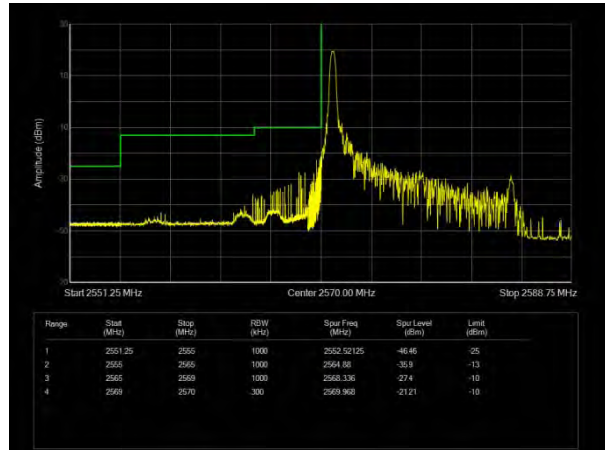
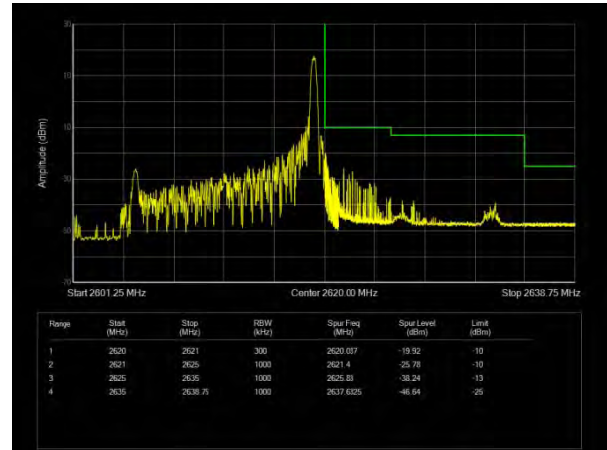




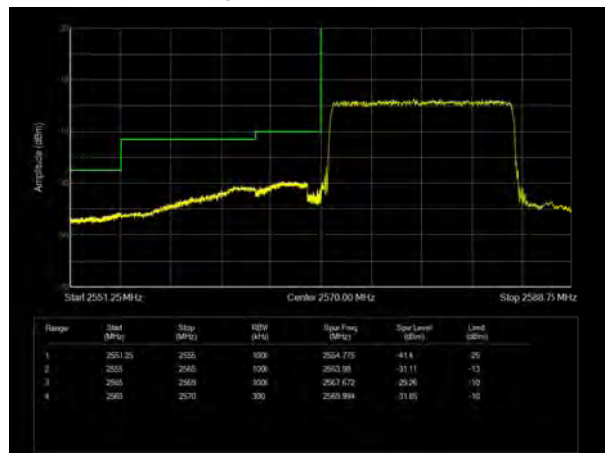
LTE Band 38 16QAM 15MHz CH-Low, 1 RB



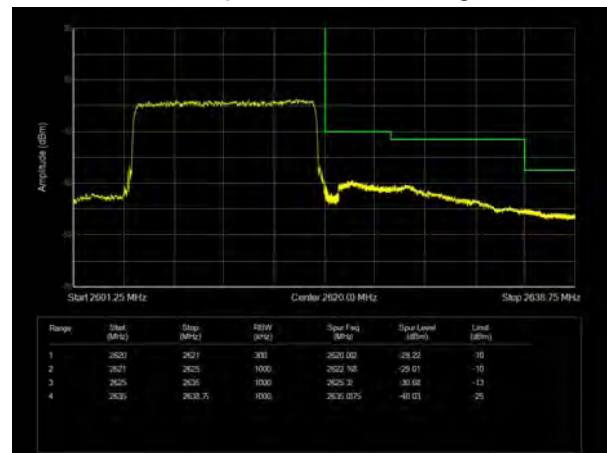
LTE Band 38 16QAM 15MHz CH-High, 1 RB



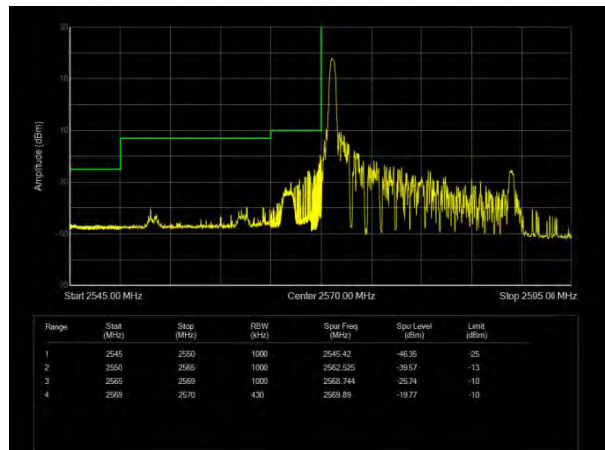
LTE Band 38 16QAM 15MHz CH-Low, 100%RB



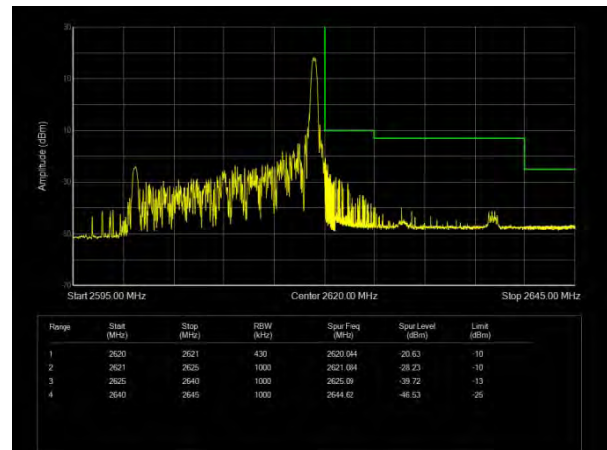
LTE Band 38 16QAM 15MHz CH-High, 100%RB



LTE Band 38 16QAM 20MHz CH-Low, 1 RB

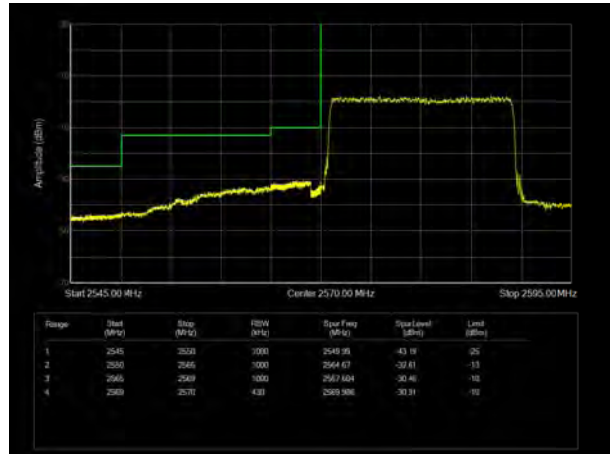


LTE Band 38 16QAM 20MHz CH-High, 1 RB

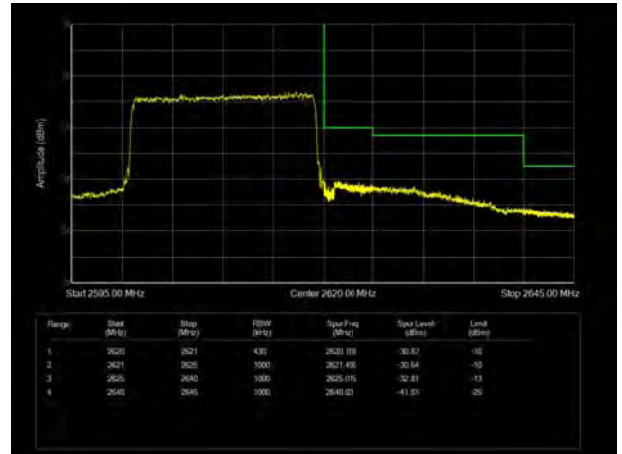




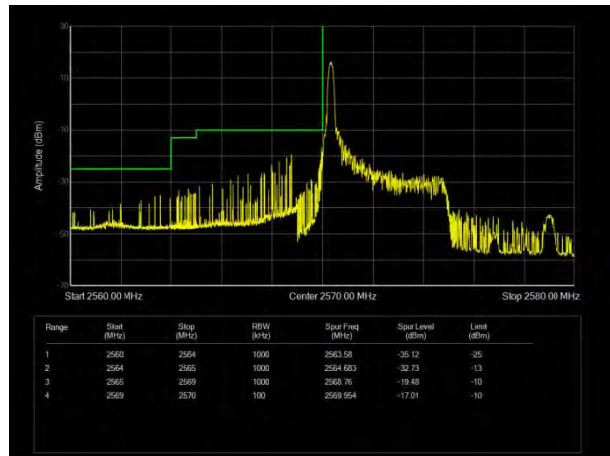
LTE Band 38 16QAM 20MHz CH-Low, 100%RB



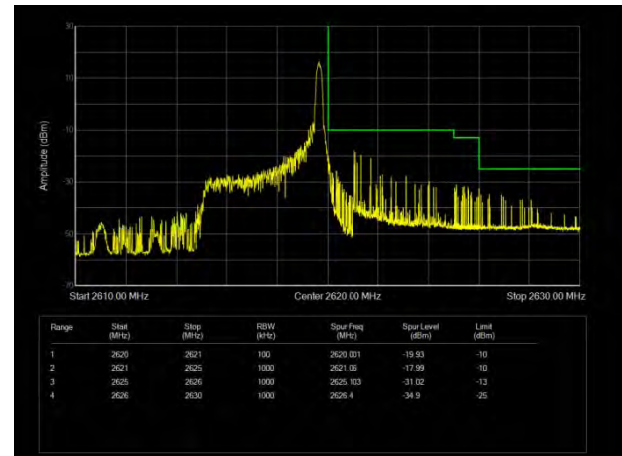
LTE Band 38 16QAM 20MHz CH-High, 100%RB



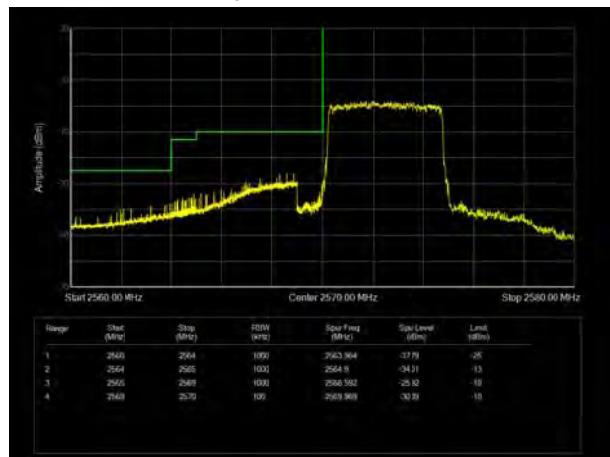
LTE Band 38 64QAM 5MHz CH-Low, 1 RB



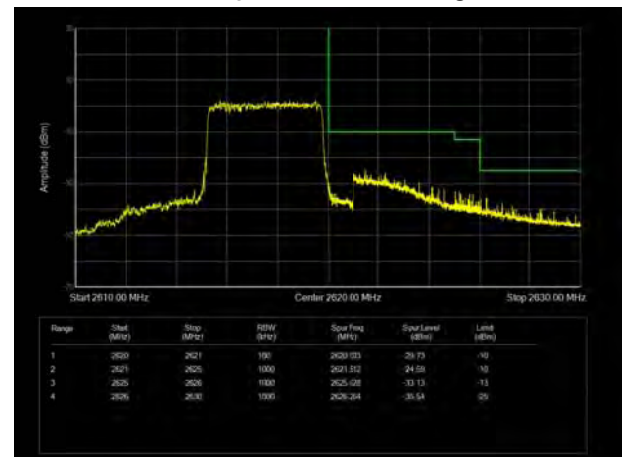
LTE Band 38 64QAM 5MHz CH-High, 1 RB



LTE Band 38 64QAM 5MHz CH-Low, 100%RB

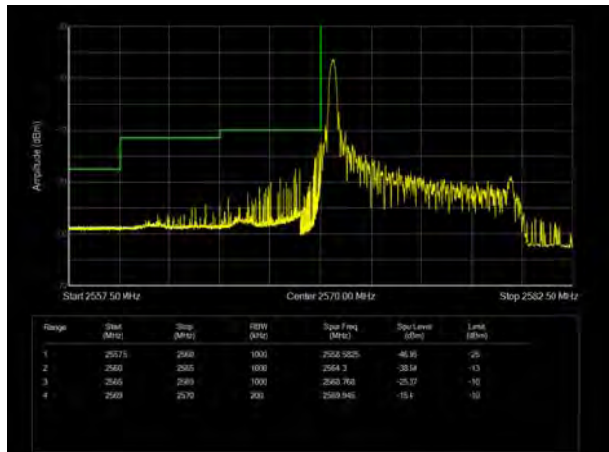


LTE Band 38 64QAM 5MHz CH-High, 100%RB

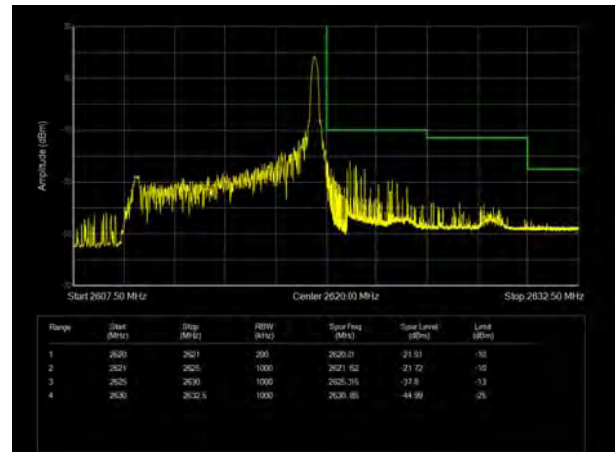




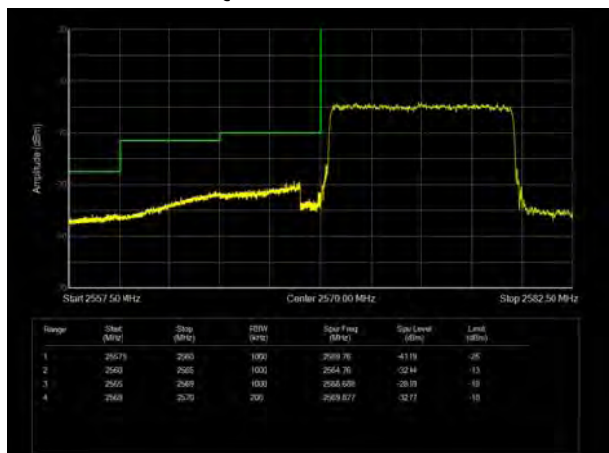
LTE Band 38 64QAM 10MHz CH-Low, 1 RB



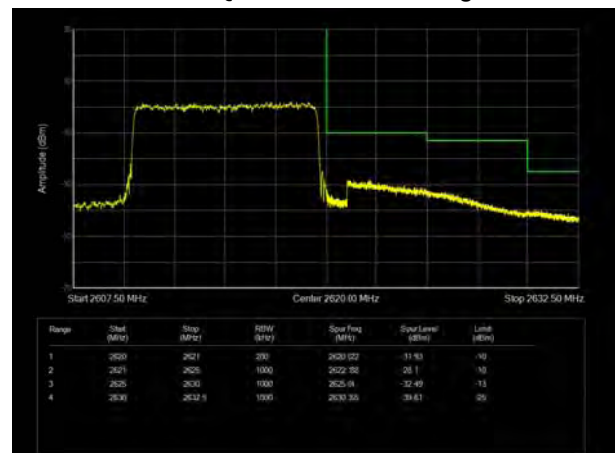
LTE Band 38 64QAM 10MHz CH-High, 1 RB



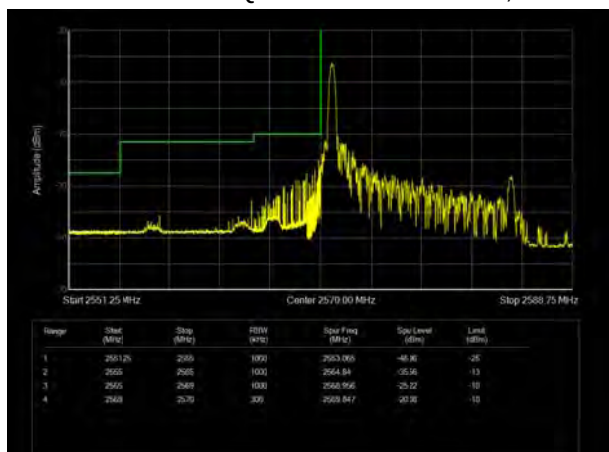
LTE Band 38 64QAM 10MHz CH-Low, 100%RB



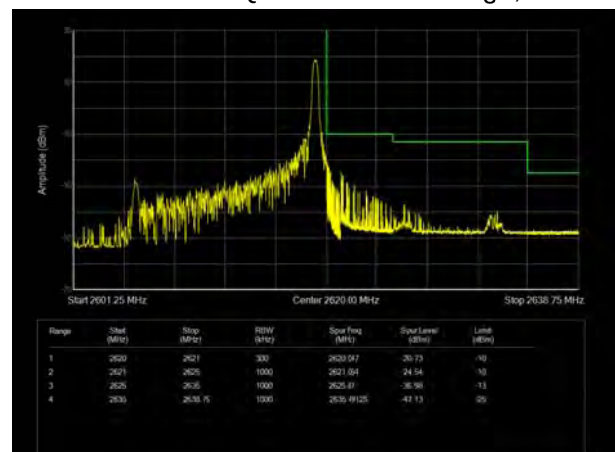
LTE Band 38 64QAM 10MHz CH-High, 100%RB



LTE Band 38 64QAM 15MHz CH-Low, 1 RB

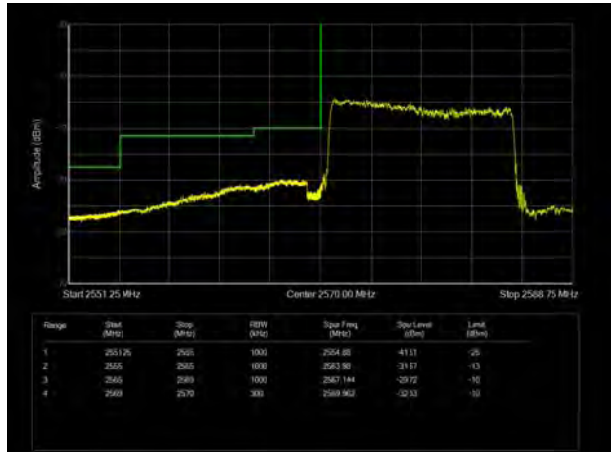


LTE Band 38 64QAM 15MHz CH-High, 1 RB

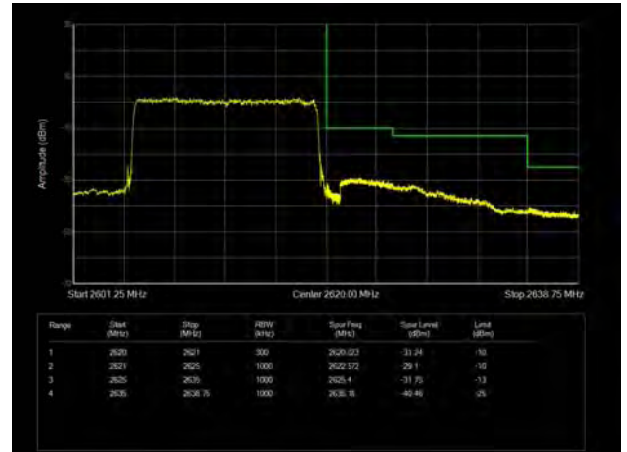




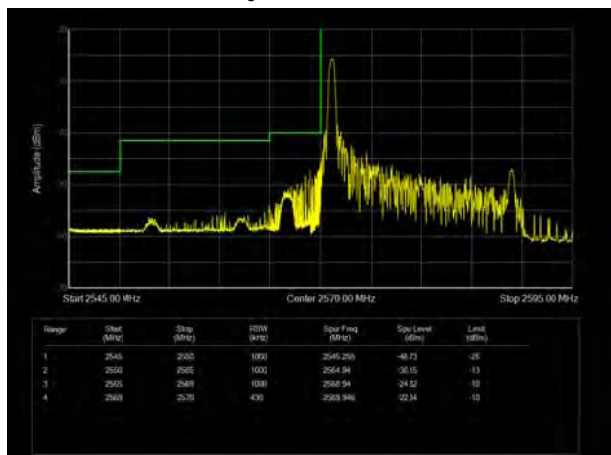
LTE Band 38 64QAM 15MHz CH-Low, 100%RB



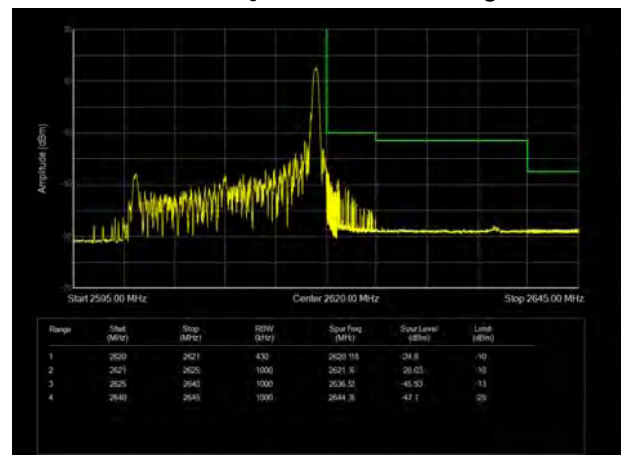
LTE Band 38 64QAM 15MHz CH-High, 100%RB



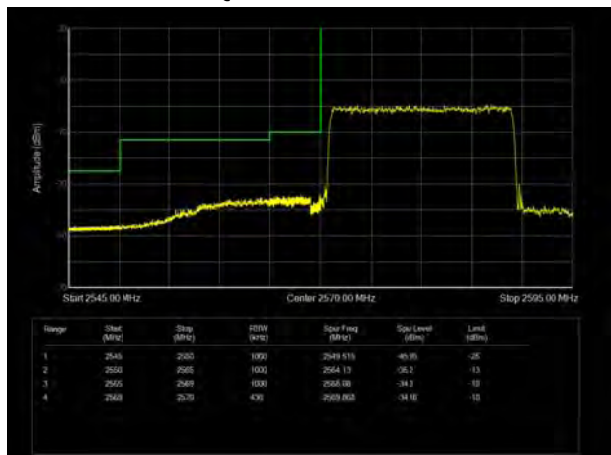
LTE Band 38 64QAM 20MHz CH-Low, 1 RB



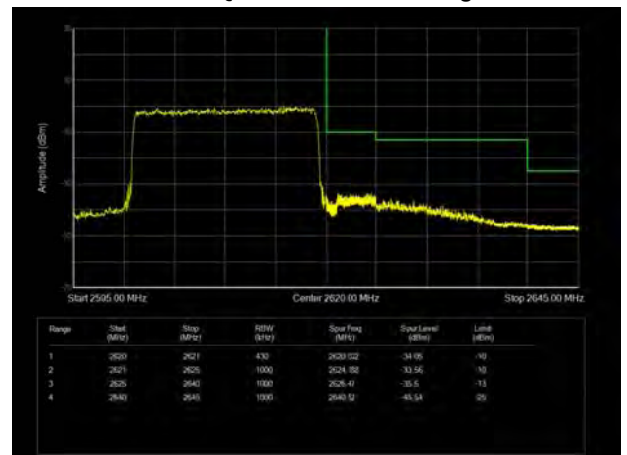
LTE Band 38 64QAM 20MHz CH-High, 1 RB



LTE Band 38 64QAM 20MHz CH-Low, 100%RB



LTE Band 38 64QAM 20MHz CH-High, 100%RB





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



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



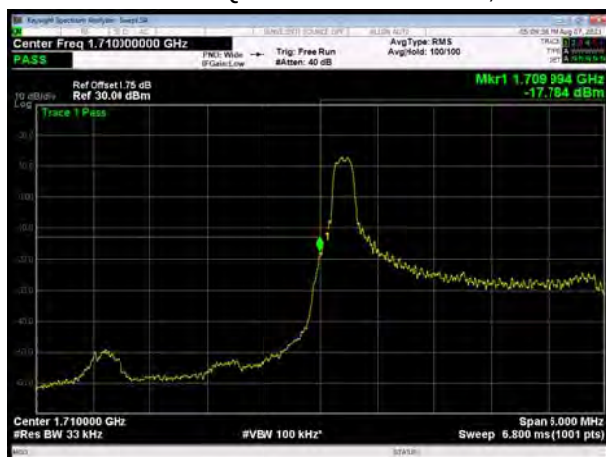
## LTE Band 66 QPSK 1.4MHz CH-Low, 100%RB



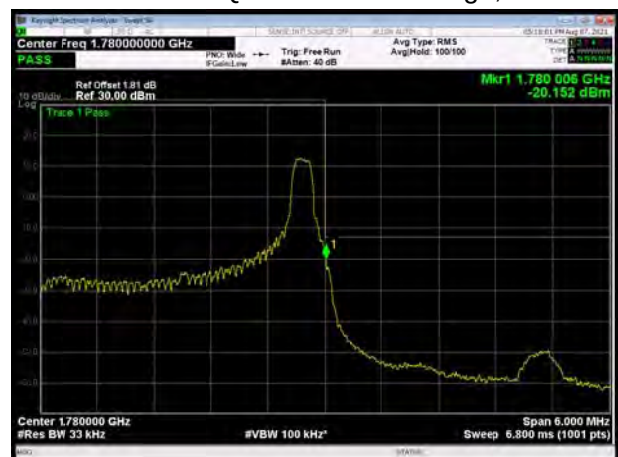
## LTE Band 66 QPSK 1.4MHz CH-High, 100%RB



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



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





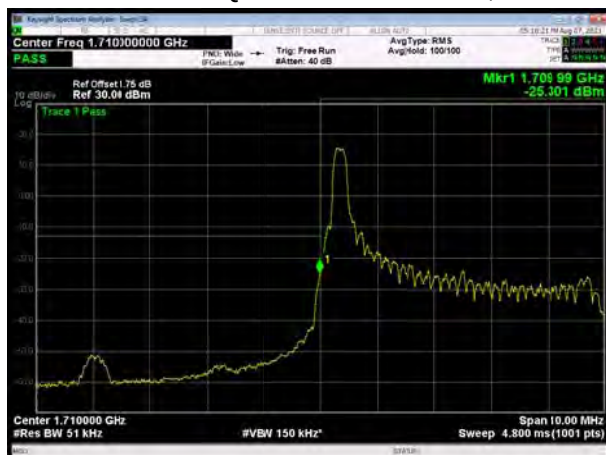
## LTE Band 66 QPSK 3MHz CH-Low, 100%RB



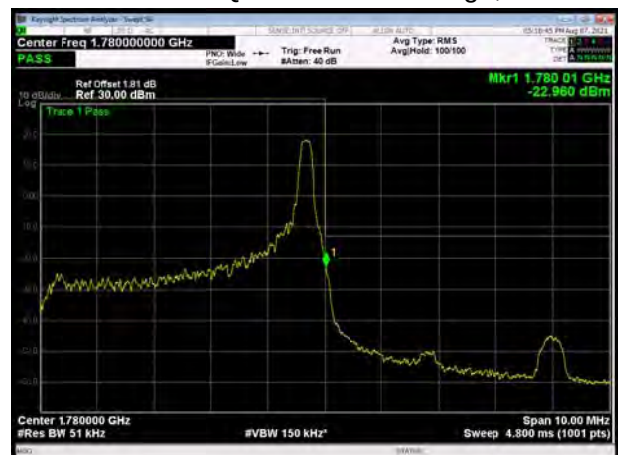
## LTE Band 66 QPSK 3MHz CH-High, 100%RB



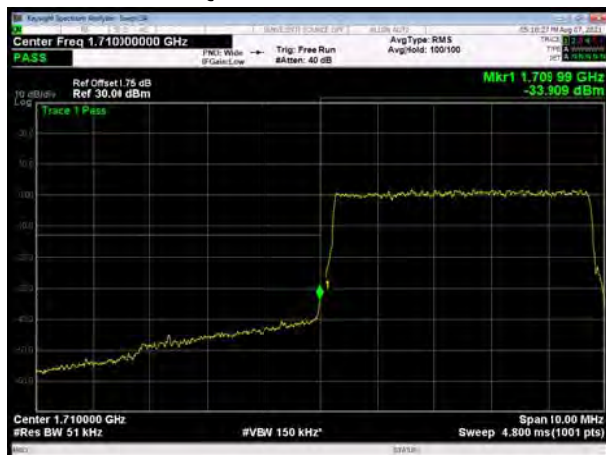
## LTE Band 66 QPSK 5MHz CH-Low, 1 RB



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



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

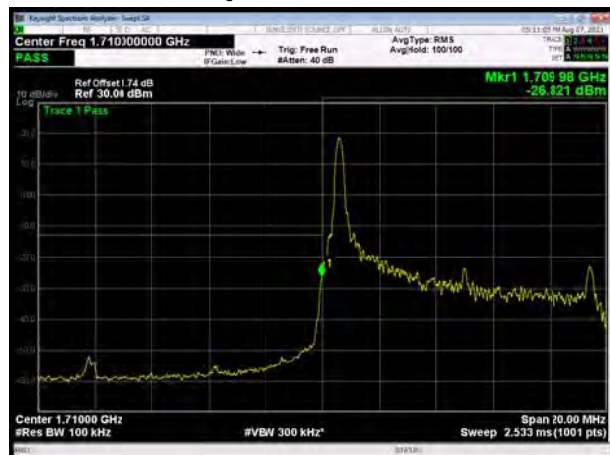


## LTE Band 66 QPSK 5MHz CH-High, 100%RB

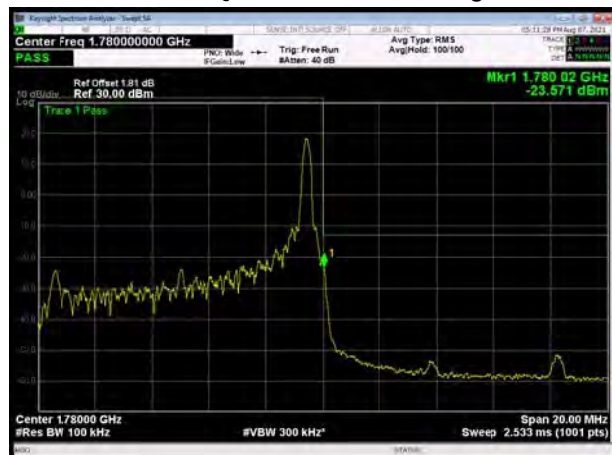




## LTE Band 66 QPSK 10MHz CH-Low, 1 RB



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



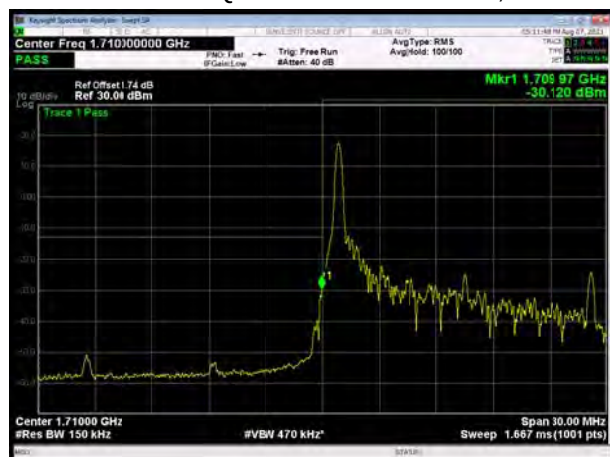
## LTE Band 66 QPSK 10MHz CH-Low, 100%RB



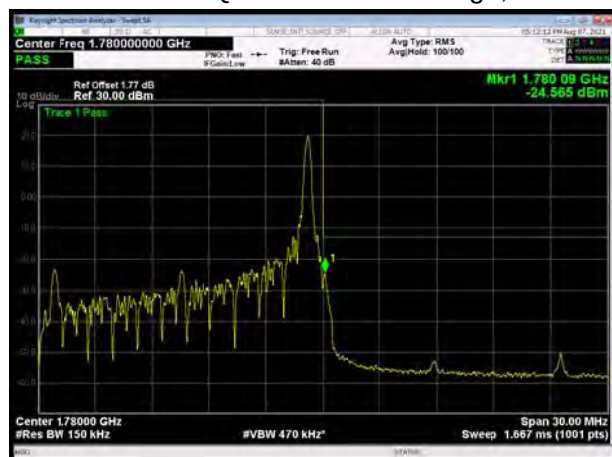
## LTE Band 66 QPSK 10MHz CH-High, 100%RB



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



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





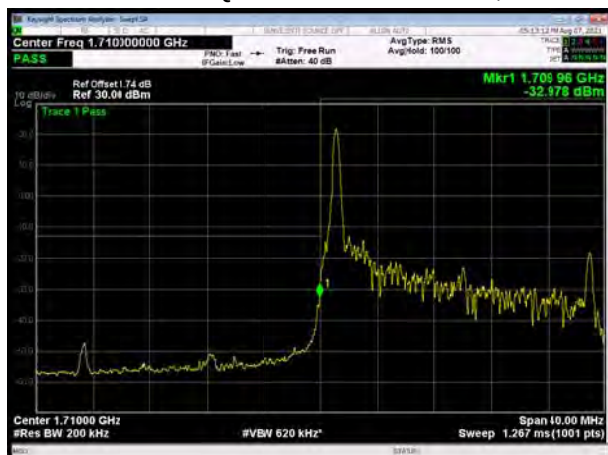
## LTE Band 66 QPSK 15MHz CH-Low, 100%RB



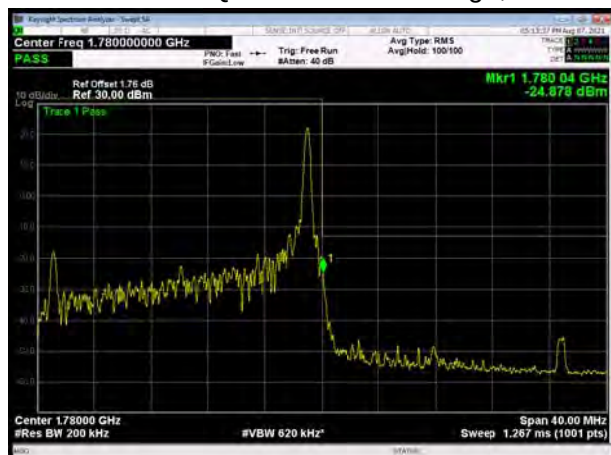
## LTE Band 66 QPSK 15MHz CH-High, 100%RB



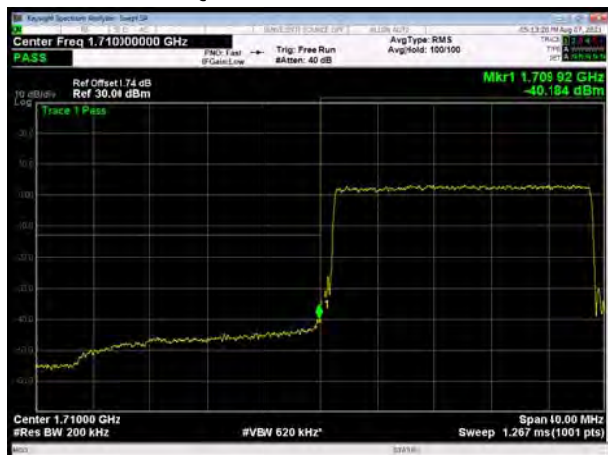
## LTE Band 66 QPSK 20MHz CH-Low, 1 RB



## 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

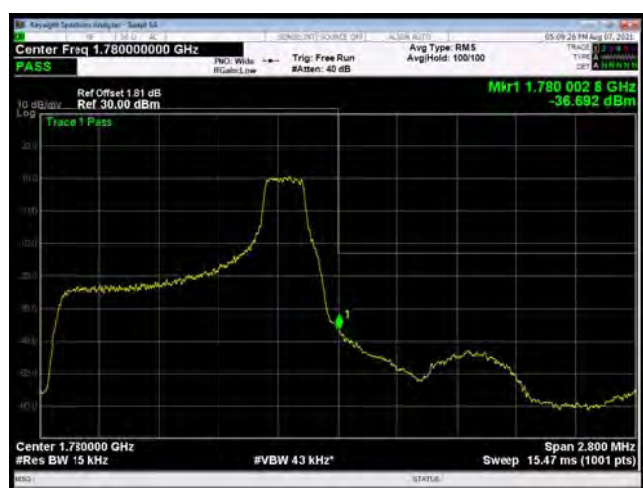




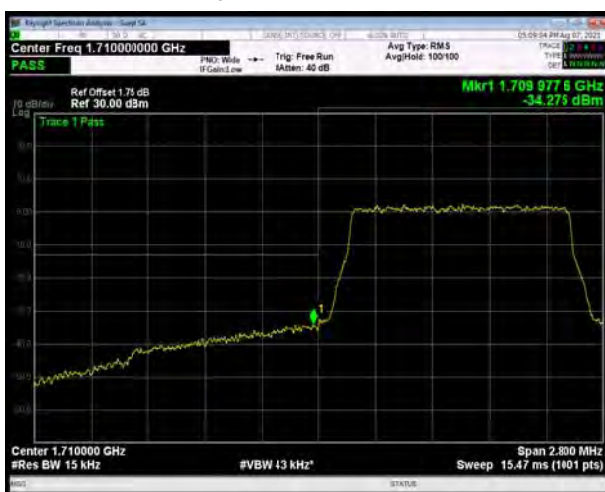
LTE Band 66 16QAM 1.4MHz CH-Low, 1 RB



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



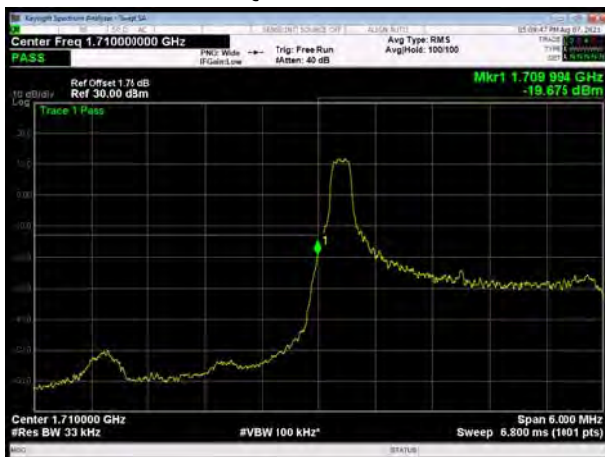
LTE Band 66 16QAM 1.4MHz CH-Low, 100%RB



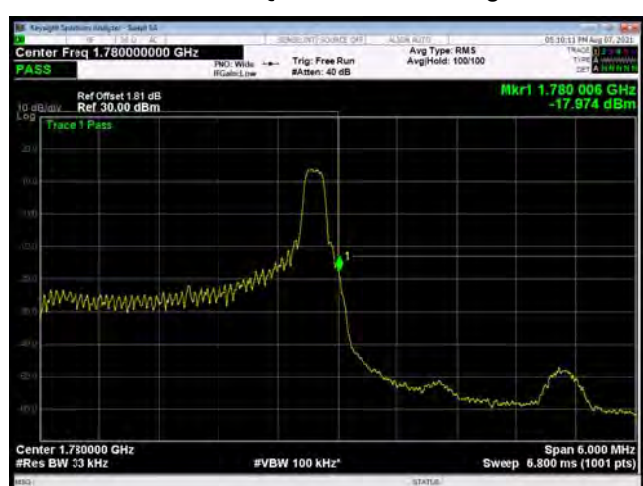
LTE Band 66 16QAM 1.4MHz CH-High, 100%RB



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

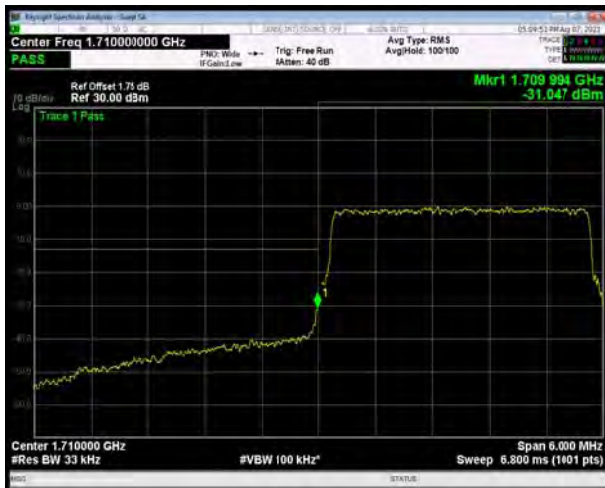


LTE Band 66 16QAM 3MHz CH-High, 1 RB





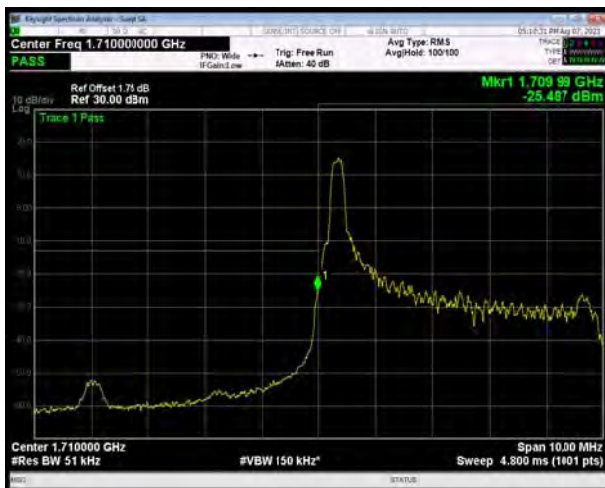
LTE Band 66 16QAM 3MHz CH-Low, 100%RB



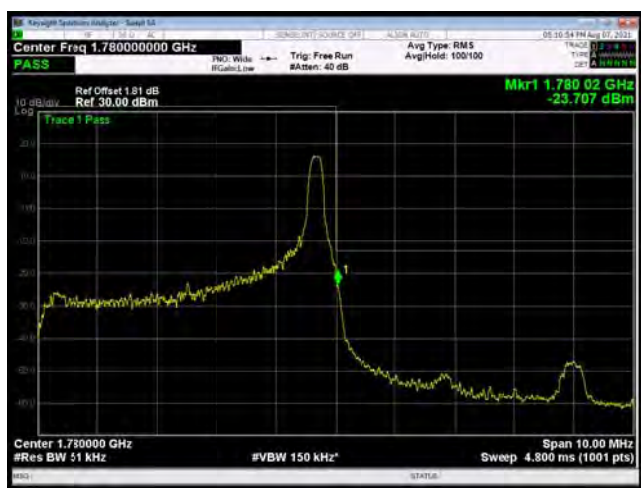
LTE Band 66 16QAM 3MHz CH-High, 100%RB



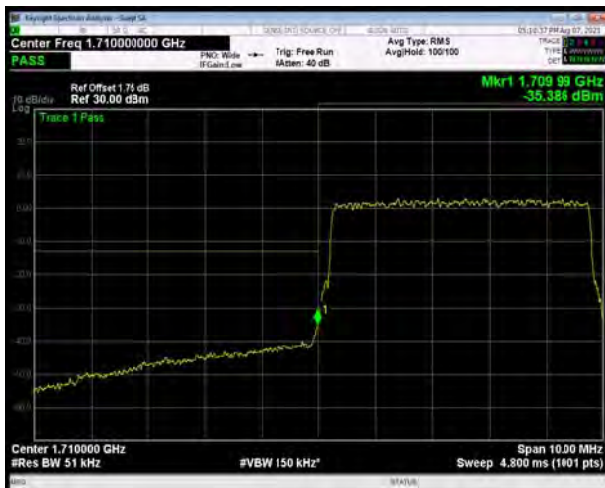
LTE Band 66 16QAM 5MHz CH-Low, 1 RB



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



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

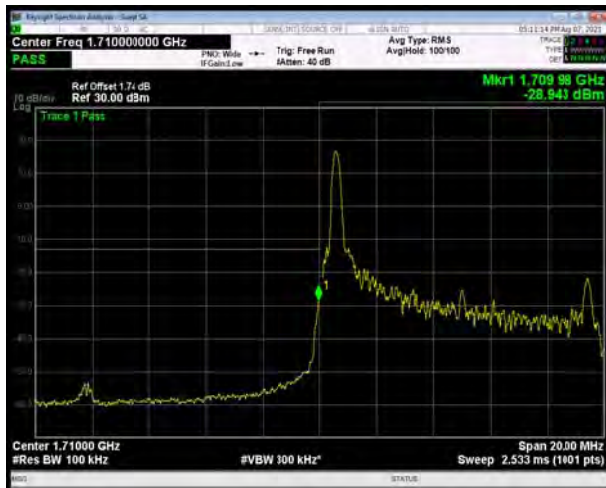


LTE Band 66 16QAM 5MHz CH-High, 100%RB

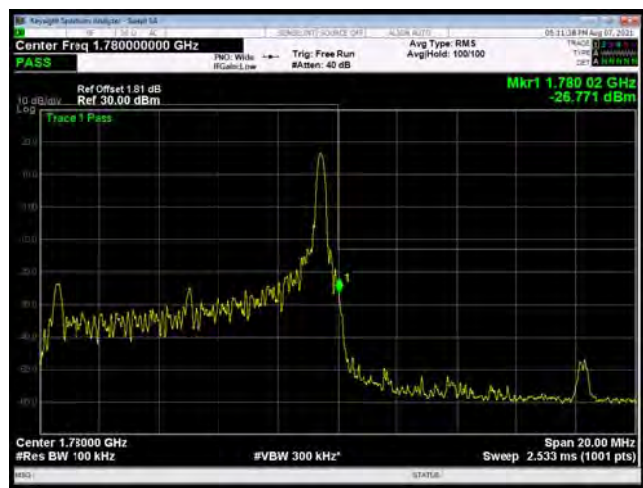




LTE Band 66 16QAM 10MHz CH-Low, 1 RB



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



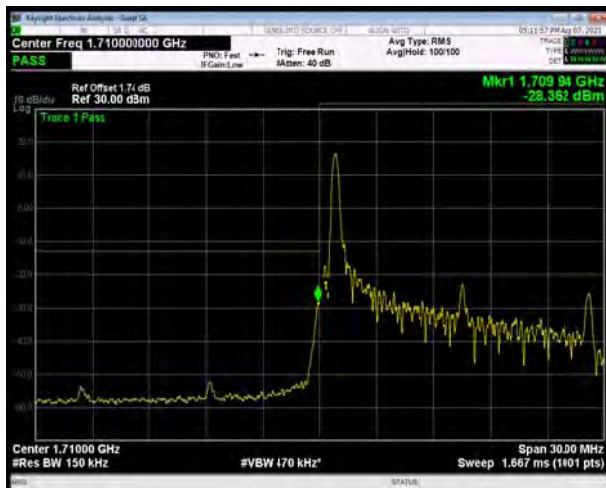
LTE Band 66 16QAM 10MHz CH-Low, 100%RB



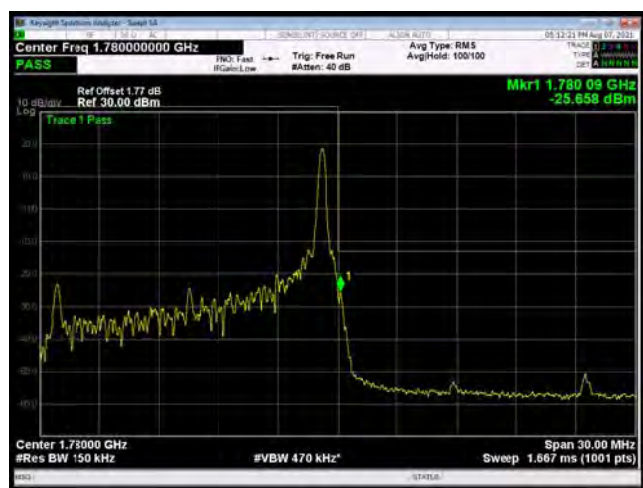
LTE Band 66 16QAM 10MHz CH-High, 100%RB



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

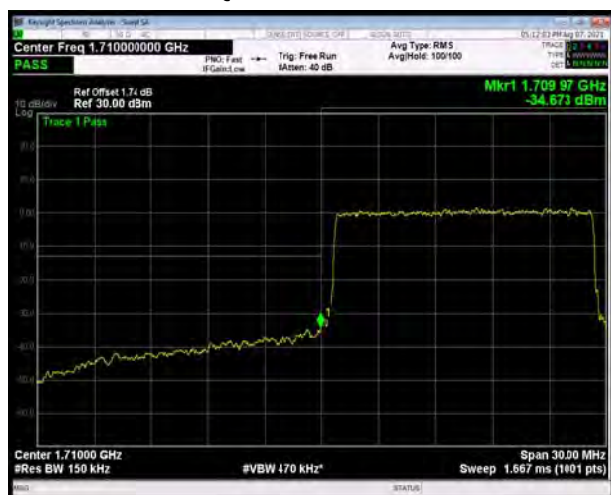


LTE Band 66 16QAM 15MHz CH-High, 1 RB





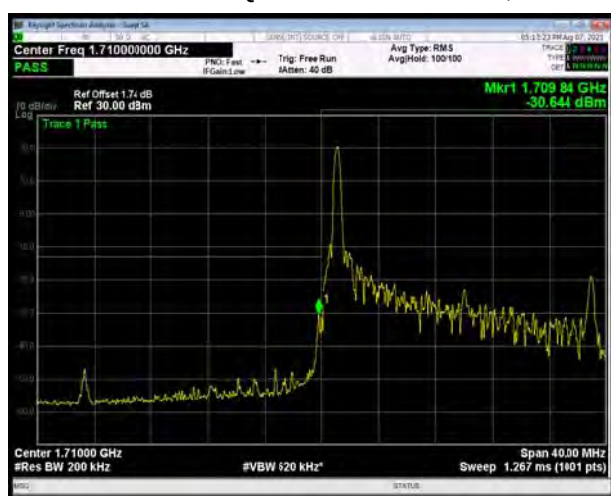
LTE Band 66 16QAM 15MHz CH-Low, 100%RB



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



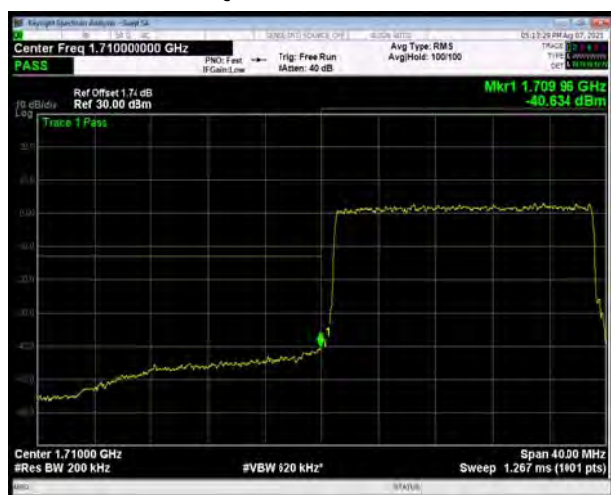
LTE Band 66 16QAM 20MHz CH-Low, 1 RB



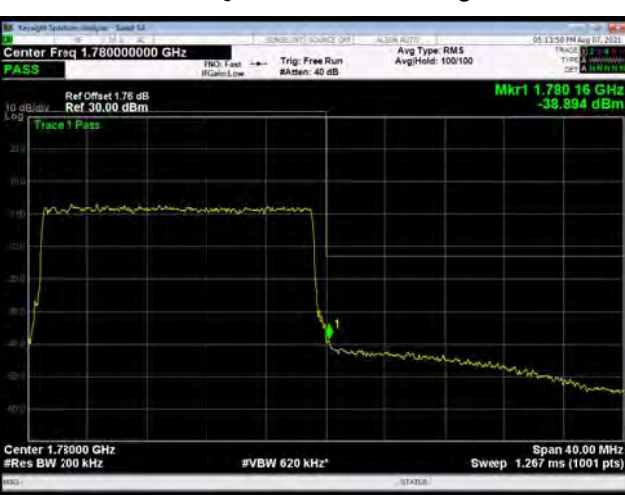
LTE Band 66 16QAM 20MHz CH-High, 1 RB



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

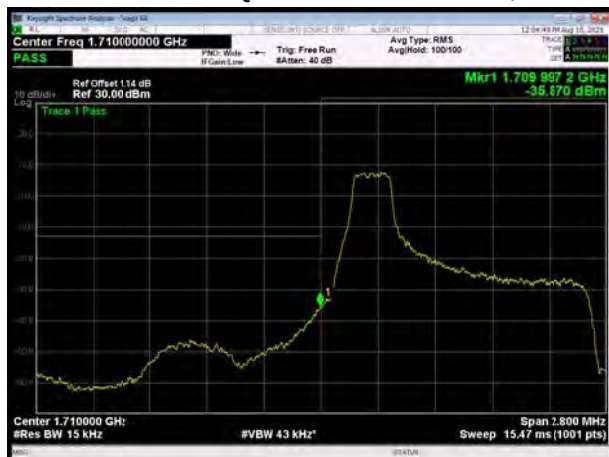


LTE Band 66 16QAM 20MHz CH-High, 100%RB





LTE Band 66 64QAM 1.4MHz CH-Low, 1 RB



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



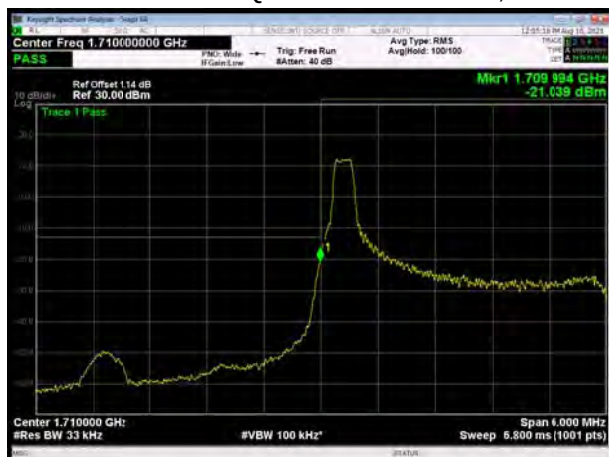
LTE Band 66 64QAM 1.4MHz CH-Low, 100%RB



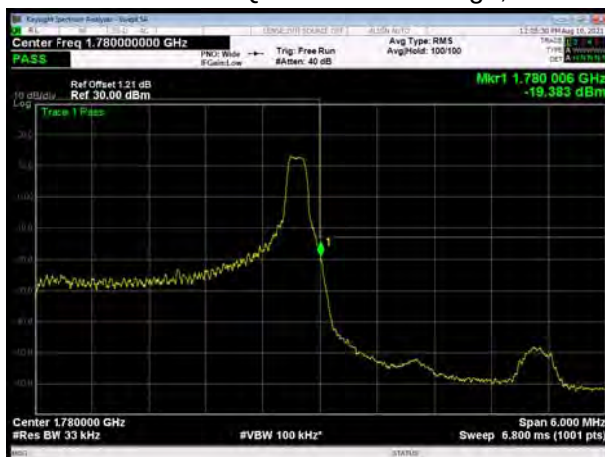
LTE Band 66 64QAM 1.4MHz CH-High, 100%RB



LTE Band 66 64QAM 3MHz CH-Low, 1 RB

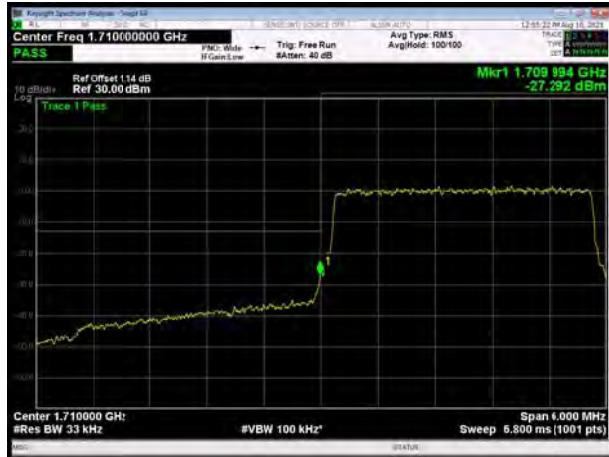


LTE Band 66 64QAM 3MHz CH-High, 1 RB

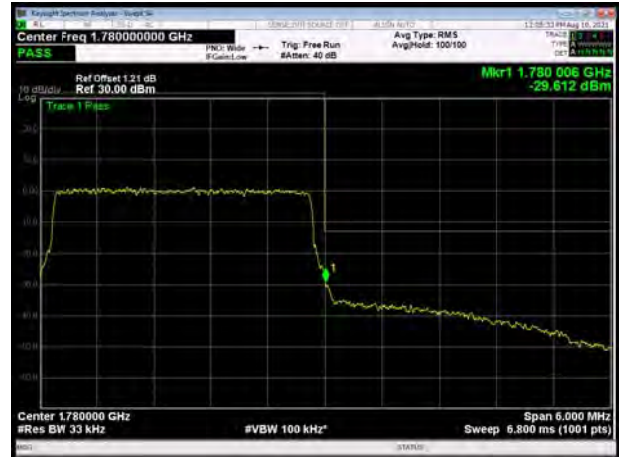




## LTE Band 66 64QAM 3MHz CH-Low, 100%RB



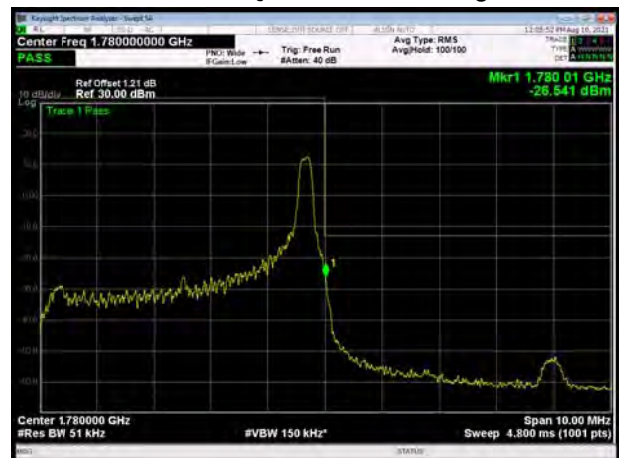
## LTE Band 66 64QAM 3MHz CH-High, 100%RB



## LTE Band 66 64QAM 5MHz CH-Low, 1 RB



## LTE Band 66 64QAM 5MHz CH-High, 1 RB



## LTE Band 66 64QAM 5MHz CH-Low, 100%RB

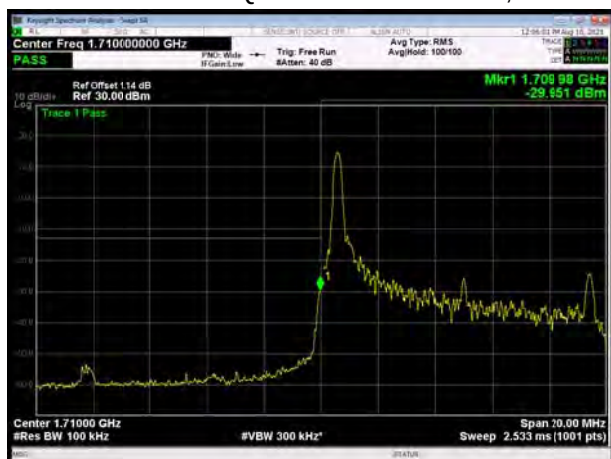


## LTE Band 66 64QAM 5MHz CH-High, 100%RB

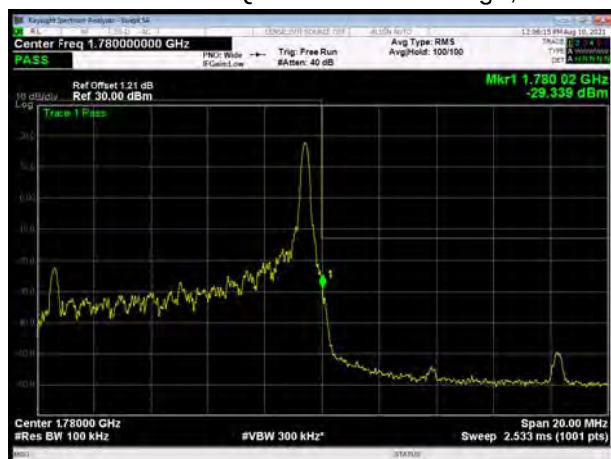




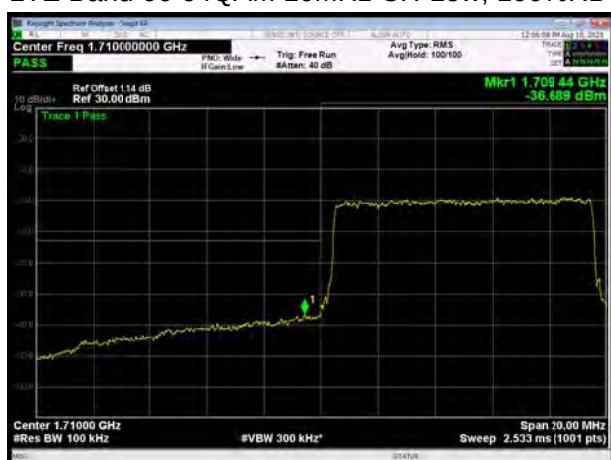
## LTE Band 66 64QAM 10MHz CH-Low, 1 RB



## LTE Band 66 64QAM 10MHz CH-High, 1 RB



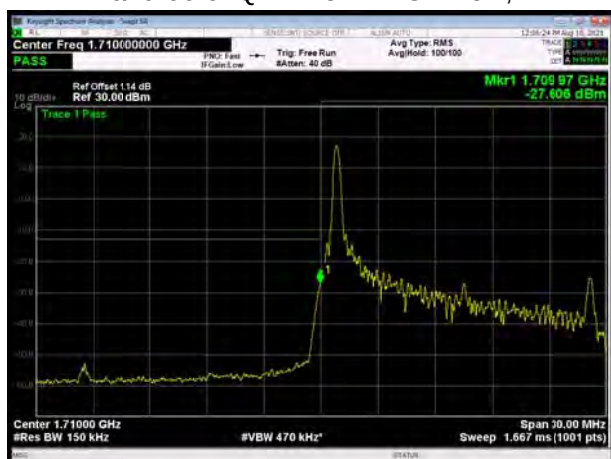
## LTE Band 66 64QAM 10MHz CH-Low, 100%RB



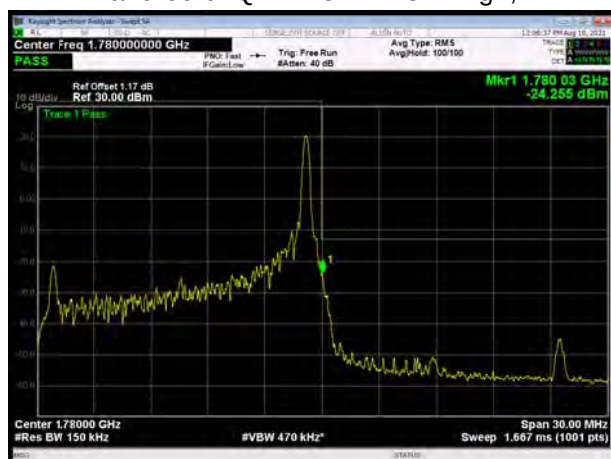
## LTE Band 66 64QAM 10MHz CH-High, 100%RB



## LTE Band 66 64QAM 15MHz CH-Low, 1 RB

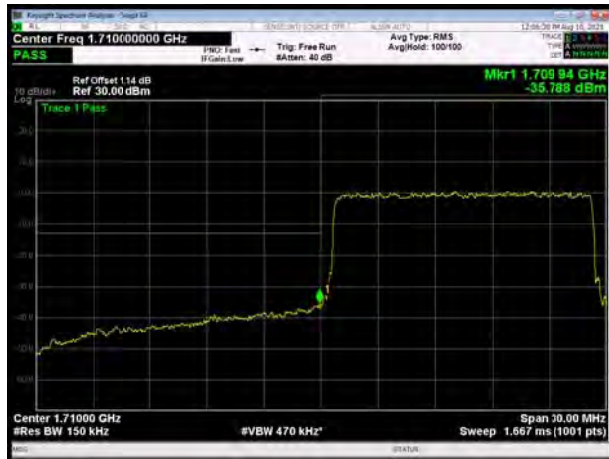


## LTE Band 66 64QAM 15MHz CH-High, 1 RB





## LTE Band 66 64QAM 15MHz CH-Low, 100%RB



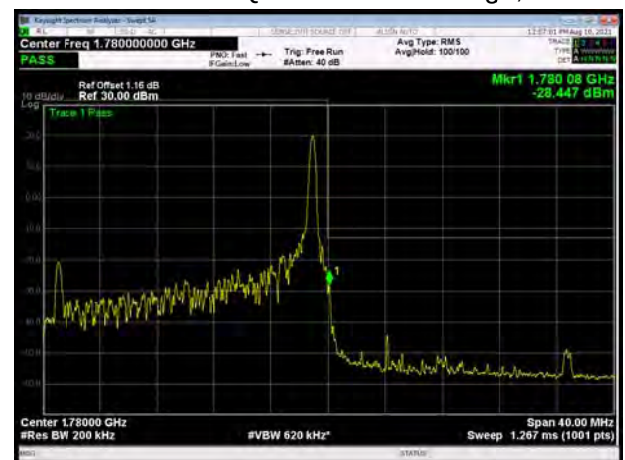
## LTE Band 66 64QAM 15MHz CH-High, 100%RB



## LTE Band 66 64QAM 20MHz CH-Low, 1 RB



## LTE Band 66 64QAM 20MHz CH-High, 1 RB



## LTE Band 66 64QAM 20MHz CH-Low, 100%RB



## LTE Band 66 64QAM 20MHz CH-High, 100%RB



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

### Ambient condition

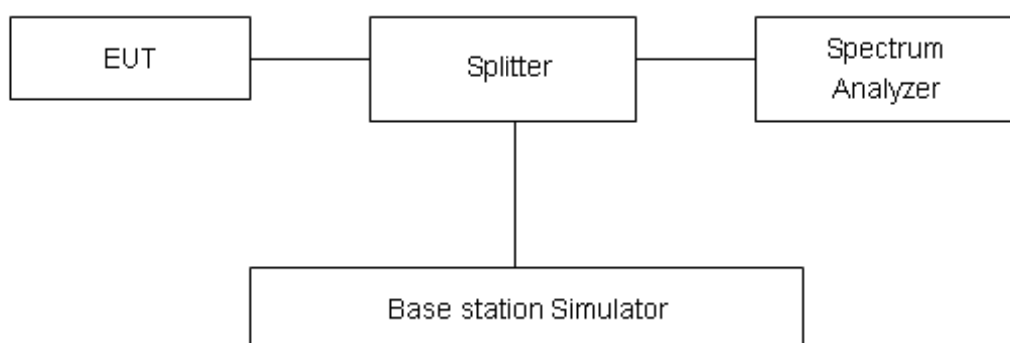
| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### 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 |
|---------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| RMC           | 1312    | 1712.4          | 25.76      | 22.81     | 2.95      | ≤13        | PASS       |
|               | 1413    | 1732.6          | 26.37      | 23.39     | 2.98      | ≤13        | PASS       |
|               | 1513    | 1752.6          | 26.33      | 23.34     | 2.99      | ≤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          | 25.32      | 19.49     | 5.83      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 25.48      | 19.62     | 5.86      | ≤13        | PASS       |
|            |                 | 20393   | 1754.3          | 25.31      | 19.59     | 5.72      | ≤13        | PASS       |
|            | 3               | 19965   | 1711.5          | 27.18      | 21.76     | 5.42      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.08      | 21.66     | 5.42      | ≤13        | PASS       |
|            |                 | 20385   | 1753.5          | 27.11      | 21.59     | 5.52      | ≤13        | PASS       |
|            | 5               | 19975   | 1712.5          | 27.07      | 21.57     | 5.50      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.13      | 21.63     | 5.50      | ≤13        | PASS       |
|            |                 | 20375   | 1752.5          | 27.05      | 21.52     | 5.53      | ≤13        | PASS       |
|            | 10              | 20000   | 1715            | 27.03      | 21.48     | 5.55      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.13      | 21.56     | 5.57      | ≤13        | PASS       |
|            |                 | 20350   | 1750            | 27.21      | 21.63     | 5.58      | ≤13        | PASS       |
|            | 15              | 20025   | 1717.5          | 27.40      | 21.60     | 5.80      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.55      | 21.65     | 5.90      | ≤13        | PASS       |
|            |                 | 20325   | 1747.5          | 27.57      | 21.64     | 5.93      | ≤13        | PASS       |
|            | 20              | 20050   | 1720            | 27.11      | 21.53     | 5.58      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.30      | 21.63     | 5.67      | ≤13        | PASS       |
|            |                 | 20300   | 1745            | 27.49      | 21.75     | 5.74      | ≤13        | PASS       |
| 16QAM      | 1.4             | 19957   | 1710.7          | 24.51      | 19.14     | 5.37      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 24.41      | 18.78     | 5.63      | ≤13        | PASS       |
|            |                 | 20393   | 1754.3          | 27.25      | 20.98     | 6.27      | ≤13        | PASS       |
|            | 3               | 19965   | 1711.5          | 27.05      | 20.72     | 6.33      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.08      | 20.80     | 6.28      | ≤13        | PASS       |
|            |                 | 20385   | 1753.5          | 26.97      | 20.64     | 6.33      | ≤13        | PASS       |
|            | 5               | 19975   | 1712.5          | 26.75      | 20.41     | 6.34      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 26.98      | 20.74     | 6.24      | ≤13        | PASS       |
|            |                 | 20375   | 1752.5          | 26.93      | 20.66     | 6.27      | ≤13        | PASS       |
|            | 10              | 20000   | 1715            | 26.95      | 20.59     | 6.36      | ≤13        | PASS       |
|            |                 | 20175   | 1732.5          | 27.05      | 20.70     | 6.35      | ≤13        | PASS       |
|            |                 | 20350   | 1750            | 27.00      | 20.66     | 6.34      | ≤13        | PASS       |



|       |     |       |        |       |       |      |     |      |
|-------|-----|-------|--------|-------|-------|------|-----|------|
|       | 15  | 20025 | 1717.5 | 27.09 | 20.76 | 6.33 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 27.09 | 20.69 | 6.40 | ≤13 | PASS |
|       |     | 20325 | 1747.5 | 27.01 | 20.60 | 6.41 | ≤13 | PASS |
|       | 20  | 20050 | 1720   | 27.00 | 20.65 | 6.35 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 27.03 | 20.64 | 6.39 | ≤13 | PASS |
|       |     | 20300 | 1745   | 27.13 | 20.72 | 6.41 | ≤13 | PASS |
| 64QAM | 1.4 | 19957 | 1710.7 | 26.49 | 20.27 | 6.22 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 26.66 | 20.38 | 6.28 | ≤13 | PASS |
|       |     | 20393 | 1754.3 | 26.65 | 20.37 | 6.28 | ≤13 | PASS |
|       | 3   | 19965 | 1711.5 | 26.48 | 20.18 | 6.30 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 26.52 | 20.23 | 6.29 | ≤13 | PASS |
|       |     | 20385 | 1753.5 | 26.31 | 20.01 | 6.30 | ≤13 | PASS |
|       | 5   | 19975 | 1712.5 | 26.34 | 20.14 | 6.20 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 26.33 | 20.04 | 6.29 | ≤13 | PASS |
|       |     | 20375 | 1752.5 | 26.33 | 20.09 | 6.24 | ≤13 | PASS |
|       | 10  | 20000 | 1715   | 26.34 | 20.04 | 6.30 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 26.53 | 20.21 | 6.32 | ≤13 | PASS |
|       |     | 20350 | 1750   | 26.35 | 20.00 | 6.35 | ≤13 | PASS |
|       | 15  | 20025 | 1717.5 | 26.45 | 20.09 | 6.36 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 26.56 | 20.17 | 6.39 | ≤13 | PASS |
|       |     | 20325 | 1747.5 | 26.56 | 20.18 | 6.38 | ≤13 | PASS |
|       | 20  | 20050 | 1720   | 26.40 | 20.05 | 6.35 | ≤13 | PASS |
|       |     | 20175 | 1732.5 | 26.63 | 20.23 | 6.40 | ≤13 | PASS |
|       |     | 20300 | 1745   | 26.60 | 20.20 | 6.40 | ≤13 | PASS |

| LTE Band 7 |                 |         |                 |            |           |           |            |            |
|------------|-----------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| Modulation | Bandwidth (MHz) | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
| QPSK       | 5               | 20775   | 2502.5          | 23.94      | 18.46     | 5.48      | ≤13        | PASS       |
|            |                 | 21100   | 2535            | 23.82      | 18.19     | 5.63      | ≤13        | PASS       |
|            |                 | 21425   | 2567.5          | 24.09      | 18.62     | 5.47      | ≤13        | PASS       |
|            | 10              | 20800   | 2505            | 24.04      | 18.46     | 5.58      | ≤13        | PASS       |
|            |                 | 21100   | 2535            | 24.03      | 18.42     | 5.61      | ≤13        | PASS       |
|            |                 | 21400   | 2565            | 25.17      | 19.55     | 5.62      | ≤13        | PASS       |
|            | 15              | 20825   | 2507.5          | 25.70      | 19.77     | 5.93      | ≤13        | PASS       |
|            |                 | 21100   | 2535            | 25.47      | 19.51     | 5.96      | ≤13        | PASS       |
|            |                 | 21375   | 2562.5          | 25.41      | 19.44     | 5.97      | ≤13        | PASS       |
|            | 20              | 20850   | 2510            | 24.33      | 18.66     | 5.67      | ≤13        | PASS       |



|       |    |       |        |       |       |      |     |      |
|-------|----|-------|--------|-------|-------|------|-----|------|
|       |    | 21100 | 2535   | 24.21 | 18.52 | 5.69 | ≤13 | PASS |
|       |    | 21350 | 2560   | 24.73 | 19.04 | 5.69 | ≤13 | PASS |
| 16QAM | 5  | 20775 | 2502.5 | 23.78 | 17.64 | 6.14 | ≤13 | PASS |
|       |    | 21100 | 2535   | 23.67 | 17.35 | 6.32 | ≤13 | PASS |
|       |    | 21425 | 2567.5 | 23.86 | 17.68 | 6.18 | ≤13 | PASS |
|       | 10 | 20800 | 2505   | 23.85 | 17.61 | 6.24 | ≤13 | PASS |
|       |    | 21100 | 2535   | 25.33 | 19.34 | 5.99 | ≤13 | PASS |
|       |    | 21400 | 2565   | 25.52 | 19.72 | 5.80 | ≤13 | PASS |
|       | 15 | 20825 | 2507.5 | 25.38 | 19.36 | 6.02 | ≤13 | PASS |
|       |    | 21100 | 2535   | 25.31 | 19.21 | 6.10 | ≤13 | PASS |
|       |    | 21375 | 2562.5 | 25.79 | 19.87 | 5.92 | ≤13 | PASS |
|       | 20 | 20850 | 2510   | 24.16 | 17.80 | 6.36 | ≤13 | PASS |
|       |    | 21100 | 2535   | 24.03 | 17.65 | 6.38 | ≤13 | PASS |
|       |    | 21350 | 2560   | 24.62 | 18.26 | 6.36 | ≤13 | PASS |
| 64QAM | 5  | 20775 | 2502.5 | 23.26 | 17.06 | 6.20 | ≤13 | PASS |
|       |    | 21100 | 2535   | 23.07 | 16.79 | 6.28 | ≤13 | PASS |
|       |    | 21425 | 2567.5 | 23.34 | 17.16 | 6.18 | ≤13 | PASS |
|       | 10 | 20800 | 2505   | 23.36 | 17.09 | 6.27 | ≤13 | PASS |
|       |    | 21100 | 2535   | 23.41 | 17.06 | 6.35 | ≤13 | PASS |
|       |    | 21400 | 2565   | 23.60 | 17.35 | 6.25 | ≤13 | PASS |
|       | 15 | 20825 | 2507.5 | 23.48 | 17.09 | 6.39 | ≤13 | PASS |
|       |    | 21100 | 2535   | 23.44 | 17.04 | 6.40 | ≤13 | PASS |
|       |    | 21375 | 2562.5 | 23.95 | 17.61 | 6.34 | ≤13 | PASS |
|       | 20 | 20850 | 2510   | 23.69 | 17.34 | 6.35 | ≤13 | PASS |
|       |    | 21100 | 2535   | 23.51 | 17.14 | 6.37 | ≤13 | PASS |
|       |    | 21350 | 2560   | 24.11 | 17.75 | 6.36 | ≤13 | PASS |

| LTE Band 38 |                 |         |                 |            |           |           |            |            |
|-------------|-----------------|---------|-----------------|------------|-----------|-----------|------------|------------|
| Modulation  | Bandwidth (MHz) | Channel | Frequency (MHz) | Peak (dBm) | Avg (dBm) | PAPR (dB) | Limit (dB) | Conclusion |
| QPSK        | 5               | 37775   | 2572.5          | 26.66      | 17.40     | 9.26      | ≤13        | PASS       |
|             |                 | 38000   | 2595            | 26.62      | 17.67     | 8.95      | ≤13        | PASS       |
|             |                 | 38225   | 2617.5          | 26.70      | 18.38     | 8.32      | ≤13        | PASS       |
|             | 10              | 37800   | 2575            | 26.79      | 18.30     | 8.49      | ≤13        | PASS       |
|             |                 | 38000   | 2595            | 26.69      | 17.78     | 8.91      | ≤13        | PASS       |



|       |    |       |        |       |       |       |     |      |
|-------|----|-------|--------|-------|-------|-------|-----|------|
|       |    | 38200 | 2615   | 26.56 | 17.64 | 8.92  | ≤13 | PASS |
|       | 15 | 37825 | 2577.5 | 27.16 | 18.04 | 9.12  | ≤13 | PASS |
|       |    | 38000 | 2595   | 27.07 | 18.23 | 8.84  | ≤13 | PASS |
|       |    | 38175 | 2612.5 | 27.08 | 17.97 | 9.11  | ≤13 | PASS |
|       | 20 | 37850 | 2580   | 26.65 | 16.93 | 9.72  | ≤13 | PASS |
|       |    | 38000 | 2595   | 26.78 | 18.18 | 8.60  | ≤13 | PASS |
|       |    | 38150 | 2610   | 26.89 | 18.16 | 8.73  | ≤13 | PASS |
| 16QAM | 5  | 37775 | 2572.5 | 26.57 | 17.56 | 9.01  | ≤13 | PASS |
|       |    | 38000 | 2595   | 26.24 | 15.77 | 10.47 | ≤13 | PASS |
|       |    | 38225 | 2617.5 | 26.51 | 17.57 | 8.94  | ≤13 | PASS |
|       | 10 | 37800 | 2575   | 26.59 | 16.53 | 10.06 | ≤13 | PASS |
|       |    | 38000 | 2595   | 26.41 | 16.53 | 9.88  | ≤13 | PASS |
|       |    | 38200 | 2615   | 26.44 | 16.27 | 10.17 | ≤13 | PASS |
|       | 15 | 37825 | 2577.5 | 26.95 | 17.82 | 9.13  | ≤13 | PASS |
|       |    | 38000 | 2595   | 26.61 | 16.52 | 10.09 | ≤13 | PASS |
|       |    | 38175 | 2612.5 | 26.55 | 16.12 | 10.43 | ≤13 | PASS |
|       | 20 | 37850 | 2580   | 26.65 | 16.85 | 9.80  | ≤13 | PASS |
|       |    | 38000 | 2595   | 26.43 | 16.59 | 9.84  | ≤13 | PASS |
|       |    | 38150 | 2610   | 26.49 | 16.45 | 10.04 | ≤13 | PASS |
| 64QAM | 5  | 37775 | 2572.5 | 26.31 | 18.25 | 8.06  | ≤13 | PASS |
|       |    | 38000 | 2595   | 25.95 | 16.61 | 9.34  | ≤13 | PASS |
|       |    | 38225 | 2617.5 | 25.86 | 16.47 | 9.39  | ≤13 | PASS |
|       | 10 | 37800 | 2575   | 26.25 | 17.00 | 9.25  | ≤13 | PASS |
|       |    | 38000 | 2595   | 26.11 | 16.84 | 9.27  | ≤13 | PASS |
|       |    | 38200 | 2615   | 26.04 | 16.57 | 9.47  | ≤13 | PASS |
|       | 15 | 37825 | 2577.5 | 26.34 | 16.60 | 9.74  | ≤13 | PASS |
|       |    | 38000 | 2595   | 26.32 | 17.81 | 8.51  | ≤13 | PASS |
|       |    | 38175 | 2612.5 | 26.31 | 17.74 | 8.57  | ≤13 | PASS |
|       | 20 | 37850 | 2580   | 26.11 | 15.78 | 10.33 | ≤13 | PASS |
|       |    | 38000 | 2595   | 25.96 | 16.04 | 9.92  | ≤13 | PASS |
|       |    | 38150 | 2610   | 26.11 | 17.03 | 9.08  | ≤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          | 25.45      | 19.67     | 5.78      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 25.95      | 20.18     | 5.77      | ≤13        | PASS       |
|             |                 | 132665  | 1779.3          | 23.63      | 18.26     | 5.37      | ≤13        | PASS       |
|             | 3               | 131987  | 1711.5          | 23.99      | 18.56     | 5.43      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 23.82      | 18.20     | 5.62      | ≤13        | PASS       |
|             |                 | 132657  | 1778.5          | 23.78      | 18.39     | 5.39      | ≤13        | PASS       |
|             | 5               | 131997  | 1712.5          | 25.52      | 19.67     | 5.85      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 25.82      | 20.05     | 5.77      | ≤13        | PASS       |
|             |                 | 132647  | 1777.5          | 25.87      | 20.25     | 5.62      | ≤13        | PASS       |
|             | 10              | 132022  | 1715            | 25.54      | 19.64     | 5.90      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.33      | 21.74     | 5.59      | ≤13        | PASS       |
|             |                 | 132622  | 1775            | 27.10      | 21.66     | 5.44      | ≤13        | PASS       |
|             | 15              | 132047  | 1717.5          | 27.48      | 21.69     | 5.79      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.53      | 21.58     | 5.95      | ≤13        | PASS       |
|             |                 | 132597  | 1772.5          | 27.24      | 21.12     | 6.12      | ≤13        | PASS       |
|             | 20              | 132072  | 1720            | 25.40      | 19.62     | 5.78      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 25.97      | 20.08     | 5.89      | ≤13        | PASS       |
|             |                 | 132572  | 1770            | 25.48      | 19.70     | 5.78      | ≤13        | PASS       |
| 16QAM       | 1.4             | 131979  | 1710.7          | 24.75      | 19.32     | 5.43      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 23.69      | 17.23     | 6.46      | ≤13        | PASS       |
|             |                 | 132665  | 1779.3          | 23.41      | 17.25     | 6.16      | ≤13        | PASS       |
|             | 3               | 131987  | 1711.5          | 23.81      | 17.52     | 6.29      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 23.74      | 17.29     | 6.45      | ≤13        | PASS       |
|             |                 | 132657  | 1778.5          | 23.60      | 17.42     | 6.18      | ≤13        | PASS       |
|             | 5               | 131997  | 1712.5          | 24.85      | 19.55     | 5.30      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 24.99      | 19.10     | 5.89      | ≤13        | PASS       |
|             |                 | 132647  | 1777.5          | 24.61      | 19.19     | 5.42      | ≤13        | PASS       |
|             | 10              | 132022  | 1715            | 24.79      | 19.34     | 5.45      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.46      | 21.17     | 6.29      | ≤13        | PASS       |
|             |                 | 132622  | 1775            | 27.01      | 20.79     | 6.22      | ≤13        | PASS       |
|             | 15              | 132047  | 1717.5          | 27.12      | 20.74     | 6.38      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 27.57      | 21.21     | 6.36      | ≤13        | PASS       |
|             |                 | 132597  | 1772.5          | 24.79      | 19.15     | 5.64      | ≤13        | PASS       |
|             | 20              | 132072  | 1720            | 24.97      | 19.18     | 5.79      | ≤13        | PASS       |
|             |                 | 132322  | 1745            | 25.58      | 19.61     | 5.97      | ≤13        | PASS       |
|             |                 | 132572  | 1770            | 25.05      | 19.32     | 5.73      | ≤13        | PASS       |



|       |     |        |        |       |       |      |     |      |
|-------|-----|--------|--------|-------|-------|------|-----|------|
| 64QAM | 1.4 | 131979 | 1710.7 | 24.03 | 18.72 | 5.31 | ≤13 | PASS |
|       |     | 132322 | 1745   | 24.49 | 18.76 | 5.73 | ≤13 | PASS |
|       |     | 132665 | 1779.3 | 23.94 | 18.62 | 5.32 | ≤13 | PASS |
|       | 3   | 131987 | 1711.5 | 24.23 | 18.91 | 5.32 | ≤13 | PASS |
|       |     | 132322 | 1745   | 24.51 | 18.74 | 5.77 | ≤13 | PASS |
|       |     | 132657 | 1778.5 | 25.77 | 19.23 | 6.54 | ≤13 | PASS |
|       | 5   | 131997 | 1712.5 | 26.35 | 20.11 | 6.24 | ≤13 | PASS |
|       |     | 132322 | 1745   | 26.73 | 20.46 | 6.27 | ≤13 | PASS |
|       |     | 132647 | 1777.5 | 26.56 | 20.58 | 5.98 | ≤13 | PASS |
|       | 10  | 132022 | 1715   | 26.42 | 20.10 | 6.32 | ≤13 | PASS |
|       |     | 132322 | 1745   | 26.91 | 20.60 | 6.31 | ≤13 | PASS |
|       |     | 132622 | 1775   | 26.33 | 20.12 | 6.21 | ≤13 | PASS |
|       | 15  | 132047 | 1717.5 | 26.57 | 20.20 | 6.37 | ≤13 | PASS |
|       |     | 132322 | 1745   | 24.76 | 18.87 | 5.89 | ≤13 | PASS |
|       |     | 132597 | 1772.5 | 24.19 | 18.53 | 5.66 | ≤13 | PASS |
|       | 20  | 132072 | 1720   | 24.40 | 18.59 | 5.81 | ≤13 | PASS |
|       |     | 132322 | 1745   | 25.03 | 19.15 | 5.88 | ≤13 | PASS |
|       |     | 132572 | 1770   | 24.44 | 18.69 | 5.75 | ≤13 | PASS |

## 5.5 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 -30°C to +50°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 -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

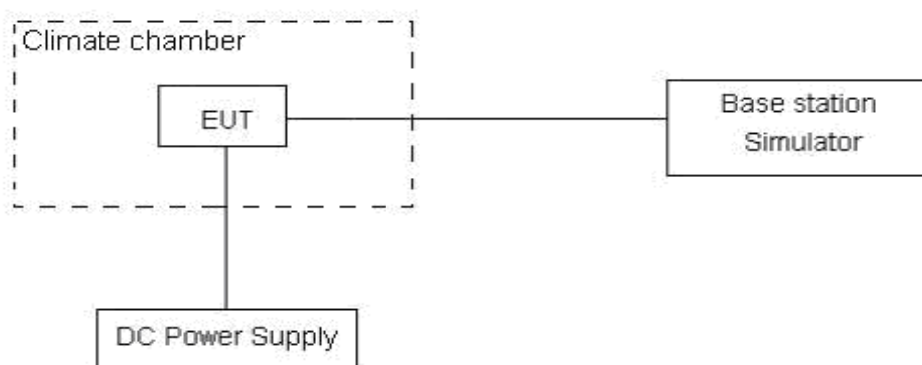
#### Frequency Stability (Voltage Variation)

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

**Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced 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 3.4 V and 4.35 V, with a nominal voltage of 3.8V.

### Test setup



### Limits

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 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  |         |                    |                    |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|---------------------------------|---------------------------------|---------|
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| Temperature    | Voltage | QPSK               | BPSK               | QPSK                            | BPSK                            |         |
| Normal (25℃)   | Normal  | 2.71               | 3.13               | 0.00156                         | 0.00181                         | PASS    |
| Extreme (50℃)  |         | 7.35               | 12.43              | 0.00424                         | 0.00718                         | PASS    |
| Extreme (40℃)  |         | 8.70               | 15.69              | 0.00502                         | 0.00905                         | PASS    |
| Extreme (30℃)  |         | 8.36               | 14.63              | 0.00483                         | 0.00845                         | PASS    |
| Extreme (20℃)  |         | 2.59               | 10.60              | 0.00150                         | 0.00612                         | PASS    |
| Extreme (10℃)  |         | 8.00               | 1.42               | 0.00462                         | 0.00082                         | PASS    |
| Extreme (0℃)   |         | 11.62              | 3.79               | 0.00670                         | 0.00219                         | PASS    |
| Extreme (-10℃) |         | 12.39              | 4.59               | 0.00715                         | 0.00265                         | PASS    |
| Extreme (-20℃) |         | 11.87              | 13.38              | 0.00685                         | 0.00772                         | PASS    |
| Extreme (-30℃) |         | 11.09              | 7.59               | 0.00640                         | 0.00438                         | PASS    |
| 25℃            | LV      | 17.59              | 17.31              | 0.01015                         | 0.00999                         | PASS    |
|                | HV      | 9.57               | 17.72              | 0.00552                         | 0.01023                         | PASS    |

| LTE Band 4     |         |                    |                    |                    |                                 |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 1.4MHz  |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 10.37              | 6.68               | 4.85               | 0.00599                         | 0.00386                         | 0.00280                         | PASS    |
| Extreme (50℃)  |         | 7.91               | 14.57              | 13.56              | 0.00456                         | 0.00841                         | 0.00783                         | PASS    |
| Extreme (40℃)  |         | 13.61              | 8.03               | 14.62              | 0.00786                         | 0.00463                         | 0.00844                         | PASS    |
| Extreme (30℃)  |         | 3.18               | 6.12               | 14.77              | 0.00184                         | 0.00353                         | 0.00853                         | PASS    |
| Extreme (20℃)  |         | 1.10               | 7.59               | 17.81              | 0.00064                         | 0.00438                         | 0.01028                         | PASS    |
| Extreme (10℃)  |         | 9.44               | 1.53               | 16.78              | 0.00545                         | 0.00089                         | 0.00969                         | PASS    |
| Extreme (0℃)   |         | 6.95               | 12.73              | 12.84              | 0.00401                         | 0.00735                         | 0.00741                         | PASS    |
| Extreme (-10℃) |         | 15.45              | 2.07               | 1.48               | 0.00892                         | 0.00119                         | 0.00085                         | PASS    |
| Extreme (-20℃) |         | 8.09               | 13.18              | 15.29              | 0.00467                         | 0.00761                         | 0.00883                         | PASS    |
| Extreme (-30℃) |         | 11.13              | 1.40               | 4.34               | 0.00642                         | 0.00081                         | 0.00251                         | PASS    |
| 25℃            | LV      | 11.69              | 12.28              | 12.99              | 0.00675                         | 0.00709                         | 0.00750                         | PASS    |
|                | HV      | 6.65               | 10.57              | 2.62               | 0.00384                         | 0.00610                         | 0.00151                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 3MHz    |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |



|                |         |                    |                    |                    |                                 |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Normal (25℃)   | Normal  | 15.00              | 6.20               | 9.14               | 0.00866                         | 0.00358                         | 0.00528                         | PASS    |
| Extreme (50℃)  |         | 6.40               | 15.70              | 3.63               | 0.00369                         | 0.00906                         | 0.00210                         | PASS    |
| Extreme (40℃)  |         | 5.21               | 6.23               | 6.83               | 0.00301                         | 0.00359                         | 0.00394                         | PASS    |
| Extreme (30℃)  |         | 10.23              | 10.43              | 5.15               | 0.00591                         | 0.00602                         | 0.00297                         | PASS    |
| Extreme (20℃)  |         | 6.18               | 14.62              | 5.04               | 0.00357                         | 0.00844                         | 0.00291                         | PASS    |
| Extreme (10℃)  |         | 17.78              | 15.03              | 9.53               | 0.01026                         | 0.00868                         | 0.00550                         | PASS    |
| Extreme (0℃)   |         | 4.11               | 8.45               | 7.31               | 0.00237                         | 0.00488                         | 0.00422                         | PASS    |
| Extreme (-10℃) |         | 1.84               | 14.32              | 12.52              | 0.00106                         | 0.00827                         | 0.00723                         | PASS    |
| Extreme (-20℃) |         | 11.68              | 17.46              | 1.58               | 0.00674                         | 0.01008                         | 0.00091                         | PASS    |
| Extreme (-30℃) |         | 2.74               | 10.33              | 13.77              | 0.00158                         | 0.00596                         | 0.00795                         | PASS    |
| 25℃            | LV      | 17.09              | 7.68               | 6.35               | 0.00986                         | 0.00443                         | 0.00366                         | PASS    |
|                | HV      | 16.11              | 15.66              | 12.08              | 0.00930                         | 0.00904                         | 0.00697                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 5MHz    |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 16.96              | 3.46               | 8.66               | 0.00979                         | 0.00200                         | 0.00500                         | PASS    |
| Extreme (50℃)  |         | 15.35              | 7.60               | 8.84               | 0.00886                         | 0.00439                         | 0.00510                         | PASS    |
| Extreme (40℃)  |         | 11.73              | 8.26               | 2.90               | 0.00677                         | 0.00477                         | 0.00167                         | PASS    |
| Extreme (30℃)  |         | 6.94               | 9.87               | 16.85              | 0.00400                         | 0.00570                         | 0.00973                         | PASS    |
| Extreme (20℃)  |         | 12.77              | 5.92               | 9.67               | 0.00737                         | 0.00342                         | 0.00558                         | PASS    |
| Extreme (10℃)  |         | 15.14              | 13.34              | 9.84               | 0.00874                         | 0.00770                         | 0.00568                         | PASS    |
| Extreme (0℃)   |         | 2.61               | 16.41              | 8.78               | 0.00150                         | 0.00947                         | 0.00506                         | PASS    |
| Extreme (-10℃) |         | 14.12              | 2.41               | 2.63               | 0.00815                         | 0.00139                         | 0.00152                         | PASS    |
| Extreme (-20℃) |         | 15.51              | 7.85               | 12.55              | 0.00895                         | 0.00453                         | 0.00724                         | PASS    |
| Extreme (-30℃) |         | 9.69               | 9.68               | 13.77              | 0.00559                         | 0.00559                         | 0.00795                         | PASS    |
| 25℃            | LV      | 12.71              | 2.83               | 12.07              | 0.00734                         | 0.00163                         | 0.00696                         | PASS    |
|                | HV      | 3.13               | 12.65              | 14.64              | 0.00181                         | 0.00730                         | 0.00845                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 10MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 9.03               | 10.87              | 8.62               | 0.00521                         | 0.00627                         | 0.00497                         | PASS    |
| Extreme (50℃)  |         | 7.79               | 8.58               | 1.51               | 0.00450                         | 0.00495                         | 0.00087                         | PASS    |
| Extreme (40℃)  |         | 15.53              | 3.06               | 14.57              | 0.00897                         | 0.00177                         | 0.00841                         | PASS    |
| Extreme (30℃)  |         | 9.29               | 4.51               | 14.55              | 0.00536                         | 0.00260                         | 0.00840                         | PASS    |
| Extreme (20℃)  |         | 1.78               | 14.72              | 16.37              | 0.00103                         | 0.00850                         | 0.00945                         | PASS    |
| Extreme (10℃)  |         | 12.85              | 10.04              | 14.65              | 0.00742                         | 0.00580                         | 0.00846                         | PASS    |
| Extreme (0℃)   |         | 6.40               | 6.73               | 1.22               | 0.00369                         | 0.00388                         | 0.00071                         | PASS    |
| Extreme (-10℃) |         | 12.96              | 11.82              | 14.27              | 0.00748                         | 0.00682                         | 0.00823                         | PASS    |
| Extreme (-20℃) |         | 5.71               | 2.90               | 10.85              | 0.00329                         | 0.00167                         | 0.00626                         | PASS    |



|                |         |                    |                    |                    |                                 |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Extreme (-30℃) |         | 5.67               | 11.92              | 14.19              | 0.00327                         | 0.00688                         | 0.00819                         | PASS    |
| 25℃            | LV      | 1.98               | 12.54              | 5.97               | 0.00114                         | 0.00724                         | 0.00345                         | PASS    |
|                | HV      | 11.52              | 1.51               | 6.37               | 0.00665                         | 0.00087                         | 0.00368                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 15MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 12.85              | 12.45              | 10.64              | 0.00742                         | 0.00718                         | 0.00614                         | PASS    |
| Extreme (50℃)  |         | 13.81              | 5.42               | 14.96              | 0.00797                         | 0.00313                         | 0.00863                         | PASS    |
| Extreme (40℃)  |         | 2.14               | 7.85               | 3.23               | 0.00123                         | 0.00453                         | 0.00186                         | PASS    |
| Extreme (30℃)  |         | 9.63               | 1.41               | 1.59               | 0.00556                         | 0.00081                         | 0.00092                         | PASS    |
| Extreme (20℃)  |         | 6.58               | 15.21              | 2.36               | 0.00380                         | 0.00878                         | 0.00136                         | PASS    |
| Extreme (10℃)  |         | 7.96               | 3.68               | 8.25               | 0.00460                         | 0.00212                         | 0.00476                         | PASS    |
| Extreme (0℃)   |         | 1.74               | 9.85               | 15.17              | 0.00100                         | 0.00569                         | 0.00876                         | PASS    |
| Extreme (-10℃) |         | 15.07              | 11.61              | 5.47               | 0.00870                         | 0.00670                         | 0.00316                         | PASS    |
| Extreme (-20℃) |         | 17.47              | 15.35              | 11.30              | 0.01009                         | 0.00886                         | 0.00652                         | PASS    |
| Extreme (-30℃) |         | 5.21               | 15.39              | 4.76               | 0.00301                         | 0.00888                         | 0.00275                         | PASS    |
| 25℃            | LV      | 9.83               | 4.95               | 6.39               | 0.00568                         | 0.00286                         | 0.00369                         | PASS    |
|                | HV      | 15.09              | 15.69              | 13.70              | 0.00871                         | 0.00906                         | 0.00791                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 20MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 17.26              | 16.77              | 1.80               | 0.00996                         | 0.00968                         | 0.00104                         | PASS    |
| Extreme (50℃)  |         | 1.25               | 14.81              | 13.41              | 0.00072                         | 0.00855                         | 0.00774                         | PASS    |
| Extreme (40℃)  |         | 15.93              | 16.91              | 4.58               | 0.00920                         | 0.00976                         | 0.00264                         | PASS    |
| Extreme (30℃)  |         | 11.26              | 2.71               | 1.88               | 0.00650                         | 0.00156                         | 0.00109                         | PASS    |
| Extreme (20℃)  |         | 1.28               | 5.22               | 14.73              | 0.00074                         | 0.00301                         | 0.00850                         | PASS    |
| Extreme (10℃)  |         | 11.70              | 1.58               | 6.11               | 0.00675                         | 0.00091                         | 0.00352                         | PASS    |
| Extreme (0℃)   |         | 16.69              | 4.27               | 7.86               | 0.00963                         | 0.00247                         | 0.00453                         | PASS    |
| Extreme (-10℃) |         | 9.95               | 4.37               | 5.50               | 0.00574                         | 0.00252                         | 0.00317                         | PASS    |
| Extreme (-20℃) |         | 10.70              | 5.72               | 8.35               | 0.00617                         | 0.00330                         | 0.00482                         | PASS    |
| Extreme (-30℃) |         | 15.95              | 5.68               | 15.18              | 0.00921                         | 0.00328                         | 0.00876                         | PASS    |
| 25℃            | LV      | 15.42              | 16.40              | 10.70              | 0.00890                         | 0.00946                         | 0.00618                         | PASS    |
|                | HV      | 15.67              | 17.29              | 15.56              | 0.00904                         | 0.00998                         | 0.00898                         | PASS    |



| LTE Band 7     |         |                    |                    |                    |                                 |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 5MHz    |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 13.00              | 13.94              | 9.68               | 0.00513                         | 0.00550                         | 0.00382                         | PASS    |
| Extreme (50℃)  |         | 12.27              | 3.43               | 3.48               | 0.00484                         | 0.00135                         | 0.00137                         | PASS    |
| Extreme (40℃)  |         | 6.30               | 5.81               | 10.67              | 0.00248                         | 0.00229                         | 0.00421                         | PASS    |
| Extreme (30℃)  |         | 6.18               | 14.34              | 11.76              | 0.00244                         | 0.00566                         | 0.00464                         | PASS    |
| Extreme (20℃)  |         | 8.46               | 8.23               | 1.12               | 0.00334                         | 0.00325                         | 0.00044                         | PASS    |
| Extreme (10℃)  |         | 1.95               | 2.62               | 8.13               | 0.00077                         | 0.00103                         | 0.00321                         | PASS    |
| Extreme (0℃)   |         | 1.64               | 11.42              | 1.50               | 0.00065                         | 0.00450                         | 0.00059                         | PASS    |
| Extreme (-10℃) |         | 16.50              | 15.61              | 7.94               | 0.00651                         | 0.00616                         | 0.00313                         | PASS    |
| Extreme (-20℃) |         | 14.30              | 7.68               | 17.62              | 0.00564                         | 0.00303                         | 0.00695                         | PASS    |
| Extreme (-30℃) |         | 8.80               | 14.82              | 13.36              | 0.00347                         | 0.00585                         | 0.00527                         | PASS    |
| 25℃            | LV      | 17.37              | 13.77              | 2.46               | 0.00685                         | 0.00543                         | 0.00097                         | PASS    |
|                | HV      | 17.41              | 3.04               | 16.95              | 0.00687                         | 0.00120                         | 0.00669                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 10MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 16.89              | 4.82               | 14.01              | 0.00666                         | 0.00190                         | 0.00553                         | PASS    |
| Extreme (50℃)  |         | 13.06              | 4.84               | 9.93               | 0.00515                         | 0.00191                         | 0.00392                         | PASS    |
| Extreme (40℃)  |         | 16.52              | 15.88              | 7.94               | 0.00652                         | 0.00626                         | 0.00313                         | PASS    |
| Extreme (30℃)  |         | 8.33               | 14.30              | 6.33               | 0.00328                         | 0.00564                         | 0.00250                         | PASS    |
| Extreme (20℃)  |         | 14.19              | 7.31               | 16.68              | 0.00560                         | 0.00288                         | 0.00658                         | PASS    |
| Extreme (10℃)  |         | 5.13               | 13.44              | 6.56               | 0.00203                         | 0.00530                         | 0.00259                         | PASS    |
| Extreme (0℃)   |         | 5.27               | 2.85               | 9.71               | 0.00208                         | 0.00112                         | 0.00383                         | PASS    |
| Extreme (-10℃) |         | 17.36              | 16.00              | 10.21              | 0.00685                         | 0.00631                         | 0.00403                         | PASS    |
| Extreme (-20℃) |         | 12.38              | 10.12              | 3.52               | 0.00488                         | 0.00399                         | 0.00139                         | PASS    |
| Extreme (-30℃) |         | 12.00              | 13.70              | 10.17              | 0.00473                         | 0.00540                         | 0.00401                         | PASS    |
| 25℃            | LV      | 6.11               | 17.29              | 8.49               | 0.00241                         | 0.00682                         | 0.00335                         | PASS    |
|                | HV      | 11.15              | 13.63              | 2.59               | 0.00440                         | 0.00538                         | 0.00102                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 15MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 3.17               | 7.59               | 6.39               | 0.00125                         | 0.00299                         | 0.00252                         | PASS    |
| Extreme (50℃)  |         | 9.52               | 2.19               | 2.15               | 0.00376                         | 0.00086                         | 0.00085                         | PASS    |
| Extreme (40℃)  |         | 12.54              | 15.49              | 15.77              | 0.00495                         | 0.00611                         | 0.00622                         | PASS    |



| Extreme (30℃)  |         | 8.60               | 4.21               | 17.71              | 0.00339                         | 0.00166                         | 0.00699                         | PASS    |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Extreme (20℃)  |         | 4.46               | 1.36               | 8.92               | 0.00176                         | 0.00054                         | 0.00352                         | PASS    |
| Extreme (10℃)  |         | 15.54              | 17.01              | 17.55              | 0.00613                         | 0.00671                         | 0.00692                         | PASS    |
| Extreme (0℃)   |         | 6.35               | 8.00               | 8.36               | 0.00251                         | 0.00315                         | 0.00330                         | PASS    |
| Extreme (-10℃) |         | 12.22              | 9.07               | 7.33               | 0.00482                         | 0.00358                         | 0.00289                         | PASS    |
| Extreme (-20℃) |         | 15.35              | 12.69              | 4.24               | 0.00605                         | 0.00501                         | 0.00167                         | PASS    |
| Extreme (-30℃) |         | 17.62              | 5.09               | 17.96              | 0.00695                         | 0.00201                         | 0.00708                         | PASS    |
| 25℃            | LV      | 15.29              | 16.86              | 12.55              | 0.00603                         | 0.00665                         | 0.00495                         | PASS    |
|                | HV      | 12.27              | 4.33               | 7.44               | 0.00484                         | 0.00171                         | 0.00293                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 20MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 16.44              | 11.78              | 11.52              | 0.00648                         | 0.00465                         | 0.00455                         |         |
| Extreme (50℃)  |         | 17.72              | 16.70              | 10.38              | 0.00699                         | 0.00659                         | 0.00410                         | PASS    |
| Extreme (40℃)  |         | 1.55               | 12.40              | 4.35               | 0.00061                         | 0.00489                         | 0.00172                         | PASS    |
| Extreme (30℃)  |         | 9.04               | 8.12               | 13.78              | 0.00356                         | 0.00320                         | 0.00544                         | PASS    |
| Extreme (20℃)  |         | 8.06               | 9.28               | 10.55              | 0.00318                         | 0.00366                         | 0.00416                         | PASS    |
| Extreme (10℃)  |         | 14.98              | 16.98              | 9.72               | 0.00591                         | 0.00670                         | 0.00383                         | PASS    |
| Extreme (0℃)   |         | 17.80              | 17.54              | 3.98               | 0.00702                         | 0.00692                         | 0.00157                         | PASS    |
| Extreme (-10℃) |         | 6.54               | 11.66              | 17.92              | 0.00258                         | 0.00460                         | 0.00707                         | PASS    |
| Extreme (-20℃) |         | 15.58              | 14.02              | 5.24               | 0.00615                         | 0.00553                         | 0.00207                         | PASS    |
| Extreme (-30℃) |         | 10.81              | 6.02               | 7.46               | 0.00426                         | 0.00237                         | 0.00294                         | PASS    |
| 25℃            | LV      | 2.80               | 13.70              | 7.47               | 0.00111                         | 0.00540                         | 0.00295                         | PASS    |
|                | HV      | 12.85              | 12.80              | 17.84              | 0.00507                         | 0.00505                         | 0.00704                         | PASS    |

| LTE Band 38    |         |                    |                    |                    |                                 |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 5MHz    |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 14.65              | 7.27               | 6.66               | 0.00564                         | 0.00280                         | 0.00257                         | PASS    |
| Extreme (50℃)  |         | 4.09               | 11.87              | 15.99              | 0.00158                         | 0.00457                         | 0.00616                         | PASS    |
| Extreme (40℃)  |         | 8.60               | 7.42               | 14.49              | 0.00332                         | 0.00286                         | 0.00558                         | PASS    |
| Extreme (30℃)  |         | 17.33              | 1.44               | 12.75              | 0.00668                         | 0.00055                         | 0.00491                         | PASS    |
| Extreme (20℃)  |         | 4.94               | 17.28              | 7.56               | 0.00190                         | 0.00666                         | 0.00292                         | PASS    |
| Extreme (10℃)  |         | 8.85               | 1.53               | 8.59               | 0.00341                         | 0.00059                         | 0.00331                         | PASS    |
| Extreme (0℃)   |         | 2.54               | 15.10              | 6.88               | 0.00098                         | 0.00582                         | 0.00265                         | PASS    |
| Extreme (-10℃) |         | 7.59               | 13.96              | 8.48               | 0.00292                         | 0.00538                         | 0.00327                         | PASS    |
| Extreme (-20℃) |         | 1.94               | 14.59              | 2.92               | 0.00075                         | 0.00562                         | 0.00112                         | PASS    |
| Extreme (-30℃) |         | 10.47              | 1.29               | 13.08              | 0.00403                         | 0.00050                         | 0.00504                         | PASS    |



| 25℃            | LV      | 12.11              | 11.01              | 2.38               | 0.00467                         | 0.00424                         | 0.00092                         | PASS    |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
|                | HV      | 10.22              | 1.88               | 1.35               | 0.00394                         | 0.00072                         | 0.00052                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 10MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 3.48               | 4.47               | 3.30               | 0.00134                         | 0.00172                         | 0.00127                         | PASS    |
| Extreme (50℃)  |         | 10.34              | 12.42              | 5.87               | 0.00398                         | 0.00479                         | 0.00226                         | PASS    |
| Extreme (40℃)  |         | 4.14               | 9.85               | 14.26              | 0.00160                         | 0.00380                         | 0.00550                         | PASS    |
| Extreme (30℃)  |         | 3.17               | 9.61               | 1.25               | 0.00122                         | 0.00370                         | 0.00048                         | PASS    |
| Extreme (20℃)  |         | 8.72               | 16.73              | 2.79               | 0.00336                         | 0.00645                         | 0.00107                         | PASS    |
| Extreme (10℃)  |         | 6.52               | 8.82               | 17.99              | 0.00251                         | 0.00340                         | 0.00693                         | PASS    |
| Extreme (0℃)   |         | 5.31               | 1.14               | 1.07               | 0.00205                         | 0.00044                         | 0.00041                         | PASS    |
| Extreme (-10℃) |         | 11.00              | 6.74               | 1.65               | 0.00424                         | 0.00260                         | 0.00064                         | PASS    |
| Extreme (-20℃) |         | 15.80              | 13.82              | 13.93              | 0.00609                         | 0.00533                         | 0.00537                         | PASS    |
| Extreme (-30℃) |         | 10.60              | 16.38              | 7.42               | 0.00408                         | 0.00631                         | 0.00286                         | PASS    |
| 25℃            | LV      | 1.78               | 9.61               | 10.89              | 0.00068                         | 0.00370                         | 0.00420                         | PASS    |
|                | HV      | 9.64               | 14.19              | 12.96              | 0.00371                         | 0.00547                         | 0.00499                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 15MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 13.00              | 15.00              | 5.00               | 0.00501                         | 0.00578                         | 0.00193                         | PASS    |
| Extreme (50℃)  |         | 3.00               | 4.00               | 16.00              | 0.00116                         | 0.00154                         | 0.00617                         | PASS    |
| Extreme (40℃)  |         | 14.00              | 10.00              | 10.00              | 0.00539                         | 0.00385                         | 0.00385                         | PASS    |
| Extreme (30℃)  |         | 14.00              | 3.00               | 13.00              | 0.00539                         | 0.00116                         | 0.00501                         | PASS    |
| Extreme (20℃)  |         | 2.00               | 16.00              | 4.00               | 0.00077                         | 0.00617                         | 0.00154                         | PASS    |
| Extreme (10℃)  |         | 4.00               | 4.00               | 5.00               | 0.00154                         | 0.00154                         | 0.00193                         | PASS    |
| Extreme (0℃)   |         | 11.00              | 15.00              | 3.00               | 0.00424                         | 0.00578                         | 0.00116                         | PASS    |
| Extreme (-10℃) |         | 11.00              | 8.00               | 8.00               | 0.00424                         | 0.00308                         | 0.00308                         | PASS    |
| Extreme (-20℃) |         | 3.00               | 13.00              | 17.00              | 0.00116                         | 0.00501                         | 0.00655                         | PASS    |
| Extreme (-30℃) |         | 1.00               | 7.00               | 1.00               | 0.00039                         | 0.00270                         | 0.00039                         | PASS    |
| 25℃            | LV      | 14.00              | 17.00              | 12.00              | 0.00539                         | 0.00655                         | 0.00462                         | PASS    |
|                | HV      | 2.00               | 7.00               | 15.00              | 0.00077                         | 0.00270                         | 0.00578                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 20MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 11.00              | 11.00              | 8.00               | 0.00424                         | 0.00424                         | 0.00308                         | PASS    |
| Extreme (50℃)  |         | 5.00               | 5.00               | 14.00              | 0.00193                         | 0.00193                         | 0.00539                         | PASS    |
| Extreme (40℃)  |         | 2.00               | 12.00              | 12.00              | 0.00077                         | 0.00462                         | 0.00462                         | PASS    |



|                |    |       |       |       |         |         |         |      |
|----------------|----|-------|-------|-------|---------|---------|---------|------|
| Extreme (30℃)  |    | 14.00 | 10.00 | 2.00  | 0.00539 | 0.00385 | 0.00077 | PASS |
| Extreme (20℃)  |    | 12.00 | 5.00  | 4.00  | 0.00462 | 0.00193 | 0.00154 | PASS |
| Extreme (10℃)  |    | 2.00  | 16.00 | 15.00 | 0.00077 | 0.00617 | 0.00578 | PASS |
| Extreme (0℃)   |    | 9.00  | 13.00 | 7.00  | 0.00347 | 0.00501 | 0.00270 | PASS |
| Extreme (-10℃) |    | 3.00  | 1.00  | 9.00  | 0.00116 | 0.00039 | 0.00347 | PASS |
| Extreme (-20℃) |    | 10.00 | 9.00  | 11.00 | 0.00385 | 0.00347 | 0.00424 | PASS |
| Extreme (-30℃) |    | 14.00 | 5.00  | 14.00 | 0.00539 | 0.00193 | 0.00539 | PASS |
| 25℃            | LV | 6.00  | 9.00  | 1.00  | 0.00231 | 0.00347 | 0.00039 | PASS |
|                | HV | 8.00  | 6.00  | 8.00  | 0.00308 | 0.00231 | 0.00308 | PASS |

| LTE Band 66    |         |                    |                    |                    |                                 |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 1.4MHz  |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 7.00               | 6.00               | 1.00               | 0.00401                         | 0.00344                         | 0.00057                         | PASS    |
| Extreme (50℃)  |         | 14.00              | 9.00               | 15.00              | 0.00802                         | 0.00516                         | 0.00860                         | PASS    |
| Extreme (40℃)  |         | 12.00              | 14.00              | 10.00              | 0.00688                         | 0.00802                         | 0.00573                         | PASS    |
| Extreme (30℃)  |         | 1.00               | 7.00               | 6.00               | 0.00057                         | 0.00401                         | 0.00344                         | PASS    |
| Extreme (20℃)  |         | 9.00               | 3.00               | 4.00               | 0.00516                         | 0.00172                         | 0.00229                         | PASS    |
| Extreme (10℃)  |         | 7.00               | 15.00              | 2.00               | 0.00401                         | 0.00860                         | 0.00115                         | PASS    |
| Extreme (0℃)   |         | 12.00              | 6.00               | 14.00              | 0.00688                         | 0.00344                         | 0.00802                         | PASS    |
| Extreme (-10℃) |         | 1.00               | 16.00              | 14.00              | 0.00057                         | 0.00917                         | 0.00802                         | PASS    |
| Extreme (-20℃) |         | 6.00               | 4.00               | 1.00               | 0.00344                         | 0.00229                         | 0.00057                         | PASS    |
| Extreme (-30℃) |         | 3.00               | 9.00               | 6.00               | 0.00172                         | 0.00516                         | 0.00344                         | PASS    |
| 25℃            | LV      | 3.00               | 7.00               | 5.00               | 0.00172                         | 0.00401                         | 0.00287                         | PASS    |
|                | HV      | 1.00               | 14.00              | 1.00               | 0.00057                         | 0.00802                         | 0.00057                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 3MHz    |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 7.00               | 10.00              | 6.00               | 0.00401                         | 0.00573                         | 0.00344                         | PASS    |
| Extreme (50℃)  |         | 2.00               | 10.00              | 15.00              | 0.00115                         | 0.00573                         | 0.00860                         | PASS    |
| Extreme (40℃)  |         | 3.00               | 14.00              | 1.00               | 0.00172                         | 0.00802                         | 0.00057                         | PASS    |
| Extreme (30℃)  |         | 9.00               | 17.00              | 1.00               | 0.00516                         | 0.00974                         | 0.00057                         | PASS    |
| Extreme (20℃)  |         | 16.00              | 7.00               | 8.00               | 0.00917                         | 0.00401                         | 0.00458                         | PASS    |
| Extreme (10℃)  |         | 7.00               | 10.00              | 17.00              | 0.00401                         | 0.00573                         | 0.00974                         | PASS    |
| Extreme (0℃)   |         | 7.00               | 16.00              | 5.00               | 0.00401                         | 0.00917                         | 0.00287                         | PASS    |
| Extreme (-10℃) |         | 5.00               | 10.00              | 11.00              | 0.00287                         | 0.00573                         | 0.00630                         | PASS    |
| Extreme (-20℃) |         | 17.00              | 3.00               | 12.00              | 0.00974                         | 0.00172                         | 0.00688                         | PASS    |
| Extreme (-30℃) |         | 13.00              | 12.00              | 4.00               | 0.00745                         | 0.00688                         | 0.00229                         | PASS    |
| 25℃            | LV      | 6.00               | 9.00               | 3.00               | 0.00344                         | 0.00516                         | 0.00172                         | PASS    |
|                | HV      | 5.00               | 5.00               | 17.00              | 0.00287                         | 0.00287                         | 0.00974                         | PASS    |



| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| BANDWIDTH      | 5MHz    |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 1.00               | 9.00               | 5.00               | 0.00057                         | 0.00516                         | 0.00287                         | PASS    |
| Extreme (50℃)  |         | 16.00              | 12.00              | 9.00               | 0.00917                         | 0.00688                         | 0.00516                         | PASS    |
| Extreme (40℃)  |         | 11.00              | 9.00               | 5.00               | 0.00630                         | 0.00516                         | 0.00287                         | PASS    |
| Extreme (30℃)  |         | 10.00              | 3.00               | 16.00              | 0.00573                         | 0.00172                         | 0.00917                         | PASS    |
| Extreme (20℃)  |         | 12.00              | 10.00              | 16.00              | 0.00688                         | 0.00573                         | 0.00917                         | PASS    |
| Extreme (10℃)  |         | 16.00              | 7.00               | 11.00              | 0.00917                         | 0.00401                         | 0.00630                         | PASS    |
| Extreme (0℃)   |         | 3.00               | 16.00              | 2.00               | 0.00172                         | 0.00917                         | 0.00115                         | PASS    |
| Extreme (-10℃) |         | 14.00              | 10.00              | 10.00              | 0.00802                         | 0.00573                         | 0.00573                         | PASS    |
| Extreme (-20℃) |         | 14.00              | 17.00              | 6.00               | 0.00802                         | 0.00974                         | 0.00344                         | PASS    |
| Extreme (-30℃) |         | 11.00              | 1.00               | 13.00              | 0.00630                         | 0.00057                         | 0.00745                         | PASS    |
| 25℃            | LV      | 5.00               | 14.00              | 7.00               | 0.00287                         | 0.00802                         | 0.00401                         | PASS    |
|                | HV      | 8.00               | 17.00              | 14.00              | 0.00458                         | 0.00974                         | 0.00802                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 10MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 5.00               | 4.00               | 2.00               | 0.00287                         | 0.00229                         | 0.00115                         | PASS    |
| Extreme (50℃)  |         | 3.00               | 4.00               | 7.00               | 0.00172                         | 0.00229                         | 0.00401                         | PASS    |
| Extreme (40℃)  |         | 12.00              | 12.00              | 5.00               | 0.00688                         | 0.00688                         | 0.00287                         | PASS    |
| Extreme (30℃)  |         | 10.00              | 16.00              | 4.00               | 0.00573                         | 0.00917                         | 0.00229                         | PASS    |
| Extreme (20℃)  |         | 16.00              | 7.00               | 2.00               | 0.00917                         | 0.00401                         | 0.00115                         | PASS    |
| Extreme (10℃)  |         | 3.00               | 7.00               | 9.00               | 0.00172                         | 0.00401                         | 0.00516                         | PASS    |
| Extreme (0℃)   |         | 10.00              | 15.00              | 2.00               | 0.00573                         | 0.00860                         | 0.00115                         | PASS    |
| Extreme (-10℃) |         | 5.00               | 9.00               | 14.00              | 0.00287                         | 0.00516                         | 0.00802                         | PASS    |
| Extreme (-20℃) |         | 7.00               | 13.00              | 3.00               | 0.00401                         | 0.00745                         | 0.00172                         | PASS    |
| Extreme (-30℃) |         | 11.00              | 16.00              | 17.00              | 0.00630                         | 0.00917                         | 0.00974                         | PASS    |
| 25℃            | LV      | 2.00               | 1.00               | 1.00               | 0.00115                         | 0.00057                         | 0.00057                         | PASS    |
|                | HV      | 11.00              | 7.00               | 17.00              | 0.00630                         | 0.00401                         | 0.00974                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 15MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 8.00               | 10.00              | 3.00               | 0.00458                         | 0.00573                         | 0.00172                         | PASS    |
| Extreme (50℃)  |         | 7.00               | 2.00               | 10.00              | 0.00401                         | 0.00115                         | 0.00573                         | PASS    |
| Extreme (40℃)  |         | 12.00              | 15.00              | 15.00              | 0.00688                         | 0.00860                         | 0.00860                         | PASS    |
| Extreme (30℃)  |         | 7.00               | 10.00              | 16.00              | 0.00401                         | 0.00573                         | 0.00917                         | PASS    |
| Extreme (20℃)  |         | 7.00               | 4.00               | 11.00              | 0.00401                         | 0.00229                         | 0.00630                         | PASS    |
| Extreme (10℃)  |         | 3.00               | 7.00               | 2.00               | 0.00172                         | 0.00401                         | 0.00115                         | PASS    |
| Extreme (0℃)   |         | 10.00              | 2.00               | 7.00               | 0.00573                         | 0.00115                         | 0.00401                         | PASS    |



|                |         |                    |                    |                    |                                 |                                 |                                 |         |
|----------------|---------|--------------------|--------------------|--------------------|---------------------------------|---------------------------------|---------------------------------|---------|
| Extreme (-10℃) |         | 16.00              | 7.00               | 7.00               | 0.00917                         | 0.00401                         | 0.00401                         | PASS    |
| Extreme (-20℃) |         | 12.00              | 6.00               | 2.00               | 0.00688                         | 0.00344                         | 0.00115                         | PASS    |
| Extreme (-30℃) |         | 3.00               | 13.00              | 8.00               | 0.00172                         | 0.00745                         | 0.00458                         | PASS    |
| 25℃            | LV      | 17.00              | 6.00               | 4.00               | 0.00974                         | 0.00344                         | 0.00229                         | PASS    |
|                | HV      | 5.00               | 1.00               | 5.00               | 0.00287                         | 0.00057                         | 0.00287                         | PASS    |
| Condition      |         | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Freq.Error<br>(Hz) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Frequency<br>Stability<br>(ppm) | Verdict |
| BANDWIDTH      | 20MHz   |                    |                    |                    |                                 |                                 |                                 |         |
| Temperature    | Voltage | 64QAM              | 16QAM              | QPSK               | 64QAM                           | 16QAM                           | QPSK                            |         |
| Normal (25℃)   | Normal  | 17.00              | 9.00               | 1.00               | 0.00974                         | 0.00516                         | 0.00057                         | PASS    |
| Extreme (50℃)  |         | 10.00              | 6.00               | 6.00               | 0.00573                         | 0.00344                         | 0.00344                         | PASS    |
| Extreme (40℃)  |         | 3.00               | 4.00               | 16.00              | 0.00172                         | 0.00229                         | 0.00917                         | PASS    |
| Extreme (30℃)  |         | 15.00              | 4.00               | 4.00               | 0.00860                         | 0.00229                         | 0.00229                         | PASS    |
| Extreme (20℃)  |         | 15.00              | 1.00               | 6.00               | 0.00860                         | 0.00057                         | 0.00344                         | PASS    |
| Extreme (10℃)  |         | 15.00              | 6.00               | 5.00               | 0.00860                         | 0.00344                         | 0.00287                         | PASS    |
| Extreme (0℃)   |         | 12.00              | 11.00              | 15.00              | 0.00688                         | 0.00630                         | 0.00860                         | PASS    |
| Extreme (-10℃) |         | 7.00               | 5.00               | 3.00               | 0.00401                         | 0.00287                         | 0.00172                         | PASS    |
| Extreme (-20℃) |         | 13.00              | 3.00               | 16.00              | 0.00745                         | 0.00172                         | 0.00917                         | PASS    |
| Extreme (-30℃) |         | 3.00               | 4.00               | 17.00              | 0.00172                         | 0.00229                         | 0.00974                         | PASS    |
| 25℃            | LV      | 11.00              | 17.00              | 10.00              | 0.00630                         | 0.00974                         | 0.00573                         | PASS    |
|                | HV      | 15.00              | 11.00              | 3.00               | 0.00860                         | 0.00630                         | 0.00172                         | PASS    |

## 5.6 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.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

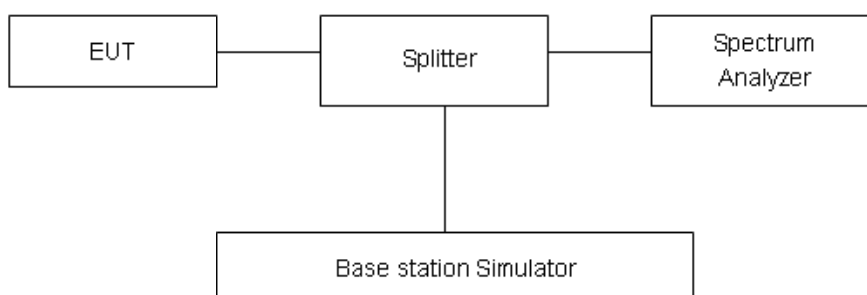
RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

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

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(m)  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

|                     |         |
|---------------------|---------|
| Part 27.53(h) Limit | -13 dBm |
| Part 27.53(m) Limit | -25 dBm |



## Measurement Uncertainty

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

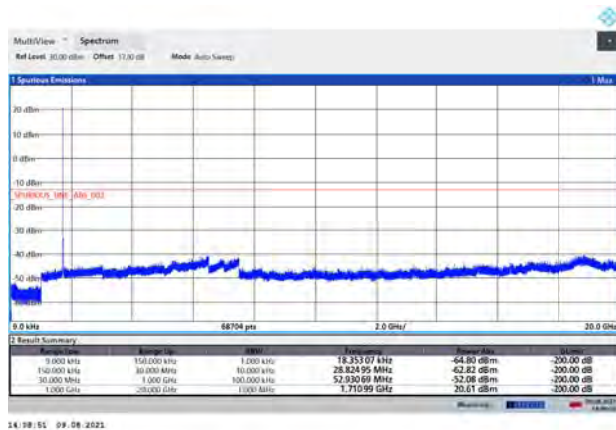
| Frequency  | Uncertainty |
|------------|-------------|
| 9kHz-1GHz  | 0.684 dB    |
| 1GHz-27GHz | 1.407 dB    |

## 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.

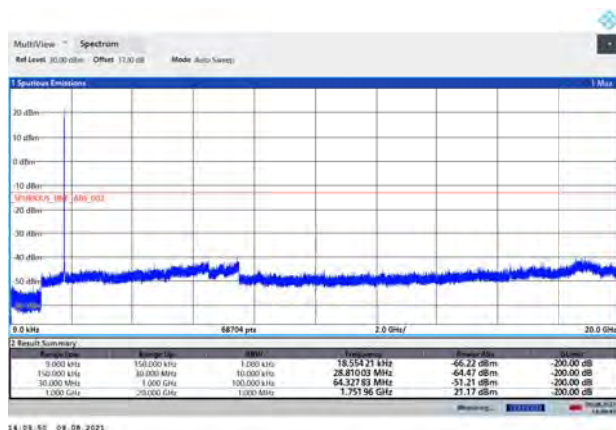
WCDMA Band IV CH-Low 9kHz~20GHz



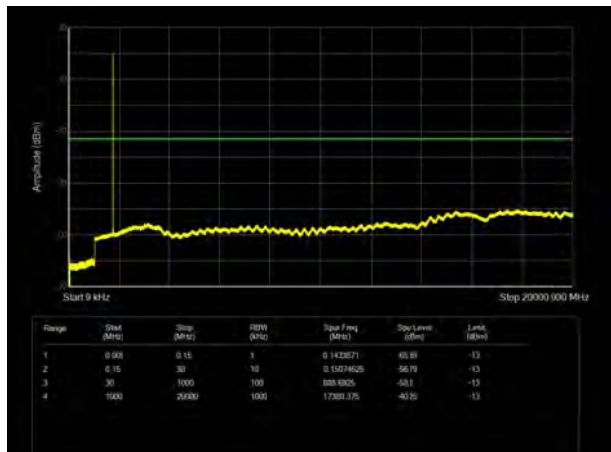
WCDMA Band IV CH-Middle 9kHz~20GHz



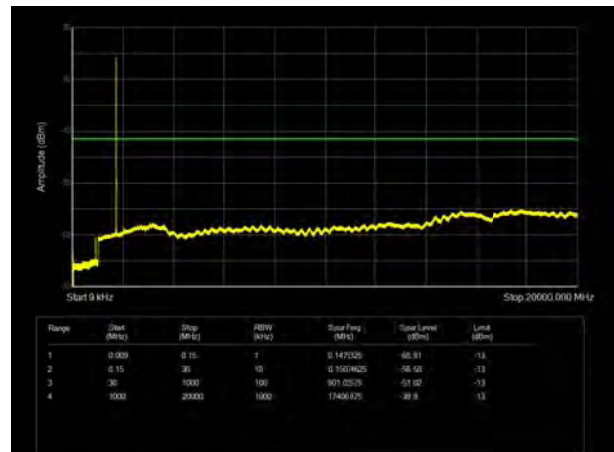
WCDMA Band IV CH-High 9kHz~20GHz



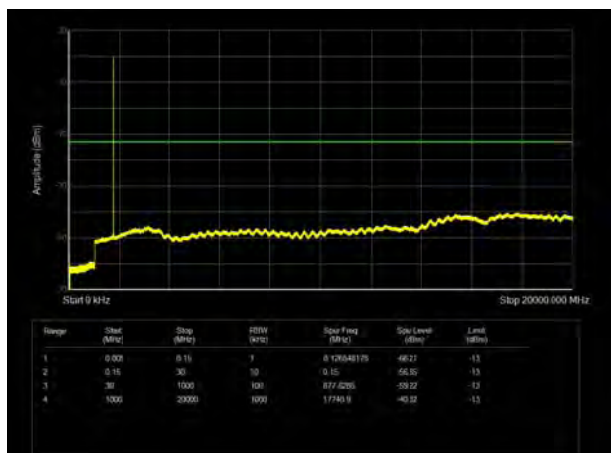
LTE Band 4 1.4MHz CH-Low 9kHz~20GHz



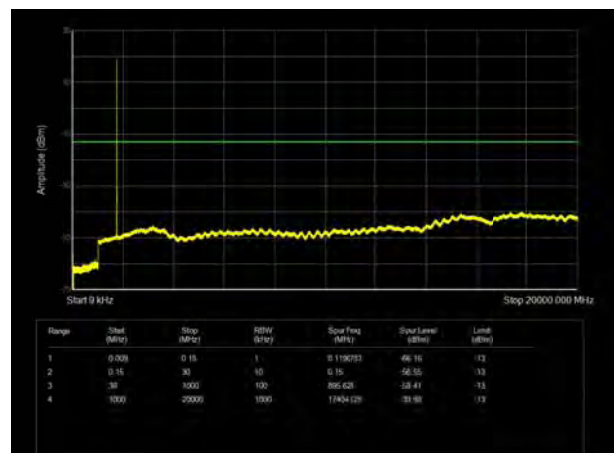
LTE Band 4 3MHz CH- Low 9kHz~20GHz



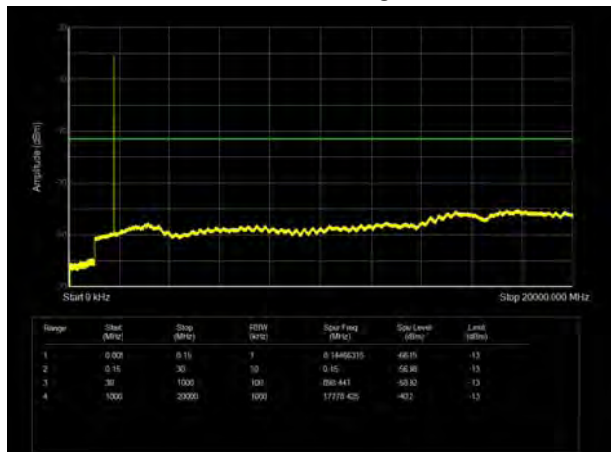
LTE Band 4 1.4MHz CH- Middle 9kHz~20GHz



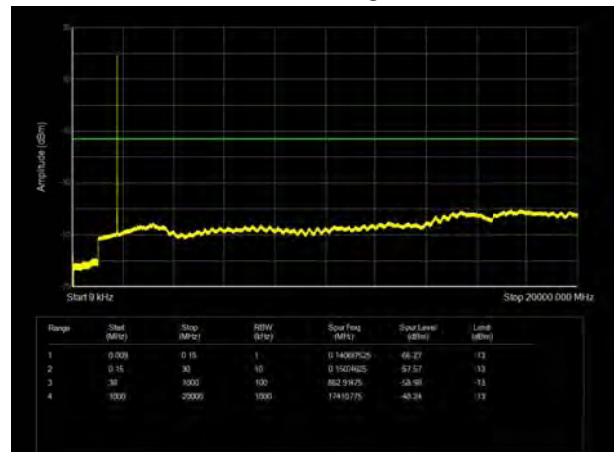
LTE Band 4 3MHz CH- Middle 9kHz~20GHz



LTE Band 4 1.4MHz CH- High 9kHz~20GHz

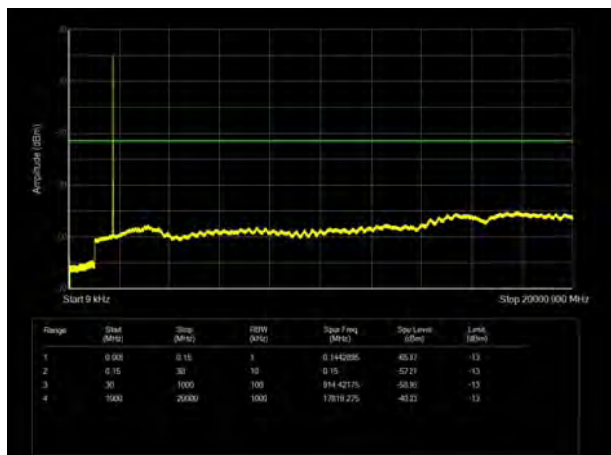


LTE Band 4 3MHz CH-High 9kHz~20GHz

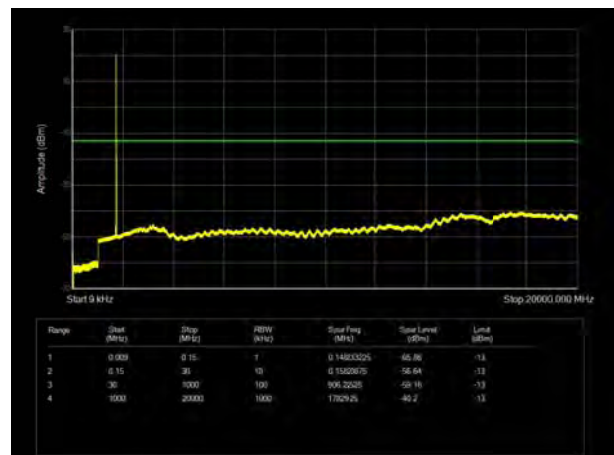




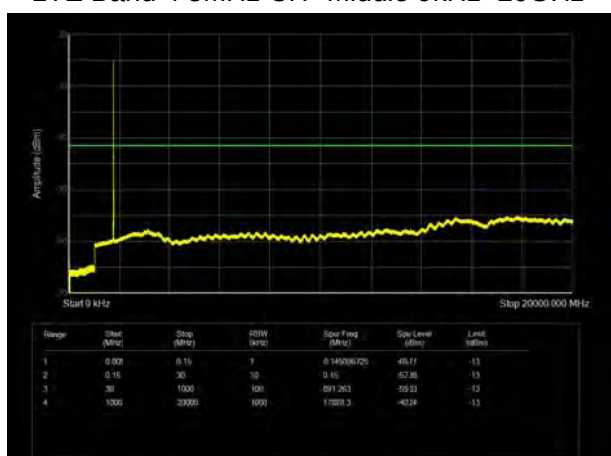
## LTE Band 4 5MHz CH- Low 9kHz~20GHz



## LTE Band 4 10MHz CH- Low 9kHz~20GHz



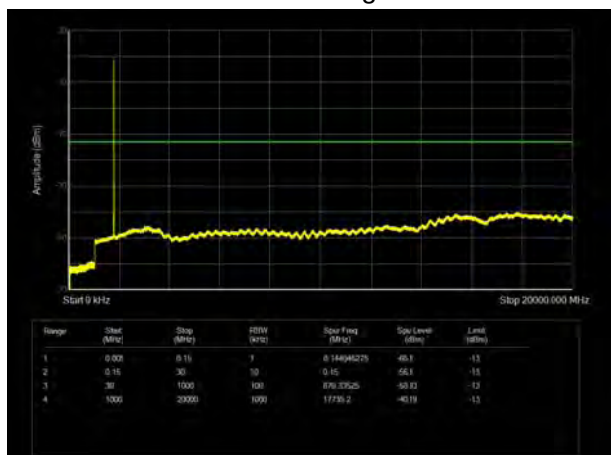
## LTE Band 4 5MHz CH- Middle 9kHz~20GHz



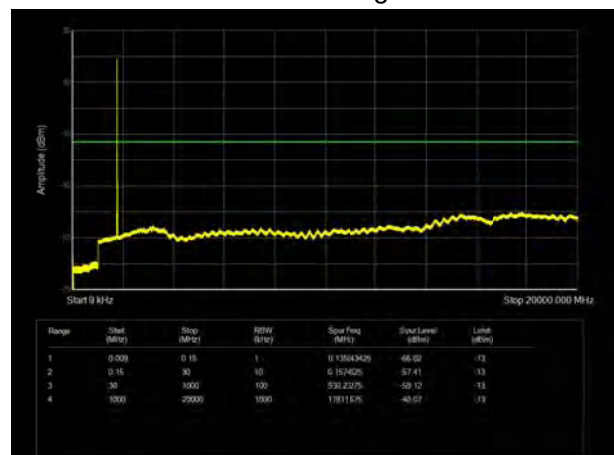
## LTE Band 4 10MHz CH- Middle 9kHz~20GHz



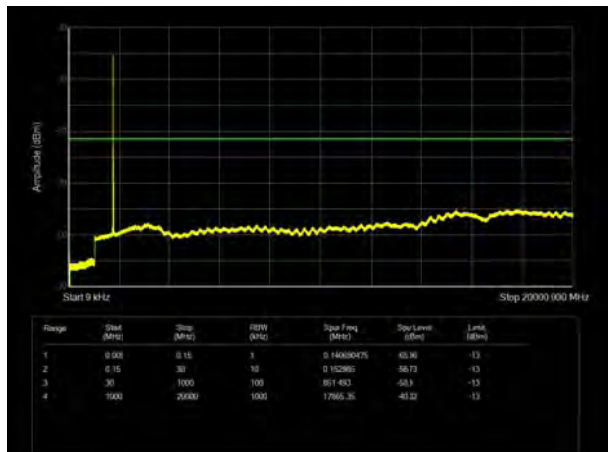
## LTE Band 4 5MHz CH-High 9kHz~20GHz



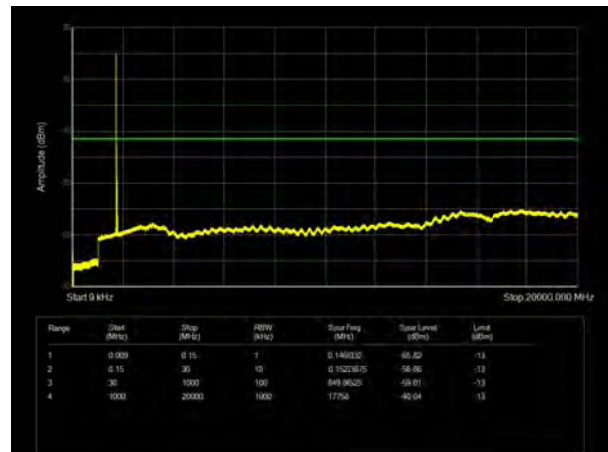
## LTE Band 4 10MHz CH-High 9kHz~20GHz



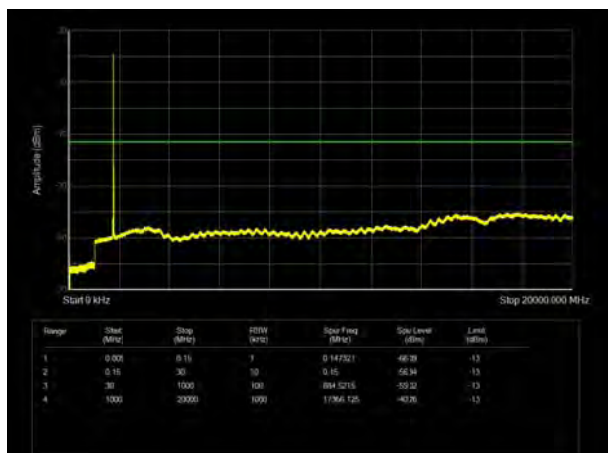
LTE Band 4 15MHz CH- Low 9kHz~20GHz



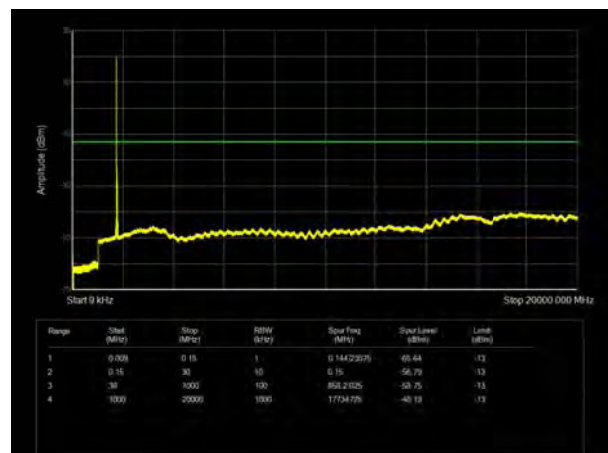
LTE Band 4 20MHz CH-Low 9kHz~20GHz



LTE Band 4 15MHz CH- Middle 9kHz~20GHz



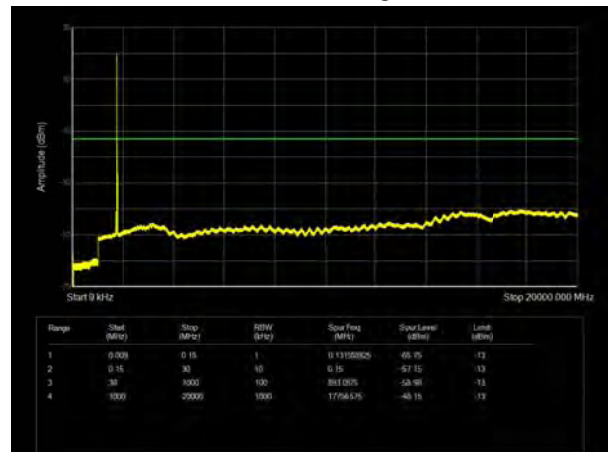
LTE Band 4 20MHz CH- Middle 9kHz~20GHz



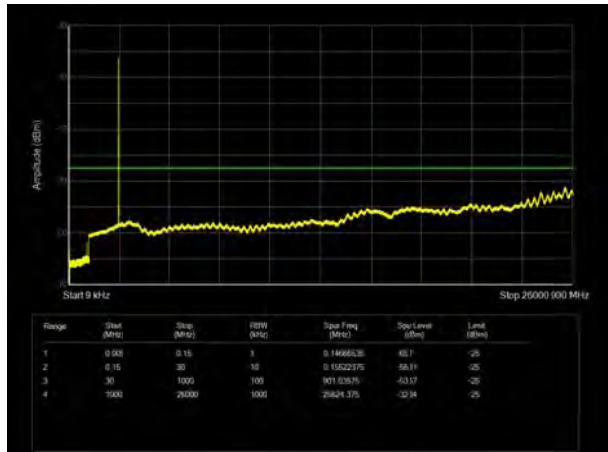
LTE Band 4 15MHz CH-High 9kHz~20GHz



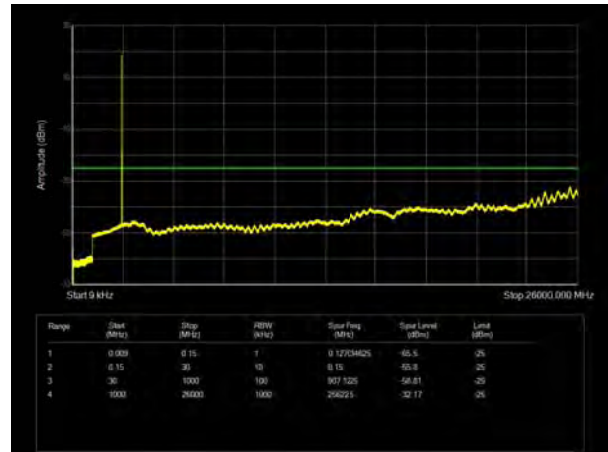
LTE Band 4 20MHz CH- High 9kHz~20GHz



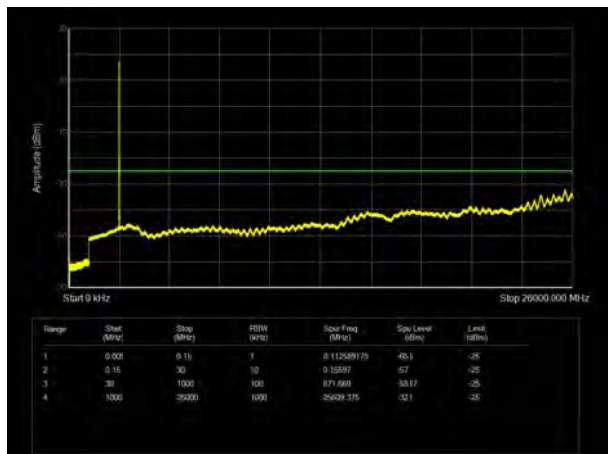
### LTE Band 7 5MHz CH-Low 9kHz~26GHz



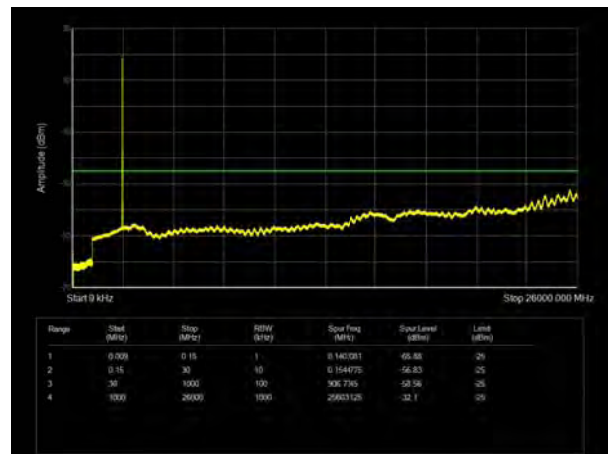
### LTE Band 7 10MHz CH- Low 9kHz~26GHz



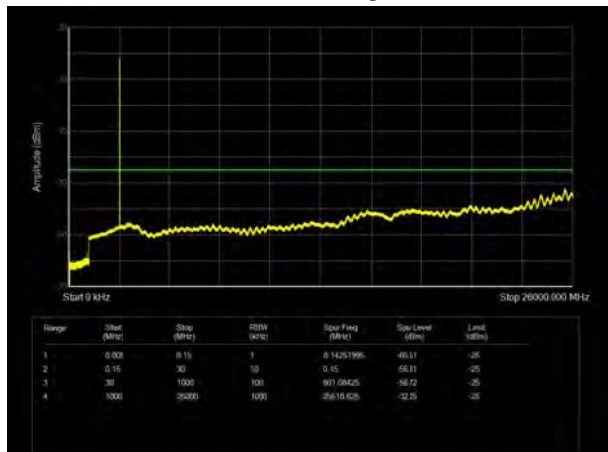
### LTE Band 7 5MHz CH- Middle 9kHz~26GHz



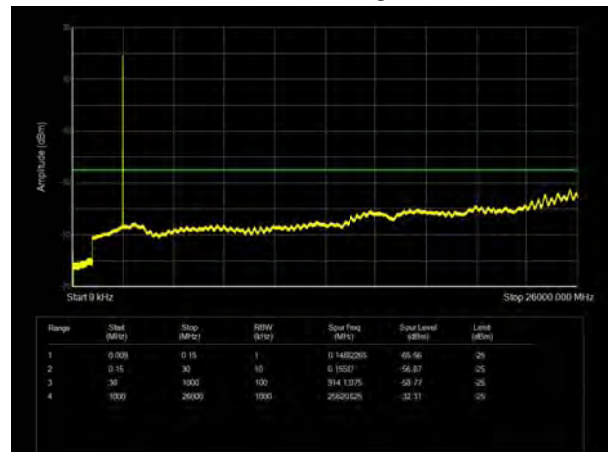
### LTE Band 7 10MHz CH- Middle 9kHz~26GHz



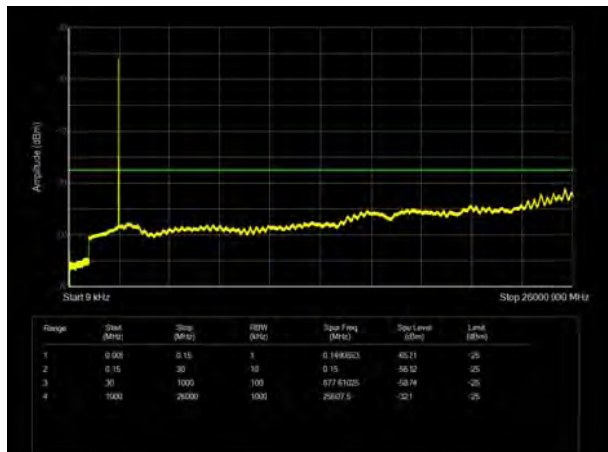
### LTE Band 7 5MHz CH- High 9kHz~26GHz



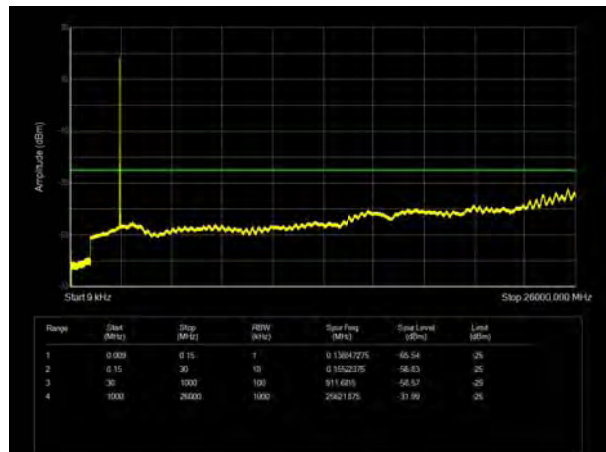
### LTE Band 7 10MHz CH-High 9kHz~26GHz



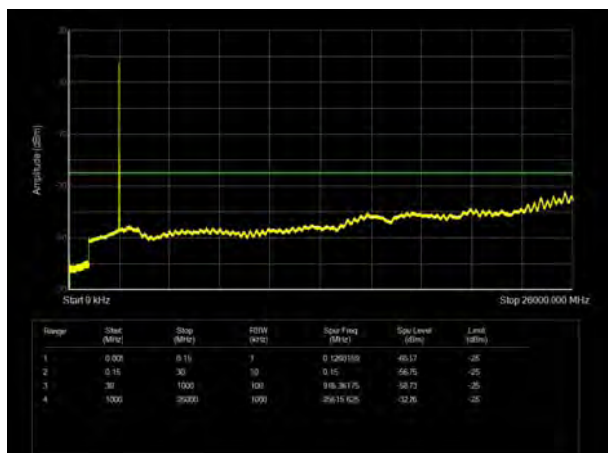
LTE Band 7 15MHz CH- Low 9kHz~26GHz



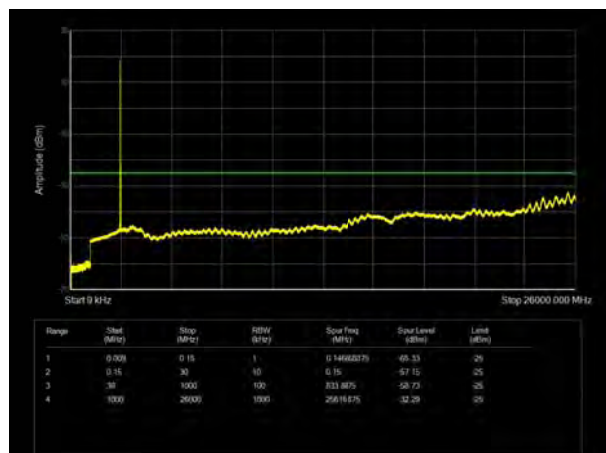
LTE Band 7 20MHz CH-Low 9kHz~26GHz



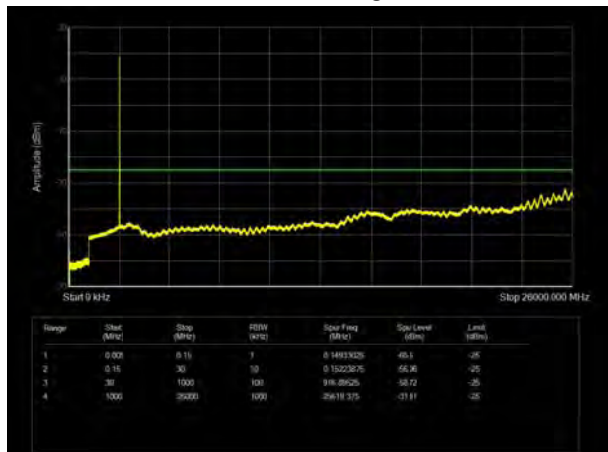
LTE Band 7 15MHz CH- Middle 9kHz~26GHz



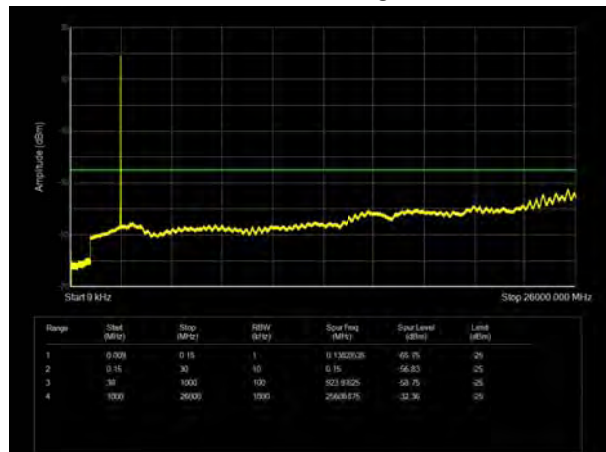
LTE Band 7 20MHz CH- Middle 9kHz~26GHz



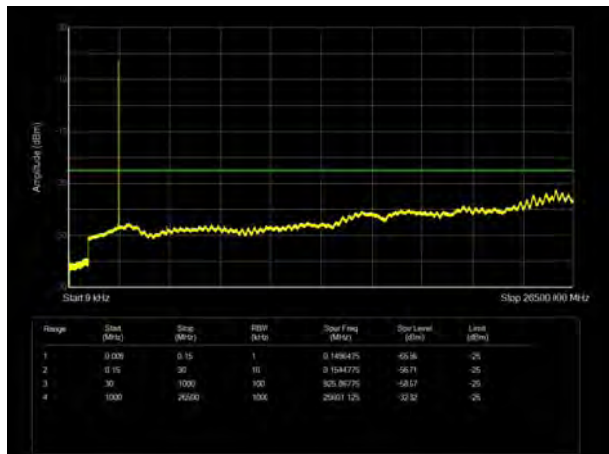
LTE Band 7 15MHz CH-High 9kHz~26GHz



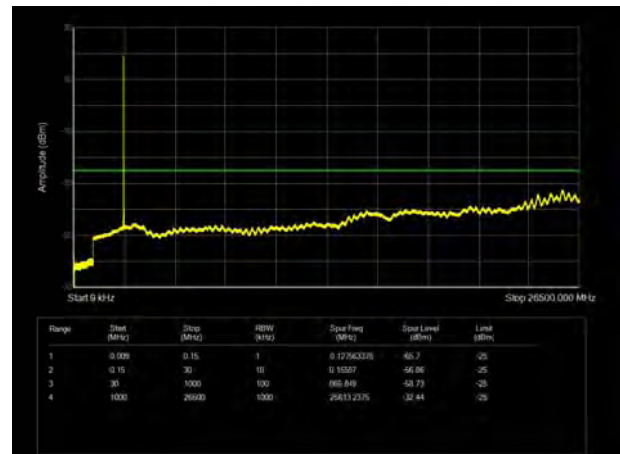
LTE Band 7 20MHz CH- High 9kHz~26GHz



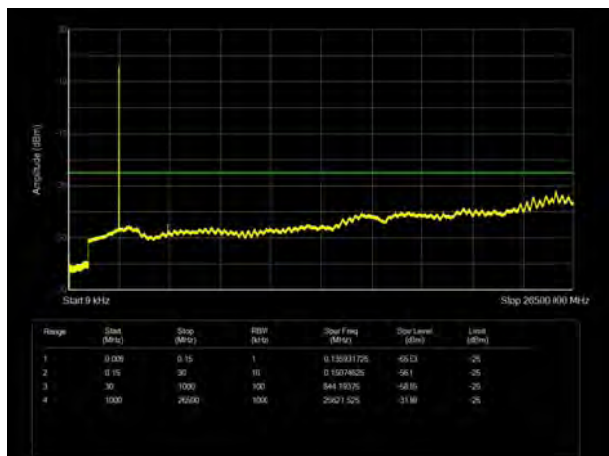
### LTE Band 38 5MHz CH- Low 9kHz~26.5GHz



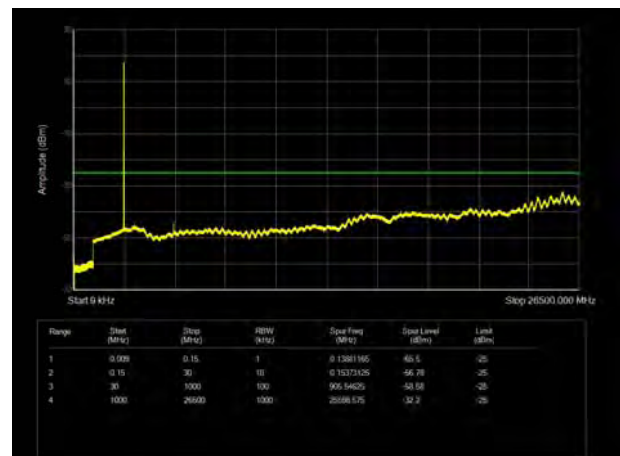
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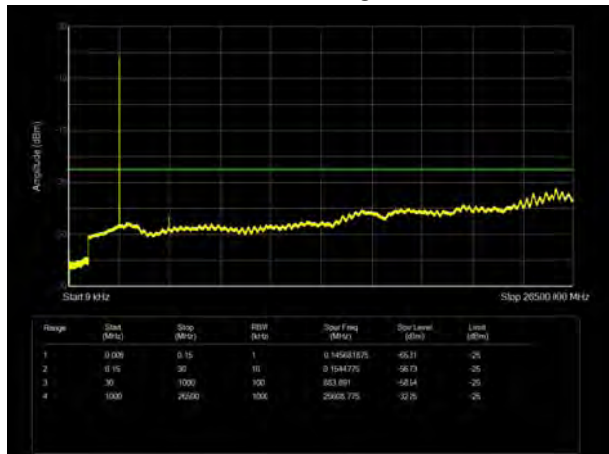
### LTE Band 38 5MHz CH- Middle 9kHz~26.5GHz



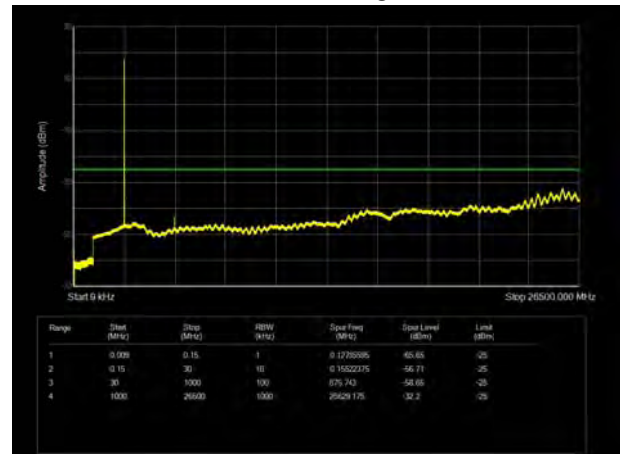
### LTE Band 38 10MHz CH- Middle 9kHz~26.5GHz



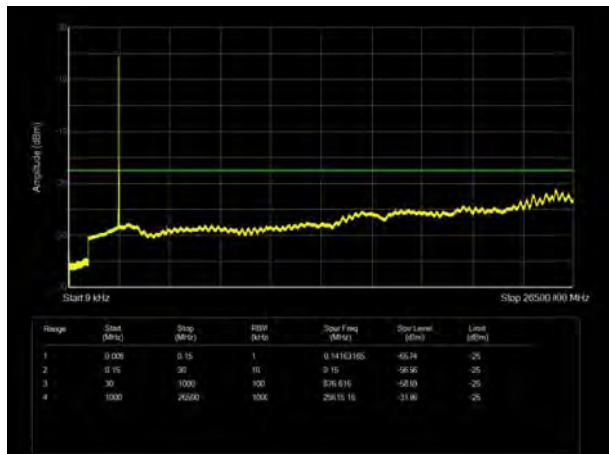
### LTE Band 38 5MHz CH-High 9kHz~26.5GHz



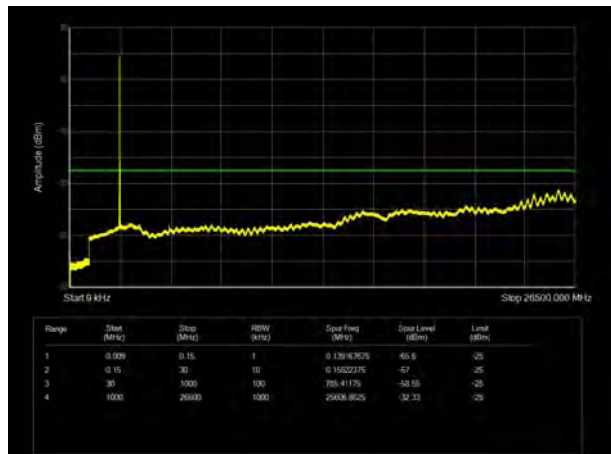
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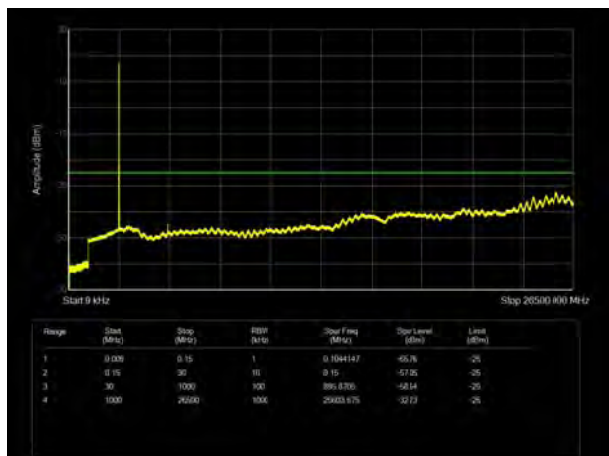
LTE Band 38 15MHz CH- Low 9kHz~26.5GHz



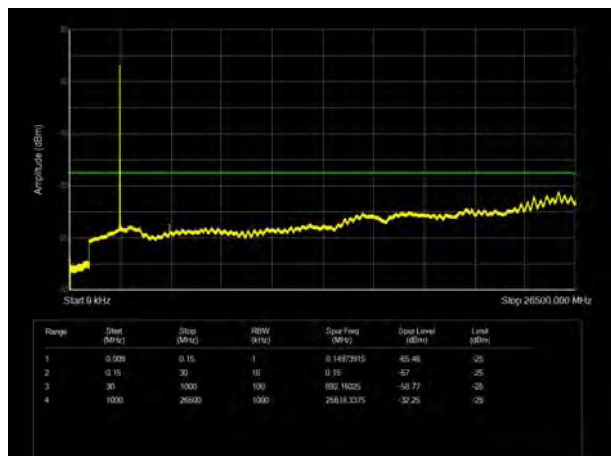
LTE Band 38 20MHz CH-Low 9kHz~26.5GHz



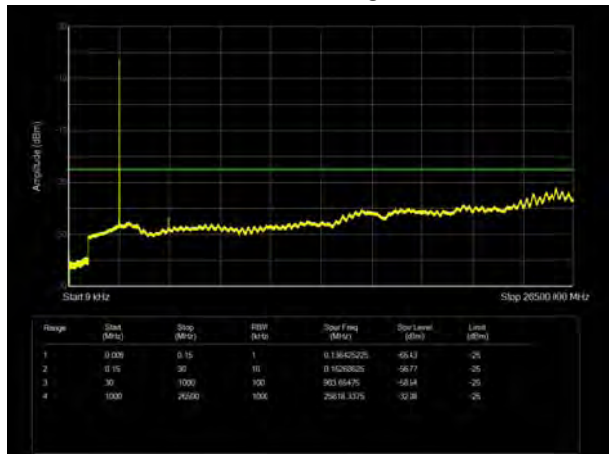
LTE Band 38 15MHz CH- Middle 9kHz~26.5GHz



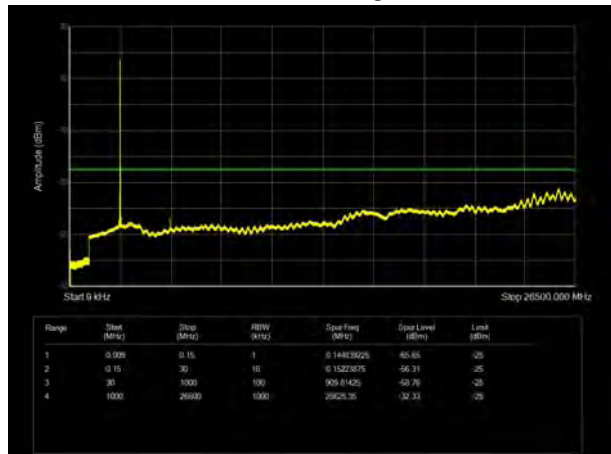
LTE Band 38 20MHz CH- Middle 9kHz~26.5GHz



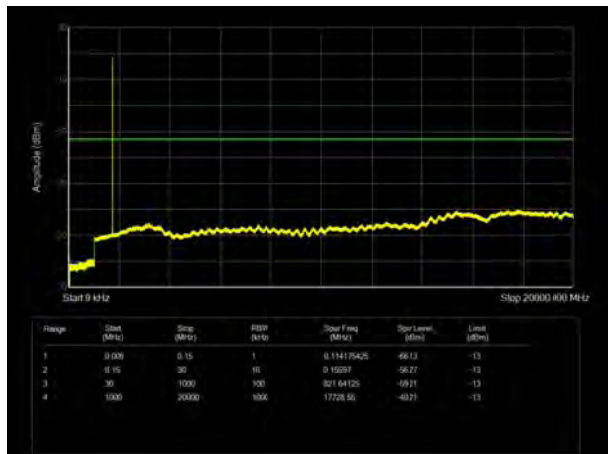
LTE Band 38 15MHz CH-High 9kHz~26.5GHz



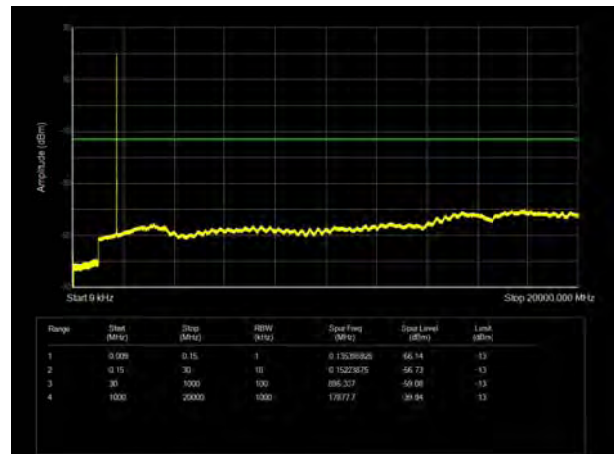
LTE Band 38 20MHz CH- High 9kHz~26.5GHz



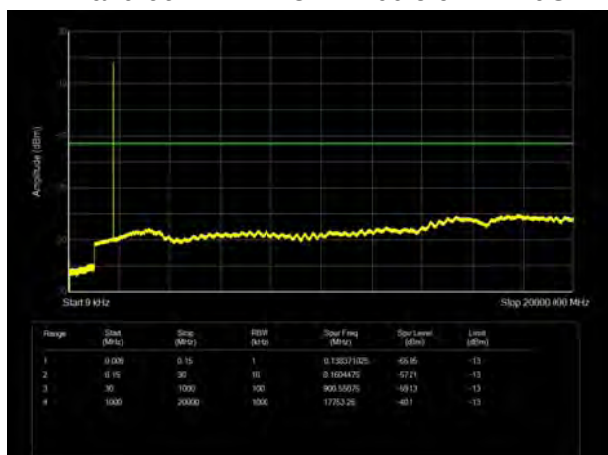
LTE Band 66 1.4MHz CH-Low 9kHz~20GHz



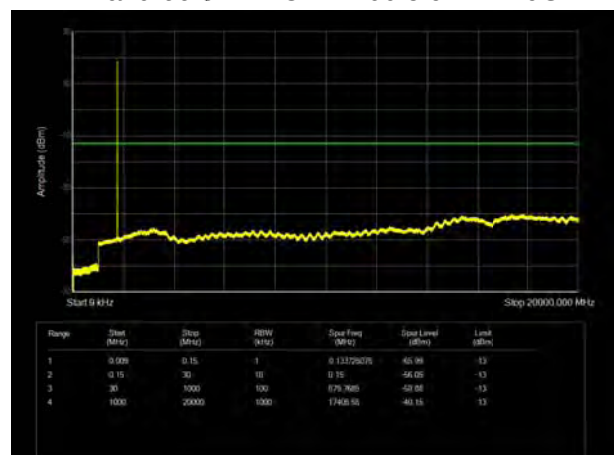
LTE Band 66 3MHz CH- Low 9kHz~20GHz



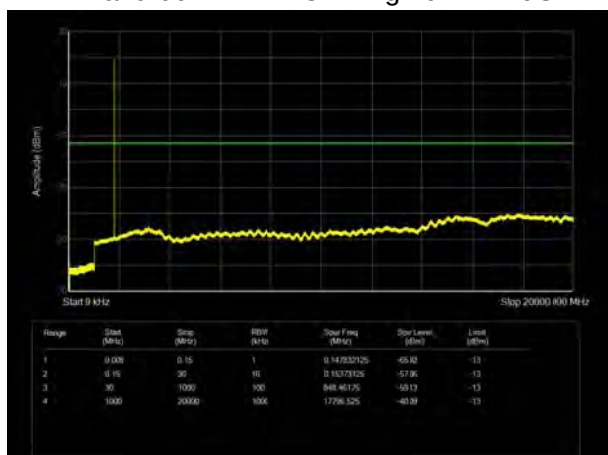
LTE Band 66 1.4MHz CH- Middle 9kHz~20GHz



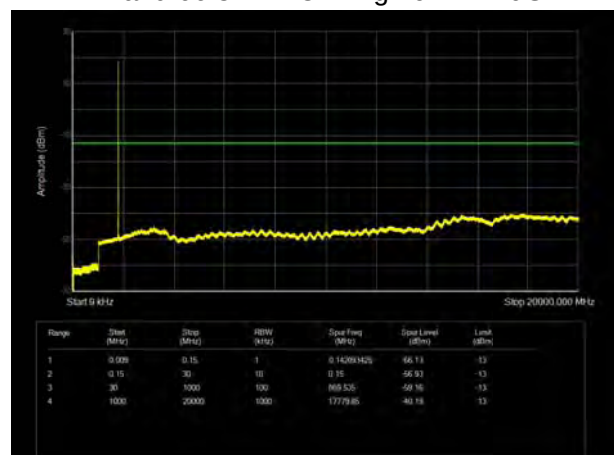
LTE Band 66 3MHz CH- Middle 9kHz~20GHz



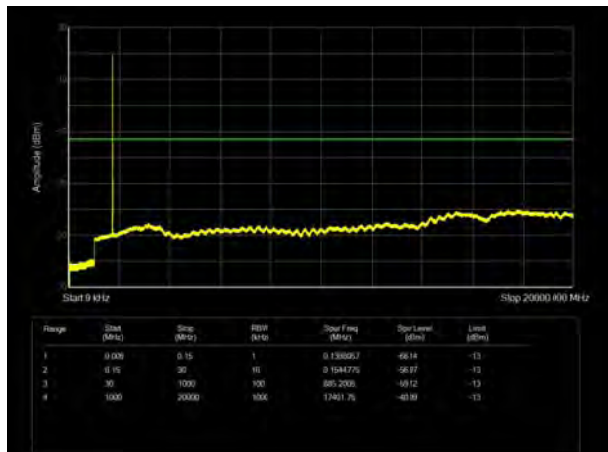
LTE Band 66 1.4MHz CH- High 9kHz~20GHz



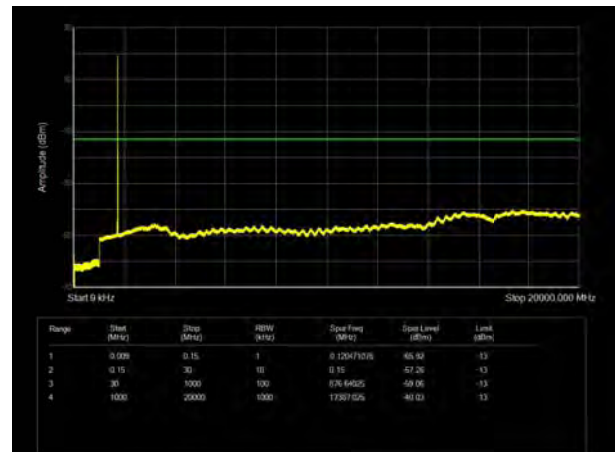
LTE Band 66 3MHz CH-High 9kHz~20GHz



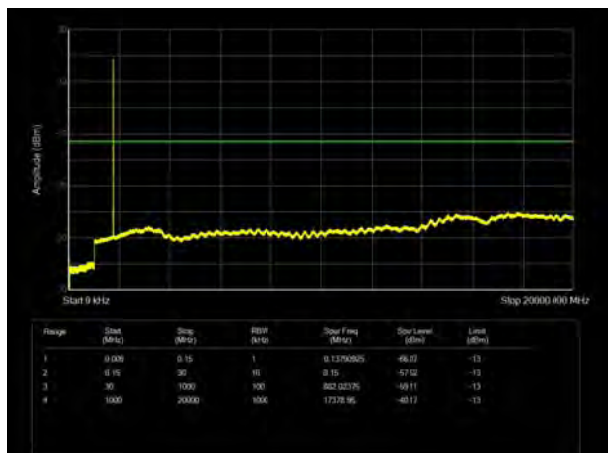
LTE Band 66 5MHz CH- Low 9kHz~20GHz



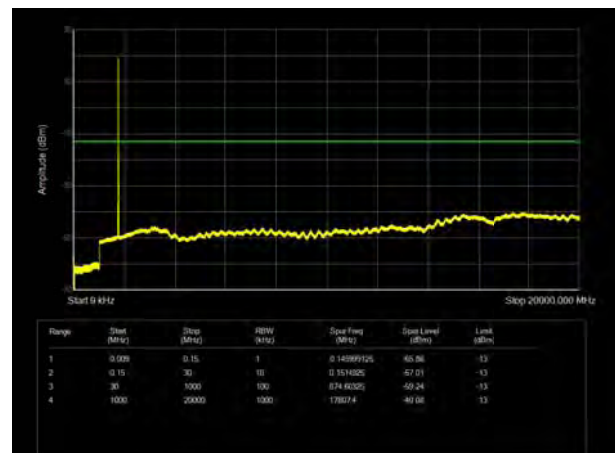
LTE Band 66 10MHz CH-Low 9kHz~20GHz



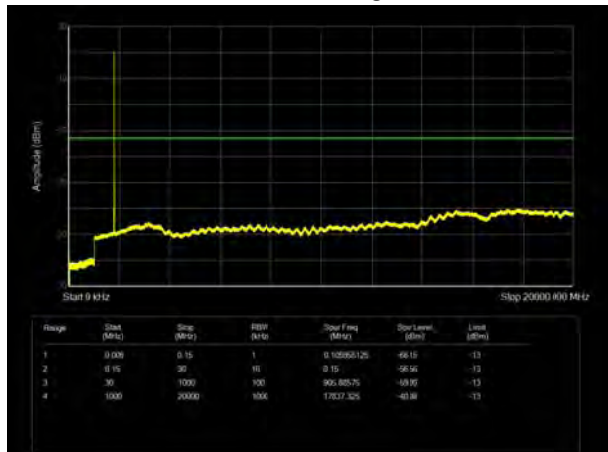
LTE Band 66 5MHz CH- Middle 9kHz~20GHz



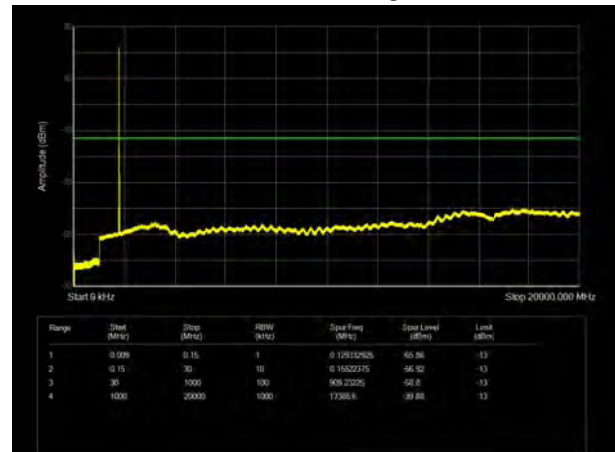
LTE Band 66 10MHz CH- Middle 9kHz~20GHz



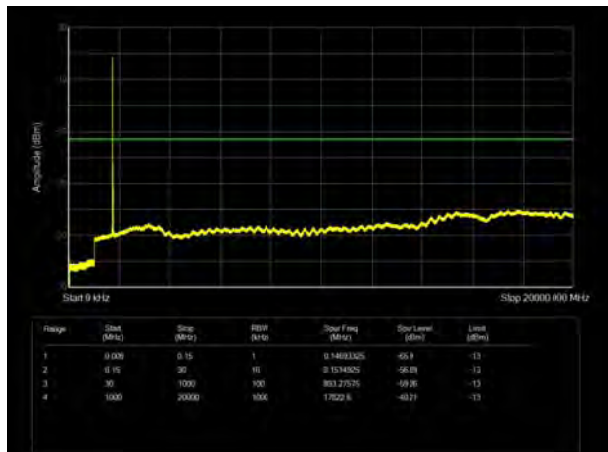
LTE Band 66 5MHz CH-High 9kHz~20GHz



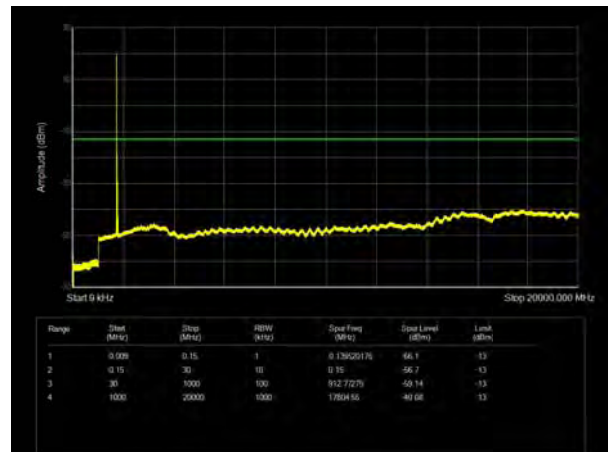
LTE Band 66 10MHz CH- High 9kHz~20GHz



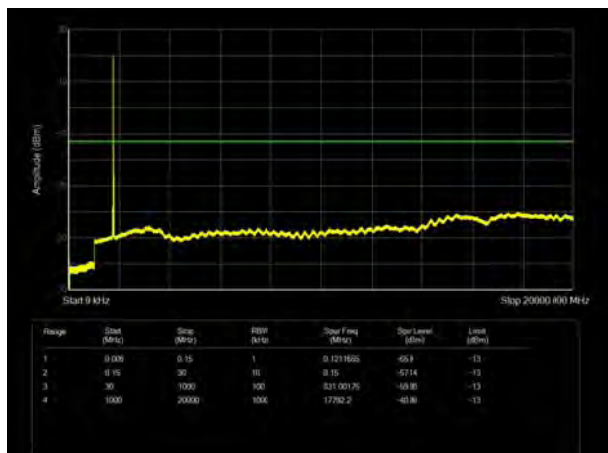
## LTE Band 66 15MHz CH- Low 9kHz~20GHz



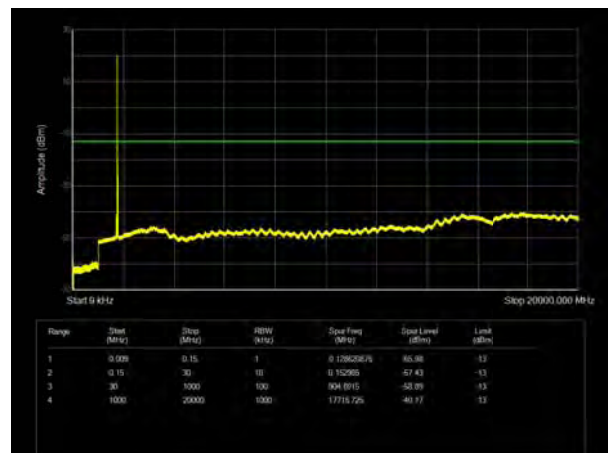
## LTE Band 66 20MHz CH-Low 9kHz~20GHz



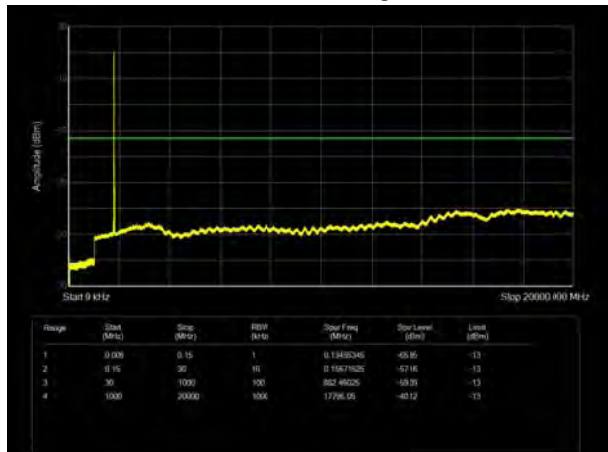
## LTE Band 66 15MHz CH- Middle 9kHz~20GHz



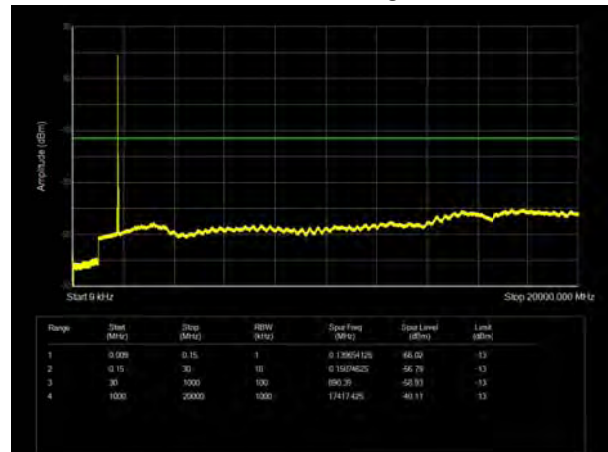
## LTE Band 66 20MHz CH- Middle 9kHz~20GHz



## LTE Band 66 15MHz CH-High 9kHz~20GHz



## LTE Band 66 20MHz CH- High 9kHz~20GHz





## 5.7 Radiates Spurious Emission

### Ambient condition

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

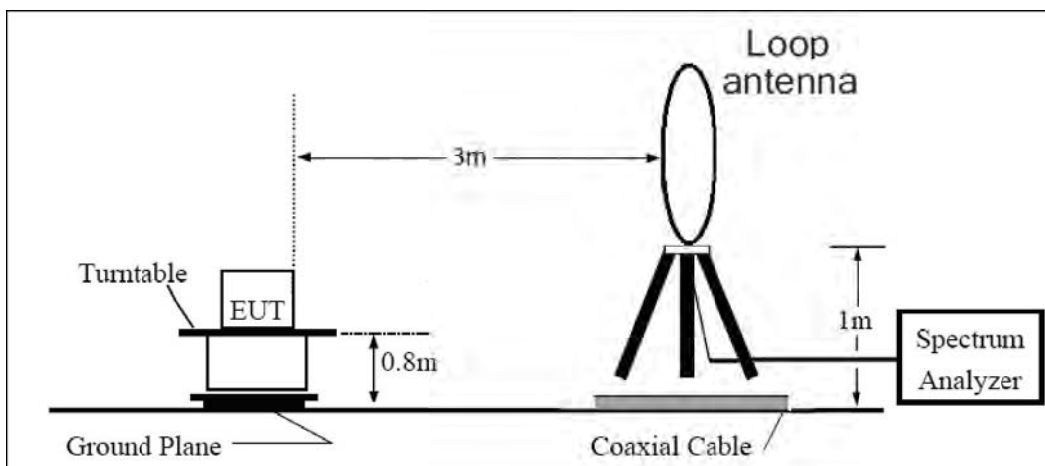
### Method of Measurement

1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: 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). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 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 loop antenna, A log-periodic antenna or 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=100kHz, VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, 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,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .

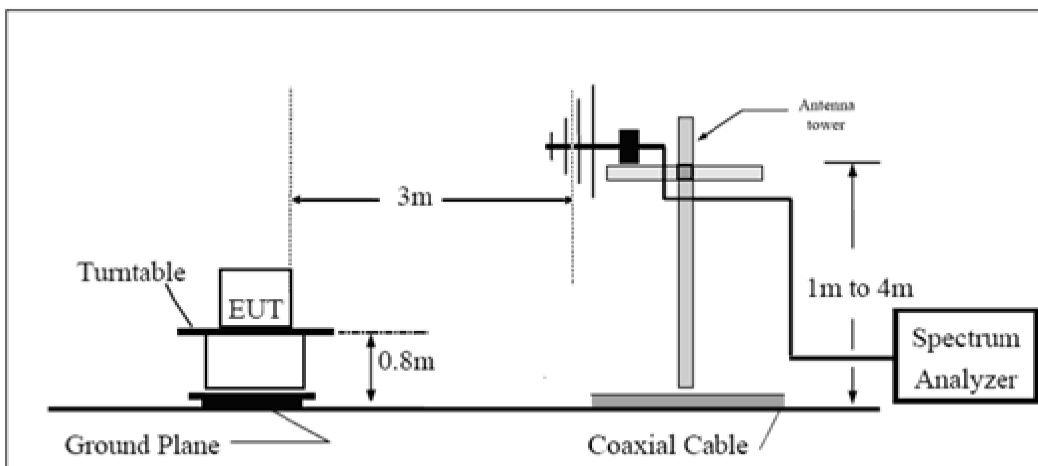
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

### Test setup

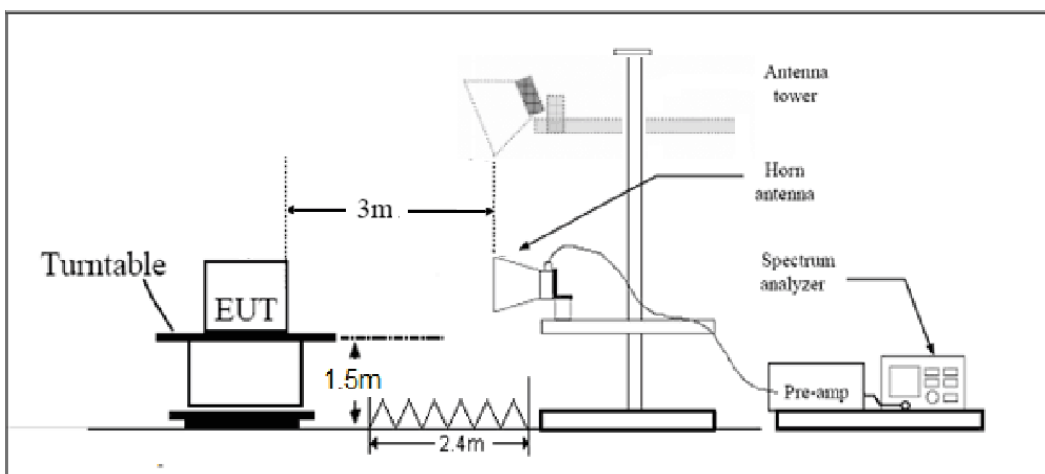
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

### 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(m)  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

|                     |         |
|---------------------|---------|
| Part 27.53(h) Limit | -13 dBm |
| Part 27.53(m) Limit | -25 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 9kHz 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                                                                                                                                                             | 3465.20         | -67.05   | 2.70            | 12.70      | Horizontal           | -57.05           | -13.00      | 44.05       | 0             |
| 3                                                                                                                                                             | 5197.80         | -60.92   | 3.20            | 12.50      | Horizontal           | -51.62           | -13.00      | 38.62       | 45            |
| 4                                                                                                                                                             | 6930.40         | -61.56   | 4.20            | 11.80      | Horizontal           | -53.96           | -13.00      | 40.96       | 90            |
| 5                                                                                                                                                             | 8662.50         | -56.13   | 4.40            | 12.50      | Horizontal           | -48.03           | -13.00      | 35.03       | 45            |
| 6                                                                                                                                                             | 10395.60        | -48.77   | 4.70            | 11.30      | Horizontal           | -42.17           | -13.00      | 29.17       | 315           |
| 7                                                                                                                                                             | 12128.20        | -52.01   | 5.20            | 13.80      | Horizontal           | -43.41           | -13.00      | 30.41       | 90            |
| 8                                                                                                                                                             | 13860.80        | -48.56   | 5.70            | 11.30      | Horizontal           | -42.96           | -13.00      | 29.96       | 45            |
| 9                                                                                                                                                             | 15593.40        | -51.85   | 6.10            | 16.80      | Horizontal           | -41.15           | -13.00      | 28.15       | 180           |
| 10                                                                                                                                                            | 17326.00        | -48.60   | 6.10            | 14.20      | Horizontal           | -40.50           | -13.00      | 27.50       | 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. |                 |          |                 |            |                      |                  |             |             |               |

LTE Band 4 QPSK 1.4MHz 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                                                                                                                                                             | 3464.25         | -36.54   | 2.70            | 12.70      | Horizontal           | -26.54           | -13.00      | 13.54       | 0             |
| 3                                                                                                                                                             | 5197.50         | -50.67   | 3.20            | 12.50      | Horizontal           | -41.37           | -13.00      | 28.37       | 225           |
| 4                                                                                                                                                             | 6930.00         | -56.14   | 4.20            | 11.80      | Horizontal           | -48.54           | -13.00      | 35.54       | 225           |
| 5                                                                                                                                                             | 8662.50         | -54.03   | 4.40            | 12.50      | Horizontal           | -45.93           | -13.00      | 32.93       | 45            |
| 6                                                                                                                                                             | 10395.00        | -50.43   | 4.70            | 11.30      | Horizontal           | -43.83           | -13.00      | 30.83       | 135           |
| 7                                                                                                                                                             | 12127.50        | -52.91   | 5.20            | 13.80      | Horizontal           | -44.31           | -13.00      | 31.31       | 90            |
| 8                                                                                                                                                             | 13860.00        | -48.77   | 5.70            | 11.30      | Horizontal           | -43.17           | -13.00      | 30.17       | 315           |
| 9                                                                                                                                                             | 15592.50        | -53.73   | 6.10            | 16.80      | Horizontal           | -43.03           | -13.00      | 30.03       | 0             |
| 10                                                                                                                                                            | 17325.00        | -48.35   | 6.10            | 14.20      | Horizontal           | -40.25           | -13.00      | 27.25       | 45            |
| 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 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                                                                                                                                                             | 3460.50         | -39.31   | 2.70            | 12.70      | Horizontal           | -29.31           | -13.00      | 16.31       | 0             |
| 3                                                                                                                                                             | 5191.50         | -49.68   | 3.20            | 12.50      | Horizontal           | -40.38           | -13.00      | 27.38       | 135           |
| 4                                                                                                                                                             | 6930.00         | -56.90   | 4.20            | 11.80      | Horizontal           | -49.30           | -13.00      | 36.30       | 45            |
| 5                                                                                                                                                             | 8662.50         | -55.78   | 4.40            | 12.50      | Horizontal           | -47.68           | -13.00      | 34.68       | 135           |
| 6                                                                                                                                                             | 10395.00        | -50.63   | 4.70            | 11.30      | Horizontal           | -44.03           | -13.00      | 31.03       | 0             |
| 7                                                                                                                                                             | 12127.50        | -51.92   | 5.20            | 13.80      | Horizontal           | -43.32           | -13.00      | 30.32       | 90            |
| 8                                                                                                                                                             | 13860.00        | -49.56   | 5.70            | 11.30      | Horizontal           | -43.96           | -13.00      | 30.96       | 45            |
| 9                                                                                                                                                             | 15592.50        | -52.85   | 6.10            | 16.80      | Horizontal           | -42.15           | -13.00      | 29.15       | 225           |
| 10                                                                                                                                                            | 17325.00        | -48.32   | 6.10            | 14.20      | Horizontal           | -40.22           | -13.00      | 27.22       | 135           |
| 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 4 QPSK 20MHz 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                                                                                                                                                             | 3445.00         | -40.58   | 2.70            | 12.70      | Horizontal           | -30.58           | -13.00      | 17.58       | 45            |
| 3                                                                                                                                                             | 5167.50         | -50.73   | 3.20            | 12.50      | Horizontal           | -41.43           | -13.00      | 28.43       | 90            |
| 4                                                                                                                                                             | 6890.00         | -53.00   | 4.20            | 11.80      | Horizontal           | -45.40           | -13.00      | 32.40       | 45            |
| 5                                                                                                                                                             | 8612.50         | -55.93   | 4.40            | 12.50      | Horizontal           | -47.83           | -13.00      | 34.83       | 135           |
| 6                                                                                                                                                             | 10335.00        | -49.42   | 4.70            | 11.30      | Horizontal           | -42.82           | -13.00      | 29.82       | 0             |
| 7                                                                                                                                                             | 12057.50        | -51.32   | 5.20            | 13.80      | Horizontal           | -42.72           | -13.00      | 29.72       | 90            |
| 8                                                                                                                                                             | 13780.00        | -48.48   | 5.70            | 11.30      | Horizontal           | -42.88           | -13.00      | 29.88       | 45            |
| 9                                                                                                                                                             | 15502.50        | -53.41   | 6.10            | 16.80      | Horizontal           | -42.71           | -13.00      | 29.71       | 90            |
| 10                                                                                                                                                            | 17225.00        | -49.91   | 6.10            | 14.20      | Horizontal           | -41.81           | -13.00      | 28.81       | 45            |
| 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 7 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        | 5065.80         | -51.77   | 3.40            | 12.50      | Horizontal           | -42.67           | -25.00      | 17.67       | 45            |
| 3        | 7598.60         | -44.36   | 4.40            | 12.20      | Horizontal           | -36.56           | -25.00      | 11.56       | 135           |
| 4        | 10130.63        | -40.20   | 4.70            | 11.30      | Horizontal           | -33.60           | -25.00      | 8.60        | 0             |
| 5        | 12675.00        | -43.66   | 5.40            | 13.20      | Horizontal           | -35.86           | -25.00      | 10.86       | 90            |
| 6        | 15210.00        | -47.22   | 6.10            | 13.10      | Horizontal           | -40.22           | -25.00      | 15.22       | 45            |
| 7        | 17745.00        | -49.52   | 6.10            | 14.20      | Horizontal           | -41.42           | -25.00      | 16.42       | 90            |
| 8        | 20280.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 9        | 22815.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 10       | 25350.00        | -        | -               | -          | -                    | -                | -           | -           | -             |

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 7 QPSK 20MHz 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        | 5052.38         | -50.25   | 3.40            | 12.50      | Horizontal           | -41.15           | -25.00      | 16.15       | 90            |
| 3        | 7575.00         | -41.55   | 4.40            | 12.20      | Horizontal           | -33.75           | -25.00      | 8.75        | 45            |
| 4        | 10100.00        | -39.71   | 4.70            | 11.30      | Horizontal           | -33.11           | -25.00      | 8.11        | 90            |
| 5        | 12625.00        | -42.94   | 5.40            | 13.20      | Horizontal           | -35.14           | -25.00      | 10.14       | 90            |
| 6        | 15150.00        | -47.22   | 6.10            | 13.10      | Horizontal           | -40.22           | -25.00      | 15.22       | 45            |
| 7        | 17675.00        | -49.38   | 6.10            | 14.20      | Horizontal           | -41.28           | -25.00      | 16.28       | 135           |
| 8        | 20280.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 9        | 22815.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 10       | 25350.00        | -        | -               | -          | -                    | -                | -           | -           | -             |

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 38 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        | 5180.00         | -44.59   | 3.20            | 12.50      | Horizontal           | -35.29           | -25.00      | 10.29       | 90            |
| 3        | 7770.00         | -51.18   | 4.40            | 12.30      | Horizontal           | -43.28           | -25.00      | 18.28       | 225           |
| 4        | 10360.00        | -45.05   | 4.70            | 11.80      | Horizontal           | -37.95           | -25.00      | 12.95       | 315           |
| 5        | 12950.00        | -50.10   | 5.40            | 14.00      | Horizontal           | -41.50           | -25.00      | 16.50       | 45            |
| 6        | 15540.00        | -52.37   | 6.10            | 16.80      | Horizontal           | -41.67           | -25.00      | 16.67       | 90            |
| 7        | 18130.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 8        | 20720.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 9        | 23310.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 10       | 25900.00        | -        | -               | -          | -                    | -                | -           | -           | -             |

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 38 QPSK 20MHz 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        | 5170.00         | -44.18   | 3.20            | 12.50      | Horizontal           | -34.88           | -25.00      | 9.88        | 90            |
| 3        | 7755.00         | -52.51   | 4.40            | 12.30      | Horizontal           | -44.61           | -25.00      | 19.61       | 315           |
| 4        | 10340.00        | -44.85   | 4.70            | 11.80      | Horizontal           | -37.75           | -25.00      | 12.75       | 45            |
| 5        | 12925.00        | -48.60   | 5.40            | 14.00      | Horizontal           | -40.00           | -25.00      | 15.00       | 225           |
| 6        | 15510.00        | -52.27   | 6.10            | 16.80      | Horizontal           | -41.57           | -25.00      | 16.57       | 0             |
| 7        | 18095.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 8        | 20680.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 9        | 23265.00        | -        | -               | -          | -                    | -                | -           | -           | -             |
| 10       | 25850.00        | -        | -               | -          | -                    | -                | -           | -           | -             |

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 1.4MHz 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        | 3488.60         | -40.13   | 2.70            | 12.70      | Horizontal           | -30.13           | -13.00      | 17.13       | 90            |
| 3        | 5232.90         | -47.15   | 3.20            | 12.50      | Horizontal           | -37.85           | -13.00      | 24.85       | 45            |
| 4        | 6977.20         | -57.54   | 4.20            | 11.80      | Horizontal           | -49.94           | -13.00      | 36.94       | 270           |
| 5        | 8721.50         | -51.77   | 4.40            | 12.50      | Horizontal           | -43.67           | -13.00      | 30.67       | 180           |
| 6        | 10465.80        | -49.08   | 4.70            | 11.80      | Horizontal           | -41.98           | -13.00      | 28.98       | 135           |
| 7        | 12210.10        | -48.63   | 5.20            | 13.80      | Horizontal           | -40.03           | -13.00      | 27.03       | 270           |
| 8        | 13954.40        | -49.91   | 5.70            | 13.20      | Horizontal           | -42.41           | -13.00      | 29.41       | 90            |
| 9        | 15698.70        | -51.87   | 6.10            | 16.80      | Horizontal           | -41.17           | -13.00      | 28.17       | 45            |
| 10       | 17443.00        | -48.32   | 6.10            | 14.20      | Horizontal           | -40.22           | -13.00      | 27.22       | 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 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        | 3485.00         | -40.79   | 2.70            | 12.70      | Horizontal           | -30.79           | -13.00      | 17.79       | 45            |
| 3        | 5227.50         | -49.40   | 3.20            | 12.50      | Horizontal           | -40.10           | -13.00      | 27.10       | 225           |
| 4        | 6970.00         | -57.45   | 4.20            | 11.80      | Horizontal           | -49.85           | -13.00      | 36.85       | 90            |
| 5        | 8712.50         | -52.82   | 4.40            | 12.50      | Horizontal           | -44.72           | -13.00      | 31.72       | 0             |
| 6        | 10455.00        | -49.65   | 4.70            | 11.80      | Horizontal           | -42.55           | -13.00      | 29.55       | 0             |
| 7        | 12197.50        | -49.20   | 5.20            | 13.80      | Horizontal           | -40.60           | -13.00      | 27.60       | 45            |
| 8        | 13940.00        | -50.71   | 5.70            | 13.20      | Horizontal           | -43.21           | -13.00      | 30.21       | 180           |
| 9        | 15682.50        | -54.10   | 6.10            | 16.80      | Horizontal           | -43.40           | -13.00      | 30.40       | 90            |
| 10       | 17425.00        | -48.67   | 6.10            | 14.20      | Horizontal           | -40.57           | -13.00      | 27.57       | 270           |

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 20MHz 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                                                                                                                                                             | 3470.00         | -43.95   | 2.70            | 12.70      | Horizontal           | -33.95           | -13.00      | 20.95       | 225           |
| 3                                                                                                                                                             | 5205.00         | -53.26   | 3.20            | 12.50      | Horizontal           | -43.96           | -13.00      | 30.96       | 45            |
| 4                                                                                                                                                             | 6940.00         | -54.96   | 4.20            | 11.80      | Horizontal           | -47.36           | -13.00      | 34.36       | 315           |
| 5                                                                                                                                                             | 8675.00         | -52.70   | 4.40            | 12.50      | Horizontal           | -44.60           | -13.00      | 31.60       | 90            |
| 6                                                                                                                                                             | 10410.00        | -49.03   | 4.70            | 11.80      | Horizontal           | -41.93           | -13.00      | 28.93       | 0             |
| 7                                                                                                                                                             | 12145.00        | -50.06   | 5.20            | 13.80      | Horizontal           | -41.46           | -13.00      | 28.46       | 0             |
| 8                                                                                                                                                             | 13880.00        | -50.09   | 5.70            | 13.20      | Horizontal           | -42.59           | -13.00      | 29.59       | 45            |
| 9                                                                                                                                                             | 15615.00        | -50.72   | 6.10            | 16.80      | Horizontal           | -40.02           | -13.00      | 27.02       | 315           |
| 10                                                                                                                                                            | 17350.00        | -47.59   | 6.10            | 14.20      | Horizontal           | -39.49           | -13.00      | 26.49       | 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 |
|--------------------------------------|--------------|------------|---------------|------------------|-----------------|
| Horn Antenna                         | Schwarzbeck  | BBHA 9120D | 01799         | 2019-09-21       | 2022-09-20      |
| Signal Analyzer                      | R&S          | FSV30      | 100815        | 2020-12-17       | 2021-12-16      |
| TRILOG Broadband Antenna             | SCHWARZBECK  | VULB 9163  | 01439         | 2021-06-30       | 2024-06-29      |
| Software                             | R&S          | EMC32      | 9.26.01       | /                | /               |
| Universal Radio Communication Tester | R&S          | CMW500     | 150415        | 2021-05-15       | 2022-05-14      |
| Spectrum Analyzer                    | Keysight     | N9020A     | MY52330084    | 2021-05-15       | 2022-05-14      |
| Universal Radio Communication Tester | Agilent      | E5515C     | GB44400275    | 2021-05-15       | 2022-05-14      |
| Spectrum Analyzer                    | R&S          | FSV3030    | 101411        | 2020-12-13       | 2021-12-12      |

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



## ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



## ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.



## ANNEX C: Product Change Description

The Product Change Description are submitted separately.