



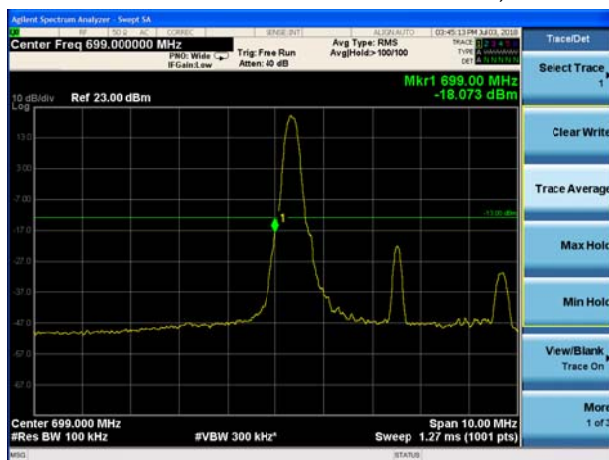
## LTE Band 12 16QAM 3MHz CH-Low, 100%RB



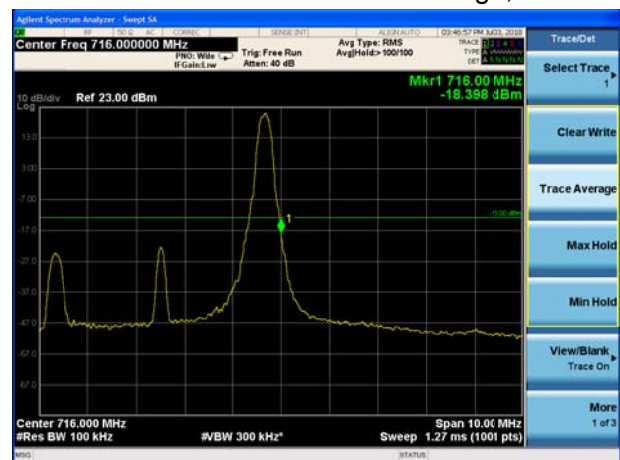
## LTE Band 12 16QAM 3MHz CH-High, 100%RB



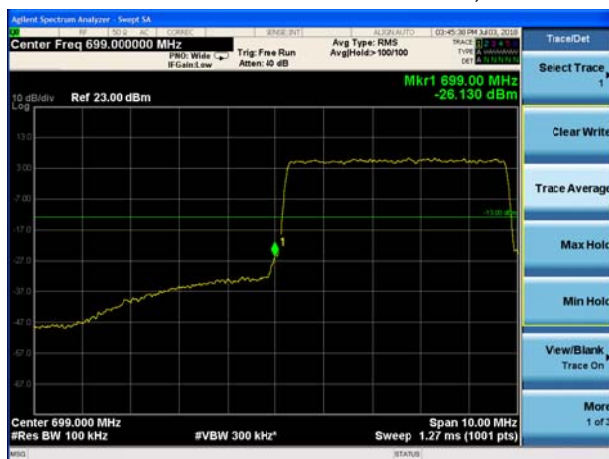
## LTE Band 12 16QAM 5MHz CH-Low, 1 RB



## LTE Band 12 16QAM 5MHz CH-High, 1 RB



## LTE Band 12 16QAM 5MHz CH-Low, 100%RB

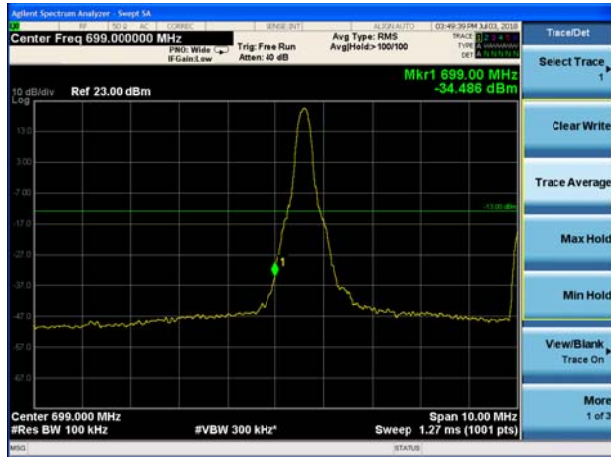


## LTE Band 12 16QAM 5MHz CH-High, 100%RB

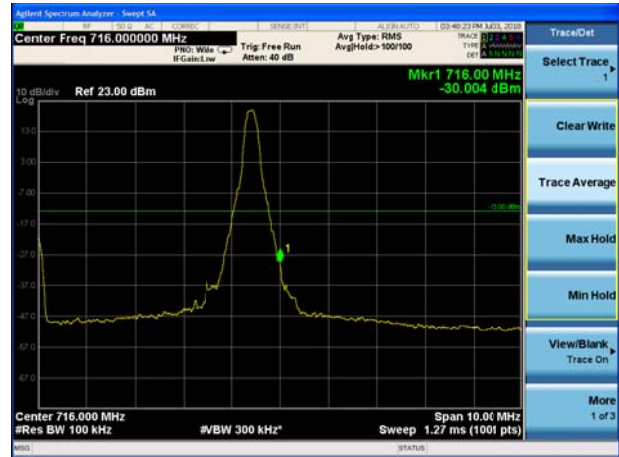




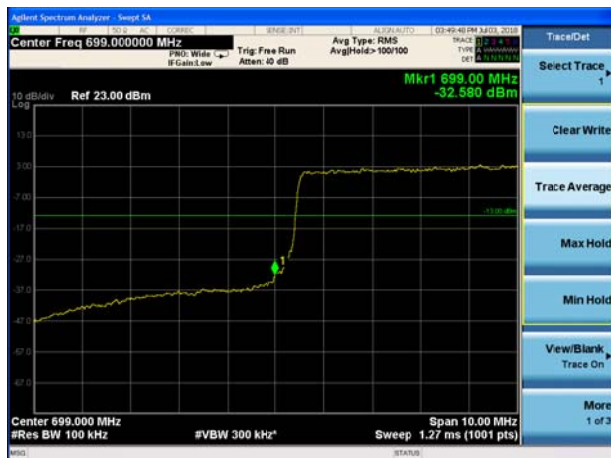
## LTE Band 12 16QAM 10MHz CH-Low, 1 RB



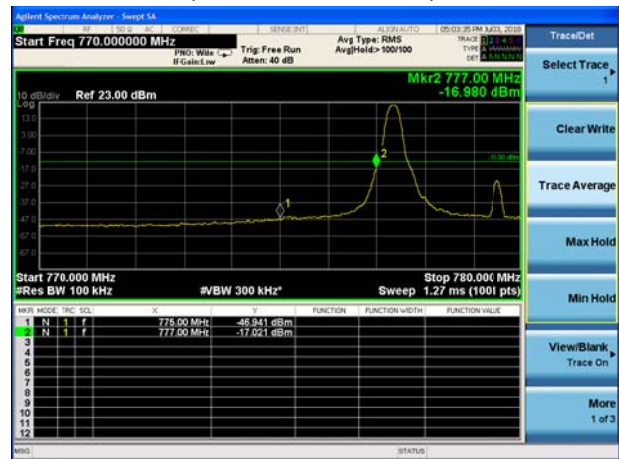
## LTE Band 12 16QAM 10MHz CH-High, 1 RB



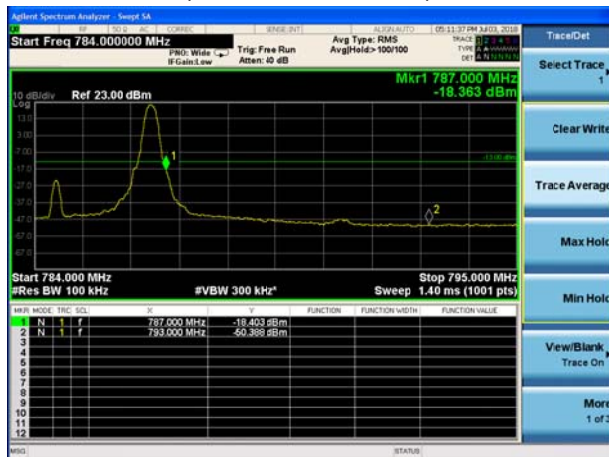
## LTE Band 12 16QAM 10MHz CH-Low, 100%RB



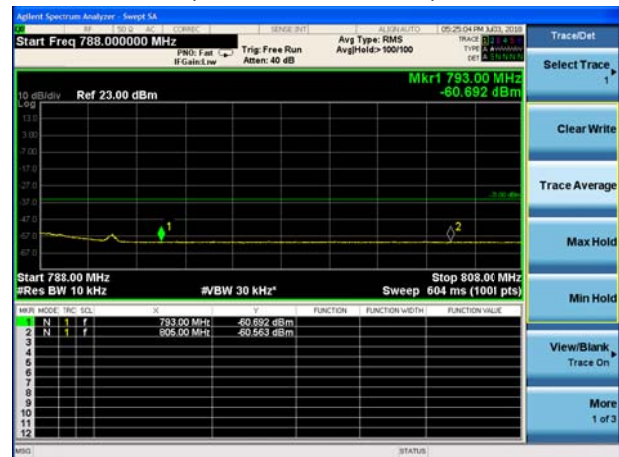
## LTE Band 12 16QAM 10MHz CH-High, 100%RB

LTE Band 13 QPSK 5MHz CH-Low, 1 RB  
(763MHz ~775MHz)LTE Band 13 QPSK 5MHz CH-Low, 1 RB  
(775MHz ~777MHz)

LTE Band 13 QPSK 5MHz CH-High, 1 RB  
(787MHz ~793MHz)



LTE Band 13 QPSK 5MHz CH-High, 1 RB  
(793MHz ~805MHz)



LTE Band 13 QPSK 5MHz CH-Low, 100%RB  
(763MHz ~775MHz)



LTE Band 13 QPSK 5MHz CH-Low, 100%RB  
(775MHz ~777MHz)

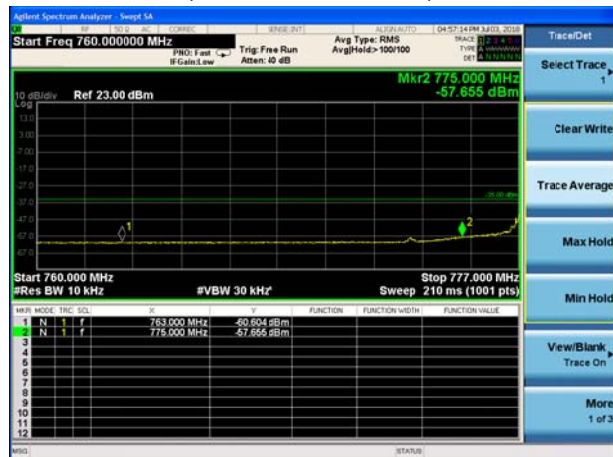
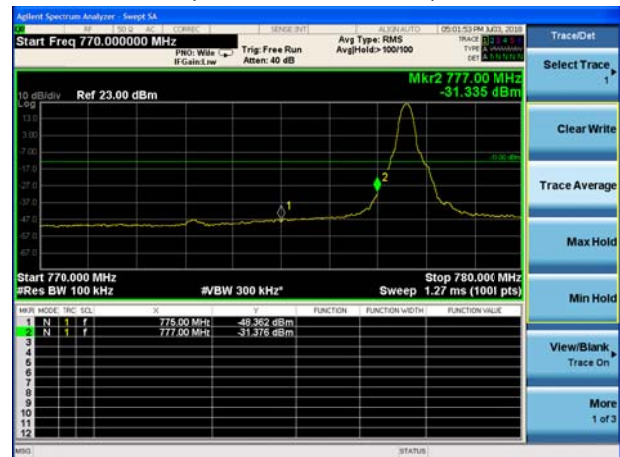
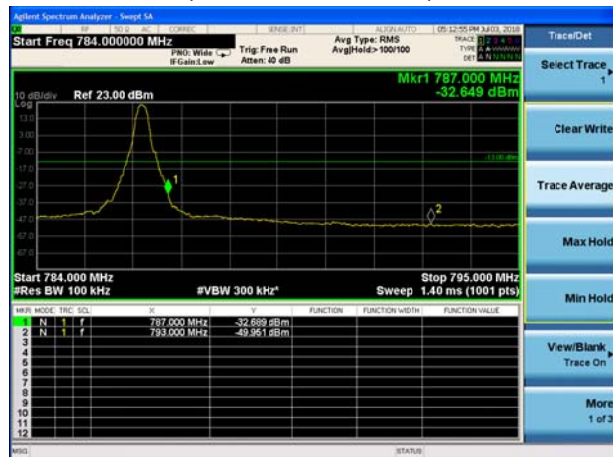
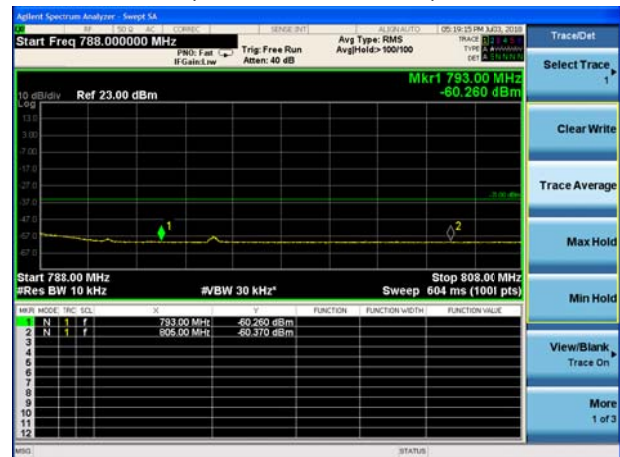


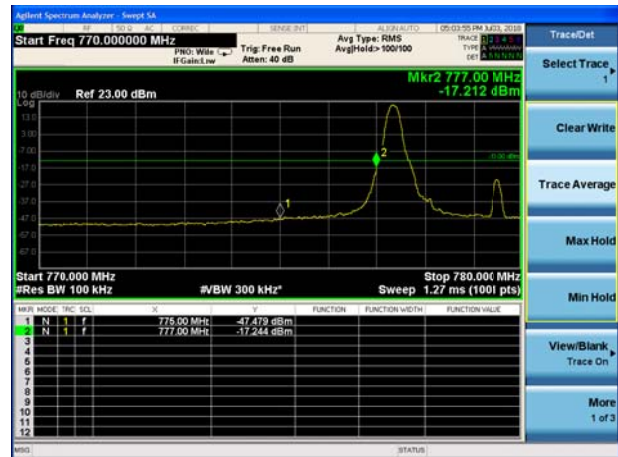
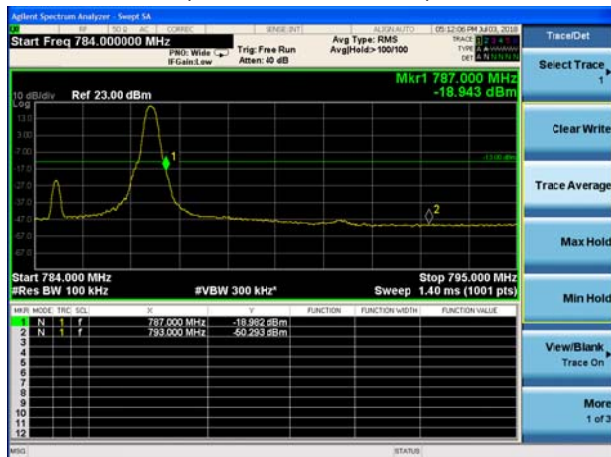
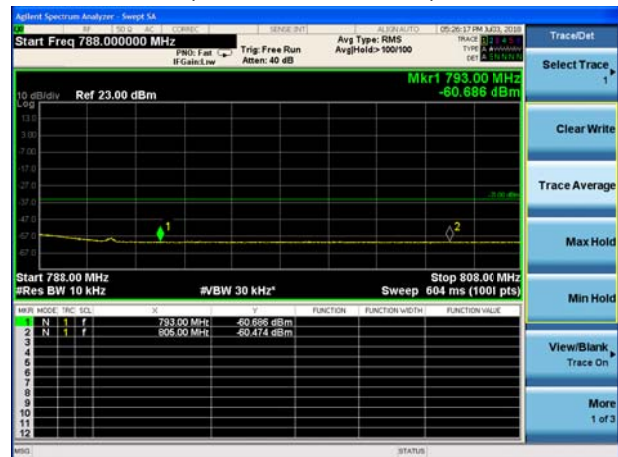
LTE Band 13 QPSK 5MHz CH-High, 100%RB  
(787MHz ~793MHz)

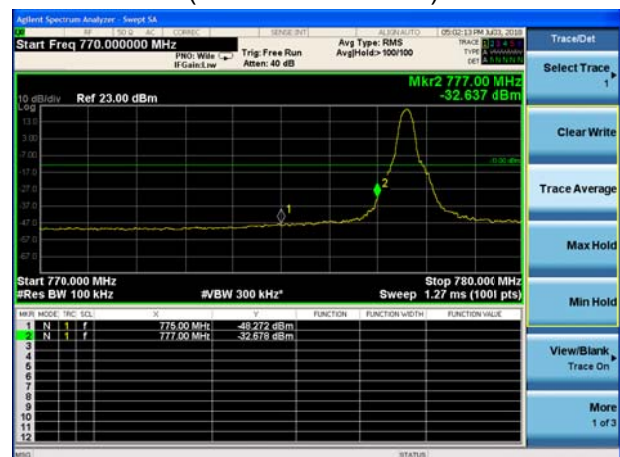


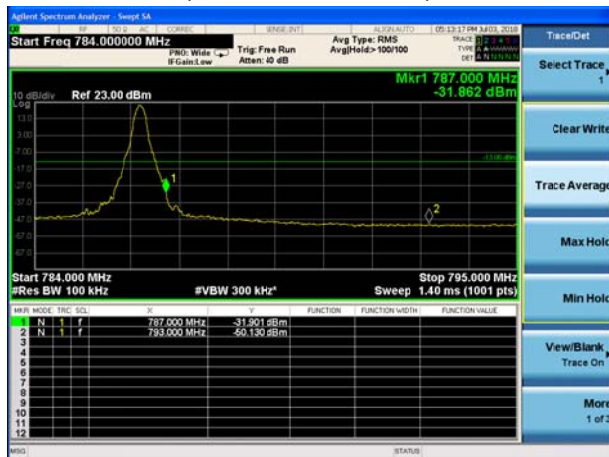
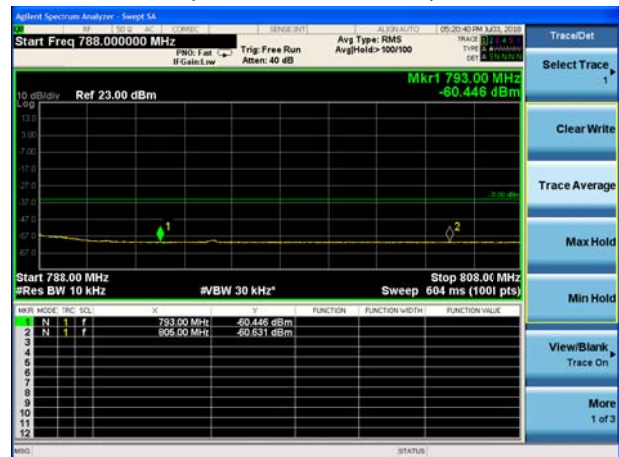
LTE Band 13 QPSK 5MHz CH-High, 100%RB  
(793MHz ~805MHz)



LTE Band 13 QPSK 10MHz CH-Low, 1 RB  
(763MHz ~775MHz)LTE Band 13 QPSK 10MHz CH-Low, 1 RB  
(775MHz ~777MHz)LTE Band 13 QPSK 10MHz CH-High, 1 RB  
(787MHz ~793MHz)LTE Band 13 QPSK 10MHz CH-High, 1 RB  
(793MHz ~805MHz)LTE Band 13 QPSK 10MHz CH-Low, 100%RB  
(763MHz ~775MHz)LTE Band 13 QPSK 10MHz CH-Low, 100%RB  
(775MHz ~777MHz)

LTE Band 13 QPSK 10MHz CH-High, 100%RB  
(787MHz ~793MHz)LTE Band 13 QPSK 10MHz CH-High, 100%RB  
(793MHz ~805MHz)LTE Band 13 16QAM 5MHz CH-Low, 1 RB  
(763MHz ~775MHz)LTE Band 13 16QAM 5MHz CH-Low, 1 RB  
(775MHz ~777MHz)LTE Band 13 16QAM 5MHz CH-High, 1 RB  
(787MHz ~793MHz)LTE Band 13 16QAM 5MHz CH-High, 1 RB  
(793MHz ~805MHz)

LTE Band 13 16QAM 5MHz CH-Low, 100%RB  
(763MHz ~775MHz)LTE Band 13 16QAM 5MHz CH-Low, 100%RB  
(775MHz ~777MHz)LTE Band 13 16QAM 5MHz CH-High, 100%RB  
(787MHz ~793MHz)LTE Band 13 16QAM 5MHz CH-High, 100%RB  
(793MHz ~805MHz)LTE Band 13 16QAM 10MHz CH-Low, 1 RB  
(763MHz ~775MHz)LTE Band 13 16QAM 10MHz CH-Low, 1 RB  
(775MHz ~777MHz)

LTE Band 13 16QAM 10MHz CH-High, 1 RB  
(787MHz ~793MHz)LTE Band 13 16QAM 10MHz CH-High, 1 RB  
(793MHz ~805MHz)LTE Band 13 16QAM 10MHz CH-Low, 100%RB  
(763MHz ~775MHz)LTE Band 13 16QAM 10MHz CH-Low, 100%RB  
(775MHz ~777MHz)LTE Band 13 16QAM 10MHz CH-High, 100%RB  
(787MHz ~793MHz)LTE Band 13 16QAM 10MHz CH-High, 100%RB  
(793MHz ~805MHz)



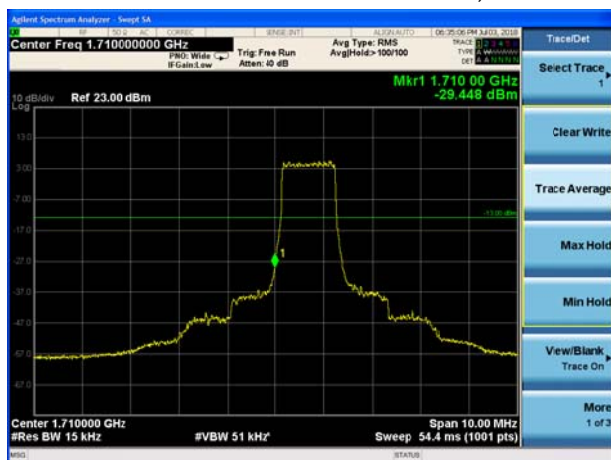
## LTE Band 66 QPSK 1.4MHz CH-Low, 1 RB



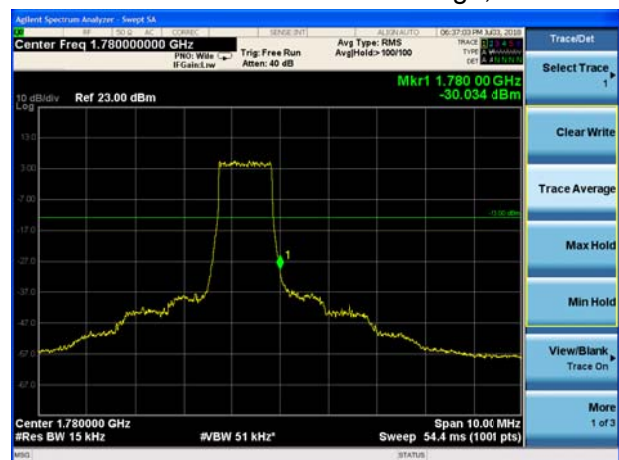
## LTE Band 66 QPSK 1.4MHz CH-High, 1 RB



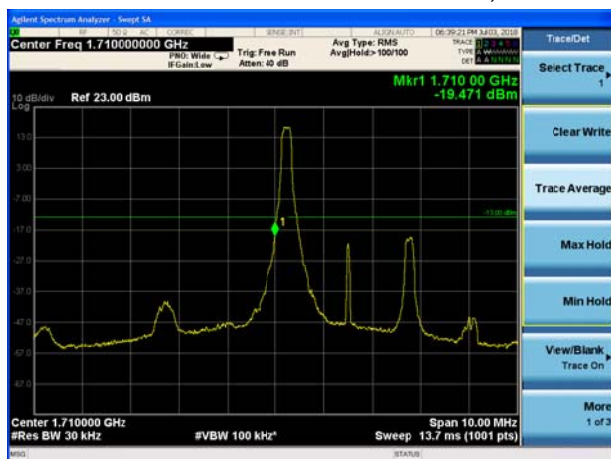
## LTE Band 66 QPSK 1.4MHz CH-Low, 100%RB



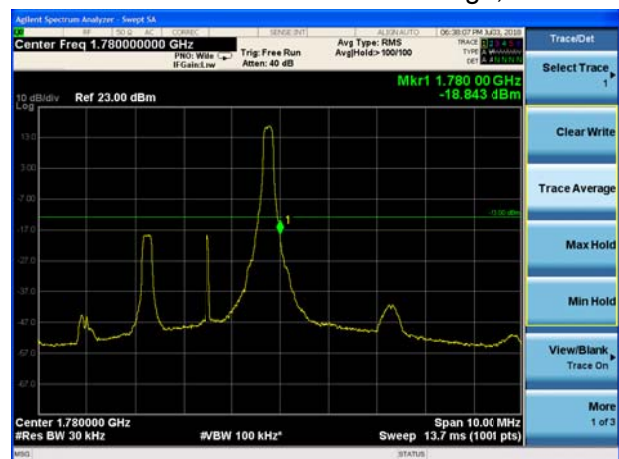
## LTE Band 66 QPSK 1.4MHz CH-High, 100%RB



## LTE Band 66 QPSK 3MHz CH-Low, 1 RB

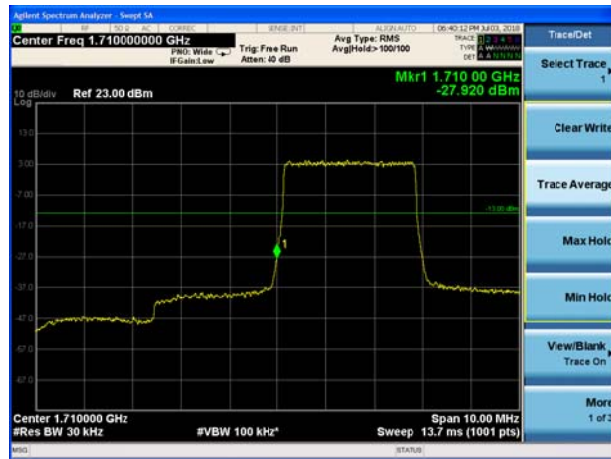


## LTE Band 66 QPSK 3MHz CH-High, 1 RB





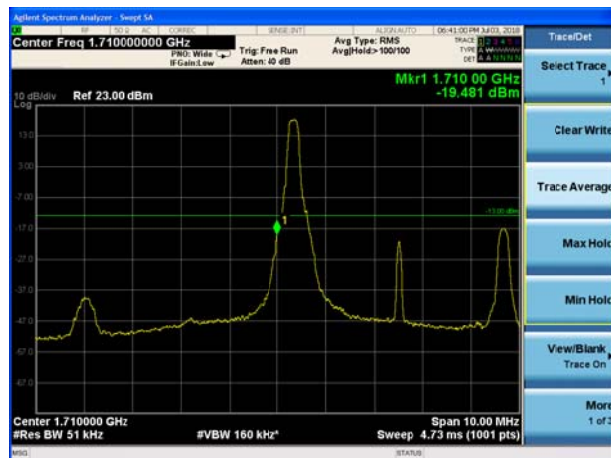
## LTE Band 66 QPSK 3MHz CH-Low, 100%RB



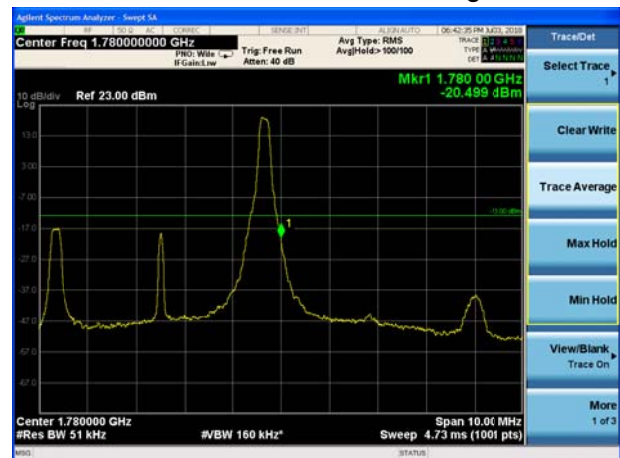
## LTE Band 66 QPSK 3MHz CH-High, 100%RB



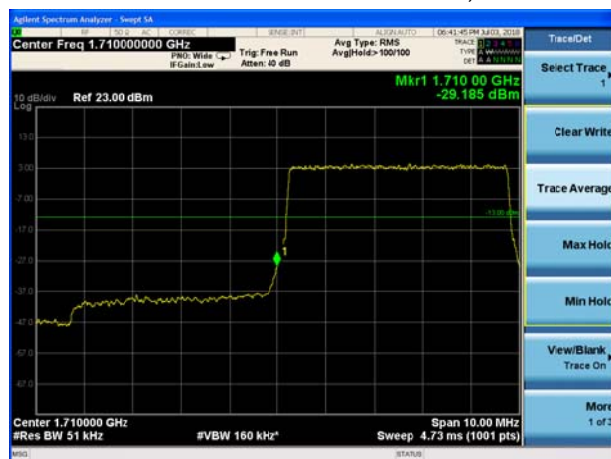
## LTE Band 66 QPSK 5MHz CH-Low, 1 RB



## LTE Band 66 QPSK 5MHz CH-High, 1 RB



## LTE Band 66 QPSK 5MHz CH-Low, 100%RB

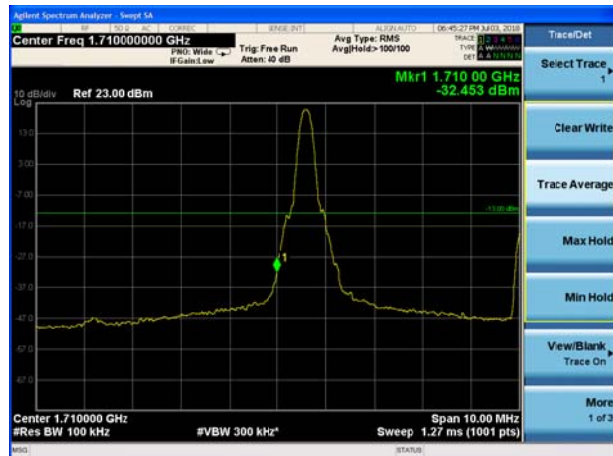


## LTE Band 66 QPSK 5MHz CH-High, 100%RB

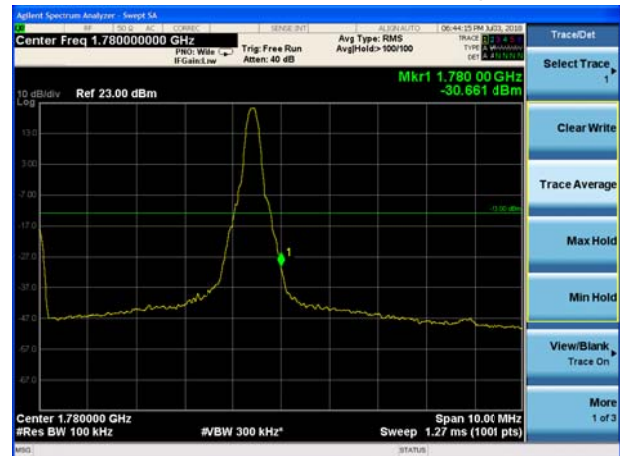




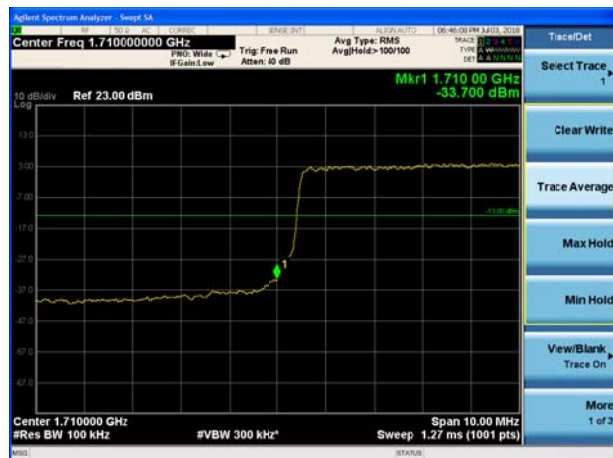
## LTE Band 66 QPSK 10MHz CH-Low, 1 RB



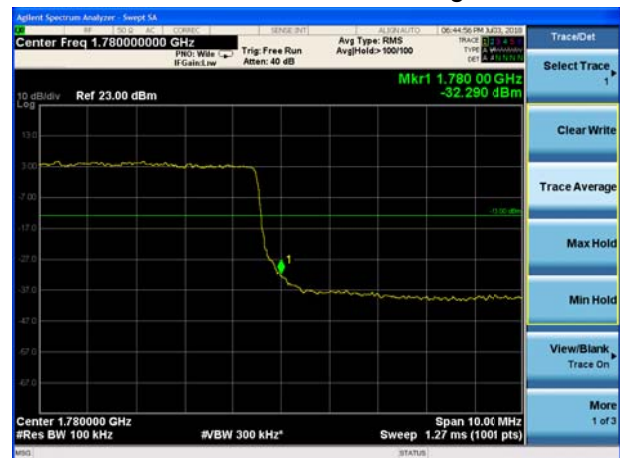
## LTE Band 66 QPSK 10MHz CH-High, 1 RB



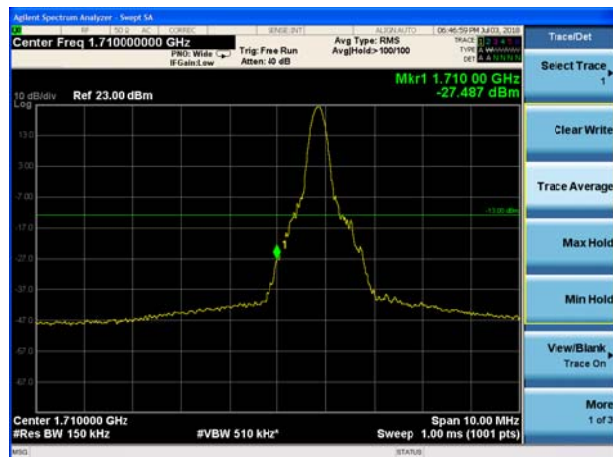
## LTE Band 66 QPSK 10MHz CH-Low, 100%RB



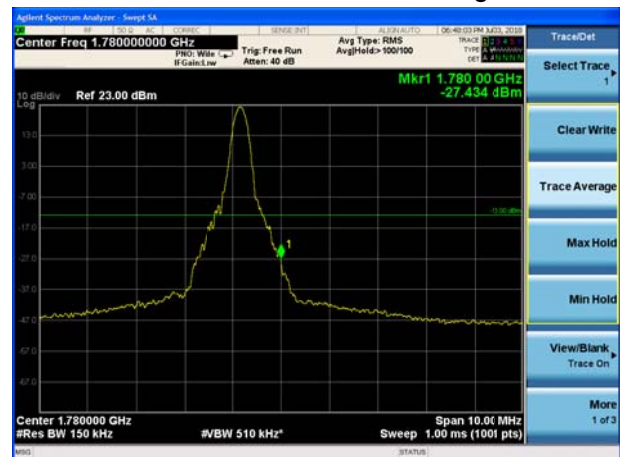
## LTE Band 66 QPSK 10MHz CH-High, 100%RB



## LTE Band 66 QPSK 15MHz CH-Low, 1 RB



## LTE Band 66 QPSK 15MHz CH-High, 1 RB





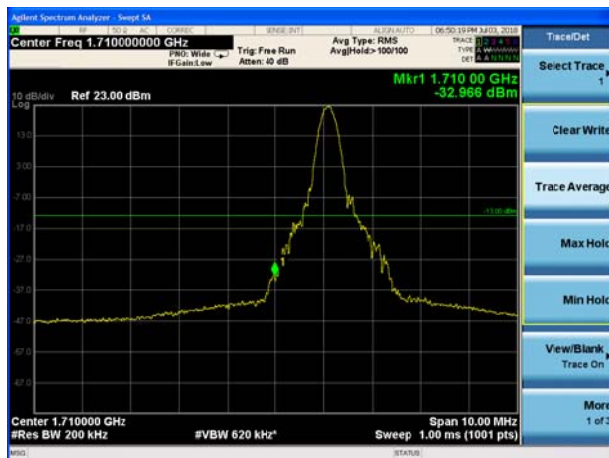
## LTE Band 66 QPSK 15MHz CH-Low, 100%RB



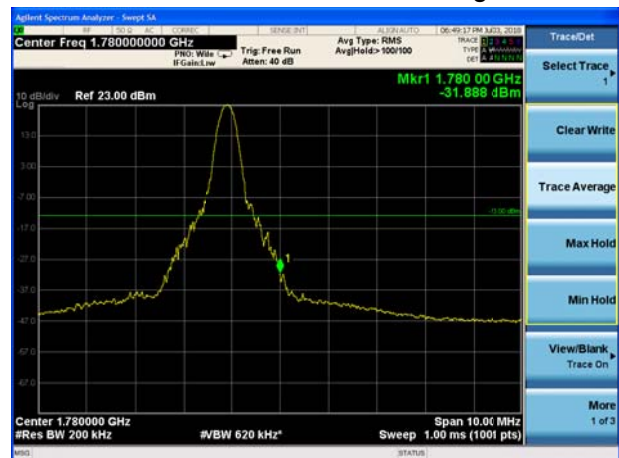
## LTE Band 66 QPSK 15MHz CH-High, 100%RB



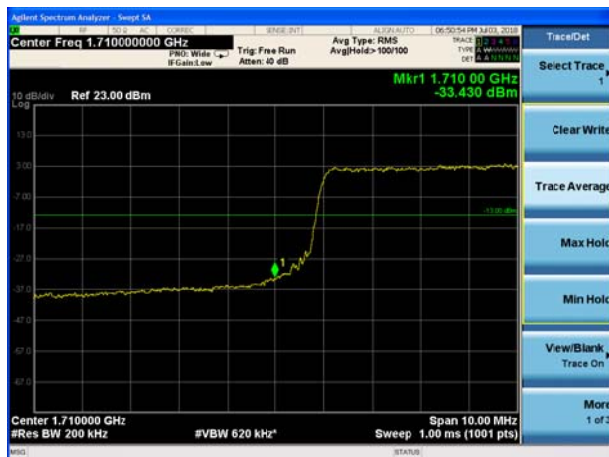
## LTE Band 66 QPSK 20MHz CH-Low, 1 RB



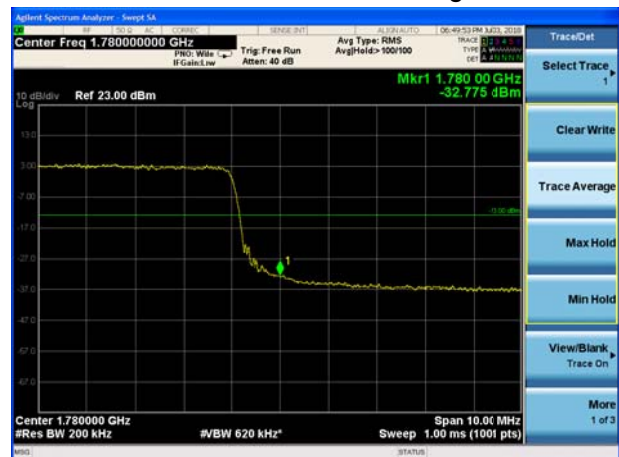
## LTE Band 66 QPSK 20MHz CH-High, 1 RB



## LTE Band 66 QPSK 20MHz CH-Low, 100%RB

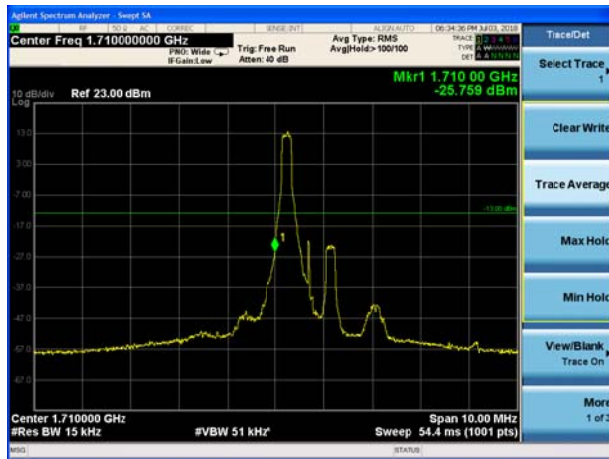


## LTE Band 66 QPSK 20MHz CH-High, 100%RB





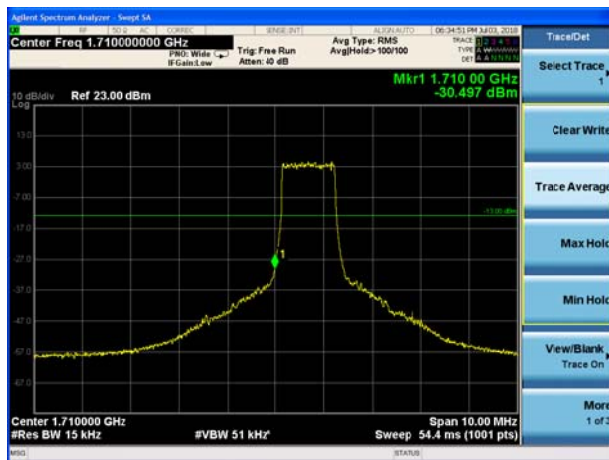
## LTE Band 66 16QAM 1.4MHz CH-Low, 1 RB



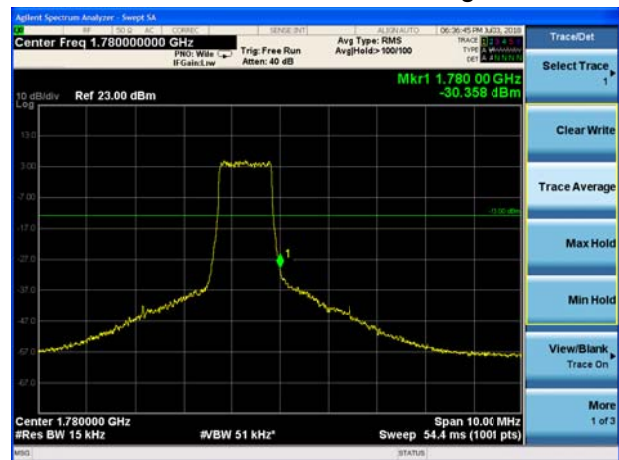
## LTE Band 66 16QAM 1.4MHz CH-High, 1 RB



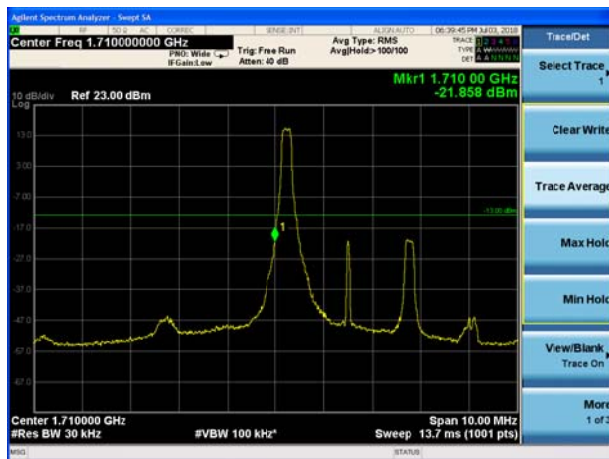
## LTE Band 66 16QAM 1.4MHz CH-Low, 100%RB



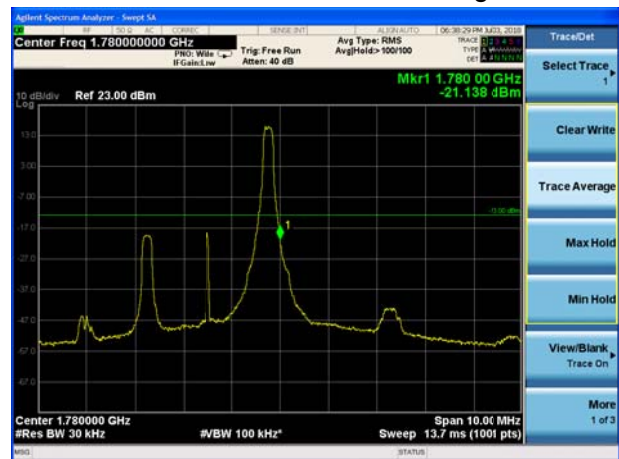
## LTE Band 66 16QAM 1.4MHz CH-High, 100%RB



## LTE Band 66 16QAM 3MHz CH-Low, 1 RB

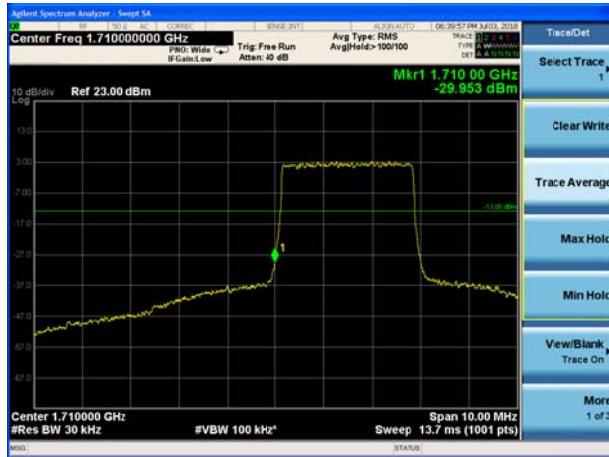


## LTE Band 66 16QAM 3MHz CH-High, 1 RB





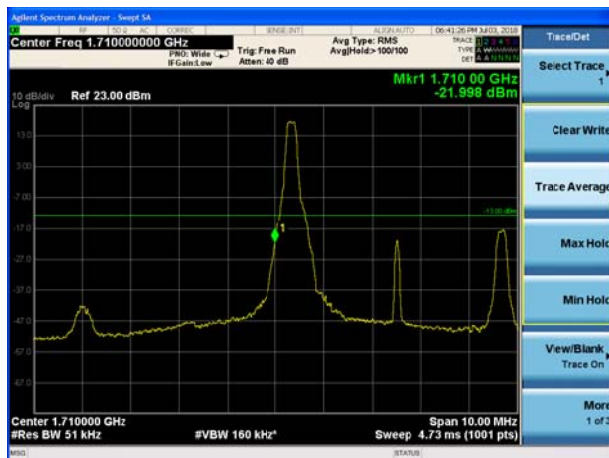
## LTE Band 66 16QAM 3MHz CH-Low, 100%RB



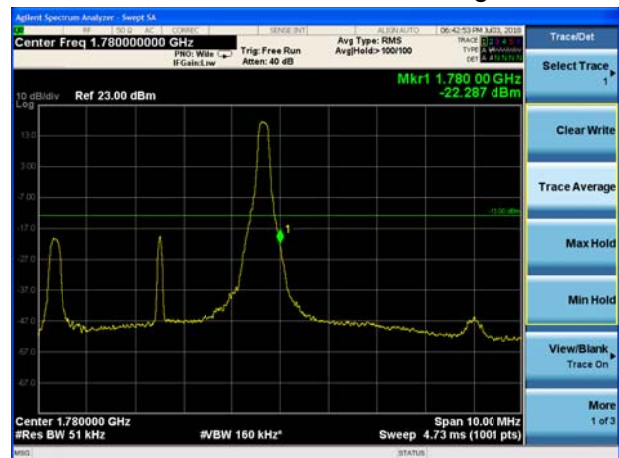
## LTE Band 66 16QAM 3MHz CH-High, 100%RB



## LTE Band 66 16QAM 5MHz CH-Low, 1 RB



## LTE Band 66 16QAM 5MHz CH-High, 1 RB



## LTE Band 66 16QAM 5MHz CH-Low, 100%RB

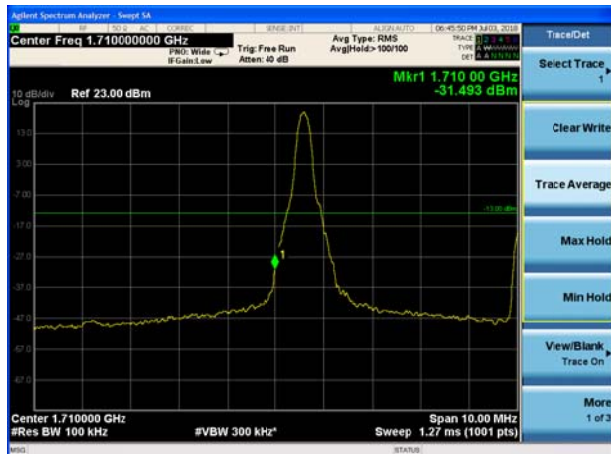


## LTE Band 66 16QAM 5MHz CH-High, 100%RB

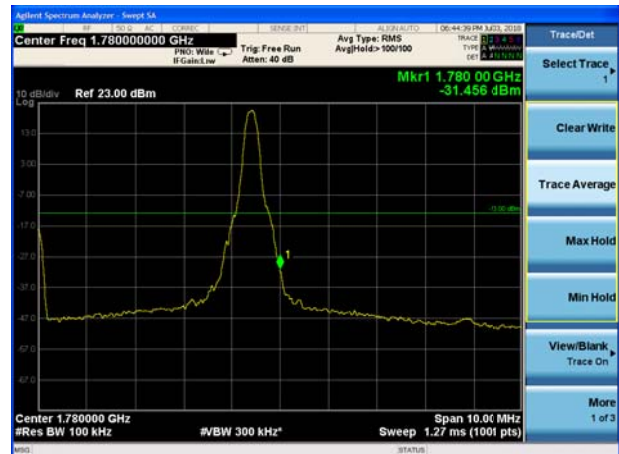




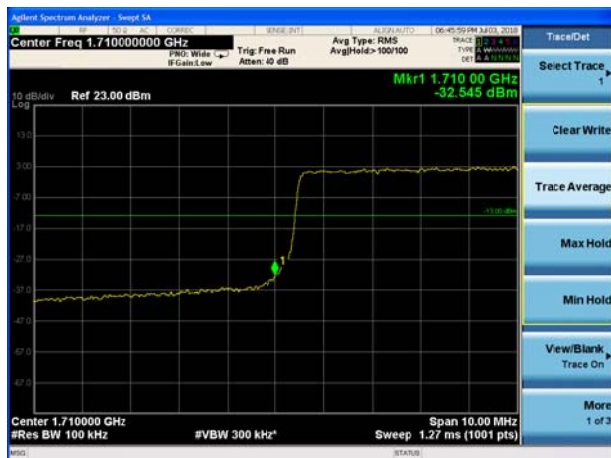
## LTE Band 66 16QAM 10MHz CH-Low, 1 RB



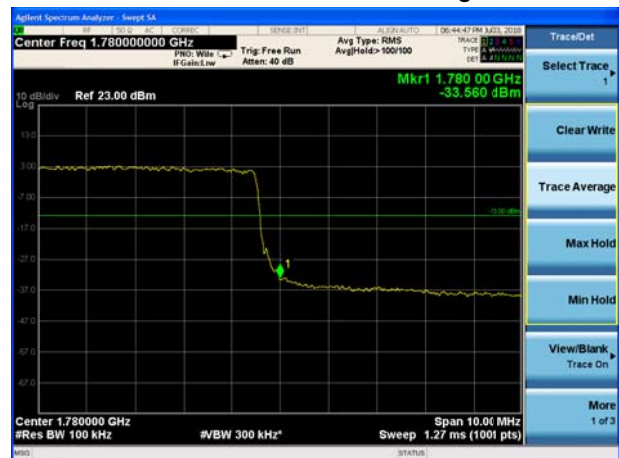
## LTE Band 66 16QAM 10MHz CH-High, 1 RB



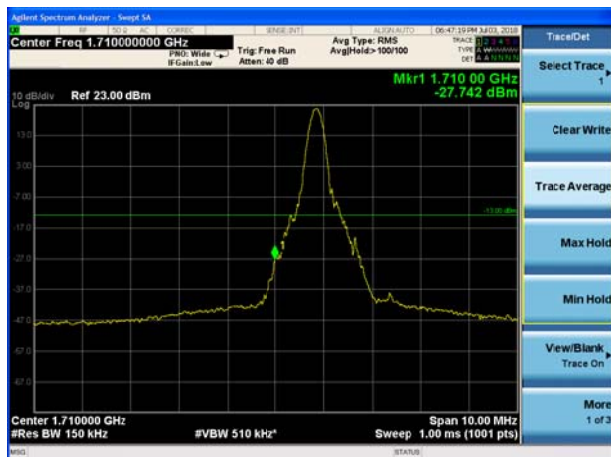
## LTE Band 66 16QAM 10MHz CH-Low, 100%RB



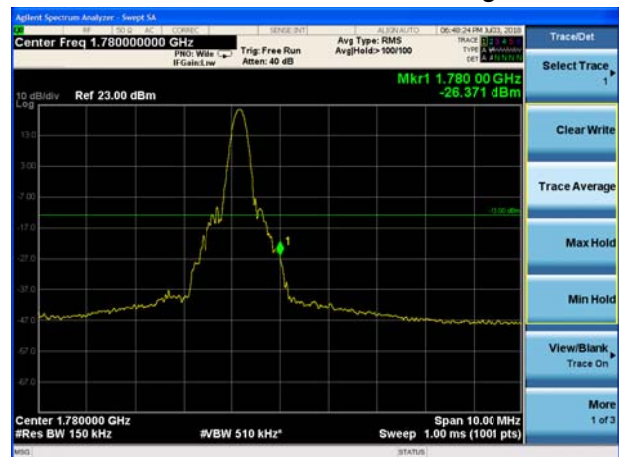
## LTE Band 66 16QAM 10MHz CH-High, 100%RB



## LTE Band 66 16QAM 15MHz CH-Low, 1 RB



## LTE Band 66 16QAM 15MHz CH-High, 1 RB





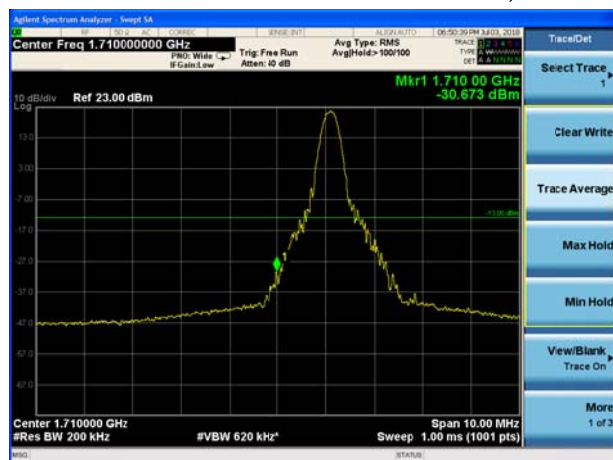
## LTE Band 66 16QAM 15MHz CH-Low, 100%RB



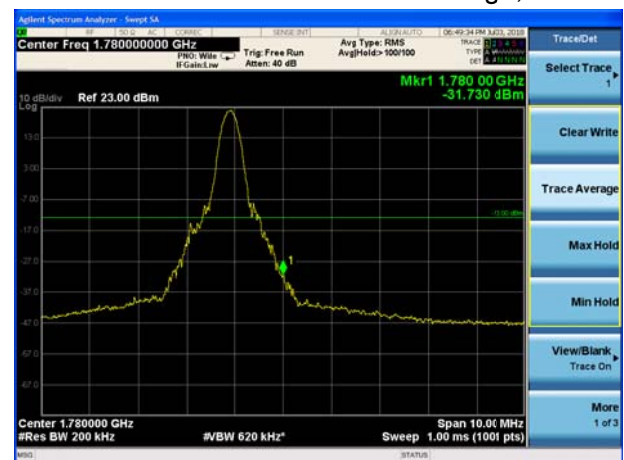
## LTE Band 66 16QAM 15MHz CH-High, 100%RB



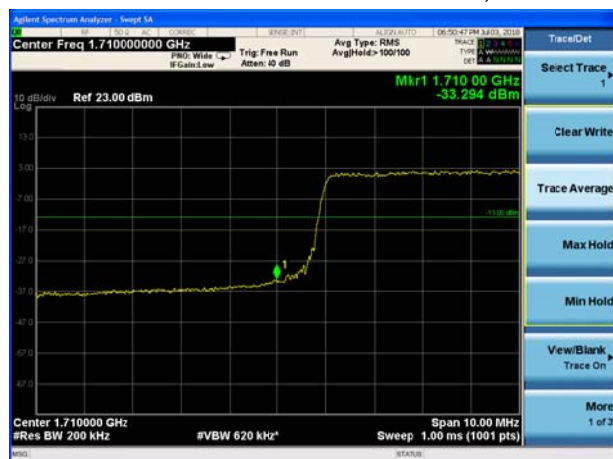
## LTE Band 66 16QAM 20MHz CH-Low, 1 RB



## LTE Band 66 16QAM 20MHz CH-High, 1 RB



## LTE Band 66 16QAM 20MHz CH-Low, 100%RB

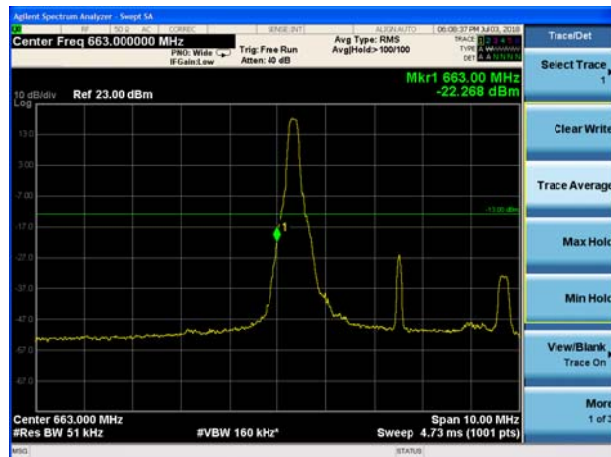


## LTE Band 66 16QAM 20MHz CH-High, 100%RB

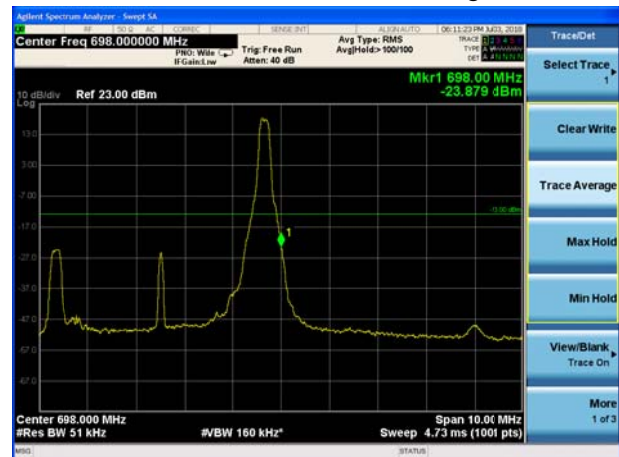




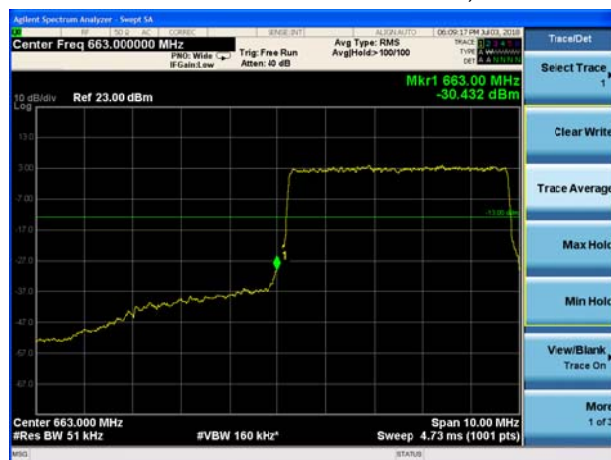
## LTE Band 71 QPSK 5MHz CH-Low, 1 RB



## LTE Band 71 QPSK 5MHz CH-High, 1 RB



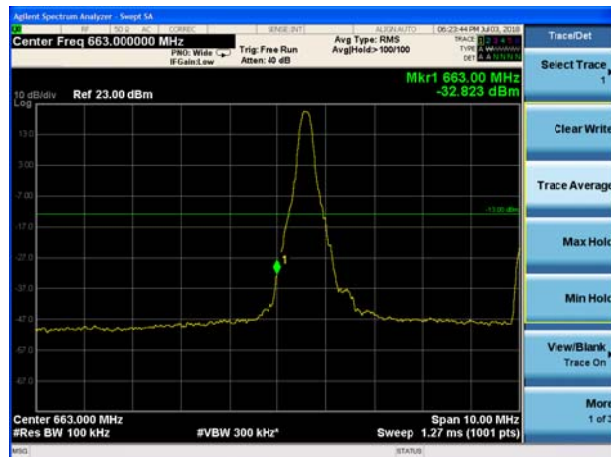
## LTE Band 71 QPSK 5MHz CH-Low, 100%RB



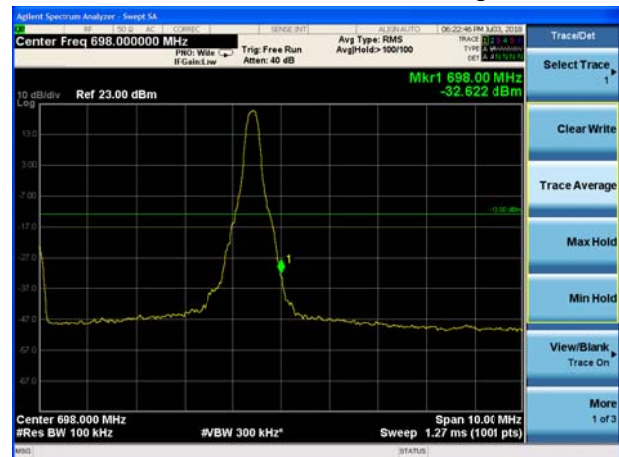
## LTE Band 71 QPSK 5MHz CH-High, 100%RB



## LTE Band 71 QPSK 10MHz CH-Low, 1 RB



## LTE Band 71 QPSK 10MHz CH-High, 1 RB





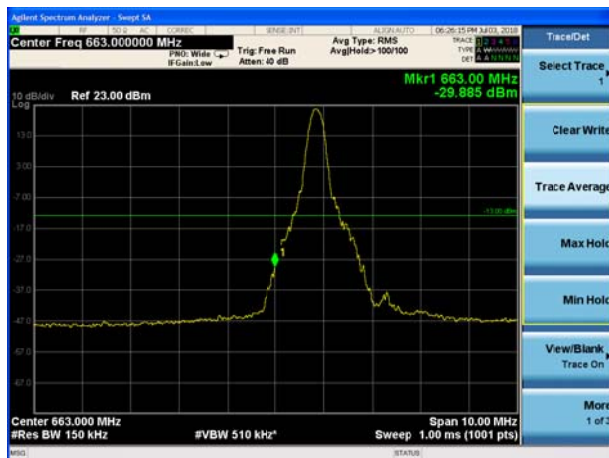
## LTE Band 71 QPSK 10MHz CH-Low, 100%RB



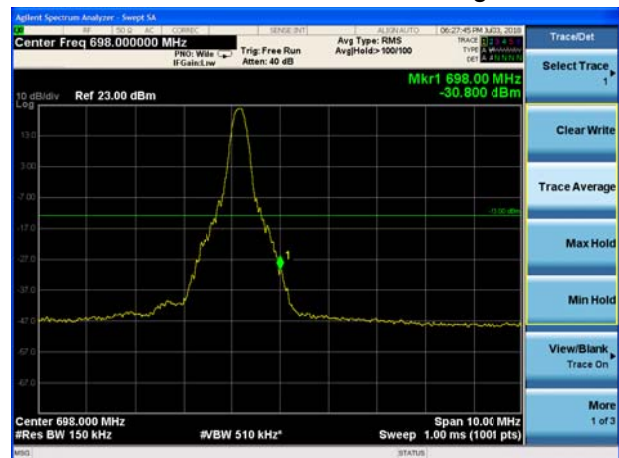
## LTE Band 71 QPSK 10MHz CH-High, 100%RB



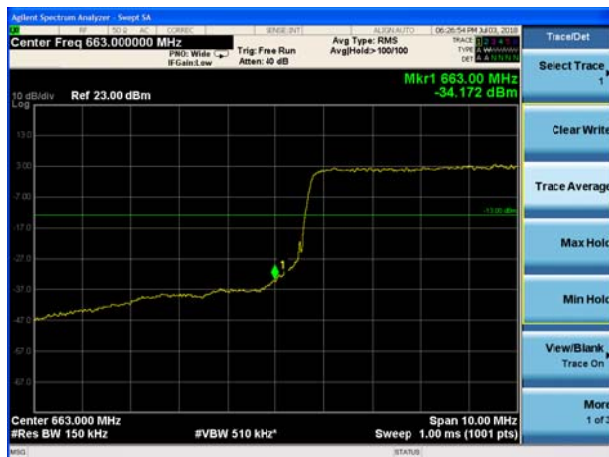
## LTE Band 71 QPSK 15MHz CH-Low, 1 RB



## LTE Band 71 QPSK 15MHz CH-High, 1 RB



## LTE Band 71 QPSK 15MHz CH-Low, 100%RB

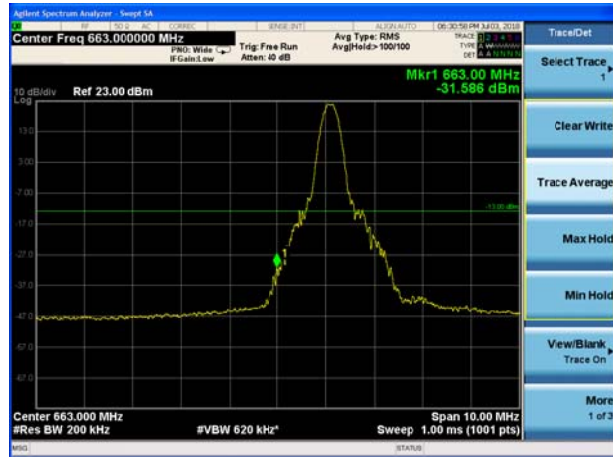


## LTE Band 71 QPSK 15MHz CH-High, 100%RB

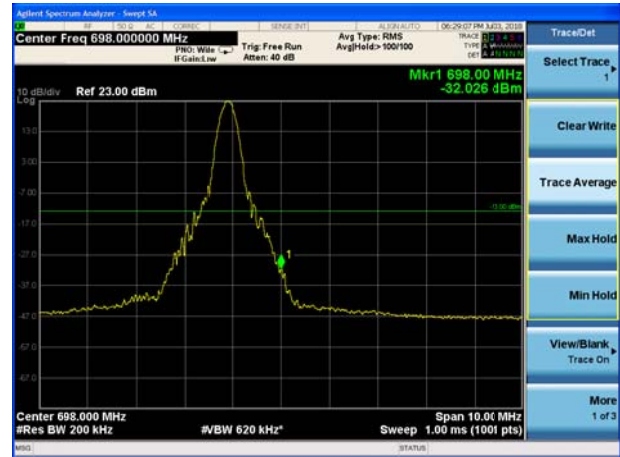




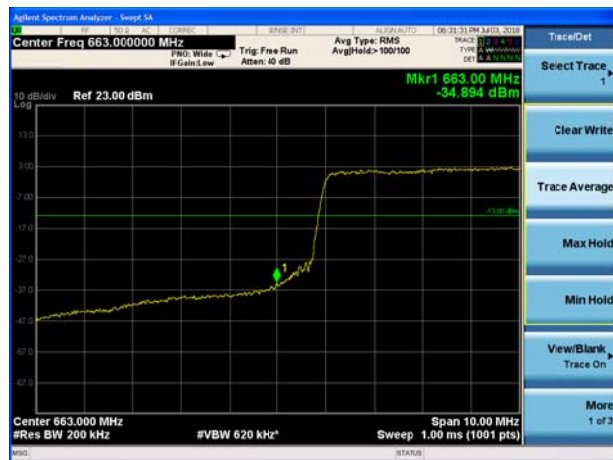
## LTE Band 71 QPSK 20MHz CH-Low, 1 RB



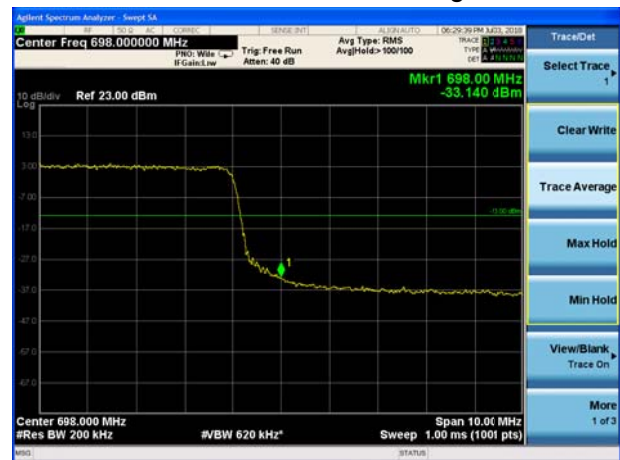
## LTE Band 71 QPSK 20MHz CH-High, 1 RB



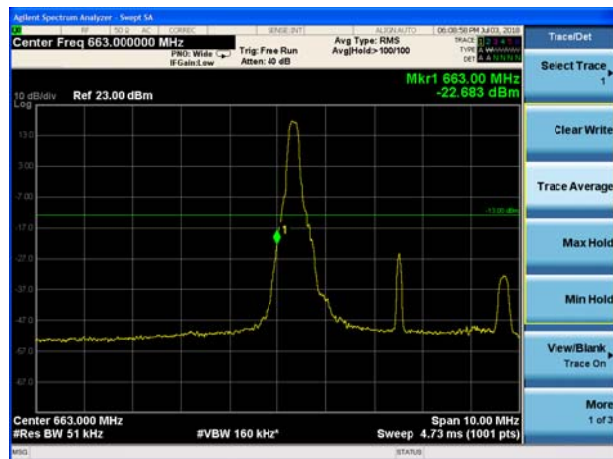
## LTE Band 71 QPSK 20MHz CH-Low, 100%RB



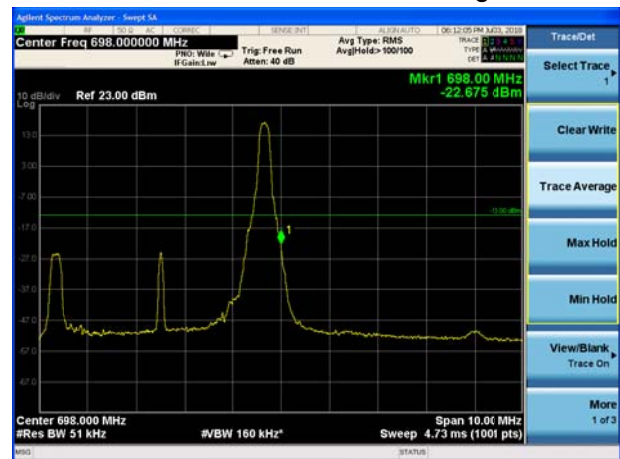
## LTE Band 71 QPSK 20MHz CH-High, 100%RB



## LTE Band 71 16QAM 5MHz CH-Low, 1 RB



## LTE Band 71 16QAM 5MHz CH-High, 1 RB





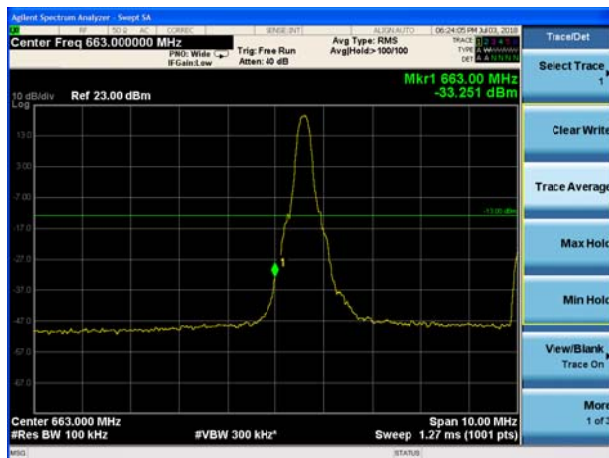
## LTE Band 71 16QAM 5MHz CH-Low, 100%RB



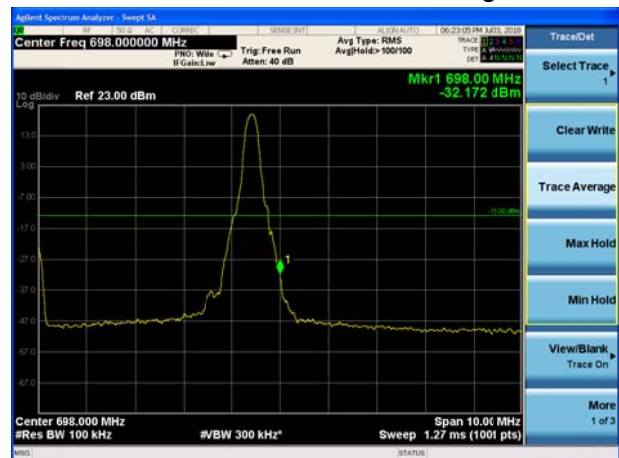
## LTE Band 71 16QAM 5MHz CH-High, 100%RB



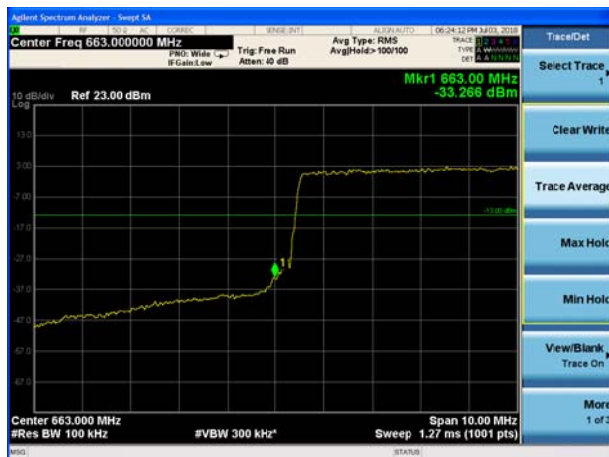
## LTE Band 71 16QAM 10MHz CH-Low, 1 RB



## LTE Band 71 16QAM 10MHz CH-High, 1 RB



## LTE Band 71 16QAM 10MHz CH-Low, 100%RB

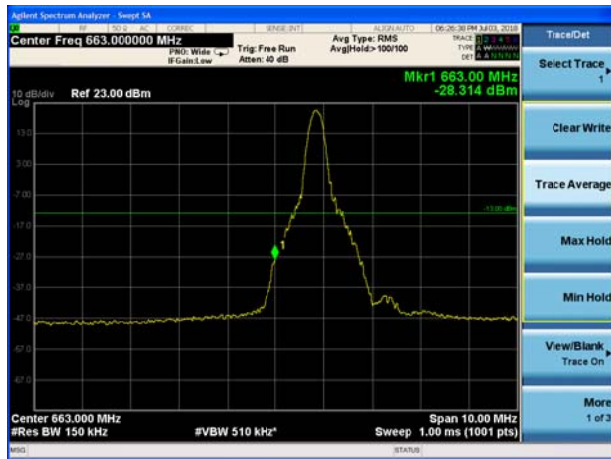


## LTE Band 71 16QAM 10MHz CH-High, 100%RB

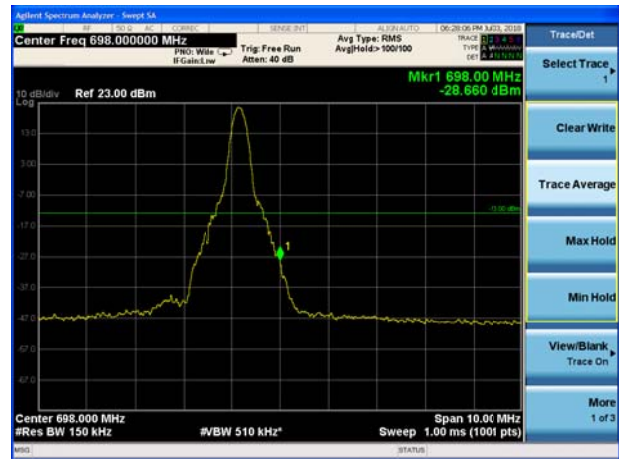




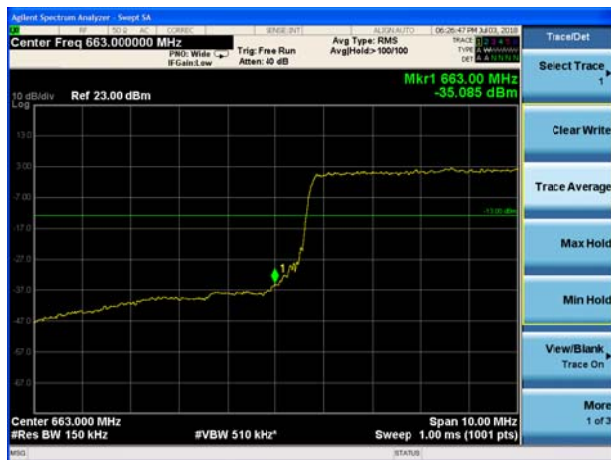
## LTE Band 71 16QAM 15MHz CH-Low, 1 RB



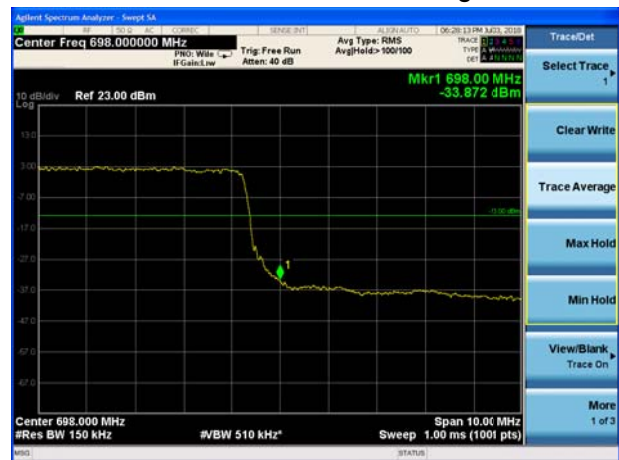
## LTE Band 71 16QAM 15MHz CH-High, 1 RB



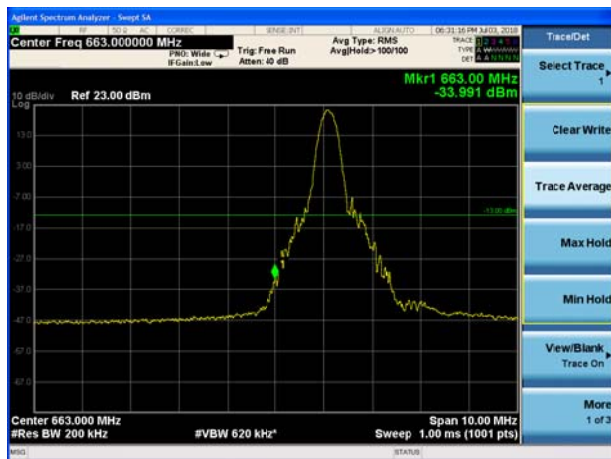
## LTE Band 71 16QAM 15MHz CH-Low, 100%RB



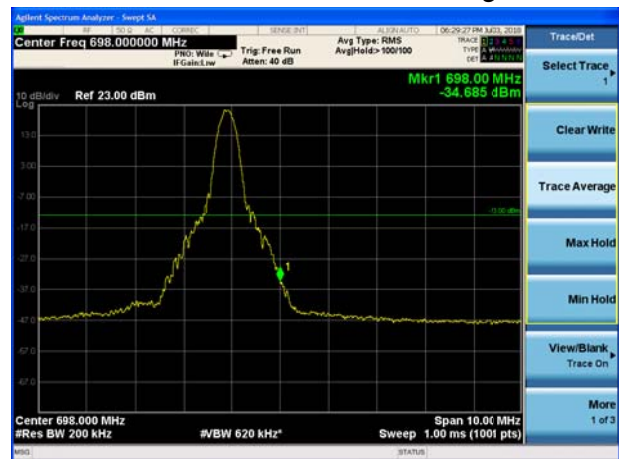
## LTE Band 71 16QAM 15MHz CH-High, 100%RB



## LTE Band 71 16QAM 20MHz CH-Low, 1 RB

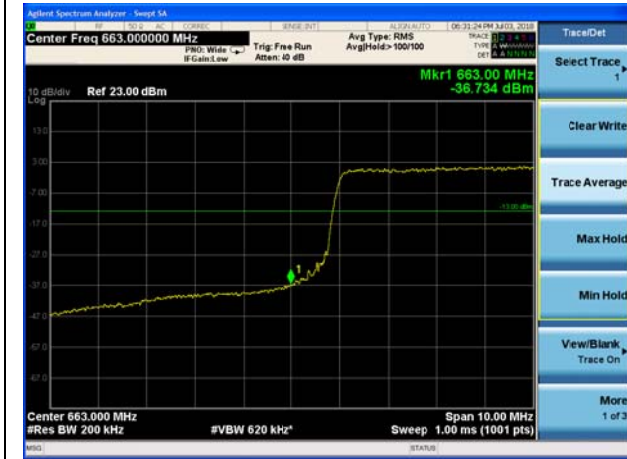


## LTE Band 71 16QAM 20MHz CH-High, 1 RB





## LTE Band 71 16QAM 20MHz CH-Low, 100%RB



## LTE Band 71 16QAM 20MHz CH-High, 100%RB



## 5.5 Peak-to-Average Power Ratio (PAPR)

### Ambient condition

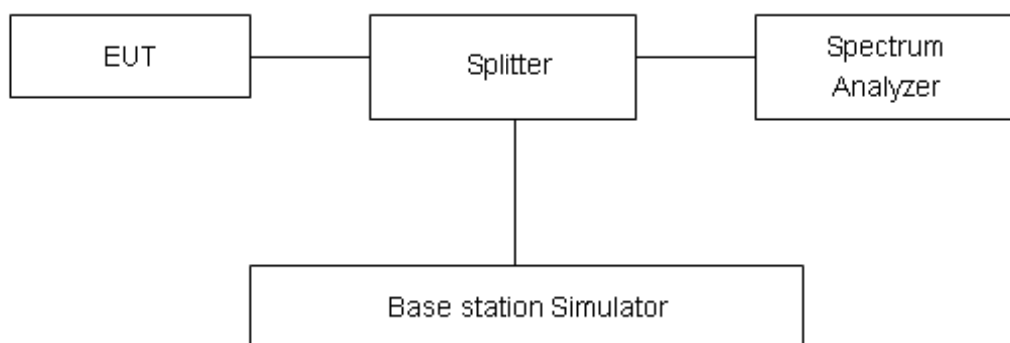
| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

### Test Setup



### Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4$  dB.

**Test Results**

| WCDMA Band IV | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
|---------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| <b>RMC</b>    | 1312    | 1712.4          | 26.51      | 23.46     | 3.05      | ≤13        | PASS       |
|               | 1413    | 1732.6          | 26.30      | 23.35     | 2.95      | ≤13        | PASS       |
|               | 1513    | 1752.6          | 26.19      | 23.37     | 2.82      | ≤13        | PASS       |

| LTE Band 4 |                 |         |                 |            |           |           |            |            |
|------------|-----------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
| QPSK       | 1.4             | 19957   | 1710.7          | 27.15      | 22.30     | 4.85      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.21      | 22.40     | 4.81      | ≤13        | PASS       |
|            |                 | 20393   | 1754.3          | 27.12      | 22.64     | 4.48      | ≤13        | PASS       |
|            | 3               | 19965   | 1711.5          | 27.30      | 22.33     | 4.97      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.37      | 22.44     | 4.93      | ≤13        | PASS       |
|            |                 | 20385   | 1753.5          | 27.37      | 22.67     | 4.70      | ≤13        | PASS       |
|            | 5               | 19975   | 1712.5          | 27.31      | 22.31     | 5.00      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.33      | 22.43     | 4.90      | ≤13        | PASS       |
|            |                 | 20375   | 1752.5          | 27.29      | 22.65     | 4.64      | ≤13        | PASS       |
|            | 10              | 20000   | 1715            | 27.34      | 22.39     | 4.95      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.28      | 22.45     | 4.83      | ≤13        | PASS       |
|            |                 | 20350   | 1750            | 27.31      | 22.69     | 4.62      | ≤13        | PASS       |
|            | 15              | 20025   | 1717.5          | 27.40      | 22.37     | 5.03      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.27      | 22.41     | 4.86      | ≤13        | PASS       |
|            |                 | 20325   | 1747.5          | 27.20      | 22.64     | 4.56      | ≤13        | PASS       |
|            | 20              | 20050   | 1720            | 27.26      | 22.34     | 4.92      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.14      | 22.36     | 4.78      | ≤13        | PASS       |
|            |                 | 20300   | 1745            | 27.23      | 22.60     | 4.63      | ≤13        | PASS       |
| 16QAM      | 1.4             | 19957   | 1710.7          | 27.03      | 21.34     | 5.69      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.07      | 21.48     | 5.59      | ≤13        | PASS       |
|            |                 | 20393   | 1754.3          | 26.99      | 21.68     | 5.31      | ≤13        | PASS       |
|            | 3               | 19965   | 1711.5          | 27.15      | 21.37     | 5.78      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.21      | 21.52     | 5.69      | ≤13        | PASS       |
|            |                 | 20385   | 1753.5          | 27.21      | 21.71     | 5.50      | ≤13        | PASS       |
|            | 5               | 19975   | 1712.5          | 27.11      | 21.35     | 5.76      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.16      | 21.48     | 5.68      | ≤13        | PASS       |
|            |                 | 20375   | 1752.5          | 27.05      | 21.66     | 5.39      | ≤13        | PASS       |
|            | 10              | 20000   | 1715            | 27.14      | 21.38     | 5.76      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.18      | 21.53     | 5.65      | ≤13        | PASS       |
|            |                 | 20350   | 1750            | 27.14      | 21.70     | 5.44      | ≤13        | PASS       |



|  |    |       |        |       |       |      |     |      |
|--|----|-------|--------|-------|-------|------|-----|------|
|  | 15 | 20025 | 1717.5 | 27.12 | 21.35 | 5.77 | ≤13 | PASS |
|  |    | 20175 | 1732.5 | 27.08 | 21.48 | 5.60 | ≤13 | PASS |
|  |    | 20325 | 1747.5 | 26.95 | 21.66 | 5.29 | ≤13 | PASS |
|  | 20 | 20050 | 1720   | 27.04 | 21.33 | 5.71 | ≤13 | PASS |
|  |    | 20175 | 1732.5 | 27.03 | 21.44 | 5.59 | ≤13 | PASS |
|  |    | 20300 | 1745   | 27.03 | 21.63 | 5.40 | ≤13 | PASS |

| LTE Band 12 |                 |         |                 |            |           |           |            |            |
|-------------|-----------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| Modulation  | Bandwidth (MHz) | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
| QPSK        | 1.4             | 23017   | 699.7           | 27.71      | 22.61     | 5.10      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.72      | 22.57     | 5.15      | ≤13        | PASS       |
|             |                 | 23173   | 715.3           | 27.70      | 22.65     | 5.05      | ≤13        | PASS       |
|             | 3               | 23025   | 700.5           | 27.83      | 22.64     | 5.19      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.82      | 22.61     | 5.21      | ≤13        | PASS       |
|             |                 | 23165   | 714.5           | 27.87      | 22.68     | 5.19      | ≤13        | PASS       |
|             | 5               | 23035   | 701.5           | 27.87      | 22.68     | 5.19      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.75      | 22.58     | 5.17      | ≤13        | PASS       |
|             |                 | 23155   | 713.5           | 27.86      | 22.65     | 5.21      | ≤13        | PASS       |
|             | 10              | 23060   | 704             | 27.83      | 22.65     | 5.18      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.60      | 22.53     | 5.07      | ≤13        | PASS       |
|             |                 | 23130   | 711             | 27.76      | 22.61     | 5.15      | ≤13        | PASS       |
| 16QAM       | 1.4             | 23017   | 699.7           | 27.73      | 21.71     | 6.02      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.57      | 21.63     | 5.94      | ≤13        | PASS       |
|             |                 | 23173   | 715.3           | 27.73      | 21.84     | 5.89      | ≤13        | PASS       |
|             | 3               | 23025   | 700.5           | 27.78      | 21.74     | 6.04      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.71      | 21.67     | 6.04      | ≤13        | PASS       |
|             |                 | 23165   | 714.5           | 27.89      | 21.87     | 6.02      | ≤13        | PASS       |
|             | 5               | 23035   | 701.5           | 27.70      | 21.72     | 5.98      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.59      | 21.63     | 5.96      | ≤13        | PASS       |
|             |                 | 23155   | 713.5           | 27.81      | 21.82     | 5.99      | ≤13        | PASS       |
|             | 10              | 23060   | 704             | 27.68      | 21.70     | 5.98      | ≤13        | PASS       |
|             |                 | 23095   | 707.5           | 27.50      | 21.59     | 5.91      | ≤13        | PASS       |
|             |                 | 23130   | 711             | 27.76      | 21.79     | 5.97      | ≤13        | PASS       |

| LTE Band 13 |                 |         |                 |            |           |           |            |            |
|-------------|-----------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| Modulation  | Bandwidth (MHz) | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
| QPSK        | 5               | 23205   | 779.5           | 27.81      | 22.81     | 5.00      | ≤13        | PASS       |



|       |    |       |       |       |       |      |     |      |
|-------|----|-------|-------|-------|-------|------|-----|------|
| 16QAM |    | 23230 | 782   | 27.79 | 22.74 | 5.05 | ≤13 | PASS |
|       |    | 23255 | 784.5 | 27.89 | 22.80 | 5.09 | ≤13 | PASS |
|       | 10 | 23230 | 782   | 27.75 | 22.74 | 5.01 | ≤13 | PASS |
|       | 5  | 23205 | 779.5 | 27.57 | 21.74 | 5.83 | ≤13 | PASS |
|       |    | 23230 | 782   | 27.81 | 21.96 | 5.85 | ≤13 | PASS |
|       |    | 23255 | 784.5 | 27.47 | 21.62 | 5.85 | ≤13 | PASS |
|       | 10 | 23230 | 782   | 27.65 | 21.82 | 5.83 | ≤13 | PASS |

| LTE Band 66 |                 |         |                 |            |           |           |            |            |
|-------------|-----------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| Modulation  | Bandwidth (MHz) | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
| QPSK        | 1.4             | 131979  | 1710.7          | 27.40      | 22.51     | 4.89      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.22      | 22.73     | 4.49      | ≤13        | PASS       |
|             |                 | 132665  | 1779.3          | 27.31      | 22.34     | 4.97      | ≤13        | PASS       |
|             | 3               | 131987  | 1711.5          | 27.51      | 22.54     | 4.97      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.47      | 22.77     | 4.70      | ≤13        | PASS       |
|             |                 | 132657  | 1778.5          | 27.48      | 22.37     | 5.11      | ≤13        | PASS       |
|             | 5               | 131997  | 1712.5          | 27.52      | 22.52     | 5.00      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.40      | 22.76     | 4.64      | ≤13        | PASS       |
|             |                 | 132647  | 1777.5          | 27.38      | 22.35     | 5.03      | ≤13        | PASS       |
|             | 10              | 132022  | 1715            | 27.54      | 22.60     | 4.94      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.34      | 22.78     | 4.56      | ≤13        | PASS       |
|             |                 | 132622  | 1775            | 27.37      | 22.39     | 4.98      | ≤13        | PASS       |
|             | 15              | 132047  | 1717.5          | 27.57      | 22.58     | 4.99      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.25      | 22.74     | 4.51      | ≤13        | PASS       |
|             |                 | 132597  | 1772.5          | 27.36      | 22.34     | 5.02      | ≤13        | PASS       |
|             | 20              | 132072  | 1720            | 27.46      | 22.55     | 4.91      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.25      | 22.69     | 4.56      | ≤13        | PASS       |
|             |                 | 132572  | 1770            | 27.21      | 22.30     | 4.91      | ≤13        | PASS       |
| 16QAM       | 1.4             | 131979  | 1710.7          | 27.34      | 21.65     | 5.69      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.08      | 21.84     | 5.24      | ≤13        | PASS       |
|             |                 | 132665  | 1779.3          | 27.26      | 21.45     | 5.81      | ≤13        | PASS       |
|             | 3               | 131987  | 1711.5          | 27.44      | 21.68     | 5.76      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.35      | 21.88     | 5.47      | ≤13        | PASS       |
|             |                 | 132657  | 1778.5          | 27.37      | 21.48     | 5.89      | ≤13        | PASS       |
|             | 5               | 131997  | 1712.5          | 27.41      | 21.66     | 5.75      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.20      | 21.84     | 5.36      | ≤13        | PASS       |
|             |                 | 132647  | 1777.5          | 27.23      | 21.43     | 5.80      | ≤13        | PASS       |



|  |    |        |        |       |       |      |     |      |
|--|----|--------|--------|-------|-------|------|-----|------|
|  | 10 | 132022 | 1715   | 27.48 | 21.69 | 5.79 | ≤13 | PASS |
|  |    | 132322 | 1745   | 27.25 | 21.89 | 5.36 | ≤13 | PASS |
|  |    | 132622 | 1775   | 27.28 | 21.47 | 5.81 | ≤13 | PASS |
|  | 15 | 132047 | 1717.5 | 27.39 | 21.66 | 5.73 | ≤13 | PASS |
|  |    | 132322 | 1745   | 27.08 | 21.84 | 5.24 | ≤13 | PASS |
|  |    | 132597 | 1772.5 | 27.17 | 21.43 | 5.74 | ≤13 | PASS |
|  | 20 | 132072 | 1720   | 27.33 | 21.64 | 5.69 | ≤13 | PASS |
|  |    | 132322 | 1745   | 27.16 | 21.80 | 5.36 | ≤13 | PASS |
|  |    | 132572 | 1770   | 27.10 | 21.40 | 5.70 | ≤13 | PASS |

| LTE Band 71 |                 |         |                 |            |           |           |            |            |
|-------------|-----------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| Modulation  | Bandwidth (MHz) | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
|             | 5               | 133147  | 665.5           | 27.25      | 22.17     | 5.08      | ≤13        | PASS       |
|             |                 | 133297  | 680.5           | 27.48      | 22.40     | 5.08      | ≤13        | PASS       |
|             |                 | 133447  | 695.5           | 27.35      | 22.20     | 5.15      | ≤13        | PASS       |
|             | 10              | 133172  | 668             | 27.33      | 22.25     | 5.08      | ≤13        | PASS       |
|             |                 | 133297  | 680.5           | 27.47      | 22.42     | 5.05      | ≤13        | PASS       |
|             |                 | 133422  | 693             | 27.31      | 22.24     | 5.07      | ≤13        | PASS       |
|             | 15              | 133197  | 670.5           | 27.45      | 22.23     | 5.22      | ≤13        | PASS       |
|             |                 | 133297  | 680.5           | 27.28      | 22.11     | 5.17      | ≤13        | PASS       |
|             |                 | 133397  | 690.5           | 27.40      | 22.19     | 5.21      | ≤13        | PASS       |
|             | 20              | 133222  | 673             | 27.24      | 22.20     | 5.04      | ≤13        | PASS       |
|             |                 | 133322  | 683             | 27.36      | 22.33     | 5.03      | ≤13        | PASS       |
|             |                 | 133372  | 688             | 27.23      | 22.15     | 5.08      | ≤13        | PASS       |
|             | 5               | 133147  | 665.5           | 27.14      | 21.32     | 5.82      | ≤13        | PASS       |
|             |                 | 133297  | 680.5           | 27.36      | 21.50     | 5.86      | ≤13        | PASS       |
|             |                 | 133447  | 695.5           | 27.22      | 21.31     | 5.91      | ≤13        | PASS       |
|             | 10              | 133172  | 668             | 27.22      | 21.35     | 5.87      | ≤13        | PASS       |
|             |                 | 133297  | 680.5           | 27.37      | 21.55     | 5.82      | ≤13        | PASS       |
|             |                 | 133422  | 693             | 27.24      | 21.35     | 5.89      | ≤13        | PASS       |
|             | 15              | 133197  | 670.5           | 27.25      | 21.32     | 5.93      | ≤13        | PASS       |
|             |                 | 133297  | 680.5           | 26.98      | 21.11     | 5.87      | ≤13        | PASS       |
|             |                 | 133397  | 690.5           | 27.25      | 21.31     | 5.94      | ≤13        | PASS       |
|             | 20              | 133222  | 673             | 27.16      | 21.30     | 5.86      | ≤13        | PASS       |
|             |                 | 133322  | 683             | 27.29      | 21.46     | 5.83      | ≤13        | PASS       |
|             |                 | 133372  | 688             | 27.16      | 21.28     | 5.88      | ≤13        | PASS       |

## 5.6 Frequency Stability

### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Method of Measurement

#### Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -40°C to +85°C in 10°C step size.

(1) With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -40°C to +85°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

#### Frequency Stability (Voltage Variation)

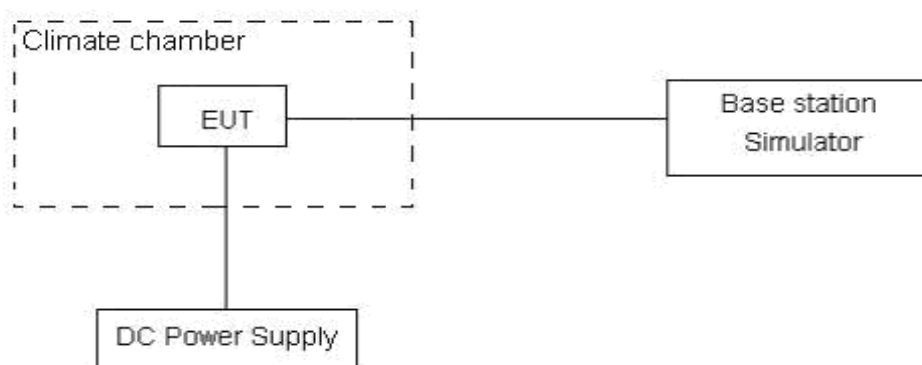
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

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

This transceiver is specified to operate with an input voltage of between 3.3 V and 4.3 V, with a nominal voltage of 3.8V.

### Test setup



### Limits

No specific frequency stability requirements in part 27.54

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 3, U = 0.01\text{ppm}$ .

**Test Result**
**WCDMA Band IV**

| WCDMA Band IV   |         |                   |                    |           |                          |
|-----------------|---------|-------------------|--------------------|-----------|--------------------------|
| Condition       |         | 1710              | 1755               | Delta(Hz) | Frequency Stability(ppm) |
| Temperature     | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)   | Normal  | 1710.0279         | 1754.9113          | 2.13      | 0.00113                  |
| Extreme (85°C)  |         | 1710.0281         | 1754.9112          | -3.16     | -0.00168                 |
| Extreme (80°C)  |         | 1710.0276         | 1754.9116          | 0.59      | 0.00031                  |
| Extreme (70°C)  |         | 1710.0291         | 1754.9101          | -5.54     | -0.00295                 |
| Extreme (60°C)  |         | 1710.0272         | 1754.9122          | -1.17     | -0.00062                 |
| Extreme (50°C)  |         | 1710.0269         | 1754.9123          | 0.16      | 0.00009                  |
| Extreme (40°C)  |         | 1710.0284         | 1754.9108          | -5.52     | -0.00294                 |
| Extreme (30°C)  |         | 1710.0273         | 1754.9119          | -3.36     | -0.00179                 |
| Extreme (20°C)  |         | 1710.0271         | 1754.9122          | 0.69      | 0.00037                  |
| Extreme (10°C)  |         | 1710.0286         | 1754.9106          | 0.89      | 0.00047                  |
| Extreme (0°C)   |         | 1710.0277         | 1754.9115          | 3.19      | 0.00170                  |
| Extreme (-10°C) |         | 1710.0291         | 1754.9122          | 0.39      | 0.00021                  |
| Extreme (-20°C) |         | 1710.0323         | 1754.9153          | 3.56      | 0.00189                  |
| Extreme (-30°C) |         | 1710.0339         | 1754.9175          | 0.19      | 0.00010                  |
| Extreme (-40°C) |         | 1710.0345         | 1754.9187          | 2.80      | 0.00149                  |
| 25C             | LV      | 1710.0316         | 1754.9147          | 2.96      | 0.00157                  |
|                 | HV      | 1710.0303         | 1754.9156          | 0.49      | 0.00026                  |

| LTE Band 4              |         |                   |                    |           |                          |
|-------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| (QPSK, 20MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition               |         | 1710              | 1755               | Delta(Hz) | Frequency Stability(ppm) |
| Temperature             | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)           | Normal  | 1710.6538         | 1754.4302          | 1.44      | 0.00083                  |
| Extreme (85°C)          |         | 1710.6549         | 1754.4314          | 0.86      | 0.00050                  |
| Extreme (80°C)          |         | 1710.6516         | 1754.4275          | -2.69     | -0.00155                 |
| Extreme (70°C)          |         | 1710.6529         | 1754.4294          | -1.82     | -0.00105                 |
| Extreme (60°C)          |         | 1710.6515         | 1754.4285          | 2.10      | 0.00121                  |
| Extreme (50°C)          |         | 1710.6521         | 1754.4286          | 0.86      | 0.00050                  |
| Extreme (40°C)          |         | 1710.6534         | 1754.4299          | -0.07     | -0.00004                 |
| Extreme (30°C)          |         | 1710.6541         | 1754.4306          | 0.35      | 0.00020                  |
| Extreme (20°C)          |         | 1710.6523         | 1754.4285          | -0.40     | -0.00023                 |
| Extreme (10°C)          |         | 1710.6532         | 1754.4297          | -0.20     | -0.00012                 |
| Extreme (0°C)           |         | 1710.6519         | 1754.4284          | 0.56      | 0.00032                  |



|                          |         |                   |                    |           |                          |
|--------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| Extreme (-10°C)          |         | 1710.6514         | 1754.4279          | -2.60     | -0.00150                 |
| Extreme (-20°C)          |         | 1710.6525         | 1754.4291          | -0.42     | -0.00024                 |
| Extreme (-30°C)          |         | 1710.6558         | 1754.4323          | 1.26      | 0.00073                  |
| Extreme (-40°C)          |         | 1710.6576         | 1754.4335          | 3.50      | 0.00202                  |
| 25°C                     | LV      | 1710.6522         | 1754.4287          | -1.15     | -0.00066                 |
|                          | HV      | 1710.6528         | 1754.4293          | 0.97      | 0.00056                  |
| (16QAM, 20MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition                |         | 1710              | 1755               | Delta(Hz) | Frequency Stability(ppm) |
| Temperature              | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)            | Normal  | 1710.6387         | 1754.5105          | -6.99     | -0.00403                 |
| Extreme (85°C)           |         | 1710.6369         | 1754.5094          | 3.06      | 0.00177                  |
| Extreme (80°C)           |         | 1710.6408         | 1754.5133          | -3.56     | -0.00205                 |
| Extreme (70°C)           |         | 1710.6389         | 1754.5114          | -5.22     | -0.00301                 |
| Extreme (60°C)           |         | 1710.6403         | 1754.5128          | -3.92     | -0.00226                 |
| Extreme (50°C)           |         | 1710.6397         | 1754.5122          | -2.16     | -0.00125                 |
| Extreme (40°C)           |         | 1710.6384         | 1754.5109          | -2.64     | -0.00152                 |
| Extreme (30°C)           |         | 1710.6377         | 1754.5102          | 0.55      | 0.00032                  |
| Extreme (20°C)           |         | 1710.6398         | 1754.5123          | 0.33      | 0.00019                  |
| Extreme (10°C)           |         | 1710.6386         | 1754.5111          | -2.00     | -0.00115                 |
| Extreme (0°C)            |         | 1710.6399         | 1754.5124          | 0.06      | 0.00003                  |
| Extreme (-10°C)          |         | 1710.6404         | 1754.5129          | 4.07      | 0.00235                  |
| Extreme (-20°C)          |         | 1710.6393         | 1754.5118          | -0.53     | -0.00031                 |
| Extreme (-30°C)          |         | 1710.6363         | 1754.5085          | 2.99      | 0.00173                  |
| Extreme (-40°C)          |         | 1710.6348         | 1754.5073          | 0.55      | 0.00032                  |
| 25°C                     | LV      | 1710.6396         | 1754.5121          | 0.15      | 0.00009                  |
|                          | HV      | 1710.6391         | 1754.5115          | 3.19      | 0.00184                  |

|                         |         |                   |                    |           |                          |
|-------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| LTE Band 12             |         |                   |                    |           |                          |
| (QPSK, 10MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition               |         | 699               | 716                | Delta(Hz) | Frequency Stability(ppm) |
| Temperature             | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)           | Normal  | 699.2572          | 715.7323           | -0.91     | -0.00109                 |
| Extreme (85°C)          |         | 699.2583          | 715.7311           | -3.35     | -0.00400                 |
| Extreme (80°C)          |         | 699.2544          | 715.7272           | -3.47     | -0.00415                 |
| Extreme (70°C)          |         | 699.2563          | 715.7291           | -6.40     | -0.00765                 |
| Extreme (60°C)          |         | 699.2549          | 715.7277           | -5.64     | -0.00674                 |
| Extreme (50°C)          |         | 699.2555          | 715.7283           | -0.38     | -0.00045                 |
| Extreme (40°C)          |         | 699.2568          | 715.7296           | -1.02     | -0.00122                 |
| Extreme (30°C)          |         | 699.2575          | 715.7303           | -1.09     | -0.00130                 |



|                          |         |                   |                    |           |                          |
|--------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| Extreme (20°C)           |         | 699.2554          | 715.7282           | 3.16      | 0.00378                  |
| Extreme (10°C)           |         | 699.2566          | 715.7294           | 1.15      | 0.00137                  |
| Extreme (0°C)            |         | 699.2553          | 715.7281           | -3.64     | -0.00435                 |
| Extreme (-10°C)          |         | 699.2548          | 715.7276           | -4.34     | -0.00519                 |
| Extreme (-20°C)          |         | 699.2559          | 715.7287           | -0.35     | -0.00042                 |
| Extreme (-30°C)          |         | 699.2592          | 715.7324           | 2.28      | 0.00273                  |
| Extreme (-40°C)          |         | 699.2604          | 715.7332           | -3.92     | -0.00469                 |
| 25°C                     | LV      | 699.2556          | 715.7284           | -5.58     | -0.00667                 |
|                          | HV      | 699.2562          | 715.7295           | 0.20      | 0.00024                  |
| (16QAM, 10MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition                |         | 699               | 716                | Delta(Hz) | Frequency Stability(ppm) |
| Temperature              | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)            | Normal  | 699.3118          | 715.6805           | 0.85      | 0.00102                  |
| Extreme (85°C)           |         | 699.3107          | 715.6794           | -0.85     | -0.00102                 |
| Extreme (80°C)           |         | 699.3146          | 715.6833           | -0.21     | -0.00025                 |
| Extreme (70°C)           |         | 699.3127          | 715.6814           | -1.63     | -0.00195                 |
| Extreme (60°C)           |         | 699.3141          | 715.6828           | -1.10     | -0.00132                 |
| Extreme (50°C)           |         | 699.3135          | 715.6822           | 0.86      | 0.00103                  |
| Extreme (40°C)           |         | 699.3122          | 715.6809           | -1.34     | -0.00160                 |
| Extreme (30°C)           |         | 699.3115          | 715.6802           | -3.09     | -0.00369                 |
| Extreme (20°C)           |         | 699.3136          | 715.6823           | -2.91     | -0.00348                 |
| Extreme (10°C)           |         | 699.3124          | 715.6811           | -2.10     | -0.00251                 |
| Extreme (0°C)            |         | 699.3137          | 715.6824           | 0.08      | 0.00010                  |
| Extreme (-10°C)          |         | 699.3142          | 715.6829           | 2.56      | 0.00306                  |
| Extreme (-20°C)          |         | 699.3131          | 715.6818           | -1.21     | -0.00145                 |
| Extreme (-30°C)          |         | 699.3098          | 715.6785           | -1.31     | -0.00157                 |
| Extreme (-40°C)          |         | 699.3086          | 715.6773           | 0.69      | 0.00082                  |
| 25°C                     | LV      | 699.3134          | 715.6821           | 3.45      | 0.00412                  |
|                          | HV      | 699.3128          | 715.6815           | 4.51      | 0.00539                  |

|                         |         |                   |                    |           |                          |
|-------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| LTE Band 13             |         |                   |                    |           |                          |
| (QPSK, 10MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition               |         | 777               | 787                | Delta(Hz) | Frequency Stability(ppm) |
| Temperature             | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)           | Normal  | 777.4363          | 786.5756           | 2.53      | 0.00302                  |
| Extreme (85°C)          |         | 777.4364          | 786.5755           | -5.60     | -0.00669                 |
| Extreme (80°C)          |         | 777.4360          | 786.5759           | 12.94     | 0.01547                  |
| Extreme (70°C)          |         | 777.4375          | 786.5744           | -4.47     | -0.00534                 |
| Extreme (60°C)          |         | 777.4356          | 786.5763           | 0.11      | 0.00013                  |



|                          |         |                   |                    |           |                          |
|--------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| Extreme (50°C)           |         | 777.4353          | 786.5766           | 0.59      | 0.00071                  |
| Extreme (40°C)           |         | 777.4368          | 786.5751           | -0.47     | -0.00056                 |
| Extreme (30°C)           |         | 777.4357          | 786.5762           | 3.15      | 0.00377                  |
| Extreme (20°C)           |         | 777.4354          | 786.5765           | 6.52      | 0.00779                  |
| Extreme (10°C)           |         | 777.4370          | 786.5749           | 5.15      | 0.00616                  |
| Extreme (0°C)            |         | 777.4361          | 786.5758           | 1.84      | 0.00220                  |
| Extreme (-10°C)          |         | 777.4356          | 786.5751           | -0.64     | -0.00077                 |
| Extreme (-20°C)          |         | 777.4362          | 786.5765           | -1.12     | -0.00134                 |
| Extreme (-30°C)          |         | 777.4356          | 786.5763           | -1.60     | -0.00191                 |
| Extreme (-40°C)          |         | 777.4362          | 786.5757           | -3.90     | -0.00466                 |
| 25°C                     | LV      | 777.4356          | 786.5755           | 5.91      | 0.00707                  |
|                          | HV      | 777.4362          | 786.5744           | 3.58      | 0.00428                  |
| (16QAM, 10MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition                |         | 777               | 787                | Delta(Hz) | Frequency Stability(ppm) |
| Temperature              | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)            | Normal  | 777.5179          | 786.5012           | -11.34    | -0.01356                 |
| Extreme (85°C)           |         | 777.5180          | 786.5011           | 7.20      | 0.00861                  |
| Extreme (80°C)           |         | 777.5176          | 786.5015           | -10.21    | -0.01221                 |
| Extreme (70°C)           |         | 777.5191          | 786.5131           | -5.63     | -0.00673                 |
| Extreme (60°C)           |         | 777.5172          | 786.5019           | -5.15     | -0.00616                 |
| Extreme (50°C)           |         | 777.5169          | 786.5022           | -6.21     | -0.00742                 |
| Extreme (40°C)           |         | 777.5184          | 786.5007           | -2.59     | -0.00310                 |
| Extreme (30°C)           |         | 777.5173          | 786.5018           | 0.78      | 0.00093                  |
| Extreme (20°C)           |         | 777.5170          | 786.5021           | -0.59     | -0.00071                 |
| Extreme (10°C)           |         | 777.5186          | 786.5005           | -3.90     | -0.00466                 |
| Extreme (0°C)            |         | 777.5177          | 786.5014           | -6.38     | -0.00763                 |
| Extreme (-10°C)          |         | 777.5176          | 786.5011           | -6.86     | -0.00820                 |
| Extreme (-20°C)          |         | 777.5169          | 786.5131           | -7.34     | -0.00877                 |
| Extreme (-30°C)          |         | 777.5173          | 786.5018           | -9.64     | -0.01152                 |
| Extreme (-40°C)          |         | 777.5186          | 786.5005           | 0.17      | 0.00020                  |
| 25°C                     | LV      | 777.5172          | 786.5019           | -7.34     | -0.00877                 |
|                          | HV      | 777.5178          | 786.5013           | -2.76     | -0.00330                 |

| LTE Band 66              |         |                   |                    |           |                          |
|--------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| (QPSK, 20MHz BANDWIDTH)  |         |                   |                    |           |                          |
| Condition                |         | 1710              | 1780               | Delta(Hz) | Frequency Stability(ppm) |
| Temperature              | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)            | Normal  | 1710.3406         | 1779.6709          | 3.51      | 0.00201                  |
| Extreme (85°C)           |         | 1710.3405         | 1779.6708          | 4.90      | 0.00281                  |
| Extreme (80°C)           |         | 1710.3403         | 1779.6703          | -2.65     | -0.00152                 |
| Extreme (70°C)           |         | 1710.3421         | 1779.6723          | -1.64     | -0.00094                 |
| Extreme (60°C)           |         | 1710.3418         | 1779.6721          | 3.59      | 0.00206                  |
| Extreme (50°C)           |         | 1710.3409         | 1779.6712          | -7.62     | -0.00437                 |
| Extreme (40°C)           |         | 1710.3394         | 1779.6697          | -2.49     | -0.00143                 |
| Extreme (30°C)           |         | 1710.3413         | 1779.6716          | -1.06     | -0.00061                 |
| Extreme (20°C)           |         | 1710.3416         | 1779.6719          | 6.30      | 0.00361                  |
| Extreme (10C)            |         | 1710.3401         | 1779.6704          | -9.93     | -0.00569                 |
| Extreme (0°C)            |         | 1710.3412         | 1779.6715          | 5.59      | 0.00320                  |
| Extreme (-10°C)          |         | 1710.3415         | 1779.6718          | 3.51      | 0.00201                  |
| Extreme (-20°C)          |         | 1710.3399         | 1779.6702          | -9.02     | -0.00517                 |
| Extreme (-30°C)          |         | 1710.3409         | 1779.6712          | -7.21     | -0.00413                 |
| Extreme (-40°C)          |         | 1710.3408         | 1779.6711          | -8.13     | -0.00466                 |
| 25°C                     | LV      | 1710.3413         | 1779.6716          | 3.89      | 0.00223                  |
|                          | HV      | 1710.3407         | 1779.6713          | 6.47      | 0.00371                  |
| (16QAM, 20MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition                |         | 1710              | 1780               | Delta(Hz) | Frequency Stability(ppm) |
| Temperature              | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)            | Normal  | 1710.4049         | 1779.7132          | -1.97     | -0.00113                 |
| Extreme (85°C)           |         | 1710.4051         | 1779.7131          | -2.98     | -0.00171                 |
| Extreme (80°C)           |         | 1710.4069         | 1779.7131          | -6.40     | -0.00367                 |
| Extreme (70°C)           |         | 1710.4047         | 1779.7144          | -4.42     | -0.00253                 |
| Extreme (60°C)           |         | 1710.4042         | 1779.7145          | 0.08      | 0.00005                  |
| Extreme (50°C)           |         | 1710.4046         | 1779.7135          | -0.67     | -0.00038                 |
| Extreme (40°C)           |         | 1710.4061         | 1779.7123          | -8.29     | -0.00475                 |
| Extreme (30°C)           |         | 1710.4042         | 1779.7139          | -1.03     | -0.00059                 |
| Extreme (20°C)           |         | 1710.4039         | 1779.7142          | 0.28      | 0.00016                  |
| Extreme (10C)            |         | 1710.4054         | 1779.7127          | -4.34     | -0.00249                 |
| Extreme (0°C)            |         | 1710.4043         | 1779.7138          | -2.64     | -0.00151                 |
| Extreme (-10°C)          |         | 1710.4043         | 1779.7141          | -2.85     | -0.00163                 |
| Extreme (-20°C)          |         | 1710.4056         | 1779.7125          | -6.34     | -0.00363                 |
| Extreme (-30°C)          |         | 1710.4046         | 1779.7135          | -2.06     | -0.00118                 |
| Extreme (-40°C)          |         | 1710.4047         | 1779.7134          | -5.29     | -0.00303                 |



|      |    |           |           |       |          |
|------|----|-----------|-----------|-------|----------|
| 25°C | LV | 1710.4042 | 1779.7139 | -3.54 | -0.00203 |
|      | HV | 1710.4048 | 1779.7133 | -7.00 | -0.00401 |

| LTE Band 71              |         |                   |                    |           |                          |
|--------------------------|---------|-------------------|--------------------|-----------|--------------------------|
| (QPSK, 20MHz BANDWIDTH)  |         |                   |                    |           |                          |
| Condition                |         | 663               | 698                | Delta(Hz) | Frequency Stability(ppm) |
| Temperature              | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)            | Normal  | 663.5332          | 697.4977           | 4.02      | 0.00230                  |
| Extreme (85°C)           |         | 663.6528          | 697.6175           | 6.14      | 0.00352                  |
| Extreme (80°C)           |         | 663.5318          | 697.4965           | -2.23     | -0.00128                 |
| Extreme (70°C)           |         | 663.5432          | 697.5079           | -1.56     | -0.00089                 |
| Extreme (60°C)           |         | 663.5391          | 697.5038           | 6.49      | 0.00372                  |
| Extreme (50°C)           |         | 663.5361          | 697.5008           | -5.08     | -0.00291                 |
| Extreme (40°C)           |         | 663.5318          | 697.4965           | -1.82     | -0.00104                 |
| Extreme (30°C)           |         | 663.5432          | 697.5079           | -0.55     | -0.00032                 |
| Extreme (20°C)           |         | 663.5391          | 697.5038           | 7.17      | 0.00411                  |
| Extreme (10C)            |         | 663.5321          | 697.4968           | -9.32     | -0.00534                 |
| Extreme (0°C)            |         | 663.5375          | 697.5022           | 7.40      | 0.00424                  |
| Extreme (-10°C)          |         | 663.5387          | 697.5034           | 4.78      | 0.00274                  |
| Extreme (-20°C)          |         | 663.5345          | 697.4992           | -8.13     | -0.00466                 |
| Extreme (-30°C)          |         | 663.5361          | 697.5008           | -6.09     | -0.00349                 |
| Extreme (-40°C)          |         | 663.5311          | 697.4958           | -7.05     | -0.00404                 |
| 25°C                     | LV      | 663.5326          | 697.4973           | 6.36      | 0.00364                  |
|                          | HV      | 663.5361          | 697.5008           | 7.38      | 0.00423                  |
| (16QAM, 20MHz BANDWIDTH) |         |                   |                    |           |                          |
| Condition                |         | 663               | 698                | Delta(Hz) | Frequency Stability(ppm) |
| Temperature              | Voltage | F low@-13dBm(MHz) | F high@-13dBm(MHz) |           |                          |
| Normal (25°C)            | Normal  | 663.5258          | 697.4905           | 0.97      | 0.00056                  |
| Extreme (85°C)           |         | 663.4064          | 697.3707           | 3.93      | 0.00225                  |
| Extreme (80°C)           |         | 663.5282          | 697.4926           | 1.26      | 0.00072                  |
| Extreme (70°C)           |         | 663.5161          | 697.4808           | 3.21      | 0.00184                  |
| Extreme (60°C)           |         | 663.5199          | 697.4846           | 4.58      | 0.00262                  |
| Extreme (50°C)           |         | 663.5227          | 697.4874           | 2.22      | 0.00127                  |
| Extreme (40°C)           |         | 663.5273          | 697.4917           | 1.50      | 0.00086                  |
| Extreme (30°C)           |         | 663.5156          | 697.4803           | 0.31      | 0.00018                  |
| Extreme (20°C)           |         | 663.5197          | 697.4844           | 3.52      | 0.00202                  |
| Extreme (10C)            |         | 663.5267          | 697.4914           | -1.33     | -0.00076                 |
| Extreme (0°C)            |         | 663.5213          | 697.4867           | 1.95      | 0.00112                  |
| Extreme (-10°C)          |         | 663.5201          | 697.4848           | 1.46      | 0.00084                  |



|                 |    |          |          |      |         |
|-----------------|----|----------|----------|------|---------|
| Extreme (-20°C) |    | 663.5243 | 697.4891 | 0.63 | 0.00036 |
| Extreme (-30°C) |    | 663.5227 | 697.4874 | 2.25 | 0.00129 |
| Extreme (-40°C) |    | 663.5277 | 697.4924 | 2.07 | 0.00119 |
| 25°C            | LV | 663.5262 | 697.4909 | 2.96 | 0.00170 |
|                 | HV | 663.5227 | 697.4874 | 0.84 | 0.00048 |

## 5.7 Spurious Emissions at Antenna Terminals

### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier. The peak detector is used.

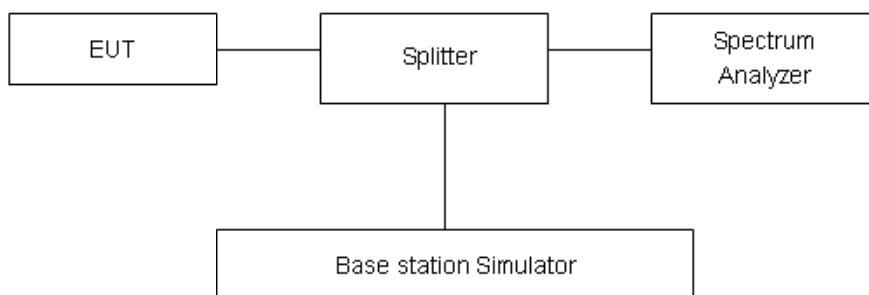
RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

### Test setup



### Limits

LTE -4 Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB..”

LTE -12 Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

LTE -13 Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent

isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

LTE 13- Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

|                             |                                     |         |
|-----------------------------|-------------------------------------|---------|
| Part 27.53(a)/(h)/(g) Limit |                                     | -13 dBm |
| Part 27.53(f) Limit         | Limit out of the band 1559-1610 MHz | -13 dBm |
|                             | Limit in the band 1559-1610 MHz     | -40 dBm |

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

| Frequency  | Uncertainty |
|------------|-------------|
| 9kHz-1GHz  | 0.684 dB    |
| 1GHz-27GHz | 1.407 dB    |

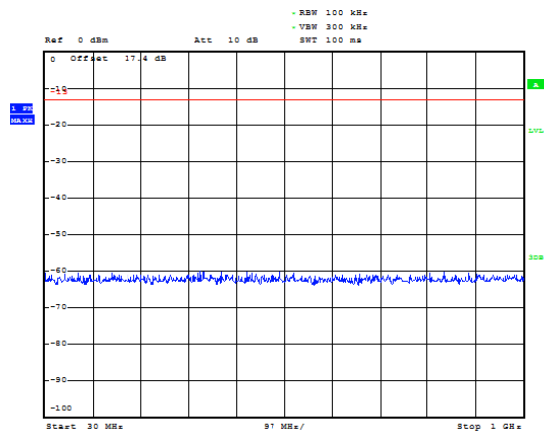


## Test Result

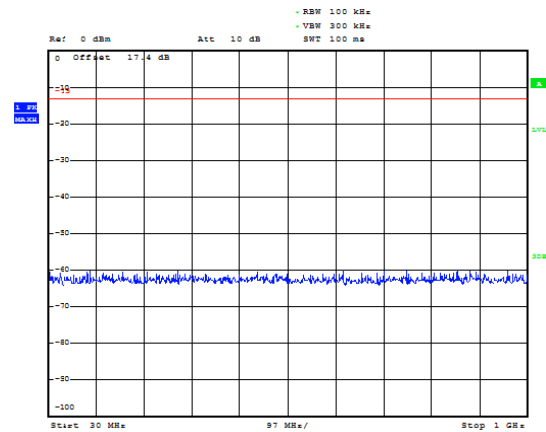
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

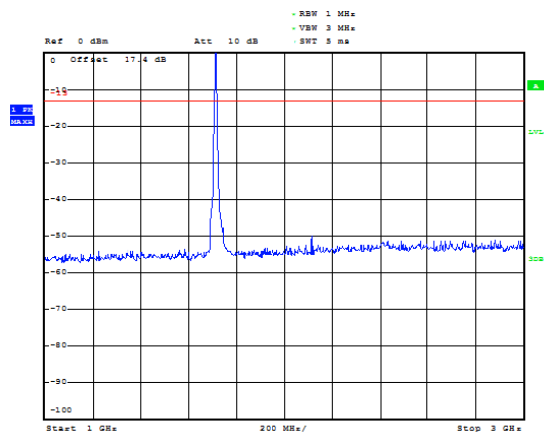
WCDMA Band IV CH-Low 30MHz~1GHz



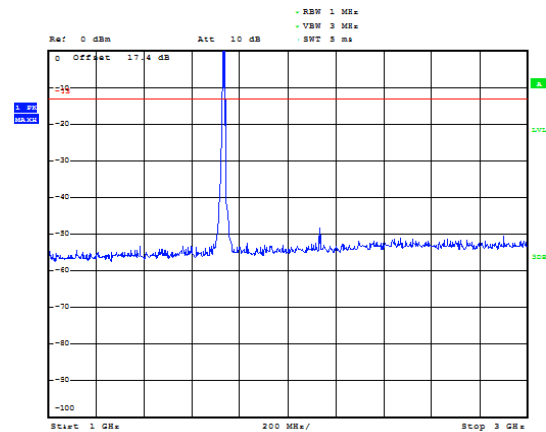
WCDMA Band IV CH-Middle 30MHz~1GHz



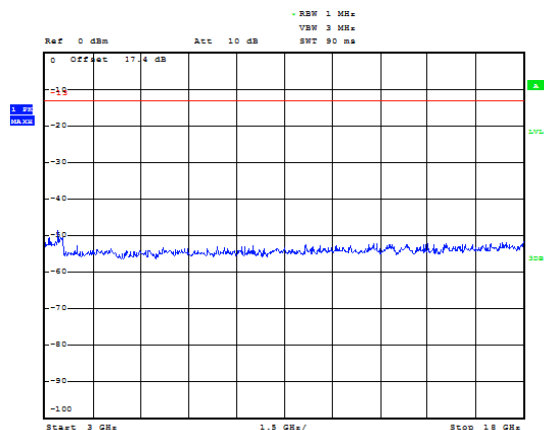
WCDMA Band IV CH-Low 1GHz~3GHz



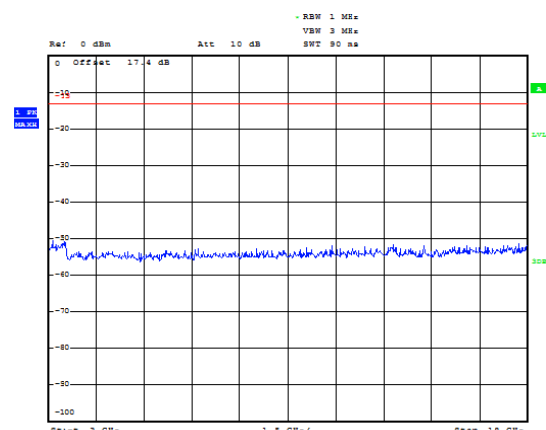
WCDMA Band IV CH-Middle 1GHz~3GHz



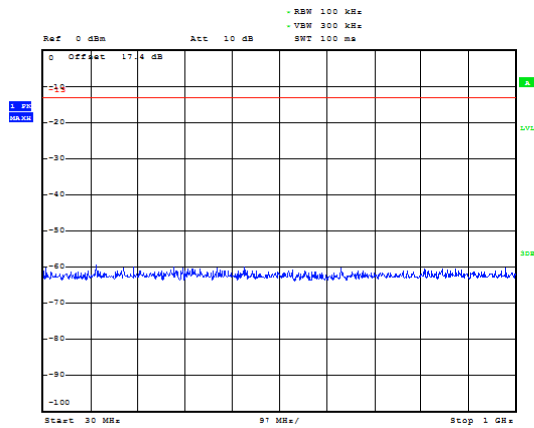
WCDMA Band IV CH-Low 3GHz~18GHz



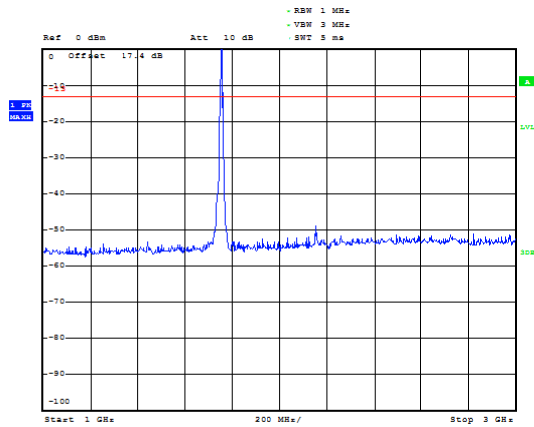
WCDMA Band IV CH-Middle 3GHz~18GHz



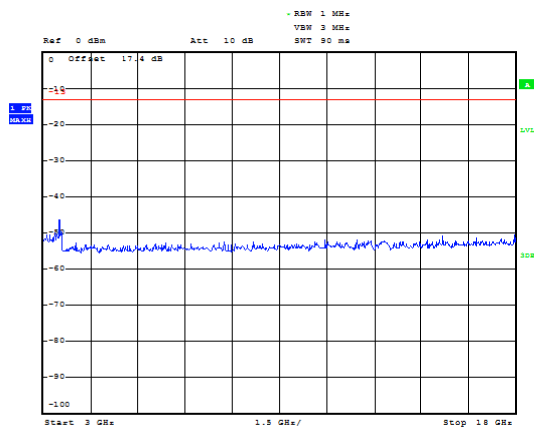
### WCDMA Band IV CH-High 30MHz~1GHz



### WCDMA Band IV CH-High 1GHz~3GHz

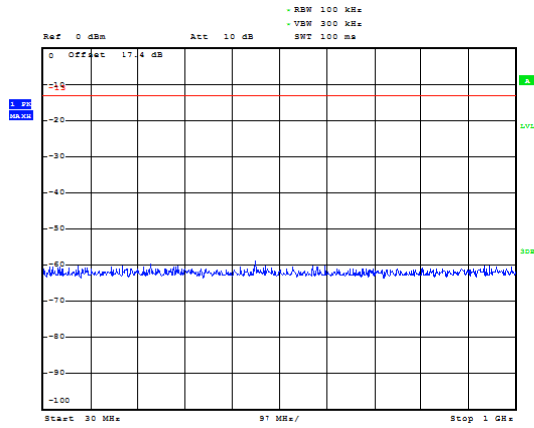


### WCDMA Band IV CH-High 3GHz~18GHz

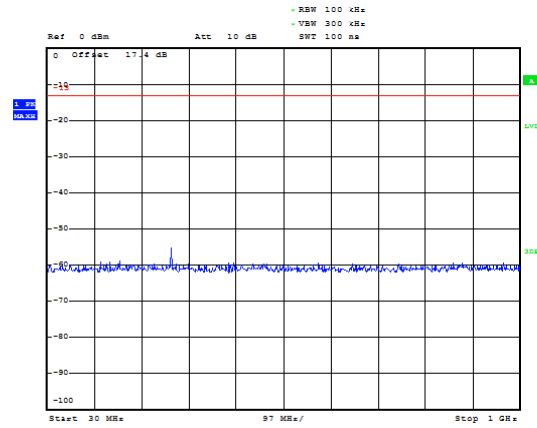




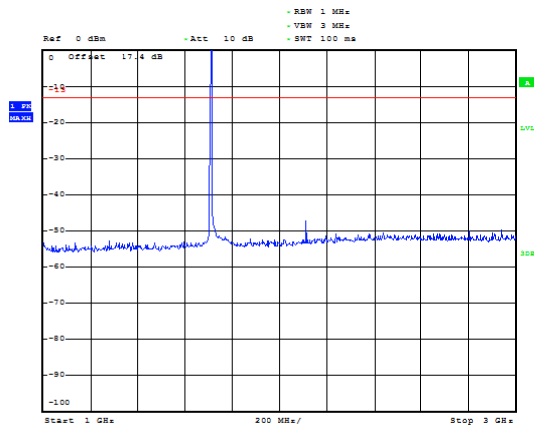
## LTE Band 4 1.4MHz CH-Low 30MHz~1GHz



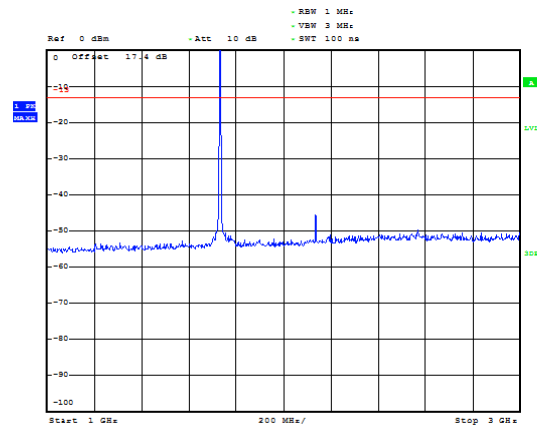
## LTE Band 4 1.4MHz CH-Middle 30MHz~1GHz



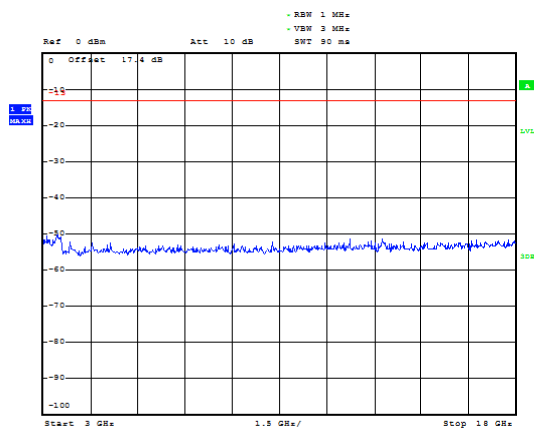
## LTE Band 4 1.4MHz CH-Low 1GHz~3GHz



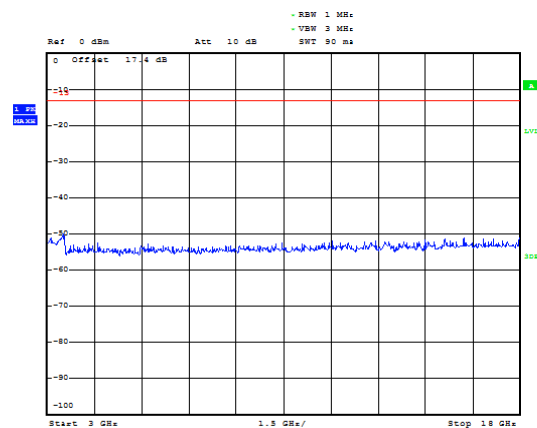
## LTE Band 4 1.4MHz CH-Middle 1GHz~3GHz



## LTE Band 4 1.4MHz CH-Low 3GHz~18GHz

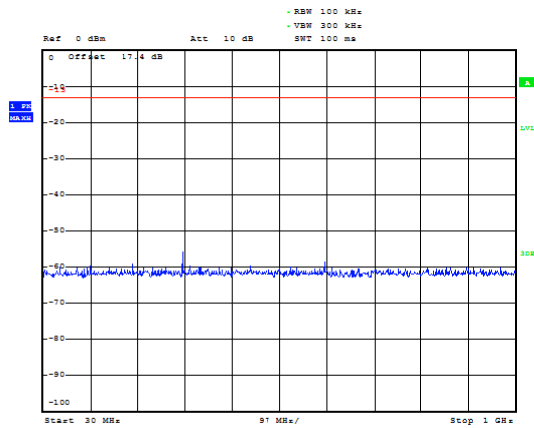


## LTE Band 4 1.4MHz CH-Middle 3GHz~18GHz

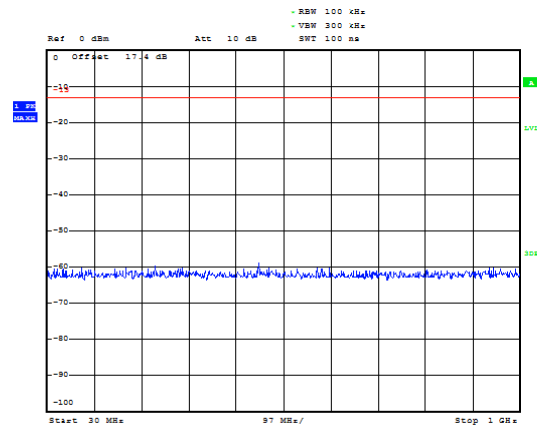




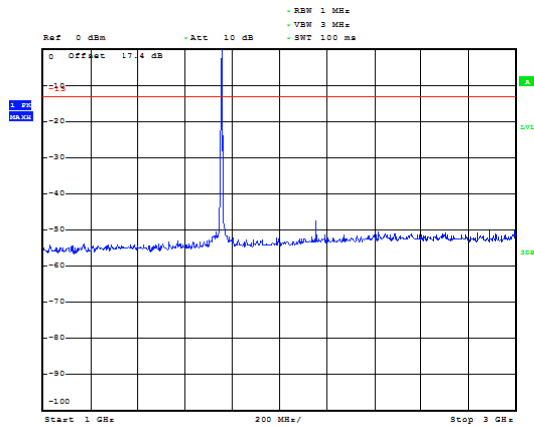
## LTE Band 4 1.4MHz CH-High 30MHz~1GHz



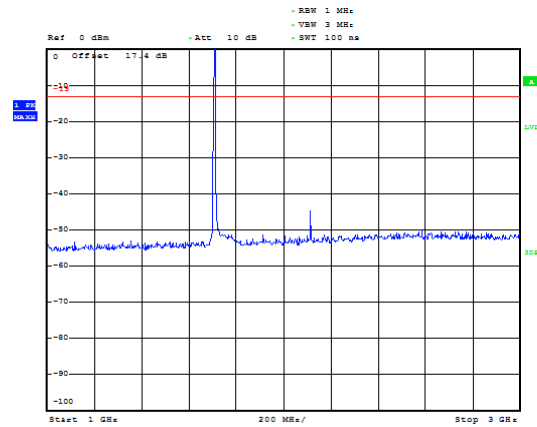
## LTE Band 4 3MHz CH-Low 30MHz~1GHz



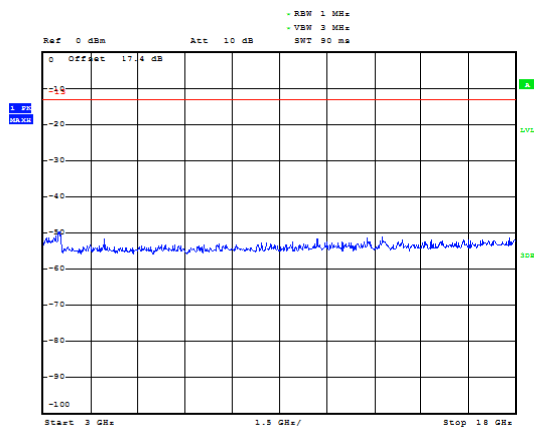
## LTE Band 4 1.4MHz CH-High 1GHz~3GHz



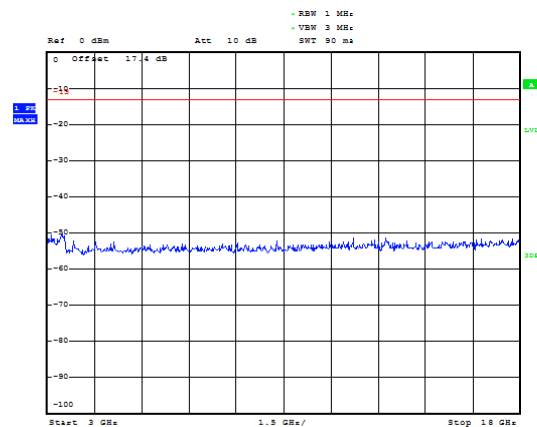
## LTE Band 4 3MHz CH-Low 1GHz~3GHz



## LTE Band 4 1.4MHz CH-High 3GHz~18GHz

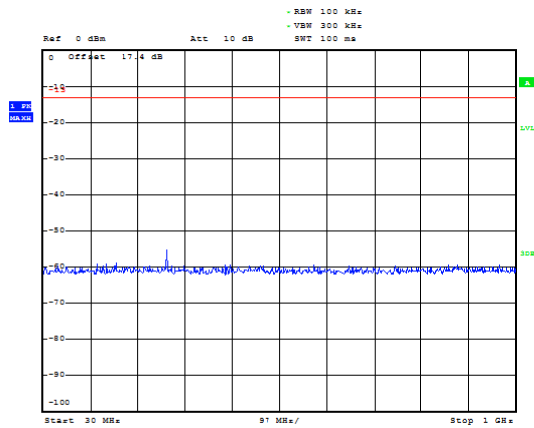


## LTE Band 4 3MHz CH-Low 3GHz~18GHz

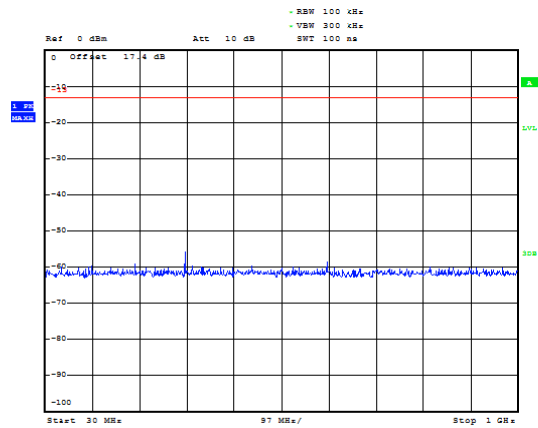




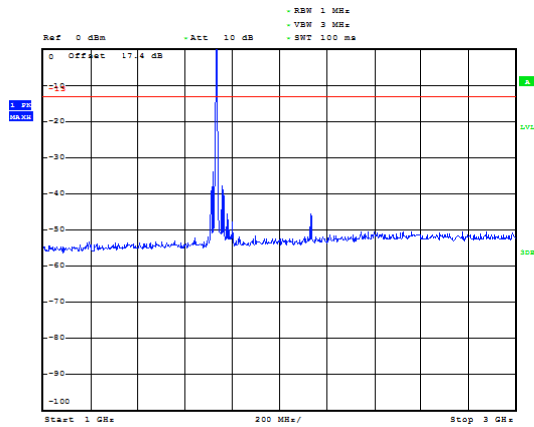
## LTE Band 4 3MHz CH-Middle 30MHz~1GHz



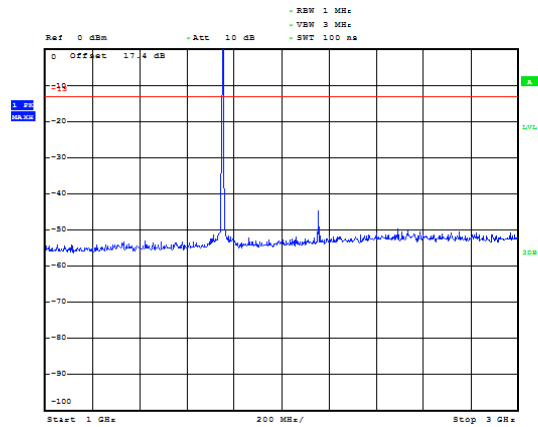
## LTE Band 4 3MHz CH-High 30MHz~1GHz



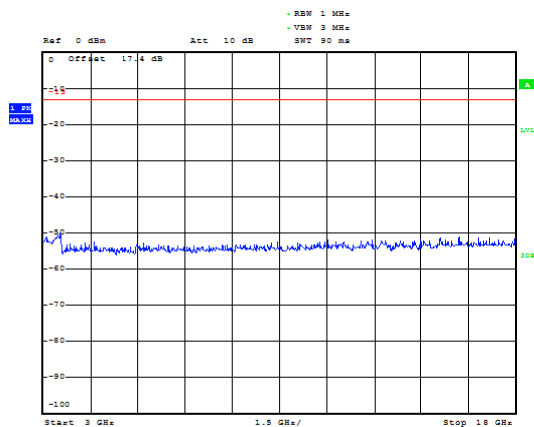
## LTE Band 4 3MHz CH-Middle 1GHz~3GHz



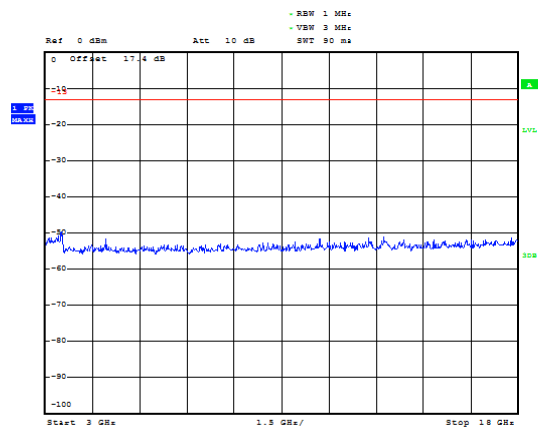
## LTE Band 4 3MHz CH-High 1GHz~3GHz



## LTE Band 4 3MHz CH-Middle 3GHz~18GHz

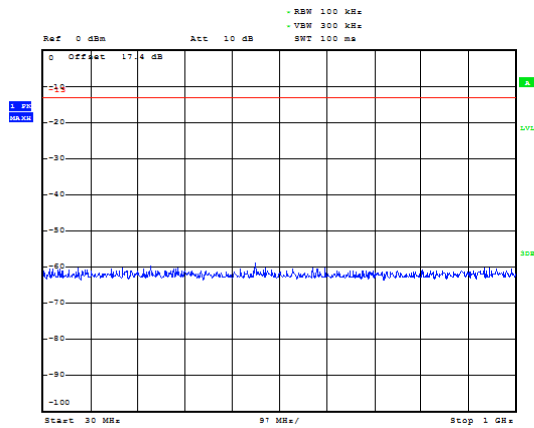


## LTE Band 4 3MHz CH-High 3GHz~18GHz

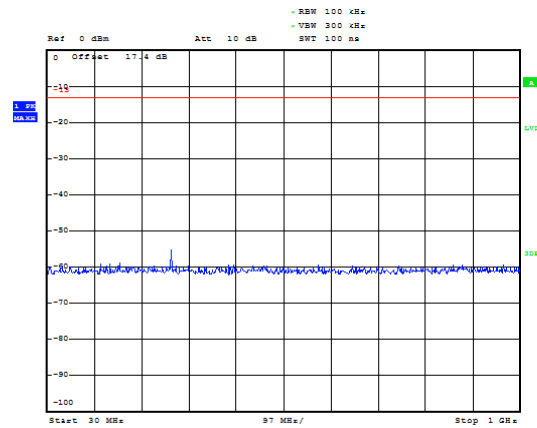




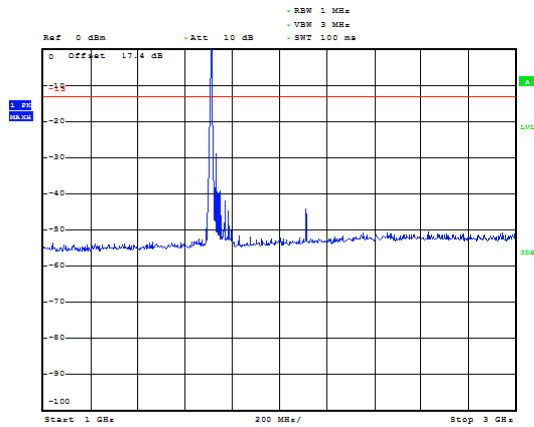
## LTE Band 4 5MHz CH-Low 30MHz~1GHz



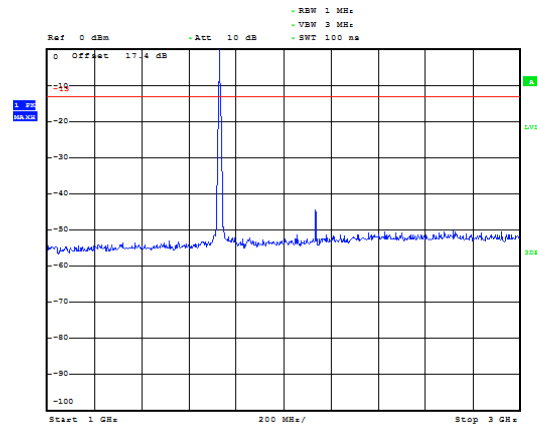
## LTE Band 4 5MHz CH-Middle 30MHz~1GHz



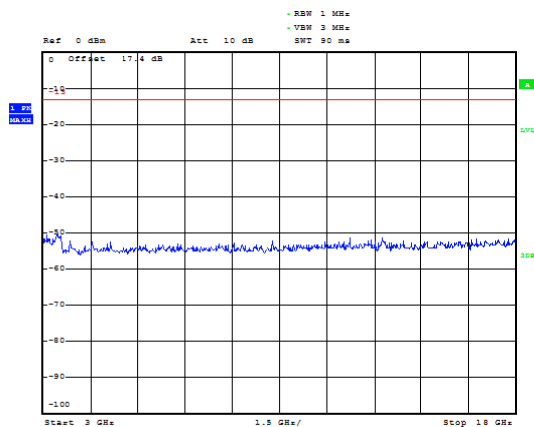
## LTE Band 4 5MHz CH-Low 1GHz~3GHz



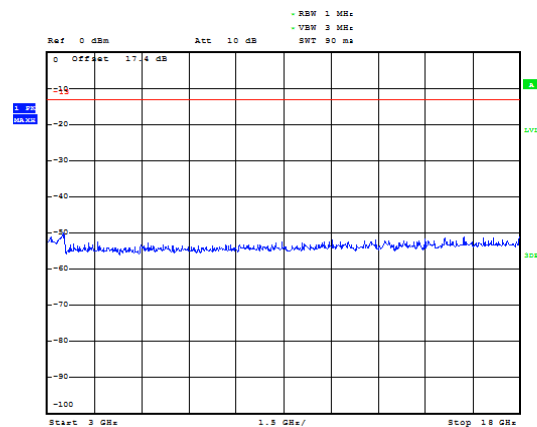
## LTE Band 4 5MHz CH-Middle 1GHz~3GHz



## LTE Band 4 5MHz CH-Low 3GHz~18GHz

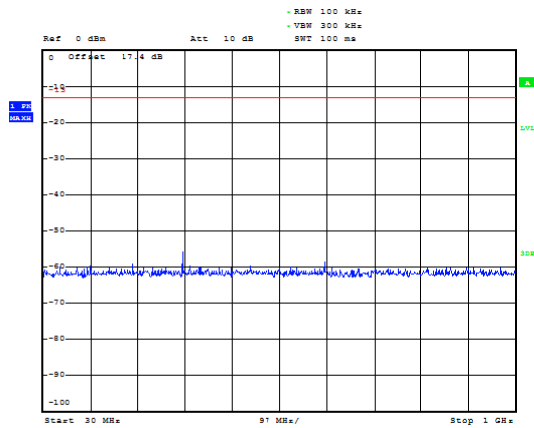


## LTE Band 4 5MHz CH-Middle 3GHz~18GHz

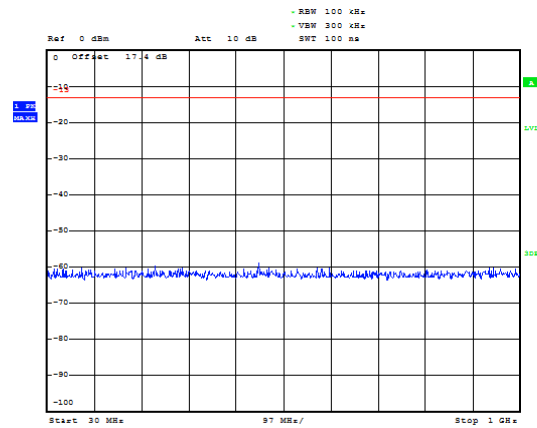




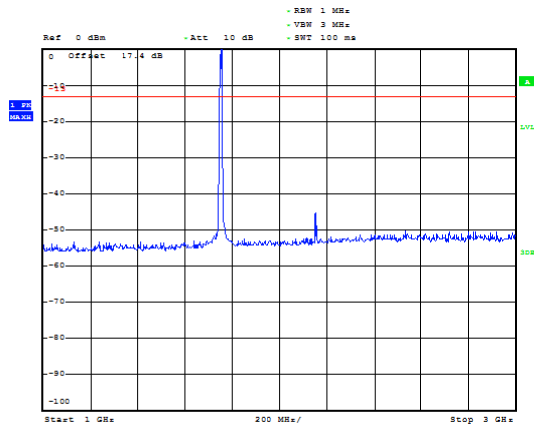
## LTE Band 4 5MHz CH-High 30MHz~1GHz



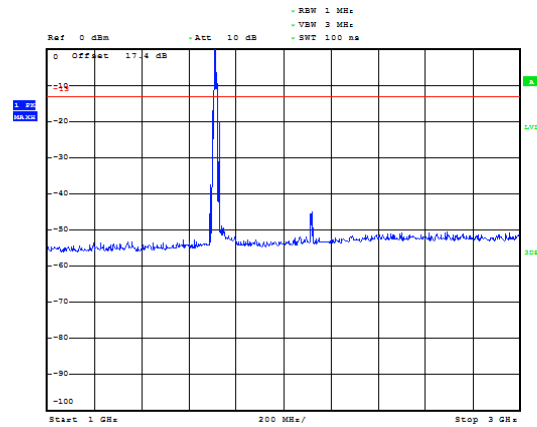
## LTE Band 4 10MHz CH-Low 30MHz~1GHz



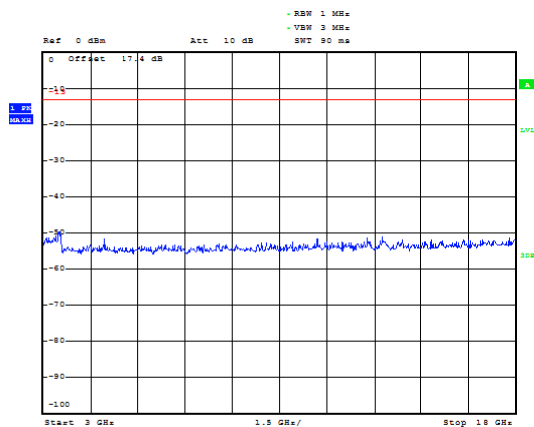
## LTE Band 4 5MHz CH-High 1GHz~3GHz



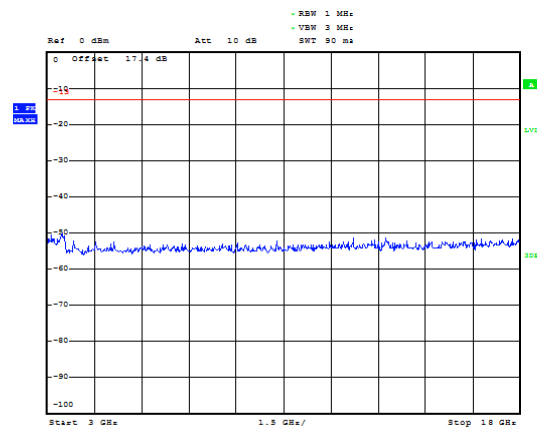
## LTE Band 4 10MHz CH-Low 1GHz~3GHz



## LTE Band 4 5MHz CH-High 3GHz~18GHz

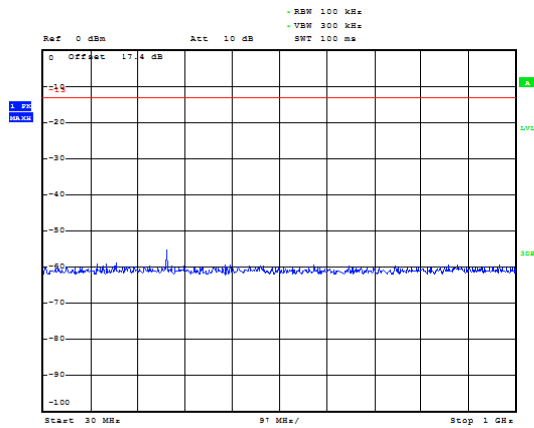


## LTE Band 4 10MHz CH-Low 3GHz~18GHz

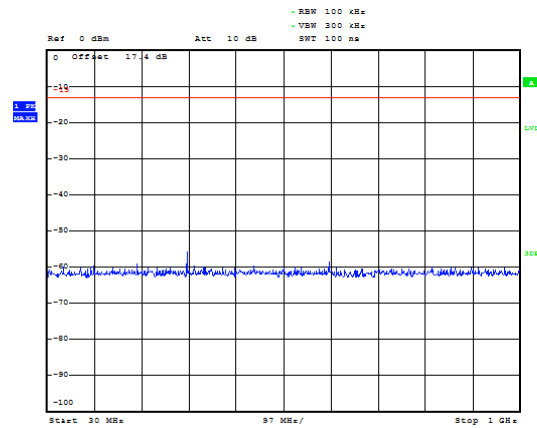




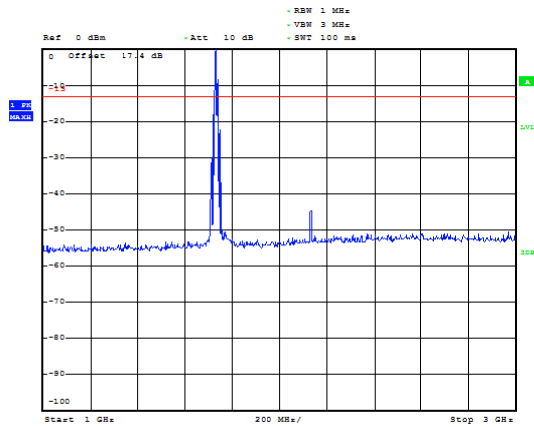
## LTE Band 4 10MHz CH-Middle 30MHz~1GHz



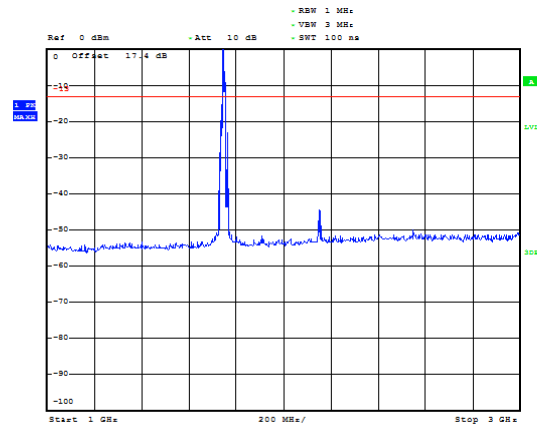
## LTE Band 4 10MHz CH-High 30MHz~1GHz



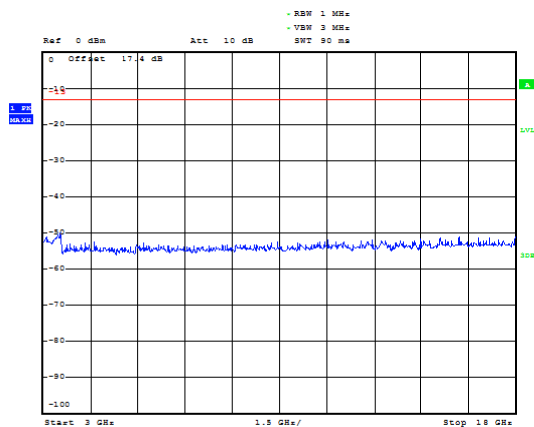
## LTE Band 4 10MHz CH-Middle 1GHz~3GHz



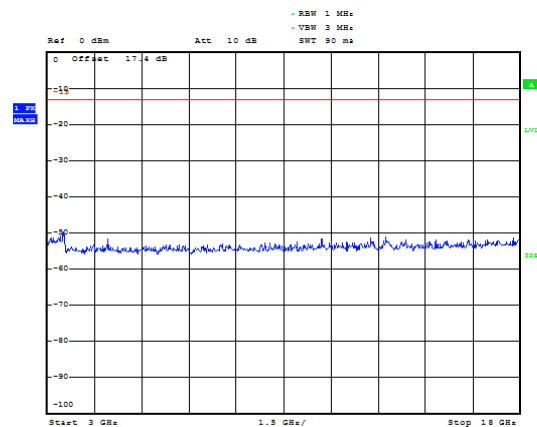
## LTE Band 4 10MHz CH-High 1GHz~3GHz



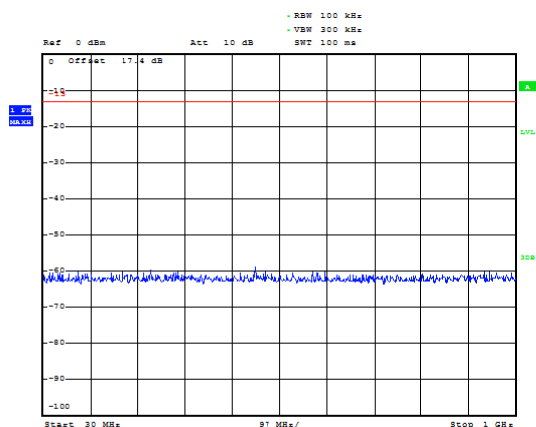
## LTE Band 4 10MHz CH-Middle 3GHz~18GHz



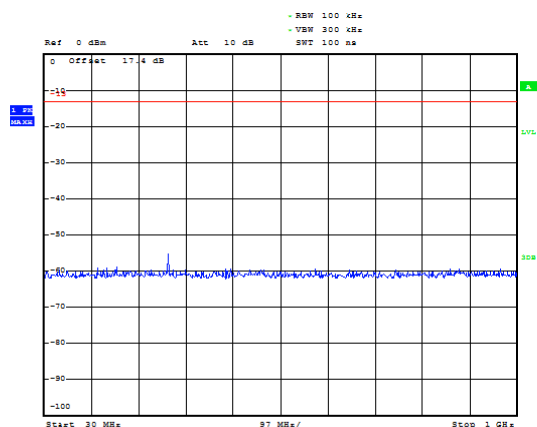
## LTE Band 4 10MHz CH-High 3GHz~18GHz



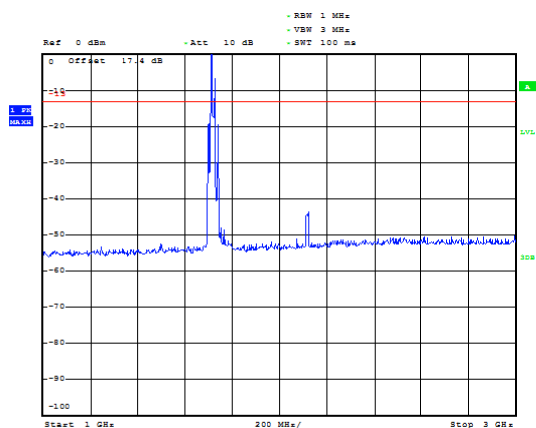
### LTE Band 4 15MHz CH-Low 30MHz~1GHz



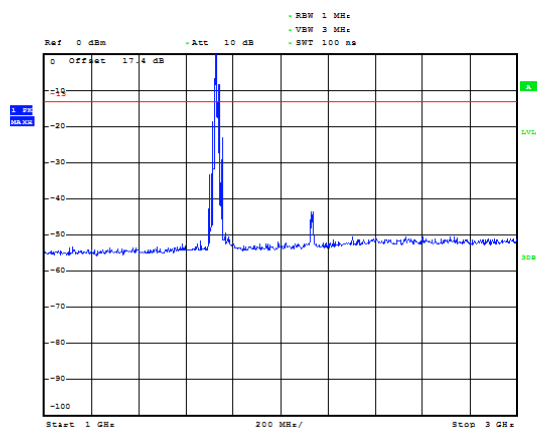
### LTE Band 4 15MHz CH-Middle 30MHz~1GHz



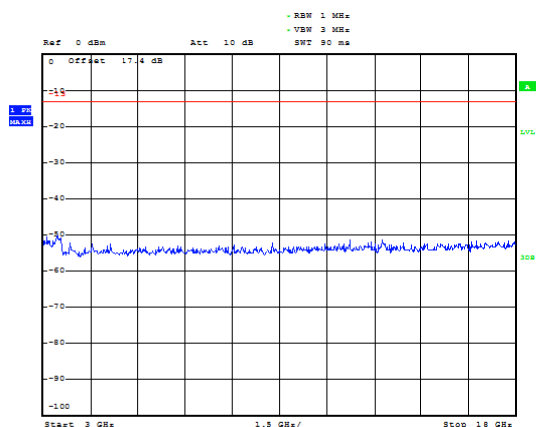
### LTE Band 4 15MHz CH-Low 1GHz~3GHz



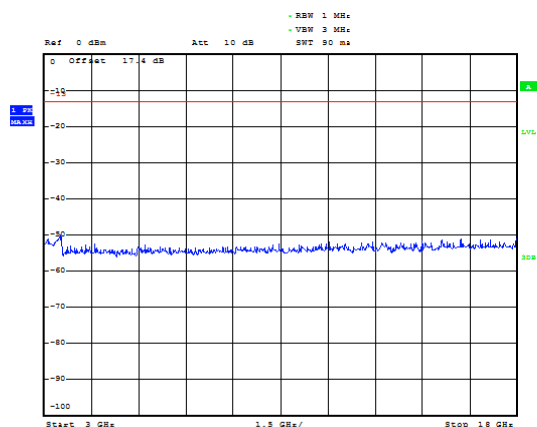
### LTE Band 4 15MHz CH-Middle 1GHz~3GHz



### LTE Band 4 15MHz CH-Low 3GHz~18GHz

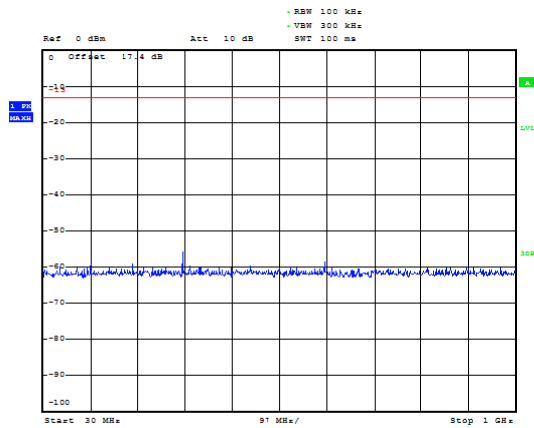


### LTE Band 4 15MHz CH-Middle 3GHz~18GHz

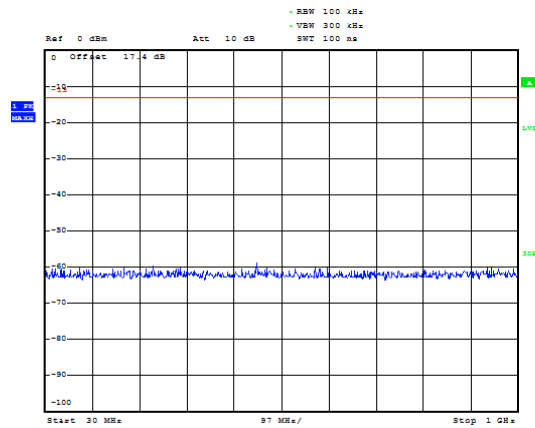




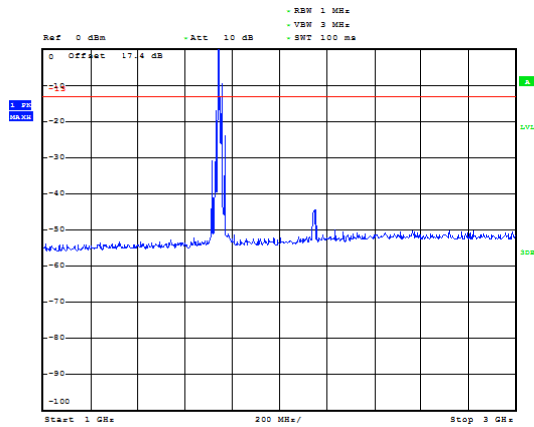
## LTE Band 4 15MHz CH-High 30MHz~1GHz



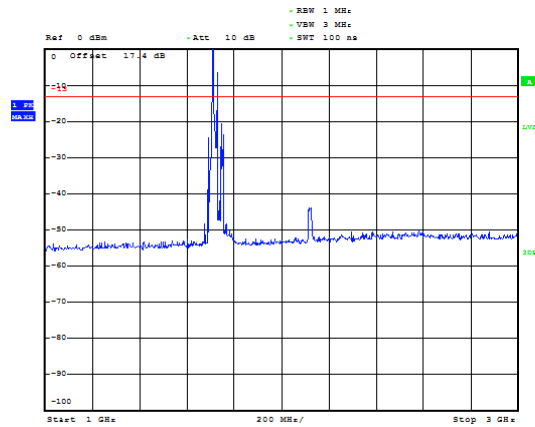
## LTE Band 4 20MHz CH-Low 30MHz~1GHz



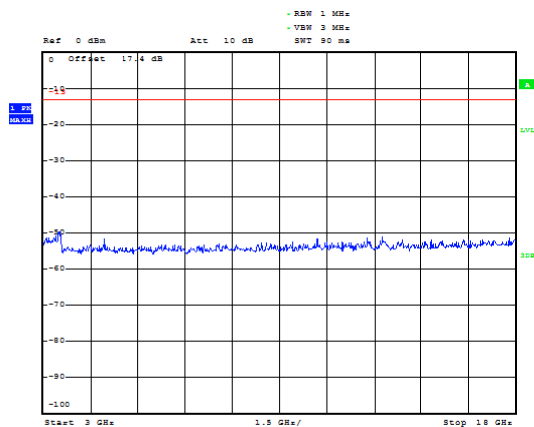
## LTE Band 4 15MHz CH-High 1GHz~3GHz



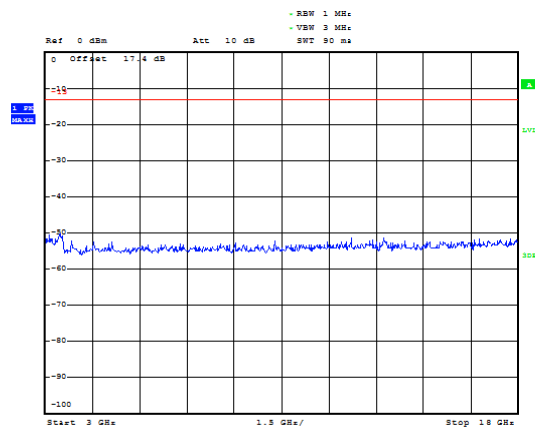
## LTE Band 4 20MHz CH-Low 1GHz~3GHz



## LTE Band 4 15MHz CH-High 3GHz~18GHz

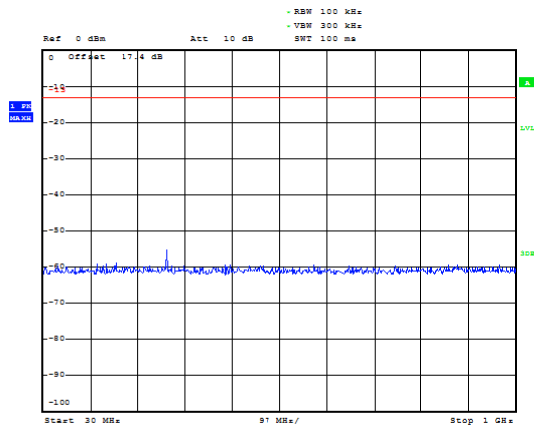


## LTE Band 4 20MHz CH-Low 3GHz~18GHz

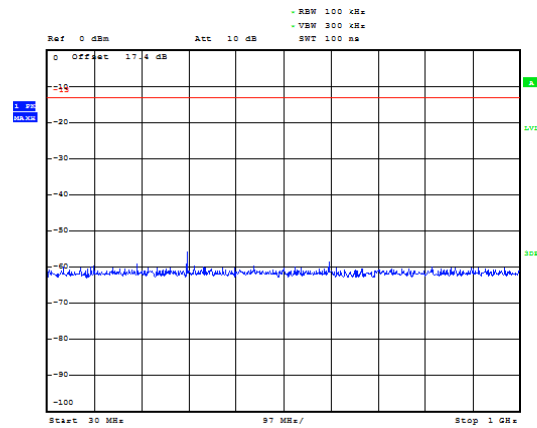




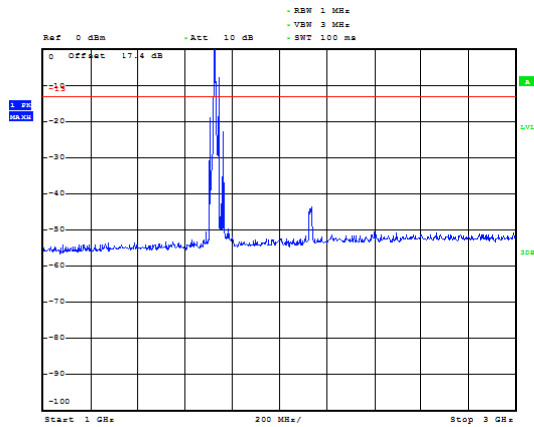
## LTE Band 4 20MHz CH-Middle 30MHz~1GHz



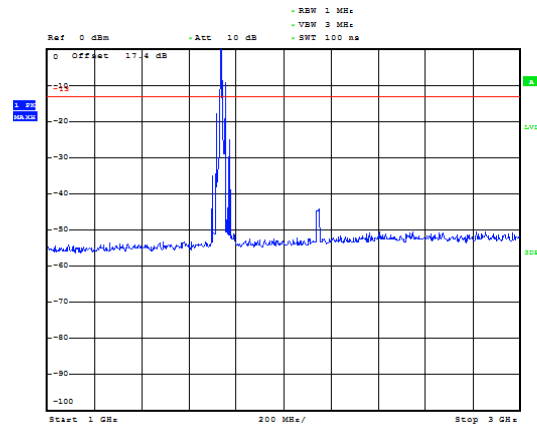
## LTE Band 4 20MHz CH-High 30MHz~1GHz



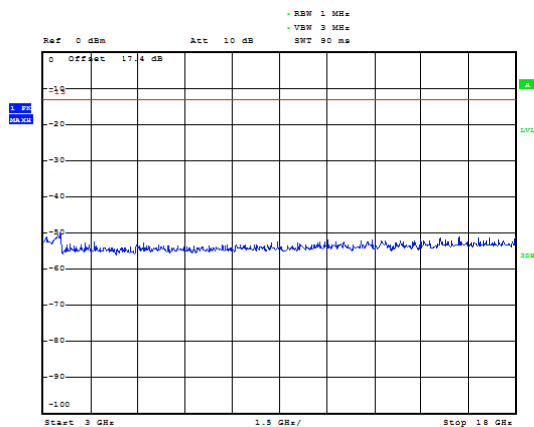
## LTE Band 4 20MHz CH-Middle 1GHz~3GHz



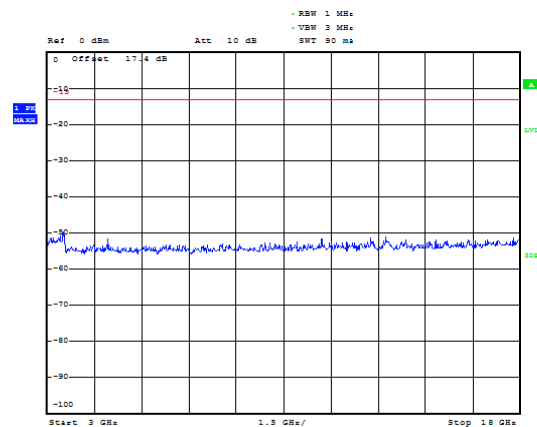
## LTE Band 4 20MHz CH-High 1GHz~3GHz



## LTE Band 4 20MHz CH-Middle 3GHz~18GHz

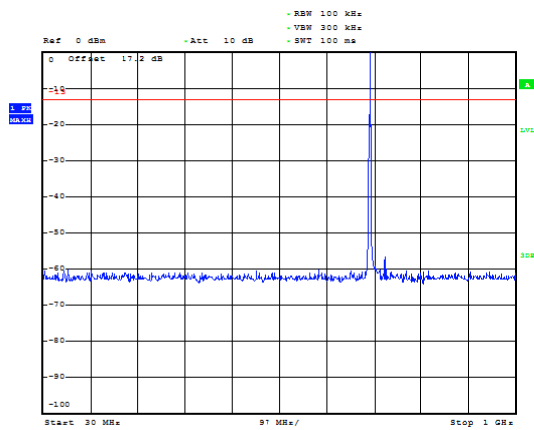


## LTE Band 4 20MHz CH-High 3GHz~18GHz

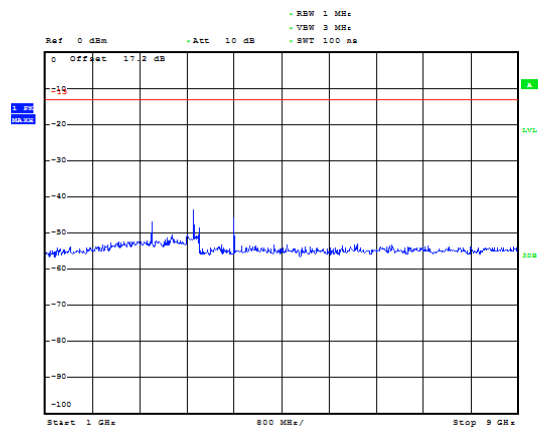




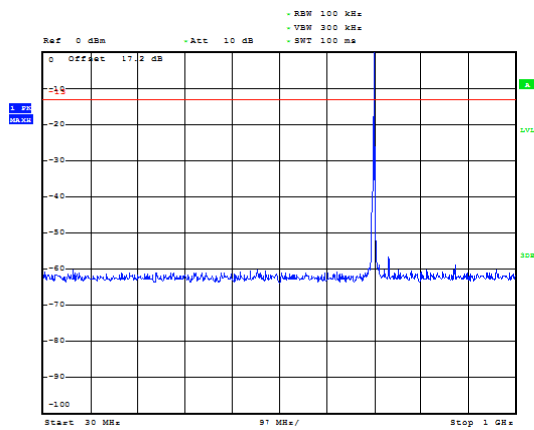
## LTE Band 12 1.4MHz CH-Low 30MHz~1GHz



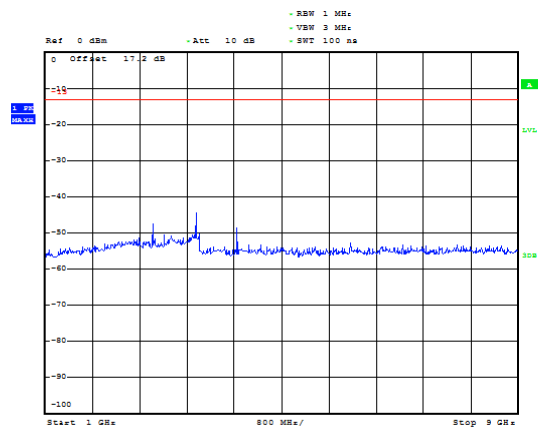
## LTE Band 12 1.4MHz CH-Low 1GHz~9GHz



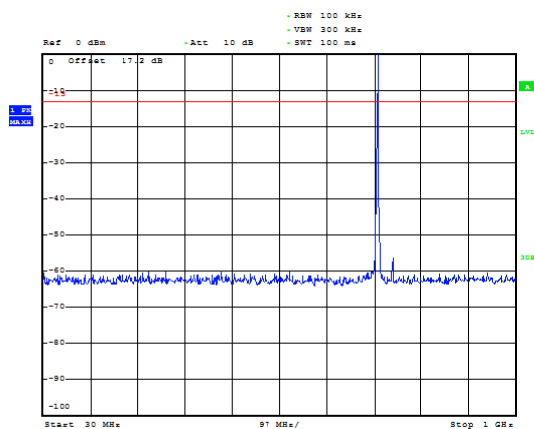
## LTE Band 12 1.4MHz CH- Middle 30MHz~1GHz



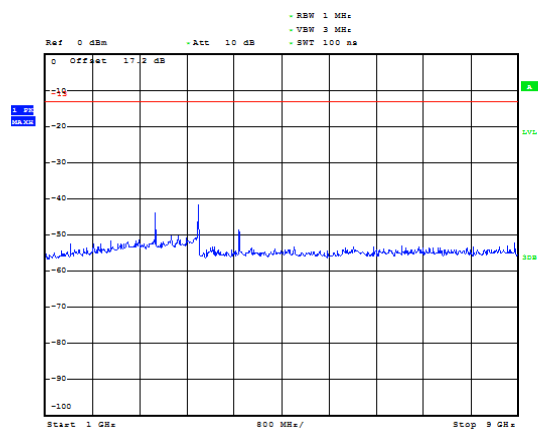
## LTE Band 12 1.4MHz CH- Middle 1GHz~9GHz



## LTE Band 12 1.4MHz CH-High 30MHz~1GHz

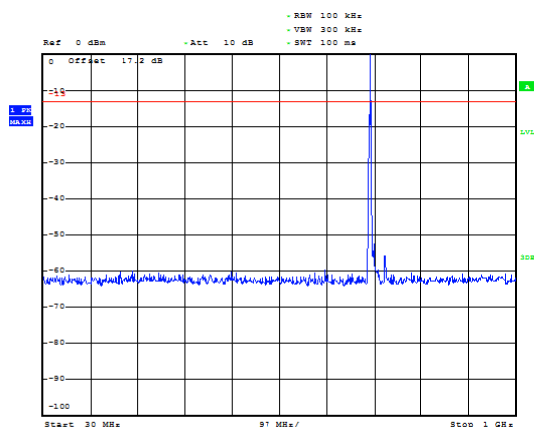


## LTE Band 12 1.4MHz CH-High 1GHz~9GHz

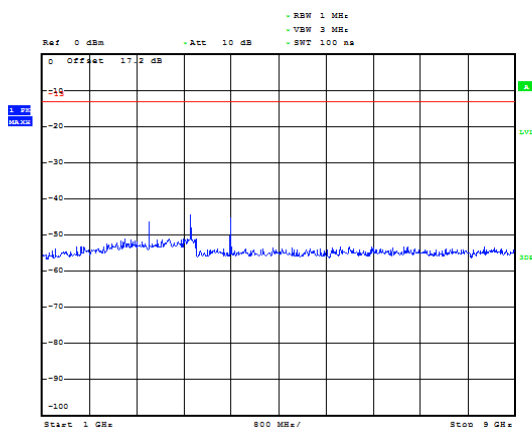




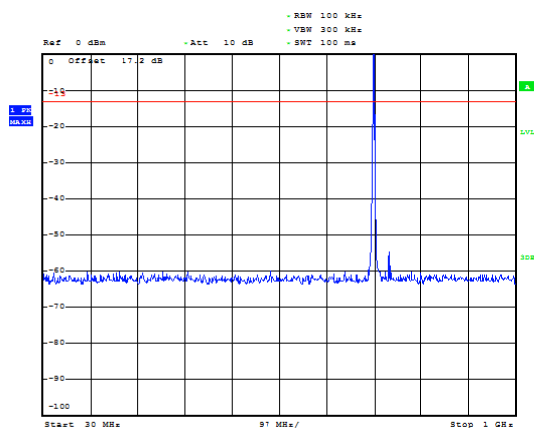
## LTE Band 12 3MHz CH-Low 30MHz~1GHz



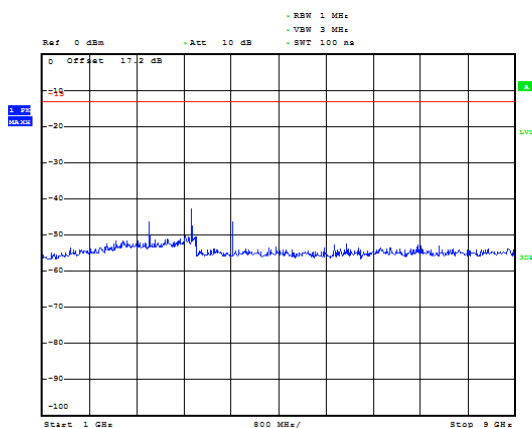
## LTE Band 12 3MHz CH-Low 1GHz~9GHz



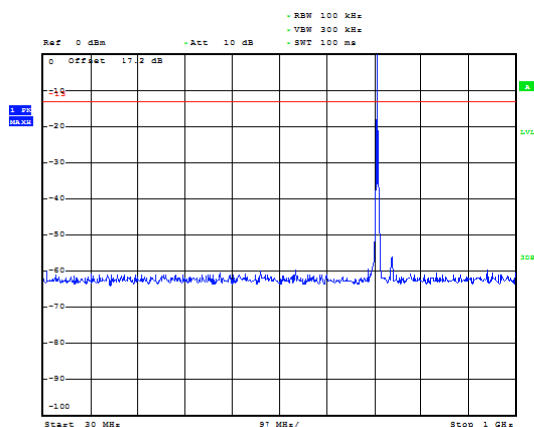
## LTE Band 12 3MHz CH- Middle 30MHz~1GHz



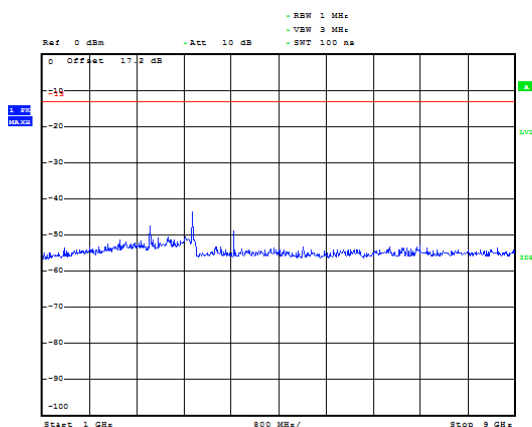
## LTE Band 12 3MHz CH- Middle 1GHz~9GHz



## LTE Band 12 3MHz CH-High 30MHz~1GHz

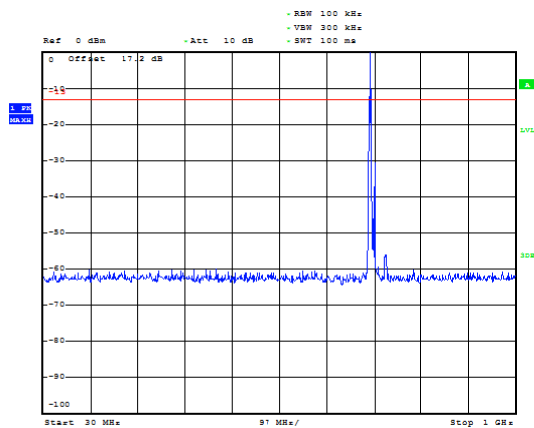


## LTE Band 12 3MHz CH-High 1GHz~9GHz

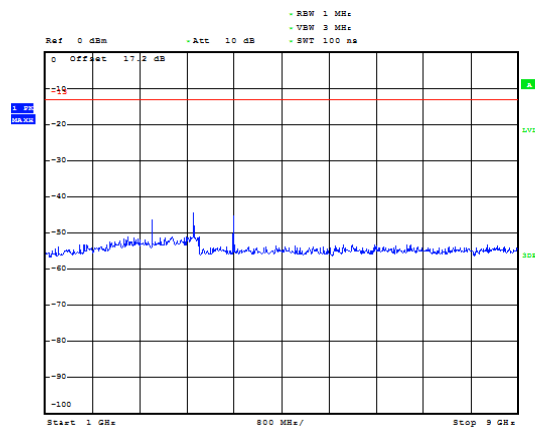




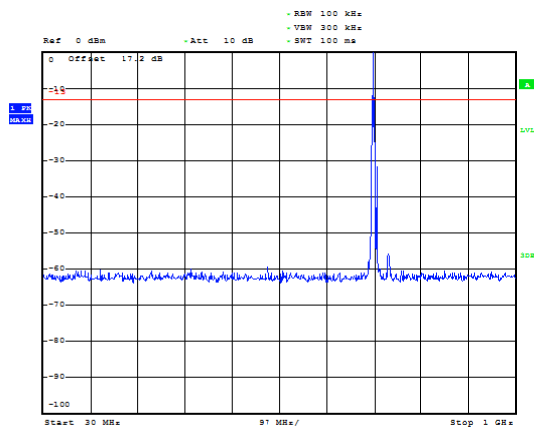
## LTE Band 12 5MHz CH-Low 30MHz~1GHz



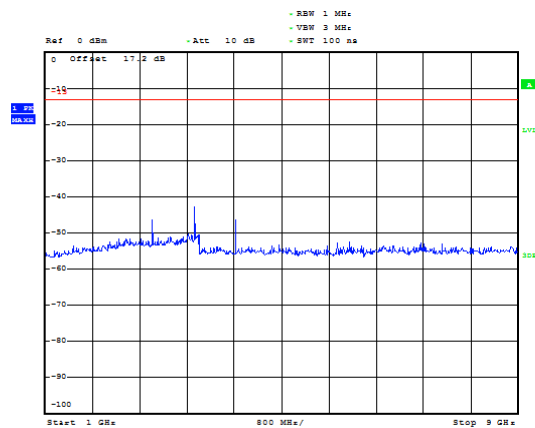
## LTE Band 12 5MHz CH-Low 1GHz~9GHz



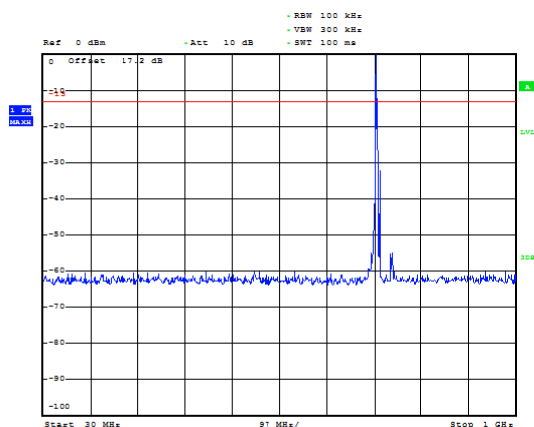
## LTE Band 12 5MHz CH- Middle 30MHz~1GHz



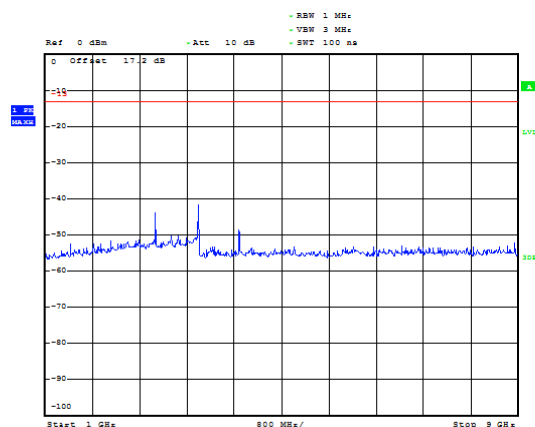
## LTE Band 12 5MHz CH- Middle 1GHz~9GHz



## LTE Band 12 5MHz CH-High 30MHz~1GHz

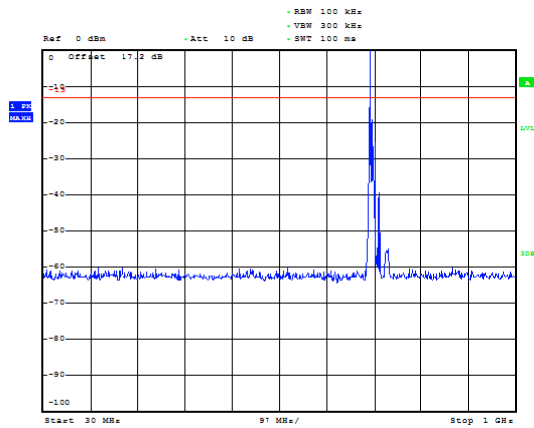


## LTE Band 12 5MHz CH-High 1GHz~9GHz

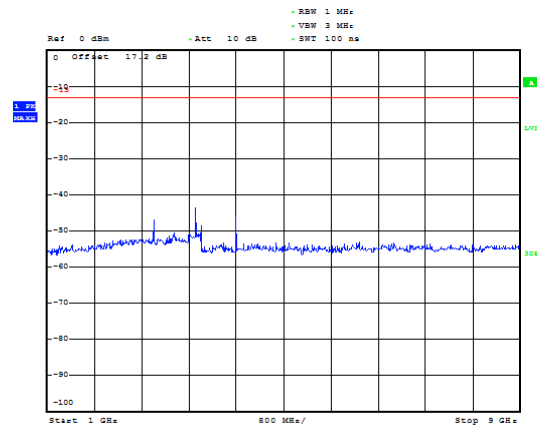




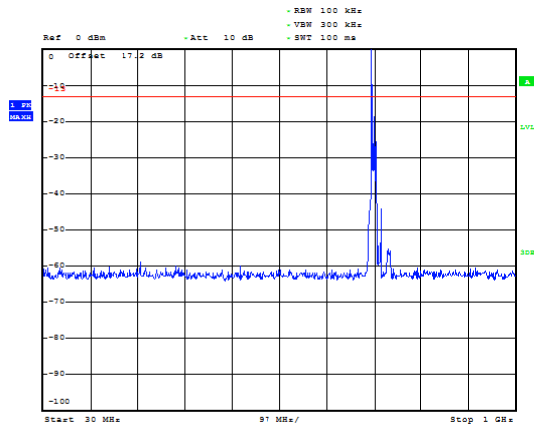
## LTE Band 12 10MHz CH-Low 30MHz~1GHz



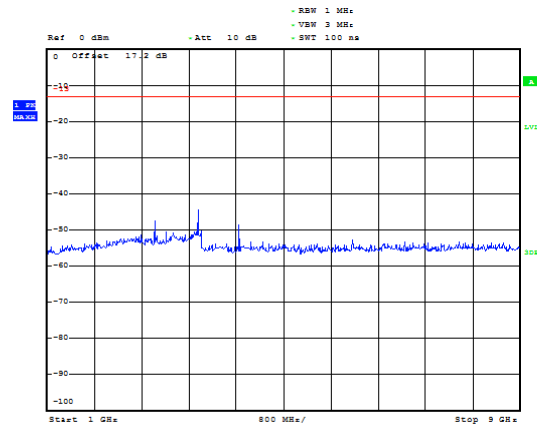
## LTE Band 12 10MHz CH-Low 1GHz~9GHz



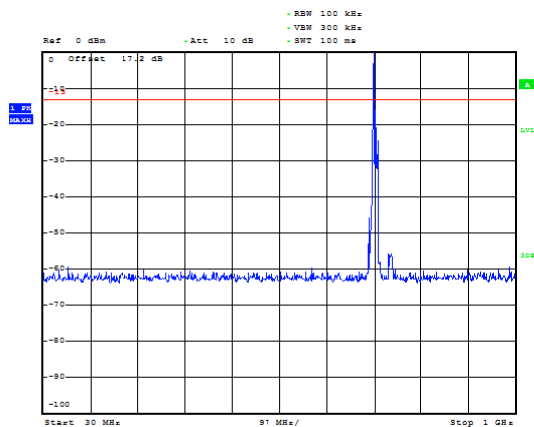
## LTE Band 12 10MHz CH- Middle 30MHz~1GHz



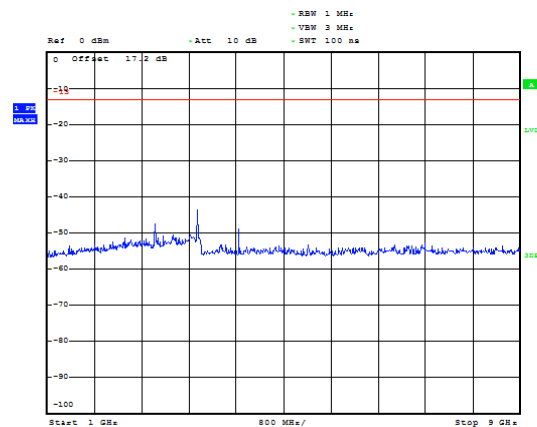
## LTE Band 12 10MHz CH- Middle 1GHz~9GHz



## LTE Band 12 10MHz CH-High 30MHz~1GHz

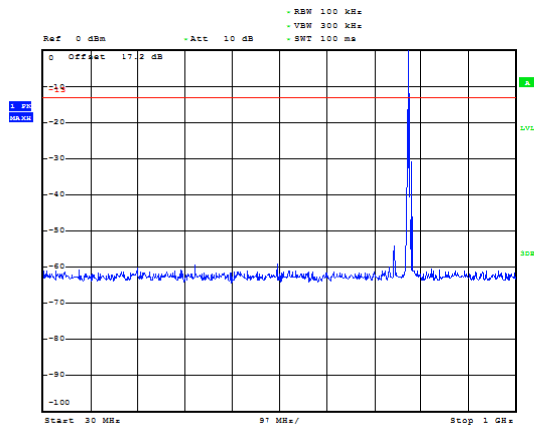


## LTE Band 12 10MHz CH-High 1GHz~9GHz

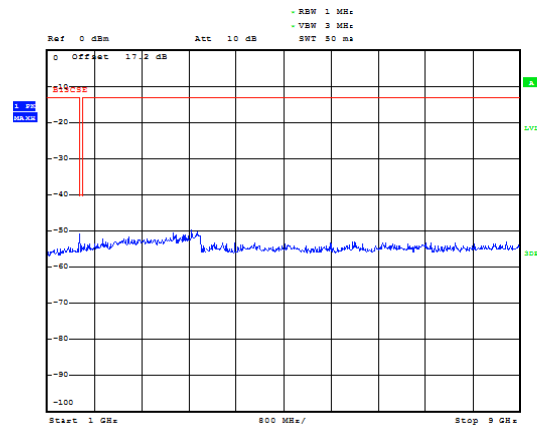




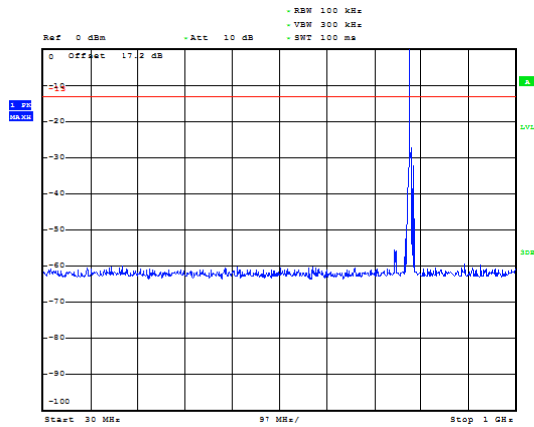
## LTE Band 13 5MHz CH-Low 30MHz~1GHz



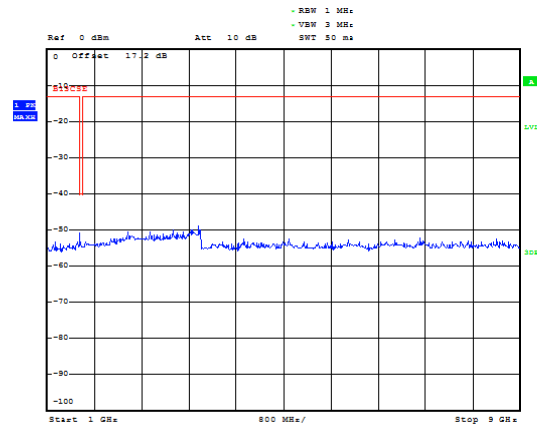
## LTE Band 13 5MHz CH-Low 1GHz~9GHz



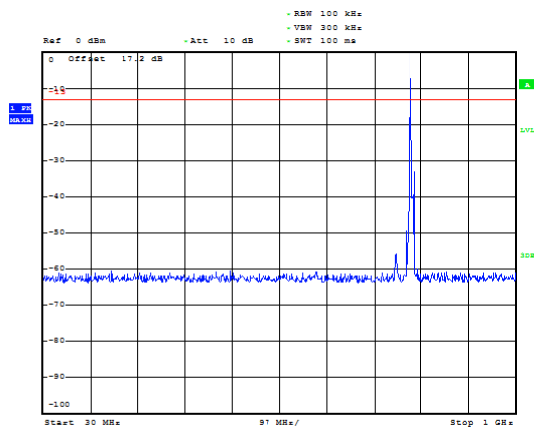
## LTE Band 13 5MHz CH-Middle 30MHz~1GHz



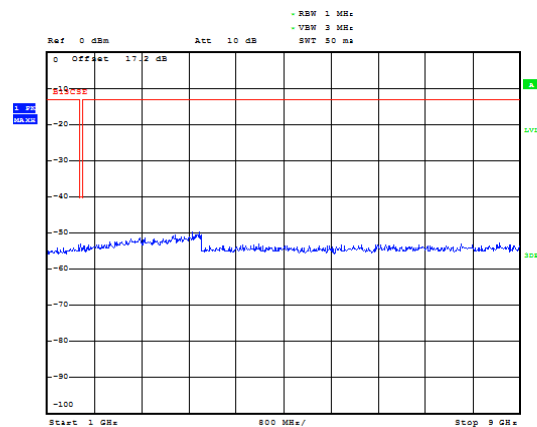
## LTE Band 13 5MHz CH-Middle 1GHz~9GHz



## LTE Band 13 5MHz CH-High 30MHz~1GHz

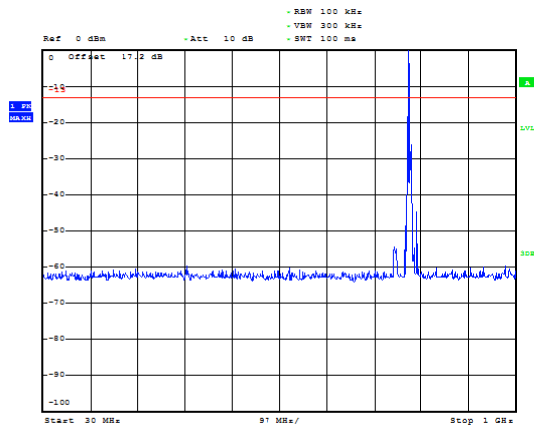


## LTE Band 13 5MHz CH-High 1GHz~9GHz

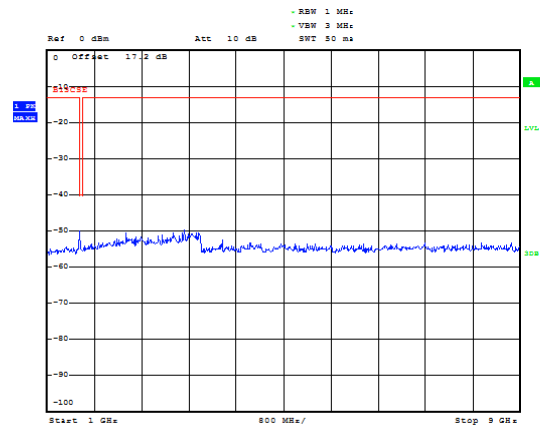




## LTE Band 13 10MHz CH-Middle 30MHz~1GHz

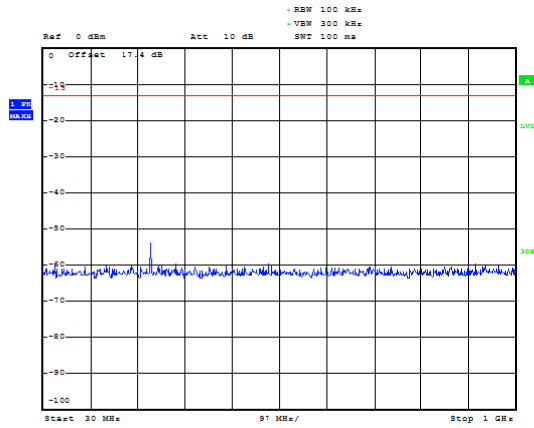


## LTE Band 13 10MHz CH-Middle 1GHz~9GHz

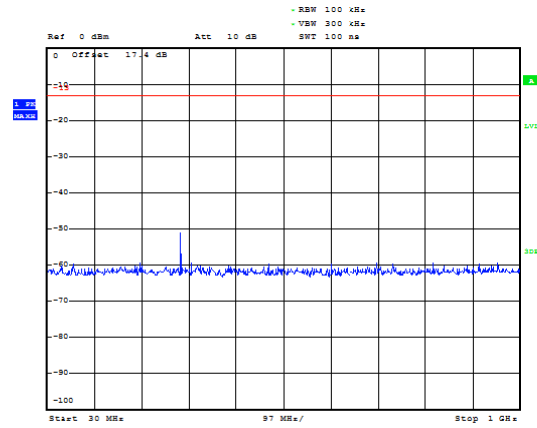




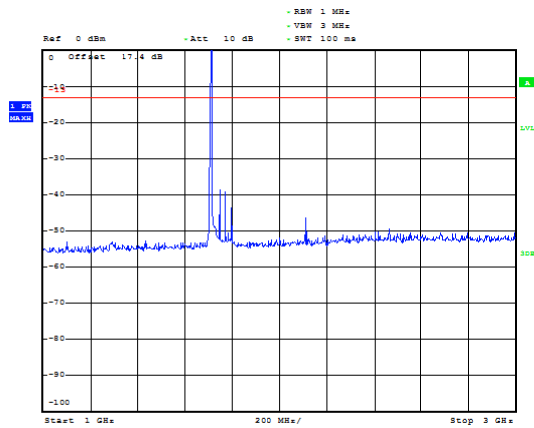
## LTE Band 66 1.4MHz CH-Low 30MHz~1GHz



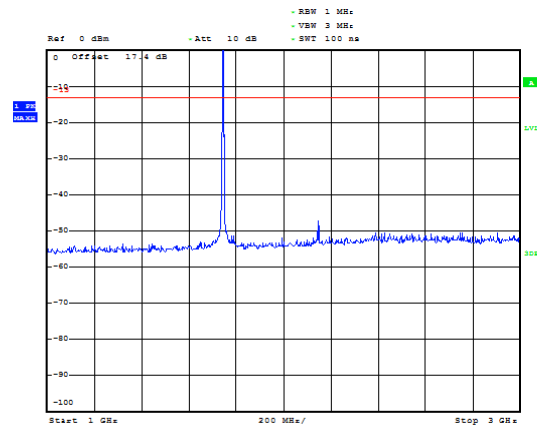
## LTE Band 66 1.4MHz CH-Middle 30MHz~1GHz



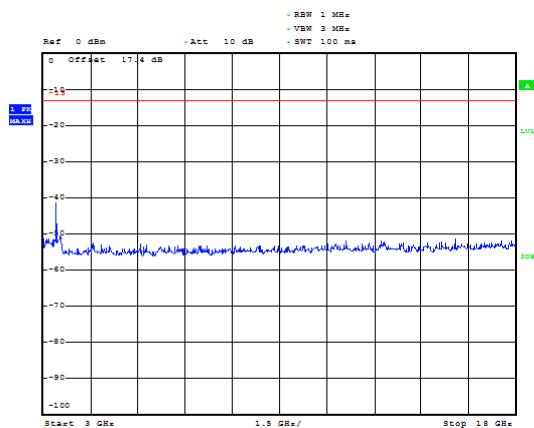
## LTE Band 66 1.4MHz CH-Low 1GHz~3GHz



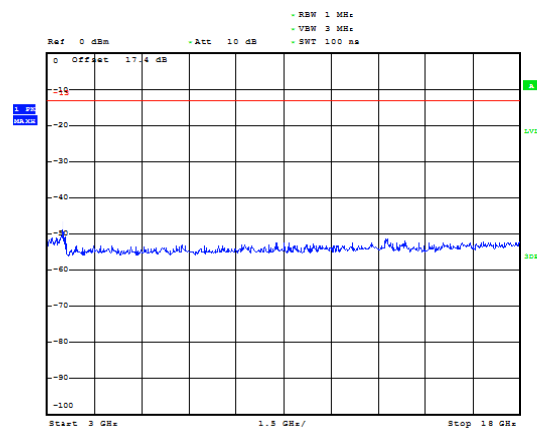
## LTE Band 66 1.4MHz CH-Middle 1GHz~3GHz



## LTE Band 66 1.4MHz CH-Low 3GHz~18GHz

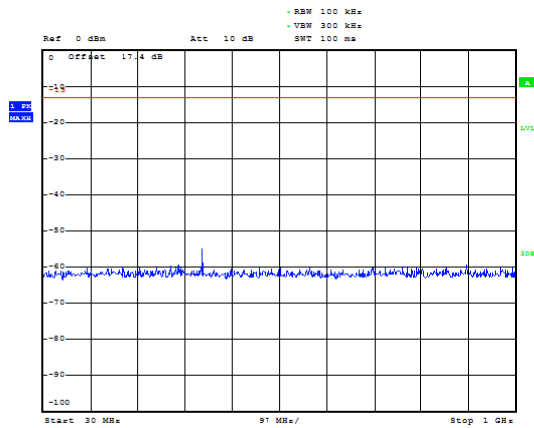


## LTE Band 66 1.4MHz CH-Middle 3GHz~18GHz

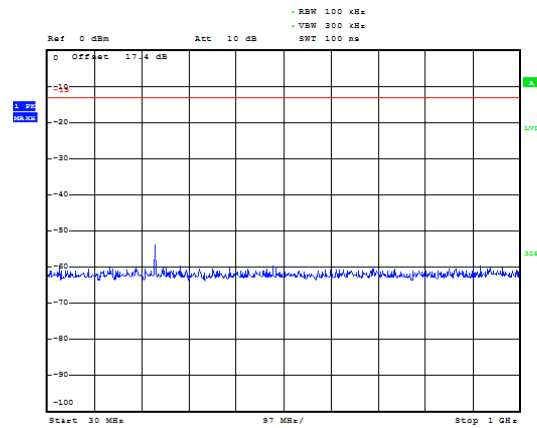




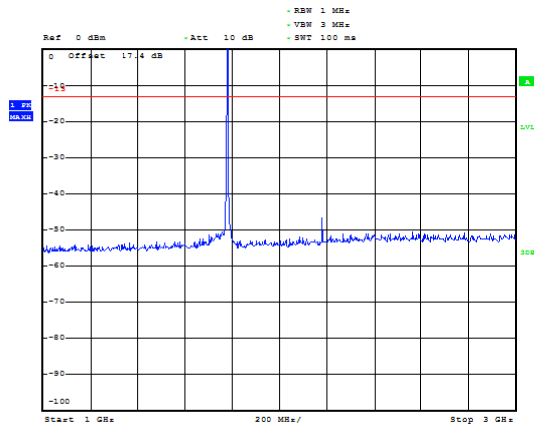
## LTE Band 66 1.4MHz CH-High 30MHz~1GHz



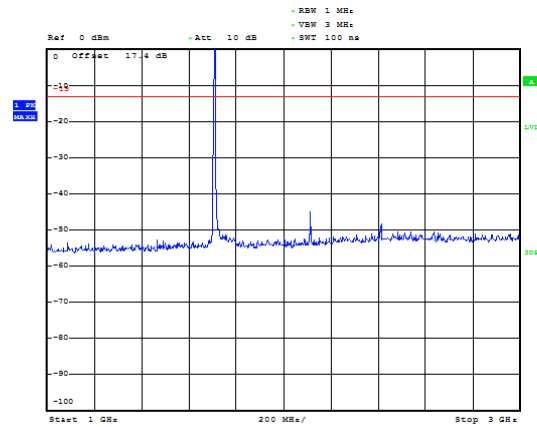
## LTE Band 66 3MHz CH-Low 30MHz~1GHz



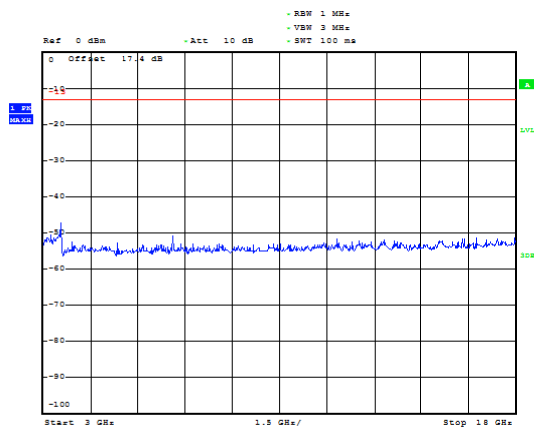
## LTE Band 66 1.4MHz CH-High 1GHz~3GHz



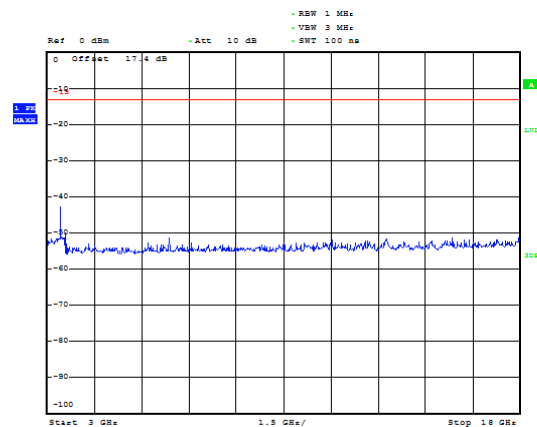
## LTE Band 66 3MHz CH-Low 1GHz~3GHz



## LTE Band 66 1.4MHz CH-High 3GHz~18GHz

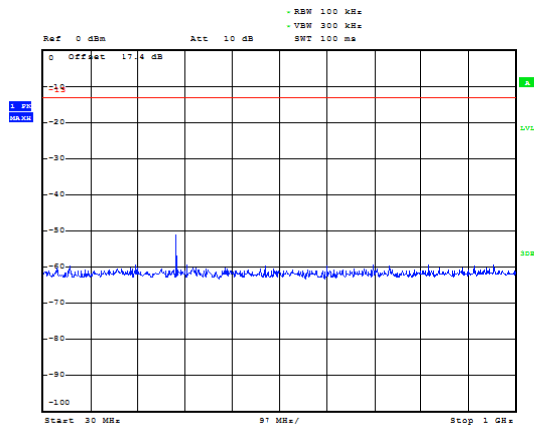


## LTE Band 66 3MHz CH-Low 3GHz~18GHz

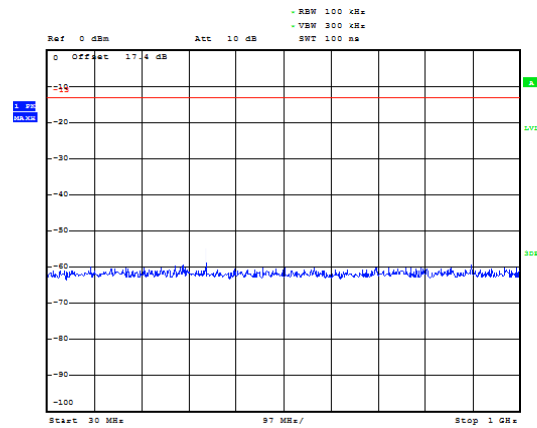




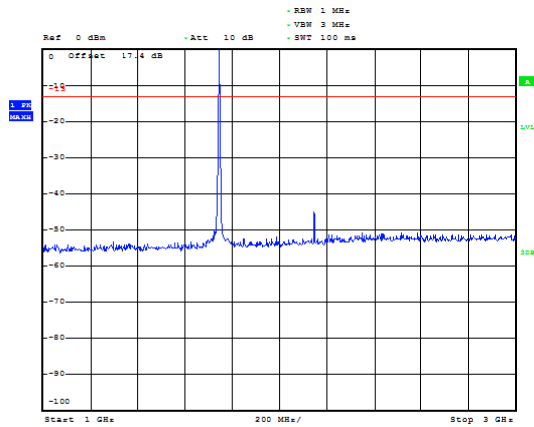
## LTE Band 66 3MHz CH-Middle 30MHz~1GHz



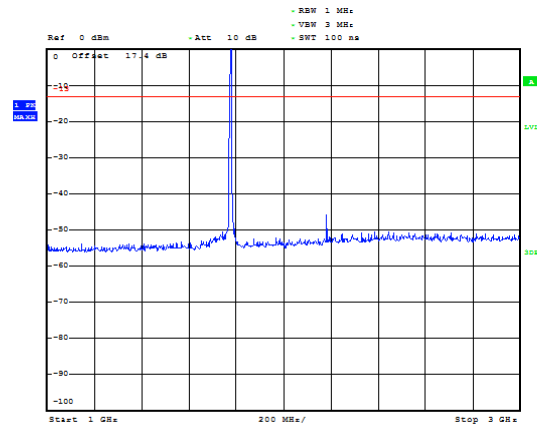
## LTE Band 66 3MHz CH-High 30MHz~1GHz



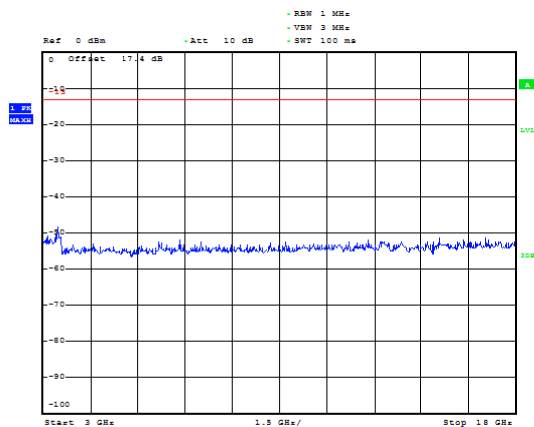
## LTE Band 66 3MHz CH-Middle 1GHz~3GHz



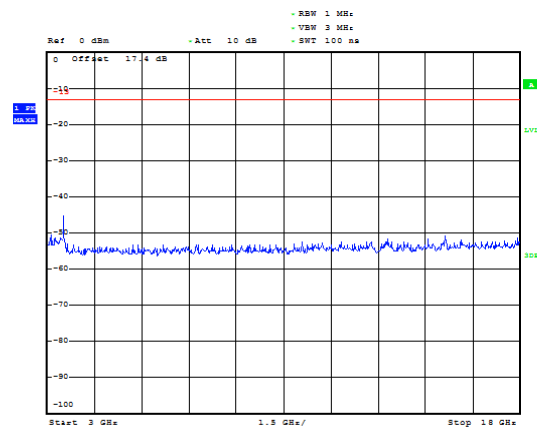
## LTE Band 66 3MHz CH-High 1GHz~3GHz



## LTE Band 66 3MHz CH-Middle 3GHz~18GHz

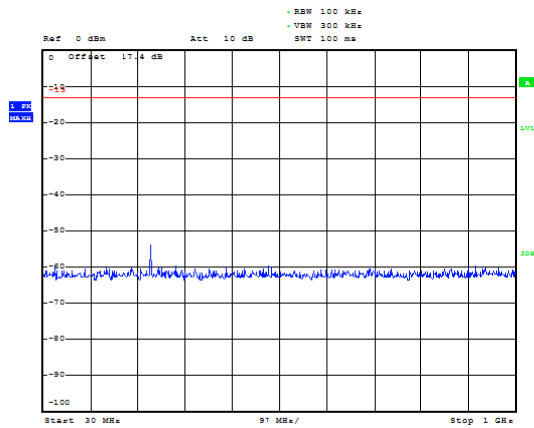


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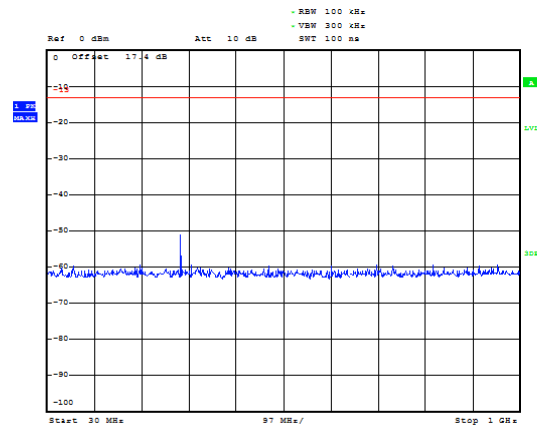




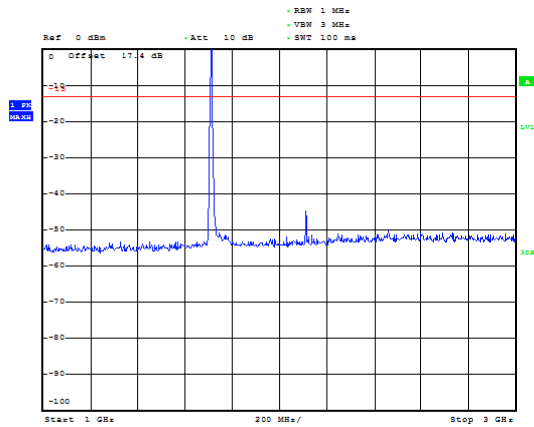
## LTE Band 66 5MHz CH-Low 30MHz~1GHz



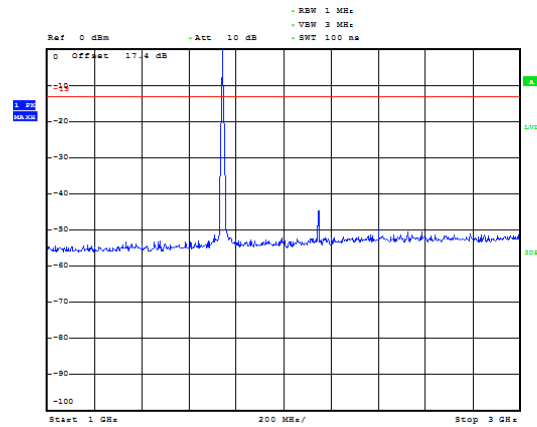
## LTE Band 66 5MHz CH-Middle 30MHz~1GHz



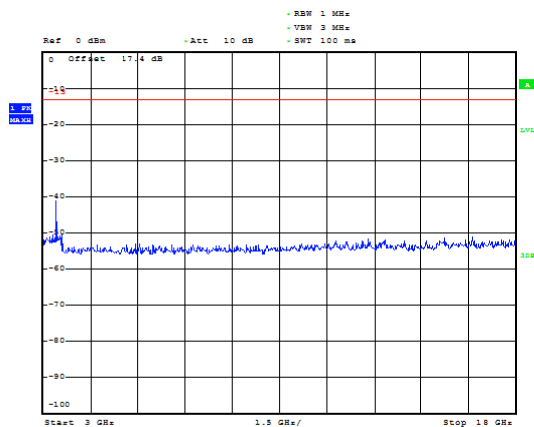
## LTE Band 66 5MHz CH-Low 1GHz~3GHz



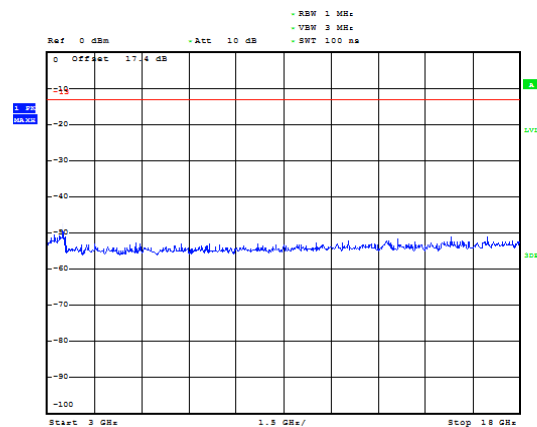
## LTE Band 66 5MHz CH-Middle 1GHz~3GHz



## LTE Band 66 5MHz CH-Low 3GHz~18GHz

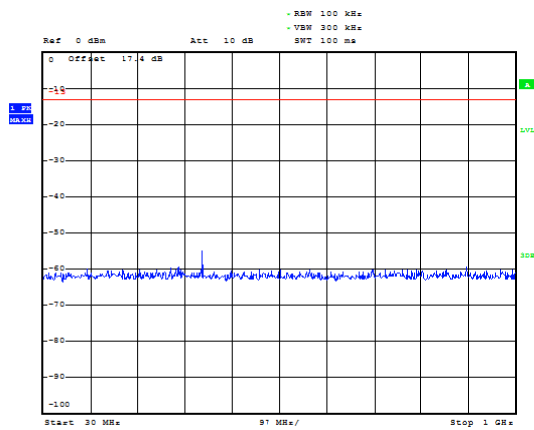


## LTE Band 66 5MHz CH-Middle 3GHz~18GHz

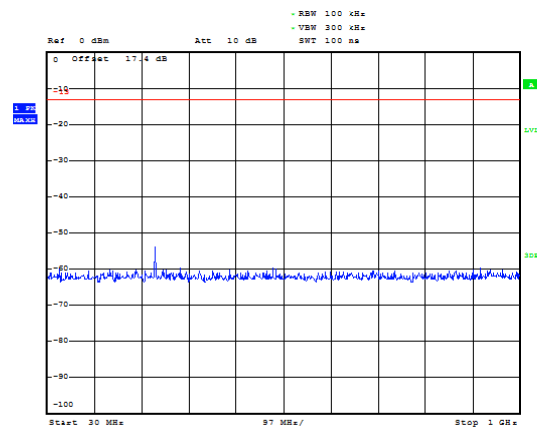




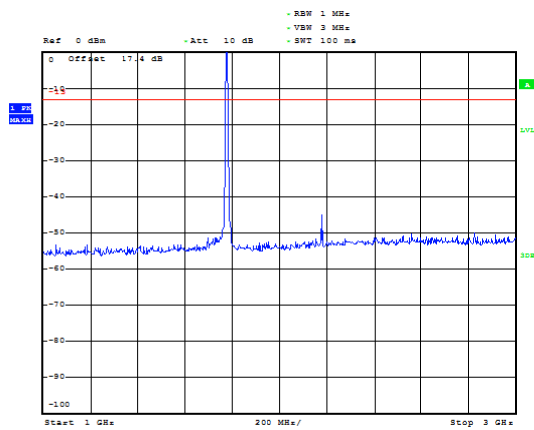
## LTE Band 66 5MHz CH-High 30MHz~1GHz



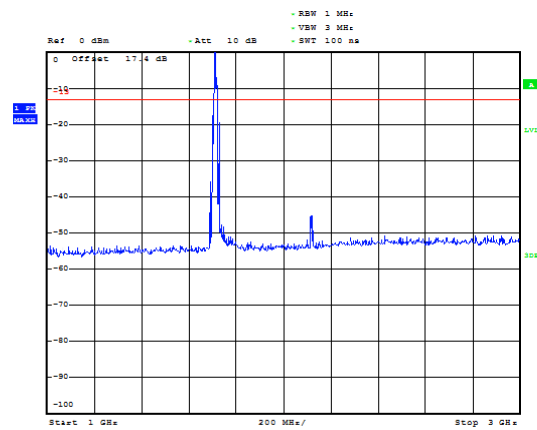
## LTE Band 66 10MHz CH-Low 30MHz~1GHz



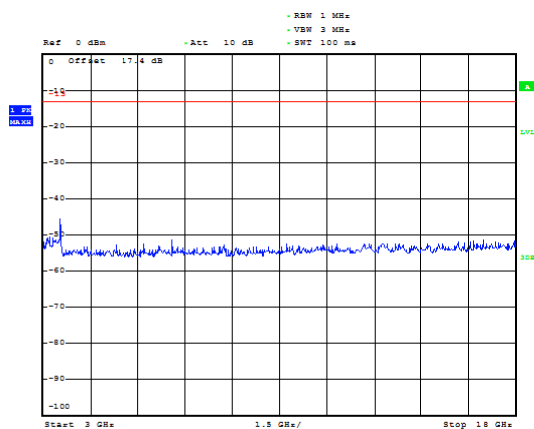
## LTE Band 66 5MHz CH-High 1GHz~3GHz



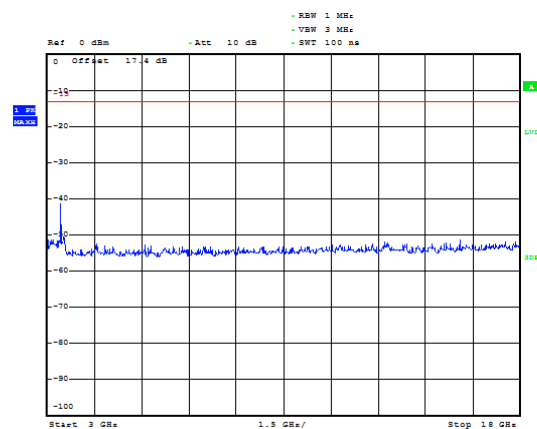
## LTE Band 66 10MHz CH-Low 1GHz~3GHz



## LTE Band 66 5MHz CH-High 3GHz~18GHz

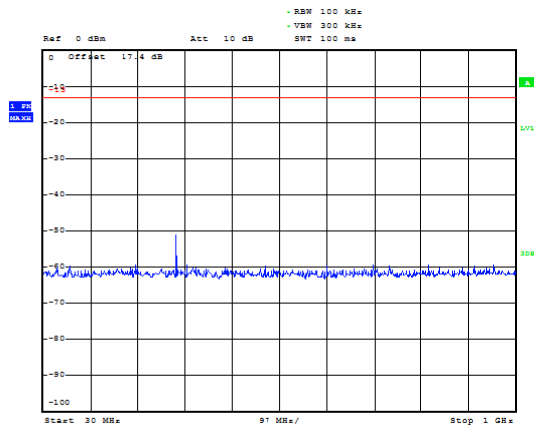


## LTE Band 66 10MHz CH-Low 3GHz~18GHz

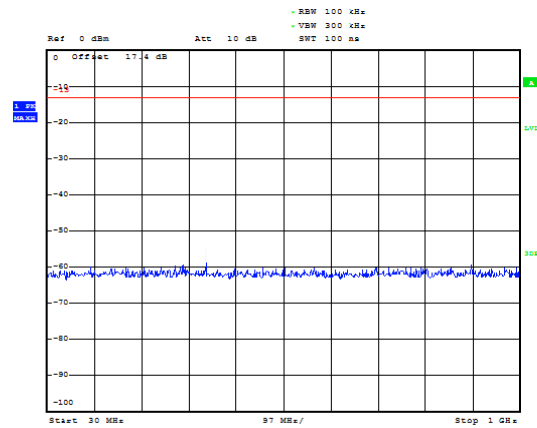




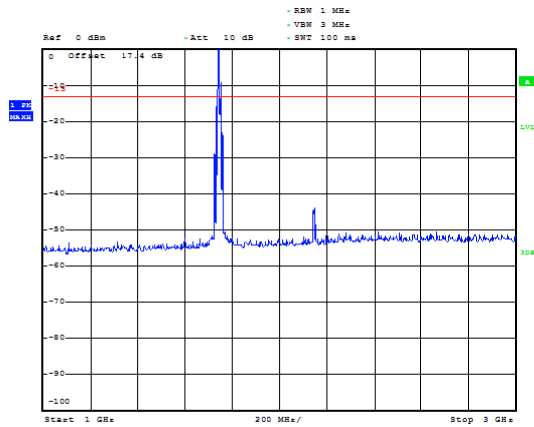
## LTE Band 66 10MHz CH-Middle 30MHz~1GHz



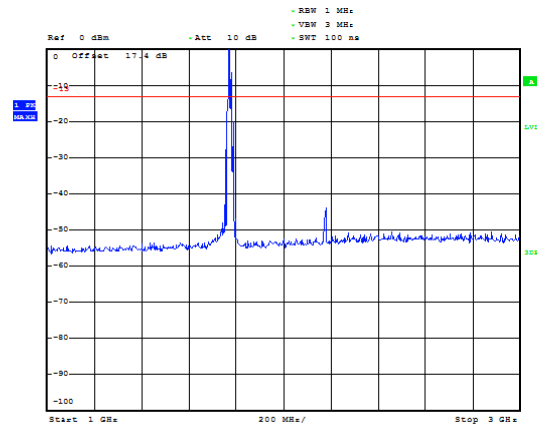
## LTE Band 66 10MHz CH-High 30MHz~1GHz



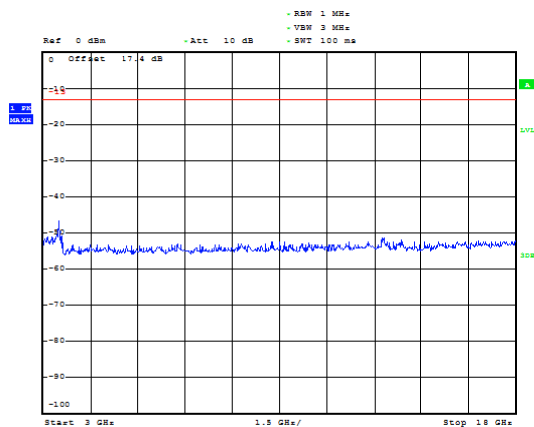
## LTE Band 66 10MHz CH-Middle 1GHz~3GHz



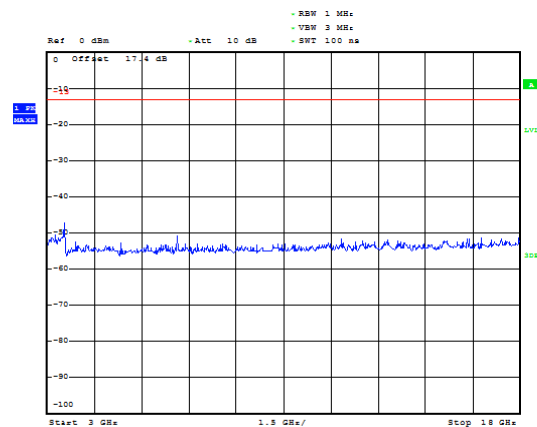
## LTE Band 66 10MHz CH-High 1GHz~3GHz



## LTE Band 66 10MHz CH-Middle 3GHz~18GHz



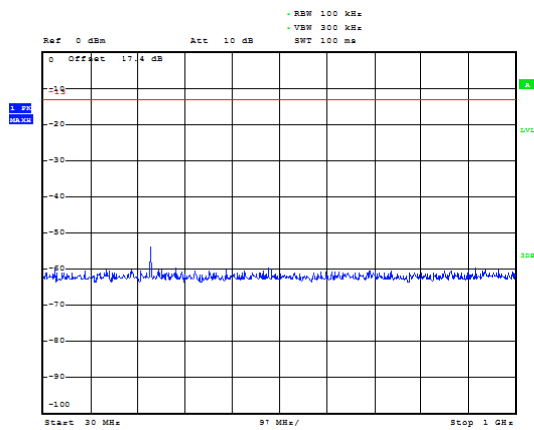
## LTE Band 66 10MHz CH-High 3GHz~18GHz



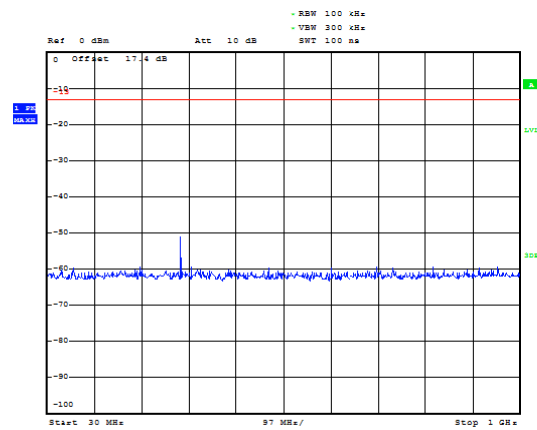




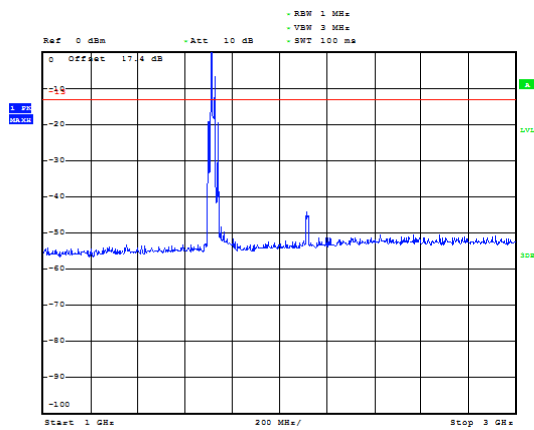
## LTE Band 66 15MHz CH-Low 30MHz~1GHz



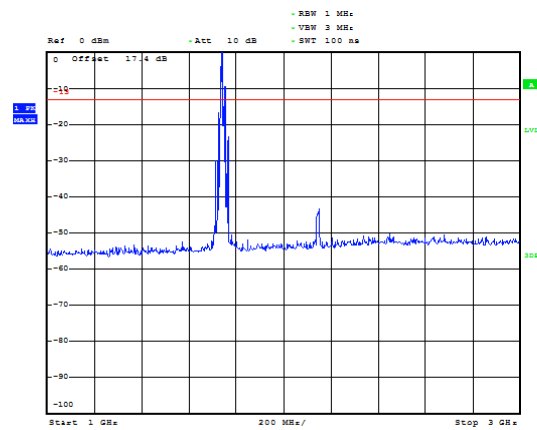
## LTE Band 66 15MHz CH-Middle 30MHz~1GHz



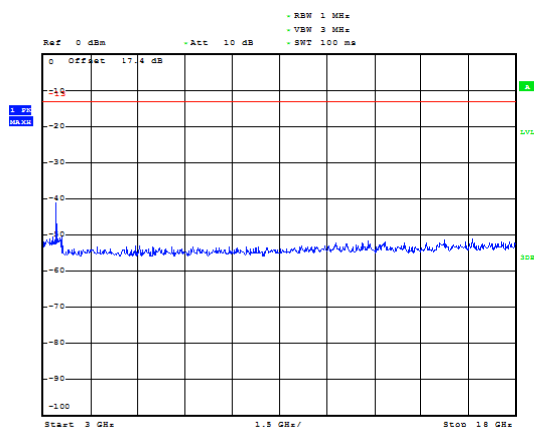
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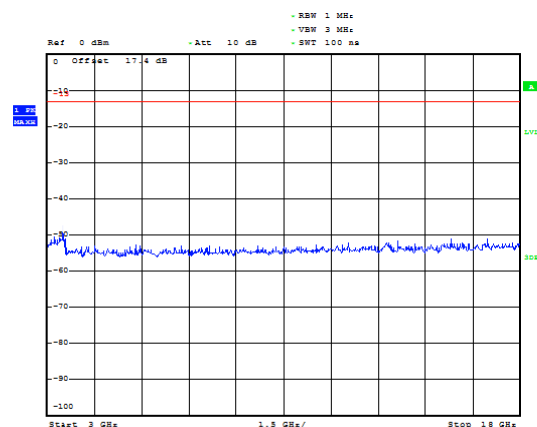
## LTE Band 66 15MHz CH-Middle 1GHz~3GHz



## LTE Band 66 15MHz CH-Low 3GHz~18GHz

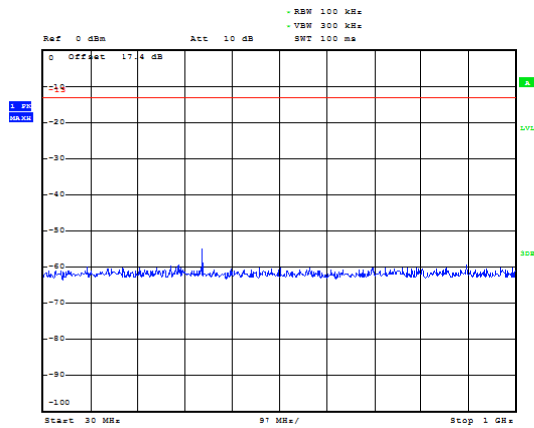


## LTE Band 66 15MHz CH-Middle 3GHz~18GHz

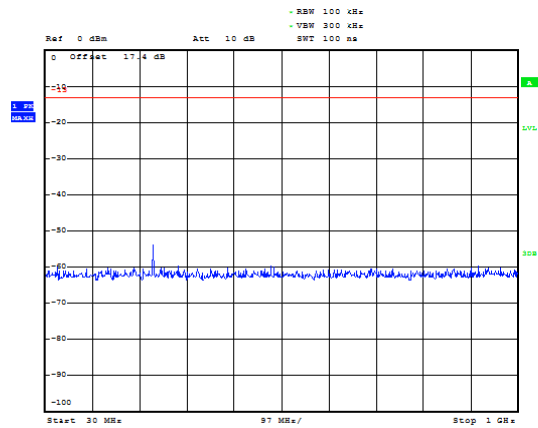




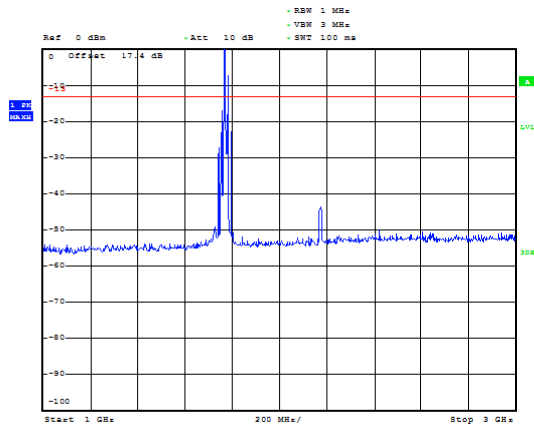
## LTE Band 66 15MHz CH-High 30MHz~1GHz



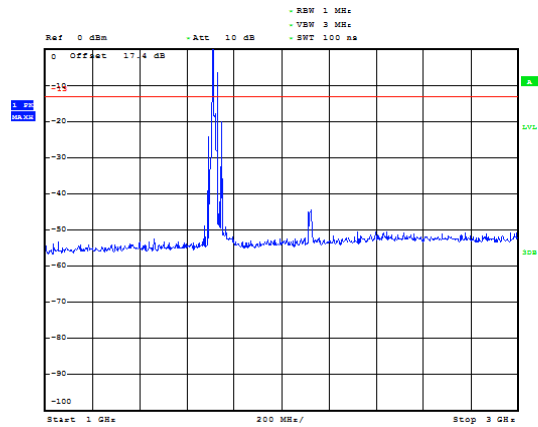
## LTE Band 66 20MHz CH-Low 30MHz~1GHz



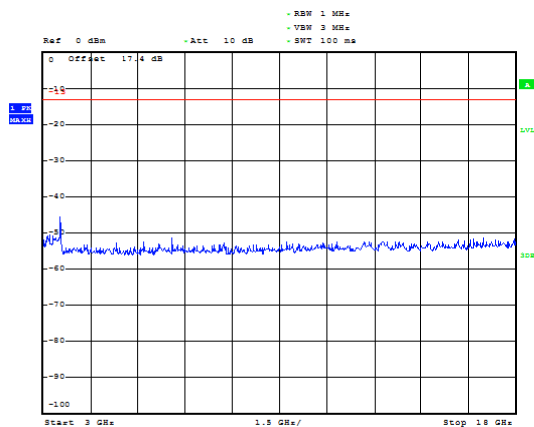
## LTE Band 66 15MHz CH-High 1GHz~3GHz



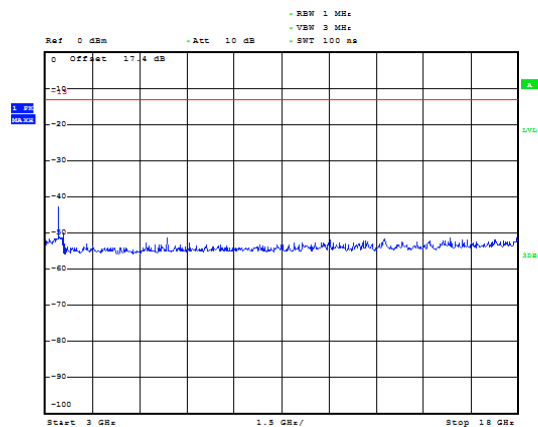
## LTE Band 66 20MHz CH-Low 1GHz~3GHz



## LTE Band 66 15MHz CH-High 3GHz~18GHz

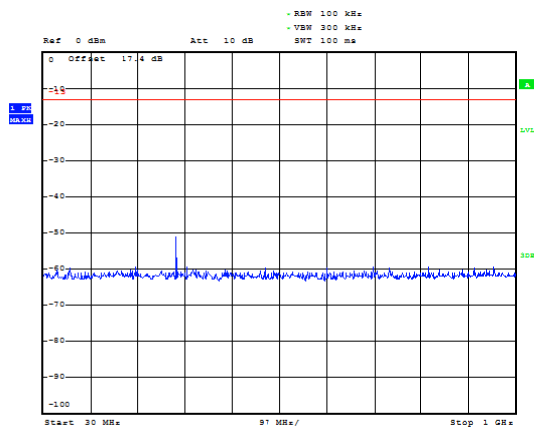


## LTE Band 66 20MHz CH-Low 3GHz~18GHz

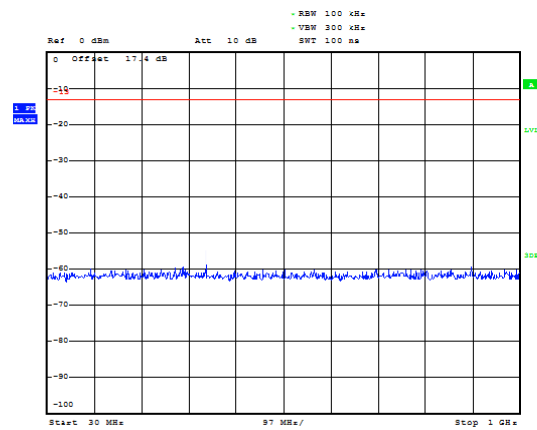




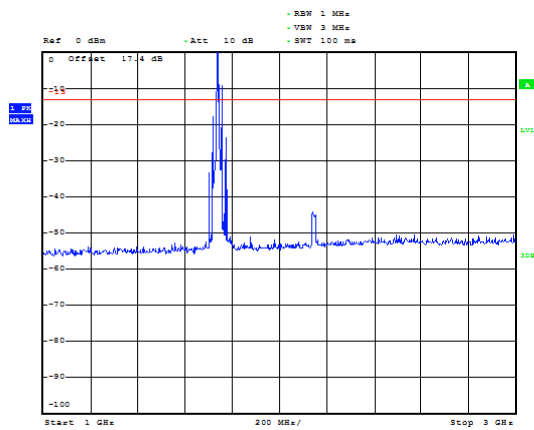
## LTE Band 66 20MHz CH-Middle 30MHz~1GHz



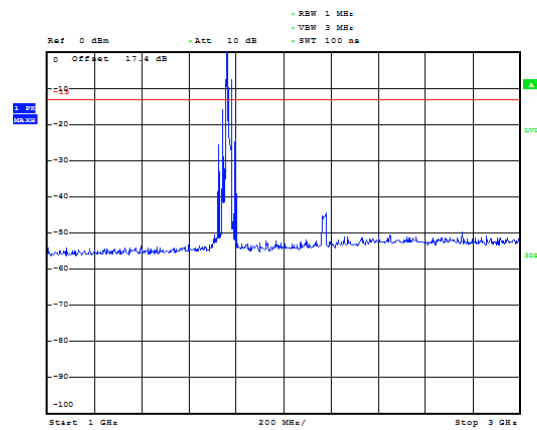
## LTE Band 66 20MHz CH-High 30MHz~1GHz



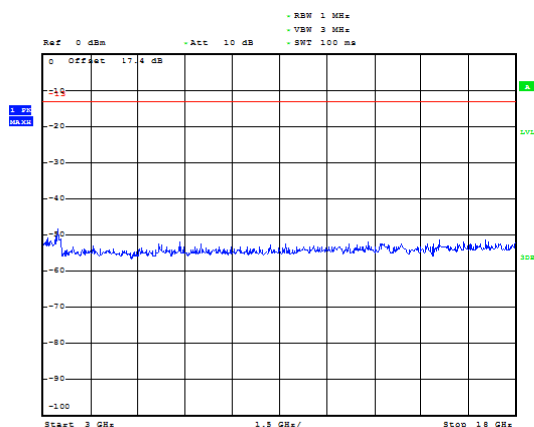
## LTE Band 66 20MHz CH-Middle 1GHz~3GHz



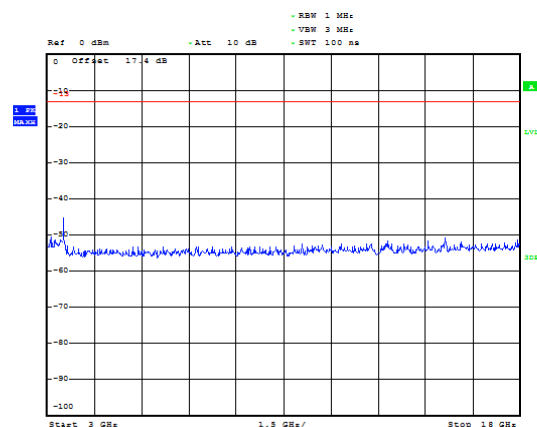
## LTE Band 66 20MHz CH-High 1GHz~3GHz



## LTE Band 66 20MHz CH-Middle 3GHz~18GHz

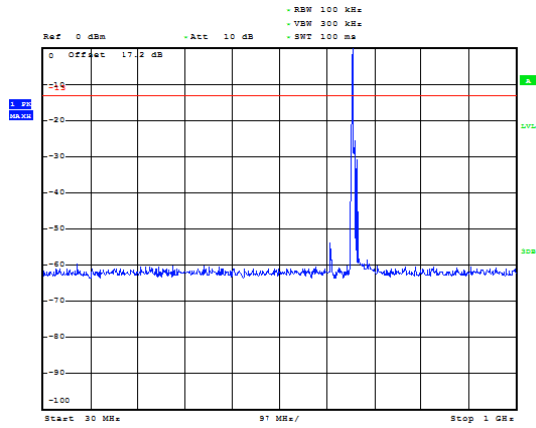


## LTE Band 66 20MHz CH-High 3GHz~18GHz

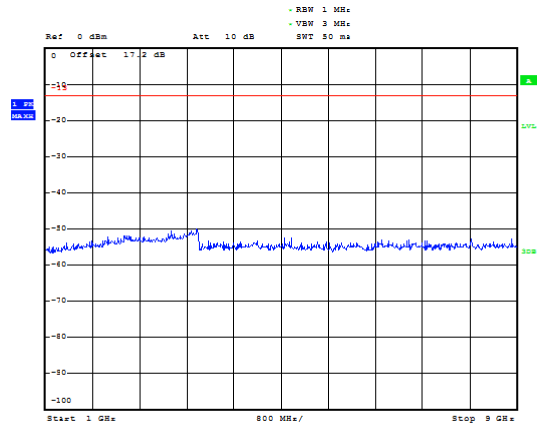




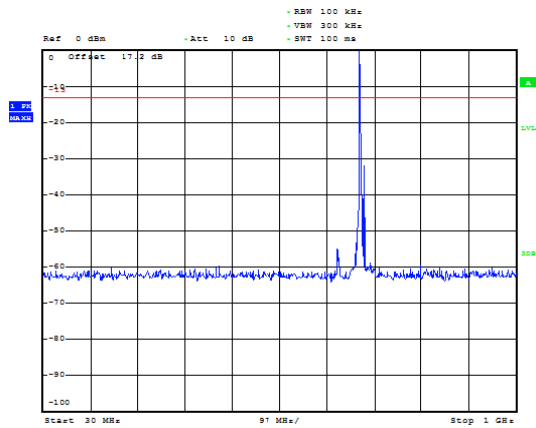
## LTE Band 71 5MHz CH-Low 30MHz~1GHz



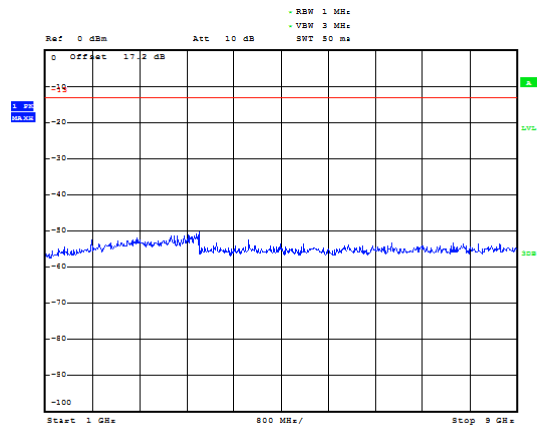
## LTE Band 71 5MHz CH-Low 1GHz~9GHz



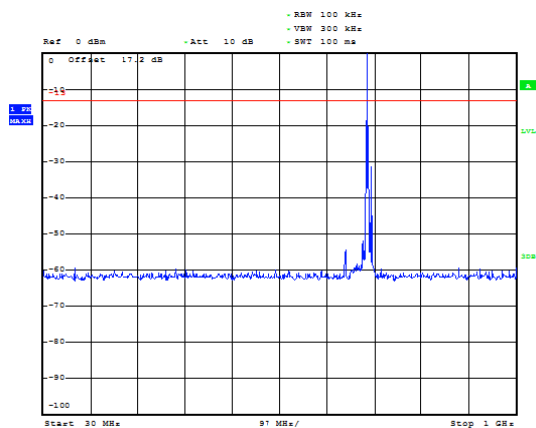
## LTE Band 71 5MHz CH-Middle 30MHz~1GHz



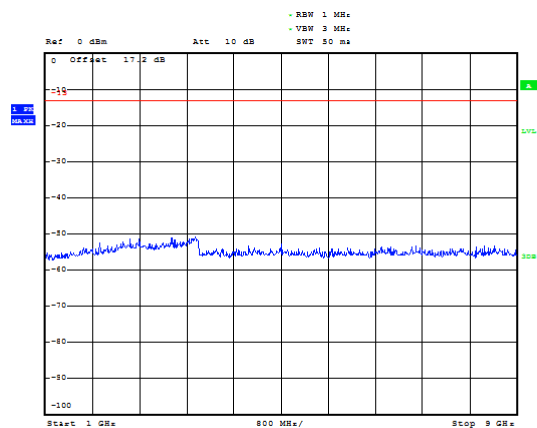
## LTE Band 71 5MHz CH-Middle 1GHz~9GHz



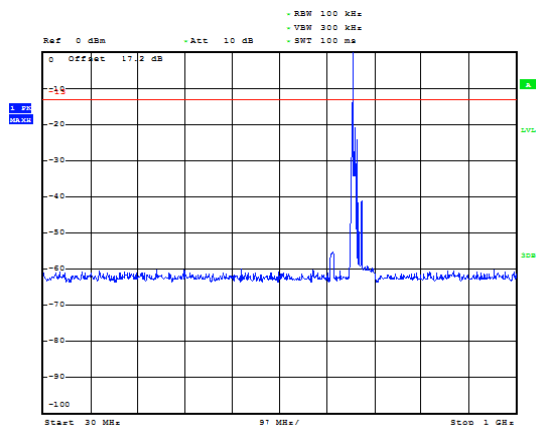
## LTE Band 71 5MHz CH-High 30MHz~1GHz



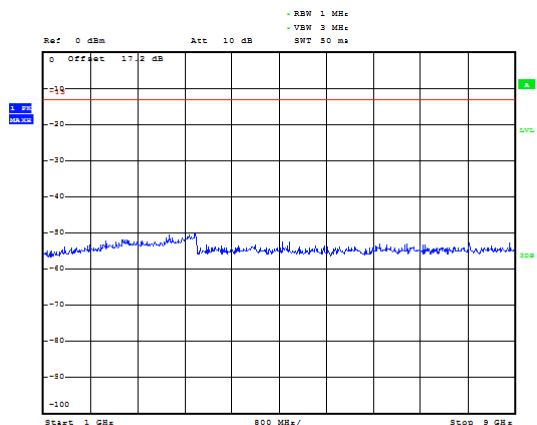
## LTE Band 71 5MHz CH-High 1GHz~9GHz



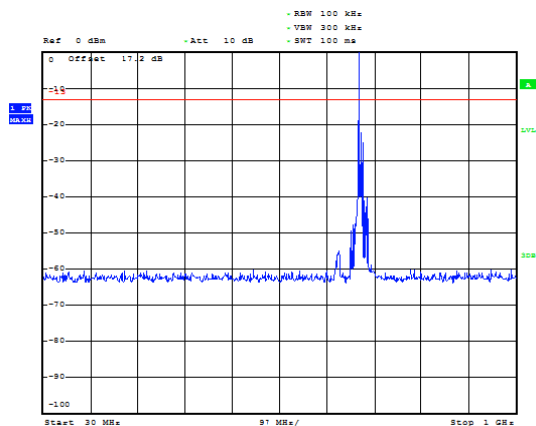
### LTE Band 71 10MHz CH-Low 30MHz~1GHz



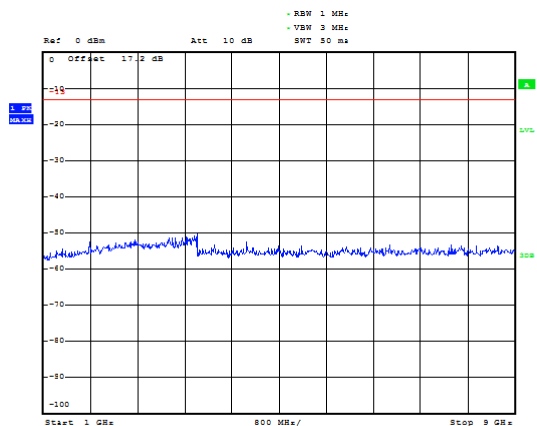
### LTE Band 71 10MHz CH-Low 1GHz~9GHz



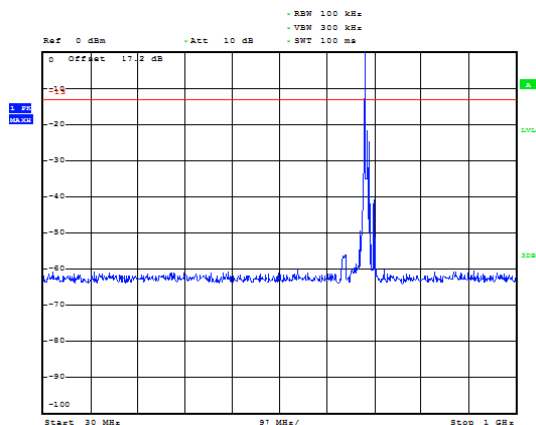
### LTE Band 71 10MHz CH-Middle 30MHz~1GHz



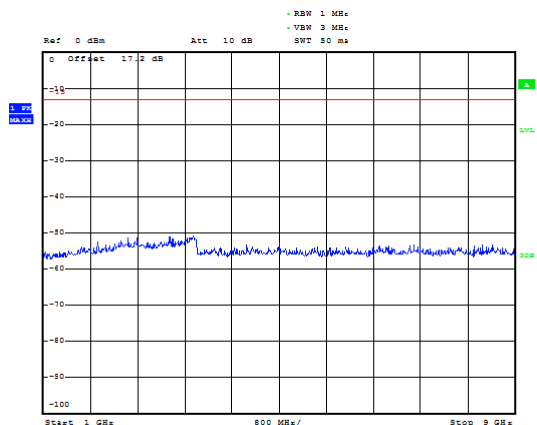
### LTE Band 71 10MHz CH-Middle 1GHz~9GHz



### LTE Band 71 10MHz CH-High 30MHz~1GHz

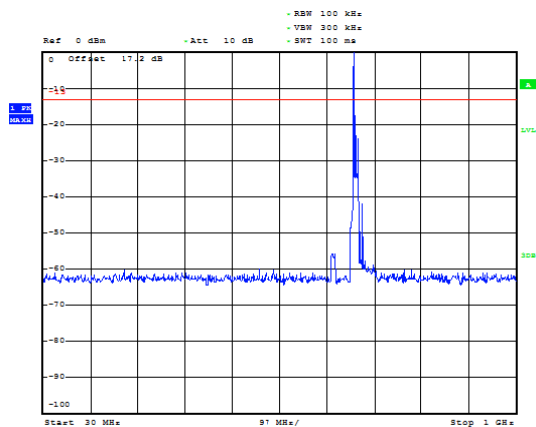


### LTE Band 71 10MHz CH-High 1GHz~9GHz

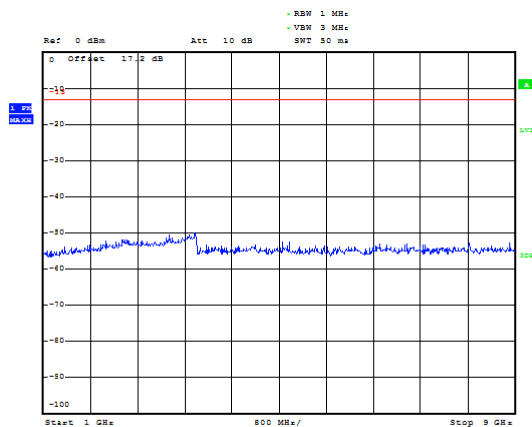




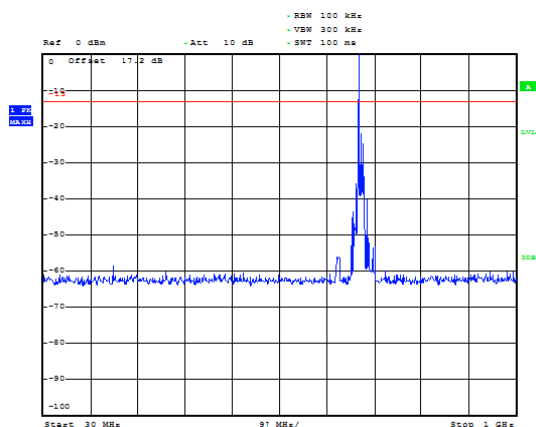
## LTE Band 71 15MHz CH-Low 30MHz~1GHz



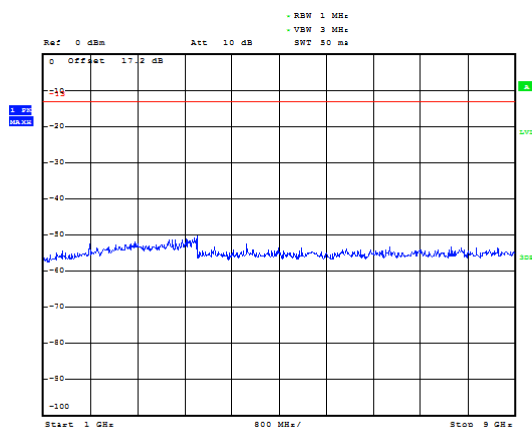
## LTE Band 71 15MHz CH-Low 1GHz~9GHz



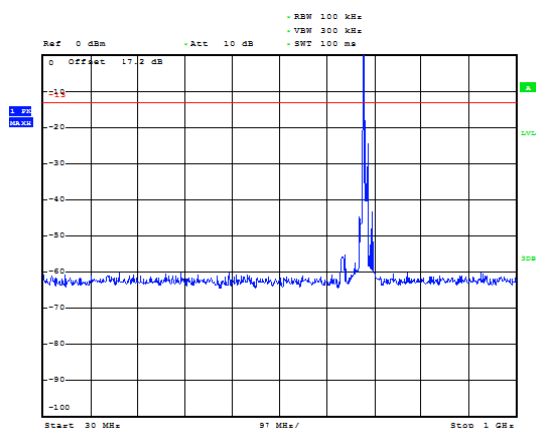
## LTE Band 71 15MHz CH-Middle 30MHz~1GHz



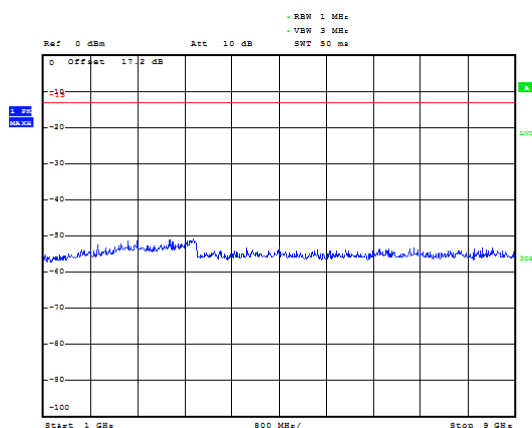
## LTE Band 71 15MHz CH-Middle 1GHz~9GHz



## LTE Band 71 15MHz CH-High 30MHz~1GHz

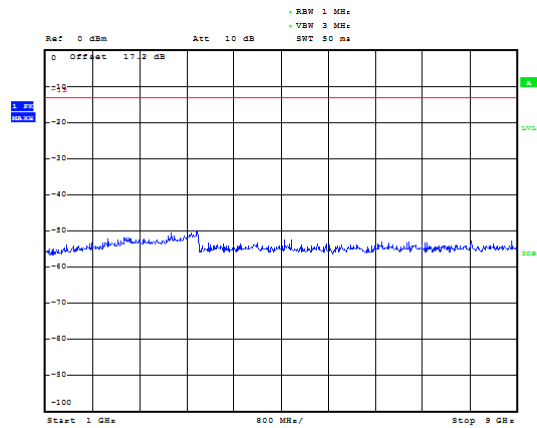
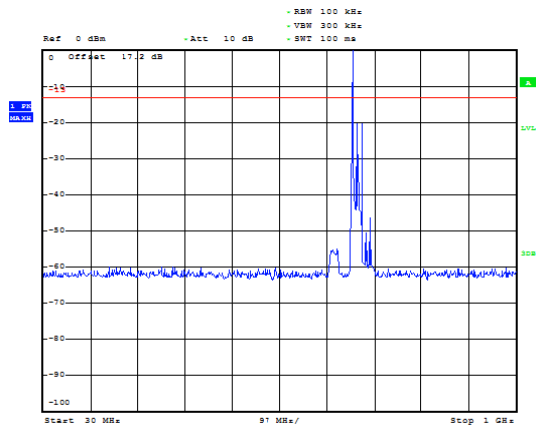


## LTE Band 71 15MHz CH-High 1GHz~9GHz

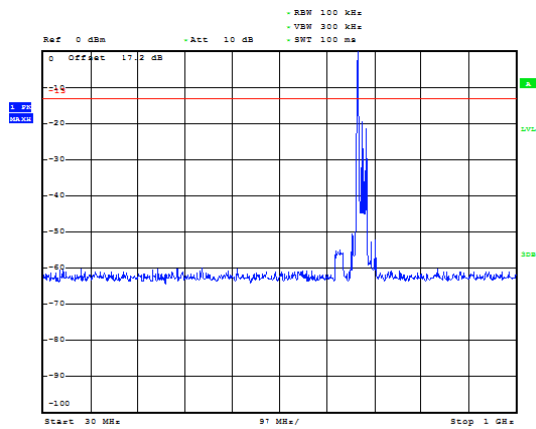


## LTE Band 71 20MHz CH-Low 30MHz~1GHz

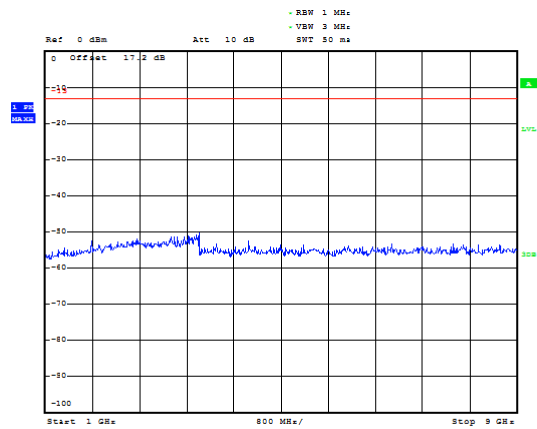
## LTE Band 71 20MHz CH-Low 1GHz~9GHz



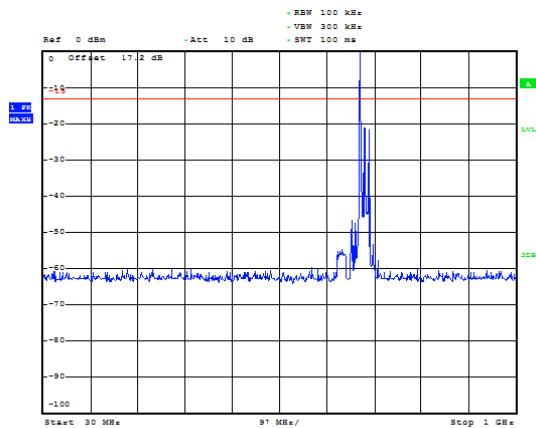
LTE Band 71 20MHz CH-Middle 30MHz~1GHz



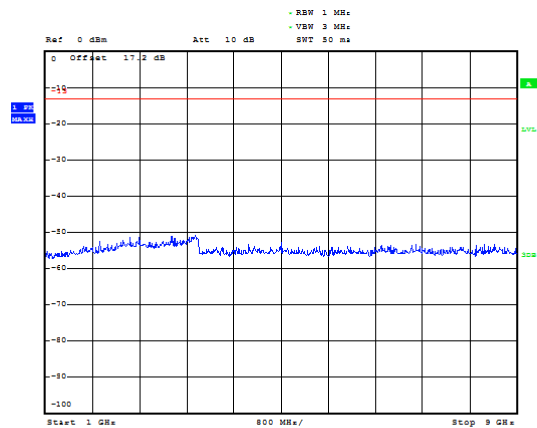
LTE Band 71 20MHz CH-Middle 1GHz~9GHz



LTE Band 71 20MHz CH-High 30MHz~1GHz



LTE Band 71 20MHz CH-High 1GHz~9GHz



## 5.8 Radiates Spurious Emission

### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Method of Measurement

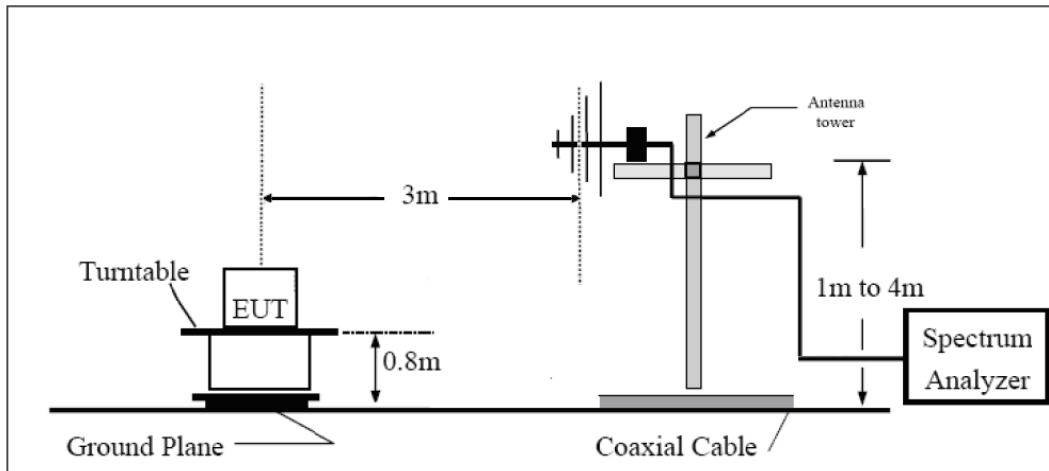
1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
  2. The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
  3. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
  4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, And the maximum value of the receiver should be recorded as (Pr).
  5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
  6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
  7. The measurement results are obtained as described below:  

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
 The measurement results are amend as described below:  

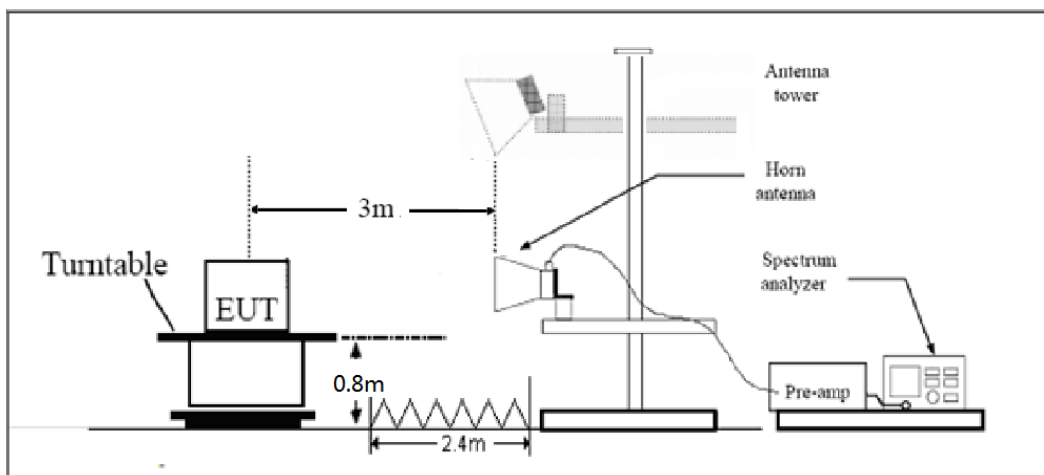
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
  8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .
- The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

## Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

## Limits

Rule Part 27.53(h) specifies that “for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB..”

Rule Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands

immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Rule Part 27.53(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Part 27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

|                             |                                     |         |
|-----------------------------|-------------------------------------|---------|
| Part 27.53(a)/(h)/(g) Limit |                                     | -13 dBm |
| Part 27.53(f) Limit         | Limit out of the band 1559-1610 MHz | -13 dBm |
|                             | Limit in the band 1559-1610 MHz     | -40 dBm |

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = \pm 1.96$ ,  $U = \pm 3.55$  dB.

## Test Result

Sweep the whole frequency band through the range from 30MHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

### WCDMA Band IV CH-Middle

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3465.2          | -58.16   | 2.6             | 10.75      | Horizontal           | -50.01           | -13.00      | 37.01       | 90            |
| 3        | 5197.8          | -62.42   | 2.4             | 11.05      | Horizontal           | -53.77           | -13.00      | 40.77       | 135           |
| 4        | 6930.4          | -52.92   | 4.5             | 11.15      | Horizontal           | -46.27           | -13.00      | 33.27       | 45            |
| 5        | 8663.0          | -55.39   | 5.1             | 11.35      | Horizontal           | -49.14           | -13.00      | 36.14       | 0             |
| 6        | 10395.6         | -55.25   | 5.3             | 11.95      | Horizontal           | -48.60           | -13.00      | 35.60       | 225           |
| 7        | 12128.2         | -54.80   | 5.5             | 13.55      | Horizontal           | -46.75           | -13.00      | 33.75       | 270           |
| 8        | 13860.8         | -52.18   | 6.3             | 13.75      | Horizontal           | -44.73           | -13.00      | 31.73       | 180           |
| 9        | 15593.4         | -53.33   | 6.7             | 13.85      | Horizontal           | -46.18           | -13.00      | 33.18       | 225           |
| 10       | 17326.0         | -51.33   | 6.8             | 14.25      | Horizontal           | -43.88           | -13.00      | 30.88       | 315           |

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.  
2. The worst emission was found in the antenna is Horizontal position.

### LTE Band 4 QPSK 5MHz CH-Middle, RB 1

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2        | 3460.5          | -54.46   | 2.6             | 10.75      | Horizontal           | -46.31           | -13.00      | 33.31       | 90            |
| 3        | 5191.5          | -59.67   | 2.4             | 11.05      | Horizontal           | -51.02           | -13.00      | 38.02       | 315           |
| 4        | 6930.0          | -45.66   | 4.5             | 11.15      | Horizontal           | -39.01           | -13.00      | 26.01       | 225           |
| 5        | 8662.5          | -56.26   | 5.1             | 11.35      | Horizontal           | -50.01           | -13.00      | 37.01       | 270           |
| 6        | 10395.0         | -55.48   | 5.3             | 11.95      | Horizontal           | -48.83           | -13.00      | 35.83       | 90            |
| 7        | 12127.5         | -53.74   | 5.5             | 13.55      | Horizontal           | -45.69           | -13.00      | 32.69       | 135           |
| 8        | 13860.0         | -52.20   | 6.3             | 13.75      | Horizontal           | -44.75           | -13.00      | 31.75       | 45            |
| 9        | 15592.5         | -53.93   | 6.7             | 13.85      | Horizontal           | -46.78           | -13.00      | 33.78       | 45            |
| 10       | 17325.0         | -47.52   | 6.8             | 14.25      | Horizontal           | -40.07           | -13.00      | 27.07       | 0             |

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.  
2. The worst emission was found in the antenna is Horizontal position.



## LTE Band 12 QPSK 5MHz CH-Middle, RB 1

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | ERP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|-----------------|-------------|-------------|---------------|
| 2        | 1415.0          | -67.96   | 2.00            | 10.75      | Horizontal           | -61.36          | -13.00      | 48.36       | 180           |
| 3        | 2122.5          | -56.18   | 2.51            | 11.05      | Horizontal           | -49.79          | -13.00      | 36.79       | 225           |
| 4        | 2830.0          | -57.29   | 4.20            | 11.15      | Horizontal           | -52.49          | -13.00      | 39.49       | 315           |
| 5        | 3537.5          | -52.01   | 5.20            | 11.15      | Horizontal           | -48.21          | -13.00      | 35.21       | 135           |
| 6        | 4245.0          | -53.13   | 5.50            | 11.95      | Horizontal           | -48.83          | -13.00      | 35.83       | 0             |
| 7        | 4952.5          | -61.19   | 5.70            | 13.55      | Horizontal           | -55.49          | -13.00      | 42.49       | 45            |
| 8        | 5660.0          | -60.70   | 6.30            | 13.75      | Horizontal           | -55.40          | -13.00      | 42.40       | 315           |
| 9        | 6367.5          | -56.87   | 6.80            | 13.85      | Horizontal           | -51.97          | -13.00      | 38.97       | 180           |
| 10       | 7075.0          | -55.40   | 6.90            | 14.25      | Horizontal           | -50.20          | -13.00      | 37.20       | 135           |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

## LTE Band 13 QPSK 5MHz CH-Middle, RB 1

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | ERP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|-----------------|-------------|-------------|---------------|
| 2        | 1564.0          | -65.63   | 2.00            | 10.75      | Horizontal           | -59.03          | -40.00      | 19.03       | 135           |
| 3        | 2346.0          | -53.93   | 2.51            | 11.05      | Horizontal           | -47.54          | -13.00      | 34.54       | 45            |
| 4        | 3128.0          | -61.26   | 4.20            | 11.15      | Horizontal           | -56.46          | -13.00      | 43.46       | 90            |
| 5        | 3910.0          | -60.06   | 5.20            | 11.15      | Horizontal           | -56.26          | -13.00      | 43.26       | 135           |
| 6        | 4692.0          | -59.82   | 5.50            | 11.95      | Horizontal           | -55.52          | -13.00      | 42.52       | 180           |
| 7        | 5474.0          | -61.02   | 5.70            | 13.55      | Horizontal           | -55.32          | -13.00      | 42.32       | 225           |
| 8        | 6256.0          | -59.25   | 6.30            | 13.75      | Horizontal           | -53.95          | -13.00      | 40.95       | 315           |
| 9        | 7038.0          | -54.98   | 6.80            | 13.85      | Horizontal           | -50.08          | -13.00      | 37.08       | 270           |
| 10       | 7820.0          | -54.13   | 6.90            | 14.25      | Horizontal           | -48.93          | -13.00      | 35.93       | 135           |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



## LTE Band 66 QPSK 5MHz CH-Middle, RB 1

| Harmonic                                                                                                                                                      | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | EIRP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|-----------------|------------|----------------------|------------------|-------------|-------------|---------------|
| 2                                                                                                                                                             | 3460.5          | -60.24   | 2.6             | 10.75      | Horizontal           | -52.09           | -13.00      | 39.09       | 180           |
| 3                                                                                                                                                             | 5191.5          | -63.42   | 2.4             | 11.05      | Horizontal           | -54.77           | -13.00      | 41.77       | 135           |
| 4                                                                                                                                                             | 6930            | -50.34   | 4.5             | 11.15      | Horizontal           | -43.69           | -13.00      | 30.69       | 90            |
| 5                                                                                                                                                             | 8662.5          | -56.33   | 5.1             | 11.35      | Horizontal           | -50.08           | -13.00      | 37.08       | 45            |
| 6                                                                                                                                                             | 10395           | -51.45   | 5.3             | 11.95      | Horizontal           | -44.80           | -13.00      | 31.80       | 315           |
| 7                                                                                                                                                             | 12127.5         | -54.58   | 5.5             | 13.55      | Horizontal           | -46.53           | -13.00      | 33.53       | 270           |
| 8                                                                                                                                                             | 13860           | -52.05   | 6.3             | 13.75      | Horizontal           | -44.60           | -13.00      | 31.60       | 90            |
| 9                                                                                                                                                             | 15592.5         | -54.03   | 6.7             | 13.85      | Horizontal           | -46.88           | -13.00      | 33.88       | 135           |
| 10                                                                                                                                                            | 17325           | -50.05   | 6.8             | 14.25      | Horizontal           | -42.60           | -13.00      | 29.60       | 0             |
| Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.<br>2. The worst emission was found in the antenna is Horizontal position. |                 |          |                 |            |                      |                  |             |             |               |

## LTE Band 71 QPSK 5MHz CH-Middle, RB 1

| Harmonic                                                                                                                                                      | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | ERP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|-----------------|------------|----------------------|-----------------|-------------|-------------|---------------|
| 2                                                                                                                                                             | 1361.0          | -56.30   | 2.00            | 10.75      | Horizontal           | -47.55          | -13.00      | 34.55       | 135           |
| 3                                                                                                                                                             | 2041.5          | -60.98   | 2.51            | 11.05      | Horizontal           | -52.44          | -13.00      | 39.44       | 315           |
| 4                                                                                                                                                             | 2722.0          | -65.41   | 4.20            | 11.15      | Horizontal           | -58.46          | -13.00      | 45.46       | 90            |
| 5                                                                                                                                                             | 3402.5          | -63.41   | 5.20            | 11.15      | Horizontal           | -57.46          | -13.00      | 44.46       | 90            |
| 6                                                                                                                                                             | 4083.0          | -62.97   | 5.50            | 11.95      | Horizontal           | -56.52          | -13.00      | 43.52       | 135           |
| 7                                                                                                                                                             | 4763.5          | -63.39   | 5.70            | 13.55      | Horizontal           | -55.54          | -13.00      | 42.54       | 45            |
| 8                                                                                                                                                             | 5444.0          | -61.71   | 6.30            | 13.75      | Horizontal           | -54.26          | -13.00      | 41.26       | 225           |
| 9                                                                                                                                                             | 6124.5          | -61.77   | 6.80            | 13.85      | Horizontal           | -54.72          | -13.00      | 41.72       | 315           |
| 10                                                                                                                                                            | 6805.0          | -60.38   | 6.90            | 14.25      | Horizontal           | -53.03          | -13.00      | 40.03       | 90            |
| Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.<br>2. The worst emission was found in the antenna is Horizontal position. |                 |          |                 |            |                      |                 |             |             |               |

## 6 Main Test Instruments

| Name                   | Manufacturer | Type              | Serial Number | Calibration Date | Expiration Date |
|------------------------|--------------|-------------------|---------------|------------------|-----------------|
| Base Station Simulator | R&S          | CMW500            | 113824        | 2019-05-19       | 2020-05-18      |
| Power Splitter         | Hua Xiang    | SHX-GF2-2-13      | 10120101      | /                | /               |
| Spectrum Analyzer      | Key sight    | N9010A            | MY50210259    | 2019-05-19       | 2020-05-18      |
| Signal Analyzer        | R&S          | FSV30             | 100815        | 2018-12-16       | 2019-12-15      |
| Loop Antenna           | SCHWARZBECK  | FMZB1519          | 1519-047      | 2017-09-26       | 2019-09-25      |
| Trilog Antenna         | SCHWARZBECK  | VUBL 9163         | 9163-201      | 2017-11-18       | 2019-11-17      |
| Horn Antenna           | R&S          | HF907             | 100126        | 2018-07-07       | 2020-07-06      |
| Horn Antenna           | ETS-Lindgren | 3160-09           | 00102643      | 2018-06-20       | 2020-06-19      |
| Horn Antenna           | STEATITE     | QSH-SL-26-40-K-15 | 16779         | 2017-07-20       | 2019-07-19      |
| Signal generator       | R&S          | SMB 100A          | 102594        | 2019-05-19       | 2020-05-18      |
| Climatic Chamber       | ESPEC        | SU-242            | 93000506      | 2017-12-17       | 2020-12-16      |
| Preamplifier           | R&S          | SCU18             | 102327        | 2019-05-19       | 2020-05-18      |
| MOB COMMS DC SUPPLY    | Keysight     | 66319D            | MY43004105    | 2019-05-19       | 2020-05-18      |
| RF Cable               | Agilent      | SMA 15cm          | 0001          | 2019-06-14       | 2019-09-13      |
| Software               | R&S          | EMC32             | 9.26.0        | /                | /               |

**\*\*\*\*\*END OF REPORT \*\*\*\*\***

## ANNEX A: Product Change Description

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Quectel Wireless Solutions Co., Ltd.

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# Statement

We, Quectel Wireless Solutions Co., Ltd, declare the following models as series application.

**Name:** LTE Module

**Parent Model:** EC25-AFX

**Variant Model:** EC25-AFXD, EC25-AFXD MINIPCIE

EC25-AFX, EC25-AFXD and EC25-AFXD MINIPCIE are all LTE modules. They use the same chipset, support same bands and share the same software & hardware design. The only difference is EC25-AFXD and EC25-AFXD MINIPCIE are data only modules which is configured by firmware based on EC25-AFX.

Following details are the difference of these modules.

| Module                          | Frequency bands                                         | Capability          |
|---------------------------------|---------------------------------------------------------|---------------------|
| EC25-AFX<br>EC25-AFX MINIPCIE   | FDD:<br>B2/B4/B5/B12/B13/B14/B66/B71<br>WCDMA: B2/B4/B5 | Cat.4<br>Data&Voice |
| EC25-AFXD<br>EC25-AFXD MINIPCIE | FDD:<br>B2/B4/B5/B12/B13/B14/B66/B71<br>WCDMA: B2/B4/B5 | Cat.4<br>Data Only  |

Meanwhile, EC25-AFXD MINIPCIE makes up of EC25-AFXD module and PCIe carrier board. The carrier board switches EC25-AFXD module to follow PCI Express Mini Card 1.2 standard connector protocol. No any other internal changes in EC25-AFXD module. We hereby state that two models are identical in interior structure and components, and just connector interface is different for the marketing requirement.

Your assistance on this matter is highly appreciated.

Sincerely,

Name: Jean Hu 

Title: Certification Section