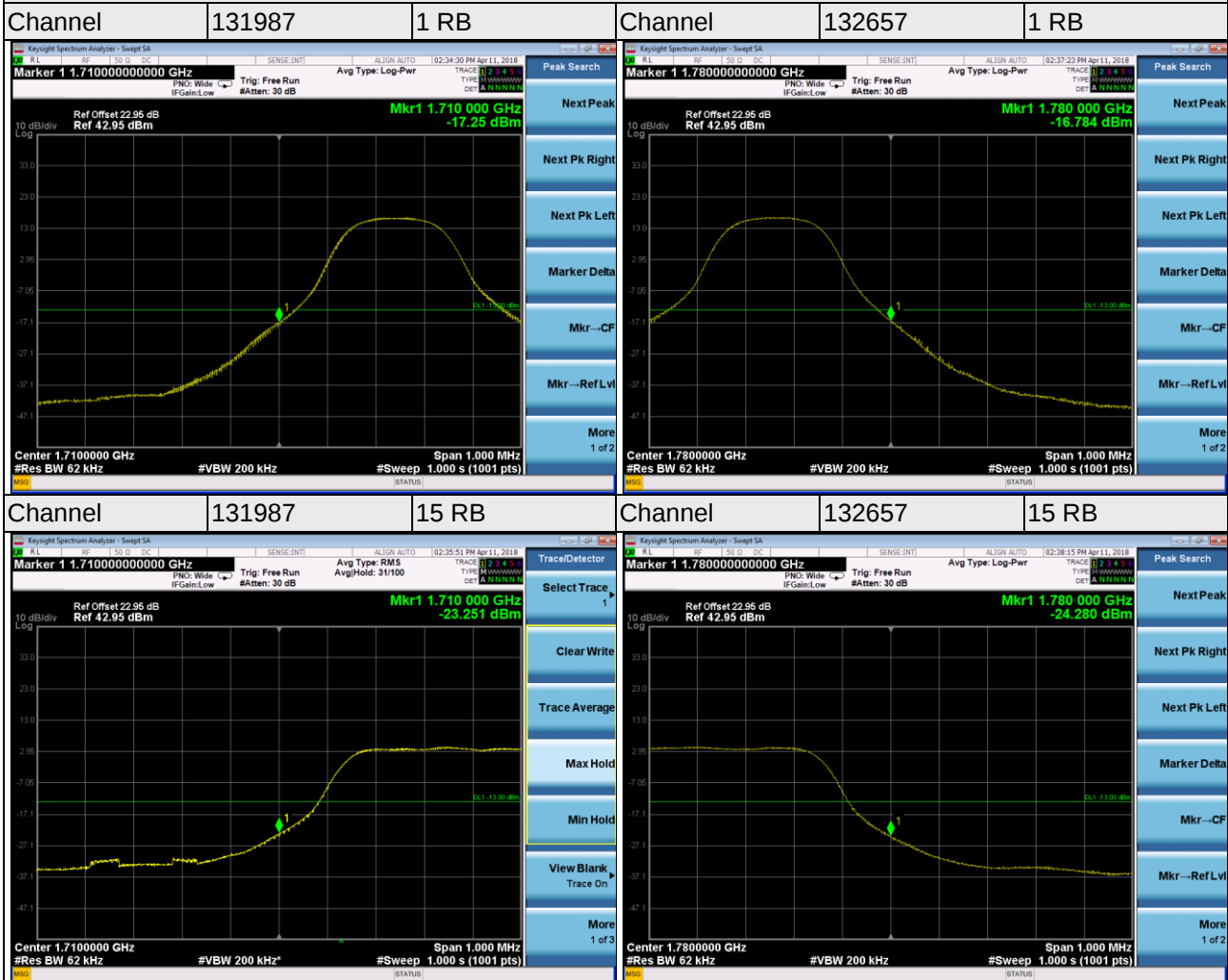


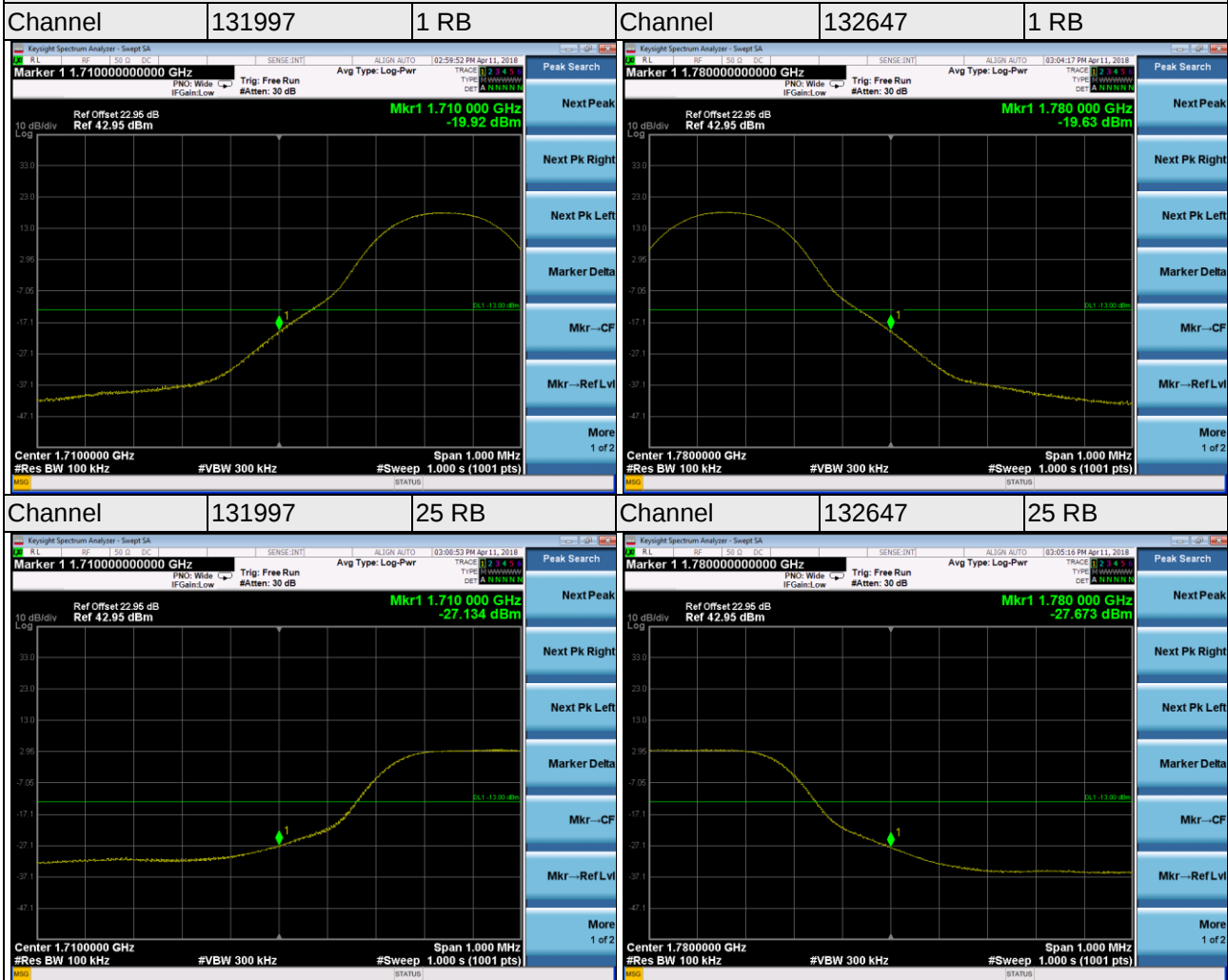
## LTE Band 66

### Channel Bandwidth 3MHz



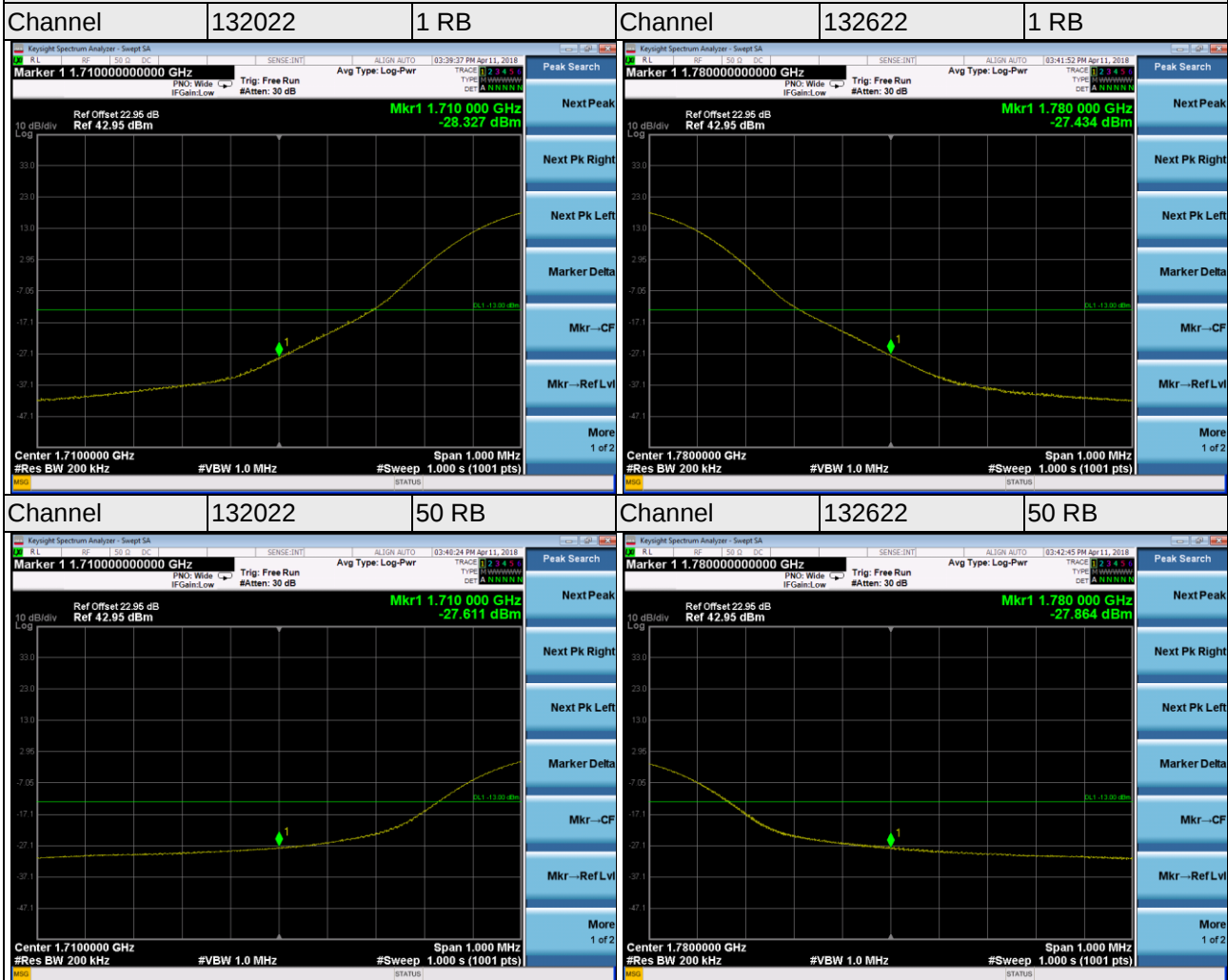
## LTE Band 66

### Channel Bandwidth 5MHz



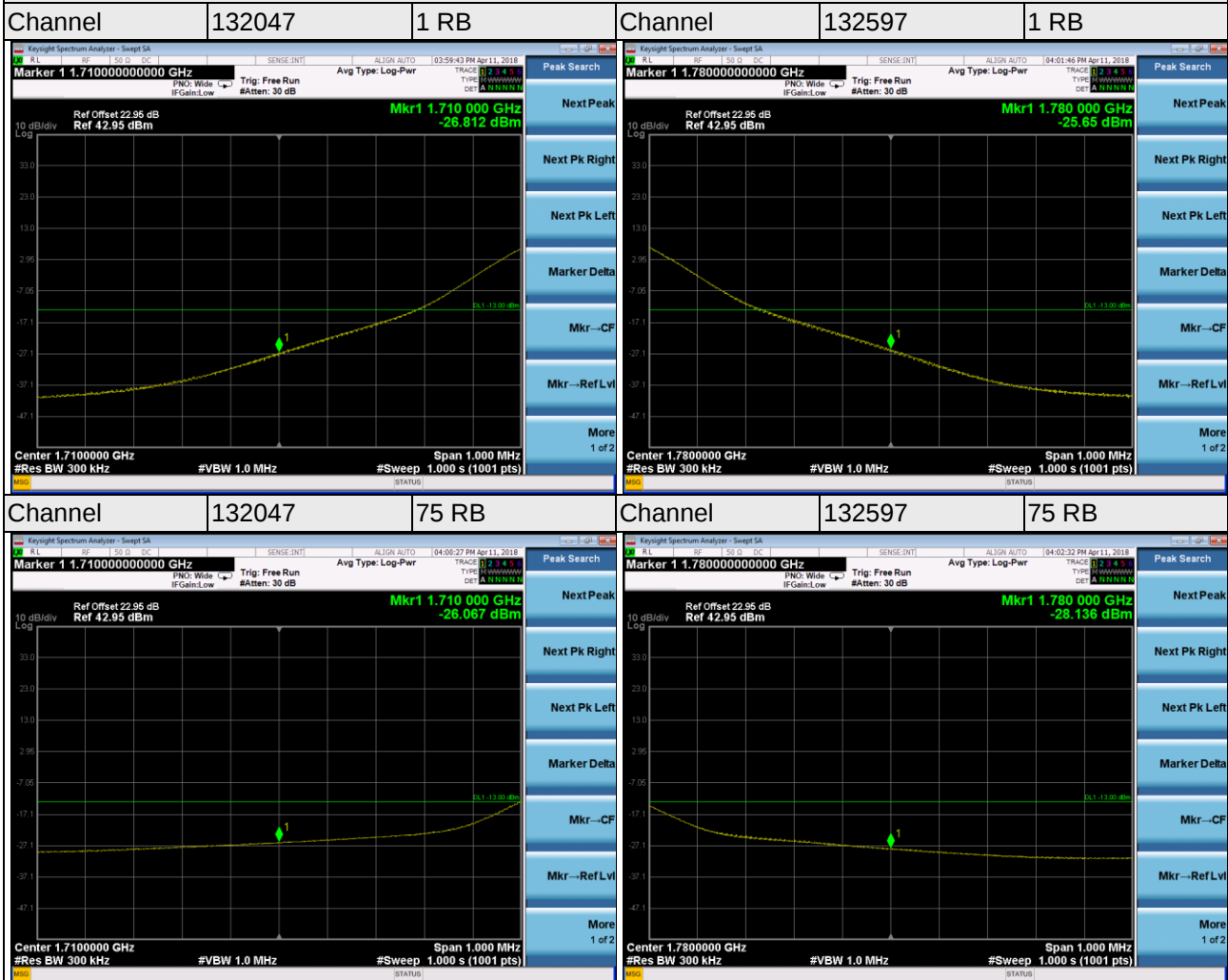
## LTE Band 66

### Channel Bandwidth 10MHz



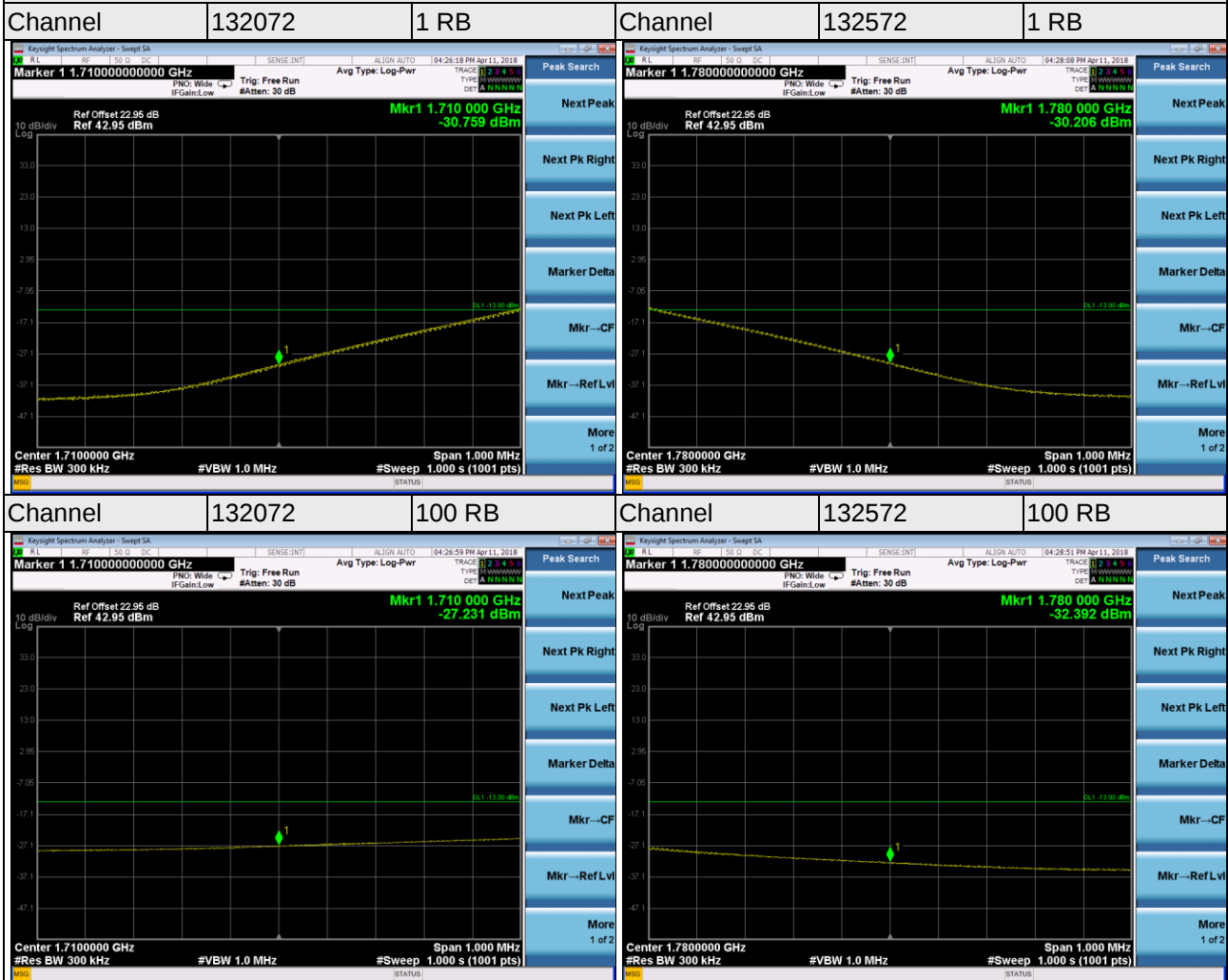
## LTE Band 66

### Channel Bandwidth 15MHz



## LTE Band 66

### Channel Bandwidth 20MHz

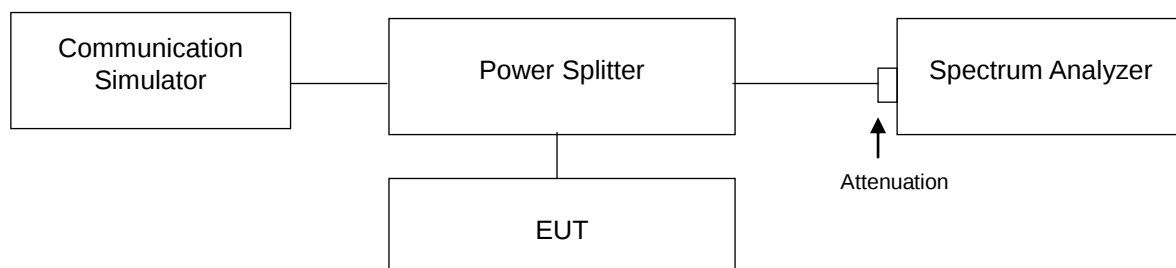


## 4.6 Peak to Average Ratio

### 4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

### 4.5.2 Test Setup

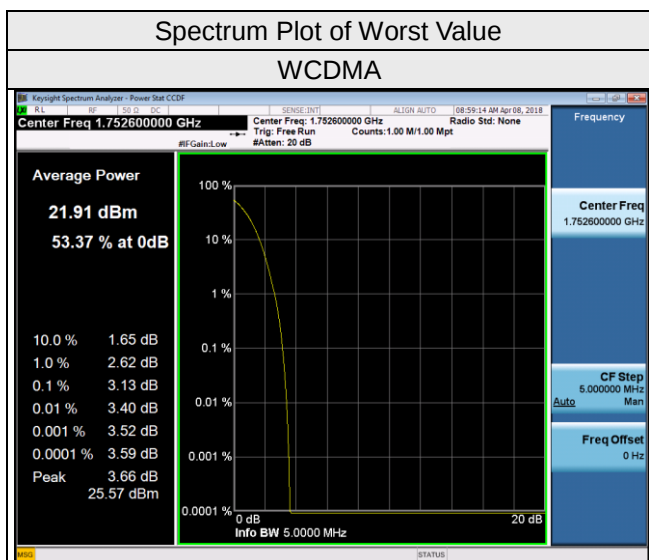


### 4.5.3 Test Procedures

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

#### 4.5.4 Test Results

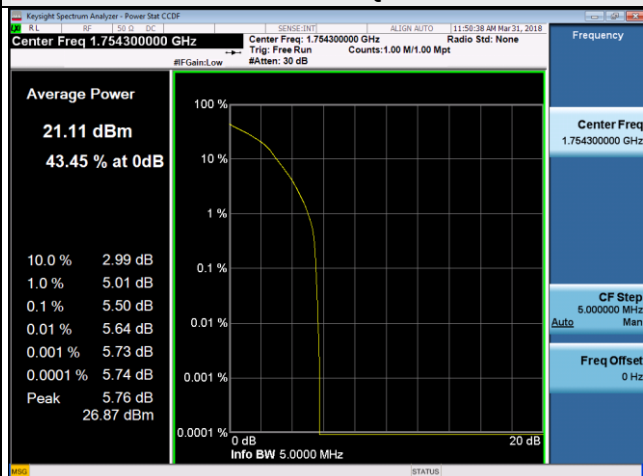
| Channel | Freq. (MHz) | Peak to Average Ratio (dB) |
|---------|-------------|----------------------------|
|         |             | WCDMA                      |
| 1312    | 1712.4      | 3.10                       |
| 1413    | 1732.6      | 3.12                       |
| 1513    | 1752.6      | 3.13                       |



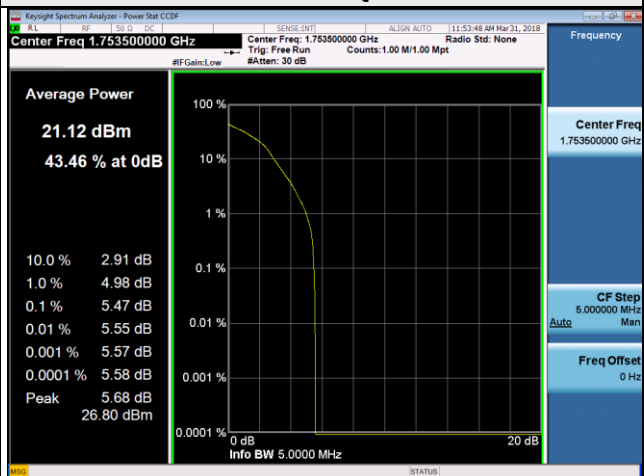
| LTE Band 4               |                 |                            |       |       |                         |                 |                            |       |       |
|--------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel Bandwidth 1.4MHz |                 |                            |       |       | Channel Bandwidth 3MHz  |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 19957                    | 1710.7          | 3.76                       | 5.42  | 5.43  | 19965                   | 1711.5          | 3.53                       | 5.28  | 5.32  |
| 20175                    | 1732.5          | 3.86                       | 4.63  | 4.74  | 20175                   | 1732.5          | 3.79                       | 4.51  | 4.55  |
| 20393                    | 1754.3          | 3.85                       | 5.50  | 5.50  | 20385                   | 1753.5          | 3.7                        | 5.39  | 5.47  |
| Channel Bandwidth 5MHz   |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 19975                    | 1712.5          | 3.55                       | 5.26  | 5.31  | 20000                   | 1715            | 3.51                       | 5.22  | 5.36  |
| 20175                    | 1732.5          | 3.6                        | 4.34  | 4.42  | 20175                   | 1732.5          | 3.54                       | 4.21  | 4.37  |
| 20375                    | 1752.5          | 3.75                       | 5.44  | 5.50  | 20350                   | 1750            | 3.62                       | 5.02  | 5.08  |
| Channel Bandwidth 15MHz  |                 |                            |       |       | Channel Bandwidth 20MHz |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 20025                    | 1717.5          | 3.42                       | 5.06  | 5.16  | 20050                   | 1720            | 3.46                       | 5.07  | 5.23  |
| 20175                    | 1732.5          | 3.5                        | 4.19  | 4.31  | 20175                   | 1732.5          | 3.44                       | 4.80  | 4.89  |
| 20325                    | 1747.5          | 3.47                       | 5.30  | 4.19  | 20300                   | 1745            | 3.49                       | 5.21  | 5.13  |

## Spectrum Plot of Worst Value

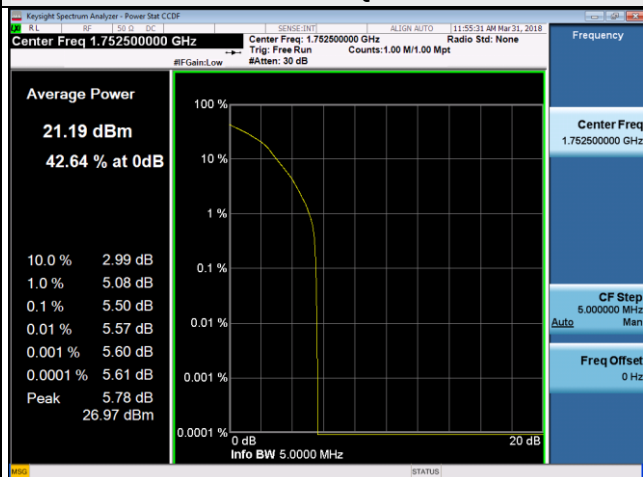
1.4MHz / 64QAM



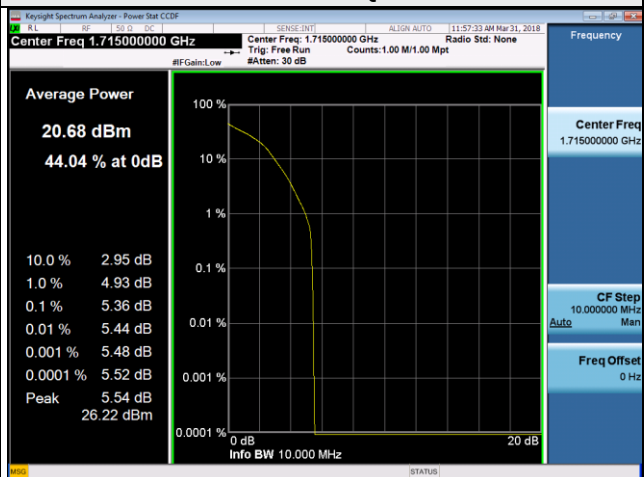
3MHz / 64QAM



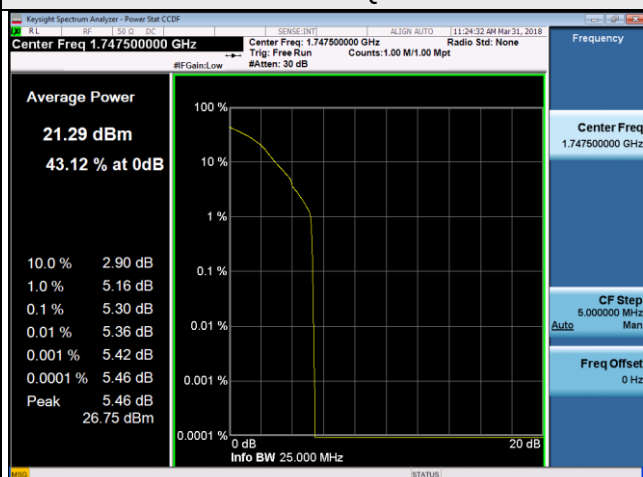
5MHz / 64QAM



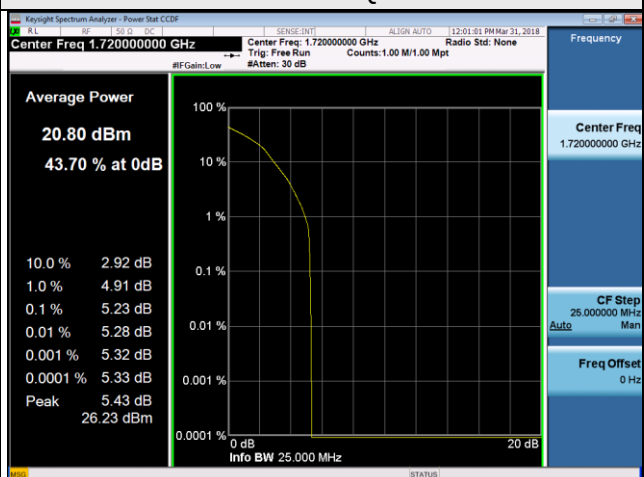
10MHz / 64QAM



15MHz / 16QAM



20MHz / 64QAM



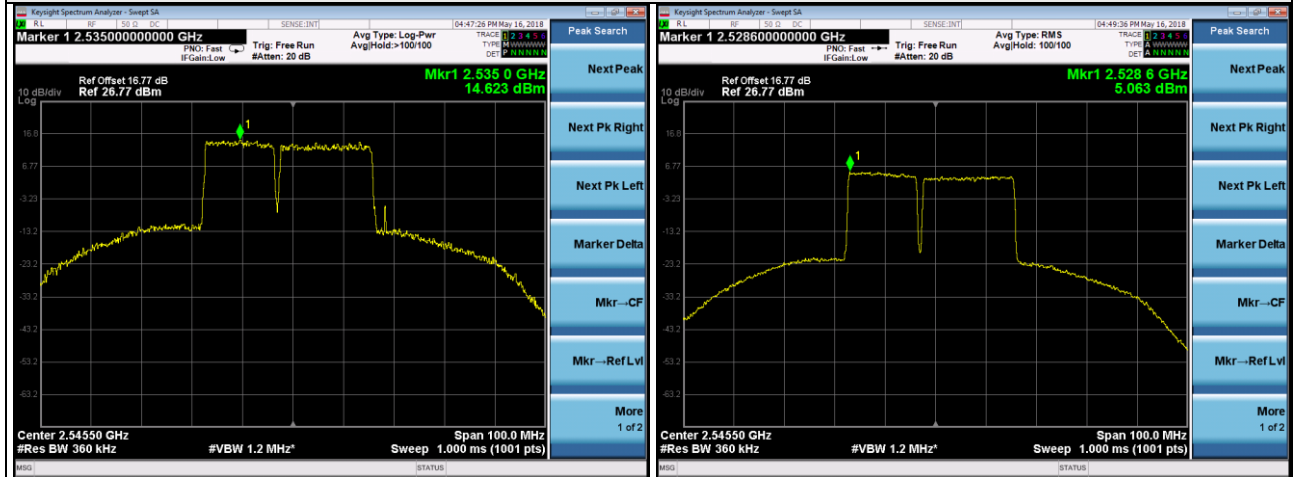
| LTE Band 7              |                 |                            |       |       |                         |                 |                            |       |       |
|-------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel Bandwidth 5MHz  |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
| Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 20775                   | 2502.5          | 3.63                       | 4.99  | 5.11  | 20800                   | 2505            | 3.57                       | 5.18  | 5.28  |
| 21100                   | 2535            | 3.38                       | 4.13  | 4.21  | 21100                   | 2535            | 3.45                       | 4.08  | 4.16  |
| 21425                   | 2567.5          | 3.59                       | 4.42  | 4.49  | 21400                   | 2565            | 3.53                       | 5.34  | 5.29  |
| Channel Bandwidth 15MHz |                 |                            |       |       | Channel Bandwidth 20MHz |                 |                            |       |       |
| Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 20825                   | 2507.5          | 3.54                       | 4.88  | 5.06  | 20850                   | 2510            | 3.55                       | 4.72  | 4.88  |
| 21100                   | 2535            | 3.49                       | 4.07  | 4.15  | 21100                   | 2535            | 3.46                       | 4.29  | 4.59  |
| 21375                   | 2562.5          | 3.53                       | 5.28  | 5.33  | 21350                   | 2560            | 3.57                       | 5.24  | 5.36  |



# LTE CA\_7C

| Channel     | Freq. (MHz) | Peak to Average Ratio (dB) |         |            |
|-------------|-------------|----------------------------|---------|------------|
|             |             | Peak                       | Average | Difference |
| 21100+21271 | 2535+2552.1 | 14.62                      | 5.06    | 9.56       |

## Spectrum Plot of Worst Value



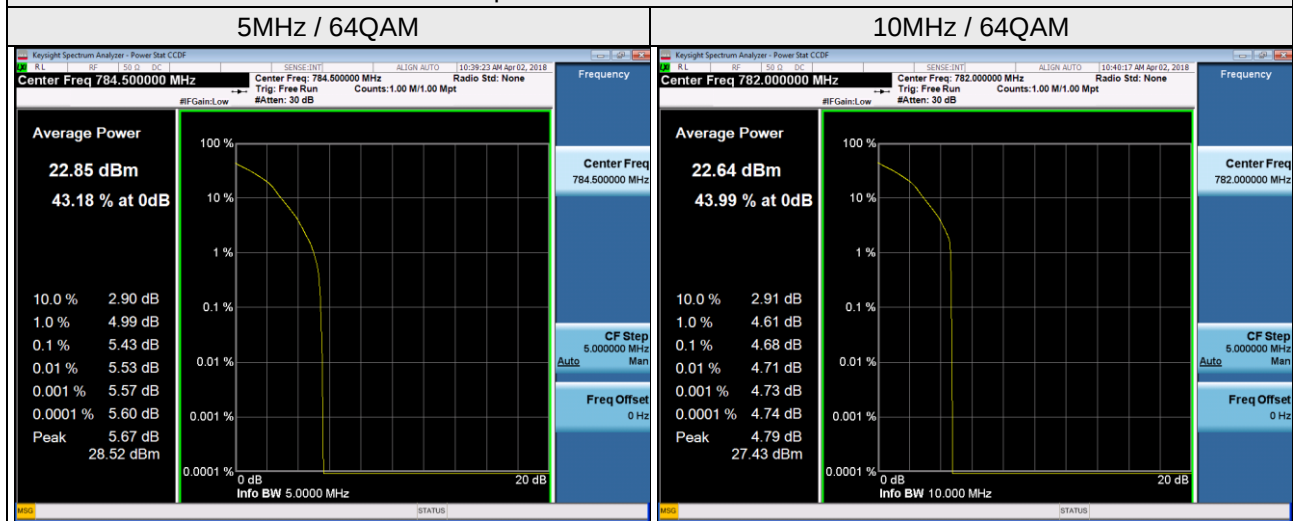
| LTE Band 12              |                 |                            |       |       |                         |                 |                            |       |       |
|--------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel Bandwidth 1.4MHz |                 |                            |       |       | Channel Bandwidth 3MHz  |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 23017                    | 699.7           | 3.89                       | 5.60  | 5.52  | 23025                   | 700.5           | 3.69                       | 5.43  | 5.51  |
| 23095                    | 707.5           | 3.86                       | 5.42  | 5.40  | 23095                   | 707.5           | 3.65                       | 5.37  | 5.33  |
| 23173                    | 715.3           | 3.85                       | 5.02  | 5.06  | 23165                   | 714.5           | 3.66                       | 5.31  | 5.40  |
| Channel Bandwidth 5MHz   |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 23035                    | 701.5           | 3.66                       | 5.40  | 5.45  | 23060                   | 704             | 3.6                        | 5.32  | 5.39  |
| 23095                    | 707.5           | 3.65                       | 4.77  | 5.01  | 23095                   | 707.5           | 3.56                       | 5.35  | 5.40  |
| 23155                    | 713.5           | 3.66                       | 5.47  | 5.45  | 23130                   | 711             | 3.57                       | 5.17  | 5.29  |



### LTE Band 13

| Channel Bandwidth 5MHz |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
|------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel                | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                        |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 23205                  | 779.5           | 3.58                       | 4.54  | 4.59  | 23230                   | 782             | 3.5                        | 4.59  | 4.68  |
| 23230                  | 782             | 3.63                       | 5.32  | 5.38  |                         |                 |                            |       |       |
| 23255                  | 784.5           | 3.53                       | 5.35  | 5.43  |                         |                 |                            |       |       |

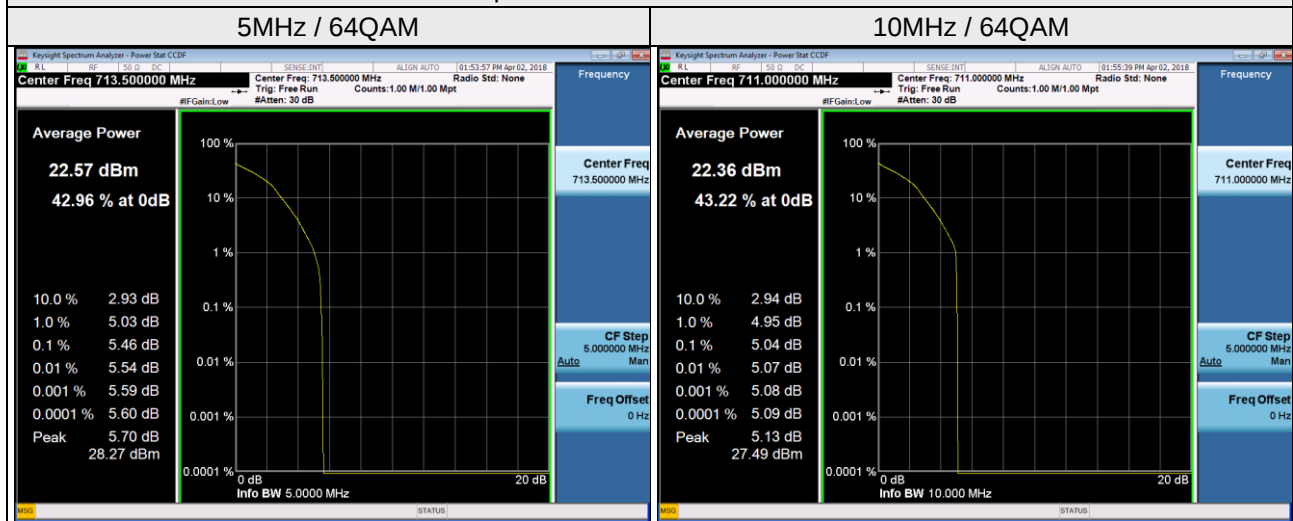
### Spectrum Plot of Worst Value



### LTE Band 17

| Channel Bandwidth 5MHz |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
|------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel                | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                        |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 23755                  | 706.5           | 3.65                       | 4.84  | 4.97  | 23780                   | 709             | 3.58                       | 4.80  | 4.87  |
| 23790                  | 710             | 3.66                       | 5.11  | 5.30  | 23790                   | 710             | 3.54                       | 4.48  | 4.66  |
| 23825                  | 713.5           | 3.67                       | 5.42  | 5.46  | 23800                   | 711             | 3.56                       | 4.95  | 5.04  |

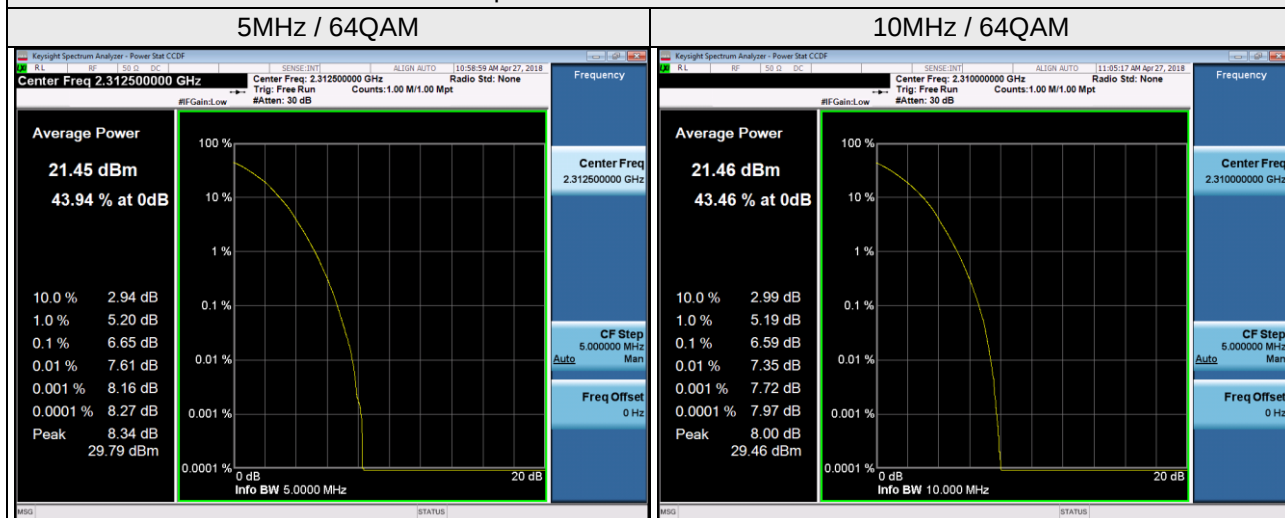
### Spectrum Plot of Worst Value



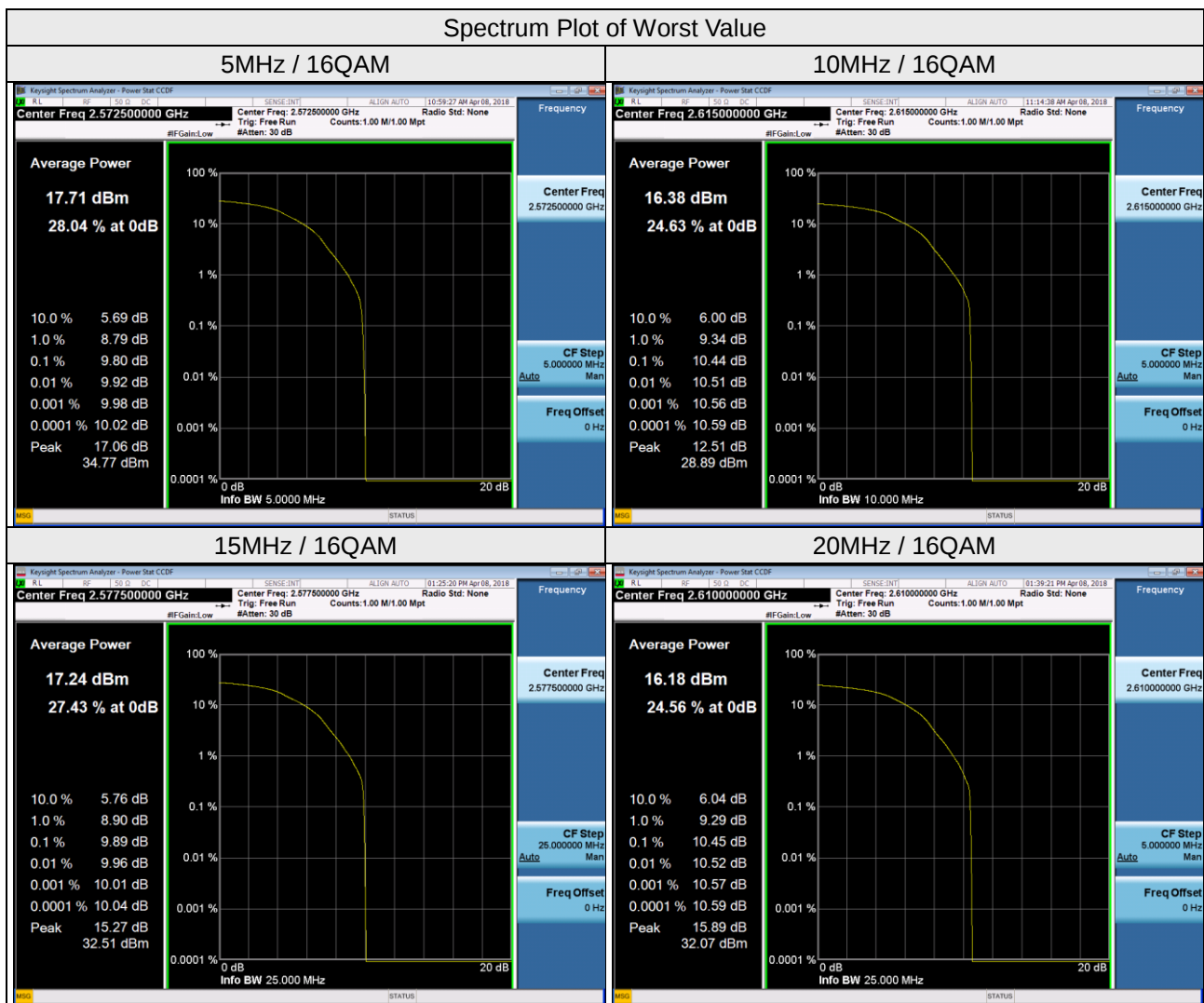
### LTE Band 30

| Channel Bandwidth 5MHz |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
|------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel                | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                        |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 27685                  | 2307.5          | 4.55                       | 5.71  | 6.52  | 27710                   | 2310            | 4.54                       | 5.68  | 6.59  |
| 27710                  | 2310            | 4.62                       | 5.73  | 6.57  |                         |                 |                            |       |       |
| 27735                  | 2312.5          | 4.83                       | 6.01  | 6.65  |                         |                 |                            |       |       |

### Spectrum Plot of Worst Value



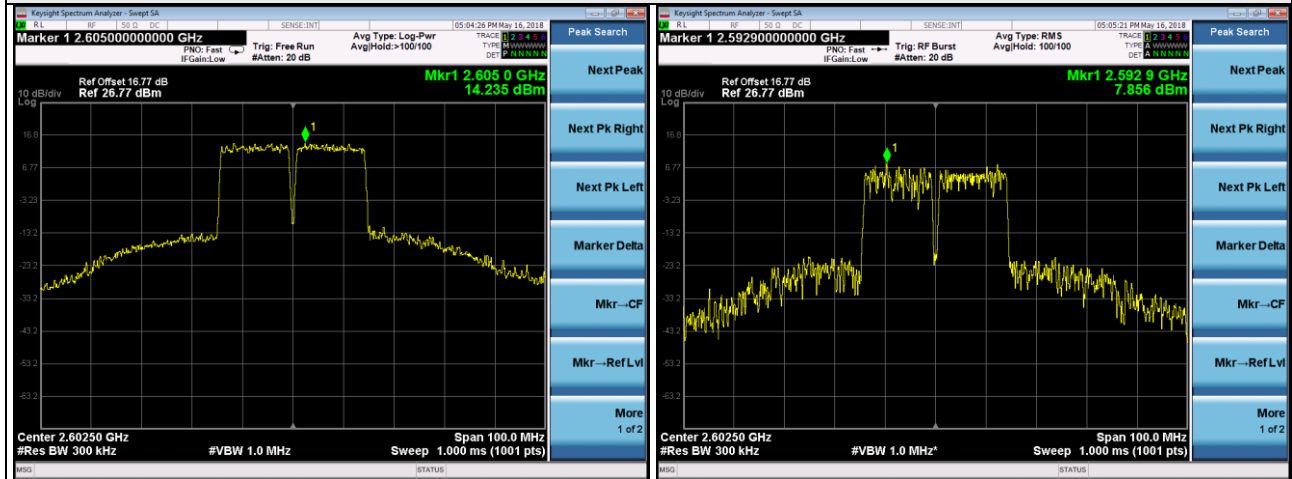
| LTE Band 38             |                 |                            |       |       |                         |                 |                            |       |       |
|-------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel Bandwidth 5MHz  |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
| Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 37775                   | 2572.5          | 7.84                       | 9.80  | 9.50  | 37800                   | 2575            | 7.88                       | 8.82  | 9.80  |
| 38000                   | 2595            | 7.47                       | 8.89  | 9.68  | 38000                   | 2595            | 7.24                       | 9.20  | 10.13 |
| 38225                   | 2617.5          | 7.5                        | 9.27  | 9.45  | 38200                   | 2615            | 7.03                       | 10.44 | 9.42  |
| Channel Bandwidth 15MHz |                 |                            |       |       | Channel Bandwidth 20MHz |                 |                            |       |       |
| Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 37825                   | 2577.5          | 7.61                       | 9.89  | 8.20  | 37850                   | 2580            | 7.71                       | 9.65  | 8.38  |
| 38000                   | 2595            | 7.21                       | 8.36  | 8.51  | 38000                   | 2595            | 7.56                       | 9.85  | 8.23  |
| 38175                   | 2612.5          | 6.91                       | 8.42  | 9.55  | 38150                   | 2610            | 7.22                       | 10.45 | 9.89  |



# LTE CA\_38C

| Channel     | Freq. (MHz) | Peak to Average Ratio (dB) |         |            |
|-------------|-------------|----------------------------|---------|------------|
|             |             | Peak                       | Average | Difference |
| 38000+38150 | 2595+2610   | 14.24                      | 7.86    | 6.38       |

## Spectrum Plot of Worst Value



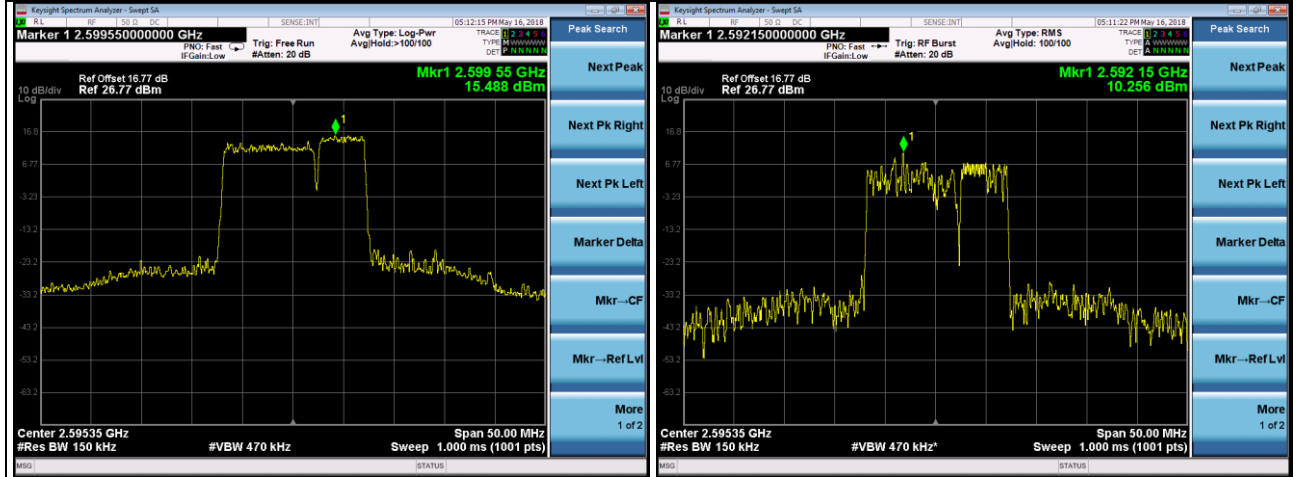
| LTE Band 41             |                 |                            |       |       |                         |                 |                            |       |       |
|-------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel Bandwidth 5MHz  |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
| Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 39675                   | 2498.5          | 10.09                      | 9.74  | 9.49  | 39700                   | 2501            | 12.3                       | 9.13  | 9.37  |
| 40620                   | 2593            | 7.71                       | 8.36  | 9.07  | 50620                   | 2593            | 7.21                       | 8.84  | 8.95  |
| 41565                   | 2687.5          | 7.97                       | 9.19  | 9.38  | 41540                   | 2685            | 7.21                       | 9.51  | 9.14  |
| Channel Bandwidth 15MHz |                 |                            |       |       | Channel Bandwidth 20MHz |                 |                            |       |       |
| Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                         |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 39725                   | 2503.5          | 7.57                       | 8.36  | 8.19  | 39750                   | 2506            | 7.37                       | 9.56  | 8.25  |
| 40620                   | 2593            | 7.63                       | 7.83  | 8.03  | 40620                   | 2593            | 7.29                       | 9.12  | 8.04  |
| 41515                   | 2682.5          | 7.29                       | 9.42  | 8.28  | 41490                   | 2680            | 7.67                       | 9.54  | 9.80  |



# LTE CA\_41C

| Channel     | Freq. (MHz) | Peak to Average Ratio (dB) |         |            |
|-------------|-------------|----------------------------|---------|------------|
|             |             | Peak                       | Average | Difference |
| 40620+40692 | 2593+2600.2 | 15.49                      | 10.26   | 5.23       |

## Spectrum Plot of Worst Value



| LTE Band 66              |                 |                            |       |       |                         |                 |                            |       |       |
|--------------------------|-----------------|----------------------------|-------|-------|-------------------------|-----------------|----------------------------|-------|-------|
| Channel Bandwidth 1.4MHz |                 |                            |       |       | Channel Bandwidth 3MHz  |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 131979                   | 1710.7          | 4.67                       | 4.85  | 6.03  | 131987                  | 1711.5          | 3.51                       | 4.77  | 5.93  |
| 132322                   | 1745            | 4.82                       | 5.72  | 6.46  | 132322                  | 1745            | 3.62                       | 5.61  | 6.41  |
| 132665                   | 1779.3          | 4.94                       | 5.71  | 6.38  | 132657                  | 1778.5          | 3.56                       | 5.56  | 6.35  |
| Channel Bandwidth 5MHz   |                 |                            |       |       | Channel Bandwidth 10MHz |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 131997                   | 1712.5          | 3.54                       | 4.79  | 5.91  | 132022                  | 1715            | 3.47                       | 4.59  | 5.77  |
| 132322                   | 1745            | 3.65                       | 5.59  | 6.44  | 132322                  | 1745            | 3.53                       | 5.56  | 6.44  |
| 132647                   | 1777.5          | 3.54                       | 5.21  | 6.19  | 132622                  | 1775            | 3.49                       | 4.52  | 5.69  |
| Channel Bandwidth 15MHz  |                 |                            |       |       | Channel Bandwidth 20MHz |                 |                            |       |       |
| Channel                  | Frequency (MHz) | Peak To Average Ratio (dB) |       |       | Channel                 | Frequency (MHz) | Peak To Average Ratio (dB) |       |       |
|                          |                 | QPSK                       | 16QAM | 64QAM |                         |                 | QPSK                       | 16QAM | 64QAM |
| 132047                   | 1717.5          | 3.38                       | 4.47  | 5.68  | 132072                  | 1720            | 3.48                       | 4.50  | 5.62  |
| 132322                   | 1745            | 3.49                       | 5.32  | 6.08  | 132322                  | 1745            | 3.5                        | 4.38  | 5.38  |
| 132597                   | 1772.5          | 3.45                       | 5.45  | 6.30  | 132572                  | 1770            | 3.49                       | 5.45  | 6.33  |