

# FCC

## CERTIFICATION TEST REPORT

*For*

Tablet

MODEL No.: MS-NF21

FCC ID: I4L-MSNF21

Trademark: MSI

REPORT NO.: ES180611012W07

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*Prepared for*

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## 1 TEST RESULT CERTIFICATION

|                      |                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------|
| Applicant:           | Micro-Star International Co., Ltd.<br>No., 69, Lide St., Zhonghe Dist., New Taipei City, Taiwan       |
| Manufacturer:        | MSI Electronics (Kunshan) Co., Ltd.<br>No.88 East Qianjin Road, Kunshan city, Jiangsu province, China |
| Product Description: | Tablet                                                                                                |
| Trademark:           | MSI                                                                                                   |
| Model Number:        | MS-NF21                                                                                               |

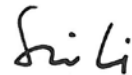
Measurement Procedure Used:

| APPLICABLE STANDARDS                                                                                                 |             |
|----------------------------------------------------------------------------------------------------------------------|-------------|
| STANDARD                                                                                                             | TEST RESULT |
| FCC 47 CFR Part 2, Subpart J<br>FCC 47 CFR Part 22, Subpart H<br>FCC 47 CFR Part 24, Subpart E<br>FCC 47 CFR Part 27 | PASS        |

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.25 (2015) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, 22(H), 24(E), 27.

The test results of this report relate only to the tested sample identified in this report

Date of Test : June 11, 2018 to September 03, 2018

Prepared by :   
Sevin Li/Editor

Reviewer :   
Joe Xia/Supervisor

Approve & Authorized Signer :   
Lisa Wang/Manager



## 2 EUT TECHNICAL DESCRIPTION

| Characteristics               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device Type                   | Potable Equipment For LTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operation Band:               | LTE BAND2, LTE BAND4, LTE BAND5, LTE BAND7, LTE BAND12, LTE BAND13, LTE BAND25, LTE BAND26, LTE BAND30, LTE BAND41,                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Modulation:                   | QPSK, 16QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Operating Frequency Range(s): | FDD:<br>TX 1850 to 1910MHz /RX 1930 to 1990MHz for LTE BAND2<br>TX 1710 to 1755MHz /RX 2110 to 2155MHz for LTE BAND4<br>TX 824 to 849MHz /RX 869 to 894MHz for LTE BAND5<br>TX 2500 to 2570MHz /RX 2620 to 2690MHz for LTE BAND7<br>TX 699 to 716MHz /RX 729 to 746MHz for LTE BAND12<br>TX 777 to 787MHz /RX 746 to 756MHz for LTE BAND13<br>TX 1850 to 1915MHz /RX 1930 to 1995MHz for LTE BAND25<br>TX 824 to 849MHz /RX 869 to 894MHz for LTE BAND26<br>TX 2305 to 2315MHz /RX 2350 to 2360MHz for LTE BAND30<br>TDD:<br>TX/RX 2496-2690MHz for LTE BAND41 |
| Supported Channel Bandwidth:  | LTE BAND2 <input checked="" type="checkbox"/> 1.4MHz, <input checked="" type="checkbox"/> 3MHz, <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz, <input checked="" type="checkbox"/> 15MHz, <input checked="" type="checkbox"/> 20MHz,                                                                                                                                                                                                                                                                                     |
|                               | LTE BAND4 <input checked="" type="checkbox"/> 1.4MHz, <input checked="" type="checkbox"/> 3MHz, <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz, <input checked="" type="checkbox"/> 15MHz, <input checked="" type="checkbox"/> 20MHz,                                                                                                                                                                                                                                                                                     |
|                               | LTE BAND5 <input checked="" type="checkbox"/> 1.4MHz, <input checked="" type="checkbox"/> 3MHz, <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz                                                                                                                                                                                                                                                                                                                                                                            |
|                               | LTE BAND7 <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz, <input checked="" type="checkbox"/> 15MHz, <input checked="" type="checkbox"/> 20MHz,                                                                                                                                                                                                                                                                                                                                                                           |
|                               | LTE BAND12 <input checked="" type="checkbox"/> 1.4MHz, <input checked="" type="checkbox"/> 3MHz, <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz                                                                                                                                                                                                                                                                                                                                                                           |
|                               | LTE BAND13 <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                               | LTE BAND25 <input checked="" type="checkbox"/> 1.4MHz, <input checked="" type="checkbox"/> 3MHz, <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz, <input checked="" type="checkbox"/> 15MHz, <input checked="" type="checkbox"/> 20MHz,                                                                                                                                                                                                                                                                                    |
|                               | LTE BAND26 <input checked="" type="checkbox"/> 1.4MHz, <input checked="" type="checkbox"/> 3MHz, <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz, <input checked="" type="checkbox"/> 15MHz                                                                                                                                                                                                                                                                                                                                |
|                               | LTE BAND30 <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                               | LTE BAND41 <input checked="" type="checkbox"/> 5MHz, <input checked="" type="checkbox"/> 10MHz, <input checked="" type="checkbox"/> 15MHz, <input checked="" type="checkbox"/> 20MHz,                                                                                                                                                                                                                                                                                                                                                                          |
| TX and RX Antenna:            | Ant1 (Main Antenna)-Support Transmit and Receive<br>Ant2 (Slave Antenna)-Only Support Receive<br>Remark: Ant2 cannot work independently, it only assists receiving function with the main antenna                                                                                                                                                                                                                                                                                                                                                              |
| Antenna Type                  | FPC antenna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Antenna Gain                  | 4.8dBi for LTE BAND2<br>4.7dBi for LTE BAND4<br>3.7dBi for LTE BAND5<br>1.88dBi for LTE BAND7<br>4.1dBi for LTE BAND12<br>4.1dBi for LTE BAND13<br>4.8dBi for LTE BAND25<br>3.7dBi for LTE BAND26                                                                                                                                                                                                                                                                                                                                                              |

|                             |                                                                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | 1.88dBi for LTE BAND30<br>1.88dBi for LTE BAND41                                                                                               |
| <b>Power supply</b>         | <input checked="" type="checkbox"/> DC 7.6V internal rechargeable lithium battery<br><input checked="" type="checkbox"/> DC 19.5V from Adapter |
|                             | <input checked="" type="checkbox"/> Adapter:<br>Model: ADP-120MH D<br>INPUT: 100-240V~ 2.2A 50-60Hz<br>OUTPUT: DC 19.5V, 6.15A                 |
| <b>Battery information:</b> | Rating: DC 7.6V, 6200mAh, 47.12Wh                                                                                                              |

**Note:** for more details, please refer to the User's manual of the EUT.

### 3 SUMMARY OF TEST RESULT

#### 3.1 TEST ITEM

| FCC Rule                         | Test Parameter                             | Verdict | Remark |
|----------------------------------|--------------------------------------------|---------|--------|
| 2.1046                           | RF Power Output                            | PASS    |        |
| 22.913, 24.232, 27.50            | Equivalent (Isotropic) Radiated Power      | PASS    |        |
| 2.1047                           | Modulation Characteristics                 | PASS    |        |
| 2.1049                           | Occupied Bandwidth                         | PASS    |        |
| 2.1051, 22.917,<br>24.238, 27.53 | Out of Band Emissions at Antenna Terminals | PASS    |        |
|                                  | Band Edge Emission                         | PASS    |        |
| 2.1053, 22.917,<br>24.238, 27.53 | Field Strength of Spurious Radiation       | PASS    |        |
| 2.1055, 22.355,<br>24.235, 27.54 | Frequency Stability versus Temperature     | PASS    |        |
|                                  | Frequency Stability versus Voltage         | PASS    |        |
| 24.232, 27.50                    | Peak to Average Ratio                      | PASS    |        |
| NOTE1: N/A (Not Applicable)      |                                            |         |        |

#### RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: I4L-MSNF21 filing to comply with FCC 47 CFR Part 2, 22(H), 24(E), 27

The system is compliance with Subpart B is authorized under a SDOC procedure

#### 3.2 OUTLINE OF EUT

The T1150 sample, for LTE band supporting B2/B4/B5/B7/B12/B13/B25/B26/B30/B41, The uplink frequency band of LTE B2 is covered by B25, the uplink frequency band of LTE B5 is covered by B26. For test reduction, the bands covered by other bands, e.g., B2/B5 are reduced. The uplink frequencies and bandwidth configurations information are as following table:

| Band No. | Frequency range (MHz) | Bandwidth configurations (MHz) | Note                                                                                                                                                        |
|----------|-----------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2        | 1850 - 1910           | 1.4/3/5/10/15/20               | Covered by B25 (B2 is a subset of B25. Both bands share the same hardware and have the same radio performance. Separate measurement in B2 is not required.) |
| 4        | 1710 - 1755           | 1.4/3/5/10/15/20               | --                                                                                                                                                          |
| 5        | 824 - 849             | 1.4/3/5/10                     | Covered by B26 (B5 is a subset of B26. Both bands share the same hardware and have the same radio performance. Separate measurement in B5 is not required.) |
| 7        | 2500 - 2570           | 5/10/15/20                     | --                                                                                                                                                          |
| 12       | 699 - 716             | 1.4/3/5/10                     | --                                                                                                                                                          |
| 13       | 777 - 787             | 5/10                           | --                                                                                                                                                          |
| 25       | 1850 - 1915           | 1.4/3/5/10/15/20               | --                                                                                                                                                          |
| 26       | 824 - 849             | 1.4/3/5/10/15                  | --                                                                                                                                                          |
| 30       | 2305 - 2315           | 5/10                           | --                                                                                                                                                          |
| 41       | 2496 - 2690           | 5/10/15/20                     | TDD                                                                                                                                                         |

## 4 TEST METHODOLOGY

### 4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 22H

FCC 47 CFR Part 24E

FCC 47 CFR Part 27

KDB971168 D01: v02r02

ANSI/TIA-603-D-2010

ANSI C63.26:2015

### 4.2 MEASUREMENT EQUIPMENT USED

#### 4.2.1 Radiated Emission Test Equipment

| EQUIPMENT TYPE    | MFR         | MODEL NUMBER    | SERIAL NUMBER | LAST CAL.    |
|-------------------|-------------|-----------------|---------------|--------------|
| EMI Test Receiver | R & S       | ESU             | 1302.6005.26  | May 20, 2018 |
| Pre-Amplifier     | HP          | 8447D           | 2944A07999    | May 19, 2018 |
| Bilog Antenna     | Schwarzbeck | VULB9163        | 142           | May 19, 2018 |
| Bilog Antenna     | Schwarzbeck | VULB9163        | 141           | May 19, 2018 |
| Loop Antenna      | ARA         | PLA-1030/B      | 1029          | May 19, 2018 |
| Horn Antenna      | Schwarzbeck | BBHA 9170       | BBHA9170399   | May 20, 2018 |
| Horn Antenna      | Schwarzbeck | BBHA 9120       | D143          | May 19, 2018 |
| Cable             | Schwarzbeck | AK9513          | ACRX1         | May 20, 2018 |
| Cable             | Rosenberger | N/A             | FP2RX2        | May 20, 2018 |
| Cable             | Schwarzbeck | AK9513          | CRPX1         | May 20, 2018 |
| Cable             | Schwarzbeck | AK9513          | CRRX2         | May 20, 2018 |
| Cable             | H+B         | 0.5M SF104-26.5 | 289147/4      | May 20, 2018 |
| Cable             | H+B         | 3M SF104-26.5   | 295838/4      | May 20, 2018 |
| Cable             | H+B         | 6M SF104-26.5   | 295840/4      | May 20, 2018 |

#### 4.2.2 Radio Frequency Test Equipment

| EQUIPMENT TYPE                | MFR                  | MODEL NUMBER  | SERIAL NUMBER           | LAST CAL.    |
|-------------------------------|----------------------|---------------|-------------------------|--------------|
| Spectrum Analyzer             | Agilent              | E4407B        | 88156318                | May 20, 2018 |
| Power meter                   | Anritsu              | ML2495A       | 0824006                 | May 20, 2018 |
| Power sensor                  | Anritsu              | MA2411B       | 0738172                 | May 20, 2018 |
| Spectrum Analyzer             | Agilent              | N9010A        | My53470879              | May 20, 2018 |
| Spectrum Analyzer             | R & S                | FSV30         | 103040                  | May 20, 2018 |
| Spectrum Analyzer             | R & S                | FSV40         | 132.1-3008K39-100967-AP | May 20, 2018 |
| Universal Radio Communication | R&S                  | CMW500        | 1201.0002K50-140822zk   | May 20, 2018 |
| Universal Radio Communication | R&S                  | CMU200        | 111226                  | May 20, 2018 |
| Power Splitter                | MInI-Circuits        | ZFRSC-183-S + | S F808201417            | May 20, 2018 |
| Attenuator                    | Weinschel Associates | WA14          | 18-10-12                | May 20, 2018 |
| Temp. / Humidity Chamber      | Kingson              | THS-M1        | 242                     | May 20, 2018 |

**Remark:** Each piece of equipment is scheduled for calibration once a year.

### 4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition. The CMU200 and CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

During all testing, EUT is in link mode with base station emulator at maximum power level.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

#### ■ Test Mode and system config

Configure the CMW500 call box to support all LTE tests in respect to the 3GPP 36.521.

UE term. Conn: User defined Channels

Exp. Nominal Power Mode: According to UL Power Control Settings

RS EPRE: -75.0 dBm/15kHz Full Cell BW Power: -50.2 dBm

PSS Power Offset = SSS Power Offset = PBCH Power Offset = PCFICH Power Offset = PDCCH Power Offset = 0.0 dB

PHICH Power Offset = -12 dB

OCNG ON

PDSCH Power Offset PA: 0 dB, Power Ratio Index PB: 0 (rhoB/rhoA: 1)

Active TPC Setup: Max Power

Security Settings: Authentication OFF, NAS Security OFF, AS Security OFF

Integrity Algorithm: NULL

Milenage OFF

Configure the desired channel, BW, resource block allocation and modulation.

Connect to test set.

Set CMW500 TPC Setup to Max Power (Up power control command).

According to 3GPP 36.521, V9.1.0., the output power level for Power Class 3 LTE is to be 23.0dBm + 2.7dB. The lower limit is shifted down by the MPR amount allowed for certain configurations. Maximum Power Reduction (MPR) is allowed due to higher order modulation and transmit bandwidth configurations. These MPR levels reduce the lower limit of each output power by the either 1 or 2dB per 3GPP 36.521.

| Modulation | Channel bandwidth / Transmission bandwidth configuration[RB] |      |      |       |       |       | MPR (dB) |
|------------|--------------------------------------------------------------|------|------|-------|-------|-------|----------|
|            | 1.4MHz                                                       | 3MHz | 5MHz | 10MHz | 15MHz | 20MHz |          |
| QPSK       | > 5                                                          | > 4  | > 8  | > 12  | > 16  | > 18  | ≤ 1      |
| 16 QAM     | ≤ 5                                                          | ≤ 4  | ≤ 8  | ≤ 12  | ≤ 16  | ≤ 18  | ≤ 1      |
| 16 QAM     | > 5                                                          | > 4  | > 8  | > 12  | > 16  | > 18  | ≤ 2      |

## ■ Test Environment

| Environment Parameter                                                                                                   | Selected Values During Tests |         |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------|---------|
| Relative Humidity                                                                                                       | Ambient                      |         |
| Temperature                                                                                                             | TN                           | Ambient |
| Ambient                                                                                                                 | VL                           | 3.03V   |
|                                                                                                                         | VN                           | 3.7V    |
|                                                                                                                         | VH                           | 4.07V   |
| NOTE: VL= Lower Extreme Test Voltage<br>VN= Nominal Voltage<br>VH= Upper Extreme Test Voltage<br>TN= Normal Temperature |                              |         |

## ■ Test Channel and Frequency

| Test Mode | Bandwidth | TX / RX | RF Channel    |               |               |
|-----------|-----------|---------|---------------|---------------|---------------|
|           |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND2 | 1.4MHz    | TX      | Channel 18607 | Mid CH 18900  | High CH 19193 |
|           |           |         | 1850.7 MHz    | 1880.0 MHz    | 1909.3 MHz    |
|           |           | RX      | Channel 607   | Channel 900   | Channel 1193  |
|           |           |         | 1930.7 MHz    | 1960 MHz      | 1989.3MHz     |
|           | 3MHz      | TX      | Channel 18615 | Channel 18900 | Channel 19185 |
|           |           |         | 1851.5MHz     | 1880.0MHz     | 1908.5MHz     |
|           |           | RX      | Channel 615   | Channel 900   | Channel 1185  |
|           |           |         | 1931.5 MHz    | 1960 MHz      | 1988.5 MHz    |
|           | 5MHz      | TX      | Channel 18625 | Channel 18900 | Channel 19175 |
|           |           |         | 1852.5 MHz    | 1880 MHz      | 1907.5 MHz    |
|           |           | RX      | Channel 625   | Channel 900   | Channel 1175  |
|           |           |         | 1932.5 MHz    | 1960 MHz      | 1987.5 MHz    |
|           | 10MHz     | TX      | Channel 18650 | Channel 18900 | Channel 19150 |
|           |           |         | 1855 MHz      | 1880 MHz      | 1905 MHz      |
|           |           | RX      | Channel 650   | Channel 900   | Channel 1150  |
|           |           |         | 1935 MHz      | 1960 MHz      | 1985 MHz      |
|           | 15MHz     | TX      | Channel 18675 | Channel 18900 | Channel 19125 |
|           |           |         | 1857.5 MHz    | 1880 MHz      | 1902.5 MHz    |
|           |           | RX      | Channel 675   | Channel 900   | Channel 1125  |
|           |           |         | 1937.5 MHz    | 1960 MHz      | 1982.5 MHz    |
|           | 20MHz     | TX      | Channel 18700 | Channel 18900 | Channel 19100 |
|           |           |         | 1860 MHz      | 1880 MHz      | 1900 MHz      |
|           |           | RX      | Channel 700   | Channel 900   | Channel 1100  |
|           |           |         | 1940 MHz      | 1960 MHz      | 1980 MHz      |

| Test Mode | Bandwidth | TX / RX | RF Channel    |               |               |
|-----------|-----------|---------|---------------|---------------|---------------|
|           |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND4 | 1.4MHz    | TX      | Channel 19957 | Channel 20175 | Channel 20393 |
|           |           |         | 1710.7 MHz    | 1732.5 MHz    | 1754.3 MHz    |
|           |           | RX      | Channel 1957  | Channel 2175  | Channel 2393  |
|           |           |         | 2110.7 MHz    | 2132.5MHz     | 2154.3 MHz    |
|           | 3MHz      | TX      | Channel 19965 | Channel 20175 | Channel 20385 |
|           |           |         | 1711.5 MHz    | 1732.5 MHz    | 1753.5 MHz    |
|           |           | RX      | Channel 2000  | Channel 2175  | Channel 2350  |
|           |           |         | 2111.5 MHz    | 2132.5MHz     | 2153.5 MHz    |
|           | 5MHz      | TX      | Channel 19975 | Channel 20175 | Channel 20375 |
|           |           |         | 1712.5 MHz    | 1732.5 MHz    | 1752.5 MHz    |
|           |           | RX      | Channel 1975  | Channel 2175  | Channel 2375  |

|          |       |    |               |               |               |
|----------|-------|----|---------------|---------------|---------------|
|          |       |    | 2112.5 MHz    | 2132.5MHz     | 2152.5 MHz    |
|          | 10MHz | TX | Channel 20000 | Channel 20175 | Channel 20350 |
|          |       |    | 1715 MHz      | 1732.5 MHz    | 1750 MHz      |
|          |       | RX | Channel 2000  | Channel 2175  | Channel 2350  |
|          |       |    | 2115 MHz      | 2132.5MHz     | 2150 MHz      |
|          | 15MHz | TX | Channel 20025 | Channel 20175 | Channel 20325 |
|          |       |    | 1717.5 MHz    | 1732.5 MHz    | 1747.5 MHz    |
|          |       | RX | Channel 2025  | Channel 2175  | Channel 2325  |
|          |       |    | 2117.5 MHz    | 2132.5MHz     | 2147.5 MHz    |
|          | 20MHz | TX | Channel 20050 | Channel 20175 | Channel 20300 |
|          |       |    | 1720 MHz      | 1732.5 MHz    | 1745 MHz      |
|          |       | RX | Channel 2050  | Channel 2175  | Channel 2300  |
| 2120 MHz |       |    | 2132.5MHz     | 2145 MHz      |               |

| Test Mode | Bandwidth | TX / RX | RF Channel    |               |               |
|-----------|-----------|---------|---------------|---------------|---------------|
|           |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND5 | 1.4MHz    | TX      | Channel 20407 | Channel 20525 | Channel 20643 |
|           |           |         | 824.7 MHz     | 836.5 MHz     | 848.3 MHz     |
|           |           | RX      | Channel 8697  | Channel 2525  | Channel 2643  |
|           |           |         | 859.7 MHz     | 881.5 MHz     | 893.3 MHz     |
|           | 3MHz      | TX      | Channel 20415 | Channel 20525 | Channel 20635 |
|           |           |         | 825.5 MHz     | 836.5 MHz     | 847.5 MHz     |
|           |           | RX      | Channel 2415  | Channel 2525  | Channel 2635  |
|           |           |         | 870.5 MHz     | 881.5 MHz     | 892.5 MHz     |
|           | 5MHz      | TX      | Channel 20425 | Channel 20525 | Channel 20625 |
|           |           |         | 826.5 MHz     | 836.5 MHz     | 846.5 MHz     |
|           |           | RX      | Channel 2425  | Channel 2525  | Channel 2625  |
|           |           |         | 871.5 MHz     | 881.5 MHz     | 891.5 MHz     |
|           | 10MHz     | TX      | Channel 20450 | Channel 20525 | Channel 20600 |
|           |           |         | 829 MHz       | 836.5 MHz     | 844 MHz       |
|           |           | RX      | Channel 2450  | Channel 2525  | Channel 2600  |
|           |           |         | 874 MHz       | 881.5 MHz     | 889 MHz       |

|            |        |    |               |               |               |
|------------|--------|----|---------------|---------------|---------------|
| LTE BAND26 | 1.4MHz | TX | Channel 26697 | Channel 26865 | Channel 27033 |
|            |        |    | 814.7 MHz     | 831.5 MHz     | 848.3 MHz     |
|            |        | RX | Channel 8697  | Channel 8865  | Channel 9033  |
|            |        |    | 859.7 MHz     | 876.5 MHz     | 893.3 MHz     |
|            | 3MHz   | TX | Channel 26705 | Channel 26865 | Channel 27025 |
|            |        |    | 815.5 MHz     | 831.5 MHz     | 847.5 MHz     |
|            |        | RX | Channel 8705  | Channel 8865  | Channel 9025  |
|            |        |    | 860.5 MHz     | 876.5 MHz     | 892.5 MHz     |

| Test Mode | Bandwidth | TX / RX | RF Channel    |               |               |
|-----------|-----------|---------|---------------|---------------|---------------|
|           |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND7 | 5MHz      | TX      | Channel 20775 | Channel 21100 | Channel 21425 |
|           |           |         | 2502.5 MHz    | 2535 MHz      | 2567.5 MHz    |
|           |           | RX      | Channel 2775  | Channel 3100  | Channel 3425  |
|           |           |         | 2622.5 MHz    | 2655 MHz      | 2687.5 MHz    |
|           | 10MHz     | TX      | Channel 20800 | Channel 21100 | Channel 21400 |
|           |           |         | 2505 MHz      | 2535 MHz      | 2565 MHz      |
|           |           | RX      | Channel 2800  | Channel 3100  | Channel 3400  |
|           |           |         | 2625 MHz      | 2655 MHz      | 2685MHz       |
|           | 15MHz     | TX      | Channel 20825 | Channel 21100 | Channel 21375 |
|           |           |         | 2507.5 MHz    | 2535 MHz      | 2562.5 MHz    |

|  |       |    |               |              |               |
|--|-------|----|---------------|--------------|---------------|
|  | 20MHz | RX | Channel 2825  | Channel 3100 | Channel 3375  |
|  |       |    | 2627.5 MHz    | 2655 MHz     | 2682.5 MHz    |
|  |       | TX | Channel 20850 | Channel 3100 | Channel 21350 |
|  |       |    | 2510 MHz      | 2655 MHz     | 2560 MHz      |
|  |       | RX | Channel 2850  | Channel 3100 | Channel 3350  |
|  |       |    | 2630 MHz      | 2655 MHz     | 2680 MHz      |

| Test Mode  | Bandwidth | TX / RX | RF Channel    |               |               |
|------------|-----------|---------|---------------|---------------|---------------|
|            |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND12 | 1.4MHz    | TX      | Channel 23017 | Channel 23095 | Channel 23173 |
|            |           |         | 699.7 MHz     | 707.5 MHz     | 715.3 MHz     |
|            |           | RX      | Channel 5017  | Channel 5095  | Channel 5173  |
|            |           |         | 729.7 MHz     | 737.5 MHz     | 745.3 MHz     |
|            | 3MHz      | TX      | Channel 23025 | Channel 23095 | Channel 23165 |
|            |           |         | 700.5 MHz     | 707.5 MHz     | 714.5 MHz     |
|            |           | RX      | Channel 5025  | Channel 5095  | Channel 5165  |
|            |           |         | 730.5 MHz     | 737.5 MHz     | 744.5 MHz     |
|            | 5MHz      | TX      | Channel 23035 | Channel 23095 | Channel 23155 |
|            |           |         | 701.5 MHz     | 707.5 MHz     | 713.5 MHz     |
|            |           | RX      | Channel 5035  | Channel 5095  | Channel 5155  |
|            |           |         | 731.5 MHz     | 737.5 MHz     | 743.5 MHz     |
|            | 10MHz     | TX      | Channel 23060 | Channel 23095 | Channel 23155 |
|            |           |         | 704 MHz       | 707.5 MHz     | 711 MHz       |
|            |           | RX      | Channel 5060  | Channel 5095  | Channel 5130  |
|            |           |         | 734 MHz       | 737.5 MHz     | 741 MHz       |

| Test Mode  | Bandwidth | TX / RX | RF Channel    |               |               |
|------------|-----------|---------|---------------|---------------|---------------|
|            |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND13 | 5MHz      | TX      | Channel 23205 | Channel 23230 | Channel 23255 |
|            |           |         | 779.5 MHz     | 782 MHz       | 784.5 MHz     |
|            |           | RX      | Channel 5205  | Channel 5230  | Channel 5255  |
|            |           |         | 748.35 MHz    | 751 MHz       | 753.5 MHz     |
|            | 10MHz     | TX      | Channel 23230 | Channel 23230 | Channel 23230 |
|            |           |         | 782 MHz       | 782 MHz       | 782 MHz       |
|            |           | RX      | Channel 5230  | Channel 5230  | Channel 5230  |
|            |           |         | 751 MHz       | 751 MHz       | 751 MHz       |

| Test Mode  | Bandwidth | TX / RX | RF Channel    |               |               |
|------------|-----------|---------|---------------|---------------|---------------|
|            |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND25 | 1.4MHz    | TX      | Channel 26047 | Channel 26365 | Channel 26683 |
|            |           |         | 1850.7 MHz    | 1882.5 MHz    | 1914.3 MHz    |
|            |           | RX      | Channel 8047  | Channel 8365  | Channel 8047  |
|            |           |         | 1930.7 MHz    | 1962.5 MHz    | 1992.5 MHz    |
|            | 3MHz      | TX      | Channel 26055 | Channel 26365 | Channel 26675 |
|            |           |         | 1851.5 MHz    | 1882.5 MHz    | 1913.5 MHz    |
|            |           | RX      | Channel 8055  | Channel 8365  | Channel 8055  |
|            |           |         | 1931.5 MHz    | 1962.5 MHz    | 1990.0 MHz    |
|            | 5MHz      | TX      | Channel 26065 | Channel 26365 | Channel 26665 |
|            |           |         | 1852.5 MHz    | 1882.5 MHz    | 1912.5 MHz    |
|            |           | RX      | Channel 8065  | Channel 8365  | Channel 8665  |
|            |           |         | 1932.5 MHz    | 1962.5 MHz    | 1992.5 MHz    |
|            | 10MHz     | TX      | Channel 26090 | Channel 26365 | Channel 26640 |
|            |           |         | 1855 MHz      | 1882.5 MHz    | 1910 MHz      |
|            |           | RX      | Channel 8090  | Channel 8365  | Channel 8640  |
|            |           |         |               |               |               |

|  |       |    |               |               |               |
|--|-------|----|---------------|---------------|---------------|
|  | 15MHz | TX | 1935.0 MHz    | 1962.5 MHz    | 1990.0 MHz    |
|  |       |    | Channel 26115 | Channel 26365 | Channel 26615 |
|  |       | RX | 1857.5 MHz    | 1882.5 MHz    | 1907.5 MHz    |
|  |       |    | Channel 8115  | Channel 8365  | Channel 8615  |
|  | 20MHz | TX | 1937.5 MHz    | 1962.5 MHz    | 1987.5 MHz    |
|  |       |    | Channel 26140 | Channel 26365 | Channel 26590 |
|  |       | RX | 1860 MHz      | 1882.5 MHz    | 1905 MHz      |
|  |       |    | Channel 8140  | Channel 8365  | Channel 8590  |
|  |       |    | 1940.0 MHz    | 1962.5 MHz    | 1985.0 MHz    |

| Test Mode  | Bandwidth | TX / RX | RF Channel    |               |               |
|------------|-----------|---------|---------------|---------------|---------------|
|            |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND26 | 1.4MHz    | TX      | Channel 26797 | Channel 26915 | Channel 27033 |
|            |           |         | 824.7 MHz     | 836.5 MHz     | 848.3 MHz     |
|            |           | RX      | Channel 8797  | Channel 8915  | Channel 9033  |
|            |           |         | 859.7 MHz     | 881.5 MHz     | 893.3 MHz     |
|            | 3MHz      | TX      | Channel 26805 | Channel 26915 | Channel 27025 |
|            |           |         | 825.5 MHz     | 836.5 MHz     | 847.5 MHz     |
|            |           | RX      | Channel 8805  | Channel 8915  | Channel 9025  |
|            |           |         | 870.5 MHz     | 881.5 MHz     | 892.5 MHz     |
|            | 5MHz      | TX      | Channel 26815 | Channel 26915 | Channel 27015 |
|            |           |         | 826.5 MHz     | 836.5 MHz     | 846.5 MHz     |
|            |           | RX      | Channel 8815  | Channel 8915  | Channel 2625  |
|            |           |         | 871.5 MHz     | 881.5 MHz     | 891.5 MHz     |
|            | 10MHz     | TX      | Channel 26840 | Channel 26915 | Channel 26990 |
|            |           |         | 829 MHz       | 836.5 MHz     | 844 MHz       |
|            |           | RX      | Channel 8840  | Channel 8915  | Channel 2600  |
|            |           |         | 874 MHz       | 881.5 MHz     | 889 MHz       |
|            | 15MHz     | TX      | Channel 26865 | Channel 26915 | Channel 26965 |
|            |           |         | 831.5 MHz     | 836.5 MHz     | 841.5 MHz     |
|            |           | RX      | Channel 8865  | Channel 8915  | Channel 2575  |
|            |           |         | 876.5 MHz     | 881.5 MHz     | 886.5 MHz     |

| Test Mode  | Bandwidth | TX / RX | RF Channel    |               |               |
|------------|-----------|---------|---------------|---------------|---------------|
|            |           |         | Low (L)       | Middle (M)    | High (H)      |
| LTE BAND30 | 5MHz      | TX      | Channel 27685 | Channel 27710 | Channel 27735 |
|            |           |         | 2307.5 MHz    | 2310 MHz      | 2312.5 MHz    |
|            |           | RX      | Channel 9795  | Channel 9820  | Channel 9845  |
|            |           |         | 2352.5 MHz    | 2355 MHz      | 2357.5 MHz    |
|            | 10MHz     | TX      | Channel 27710 | Channel 27710 | Channel 27710 |
|            |           |         | 2310MHz       | 2310 MHz      | 2310 MHz      |
|            |           | RX      | Channel 9820  | Channel 9820  | Channel 9820  |
|            |           |         | 2355 MHz      | 2355 MHz      | 2355 MHz      |

| Test Frequency ID |            | Bandwidth [MHz] | EARFCN | Frequency (UL and DL) [MHz] |
|-------------------|------------|-----------------|--------|-----------------------------|
| LTE Band 41       | Low Range  | 5               | 39675  | 2498.5                      |
|                   |            | 10              | 39700  | 2501                        |
|                   |            | 15              | 39725  | 2503.5                      |
|                   |            | 20              | 39750  | 2506                        |
|                   | Mid-Range  | 5/10/15/20      | 40620  | 2593                        |
|                   | High Range | 5               | 41565  | 2687.5                      |
|                   |            | 10              | 41540  | 2685                        |
|                   |            | 15              | 41515  | 2682.5                      |
|                   |            | 20              | 41490  | 2680                        |

## 5 FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.26 and CISPR Publication 22.

### 5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS, 2016.10.24

The certificate is valid until 2022.10.28

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005)

The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen 2015.4

The Laboratory has been assessed according to the requirements ISO/IEC 17025.

Accredited by FCC, August 06, 2018

The certificate is valid until August 07, 2020

Designation Number: CN1204

Test Firm Registration Number: 882943

Accredited by Industry Canada, November 24, 2015

The Certificate Registration Number is 4480A

Name of Firm

: EMTEK (SHENZHEN) CO., LTD.

Site Location

: Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## 6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

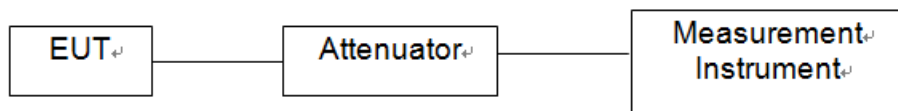
| Parameter               | Uncertainty               |
|-------------------------|---------------------------|
| Radio Frequency         | $\pm 1 \times 10^{-5}$    |
| RF Power Output         | $\pm 1.0\text{dB}$        |
| Radiated Emission Test  | $\pm 2.0\text{dB}$        |
| Occupied Bandwidth Test | $\pm 1.0\text{dB}$        |
| Band Edge Test          | $\pm 3\text{dB}$          |
| All emission, radiated  | $\pm 3\text{dB}$          |
| Antenna Port Emission   | $\pm 3\text{dB}$          |
| Temperature             | $\pm 0.5^{\circ}\text{C}$ |
| Humidity                | $\pm 3\%$                 |

Measurement Uncertainty for a level of Confidence of 95%

## 7 SETUP OF EQUIPMENT UNDER TEST

### 7.1 RADIO FREQUENCY TEST SETUP 1

The component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



### 7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.26-2015 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

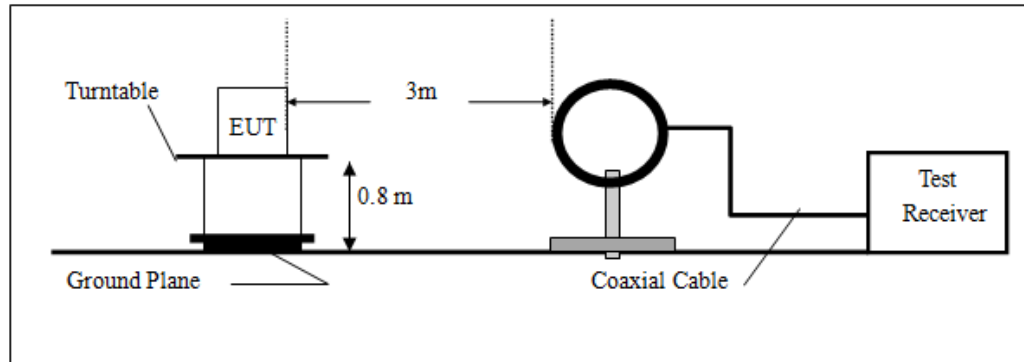
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

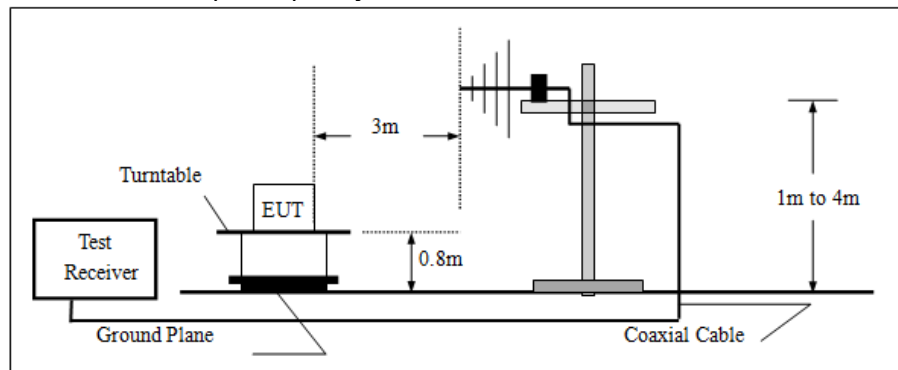
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

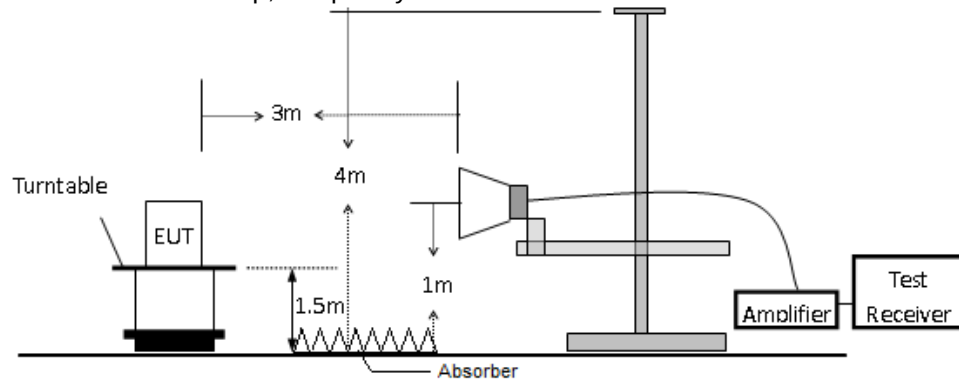
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz



### 7.3 SUPPORT EQUIPMENT

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Note |
|------|-----------|-----------|----------------|--------|------|
| N/A  | N/A       | N/A       | N/A            | N/A    | N/A  |

**Notes:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 8 TEST REQUIREMENTS

### 8.1 RF POWER OUTPUT

#### 8.1.1 Conformance Limit

No limit requirement.

#### 8.1.2 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

#### 8.1.3 Test Procedure

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the ARFCN range, power control level set to Max power. The frequency band is set as selected frequency,

The RF output of the transmitter was connected to base station simulator.

Set EUT at maximum average power by base station simulator.

Set RBW = 1-5% of the OBW, not to exceed 1 MHz.

Set VBW  $\geq 3 \times$  RBW.

Number of points in sweep  $\geq 2 \times$  span / RBW. (This gives bin-to-bin spacing  $\leq$  RBW/2, so that narrowband signals are not lost between frequency bins.)

Sweep time = auto.

Detector = RMS (power averaging).

Set sweep trigger to "free run".

Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the on and off periods of the transmitter.

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

Add  $10 \log(1/x)$ , where  $x$  is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add  $10 \log(1/0.25) = 6$  dB if the duty cycle is a constant 25%.

Measure lowest, middle, and highest channels for each bandwidth and different modulation.

Measure and record the results in the test report.

#### 8.1.4 Test Results

Pass

Note: The details please see Appendix A.

## 8.2 EFFECTIVE (ISOTROPIC) RADIATED POWER

### 8.2.1 Conformance Limit

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| LTE BAND2 (25)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FCC Part 24.232              |
| Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.                                                                                                                                                                                                                                                                                                           |                              |
| LTE BAND4                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FCC Part 27.50               |
| Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications. |                              |
| LTE BAND5 (26)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FCC Part 22.913, Part 90.635 |
| According to Part 22.913(a) the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts; According to Part 90.635(b), the maximum output power of the transmitter for mobile stations is 100 watts (20 dBw);                                                                                                                                                                                                                                             |                              |
| LTE BAND7                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FCC Part 27.50               |
| Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.                                                                                                                                                                                                                                                                                                                                 |                              |
| LTE BAND12                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FCC Part 27.50               |
| Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.                                                                                                                                                                                                                                                                                                     |                              |
| LTE BAND13                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FCC Part 27.50               |
| Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP                                                                                                                                                                                                                                                                                                                                                |                              |
| LTE BAND17                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FCC Part 27.50               |
| Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP                                                                                                                                                                                                                                                                                                                                                |                              |
| LTE BAND30                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FCC Part 27.50               |
| Mobile and portable stations. (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards                                                                                                                                                                  |                              |
| LTE BAND41                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FCC Part 27.50               |
| Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.                                                                                                                                                                                                                                                                                                                                 |                              |

### 8.2.2 Test Configuration

Test according to clause 7.3 radio frequency test setup 3

### 8.2.3 Test Procedure

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the Mid ARFCN range, power control level set to Max power. MS TXPWR\_MAX\_CCH is set to the maximum value supported by the Power Class of the Mobile under test

The instrument must have an available measurement/resolution bandwidth that is equal to or exceeds the OBW. If this capability is available, then the following procedure can be used to determine the total peak output power.

- Set the RBW  $\geq$  OBW.
- Set VBW  $\geq 3 \times$  RBW.
- Set span  $\geq 2 \times$  RBW
- Sweep time = auto couple.

- e) Detector = peak.
- f) Ensure that the number of measurement points  $\geq \text{span/RBW}$ .
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the peak amplitude level.

The EUT was placed on a turn table which is 0.8m above ground plane. Maximum procedure was performed on the six highest emissions to ensure EUT compliance. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. Repeat above procedures until all frequency measured was complete.

A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.

The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).

The EUT shall be replaced by a substitution antenna. The test setup refers to figure below. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antennapolarization.

A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna.

The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

The measurement results are obtained as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} - \text{Ga}$$

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

ERP can be calculated from EIRP by subtracting the gain of the dipole,

$$\text{ERP} = \text{EIRP} - 2.15\text{dBi}.$$

#### 8.2.4 Test Results

Pass

Note: The details please see Appendix B.

### **8.3 MODULATION CHARACTERISTICS**

#### **8.3.1 Conformance Limit**

No specific modulation characteristics requirement limits.

#### **8.3.2 Test Configuration**

Test according to clause 7.1 radio frequency test setup 1

#### **8.3.3 Test Procedure**

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the Mid ARFCN range, power control level set to Max power. MS TXPWR\_MAX\_CCH is set to the maximum value supported by the Power Class of the Mobile under test, The frequency band is set as selected frequency, test method was according to 3GPP TS 51.010 and 3GPP TS 34.121. and 3GPP2 C.S0011/TIA-98-E for 1XRTT. and 3GPP2 C.S0033-0/tia-866 for Rel.0 and 3GPP2 C.S0033-A for Rev.A The waveform quality and constellation of the was tested.

#### **8.3.4 Test Results**

Pass

## 8.4 OCCUPIED BANDWIDTH

### 8.4.1 Conformance Limit

No specific modulation characteristics requirement limits.

### 8.4.2 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.4.3 Test Procedure

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the Mid ARFCN range, power control level set to Max power. MS TXPWR\_MAX\_CCH is set to the maximum value supported by the Power Class of the Mobile under test,

#### ■ 99% Occupied bandwidth

The following procedure shall be used for measuring (99 %) power bandwidth

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.
- NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.
- Set the detection mode to peak, and the trace mode to max hold..
- Use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.
- If the instrument does not have a 99 % power bandwidth function, the trace data points are to be recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % power bandwidth is the difference between these two frequencies.
- The OBW shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

#### ■ 26 dB Occupied bandwidth

The reference value is the highest level of the spectral envelope of the modulated signal.

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
- The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- Set the reference level of the instrument as required to prevent the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.
- NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.
- The dynamic range of the spectrum analyzer at the selected RBW shall be at least 10 dB below the target “-X dB down” requirement (i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference value).
- Set the detection mode to peak, and the trace mode to max hold.
- Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- Determine the “-X dB down amplitude” as equal to (Reference Value – X). Alternatively, this calculation

can be performed by the analyzer by using the marker-delta function.

i) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB down amplitude” determined in step g). If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.

j) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s)

#### **8.4.4 Test Results**

Pass

Note: The details please see Appendix C.

## 8.5 BAND EDGE EMISSION

### 8.5.1 Conformance Limit

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| LTE BAND5 (26)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FCC Part 22.917, Part 90.691 |
| $\leq -13$ dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |
| LTE BAND2 (25)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FCC Part 24.238              |
| $\leq -13$ dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |
| LTE BAND4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FCC Part 27.53(h)            |
| $\leq -13$ dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |
| LTE BAND7 (41)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FCC Part 27.53(m)            |
| For mobile digital stations, 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. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees |                              |
| LTE BAND12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FCC Part 27.53(g)            |
| $\leq -13$ dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |
| LTE BAND13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FCC Part 27.53(c)            |
| $\leq -13$ dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |
| LTE BAND30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FCC Part 27.53(a)            |
| By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz                                                                                                                                                                                                                                                                                                                                                                                                 |                              |
| By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |

### 8.5.2 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.5.3 Test Procedure

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the Mid ARFCN range, power control level set to Max power. MS TXPWR\_MAX\_CCH is set to the maximum value supported by the Power Class of the Mobile under test,

Spectrum Analyzer is set as below:  
SET RBW  $\geq 1\%$  of Emission BW.  
SET VBW about three times of RBW  
Detector: RMS  
Trace mode= max hold.

### 8.5.4 Test Results

Pass

Note: The details please see Appendix D.

## 8.6 OUT OF BAND EMISSIONS AT ANTENNA TERMINALS

### 8.6.1 Conformance Limit

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| LTE BAND2 (25)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FCC Part 24.238   |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FCC Part 27.53(h) |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND5(26)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | FCC Part 22.917   |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND7 (41)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FCC Part 27.53(m) |
| For mobile digital stations, 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. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees |                   |
| LTE BAND12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FCC Part 27.53(g) |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FCC Part 27.53(c) |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FCC Part 27.53(a) |
| By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log(P)$ dB above 2365 MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |

The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

### 8.6.2 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

### 8.6.3 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer  
Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the Mid ARFCN range, power control level set to Max power. MS TXPWR\_MAX\_CCH is set to the maximum value supported by the Power Class of the Mobile under test,

Spectrum Analyzer is set as below:

9kHz~150kHz, RBW = 1KHz, VBW  $\geq 3 \times$  RBW,

150kHz~30MHz, RBW = 10KHz, VBW  $\geq 3 \times$  RBW,

30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz. Above 1GHz, RBW = 1 MHz, VBW = 3 MHz.

Detector: Peak

Trace mode= max hold.

#### **8.6.4 Test Results**

Pass

Note: The details please see Appendix E.

## 8.7 FIELD STRENGTH OF SPURIOUS RADIATION

### 8.7.1 Conformance Limit

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| LTE BAND2 (25)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FCC Part 24.238   |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FCC Part 27.53(h) |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND5(26)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | FCC Part 22.917   |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND7 (41)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FCC Part 27.53(m) |
| For mobile digital stations, 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. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees |                   |
| LTE BAND12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FCC Part 27.53(g) |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FCC Part 27.53(c) |
| Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |
| LTE BAND30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FCC Part 27.53(a) |
| By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log(P)$ dB above 2365 MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |

The specification that emissions shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

### 8.7.2 Test Configuration

Test according to clause 7.3 radio frequency test setup 3

### 8.7.3 Test Procedure

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the Mid ARFCN range, power control level set to Max power. MS TXPWR\_MAX\_CCH is set to the maximum value supported by the Power Class of the Mobile under test.

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). 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 emissions

are attenuated at least 26 dB below the transmitter power.

then the following procedure can be used to determine spurious emission

- a) RBW = 1 MHz for  $f \geq 1$  GHz (1GHz to 25GHz), 100 kHz for  $f < 1$  GHz (30MHz to 1GHz), 200Hz for  $f < 150$  KHz (9KHz to 150KHz), 9KHz for  $f < 30$  MHz (150KHz to 30KHz)
- b) Set VBW  $\geq 3 \times$  RBW.
- c) Set span wide enough to fully capture the emission being measured
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Ensure that the number of measurement points  $\geq$  span/RBW.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the peak amplitude level.

Step1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.

Step2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.

Step3. The table was rotated 360 degrees to determine the position of the highest spurious emission.

Step4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.

Step5. Make the measurement with the spectrum analyzer's RBW , VBW , taking the record of maximum spurious emission.

Step6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.

Step7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

Step8. Taking the record of output power at antenna port.

Step9. Repeat step 7 to step 8 for another polarization.

Step10. Emission level (dBm) = output power + substitution Gain. Test Results

#### **8.7.4 Test Results**

Pass

Note: The details please see Appendix F.

## **8.8 FREQUENCY STABILITY**

### **8.8.1 Conformance Limit**

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

### **8.8.2 Test Configuration**

Test according to clause 7.2 conducted emission test setup2.

### **8.8.3 Test Procedure**

Connect the EUT to Universal Radio Communication Tester CMU200 or CMU500 via the antenna connector. A call is set up by the SS according to the generic call set up procedure on a channel with ARFCN in the ARFCN range, power control level set to Max power. MS TXPWR\_MAX\_CCH is set to the maximum value supported by the Power Class of the Mobile under test.

EUT was placed at temperature chamber and connected to an external power supply.

Temperature and voltage condition shall be tested to confirm frequency stability.

(a) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than  $10^{\circ}$  centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short-term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(b) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 95 to 105 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point, which shall be specified by the manufacturer.

### **8.8.4 Test Results**

Pass

Note: The details please see Appendix G.

## 8.9 PEAK TO AVERAGE RATIO

### 8.9.1 Conformance Limit

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| LTE BAND2 (25)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FCC Part 24.232 |
| Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB. |                 |
| LTE BAND4(7)(30)(41)                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FCC Part 27.50  |
| Equipment employed must be authorized in accordance with the provisions of §24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.                 |                 |

### 8.9.2 Test Configuration

Test according to clause 7.1 conducted emission test setup1.

### 8.9.3 Test Procedure

The EUT was connected to Spectrum Analyzer and Base Station via power divider.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set the number of counts to a value that stabilizes the measured CCDF curve.

Set the measurement interval to 1 ms.

Record the maximum PAPR level associated with a probability of 0.1%.

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) 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.

e) Record the maximum PAPR level associated with a probability of 0.1%.

### 8.9.4 Test Results

Pass

Note: The details please see Appendix H.

**APPENDIX A: TEST DATA FOR RF POWER OUTPUT**

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18607 | Mid CH 18900 | High CH 19193 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1850.7 MHz   | 1880.0 MHz   | 1909.3 MHz    |
| 2/1.4   | QPSK       | 1       | 0         | 22.48        | 22.57        | 22.52         |
|         |            | 1       | 2         | 22.47        | 22.56        | 22.51         |
|         |            | 1       | 5         | 22.44        | 22.53        | 22.48         |
|         |            | 3       | 0         | 22.47        | 22.56        | 22.51         |
|         |            | 3       | 1         | 22.46        | 22.55        | 22.50         |
|         |            | 3       | 3         | 22.43        | 22.52        | 22.47         |
|         | 16QAM      | 6       | 0         | 21.54        | 21.63        | 21.58         |
|         |            | 1       | 0         | 21.49        | 21.58        | 21.53         |
|         |            | 1       | 2         | 21.46        | 21.55        | 21.50         |
|         |            | 1       | 5         | 21.45        | 21.54        | 21.49         |
|         |            | 3       | 0         | 21.47        | 21.56        | 21.51         |
|         |            | 3       | 1         | 21.44        | 21.53        | 21.48         |
|         |            | 3       | 3         | 21.43        | 21.52        | 21.47         |
|         |            | 6       | 0         | 20.49        | 20.58        | 20.53         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18615 | Mid CH 18900 | High CH 19185 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1851.5 MHz   | 1880.0 MHz   | 1908.5 MHz    |
| 2/3     | QPSK       | 1       | 0         | 22.51        | 22.60        | 22.55         |
|         |            | 1       | 7         | 22.50        | 22.59        | 22.54         |
|         |            | 1       | 14        | 22.47        | 22.56        | 22.51         |
|         |            | 8       | 0         | 21.56        | 21.65        | 21.60         |
|         |            | 8       | 3         | 21.54        | 21.63        | 21.58         |
|         |            | 8       | 7         | 21.49        | 21.58        | 21.53         |
|         |            | 15      | 0         | 21.57        | 21.66        | 21.61         |
|         | 16QAM      | 1       | 0         | 21.52        | 21.61        | 21.56         |
|         |            | 1       | 7         | 21.49        | 21.58        | 21.53         |
|         |            | 1       | 14        | 21.48        | 21.57        | 21.52         |
|         |            | 8       | 0         | 20.60        | 20.69        | 20.64         |
|         |            | 8       | 3         | 20.59        | 20.68        | 20.63         |
|         |            | 8       | 7         | 20.54        | 20.63        | 20.58         |
|         |            | 15      | 0         | 20.52        | 20.61        | 20.56         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18625 | Mid CH 18900 | High CH 19175 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1852.5 MHz   | 1880.0 MHz   | 1907.5 MHz    |
| 2/5     | QPSK       | 1       | 0         | 22.54        | 22.63        | 22.58         |
|         |            | 1       | 12        | 22.53        | 22.62        | 22.57         |
|         |            | 1       | 24        | 22.50        | 22.59        | 22.54         |
|         |            | 12      | 0         | 21.59        | 21.68        | 21.63         |
|         |            | 12      | 6         | 21.57        | 21.66        | 21.61         |
|         |            | 12      | 13        | 21.52        | 21.61        | 21.56         |
|         |            | 25      | 0         | 21.60        | 21.69        | 21.64         |
|         | 16QAM      | 1       | 0         | 21.55        | 21.64        | 21.59         |
|         |            | 1       | 12        | 21.52        | 21.61        | 21.56         |
|         |            | 1       | 24        | 21.51        | 21.60        | 21.55         |
|         |            | 12      | 0         | 20.63        | 20.72        | 20.67         |
|         |            | 12      | 6         | 20.62        | 20.71        | 20.66         |
|         |            | 12      | 13        | 20.57        | 20.66        | 20.61         |
|         |            | 25      | 0         | 20.55        | 20.64        | 20.59         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18650 | Mid CH 18900 | High CH 19150 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1855.0 MHz   | 1880.0 MHz   | 1905.0 MHz    |
| 2/10    | QPSK       | 1       | 0         | 22.56        | 22.65        | 22.60         |
|         |            | 1       | 24        | 22.55        | 22.64        | 22.59         |
|         |            | 1       | 49        | 22.52        | 22.61        | 22.56         |
|         |            | 25      | 0         | 21.61        | 21.70        | 21.65         |
|         |            | 25      | 12        | 21.59        | 21.68        | 21.63         |
|         |            | 25      | 25        | 21.54        | 21.63        | 21.58         |
|         |            | 50      | 0         | 21.62        | 21.71        | 21.66         |
|         | 16QAM      | 1       | 0         | 21.57        | 21.66        | 21.61         |
|         |            | 1       | 24        | 21.54        | 21.63        | 21.58         |
|         |            | 1       | 49        | 21.53        | 21.62        | 21.57         |
|         |            | 25      | 0         | 20.65        | 20.74        | 20.69         |
|         |            | 25      | 12        | 20.64        | 20.73        | 20.68         |
|         |            | 25      | 25        | 20.59        | 20.68        | 20.63         |
|         |            | 50      | 0         | 20.57        | 20.66        | 20.61         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18675 | Mid CH 18900 | High CH 19125 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1857.5 MHz   | 1880.0 MHz   | 1902.5 MHz    |
| 2/15    | QPSK       | 1       | 0         | 22.59        | 22.68        | 22.63         |
|         |            | 1       | 37        | 22.58        | 22.67        | 22.62         |
|         |            | 1       | 74        | 22.55        | 22.64        | 22.59         |
|         |            | 36      | 0         | 21.64        | 21.73        | 21.68         |
|         |            | 36      | 19        | 21.62        | 21.71        | 21.66         |
|         |            | 36      | 39        | 21.57        | 21.66        | 21.61         |
|         |            | 75      | 0         | 21.65        | 21.74        | 21.69         |
|         | 16QAM      | 1       | 0         | 21.60        | 21.69        | 21.64         |
|         |            | 1       | 37        | 21.57        | 21.66        | 21.61         |
|         |            | 1       | 74        | 21.56        | 21.65        | 21.60         |
|         |            | 36      | 0         | 20.68        | 20.77        | 20.72         |
|         |            | 36      | 19        | 20.67        | 20.76        | 20.71         |
|         |            | 36      | 39        | 20.62        | 20.71        | 20.66         |
|         |            | 75      | 0         | 20.60        | 20.69        | 20.64         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18700 | Mid CH 18900 | High CH 19100 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1860.0 MHz   | 1880.0 MHz   | 1900.0 MHz    |
| 2/20    | QPSK       | 1       | 0         | 22.64        | <b>22.73</b> | 22.68         |
|         |            | 1       | 50        | 22.63        | 22.72        | 22.67         |
|         |            | 1       | 99        | 22.60        | 22.69        | 22.64         |
|         |            | 50      | 0         | 21.69        | 21.78        | 21.73         |
|         |            | 50      | 25        | 21.67        | 21.76        | 21.71         |
|         |            | 50      | 50        | 21.62        | 21.71        | 21.66         |
|         |            | 100     | 0         | 21.70        | 21.79        | 21.74         |
|         | 16QAM      | 1       | 0         | 21.65        | 21.74        | 21.69         |
|         |            | 1       | 50        | 21.62        | 21.71        | 21.66         |
|         |            | 1       | 99        | 21.61        | 21.70        | 21.65         |
|         |            | 50      | 0         | 20.73        | 20.82        | 20.77         |
|         |            | 50      | 25        | 20.72        | 20.81        | 20.76         |
|         |            | 50      | 50        | 20.67        | 20.76        | 20.71         |
|         |            | 100     | 0         | 20.65        | 20.74        | 20.69         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>19957         | Mid CH<br>20175         | High CH<br>20393        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1710.7 MHz | Frequency<br>1732.5 MHz | Frequency<br>1754.3 MHz |
| 4/1.4   | QPSK       | 1       | 0         | 22.57                   | 22.64                   | 22.55                   |
|         |            | 1       | 2         | 22.56                   | 22.63                   | 22.54                   |
|         |            | 1       | 5         | 22.53                   | 22.60                   | 22.51                   |
|         |            | 3       | 0         | 22.55                   | 22.62                   | 22.53                   |
|         |            | 3       | 1         | 22.54                   | 22.61                   | 22.52                   |
|         |            | 3       | 3         | 22.51                   | 22.58                   | 22.49                   |
|         | 16QAM      | 6       | 0         | 21.63                   | 21.70                   | 21.61                   |
|         |            | 1       | 0         | 21.58                   | 21.65                   | 21.56                   |
|         |            | 1       | 2         | 21.55                   | 21.62                   | 21.53                   |
|         |            | 1       | 5         | 21.54                   | 21.61                   | 21.52                   |
|         |            | 3       | 0         | 21.57                   | 21.64                   | 21.55                   |
|         |            | 3       | 1         | 21.54                   | 21.61                   | 21.52                   |
|         |            | 3       | 3         | 21.53                   | 21.60                   | 21.51                   |
|         |            | 6       | 0         | 20.58                   | 20.65                   | 20.56                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>19965         | Mid CH<br>20175         | High CH<br>20385        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1711.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1753.5 MHz |
| 4/3     | QPSK       | 1       | 0         | 22.58                   | 22.65                   | 22.56                   |
|         |            | 1       | 7         | 22.57                   | 22.64                   | 22.55                   |
|         |            | 1       | 14        | 22.54                   | 22.61                   | 22.52                   |
|         |            | 8       | 0         | 21.63                   | 21.70                   | 21.61                   |
|         |            | 8       | 3         | 21.61                   | 21.68                   | 21.59                   |
|         |            | 8       | 7         | 21.56                   | 21.63                   | 21.54                   |
|         |            | 15      | 0         | 21.64                   | 21.71                   | 21.62                   |
|         | 16QAM      | 1       | 0         | 21.59                   | 21.66                   | 21.57                   |
|         |            | 1       | 7         | 21.56                   | 21.63                   | 21.54                   |
|         |            | 1       | 14        | 21.55                   | 21.62                   | 21.53                   |
|         |            | 8       | 0         | 20.67                   | 20.74                   | 20.65                   |
|         |            | 8       | 3         | 20.66                   | 20.73                   | 20.64                   |
|         |            | 8       | 7         | 20.61                   | 20.68                   | 20.59                   |
|         |            | 15      | 0         | 20.59                   | 20.66                   | 20.57                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>19975         | Mid CH<br>20175         | High CH<br>20375        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1712.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1752.5 MHz |
| 4/5     | QPSK       | 1       | 0         | 22.61                   | 22.68                   | 22.59                   |
|         |            | 1       | 12        | 22.60                   | 22.67                   | 22.58                   |
|         |            | 1       | 24        | 22.57                   | 22.64                   | 22.55                   |
|         |            | 12      | 0         | 21.66                   | 21.73                   | 21.64                   |
|         |            | 12      | 6         | 21.64                   | 21.71                   | 21.62                   |
|         |            | 12      | 13        | 21.59                   | 21.66                   | 21.57                   |
|         |            | 25      | 0         | 21.67                   | 21.74                   | 21.65                   |
|         | 16QAM      | 1       | 0         | 21.62                   | 21.69                   | 21.60                   |
|         |            | 1       | 12        | 21.59                   | 21.66                   | 21.57                   |
|         |            | 1       | 24        | 21.58                   | 21.65                   | 21.56                   |
|         |            | 12      | 0         | 20.70                   | 20.77                   | 20.68                   |
|         |            | 12      | 6         | 20.69                   | 20.76                   | 20.67                   |
|         |            | 12      | 13        | 20.64                   | 20.71                   | 20.62                   |
|         |            | 25      | 0         | 20.62                   | 20.69                   | 20.60                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20000       | Mid CH<br>20175         | High CH<br>20350      |
|---------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|
|         |            |         |           | Frequency<br>1715 MHz | Frequency<br>1732.5 MHz | Frequency<br>1750 MHz |
| 4/10    | QPSK       | 1       | 0         | 22.65                 | 22.72                   | 22.63                 |
|         |            | 1       | 24        | 22.64                 | 22.71                   | 22.62                 |
|         |            | 1       | 49        | 22.61                 | 22.68                   | 22.59                 |
|         |            | 25      | 0         | 21.70                 | 21.77                   | 21.68                 |
|         |            | 25      | 12        | 21.68                 | 21.75                   | 21.66                 |
|         |            | 25      | 25        | 21.63                 | 21.70                   | 21.61                 |
|         |            | 50      | 0         | 21.71                 | 21.78                   | 21.69                 |
|         | 16QAM      | 1       | 0         | 21.66                 | 21.73                   | 21.64                 |
|         |            | 1       | 24        | 21.63                 | 21.70                   | 21.61                 |
|         |            | 1       | 49        | 21.62                 | 21.69                   | 21.60                 |
|         |            | 25      | 0         | 20.74                 | 20.81                   | 20.72                 |
|         |            | 25      | 12        | 20.73                 | 20.80                   | 20.71                 |
|         |            | 25      | 25        | 20.68                 | 20.75                   | 20.66                 |
|         |            | 50      | 0         | 20.66                 | 20.73                   | 20.64                 |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 20025         | Mid CH 20175         | High CH 20325        |
|---------|------------|---------|-----------|----------------------|----------------------|----------------------|
|         |            |         |           | Frequency 1717.5 MHz | Frequency 1732.5 MHz | Frequency 1747.5 MHz |
| 4/15    | QPSK       | 1       | 0         | 22.71                | 22.78                | 22.69                |
|         |            | 1       | 37        | 22.70                | 22.77                | 22.68                |
|         |            | 1       | 74        | 22.67                | 22.74                | 22.65                |
|         |            | 36      | 0         | 21.76                | 21.83                | 21.74                |
|         |            | 36      | 19        | 21.74                | 21.81                | 21.72                |
|         |            | 36      | 39        | 21.69                | 21.76                | 21.67                |
|         |            | 75      | 0         | 21.77                | 21.84                | 21.75                |
|         | 16QAM      | 1       | 0         | 21.72                | 21.79                | 21.70                |
|         |            | 1       | 37        | 21.69                | 21.76                | 21.67                |
|         |            | 1       | 74        | 21.68                | 21.75                | 21.66                |
|         |            | 36      | 0         | 20.80                | 20.87                | 20.78                |
|         |            | 36      | 19        | 20.79                | 20.86                | 20.77                |
|         |            | 36      | 39        | 20.74                | 20.81                | 20.72                |
|         |            | 75      | 0         | 20.72                | 20.79                | 20.70                |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 20050       | Mid CH 20175         | High CH 20300      |
|---------|------------|---------|-----------|--------------------|----------------------|--------------------|
|         |            |         |           | Frequency 1720 MHz | Frequency 1732.5 MHz | Frequency 1745 MHz |
| 4/20    | QPSK       | 1       | 0         | 22.74              | <b>22.81</b>         | 22.72              |
|         |            | 1       | 50        | 22.73              | 22.80                | 22.71              |
|         |            | 1       | 99        | 22.70              | 22.77                | 22.68              |
|         |            | 50      | 0         | 21.79              | 21.86                | 21.77              |
|         |            | 50      | 25        | 21.77              | 21.84                | 21.75              |
|         |            | 50      | 50        | 21.72              | 21.79                | 21.70              |
|         |            | 100     | 0         | 21.80              | 21.87                | 21.78              |
|         | 16QAM      | 1       | 0         | 21.75              | 21.82                | 21.73              |
|         |            | 1       | 50        | 21.72              | 21.79                | 21.70              |
|         |            | 1       | 99        | 21.71              | 21.78                | 21.69              |
|         |            | 50      | 0         | 20.83              | 20.90                | 20.81              |
|         |            | 50      | 25        | 20.82              | 20.89                | 20.80              |
|         |            | 50      | 50        | 20.77              | 20.84                | 20.75              |
|         |            | 100     | 0         | 20.75              | 20.82                | 20.73              |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26697          | Mid CH<br>(26915)       | High CH<br>27033         |
|---------|------------|---------|-----------|--------------------------|-------------------------|--------------------------|
|         |            |         |           | Frequency<br>(824.7) MHz | Frequency<br>(836.5)MHz | Frequency<br>(848.3) MHz |
| 5/1.4   | QPSK       | 1       | 0         | 22.83                    | 22.92                   | 22.88                    |
|         |            | 1       | 2         | 22.82                    | 22.91                   | 22.87                    |
|         |            | 1       | 5         | 22.79                    | 22.88                   | 22.84                    |
|         |            | 3       | 0         | 22.81                    | 22.90                   | 22.86                    |
|         |            | 3       | 1         | 22.80                    | 22.89                   | 22.85                    |
|         |            | 3       | 3         | 22.77                    | 22.86                   | 22.82                    |
|         |            | 6       | 0         | 21.89                    | 21.98                   | 21.94                    |
|         | 16QAM      | 1       | 0         | 21.84                    | 21.93                   | 21.89                    |
|         |            | 1       | 2         | 21.81                    | 21.90                   | 21.86                    |
|         |            | 1       | 5         | 21.80                    | 21.89                   | 21.85                    |
|         |            | 3       | 0         | 21.83                    | 21.92                   | 21.88                    |
|         |            | 3       | 1         | 21.80                    | 21.89                   | 21.85                    |
|         |            | 3       | 3         | 21.79                    | 21.88                   | 21.84                    |
|         |            | 6       | 0         | 20.84                    | 20.93                   | 20.89                    |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(26805)       | Mid CH<br>(26915)       | High CH<br>(27025)      |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>(825.5)MHz | Frequency<br>(836.5)MHz | Frequency<br>(847.5)MHz |
| 5/3     | QPSK       | 1       | 0         | 22.87                   | 22.96                   | 22.92                   |
|         |            | 1       | 7         | 22.86                   | 22.95                   | 22.91                   |
|         |            | 1       | 14        | 22.83                   | 22.92                   | 22.88                   |
|         |            | 8       | 0         | 21.92                   | 22.01                   | 21.97                   |
|         |            | 8       | 3         | 21.90                   | 21.99                   | 21.95                   |
|         |            | 8       | 7         | 21.85                   | 21.94                   | 21.90                   |
|         |            | 15      | 0         | 21.93                   | 22.02                   | 21.98                   |
|         | 16QAM      | 1       | 0         | 21.88                   | 21.97                   | 21.93                   |
|         |            | 1       | 7         | 21.85                   | 21.94                   | 21.90                   |
|         |            | 1       | 14        | 21.84                   | 21.93                   | 21.89                   |
|         |            | 8       | 0         | 20.96                   | 21.05                   | 21.01                   |
|         |            | 8       | 3         | 20.95                   | 21.04                   | 21.00                   |
|         |            | 8       | 7         | 20.90                   | 20.99                   | 20.95                   |
|         |            | 15      | 0         | 20.88                   | 20.97                   | 20.93                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (26815)       | Mid CH (26915)       | High CH (27015)      |
|---------|------------|---------|-----------|----------------------|----------------------|----------------------|
|         |            |         |           | Frequency (826.5)MHz | Frequency (836.5)MHz | Frequency (846.5)MHz |
| 5/5     | QPSK       | 1       | 0         | 22.93                | 23.02                | 22.98                |
|         |            | 1       | 12        | 22.92                | 23.01                | 22.97                |
|         |            | 1       | 24        | 22.89                | 22.98                | 22.94                |
|         |            | 12      | 0         | 21.98                | 22.07                | 22.03                |
|         |            | 12      | 6         | 21.96                | 22.05                | 22.01                |
|         |            | 12      | 13        | 21.91                | 22.00                | 21.96                |
|         |            | 25      | 0         | 21.99                | 22.08                | 22.04                |
|         | 16QAM      | 1       | 0         | 21.94                | 22.03                | 21.99                |
|         |            | 1       | 12        | 21.91                | 22.00                | 21.96                |
|         |            | 1       | 24        | 21.90                | 21.99                | 21.95                |
|         |            | 12      | 0         | 21.02                | 21.11                | 21.07                |
|         |            | 12      | 6         | 21.01                | 21.10                | 21.06                |
|         |            | 12      | 13        | 20.96                | 21.05                | 21.01                |
|         |            | 25      | 0         | 20.94                | 21.03                | 20.99                |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (26840)     | Mid CH (26915)       | High CH (26990)    |
|---------|------------|---------|-----------|--------------------|----------------------|--------------------|
|         |            |         |           | Frequency (829)MHz | Frequency (836.5)MHz | Frequency (844)MHz |
| 5/10    | QPSK       | 1       | 0         | 22.96              | <b>23.05</b>         | 23.01              |
|         |            | 1       | 24        | 22.95              | 23.04                | 23.00              |
|         |            | 1       | 49        | 22.92              | 23.01                | 22.97              |
|         |            | 25      | 0         | 22.01              | 22.10                | 22.06              |
|         |            | 25      | 12        | 21.99              | 22.08                | 22.04              |
|         |            | 25      | 25        | 21.94              | 22.03                | 21.99              |
|         |            | 50      | 0         | 22.02              | 22.11                | 22.07              |
|         | 16QAM      | 1       | 0         | 21.97              | 22.06                | 22.02              |
|         |            | 1       | 24        | 21.94              | 22.03                | 21.99              |
|         |            | 1       | 49        | 21.93              | 22.02                | 21.98              |
|         |            | 25      | 0         | 21.05              | 21.14                | 21.10              |
|         |            | 25      | 12        | 21.04              | 21.13                | 21.09              |
|         |            | 25      | 25        | 20.99              | 21.08                | 21.04              |
|         |            | 50      | 0         | 20.97              | 21.06                | 21.02              |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20775         | Mid CH<br>21100       | High CH<br>21425        |
|---------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|
|         |            |         |           | Frequency<br>2502.5 MHz | Frequency<br>2535 MHz | Frequency<br>2567.5 MHz |
| 7/5     | QPSK       | 1       | 0         | 20.31                   | 20.43                 | 20.38                   |
|         |            | 1       | 12        | 20.30                   | 20.42                 | 20.37                   |
|         |            | 1       | 24        | 20.27                   | 20.39                 | 20.34                   |
|         |            | 12      | 0         | 19.36                   | 19.48                 | 19.43                   |
|         |            | 12      | 6         | 19.34                   | 19.46                 | 19.41                   |
|         |            | 12      | 13        | 19.29                   | 19.41                 | 19.36                   |
|         |            | 25      | 0         | 19.37                   | 19.49                 | 19.44                   |
|         | 16QAM      | 1       | 0         | 19.32                   | 19.44                 | 19.39                   |
|         |            | 1       | 12        | 19.29                   | 19.41                 | 19.36                   |
|         |            | 1       | 24        | 19.28                   | 19.40                 | 19.35                   |
|         |            | 12      | 0         | 18.40                   | 18.52                 | 18.47                   |
|         |            | 12      | 6         | 18.39                   | 18.51                 | 18.46                   |
|         |            | 12      | 13        | 18.34                   | 18.46                 | 18.41                   |
|         |            | 25      | 0         | 18.32                   | 18.44                 | 18.39                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20800       | Mid CH<br>21100       | High CH<br>21400      |
|---------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|
|         |            |         |           | Frequency<br>2505 MHz | Frequency<br>2535 MHz | Frequency<br>2565 MHz |
| 7/10    | QPSK       | 1       | 0         | 20.35                 | 20.47                 | 20.42                 |
|         |            | 1       | 24        | 20.34                 | 20.46                 | 20.41                 |
|         |            | 1       | 49        | 20.31                 | 20.43                 | 20.38                 |
|         |            | 25      | 0         | 19.40                 | 19.52                 | 19.47                 |
|         |            | 25      | 12        | 19.38                 | 19.50                 | 19.45                 |
|         |            | 25      | 25        | 19.33                 | 19.45                 | 19.40                 |
|         |            | 50      | 0         | 19.41                 | 19.53                 | 19.48                 |
|         | 16QAM      | 1       | 0         | 19.36                 | 19.48                 | 19.43                 |
|         |            | 1       | 24        | 19.33                 | 19.45                 | 19.40                 |
|         |            | 1       | 49        | 19.32                 | 19.44                 | 19.39                 |
|         |            | 25      | 0         | 18.44                 | 18.56                 | 18.51                 |
|         |            | 25      | 12        | 18.43                 | 18.55                 | 18.50                 |
|         |            | 25      | 25        | 18.38                 | 18.50                 | 18.45                 |
|         |            | 50      | 0         | 18.36                 | 18.48                 | 18.43                 |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20825         | Mid CH<br>21100       | High CH<br>21375        |
|---------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|
|         |            |         |           | Frequency<br>2507.5 MHz | Frequency<br>2535 MHz | Frequency<br>2562.5 MHz |
| 7/15    | QPSK       | 1       | 0         | 20.41                   | 20.53                 | 20.48                   |
|         |            | 1       | 37        | 20.40                   | 20.52                 | 20.47                   |
|         |            | 1       | 74        | 20.37                   | 20.49                 | 20.44                   |
|         |            | 36      | 0         | 19.46                   | 19.58                 | 19.53                   |
|         |            | 36      | 19        | 19.44                   | 19.56                 | 19.51                   |
|         |            | 36      | 39        | 19.39                   | 19.51                 | 19.46                   |
|         |            | 75      | 0         | 19.47                   | 19.59                 | 19.54                   |
|         | 16QAM      | 1       | 0         | 19.42                   | 19.54                 | 19.49                   |
|         |            | 1       | 37        | 19.39                   | 19.51                 | 19.46                   |
|         |            | 1       | 74        | 19.38                   | 19.50                 | 19.45                   |
|         |            | 36      | 0         | 18.50                   | 18.62                 | 18.57                   |
|         |            | 36      | 19        | 18.49                   | 18.61                 | 18.56                   |
|         |            | 36      | 39        | 18.44                   | 18.56                 | 18.51                   |
|         |            | 75      | 0         | 18.42                   | 18.54                 | 18.49                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20850       | Mid CH<br>21100       | High CH<br>21350      |
|---------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|
|         |            |         |           | Frequency<br>2510 MHz | Frequency<br>2535 MHz | Frequency<br>2560 MHz |
| 7/20    | QPSK       | 1       | 0         | 20.44                 | <b>20.56</b>          | 20.51                 |
|         |            | 1       | 50        | 20.43                 | 20.55                 | 20.50                 |
|         |            | 1       | 99        | 20.40                 | 20.52                 | 20.47                 |
|         |            | 50      | 0         | 19.49                 | 19.61                 | 19.56                 |
|         |            | 50      | 25        | 19.47                 | 19.59                 | 19.54                 |
|         |            | 50      | 50        | 19.42                 | 19.54                 | 19.49                 |
|         |            | 100     | 0         | 19.50                 | 19.62                 | 19.57                 |
|         | 16QAM      | 1       | 0         | 19.45                 | 19.57                 | 19.52                 |
|         |            | 1       | 50        | 19.42                 | 19.54                 | 19.49                 |
|         |            | 1       | 99        | 19.41                 | 19.53                 | 19.48                 |
|         |            | 50      | 0         | 18.53                 | 18.65                 | 18.60                 |
|         |            | 50      | 25        | 18.52                 | 18.64                 | 18.59                 |
|         |            | 50      | 50        | 18.47                 | 18.59                 | 18.54                 |
|         |            | 100     | 0         | 18.45                 | 18.57                 | 18.52                 |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 23017        | Mid CH 23095        | High CH 23173       |
|---------|------------|---------|-----------|---------------------|---------------------|---------------------|
|         |            |         |           | Frequency 699.7 MHz | Frequency 707.5 MHz | Frequency 715.3 MHz |
| 12/1.4  | QPSK       | 1       | 0         | 22.62               | 22.71               | 22.59               |
|         |            | 1       | 2         | 22.61               | 22.70               | 22.58               |
|         |            | 1       | 5         | 22.58               | 22.67               | 22.55               |
|         |            | 3       | 0         | 22.60               | 22.69               | 22.57               |
|         |            | 3       | 1         | 22.59               | 22.68               | 22.56               |
|         |            | 3       | 3         | 22.56               | 22.65               | 22.53               |
|         |            | 6       | 0         | 21.63               | 21.73               | 21.60               |
|         | 16QAM      | 1       | 0         | 21.58               | 21.68               | 21.55               |
|         |            | 1       | 2         | 21.55               | 21.65               | 21.52               |
|         |            | 1       | 5         | 21.54               | 21.64               | 21.51               |
|         |            | 3       | 0         | 21.57               | 21.67               | 21.54               |
|         |            | 3       | 1         | 21.54               | 21.64               | 21.51               |
|         |            | 3       | 3         | 21.53               | 21.63               | 21.50               |
|         |            | 6       | 0         | 20.58               | 20.68               | 20.55               |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 23025        | Mid CH 23095        | High CH 23165       |
|---------|------------|---------|-----------|---------------------|---------------------|---------------------|
|         |            |         |           | Frequency 700.5 MHz | Frequency 707.5 MHz | Frequency 714.5 MHz |
| 12/3    | QPSK       | 1       | 0         | 22.66               | 22.75               | 22.63               |
|         |            | 1       | 7         | 22.65               | 22.74               | 22.62               |
|         |            | 1       | 14        | 22.62               | 22.71               | 22.59               |
|         |            | 8       | 0         | 21.66               | 21.76               | 21.63               |
|         |            | 8       | 3         | 21.64               | 21.74               | 21.61               |
|         |            | 8       | 7         | 21.59               | 21.69               | 21.56               |
|         |            | 15      | 0         | 21.67               | 21.77               | 21.64               |
|         | 16QAM      | 1       | 0         | 21.62               | 21.72               | 21.59               |
|         |            | 1       | 7         | 21.59               | 21.69               | 21.56               |
|         |            | 1       | 14        | 21.58               | 21.68               | 21.55               |
|         |            | 8       | 0         | 20.70               | 20.80               | 20.67               |
|         |            | 8       | 3         | 20.69               | 20.79               | 20.66               |
|         |            | 8       | 7         | 20.64               | 20.74               | 20.61               |
|         |            | 15      | 0         | 20.62               | 20.72               | 20.59               |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>23035        | Mid CH<br>23095        | High CH<br>23155       |
|---------|------------|---------|-----------|------------------------|------------------------|------------------------|
|         |            |         |           | Frequency<br>701.5 MHz | Frequency<br>707.5 MHz | Frequency<br>713.5 MHz |
| 12/5    | QPSK       | 1       | 0         | 22.72                  | 22.81                  | 22.69                  |
|         |            | 1       | 12        | 22.71                  | 22.80                  | 22.68                  |
|         |            | 1       | 24        | 22.68                  | 22.77                  | 22.65                  |
|         |            | 12      | 0         | 21.72                  | 21.82                  | 21.69                  |
|         |            | 12      | 6         | 21.70                  | 21.80                  | 21.67                  |
|         |            | 12      | 13        | 21.65                  | 21.75                  | 21.62                  |
|         |            | 25      | 0         | 21.73                  | 21.83                  | 21.70                  |
|         | 16QAM      | 1       | 0         | 21.68                  | 21.78                  | 21.65                  |
|         |            | 1       | 12        | 21.65                  | 21.75                  | 21.62                  |
|         |            | 1       | 24        | 21.64                  | 21.74                  | 21.61                  |
|         |            | 12      | 0         | 20.76                  | 20.86                  | 20.73                  |
|         |            | 12      | 6         | 20.75                  | 20.85                  | 20.72                  |
|         |            | 12      | 13        | 20.70                  | 20.80                  | 20.67                  |
|         |            | 25      | 0         | 20.68                  | 20.78                  | 20.65                  |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>23060      | Mid CH<br>23095        | High CH<br>23130     |
|---------|------------|---------|-----------|----------------------|------------------------|----------------------|
|         |            |         |           | Frequency<br>704 MHz | Frequency<br>707.5 MHz | Frequency<br>711 MHz |
| 12/10   | QPSK       | 1       | 0         | 22.75                | <b>22.84</b>           | 22.72                |
|         |            | 1       | 24        | 22.74                | 22.83                  | 22.71                |
|         |            | 1       | 49        | 22.71                | 22.80                  | 22.68                |
|         |            | 25      | 0         | 21.75                | 21.85                  | 21.72                |
|         |            | 25      | 12        | 21.73                | 21.83                  | 21.70                |
|         |            | 25      | 25        | 21.68                | 21.78                  | 21.65                |
|         |            | 50      | 0         | 21.76                | 21.86                  | 21.73                |
|         | 16QAM      | 1       | 0         | 21.71                | 21.81                  | 21.68                |
|         |            | 1       | 24        | 21.68                | 21.78                  | 21.65                |
|         |            | 1       | 49        | 21.67                | 21.77                  | 21.64                |
|         |            | 25      | 0         | 20.79                | 20.89                  | 20.76                |
|         |            | 25      | 12        | 20.78                | 20.88                  | 20.75                |
|         |            | 25      | 25        | 20.73                | 20.83                  | 20.70                |
|         |            | 50      | 0         | 20.71                | 20.81                  | 20.68                |

| Band/BW | Modulation | RB Size | RB Offset | CH 23205  | CH 23230  | CH 23255  |
|---------|------------|---------|-----------|-----------|-----------|-----------|
|         |            |         |           | 779.5 MHz | 782.0 MHz | 784.5 MHz |
| 13 / 5  | QPSK       | 1       | 0         | 22.72     | 22.75     | 22.81     |
|         |            | 1       | 12        | 22.71     | 22.74     | 22.80     |
|         |            | 1       | 24        | 22.68     | 22.71     | 22.77     |
|         |            | 12      | 0         | 21.77     | 21.80     | 21.86     |
|         |            | 12      | 6         | 21.75     | 21.78     | 21.84     |
|         |            | 12      | 13        | 21.70     | 21.73     | 21.79     |
|         |            | 25      | 0         | 21.78     | 21.81     | 21.87     |
|         | 16QAM      | 1       | 0         | 21.73     | 21.76     | 21.82     |
|         |            | 1       | 12        | 21.70     | 21.73     | 21.79     |
|         |            | 1       | 24        | 21.69     | 21.72     | 21.78     |
|         |            | 12      | 0         | 20.81     | 20.84     | 20.90     |
|         |            | 12      | 6         | 20.80     | 20.83     | 20.89     |
|         |            | 12      | 13        | 20.75     | 20.78     | 20.84     |
|         |            | 25      | 0         | 20.73     | 20.76     | 20.82     |

| Band/BW | Modulation | RB Size | RB Offset | CH  | CH 23230     | CH  |
|---------|------------|---------|-----------|-----|--------------|-----|
|         |            |         |           | MHz | 782.0 MHz    | MHz |
| 13 / 10 | QPSK       | 1       | 0         | /   | <b>22.78</b> | /   |
|         |            | 1       | 24        | /   | 22.77        | /   |
|         |            | 1       | 49        | /   | 22.74        | /   |
|         |            | 25      | 0         | /   | 21.72        | /   |
|         |            | 25      | 12        | /   | 21.70        | /   |
|         |            | 25      | 25        | /   | 21.65        | /   |
|         |            | 50      | 0         | /   | 21.73        | /   |
|         | 16QAM      | 1       | 0         | /   | 21.68        | /   |
|         |            | 1       | 24        | /   | 21.65        | /   |
|         |            | 1       | 49        | /   | 21.64        | /   |
|         |            | 25      | 0         | /   | 20.76        | /   |
|         |            | 25      | 12        | /   | 20.75        | /   |
|         |            | 25      | 25        | /   | 20.70        | /   |
|         |            | 50      | 0         | /   | 20.68        | /   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 26047         | Mid CH 26365         | High CH 26683        |
|---------|------------|---------|-----------|----------------------|----------------------|----------------------|
|         |            |         |           | Frequency 1850.7 MHz | Frequency 1882.5 MHz | Frequency 1914.3 MHz |
| 25/1.4  | QPSK       | 1       | 0         | 22.56                | 22.64                | 22.59                |
|         |            | 1       | 2         | 22.55                | 22.63                | 22.58                |
|         |            | 1       | 5         | 22.52                | 22.60                | 22.55                |
|         |            | 3       | 0         | 22.54                | 22.62                | 22.57                |
|         |            | 3       | 1         | 22.53                | 22.61                | 22.56                |
|         |            | 3       | 3         | 22.50                | 22.58                | 22.53                |
|         |            | 6       | 0         | 21.62                | 21.70                | 21.65                |
|         | 16QAM      | 1       | 0         | 21.57                | 21.65                | 21.60                |
|         |            | 1       | 2         | 21.54                | 21.62                | 21.57                |
|         |            | 1       | 5         | 21.53                | 21.61                | 21.56                |
|         |            | 3       | 0         | 21.56                | 21.64                | 21.59                |
|         |            | 3       | 1         | 21.53                | 21.61                | 21.56                |
|         |            | 3       | 3         | 21.52                | 21.60                | 21.55                |
|         |            | 6       | 0         | 20.57                | 20.65                | 20.60                |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 26055         | Mid CH 26365         | High CH 26675        |
|---------|------------|---------|-----------|----------------------|----------------------|----------------------|
|         |            |         |           | Frequency 1851.5 MHz | Frequency 1882.5 MHz | Frequency 1913.5 MHz |
| (25)/3  | QPSK       | 1       | 0         | 22.57                | 22.65                | 22.60                |
|         |            | 1       | 7         | 22.56                | 22.64                | 22.59                |
|         |            | 1       | 14        | 22.53                | 22.61                | 22.56                |
|         |            | 8       | 0         | 21.62                | 21.70                | 21.65                |
|         |            | 8       | 3         | 21.60                | 21.68                | 21.63                |
|         |            | 8       | 7         | 21.55                | 21.63                | 21.58                |
|         |            | 15      | 0         | 21.63                | 21.71                | 21.66                |
|         | 16QAM      | 1       | 0         | 21.58                | 21.66                | 21.61                |
|         |            | 1       | 7         | 21.55                | 21.63                | 21.58                |
|         |            | 1       | 14        | 21.54                | 21.62                | 21.57                |
|         |            | 8       | 0         | 20.66                | 20.74                | 20.69                |
|         |            | 8       | 3         | 20.65                | 20.73                | 20.68                |
|         |            | 8       | 7         | 20.60                | 20.68                | 20.63                |
|         |            | 15      | 0         | 20.58                | 20.66                | 20.61                |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26065         | Mid CH<br>26365         | High CH<br>26665        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1852.5 MHz | Frequency<br>1882.5 MHz | Frequency<br>1912.5 MHz |
| 25/5    | QPSK       | 1       | 0         | 22.59                   | 22.67                   | 22.62                   |
|         |            | 1       | 12        | 22.58                   | 22.66                   | 22.61                   |
|         |            | 1       | 24        | 22.55                   | 22.63                   | 22.58                   |
|         |            | 12      | 0         | 21.64                   | 21.72                   | 21.67                   |
|         |            | 12      | 6         | 21.62                   | 21.70                   | 21.65                   |
|         |            | 12      | 13        | 21.57                   | 21.65                   | 21.60                   |
|         |            | 25      | 0         | 21.65                   | 21.73                   | 21.68                   |
|         | 16QAM      | 1       | 0         | 21.60                   | 21.68                   | 21.63                   |
|         |            | 1       | 12        | 21.57                   | 21.65                   | 21.60                   |
|         |            | 1       | 24        | 21.56                   | 21.64                   | 21.59                   |
|         |            | 12      | 0         | 20.68                   | 20.76                   | 20.71                   |
|         |            | 12      | 6         | 20.67                   | 20.75                   | 20.70                   |
|         |            | 12      | 13        | 20.62                   | 20.70                   | 20.65                   |
|         |            | 25      | 0         | 20.60                   | 20.68                   | 20.63                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26090       | Mid CH<br>26365         | High CH<br>26640      |
|---------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|
|         |            |         |           | Frequency<br>1855 MHz | Frequency<br>1882.5 MHz | Frequency<br>1910 MHz |
| 25/10   | QPSK       | 1       | 0         | 22.61                 | 22.69                   | 22.64                 |
|         |            | 1       | 24        | 22.60                 | 22.68                   | 22.63                 |
|         |            | 1       | 49        | 22.57                 | 22.65                   | 22.60                 |
|         |            | 25      | 0         | 21.66                 | 21.74                   | 21.69                 |
|         |            | 25      | 12        | 21.64                 | 21.72                   | 21.67                 |
|         |            | 25      | 25        | 21.59                 | 21.67                   | 21.62                 |
|         |            | 50      | 0         | 21.67                 | 21.75                   | 21.70                 |
|         | 16QAM      | 1       | 0         | 21.62                 | 21.70                   | 21.65                 |
|         |            | 1       | 24        | 21.59                 | 21.67                   | 21.62                 |
|         |            | 1       | 49        | 21.58                 | 21.66                   | 21.61                 |
|         |            | 25      | 0         | 20.70                 | 20.78                   | 20.73                 |
|         |            | 25      | 12        | 20.69                 | 20.77                   | 20.72                 |
|         |            | 25      | 25        | 20.64                 | 20.72                   | 20.67                 |
|         |            | 50      | 0         | 20.62                 | 20.70                   | 20.65                 |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26115         | Mid CH<br>26365         | High CH<br>26615        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1857.5 MHz | Frequency<br>1882.5 MHz | Frequency<br>1907.5 MHz |
| 25/15   | QPSK       | 1       | 0         | 22.63                   | 22.71                   | 22.66                   |
|         |            | 1       | 37        | 22.62                   | 22.70                   | 22.65                   |
|         |            | 1       | 74        | 22.59                   | 22.67                   | 22.62                   |
|         |            | 36      | 0         | 21.68                   | 21.76                   | 21.71                   |
|         |            | 36      | 19        | 21.66                   | 21.74                   | 21.69                   |
|         |            | 36      | 39        | 21.61                   | 21.69                   | 21.64                   |
|         |            | 75      | 0         | 21.69                   | 21.77                   | 21.72                   |
|         | 16QAM      | 1       | 0         | 21.64                   | 21.72                   | 21.67                   |
|         |            | 1       | 37        | 21.61                   | 21.69                   | 21.64                   |
|         |            | 1       | 74        | 21.60                   | 21.68                   | 21.63                   |
|         |            | 36      | 0         | 20.72                   | 20.80                   | 20.75                   |
|         |            | 36      | 19        | 20.71                   | 20.79                   | 20.74                   |
|         |            | 36      | 39        | 20.66                   | 20.74                   | 20.69                   |
|         |            | 75      | 0         | 20.64                   | 20.72                   | 20.67                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26140       | Mid CH<br>26365         | High CH<br>26590      |
|---------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|
|         |            |         |           | Frequency<br>1860 MHz | Frequency<br>1882.5 MHz | Frequency<br>1905 MHz |
| 25/20   | QPSK       | 1       | 0         | 22.66                 | <b>22.74</b>            | 22.69                 |
|         |            | 1       | 50        | 22.65                 | 22.73                   | 22.68                 |
|         |            | 1       | 99        | 22.62                 | 22.70                   | 22.65                 |
|         |            | 50      | 0         | 21.71                 | 21.79                   | 21.74                 |
|         |            | 50      | 25        | 21.69                 | 21.77                   | 21.72                 |
|         |            | 50      | 50        | 21.64                 | 21.72                   | 21.67                 |
|         |            | 100     | 0         | 21.72                 | 21.80                   | 21.75                 |
|         | 16QAM      | 1       | 0         | 21.67                 | 21.75                   | 21.70                 |
|         |            | 1       | 50        | 21.64                 | 21.72                   | 21.67                 |
|         |            | 1       | 99        | 21.63                 | 21.71                   | 21.66                 |
|         |            | 50      | 0         | 20.75                 | 20.83                   | 20.78                 |
|         |            | 50      | 25        | 20.74                 | 20.82                   | 20.77                 |
|         |            | 50      | 50        | 20.69                 | 20.77                   | 20.72                 |
|         |            | 100     | 0         | 20.67                 | 20.75                   | 20.70                 |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26697          | Mid CH<br>(26915)       | High CH<br>27033         |
|---------|------------|---------|-----------|--------------------------|-------------------------|--------------------------|
|         |            |         |           | Frequency<br>(824.7) MHz | Frequency<br>(836.5)MHz | Frequency<br>(848.3) MHz |
| 26/1.4  | QPSK       | 1       | 0         | 22.66                    | 22.72                   | 22.64                    |
|         |            | 1       | 2         | 22.65                    | 22.71                   | 22.63                    |
|         |            | 1       | 5         | 22.62                    | 22.68                   | 22.60                    |
|         |            | 3       | 0         | 22.64                    | 22.70                   | 22.62                    |
|         |            | 3       | 1         | 22.63                    | 22.69                   | 22.61                    |
|         |            | 3       | 3         | 22.60                    | 22.66                   | 22.58                    |
|         |            | 6       | 0         | 21.72                    | 21.78                   | 21.70                    |
|         | 16QAM      | 1       | 0         | 21.67                    | 21.73                   | 21.65                    |
|         |            | 1       | 2         | 21.64                    | 21.70                   | 21.62                    |
|         |            | 1       | 5         | 21.63                    | 21.69                   | 21.61                    |
|         |            | 3       | 0         | 21.66                    | 21.72                   | 21.64                    |
|         |            | 3       | 1         | 21.63                    | 21.69                   | 21.61                    |
|         |            | 3       | 3         | 21.62                    | 21.68                   | 21.60                    |
|         |            | 6       | 0         | 20.67                    | 20.73                   | 20.65                    |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(26805)       | Mid CH<br>(26915)       | High CH<br>(27025)      |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>(825.5)MHz | Frequency<br>(836.5)MHz | Frequency<br>(847.5)MHz |
| (26)/3  | QPSK       | 1       | 0         | 22.67                   | 22.73                   | 22.65                   |
|         |            | 1       | 7         | 22.66                   | 22.72                   | 22.64                   |
|         |            | 1       | 14        | 22.63                   | 22.69                   | 22.61                   |
|         |            | 8       | 0         | 21.72                   | 21.78                   | 21.70                   |
|         |            | 8       | 3         | 21.70                   | 21.76                   | 21.68                   |
|         |            | 8       | 7         | 21.65                   | 21.71                   | 21.63                   |
|         |            | 15      | 0         | 21.73                   | 21.79                   | 21.71                   |
|         | 16QAM      | 1       | 0         | 21.68                   | 21.74                   | 21.66                   |
|         |            | 1       | 7         | 21.65                   | 21.71                   | 21.63                   |
|         |            | 1       | 14        | 21.64                   | 21.70                   | 21.62                   |
|         |            | 8       | 0         | 20.76                   | 20.82                   | 20.74                   |
|         |            | 8       | 3         | 20.75                   | 20.81                   | 20.73                   |
|         |            | 8       | 7         | 20.70                   | 20.76                   | 20.68                   |
|         |            | 15      | 0         | 20.68                   | 20.74                   | 20.66                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (26815)       | Mid CH (26915)       | High CH (27015)      |
|---------|------------|---------|-----------|----------------------|----------------------|----------------------|
|         |            |         |           | Frequency (826.5)MHz | Frequency (836.5)MHz | Frequency (846.5)MHz |
| (26)/5  | QPSK       | 1       | 0         | 22.69                | 22.75                | 22.67                |
|         |            | 1       | 12        | 22.68                | 22.74                | 22.66                |
|         |            | 1       | 24        | 22.65                | 22.71                | 22.63                |
|         |            | 12      | 0         | 21.74                | 21.80                | 21.72                |
|         |            | 12      | 6         | 21.72                | 21.78                | 21.70                |
|         |            | 12      | 13        | 21.67                | 21.73                | 21.65                |
|         |            | 25      | 0         | 21.75                | 21.81                | 21.73                |
|         | 16QAM      | 1       | 0         | 21.70                | 21.76                | 21.68                |
|         |            | 1       | 12        | 21.67                | 21.73                | 21.65                |
|         |            | 1       | 24        | 21.66                | 21.72                | 21.64                |
|         |            | 12      | 0         | 20.78                | 20.84                | 20.76                |
|         |            | 12      | 6         | 20.77                | 20.83                | 20.75                |
|         |            | 12      | 13        | 20.72                | 20.78                | 20.70                |
|         |            | 25      | 0         | 20.70                | 20.76                | 20.68                |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (26840)     | Mid CH (26915)       | High CH (26990)    |
|---------|------------|---------|-----------|--------------------|----------------------|--------------------|
|         |            |         |           | Frequency (829)MHz | Frequency (836.5)MHz | Frequency (844)MHz |
| (26)/10 | QPSK       | 1       | 0         | 22.71              | 22.77                | 22.69              |
|         |            | 1       | 24        | 22.70              | 22.76                | 22.68              |
|         |            | 1       | 49        | 22.67              | 22.73                | 22.65              |
|         |            | 25      | 0         | 21.76              | 21.82                | 21.74              |
|         |            | 25      | 12        | 21.74              | 21.80                | 21.72              |
|         |            | 25      | 25        | 21.69              | 21.75                | 21.67              |
|         |            | 50      | 0         | 21.77              | 21.83                | 21.75              |
|         | 16QAM      | 1       | 0         | 21.72              | 21.78                | 21.70              |
|         |            | 1       | 24        | 21.69              | 21.75                | 21.67              |
|         |            | 1       | 49        | 21.68              | 21.74                | 21.66              |
|         |            | 25      | 0         | 20.80              | 20.86                | 20.78              |
|         |            | 25      | 12        | 20.79              | 20.85                | 20.77              |
|         |            | 25      | 25        | 20.74              | 20.80                | 20.72              |
|         |            | 50      | 0         | 20.72              | 20.78                | 20.70              |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(26865)       | Mid CH<br>(26915)       | High CH<br>(26965)      |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>(831.5)MHz | Frequency<br>(836.5)MHz | Frequency<br>(841.5)MHz |
| (26)/15 | QPSK       | 1       | 0         | 22.73                   | <b>22.79</b>            | 22.71                   |
|         |            | 1       | 37        | 22.72                   | 22.78                   | 22.70                   |
|         |            | 1       | 74        | 22.69                   | 22.75                   | 22.67                   |
|         |            | 36      | 0         | 21.78                   | 21.84                   | 21.76                   |
|         |            | 36      | 19        | 21.76                   | 21.82                   | 21.74                   |
|         |            | 36      | 39        | 21.71                   | 21.77                   | 21.69                   |
|         |            | 75      | 0         | 21.79                   | 21.85                   | 21.77                   |
|         | 16QAM      | 1       | 0         | 21.74                   | 21.80                   | 21.72                   |
|         |            | 1       | 37        | 21.71                   | 21.77                   | 21.69                   |
|         |            | 1       | 74        | 21.70                   | 21.76                   | 21.68                   |
|         |            | 36      | 0         | 20.82                   | 20.88                   | 20.80                   |
|         |            | 36      | 19        | 20.81                   | 20.87                   | 20.79                   |
|         |            | 36      | 39        | 20.76                   | 20.82                   | 20.74                   |
|         |            | 75      | 0         | 20.74                   | 20.80                   | 20.72                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>27685 | Mid CH<br>27710 | High CH<br>27735 |
|---------|------------|---------|-----------|-----------------|-----------------|------------------|
|         |            |         |           | 2307.5<br>MHz   | 2310.0<br>MHz   | 2312.5<br>MHz    |
| 30 / 5  | QPSK       | 1       | 0         | 22.68           | 22.71           | 22.66            |
|         |            | 1       | 12        | 22.67           | 22.70           | 22.65            |
|         |            | 1       | 24        | 22.64           | 22.67           | 22.62            |
|         |            | 12      | 0         | 21.73           | 21.76           | 21.71            |
|         |            | 12      | 6         | 21.71           | 21.74           | 21.69            |
|         |            | 12      | 13        | 21.66           | 21.69           | 21.64            |
|         |            | 25      | 0         | 21.74           | 21.77           | 21.72            |
|         | 16QAM      | 1       | 0         | 21.69           | 21.72           | 21.67            |
|         |            | 1       | 12        | 21.66           | 21.69           | 21.64            |
|         |            | 1       | 24        | 21.65           | 21.68           | 21.63            |
|         |            | 12      | 0         | 20.77           | 20.80           | 20.75            |
|         |            | 12      | 6         | 20.76           | 20.79           | 20.74            |
|         |            | 12      | 13        | 20.71           | 20.74           | 20.69            |
|         |            | 25      | 0         | 20.69           | 20.72           | 20.67            |

| Band/BW | Modulation | RB Size | RB Offset | CH  | Mid CH<br>27710 | CH  |
|---------|------------|---------|-----------|-----|-----------------|-----|
|         |            |         |           | MHz | 2310.0<br>MHz   | MHz |
| 30 / 10 | QPSK       | 1       | 0         | /   | <b>22.69</b>    | /   |
|         |            | 1       | 24        | /   | 22.68           | /   |
|         |            | 1       | 49        | /   | 22.65           | /   |
|         |            | 25      | 0         | /   | 21.74           | /   |
|         |            | 25      | 12        | /   | 21.72           | /   |
|         |            | 25      | 25        | /   | 21.67           | /   |
|         |            | 50      | 0         | /   | 21.75           | /   |
|         | 16QAM      | 1       | 0         | /   | 21.70           | /   |
|         |            | 1       | 24        | /   | 21.67           | /   |
|         |            | 1       | 49        | /   | 21.66           | /   |
|         |            | 25      | 0         | /   | 20.78           | /   |
|         |            | 25      | 12        | /   | 20.77           | /   |
|         |            | 25      | 25        | /   | 20.72           | /   |
|         |            | 50      | 0         | /   | 20.70           | /   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (39675)        | Mid CH (40620)      | High CH (41565)       |
|---------|------------|---------|-----------|-----------------------|---------------------|-----------------------|
|         |            |         |           | Frequency (2498.5)MHz | Frequency (2593)MHz | Frequency (2687.5)MHz |
| (41)/5  | QPSK       | 1       | 0         | 22.53                 | 22.69               | 22.51                 |
|         |            | 1       | 12        | 22.52                 | 22.68               | 22.50                 |
|         |            | 1       | 24        | 22.49                 | 22.65               | 22.47                 |
|         |            | 12      | 0         | 21.58                 | 21.74               | 21.56                 |
|         |            | 12      | 6         | 21.56                 | 21.72               | 21.54                 |
|         |            | 12      | 13        | 21.51                 | 21.67               | 21.49                 |
|         |            | 25      | 0         | 21.59                 | 21.75               | 21.57                 |
|         | 16QAM      | 1       | 0         | 21.54                 | 21.70               | 21.52                 |
|         |            | 1       | 12        | 21.51                 | 21.67               | 21.49                 |
|         |            | 1       | 24        | 21.50                 | 21.66               | 21.48                 |
|         |            | 12      | 0         | 20.62                 | 20.78               | 20.60                 |
|         |            | 12      | 6         | 20.61                 | 20.77               | 20.59                 |
|         |            | 12      | 13        | 20.56                 | 20.72               | 20.54                 |
|         |            | 25      | 0         | 20.54                 | 20.70               | 20.52                 |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (39700)      | Mid CH (40620)      | High CH (41540)     |
|---------|------------|---------|-----------|---------------------|---------------------|---------------------|
|         |            |         |           | Frequency (2501)MHz | Frequency (2593)MHz | Frequency (2685)MHz |
| (41)/10 | QPSK       | 1       | 0         | 22.56               | 22.72               | 22.54               |
|         |            | 1       | 24        | 22.55               | 22.71               | 22.53               |
|         |            | 1       | 49        | 22.52               | 22.68               | 22.50               |
|         |            | 25      | 0         | 21.61               | 21.77               | 21.59               |
|         |            | 25      | 12        | 21.59               | 21.75               | 21.57               |
|         |            | 25      | 25        | 21.54               | 21.70               | 21.52               |
|         |            | 50      | 0         | 21.62               | 21.78               | 21.60               |
|         | 16QAM      | 1       | 0         | 21.57               | 21.73               | 21.55               |
|         |            | 1       | 24        | 21.54               | 21.70               | 21.52               |
|         |            | 1       | 49        | 21.53               | 21.69               | 21.51               |
|         |            | 25      | 0         | 20.65               | 20.81               | 20.63               |
|         |            | 25      | 12        | 20.64               | 20.80               | 20.62               |
|         |            | 25      | 25        | 20.59               | 20.75               | 20.57               |
|         |            | 50      | 0         | 20.57               | 20.73               | 20.55               |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (39725)        | Mid CH (40620)      | High CH (41515)       |
|---------|------------|---------|-----------|-----------------------|---------------------|-----------------------|
|         |            |         |           | Frequency (2503.5)MHz | Frequency (2593)MHz | Frequency (2682.5)MHz |
| (41)/15 | QPSK       | 1       | 0         | 22.60                 | 22.76               | 22.58                 |
|         |            | 1       | 37        | 22.59                 | 22.75               | 22.57                 |
|         |            | 1       | 74        | 22.56                 | 22.72               | 22.54                 |
|         |            | 36      | 0         | 21.65                 | 21.81               | 21.63                 |
|         |            | 36      | 19        | 21.63                 | 21.79               | 21.61                 |
|         |            | 36      | 39        | 21.58                 | 21.74               | 21.56                 |
|         |            | 75      | 0         | 21.66                 | 21.82               | 21.64                 |
|         | 16QAM      | 1       | 0         | 21.61                 | 21.77               | 21.59                 |
|         |            | 1       | 37        | 21.58                 | 21.74               | 21.56                 |
|         |            | 1       | 74        | 21.57                 | 21.73               | 21.55                 |
|         |            | 36      | 0         | 20.69                 | 20.85               | 20.67                 |
|         |            | 36      | 19        | 20.68                 | 20.84               | 20.66                 |
|         |            | 36      | 39        | 20.63                 | 20.79               | 20.61                 |
|         |            | 75      | 0         | 20.61                 | 20.77               | 20.59                 |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (39750)      | Mid CH (40620)      | High CH (41490)     |
|---------|------------|---------|-----------|---------------------|---------------------|---------------------|
|         |            |         |           | Frequency (2506)MHz | Frequency (2593)MHz | Frequency (2680)MHz |
| (41)/20 | QPSK       | 1       | 0         | 22.66               | <b>22.82</b>        | 22.64               |
|         |            | 1       | 50        | 22.65               | 22.81               | 22.63               |
|         |            | 1       | 99        | 22.62               | 22.78               | 22.60               |
|         |            | 50      | 0         | 21.71               | 21.87               | 21.69               |
|         |            | 50      | 25        | 21.69               | 21.85               | 21.67               |
|         |            | 50      | 50        | 21.64               | 21.80               | 21.62               |
|         |            | 100     | 0         | 21.72               | 21.88               | 21.70               |
|         | 16QAM      | 1       | 0         | 21.67               | 21.83               | 21.65               |
|         |            | 1       | 50        | 21.64               | 21.80               | 21.62               |
|         |            | 1       | 99        | 21.63               | 21.79               | 21.61               |
|         |            | 50      | 0         | 20.75               | 20.91               | 20.73               |
|         |            | 50      | 25        | 20.74               | 20.90               | 20.72               |
|         |            | 50      | 50        | 20.69               | 20.85               | 20.67               |
|         |            | 100     | 0         | 20.67               | 20.83               | 20.65               |

**APPENDIX B: TEST DATA FOR EFFECTIVE (ISOTROPIC) RADIATED POWER**

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18607 | Mid CH 18900 | High CH 19193 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1850.7 MHz   | 1880.0 MHz   | 1909.3 MHz    |
| 2/1.4   | QPSK       | 1       | 0         | 24.17        | 24.37        | 24.49         |
|         |            | 1       | 2         | 24.09        | 24.07        | 24.37         |
|         |            | 1       | 5         | 24.31        | 24.12        | 24.22         |
|         |            | 3       | 0         | 24.29        | 24.25        | 24.16         |
|         |            | 3       | 1         | 24.17        | 24.45        | 23.99         |
|         |            | 3       | 3         | 24.17        | 24.22        | 24.04         |
|         |            | 6       | 0         | 23.22        | 23.42        | 23.18         |
|         | 16QAM      | 1       | 0         | 23.35        | 23.22        | 23.17         |
|         |            | 1       | 2         | 23.38        | 23.38        | 23.21         |
|         |            | 1       | 5         | 23.20        | 23.31        | 23.22         |
|         |            | 3       | 0         | 23.32        | 23.40        | 23.43         |
|         |            | 3       | 1         | 23.28        | 23.26        | 23.06         |
|         |            | 3       | 3         | 23.17        | 23.35        | 22.94         |
|         |            | 6       | 0         | 22.15        | 22.19        | 22.36         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18615 | Mid CH 18900 | High CH 19185 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1851.5 MHz   | 1880.0 MHz   | 1908.5 MHz    |
| 2/3     | QPSK       | 1       | 0         | 24.10        | 24.51        | 24.29         |
|         |            | 1       | 7         | 23.97        | 24.55        | 24.28         |
|         |            | 1       | 14        | 24.23        | 24.52        | 24.39         |
|         |            | 8       | 0         | 23.07        | 23.35        | 23.27         |
|         |            | 8       | 3         | 23.35        | 23.28        | 23.19         |
|         |            | 8       | 7         | 23.22        | 23.24        | 23.42         |
|         |            | 15      | 0         | 23.30        | 23.14        | 23.32         |
|         | 16QAM      | 1       | 0         | 23.10        | 23.31        | 23.37         |
|         |            | 1       | 7         | 23.39        | 23.24        | 23.35         |
|         |            | 1       | 14        | 23.45        | 23.23        | 23.28         |
|         |            | 8       | 0         | 22.36        | 22.61        | 22.54         |
|         |            | 8       | 3         | 22.50        | 22.25        | 22.24         |
|         |            | 8       | 7         | 22.25        | 22.49        | 22.21         |
|         |            | 15      | 0         | 22.33        | 22.45        | 22.41         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18625 | Mid CH 18900 | High CH 19175 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1852.5 MHz   | 1880.0 MHz   | 1907.5 MHz    |
| 2/5     | QPSK       | 1       | 0         | 24.41        | 24.41        | 24.34         |
|         |            | 1       | 12        | 24.28        | 24.60        | 24.33         |
|         |            | 1       | 24        | 24.41        | 24.40        | 24.19         |
|         |            | 12      | 0         | 23.29        | 23.13        | 23.37         |
|         |            | 12      | 6         | 23.27        | 23.43        | 23.31         |
|         |            | 12      | 13        | 23.35        | 23.48        | 23.49         |
|         |            | 25      | 0         | 23.49        | 23.32        | 23.30         |
|         | 16QAM      | 1       | 0         | 23.42        | 23.21        | 23.38         |
|         |            | 1       | 12        | 23.22        | 23.16        | 23.58         |
|         |            | 1       | 24        | 23.29        | 23.36        | 23.22         |
|         |            | 12      | 0         | 22.48        | 22.35        | 22.60         |
|         |            | 12      | 6         | 22.31        | 22.45        | 22.27         |
|         |            | 12      | 13        | 22.24        | 22.33        | 22.16         |
|         |            | 25      | 0         | 22.46        | 22.36        | 22.21         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18650 | Mid CH 18900 | High CH 19150 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1855.0 MHz   | 1880.0 MHz   | 1905.0 MHz    |
| 2/10    | QPSK       | 1       | 0         | 24.23        | 24.25        | 24.44         |
|         |            | 1       | 24        | 24.40        | 24.40        | 24.39         |
|         |            | 1       | 49        | 24.54        | 24.36        | 24.06         |
|         |            | 25      | 0         | 23.52        | 23.57        | 23.30         |
|         |            | 25      | 12        | 23.57        | 23.53        | 23.55         |
|         |            | 25      | 25        | 23.27        | 23.29        | 23.31         |
|         |            | 50      | 0         | 23.18        | 23.28        | 23.41         |
|         | 16QAM      | 1       | 0         | 23.45        | 23.18        | 23.37         |
|         |            | 1       | 24        | 23.46        | 23.20        | 23.37         |
|         |            | 1       | 49        | 23.34        | 23.41        | 23.35         |
|         |            | 25      | 0         | 22.55        | 22.29        | 22.38         |
|         |            | 25      | 12        | 22.50        | 22.44        | 22.60         |
|         |            | 25      | 25        | 22.24        | 22.61        | 22.43         |
|         |            | 50      | 0         | 22.41        | 22.17        | 22.14         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18675 | Mid CH 18900 | High CH 19125 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1857.5 MHz   | 1880.0 MHz   | 1902.5 MHz    |
| 2/15    | QPSK       | 1       | 0         | 24.14        | 24.17        | 24.53         |
|         |            | 1       | 37        | 24.42        | 24.24        | 24.18         |
|         |            | 1       | 74        | 24.08        | 24.21        | 24.07         |
|         |            | 36      | 0         | 23.48        | 23.66        | 23.20         |
|         |            | 36      | 19        | 23.41        | 23.51        | 23.37         |
|         |            | 36      | 39        | 23.13        | 23.43        | 23.34         |
|         | 16QAM      | 75      | 0         | 23.56        | 23.34        | 23.60         |
|         |            | 1       | 0         | 23.51        | 23.40        | 23.40         |
|         |            | 1       | 37        | 23.23        | 23.25        | 23.56         |
|         |            | 1       | 74        | 23.40        | 23.13        | 23.26         |
|         |            | 36      | 0         | 22.29        | 22.27        | 22.54         |
|         |            | 36      | 19        | 22.32        | 22.58        | 22.41         |
|         |            | 36      | 39        | 22.37        | 22.46        | 22.32         |
|         |            | 75      | 0         | 22.45        | 22.52        | 22.40         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 18700 | Mid CH 18900 | High CH 19100 |
|---------|------------|---------|-----------|--------------|--------------|---------------|
|         |            |         |           | 1860.0 MHz   | 1880.0 MHz   | 1900.0 MHz    |
| 2/20    | QPSK       | 1       | 0         | 24.48        | 24.45        | 24.44         |
|         |            | 1       | 50        | 24.27        | 24.63        | 24.36         |
|         |            | 1       | 99        | 24.30        | 24.46        | 24.26         |
|         |            | 50      | 0         | 23.32        | 23.53        | 23.73         |
|         |            | 50      | 25        | 23.39        | 23.38        | 23.58         |
|         |            | 50      | 50        | 23.39        | 23.57        | 23.45         |
|         |            | 100     | 0         | 23.48        | 23.50        | 23.67         |
|         | 16QAM      | 1       | 0         | 23.25        | 23.46        | 23.54         |
|         |            | 1       | 50        | 23.29        | 23.45        | 23.50         |
|         |            | 1       | 99        | 23.33        | 23.16        | 23.61         |
|         |            | 50      | 0         | 22.39        | 22.51        | 22.34         |
|         |            | 50      | 25        | 22.36        | 22.57        | 22.44         |
|         |            | 50      | 50        | 22.50        | 22.45        | 22.47         |
|         |            | 100     | 0         | 22.61        | 22.48        | 22.36         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>19957         | Mid CH<br>20175         | High CH<br>20393        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1710.7 MHz | Frequency<br>1732.5 MHz | Frequency<br>1754.3 MHz |
| 4/1.4   | QPSK       | 1       | 0         | 24.77                   | 24.70                   | 24.63                   |
|         |            | 1       | 2         | 24.68                   | 24.63                   | 24.73                   |
|         |            | 1       | 5         | 24.56                   | 24.46                   | 24.67                   |
|         |            | 3       | 0         | 24.66                   | 24.55                   | 24.50                   |
|         |            | 3       | 1         | 24.78                   | 24.61                   | 24.59                   |
|         |            | 3       | 3         | 24.71                   | 24.69                   | 24.58                   |
|         |            | 6       | 0         | 23.77                   | 23.53                   | 23.70                   |
|         | 16QAM      | 1       | 0         | 23.60                   | 23.75                   | 23.73                   |
|         |            | 1       | 2         | 23.88                   | 23.61                   | 23.77                   |
|         |            | 1       | 5         | 23.62                   | 23.70                   | 23.52                   |
|         |            | 3       | 0         | 23.52                   | 23.67                   | 23.60                   |
|         |            | 3       | 1         | 23.52                   | 23.65                   | 23.57                   |
|         |            | 3       | 3         | 23.50                   | 23.65                   | 23.70                   |
|         |            | 6       | 0         | 22.79                   | 22.74                   | 22.79                   |
| Limit:  |            | 30      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>19965         | Mid CH<br>20175         | High CH<br>20385        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1711.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1753.5 MHz |
| 4/3     | QPSK       | 1       | 0         | 24.65                   | 24.73                   | 24.87                   |
|         |            | 1       | 7         | 24.88                   | 24.50                   | 24.56                   |
|         |            | 1       | 14        | 24.80                   | 24.73                   | 24.55                   |
|         |            | 8       | 0         | 23.92                   | 23.69                   | 23.49                   |
|         |            | 8       | 3         | 23.81                   | 23.56                   | 23.94                   |
|         |            | 8       | 7         | 23.67                   | 23.64                   | 23.72                   |
|         |            | 15      | 0         | 23.89                   | 23.57                   | 23.69                   |
|         | 16QAM      | 1       | 0         | 23.70                   | 23.57                   | 23.60                   |
|         |            | 1       | 7         | 23.63                   | 23.74                   | 23.64                   |
|         |            | 1       | 14        | 23.60                   | 23.56                   | 23.87                   |
|         |            | 8       | 0         | 22.84                   | 22.54                   | 22.59                   |
|         |            | 8       | 3         | 22.75                   | 22.88                   | 22.84                   |
|         |            | 8       | 7         | 22.81                   | 22.71                   | 22.61                   |
|         |            | 15      | 0         | 22.79                   | 22.46                   | 22.66                   |
| Limit:  |            | 30      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>19975         | Mid CH<br>20175         | High CH<br>20375        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1712.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1752.5 MHz |
| 4/5     | QPSK       | 1       | 0         | 24.82                   | 24.65                   | 24.76                   |
|         |            | 1       | 12        | 24.79                   | 24.44                   | 24.55                   |
|         |            | 1       | 24        | 24.46                   | 24.52                   | 24.55                   |
|         |            | 12      | 0         | 23.93                   | 23.76                   | 23.67                   |
|         |            | 12      | 6         | 23.78                   | 23.91                   | 23.53                   |
|         |            | 12      | 13        | 23.64                   | 23.43                   | 23.83                   |
|         |            | 25      | 0         | 23.82                   | 23.72                   | 23.94                   |
|         | 16QAM      | 1       | 0         | 23.93                   | 23.73                   | 23.49                   |
|         |            | 1       | 12        | 23.52                   | 23.69                   | 23.76                   |
|         |            | 1       | 24        | 23.80                   | 23.77                   | 23.87                   |
|         |            | 12      | 0         | 22.86                   | 22.80                   | 22.90                   |
|         |            | 12      | 6         | 22.87                   | 22.72                   | 22.73                   |
|         |            | 12      | 13        | 22.73                   | 22.57                   | 22.73                   |
|         |            | 25      | 0         | 22.84                   | 22.88                   | 22.56                   |
| Limit:  |            | 30      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20000       | Mid CH<br>20175         | High CH<br>20350      |
|---------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|
|         |            |         |           | Frequency<br>1715 MHz | Frequency<br>1732.5 MHz | Frequency<br>1750 MHz |
| 4/10    | QPSK       | 1       | 0         | 24.80                 | 24.84                   | 24.78                 |
|         |            | 1       | 24        | 24.76                 | 24.90                   | 24.73                 |
|         |            | 1       | 49        | 24.73                 | 24.79                   | 24.79                 |
|         |            | 25      | 0         | 23.92                 | 23.86                   | 23.68                 |
|         |            | 25      | 12        | 23.81                 | 23.73                   | 23.92                 |
|         |            | 25      | 25        | 23.72                 | 23.62                   | 23.71                 |
|         |            | 50      | 0         | 23.85                 | 23.82                   | 23.82                 |
|         | 16QAM      | 1       | 0         | 23.85                 | 23.68                   | 23.74                 |
|         |            | 1       | 24        | 23.85                 | 23.70                   | 23.87                 |
|         |            | 1       | 49        | 23.72                 | 23.79                   | 23.94                 |
|         |            | 25      | 0         | 22.69                 | 23.07                   | 22.81                 |
|         |            | 25      | 12        | 22.76                 | 22.94                   | 23.04                 |
|         |            | 25      | 25        | 22.60                 | 22.67                   | 22.94                 |
|         |            | 50      | 0         | 22.93                 | 22.71                   | 22.82                 |
| Limit:  |            | 30      |           |                       |                         |                       |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20025         | Mid CH<br>20175         | High CH<br>20325        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1717.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1747.5 MHz |
| 4/15    | QPSK       | 1       | 0         | 24.97                   | 24.71                   | 24.87                   |
|         |            | 1       | 37        | 24.71                   | 24.74                   | 24.86                   |
|         |            | 1       | 74        | 24.90                   | 24.70                   | 24.76                   |
|         |            | 36      | 0         | 23.98                   | 23.69                   | 23.85                   |
|         |            | 36      | 19        | 23.76                   | 23.89                   | 23.82                   |
|         |            | 36      | 39        | 23.65                   | 23.98                   | 23.77                   |
|         |            | 75      | 0         | 23.81                   | 24.04                   | 23.92                   |
|         | 16QAM      | 1       | 0         | 23.85                   | 23.61                   | 23.90                   |
|         |            | 1       | 37        | 23.60                   | 23.84                   | 23.91                   |
|         |            | 1       | 74        | 23.80                   | 23.72                   | 23.61                   |
|         |            | 36      | 0         | 22.91                   | 22.95                   | 22.93                   |
|         |            | 36      | 19        | 22.95                   | 22.91                   | 22.70                   |
|         |            | 36      | 39        | 22.68                   | 22.74                   | 22.77                   |
|         |            | 75      | 0         | 22.69                   | 22.75                   | 22.78                   |
| Limit:  |            | 30      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH 20050       | Mid CH 20175         | High CH 20300      |
|---------|------------|---------|-----------|--------------------|----------------------|--------------------|
|         |            |         |           | Frequency 1720 MHz | Frequency 1732.5 MHz | Frequency 1745 MHz |
| 4/20    | QPSK       | 1       | 0         | 24.80              | 24.83                | 24.77              |
|         |            | 1       | 50        | 24.95              | 24.70                | 24.78              |
|         |            | 1       | 99        | 24.79              | 24.76                | 24.78              |
|         |            | 50      | 0         | 24.09              | 23.85                | 23.72              |
|         |            | 50      | 25        | 23.97              | 23.73                | 23.87              |
|         |            | 50      | 50        | 24.03              | 23.77                | 24.01              |
|         |            | 100     | 0         | 23.85              | 23.98                | 23.89              |
|         | 16QAM      | 1       | 0         | 23.84              | 23.91                | 23.85              |
|         |            | 1       | 50        | 23.99              | 23.87                | 23.68              |
|         |            | 1       | 99        | 23.91              | 23.80                | 23.90              |
|         |            | 50      | 0         | 22.89              | 22.86                | 23.01              |
|         |            | 50      | 25        | 23.04              | 22.86                | 22.73              |
|         |            | 50      | 50        | 22.80              | 22.87                | 22.82              |
|         |            | 100     | 0         | 22.99              | 22.61                | 22.73              |
| Limit:  |            | 30      |           |                    |                      |                    |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26697          | Mid CH<br>(26915)       | High CH<br>27033         |
|---------|------------|---------|-----------|--------------------------|-------------------------|--------------------------|
|         |            |         |           | Frequency<br>(824.7) MHz | Frequency<br>(836.5)MHz | Frequency<br>(848.3) MHz |
| 5/1.4   | QPSK       | 1       | 0         | 24.04                    | 23.98                   | 24.14                    |
|         |            | 1       | 2         | 24.10                    | 24.26                   | 24.14                    |
|         |            | 1       | 5         | 24.08                    | 24.07                   | 24.15                    |
|         |            | 3       | 0         | 24.19                    | 24.15                   | 23.84                    |
|         |            | 3       | 1         | 24.23                    | 24.06                   | 24.29                    |
|         |            | 3       | 3         | 24.10                    | 24.26                   | 24.24                    |
|         |            | 6       | 0         | 23.13                    | 23.07                   | 23.32                    |
|         | 16QAM      | 1       | 0         | 23.43                    | 23.19                   | 23.24                    |
|         |            | 1       | 2         | 22.98                    | 23.16                   | 23.19                    |
|         |            | 1       | 5         | 23.21                    | 23.21                   | 23.42                    |
|         |            | 3       | 0         | 23.28                    | 23.29                   | 22.99                    |
|         |            | 3       | 1         | 23.25                    | 22.89                   | 23.01                    |
|         |            | 3       | 3         | 23.03                    | 23.10                   | 23.27                    |
|         |            | 6       | 0         | 22.33                    | 22.28                   | 21.99                    |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(26805)       | Mid CH<br>(26915)       | High CH<br>(27025)      |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>(825.5)MHz | Frequency<br>(836.5)MHz | Frequency<br>(847.5)MHz |
| 5/3     | QPSK       | 1       | 0         | 24.13                   | 24.26                   | 24.11                   |
|         |            | 1       | 7         | 24.03                   | 23.92                   | 24.22                   |
|         |            | 1       | 14        | 24.29                   | 23.90                   | 24.24                   |
|         |            | 8       | 0         | 23.28                   | 23.37                   | 23.18                   |
|         |            | 8       | 3         | 23.08                   | 23.30                   | 23.21                   |
|         |            | 8       | 7         | 23.11                   | 23.26                   | 23.05                   |
|         |            | 15      | 0         | 23.18                   | 23.21                   | 23.25                   |
|         | 16QAM      | 1       | 0         | 23.26                   | 23.26                   | 23.02                   |
|         |            | 1       | 7         | 23.16                   | 23.29                   | 22.89                   |
|         |            | 1       | 14        | 23.22                   | 23.17                   | 23.40                   |
|         |            | 8       | 0         | 22.46                   | 22.13                   | 22.34                   |
|         |            | 8       | 3         | 22.10                   | 22.25                   | 22.44                   |
|         |            | 8       | 7         | 22.26                   | 22.15                   | 22.24                   |
|         |            | 15      | 0         | 22.31                   | 22.13                   | 22.19                   |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (26815)       | Mid CH (26915)       | High CH (27015)      |
|---------|------------|---------|-----------|----------------------|----------------------|----------------------|
|         |            |         |           | Frequency (826.5)MHz | Frequency (836.5)MHz | Frequency (846.5)MHz |
| 5/5     | QPSK       | 1       | 0         | 23.99                | 24.24                | 24.44                |
|         |            | 1       | 12        | 24.36                | 24.39                | 24.10                |
|         |            | 1       | 24        | 24.35                | 23.99                | 24.29                |
|         |            | 12      | 0         | 23.12                | 23.44                | 23.33                |
|         |            | 12      | 6         | 22.92                | 23.42                | 23.43                |
|         |            | 12      | 13        | 23.15                | 23.29                | 23.21                |
|         | 16QAM      | 25      | 0         | 23.41                | 23.41                | 23.25                |
|         |            | 1       | 0         | 23.36                | 23.22                | 23.26                |
|         |            | 1       | 12        | 23.44                | 23.44                | 23.28                |
|         |            | 1       | 24        | 23.16                | 23.32                | 23.50                |
|         |            | 12      | 0         | 22.05                | 22.32                | 22.42                |
|         |            | 12      | 6         | 22.34                | 22.44                | 22.50                |
|         |            | 12      | 13        | 22.55                | 22.24                | 22.27                |
|         |            | 25      | 0         | 22.29                | 22.39                | 22.06                |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (26840)     | Mid CH (26915)       | High CH (26990)    |
|---------|------------|---------|-----------|--------------------|----------------------|--------------------|
|         |            |         |           | Frequency (829)MHz | Frequency (836.5)MHz | Frequency (844)MHz |
| 5/10    | QPSK       | 1       | 0         | 24.39              | 24.36                | 24.08              |
|         |            | 1       | 24        | 24.18              | 24.22                | 24.31              |
|         |            | 1       | 49        | 24.46              | 24.29                | 24.14              |
|         |            | 25      | 0         | 23.32              | 23.31                | 23.43              |
|         |            | 25      | 12        | 23.51              | 23.34                | 23.17              |
|         |            | 25      | 25        | 23.14              | 23.30                | 23.27              |
|         |            | 50      | 0         | 23.45              | 23.11                | 23.43              |
|         | 16QAM      | 1       | 0         | 23.17              | 23.45                | 23.15              |
|         |            | 1       | 24        | 23.15              | 23.18                | 23.43              |
|         |            | 1       | 49        | 23.23              | 23.42                | 23.32              |
|         |            | 25      | 0         | 22.30              | 22.13                | 22.53              |
|         |            | 25      | 12        | 22.40              | 22.52                | 22.26              |
|         |            | 25      | 25        | 22.22              | 22.26                | 22.34              |
|         |            | 50      | 0         | 21.99              | 22.39                | 22.14              |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20775         | Mid CH<br>21100       | High CH<br>21425        |
|---------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|
|         |            |         |           | Frequency<br>2502.5 MHz | Frequency<br>2535 MHz | Frequency<br>2567.5 MHz |
| 7/5     | QPSK       | 1       | 0         | 23.48                   | 23.57                 | 23.71                   |
|         |            | 1       | 12        | 23.54                   | 23.43                 | 23.32                   |
|         |            | 1       | 24        | 23.35                   | 23.66                 | 23.34                   |
|         |            | 12      | 0         | 22.60                   | 22.68                 | 22.66                   |
|         |            | 12      | 6         | 22.68                   | 22.63                 | 22.37                   |
|         |            | 12      | 13        | 22.51                   | 22.35                 | 22.58                   |
|         |            | 25      | 0         | 22.58                   | 22.55                 | 22.60                   |
|         | 16QAM      | 1       | 0         | 22.55                   | 22.62                 | 22.52                   |
|         |            | 1       | 12        | 22.62                   | 22.44                 | 22.42                   |
|         |            | 1       | 24        | 22.59                   | 22.32                 | 22.51                   |
|         |            | 12      | 0         | 21.53                   | 21.45                 | 21.82                   |
|         |            | 12      | 6         | 21.63                   | 21.52                 | 21.82                   |
|         |            | 12      | 13        | 21.68                   | 21.60                 | 21.64                   |
|         |            | 25      | 0         | 21.58                   | 21.62                 | 21.55                   |
| Limit:  |            | 33      |           |                         |                       |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20800       | Mid CH<br>21100       | High CH<br>21400      |
|---------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|
|         |            |         |           | Frequency<br>2505 MHz | Frequency<br>2535 MHz | Frequency<br>2565 MHz |
| 7/10    | QPSK       | 1       | 0         | 23.66                 | 23.50                 | 23.65                 |
|         |            | 1       | 24        | 23.72                 | 23.71                 | 23.35                 |
|         |            | 1       | 49        | 23.71                 | 23.53                 | 23.64                 |
|         |            | 25      | 0         | 22.56                 | 22.58                 | 22.69                 |
|         |            | 25      | 12        | 22.73                 | 22.51                 | 22.51                 |
|         |            | 25      | 25        | 22.60                 | 22.40                 | 22.53                 |
|         |            | 50      | 0         | 22.71                 | 22.53                 | 22.81                 |
|         | 16QAM      | 1       | 0         | 22.77                 | 22.60                 | 22.48                 |
|         |            | 1       | 24        | 22.63                 | 22.61                 | 22.51                 |
|         |            | 1       | 49        | 22.57                 | 22.75                 | 22.50                 |
|         |            | 25      | 0         | 21.65                 | 21.68                 | 21.72                 |
|         |            | 25      | 12        | 21.73                 | 21.76                 | 21.56                 |
|         |            | 25      | 25        | 21.53                 | 21.55                 | 21.44                 |
|         |            | 50      | 0         | 21.58                 | 21.44                 | 21.48                 |
| Limit:  |            | 33      |           |                       |                       |                       |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20825         | Mid CH<br>21100       | High CH<br>21375        |
|---------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|
|         |            |         |           | Frequency<br>2507.5 MHz | Frequency<br>2535 MHz | Frequency<br>2562.5 MHz |
| 7/15    | QPSK       | 1       | 0         | 23.13                   | 23.24                 | 23.47                   |
|         |            | 1       | 37        | 23.37                   | 23.39                 | 22.91                   |
|         |            | 1       | 74        | 23.12                   | 23.25                 | 23.30                   |
|         |            | 36      | 0         | 22.58                   | 22.39                 | 22.10                   |
|         |            | 36      | 19        | 22.54                   | 22.44                 | 22.46                   |
|         |            | 36      | 39        | 22.64                   | 22.60                 | 22.09                   |
|         |            | 75      | 0         | 22.47                   | 22.45                 | 21.84                   |
|         | 16QAM      | 1       | 0         | 22.32                   | 22.12                 | 22.40                   |
|         |            | 1       | 37        | 22.08                   | 22.52                 | 22.28                   |
|         |            | 1       | 74        | 22.29                   | 22.21                 | 22.14                   |
|         |            | 36      | 0         | 21.15                   | 20.98                 | 21.74                   |
|         |            | 36      | 19        | 20.95                   | 21.40                 | 21.13                   |
|         |            | 36      | 39        | 21.19                   | 21.33                 | 21.00                   |
|         |            | 75      | 0         | 21.34                   | 21.47                 | 21.18                   |
| Limit:  |            | 33      |           |                         |                       |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>20850       | Mid CH<br>21100       | High CH<br>21350      |
|---------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|
|         |            |         |           | Frequency<br>2510 MHz | Frequency<br>2535 MHz | Frequency<br>2560 MHz |
| 7/20    | QPSK       | 1       | 0         | 23.67                 | 23.86                 | 23.63                 |
|         |            | 1       | 50        | 23.43                 | 23.56                 | 23.57                 |
|         |            | 1       | 99        | 23.61                 | 23.85                 | 23.58                 |
|         |            | 50      | 0         | 22.87                 | 22.67                 | 22.64                 |
|         |            | 50      | 25        | 22.71                 | 22.55                 | 22.53                 |
|         |            | 50      | 50        | 22.77                 | 22.76                 | 22.72                 |
|         |            | 100     | 0         | 22.69                 | 22.90                 | 22.88                 |
|         | 16QAM      | 1       | 0         | 22.67                 | 22.61                 | 22.81                 |
|         |            | 1       | 50        | 22.85                 | 22.67                 | 22.50                 |
|         |            | 1       | 99        | 22.77                 | 22.71                 | 22.60                 |
|         |            | 50      | 0         | 21.88                 | 21.77                 | 21.66                 |
|         |            | 50      | 25        | 21.90                 | 21.80                 | 21.71                 |
|         |            | 50      | 50        | 21.69                 | 21.91                 | 21.67                 |
|         |            | 100     | 0         | 21.63                 | 21.78                 | 21.68                 |
| Limit:  |            | 33      |           |                       |                       |                       |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>23017        | Mid CH<br>23095        | High CH<br>23173       |
|---------|------------|---------|-----------|------------------------|------------------------|------------------------|
|         |            |         |           | Frequency<br>699.7 MHz | Frequency<br>707.5 MHz | Frequency<br>715.3 MHz |
| 12/1.4  | QPSK       | 1       | 0         | 24.35                  | 24.27                  | 24.13                  |
|         |            | 1       | 2         | 24.36                  | 24.40                  | 24.13                  |
|         |            | 1       | 5         | 24.24                  | 24.20                  | 24.18                  |
|         |            | 3       | 0         | 24.26                  | 24.36                  | 24.17                  |
|         |            | 3       | 1         | 24.12                  | 24.31                  | 24.08                  |
|         |            | 3       | 3         | 24.25                  | 24.18                  | 24.21                  |
|         | 16QAM      | 6       | 0         | 23.23                  | 23.42                  | 23.37                  |
|         |            | 1       | 0         | 23.34                  | 23.25                  | 23.11                  |
|         |            | 1       | 2         | 23.19                  | 23.22                  | 23.18                  |
|         |            | 1       | 5         | 23.20                  | 23.07                  | 23.18                  |
|         |            | 3       | 0         | 23.22                  | 23.24                  | 23.09                  |
|         |            | 3       | 1         | 23.18                  | 23.21                  | 23.26                  |
|         |            | 3       | 3         | 23.28                  | 23.37                  | 23.19                  |
|         |            | 6       | 0         | 22.26                  | 22.29                  | 22.27                  |
| Limit:  |            | 34.8    |           |                        |                        |                        |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>23025        | Mid CH<br>23095        | High CH<br>23165       |
|---------|------------|---------|-----------|------------------------|------------------------|------------------------|
|         |            |         |           | Frequency<br>700.5 MHz | Frequency<br>707.5 MHz | Frequency<br>714.5 MHz |
| 12/3    | QPSK       | 1       | 0         | 24.29                  | 24.34                  | 24.10                  |
|         |            | 1       | 7         | 24.40                  | 24.26                  | 24.31                  |
|         |            | 1       | 14        | 24.13                  | 24.27                  | 24.26                  |
|         |            | 8       | 0         | 23.54                  | 23.42                  | 23.47                  |
|         |            | 8       | 3         | 23.52                  | 23.38                  | 23.26                  |
|         |            | 8       | 7         | 23.29                  | 23.54                  | 23.25                  |
|         |            | 15      | 0         | 23.47                  | 23.48                  | 23.29                  |
|         | 16QAM      | 1       | 0         | 23.32                  | 23.33                  | 23.31                  |
|         |            | 1       | 7         | 23.27                  | 23.32                  | 23.44                  |
|         |            | 1       | 14        | 23.35                  | 23.33                  | 23.27                  |
|         |            | 8       | 0         | 22.40                  | 22.30                  | 22.33                  |
|         |            | 8       | 3         | 22.57                  | 22.34                  | 22.44                  |
|         |            | 8       | 7         | 22.38                  | 22.38                  | 22.37                  |
|         |            | 15      | 0         | 22.19                  | 22.28                  | 22.42                  |
| Limit:  |            | 34.8    |           |                        |                        |                        |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>23035        | Mid CH<br>23095        | High CH<br>23155       |
|---------|------------|---------|-----------|------------------------|------------------------|------------------------|
|         |            |         |           | Frequency<br>701.5 MHz | Frequency<br>707.5 MHz | Frequency<br>713.5 MHz |
| 12/5    | QPSK       | 1       | 0         | 24.15                  | 24.44                  | 24.44                  |
|         |            | 1       | 12        | 24.42                  | 24.26                  | 24.27                  |
|         |            | 1       | 24        | 24.52                  | 24.23                  | 24.27                  |
|         |            | 12      | 0         | 23.50                  | 23.45                  | 23.50                  |
|         |            | 12      | 6         | 23.39                  | 23.58                  | 23.36                  |
|         |            | 12      | 13        | 23.23                  | 23.43                  | 23.19                  |
|         |            | 25      | 0         | 23.47                  | 23.66                  | 23.30                  |
|         | 16QAM      | 1       | 0         | 23.49                  | 23.51                  | 23.42                  |
|         |            | 1       | 12        | 23.35                  | 23.34                  | 23.22                  |
|         |            | 1       | 24        | 23.34                  | 23.29                  | 23.31                  |
|         |            | 12      | 0         | 22.51                  | 22.43                  | 22.35                  |
|         |            | 12      | 6         | 22.59                  | 22.39                  | 22.42                  |
|         |            | 12      | 13        | 22.38                  | 22.40                  | 22.30                  |
|         |            | 25      | 0         | 22.34                  | 22.54                  | 22.28                  |
| Limit:  |            | 34.8    |           |                        |                        |                        |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>23060      | Mid CH<br>23095        | High CH<br>23130     |
|---------|------------|---------|-----------|----------------------|------------------------|----------------------|
|         |            |         |           | Frequency<br>704 MHz | Frequency<br>707.5 MHz | Frequency<br>711 MHz |
| 12/10   | QPSK       | 1       | 0         | 24.62                | 24.87                  | 24.92                |
|         |            | 1       | 24        | 24.62                | 25.07                  | 24.66                |
|         |            | 1       | 49        | 24.84                | 24.96                  | 24.83                |
|         |            | 25      | 0         | 24.30                | 24.12                  | 23.67                |
|         |            | 25      | 12        | 24.13                | 24.03                  | 23.92                |
|         |            | 25      | 25        | 24.01                | 23.94                  | 23.63                |
|         |            | 50      | 0         | 24.14                | 23.99                  | 23.83                |
|         | 16QAM      | 1       | 0         | 23.89                | 24.13                  | 23.65                |
|         |            | 1       | 24        | 23.73                | 23.86                  | 24.25                |
|         |            | 1       | 49        | 23.82                | 24.24                  | 23.82                |
|         |            | 25      | 0         | 22.82                | 22.93                  | 22.98                |
|         |            | 25      | 12        | 23.18                | 22.84                  | 23.23                |
|         |            | 25      | 25        | 22.87                | 23.07                  | 22.75                |
|         |            | 50      | 0         | 22.63                | 22.62                  | 22.92                |
| Limit:  |            | 34.8    |           |                      |                        |                      |

| Band/BW | Modulation | RB Size | RB Offset | CH 23205  | CH 23230  | CH 23255  |
|---------|------------|---------|-----------|-----------|-----------|-----------|
|         |            |         |           | 779.5 MHz | 782.0 MHz | 784.5 MHz |
| 13 / 5  | QPSK       | 1       | 0         | 24.28     | 24.20     | 24.07     |
|         |            | 1       | 12        | 24.03     | 24.13     | 24.23     |
|         |            | 1       | 24        | 24.08     | 24.30     | 24.25     |
|         |            | 12      | 0         | 23.30     | 23.29     | 23.27     |
|         |            | 12      | 6         | 23.12     | 23.22     | 23.24     |
|         |            | 12      | 13        | 23.29     | 23.11     | 23.19     |
|         |            | 25      | 0         | 23.25     | 23.30     | 23.30     |
|         | 16QAM      | 1       | 0         | 23.33     | 23.25     | 23.24     |
|         |            | 1       | 12        | 23.31     | 23.26     | 23.18     |
|         |            | 1       | 24        | 23.18     | 23.19     | 23.27     |
|         |            | 12      | 0         | 22.35     | 22.33     | 22.31     |
|         |            | 12      | 6         | 22.39     | 22.18     | 22.25     |
|         |            | 12      | 13        | 22.16     | 22.20     | 22.24     |
|         |            | 25      | 0         | 22.10     | 22.11     | 22.27     |
| Limit:  |            | 34.8    |           |           |           |           |

| Band/BW | Modulation | RB Size | RB Offset | CH  | CH 23230  | CH  |
|---------|------------|---------|-----------|-----|-----------|-----|
|         |            |         |           | MHz | 782.0 MHz | MHz |
| 13 / 10 | QPSK       | 1       | 0         | /   | 24.16     | /   |
|         |            | 1       | 24        | /   | 24.29     | /   |
|         |            | 1       | 49        | /   | 24.09     | /   |
|         |            | 25      | 0         | /   | 23.39     | /   |
|         |            | 25      | 12        | /   | 23.29     | /   |
|         |            | 25      | 25        | /   | 23.01     | /   |
|         |            | 50      | 0         | /   | 23.20     | /   |
|         | 16QAM      | 1       | 0         | /   | 23.21     | /   |
|         |            | 1       | 24        | /   | 23.20     | /   |
|         |            | 1       | 49        | /   | 23.21     | /   |
|         |            | 25      | 0         | /   | 22.38     | /   |
|         |            | 25      | 12        | /   | 22.12     | /   |
|         |            | 25      | 25        | /   | 22.26     | /   |
|         |            | 50      | 0         | /   | 22.10     | /   |
| Limit:  |            | 34.8    |           |     |           |     |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26047         | Mid CH<br>26365         | High CH<br>26683        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1850.7 MHz | Frequency<br>1882.5 MHz | Frequency<br>1914.3 MHz |
| 25/1.4  | QPSK       | 1       | 0         | 24.18                   | 24.46                   | 24.62                   |
|         |            | 1       | 2         | 24.18                   | 24.08                   | 24.53                   |
|         |            | 1       | 5         | 24.38                   | 24.24                   | 24.26                   |
|         |            | 3       | 0         | 24.47                   | 24.42                   | 24.30                   |
|         |            | 3       | 1         | 24.20                   | 24.54                   | 24.18                   |
|         |            | 3       | 3         | 24.17                   | 24.23                   | 24.06                   |
|         | 16QAM      | 6       | 0         | 23.33                   | 23.44                   | 23.24                   |
|         |            | 1       | 0         | 23.54                   | 23.30                   | 23.19                   |
|         |            | 1       | 2         | 23.44                   | 23.54                   | 23.40                   |
|         |            | 1       | 5         | 23.38                   | 23.37                   | 23.27                   |
|         |            | 3       | 0         | 23.37                   | 23.47                   | 23.62                   |
|         |            | 3       | 1         | 23.35                   | 23.34                   | 23.09                   |
|         |            | 3       | 3         | 23.29                   | 23.40                   | 23.03                   |
|         |            | 6       | 0         | 22.20                   | 22.26                   | 22.40                   |
| Limit:  |            | 33      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26055         | Mid CH<br>26365         | High CH<br>26675        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1851.5 MHz | Frequency<br>1882.5 MHz | Frequency<br>1913.5 MHz |
| (25)/3  | QPSK       | 1       | 0         | 24.22                   | 24.56                   | 24.36                   |
|         |            | 1       | 7         | 24.02                   | 24.71                   | 24.36                   |
|         |            | 1       | 14        | 24.33                   | 24.52                   | 24.45                   |
|         |            | 8       | 0         | 23.21                   | 23.36                   | 23.31                   |
|         |            | 8       | 3         | 23.40                   | 23.47                   | 23.36                   |
|         |            | 8       | 7         | 23.33                   | 23.37                   | 23.54                   |
|         |            | 15      | 0         | 23.37                   | 23.14                   | 23.37                   |
|         | 16QAM      | 1       | 0         | 23.16                   | 23.35                   | 23.41                   |
|         |            | 1       | 7         | 23.48                   | 23.29                   | 23.39                   |
|         |            | 1       | 14        | 23.55                   | 23.39                   | 23.42                   |
|         |            | 8       | 0         | 22.46                   | 22.63                   | 22.69                   |
|         |            | 8       | 3         | 22.58                   | 22.45                   | 22.40                   |
|         |            | 8       | 7         | 22.41                   | 22.65                   | 22.40                   |
|         |            | 15      | 0         | 22.35                   | 22.64                   | 22.42                   |
| Limit:  |            | 33      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26065         | Mid CH<br>26365         | High CH<br>26665        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1852.5 MHz | Frequency<br>1882.5 MHz | Frequency<br>1912.5 MHz |
| 25/5    | QPSK       | 1       | 0         | 24.51                   | 24.45                   | 24.44                   |
|         |            | 1       | 12        | 24.47                   | 24.69                   | 24.48                   |
|         |            | 1       | 24        | 24.54                   | 24.53                   | 24.20                   |
|         |            | 12      | 0         | 23.39                   | 23.14                   | 23.40                   |
|         |            | 12      | 6         | 23.32                   | 23.54                   | 23.40                   |
|         |            | 12      | 13        | 23.48                   | 23.65                   | 23.64                   |
|         |            | 25      | 0         | 23.55                   | 23.44                   | 23.36                   |
|         | 16QAM      | 1       | 0         | 23.61                   | 23.30                   | 23.56                   |
|         |            | 1       | 12        | 23.25                   | 23.32                   | 23.60                   |
|         |            | 1       | 24        | 23.45                   | 23.48                   | 23.23                   |
|         |            | 12      | 0         | 22.52                   | 22.52                   | 22.73                   |
|         |            | 12      | 6         | 22.43                   | 22.56                   | 22.36                   |
|         |            | 12      | 13        | 22.37                   | 22.48                   | 22.33                   |
|         |            | 25      | 0         | 22.57                   | 22.36                   | 22.24                   |
| Limit:  |            | 33      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26090       | Mid CH<br>26365         | High CH<br>26640      |
|---------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|
|         |            |         |           | Frequency<br>1855 MHz | Frequency<br>1882.5 MHz | Frequency<br>1910 MHz |
| 25/10   | QPSK       | 1       | 0         | 24.34                 | 24.25                   | 24.45                 |
|         |            | 1       | 24        | 24.60                 | 24.49                   | 24.53                 |
|         |            | 1       | 49        | 24.74                 | 24.54                   | 24.09                 |
|         |            | 25      | 0         | 23.62                 | 23.70                   | 23.45                 |
|         |            | 25      | 12        | 23.74                 | 23.69                   | 23.73                 |
|         |            | 25      | 25        | 23.44                 | 23.48                   | 23.44                 |
|         |            | 50      | 0         | 23.25                 | 23.42                   | 23.42                 |
|         | 16QAM      | 1       | 0         | 23.51                 | 23.36                   | 23.47                 |
|         |            | 1       | 24        | 23.47                 | 23.36                   | 23.41                 |
|         |            | 1       | 49        | 23.54                 | 23.52                   | 23.37                 |
|         |            | 25      | 0         | 22.73                 | 22.38                   | 22.42                 |
|         |            | 25      | 12        | 22.65                 | 22.60                   | 22.66                 |
|         |            | 25      | 25        | 22.30                 | 22.63                   | 22.46                 |
|         |            | 50      | 0         | 22.57                 | 22.17                   | 22.17                 |
| Limit:  |            | 33      |           |                       |                         |                       |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26115         | Mid CH<br>26365         | High CH<br>26615        |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>1857.5 MHz | Frequency<br>1882.5 MHz | Frequency<br>1907.5 MHz |
| 25/15   | QPSK       | 1       | 0         | 24.23                   | 24.18                   | 24.62                   |
|         |            | 1       | 37        | 24.48                   | 24.40                   | 24.32                   |
|         |            | 1       | 74        | 24.20                   | 24.41                   | 24.20                   |
|         |            | 36      | 0         | 23.53                   | 23.71                   | 23.32                   |
|         |            | 36      | 19        | 23.59                   | 23.62                   | 23.39                   |
|         |            | 36      | 39        | 23.26                   | 23.59                   | 23.51                   |
|         | 16QAM      | 75      | 0         | 23.68                   | 23.44                   | 23.78                   |
|         |            | 1       | 0         | 23.60                   | 23.41                   | 23.53                   |
|         |            | 1       | 37        | 23.34                   | 23.44                   | 23.61                   |
|         |            | 1       | 74        | 23.58                   | 23.31                   | 23.42                   |
|         |            | 36      | 0         | 22.39                   | 22.38                   | 22.70                   |
|         |            | 36      | 19        | 22.44                   | 22.76                   | 22.43                   |
|         |            | 36      | 39        | 22.54                   | 22.51                   | 22.43                   |
|         |            | 75      | 0         | 22.65                   | 22.72                   | 22.50                   |
| Limit:  |            | 33      |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26140       | Mid CH<br>26365         | High CH<br>26590      |
|---------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|
|         |            |         |           | Frequency<br>1860 MHz | Frequency<br>1882.5 MHz | Frequency<br>1905 MHz |
| 25/20   | QPSK       | 1       | 0         | 24.68                 | 24.58                   | 24.46                 |
|         |            | 1       | 50        | 24.41                 | 24.66                   | 24.54                 |
|         |            | 1       | 99        | 24.45                 | 24.49                   | 24.29                 |
|         |            | 50      | 0         | 23.41                 | 23.61                   | 23.92                 |
|         |            | 50      | 25        | 23.57                 | 23.57                   | 23.60                 |
|         |            | 50      | 50        | 23.56                 | 23.70                   | 23.56                 |
|         |            | 100     | 0         | 23.60                 | 23.64                   | 23.79                 |
|         | 16QAM      | 1       | 0         | 23.35                 | 23.63                   | 23.69                 |
|         |            | 1       | 50        | 23.42                 | 23.51                   | 23.55                 |
|         |            | 1       | 99        | 23.39                 | 23.28                   | 23.73                 |
|         |            | 50      | 0         | 22.47                 | 22.68                   | 22.41                 |
|         |            | 50      | 25        | 22.49                 | 22.62                   | 22.49                 |
|         |            | 50      | 50        | 22.50                 | 22.55                   | 22.58                 |
|         |            | 100     | 0         | 22.63                 | 22.63                   | 22.53                 |
| Limit:  |            | 33      |           |                       |                         |                       |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>26697          | Mid CH<br>(26915)       | High CH<br>27033         |
|---------|------------|---------|-----------|--------------------------|-------------------------|--------------------------|
|         |            |         |           | Frequency<br>(824.7) MHz | Frequency<br>(836.5)MHz | Frequency<br>(848.3) MHz |
| 26/1.4  | QPSK       | 1       | 0         | 24.80                    | 24.84                   | 24.79                    |
|         |            | 1       | 2         | 24.66                    | 24.88                   | 24.86                    |
|         |            | 1       | 5         | 24.77                    | 24.99                   | 24.74                    |
|         |            | 3       | 0         | 24.85                    | 24.95                   | 24.68                    |
|         |            | 3       | 1         | 24.78                    | 24.77                   | 24.80                    |
|         |            | 3       | 3         | 24.66                    | 24.64                   | 24.74                    |
|         |            | 6       | 0         | 23.85                    | 23.96                   | 23.92                    |
|         | 16QAM      | 1       | 0         | 23.85                    | 23.93                   | 23.73                    |
|         |            | 1       | 2         | 23.68                    | 23.93                   | 23.62                    |
|         |            | 1       | 5         | 23.83                    | 23.69                   | 23.86                    |
|         |            | 3       | 0         | 23.79                    | 24.03                   | 23.61                    |
|         |            | 3       | 1         | 23.78                    | 23.84                   | 23.77                    |
|         |            | 3       | 3         | 23.73                    | 23.83                   | 23.78                    |
|         |            | 6       | 0         | 22.78                    | 22.83                   | 22.81                    |
| Limit:  |            | 38.4    |           |                          |                         |                          |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(26805)       | Mid CH<br>(26915)       | High CH<br>(27025)      |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>(825.5)MHz | Frequency<br>(836.5)MHz | Frequency<br>(847.5)MHz |
| (26)/3  | QPSK       | 1       | 0         | 24.69                   | 24.94                   | 24.79                   |
|         |            | 1       | 7         | 24.96                   | 24.73                   | 24.71                   |
|         |            | 1       | 14        | 24.85                   | 24.78                   | 24.74                   |
|         |            | 8       | 0         | 23.73                   | 24.13                   | 23.84                   |
|         |            | 8       | 3         | 23.88                   | 24.05                   | 23.71                   |
|         |            | 8       | 7         | 23.89                   | 23.86                   | 23.77                   |
|         |            | 15      | 0         | 23.80                   | 23.94                   | 23.93                   |
|         | 16QAM      | 1       | 0         | 23.85                   | 23.86                   | 23.70                   |
|         |            | 1       | 7         | 23.85                   | 23.81                   | 23.93                   |
|         |            | 1       | 14        | 23.84                   | 23.85                   | 23.81                   |
|         |            | 8       | 0         | 22.80                   | 23.02                   | 22.96                   |
|         |            | 8       | 3         | 22.87                   | 23.01                   | 22.83                   |
|         |            | 8       | 7         | 22.80                   | 22.85                   | 22.89                   |
|         |            | 15      | 0         | 22.70                   | 22.76                   | 22.94                   |
| Limit:  |            | 38.4    |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (26815)       | Mid CH (26915)       | High CH (27015)      |
|---------|------------|---------|-----------|----------------------|----------------------|----------------------|
|         |            |         |           | Frequency (826.5)MHz | Frequency (836.5)MHz | Frequency (846.5)MHz |
| (26)/5  | QPSK       | 1       | 0         | 24.99                | 25.02                | 24.94                |
|         |            | 1       | 12        | 24.91                | 24.94                | 24.78                |
|         |            | 1       | 24        | 24.83                | 24.75                | 24.88                |
|         |            | 12      | 0         | 23.91                | 24.00                | 23.76                |
|         |            | 12      | 6         | 24.06                | 23.94                | 23.92                |
|         |            | 12      | 13        | 23.71                | 23.86                | 23.84                |
|         | 16QAM      | 25      | 0         | 23.86                | 24.08                | 24.03                |
|         |            | 1       | 0         | 23.78                | 24.00                | 23.92                |
|         |            | 1       | 12        | 23.89                | 23.96                | 23.72                |
|         |            | 1       | 24        | 23.72                | 23.87                | 23.96                |
|         |            | 12      | 0         | 22.98                | 22.90                | 22.92                |
|         |            | 12      | 6         | 22.91                | 22.96                | 22.83                |
|         |            | 12      | 13        | 22.79                | 22.85                | 22.80                |
|         |            | 25      | 0         | 22.79                | 23.06                | 22.78                |
| Limit:  |            | 38.4    |           |                      |                      |                      |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(26840)     | Mid CH<br>(26915)       | High CH<br>(26990)    |
|---------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|
|         |            |         |           | Frequency<br>(829)MHz | Frequency<br>(836.5)MHz | Frequency<br>(844)MHz |
| (26)/10 | QPSK       | 1       | 0         |                       |                         |                       |
|         |            | 1       | 24        | 24.71                 | 24.99                   | 24.95                 |
|         |            | 1       | 49        | 24.85                 | 24.76                   | 24.95                 |
|         |            | 1       | 49        | 24.85                 | 24.80                   | 24.89                 |
|         |            | 25      | 0         | 24.01                 | 23.98                   | 23.93                 |
|         |            | 25      | 12        | 24.05                 | 23.88                   | 23.89                 |
|         |            | 25      | 25        | 23.98                 | 23.98                   | 23.78                 |
|         | 16QAM      | 50      | 0         | 23.83                 | 23.96                   | 23.87                 |
|         |            | 1       | 0         | 23.95                 | 23.78                   | 23.96                 |
|         |            | 1       | 24        | 23.85                 | 23.99                   | 23.83                 |
|         |            | 1       | 49        | 23.73                 | 23.95                   | 23.79                 |
|         |            | 25      | 0         | 22.95                 | 22.95                   | 22.97                 |
|         |            | 25      | 12        | 22.89                 | 22.89                   | 22.89                 |
|         |            | 25      | 25        | 22.93                 | 22.84                   | 22.88                 |
|         |            | 50      | 0         | 22.91                 | 23.09                   | 23.06                 |
| Limit:  |            | 38.4    |           |                       |                         |                       |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(26865)       | Mid CH<br>(26915)       | High CH<br>(26965)      |
|---------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|
|         |            |         |           | Frequency<br>(831.5)MHz | Frequency<br>(836.5)MHz | Frequency<br>(841.5)MHz |
| (26)/15 | QPSK       | 1       | 0         | 24.90                   | 24.78                   | 24.84                   |
|         |            | 1       | 37        | 24.80                   | 24.79                   | 24.82                   |
|         |            | 1       | 74        | 24.71                   | 24.98                   | 24.85                   |
|         |            | 36      | 0         | 24.02                   | 24.00                   | 24.10                   |
|         |            | 36      | 19        | 23.84                   | 23.97                   | 23.90                   |
|         |            | 36      | 39        | 23.92                   | 23.83                   | 23.78                   |
|         |            | 75      | 0         | 23.98                   | 24.02                   | 23.81                   |
|         | 16QAM      | 1       | 0         | 24.00                   | 24.06                   | 23.93                   |
|         |            | 1       | 37        | 23.93                   | 23.95                   | 23.98                   |
|         |            | 1       | 74        | 23.96                   | 23.95                   | 23.96                   |
|         |            | 36      | 0         | 23.04                   | 22.94                   | 23.05                   |
|         |            | 36      | 19        | 23.01                   | 23.07                   | 22.88                   |
|         |            | 36      | 39        | 22.94                   | 22.89                   | 22.88                   |
|         |            | 75      | 0         | 23.02                   | 23.03                   | 22.92                   |
| Limit:  |            | 38.4    |           |                         |                         |                         |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>27685 | Mid CH<br>27710 | High CH<br>27735 |
|---------|------------|---------|-----------|-----------------|-----------------|------------------|
|         |            |         |           | 2307.5<br>MHz   | 2310.0<br>MHz   | 2312.5<br>MHz    |
| 30 / 5  | QPSK       | 1       | 0         | 23.47           | 23.43           | 23.19            |
|         |            | 1       | 12        | 23.26           | 23.46           | 23.37            |
|         |            | 1       | 24        | 23.32           | 23.41           | 23.20            |
|         |            | 12      | 0         | 22.46           | 22.51           | 22.62            |
|         |            | 12      | 6         | 22.45           | 22.35           | 22.29            |
|         |            | 12      | 13        | 22.24           | 22.37           | 22.42            |
|         |            | 25      | 0         | 22.29           | 22.64           | 22.29            |
|         | 16QAM      | 1       | 0         | 22.35           | 22.36           | 22.19            |
|         |            | 1       | 12        | 22.22           | 22.40           | 22.27            |
|         |            | 1       | 24        | 22.35           | 22.29           | 22.22            |
|         |            | 12      | 0         | 21.56           | 21.53           | 21.26            |
|         |            | 12      | 6         | 21.33           | 21.39           | 21.36            |
|         |            | 12      | 13        | 21.44           | 21.62           | 21.27            |
|         |            | 25      | 0         | 21.11           | 21.41           | 21.50            |
| Limit:  |            | /       |           |                 |                 |                  |

| Band/BW | Modulation | RB<br>Size | RB<br>Offset | CH  | Mid CH<br>27710 | CH  |
|---------|------------|------------|--------------|-----|-----------------|-----|
|         |            |            |              | MHz | 2310.0<br>MHz   | MHz |
| 30 / 10 | QPSK       | 1          | 0            | /   | 23.45           | /   |
|         |            | 1          | 24           | /   | 23.15           | /   |
|         |            | 1          | 49           | /   | 23.17           | /   |
|         |            | 25         | 0            | /   | 22.43           | /   |
|         |            | 25         | 12           | /   | 22.19           | /   |
|         |            | 25         | 25           | /   | 22.18           | /   |
|         | 16QAM      | 50         | 0            | /   | 22.31           | /   |
|         |            | 1          | 0            | /   | 22.44           | /   |
|         |            | 1          | 24           | /   | 22.43           | /   |
|         |            | 1          | 49           | /   | 22.20           | /   |
|         |            | 25         | 0            | /   | 21.43           | /   |
|         |            | 25         | 12           | /   | 21.54           | /   |
|         |            | 25         | 25           | /   | 21.30           | /   |
|         |            | 50         | 0            | /   | 21.31           | /   |
| Limit:  |            | /          |              |     |                 |     |

| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(39675)        | Mid CH<br>(40620)      | High CH<br>(41565)       |
|---------|------------|---------|-----------|--------------------------|------------------------|--------------------------|
|         |            |         |           | Frequency<br>(2498.5)MHz | Frequency<br>(2593)MHz | Frequency<br>(2687.5)MHz |
| (41)/5  | QPSK       | 1       | 0         | 23.78                    | 24.05                  | 23.90                    |
|         |            | 1       | 12        | 23.86                    | 23.84                  | 23.96                    |
|         |            | 1       | 24        | 23.99                    | 23.92                  | 23.95                    |
|         |            | 12      | 0         | 22.93                    | 22.96                  | 23.12                    |
|         |            | 12      | 6         | 22.96                    | 22.99                  | 22.91                    |
|         |            | 12      | 13        | 22.84                    | 22.62                  | 22.96                    |
|         |            | 25      | 0         | 23.01                    | 22.81                  | 22.83                    |
|         | 16QAM      | 1       | 0         | 23.00                    | 22.81                  | 23.00                    |
|         |            | 1       | 12        | 22.82                    | 22.99                  | 22.83                    |
|         |            | 1       | 24        | 22.76                    | 22.74                  | 22.89                    |
|         |            | 12      | 0         | 21.81                    | 22.00                  | 21.76                    |
|         |            | 12      | 6         | 21.90                    | 21.84                  | 22.14                    |
|         |            | 12      | 13        | 21.79                    | 21.77                  | 22.07                    |
|         |            | 25      | 0         | 22.04                    | 21.89                  | 22.12                    |
| Limit:  |            | 33      |           |                          |                        |                          |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (39700)      | Mid CH (40620)      | High CH (41540)     |
|---------|------------|---------|-----------|---------------------|---------------------|---------------------|
|         |            |         |           | Frequency (2501)MHz | Frequency (2593)MHz | Frequency (2685)MHz |
| (41)/10 | QPSK       | 1       | 0         | 23.81               | 23.93               | 23.74               |
|         |            | 1       | 24        | 23.67               | 23.77               | 23.87               |
|         |            | 1       | 49        | 23.74               | 23.58               | 23.78               |
|         |            | 25      | 0         | 23.01               | 22.86               | 23.08               |
|         |            | 25      | 12        | 22.89               | 22.81               | 22.87               |
|         |            | 25      | 25        | 23.05               | 22.83               | 23.03               |
|         |            | 50      | 0         | 22.86               | 22.95               | 23.02               |
|         | 16QAM      | 1       | 0         | 22.81               | 23.03               | 23.06               |
|         |            | 1       | 24        | 22.78               | 22.84               | 22.92               |
|         |            | 1       | 49        | 22.69               | 22.62               | 22.88               |
|         |            | 25      | 0         | 21.96               | 21.74               | 21.93               |
|         |            | 25      | 12        | 21.76               | 21.84               | 21.84               |
|         |            | 25      | 25        | 21.70               | 21.83               | 21.86               |
|         |            | 50      | 0         | 21.78               | 21.73               | 21.89               |
| Limit:  |            | 33      |           |                     |                     |                     |

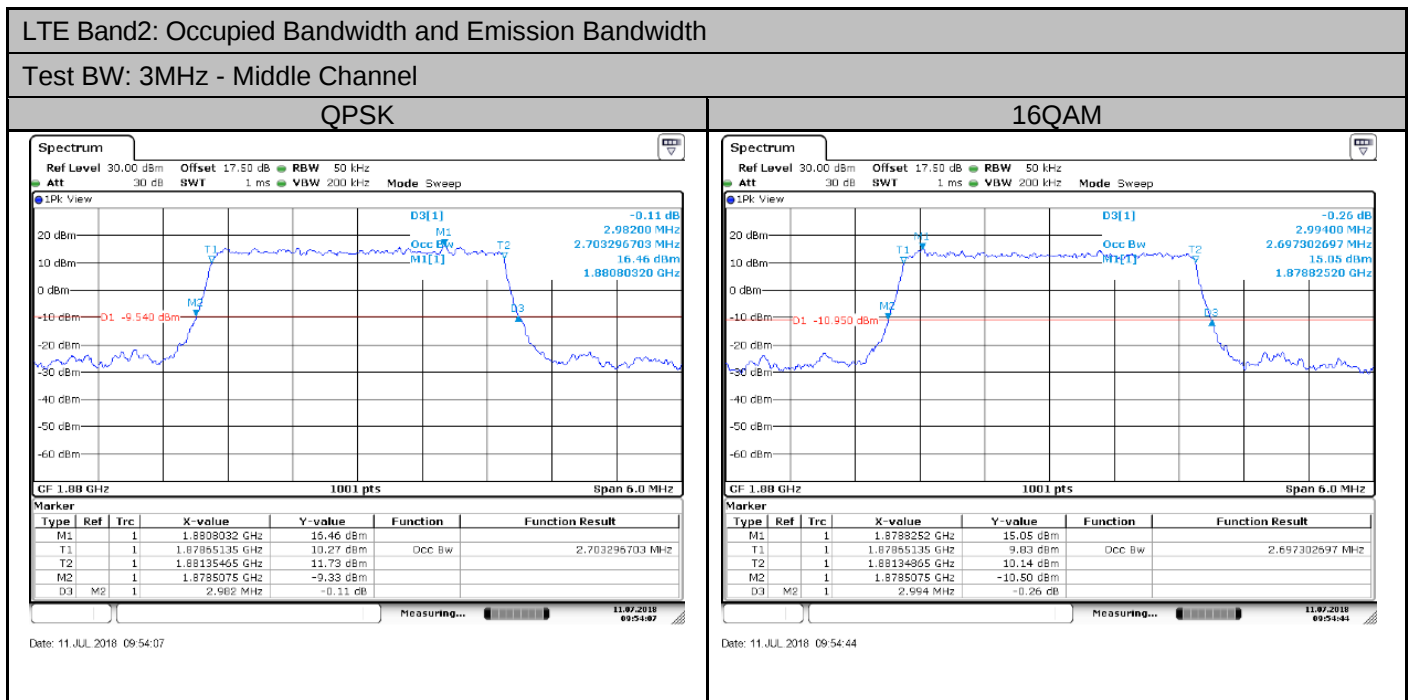
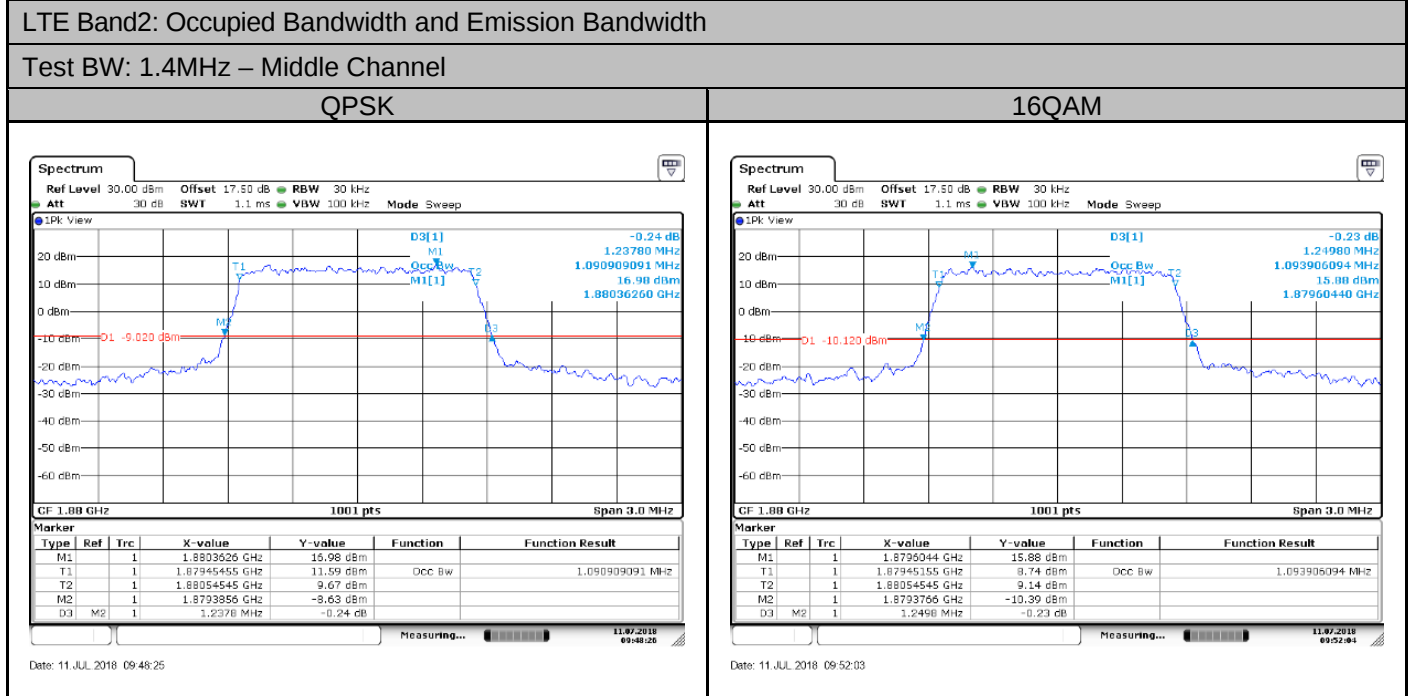
| Band/BW | Modulation | RB Size | RB Offset | Low CH<br>(39725)        | Mid CH<br>(40620)      | High CH<br>(41515)       |
|---------|------------|---------|-----------|--------------------------|------------------------|--------------------------|
|         |            |         |           | Frequency<br>(2503.5)MHz | Frequency<br>(2593)MHz | Frequency<br>(2682.5)MHz |
| (41)/15 | QPSK       | 1       | 0         | 24.01                    | 23.83                  | 23.99                    |
|         |            | 1       | 37        | 23.94                    | 24.08                  | 24.00                    |
|         |            | 1       | 74        | 23.93                    | 23.97                  | 23.87                    |
|         |            | 36      | 0         | 22.89                    | 22.95                  | 23.09                    |
|         |            | 36      | 19        | 22.76                    | 23.14                  | 23.06                    |
|         |            | 36      | 39        | 22.93                    | 22.93                  | 22.96                    |
|         |            | 75      | 0         | 23.00                    | 23.07                  | 23.06                    |
|         | 16QAM      | 1       | 0         | 22.90                    | 23.02                  | 23.06                    |
|         |            | 1       | 37        | 22.84                    | 22.87                  | 23.10                    |
|         |            | 1       | 74        | 23.03                    | 22.91                  | 22.95                    |
|         |            | 36      | 0         | 21.92                    | 22.04                  | 22.09                    |
|         |            | 36      | 19        | 22.06                    | 21.96                  | 22.05                    |
|         |            | 36      | 39        | 21.76                    | 22.06                  | 21.96                    |
|         |            | 75      | 0         | 21.89                    | 21.83                  | 21.83                    |
| Limit:  |            | 33      |           |                          |                        |                          |

| Band/BW | Modulation | RB Size | RB Offset | Low CH (39750)      | Mid CH (40620)      | High CH (41490)     |
|---------|------------|---------|-----------|---------------------|---------------------|---------------------|
|         |            |         |           | Frequency (2506)MHz | Frequency (2593)MHz | Frequency (2680)MHz |
| (41)/20 | QPSK       | 1       | 0         | 24.09               | 23.85               | 24.00               |
|         |            | 1       | 50        | 24.01               | 24.07               | 23.92               |
|         |            | 1       | 99        | 24.20               | 24.11               | 23.85               |
|         |            | 50      | 0         | 22.93               | 22.99               | 23.14               |
|         |            | 50      | 25        | 22.95               | 23.03               | 23.03               |
|         |            | 50      | 50        | 23.07               | 23.06               | 23.20               |
|         |            | 100     | 0         | 23.18               | 23.10               | 23.14               |
|         | 16QAM      | 1       | 0         | 23.05               | 23.06               | 23.11               |
|         |            | 1       | 50        | 23.02               | 22.93               | 23.08               |
|         |            | 1       | 99        | 23.02               | 23.13               | 22.92               |
|         |            | 50      | 0         | 22.13               | 22.16               | 22.21               |
|         |            | 50      | 25        | 22.14               | 21.91               | 22.29               |
|         |            | 50      | 50        | 22.10               | 22.06               | 22.02               |
|         |            | 100     | 0         | 22.01               | 22.03               | 22.12               |
| Limit:  |            | 33      |           |                     |                     |                     |

## APPENDIX C: TEST DATA FOR OCCUPIED BANDWIDTH

| Operation Mode | Band Width | Channel Number | Channel Frequency (MHz) | QPSK                     |                          | 16QAM                    |                          |
|----------------|------------|----------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                |            |                |                         | Occupied Bandwidth (KHz) | Emission Bandwidth (KHz) | Occupied Bandwidth (KHz) | Emission Bandwidth (KHz) |
| LTE BAND2      | 1.4MHz     | 18900          | 1880                    | 1090.9                   | 1237.8                   | 1093.9                   | 1249.8                   |
|                | 3MHz       | 18900          | 1880                    | 2703                     | 2982                     | 2697                     | 2994                     |
|                | 5MHz       | 18900          | 1880                    | 4525                     | 4592                     | 4496                     | 4972                     |
|                | 10MHz      | 18900          | 1880                    | 9051                     | 10087                    | 9051                     | 10007                    |
|                | 15MHz      | 18900          | 1880                    | 13516                    | 14709                    | 13487                    | 14679                    |
|                | 20MHz      | 18900          | 1880                    | 18462                    | 20394                    | 18501                    | 20633                    |
| LTE BAND4      | 1.4MHz     | 20175          | 1732.5                  | 1096.9                   | 1222.8                   | 1090.9                   | 1237.8                   |
|                | 3MHz       | 20175          | 1732.5                  | 2.697                    | 2994                     | 2697                     | 2982                     |
|                | 5MHz       | 20175          | 1732.5                  | 4515                     | 4960                     | 4505                     | 4950                     |
|                | 10MHz      | 20175          | 1732.5                  | 9051                     | 10065                    | 9071                     | 9985                     |
|                | 15MHz      | 20175          | 1732.5                  | 13516                    | 14840                    | 13516                    | 14750                    |
|                | 20MHz      | 20175          | 1732.5                  | 18541                    | 20544                    | 18422                    | 20544                    |
| LTE BAND5      | 1.4MHz     | 20525          | 836.5                   | 1096.9                   | 1234.8                   | 1093.9                   | 1243.8                   |
|                | 3MHz       | 20525          | 836.5                   | 2703                     | 2970                     | 2685                     | 3000                     |
|                | 5MHz       | 20525          | 836.5                   | 4496                     | 4958                     | 4496                     | 4958                     |
|                | 10MHz      | 20525          | 836.5                   | 9051                     | 10053                    | 9051                     | 9993                     |
| LTE BAND7      | 5MHz       | 21100          | 2535                    | 4525                     | 4985                     | 4525                     | 4975                     |
|                | 10MHz      | 21100          | 2535                    | 9051                     | 10040                    | 9071                     | 10020                    |
|                | 15MHz      | 21100          | 2535                    | 13516                    | 14845                    | 13516                    | 14725                    |
|                | 20MHz      | 21100          | 2535                    | 18501                    | 20639                    | 18581                    | 20719                    |
| LTE BAND12     | 1.4MHz     | 23095          | 707.5                   | 1099.9                   | 1234.8                   | 1093.9                   | 1240.8                   |
|                | 3MHz       | 23095          | 707.5                   | 2697                     | 2976                     | 2691                     | 3018                     |
|                | 5MHz       | 23095          | 707.5                   | 4515                     | 4935                     | 4525                     | 4975                     |
|                | 10MHz      | 23095          | 707.5                   | 9071                     | 1005                     | 9051                     | 9991                     |
| LTE BAND13     | 5MHz       | 23230          | 782.0                   | 4515                     | 4995                     | 4486                     | 4925                     |
|                | 10MHz      | 23230          | 782.0                   | 9031                     | 10039                    | 9051                     | 10000                    |
| LTE BAND25     | 1.4MHz     | 26365          | 1882.5                  | 1096.9                   | 1258.7                   | 1099.9                   | 1252.7                   |
|                | 3MHz       | 26365          | 1882.5                  | 2703                     | 2985                     | 2715                     | 3027                     |
|                | 5MHz       | 26365          | 1882.5                  | 4525                     | 4945                     | 4496                     | 5005                     |
|                | 10MHz      | 26365          | 1882.5                  | 9071                     | 10180                    | 9051                     | 10020                    |
|                | 15MHz      | 26365          | 1882.5                  | 13516                    | 14725                    | 13516                    | 14785                    |
|                | 20MHz      | 26365          | 1882.5                  | 18501                    | 20699                    | 18541                    | 20659                    |
| LTE BAND26     | 1.4MHz     | 26915          | 836.5                   | 1093.9                   | 1243.8                   | 1093.9                   | 1249.8                   |
|                | 3MHz       | 26915          | 836.5                   | 2697                     | 3000                     | 2697                     | 2697                     |
|                | 5MHz       | 26915          | 836.5                   | 4525                     | 4942                     | 4496                     | 4932                     |
|                | 10MHz      | 26915          | 836.5                   | 9051                     | 10107                    | 9051                     | 9987                     |
|                | 15MHz      | 26915          | 836.5                   | 13487                    | 14752                    | 13487                    | 14722                    |
| LTE BAND30     | 5MHz       | 27710          | 2310                    | 4505                     | 4935                     | 4496                     | 4945                     |
|                | 10MHz      | 27710          | 2310                    | 9051                     | 10060                    | 9071                     | 10040                    |
| LTE BAND41     | 5MHz       | 40620          | 2593                    | 4496                     | 4985                     | 4505                     | 5015                     |
|                | 10MHz      | 40620          | 2593                    | 9071                     | 10789                    | 9051                     | 10169                    |
|                | 15MHz      | 40620          | 2593                    | 13516                    | 15.924                   | 13487                    | 15774                    |
|                | 20MHz      | 40620          | 2593                    | 18501                    | 21968                    | 18541                    | 22607                    |

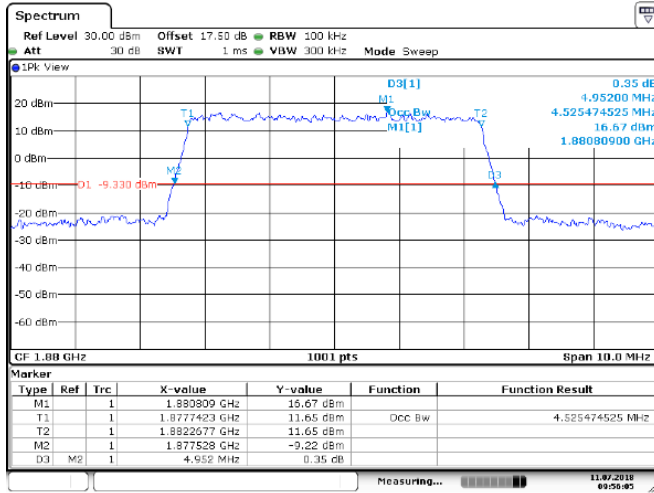
Test plots as follow:



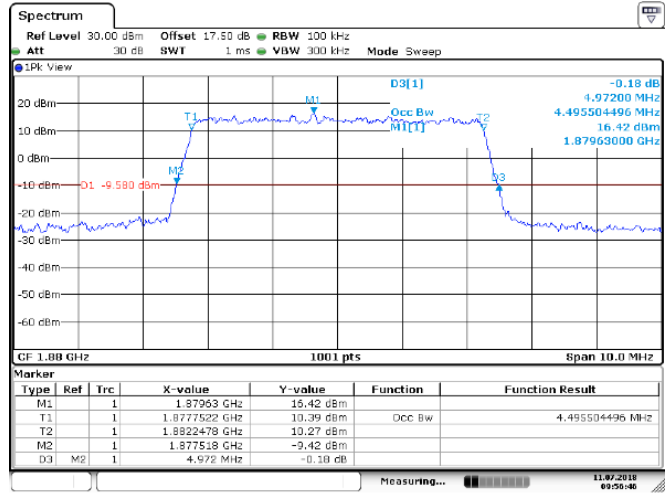
## LTE Band2: Occupied Bandwidth and Emission Bandwidth

### Test BW: 5MHz - Middle Channel

#### QPSK



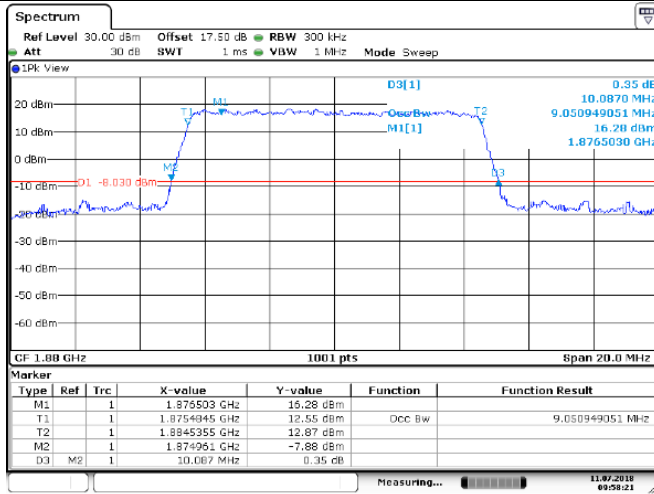
#### 16QAM



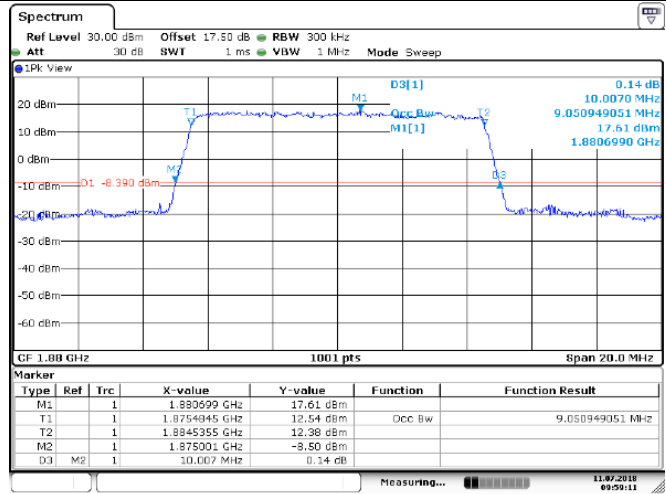
## LTE Band2: Occupied Bandwidth and Emission Bandwidth

### Test BW: 10MHz - Middle Channel

#### QPSK



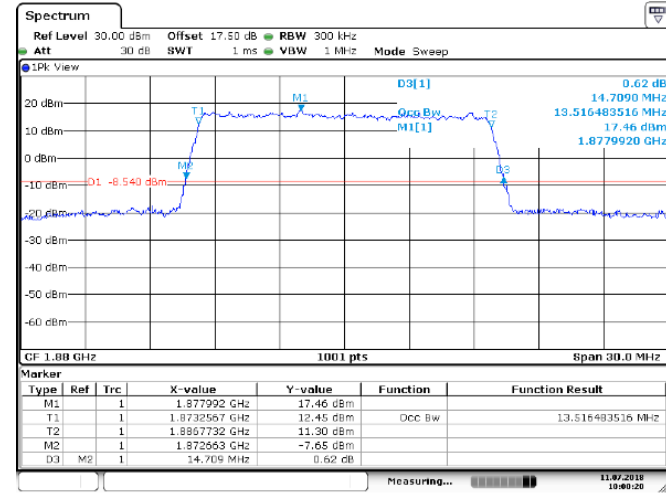
#### 16QAM



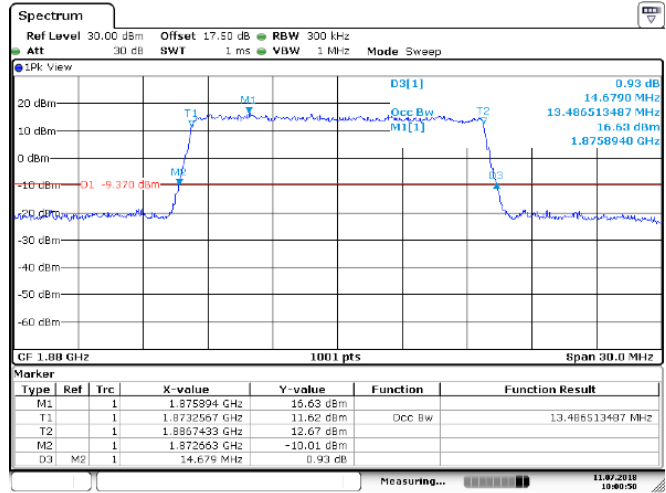
## LTE Band2: Occupied Bandwidth and Emission Bandwidth

Test BW: 15MHz - Middle Channel

QPSK



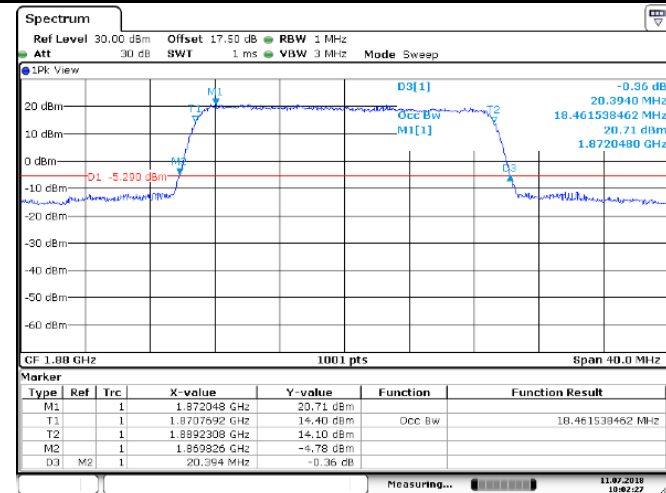
16QAM



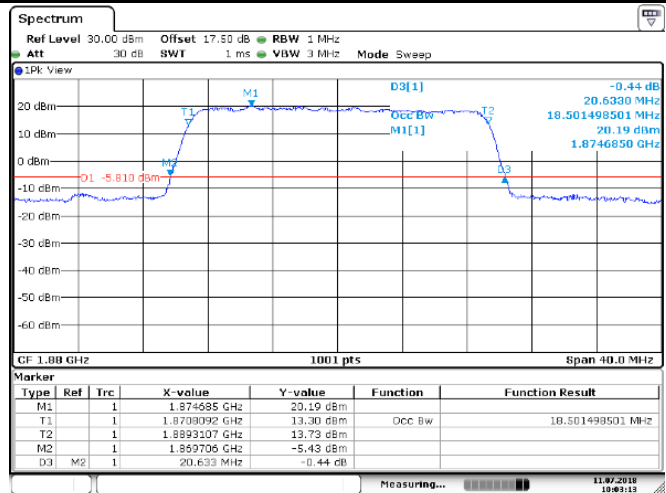
## LTE Band2: Occupied Bandwidth and Emission Bandwidth

Test BW: 20MHz - Middle Channel

QPSK



16QAM

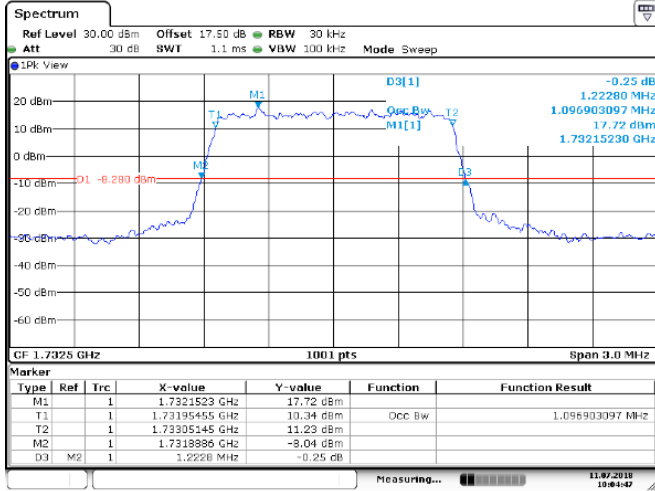


LTE Band4: Occupied Bandwidth and Emission Bandwidth

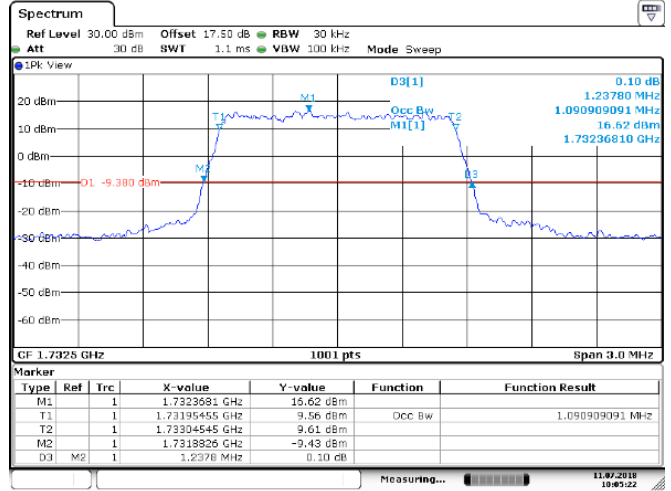
Test BW: 1.4MHz – Middle Channel

QPSK

16QAM



Date: 11 JUL 2018 10:04:47



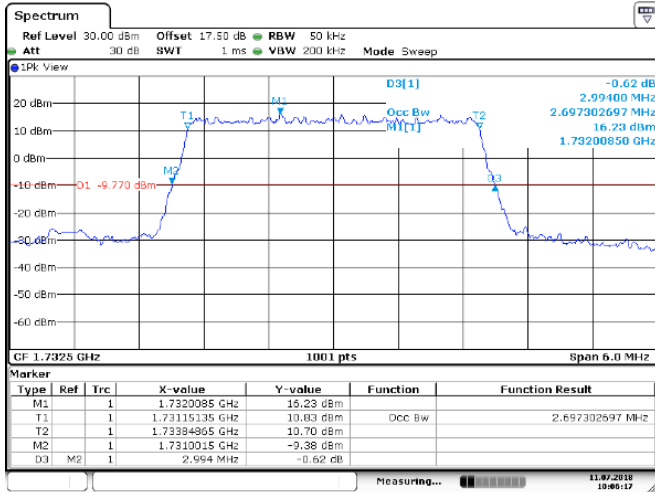
Date: 11 JUL 2018 10:05:22

LTE Band4: Occupied Bandwidth and Emission Bandwidth

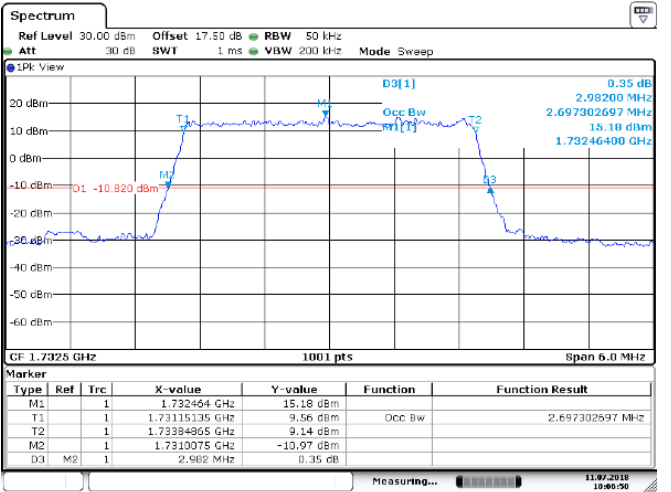
Test BW: 3MHz - Middle Channel

QPSK

16QAM



Date: 11 JUL 2018 10:06:17

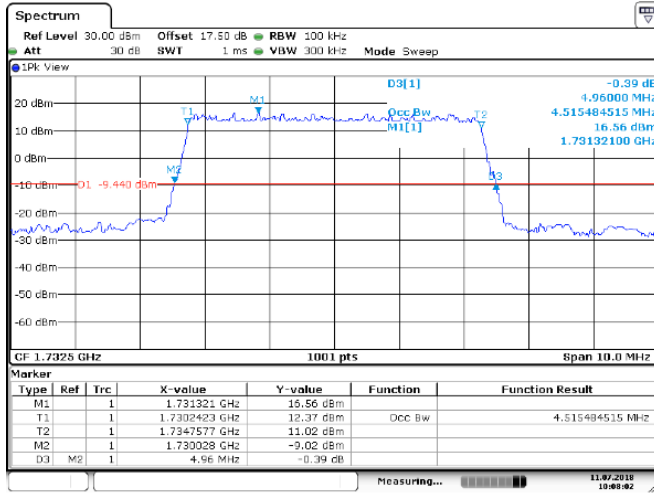


Date: 11 JUL 2018 10:06:50

## LTE Band4: Occupied Bandwidth and Emission Bandwidth

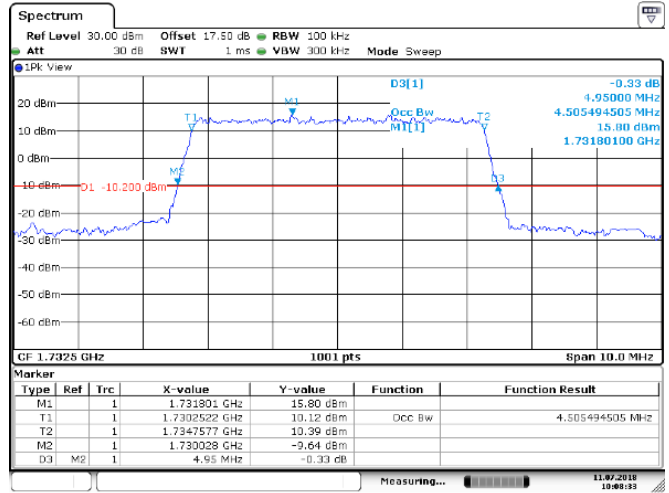
### Test BW: 5MHz - Middle Channel

#### QPSK



Date: 11 JUL 2018 10:08:02

#### 16QAM

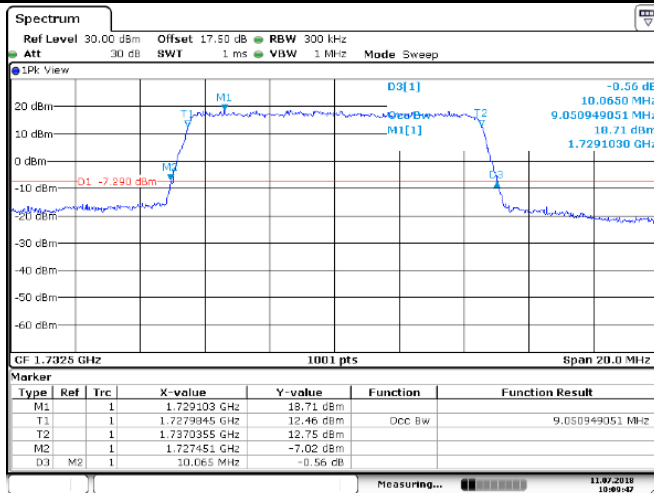


Date: 11 JUL 2018 10:08:03

## LTE Band4: Occupied Bandwidth and Emission Bandwidth

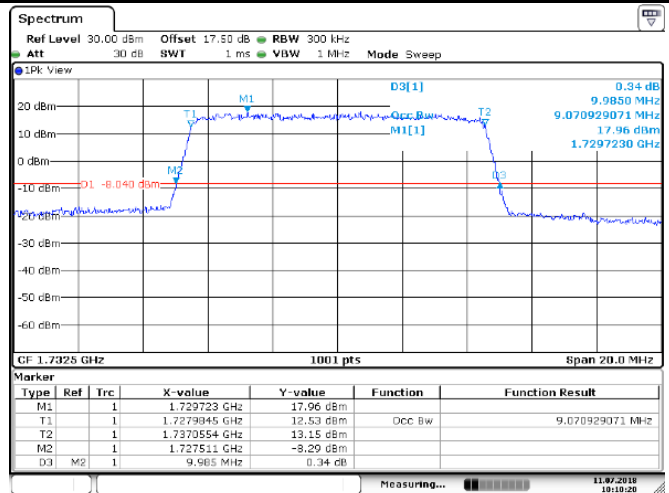
### Test BW: 10MHz - Middle Channel

#### QPSK



Date: 11 JUL 2018 10:09:47

#### 16QAM



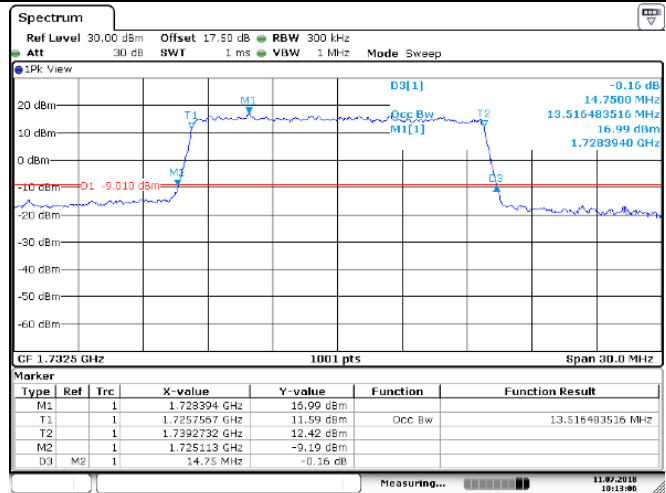
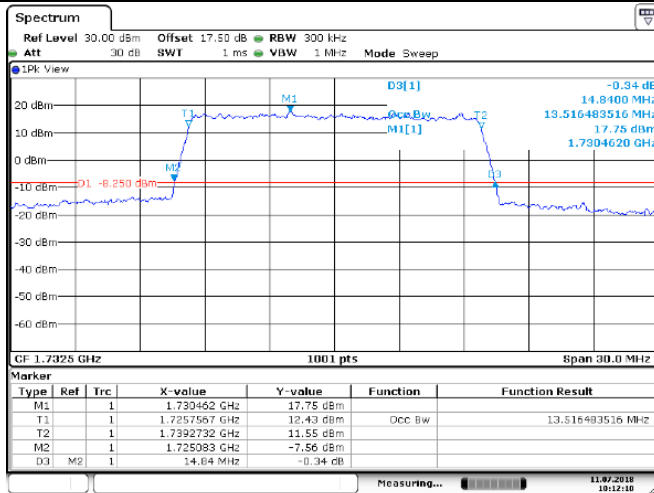
Date: 11 JUL 2018 10:10:20

## LTE Band4: Occupied Bandwidth and Emission Bandwidth

Test BW: 15MHz - Middle Channel

QPSK

16QAM

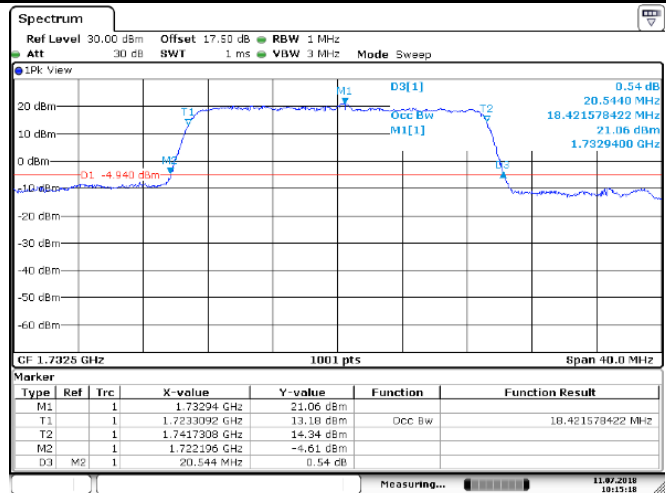
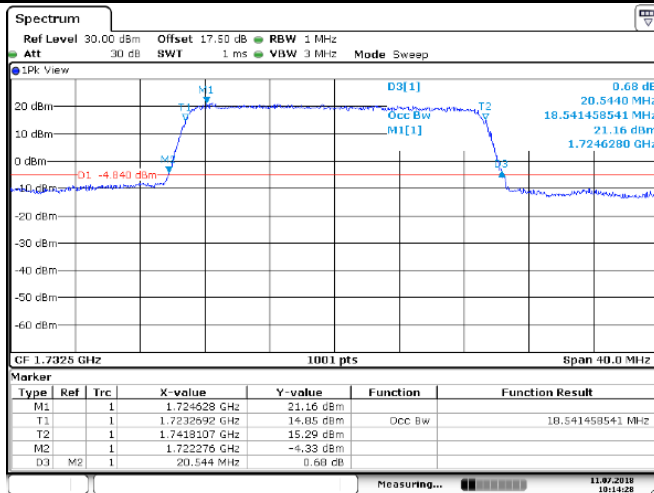


## LTE Band4: Occupied Bandwidth and Emission Bandwidth

Test BW: 20MHz - Middle Channel

QPSK

16QAM

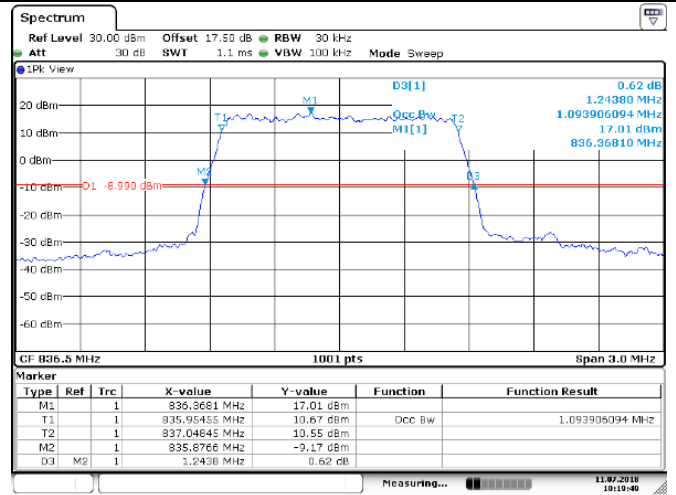
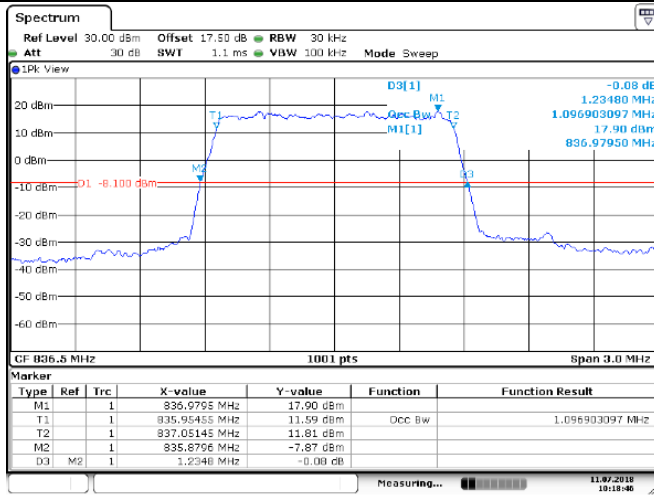


## LTE Band5: Occupied Bandwidth and Emission Bandwidth

Test BW: 1.4MHz – Middle Channel

QPSK

16QAM

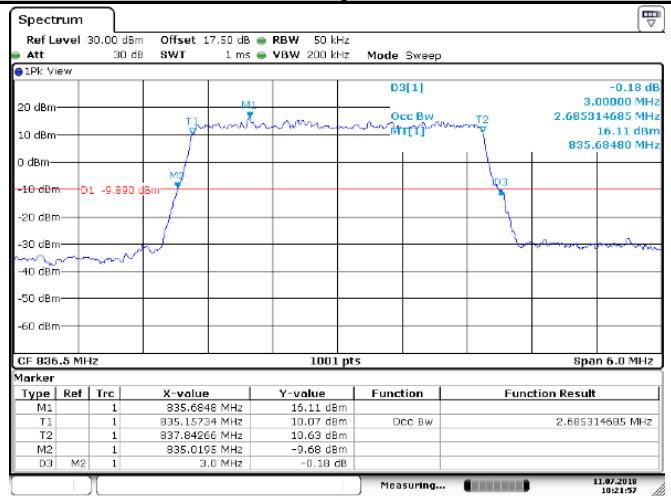
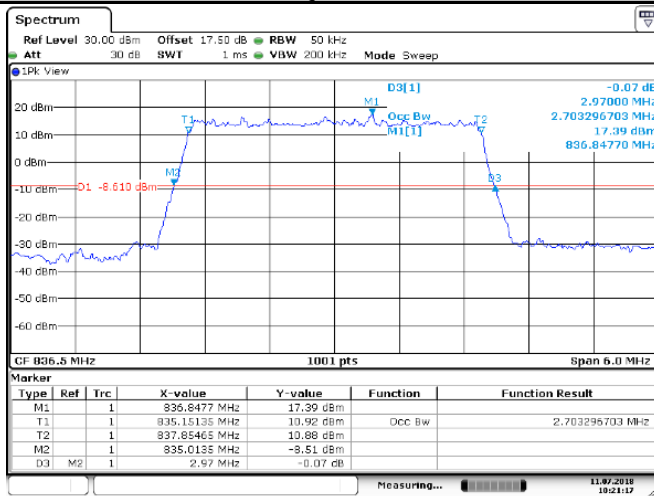


## LTE Band5: Occupied Bandwidth and Emission Bandwidth

Test BW: 3MHz - Middle Channel

QPSK

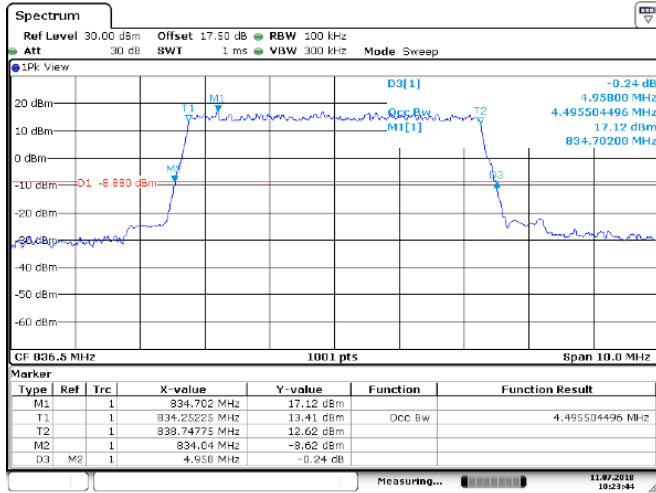
16QAM



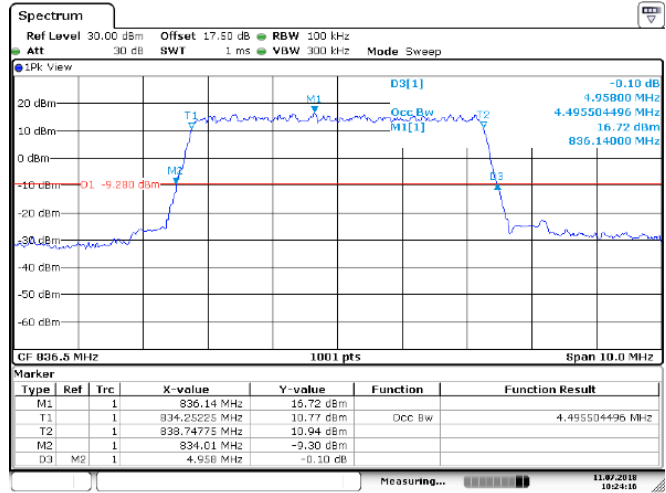
## LTE Band4: Occupied Bandwidth and Emission Bandwidth

### Test BW: 5MHz - Middle Channel

#### QPSK



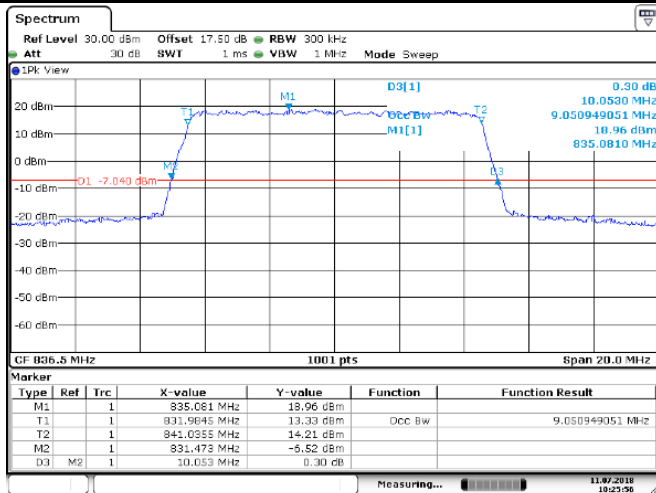
#### 16QAM



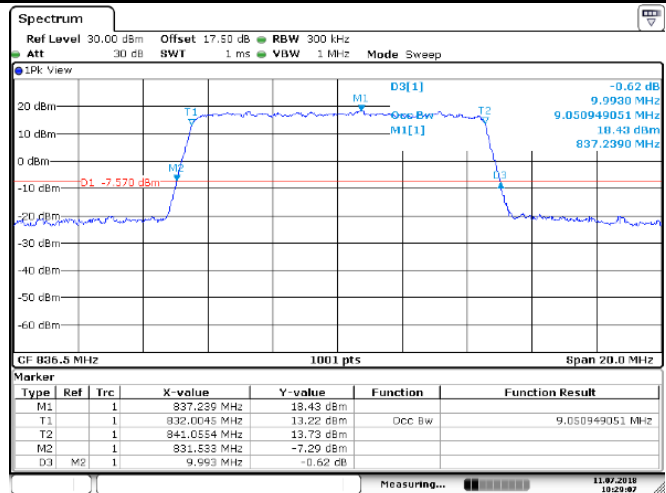
## LTE Band5: Occupied Bandwidth and Emission Bandwidth

### Test BW: 10MHz - Middle Channel

#### QPSK



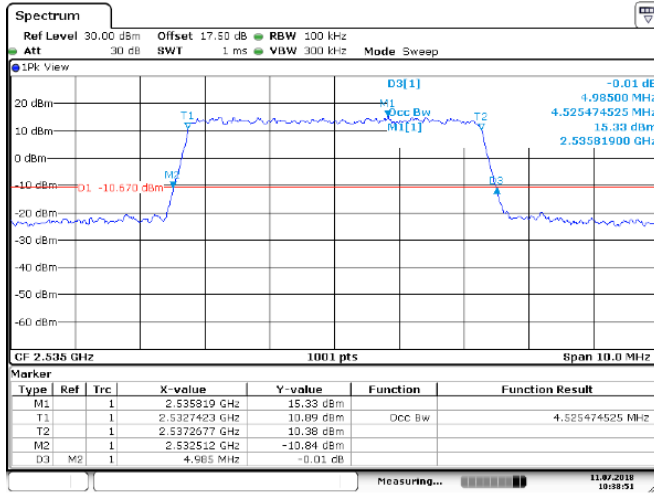
#### 16QAM



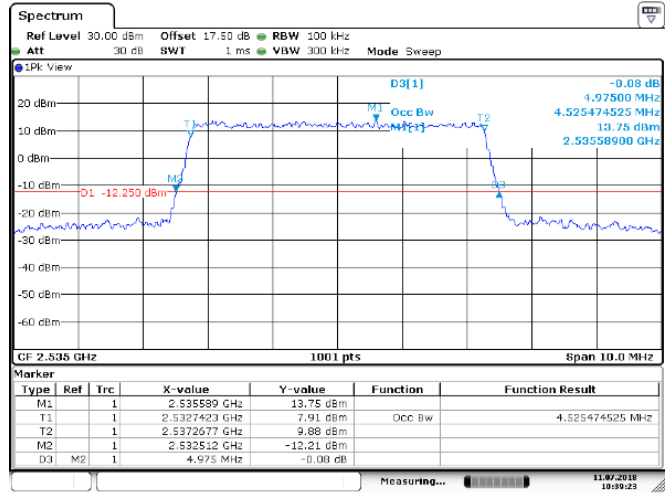
## LTE Band7: Occupied Bandwidth and Emission Bandwidth

### Test BW: 5MHz - Middle Channel

#### QPSK



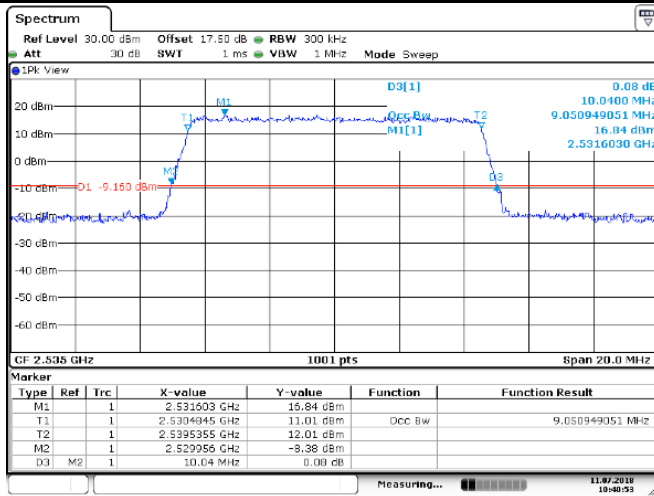
#### 16QAM



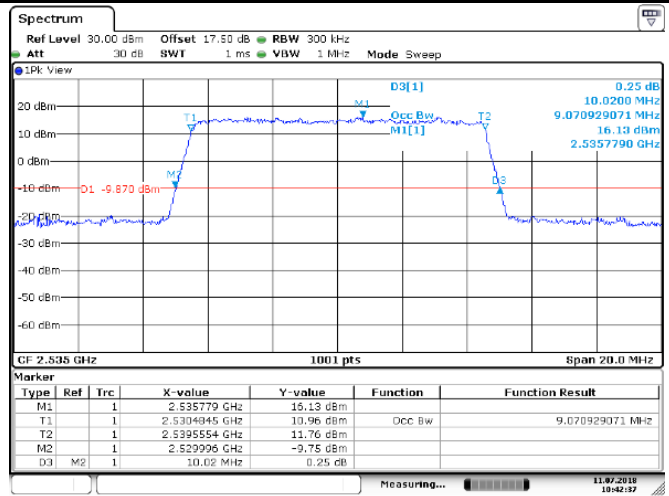
## LTE Band7: Occupied Bandwidth and Emission Bandwidth

### Test BW: 10MHz - Middle Channel

#### QPSK



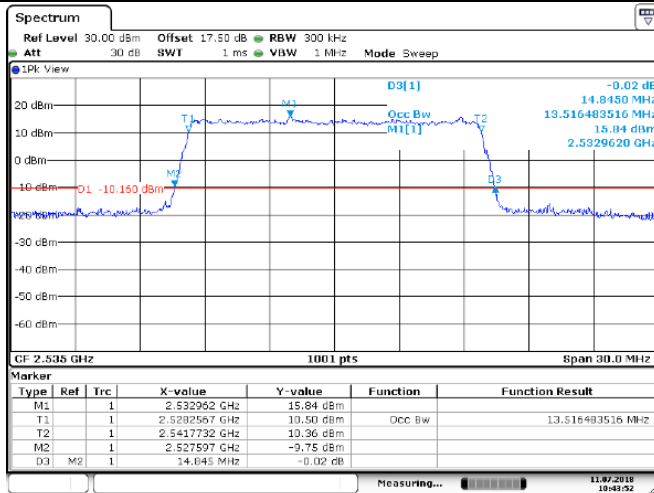
#### 16QAM



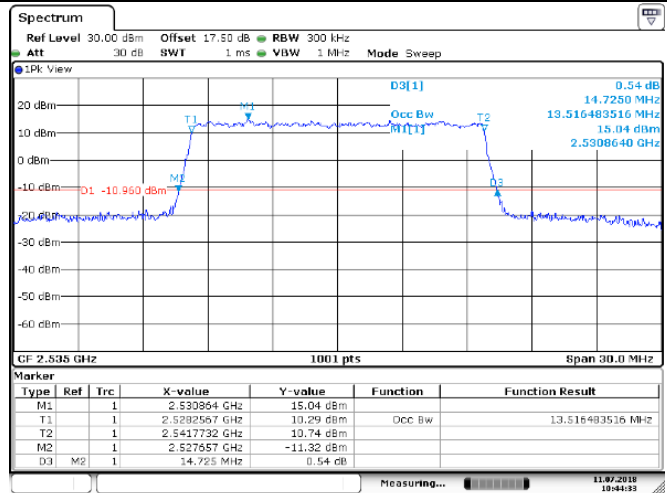
## LTE Band7: Occupied Bandwidth and Emission Bandwidth

### Test BW: 15MHz - Middle Channel

#### QPSK



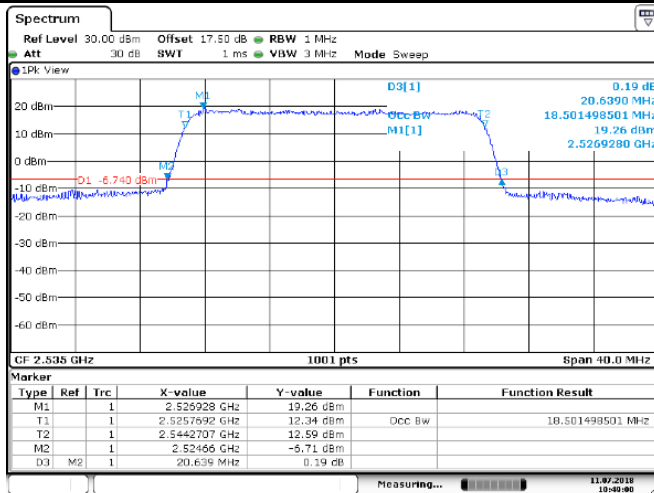
#### 16QAM



## LTE Band7: Occupied Bandwidth and Emission Bandwidth

### Test BW: 20MHz - Middle Channel

#### QPSK



#### 16QAM

