



# TEST REPORT

**MANUFACTURER** : Hot Pepper, Inc.

**PRODUCT NAME** : 4G Feature Phone

**MODEL NAME** : HPP-LF2

**BRAND NAME** : Hot Pepper

**FCC ID** : 2APD4-A90L

**STANDARD(S)** : 47 CFR Part 22, Subpart H  
47 CFR Part 24, Subpart E  
47 CFR Part 27, Subpart F&H&L&M

**RECEIPT DATE** : 2019-08-12

**TEST DATE** : 2019-08-12 to 2019-08-21

**ISSUE DATE** : 2020-01-20

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# DIRECTORY

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| Change History |            |                   |
|----------------|------------|-------------------|
| Version        | Date       | Reason for change |
| 1.0            | 2020-01-20 | First edition     |
|                |            |                   |



# 1. Technical Information

**Note:** Provide by applicant.

## 1.1. Applicant and Manufacturer Information

|                              |                                                    |
|------------------------------|----------------------------------------------------|
| <b>Applicant:</b>            | Hot Pepper, Inc.                                   |
| <b>Applicant Address:</b>    | 5151 California Ave., Suite 100, Irvine 92617, USA |
| <b>Manufacturer:</b>         | Hot Pepper, Inc.                                   |
| <b>Manufacturer Address:</b> | 5151 California Ave., Suite 100, Irvine 92617, USA |

## 1.2. Equipment Under Test (EUT) Description

|                                |                                                                                    |                           |
|--------------------------------|------------------------------------------------------------------------------------|---------------------------|
| <b>Product Name:</b>           | 4G Feature Phone                                                                   |                           |
| <b>Serial No:</b>              | (N/A, marked #1 by test site)                                                      |                           |
| <b>Hardware Version:</b>       | A90L_MAINBOARD_P1                                                                  |                           |
| <b>Software Version:</b>       | HPP-LF2-V1.0.3-190809                                                              |                           |
| <b>Modulation Type:</b>        | QPSK<br>16QAM                                                                      |                           |
| <b>Operation Band:</b>         | Band 2 / 4 / 5 / 13                                                                |                           |
| <b>Frequency Range:</b>        | LTE Band 2                                                                         | Tx: 1850.7MHz -1909.3MHz  |
|                                |                                                                                    | Rx: 1930.7MHz -1989.3MHz  |
|                                | LTE Band 4                                                                         | Tx: 1710.7MHz -1754.3MHz  |
|                                |                                                                                    | Rx: 2110.7MHz - 2154.3MHz |
|                                | LTE Band 5                                                                         | Tx: 824.7MHz -848.3MHz    |
|                                |                                                                                    | Rx: 869.7MHz – 893.3MHz   |
|                                | LTE Band 13                                                                        | Tx: 779.5MHz - 784.5MHz   |
|                                |                                                                                    | Rx: 748.5MHz – 753.5MHz   |
| <b>Antenna Type:</b>           | Fixed Internal                                                                     |                           |
| <b>Antenna Gain:</b>           | LTE Band2:-0.9dbi;<br>LTE Band4:-0.8dbi<br>LTE Band5:-1.2dbi<br>LTE Band13:-1.5dbi |                           |
| <b>Accessory Information::</b> | Battery                                                                            |                           |
|                                | Manufacturer:                                                                      | Shenzhen HUATIAN TONG     |



|                               |                |                                       |
|-------------------------------|----------------|---------------------------------------|
|                               |                | TECHNOLOGY CO.LTD                     |
|                               | Brand Name:    | Hot Pepper                            |
|                               | Model No.:     | HPP-LF2                               |
|                               | Serial No.:    | (N/A, marked #1 by test site)         |
|                               | Capacity:      | 1700mAh                               |
|                               | Rated Voltage: | 3.80V                                 |
|                               | Charge Limit:  | 4.35V                                 |
| <b>Accessory Information:</b> | AC Adapter     |                                       |
|                               | Manufacturer:  | Shenzhen Tianyin Electronics Co.,Ltd. |
|                               | Brand Name:    | Hot Pepper                            |
|                               | Model No.:     | TPA-46B050100UU                       |
|                               | Serial No.:    | (N/A, marked #1 by test site)         |
|                               | Rated Input:   | 100-240V ~ 50/60Hz 0.2A               |
|                               | Rated Output:  | 5V=1.0A                               |

**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 Channel

| Band | Bandwidth<br>(MHz) | Low Channel |                    | Middle Channel |                    | High Channel |                    |
|------|--------------------|-------------|--------------------|----------------|--------------------|--------------|--------------------|
|      |                    | Channel     | Frequency<br>(MHz) | Channel        | Frequency<br>(MHz) | Channel      | Frequency<br>(MHz) |
| 2    | 1.4                | 18607       | 1850.7             | 18900          | 1880               | 19193        | 1909.3             |
|      | 3                  | 18615       | 1851.7             | 18900          | 1880               | 19185        | 1908.5             |
|      | 5                  | 18625       | 1852.5             | 18900          | 1880               | 19175        | 1907.5             |
|      | 10                 | 18650       | 1855               | 18900          | 1880               | 19150        | 1905               |
|      | 15                 | 18675       | 1857.5             | 18900          | 1880               | 19125        | 1902.5             |
|      | 20                 | 18700       | 1860               | 18900          | 1880               | 19100        | 1900               |
| 4    | 1.4                | 19957       | 1710.7             | 20175          | 1732.5             | 20393        | 1754.3             |
|      | 3                  | 19965       | 1711.5             | 20175          | 1732.5             | 20385        | 1753.5             |
|      | 5                  | 19975       | 1712.5             | 20175          | 1732.5             | 20375        | 1752.5             |
|      | 10                 | 20000       | 1715               | 20175          | 1732.5             | 20350        | 1750               |
|      | 15                 | 20025       | 1717.5             | 20175          | 1732.5             | 20325        | 1747.5             |
|      | 20                 | 20050       | 1720               | 20175          | 1732.5             | 20300        | 1745               |
| 5    | 1.4                | 20407       | 824.7              | 20525          | 836.5              | 20643        | 848.3              |
|      | 3                  | 20415       | 825.5              | 20525          | 836.5              | 20635        | 847.5              |
|      | 5                  | 20425       | 826.5              | 20525          | 836.5              | 20625        | 846.5              |
|      | 10                 | 20450       | 829                | 20525          | 836.5              | 20600        | 844                |
| 13   | 5                  | 23205       | 779.5              | 23230          | 782                | 23255        | 784.5              |
|      | 10                 | /           | /                  | 23230          | 782                | /            | /                  |

## 1.4. Emission Designator

| LTE B2  | Emission Designator (99%OBW) |          |
|---------|------------------------------|----------|
| BW(MHz) | QPSK                         | 16QAM    |
| 1.4     | 1M10G7D                      | 1M10W7D  |
| 3       | 2M69G7D                      | 2M69W7D  |
| 5       | 4M53G7D                      | 4M53W7D  |
| 10      | 9M03G7D                      | 9M01W7D  |
| 15      | 13M51G7D                     | 13M53W7D |
| 20      | 18M04G7D                     | 18M02W7D |
| LTE B4  | Emission Designator (99%OBW) |          |
| BW(MHz) | QPSK                         | 16QAM    |
| 1.4     | 1M10G7D                      | 1M10W7D  |
| 3       | 2M69G7D                      | 2M69W7D  |
| 5       | 4M53G7D                      | 4M52W7D  |
| 10      | 9M00G7D                      | 9M00W7D  |
| 15      | 13M50G7D                     | 13M48W7D |
| 20      | 17M99G7D                     | 18M96W7D |
| LTE B5  | Emission Designator (99%OBW) |          |
| BW(MHz) | QPSK                         | 16QAM    |
| 1.4     | 1M09G7D                      | 1M10W7D  |
| 3       | 2M70G7D                      | 2M69W7D  |
| 5       | 4M53G7D                      | 4M53W7D  |
| 10      | 9M02G7D                      | 9M01W7D  |
| LTE B13 | Emission Designator (99%OBW) |          |
| BW(MHz) | QPSK                         | 16QAM    |
| 5       | 4M53G7D                      | 4M52W7D  |
| 10      | 8M97G7D                      | 8M97W7D  |

## 1.5. 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 22 | Public Mobile Services                                                        |



|   |                |                                                |
|---|----------------|------------------------------------------------|
| 3 | 47 CFR Part 24 | Personal Communications Services               |
| 4 | 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    | Aug 14, 2019                 | Lai Huihuang  | PASS   |
| 2.1049                                                                                               | Occupied Bandwidth                    | Aug 13, 2019<br>Aug 19, 2019 | Lai Huihuang  | PASS   |
| 2.1055, 22.355,<br>24.235, 27.54                                                                     | Frequency Stability                   | Aug 13, 2019<br>Aug 19, 2019 | Lai Huihuang  | PASS   |
| 22.913(d), 24.232(d),<br>27.50(d)(5)                                                                 | Peak to Average Ratio                 | Aug 13, 2019<br>Aug 19, 2019 | Lai Huihuang  | PASS   |
| 2.1051, 22.917(a), 24.238,<br>27.53(c), 27.53(g), 27.53<br>(h) 27.53(m)                              | Conducted Spurious Emissions          | Aug 13, 2019<br>Aug 19, 2019 | Lai Huihuang  | PASS   |
| 2.1051, 22.917(a), 24.238,<br>27.53(c), 27.53(g), 27.53<br>(h) 27.53(m)                              | Band Edge                             | Aug 13, 2019<br>Aug 19, 2019 | Lai Huihuang  | PASS   |
| 22.913(a)(2), 24.232(c),<br>27.50(a)(3), 27.50(b)(10), 2<br>7.50(c)(10), 27.50(d)(4),<br>27.50(h)(2) | Transmitter Radiated Power (EIPR/ERP) | Aug 21, 2019<br>Aug 24, 2019 | Yaming Luo    | PASS   |
| 2.1051, 22.917(a), 24.238,<br>27.53(c), 27.53(g), 27.53<br>(h) 27.53(m)                              | Radiated Spurious Emissions           | Aug 21, 2019<br>Aug 24, 2019 | Yaming Luo    | PASS   |

**Note:** The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03r01 and ANSI/TIA-603-E-2016.



## 1.6. 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  |

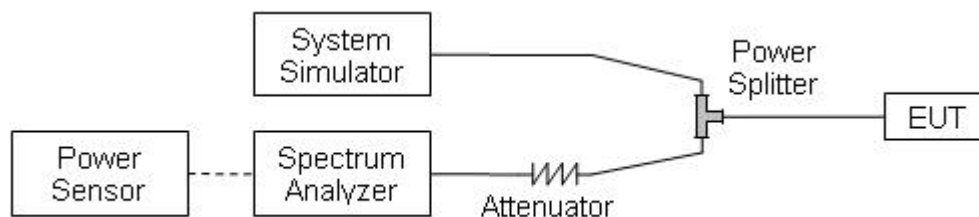
## 2. 47 CFR Part 2, Part 22H, Part 24E and 27 F&H&L&M Requirements

### 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 D01v03r01 Section 5.2 and ANSI/TIA-603-E-2016.



## 2.1.4. Result

| LTE Band 2 |            |      |        |             |                |              |
|------------|------------|------|--------|-------------|----------------|--------------|
| Bandwidth  | Modulation | RB   | RB     | Low Channel | Middle Channel | High Channel |
| MHz        |            | Size | Offset | dBm         | dBm            | dBm          |
| 1.4        | QPSK       | 1    | 0      | 22.38       | 22.54          | 22.51        |
|            |            | 1    | 3      | 22.66       | 22.72          | 22.61        |
|            |            | 1    | 5      | 22.61       | 22.39          | 22.60        |
|            |            | 3    | 0      | 22.68       | 22.56          | 22.44        |
|            |            | 3    | 1      | 22.71       | 22.72          | 22.48        |
|            |            | 3    | 3      | 22.62       | 22.50          | 22.42        |
|            | 16-QAM     | 6    | 0      | 21.77       | 21.66          | 21.85        |
|            |            | 1    | 0      | 21.53       | 21.42          | 21.81        |
|            |            | 1    | 3      | 21.77       | 21.75          | 21.83        |
|            |            | 1    | 5      | 21.55       | 21.91          | 21.46        |
|            |            | 3    | 0      | 21.87       | 21.84          | 21.86        |
|            |            | 3    | 1      | 21.99       | 21.96          | 21.69        |
|            |            | 3    | 3      | 21.68       | 21.93          | 21.59        |
|            |            | 6    | 0      | 20.85       | 20.78          | 20.46        |
| 3          | QPSK       | 1    | 0      | 22.62       | 22.41          | 22.46        |
|            |            | 1    | 8      | 22.51       | 22.42          | 22.47        |
|            |            | 1    | 14     | 22.66       | 22.55          | 22.58        |
|            |            | 8    | 0      | 21.63       | 21.62          | 21.74        |
|            |            | 8    | 4      | 21.76       | 21.67          | 21.63        |
|            |            | 8    | 7      | 21.77       | 21.73          | 21.63        |
|            |            | 15   | 0      | 21.66       | 21.65          | 21.68        |
|            | 16-QAM     | 1    | 0      | 21.59       | 21.42          | 21.86        |
|            |            | 1    | 8      | 21.38       | 21.52          | 21.90        |
|            |            | 1    | 14     | 21.46       | 21.53          | 21.37        |
|            |            | 8    | 0      | 20.88       | 20.54          | 20.69        |
|            |            | 8    | 4      | 20.62       | 20.77          | 20.66        |
|            |            | 8    | 7      | 20.56       | 20.65          | 20.69        |
|            |            | 15   | 0      | 20.69       | 20.62          | 20.56        |
| 5          | QPSK       | 1    | 0      | 22.46       | 22.41          | 22.44        |
|            |            | 1    | 12     | 22.71       | 22.77          | 22.71        |
|            |            | 1    | 24     | 22.53       | 22.56          | 22.64        |
|            |            | 12   | 0      | 21.65       | 21.54          | 21.49        |
|            |            | 12   | 7      | 21.72       | 21.60          | 21.61        |



|    |        |    |    |       |       |       |
|----|--------|----|----|-------|-------|-------|
|    |        | 12 | 13 | 21.56 | 21.52 | 21.50 |
|    |        | 25 | 0  | 21.65 | 21.58 | 21.55 |
|    | 16-QAM | 1  | 0  | 21.70 | 21.89 | 21.48 |
|    |        | 1  | 12 | 21.87 | 21.76 | 21.72 |
|    |        | 1  | 24 | 21.67 | 21.50 | 21.48 |
|    |        | 12 | 0  | 20.67 | 20.66 | 20.65 |
|    |        | 12 | 7  | 20.75 | 20.72 | 20.64 |
|    |        | 12 | 13 | 20.77 | 20.68 | 20.62 |
|    |        | 25 | 0  | 20.61 | 20.54 | 20.51 |
| 10 | QPSK   | 1  | 0  | 22.54 | 22.36 | 22.43 |
|    |        | 1  | 24 | 22.64 | 22.58 | 22.50 |
|    |        | 1  | 49 | 22.57 | 22.31 | 22.55 |
|    |        | 25 | 0  | 21.59 | 21.57 | 21.56 |
|    |        | 25 | 12 | 21.66 | 21.58 | 21.51 |
|    |        | 25 | 25 | 21.69 | 21.54 | 21.50 |
|    |        | 50 | 0  | 21.62 | 21.57 | 21.50 |
|    | 16-QAM | 1  | 0  | 21.79 | 21.88 | 21.42 |
|    |        | 1  | 24 | 21.56 | 21.48 | 21.39 |
|    |        | 1  | 49 | 21.51 | 21.41 | 21.41 |
|    |        | 25 | 0  | 20.66 | 20.72 | 20.65 |
|    |        | 25 | 12 | 20.78 | 20.57 | 20.61 |
|    |        | 25 | 25 | 20.79 | 20.54 | 20.44 |
|    |        | 50 | 0  | 20.67 | 20.57 | 20.45 |
| 15 | QPSK   | 1  | 0  | 22.49 | 22.47 | 22.14 |
|    |        | 1  | 37 | 22.49 | 22.29 | 22.30 |
|    |        | 1  | 74 | 22.41 | 22.22 | 22.39 |
|    |        | 36 | 0  | 21.64 | 21.49 | 21.48 |
|    |        | 36 | 20 | 21.56 | 21.45 | 21.47 |
|    |        | 36 | 39 | 21.60 | 21.40 | 21.44 |
|    |        | 75 | 0  | 21.63 | 21.60 | 21.56 |
|    | 16-QAM | 1  | 0  | 22.01 | 21.51 | 21.60 |
|    |        | 1  | 37 | 21.85 | 21.87 | 21.73 |
|    |        | 1  | 74 | 21.57 | 21.51 | 21.65 |
|    |        | 36 | 0  | 20.40 | 20.61 | 20.46 |
|    |        | 36 | 20 | 20.41 | 20.44 | 20.41 |
|    |        | 36 | 39 | 20.54 | 20.41 | 20.47 |
|    |        | 75 | 0  | 20.63 | 20.53 | 20.57 |
| 20 | QPSK   | 1  | 0  | 22.54 | 22.56 | 22.59 |



|  |        |     |    |       |       |       |
|--|--------|-----|----|-------|-------|-------|
|  |        | 1   | 49 | 22.79 | 22.55 | 22.53 |
|  |        | 1   | 99 | 22.57 | 22.54 | 22.57 |
|  |        | 50  | 0  | 21.49 | 21.37 | 21.49 |
|  |        | 50  | 24 | 21.46 | 21.35 | 21.38 |
|  |        | 50  | 50 | 21.47 | 21.33 | 21.27 |
|  |        | 100 | 0  | 21.45 | 21.26 | 21.40 |
|  |        | 100 | 0  | 21.45 | 21.26 | 21.40 |
|  | 16-QAM | 1   | 0  | 21.56 | 21.75 | 21.45 |
|  |        | 1   | 49 | 21.78 | 21.66 | 21.82 |
|  |        | 1   | 99 | 21.37 | 21.36 | 21.46 |
|  |        | 50  | 0  | 20.52 | 20.49 | 20.50 |
|  |        | 50  | 24 | 20.65 | 20.39 | 20.45 |
|  |        | 50  | 50 | 20.64 | 20.47 | 20.29 |
|  |        | 100 | 0  | 20.58 | 20.44 | 20.40 |

| LTE Band 4 |            |      |        |             |                |              |
|------------|------------|------|--------|-------------|----------------|--------------|
| Bandwidth  | Modulation | RB   | RB     | Low Channel | Middle Channel | High Channel |
| MHz        |            | Size | Offset | dBm         | dBm            | dBm          |
| 1.4        | QPSK       | 1    | 0      | 22.13       | 21.83          | 21.87        |
|            |            | 1    | 3      | 22.30       | 22.01          | 22.04        |
|            |            | 1    | 5      | 22.12       | 21.85          | 21.91        |
|            |            | 3    | 0      | 21.99       | 21.96          | 21.90        |
|            |            | 3    | 1      | 22.27       | 21.94          | 22.00        |
|            |            | 3    | 3      | 22.28       | 21.93          | 22.00        |
|            |            | 6    | 0      | 21.23       | 20.91          | 20.96        |
|            | 16-QAM     | 1    | 0      | 21.20       | 20.83          | 21.00        |
|            |            | 1    | 3      | 21.33       | 21.00          | 21.22        |
|            |            | 1    | 5      | 21.22       | 20.84          | 21.02        |
|            |            | 3    | 0      | 21.90       | 21.96          | 21.90        |
|            |            | 3    | 1      | 21.93       | 21.04          | 21.96        |
|            |            | 3    | 3      | 21.93       | 21.90          | 21.71        |
|            |            | 6    | 0      | 20.65       | 20.62          | 20.89        |
| 3          | QPSK       | 1    | 0      | 22.62       | 22.54          | 22.69        |
|            |            | 1    | 8      | 22.71       | 22.58          | 22.62        |
|            |            | 1    | 14     | 22.58       | 22.68          | 22.57        |
|            |            | 8    | 0      | 21.71       | 21.69          | 21.67        |
|            |            | 8    | 4      | 21.78       | 21.66          | 21.63        |
|            |            | 8    | 7      | 21.71       | 21.53          | 21.65        |
|            |            | 15   | 0      | 21.74       | 21.67          | 21.64        |



|    |        |    |    |       |       |       |
|----|--------|----|----|-------|-------|-------|
|    | 16-QAM | 1  | 0  | 21.61 | 21.66 | 21.99 |
|    |        | 1  | 8  | 21.51 | 21.98 | 21.54 |
|    |        | 1  | 14 | 21.95 | 21.50 | 21.61 |
|    |        | 8  | 0  | 20.92 | 20.65 | 20.83 |
|    |        | 8  | 4  | 20.75 | 20.80 | 20.84 |
|    |        | 8  | 7  | 20.62 | 20.78 | 20.78 |
|    |        | 15 | 0  | 20.72 | 20.61 | 20.70 |
| 5  | QPSK   | 1  | 0  | 22.13 | 21.86 | 21.78 |
|    |        | 1  | 12 | 22.18 | 21.93 | 21.92 |
|    |        | 1  | 24 | 22.10 | 21.78 | 21.86 |
|    |        | 12 | 0  | 21.14 | 20.95 | 20.86 |
|    |        | 12 | 7  | 21.17 | 20.88 | 20.87 |
|    |        | 12 | 13 | 21.20 | 20.84 | 20.92 |
|    |        | 25 | 0  | 21.17 | 20.88 | 20.94 |
|    | 16-QAM | 1  | 0  | 21.73 | 21.61 | 21.71 |
|    |        | 1  | 12 | 21.78 | 21.15 | 21.88 |
|    |        | 1  | 24 | 21.63 | 21.60 | 21.09 |
|    |        | 12 | 0  | 20.80 | 20.69 | 20.89 |
|    |        | 12 | 7  | 20.82 | 20.72 | 20.75 |
|    |        | 12 | 13 | 20.86 | 20.71 | 20.68 |
|    |        | 25 | 0  | 20.69 | 20.64 | 20.68 |
| 10 | QPSK   | 1  | 0  | 22.78 | 22.56 | 22.63 |
|    |        | 1  | 24 | 22.92 | 22.70 | 22.71 |
|    |        | 1  | 49 | 22.71 | 22.55 | 22.54 |
|    |        | 25 | 0  | 21.18 | 21.05 | 21.01 |
|    |        | 25 | 12 | 21.21 | 21.00 | 21.02 |
|    |        | 25 | 25 | 21.22 | 20.93 | 21.00 |
|    |        | 50 | 0  | 21.23 | 20.96 | 21.03 |
|    | 16-QAM | 1  | 0  | 21.21 | 21.50 | 21.06 |
|    |        | 1  | 24 | 21.32 | 21.54 | 21.22 |
|    |        | 1  | 49 | 21.14 | 21.43 | 21.09 |
|    |        | 25 | 0  | 20.78 | 20.93 | 20.84 |
|    |        | 25 | 12 | 20.97 | 20.75 | 20.77 |
|    |        | 25 | 25 | 20.93 | 20.63 | 20.70 |
|    |        | 50 | 0  | 20.72 | 20.62 | 20.64 |
| 15 | QPSK   | 1  | 0  | 22.76 | 22.56 | 22.67 |
|    |        | 1  | 37 | 22.90 | 22.85 | 22.81 |
|    |        | 1  | 74 | 22.65 | 22.59 | 22.57 |



|    |        |     |    |       |       |       |
|----|--------|-----|----|-------|-------|-------|
|    |        | 36  | 0  | 21.69 | 21.84 | 21.75 |
|    |        | 36  | 20 | 21.74 | 21.67 | 21.83 |
|    |        | 36  | 39 | 21.78 | 21.64 | 21.63 |
|    |        | 75  | 0  | 21.79 | 21.75 | 21.81 |
|    | 16-QAM | 1   | 0  | 21.96 | 21.35 | 21.63 |
|    |        | 1   | 37 | 21.17 | 21.71 | 21.82 |
|    |        | 1   | 74 | 21.87 | 21.48 | 21.46 |
|    |        | 36  | 0  | 20.79 | 20.66 | 20.67 |
|    |        | 36  | 20 | 20.67 | 20.66 | 20.64 |
|    |        | 36  | 39 | 20.76 | 20.63 | 20.70 |
|    |        | 75  | 0  | 20.66 | 20.68 | 20.74 |
| 20 | QPSK   | 1   | 0  | 22.94 | 22.85 | 22.81 |
|    |        | 1   | 49 | 22.30 | 22.35 | 22.42 |
|    |        | 1   | 99 | 22.40 | 22.42 | 22.39 |
|    |        | 50  | 0  | 21.78 | 21.75 | 21.77 |
|    |        | 50  | 24 | 21.76 | 21.70 | 21.70 |
|    |        | 50  | 50 | 21.72 | 21.52 | 21.63 |
|    |        | 100 | 0  | 21.65 | 21.67 | 21.65 |
|    | 16-QAM | 1   | 0  | 21.94 | 21.75 | 21.73 |
|    |        | 1   | 49 | 21.42 | 21.96 | 21.50 |
|    |        | 1   | 99 | 21.95 | 21.92 | 21.30 |
|    |        | 50  | 0  | 20.59 | 20.67 | 20.76 |
|    |        | 50  | 24 | 20.68 | 20.66 | 20.71 |
|    |        | 50  | 50 | 20.62 | 20.61 | 20.71 |
|    |        | 100 | 0  | 20.97 | 20.93 | 20.99 |

| LTE Band 5 |            |      |        |             |                |              |
|------------|------------|------|--------|-------------|----------------|--------------|
| Bandwidth  | Modulation | RB   | RB     | Low Channel | Middle Channel | High Channel |
| MHz        |            | Size | Offset | dBm         | dBm            | dBm          |
| 1.4        | QPSK       | 1    | 0      | 22.30       | 22.10          | 22.28        |
|            |            | 1    | 3      | 22.48       | 22.32          | 22.40        |
|            |            | 1    | 5      | 22.25       | 22.10          | 22.32        |
|            |            | 3    | 0      | 22.25       | 22.15          | 22.20        |
|            |            | 3    | 1      | 22.23       | 22.17          | 22.19        |
|            |            | 3    | 3      | 22.23       | 22.18          | 22.14        |
|            |            | 6    | 0      | 21.31       | 21.25          | 21.30        |
|            | 16-QAM     | 1    | 0      | 21.22       | 21.34          | 21.02        |
|            |            | 1    | 3      | 21.46       | 21.51          | 21.16        |



|    |        |    |    |       |       |       |
|----|--------|----|----|-------|-------|-------|
|    |        | 1  | 5  | 21.20 | 21.32 | 20.99 |
|    |        | 3  | 0  | 21.42 | 21.16 | 21.15 |
|    |        | 3  | 1  | 21.42 | 21.18 | 21.14 |
|    |        | 3  | 3  | 21.42 | 21.24 | 21.12 |
|    |        | 6  | 0  | 20.29 | 20.17 | 20.20 |
| 3  | QPSK   | 1  | 0  | 22.25 | 22.10 | 22.29 |
|    |        | 1  | 8  | 22.16 | 22.09 | 22.34 |
|    |        | 1  | 14 | 22.16 | 22.14 | 22.40 |
|    |        | 8  | 0  | 21.32 | 21.24 | 21.30 |
|    |        | 8  | 4  | 21.30 | 21.24 | 21.28 |
|    |        | 8  | 7  | 21.29 | 21.25 | 21.25 |
|    |        | 15 | 0  | 21.31 | 21.19 | 21.19 |
|    | 16-QAM | 1  | 0  | 21.56 | 21.36 | 21.11 |
|    |        | 1  | 8  | 21.46 | 21.33 | 21.07 |
|    |        | 1  | 14 | 21.46 | 21.33 | 21.09 |
|    |        | 8  | 0  | 20.32 | 20.14 | 20.25 |
|    |        | 8  | 4  | 20.28 | 20.16 | 20.25 |
|    |        | 8  | 7  | 20.26 | 20.20 | 20.19 |
|    |        | 15 | 0  | 20.25 | 20.03 | 20.15 |
| 5  | QPSK   | 1  | 0  | 22.20 | 22.08 | 22.06 |
|    |        | 1  | 12 | 22.23 | 22.22 | 22.17 |
|    |        | 1  | 24 | 22.12 | 22.06 | 22.03 |
|    |        | 12 | 0  | 21.28 | 21.18 | 21.20 |
|    |        | 12 | 7  | 21.26 | 21.17 | 21.17 |
|    |        | 12 | 13 | 21.25 | 21.19 | 21.16 |
|    |        | 25 | 0  | 21.29 | 21.20 | 21.25 |
|    | 16-QAM | 1  | 0  | 21.42 | 21.24 | 21.42 |
|    |        | 1  | 12 | 21.55 | 21.36 | 21.46 |
|    |        | 1  | 24 | 21.35 | 21.22 | 21.24 |
|    |        | 12 | 0  | 20.20 | 20.09 | 20.27 |
|    |        | 12 | 7  | 20.21 | 20.15 | 20.24 |
|    |        | 12 | 13 | 20.23 | 20.16 | 20.21 |
|    |        | 25 | 0  | 20.28 | 20.15 | 20.21 |
| 10 | QPSK   | 1  | 0  | 22.18 | 22.13 | 22.25 |
|    |        | 1  | 24 | 22.48 | 22.32 | 22.51 |
|    |        | 1  | 49 | 22.10 | 22.13 | 22.32 |
|    |        | 25 | 0  | 21.28 | 21.22 | 21.29 |
|    |        | 25 | 12 | 21.29 | 21.23 | 21.30 |



|  |        |    |    |       |       |       |
|--|--------|----|----|-------|-------|-------|
|  |        | 25 | 25 | 21.32 | 21.24 | 21.34 |
|  |        | 50 | 0  | 21.31 | 21.21 | 21.31 |
|  | 16-QAM | 1  | 0  | 21.46 | 21.26 | 21.14 |
|  |        | 1  | 24 | 21.57 | 21.48 | 21.24 |
|  |        | 1  | 49 | 21.34 | 21.32 | 21.15 |
|  |        | 25 | 0  | 20.32 | 20.22 | 20.27 |
|  |        | 25 | 12 | 20.34 | 20.15 | 20.27 |
|  |        | 25 | 25 | 20.37 | 20.20 | 20.28 |
|  |        | 50 | 0  | 20.29 | 20.20 | 20.30 |

| LTE Band 13 |            |      |        |             |                |              |
|-------------|------------|------|--------|-------------|----------------|--------------|
| Bandwidth   | Modulation | RB   | RB     | Low Channel | Middle Channel | High Channel |
| MHz         |            | Size | Offset | dBm         | dBm            | dBm          |
| 5           | QPSK       | 1    | 0      | 23.56       | 23.41          | 23.38        |
|             |            | 1    | 12     | 23.57       | 23.52          | 23.54        |
|             |            | 1    | 24     | 23.52       | 23.35          | 23.46        |
|             |            | 12   | 0      | 22.16       | 22.17          | 22.24        |
|             |            | 12   | 7      | 22.19       | 22.24          | 22.23        |
|             |            | 12   | 13     | 22.27       | 22.25          | 22.20        |
|             |            | 50   | 0      | 22.18       | 22.20          | 22.18        |
|             | 16-QAM     | 1    | 0      | 22.30       | 22.32          | 22.17        |
|             |            | 1    | 12     | 22.46       | 22.44          | 22.24        |
|             |            | 1    | 24     | 22.38       | 22.40          | 22.15        |
|             |            | 12   | 0      | 21.05       | 21.06          | 21.13        |
|             |            | 12   | 7      | 21.05       | 21.15          | 21.13        |
|             |            | 12   | 13     | 21.05       | 21.27          | 21.13        |
|             |            | 50   | 0      | 21.10       | 21.13          | 21.16        |
| 10          | QPSK       | 1    | 0      | /           | 23.82          | /            |
|             |            | 1    | 24     | /           | 23.48          | /            |
|             |            | 1    | 49     | /           | 23.43          | /            |
|             |            | 25   | 0      | /           | 22.16          | /            |
|             |            | 25   | 12     | /           | 22.17          | /            |
|             |            | 25   | 25     | /           | 22.20          | /            |
|             |            | 50   | 0      | /           | 22.16          | /            |
|             | 16-QAM     | 1    | 0      | /           | 22.17          | /            |
|             |            | 1    | 24     | /           | 22.33          | /            |
|             |            | 1    | 49     | /           | 22.46          | /            |
|             |            | 25   | 0      | /           | 21.18          | /            |



REPORT No. : XM19070036W05

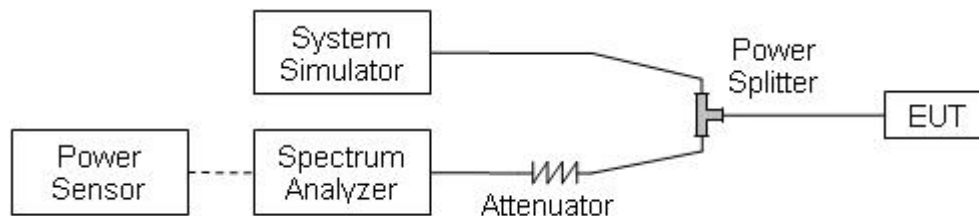
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|--|--|----|----|---|-------|---|
|  |  | 25 | 12 | / | 21.18 | / |
|  |  | 25 | 25 | / | 21.19 | / |
|  |  | 50 | 0  | / | 21.14 | / |

## 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 D01v03r01 Section 4.1 and ANSI/TIA-603-E-2016.

**2.2.4. Test Result**

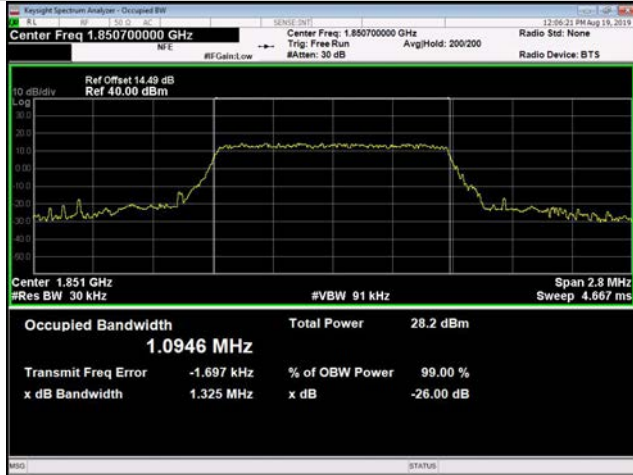
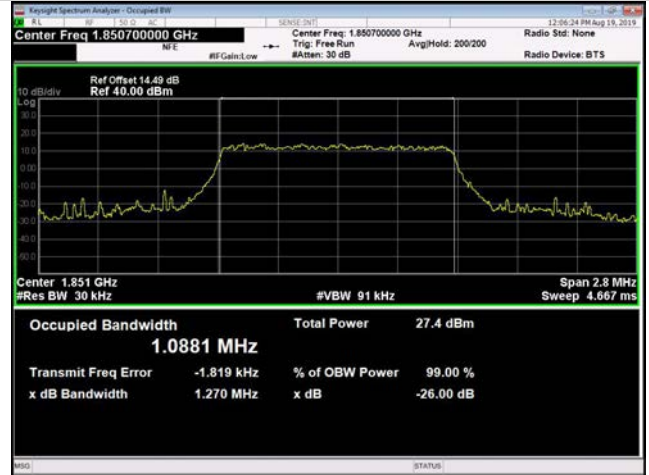
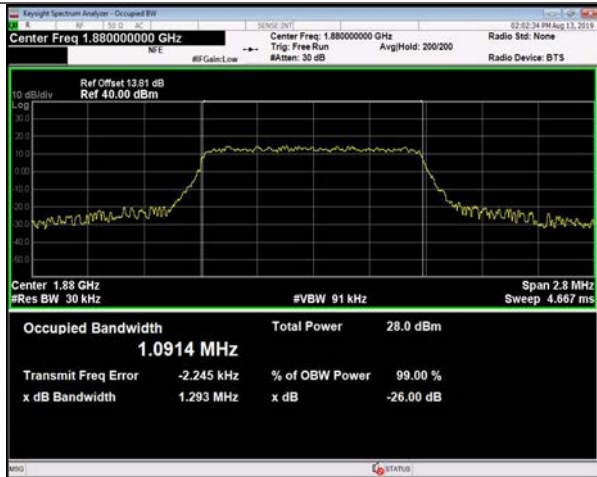
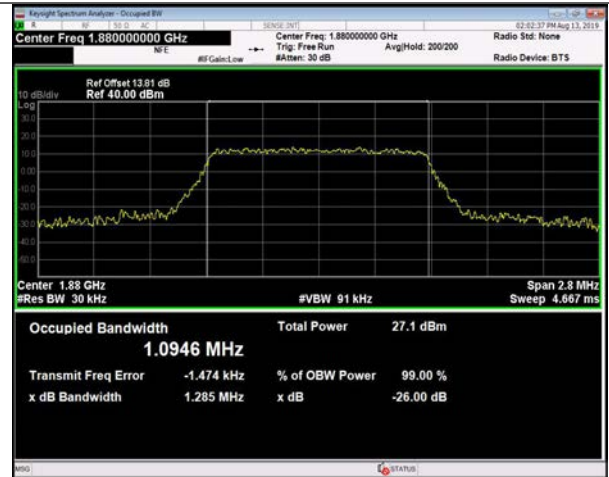
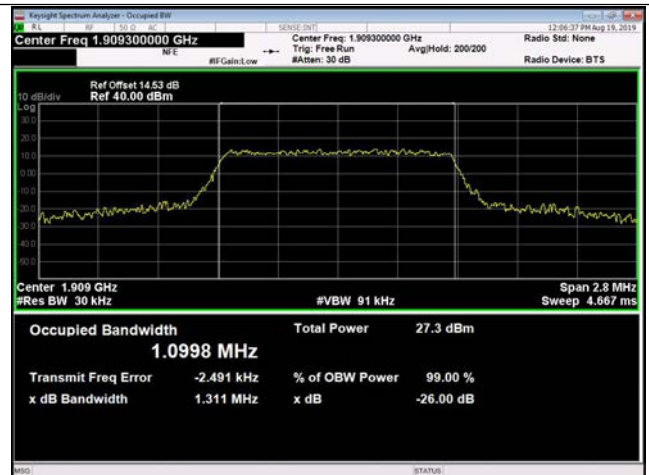
| LTE Band 2 |            |             |                |                |                |              |                |
|------------|------------|-------------|----------------|----------------|----------------|--------------|----------------|
| BW<br>MHz  | Modulation | Low Channel |                | Middle Channel |                | High Channel |                |
|            |            | OBW<br>MHz  | 26dB BW<br>MHz | OBW<br>MHz     | 26dB BW<br>MHz | OBW<br>MHz   | 26dB BW<br>MHz |
| 1.4        | QPSK       | 1.095       | 1.325          | 1.091          | 1.293          | 1.091        | 1.292          |
|            | 16QAM      | 1.088       | 1.270          | 1.095          | 1.285          | 1.100        | 1.311          |
| 3          | QPSK       | 2.691       | 3.056          | 2.689          | 2.902          | 2.693        | 2.917          |
|            | 16QAM      | 2.687       | 2.909          | 2.692          | 2.937          | 2.687        | 2.933          |
| 5          | QPSK       | 4.529       | 5.193          | 4.531          | 5.205          | 4.508        | 5.207          |
|            | 16QAM      | 4.515       | 5.123          | 4.517          | 5.150          | 4.530        | 5.183          |
| 10         | QPSK       | 9.016       | 10.042         | 9.033          | 10.138         | 9.013        | 10.184         |
|            | 16QAM      | 9.013       | 9.955          | 8.999          | 10.047         | 9.011        | 10.105         |
| 15         | QPSK       | 13.490      | 15.023         | 13.491         | 15.224         | 13.517       | 15.046         |
|            | 16QAM      | 13.474      | 14.749         | 13.487         | 14.860         | 13.539       | 14.823         |
| 20         | QPSK       | 17.994      | 19.688         | 17.947         | 19.491         | 18.044       | 18.565         |
|            | 16QAM      | 17.968      | 19.909         | 18.014         | 19.964         | 18.015       | 19.631         |

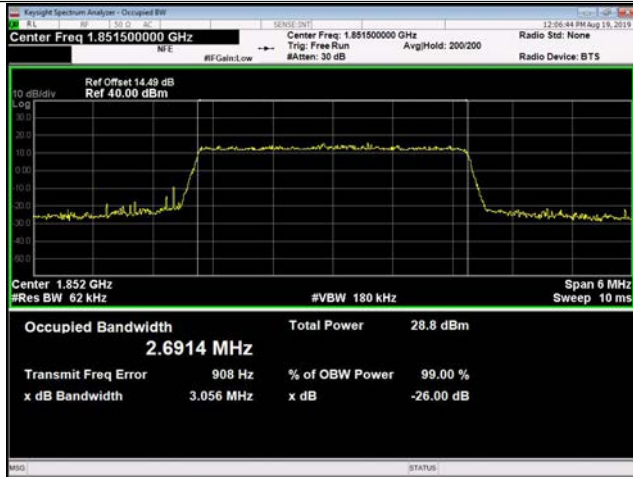
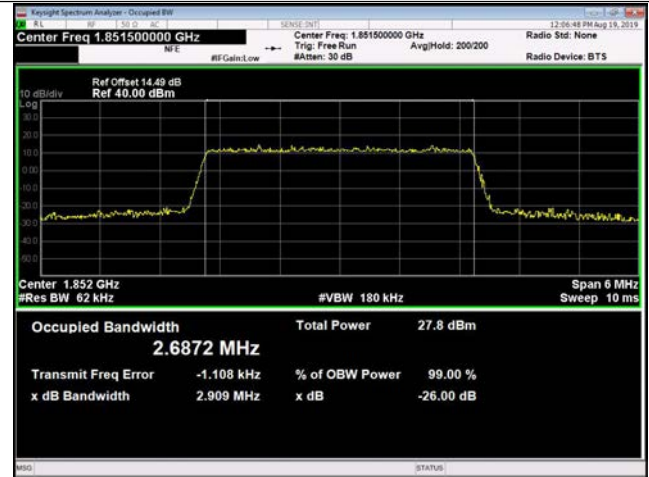
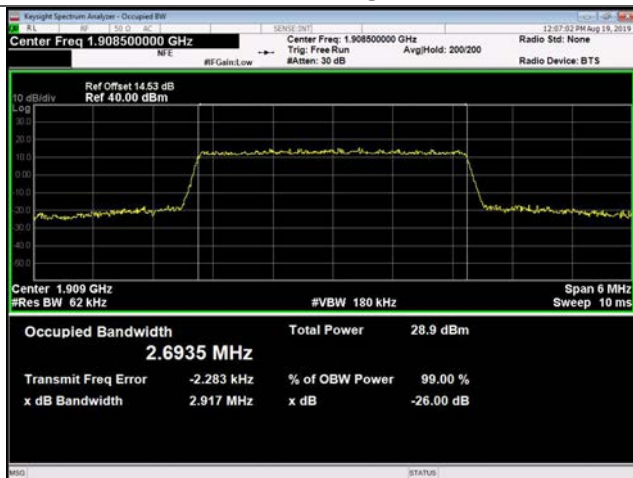
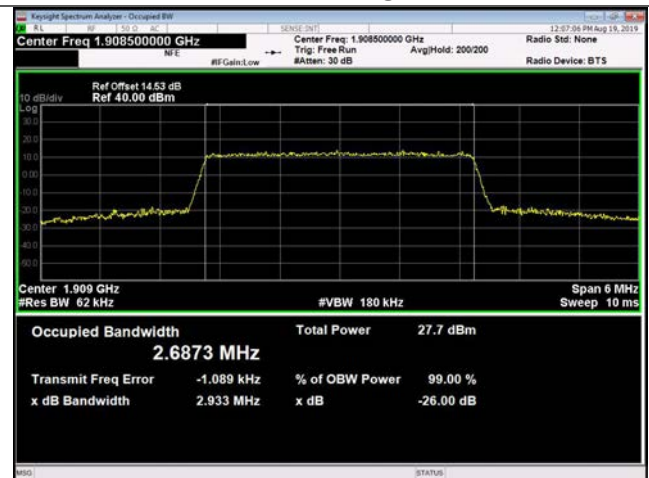
| LTE Band 4 |            |             |                |                |                |              |                |
|------------|------------|-------------|----------------|----------------|----------------|--------------|----------------|
| BW<br>MHz  | Modulation | Low Channel |                | Middle Channel |                | High Channel |                |
|            |            | OBW<br>MHz  | 26dB BW<br>MHz | OBW<br>MHz     | 26dB BW<br>MHz | OBW<br>MHz   | 26dB BW<br>MHz |
| 1.4        | QPSK       | 1.103       | 1.289          | 1.089          | 1.272          | 1.100        | 1.298          |
|            | 16QAM      | 1.088       | 1.287          | 1.096          | 1.304          | 1.086        | 1.282          |
| 3          | QPSK       | 2.694       | 2.928          | 2.684          | 2.907          | 2.680        | 2.892          |
|            | 16QAM      | 2.656       | 2.904          | 2.683          | 2.902          | 2.686        | 2.917          |
| 5          | QPSK       | 4.528       | 5.206          | 4.511          | 5.126          | 4.513        | 5.155          |
|            | 16QAM      | 4.507       | 5.081          | 4.515          | 5.126          | 4.508        | 4.990          |
| 10         | QPSK       | 8.989       | 10.05          | 9.008          | 10.01          | 8.980        | 10.14          |
|            | 16QAM      | 8.975       | 10.03          | 9.001          | 10.07          | 8.974        | 10.10          |
| 15         | QPSK       | 13.447      | 14.71          | 13.501         | 14.99          | 13.46        | 14.98          |
|            | 16QAM      | 13.464      | 14.86          | 13.482         | 14.67          | 13.445       | 14.67          |
| 20         | QPSK       | 17.943      | 19.670         | 17.962         | 19.440         | 17.989       | 19.57          |
|            | 16QAM      | 17.902      | 19.490         | 17.956         | 19.58          | 17.950       | 19.650         |

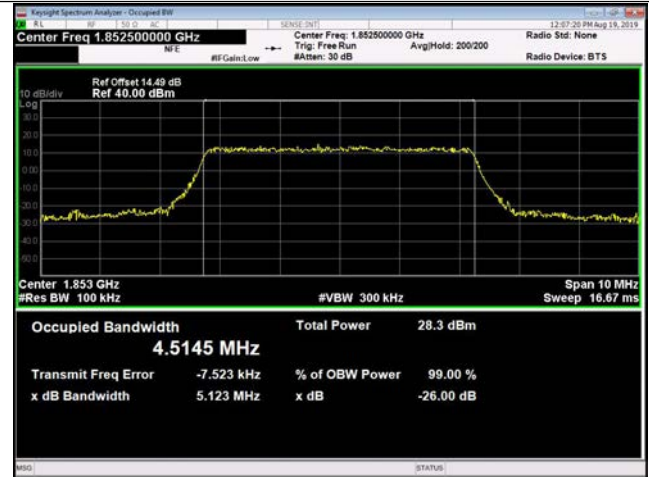
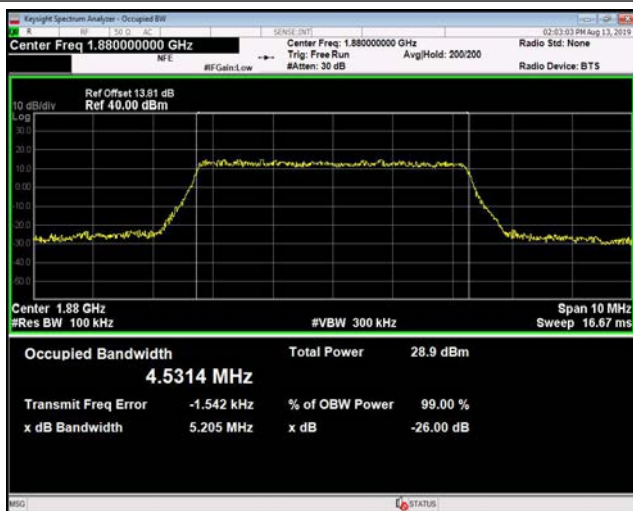
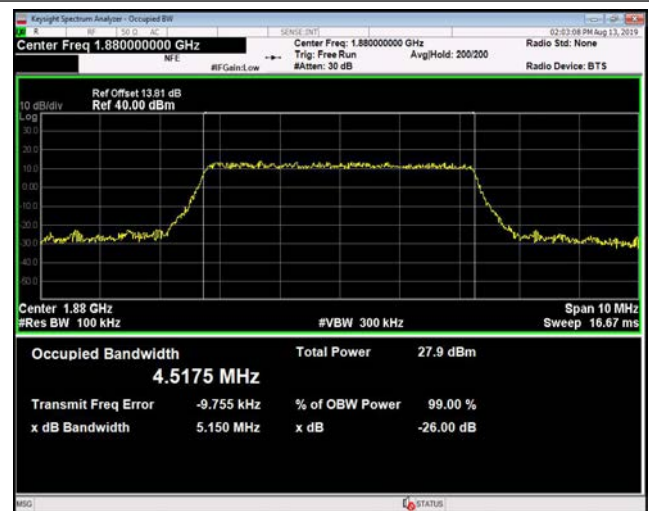
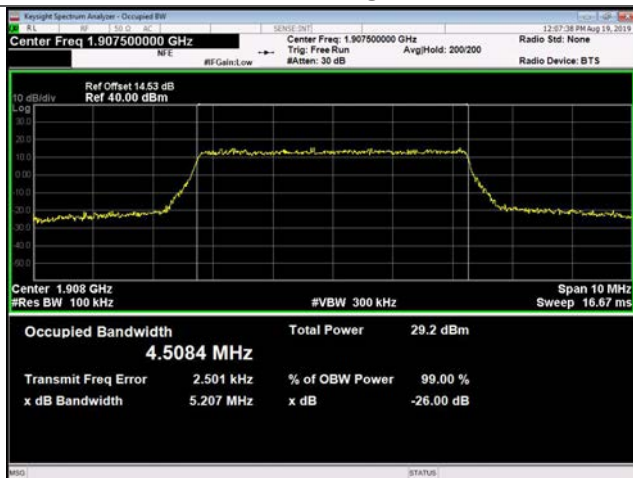
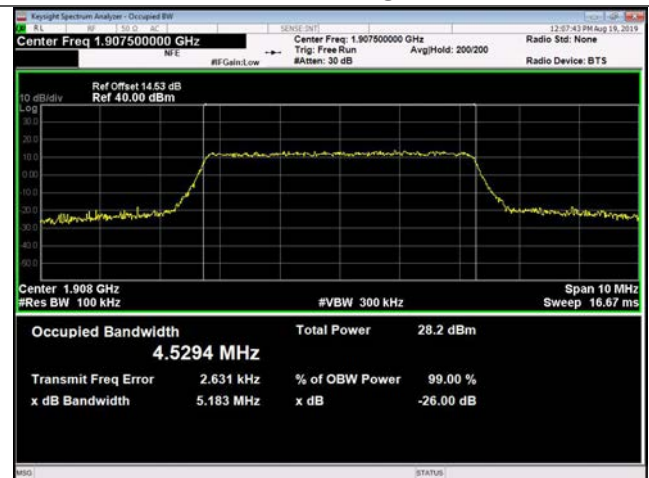


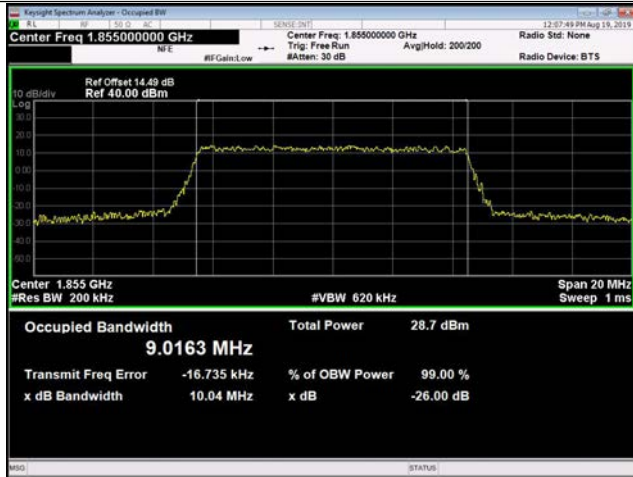
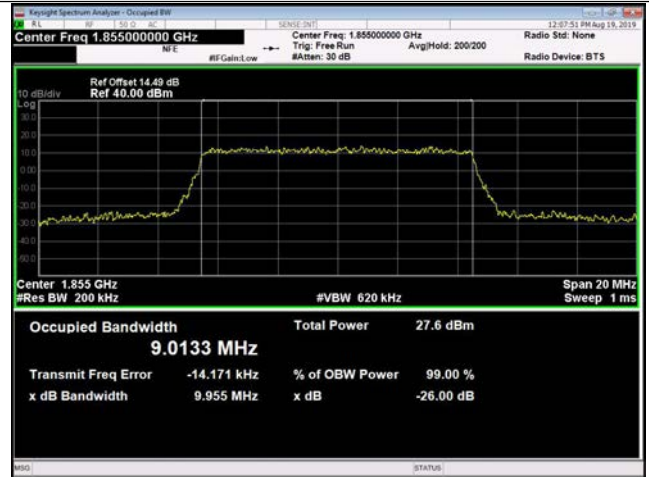
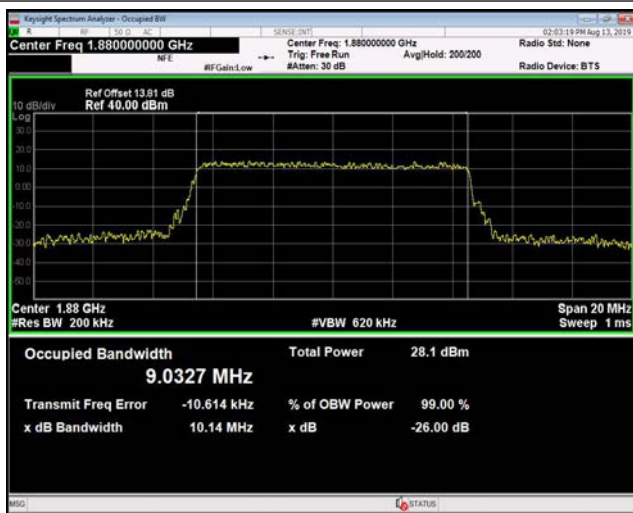
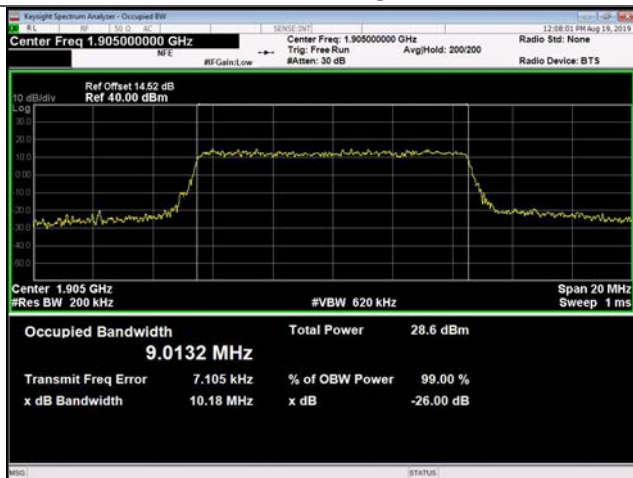
| LTE Band 5 |            |             |         |                |         |              |         |
|------------|------------|-------------|---------|----------------|---------|--------------|---------|
| BW         | Modulation | Low Channel |         | Middle Channel |         | High Channel |         |
|            |            | OBW         | 26dB BW | OBW            | 26dB BW | OBW          | 26dB BW |
| MHz        |            | MHz         | MHz     | MHz            | MHz     | MHz          | MHz     |
| 1.4        | QPSK       | 1.088       | 1.298   | 1.094          | 1.2286  | 1.093        | 1.281   |
|            | 16QAM      | 1.088       | 1.276   | 1.098          | 1.294   | 1.092        | 1.289   |
| 3          | QPSK       | 2.695       | 2.918   | 2.695          | 2.895   | 2.695        | 2.915   |
|            | 16QAM      | 2.689       | 2.917   | 2.687          | 2.906   | 2.687        | 2.928   |
| 5          | QPSK       | 4.528       | 5.152   | 4.531          | 4.929   | 4.509        | 5.139   |
|            | 16QAM      | 4.517       | 5.135   | 4.506          | 5.204   | 4.531        | 5.237   |
| 10         | QPSK       | 9.021       | 9.900   | 8.978          | 10.003  | 9.006        | 10.085  |
|            | 16QAM      | 9.012       | 9.934   | 8.966          | 10.003  | 9.002        | 9.967   |

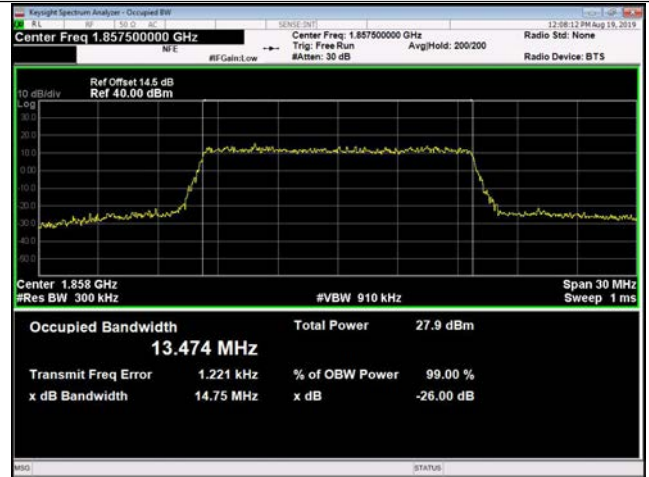
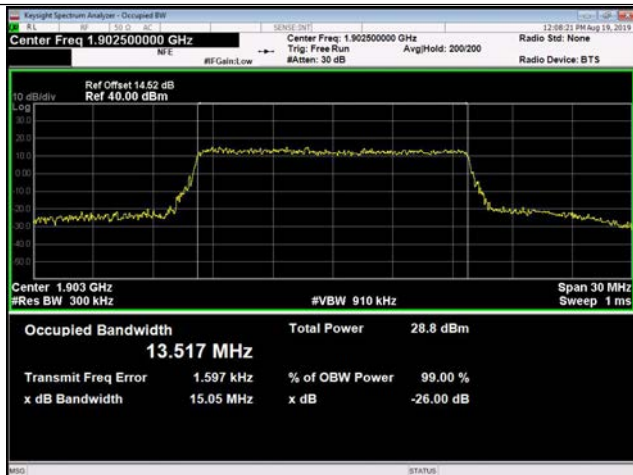
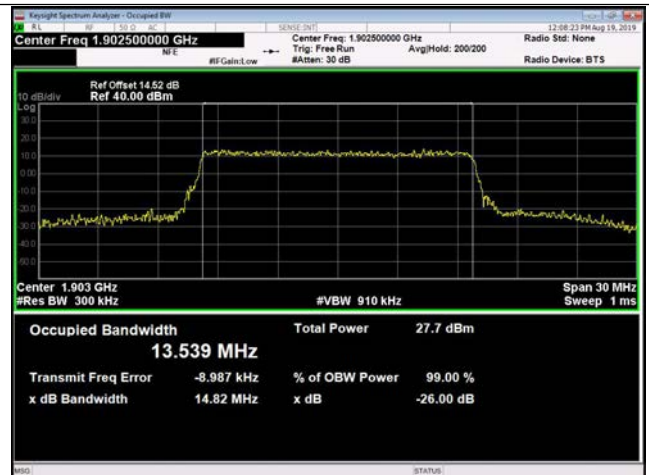
| LTE Band 13 |            |             |         |                |         |              |         |
|-------------|------------|-------------|---------|----------------|---------|--------------|---------|
| BW          | Modulation | Low Channel |         | Middle Channel |         | High Channel |         |
|             |            | OBW         | 26dB BW | OBW            | 26dB BW | OBW          | 26dB BW |
| MHz         |            | MHz         | MHz     | MHz            | MHz     | MHz          | MHz     |
| 5           | QPSK       | 4.5123      | 5.134   | 4.5122         | 5.204   | 4.526        | 5.412   |
|             | 16QAM      | 4.5111      | 5.163   | 4.5145         | 5.160   | 4.5140       | 5.160   |
| 10          | QPSK       | /           | /       | 8.9738         | 10.03   | /            | /       |
|             | 16QAM      | /           | /       | 8.9742         | 9.943   | /            | /       |

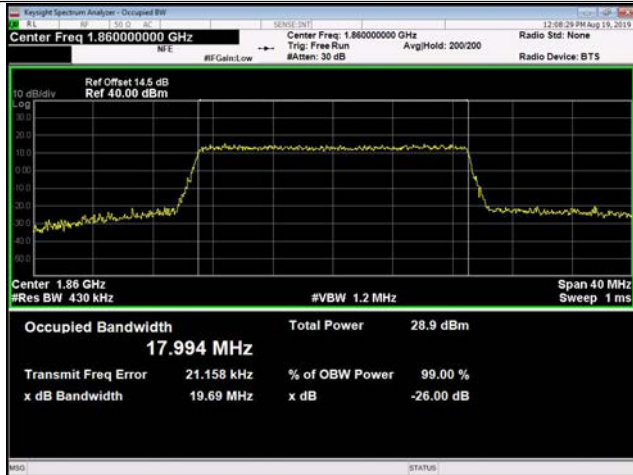
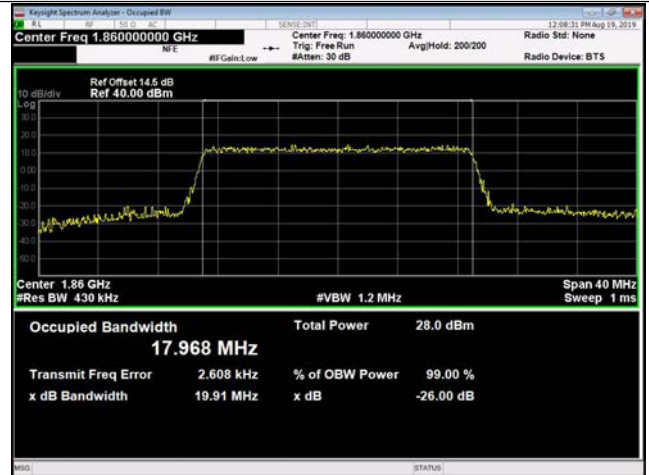
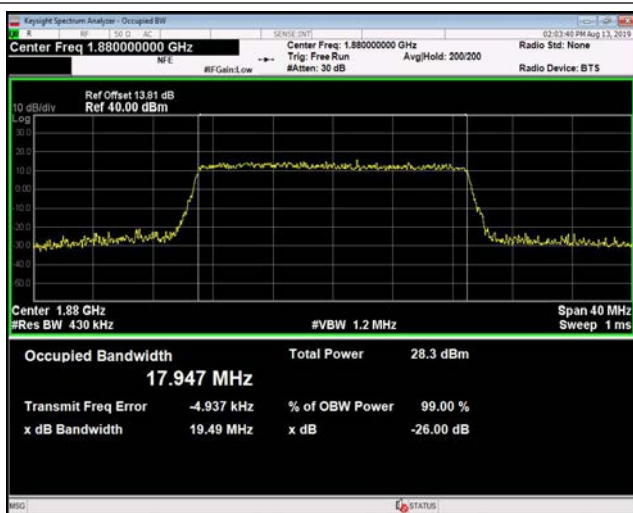
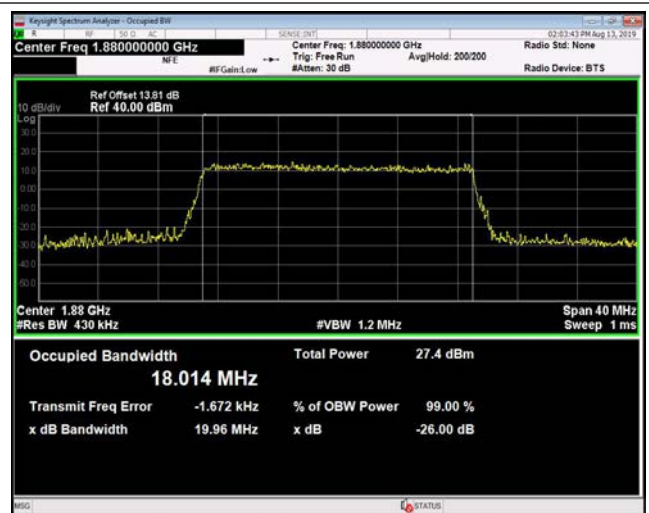
**LTE Band 2 \_ 99% Bandwidth & 26dB Bandwidth****1.4MHz / QPSK / Low Channel****1.4MHz / 16QAM / Low Channel****1.4MHz / QPSK / Middle Channel I****1.4MHz / 16QAM / Middle Channel****1.4MHz / QPSK / High Channel****1.4MHz / 16QAM / High Channel**

**LTE Band 2 \_ 99% Bandwidth & 26dB Bandwidth****3MHz / QPSK / Low Channel****3MHz / 16QAM / Low Channel****3MHz / QPSK / Middle Channel****3MHz / 16QAM / Middle Channel****3MHz / QPSK / High Channel****3MHz / 16QAM / High Channel**

**LTE Band 2 \_ 99% Bandwidth & 26dB Bandwidth****5MHz / QPSK / Low Channel****5MHz / 16QAM / Low Channel****5MHz / QPSK / Middle Channel****5MHz / 16QAM / Middle Channel****5MHz / QPSK / High Channel****5MHz / 16QAM / High Channel**

**LTE Band 2 \_ 99% Bandwidth & 26dB Bandwidth****10MHz / QPSK / Low Channel****10MHz / 16QAM / Low Channel****10MHz / QPSK / Middle Channel****10MHz / 16QAM / Middle Channel****10MHz / QPSK / High Channel****10MHz / 16QAM / High Channel**

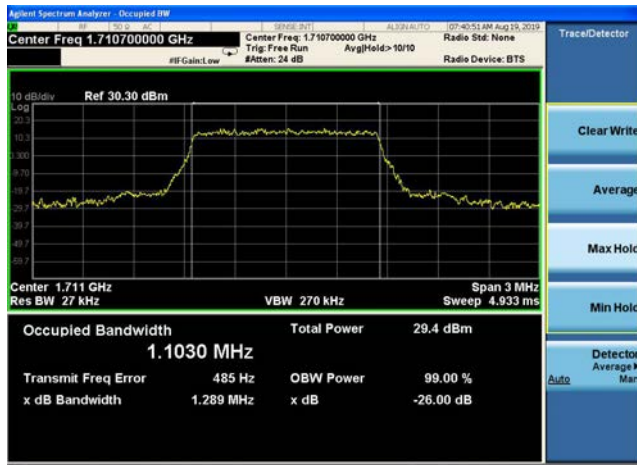
**LTE Band 2 \_ 99% Bandwidth & 26dB Bandwidth****15MHz / QPSK / Low Channel****15MHz / 16QAM / Low Channel****15MHz / QPSK / Middle Channel****15MHz / 16QAM / Middle Channel****15MHz / QPSK / High Channel****15MHz / 16QAM / High Channel**

**LTE Band 2 \_ 99% Bandwidth & 26dB Bandwidth****20MHz / QPSK / Low Channel****20MHz / 16QAM / Low Channel****20MHz / QPSK / Middle Channel****20MHz / 16QAM / Middle Channel****20MHz / QPSK / High Channel****20MHz / 16QAM / High Channel**



## LTE Band 4 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 1.4MHz / QPSK / Low Channel



## 1.4MHz / 16QAM / Low Channel



## 1.4MHz / QPSK / Middle Channel



## 1.4MHz / 16QAM / Middle Channel



## 1.4MHz / QPSK / High Channel



## 1.4MHz / 16QAM / High Channel





## LTE Band 4 \_ 99% Bandwidth &amp; 26dB Bandwidth

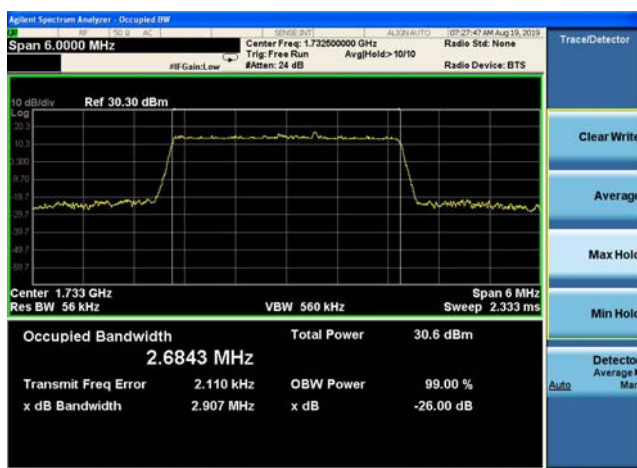
## 3MHz / QPSK / Low Channel



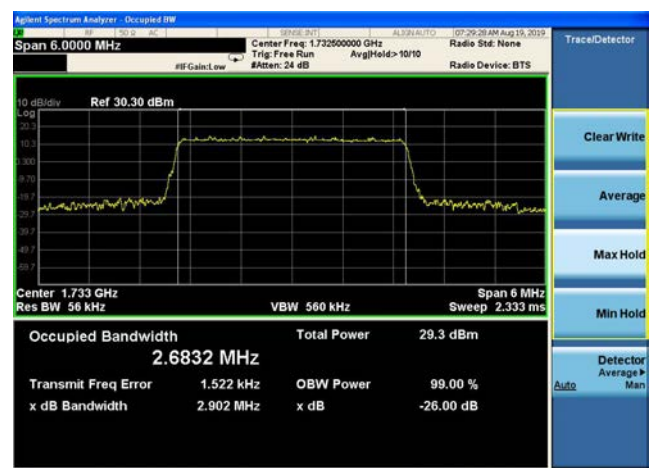
## 3MHz / 16QAM / Low Channel



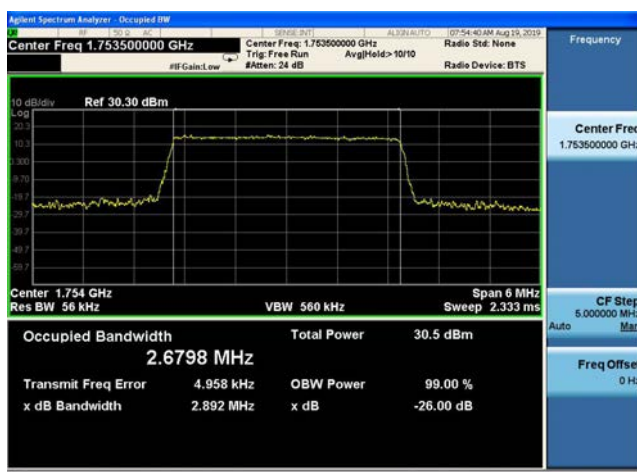
## 3MHz / QPSK / Middle Channel



## 3MHz / 16QAM / Middle Channel



## 3MHz / QPSK / High Channel



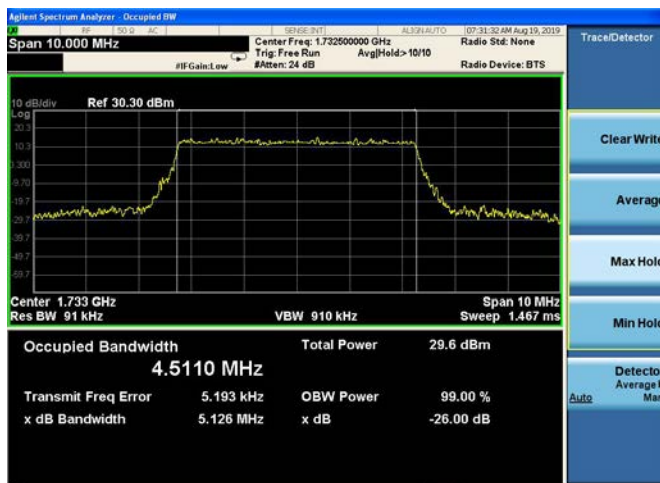
## 3MHz / 16QAM / High Channel





## LTE Band 4 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 5MHz / QPSK / Low Channel



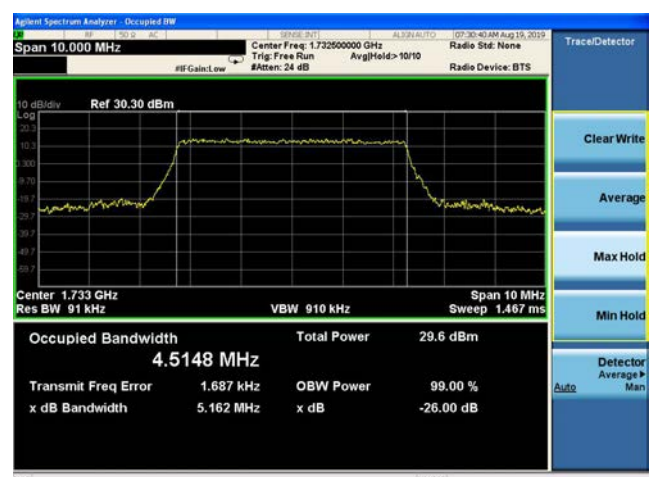
## 5MHz / 16QAM / Low Channel



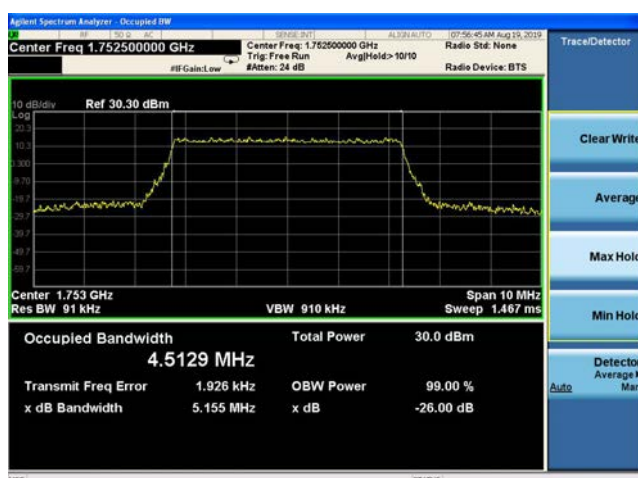
## 5MHz / QPSK / Middle Channel



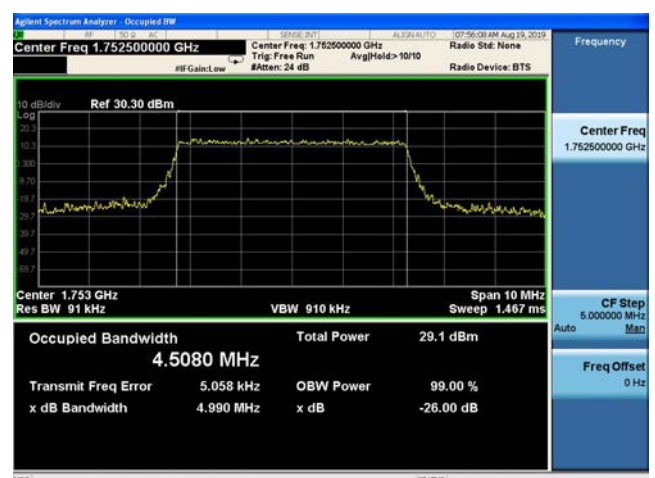
## 5MHz / 16QAM / Middle Channel



## 5MHz / QPSK / High Channel



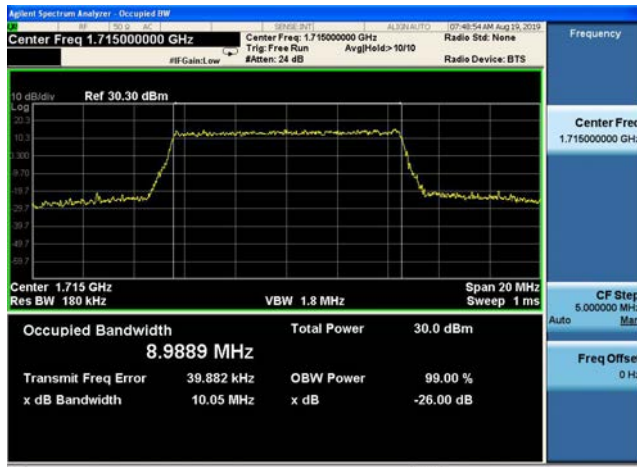
## 5MHz / 16QAM / High Channel



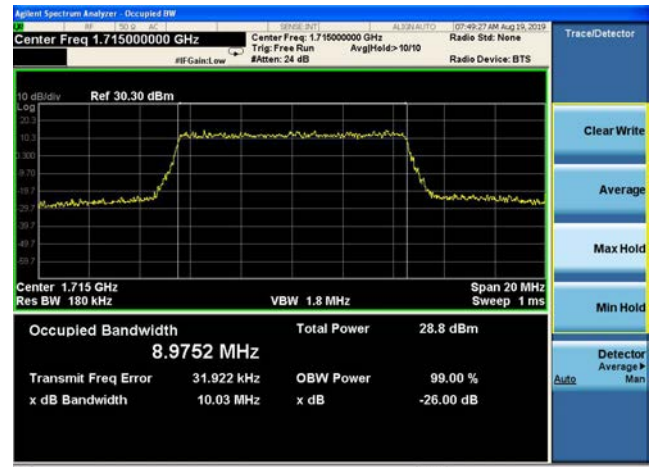


## LTE Band 4 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 10MHz / QPSK / Low Channel



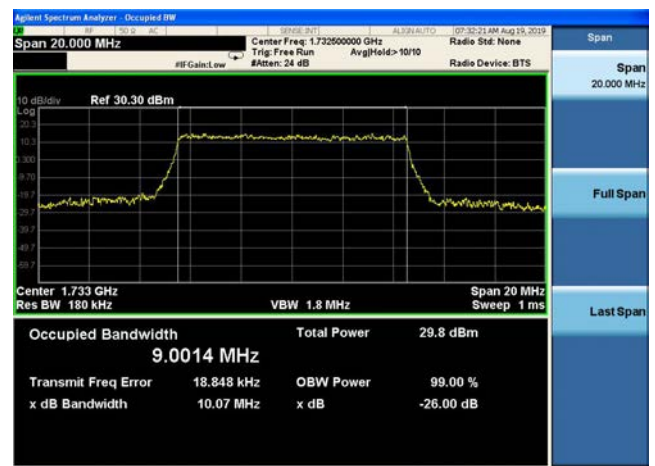
## 10MHz / 16QAM / Low Channel



## 10MHz / QPSK / Middle Channel



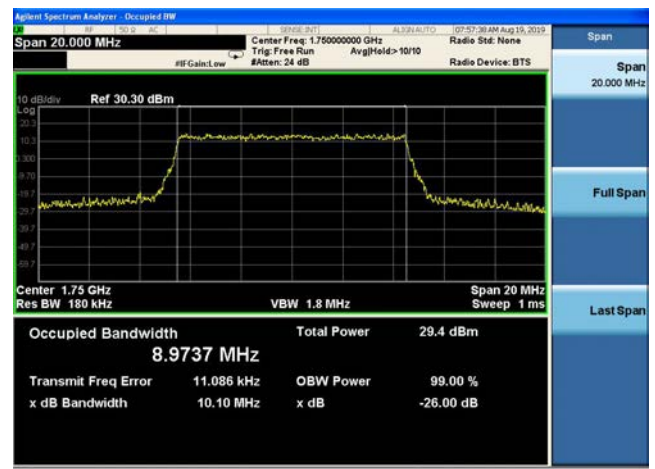
## 10MHz / 16QAM / Middle Channel



## 10MHz / QPSK / High Channel



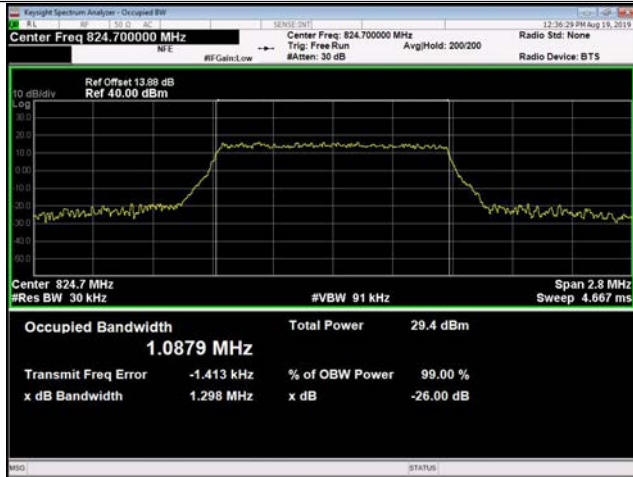
## 10MHz / 16QAM / High Channel



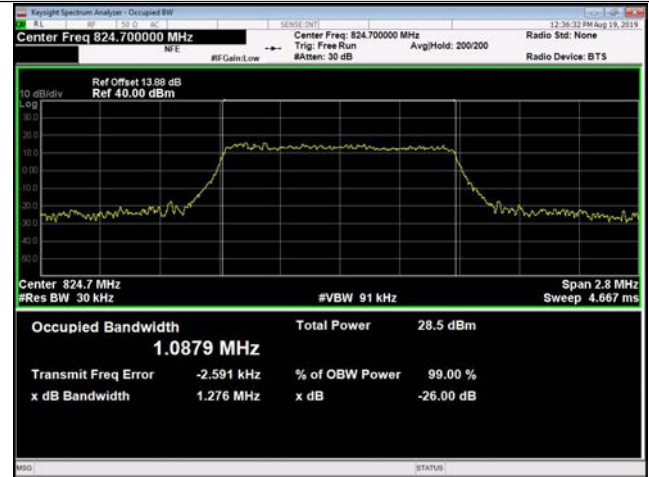


## LTE Band 5 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 1.4MHz / QPSK / Low Channel



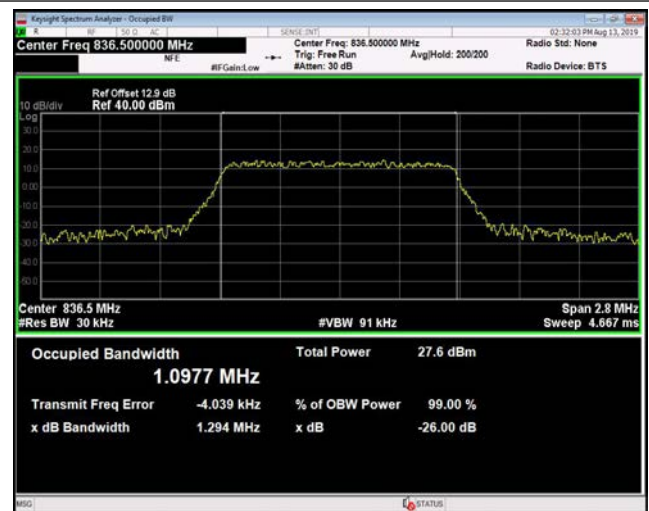
## 1.4MHz / 16QAM / Low Channel



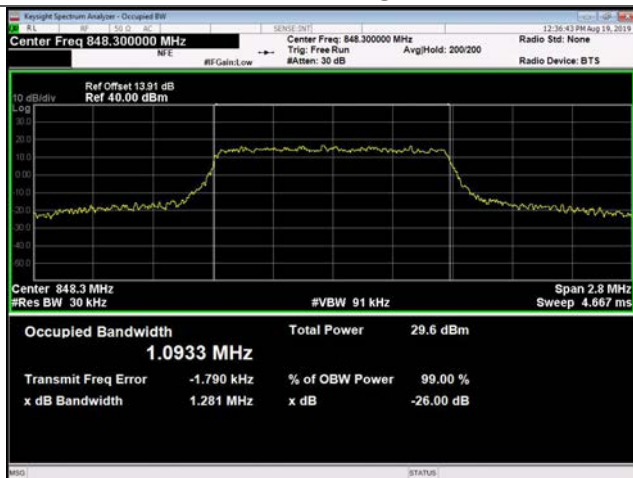
## 1.4MHz / QPSK / Middle Channel



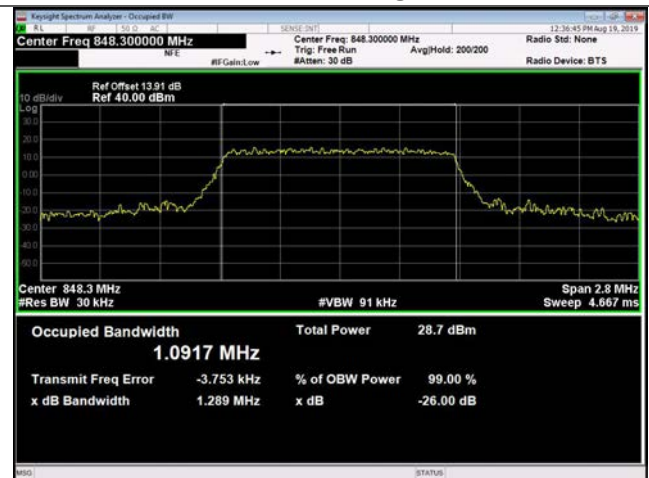
## 1.4MHz / 16QAM / Middle Channel



## 1.4MHz / QPSK / High Channel



## 1.4MHz / 16QAM / High Channel





## LTE Band 5 \_ 99% Bandwidth &amp; 26dB Bandwidth

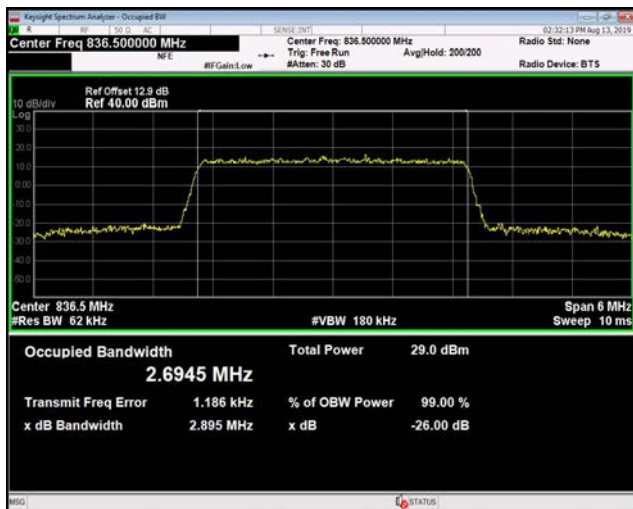
## 3MHz / QPSK / Low Channel



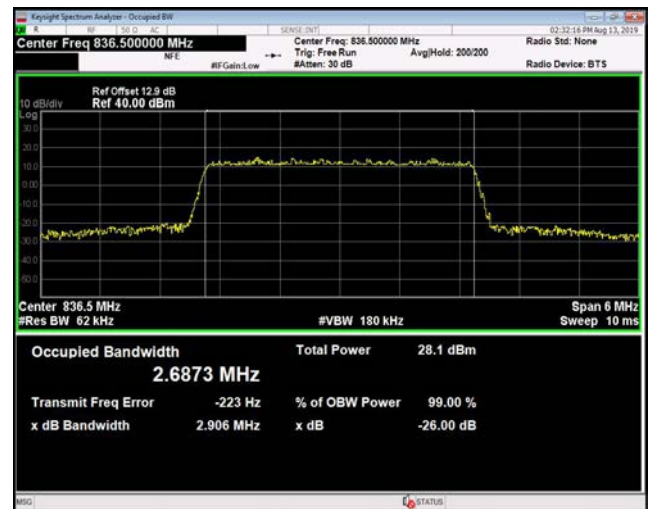
## 3MHz / 16QAM / Low Channel



## 3MHz / QPSK / Middle Channel



## 3MHz / 16QAM / Middle Channel



## 3MHz / QPSK / High Channel



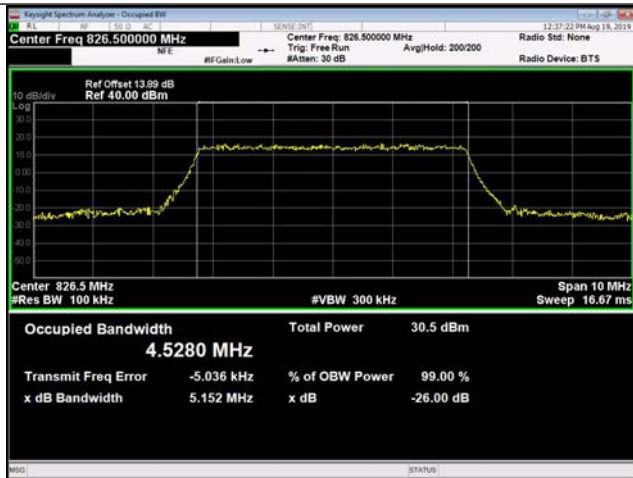
## 3MHz / 16QAM / High Channel



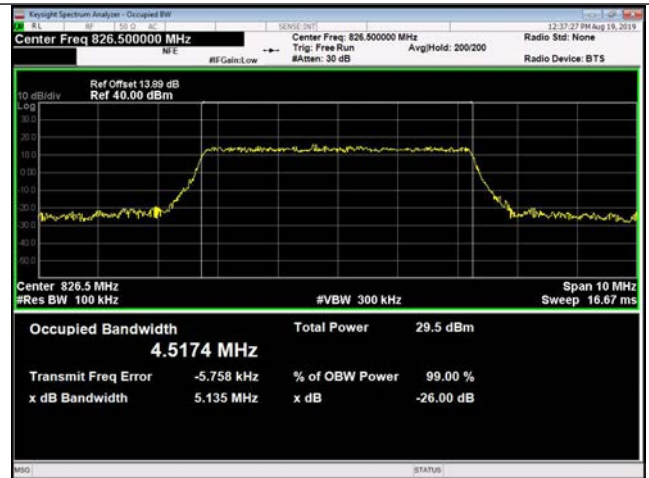


## LTE Band 5 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 5MHz / QPSK / Low Channel



## 5MHz / 16QAM / Low Channel



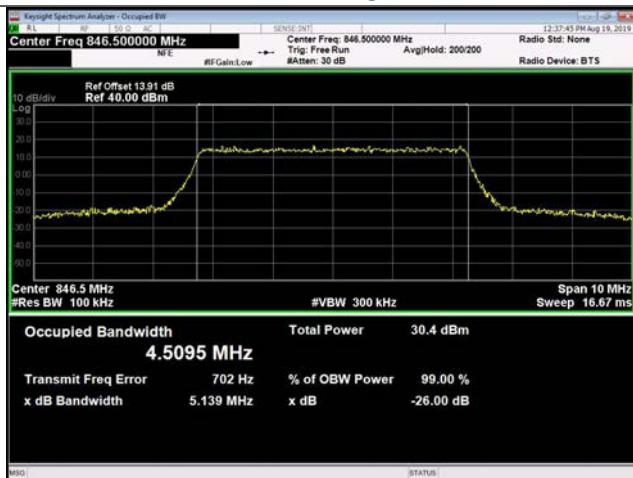
## 5MHz / QPSK / Middle Channel



## 5MHz / 16QAM / Middle Channel



## 5MHz / QPSK / High Channel



## 5MHz / 16QAM / High Channel





## LTE Band 5 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 10MHz / QPSK / Low Channel



## 10MHz / 16QAM / Low Channel



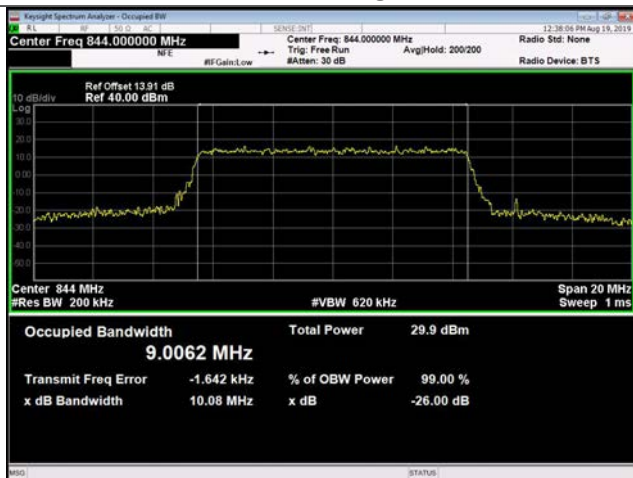
## 10MHz / QPSK / Middle Channel



## 10MHz / 16QAM / Middle Channel



## 10MHz / QPSK / High Channel



## 10MHz / 16QAM / High Channel





## LTE Band 13 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 5MHz / QPSK / Low Channel



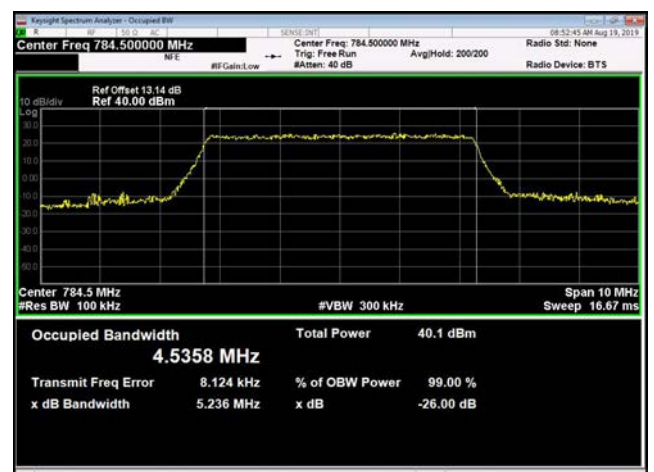
## 5MHz / 16QAM / Low Channel



## 5MHz / QPSK / Middle Channel



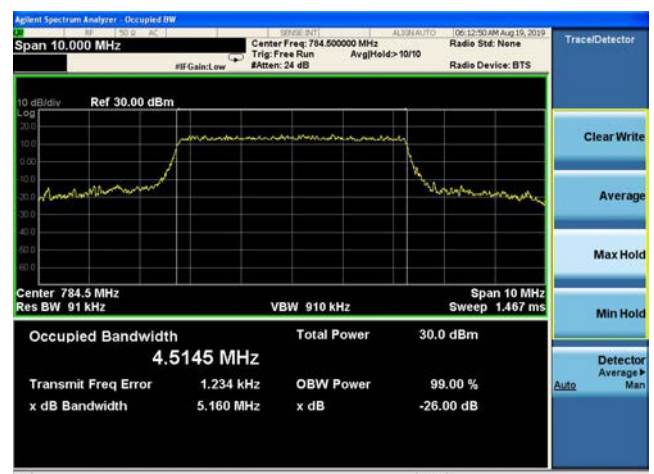
## 5MHz / 16QAM / Middle Channel



## 5MHz / QPSK / High Channel



## 5MHz / 16QAM / High Channel



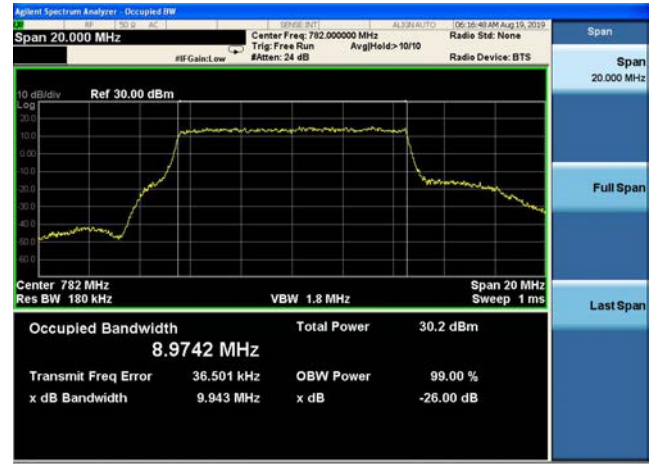


## LTE Band 13 \_ 99% Bandwidth &amp; 26dB Bandwidth

## 10MHz / QPSK / Middle Channel



## 10MHz / 16QAM / Middle Channel





## 2.3. Frequency Stability

### 2.3.1. Requirement

According to FCC section 2.1055 & 27.54&24.235&22.355, 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 -15°C to +55°C at intervals of not more than 10°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 D01v03r01 Section 9.0 and ANSI/TIA-603-E-2016.

**2.3.4. Test Result**

The nominal, highest and lowest extreme voltages are separately 3.85Vdc, 4.35 Vdc and 3.5 Vdc, which are specified by the applicant; the normal temperature here used is 20°C.

| <b>LTE Band 2, QPSK, Channel 18900, Frequency 1880.0MHz</b> |                  |                       |                  |               |
|-------------------------------------------------------------|------------------|-----------------------|------------------|---------------|
| <b>Limit =Within Authorized Band</b>                        |                  |                       |                  |               |
| <b>Power (VDC)</b>                                          | <b>Temp (°C)</b> | <b>Fre. Dev. (Hz)</b> | <b>Deviation</b> | <b>Result</b> |
|                                                             |                  |                       | <b>(ppm)</b>     |               |
| 3.8                                                         | +20(Ref)         | 23                    | 0.012            | PASS          |
|                                                             | -15              | 25                    | 0.013            |               |
|                                                             | -5               | -62                   | -0.033           |               |
|                                                             | +5               | 54                    | 0.029            |               |
|                                                             | +15              | -25                   | -0.013           |               |
|                                                             | +25              | -48                   | -0.026           |               |
|                                                             | +35              | 31                    | 0.016            |               |
|                                                             | +45              | 32                    | 0.017            |               |
|                                                             | +55              | 42                    | 0.022            |               |
| 4.35                                                        | +20              | 16                    | 0.009            | PASS          |
| 3.5                                                         | +20              | -36                   | -0.019           |               |

| <b>LTE Band 4, QPSK, Channel 20175, Frequency 1732.5MHz</b> |                  |                       |                  |               |
|-------------------------------------------------------------|------------------|-----------------------|------------------|---------------|
| <b>Limit =Within Authorized Band</b>                        |                  |                       |                  |               |
| <b>Power (VDC)</b>                                          | <b>Temp (°C)</b> | <b>Fre. Dev. (Hz)</b> | <b>Deviation</b> | <b>Result</b> |
|                                                             |                  |                       | <b>(ppm)</b>     |               |
| 3.8                                                         | +20(Ref)         | 4.3                   | 0.002            | PASS          |
|                                                             | -15              | -77                   | -0.044           |               |
|                                                             | -5               | 46                    | 0.027            |               |
|                                                             | +5               | 4                     | 0.002            |               |
|                                                             | +15              | -65                   | -0.038           |               |
|                                                             | +25              | 52                    | 0.030            |               |
|                                                             | +35              | 31                    | 0.018            |               |
|                                                             | +45              | 32                    | 0.018            |               |
|                                                             | +55              | 35.2                  | 0.020            |               |
| 4.35                                                        | +20              | 25                    | 0.014            | PASS          |
| 3.5                                                         | +20              | -56                   | -0.032           |               |



| LTE Band 5, QPSK, Channel 20525, Frequency 836.5MHz |           |                |                 |        |
|-----------------------------------------------------|-----------|----------------|-----------------|--------|
| Limit =Within Authorized Band                       |           |                |                 |        |
| Power (VDC)                                         | Temp (°C) | Fre. Dev. (Hz) | Deviation (ppm) | Result |
| 3.8                                                 | +20(Ref)  | 5.3            | 0.006           | PASS   |
|                                                     | -15       | -87            | -0.104          |        |
|                                                     | -5        | 43             | 0.051           |        |
|                                                     | +5        | 14             | 0.017           |        |
|                                                     | +15       | -75            | -0.090          |        |
|                                                     | +25       | 35             | 0.042           |        |
|                                                     | +35       | 31             | 0.037           |        |
|                                                     | +45       | 12             | 0.014           |        |
|                                                     | +55       | 35.6           | 0.043           |        |
| 4.35                                                | +20       | 8              | 0.010           | PASS   |
| 3.5                                                 | +20       | -66            | -0.079          |        |

| LTE Band 13, QPSK, Channel 23230, Frequency 782MHz |           |                |                 |        |
|----------------------------------------------------|-----------|----------------|-----------------|--------|
| Limit =Within Authorized Band                      |           |                |                 |        |
| Power (VDC)                                        | Temp (°C) | Fre. Dev. (Hz) | Deviation (ppm) | Result |
| 3.85                                               | +20(Ref)  | 13             | 0.017           | PASS   |
|                                                    | -15       | 33             | 0.042           |        |
|                                                    | -5        | 54             | 0.069           |        |
|                                                    | +5        | -96            | -0.123          |        |
|                                                    | +15       | 39             | 0.050           |        |
|                                                    | +25       | 38             | 0.049           |        |
|                                                    | +35       | 21             | 0.027           |        |
|                                                    | +45       | 14             | 0.018           |        |
|                                                    | +55       | -33            | -0.042          |        |
| 4.4                                                | +20       | 35             | 0.045           | PASS   |
| 3.5                                                | +20       | 54             | 0.069           |        |

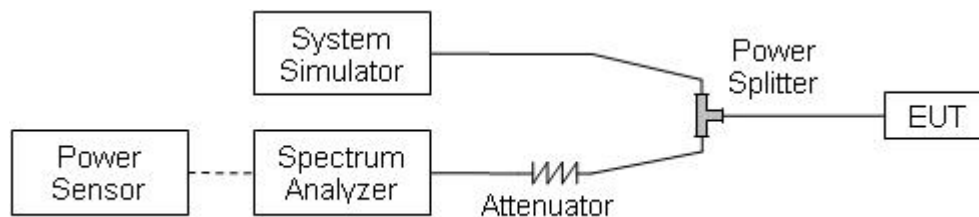
## 2.4. Peak to Average Ratio

### 2.4.1. Requirement

According to FCC section 24.232(d)&27.50(d)(5)&22.913(d), 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 D01v03r01 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%.

| LTE Band 2         |         |                           |       |
|--------------------|---------|---------------------------|-------|
| Bandwidth<br>(MHz) | Channel | Peak to Average Ratio(dB) |       |
|                    |         | QPSK                      | 16QAM |
| 1.4                | Low     | 4.19                      | 5.30  |
|                    | Middle  | 4.39                      | 5.35  |
|                    | High    | 3.17                      | 4.37  |
| 3                  | Low     | 4.13                      | 5.05  |
|                    | Middle  | 4.37                      | 5.16  |
|                    | High    | 3.37                      | 4.38  |
| 5                  | Low     | 5.02                      | 5.71  |
|                    | Middle  | 4.53                      | 5.30  |
|                    | High    | 5.04                      | 5.73  |
| 10                 | Low     | 4.20                      | 5.11  |
|                    | Middle  | 4.32                      | 5.22  |
|                    | High    | 4.03                      | 4.94  |
| 15                 | Low     | 4.21                      | 5.14  |
|                    | Middle  | 5.26                      | 5.11  |
|                    | High    | 4.14                      | 5.04  |
| 20                 | Low     | 4.34                      | 5.11  |
|                    | Middle  | 4.29                      | 4.07  |
|                    | High    | 5.37                      | 5.83  |

| LTE Band 4         |         |                           |       |
|--------------------|---------|---------------------------|-------|
| Bandwidth<br>(MHz) | Channel | Peak to Average Ratio(dB) |       |
|                    |         | QPSK                      | 16QAM |
| 1.4                | Low     | 5.86                      | 5.67  |
|                    | Middle  | 6.03                      | 6.00  |
|                    | High    | 4.73                      | 5.58  |
| 3                  | Low     | 5.34                      | 6.13  |
|                    | Middle  | 5.40                      | 5.55  |
|                    | High    | 5.13                      | 6.04  |
| 5                  | Low     | 5.89                      | 6.25  |
|                    | Middle  | 5.41                      | 6.24  |
|                    | High    | 5.15                      | 5.40  |
| 10                 | Low     | 5.89                      | 6.11  |
|                    | Middle  | 5.82                      | 6.15  |
|                    | High    | 5.79                      | 6.07  |
| 15                 | Low     | 5.04                      | 5.22  |
|                    | Middle  | 6.09                      | 6.26  |
|                    | High    | 5.99                      | 6.27  |
| 20                 | Low     | 5.21                      | 6.25  |
|                    | Middle  | 5.65                      | 6.20  |
|                    | High    | 5.50                      | 6.25  |



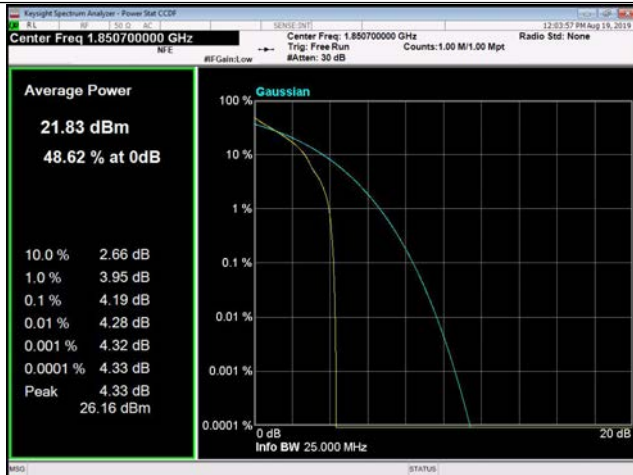
| LTE Band 5         |         |                           |       |
|--------------------|---------|---------------------------|-------|
| Bandwidth<br>(MHz) | Channel | Peak to Average Ratio(dB) |       |
|                    |         | QPSK                      | 16QAM |
| 1.4                | Low     | 4.78                      | 5.71  |
|                    | Middle  | 4.09                      | 5.06  |
|                    | High    | 3.88                      | 4.86  |
| 3                  | Low     | 4.96                      | 5.86  |
|                    | Middle  | 3.99                      | 4.85  |
|                    | High    | 4.25                      | 5.21  |
| 5                  | Low     | 5.05                      | 5.85  |
|                    | Middle  | 4.19                      | 4.94  |
|                    | High    | 4.48                      | 5.40  |
| 10                 | Low     | 5.00                      | 5.85  |
|                    | Middle  | 4.24                      | 5.08  |
|                    | High    | 4.74                      | 5.63  |

| LTE Band 13        |         |                           |       |
|--------------------|---------|---------------------------|-------|
| Bandwidth<br>(MHz) | Channel | Peak to Average Ratio(dB) |       |
|                    |         | QPSK                      | 16QAM |
| 5                  | Low     | 4.67                      | 5.35  |
|                    | Middle  | 4.76                      | 5.39  |
|                    | High    | 4.59                      | 4.71  |
| 10                 | Low     | /                         | /     |
|                    | Middle  | 4.60                      | 5.40  |
|                    | High    | /                         | /     |

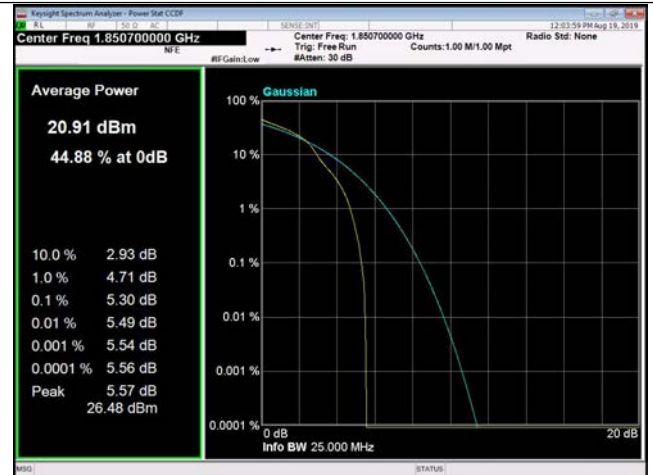


## LTE Band 2 \_ Peak-to-Average Radio

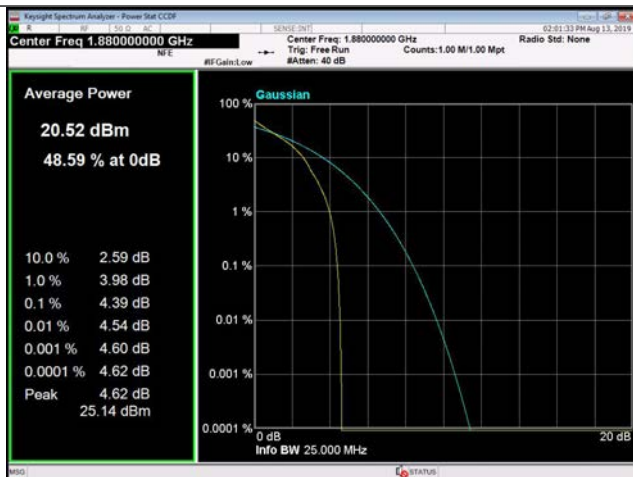
## 1.4MHz / QPSK / Low Channel



## 1.4MHz / 16QAM / Low Channel



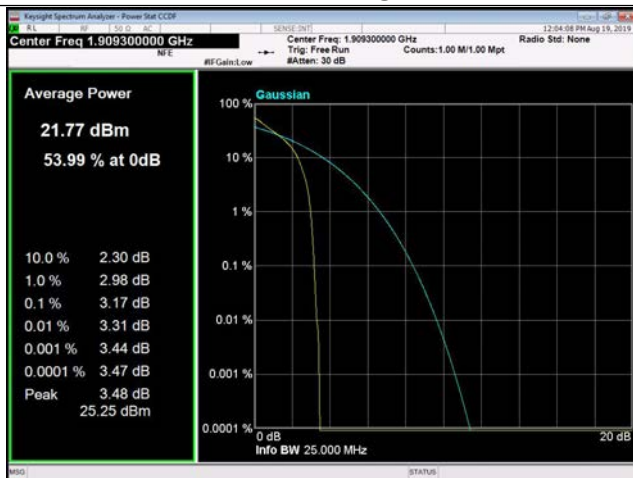
## 1.4MHz / QPSK / Middle Channel



## 1.4MHz / 16QAM / Middle Channel

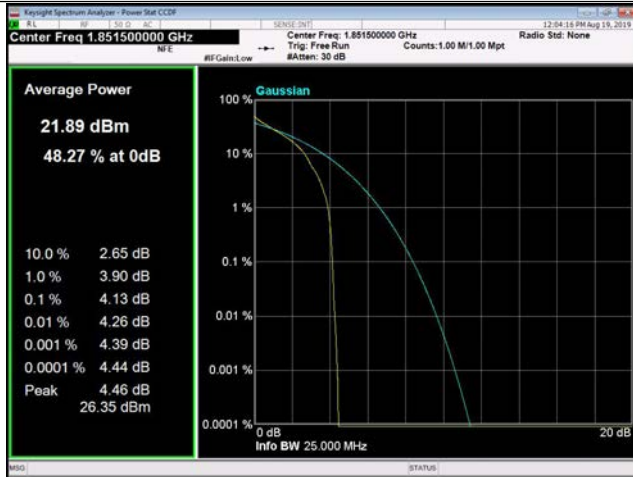
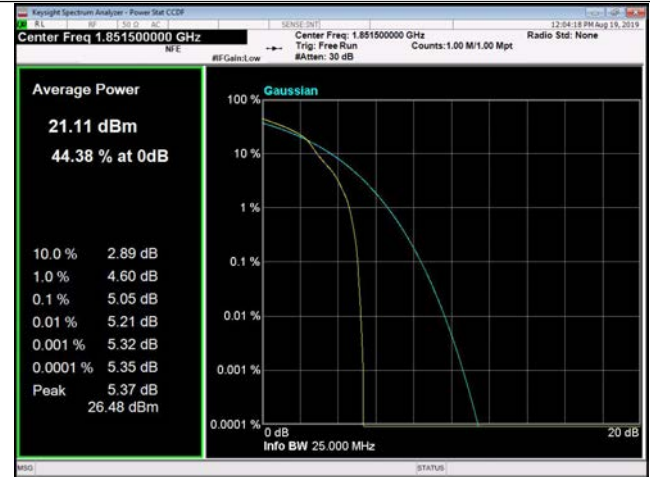
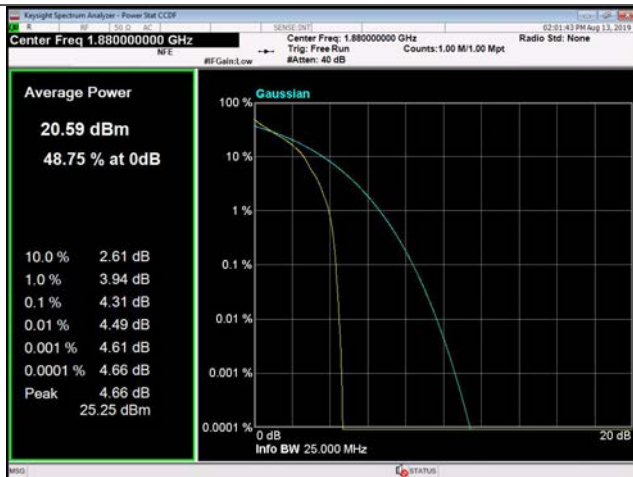
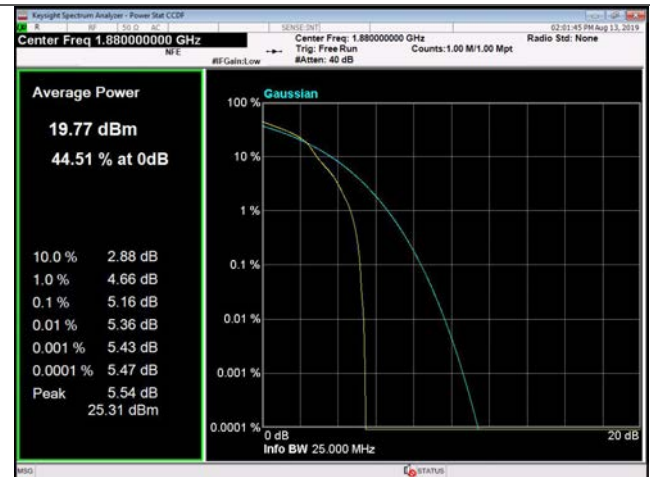
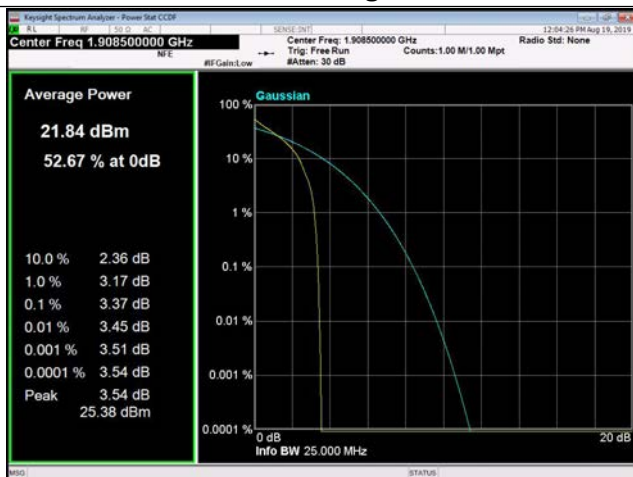
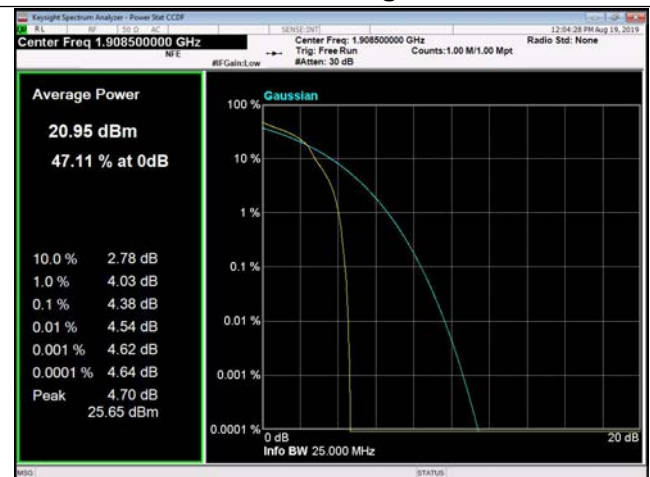


## 1.4MHz / QPSK / High Channel



## 1.4MHz / 16QAM / High Channel



**LTE Band 2 \_ Peak-to-Average Radio****3MHz / QPSK / Low Channel****3MHz / 16QAM / Low Channel****3MHz / QPSK / Middle Channel****3MHz / 16QAM / Middle Channel****3MHz / QPSK / High Channel****3MHz / 16QAM / High Channel**

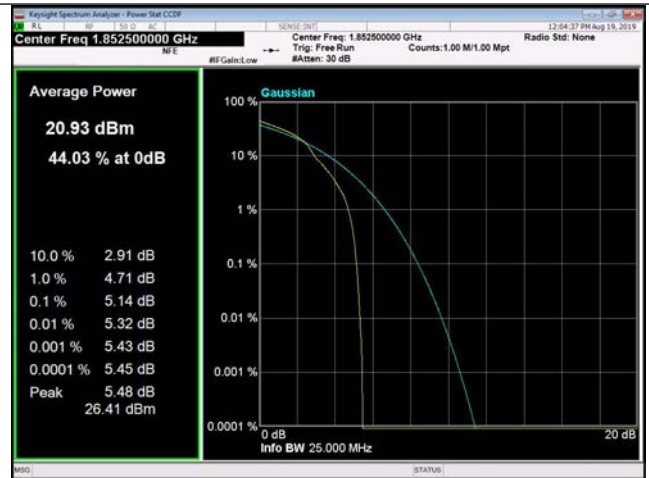


## LTE Band 2 \_ Peak-to-Average Ratio

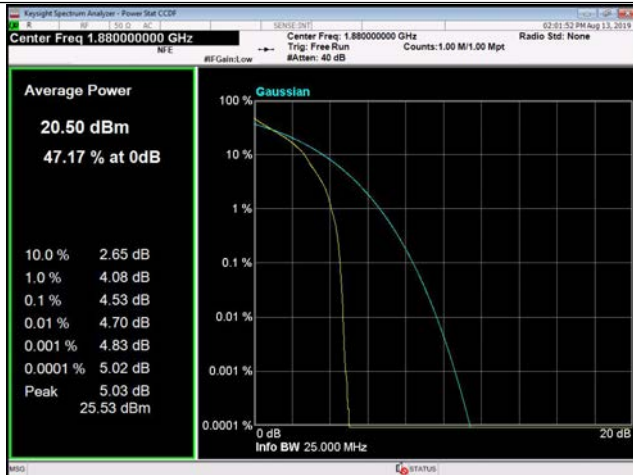
## 5MHz / QPSK / Low Channel



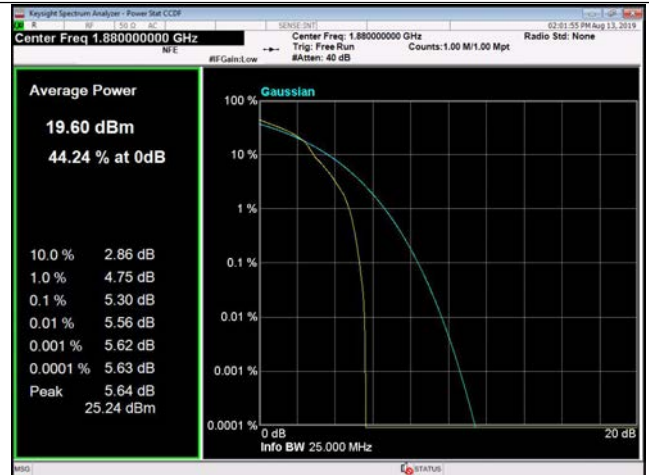
## 5MHz / 16QAM / Low Channel



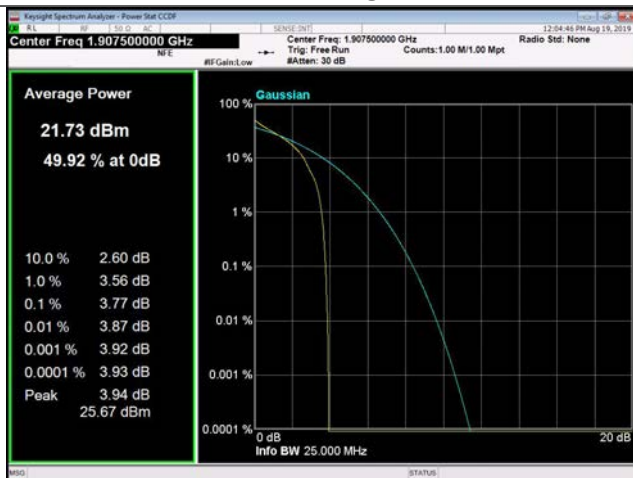
## 5MHz / QPSK / Middle Channel



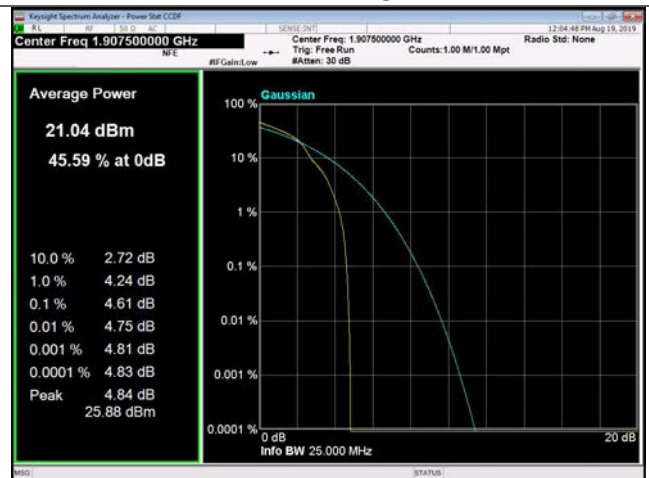
## 5MHz / 16QAM / Middle Channel



## 5MHz / QPSK / High Channel



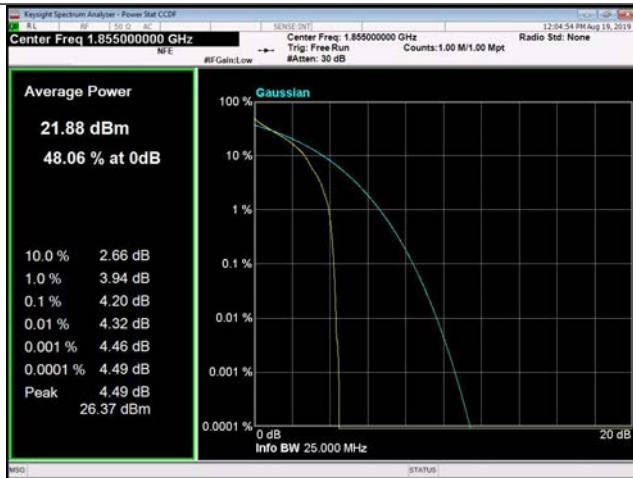
## 5MHz / 16QAM / High Channel



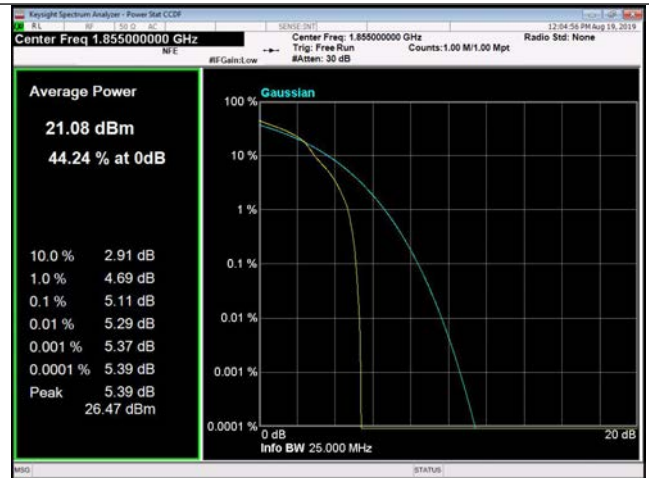


## LTE Band 2 \_ Peak-to-Average Ratio

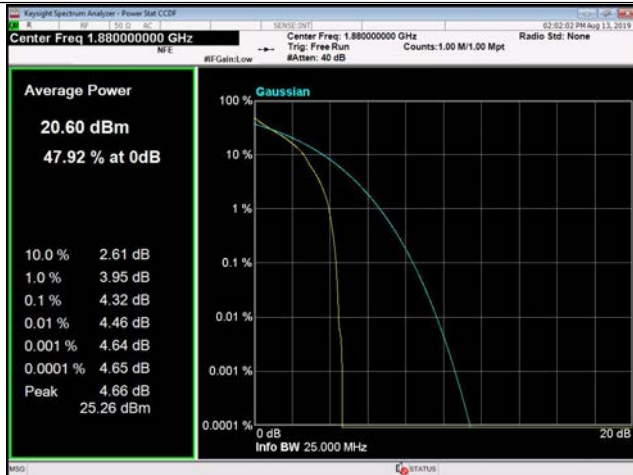
## 10MHz / QPSK / Low Channel



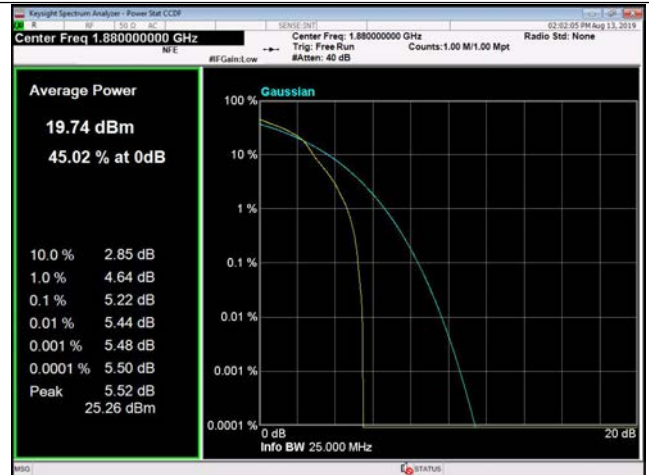
## 10MHz / 16QAM / Low Channel



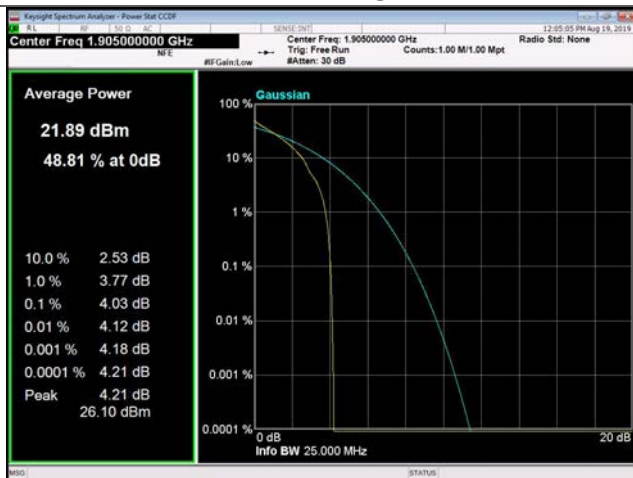
## 10MHz / QPSK / Middle Channel



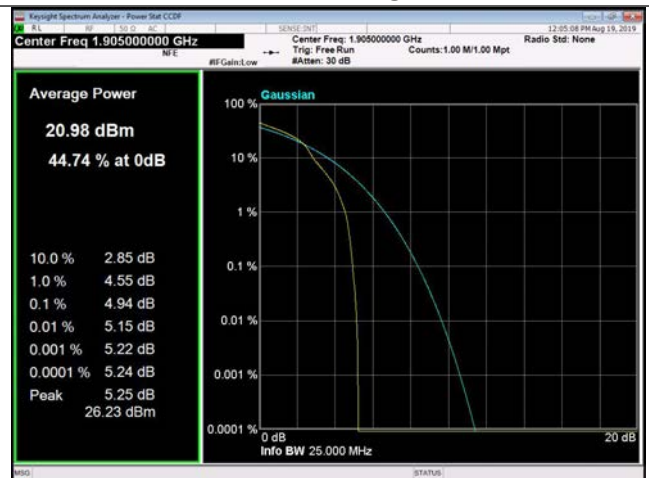
## 10MHz / 16QAM / Middle Channel



## 10MHz / QPSK / High Channel



## 10MHz / 16QAM / High Channel



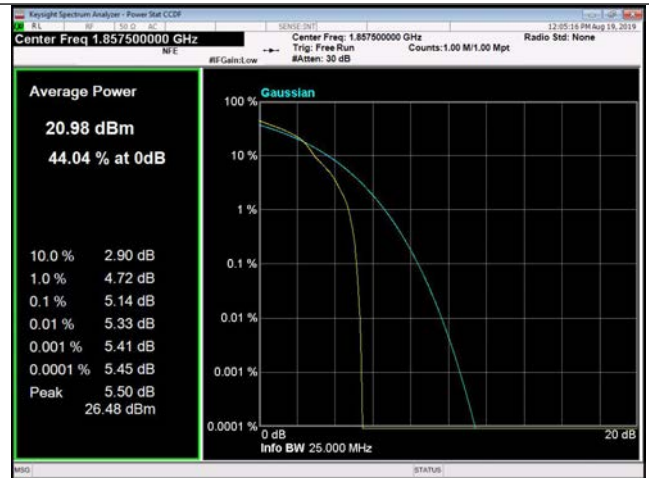


## LTE Band 2 \_ Peak-to-Average Ratio

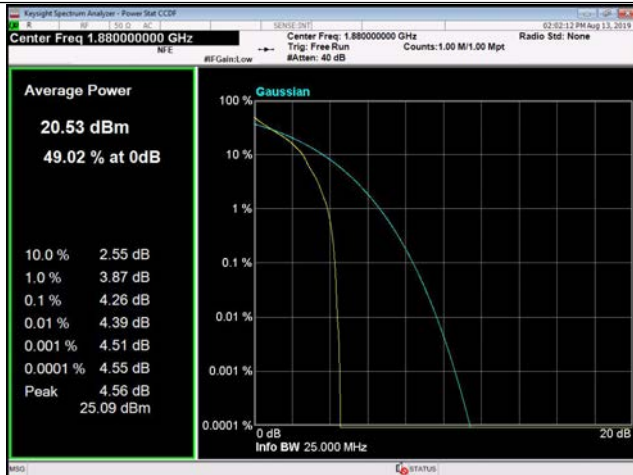
## 15MHz / QPSK / Low Channel



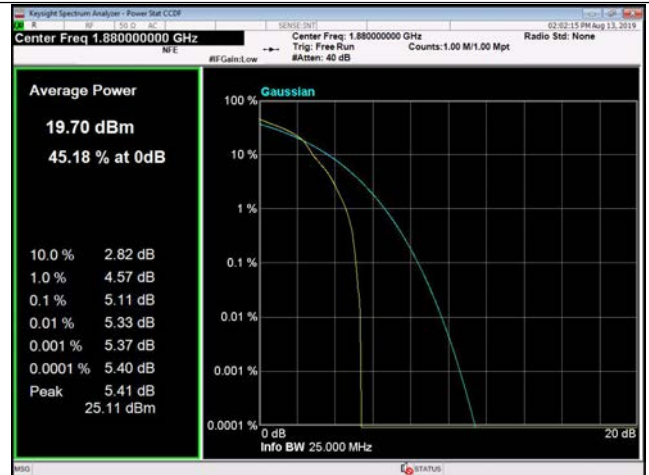
## 15MHz / 16QAM / Low Channel



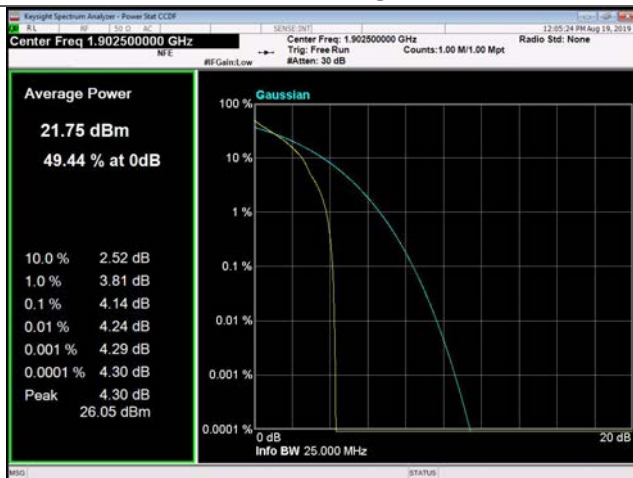
## 15MHz / QPSK / Middle Channel



## 15MHz / 16QAM / Middle Channel



## 15MHz / QPSK / High Channel



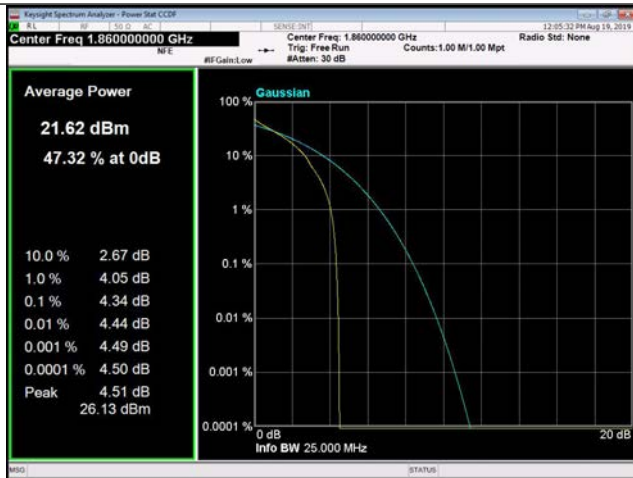
## 15MHz / 16QAM / High Channel



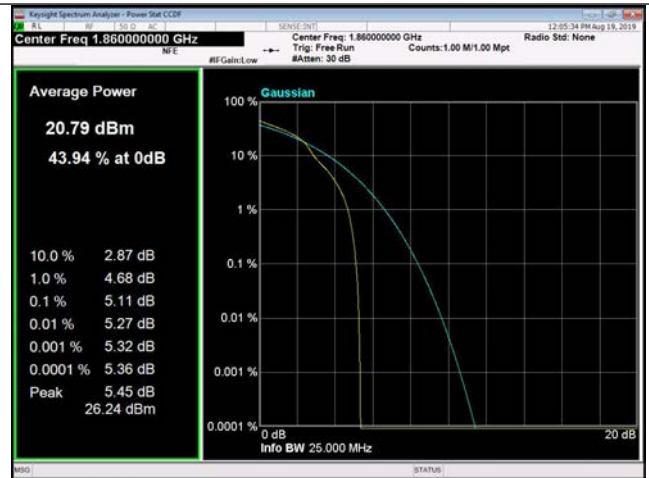


## LTE Band 2 \_ Peak-to-Average Radio

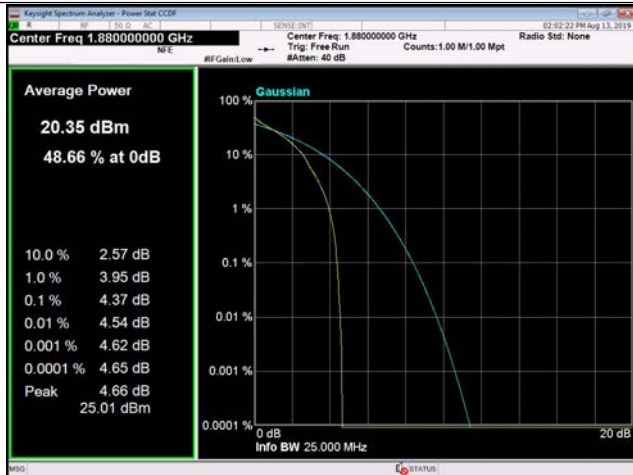
## 20MHz / QPSK / Low Channel



## 20MHz / 16QAM / Low Channel



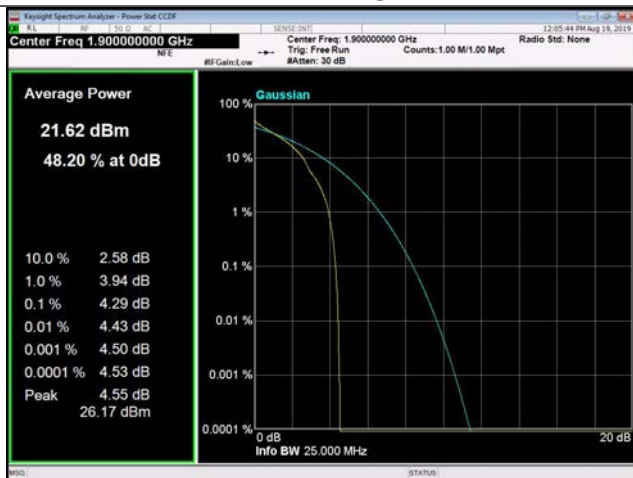
## 20MHz / QPSK / Middle Channel



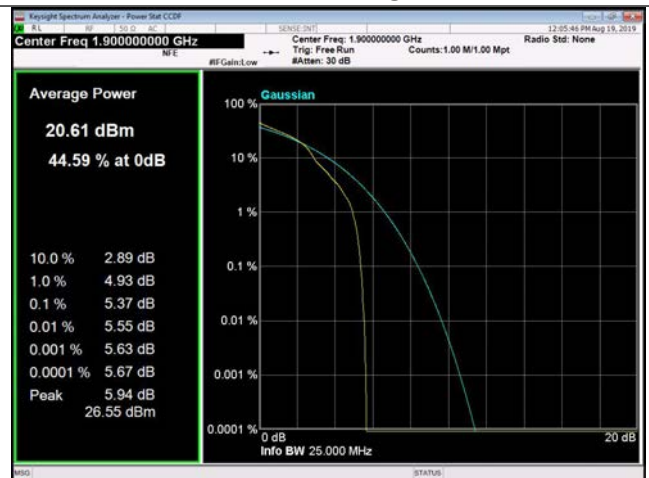
## 20MHz / 16QAM / Middle Channel



## 20MHz / QPSK / High Channel



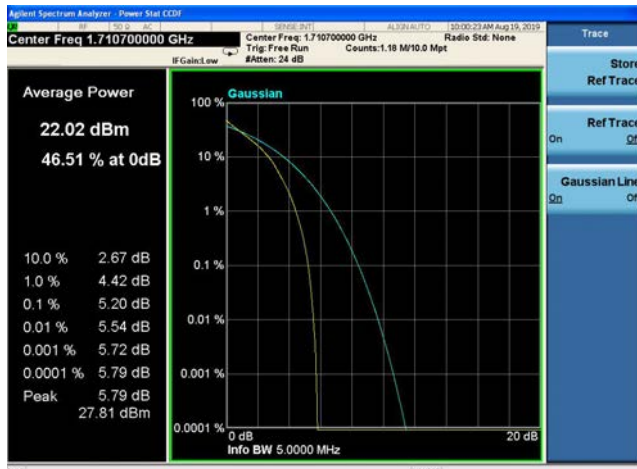
## 20MHz / 16QAM / High Channel





## LTE Band 4 \_ Peak-to-Average Radio

## 1.4MHz / QPSK / Low Channel



## 1.4MHz / 16QAM / Low Channel



## 1.4MHz / QPSK / Middle Channel



## 1.4MHz / 16QAM / Middle Channel



## 1.4MHz / QPSK / High Channel



## 1.4MHz / 16QAM / High Channel





## LTE Band 4 \_ Peak-to-Average Radio

## 3MHz / QPSK / Low Channel



## 3MHz / 16QAM / Low Channel



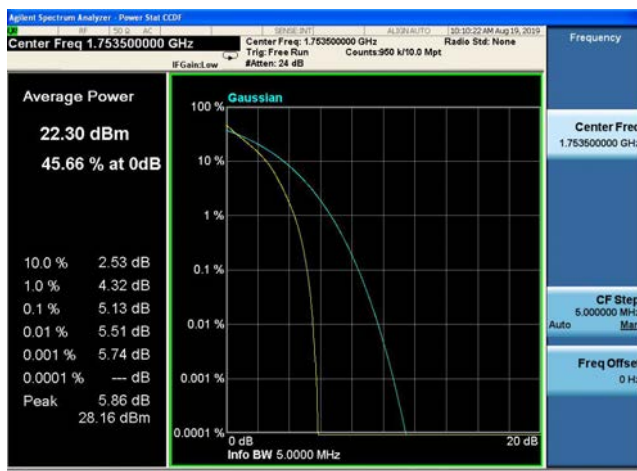
## 3MHz / QPSK / Middle Channel



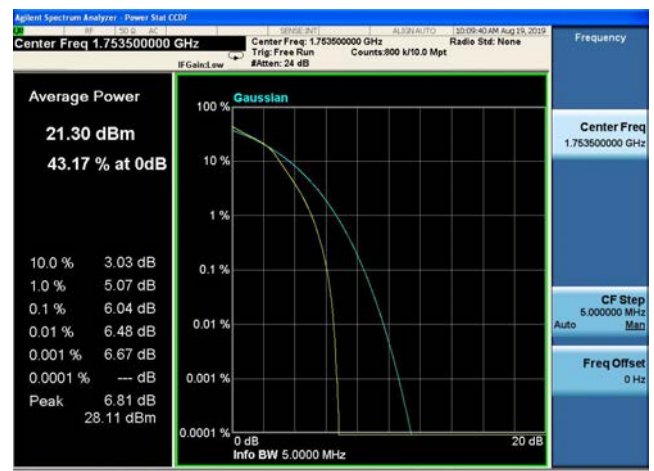
## 3MHz / 16QAM / Middle Channel



## 3MHz / QPSK / High Channel



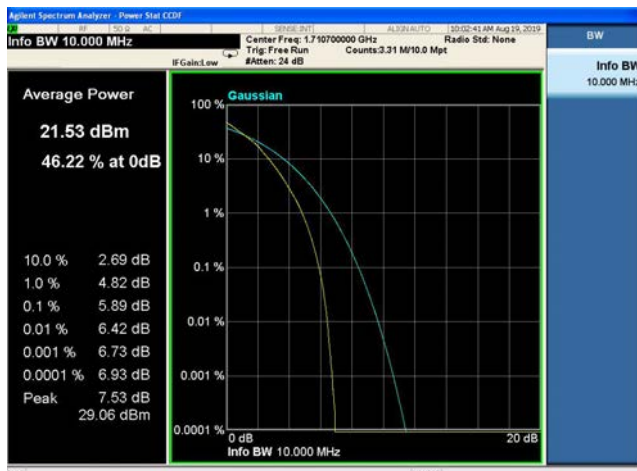
## 3MHz / 16QAM / High Channel





## LTE Band 4 \_ Peak-to-Average Ratio

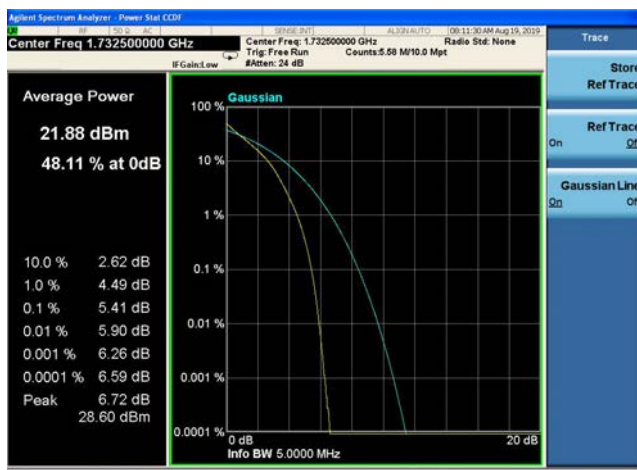
## 5MHz / QPSK / Low Channel



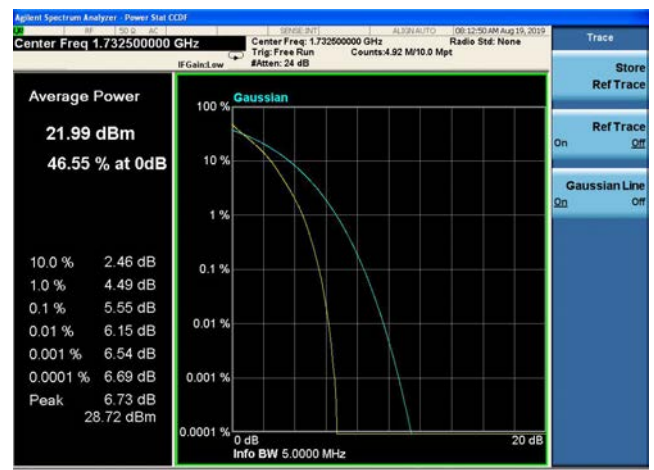
## 5MHz / 16QAM / Low Channel



## 5MHz / QPSK / Middle Channel



## 5MHz / 16QAM / Middle Channel



## 5MHz / QPSK / High Channel



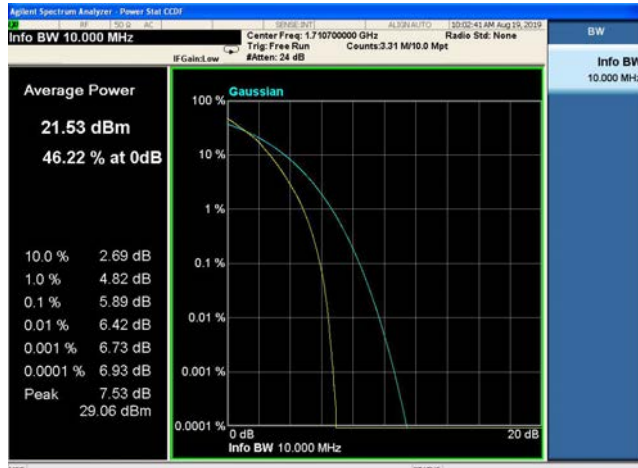
## 5MHz / 16QAM / High Channel





## LTE Band 4 \_ Peak-to-Average Radio

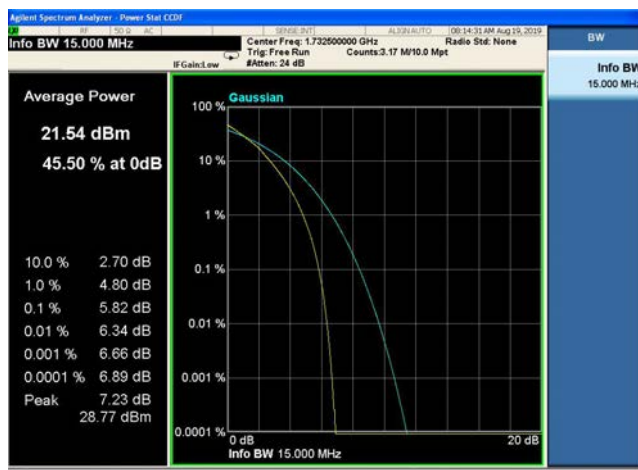
## 10MHz / QPSK / Low Channel



## 10MHz / 16QAM / Low Channel



## 10MHz / QPSK / Middle Channel



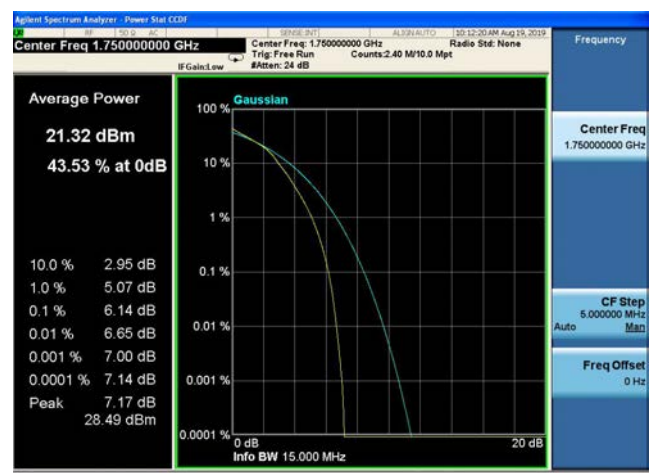
## 10MHz / 16QAM / Middle Channel



## 10MHz / QPSK / High Channel

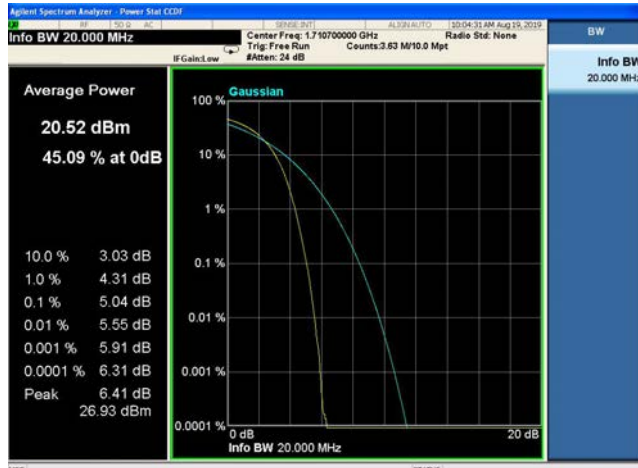


## 10MHz / 16QAM / High Channel



# LTE Band 4 \_ Peak-to-Average Radio

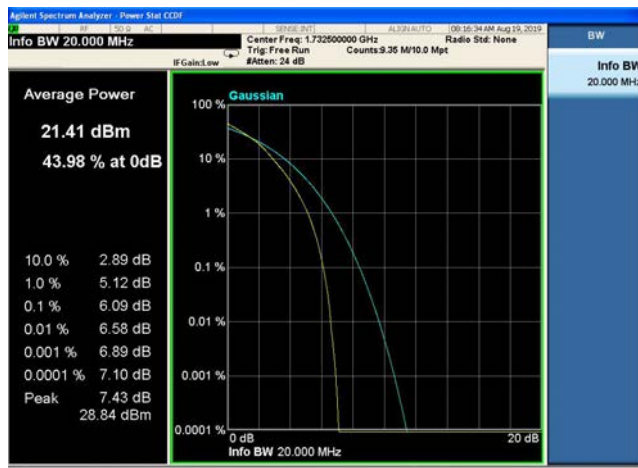
## 15MHz / QPSK / Low Channel



## 15MHz / 16QAM / Low Channel



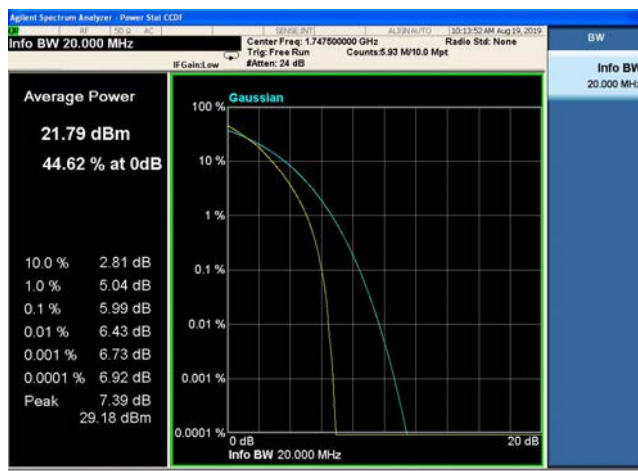
## 15MHz / QPSK / Middle Channel



## 15MHz / 16QAM / Middle Channel



## 15MHz / QPSK / High Channel



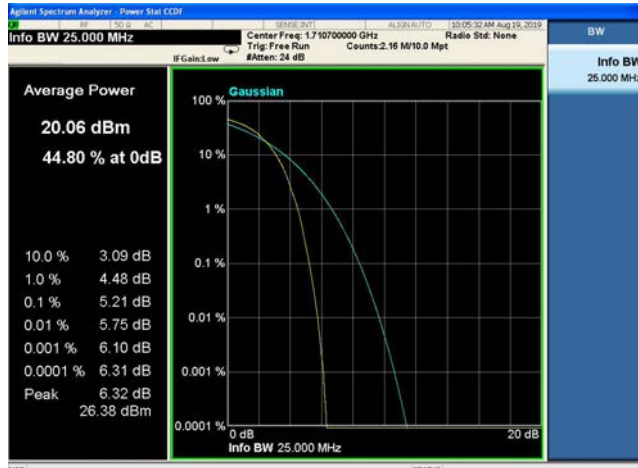
## 15MHz / 16QAM / High Channel





## LTE Band 4 \_ Peak-to-Average Radio

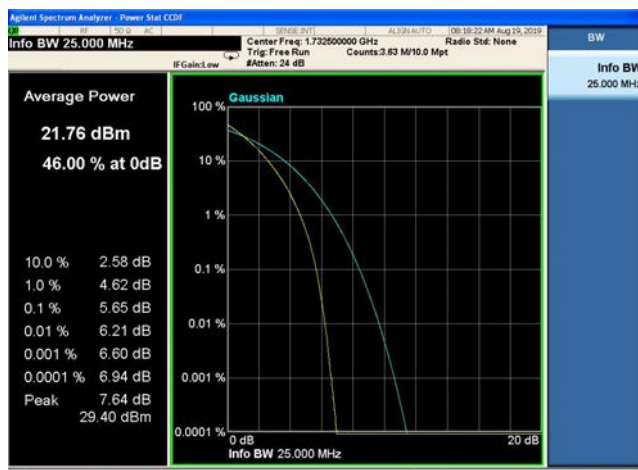
## 20MHz / QPSK / Low Channel



## 20MHz / 16QAM / Low Channel



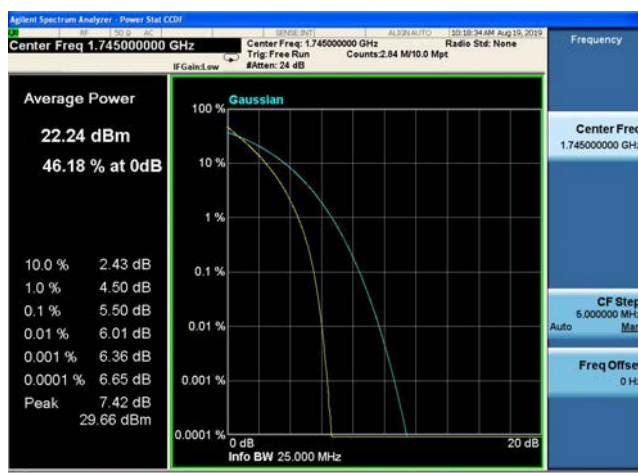
## 20MHz / QPSK / Middle Channel



## 20MHz / 16QAM / Middle Channel



## 20MHz / QPSK / High Channel



## 20MHz / 16QAM / High Channel

