



# TEST REPORT

**APPLICANT** : Nubia Technology Co.,Ltd  
**PRODUCT NAME** : NX619J  
**MODEL NAME** : NX619J  
**BRAND NAME** : NUBIA  
**FCC ID** : 2AHJO-NX619J  
**STANDARD(S)** : 47 CFR Part 27, Subpart H&L&M  
**RECEIPT DATE** : 2018-11-22  
**TEST DATE** : 2018-11-23 to 2019-01-21  
**ISSUE DATE** : 2019-01-22

Edited by: Zhao Zetian  
Zhao Zetian (Test Engineer)

Approved by: Peng Huarui  
Peng Huarui ( Supervisor )

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| <b>Change History</b> |             |                          |
|-----------------------|-------------|--------------------------|
| <b>Version</b>        | <b>Date</b> | <b>Reason for change</b> |
| 1.0                   | 2019-01-22  | First edition            |
|                       |             |                          |



# 1. Technical Information

Note: Provide by applicant.

## 1.1. Applicant and Manufacturer Information

|                              |   |
|------------------------------|---|
| <b>Applicant:</b>            | Nubia Technology Co.,Ltd  |
| <b>Applicant Address:</b>    | 10/F, Tower A, Hans Innovation Mansion, North Ring Rd.,<br>No.9018, High-Tech Park, Nanshan District, Shenzhen, China |
| <b>Manufacturer:</b>         | Nubia Technology Co.,Ltd  |
| <b>Manufacturer Address:</b> | 10/F, Tower A, Hans Innovation Mansion, North Ring Rd.,<br>No.9018, High-Tech Park, Nanshan District, Shenzhen, China |

## 1.2. Equipment Under Test (EUT) Description

|                             |  |   |
|-----------------------------|--|---|
| <b>Product Name:</b>        | NX619J   |   |
| <b>Serial No:</b>           | (N/A, marked #1 by test site)  |   |
| <b>Hardware Version:</b>    | NX619J_V1AMB   |   |
| <b>Software Version:</b>    | NX619J_ENCommon_V1.07  |   |
| <b>Modulation Type:</b>     | QPSK, 16QAM,64QAM  |   |
| <b>Operation Band:</b>      | Band 66  |   |
| <b>Frequency Range:</b>     | LTE Band 66  | Tx: 1710MHz -1780MHz                        |
|                             |  | Rx: 2110MHz -2200MHz                        |
| <b>Channel Bandwidth</b>    | LTE Band 66  | 1.4MHz, 3 MHz, 5 MHz, 10MHz, 15 MHz, 20 MHz |
| <b>Emission Designator:</b> | 1M09G7D (LTE Band 66, QPSK, BW 1.4MHz)<br>1M09W7D (LTE Band 66, 16QAM, BW 1.4MHz)<br>1M09W7D (LTE Band 66, 64QAM, BW 1.4MHz)<br>2M70G7D (LTE Band 66, QPSK, BW 3MHz)<br>2M70W7D (LTE Band 66, 16QAM, BW 3MHz)<br>2M70 W7D (LTE Band 66, 64QAM, BW 3MHz)<br>4M49G7D (LTE Band 66, QPSK, BW 5MHz)<br>4M50W7D (LTE Band 66, 16QAM, BW 5MHz)<br>4M50W7D (LTE Band 66, 64QAM, BW 5MHz)<br>8M97G7D (LTE Band 66, QPSK, BW 10MHz)<br>8M96W7D (LTE Band 66, 16QAM, BW 10MHz)<br>8M97W7D (LTE Band 66, 64QAM, BW 10MHz)<br>13M46G7D (LTE Band 66, QPSK, BW 15MHz) |   |



|   |  |                                   |
|---|--|-----------------------------------|
|   | 13M47W7D (LTE Band 66, 16QAM, BW 15MHz)<br>13M44W7D (LTE Band 66, 64QAM, BW 15MHz)<br>17M93G7D (LTE Band 66, QPSK, BW 20MHz)<br>17M94W7D (LTE Band 66, 16QAM, BW 20MHz)<br>17M97W7D (LTE Band 66, 64QAM, BW 20MHz) |                                   |
| <b>Antenna Type:</b>                      | PIFA Antenna   |                                   |
| <b>Antenna Gain:<br/>( Top Antenna)</b>   | LTE Band 66  | 1.43 dBi                          |
| <b>Antenna Gain:<br/>(Bottom Antenna)</b> | LTE Band 66  | 1.47 dBi                          |
| <b>Accessory Information::</b>            | Battery  |                                   |
|   | Brand Name:  | ATL                               |
|   | Model No.:   | Li3937T44P6h886639                |
|   | Serial No.:  | (N/A, marked #1 by test site)     |
|   | Capacity:  | 3800mAh                           |
|   | Rated Voltage:   | 3.85V                             |
|   | Charge Limit:  | 4.4V                              |
| <b>Accessory Information:</b>             | AC Adapter   |                                   |
|   | Brand Name:  | CHENYANG                          |
|   | Model No.:   | CYNBY090200-A00                   |
|   | Serial No.:  | (N/A, marked #1 by test site)     |
|   | Rated Input:   | 100-240V~ 50/60Hz 0.5A            |
|   | Rated Output:  | 5V=3.0A; 9V=2.0A;12V=1.5A         |
| <b>Accessory Information:</b>             | AC Adapter 2   |                                   |
|   | Brand Name:  | XINSPower                         |
|   | Model No.:   | Q183                              |
|   | Serial No.:  | (N/A, marked #1 by test site)     |
|   | Rated Input:   | 100-240V ~ 50/60Hz 0.5A           |
|   | Rated Output:  | 3.6-6V=3.0A; 6-9V=2.0A;9-12V=1.5A |

**Note 1:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



### 1.3. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 27 for the EUT FCC ID Certification:

| No | Identity       | Document Title  |
|----|----------------|---|
| 1  | 47 CFR Part 2  | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| 2  | 47 CFR Part 27 | Miscellaneous Wireless Communications Services                                |

Test detailed items/section required by FCC rules and results are as below:

| Section                                | Description                         | Test Date       | Test Engineer | Result |
|--|-------------------------------------|-----------------|---------------|--------|
| 2.1046                                 | Transmitter Conducted Output Power  | Jan 17, 2019    | Gao Mingzhou  | PASS   |
| 2.1049                                 | Occupied Bandwidth                  | Dec 21, 2018    | Gao Mingzhou  | PASS   |
| 2.1055,27.54                           | Frequency Stability                 | Dec 22, 2018    | Gao Mingzhou  | PASS   |
| 27.50(d)(5)                            | Peak to Average Ratio               | Dec 21&22, 2018 | Gao Mingzhou  | PASS   |
| 2.1051, 27.53(g)(h)(m)(4)              | Conducted Spurious Emissions        | Jan 17, 2019    | Gao Mingzhou  | PASS   |
| 2.1051, 27.53(g)(h)(m)(4)              | Band Edge                           | Dec 25, 2018    | Gao Mingzhou  | PASS   |
| ,27.50(c)(10) 27.50(d)(4), 27.50(h)(2) | Equivalent Isotropic Radiated Power | Dec 01, 2018    | Wang Dalong   | PASS   |
| 2.1051, 27.53(g)(h)(m)(4)              | Radiated Spurious Emissions         | Dec 01&02, 2018 | Wang Dalong   | PASS   |

**Note:** The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 (Oct 27, 2017) and ANSI/TIA-603-E-2016.

### 1.4. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

|                             |         |
|-----------------------------|---------|
| Temperature (°C):           | 15 - 35 |
| Relative Humidity (%):      | 30 -60  |
| Atmospheric Pressure (kPa): | 86-106  |

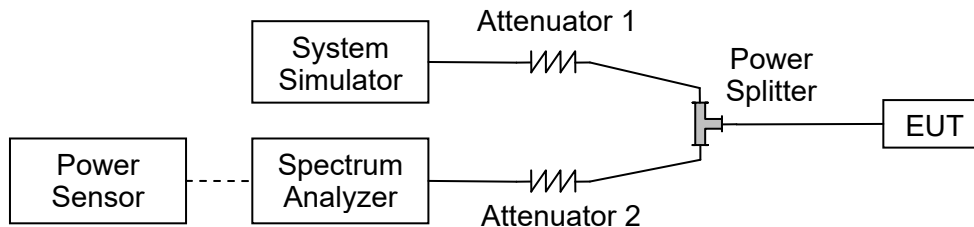
## 2. 47 CFR Part 2, and 27H&L&M Requirements

### 2.1. Transmitter Conducted Output Power

#### 2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

#### 2.1.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

#### 2.1.3. Test procedure

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

#### 2.1.4. Result



Top Antenna (Down Power):

| <b>LTE Band66</b> |            |         |           |                               |                                  |                                |
|-------------------|------------|---------|-----------|-------------------------------|----------------------------------|--------------------------------|
| BW [MHz]          | Modulation | RB Size | RB Offset | Average Power Low Ch. / Freq. | Average Power Middle Ch. / Freq. | Average Power High Ch. / Freq. |
| Channel           |            |         |           | 132072                        | 132322                           | 132572                         |
| Frequency (MHz)   |            |         |           | 1720                          | 1745                             | 1770                           |
| 20                | QPSK       | 1       | 0         | 18.34                         | 18.13                            | 18.01                          |
| 20                | QPSK       | 1       | 49        | 18.04                         | 17.97                            | 17.58                          |
| 20                | QPSK       | 1       | 99        | 17.99                         | 17.81                            | 17.52                          |
| 20                | QPSK       | 50      | 0         | 17.20                         | 17.21                            | 17.04                          |
| 20                | QPSK       | 50      | 24        | 17.13                         | 17.15                            | 16.96                          |
| 20                | QPSK       | 50      | 50        | 17.27                         | 17.08                            | 16.74                          |
| 20                | QPSK       | 100     | 0         | 17.09                         | 17.12                            | 16.83                          |
| 20                | 16QAM      | 1       | 0         | 17.55                         | 17.89                            | 17.57                          |
| 20                | 16QAM      | 1       | 49        | 17.23                         | 17.63                            | 17.24                          |
| 20                | 16QAM      | 1       | 99        | 17.15                         | 17.57                            | 17.08                          |
| 20                | 16QAM      | 50      | 0         | 16.34                         | 16.31                            | 16.09                          |
| 20                | 16QAM      | 50      | 24        | 16.22                         | 16.23                            | 16.00                          |
| 20                | 16QAM      | 50      | 50        | 16.17                         | 16.19                            | 15.89                          |
| 20                | 16QAM      | 100     | 0         | 16.16                         | 16.18                            | 15.99                          |
| 20                | 64QAM      | 1       | 0         | 17.08                         | 17.13                            | 17.05                          |
| 20                | 64QAM      | 1       | 49        | 16.96                         | 16.97                            | 16.89                          |
| 20                | 64QAM      | 1       | 99        | 16.76                         | 16.76                            | 16.71                          |
| 20                | 64QAM      | 50      | 0         | 16.35                         | 16.39                            | 16.32                          |
| 20                | 64QAM      | 50      | 24        | 16.29                         | 16.30                            | 16.25                          |
| 20                | 64QAM      | 50      | 50        | 16.13                         | 16.20                            | 16.17                          |
| 20                | 64QAM      | 100     | 0         | 16.02                         | 16.10                            | 16.05                          |
| Channel           |            |         |           | 132047                        | 132322                           | 132597                         |
| Frequency (MHz)   |            |         |           | 1717.5                        | 1745                             | 1772.5                         |
| 15                | QPSK       | 1       | 0         | 18.11                         | 18.02                            | 18.14                          |
| 15                | QPSK       | 1       | 37        | 18.08                         | 18.12                            | 18.19                          |
| 15                | QPSK       | 1       | 74        | 17.97                         | 17.91                            | 18.02                          |
| 15                | QPSK       | 36      | 0         | 16.83                         | 16.95                            | 16.87                          |
| 15                | QPSK       | 36      | 20        | 16.92                         | 16.90                            | 16.82                          |
| 15                | QPSK       | 36      | 39        | 16.98                         | 17.03                            | 17.07                          |
| 15                | QPSK       | 75      | 0         | 17.06                         | 17.03                            | 16.86                          |
| 15                | 16QAM      | 1       | 0         | 17.08                         | 17.05                            | 16.91                          |





|    |       |    |    |       |       |       |
|----|-------|----|----|-------|-------|-------|
| 15 | 16QAM | 1  | 37 | 16.89 | 16.63 | 16.86 |
| 15 | 16QAM | 1  | 74 | 16.86 | 16.66 | 16.86 |
| 15 | 16QAM | 36 | 0  | 16.71 | 16.75 | 16.65 |
| 15 | 16QAM | 36 | 20 | 16.88 | 16.86 | 16.79 |
| 15 | 16QAM | 36 | 39 | 16.69 | 16.86 | 16.66 |
| 15 | 16QAM | 75 | 0  | 16.70 | 16.83 | 16.65 |
| 15 | 64QAM | 1  | 0  | 16.45 | 16.48 | 16.31 |
| 15 | 64QAM | 1  | 37 | 16.32 | 16.46 | 16.31 |
| 15 | 64QAM | 1  | 74 | 16.38 | 16.43 | 16.33 |
| 15 | 64QAM | 36 | 0  | 16.40 | 16.49 | 16.48 |
| 15 | 64QAM | 36 | 20 | 16.42 | 16.33 | 16.41 |
| 15 | 64QAM | 36 | 39 | 16.40 | 16.38 | 16.33 |
| 15 | 64QAM | 75 | 0  | 16.44 | 16.46 | 16.33 |

| Channel         |       |    |    | 132022 | 132322 | 132622 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   |
| 10              | QPSK  | 1  | 0  | 17.95  | 18.16  | 17.93  |
| 10              | QPSK  | 1  | 25 | 17.97  | 18.05  | 18.02  |
| 10              | QPSK  | 1  | 49 | 17.93  | 18.03  | 18.08  |
| 10              | QPSK  | 25 | 0  | 16.98  | 16.92  | 16.91  |
| 10              | QPSK  | 25 | 12 | 17.06  | 16.85  | 16.87  |
| 10              | QPSK  | 25 | 25 | 16.97  | 16.90  | 16.97  |
| 10              | QPSK  | 50 | 0  | 16.97  | 17.07  | 17.05  |
| 10              | 16QAM | 1  | 0  | 16.91  | 17.00  | 17.01  |
| 10              | 16QAM | 1  | 25 | 17.02  | 16.95  | 16.90  |
| 10              | 16QAM | 1  | 49 | 16.89  | 17.05  | 17.04  |
| 10              | 16QAM | 25 | 0  | 16.84  | 16.87  | 16.72  |
| 10              | 16QAM | 25 | 12 | 16.67  | 16.75  | 16.89  |
| 10              | 16QAM | 25 | 25 | 16.69  | 16.63  | 16.64  |
| 10              | 16QAM | 50 | 0  | 16.77  | 16.72  | 16.69  |
| 10              | 64QAM | 1  | 0  | 16.46  | 16.44  | 16.48  |
| 10              | 64QAM | 1  | 25 | 16.38  | 16.32  | 16.49  |
| 10              | 64QAM | 1  | 49 | 16.33  | 16.49  | 16.48  |
| 10              | 64QAM | 25 | 0  | 16.43  | 16.46  | 16.36  |
| 10              | 64QAM | 25 | 12 | 16.32  | 16.37  | 16.45  |
| 10              | 64QAM | 25 | 25 | 16.41  | 16.35  | 16.45  |
| 10              | 64QAM | 50 | 0  | 16.34  | 16.42  | 16.37  |



| Channel         |       |    |    | 131997 | 132322 | 132647 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1777.5 |
| 5               | QPSK  | 1  | 0  | 18.05  | 17.98  | 17.97  |
| 5               | QPSK  | 1  | 12 | 17.95  | 17.92  | 18.13  |
| 5               | QPSK  | 1  | 24 | 18.11  | 18.08  | 18.06  |
| 5               | QPSK  | 12 | 0  | 18.11  | 18.02  | 18.14  |
| 5               | QPSK  | 12 | 7  | 16.99  | 17.07  | 16.92  |
| 5               | QPSK  | 12 | 13 | 16.94  | 16.81  | 16.91  |
| 5               | QPSK  | 25 | 0  | 17.10  | 16.85  | 16.85  |
| 5               | 16QAM | 1  | 0  | 16.96  | 16.94  | 16.81  |
| 5               | 16QAM | 1  | 12 | 16.89  | 17.04  | 16.95  |
| 5               | 16QAM | 1  | 24 | 16.90  | 17.04  | 16.90  |
| 5               | 16QAM | 12 | 0  | 16.66  | 16.89  | 16.73  |
| 5               | 16QAM | 12 | 7  | 16.77  | 16.73  | 16.88  |
| 5               | 16QAM | 12 | 13 | 16.70  | 16.82  | 16.65  |
| 5               | 16QAM | 25 | 0  | 16.81  | 16.75  | 16.70  |
| 5               | 64QAM | 1  | 0  | 16.47  | 16.40  | 16.49  |
| 5               | 64QAM | 1  | 12 | 16.31  | 16.37  | 16.50  |
| 5               | 64QAM | 1  | 24 | 16.47  | 16.32  | 16.45  |
| 5               | 64QAM | 12 | 0  | 16.43  | 16.42  | 16.38  |
| 5               | 64QAM | 12 | 7  | 16.36  | 16.44  | 16.36  |
| 5               | 64QAM | 12 | 13 | 16.34  | 16.41  | 16.43  |
| 5               | 64QAM | 25 | 0  | 16.30  | 16.42  | 16.43  |

| Channel         |       |    |    | 131987 | 132322 | 132657 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |
| 3               | QPSK  | 1  | 0  | 17.95  | 18.16  | 17.93  |
| 3               | QPSK  | 1  | 8  | 17.97  | 18.05  | 18.02  |
| 3               | QPSK  | 1  | 14 | 17.93  | 18.03  | 18.08  |
| 3               | QPSK  | 8  | 0  | 16.93  | 17.00  | 17.08  |
| 3               | QPSK  | 8  | 4  | 17.02  | 16.95  | 16.87  |
| 3               | QPSK  | 8  | 7  | 17.07  | 16.84  | 17.03  |
| 3               | QPSK  | 15 | 0  | 16.82  | 16.89  | 16.85  |
| 3               | 16QAM | 1  | 0  | 16.92  | 16.92  | 16.95  |
| 3               | 16QAM | 1  | 8  | 16.94  | 16.93  | 16.85  |
| 3               | 16QAM | 1  | 14 | 16.62  | 16.73  | 16.69  |
| 3               | 16QAM | 8  | 0  | 16.72  | 16.61  | 16.63  |



|                 |       |    |    |        |        |        |
|-----------------|-------|----|----|--------|--------|--------|
| 3               | 16QAM | 8  | 4  | 16.64  | 16.80  | 16.68  |
| 3               | 16QAM | 8  | 7  | 16.87  | 16.64  | 16.83  |
| 3               | 16QAM | 15 | 0  | 16.32  | 16.46  | 16.31  |
| 3               | 64QAM | 1  | 0  | 16.38  | 16.43  | 16.33  |
| 3               | 64QAM | 1  | 8  | 16.40  | 16.49  | 16.48  |
| 3               | 64QAM | 1  | 14 | 16.46  | 16.44  | 16.48  |
| 3               | 64QAM | 8  | 0  | 16.38  | 16.32  | 16.49  |
| 3               | 64QAM | 8  | 4  | 16.33  | 16.49  | 16.48  |
| 3               | 64QAM | 8  | 7  | 16.02  | 16.29  | 16.19  |
| 3               | 64QAM | 15 | 0  | 15.89  | 15.99  | 15.89  |
| Channel         |       |    |    | 131979 | 132322 | 132665 |
| Frequency (MHz) |       |    |    | 1710.7 | 1745   | 1779.3 |
| 1.4             | QPSK  | 1  | 0  | 17.92  | 18.05  | 18.14  |
| 1.4             | QPSK  | 1  | 3  | 18.07  | 18.00  | 18.02  |
| 1.4             | QPSK  | 1  | 5  | 17.92  | 18.04  | 18.05  |
| 1.4             | QPSK  | 3  | 0  | 17.02  | 16.95  | 16.90  |
| 1.4             | QPSK  | 3  | 1  | 16.89  | 17.05  | 17.04  |
| 1.4             | QPSK  | 3  | 3  | 16.92  | 17.01  | 16.93  |
| 1.4             | QPSK  | 6  | 0  | 16.86  | 16.82  | 16.80  |
| 1.4             | 16QAM | 1  | 0  | 16.89  | 17.04  | 16.95  |
| 1.4             | 16QAM | 1  | 3  | 16.72  | 16.77  | 16.85  |
| 1.4             | 16QAM | 1  | 5  | 16.68  | 16.87  | 16.83  |
| 1.4             | 16QAM | 3  | 0  | 16.75  | 16.87  | 16.64  |
| 1.4             | 16QAM | 3  | 1  | 16.68  | 16.67  | 16.69  |
| 1.4             | 16QAM | 3  | 3  | 16.47  | 16.32  | 16.45  |
| 1.4             | 16QAM | 6  | 0  | 16.30  | 16.44  | 16.31  |
| 1.4             | 64QAM | 1  | 0  | 16.42  | 16.40  | 16.42  |
| 1.4             | 64QAM | 1  | 3  | 16.43  | 16.44  | 16.33  |
| 1.4             | 64QAM | 1  | 5  | 16.38  | 16.32  | 16.49  |
| 1.4             | 64QAM | 3  | 0  | 16.40  | 16.32  | 16.34  |
| 1.4             | 64QAM | 3  | 1  | 16.39  | 16.49  | 16.49  |
| 1.4             | 64QAM | 3  | 3  | 16.37  | 16.37  | 16.37  |
| 1.4             | 64QAM | 6  | 0  | 16.47  | 16.30  | 16.40  |



Bottom Antenna (Full Power):

| <b>LTE Band66</b> |            |         |           |                               |                                  |                                |
|-------------------|------------|---------|-----------|-------------------------------|----------------------------------|--------------------------------|
| BW [MHz]          | Modulation | RB Size | RB Offset | Average Power Low Ch. / Freq. | Average Power Middle Ch. / Freq. | Average Power High Ch. / Freq. |
| Channel           |            |         |           | 132072                        | 132322                           | 132572                         |
| Frequency (MHz)   |            |         |           | 1720                          | 1745                             | 1770                           |
| 20                | QPSK       | 1       | 0         | 22.98                         | 22.80                            | 22.71                          |
| 20                | QPSK       | 1       | 49        | 22.83                         | 22.71                            | 22.71                          |
| 20                | QPSK       | 1       | 99        | 22.74                         | 22.54                            | 22.21                          |
| 20                | QPSK       | 50      | 0         | 21.65                         | 21.97                            | 21.83                          |
| 20                | QPSK       | 50      | 24        | 21.81                         | 21.93                            | 21.90                          |
| 20                | QPSK       | 50      | 50        | 21.98                         | 21.97                            | 21.60                          |
| 20                | QPSK       | 100     | 0         | 21.73                         | 21.77                            | 21.75                          |
| 20                | 16QAM      | 1       | 0         | 21.99                         | 21.93                            | 21.73                          |
| 20                | 16QAM      | 1       | 49        | 21.68                         | 21.89                            | 21.93                          |
| 20                | 16QAM      | 1       | 99        | 21.82                         | 21.97                            | 21.92                          |
| 20                | 16QAM      | 50      | 0         | 21.62                         | 21.63                            | 21.68                          |
| 20                | 16QAM      | 50      | 24        | 21.60                         | 21.69                            | 21.67                          |
| 20                | 16QAM      | 50      | 50        | 21.63                         | 21.63                            | 21.69                          |
| 20                | 16QAM      | 100     | 0         | 21.61                         | 21.62                            | 21.62                          |
| 20                | 64QAM      | 1       | 0         | 21.64                         | 21.61                            | 21.65                          |
| 20                | 64QAM      | 1       | 49        | 21.60                         | 21.68                            | 21.61                          |
| 20                | 64QAM      | 1       | 99        | 21.67                         | 21.69                            | 21.69                          |
| 20                | 64QAM      | 50      | 0         | 20.87                         | 20.96                            | 20.89                          |
| 20                | 64QAM      | 50      | 24        | 20.77                         | 20.81                            | 20.88                          |
| 20                | 64QAM      | 50      | 50        | 20.72                         | 20.74                            | 20.92                          |
| 20                | 64QAM      | 100     | 0         | 20.93                         | 20.73                            | 20.76                          |
| Channel           |            |         |           | 132047                        | 132322                           | 132597                         |
| Frequency (MHz)   |            |         |           | 1717.5                        | 1745                             | 1772.5                         |
| 15                | QPSK       | 1       | 0         | 22.97                         | 22.82                            | 22.52                          |
| 15                | QPSK       | 1       | 37        | 22.85                         | 22.89                            | 22.73                          |
| 15                | QPSK       | 1       | 74        | 22.89                         | 22.58                            | 22.21                          |
| 15                | QPSK       | 36      | 0         | 21.81                         | 21.99                            | 21.78                          |
| 15                | QPSK       | 36      | 20        | 21.78                         | 21.98                            | 21.87                          |
| 15                | QPSK       | 36      | 39        | 21.73                         | 21.89                            | 21.73                          |
| 15                | QPSK       | 75      | 0         | 21.61                         | 21.80                            | 21.95                          |
| 15                | 16QAM      | 1       | 0         | 21.68                         | 21.64                            | 21.64                          |



|    |       |    |    |       |       |       |
|----|-------|----|----|-------|-------|-------|
| 15 | 16QAM | 1  | 37 | 21.68 | 21.66 | 21.62 |
| 15 | 16QAM | 1  | 74 | 21.67 | 21.67 | 21.63 |
| 15 | 16QAM | 36 | 0  | 21.64 | 21.64 | 21.69 |
| 15 | 16QAM | 36 | 20 | 21.61 | 21.62 | 21.66 |
| 15 | 16QAM | 36 | 39 | 21.63 | 21.61 | 21.62 |
| 15 | 16QAM | 75 | 0  | 21.68 | 21.65 | 21.60 |
| 15 | 64QAM | 1  | 0  | 21.65 | 21.61 | 21.64 |
| 15 | 64QAM | 1  | 37 | 21.60 | 21.63 | 21.64 |
| 15 | 64QAM | 1  | 74 | 21.70 | 21.69 | 21.62 |
| 15 | 64QAM | 36 | 0  | 20.91 | 20.76 | 20.81 |
| 15 | 64QAM | 36 | 20 | 20.94 | 20.75 | 20.81 |
| 15 | 64QAM | 36 | 39 | 20.75 | 20.78 | 20.74 |
| 15 | 64QAM | 75 | 0  | 20.88 | 20.99 | 20.79 |

| Channel         |       |    |    | 132022 | 132322 | 132622 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   |
| 10              | QPSK  | 1  | 0  | 22.87  | 22.72  | 22.36  |
| 10              | QPSK  | 1  | 25 | 22.69  | 22.86  | 22.89  |
| 10              | QPSK  | 1  | 49 | 22.87  | 22.64  | 22.18  |
| 10              | QPSK  | 25 | 0  | 21.76  | 21.93  | 21.78  |
| 10              | QPSK  | 25 | 12 | 21.83  | 21.90  | 21.91  |
| 10              | QPSK  | 25 | 25 | 21.77  | 21.65  | 21.64  |
| 10              | QPSK  | 50 | 0  | 21.88  | 21.95  | 21.75  |
| 10              | 16QAM | 1  | 0  | 21.91  | 21.94  | 21.86  |
| 10              | 16QAM | 1  | 25 | 21.71  | 21.92  | 21.90  |
| 10              | 16QAM | 1  | 49 | 21.92  | 21.81  | 21.82  |
| 10              | 16QAM | 25 | 0  | 21.68  | 21.64  | 21.65  |
| 10              | 16QAM | 25 | 12 | 21.66  | 21.66  | 21.62  |
| 10              | 16QAM | 25 | 25 | 21.65  | 21.69  | 21.67  |
| 10              | 16QAM | 50 | 0  | 21.68  | 21.68  | 21.61  |
| 10              | 64QAM | 1  | 0  | 21.69  | 21.63  | 21.62  |
| 10              | 64QAM | 1  | 25 | 21.67  | 21.67  | 21.65  |
| 10              | 64QAM | 1  | 49 | 21.61  | 21.66  | 21.65  |
| 10              | 64QAM | 25 | 0  | 20.75  | 20.88  | 20.76  |
| 10              | 64QAM | 25 | 12 | 20.97  | 20.93  | 20.87  |
| 10              | 64QAM | 25 | 25 | 20.78  | 20.73  | 20.77  |
| 10              | 64QAM | 50 | 0  | 20.93  | 20.73  | 20.76  |



| Channel         |       |    |    | 131997 | 132322 | 132647 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1777.5 |
| 5               | QPSK  | 1  | 0  | 22.86  | 22.70  | 22.24  |
| 5               | QPSK  | 1  | 12 | 22.96  | 22.58  | 22.67  |
| 5               | QPSK  | 1  | 24 | 22.90  | 22.73  | 22.25  |
| 5               | QPSK  | 12 | 0  | 21.87  | 21.76  | 21.66  |
| 5               | QPSK  | 12 | 7  | 21.72  | 21.61  | 21.64  |
| 5               | QPSK  | 12 | 13 | 21.99  | 21.93  | 21.73  |
| 5               | QPSK  | 25 | 0  | 21.70  | 21.87  | 21.62  |
| 5               | 16QAM | 1  | 0  | 21.70  | 21.82  | 21.73  |
| 5               | 16QAM | 1  | 12 | 21.99  | 21.94  | 21.86  |
| 5               | 16QAM | 1  | 24 | 21.82  | 21.95  | 21.74  |
| 5               | 16QAM | 12 | 0  | 21.62  | 21.65  | 21.61  |
| 5               | 16QAM | 12 | 7  | 21.62  | 21.62  | 21.70  |
| 5               | 16QAM | 12 | 13 | 21.61  | 21.67  | 21.69  |
| 5               | 16QAM | 25 | 0  | 21.63  | 21.68  | 21.68  |
| 5               | 64QAM | 1  | 0  | 21.67  | 21.65  | 21.62  |
| 5               | 64QAM | 1  | 12 | 21.65  | 21.63  | 21.65  |
| 5               | 64QAM | 1  | 24 | 21.61  | 21.67  | 21.60  |
| 5               | 64QAM | 12 | 0  | 20.82  | 20.70  | 20.79  |
| 5               | 64QAM | 12 | 7  | 20.85  | 20.93  | 20.77  |
| 5               | 64QAM | 12 | 13 | 20.70  | 20.72  | 20.75  |
| 5               | 64QAM | 25 | 0  | 20.92  | 20.87  | 20.94  |

| Channel         |       |    |    | 131987 | 132322 | 132657 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |
| 3               | QPSK  | 1  | 0  | 22.83  | 22.66  | 22.15  |
| 3               | QPSK  | 1  | 8  | 22.81  | 22.72  | 22.80  |
| 3               | QPSK  | 1  | 14 | 22.74  | 22.77  | 22.79  |
| 3               | QPSK  | 8  | 0  | 21.95  | 21.76  | 22.00  |
| 3               | QPSK  | 8  | 4  | 21.75  | 21.83  | 21.69  |
| 3               | QPSK  | 8  | 7  | 22.00  | 21.69  | 21.72  |
| 3               | QPSK  | 15 | 0  | 21.73  | 21.90  | 21.87  |
| 3               | 16QAM | 1  | 0  | 21.90  | 21.71  | 21.81  |
| 3               | 16QAM | 1  | 8  | 21.61  | 21.90  | 21.80  |
| 3               | 16QAM | 1  | 14 | 21.98  | 21.75  | 21.84  |
| 3               | 16QAM | 8  | 0  | 21.68  | 21.62  | 21.60  |



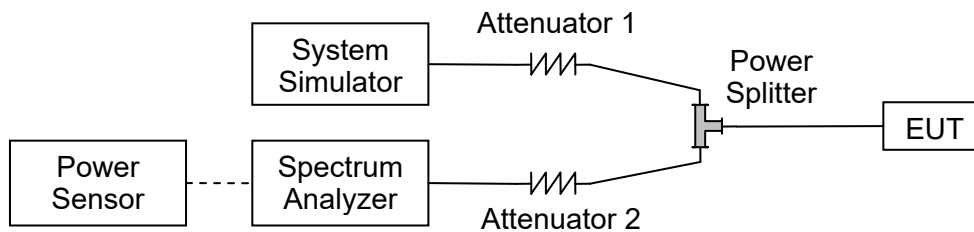
|                 |       |    |    |        |        |        |
|-----------------|-------|----|----|--------|--------|--------|
| 3               | 16QAM | 8  | 4  | 21.69  | 21.67  | 21.62  |
| 3               | 16QAM | 8  | 7  | 21.69  | 21.67  | 21.69  |
| 3               | 16QAM | 15 | 0  | 21.68  | 21.61  | 21.60  |
| 3               | 64QAM | 1  | 0  | 21.61  | 21.66  | 21.67  |
| 3               | 64QAM | 1  | 8  | 21.60  | 21.61  | 21.70  |
| 3               | 64QAM | 1  | 14 | 21.60  | 21.67  | 21.65  |
| 3               | 64QAM | 8  | 0  | 20.83  | 20.94  | 20.92  |
| 3               | 64QAM | 8  | 4  | 20.78  | 20.96  | 20.85  |
| 3               | 64QAM | 8  | 7  | 20.75  | 20.94  | 20.83  |
| 3               | 64QAM | 15 | 0  | 20.78  | 20.94  | 20.71  |
| Channel         |       |    |    | 131979 | 132322 | 132665 |
| Frequency (MHz) |       |    |    | 1710.7 | 1745   | 1779.3 |
| 1.4             | QPSK  | 1  | 0  | 22.73  | 22.50  | 21.99  |
| 1.4             | QPSK  | 1  | 3  | 22.81  | 22.71  | 22.84  |
| 1.4             | QPSK  | 1  | 5  | 22.78  | 22.71  | 22.80  |
| 1.4             | QPSK  | 3  | 0  | 21.79  | 21.70  | 21.73  |
| 1.4             | QPSK  | 3  | 1  | 21.65  | 21.93  | 21.69  |
| 1.4             | QPSK  | 3  | 3  | 21.88  | 21.60  | 21.98  |
| 1.4             | QPSK  | 6  | 0  | 21.88  | 21.85  | 21.65  |
| 1.4             | 16QAM | 1  | 0  | 21.83  | 21.97  | 21.86  |
| 1.4             | 16QAM | 1  | 3  | 21.86  | 21.92  | 21.97  |
| 1.4             | 16QAM | 1  | 5  | 21.64  | 21.61  | 21.67  |
| 1.4             | 16QAM | 3  | 0  | 21.65  | 21.63  | 21.69  |
| 1.4             | 16QAM | 3  | 1  | 21.66  | 21.69  | 21.66  |
| 1.4             | 16QAM | 3  | 3  | 21.70  | 21.61  | 21.64  |
| 1.4             | 16QAM | 6  | 0  | 21.63  | 21.67  | 21.63  |
| 1.4             | 64QAM | 1  | 0  | 20.92  | 20.90  | 20.88  |
| 1.4             | 64QAM | 1  | 3  | 20.99  | 20.89  | 20.96  |
| 1.4             | 64QAM | 1  | 5  | 20.96  | 20.93  | 20.76  |
| 1.4             | 64QAM | 3  | 0  | 20.80  | 20.72  | 20.80  |
| 1.4             | 64QAM | 3  | 1  | 20.83  | 20.88  | 20.86  |
| 1.4             | 64QAM | 3  | 3  | 20.72  | 20.91  | 20.73  |
| 1.4             | 64QAM | 6  | 0  | 20.92  | 20.90  | 20.88  |

## 2.2. Occupied Bandwidth

### 2.2.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. Occupied bandwidth is also known as the 99% emission bandwidth.

### 2.2.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

### 2.2.3. Test procedure

KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

### 2.2.4. Test Result

| LTE Band 66, BW: 1.4MHz |                 |                     |                      |                     |                      |
|-------------------------|-----------------|---------------------|----------------------|---------------------|----------------------|
| Channel                 | Frequency (MHz) | QPSK                |                      | 16QAM               |                      |
|                         |                 | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) |
| 131979                  | 1710.7          | 1.090               | 1.233                | 1.090               | 1.243                |
| 132322                  | 1745            | 1.084               | 1.229                | 1.092               | 1.247                |
| 132665                  | 1779.3          | 1.090               | 1.233                | 1.092               | 1.237                |





| <b>LTE Band 66, BW: 1.4MHz</b> |                 |                     |                      |                     |                      |
|--------------------------------|-----------------|---------------------|----------------------|---------------------|----------------------|
| Channel                        | Frequency (MHz) | 64QAM               |                      |                     |                      |
|                                |                 | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) |                     |                      |
| 131979                         | 1710.7          | 1.088               | 1.236                |                     |                      |
| 132322                         | 1745            | 1.087               | 1.232                |                     |                      |
| 132665                         | 1779.3          | 1.086               | 1.237                |                     |                      |
| <b>LTE Band66, BW: 3MHz</b>    |                 |                     |                      |                     |                      |
| Channel                        | Frequency (MHz) | QPSK                |                      | 16QAM               |                      |
|                                |                 | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) |
| 131987                         | 1711.5          | 2.689               | 2.960                | 2.690               | 2.994                |
| 132322                         | 1745            | 2.690               | 2.986                | 2.692               | 2.994                |
| 132657                         | 1778.5          | 2.689               | 2.978                | 2.696               | 2.987                |
| <b>LTE Band66, BW: 3MHz</b>    |                 |                     |                      |                     |                      |
| Channel                        | Frequency (MHz) | 64QAM               |                      |                     |                      |
|                                |                 | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) |                     |                      |
| 131987                         | 1711.5          | 2.697               | 2.977                |                     |                      |
| 132322                         | 1745            | 2.699               | 2.984                |                     |                      |
| 132657                         | 1778.5          | 2.701               | 2.973                |                     |                      |
| <b>LTE Band 66, BW: 5MHz</b>   |                 |                     |                      |                     |                      |
| Channel                        | Frequency (MHz) | QPSK                |                      | 16QAM               |                      |
|                                |                 | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) |
| 131997                         | 1712.5          | 4.476               | 4.936                | 4.488               | 4.969                |
| 132322                         | 1745            | 4.490               | 4.970                | 4.495               | 4.907                |
| 132647                         | 1777.5          | 4.485               | 4.919                | 4.491               | 4.938                |
| <b>LTE Band 66, BW: 5MHz</b>   |                 |                     |                      |                     |                      |
| Channel                        | Frequency (MHz) | 64QAM               |                      |                     |                      |
|                                |                 | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) |                     |                      |
| 131997                         | 1712.5          | 4.504               | 4.982                |                     |                      |
| 132322                         | 1745            | 4.496               | 4.963                |                     |                      |
| 132647                         | 1777.5          | 4.502               | 4.963                |                     |                      |
| <b>LTE Band 66, BW: 10MHz</b>  |                 |                     |                      |                     |                      |
| Channel                        | Frequency       | QPSK                |                      | 16QAM               |                      |



|        | (MHz) | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) |
|--------|-------|------------------------|-------------------------|------------------------|-------------------------|
| 132022 | 1715  | 8.959                  | 9.740                   | 8.941                  | 9.678                   |
| 132322 | 1745  | 8.966                  | 9.732                   | 8.958                  | 9.672                   |
| 132622 | 1775  | 8.980                  | 9.785                   | 8.959                  | 9.715                   |

**LTE Band 66, BW: 10MHz**

| Channel | Frequency<br>(MHz) | 64QAM                  |                         |  |  |
|---------|--------------------|------------------------|-------------------------|--|--|
|         |                    | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) |  |  |
| 132022  | 1715               | 8.971                  | 9.800                   |  |  |
| 132322  | 1745               | 8.969                  | 9.780                   |  |  |
| 132622  | 1775               | 8.973                  | 9.788                   |  |  |

**LTE Band 66, BW: 15MHz**

| Channel | Frequency<br>(MHz) | QPSK                   |                         | 16QAM                  |                         |
|---------|--------------------|------------------------|-------------------------|------------------------|-------------------------|
|         |                    | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) |
| 132047  | 1717.5             | 13.460                 | 14.58                   | 13.443                 | 14.54                   |
| 132322  | 1745               | 13.448                 | 14.55                   | 13.433                 | 14.65                   |
| 132597  | 1902.5             | 13.430                 | 14.49                   | 13.473                 | 14.53                   |

**LTE Band 66, BW: 15MHz**

| Channel | Frequency<br>(MHz) | 64QAM                  |                         |  |  |
|---------|--------------------|------------------------|-------------------------|--|--|
|         |                    | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) |  |  |
| 132047  | 1717.5             | 13.425                 | 14.73                   |  |  |
| 132322  | 1745               | 13.441                 | 14.73                   |  |  |
| 132597  | 1902.5             | 13.425                 | 14.58                   |  |  |

**LTE Band 66, BW: 20MHz**

| Channel | Frequency<br>(MHz) | QPSK                   |                         | 16QAM                  |                         |
|---------|--------------------|------------------------|-------------------------|------------------------|-------------------------|
|         |                    | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) | 99% Bandwidth<br>(MHz) | 26dB Bandwidth<br>(MHz) |
| 132072  | 1720               | 17.904                 | 19.45                   | 17.944                 | 19.30                   |
| 132322  | 1745               | 17.925                 | 19.37                   | 17.941                 | 19.38                   |
| 132572  | 1770               | 17.916                 | 19.23                   | 17.927                 | 19.39                   |



| LTE Band 66, BW: 20MHz |                 |                     |                      |  |  |
|------------------------|-----------------|---------------------|----------------------|--|--|
| Channel                | Frequency (MHz) | 64QAM               |                      |  |  |
|                        |                 | 99% Bandwidth (MHz) | 26dB Bandwidth (MHz) |  |  |
| 132072                 | 1720            | 17.922              | 19.41                |  |  |
| 132322                 | 1745            | 17.940              | 19.50                |  |  |
| 132572                 | 1770            | 17.972              | 19.42                |  |  |

### LTE Band 2 99%&26dB Bandwidth

| 1.4MHz/QPSK/Low CH   | 1.4MHz/16QAM/Low CH   |
|--|---|
| <p><b>1.4MHz/QPSK/Low CH</b></p> <p>Center Freq: 1.710700000 GHz</p> <p>Occupied Bandwidth: 1.0902 MHz</p> <p>Total Power: 29.0 dBm</p> <p>Transmit Freq Error: 816 Hz</p> <p>x dB Bandwidth: 1.233 MHz</p>  | <p><b>1.4MHz/16QAM/Low CH</b></p> <p>Center Freq: 1.710700000 GHz</p> <p>Occupied Bandwidth: 1.0898 MHz</p> <p>Total Power: 28.3 dBm</p> <p>Transmit Freq Error: 3.400 kHz</p> <p>x dB Bandwidth: 1.243 MHz</p> |
| 1.4MHz/QPSK/Mid CH   | 1.4MHz/16QAM/Mid CH   |
| <p><b>1.4MHz/QPSK/Mid CH</b></p> <p>Center Freq: 1.745000000 GHz</p> <p>Occupied Bandwidth: 1.0839 MHz</p> <p>Total Power: 29.8 dBm</p> <p>Transmit Freq Error: -752 Hz</p> <p>x dB Bandwidth: 1.229 MHz</p> | <p><b>1.4MHz/16QAM/Mid CH</b></p> <p>Center Freq: 1.745000000 GHz</p> <p>Occupied Bandwidth: 1.0920 MHz</p> <p>Total Power: 28.3 dBm</p> <p>Transmit Freq Error: 3.623 kHz</p> <p>x dB Bandwidth: 1.247 MHz</p> |



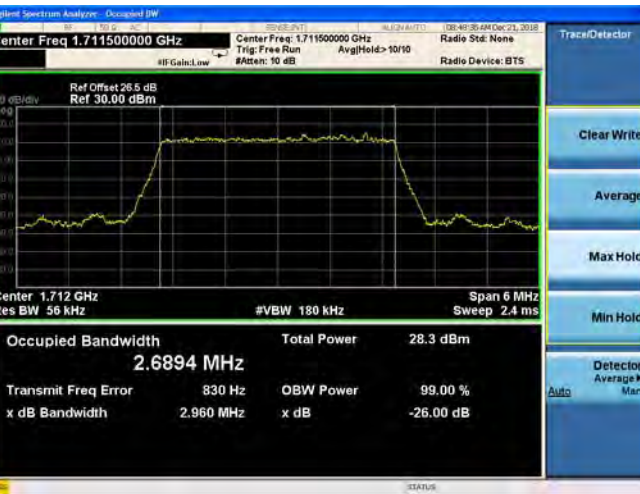
**1.4MHz/QPSK/High CH**



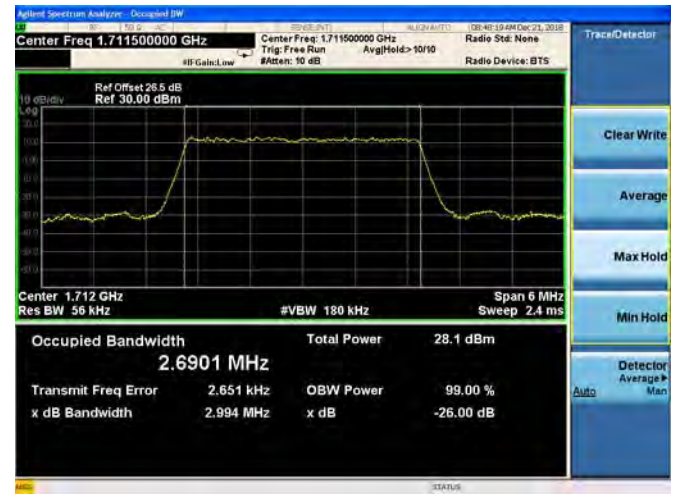
**1.4MHz/16QAM/High CH**



**3MHz/QPSK/Low CH**



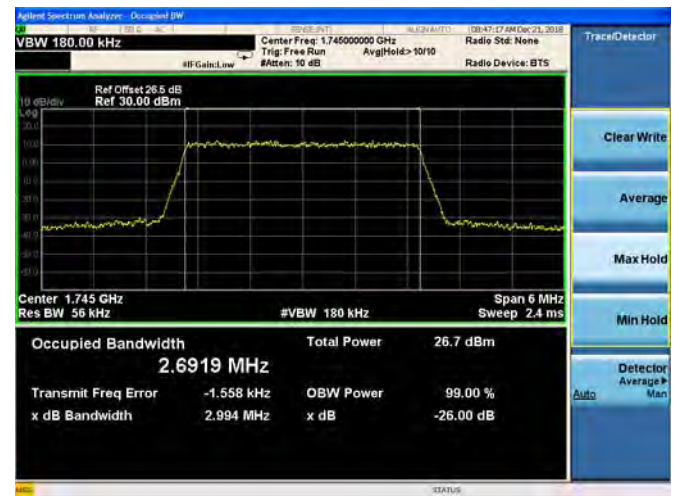
**3MHz/16QAM/Low CH**



**3MHz/QPSK/Mid CH**



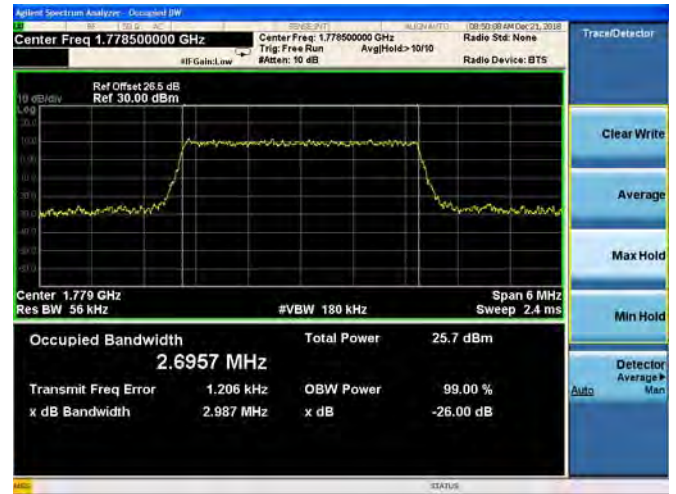
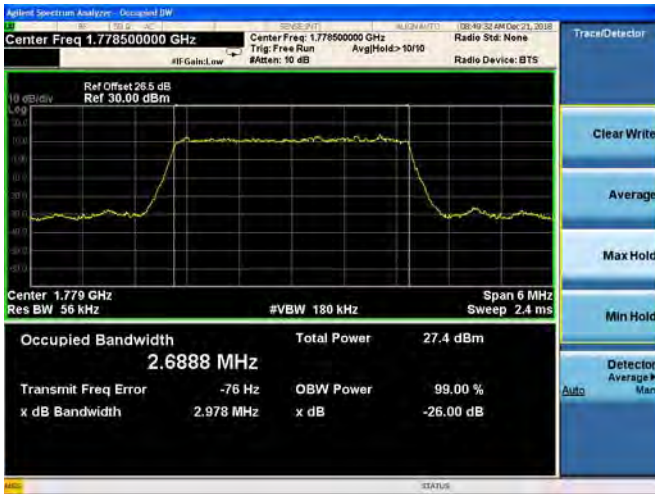
**3MHz/16QAM/Mid CH**





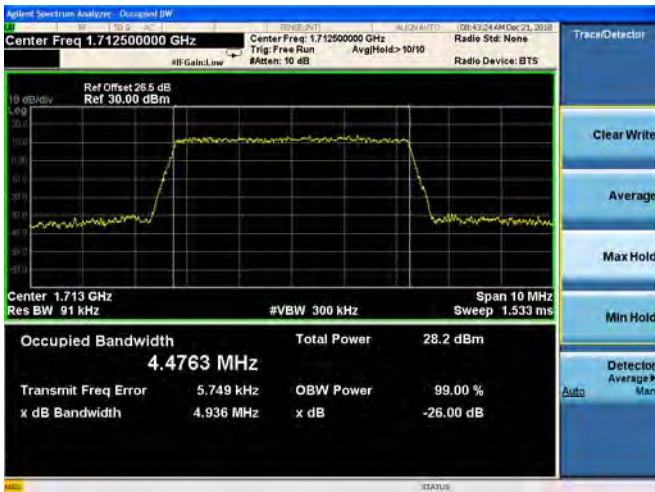
**3MHz/QPSK/High CH**

**3MHz/16QAM/High CH**



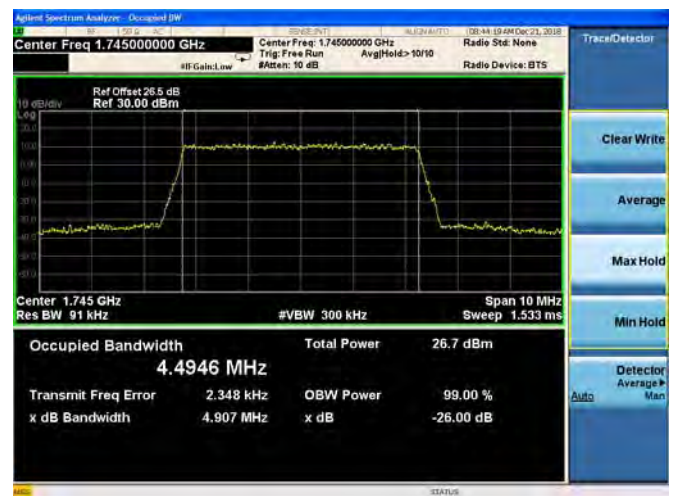
**5MHz/QPSK/Low CH**

**5MHz/16QAM/Low CH**



**5MHz/QPSK/Mid CH**

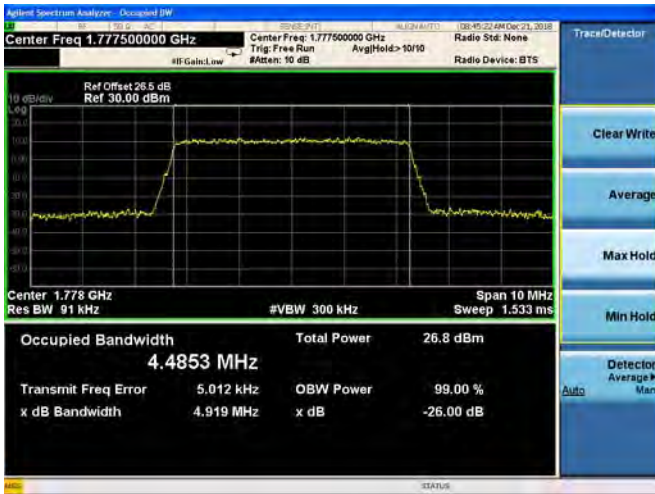
**5MHz/16QAM/Mid CH**





**5MHz/QPSK/High CH**

**5MHz/16QAM/High CH**



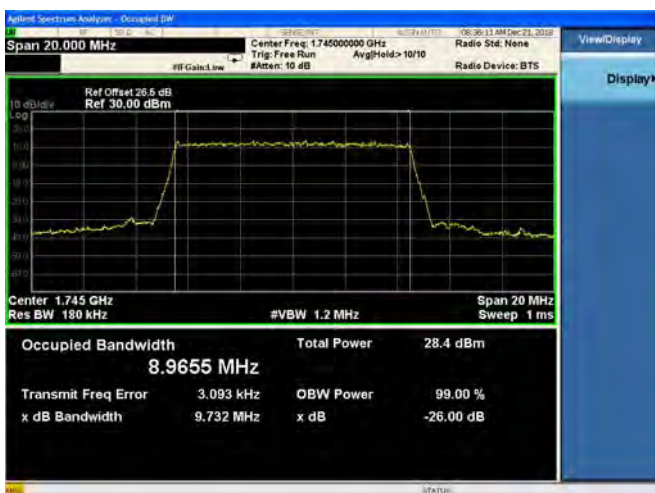
**10MHz/QPSK/Low CH**

**10MHz/16QAM/Low CH**



**10MHz/QPSK/Mid CH**

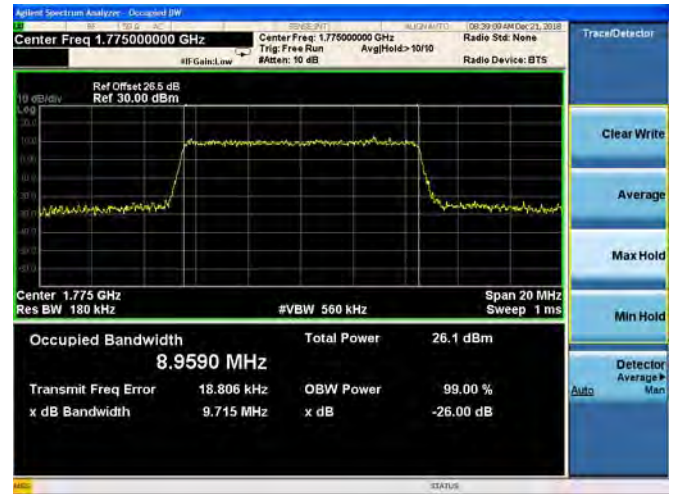
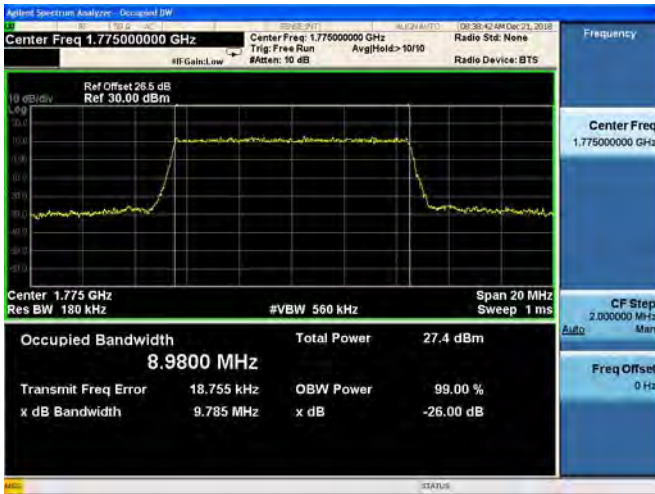
**10MHz/16QAM/Mid CH**





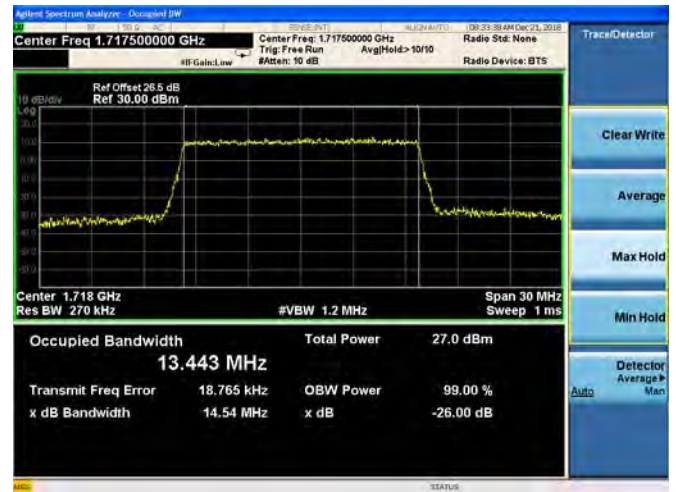
**10MHz/QPSK/High CH**

**10MHz/16QAM/High CH**



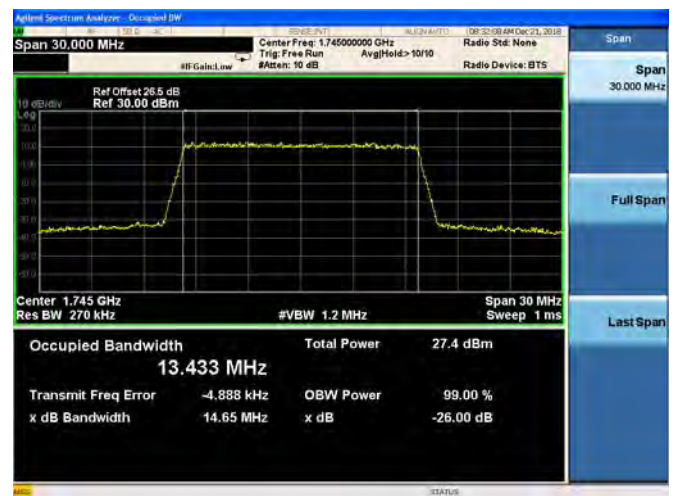
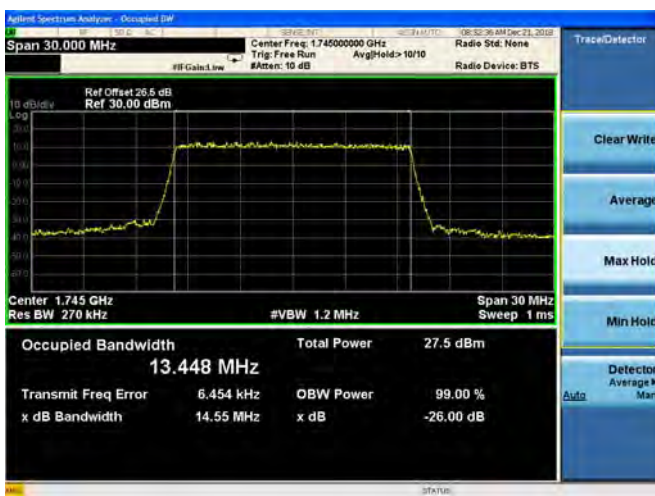
**15MHz/QPSK/Low CH**

**15MHz/16QAM/Low CH**



**15MHz/QPSK/Mid CH**

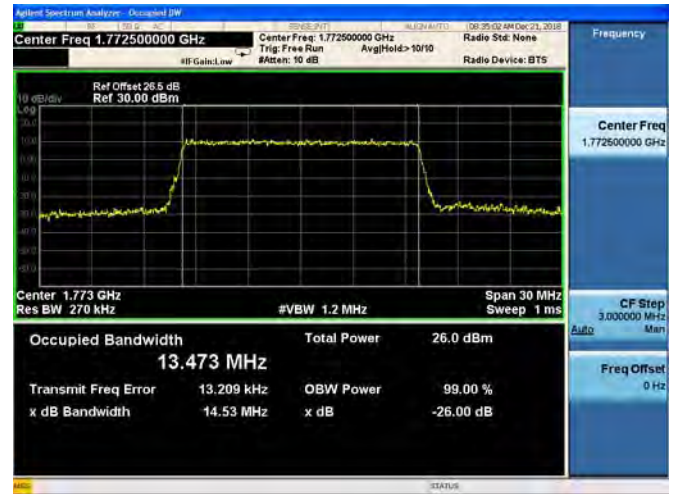
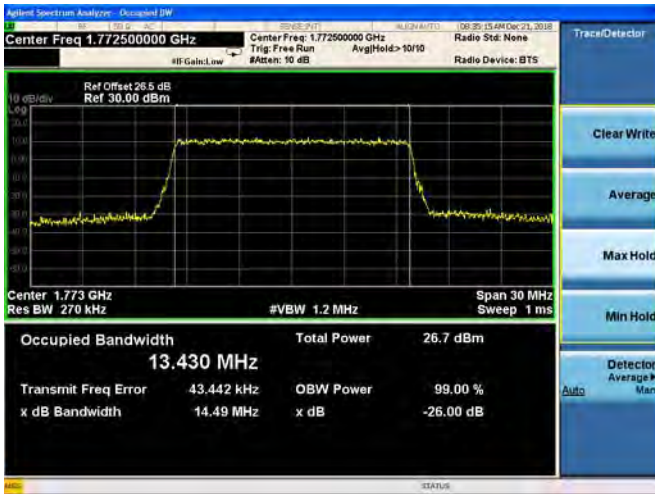
**15MHz/16QAM/Mid CH**





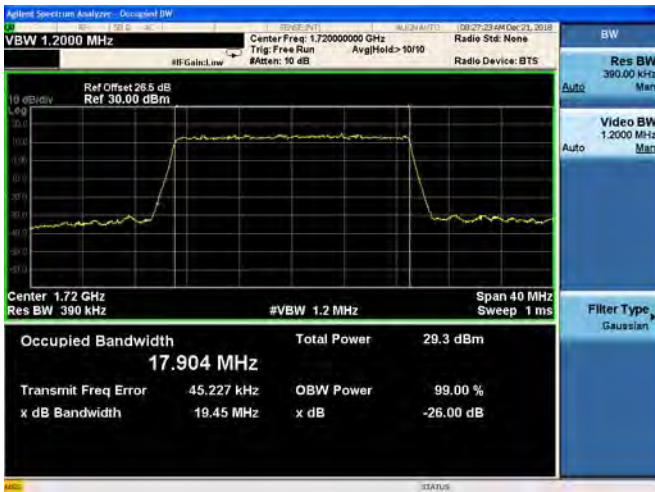
**15MHz/QPSK/High CH**

**15MHz/16QAM/High CH**



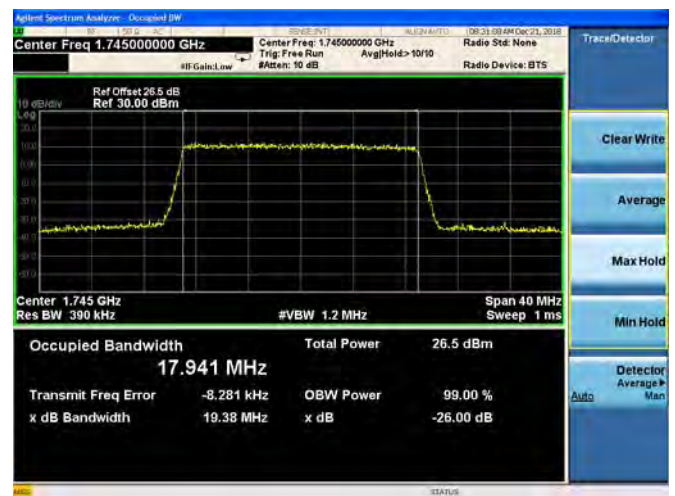
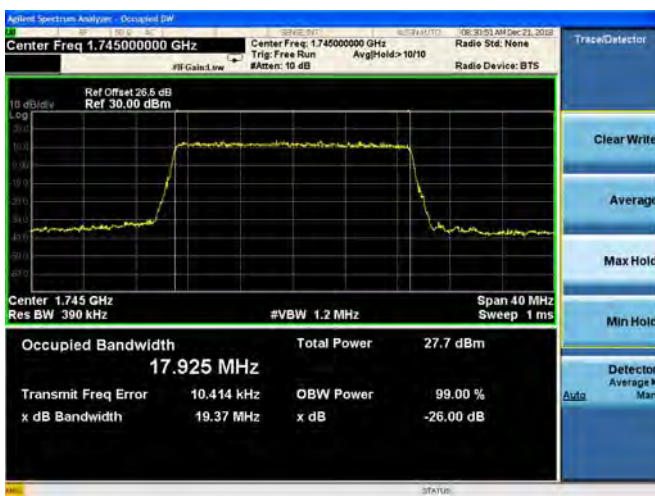
**20MHz/QPSK/Low CH**

**20MHz/16QAM/Low CH**



**20MHz/QPSK/Mid CH**

**20MHz/16QAM/Mid CH**

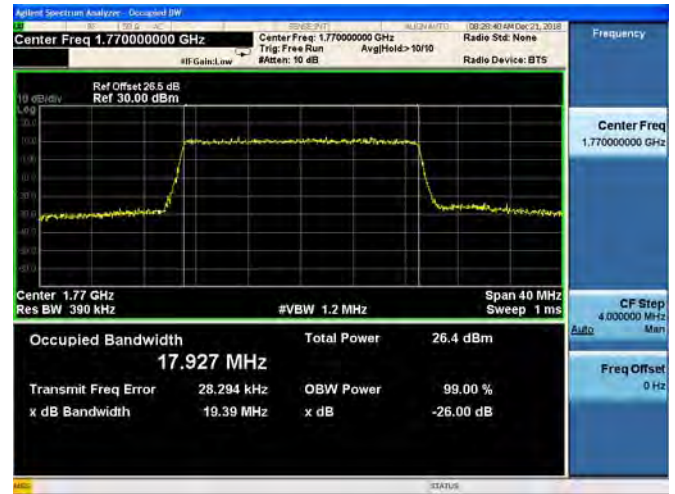






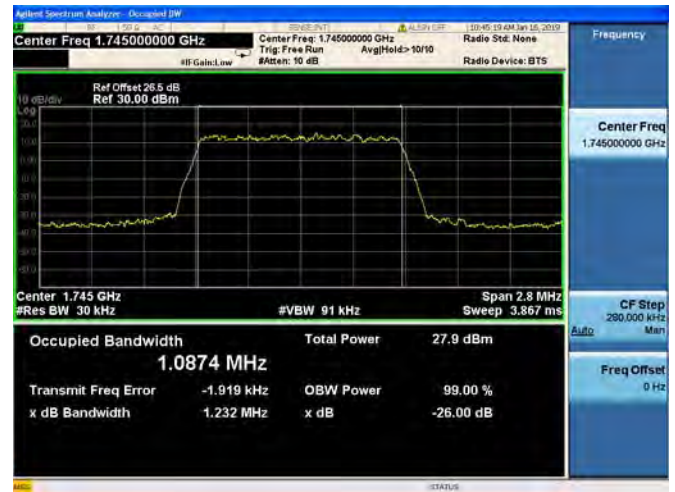
**20MHz/QPSK/High CH**

**20MHz/16QAM/High CH**



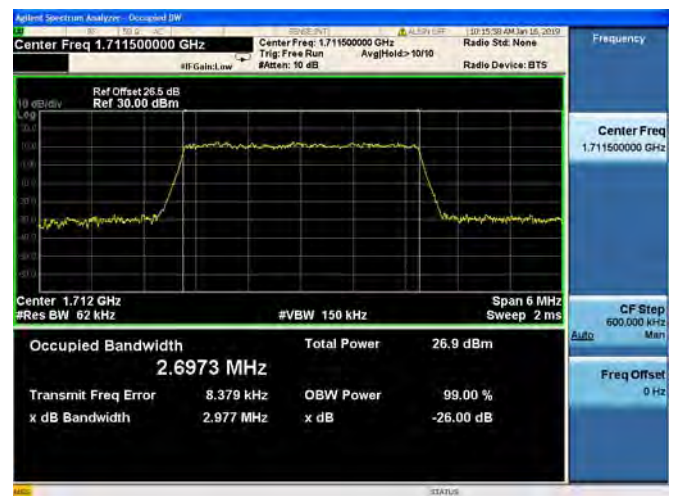
**1.4MHz/64QAM/Low CH**

**1.4MHz/64QAM/Mid CH**



**1.4MHz/64QAM/High CH**

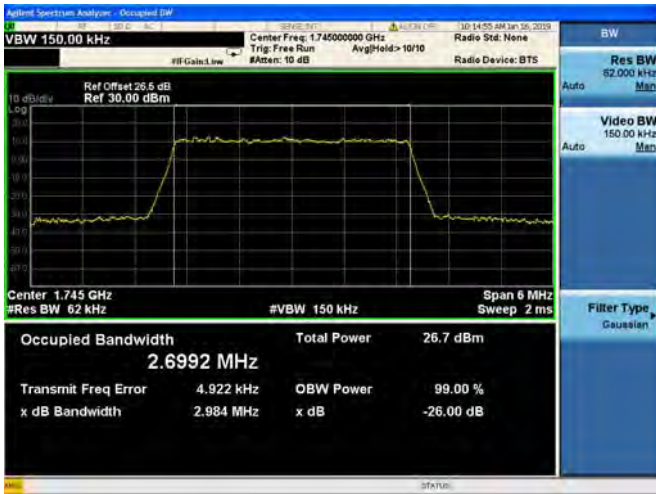
**3MHz/64QAM/Low CH**





**3MHz/64QAM/Mid CH**

**3MHz/64QAM/High CH**



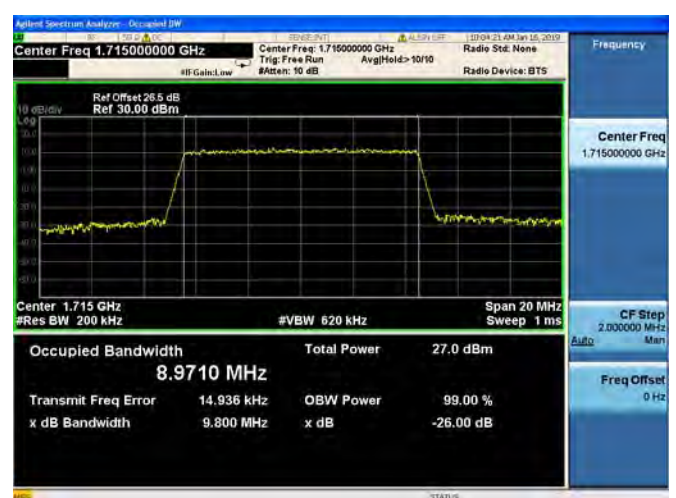
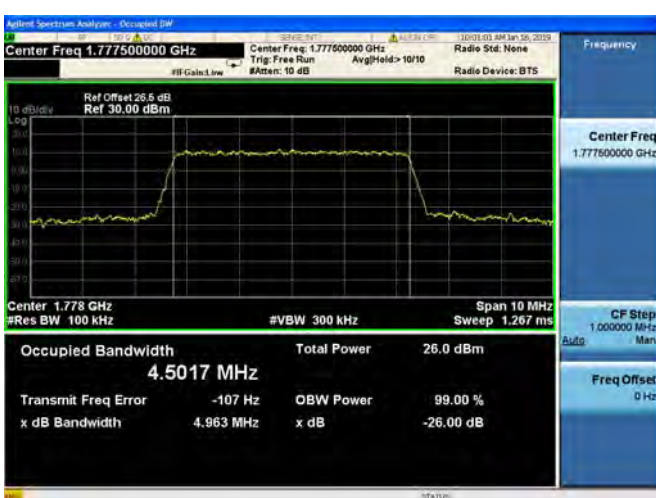
**5MHz/64QAM/Low CH**

**5MHz/64QAM/Mid CH**



**5MHz/64QAM/High CH**

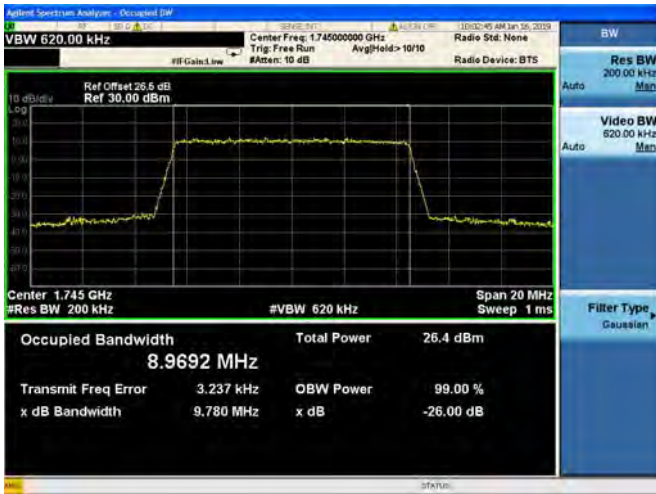
**10MHz/64QAM/Low CH**





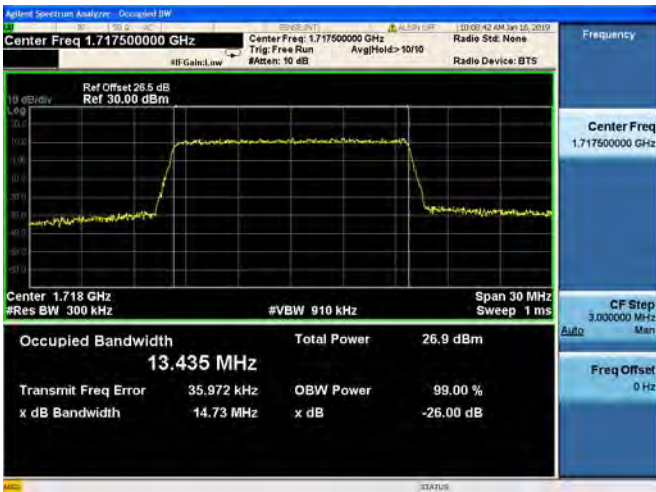
**10MHz/64QAM/Mid CH**

**10MHz/64QAM/High CH**



**15MHz/64QAM/Low CH**

**15MHz/64QAM/Mid CH**



**15MHz/64QAM/High CH**

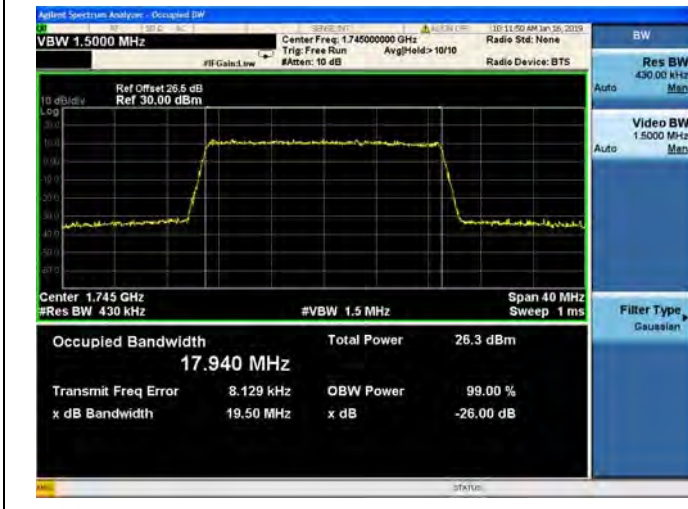
**20MHz/64QAM/Low CH**





**20MHz/64QAM/Mid CH**

**20MHz/64QAM/High CH**



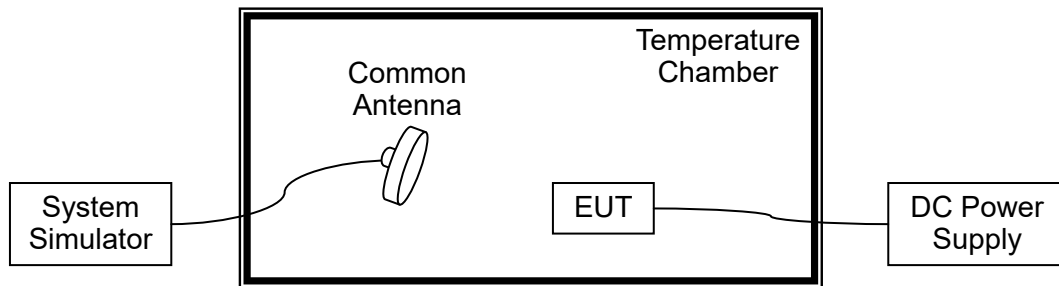
## 2.3. Frequency Stability

### 2.3.1. Requirement

According to FCC section 2.1055 & 27.54&24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  at intervals of not more than  $10^{\circ}\text{C}$ .
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

### 2.3.2. Test Description



The EUT which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power. A call is established between the EUT and the SS via a Common Antenna.

### 2.3.3. Test procedure

KDB 971168 D01v03 Section 9.0 and ANSI/TIA-603-E-2016.

### 2.3.4. Test Result

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.35VDC and 3.5VDC, which are specified by the applicant; the normal temperature here used is  $20^{\circ}\text{C}$ .



| LTE Band 66, QPSK, Channel 132322, Frequency 1745MHz<br>Limit =1745 MHz*1ppm=1745Hz |             |           |                |                 |        |
|---|-------------|-----------|----------------|-----------------|--------|
| Voltage (%)   | Power (VDC) | Temp (°C) | Fre. Dev. (Hz) | Deviation (ppm) | Result |
| 100   | 3.8         | -30       | 25             | 0.014           | PASS   |
| 100   |             | -20       | -83            | -0.048          |        |
| 100   |             | -10       | -77            | -0.044          |        |
| 100   |             | 0         | -47            | -0.027          |        |
| 100   |             | +10       | -68            | -0.039          |        |
| 100   |             | +20       | 54             | 0.031           |        |
| 100   |             | +30       | 25             | 0.014           |        |
| 100   |             | +40       | 23             | 0.013           |        |
| 100   |             | +50       | 26             | 0.015           |        |
| 115   |             | 4.35      | +20            | 46              |        |
| 85  | 3.5         | +20       | -32            | -0.018          |        |

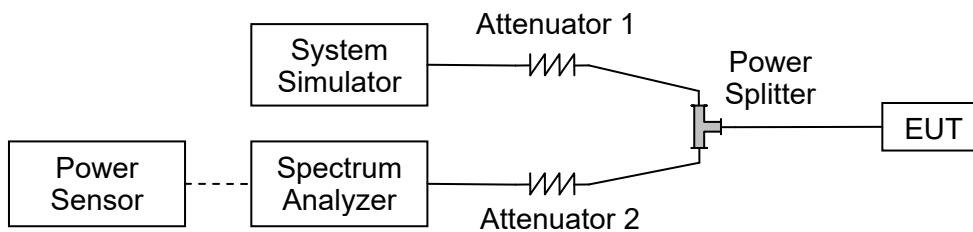
## 2.4. Peak to Average Ratio

### 2.4.1. Requirement

According to FCC section 27.50(d)(5), the peak to average ratio (PAR) of the transmission may not exceed 13dB.

### 2.4.2. Test Description

#### A. Test Set:



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

### 2.4.3. Test procedure

KDB 971168 D01v03 Section 5.7 and ANSI/TIA-603-E-2016.

### 2.4.4. Test Result

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



| <b>LTE Band 66, BW: 1.4MHz</b> |                 |                           |       |       |
|--------------------------------|-----------------|---------------------------|-------|-------|
| Channel                        | Frequency (MHz) | Peak to Average Ratio(dB) |       |       |
|                                |                 | QPSK                      | 16QAM | 64QAM |
| 131979                         | 1710.7          | 4.76                      | 5.77  | 4.84  |
| 132322                         | 1745            | 4.99                      | 6.05  | 4.88  |
| 132665                         | 1779.3          | 4.66                      | 5.62  | 4.53  |
| <b>LTE Band 66, BW: 3MHz</b>   |                 |                           |       |       |
| Channel                        | Frequency (MHz) | Peak to Average Ratio(dB) |       |       |
|                                |                 | QPSK                      | 16QAM | 64QAM |
| 131987                         | 1711.5          | 4.60                      | 5.83  | 4.58  |
| 132322                         | 1745            | 5.23                      | 6.06  | 4.81  |
| 132657                         | 1778.5          | 4.58                      | 5.76  | 4.50  |
| <b>LTE Band 66, BW: 5MHz</b>   |                 |                           |       |       |
| Channel                        | Frequency (MHz) | Peak to Average Ratio(dB) |       |       |
|                                |                 | QPSK                      | 16QAM | 64QAM |
| 131997                         | 1712.5          | 4.75                      | 5.79  | 4.69  |
| 132322                         | 1745            | 4.89                      | 5.99  | 4.94  |
| 132647                         | 1777.5          | 4.76                      | 5.80  | 4.64  |
| <b>LTE Band 66, BW: 10MHz</b>  |                 |                           |       |       |
| Channel                        | Frequency (MHz) | Peak to Average Ratio(dB) |       |       |
|                                |                 | QPSK                      | 16QAM | 64QAM |
| 132022                         | 1715            | 4.75                      | 5.03  | 4.72  |
| 132322                         | 1745            | 4.87                      | 6.00  | 4.85  |
| 132622                         | 1775            | 4.88                      | 5.88  | 4.84  |
| <b>LTE Band 66, BW: 15MHz</b>  |                 |                           |       |       |
| Channel                        | Frequency (MHz) | Peak to Average Ratio(dB) |       |       |
|                                |                 | QPSK                      | 16QAM | 64QAM |
| 132047                         | 1717.5          | 4.74                      | 5.76  | 4.60  |
| 132322                         | 1745            | 4.82                      | 5.79  | 4.87  |
| 132597                         | 1902.5          | 4.77                      | 5.87  | 4.64  |
| <b>LTE Band 66, BW: 20MHz</b>  |                 |                           |       |       |
| Channel                        | Frequency (MHz) | Peak to Average Ratio(dB) |       |       |
|                                |                 | QPSK                      | 16QAM | 64QAM |
| 132072                         | 1720            | 5.81                      | 4.64  | 4.62  |
| 132322                         | 1745            | 4.74                      | 5.56  | 4.86  |
| 132572                         | 1770            | 4.83                      | 5.93  | 4.85  |



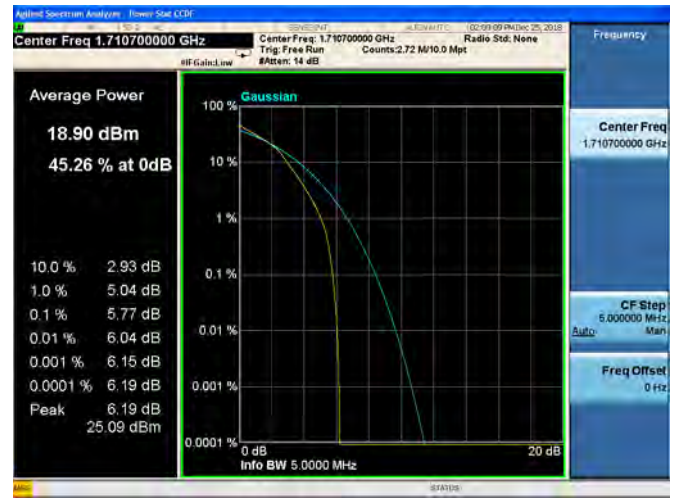


LTE Band 2 Peak to Average Ratio

1.4MHz/QPSK/Low CH



1.4MHz/16QAM/Low CH



1.4MHz/QPSK/Mid CH

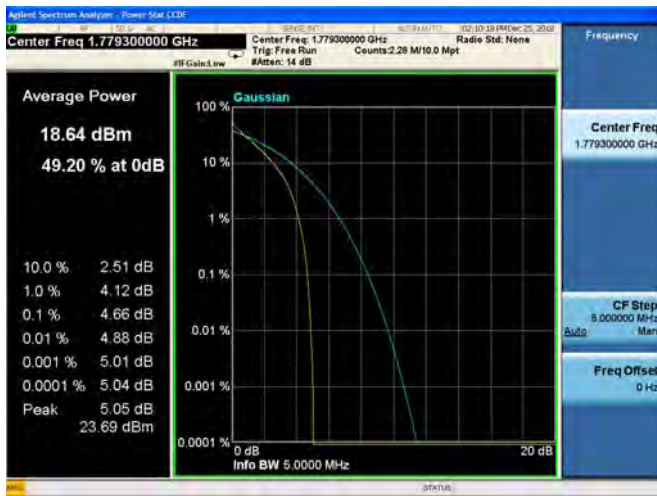


1.4MHz/16QAM/Mid CH

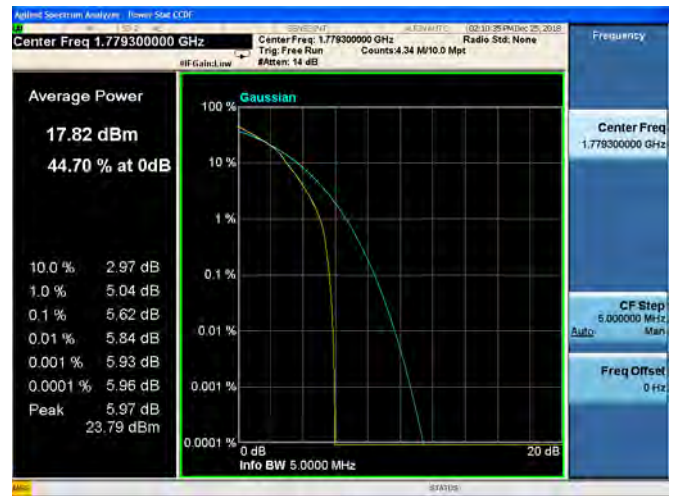




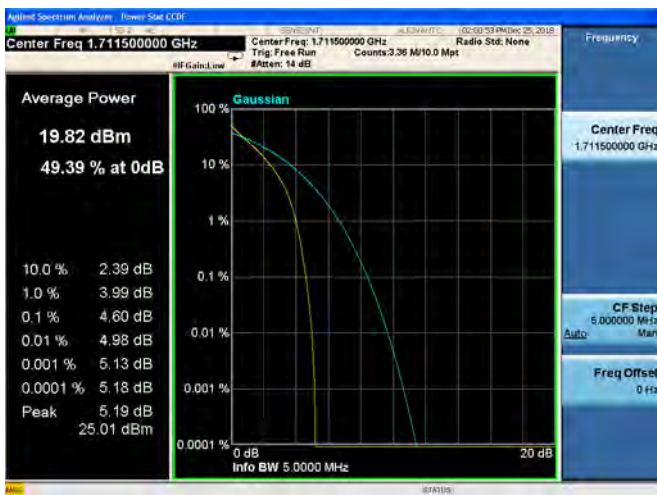
**1.4MHz/QPSK/High CH**



**1.4MHz/16QAM/High CH**



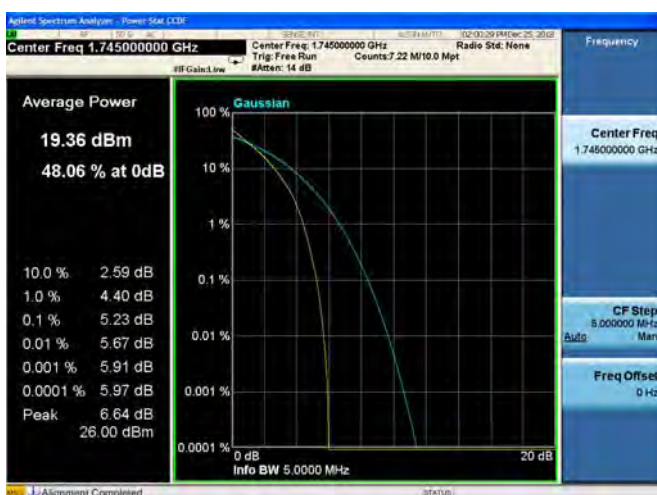
**3MHz/QPSK/Low CH**



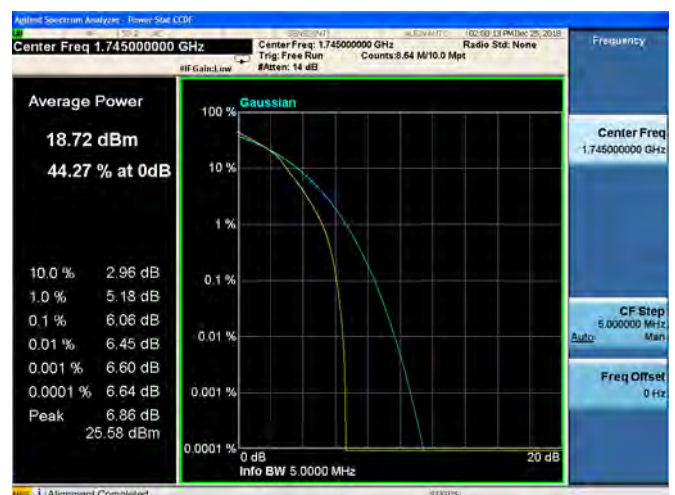
**3MHz/16QAM/Low CH**



**3MHz/QPSK/Mid CH**



**3MHz/16QAM/Mid CH**

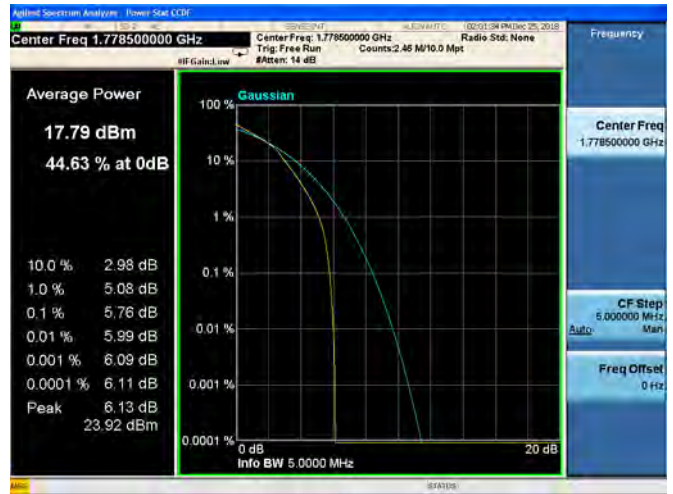




**3MHz/QPSK/High CH**



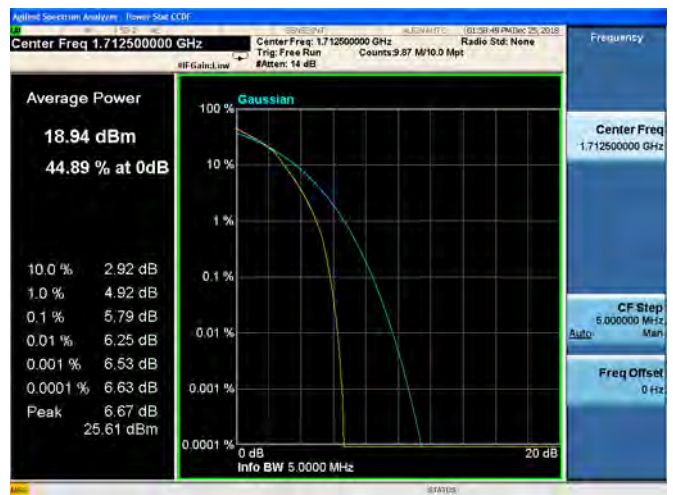
**3MHz/16QAM/High CH**



**5MHz/QPSK/Low CH**



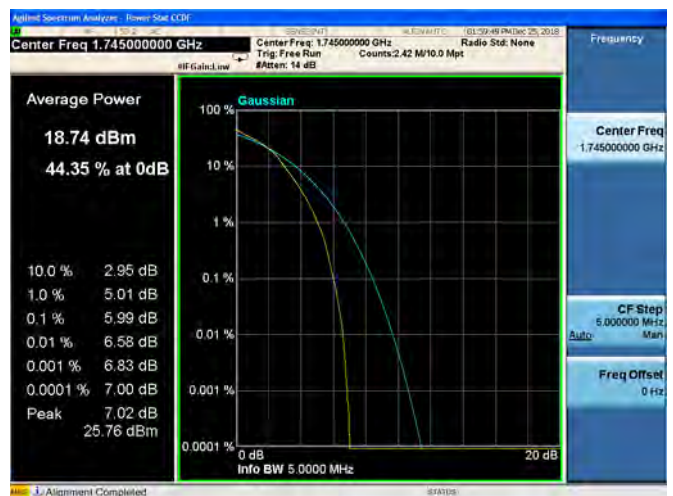
**5MHz/16QAM/Low CH**



**5MHz/QPSK/Mid CH**

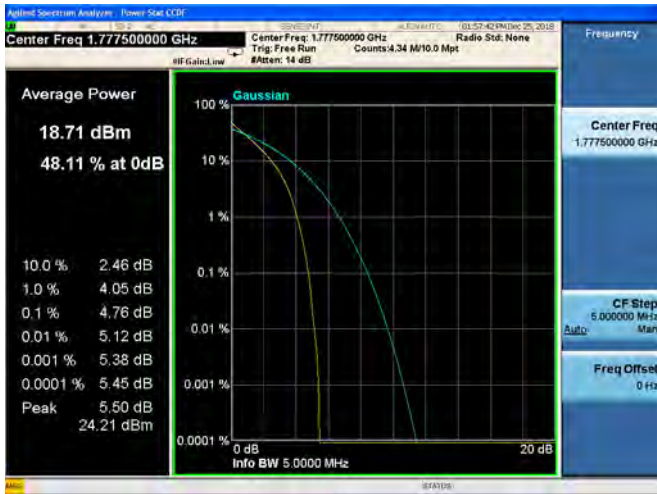


**5MHz/16QAM/Mid CH**

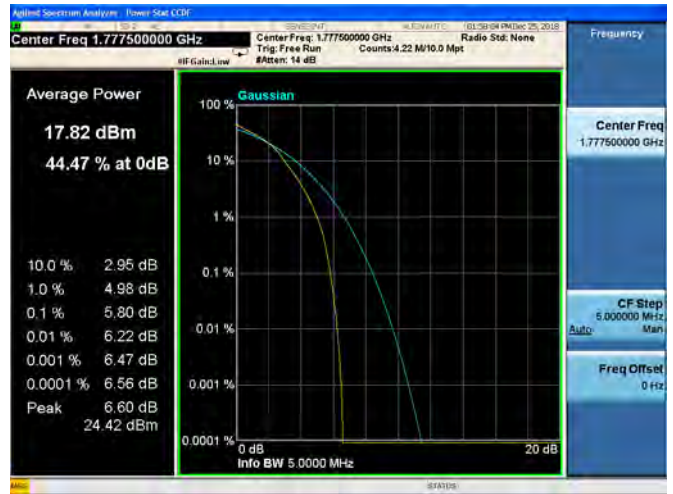




**5MHz/QPSK/High CH**



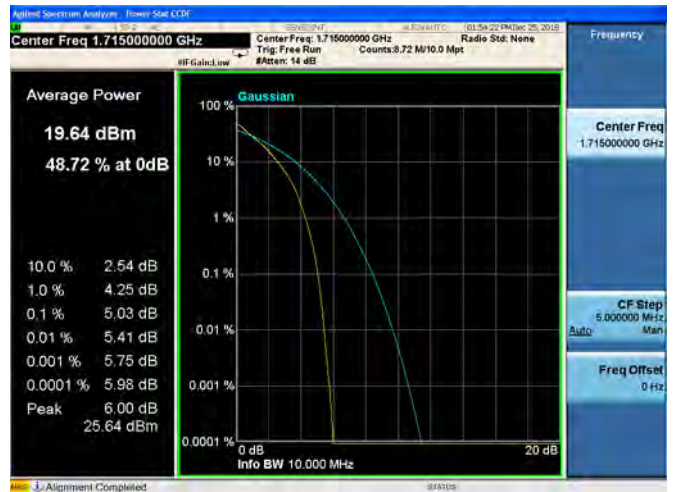
**5MHz/16QAM/High CH**



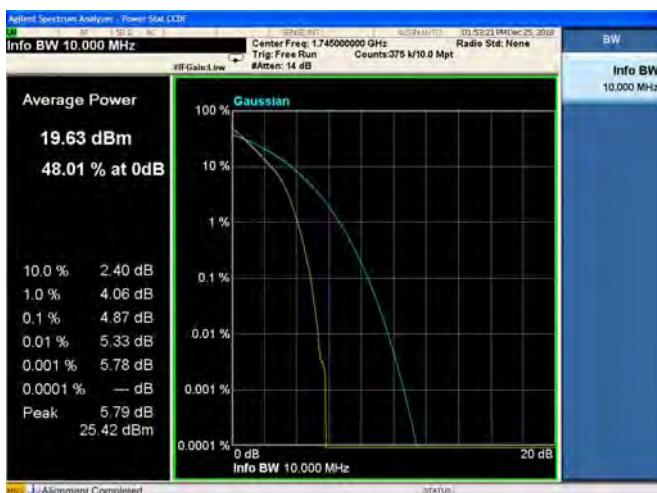
**10MHz/QPSK/Low CH**



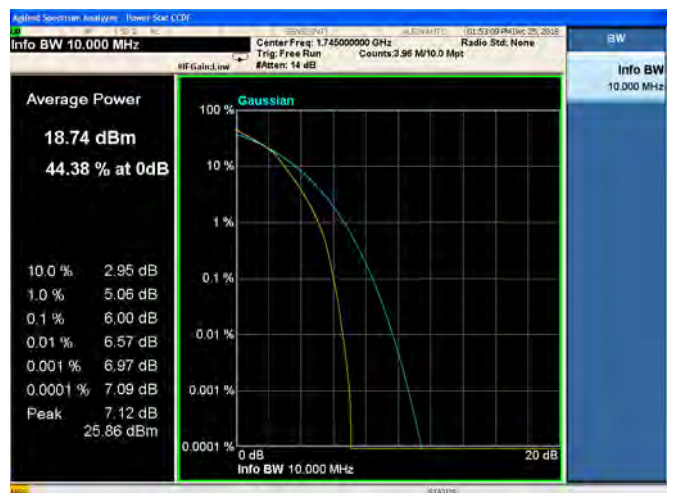
**10MHz/16QAM/Low CH**



**10MHz/QPSK/Mid CH**

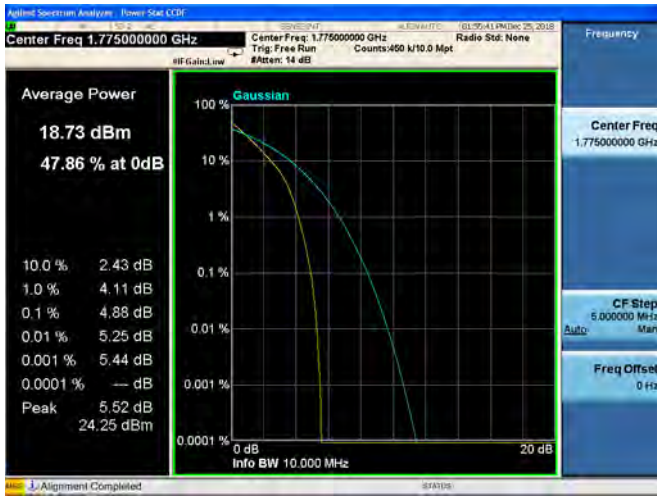


**10MHz/16QAM/Mid CH**

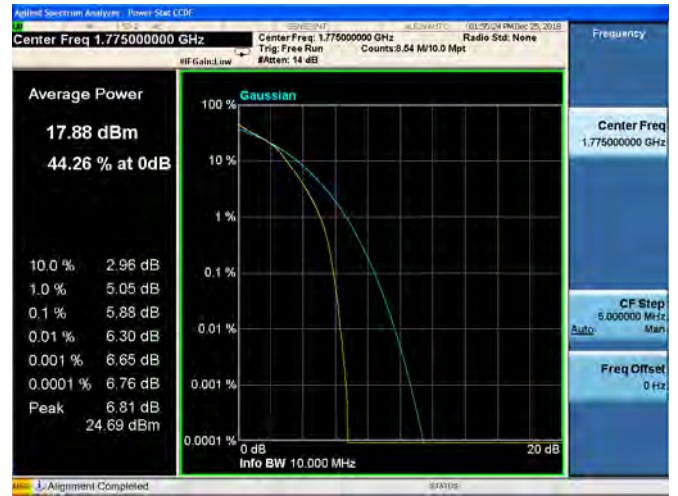




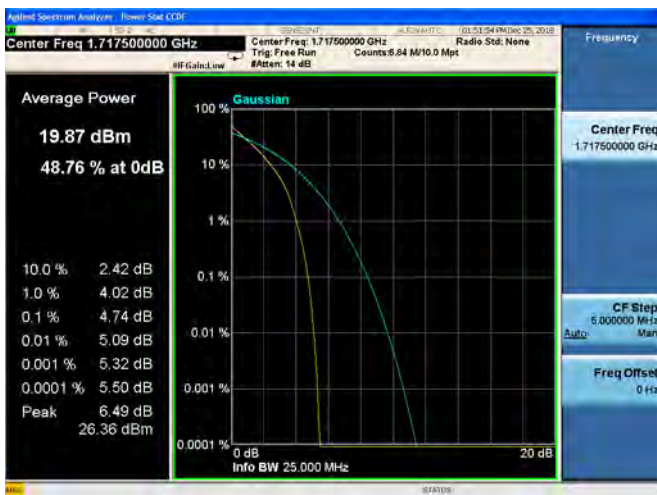
**10MHz/QPSK/High CH**



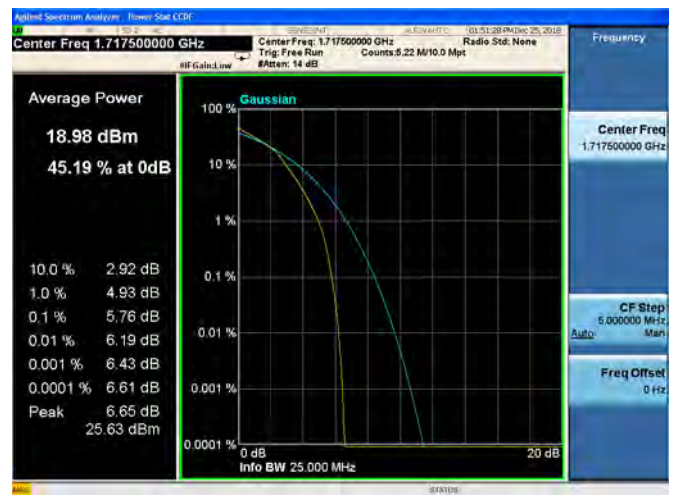
**10MHz/16QAM/High CH**



**15MHz/QPSK/Low CH**



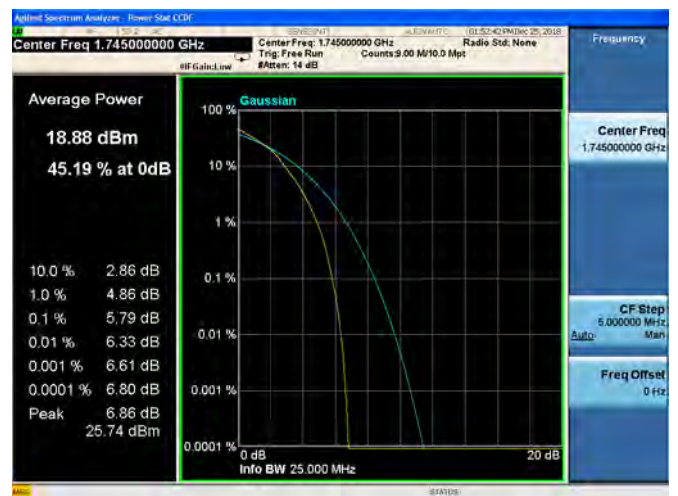
**15MHz/16QAM/Low CH**



**15MHz/QPSK/Mid CH**

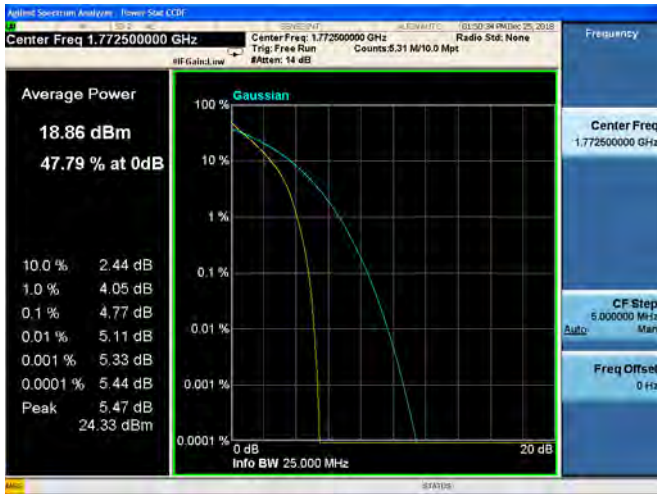


**15MHz/16QAM/Mid CH**

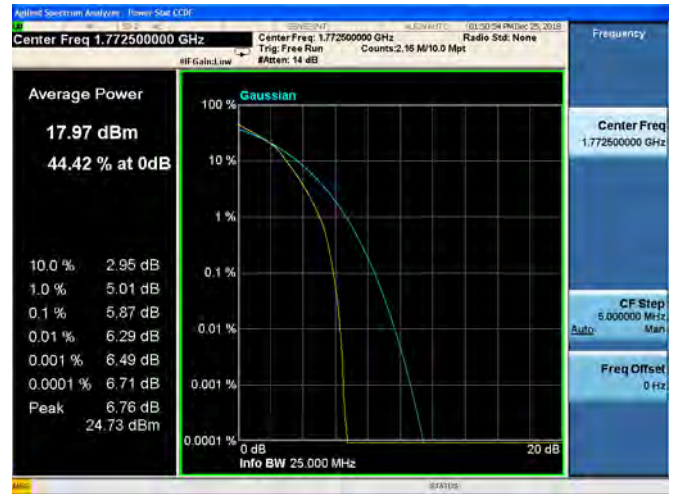




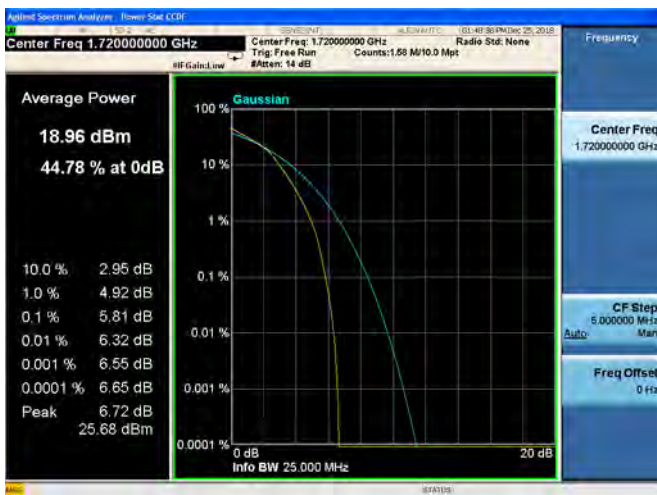
**15MHz/QPSK/High CH**



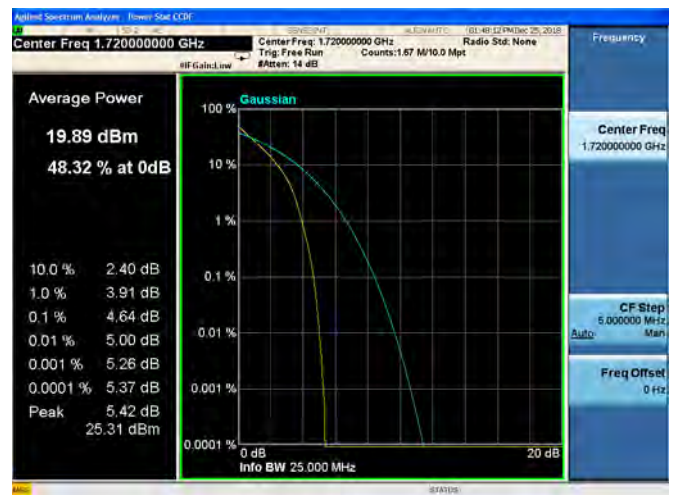
**15MHz/16QAM/High CH**



**20MHz/QPSK/Low CH**



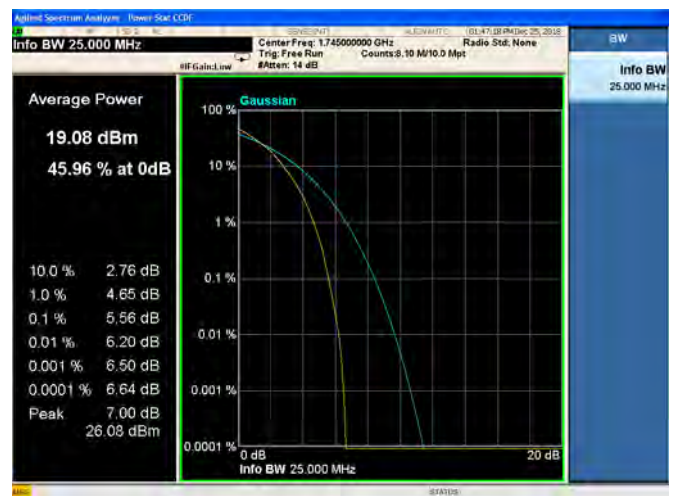
**20MHz/16QAM/Low CH**



**20MHz/QPSK/Mid CH**



**20MHz/16QAM/Mid CH**

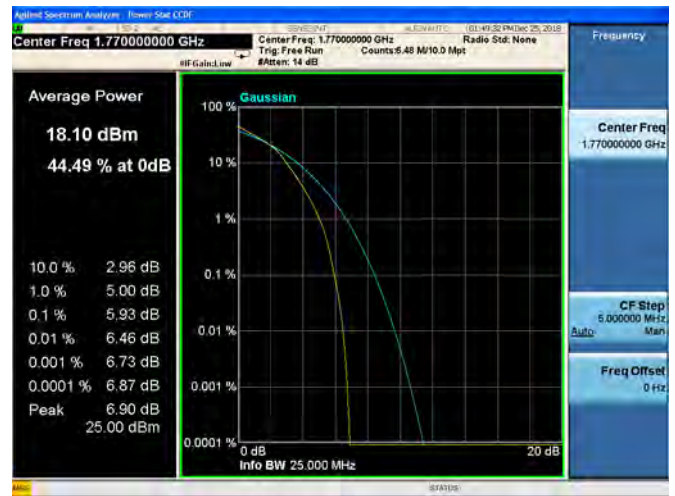




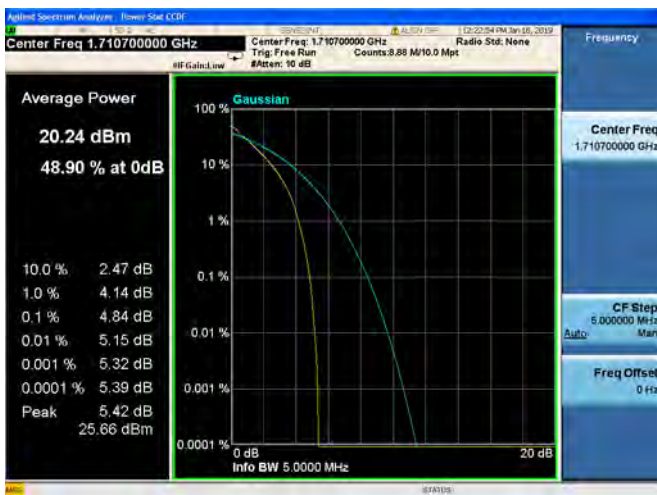
**20MHz/QPSK/High CH**



**20MHz/16QAM/High CH**



**1.4MHz/64QAM/Low CH**



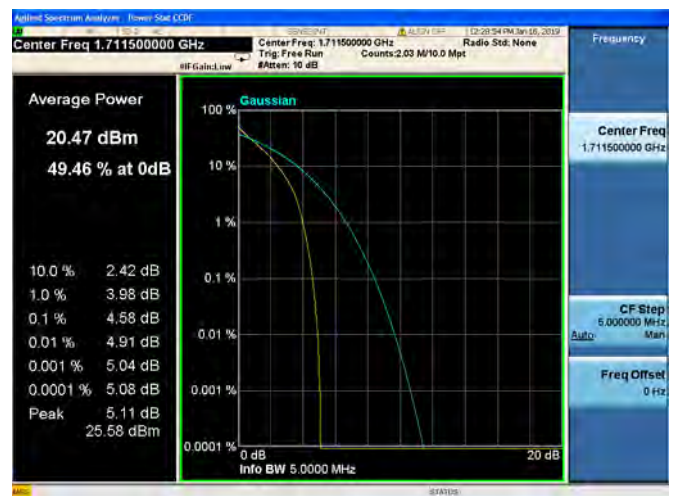
**1.4MHz/64QAM/Mid CH**



**1.4MHz/64QAM/High CH**

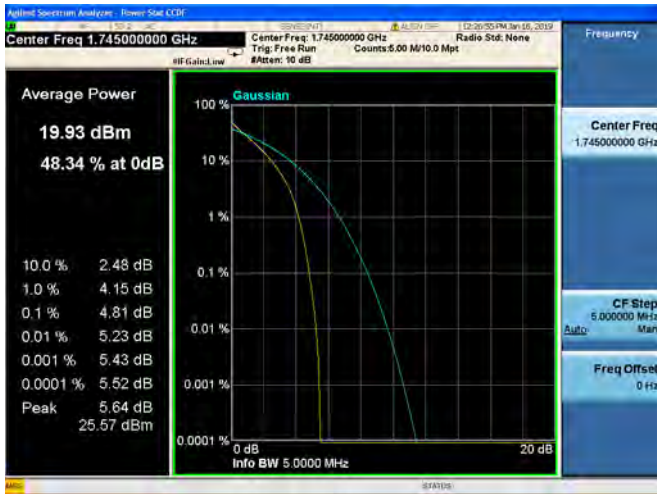


**3MHz/64QAM/Low CH**

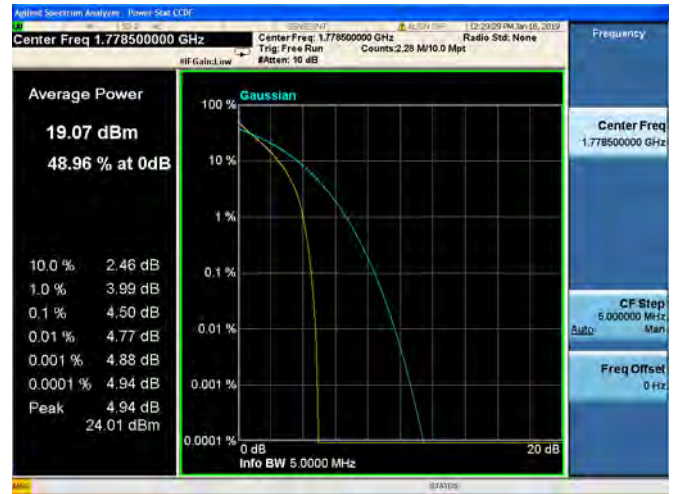




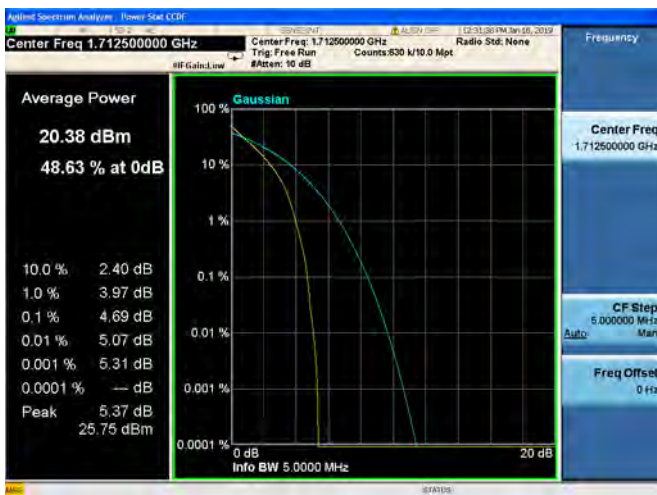
**3MHz/64QAM/Mid CH**



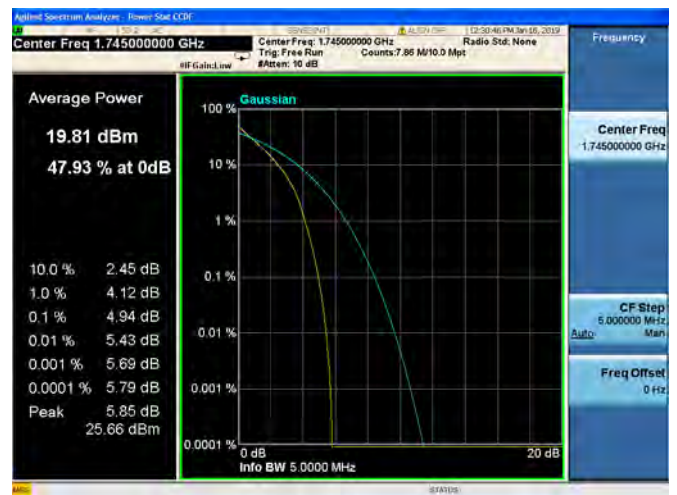
**3MHz/64QAM/High CH**



**5MHz/64QAM/Low CH**



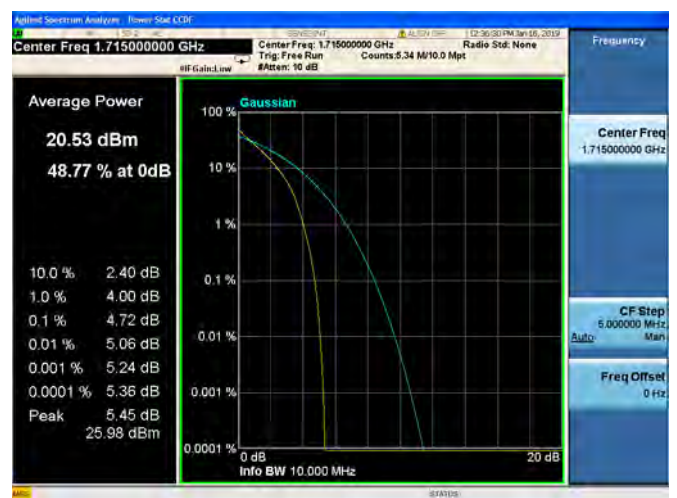
**5MHz/64QAM/Mid CH**



**5MHz/64QAM/High CH**



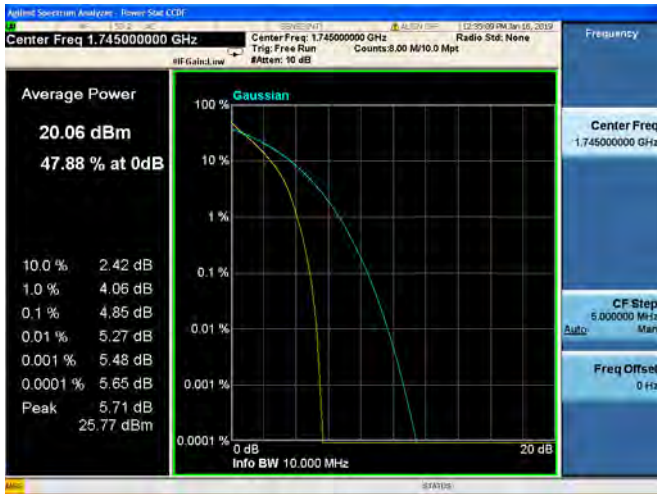
**10MHz/64QAM/Low CH**



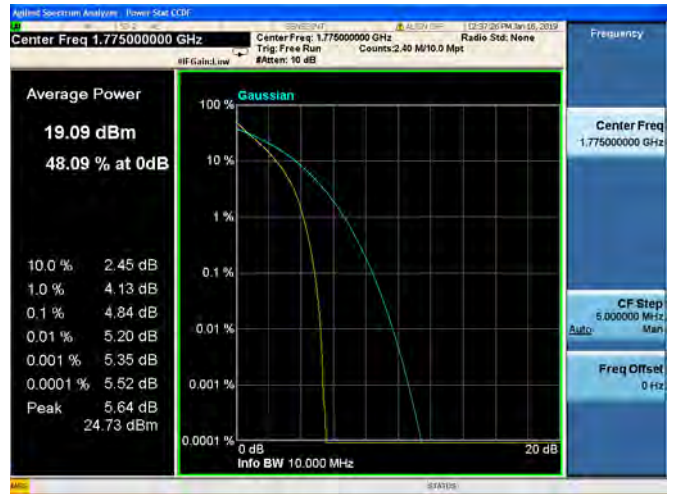




10MHz/64QAM/Mid CH



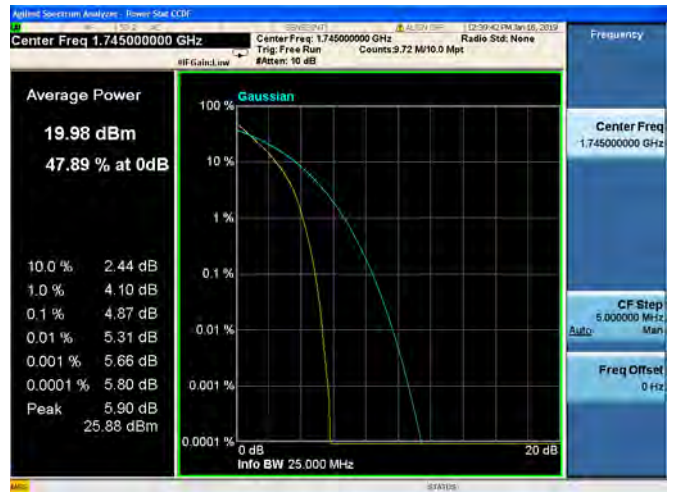
10MHz/64QAM/High CH



15MHz/64QAM/Low CH



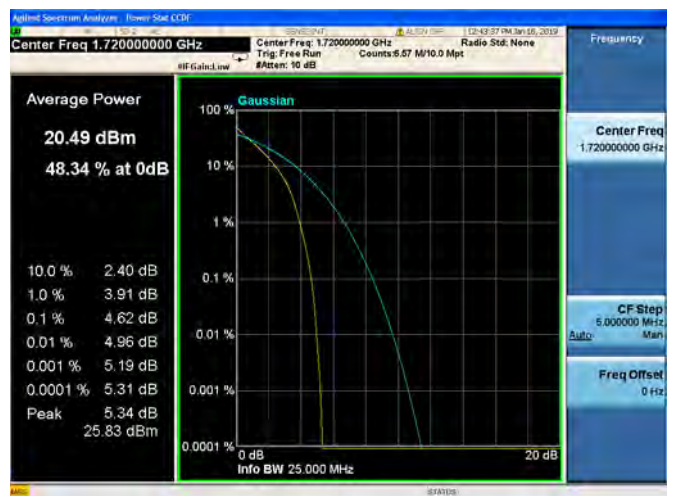
15MHz/64QAM/Mid CH

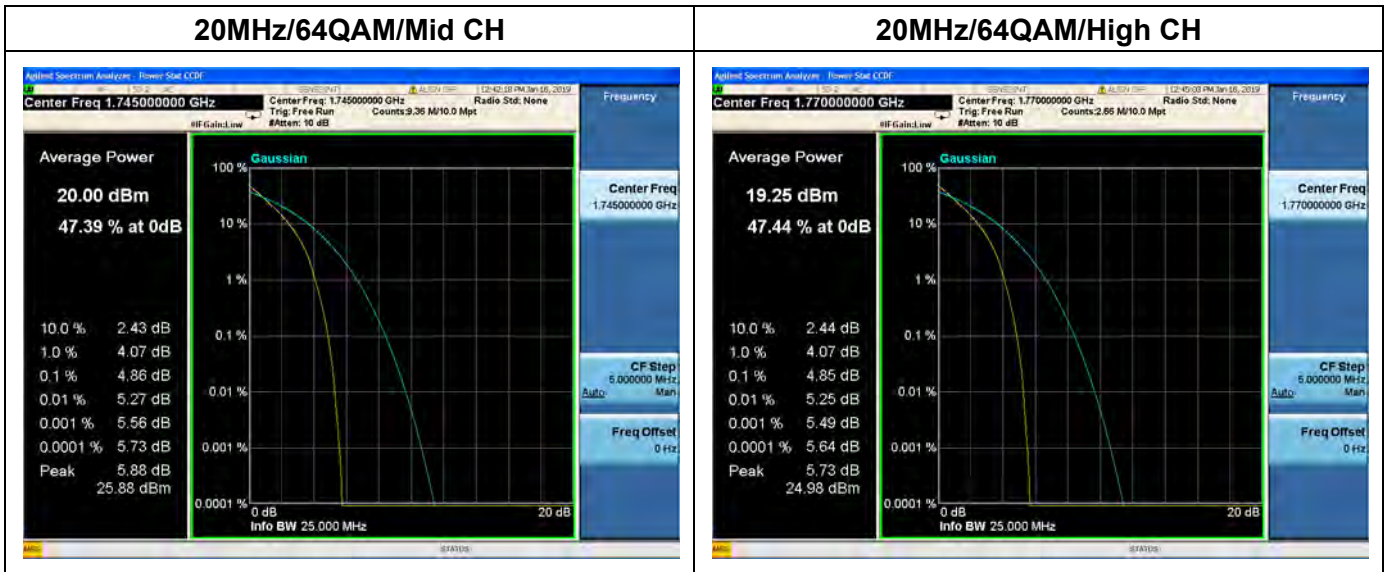


15MHz/64QAM/High CH



20MHz/64QAM/Low CH





## 2.5. Conducted Spurious Emissions

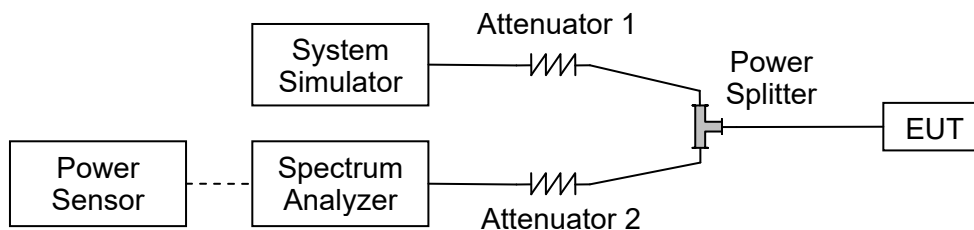
### 2.5.1. Requirement

According to FCC section 2.1051, 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. This calculated to be -13dBm.

Additional requirement for LTE Band 7:

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  $55 + 10 \log(P)$  dB. This calculated to be -25dBm.

### 2.5.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

### 2.5.3. Test procedure

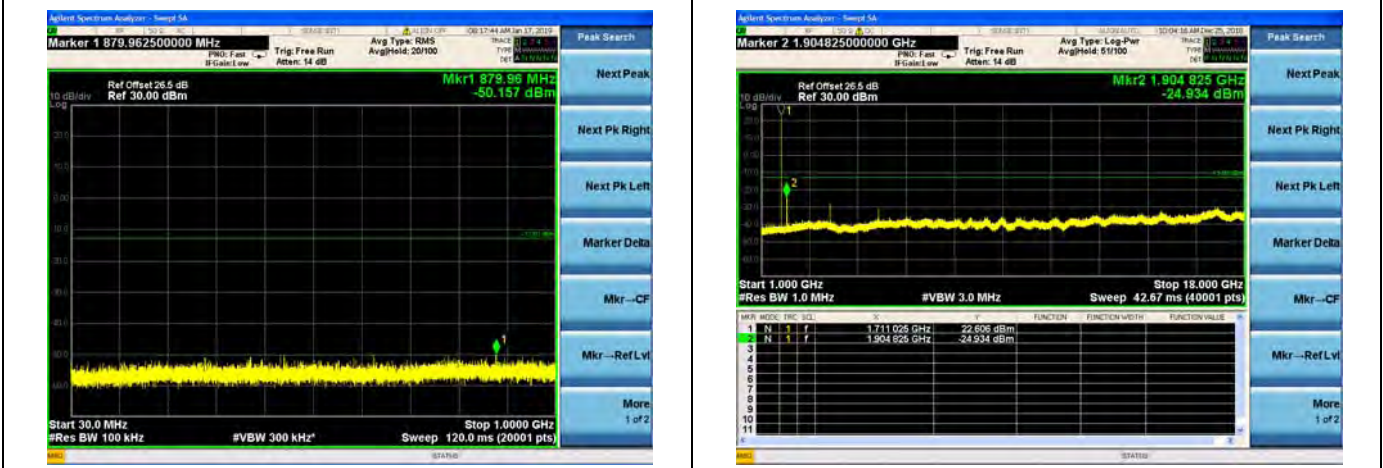
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

### 2.5.4. Test Result

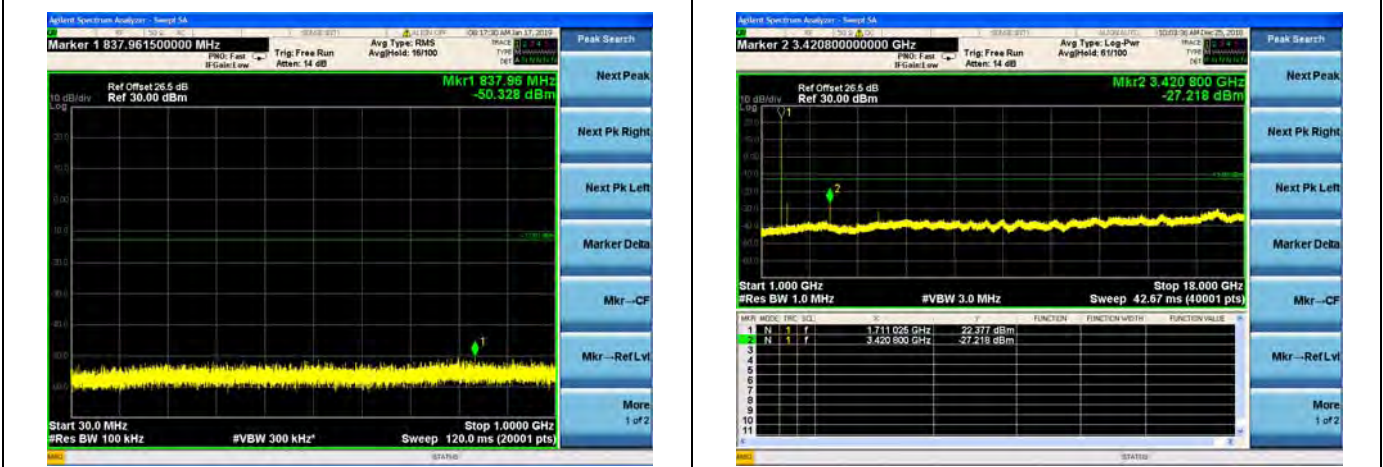


LTE Band 66 1.4MHz BW Low Channel

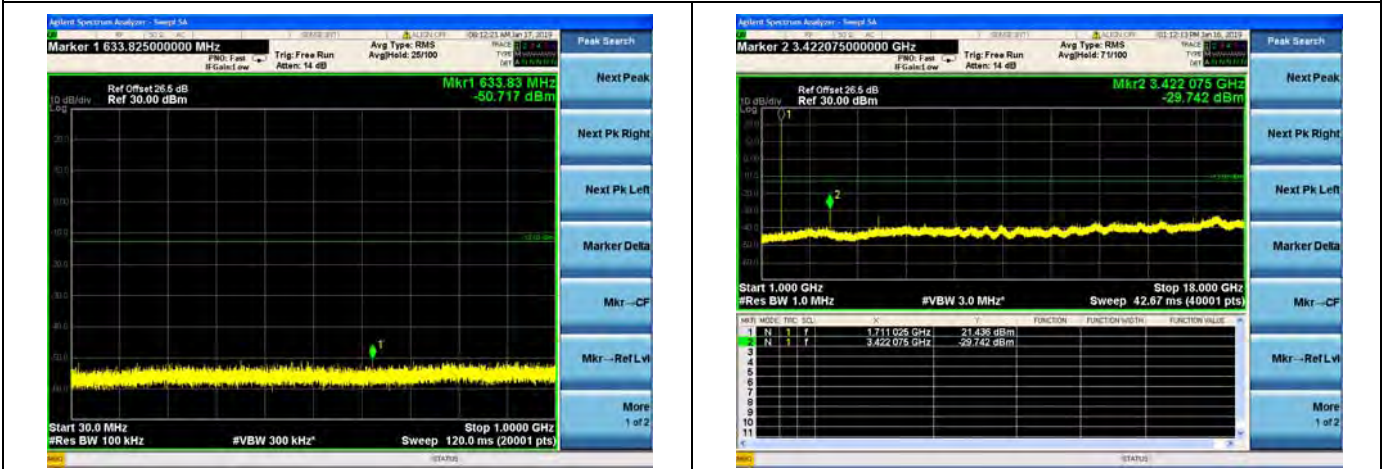
QPSK



16QAM



64QAM





LTE Band 66 1.4MHz BW Mid Channel

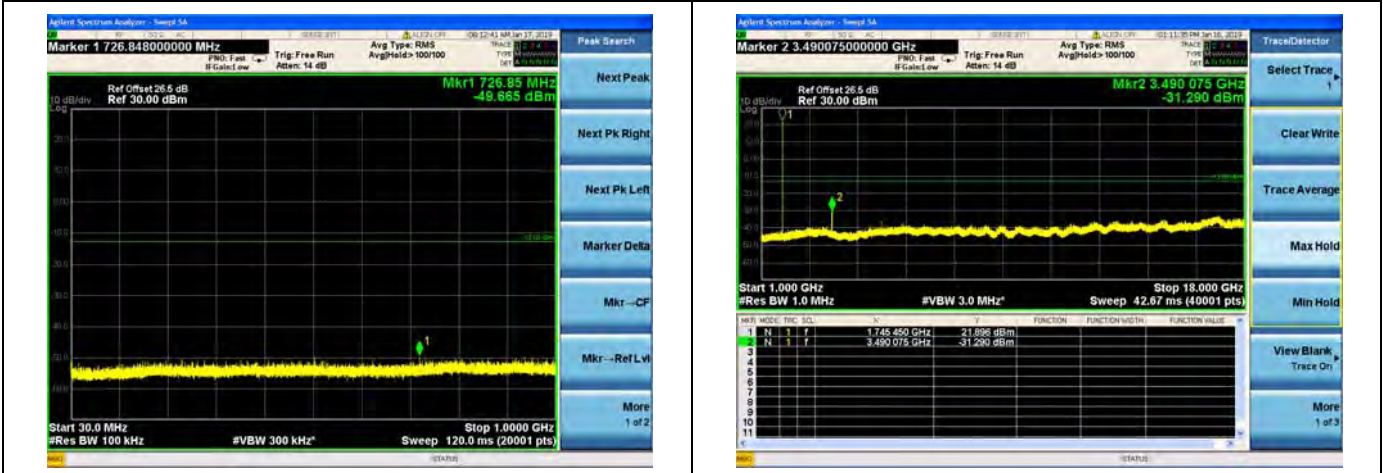
QPSK



16QAM



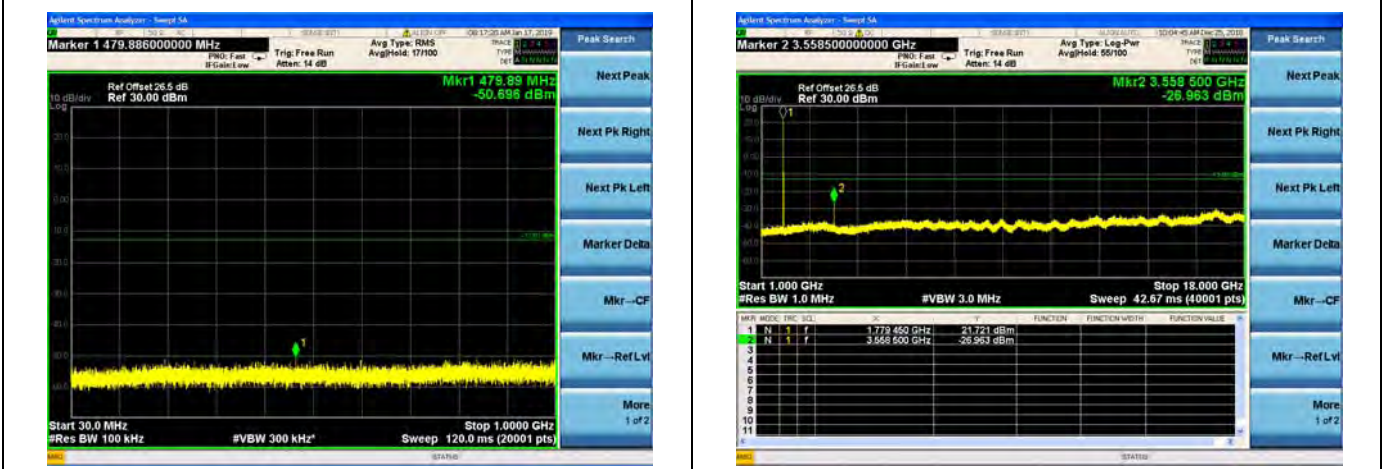
64QAM



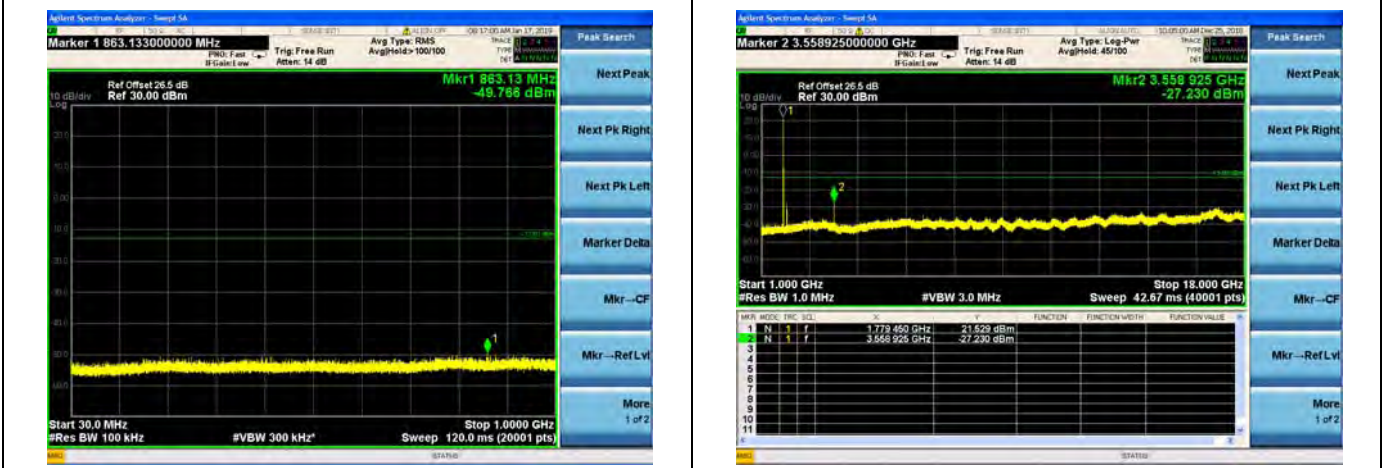


LTE Band 66 1.4MHz BW High Channel

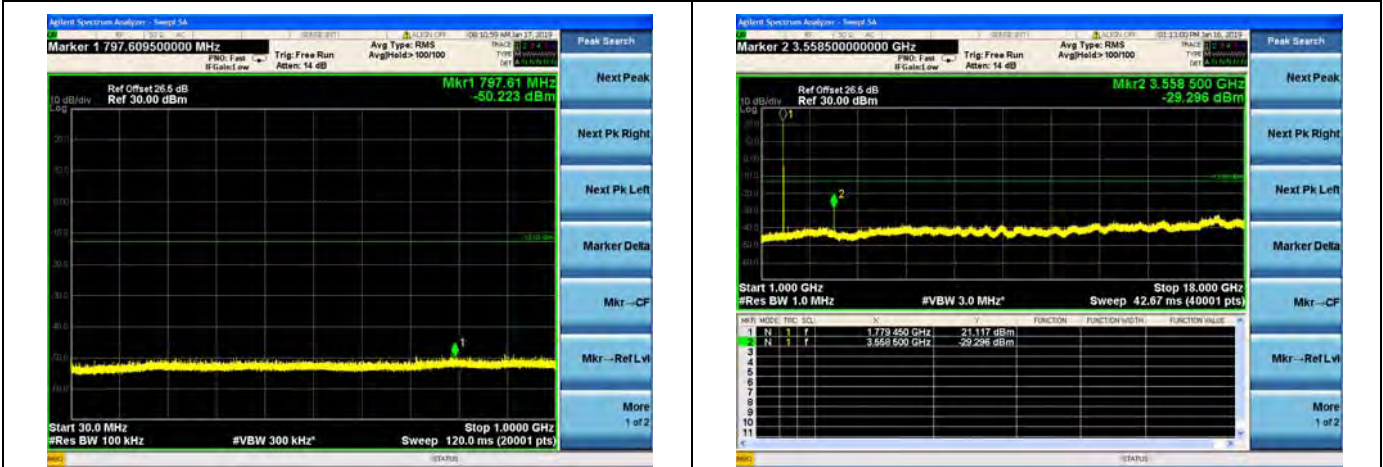
QPSK



16QAM



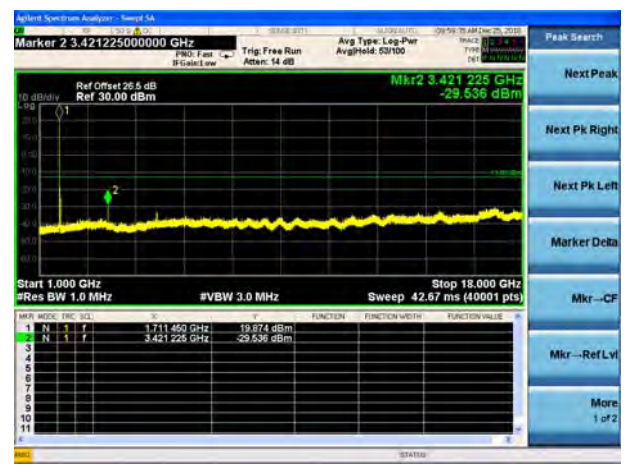
64QAM



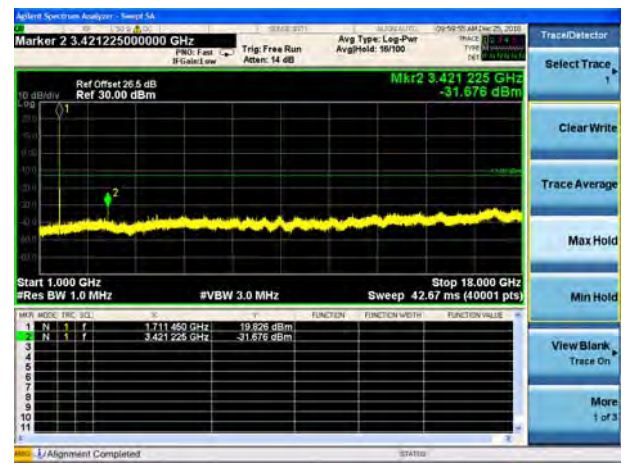
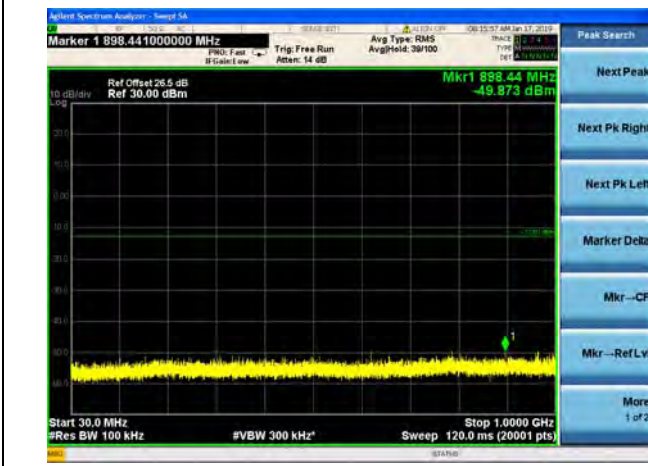


LTE Band 66 3MHz BW Low Channel

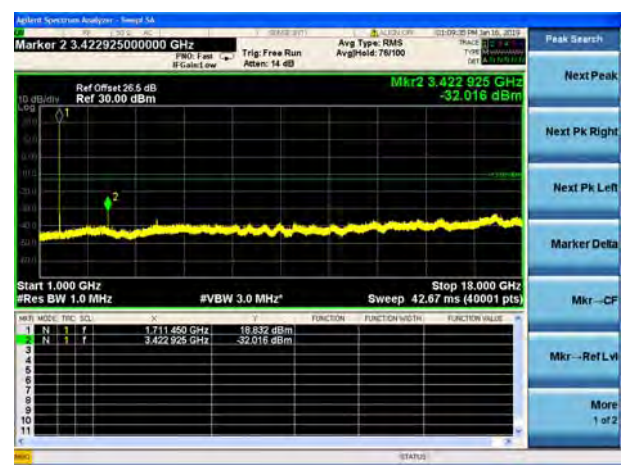
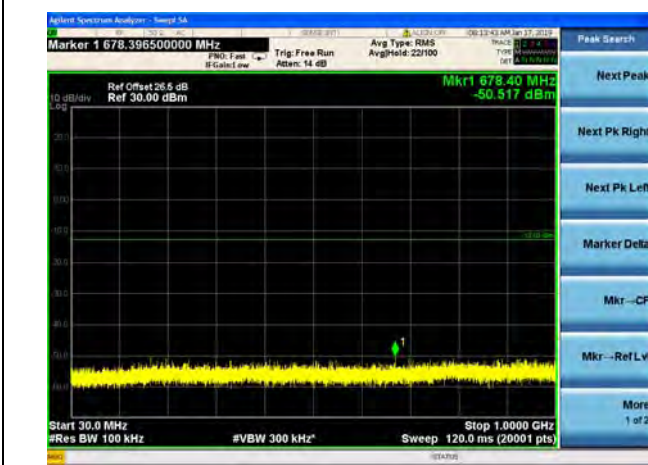
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16QAM



64QAM





LTE Band 66 3MHz BW Mid Channel

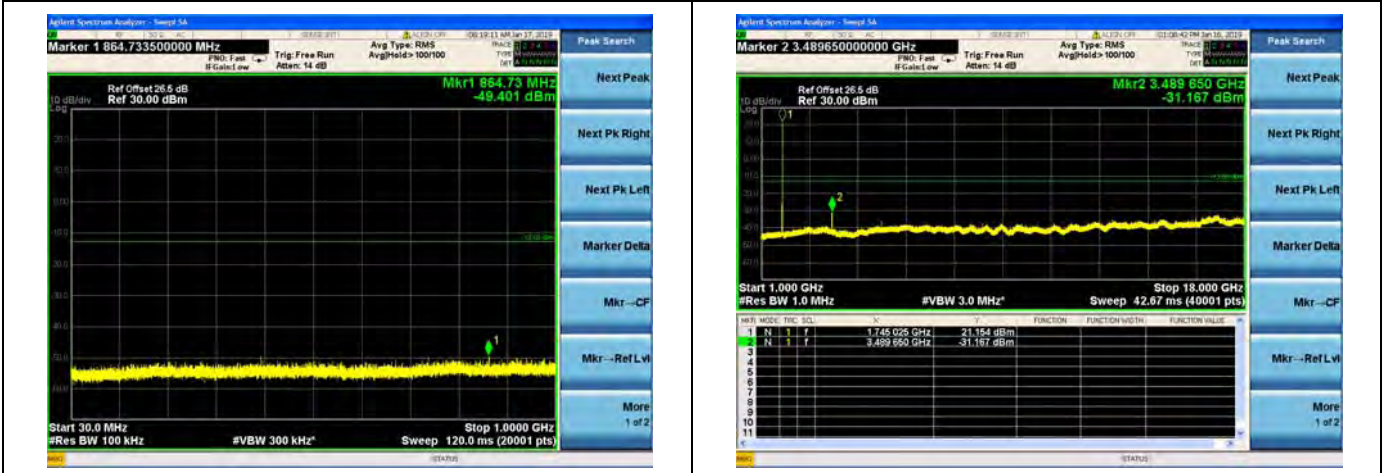
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16QAM



64QAM

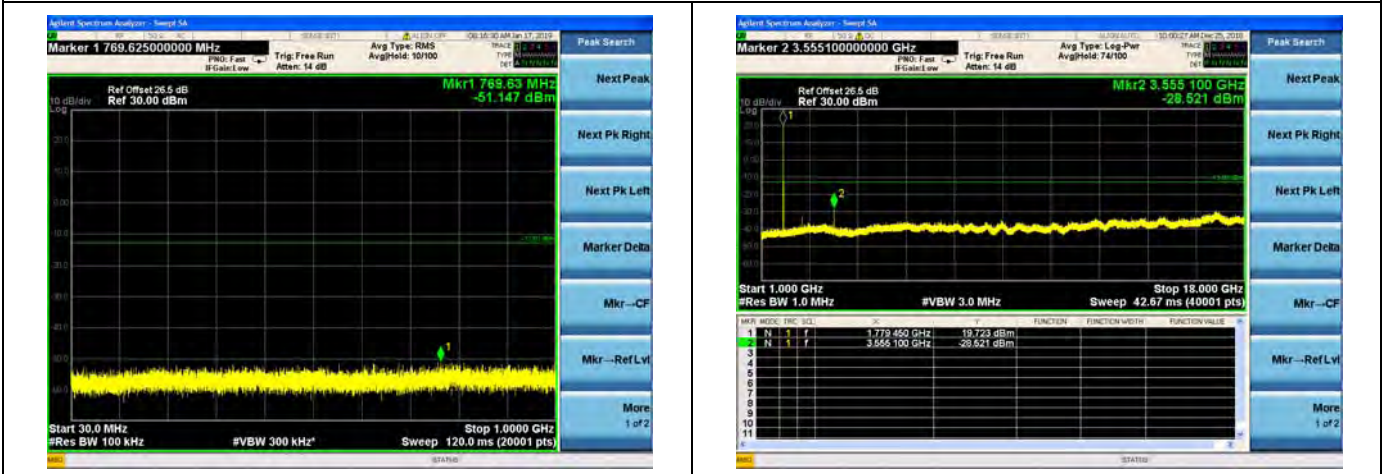




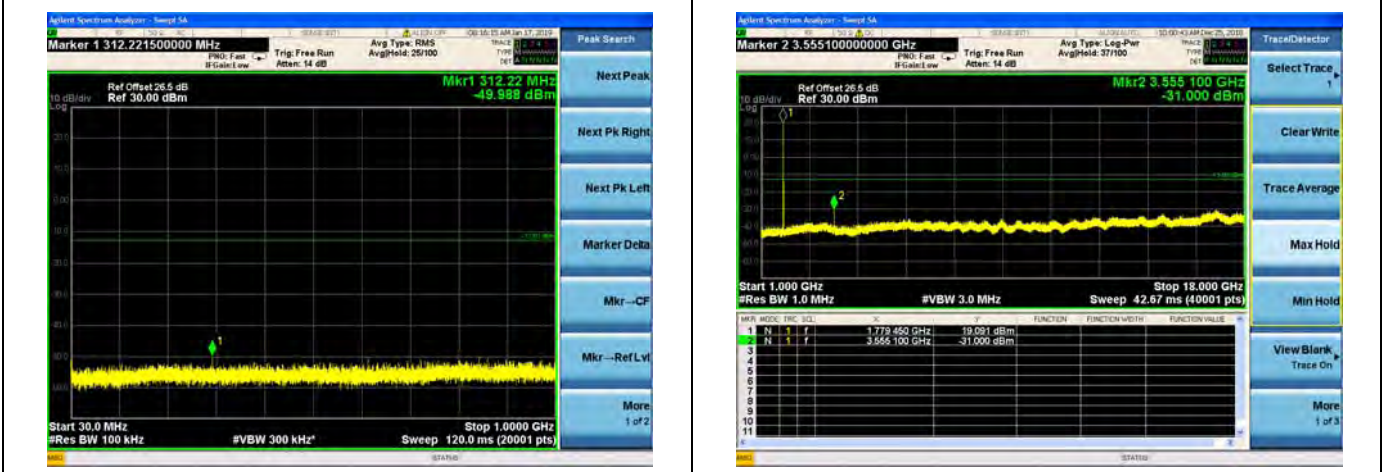


LTE Band 66 3MHz BW High Channel

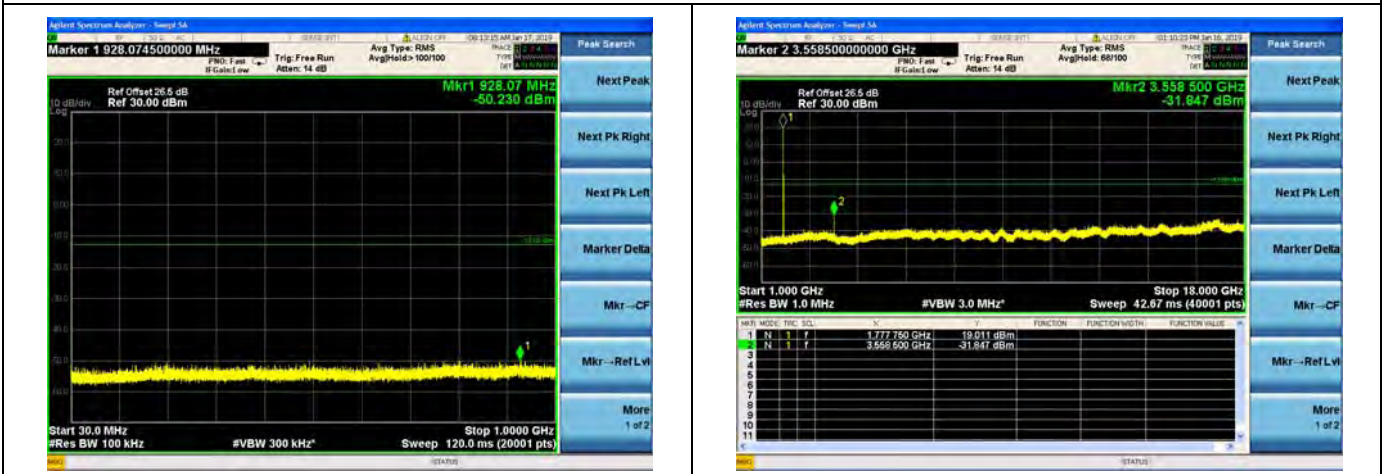
QPSK



16QAM



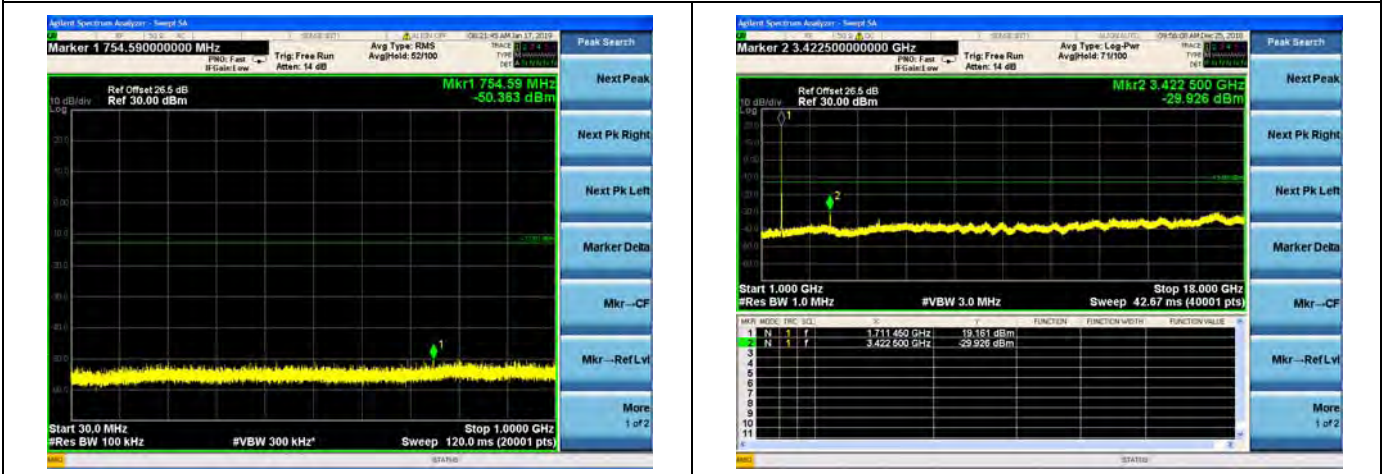
64QAM





LTE Band 66 5MHz BW Low Channel

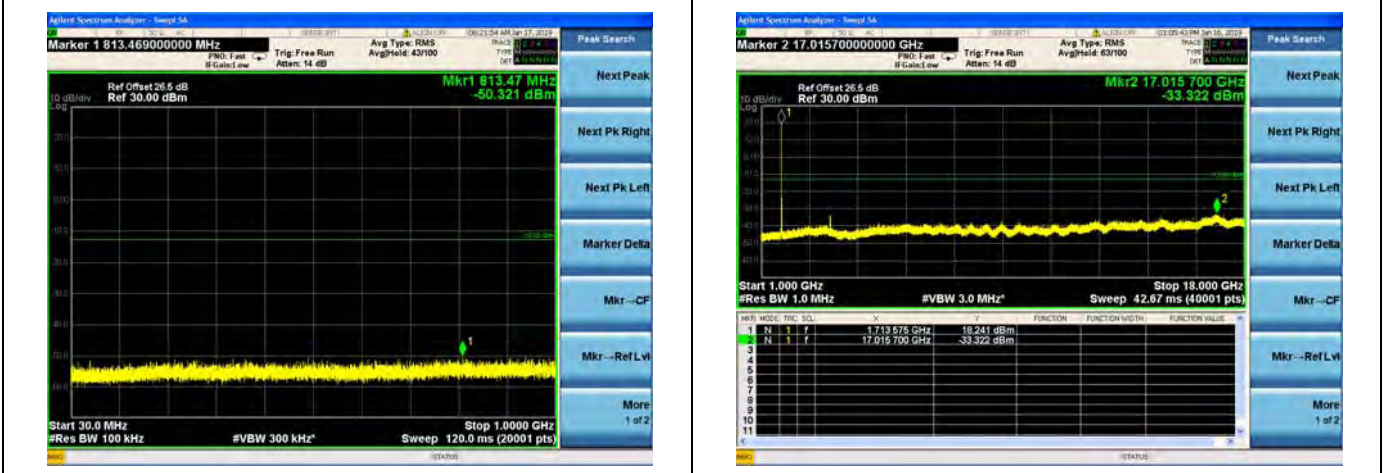
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16QAM



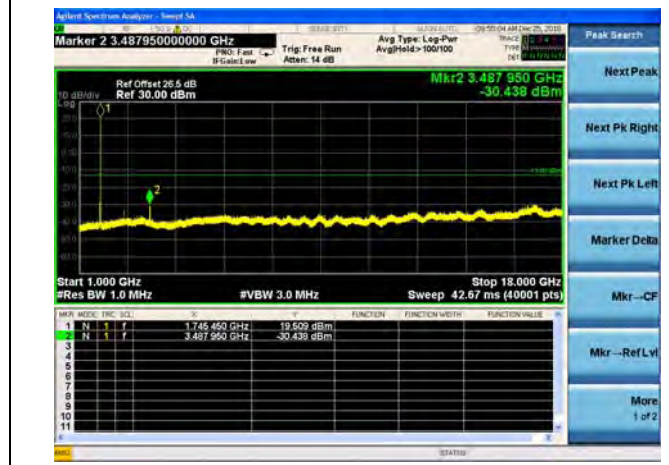
64QAM



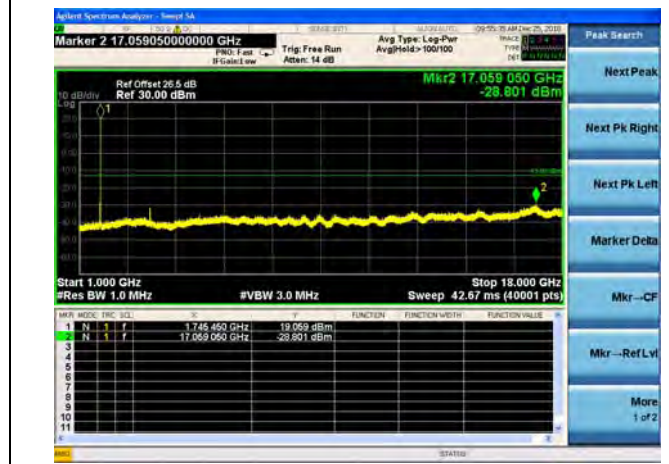
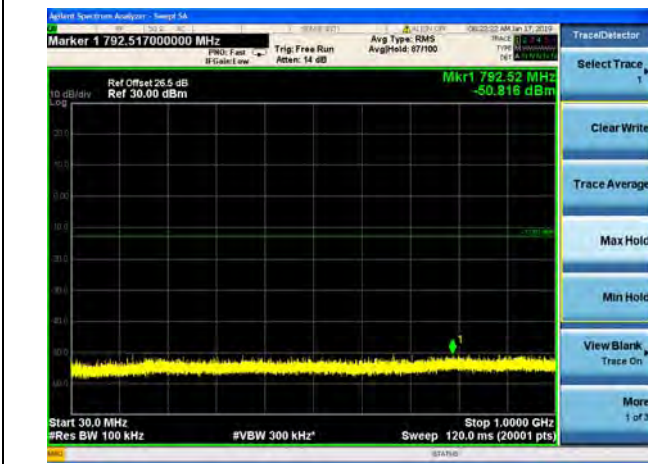


LTE Band 66 5MHz BW Mid Channel

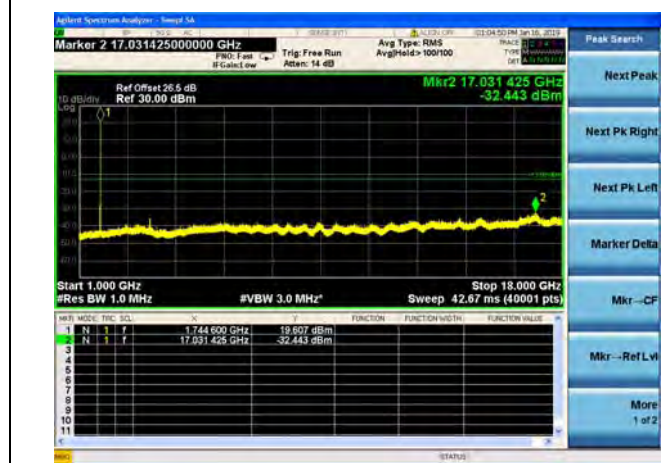
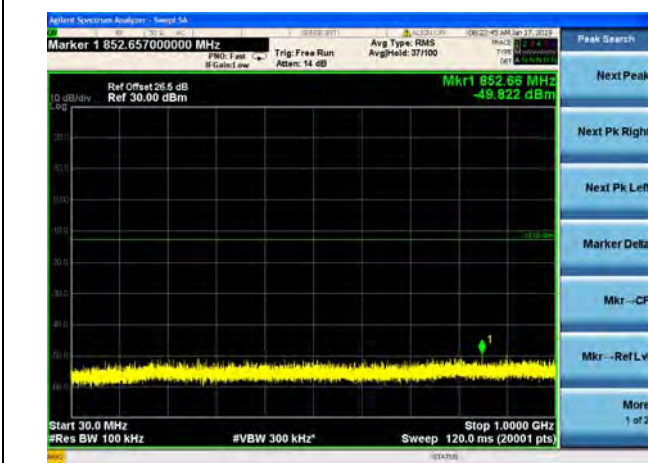
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16QAM



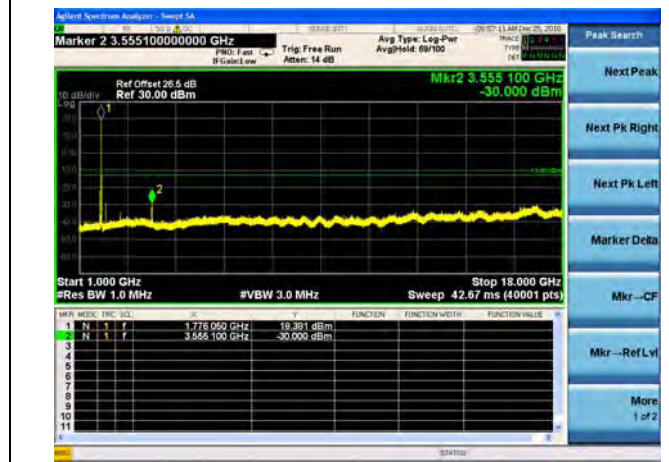
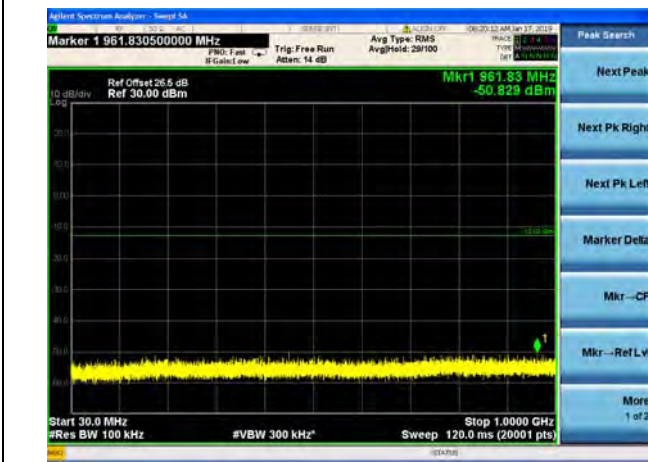
64QAM



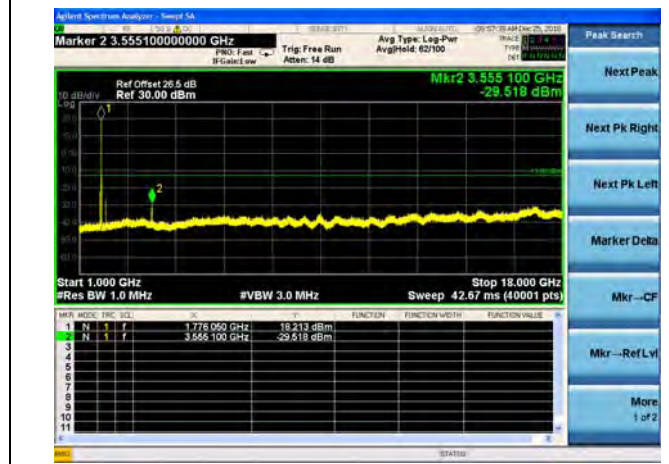
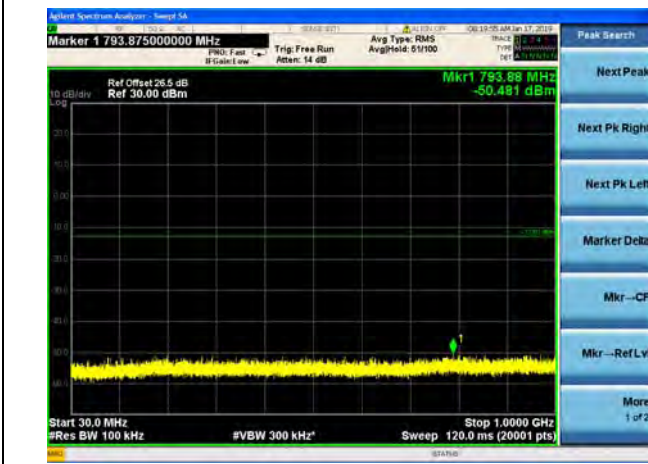


LTE Band 66 5MHz BW High Channel

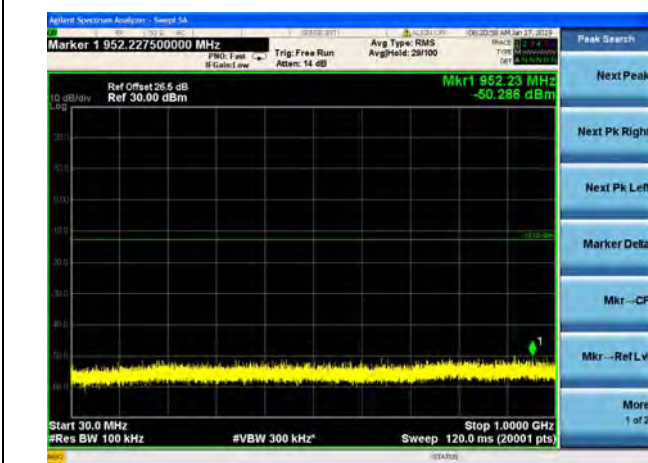
QPSK



16QAM



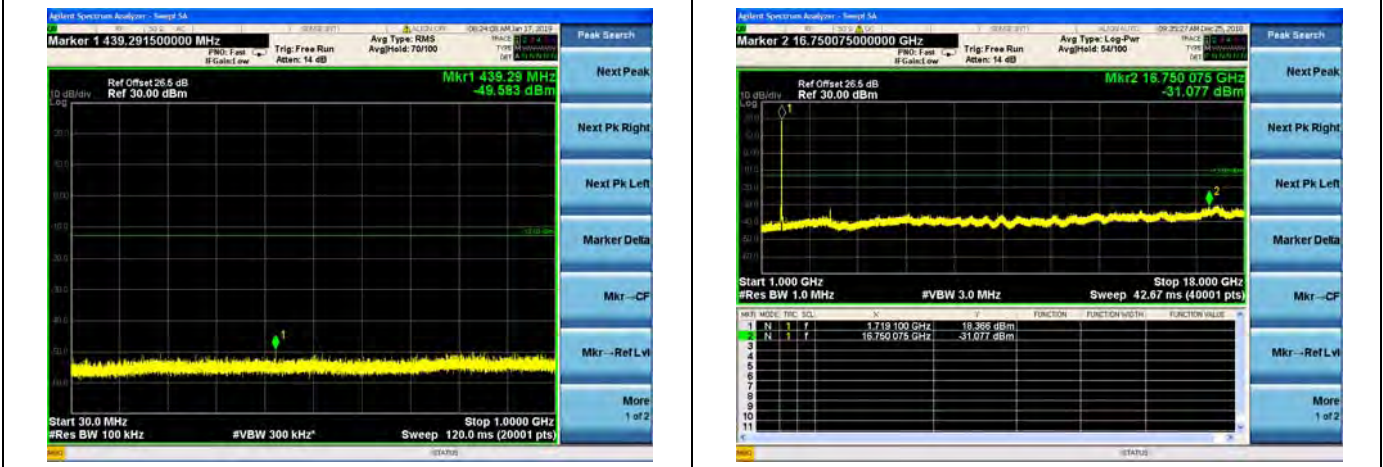
64QAM





LTE Band 66 10MHz BW Low Channel

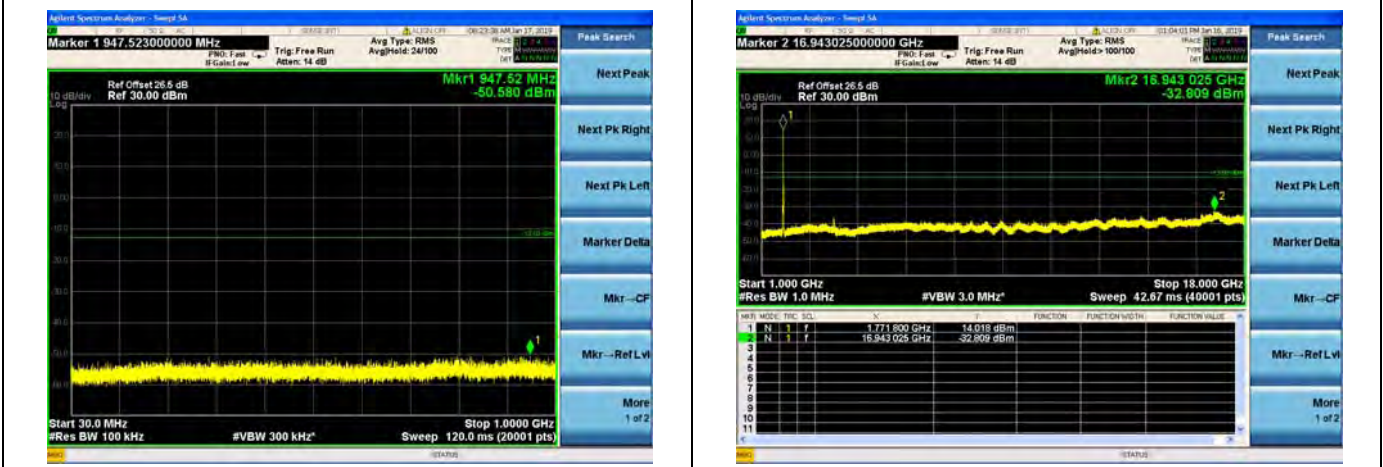
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16QAM



64QAM



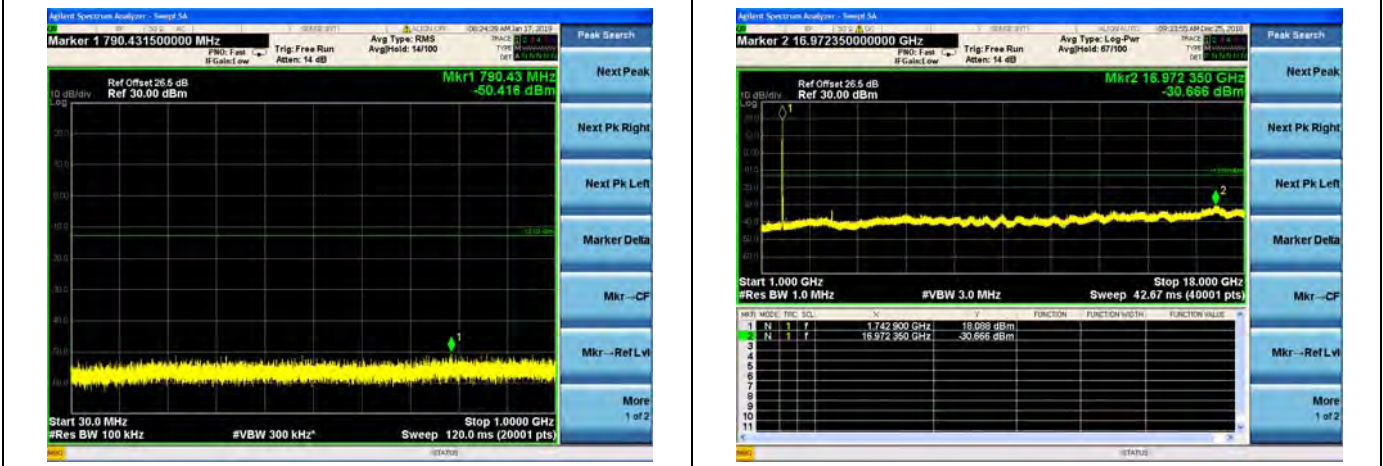


LTE Band 66 10MHz BW Mid Channel

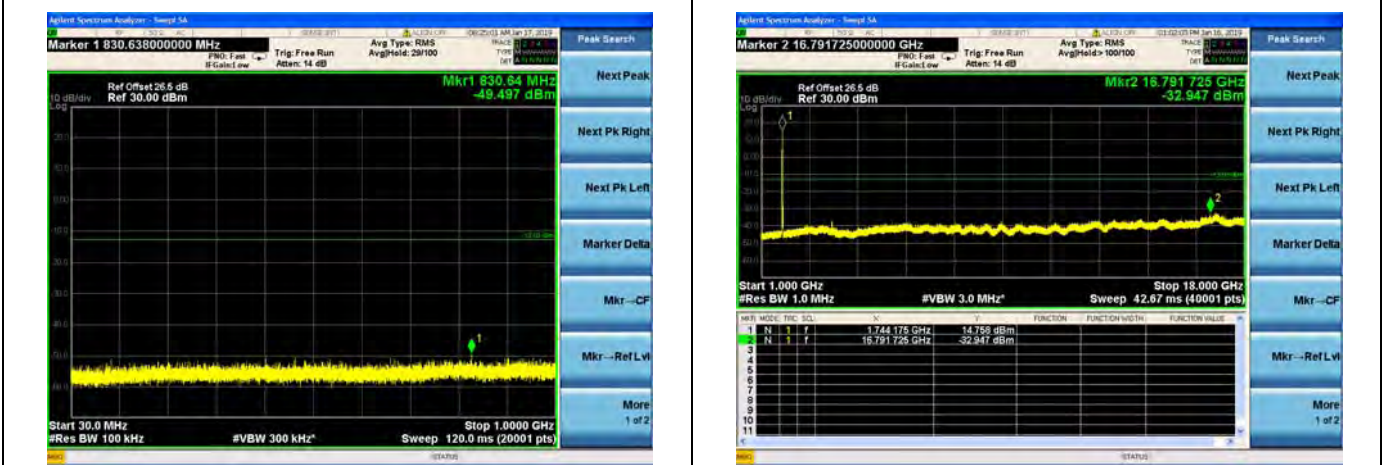
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16QAM



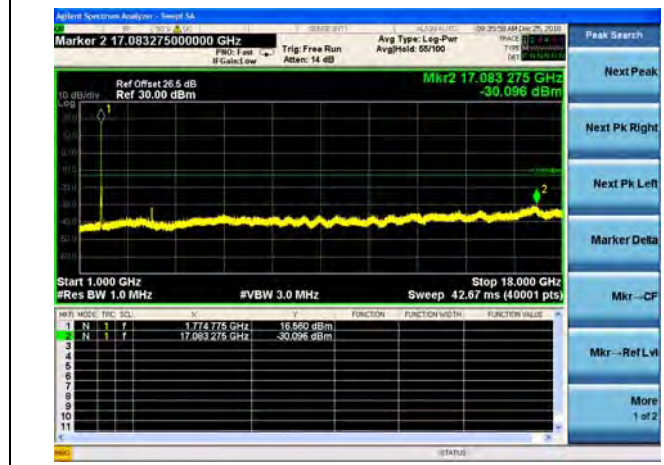
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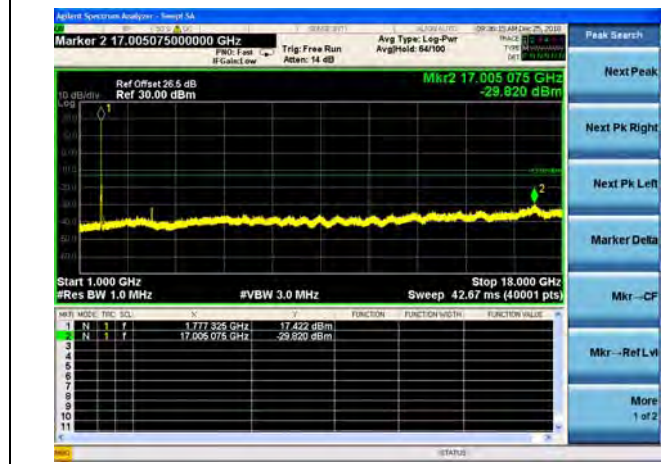


LTE Band 66 10MHz BW High Channel

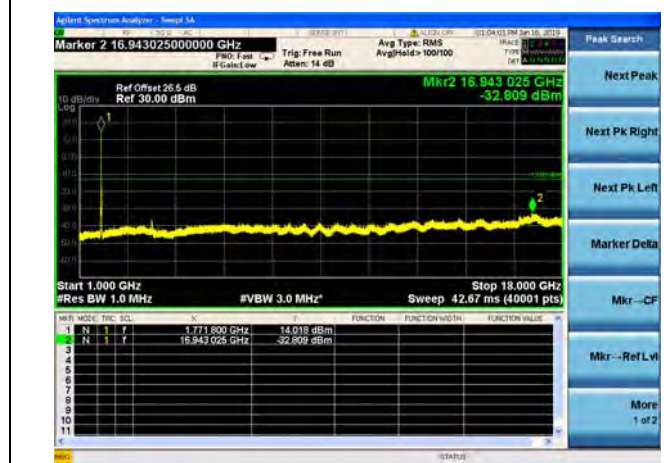
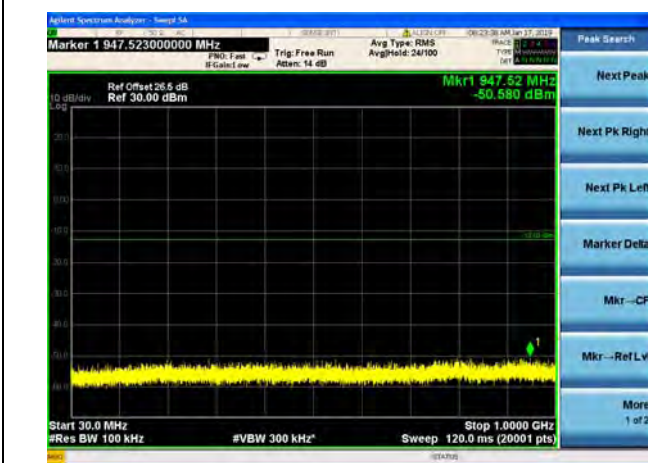
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16QAM



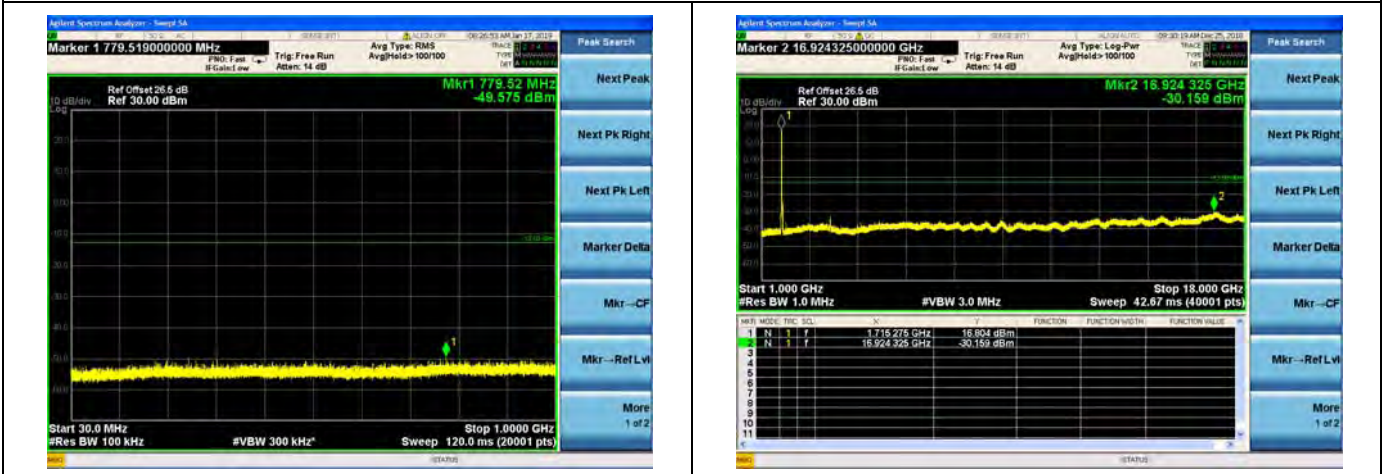
64QAM





LTE Band 66 15MHz BW Low Channel

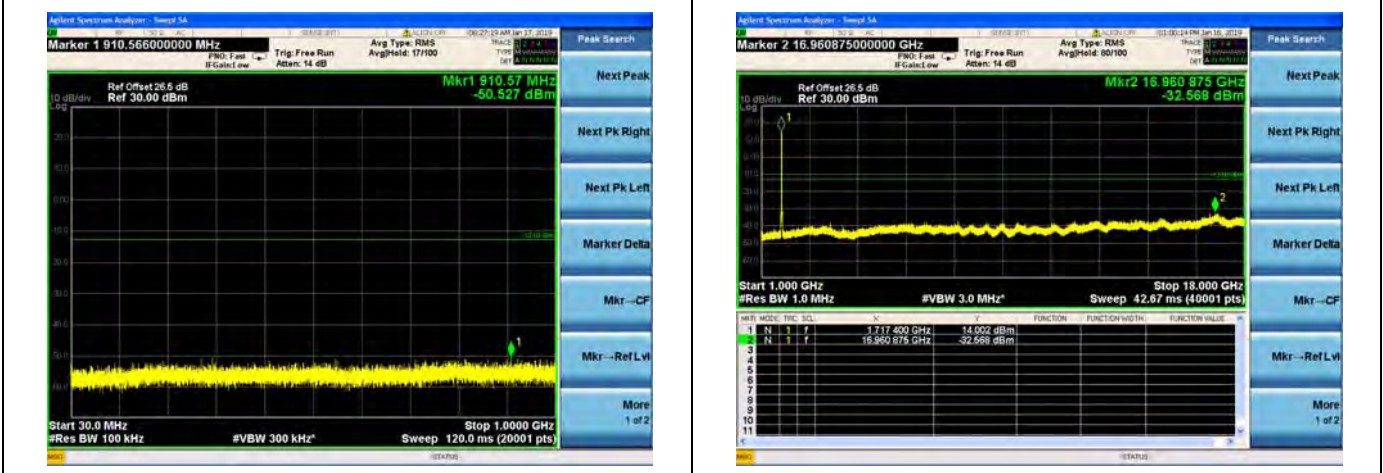
QPSK



16QAM



64QAM

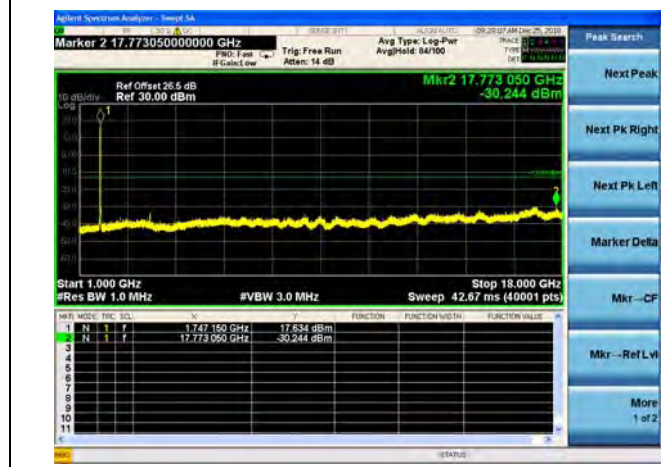
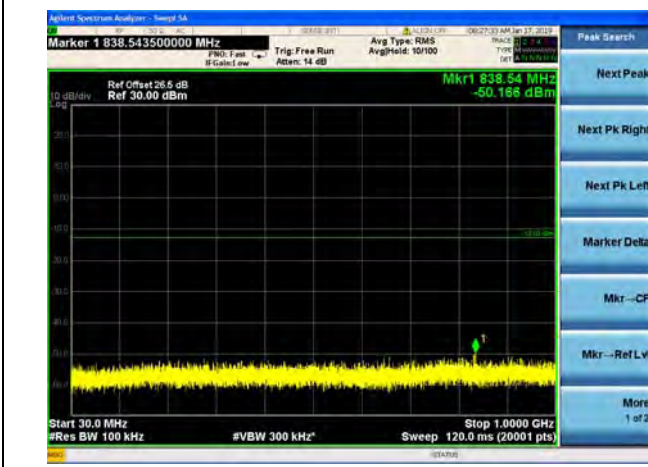




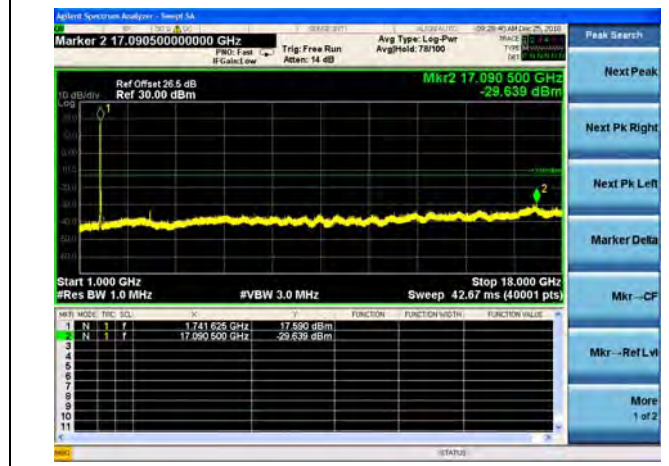
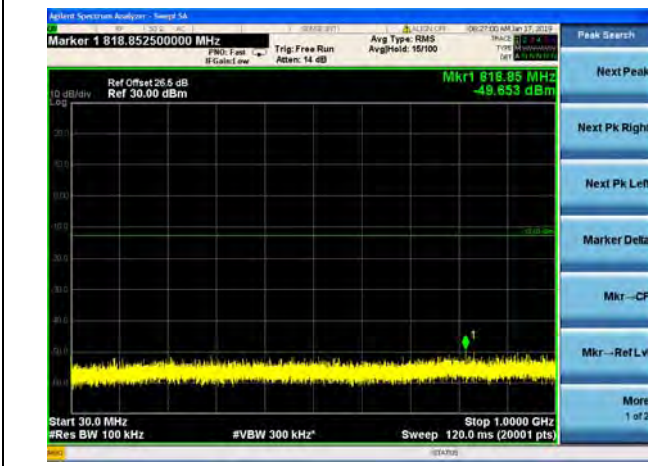


LTE Band 66 15MHz BW Mid Channel

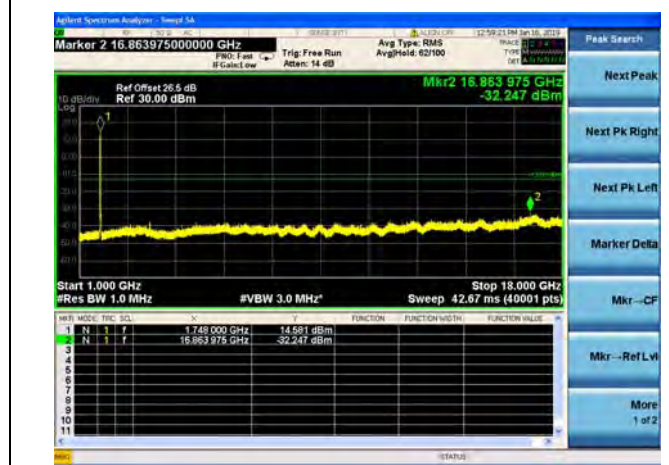
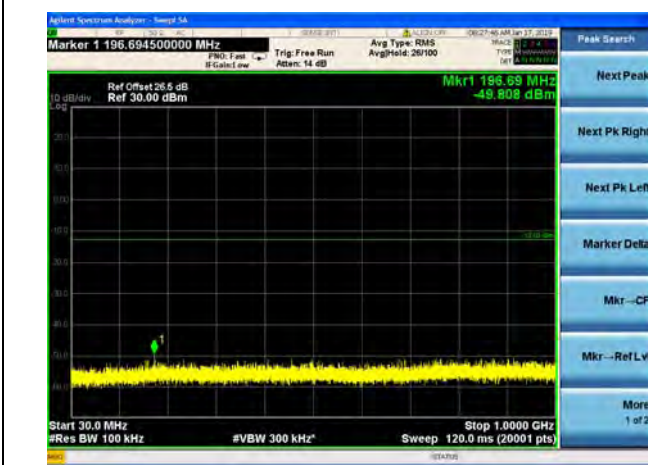
QPSK



16QAM



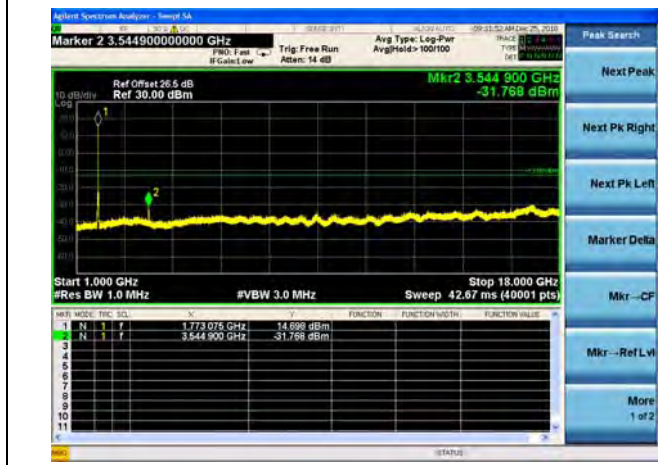
64QAM



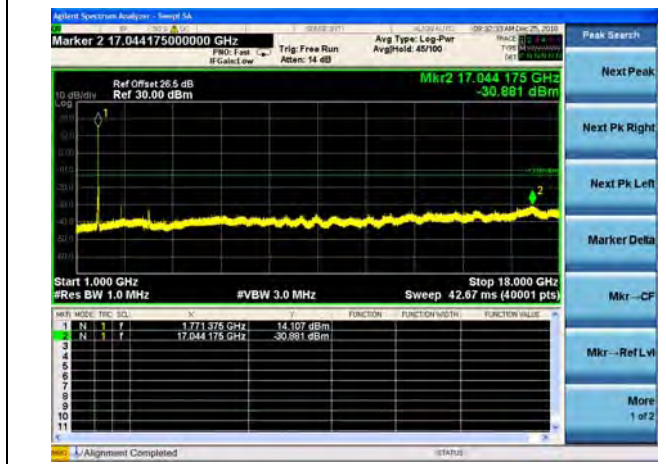


LTE Band 66 15MHz BW High Channel

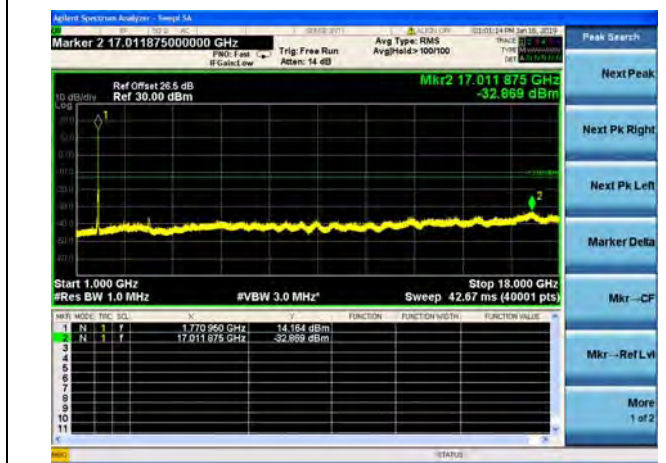
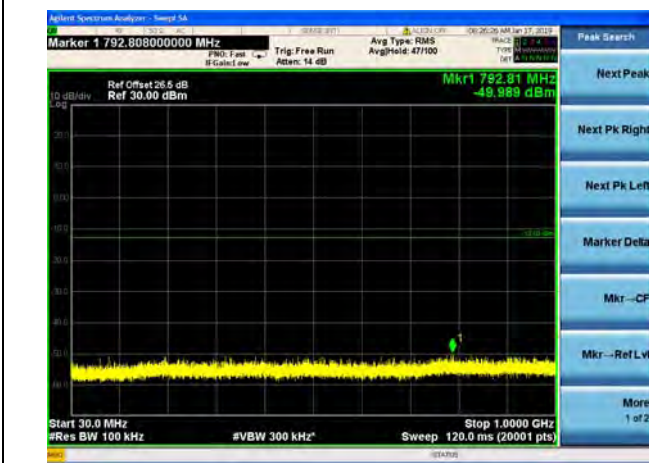
QPSK



16QAM



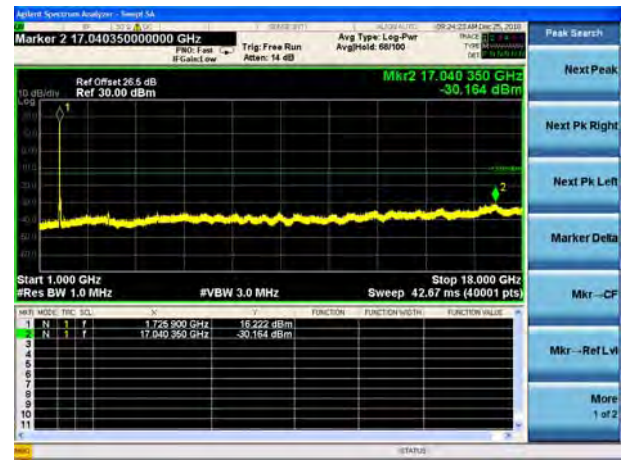
64QAM



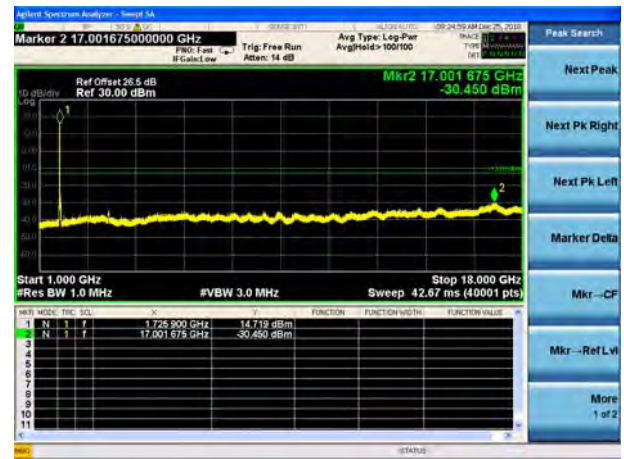
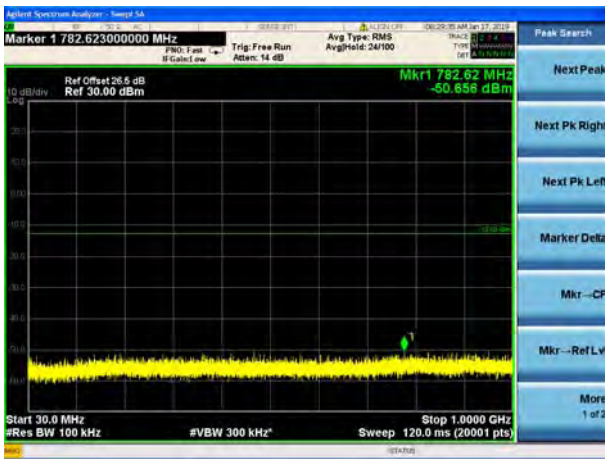


LTE Band 66 20MHz BW Low Channel

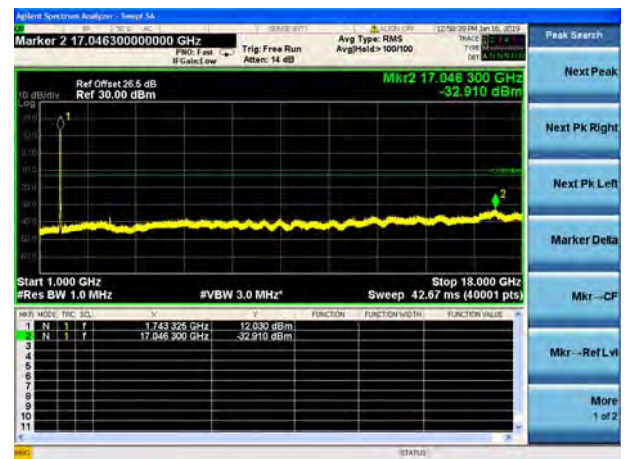
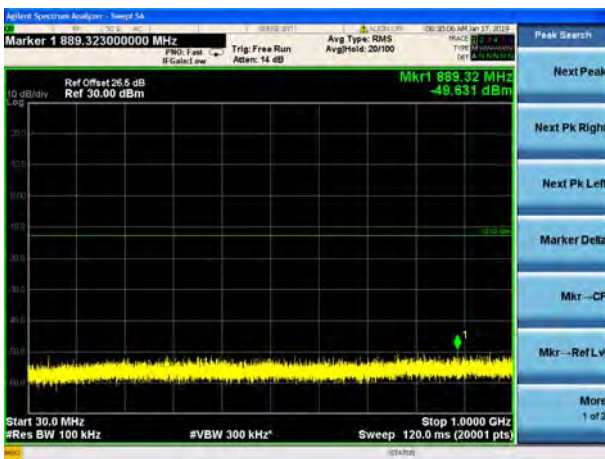
QPSK



16QAM



64QAM





LTE Band 66 20MHz BW Mid Channel

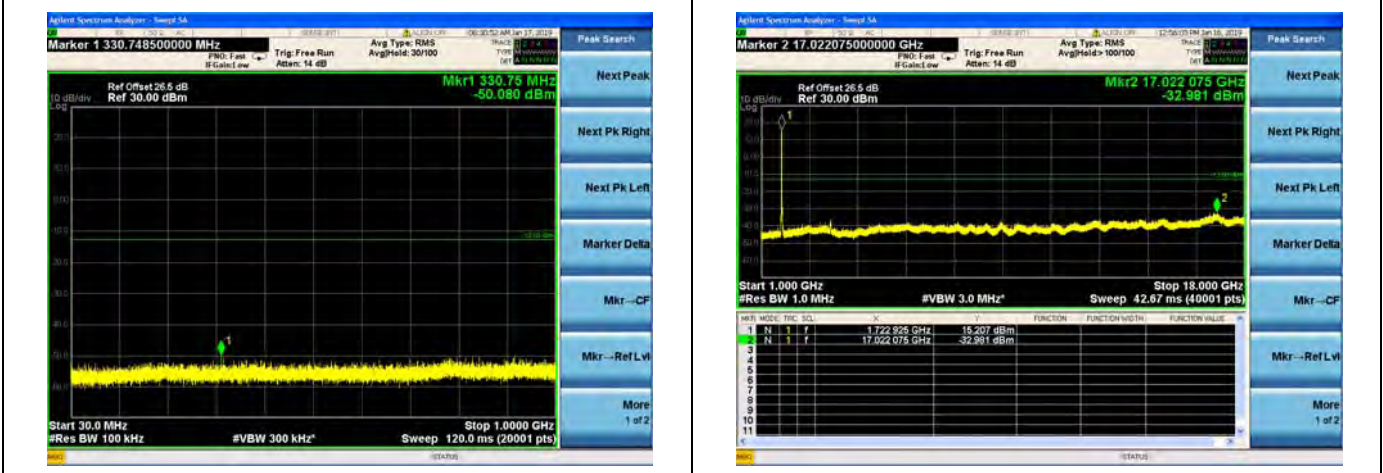
QPSK



16QAM



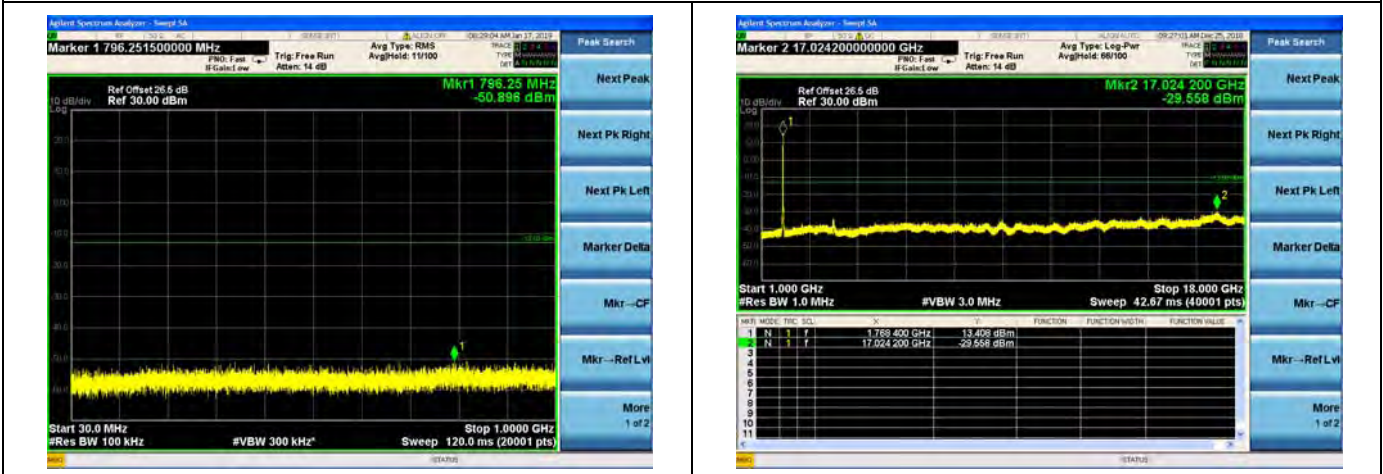
64QAM



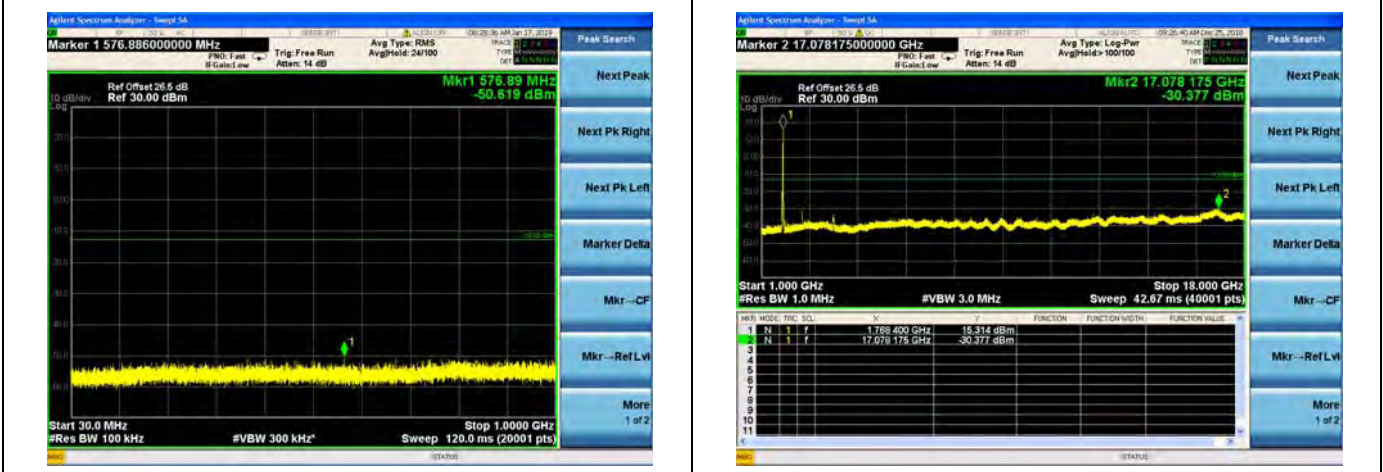


LTE Band 66 20MHz BW High Channel

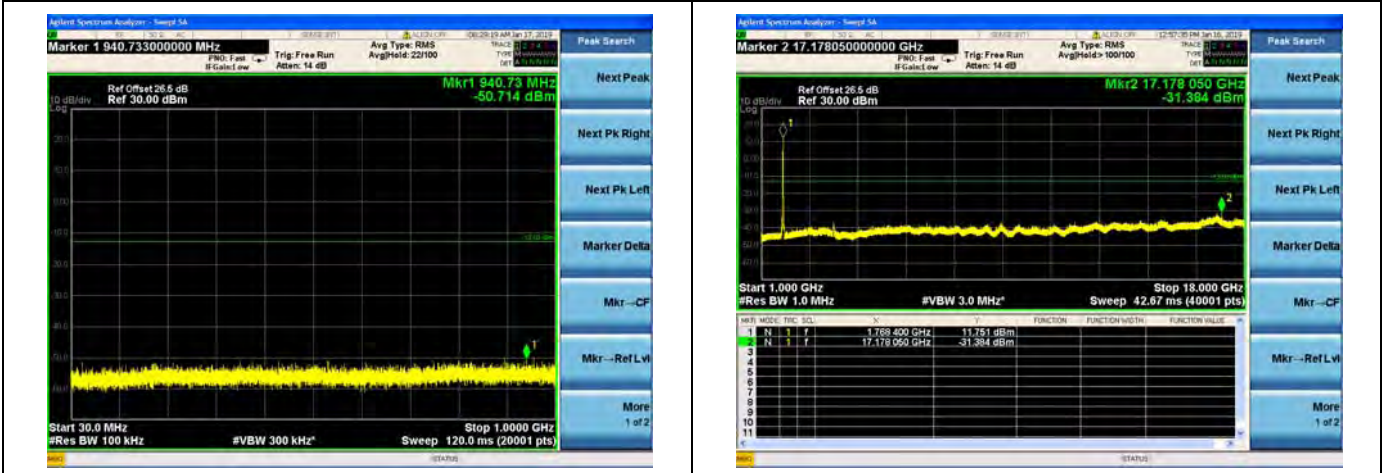
QPSK



16QAM



16QAM





## 2.6. Band Edge

### 2.6.1. Requirement

According to FCC section 22.917(a), 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.

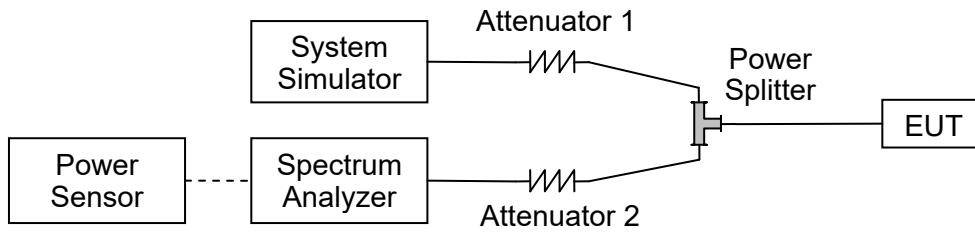
According to FCC section 24.238(a), The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to FCC section 27.53(g), For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to FCC section 27.53(h), For operations in the 1710–1755MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.

According to FCC section 27.53(m) (4), 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.

### 2.6.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

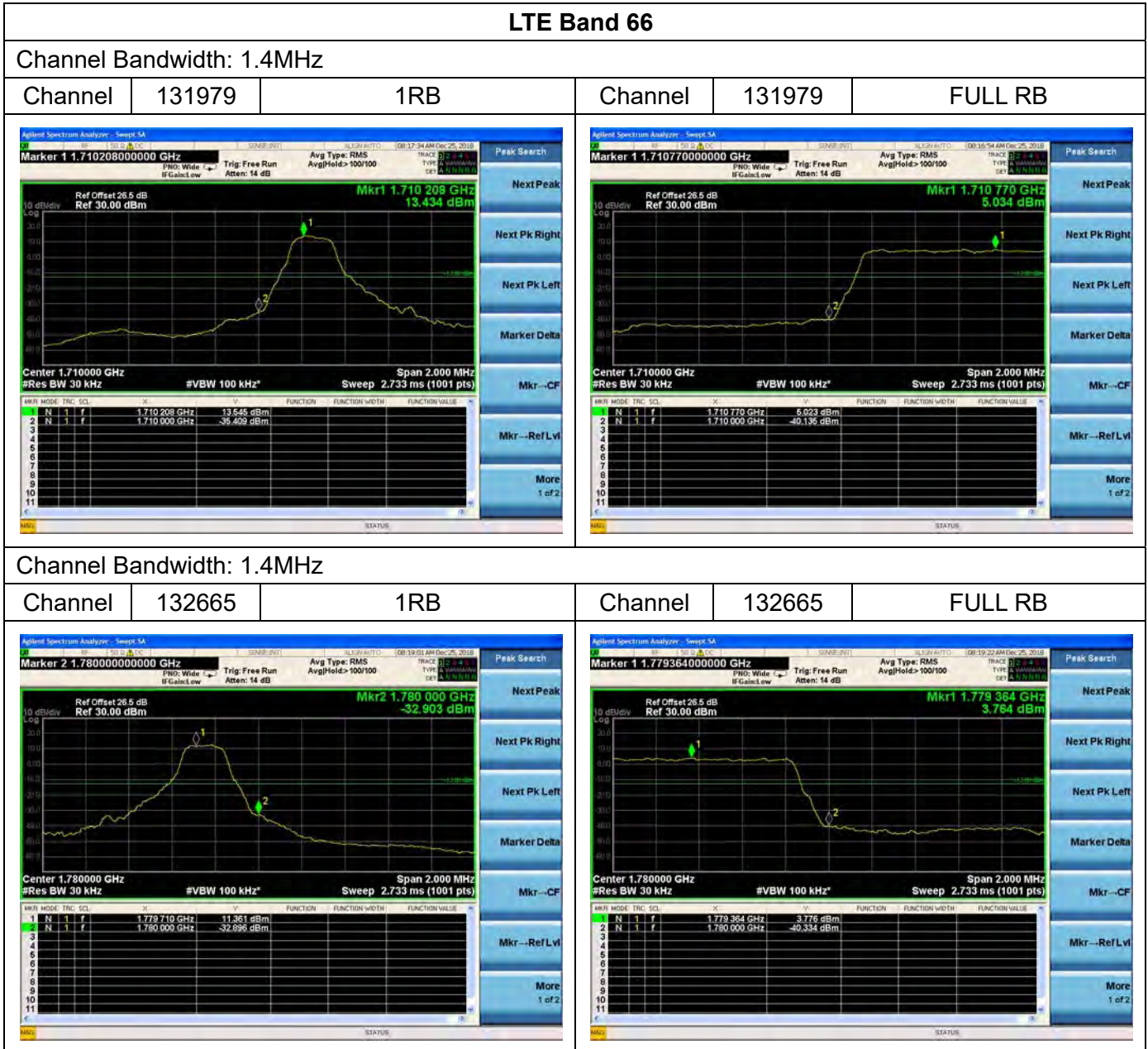
### 2.6.3. Test procedure

KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.



2.6.4. Test Result

The center frequency of spectrum is the band edge frequency and span is 2MHz, Record the max trace into the test report.

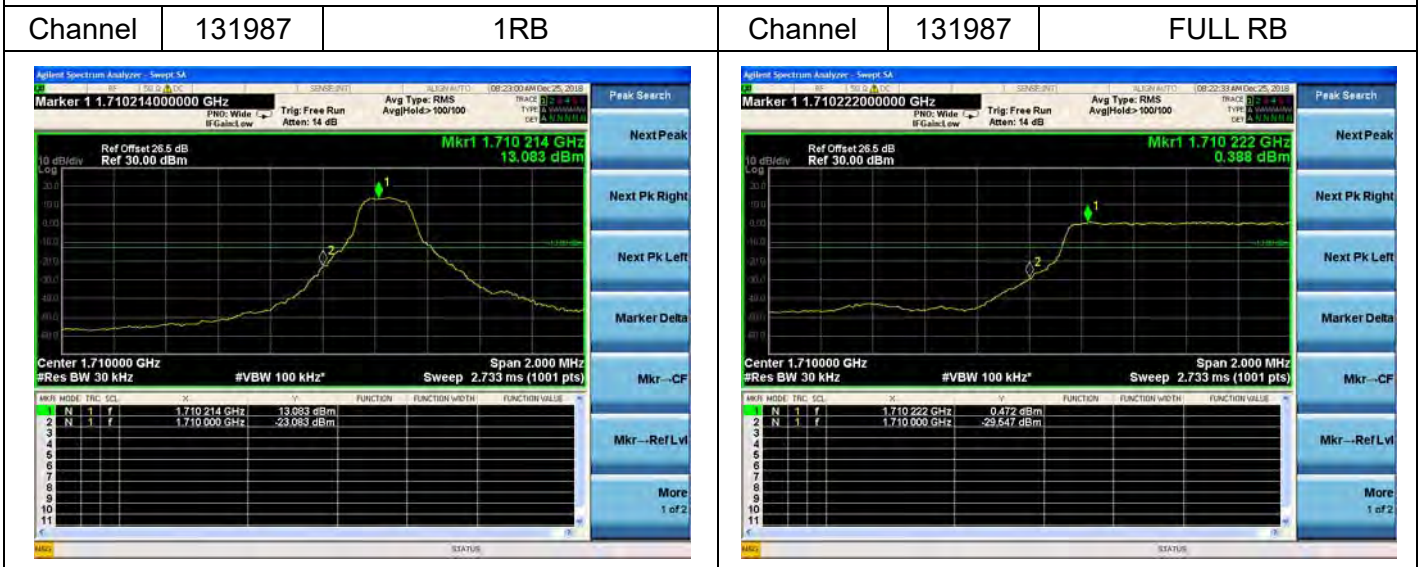




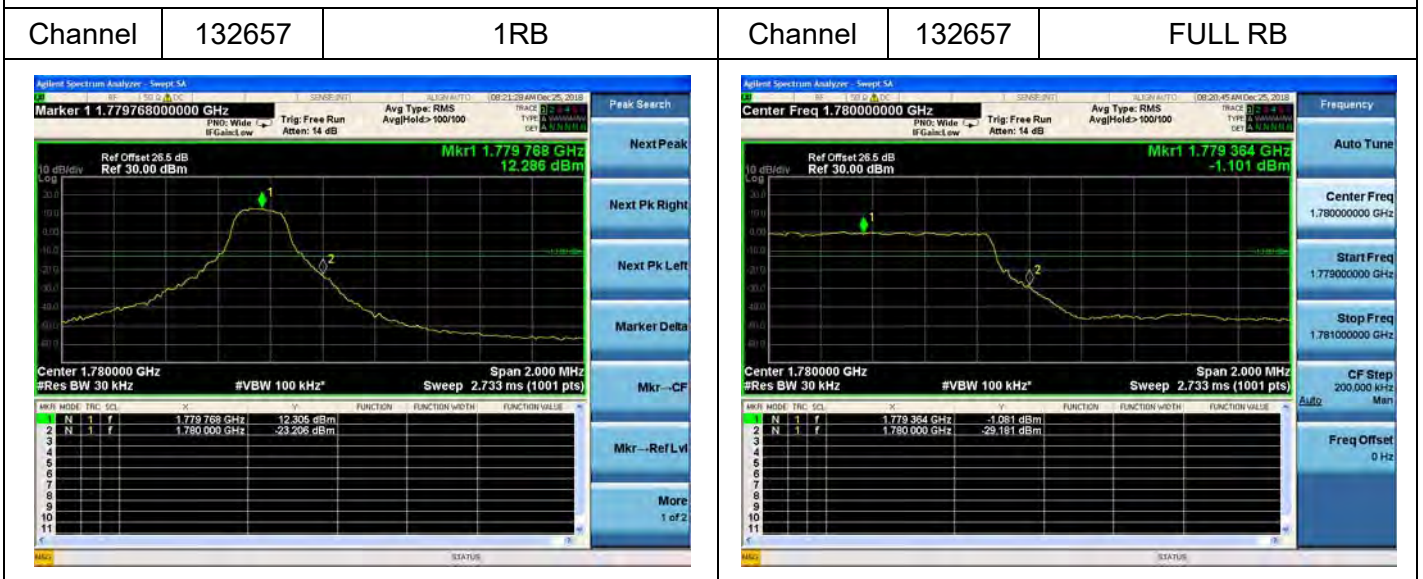


LTE Band 66

Channel Bandwidth: 3MHz



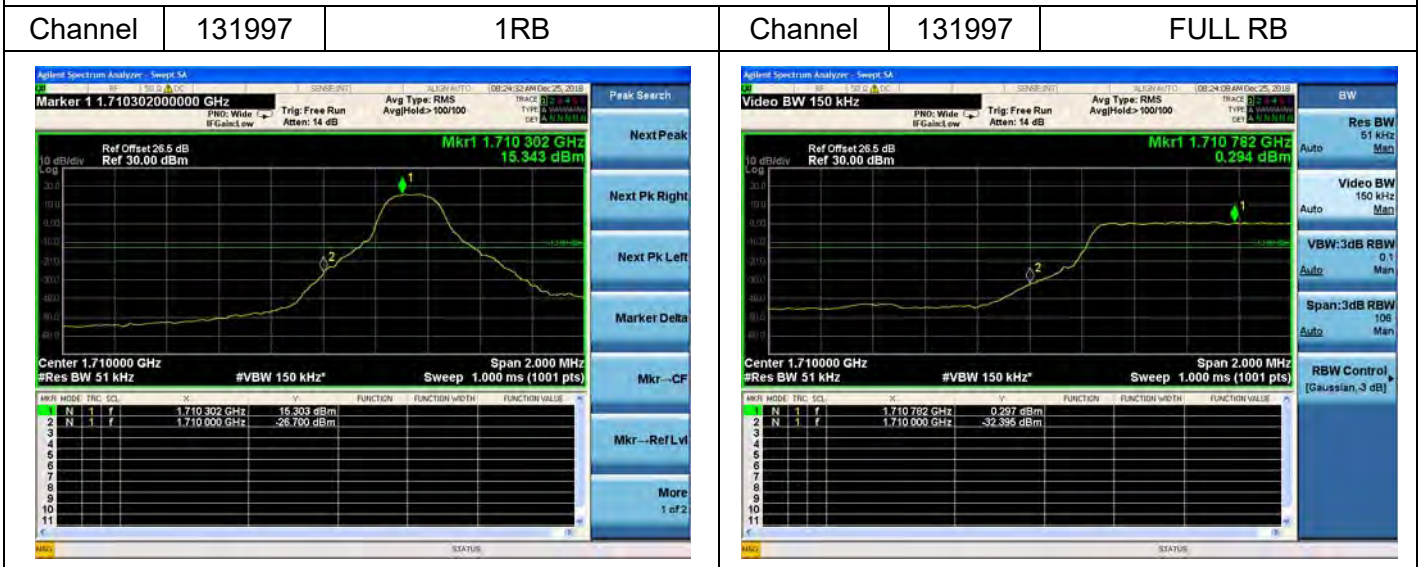
Channel Bandwidth: 3MHz



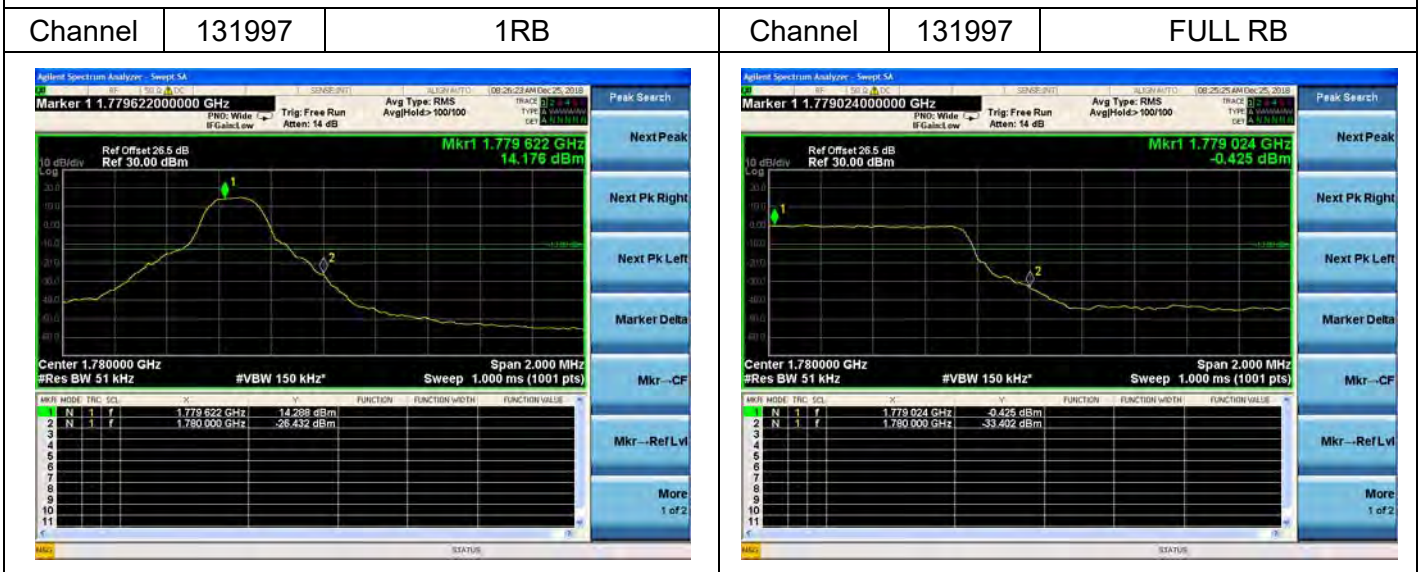


LTE Band 66

Channel Bandwidth: 5MHz



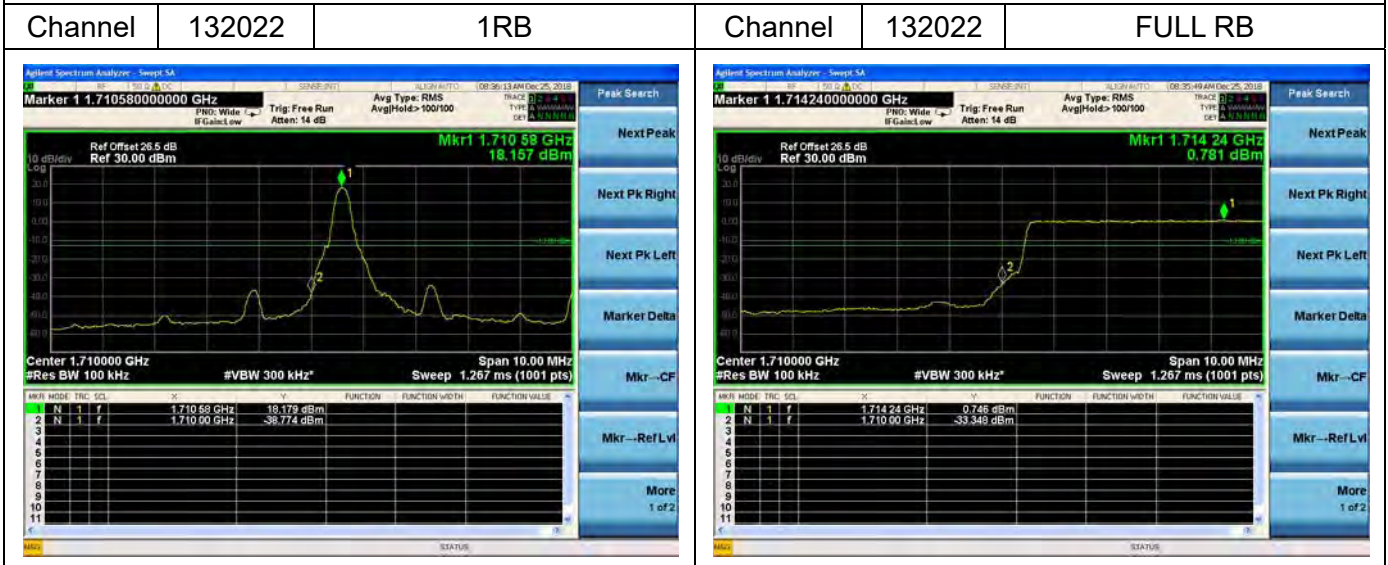
Channel Bandwidth: 5MHz



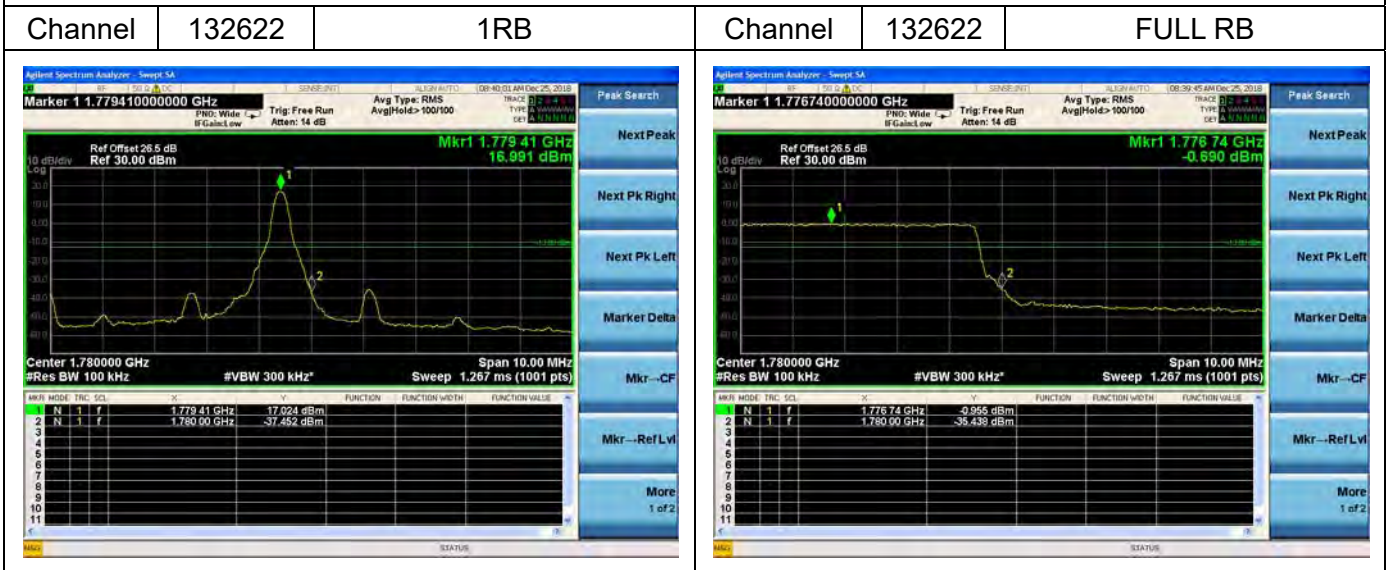


LTE Band 66

Channel Bandwidth: 10MHz



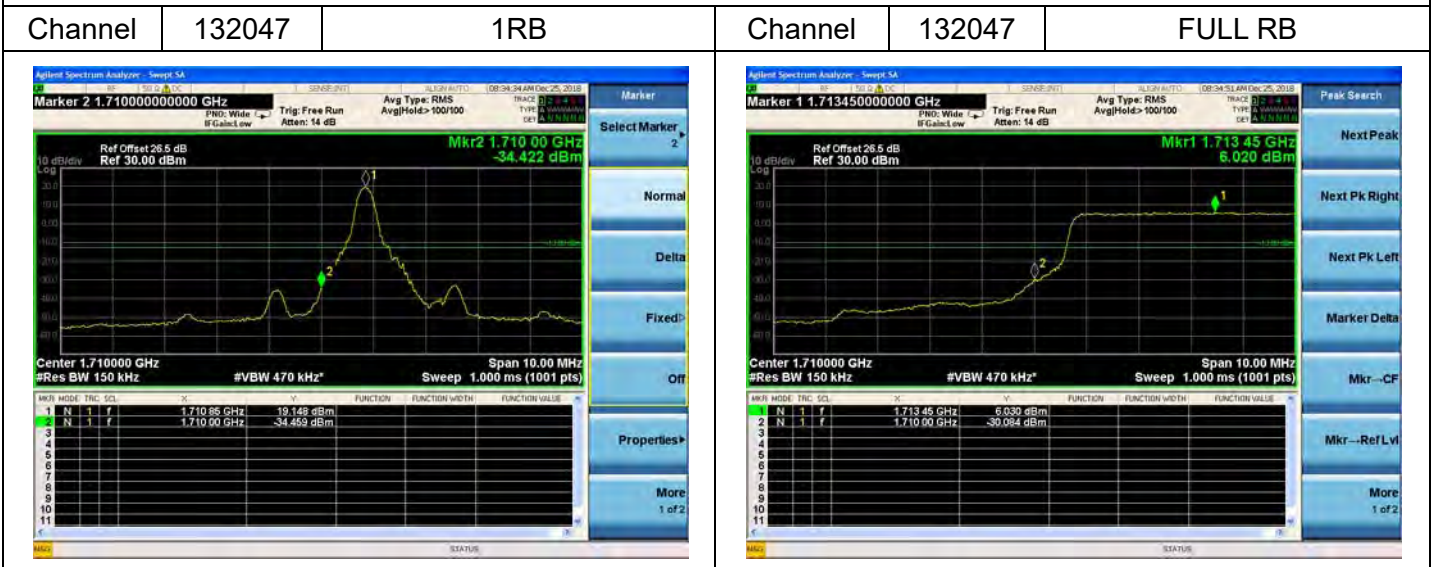
Channel Bandwidth: 10MHz



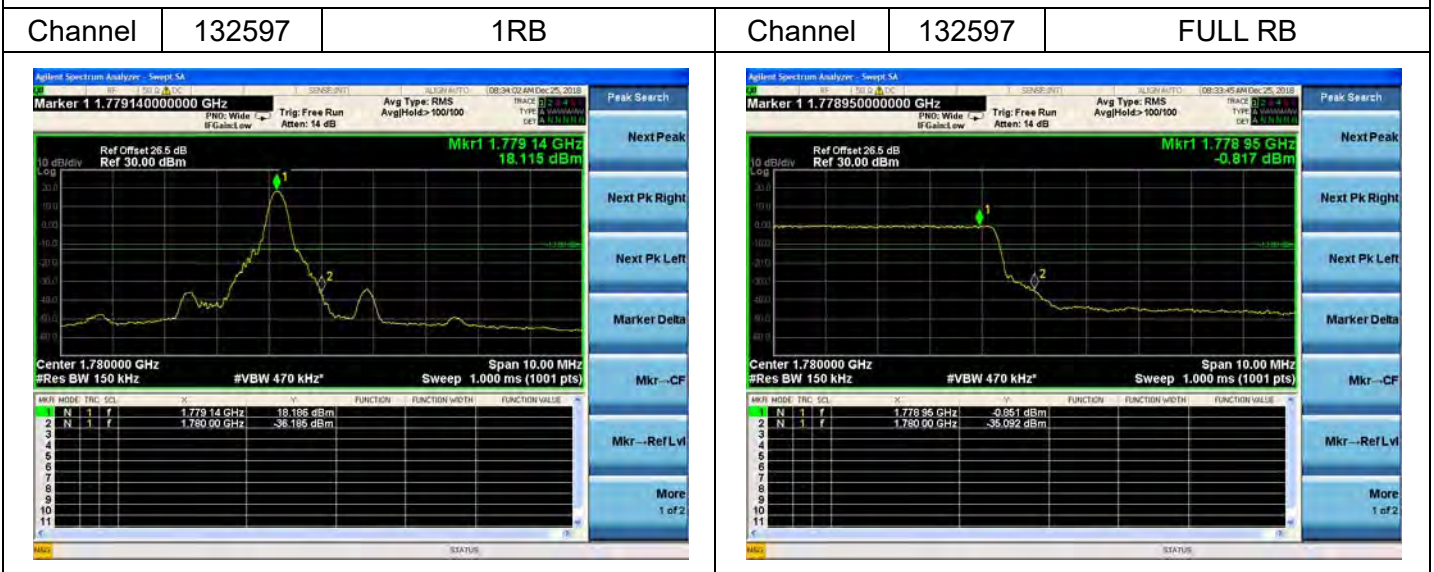


LTE Band 66

Channel Bandwidth: 15MHz



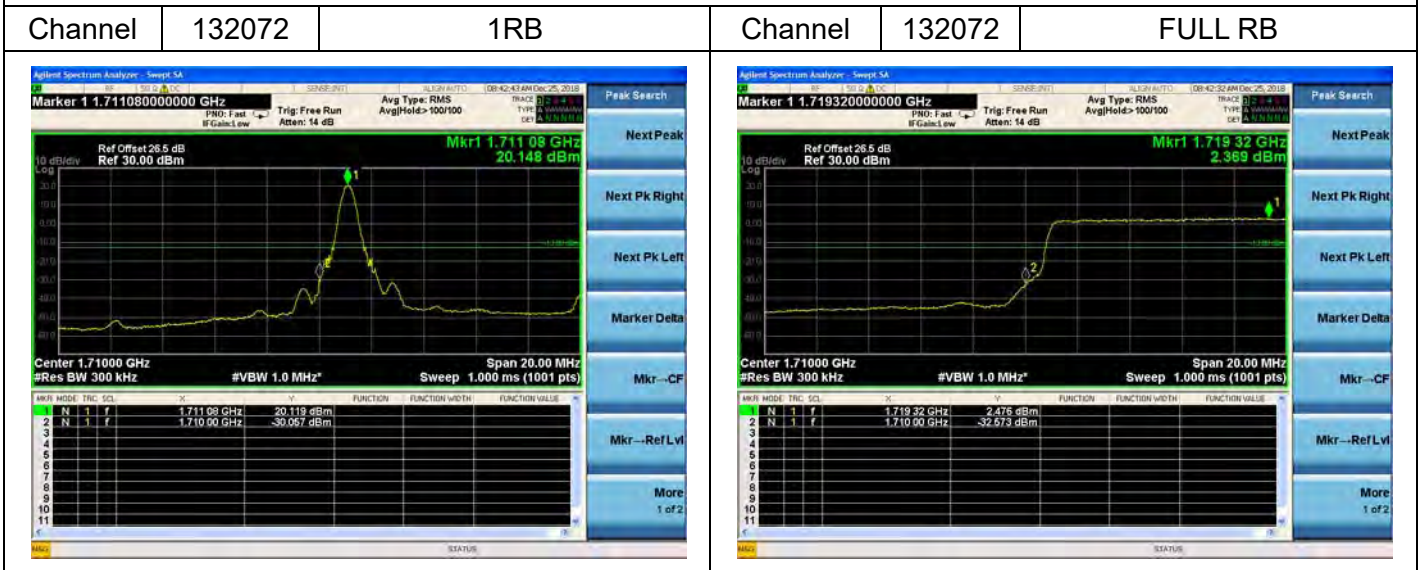
Channel Bandwidth: 15MHz



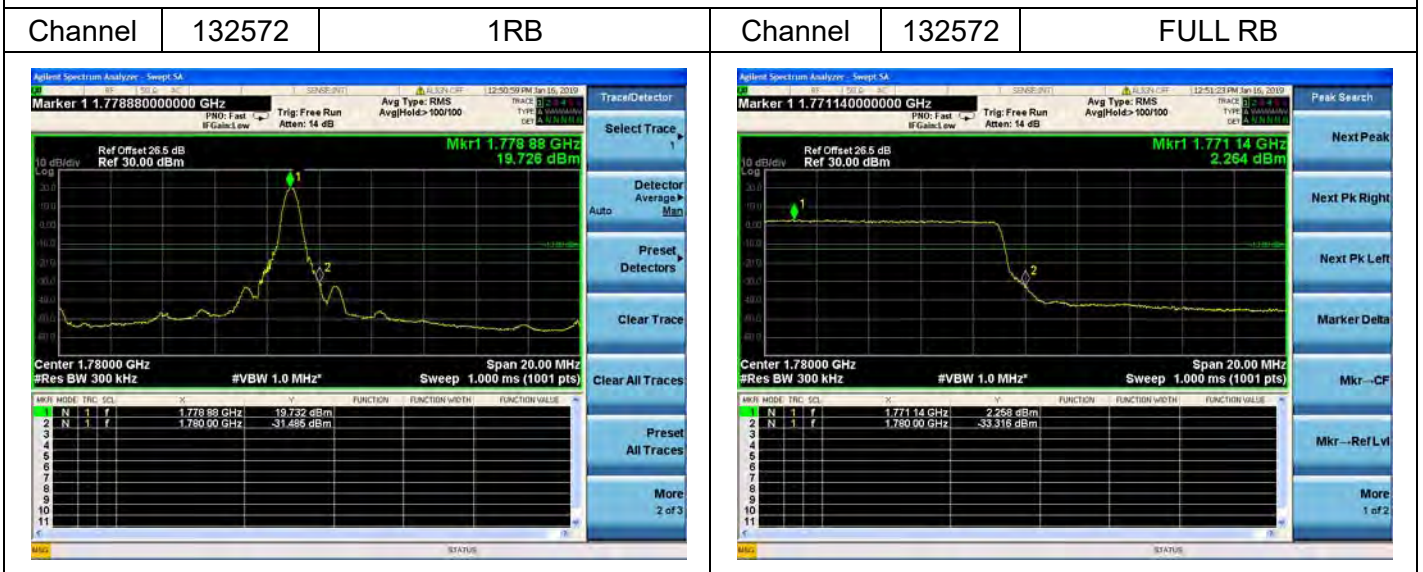


LTE Band 66

Channel Bandwidth: 20MHz



Channel Bandwidth: 20MHz



## 2.7. Transmitter Radiated Power (EIRP/ERP)

### 2.7.1. Requirement

According to FCC section 24.232 (c) for LTE Band 2, 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.

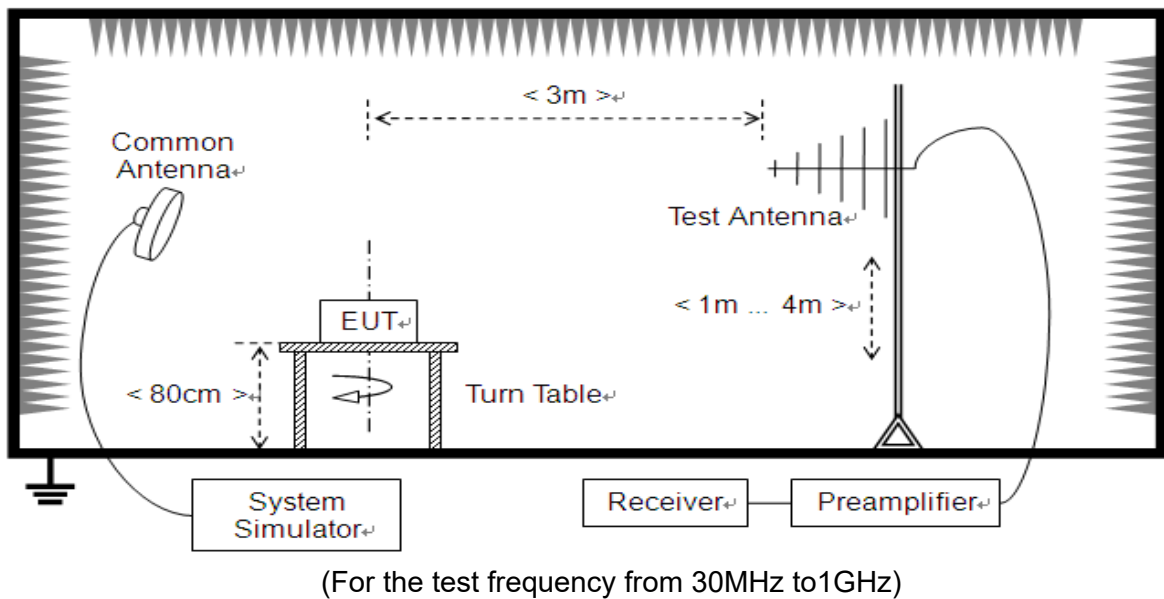
According to FCC section 27.50 (d) for LTE Band 4, fixed, mobile and portable (hand-held) stations in the 1710-1755MHz band are limited to 1wat EIRP.

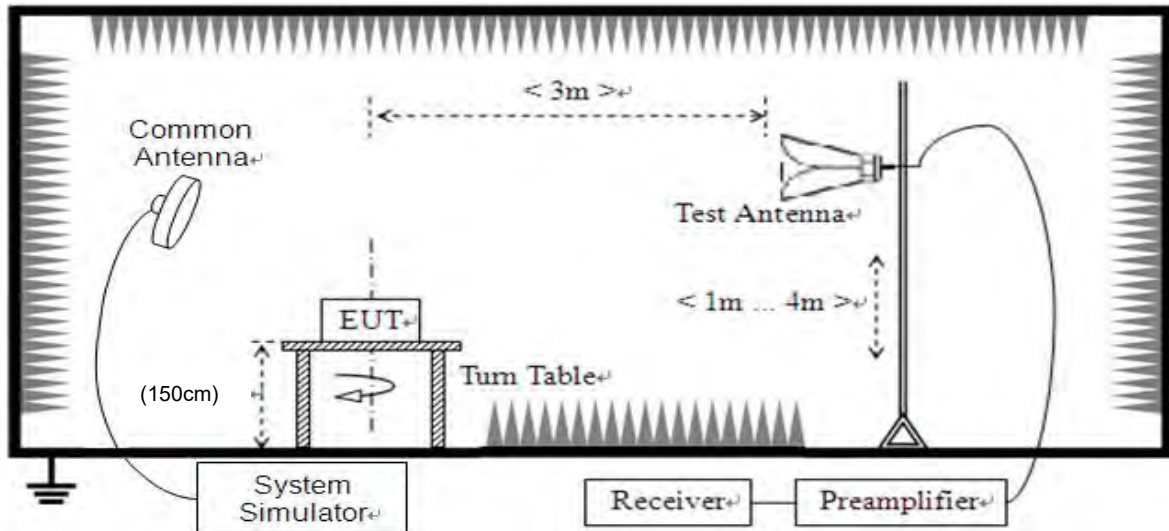
According to FCC section22.913 (a.2) for LTE Band 5, the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC section 27.50 (h) for LTE Band 7, 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.

According to FCC section 27.50 (c) for LTE Band 12/17,66, Portable stations (hand-held devices) operating in the 704-716MHz band are limited to 3watts ERP.

### 2.7.2. Test Description





(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading. A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

### 2.7.3. Test procedure

KDB 971168 D01v03 Section 51&5.2 and ANSI/TIA-603-E-2016.



#### 2.7.4. Test Result

The EUT was verified under all configurations (RB size and offset) and the worst case radiated power reported for each modulation/channel bandwidth.

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST\_TX}} - P_{\text{SUBST\_RX}} - L_{\text{SUBST\_CABLES}} + G_{\text{SUBST\_TX\_ANT}}$$

$$A_{\text{TOT}} = L_{\text{CABLES}} + A_{\text{SUBST}}$$

Where  $A_{\text{SUBST}}$  is the final substitution correction including receive antenna gain.

$P_{\text{SUBST\_TX}}$  is signal generator level,

$P_{\text{SUBST\_RX}}$  is receiver level,

$L_{\text{SUBST\_CABLES}}$  is cable losses including TX cable,

$G_{\text{SUBST\_TX\_ANT}}$  is substitution antenna gain.

$A_{\text{TOT}}$  is total correction factor including cable loss and substitution correction

During the test, the data of  $A_{\text{TOT}}$  was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of  $A_{\text{TOT}}$ .

**Note:** Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.





| LTE Band66:Top Antenna |            |         |           |                 |                    |                  |
|------------------------|------------|---------|-----------|-----------------|--------------------|------------------|
| BW [MHz]               | Modulation | RB Size | RB Offset | Low Ch. / Freq. | Middle Ch. / Freq. | High Ch. / Freq. |
| Channel                |            |         |           | 132072          | 132322             | 132572           |
| Frequency (MHz)        |            |         |           | 1720            | 1745               | 1770             |
| 20                     | QPSK       | 1       | 0         | 19.77           | 19.56              | 19.44            |
| 20                     | QPSK       | 1       | 49        | 19.47           | 19.4               | 19.01            |
| 20                     | QPSK       | 1       | 99        | 19.42           | 19.24              | 18.95            |
| 20                     | QPSK       | 50      | 0         | 18.63           | 18.64              | 18.47            |
| 20                     | QPSK       | 50      | 24        | 18.56           | 18.58              | 18.39            |
| 20                     | QPSK       | 50      | 50        | 18.7            | 18.51              | 18.17            |
| 20                     | QPSK       | 100     | 0         | 18.52           | 18.55              | 18.26            |
| 20                     | 16QAM      | 1       | 0         | 18.98           | 19.32              | 19               |
| 20                     | 16QAM      | 1       | 49        | 18.66           | 19.06              | 18.67            |
| 20                     | 16QAM      | 1       | 99        | 18.58           | 19                 | 18.51            |
| 20                     | 16QAM      | 50      | 0         | 17.77           | 17.74              | 17.52            |
| 20                     | 16QAM      | 50      | 24        | 17.65           | 17.66              | 17.43            |
| 20                     | 16QAM      | 50      | 50        | 17.6            | 17.62              | 17.32            |
| 20                     | 16QAM      | 100     | 0         | 17.59           | 17.61              | 17.42            |
| 20                     | 64QAM      | 1       | 0         | 18.51           | 18.56              | 18.48            |
| 20                     | 64QAM      | 1       | 49        | 18.39           | 18.4               | 18.32            |
| 20                     | 64QAM      | 1       | 99        | 18.19           | 18.19              | 18.14            |
| 20                     | 64QAM      | 50      | 0         | 17.78           | 17.82              | 17.75            |
| 20                     | 64QAM      | 50      | 24        | 17.72           | 17.73              | 17.68            |
| 20                     | 64QAM      | 50      | 50        | 17.56           | 17.63              | 17.6             |
| 20                     | 64QAM      | 100     | 0         | 17.45           | 17.53              | 17.48            |
| Channel                |            |         |           | 132047          | 132322             | 132597           |
| Frequency (MHz)        |            |         |           | 1717.5          | 1745               | 1772.5           |
| 15                     | QPSK       | 1       | 0         | 19.54           | 19.45              | 19.57            |
| 15                     | QPSK       | 1       | 37        | 19.51           | 19.55              | 19.62            |
| 15                     | QPSK       | 1       | 74        | 19.4            | 19.34              | 19.45            |
| 15                     | QPSK       | 36      | 0         | 18.26           | 18.38              | 18.3             |
| 15                     | QPSK       | 36      | 20        | 18.35           | 18.33              | 18.25            |
| 15                     | QPSK       | 36      | 39        | 18.41           | 18.46              | 18.5             |
| 15                     | QPSK       | 75      | 0         | 18.49           | 18.46              | 18.29            |
| 15                     | 16QAM      | 1       | 0         | 18.51           | 18.48              | 18.34            |
| 15                     | 16QAM      | 1       | 37        | 18.32           | 18.06              | 18.29            |



|    |       |    |    |       |       |       |
|----|-------|----|----|-------|-------|-------|
| 15 | 16QAM | 1  | 74 | 18.29 | 18.09 | 18.29 |
| 15 | 16QAM | 36 | 0  | 18.14 | 18.18 | 18.08 |
| 15 | 16QAM | 36 | 20 | 18.31 | 18.29 | 18.22 |
| 15 | 16QAM | 36 | 39 | 18.12 | 18.29 | 18.09 |
| 15 | 16QAM | 75 | 0  | 18.13 | 18.26 | 18.08 |
| 15 | 64QAM | 1  | 0  | 17.88 | 17.91 | 17.74 |
| 15 | 64QAM | 1  | 37 | 17.75 | 17.89 | 17.74 |
| 15 | 64QAM | 1  | 74 | 17.81 | 17.86 | 17.76 |
| 15 | 64QAM | 36 | 0  | 17.83 | 17.92 | 17.91 |
| 15 | 64QAM | 36 | 20 | 17.85 | 17.76 | 17.84 |
| 15 | 64QAM | 36 | 39 | 17.83 | 17.81 | 17.76 |
| 15 | 64QAM | 75 | 0  | 17.87 | 17.89 | 17.76 |

| Channel         |       |    |    | 132022 | 132322 | 132622 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   |
| 10              | QPSK  | 1  | 0  | 19.38  | 19.59  | 19.36  |
| 10              | QPSK  | 1  | 25 | 19.4   | 19.48  | 19.45  |
| 10              | QPSK  | 1  | 49 | 19.36  | 19.46  | 19.51  |
| 10              | QPSK  | 25 | 0  | 18.41  | 18.35  | 18.34  |
| 10              | QPSK  | 25 | 12 | 18.49  | 18.28  | 18.3   |
| 10              | QPSK  | 25 | 25 | 18.4   | 18.33  | 18.4   |
| 10              | QPSK  | 50 | 0  | 18.4   | 18.5   | 18.48  |
| 10              | 16QAM | 1  | 0  | 18.34  | 18.43  | 18.44  |
| 10              | 16QAM | 1  | 25 | 18.45  | 18.38  | 18.33  |
| 10              | 16QAM | 1  | 49 | 18.32  | 18.48  | 18.47  |
| 10              | 16QAM | 25 | 0  | 18.27  | 18.3   | 18.15  |
| 10              | 16QAM | 25 | 12 | 18.1   | 18.18  | 18.32  |
| 10              | 16QAM | 25 | 25 | 18.12  | 18.06  | 18.07  |
| 10              | 16QAM | 50 | 0  | 18.2   | 18.15  | 18.12  |
| 10              | 64QAM | 1  | 0  | 17.89  | 17.87  | 17.91  |
| 10              | 64QAM | 1  | 25 | 17.81  | 17.75  | 17.92  |
| 10              | 64QAM | 1  | 49 | 17.76  | 17.92  | 17.91  |
| 10              | 64QAM | 25 | 0  | 17.86  | 17.89  | 17.79  |
| 10              | 64QAM | 25 | 12 | 17.75  | 17.8   | 17.88  |
| 10              | 64QAM | 25 | 25 | 17.84  | 17.78  | 17.88  |
| 10              | 64QAM | 50 | 0  | 17.77  | 17.85  | 17.8   |
| Channel         |       |    |    | 131997 | 132322 | 132647 |
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1778.5 |



|   |       |    |    |       |       |       |
|---|-------|----|----|-------|-------|-------|
| 5 | QPSK  | 1  | 0  | 19.48 | 19.41 | 19.4  |
| 5 | QPSK  | 1  | 12 | 19.38 | 19.35 | 19.56 |
| 5 | QPSK  | 1  | 24 | 19.54 | 19.51 | 19.49 |
| 5 | QPSK  | 12 | 0  | 19.54 | 19.45 | 19.57 |
| 5 | QPSK  | 12 | 7  | 18.42 | 18.5  | 18.35 |
| 5 | QPSK  | 12 | 13 | 18.37 | 18.24 | 18.34 |
| 5 | QPSK  | 25 | 0  | 18.53 | 18.28 | 18.28 |
| 5 | 16QAM | 1  | 0  | 18.39 | 18.37 | 18.24 |
| 5 | 16QAM | 1  | 12 | 18.32 | 18.47 | 18.38 |
| 5 | 16QAM | 1  | 24 | 18.33 | 18.47 | 18.33 |
| 5 | 16QAM | 12 | 0  | 18.09 | 18.32 | 18.16 |
| 5 | 16QAM | 12 | 7  | 18.2  | 18.16 | 18.31 |
| 5 | 16QAM | 12 | 13 | 18.13 | 18.25 | 18.08 |
| 5 | 16QAM | 25 | 0  | 18.24 | 18.18 | 18.13 |
| 5 | 64QAM | 1  | 0  | 17.9  | 17.83 | 17.92 |
| 5 | 64QAM | 1  | 12 | 17.74 | 17.8  | 17.93 |
| 5 | 64QAM | 1  | 24 | 17.9  | 17.75 | 17.88 |
| 5 | 64QAM | 12 | 0  | 17.86 | 17.85 | 17.81 |
| 5 | 64QAM | 12 | 7  | 17.79 | 17.87 | 17.79 |
| 5 | 64QAM | 12 | 13 | 17.77 | 17.84 | 17.86 |
| 5 | 64QAM | 25 | 0  | 17.73 | 17.85 | 17.86 |

| Channel         |       |    |    | 131987 | 132322 | 132657 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |
| 3               | QPSK  | 1  | 0  | 19.38  | 19.59  | 19.36  |
| 3               | QPSK  | 1  | 8  | 19.4   | 19.48  | 19.45  |
| 3               | QPSK  | 1  | 14 | 19.36  | 19.46  | 19.51  |
| 3               | QPSK  | 8  | 0  | 18.36  | 18.43  | 18.51  |
| 3               | QPSK  | 8  | 4  | 18.45  | 18.38  | 18.3   |
| 3               | QPSK  | 8  | 7  | 18.5   | 18.27  | 18.46  |
| 3               | QPSK  | 15 | 0  | 18.25  | 18.32  | 18.28  |
| 3               | 16QAM | 1  | 0  | 18.35  | 18.35  | 18.38  |
| 3               | 16QAM | 1  | 8  | 18.37  | 18.36  | 18.28  |
| 3               | 16QAM | 1  | 14 | 18.05  | 18.16  | 18.12  |
| 3               | 16QAM | 8  | 0  | 18.15  | 18.04  | 18.06  |
| 3               | 16QAM | 8  | 4  | 18.07  | 18.23  | 18.11  |
| 3               | 16QAM | 8  | 7  | 18.3   | 18.07  | 18.26  |
| 3               | 16QAM | 15 | 0  | 17.75  | 17.89  | 17.74  |



|                 |       |    |    |        |        |        |
|-----------------|-------|----|----|--------|--------|--------|
| 3               | 64QAM | 1  | 0  | 17.81  | 17.86  | 17.76  |
| 3               | 64QAM | 1  | 8  | 17.83  | 17.92  | 17.91  |
| 3               | 64QAM | 1  | 14 | 17.89  | 17.87  | 17.91  |
| 3               | 64QAM | 8  | 0  | 17.81  | 17.75  | 17.92  |
| 3               | 64QAM | 8  | 4  | 17.76  | 17.92  | 17.91  |
| 3               | 64QAM | 8  | 7  | 17.45  | 17.72  | 17.62  |
| 3               | 64QAM | 15 | 0  | 17.32  | 17.42  | 17.32  |
| Channel         |       |    |    | 131979 | 132322 | 132665 |
| Frequency (MHz) |       |    |    | 1710.7 | 1745   | 1779.3 |
| 1.4             | QPSK  | 1  | 0  | 19.35  | 19.48  | 19.57  |
| 1.4             | QPSK  | 1  | 3  | 19.5   | 19.43  | 19.45  |
| 1.4             | QPSK  | 1  | 5  | 19.35  | 19.47  | 19.48  |
| 1.4             | QPSK  | 3  | 0  | 18.45  | 18.38  | 18.33  |
| 1.4             | QPSK  | 3  | 1  | 18.32  | 18.48  | 18.47  |
| 1.4             | QPSK  | 3  | 3  | 18.35  | 18.44  | 18.36  |
| 1.4             | QPSK  | 6  | 0  | 18.29  | 18.25  | 18.23  |
| 1.4             | 16QAM | 1  | 0  | 18.32  | 18.47  | 18.38  |
| 1.4             | 16QAM | 1  | 3  | 18.15  | 18.2   | 18.28  |
| 1.4             | 16QAM | 1  | 5  | 18.11  | 18.3   | 18.26  |
| 1.4             | 16QAM | 3  | 0  | 18.18  | 18.3   | 18.07  |
| 1.4             | 16QAM | 3  | 1  | 18.11  | 18.1   | 18.12  |
| 1.4             | 16QAM | 3  | 3  | 17.9   | 17.75  | 17.88  |
| 1.4             | 16QAM | 6  | 0  | 17.73  | 17.87  | 17.74  |
| 1.4             | 64QAM | 1  | 0  | 17.85  | 17.83  | 17.85  |
| 1.4             | 64QAM | 1  | 3  | 17.86  | 17.87  | 17.76  |
| 1.4             | 64QAM | 1  | 5  | 17.81  | 17.75  | 17.92  |
| 1.4             | 64QAM | 3  | 0  | 17.83  | 17.75  | 17.77  |
| 1.4             | 64QAM | 3  | 1  | 17.82  | 17.92  | 17.92  |
| 1.4             | 64QAM | 3  | 3  | 17.8   | 17.8   | 17.8   |
| 1.4             | 64QAM | 6  | 0  | 17.9   | 17.73  | 17.83  |

| LTE Band66:Bottom Antenna |            |         |           |                 |                    |                  |
|---------------------------|------------|---------|-----------|-----------------|--------------------|------------------|
| BW [MHz]                  | Modulation | RB Size | RB Offset | Low Ch. / Freq. | Middle Ch. / Freq. | High Ch. / Freq. |
| Channel                   |            |         |           | 132072          | 132322             | 132572           |
| Frequency (MHz)           |            |         |           | 1720            | 1745               | 1770             |
| 20                        | QPSK       | 1       | 0         | 24.45           | 24.27              | 24.18            |



|                 |       |     |    |        |        |        |
|-----------------|-------|-----|----|--------|--------|--------|
| 20              | QPSK  | 1   | 49 | 24.3   | 24.18  | 24.18  |
| 20              | QPSK  | 1   | 99 | 24.21  | 24.01  | 23.68  |
| 20              | QPSK  | 50  | 0  | 23.12  | 23.44  | 23.3   |
| 20              | QPSK  | 50  | 24 | 23.28  | 23.4   | 23.37  |
| 20              | QPSK  | 50  | 50 | 23.45  | 23.44  | 23.07  |
| 20              | QPSK  | 100 | 0  | 23.2   | 23.24  | 23.22  |
| 20              | 16QAM | 1   | 0  | 23.46  | 23.4   | 23.2   |
| 20              | 16QAM | 1   | 49 | 23.15  | 23.36  | 23.4   |
| 20              | 16QAM | 1   | 99 | 23.29  | 23.44  | 23.39  |
| 20              | 16QAM | 50  | 0  | 23.09  | 23.1   | 23.15  |
| 20              | 16QAM | 50  | 24 | 23.07  | 23.16  | 23.14  |
| 20              | 16QAM | 50  | 50 | 23.1   | 23.1   | 23.16  |
| 20              | 16QAM | 100 | 0  | 23.08  | 23.09  | 23.09  |
| 20              | 64QAM | 1   | 0  | 23.11  | 23.08  | 23.12  |
| 20              | 64QAM | 1   | 49 | 23.07  | 23.15  | 23.08  |
| 20              | 64QAM | 1   | 99 | 23.14  | 23.16  | 23.16  |
| 20              | 64QAM | 50  | 0  | 22.34  | 22.43  | 22.36  |
| 20              | 64QAM | 50  | 24 | 22.24  | 22.28  | 22.35  |
| 20              | 64QAM | 50  | 50 | 22.19  | 22.21  | 22.39  |
| 20              | 64QAM | 100 | 0  | 22.4   | 22.2   | 22.23  |
| Channel         |       |     |    | 132047 | 132322 | 132597 |
| Frequency (MHz) |       |     |    | 1717.5 | 1745   | 1772.5 |
| 15              | QPSK  | 1   | 0  | 24.44  | 24.29  | 23.99  |
| 15              | QPSK  | 1   | 37 | 24.32  | 24.36  | 24.2   |
| 15              | QPSK  | 1   | 74 | 24.36  | 24.05  | 23.68  |
| 15              | QPSK  | 36  | 0  | 23.28  | 23.46  | 23.25  |
| 15              | QPSK  | 36  | 20 | 23.25  | 23.45  | 23.34  |
| 15              | QPSK  | 36  | 39 | 23.2   | 23.36  | 23.2   |
| 15              | QPSK  | 75  | 0  | 23.08  | 23.27  | 23.42  |
| 15              | 16QAM | 1   | 0  | 23.15  | 23.11  | 23.11  |
| 15              | 16QAM | 1   | 37 | 23.15  | 23.13  | 23.09  |
| 15              | 16QAM | 1   | 74 | 23.14  | 23.14  | 23.1   |
| 15              | 16QAM | 36  | 0  | 23.11  | 23.11  | 23.16  |
| 15              | 16QAM | 36  | 20 | 23.08  | 23.09  | 23.13  |
| 15              | 16QAM | 36  | 39 | 23.1   | 23.08  | 23.09  |
| 15              | 16QAM | 75  | 0  | 23.15  | 23.12  | 23.07  |
| 15              | 64QAM | 1   | 0  | 23.12  | 23.08  | 23.11  |
| 15              | 64QAM | 1   | 37 | 23.07  | 23.1   | 23.11  |



|    |       |    |    |       |       |       |
|----|-------|----|----|-------|-------|-------|
| 15 | 64QAM | 1  | 74 | 23.17 | 23.16 | 23.09 |
| 15 | 64QAM | 36 | 0  | 22.38 | 22.23 | 22.28 |
| 15 | 64QAM | 36 | 20 | 22.41 | 22.22 | 22.28 |
| 15 | 64QAM | 36 | 39 | 22.22 | 22.25 | 22.21 |
| 15 | 64QAM | 75 | 0  | 22.35 | 22.46 | 22.26 |

|                 |       |    |    |        |        |        |
|-----------------|-------|----|----|--------|--------|--------|
| Channel         |       |    |    | 132022 | 132322 | 132622 |
| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   |
| 10              | QPSK  | 1  | 0  | 24.34  | 24.19  | 23.83  |
| 10              | QPSK  | 1  | 25 | 24.16  | 24.33  | 24.36  |
| 10              | QPSK  | 1  | 49 | 24.34  | 24.11  | 23.65  |
| 10              | QPSK  | 25 | 0  | 23.23  | 23.4   | 23.25  |
| 10              | QPSK  | 25 | 12 | 23.3   | 23.37  | 23.38  |
| 10              | QPSK  | 25 | 25 | 23.24  | 23.12  | 23.11  |
| 10              | QPSK  | 50 | 0  | 23.35  | 23.42  | 23.22  |
| 10              | 16QAM | 1  | 0  | 23.38  | 23.41  | 23.33  |
| 10              | 16QAM | 1  | 25 | 23.18  | 23.39  | 23.37  |
| 10              | 16QAM | 1  | 49 | 23.39  | 23.28  | 23.29  |
| 10              | 16QAM | 25 | 0  | 23.15  | 23.11  | 23.12  |
| 10              | 16QAM | 25 | 12 | 23.13  | 23.13  | 23.09  |
| 10              | 16QAM | 25 | 25 | 23.12  | 23.16  | 23.14  |
| 10              | 16QAM | 50 | 0  | 23.15  | 23.15  | 23.08  |
| 10              | 64QAM | 1  | 0  | 23.16  | 23.1   | 23.09  |
| 10              | 64QAM | 1  | 25 | 23.14  | 23.14  | 23.12  |
| 10              | 64QAM | 1  | 49 | 23.08  | 23.13  | 23.12  |
| 10              | 64QAM | 25 | 0  | 22.22  | 22.35  | 22.23  |
| 10              | 64QAM | 25 | 12 | 22.44  | 22.4   | 22.34  |
| 10              | 64QAM | 25 | 25 | 22.25  | 22.2   | 22.24  |
| 10              | 64QAM | 50 | 0  | 22.4   | 22.2   | 22.23  |
| Channel         |       |    |    | 131997 | 132322 | 132647 |
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1778.5 |
| 5               | QPSK  | 1  | 0  | 24.33  | 24.17  | 23.71  |
| 5               | QPSK  | 1  | 12 | 24.43  | 24.05  | 24.14  |
| 5               | QPSK  | 1  | 24 | 24.37  | 24.2   | 23.72  |
| 5               | QPSK  | 12 | 0  | 23.34  | 23.23  | 23.13  |
| 5               | QPSK  | 12 | 7  | 23.19  | 23.08  | 23.11  |
| 5               | QPSK  | 12 | 13 | 23.46  | 23.4   | 23.2   |
| 5               | QPSK  | 25 | 0  | 23.17  | 23.34  | 23.09  |



|   |       |    |    |       |       |       |
|---|-------|----|----|-------|-------|-------|
| 5 | 16QAM | 1  | 0  | 23.17 | 23.29 | 23.2  |
| 5 | 16QAM | 1  | 12 | 23.46 | 23.41 | 23.33 |
| 5 | 16QAM | 1  | 24 | 23.29 | 23.42 | 23.21 |
| 5 | 16QAM | 12 | 0  | 23.09 | 23.12 | 23.08 |
| 5 | 16QAM | 12 | 7  | 23.09 | 23.09 | 23.17 |
| 5 | 16QAM | 12 | 13 | 23.08 | 23.14 | 23.16 |
| 5 | 16QAM | 25 | 0  | 23.1  | 23.15 | 23.15 |
| 5 | 64QAM | 1  | 0  | 23.14 | 23.12 | 23.09 |
| 5 | 64QAM | 1  | 12 | 23.12 | 23.1  | 23.12 |
| 5 | 64QAM | 1  | 24 | 23.08 | 23.14 | 23.07 |
| 5 | 64QAM | 12 | 0  | 22.29 | 22.17 | 22.26 |
| 5 | 64QAM | 12 | 7  | 22.32 | 22.4  | 22.24 |
| 5 | 64QAM | 12 | 13 | 22.17 | 22.19 | 22.22 |
| 5 | 64QAM | 25 | 0  | 22.39 | 22.34 | 22.41 |

| Channel         |       |    |    | 131987 | 132322 | 132657 |
|-----------------|-------|----|----|--------|--------|--------|
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |
| 3               | QPSK  | 1  | 0  | 24.3   | 24.13  | 23.62  |
| 3               | QPSK  | 1  | 8  | 24.28  | 24.19  | 24.27  |
| 3               | QPSK  | 1  | 14 | 24.21  | 24.24  | 24.26  |
| 3               | QPSK  | 8  | 0  | 23.42  | 23.23  | 23.47  |
| 3               | QPSK  | 8  | 4  | 23.22  | 23.3   | 23.16  |
| 3               | QPSK  | 8  | 7  | 23.47  | 23.16  | 23.19  |
| 3               | QPSK  | 15 | 0  | 23.2   | 23.37  | 23.34  |
| 3               | 16QAM | 1  | 0  | 23.37  | 23.18  | 23.28  |
| 3               | 16QAM | 1  | 8  | 23.08  | 23.37  | 23.27  |
| 3               | 16QAM | 1  | 14 | 23.45  | 23.22  | 23.31  |
| 3               | 16QAM | 8  | 0  | 23.15  | 23.09  | 23.07  |
| 3               | 16QAM | 8  | 4  | 23.16  | 23.14  | 23.09  |
| 3               | 16QAM | 8  | 7  | 23.16  | 23.14  | 23.16  |
| 3               | 16QAM | 15 | 0  | 23.15  | 23.08  | 23.07  |
| 3               | 64QAM | 1  | 0  | 23.08  | 23.13  | 23.14  |
| 3               | 64QAM | 1  | 8  | 23.07  | 23.08  | 23.17  |
| 3               | 64QAM | 1  | 14 | 23.07  | 23.14  | 23.12  |
| 3               | 64QAM | 8  | 0  | 22.3   | 22.41  | 22.39  |
| 3               | 64QAM | 8  | 4  | 22.25  | 22.43  | 22.32  |
| 3               | 64QAM | 8  | 7  | 22.22  | 22.41  | 22.3   |
| 3               | 64QAM | 15 | 0  | 22.25  | 22.41  | 22.18  |



| Channel         |       |   |   | 131979 | 132322 | 132665 |
|-----------------|-------|---|---|--------|--------|--------|
| Frequency (MHz) |       |   |   | 1710.7 | 1745   | 1779.3 |
| 1.4             | QPSK  | 1 | 0 | 24.2   | 23.97  | 23.46  |
| 1.4             | QPSK  | 1 | 3 | 24.28  | 24.18  | 24.31  |
| 1.4             | QPSK  | 1 | 5 | 24.25  | 24.18  | 24.27  |
| 1.4             | QPSK  | 3 | 0 | 23.26  | 23.17  | 23.2   |
| 1.4             | QPSK  | 3 | 1 | 23.12  | 23.4   | 23.16  |
| 1.4             | QPSK  | 3 | 3 | 23.35  | 23.07  | 23.45  |
| 1.4             | QPSK  | 6 | 0 | 23.35  | 23.32  | 23.12  |
| 1.4             | 16QAM | 1 | 0 | 23.3   | 23.44  | 23.33  |
| 1.4             | 16QAM | 1 | 3 | 23.33  | 23.39  | 23.44  |
| 1.4             | 16QAM | 1 | 5 | 23.11  | 23.08  | 23.14  |
| 1.4             | 16QAM | 3 | 0 | 23.12  | 23.1   | 23.16  |
| 1.4             | 16QAM | 3 | 1 | 23.13  | 23.16  | 23.13  |
| 1.4             | 16QAM | 3 | 3 | 23.17  | 23.08  | 23.11  |
| 1.4             | 16QAM | 6 | 0 | 23.1   | 23.14  | 23.1   |
| 1.4             | 64QAM | 1 | 0 | 22.39  | 22.37  | 22.35  |
| 1.4             | 64QAM | 1 | 3 | 22.46  | 22.36  | 22.43  |
| 1.4             | 64QAM | 1 | 5 | 22.43  | 22.4   | 22.23  |
| 1.4             | 64QAM | 3 | 0 | 22.27  | 22.19  | 22.27  |
| 1.4             | 64QAM | 3 | 1 | 22.3   | 22.35  | 22.33  |
| 1.4             | 64QAM | 3 | 3 | 22.19  | 22.38  | 22.2   |
| 1.4             | 64QAM | 6 | 0 | 22.39  | 22.37  | 22.35  |



## 2.8. Radiated Spurious Emissions

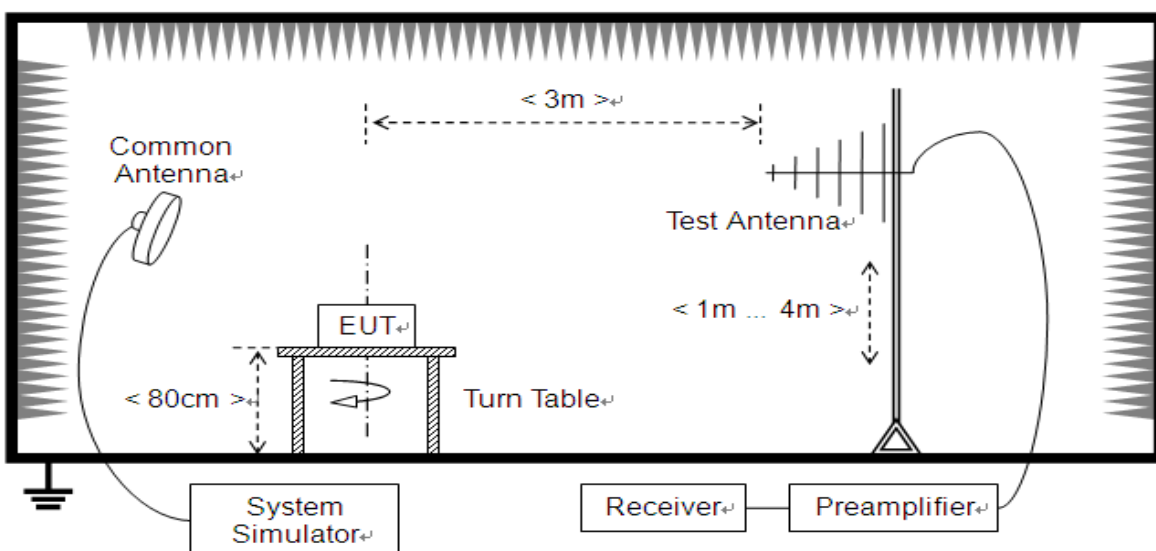
### 2.8.1. Requirement

According to FCC section 2.1051, 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  $43 + 10 \cdot \log(P)$  dB. This calculated to be -13dBm.

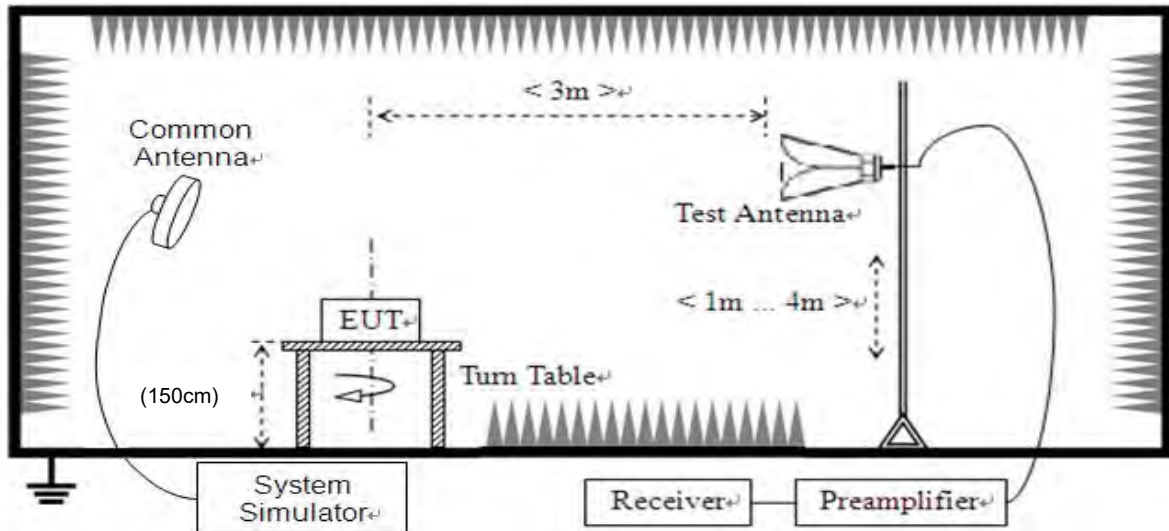
Additional requirement for LTE Band 7:

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  $55 + 10 \log(P)$  dB. This calculated to be -25dBm.

### 2.8.2. Test Description



(For the test frequency from 30MHz to 1GHz)



(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading. A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

**Note:** when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

### 2.8.3. Test procedure

KDB 971168 D01v03 Section 5.8 and ANSI/TIA-603-E-2016.



#### 2.8.4. Test Result

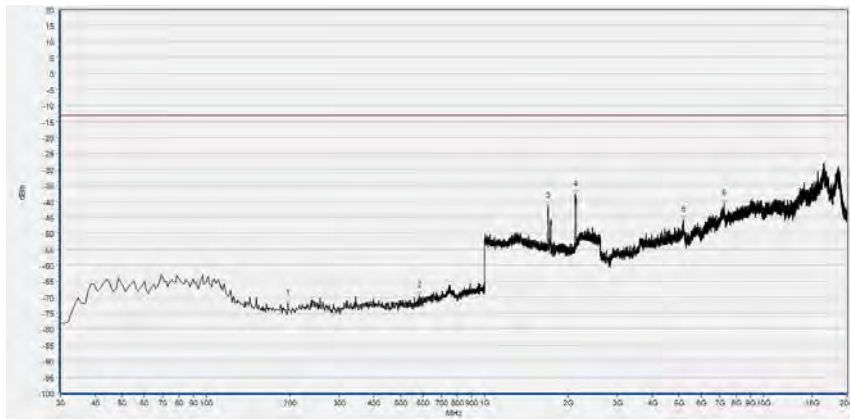
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. Test Antenna height is varied from 1m to 4m above the ground, and the Turn Table is actuated to turn from 0° to 360°, both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

**Note1:** The power of the EUT transmitting frequency should be ignored.

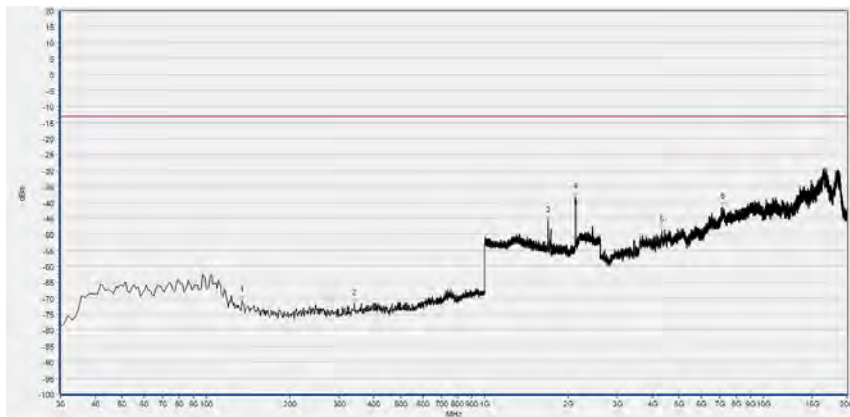
**Note2:** All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

**Note3:** All bandwidth and test channel were considered and evaluated respectively by performing full test for each band, only the worst cases were recorded in this test report.

LTE Band 66 20MHz BW, Low Channel, QPSK

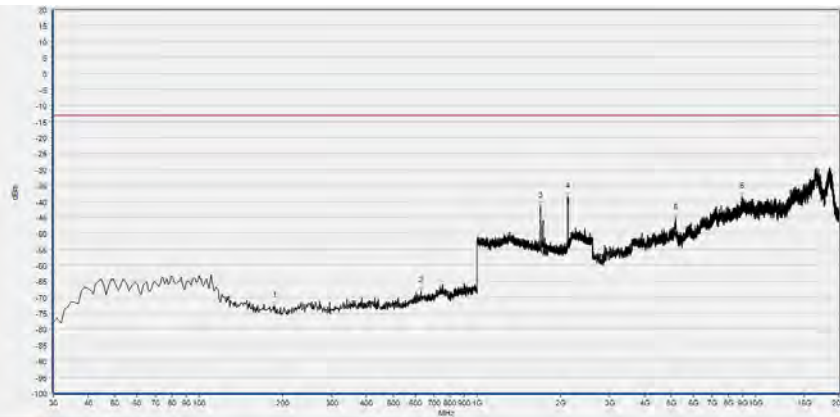


| No. | Fre. (MHz) | Peak   | Limit(PK) | Antenna    | Verdict |
|-----|------------|--------|-----------|------------|---------|
| 1   | 197.007    | -72.10 | -13.00    | Horizontal | PASS    |
| 2   | 583.453    | -69.59 | -13.00    | Horizontal | PASS    |
| 3   | 1693.147   | -41.37 | -13.00    | Horizontal | N.A     |
| 4   | 2114.957   | -37.91 | -13.00    | Horizontal | N.A     |
| 5   | 5164.027   | -46.01 | -13.00    | Horizontal | PASS    |
| 6   | 7226.271   | -40.83 | -13.00    | Horizontal | PASS    |

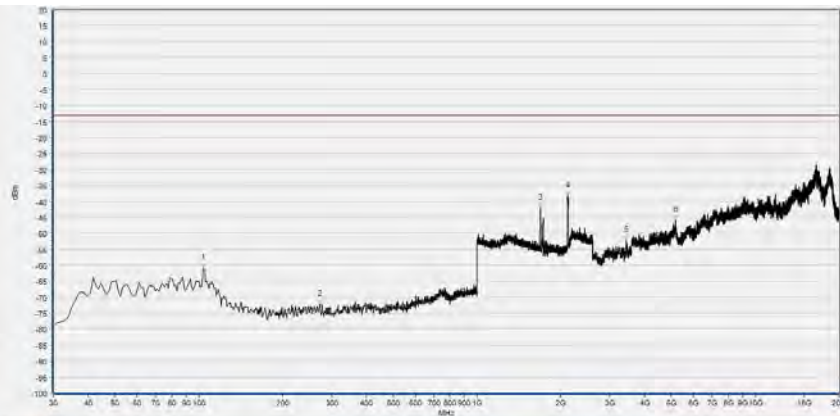


| No. | Freq(MHz) | Peak   | limit PK | Antenna  | Verdict |
|-----|-----------|--------|----------|----------|---------|
| 1   | 134.865   | -70.66 | -13.00   | Vertical | PASS    |
| 2   | 340.711   | -71.56 | -13.00   | Vertical | PASS    |
| 3   | 1692.346  | -45.69 | -13.00   | Vertical | N.A     |
| 4   | 2118.159  | -38.24 | -13.00   | Vertical | N.A     |
| 5   | 4331.589  | -48.80 | -13.00   | Vertical | PASS    |
| 6   | 7168.261  | -41.44 | -13.00   | Vertical | PASS    |

LTE Band 66 20MHz BW, Low Channel, 16QAM

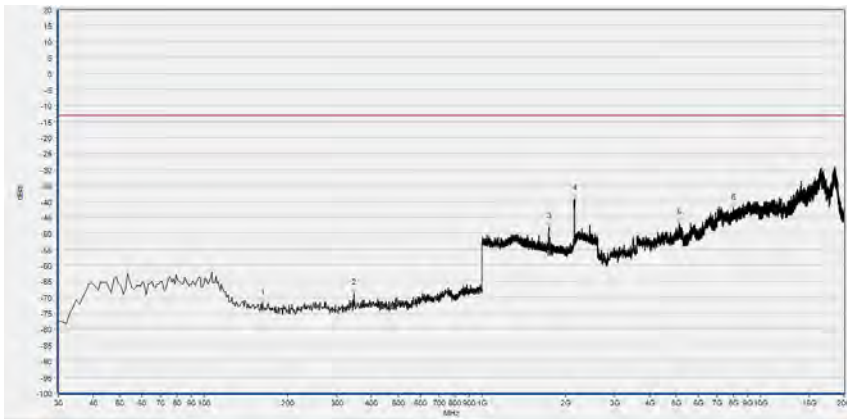


| No. | Fre. (MHz) | Peak   | Limit(PK) | Antenna    | Verdict |
|-----|------------|--------|-----------|------------|---------|
| 1   | 187.297    | -72.72 | -13.00    | Horizontal | PASS    |
| 2   | 628.118    | -67.95 | -13.00    | Horizontal | PASS    |
| 3   | 1690.745   | -41.52 | -13.00    | Horizontal | N.A     |
| 4   | 2116.558   | -38.45 | -13.00    | Horizontal | N.A     |
| 5   | 5178.530   | -45.32 | -13.00    | Horizontal | PASS    |
| 6   | 8952.059   | -38.54 | -13.00    | Horizontal | PASS    |

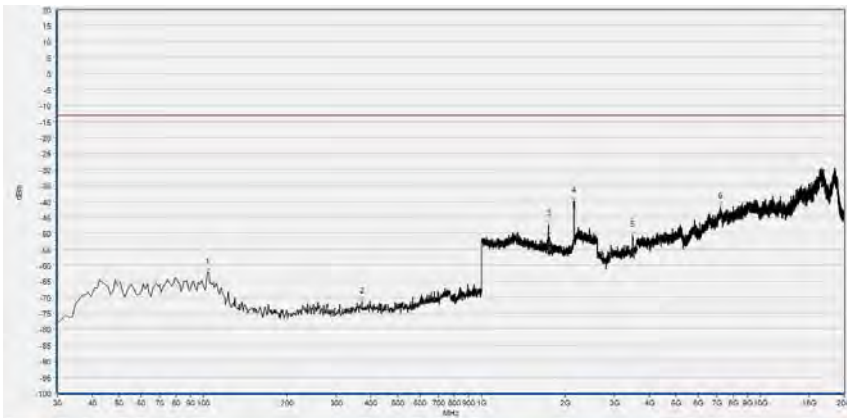


| Num. | Freq(MHz) | Peak   | limit PK | Antenna  | Verdict |
|------|-----------|--------|----------|----------|---------|
| 1    | 103.794   | -60.91 | -13.00   | Vertical | PASS    |
| 2    | 271.772   | -72.38 | -13.00   | Vertical | PASS    |
| 3    | 1691.546  | -42.12 | -13.00   | Vertical | N.A     |
| 4    | 2116.558  | -38.24 | -13.00   | Vertical | N.A     |
| 5    | 3444.041  | -52.08 | -13.00   | Vertical | PASS    |
| 6    | 5169.828  | -45.82 | -13.00   | Vertical | PASS    |

LTE Band 66 20MHz BW, Mid Channel, QPSK



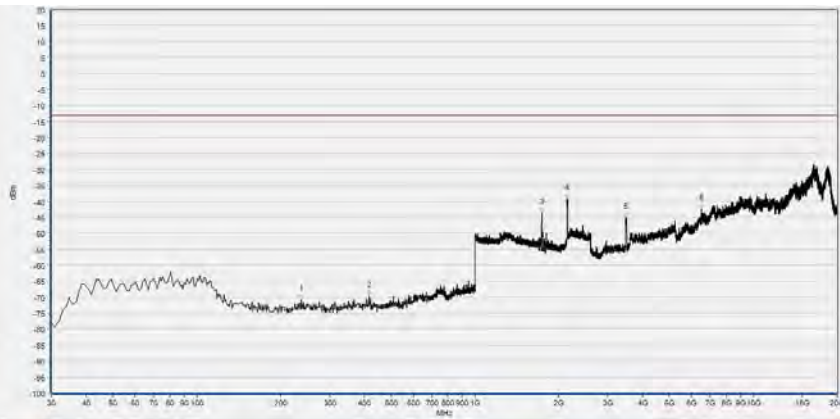
| No. | Fre. (MHz) | Peak   | Limit(PK) | Antenna  | Verdict |
|-----|------------|--------|-----------|----------|---------|
| 1   | 163.023    | -71.94 | -13.00    | Vertical | PASS    |
| 2   | 346.537    | -68.71 | -13.00    | Vertical | PASS    |
| 3   | 1737.169   | -47.86 | -13.00    | Vertical | N.A     |
| 4   | 2150.175   | -39.20 | -13.00    | Vertical | N.A     |
| 5   | 5111.819   | -46.84 | -13.00    | Vertical | PASS    |
| 6   | 8003.601   | -42.01 | -13.00    | Vertical | PASS    |



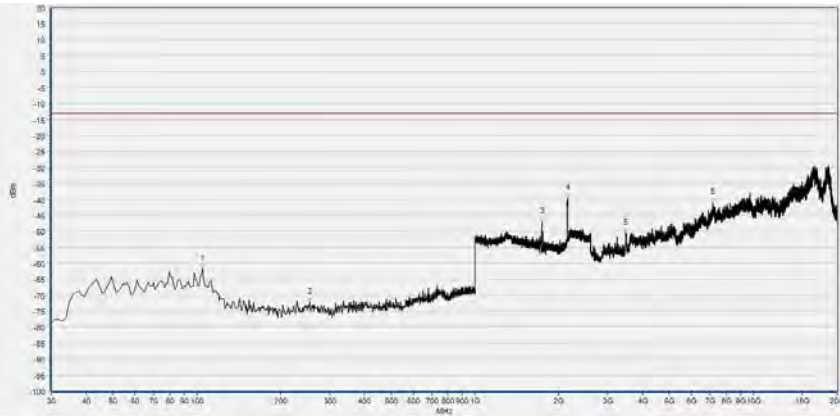
| No. | Freq(MHz) | Peak   | limit PK | Antenna  | Verdict |
|-----|-----------|--------|----------|----------|---------|
| 1   | 103.794   | -62.34 | -13.00   | Vertical | PASS    |
| 2   | 371.782   | -71.42 | -13.00   | Vertical | PASS    |
| 3   | 1737.169  | -47.22 | -13.00   | Vertical | N.A     |
| 4   | 2142.171  | -39.82 | -13.00   | Vertical | N.A     |
| 5   | 3484.647  | -50.64 | -13.00   | Vertical | PASS    |
| 6   | 7211.769  | -41.57 | -13.00   | Vertical | PASS    |



LTE Band 66 20MHz BW, Mid Channel, 16QAM

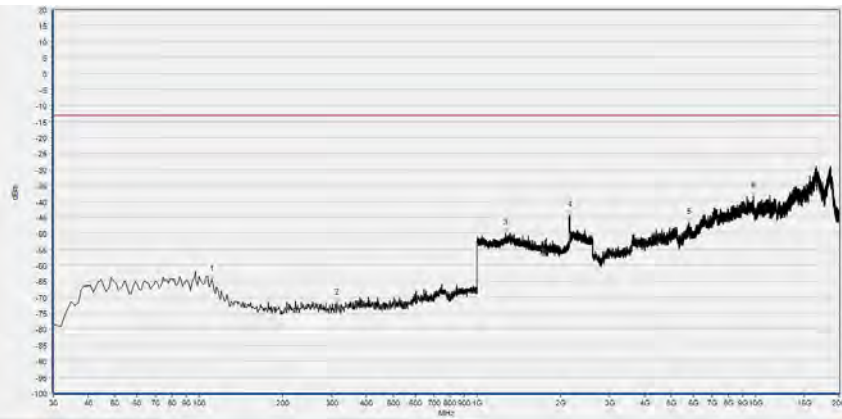


| No. | Fre. (MHz) | Peak   | Limit(PK) | Antenna    | Verdict |
|-----|------------|--------|-----------|------------|---------|
| 1   | 237.788    | -70.67 | -13.00    | Horizontal | PASS    |
| 2   | 415.475    | -69.68 | -13.00    | Horizontal | PASS    |
| 3   | 1736.368   | -43.46 | -13.00    | Horizontal | N.A     |
| 4   | 2139.770   | -39.15 | -13.00    | Horizontal | N.A     |
| 5   | 3478.846   | -45.13 | -13.00    | Horizontal | PASS    |
| 6   | 6515.653   | -42.34 | -13.00    | Horizontal | PASS    |

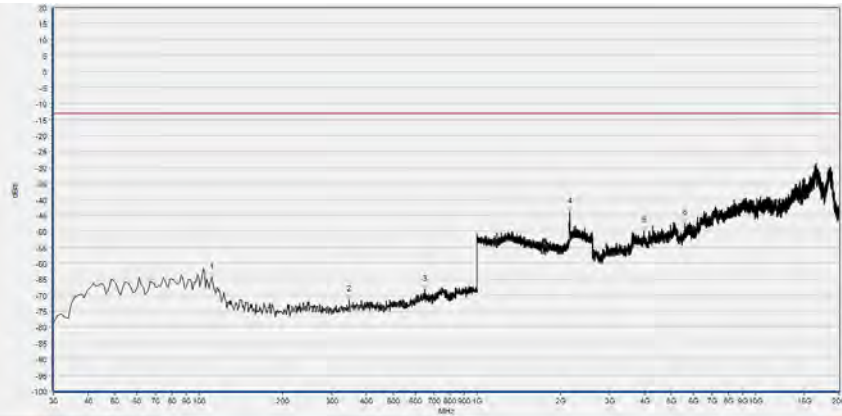


| No. | Fre. (MHz) | Peak   | Limit(PK) | Antenna  | Verdict |
|-----|------------|--------|-----------|----------|---------|
| 1   | 104.765    | -61.76 | -13.00    | Vertical | PASS    |
| 2   | 254.294    | -72.36 | -13.00    | Vertical | PASS    |
| 3   | 1737.169   | -47.04 | -13.00    | Vertical | N/A     |
| 4   | 2150.175   | -39.66 | -13.00    | Vertical | N/A     |
| 5   | 3481.747   | -50.57 | -13.00    | Vertical | PASS    |
| 6   | 7156.659   | -40.90 | -13.00    | Vertical | PASS    |

LTE Band 66 20MHz BW, High Channel, QPSK



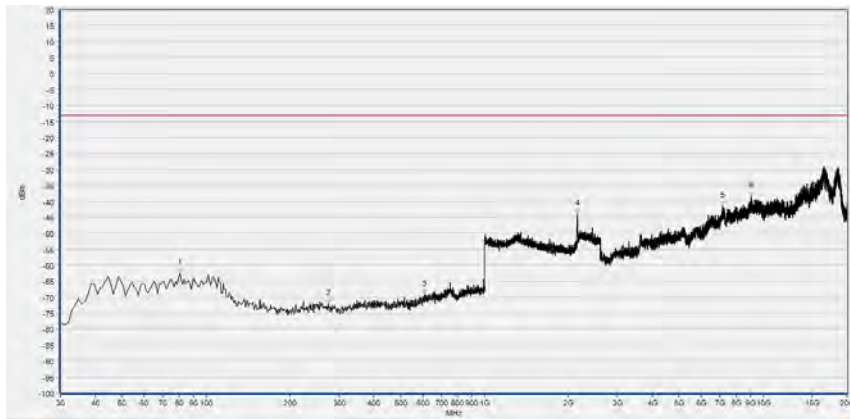
| No. | Fre. (MHz) | Peak   | Limit(PK) | Antenna    | Verdict |
|-----|------------|--------|-----------|------------|---------|
| 1   | 111.562    | -64.49 | -13.00    | Horizontal | PASS    |
| 2   | 313.524    | -71.77 | -13.00    | Horizontal | PASS    |
| 3   | 1264.932   | -49.99 | -13.00    | Horizontal | PASS    |
| 4   | 2153.377   | -44.28 | -13.00    | Horizontal | N.A     |
| 5   | 5773.129   | -46.59 | -13.00    | Horizontal | PASS    |
| 6   | 9836.706   | -38.29 | -13.00    | Horizontal | PASS    |



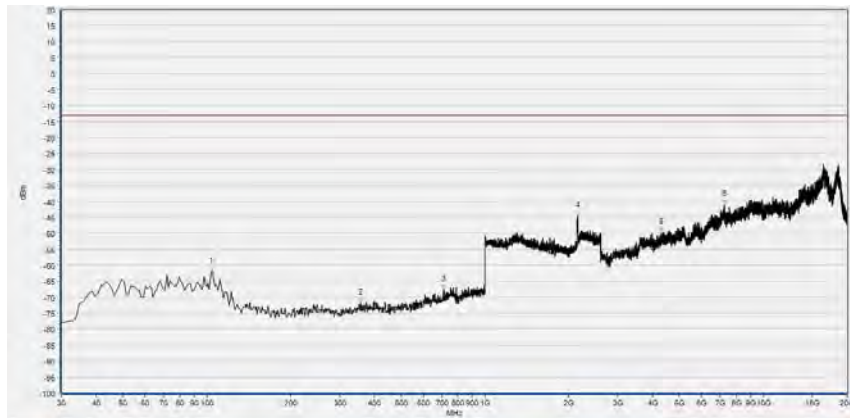
| No. | Freq(MHz) | Peak   | limit PK | Antenna  | Verdict |
|-----|-----------|--------|----------|----------|---------|
| 1   | 111.562   | -64.50 | -13.00   | Vertical | PASS    |
| 2   | 347.508   | -71.29 | -13.00   | Vertical | PASS    |
| 3   | 648.509   | -68.35 | -13.00   | Vertical | PASS    |
| 4   | 2154.177  | -44.02 | -13.00   | Vertical | N.A     |
| 5   | 3977.730  | -49.84 | -13.00   | Vertical | PASS    |
| 6   | 5590.398  | -47.47 | -13.00   | Vertical | PASS    |



LTE Band 66 20MHz BW, High Channel, 16QAM



| No. | Fre. (MHz) | Peak   | Limit(PK) | Antenna    | Verdict |
|-----|------------|--------|-----------|------------|---------|
| 1   | 80.490     | -62.46 | -13.00    | Horizontal | PASS    |
| 2   | 275.656    | -71.99 | -13.00    | Horizontal | PASS    |
| 3   | 609.670    | -69.13 | -13.00    | Horizontal | PASS    |
| 4   | 2154.177   | -43.96 | -13.00    | Horizontal | N.A     |
| 5   | 7171.162   | -41.46 | -13.00    | Horizontal | PASS    |
| 6   | 9041.974   | -38.29 | -13.00    | Horizontal | PASS    |



| Num. | Freq(MHz) | Peak   | limit PK | Antenna  | Verdict |
|------|-----------|--------|----------|----------|---------|
| 1    | 103.794   | -62.04 | -13.00   | Vertical | PASS    |
| 2    | 356.246   | -71.89 | -13.00   | Vertical | PASS    |
| 3    | 709.680   | -67.65 | -13.00   | Vertical | PASS    |
| 4    | 2153.377  | -44.67 | -13.00   | Vertical | N.A     |
| 5    | 4311.285  | -49.76 | -13.00   | Vertical | PASS    |
| 6    | 7226.271  | -41.10 | -13.00   | Vertical | PASS    |



## Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

| Test items                          | Uncertainty   |
|-------------------------------------|---------------|
| Output Power                        | $\pm 2.22$ dB |
| Bandwidth                           | $\pm 5\%$     |
| Conducted Spurious Emission         | $\pm 2.77$ dB |
| Band Edge                           | $\pm 2.77$ dB |
| Equivalent Isotropic Radiated Power | $\pm 2.22$ dB |
| Radiated Spurious Emissions         | $\pm 6$ dB    |

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$



## Annex B Testing Laboratory Information

### 1. Identification of the Responsible Testing Laboratory

|                            |  |
|----------------------------|--|
| <b>Laboratory Name:</b>    | Shenzhen Morlab Communications Technology Co., Ltd.<br>Morlab Laboratory   |
| <b>Laboratory Address:</b> | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |
| <b>Telephone:</b>          | +86 755 36698555   |
| <b>Facsimile:</b>          | +86 755 36698525   |

### 2. Identification of the Responsible Testing Location

|                 |  |
|-----------------|--|
| <b>Name:</b>    | Shenzhen Morlab Communications Technology Co., Ltd.<br>Morlab Laboratory   |
| <b>Address:</b> | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |

### 3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.



#### 4. Test Equipments Utilized

##### 4.1 Conducted Test Equipments

| Equipment Name         | Serial No. | Type      | Manufacturer                                   | Cal. Date  | Cal. Due   |
|------------------------|------------|-----------|--|------------|------------|
| Power Splitter         | NW521      | 1506A     | Weinschel                                      | 2018.04.17 | 2019.04.16 |
| Attenuator 1           | (N/A.)     | 10dB      | Resnet   | 2018.04.17 | 2019.04.16 |
| Attenuator 2           | (N/A.)     | 3dB       | Resnet   | 2018.04.17 | 2019.04.16 |
| EXA Signal Analyzer    | MY53470836 | N9010A    | Agilent  | 2018.11.06 | 2019.11.05 |
| USB Power Sensor       | MY54210011 | U2021XA   | Agilent  | 2018.04.17 | 2019.04.16 |
| System Simulator       | 152038     | CMW500    | R&S  | 2018.05.08 | 2019.05.07 |
| RF cable (30MHz-26GHz) | CB01       | RF01      | Morlab   | N/A        | N/A        |
| Coaxial cable          | CB02       | RF02      | Morlab   | N/A        | N/A        |
| SMA connector          | CN01       | RF03      | HUBER-SUHNER                                   | N/A        | N/A        |
| Temperature Chamber    | (N/A)      | HUT705P   | CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD | 2018.04.17 | 2019.04.16 |
| Computer               | T430i      | Think Pad | Lenovo   | N/A        | N/A        |

**4.2 Radiated Test Equipments**

| Equipment Name                       | Serial No. | Type            | Manufacturer   | Cal. Date  | Cal. Due   |
|--------------------------------------|------------|-----------------|----------------|------------|------------|
| System Simulator                     | 152038     | CMW500          | R&S            | 2018.08.04 | 2019.08.03 |
| Receiver                             | MY54130016 | N9038A          | Agilent        | 2018.05.18 | 2019.05.17 |
| Test Antenna - Bi-Log                | 9163-519   | VULB 9163       | Schwarzbeck    | 2018.03.03 | 2019.03.02 |
| Test Antenna - Horn                  | 9170C-531  | BBHA9170        | Schwarzbeck    | 2018.08.06 | 2019.08.05 |
| Test Antenna - Horn                  | 01774      | BBHA 9120D      | Schwarzbeck    | 2018.08.02 | 2019.08.01 |
| Coaxial cable (N male) (9KHz-30MHz)  | CB04       | EMC04           | Morlab         | N/A        | N/A        |
| Coaxial cable (N male) (30MHz-26GHz) | CB02       | EMC02           | Morlab         | N/A        | N/A        |
| Coaxial cable (N male) (30MHz-26GHz) | CB03       | EMC03           | Morlab         | N/A        | N/A        |
| 1-18GHz pre-Amplifier                | MA02       | TS-PR18         | Rohde& Schwarz | 2018.05.08 | 2019.05.07 |
| 18-26.5GHz pre-Amplifier             | MA03       | TS-PR18         | Rohde& Schwarz | 2018.05.08 | 2019.05.07 |
| Notch Filter                         | N/A        | WRCGV-W Band 66 | Wainwright     | 2018.12.01 | 2019.11.30 |
| Anechoic Chamber                     | N/A        | 9m*6m*6m        | CRT            | 2017.11.19 | 2020.11.18 |

END OF REPORT