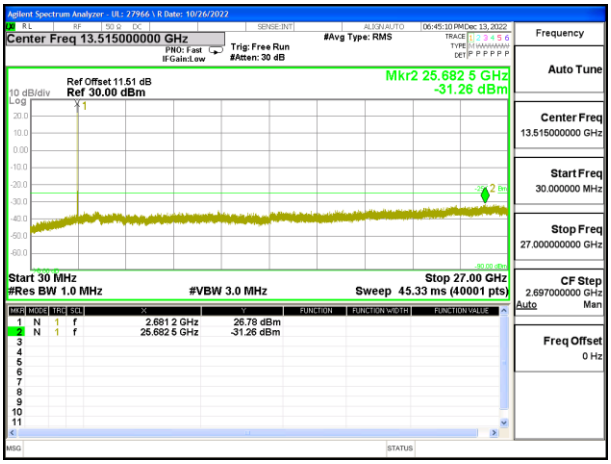
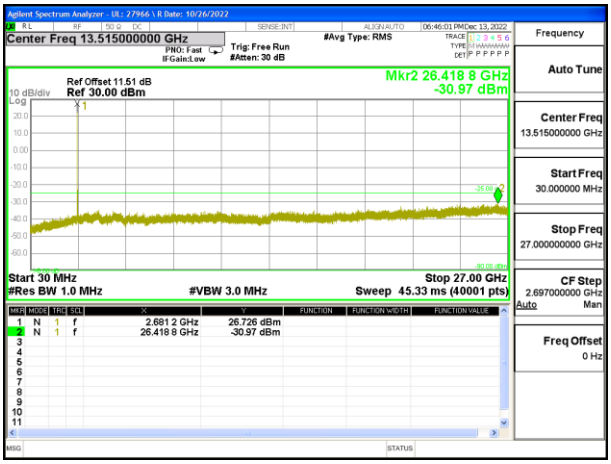
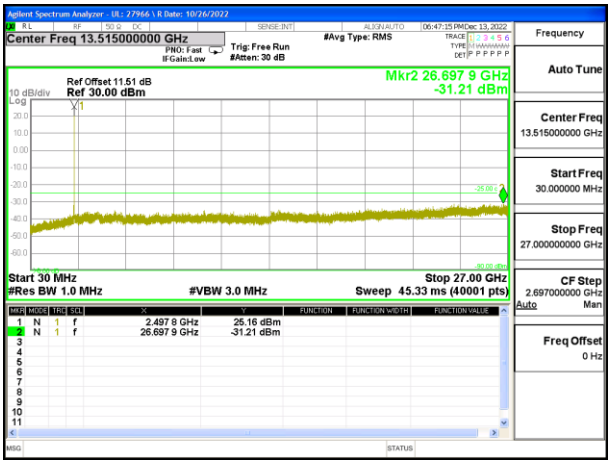


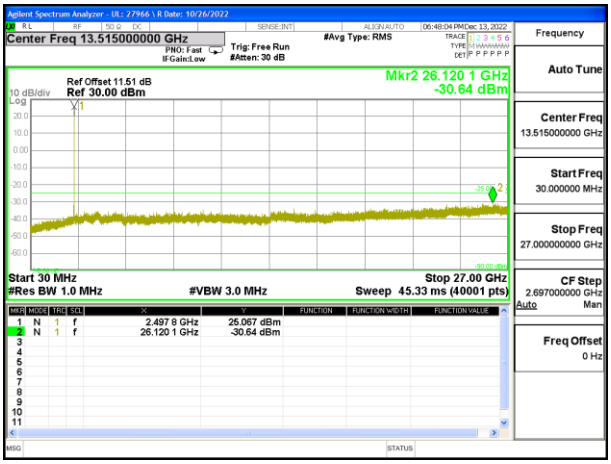

LTE B41 10MHz QPSK High Channel RB1-0



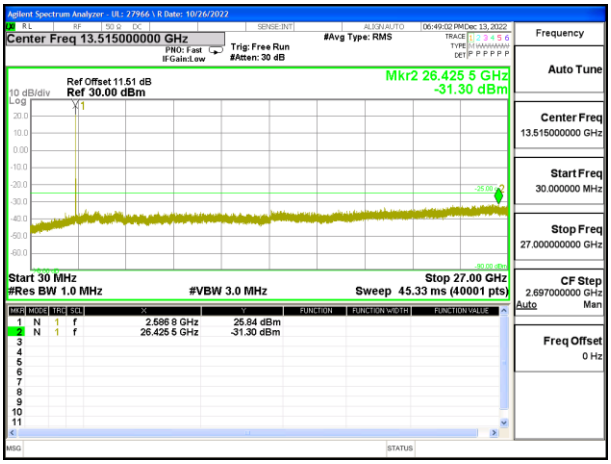

LTE B41 10MHz 16QAM High Channel RB1-0



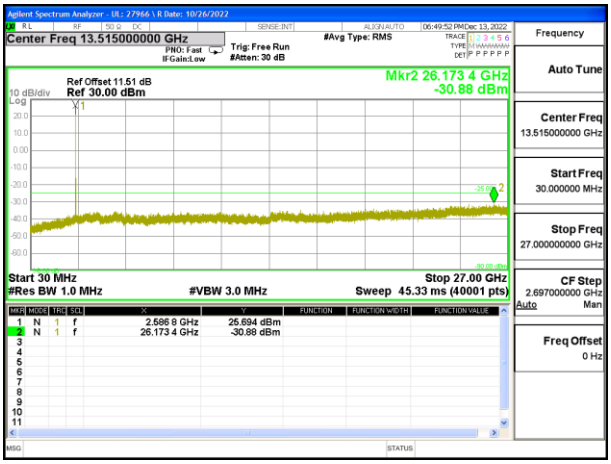

LTE B41 15MHz QPSK Low Channel RB1-0



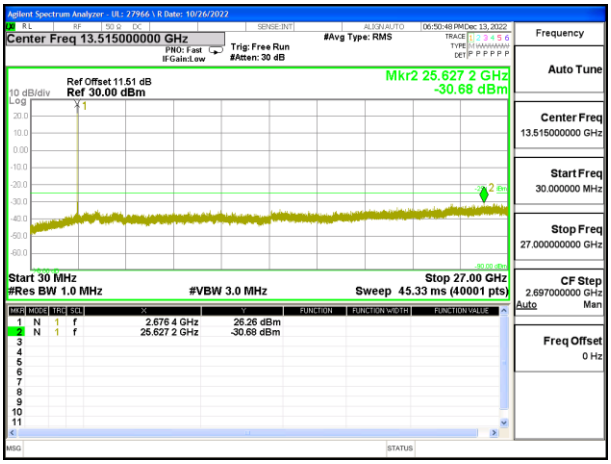

LTE B41 15MHz 16QAM Low Channel RB1-0



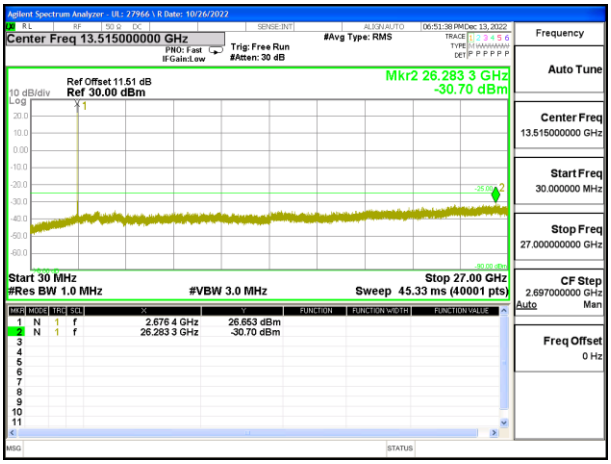

LTE B41 15MHz QPSK Middle Channel RB1-0



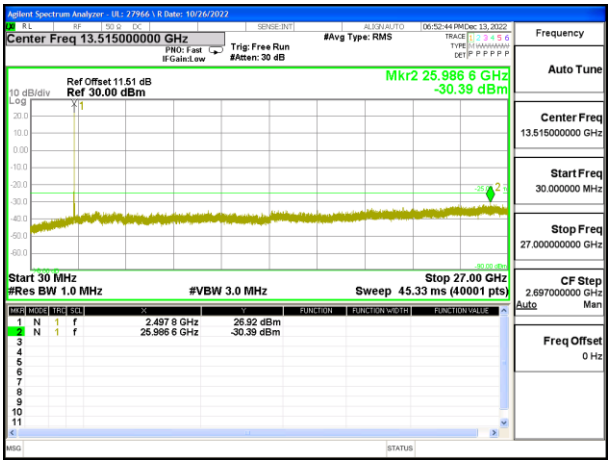

LTE B41 15MHz 16QAM Middle Channel RB1-0



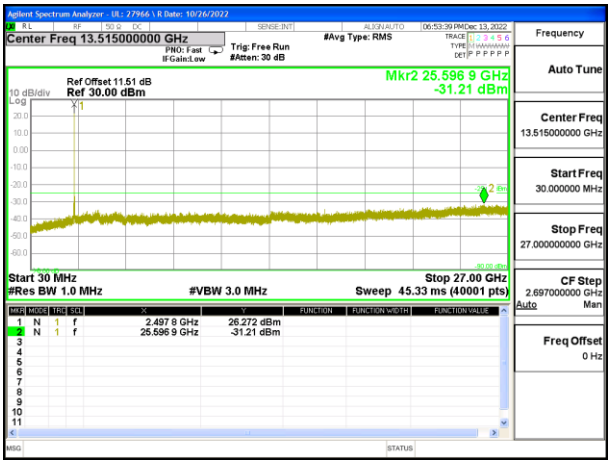

LTE B41 15MHz QPSK High Channel RB1-0




LTE B41 15MHz 16QAM High Channel RB1-0




LTE B41 20MHz QPSK Low Channel RB1-0

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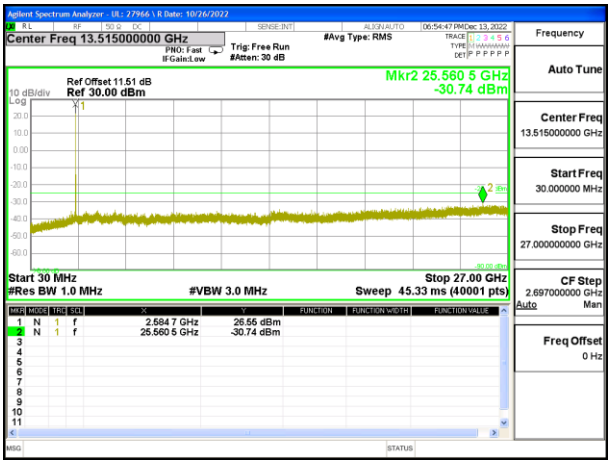


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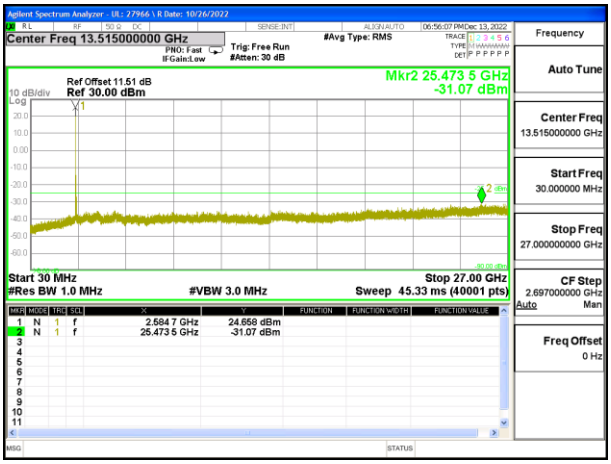
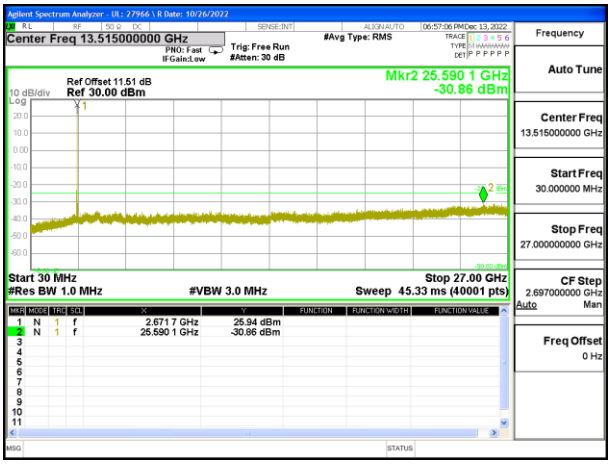
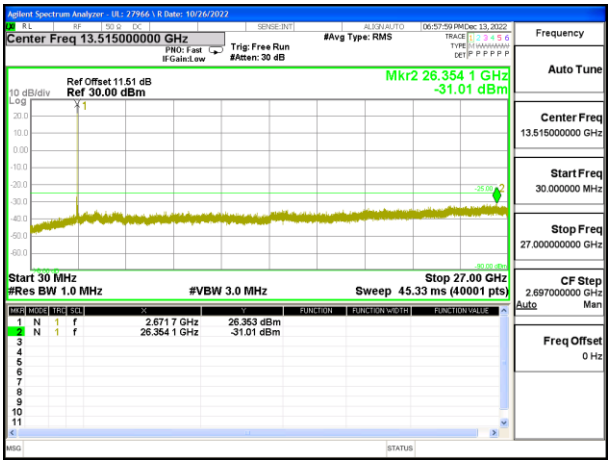



LTE B41 20MHz 16QAM Middle Channel RB1-0




LTE B41 20MHz QPSK High Channel RB1-0

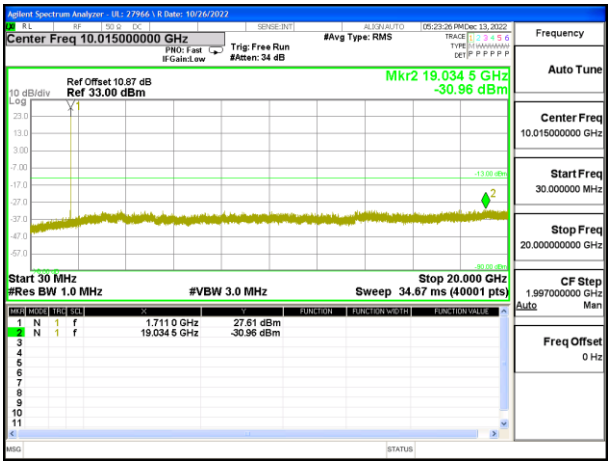



LTE B41 20MHz 16QAM High Channel RB1-0

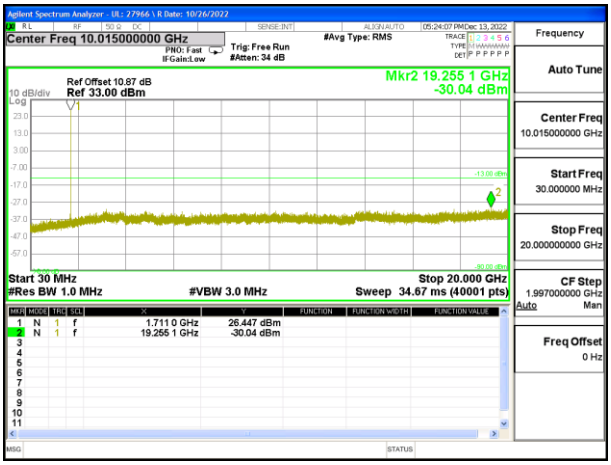
## 9.3.13. LTE BAND 66

**LIMITS**

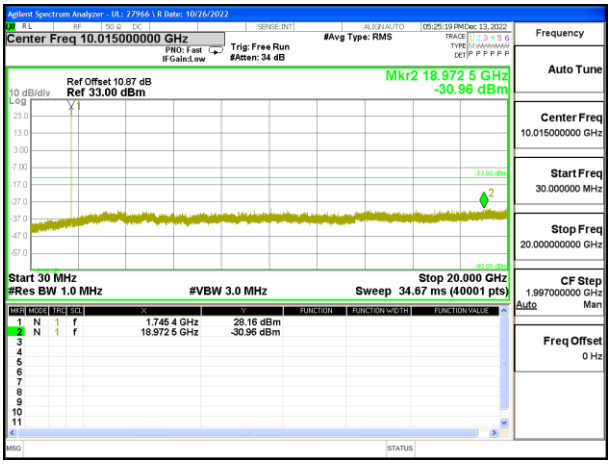
FCC: §27.53 (h)
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.



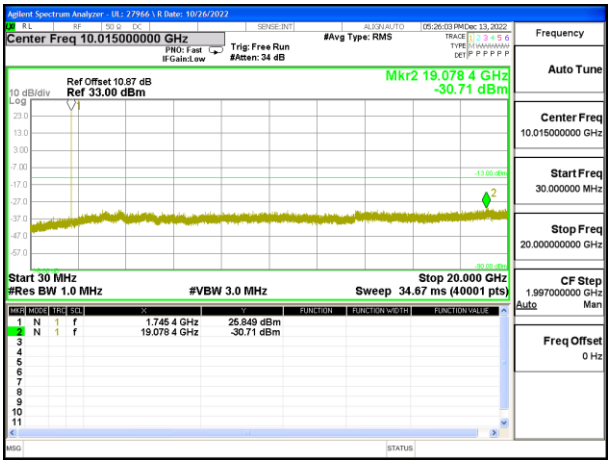

LTE B66 1.4MHz QPSK Low Channel RB1-0




LTE B66 1.4MHz 16QAM Low Channel RB1-0




LTE B66 1.4MHz QPSK Middle Channel RB1-0

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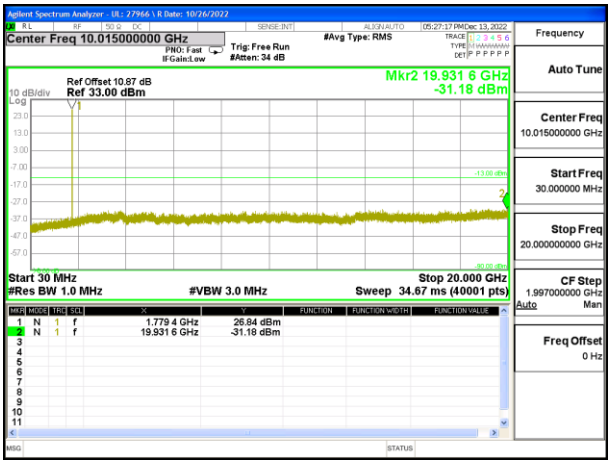
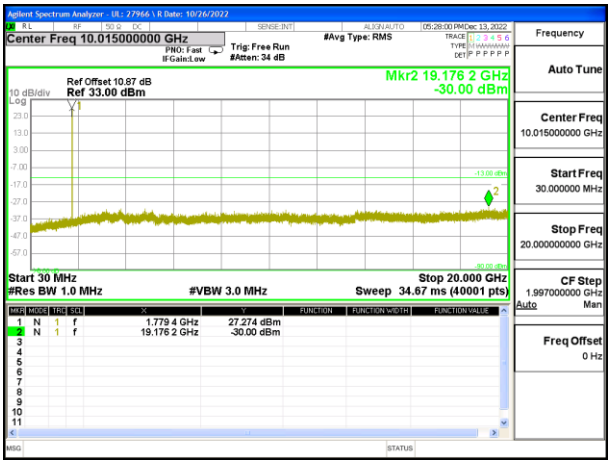
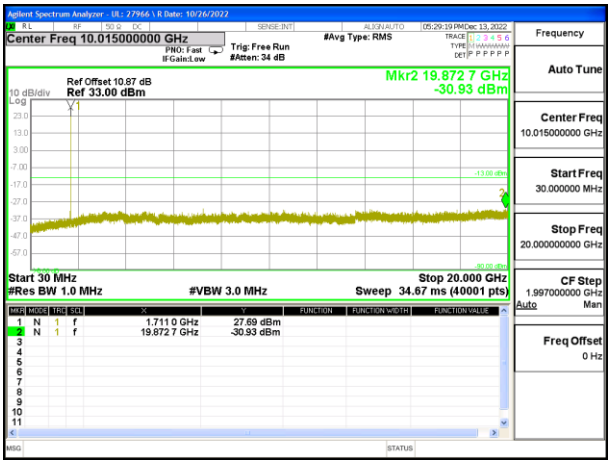


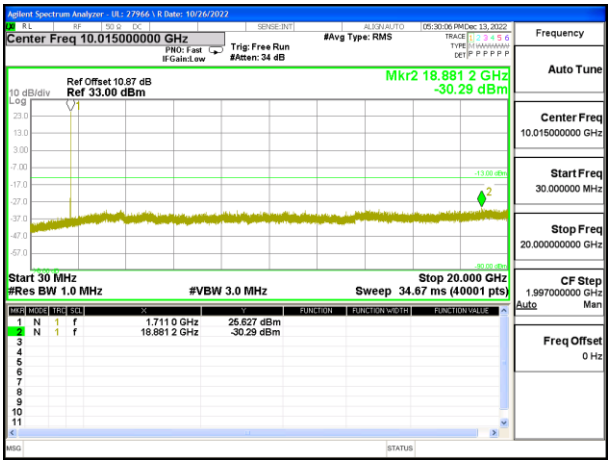

LTE B66 1.4MHz QPSK High Channel RB1-0



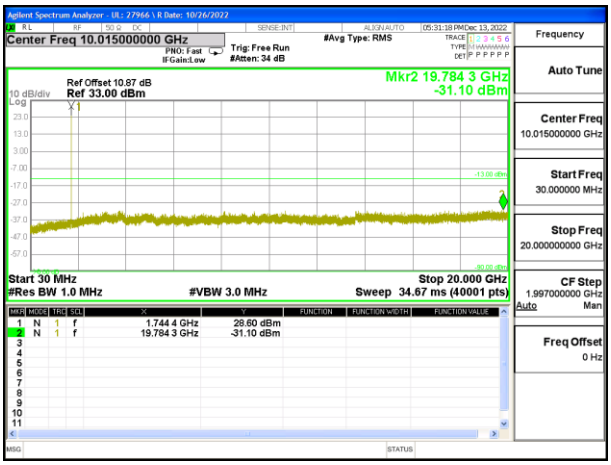

LTE B66 1.4MHz 16QAM High Channel RB1-0



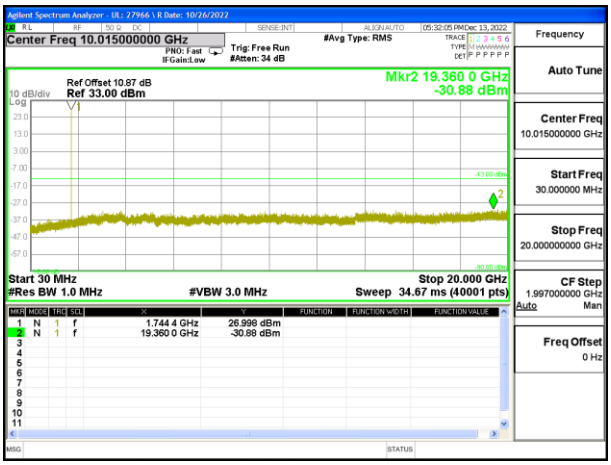

LTE B66 3MHz QPSK Low Channel RB1-0




LTE B66 3MHz 16QAM Low Channel RB1-0




LTE B66 3MHz QPSK Middle Channel RB1-0

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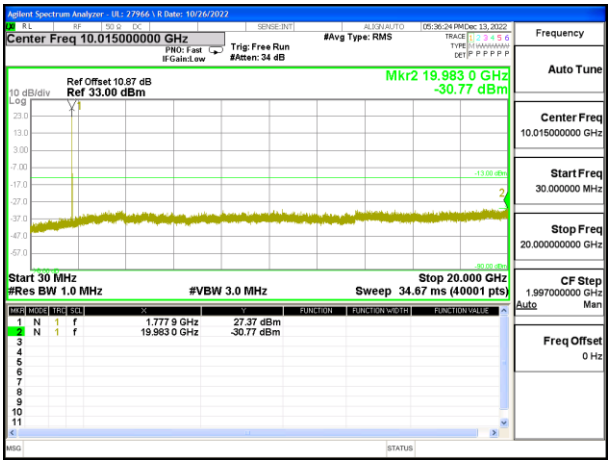
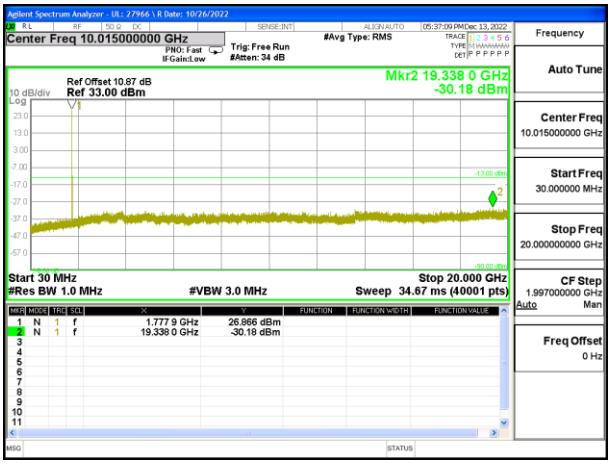
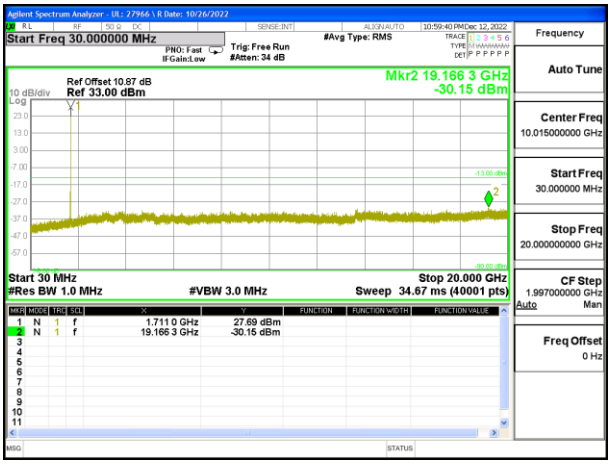


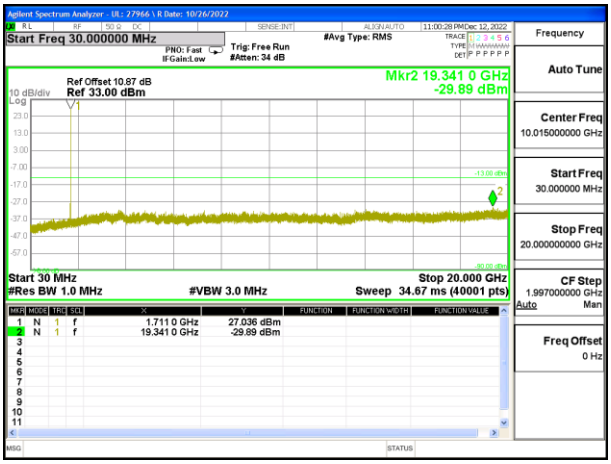

LTE B66 3MHz QPSK High Channel RB1-0



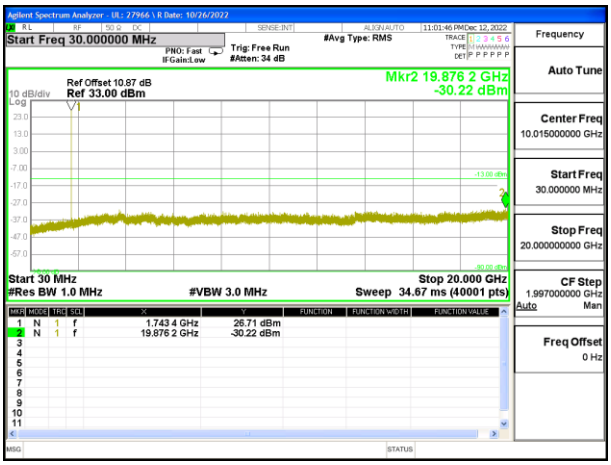

LTE B66 3MHz 16QAM High Channel RB1-0



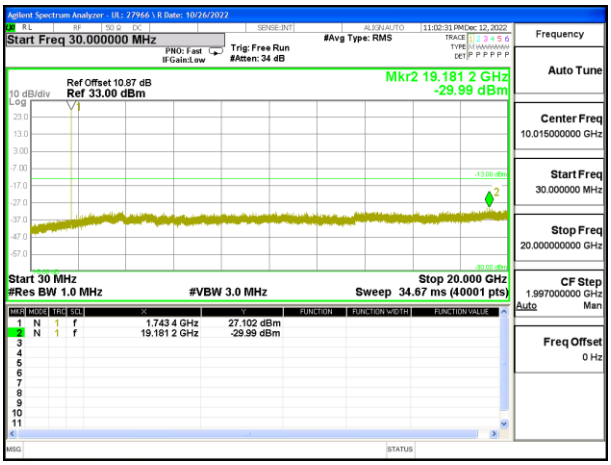

LTE B66 5MHz QPSK Low Channel RB1-0




LTE B66 5MHz 16QAM Low Channel RB1-0




LTE B66 5MHz QPSK Middle Channel RB1-0

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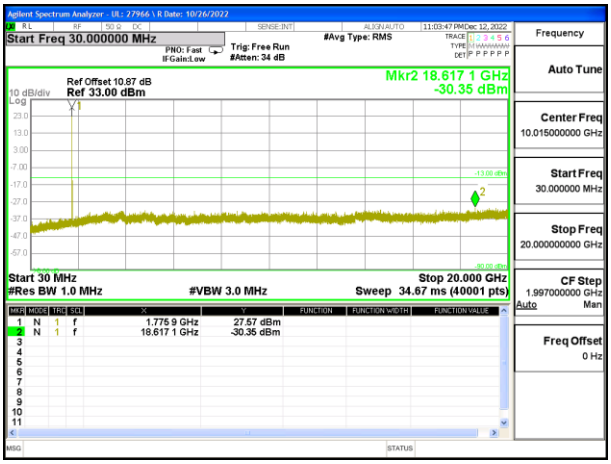
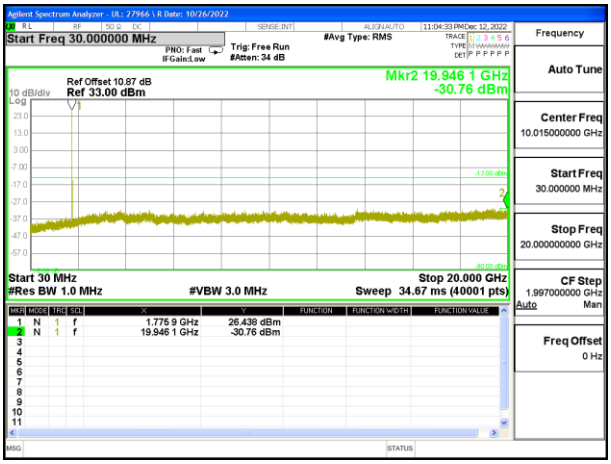
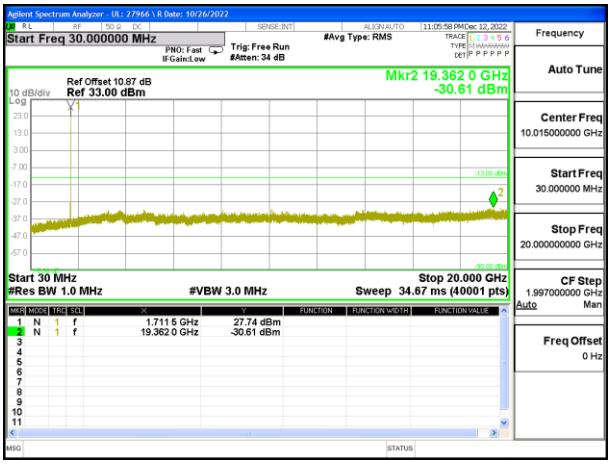


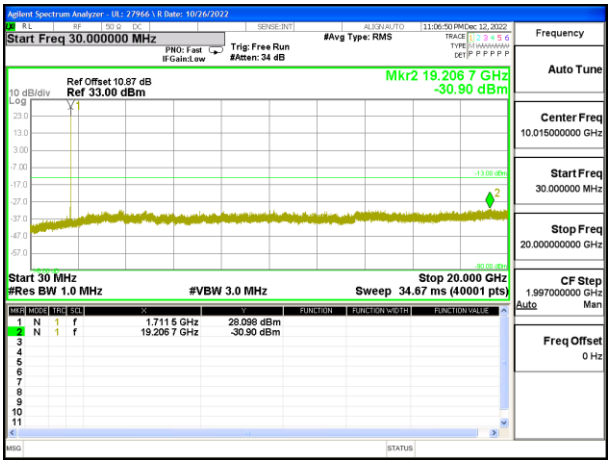

LTE B66 5MHz QPSK High Channel RB1-0



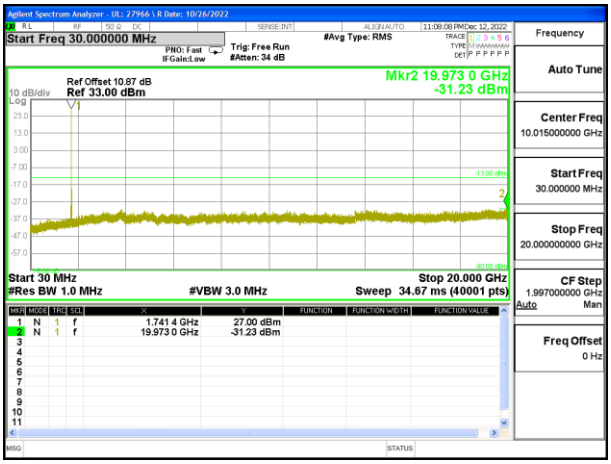

LTE B66 5MHz 16QAM High Channel RB1-0



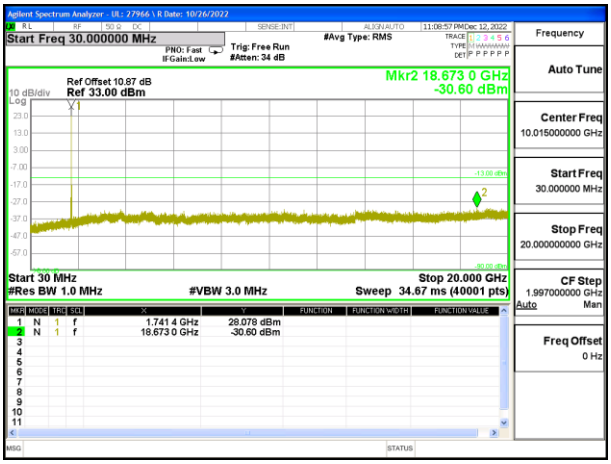

LTE B66 10MHz QPSK Low Channel RB1-0



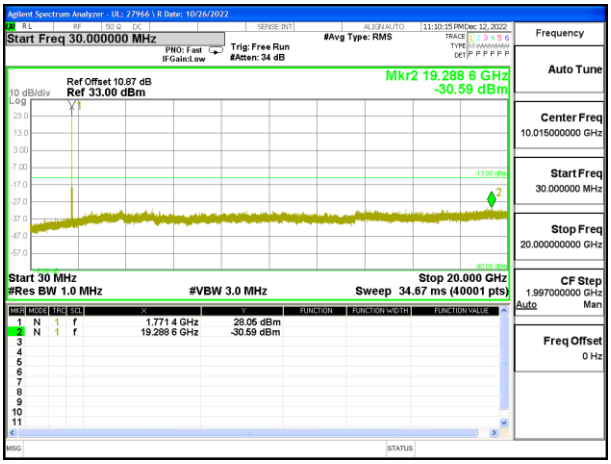

LTE B66 10MHz 16QAM Low Channel RB1-0



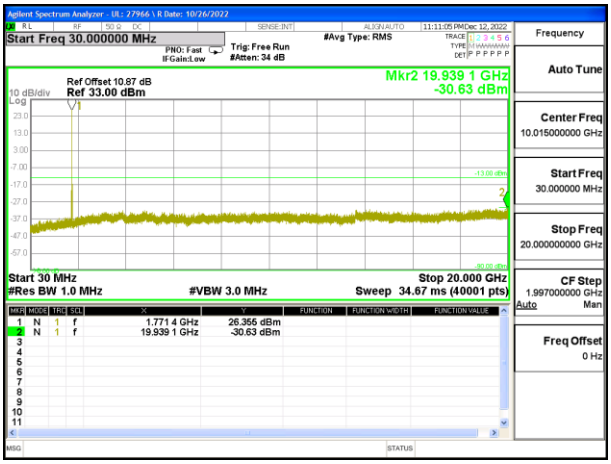

LTE B66 10MHz QPSK Middle Channel RB1-0



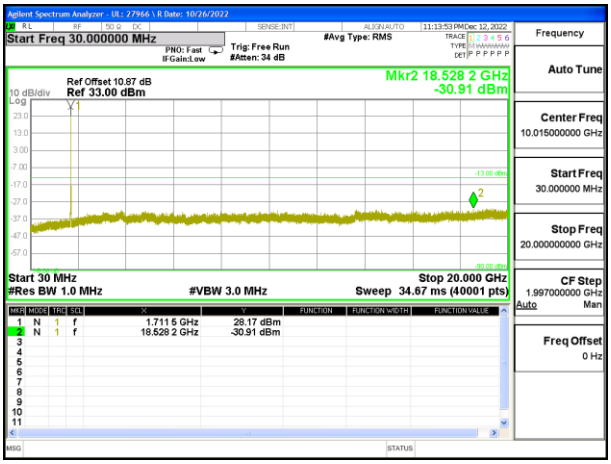

LTE B66 10MHz 16QAM Middle Channel RB1-0



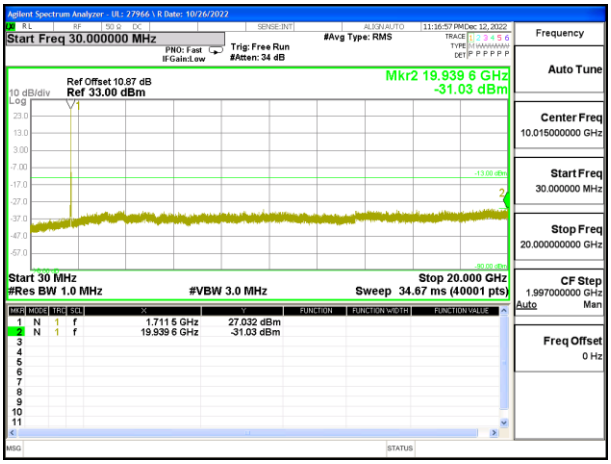

LTE B66 10MHz QPSK High Channel RB1-0



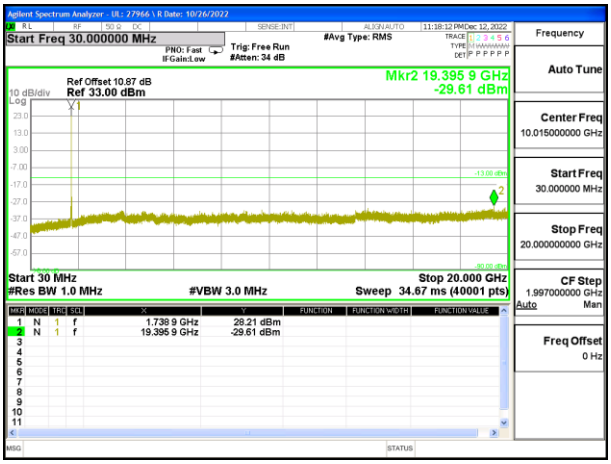

LTE B66 10MHz 16QAM High Channel RB1-0



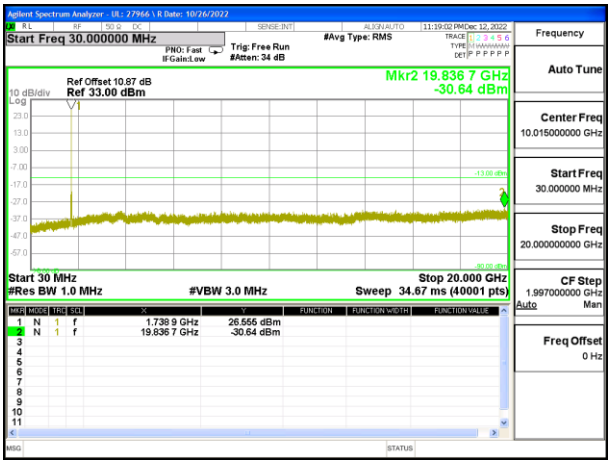

LTE B66 15MHz QPSK Low Channel RB1-0



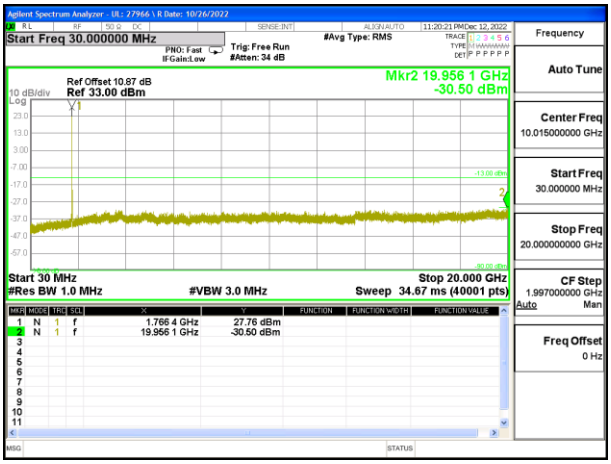

LTE B66 15MHz 16QAM Low Channel RB1-0



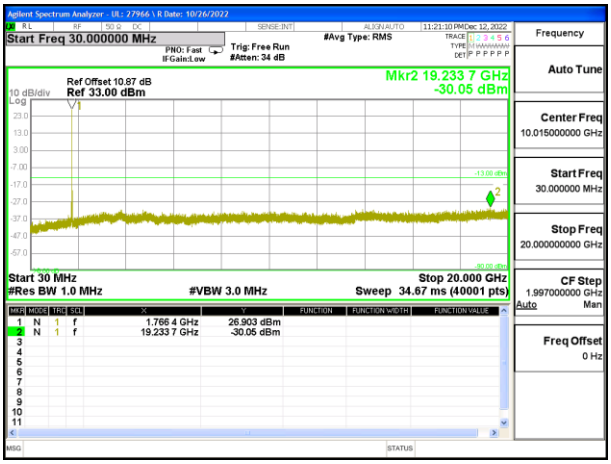

LTE B66 15MHz QPSK Middle Channel RB1-0



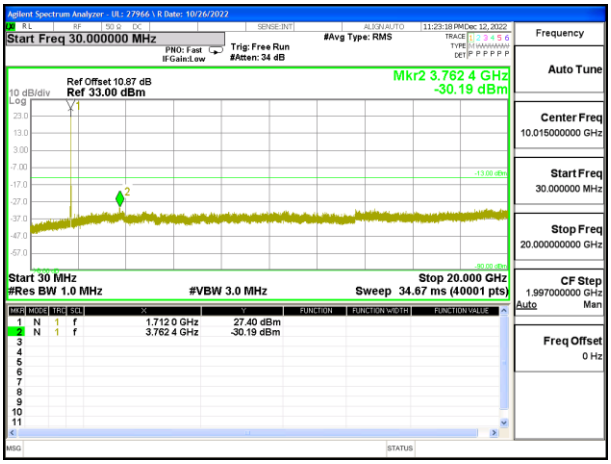

LTE B66 15MHz 16QAM Middle Channel RB1-0



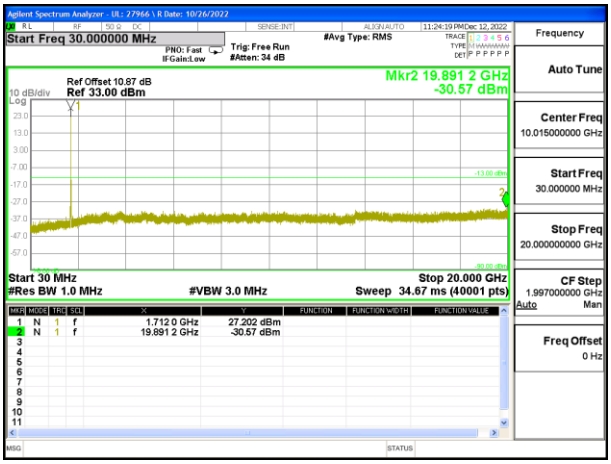

LTE B66 15MHz QPSK High Channel RB1-0



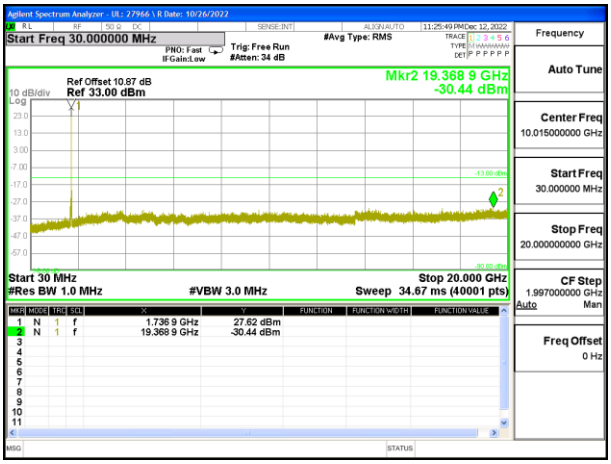

LTE B66 15MHz 16QAM High Channel RB1-0



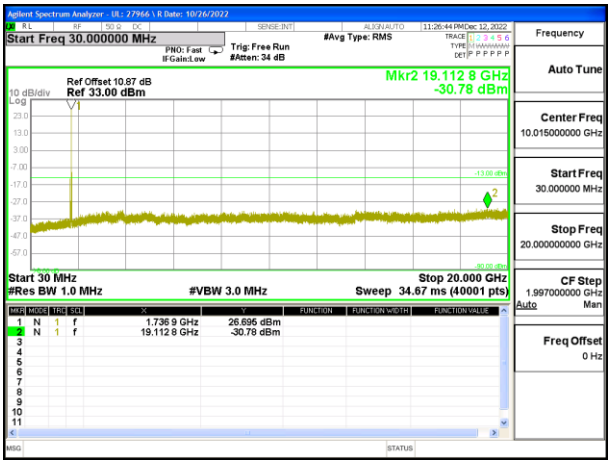

LTE B66 20MHz QPSK Low Channel RB1-0



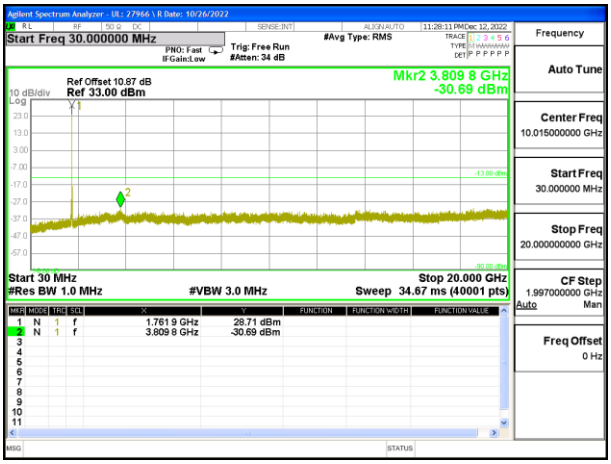

LTE B66 20MHz 16QAM Low Channel RB1-0



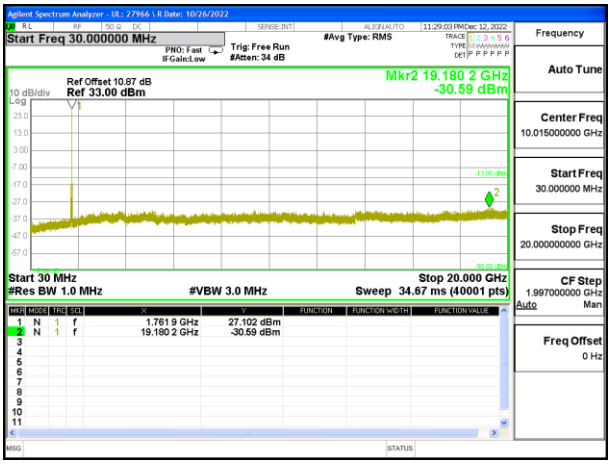

LTE B66 20MHz QPSK Middle Channel RB1-0




LTE B66 20MHz 16QAM Middle Channel RB1-0




LTE B66 20MHz QPSK High Channel RB1-0




LTE B66 20MHz 16QAM High Channel RB1-0

# 9.4. FREQUENCY STABILITY

**RULE PART(S)**

FCC: §2.1055, §22.355, §24.235, and §27.54

**LIMITS**

FCC §22.355
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

FCC §24.235 & §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

**TEST PROCEDURE**

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.2725VDC, Normal, 3.85VDC and High voltage, 4.4275VDC.
  End Voltage, 2.8VDC.

**Frequency Stability vs Temperature:**
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

**Frequency Stability vs Voltage:**
The peak frequency error is recorded (worst-case).

**RESULTS**

See the following pages.

### 9.4.1. GSM

**LIMITS**

FCC: §22.355

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

| Test Engineer ID: | 39005 | Test Date: | 12/9/2022 |
|---|---|---|---|

**GPRS 850**

| Limit | | 824 | 849 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 824.0212 | 848.9546 | | |
| Extreme (50C) | | 824.0212 | 848.9546 | 8.0 | 0.010 |
| Extreme (40C) | | 824.0212 | 848.9546 | 7.5 | 0.009 |
| Extreme (30C) | | 824.0212 | 848.9546 | 7.2 | 0.009 |
| Extreme (10C) | | 824.0212 | 848.9546 | 7.1 | 0.008 |
| Extreme (0C) | | 824.0212 | 848.9546 | 8.0 | 0.010 |
| Extreme (-10C) | | 824.0212 | 848.9546 | 11.0 | 0.013 |
| Extreme (-20C) | | 824.0212 | 848.9546 | 10.0 | 0.012 |
| Extreme (-30C) | | 824.0212 | 848.9546 | 12.0 | 0.014 |
| | | | | | |
| 20C | 15% | 824.0212 | 848.9546 | 6.2 | 0.007 |
| | -15% | 824.0212 | 848.9546 | 6.1 | 0.007 |
| | End Point | 824.0212 | 848.9546 | 5.6 | 0.007 |

**LIMITS**

FCC: §24.235
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Test Engineer ID: | 39005 | Test Date: | 12/9/2022 |
|---|---|---|---|

**GPRS 1900**

| Limit | | 1850 | 1910 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm | F high @ -13dBm | | |
| Temperature | Voltage | (MHz) | (MHz) | | |
| Normal (20C) | Normal | 1850.0359 | 1909.9693 | | |
| Extreme (50C) | | 1850.0359 | 1909.9693 | 8.5 | 0.004 |
| Extreme (40C) | | 1850.0359 | 1909.9693 | 9.0 | 0.005 |
| Extreme (30C) | | 1850.0359 | 1909.9693 | 7.5 | 0.004 |
| Extreme (10C) | | 1850.0359 | 1909.9693 | 6.4 | 0.003 |
| Extreme (0C) | | 1850.0359 | 1909.9693 | 8.5 | 0.004 |
| Extreme (-10C) | | 1850.0359 | 1909.9693 | 6.5 | 0.003 |
| Extreme (-20C) | | 1850.0359 | 1909.9693 | 8.0 | 0.004 |
| Extreme (-30C) | | 1850.0359 | 1909.9693 | 7.0 | 0.004 |
| | | | | | |
| 20C | 15% | 1850.0359 | 1909.9693 | 7.0 | 0.004 |
| | -15% | 1850.0359 | 1909.9693 | 7.1 | 0.004 |
| | End Point | 1850.0359 | 1909.9693 | 6.8 | 0.004 |

## 9.4.2. WCDMA

**LIMITS**

FCC: §22.355

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

| | | | |
|---|---|---|---|
| **Test Engineer ID:** | 39005 | **Test Date:** | 12/9/2022 |

**WCDMA REL 99 BAND 5**

| Limit | | 824 | 849 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm | F high @ -13dBm | | |
| Temperature | Voltage | (MHz) | (MHz) | | |
| Normal (20C) | Normal | 824.2310 | 848.8050 | | |
| Extreme (50C) | | 824.2310 | 848.8050 | 0.3 | 0.0003 |
| Extreme (40C) | | 824.2310 | 848.8050 | 0.2 | 0.0002 |
| Extreme (30C) | | 824.2310 | 848.8050 | 0.2 | 0.0003 |
| Extreme (10C) | | 824.2310 | 848.8050 | 0.3 | 0.0004 |
| Extreme (0C) | | 824.2310 | 848.8050 | 0.2 | 0.0002 |
| Extreme (-10C) | | 824.2310 | 848.8050 | 0.2 | 0.0003 |
| Extreme (-20C) | | 824.2310 | 848.8050 | 0.4 | 0.0005 |
| Extreme (-30C) | | 824.2310 | 848.8050 | 0.1 | 0.0001 |
| | | | | | |
| 20C | 15% | 824.2310 | 848.8050 | 0.3 | 0.0004 |
| | -15% | 824.2310 | 848.8050 | 0.2 | 0.0003 |
| | End Point | 824.2310 | 848.8050 | 0.2 | 0.0003 |

**LIMITS**

FCC: §24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Test Engineer ID: | 39005 | Test Date: | 12/9/2022 |
|---|---|---|---|

**WCDMA REL 99 BAND 2**

| Limit | | 1850 | 1910 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 1850.1477 | 1909.8407 | | |
| Extreme (50C) | | 1850.1477 | 1909.8407 | -0.6 | -0.0003 |
| Extreme (40C) | | 1850.1477 | 1909.8407 | -0.4 | -0.0002 |
| Extreme (30C) | | 1850.1477 | 1909.8407 | -0.5 | -0.0002 |
| Extreme (10C) | | 1850.1477 | 1909.8407 | -0.3 | -0.0002 |
| Extreme (0C) | | 1850.1477 | 1909.8407 | -0.5 | -0.0002 |
| Extreme (-10C) | | 1850.1477 | 1909.8407 | -0.4 | -0.0002 |
| Extreme (-20C) | | 1850.1477 | 1909.8407 | -0.4 | -0.0002 |
| Extreme (-30C) | | 1850.1477 | 1909.8407 | -0.4 | -0.0002 |
| | | | | | |
| 20C | 15% | 1850.1477 | 1909.8407 | -0.5 | -0.0003 |
| | -15% | 1850.1477 | 1909.8407 | -0.5 | -0.0003 |
| | End Point | 1850.1477 | 1909.8407 | -0.5 | -0.0003 |

**LIMITS**

FCC: §27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block

| Test Engineer ID: | 39005 | Test Date: | 12/9/2022 |
|---|---|---|---|

**WCDMA REL 99 BAND 4**

| Limit | | 1710 | 1755 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 1710.1607 | 1754.8497 | | |
| Extreme (50C) | | 1710.1607 | 1754.8497 | -0.4 | -0.0002 |
| Extreme (40C) | | 1710.1607 | 1754.8497 | -0.4 | -0.0002 |
| Extreme (30C) | | 1710.1607 | 1754.8497 | -0.5 | -0.0003 |
| Extreme (10C) | | 1710.1607 | 1754.8497 | -0.3 | -0.0002 |
| Extreme (0C) | | 1710.1607 | 1754.8497 | -0.4 | -0.0002 |
| Extreme (-10C) | | 1710.1607 | 1754.8497 | -0.4 | -0.0002 |
| Extreme (-20C) | | 1710.1607 | 1754.8497 | -0.3 | -0.0002 |
| Extreme (-30C) | | 1710.1607 | 1754.8497 | -0.3 | -0.0002 |
| | | | | | |
| 20C | 15% | 1710.1607 | 1754.8497 | -0.3 | -0.0002 |
| | -15% | 1710.1607 | 1754.8497 | -0.5 | -0.0003 |
| | End Point | 1710.1607 | 1754.8497 | -0.4 | -0.0002 |

## 9.4.3. LTE BAND 2

**LIMITS**

FCC: §24.235
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Test Engineer ID: | 39005 | Test Date: | 12/12/2022 |
|---|---|---|---|

**QPSK, (20MHz BANDWIDTH)**

| Limit | | 1850 | 1910 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 1850.7550 | 1909.2740 | | |
| Extreme (50C) | | 1850.7550 | 1909.2740 | 1.5 | 0.001 |
| Extreme (40C) | | 1850.7550 | 1909.2740 | 1.0 | 0.001 |
| Extreme (30C) | | 1850.7550 | 1909.2740 | -1.4 | -0.001 |
| Extreme (10C) | | 1850.7550 | 1909.2740 | 1.1 | 0.001 |
| Extreme (0C) | | 1850.7550 | 1909.2740 | -1.0 | -0.001 |
| Extreme (-10C) | | 1850.7550 | 1909.2740 | -1.2 | -0.001 |
| Extreme (-20C) | | 1850.7550 | 1909.2740 | 1.1 | 0.001 |
| Extreme (-30C) | | 1850.7550 | 1909.2740 | -1.1 | -0.001 |
| | | | | | |
| 20C | 15% | 1850.7550 | 1909.2740 | 1.3 | 0.001 |
| | -15% | 1850.7550 | 1909.2740 | -1.2 | -0.001 |
| | End Point | 1850.7550 | 1909.2740 | 1.0 | 0.001 |

## 9.4.4. LTE BAND 5

**LIMITS**

FCC: §22.355
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

| Test Engineer ID: | 39005 | Test Date: | 12/12/2022 |
|---|---|---|---|

**QPSK, (10MHz BANDWIDTH)**

| Limit | | 824 | 849 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 824.2970 | 848.7100 | | |
| Extreme (50C) | | 824.2970 | 848.7100 | 1.1 | 0.001 |
| Extreme (40C) | | 824.2970 | 848.7100 | 1.4 | 0.002 |
| Extreme (30C) | | 824.2970 | 848.7100 | 1.2 | 0.001 |
| Extreme (10C) | | 824.2970 | 848.7100 | 2.0 | 0.002 |
| Extreme (0C) | | 824.2970 | 848.7100 | 2.2 | 0.003 |
| Extreme (-10C) | | 824.2970 | 848.7100 | 1.6 | 0.002 |
| Extreme (-20C) | | 824.2970 | 848.7100 | 1.4 | 0.002 |
| Extreme (-30C) | | 824.2970 | 848.7100 | -4.1 | -0.005 |
| | | | | | |
| 20C | 15% | 824.2970 | 848.7100 | 2.0 | 0.002 |
| | -15% | 824.2970 | 848.7100 | 2.1 | 0.003 |
| | End Point | 824.2970 | 848.7100 | 1.6 | 0.002 |

## 9.4.5. LTE BAND 12

**LIMITS**

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Test Engineer ID: | 39005 | Test Date: | 12/14/2022 |
|---|---|---|---|

**QPSK, (10MHz BANDWIDTH)**

| Limit | | 699 | 716 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 699.3570 | 715.6770 | | |
| Extreme (50C) | | 699.3570 | 715.6770 | -1.0 | -0.001 |
| Extreme (40C) | | 699.3570 | 715.6770 | -0.5 | -0.001 |
| Extreme (30C) | | 699.3570 | 715.6770 | 1.1 | 0.002 |
| Extreme (10C) | | 699.3570 | 715.6770 | 1.0 | 0.001 |
| Extreme (0C) | | 699.3570 | 715.6770 | 0.8 | 0.001 |
| Extreme (-10C) | | 699.3570 | 715.6770 | -0.5 | -0.001 |
| Extreme (-20C) | | 699.3570 | 715.6770 | -1.1 | -0.002 |
| Extreme (-30C) | | 699.3570 | 715.6770 | -1.0 | -0.001 |
| | | | | | |
| 20C | 15% | 699.3570 | 715.6770 | 1.0 | 0.001 |
| | -15% | 699.3570 | 715.6770 | 1.1 | 0.001 |
| | End Point | 699.3570 | 715.6770 | 1.0 | 0.001 |

## 9.4.6. LTE BAND 13

**LIMITS**

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Test Engineer ID: | 39005 | Test Date: | 12/12/2022 |
|---|---|---|---|

**QPSK, (10MHz BANDWIDTH)**

| Limit | | 777 | 787 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm | F high @ -13dBm | | |
| Temperature | Voltage | (MHz) | (MHz) | | |
| Normal (20C) | Normal | 777.2636 | 786.7428 | | |
| Extreme (50C) | | 777.2636 | 786.7428 | -2.1 | -0.003 |
| Extreme (40C) | | 777.2636 | 786.7428 | -2.2 | -0.003 |
| Extreme (30C) | | 777.2636 | 786.7428 | -3.3 | -0.004 |
| Extreme (10C) | | 777.2636 | 786.7428 | -1.9 | -0.002 |
| Extreme (0C) | | 777.2636 | 786.7428 | -2.7 | -0.003 |
| Extreme (-10C) | | 777.2636 | 786.7428 | -3.0 | -0.004 |
| Extreme (-20C) | | 777.2636 | 786.7428 | -2.5 | -0.003 |
| Extreme (-30C) | | 777.2636 | 786.7428 | -3.4 | -0.004 |
| | | | | | |
| 20C | 15% | 777.2636 | 786.7428 | -1.9 | -0.002 |
| | -15% | 777.2636 | 786.7428 | -1.9 | -0.002 |
| | End Point | 777.2636 | 786.7428 | -2.2 | -0.003 |

## 9.4.7. LTE BAND 26(FCC PART 90S)

**LIMITS**

FCC: §90.213
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

| Test Engineer ID: | 39005 | Test Date: | 12/15/2022 |
|---|---|---|---|

**QPSK (5MHz BANDWIDTH)**

| Limit | | 814 | 824 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 814.1350 | 823.8450 | | |
| Extreme (50C) | | 814.1350 | 823.8450 | -1.2 | -0.002 |
| Extreme (40C) | | 814.1350 | 823.8450 | -1.1 | -0.001 |
| Extreme (30C) | | 814.1350 | 823.8450 | -1.1 | -0.001 |
| Extreme (10C) | | 814.1350 | 823.8450 | -1.2 | -0.002 |
| Extreme (0C) | | 814.1350 | 823.8450 | -1.0 | -0.001 |
| Extreme (-10C) | | 814.1350 | 823.8450 | -0.1 | 0.000 |
| Extreme (-20C) | | 814.1350 | 823.8450 | -1.2 | -0.001 |
| Extreme (-30C) | | 814.1350 | 823.8450 | -1.3 | -0.002 |
| | | | | | |
| 20C | 15% | 814.1350 | 823.8450 | -1.0 | -0.001 |
| | -15% | 814.1350 | 823.8450 | -1.3 | -0.002 |
| | End Point | 814.1350 | 823.8450 | -1.4 | -0.002 |

## 9.4.8. LTE BAND 26(FCC PART 22)

**LIMITS**

FCC: §22.355
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

| Test Engineer ID: | 39005 | Test Date: | 12/15/2022 |
|---|---|---|---|

**QPSK (15MHz BANDWIDTH)**

| Limit | | 824 | 849 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm | F high @ -13dBm | | |
| Temperature | Voltage | (MHz) | (MHz) | | |
| Normal (20C) | | 824.5550 | 848.4750 | | |
| Extreme (50C) | | 824.5550 | 848.4750 | -1.2 | -0.001 |
| Extreme (40C) | | 824.5550 | 848.4750 | -1.3 | -0.002 |
| Extreme (30C) | | 824.5550 | 848.4750 | -1.1 | -0.001 |
| Extreme (10C) | Normal | 824.5550 | 848.4750 | -1.4 | -0.002 |
| Extreme (0C) | | 824.5550 | 848.4750 | -1.0 | -0.001 |
| Extreme (-10C) | | 824.5550 | 848.4750 | -1.5 | -0.002 |
| Extreme (-20C) | | 824.5550 | 848.4750 | -1.3 | -0.002 |
| Extreme (-30C) | | 824.5550 | 848.4750 | -1.3 | -0.001 |
| | | | | | |
| 20C | 15% | 824.5550 | 848.4750 | -1.2 | -0.001 |
| | -15% | 824.5550 | 848.4750 | -1.3 | -0.001 |
| | End Point | 824.5550 | 848.4750 | -1.2 | -0.001 |

## 9.4.9. LTE BAND 41

**LIMITS**

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Test Engineer ID: | 39005 | Test Date: | 12/16/2022 |
|---|---|---|---|

**QPSK, (20MHz BANDWIDTH)**

| Limit | | 2496 | 2690 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm | F high @ -13dBm | | |
| Temperature | Voltage | (MHz) | (MHz) | | |
| Normal (20C) | Normal | 2496.7940 | 2689.2330 | | |
| Extreme (50C) | | 2496.7940 | 2689.2330 | 3.2 | 0.001 |
| Extreme (40C) | | 2496.7940 | 2689.2330 | 4.1 | 0.002 |
| Extreme (30C) | | 2496.7940 | 2689.2330 | 3.5 | 0.001 |
| Extreme (10C) | | 2496.7940 | 2689.2330 | 4.0 | 0.002 |
| Extreme (0C) | | 2496.7940 | 2689.2330 | 3.6 | 0.001 |
| Extreme (-10C) | | 2496.7940 | 2689.2330 | 2.5 | 0.001 |
| Extreme (-20C) | | 2496.7940 | 2689.2330 | 3.2 | 0.001 |
| Extreme (-30C) | | 2496.7940 | 2689.2330 | 4.0 | 0.002 |
| | | | | | |
| 20C | 15% | 2496.7940 | 2689.2330 | 2.2 | 0.001 |
| | -15% | 2496.7940 | 2689.2330 | 2.4 | 0.001 |
| | End Point | 2496.7940 | 2689.2330 | 3.0 | 0.001 |

## 9.4.10. LTE BAND 66

**LIMITS**

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Test Engineer ID: | 39005 | Test Date: | 12/16/2022 |
|---|---|---|---|

**QPSK, (20MHz BANDWIDTH)**

| Limit | | 1710 | 1780 | Delta (Hz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| Condition | | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) | | |
| Temperature | Voltage | | | | |
| Normal (20C) | Normal | 1710.7000 | 1779.2600 | | |
| Extreme (50C) | | 1710.7000 | 1779.2600 | -2.0 | -0.001 |
| Extreme (40C) | | 1710.7000 | 1779.2600 | -2.3 | -0.001 |
| Extreme (30C) | | 1710.7000 | 1779.2600 | -1.9 | -0.001 |
| Extreme (10C) | | 1710.7000 | 1779.2600 | -1.8 | -0.001 |
| Extreme (0C) | | 1710.7000 | 1779.2600 | -1.5 | -0.001 |
| Extreme (-10C) | | 1710.7000 | 1779.2600 | -1.9 | -0.001 |
| Extreme (-20C) | | 1710.7000 | 1779.2600 | -1.5 | -0.001 |
| Extreme (-30C) | | 1710.7000 | 1779.2600 | -1.5 | -0.001 |
| | | | | | |
| 20C | 15% | 1710.7000 | 1779.2600 | -2.2 | -0.001 |
| | -15% | 1710.7000 | 1779.2600 | -3.1 | -0.002 |
| | End Point | 1710.7000 | 1779.2600 | -3.5 | -0.002 |

## 9.5. PEAK-TO-AVERAGE POWER RATIO

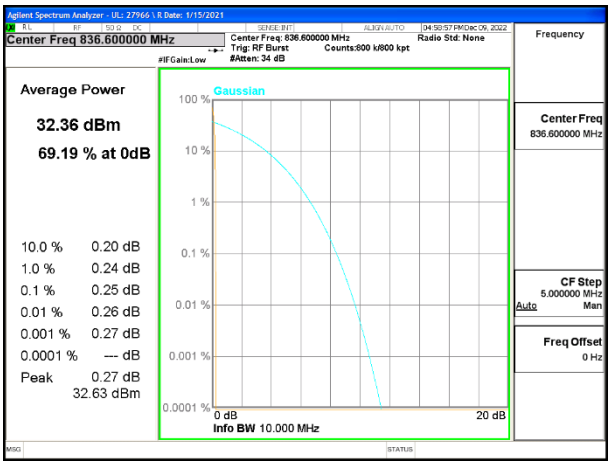
**LIMITS**

In addition, the peak to average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

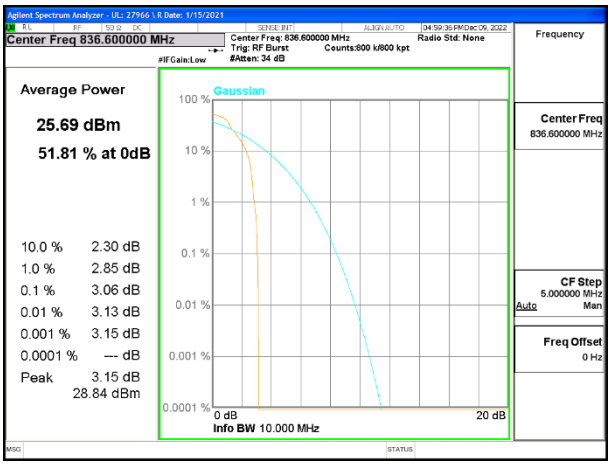
**RESULT**

The results from all CCDF plots are passed with 13dB peak-to-average power ratio criteria.

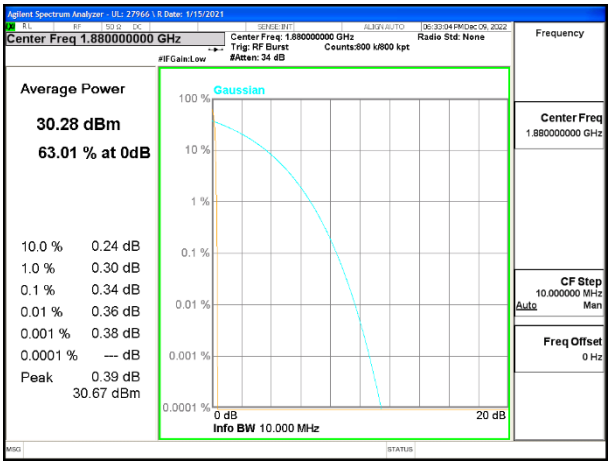
## 9.5.1. GSM



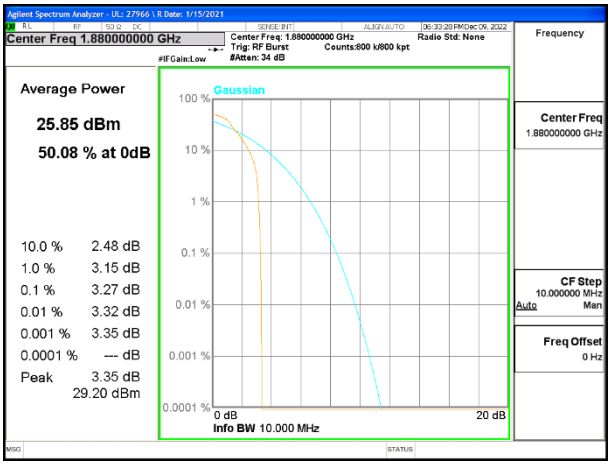

GSM 850 GPRS Middle Channel




GSM 850 EGPRS Middle Channel

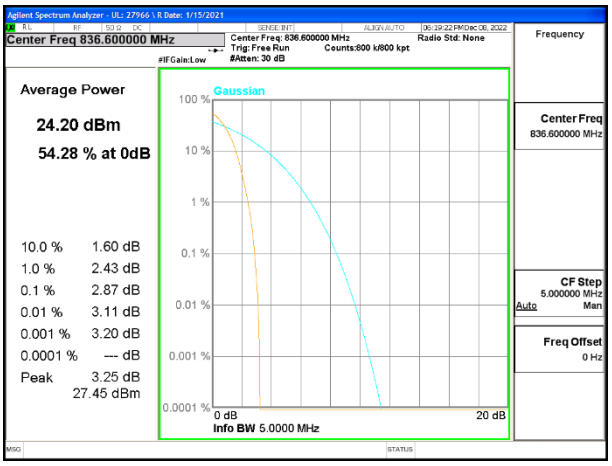



GSM 1900 GPRS Middle Channel

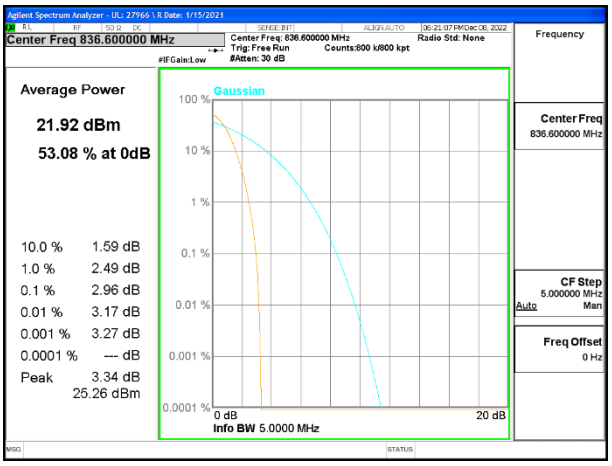



GSM 1900 EGPRS Middle Channel

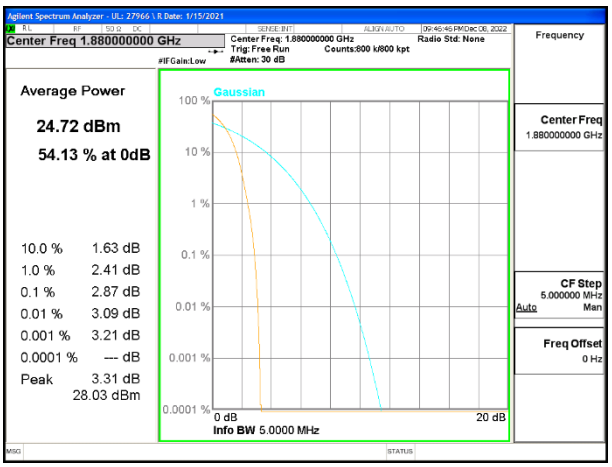
## 9.5.2. WCDMA



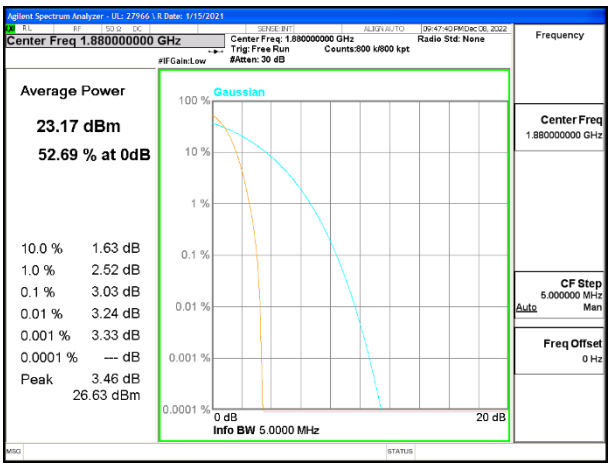

WCDMA Band 5 Rel 99 Middle Channel



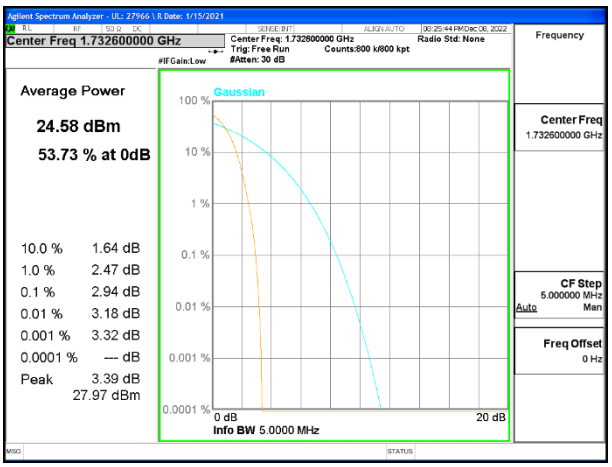

WCDMA Band 5 HSDPA Middle Channel



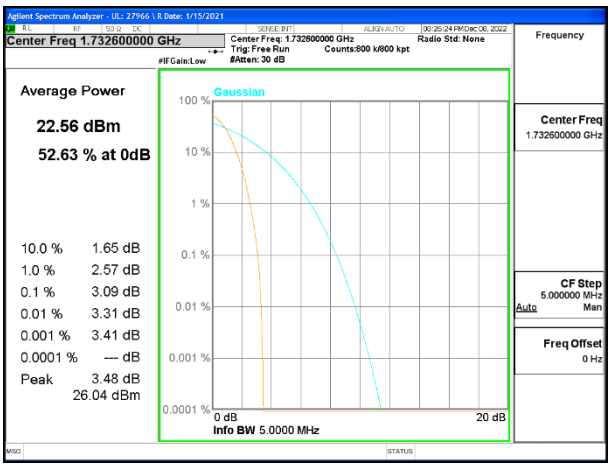

WCDMA Band 2 Rel 99 Middle Channel




WCDMA Band 2 HSDPA Middle Channel

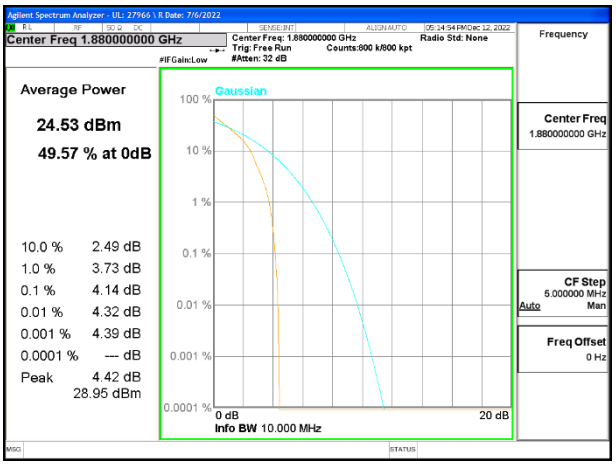



WCDMA Band 4 Rel 99 Middle Channel

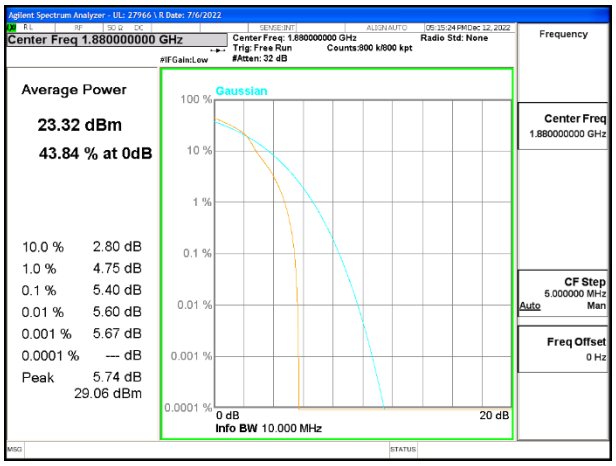



WCDMA Band 4 HSDPA Middle Channel

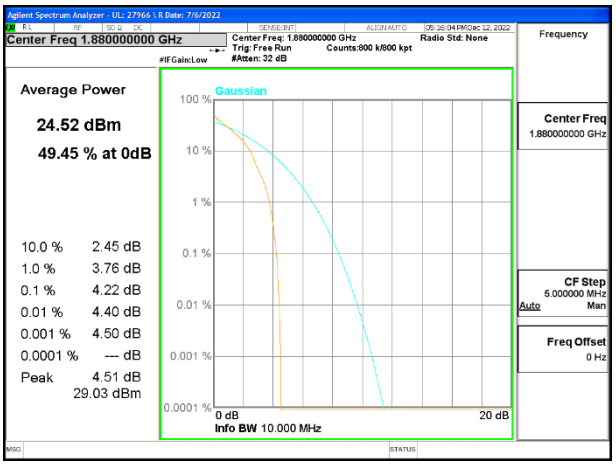
## 9.5.3. LTE BAND 2



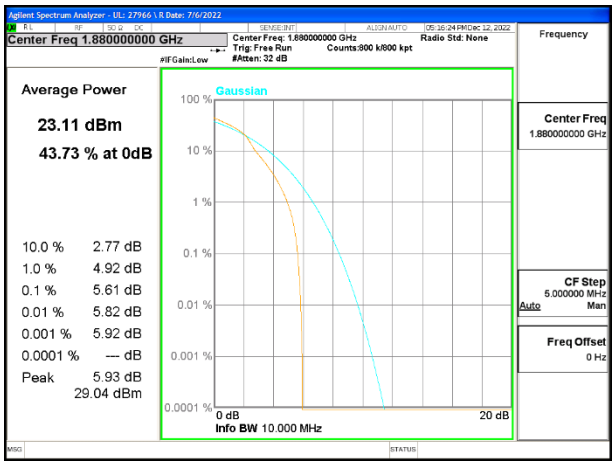

LTE B2 1.4MHz QPSK Mid Channel



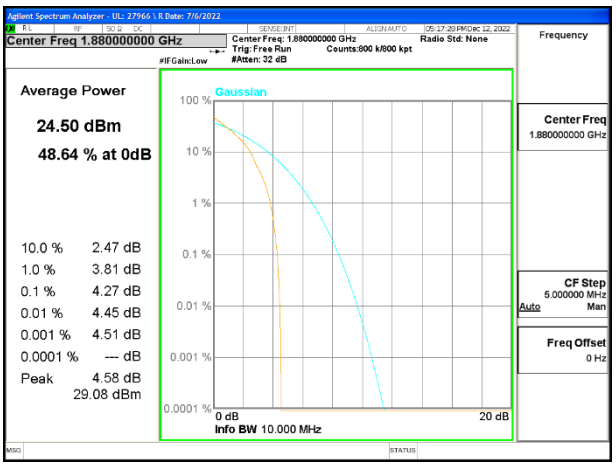

LTE B2 1.4MHz 16QAM Mid Channel



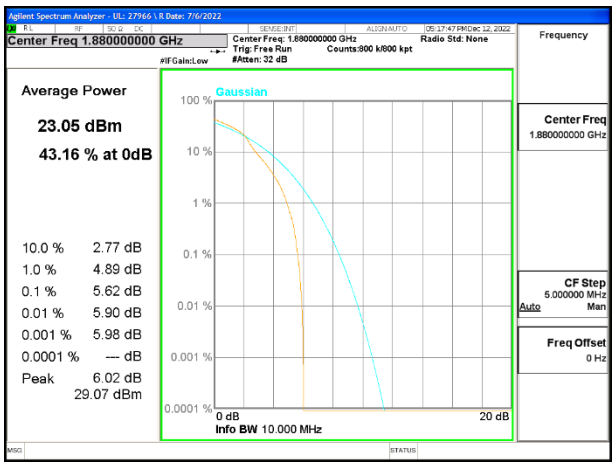

LTE B2 3MHz QPSK Mid Channel



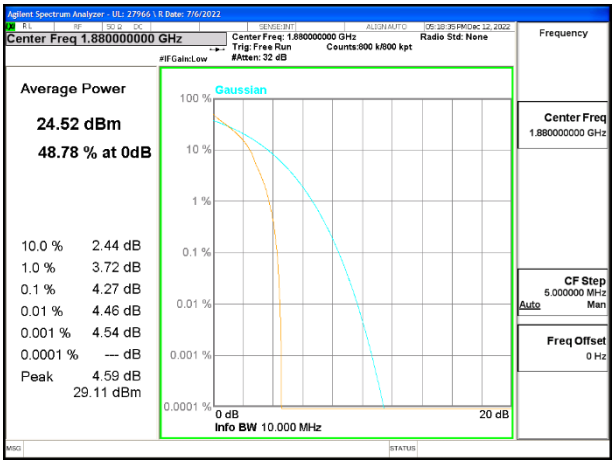

LTE B2 3MHz 16QAM Mid Channel



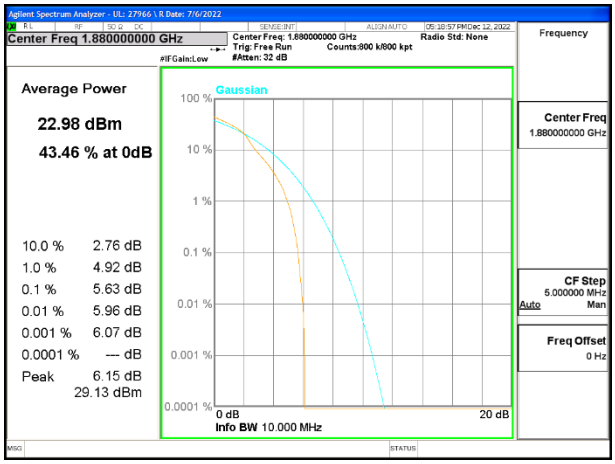

LTE B2 5MHz QPSK Mid Channel



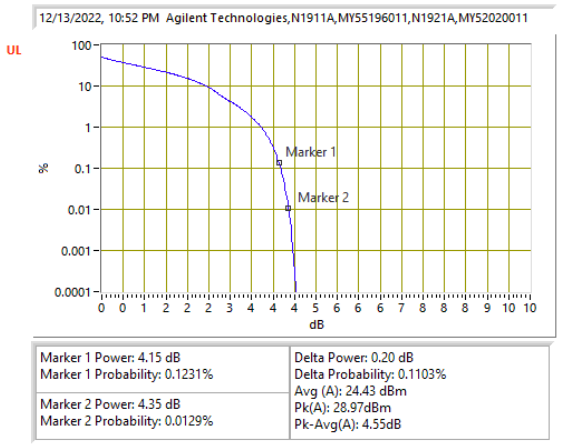

LTE B2 5MHz 16QAM Mid Channel



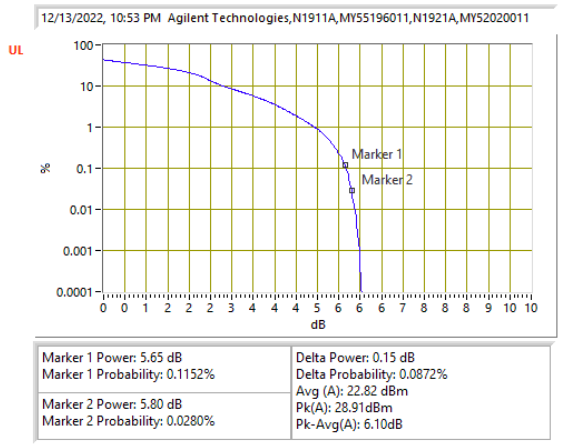

LTE B2 10MHz QPSK Mid Channel



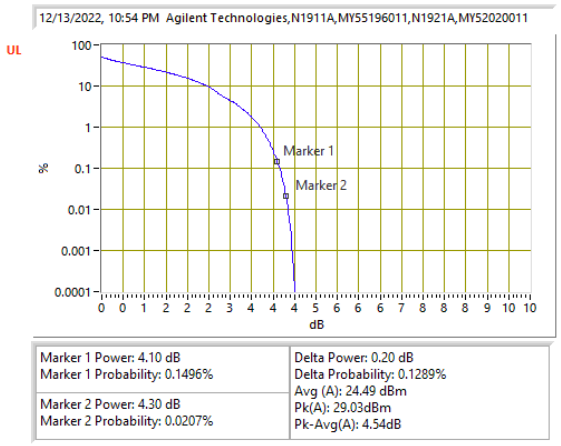

LTE B2 10MHz 16QAM Mid Channel



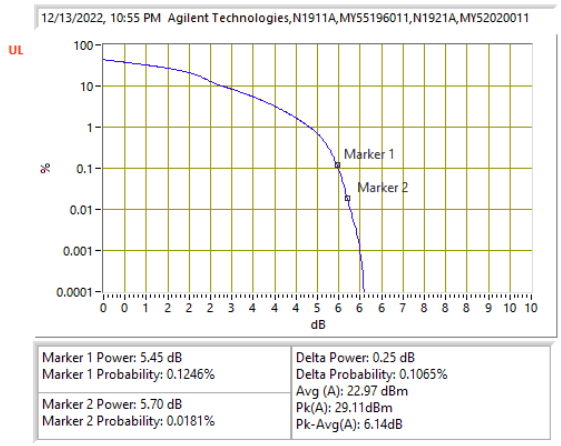

LTE B2 15MHz QPSK Mid Channel




LTE B2 15MHz 16QAM Mid Channel

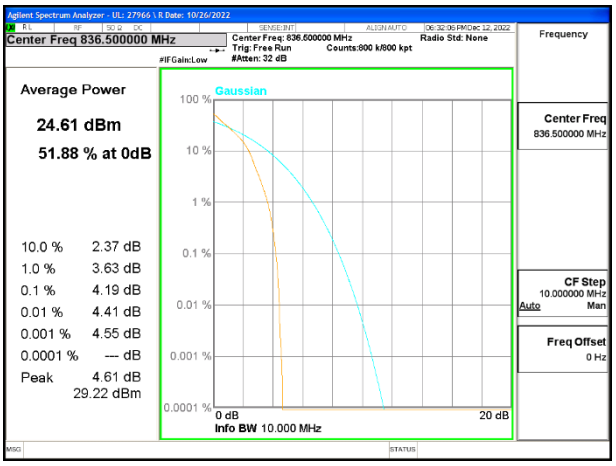



LTE B2 20MHz QPSK Mid Channel

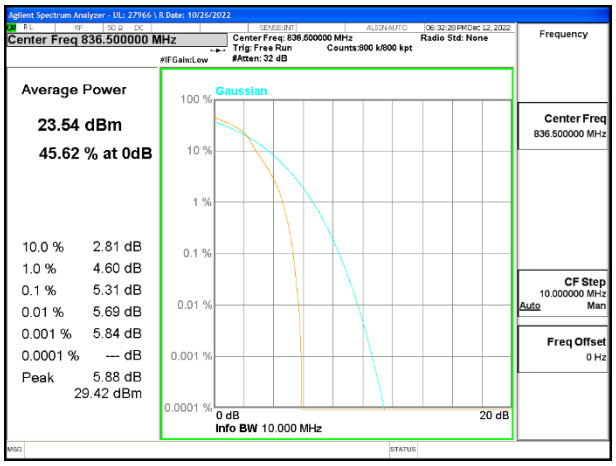



LTE B2 20MHz 16QAM Mid Channel

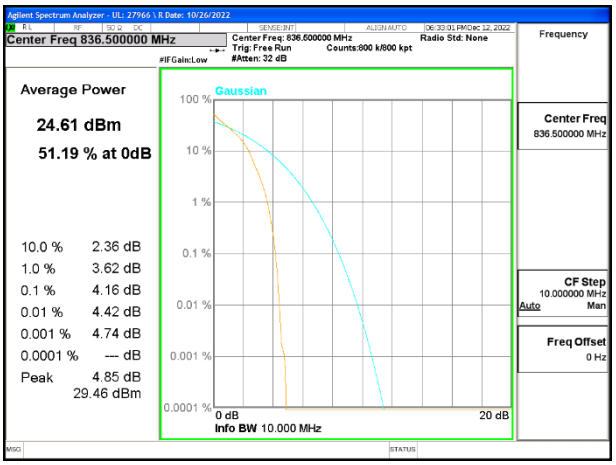
## 9.5.4. LTE BAND 5



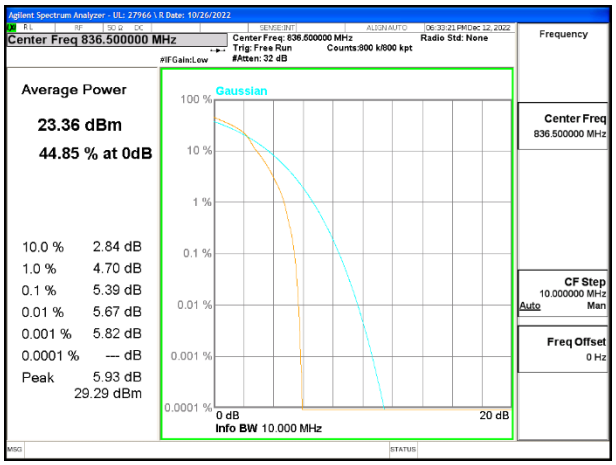

LTE B5 1.4MHz QPSK Mid Channel



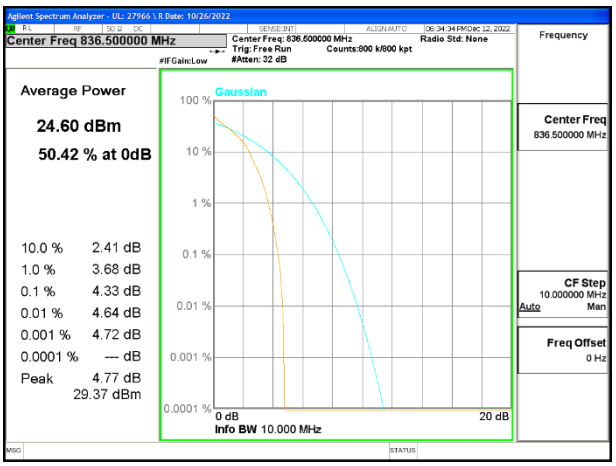

LTE B5 1.4MHz 16QAM Mid Channel



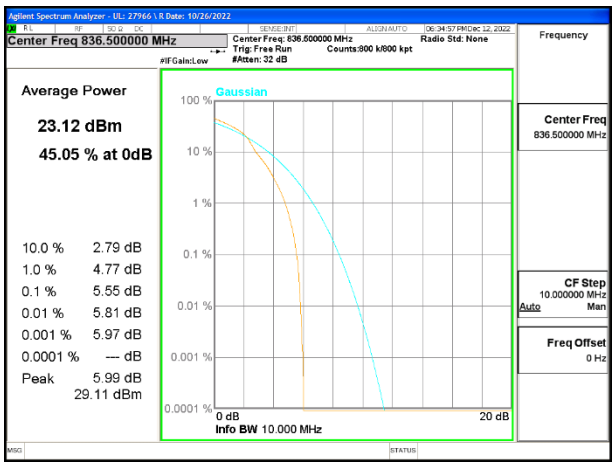

LTE B5 3MHz QPSK Mid Channel



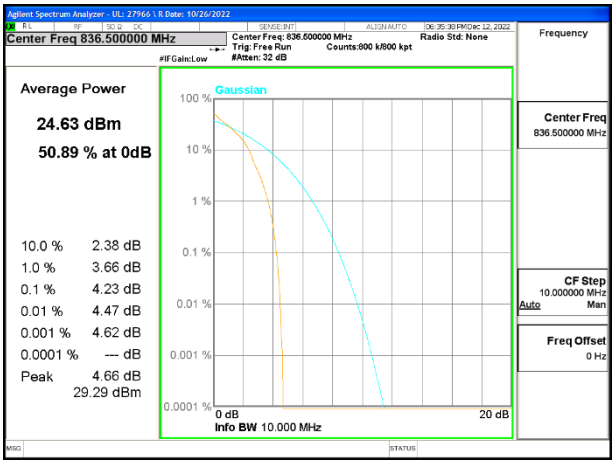

LTE B5 3MHz 16QAM Mid Channel



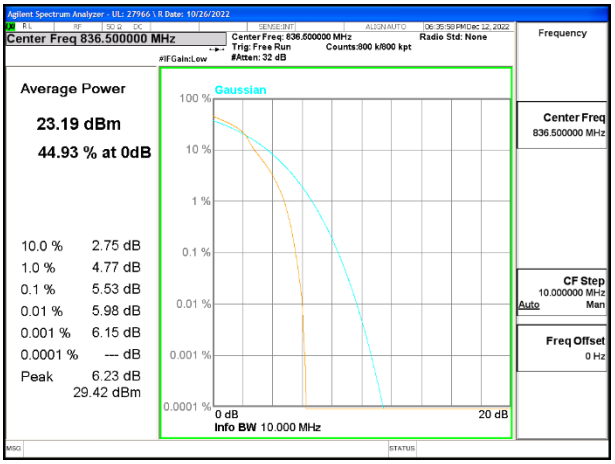

LTE B5 5MHz QPSK Mid Channel




LTE B5 5MHz 16QAM Mid Channel

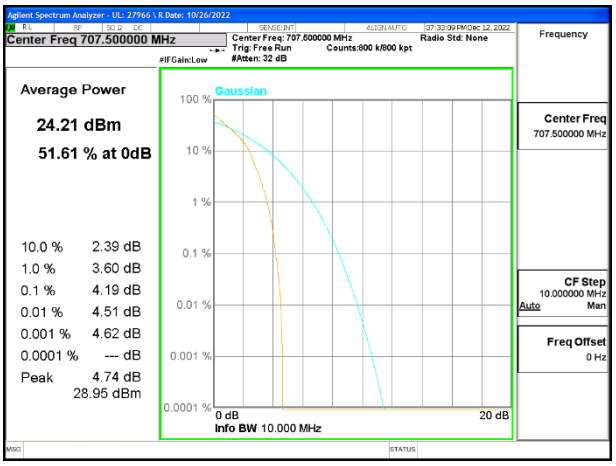



LTE B5 10MHz QPSK Mid Channel

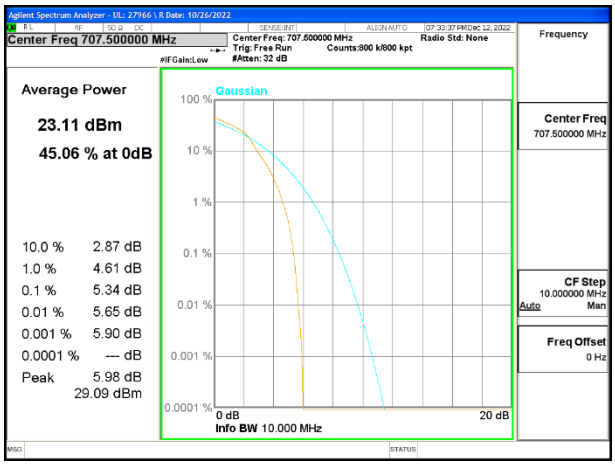



LTE B5 10MHz 16QAM Mid Channel

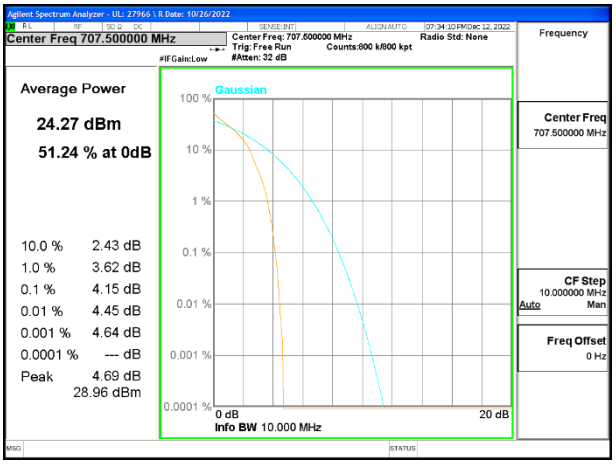
## 9.5.5. LTE BAND 12



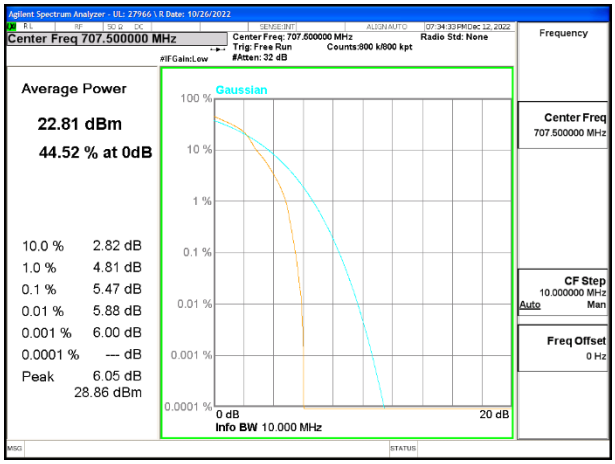

LTE B12 1.4MHz QPSK Mid Channel



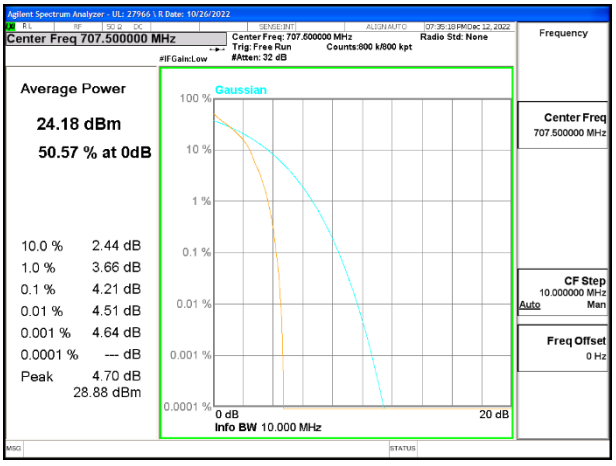

LTE B12 1.4MHz 16QAM Mid Channel



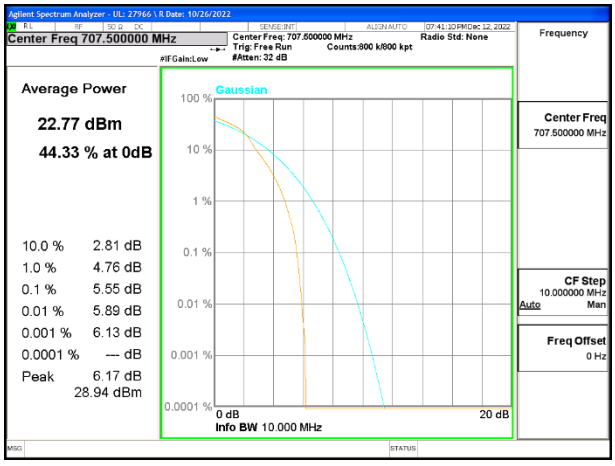

LTE B12 3MHz QPSK Mid Channel



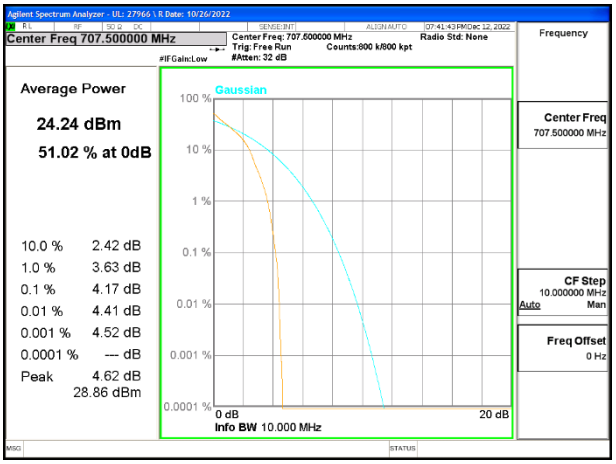

LTE B12 3MHz 16QAM Mid Channel



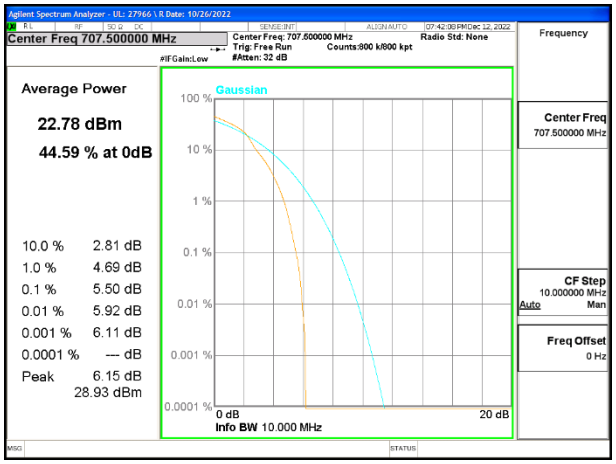

LTE B12 5MHz QPSK Mid Channel




LTE B12 5MHz 16QAM Mid Channel

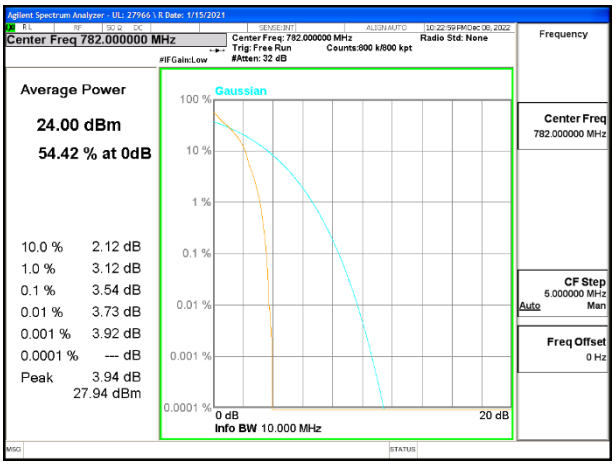



LTE B12 10MHz QPSK Mid Channel

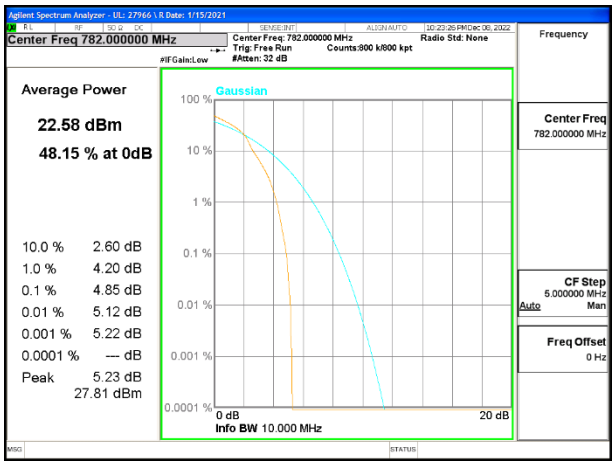



LTE B12 10MHz 16QAM Mid Channel

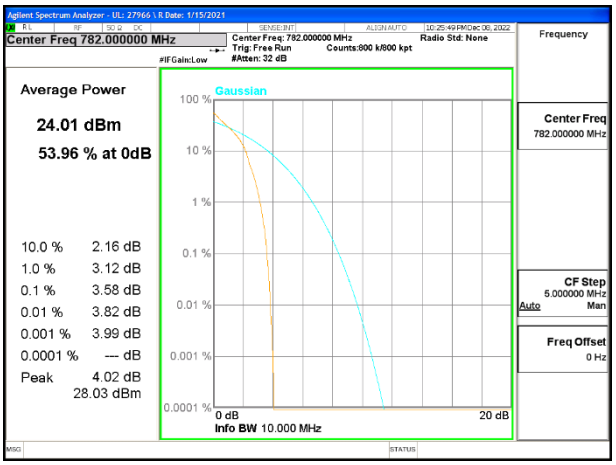
## 9.5.6. LTE BAND 13



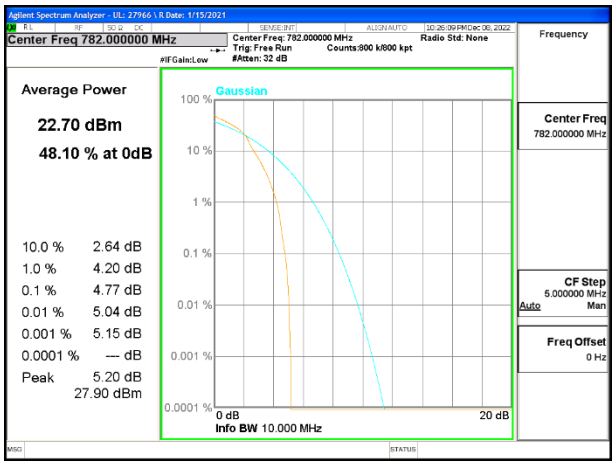

LTE B13 5MHz QPSK Mid Channel




LTE B13 5MHz 16QAM Mid Channel




LTE B13 10MHz QPSK Mid Channel




LTE B13 10MHz 16QAM Mid Channel