

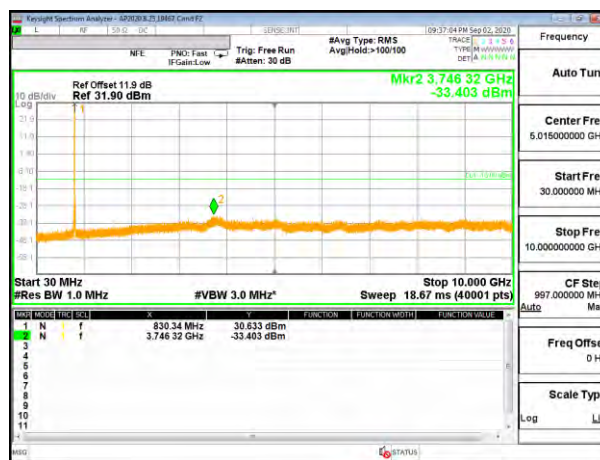
**5G NR Band n5**



5G NR Band n5 20MHz QPSK Low Channel RB1-1



5G NR Band n5 20MHz QPSK Middle Channel RB1-1



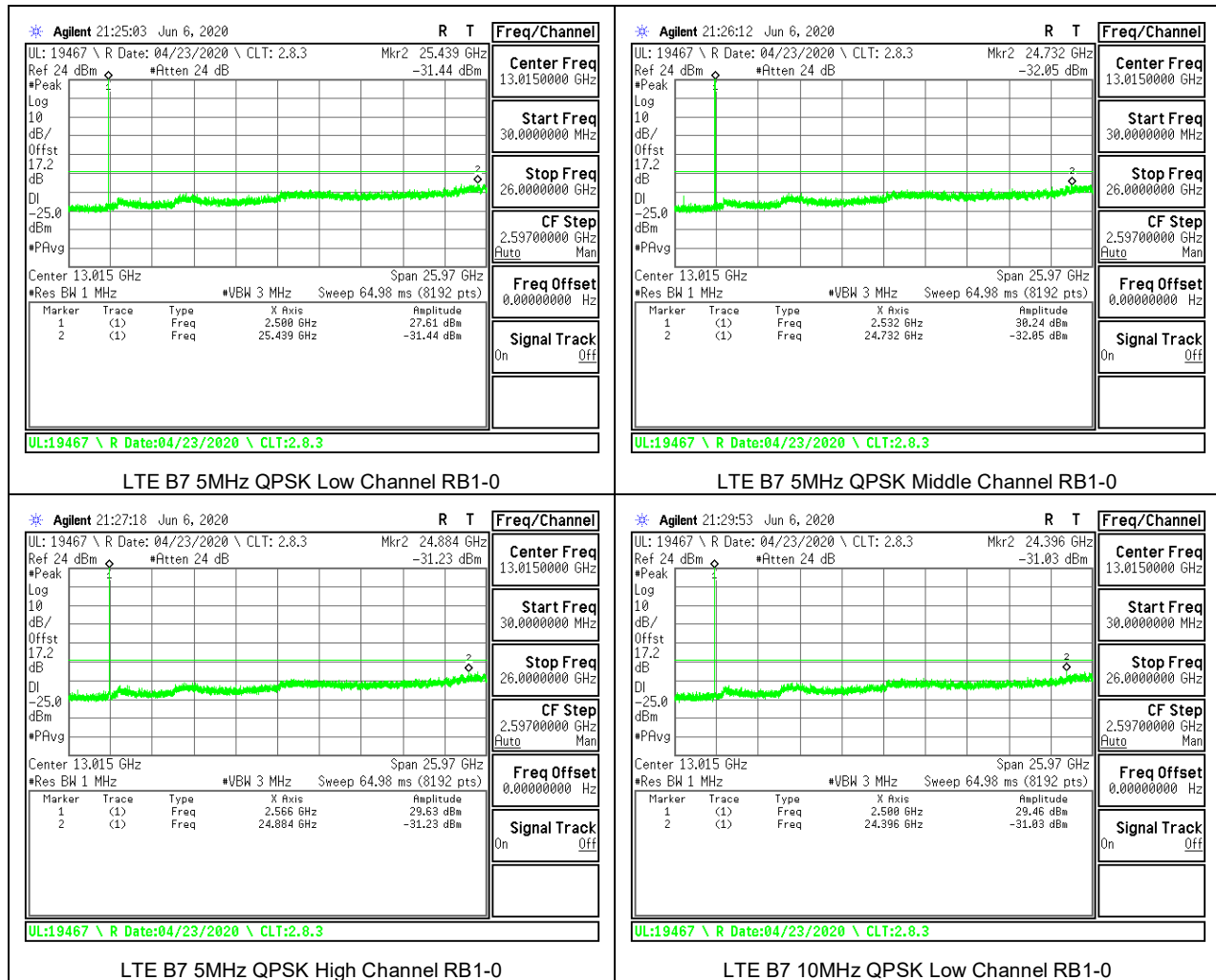
5G NR Band n5 20MHz QPSK High Channel RB1-1

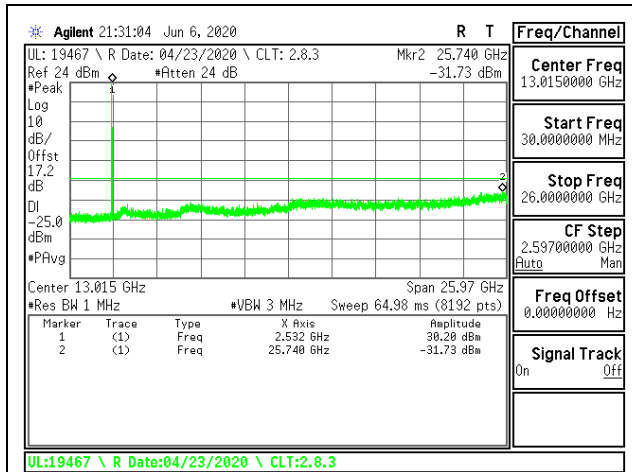
### 8.3.3. LTE BAND 7

#### LIMITS

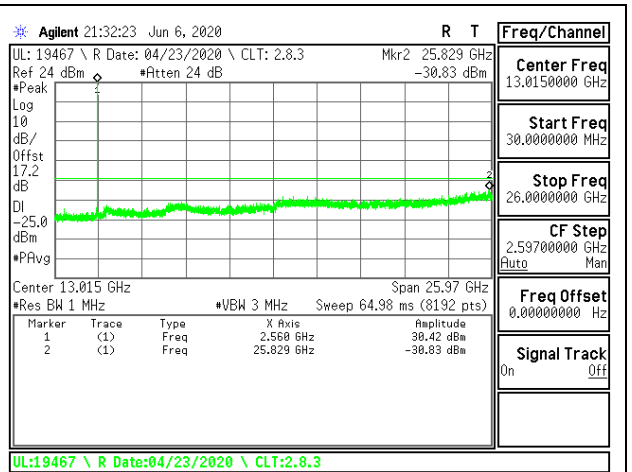
FCC: §27.53 (m)

The minimum permissible attenuation level of any spurious emissions is  $55 + 10 \log (P)$  dB where transmitting power (P) in Watts.

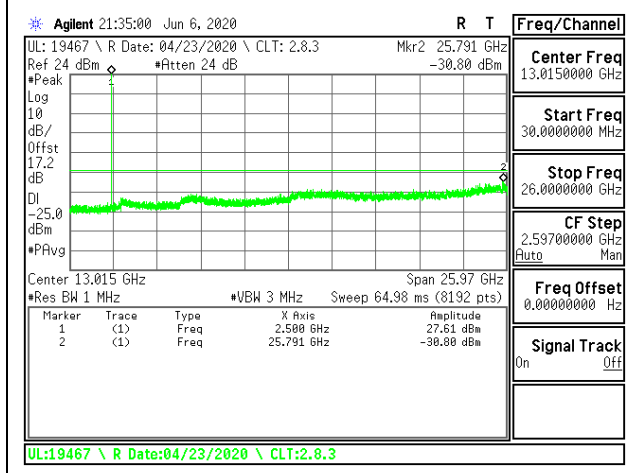




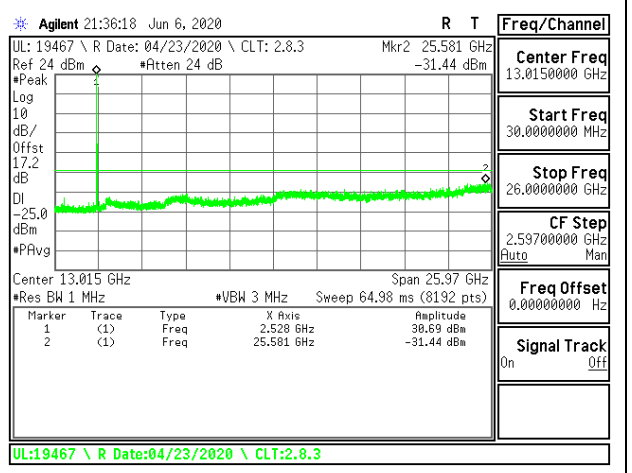
LTE B7 10MHz QPSK Middle Channel RB1-0



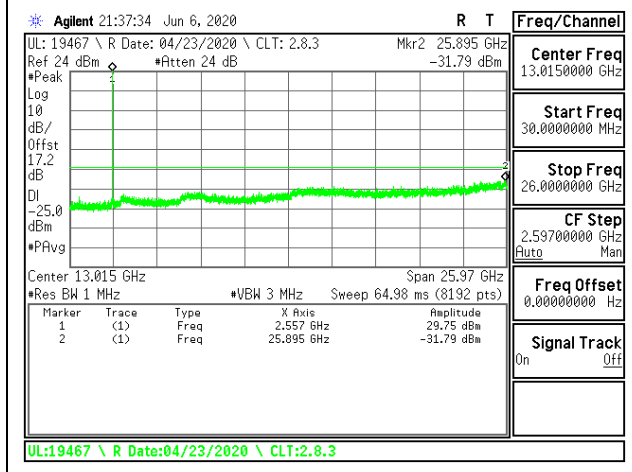
LTE B7 10MHz QPSK High Channel RB1-0



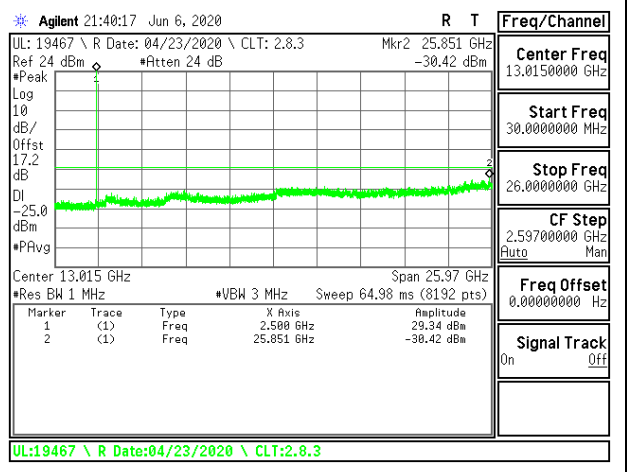
LTE B7 15MHz QPSK Low Channel RB1-0



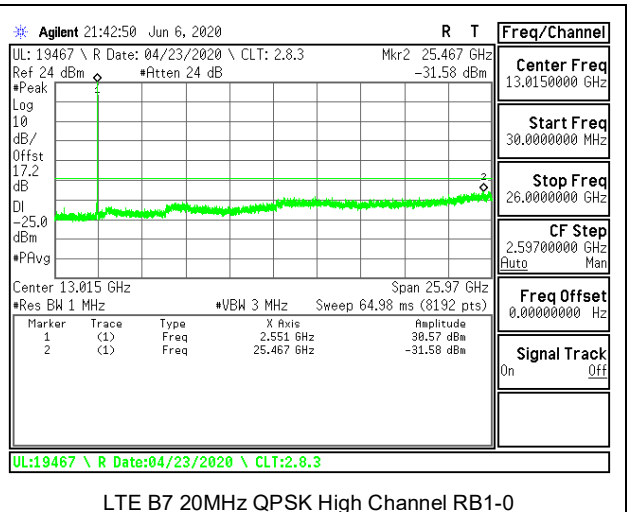
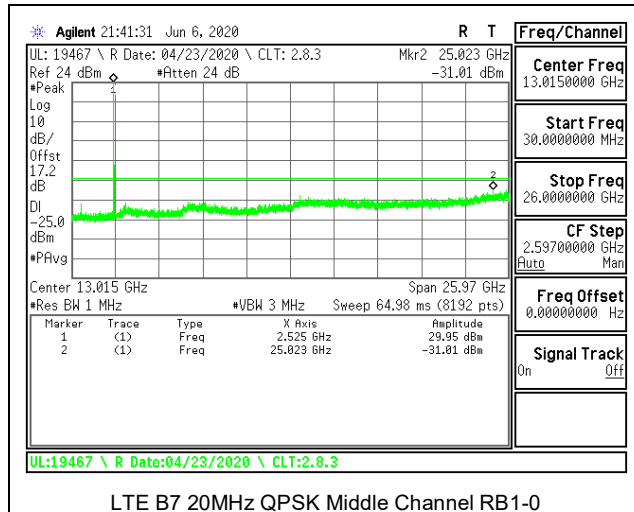
LTE B7 15MHz QPSK Middle Channel RB1-0



LTE B7 15MHz QPSK High Channel RB1-0



LTE B7 20MHz QPSK Low Channel RB1-0



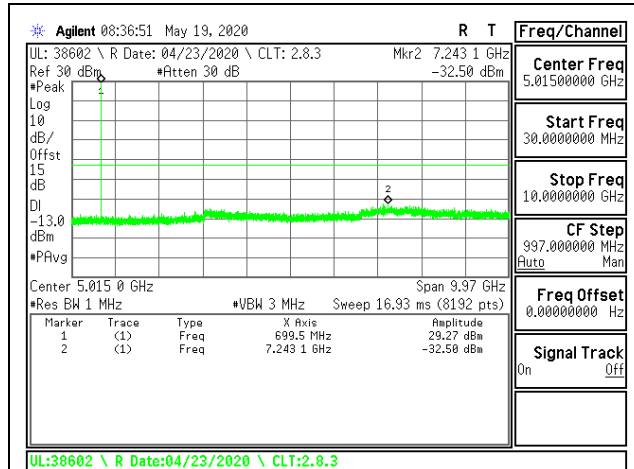
### 8.3.4. LTE BAND 12 AND 5G NR Band n12

#### LIMITS

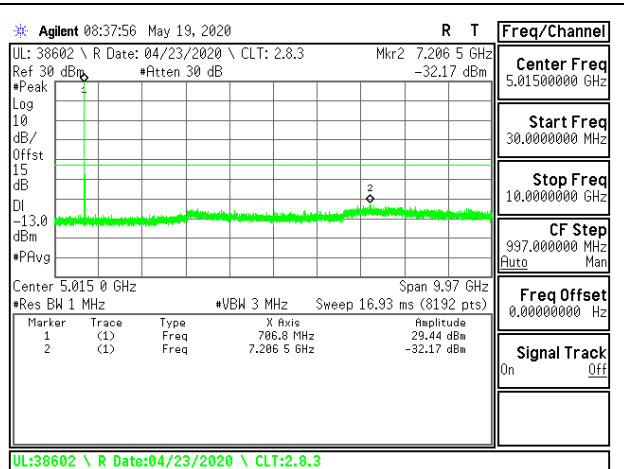
FCC: §27.53 (g)

The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log(P)$  dB where transmitting power (P) in Watts.

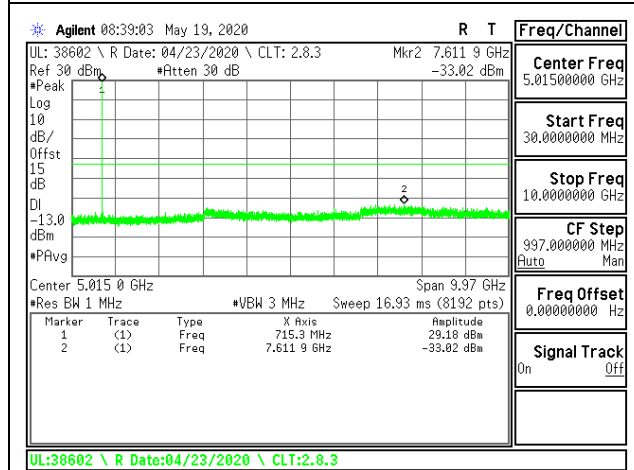
#### LTE BAND 12



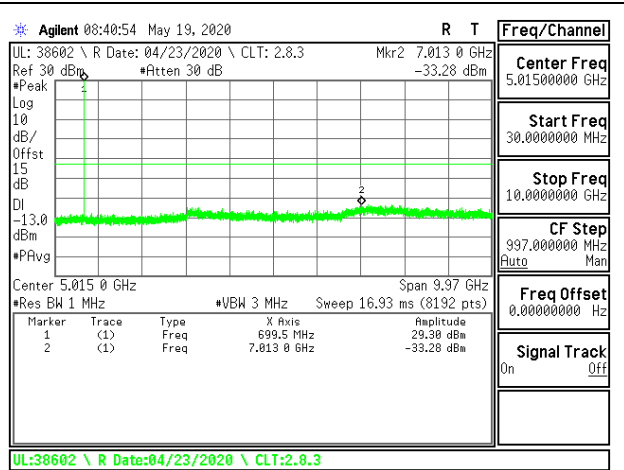
LTE B12 1.4MHz QPSK Low Channel RB1-0



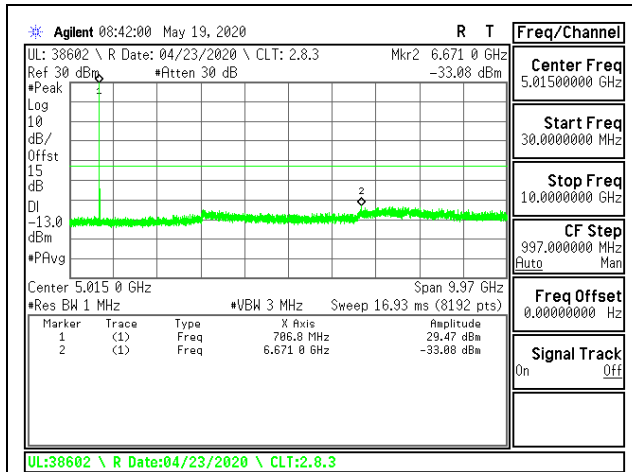
LTE B12 1.4MHz QPSK Middle Channel RB1-0



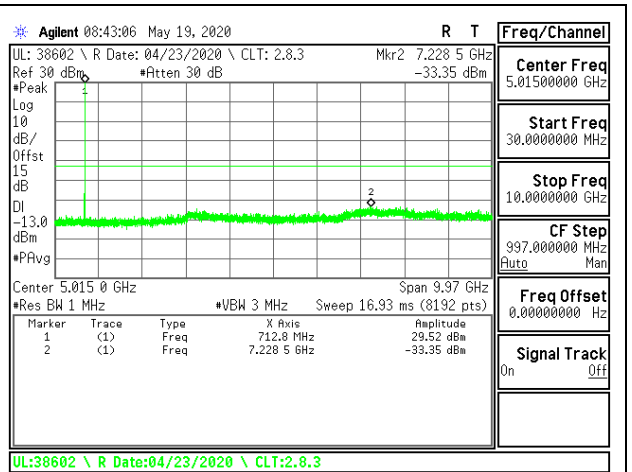
LTE B12 1.4MHz QPSK High Channel RB1-0



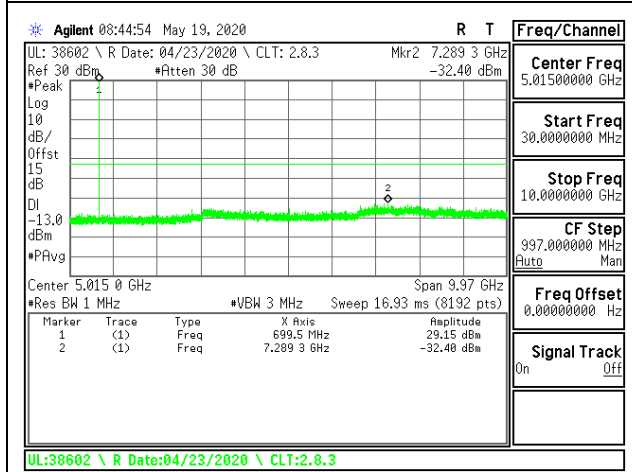
LTE B12 3MHz QPSK Low Channel RB1-0



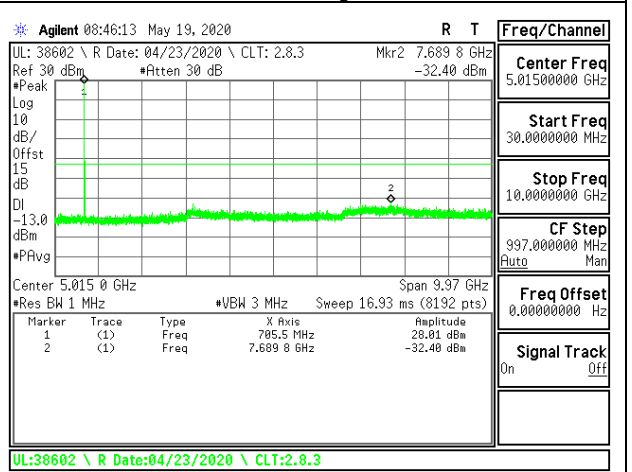
LTE B12 3MHz QPSK Middle Channel RB1-0



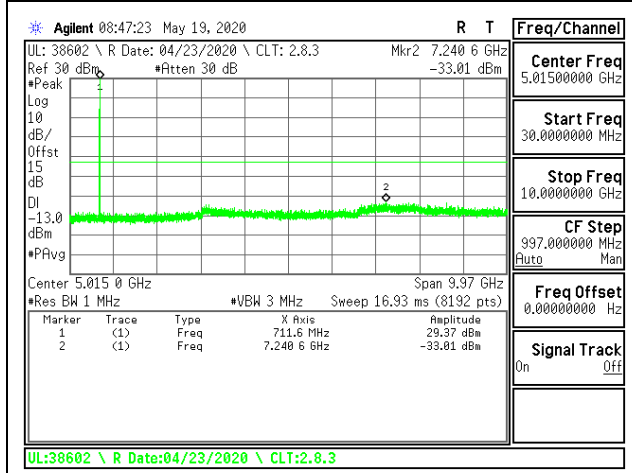
LTE B12 3MHz QPSK High Channel RB1-0



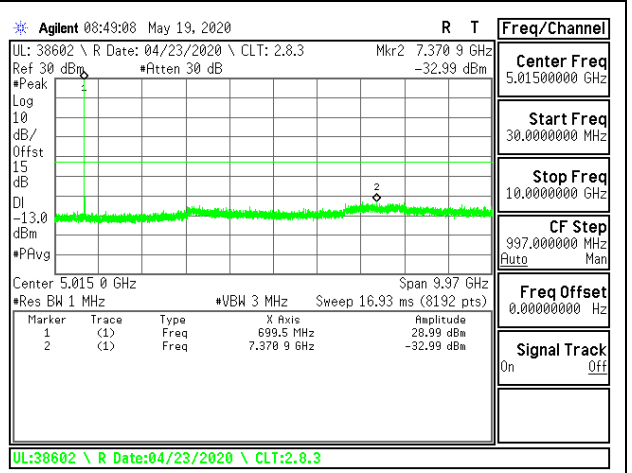
LTE B12 5MHz QPSK Low Channel RB1-0



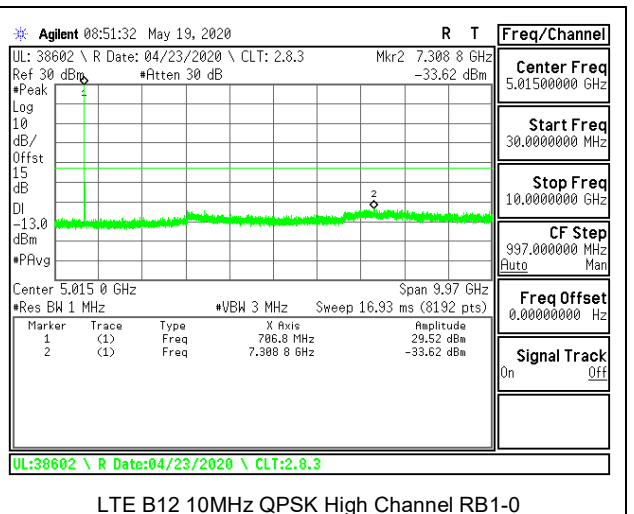
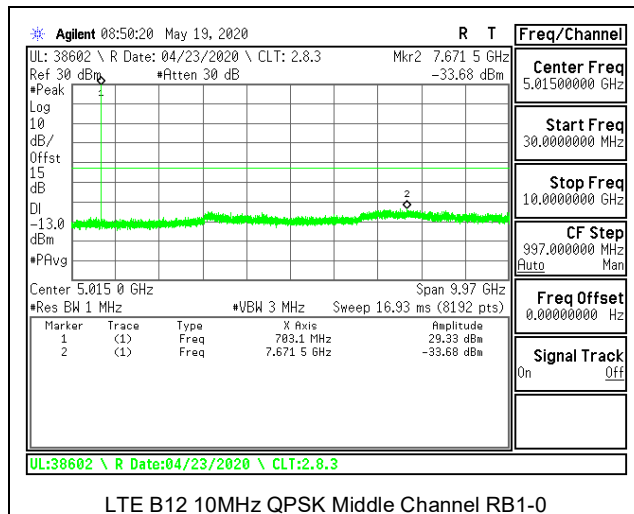
LTE B12 5MHz QPSK Middle Channel RB1-0



LTE B12 5MHz QPSK High Channel RB1-0

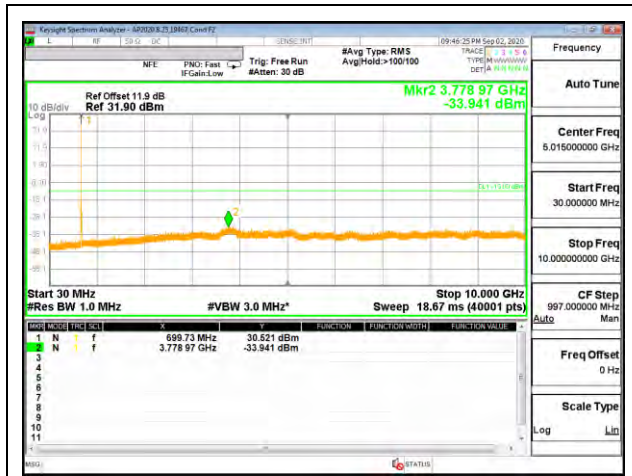


LTE B12 10MHz QPSK Low Channel RB1-0





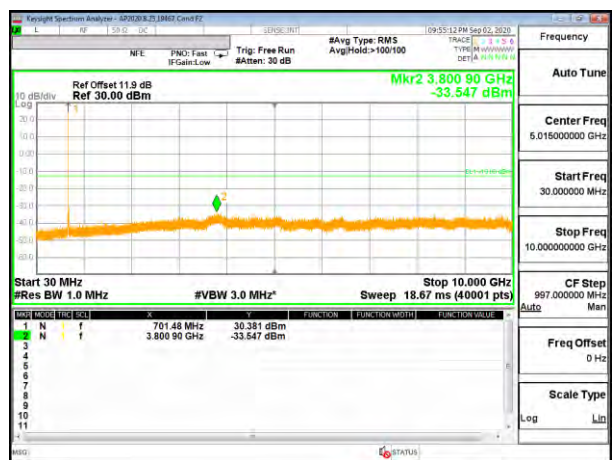
**5G NR Band n12**



5G NR Band n12 15MHz QPSK Low Channel RB1-1



5G NR Band n12 15MHz QPSK Middle Channel RB1-1



5G NR Band n12 15MHz QPSK High Channel RB1-1

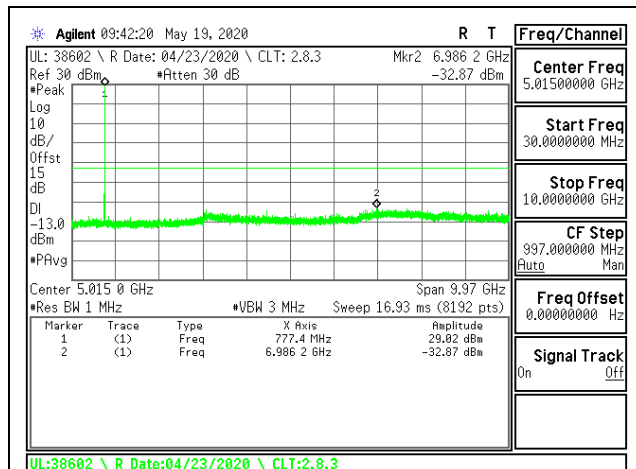
### 8.3.5. LTE BAND 13

#### **LIMITS**

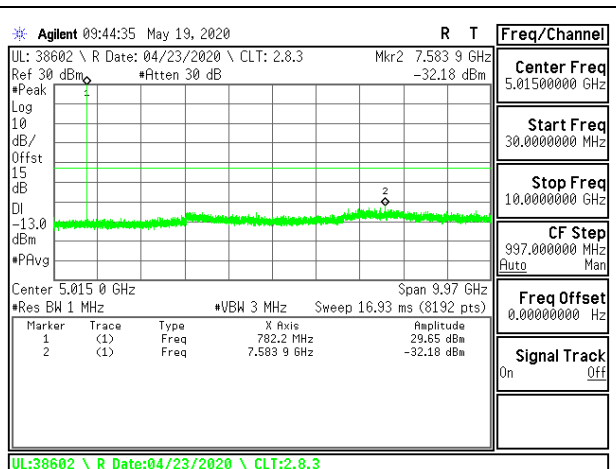
FCC: §27.53 (c), (f)

The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log (P)$  dB where transmitting power (P) in Watts. The band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

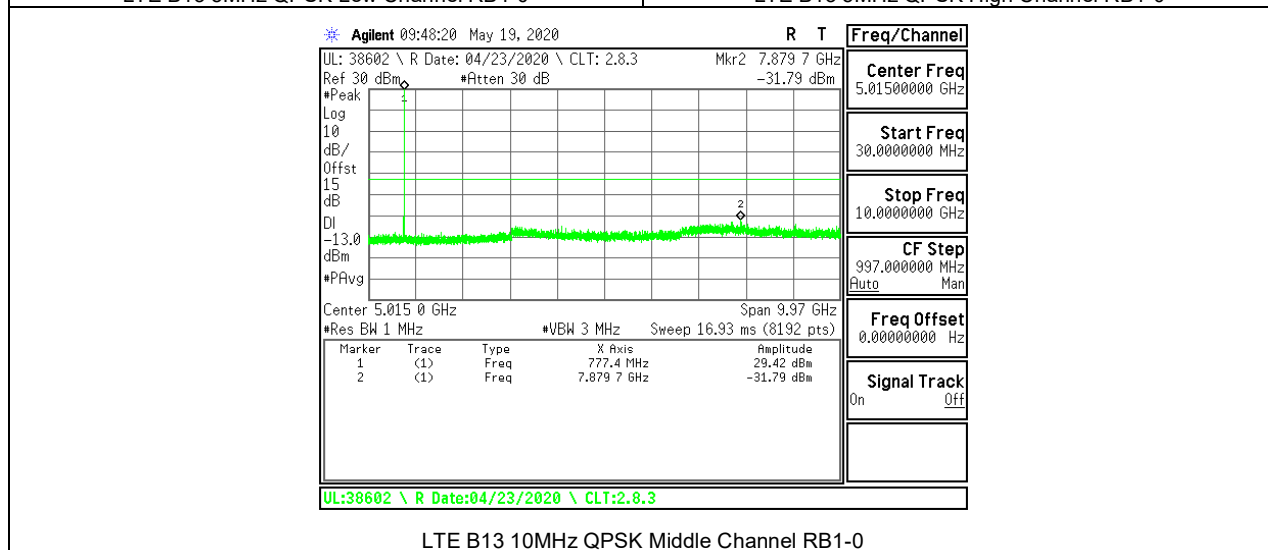
Note: Radiated data in section 9.1.6 confirms a compliance for the emissions in GPS 1559-1610 MHz band were wideband emissions therefore the  $-40$ dBm/MHz limit was used.



LTE B13 5MHz QPSK Low Channel RB1-0



LTE B13 5MHz QPSK High Channel RB1-0



LTE B13 10MHz QPSK Middle Channel RB1-0

Note: Radiated data in section 9.1.6 confirms a compliance with narrowband limits for GPS1559-1610 MHz band.

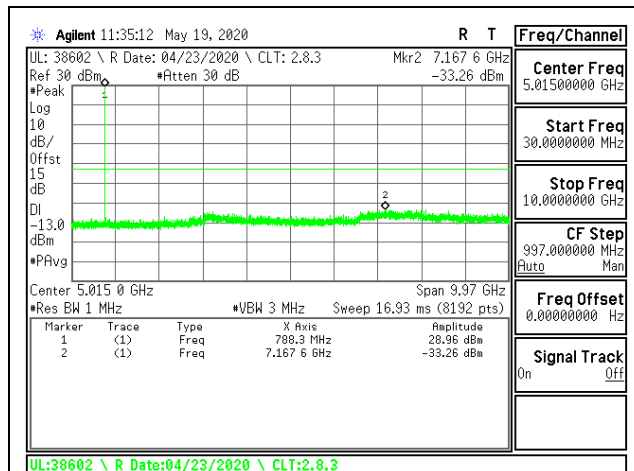
### 8.3.6. LTE BAND 14

#### **LIMITS**

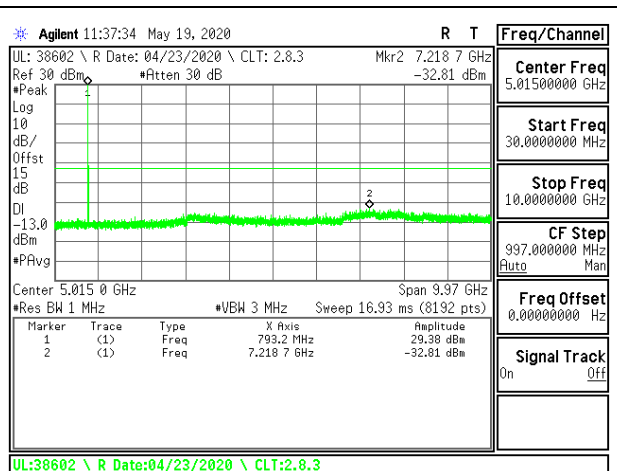
FCC: §90.543 (e), (f)

The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log (P)$  dB where transmitting power (P) in Watts. The band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

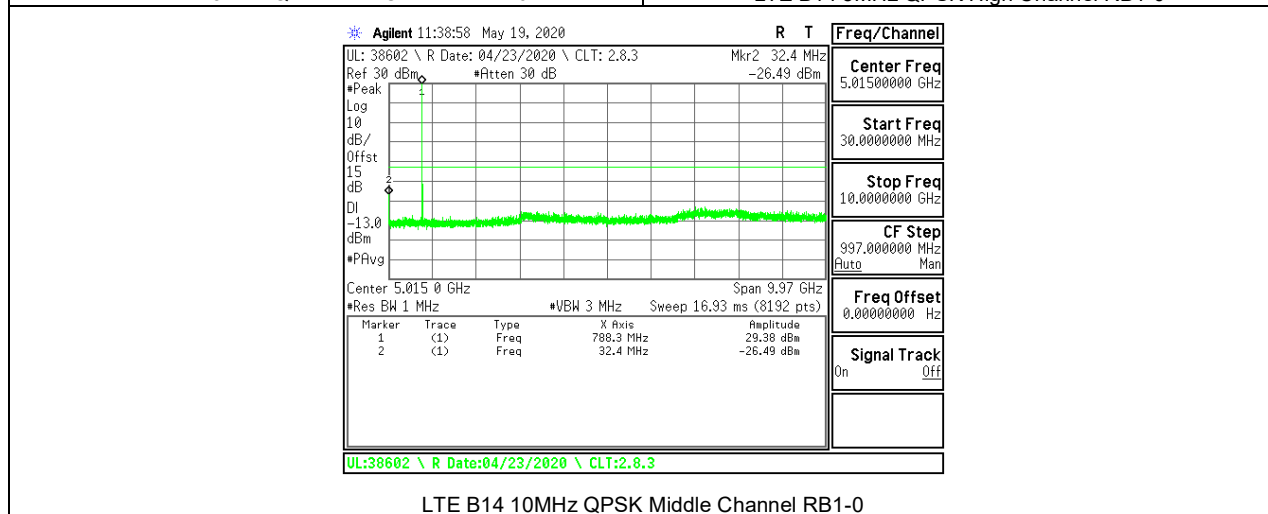
Note: Radiated data in section 9.1.7 confirms a compliance for the emissions in GPS 1559-1610 MHz band were wideband emissions therefore the  $-40$ dBm/MHz limit was used.



LTE B14 5MHz QPSK Low Channel RB1-0



LTE B14 5MHz QPSK High Channel RB1-0



LTE B14 10MHz QPSK Middle Channel RB1-0

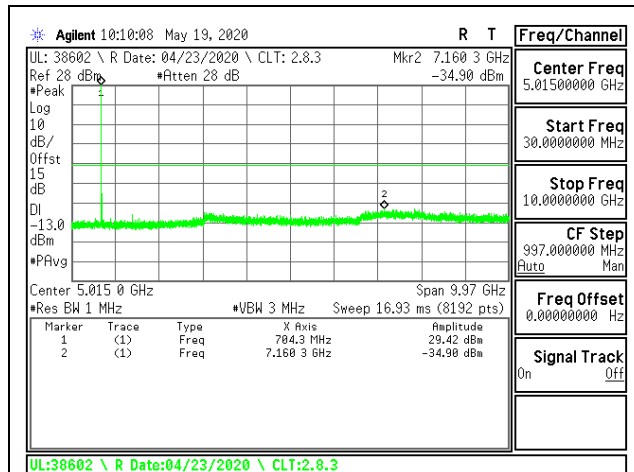
Note: Radiated data in section 9.1.7 confirms a compliance with narrowband limits for GPS1559-1610 MHz band.

### 8.3.7. LTE BAND 17

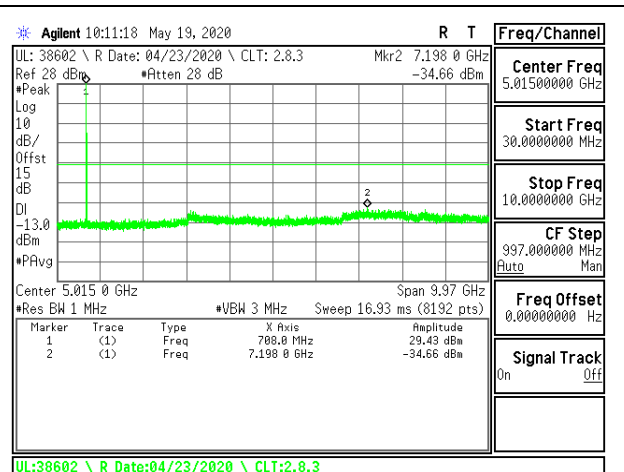
#### LIMITS

FCC: §27.53 (g)

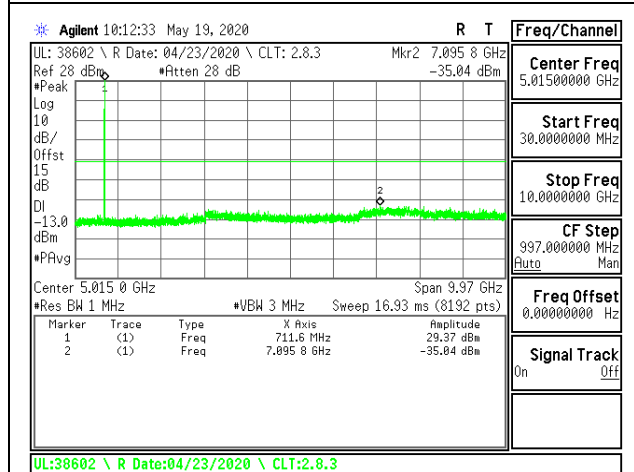
The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log(P)$  dB where transmitting power (P) in Watts.



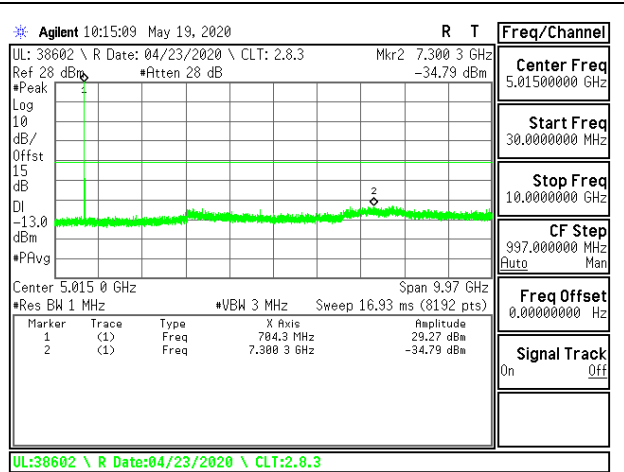
LTE B17 5MHz QPSK Low Channel RB1-0



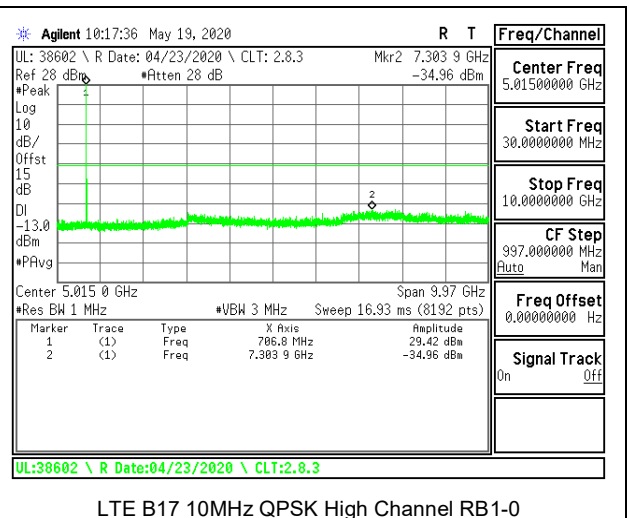
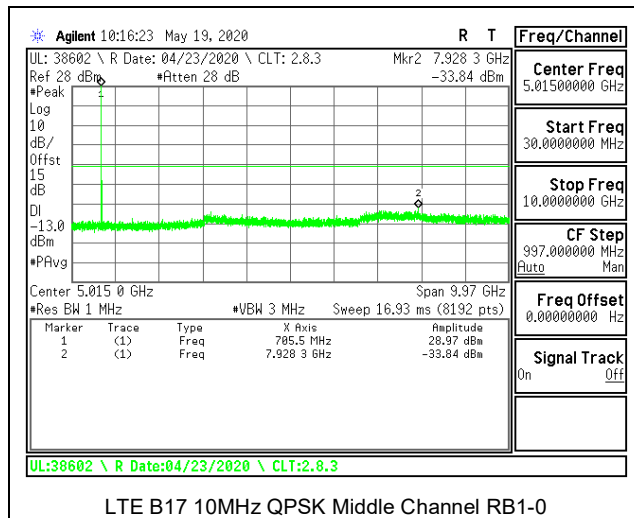
LTE B17 5MHz QPSK Middle Channel RB1-0



LTE B17 5MHz QPSK High Channel RB1-0



LTE B17 10MHz QPSK Low Channel RB1-0

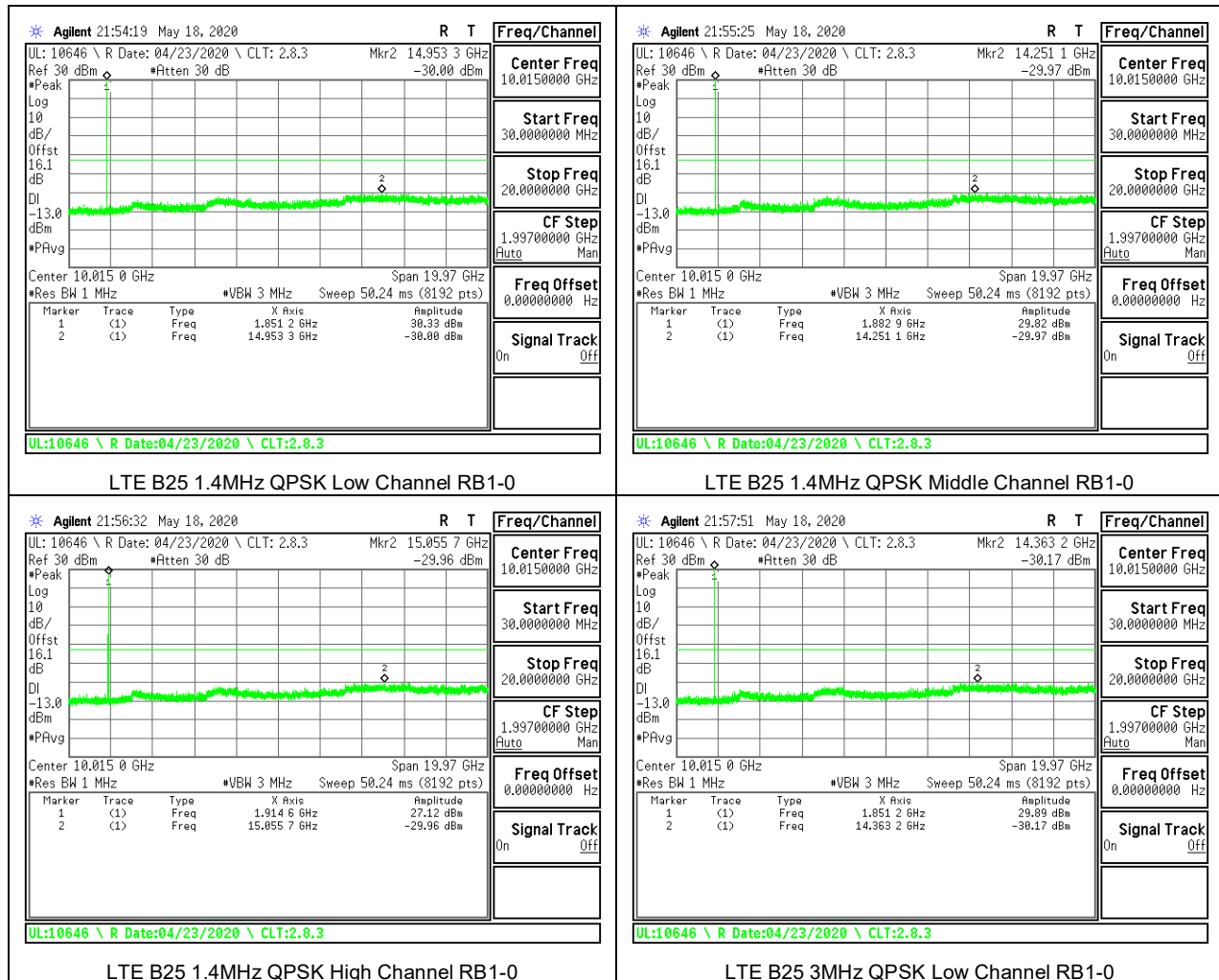


### 8.3.8. LTE BAND 25

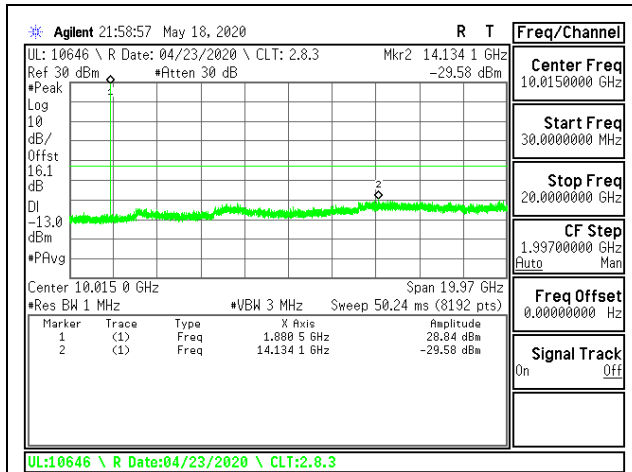
#### LIMITS

FCC: §24.238

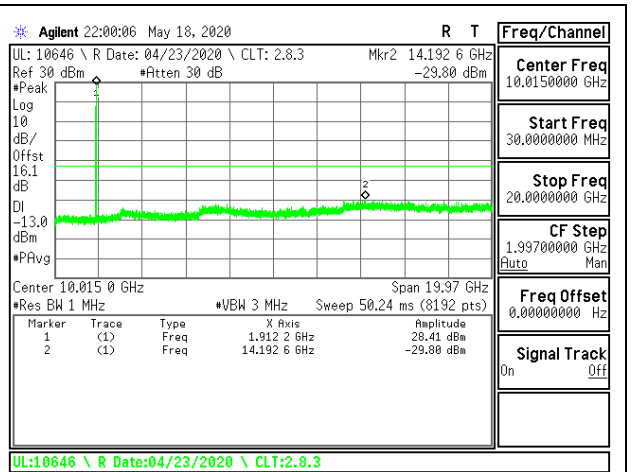
The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log(P)$  dB where transmitting power (P) in Watts.



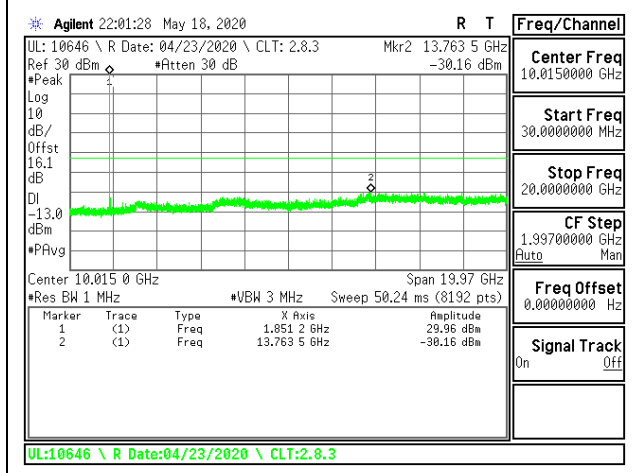




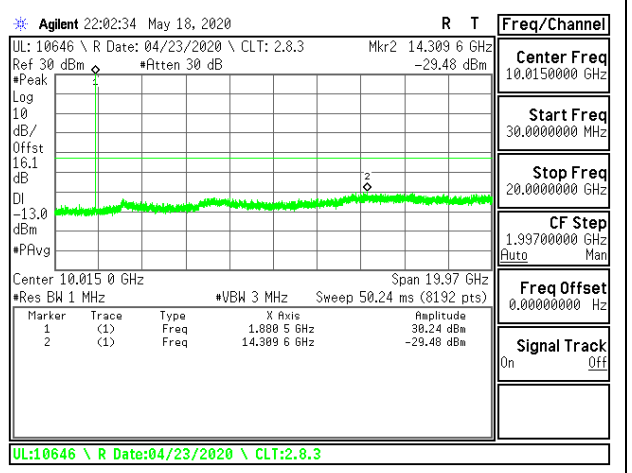
LTE B25 3MHz QPSK Middle Channel RB1-0



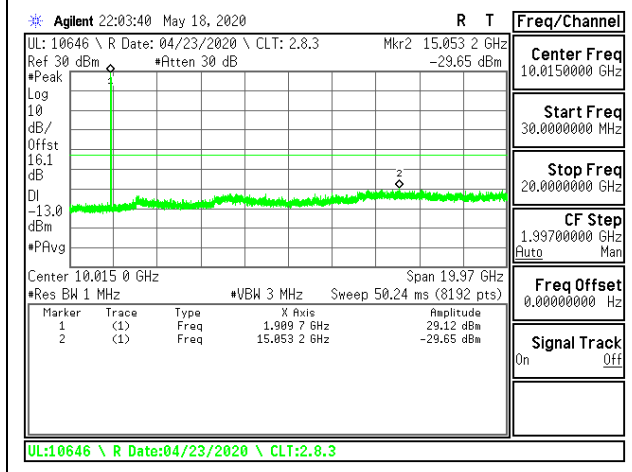
LTE B25 3MHz QPSK High Channel RB1-0



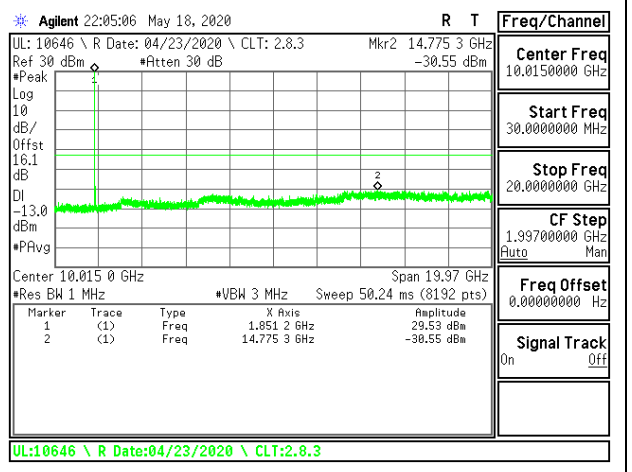
LTE B25 5MHz QPSK Low Channel RB1-0



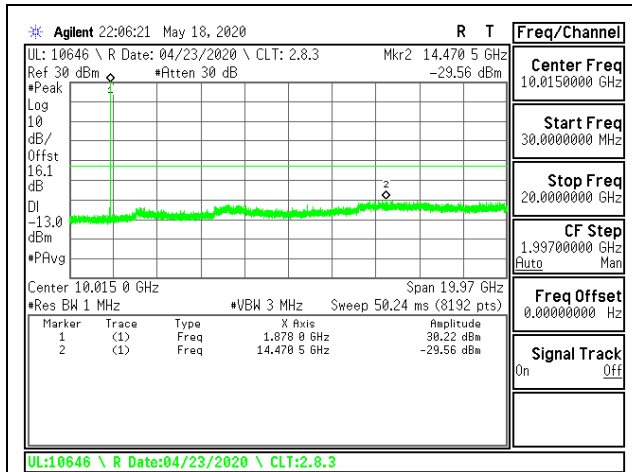
LTE B25 5MHz QPSK Middle Channel RB1-0



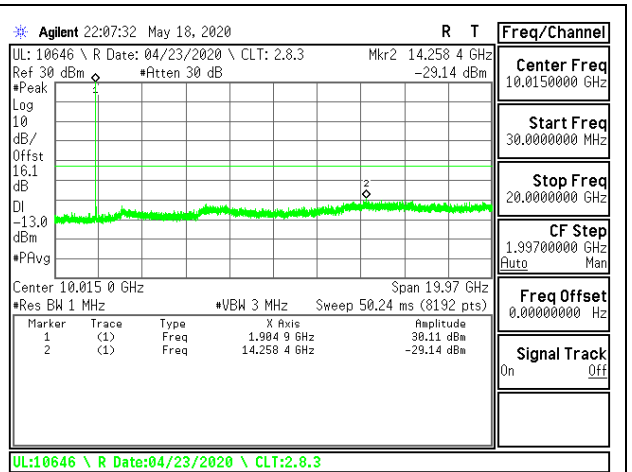
LTE B25 5MHz QPSK High Channel RB1-0



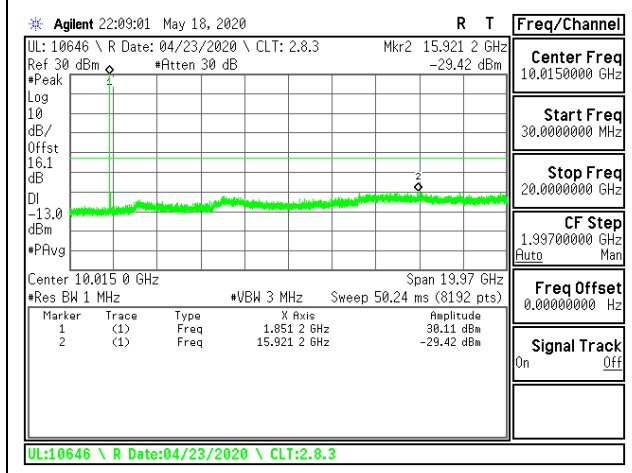
LTE B25 10MHz QPSK Low Channel RB1-0



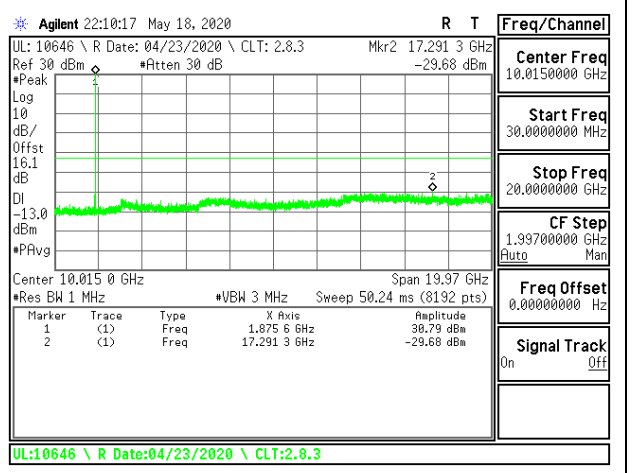
LTE B25 10MHz QPSK Middle Channel RB1-0



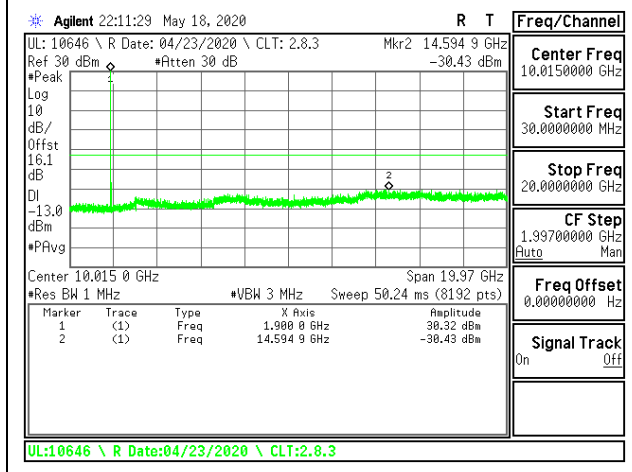
LTE B25 10MHz QPSK High Channel RB1-0



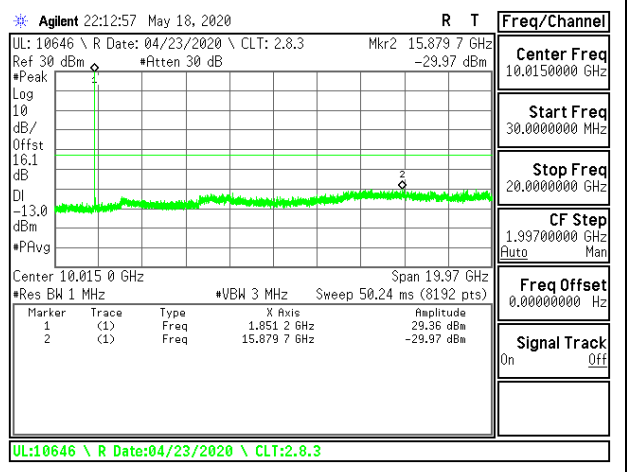
LTE B25 15MHz QPSK Low Channel RB1-0



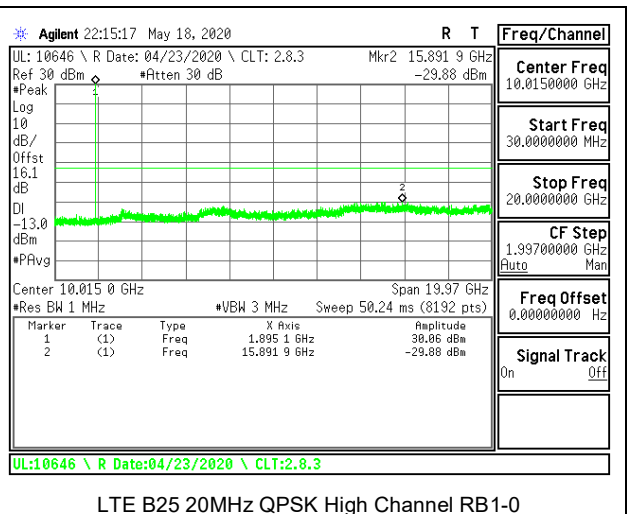
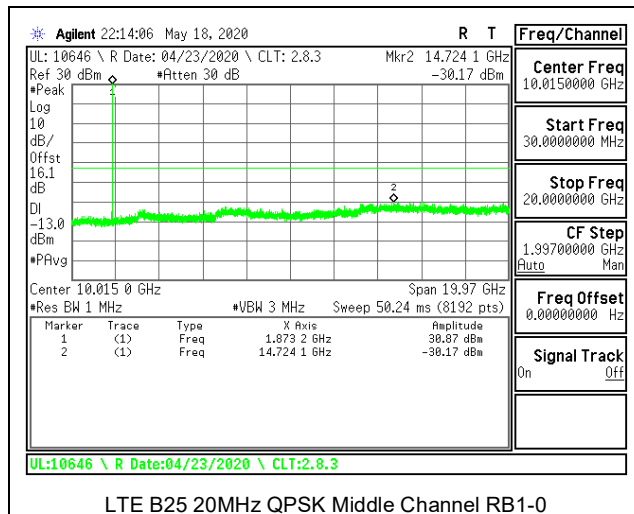
LTE B25 15MHz QPSK Middle Channel RB1-0



LTE B25 15MHz QPSK High Channel RB1-0



LTE B25 20MHz QPSK Low Channel RB1-0

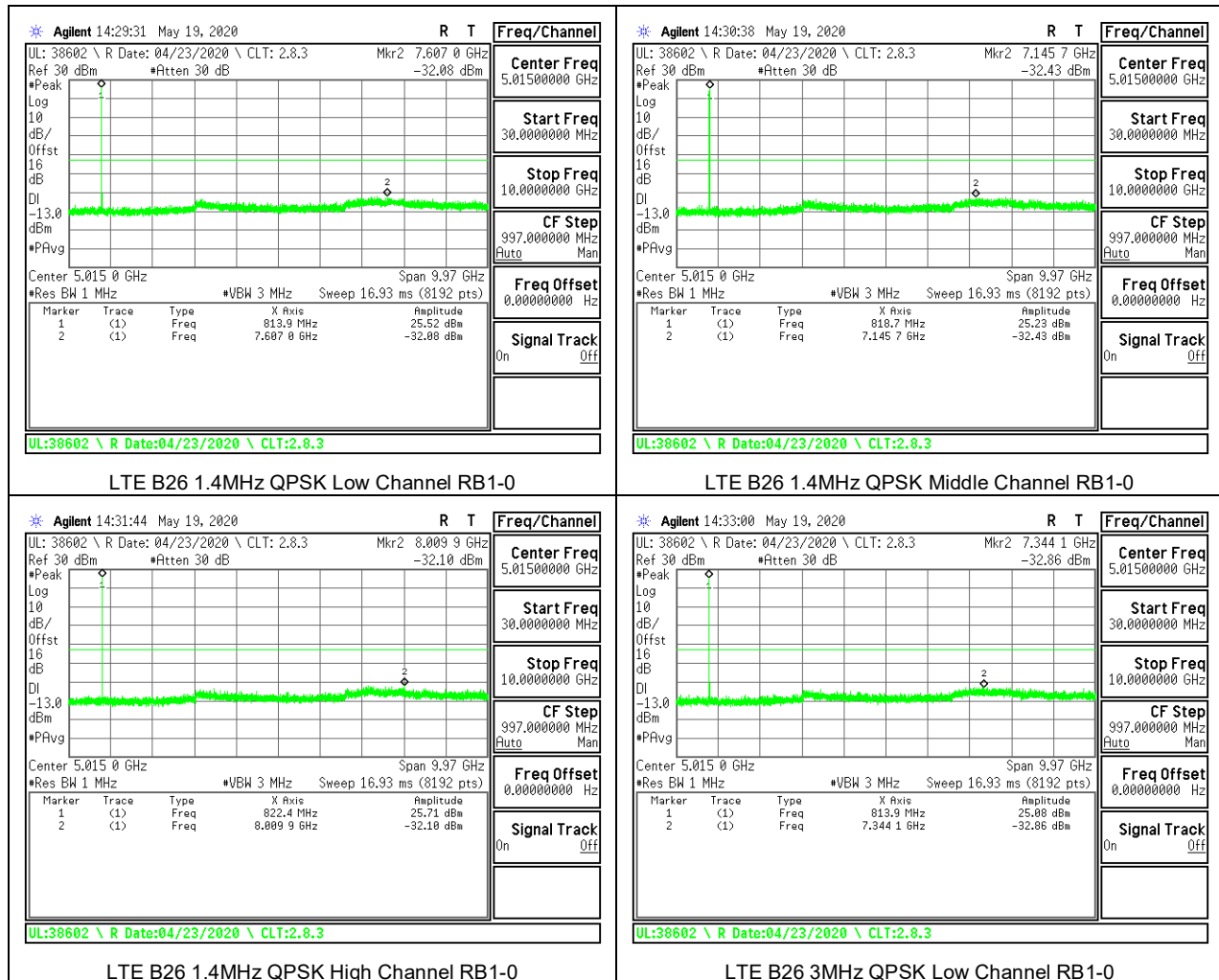


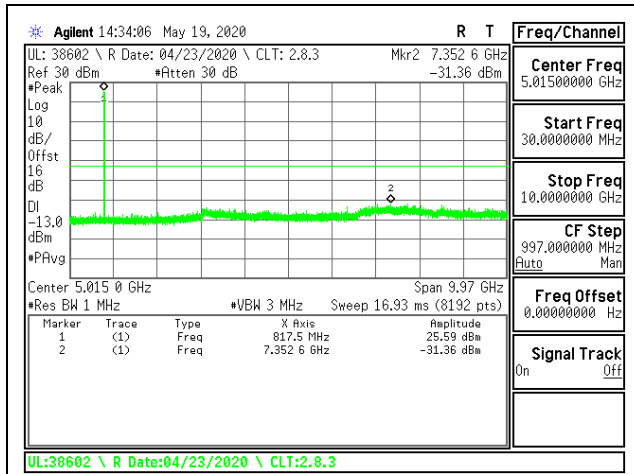
### 8.3.9. LTE BAND 26 (PART 90S)

#### LIMITS

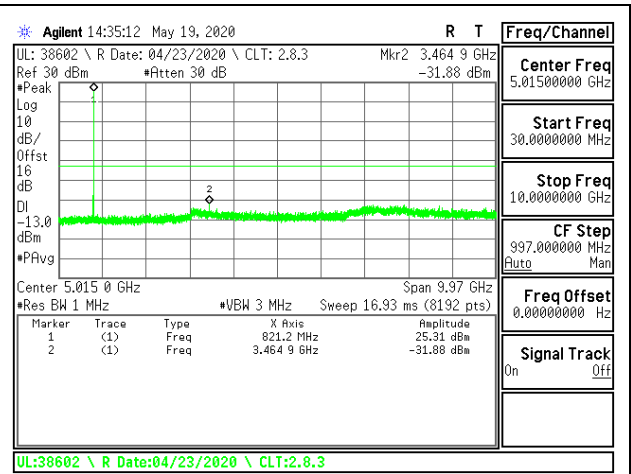
FCC: §90.691

The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log(P)$  dB where transmitting power (P) in Watts.

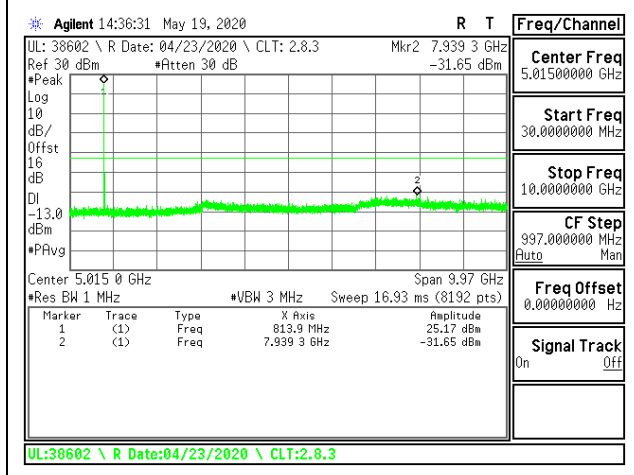




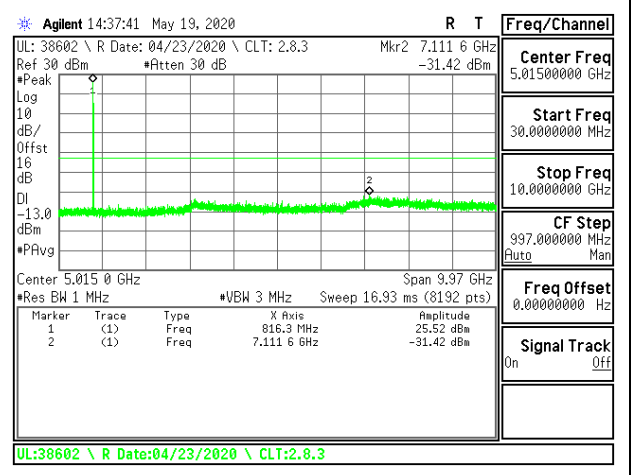
LTE B26 3MHz QPSK Middle Channel RB1-0



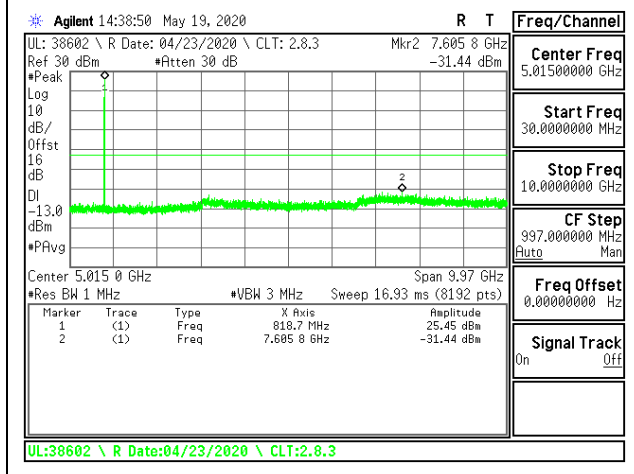
LTE B26 3MHz QPSK High Channel RB1-0



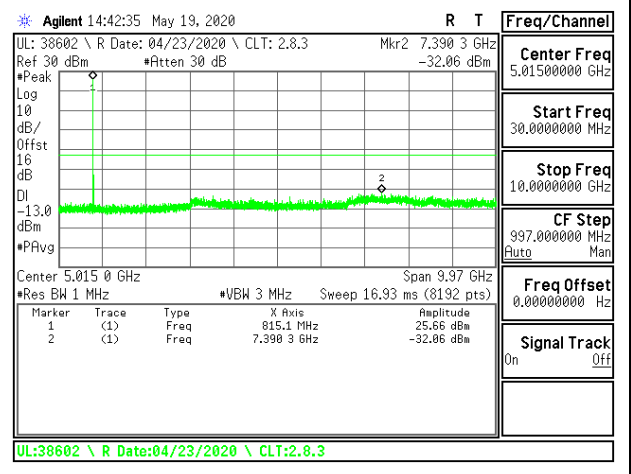
LTE B26 5MHz QPSK Low Channel RB1-0



LTE B26 5MHz QPSK Middle Channel RB1-0



LTE B26 5MHz QPSK High Channel RB1-0



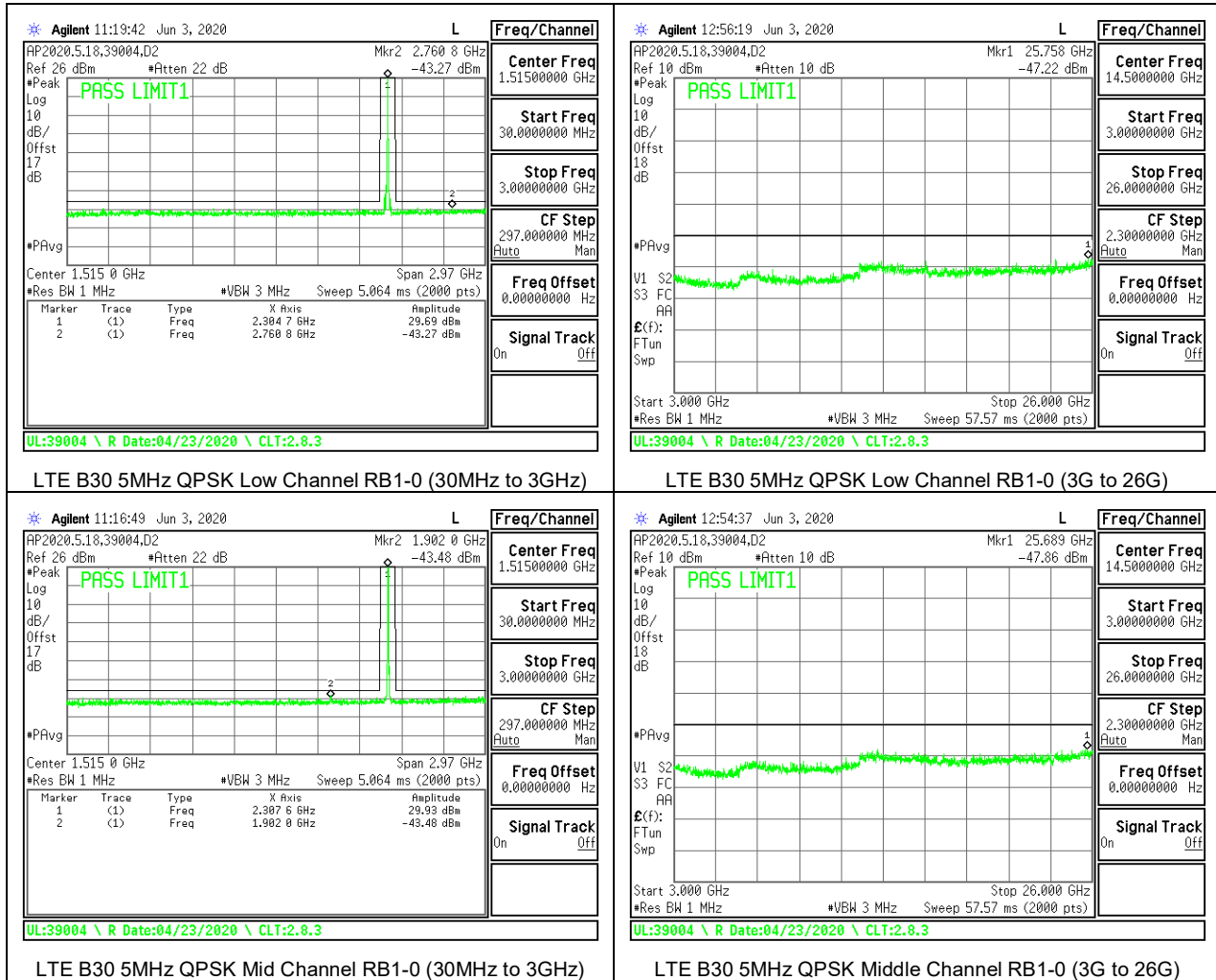
LTE B26 10MHz QPSK Middle Channel RB1-0

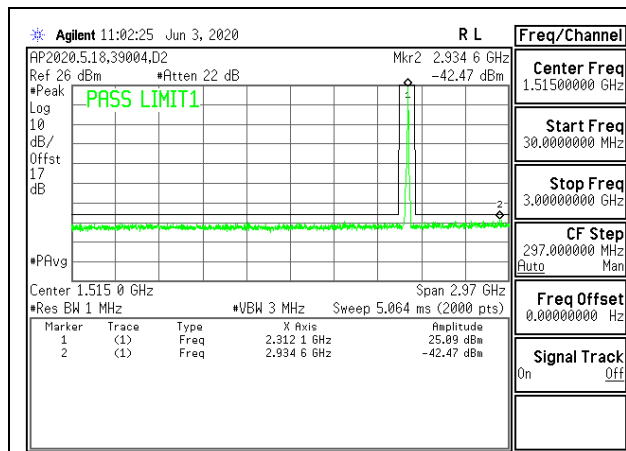
### 8.3.10. LTE BAND 30

#### LIMITS

FCC: §27.53 (a)

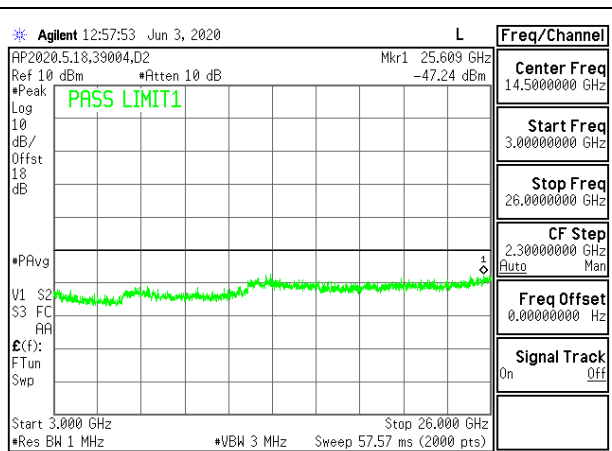
The minimum permissible attenuation level of any spurious emissions is  $70 + 10 \log(P)$  dB where transmitting power (P) in Watts.





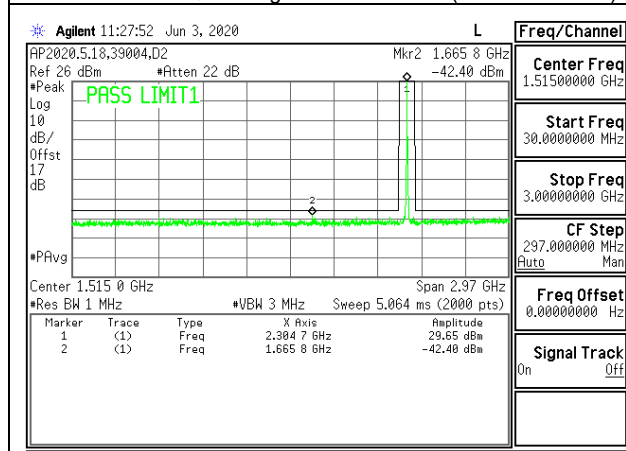
UL:39004 \ R Date:04/23/2020 \ CLT:2.8.3

LTE B30 5MHz QPSK High Channel RB1-0 (30MHz to 3GHz)



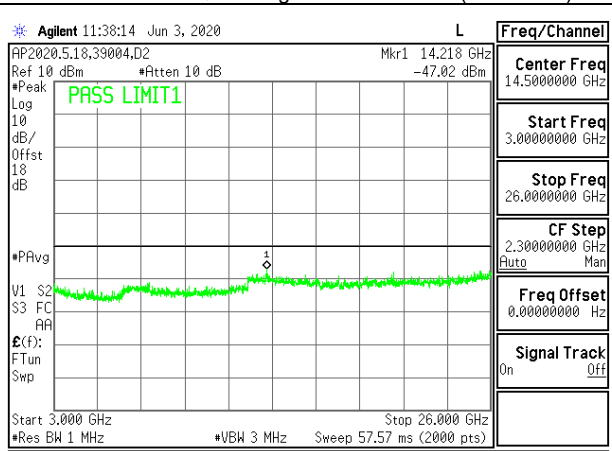
UL:39004 \ R Date:04/23/2020 \ CLT:2.8.3

LTE B30 5MHz QPSK High Channel RB1-0 (3G to 26G)



UL:39004 \ R Date:04/23/2020 \ CLT:2.8.3

LTE B30 10MHz QPSK Mid Channel RB1-0 (30MHz to 3GHz)



UL:39004 \ R Date:04/23/2020 \ CLT:2.8.3

LTE B30 10MHz QPSK Middle Channel RB1-0 (3G to 26G)

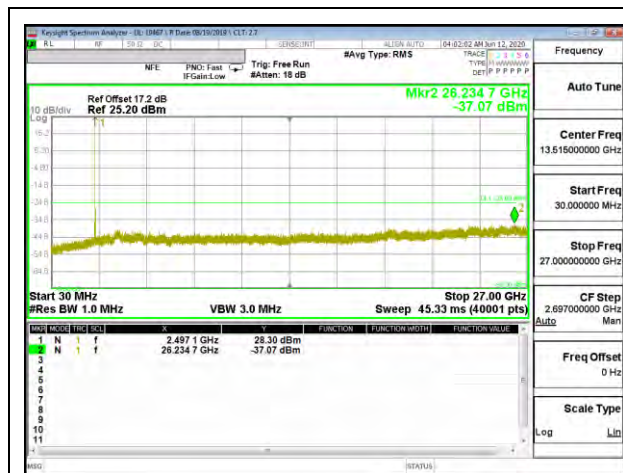
### 8.3.11. LTE BAND 41 AND 5G NR Band n41

#### LIMITS

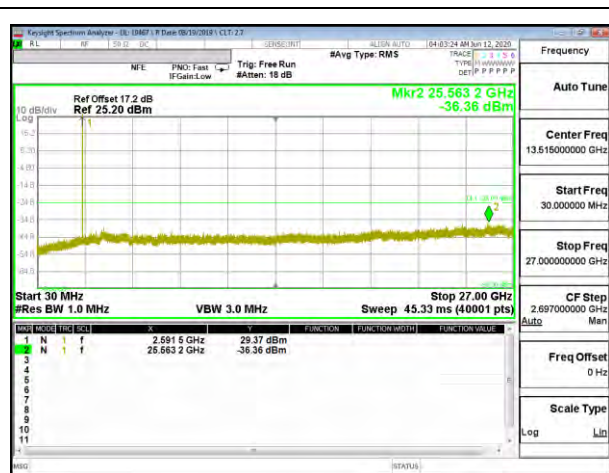
FCC: §27.53 (m)

The minimum permissible attenuation level of any spurious emissions is  $55 + 10 \log (P)$  dB where transmitting power (P) in Watts.

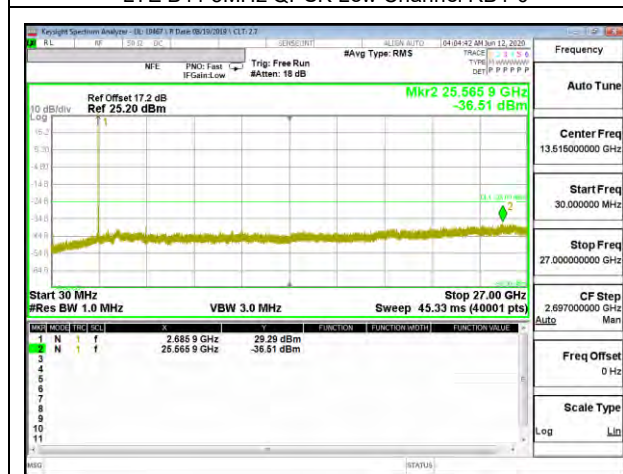
#### LTE BAND 41



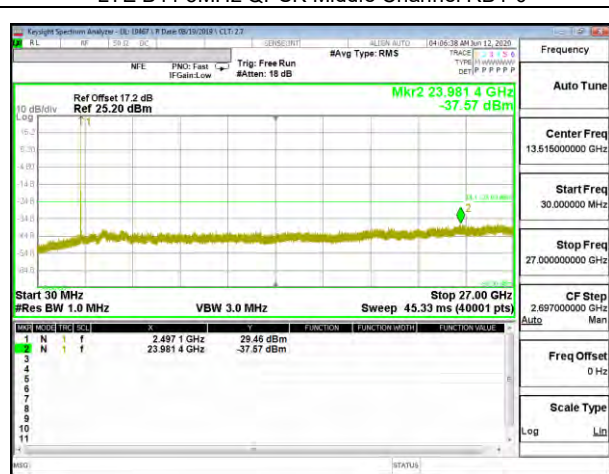
LTE B41 5MHz QPSK Low Channel RB1-0



LTE B41 5MHz QPSK Middle Channel RB1-0

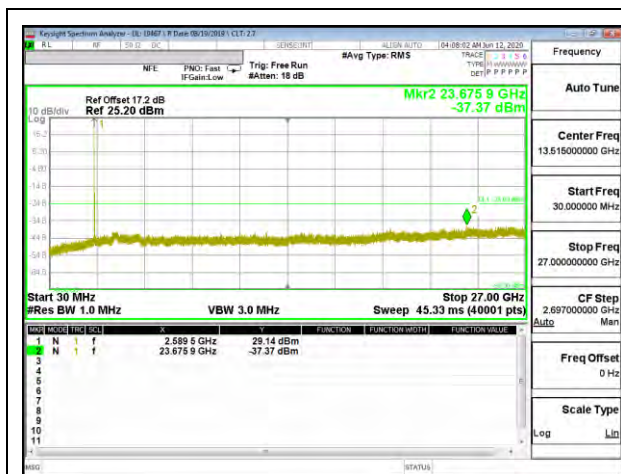


LTE B41 5MHz QPSK High Channel RB1-0

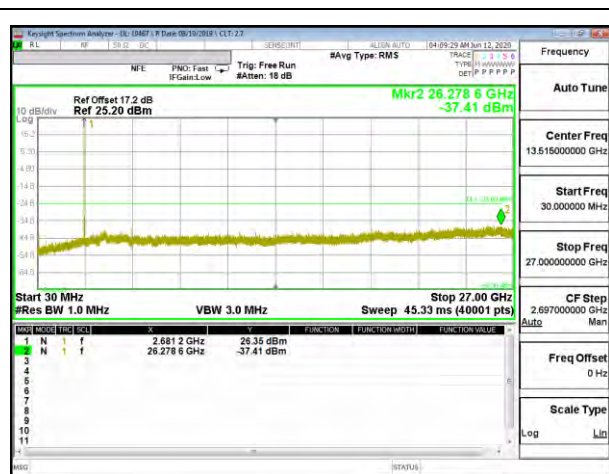


LTE B41 10MHz QPSK Low Channel RB1-0

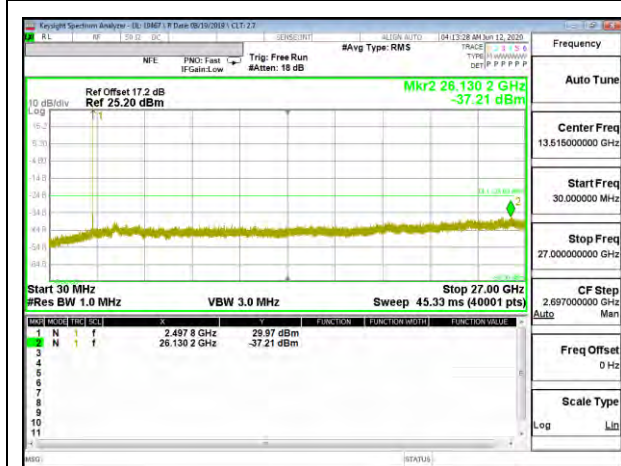




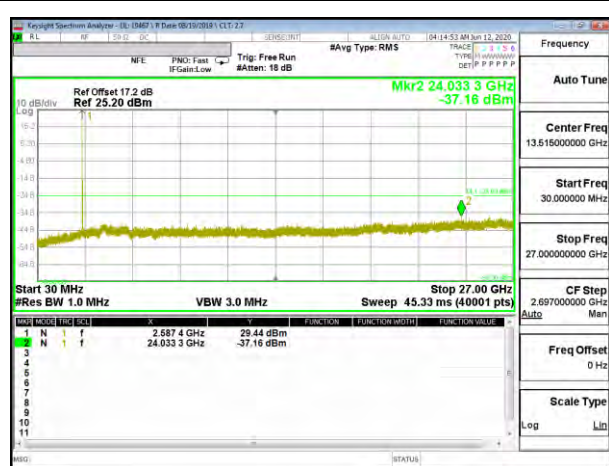
LTE B41 10MHz QPSK Middle Channel RB1-0



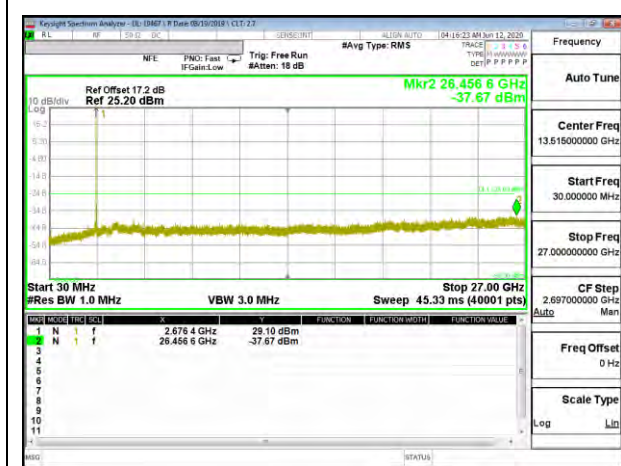
LTE B41 10MHz QPSK High Channel RB1-0



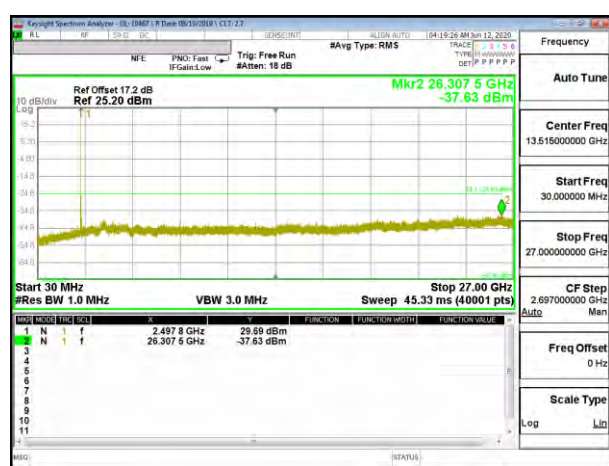
LTE B41 15MHz QPSK Low Channel RB1-0



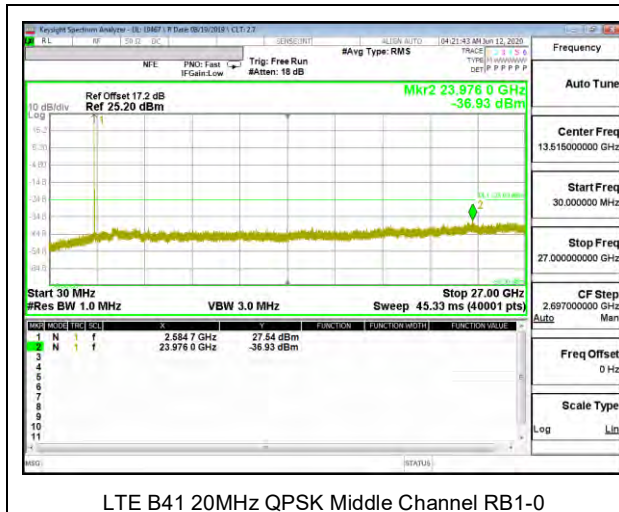
LTE B41 15MHz QPSK Middle Channel RB1-0



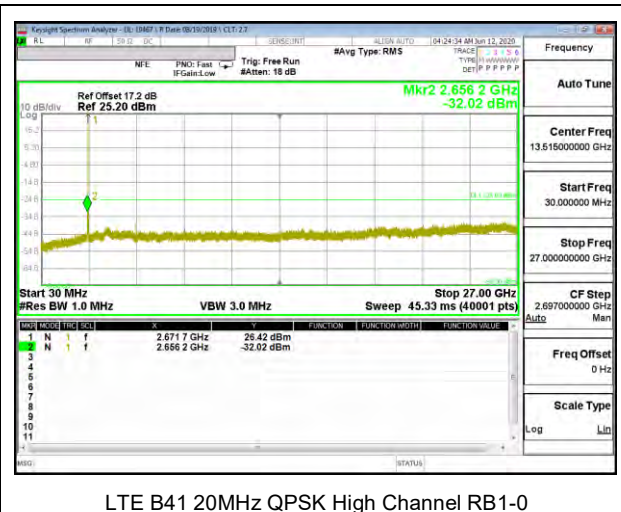
LTE B41 15MHz QPSK High Channel RB1-0



LTE B41 20MHz QPSK Low Channel RB1-0



LTE B41 20MHz QPSK Middle Channel RB1-0



LTE B41 20MHz QPSK High Channel RB1-0

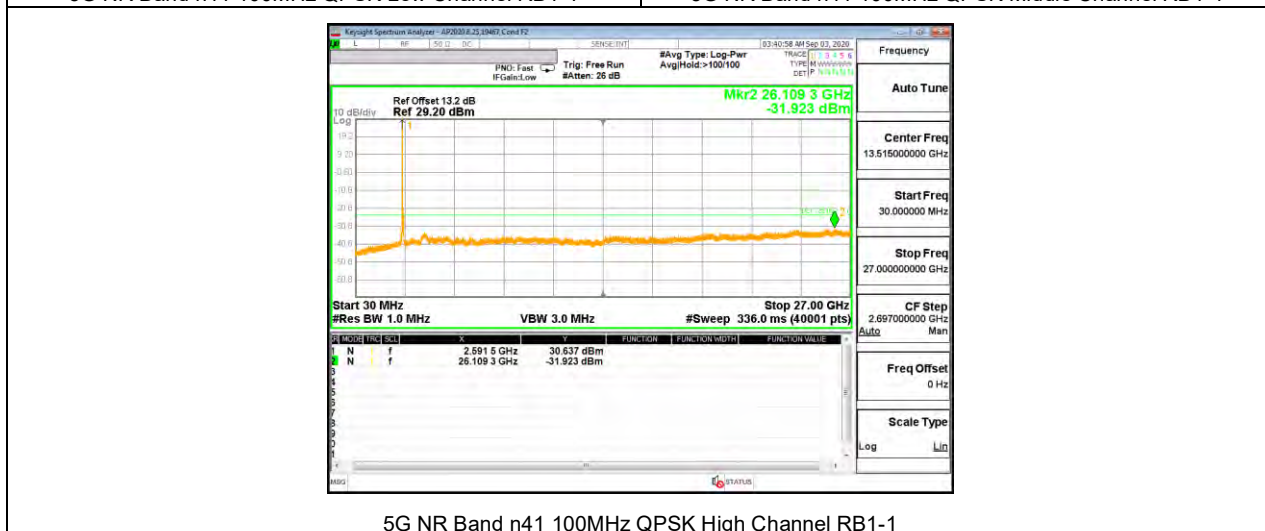
**5G NR Band n41**



5G NR Band n41 100MHz QPSK Low Channel RB1-1



5G NR Band n41 100MHz QPSK Middle Channel RB1-1



5G NR Band n41 100MHz QPSK High Channel RB1-1

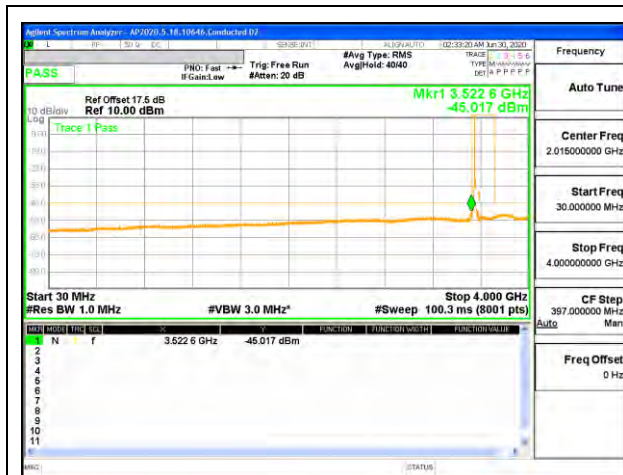
### 8.3.12. LTE BAND 48

#### LIMITS

FCC: §96.41

(e) 3.5 GHz Emissions and Interference Limits—

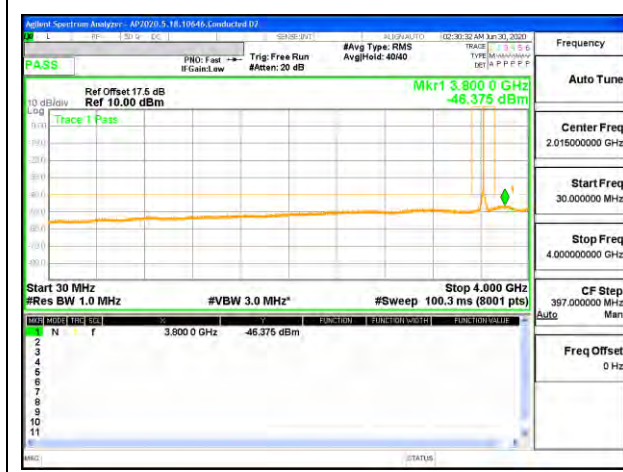
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.



LTE B48 5MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



LTE B48 5MHz QPSK Low Channel RB1-0 (4G to 40G)



LTE B48 5MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



LTE B48 5MHz QPSK Middle Channel RB1-0 (4G to 40G)



LTE B48 5MHz QPSK High Channel RB1-0 (30MHz to 4GHz)



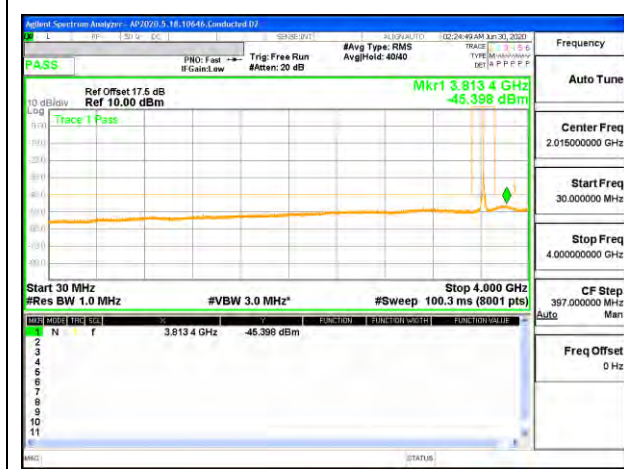
LTE B48 5MHz QPSK High Channel RB1-0 (4G to 40G)



LTE B48 10MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



LTE B48 10MHz QPSK Low Channel RB1-0 (4G to 40G)



LTE B48 10MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



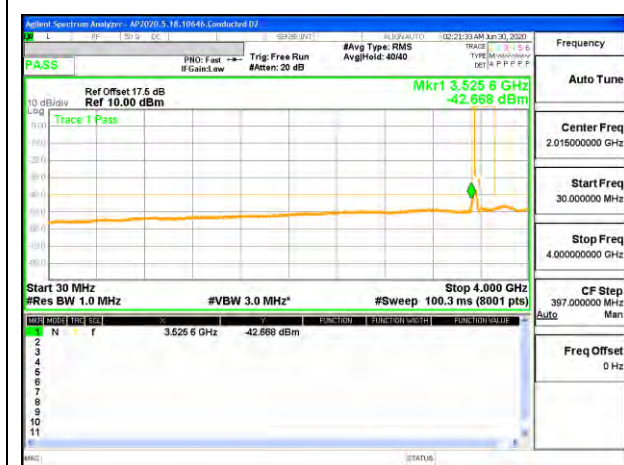
LTE B48 10MHz QPSK Middle Channel RB1-0 (4G to 40G)



LTE B48 10MHz QPSK High Channel RB1-0 (30MHz to 4GHz)



LTE B48 10MHz QPSK High Channel RB1-0 (4G to 40G)



LTE B48 15MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



LTE B48 15MHz QPSK Low Channel RB1-0 (4G to 40G)



LTE B48 15MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



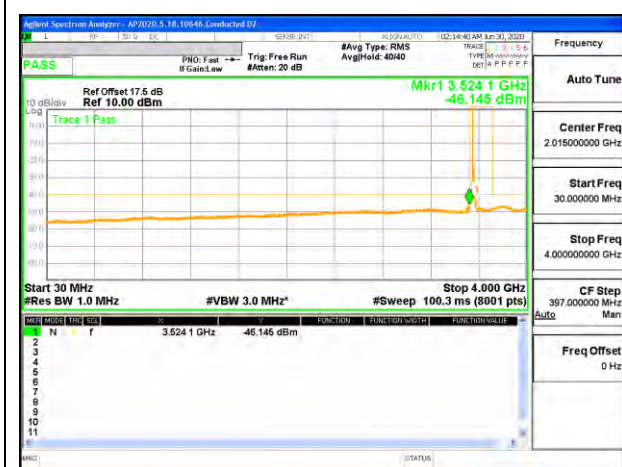
LTE B48 15MHz QPSK Middle Channel RB1-0 (4G to 40G)



LTE B48 15MHz QPSK High Channel RB1-0 (30MHz to 4GHz)



LTE B48 15MHz QPSK High Channel RB1-0 (4G to 40G)



LTE B48 20MHz QPSK Low Channel RB1-0 (30MHz to 4GHz)



LTE B48 20MHz QPSK Low Channel RB1-0 (4G to 40G)



LTE B48 20MHz QPSK Mid Channel RB1-0 (30MHz to 4GHz)



LTE B48 20MHz QPSK Middle Channel RB1-0 (4G to 40G)



LTE B48 20MHz QPSK High Channel RB1-0 (30MHz to 4GHz)



LTE B48 20MHz QPSK High Channel RB1-0 (4G to 40G)

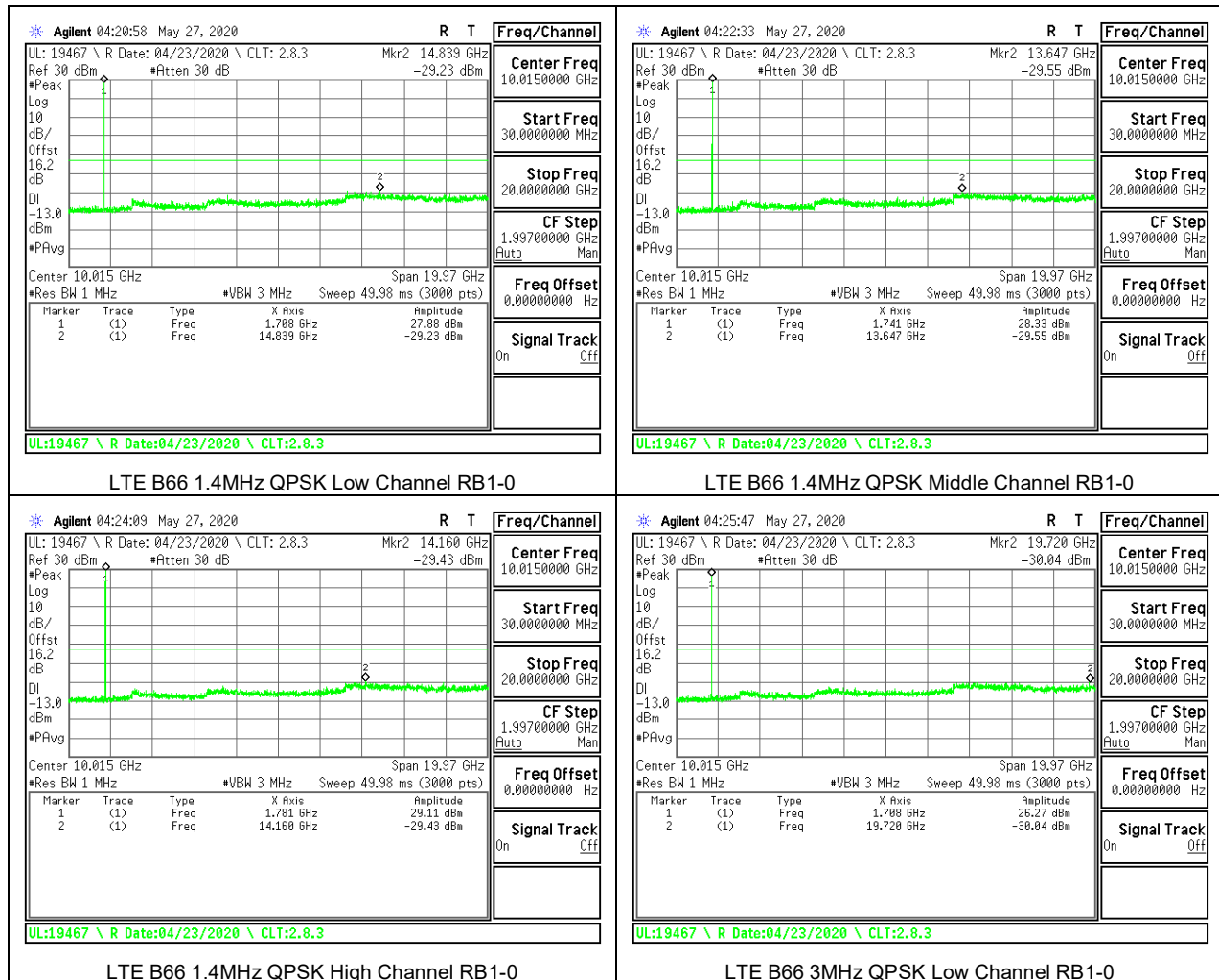


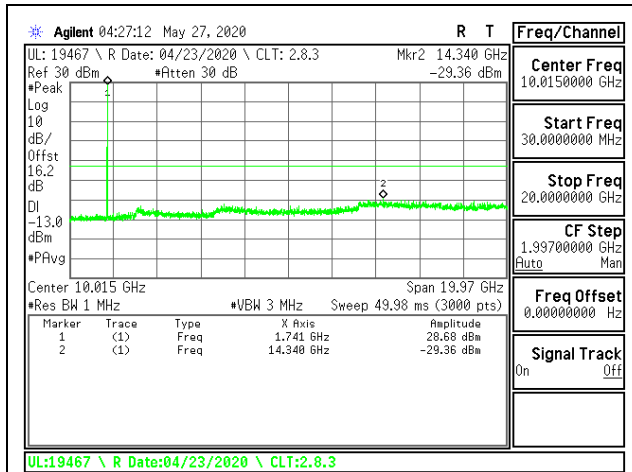
### 8.3.13. LTE BAND 66

#### LIMITS

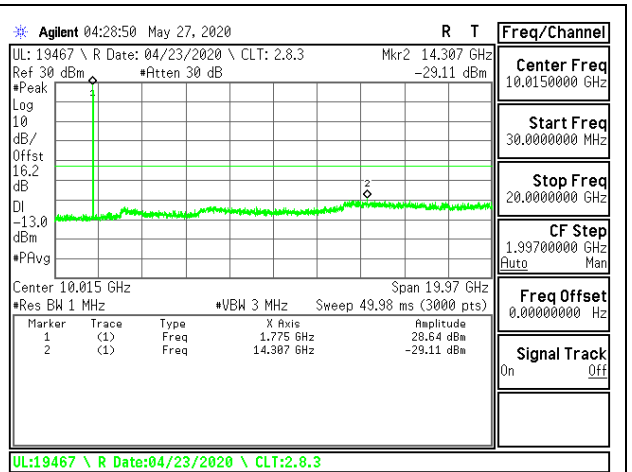
FCC: §27.53 (h)

The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log(P)$  dB where transmitting power (P) in Watts.

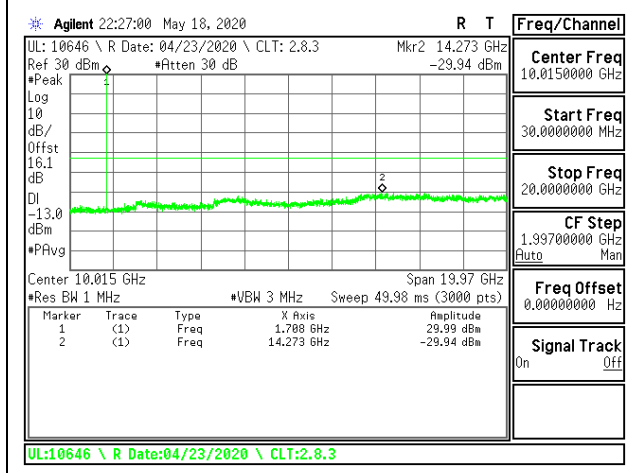




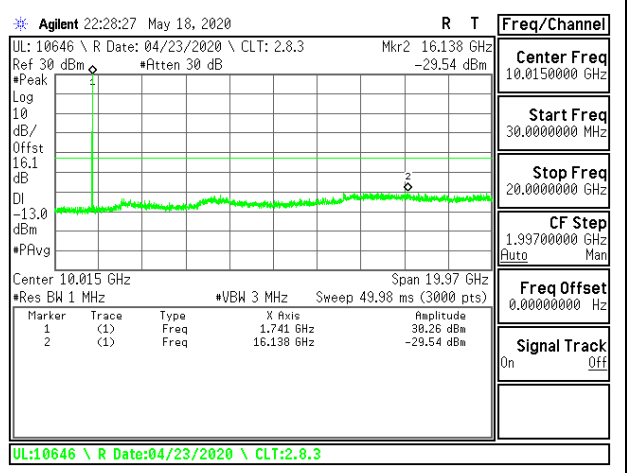
LTE B66 3MHz QPSK Middle Channel RB1-0



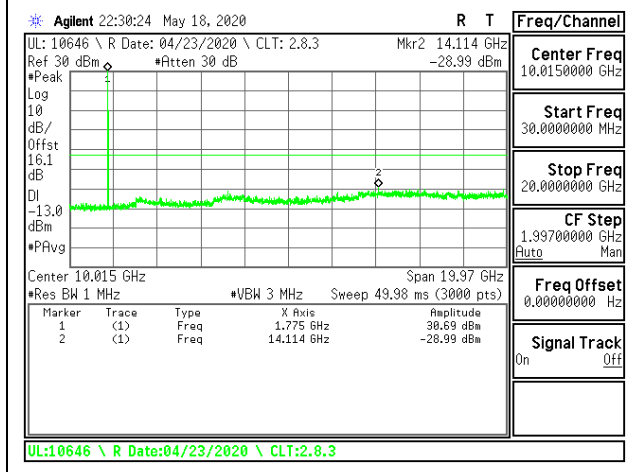
LTE B66 3MHz QPSK High Channel RB1-0



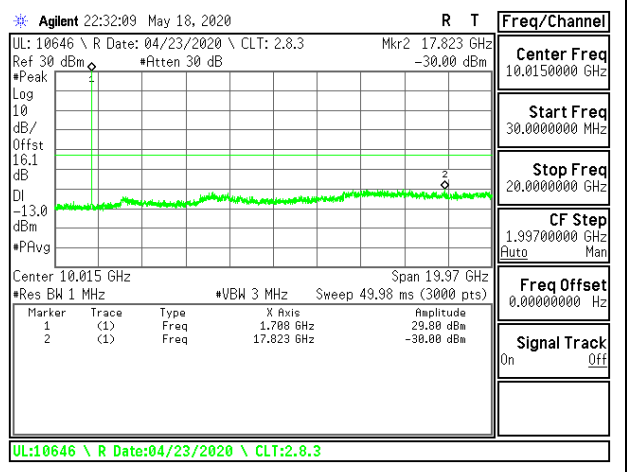
LTE B66 5MHz QPSK Low Channel RB1-0



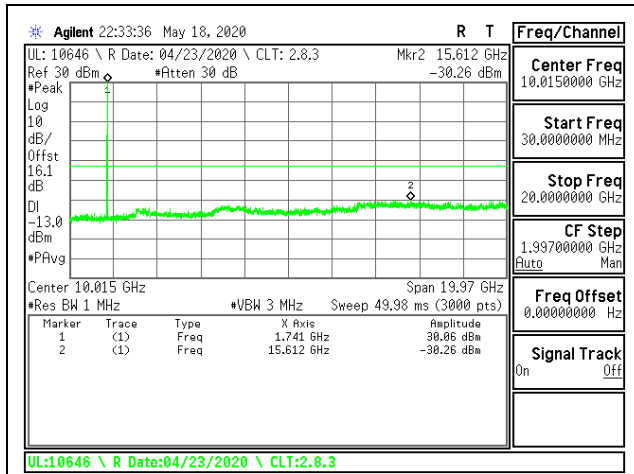
LTE B66 5MHz QPSK Middle Channel RB1-0



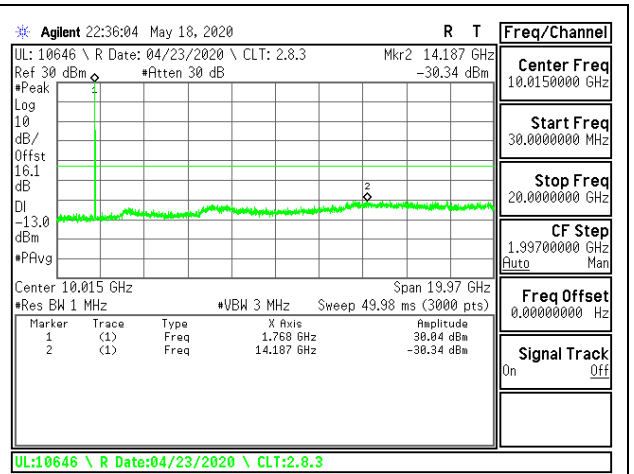
LTE B66 5MHz QPSK High Channel RB1-0



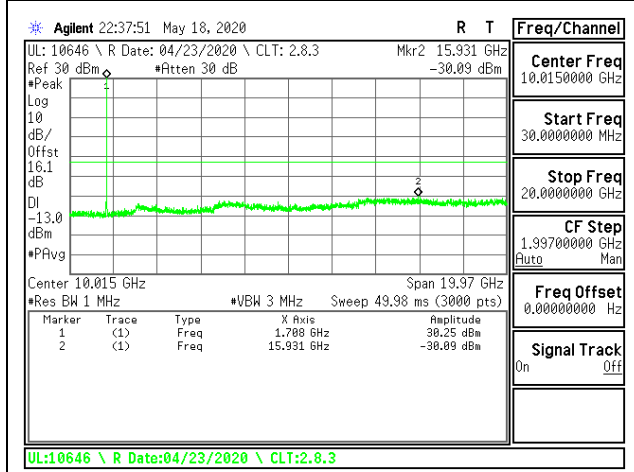
LTE B66 10MHz QPSK Low Channel RB1-0



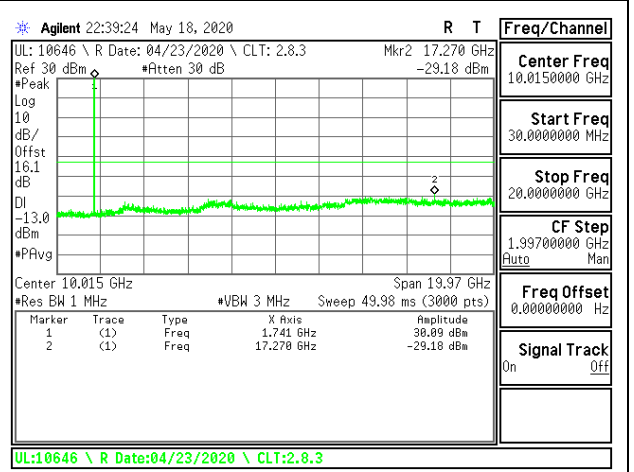
LTE B66 10MHz QPSK Middle Channel RB1-0



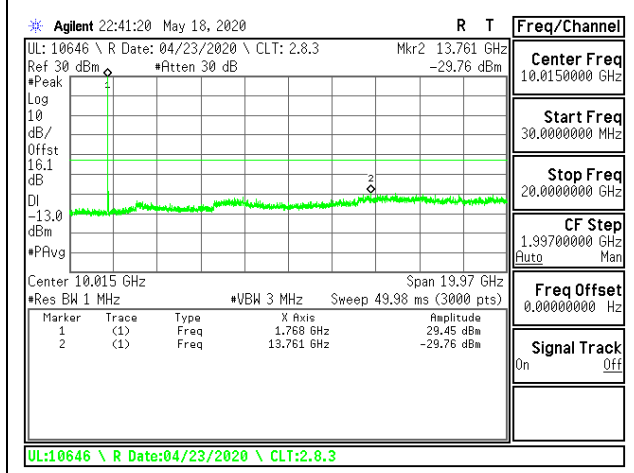
LTE B66 10MHz QPSK High Channel RB1-0



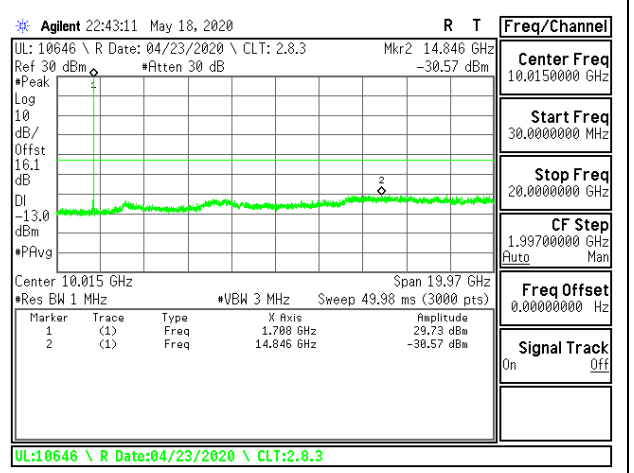
LTE B66 15MHz QPSK Low Channel RB1-0



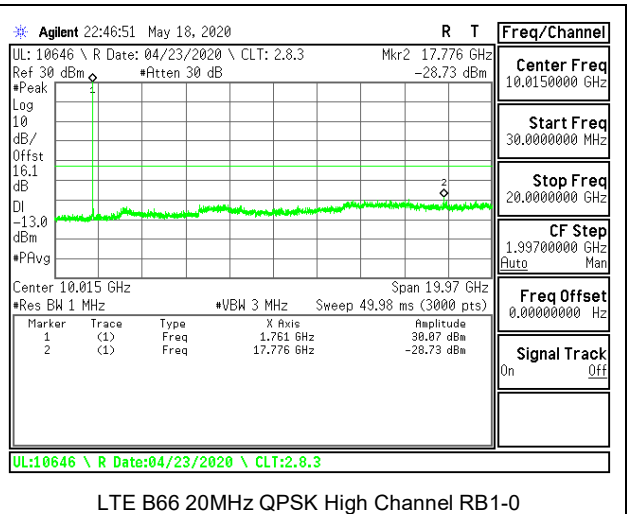
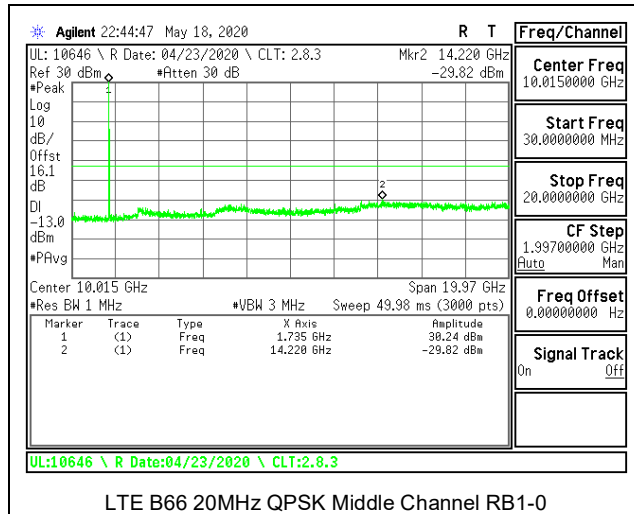
LTE B66 15MHz QPSK Middle Channel RB1-0



LTE B66 15MHz QPSK High Channel RB1-0



LTE B66 20MHz QPSK Low Channel RB1-0

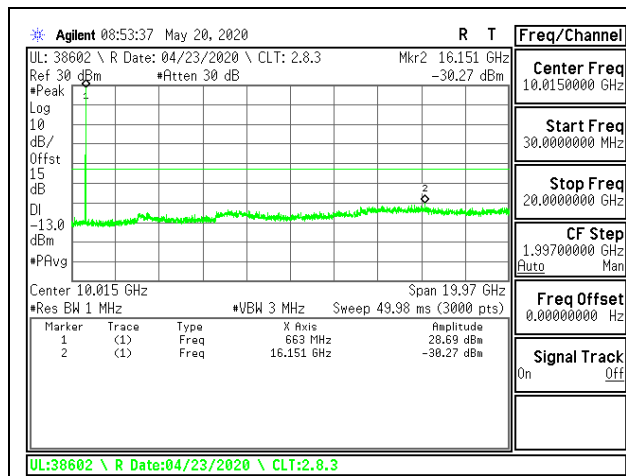


### 8.3.14. LTE BAND 71

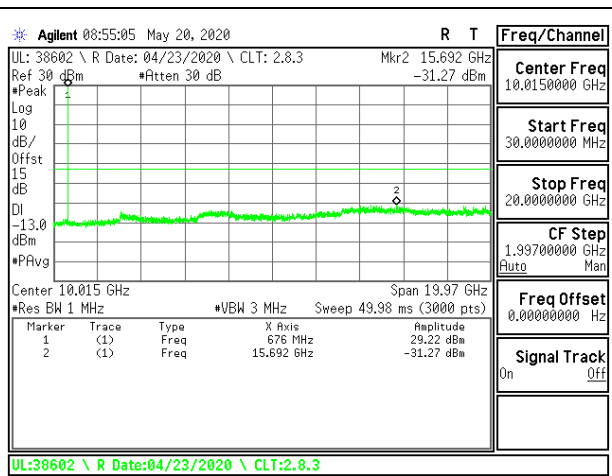
#### LIMITS

FCC: §27.53 (g)

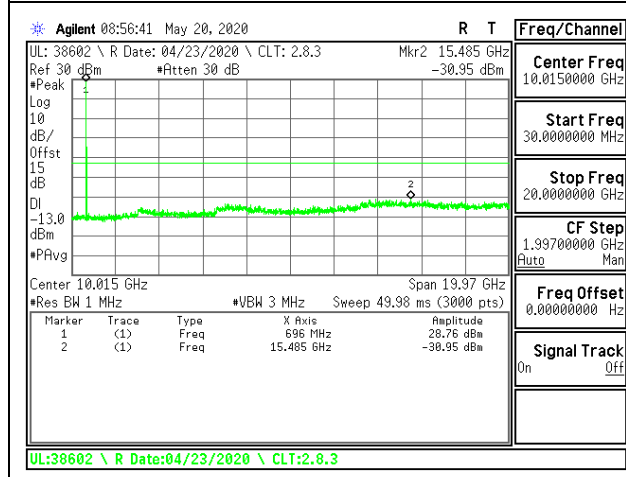
The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log (P)$  dB where transmitting power (P) in Watts.



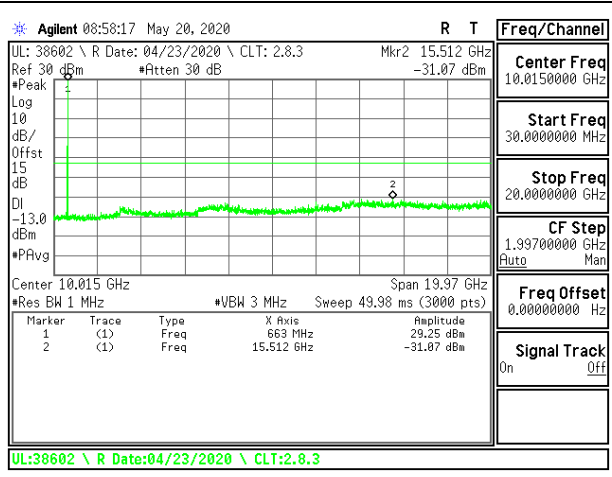
LTE B71 5MHz QPSK Low Channel RB1-0



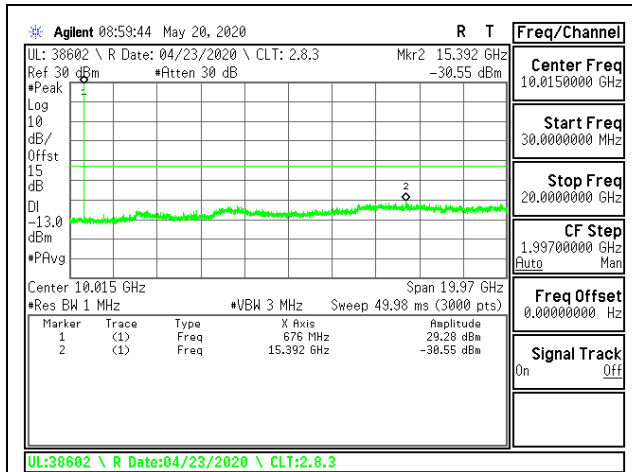
LTE B71 5MHz QPSK Middle Channel RB1-0



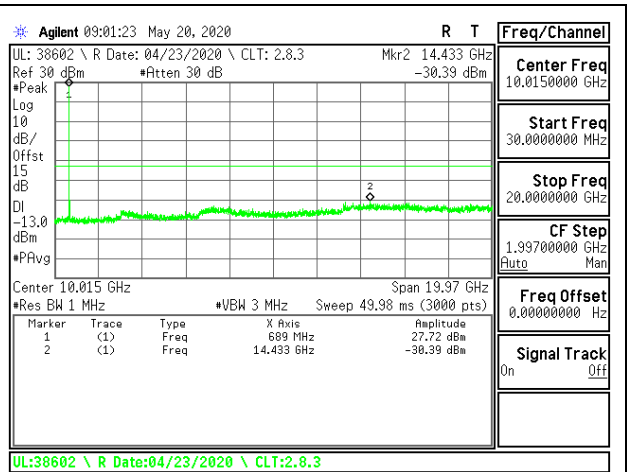
LTE B71 5MHz QPSK High Channel RB1-0



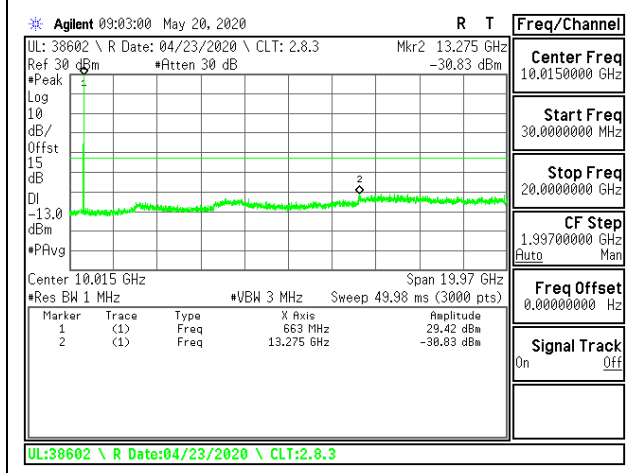
LTE B71 10MHz QPSK Low Channel RB1-0



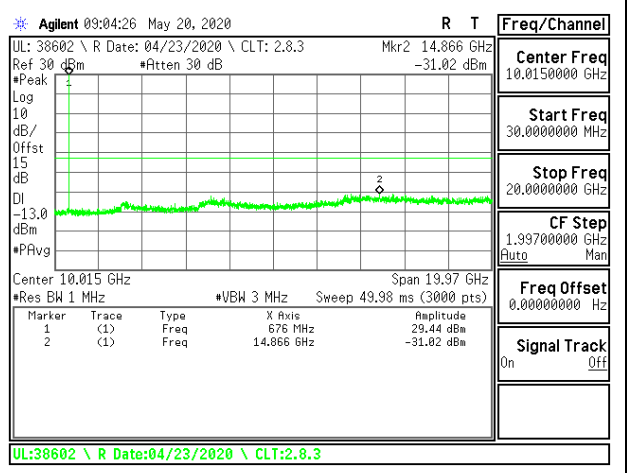
LTE B71 10MHz QPSK Middle Channel RB1-0



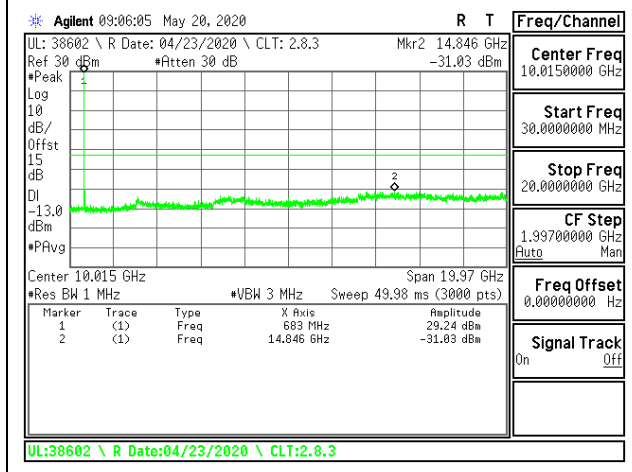
LTE 71 10MHz QPSK High Channel RB1-0



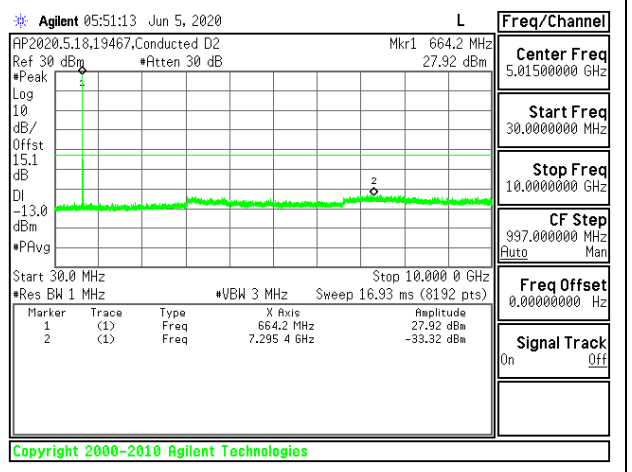
LTE B71 15MHz QPSK Low Channel RB1-0



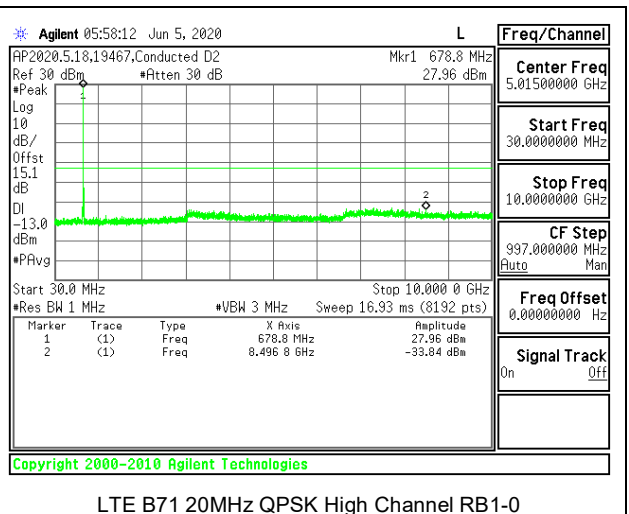
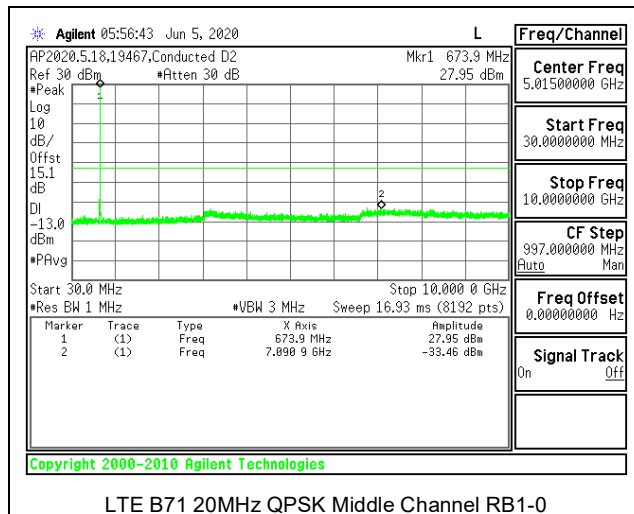
LTE B71 15MHz QPSK Middle Channel RB1-0



LTE B71 15MHz QPSK High Channel RB1-0



LTE B71 20MHz QPSK Low Channel RB1-0



### 8.3.15. 5G NR Band n77

#### LIMITS

FCC: §27.53

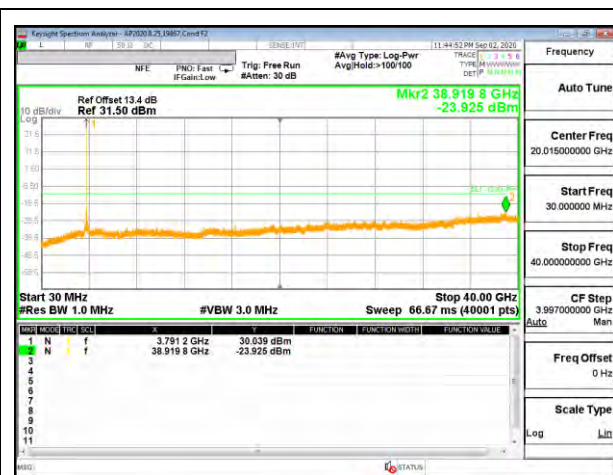
Emission limits

(1) 3.7 GHz Service. The following emission limits apply to stations transmitting in the 3700-3980 MHz band:

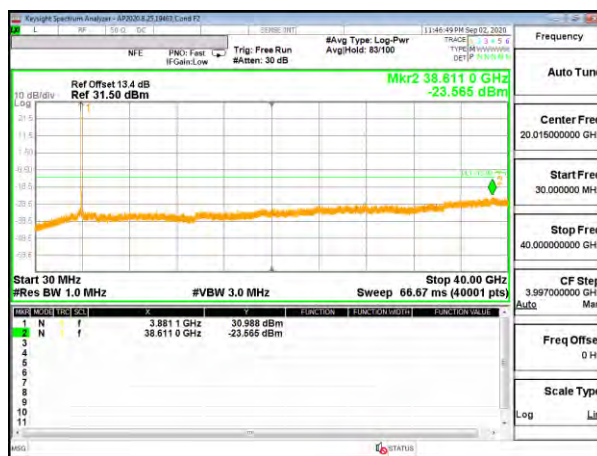
(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz.



5G NR Band n77 100MHz QPSK Low Channel RB1-1



5G NR Band n77 100MHz QPSK Mid Channel RB1-1



5G NR Band n77 100MHz QPSK High Channel RB1-1



## 8.4. FREQUENCY STABILITY

### TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

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

Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.  
End Voltage, 3.2VDC.

#### **Frequency Stability vs Temperature:**

The EUT is placed inside a temperature chamber. The temperature is set to 20°C 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 +50°C is reached.

#### **Frequency Stability vs Voltage:**

The peak frequency error is recorded (worst-case).

### RESULTS

See the following pages.

### 8.4.1. 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.

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### QPSK (20MHz BANDWIDTH)

| Limit          |           | 1850                 | 1910                  | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | 2.8       |                      |                       |            |                           |
| Normal (20C)   | Normal    | 1850.9999            | 1909.0213             |            |                           |
| Extreme (50C)  |           | 1850.9998            | 1909.0213             | -2.0       | -0.001                    |
| Extreme (40C)  |           | 1850.9998            | 1909.0213             | -1.2       | -0.001                    |
| Extreme (30C)  |           | 1850.9998            | 1909.0213             | -1.9       | -0.001                    |
| Extreme (10C)  |           | 1850.9998            | 1909.0213             | -0.1       | 0.000                     |
| Extreme (0C)   |           | 1850.9998            | 1909.0213             | -1.7       | -0.001                    |
| Extreme (-10C) |           | 1850.9998            | 1909.0213             | -0.7       | 0.000                     |
| Extreme (-20C) |           | 1850.9998            | 1909.0213             | -0.7       | 0.000                     |
| Extreme (-30C) |           | 1850.9998            | 1909.0213             | -0.8       | 0.000                     |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 1850.9998            | 1909.0213             | -1.1       | -0.001                    |
|                | -15%      | 1850.9998            | 1909.0213             | -1.0       | -0.001                    |
|                | End Point | 1850.9998            | 1909.0213             | -0.7       | 0.000                     |

### 8.4.2. LTE BAND 5 AND n5

#### LIMITS

FCC: §22.355

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### LTE BAND 5 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    | 824.4947             | 848.5183              |            |                           |
| Extreme (50C)  |           | 824.4947             | 848.5183              | -2.9       | -0.003                    |
| Extreme (40C)  |           | 824.4947             | 848.5183              | -1.3       | -0.002                    |
| Extreme (30C)  |           | 824.4947             | 848.5183              | -1.5       | -0.002                    |
| Extreme (10C)  |           | 824.4947             | 848.5183              | 0.1        | 0.000                     |
| Extreme (0C)   |           | 824.4947             | 848.5183              | 0.4        | 0.000                     |
| Extreme (-10C) |           | 824.4947             | 848.5183              | -0.4       | 0.000                     |
| Extreme (-20C) |           | 824.4947             | 848.5183              | -1.2       | -0.001                    |
| Extreme (-30C) |           | 824.4947             | 848.5183              | -0.1       | 0.000                     |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 824.4947             | 848.5183              | -2.4       | -0.003                    |
|                | -15%      | 824.4947             | 848.5183              | -0.6       | -0.001                    |
|                | End Point | 824.4947             | 848.5183              | -0.4       | -0.001                    |

**5G NR Band n5 QPSK (20MHz BANDWIDTH)**

| Limit          |           | 824                  | 849                   | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 824.4688             | 847.4390              |            |                           |
| Extreme (50C)  |           | 824.4688             | 847.4390              | -11.8      | -0.014                    |
| Extreme (40C)  |           | 824.4688             | 847.4390              | -11.8      | -0.014                    |
| Extreme (30C)  |           | 824.4688             | 847.4390              | -10.8      | -0.013                    |
| Extreme (10C)  |           | 824.4688             | 847.4390              | -9.3       | -0.011                    |
| Extreme (0C)   |           | 824.4688             | 847.4390              | 11.3       | 0.014                     |
| Extreme (-10C) |           | 824.4688             | 847.4390              | -10.1      | -0.012                    |
| Extreme (-20C) |           | 824.4688             | 847.4390              | -8.2       | -0.010                    |
| Extreme (-30C) |           | 824.4688             | 847.4390              | -13.1      | -0.016                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 824.4688             | 847.4390              | -11.5      | -0.014                    |
|                | -15%      | 824.4688             | 847.4390              | -10.8      | -0.013                    |
|                | End Point | 824.4688             | 847.4390              | -10.5      | -0.012                    |

### 8.4.3. LTE BAND 7

#### 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: | 19178 | Test Date: | 6/19/2020 |
|-------------------|-------|------------|-----------|

#### QPSK (20MHz BANDWIDTH)

| Limit          |           | 2500                 | 2570                  | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 2500.9938            | 2569.0063             |            |                           |
| Extreme (50C)  |           | 2500.9938            | 2569.0063             | -2.9       | -0.001                    |
| Extreme (40C)  |           | 2500.9938            | 2569.0063             | -2.4       | -0.001                    |
| Extreme (30C)  |           | 2500.9938            | 2569.0063             | -1.5       | -0.001                    |
| Extreme (10C)  |           | 2500.9938            | 2569.0063             | -0.2       | 0.000                     |
| Extreme (0C)   |           | 2500.9938            | 2569.0063             | -1.1       | 0.000                     |
| Extreme (-10C) |           | 2500.9938            | 2569.0063             | -0.8       | 0.000                     |
| Extreme (-20C) |           | 2500.9938            | 2569.0063             | -0.8       | 0.000                     |
| Extreme (-30C) |           | 2500.9938            | 2569.0063             | -0.8       | 0.000                     |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 2500.9938            | 2569.0063             | -2.7       | -0.001                    |
|                | -15%      | 2500.9938            | 2569.0063             | -2.1       | -0.001                    |
|                | End Point | 2500.9938            | 2569.0063             | -1.7       | -0.001                    |

### 8.4.4. LTE BAND 12 AND 5G NR Band n12

#### LIMITS

FCC: §27.54

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### 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    | 699.5072             | 715.5135              |            |                           |
| Extreme (50C)  |           | 699.5072             | 715.5135              | -1.0       | -0.001                    |
| Extreme (40C)  |           | 699.5072             | 715.5135              | -1.4       | -0.002                    |
| Extreme (30C)  |           | 699.5072             | 715.5135              | -0.3       | 0.000                     |
| Extreme (10C)  |           | 699.5072             | 715.5135              | -0.1       | 0.000                     |
| Extreme (0C)   |           | 699.5072             | 715.5135              | 0.1        | 0.000                     |
| Extreme (-10C) |           | 699.5072             | 715.5135              | -0.2       | 0.000                     |
| Extreme (-20C) |           | 699.5072             | 715.5135              | -2.2       | -0.003                    |
| Extreme (-30C) |           | 699.5072             | 715.5135              | -1.4       | -0.002                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 699.5072             | 715.5135              | -2.7       | -0.004                    |
|                | -15%      | 699.5072             | 715.5135              | -1.2       | -0.002                    |
|                | End Point | 699.5072             | 715.5135              | -0.1       | 0.000                     |

**5G NR Band n12 QPSK (15MHz BANDWIDTH)**

| Limit          |           | 699                  | 716                   | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 699.3872             | 714.8751              |            |                           |
| Extreme (50C)  |           | 699.3872             | 714.8751              | -13.9      | -0.020                    |
| Extreme (40C)  |           | 699.3872             | 714.8751              | -12.4      | -0.017                    |
| Extreme (30C)  |           | 699.3872             | 714.8751              | -11.9      | -0.017                    |
| Extreme (10C)  |           | 699.3872             | 714.8751              | -11.5      | -0.016                    |
| Extreme (0C)   |           | 699.3872             | 714.8751              | -13.3      | -0.019                    |
| Extreme (-10C) |           | 699.3872             | 714.8751              | -12.2      | -0.017                    |
| Extreme (-20C) |           | 699.3872             | 714.8751              | -12.6      | -0.018                    |
| Extreme (-30C) |           | 699.3872             | 714.8751              | -15.6      | -0.022                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 699.3872             | 714.8751              | -12.4      | -0.018                    |
|                | -15%      | 699.3872             | 714.8751              | -12.4      | -0.017                    |
|                | End Point | 699.3872             | 714.8751              | -12.3      | -0.017                    |

### 8.4.5. 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.

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### QPSK (10MHz BANDWIDTH)

| Limit          |           | 777                  | 787                   | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 777.4995             | 786.5124              |            |                           |
| Extreme (50C)  |           | 777.4995             | 786.5124              | -1.0       | -0.001                    |
| Extreme (40C)  |           | 777.4995             | 786.5124              | -0.9       | -0.001                    |
| Extreme (30C)  |           | 777.4995             | 786.5124              | -2.5       | -0.003                    |
| Extreme (10C)  |           | 777.4995             | 786.5124              | 0.9        | 0.001                     |
| Extreme (0C)   |           | 777.4995             | 786.5124              | -0.3       | 0.000                     |
| Extreme (-10C) |           | 777.4995             | 786.5124              | 0.4        | 0.000                     |
| Extreme (-20C) |           | 777.4995             | 786.5124              | -3.0       | -0.004                    |
| Extreme (-30C) |           | 777.4995             | 786.5124              | 1.0        | 0.001                     |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 777.4995             | 786.5124              | -2.7       | -0.003                    |
|                | -15%      | 777.4995             | 786.5124              | 0.2        | 0.000                     |
|                | End Point | 777.4995             | 786.5124              | -1.3       | -0.002                    |



### 8.4.6. LTE BAND 14

#### LIMITS

FCC: §90.539

(e) The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 ppm or better when AFC is locked to a base station, and 5 ppm or better when AFC is not locked.

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### QPSK (10MHz BANDWIDTH)

| Limit          |           | 788                  | 798                   | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 788.2415             | 797.7962              |            |                           |
| Extreme (50C)  |           | 788.2415             | 797.7962              | -6.2       | -0.008                    |
| Extreme (40C)  |           | 788.2415             | 797.7962              | -4.7       | -0.006                    |
| Extreme (30C)  |           | 788.2415             | 797.7962              | -4.0       | -0.005                    |
| Extreme (10C)  |           | 788.2415             | 797.7962              | -3.6       | -0.005                    |
| Extreme (0C)   |           | 788.2415             | 797.7962              | 3.7        | 0.005                     |
| Extreme (-10C) |           | 788.2415             | 797.7962              | -3.5       | -0.004                    |
| Extreme (-20C) |           | 788.2415             | 797.7962              | -4.4       | -0.006                    |
| Extreme (-30C) |           | 788.2415             | 797.7962              | -4.5       | -0.006                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 788.2415             | 797.7962              | -3.3       | -0.004                    |
|                | -15%      | 788.2415             | 797.7962              | 4.2        | 0.005                     |
|                | End Point | 788.2415             | 797.7962              | -4.1       | -0.005                    |

### 8.4.7. LTE BAND 17

#### LIMITS

FCC: §27.54

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### QPSK (10MHz BANDWIDTH)

| Limit          |           | 704                  | 716                   | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 704.4812             | 715.5033              |            |                           |
| Extreme (50C)  |           | 704.4812             | 715.5033              | -3.3       | -0.005                    |
| Extreme (40C)  |           | 704.4812             | 715.5033              | -3.4       | -0.005                    |
| Extreme (30C)  |           | 704.4812             | 715.5033              | -2.4       | -0.003                    |
| Extreme (10C)  |           | 704.4812             | 715.5033              | 1.6        | 0.002                     |
| Extreme (0C)   |           | 704.4812             | 715.5033              | 0.4        | 0.001                     |
| Extreme (-10C) |           | 704.4812             | 715.5033              | -1.1       | -0.002                    |
| Extreme (-20C) |           | 704.4812             | 715.5033              | 2.2        | 0.003                     |
| Extreme (-30C) |           | 704.4812             | 715.5033              | 2.9        | 0.004                     |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 704.4812             | 715.5033              | -3.3       | -0.005                    |
|                | -15%      | 704.4812             | 715.5033              | -3.2       | -0.004                    |
|                | End Point | 704.4812             | 715.5033              | -0.2       | 0.000                     |

### 8.4.8. LTE BAND 25

#### LIMITS

FCC: §24.235

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### QPSK (20MHz BANDWIDTH)

| Limit          |           | 1850           | 1915            | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------|-----------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm | F high @ -13dBm |            |                           |
| Temperature    | Voltage   | (MHz)          | (MHz)           |            |                           |
| Normal (20C)   | Normal    | 1850.9882      | 1914.0058       |            |                           |
| Extreme (50C)  |           | 1850.9882      | 1914.0058       | -2.8       | -0.001                    |
| Extreme (40C)  |           | 1850.9882      | 1914.0058       | -3.8       | -0.002                    |
| Extreme (30C)  |           | 1850.9882      | 1914.0058       | -2.3       | -0.001                    |
| Extreme (10C)  |           | 1850.9882      | 1914.0058       | -1.6       | -0.001                    |
| Extreme (0C)   |           | 1850.9882      | 1914.0058       | -0.1       | 0.000                     |
| Extreme (-10C) |           | 1850.9882      | 1914.0058       | 0.4        | 0.000                     |
| Extreme (-20C) |           | 1850.9882      | 1914.0058       | -0.1       | 0.000                     |
| Extreme (-30C) |           | 1850.9882      | 1914.0058       | -1.3       | -0.001                    |
|                |           |                |                 |            |                           |
| 20C            | 15%       | 1850.9882      | 1914.0058       | -3.4       | -0.002                    |
|                | -15%      | 1850.9882      | 1914.0058       | -2.7       | -0.001                    |
|                | End Point | 1850.9882      | 1914.0058       | -2.3       | -0.001                    |

### 8.4.9. LTE BAND 26 (PART 90S)

#### **LIMITS**

FCC: §90.213

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### **QPSK (10MHz BANDWIDTH)**

| Limit          |           | 814                  | 824                   | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 814.5026             | 823.5232              |            |                           |
| Extreme (50C)  |           | 814.5026             | 823.5232              | -2.7       | -0.003                    |
| Extreme (40C)  |           | 814.5026             | 823.5232              | -0.2       | 0.000                     |
| Extreme (30C)  |           | 814.5026             | 823.5232              | -2.2       | -0.003                    |
| Extreme (10C)  |           | 814.5026             | 823.5232              | -1.0       | -0.001                    |
| Extreme (0C)   |           | 814.5026             | 823.5232              | -0.9       | -0.001                    |
| Extreme (-10C) |           | 814.5026             | 823.5232              | 0.9        | 0.001                     |
| Extreme (-20C) |           | 814.5026             | 823.5232              | 2.9        | 0.003                     |
| Extreme (-30C) |           | 814.5026             | 823.5232              | -1.5       | -0.002                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 814.5026             | 823.5232              | 0.7        | 0.001                     |
|                | -15%      | 814.5026             | 823.5232              | -0.6       | -0.001                    |
|                | End Point | 814.5026             | 823.5232              | -1.7       | -0.002                    |

### 8.4.10. LTE BAND 30

#### **LIMITS**

FCC: §27.54

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### **QPSK (10MHz BANDWIDTH)**

| Limit          |           | 2305                 | 2315                  | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 2305.4959            | 2314.5174             |            |                           |
| Extreme (50C)  |           | 2305.4959            | 2314.5174             | -0.6       | 0.000                     |
| Extreme (40C)  |           | 2305.4959            | 2314.5174             | -1.9       | -0.001                    |
| Extreme (30C)  |           | 2305.4959            | 2314.5174             | -1.9       | -0.001                    |
| Extreme (10C)  |           | 2305.4959            | 2314.5174             | -0.9       | 0.000                     |
| Extreme (0C)   |           | 2305.4959            | 2314.5174             | 0.3        | 0.000                     |
| Extreme (-10C) |           | 2305.4959            | 2314.5174             | 0.3        | 0.000                     |
| Extreme (-20C) |           | 2305.4959            | 2314.5174             | 2.7        | 0.001                     |
| Extreme (-30C) |           | 2305.4959            | 2314.5174             | -2.7       | -0.001                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 2305.4959            | 2314.5174             | -1.4       | -0.001                    |
|                | -15%      | 2305.4959            | 2314.5174             | -2.1       | -0.001                    |
|                | End Point | 2305.4959            | 2314.5174             | -0.8       | 0.000                     |

### 8.4.11. LTE BAND 41 AND 5G NR Band n41

#### **LIMITS**

FCC: §27.54

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### **LTE BAND 41 QPSK (20MHz BANDWIDTH)**

| Limit          |           | 2496                 | 2690                  | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 2496.9029            | 2689.1068             |            |                           |
| Extreme (50C)  |           | 2496.9028            | 2689.1068             | -11.3      | -0.004                    |
| Extreme (40C)  |           | 2496.9028            | 2689.1068             | -9.7       | -0.004                    |
| Extreme (30C)  |           | 2496.9029            | 2689.1068             | -5.9       | -0.002                    |
| Extreme (10C)  |           | 2496.9028            | 2689.1068             | -7.3       | -0.003                    |
| Extreme (0C)   |           | 2496.9028            | 2689.1068             | -9.9       | -0.004                    |
| Extreme (-10C) |           | 2496.9028            | 2689.1068             | -9.9       | -0.004                    |
| Extreme (-20C) |           | 2496.9028            | 2689.1068             | -11.5      | -0.004                    |
| Extreme (-30C) |           | 2496.9028            | 2689.1068             | -8.8       | -0.003                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 2496.9028            | 2689.1068             | -12.2      | -0.005                    |
|                | -15%      | 2496.9028            | 2689.1068             | -9.6       | -0.004                    |
|                | End Point | 2496.9028            | 2689.1068             | -10.5      | -0.004                    |

**5G NR Band n41 QPSK (100MHz BANDWIDTH)**

| Limit          |           | 2496                 | 2690                  | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 2497.0086            | 2687.9440             |            |                           |
| Extreme (50C)  |           | 2497.0086            | 2687.9440             | -30.8      | -0.012                    |
| Extreme (40C)  |           | 2497.0086            | 2687.9440             | -42.9      | -0.017                    |
| Extreme (30C)  |           | 2497.0086            | 2687.9440             | -33.7      | -0.013                    |
| Extreme (10C)  |           | 2497.0086            | 2687.9440             | -34.7      | -0.013                    |
| Extreme (0C)   |           | 2497.0086            | 2687.9440             | -28.7      | -0.011                    |
| Extreme (-10C) |           | 2497.0086            | 2687.9440             | -26.3      | -0.010                    |
| Extreme (-20C) |           | 2497.0086            | 2687.9440             | -32.0      | -0.012                    |
| Extreme (-30C) |           | 2497.0086            | 2687.9440             | -34.0      | -0.013                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 2497.0086            | 2687.9440             | -30.5      | -0.012                    |
|                | -15%      | 2497.0086            | 2687.9440             | -40.0      | -0.015                    |
|                | End Point | 2497.0086            | 2687.9440             | -27.3      | -0.011                    |

**8.4.12. LTE BAND 48**

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

**QPSK (20MHz BANDWIDTH)**

| Limit          |           | 3550                 | 3700                  | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 3550.8397            | 3699.0165             |            |                           |
| Extreme (50C)  |           | 3550.8397            | 3699.0165             | 2.9        | 0.001                     |
| Extreme (40C)  |           | 3550.8397            | 3699.0165             | 2.2        | 0.001                     |
| Extreme (30C)  |           | 3550.8397            | 3699.0165             | 1.4        | 0.000                     |
| Extreme (10C)  |           | 3550.8397            | 3699.0165             | -1.7       | 0.000                     |
| Extreme (0C)   |           | 3550.8397            | 3699.0165             | -3.3       | -0.001                    |
| Extreme (-10C) |           | 3550.8397            | 3699.0165             | 2.5        | 0.001                     |
| Extreme (-20C) |           | 3550.8397            | 3699.0165             | -3.6       | -0.001                    |
| Extreme (-30C) |           | 3550.8397            | 3699.0165             | 1.5        | 0.000                     |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 3550.8397            | 3699.0165             | 1.3        | 0.000                     |
|                | -15%      | 3550.8397            | 3699.0165             | -2.8       | -0.001                    |
|                | End Point | 3550.8397            | 3699.0165             | -2.8       | -0.001                    |



### 8.4.13. 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.

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### 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    | 1710.8861            | 1779.1371             |            |                           |
| Extreme (50C)  |           | 1710.8861            | 1779.1371             | -1.0       | -0.001                    |
| Extreme (40C)  |           | 1710.8861            | 1779.1371             | -1.0       | -0.001                    |
| Extreme (30C)  |           | 1710.8861            | 1779.1371             | -1.7       | -0.001                    |
| Extreme (10C)  |           | 1710.8861            | 1779.1371             | -1.5       | -0.001                    |
| Extreme (0C)   |           | 1710.8861            | 1779.1371             | -1.7       | -0.001                    |
| Extreme (-10C) |           | 1710.8861            | 1779.1371             | 1.1        | 0.001                     |
| Extreme (-20C) |           | 1710.8861            | 1779.1371             | -4.5       | -0.003                    |
| Extreme (-30C) |           | 1710.8861            | 1779.1371             | -4.2       | -0.002                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 1710.8861            | 1779.1371             | -1.3       | -0.001                    |
|                | -15%      | 1710.8861            | 1779.1371             | -1.9       | -0.001                    |
|                | End Point | 1710.8861            | 1779.1371             | -2.2       | -0.001                    |

### 8.4.14. LTE BAND 71

#### LIMITS

FCC: §27.54

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

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 19178 | <b>Test Date:</b> | 6/19/2020 |
|--------------------------|-------|-------------------|-----------|

#### QPSK (20MHz BANDWIDTH)

| Limit          |           | 663                  | 698                   | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 663.9955             | 697.0181              |            |                           |
| Extreme (50C)  |           | 663.9955             | 697.0181              | -0.1       | 0.000                     |
| Extreme (40C)  |           | 663.9955             | 697.0181              | 0.0        | 0.000                     |
| Extreme (30C)  |           | 663.9955             | 697.0181              | -0.5       | -0.001                    |
| Extreme (10C)  |           | 663.9955             | 697.0181              | 0.2        | 0.000                     |
| Extreme (0C)   |           | 663.9955             | 697.0181              | 0.4        | 0.001                     |
| Extreme (-10C) |           | 663.9955             | 697.0181              | -0.7       | -0.001                    |
| Extreme (-20C) |           | 663.9955             | 697.0181              | -0.1       | 0.000                     |
| Extreme (-30C) |           | 663.9955             | 697.0181              | 0.0        | 0.000                     |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 663.9955             | 697.0181              | 0.3        | 0.000                     |
|                | -15%      | 663.9955             | 697.0181              | -0.4       | -0.001                    |
|                | End Point | 663.9955             | 697.0181              | -0.5       | -0.001                    |

### 8.4.15. 5G NR Band n77

#### LIMITS

FCC: §27.54

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

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 19480 | <b>Test Date:</b> | 8/4/2020 |
|--------------------------|-------|-------------------|----------|

#### 5G NR Band n77 QPSK (100MHz BANDWIDTH)

| Limit          |           | 3700                 | 3980                  | Delta (Hz) | Frequency Stability (ppm) |
|----------------|-----------|----------------------|-----------------------|------------|---------------------------|
| Condition      |           | F low @ -13dBm (MHz) | F high @ -13dBm (MHz) |            |                           |
| Temperature    | Voltage   |                      |                       |            |                           |
| Normal (20C)   | Normal    | 3700.9198            | 3977.9617             |            |                           |
| Extreme (50C)  |           | 3700.9198            | 3977.9617             | -34.3      | -0.009                    |
| Extreme (40C)  |           | 3700.9198            | 3977.9617             | -49.4      | -0.013                    |
| Extreme (30C)  |           | 3700.9198            | 3977.9617             | -38.2      | -0.010                    |
| Extreme (10C)  |           | 3700.9198            | 3977.9617             | -34.7      | -0.009                    |
| Extreme (0C)   |           | 3700.9198            | 3977.9617             | -26.4      | -0.007                    |
| Extreme (-10C) |           | 3700.9198            | 3977.9617             | 32.2       | 0.008                     |
| Extreme (-20C) |           | 3700.9198            | 3977.9617             | -32.9      | -0.009                    |
| Extreme (-30C) |           | 3700.9198            | 3977.9617             | -41.0      | -0.011                    |
|                |           |                      |                       |            |                           |
| 20C            | 15%       | 3700.9197            | 3977.9616             | -53.0      | -0.014                    |
|                | -15%      | 3700.9198            | 3977.9617             | 39.2       | 0.010                     |
|                | End Point | 3700.9198            | 3977.9617             | -33.2      | -0.009                    |

## 8.1. PEAK-TO-AVERAGE POWER RATIO

### **LIMIT**

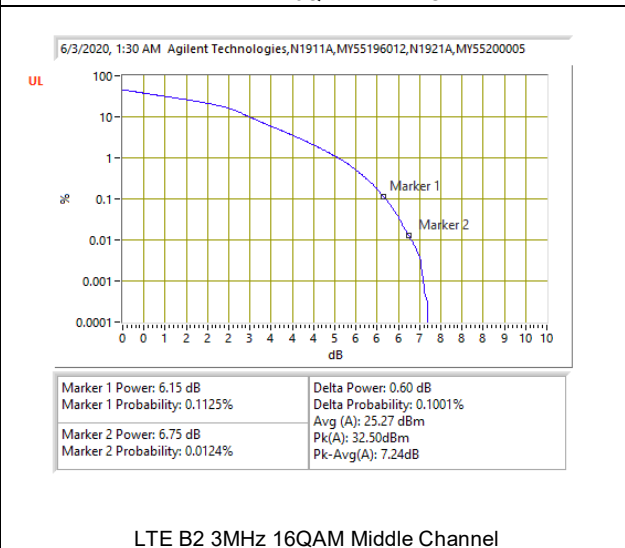
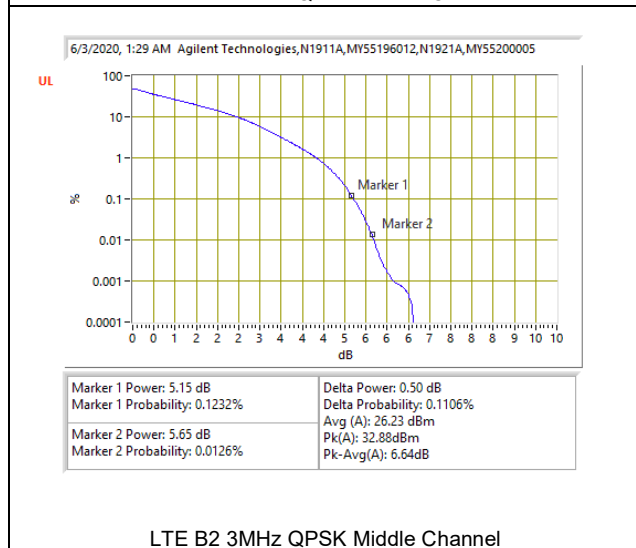
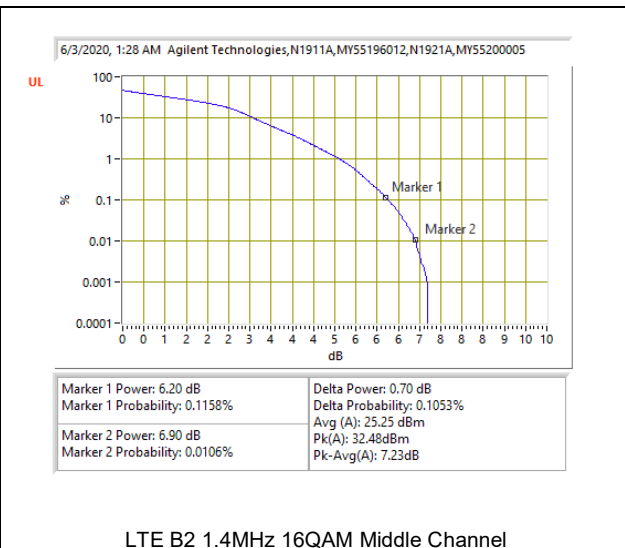
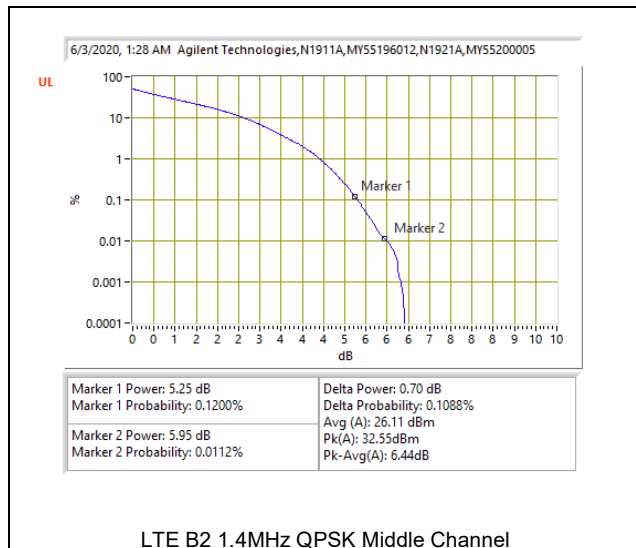
In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

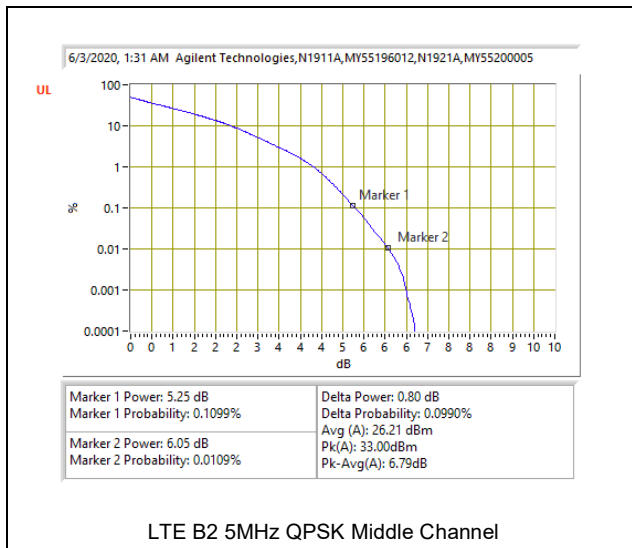
### **RESULT**

The highest output power antenna port used to measure as the worst case; full resource block (FRB) for each bandwidth was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average power ratio criteria.

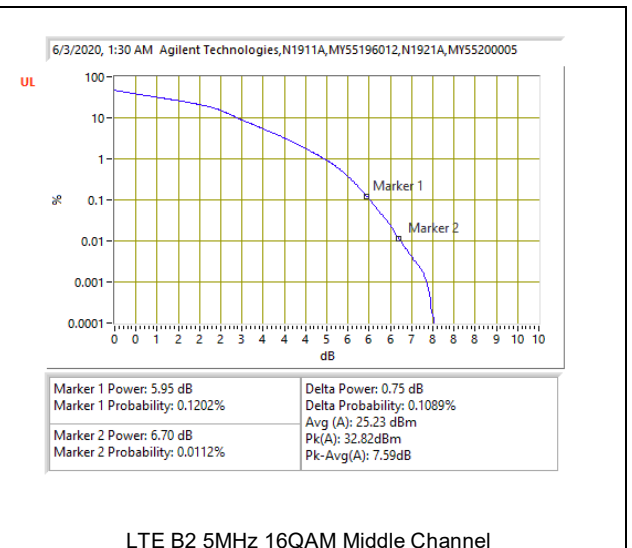
### 8.1.1. LTE BAND 2

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|

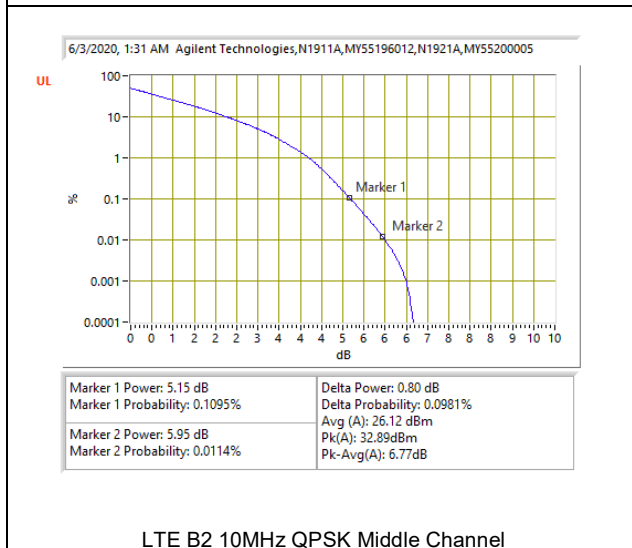




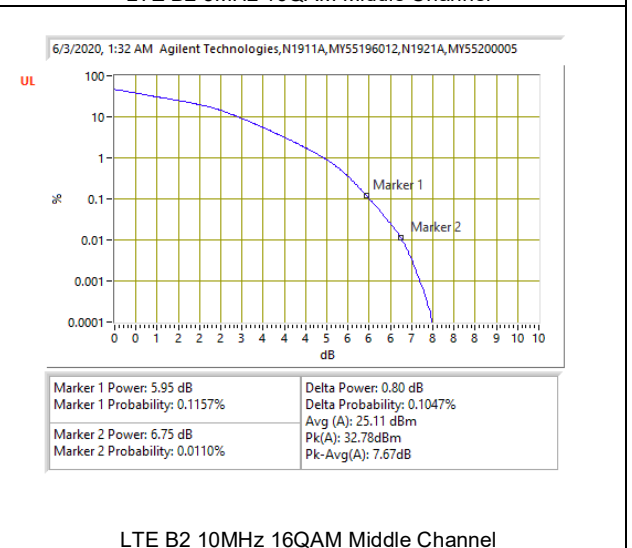
LTE B2 5MHz QPSK Middle Channel



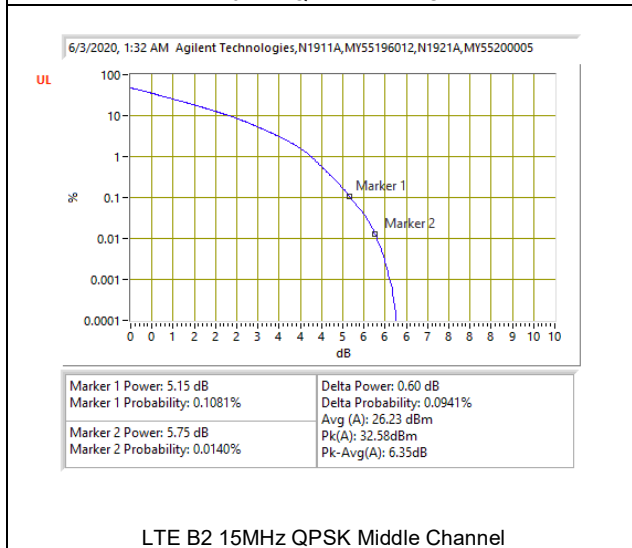
LTE B2 5MHz 16QAM Middle Channel



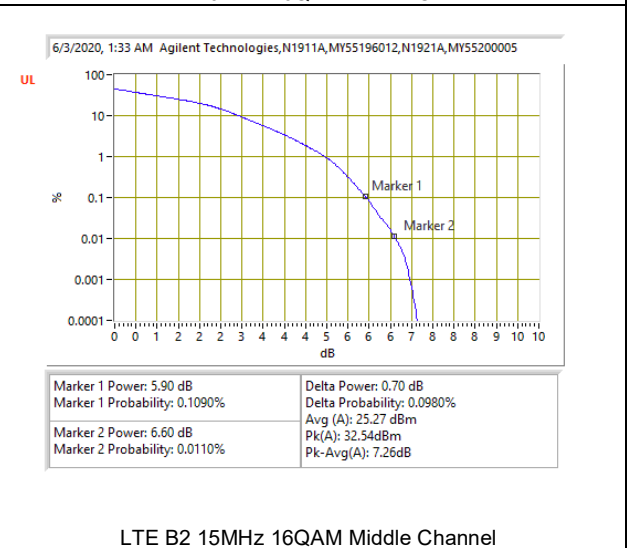
LTE B2 10MHz QPSK Middle Channel



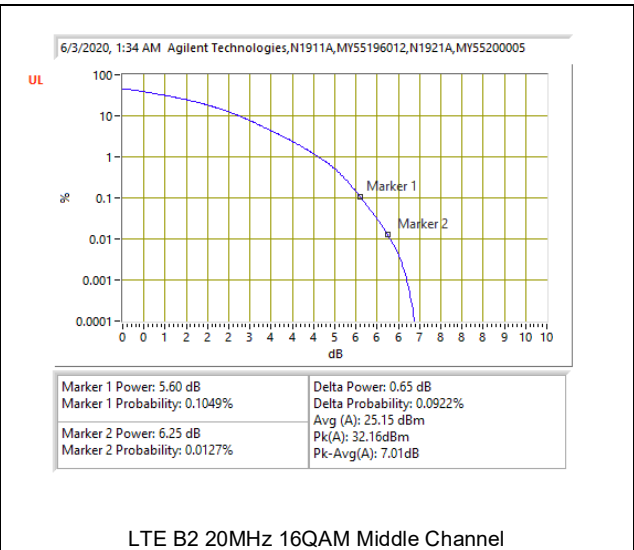
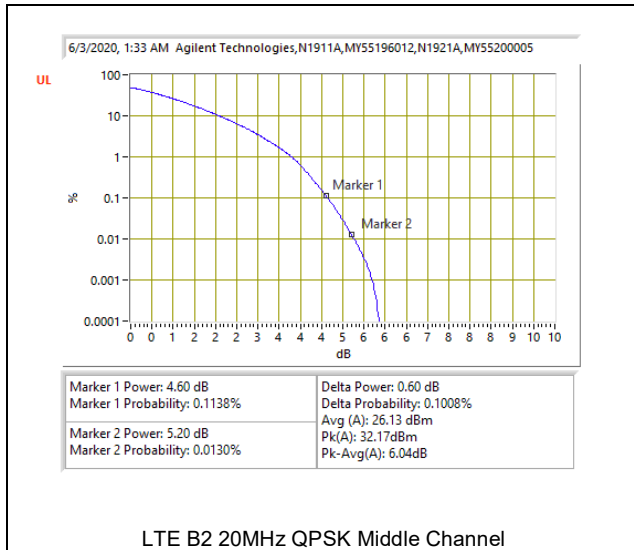
LTE B2 10MHz 16QAM Middle Channel



LTE B2 15MHz QPSK Middle Channel



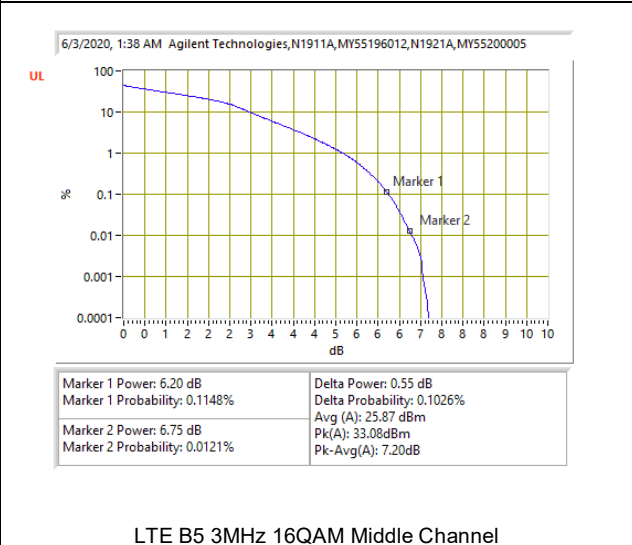
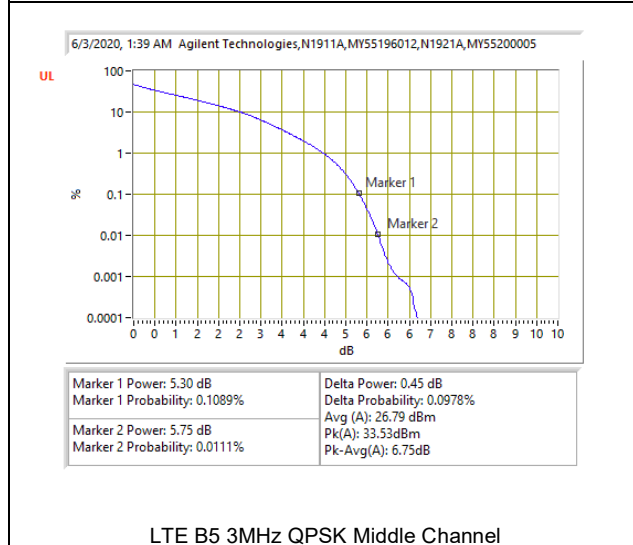
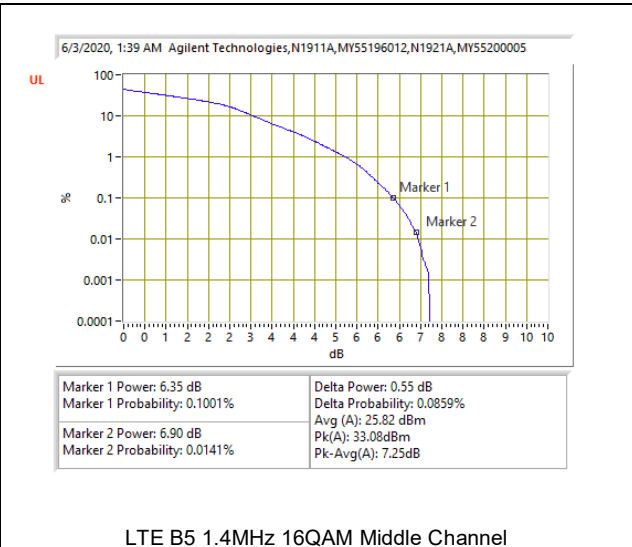
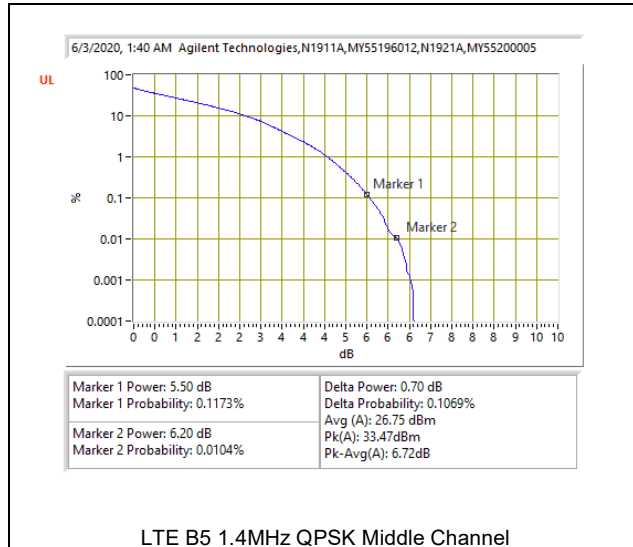
LTE B2 15MHz 16QAM Middle Channel



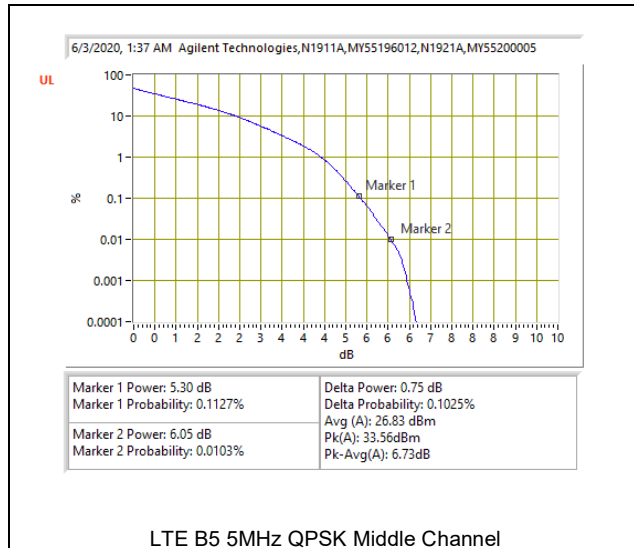
### 8.1.2. LTE BAND 5 AND 5G NR Band n5

#### LTE BAND 5

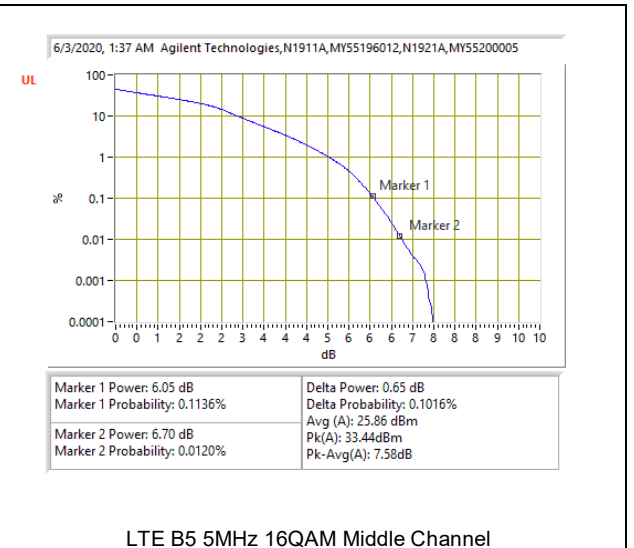
|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|



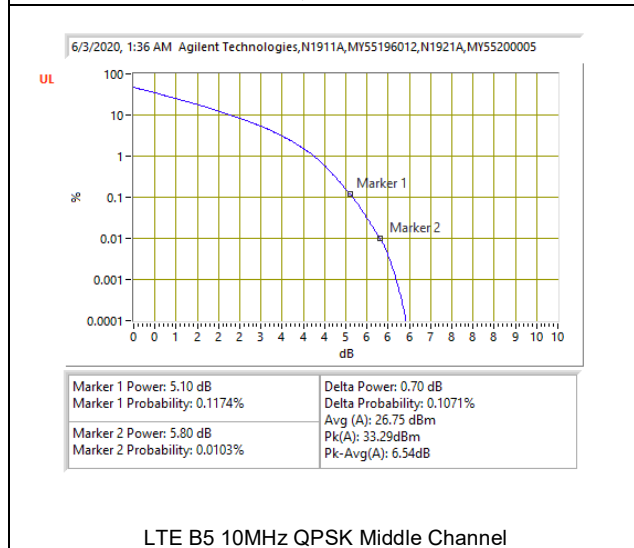




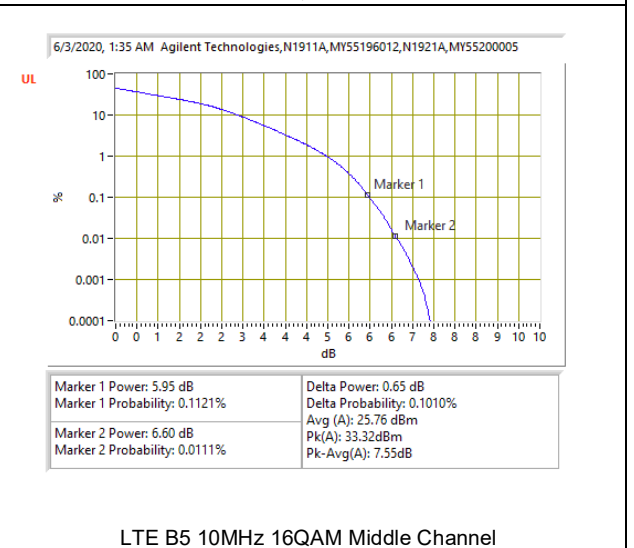
LTE B5 5MHz QPSK Middle Channel



LTE B5 5MHz 16QAM Middle Channel



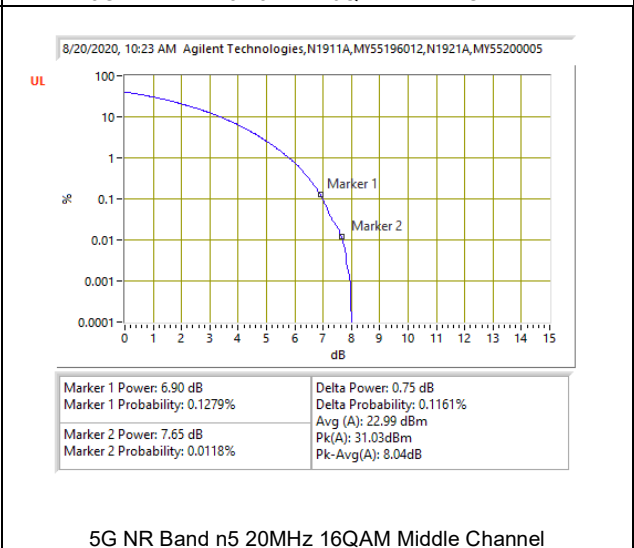
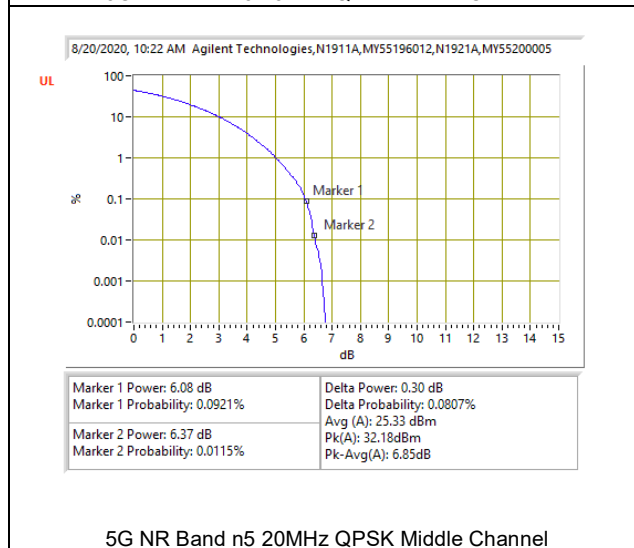
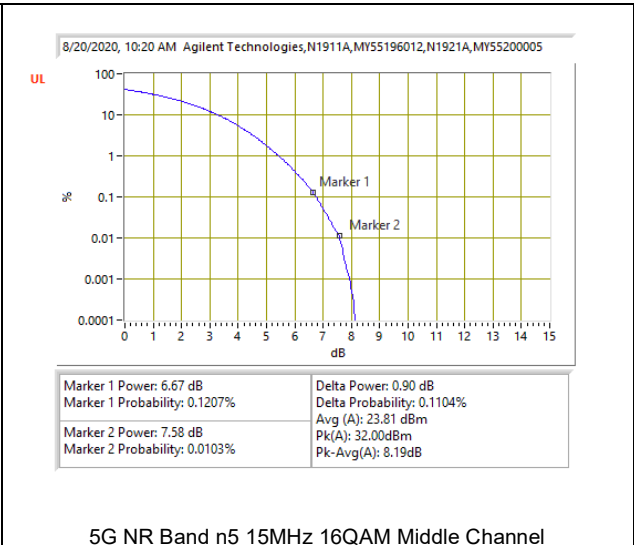
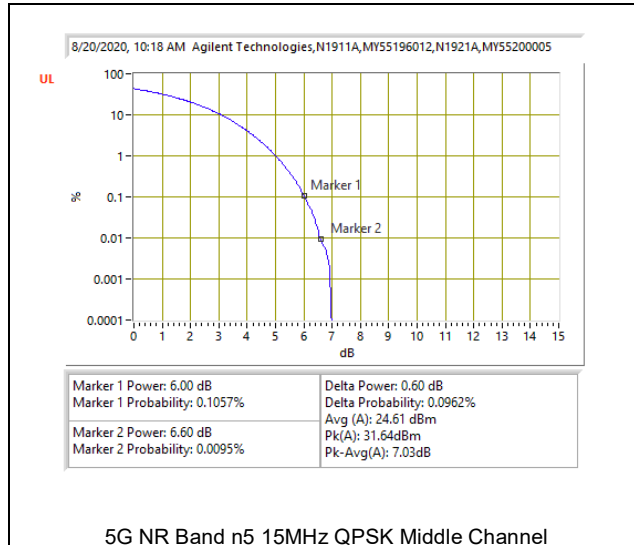
LTE B5 10MHz QPSK Middle Channel



LTE B5 10MHz 16QAM Middle Channel

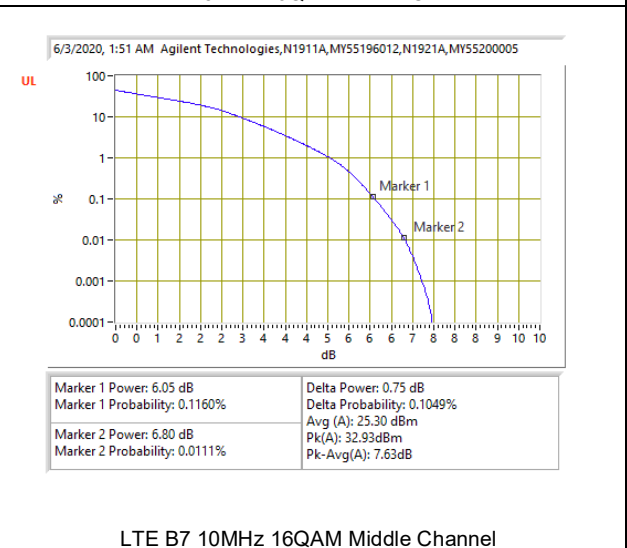
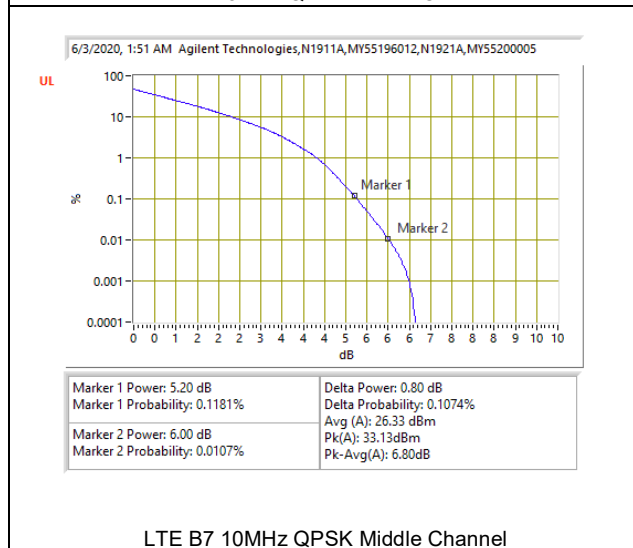
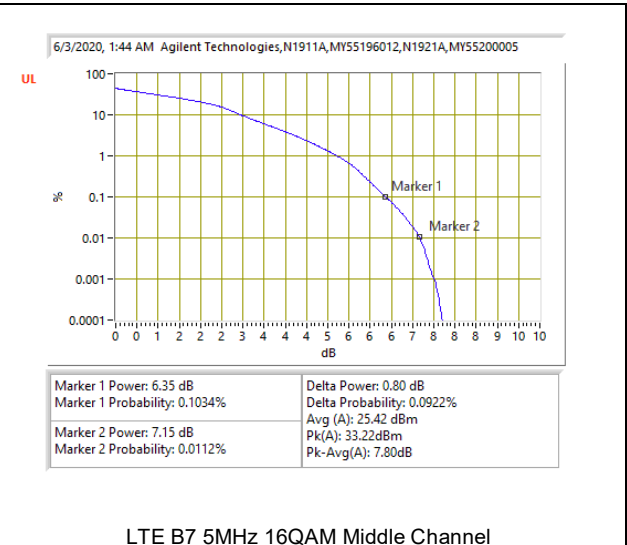
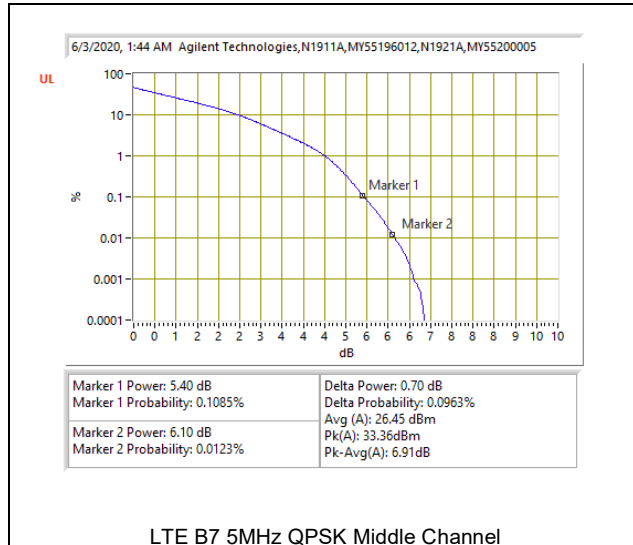
**5G NR Band n5**

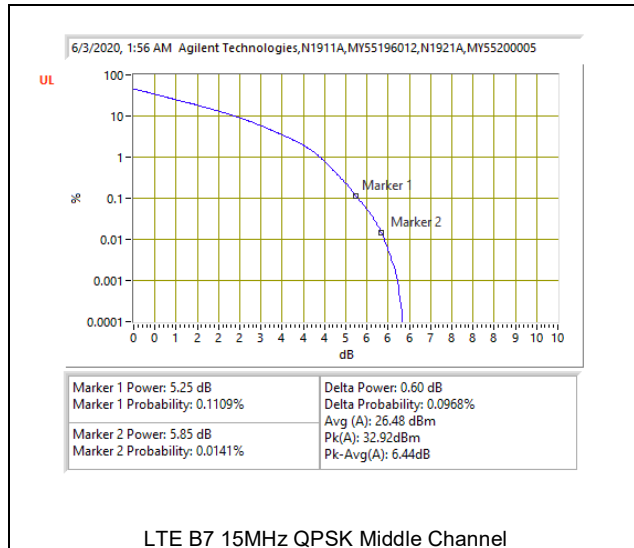
|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 39004 | <b>Test Date:</b> | 8/20/2020 |
|--------------------------|-------|-------------------|-----------|



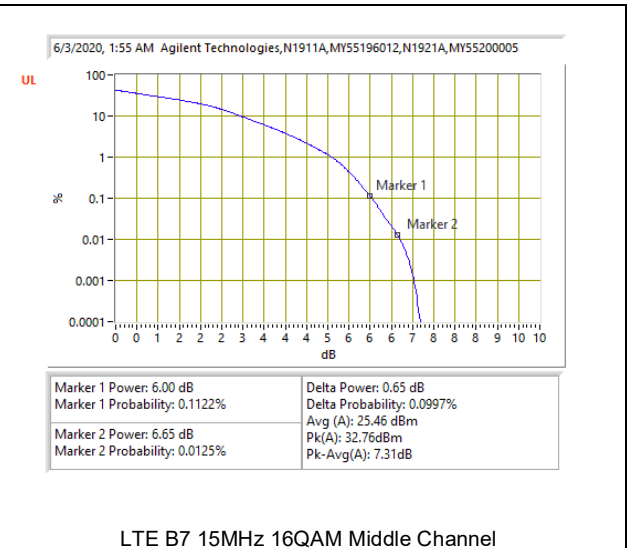
### 8.1.3. LTE BAND 7

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|

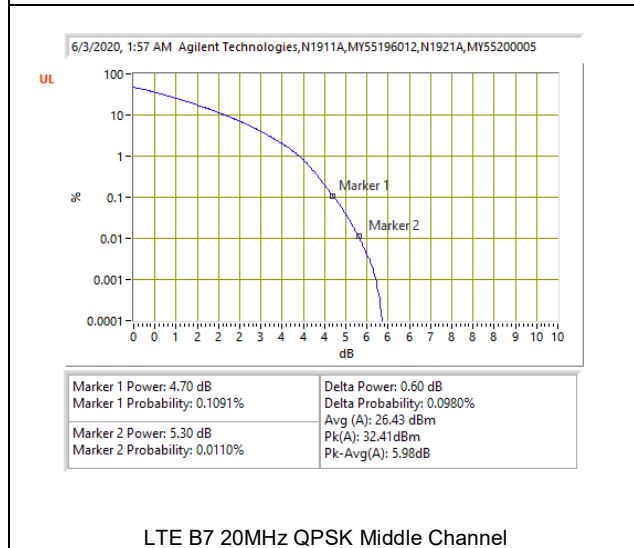




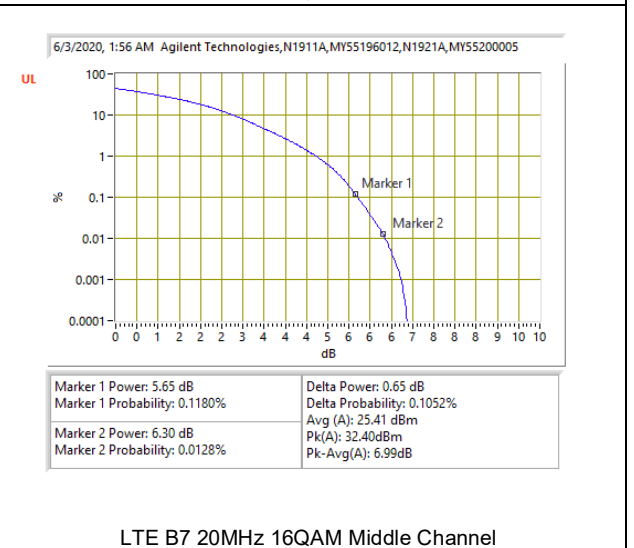
LTE B7 15MHz QPSK Middle Channel



LTE B7 15MHz 16QAM Middle Channel



LTE B7 20MHz QPSK Middle Channel

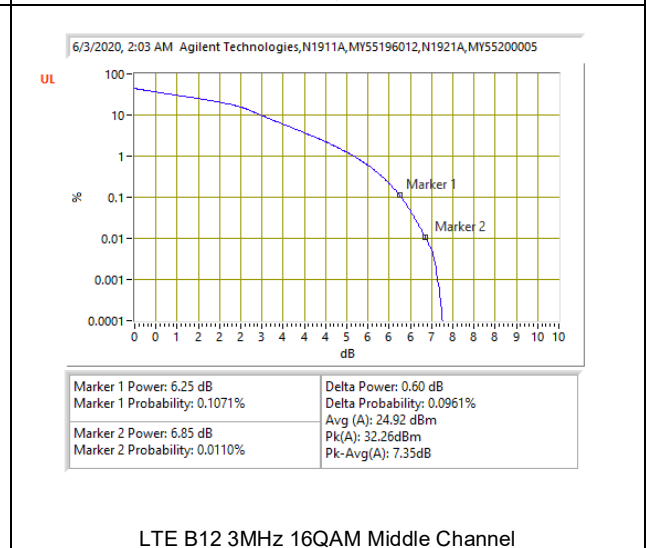
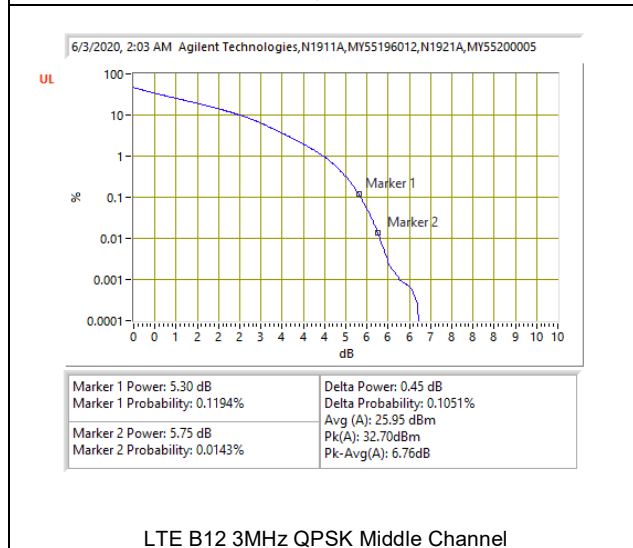
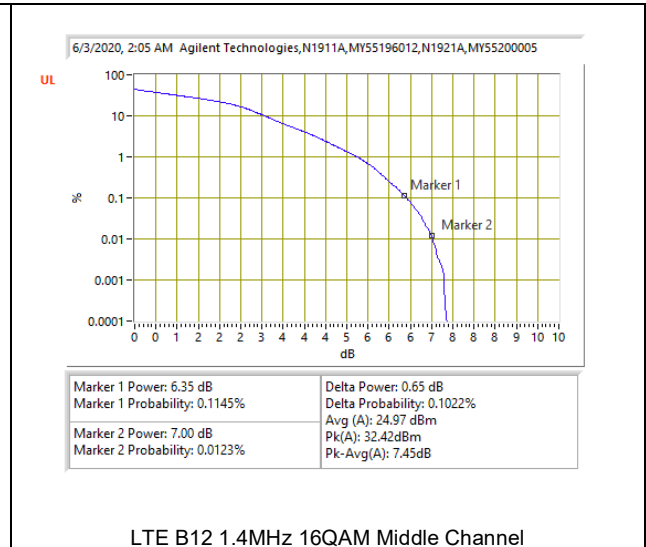
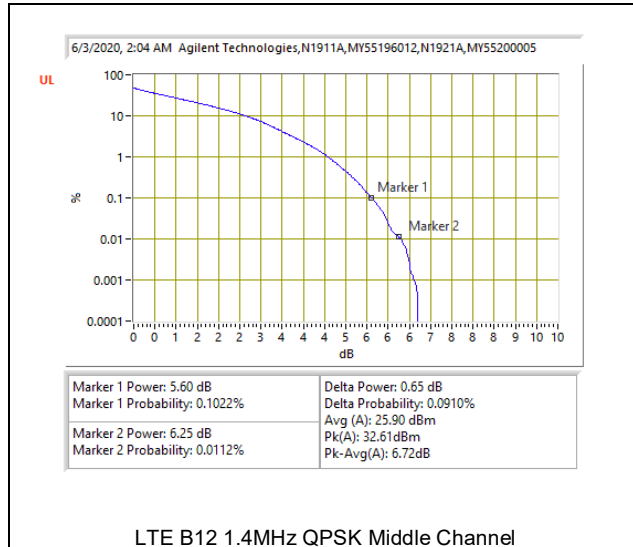


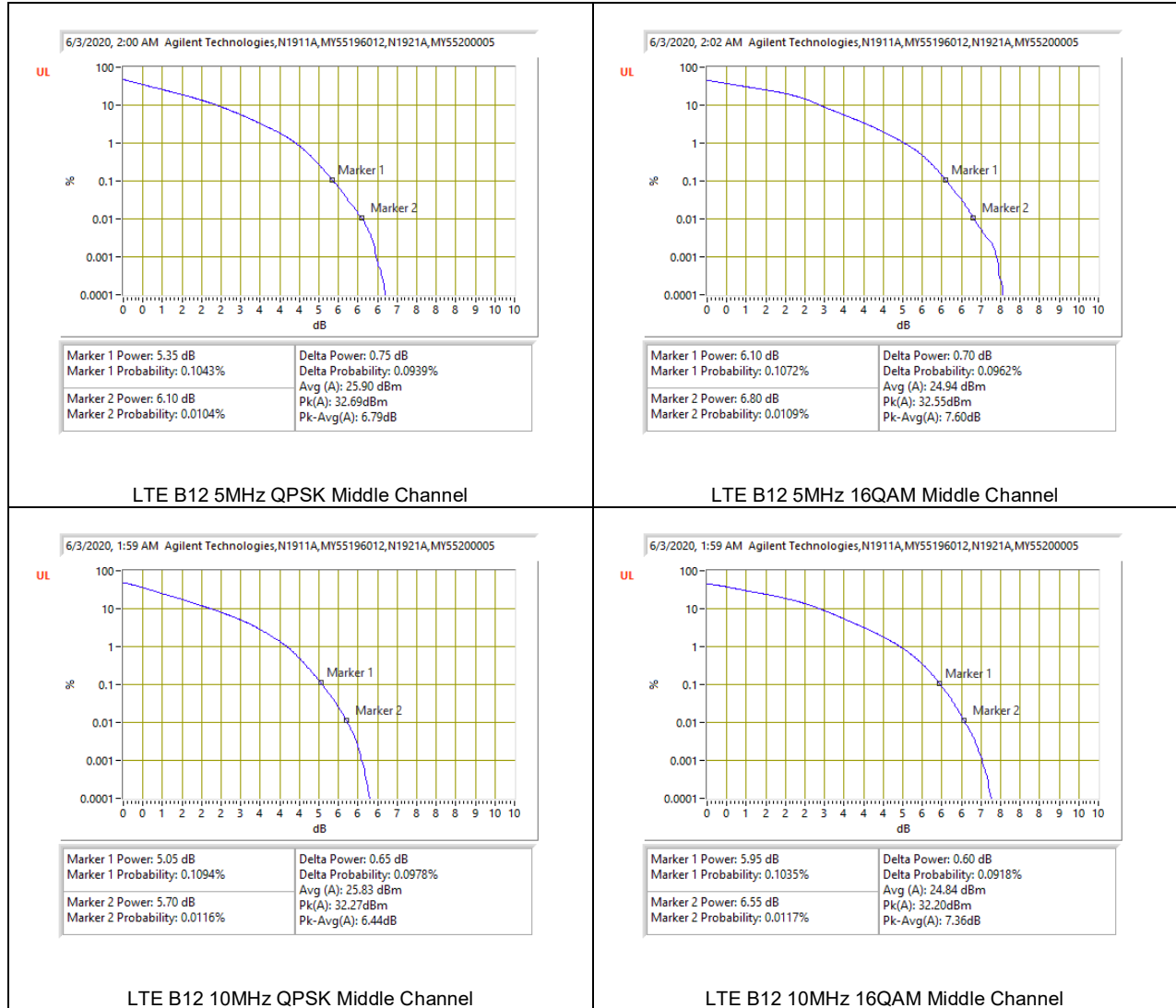
LTE B7 20MHz 16QAM Middle Channel

### 8.1.4. LTE BAND 12 AND 5G NR Band n12

#### LTE BAND 12

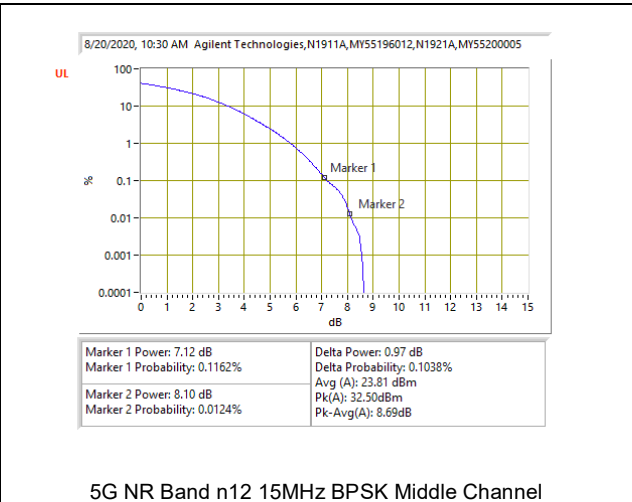
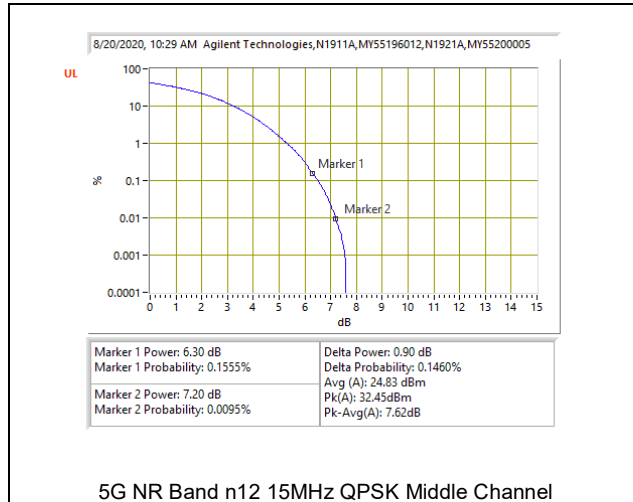
|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|





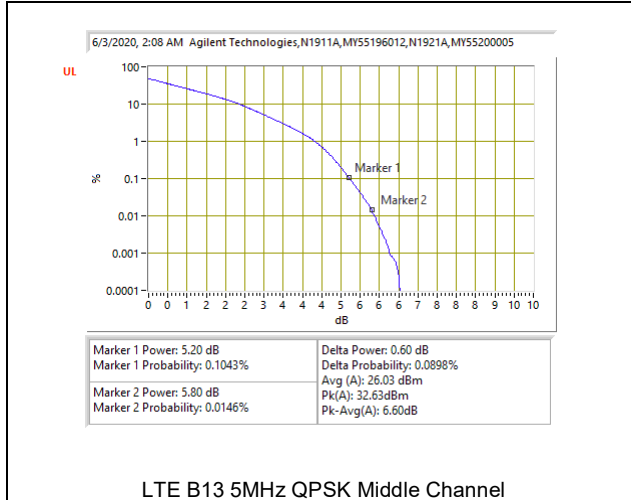
**5G NR Band n12**

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 39004 | <b>Test Date:</b> | 8/20/2020 |
|--------------------------|-------|-------------------|-----------|

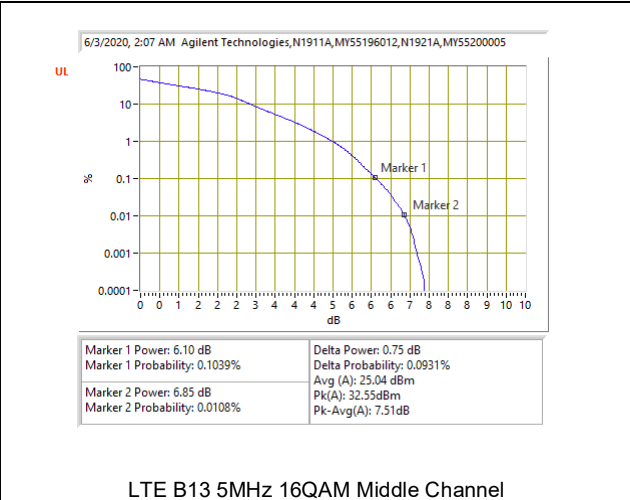


### 8.1.5. LTE BAND 13

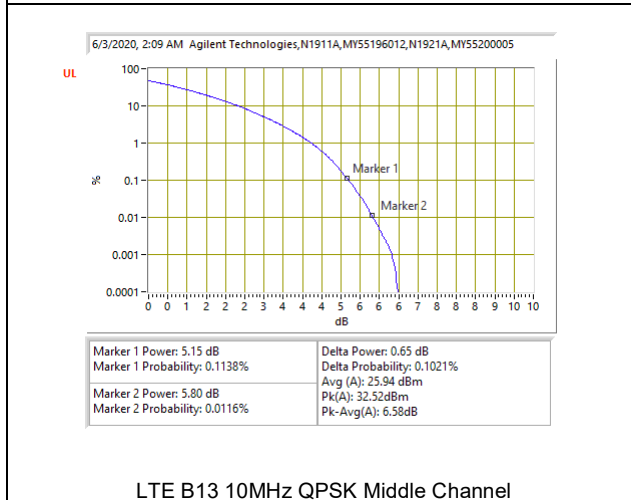
|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|



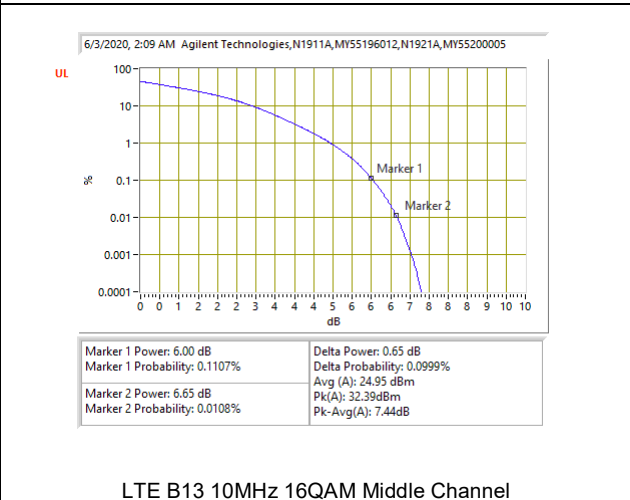
LTE B13 5MHz QPSK Middle Channel



LTE B13 5MHz 16QAM Middle Channel



LTE B13 10MHz QPSK Middle Channel

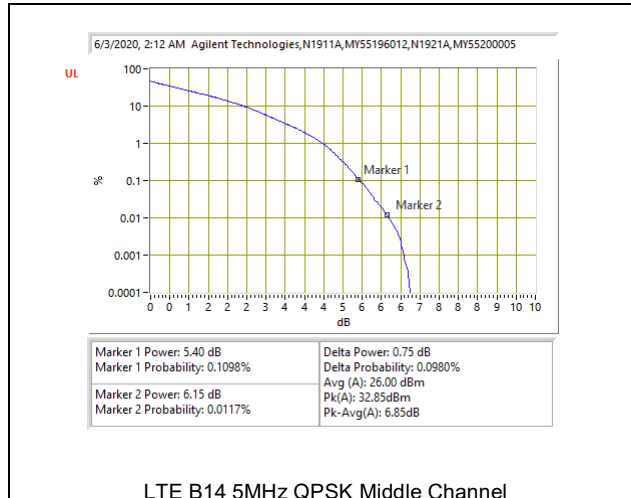


LTE B13 10MHz 16QAM Middle Channel

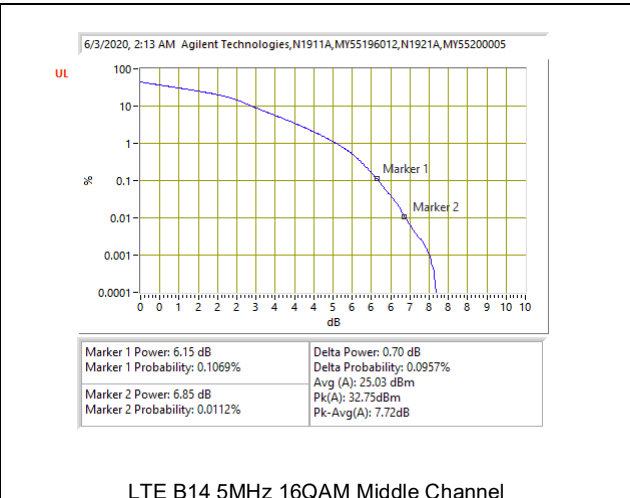


### 8.1.6. LTE BAND 14

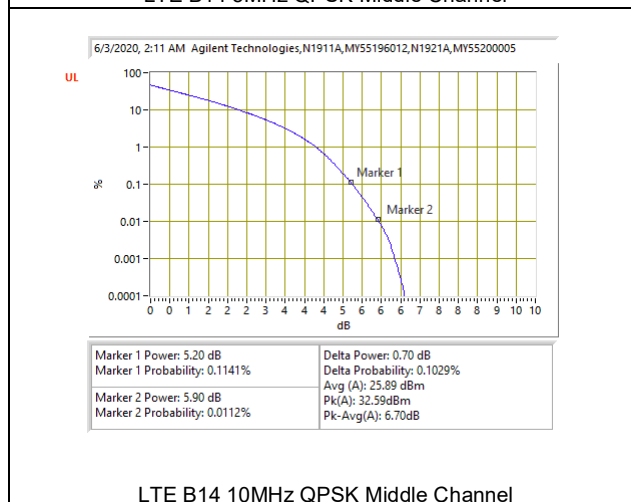
|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|



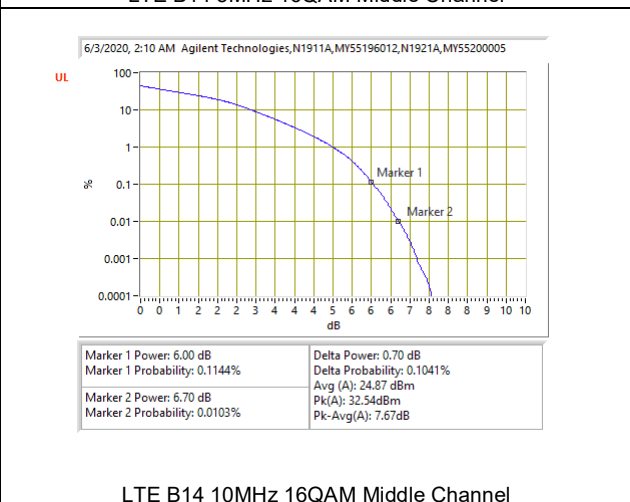
LTE B14 5MHz QPSK Middle Channel



LTE B14 5MHz 16QAM Middle Channel



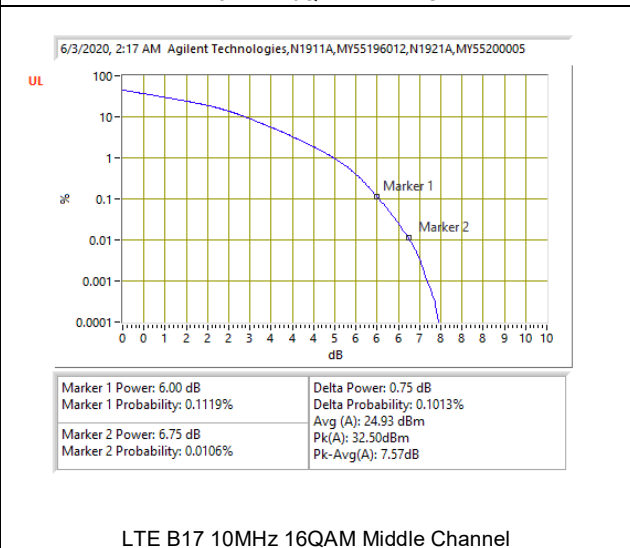
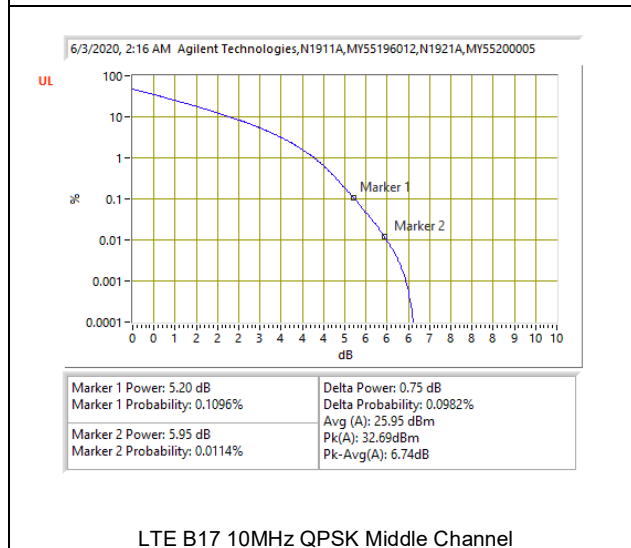
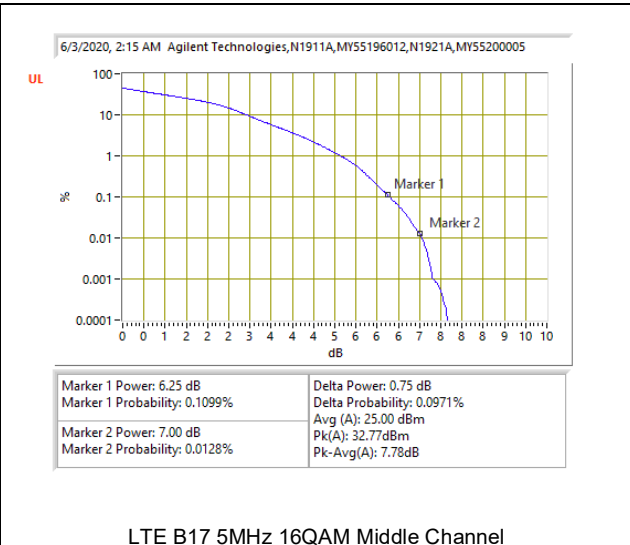
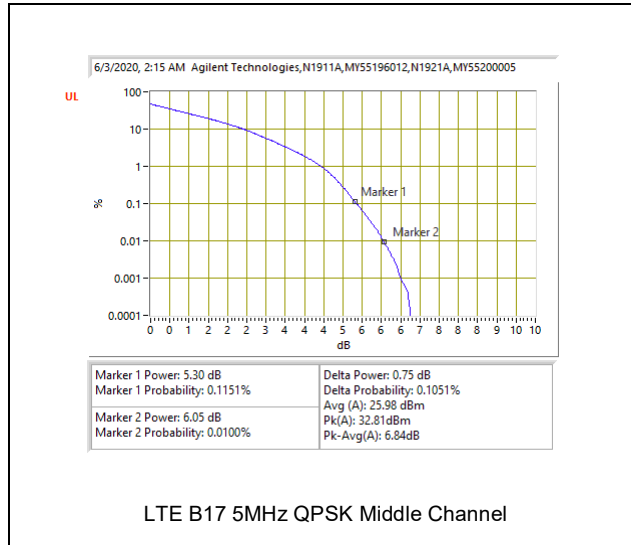
LTE B14 10MHz QPSK Middle Channel



LTE B14 10MHz 16QAM Middle Channel

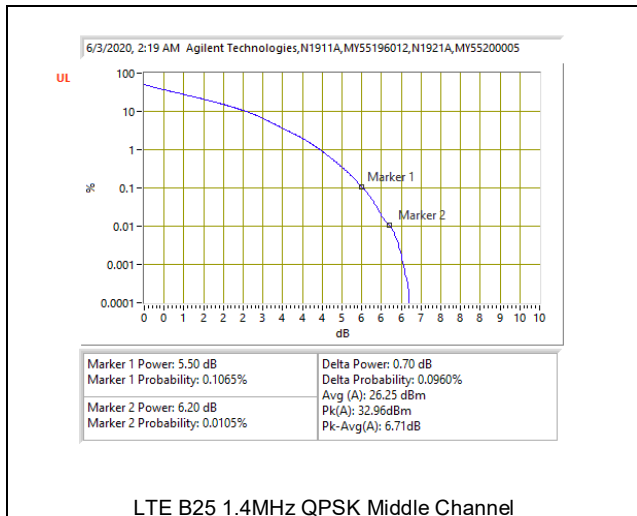
### 8.1.7. LTE BAND 17

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|

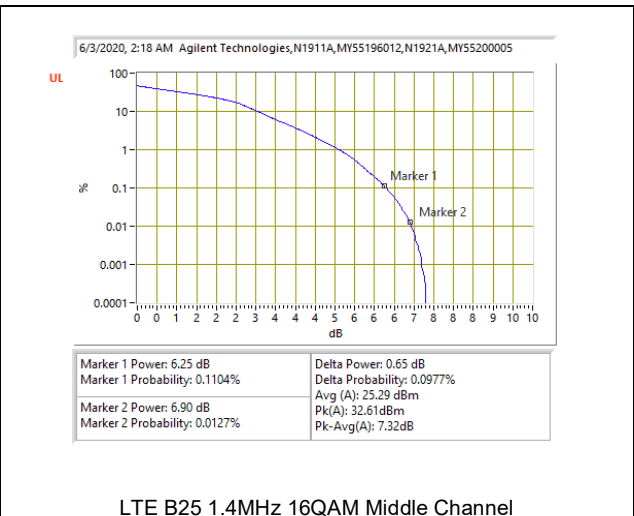


### 8.1.8. LTE BAND 25

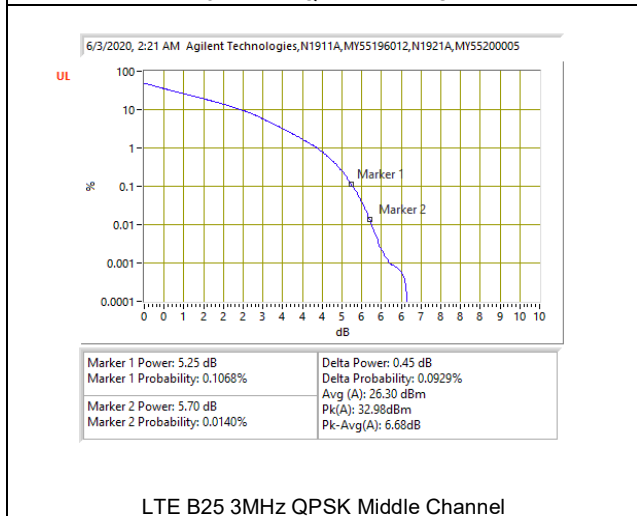
|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|



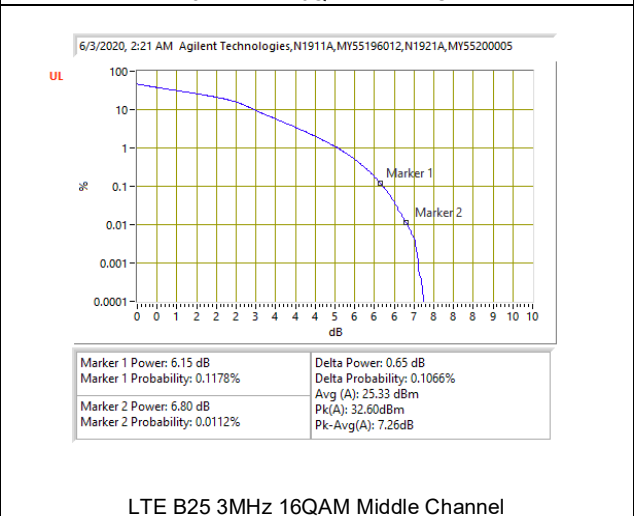
LTE B25 1.4MHz QPSK Middle Channel



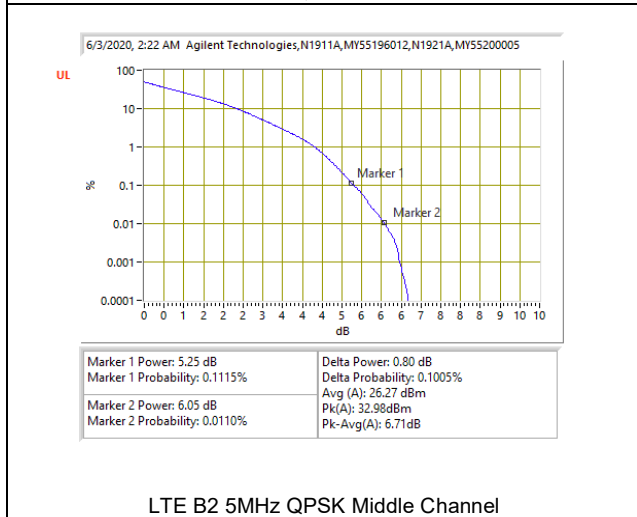
LTE B25 1.4MHz 16QAM Middle Channel



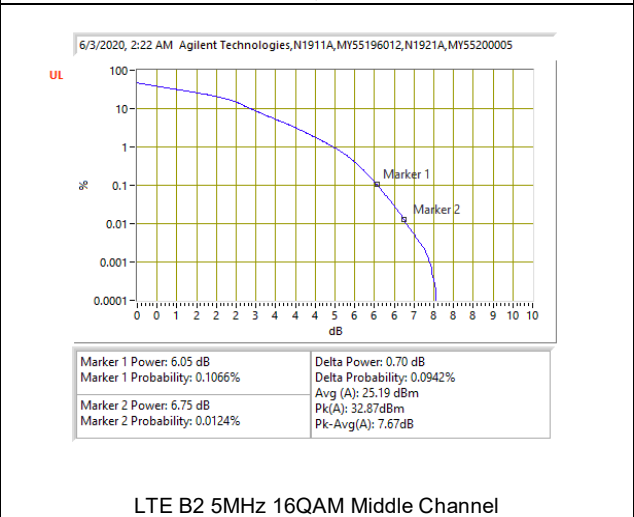
LTE B25 3MHz QPSK Middle Channel



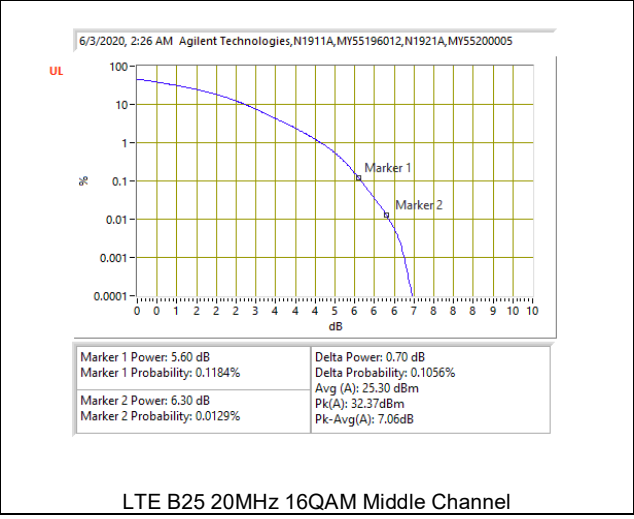
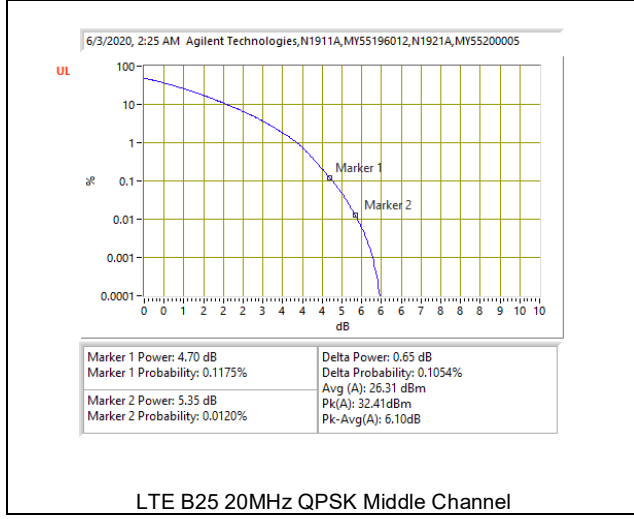
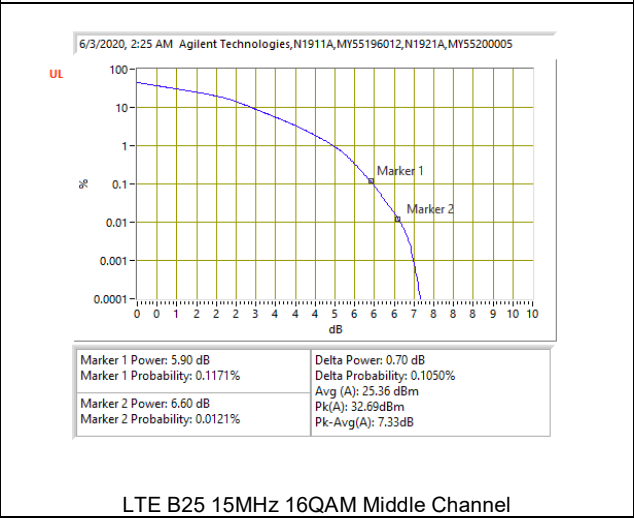
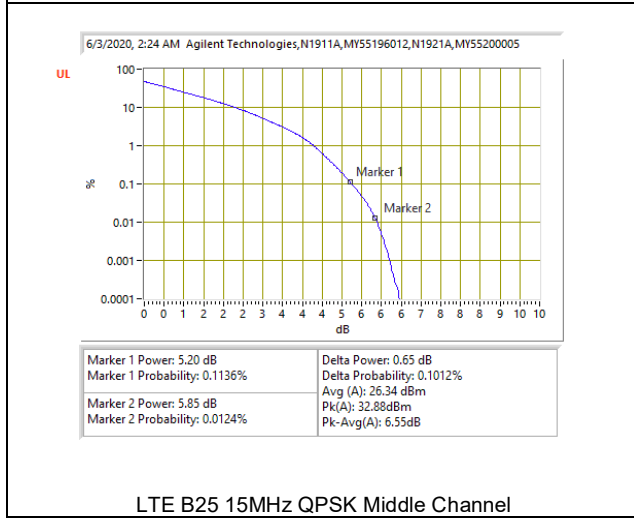
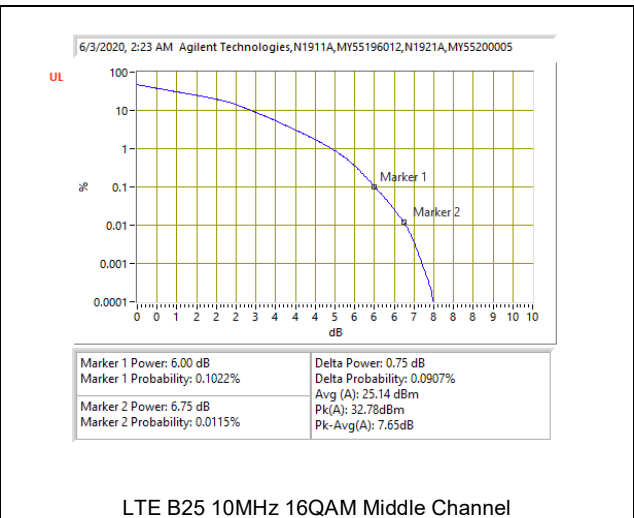
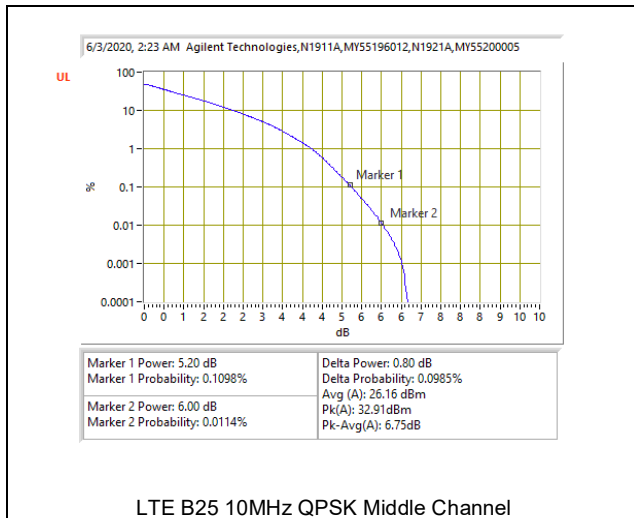
LTE B25 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel

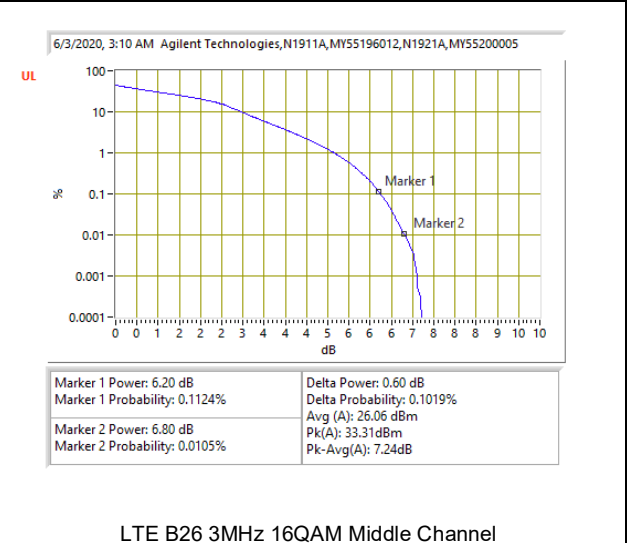
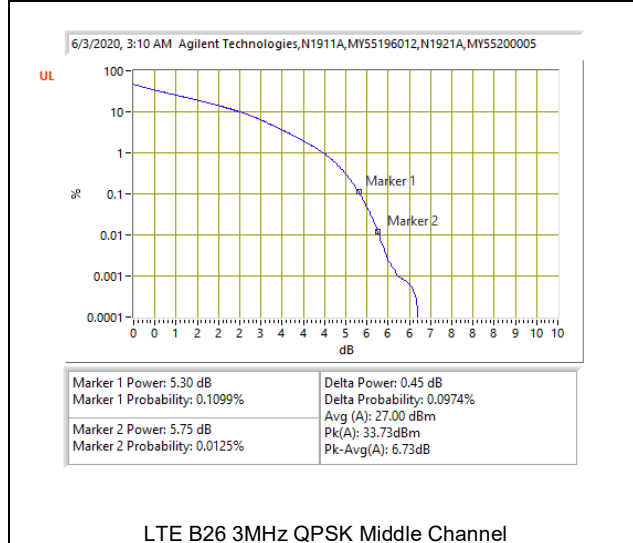
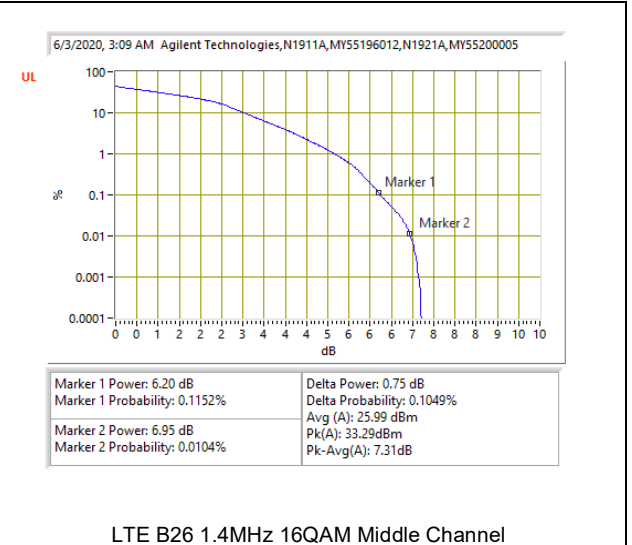
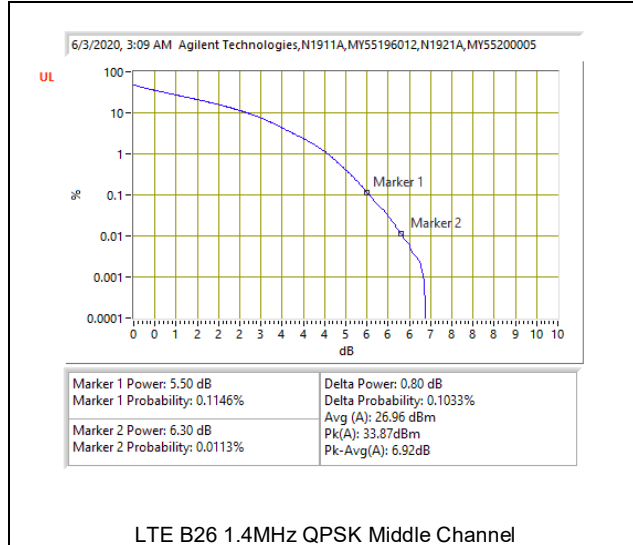


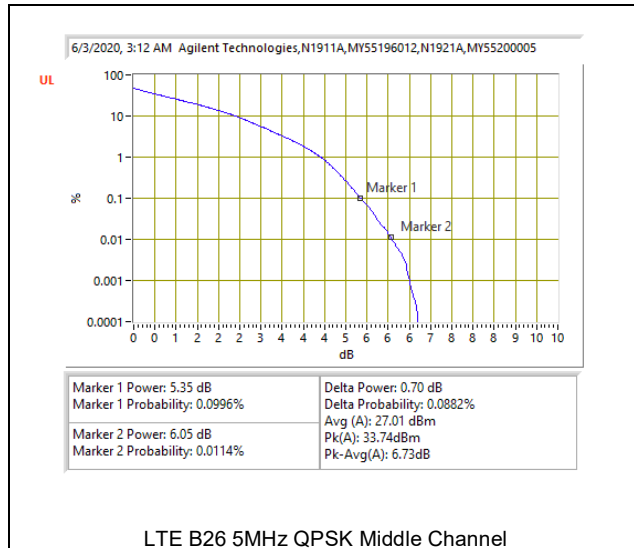
LTE B2 5MHz 16QAM Middle Channel



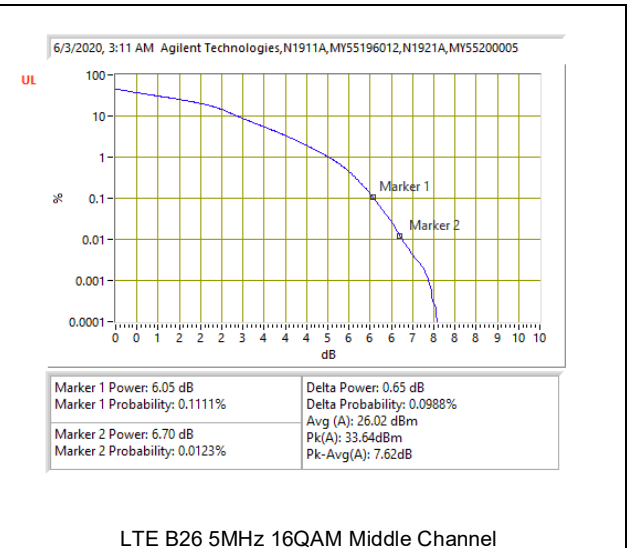
### 8.1.9. LTE BAND 26 (PART 90S)

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|

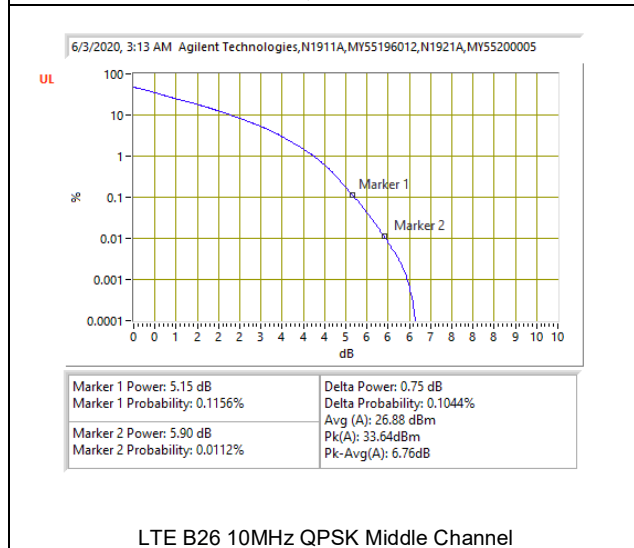




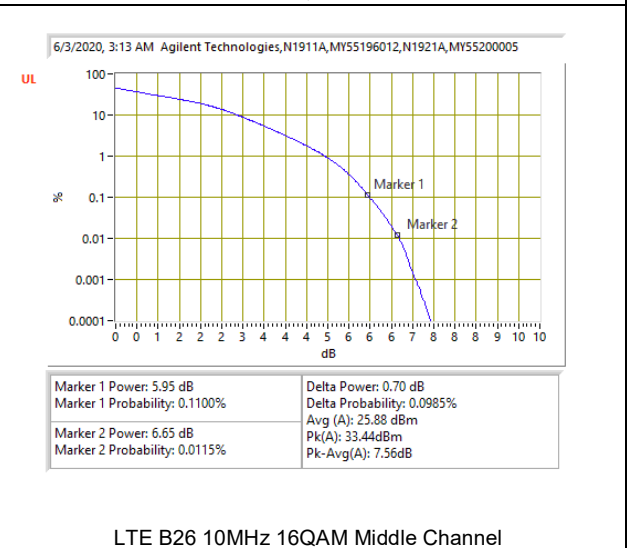
LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel



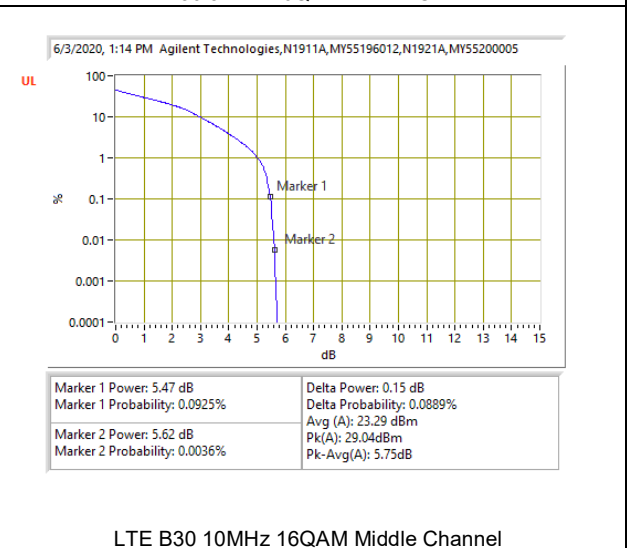
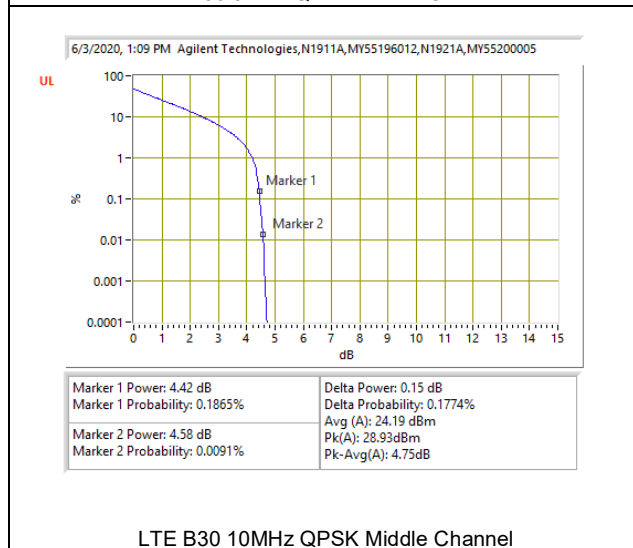
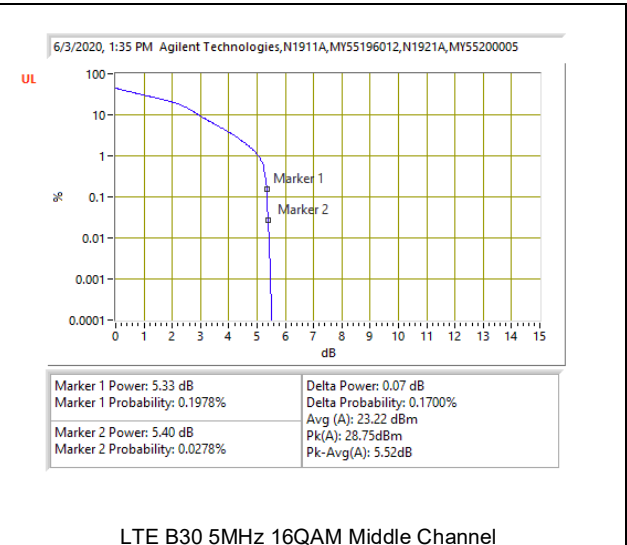
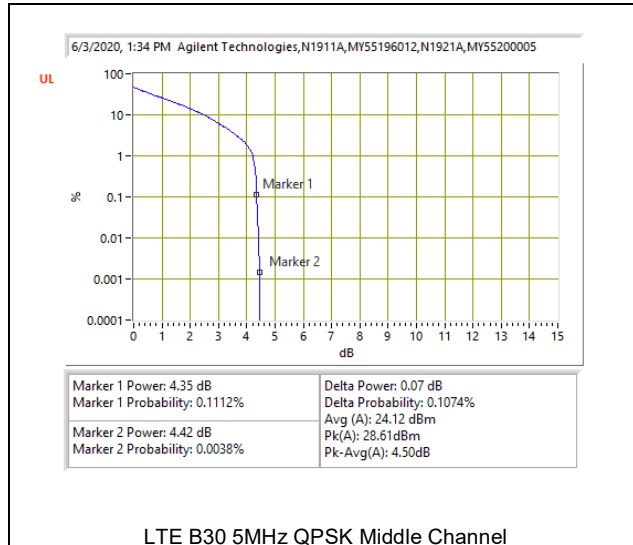
LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel

### 8.1.10. LTE BAND 30

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 39004 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|



**8.1.11. LTE BAND 41 AND 5G NR Band n41**

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 20769 | <b>Test Date:</b> | 7/6/2020 |
|--------------------------|-------|-------------------|----------|

| Band                                | Bandwidth (MHz) | Frequency (MHz) | RB Allocation | RB OffSet | Modulation | Conducted Power (dBm) |         | Peak-to-Average Power Ratio (dB) |
|-------------------------------------|-----------------|-----------------|---------------|-----------|------------|-----------------------|---------|----------------------------------|
|                                     |                 |                 |               |           |            | Peak                  | Average |                                  |
| Band 41                             | 5MHz            | 2593.0          | 25            | 0         | QPSK       | 31.64                 | 18.36   | 6.29                             |
|                                     |                 |                 |               |           | 16QAM      | 31.43                 | 17.47   | 6.97                             |
|                                     | 10MHz           |                 | 50            | 0         | QPSK       | 31.75                 | 18.37   | 6.39                             |
|                                     |                 |                 |               |           | 16QAM      | 31.54                 | 17.36   | 7.19                             |
|                                     | 15MHz           |                 | 75            | 0         | QPSK       | 31.78                 | 18.55   | 6.24                             |
|                                     |                 |                 |               |           | 16QAM      | 31.79                 | 17.56   | 7.24                             |
| 20MHz                               | 100             | 0               | QPSK          | 31.65     | 18.49      | 6.17                  |         |                                  |
|                                     |                 |                 | 16QAM         | 31.61     | 17.47      | 7.15                  |         |                                  |
| Band n41                            | 40MHz           | 2593.0          | 100           | 0         | QPSK       | 31.63                 | 27.03   | 4.60                             |
|                                     |                 |                 |               |           | 16QAM      | 31.88                 | 26.17   | 5.71                             |
|                                     | 50MHz           |                 | 128           | 0         | QPSK       | 31.21                 | 26.59   | 4.62                             |
|                                     |                 |                 |               |           | 16QAM      | 31.51                 | 25.95   | 5.56                             |
|                                     | 60MHz           |                 | 162           | 0         | QPSK       | 31.35                 | 26.54   | 4.81                             |
|                                     |                 |                 |               |           | 16QAM      | 31.48                 | 26.13   | 5.35                             |
|                                     | 80MHz           |                 | 216           | 0         | QPSK       | 30.88                 | 26.48   | 4.40                             |
|                                     |                 |                 |               |           | 16QAM      | 31.22                 | 26.17   | 5.05                             |
|                                     | 90MHz           |                 | 240           | 0         | QPSK       | 30.77                 | 26.79   | 3.98                             |
|                                     |                 |                 |               |           | 16QAM      | 31.31                 | 26.46   | 4.85                             |
|                                     | 100MHz          |                 | 270           | 0         | QPSK       | 30.45                 | 26.69   | 3.76                             |
|                                     |                 |                 |               |           | 16QAM      | 31.07                 | 26.19   | 4.88                             |
| Duty Cycle Correction Factor (dB) = |                 |                 | 6.99          |           |            |                       |         |                                  |



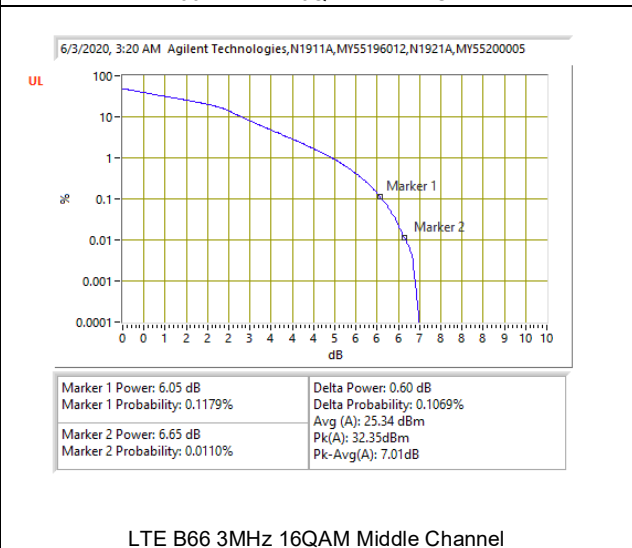
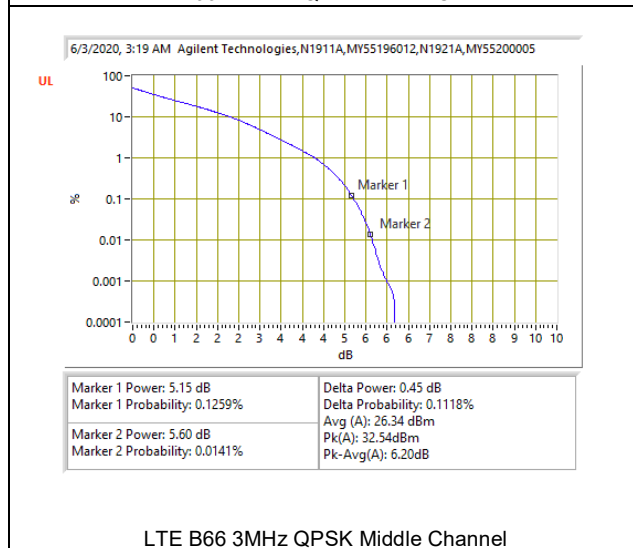
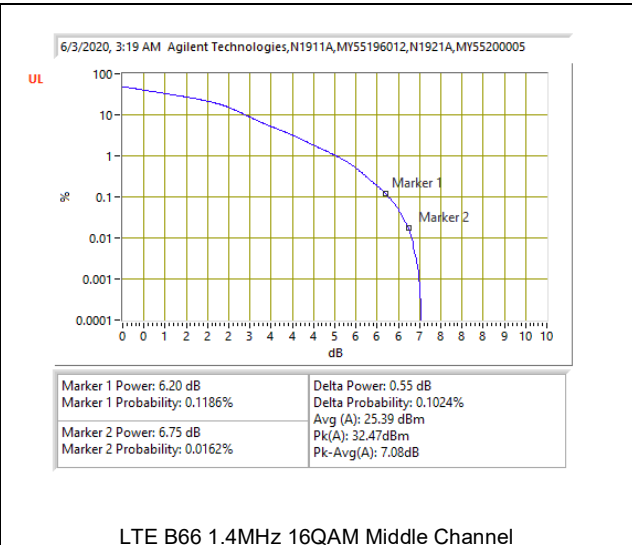
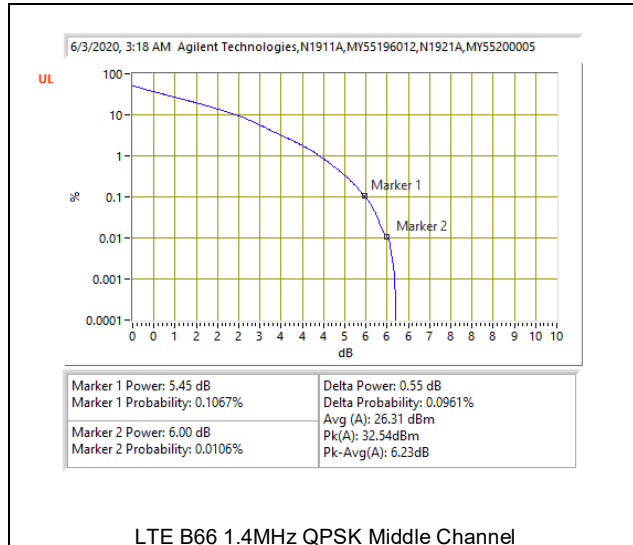
**8.1.12. LTE BAND 48**

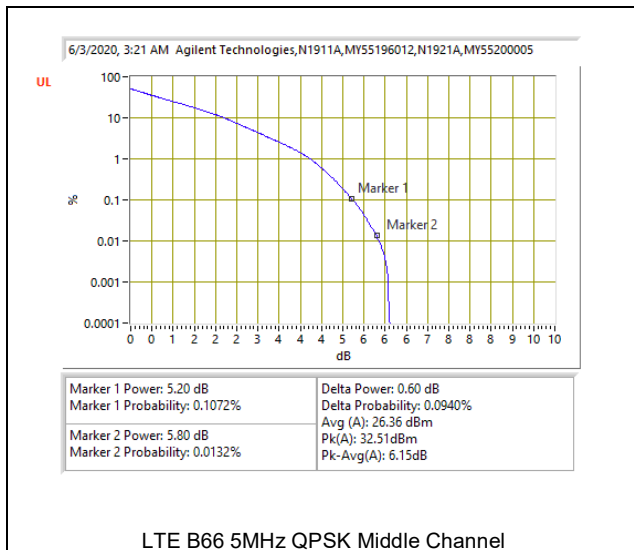
|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 20769 | <b>Test Date:</b> | 6/30/2020 |
|--------------------------|-------|-------------------|-----------|

| Band   | Bandwidth (MHz) | Frequency (MHz) | RB Allocation | RB OffSet | Modulation | Conducted Power (dBm) |         | Peak-to-Average Power Ratio (dB) |
|--|-----------------|-----------------|---------------|-----------|------------|-----------------------|---------|----------------------------------|
|  |                 |                 |               |           |            | Peak                  | Average |                                  |
| Band 48  | 5MHz            | 3625.0          | 25            | 0         | QPSK       | 32.05                 | 21.77   | 3.29                             |
|  |                 |                 |               |           | 16QAM      | 31.79                 | 20.8    | 4.00                             |
|  | 10MHz           |                 | 50            | 0         | QPSK       | 31.91                 | 21.73   | 3.19                             |
|  |                 |                 |               |           | 16QAM      | 31.47                 | 20.7    | 3.78                             |
|  | 15MHz           |                 | 75            | 0         | QPSK       | 30.84                 | 21.76   | 2.09                             |
|  |                 |                 |               |           | 16QAM      | 30.78                 | 20.81   | 2.98                             |
|  | 20MHz           |                 | 100           | 0         | QPSK       | 31.82                 | 21.74   | 3.09                             |
|  |                 |                 |               |           | 16QAM      | 31.71                 | 20.73   | 3.99                             |
| Duty Cycle Correction Factor (dB) =  |                 |                 | 6.99          |           |            |                       |         |                                  |
| Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor |                 |                 |               |           |            |                       |         |                                  |

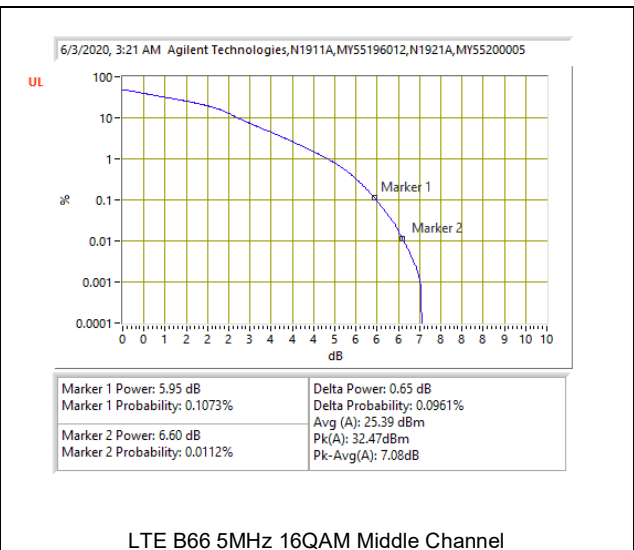
### 8.1.13. LTE BAND 66

|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|

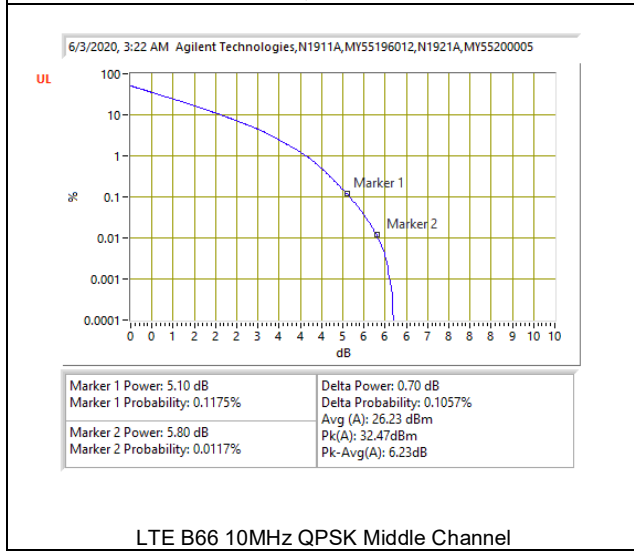




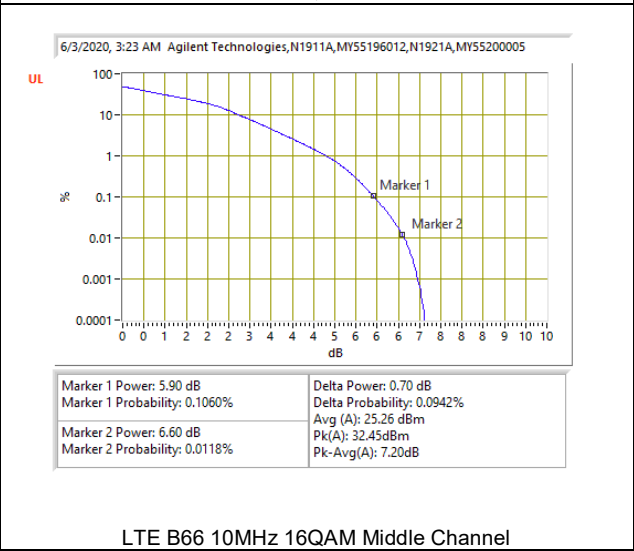
LTE B66 5MHz QPSK Middle Channel



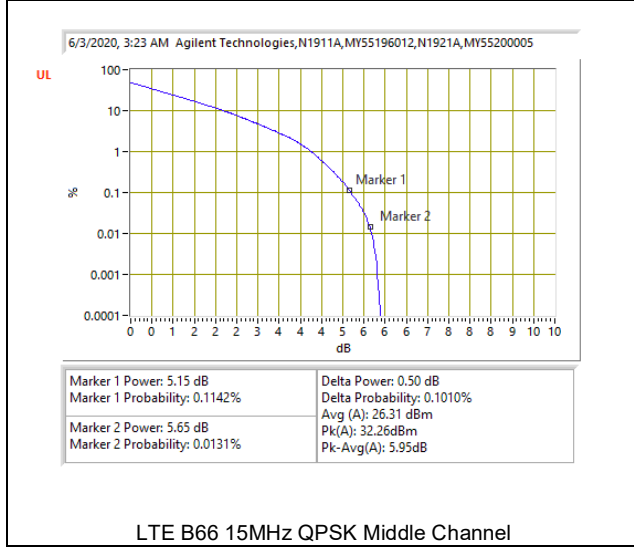
LTE B66 5MHz 16QAM Middle Channel



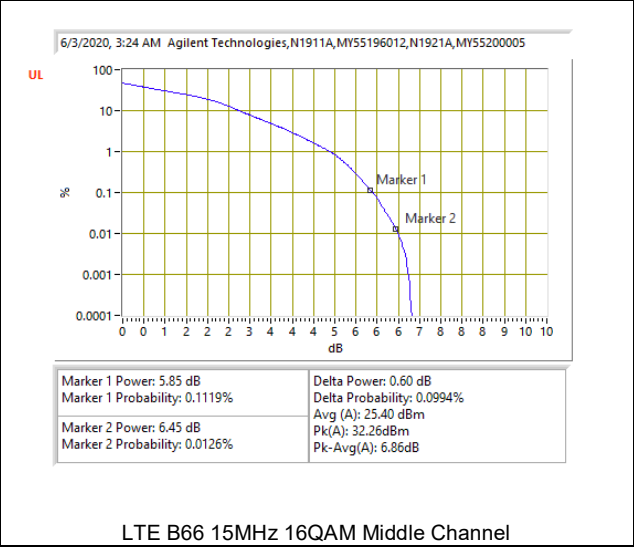
LTE B66 10MHz QPSK Middle Channel



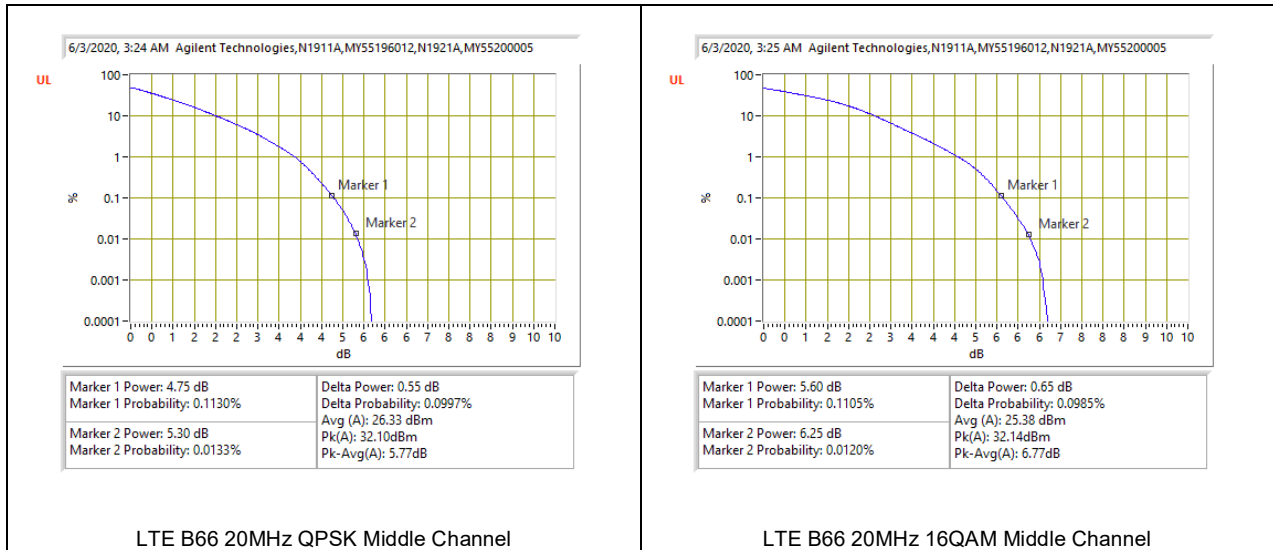
LTE B66 10MHz 16QAM Middle Channel



LTE B66 15MHz QPSK Middle Channel

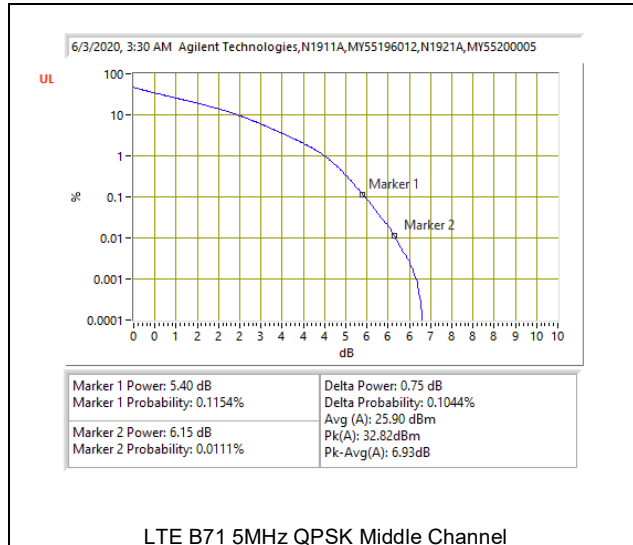


LTE B66 15MHz 16QAM Middle Channel

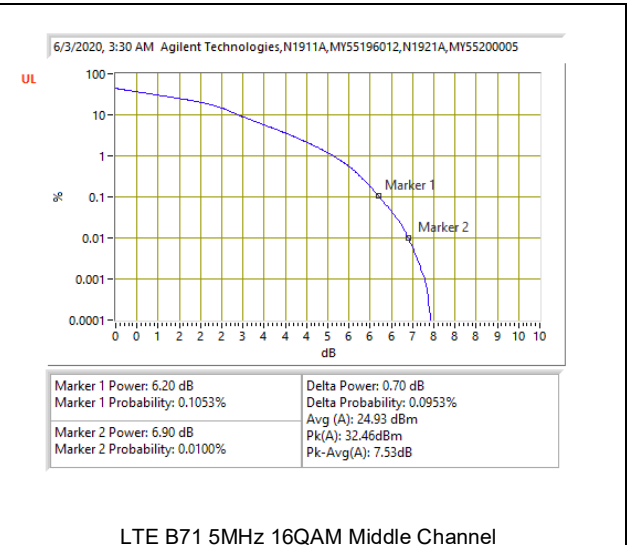


### 8.1.14. LTE BAND 71

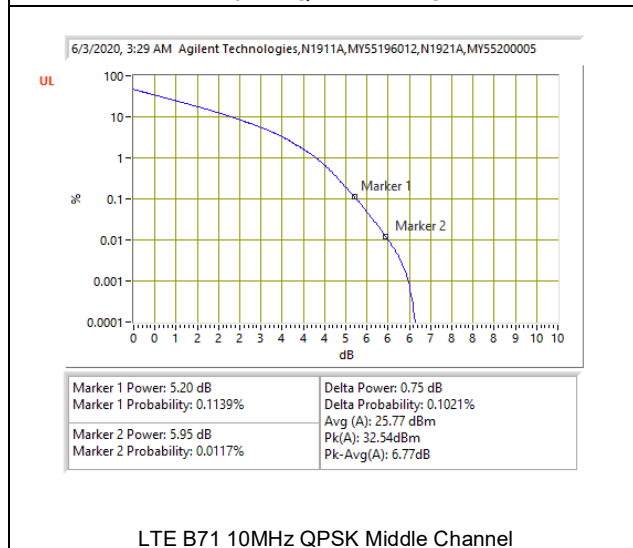
|                          |       |                   |          |
|--------------------------|-------|-------------------|----------|
| <b>Test Engineer ID:</b> | 10646 | <b>Test Date:</b> | 6/3/2020 |
|--------------------------|-------|-------------------|----------|



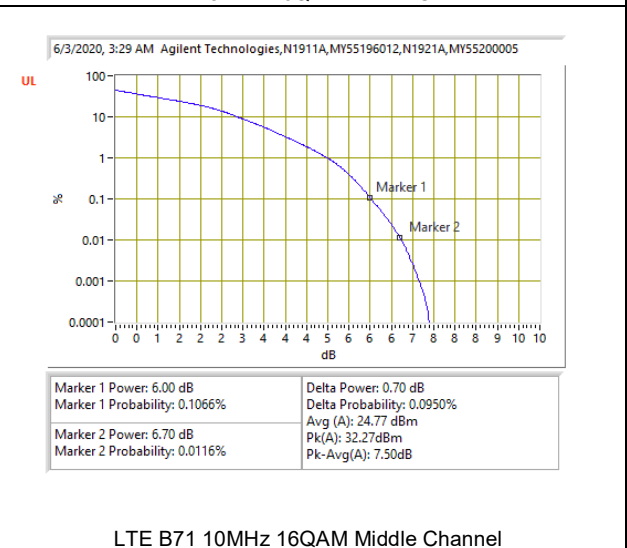
LTE B71 5MHz QPSK Middle Channel



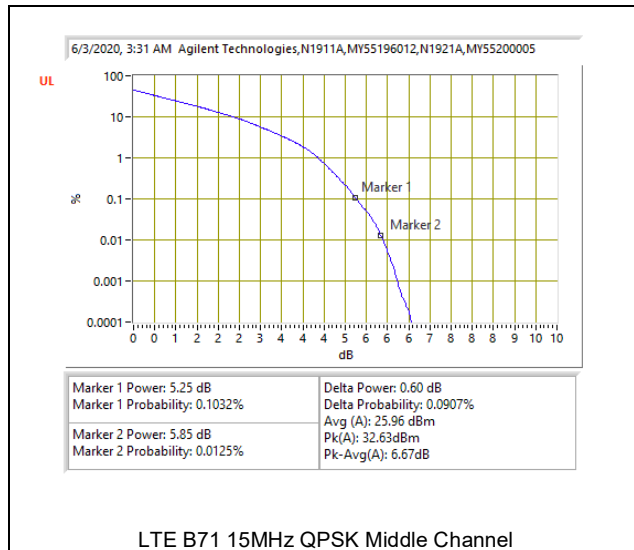
LTE B71 5MHz 16QAM Middle Channel



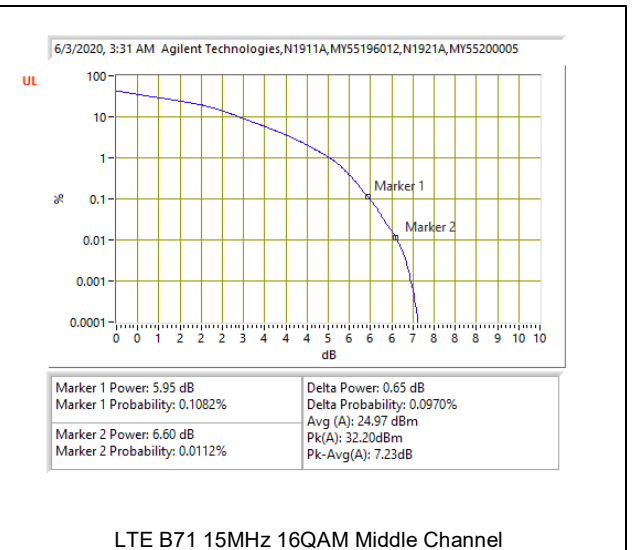
LTE B71 10MHz QPSK Middle Channel



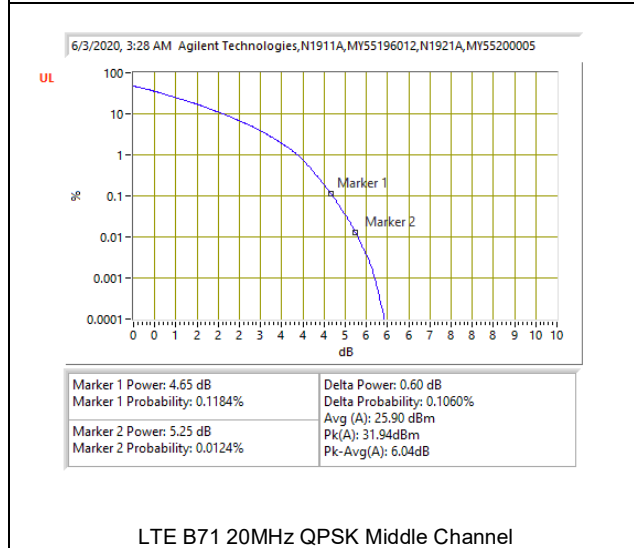
LTE B71 10MHz 16QAM Middle Channel



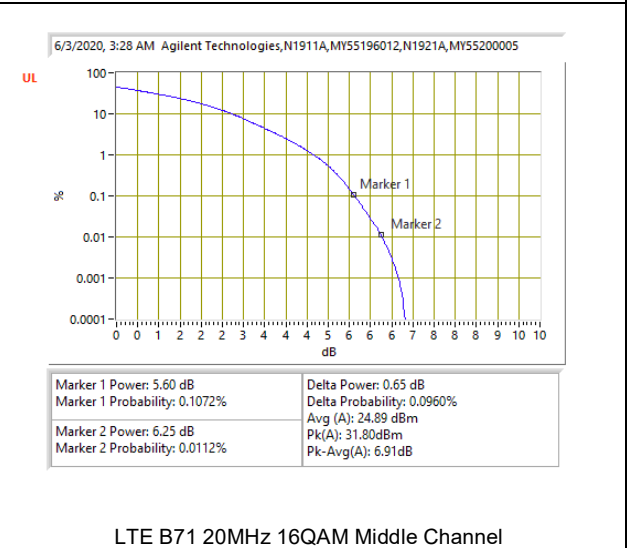
LTE B71 15MHz QPSK Middle Channel



LTE B71 15MHz 16QAM Middle Channel



LTE B71 20MHz QPSK Middle Channel



LTE B71 20MHz 16QAM Middle Channel

**8.1.15. 5G NR Band n77**

|                          |       |                   |           |
|--------------------------|-------|-------------------|-----------|
| <b>Test Engineer ID:</b> | 20769 | <b>Test Date:</b> | 8/20/2020 |
|--------------------------|-------|-------------------|-----------|

| Band     | Bandwidth (MHz) | Frequency (MHz) | RB Allocation | RB OffSet | Modulation | Conducted Power (dBm) |         | Peak-to-Average Power Ratio (dB) |
|----------|-----------------|-----------------|---------------|-----------|------------|-----------------------|---------|----------------------------------|
|          |                 |                 |               |           |            | Peak                  | Average |                                  |
| Band n77 | 20MHz           | 3840.0          | 100           | 0         | QPSK       | 31.31                 | 26.34   | 4.97                             |
|          |                 |                 |               |           | 16QAM      | 31.94                 | 25.14   | 6.80                             |
|          | 40MHz           |                 | 100           | 0         | QPSK       | 31.38                 | 25.8    | 5.58                             |
|          |                 |                 |               |           | 16QAM      | 31.68                 | 25.01   | 6.67                             |
|          | 50MHz           |                 | 128           | 0         | QPSK       | 30.75                 | 26.03   | 4.72                             |
|          |                 |                 |               |           | 16QAM      | 31.32                 | 25.07   | 6.25                             |
|          | 60MHz           |                 | 162           | 0         | QPSK       | 29.06                 | 24.55   | 4.51                             |
|          |                 |                 |               |           | 16QAM      | 29.96                 | 23.49   | 6.47                             |
|          | 80MHz           |                 | 216           | 0         | QPSK       | 28.92                 | 24.34   | 4.58                             |
|          |                 |                 |               |           | 16QAM      | 29.14                 | 23.27   | 5.87                             |
|          | 90MHz           |                 | 240           | 0         | QPSK       | 28.81                 | 24.4    | 4.41                             |
|          |                 |                 |               |           | 16QAM      | 29.06                 | 23.11   | 5.95                             |
|          | 100MHz          |                 | 270           | 0         | QPSK       | 28.18                 | 24.55   | 3.63                             |
|          |                 |                 |               |           | 16QAM      | 28.82                 | 23.49   | 5.33                             |

## 9. RADIATED TEST RESULTS

### Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, We measure the radiated emissions directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement method.

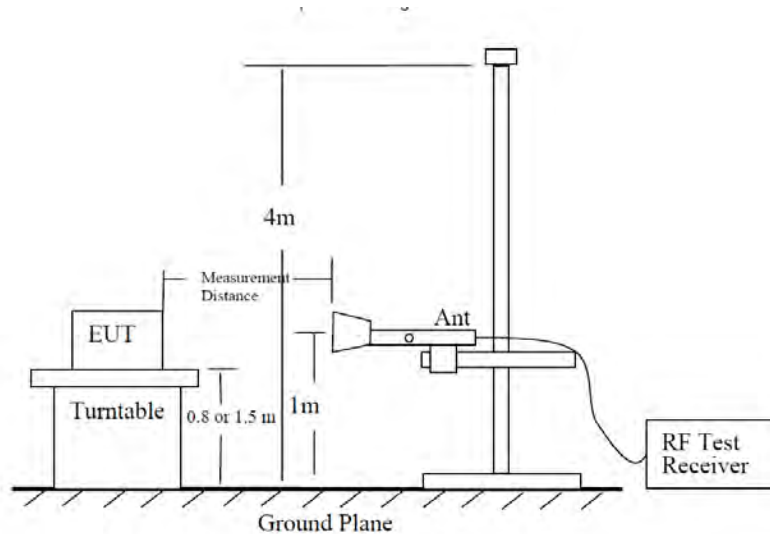


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

### Radiated Power Measurement Calculation According to ANSI C63.26-2015

- a)  $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$ .
- b)  $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$ .
- c)  $E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20\log(D) + 104.8$ ; where D is the measurement distance (in the far field region) in m.
- d)  $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$ ; where D is the measurement distance (in the far field region) in m.

So, from d)

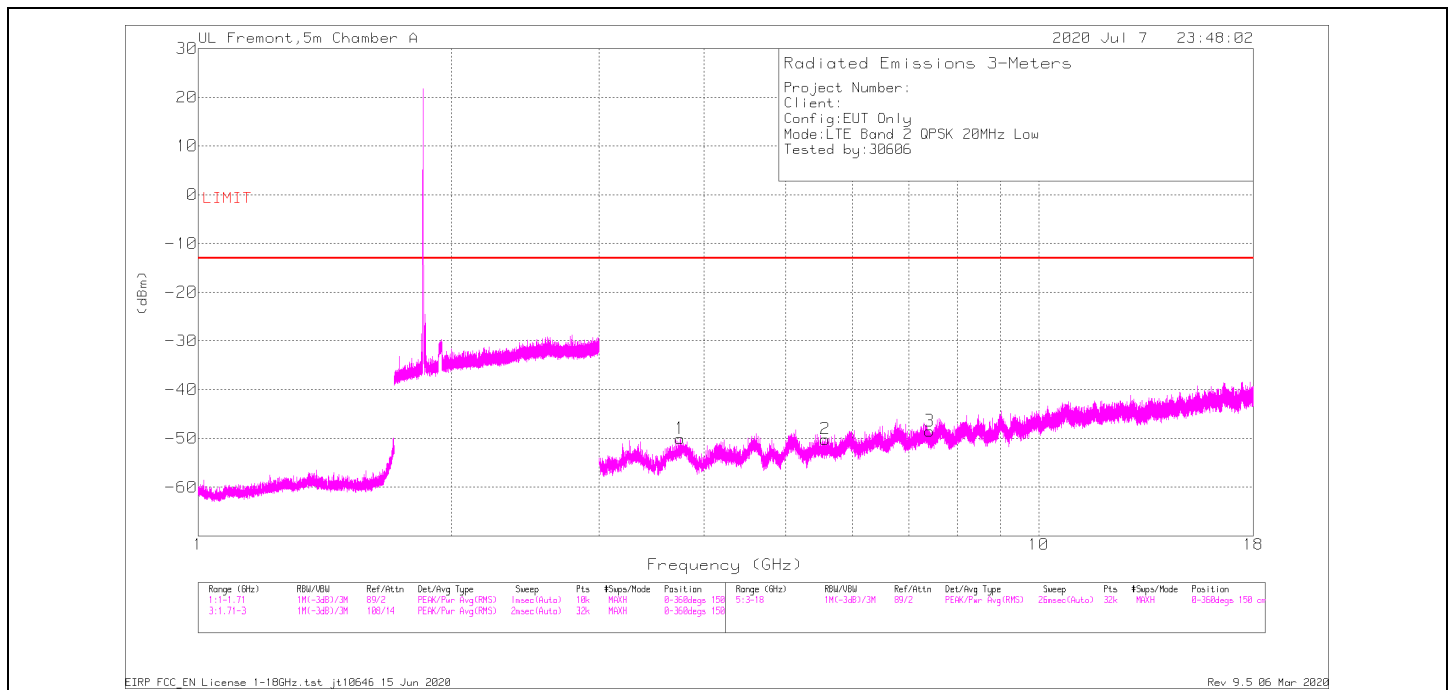
The measuring distance is usually at 3m, then  $20 \cdot \log(3) = 9.5424$

Then,  $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 9.5424 - 104.8 = E \text{ (dB}\mu\text{V/m)} - 95.2576$

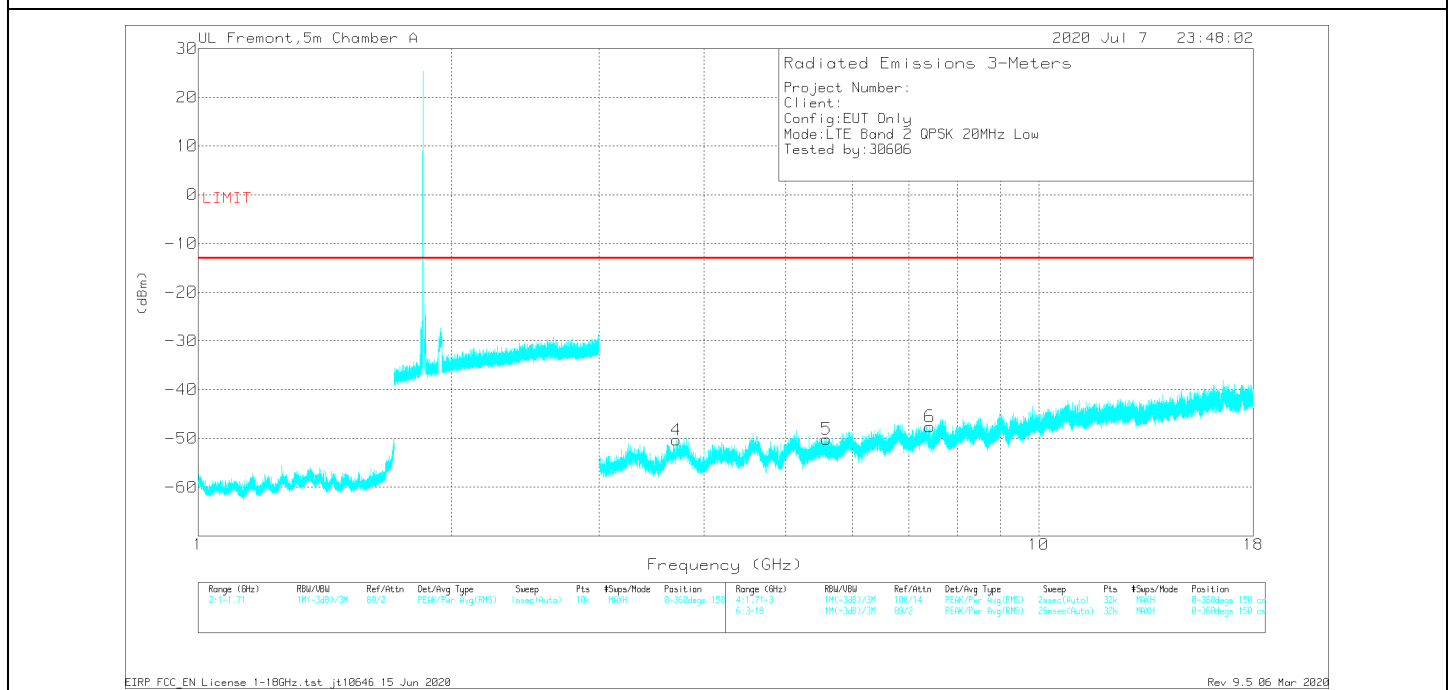
Note that: we do confidence check to our chambers every day to see if any degradation from expected/normal reading reference data. Also we do ambient check to all our chambers every month.



### 9.1. Example Plot



Horizontal Polarity



Vertical Polarity

**Trace Markers**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T962 (dB/m) | Amp/Cb/Filtr/Pad (dB) | EIRP CF | Corrected Reading (dBm) | LIMIT | Margin (dB) | Polarity |
|--------|-----------------|----------------------|-----|----------------|-----------------------|---------|-------------------------|-------|-------------|----------|
| 4      | 3.70547         | 38.97                | Pk  | 33.3           | -27.4                 | -95.2   | -50.33                  | -13   | -37.33      | V        |
| 1      | 3.74531         | 38.89                | Pk  | 33.4           | -27.1                 | -95.2   | -50.01                  | -13   | -37.01      | H        |
| 2      | 5.57156         | 36.58                | Pk  | 34.9           | -26.4                 | -95.2   | -50.12                  | -13   | -37.12      | H        |
| 5      | 5.59453         | 36.56                | Pk  | 34.9           | -26.4                 | -95.2   | -50.14                  | -13   | -37.14      | V        |
| 3      | 7.41797         | 34.41                | Pk  | 35.8           | -23.5                 | -95.2   | -48.49                  | -13   | -35.49      | H        |
| 6      | 7.42125         | 35.41                | Pk  | 35.8           | -23.6                 | -95.2   | -47.59                  | -13   | -34.59      | V        |

Pk - Peak detector

**Radiated Emissions**

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T962 (dB/m) | Amp/Cb/Filtr/Pad (dB) | EIRP CF | Corrected Reading (dBm) | LIMIT | Margin (dB) | Polarity |
|-----------------|----------------------|-----|----------------|-----------------------|---------|-------------------------|-------|-------------|----------|
| 3.7051          | 39.89                | Pk  | 33.3           | -27.4                 | -95.2   | -49.41                  | -13   | -36.41      | V        |
| 3.74759         | 40.2                 | Pk  | 33.5           | -27                   | -95.2   | -48.5                   | -13   | -35.5       | H        |
| 5.5675          | 38.18                | Pk  | 34.9           | -26.5                 | -95.2   | -48.62                  | -13   | -35.62      | H        |
| 5.59136         | 37.87                | Pk  | 34.9           | -26.4                 | -95.2   | -48.83                  | -13   | -35.83      | V        |
| 7.41778         | 36.17                | Pk  | 35.8           | -23.5                 | -95.2   | -46.73                  | -13   | -33.73      | H        |
| 7.42259         | 36.06                | Pk  | 35.7           | -23.6                 | -95.2   | -47.04                  | -13   | -34.04      | V        |

Pk - Peak detector

EIRP FCC\_EN License 1-18GHz.tst jt10646 15 Jun 2020

Rev 9.5 07 Jul 2020

## 9.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT1

### TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

All tests below 1GHz were done with a Resolution Bandwidth of 100kHz, and a Video Bandwidth of 300kHz.

### RESULTS

## 9.2.1. LTE BAND 2

### **LIMITS**

FCC: §24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

**QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)**

|                |                       |
|----------------|-----------------------|
| Project #:     | 13259315              |
| Date:          | 7/8/2020              |
| Test Engineer: | 30606                 |
| Configuration: | EUT Only              |
| Mode           | LTE Band 2 QPSK 20MHz |
| Chamber #:     | Chamber A             |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP  | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|-------|-------------------------|-----------------|-------------|----------|
| Low Channel, 1860MHz  |                      |     |                |              |       |                         |                 |             |          |
| 3.7051                | 39.89                | Pk  | 33.3           | -27.4        | -95.2 | -49.41                  | -13             | -36.41      | V        |
| 3.74759               | 40.2                 | Pk  | 33.5           | -27          | -95.2 | -48.5                   | -13             | -35.5       | H        |
| 5.5675                | 38.18                | Pk  | 34.9           | -26.5        | -95.2 | -48.62                  | -13             | -35.62      | H        |
| 5.59136               | 37.87                | Pk  | 34.9           | -26.4        | -95.2 | -48.83                  | -13             | -35.83      | V        |
| 7.41778               | 36.17                | Pk  | 35.8           | -23.5        | -95.2 | -46.73                  | -13             | -33.73      | H        |
| 7.42259               | 36.06                | Pk  | 35.7           | -23.6        | -95.2 | -47.04                  | -13             | -34.04      | V        |
| Mid Channel, 1880MHz  |                      |     |                |              |       |                         |                 |             |          |
| 3.75053               | 40.23                | Pk  | 33.5           | -27          | -95.2 | -48.47                  | -13             | -35.47      | H        |
| 3.7733                | 40.52                | Pk  | 33.6           | -27.1        | -95.2 | -48.18                  | -13             | -35.18      | V        |
| 5.62023               | 38.24                | Pk  | 34.8           | -26.4        | -95.2 | -48.56                  | -13             | -35.56      | V        |
| 5.66745               | 38.62                | Pk  | 34.8           | -26.5        | -95.2 | -48.28                  | -13             | -35.28      | H        |
| 7.52603               | 36.63                | Pk  | 35.7           | -23.2        | -95.2 | -46.07                  | -13             | -33.07      | H        |
| 7.53907               | 36.44                | Pk  | 35.7           | -22.8        | -95.2 | -45.86                  | -13             | -32.86      | V        |
| High Channel, 1900MHz |                      |     |                |              |       |                         |                 |             |          |
| 3.80134               | 39.63                | Pk  | 33.7           | -27.5        | -95.2 | -49.37                  | -13             | -36.37      | V        |
| 3.81058               | 30.98                | Av  | 33.7           | -27.6        | -95.2 | -58.12                  | -13             | -45.12      | H        |
| 5.67743               | 37.8                 | Pk  | 34.8           | -26.6        | -95.2 | -49.2                   | -13             | -36.2       | H        |
| 5.68322               | 38                   | Pk  | 34.8           | -26.7        | -95.2 | -49.1                   | -13             | -36.1       | V        |
| 7.61157               | 35.67                | Pk  | 35.8           | -21.3        | -95.2 | -45.03                  | -13             | -32.03      | V        |
| 7.61504               | 35.34                | Pk  | 35.7           | -21.3        | -95.2 | -45.46                  | -13             | -32.46      | H        |

## 9.2.2. LTE BAND 5 AND 5G NR Band n5

### **LIMITS**

FCC: §22.917(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

**QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)**

|                |                       |
|----------------|-----------------------|
| Project #:     | 13259315              |
| Date:          | 4/14/2020             |
| Test Engineer: | 50822                 |
| Configuration: | EUT Only              |
| Mode:          | LTE Band 5 QPSK 10MHz |
| Chamber #:     | Chamber A             |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Low Channel, 829MHz   |                      |     |                |              |         |                         |                 |             |          |
| 1.65605               | 41.47                | Pk  | 28.7           | -32.8        | -95.2   | -57.83                  | -13             | -44.83      | H        |
| 1.65866               | 41.63                | Pk  | 28.8           | -32.8        | -95.2   | -57.57                  | -13             | -44.57      | V        |
| 2.48597               | 41.11                | Pk  | 32.6           | -32          | -95.2   | -53.49                  | -13             | -40.49      | V        |
| 2.48937               | 41.31                | Pk  | 32.6           | -31.9        | -95.2   | -53.19                  | -13             | -40.19      | H        |
| 3.31542               | 40.2                 | Pk  | 32.8           | -30.6        | -95.2   | -52.8                   | -13             | -39.8       | H        |
| 3.31676               | 40.03                | Pk  | 32.8           | -30.6        | -95.2   | -52.97                  | -13             | -39.97      | V        |
| Mid Channel, 836.5MHz |                      |     |                |              |         |                         |                 |             |          |
| 1.67261               | 41.81                | Pk  | 28.9           | -32.8        | -95.2   | -57.29                  | -13             | -44.29      | V        |
| 1.6741                | 42.33                | Pk  | 28.9           | -32.8        | -95.2   | -56.77                  | -13             | -43.77      | H        |
| 2.50819               | 41.11                | Pk  | 32.7           | -31.8        | -95.2   | -53.19                  | -13             | -40.19      | V        |
| 2.51081               | 41.28                | Pk  | 32.6           | -31.8        | -95.2   | -53.12                  | -13             | -40.12      | H        |
| 3.34532               | 40.39                | Pk  | 32.8           | -30.8        | -95.2   | -52.81                  | -13             | -39.81      | H        |
| 3.34752               | 39.68                | Pk  | 32.8           | -30.7        | -95.2   | -53.42                  | -13             | -40.42      | V        |
| High Channel, 844MHz  |                      |     |                |              |         |                         |                 |             |          |
| 1.68786               | 41.98                | Pk  | 28.9           | -32.7        | -95.2   | -57.02                  | -13             | -44.02      | H        |
| 1.68825               | 41.79                | Pk  | 28.9           | -32.7        | -95.2   | -57.21                  | -13             | -44.21      | V        |
| 2.53444               | 41.7                 | Pk  | 32.6           | -31.7        | -95.2   | -52.6                   | -13             | -39.6       | H        |
| 2.53446               | 40.28                | Pk  | 32.6           | -31.7        | -95.2   | -54.02                  | -13             | -41.02      | V        |
| 3.37422               | 40.1                 | Pk  | 32.8           | -30.7        | -95.2   | -53                     | -13             | -40         | V        |
| 3.377                 | 40.47                | Pk  | 32.8           | -30.7        | -95.2   | -52.63                  | -13             | -39.63      | H        |

**QPSK 5G NR Band n5 (20.0MHZ BANDWIDTH)**

|                |                          |
|----------------|--------------------------|
| Project #:     | 13259315                 |
| Date:          | 7/10/2020                |
| Test Engineer: | 19479                    |
| Configuration: | EUT Only                 |
| Mode           | 5G NR Band n5 QPSK 20MHz |
| Chamber #:     | Chamber A                |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Low Channel, 834MHz   |                      |     |                |              |         |                         |                 |             |          |
| 1.66215               | 38.49                | Pk  | 29             | -32.3        | -95.2   | -59.21                  | -13             | -46.21      | V        |
| 1.67079               | 41.29                | Pk  | 29             | -32.2        | -95.2   | -56.41                  | -13             | -43.41      | H        |
| 2.4952                | 41.78                | Pk  | 33.5           | -31.3        | -95.2   | -50.62                  | -13             | -37.62      | H        |
| 2.49591               | 40.88                | Pk  | 33.5           | -31.3        | -95.2   | -51.52                  | -13             | -38.52      | V        |
| 3.35102               | 40.92                | Pk  | 33             | -30.1        | -95.2   | -50.78                  | -13             | -37.78      | V        |
| 3.35299               | 40.26                | Pk  | 33             | -30.1        | -95.2   | -51.44                  | -13             | -38.44      | H        |
| Mid Channel, 836.5MHz |                      |     |                |              |         |                         |                 |             |          |
| 1.67178               | 42.16                | Pk  | 29             | -32.2        | -95.2   | -55.54                  | -13             | -42.54      | H        |
| 1.67943               | 42.29                | Pk  | 28.9           | -32.2        | -95.2   | -55.51                  | -13             | -42.51      | V        |
| 2.5056                | 40.63                | Pk  | 33.5           | -31.4        | -95.2   | -51.77                  | -13             | -38.77      | V        |
| 2.51059               | 41.1                 | Pk  | 33.5           | -31.4        | -95.2   | -51.3                   | -13             | -38.3       | H        |
| 3.34568               | 40.33                | Pk  | 33             | -30.1        | -95.2   | -51.37                  | -13             | -38.37      | V        |
| 3.35008               | 41.04                | Pk  | 33             | -30.1        | -95.2   | -50.66                  | -13             | -37.66      | H        |
| High Channel, 839MHz  |                      |     |                |              |         |                         |                 |             |          |
| 1.68194               | 41.52                | Pk  | 28.9           | -32.2        | -95.2   | -56.28                  | -13             | -43.28      | V        |
| 1.68194               | 37.32                | Pk  | 28.9           | -32.2        | -95.2   | -60.48                  | -13             | -47.48      | V        |
| 1.6838                | 41.97                | Pk  | 29             | -32.2        | -95.2   | -55.73                  | -13             | -42.73      | H        |
| 2.51649               | 40.88                | Pk  | 33.5           | -31.4        | -95.2   | -51.42                  | -13             | -38.42      | H        |
| 2.51924               | 40.98                | Pk  | 33.5           | -31.3        | -95.2   | -51.22                  | -13             | -38.22      | V        |
| 3.35395               | 40.24                | Pk  | 33             | -30.1        | -95.2   | -51.46                  | -13             | -38.46      | V        |



### 9.2.3. LTE BAND 7

#### **LIMITS**

FCC: §27.53 (m)

At least  $55 + 10 \log (P)$  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)(6) of this section.

**QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)**

|                |                       |
|----------------|-----------------------|
| Project #:     | 13259315              |
| Date:          | 4/10/2020             |
| Test Engineer: | 10641                 |
| Configuration: | EUT Only              |
| Mode           | LTE Band 7 QPSK 20MHz |
| Chamber #:     | Chamber A             |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Low Channel, 2510MHz  |                      |     |                |              |         |                         |                 |             |          |
| 5.01996               | 39.57                | Pk  | 34.3           | -28.9        | -95.2   | -50.23                  | -25             | -25.23      | V        |
| 5.02152               | 39.16                | Pk  | 34.3           | -28.9        | -95.2   | -50.64                  | -25             | -25.64      | H        |
| 7.52898               | 35.62                | Pk  | 35.8           | -24.5        | -95.2   | -48.28                  | -25             | -23.28      | V        |
| 7.53108               | 35.76                | Pk  | 35.8           | -24.6        | -95.2   | -48.24                  | -25             | -23.24      | H        |
| 10.04155              | 33.87                | Pk  | 37.1           | -22.2        | -95.2   | -46.43                  | -25             | -21.43      | V        |
| 10.04185              | 34.89                | Pk  | 37.1           | -22.1        | -95.2   | -45.31                  | -25             | -20.31      | H        |
| Mid Channel, 2535MHz  |                      |     |                |              |         |                         |                 |             |          |
| 5.06339               | 39.04                | Pk  | 34.4           | -28.7        | -95.2   | -50.46                  | -25             | -25.46      | V        |
| 5.06349               | 38.27                | Pk  | 34.4           | -28.7        | -95.2   | -51.23                  | -25             | -26.23      | H        |
| 7.60469               | 35.93                | Pk  | 35.8           | -24.6        | -95.2   | -48.07                  | -25             | -23.07      | V        |
| 7.60705               | 36.85                | Pk  | 35.8           | -24.5        | -95.2   | -47.05                  | -25             | -22.05      | H        |
| 10.1411               | 35.33                | Pk  | 37.2           | -22          | -95.2   | -44.67                  | -25             | -19.67      | V        |
| 10.14117              | 35.24                | Pk  | 37.2           | -22          | -95.2   | -44.76                  | -25             | -19.76      | H        |
| High Channel, 2560MHz |                      |     |                |              |         |                         |                 |             |          |
| 5.13854               | 37.42                | Pk  | 34.6           | -26.2        | -95.2   | -48.58                  | -25             | -23.58      | H        |
| 5.14144               | 37.83                | Pk  | 34.5           | -26.2        | -95.2   | -48.27                  | -25             | -23.27      | V        |
| 7.65308               | 41.92                | Pk  | 35.8           | -22.4        | -95.2   | -39.58                  | -25             | -14.58      | H        |
| 7.65972               | 35.29                | Pk  | 35.8           | -22.3        | -95.2   | -46.11                  | -25             | -21.11      | V        |
| 10.22392              | 34.82                | Pk  | 37.5           | -20          | -95.2   | -41.98                  | -25             | -16.98      | H        |
| 10.23893              | 34.73                | Pk  | 37.6           | -20.1        | -95.2   | -42.17                  | -25             | -17.17      | V        |

## 9.2.4. LTE BAND 12 AND 5G NR Band n12

### **LIMITS**

FCC: §27.53 (g)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

**QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)**

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 4/16/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 12 QPSK 10MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Low Channel, 704MHz   |                      |     |                |              |         |                         |                 |             |          |
| 1.40732               | 41.91                | Pk  | 28.8           | -33.1        | -95.2   | -57.59                  | -13             | -44.59      | H        |
| 1.40889               | 41.74                | Pk  | 28.7           | -33.1        | -95.2   | -57.86                  | -13             | -44.86      | V        |
| 2.11032               | 41.78                | Pk  | 31.7           | -32.2        | -95.2   | -53.92                  | -13             | -40.92      | H        |
| 2.11247               | 42.5                 | Pk  | 31.7           | -32.2        | -95.2   | -53.2                   | -13             | -40.2       | V        |
| 2.81597               | 40.33                | Pk  | 32.5           | -31.2        | -95.2   | -53.57                  | -13             | -40.57      | H        |
| 2.81665               | 40.29                | Pk  | 32.5           | -31.3        | -95.2   | -53.71                  | -13             | -40.71      | V        |
| Mid Channel, 707.5MHz |                      |     |                |              |         |                         |                 |             |          |
| 1.41746               | 41.98                | Pk  | 28.6           | -33          | -95.2   | -57.62                  | -13             | -44.62      | H        |
| 1.4176                | 42.3                 | Pk  | 28.6           | -33          | -95.2   | -57.3                   | -13             | -44.3       | V        |
| 2.10923               | 50.78                | Pk  | 31.7           | -32.2        | -95.2   | -44.92                  | -13             | -31.92      | V        |
| 2.1093                | 52.93                | Pk  | 31.7           | -32.2        | -95.2   | -42.77                  | -13             | -29.77      | H        |
| 2.83054               | 40.77                | Pk  | 32.4           | -31.2        | -95.2   | -53.23                  | -13             | -40.23      | V        |
| 2.83154               | 40.57                | Pk  | 32.4           | -31.2        | -95.2   | -53.43                  | -13             | -40.43      | H        |
| High Channel, 711MHz  |                      |     |                |              |         |                         |                 |             |          |
| 1.42072               | 42.51                | Pk  | 28.6           | -33          | -95.2   | -57.09                  | -13             | -44.09      | H        |
| 1.42123               | 42.85                | Pk  | 28.6           | -33          | -95.2   | -56.75                  | -13             | -43.75      | V        |
| 2.11964               | 53.97                | Pk  | 31.7           | -32.2        | -95.2   | -41.73                  | -13             | -28.73      | H        |
| 2.11988               | 48.55                | Pk  | 31.7           | -32.2        | -95.2   | -47.15                  | -13             | -34.15      | V        |
| 2.84323               | 40.5                 | Pk  | 32.4           | -31.1        | -95.2   | -53.4                   | -13             | -40.4       | V        |
| 2.84555               | 40.76                | Pk  | 32.4           | -31.1        | -95.2   | -53.14                  | -13             | -40.14      | H        |

**QPSK 5G NR Band n12 (15.0MHZ BANDWIDTH)**

|                |                           |
|----------------|---------------------------|
| Project #:     | 13259315                  |
| Date:          | 7/29/2020                 |
| Test Engineer: | 50820                     |
| Configuration: | EUT Only                  |
| Mode           | 5G NR Band n12 QPSK 15MHz |
| Chamber #:     | Chamber A                 |

| Frequency (GHz)        | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|------------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Low Channel, 706.5MHz  |                      |     |                |              |         |                         |                 |             |          |
| 1.41126                | 41.27                | Pk  | 29.1           | -32.7        | -95.2   | -56.63                  | -13             | -43.63      | V        |
| 1.4141                 | 42.43                | Pk  | 29.1           | -32.7        | -95.2   | -55.47                  | -13             | -42.47      | H        |
| 2.0997                 | 44.67                | Pk  | 31.9           | -31.8        | -95.2   | -49.93                  | -13             | -36.93      | H        |
| 2.09989                | 42.11                | Pk  | 31.8           | -31.8        | -95.2   | -52.59                  | -13             | -39.59      | V        |
| 2.82412                | 39.54                | Pk  | 32.6           | -30.7        | -95.2   | -53.06                  | -13             | -40.06      | H        |
| 2.8278                 | 39.38                | Pk  | 32.5           | -30.6        | -95.2   | -53.22                  | -13             | -40.22      | V        |
| Mid Channel, 707.5MHz  |                      |     |                |              |         |                         |                 |             |          |
| 1.41331                | 42.7                 | Pk  | 29.1           | -32.7        | -95.2   | -55.2                   | -13             | -42.2       | H        |
| 1.41449                | 41.96                | Pk  | 29.1           | -32.7        | -95.2   | -55.94                  | -13             | -42.94      | V        |
| 2.12138                | 40.73                | Pk  | 31.6           | -31.7        | -95.2   | -54.07                  | -13             | -41.07      | H        |
| 2.1233                 | 41.01                | Pk  | 31.6           | -31.7        | -95.2   | -53.79                  | -13             | -40.79      | V        |
| 2.82864                | 39.77                | Pk  | 32.5           | -30.6        | -95.2   | -52.83                  | -13             | -39.83      | H        |
| 2.83178                | 39.73                | Pk  | 32.6           | -30.6        | -95.2   | -52.77                  | -13             | -39.77      | V        |
| High Channel, 708.5MHz |                      |     |                |              |         |                         |                 |             |          |
| 1.41893                | 42.23                | Pk  | 29.1           | -32.6        | -95.2   | -55.57                  | -13             | -42.57      | V        |
| 1.1664                 | 42.74                | Pk  | 28.1           | -33.2        | -95.2   | -57.56                  | -13             | -44.56      | H        |
| 2.12363                | 41.41                | Pk  | 31.6           | -31.7        | -95.2   | -53.39                  | -13             | -40.39      | H        |
| 2.12561                | 41.08                | Pk  | 31.6           | -31.6        | -95.2   | -53.62                  | -13             | -40.62      | V        |
| 2.8325                 | 40.16                | Pk  | 32.5           | -30.6        | -95.2   | -52.44                  | -13             | -39.44      | V        |
| 2.83278                | 40.23                | Pk  | 32.5           | -30.6        | -95.2   | -52.37                  | -13             | -39.37      | H        |

### 9.2.5. LTE BAND 13

#### LIMITS

FCC: §27.53

(c) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

(f) Emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

#### QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 4/16/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 13 QPSK 10MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)     | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|---------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Mid Channel, 782MHz |                      |     |                |              |         |                         |                 |             |          |
| 1.56331             | 42.38                | Pk  | 28             | -33          | -95.2   | -57.82                  | -40             | -17.82      | V        |
| 1.56492             | 42.09                | Pk  | 28             | -33          | -95.2   | -58.11                  | -40             | -18.11      | H        |
| 2.34539             | 41.38                | Pk  | 31.9           | -31.9        | -95.2   | -53.82                  | -13             | -40.82      | H        |
| 2.34667             | 41.19                | Pk  | 31.9           | -31.9        | -95.2   | -54.01                  | -13             | -41.01      | V        |
| 3.12683             | 41.02                | Pk  | 33.1           | -31          | -95.2   | -52.08                  | -13             | -39.08      | H        |
| 3.13025             | 40.46                | Pk  | 33.1           | -31          | -95.2   | -52.64                  | -13             | -39.64      | V        |

\* Emissions in the GPS band were wideband emissions therefore the -40dBm/MHz limit was used.

### 9.2.6. LTE BAND 14

#### LIMITS

FCC: §90.543 Emission Limitations. (Band 14)

(e) For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log (P)$  dB.

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

#### QPSK LTE BAND 14 (10.0MHZ BANDWIDTH)

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 4/22/2020              |
| Test Engineer: | 20792                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 14 QPSK 10MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)     | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | Amp/Cbl (dB) | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|---------------------|----------------------|-----|----------------|--------------|--------------|-------------------------|-----------------|-------------|----------|
| Mid Channel, 793MHz |                      |     |                |              |              |                         |                 |             |          |
| 1.58477             | 42.73                | Pk  | 28.1           | -32.9        | -95.2        | -57.27                  | -40             | -17.27      | V        |
| 1.58647             | 42.22                | Pk  | 28.1           | -32.9        | -95.2        | -57.78                  | -40             | -17.78      | H        |
| 2.3782              | 41.33                | Pk  | 32.2           | -31.8        | -95.2        | -53.47                  | -13             | -40.47      | V        |
| 2.37849             | 42.85                | Pk  | 32.2           | -31.8        | -95.2        | -51.95                  | -13             | -38.95      | H        |
| 3.17094             | 40.81                | Pk  | 32.9           | -30.9        | -95.2        | -52.39                  | -13             | -39.39      | H        |
| 3.17276             | 40.76                | Pk  | 32.9           | -30.9        | -95.2        | -52.44                  | -13             | -39.44      | V        |

\* Emissions in the GPS band were wideband emissions therefore the -40dBm/MHz limit was used.

### 9.2.7. LTE BAND 17

#### LIMITS

FCC: §27.53 (g)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

#### QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 4/16/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 17 QPSK 10MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)     | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|---------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Mid Channel, 710MHz |                      |     |                |              |         |                         |                 |             |          |
| 1.41987             | 43.08                | Pk  | 28.6           | -33          | -95.2   | -56.52                  | -13             | -43.52      | H        |
| 1.42229             | 42.41                | Pk  | 28.6           | -33          | -95.2   | -57.19                  | -13             | -44.19      | V        |
| 2.13053             | 41.14                | Pk  | 31.7           | -32.2        | -95.2   | -54.56                  | -13             | -41.56      | H        |
| 2.1315              | 41.22                | Pk  | 31.7           | -32.1        | -95.2   | -54.38                  | -13             | -41.38      | V        |
| 2.83939             | 40.52                | Pk  | 32.4           | -31.1        | -95.2   | -53.38                  | -13             | -40.38      | H        |
| 2.84111             | 40.86                | Pk  | 32.4           | -31.1        | -95.2   | -53.04                  | -13             | -40.04      | V        |



## 9.2.8. LTE BAND 25

### **LIMITS**

FCC: §24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

**QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)**

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 4/15/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 25 QPSK 20MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)        | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | PK Margin (dB) | Polarity |
|------------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|----------------|----------|
| Low Channel, 1860MHz   |                      |     |                |              |         |                         |                 |                |          |
| 3.7207                 | 40.83                | Pk  | 33.3           | -29.9        | -95.2   | -50.97                  | -13             | -37.97         | H        |
| 3.72115                | 33.23                | Pk  | 33.3           | -29.9        | -95.2   | -58.57                  | -13             | -45.57         | V        |
| 5.57804                | 38.66                | Pk  | 34.9           | -28          | -95.2   | -49.64                  | -13             | -36.64         | V        |
| 5.582                  | 38.47                | Pk  | 34.9           | -28          | -95.2   | -49.83                  | -13             | -36.83         | H        |
| 7.44006                | 36.25                | Pk  | 35.8           | -24.9        | -95.2   | -48.05                  | -13             | -35.05         | H        |
| 7.44138                | 35.43                | Pk  | 35.7           | -24.8        | -95.2   | -48.87                  | -13             | -35.87         | V        |
| Mid Channel, 1882.5MHz |                      |     |                |              |         |                         |                 |                |          |
| 3.76256                | 40.44                | Pk  | 33.6           | -30.1        | -95.2   | -51.26                  | -13             | -38.26         | V        |
| 3.76456                | 40.24                | Pk  | 33.6           | -30.1        | -95.2   | -51.46                  | -13             | -38.46         | H        |
| 5.64559                | 38.84                | Pk  | 34.9           | -28          | -95.2   | -49.46                  | -13             | -36.46         | V        |
| 5.6458                 | 38.19                | Pk  | 34.9           | -28          | -95.2   | -50.11                  | -13             | -37.11         | H        |
| 7.52947                | 36.02                | Pk  | 35.8           | -24.5        | -95.2   | -47.88                  | -13             | -34.88         | V        |
| 7.53025                | 35.71                | Pk  | 35.8           | -24.5        | -95.2   | -48.19                  | -13             | -35.19         | H        |
| High Channel, 1905MHz  |                      |     |                |              |         |                         |                 |                |          |
| 3.80932                | 40.5                 | Pk  | 33.7           | -30.2        | -95.2   | -51.2                   | -13             | -38.2          | H        |
| 3.81135                | 40.88                | Pk  | 33.7           | -30.2        | -95.2   | -50.82                  | -13             | -37.82         | V        |
| 5.71312                | 39.07                | Pk  | 34.9           | -28.2        | -95.2   | -49.43                  | -13             | -36.43         | H        |
| 5.71671                | 39.22                | Pk  | 35             | -28.2        | -95.2   | -49.18                  | -13             | -36.18         | V        |
| 7.61724                | 36.48                | Pk  | 35.7           | -24.3        | -95.2   | -47.32                  | -13             | -34.32         | V        |
| 7.62176                | 35.93                | Pk  | 35.8           | -24.2        | -95.2   | -47.67                  | -13             | -34.67         | H        |

**9.2.9. LTE BAND 26 (PART 90S)**

**LIMITS**

FCC: §90.691

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

**QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)**

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 4/14/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 26 QPSK 10MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)     | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|---------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Mid Channel, 819MHz |                      |     |                |              |         |                         |                 |             |          |
| 1.63768             | 41.59                | Pk  | 28.5           | -32.8        | -95.2   | -57.91                  | -13             | -44.91      | V        |
| 1.63781             | 41.69                | Pk  | 28.5           | -32.8        | -95.2   | -57.81                  | -13             | -44.81      | H        |
| 2.4564              | 42.5                 | Pk  | 32.5           | -31.9        | -95.2   | -52.1                   | -13             | -39.1       | V        |
| 2.45688             | 43.63                | Pk  | 32.5           | -31.9        | -95.2   | -50.97                  | -13             | -37.97      | H        |
| 3.27545             | 40.52                | Pk  | 32.9           | -30.8        | -95.2   | -52.58                  | -13             | -39.58      | V        |
| 3.27698             | 40.21                | Pk  | 32.9           | -30.8        | -95.2   | -52.89                  | -13             | -39.89      | H        |

### 9.2.10. LTE BAND 30

#### LIMITS

FCC: §27.53 (a)

For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than  $43 + 10 \log (P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log (P)$  dB above 2365 MHz.

#### QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 5/22/2020              |
| Test Engineer: | 20792                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 30 QPSK 10MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)      | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | Margin (dB) | Polarity |
|----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|-------------|----------|
| Mid Channel, 2310MHz |                      |     |                |              |         |                         |                 |             |          |
| 4.8567               | 38.81                | Pk  | 34.2           | -29.4        | -95.2   | -51.59                  | -40             | -11.59      | V        |
| 4.86618              | 39.29                | Pk  | 34.1           | -29.3        | -95.2   | -51.11                  | -40             | -11.11      | H        |
| 6.87778              | 35.7                 | Pk  | 35.9           | -25.1        | -95.2   | -48.7                   | -40             | -8.7        | V        |
| 6.93215              | 35.61                | Pk  | 36             | -25.5        | -95.2   | -49.09                  | -40             | -9.09       | H        |
| 8.51191              | 35.29                | Pk  | 36             | -23.6        | -95.2   | -47.51                  | -40             | -7.51       | H        |
| 9.4512               | 34.52                | Pk  | 36.5           | -22.4        | -95.2   | -46.58                  | -40             | -6.58       | V        |

### 9.2.11. LTE BAND 41 and 5G NR Band n41

#### **LIMITS**

FCC: §27.53 (m)

At least  $55 + 10 \log (P)$  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)(6) of this section.

**QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)**

|                |                        |
|----------------|------------------------|
| Project #:     | 13259315               |
| Date:          | 4/15/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 41 QPSK 20MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | PK Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|----------------|----------|
| Low Channel, 2506MHz  |                      |     |                |              |         |                         |                 |                |          |
| 5.01061               | 38.87                | Pk  | 34.3           | -29.1        | -95.2   | -51.13                  | -25             | -26.13         | H        |
| 5.0112                | 38.81                | Pk  | 34.3           | -29.1        | -95.2   | -51.19                  | -25             | -26.19         | V        |
| 7.51729               | 35.72                | Pk  | 35.7           | -24.4        | -95.2   | -48.18                  | -25             | -23.18         | V        |
| 7.51761               | 37.95                | Pk  | 35.7           | -24.4        | -95.2   | -45.95                  | -25             | -20.95         | H        |
| 10.0225               | 34.23                | Pk  | 37.1           | -22          | -95.2   | -45.87                  | -25             | -20.87         | V        |
| 10.02369              | 34.09                | Pk  | 37.1           | -22          | -95.2   | -46.01                  | -25             | -21.01         | H        |
| Mid Channel, 2593MHz  |                      |     |                |              |         |                         |                 |                |          |
| 5.18537               | 38.49                | Pk  | 34.6           | -28.5        | -95.2   | -50.61                  | -25             | -25.61         | H        |
| 5.18773               | 38.6                 | Pk  | 34.6           | -28.5        | -95.2   | -50.5                   | -25             | -25.5          | V        |
| 7.77771               | 35.51                | Pk  | 35.9           | -24.4        | -95.2   | -48.19                  | -25             | -23.19         | V        |
| 7.78011               | 36.2                 | Pk  | 35.8           | -24.4        | -95.2   | -47.6                   | -25             | -22.6          | H        |
| 10.37125              | 33.65                | Pk  | 37.4           | -21.3        | -95.2   | -45.45                  | -25             | -20.45         | H        |
| 10.37246              | 33.42                | Pk  | 37.4           | -21.3        | -95.2   | -45.68                  | -25             | -20.68         | V        |
| High Channel, 2680MHz |                      |     |                |              |         |                         |                 |                |          |
| 5.36017               | 38.51                | Pk  | 35             | -28.8        | -95.2   | -50.49                  | -25             | -25.49         | H        |
| 5.36152               | 38.72                | Pk  | 35             | -28.8        | -95.2   | -50.28                  | -25             | -25.28         | V        |
| 8.04063               | 36.14                | Pk  | 35.8           | -23.8        | -95.2   | -47.06                  | -25             | -22.06         | H        |
| 8.04099               | 36.31                | Pk  | 35.8           | -23.8        | -95.2   | -46.89                  | -25             | -21.89         | V        |
| 10.71904              | 35.6                 | Pk  | 37.9           | -21.4        | -95.2   | -43.1                   | -25             | -18.1          | V        |
| 10.72111              | 34.94                | Pk  | 37.9           | -21.4        | -95.2   | -43.76                  | -25             | -18.76         | H        |

**QPSK 5G NR Band n41 (100.0MHZ BANDWIDTH)**

|                |                            |
|----------------|----------------------------|
| Project #:     | 13259315                   |
| Date:          | 7/17/2020                  |
| Test Engineer: | 19169                      |
| Configuration: | EUT Only                   |
| Mode           | 5G NR Band n41 QPSK 100MHz |
| Chamber #:     | Chamber A                  |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T348 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | PK Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|----------------|----------|
| Low Channel, 2546MHz  |                      |     |                |              |         |                         |                 |                |          |
| 4.99013               | 39.14                | Pk  | 34.1           | -28.4        | -95.2   | -50.36                  | -25             | -25.36         | H        |
| 4.99239               | 39.39                | Pk  | 34.1           | -28.4        | -95.2   | -50.11                  | -25             | -25.11         | V        |
| 7.48763               | 37.3                 | Pk  | 36             | -23.8        | -95.2   | -45.7                   | -25             | -20.7          | V        |
| 7.4893                | 36.58                | Pk  | 36             | -23.8        | -95.2   | -46.42                  | -25             | -21.42         | H        |
| 9.98269               | 35.11                | Pk  | 37.2           | -20.9        | -95.2   | -43.79                  | -25             | -18.79         | V        |
| 9.9828                | 35.42                | Pk  | 37.2           | -20.9        | -95.2   | -43.48                  | -25             | -18.48         | H        |
| Mid Channel, 2593MHz  |                      |     |                |              |         |                         |                 |                |          |
| 5.18578               | 39.48                | Pk  | 34.6           | -27.7        | -95.2   | -48.82                  | -25             | -23.82         | H        |
| 5.18799               | 38.85                | Pk  | 34.6           | -27.7        | -95.2   | -49.45                  | -25             | -24.45         | V        |
| 7.77832               | 36.2                 | Pk  | 35.9           | -23.4        | -95.2   | -46.5                   | -25             | -21.5          | V        |
| 7.78083               | 36.18                | Pk  | 35.9           | -23.4        | -95.2   | -46.52                  | -25             | -21.52         | H        |
| 10.37314              | 34.74                | Pk  | 37.7           | -20.2        | -95.2   | -42.96                  | -25             | -17.96         | V        |
| 10.3735               | 34.68                | Pk  | 37.7           | -20.2        | -95.2   | -43.02                  | -25             | -18.02         | H        |
| High Channel, 2640MHz |                      |     |                |              |         |                         |                 |                |          |
| 5.37908               | 38.69                | Pk  | 34.8           | -27.8        | -95.2   | -49.51                  | -25             | -24.51         | V        |
| 5.37948               | 38.48                | Pk  | 34.8           | -27.8        | -95.2   | -49.72                  | -25             | -24.72         | H        |
| 8.06832               | 36.26                | Pk  | 36.2           | -23.2        | -95.2   | -45.94                  | -25             | -20.94         | H        |
| 8.06964               | 36.06                | Pk  | 36.2           | -23.2        | -95.2   | -46.14                  | -25             | -21.14         | V        |
| 10.7604               | 35.6                 | Pk  | 37.8           | -20.2        | -95.2   | -42                     | -25             | -17            | V        |
| 10.76075              | 35.77                | Pk  | 37.8           | -20.2        | -95.2   | -41.83                  | -25             | -16.83         | H        |

## 9.2.12. LTE BAND 66

### **LIMITS**

FCC: §27.53 (h)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.



**QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)**

|                |                        |
|----------------|------------------------|
| Project #:     | 13179115               |
| Date:          | 5/15/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 66 QPSK 20MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)       | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | PK Margin (dB) | Polarity |
|-----------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|----------------|----------|
| Low Channel, 1720MHz  |                      |     |                |              |         |                         |                 |                |          |
| 3.4387                | 39.83                | Pk  | 32.8           | -30.4        | -95.2   | -52.97                  | -13             | -39.97         | H        |
| 3.44112               | 39.79                | Pk  | 32.8           | -30.4        | -95.2   | -53.01                  | -13             | -40.01         | V        |
| 5.16076               | 38.1                 | Pk  | 34.5           | -28.6        | -95.2   | -51.2                   | -13             | -38.2          | H        |
| 5.16181               | 38.98                | Pk  | 34.5           | -28.6        | -95.2   | -50.32                  | -13             | -37.32         | V        |
| 6.87942               | 36.87                | Pk  | 35.9           | -25.1        | -95.2   | -47.53                  | -13             | -34.53         | H        |
| 6.88071               | 36.18                | Pk  | 35.9           | -25.1        | -95.2   | -48.22                  | -13             | -35.22         | V        |
| Mid Channel, 1745MHz  |                      |     |                |              |         |                         |                 |                |          |
| 3.49015               | -67.05               | Pk  | 33.1           | -30.1        | 12      | -52.05                  | -13             | -39.05         | 86       |
| 3.49086               | -66.83               | Pk  | 33.1           | -30.1        | 11.7    | -52.13                  | -13             | -39.13         | 187      |
| 5.2346                | -68.92               | Pk  | 34.7           | -28.9        | 11.4    | -51.72                  | -13             | -38.72         | 196      |
| 5.23565               | -68.6                | Pk  | 34.7           | -28.9        | 11.3    | -51.5                   | -13             | -38.5          | 136      |
| 6.97862               | -70.03               | Pk  | 36             | -25.5        | 10      | -49.53                  | -13             | -36.53         | 161      |
| 6.98145               | -70.94               | Pk  | 36             | -25.5        | 10.6    | -49.84                  | -13             | -36.84         | 256      |
| High Channel, 1770MHz |                      |     |                |              |         |                         |                 |                |          |
| 3.54013               | -66.96               | Pk  | 33.2           | -30.4        | 11.4    | -52.76                  | -13             | -39.76         | 228      |
| 3.54192               | -66.81               | Pk  | 33.1           | -30.4        | 11.2    | -52.91                  | -13             | -39.91         | 99       |
| 5.30772               | -68.2                | Pk  | 35             | -28.9        | 10.8    | -51.3                   | -13             | -38.3          | 112      |
| 5.30988               | -67.69               | Pk  | 35             | -28.9        | 10.8    | -50.79                  | -13             | -37.79         | 238      |
| 7.07899               | -70.41               | Pk  | 36             | -25.2        | 10.7    | -48.91                  | -13             | -35.91         | 203      |
| 7.07959               | -71.2                | Pk  | 36             | -25.2        | 10.8    | -49.6                   | -13             | -36.6          | 223      |

### 9.2.13. LTE BAND 71

#### **LIMITS**

FCC: §27.53 (g)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

**QPSK LTE BAND 71 (20.0MHZ BANDWIDTH)**

|                |                        |
|----------------|------------------------|
| Project #:     | 13179115               |
| Date:          | 5/16/2020              |
| Test Engineer: | 10641                  |
| Configuration: | EUT Only               |
| Mode           | LTE Band 71 QPSK 20MHz |
| Chamber #:     | Chamber A              |

| Frequency (GHz)        | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl (dB) | EIRP CF | Corrected Reading (dBm) | Harmonics limit | PK Margin (dB) | Polarity |
|------------------------|----------------------|-----|----------------|--------------|---------|-------------------------|-----------------|----------------|----------|
| Low Channel, 673.0MHz  |                      |     |                |              |         |                         |                 |                |          |
| 1.3449                 | 41.23                | Pk  | 29.3           | -33.2        | -95.2   | -57.87                  | -13             | -44.87         | H        |
| 1.34493                | 41.67                | Pk  | 29.3           | -33.2        | -95.2   | -57.43                  | -13             | -44.43         | V        |
| 2.01809                | 41.24                | Pk  | 31.6           | -32.4        | -95.2   | -54.76                  | -13             | -41.76         | H        |
| 2.02011                | 41.26                | Pk  | 31.6           | -32.4        | -95.2   | -54.74                  | -13             | -41.74         | V        |
| 2.69206                | 41.2                 | Pk  | 32.4           | -31.6        | -95.2   | -53.2                   | -13             | -40.2          | V        |
| 2.69333                | 41.25                | Pk  | 32.4           | -31.6        | -95.2   | -53.15                  | -13             | -40.15         | H        |
| Mid Channel, 680.5MHz  |                      |     |                |              |         |                         |                 |                |          |
| 1.36076                | -65.18               | Pk  | 29.5           | -33.1        | 10.9    | -57.88                  | -13             | -44.88         | 99       |
| 1.36216                | -64.96               | Pk  | 29.6           | -33.1        | 10.2    | -58.26                  | -13             | -45.26         | 145      |
| 2.03979                | -65.89               | Pk  | 31.6           | -32.3        | 11.5    | -55.09                  | -13             | -42.09         | 147      |
| 2.04016                | -65.59               | Pk  | 31.6           | -32.3        | 11.5    | -54.79                  | -13             | -41.79         | 201      |
| 2.72214                | -66.05               | Pk  | 32.4           | -31.5        | 11.2    | -53.95                  | -13             | -40.95         | 234      |
| 2.72365                | -66.65               | Pk  | 32.4           | -31.4        | 11.2    | -54.45                  | -13             | -41.45         | 216      |
| High Channel, 688.0MHz |                      |     |                |              |         |                         |                 |                |          |
| 1.37474                | -64.41               | Pk  | 29.3           | -33.2        | 10.6    | -57.71                  | -13             | -44.71         | 296      |
| 1.37515                | -65.29               | Pk  | 29.3           | -33.2        | 9.9     | -59.29                  | -13             | -46.29         | 197      |
| 2.16382                | -65.08               | Pk  | 31.5           | -31.9        | 11.7    | -53.78                  | -13             | -40.78         | 184      |
| 2.16425                | -66.49               | Pk  | 31.5           | -31.9        | 10.9    | -55.99                  | -13             | -42.99         | 258      |
| 2.75164                | -66.16               | Pk  | 32.4           | -31.4        | 11.8    | -53.36                  | -13             | -40.36         | 212      |
| 2.75168                | -66.04               | Pk  | 32.4           | -31.4        | 12.6    | -52.44                  | -13             | -39.44         | 188      |

### **9.3. FIELD STRENGTH OF SPURIOUS RADIATION, ANT2**

#### **TEST PROCEDURE**

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

#### **RESULTS**

### 9.3.1. LTE BAND 2

#### **LIMITS**

FCC: §24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.