13	33.16
				2098.52	V	-52.81	3.00	-49.81	69.97	
			64QAM	1399.20	V	-57.16	2.69	-54.47	73.51	32.04
				2098.67	V	-53.73	3.00	-50.73	69.77	
	707.5	1/2	QPSK	1414.86	V	-57.36	2.84	-54.52	75.99	34.47
				2122.51	V	-52.87	3.10	-49.77	71.24	
			16QAM	1415.16	V	-57.12	2.84	-54.28	74.91	33.63
				2122.35	V	-57.12	2.84	-54.28	74.91	
			64QAM	1414.50	V	-57.49	2.84	-54.65	74.44	32.79
				2122.49	V	-52.94	3.10	-49.84	69.63	
	715.3	1/2	QPSK	1430.06	V	-55.61	3.00	-52.61	73.31	33.70
				2144.96	V	-53.54	3.20	-50.34	71.04	
			16QAM	1430.35	V	-55.41	3.00	-52.41	72.38	32.97
				2145.23	V	-53.17	3.20	-49.97	69.94	
			64QAM	1429.91	V	-57.03	3.00	-54.03	72.85	31.82
				2145.18	V	-53.35	3.20	-50.15	68.97	

Note 1: Limit Calculation = 43 + $10\log_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.6.3 LTE Band 5

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	829	1/25	QPSK	1658.68	H	-56.94	3.85	-53.09	75.76	35.67
			16QAM	1658.34	H	-57.45	3.85	-53.60	75.43	34.83
			64QAM	1657.24	H	-57.75	3.84	-53.91	74.58	33.67
	836.5	1/25	QPSK	1673.02	H	-57.90	3.89	-54.01	76.11	35.10
			16QAM	1671.39	H	-57.26	3.89	-53.37	74.67	34.30
			64QAM	1674.94	H	-58.27	3.90	-54.37	74.59	33.22
	844	1/25	QPSK	1688.07	H	-57.74	3.94	-53.80	75.78	34.98
			16QAM	1685.89	H	-57.94	3.93	-54.01	75.40	34.39
			64QAM	1687.58	H	-58.23	3.94	-54.29	74.70	33.41
5	826.5	1/12	QPSK	1654.81	H	-57.07	3.84	-53.23	76.28	36.05
			16QAM	1654.78	H	-56.92	3.84	-53.08	75.26	35.18
			64QAM	1652.11	H	-57.29	3.83	-53.46	74.45	33.99
	836.5	1/12	QPSK	1672.89	H	-57.19	3.89	-53.30	75.92	35.62
			16QAM	1671.64	H	-57.67	3.89	-53.78	75.70	34.92
			64QAM	1672.50	H	-57.96	3.89	-54.07	74.87	33.80
	846.5	1/12	QPSK	1691.45	H	-58.02	3.95	-54.07	76.58	35.51
			16QAM	1692.61	H	-57.45	3.96	-53.49	75.22	34.73
			64QAM	1692.88	H	-57.50	3.96	-53.54	74.09	33.55
3	825.5	1/7	QPSK	1651.75	H	-56.85	3.83	-53.02	76.36	36.34
			16QAM	1650.13	H	-57.76	3.82	-53.94	76.62	35.68
			64QAM	1650.40	H	-58.01	3.82	-54.19	75.74	34.55
	836.5	1/7	QPSK	1674.21	H	-57.62	3.90	-53.72	76.38	35.66
			16QAM	1672.54	H	-57.66	3.89	-53.77	75.59	34.82
			64QAM	1672.78	H	-58.05	3.89	-54.16	74.87	33.71
	847.5	1/7	QPSK	1695.06	H	-57.72	3.96	-53.76	76.00	35.24
			16QAM	1694.49	H	-57.44	3.96	-53.48	74.90	34.42
			64QAM	1697.35	H	-57.92	3.97	-53.95	74.23	33.28
1.4	824.7	1/2	QPSK	1649.51	H	-57.88	3.82	-54.06	77.63	36.57
			16QAM	1649.53	H	-58.02	3.82	-54.20	76.74	35.54
			64QAM	1647.35	H	-57.39	3.82	-53.57	75.16	34.59
	836.5	1/2	QPSK	1671.53	H	-57.48	3.89	-53.59	76.20	35.61
			16QAM	1674.00	H	-57.03	3.90	-53.13	75.08	34.95
			64QAM	1674.65	H	-57.18	3.90	-53.28	74.22	33.94
	848.3	1/2	QPSK	1697.91	H	-57.48	3.97	-53.51	75.75	35.24
			16QAM	1697.26	H	-57.72	3.97	-53.75	75.25	34.50
			64QAM	1697.26	H	-57.54	3.97	-53.57	74.03	33.46

Note 1: Limit Calculation = 43 + 10log$_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.6.4 LTE Band 66, 4

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1720	1/50	QPSK	5160.36	V	-43.01	10.28	-32.73	55.62	35.89
			16QAM	5160.58	V	-42.55	10.28	-32.27	54.55	35.28
			64QAM	5160.43	V	-43.40	10.28	-33.12	54.37	34.25
	1745	1/50	QPSK	5235.42	V	-42.50	10.33	-32.17	55.98	36.81
			16QAM	5235.18	V	-40.73	10.33	-30.40	53.42	36.02
			64QAM	5235.17	V	-42.31	10.33	-31.98	53.87	34.89
	1770	1/50	QPSK	5310.12	V	-45.10	10.31	-34.79	58.47	36.68
			16QAM	5310.53	V	-44.31	10.31	-34.00	57.04	36.04
			64QAM	5310.12	V	-45.31	10.31	-35.00	56.98	34.98
15	1717.5	1/36	QPSK	5152.06	V	-43.04	10.26	-32.78	56.41	36.63
			16QAM	5151.97	V	-41.64	10.26	-31.38	54.39	36.01
			64QAM	5151.75	V	-43.14	10.26	-32.88	54.95	35.07
	1745	1/36	QPSK	5234.60	V	-43.55	10.33	-33.22	57.14	36.92
			16QAM	5234.62	V	-42.69	10.33	-32.36	55.71	36.35
			64QAM	5234.43	V	-43.27	10.33	-32.94	55.27	35.33
	1772.5	1/36	QPSK	5317.14	V	-44.50	10.30	-34.20	57.52	36.32
			16QAM	5316.74	V	-43.65	10.30	-33.35	55.85	36.50
			64QAM	5316.97	V	-44.59	10.30	-34.29	55.84	34.55
10	1715	1/25	QPSK	5145.27	V	-42.80	10.26	-32.54	56.65	37.11
			16QAM	5145.12	V	-41.82	10.26	-31.56	54.99	36.43
			64QAM	5145.19	V	-43.14	10.26	-32.88	55.22	35.34
	1745	1/25	QPSK	5235.42	V	-43.50	10.33	-33.17	57.34	37.17
			16QAM	5235.28	V	-41.84	10.33	-31.51	54.70	36.19
			64QAM	5235.47	V	-44.00	10.33	-33.67	55.93	35.26
	1775	1/25	QPSK	5325.24	V	-44.07	10.30	-33.77	57.14	36.37
			16QAM	5325.32	V	-42.94	10.30	-32.64	55.11	35.47
			64QAM	5325.39	V	-44.92	10.30	-34.62	56.04	34.42
5	1712.5	1/12	QPSK	5137.56	V	-42.81	10.26	-32.55	56.17	36.62
			16QAM	5137.57	V	-41.27	10.26	-31.01	54.05	36.04
			64QAM	5137.56	V	-42.40	10.26	-32.14	54.12	34.98
	1745	1/12	QPSK	5234.97	V	-43.76	10.33	-33.43	57.54	37.11
			16QAM	5235.12	V	-42.73	10.33	-32.40	55.65	36.25
			64QAM	5234.98	V	-43.78	10.33	-33.45	55.63	35.18
	1777.5	1/12	QPSK	5332.45	V	-44.53	10.30	-34.23	57.38	36.15
			16QAM	5332.45	V	-42.71	10.30	-32.41	54.83	35.42
			64QAM	5332.74	V	-44.00	10.30	-33.70	55.23	34.53

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
3	1711.5	1/7	QPSK	5134.38	V	-42.93	10.26	-32.67	55.52	35.85
			16QAM	5134.62	V	-41.21	10.26	-30.95	53.12	35.17
			64QAM	5134.47	V	-42.91	10.26	-32.65	53.74	34.09
	1745	1/7	QPSK	5235.18	V	-42.96	10.33	-32.63	57.05	37.42
			16QAM	5235.18	V	-42.93	10.33	-32.60	56.23	36.63
			64QAM	5235.11	V	-43.47	10.33	-33.14	55.69	35.55
	1778.5	1/7	QPSK	5335.62	V	-44.31	10.30	-34.01	56.94	35.93
			16QAM	5335.70	V	-43.86	10.30	-33.56	55.59	35.03
			64QAM	5335.67	V	-44.55	10.30	-34.25	55.29	34.04
1.4	1710.7	1/2	QPSK	5132.04	V	-41.78	10.26	-31.52	54.88	36.36
			16QAM	5131.74	V	-41.89	10.26	-31.63	54.46	35.83
			64QAM	5131.75	V	-42.57	10.26	-32.31	54.21	34.90
	1745	1/2	QPSK	5234.82	V	-43.97	10.33	-33.64	57.93	37.29
			16QAM	5234.58	V	-42.62	10.33	-32.29	55.88	36.59
			64QAM	5234.72	V	-43.29	10.33	-32.96	55.61	35.65
	1779.3	1/2	QPSK	5337.47	V	-45.71	10.30	-35.41	58.29	35.88
			16QAM	5337.81	V	-44.64	10.29	-34.35	56.47	35.12
			64QAM	5337.57	V	-44.55	10.29	-34.26	55.27	34.01

Note 1: Limit Calculation = 43 + $10\log_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.6.5 LTE Band 2

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1860	1/0	QPSK	5553.39	H	-40.21	10.42	-29.79	53.59	36.80
			16QAM	5553.45	H	-39.95	10.42	-29.53	52.55	36.02
			64QAM	5553.52	H	-40.90	10.42	-30.48	52.62	35.14
	1880	1/0	QPSK	5613.32	H	-37.09	10.60	-26.49	52.11	38.62
			16QAM	5613.29	H	-36.74	10.60	-26.14	50.82	37.68
			64QAM	5613.21	H	-37.20	10.60	-26.60	50.00	36.40
	1900	1/0	QPSK	5673.14	H	-39.13	10.70	-28.43	52.87	37.44
			16QAM	5673.28	H	-38.56	10.70	-27.86	51.47	36.61
			64QAM	5673.21	H	-39.56	10.70	-28.86	51.49	35.63
15	1857.5	1/36	QPSK	5571.99	H	-37.65	10.48	-27.17	51.30	37.13
			16QAM	5572.33	H	-36.93	10.49	-26.44	49.55	36.11
			64QAM	5572.17	H	-37.79	10.49	-27.30	49.62	35.32
	1880	1/36	QPSK	5636.50	H	-39.29	10.64	-28.65	52.71	37.06
			16QAM	5636.38	H	-38.65	10.64	-28.01	51.57	36.56
			64QAM	5639.37	H	-40.00	10.64	-29.36	51.98	35.62
	1902.5	1/36	QPSK	5707.13	H	-39.78	10.74	-29.04	53.07	37.03
			16QAM	5706.94	H	-40.41	10.74	-29.67	53.15	36.48
			64QAM	5707.22	H	-39.90	10.74	-29.16	51.68	35.52
10	1855	1/0	QPSK	5551.69	H	-40.05	10.42	-29.63	53.74	37.11
			16QAM	5551.70	H	-39.47	10.42	-29.05	52.54	36.49
			64QAM	5551.57	H	-40.58	10.42	-30.16	52.73	35.57
	1880	1/0	QPSK	5626.68	H	-39.40	10.62	-28.78	53.20	37.42
			16QAM	5626.79	H	-38.60	10.62	-27.98	51.75	36.77
			64QAM	5626.69	H	-39.90	10.62	-29.28	51.85	35.57
	1905	1/0	QPSK	5701.92	H	-40.50	10.74	-29.76	54.17	37.41
			16QAM	5701.94	H	-39.23	10.74	-28.49	52.23	36.74
			64QAM	5701.67	H	-41.30	10.74	-30.56	53.39	35.83
5	1852.5	1/12	QPSK	5557.37	H	-40.16	10.44	-29.72	53.78	37.06
			16QAM	5557.29	H	-39.49	10.43	-29.06	52.24	36.18
			64QAM	5557.51	H	-41.03	10.44	-30.59	52.93	35.34
	1880	1/12	QPSK	5640.00	H	-39.55	10.64	-28.91	53.48	37.57
			16QAM	5640.18	H	-38.98	10.64	-28.34	51.83	36.49
			64QAM	5639.90	H	-40.58	10.64	-29.94	52.53	35.59
	1907.5	1/12	QPSK	5722.65	H	-41.19	10.73	-30.46	54.58	37.12
			16QAM	5722.47	H	-40.68	10.73	-29.95	53.38	36.43
			64QAM	5722.32	H	-42.06	10.73	-31.33	53.81	35.48

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
3	1851.5	1/7	QPSK	5554.43	H	-40.32	10.43	-29.89	53.48	36.59
			16QAM	5554.50	H	-39.69	10.43	-29.26	52.07	35.81
			64QAM	5554.63	H	-40.62	10.43	-30.19	52.21	35.02
	1880	1/7	QPSK	5640.21	H	-40.14	10.64	-29.50	53.43	36.93
			16QAM	5640.06	H	-39.61	10.64	-28.97	52.16	36.19
			64QAM	5640.15	H	-40.11	10.64	-29.47	51.67	35.20
	1908.5	1/7	QPSK	5725.60	H	-41.27	10.72	-30.55	54.35	36.80
			16QAM	5725.39	H	-40.82	10.72	-30.10	53.12	36.02
			64QAM	5725.54	H	-41.88	10.72	-31.16	53.33	35.17
1.4	1850.7	1/2	QPSK	5551.96	H	-40.08	10.42	-29.66	53.43	36.77
			16QAM	5551.84	H	-39.79	10.42	-29.37	52.34	35.97
			64QAM	5552.04	H	-40.80	10.42	-30.38	52.53	35.15
	1880	1/2	QPSK	5639.82	H	-40.21	10.64	-29.57	53.73	37.16
			16QAM	5639.61	H	-39.67	10.64	-29.03	52.41	36.38
			64QAM	5639.74	H	-41.42	10.64	-30.78	53.39	35.61
	1909.3	1/2	QPSK	5727.66	H	-41.05	10.72	-30.33	54.17	36.84
			16QAM	5727.84	H	-40.95	10.72	-30.23	53.35	36.12
			64QAM	5728.05	H	-41.86	10.72	-31.14	53.47	35.33

Note 1: Limit Calculation = $43 + 10\log_{10}(P[Watts])$

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.6.6 LTE Band 7

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	2510	1/50	QPSK	7530.17	H	-49.89	11.96	-37.93	56.96	44.03
				10040.32	H	-47.21	13.15	-34.06	53.09	
			16QAM	7529.94	H	-49.65	11.96	-37.69	55.96	43.27
				10040.71	H	-47.19	13.15	-34.04	52.31	
			64QAM	7530.12	H	-50.14	11.96	-38.18	55.50	42.32
				10040.93	H	-47.11	13.15	-33.96	51.28	
	2535	1/50	QPSK	7605.23	H	-49.48	12.15	-37.33	56.33	44.00
				10140.22	H	-46.44	13.06	-33.38	52.38	
			16QAM	7604.94	H	-49.47	12.14	-37.33	55.62	43.29
				10140.34	H	-45.67	13.06	-32.61	50.90	
			64QAM	7605.01	H	-49.47	12.15	-37.32	54.75	42.43
				10140.35	H	-45.99	13.06	-32.93	50.36	
	2560	1/50	QPSK	7679.87	H	-49.86	12.23	-37.63	57.28	44.65
				10240.16	H	-44.67	13.12	-31.55	51.20	
			16QAM	7679.88	H	-49.38	12.23	-37.15	55.87	43.72
				10240.16	H	-44.67	13.12	-31.55	50.27	
			64QAM	7680.29	H	-49.04	12.23	-36.81	54.60	42.79
				10240.64	H	-46.10	13.12	-32.98	50.77	
15	2507.5	1/74	QPSK	7516.07	H	-49.44	11.94	-37.50	55.32	42.82
				10056.46	H	-47.19	13.15	-34.04	51.86	
			16QAM	7516.98	H	-50.01	11.94	-38.07	55.20	42.13
				10056.24	H	-47.02	13.15	-33.87	51.00	
			64QAM	7515.67	H	-49.92	11.94	-37.98	53.75	40.77
				10056.30	H	-47.20	13.15	-34.05	49.82	
	2535	1/74	QPSK	7597.94	H	-48.20	12.13	-36.07	55.31	44.24
				10166.60	H	-46.21	13.06	-33.15	52.39	
			16QAM	7598.67	H	-48.97	12.14	-36.83	55.17	43.34
				10167.30	H	-46.94	13.06	-33.88	52.22	
			64QAM	7598.35	H	-49.77	12.13	-37.64	54.85	42.21
				10167.21	H	-46.66	13.06	-33.60	50.81	
	2562.5	1/74	QPSK	7680.74	H	-50.82	12.23	-38.59	58.25	44.66
				10276.46	H	-45.29	13.10	-32.19	51.85	
			16QAM	7680.74	H	-50.82	12.23	-38.59	57.31	43.72
				10276.44	H	-44.96	13.10	-31.86	50.58	
			64QAM	7680.61	H	-50.84	12.23	-38.61	56.41	42.80
				10276.97	H	-45.81	13.10	-32.71	50.51	

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	2505	1/25	QPSK	7514.98	H	-48.32	11.94	-36.38	55.23	43.85
				10021.21	H	-47.34	13.14	-34.20	53.05	
			16QAM	7514.96	H	-47.79	11.94	-35.85	53.72	42.87
				10021.01	H	-47.08	13.14	-33.94	51.81	
			64QAM	7514.97	H	-49.06	11.94	-37.12	54.02	41.90
				10020.91	H	-47.15	13.14	-34.01	50.91	
	2535	1/25	QPSK	7604.90	H	-46.64	12.14	-34.50	53.30	43.80
				10140.35	H	-46.29	13.06	-33.23	52.03	
			16QAM	7605.35	H	-47.25	12.15	-35.10	53.01	42.91
				10140.33	H	-46.00	13.06	-32.94	50.85	
			64QAM	7605.40	H	-48.77	12.15	-36.62	53.60	41.98
				10140.58	H	-46.60	13.06	-33.54	50.52	
	2565	1/25	QPSK	7695.06	H	-49.37	12.24	-37.13	57.02	44.89
				10260.34	H	-45.51	13.12	-32.39	52.28	
			16QAM	7695.23	H	-49.58	12.24	-37.34	56.51	44.17
				10260.60	H	-44.99	13.12	-31.87	51.04	
			64QAM	7695.15	H	-50.16	12.24	-37.92	55.94	43.02
				10260.28	H	-46.13	13.12	-33.01	51.03	
5	2502.5	1/12	QPSK	7507.38	H	-48.24	11.93	-36.31	54.80	43.49
				10010.63	H	-47.71	13.13	-34.58	53.07	
			16QAM	7507.76	H	-48.09	11.93	-36.16	53.84	42.68
				10010.49	H	-46.57	13.13	-33.44	51.12	
			64QAM	7507.45	H	-47.89	11.93	-35.96	52.55	41.59
				10010.31	H	-47.18	13.13	-34.05	50.64	
	2535	1/12	QPSK	7605.08	H	-47.94	12.15	-35.79	54.58	43.79
				10140.59	H	-46.64	13.06	-33.58	52.37	
			16QAM	7604.92	H	-46.31	12.14	-34.17	52.20	43.03
				10140.37	H	-45.46	13.06	-32.40	50.43	
			64QAM	7605.21	H	-48.14	12.15	-35.99	52.95	41.96
				10139.22	H	-45.56	13.06	-32.50	49.46	
	2567.5	1/12	QPSK	7702.73	H	-48.67	12.25	-36.42	56.15	44.73
				10269.99	H	-45.85	13.11	-32.74	52.47	
			16QAM	7702.77	H	-47.95	12.25	-35.70	54.63	43.93
				10269.77	H	-45.55	13.11	-32.44	51.37	
			64QAM	7702.43	H	-49.27	12.25	-37.02	54.90	42.88
				10270.03	H	-45.50	13.11	-32.39	50.27	

Note 1: Limit Calculation = 55 + 10log$_{10}$ (P[Watts])

Note 2: This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the table above.

Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed

7.7 FREQUENCY STABILITY

7.7.1 LTE Band 12, 17

OPERATING FREQUENCY : 707.5 MHz
REFERENCE VOLTAGE : 3.85 VDC
LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays wthin the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+20(Ref)	707,499,996	-4	-0.0057	-0.000000565
100%		-30	707,500,009	9	0.0127	0.000001272
100%		-20	707,499,997	-3	-0.0042	-0.000000424
100%		-10	707,500,002	2	0.0028	0.000000283
100%		0	707,499,993	-7	-0.0099	-0.000000989
100%		+10	707,500,011	11	0.0155	0.000001555
100%		+20	707,499,996	-4	-0.0057	-0.000000565
100%		+30	707,499,997	-3	-0.0042	-0.000000424
100%		+40	707,499,992	-8	-0.0113	-0.000001131
100%		+50	707,500,001	1	0.0014	0.000000141
115%	4.43	+20	707,500,005	5	0.0071	0.000000707
BATT.ENDPOINT	3.70	+20	707,500,006	6	0.0085	0.000000848

Note. Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

7.7.2 LTE Band 5

OPERATING FREQUENCY : 836.5 MHz
REFERENCE VOLTAGE : 3.85 VDC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+20(Ref)	836,499,989	-11	-0.0132	-0.000001315
100%		-30	836,500,003	3	0.0036	0.000000359
100%		-20	836,499,995	-5	-0.0060	-0.000000598
100%		-10	836,499,996	-4	-0.0048	-0.000000478
100%		0	836,500,009	9	0.0108	0.000001076
100%		+10	836,499,998	-2	-0.0024	-0.000000239
100%		+20	836,499,989	-11	-0.0132	-0.000001315
100%		+30	836,499,993	-7	-0.0084	-0.000000837
100%		+40	836,500,010	10	0.0120	0.000001195
100%		+50	836,499,994	-6	-0.0072	-0.000000717
115%	4.43	+20	836,500,003	3	0.0036	0.000000359
BATT.ENDPOINT	3.70	+20	836,500,007	7	0.0084	0.000000837

7.7.3 LTE Band 66, 4

OPERATING FREQUENCY : 1732.5 MHz
REFERENCE VOLTAGE 3.85 VDC
LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays wthin the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+20(Ref)	1,745,000,003	3	0.0017	0.000000172
100%		-30	1,744,999,991	-9	-0.0052	-0.000000516
100%		-20	1,745,000,013	13	0.0074	0.000000745
100%		-10	1,744,999,993	-7	-0.0040	-0.000000401
100%		0	1,745,000,004	4	0.0023	0.000000229
100%		+10	1,745,000,001	1	0.0006	0.000000057
100%		+20	1,745,000,003	3	0.0017	0.000000172
100%		+30	1,745,000,009	9	0.0052	0.000000516
100%		+40	1,745,000,008	8	0.0046	0.000000458
100%		+50	1,745,000,003	3	0.0017	0.000000172
115%	4.43	+20	1,744,999,996	-4	-0.0023	-0.000000229
BATT.ENDPOINT	3.70	+20	1,745,000,002	2	0.0011	0.000000115

Note. Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

7.7.4 LTE Band 2

OPERATING FREQUENCY : 1880 MHz
REFERENCE VOLTAGE 3.85 VDC
LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays wthin the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+20(Ref)	1,879,999,995	-5	-0.0027	-0.000000266
100%		-30	1,880,000,004	4	0.0021	0.000000213
100%		-20	1,880,000,007	7	0.0037	0.000000372
100%		-10	1,879,999,988	-12	-0.0064	-0.000000638
100%		0	1,879,999,996	-4	-0.0021	-0.000000213
100%		+10	1,880,000,002	2	0.0011	0.000000106
100%		+20	1,879,999,995	-5	-0.0027	-0.000000266
100%		+30	1,880,000,006	6	0.0032	0.000000319
100%		+40	1,879,999,993	-7	-0.0037	-0.000000372
100%		+50	1,880,000,002	2	0.0011	0.000000106
115%	4.43	+20	1,879,999,989	-11	-0.0059	-0.000000585
BATT.ENDPOINT	3.70	+20	1,880,000,007	7	0.0037	0.000000372

Note. Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

7.7.5 LTE Band 7

OPERATING FREQUENCY : 2535 MHz
REFERENCE VOLTAGE : 3.85 VDC
LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays wthin the authorized frequency block.

VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQUENCY (Hz)	FREQ.Dev (Hz)	Deviation	
					(ppm)	(%)
100%	3.85	+20(Ref)	2,535,000,003	3	0.0012	0.000000118
100%		-30	2,534,999,992	-8	-0.0032	-0.000000316
100%		-20	2,535,000,012	12	0.0047	0.000000473
100%		-10	2,534,999,995	-5	-0.0020	-0.000000197
100%		0	2,535,000,006	6	0.0024	0.000000237
100%		+10	2,535,000,002	2	0.0008	0.000000079
100%		+20	2,535,000,003	3	0.0012	0.000000118
100%		+30	2,535,000,009	9	0.0036	0.000000355
100%		+40	2,534,999,990	-10	-0.0039	-0.000000394
100%		+50	2,535,000,007	7	0.0028	0.000000276
115%	4.43	+20	2,535,000,005	5	0.0020	0.000000197
BATT.ENDPOINT	3.70	+20	2,535,000,001	1	0.0004	0.000000039

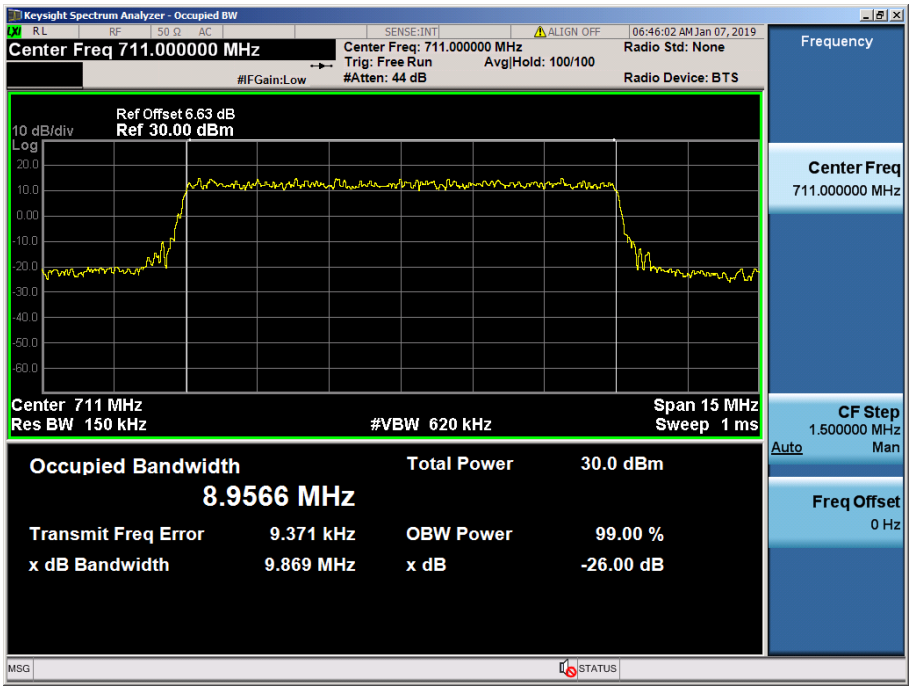
Note. Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

8. TEST PLOTS

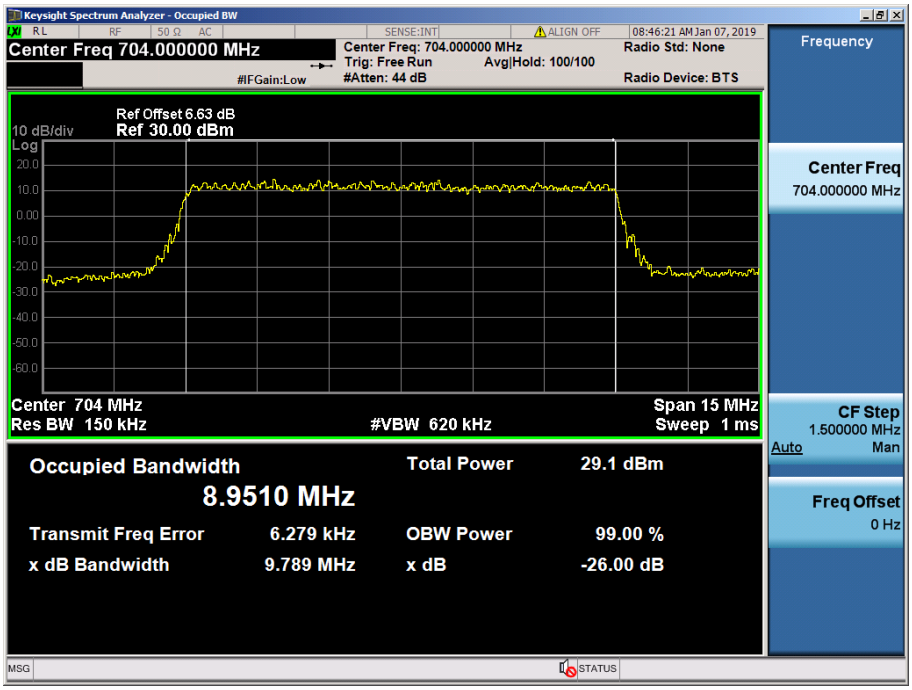
Note: All bandwidths, RB configurations, and modulations were investigated.
The worst case test results are reported.

8.1 OCCUPIED BANDWIDTH

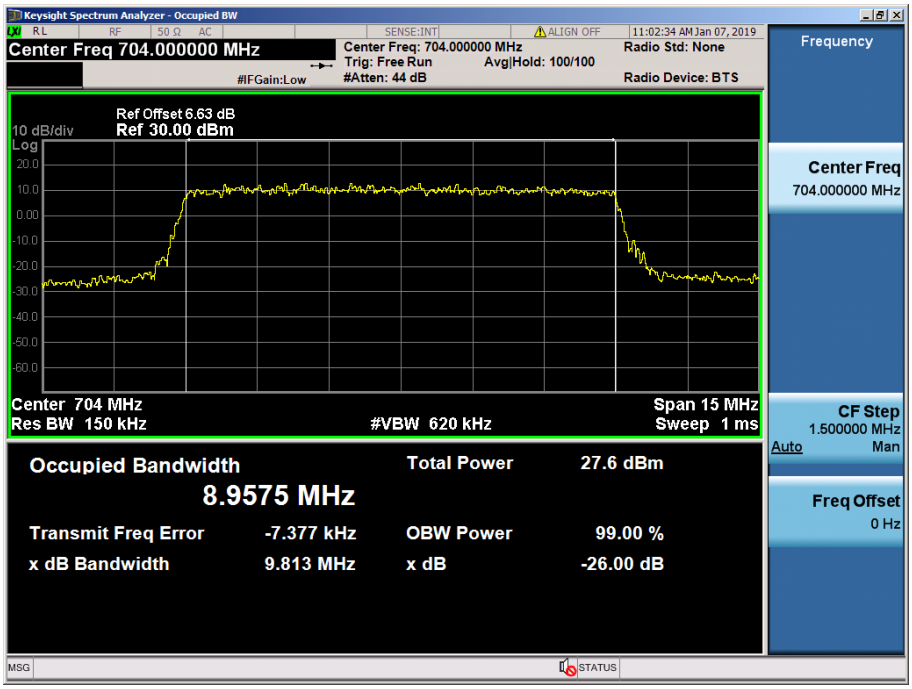
8.1.1 LTE Band 12, 17



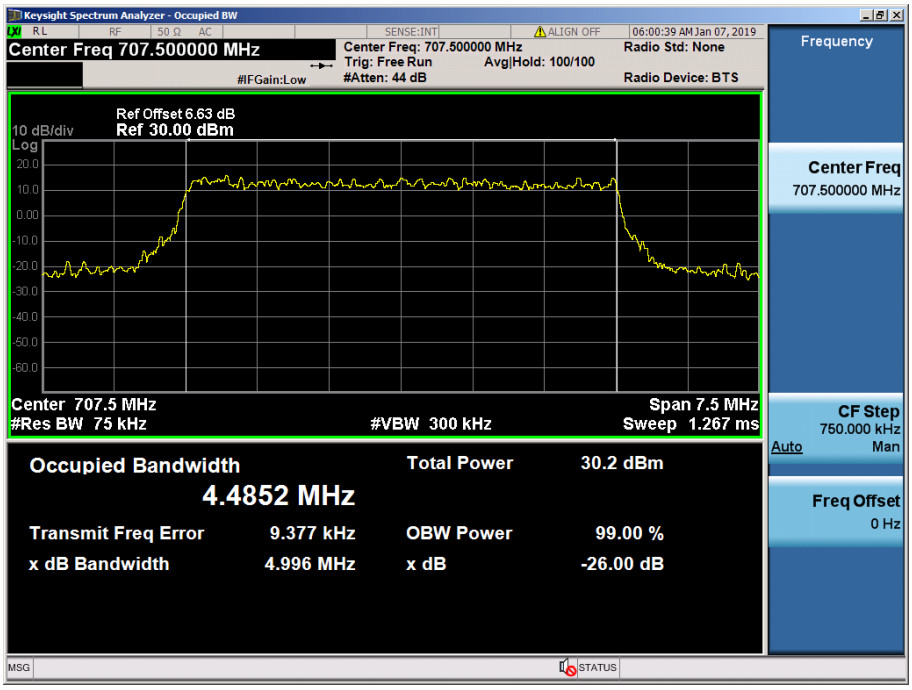
LTE Band 12, 17 / 10 MHz / QPSK - RB Size 50



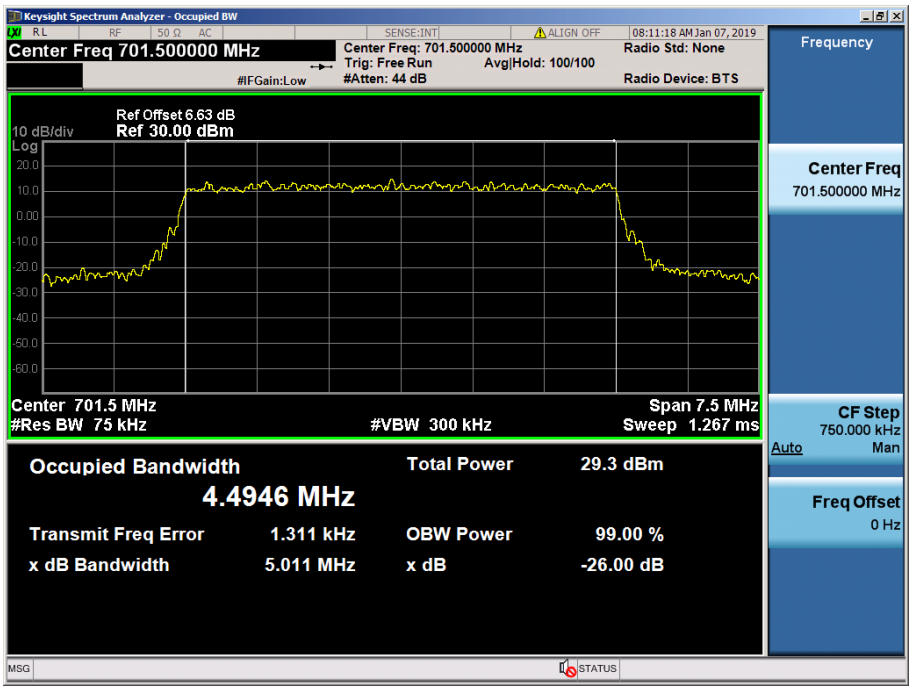
LTE Band 12, 17 / 10 MHz / 16QAM - RB Size 50



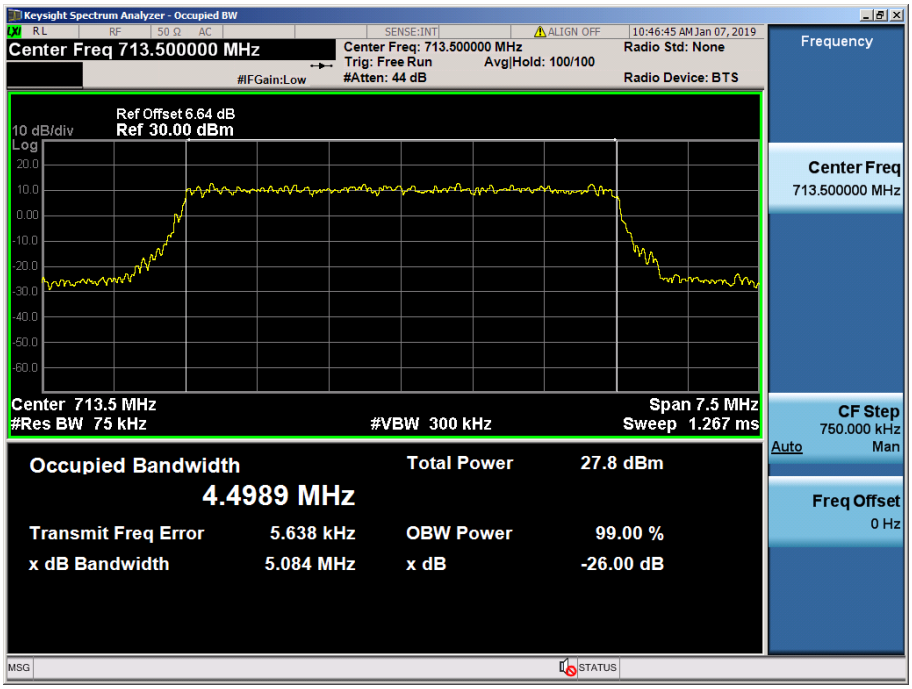
LTE Band 12, 17 / 10 MHz / 64QAM- RB Size 50



LTE Band 12, 17 / 5 MHz / QPSK - RB Size 25

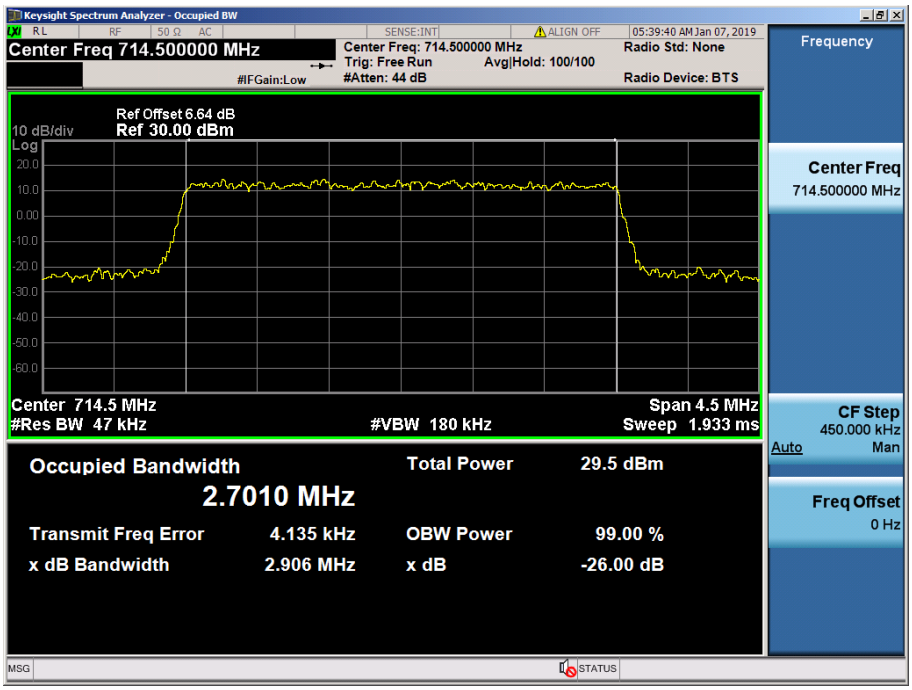


LTE Band 12, 17 / 5 MHz / 16QAM - RB Size 25

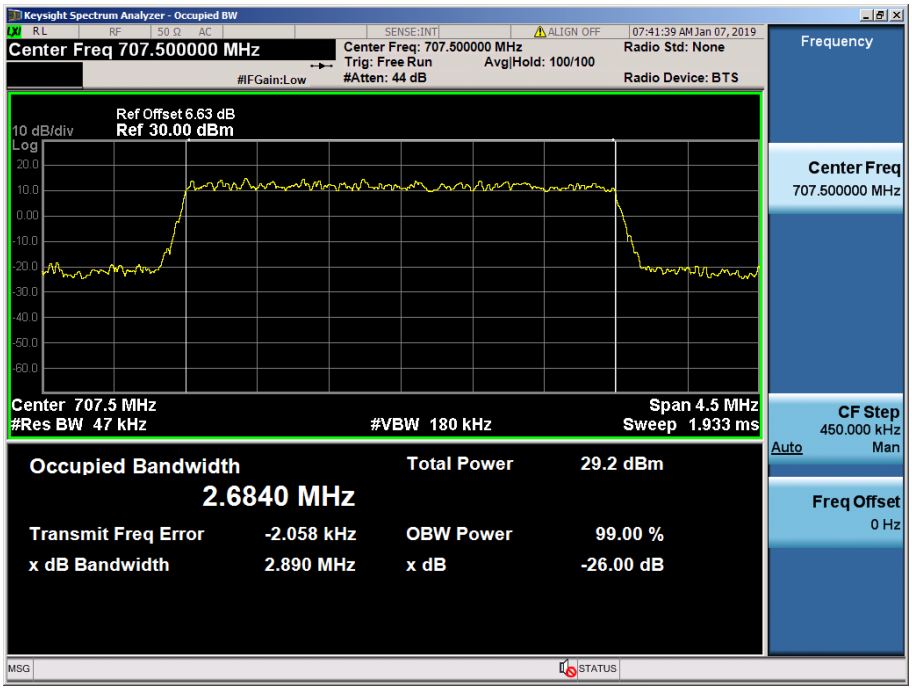


LTE Band 12, 17 / 5 MHz / 64QAM - RB Size 25

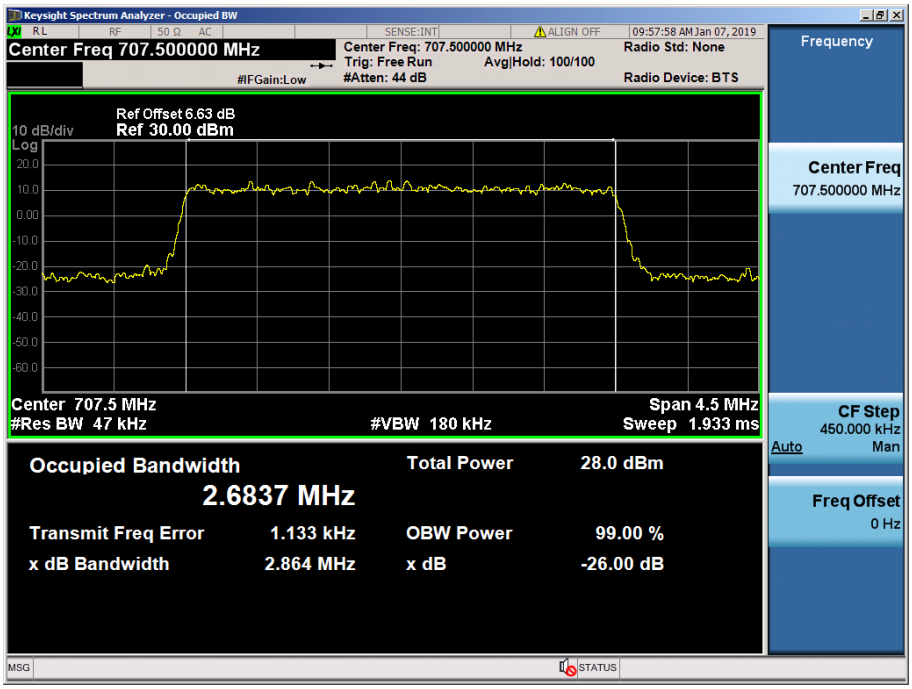
8.1.2 LTE Band 12



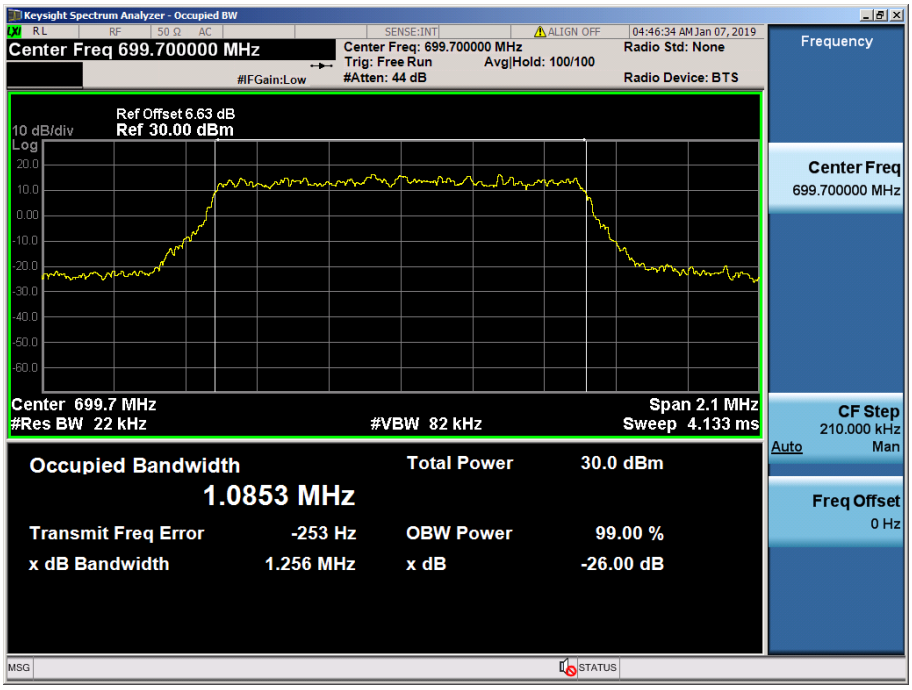
LTE Band 12 / 3 MHz / QPSK - RB Size 15



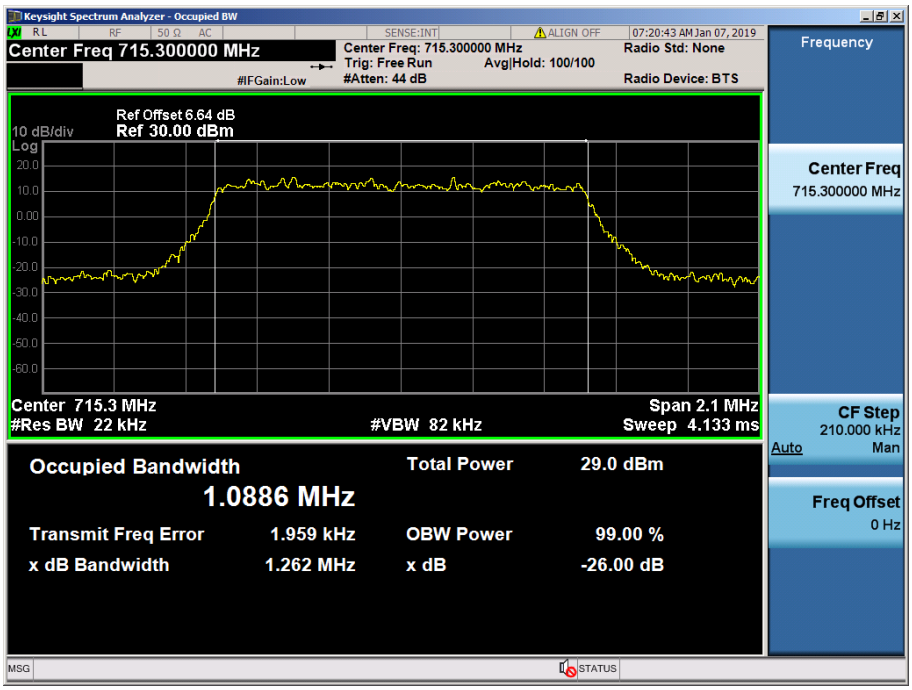
LTE Band 12 / 3 MHz / 16QAM - RB Size 15



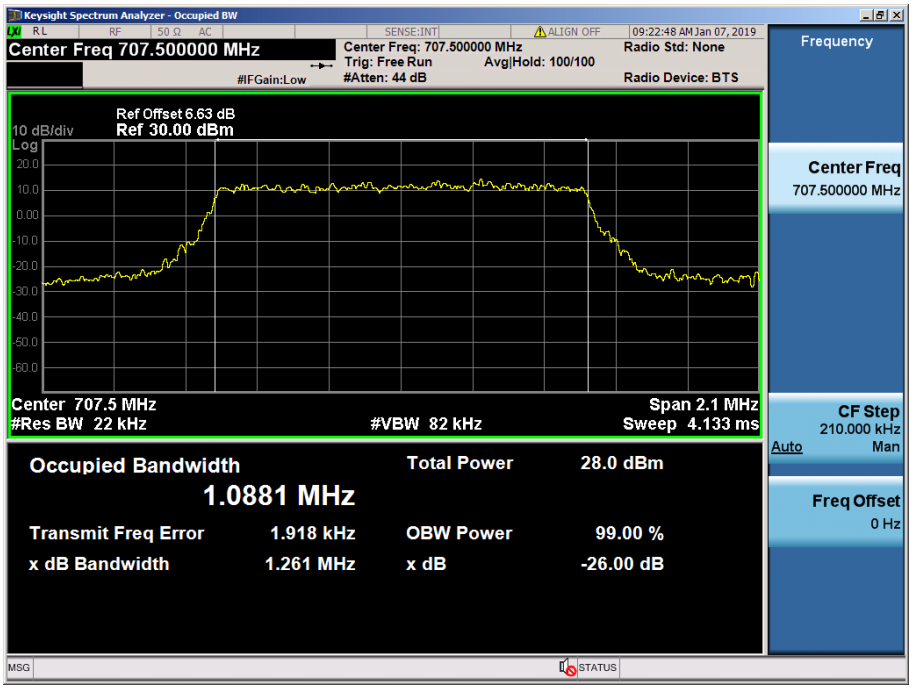
LTE Band 12 / 3 MHz / 64QAM - RB Size 15



LTE Band 12 / 1.4 MHz / QPSK - RB Size 6

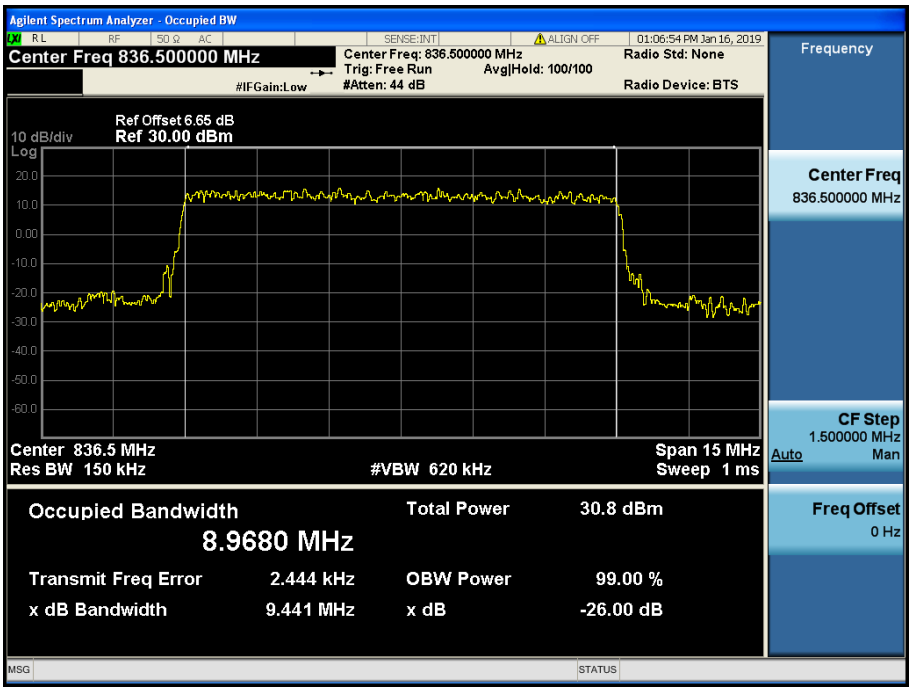


LTE Band 12 / 1.4 MHz / 16QAM - RB Size 6

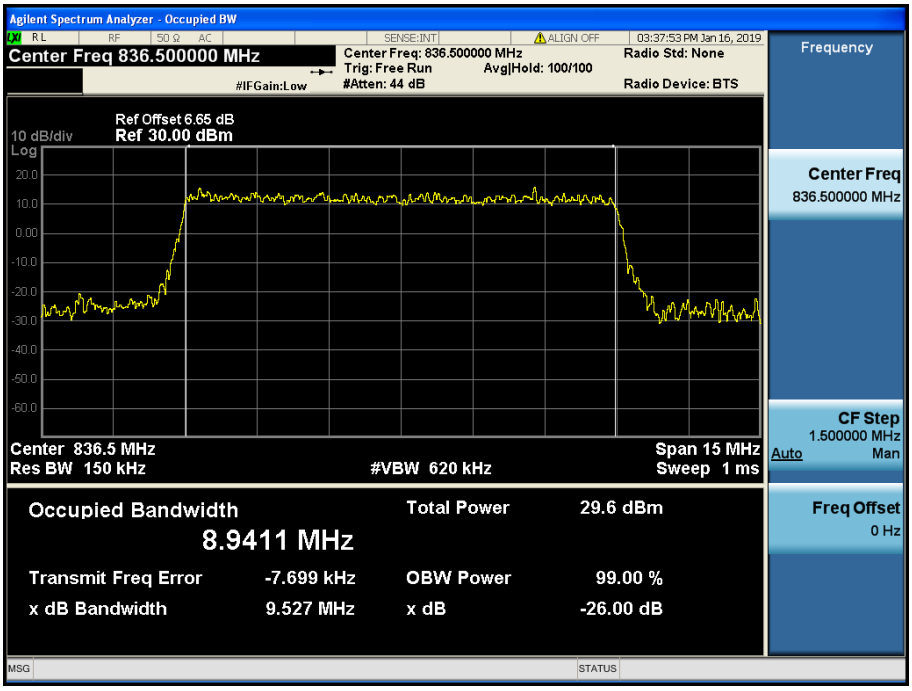


LTE Band 12 / 1.4 MHz / 64QAM - RB Size 6

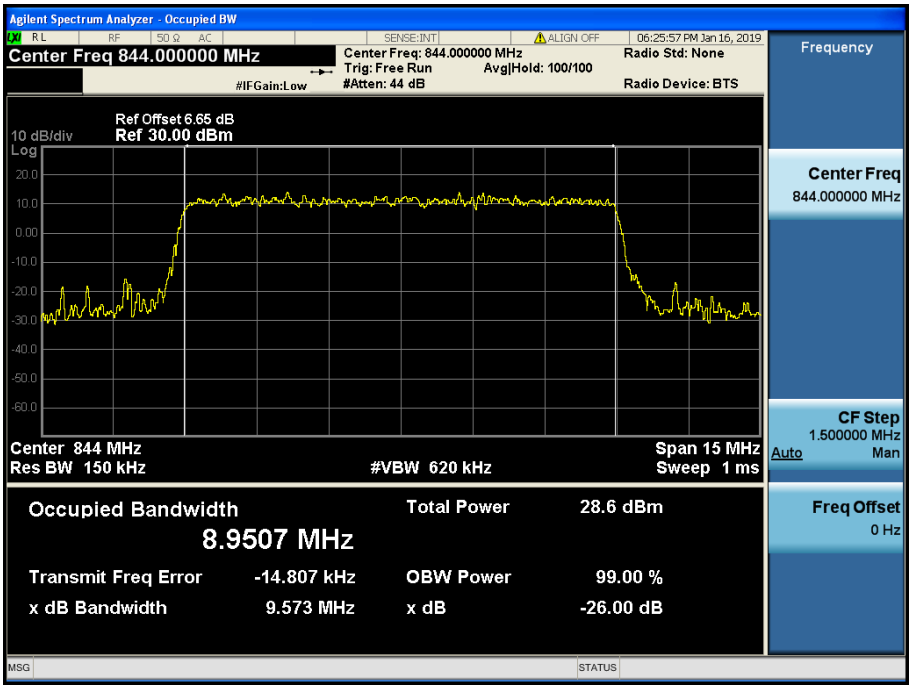
8.1.3 LTE Band 5



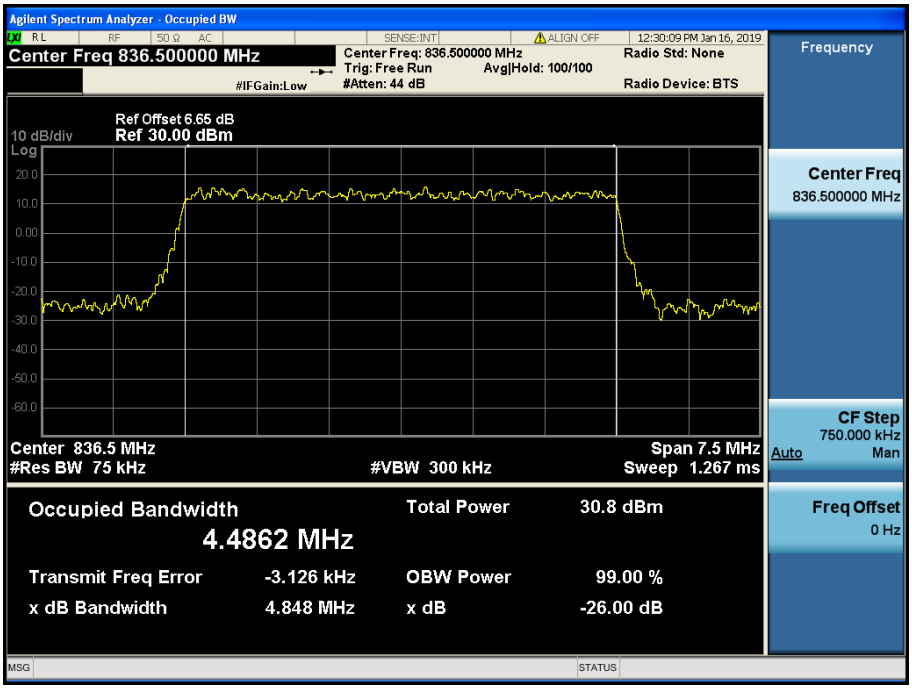
LTE Band 5 / 10 MHz / QPSK - RB Size 50



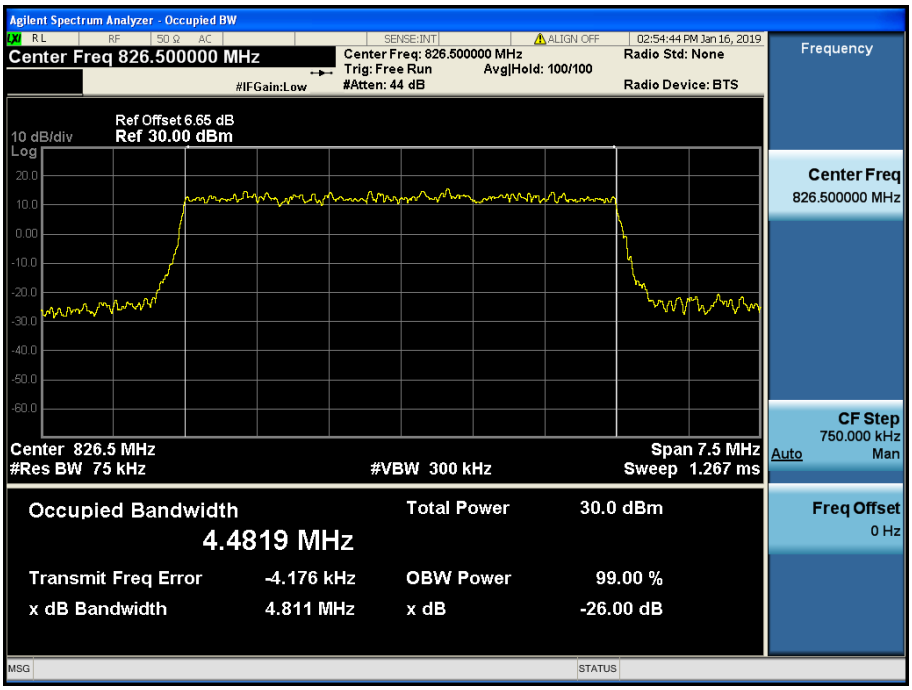
LTE Band 5 / 10 MHz / 16QAM - RB Size 50



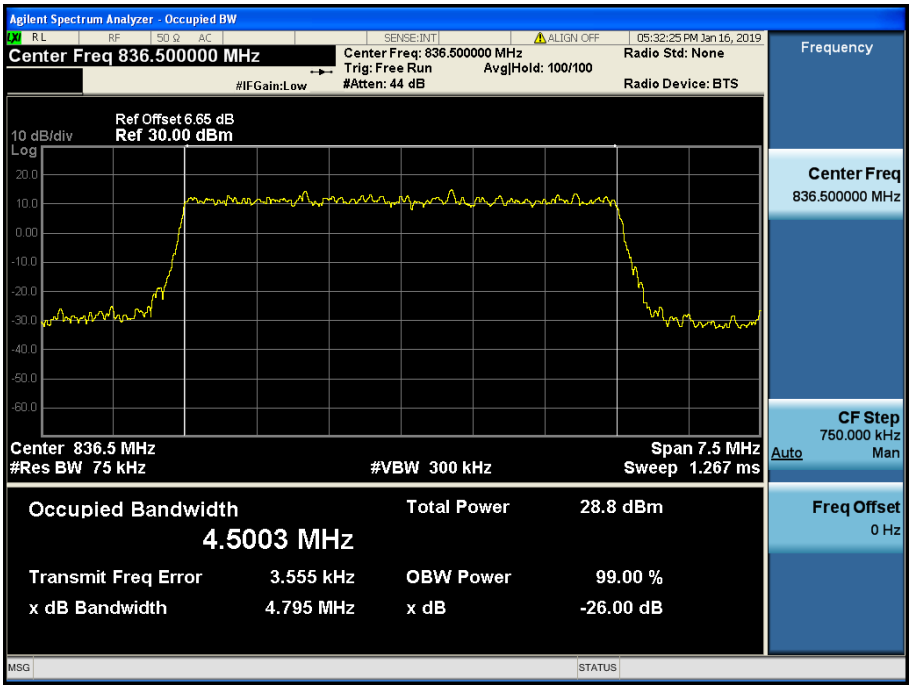
LTE Band 5 / 10 MHz / 64QAM - RB Size 50



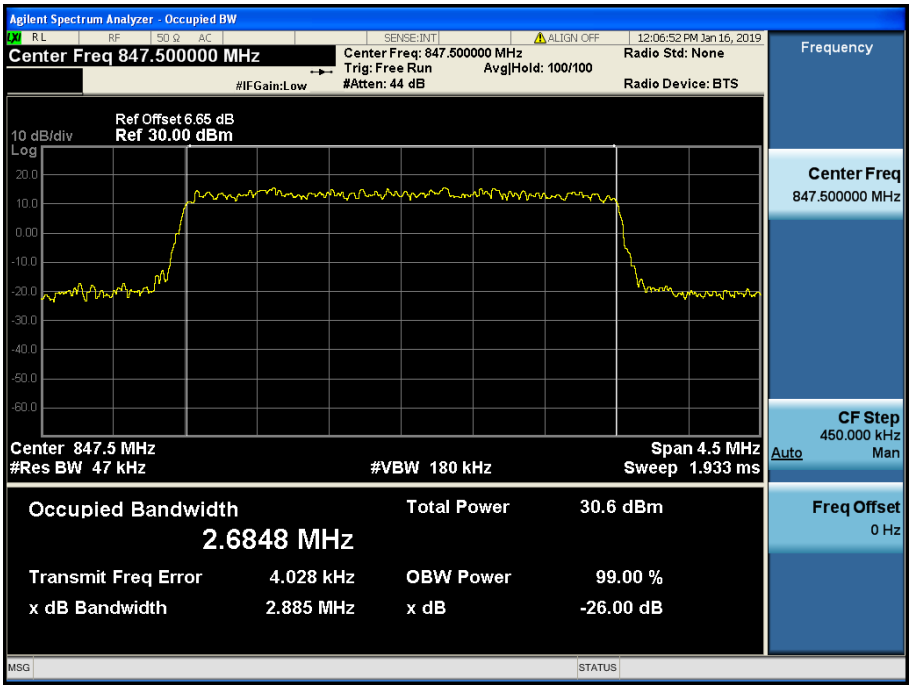
LTE Band 5 / 5 MHz / QPSK - RB Size 25



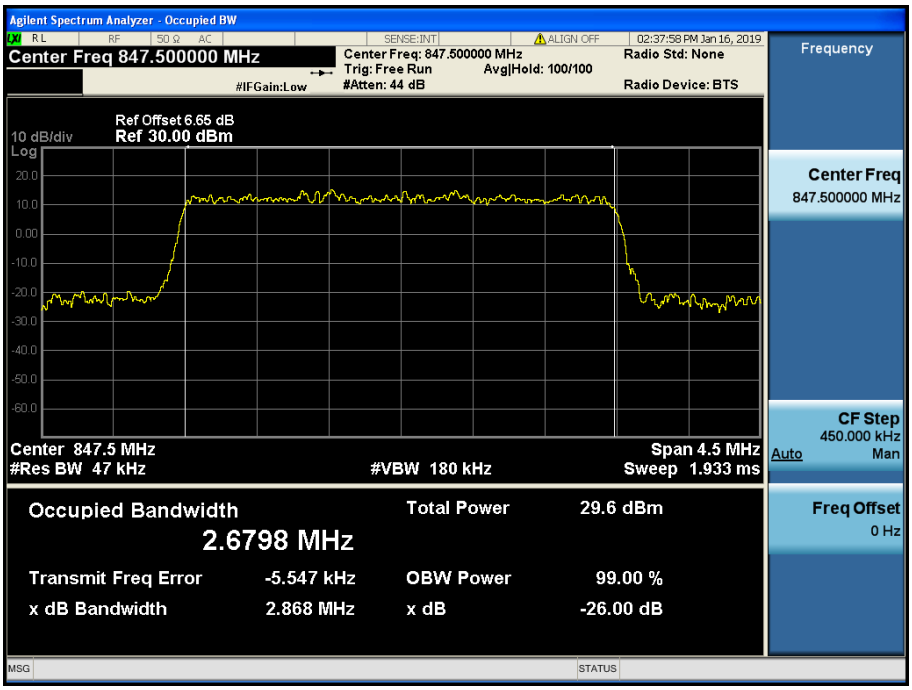
LTE Band 5 / 5 MHz / 16QAM - RB Size 25



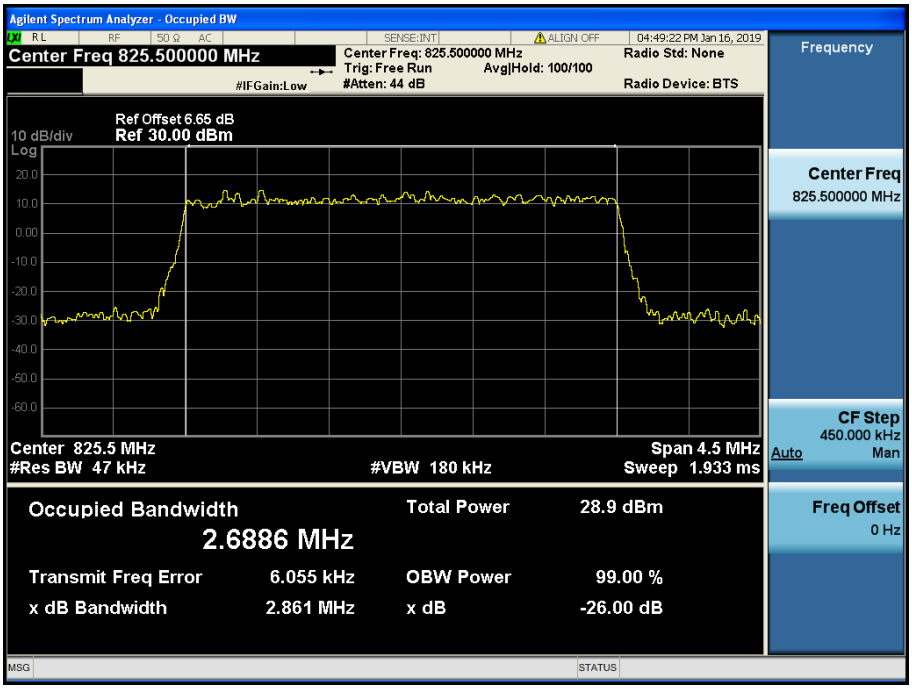
LTE Band 5 / 5 MHz / 64QAM - RB Size 25



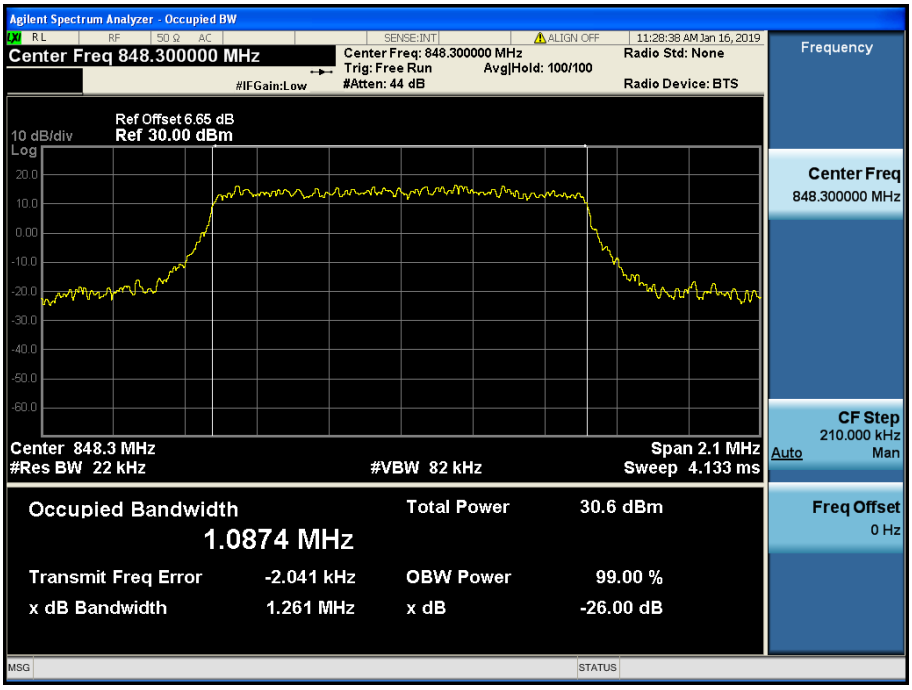
LTE Band 5 / 3 MHz / QPSK - RB Size 15



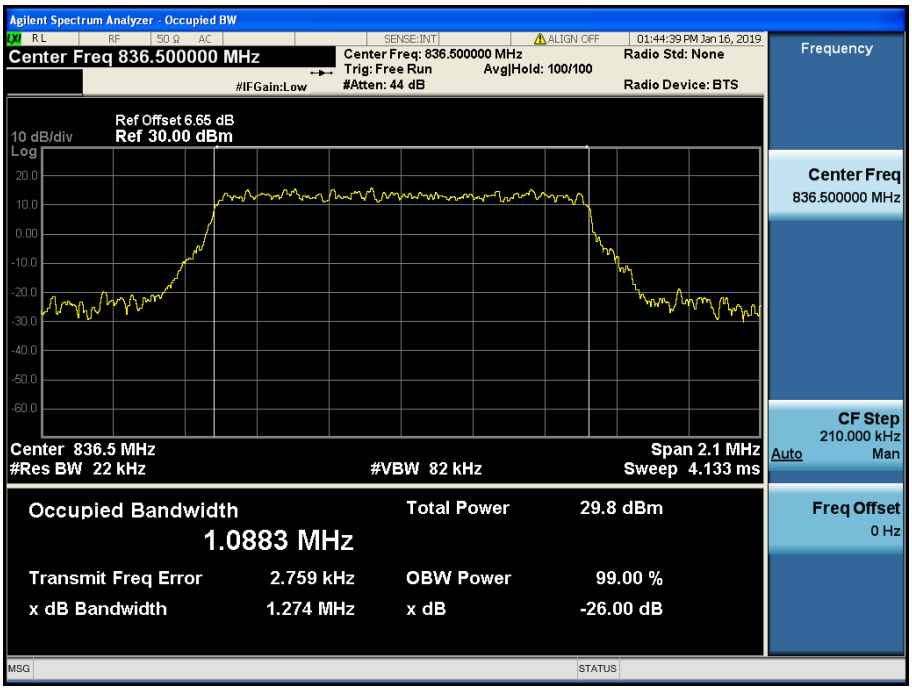
LTE Band 5 / 3 MHz / 16QAM - RB Size 15



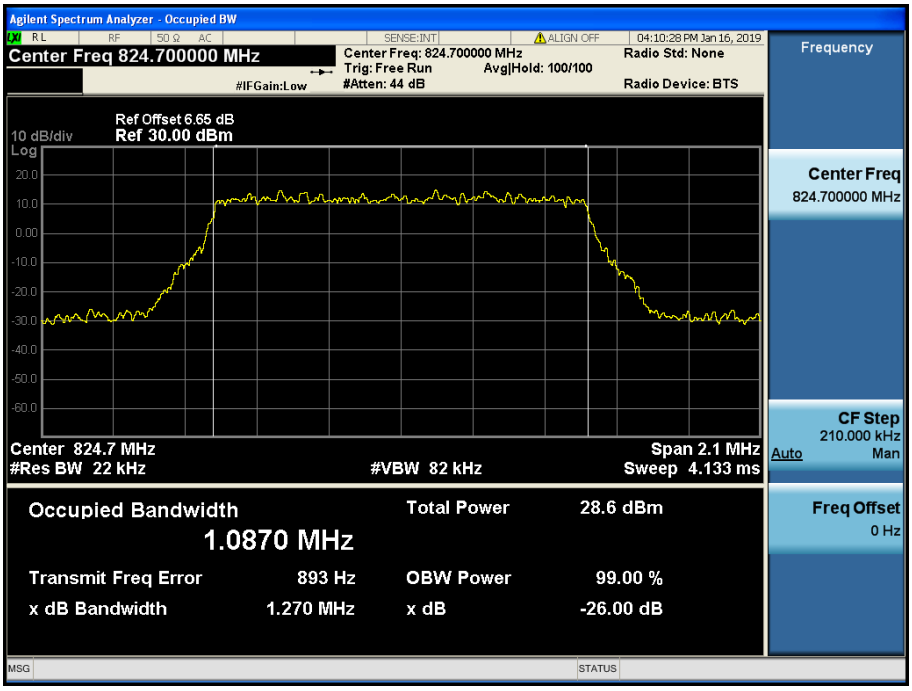
LTE Band 5 / 3 MHz / 64QAM - RB Size 15



LTE Band 5 / 1.4 MHz / QPSK - RB Size 6

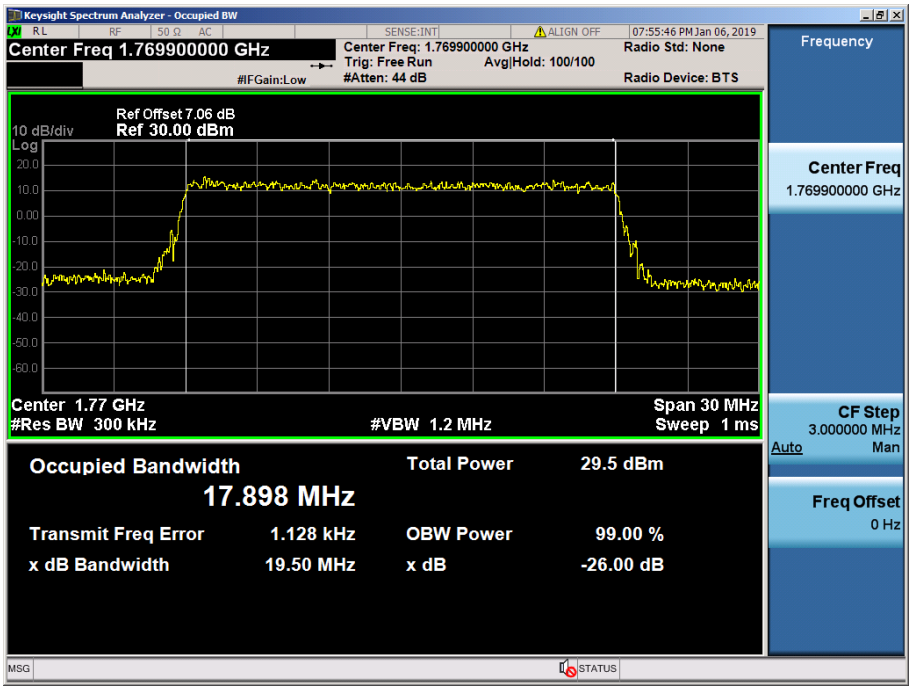


LTE Band 5 / 1.4 MHz / 16QAM - RB Size 6

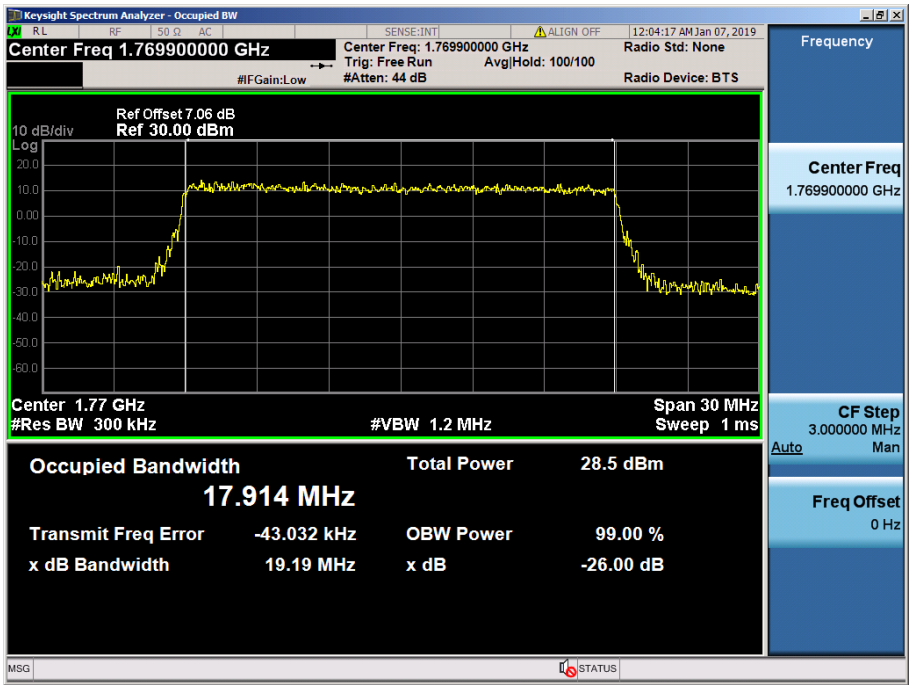


LTE Band 5 / 1.4 MHz / 64QAM - RB Size 6

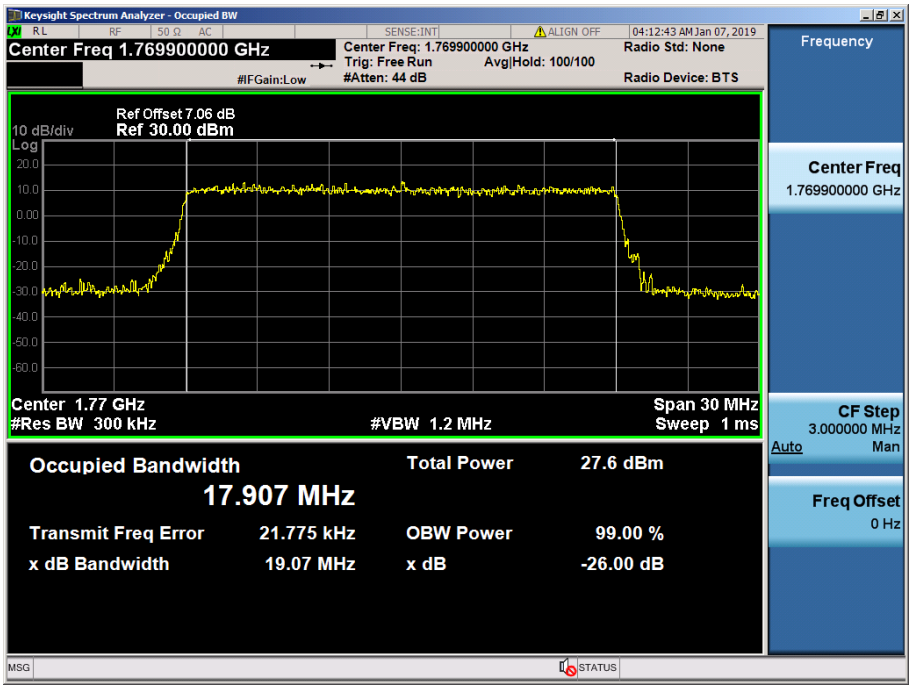
8.1.4 LTE Band 66, 4



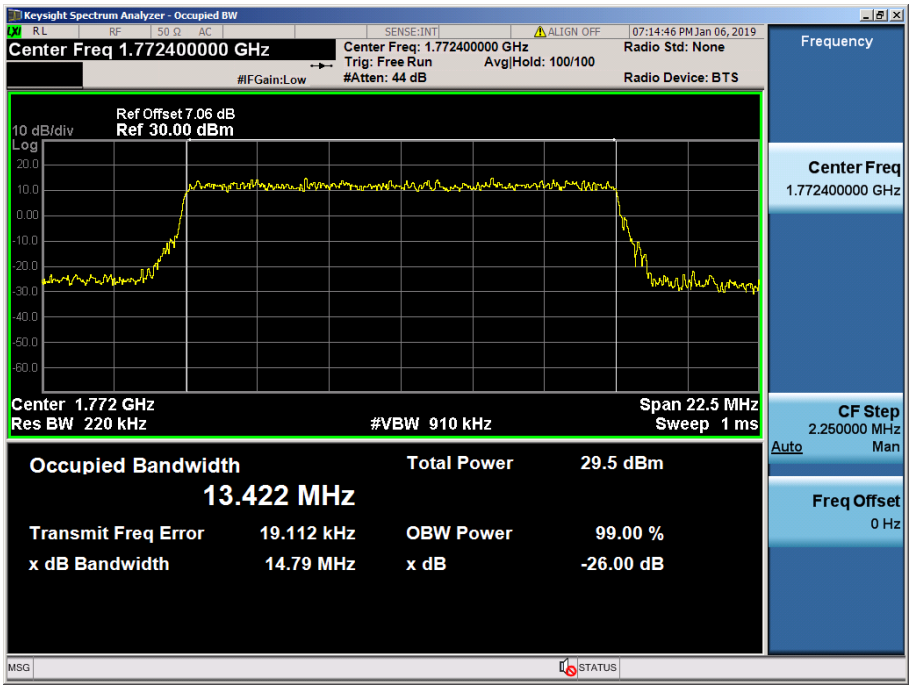
LTE Band 66, 4 / 20 MHz / QPSK - RB Size 100



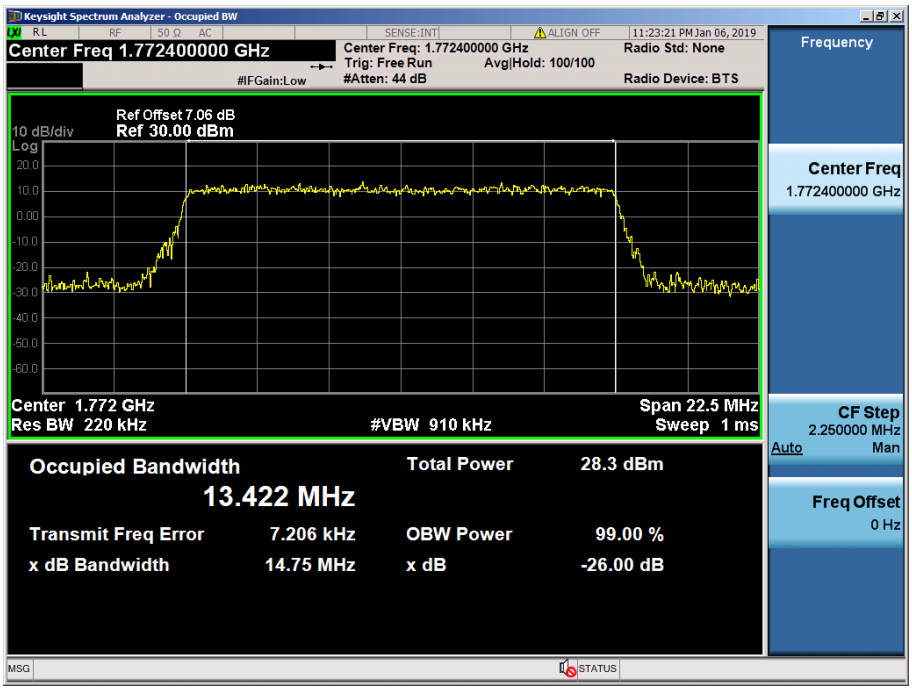
LTE Band 66, 4 / 20 MHz / 16QAM - RB Size 100



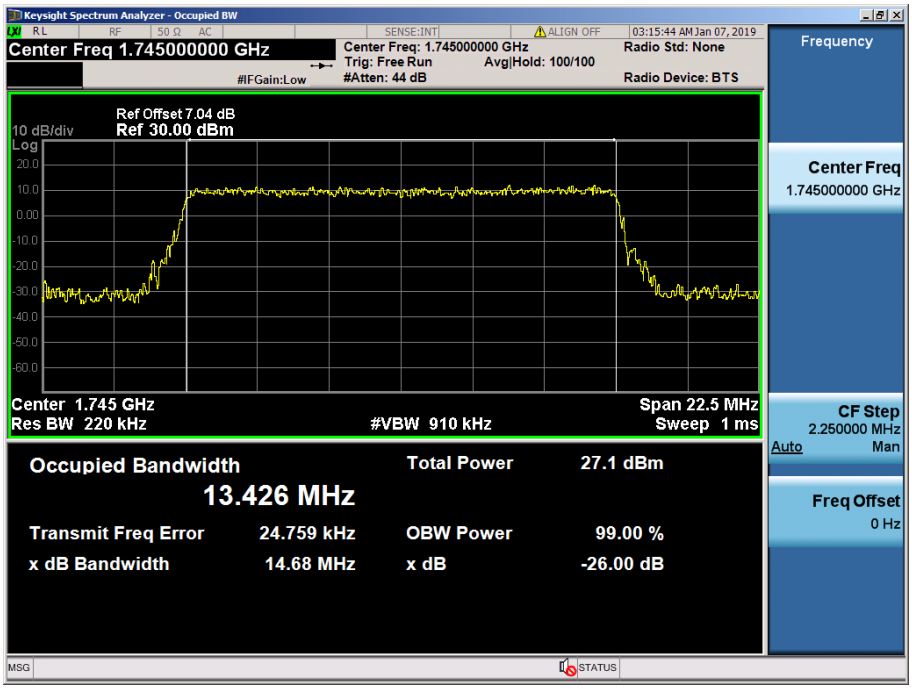
LTE Band 66, 4 / 20 MHz / 64QAM - RB Size 100



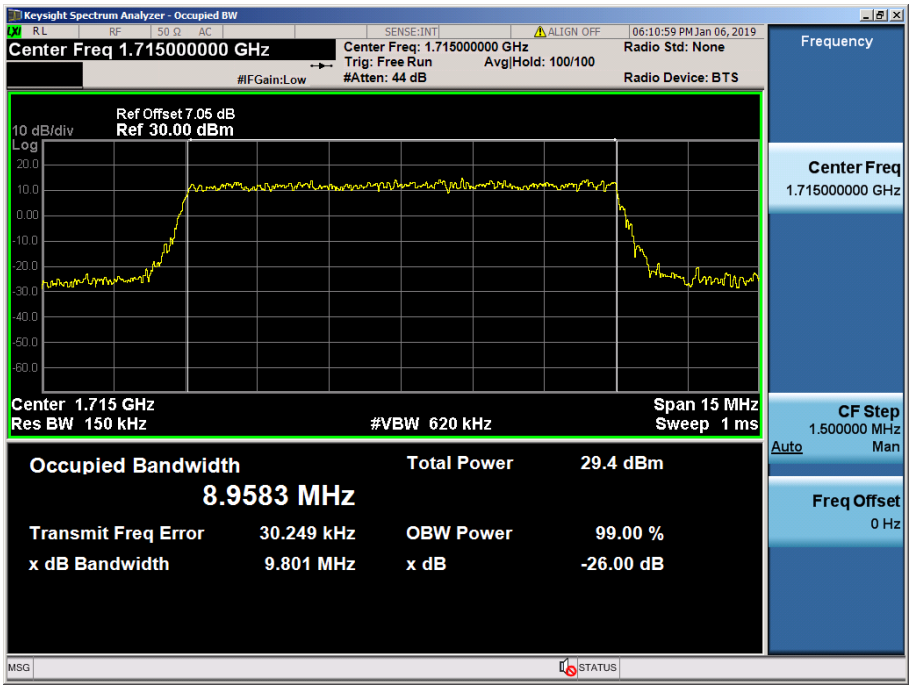
LTE Band 66, 4 / 15 MHz / QPSK - RB Size 75



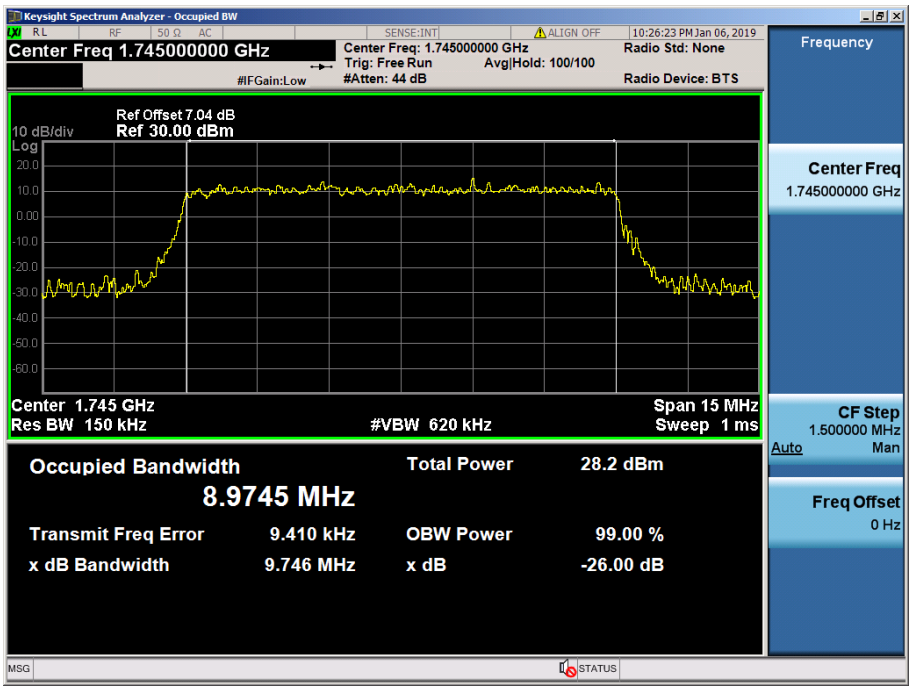
LTE Band 66, 4 / 15 MHz / 16QAM - RB Size 75



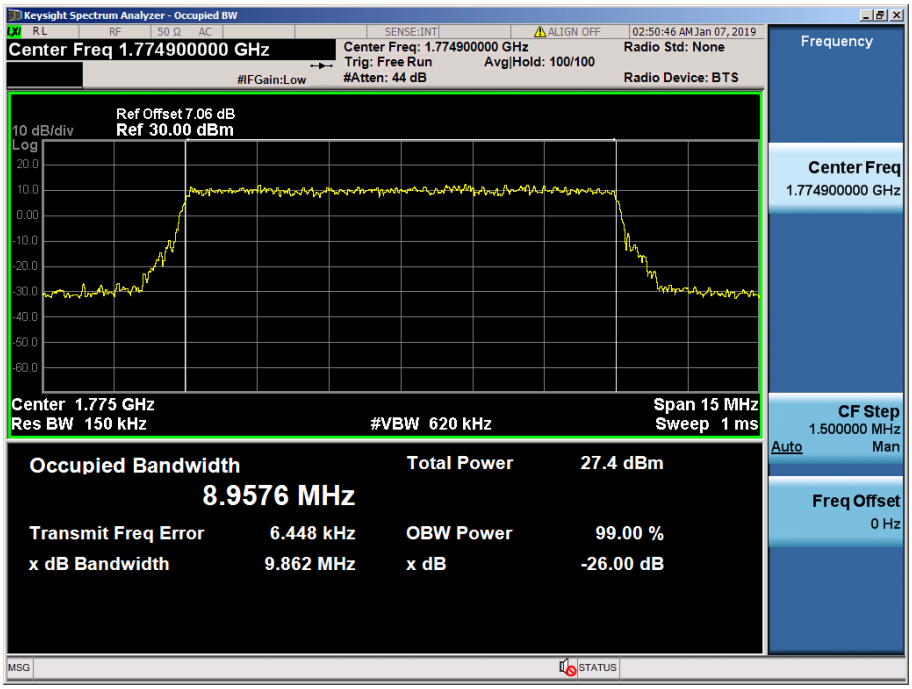
LTE Band 66, 4 / 15 MHz / 64QAM - RB Size 75



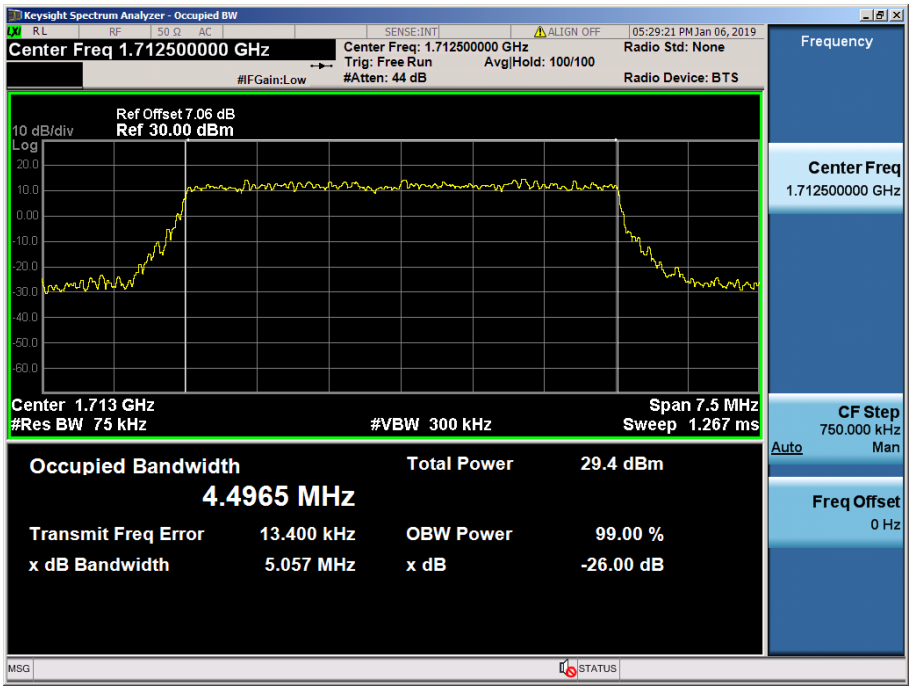
LTE Band 66, 4 / 10 MHz / QPSK - RB Size 50



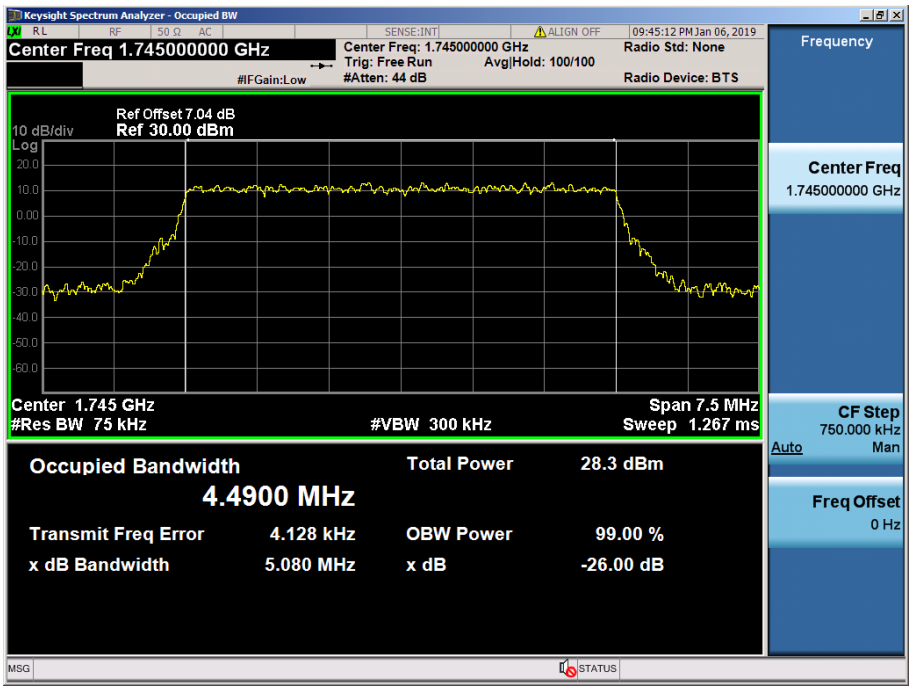
LTE Band 66, 4 / 10 MHz / 16QAM - RB Size 50



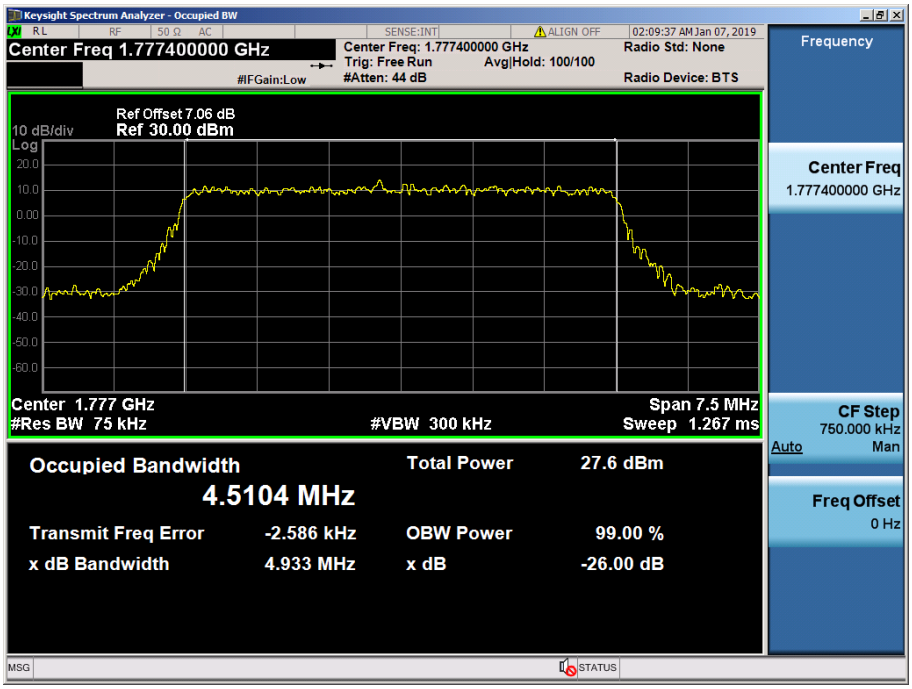
LTE Band 66, 4 / 10 MHz / 64QAM - RB Size 50



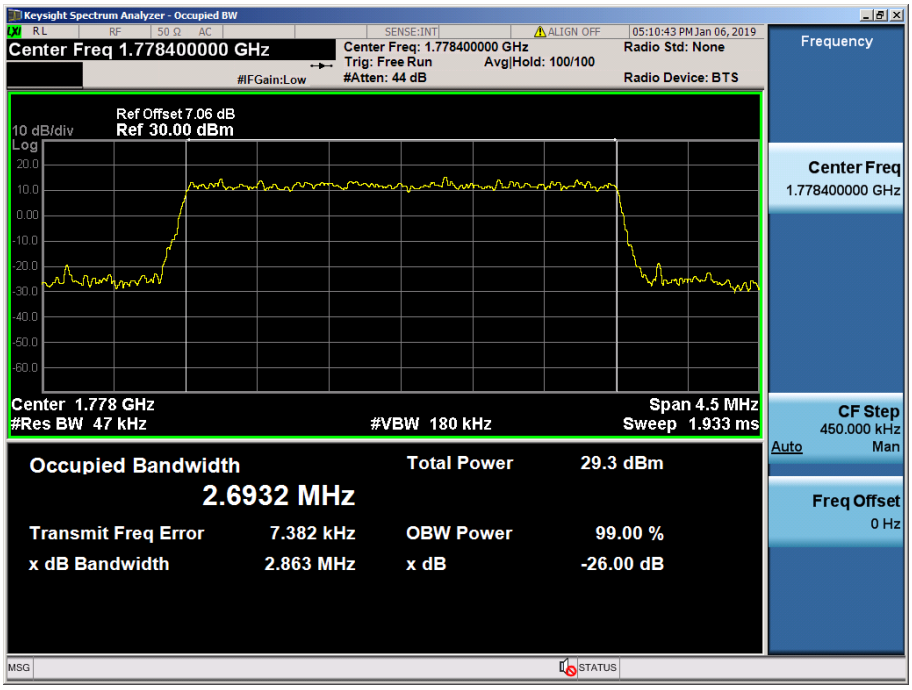
LTE Band 66, 4 / 5 MHz / QPSK - RB Size 25



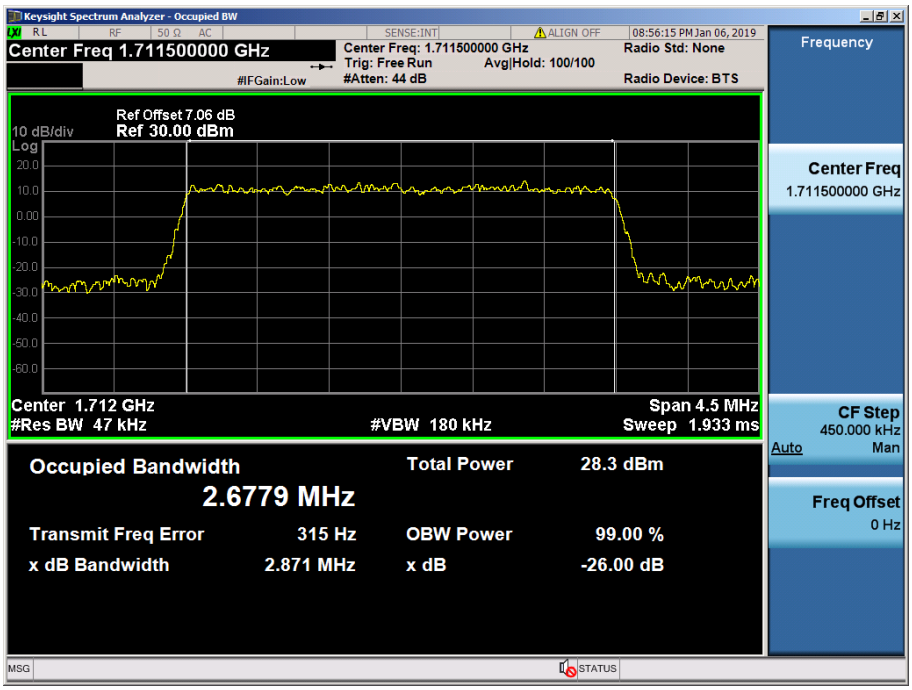
LTE Band 66, 4 / 5 MHz / 16QAM - RB Size 25



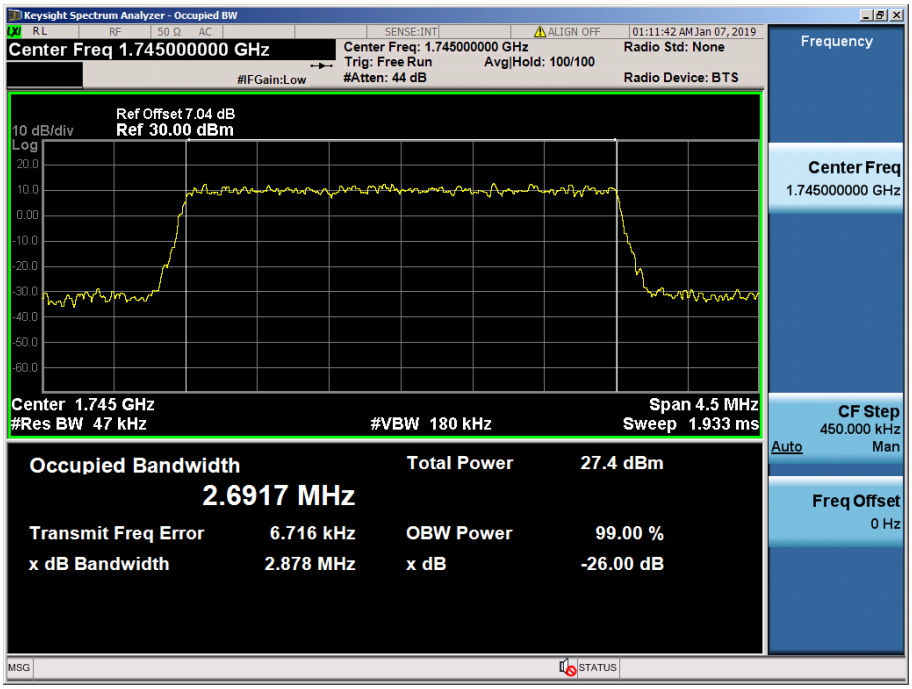
LTE Band 66, 4 / 5 MHz / 64QAM - RB Size 25



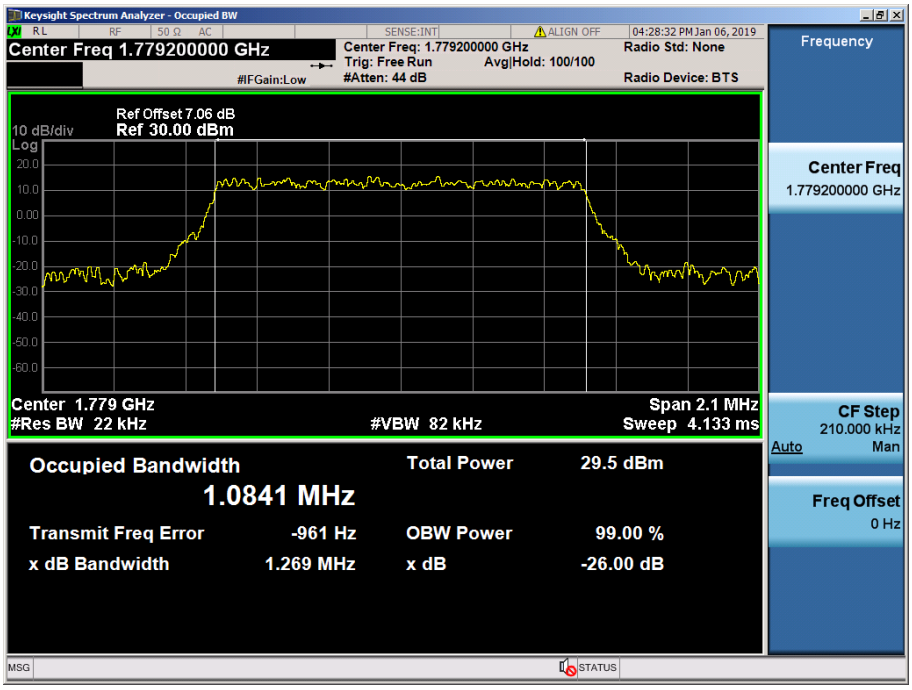
LTE Band 66, 4 / 3 MHz / QPSK - RB Size 15



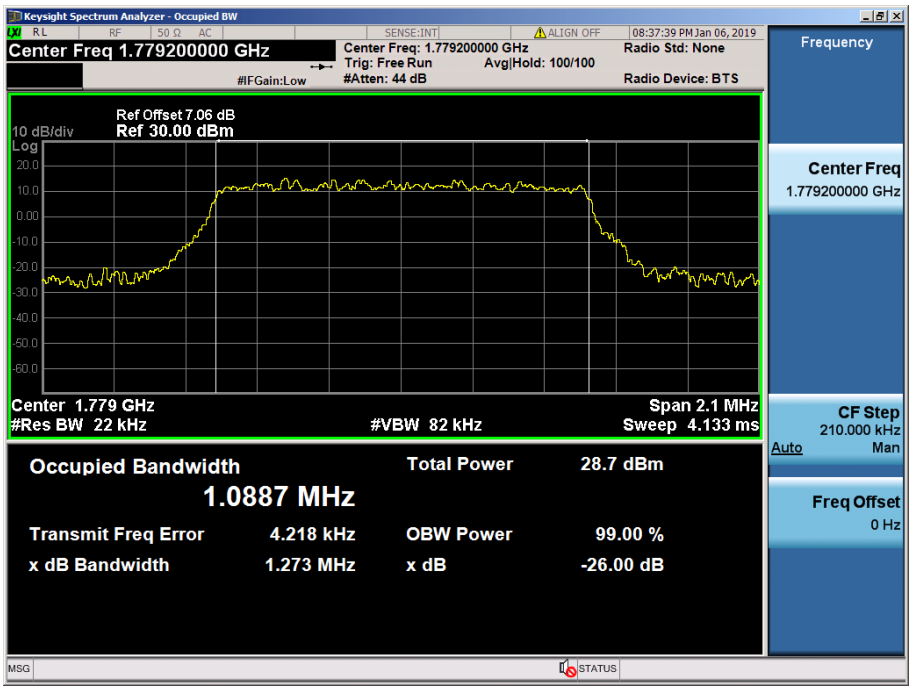
LTE Band 66, 4 / 3 MHz / 16QAM - RB Size 15



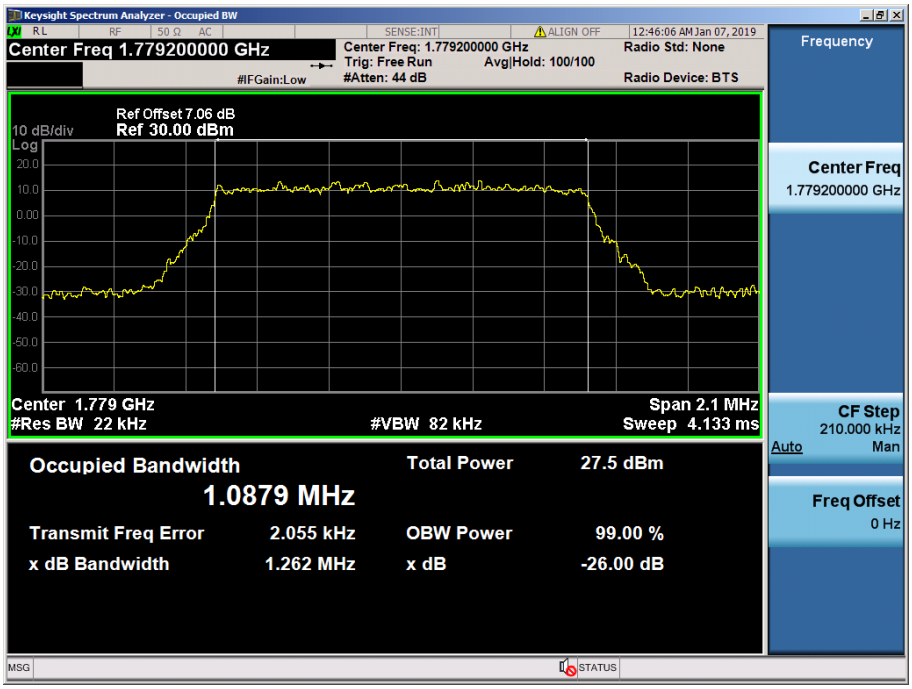
LTE Band 66, 4 / 3 MHz / 64QAM - RB Size 15



LTE Band 66, 4 / 1.4 MHz / QPSK - RB Size 6

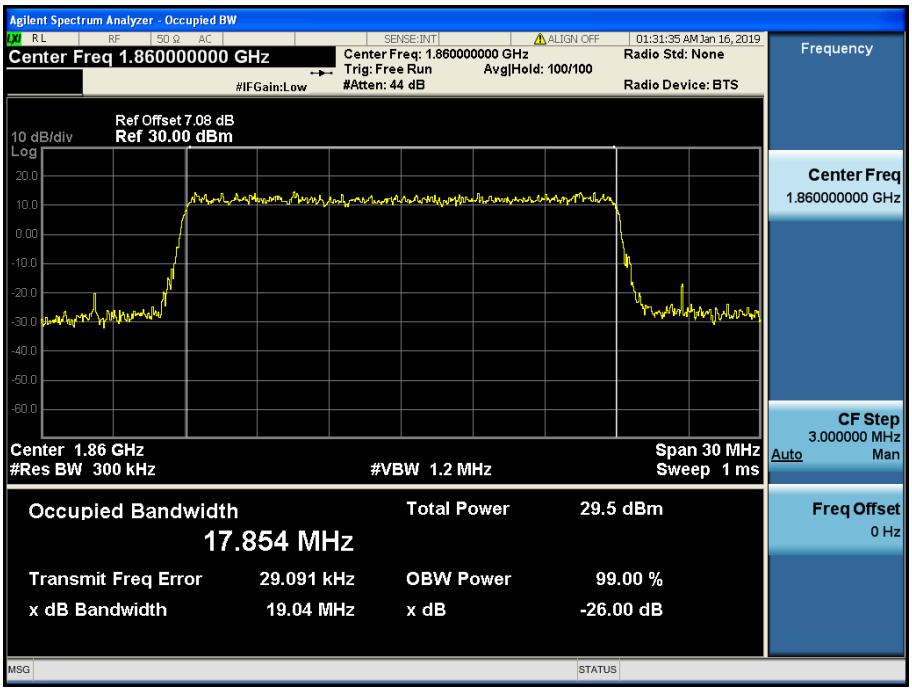


LTE Band 66, 4 / 1.4 MHz / 16QAM - RB Size 6

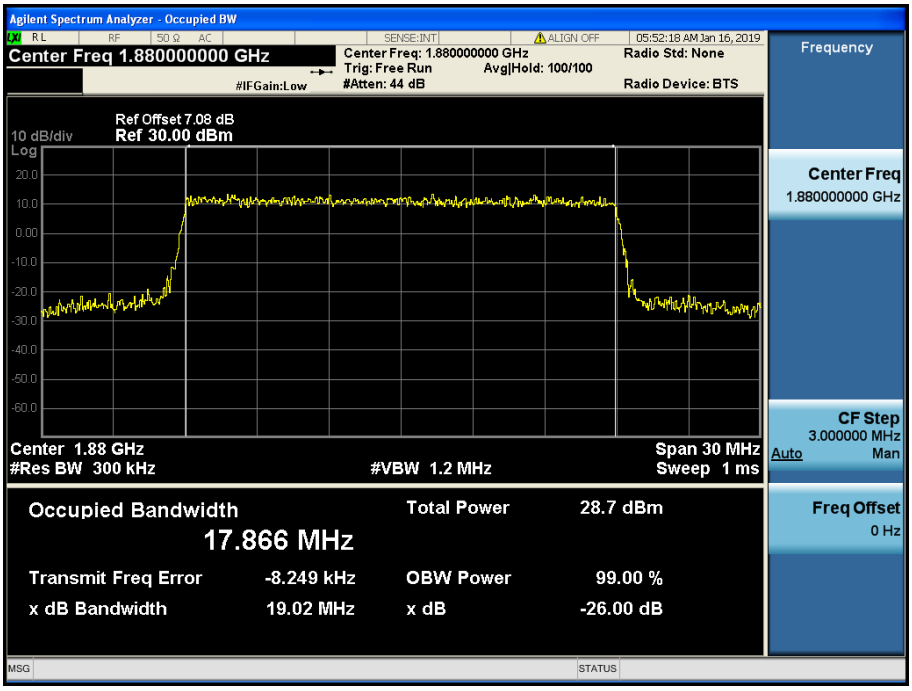


LTE Band 66, 4 / 1.4 MHz / 64QAM - RB Size 6

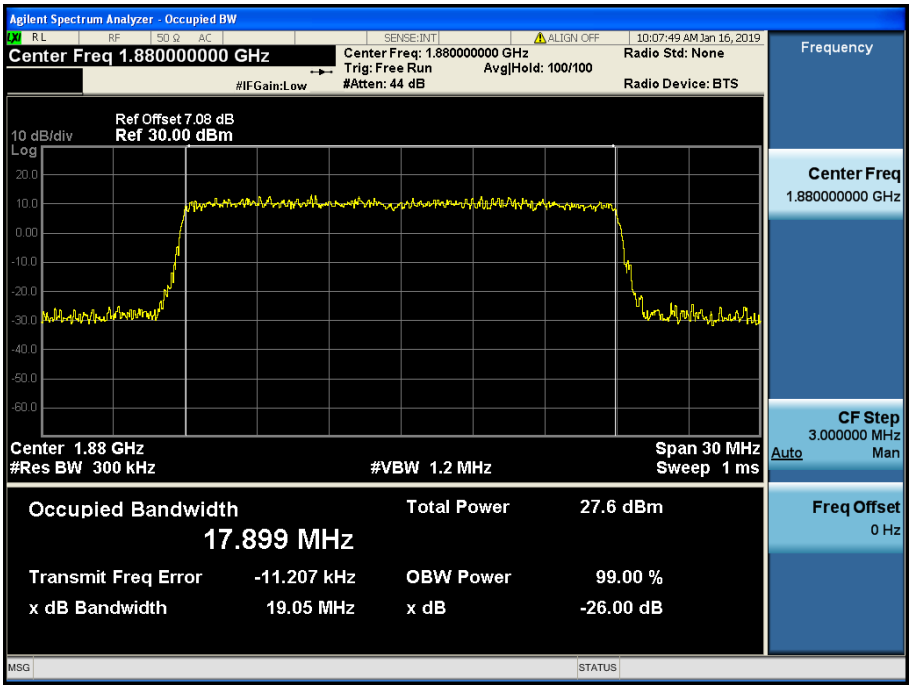
8.1.5 LTE Band 2



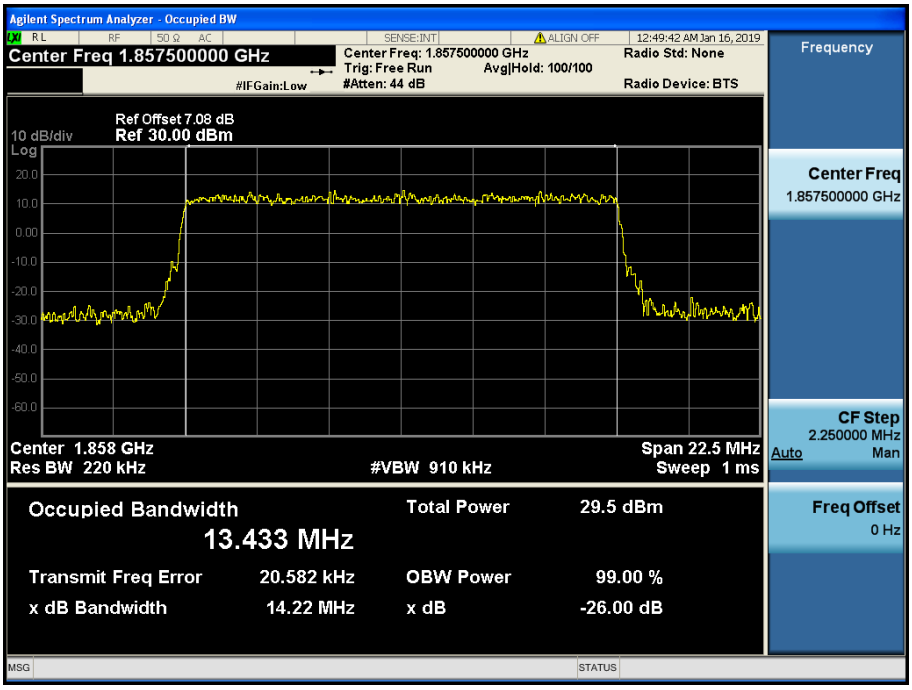
LTE Band 2 / 20 MHz / QPSK - RB Size 100



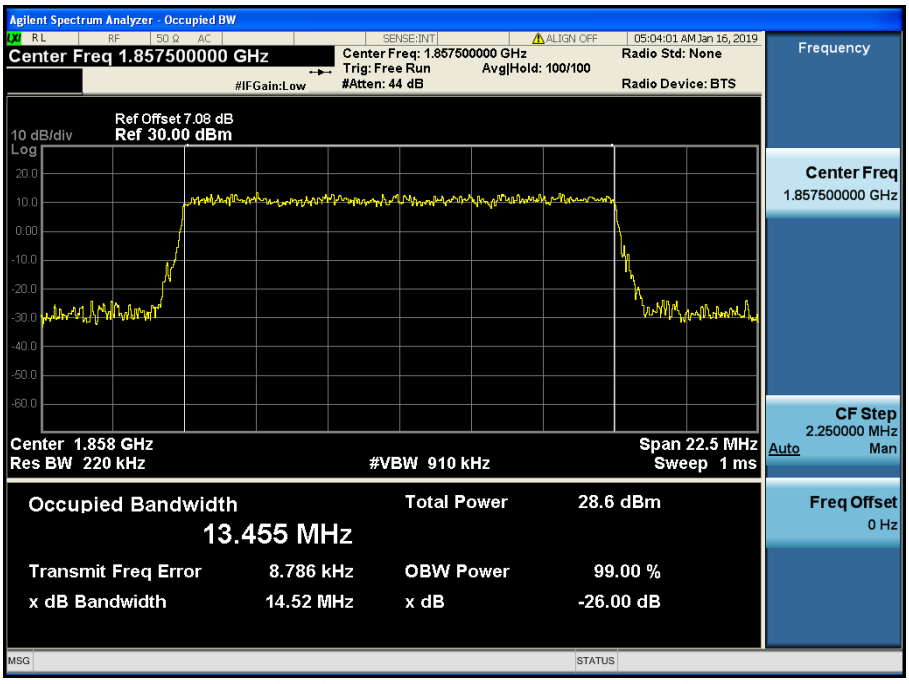
LTE Band 2 / 20 MHz / 16QAM - RB Size 100



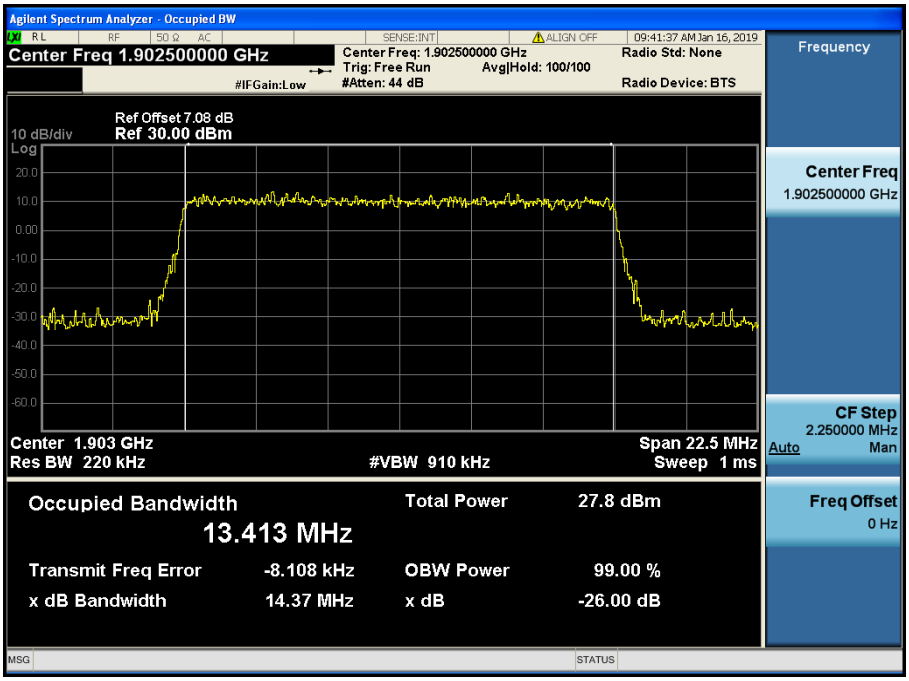
LTE Band 2 / 20 MHz / 64QAM - RB Size 100



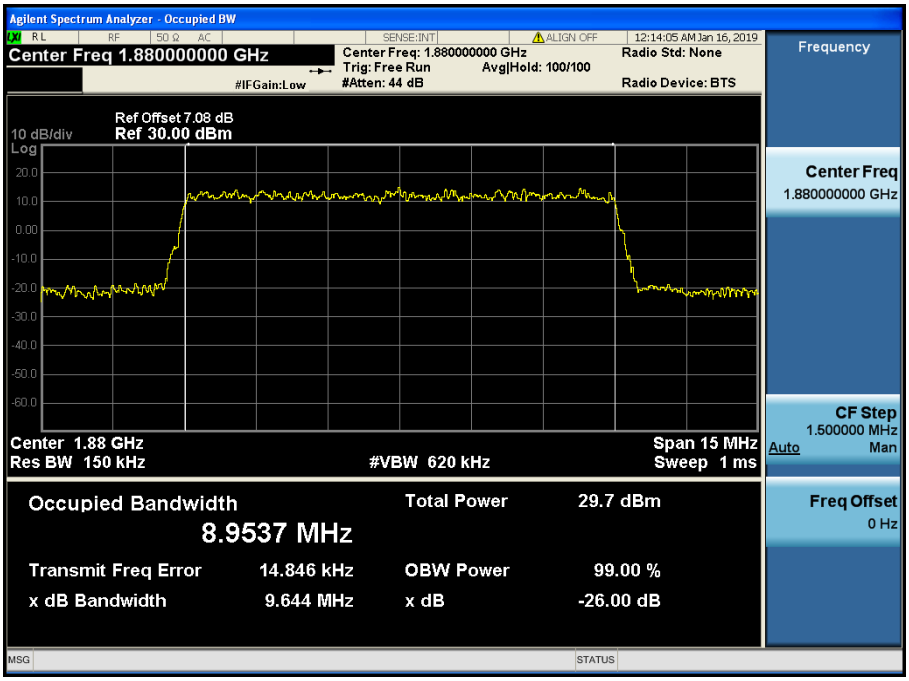
LTE Band 2 / 15 MHz / QPSK - RB Size 75



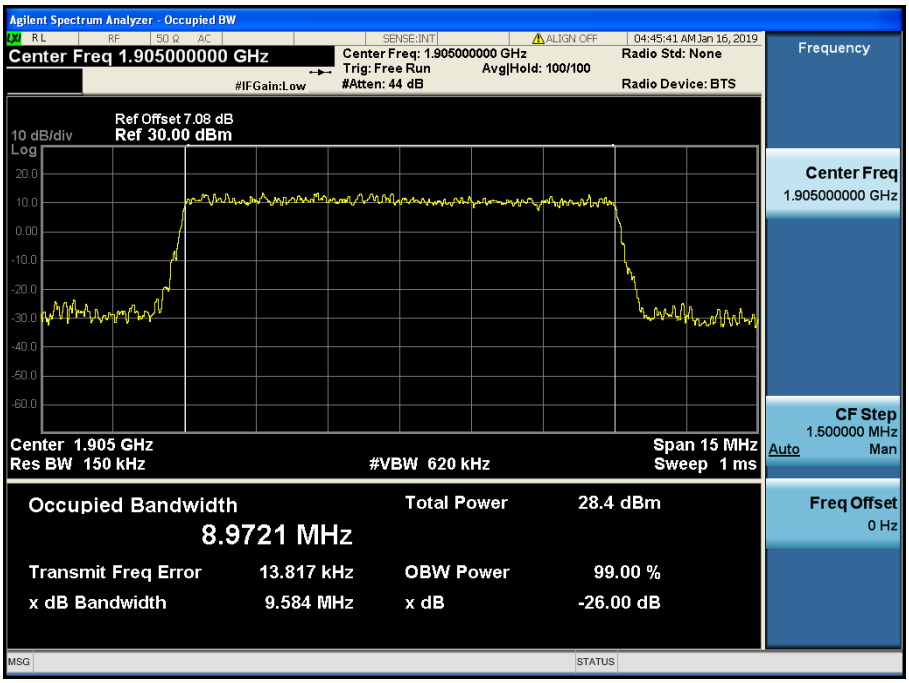
LTE Band 2 / 15 MHz / 16QAM - RB Size 75



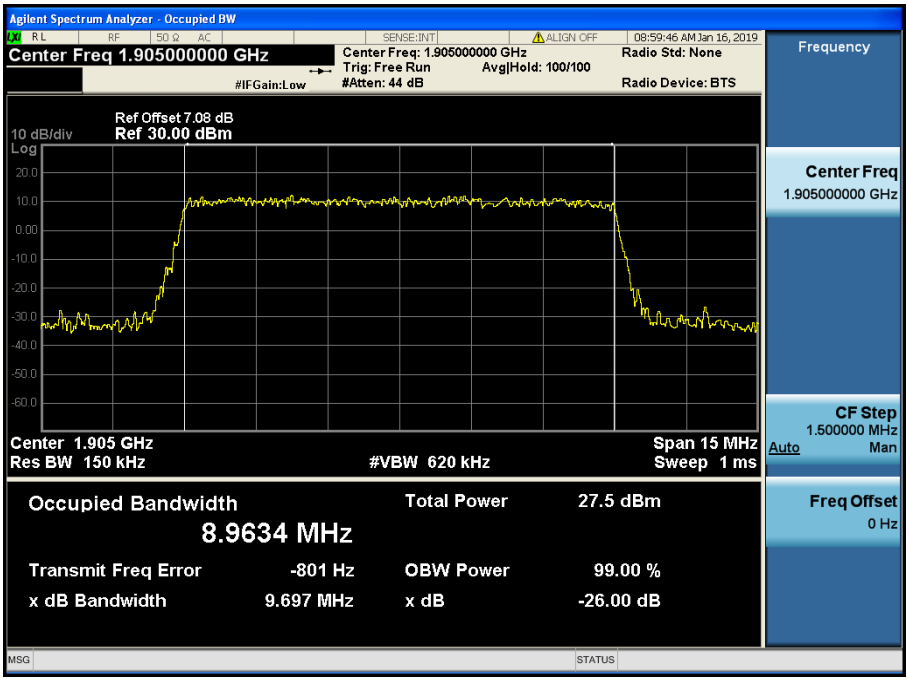
LTE Band 2 / 15 MHz / 64QAM - RB Size 75



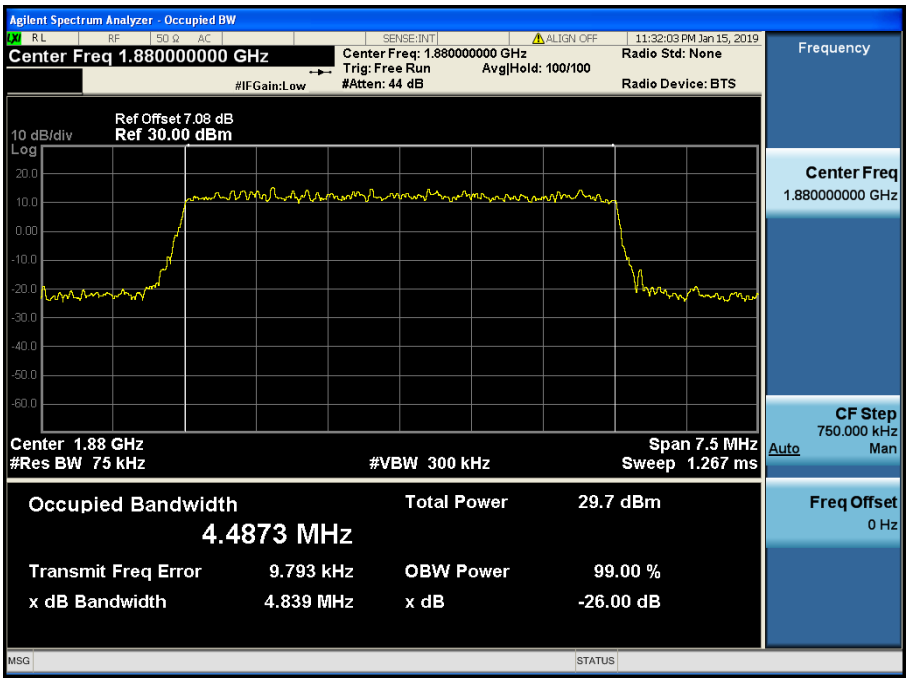
LTE Band 2 / 10 MHz / QPSK - RB Size 50



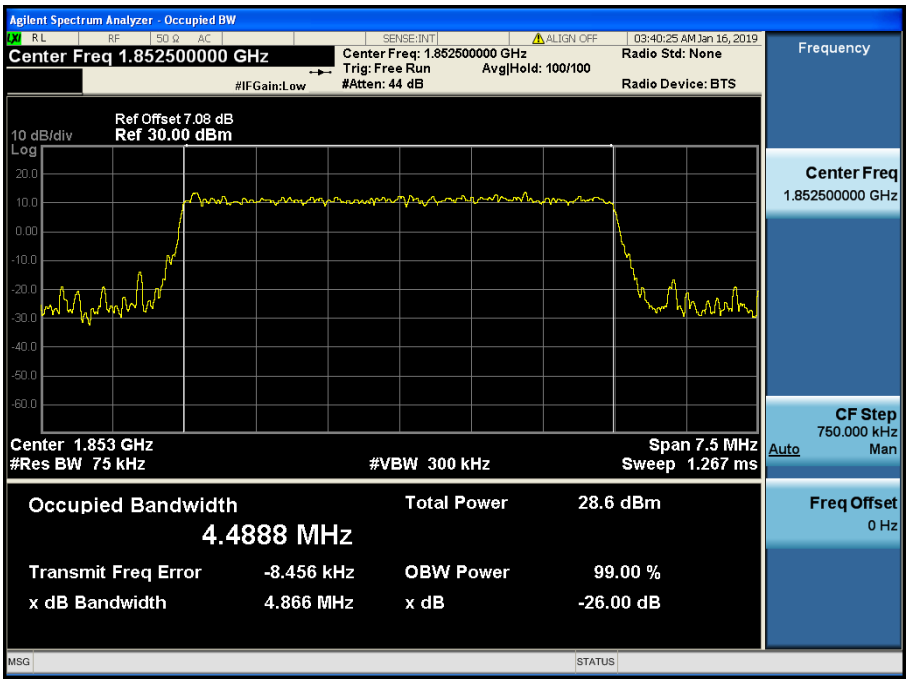
LTE Band 2 / 10 MHz / 16QAM - RB Size 50



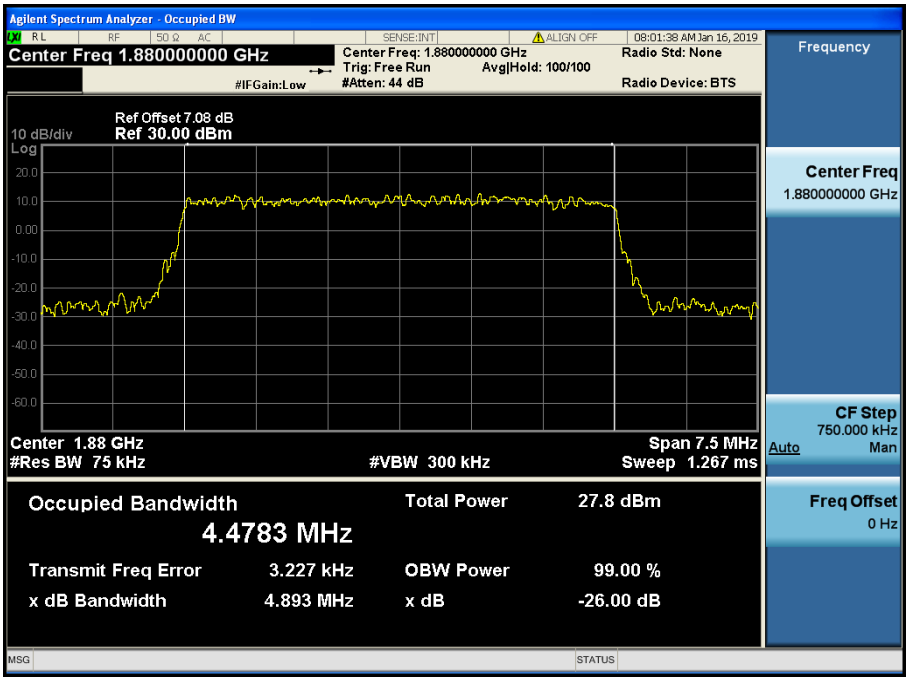
LTE Band 2 / 10 MHz / 64QAM - RB Size 50



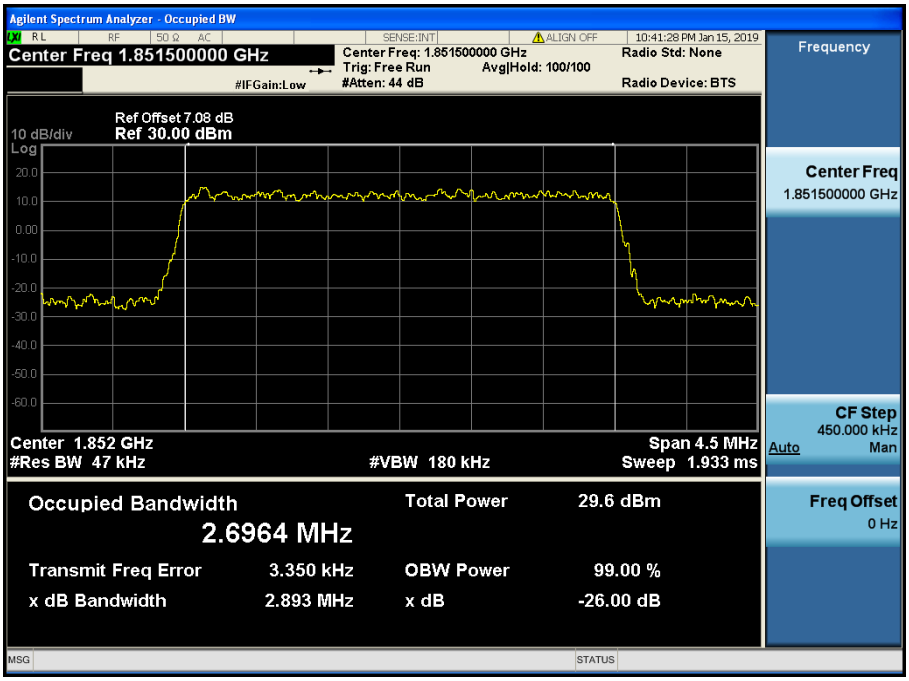
LTE Band 2 / 5 MHz / QPSK - RB Size 25



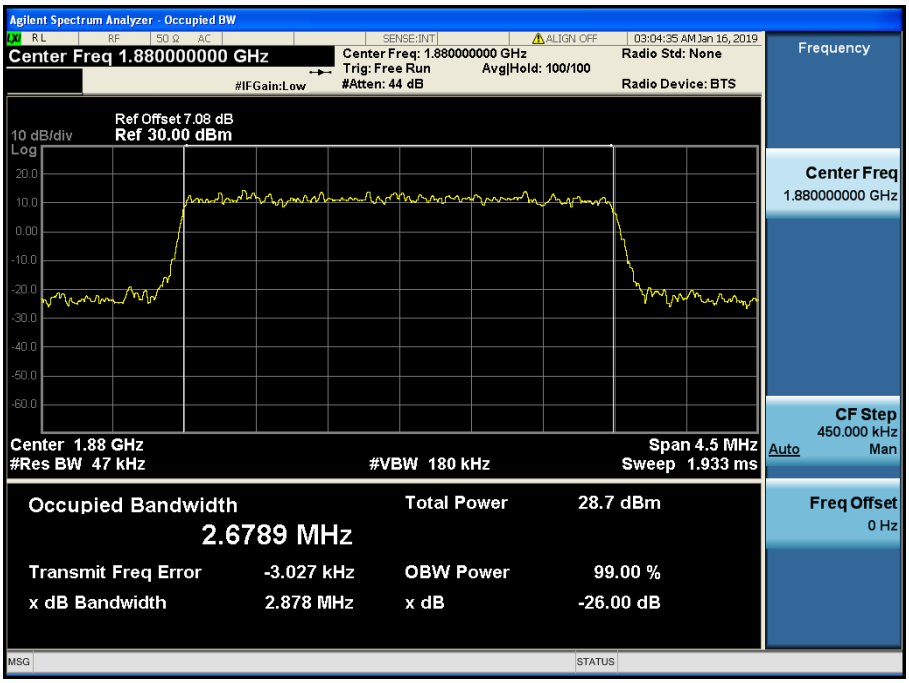
LTE Band 2 / 5 MHz / 16QAM - RB Size 25



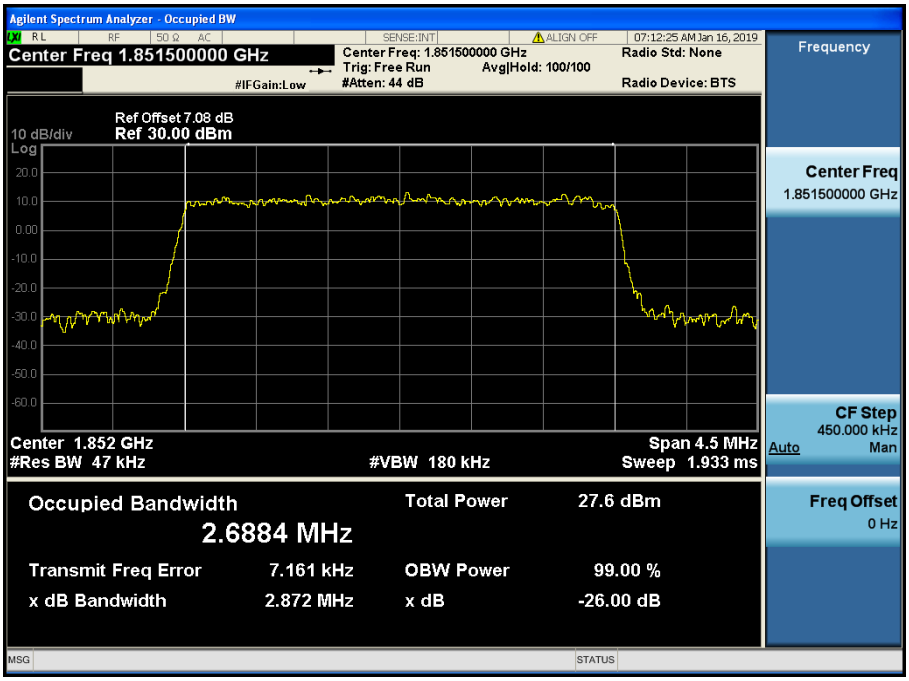
LTE Band 2 / 5 MHz / 64QAM - RB Size 25



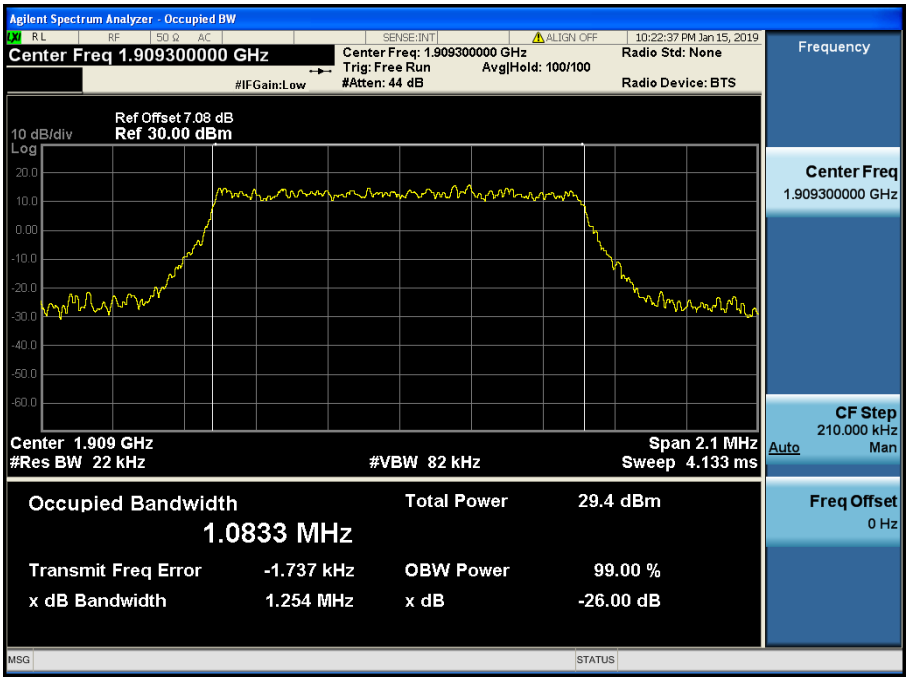
LTE Band 2 / 3 MHz / QPSK - RB Size 15



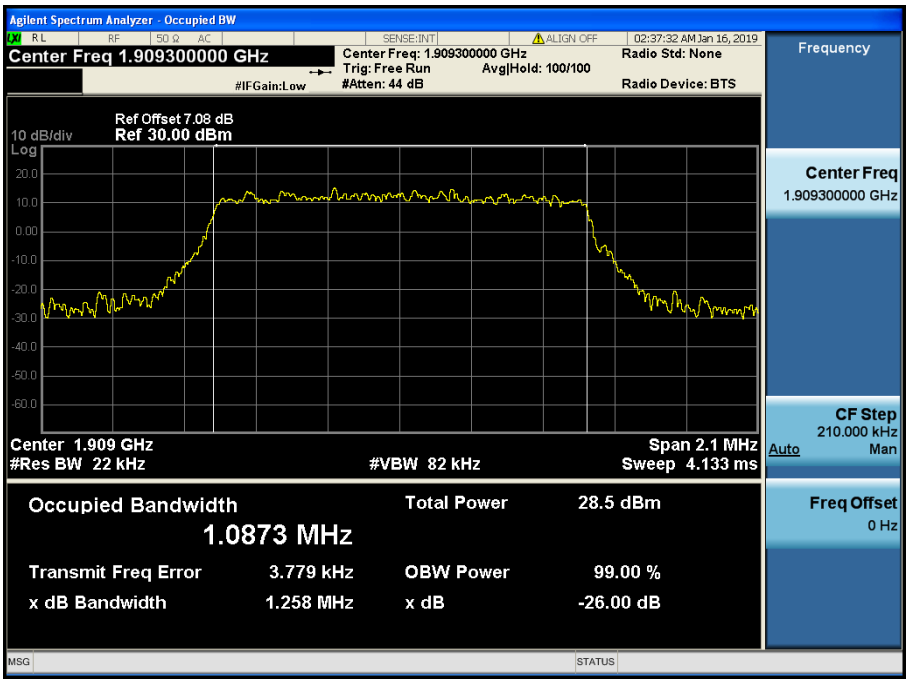
LTE Band 2 / 3 MHz / 16QAM - RB Size 15



LTE Band 2 / 3 MHz / 64QAM - RB Size 15



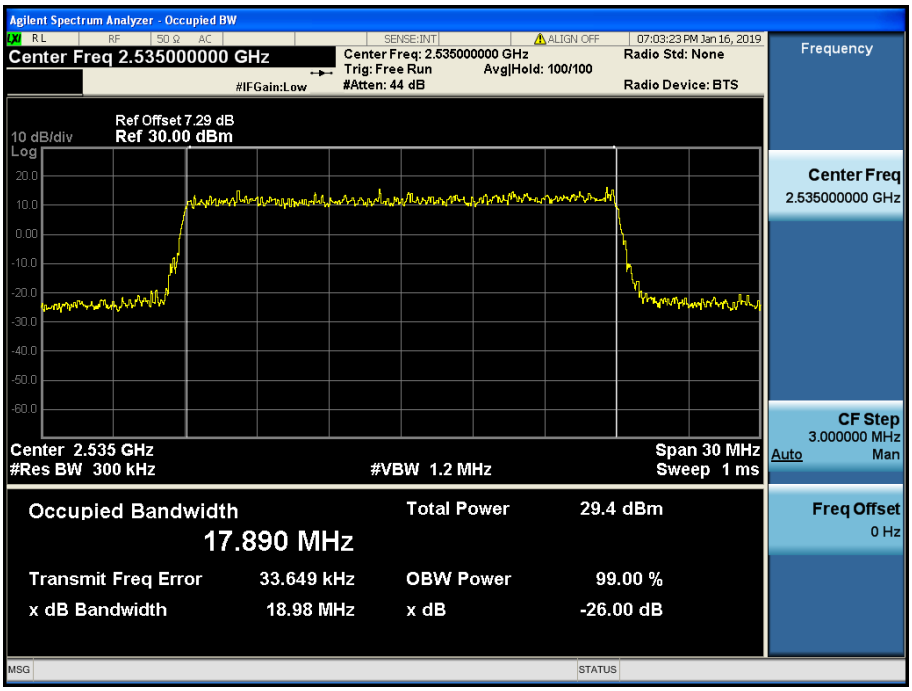
LTE Band 2 / 1.4 MHz / QPSK - RB Size 6



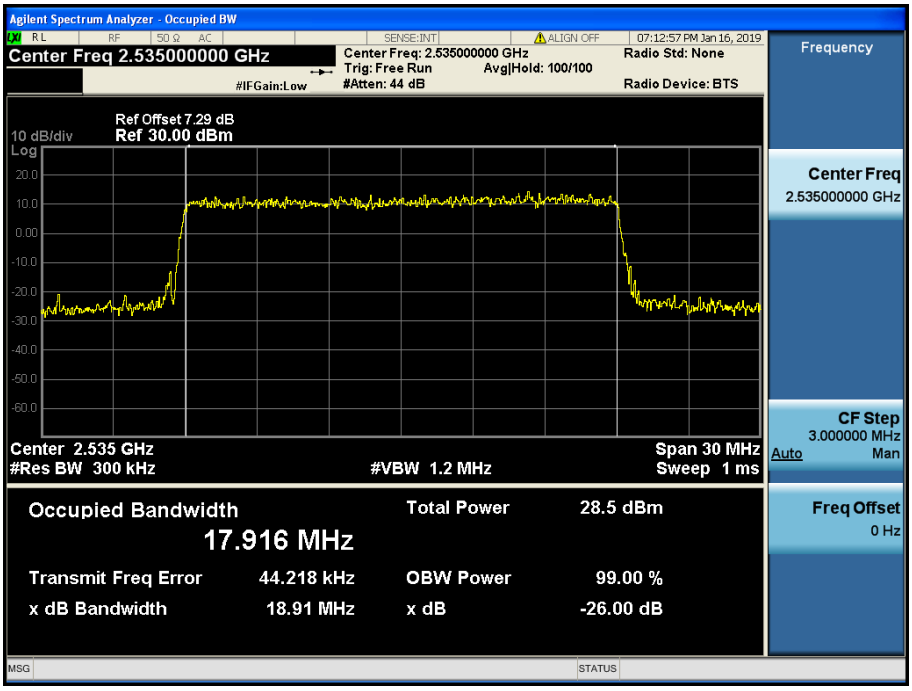
LTE Band 2 / 1.4 MHz / 16QAM - RB Size 6

LTE Band 2 / 1.4 MHz / 64QAM - RB Size 6

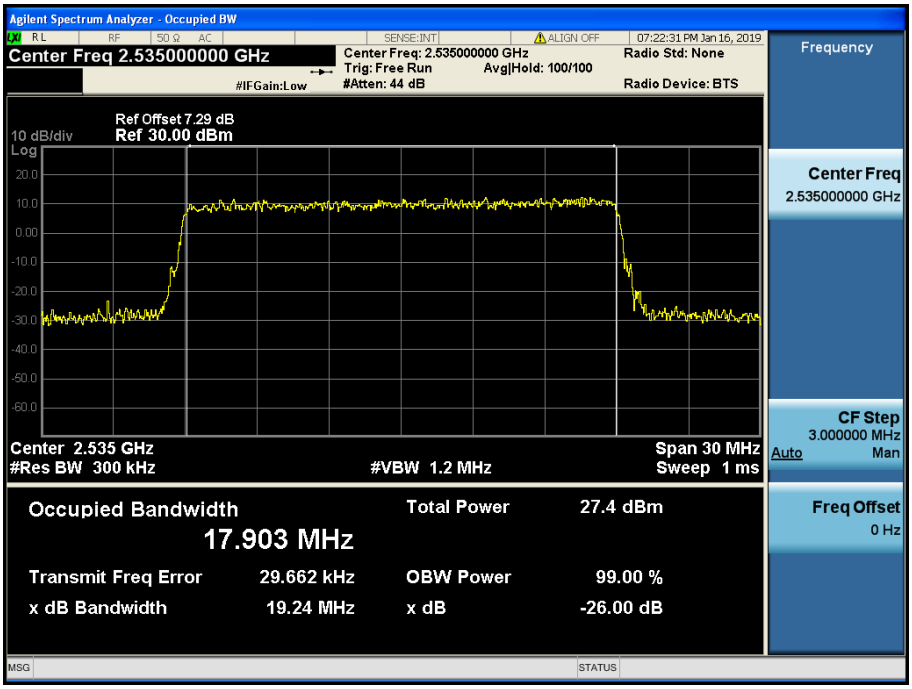
8.1.6 LTE Band 7



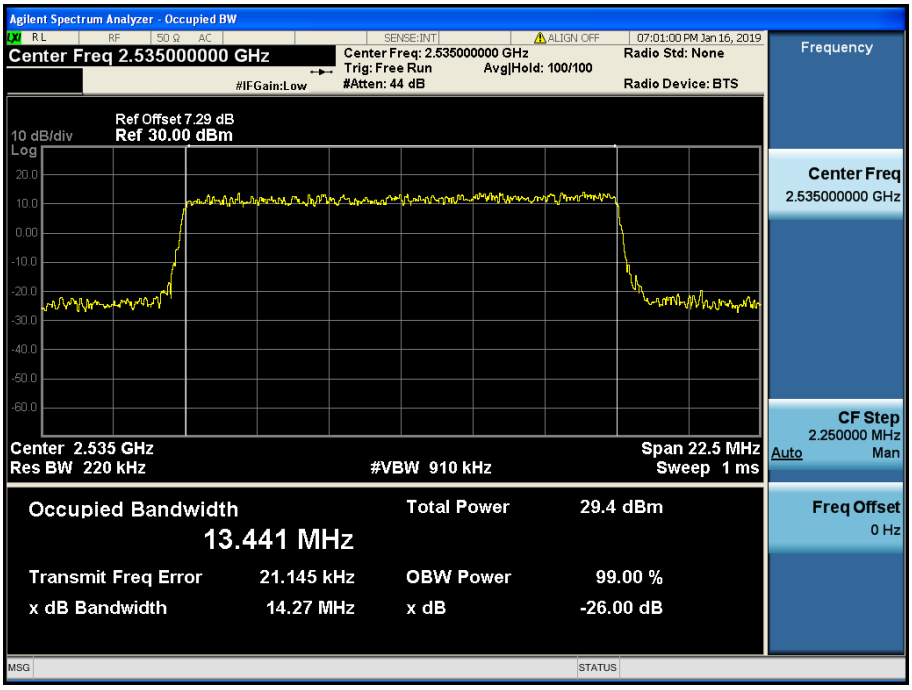
LTE Band 7 / 20 MHz / QPSK - RB Size 100



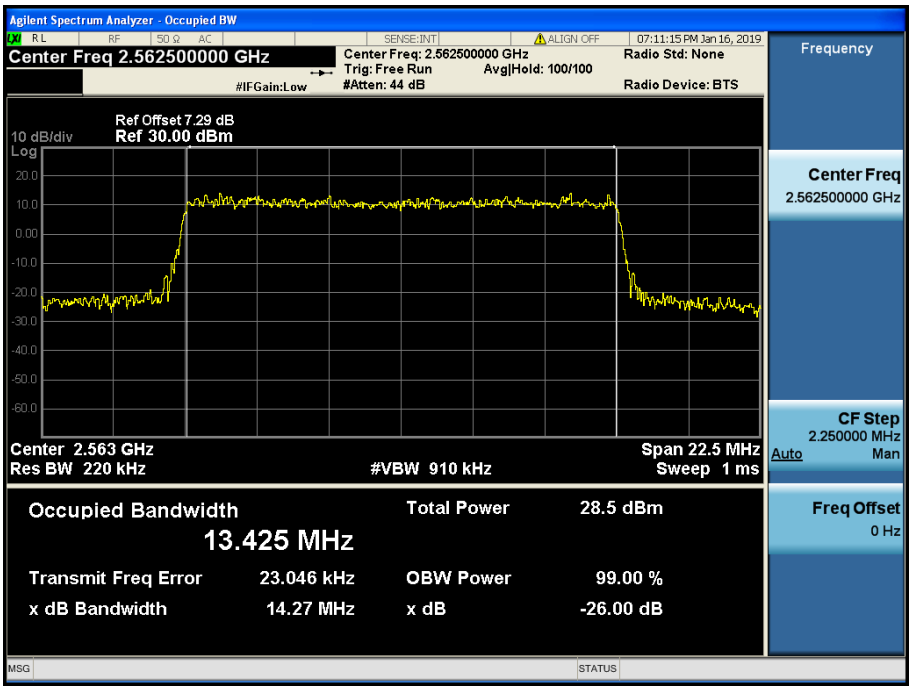
LTE Band 7 / 20 MHz / 16QAM - RB Size 100



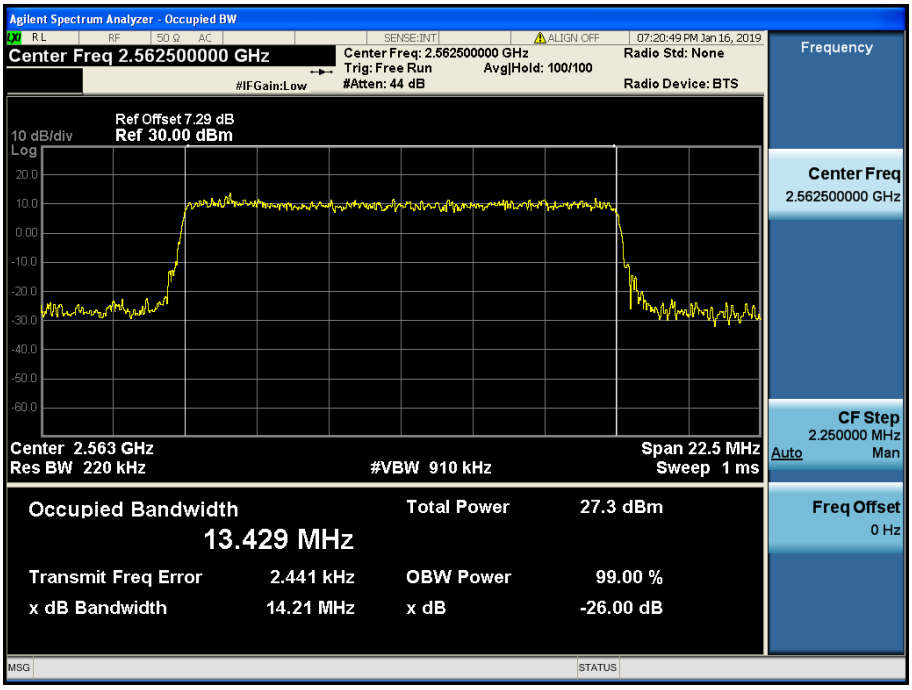
LTE Band 7 / 20 MHz / 64QAM - RB Size 100



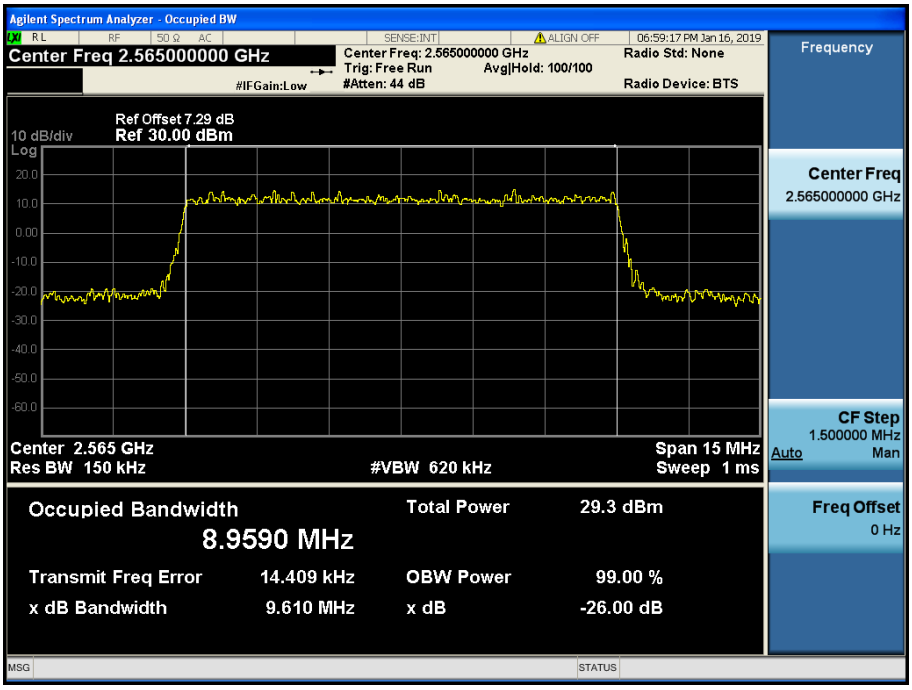
LTE Band 7 / 15 MHz / QPSK - RB Size 75



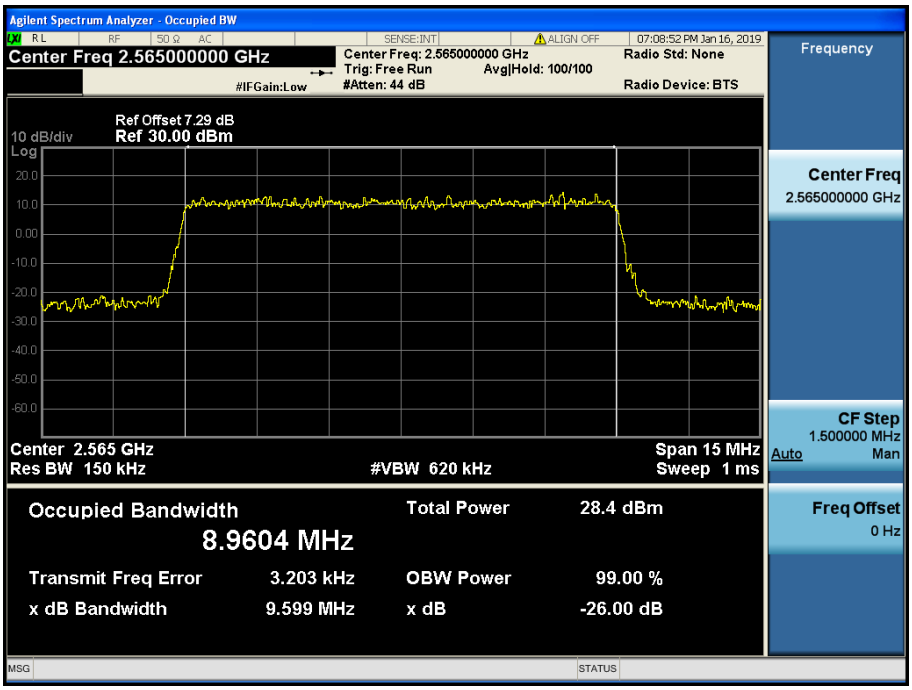
LTE Band 7 / 15 MHz / 16QAM - RB Size 75



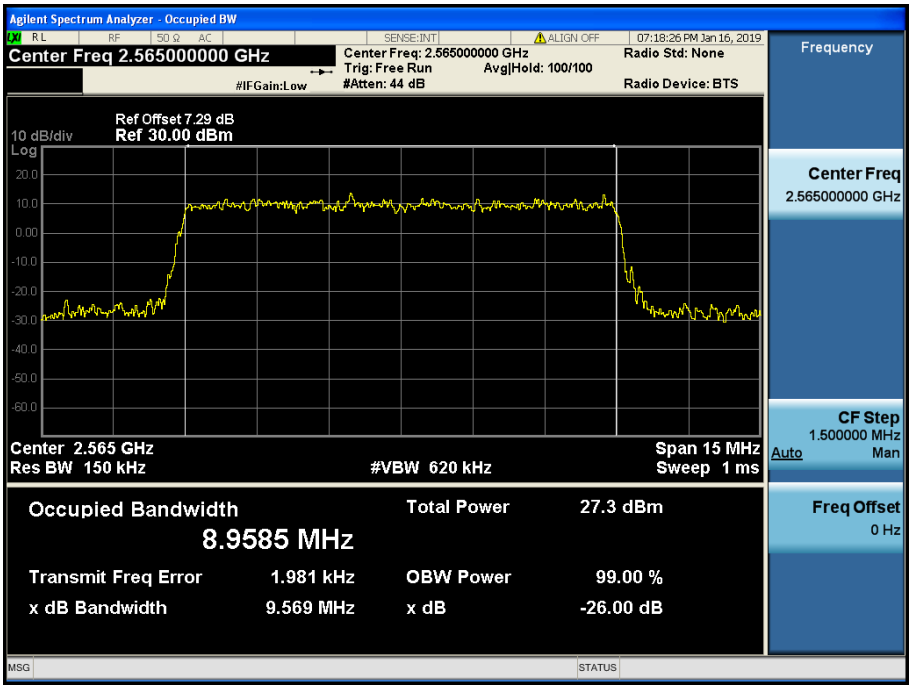
LTE Band 7 / 15 MHz / 64QAM - RB Size 75



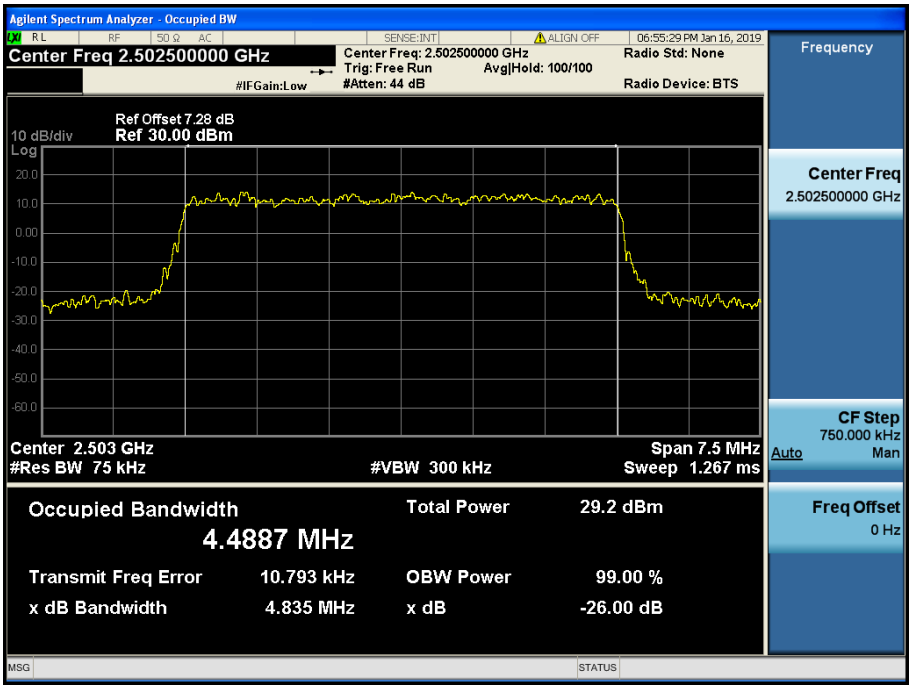
LTE Band 7 / 10 MHz / QPSK - RB Size 50



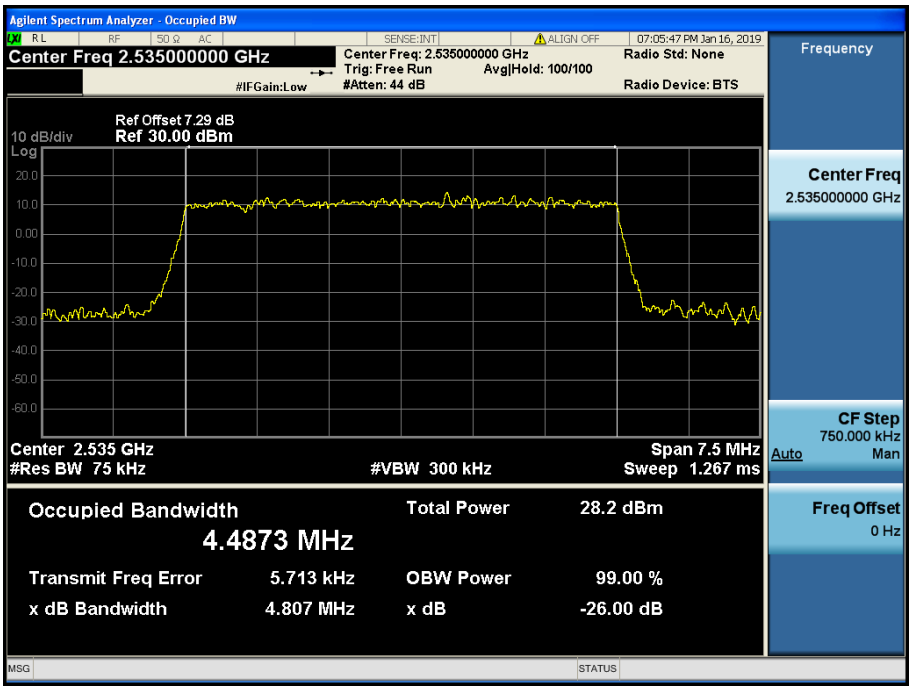
LTE Band 7 / 10 MHz / 16QAM - RB Size 50



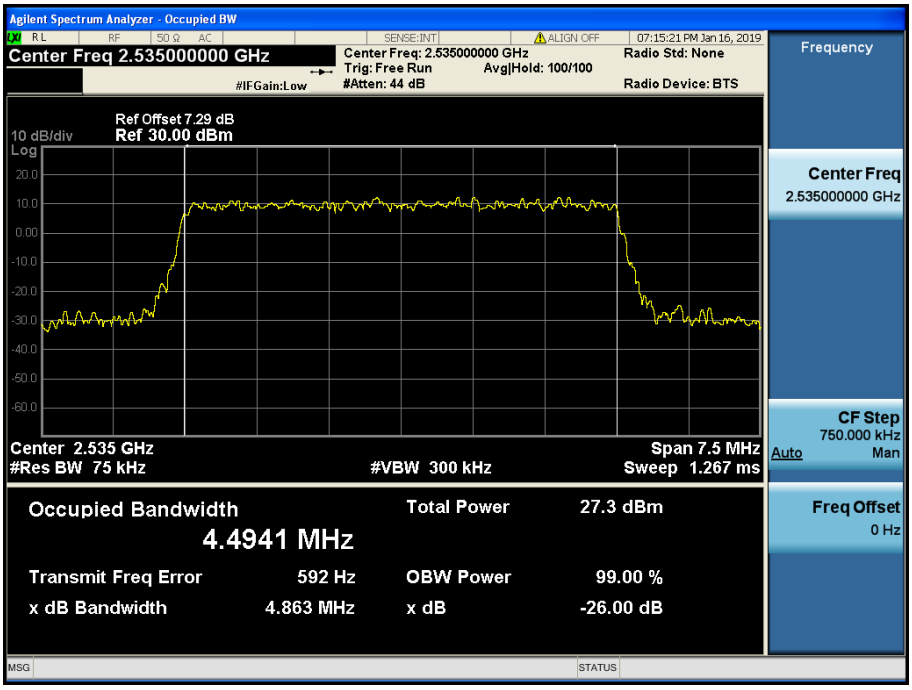
LTE Band 7 / 10 MHz / 64QAM - RB Size 50



LTE Band 7 / 5 MHz / QPSK - RB Size 25



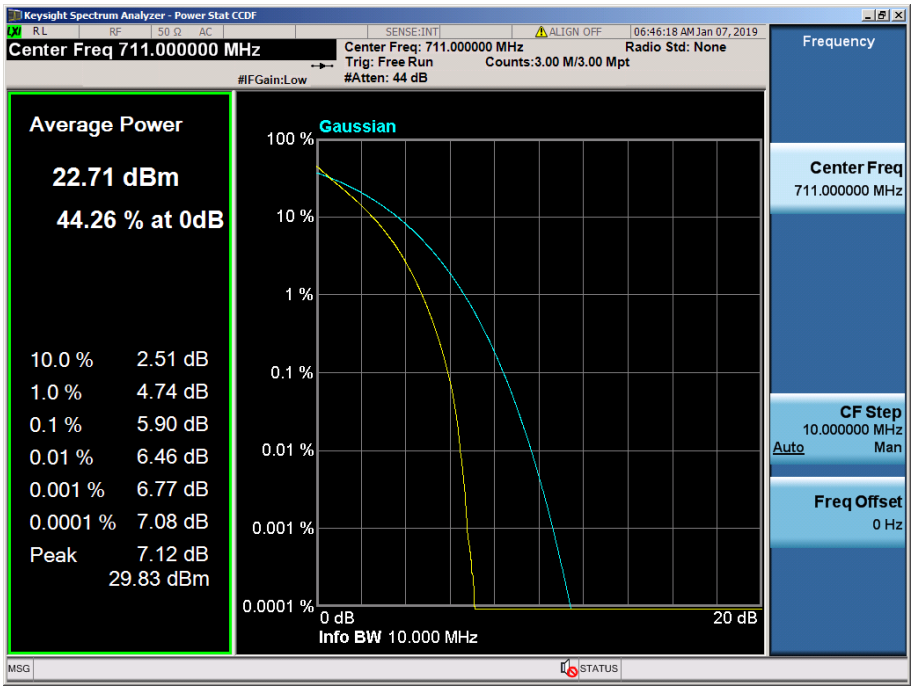
LTE Band 7 / 5 MHz / 16QAM - RB Size 25



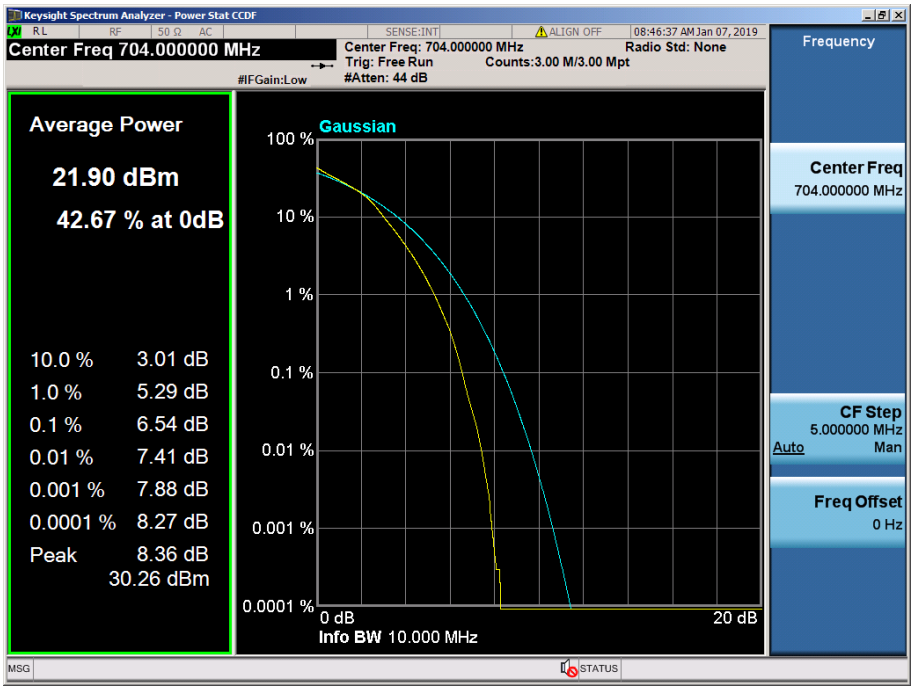
LTE Band 7 / 5 MHz / 64QAM - RB Size 25

8.2 PEAK TO AVERAGE RATIO

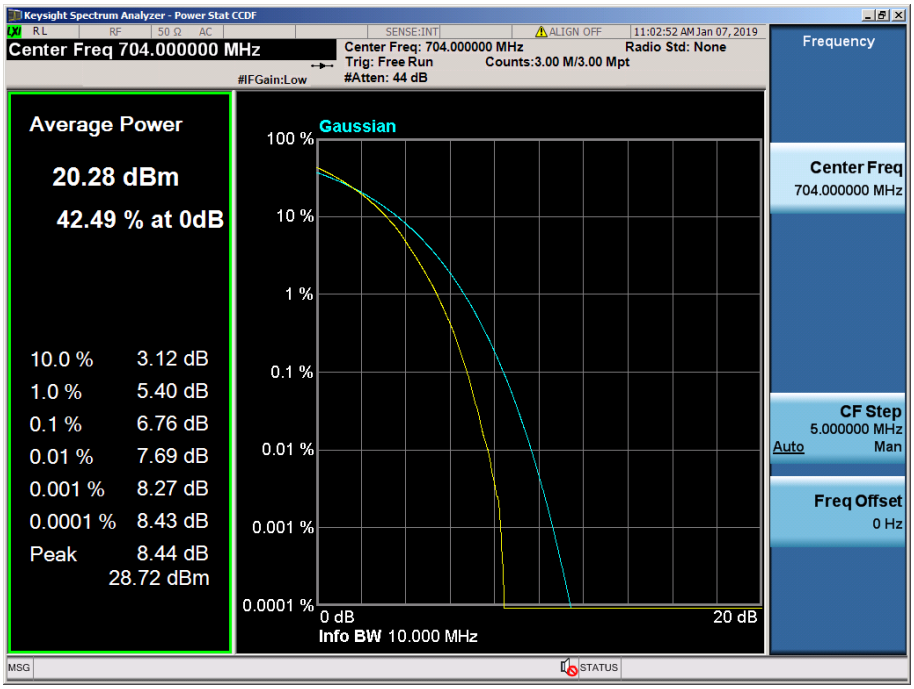
8.2.1 LTE Band 12, 17



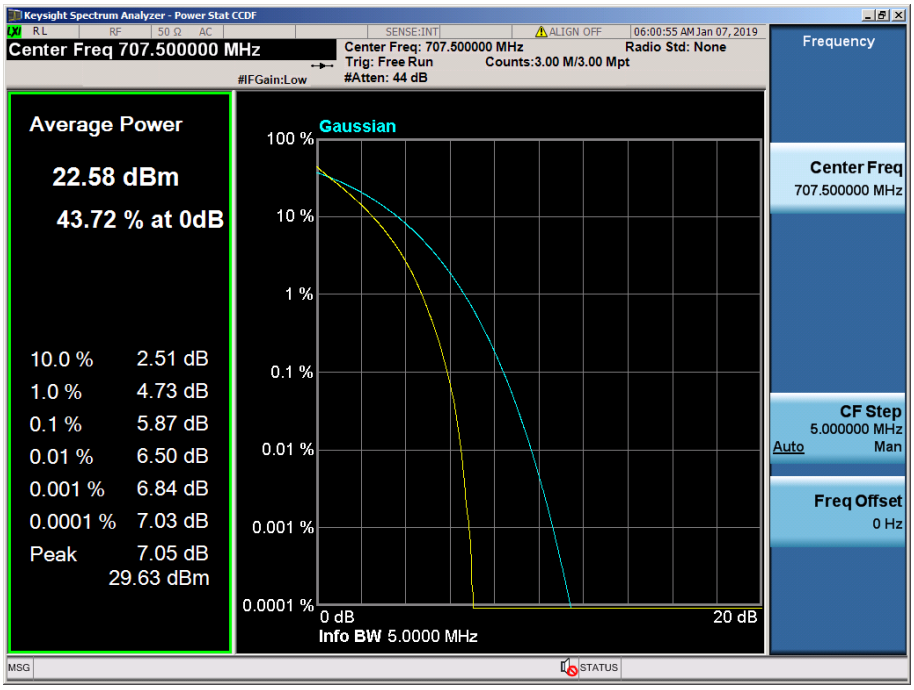
LTE Band 12, 17 / 10 MHz / QPSK - RB Size 50



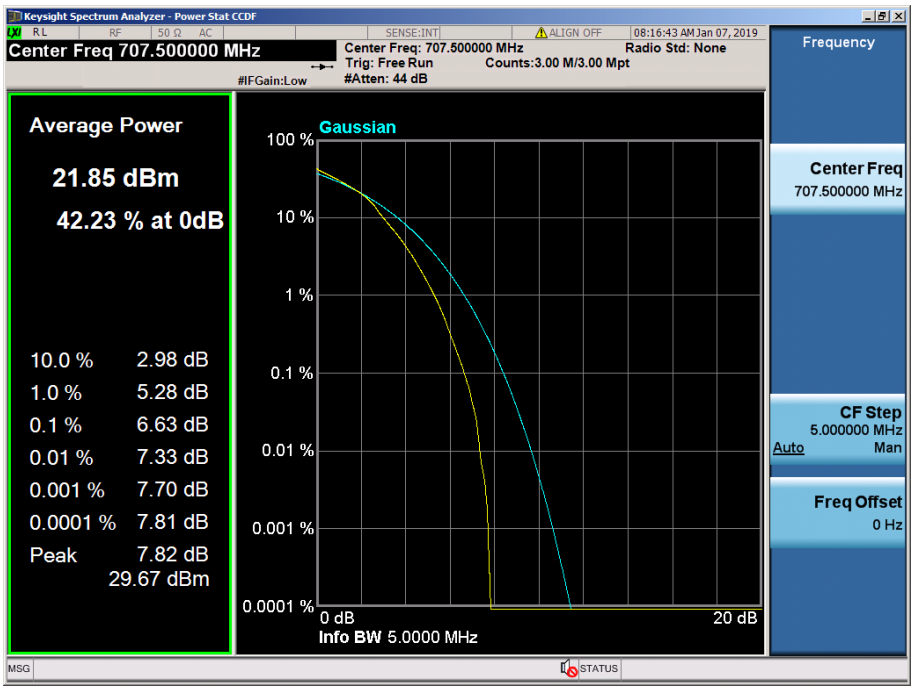
LTE Band 12, 17 / 10 MHz / 16QAM - RB Size 50



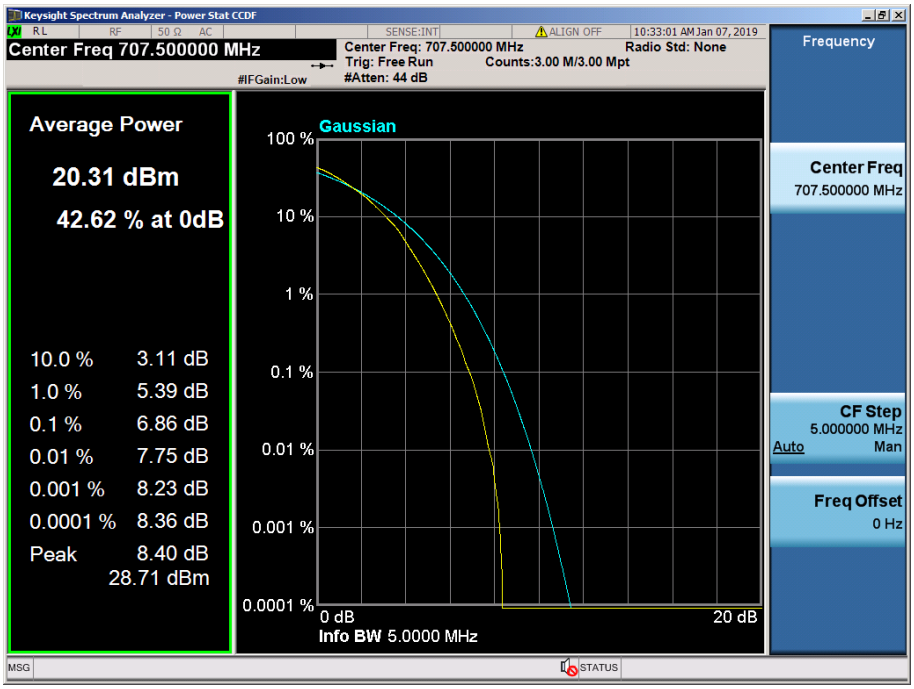
LTE Band 12, 17 / 10 MHz / 64QAM - RB Size 50



LTE Band 12, 17 / 5 MHz / QPSK - RB Size 25

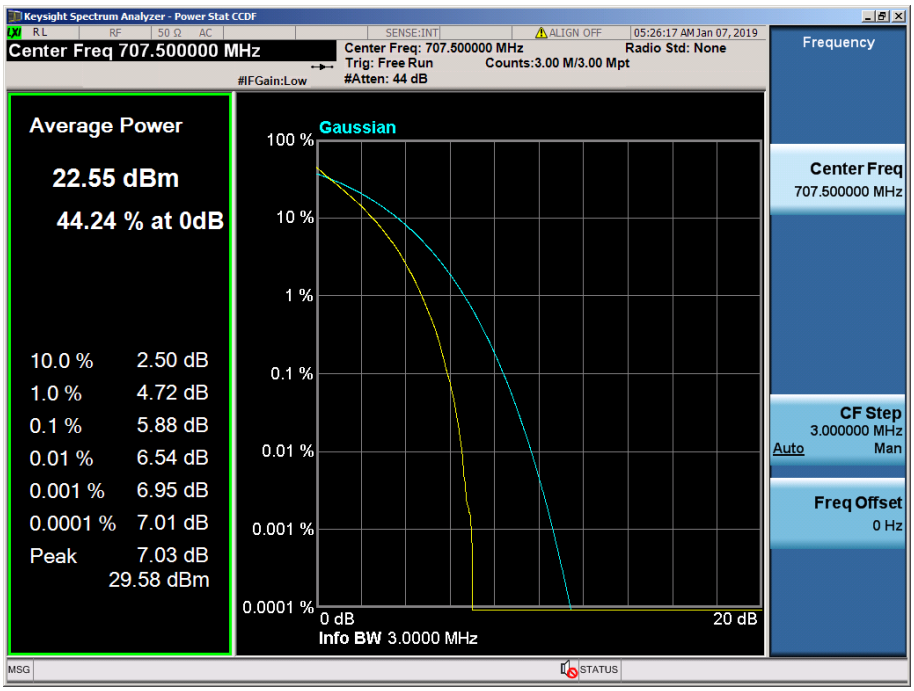


LTE Band 12, 17 / 5 MHz / 16QAM - RB Size 25

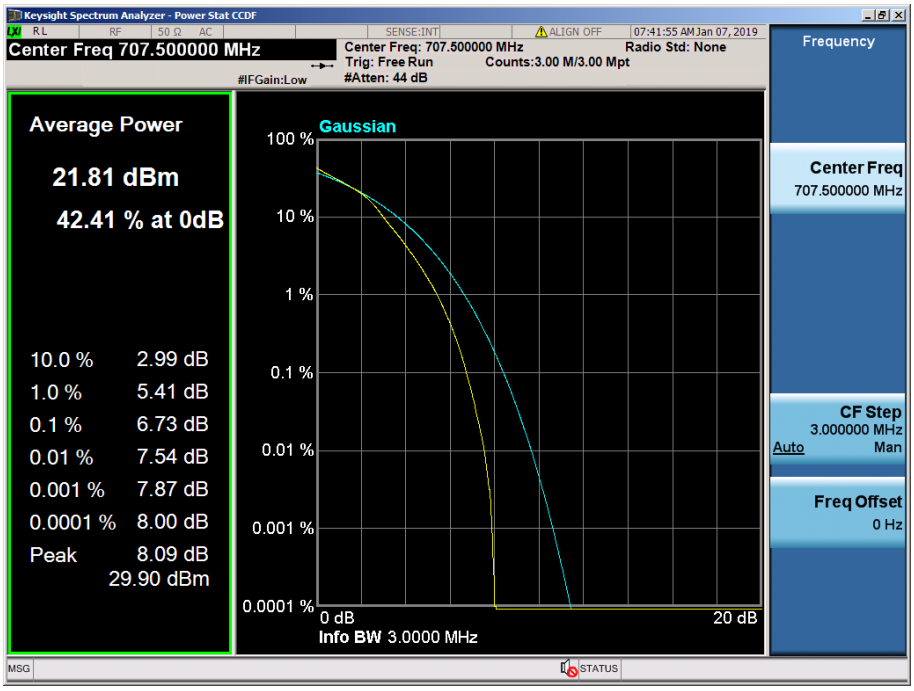


LTE Band 12, 17 / 5 MHz / 64QAM - RB Size 25

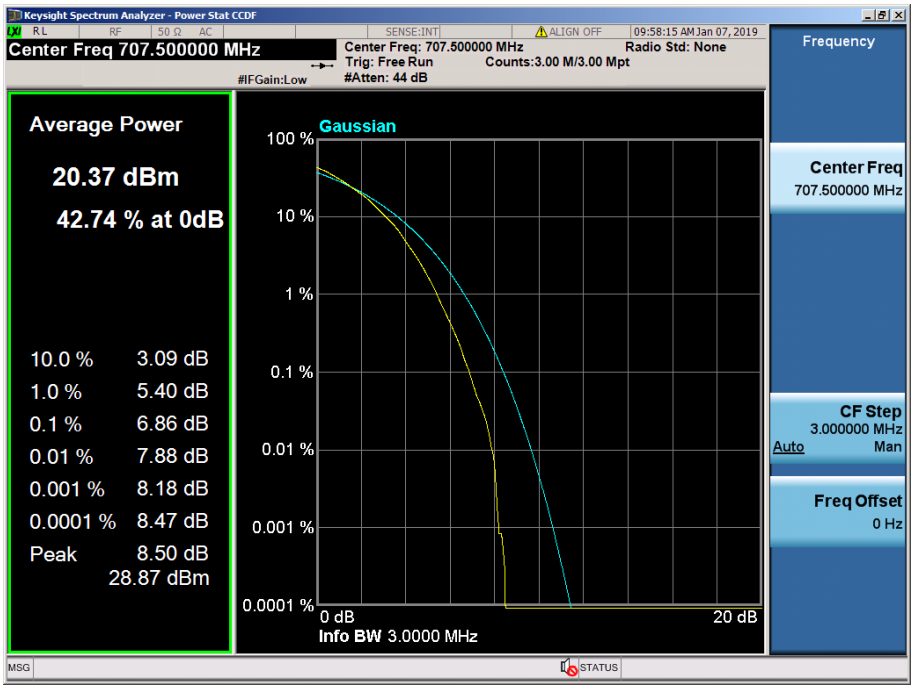
8.2.2 LTE Band 12



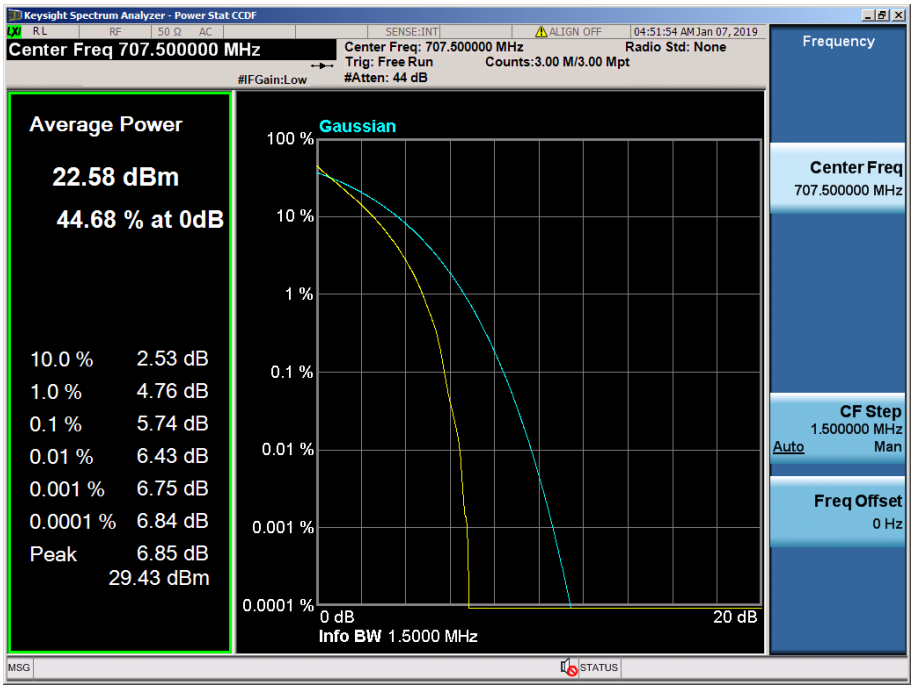
LTE Band 12 / 3 MHz / QPSK - RB Size 15



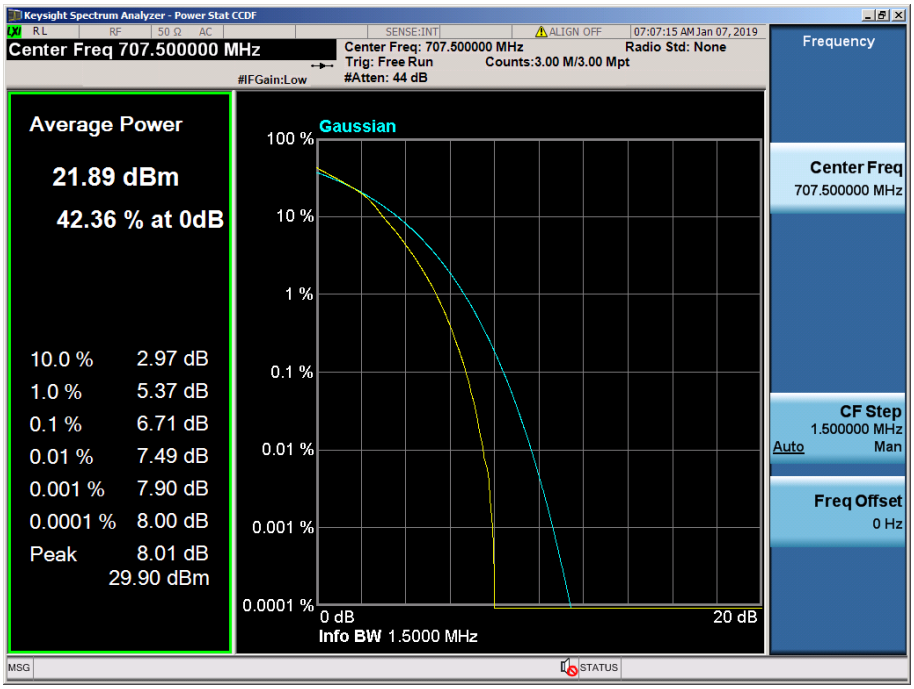
LTE Band 12 / 3 MHz / 16QAM - RB Size 15



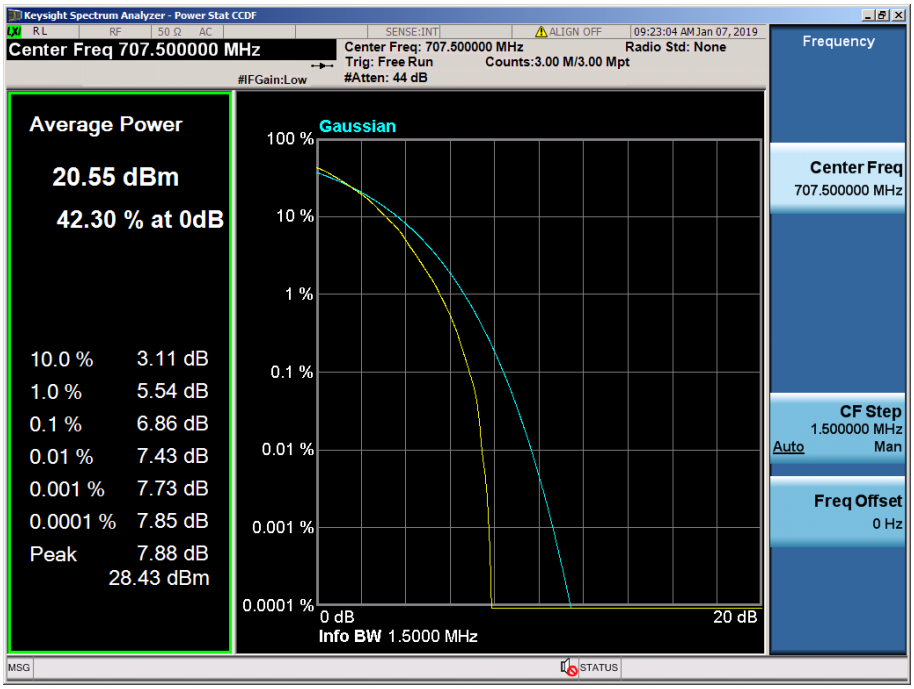
LTE Band 12 / 3 MHz / 64QAM - RB Size 15



LTE Band 12 / 1.4 MHz / QPSK - RB Size 6

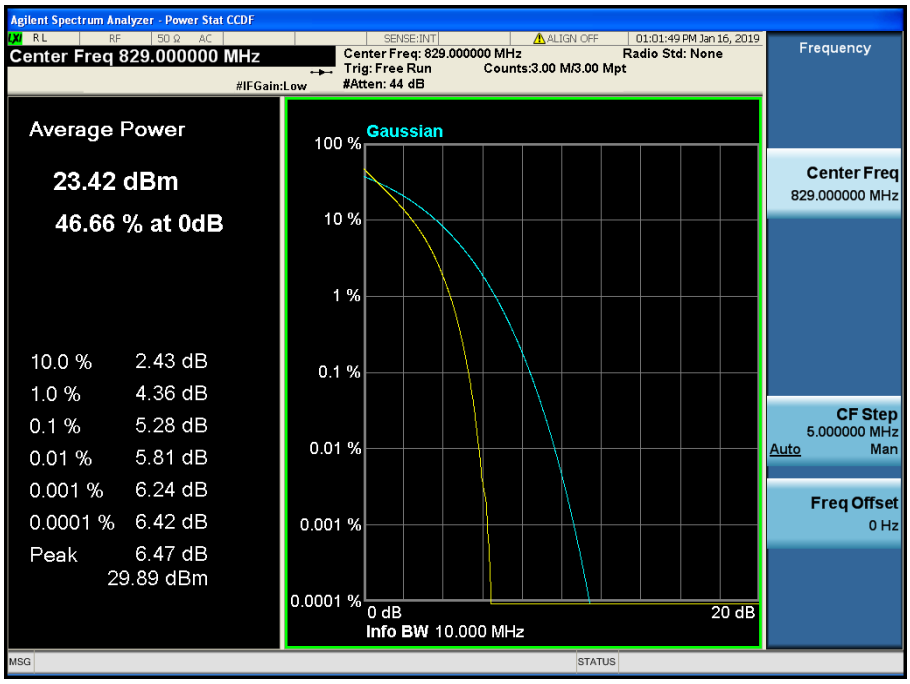


LTE Band 12 / 1.4 MHz / 16QAM - RB Size 6

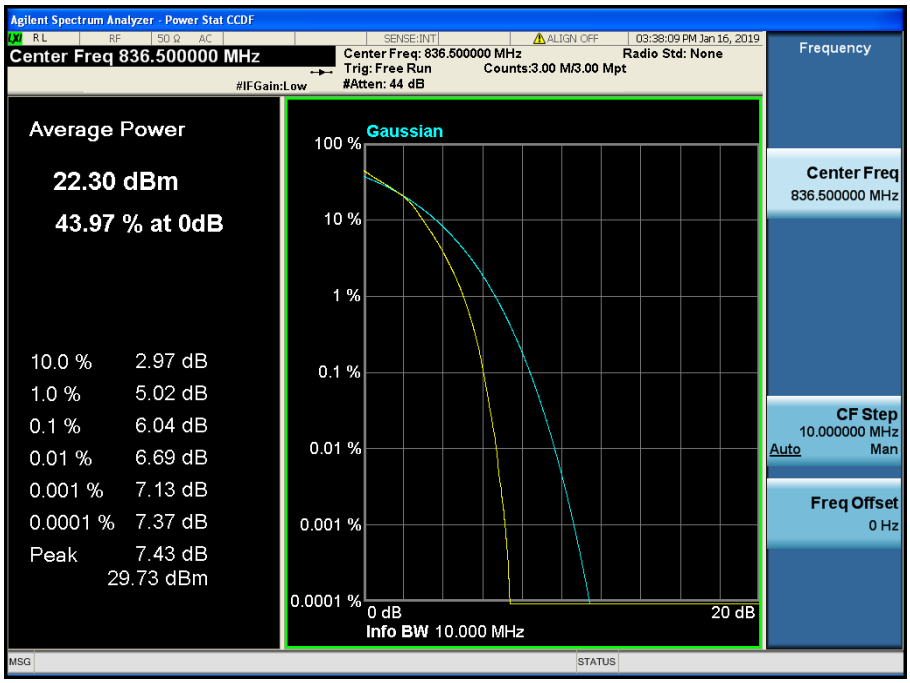


LTE Band 12 / 1.4 MHz / 64QAM - RB Size 6

8.2.3 LTE Band 5



LTE Band 5 / 10 MHz / QPSK - RB Size 50



LTE Band 5 / 10 MHz / 16QAM - RB Size 50