

RF TEST REPORT

Test item : LTE/CDMA(EVDO) Wireless Modem Module
Model No. : LTD-VL1000
Order No. : DEMC1406-02530
Date of receipt : 2014-06-24
Test duration : 2014-06-27 ~ 2014-08-14
Date of issue : 2014-08-14
Use of report : FCC Original Grant

Applicant : LG Innotek Co.,Ltd.
978-1, Jangduk-dong, Gwangsan-gu, Gwangju-City, South Korea

Test laboratory : DT&C Co., Ltd.
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935

Test specification : FCC Part 27
Test environment : See appended test report
Test result : Pass Fail

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DT&C Co., Ltd.

Tested by:



Engineer
JaeJin Lee

Reviewed by:



General Manager
Geunki Son

Test Report Version

| Test Report No. | Date | Description |
|--------------------|---------------|---|
| DRTFCC1408-1021 | Aug. 11, 2014 | Initial issue |
| DRTFCC1408-1021(1) | Aug. 14, 2014 | Re-test of BE extended LTE Band 4 OBW 3MHz High Ch (1753.5MHz) Revised the Effective Radiated Power |
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1. GENERAL INFORMATION

Applicant Name: LG Innotek Co.,Ltd.

Address: 978-1, Jangduk-dong, Gwangsan-gu, Gwangju-City, South Korea

FCC ID : YZP-VL1000
FCC Classification : PCS Licensed Transmitter (PCB)
EUT Type : LTE/CDMA(EVDO) Wireless Modem Module
Model Name : LTD-VL1000
Add Model Name : N/A
Supplying power : DC 3.8V
Antenna Type : Cellular & PCS band for CDMA 1x EVDO(Rev. A) : External type
 LTE for Band 13 and Band 4 : External type

| Mode | Tx Frequency (MHz) | Rx Frequency (MHz) | Emission Designator | Modulation | Conducted Power | |
|-------------|--------------------|--------------------|---------------------|------------|-----------------|---------------|
| | | | | | Max power (dBm) | Max power (W) |
| LTE Band 13 | 779.5 ~ 784.5 | 748.5 ~ 753.5 | 4M49G7D | QPSK | 23.28 | 0.213 |
| LTE Band 13 | 779.5 ~ 784.5 | 748.5 ~ 753.5 | 4M49W7D | 16QAM | 22.23 | 0.167 |
| LTE Band 13 | 782 | 751 | 8M94G7D | QPSK | 23.26 | 0.212 |
| LTE Band 13 | 782 | 751 | 8M92W7D | 16QAM | 22.22 | 0.167 |
| LTE Band 4 | 1710.7 ~ 1754.3 | 2110.7 ~ 2154.3 | 1M09G7D | QPSK | 23.50 | 0.224 |
| LTE Band 4 | 1710.7 ~ 1754.3 | 2110.7 ~ 2154.3 | 1M09W7D | 16QAM | 22.57 | 0.181 |
| LTE Band 4 | 1711.5 ~ 1753.5 | 2111.5 ~ 2153.5 | 2M68G7D | QPSK | 23.62 | 0.230 |
| LTE Band 4 | 1711.5 ~ 1753.5 | 2111.5 ~ 2153.5 | 2M69W7D | 16QAM | 22.62 | 0.183 |
| LTE Band 4 | 1712.5 ~ 1752.5 | 2112.5 ~ 2152.5 | 4M48G7D | QPSK | 23.90 | 0.245 |
| LTE Band 4 | 1712.5 ~ 1752.5 | 2112.5 ~ 2152.5 | 4M48W7D | 16QAM | 22.91 | 0.195 |
| LTE Band 4 | 1715 ~ 1750 | 2115 ~ 2150 | 8M95G7D | QPSK | 23.68 | 0.233 |
| LTE Band 4 | 1715 ~ 1750 | 2115 ~ 2150 | 8M92W7D | 16QAM | 22.88 | 0.194 |
| LTE Band 4 | 1717.5 ~ 1747.5 | 2117.5 ~ 2147.5 | 13M4G7D | QPSK | 23.67 | 0.233 |
| LTE Band 4 | 1717.5 ~ 1747.5 | 2117.5 ~ 2147.5 | 13M4W7D | 16QAM | 22.92 | 0.196 |
| LTE Band 4 | 1720 ~ 1745 | 2120 ~ 2145 | 17M9G7D | QPSK | 23.60 | 0.229 |
| LTE Band 4 | 1720 ~ 1745 | 2120 ~ 2145 | 17M9W7D | 16QAM | 22.83 | 0.195 |

2. INTRODUCTION

2.1. EUT DESCRIPTION

The Equipment Under Test(EUT) supports CDMA and EVDO(Rev. A) of Cellular/PCS bands and LTE(Band 4, 13). The EUT has below 2 transceivers.

1. CDMA 1x/ EVDO(Rev. A)
2. LTE

2.2. 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.

2.3. TEST FACILITY

The 3 & 10M test site and conducted measurement facility used to collect the radiated data are located at the 38, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935. The site is constructed in conformance with the requirements.

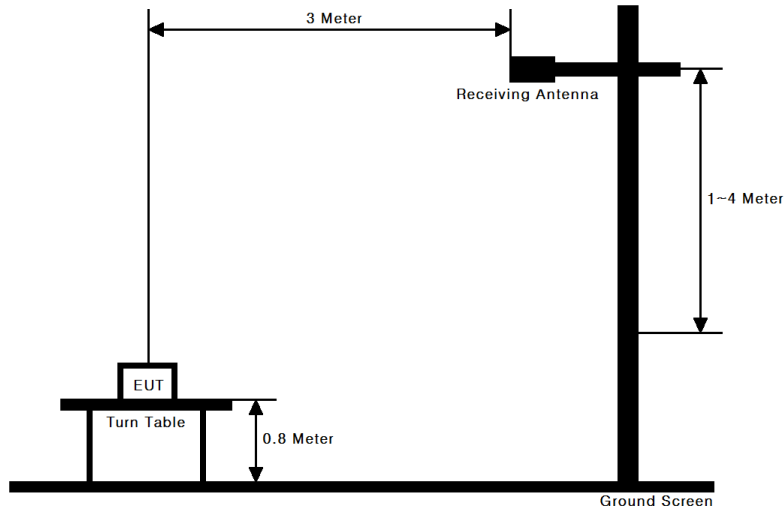
- 3 & 10M test site registration Number: 678747

3. DESCRIPTION OF TESTS

3.1 ERP & EIRP

(Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up



Test Procedure

These measurements were performed at 3 & 10m test site. The equipment under test is placed on a wooden turntable 0.8-meters above the ground plane and 3meters from the receive antenna.

Test setting

The spectrum Analyzer`s channel power function is enabled.

1. RBW = 1 ~ 5% of the expected OBW, not to exceed 1MHz & VBW ≥ 3 X RBW
2. Span = 1.5 times the OBW & Number of sweep point ≥ 2 X span / RBW
3. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the gating function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power.
4. Detector = RMS & RMS trace averaging over 100 sweeps for stabilizing

The receive 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.

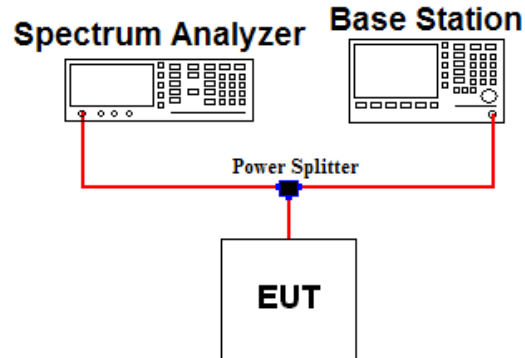
The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna`s terminal + Substitute Antenna gain

For readings above 1GHz, 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

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzer's 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.

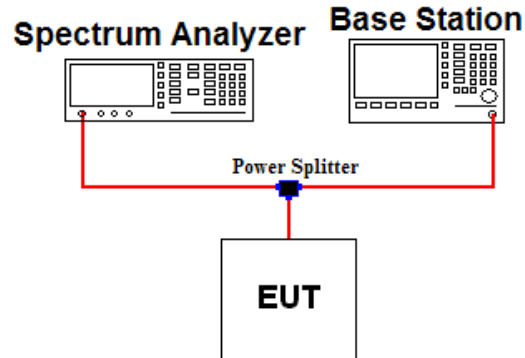
Test setting

The spectrum Analyzer's channel power function is enabled.

1. Set resolution/measurement bandwidth \geq signal's occupied 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 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 and set the measurement interval to a time that is less than or equal to the burst duration.
4. Record the maximum PAPR level associated with a probability of 0.1%

3.3 OCCUPIED BANDWIDTH.

Test set-up



Test Procedure

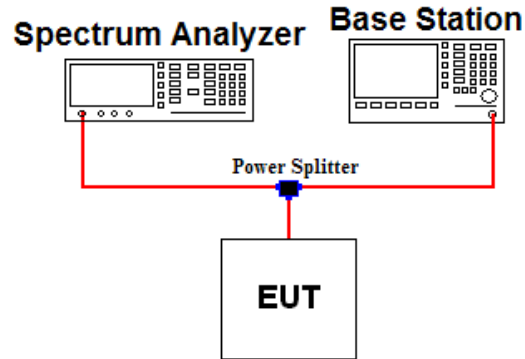
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

Test setting

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

3.4 UNDESIRABLE EMISSIONS (CONDUCTED)

Test set-up



Test Procedure

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 lowest channel with all modulations RB size and RB offsets. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB.

Test setting

1. RBW = 100kHz or 1MHz & VBW \geq 3MHz
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto & 1s for band edge
4. Number of sweep point $\geq 2 \times$ span / RBW
5. The trace was allowed to stabilize

The highest, lowest and a middle channel were tested for out of band measurements. the worst case data are reported in clause 8.3.

Note 1: In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter as employed to measure the out of band Emissions.

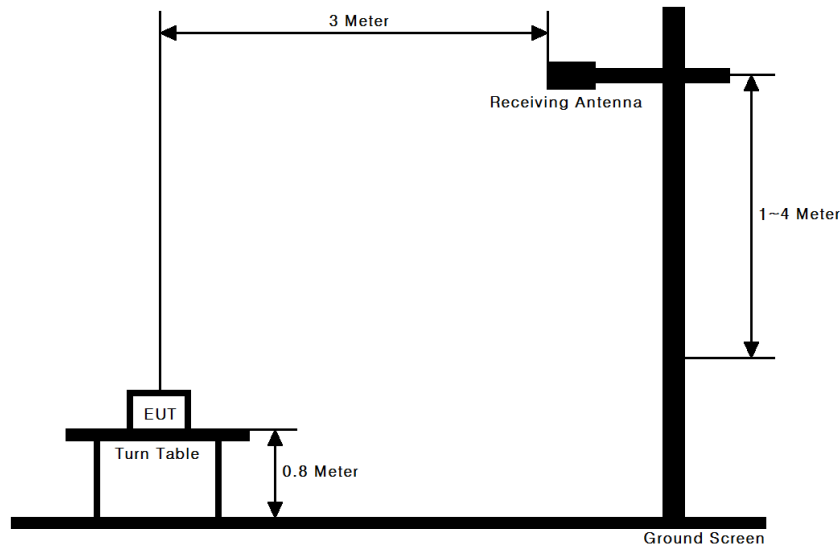
Note 2: Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for 776-788 MHz band, or 1 MHz or greater for AWS band. However, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30kHz may be employed for 776-788MHz band. 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 for AWS band.

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 3: For part 27.53(c)(4) measurement, the FCC limit is $65 + 10\log_{10}(P_{\text{[Watts]}}) = -35\text{dBm}$ in a 6.25kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25kHz with the available equipment, a bandwidth of 10kHz was used instead to show compliance. By using a 10kHz bandwidth, the limit was adjusted by $10\log_{10}(10\text{kHz}/6.25\text{kHz}) = 2.04\text{dB}$. Thus, the limit shown in all plots in the test bands was $-35\text{dBm} + 2.04\text{dB} = -32.96\text{dBm}$.

3.5 UNDESIRABLE EMISSIONS (RADIATED)

Test Set-up



Test Procedure

This measurement was performed at 3meter test range. The equipment under test is placed on a wooden turntable 0.8meters above the ground plane and 3meters from the receive antenna.

Test setting

The spectrum Analyzer`s channel power function is enabled.

1. RBW = 1 ~ 5% of the expected OBW, not to exceed 1MHz & VBW $\geq 3 \times$ RBW
2. Span = 1.5 times the OBW & Number of sweep point $\geq 2 \times$ span / RBW
3. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the gating function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power.
4. Detector = RMS & RMS trace averaging over 100 sweeps for stabilizing

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

For radiated power measurements below 1GHz, 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.

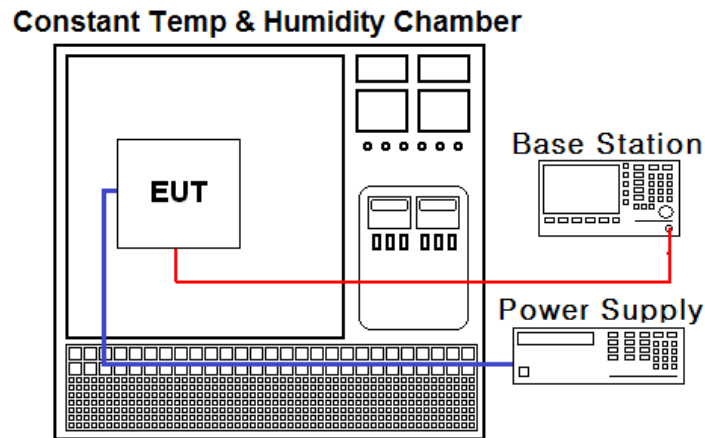
For radiated power measurements above 1GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic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

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

NOTE : For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

3.6 FREQUENCY STABILITY

Test Set-up



Test Procedure

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 battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification - the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature. (25°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 |
|------------------------------|---------------|-----------|------------------------|------------------------------|------------------|
| Multimeter | Fluke | 17B | 14/05/12 | 15/05/12 | 26030065WS |
| DC Power Supply | H.P | 66332A | 14/02/04 | 15/02/04 | GB37470200 |
| Power Splitter | Anritsu | K241B | 14/02/28 | 15/02/28 | 1301181 |
| Thermohygrometer | BODYCOM | BJ5478 | 14/03/03 | 15/03/03 | 1209 |
| Temp & Humi Test Chamber | SJ Science | SJ-TH-S50 | 13/10/22 | 14/10/22 | SJ-TH-S50-130930 |
| MXA Signal Analyzer | Agilent | N9020A | 13/09/24 | 14/09/24 | MY50200867 |
| PXA Signal Analyzer | Agilent | N9030A | 13/10/29 | 14/10/29 | MY53310140 |
| Signal Generator | Rohde Schwarz | SMF100A | 14/07/01 | 15/07/01 | 102341 |
| Vector Signal Generator | Rohde Schwarz | SMBV100A | 14/01/08 | 15/01/08 | 255571 |
| Dipole Antenna | Schwarzbeck | VHA9103 | 13/10/24 | 15/10/24 | 2116 |
| Dipole Antenna | Schwarzbeck | VHA9103 | 14/04/01 | 16/04/01 | 2117 |
| Dipole Antenna | Schwarzbeck | UHA9105 | 13/10/24 | 15/10/24 | 2261 |
| Dipole Antenna | Schwarzbeck | UHA9105 | 14/04/01 | 16/04/01 | 2262 |
| Bilog Antenna | SCHAFFNER | CBL6112B | 12/11/06 | 14/11/06 | 2737 |
| HORN ANT | ETS | 3115 | 14/02/26 | 16/02/26 | 6419 |
| HORN ANT | ETS | 3115 | 13/02/28 | 15/02/28 | 00021097 |
| Amplifier (22dB) | H.P | 8447E | 14/01/07 | 15/01/07 | 2945A02865 |
| Amplifier (30dB) | Agilent | 8449B | 14/02/27 | 15/02/27 | 3008A00370 |
| High-pass filter | Wainwright | WHKX1.0 | 13/09/12 | 14/09/12 | 9 |
| High-Pass Filter | Wainwright | WHNX2.1 | 13/09/12 | 14/09/12 | 1 |
| Radio Communication Analyzer | Anritsu | MT8820C | 14/01/10 | 15/01/10 | 6201274516 |

5. SUMMARY OF TEST RESULTS

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Status Note 1 | Reference |
|----------------------------------|--|---|----------------|---------------|-----------------------|
| 2.1046 | Conducted Output Power | N/A | Conducted | C | Section 7.1 |
| 2.1049 | Occupied Bandwidth | N/A | | C | Section 7.2, 8.1, 8.2 |
| 24.232(d) | Peak to Average Ratio | < 13dB | | C | Section 7.3, 8.3, 8.4 |
| 2.1051 27.53(c.2) 27.53(h) | Undesirable Emissions at band edge and for all out-of-band emissions | < 43+10log ₁₀ (P) dB | | C | Section 7.4, 8.5, 8.6 |
| 27.53(c.4) | Undesirable Emissions in 763 ~ 775MHz & 793 ~ 805MHz | < 65+10log ₁₀ (P) dB | | C | Section 7.4, 8.5 |
| 2.1055 27.54 | Frequency Stability | Fundamental emissions must stay within authorized frequency block | | C | Section 7.8 |
| 27.50(b.10) | Effective Radiated Power | < 3W ERP | Radiated | C | Section 7.5 |
| 27.50(d.4) | Equivalent Isotropic Radiated Power | < 1W EIRP | | C | Section 7.6 |
| 2.1051 27.53(c.2) 27.53(h) | Undesirable Emissions at band edge and for all out-of-band emissions | < 43+10log ₁₀ (P) dB | | C | Section 7.7 |
| 27.53(f) | Undesirable Emissions in 1559 ~ 1610MHz | < -70dBW/MHz (-40dBm/MHz) | | C | Section 7.7 |
| 27.53(c.4) | Undesirable Emissions in 763 ~ 775MHz & 793 ~ 805MHz | < 65+10log ₁₀ (P) dB | | C | Section 7.7 |

Note1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

The sample was tested according to the following specification:
ANSI/TIA/EIA-603-C-2004 and KDB 971168 D01 v02r01

6. SAMPLE CALCULATION

A. Emission Designator

LTE Band 13(QPSK)

Emission Designator = **8M94G7D**

LTE OBW = 8.944 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 13(16QAM)

Emission Designator = **8M92W7D**

LTE OBW = 8.921 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 4(QPSK)

Emission Designator = **17M88G7D**

LTE OBW = 17.880 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data Transmission

LTE Band 4(16QAM)

Emission Designator = **17M87W7D**

LTE OBW = 17.872 MHz

W = Amplitude/Angle Modulated

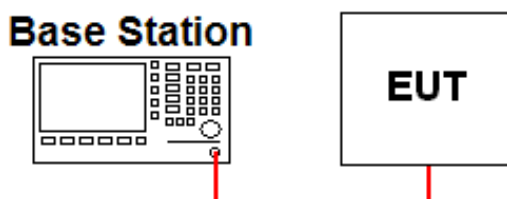
7 = Quantized/Digital Info

D = Data Transmission

7. TEST DATA

7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



▪ Band 13

| Conducted Power [dBm] | | | | | | | | | |
|-----------------------|------------|------------|-------|-------|-------|--------|-------|-------|---------|
| RB Alloc | | | 1 RB | | | MID RB | | | FULL RB |
| B.W(MHz) | Freq.(MHz) | Modulation | LOW | MID | HIGH | LOW | MID | HIGH | |
| 10 | 782 | QPSK | 23.26 | 23.08 | 22.83 | 21.82 | 21.89 | 21.81 | 21.63 |
| | | 16QAM | 22.22 | 22.18 | 22.06 | 20.85 | 20.95 | 20.84 | 20.67 |
| 5 | 779.5 | QPSK | 23.28 | 23.04 | 23.04 | 21.89 | 21.86 | 21.90 | 21.85 |
| | | 16QAM | 22.19 | 22.16 | 22.17 | 20.99 | 21.03 | 21.11 | 20.99 |
| | 784.5 | QPSK | 23.07 | 22.86 | 22.77 | 21.87 | 21.78 | 21.76 | 21.80 |
| | | 16QAM | 22.23 | 22.08 | 21.99 | 21.03 | 20.92 | 20.95 | 20.94 |

Note 1 : The conducted output power was measured using the Anritsu MT8820C

Note 2 : The number of Mid RB are used 25,12 for 10,5MHz B.W

▪ Band 4

| Conducted Power [dBm] | | | | | | | | | |
|-----------------------|------------|------------|-------|-------|-------|--------|-------|-------|---------|
| RB Alloc | | | 1 RB | | | MID RB | | | FULL RB |
| B.W(MHz) | Freq.(MHz) | Modulation | LOW | MID | HIGH | LOW | MID | HIGH | |
| 20 | 1720 | QPSK | 23.21 | 23.57 | 23.60 | 22.28 | 22.35 | 22.28 | 22.25 |
| | | 16QAM | 22.15 | 22.78 | 22.77 | 21.26 | 21.45 | 21.37 | 21.24 |
| | 1745 | QPSK | 23.23 | 23.60 | 23.25 | 22.10 | 22.18 | 22.24 | 22.10 |
| | | 16QAM | 22.26 | 22.83 | 22.48 | 21.03 | 21.18 | 21.22 | 21.16 |
| 15 | 1717.5 | QPSK | 23.29 | 23.67 | 23.59 | 22.10 | 22.37 | 22.28 | 22.26 |
| | | 16QAM | 22.20 | 22.88 | 22.61 | 21.18 | 21.42 | 21.35 | 21.20 |
| | 1732.5 | QPSK | 23.49 | 23.62 | 23.15 | 22.32 | 22.12 | 21.91 | 22.07 |
| | | 16QAM | 22.60 | 22.53 | 22.31 | 21.42 | 21.24 | 21.06 | 21.12 |
| | 1747.5 | QPSK | 23.30 | 23.62 | 23.33 | 22.27 | 22.33 | 22.26 | 22.15 |
| | | 16QAM | 22.36 | 22.92 | 22.52 | 21.30 | 21.43 | 21.28 | 21.19 |
| 10 | 1715 | QPSK | 22.94 | 23.57 | 23.54 | 22.04 | 22.45 | 22.49 | 22.15 |
| | | 16QAM | 22.06 | 22.72 | 22.85 | 20.96 | 21.39 | 21.52 | 21.16 |
| | 1732.5 | QPSK | 23.66 | 23.68 | 23.25 | 22.38 | 22.24 | 22.13 | 22.18 |
| | | 16QAM | 22.88 | 22.54 | 22.18 | 21.44 | 21.41 | 21.20 | 21.23 |
| | 1750 | QPSK | 23.61 | 23.63 | 23.20 | 22.50 | 22.38 | 22.28 | 22.23 |
| | | 16QAM | 22.71 | 22.69 | 22.63 | 21.62 | 21.48 | 21.27 | 21.21 |
| 5 | 1712.5 | QPSK | 23.12 | 23.10 | 23.66 | 21.96 | 22.03 | 22.13 | 22.00 |
| | | 16QAM | 21.97 | 22.38 | 22.89 | 21.05 | 21.18 | 21.31 | 21.05 |
| | 1732.5 | QPSK | 23.55 | 23.48 | 23.56 | 22.45 | 22.27 | 22.32 | 22.44 |
| | | 16QAM | 22.63 | 22.60 | 22.29 | 21.48 | 21.43 | 21.38 | 21.40 |
| | 1752.5 | QPSK | 23.90 | 23.32 | 23.27 | 22.37 | 22.27 | 22.40 | 22.33 |
| | | 16QAM | 22.91 | 22.55 | 22.42 | 21.39 | 21.33 | 21.33 | 21.25 |
| 3 | 1711.5 | QPSK | 23.16 | 22.94 | 23.08 | 21.98 | 21.90 | 21.87 | 21.88 |
| | | 16QAM | 22.06 | 22.19 | 22.22 | 20.98 | 20.89 | 20.92 | 20.87 |
| | 1732.5 | QPSK | 23.62 | 23.44 | 23.60 | 22.33 | 22.36 | 22.34 | 22.41 |
| | | 16QAM | 22.62 | 22.61 | 22.39 | 21.45 | 21.42 | 21.39 | 21.54 |
| | 1753.5 | QPSK | 23.31 | 23.28 | 23.24 | 22.21 | 22.33 | 22.32 | 22.32 |
| | | 16QAM | 22.48 | 22.55 | 22.42 | 21.31 | 21.28 | 21.28 | 21.27 |
| 1.4 | 1710.7 | QPSK | 22.93 | 22.88 | 22.92 | 22.80 | 22.85 | 22.85 | 21.94 |
| | | 16QAM | 22.13 | 22.21 | 22.20 | 22.17 | 22.23 | 22.23 | 21.10 |
| | 1732.5 | QPSK | 23.36 | 23.43 | 23.50 | 23.25 | 23.33 | 23.39 | 22.32 |
| | | 16QAM | 22.51 | 22.57 | 22.57 | 22.36 | 22.45 | 22.47 | 21.60 |
| | 1754.3 | QPSK | 23.35 | 23.29 | 23.27 | 23.22 | 23.18 | 23.17 | 22.30 |
| | | 16QAM | 22.56 | 22.45 | 22.48 | 22.43 | 22.26 | 22.33 | 21.35 |

Note 1 : The conducted output power was measured using the Anritsu MT8820C

Note 2 : The number of Mid RB are used 50,36,25,12,8,3 for 20,15,10,5,3,1.4MHz B.W

7.2 OCCUPIED BANDWIDTH

| Band | B.W (MHz) | Frequency (MHz) | Modulation | Test Result (MHz) |
|-------------|-----------|-----------------|------------|-------------------|
| LTE Band 13 | 10 | 782 | QPSK | 8.944 |
| | | | 16QAM | 8.921 |
| | 5 | 779.5 | QPSK | 4.486 |
| | | | 16QAM | 4.475 |
| | | 784.5 | QPSK | 4.474 |
| | | | 16QAM | 4.493 |

| Band | B.W (MHz) | Frequency (MHz) | Modulation | Test Result (MHz) |
|------------|-----------|-----------------|------------|-------------------|
| LTE Band 4 | 20 | 1720 | QPSK | 17.860 |
| | | | 16QAM | 17.839 |
| | | 1745 | QPSK | 17.880 |
| | | | 16QAM | 17.872 |
| | 15 | 1717.5 | QPSK | 13.395 |
| | | | 16QAM | 13.387 |
| | | 1732.5 | QPSK | 13.398 |
| | | | 16QAM | 13.411 |
| | | 1747.5 | QPSK | 13.412 |
| | | | 16QAM | 13.412 |
| | 10 | 1715 | QPSK | 8.943 |
| | | | 16QAM | 8.922 |
| | | 1732.5 | QPSK | 8.927 |
| | | | 16QAM | 8.914 |
| | 5 | 1712.5 | QPSK | 4.474 |
| | | | 16QAM | 4.478 |
| | | 1732.5 | QPSK | 4.480 |
| | | | 16QAM | 4.469 |
| | 3 | 1752.5 | QPSK | 4.467 |
| | | | 16QAM | 4.474 |
| | | 1711.5 | QPSK | 2.683 |
| | | | 16QAM | 2.689 |
| | 1.4 | 1732.5 | QPSK | 2.684 |
| | | | 16QAM | 2.678 |
| | | 1753.5 | QPSK | 2.683 |
| | | | 16QAM | 2.692 |
| | 1.4 | 1710.7 | QPSK | 1.086 |
| | | | 16QAM | 1.089 |
| | | 1732.5 | QPSK | 1.087 |
| | | | 16QAM | 1.088 |
| | 1754.3 | 16QAM | 1.090 | |
| | | QPSK | 1.085 | |

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

7.3 PEAK TO AVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.3

7.4 UNDESIRABLE EMISSIONS (CONDUCTED)

- Plots of the EUT's Conducted Spurious Emissions are shown in Clause 8.5

7.5 EFFECTIVE RADIATED POWER (LTE Band 13)

| Band | Mode | Maximum Output Power(dBm) | Antenna Gain (dBd) | ERP (dBm) | LIMIT (dBm) |
|------|-------|---------------------------|--------------------|-----------|-------------|
| 13 | QPSK | 25.70 | 3.16 | 28.86 | 34.77 |
| 13 | 16QAM | 25.70 | 3.16 | 28.86 | 34.77 |

Note 1 : The maximum output power used max tune-up power.

Note 2 : Available max Antenna gain is 5.31dBi in Band13 of LTE, and compliant with MPE requirement.

7.6 EQUIVALENT ISOTROPIC RADIATED POWER (LTE Band 4)

| Band | Mode | Maximum Output Power(dBm) | Antenna Gain (dBi) | EIRP (dBm) | LIMIT (dBm) |
|------|-------|---------------------------|--------------------|------------|-------------|
| 4 | QPSK | 25.70 | 4.29 | 29.99 | 30.00 |
| 4 | 16QAM | 25.70 | 4.29 | 29.99 | 30.00 |

Note 1 : The maximum output power used max tune-up power.

Note 2 : Available max Antenna gain is 4.29dBi in Band4 of LTE, and compliant with MPE requirement.

7.7 UNDESIRABLE EMISSIONS (RADIATED)

7.7.1 UNDESIRABLE EMISSIONS (LTE Band 13)

| B.W (MHz) | Test Freq. (MHz) | RB Offset/ Size | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBd) | Result (dBm) | Margin (dB) | Limit (dBm) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------------|-------------|-------------|
| 10 | 782 | 0/1 | QPSK | 1555.18 | X | H | -65.44 | 6.39 | -59.05 | 46.05 | -13 |
| | | | | 3110.63 | Y | H | -61.62 | 7.76 | -53.86 | 40.86 | |
| 5 | 779.5 | 0/1 | QPSK | 1554.78 | X | H | -68.55 | 6.39 | -62.16 | 49.16 | |
| | | | | 3109.41 | Y | H | -63.59 | 7.76 | -55.83 | 42.83 | |
| | 784.5 | 0/1 | QPSK | 3129.51 | Y | H | -63.44 | 7.76 | -55.68 | 42.68 | |
| | | | | - | - | - | - | - | - | - | |

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

Note 2: This device was tested under all modulations, RB size and RB offsets and the worst case data are reported in the table above. (The worst case mode is the QPSK modulation type with RB Size 1)

Note 3: No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.7.2 UNDESIRABLE EMISSIONS IN 763 ~ 775 MHz & 793 ~ 805 MHz(LTE Band 13)

| B.W (MHz) | Test Freq. (MHz) | RB Offset/ Size | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBd) | Result (dBm) | Margin (dB) | Limit (dBm) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------------|-------------|-------------|
| 10 | 782 | 0/1 | QPSK | 773.30 | Y | V | -40.61 | 1.20 | -39.41 | 4.41 | -35 |
| | | | | 804.25 | Y | V | -52.13 | 1.17 | -50.96 | 15.96 | |
| 5 | 779.5 | 0/1 | QPSK | 774.50 | Y | V | -47.33 | 1.20 | -46.13 | 11.13 | |
| | | | | 796.35 | Y | V | -51.86 | 1.17 | -50.69 | 15.69 | |
| | 784.5 | 0/1 | QPSK | 772.52 | Y | V | -51.21 | 1.20 | -50.01 | 15.01 | |
| | | | | 793.63 | Y | V | -52.19 | 1.18 | -51.01 | 16.01 | |

Note 1 : This device was tested under all modulations, RB size and RB offsets and the worst case data are reported in the table above. (The worst case mode is the QPSK modulation type with RB Size 1)

Note 2 : For part 27.53(c)(4) measurement, the FCC limit is $65 + 10\log_{10}(P_{[Watts]}) = -35\text{dBm}$ in a 6.25kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25kHz with the available equipment, a bandwidth of 10kHz was used instead to show compliance. By using a 10kHz bandwidth, the result was adjusted by $10\log_{10}(10\text{kHz}/6.25\text{kHz}) = 2.04\text{dB}$.

Note 3 : No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.7.3 UNDESIRABLE EMISSIONS IN 1559 ~ 1610 MHz(LTE Band 13)

| B.W (MHz) | Test Freq. (MHz) | RB Offset/ Size | Test Mode | Freq.(MHz) | EUT (Axis) | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result (dBm) | Margin (dB) | Limit (dBm/MHz) |
|-----------|------------------|-----------------|-----------|------------|------------|---------------|---------------------------|------------------|--------------|-------------|-----------------|
| 10 | 782 | 0/49 | QPSK | 1573.46 | X | H | -65.57 | 8.57 | -57.00 | 17.00 | -40.00 |
| | | | | | | | | | | | |
| 5 | 779.5 | 0/24 | QPSK | 1564.02 | X | H | -67.76 | 8.55 | -59.21 | 19.21 | |
| | | | | | | | | | | | |
| | 784.5 | 0/1 | QPSK | 1564.83 | X | H | -66.83 | 8.56 | -58.27 | 18.27 | |
| | | | | | | | | | | | |

Note 1 : This device was tested under all modulations, RB size and RB offsets and the worst case data are reported in the table above. (The worst case mode is the QPSK modulation type with RB Size 1 and Full RB)

Note 2 : No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.7.4 UNDESIRABLE EMISSIONS (LTE Band 4)

| B.W (MHz) | Test Freq. (MHz) | RB Offset/ Size | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result (dBm) | Margin (dB) | Limit (dBm) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------------|-------------|-------------|
| 20 | 1720 | 99/1 | QPSK | 3457.77 | X | V | -51.05 | 9.97 | -41.08 | 28.08 | -13 |
| | | | | 5186.81 | Z | H | -52.26 | 10.86 | -41.40 | 28.40 | |
| | 1745 | 50/1 | QPSK | 3440.28 | X | V | -51.74 | 9.97 | -41.77 | 28.77 | |
| | | | | 5234.71 | Z | H | -55.36 | 10.88 | -44.48 | 31.48 | |
| 15 | 1717.5 | 37/1 | QPSK | 3435.04 | X | V | -53.72 | 9.97 | -43.75 | 30.75 | |
| | | | | 5152.48 | Y | V | -55.96 | 10.85 | -45.11 | 32.11 | |
| | 1732.5 | 37/1 | QPSK | 3464.97 | Z | V | -52.98 | 9.97 | -43.01 | 30.01 | |
| | | | | 5197.45 | Y | H | -57.70 | 10.87 | -46.83 | 33.83 | |
| | 1747.5 | 37/1 | QPSK | 3495.03 | X | V | -53.00 | 9.98 | -43.02 | 30.02 | |
| | | | | 5242.36 | Z | H | -53.13 | 10.89 | -42.24 | 29.24 | |
| 10 | 1715 | 25/1 | QPSK | 3430.22 | X | V | -52.66 | 9.97 | -42.69 | 29.69 | |
| | | | | 5137.87 | Y | V | -58.27 | 10.85 | -47.42 | 34.42 | |
| | 1732.5 | 25/1 | QPSK | 3465.25 | Z | V | -51.05 | 9.97 | -41.08 | 28.08 | |
| | | | | 5197.91 | Y | H | -54.30 | 10.87 | -43.43 | 30.43 | |
| | 1750 | 25/1 | QPSK | 3500.22 | X | V | -52.01 | 9.98 | -42.03 | 29.03 | |
| | | | | 5250.34 | Z | H | -55.29 | 10.89 | -44.40 | 31.40 | |
| 5 | 1712.5 | 24/1 | QPSK | 3429.29 | X | H | -51.77 | 9.97 | -41.80 | 28.80 | |
| | | | | 5143.90 | Y | V | -56.49 | 10.85 | -45.64 | 32.64 | |
| | 1732.5 | 24/1 | QPSK | 3469.39 | Z | V | -50.88 | 9.97 | -40.91 | 27.91 | |
| | | | | 5204.05 | Y | H | -54.52 | 10.87 | -43.65 | 30.65 | |
| | 1752.5 | 0/1 | QPSK | 3500.74 | X | V | -52.47 | 9.98 | -42.49 | 29.49 | |
| | | | | 5251.15 | Z | H | -56.59 | 10.89 | -45.70 | 32.70 | |
| 3 | 1711.5 | 0/1 | QPSK | 3420.49 | X | H | -53.38 | 9.97 | -43.41 | 30.41 | |
| | | | | 5130.75 | Y | V | -56.22 | 10.84 | -45.38 | 32.38 | |
| | 1732.5 | 0/1 | QPSK | 3462.45 | Z | V | -52.12 | 9.97 | -42.15 | 29.15 | |
| | | | | 3504.49 | Y | H | -51.81 | 9.98 | -41.83 | 28.83 | |
| | 1753.5 | 0/1 | QPSK | 3504.49 | X | V | -53.66 | 9.98 | -43.68 | 30.68 | |
| | | | | 5256.71 | Z | H | -55.05 | 10.89 | -44.16 | 31.16 | |
| 1.4 | 1710.7 | 0/1 | QPSK | 3420.48 | X | H | -52.16 | 9.97 | -42.19 | 29.19 | |
| | | | | 5130.70 | Y | V | -56.47 | 10.84 | -45.63 | 32.63 | |
| | 1732.5 | 5/1 | QPSK | 3465.85 | Z | V | -50.24 | 9.97 | -40.27 | 27.27 | |
| | | | | 5198.85 | Y | H | -52.41 | 10.87 | -41.54 | 28.54 | |
| | 1754.3 | 0/1 | QPSK | 3507.62 | X | V | -50.41 | 9.97 | -40.44 | 27.44 | |
| | | | | 5261.50 | Z | H | -51.49 | 10.89 | -40.60 | 27.60 | |

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

Note 2 : This device was tested under all modulations, RB size and RB offsets and the worst case data are reported in the table above. (The worst case mode is the QPSK modulation type with RB Size 1)

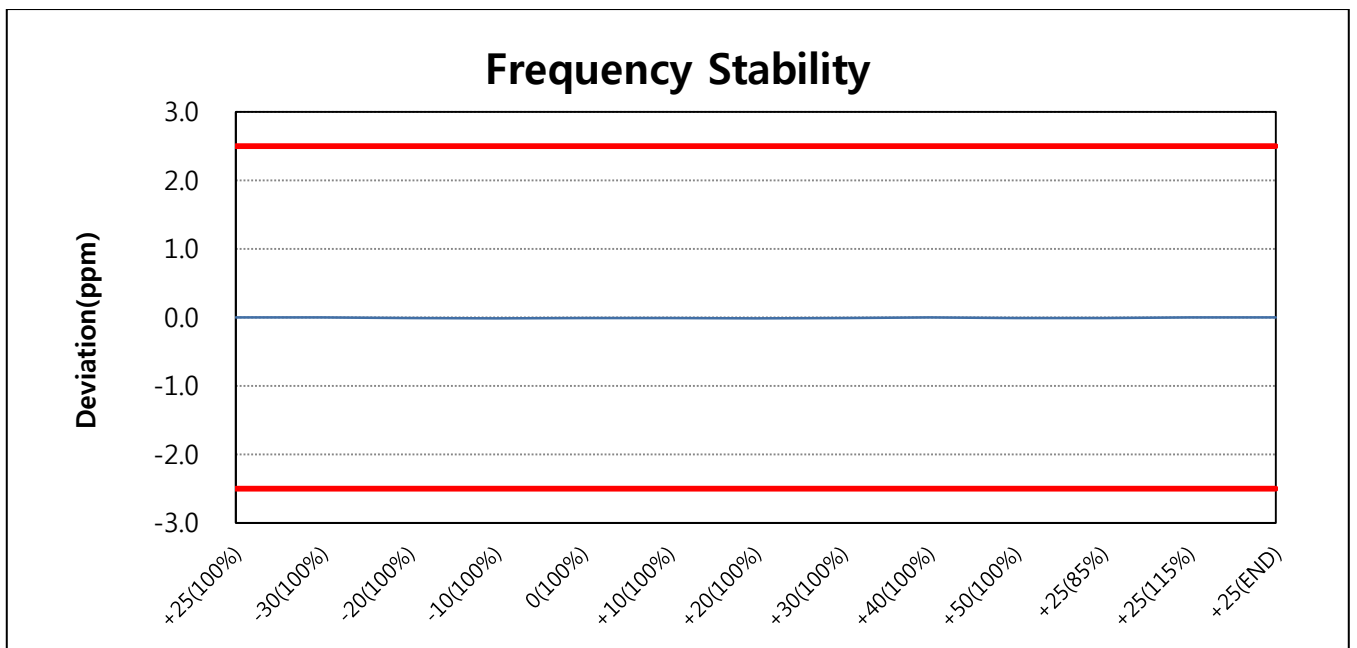
Note 3 : No other spurious and harmonic emissions were reported greater than listed emissions above table.

7.8 FREQUENCY STABILITY

7.8.1 FREQUENCY STABILITY (LTE Band 13)

OPERATING FREQUENCY : 782,000,000 Hz
 CHANNEL : 23230
 REFERENCE VOLTAGE : 3.8 V DC
 DEVIATION LIMIT : $\pm 0.00025\%$ or 2.5 ppm

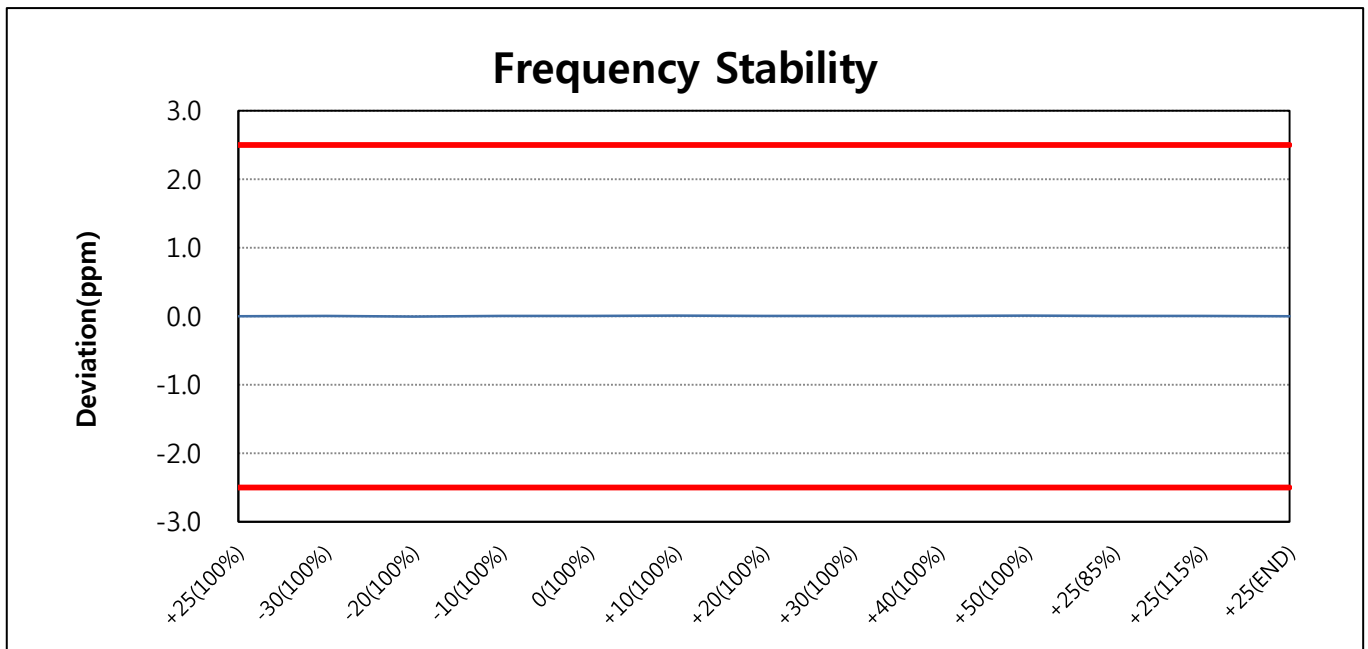
| VOLTAGE (%) | POWER (V DC) | TEMP (°C) | FREquency (Hz) | FREQ.Dev (Hz) | Deviation | |
|---------------|--------------|-----------|----------------|---------------|-----------|-------------|
| | | | | | (ppm) | (%) |
| 100% | 3.8 | +25(Ref) | 782,000,005 | 5 | 0.0 | 0 |
| 100% | | -30 | 782,000,003 | 3 | -0.0017 | -0.00000017 |
| 100% | | -20 | 781,999,997 | -3 | -0.0098 | -0.00000098 |
| 100% | | -10 | 781,999,996 | -4 | -0.0113 | -0.00000113 |
| 100% | | 0 | 781,999,996 | -4 | -0.0107 | -0.00000107 |
| 100% | | 10 | 781,999,996 | -4 | -0.0105 | -0.00000105 |
| 100% | | 20 | 781,999,995 | -5 | -0.0123 | -0.00000123 |
| 100% | | 30 | 781,999,998 | -2 | -0.0088 | -0.00000088 |
| 100% | | 40 | 782,000,003 | 3 | -0.0015 | -0.00000015 |
| 100% | | 50 | 781,999,998 | -2 | -0.0087 | -0.00000087 |
| 85% | | 3.23 | 25 | 781,999,997 | -3 | -0.0101 |
| 115% | 4.37 | 25 | 782,000,004 | 4 | -0.0012 | -0.00000012 |
| BATT.ENDPOINT | - | - | - | - | - | - |



7.8.2 FREQUENCY STABILITY (LTE Band 4)

OPERATING FREQUENCY : 1,732,500,000 Hz
 CHANNEL : 20175
 REFERENCE VOLTAGE : 3.8 V DC
 DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

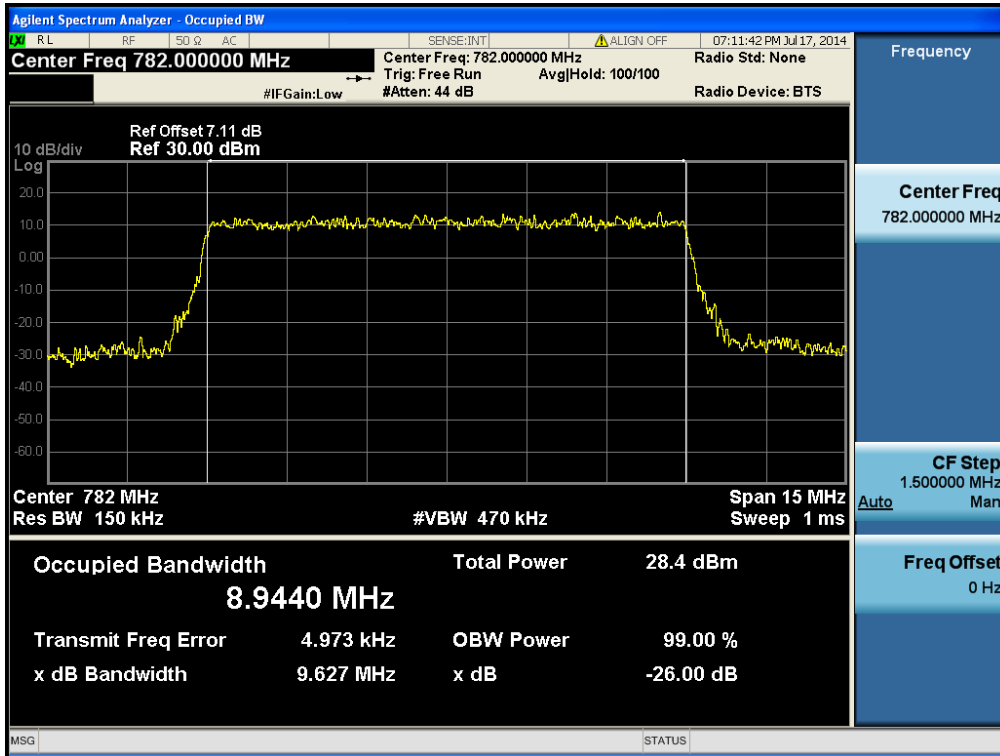
| VOLTAGE (%) | POWER (V DC) | TEMP (°C) | FREQUENCY (Hz) | FREQ.Dev (Hz) | Deviation | |
|---------------|--------------|-----------|----------------|---------------|-----------|-------------|
| | | | | | (ppm) | (%) |
| 100% | 3.8 | +25(Ref) | 1,732,499,995 | -5 | 0.0 | 0 |
| 100% | | -30 | 1,732,500,003 | 3 | 0.0048 | 0.00000048 |
| 100% | | -20 | 1,732,499,990 | -10 | -0.0028 | -0.00000028 |
| 100% | | -10 | 1,732,500,006 | 6 | 0.0064 | 0.00000064 |
| 100% | | 0 | 1,732,500,006 | 6 | 0.0066 | 0.00000066 |
| 100% | | 10 | 1,732,500,012 | 12 | 0.0097 | 0.00000097 |
| 100% | | 20 | 1,732,500,007 | 7 | 0.0071 | 0.00000071 |
| 100% | | 30 | 1,732,500,005 | 5 | 0.0057 | 0.00000057 |
| 100% | | 40 | 1,732,500,005 | 5 | 0.0057 | 0.00000057 |
| 100% | | 50 | 1,732,500,009 | 9 | 0.0083 | 0.00000083 |
| 85% | | 3.23 | 25 | 1,732,500,004 | 4 | 0.0052 |
| 115% | 4.37 | 25 | 1,732,500,007 | 7 | 0.0072 | 0.00000072 |
| BATT.ENDPOINT | - | - | - | - | - | - |



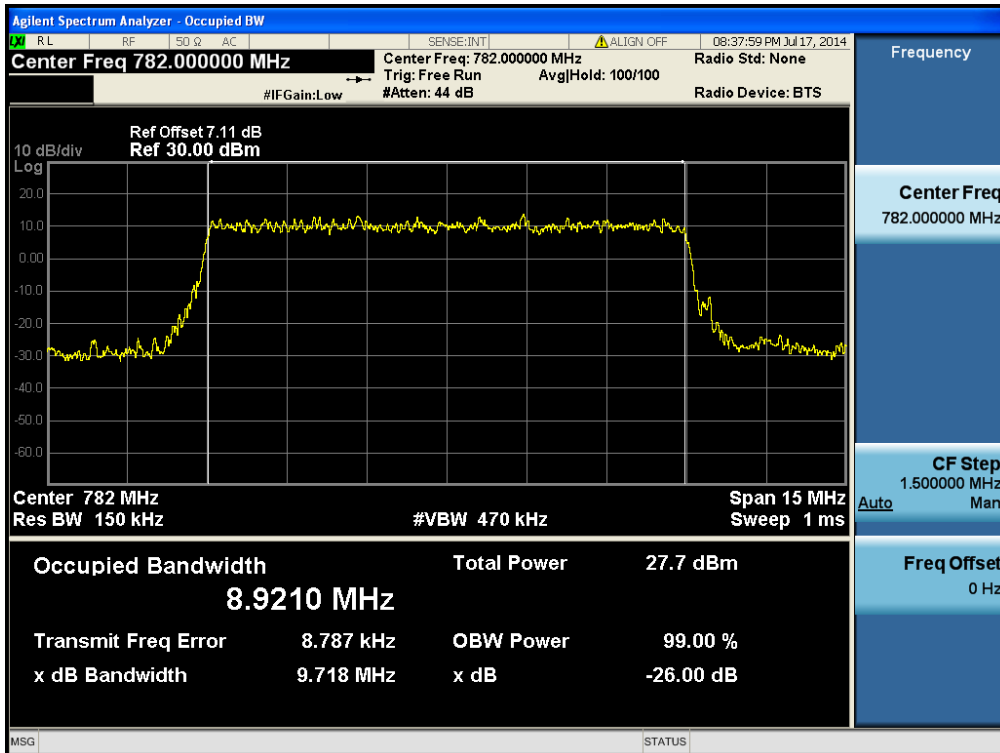
8. TEST PLOTS

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

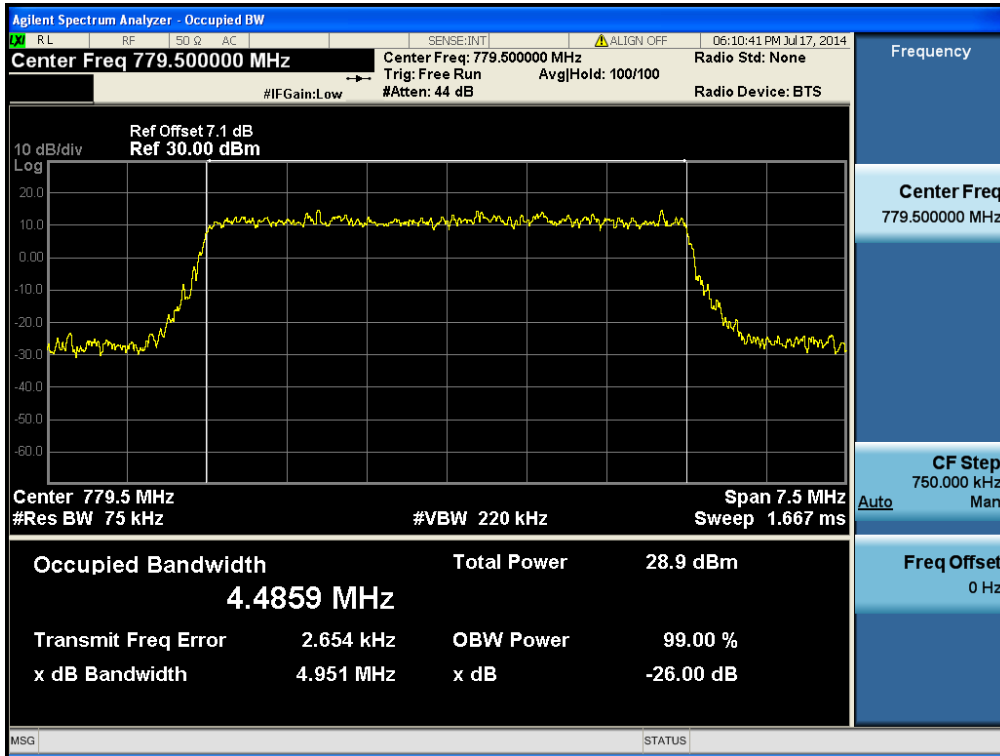
8.1 OCCUPIED BANDWIDTH (LTE Band 13)



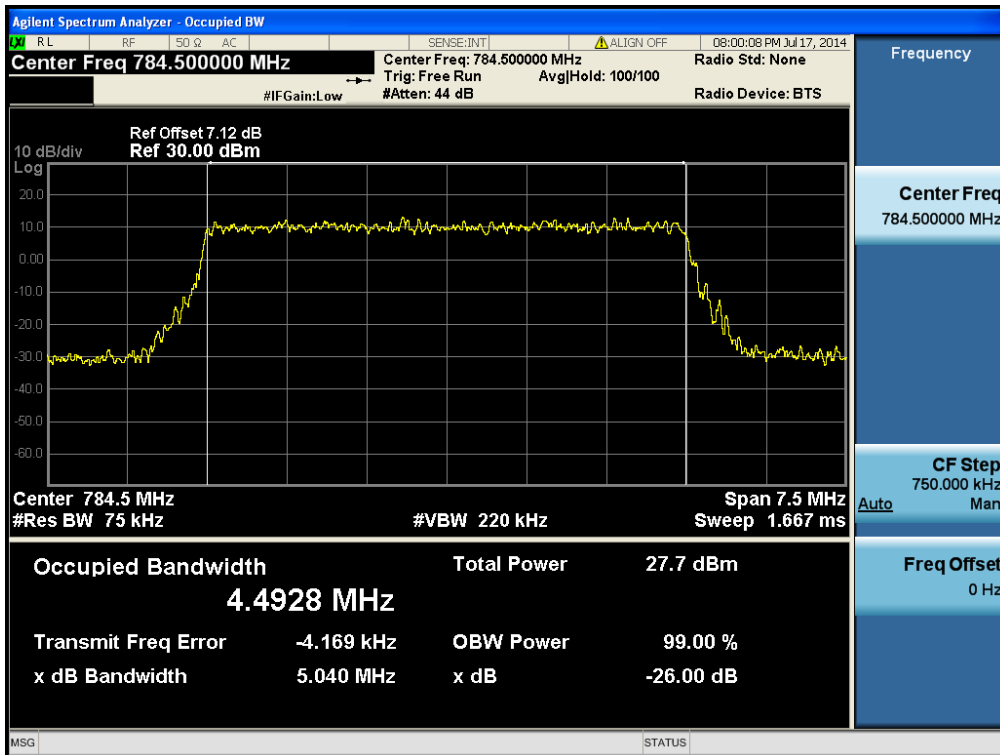
LTE Band 13 / 10MHz / QPSK - RB Size 50



LTE Band 13 / 10MHz / 16QAM - RB Size 50

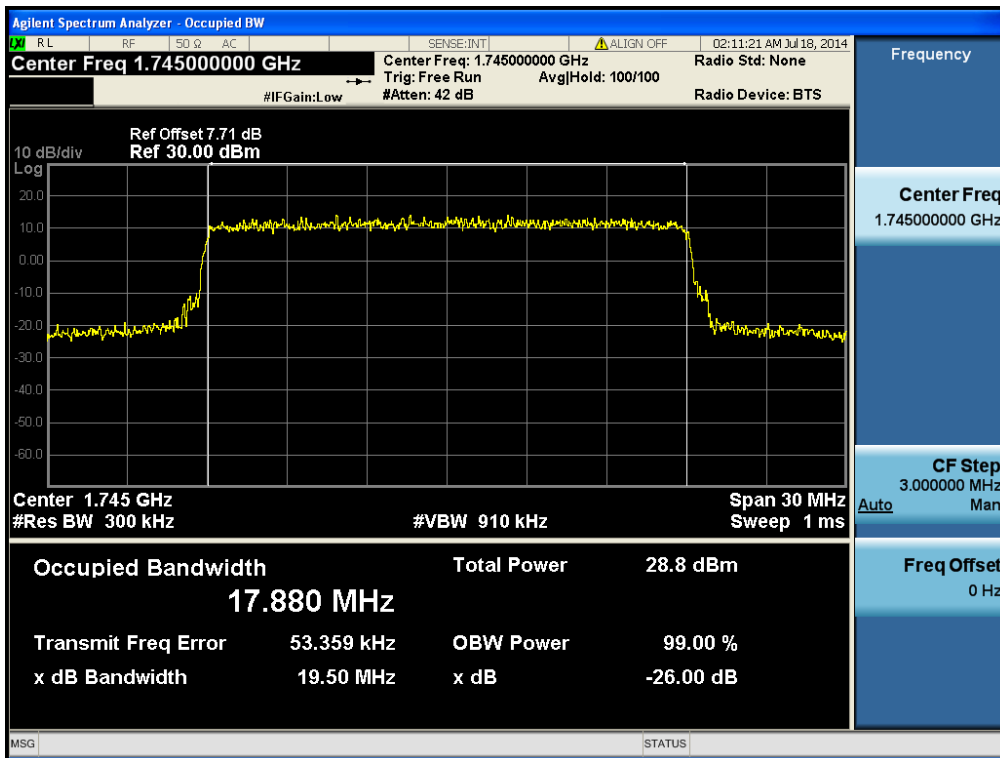


LTE Band 13 / 5MHz / QPSK - RB Size 25

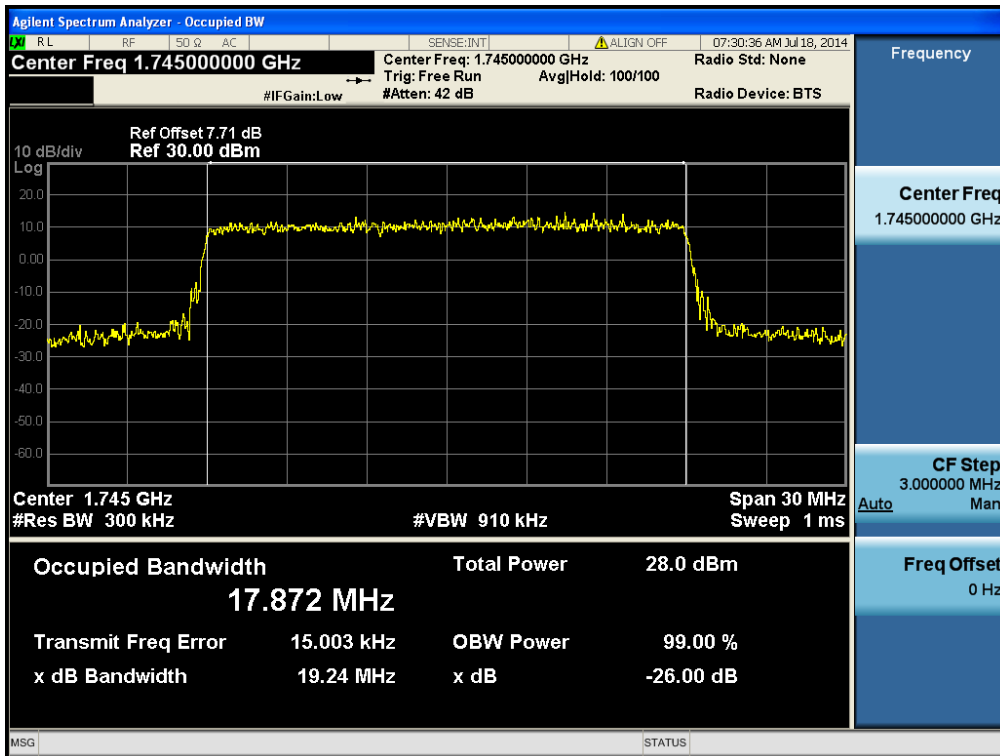


LTE Band 13 / 5MHz / 16QAM - RB Size 25

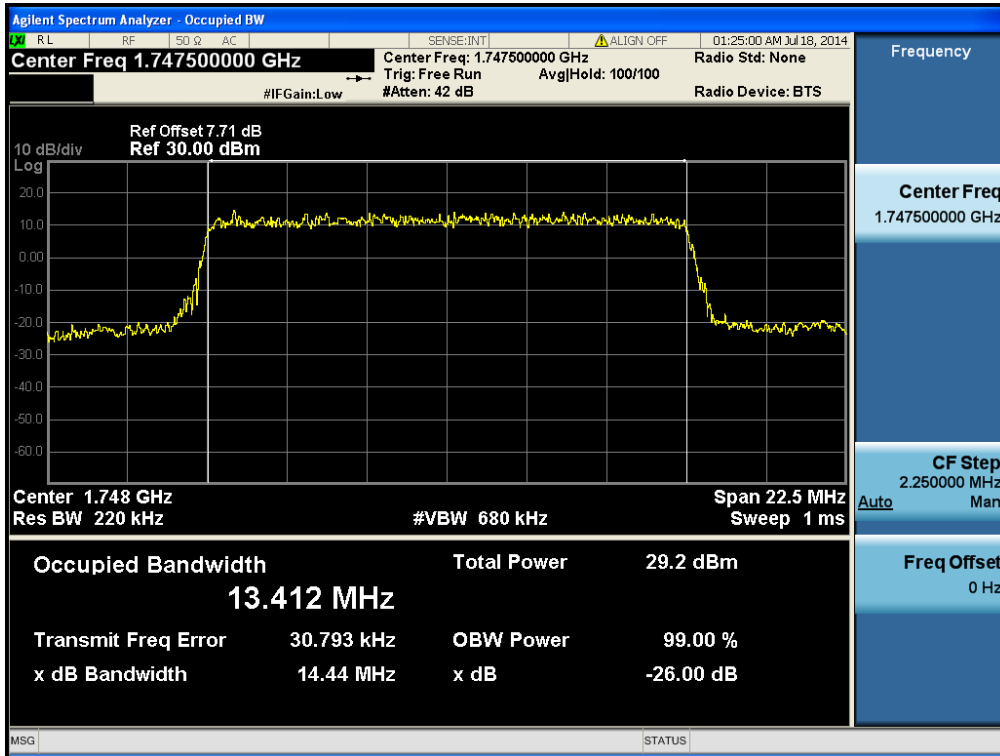
8.2 OCCUPIED BANDWIDTH (LTE Band 4)



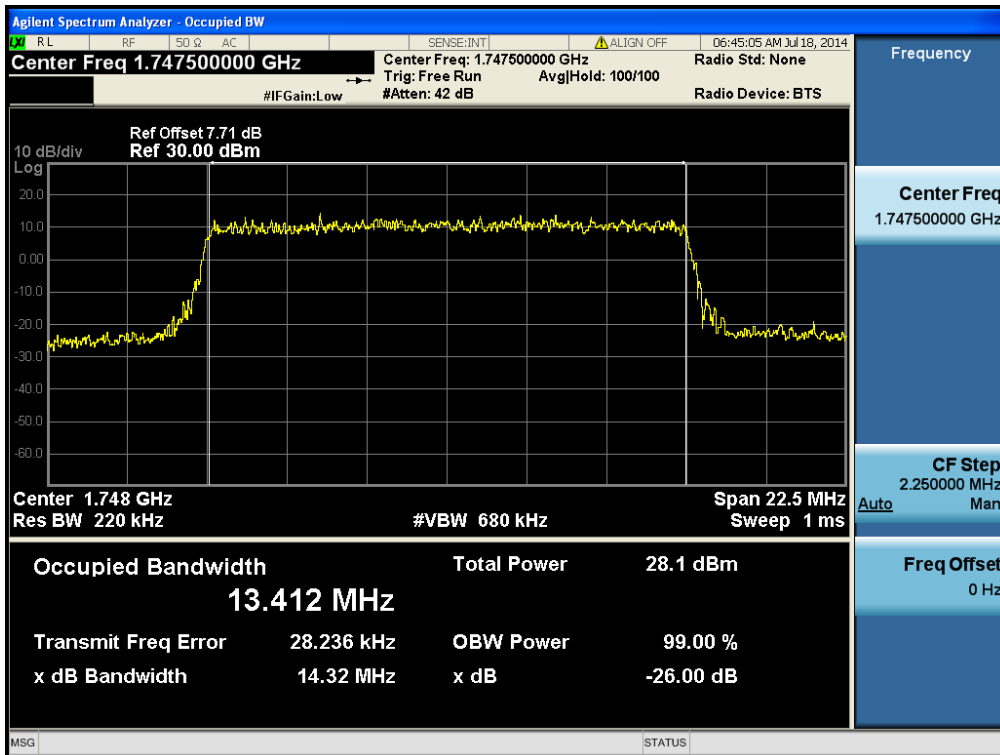
LTE Band 4 / 20MHz / QPSK - RB Size 100



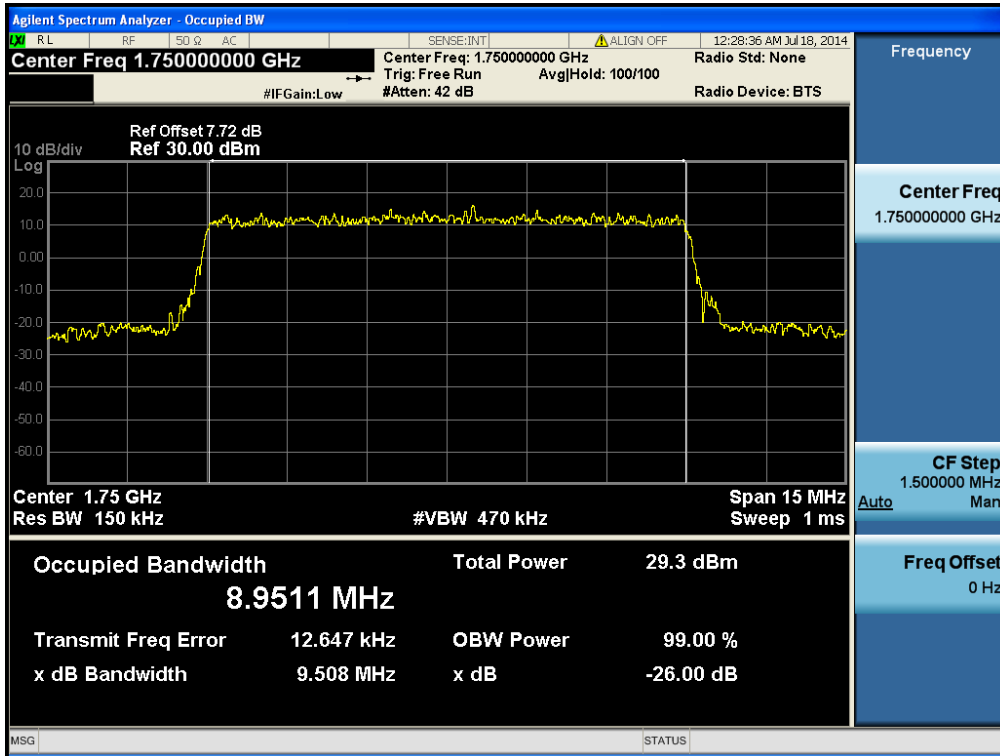
LTE Band 4 / 20MHz / 16QAM - RB Size 100



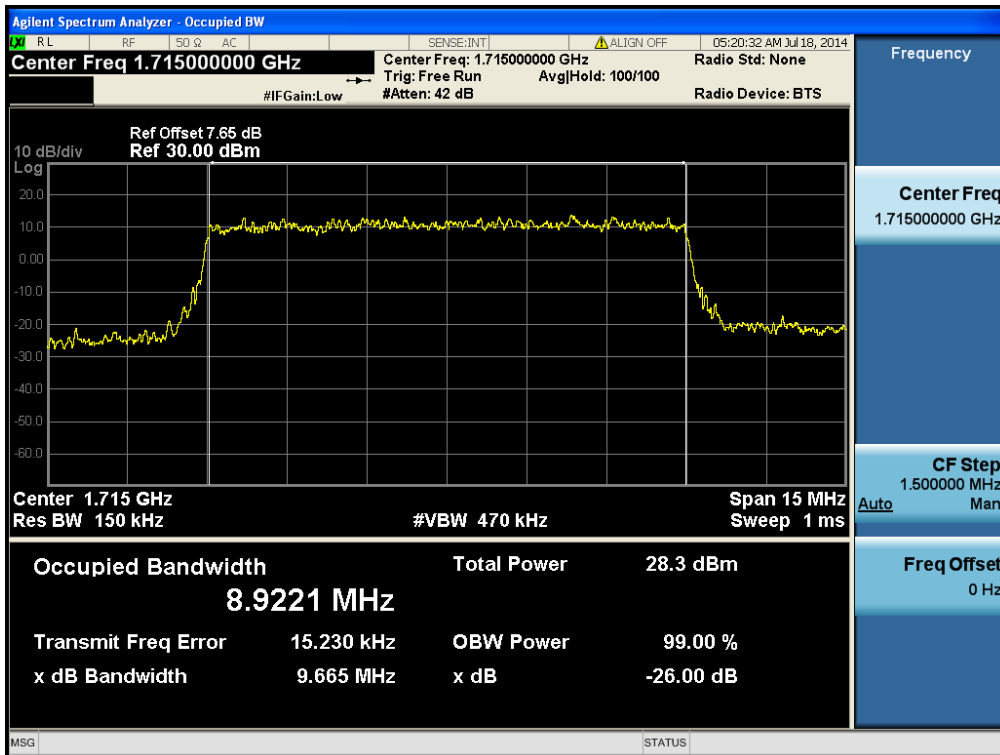
LTE Band 4 / 15MHz / QPSK - RB Size 75



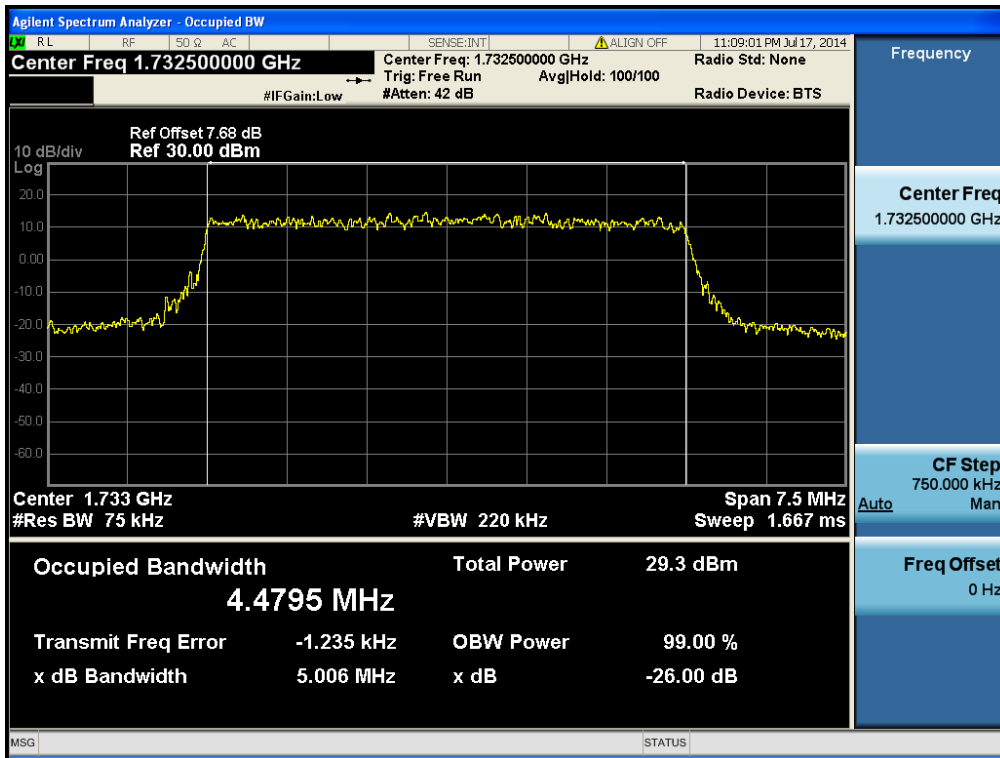
LTE Band 4 / 15MHz / 16QAM - RB Size 75



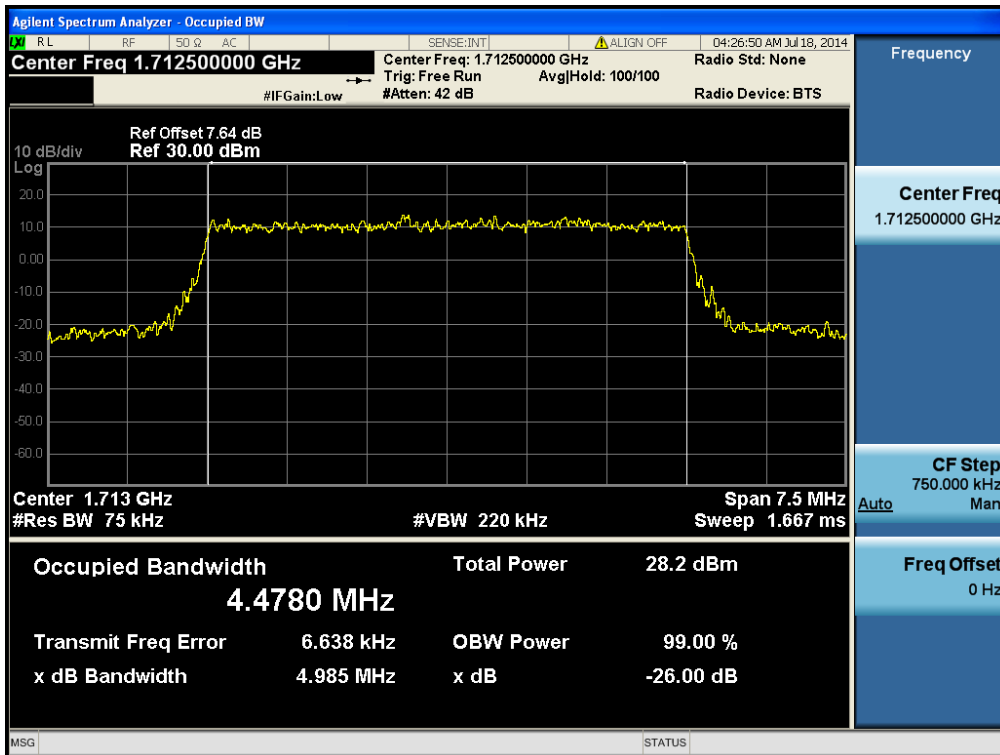
LTE Band 4 / 10MHz / QPSK - RB Size 50



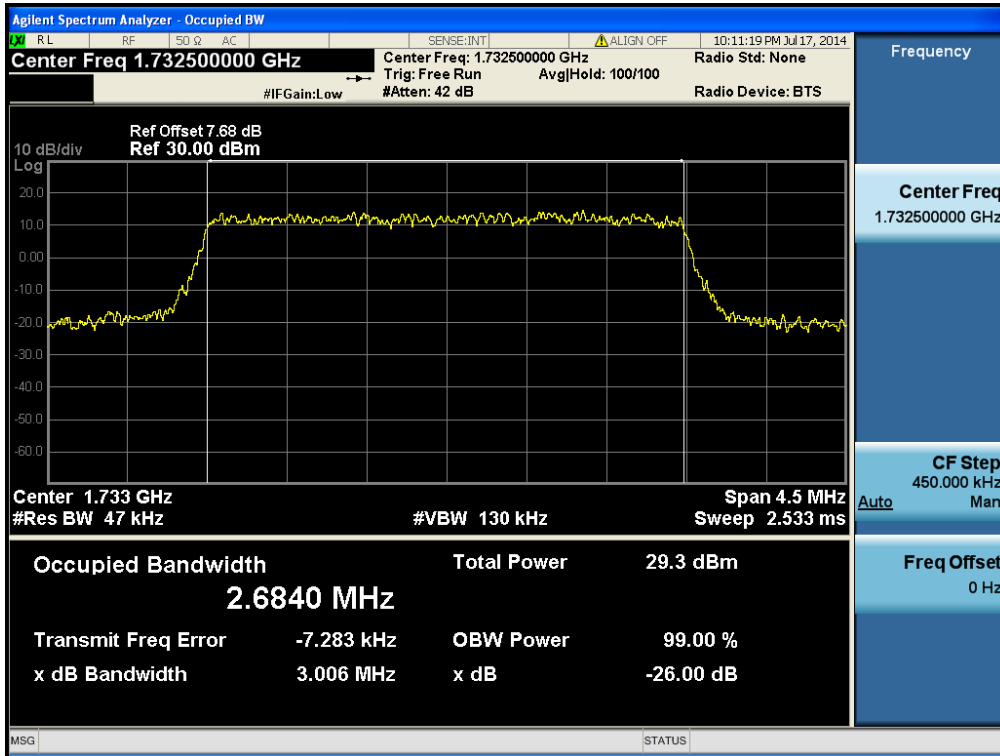
LTE Band 4 / 10MHz / 16QAM - RB Size 50



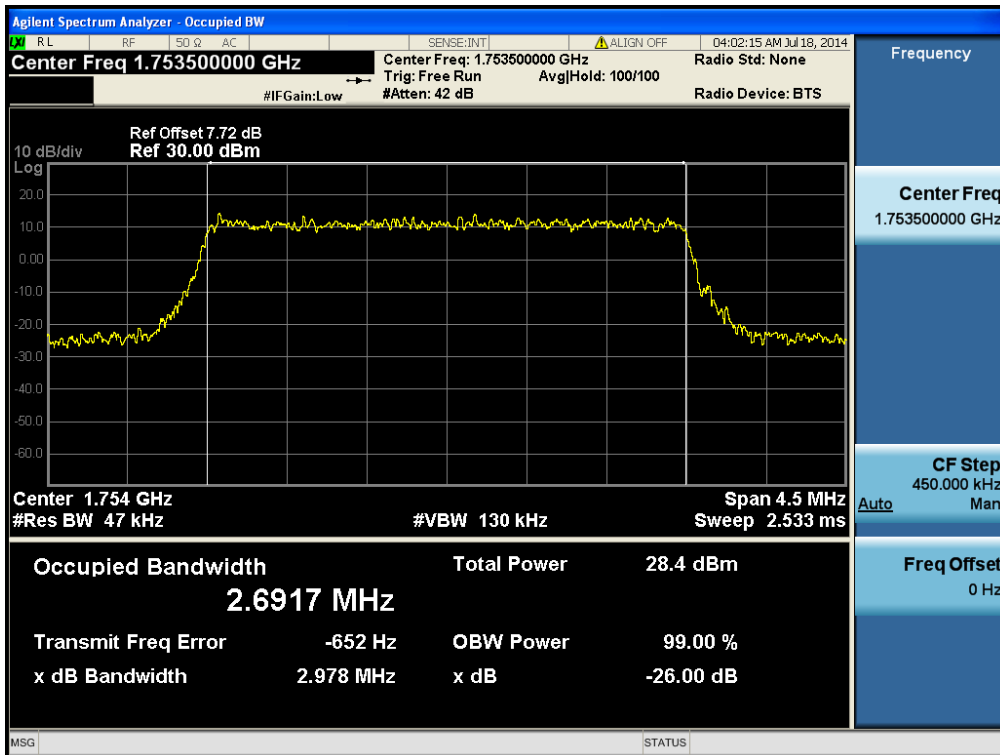
LTE Band 4 / 5MHz / QPSK - RB Size 25



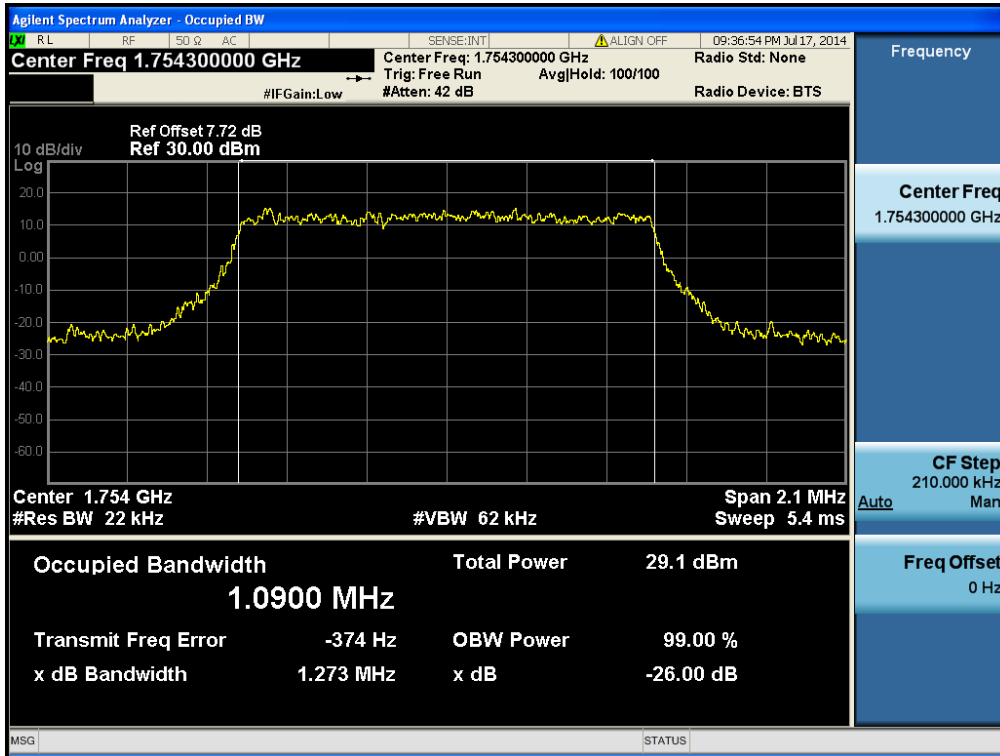
LTE Band 4 / 5MHz / 16QAM - RB Size 25



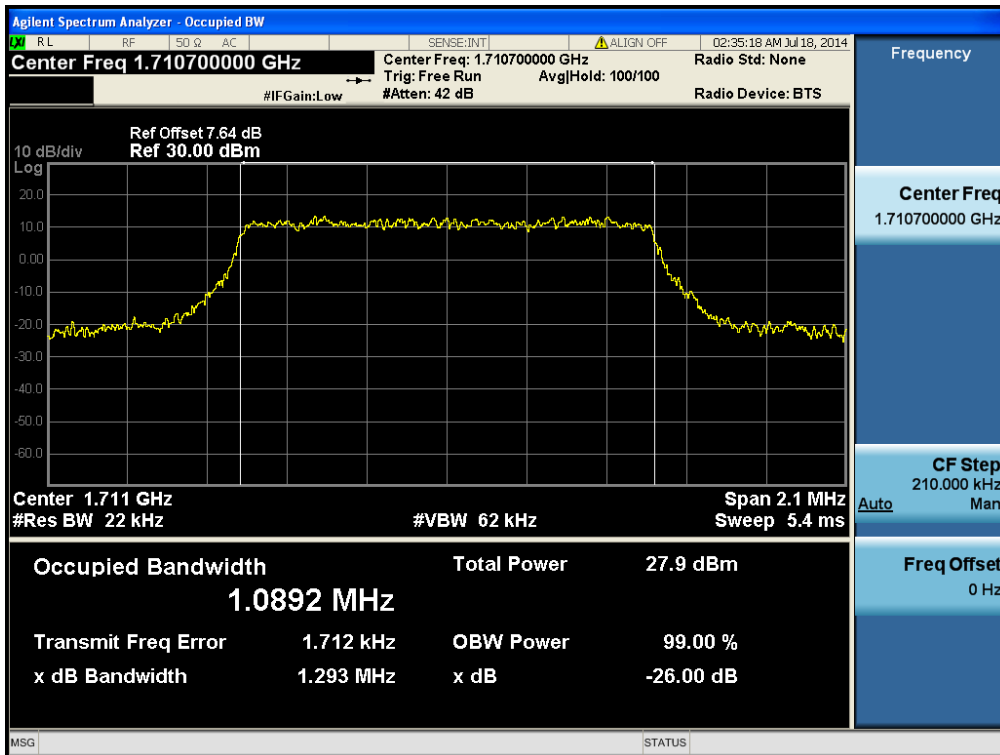
LTE Band 4 / 3MHz / QPSK - RB Size 15



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

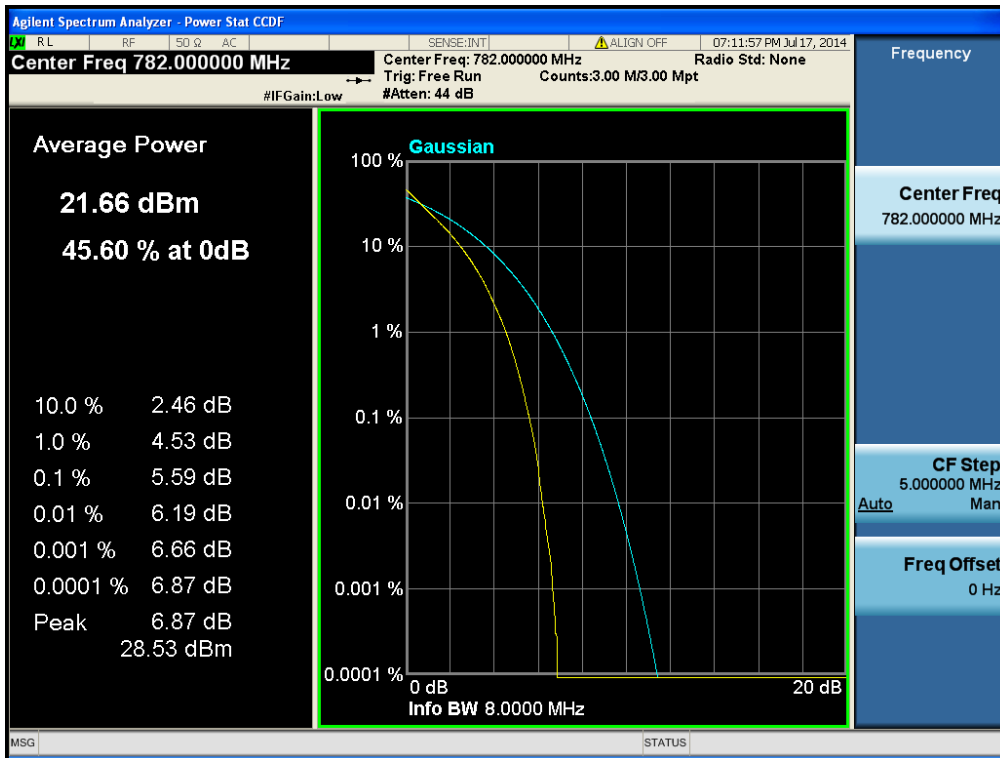


LTE Band 4 / 1.4MHz / QPSK - RB Size 6

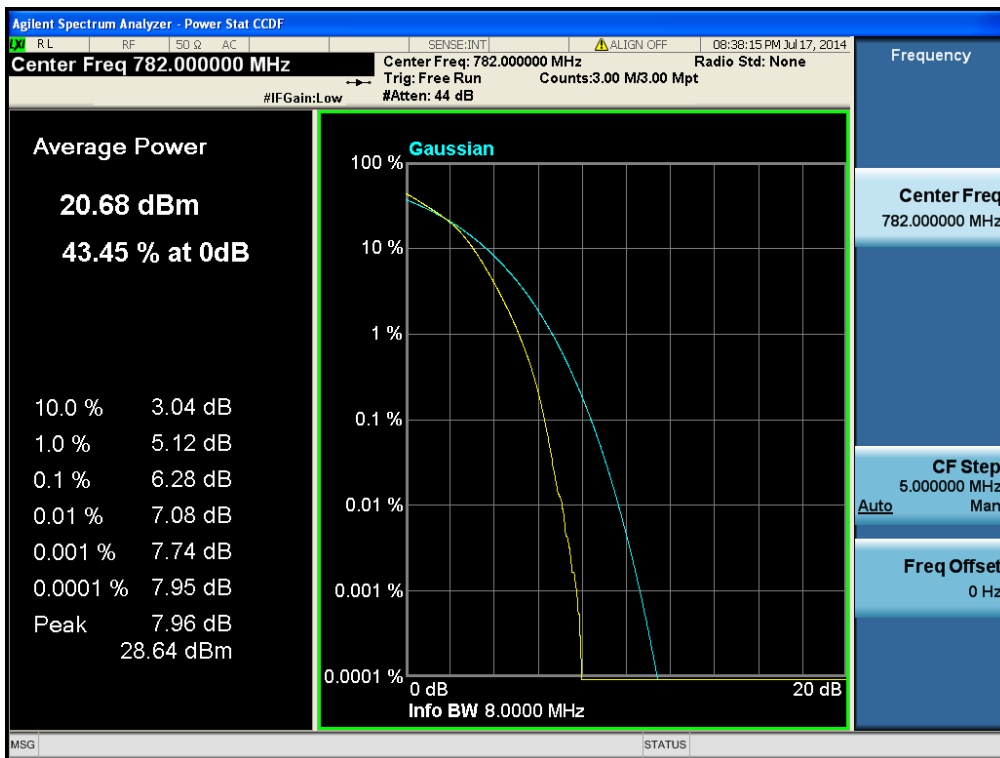


LTE Band 4 / 1.4MHz / 16QAM - RB Size 6

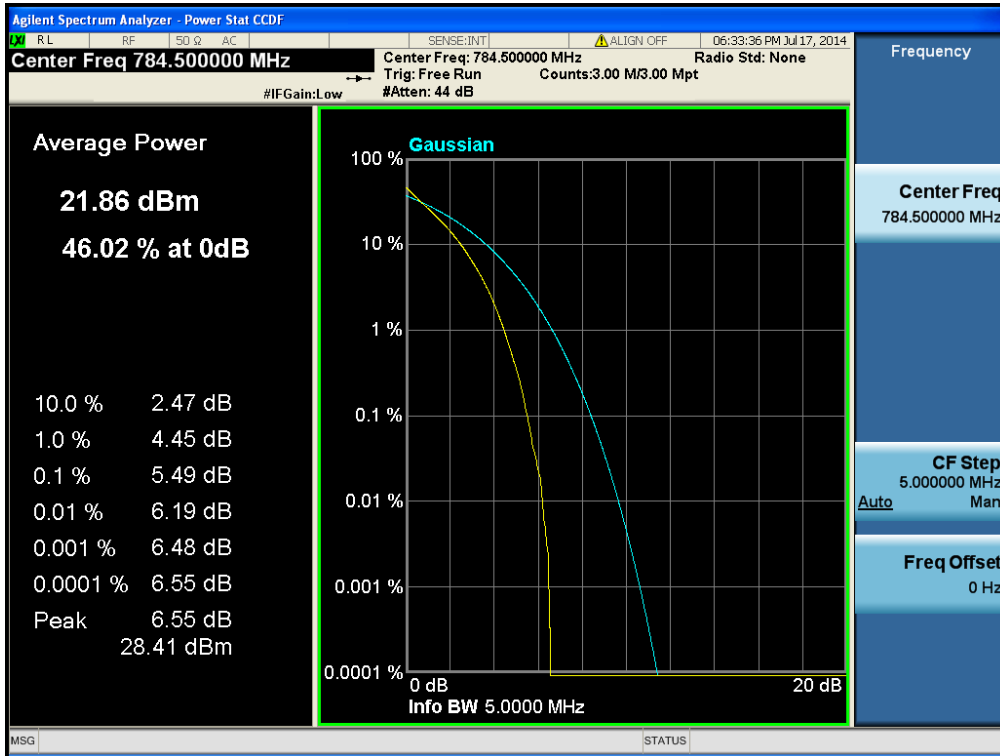
8.3 PEAK TO AVERAGE RATIO (LTE Band 13)



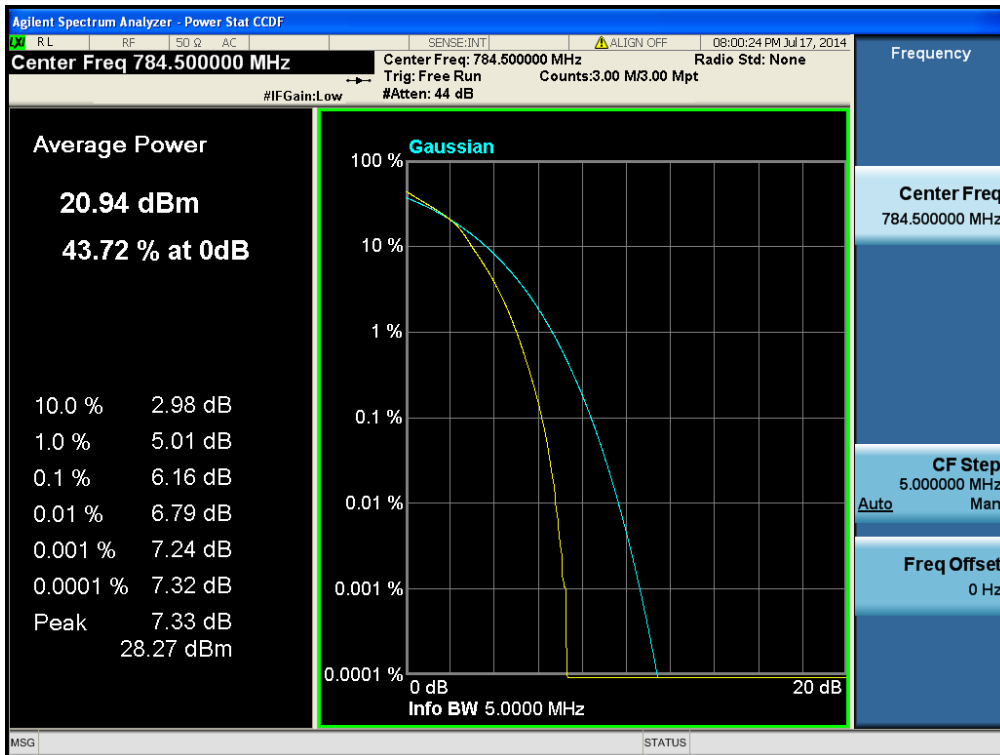
LTE Band 13 / 10MHz / QPSK - RB Size 50



LTE Band 13 / 10MHz / 16QAM - RB Size 50

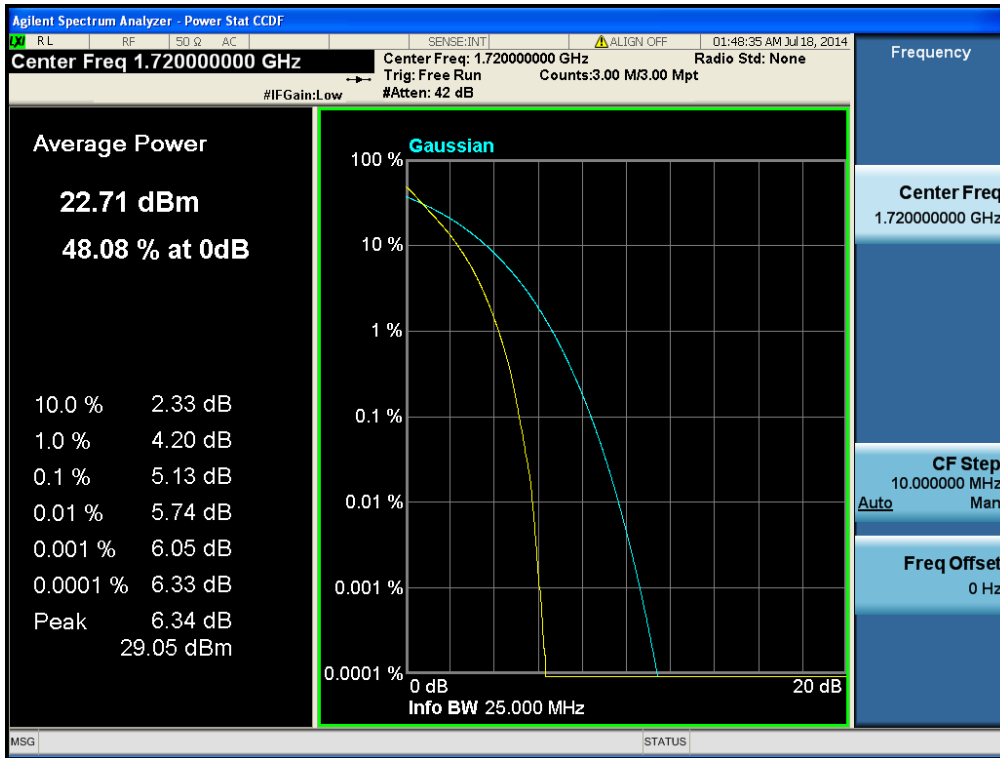


LTE Band 13 / 5MHz / QPSK - RB Size 25

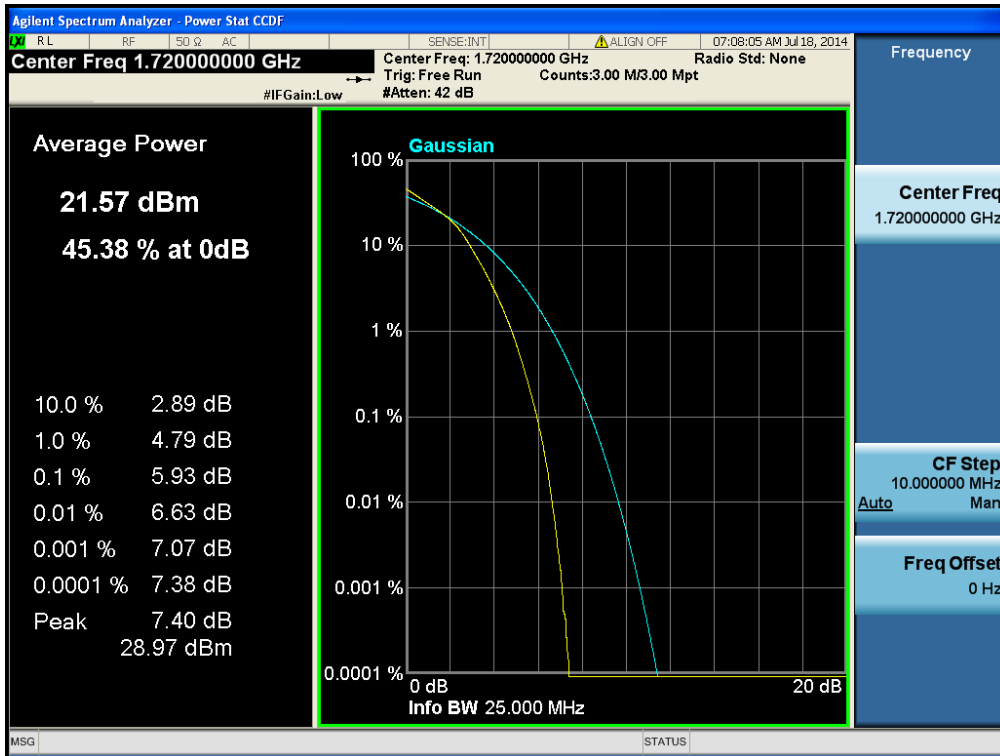


LTE Band 13 / 5MHz / 16QAM - RB Size 25

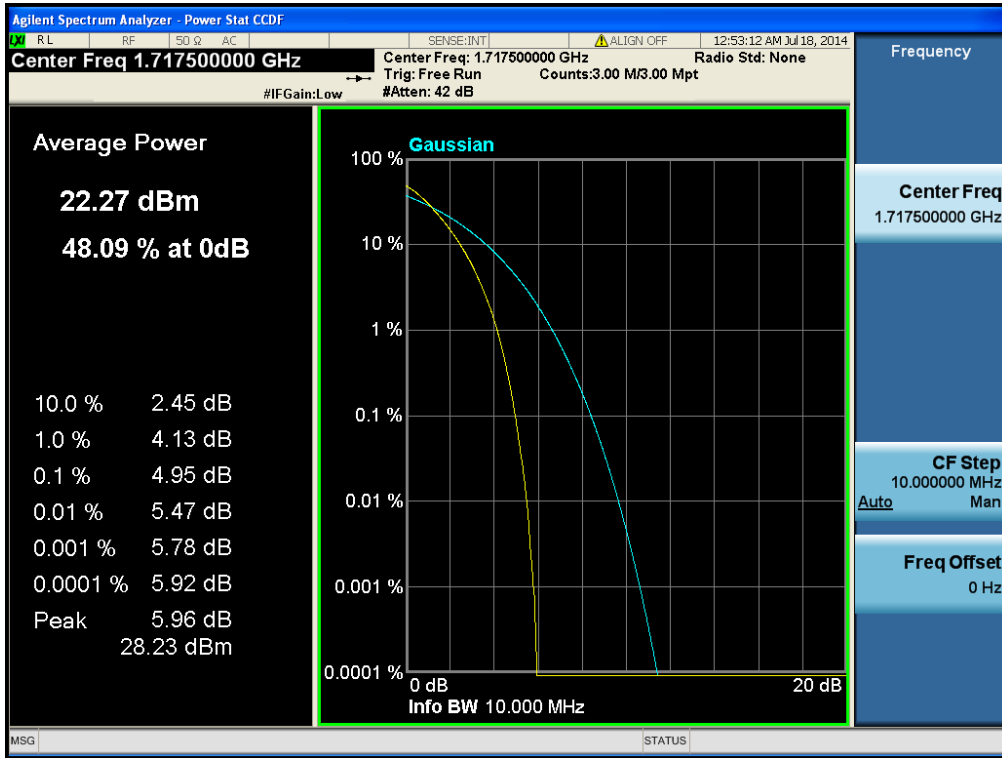
8.4 PEAK TO AVERAGE RATIO (LTE Band 4)



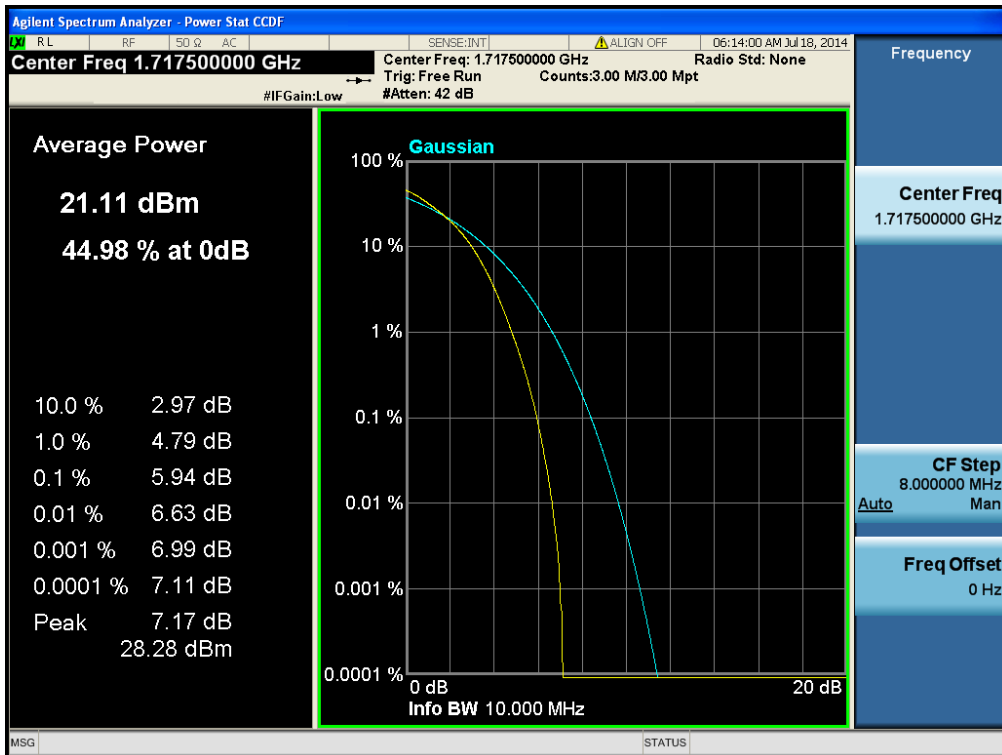
LTE Band 4 / 20MHz / QPSK - RB Size 100



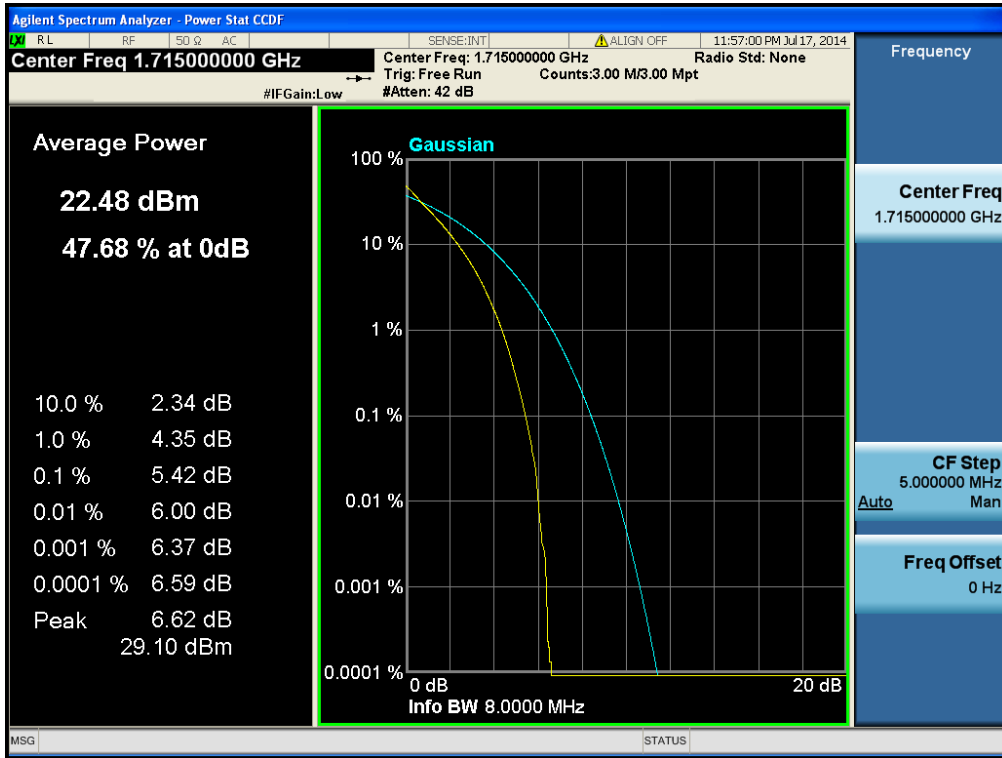
LTE Band 4 / 20MHz / 16QAM - RB Size 100



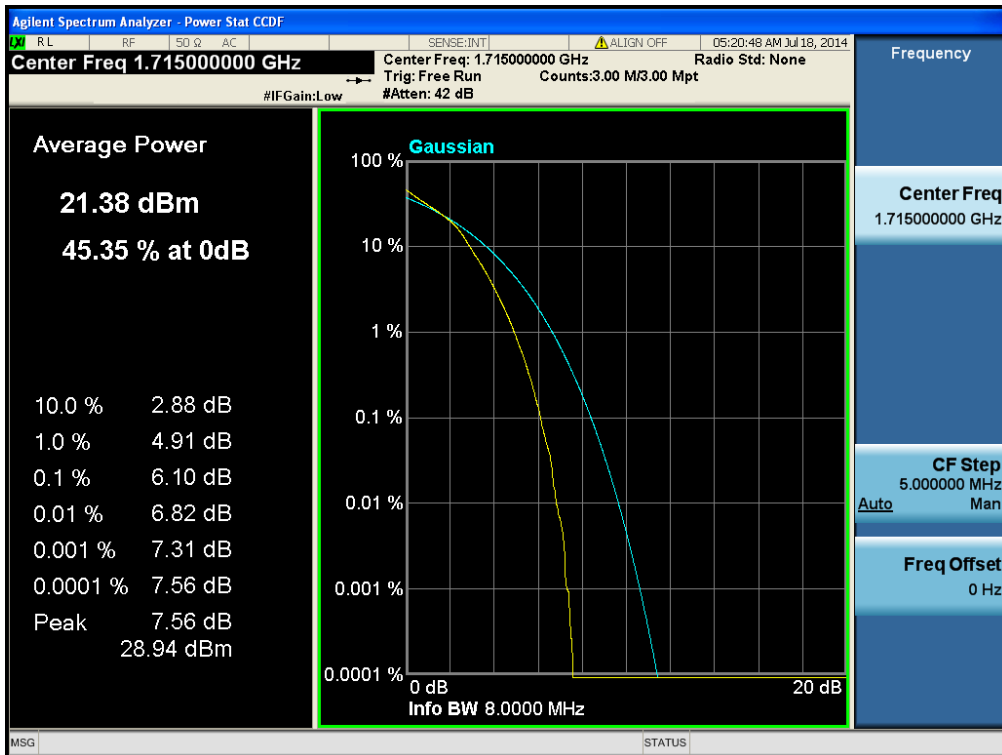
LTE Band 4 / 15MHz / QPSK - RB Size 75



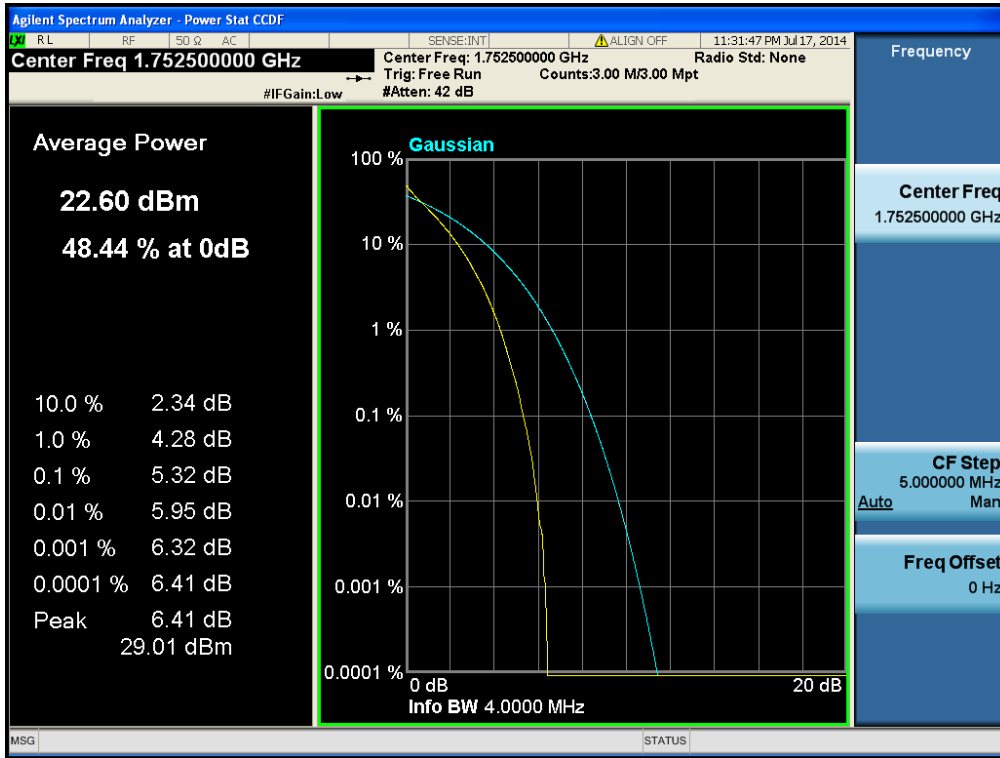
LTE Band 4 / 15MHz / 16QAM - RB Size 75



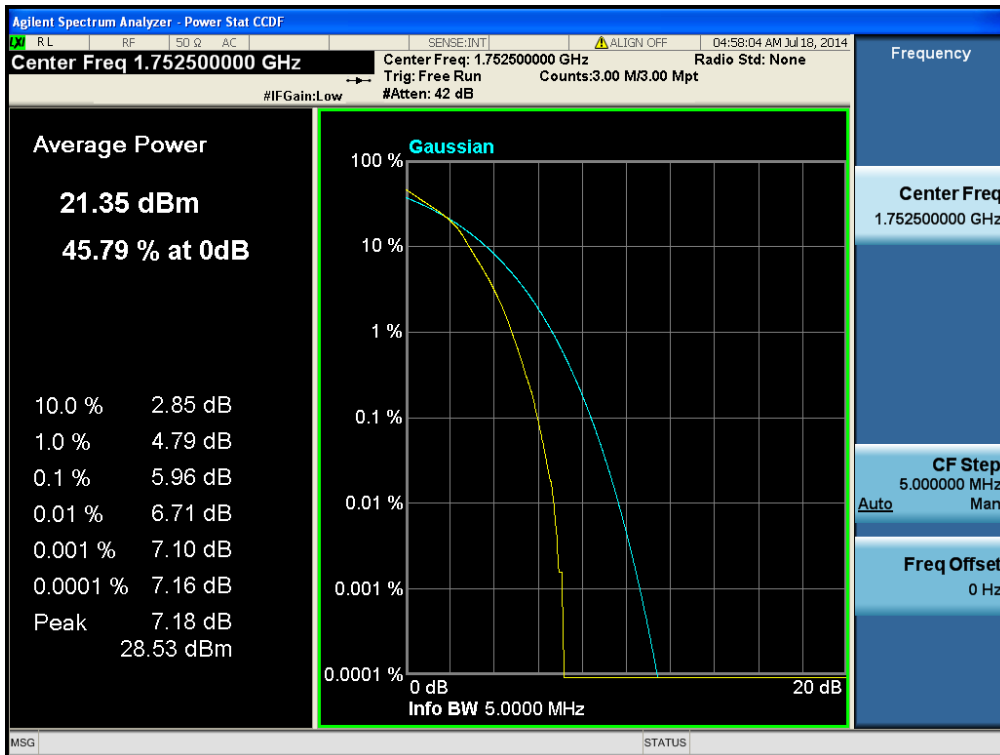
LTE Band 4 / 10MHz / QPSK - RB Size 50



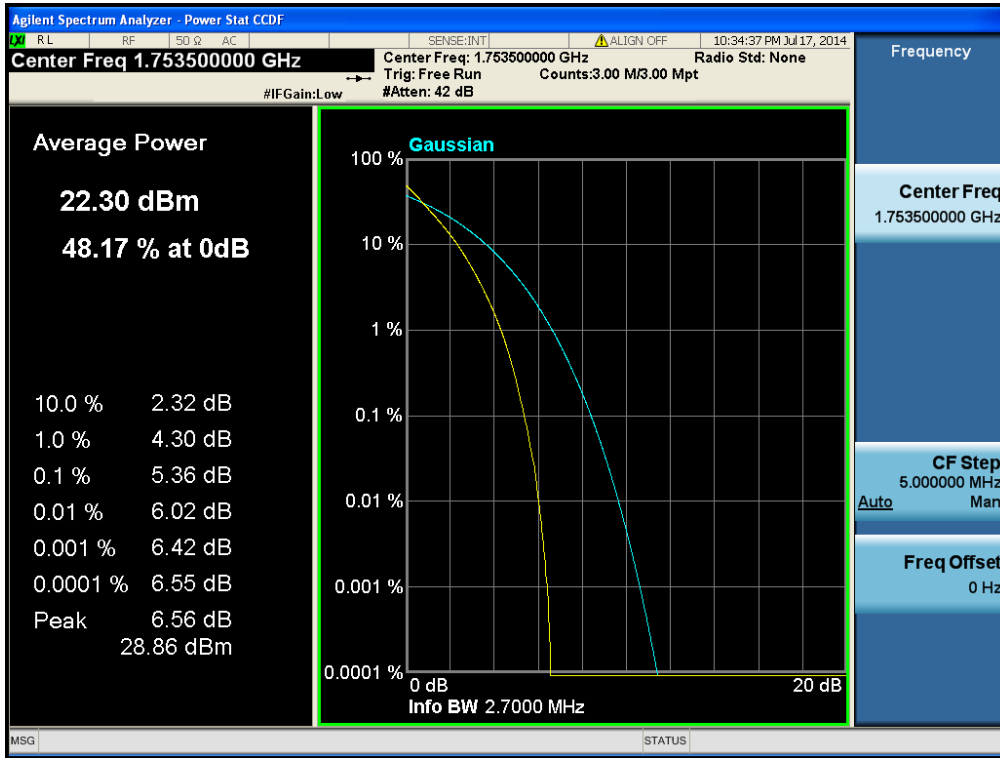
LTE Band 4 / 10MHz / 16QAM - RB Size 50



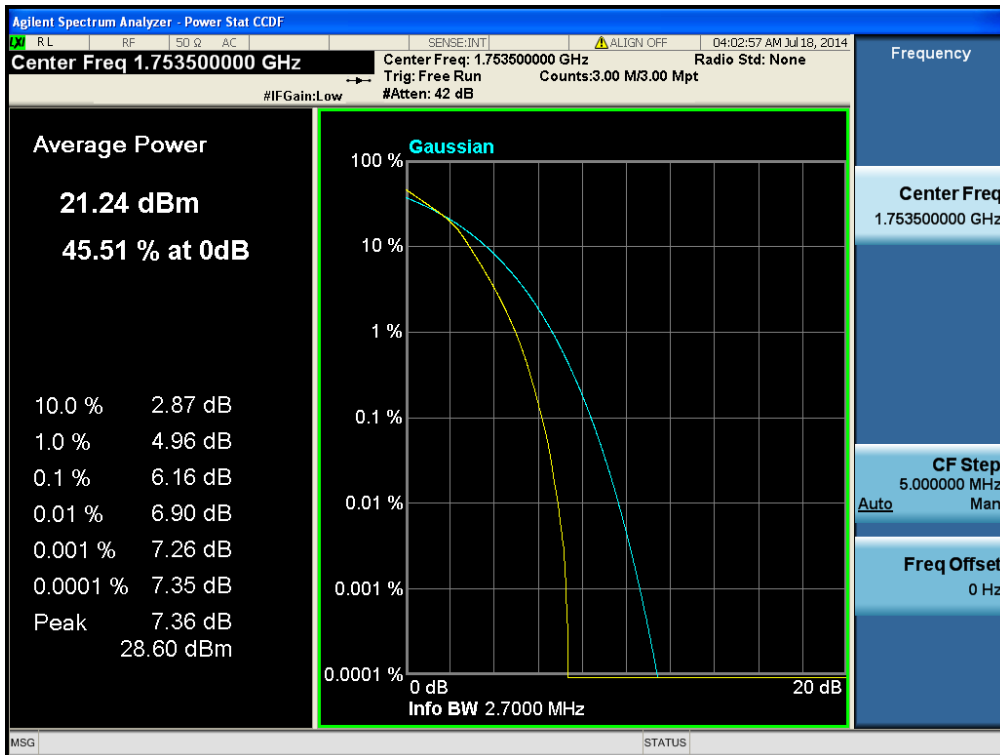
LTE Band 4 / 5MHz / QPSK - RB Size 25



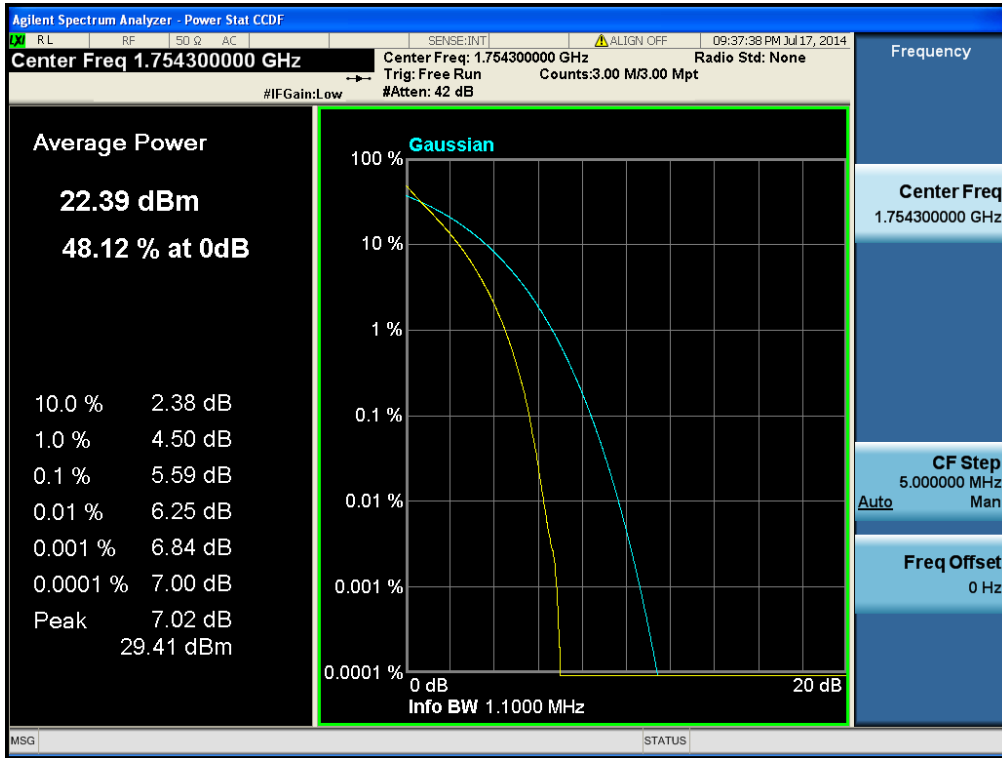
LTE Band 4 / 5MHz / 16QAM - RB Size 25



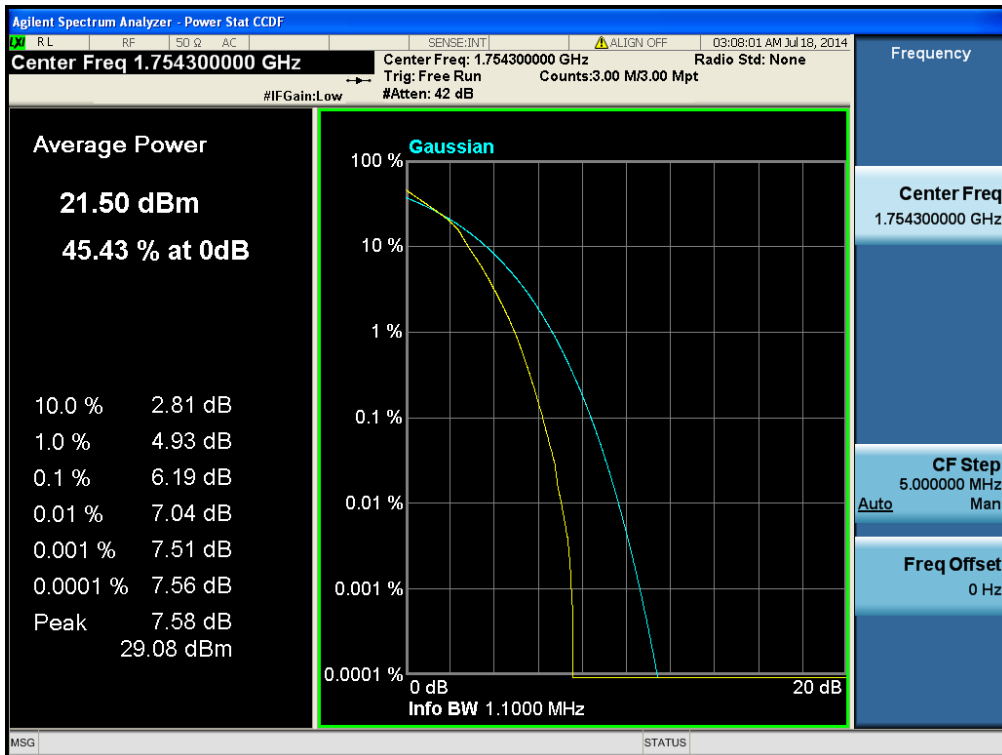
LTE Band 4 / 3MHz / QPSK - RB Size 15



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



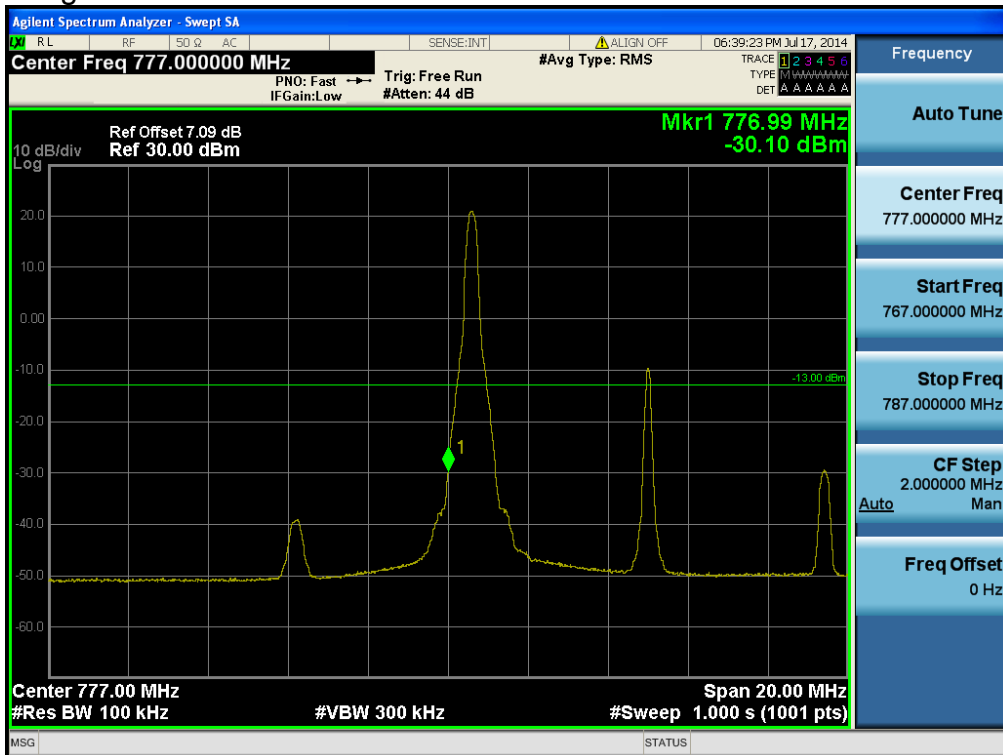
LTE Band 4 / 1.4MHz / QPSK - RB Size 6



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

8.5 UNDESIRABLE EMISSIONS (CONDUCTED- LTE Band 13)

- Lower Band Edge



LTE Band 13 / 10MHz / QPSK - RB Offset/Size (0/1)

- Lower Extended Band Edge



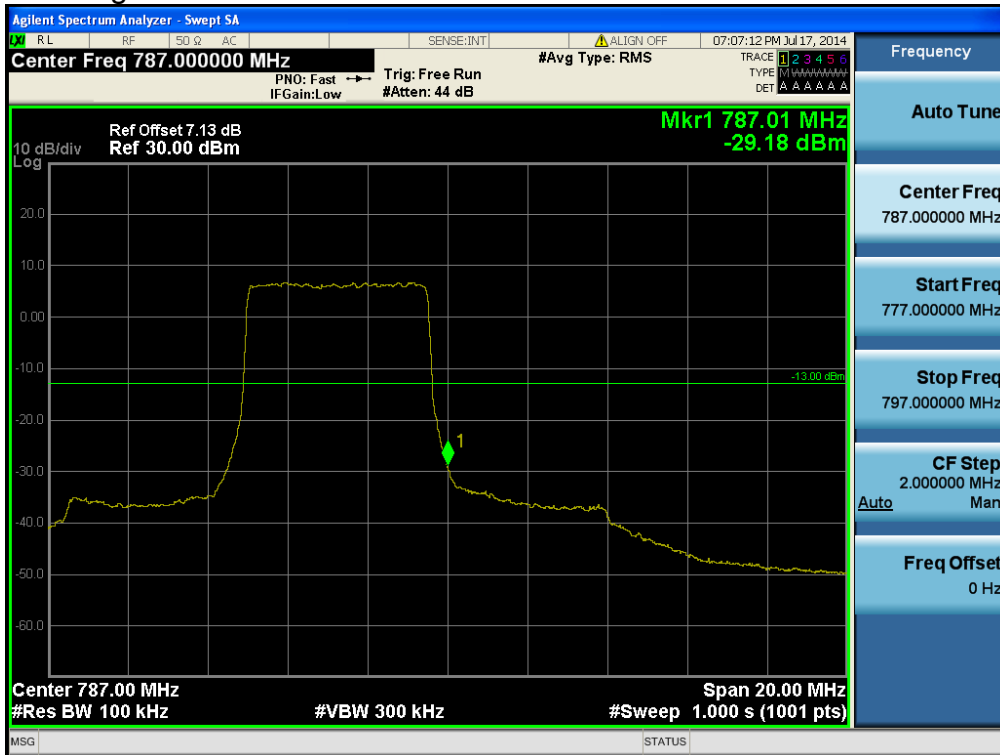
LTE Band 13 / 10MHz / QPSK - RB Offset/Size (0/25)

- Lower (763 ~ 775 MHz)



LTE Band 13 / 10MHz / QPSK - RB Offset/Size (0/25)

- Upper Band Edge



LTE Band 13 / 10MHz / QPSK - RB Offset/Size (12/25)

- Upper Extended Band Edge



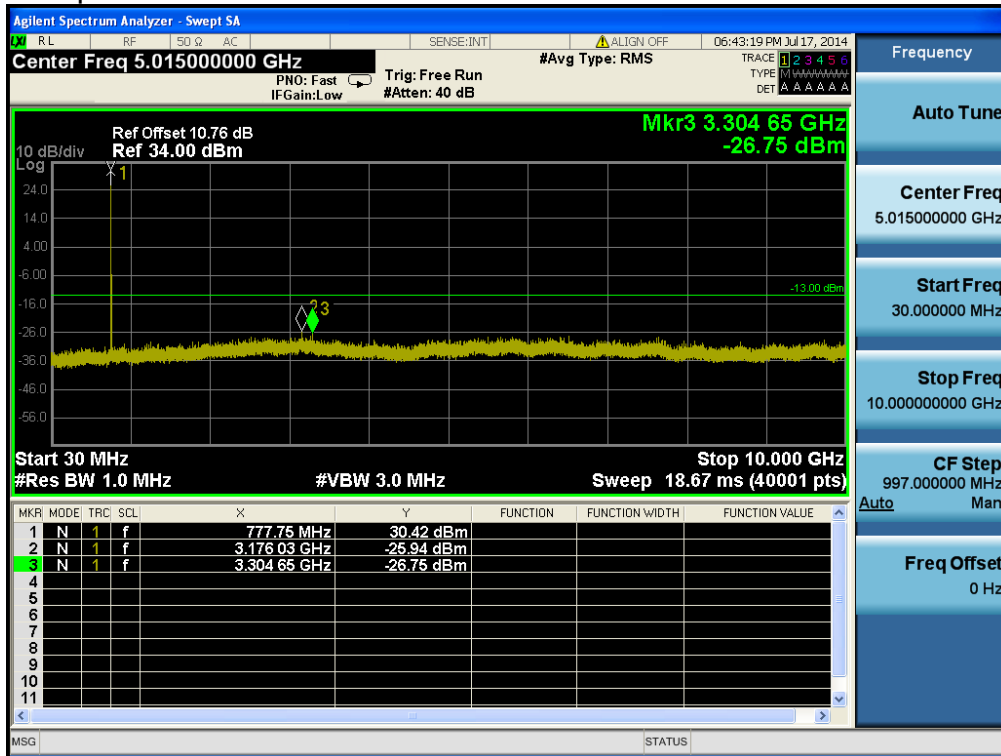
LTE Band 13 / 10MHz / QPSK - RB Offset/Size (12/25)

- Upper (793 ~ 805 MHz)



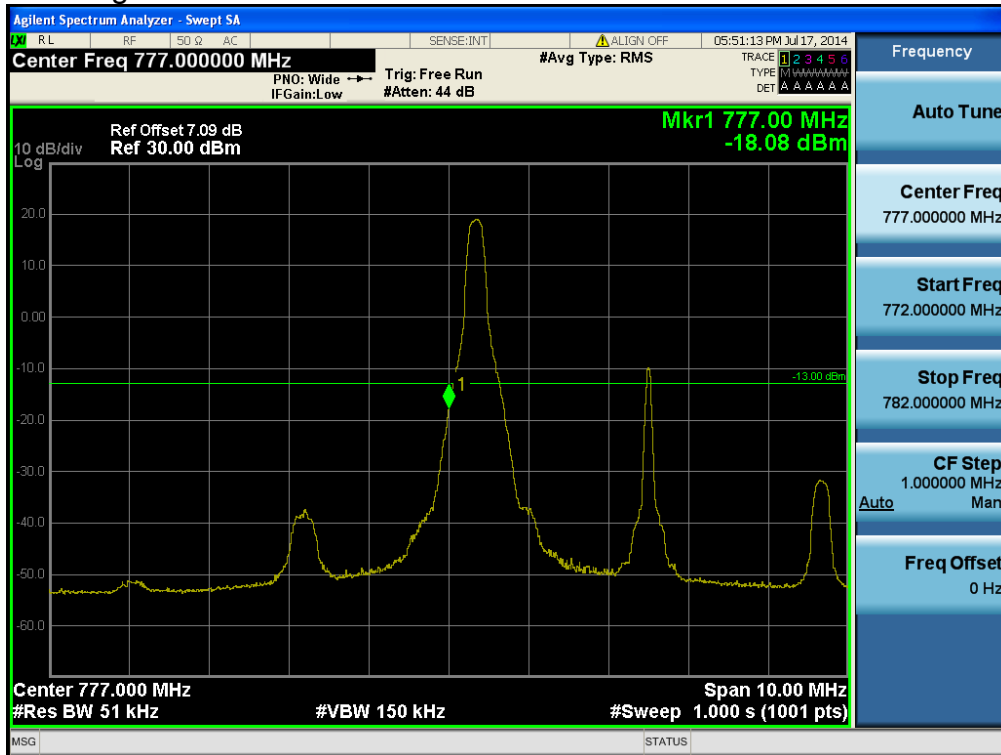
LTE Band 13 / 10MHz / QPSK - Offset/Size (0/50)

- Conducted Spurious Emissions



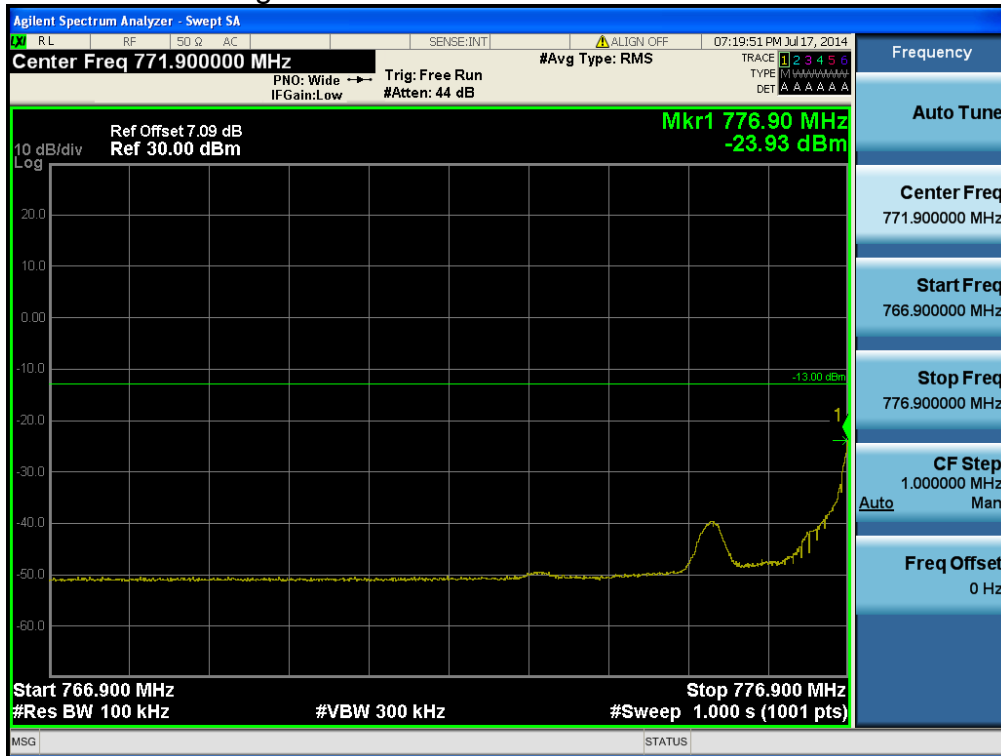
LTE Band 13 / 10MHz / QPSK - RB Offset/Size (0/1)

- Lower Band Edge



LTE Band 13 / 5MHz / QPSK - RB Offset/Size (0/1)

- Lower Extended Band Edge



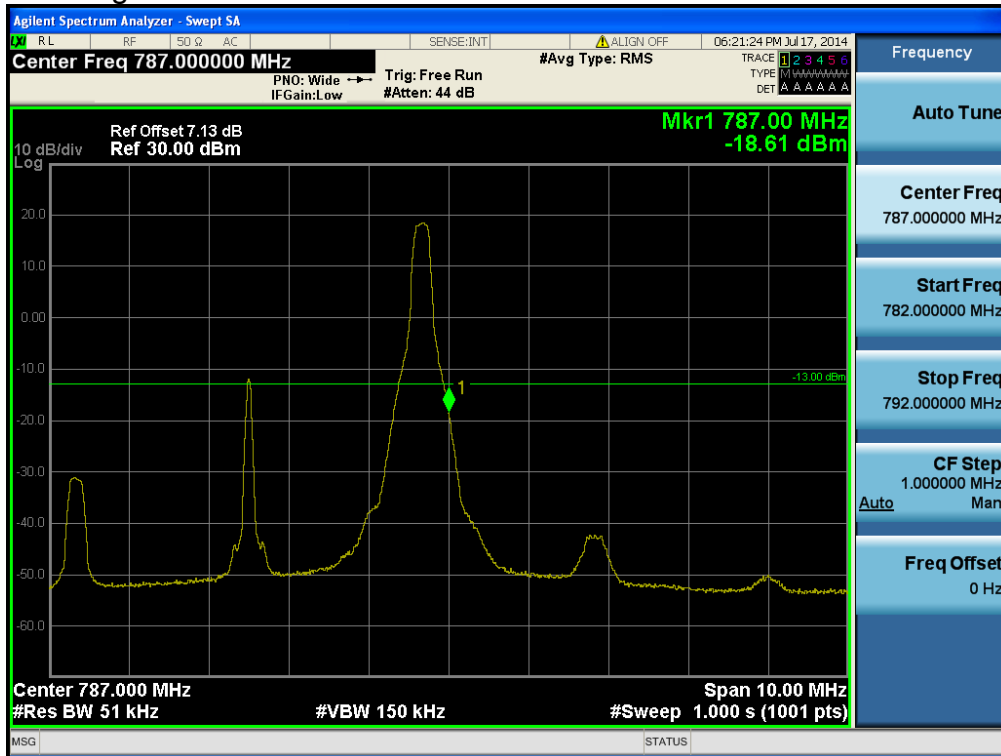
LTE Band 13 / 5MHz / 16QAM - RB Offset/Size (0/1)

- Lower (763 ~ 775 MHz)



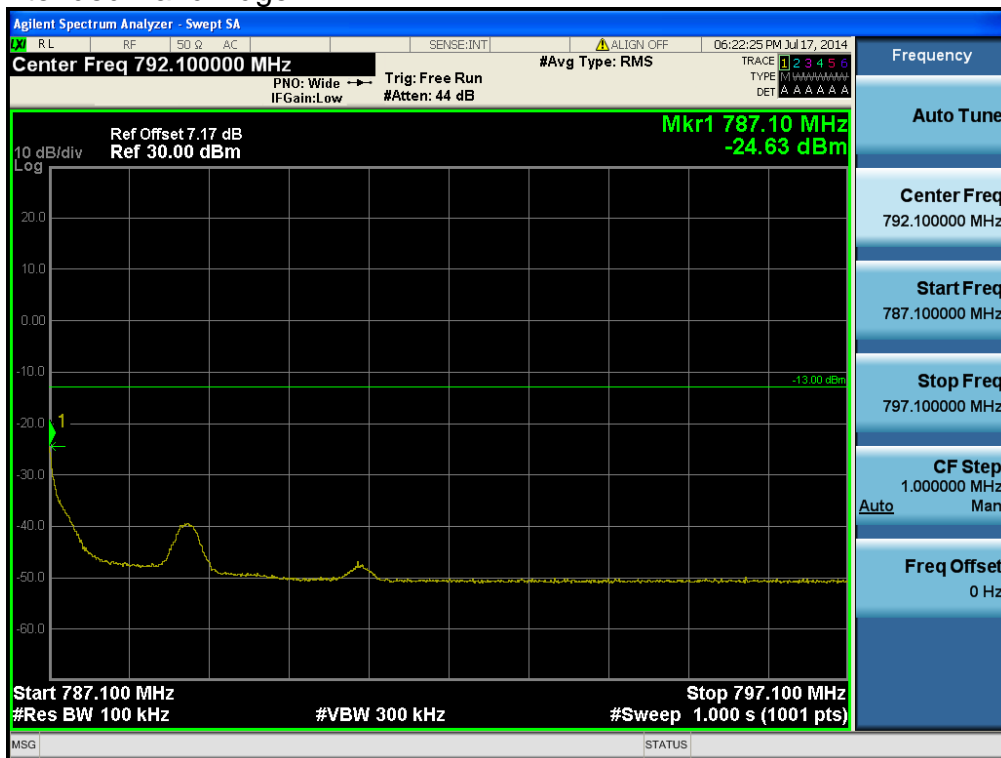
LTE Band 13 / 5MHz / QPSK - RB Offset/Size (0/25)

- Upper Band Edge



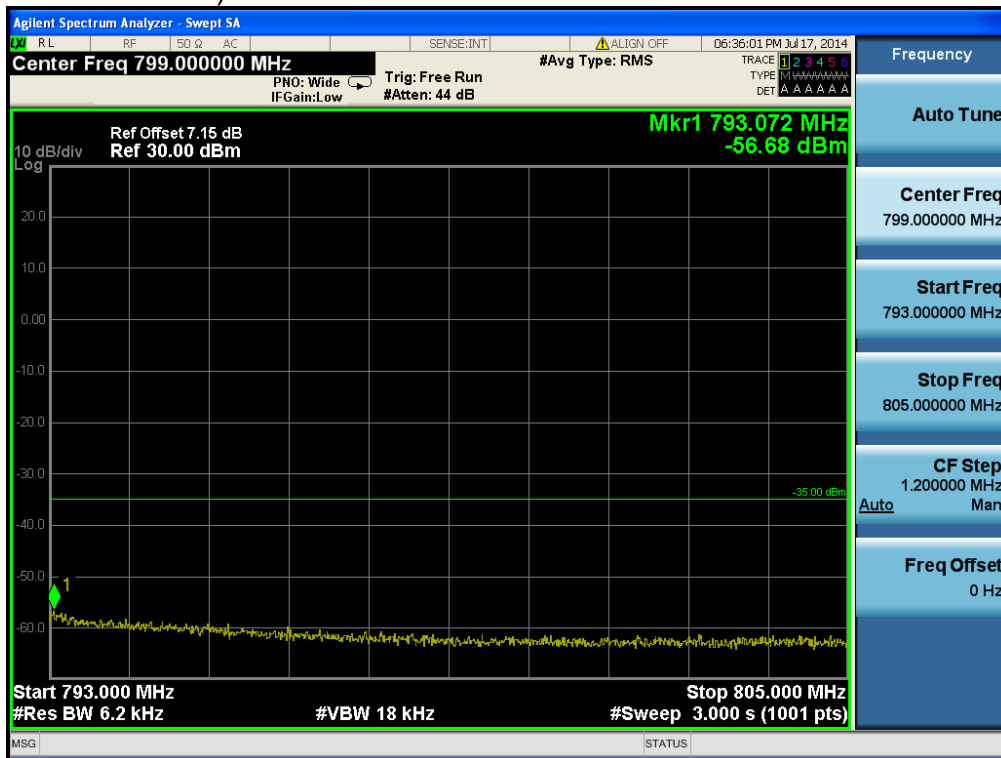
LTE Band 13 / 5MHz / QPSK - RB Offset/Size (24/1)

- Upper Extended Band Edge



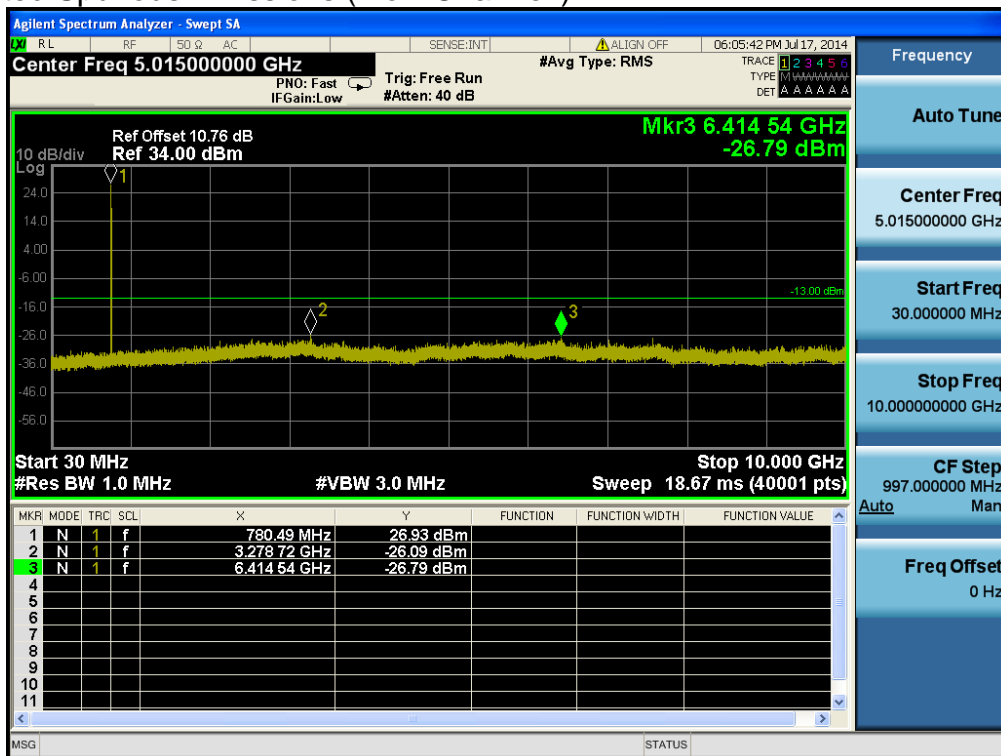
LTE Band 13 / 5MHz / QPSK - RB Offset/Size (24/1)

- Upper (793 ~ 805 MHz)



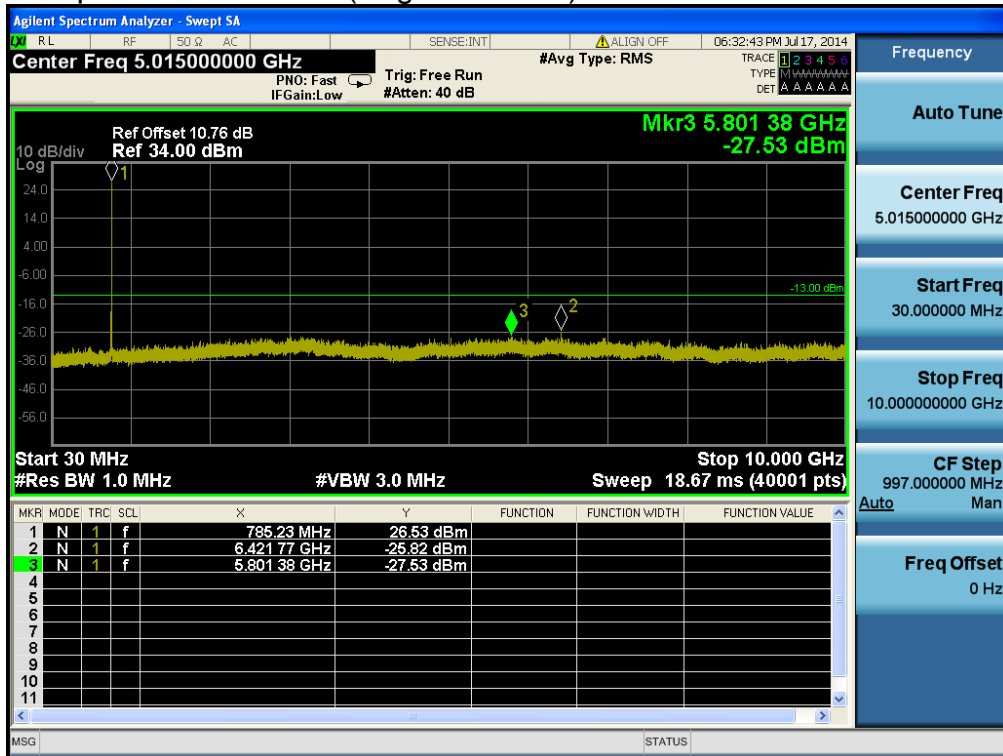
LTE Band 13 / 5MHz / QPSK - RB Offset/Size (0/25)

- Conducted Spurious Emissions (Low Channel)



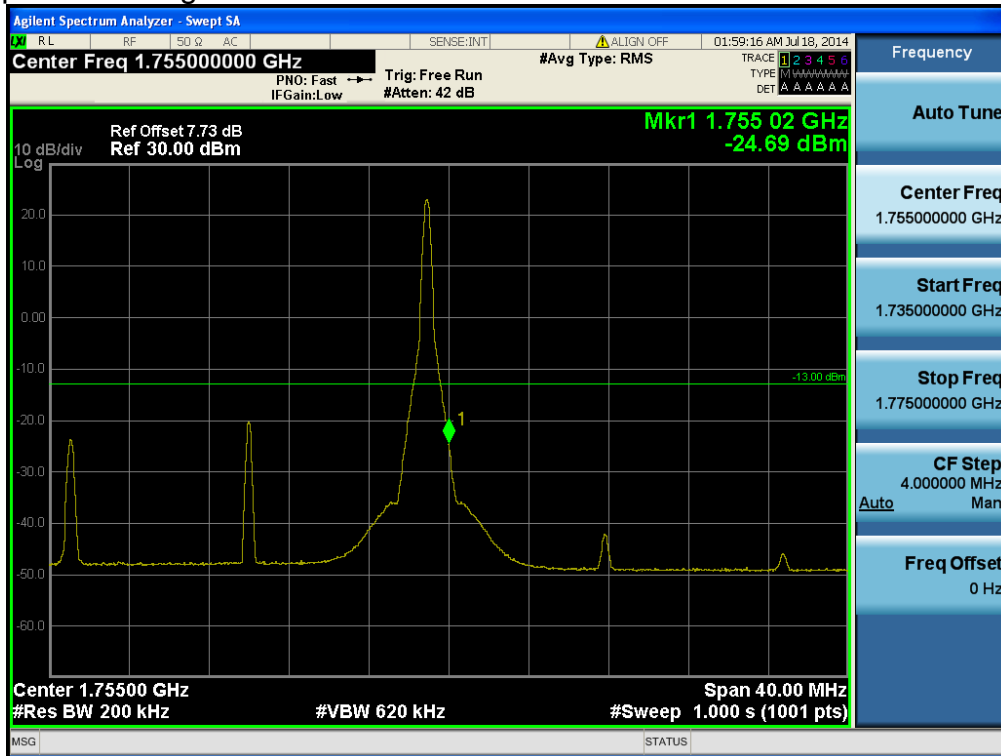
LTE Band 13 / 5MHz / QPSK - RB Offset/Size (6/12)

- Conducted Spurious Emissions (High Channel)



LTE Band 13 / 5MHz / QPSK - RB Offset/Size (13/12)

- Upper Band Edge



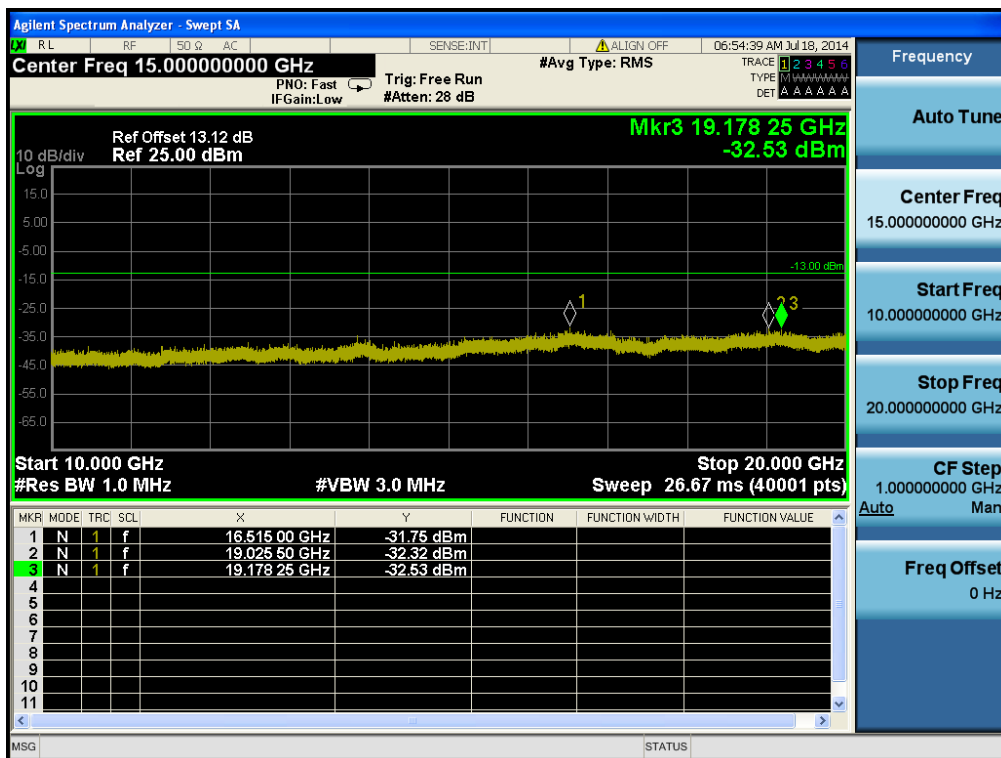
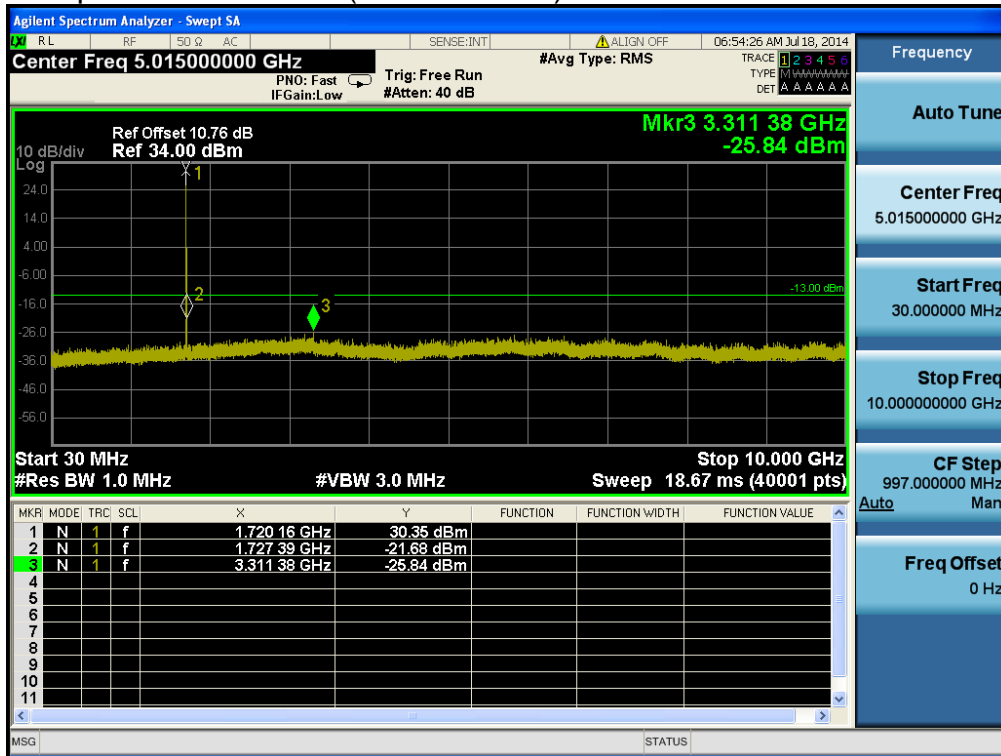
LTE Band 4 / 20MHz / QPSK - RB Offset/Size (99/1)

- Upper Extended Band Edge



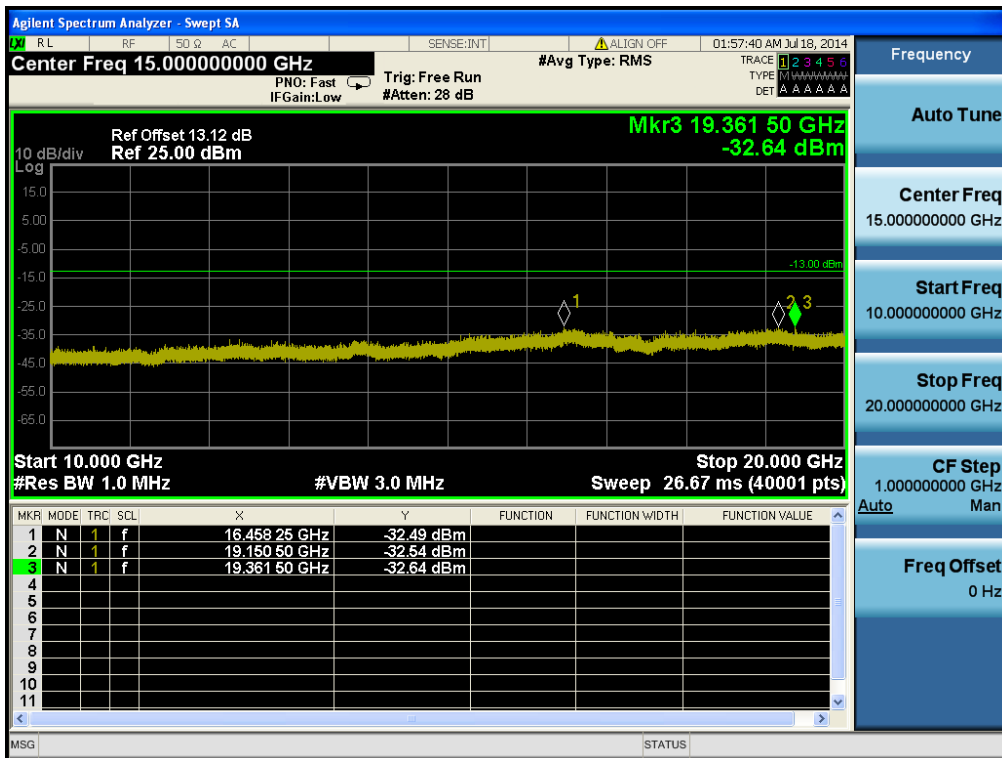
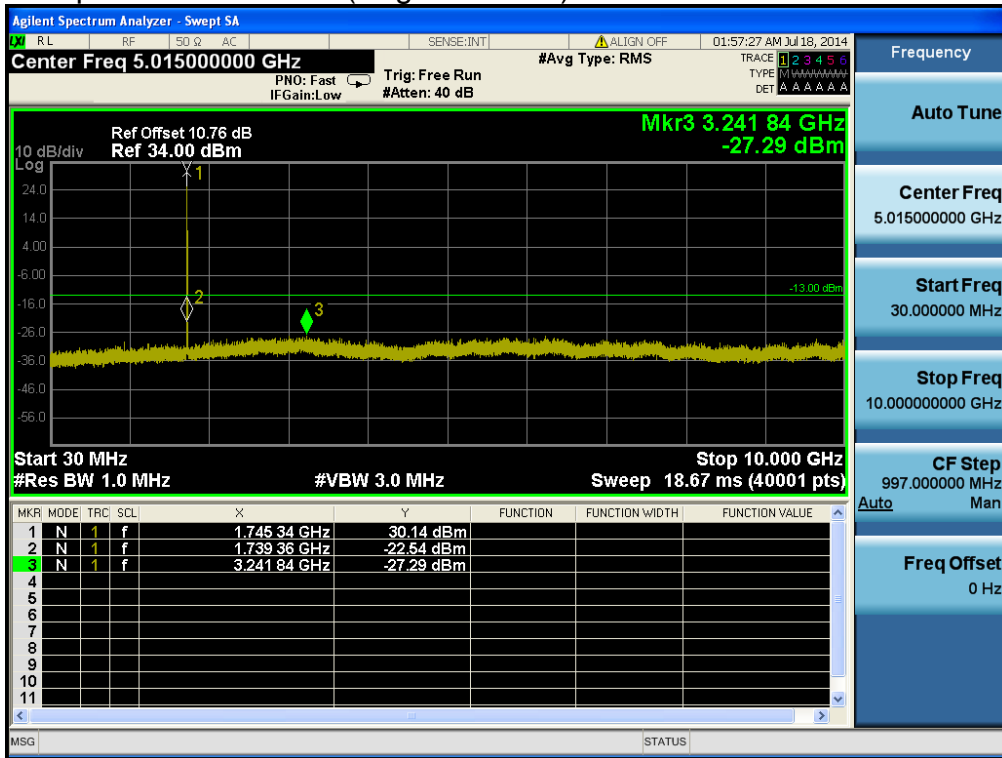
LTE Band 4 / 20MHz / QPSK - RB Offset/Size (50/50)

- Conducted Spurious Emissions (Low channel)



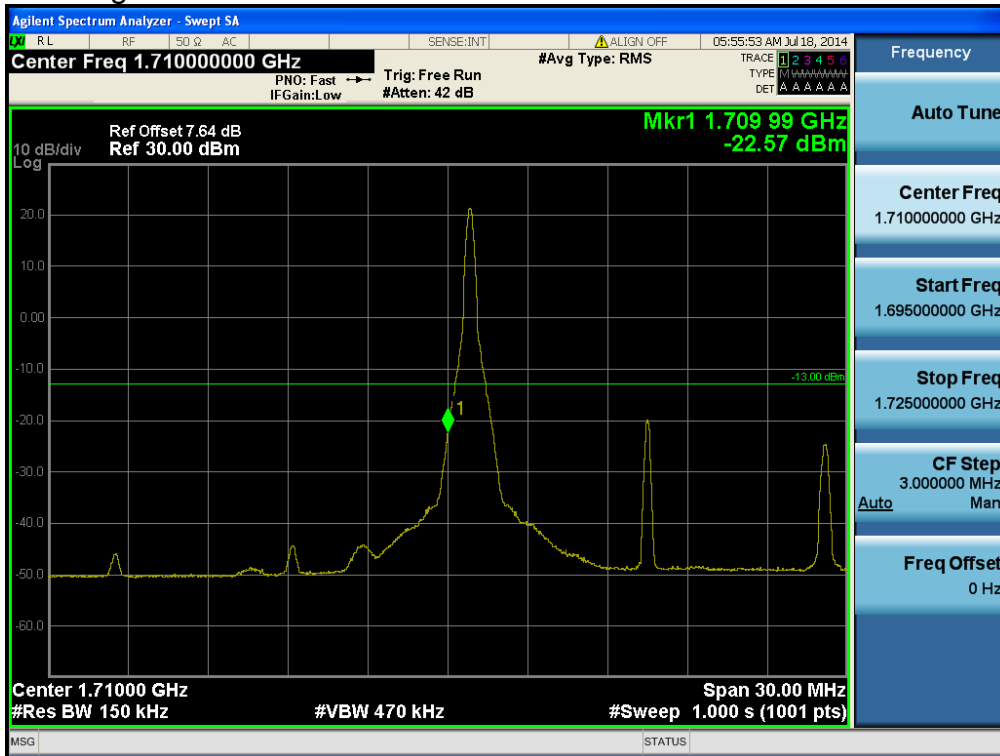
LTE Band 4 / 20MHz / 16QAM - RB Offset/Size (50/1)

- Conducted Spurious Emissions (High channel)



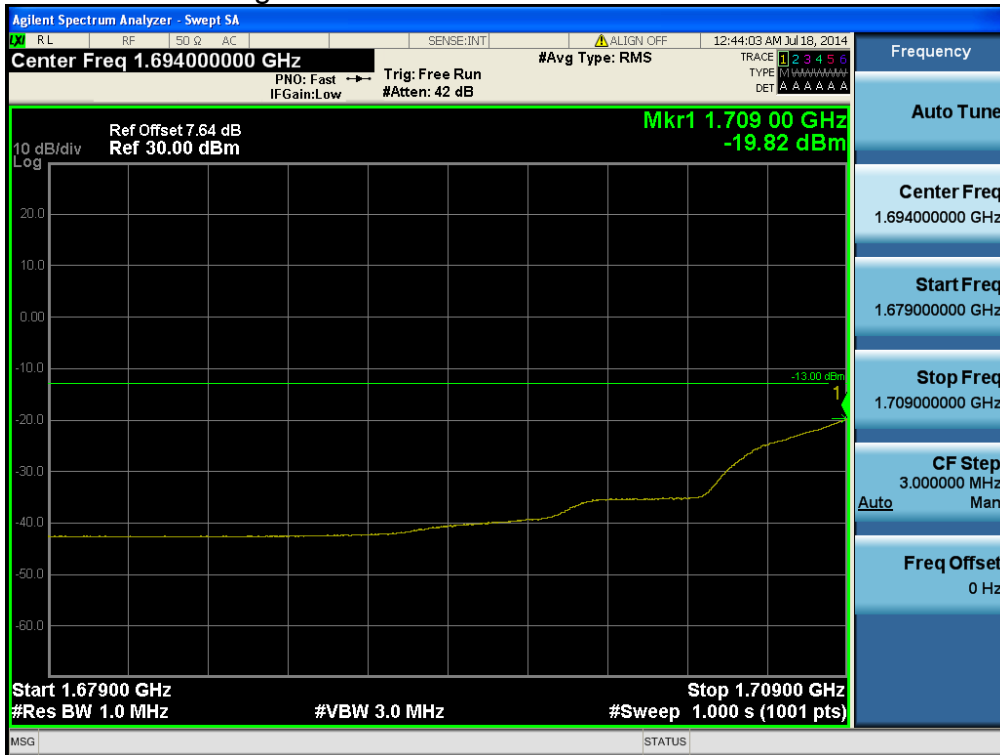
LTE Band 4 / 20MHz / QPSK - RB Offset/Size (50/1)

Lower Band Edge



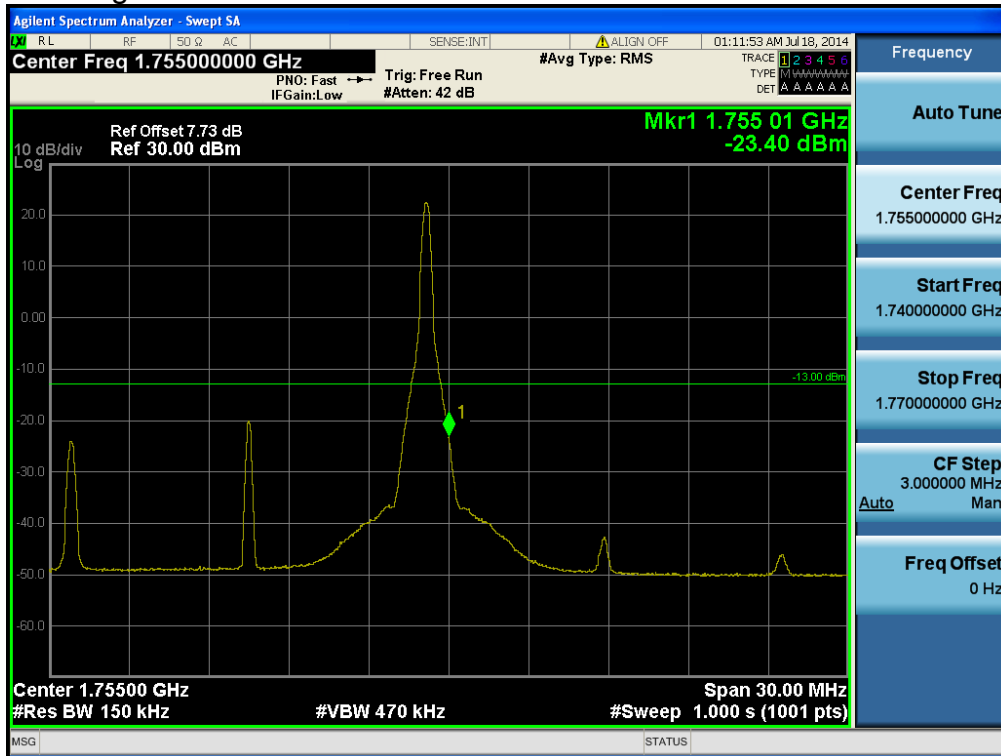
LTE Band 4 / 15MHz / 16QAM - RB Offset/Size (0/1)

- Lower Extended Band Edge



LTE Band 4 / 15MHz / QPSK - RB Offset/Size (0/36)

- Upper Band Edge



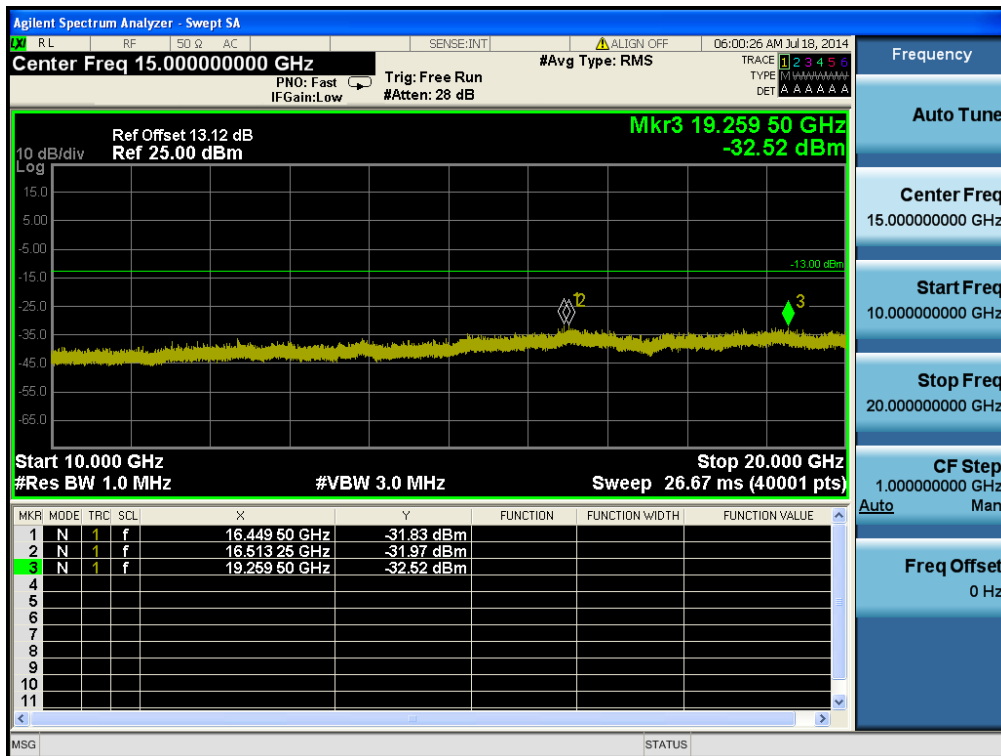
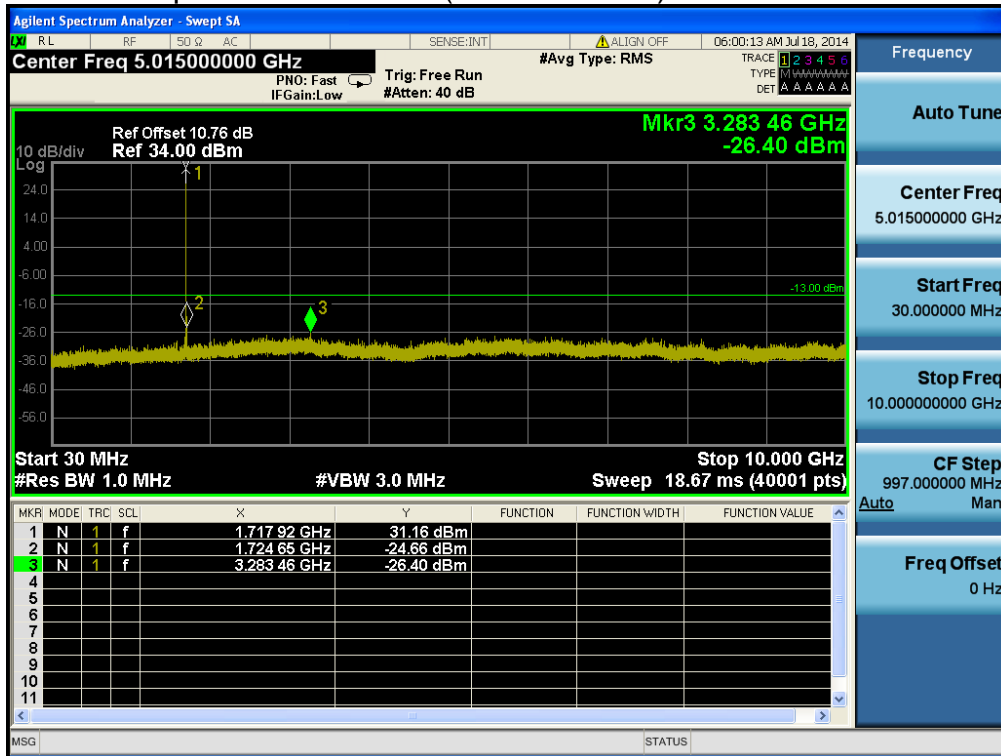
LTE Band 4 / 15MHz / QPSK - RB Offset/Size (74/1)

- Upper Extended Band Edge



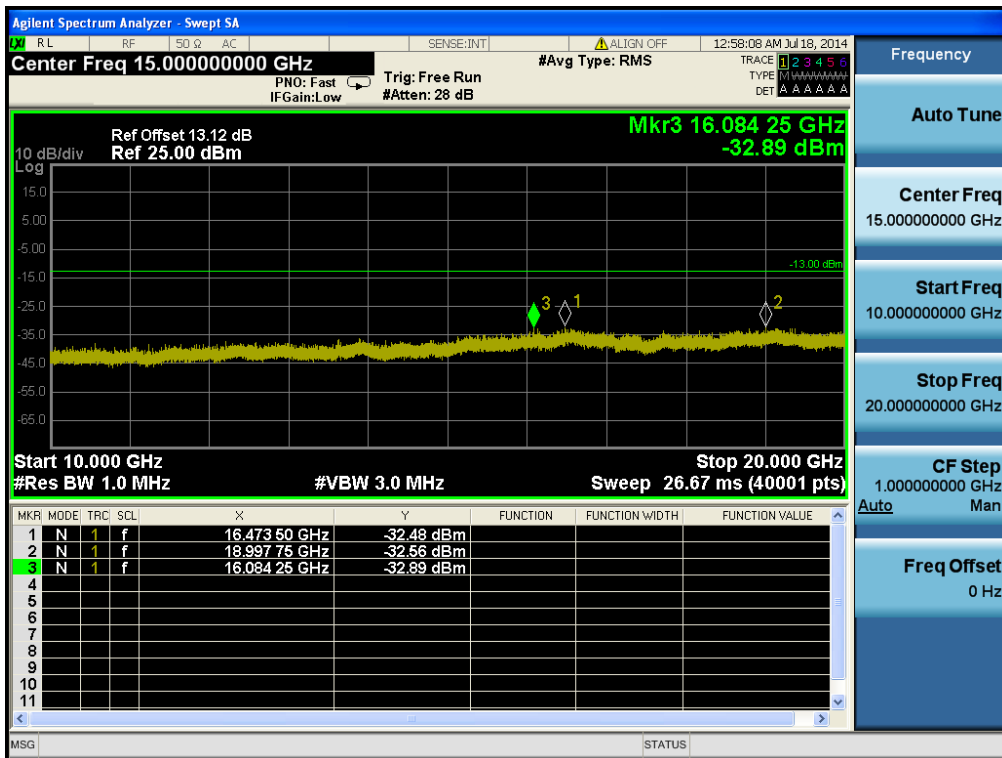
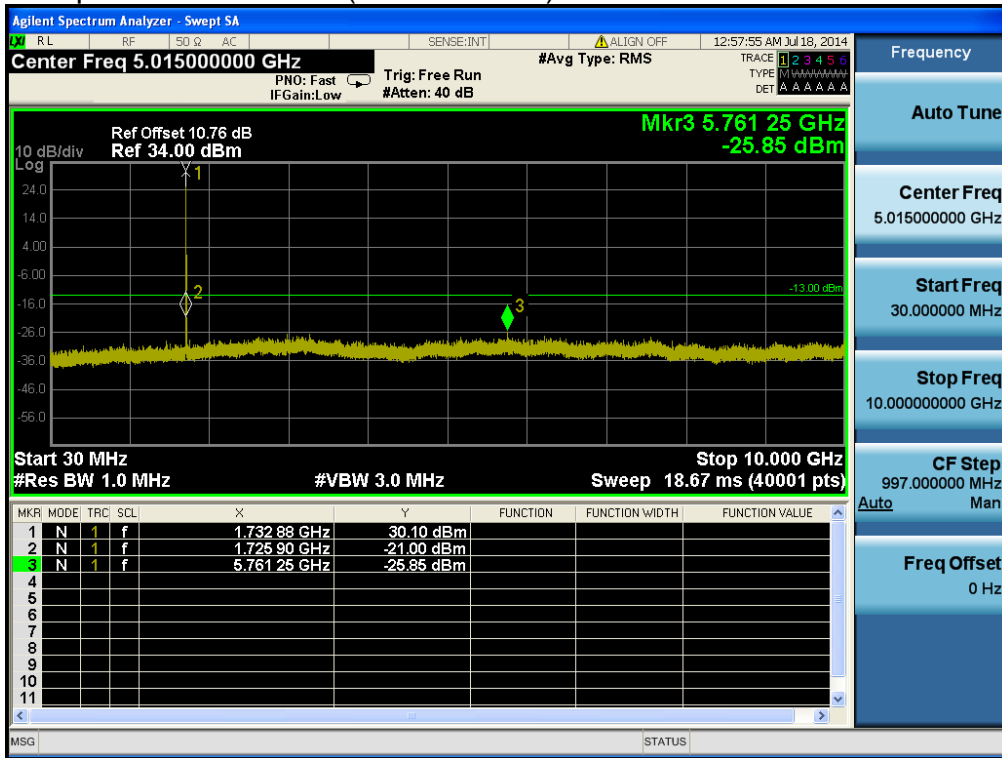
LTE Band 4 / 15MHz / QPSK - RB Offset/Size (39/36)

- Lower Conducted Spurious Emissions (Low Channel)



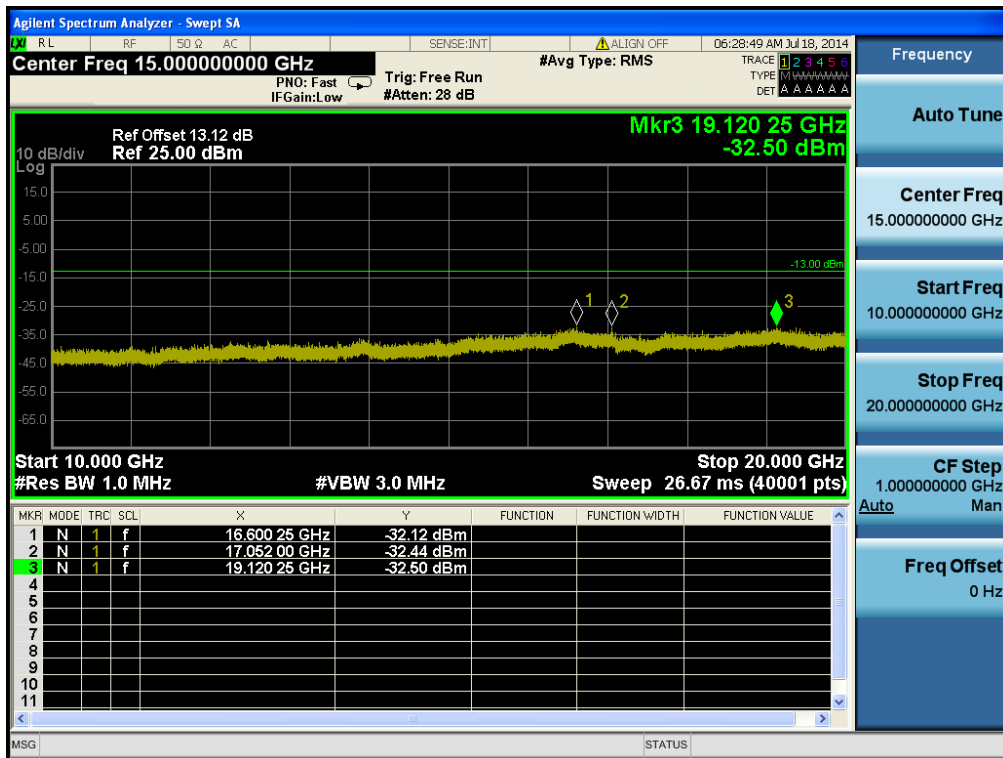
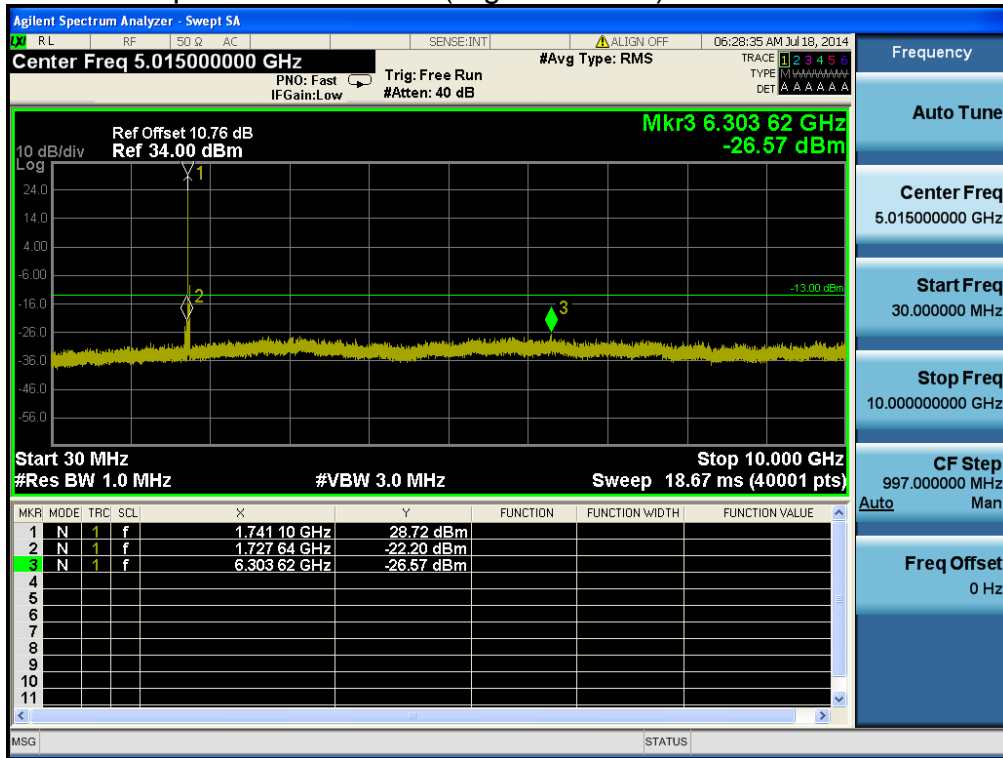
LTE Band 4 / 15MHz / 16QAM - RB Offset/Size (37/1)

- Conducted Spurious Emissions (Mid channel)



LTE Band 4 / 15MHz / QPSK - RB Offset/Size (37/1)

- Upper Conducted Spurious Emissions (High Channel)



LTE Band 4 / 15MHz / 16QAM - RB Offset/Size (0/1)

- Lower Band Edge



LTE Band 4 / 10MHz / QPSK - RB Offset/Size (0/25)

- Lower Extended Band Edge



LTE Band 4 / 10MHz / QPSK - RB Offset/Size (0/25)

- Upper Band Edge



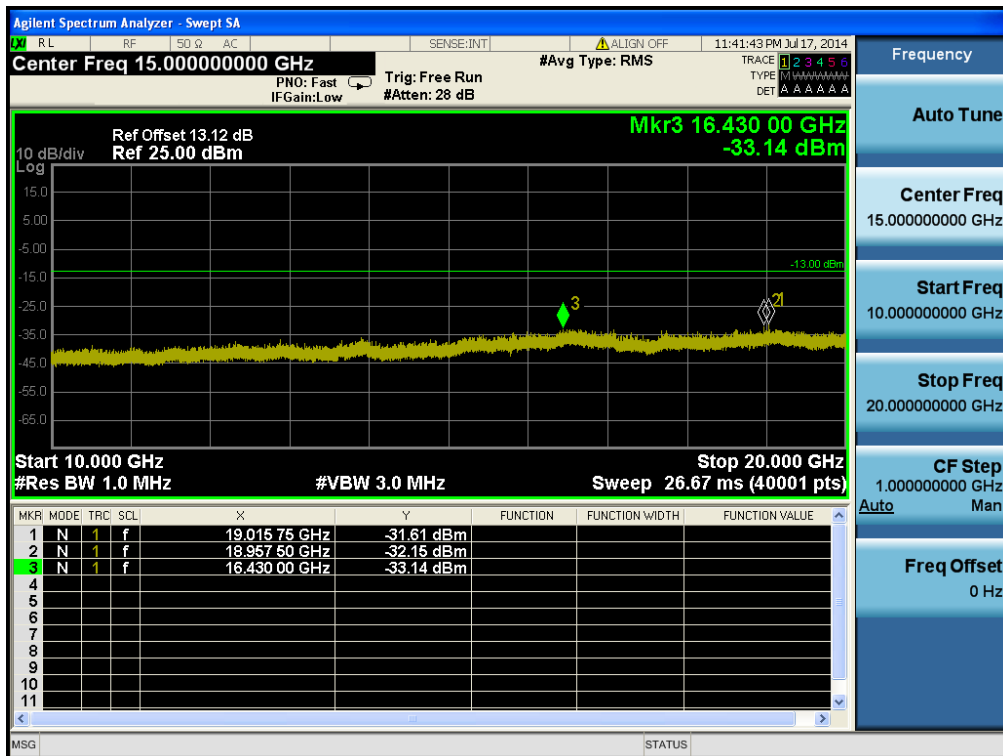
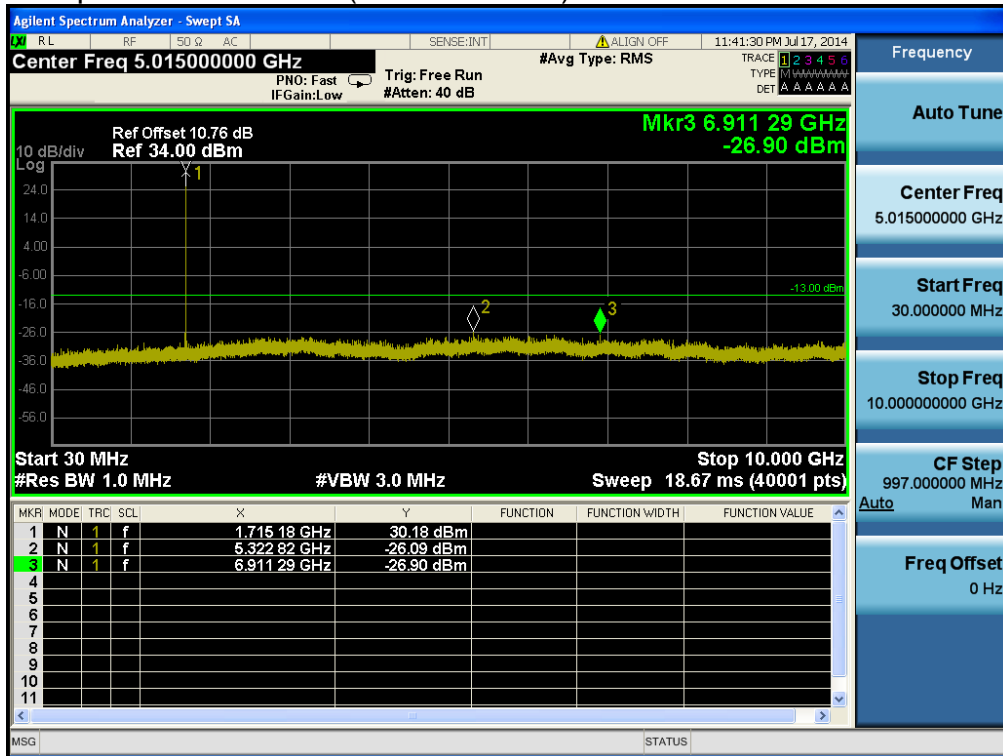
LTE Band 4 / 10MHz / QPSK - RB Offset/Size (25/25)

- Upper Extended Band Edge



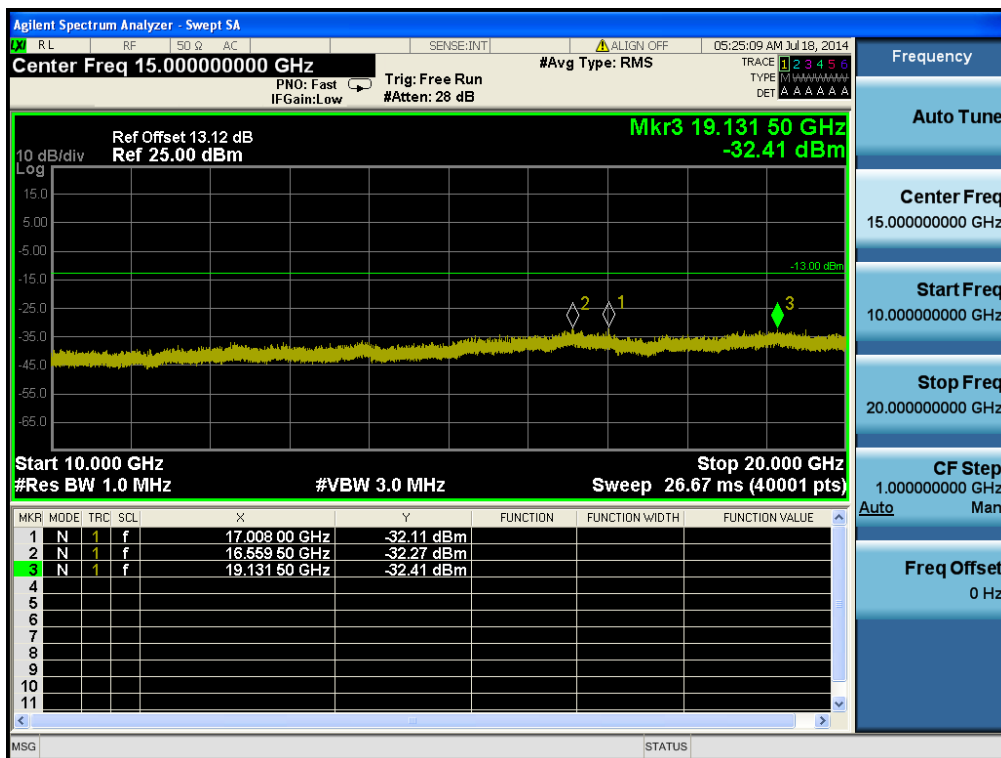
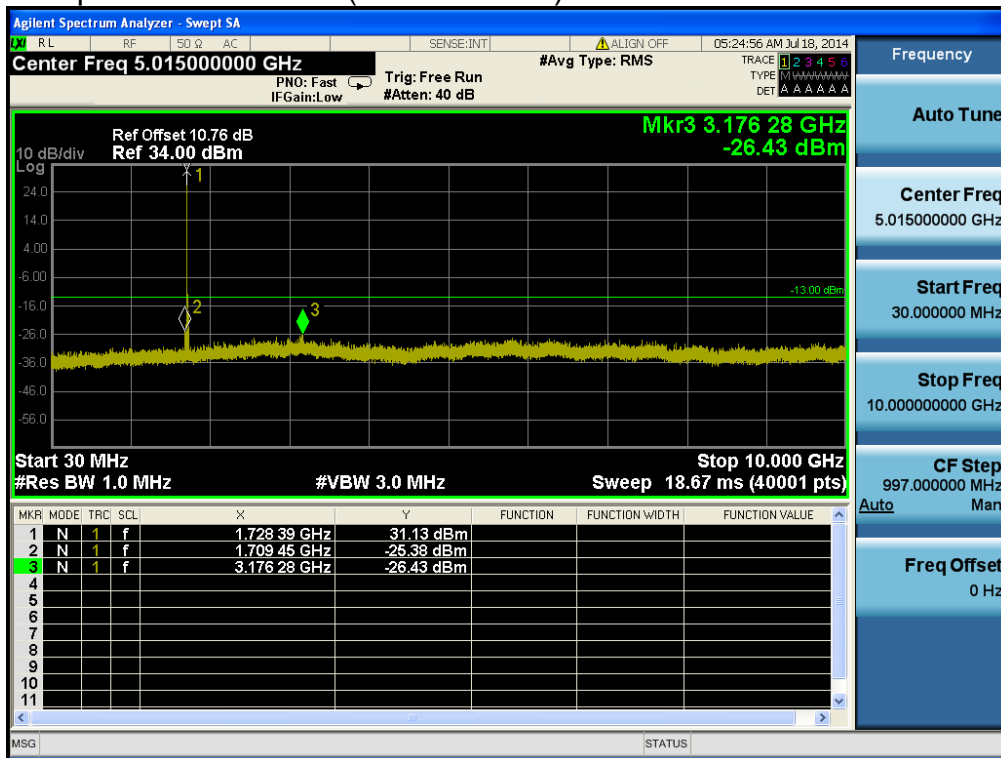
LTE Band 4 / 10MHz / QPSK - RB Offset/Size (25/25)

- Conducted Spurious Emissions (Low Channel)



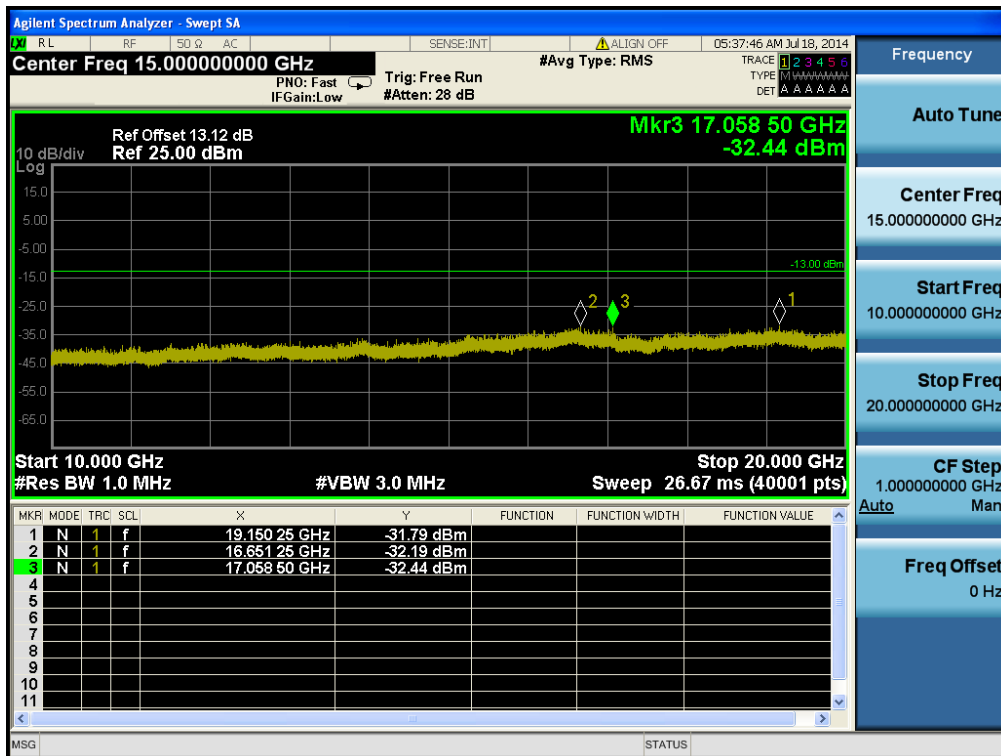
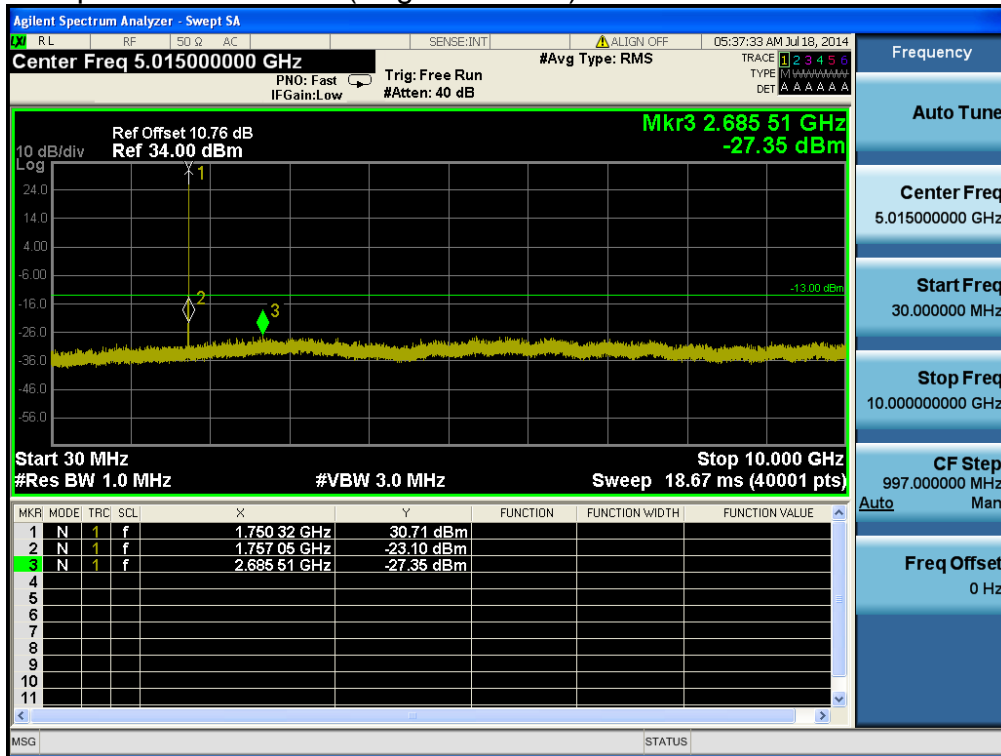
LTE Band 4 / 10MHz / QPSK - RB Offset/Size (25/1)

- Conducted Spurious Emissions (Mid Channel)



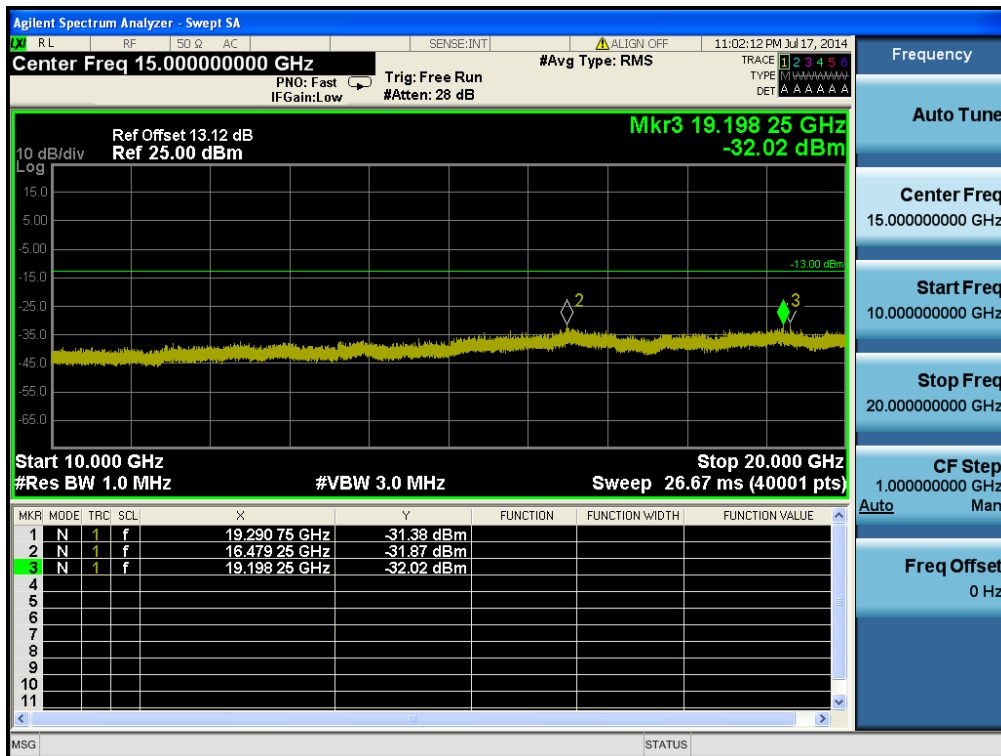
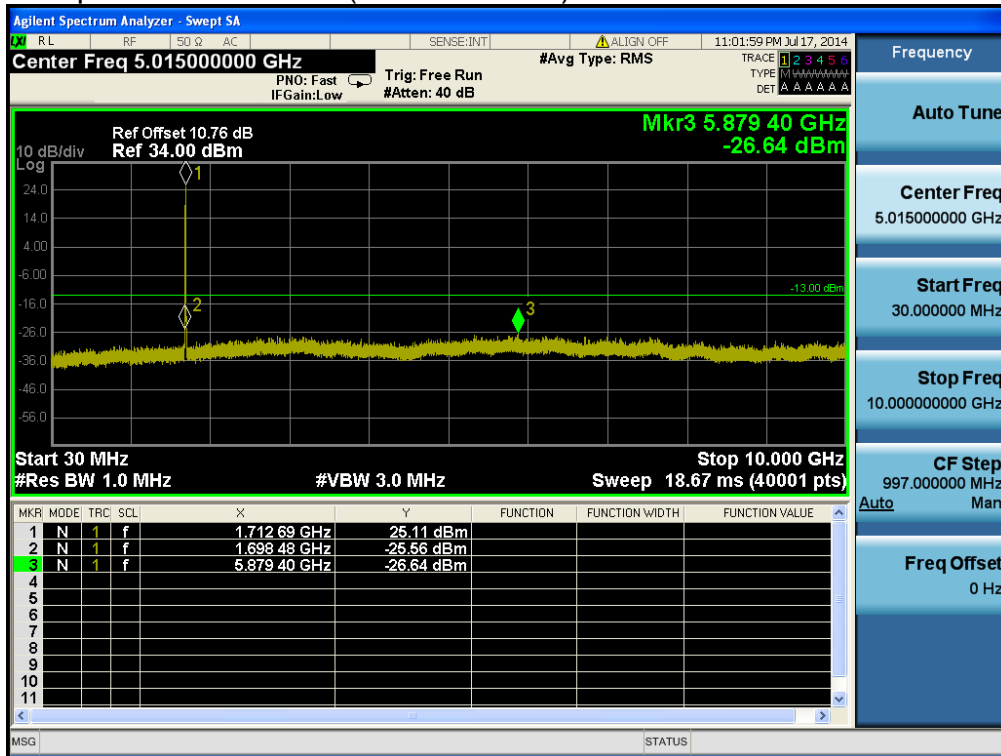
LTE Band 4 / 10MHz / 16QAM - RB Offset/Size (0/1)

- Conducted Spurious Emissions (High Channel)



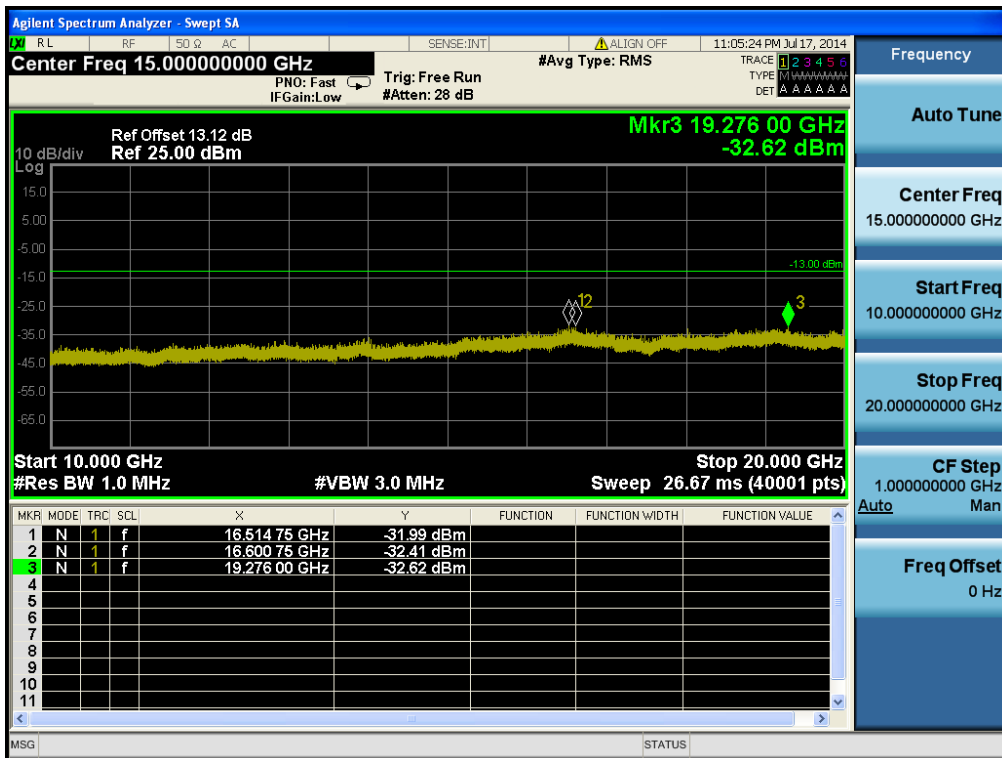
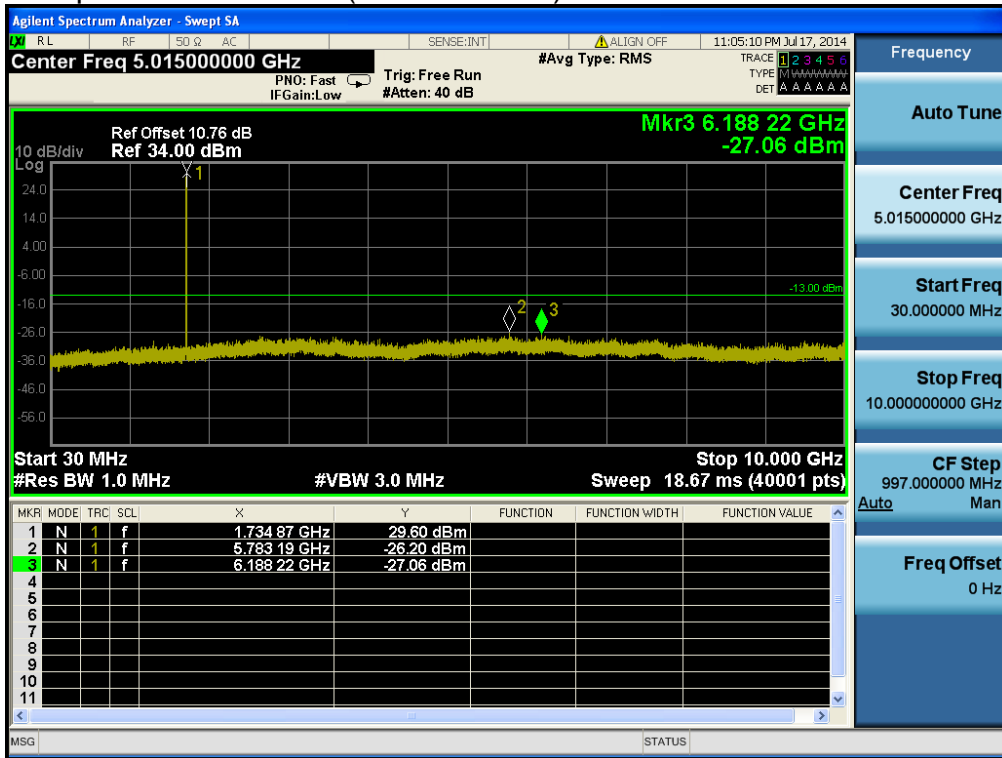
LTE Band 4 / 10MHz / 16QAM - RB Offset/Size (25/1)

- Conducted Spurious Emissions (Low Channel)



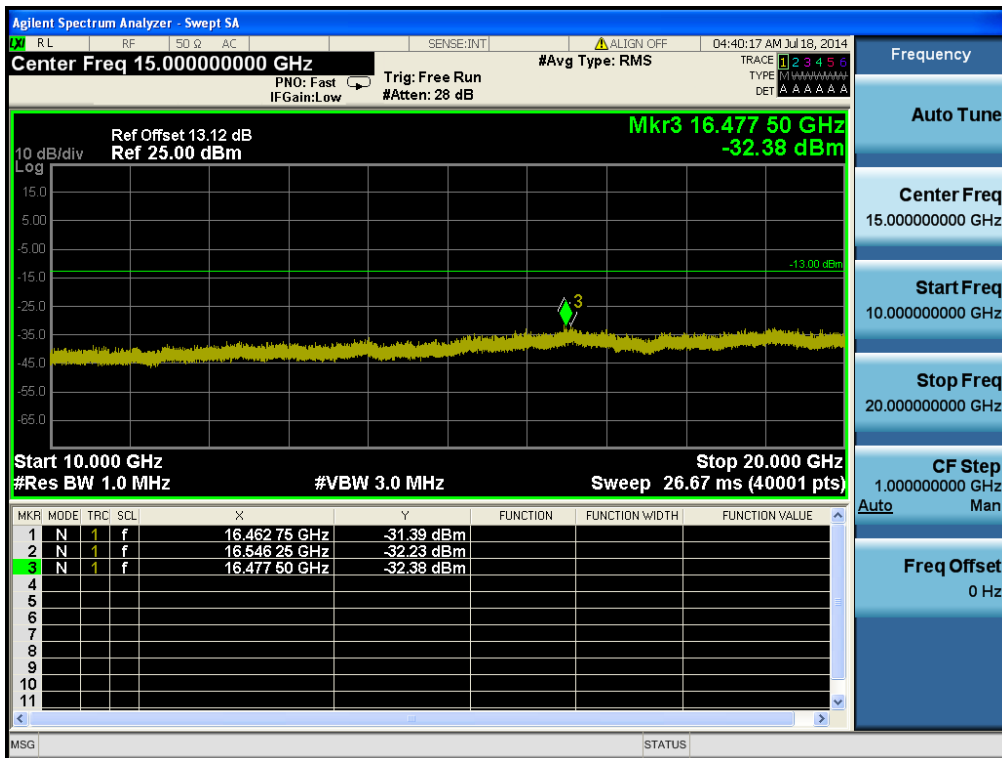
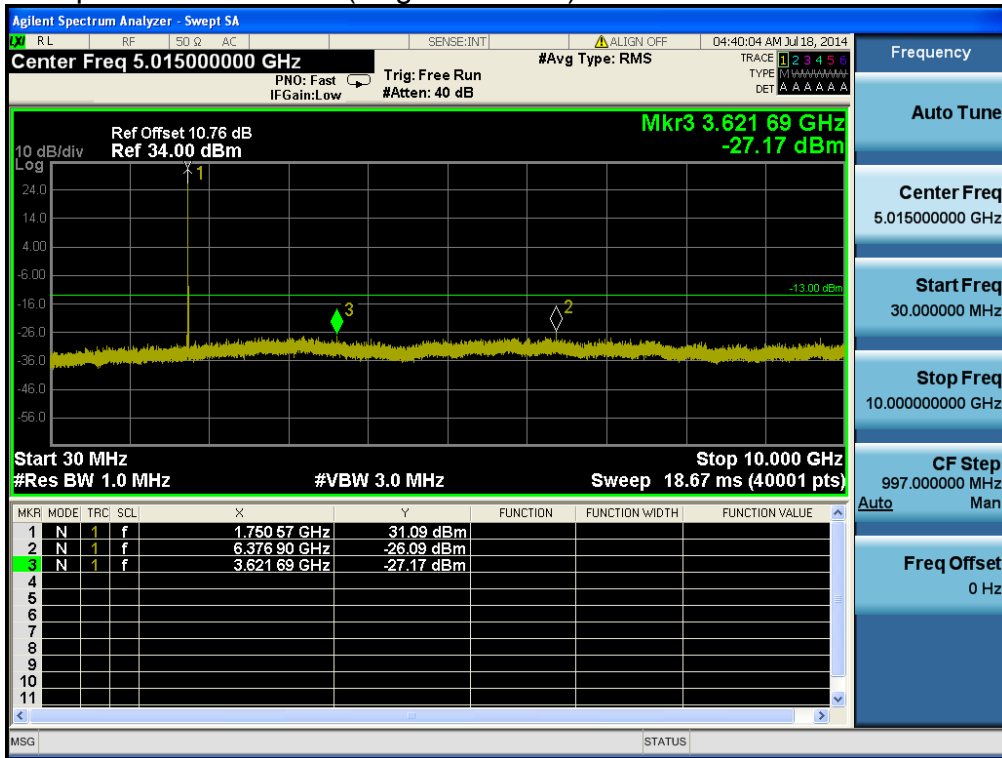
LTE Band 4 / 5MHz / QPSK - RB Offset/Size (0/25)

- Conducted Spurious Emissions (Mid Channel)



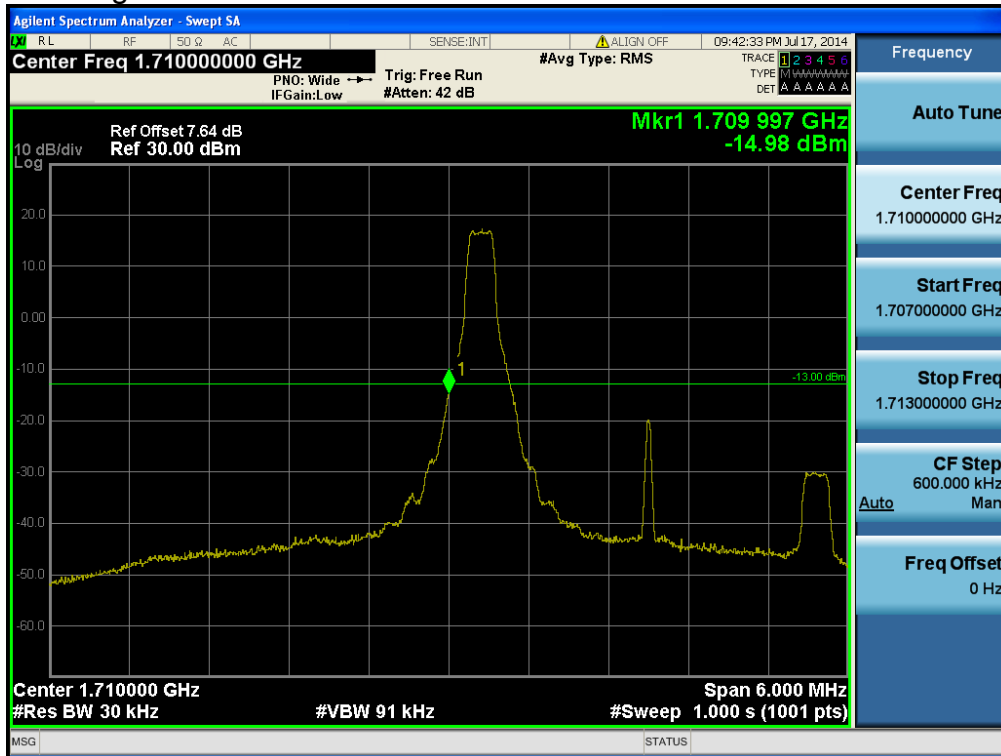
LTE Band 4 / 5MHz / QPSK - RB Offset/Size (24/1)

- Conducted Spurious Emissions (High Channel)



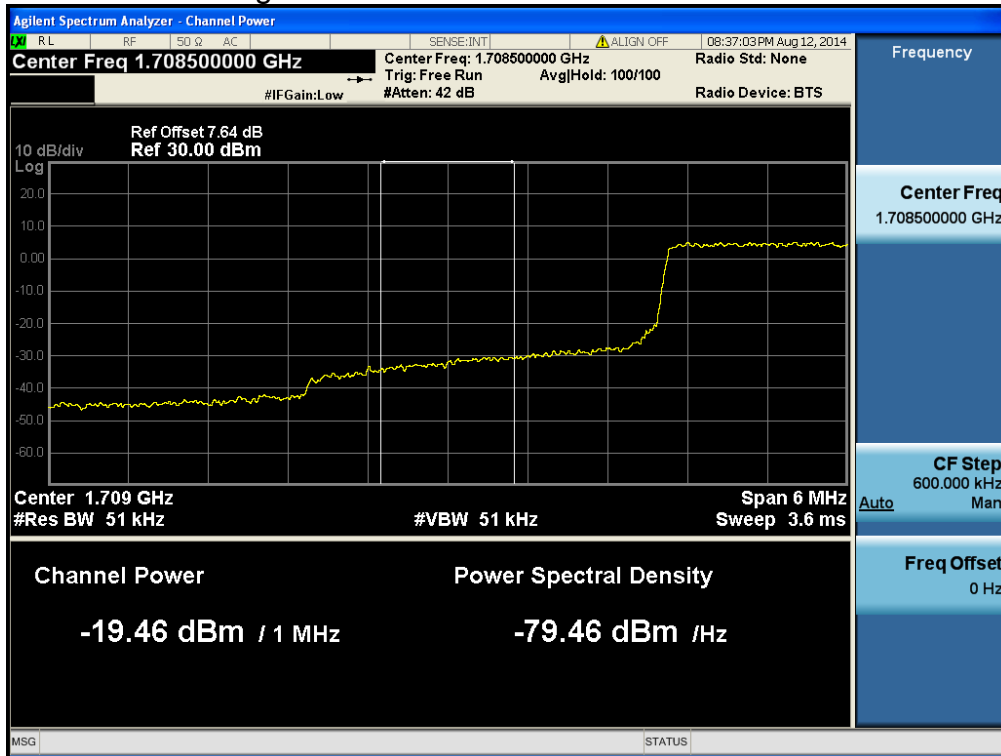
LTE Band 4 / 5MHz / 16QAM - RB Offset/Size (0/1)

- Lower Band Edge



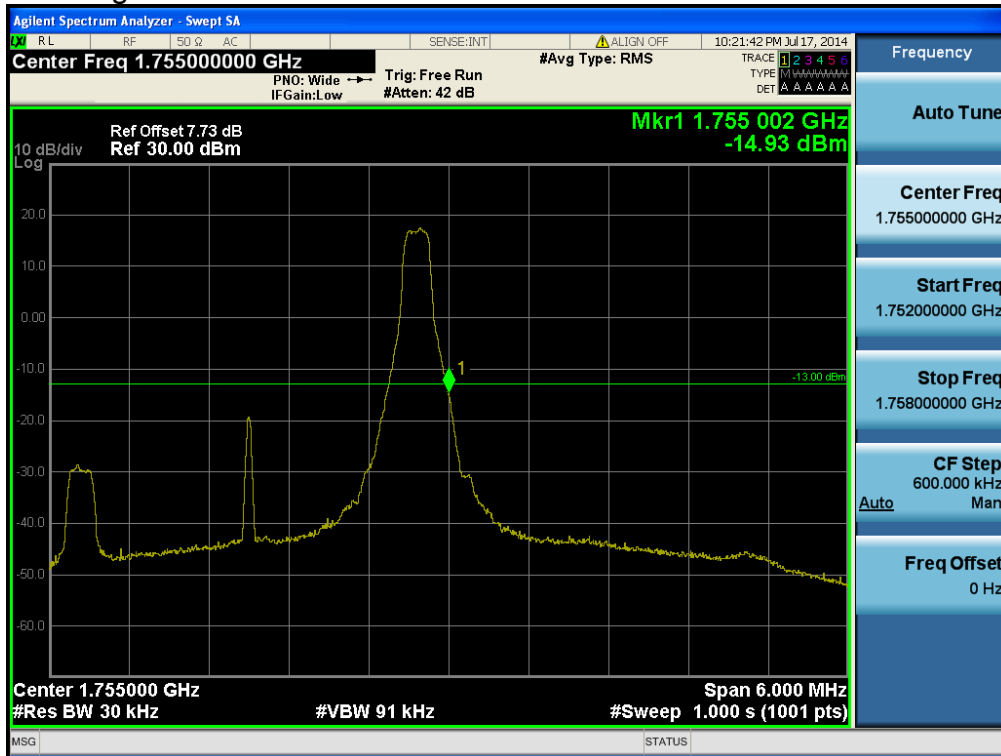
LTE Band 4 / 3MHz / QPSK - RB Offset/Size (0/1)

- Lower Extended Band Edge



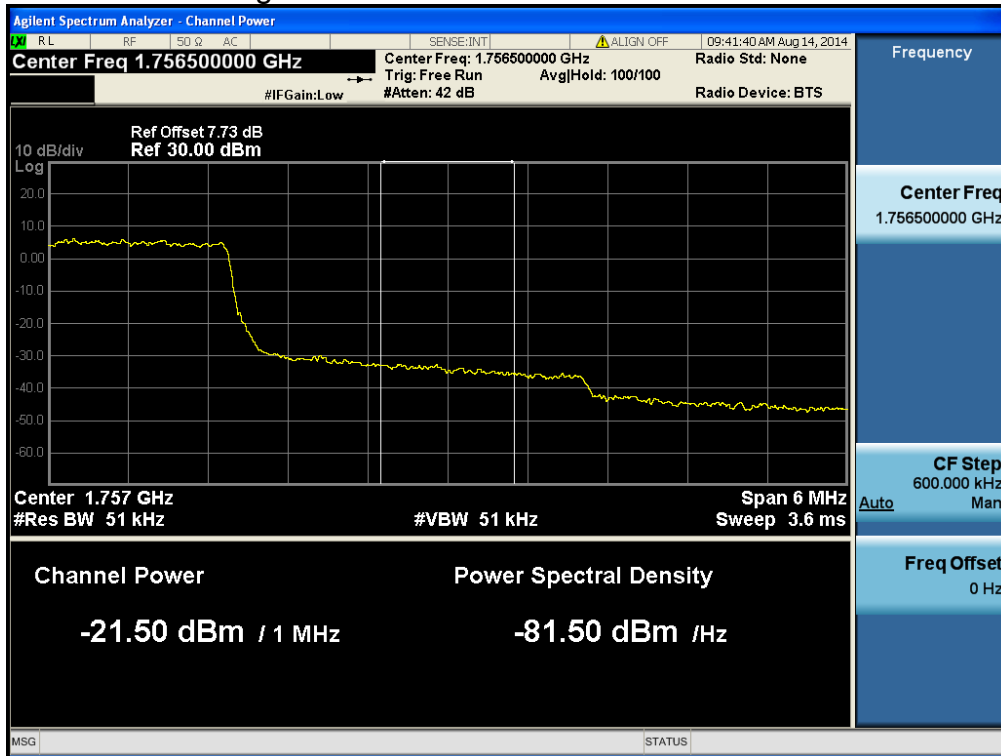
LTE Band 4 / 3MHz / QPSK - RB Offset/Size (0/15)

- Upper Band Edge



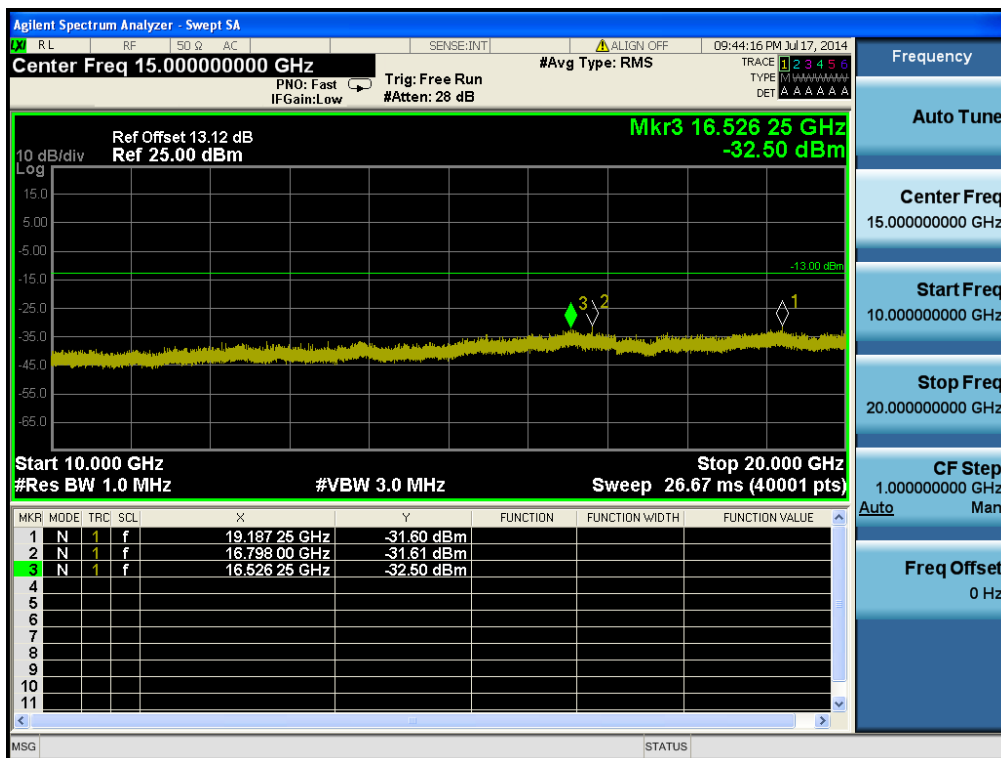
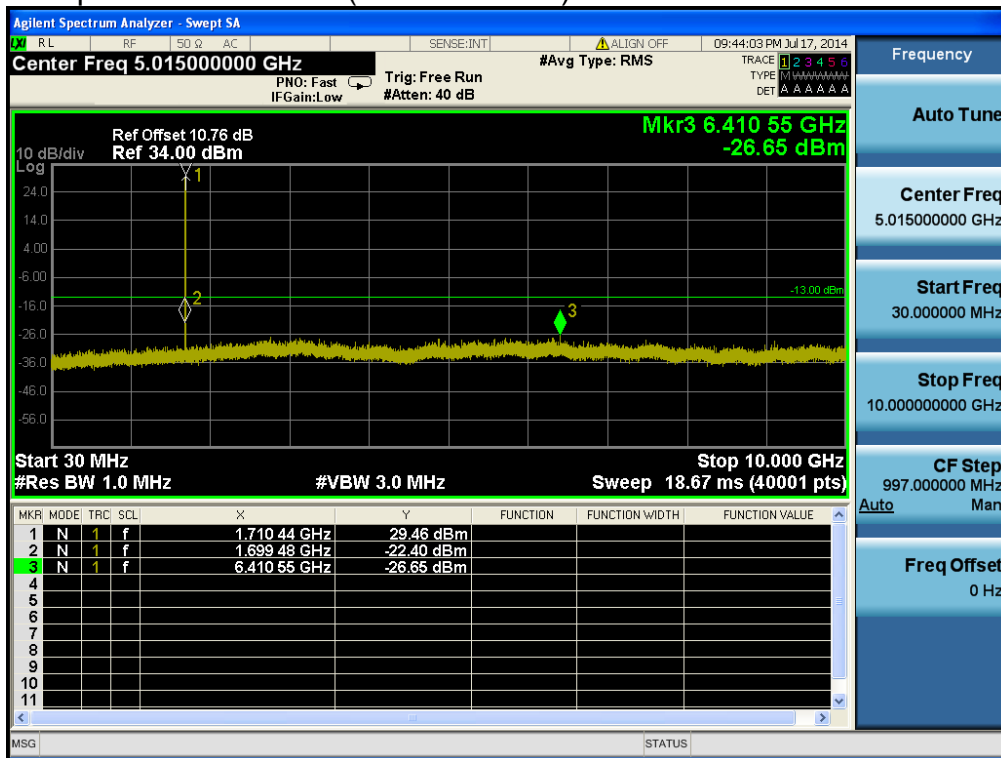
LTE Band 4 / 3MHz / QPSK - RB Offset/Size (14/1)

- Upper Extended Band Edge



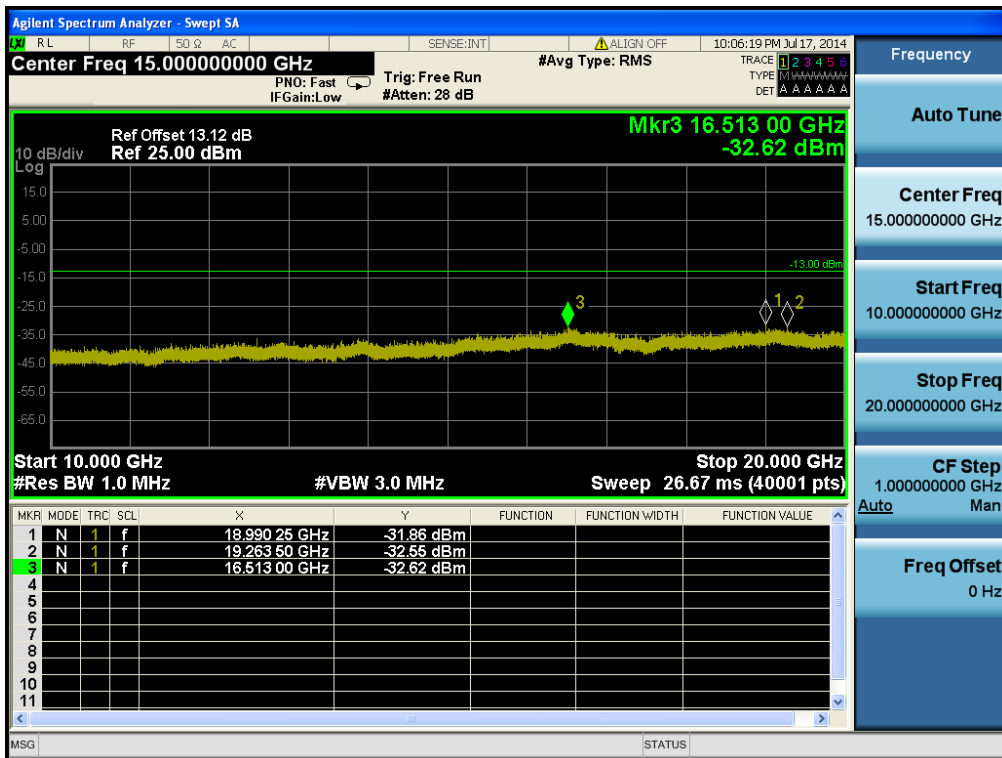
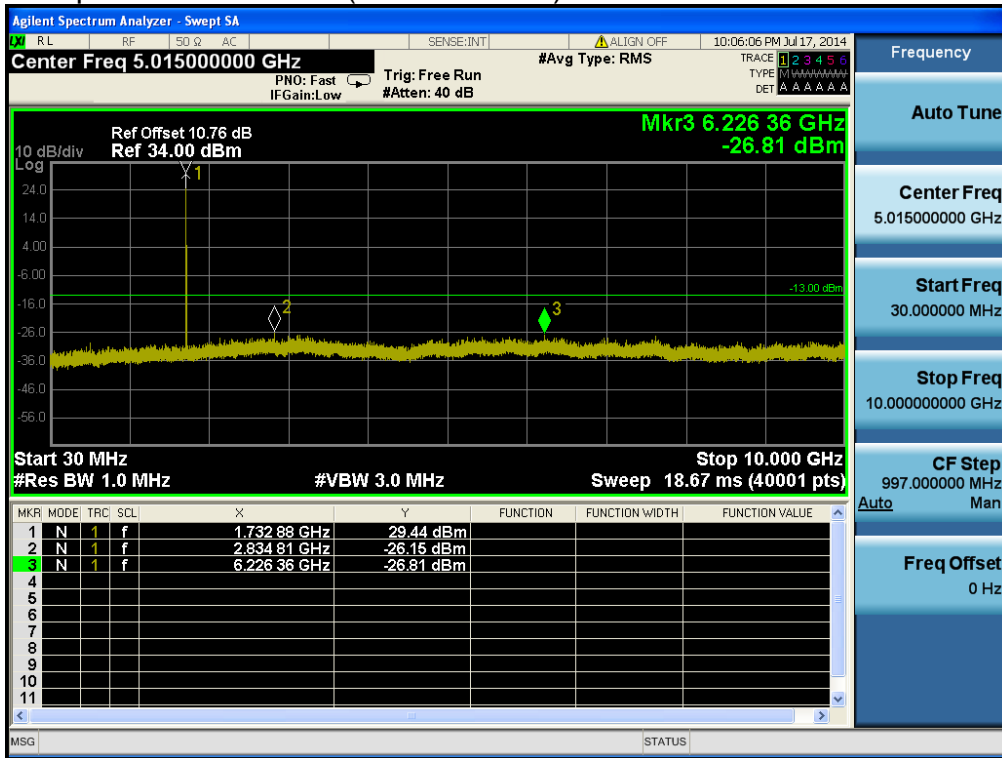
LTE Band 4 / 3MHz / QPSK - RB Offset/Size (0/15)

- Conducted Spurious Emissions (Low Channel)



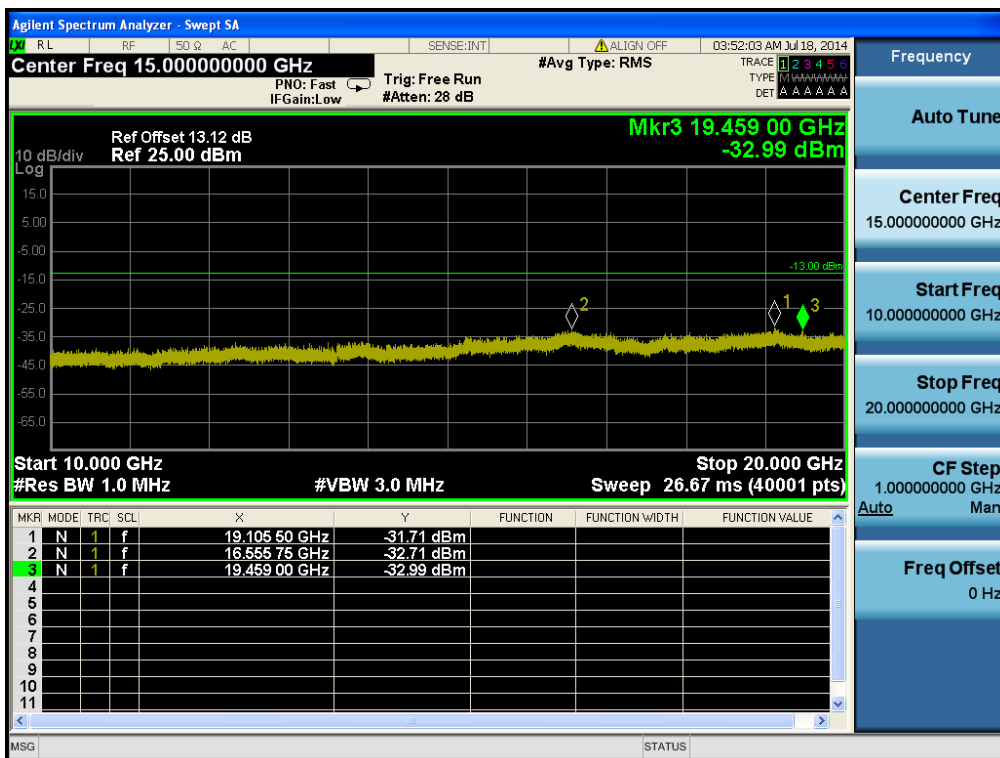
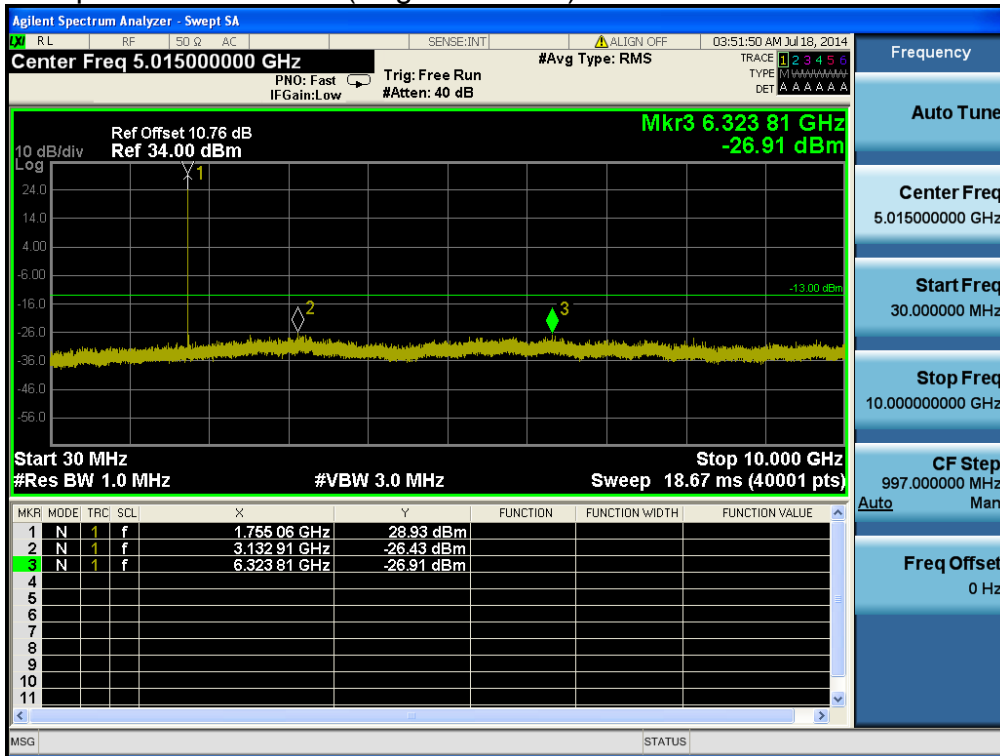
LTE Band 4 / 3MHz / QPSK - RB Offset/Size (0/1)

- Conducted Spurious Emissions (Mid Channel)



LTE Band 4 / 3MHz / QPSK - RB Offset/Size (7/1)

- Conducted Spurious Emissions (High Channel)



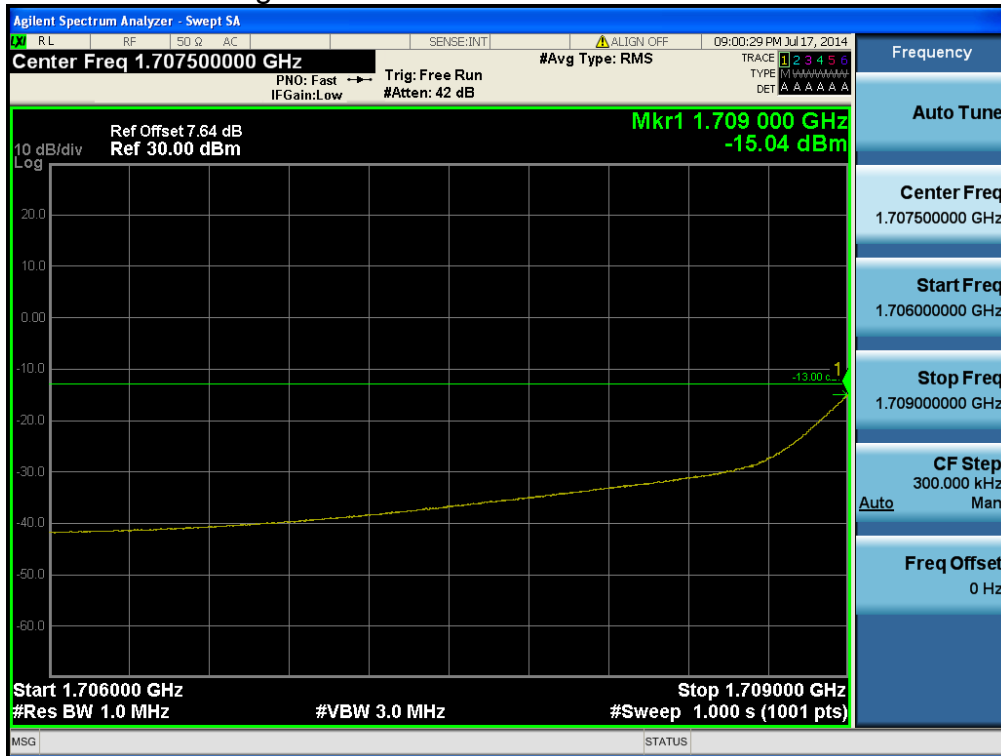
LTE Band 4 / 3MHz / QPSK - RB Offset/Size (14/1)

- Lower Band Edge



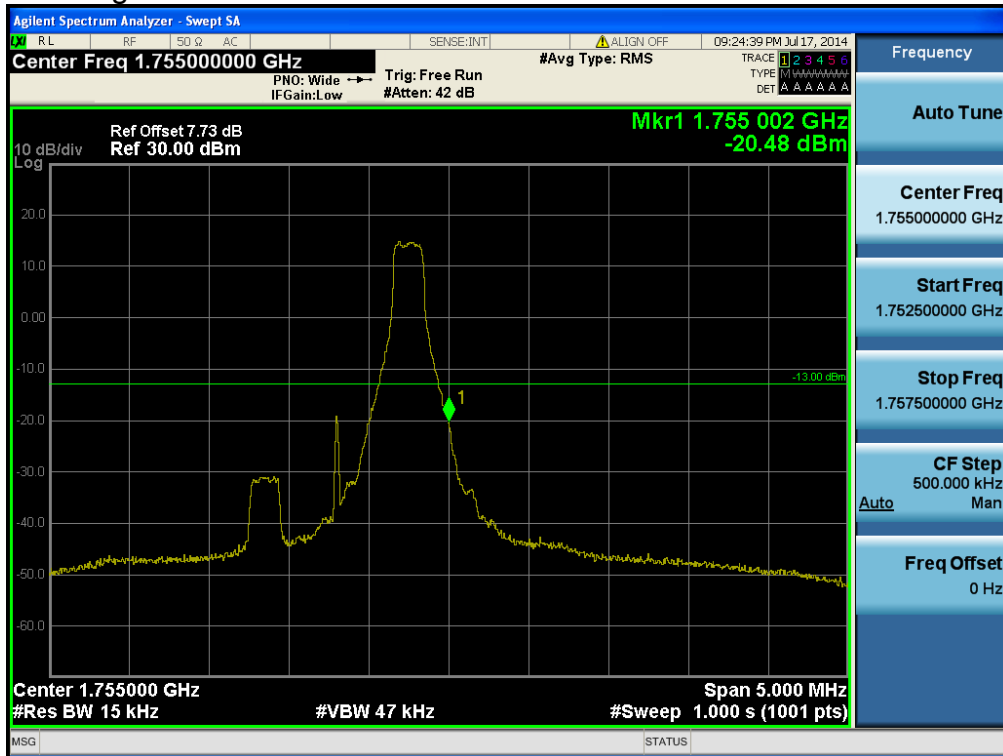
LTE Band 4 / 1.4MHz / QPSK - RB Offset/Size (0/3)

- Lower Extended Band Edge



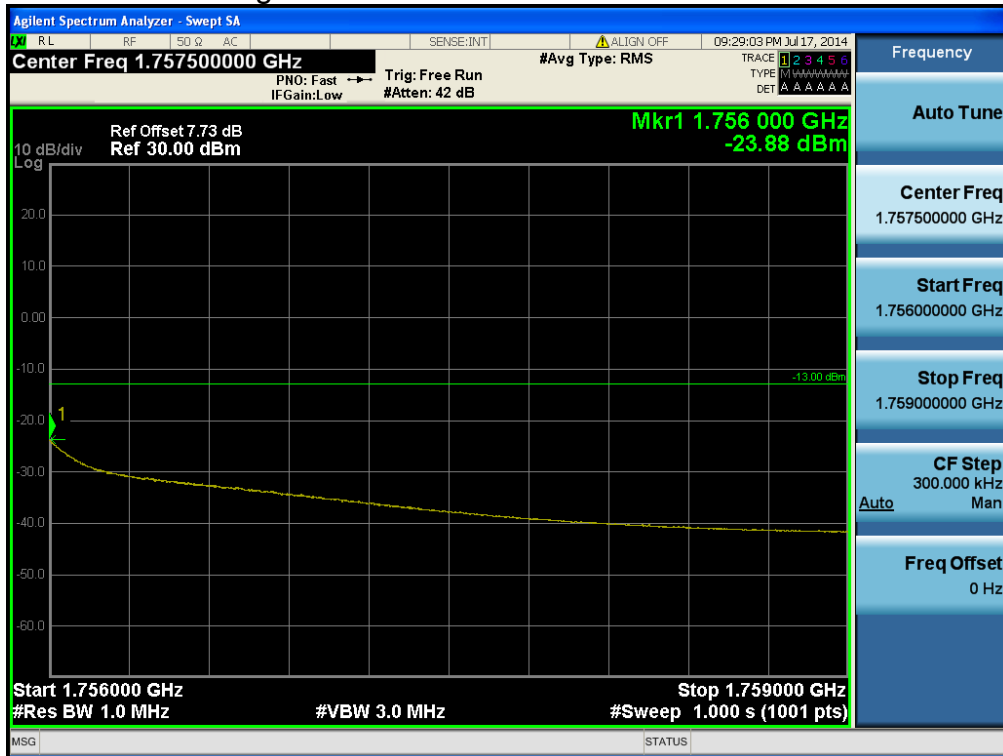
LTE Band 4 / 1.4MHz / QPSK - RB Offset/Size (1/3)

- Upper Band Edge



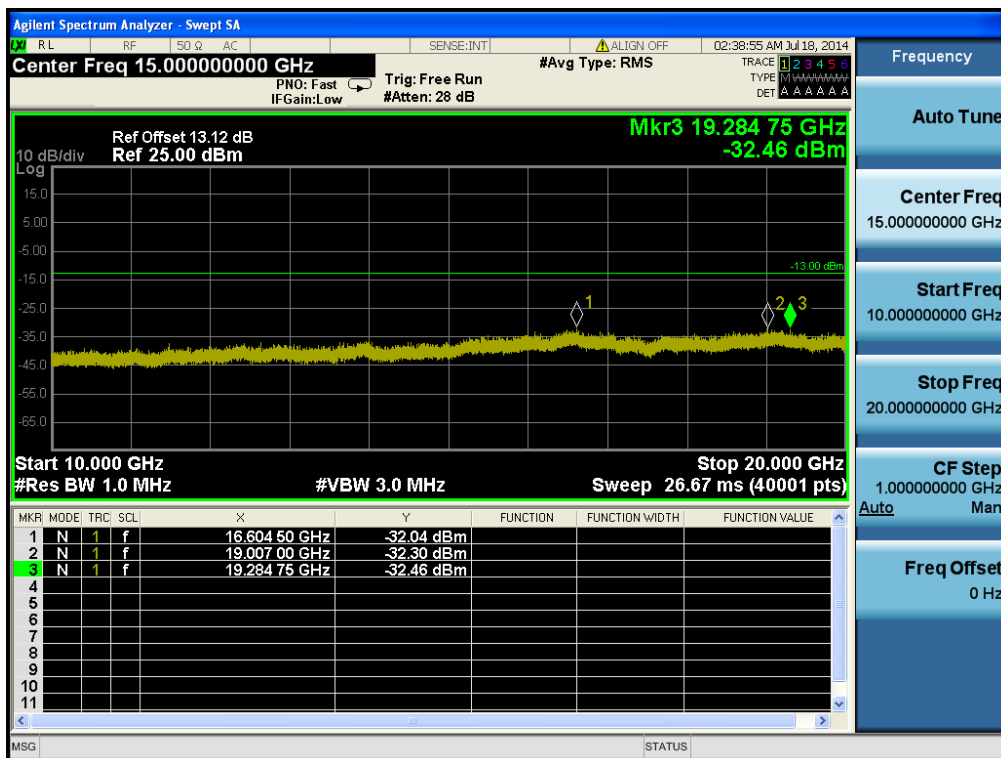
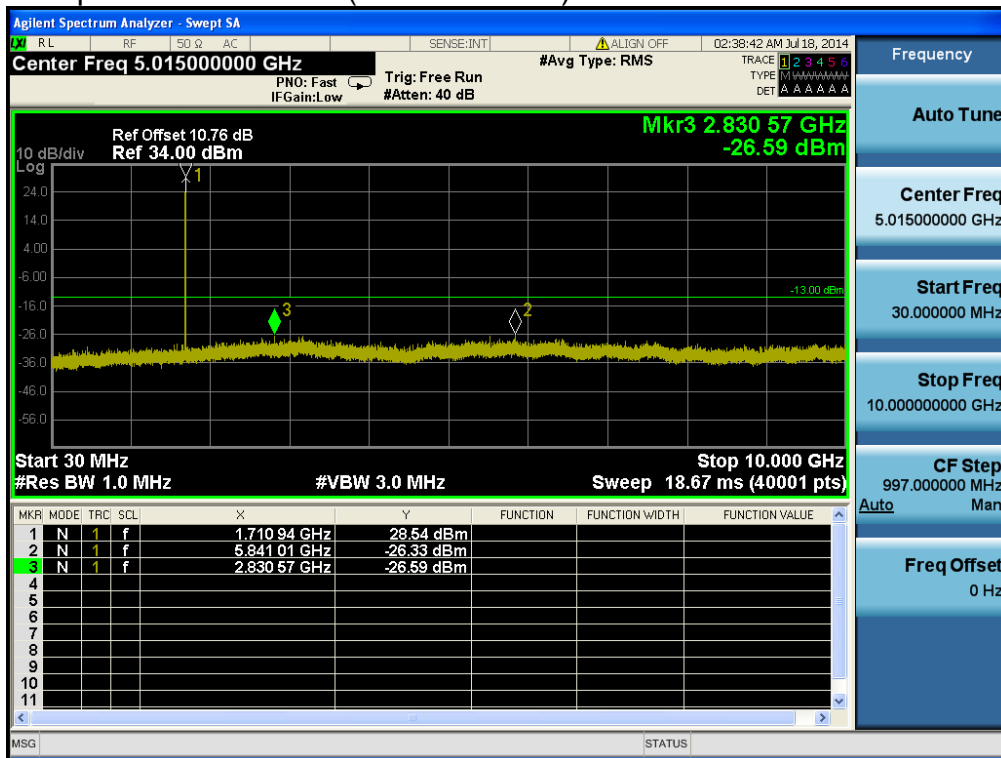
LTE Band 4 / 1.4MHz / QPSK - RB Offset/Size (5/1)

- Upper Extended Band Edge



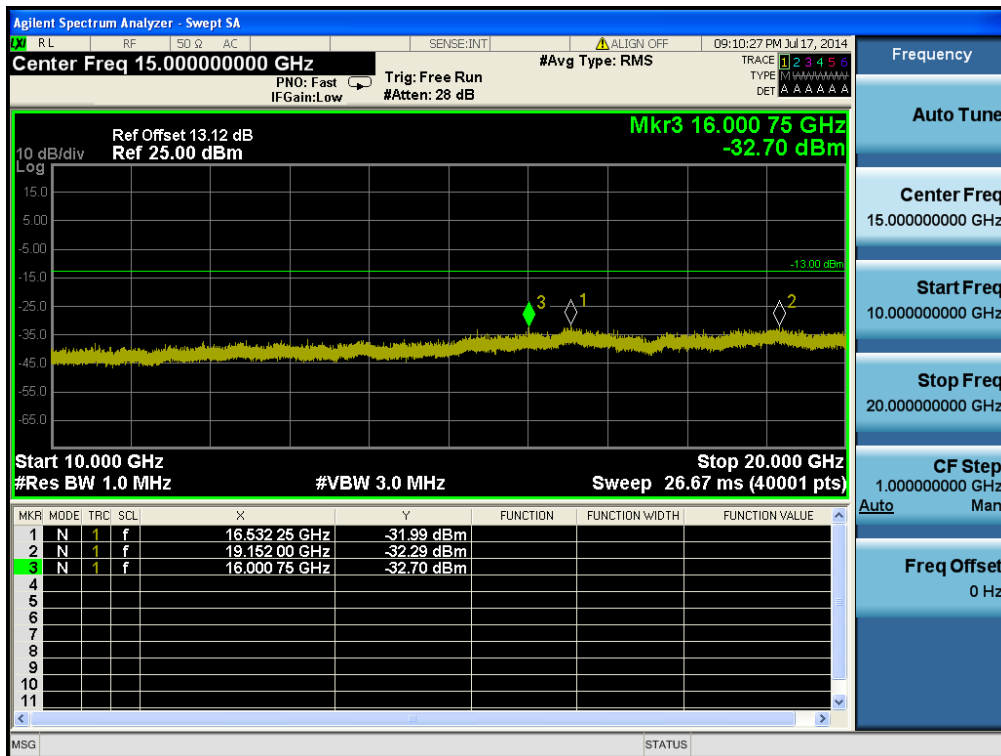
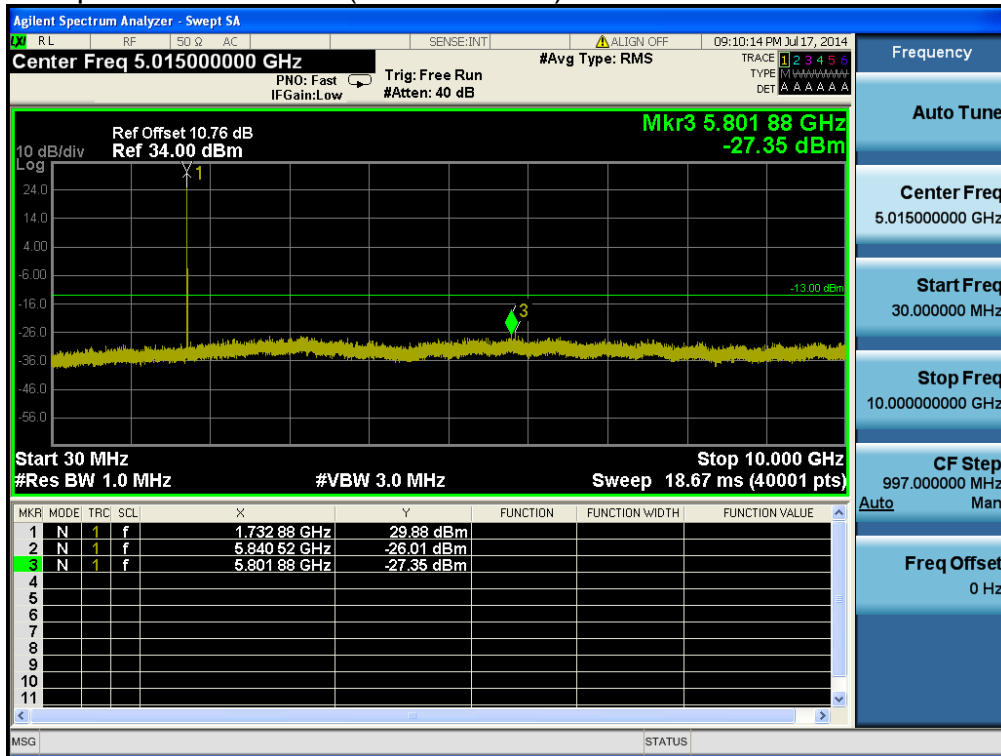
LTE Band 4 / 1.4MHz / QPSK - RB Offset/Size (0/3)

- Conducted Spurious Emissions (Low Channel)



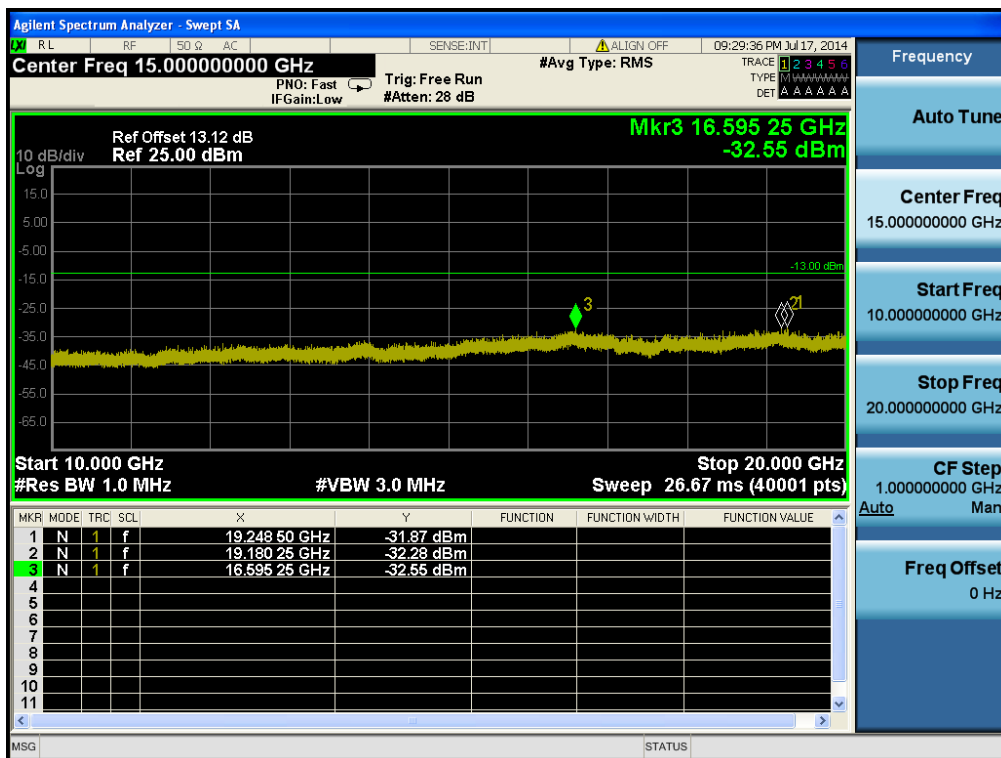
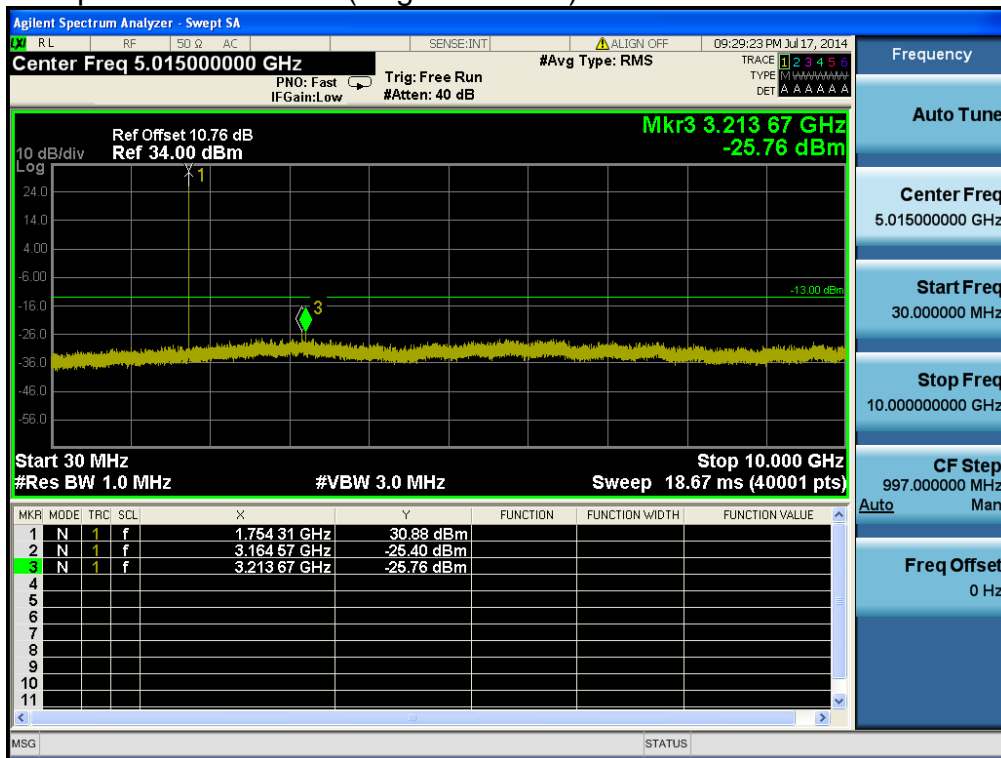
LTE Band 4 / 1.4MHz / 16QAM - RB Offset/Size (0/6)

- Conducted Spurious Emissions (Mid Channel)



LTE Band 4 / 1.4MHz / QPSK - RB Offset/Size (3/1)

- Conducted Spurious Emissions (High Channel)



LTE Band 4 / 1.4MHz / QPSK - RB Offset/Size (0/3)