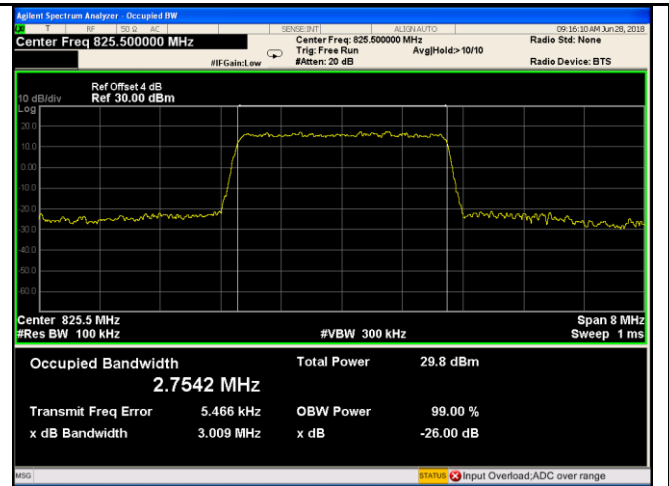
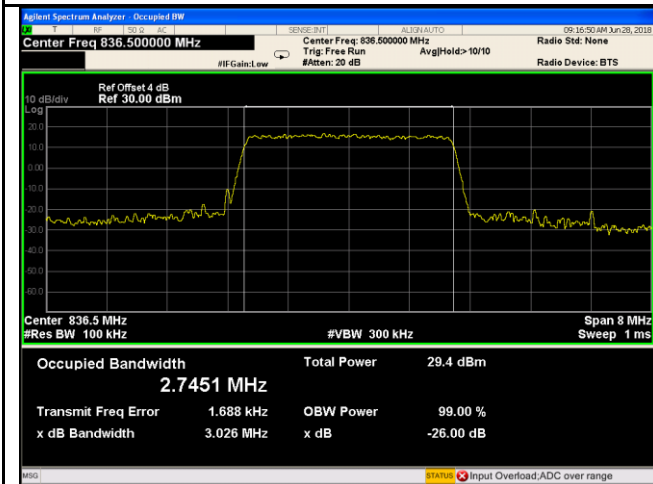


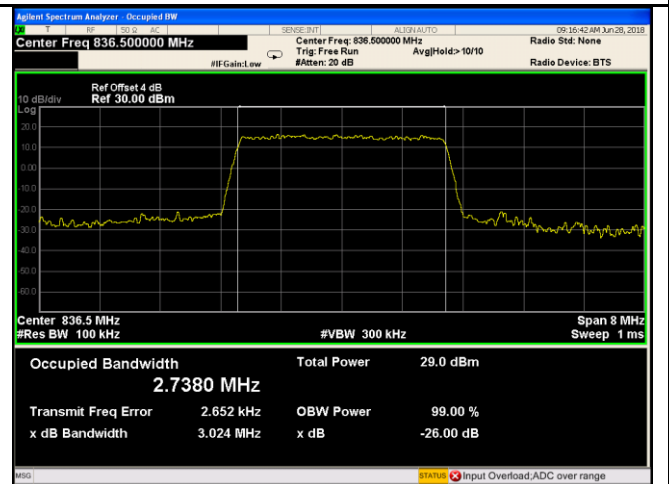
LTE Band V - Low CH QPSK-3



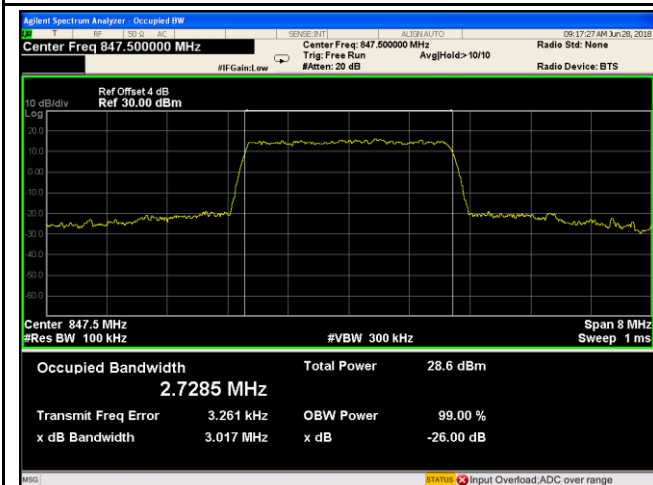
LTE Band V - Low CH 16QAM-3



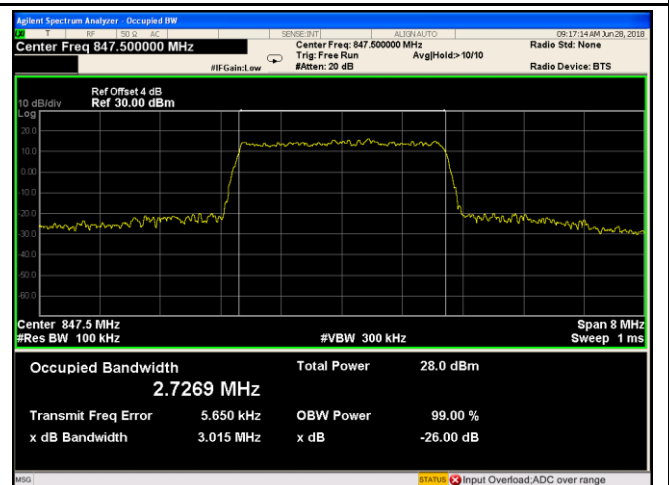
LTE Band V - Middle CH QPSK-3



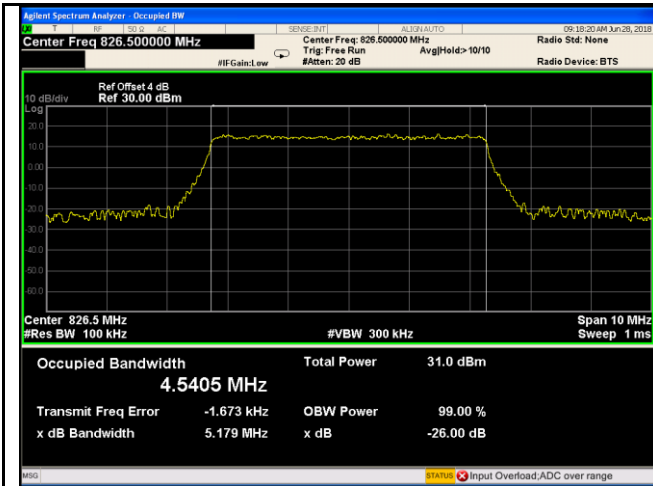
LTE Band V - Middle CH 16QAM-3



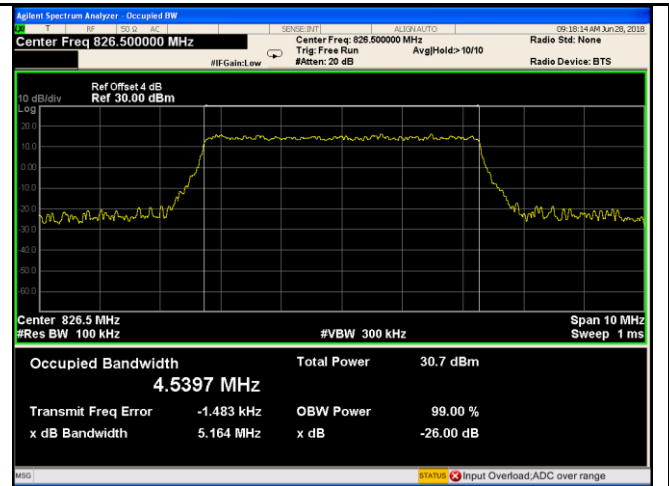
LTE Band V - High CH QPSK-3



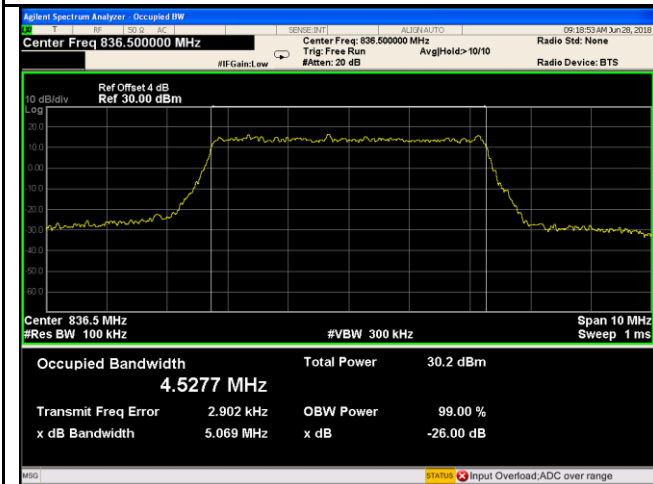
LTE Band V - High CH 16QAM-3



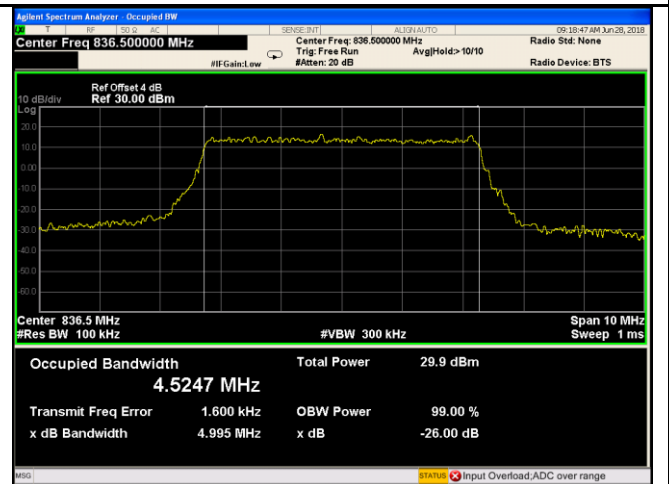
LTE Band V - Low CH QPSK-5



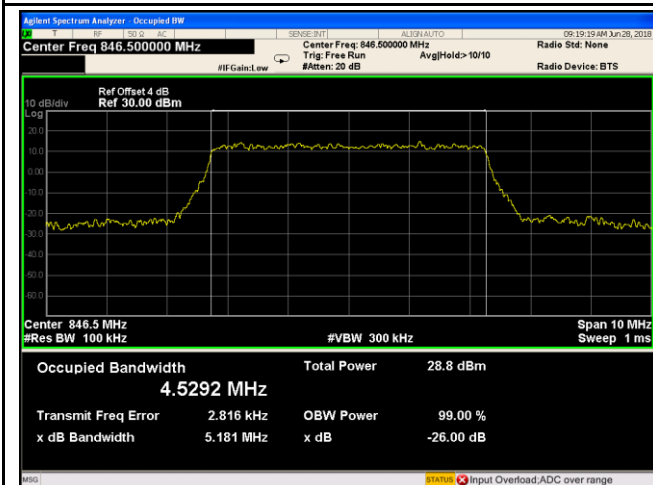
LTE Band V - Low CH 16QAM-5



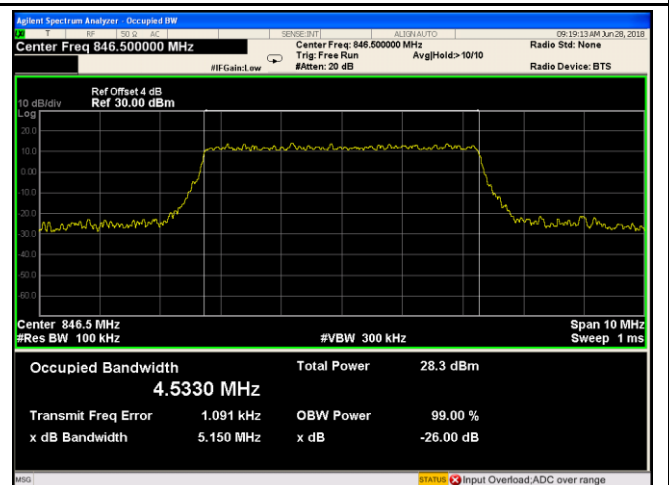
LTE Band V - Middle CH QPSK-5



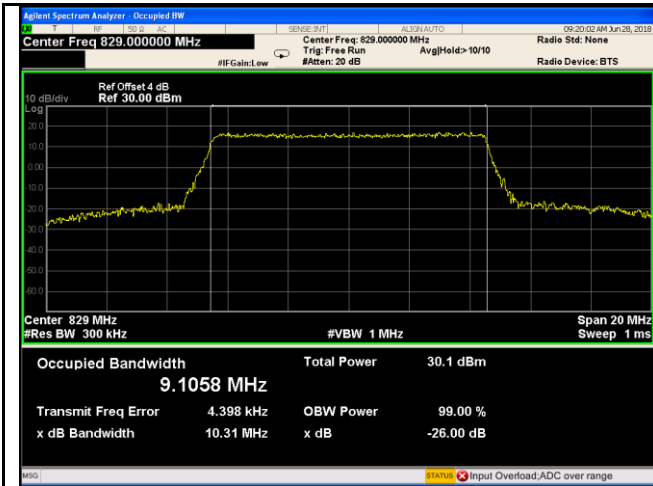
LTE Band V - Middle CH 16QAM-5



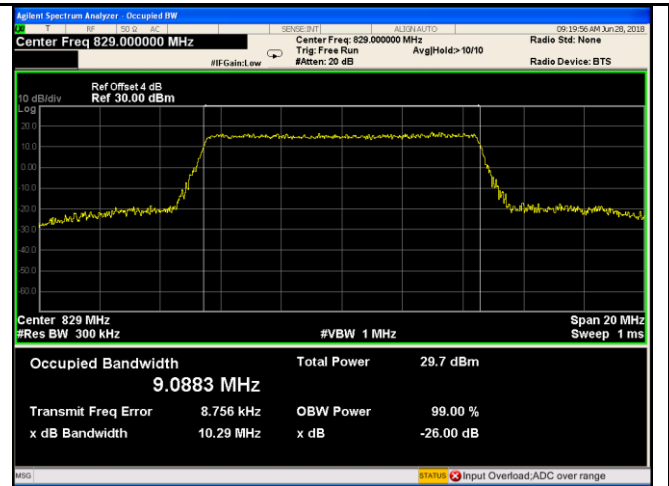
LTE Band V - High CH QPSK-5



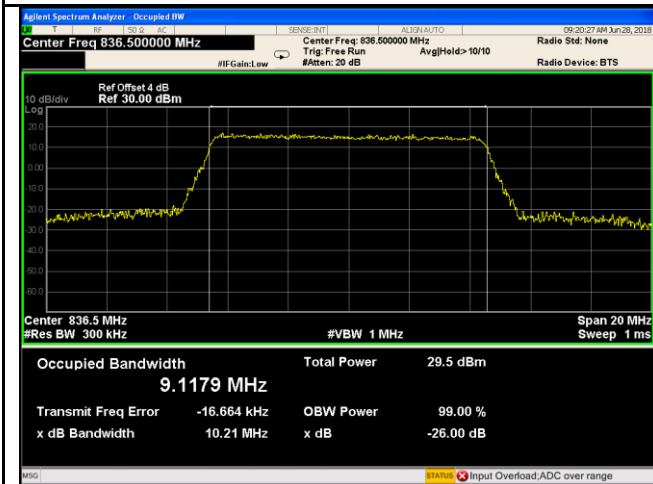
LTE Band V - High CH 16QAM-5



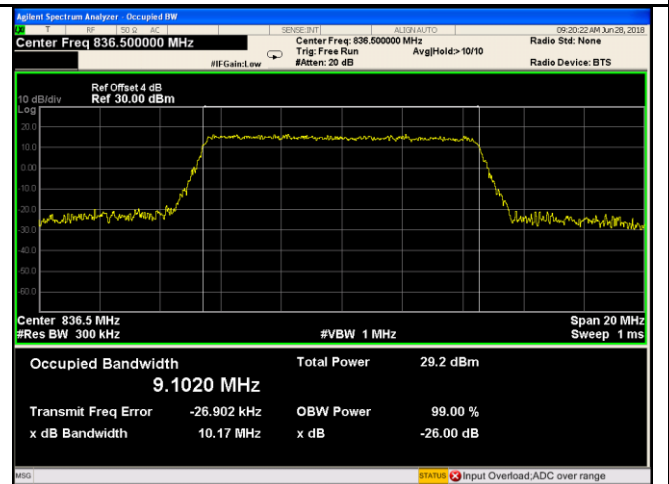
LTE Band V - Low CH QPSK-10



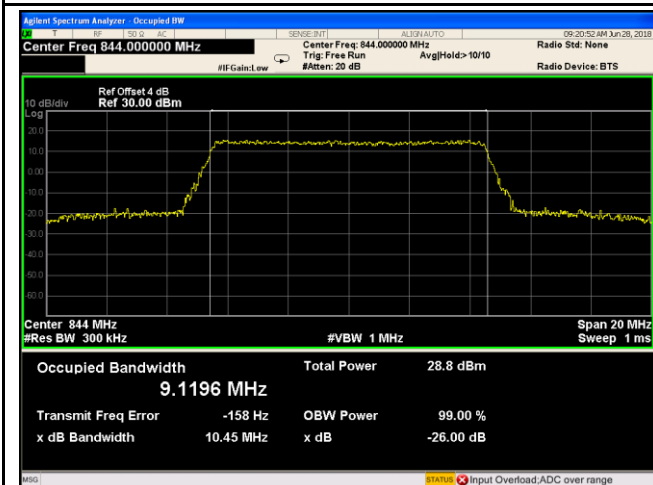
LTE Band V - Low CH 16QAM-10



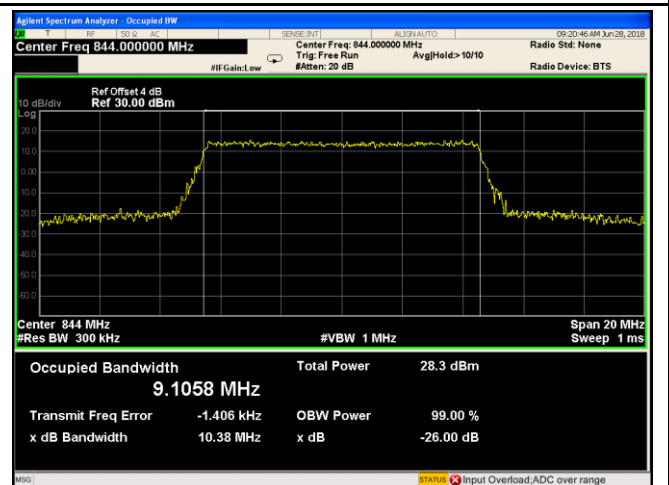
LTE Band V - Middle CH QPSK-10



LTE Band V - Middle CH 16QAM-10

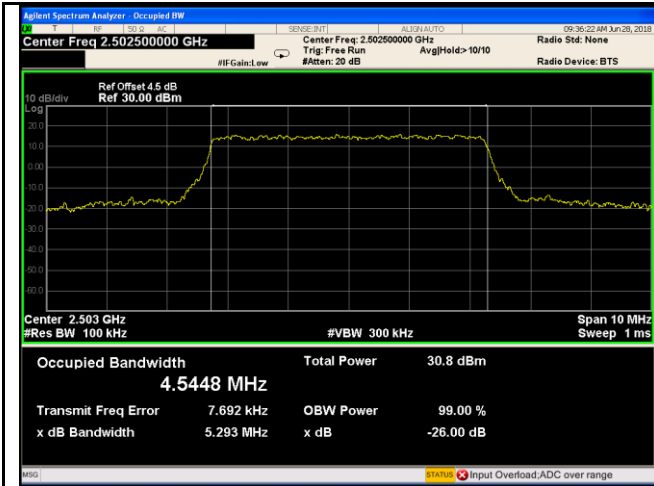


LTE Band V - High CH QPSK-10

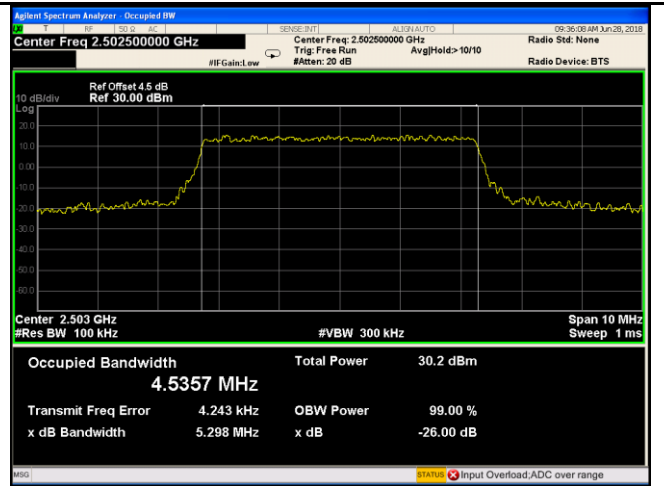


LTE Band V - High CH 16QAM-10

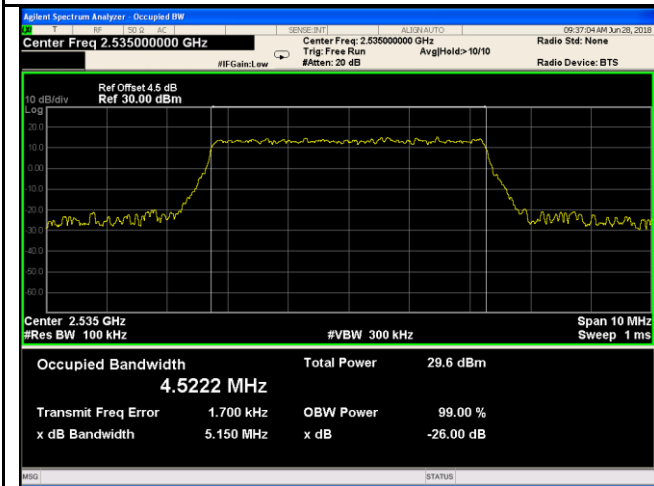
### LTE Band VII (Part 27)



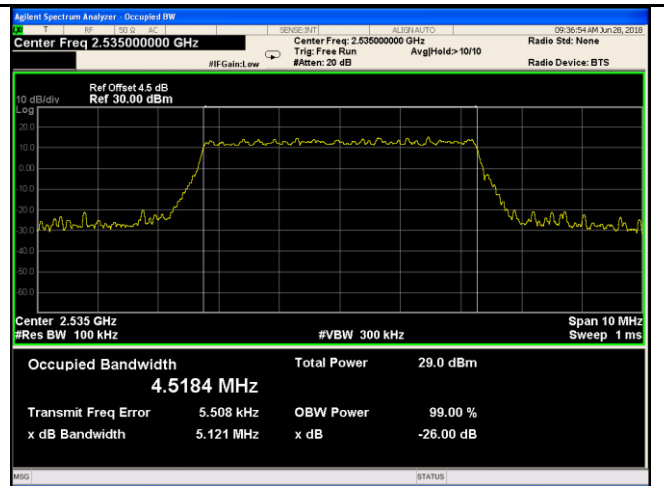
LTE Band VII - Low CH QPSK-5



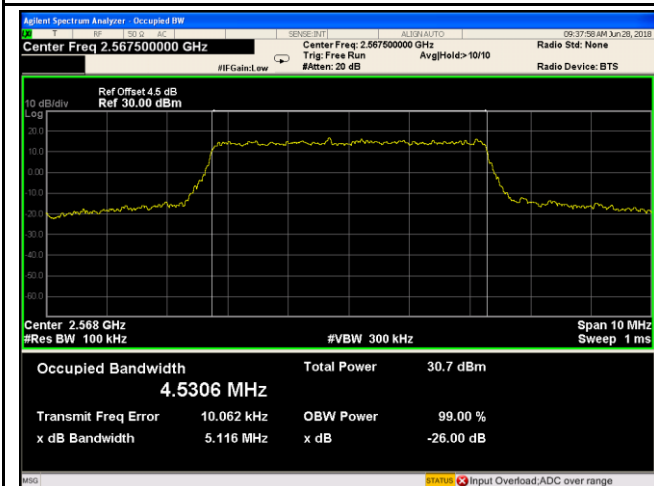
LTE Band VII - Low CH 16QAM-5



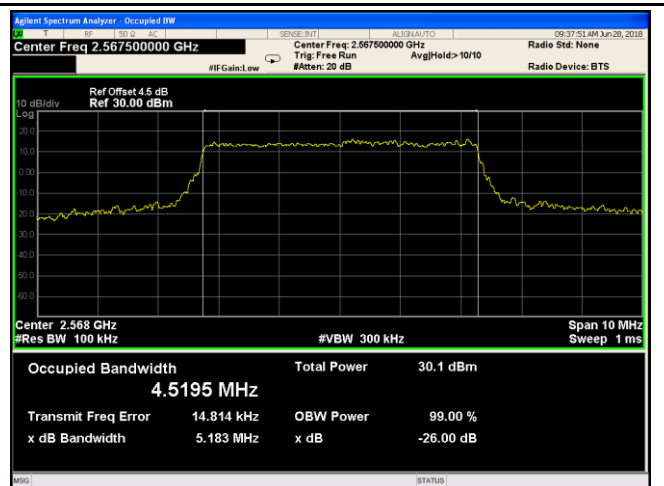
LTE Band VII - Middle CH QPSK-5



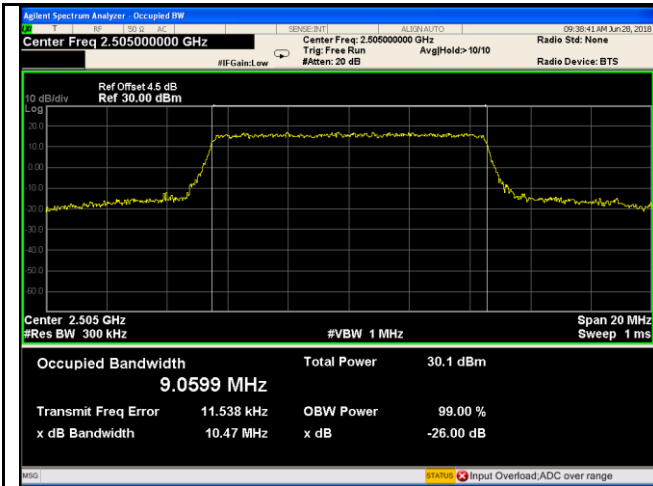
LTE Band VII - Middle CH 16QAM-5



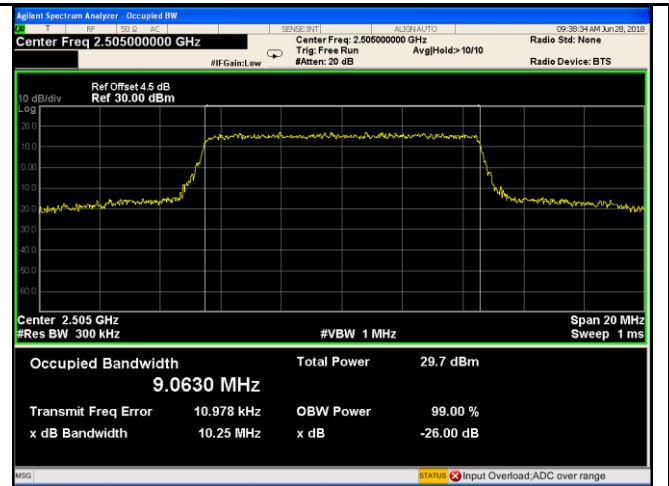
LTE Band VII - High CH QPSK-5



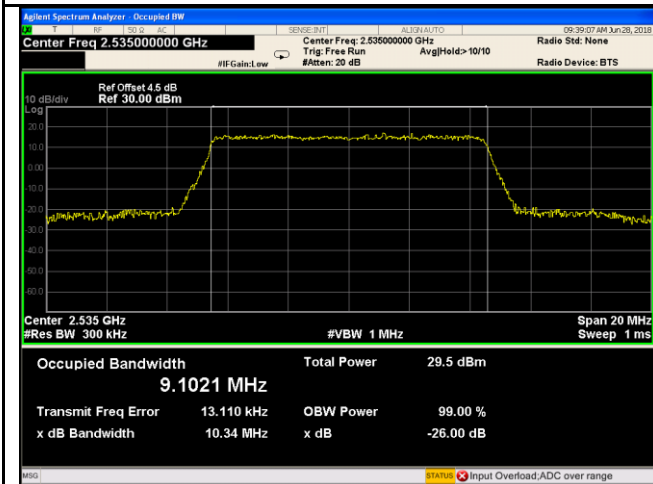
LTE Band VII - High CH 16QAM-5



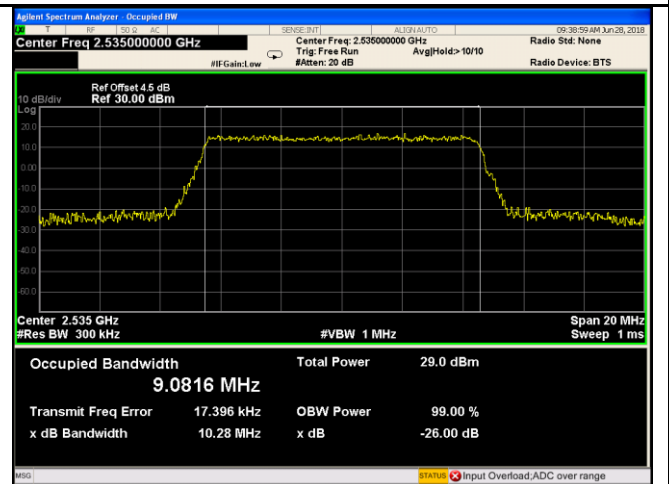
LTE Band VII - Low CH QPSK-10



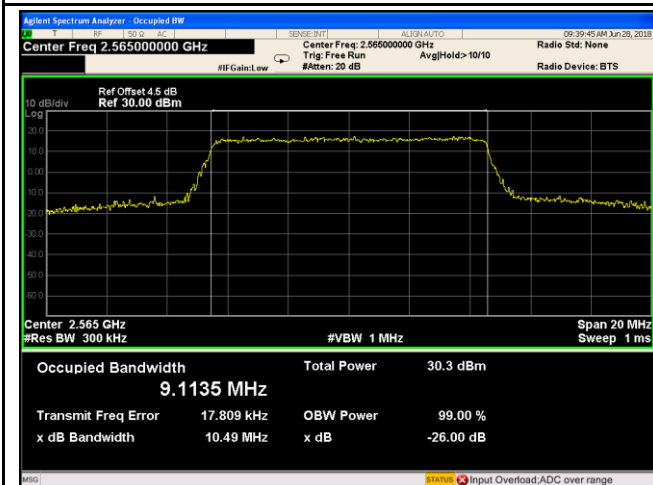
LTE Band VII - Low CH 16QAM-10



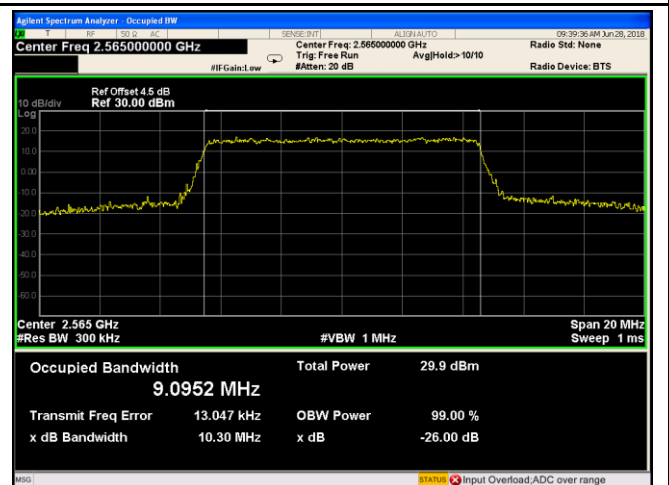
LTE Band VII - Middle CH QPSK-10



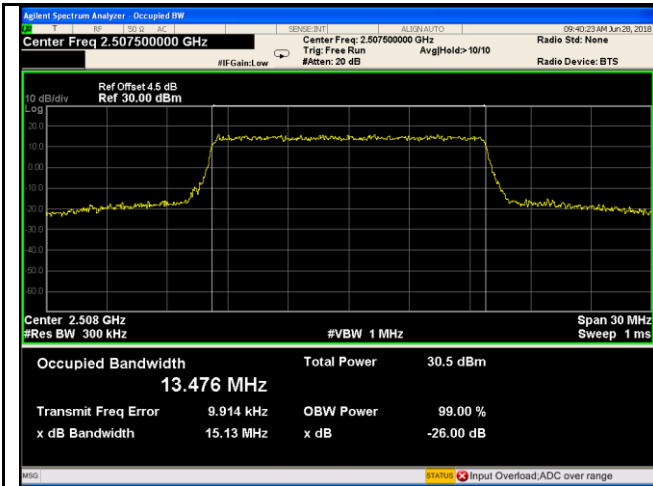
LTE Band VII - Middle CH 16QAM-10



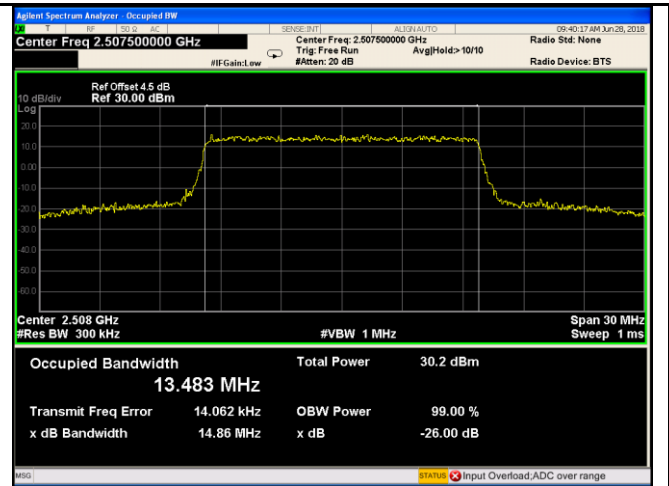
LTE Band VII - High CH QPSK-10



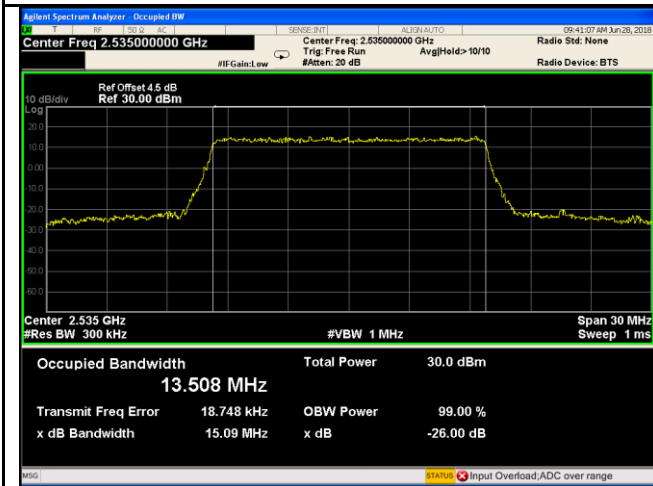
LTE Band VII - High CH 16QAM-10



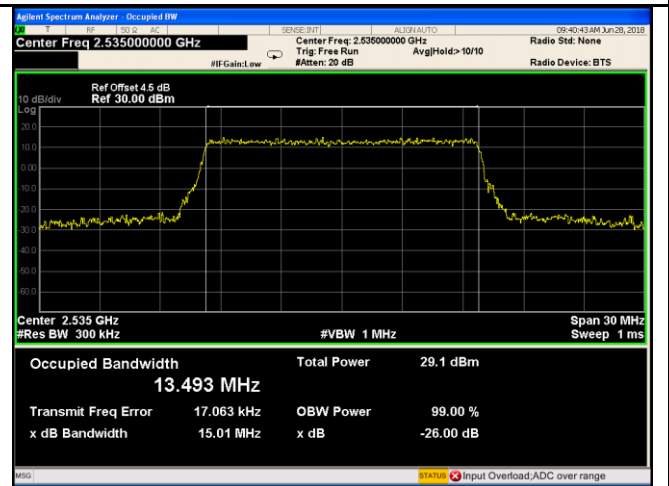
LTE Band VII - Low CH QPSK-15



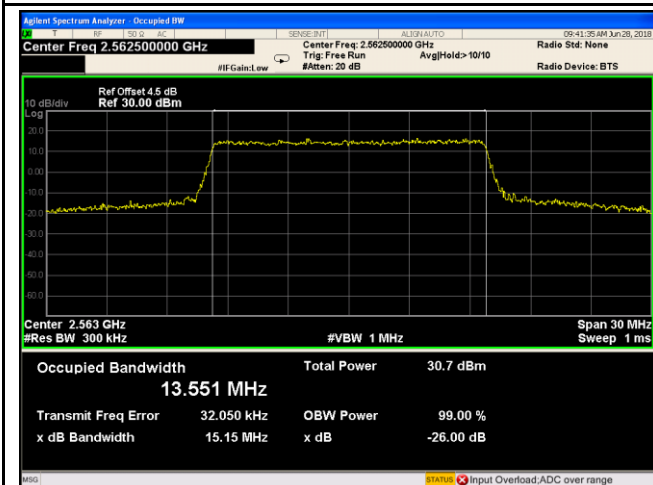
LTE Band VII - Low CH 16QAM-15



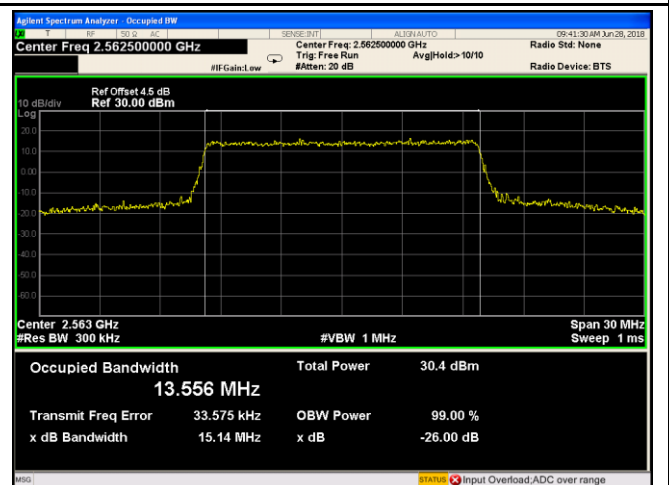
LTE Band VII - Middle CH QPSK-15



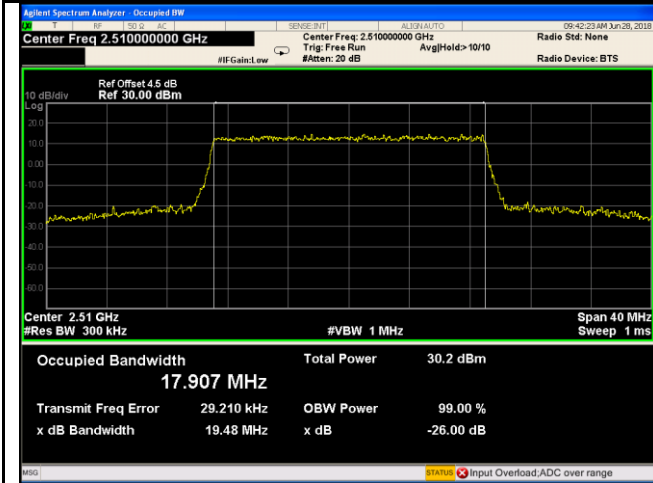
LTE Band VII - Middle CH 16QAM-15



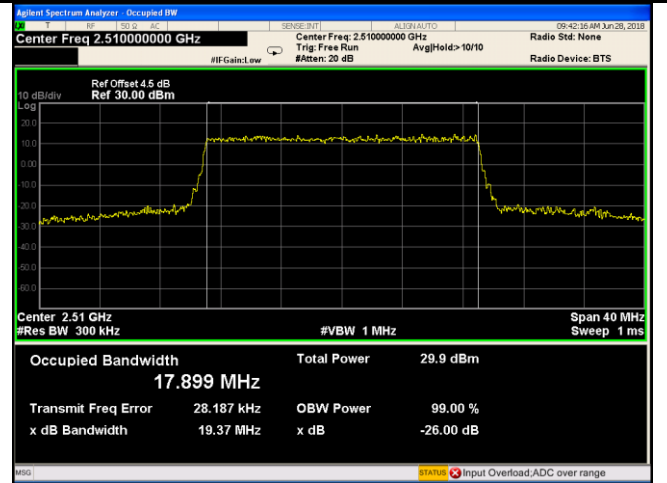
LTE Band VII - High CH QPSK-15



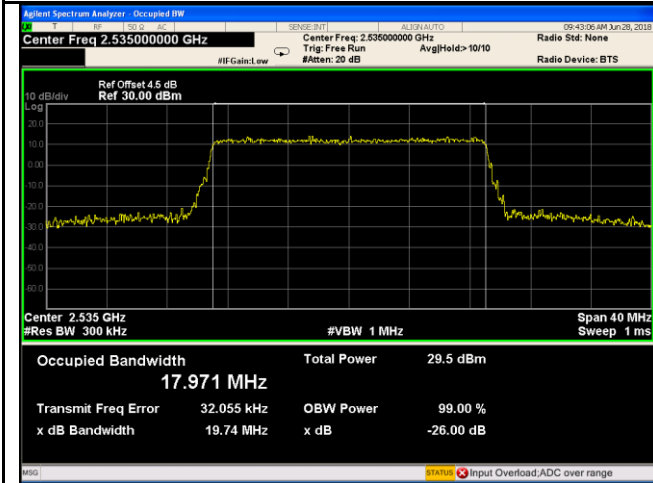
LTE Band VII - High CH 16QAM-15



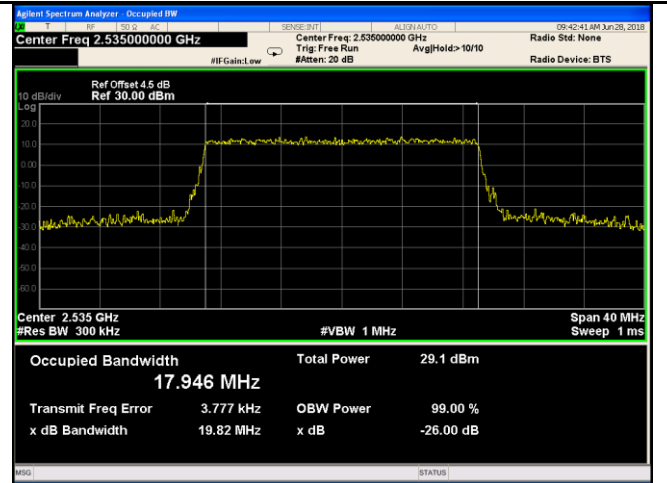
LTE Band VII - Low CH QPSK-20



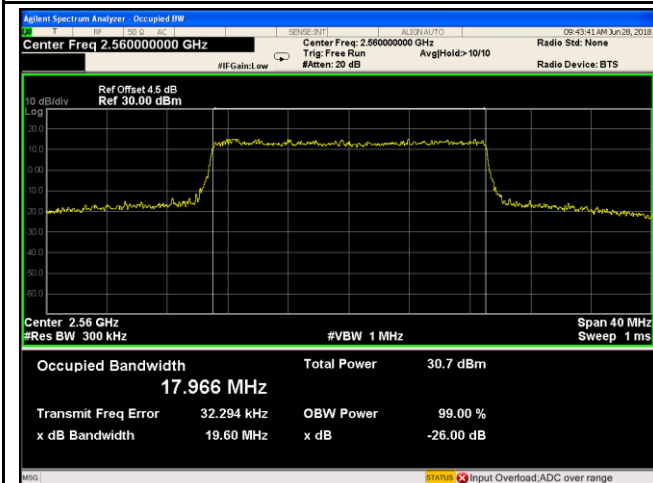
LTE Band VII - Low CH 16QAM-20



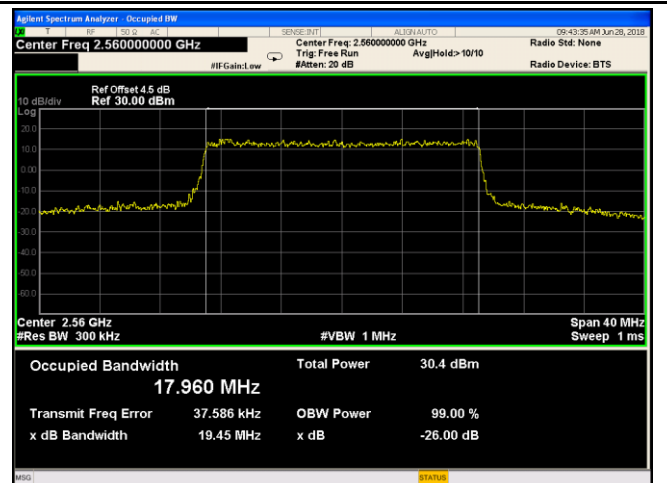
LTE Band VII - Middle CH QPSK-20



LTE Band VII - Middle CH 16QAM-20



LTE Band VII - High CH QPSK-20

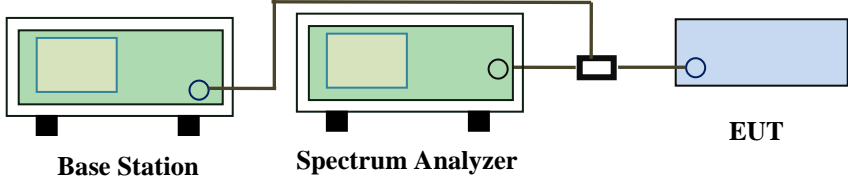


LTE Band VII - High CH 16QAM-20

## 6.5 Spurious Emissions at Antenna Terminals

|                      |               |
|----------------------|---------------|
| Temperature          | 24°C          |
| Relative Humidity    | 57%           |
| Atmospheric Pressure | 1022mbar      |
| Test date :          | June 28, 2018 |
| Tested By :          | Aarron Liang  |

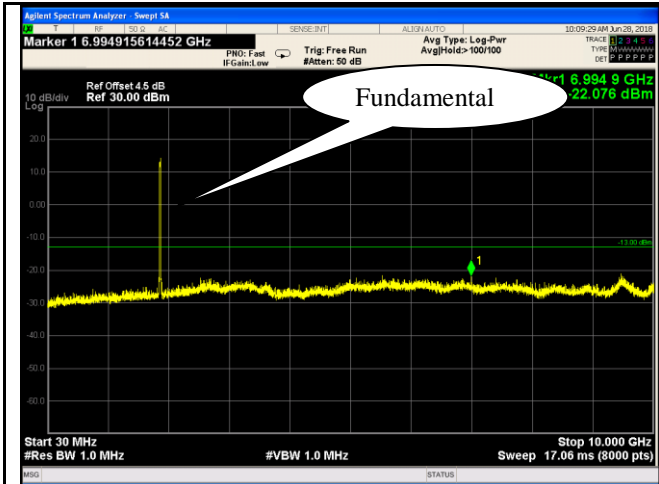
### Requirement(s):

| Spec  | Item   | Requirement  | Applicable                          |
|---|--|--|-------------------------------------|
| §2.1051,<br>§22.917(a)&<br>§24.238(a)<br>§ 27.53(h) | a)   | The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log(P)$ dB | <input checked="" type="checkbox"/> |
| Test Setup  |  <p style="text-align: center;">Base Station                  Spectrum Analyzer                  EUT</p>   |  |                                     |
| Test Procedure                                      | <ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The Band Edges of low and high channels for the highest RF powers were measured.</li> <li>- Setting RBW as roughly BW/100.</li> </ul> |  |                                     |
| Remark  |  |  |                                     |
| Result  | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail   |  |                                     |

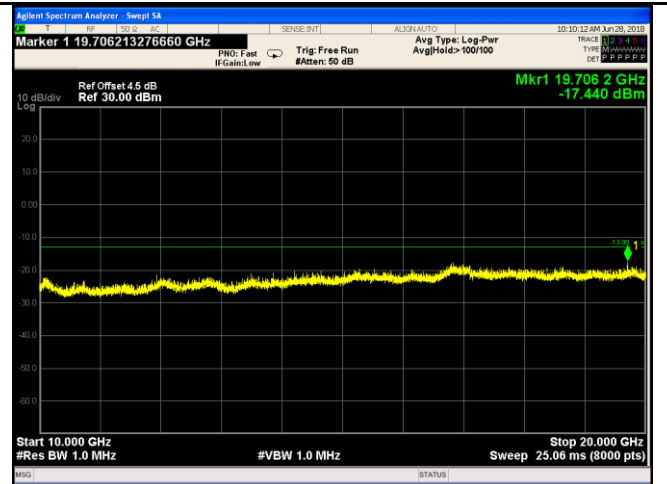
Test Data     Yes                   N/A  
 Test Plot     Yes (See below)     N/A



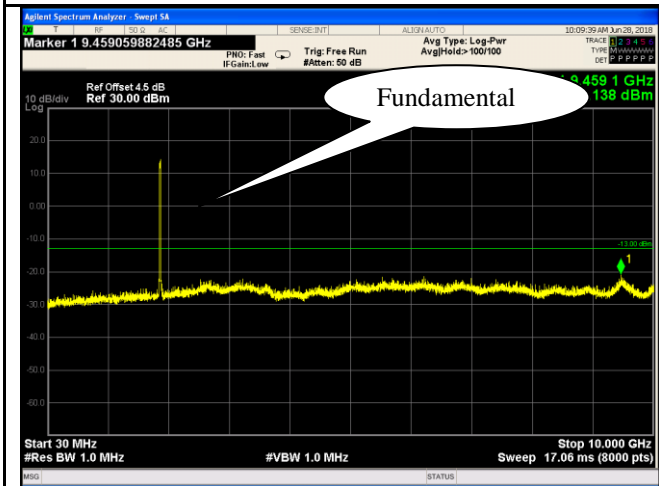
Test Plots 30MHz-5GHz  
LTE Band II (Part 24E)



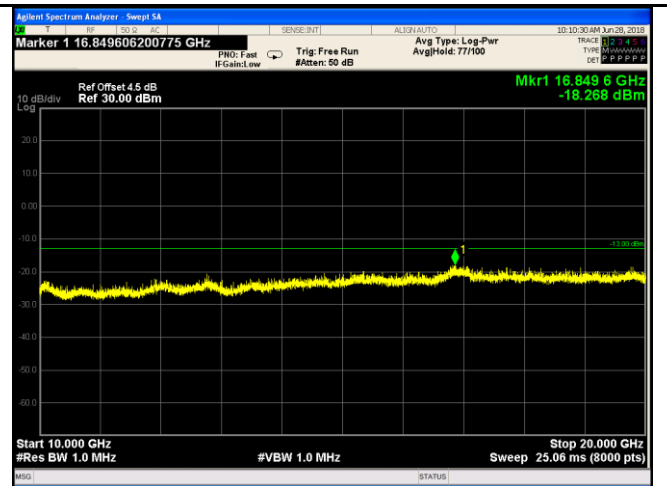
LTE Band II - Low Channel-1



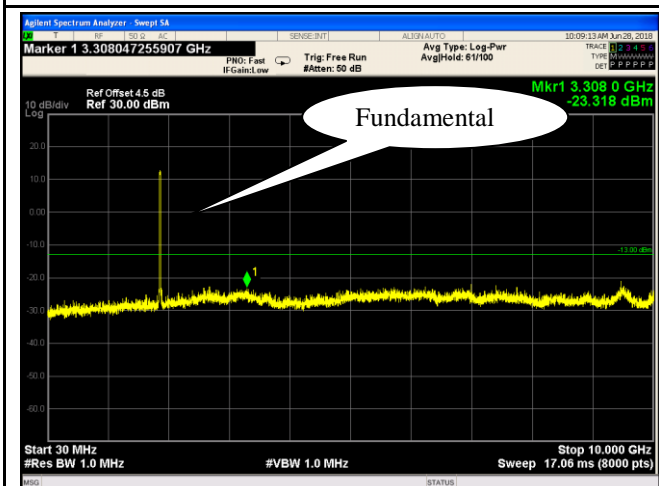
LTE Band II - Low Channel-2



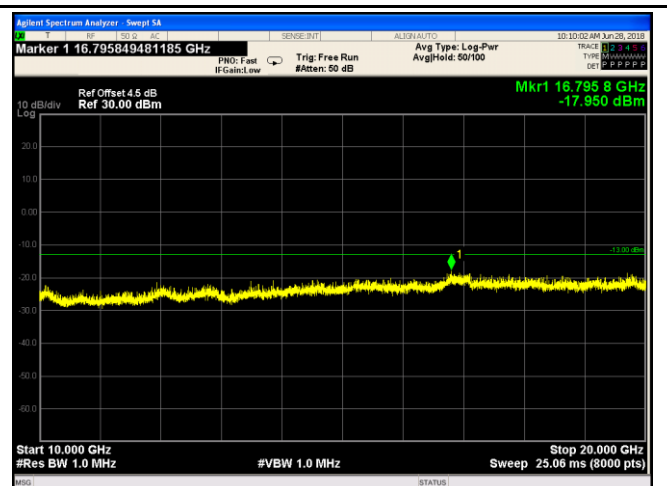
LTE Band II Middle Channel-1



LTE Band II Middle Channel-2

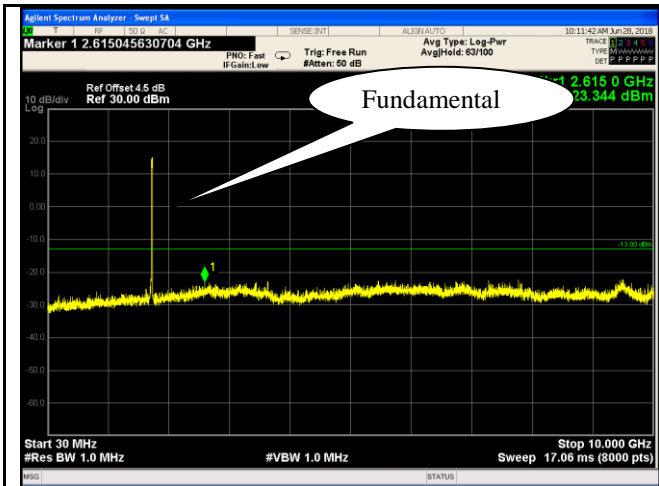


LTE Band II - High Channel-1

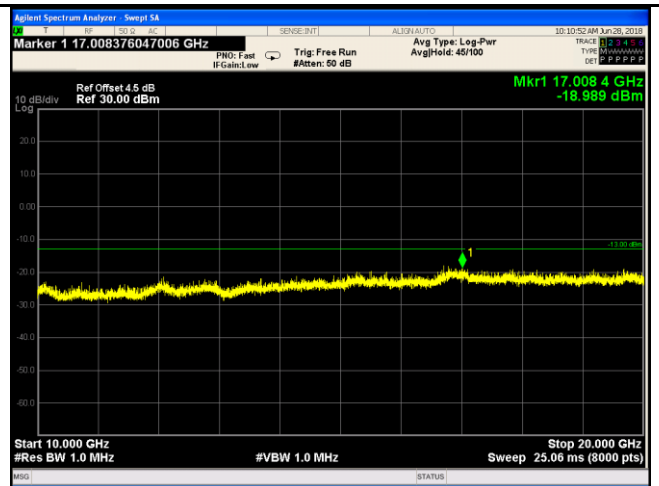


LTE Band II - High Channel-2

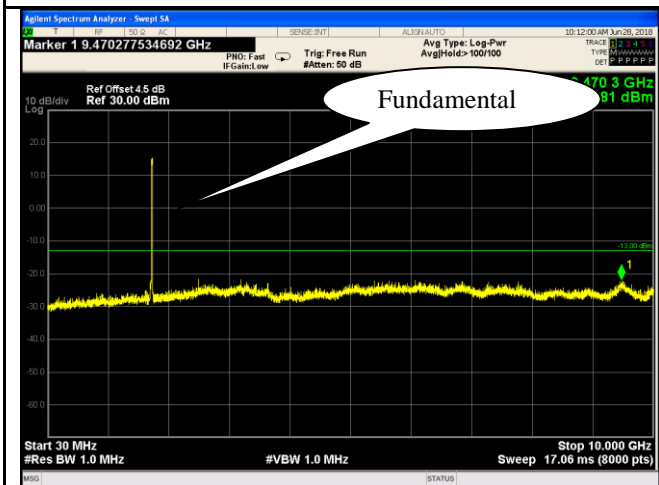
### LTE Band IV (Part27) result



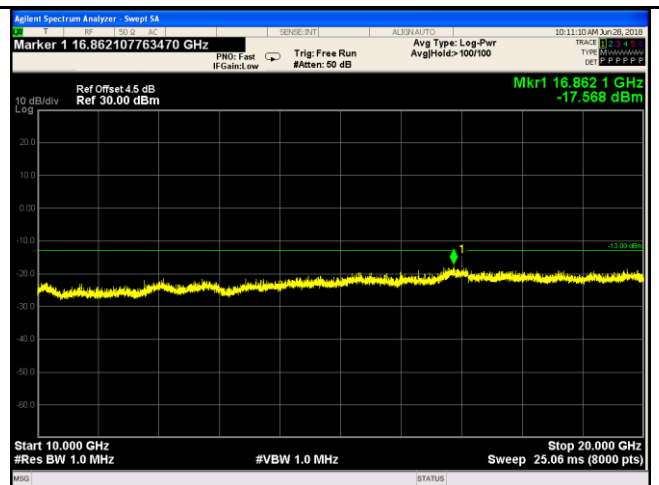
LTE Band IV - Low Channel-1



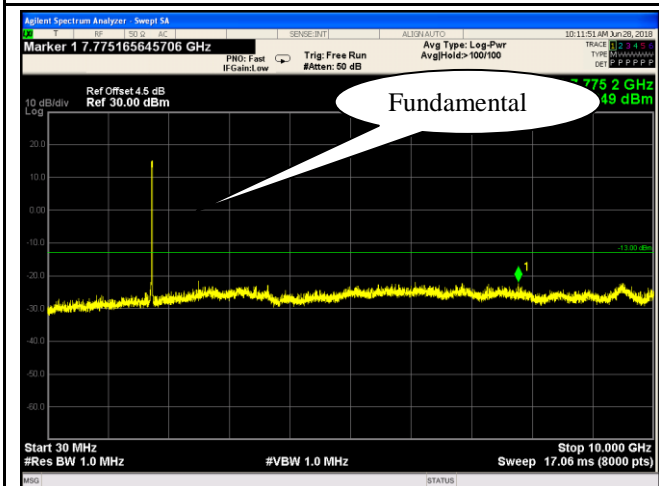
LTE Band IV - Low Channel-2



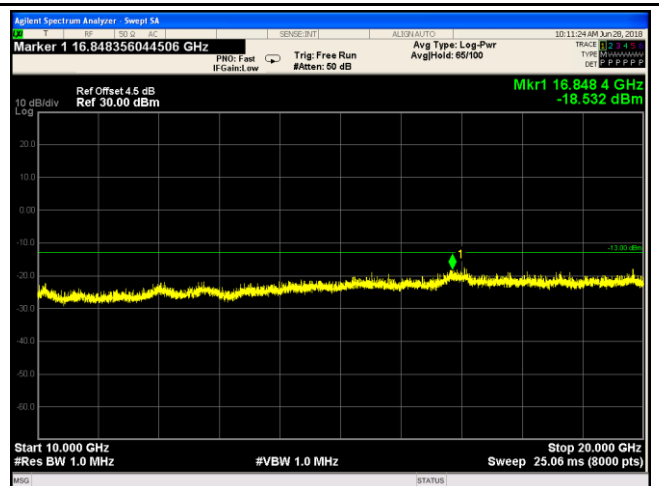
LTE Band IV - Middle Channel-1



LTE Band IV - Middle Channel-2

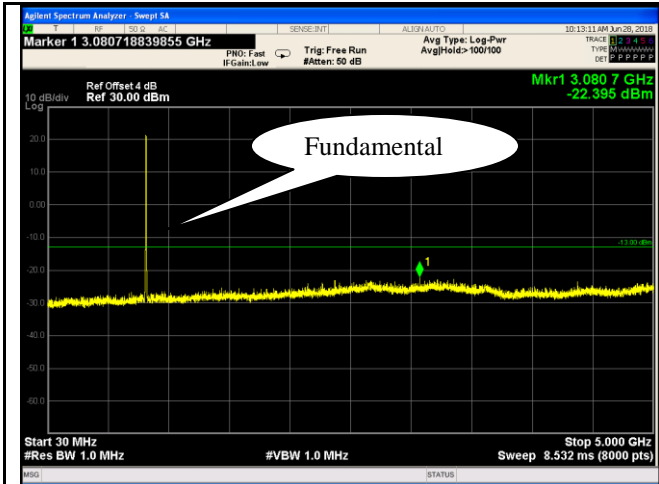


LTE Band IV - High Channel-1

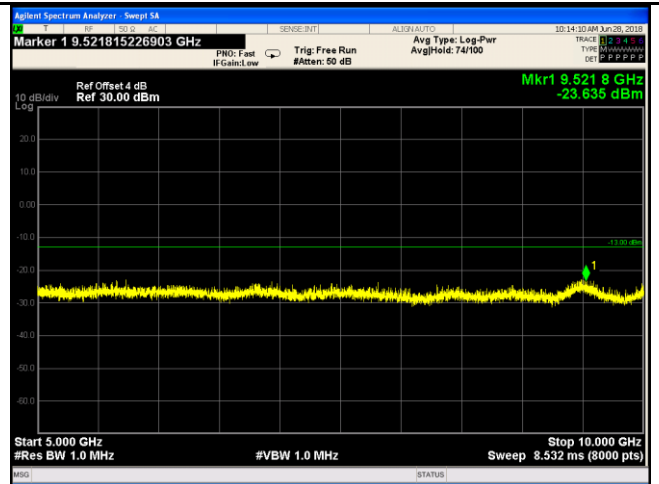


LTE Band IV - High Channel-2

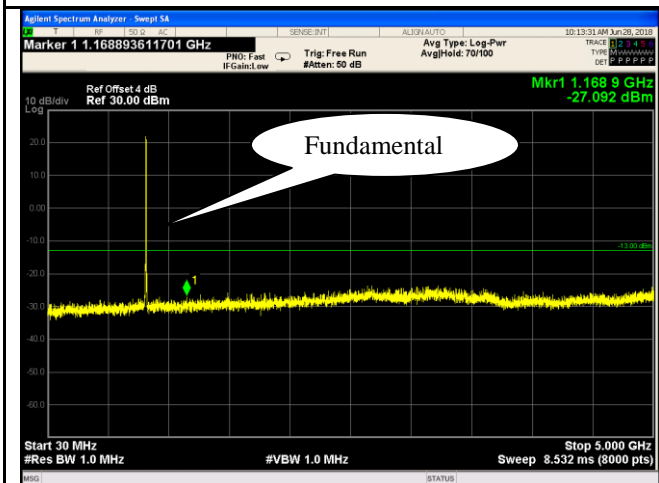
### LTE Band V (Part 22H)



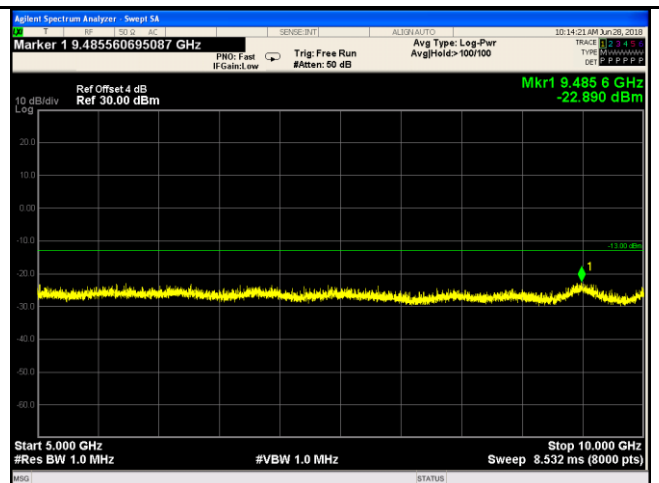
LTE Band V - Low Channel-1



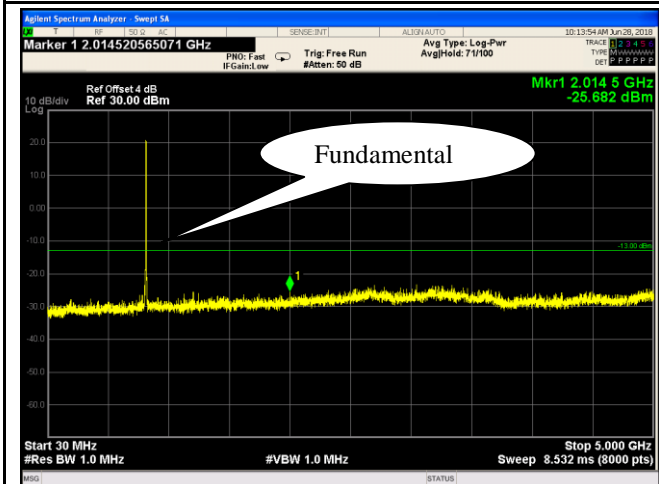
LTE Band V - Low Channel-2



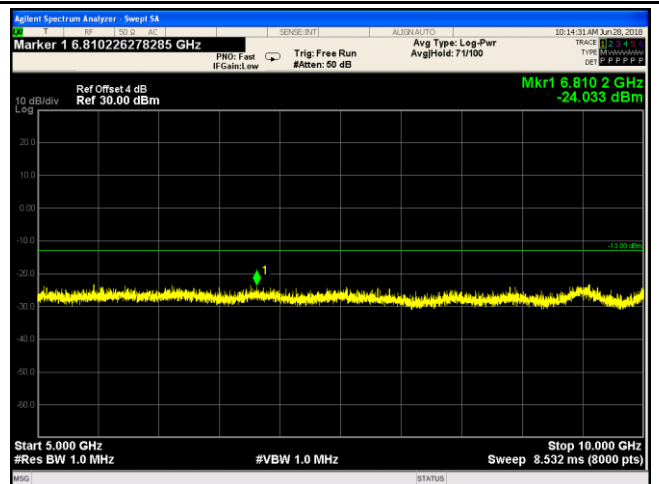
LTE Band V - Middle Channel-1



LTE Band V - Middle Channel-2

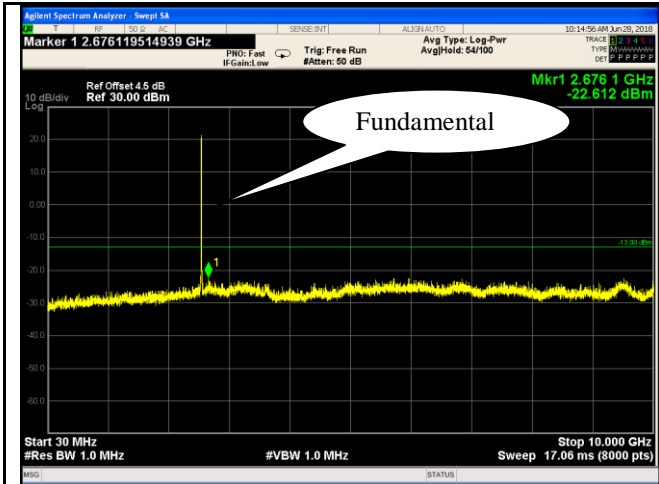


LTE Band V - High Channel-1

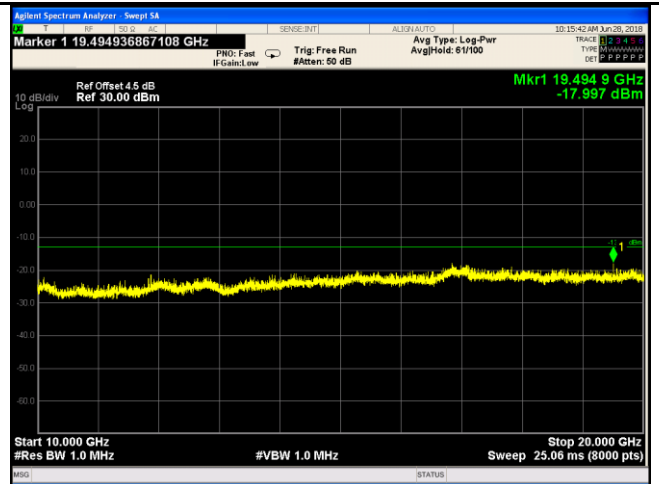


LTE Band V - High Channel-2

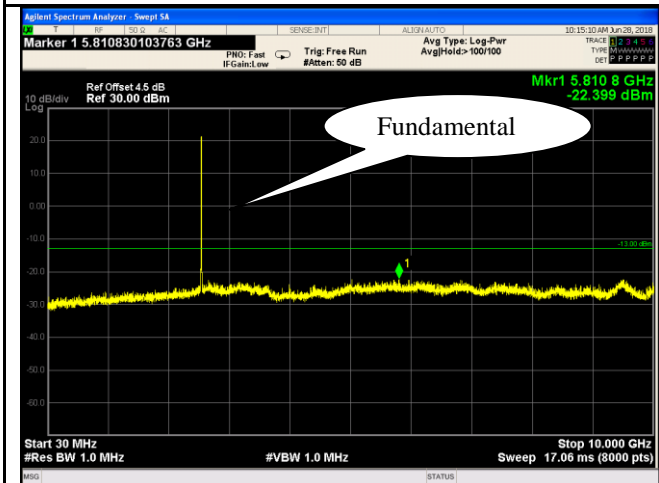
### LTE Band VII (Part 27)



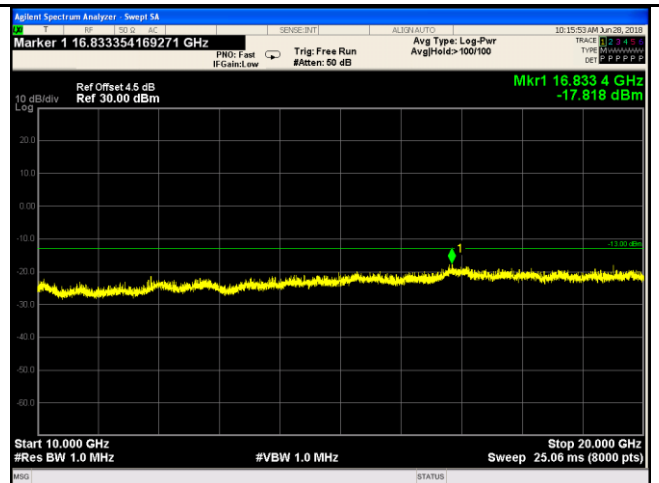
LTE Band VII - Low Channel-1



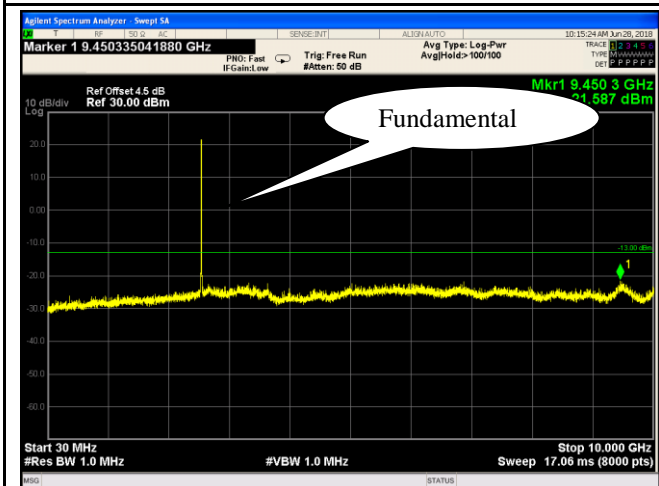
LTE Band VII - Low Channel-2



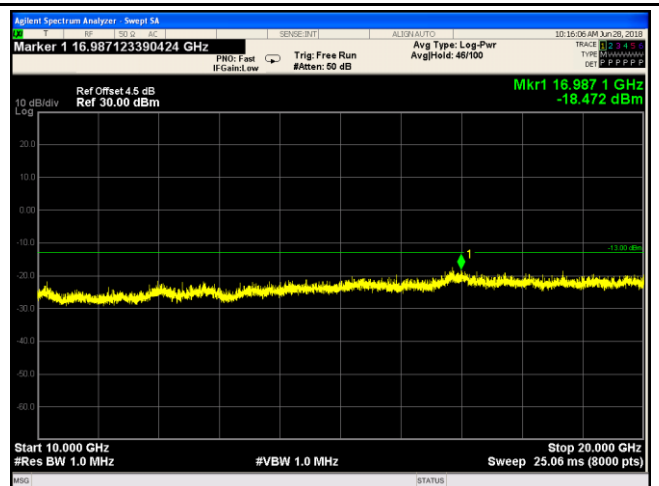
LTE Band VII - Middle Channel-1



LTE Band VII - Middle Channel-2



LTE Band VII - High Channel-1



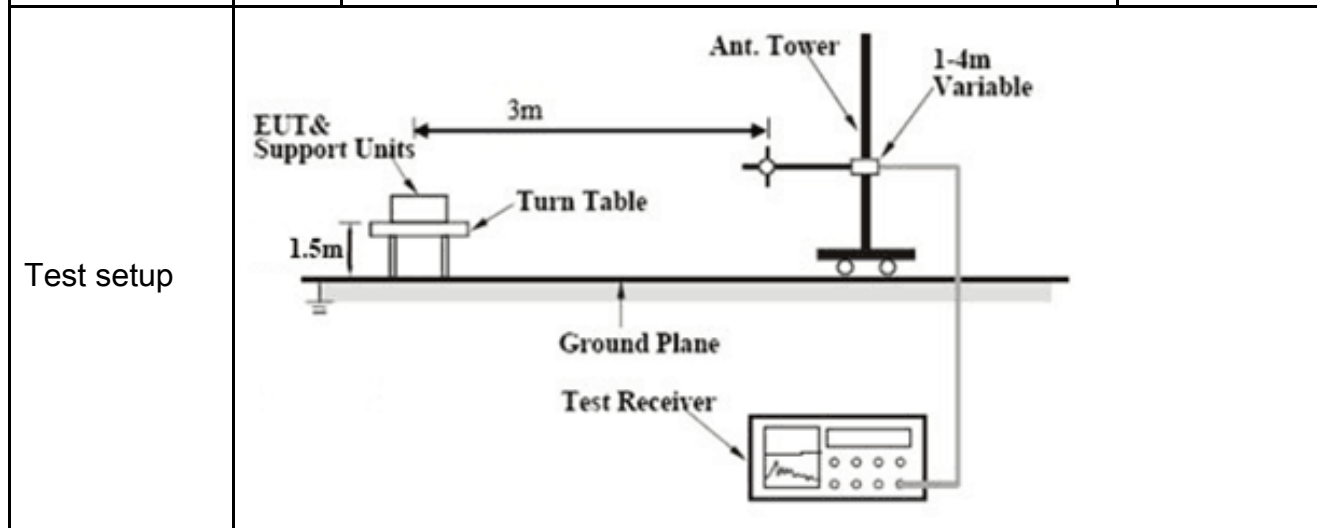
LTE Band VII - High Channel-2

## 6.6 Spurious Radiated Emissions

|                      |               |
|----------------------|---------------|
| Temperature          | 24°C          |
| Relative Humidity    | 57%           |
| Atmospheric Pressure | 1023mbar      |
| Test date :          | June 27, 2018 |
| Tested By :          | Aarron Liang  |

### Requirement(s):

| Spec   | Item | Requirement   | Applicable                          |
|--|------|---|-------------------------------------|
| §2.1053,<br>§22.917 &<br>§24.238<br>§ 27.53(h) | a)   | The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic. | <input checked="" type="checkbox"/> |



|                |   |
|----------------|---|
| Test Procedure | <ol style="list-style-type: none"> <li>The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.</li> <li>The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.</li> <li>Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.<br/>Sample Calculation:<br/>EUT Field Strength = Raw Amplitude (dBµV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)</li> </ol> |
|----------------|---|

|        |  |
|--------|--|
| Remark |  |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

## LTE Band II (Part 24E) result

### Low channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|----------------------------|----------------|----------------|
| 3720               | V                             | -25.51                     | -13            | -12.51         |
| 3720               | H                             | -25.18                     | -13            | -12.18         |
| 420.16             | V                             | -41.68                     | -13            | -28.68         |
| 498.15             | H                             | -33.31                     | -13            | -20.31         |

### Middle channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|----------------------------|----------------|----------------|
| 3760               | V                             | -23.42                     | -13            | -10.42         |
| 3760               | H                             | -28.79                     | -13            | -15.79         |
| 541.36             | V                             | -40.61                     | -13            | -27.61         |
| 699.87             | H                             | -41.37                     | -13            | -28.37         |

### High channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|----------------------------|----------------|----------------|
| 3800               | V                             | -26.96                     | -13            | -13.96         |
| 3800               | H                             | -24.53                     | -13            | -11.53         |
| 416.13             | V                             | -40.8                      | -13            | -27.8          |
| 350.09             | H                             | -35.4                      | -13            | -22.4          |

**Note:**

- 1, The testing has been conformed to  $10 \times 1907.5 \text{MHz} = 19,075 \text{MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

## LTE Band IV (Part27) result

### Low channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 3440               | V                             | -33.7                         | -13            | -20.7          |
| 3440               | H                             | -35.41                        | -13            | -22.41         |
| 817.39             | V                             | -33.81                        | -13            | -20.81         |
| 489.94             | H                             | -37.61                        | -13            | -24.61         |

### Middle channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 3465               | V                             | -29.03                        | -13            | -16.03         |
| 3465               | H                             | -33.53                        | -13            | -20.53         |
| 200.8              | V                             | -37.61                        | -13            | -24.61         |
| 738.88             | H                             | -41.85                        | -13            | -28.85         |

### High channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 3490               | V                             | -34.89                        | -13            | -21.89         |
| 3490               | H                             | -36.1                         | -13            | -23.1          |
| 293.34             | V                             | -35                           | -13            | -22            |
| 785.66             | H                             | -33.59                        | -13            | -20.59         |

**Note:**

- 1, The testing has been conformed to  $10 \times 1752.5 \text{ MHz} = 17,525 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.



## LTE Band V (Part22H) result

### Low channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 1658               | V                             | -24.34                        | -13            | -11.34         |
| 1658               | H                             | -24.84                        | -13            | -11.84         |
| 434.02             | V                             | -41.47                        | -13            | -28.47         |
| 389.75             | H                             | -36.37                        | -13            | -23.37         |

### Middle channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 1673               | V                             | -30.84                        | -13            | -17.84         |
| 1673               | H                             | -33.89                        | -13            | -20.89         |
| 746.34             | V                             | -37.44                        | -13            | -24.44         |
| 495.34             | H                             | -41.11                        | -13            | -28.11         |

### High channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 1688               | V                             | -32.35                        | -13            | -19.35         |
| 1688               | H                             | -30.67                        | -13            | -17.67         |
| 664.6              | V                             | -40.35                        | -13            | -27.35         |
| 422.19             | H                             | -35.28                        | -13            | -22.28         |

**Note:**

- 1, The testing has been conformed to  $10 \times 846.5 \text{MHz} = 8,465 \text{MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

## LTE Band VII (Part27) result

### Low channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 5020               | V                             | -32.06                        | -13            | -19.06         |
| 5020               | H                             | -31.54                        | -13            | -18.54         |
| 616.78             | V                             | -34.65                        | -13            | -21.65         |
| 228.98             | H                             | -39.96                        | -13            | -26.96         |

### Middle channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 5070               | V                             | -26.73                        | -13            | -13.73         |
| 5070               | H                             | -33.26                        | -13            | -20.26         |
| 614.91             | V                             | -33.89                        | -13            | -20.89         |
| 723.15             | H                             | -37.11                        | -13            | -24.11         |

### High channel

| Frequency<br>(MHz) | Antenna Polarization<br>(H/V) | Corrected<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|--------------------|-------------------------------|-------------------------------|----------------|----------------|
| 5120               | V                             | -33.63                        | -13            | -20.63         |
| 5120               | H                             | -32.72                        | -13            | -19.72         |
| 760.75             | V                             | -39.09                        | -13            | -26.09         |
| 841.55             | H                             | -39.37                        | -13            | -26.37         |

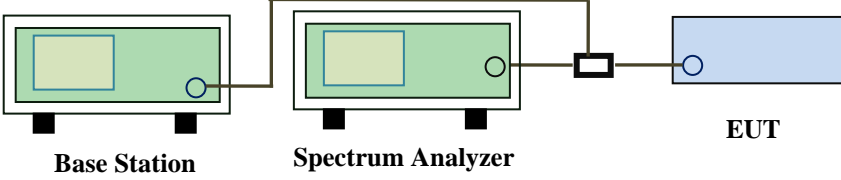
**Note:**

- 1, The testing has been conformed to  $10 \times 2567.5 \text{MHz} = 25,675 \text{MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z -Axis were investigated. The results above show only the worst case.

## 6.7 Band Edge

|                      |                  |
|----------------------|------------------|
| Temperature          | 24°C             |
| Relative Humidity    | 57%              |
| Atmospheric Pressure | 1023mbar         |
| Test date :          | June 27&28, 2018 |
| Tested By :          | Aarron Liang     |

### Requirement(s):

| Spec                                   | Item   | Requirement  | Applicable                          |
|--|--|--|-------------------------------------|
| §22.917(a)<br>§24.238(a)<br>§ 27.53(h) | a)   | The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. | <input checked="" type="checkbox"/> |
| Test setup                             |  <p>The diagram shows a Base Station (green box) connected to a Spectrum Analyzer (green box) and an EUT (blue box) via a power divider (black box). The Base Station and Spectrum Analyzer are connected to each other, and the Spectrum Analyzer is connected to the power divider, which then splits the signal to the EUT.</p> |  |                                     |
| Procedure                              | <ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.</li> </ul>  |  |                                     |
| Remark                                 |  |  |                                     |
| Result                                 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail   |  |                                     |

Test Data     Yes       N/A

Test Plot     Yes (See below)       N/A

**LTE Band II (Part 24E) result**

| BW(MHz) | Channel | Frequency (MHz) | Mode  | Emission (dBm) | Limit (dBm) |
|---------|---------|-----------------|-------|----------------|-------------|
| 1.4     | 18607   | 1850            | QPSK  | -23.213        | -13         |
|         |         |                 | 16QAM | -25.162        | -13         |
| 1.4     | 18900   | 1910            | QPSK  | -22.933        | -13         |
|         |         |                 | 16QAM | -24.177        | -13         |
| 3       | 18615   | 1850            | QPSK  | -23.608        | -13         |
|         |         |                 | 16QAM | -22.024        | -13         |
| 3       | 19185   | 1910            | QPSK  | -15.525        | -13         |
|         |         |                 | 16QAM | -16.364        | -13         |
| 5       | 18625   | 1850            | QPSK  | -16.641        | -13         |
|         |         |                 | 16QAM | -14.573        | -13         |
| 5       | 19175   | 1910            | QPSK  | -15.388        | -13         |
|         |         |                 | 16QAM | -15.783        | -13         |
| 10      | 18650   | 1850            | QPSK  | -14.083        | -13         |
|         |         |                 | 16QAM | -17.456        | -13         |
| 10      | 19150   | 1910            | QPSK  | -16.718        | -13         |
|         |         |                 | 16QAM | -17.258        | -13         |
| 15      | 18675   | 1850            | QPSK  | -21.316        | -13         |
|         |         |                 | 16QAM | -20.598        | -13         |
| 15      | 19125   | 1910            | QPSK  | -13.967        | -13         |
|         |         |                 | 16QAM | -16.690        | -13         |
| 20      | 18700   | 1850            | QPSK  | -20.410        | -13         |
|         |         |                 | 16QAM | -23.029        | -13         |
| 20      | 19100   | 1910            | QPSK  | -19.355        | -13         |
|         |         |                 | 16QAM | -21.083        | -13         |

### LTE Band IV (Part 27) result

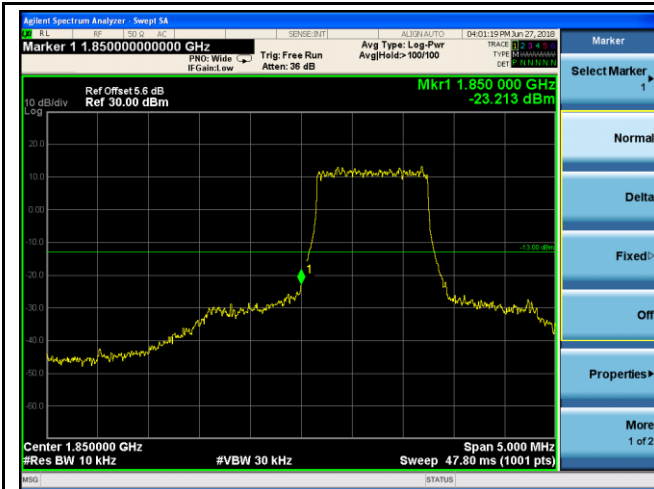
| BW(MHz) | Channel | Frequency (MHz) | Mode  | Emission (dBm) | Limit (dBm) |
|---------|---------|-----------------|-------|----------------|-------------|
| 1.4     | 19957   | 1709.9          | QPSK  | -18.964        | -13         |
|         |         |                 | 16QAM | -19.533        | -13         |
| 1.4     | 20393   | 1755            | QPSK  | -26.923        | -13         |
|         |         |                 | 16QAM | -28.324        | -13         |
| 3       | 19965   | 1709.9          | QPSK  | -16.158        | -13         |
|         |         |                 | 16QAM | -18.267        | -13         |
| 3       | 20385   | 1755            | QPSK  | -24.306        | -13         |
|         |         |                 | 16QAM | -23.984        | -13         |
| 5       | 19975   | 1709.9          | QPSK  | -14.207        | -13         |
|         |         |                 | 16QAM | -16.051        | -13         |
| 5       | 20375   | 1755            | QPSK  | -18.522        | -13         |
|         |         |                 | 16QAM | -18.482        | -13         |
| 10      | 20000   | 1709.9          | QPSK  | -14.449        | -13         |
|         |         |                 | 16QAM | -15.198        | -13         |
| 10      | 20350   | 1755            | QPSK  | -15.155        | -13         |
|         |         |                 | 16QAM | -16.514        | -13         |
| 15      | 20025   | 1709.9          | QPSK  | -16.456        | -13         |
|         |         |                 | 16QAM | -17.159        | -13         |
| 15      | 20325   | 1755            | QPSK  | -16.334        | -13         |
|         |         |                 | 16QAM | -18.326        | -13         |
| 20      | 20050   | 1709.9          | QPSK  | -20.210        | -13         |
|         |         |                 | 16QAM | -21.519        | -13         |
| 20      | 20300   | 1755            | QPSK  | -23.142        | -13         |
|         |         |                 | 16QAM | -20.884        | -13         |

**LTE Band V (Part 22H) result**

| BW(MHz) | Channel | Frequency (MHz) | Mode  | Emission (dBm) | Limit (dBm) |
|---------|---------|-----------------|-------|----------------|-------------|
| 1.4     | 20407   | 823.9           | QPSK  | -22.469        | -13         |
|         |         |                 | 16QAM | -23.947        | -13         |
| 1.4     | 20643   | 849             | QPSK  | -29.041        | -13         |
|         |         |                 | 16QAM | -31.231        | -13         |
| 3       | 20415   | 824             | QPSK  | -21.582        | -13         |
|         |         |                 | 16QAM | -22.617        | -13         |
| 3       | 20635   | 849             | QPSK  | -26.422        | -13         |
|         |         |                 | 16QAM | -26.136        | -13         |
| 5       | 20425   | 824             | QPSK  | -14.320        | -13         |
|         |         |                 | 16QAM | -13.957        | -13         |
| 5       | 20625   | 849             | QPSK  | -15.610        | -13         |
|         |         |                 | 16QAM | -17.596        | -13         |
| 10      | 20450   | 824             | QPSK  | -13.554        | -13         |
|         |         |                 | 16QAM | -15.804        | -13         |
| 10      | 20800   | 849             | QPSK  | -16.444        | -13         |
|         |         |                 | 16QAM | -16.466        | -13         |

### Test Plots

#### LTE Band II (Part 24E)



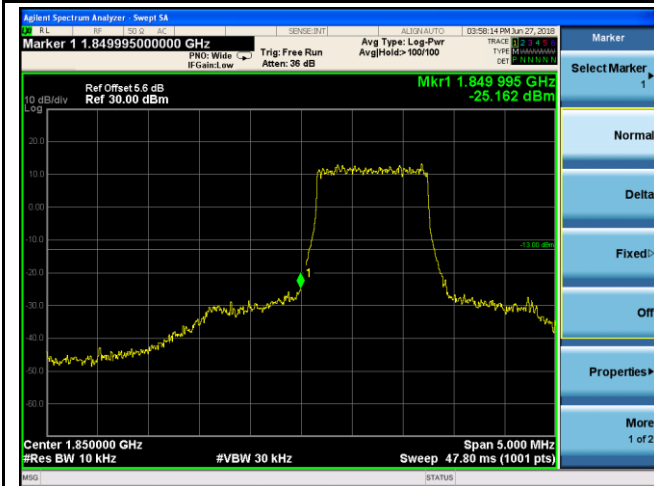
LTE Band II - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.19/10)=4.5+1.1=5.6dB



LTE Band II - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.04/10)=4.5+1.1=5.6dB



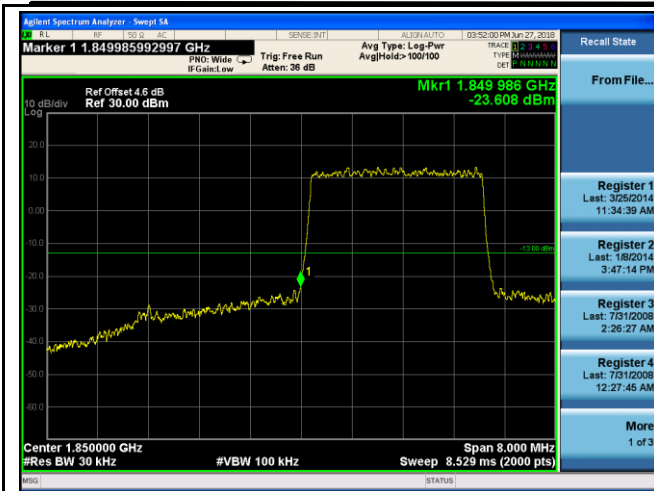
LTE Band II - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.25/10)=4.5+1.1=5.6 dB



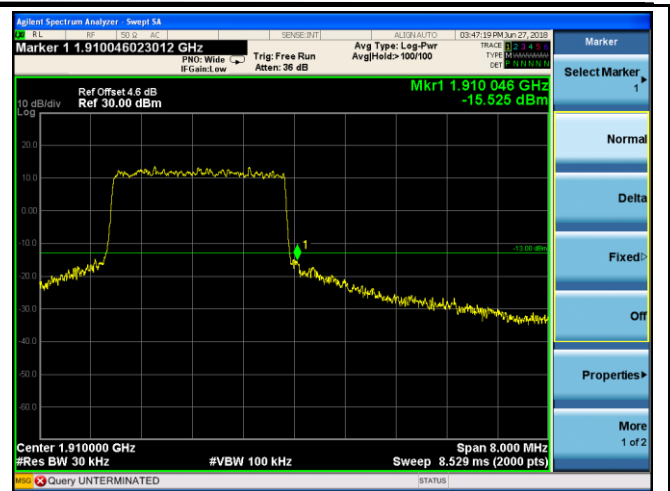
LTE Band II - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.07/10)=4.5+1.1=5.6 dB



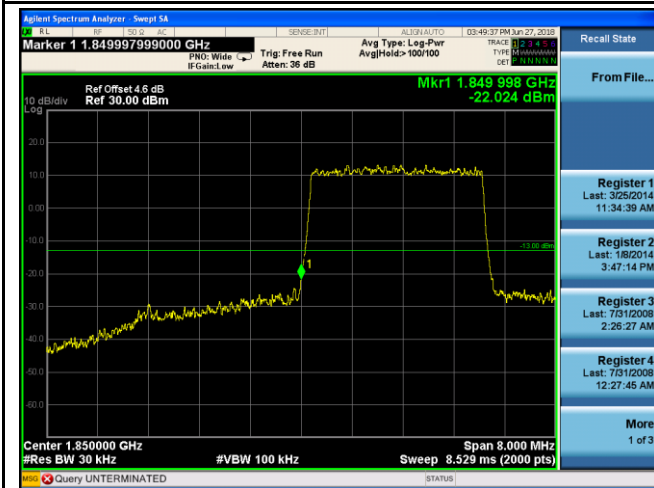
LTE Band II - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log  
(52.15/30)=4.5+0.1=4.6 dB



LTE Band II - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log  
(30.30/30)=4.5+0.1=4.6 dB



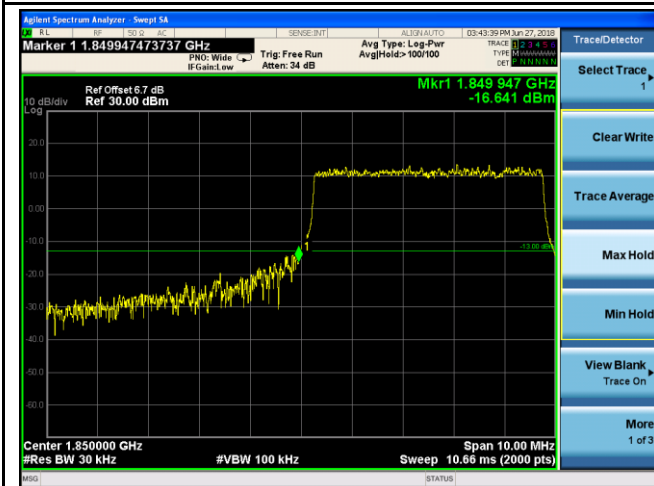
LTE Band II - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
(30.14/30)=4.5+0.1=4.6 dB

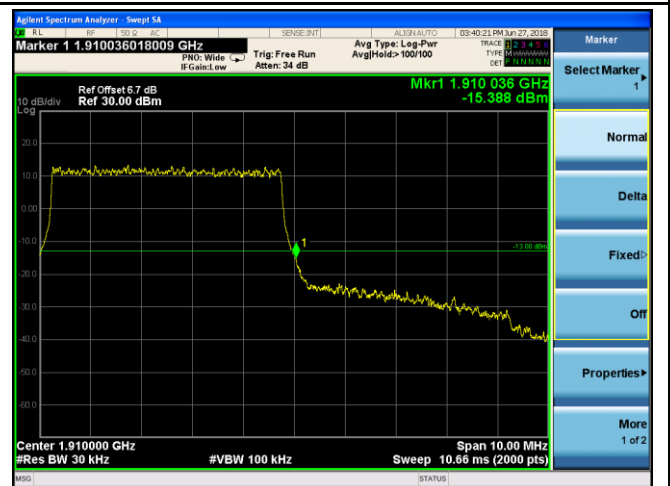


LTE Band II - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
(30.28/30)=4.5+0.1=4.6 dB



LTE Band II - Low Channel QPSK-5



LTE Band II - High Channel QPSK-5