

# TEST REPORT



**DT&C Co., Ltd.**

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Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC1710-0233

2. Customer

• Name : BLUEBIRD INC.

• Address (FCC) : (Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul South Korea

Address (IC) : (Dogok-dong, SEI Tower13,14)39, Eonjuro30-gil, Gangnam-gu Seoul 06292  
Korea (Republic Of)

3. Use of Report : FCC & IC Original Grant

4. Product Name / Model Name : Printer intergrated Tablet / PT550

FCC ID : SS4PT550 / IC : 22515-PT550

5. Test Method Used : KDB Procedure



Test Specification : FCC Part 22, 24, 27

132 Issue 3, 133 Issue 6, 139 Issue 3

6. Date of Test : 2017.08.03 ~ 2017.08.28

7. Testing Environment : See appended test report.

8. Test Result : Refer to the attached test result.

|             |  |   |
|-------------|--|---|
| Affirmation | Tested by  | Technical Manager   |
|             | Name : JaeHyeok Bang  | Name : Geunki Son  (Signature) |

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2017 . 10 . 26 .

**DT&C Co., Ltd.**

If this report is required to confirmation of authenticity, please contact to [report@dtnc.net](mailto:report@dtnc.net)

## Test Report Version

| Test Report No. | Date          | Description   |
|-----------------|---------------|---------------|
| DRTFCC1710-0233 | Oct. 26, 2017 | Initial issue |
|                 |               |               |
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## 1. GENERAL INFORMATION

**Applicant Name:** Bluebird Inc.  
**Address (FCC):** (Dogok-dong, SEI Tower 13,14) 39, Eonjuro30-gil, Gangnam-gu, Seoul South Korea  
**Address (IC):** (Dogok-dong, SEI Tower13,14)39, Eonjuro30-gil, Gangnam-gu Seoul 06292 Korea (Republic Of)

**FCC ID** : SS4PT550

**IC** : 22515-PT550

**FCC Classification** : Licensed Transmitter (PCB)

**EUT Type** : Printer intergrated Tablet

**Model Name** : PT550

**Add Model Name** : NA

**Supplying power** : DC 9.0 V

**Hardware version** : Rev0.2

**Software version** : R 1.0

**Antenna Information** : Internal Antenna

**Antenna Gain** : LTE Band 5: -10.957dBi  
LTE Band 4: -0.338dBi  
LTE Band 2: -0.269dBi

| Mode       | TX Frequency (MHz) | Emission Designator | Modulation | ERP(For the FCC) |               | EIRP(For the IC) |               |
|------------|--------------------|---------------------|------------|------------------|---------------|------------------|---------------|
|            |                    |                     |            | Max power (dBm)  | Max power (W) | Max power (dBm)  | Max power (W) |
| LTE Band 5 | 829 ~ 844          | 8M97G7D             | QPSK       | 21.37            | 0.137         | 23.52            | 0.225         |
| LTE Band 5 | 829 ~ 844          | 8M95W7D             | 16QAM      | 20.34            | 0.108         | 22.49            | 0.177         |
| LTE Band 5 | 826.5 ~ 846.5      | 4M50G7D             | QPSK       | 21.16            | 0.131         | 23.31            | 0.214         |
| LTE Band 5 | 826.5 ~ 846.5      | 4M50W7D             | 16QAM      | 20.19            | 0.104         | 22.34            | 0.171         |
| LTE Band 5 | 825.5 ~ 847.5      | 2M70G7D             | QPSK       | 21.47            | 0.140         | 23.62            | 0.230         |
| LTE Band 5 | 825.5 ~ 847.5      | 2M70W7D             | 16QAM      | 20.75            | 0.119         | 22.90            | 0.195         |
| LTE Band 5 | 824.7 ~ 848.3      | 1M09G7D             | QPSK       | 21.36            | 0.137         | 23.51            | 0.224         |
| LTE Band 5 | 824.7 ~ 848.3      | 1M10W7D             | 16QAM      | 20.50            | 0.112         | 22.65            | 0.184         |

| Mode       | TX Frequency (MHz) | Emission Designator | Modulation | EIRP (FCC & IC) |              |
|------------|--------------------|---------------------|------------|-----------------|--------------|
|            |                    |                     |            | Max power(dBm)  | Max power(W) |
| LTE Band 4 | 1720 ~ 1745        | 17M9G7D             | QPSK       | 25.77           | 0.378        |
| LTE Band 4 | 1720 ~ 1745        | 17M9W7D             | 16QAM      | 25.11           | 0.324        |
| LTE Band 4 | 1717.5 ~ 1747.5    | 13M5G7D             | QPSK       | 25.73           | 0.374        |
| LTE Band 4 | 1717.5 ~ 1747.5    | 13M5W7D             | 16QAM      | 25.10           | 0.324        |
| LTE Band 4 | 1715 ~ 1750        | 8M95G7D             | QPSK       | 25.70           | 0.372        |
| LTE Band 4 | 1715 ~ 1750        | 8M96W7D             | 16QAM      | 24.64           | 0.291        |
| LTE Band 4 | 1712.5 ~ 1752.5    | 4M49G7D             | QPSK       | 25.82           | 0.382        |
| LTE Band 4 | 1712.5 ~ 1752.5    | 4M50W7D             | 16QAM      | 24.88           | 0.308        |
| LTE Band 4 | 1711.5 ~ 1753.5    | 2M70G7D             | QPSK       | 25.76           | 0.377        |
| LTE Band 4 | 1711.5 ~ 1753.5    | 2M70W7D             | 16QAM      | 24.98           | 0.315        |
| LTE Band 4 | 1710.7 ~ 1754.3    | 1M09G7D             | QPSK       | 25.89           | 0.388        |
| LTE Band 4 | 1710.7 ~ 1754.3    | 1M09W7D             | 16QAM      | 25.04           | 0.319        |
| LTE Band 2 | 1860 ~ 1900        | 17M9G7D             | QPSK       | 25.84           | 0.384        |
| LTE Band 2 | 1860 ~ 1900        | 17M9W7D             | 16QAM      | 25.23           | 0.333        |
| LTE Band 2 | 1857.5 ~ 1902.5    | 13M5G7D             | QPSK       | 25.72           | 0.373        |
| LTE Band 2 | 1857.5 ~ 1902.5    | 13M4W7D             | 16QAM      | 25.12           | 0.325        |
| LTE Band 2 | 1855 ~ 1905        | 8M95G7D             | QPSK       | 25.35           | 0.343        |
| LTE Band 2 | 1855 ~ 1905        | 8M97W7D             | 16QAM      | 24.41           | 0.276        |
| LTE Band 2 | 1852.5 ~ 1907.5    | 4M51G7D             | QPSK       | 25.41           | 0.348        |
| LTE Band 2 | 1852.5 ~ 1907.5    | 4M50W7D             | 16QAM      | 24.89           | 0.308        |
| LTE Band 2 | 1851.5 ~ 1908.5    | 2M71G7D             | QPSK       | 26.00           | 0.398        |
| LTE Band 2 | 1851.5 ~ 1908.5    | 2M70W7D             | 16QAM      | 25.29           | 0.338        |
| LTE Band 2 | 1850.7 ~ 1909.3    | 1M09G7D             | QPSK       | 26.03           | 0.401        |
| LTE Band 2 | 1850.7 ~ 1909.3    | 1M09W7D             | 16QAM      | 25.45           | 0.351        |

## 2. INTRODUCTION

### 2.1 EUT DESCRIPTION

The Equipment under Test (EUT) supports WCDMA, LTE, WLAN, Bluetooth

### 2.2. EUT CAPABILITIES

This ETU contains the following capabilities:

850/1900 GPRS/EDGE, 850/1900 WCDMA/HSUPA, Multi-band LTE, 802.11b/g/n WLAN(2.4GHz), Bluetooth(BDR, EDR, LE)

### 2.3. TESTING ENVIRONMENT

| Ambient Condition   |                 |
|---------------------|-----------------|
| ▪ Temperature       | +21 °C ~ +25 °C |
| ▪ Relative Humidity | 42 % ~ 45 %     |

### 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)    | $\pm 5.1$ dB (The confidence level is about 95 %, $k = 2$ ) |
| Radiated Disturbance (1 GHz ~ 18 GHz) | $\pm 5.4$ dB (The confidence level is about 95 %, $k = 2$ ) |
| Radiated Disturbance (Above 18 GHz)   | $\pm 5.3$ dB (The confidence level is about 95 %, $k = 2$ ) |

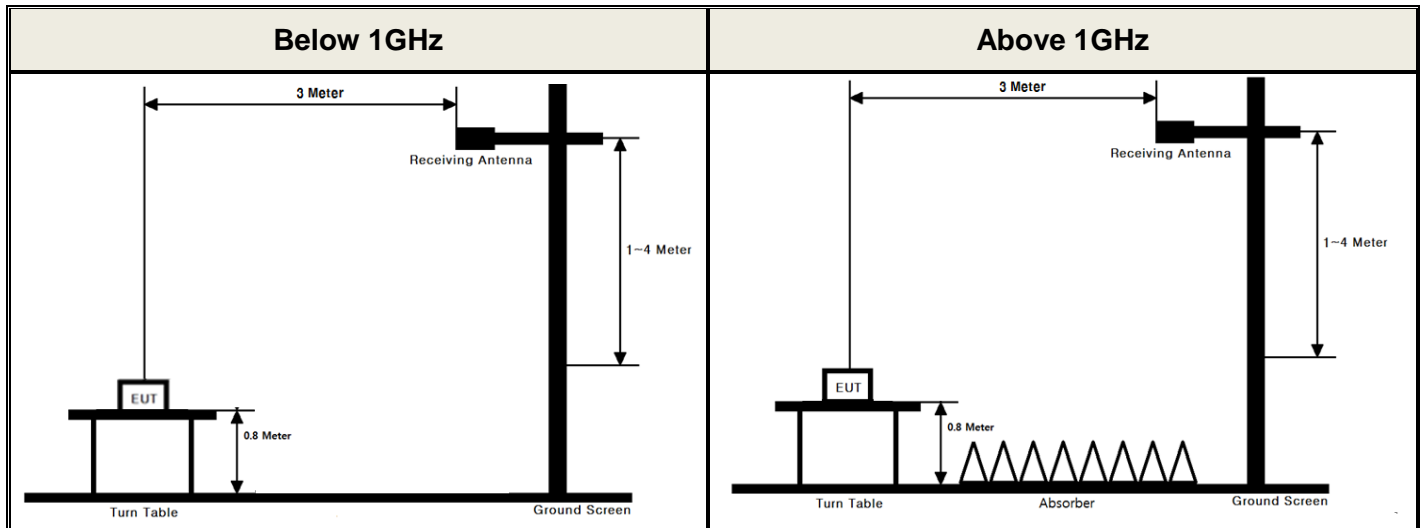
### 2.6. TEST FACILITY

|  |                    |
|--|--------------------|
| <b>DT&amp;C Co., Ltd.</b>  |                    |
| 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 site is constructed in conformance with the requirements. |                    |
| - FCC MRA Accredited Test Firm No. : KR0034  |                    |
| - IC Test site No. : 5740A-3   |                    |
| <a href="http://www.dtnet.net">www.dtnet.net</a>   |                    |
| 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



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 D01v02r02 - Section 5.2.1

##### Test setting

1. Set span to at least 1.5 times the OBW.
2. Set RBW = 1-5 % of the OBW, not to exceed 1 MHz.
3. Set VBW  $\geq 3 \times$  RBW.
4. Set number of points in sweep  $\geq 2 \times$  span / RBW.
5. Sweep time = auto couple.
6. Detector = RMS (power averaging).
7. If the EUT can be configured to transmit continuously (i.e., burst duty cycle  $\geq 98$  %), then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle  $< 98$  %), 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.  
Ensure that the sweep time is less than or equal to the transmission burst duration.
9. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band 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.

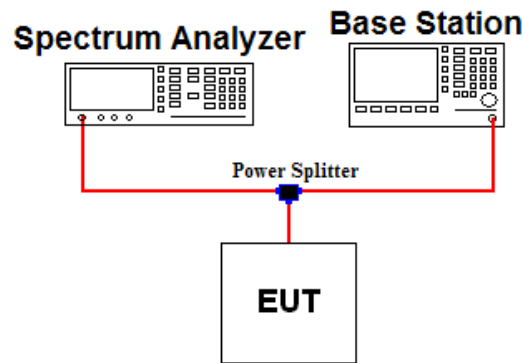
The ERP/EIRP is calculated using the following formula:

**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 D01v02r02 - Section 5.7.1

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.

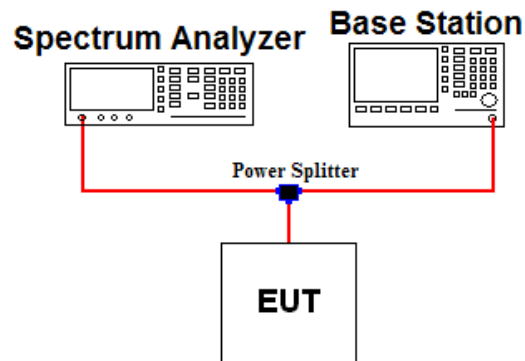
### Test setting

The spectrum Analyzer`s CCDF measurement function is enabled.

1. Set resolution/measurement bandwidth  $\geq$  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

##### - KDB971168 D01v02r02 - Section 4.2

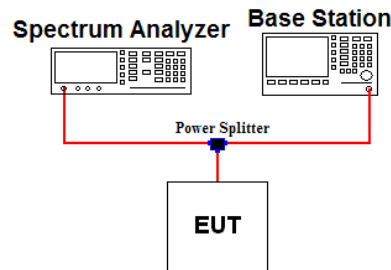
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power of a given emission.

#### 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.  $RBW = 1 \sim 5 \%$  of the expected OBW &  $VBW \geq 3 \times RBW$
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 D01v02r02 - Section 6

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 or requirements on note 3 in case of band 7 and 41.

#### 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  $\geq 1\%$  of the emission bandwidth
4. VBW  $\geq 3 \times$  RBW
5. Detector = RMS & Trace mode = Max hold
6. Sweep time = Auto couple or 1 s for band edge
7. Number of sweep point  $\geq 2 \times$  span / RBW
8. The trace was allowed to stabilize

Note 1: Per Part 22.917(b)(1) / 24.238(b) / 27.53(h)(3) 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.

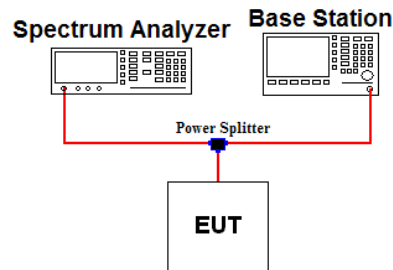
Note 2: Per Part 27(g) for operations in the 600 MHz band and the 698-746 MHz band, compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a 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 than  $43 + 10 \log(P)$  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 D01v02r02 - Section 6

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 10<sup>th</sup> harmonic.

The power of any spurious emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB or  $55 + 10 \log(P)$  in case of band 7 and 41.

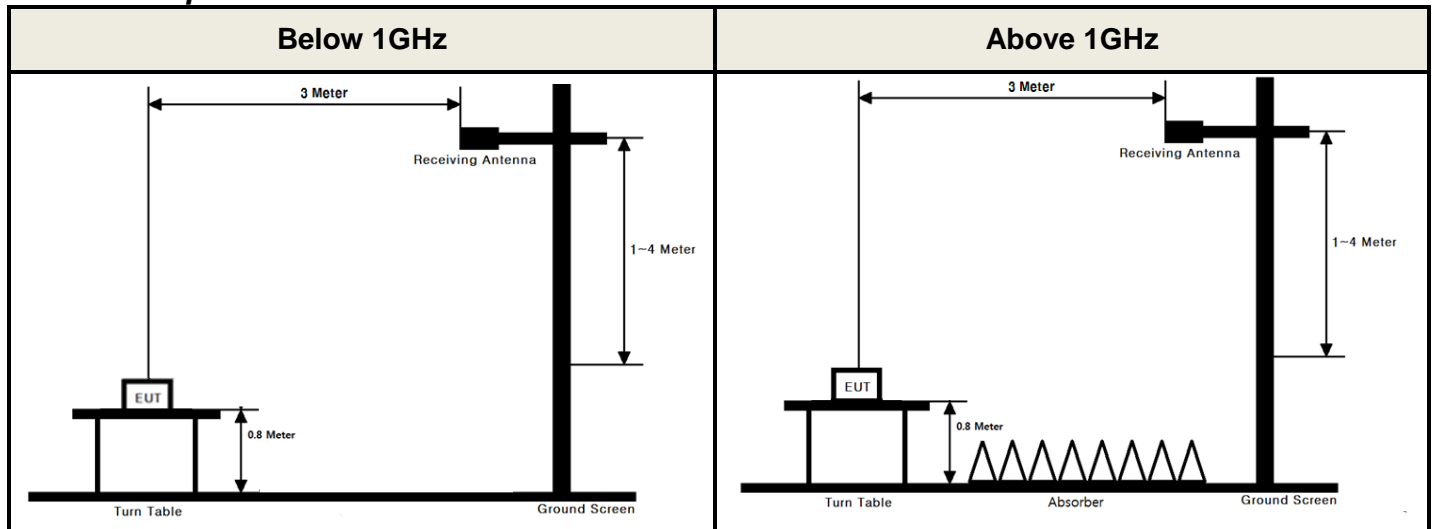
#### Test setting

1. RBW = 100 kHz(Below 1 GHz) or 1 MHz(Above 1 GHz) & VBW  $\geq 3 \times$  RBW ( Refer to Note 1)
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point  $\geq 2 \times$  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



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 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 2.2.12
- KDB971168 D01v02r02 - Section 5.8

#### Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW  $\geq$  3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point  $\geq$  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.

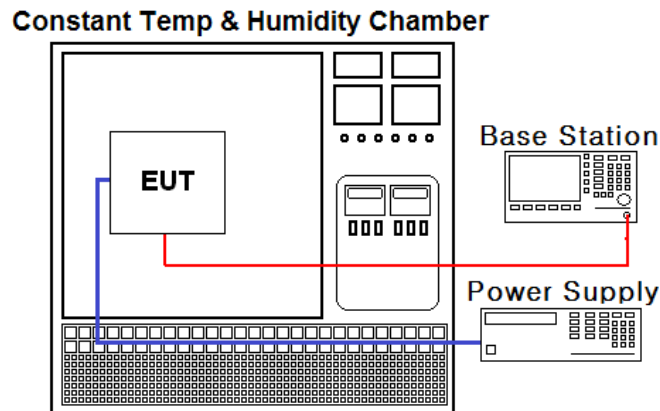
For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

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 D01v02r02 - 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  $\pm 0.00025\%$  ( $\pm 2.5$  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<br>(yy/mm/dd) | Next.Cal. Date<br>(yy/mm/dd) | S/N              |
|------------------------------|----------------------|-----------------------------|------------------------|------------------------------|------------------|
| Spectrum Analyzer            | Agilent Technologies | N9020A                      | 16/10/11               | 17/10/11                     | MY46471251       |
| Spectrum Analyzer            | Agilent Technologies | N9020A                      | 17/01/11               | 18/01/11                     | MY50200828       |
| Spectrum Analyzer            | Agilent Technologies | N9030A                      | 16/10/18               | 17/10/18                     | MY53310140       |
| DC power supply              | Agilent Technologies | 66332A                      | 16/09/08               | 17/09/08                     | GB42110550       |
| Multimeter                   | FLUKE                | 17B                         | 17/04/12               | 18/04/12                     | 26030065WS       |
| Temp & Humi Test Chamber     | SJ Science           | SJ-TH-S50                   | 17/01/25               | 18/01/25                     | SJ-TH-S50-120203 |
| Thermohygrometer             | BODYCOM              | BJ5478                      | 17/01/11               | 18/01/11                     | 1209             |
| Radio Communication Analyzer | Anritsu              | MT8820C                     | 17/01/03               | 18/01/03                     | 6201274516       |
| Attenuator                   | SMAJK                | SMAJK-2-3                   | 16/10/11               | 17/10/11                     | 2                |
| Signal Generator             | Rohde Schwarz        | SMBV100A                    | 17/01/04               | 18/01/04                     | 255571           |
| Signal Generator             | Rohde Schwarz        | SMF100A                     | 17/04/21               | 18/04/21                     | 102341           |
| Loop Antenna                 | Schwarzbeck          | FMZB1513                    | 16/04/22               | 18/04/22                     | 1513-128         |
| BILOG ANTENNA                | Schwarzbeck          | VULB 9160                   | 16/11/11               | 18/11/11                     | 3151             |
| Dipole Antenna               | Schwarzbeck          | VHA9103                     | 17/03/14               | 19/03/14                     | 2116             |
| Dipole Antenna               | Schwarzbeck          | VHA9103                     | 16/04/15               | 18/04/15                     | 2117             |
| Dipole Antenna               | Schwarzbeck          | UHA9105                     | 17/03/14               | 19/03/14                     | 2261             |
| Dipole Antenna               | Schwarzbeck          | UHA9105                     | 16/04/15               | 18/04/15                     | 2262             |
| HORN ANT                     | ETS                  | 3117                        | 16/05/13               | 18/05/13                     | 00140394         |
| HORN ANT                     | ETS                  | 3117                        | 16/02/26               | 18/02/26                     | 00152145         |
| HORN ANT                     | A.H.Systems          | SAS-574                     | 17/04/25               | 19/04/25                     | 154              |
| HORN ANT                     | A.H.Systems          | SAS-574                     | 15/09/03               | 17/09/03                     | 155              |
| PreAmplifier                 | TSJ                  | MLA-010K01-B01-27           | 17/03/06               | 18/03/06                     | 1844539          |
| Amplifier                    | RF Bay Inc           | MPA-40-40                   | 17/04/12               | 18/04/12                     | 21151801         |
| Amplifier                    | EMPOWER              | BBS3Q7ELU                   | 16/09/08               | 17/09/08                     | 1020             |
| PreAmplifier                 | Agilent              | 8449B                       | 16/10/19               | 17/10/19                     | 3008A02108       |
| PreAmplifier                 | A.H.Systems Inc.     | PAM-1840VH                  | 16/12/04               | 17/12/04                     | 163              |
| High-pass filter             | Wainwright           | WHKX12-935-1000-15000-40SS  | 16/09/09               | 17/09/09                     | 7                |
| High-pass filter             | Wainwright           | WHKX12-2580-3000-18000-80SS | 16/09/09               | 17/09/09                     | 3                |
| High-pass filter             | Wainwright           | WHNX5.0                     | 16/09/08               | 17/09/08                     | 8                |
| Power Splitter               | Anritsu              | K241B                       | 17/01/11               | 18/01/11                     | 016681           |



## 5. SUMMARY OF TEST RESULTS

| FCC Part Section(s)                          | RSS Section(s)                                  | Test Description                         | Test Limit  | Test Condition | Status<br>Note 1 |
|--|---|--|---|----------------|------------------|
| 2.1046                                       | -   | Conducted Output Power                   | N/A   | Conducted      | C                |
| 2.1049                                       | RSS-GEN[6.6]                                    | Occupied Bandwidth                       | N/A   |                | C                |
| 24.232(d)<br>27.50(d.5)                      | RSS-132 [5.4]<br>RSS-133 [6.4]<br>RSS-139 [6.5] | Peak to Average Ratio                    | < 13 dB   |                | C                |
| 2.1051<br>22.917(a)<br>24.238(a)<br>27.53(h) | RSS-132 [5.5]<br>RSS-133 [6.5]<br>RSS-139 [6.6] | Band Edge / Conducted Spurious Emissions | > 43 + 10log <sub>10</sub> (P) dB at Band edge and for all out-of-band emissions  |                | C                |
| 2.1055<br>22.355<br>24.235<br>27.54          | RSS-132 [5.3]<br>RSS-133 [6.3]<br>RSS-139 [6.4] | Frequency Stability                      | < 2.5 ppm (Part 22), (RSS-132, 133)<br>Fundamental emissions must stay within Authorized frequency block (Part 24, 27), (RSS-139) |                | C                |
| 22.913(a.2)                                  | RSS-132 [5.4]                                   | Radiated Output Power (B5)               | < 7 Watts max. ERP (Part 22)<br>< 11.5 Watts max. EIRP (RSS-132)  | Radiated       | C                |
| 24.232(c)                                    | RSS-133 [6.4]                                   | Radiated Output Power (B2)               | < 2 Watts max. EIRP   |                | C                |
| 27.50(d.4)                                   | RSS-139 [6.5]                                   | Radiated Output Power (B4)               | < 1 Watts max. EIRP   |                |                  |
| 2.1053<br>22.917(a)<br>24.238(a)<br>27.53(h) | RSS-132 [5.5]<br>RSS-133 [6.5]<br>RSS-139 [6.6] | Undesirable Emissions                    | > 43 + 10log <sub>10</sub> (P) dB for all out-of-band emissions   |                | C                |

Note 1: **C**=Comply    **NC**=Not Comply    **NT**=Not Tested    **NA**=Not Applicable

## 6. SAMPLE CALCULATION

### A. Emission Designator

#### LTE Band 5(QPSK)

Emission Designator = **8M97G7D**  
 LTE OBW = 8.967 MHz  
 G = Phase Modulation  
 7 = Quantized/Digital Info  
 D = Data Transmission

#### LTE Band 5(16QAM)

Emission Designator = **8M95W7D**  
 LTE OBW = 8.950 MHz  
 W = Amplitude/Angle Modulated  
 7 = Quantized/Digital Info  
 D = Data Transmission

#### LTE Band 4(QPSK)

Emission Designator = **17M9G7D**  
 LTE OBW = 17.921 MHz  
 G = Phase Modulation  
 7 = Quantized/Digital Info  
 D = Data Transmission

#### LTE Band 4(16QAM)

Emission Designator = **17M9W7D**  
 LTE OBW = 17.875 MHz  
 W = Amplitude/Angle Modulated  
 7 = Quantized/Digital Info  
 D = Data Transmission

#### LTE Band 2(QPSK)

Emission Designator = **17M9G7D**  
 LTE OBW = 17.907 MHz  
 G = Phase Modulation  
 7 = Quantized/Digital Info  
 D = Data Transmission

#### LTE Band 2(16QAM)

Emission Designator = **17M9W7D**  
 LTE OBW = 17.904 MHz  
 W = Amplitude/Angle Modulated  
 7 = Quantized/Digital Info  
 D = Data Transmission

### B. For substitution method

| 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                      | 1720                 | QPSK      | 1/0             | -20.18                      | Y        | H             | 19.95                     | 5.82              | 25.77      | 0.378    |

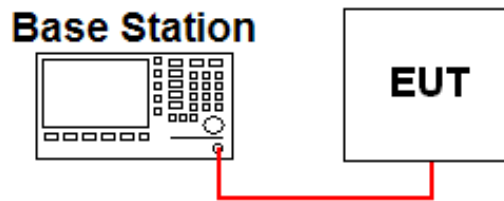
#### ERP or EIRP = Level @ Ant Terminal LEVEL(dBm) + Tx Ant. Gain

- 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 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 5

| Conducted Power [dBm] |            |            |        |        |        |        |        |        |         |
|-----------------------|------------|------------|--------|--------|--------|--------|--------|--------|---------|
| RB Alloc              |            |            | 1 RB   |        |        | MID RB |        |        | FULL RB |
| B.W(MHz)              | Freq.(MHz) | Modulation | LOW    | MID    | HIGH   | LOW    | MID    | HIGH   |         |
| 10                    | 829        | QPSK       | 22.890 | 22.830 | 22.370 | 21.590 | 21.590 | 21.550 | 21.690  |
|                       |            | 16QAM      | 21.900 | 21.730 | 22.110 | 20.720 | 20.600 | 20.800 | 20.630  |
|                       | 836.5      | QPSK       | 22.930 | 22.940 | 22.950 | 21.550 | 21.700 | 21.660 | 21.590  |
|                       |            | 16QAM      | 22.070 | 22.250 | 22.240 | 20.590 | 20.760 | 20.660 | 20.590  |
|                       | 844        | QPSK       | 22.910 | 23.020 | 22.700 | 21.700 | 21.660 | 21.600 | 21.730  |
|                       |            | 16QAM      | 22.030 | 22.190 | 21.960 | 20.840 | 20.800 | 20.760 | 20.700  |
| 5                     | 826.5      | QPSK       | 22.770 | 22.840 | 22.740 | 21.560 | 21.480 | 21.430 | 21.510  |
|                       |            | 16QAM      | 21.920 | 21.830 | 21.870 | 20.480 | 20.410 | 20.460 | 20.660  |
|                       | 836.5      | QPSK       | 22.940 | 22.970 | 22.810 | 21.590 | 21.620 | 21.640 | 21.520  |
|                       |            | 16QAM      | 21.920 | 21.980 | 22.200 | 20.570 | 20.650 | 20.770 | 20.580  |
|                       | 846.5      | QPSK       | 22.660 | 22.750 | 22.840 | 21.710 | 21.540 | 21.520 | 21.670  |
|                       |            | 16QAM      | 22.260 | 21.970 | 21.940 | 20.680 | 20.600 | 20.560 | 20.750  |
| 3                     | 825.5      | QPSK       | 22.960 | 22.680 | 22.670 | 21.670 | 21.510 | 21.430 | 21.550  |
|                       |            | 16QAM      | 22.000 | 21.880 | 21.750 | 20.730 | 20.650 | 20.710 | 20.710  |
|                       | 836.5      | QPSK       | 22.830 | 22.890 | 22.940 | 21.690 | 21.590 | 21.620 | 21.500  |
|                       |            | 16QAM      | 22.110 | 22.010 | 22.090 | 20.830 | 20.830 | 20.950 | 20.670  |
|                       | 847.5      | QPSK       | 22.930 | 22.860 | 22.870 | 21.740 | 21.560 | 21.550 | 21.620  |
|                       |            | 16QAM      | 22.070 | 21.940 | 22.140 | 20.880 | 20.840 | 20.720 | 20.820  |
| 1.4                   | 824.7      | QPSK       | 22.740 | 22.670 | 22.560 | 22.440 | 22.560 | 22.370 | 21.580  |
|                       |            | 16QAM      | 22.010 | 21.940 | 21.980 | 21.580 | 21.500 | 21.420 | 20.560  |
|                       | 836.5      | QPSK       | 22.800 | 22.810 | 22.750 | 22.560 | 22.640 | 22.620 | 21.620  |
|                       |            | 16QAM      | 21.600 | 21.840 | 22.030 | 21.840 | 21.870 | 21.860 | 20.620  |
|                       | 848.3      | QPSK       | 22.710 | 22.690 | 22.670 | 22.590 | 22.590 | 22.550 | 21.660  |
|                       |            | 16QAM      | 21.640 | 21.860 | 22.100 | 21.790 | 21.960 | 21.930 | 20.710  |

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

• 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       | 23.440 | 23.450 | 23.240 | 22.240 | 22.150 | 22.100 | 22.100  |
|                       |            | 16QAM      | 22.740 | 22.480 | 22.630 | 21.080 | 21.110 | 21.060 | 21.150  |
|                       | 1732.5     | QPSK       | 23.410 | 23.300 | 23.320 | 22.330 | 22.190 | 22.160 | 22.280  |
|                       |            | 16QAM      | 22.730 | 22.550 | 22.240 | 21.340 | 21.260 | 21.150 | 21.200  |
|                       | 1745       | QPSK       | 23.710 | 23.400 | 23.320 | 22.370 | 22.400 | 22.250 | 22.420  |
|                       |            | 16QAM      | 22.950 | 22.510 | 22.330 | 21.410 | 21.320 | 21.490 | 21.440  |
| 15                    | 1717.5     | QPSK       | 23.220 | 23.340 | 23.410 | 21.960 | 22.140 | 22.100 | 22.060  |
|                       |            | 16QAM      | 22.120 | 22.490 | 22.620 | 21.040 | 21.190 | 21.020 | 21.100  |
|                       | 1732.5     | QPSK       | 23.570 | 23.410 | 23.540 | 22.300 | 22.180 | 22.150 | 22.280  |
|                       |            | 16QAM      | 22.770 | 22.220 | 22.730 | 21.320 | 21.300 | 21.290 | 21.370  |
|                       | 1747.5     | QPSK       | 23.760 | 23.470 | 23.560 | 22.510 | 22.200 | 22.230 | 22.270  |
|                       |            | 16QAM      | 22.910 | 22.680 | 22.720 | 21.430 | 21.410 | 21.330 | 21.360  |
| 10                    | 1715       | QPSK       | 23.200 | 23.260 | 23.470 | 22.070 | 21.980 | 22.080 | 21.900  |
|                       |            | 16QAM      | 22.650 | 22.570 | 22.600 | 21.160 | 21.140 | 21.380 | 21.040  |
|                       | 1732.5     | QPSK       | 23.510 | 23.630 | 23.410 | 22.310 | 22.210 | 22.290 | 22.300  |
|                       |            | 16QAM      | 22.730 | 22.800 | 22.660 | 21.530 | 21.350 | 21.420 | 21.340  |
|                       | 1750       | QPSK       | 23.370 | 23.650 | 23.550 | 22.370 | 22.250 | 22.190 | 22.180  |
|                       |            | 16QAM      | 22.810 | 22.840 | 22.710 | 21.600 | 21.290 | 21.420 | 21.280  |
| 5                     | 1712.5     | QPSK       | 23.080 | 23.110 | 23.300 | 21.940 | 21.970 | 22.020 | 21.920  |
|                       |            | 16QAM      | 22.410 | 22.350 | 22.460 | 20.980 | 21.060 | 21.010 | 21.110  |
|                       | 1732.5     | QPSK       | 23.530 | 23.490 | 23.330 | 22.290 | 22.210 | 22.200 | 22.260  |
|                       |            | 16QAM      | 22.680 | 22.730 | 22.630 | 21.320 | 21.140 | 21.200 | 21.330  |
|                       | 1752.5     | QPSK       | 23.600 | 23.500 | 23.380 | 22.240 | 22.210 | 22.310 | 22.250  |
|                       |            | 16QAM      | 22.770 | 22.650 | 22.810 | 21.290 | 21.160 | 21.260 | 21.410  |
| 3                     | 1711.5     | QPSK       | 23.180 | 23.170 | 23.190 | 22.060 | 22.080 | 22.050 | 22.010  |
|                       |            | 16QAM      | 22.550 | 22.460 | 22.520 | 21.300 | 21.270 | 21.300 | 21.250  |
|                       | 1732.5     | QPSK       | 23.230 | 23.390 | 23.430 | 22.230 | 22.240 | 22.180 | 22.190  |
|                       |            | 16QAM      | 22.810 | 22.600 | 22.880 | 21.490 | 21.530 | 21.550 | 21.460  |
|                       | 1753.5     | QPSK       | 23.520 | 23.520 | 23.530 | 22.280 | 22.300 | 22.310 | 22.290  |
|                       |            | 16QAM      | 22.830 | 22.770 | 22.850 | 21.560 | 21.430 | 21.430 | 21.500  |
| 1.4                   | 1710.7     | QPSK       | 23.160 | 23.300 | 23.190 | 23.210 | 23.160 | 23.140 | 22.000  |
|                       |            | 16QAM      | 22.530 | 22.580 | 22.580 | 22.360 | 22.410 | 22.400 | 21.120  |
|                       | 1732.5     | QPSK       | 23.120 | 23.450 | 23.500 | 23.080 | 23.270 | 23.210 | 22.150  |
|                       |            | 16QAM      | 22.730 | 22.710 | 22.560 | 22.570 | 22.630 | 22.580 | 21.240  |
|                       | 1754.3     | QPSK       | 23.390 | 23.490 | 23.460 | 23.310 | 23.250 | 23.220 | 22.240  |
|                       |            | 16QAM      | 22.930 | 22.730 | 22.590 | 22.290 | 22.610 | 22.650 | 21.400  |

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

• Band 2

| 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       | 23.680 | 23.550 | 23.400 | 22.700 | 22.490 | 22.440 | 22.570  |
|                       |            | 16QAM      | 22.760 | 23.090 | 22.930 | 21.710 | 21.530 | 21.480 | 21.690  |
|                       | 1732.5     | QPSK       | 23.730 | 23.350 | 23.340 | 22.610 | 22.450 | 22.410 | 22.530  |
|                       |            | 16QAM      | 23.400 | 22.820 | 22.420 | 21.520 | 21.260 | 21.550 | 21.530  |
|                       | 1745       | QPSK       | 23.550 | 23.490 | 23.240 | 22.650 | 22.680 | 22.480 | 22.590  |
|                       |            | 16QAM      | 23.060 | 23.200 | 22.600 | 21.580 | 21.650 | 21.570 | 21.590  |
| 15                    | 1717.5     | QPSK       | 23.680 | 23.570 | 23.400 | 22.580 | 22.510 | 22.470 | 22.600  |
|                       |            | 16QAM      | 23.250 | 23.090 | 22.770 | 21.620 | 21.670 | 21.510 | 21.610  |
|                       | 1732.5     | QPSK       | 23.520 | 23.300 | 23.500 | 22.600 | 22.410 | 22.410 | 22.520  |
|                       |            | 16QAM      | 23.060 | 22.360 | 22.480 | 21.590 | 21.540 | 21.480 | 21.610  |
|                       | 1747.5     | QPSK       | 23.580 | 23.560 | 23.130 | 22.720 | 22.510 | 22.500 | 22.560  |
|                       |            | 16QAM      | 22.750 | 23.050 | 22.930 | 21.660 | 21.620 | 21.470 | 21.580  |
| 10                    | 1715       | QPSK       | 23.870 | 23.650 | 23.460 | 22.650 | 22.630 | 22.630 | 22.530  |
|                       |            | 16QAM      | 23.000 | 23.260 | 23.080 | 21.830 | 21.830 | 21.870 | 21.660  |
|                       | 1732.5     | QPSK       | 23.540 | 23.430 | 23.350 | 22.540 | 22.430 | 22.360 | 22.440  |
|                       |            | 16QAM      | 23.000 | 22.920 | 22.940 | 21.670 | 21.610 | 21.460 | 21.460  |
|                       | 1750       | QPSK       | 23.630 | 23.310 | 23.000 | 22.630 | 22.500 | 22.440 | 22.600  |
|                       |            | 16QAM      | 23.220 | 23.060 | 22.460 | 21.810 | 21.490 | 21.550 | 21.620  |
| 5                     | 1712.5     | QPSK       | 23.590 | 23.390 | 23.560 | 22.510 | 22.530 | 22.590 | 22.560  |
|                       |            | 16QAM      | 23.050 | 23.200 | 23.050 | 21.610 | 21.700 | 21.540 | 21.680  |
|                       | 1732.5     | QPSK       | 23.280 | 23.240 | 23.270 | 22.480 | 22.370 | 22.320 | 22.430  |
|                       |            | 16QAM      | 22.960 | 22.820 | 22.800 | 21.440 | 21.270 | 21.510 | 21.630  |
|                       | 1752.5     | QPSK       | 23.390 | 23.520 | 22.990 | 22.520 | 22.460 | 22.400 | 22.500  |
|                       |            | 16QAM      | 22.930 | 22.910 | 22.780 | 21.500 | 21.670 | 21.490 | 21.540  |
| 3                     | 1711.5     | QPSK       | 23.370 | 23.620 | 23.440 | 22.380 | 22.520 | 22.480 | 22.380  |
|                       |            | 16QAM      | 23.240 | 23.140 | 23.210 | 21.850 | 21.900 | 21.880 | 21.700  |
|                       | 1732.5     | QPSK       | 23.340 | 23.130 | 23.320 | 22.500 | 22.160 | 22.350 | 22.420  |
|                       |            | 16QAM      | 23.000 | 22.860 | 22.970 | 21.670 | 21.590 | 21.590 | 21.610  |
|                       | 1753.5     | QPSK       | 23.380 | 23.300 | 23.180 | 22.470 | 22.450 | 22.460 | 22.420  |
|                       |            | 16QAM      | 23.050 | 22.970 | 22.500 | 21.740 | 21.780 | 21.740 | 21.790  |
| 1.4                   | 1710.7     | QPSK       | 23.090 | 23.160 | 23.170 | 23.160 | 23.300 | 23.250 | 22.210  |
|                       |            | 16QAM      | 23.230 | 23.150 | 23.210 | 22.790 | 22.920 | 22.940 | 21.700  |
|                       | 1732.5     | QPSK       | 23.150 | 23.110 | 23.060 | 23.080 | 23.050 | 23.140 | 22.150  |
|                       |            | 16QAM      | 22.940 | 22.970 | 22.910 | 22.560 | 22.620 | 22.740 | 21.550  |
|                       | 1754.3     | QPSK       | 23.120 | 23.330 | 23.200 | 23.430 | 23.260 | 23.190 | 22.410  |
|                       |            | 16QAM      | 22.870 | 22.680 | 22.490 | 22.470 | 22.350 | 22.260 | 21.420  |

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

## **7.2 OCCUPIED BANDWIDTH**

- 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 8.2

## **7.4 BAND EDGE EMISSIONS (Conducted)**

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

## **7.5 SPURIOUS AND HARMONICS EMISSIONS (Conducted)**

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

## 7.6 ERP & EIRP

### 7.6.1 LTE Band 5

| Channel Bandwidth (MHz) | Test Frequency (MHz) | Test Mode | RB Size/ Offset | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain (dBd) | ERP (dBm) | ERP (W) |
|-------------------------|----------------------|-----------|-----------------|----------|---------------|---------------------------|-------------------|-----------|---------|
| 10                      | 829                  | QPSK      | 1/0             | Z        | H             | 20.14                     | 1.23              | 21.37     | 0.137   |
|                         |                      | 16QAM     | 1/0             | Z        | H             | 19.11                     | 1.23              | 20.34     | 0.108   |
|                         | 836.5                | QPSK      | 1/25            | Z        | H             | 19.53                     | 1.22              | 20.75     | 0.119   |
|                         |                      | 16QAM     | 1/25            | Z        | H             | 18.55                     | 1.22              | 19.77     | 0.095   |
|                         | 844                  | QPSK      | 1/25            | Z        | H             | 19.55                     | 1.21              | 20.76     | 0.119   |
|                         |                      | 16QAM     | 1/25            | Z        | H             | 18.76                     | 1.21              | 19.97     | 0.099   |
| 5                       | 826.5                | QPSK      | 1/12            | Z        | H             | 19.93                     | 1.23              | 21.16     | 0.131   |
|                         |                      | 16QAM     | 1/12            | Z        | H             | 18.96                     | 1.23              | 20.19     | 0.104   |
|                         | 836.5                | QPSK      | 1/12            | Z        | H             | 19.58                     | 1.22              | 20.80     | 0.120   |
|                         |                      | 16QAM     | 1/12            | Z        | H             | 18.57                     | 1.22              | 19.79     | 0.095   |
|                         | 846.5                | QPSK      | 1/12            | Z        | H             | 19.45                     | 1.21              | 20.66     | 0.116   |
|                         |                      | 16QAM     | 1/12            | Z        | H             | 18.55                     | 1.21              | 19.76     | 0.095   |
| 3                       | 825.5                | QPSK      | 1/0             | Z        | H             | 19.81                     | 1.23              | 21.04     | 0.127   |
|                         |                      | 16QAM     | 1/0             | Z        | H             | 18.90                     | 1.23              | 20.13     | 0.103   |
|                         | 836.5                | QPSK      | 1/0             | Z        | H             | 19.71                     | 1.22              | 20.93     | 0.124   |
|                         |                      | 16QAM     | 1/0             | Z        | H             | 19.26                     | 1.22              | 20.48     | 0.112   |
|                         | 847.5                | QPSK      | 1/0             | Z        | H             | 20.26                     | 1.21              | 21.47     | 0.140   |
|                         |                      | 16QAM     | 1/0             | Z        | H             | 19.54                     | 1.21              | 20.75     | 0.119   |
| 1.4                     | 824.7                | QPSK      | 1/0             | Z        | H             | 19.43                     | 1.23              | 20.66     | 0.116   |
|                         |                      | 16QAM     | 1/0             | Z        | H             | 18.63                     | 1.23              | 19.86     | 0.097   |
|                         | 836.5                | QPSK      | 1/0             | Z        | H             | 19.50                     | 1.22              | 20.72     | 0.118   |
|                         |                      | 16QAM     | 1/0             | Z        | H             | 18.68                     | 1.22              | 19.90     | 0.098   |
|                         | 848.3                | QPSK      | 1/0             | Z        | H             | 20.15                     | 1.21              | 21.36     | 0.137   |
|                         |                      | 16QAM     | 1/0             | Z        | H             | 19.29                     | 1.21              | 20.50     | 0.112   |

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

**7.6.2 LTE Band 4**

| Channel Bandwidth (MHz) | Test Frequency (MHz) | Test Mode | RB Size/Offset | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain (dBi) | EIRP (dBm) | EIRP (W) |
|-------------------------|----------------------|-----------|----------------|----------|---------------|---------------------------|-------------------|------------|----------|
| 20                      | 1720                 | QPSK      | 1/0            | Y        | H             | 19.95                     | 5.82              | 25.77      | 0.378    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.29                     | 5.82              | 25.11      | 0.324    |
|                         | 1732.5               | QPSK      | 1/0            | Y        | H             | 18.87                     | 5.75              | 24.62      | 0.290    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.08                     | 5.75              | 23.83      | 0.242    |
|                         | 1745                 | QPSK      | 1/0            | Y        | H             | 19.62                     | 5.67              | 25.29      | 0.338    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.67                     | 5.67              | 24.34      | 0.272    |
| 15                      | 1717.5               | QPSK      | 1/74           | Y        | H             | 18.91                     | 5.84              | 24.75      | 0.299    |
|                         |                      | 16QAM     | 1/74           | Y        | H             | 17.79                     | 5.84              | 23.63      | 0.231    |
|                         | 1732.5               | QPSK      | 1/0            | Y        | H             | 19.76                     | 5.75              | 25.51      | 0.356    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.82                     | 5.75              | 24.57      | 0.286    |
|                         | 1747.5               | QPSK      | 1/0            | Y        | H             | 20.07                     | 5.66              | 25.73      | 0.374    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.44                     | 5.66              | 25.10      | 0.324    |
| 10                      | 1715                 | QPSK      | 1/49           | Y        | H             | 18.58                     | 5.85              | 24.43      | 0.277    |
|                         |                      | 16QAM     | 1/49           | Y        | H             | 17.99                     | 5.85              | 23.84      | 0.242    |
|                         | 1732.5               | QPSK      | 1/25           | Y        | H             | 18.89                     | 5.75              | 24.64      | 0.291    |
|                         |                      | 16QAM     | 1/25           | Y        | H             | 18.04                     | 5.75              | 23.79      | 0.239    |
|                         | 1750                 | QPSK      | 1/25           | Y        | H             | 20.06                     | 5.64              | 25.70      | 0.372    |
|                         |                      | 16QAM     | 1/25           | Y        | H             | 19.00                     | 5.64              | 24.64      | 0.291    |
| 5                       | 1712.5               | QPSK      | 1/24           | Y        | H             | 19.04                     | 5.87              | 24.91      | 0.310    |
|                         |                      | 16QAM     | 1/24           | Y        | H             | 18.46                     | 5.87              | 24.33      | 0.271    |
|                         | 1732.5               | QPSK      | 1/0            | Y        | H             | 19.14                     | 5.75              | 24.89      | 0.308    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.20                     | 5.75              | 23.95      | 0.248    |
|                         | 1752.5               | QPSK      | 1/0            | Y        | H             | 20.19                     | 5.63              | 25.82      | 0.382    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.25                     | 5.63              | 24.88      | 0.308    |
| 3                       | 1711.5               | QPSK      | 1/14           | Y        | H             | 19.06                     | 5.87              | 24.93      | 0.311    |
|                         |                      | 16QAM     | 1/14           | Y        | H             | 18.35                     | 5.87              | 24.22      | 0.264    |
|                         | 1732.5               | QPSK      | 1/14           | Y        | H             | 18.92                     | 5.75              | 24.67      | 0.293    |
|                         |                      | 16QAM     | 1/14           | Y        | H             | 17.86                     | 5.75              | 23.61      | 0.230    |
|                         | 1753.5               | QPSK      | 1/14           | Y        | H             | 20.14                     | 5.62              | 25.76      | 0.377    |
|                         |                      | 16QAM     | 1/14           | Y        | H             | 19.36                     | 5.62              | 24.98      | 0.315    |
| 1.4                     | 1710.7               | QPSK      | 1/2            | Y        | H             | 18.94                     | 5.88              | 24.82      | 0.303    |
|                         |                      | 16QAM     | 1/2            | Y        | H             | 17.84                     | 5.88              | 23.72      | 0.236    |
|                         | 1732.5               | QPSK      | 1/5            | Y        | H             | 18.57                     | 5.75              | 24.32      | 0.270    |
|                         |                      | 16QAM     | 1/5            | Y        | H             | 17.85                     | 5.75              | 23.60      | 0.229    |
|                         | 1754.3               | QPSK      | 1/2            | Y        | H             | 20.28                     | 5.61              | 25.89      | 0.388    |
|                         |                      | 16QAM     | 1/2            | Y        | H             | 19.43                     | 5.61              | 25.04      | 0.319    |

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



**7.6.3 LTE Band 2**

| Channel Bandwidth (MHz) | Test Frequency (MHz) | Test Mode | RB Size/Offset | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain (dBi) | EIRP (dBm) | EIRP (W) |
|-------------------------|----------------------|-----------|----------------|----------|---------------|---------------------------|-------------------|------------|----------|
| 20                      | 1860                 | QPSK      | 1/0            | Y        | H             | 20.54                     | 5.02              | 25.56      | 0.360    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 20.21                     | 5.02              | 25.23      | 0.333    |
|                         | 1880                 | QPSK      | 1/0            | Y        | H             | 20.80                     | 4.91              | 25.71      | 0.372    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 20.18                     | 4.91              | 25.09      | 0.323    |
|                         | 1900                 | QPSK      | 1/0            | Y        | H             | 21.03                     | 4.81              | 25.84      | 0.384    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.95                     | 4.81              | 24.76      | 0.299    |
| 15                      | 1857.5               | QPSK      | 1/0            | Y        | H             | 20.10                     | 5.03              | 25.13      | 0.326    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.45                     | 5.03              | 24.48      | 0.281    |
|                         | 1880                 | QPSK      | 1/0            | Y        | H             | 20.81                     | 4.91              | 25.72      | 0.373    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 20.21                     | 4.91              | 25.12      | 0.325    |
|                         | 1902.5               | QPSK      | 1/0            | Y        | H             | 19.93                     | 4.80              | 24.73      | 0.297    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.61                     | 4.80              | 23.41      | 0.219    |
| 10                      | 1855                 | QPSK      | 1/0            | Y        | H             | 20.30                     | 5.05              | 25.35      | 0.343    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.36                     | 5.05              | 24.41      | 0.276    |
|                         | 1880                 | QPSK      | 1/0            | Y        | H             | 19.49                     | 4.91              | 24.40      | 0.275    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.59                     | 4.91              | 23.50      | 0.224    |
|                         | 1905                 | QPSK      | 1/0            | Y        | H             | 20.19                     | 4.79              | 24.98      | 0.315    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.03                     | 4.79              | 23.82      | 0.241    |
| 5                       | 1852.5               | QPSK      | 1/12           | Y        | H             | 20.35                     | 5.06              | 25.41      | 0.348    |
|                         |                      | 16QAM     | 1/12           | Y        | H             | 19.83                     | 5.06              | 24.89      | 0.308    |
|                         | 1880                 | QPSK      | 1/12           | Y        | H             | 19.19                     | 4.91              | 24.10      | 0.257    |
|                         |                      | 16QAM     | 1/12           | Y        | H             | 18.14                     | 4.91              | 23.05      | 0.202    |
|                         | 1907.5               | QPSK      | 1/12           | Y        | H             | 19.28                     | 4.77              | 24.05      | 0.254    |
|                         |                      | 16QAM     | 1/12           | Y        | H             | 18.81                     | 4.77              | 23.58      | 0.228    |
| 3                       | 1851.5               | QPSK      | 1/0            | Y        | H             | 20.94                     | 5.06              | 26.00      | 0.398    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 20.23                     | 5.06              | 25.29      | 0.338    |
|                         | 1880                 | QPSK      | 1/0            | Y        | H             | 19.79                     | 4.91              | 24.70      | 0.295    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.16                     | 4.91              | 24.07      | 0.255    |
|                         | 1908.5               | QPSK      | 1/0            | Y        | H             | 19.27                     | 4.77              | 24.04      | 0.254    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.86                     | 4.77              | 23.63      | 0.231    |
| 1.4                     | 1850.7               | QPSK      | 1/0            | Y        | H             | 20.96                     | 5.07              | 26.03      | 0.401    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 20.38                     | 5.07              | 25.45      | 0.351    |
|                         | 1880                 | QPSK      | 1/0            | Y        | H             | 19.57                     | 4.91              | 24.48      | 0.281    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 19.09                     | 4.91              | 24.00      | 0.251    |
|                         | 1909.3               | QPSK      | 1/0            | Y        | H             | 19.15                     | 4.76              | 23.91      | 0.246    |
|                         |                      | 16QAM     | 1/0            | Y        | H             | 18.51                     | 4.76              | 23.27      | 0.212    |

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

## 7.7 UNDESIRABLE EMISSIONS (Radiated)

### 7.7.1 LTE Band 5

| B.W<br>(MHz) | Test<br>Freq.<br>(MHz) | RB<br>Size/<br>Offset | Test<br>Mode | Freq.(MHz) | EUT<br>Axis | Ant<br>Pol<br>(H/V) | Level(dBm)<br>@ Ant<br>Terminal | TX Ant<br>Gain(dBd) | Result |       | Limit<br>(dBc) |
|--------------|------------------------|-----------------------|--------------|------------|-------------|---------------------|---------------------------------|---------------------|--------|-------|----------------|
|              |                        |                       |              |            |             |                     |                                 |                     | (dBm)  | (dBc) |                |
| 10           | 829                    | 1/0                   | QPSK         | 1649.23    | Z           | H                   | -35.94                          | 5.92                | -30.02 | 51.39 | 34.37          |
|              |                        |                       |              | 2473.87    | Y           | H                   | -35.05                          | 6.20                | -28.85 | 50.22 |                |
|              |                        |                       |              | 3298.68    | Z           | H                   | -49.22                          | 7.90                | -41.32 | 62.69 |                |
|              |                        |                       |              | 4122.86    | Y           | H                   | -40.21                          | 9.31                | -30.90 | 52.27 |                |
|              |                        | 1/0                   | 16QAM        | 1649.24    | Z           | H                   | -36.55                          | 5.92                | -30.63 | 50.97 | 33.34          |
|              |                        |                       |              | 2473.82    | Y           | H                   | -35.44                          | 6.20                | -29.24 | 49.58 |                |
|              |                        |                       |              | 3298.38    | Z           | H                   | -49.34                          | 7.89                | -41.45 | 61.79 |                |
|              |                        |                       |              | 4122.83    | Y           | H                   | -41.14                          | 9.31                | -31.83 | 52.17 |                |
|              | 836.5                  | 1/25                  | QPSK         | 1673.15    | Z           | H                   | -39.98                          | 5.93                | -34.05 | 54.80 | 33.75          |
|              |                        |                       |              | 2509.70    | Y           | H                   | -38.28                          | 6.19                | -32.09 | 52.84 |                |
|              |                        |                       |              | 3346.39    | Z           | H                   | -49.96                          | 8.02                | -41.94 | 62.69 |                |
|              |                        |                       |              | 4182.91    | Y           | H                   | -36.68                          | 9.37                | -27.31 | 48.06 |                |
|              |                        | 1/25                  | 16QAM        | 1673.17    | Z           | H                   | -40.37                          | 5.93                | -34.44 | 54.21 | 32.77          |
|              |                        |                       |              | 2509.75    | Y           | H                   | -38.41                          | 6.19                | -32.22 | 51.99 |                |
|              |                        |                       |              | 3346.58    | Z           | H                   | -44.47                          | 8.02                | -36.45 | 56.22 |                |
|              |                        |                       |              | 4182.65    | Y           | H                   | -48.21                          | 9.37                | -38.84 | 58.61 |                |
|              | 844                    | 1/25                  | QPSK         | 1688.19    | Z           | H                   | -42.05                          | 5.94                | -36.11 | 56.87 | 33.76          |
|              |                        |                       |              | 2532.27    | Y           | H                   | -42.92                          | 6.20                | -36.72 | 57.48 |                |
|              |                        |                       |              | 3376.25    | Z           | H                   | -47.92                          | 8.10                | -39.82 | 60.58 |                |
|              |                        |                       |              | 4220.71    | Y           | H                   | -49.53                          | 9.37                | -40.16 | 60.92 |                |
| 1/25         |                        | 16QAM                 | 1688.18      | Z          | H           | -43.00              | 5.94                            | -37.06              | 57.03  | 32.97 |                |
|              |                        |                       | 2532.18      | Y          | H           | -43.88              | 6.20                            | -37.68              | 57.65  |       |                |
|              |                        |                       | 3376.18      | Z          | H           | -48.12              | 8.10                            | -40.02              | 59.99  |       |                |
|              |                        |                       | 4220.61      | Y          | H           | -49.80              | 9.37                            | -40.43              | 60.40  |       |                |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBd) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 5         | 826.5            | 1/12            | QPSK      | 1653.05    | Z        | H             | -35.20                    | 5.93             | -29.27 | 50.43 | 34.16       |
|           |                  |                 |           | 2479.50    | Y        | H             | -34.36                    | 6.20             | -28.16 | 49.32 |             |
|           |                  |                 |           | 3305.99    | Z        | H             | -48.98                    | 7.92             | -41.06 | 62.22 |             |
|           |                  |                 |           | 4132.78    | Y        | H             | -40.85                    | 9.32             | -31.53 | 52.69 |             |
|           |                  | 1/12            | 16QAM     | 1653.01    | Z        | H             | -36.35                    | 5.93             | -30.42 | 50.61 | 33.19       |
|           |                  |                 |           | 2479.54    | Y        | H             | -34.74                    | 6.20             | -28.54 | 48.73 |             |
|           |                  |                 |           | 3306.09    | Z        | H             | -49.64                    | 7.92             | -41.72 | 61.91 |             |
|           |                  |                 |           | 4132.55    | Y        | H             | -41.72                    | 9.32             | -32.40 | 52.59 |             |
|           | 836.5            | 1/12            | QPSK      | 1672.98    | Z        | H             | -40.12                    | 5.93             | -34.19 | 54.99 | 33.80       |
|           |                  |                 |           | 2509.44    | Y        | H             | -37.61                    | 6.19             | -31.42 | 52.22 |             |
|           |                  |                 |           | 3345.88    | Z        | H             | -44.18                    | 8.02             | -36.16 | 56.96 |             |
|           |                  |                 |           | 4182.56    | Y        | H             | -47.42                    | 9.37             | -38.05 | 58.85 |             |
|           |                  | 1/12            | 16QAM     | 1673.09    | Z        | H             | -41.00                    | 5.93             | -35.07 | 54.86 | 32.79       |
|           |                  |                 |           | 2509.38    | Y        | H             | -38.28                    | 6.19             | -32.09 | 51.88 |             |
|           |                  |                 |           | 3346.08    | Z        | H             | -44.71                    | 8.02             | -36.69 | 56.48 |             |
|           |                  |                 |           | 4182.78    | Y        | H             | -48.19                    | 9.37             | -38.82 | 58.61 |             |
|           | 846.5            | 1/12            | QPSK      | 1693.03    | Z        | H             | -43.21                    | 5.94             | -37.27 | 57.93 | 33.66       |
|           |                  |                 |           | 2539.46    | Y        | H             | -39.31                    | 6.21             | -33.10 | 53.76 |             |
|           |                  |                 |           | 3386.03    | Z        | H             | -43.32                    | 8.12             | -35.20 | 55.86 |             |
|           |                  |                 |           | 4232.77    | Y        | H             | -47.20                    | 9.36             | -37.84 | 58.50 |             |
| 1/12      |                  | 16QAM           | 1693.14   | Z          | H        | -44.17        | 5.94                      | -38.23           | 57.99  | 32.76 |             |
|           |                  |                 | 2539.40   | Y          | H        | -39.46        | 6.21                      | -33.25           | 53.01  |       |             |
|           |                  |                 | 3386.01   | Z          | H        | -43.51        | 8.12                      | -35.39           | 55.15  |       |             |
|           |                  |                 | 4232.51   | Y          | H        | -47.72        | 9.36                      | -38.36           | 58.12  |       |             |

| B.W<br>(MHz) | Test<br>Freq.<br>(MHz) | RB<br>Size/<br>Offset | Test<br>Mode | Freq.(MHz) | EUT<br>Axis | Ant<br>Pol<br>(H/V) | Level(dBm)<br>@ Ant<br>Terminal | TX Ant<br>Gain(dBd) | Result |       | Limit<br>(dBc) |
|--------------|------------------------|-----------------------|--------------|------------|-------------|---------------------|---------------------------------|---------------------|--------|-------|----------------|
|              |                        |                       |              |            |             |                     |                                 |                     | (dBm)  | (dBc) |                |
| 3            | 825.5                  | 1/0                   | QPSK         | 1648.46    | Z           | H                   | -37.09                          | 5.92                | -31.17 | 52.21 | 34.04          |
|              |                        |                       |              | 2472.70    | Y           | H                   | -35.01                          | 6.20                | -28.81 | 49.85 |                |
|              |                        |                       |              | 3296.79    | Z           | H                   | -49.19                          | 7.89                | -41.30 | 62.34 |                |
|              |                        |                       |              | 4121.24    | Y           | H                   | -41.00                          | 9.31                | -31.69 | 52.73 |                |
|              |                        | 1/0                   | 16QAM        | 1648.44    | Z           | H                   | -37.89                          | 5.92                | -31.97 | 52.10 | 33.13          |
|              |                        |                       |              | 2472.80    | Y           | H                   | -35.38                          | 6.20                | -29.18 | 49.31 |                |
|              |                        |                       |              | 3296.85    | Z           | H                   | -49.38                          | 7.89                | -41.49 | 61.62 |                |
|              |                        |                       |              | 4121.21    | Y           | H                   | -41.51                          | 9.31                | -32.20 | 52.33 |                |
|              | 836.5                  | 1/0                   | QPSK         | 1670.57    | Z           | H                   | -40.80                          | 5.93                | -34.87 | 55.80 | 33.93          |
|              |                        |                       |              | 2505.64    | Y           | H                   | -37.45                          | 6.19                | -31.26 | 52.19 |                |
|              |                        |                       |              | 3340.95    | Z           | H                   | -42.39                          | 8.01                | -34.38 | 55.31 |                |
|              |                        |                       |              | 4176.19    | Y           | H                   | -46.84                          | 9.37                | -37.47 | 58.40 |                |
|              |                        | 1/0                   | 16QAM        | 1670.51    | Z           | H                   | -41.25                          | 5.93                | -35.32 | 55.80 | 33.48          |
|              |                        |                       |              | 2505.75    | Y           | H                   | -38.27                          | 6.19                | -32.08 | 52.56 |                |
|              |                        |                       |              | 3341.04    | Z           | H                   | -43.24                          | 8.01                | -35.23 | 55.71 |                |
|              |                        |                       |              | 4175.94    | Y           | H                   | -47.14                          | 9.37                | -37.77 | 58.25 |                |
|              | 847.5                  | 1/0                   | QPSK         | 1692.41    | Z           | H                   | -43.67                          | 5.94                | -37.73 | 59.20 | 34.47          |
|              |                        |                       |              | 2538.64    | Y           | H                   | -44.15                          | 6.21                | -37.94 | 59.41 |                |
|              |                        |                       |              | 3384.94    | Z           | H                   | -43.56                          | 8.12                | -35.44 | 56.91 |                |
|              |                        |                       |              | 4231.18    | Y           | H                   | -47.54                          | 9.36                | -38.18 | 59.65 |                |
| 1/0          |                        | 16QAM                 | 1692.42      | Z          | H           | -44.22              | 5.94                            | -38.28              | 59.03  | 33.75 |                |
|              |                        |                       | 2538.68      | Y          | H           | -45.21              | 6.21                            | -39.00              | 59.75  |       |                |
|              |                        |                       | 3385.06      | Z          | H           | -44.46              | 8.12                            | -36.34              | 57.09  |       |                |
|              |                        |                       | 4231.29      | Y          | H           | -47.83              | 9.36                            | -38.47              | 59.22  |       |                |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBd) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 1.4       | 824.7            | 1/0             | QPSK      | 1648.44    | Z        | H             | -36.43                    | 5.92             | -30.51 | 51.17 | 33.66       |
|           |                  |                 |           | 2472.74    | Y        | H             | -35.06                    | 6.20             | -28.86 | 49.52 |             |
|           |                  |                 |           | 3297.10    | Z        | H             | -48.41                    | 7.89             | -40.52 | 61.18 |             |
|           |                  |                 |           | 4121.22    | Y        | H             | -40.91                    | 9.31             | -31.60 | 52.26 |             |
|           |                  | 1/0             | 16QAM     | 1648.52    | Z        | H             | -36.82                    | 5.92             | -30.90 | 50.76 | 32.86       |
|           |                  |                 |           | 2472.68    | Y        | H             | -35.36                    | 6.20             | -29.16 | 49.02 |             |
|           |                  |                 |           | 3296.72    | Z        | H             | -48.70                    | 7.89             | -40.81 | 60.67 |             |
|           |                  |                 |           | 4121.23    | Y        | H             | -41.13                    | 9.31             | -31.82 | 51.68 |             |
|           | 836.5            | 1/0             | QPSK      | 1672.14    | Z        | H             | -38.64                    | 5.93             | -32.71 | 53.43 | 33.72       |
|           |                  |                 |           | 2508.12    | Y        | H             | -37.95                    | 6.19             | -31.76 | 52.48 |             |
|           |                  |                 |           | 3344.27    | Z        | H             | -43.90                    | 8.02             | -35.88 | 56.60 |             |
|           |                  |                 |           | 4180.32    | Y        | H             | -47.25                    | 9.37             | -37.88 | 58.60 |             |
|           |                  | 1/0             | 16QAM     | 1672.22    | Z        | H             | -38.98                    | 5.93             | -33.05 | 52.95 | 32.90       |
|           |                  |                 |           | 2508.03    | Y        | H             | -38.84                    | 6.19             | -32.65 | 52.55 |             |
|           |                  |                 |           | 3344.27    | Z        | H             | -44.35                    | 8.02             | -36.33 | 56.23 |             |
|           |                  |                 |           | 4180.27    | Y        | H             | -48.68                    | 9.37             | -39.31 | 59.21 |             |
|           | 848.3            | 1/0             | QPSK      | 1695.67    | Z        | H             | -43.21                    | 5.94             | -37.27 | 58.63 | 34.36       |
|           |                  |                 |           | 2543.46    | Y        | H             | -44.14                    | 6.21             | -37.93 | 59.29 |             |
|           |                  |                 |           | 3391.35    | Z        | H             | -43.69                    | 8.14             | -35.55 | 56.91 |             |
|           |                  |                 |           | 4239.19    | Y        | H             | -47.95                    | 9.35             | -38.60 | 59.96 |             |
| 1/0       |                  | 16QAM           | 1695.64   | Z          | H        | -43.29        | 5.94                      | -37.35           | 57.85  | 33.50 |             |
|           |                  |                 | 2543.43   | Y          | H        | -47.02        | 6.21                      | -40.81           | 61.31  |       |             |
|           |                  |                 | 3391.37   | Z          | H        | -44.17        | 8.14                      | -36.03           | 56.53  |       |             |
|           |                  |                 | 4239.43   | Y          | H        | -49.29        | 9.35                      | -39.94           | 60.44  |       |             |

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

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.

**7.7.2 LTE Band 4**

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 20        | 1720             | 1/0             | QPSK      | 3422.10    | Z        | H             | -49.96                    | 8.24             | -41.72 | 67.49 | 38.77       |
|           |                  |                 |           | 5133.20    | X        | V             | -43.72                    | 10.34            | -33.38 | 59.15 |             |
|           |                  |                 |           | 6844.48    | X        | V             | -37.41                    | 11.51            | -25.90 | 51.67 |             |
|           |                  |                 |           | 8555.54    | Y        | V             | -44.71                    | 13.22            | -31.49 | 57.26 |             |
|           |                  | 1/0             | 16QAM     | 3422.16    | Z        | H             | -50.08                    | 8.24             | -41.84 | 66.95 | 38.11       |
|           |                  |                 |           | 5133.35    | X        | V             | -44.90                    | 10.34            | -34.56 | 59.67 |             |
|           |                  |                 |           | 6844.35    | X        | V             | -37.86                    | 11.51            | -26.35 | 51.46 |             |
|           |                  |                 |           | 8555.58    | Y        | V             | -44.78                    | 13.22            | -31.56 | 56.67 |             |
|           | 1732.5           | 1/0             | QPSK      | 3447.30    | Z        | H             | -50.23                    | 8.33             | -41.90 | 66.52 | 37.62       |
|           |                  |                 |           | 5170.76    | X        | V             | -44.41                    | 10.40            | -34.01 | 58.63 |             |
|           |                  |                 |           | 6894.35    | X        | V             | -39.12                    | 11.51            | -27.61 | 52.23 |             |
|           |                  |                 |           | 8617.99    | Y        | V             | -44.02                    | 13.32            | -30.70 | 55.32 |             |
|           |                  | 1/0             | 16QAM     | 3447.23    | Z        | H             | -49.93                    | 8.33             | -41.60 | 65.43 | 36.83       |
|           |                  |                 |           | 5170.81    | X        | V             | -44.91                    | 10.40            | -34.51 | 58.34 |             |
|           |                  |                 |           | 6894.47    | X        | V             | -39.18                    | 11.51            | -27.67 | 51.50 |             |
|           |                  |                 |           | 8617.87    | Y        | V             | -44.32                    | 13.32            | -31.00 | 54.83 |             |
|           | 1745             | 1/0             | QPSK      | 3472.04    | Z        | H             | -49.63                    | 8.41             | -41.22 | 66.51 | 38.29       |
|           |                  |                 |           | 5208.16    | X        | V             | -44.82                    | 10.46            | -34.36 | 59.65 |             |
|           |                  |                 |           | 6944.40    | X        | V             | -38.17                    | 11.63            | -26.54 | 51.83 |             |
|           |                  |                 |           | 8680.51    | Y        | V             | -44.22                    | 13.32            | -30.90 | 56.19 |             |
| 1/0       |                  | 16QAM           | 3472.30   | Z          | H        | -49.73        | 8.41                      | -41.32           | 65.66  | 37.34 |             |
|           |                  |                 | 5208.32   | X          | V        | -45.67        | 10.46                     | -35.21           | 59.55  |       |             |
|           |                  |                 | 6944.23   | X          | V        | -38.31        | 11.63                     | -26.68           | 51.02  |       |             |
|           |                  |                 | 8680.23   | Y          | V        | -44.45        | 13.32                     | -31.13           | 55.47  |       |             |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 15        | 1717.5           | 1/74            | QPSK      | 3448.19    | Z        | H             | -50.24                    | 8.33             | -41.91 | 66.66 | 37.75       |
|           |                  |                 |           | 5172.44    | X        | V             | -43.82                    | 10.40            | -33.42 | 58.17 |             |
|           |                  |                 |           | 6896.69    | X        | V             | -39.41                    | 11.51            | -27.90 | 52.65 |             |
|           |                  |                 |           | 8620.72    | Y        | V             | -43.87                    | 13.32            | -30.55 | 55.30 |             |
|           |                  | 1/74            | 16QAM     | 3448.17    | Z        | H             | -49.85                    | 8.33             | -41.52 | 65.15 | 36.63       |
|           |                  |                 |           | 5172.49    | X        | V             | -44.34                    | 10.40            | -33.94 | 57.57 |             |
|           |                  |                 |           | 6896.54    | X        | V             | -39.73                    | 11.51            | -28.22 | 51.85 |             |
|           |                  |                 |           | 8620.86    | Y        | V             | -44.14                    | 13.32            | -30.82 | 54.45 |             |
|           | 1732.5           | 1/0             | QPSK      | 3451.65    | Z        | H             | -49.01                    | 8.34             | -40.67 | 66.18 | 38.51       |
|           |                  |                 |           | 5177.51    | X        | V             | -43.56                    | 10.41            | -33.15 | 58.66 |             |
|           |                  |                 |           | 6903.30    | X        | V             | -39.17                    | 11.63            | -27.54 | 53.05 |             |
|           |                  |                 |           | 8629.28    | Y        | V             | -43.77                    | 13.32            | -30.45 | 55.96 |             |
|           |                  | 1/0             | 16QAM     | 3451.78    | Z        | H             | -49.07                    | 8.34             | -40.73 | 65.30 | 37.57       |
|           |                  |                 |           | 5177.30    | X        | V             | -43.89                    | 10.41            | -33.48 | 58.05 |             |
|           |                  |                 |           | 6903.36    | X        | V             | -39.69                    | 11.63            | -28.06 | 52.63 |             |
|           |                  |                 |           | 8629.36    | Y        | V             | -44.09                    | 13.32            | -30.77 | 55.34 |             |
|           | 1747.5           | 1/0             | QPSK      | 3481.65    | Z        | H             | -49.54                    | 8.45             | -41.09 | 66.82 | 38.73       |
|           |                  |                 |           | 5222.55    | X        | V             | -46.53                    | 10.47            | -36.06 | 61.79 |             |
|           |                  |                 |           | 6963.57    | X        | V             | -39.63                    | 11.63            | -28.00 | 53.73 |             |
|           |                  |                 |           | 8704.16    | Y        | V             | -44.89                    | 13.32            | -31.57 | 57.30 |             |
|           |                  | 1/0             | 16QAM     | 3481.60    | Z        | H             | -49.58                    | 8.45             | -41.13 | 66.23 | 38.10       |
|           |                  |                 |           | 5222.43    | X        | V             | -46.44                    | 10.47            | -35.97 | 61.07 |             |
|           |                  |                 |           | 6963.36    | X        | V             | -39.97                    | 11.63            | -28.34 | 53.44 |             |
|           |                  |                 |           | 8704.37    | Y        | V             | -44.95                    | 13.32            | -31.63 | 56.73 |             |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 10        | 1715             | 1/49            | QPSK      | 3438.98    | Z        | H             | -49.17                    | 8.30             | -40.87 | 65.30 | 37.43       |
|           |                  |                 |           | 5158.16    | X        | V             | -44.06                    | 10.38            | -33.68 | 58.11 |             |
|           |                  |                 |           | 6877.66    | X        | V             | -41.70                    | 11.51            | -30.19 | 54.62 |             |
|           |                  |                 |           | 8957.14    | Y        | V             | -44.07                    | 13.31            | -30.76 | 55.19 |             |
|           |                  | 1/49            | 16QAM     | 3438.65    | Z        | H             | -49.11                    | 8.30             | -40.81 | 64.65 | 36.84       |
|           |                  |                 |           | 5158.11    | X        | V             | -44.70                    | 10.38            | -34.32 | 58.16 |             |
|           |                  |                 |           | 6877.63    | X        | V             | -41.63                    | 11.51            | -30.12 | 53.96 |             |
|           |                  |                 |           | 8957.22    | Y        | V             | -43.76                    | 13.31            | -30.45 | 54.29 |             |
|           | 1732.5           | 1/25            | QPSK      | 3465.43    | Z        | H             | -51.18                    | 8.39             | -42.79 | 67.43 | 37.64       |
|           |                  |                 |           | 5197.85    | X        | V             | -45.35                    | 10.45            | -34.90 | 59.54 |             |
|           |                  |                 |           | 6930.40    | X        | V             | -39.85                    | 11.63            | -28.22 | 52.86 |             |
|           |                  |                 |           | 8663.13    | Y        | V             | -44.92                    | 13.32            | -31.60 | 56.24 |             |
|           |                  | 1/25            | 16QAM     | 3465.03    | Z        | H             | -51.33                    | 8.39             | -42.94 | 66.73 | 36.79       |
|           |                  |                 |           | 5197.75    | X        | V             | -45.77                    | 10.45            | -35.32 | 59.11 |             |
|           |                  |                 |           | 6930.33    | X        | V             | -39.84                    | 11.63            | -28.21 | 52.00 |             |
|           |                  |                 |           | 8662.81    | Y        | V             | -44.88                    | 13.32            | -31.56 | 55.35 |             |
|           | 1750             | 1/25            | QPSK      | 3550.34    | Z        | H             | -46.99                    | 8.54             | -38.45 | 64.15 | 38.70       |
|           |                  |                 |           | 5250.18    | X        | V             | -44.79                    | 10.49            | -34.30 | 60.00 |             |
|           |                  |                 |           | 7000.35    | X        | V             | -39.91                    | 11.76            | -28.15 | 53.85 |             |
|           |                  |                 |           | 8750.65    | Y        | V             | -44.15                    | 13.32            | -30.83 | 56.53 |             |
| 1/25      |                  | 16QAM           | 3500.08   | Z          | H        | -47.69        | 8.51                      | -39.18           | 63.82  | 37.64 |             |
|           |                  |                 | 5250.26   | X          | V        | -44.31        | 10.49                     | -33.82           | 58.46  |       |             |
|           |                  |                 | 7000.33   | X          | V        | -39.48        | 11.76                     | -27.72           | 52.36  |       |             |
|           |                  |                 | 8750.16   | Y          | V        | -43.92        | 13.32                     | -30.60           | 55.24  |       |             |



| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |       |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|-------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |       |
| 5         | 1712.5           | 1/24            | QPSK      | 3429.63    | Z        | H             | -49.25                    | 8.26             | -40.99 | 65.90 | 37.91       |       |
|           |                  |                 |           | 5143.96    | X        | V             | -44.55                    | 10.35            | -34.20 | 59.11 |             |       |
|           |                  |                 |           | 6858.51    | X        | V             | -40.61                    | 11.51            | -29.10 | 54.01 |             |       |
|           |                  |                 |           | 8573.35    | Y        | V             | -44.07                    | 13.22            | -30.85 | 55.76 |             |       |
|           |                  | 1/24            | 16QAM     | 3429.33    | Z        | H             | -49.49                    | 8.26             | -41.23 | 65.56 |             | 37.33 |
|           |                  |                 |           | 5144.08    | X        | V             | -44.36                    | 10.35            | -34.01 | 58.34 |             |       |
|           |                  |                 |           | 6858.68    | X        | V             | -40.58                    | 11.51            | -29.07 | 53.40 |             |       |
|           |                  |                 |           | 8573.35    | Y        | V             | -43.99                    | 13.22            | -30.77 | 55.10 |             |       |
|           | 1732.5           | 1/0             | QPSK      | 3460.58    | Z        | H             | -50.63                    | 8.37             | -42.26 | 67.15 | 37.89       |       |
|           |                  |                 |           | 5191.21    | X        | V             | -46.70                    | 10.44            | -36.26 | 61.15 |             |       |
|           |                  |                 |           | 6921.34    | X        | V             | -39.40                    | 11.63            | -27.77 | 52.66 |             |       |
|           |                  |                 |           | 8651.56    | Y        | V             | -43.90                    | 13.32            | -30.58 | 55.47 |             |       |
|           |                  | 1/0             | 16QAM     | 3460.73    | Z        | H             | -50.60                    | 8.37             | -42.23 | 66.18 | 36.95       |       |
|           |                  |                 |           | 5191.03    | X        | V             | -46.98                    | 10.43            | -36.55 | 60.50 |             |       |
|           |                  |                 |           | 6921.18    | X        | V             | -39.43                    | 11.63            | -27.80 | 51.75 |             |       |
|           |                  |                 |           | 8651.37    | Y        | V             | -44.65                    | 13.32            | -31.33 | 55.28 |             |       |
| 1752.5    | 1/0              | QPSK            | 3500.62   | Z          | H        | -45.41        | 8.51                      | -36.90           | 62.72  | 38.82 |             |       |
|           |                  |                 | 5250.88   | X          | V        | -45.04        | 10.49                     | -34.55           | 60.37  |       |             |       |
|           |                  |                 | 7001.51   | X          | V        | -40.97        | 11.76                     | -29.21           | 55.03  |       |             |       |
|           |                  |                 | 8751.63   | Y          | V        | -43.71        | 13.32                     | -30.39           | 56.21  |       |             |       |
|           | 1/0              | 16QAM           | 3500.67   | Z          | H        | -45.68        | 8.51                      | -37.17           | 62.05  | 37.88 |             |       |
|           |                  |                 | 5250.82   | X          | V        | -45.42        | 10.49                     | -34.93           | 59.81  |       |             |       |
|           |                  |                 | 7001.19   | X          | V        | -40.96        | 11.76                     | -29.20           | 54.08  |       |             |       |
|           |                  |                 | 8751.77   | Y          | V        | -43.89        | 13.32                     | -30.57           | 55.45  |       |             |       |

| B.W<br>(MHz) | Test<br>Freq.<br>(MHz) | RB<br>Size/<br>Offset | Test<br>Mode | Freq.(MHz) | EUT<br>Axis | Ant<br>Pol<br>(H/V) | Level(dBm)<br>@ Ant<br>Terminal | TX Ant<br>Gain(dBi) | Result |       | Limit<br>(dBc) |       |
|--------------|------------------------|-----------------------|--------------|------------|-------------|---------------------|---------------------------------|---------------------|--------|-------|----------------|-------|
|              |                        |                       |              |            |             |                     |                                 |                     | (dBm)  | (dBc) |                |       |
| 3            | 1711.5                 | 1/14                  | QPSK         | 3425.40    | Z           | H                   | -49.56                          | 8.25                | -41.31 | 66.24 | 37.93          |       |
|              |                        |                       |              | 5138.34    | X           | V                   | -46.04                          | 10.35               | -35.69 | 60.62 |                |       |
|              |                        |                       |              | 6851.02    | X           | V                   | -39.59                          | 11.51               | -28.08 | 53.01 |                |       |
|              |                        |                       |              | 8563.79    | Y           | V                   | -44.73                          | 13.22               | -31.51 | 56.44 |                |       |
|              |                        | 1/14                  | 16QAM        | 3425.38    | Z           | H                   | -49.93                          | 8.25                | -41.68 | 65.90 |                | 37.22 |
|              |                        |                       |              | 5138.22    | X           | V                   | -46.15                          | 10.34               | -35.81 | 60.03 |                |       |
|              |                        |                       |              | 6850.89    | X           | V                   | -40.93                          | 11.51               | -29.42 | 53.64 |                |       |
|              |                        |                       |              | 8563.95    | Y           | V                   | -44.43                          | 13.22               | -31.21 | 55.43 |                |       |
|              | 1732.5                 | 1/14                  | QPSK         | 3467.47    | Z           | H                   | -51.49                          | 8.40                | -43.09 | 67.76 | 37.67          |       |
|              |                        |                       |              | 5201.05    | X           | V                   | -47.22                          | 10.45               | -36.77 | 61.44 |                |       |
|              |                        |                       |              | 6935.17    | X           | V                   | -38.62                          | 11.63               | -26.99 | 51.66 |                |       |
|              |                        |                       |              | 8669.00    | Y           | V                   | -44.06                          | 13.32               | -30.74 | 55.41 |                |       |
|              |                        | 1/14                  | 16QAM        | 3467.55    | Z           | H                   | -51.77                          | 8.40                | -43.37 | 66.98 | 36.61          |       |
|              |                        |                       |              | 5201.20    | X           | V                   | -47.68                          | 10.45               | -37.23 | 60.84 |                |       |
|              |                        |                       |              | 6934.98    | X           | V                   | -38.74                          | 11.63               | -27.11 | 50.72 |                |       |
|              |                        |                       |              | 8668.79    | Y           | V                   | -44.24                          | 13.32               | -30.92 | 54.53 |                |       |
|              | 1753.5                 | 1/14                  | QPSK         | 3509.45    | Z           | H                   | -45.68                          | 8.51                | -37.17 | 62.93 | 38.76          |       |
|              |                        |                       |              | 5264.07    | X           | V                   | -45.89                          | 10.49               | -35.40 | 61.16 |                |       |
|              |                        |                       |              | 7019.10    | X           | V                   | -40.72                          | 11.76               | -28.96 | 54.72 |                |       |
|              |                        |                       |              | 8773.68    | Y           | V                   | -42.94                          | 13.32               | -29.62 | 55.38 |                |       |
| 1/14         |                        | 16QAM                 | 3509.55      | Z          | H           | -45.51              | 8.51                            | -37.00              | 61.98  | 37.98 |                |       |
|              |                        |                       | 5264.37      | X          | V           | -45.97              | 10.50                           | -35.47              | 60.45  |       |                |       |
|              |                        |                       | 7019.13      | X          | V           | -41.02              | 11.76                           | -29.26              | 54.24  |       |                |       |
|              |                        |                       | 8773.86      | Y          | V           | -43.96              | 13.32                           | -30.64              | 55.62  |       |                |       |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |       |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|-------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |       |
| 1.4       | 1710.7           | 1/2             | QPSK      | 3421.49    | Z        | H             | -49.84                    | 8.24             | -41.60 | 66.42 | 37.82       |       |
|           |                  |                 |           | 5131.94    | X        | V             | -44.76                    | 10.33            | -34.43 | 59.25 |             |       |
|           |                  |                 |           | 6842.53    | X        | V             | -39.91                    | 11.51            | -28.40 | 53.22 |             |       |
|           |                  |                 |           | 8553.20    | Y        | V             | -45.02                    | 13.22            | -31.80 | 56.62 |             |       |
|           |                  | 1/2             | 16QAM     | 3421.24    | Z        | H             | -49.97                    | 8.23             | -41.74 | 65.46 |             | 36.72 |
|           |                  |                 |           | 5131.93    | X        | V             | -45.02                    | 10.33            | -34.69 | 58.41 |             |       |
|           |                  |                 |           | 6842.26    | X        | V             | -39.84                    | 11.51            | -28.33 | 52.05 |             |       |
|           |                  |                 |           | 8553.35    | Y        | V             | -45.00                    | 13.22            | -31.78 | 55.50 |             |       |
|           | 1732.5           | 1/5             | QPSK      | 3465.86    | Z        | H             | -51.34                    | 8.39             | -42.95 | 67.27 | 37.32       |       |
|           |                  |                 |           | 5199.05    | X        | V             | -44.92                    | 10.45            | -34.47 | 58.79 |             |       |
|           |                  |                 |           | 6931.79    | X        | V             | -39.09                    | 11.63            | -27.46 | 51.78 |             |       |
|           |                  |                 |           | 8664.92    | Y        | V             | -44.59                    | 13.32            | -31.27 | 55.59 |             |       |
|           |                  | 1/5             | 16QAM     | 3465.85    | Z        | H             | -51.48                    | 8.39             | -43.09 | 66.69 | 36.60       |       |
|           |                  |                 |           | 5198.79    | X        | V             | -44.83                    | 10.45            | -34.38 | 57.98 |             |       |
|           |                  |                 |           | 6931.95    | X        | V             | -38.77                    | 11.63            | -27.14 | 50.74 |             |       |
|           |                  |                 |           | 8664.71    | Y        | V             | -44.54                    | 13.32            | -31.22 | 54.82 |             |       |
|           | 1754.3           | 1/2             | QPSK      | 3508.40    | Z        | H             | -43.98                    | 8.51             | -35.47 | 61.36 | 38.89       |       |
|           |                  |                 |           | 5262.68    | X        | V             | -44.21                    | 10.49            | -33.72 | 59.61 |             |       |
|           |                  |                 |           | 7017.03    | X        | V             | -41.83                    | 11.76            | -30.07 | 55.96 |             |       |
|           |                  |                 |           | 8771.22    | Y        | V             | -43.93                    | 13.32            | -30.61 | 56.50 |             |       |
| 1/2       |                  | 16QAM           | 3508.39   | Z          | H        | -43.96        | 8.51                      | -35.45           | 60.49  | 38.04 |             |       |
|           |                  |                 | 5262.74   | X          | V        | -44.37        | 10.49                     | -33.88           | 58.92  |       |             |       |
|           |                  |                 | 7016.95   | X          | V        | -41.96        | 11.76                     | -30.20           | 55.24  |       |             |       |
|           |                  |                 | 8771.06   | Y          | V        | -43.99        | 13.32                     | -30.67           | 55.71  |       |             |       |

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

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.

**7.7.3 LTE Band 2**

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 20        | 1860             | 1/0             | QPSK      | 3702.14    | X        | V             | -36.31                    | 8.49             | -27.82 | 53.38 | 38.56       |
|           |                  |                 |           | 5553.33    | Y        | H             | -41.22                    | 10.67            | -30.55 | 56.11 |             |
|           |                  |                 |           | 7404.35    | X        | V             | -42.60                    | 12.23            | -30.37 | 55.93 |             |
|           |                  |                 |           | 9255.44    | X        | H             | -38.03                    | 13.40            | -24.63 | 50.19 |             |
|           |                  | 1/0             | 16QAM     | 3702.17    | X        | V             | -36.48                    | 8.49             | -27.99 | 53.22 | 38.23       |
|           |                  |                 |           | 5553.31    | Y        | H             | -41.17                    | 10.67            | -30.50 | 55.73 |             |
|           |                  |                 |           | 7404.60    | X        | V             | -41.71                    | 12.23            | -29.48 | 54.71 |             |
|           |                  |                 |           | 9255.48    | X        | H             | -37.84                    | 13.40            | -24.44 | 49.67 |             |
|           | 1880             | 1/0             | QPSK      | 3742.17    | X        | V             | -36.19                    | 8.51             | -27.68 | 53.39 | 38.71       |
|           |                  |                 |           | 5613.29    | Y        | H             | -40.15                    | 10.71            | -29.44 | 55.15 |             |
|           |                  |                 |           | 7484.33    | X        | V             | -41.90                    | 12.23            | -29.67 | 55.38 |             |
|           |                  |                 |           | 9355.49    | X        | H             | -39.50                    | 13.49            | -26.01 | 51.72 |             |
|           |                  | 1/0             | 16QAM     | 3742.15    | X        | V             | -36.19                    | 8.51             | -27.68 | 52.77 | 38.09       |
|           |                  |                 |           | 5613.41    | Y        | H             | -40.21                    | 10.71            | -29.50 | 54.59 |             |
|           |                  |                 |           | 7484.32    | X        | V             | -42.17                    | 12.23            | -29.94 | 55.03 |             |
|           |                  |                 |           | 9355.49    | X        | H             | -40.03                    | 13.49            | -26.54 | 51.63 |             |
|           | 1900             | 1/0             | QPSK      | 3782.16    | X        | V             | -35.33                    | 8.52             | -26.81 | 52.65 | 38.84       |
|           |                  |                 |           | 5673.22    | Y        | H             | -40.03                    | 10.81            | -29.22 | 55.06 |             |
|           |                  |                 |           | 7564.34    | X        | V             | -43.42                    | 12.35            | -31.07 | 56.91 |             |
|           |                  |                 |           | 9455.26    | X        | H             | -40.56                    | 13.38            | -27.18 | 53.02 |             |
| 1/0       |                  | 16QAM           | 3782.23   | X          | V        | -35.47        | 8.52                      | -26.95           | 51.71  | 37.76 |             |
|           |                  |                 | 5673.32   | Y          | H        | -41.26        | 10.81                     | -30.45           | 55.21  |       |             |
|           |                  |                 | 7654.38   | X          | V        | -44.01        | 12.46                     | -31.55           | 56.31  |       |             |
|           |                  |                 | 9455.46   | X          | H        | -40.92        | 13.38                     | -27.54           | 52.30  |       |             |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 15        | 1857.5           | 1/0             | QPSK      | 3701.74    | X        | V             | -36.33                    | 8.49             | -27.84 | 52.97 | 38.13       |
|           |                  |                 |           | 5552.64    | Y        | H             | -41.24                    | 10.67            | -30.57 | 55.70 |             |
|           |                  |                 |           | 7403.52    | X        | V             | -42.44                    | 12.23            | -30.21 | 55.34 |             |
|           |                  |                 |           | 9254.18    | X        | H             | -37.71                    | 13.40            | -24.31 | 49.44 |             |
|           |                  | 1/0             | 16QAM     | 3701.65    | X        | V             | -36.42                    | 8.49             | -27.93 | 52.41 | 37.48       |
|           |                  |                 |           | 5552.51    | Y        | H             | -41.30                    | 10.67            | -30.63 | 55.11 |             |
|           |                  |                 |           | 7403.09    | X        | V             | -42.40                    | 12.23            | -30.17 | 54.65 |             |
|           |                  |                 |           | 9254.10    | X        | H             | -38.14                    | 13.40            | -24.74 | 49.22 |             |
|           | 1880             | 1/0             | QPSK      | 3746.68    | X        | V             | -36.29                    | 8.51             | -27.78 | 53.50 | 38.72       |
|           |                  |                 |           | 5620.07    | Y        | H             | -41.05                    | 10.72            | -30.33 | 56.05 |             |
|           |                  |                 |           | 7493.29    | X        | V             | -41.83                    | 12.23            | -29.60 | 55.32 |             |
|           |                  |                 |           | 9366.44    | X        | H             | -39.84                    | 13.49            | -26.35 | 52.07 |             |
|           |                  | 1/0             | 16QAM     | 3746.72    | X        | V             | -36.10                    | 8.51             | -27.59 | 52.71 | 38.12       |
|           |                  |                 |           | 5620.03    | Y        | H             | -41.34                    | 10.72            | -30.62 | 55.74 |             |
|           |                  |                 |           | 7493.13    | X        | V             | -42.24                    | 12.23            | -30.01 | 55.13 |             |
|           |                  |                 |           | 9366.81    | X        | H             | -40.54                    | 13.49            | -27.05 | 52.17 |             |
|           | 1902.5           | 1/0             | QPSK      | 3791.69    | X        | V             | -35.71                    | 8.53             | -27.18 | 51.91 | 37.73       |
|           |                  |                 |           | 5687.57    | Y        | H             | -40.90                    | 10.83            | -30.07 | 54.80 |             |
|           |                  |                 |           | 7583.16    | X        | V             | -43.48                    | 12.35            | -31.13 | 55.86 |             |
|           |                  |                 |           | 9479.09    | X        | H             | -41.33                    | 13.38            | -27.95 | 52.68 |             |
| 1/0       |                  | 16QAM           | 3791.67   | X          | V        | -35.86        | 8.53                      | -27.33           | 50.74  | 36.41 |             |
|           |                  |                 | 5687.41   | Y          | H        | -40.67        | 10.83                     | -29.84           | 53.25  |       |             |
|           |                  |                 | 7583.49   | X          | V        | -43.08        | 12.35                     | -30.73           | 54.14  |       |             |
|           |                  |                 | 9479.28   | X          | H        | -41.66        | 13.38                     | -28.28           | 51.69  |       |             |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |       |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|-------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |       |
| 10        | 1855             | 1/0             | QPSK      | 3701.21    | X        | V             | -35.99                    | 8.49             | -27.50 | 52.85 | 38.35       |       |
|           |                  |                 |           | 5551.63    | Y        | H             | -41.74                    | 10.67            | -31.07 | 56.42 |             |       |
|           |                  |                 |           | 7402.45    | X        | V             | -42.61                    | 12.23            | -30.38 | 55.73 |             |       |
|           |                  |                 |           | 9252.90    | X        | H             | -38.51                    | 13.40            | -25.11 | 50.46 |             |       |
|           |                  | 1/0             | 16QAM     | 3701.26    | X        | V             | -36.10                    | 8.49             | -27.61 | 52.02 |             | 37.41 |
|           |                  |                 |           | 5551.82    | Y        | H             | -41.43                    | 10.67            | -30.76 | 55.17 |             |       |
|           |                  |                 |           | 7402.26    | X        | V             | -42.49                    | 12.23            | -30.26 | 54.67 |             |       |
|           |                  |                 |           | 9252.88    | X        | H             | -38.28                    | 13.40            | -24.88 | 49.29 |             |       |
|           | 1880             | 1/12            | QPSK      | 3751.27    | X        | V             | -35.89                    | 8.51             | -27.38 | 51.78 | 37.40       |       |
|           |                  |                 |           | 5626.76    | Y        | H             | -38.43                    | 10.73            | -27.70 | 52.10 |             |       |
|           |                  |                 |           | 7502.37    | X        | V             | -42.67                    | 12.35            | -30.32 | 54.72 |             |       |
|           |                  |                 |           | 9377.90    | X        | H             | -39.55                    | 13.49            | -26.06 | 50.46 |             |       |
|           |                  | 1/12            | 16QAM     | 3751.17    | X        | V             | -36.08                    | 8.51             | -27.57 | 51.07 | 36.50       |       |
|           |                  |                 |           | 5626.83    | Y        | H             | -39.73                    | 10.73            | -29.00 | 52.50 |             |       |
|           |                  |                 |           | 7502.45    | X        | V             | -42.89                    | 12.35            | -30.54 | 54.04 |             |       |
|           |                  |                 |           | 9377.90    | X        | H             | -39.83                    | 13.49            | -26.34 | 49.84 |             |       |
|           | 1905             | 1/0             | QPSK      | 3801.23    | X        | V             | -35.98                    | 8.53             | -27.45 | 52.43 | 37.98       |       |
|           |                  |                 |           | 5701.74    | Y        | H             | -42.80                    | 10.85            | -31.95 | 56.93 |             |       |
|           |                  |                 |           | 7602.13    | X        | V             | -43.32                    | 12.46            | -30.86 | 55.84 |             |       |
|           |                  |                 |           | 9502.81    | X        | H             | -40.17                    | 13.38            | -26.79 | 51.77 |             |       |
| 1/0       |                  | 16QAM           | 3801.21   | X          | V        | -36.07        | 8.53                      | -27.54           | 51.36  | 36.82 |             |       |
|           |                  |                 | 5701.63   | Y          | H        | -43.57        | 10.85                     | -32.72           | 56.54  |       |             |       |
|           |                  |                 | 7602.15   | X          | V        | -43.35        | 12.46                     | -30.89           | 54.71  |       |             |       |
|           |                  |                 | 9502.82   | X          | H        | -40.20        | 13.38                     | -26.82           | 50.64  |       |             |       |

| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |
| 5         | 1852.5           | 1/12            | QPSK      | 3704.97    | X        | V             | -36.21                    | 8.49             | -27.72 | 53.13 | 38.41       |
|           |                  |                 |           | 5557.51    | Y        | H             | -42.88                    | 10.67            | -32.21 | 57.62 |             |
|           |                  |                 |           | 7410.07    | X        | V             | -42.58                    | 12.23            | -30.35 | 55.76 |             |
|           |                  |                 |           | 9262.57    | X        | H             | -38.56                    | 13.40            | -25.16 | 50.57 |             |
|           |                  | 1/12            | 16QAM     | 3704.98    | X        | V             | -36.40                    | 8.49             | -27.91 | 52.80 | 37.89       |
|           |                  |                 |           | 5557.33    | Y        | H             | -42.89                    | 10.67            | -32.22 | 57.11 |             |
|           |                  |                 |           | 7409.90    | X        | V             | -42.61                    | 12.23            | -30.38 | 55.27 |             |
|           |                  |                 |           | 9262.62    | X        | H             | -38.38                    | 13.40            | -24.98 | 49.87 |             |
|           | 1880             | 1/12            | QPSK      | 3760.02    | X        | V             | -35.91                    | 8.51             | -27.40 | 51.50 | 37.10       |
|           |                  |                 |           | 5639.90    | Y        | H             | -39.85                    | 10.75            | -29.10 | 53.20 |             |
|           |                  |                 |           | 7519.79    | X        | V             | -44.01                    | 12.35            | -31.66 | 55.76 |             |
|           |                  |                 |           | 9400.05    | X        | H             | -40.07                    | 13.38            | -26.69 | 50.79 |             |
|           |                  | 1/12            | 16QAM     | 3759.95    | X        | V             | -35.94                    | 8.51             | -27.43 | 50.48 | 36.05       |
|           |                  |                 |           | 5640.09    | Y        | H             | -40.35                    | 10.75            | -29.60 | 52.65 |             |
|           |                  |                 |           | 7519.91    | X        | V             | -44.59                    | 12.35            | -32.24 | 55.29 |             |
|           |                  |                 |           | 9400.10    | X        | H             | -40.53                    | 13.38            | -27.15 | 50.20 |             |
|           | 1907.5           | 1/12            | QPSK      | 3814.98    | X        | V             | -35.89                    | 8.55             | -27.34 | 51.39 | 37.05       |
|           |                  |                 |           | 5722.42    | Y        | H             | -40.18                    | 10.88            | -29.30 | 53.35 |             |
|           |                  |                 |           | 7630.12    | X        | V             | -44.96                    | 12.46            | -32.50 | 56.55 |             |
|           |                  |                 |           | 9537.51    | X        | H             | -38.81                    | 13.38            | -25.43 | 49.48 |             |
| 1/12      |                  | 16QAM           | 3815.00   | X          | V        | -35.65        | 8.55                      | -27.10           | 50.68  | 36.58 |             |
|           |                  |                 | 5722.62   | Y          | H        | -41.33        | 10.88                     | -30.45           | 54.03  |       |             |
|           |                  |                 | 7630.13   | X          | V        | -45.23        | 12.46                     | -32.77           | 56.35  |       |             |
|           |                  |                 | 9537.84   | X          | H        | -39.29        | 13.38                     | -25.91           | 49.49  |       |             |

| B.W<br>(MHz) | Test<br>Freq.<br>(MHz) | RB<br>Size/<br>Offset | Test<br>Mode | Freq.(MHz) | EUT<br>Axis | Ant<br>Pol<br>(H/V) | Level(dBm)<br>@ Ant<br>Terminal | TX Ant<br>Gain(dBi) | Result |       | Limit<br>(dBc) |
|--------------|------------------------|-----------------------|--------------|------------|-------------|---------------------|---------------------------------|---------------------|--------|-------|----------------|
|              |                        |                       |              |            |             |                     |                                 |                     | (dBm)  | (dBc) |                |
| 3            | 1851.5                 | 1/0                   | QPSK         | 3700.30    | X           | V                   | -35.98                          | 8.49                | -27.49 | 53.49 | 39.00          |
|              |                        |                       |              | 5550.72    | Y           | H                   | -42.59                          | 10.67               | -31.92 | 57.92 |                |
|              |                        |                       |              | 7400.91    | X           | V                   | -42.45                          | 12.23               | -30.22 | 56.22 |                |
|              |                        |                       |              | 9251.27    | X           | H                   | -38.65                          | 13.40               | -25.25 | 51.25 |                |
|              |                        | 1/0                   | 16QAM        | 3700.53    | X           | V                   | -36.09                          | 8.49                | -27.60 | 52.89 | 38.29          |
|              |                        |                       |              | 5550.69    | Y           | H                   | -42.54                          | 10.67               | -31.87 | 57.16 |                |
|              |                        |                       |              | 7401.09    | X           | V                   | -42.80                          | 12.23               | -30.57 | 55.86 |                |
|              |                        |                       |              | 9251.30    | X           | H                   | -38.61                          | 13.40               | -25.21 | 50.50 |                |
|              | 1880                   | 1/0                   | QPSK         | 3757.55    | X           | V                   | -36.17                          | 8.51                | -27.66 | 52.36 | 37.70          |
|              |                        |                       |              | 5636.34    | Y           | H                   | -39.86                          | 10.75               | -29.11 | 53.81 |                |
|              |                        |                       |              | 7515.05    | X           | V                   | -44.11                          | 12.35               | -31.76 | 56.46 |                |
|              |                        |                       |              | 9393.71    | X           | H                   | -40.20                          | 13.49               | -26.71 | 51.41 |                |
|              |                        | 1/0                   | 16QAM        | 3757.40    | X           | V                   | -36.23                          | 8.51                | -27.72 | 51.79 | 37.07          |
|              |                        |                       |              | 5636.37    | Y           | H                   | -41.85                          | 10.75               | -31.10 | 55.17 |                |
|              |                        |                       |              | 7515.03    | X           | V                   | -44.45                          | 12.35               | -32.10 | 56.17 |                |
|              |                        |                       |              | 9393.43    | X           | H                   | -40.24                          | 13.49               | -26.75 | 50.82 |                |
|              | 1908.5                 | 1/0                   | QPSK         | 3814.50    | X           | V                   | -35.60                          | 8.55                | -27.05 | 51.09 | 37.04          |
|              |                        |                       |              | 5721.82    | Y           | H                   | -39.24                          | 10.88               | -28.36 | 52.40 |                |
|              |                        |                       |              | 7629.04    | X           | V                   | -45.16                          | 12.46               | -32.70 | 56.74 |                |
|              |                        |                       |              | 9536.14    | X           | H                   | -39.95                          | 13.38               | -26.57 | 50.61 |                |
| 1/0          |                        | 16QAM                 | 3814.47      | X          | V           | -35.53              | 8.55                            | -26.98              | 50.61  | 36.63 |                |
|              |                        |                       | 5721.69      | Y          | H           | -39.52              | 10.88                           | -28.64              | 52.27  |       |                |
|              |                        |                       | 7628.84      | X          | V           | -45.05              | 12.46                           | -32.59              | 56.22  |       |                |
|              |                        |                       | 9536.23      | X          | H           | -39.93              | 13.38                           | -26.55              | 50.18  |       |                |



| B.W (MHz) | Test Freq. (MHz) | RB Size/ Offset | Test Mode | Freq.(MHz) | EUT Axis | Ant Pol (H/V) | Level(dBm) @ Ant Terminal | TX Ant Gain(dBi) | Result |       | Limit (dBc) |       |
|-----------|------------------|-----------------|-----------|------------|----------|---------------|---------------------------|------------------|--------|-------|-------------|-------|
|           |                  |                 |           |            |          |               |                           |                  | (dBm)  | (dBc) |             |       |
| 1.4       | 1850.7           | 1/0             | QPSK      | 3700.62    | X        | V             | -36.38                    | 8.49             | -27.89 | 53.92 | 39.03       |       |
|           |                  |                 |           | 5550.83    | Y        | H             | -42.29                    | 10.67            | -31.62 | 57.65 |             |       |
|           |                  |                 |           | 8400.90    | X        | V             | -43.51                    | 13.12            | -30.39 | 56.42 |             |       |
|           |                  |                 |           | 9251.27    | X        | H             | -38.55                    | 13.40            | -25.15 | 51.18 |             |       |
|           |                  | 1/0             | 16QAM     | 3700.51    | X        | V             | -36.42                    | 8.49             | -27.93 | 53.38 |             | 38.45 |
|           |                  |                 |           | 5550.88    | Y        | H             | -42.25                    | 10.67            | -31.58 | 57.03 |             |       |
|           |                  |                 |           | 7400.88    | X        | V             | -43.32                    | 12.23            | -31.09 | 56.54 |             |       |
|           |                  |                 |           | 9251.10    | X        | H             | -37.82                    | 13.40            | -24.42 | 49.87 |             |       |
|           | 1880             | 1/0             | QPSK      | 3759.12    | X        | V             | -36.15                    | 8.51             | -27.64 | 52.12 | 37.48       |       |
|           |                  |                 |           | 5638.62    | Y        | H             | -39.68                    | 10.75            | -28.93 | 53.41 |             |       |
|           |                  |                 |           | 7518.25    | X        | V             | -44.22                    | 12.35            | -31.87 | 56.35 |             |       |
|           |                  |                 |           | 9397.62    | X        | H             | -40.28                    | 13.49            | -26.79 | 51.27 |             |       |
|           |                  | 1/0             | 16QAM     | 3759.07    | X        | V             | -36.21                    | 8.51             | -27.70 | 51.70 | 37.00       |       |
|           |                  |                 |           | 5638.68    | Y        | H             | -39.95                    | 10.75            | -29.20 | 53.20 |             |       |
|           |                  |                 |           | 7518.17    | X        | V             | -44.53                    | 12.35            | -32.18 | 56.18 |             |       |
|           |                  |                 |           | 9397.88    | X        | H             | -39.85                    | 13.49            | -26.36 | 50.36 |             |       |
|           | 1909.3           | 1/0             | QPSK      | 3817.64    | X        | V             | -35.91                    | 8.55             | -27.36 | 51.27 | 36.91       |       |
|           |                  |                 |           | 5726.55    | Y        | H             | -39.72                    | 10.89            | -28.83 | 52.74 |             |       |
|           |                  |                 |           | 7635.41    | X        | V             | -44.10                    | 12.46            | -31.64 | 55.55 |             |       |
|           |                  |                 |           | 9544.34    | X        | H             | -40.49                    | 13.38            | -27.11 | 51.02 |             |       |
|           |                  | 1/0             | 16QAM     | 3817.67    | X        | V             | -35.75                    | 8.55             | -27.20 | 50.47 | 36.27       |       |
|           |                  |                 |           | 5726.47    | Y        | H             | -39.39                    | 10.89            | -28.50 | 51.77 |             |       |
|           |                  |                 |           | 7635.51    | X        | V             | -44.08                    | 12.46            | -31.62 | 54.89 |             |       |
|           |                  |                 |           | 9544.35    | X        | H             | -39.82                    | 13.38            | -26.44 | 49.71 |             |       |

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

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

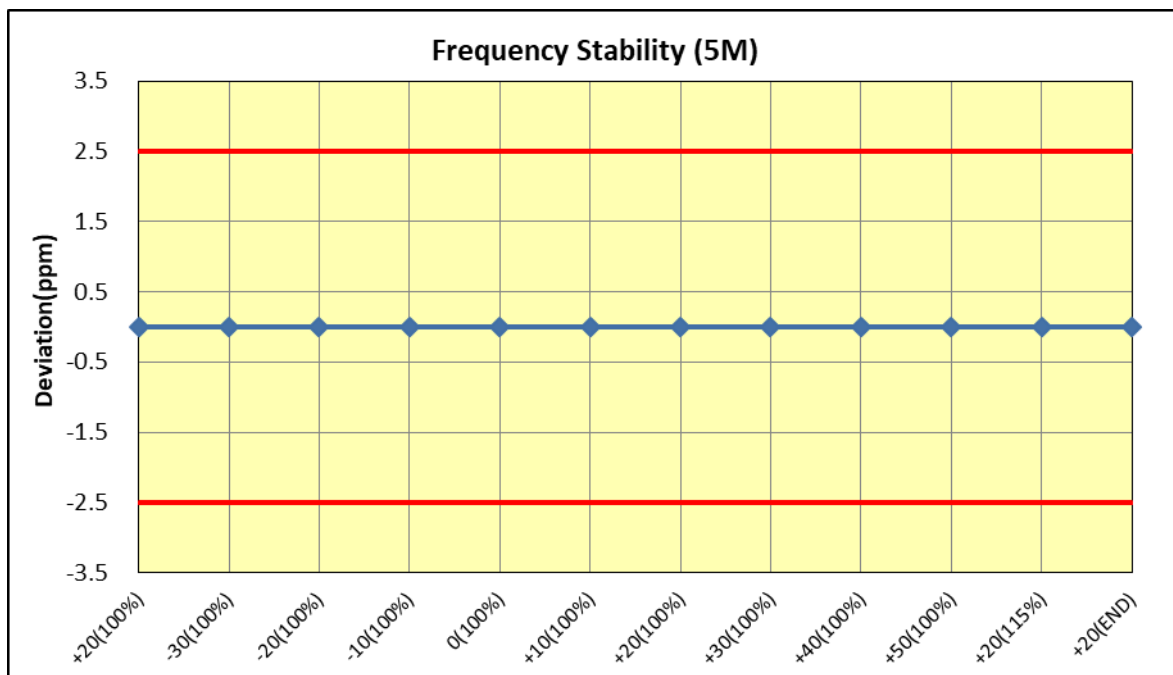
Note 3: The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

## 7.8 FREQUENCY STABILITY

### 7.8.1 LTE Band 5

OPERATING FREQUENCY : 836.5 MHz  
 REFERENCE VOLTAGE : 9.00 VDC  
 DEVIATION LIMIT :  $\pm 0.00025\%$  or  $\pm 2.5$  ppm

| VOLTAGE (%)   | POWER (V DC) | TEMP (°C) | FREQUENCY (Hz) | FREQ.Dev (Hz) | Deviation |              |
|---------------|--------------|-----------|----------------|---------------|-----------|--------------|
|               |              |           |                |               | (ppm)     | (%)          |
| 100%          | 9.00         | +20(Ref)  | 836,499,993    | -7            | -0.0084   | -0.000000837 |
| 100%          |              | -30       | 836,499,995    | -5            | -0.0060   | -0.000000598 |
| 100%          |              | -20       | 836,499,995    | -5            | -0.0060   | -0.000000598 |
| 100%          |              | -10       | 836,499,993    | -7            | -0.0084   | -0.000000837 |
| 100%          |              | 0         | 836,499,994    | -6            | -0.0072   | -0.000000717 |
| 100%          |              | +10       | 836,499,994    | -6            | -0.0072   | -0.000000717 |
| 100%          |              | +20       | 836,499,993    | -7            | -0.0084   | -0.000000837 |
| 100%          |              | +30       | 836,500,004    | 4             | 0.0048    | 0.000000478  |
| 100%          |              | +40       | 836,500,002    | 2             | 0.0024    | 0.000000239  |
| 100%          |              | +50       | 836,500,002    | 2             | 0.0024    | 0.000000239  |
| 115%          |              | 10.35     | +20            | 836,499,992   | -4        | -0.0048      |
| BATT.ENDPOINT | 8.40         | +20       | 836,499,992    | -8            | -0.0096   | -0.000000956 |

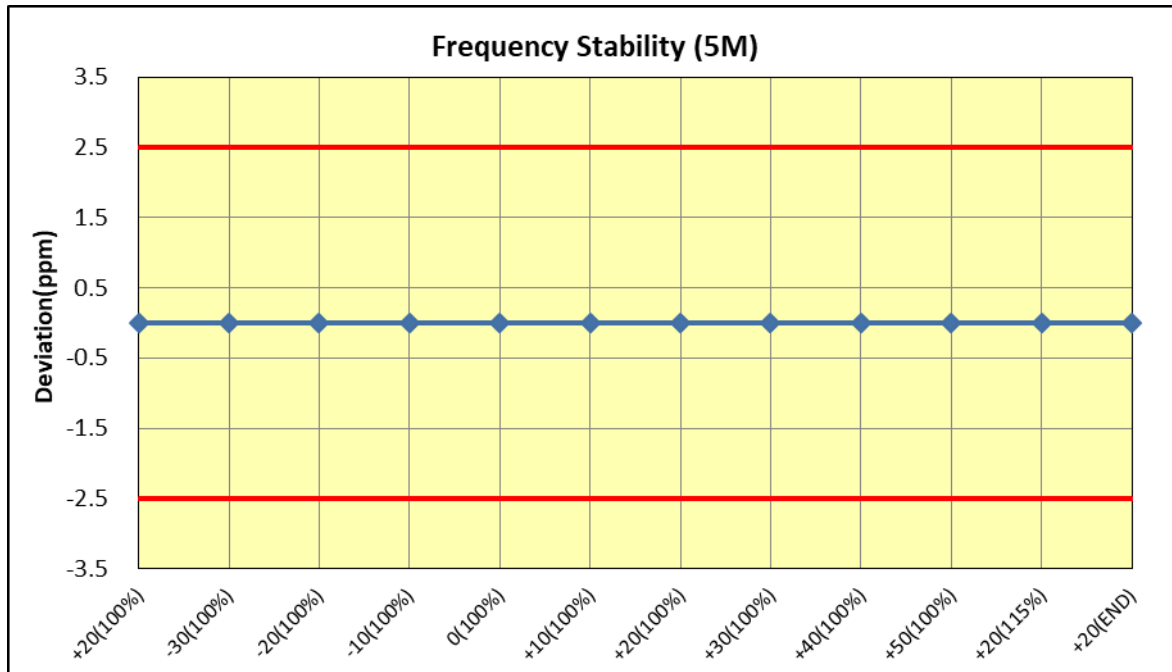


**Note.** Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. as such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability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

7.8.2 LTE Band 4

OPERATING FREQUENCY : 1732.5 MHz  
 REFERENCE VOLTAGE : 9.00 VDC  
 LIMIT : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| VOLTAGE (%)   | POWER (V DC) | TEMP (°C) | FREQUENCY (Hz) | FREQ.Dev (Hz) | Deviation |              |
|---------------|--------------|-----------|----------------|---------------|-----------|--------------|
|               |              |           |                |               | (ppm)     | (%)          |
| 100%          | 9.00         | +20(Ref)  | 1,732,499,993  | -7            | -0.0040   | -0.000000404 |
| 100%          |              | -30       | 1,732,499,997  | -3            | -0.0017   | -0.000000173 |
| 100%          |              | -20       | 1,732,499,996  | -4            | -0.0023   | -0.000000231 |
| 100%          |              | -10       | 1,732,499,994  | -6            | -0.0035   | -0.000000346 |
| 100%          |              | 0         | 1,732,499,994  | -6            | -0.0035   | -0.000000346 |
| 100%          |              | +10       | 1,732,499,995  | -5            | -0.0029   | -0.000000289 |
| 100%          |              | +20       | 1,732,499,993  | -7            | -0.0040   | -0.000000404 |
| 100%          |              | +30       | 1,732,499,992  | -8            | -0.0046   | -0.000000462 |
| 100%          |              | +40       | 1,732,499,993  | -7            | -0.0040   | -0.000000404 |
| 100%          |              | +50       | 1,732,499,994  | -6            | -0.0035   | -0.000000346 |
| 115%          |              | 10.35     | +20            | 1,732,499,995 | -5        | -0.0029      |
| BATT.ENDPOINT | 8.40         | +20       | 1,732,499,995  | -5            | -0.0029   | -0.000000289 |

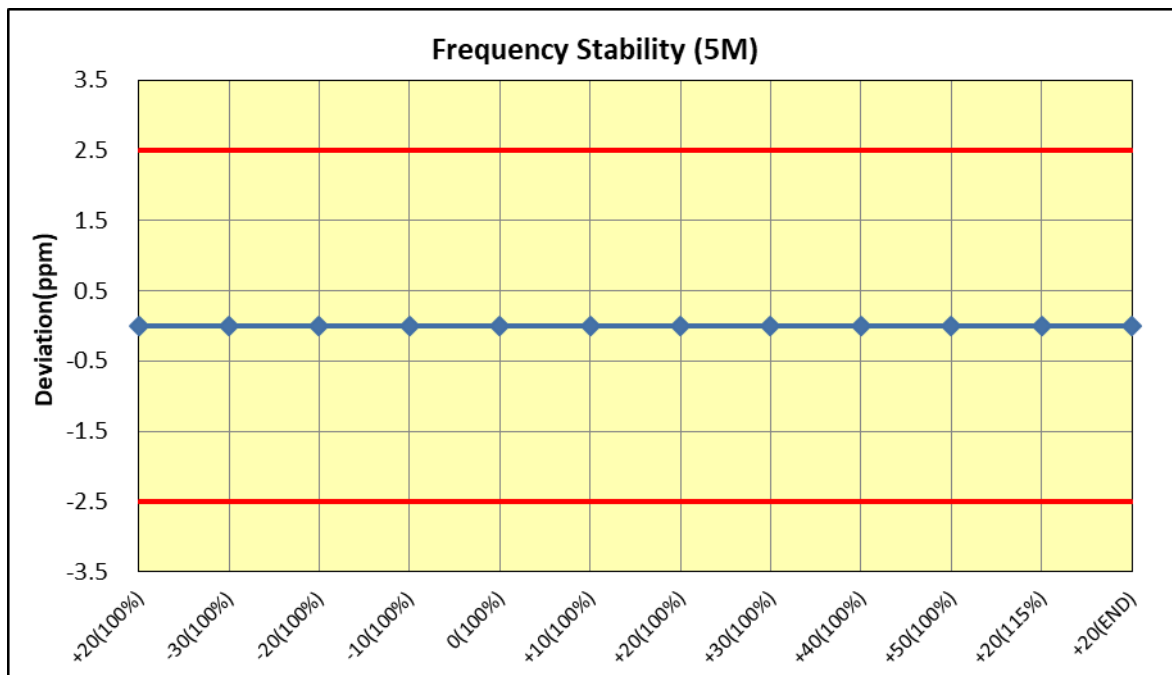


**Note.** Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. as such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability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

7.8.3 LTE Band 2

OPERATING FREQUENCY : 1880 MHz  
 CHANNEL : 18900  
 REFERENCE VOLTAGE : 9.00 VDC  
 LIMIT(FCC) : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.  
 DEVIATION LIMIT(IC) : ± 0.00025 % or 2.5 ppm

| VOLTAGE (%)   | POWER (V DC) | TEMP (°C) | FREQUENCY (Hz) | FREQ.Dev (Hz) | Deviation |              |
|---------------|--------------|-----------|----------------|---------------|-----------|--------------|
|               |              |           |                |               | (ppm)     | (%)          |
| 100%          | 9.00         | +20(Ref)  | 1,880,000,001  | 1             | 0.0005    | 0.000000053  |
| 100%          |              | -30       | 1,879,999,999  | -1            | -0.0005   | -0.000000053 |
| 100%          |              | -20       | 1,879,999,994  | -6            | -0.0032   | -0.000000319 |
| 100%          |              | -10       | 1,879,999,993  | -7            | -0.0037   | -0.000000372 |
| 100%          |              | 0         | 1,879,999,993  | -7            | -0.0037   | -0.000000372 |
| 100%          |              | +10       | 1,879,999,995  | -5            | -0.0027   | -0.000000266 |
| 100%          |              | +20       | 1,880,000,001  | 1             | 0.0005    | 0.000000053  |
| 100%          |              | +30       | 1,879,999,994  | -6            | -0.0032   | -0.000000319 |
| 100%          |              | +40       | 1,879,999,995  | -5            | -0.0027   | -0.000000266 |
| 100%          |              | +50       | 1,879,999,995  | -5            | -0.0027   | -0.000000266 |
| 115%          |              | 10.35     | +20            | 1,879,999,996 | -6        | -0.0021      |
| BATT.ENDPOINT | 8.40         | +20       | 1,879,999,996  | -4            | -0.0021   | -0.000000213 |



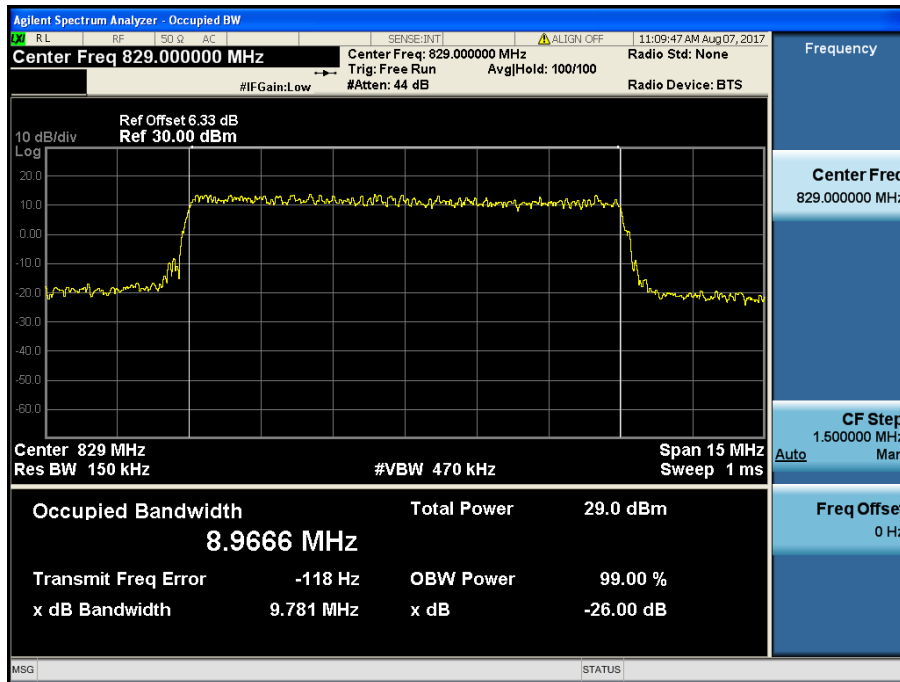
**Note.** Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. as such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability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

## 8. TEST PLOTS

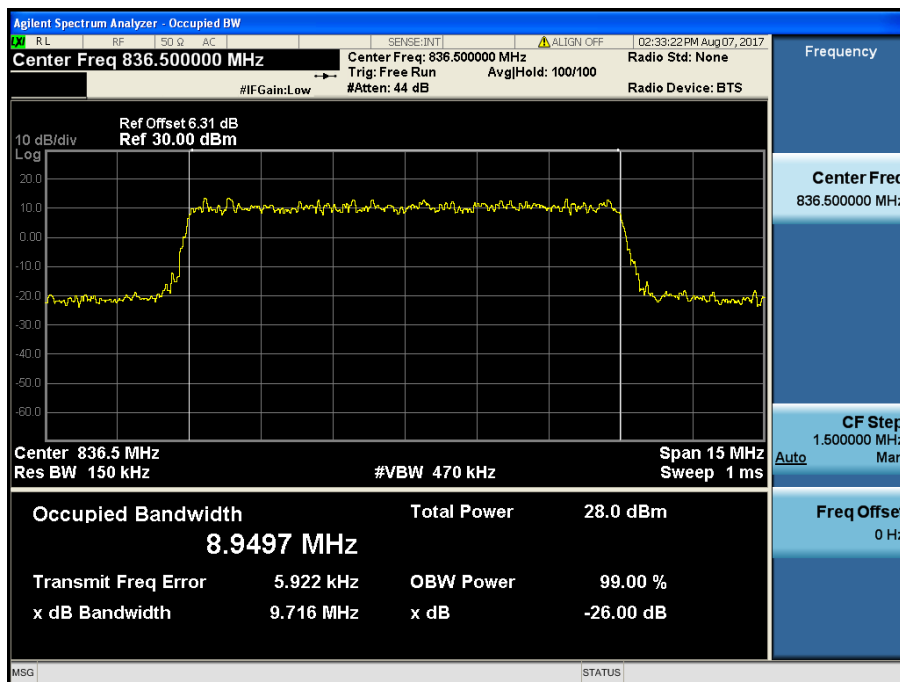
Note: All bandwidths, RB configurations, and modulations were investigated.  
The worst case test results are reported.

### 8.1 OCCUPIED BANDWIDTH

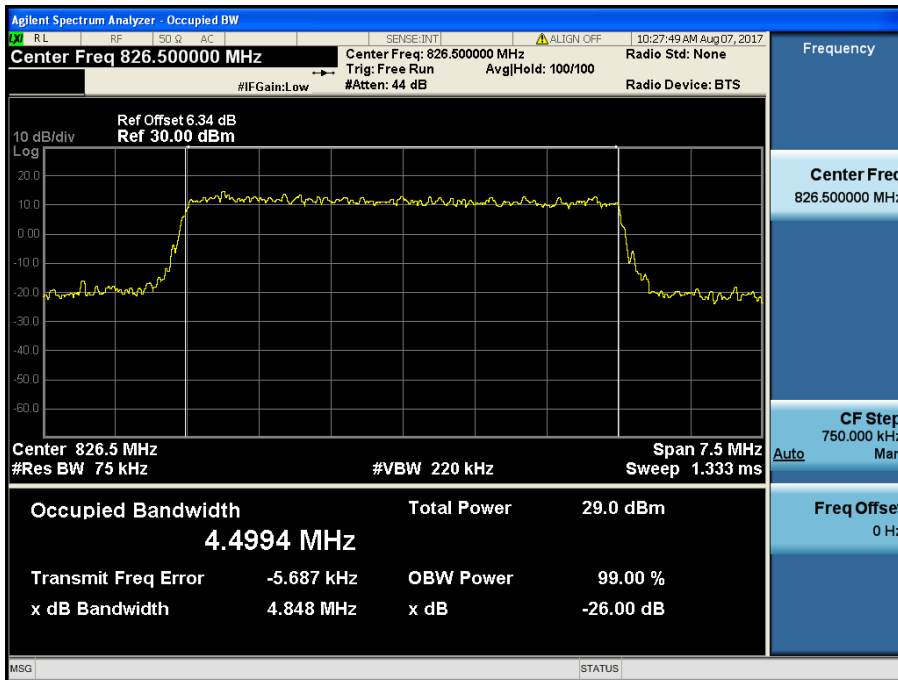
#### 8.1.1 LTE Band 5



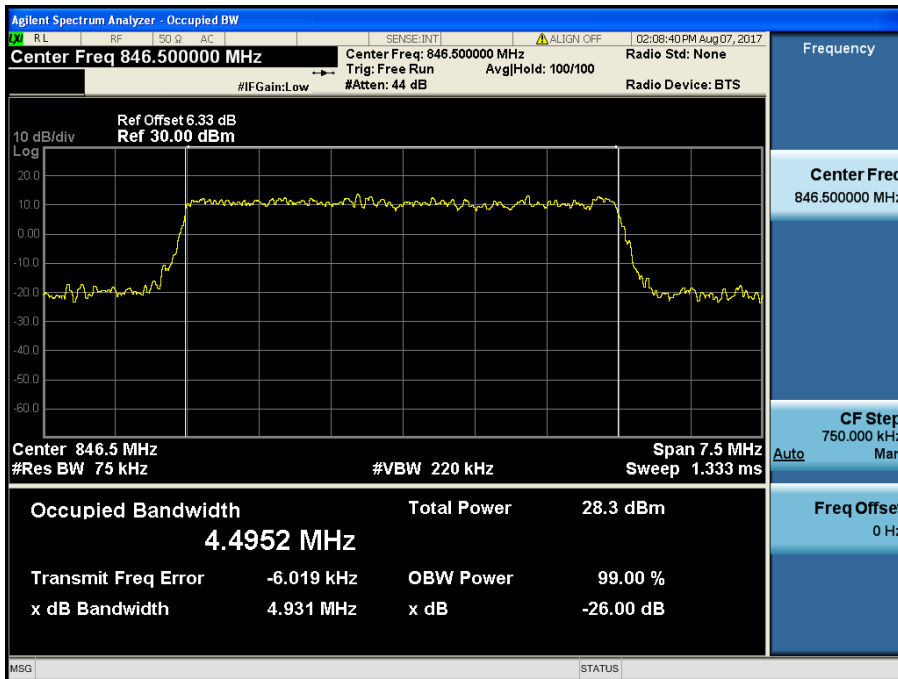
LTE Band 5 / 10 MHz / QPSK - RB Size 50



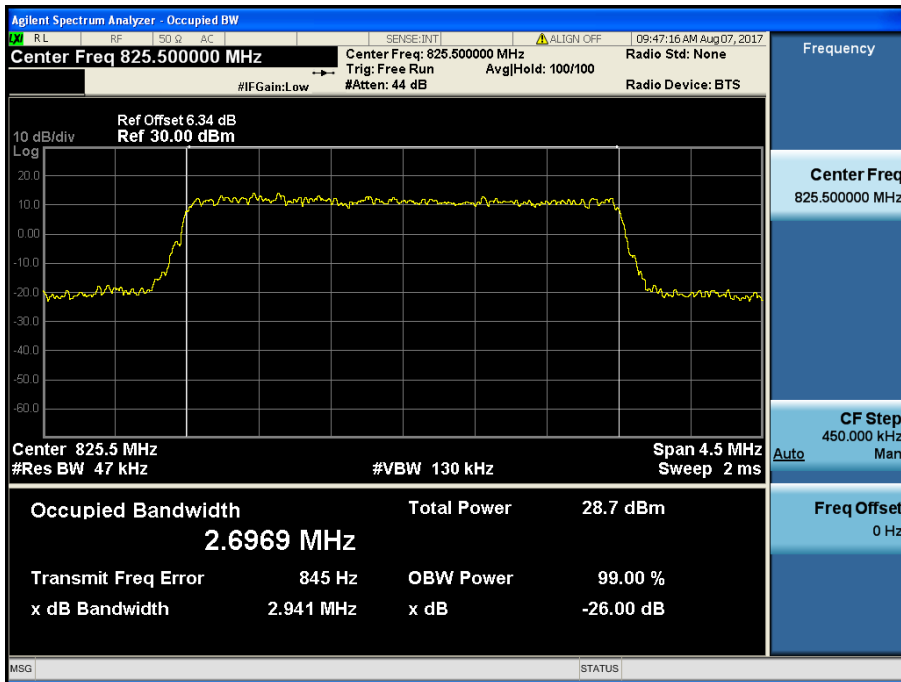
LTE Band 5 / 10 MHz / 16QAM - RB Size 50



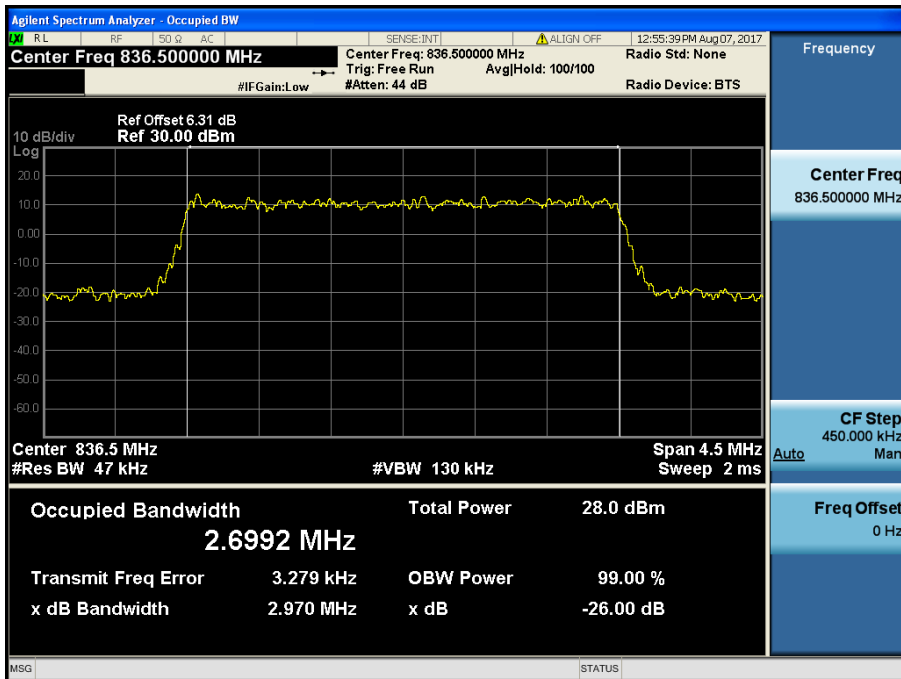
LTE Band 5 / 5 MHz / QPSK - RB Size 25



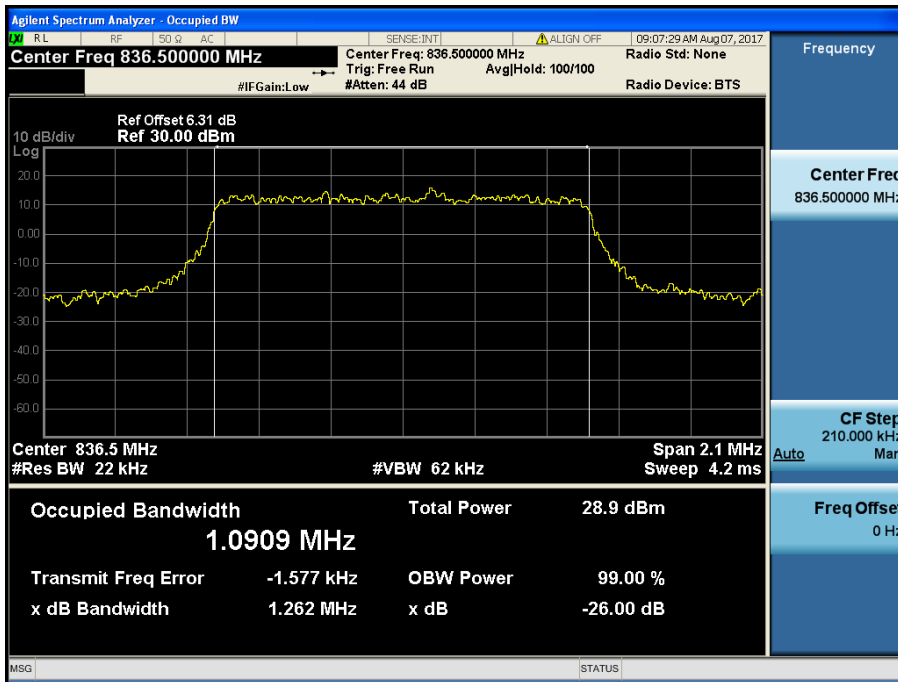
LTE Band 5 / 5 MHz / 16QAM - RB Size 25



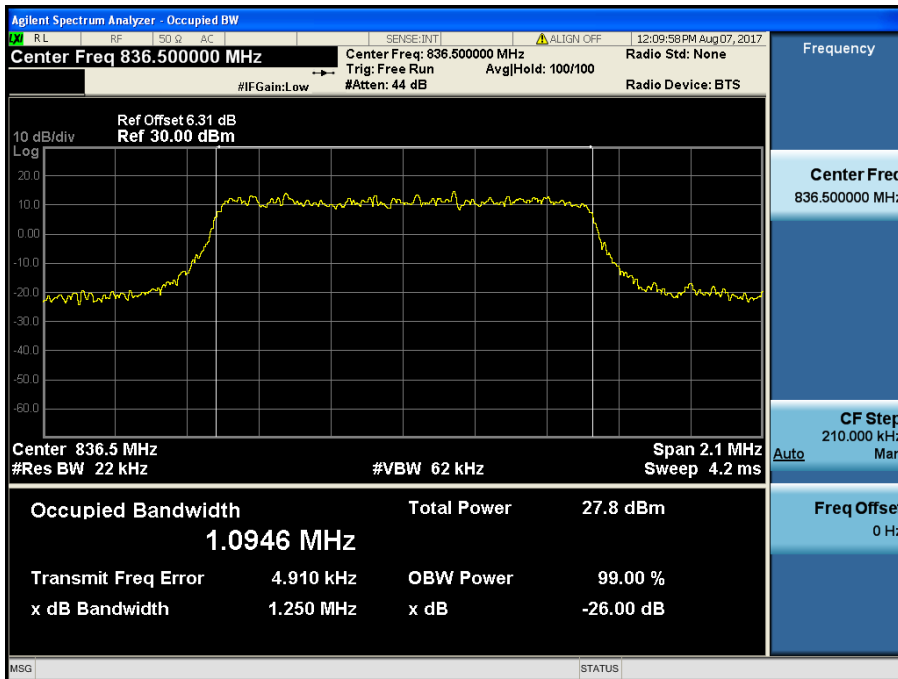
LTE Band 5 / 3 MHz / QPSK - RB Size 15



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



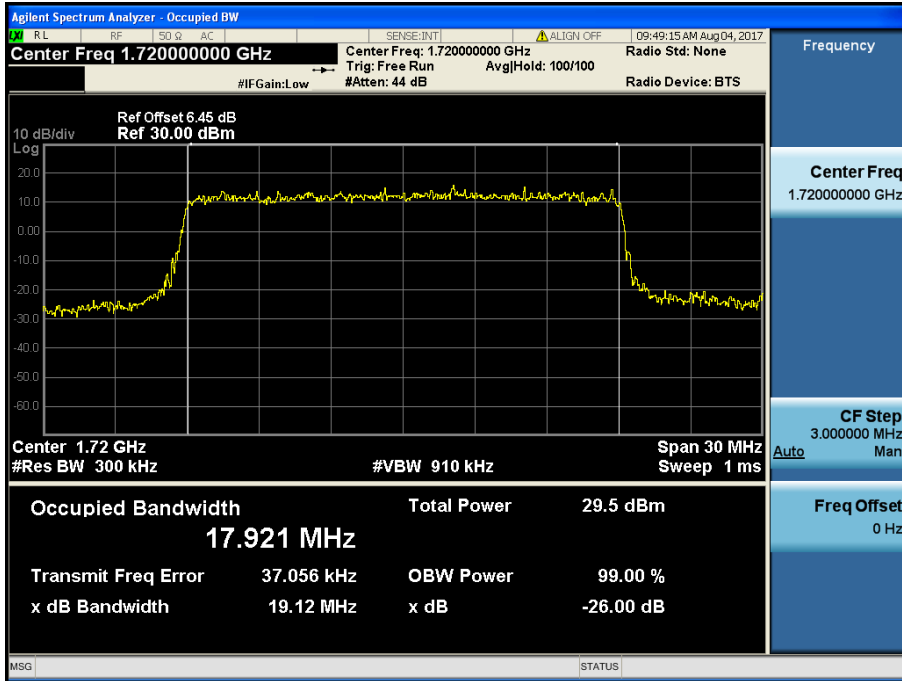
LTE Band 5 / 1.4 MHz / QPSK - RB Size 6



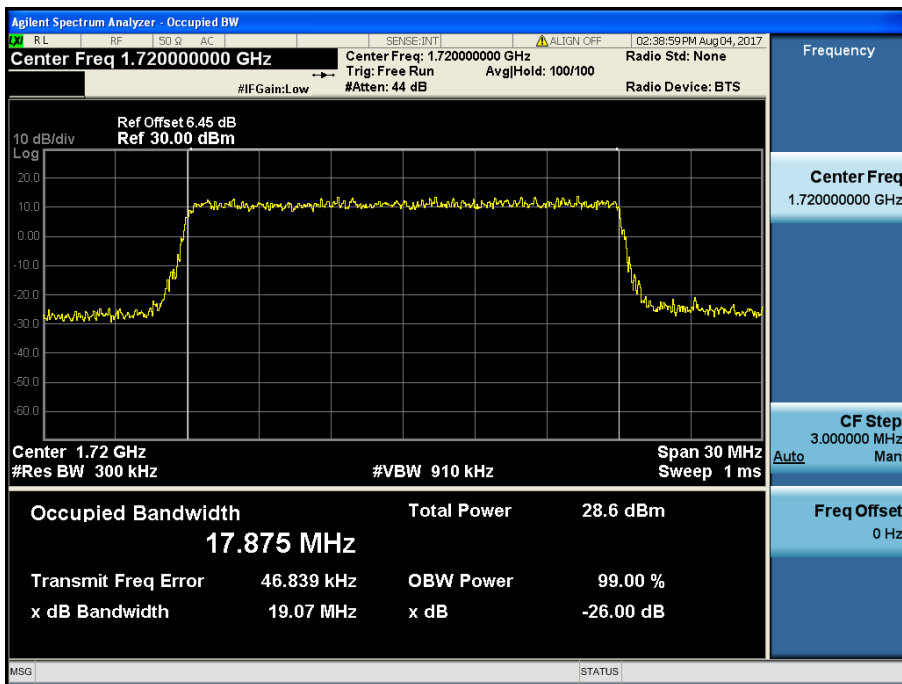
LTE Band 5 / 1.4 MHz / 16QAM - RB Size 6



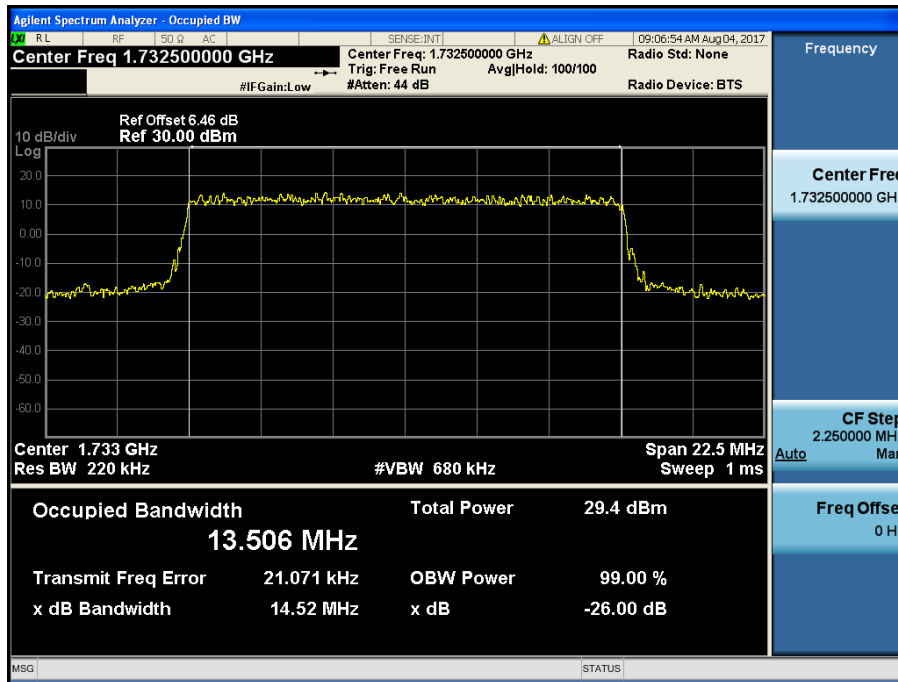
8.1.2 LTE Band 4



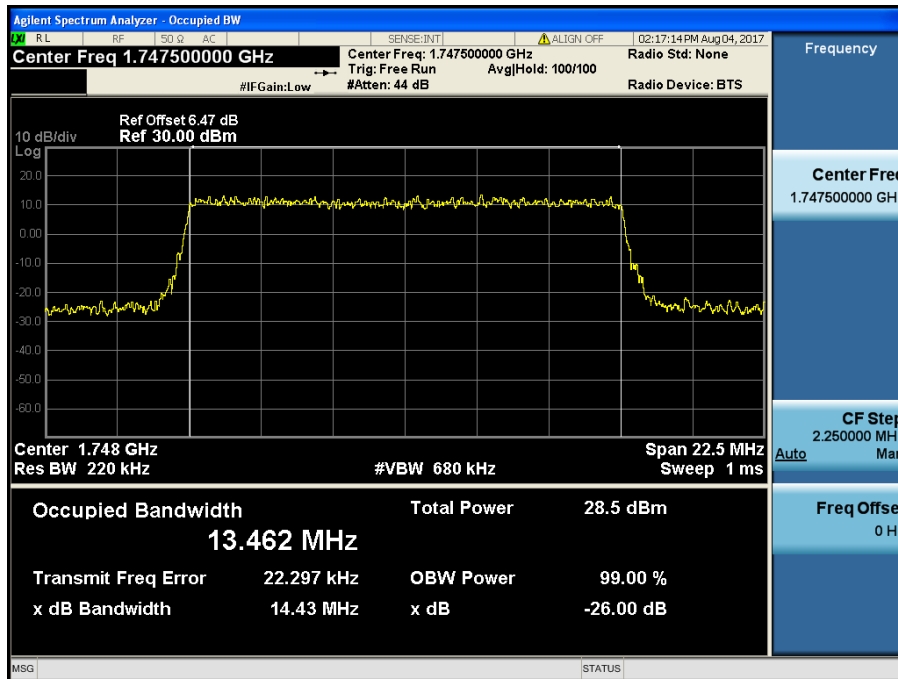
LTE Band 4 / 20 MHz / QPSK - RB Size 100



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



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



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