

#### 8.4.1. LTE BAND 2

|            |       |              |         |
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| <b>ID:</b> | 38602 | <b>Date:</b> | 5/16/17 |
|------------|-------|--------------|---------|

##### QPSK, (20MHz BANDWIDTH)

| Limit          |           | 1850                       | 1910                        | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 1851.0944                  | 1908.9412                   |               |                                 |
| Extreme (50C)  |           | 1851.0944                  | 1908.9412                   | 16.1          | 0.009                           |
| Extreme (40C)  |           | 1851.0944                  | 1908.9412                   | 18.3          | 0.010                           |
| Extreme (30C)  |           | 1851.0944                  | 1908.9412                   | 15.8          | 0.008                           |
| Extreme (10C)  |           | 1851.0944                  | 1908.9412                   | 17.2          | 0.009                           |
| Extreme (0C)   |           | 1851.0944                  | 1908.9412                   | 18.2          | 0.010                           |
| Extreme (-10C) |           | 1851.0944                  | 1908.9412                   | 18.6          | 0.010                           |
| Extreme (-20C) |           | 1851.0944                  | 1908.9412                   | 17.9          | 0.010                           |
| Extreme (-30C) |           | 1851.0944                  | 1908.9412                   | 18.8          | 0.010                           |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 1851.0944                  | 1908.9412                   | 14.6          | 0.008                           |
|                | -15%      | 1851.0944                  | 1908.9412                   | 15.1          | 0.008                           |
|                | End Point | 1851.0944                  | 1908.9412                   | 15.6          | 0.008                           |

#### 8.4.2. LTE BAND 4

|            |       |              |        |
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| <b>ID:</b> | 38602 | <b>Date:</b> | 5/8/17 |
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##### QPSK, (3.0MHz BANDWIDTH)

| Limit          |           | 1710                       | 1755                        | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 1710.1453                  | 1754.8482                   |               |                                 |
| Extreme (50C)  |           | 1710.1453                  | 1754.8483                   | 19.9          | 0.011                           |
| Extreme (40C)  |           | 1710.1453                  | 1754.8483                   | 19.5          | 0.011                           |
| Extreme (30C)  |           | 1710.1453                  | 1754.8483                   | 19.1          | 0.011                           |
| Extreme (10C)  |           | 1710.1453                  | 1754.8483                   | 18.0          | 0.010                           |
| Extreme (0C)   |           | 1710.1453                  | 1754.8483                   | 18.8          | 0.011                           |
| Extreme (-10C) |           | 1710.1453                  | 1754.8483                   | 19.0          | 0.011                           |
| Extreme (-20C) |           | 1710.1453                  | 1754.8483                   | 20.5          | 0.012                           |
| Extreme (-30C) |           | 1710.1453                  | 1754.8483                   | 19.9          | 0.011                           |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 1710.1453                  | 1754.8483                   | 13.8          | 0.008                           |
|                | -15%      | 1710.1453                  | 1754.8483                   | 13.4          | 0.008                           |
|                | End Point | 1710.1453                  | 1754.8483                   | 13.7          | 0.008                           |

### 8.4.3. LTE BAND 5

|            |       |              |         |
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| <b>ID:</b> | 38602 | <b>Date:</b> | 5/16/17 |
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#### QPSK, (10MHz BANDWIDTH)

| Limit          |           | 824                        | 849                         | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 824.5283                   | 848.4923                    |               |                                 |
| Extreme (50C)  |           | 824.5283                   | 848.4923                    | -8.7          | -0.010                          |
| Extreme (40C)  |           | 824.5283                   | 848.4923                    | -7.8          | -0.009                          |
| Extreme (30C)  |           | 824.5283                   | 848.4923                    | -14.5         | -0.017                          |
| Extreme (10C)  |           | 824.5283                   | 848.4923                    | -17.4         | -0.021                          |
| Extreme (0C)   |           | 824.5283                   | 848.4923                    | -21.0         | -0.025                          |
| Extreme (-10C) |           | 824.5283                   | 848.4923                    | -18.3         | -0.022                          |
| Extreme (-20C) |           | 824.5283                   | 848.4923                    | -10.4         | -0.012                          |
| Extreme (-30C) |           | 824.5283                   | 848.4923                    | -7.8          | -0.009                          |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 824.5283                   | 848.4923                    | -13.7         | -0.016                          |
|                | -15%      | 824.5283                   | 848.4923                    | -13.7         | -0.016                          |
|                | End Point | 824.5283                   | 848.4923                    | -13.6         | -0.016                          |

### 8.4.4. LTE BAND 7

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#### QPSK, (20MHz BANDWIDTH)

| Limit          |           | 2500                       | 2570                        | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 2501.0896                  | 2568.9439                   |               |                                 |
| Extreme (50C)  |           | 2501.0896                  | 2568.9439                   | 30.2          | 0.012                           |
| Extreme (40C)  |           | 2501.0896                  | 2568.9439                   | -28.1         | -0.011                          |
| Extreme (30C)  |           | 2501.0896                  | 2568.9439                   | -28.7         | -0.011                          |
| Extreme (10C)  |           | 2501.0896                  | 2568.9439                   | 26.9          | 0.011                           |
| Extreme (0C)   |           | 2501.0896                  | 2568.9439                   | -32.9         | -0.013                          |
| Extreme (-10C) |           | 2501.0896                  | 2568.9439                   | -31.8         | -0.013                          |
| Extreme (-20C) |           | 2501.0896                  | 2568.9439                   | -33.5         | -0.013                          |
| Extreme (-30C) |           | 2501.0896                  | 2568.9439                   | -35.1         | -0.014                          |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 2501.0896                  | 2568.9439                   | -19.2         | -0.008                          |
|                | -15%      | 2501.0896                  | 2568.9439                   | -17.7         | -0.007                          |
|                | End Point | 2501.0896                  | 2568.9439                   | -15.9         | -0.006                          |

#### 8.4.5. LTE BAND 12

|            |       |              |         |
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| <b>ID:</b> | 29446 | <b>Date:</b> | 5/16/17 |
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##### QPSK, (10MHz BANDWIDTH)

| Limit          |           | 699                        | 716                         | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 699.5358                   | 715.4723                    |               |                                 |
| Extreme (50C)  |           | 699.5358                   | 715.4723                    | -11.6         | -0.02                           |
| Extreme (40C)  |           | 699.5358                   | 715.4723                    | -13.3         | -0.02                           |
| Extreme (30C)  |           | 699.5358                   | 715.4723                    | -10.6         | -0.01                           |
| Extreme (10C)  |           | 699.5358                   | 715.4723                    | -9.8          | -0.01                           |
| Extreme (0C)   |           | 699.5358                   | 715.4723                    | -8.8          | -0.01                           |
| Extreme (-10C) |           | 699.5358                   | 715.4723                    | -8.9          | -0.01                           |
| Extreme (-20C) |           | 699.5358                   | 715.4723                    | -9.3          | -0.01                           |
| Extreme (-30C) |           | 699.5358                   | 715.4723                    | -9.5          | -0.01                           |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 699.5358                   | 715.4723                    | -15.1         | -0.02                           |
|                | -15%      | 699.5358                   | 715.4723                    | -16.1         | -0.02                           |
|                | End Point | 699.5358                   | 715.4723                    | -17.2         | -0.02                           |

#### 8.4.6. LTE BAND 13

|            |       |              |         |
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| <b>ID:</b> | 29446 | <b>Date:</b> | 5/16/17 |
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##### QPSK, (10MHz BANDWIDTH)

| Limit          |           | 777                        | 787                         | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 777.5447                   | 786.4786                    |               |                                 |
| Extreme (50C)  |           | 777.5447                   | 786.4786                    | -14.1         | -0.018                          |
| Extreme (40C)  |           | 777.5447                   | 786.4786                    | -13.9         | -0.018                          |
| Extreme (30C)  |           | 777.5447                   | 786.4786                    | -13.2         | -0.017                          |
| Extreme (10C)  |           | 777.5447                   | 786.4786                    | -12.9         | -0.016                          |
| Extreme (0C)   |           | 777.5447                   | 786.4786                    | -10.6         | -0.014                          |
| Extreme (-10C) |           | 777.5447                   | 786.4786                    | -11.3         | -0.014                          |
| Extreme (-20C) |           | 777.5447                   | 786.4786                    | -11.4         | -0.015                          |
| Extreme (-30C) |           | 777.5447                   | 786.4786                    | -9.2          | -0.012                          |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 777.5447                   | 786.4786                    | -15.7         | -0.020                          |
|                | -15%      | 777.5447                   | 786.4786                    | -16.8         | -0.022                          |
|                | End Point | 777.5447                   | 786.4786                    | -16.5         | -0.021                          |

#### 8.4.7. LTE BAND 17

|            |       |              |         |
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##### QPSK, (10MHz BANDWIDTH)

| Limit          |           | 704                        | 716                         | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 704.5212                   | 715.4716                    |               |                                 |
| Extreme (50C)  |           | 704.5212                   | 715.4716                    | 8.9           | 0.012                           |
| Extreme (40C)  |           | 704.5212                   | 715.4716                    | 7.2           | 0.010                           |
| Extreme (30C)  |           | 704.5212                   | 715.4716                    | 5.7           | 0.008                           |
| Extreme (10C)  |           | 704.5212                   | 715.4716                    | 8.0           | 0.011                           |
| Extreme (0C)   |           | 704.5212                   | 715.4716                    | 9.6           | 0.014                           |
| Extreme (-10C) |           | 704.5212                   | 715.4716                    | 8.2           | 0.012                           |
| Extreme (-20C) |           | 704.5212                   | 715.4716                    | 9.5           | 0.013                           |
| Extreme (-30C) |           | 704.5212                   | 715.4716                    | 10.7          | 0.015                           |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 704.5212                   | 715.4716                    | 9.8           | 0.014                           |
|                | -15%      | 704.5212                   | 715.4716                    | 8.9           | 0.013                           |
|                | End Point | 704.5212                   | 715.4716                    | 9.2           | 0.013                           |

#### 8.4.8. LTE BAND 25

|            |       |              |         |
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| <b>ID:</b> | 29446 | <b>Date:</b> | 5/16/17 |
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##### QPSK, (20MHz BANDWIDTH)

| Limit          |           | 1850                       | 1915                        | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 1851.0799                  | 1913.9616                   |               |                                 |
| Extreme (50C)  |           | 1851.0799                  | 1913.9616                   | -26.5         | -0.014                          |
| Extreme (40C)  |           | 1851.0799                  | 1913.9616                   | -21.6         | -0.011                          |
| Extreme (30C)  |           | 1851.0799                  | 1913.9616                   | -22.9         | -0.012                          |
| Extreme (10C)  |           | 1851.0799                  | 1913.9616                   | -28.1         | -0.015                          |
| Extreme (0C)   |           | 1851.0799                  | 1913.9616                   | -31.9         | -0.017                          |
| Extreme (-10C) |           | 1851.0799                  | 1913.9616                   | -31.9         | -0.017                          |
| Extreme (-20C) |           | 1851.0799                  | 1913.9616                   | -43.5         | -0.023                          |
| Extreme (-30C) |           | 1851.0798                  | 1913.9615                   | -57.4         | -0.030                          |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 1851.0799                  | 1913.9616                   | -20.5         | -0.011                          |
|                | -15%      | 1851.0799                  | 1913.9616                   | -20.3         | -0.011                          |
|                | End Point | 1851.0799                  | 1913.9616                   | -21.0         | -0.011                          |

#### 8.4.9. LTE BAND 26

|            |       |              |         |
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| <b>ID:</b> | 29446 | <b>Date:</b> | 5/16/17 |
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##### QPSK, (10MHz BANDWIDTH)

| Limit          |           | 814                        | 824                         | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 814.5401                   | 823.4723                    |               |                                 |
| Extreme (50C)  |           | 814.5401                   | 823.4723                    | 8.4           | 0.010                           |
| Extreme (40C)  |           | 814.5401                   | 823.4723                    | 6.8           | 0.008                           |
| Extreme (30C)  |           | 814.5401                   | 823.4723                    | 9.6           | 0.012                           |
| Extreme (10C)  |           | 814.5401                   | 823.4723                    | 8.0           | 0.010                           |
| Extreme (0C)   |           | 814.5401                   | 823.4723                    | 8.8           | 0.011                           |
| Extreme (-10C) |           | 814.5401                   | 823.4723                    | 8.8           | 0.011                           |
| Extreme (-20C) |           | 814.5401                   | 823.4723                    | 11.5          | 0.014                           |
| Extreme (-30C) |           | 814.5401                   | 823.4723                    | 10.8          | 0.013                           |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 814.5401                   | 823.4723                    | 8.7           | 0.011                           |
|                | -15%      | 814.5401                   | 823.4723                    | 8.6           | 0.010                           |
|                | End Point | 814.5401                   | 823.4723                    | 8.3           | 0.010                           |

#### 8.4.10. LTE BAND 30

|            |       |              |         |
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##### QPSK, (10MHz BANDWIDTH)

| Limit          |           | 2305                       | 2315                        | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 2305.5221                  | 2314.5033                   |               |                                 |
| Extreme (50C)  |           | 2305.5221                  | 2314.5033                   | 28.7          | 0.012                           |
| Extreme (40C)  |           | 2305.5221                  | 2314.5033                   | 24.0          | 0.010                           |
| Extreme (30C)  |           | 2305.5221                  | 2314.5033                   | 22.4          | 0.010                           |
| Extreme (10C)  |           | 2305.5221                  | 2314.5033                   | 28.4          | 0.012                           |
| Extreme (0C)   |           | 2305.5221                  | 2314.5033                   | 27.6          | 0.012                           |
| Extreme (-10C) |           | 2305.5221                  | 2314.5033                   | -32.1         | -0.014                          |
| Extreme (-20C) |           | 2305.5221                  | 2314.5033                   | -34.2         | -0.015                          |
| Extreme (-30C) |           | 2305.5221                  | 2314.5033                   | -39.4         | -0.017                          |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 2305.5221                  | 2314.5033                   | 21.7          | 0.009                           |
|                | -15%      | 2305.5221                  | 2314.5033                   | 21.8          | 0.009                           |
|                | End Point | 2305.5221                  | 2314.5033                   | 21.1          | 0.009                           |

#### 8.4.11. LTE BAND 41

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##### QPSK, (20MHz BANDWIDTH)

| Limit          |           | 2496                       | 2690                        | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 2496.8392                  | 2689.3259                   |               |                                 |
| Extreme (50C)  |           | 2496.8392                  | 2689.3259                   | 32.2          | 0.012                           |
| Extreme (40C)  |           | 2496.8392                  | 2689.3259                   | 22.5          | 0.009                           |
| Extreme (30C)  |           | 2496.8392                  | 2689.3259                   | 22.0          | 0.008                           |
| Extreme (10C)  |           | 2496.8392                  | 2689.3259                   | 15.4          | 0.006                           |
| Extreme (0C)   |           | 2496.8392                  | 2689.3259                   | 15.1          | 0.006                           |
| Extreme (-10C) |           | 2496.8392                  | 2689.3259                   | 16.4          | 0.006                           |
| Extreme (-20C) |           | 2496.8392                  | 2689.3259                   | 13.2          | 0.005                           |
| Extreme (-30C) |           | 2496.8392                  | 2689.3259                   | 15.4          | 0.006                           |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 2496.8392                  | 2689.3259                   | 26.8          | 0.010                           |
|                | -15%      | 2496.8392                  | 2689.3259                   | 23.9          | 0.009                           |
|                | End Point | 2496.8392                  | 2689.3259                   | 23.1          | 0.009                           |

#### 8.4.12. LTE BAND 66

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##### QPSK, (20MHz BANDWIDTH)

| Limit          |           | 1710                       | 1780                        | Delta<br>(Hz) | Frequency<br>Stability<br>(ppm) |
|----------------|-----------|----------------------------|-----------------------------|---------------|---------------------------------|
| Condition      |           | F low @<br>-13dBm<br>(MHz) | F high @<br>-13dBm<br>(MHz) |               |                                 |
| Temperature    | Voltage   |                            |                             |               |                                 |
| Normal (20C)   | Normal    | 1711.0937                  | 1778.8888                   |               |                                 |
| Extreme (50C)  |           | 1711.0937                  | 1778.8888                   | -16.6         | -0.010                          |
| Extreme (40C)  |           | 1711.0937                  | 1778.8888                   | -15.4         | -0.009                          |
| Extreme (30C)  |           | 1711.0937                  | 1778.8888                   | -17.0         | -0.010                          |
| Extreme (10C)  |           | 1711.0937                  | 1778.8888                   | -17.9         | -0.010                          |
| Extreme (0C)   |           | 1711.0937                  | 1778.8888                   | -19.3         | -0.011                          |
| Extreme (-10C) |           | 1711.0937                  | 1778.8888                   | 16.5          | 0.009                           |
| Extreme (-20C) |           | 1711.0937                  | 1778.8888                   | 20.1          | 0.012                           |
| Extreme (-30C) |           | 1711.0937                  | 1778.8888                   | 19.7          | 0.011                           |
|                |           |                            |                             |               |                                 |
| 20C            | 15%       | 1711.0937                  | 1778.8888                   | 15.7          | 0.009                           |
|                | -15%      | 1711.0937                  | 1778.8888                   | 13.5          | 0.008                           |
|                | End Point | 1711.0937                  | 1778.8888                   | 13.8          | 0.008                           |

## 8.5. PEAK-TO-AVERAGE RATIO

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.

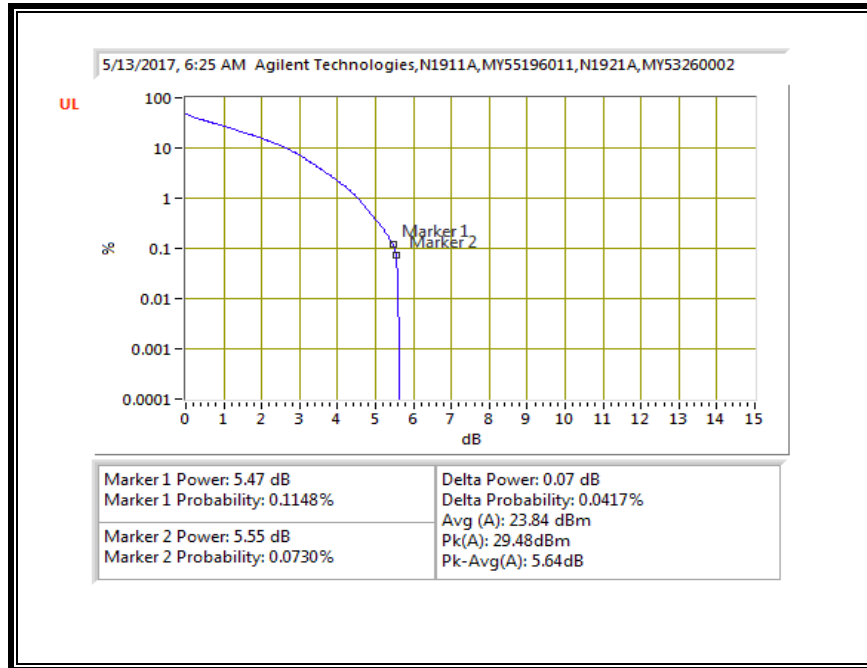
### RESULT

Test was performed on LAT 1 antenna; full resource block (FRB) for each bandwidth combination was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average ratio criteria.

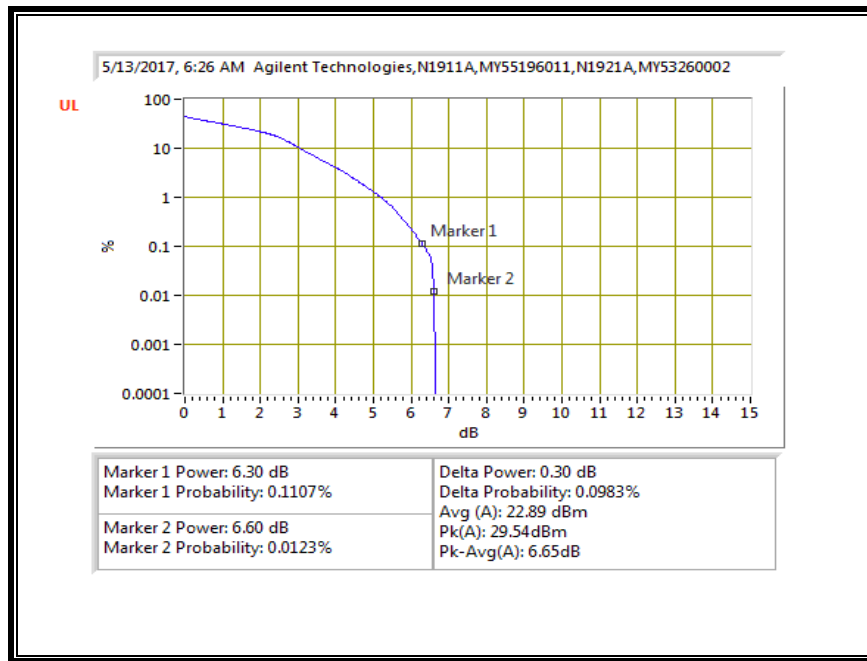
|            |       |              |         |
|------------|-------|--------------|---------|
| <b>ID:</b> | 40813 | <b>Date:</b> | 5/13/17 |
|------------|-------|--------------|---------|

### 8.5.1. LTE BAND 2

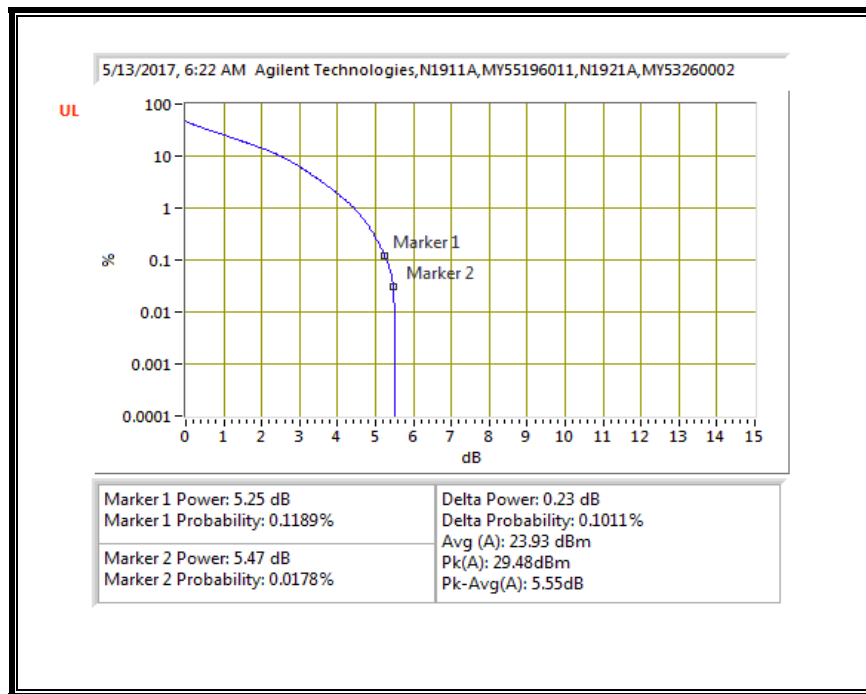
#### QPSK, (1.4 MHz BAND WIDTH)



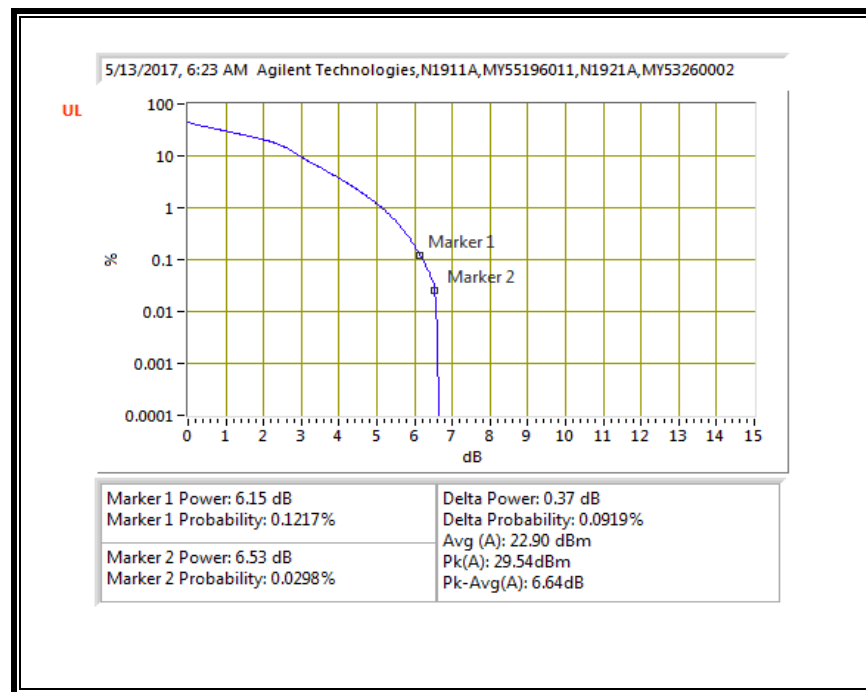
#### 16QAM, (1.4 MHz BAND WIDTH)



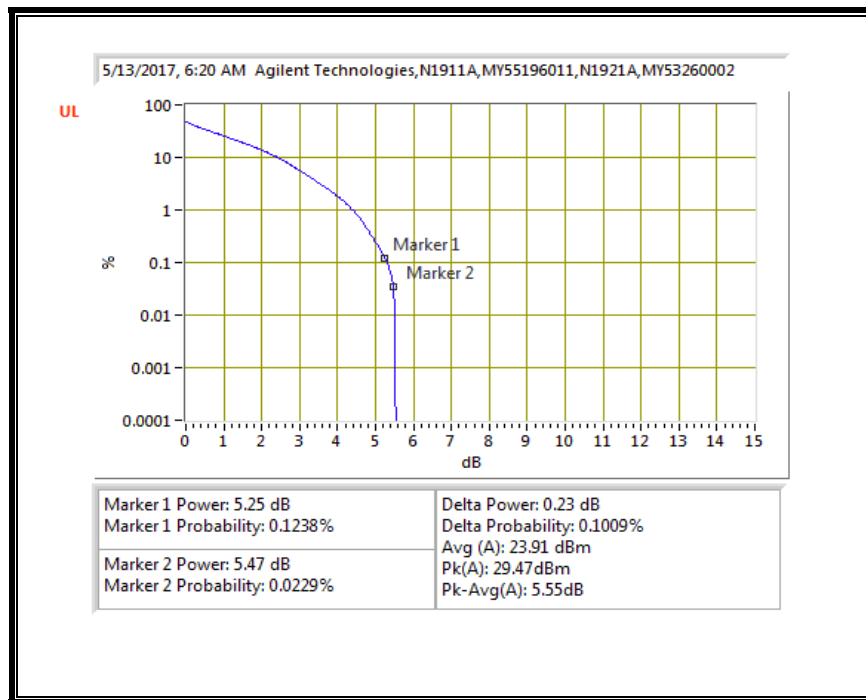
**QPSK, (3.0 MHz BAND WIDTH)**



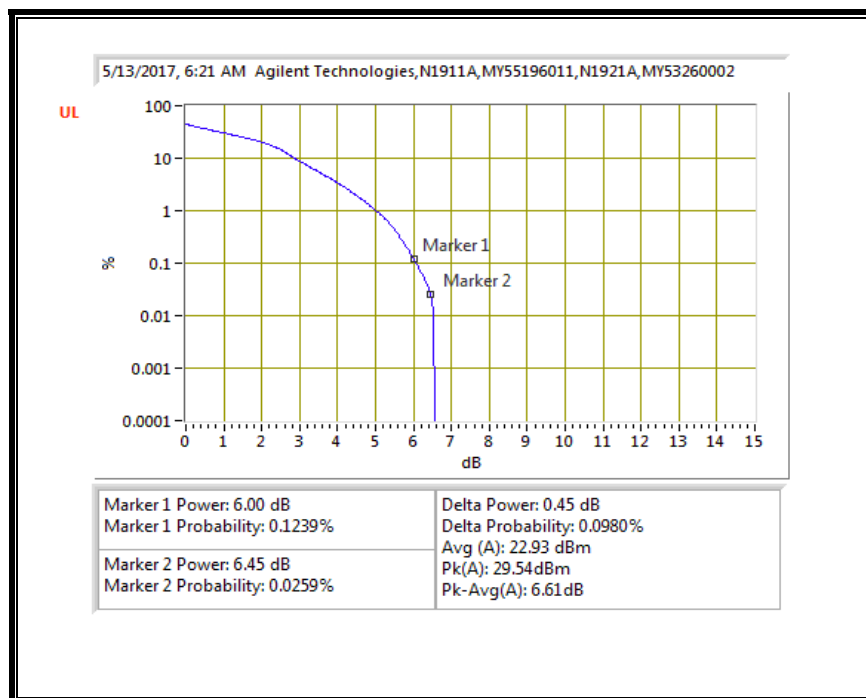
**16QAM, (3.0 MHz BAND WIDTH)**



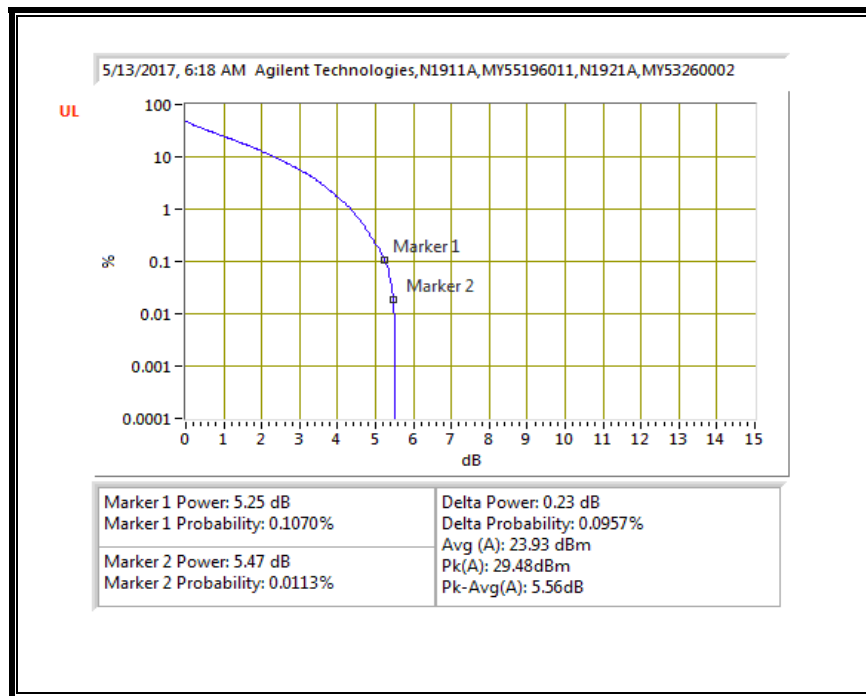
**QPSK, (5.0 MHz BAND WIDTH)**



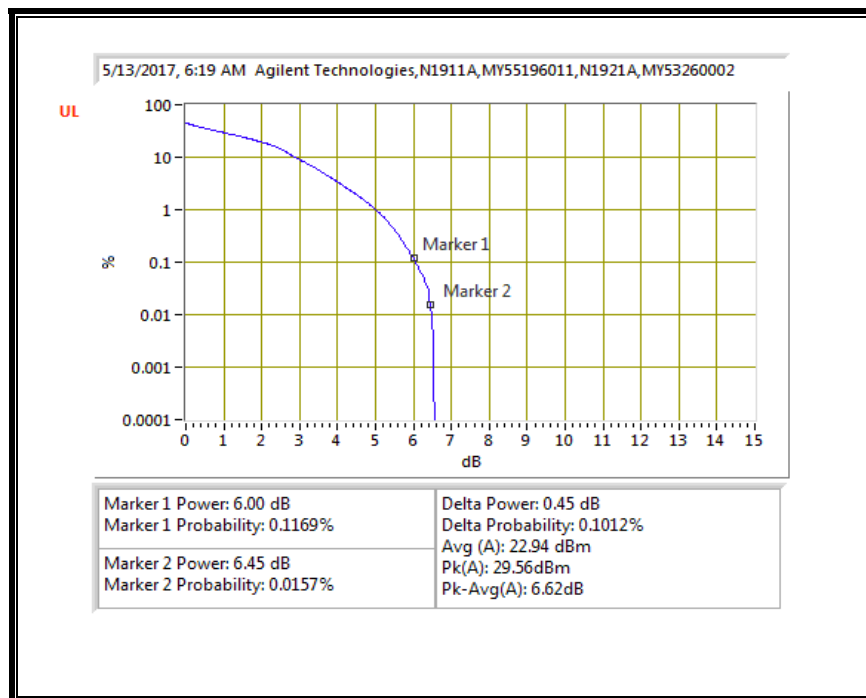
**16QAM, (5.0 MHz BAND WIDTH)**



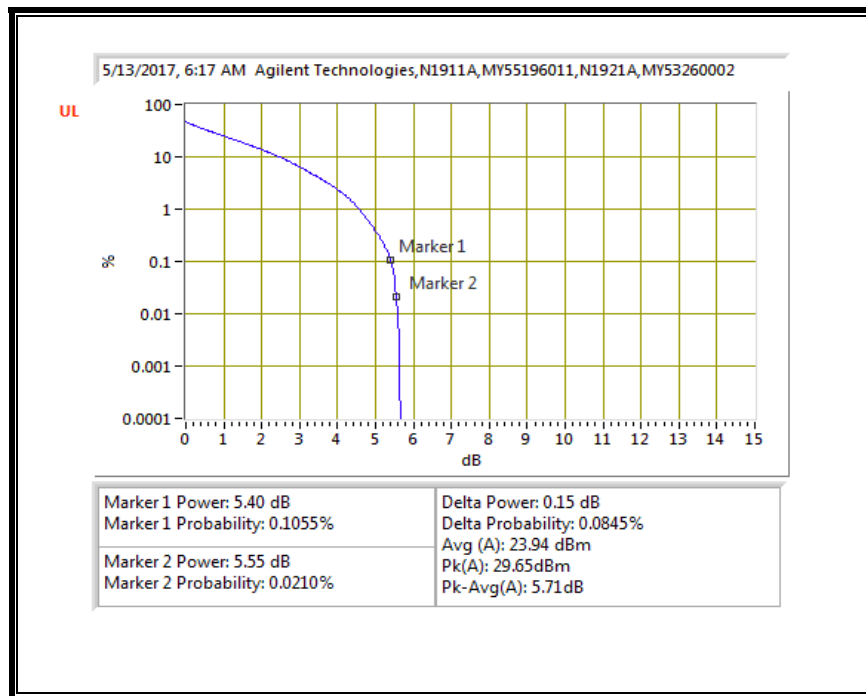
**QPSK, (10.0 MHz BAND WIDTH)**



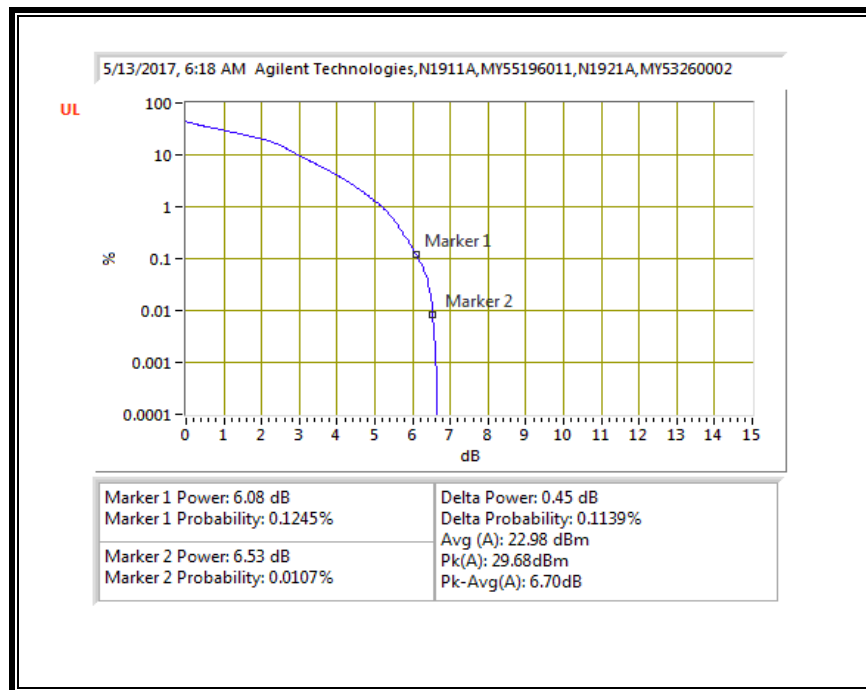
**16QAM, (10.0 MHz BAND WIDTH)**



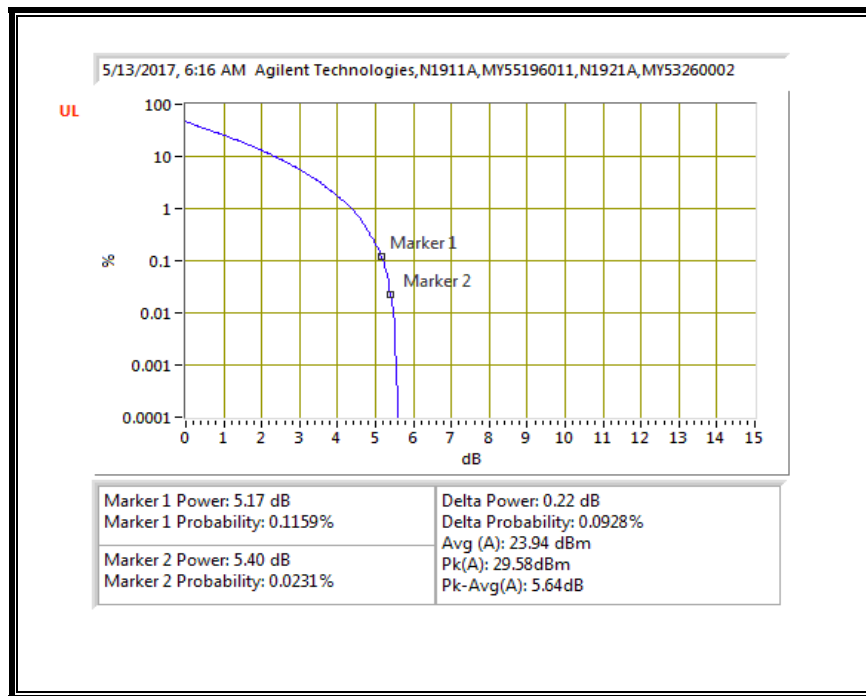
**QPSK, (15.0 MHz BAND WIDTH)**



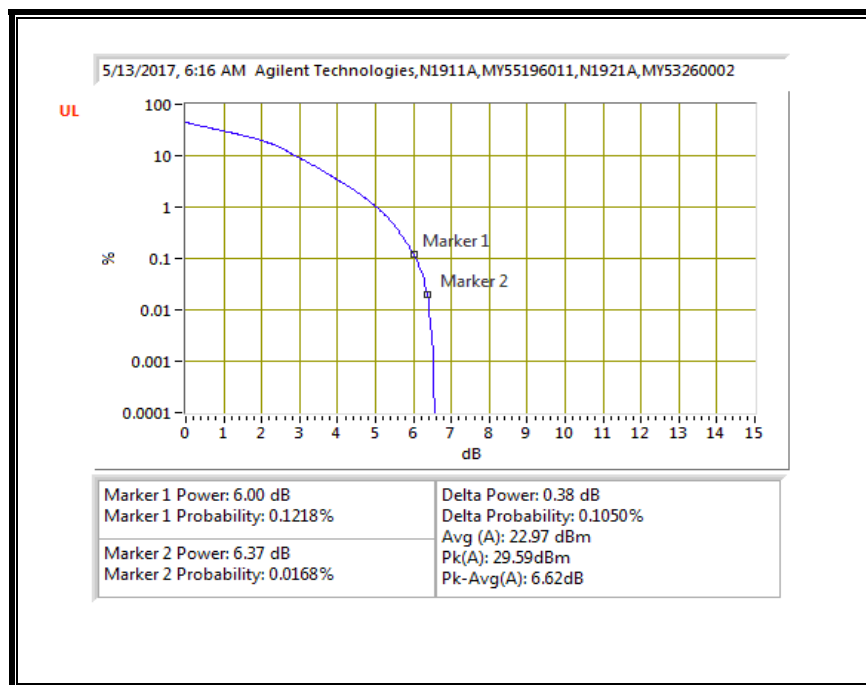
**16QAM, (15.0 MHz BAND WIDTH)**



**QPSK, (20.0 MHz BAND WIDTH)**

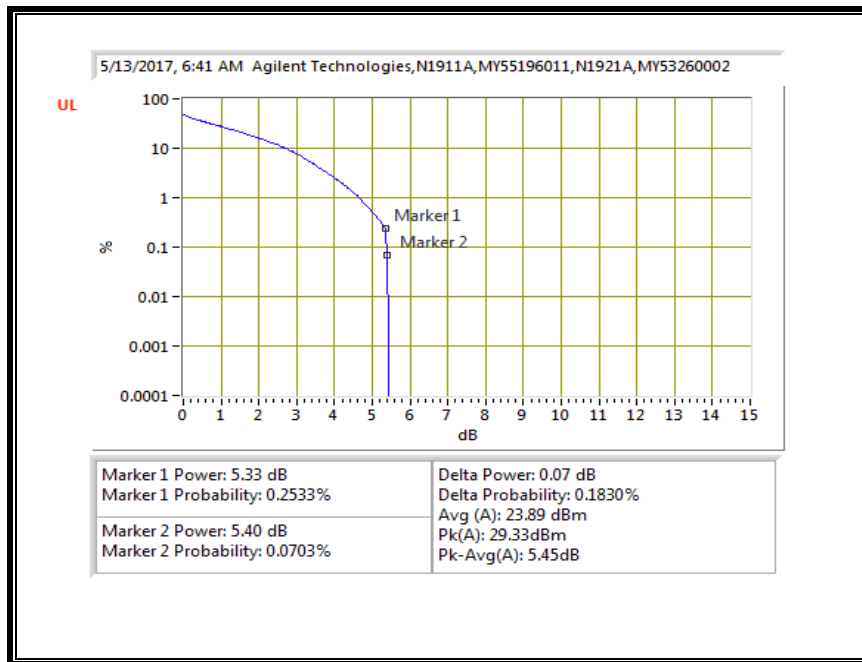


**16QAM, (20.0 MHz BAND WIDTH)**

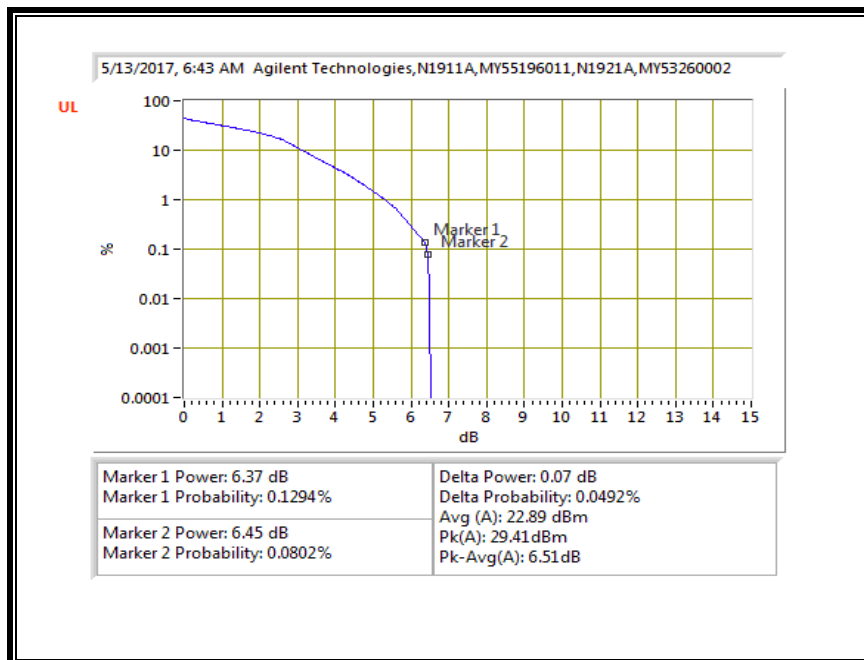


## 8.5.2. LTE BAND 4

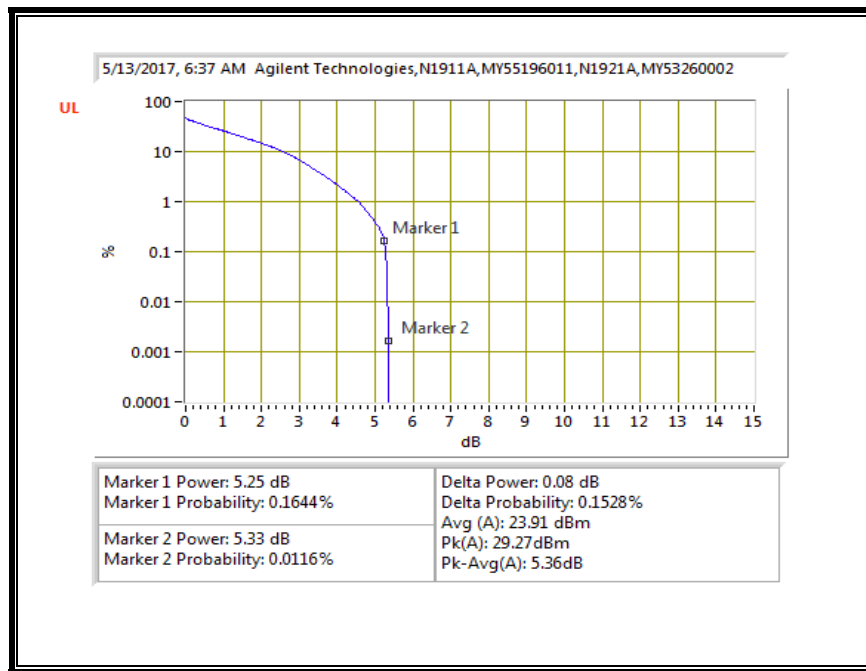
### QPSK, (1.4 MHz BAND WIDTH)



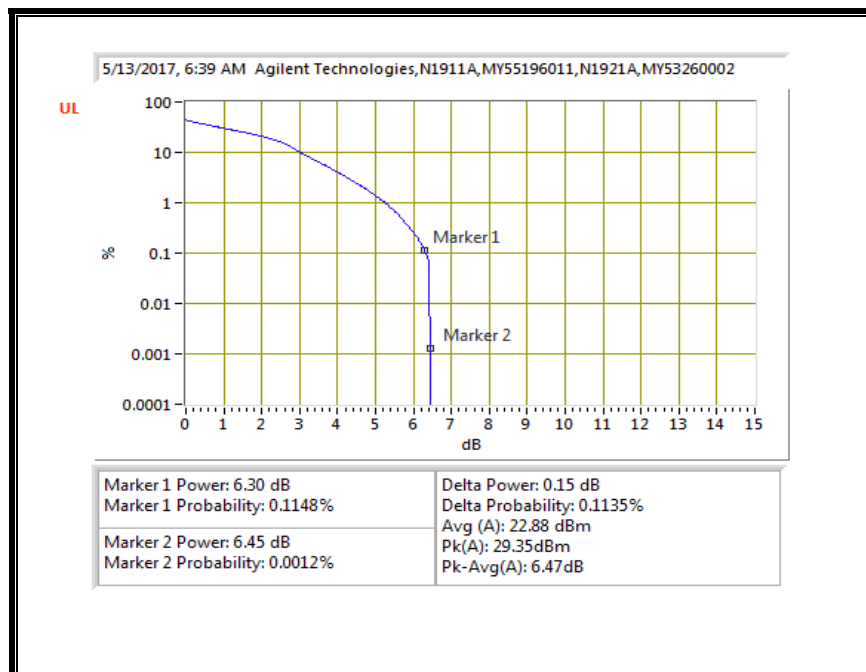
### 16QAM, (1.4 MHz BAND WIDTH)



**QPSK, (3.0 MHz BAND WIDTH)**

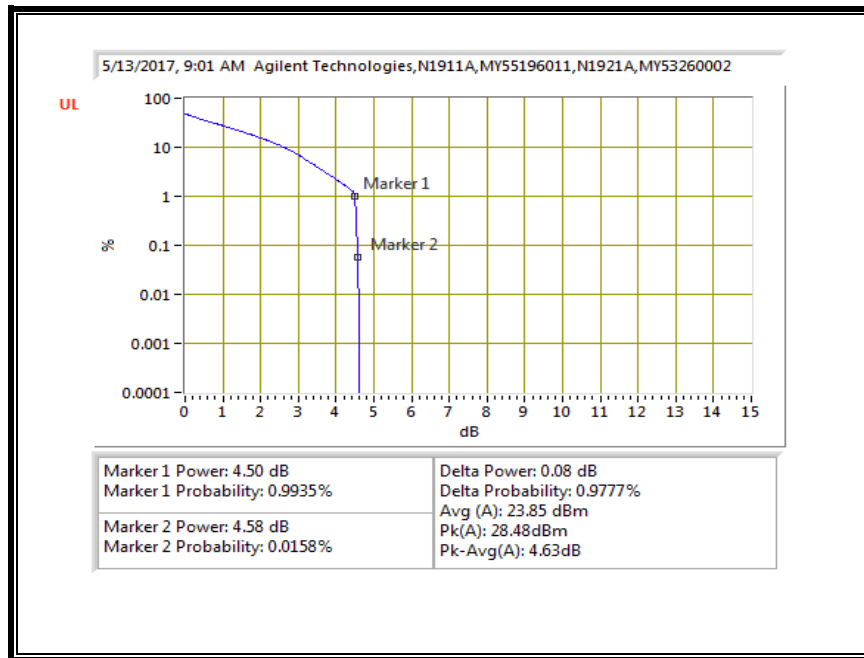


**16QAM, (3.0 MHz BAND WIDTH)**

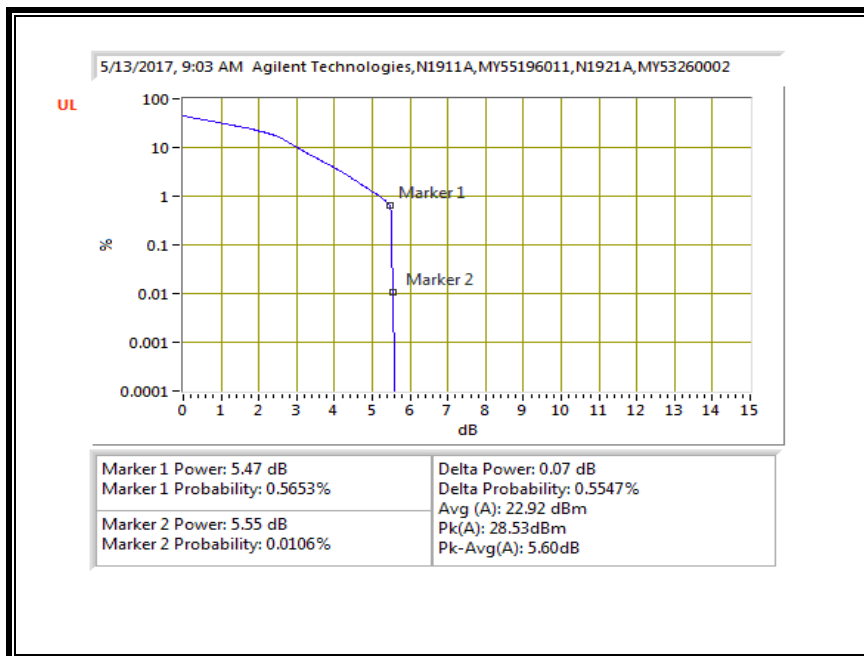


### 8.5.3. LTE BAND 5

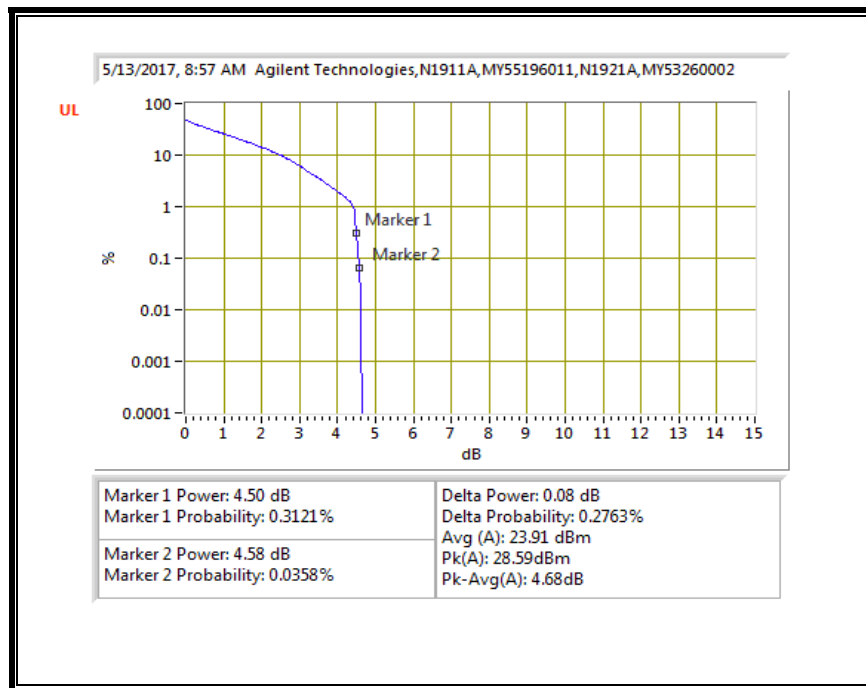
#### QPSK, (1.4 MHz BAND WIDTH)



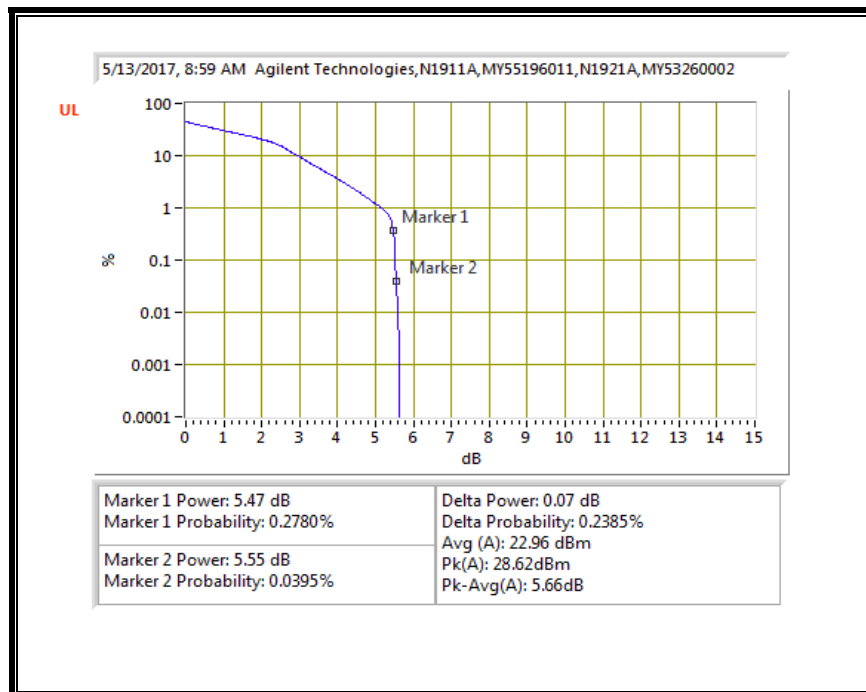
#### 16QAM, (1.4 MHz BAND WIDTH)



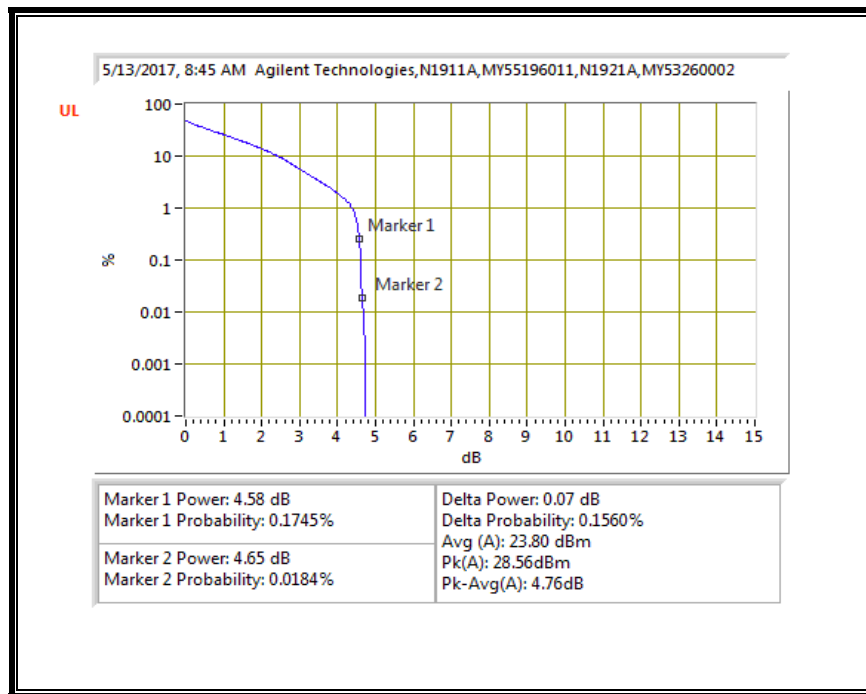
**QPSK, (3.0 MHz BAND WIDTH)**



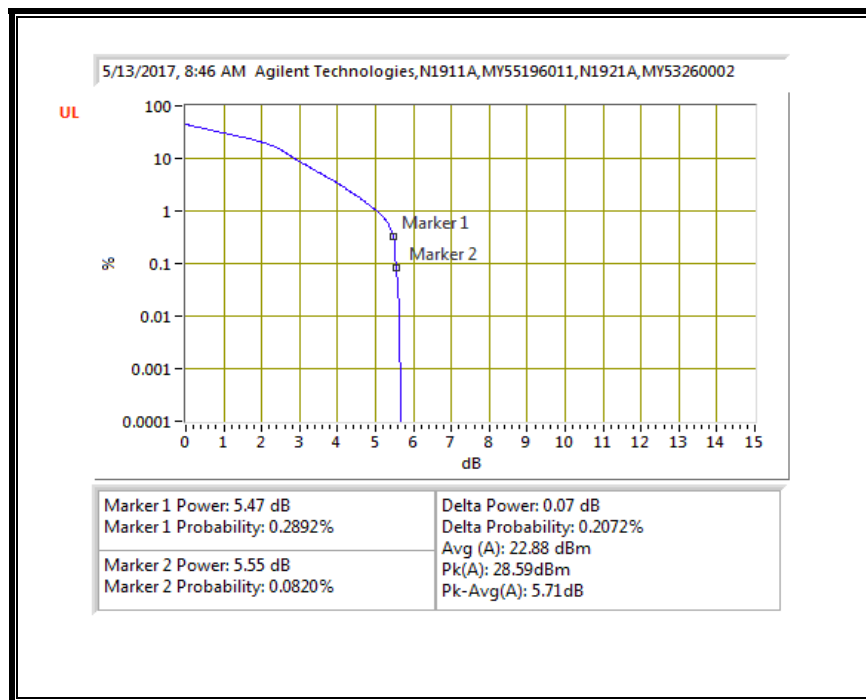
**16QAM, (3.0 MHz BAND WIDTH)**



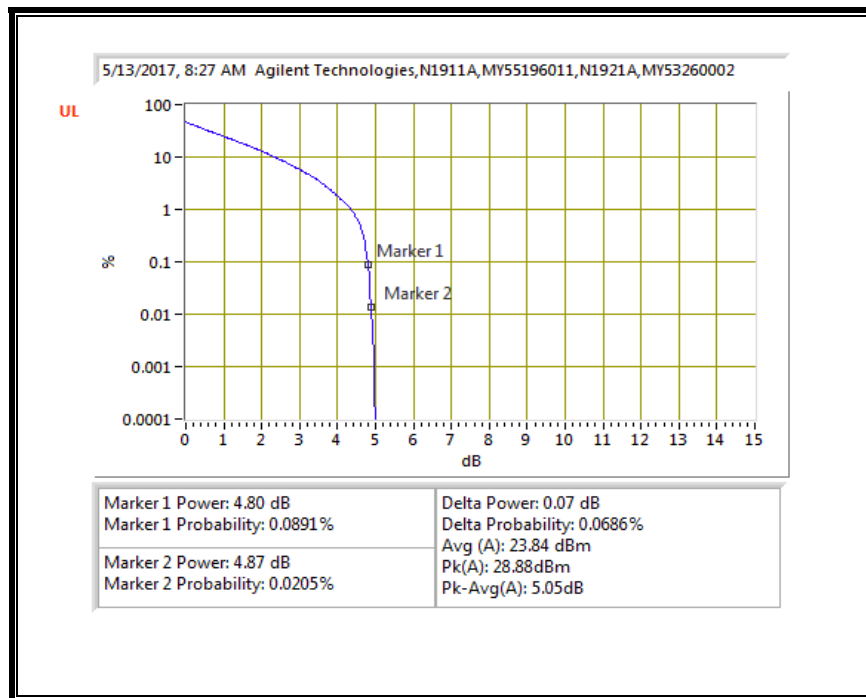
**QPSK, (5.0 MHz BAND WIDTH)**



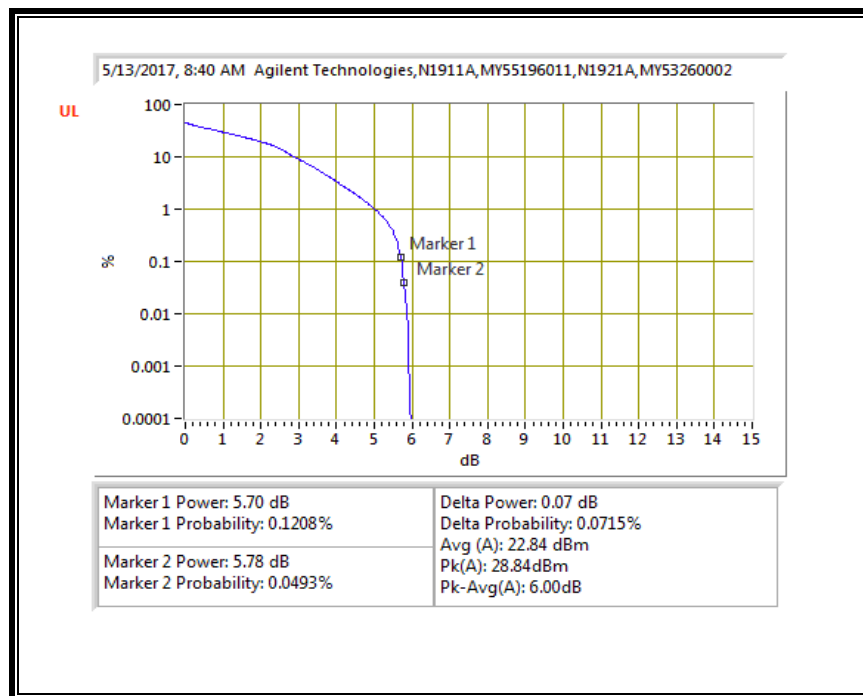
**16QAM, (5.0 MHz BAND WIDTH)**



**QPSK, (10.0 MHz BAND WIDTH)**

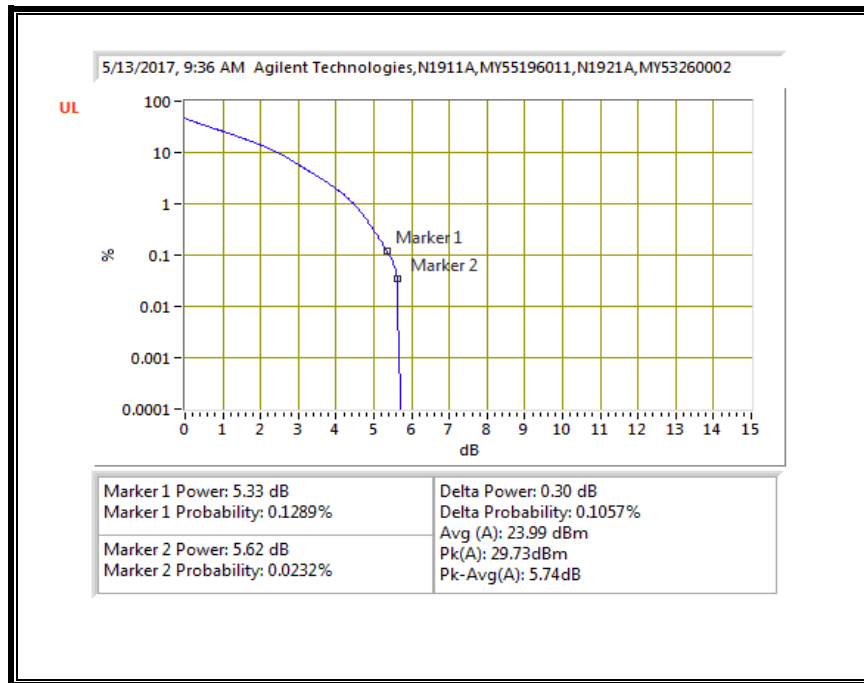


**16QAM, (10.0 MHz BAND WIDTH)**

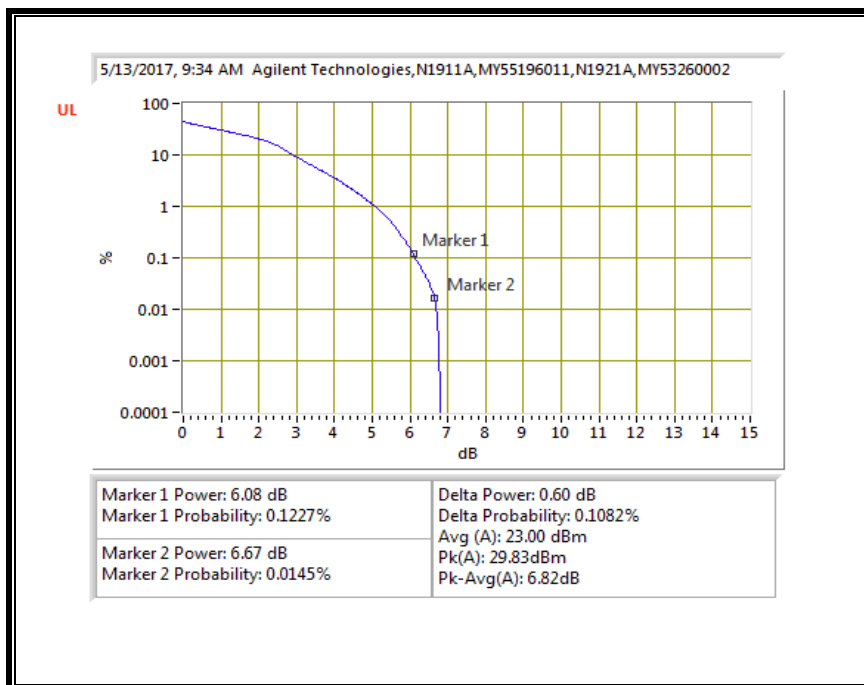


#### 8.5.4. LTE BAND 7

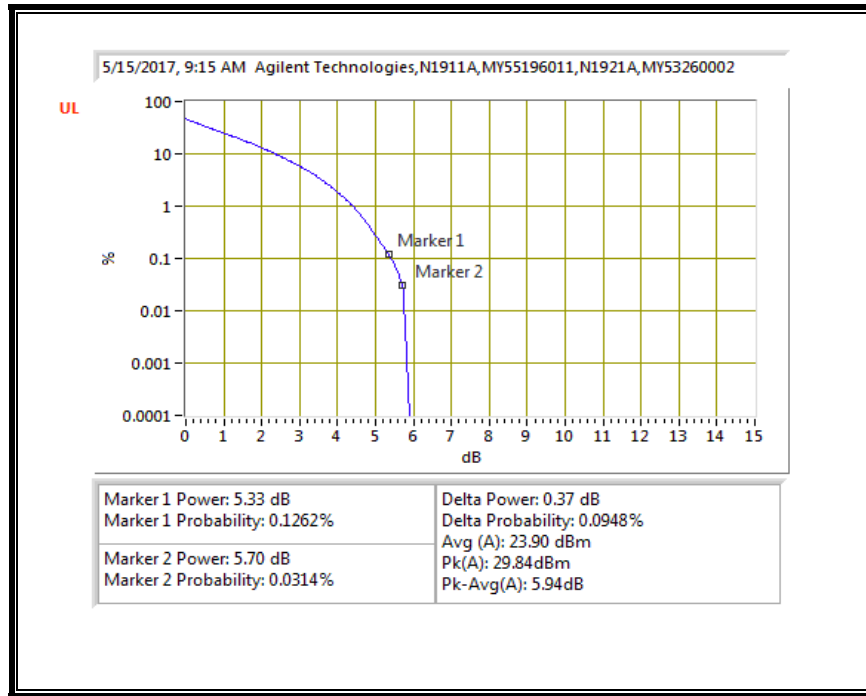
##### QPSK, (5.0 MHz BAND WIDTH)



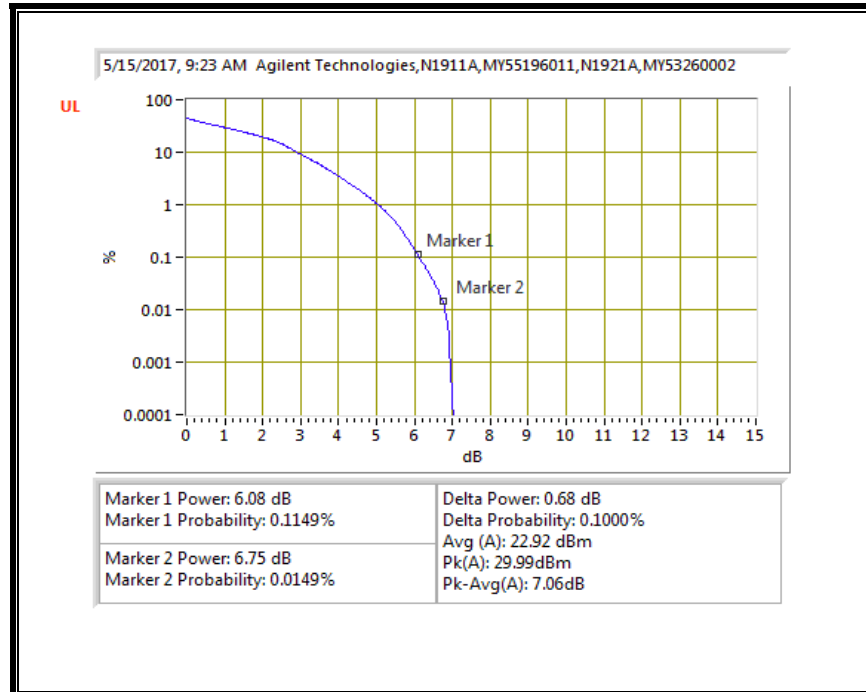
##### 16QAM, (5.0 MHz BAND WIDTH)



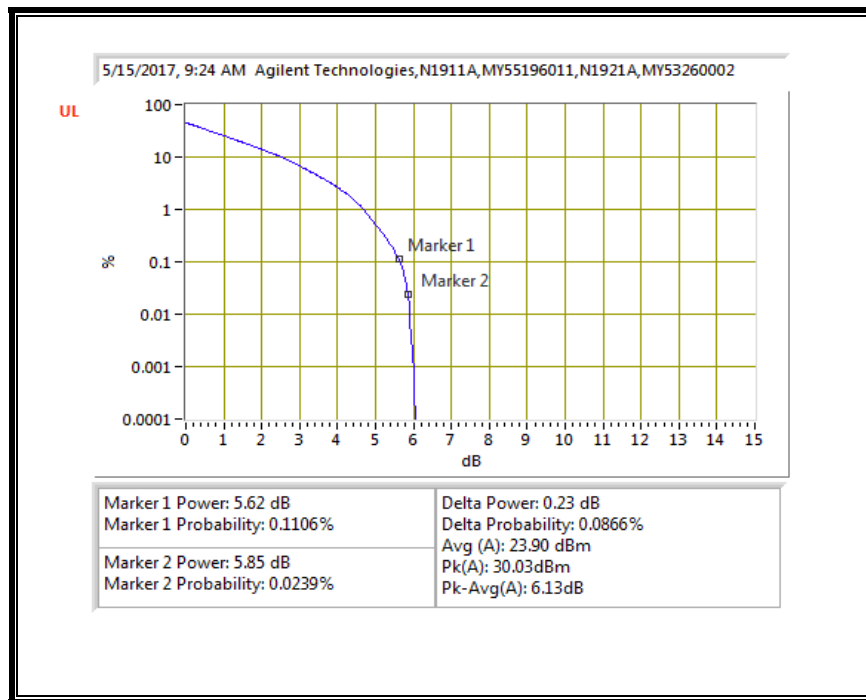
**QPSK, (10.0 MHz BAND WIDTH)**



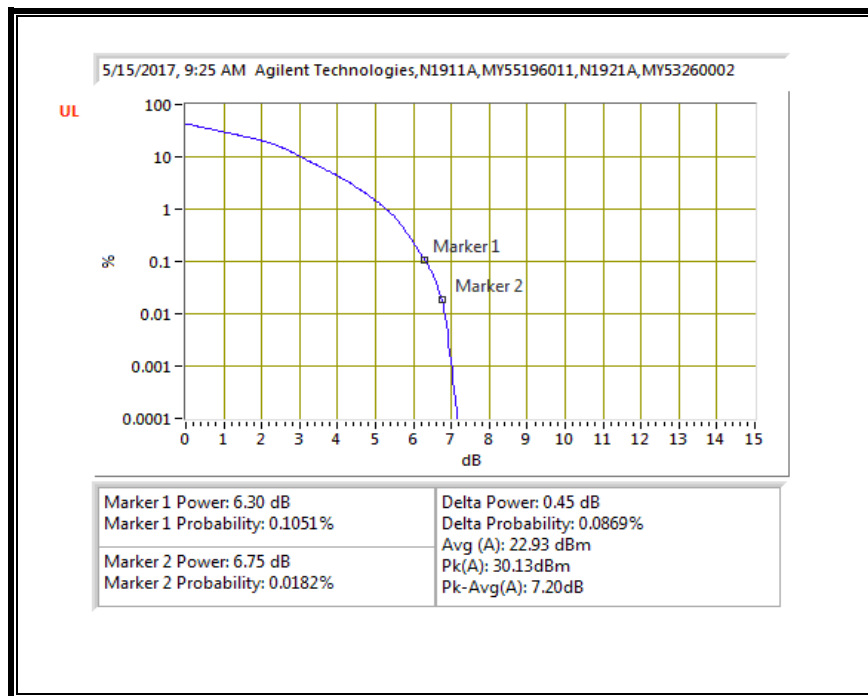
**16QAM, (10.0 MHz BAND WIDTH)**



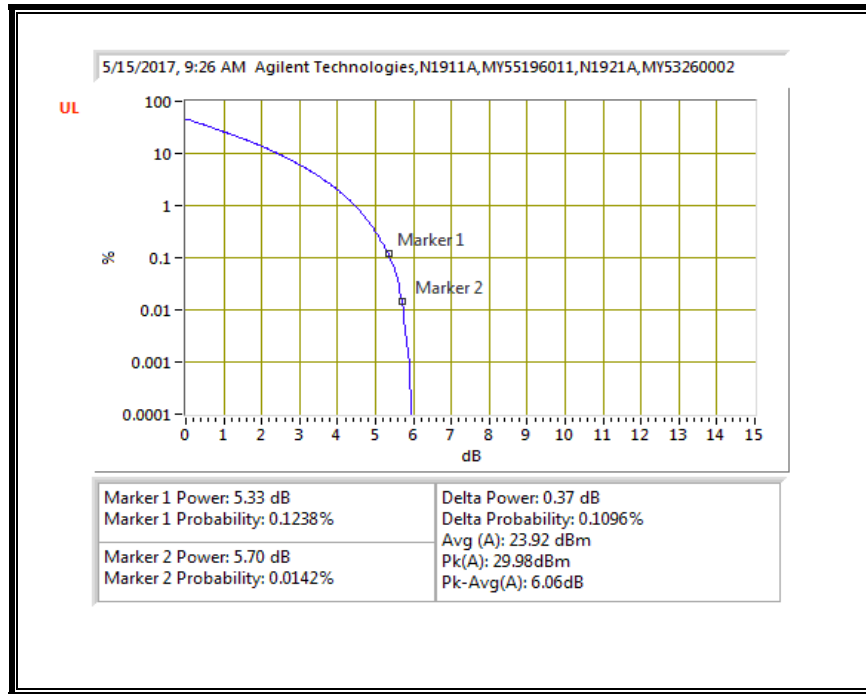
**QPSK, (15.0 MHz BAND WIDTH)**



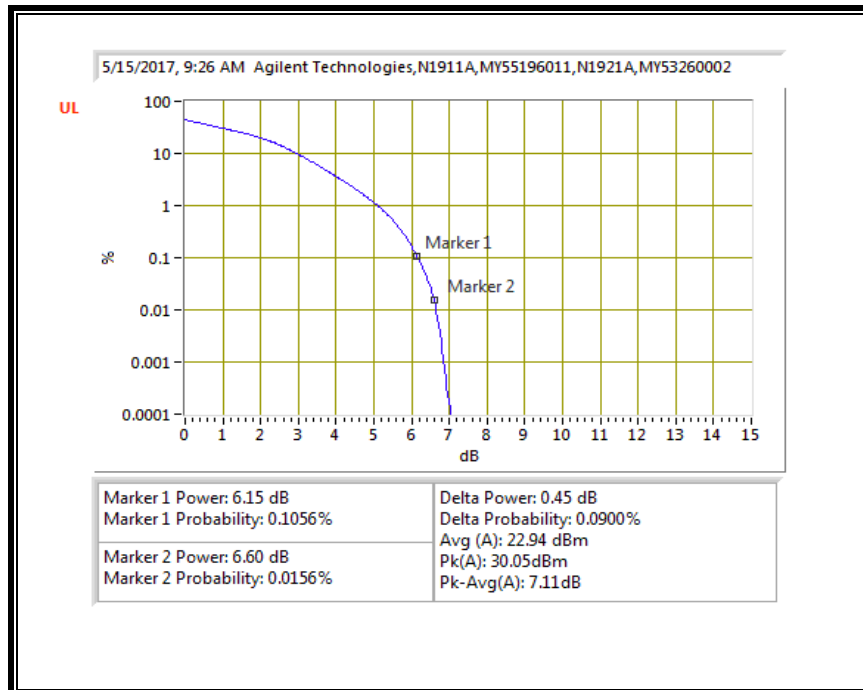
**16QAM, (15.0 MHz BAND WIDTH)**



**QPSK, (20.0 MHz BAND WIDTH)**

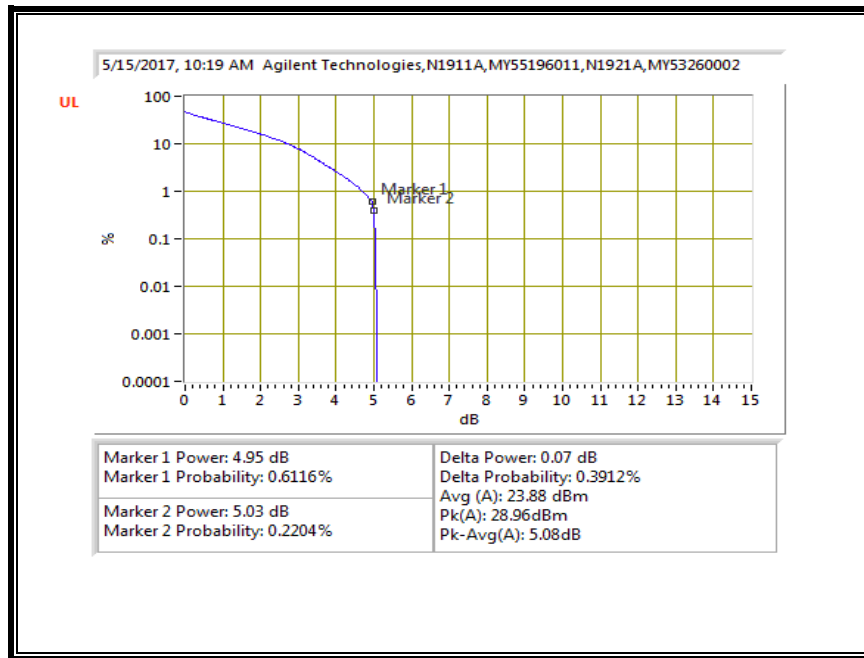


**16QAM, (20.0 MHz BAND WIDTH)**

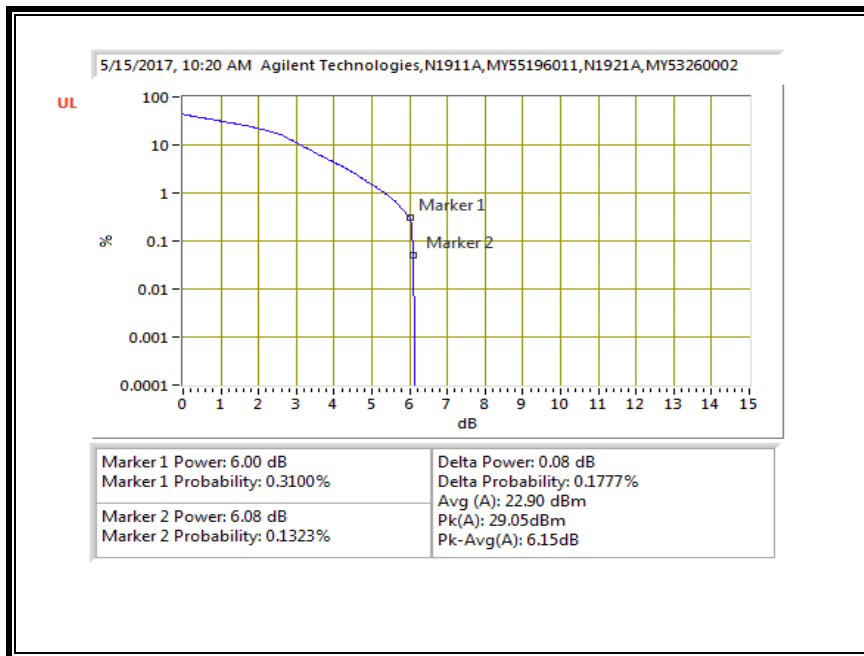


### 8.5.5. LTE BAND 12

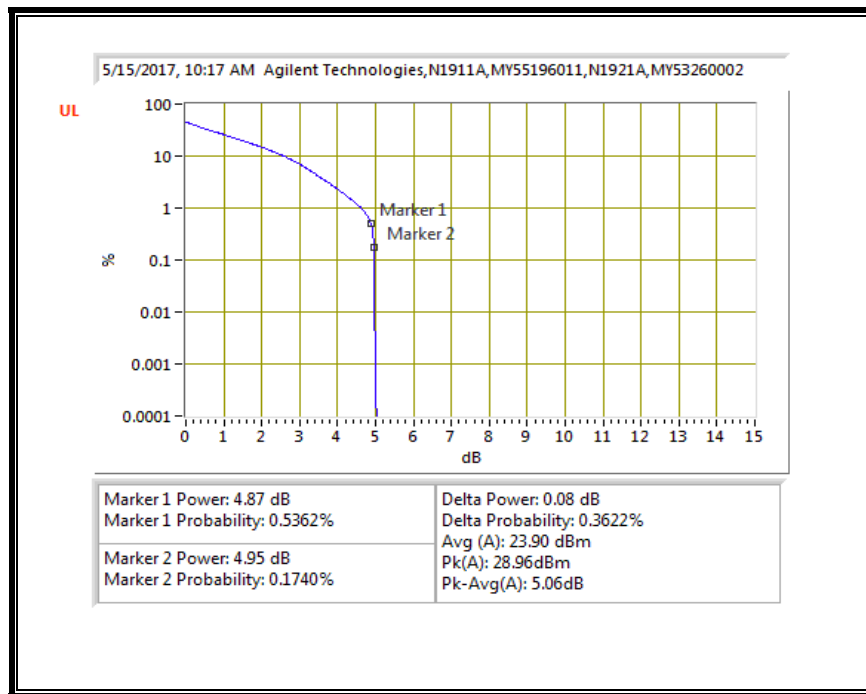
#### QPSK, (1.4 MHz BAND WIDTH)



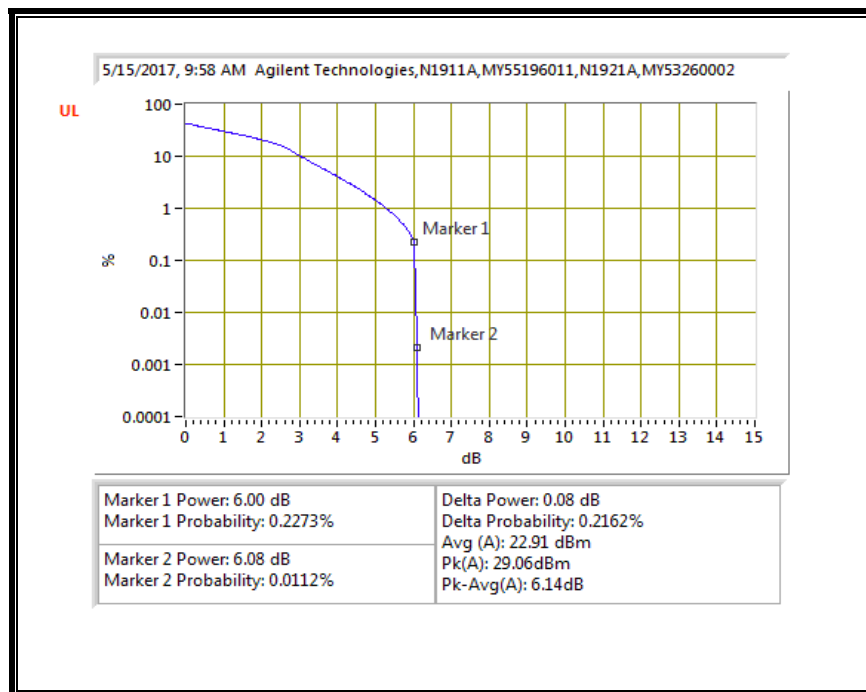
#### 16QAM, (1.4 MHz BAND WIDTH)



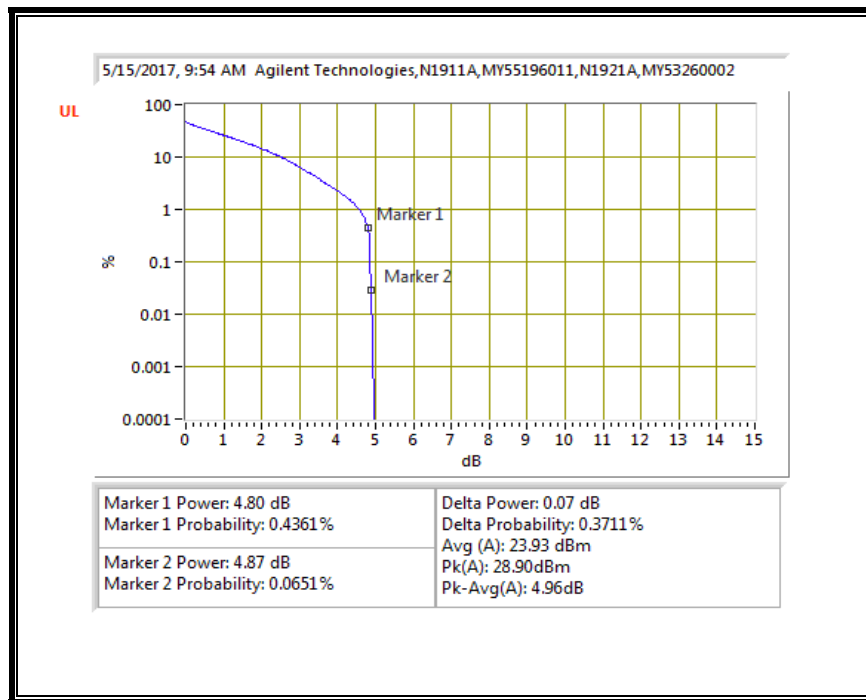
**QPSK, (3.0 MHz BAND WIDTH)**



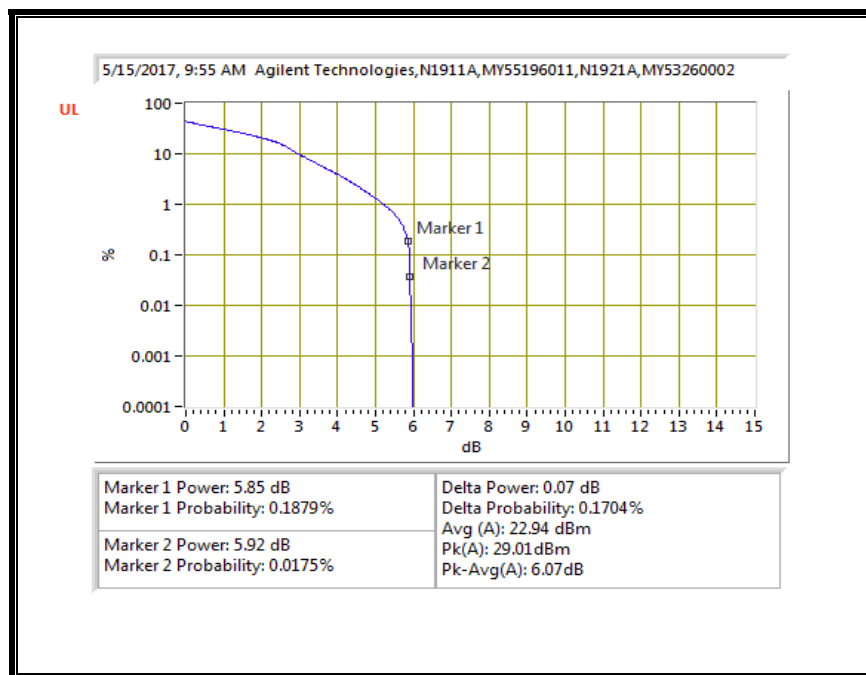
**16QAM, (3.0 MHz BAND WIDTH)**



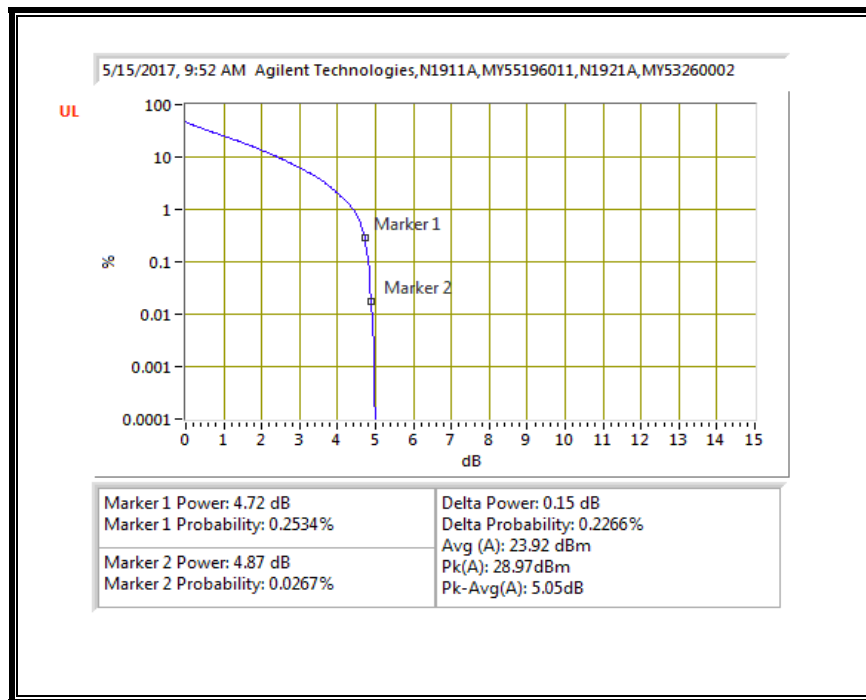
**QPSK, (5.0 MHz BAND WIDTH)**



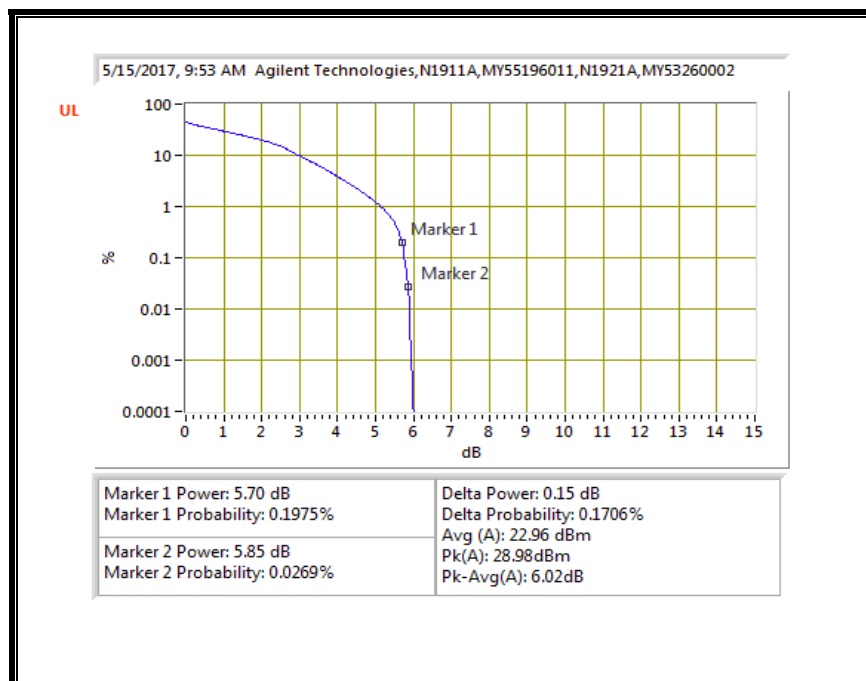
**16QAM, (5.0 MHz BAND WIDTH)**



**QPSK, (10.0 MHz BAND WIDTH)**

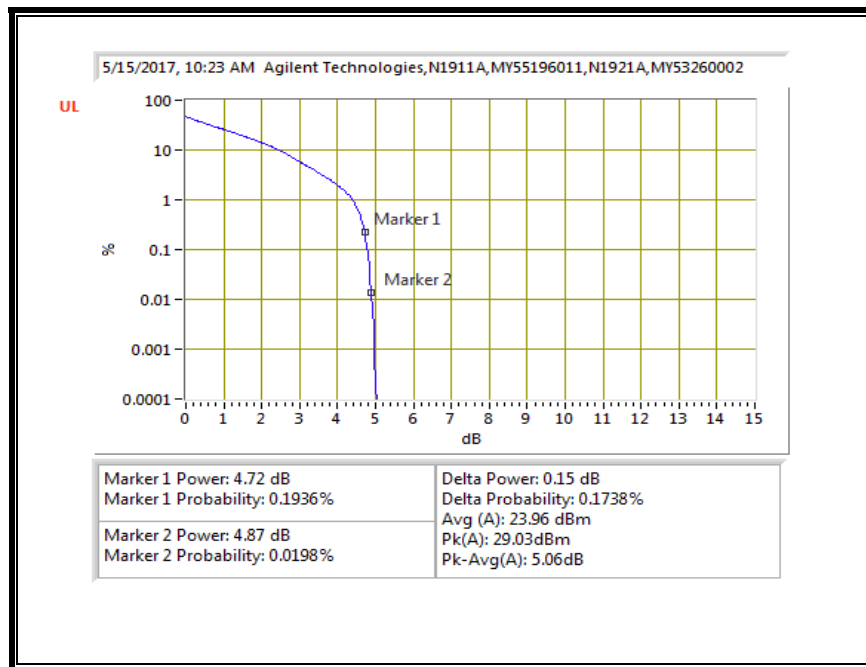


**16QAM, (10.0 MHz BAND WIDTH)**

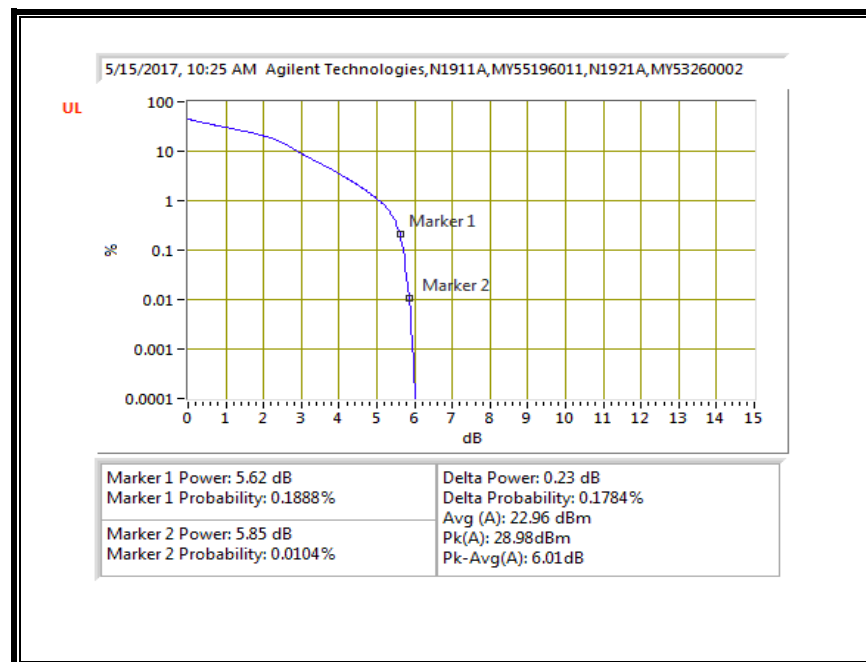


### 8.5.6. LTE BAND 13

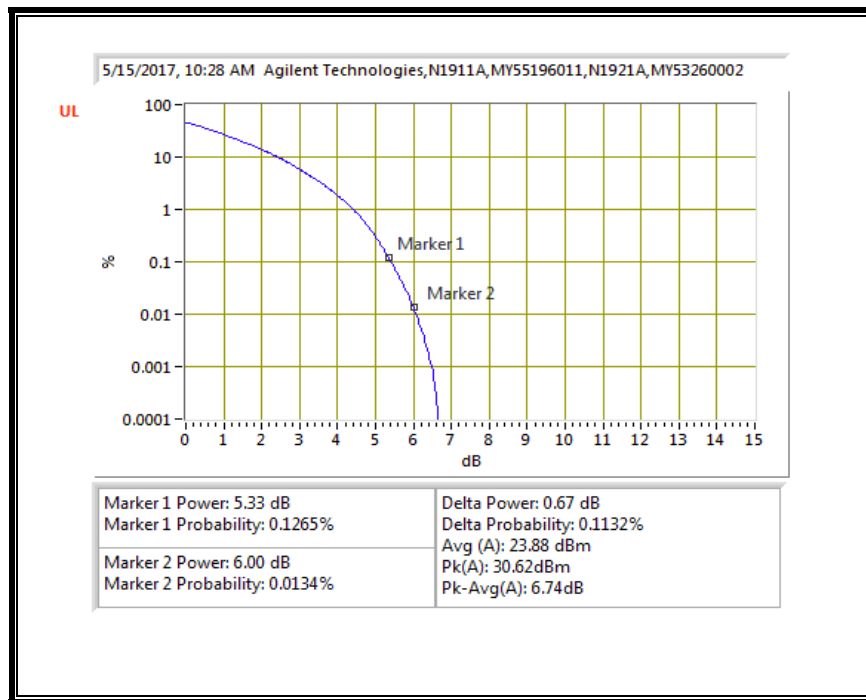
#### QPSK, (5.0 MHz BAND WIDTH)



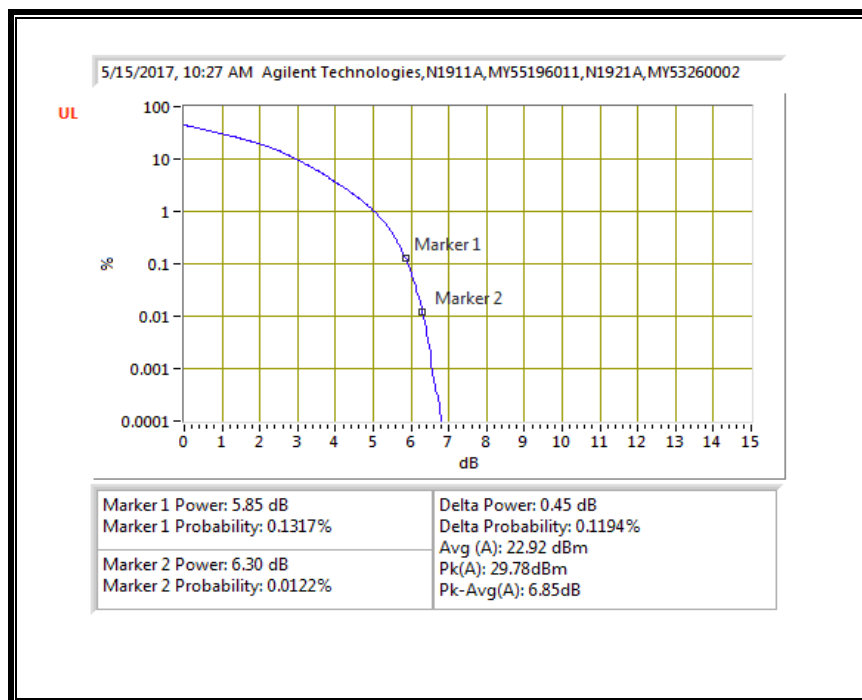
#### 16QAM, (5.0 MHz BAND WIDTH)



**QPSK, (10.0 MHz BAND WIDTH)**

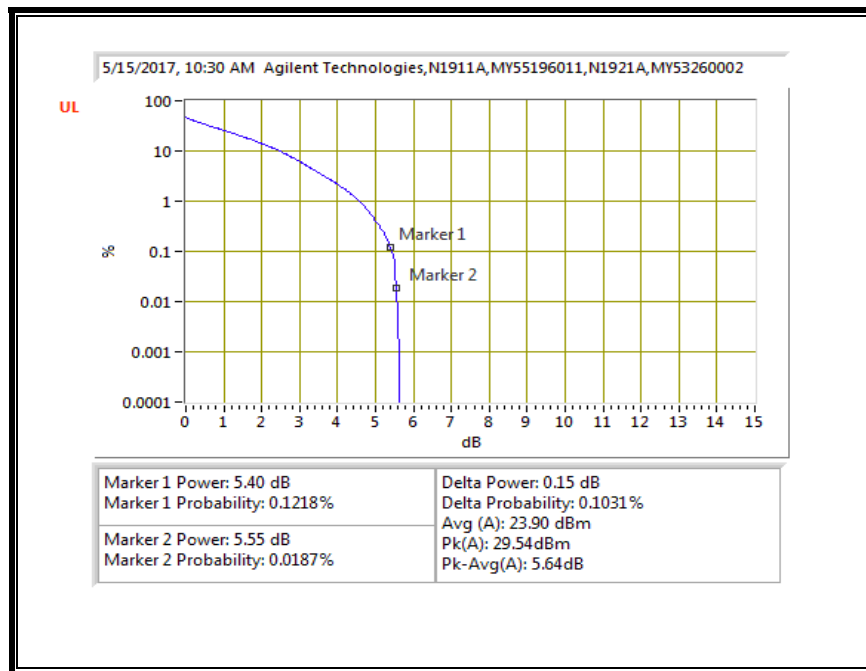


**16QAM, (10.0 MHz BAND WIDTH)**

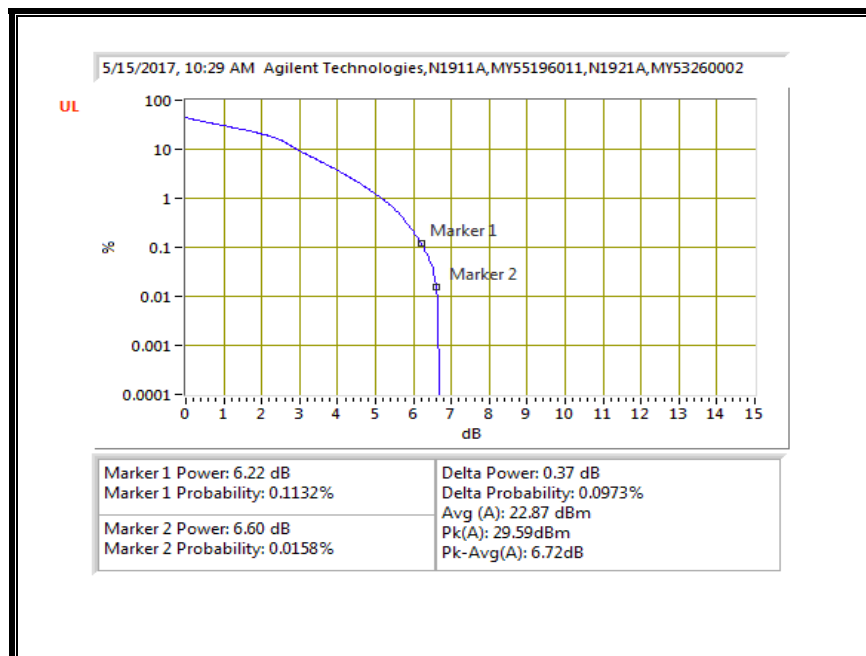


### 8.5.7. LTE BAND 17

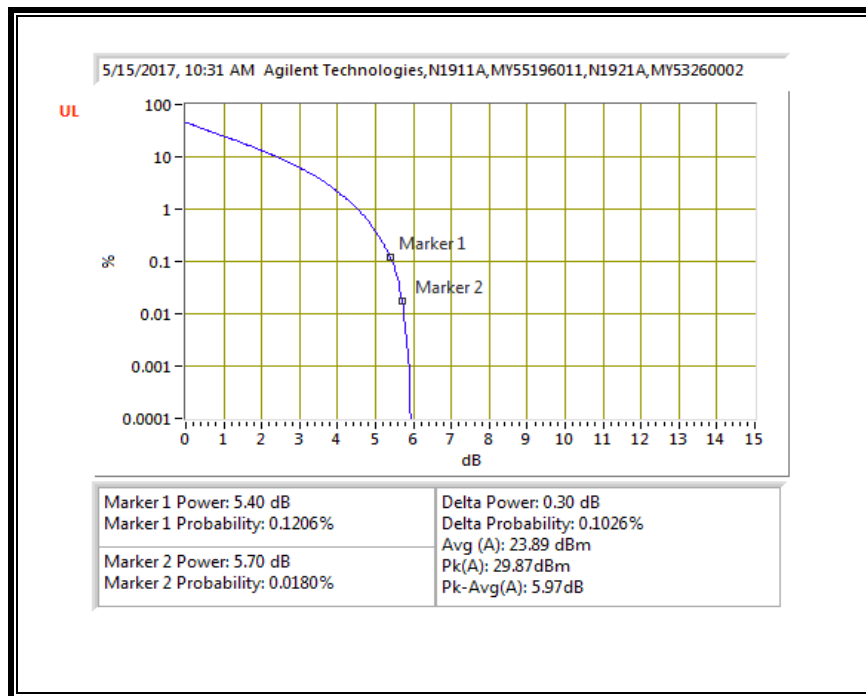
#### QPSK, (5.0 MHz BAND WIDTH)



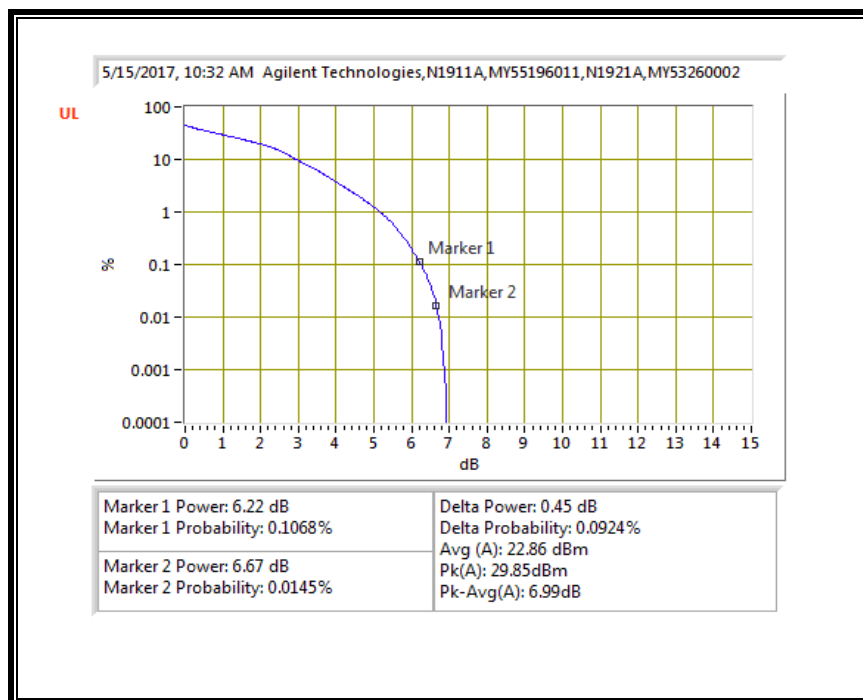
#### 16QAM, (5.0 MHz BAND WIDTH)



**QPSK, (10.0 MHz BAND WIDTH)**

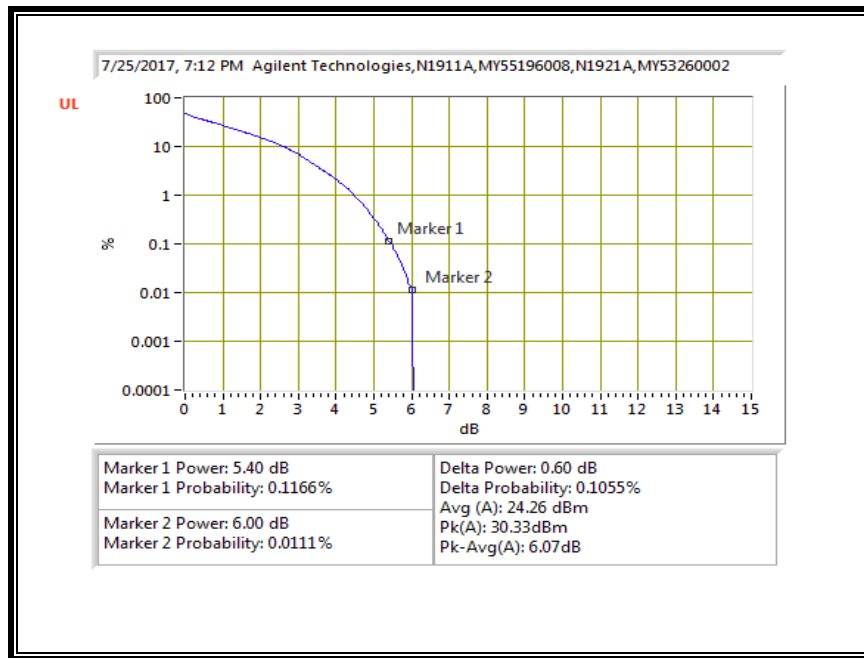


**16QAM, (10.0 MHz BAND WIDTH)**

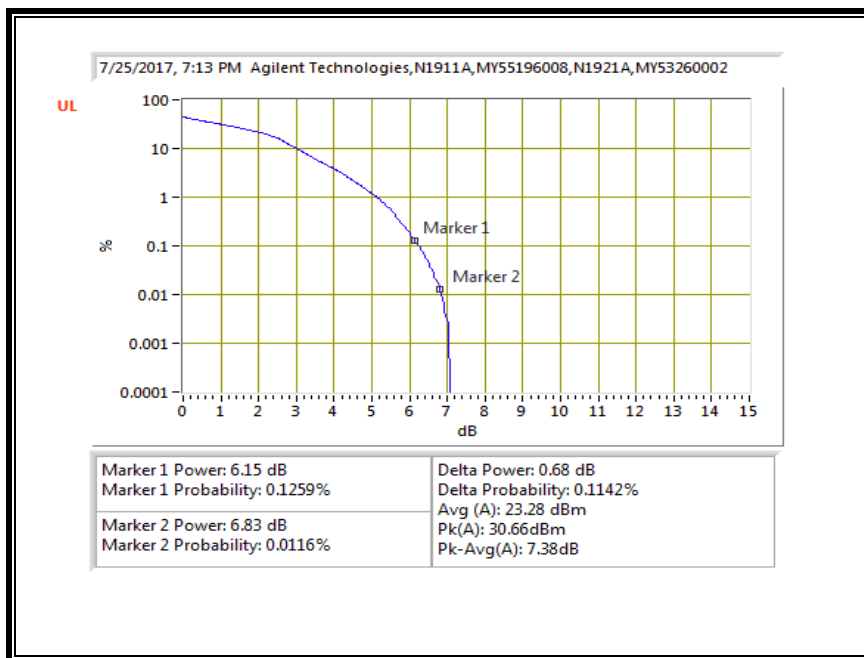


### 8.5.8. LTE BAND 25

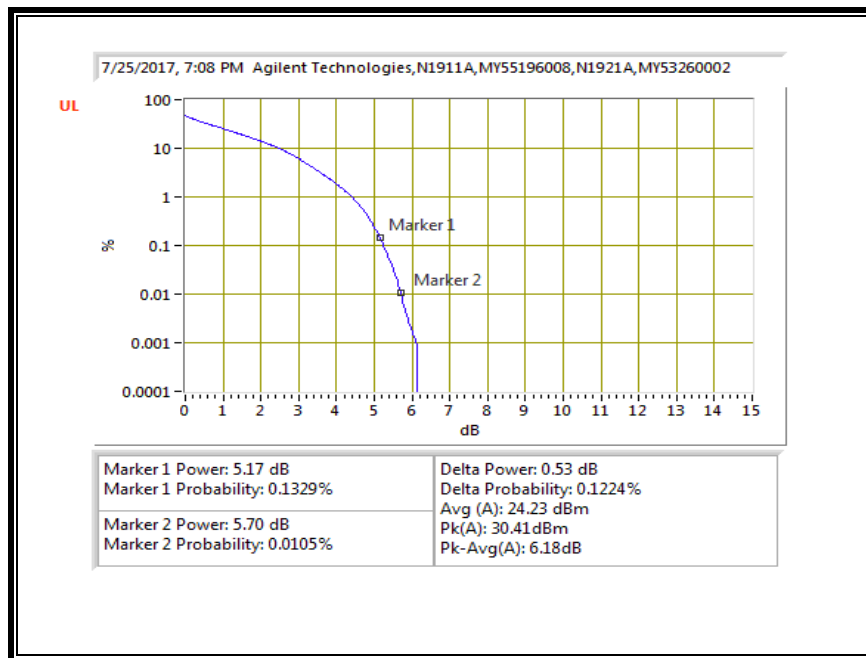
#### QPSK, (1.4 MHz BAND WIDTH)



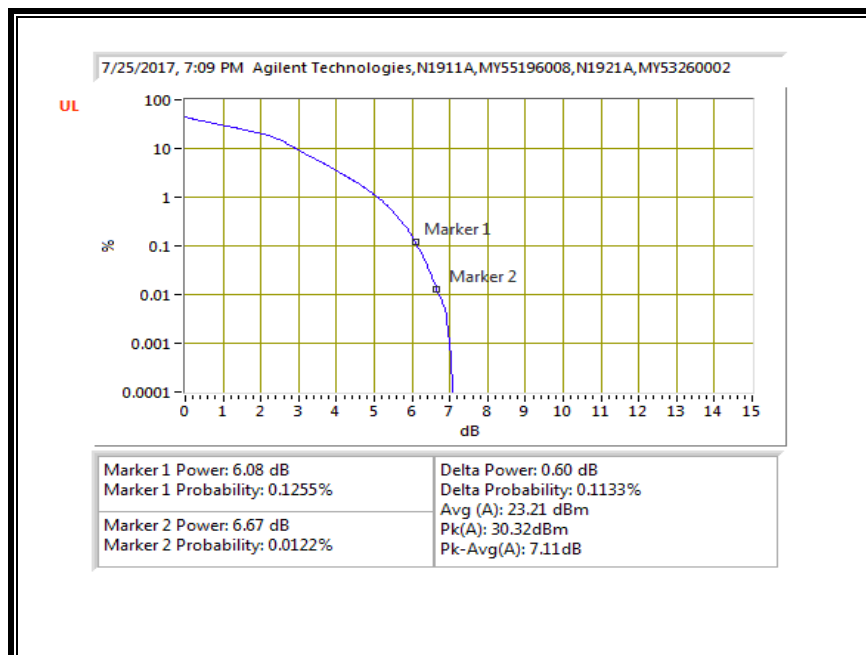
#### 16QAM, (1.4 MHz BAND WIDTH)



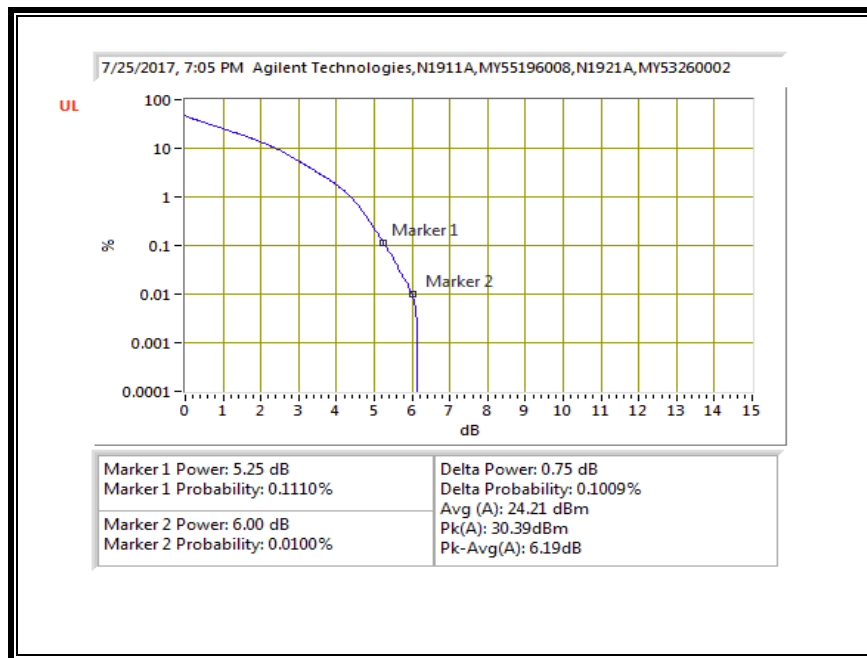
**QPSK, (3.0 MHz BAND WIDTH)**



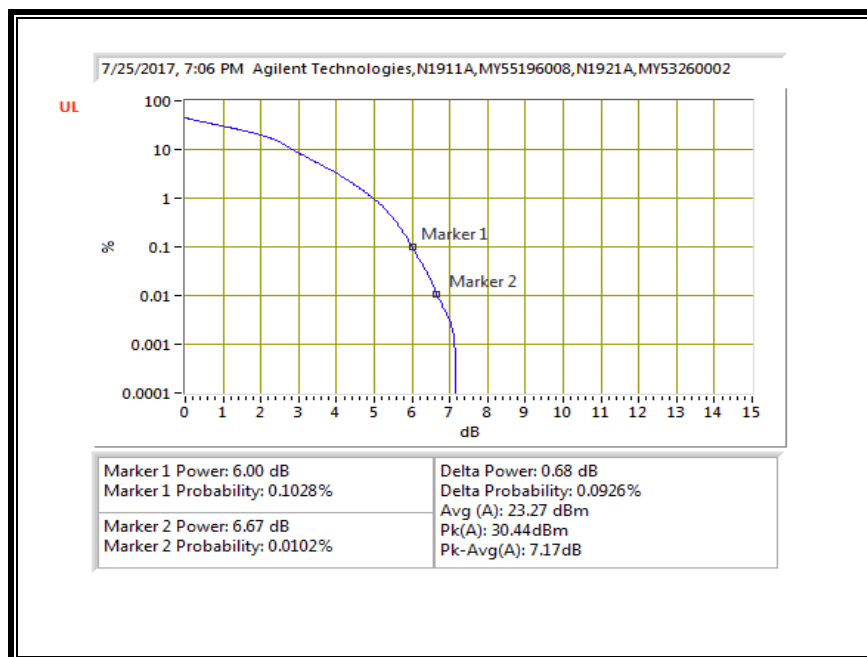
**16QAM, (3.0 MHz BAND WIDTH)**



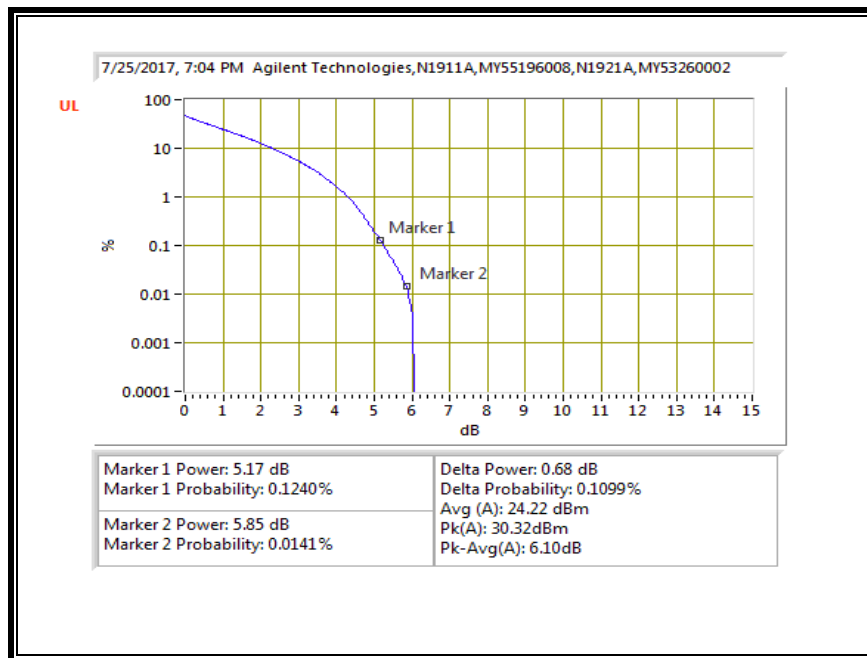
**QPSK, (5.0 MHz BAND WIDTH)**



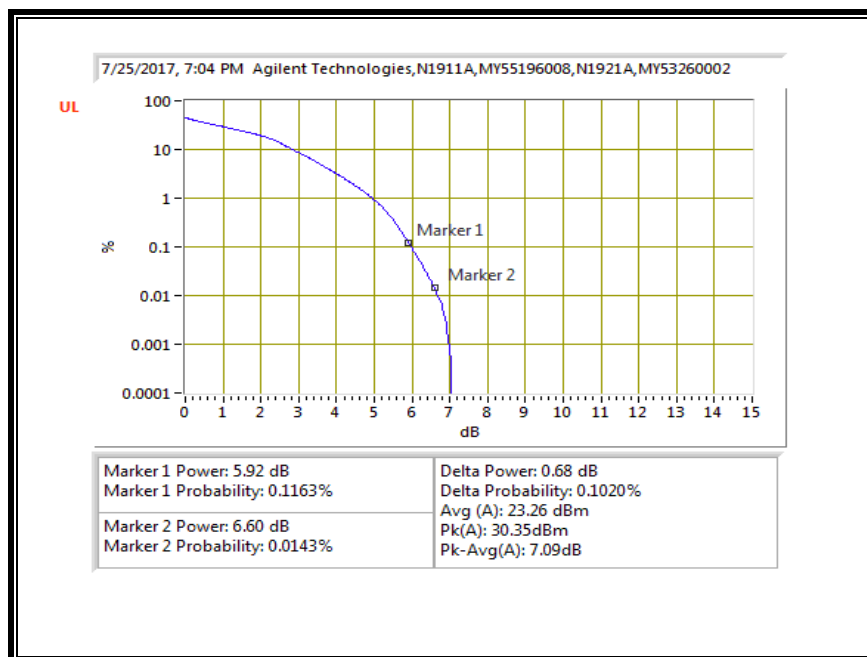
**16QAM, (5.0 MHz BAND WIDTH)**



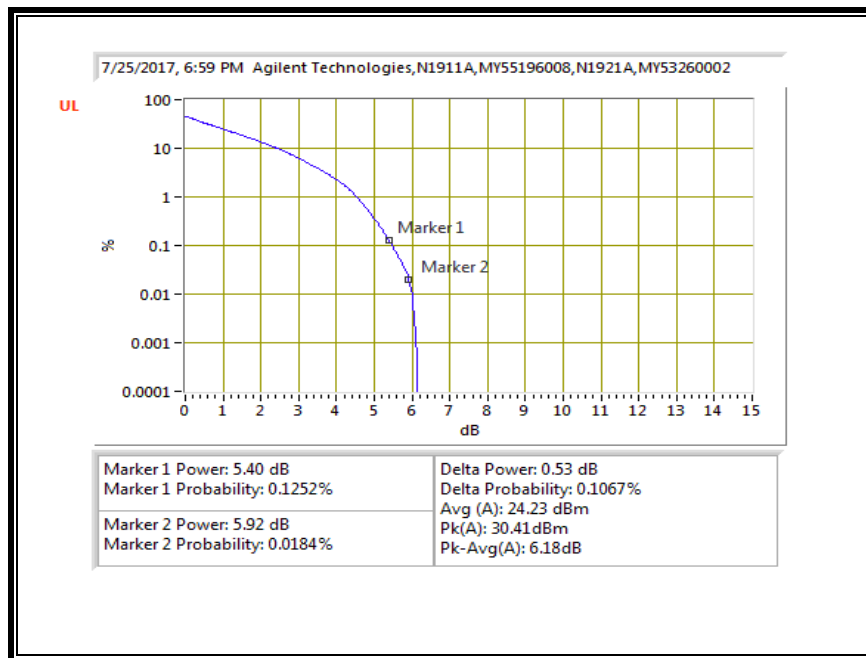
**QPSK, (10.0 MHz BAND WIDTH)**



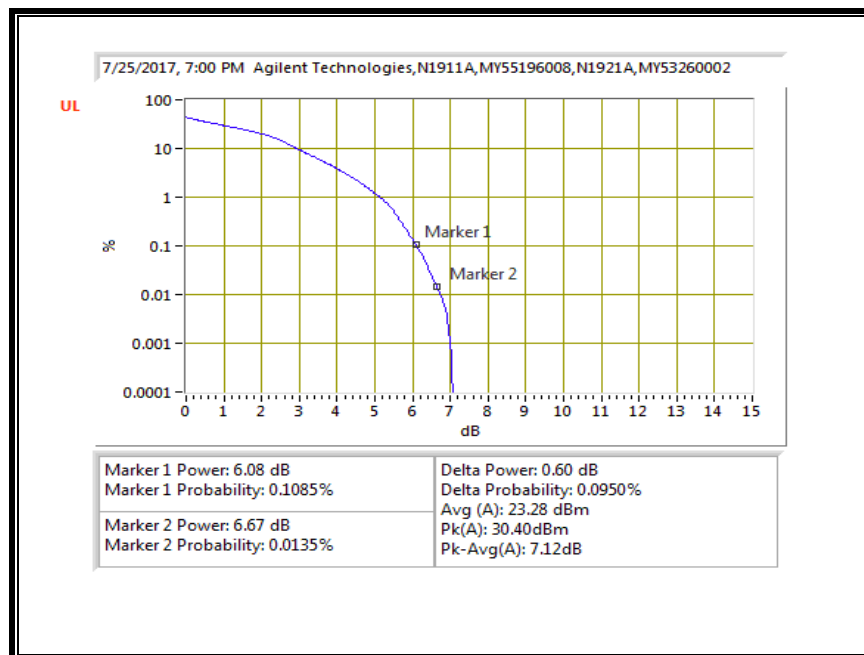
**16QAM, (10.0 MHz BAND WIDTH)**



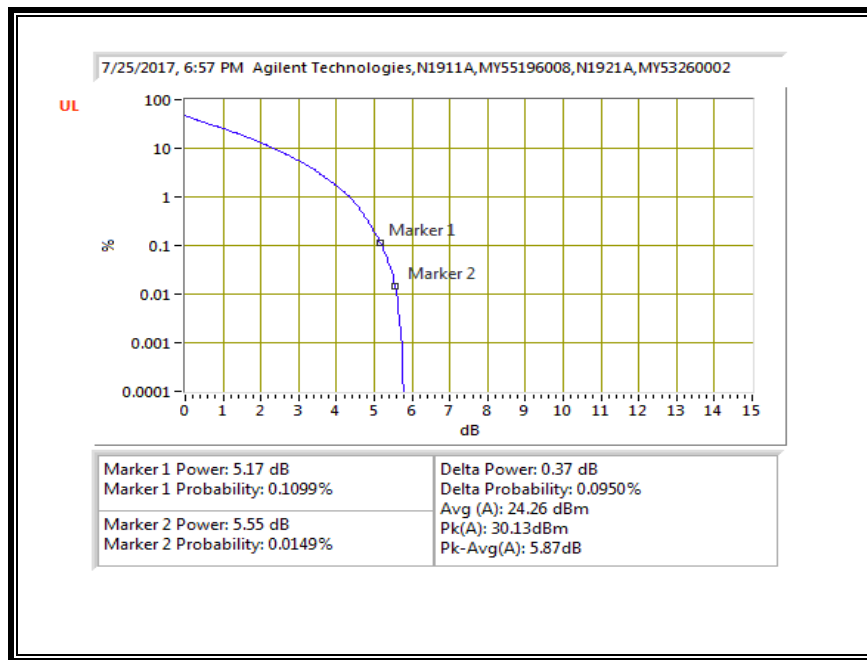
**QPSK, (15.0 MHz BAND WIDTH)**



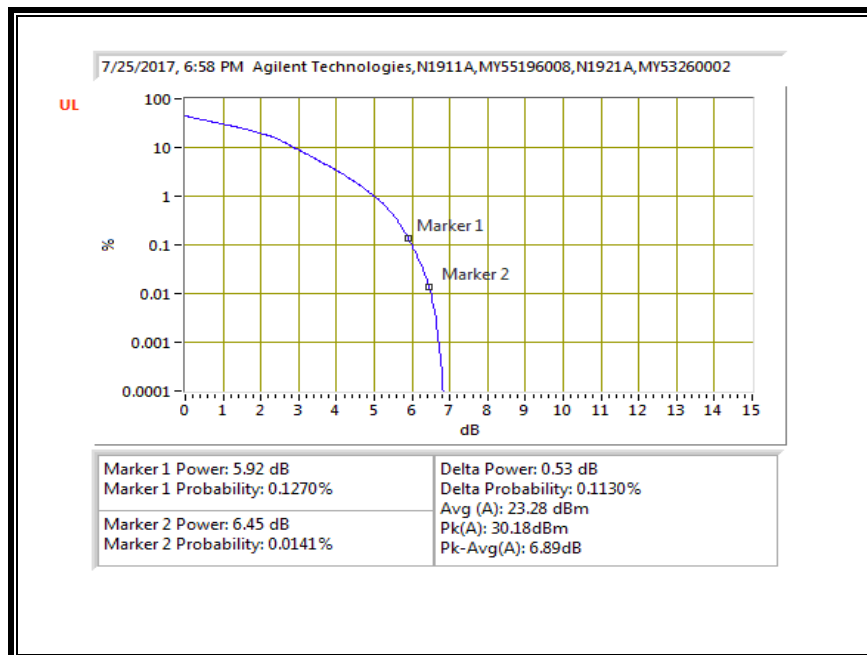
**16QAM, (15.0 MHz BAND WIDTH)**



**QPSK, (20.0 MHz BAND WIDTH)**

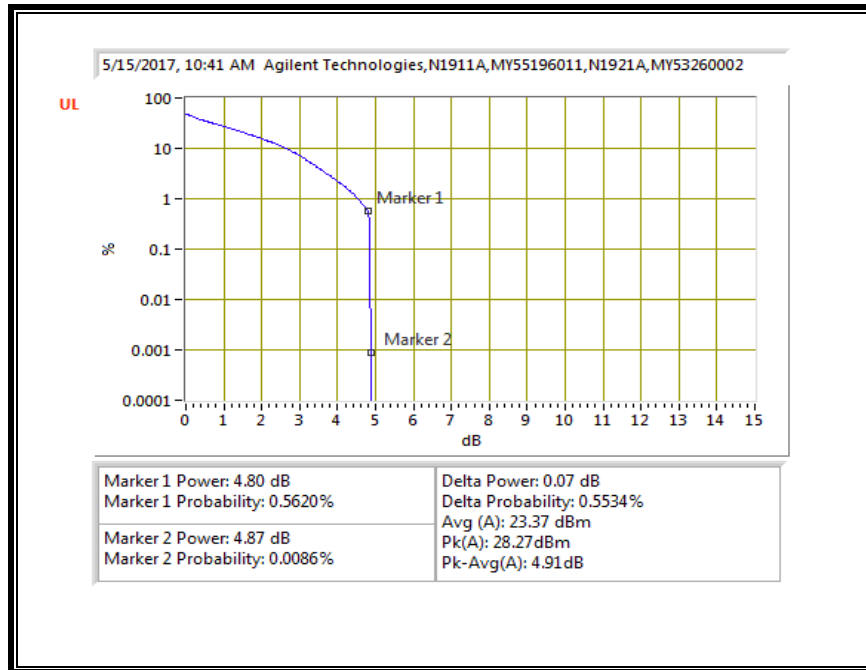


**16QAM, (20.0 MHz BAND WIDTH)**

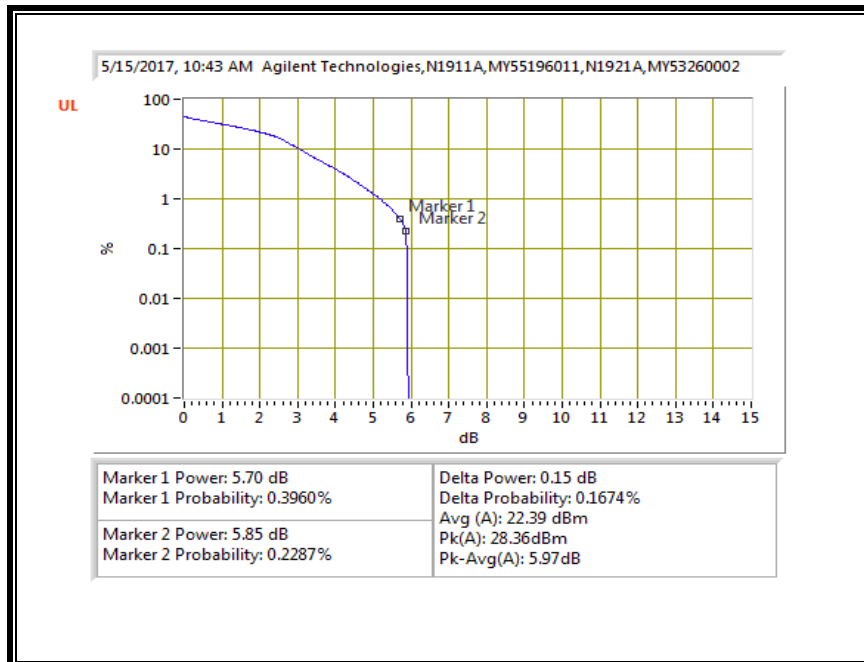


## 8.5.9. LTE BAND 26

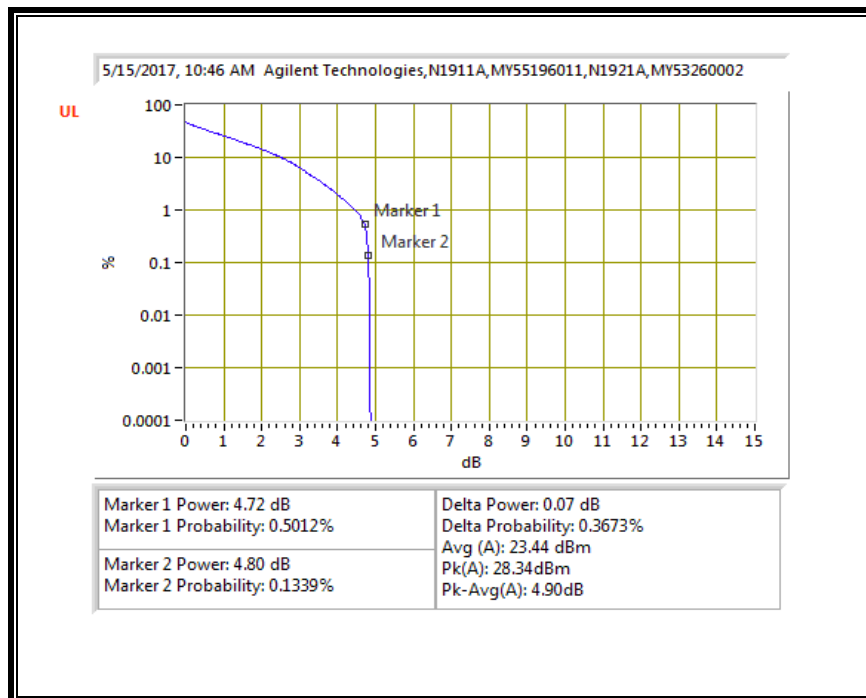
### QPSK, (1.4 MHz BAND WIDTH)



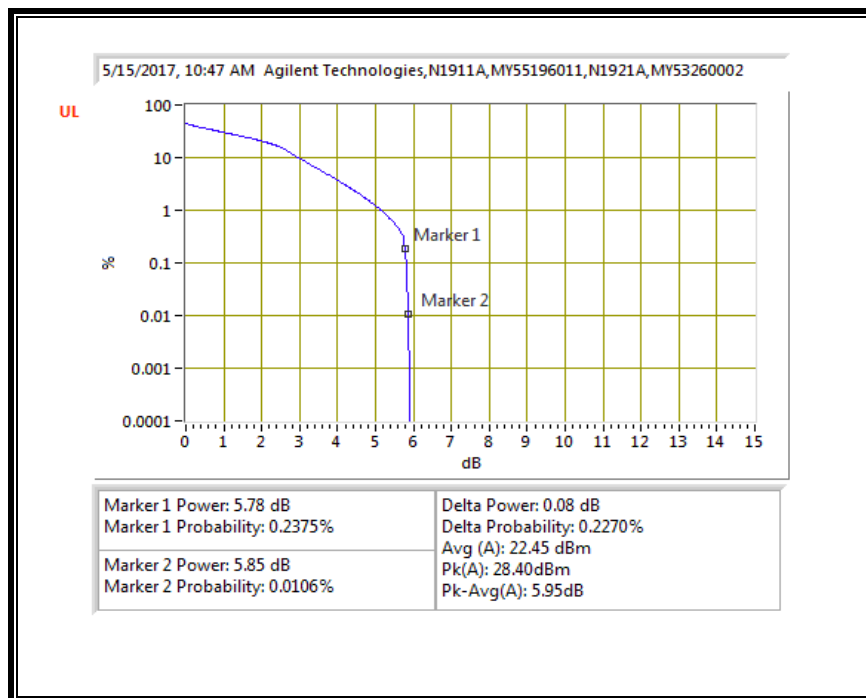
### 16QAM, (1.4 MHz BAND WIDTH)



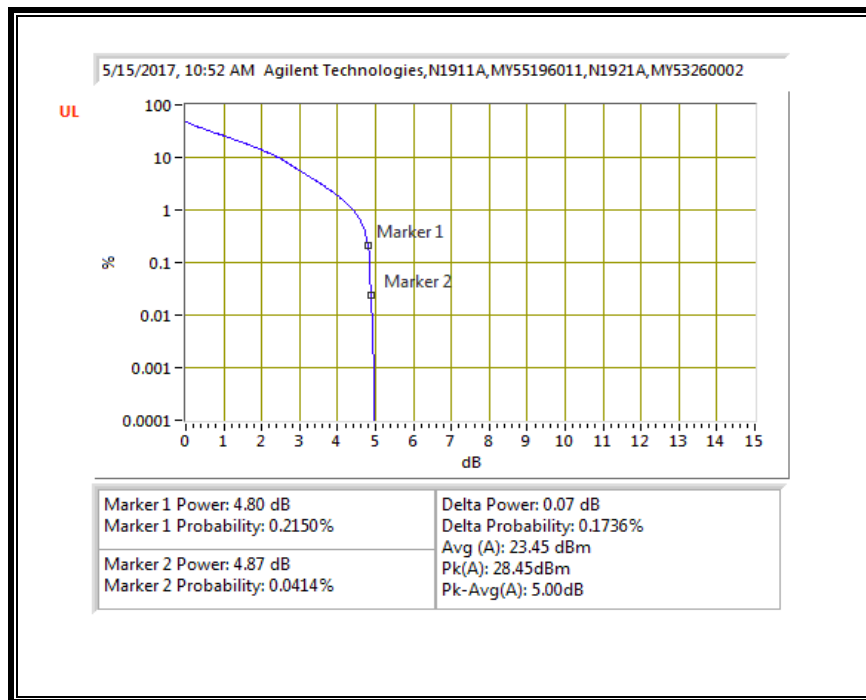
**QPSK, (3.0 MHz BAND WIDTH)**



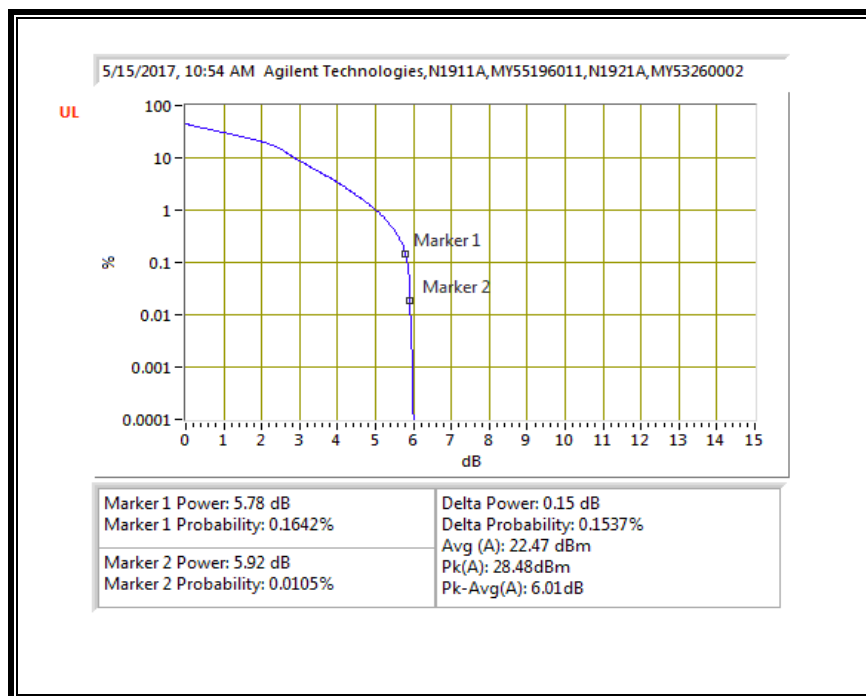
**16QAM, (3.0 MHz BAND WIDTH)**



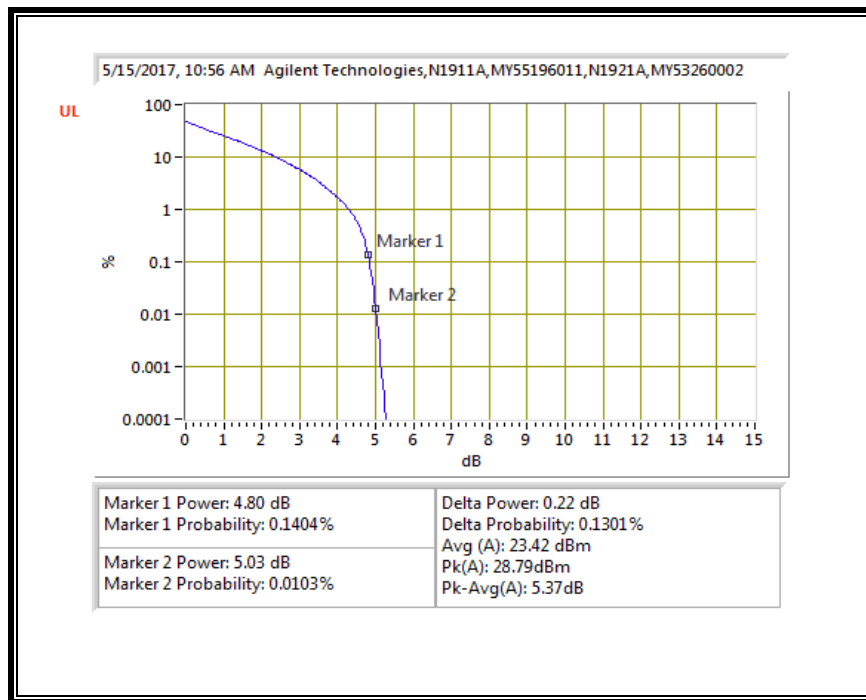
**QPSK, (5.0 MHz BAND WIDTH)**



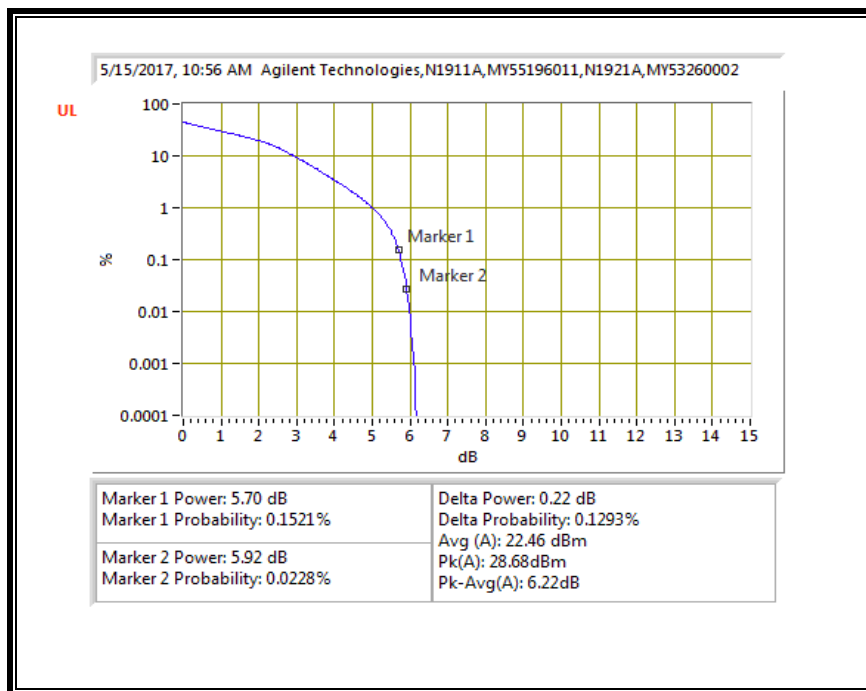
**16QAM, (5.0 MHz BAND WIDTH)**



**QPSK, (10.0 MHz BAND WIDTH)**

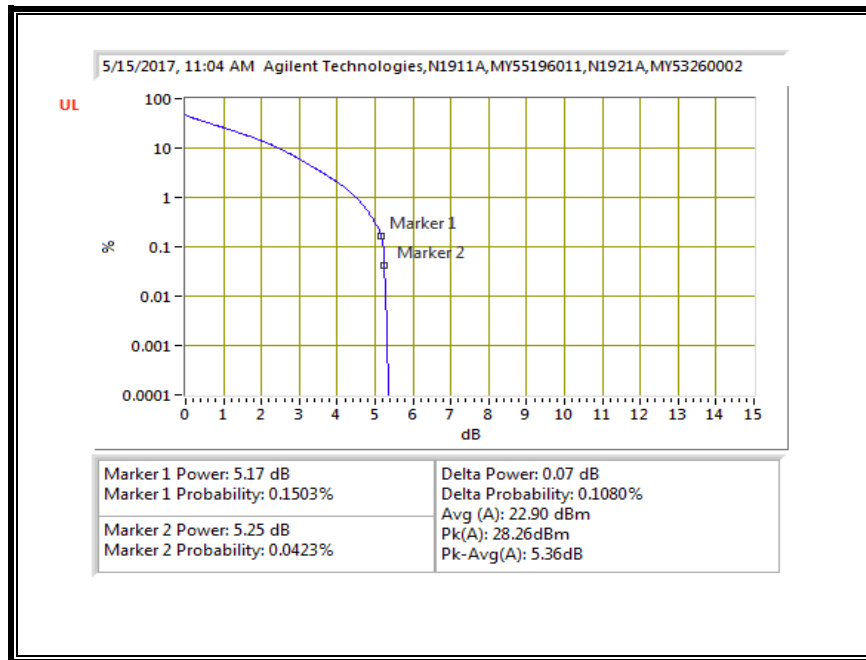


**16QAM, (10.0 MHz BAND WIDTH)**

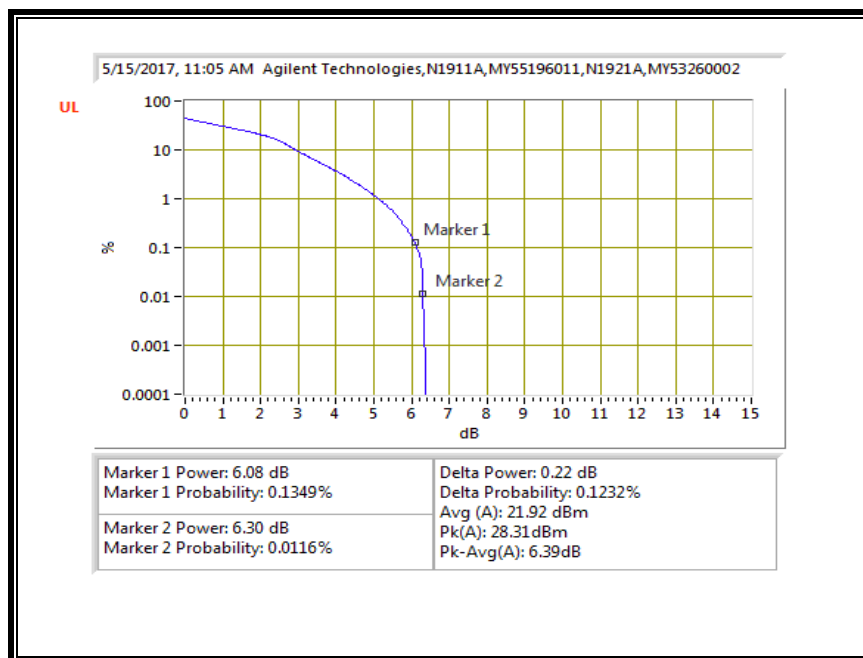


## 8.5.10. LTE BAND 30

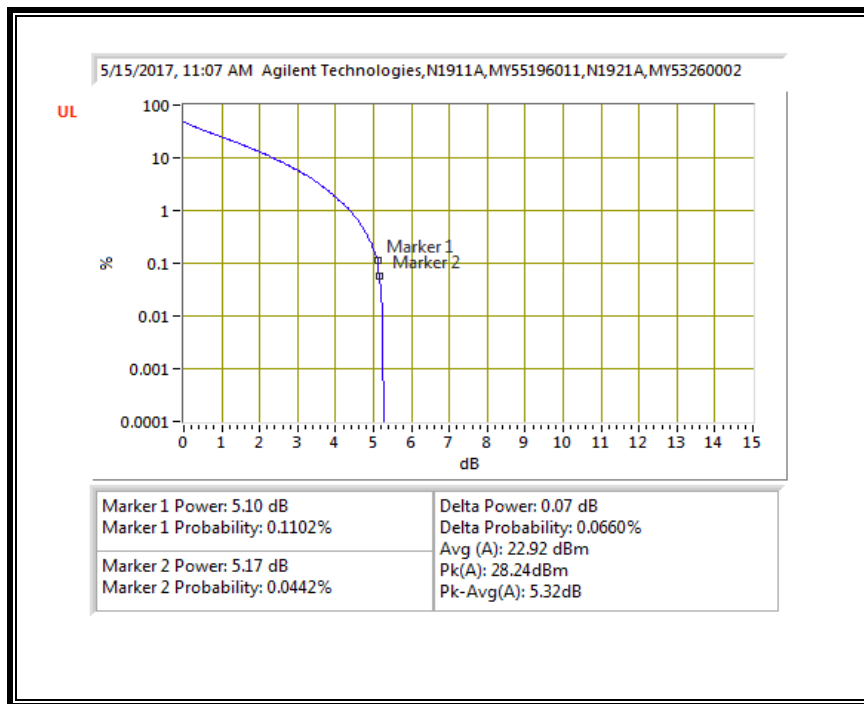
### QPSK, (5.0 MHz BAND WIDTH)



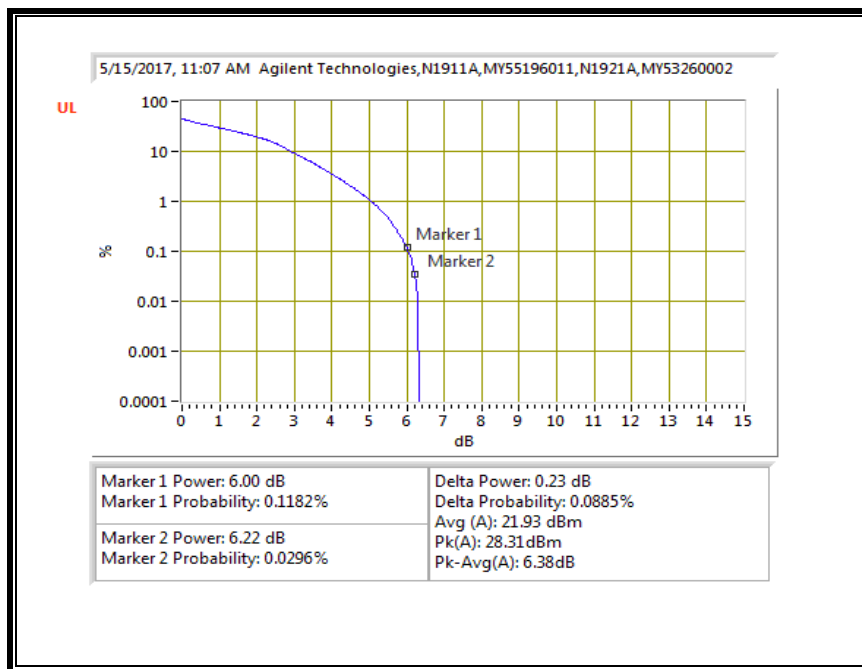
### 16QAM, (5.0 MHz BAND WIDTH)



**QPSK, (10.0 MHz BAND WIDTH)**



**16QAM, (10.0 MHz BAND WIDTH)**



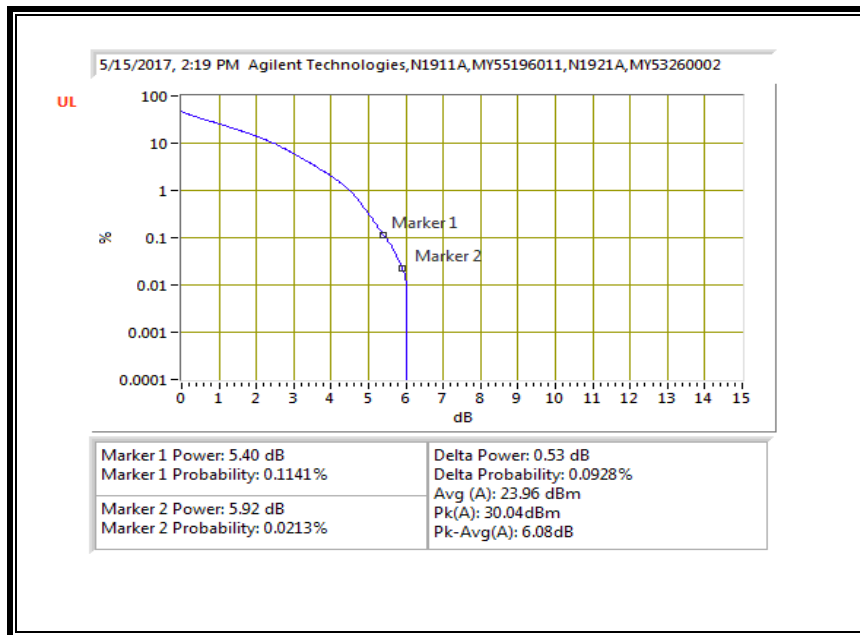
### 8.5.11. LTE BAND 41

|            |       |              |         |
|------------|-------|--------------|---------|
| <b>ID:</b> | 50820 | <b>Date:</b> | 5/15/17 |
|------------|-------|--------------|---------|

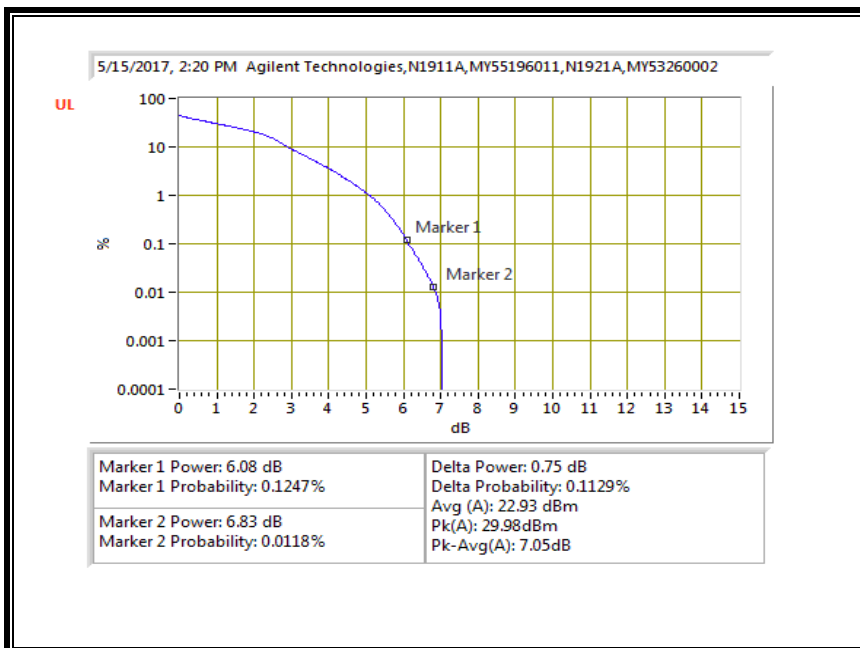
| Mode                                                                                 | Channel Band- | Frequency (MHz) | RB Size | RB OffSet | Modulation | Conducted Power (dBm) |         | Peak-to-Average Ratio |
|--------------------------------------------------------------------------------------|---------------|-----------------|---------|-----------|------------|-----------------------|---------|-----------------------|
|                                                                                      |               |                 |         |           |            | Peak                  | Average |                       |
| LTE Band 41                                                                          | 5MHz          | 2593.0          | 25      | 0         | QPSK       | 26.82                 | 16.92   | 2.91                  |
|                                                                                      |               |                 |         |           | 16QAM      | 26.84                 | 15.92   | 3.93                  |
|                                                                                      | 10MHz         |                 | 50      | 0         | QPSK       | 26.82                 | 16.96   | 2.87                  |
|                                                                                      |               |                 |         |           | 16QAM      | 26.85                 | 15.99   | 3.87                  |
|                                                                                      | 15MHz         |                 | 75      | 0         | QPSK       | 26.79                 | 16.93   | 2.87                  |
|                                                                                      |               |                 |         |           | 16QAM      | 26.82                 | 15.95   | 3.88                  |
|                                                                                      | 20MHz         |                 | 100     | 0         | QPSK       | 26.71                 | 16.97   | 2.75                  |
|                                                                                      |               |                 |         |           | 16QAM      | 26.76                 | 15.99   | 3.78                  |
| Duty Cycle Correction Factor (dB)=                                                   |               |                 | 6.99    |           |            |                       |         |                       |
| Peak to Average Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor |               |                 |         |           |            |                       |         |                       |

## 8.5.12. LTE BAND 66

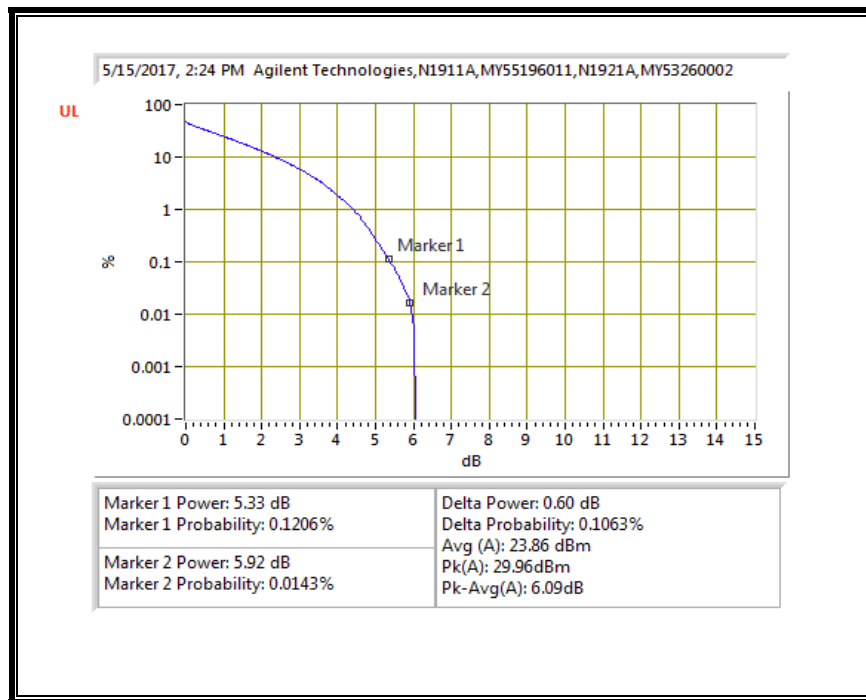
### QPSK, (5.0 MHz BAND WIDTH)



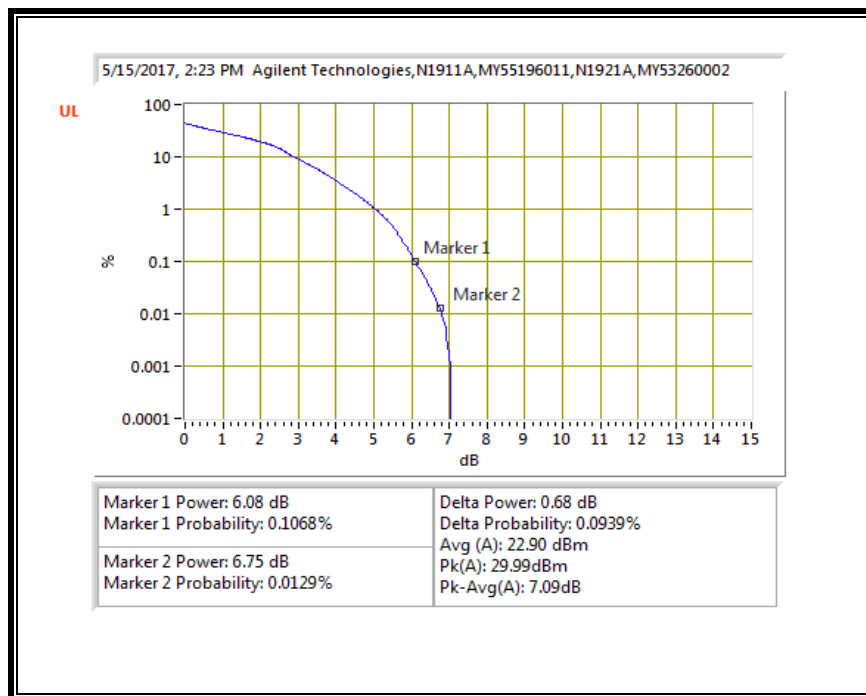
### 16QAM, (5.0 MHz BAND WIDTH)



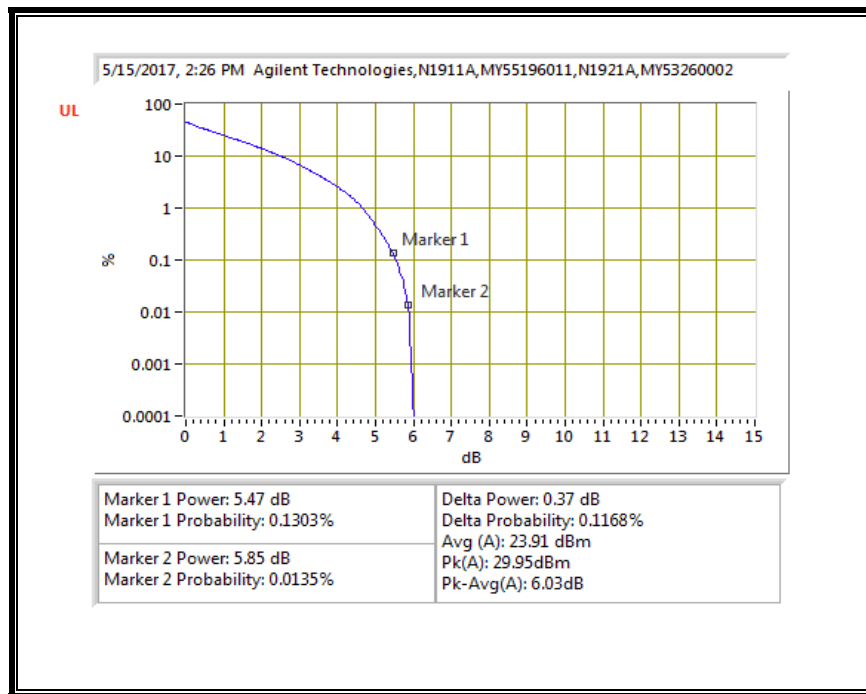
**QPSK, (10.0 MHz BAND WIDTH)**



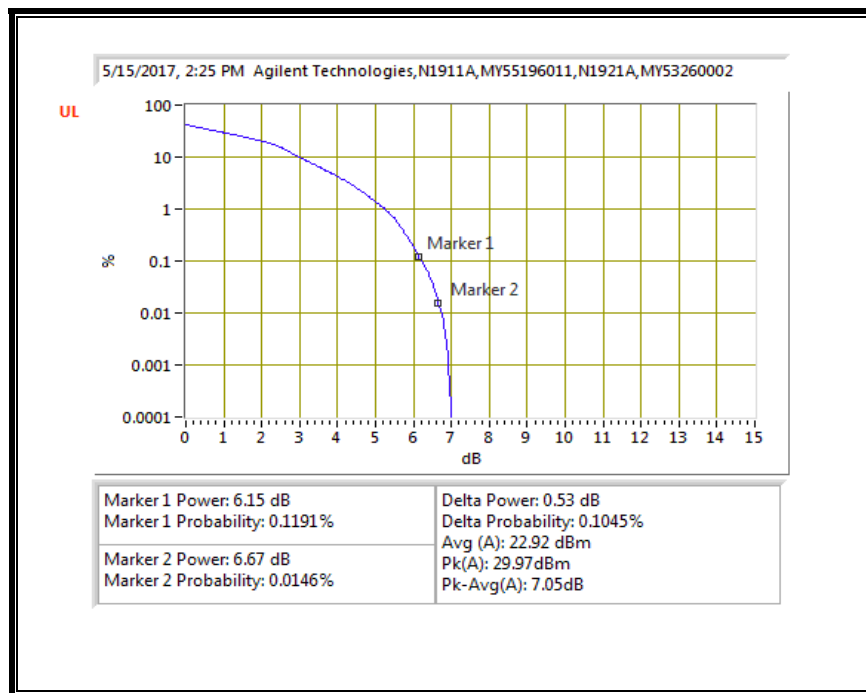
**16QAM, (10.0 MHz BAND WIDTH)**



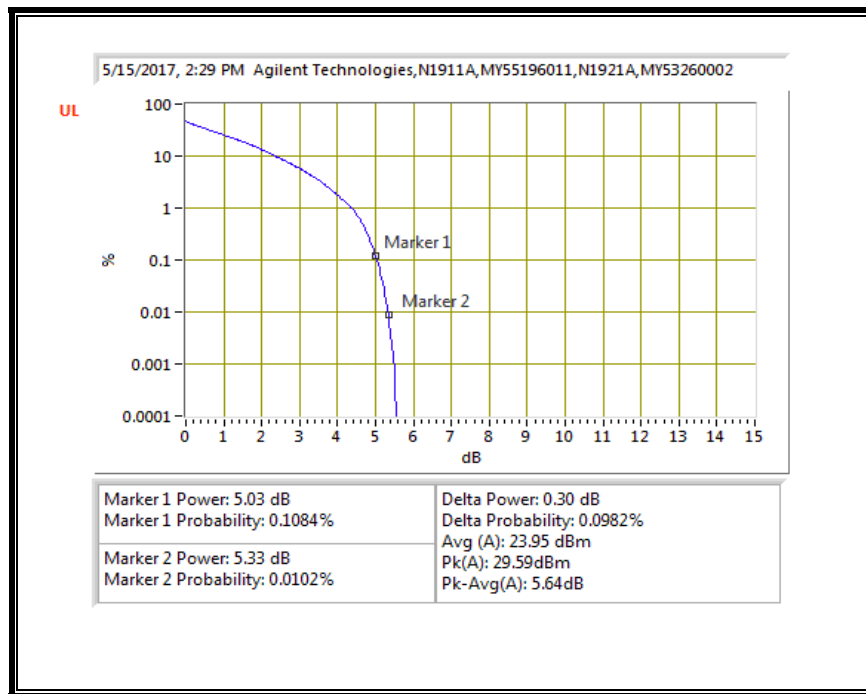
**QPSK, (15.0 MHz BAND WIDTH)**



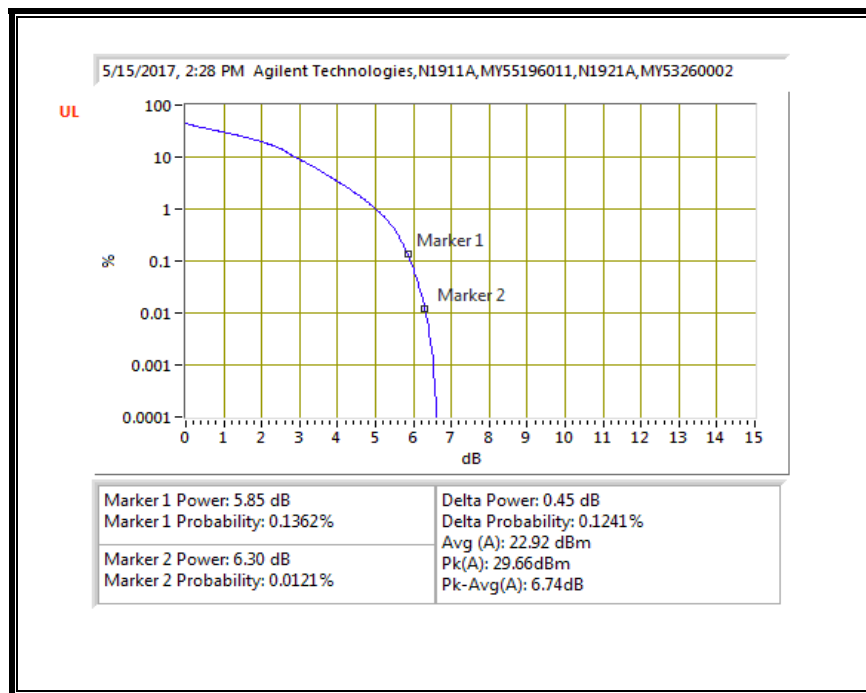
**16QAM, (15.0 MHz BAND WIDTH)**



**QPSK, (20.0 MHz BAND WIDTH)**



**16QAM, (20.0 MHz BAND WIDTH)**



## 9. RADIATED TEST RESULTS

### 9.1. FIELD STRENGTH OF SPURIOUS RADIATION, LAT 1

#### RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53, §90.691

#### LIMIT

FCC: §22.917 (e) and §24.238 (a): Out of band emissions. 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.

FCC: §27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.

FCC: §27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

## **TEST PROCEDURE**

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power,  $P$  (dBW), as follows:

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \log_{10}(p)$ , dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than  $43 + 10 \log_{10}(p)$ , dB at the channel edges and  $55 + 10 \log_{10}(p)$  at 5.5 MHz away and beyond the channel edges where  $p$  in (a) and (b) is the transmitter power measured in watts.

**MODES TESTED**

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

**RESULTS**

## 9.1.1. LTE BAND 2

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

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                         |                  |                 |               |                         |        |            |       |       |       |       |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|---------------|-------------------------|--------|------------|-------|-------|-------|-------|--|
| <b>Company:</b><br><b>Project #:</b> 11792114<br><b>Date:</b> 05/31/17<br><b>Test Engineer:</b> 39004<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 2, 20MHz QPSK |                  |                 |               |                         |        |            |       |       |       |       |  |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                               |                  |                 |               |                         |        |            |       |       |       |       |  |
| Chamber                                                                                                                                                                        |                  |                 | Pre-amplifier |                         |        | Filter     |       |       | Limit |       |  |
| 3m Chamber E                                                                                                                                                                   |                  |                 | 3m Chamber E  |                         |        | Filter     |       |       | EIRP  |       |  |
| Frequency (GHz)                                                                                                                                                                | SA reading (dBm) | Ant. Pol. (H/V) | Distance      | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |  |
| <b>Low Channel (1860MHz)</b>                                                                                                                                                   |                  |                 |               |                         |        |            |       |       |       |       |  |
| 3.72                                                                                                                                                                           | -63.6            | H               | 3.0           | -13.6                   | 38.6   | 1.0        | -51.2 | -13.0 | -38.2 |       |  |
| 5.58                                                                                                                                                                           | -65.7            | H               | 3.0           | -11.6                   | 38.6   | 1.0        | -49.1 | -13.0 | -36.1 |       |  |
| 7.44                                                                                                                                                                           | -66.4            | H               | 3.0           | -8.6                    | 37.8   | 1.0        | -45.4 | -13.0 | -32.4 |       |  |
| 3.72                                                                                                                                                                           | -63.5            | V               | 3.0           | -13.5                   | 38.6   | 1.0        | -51.1 | -13.0 | -38.1 |       |  |
| 5.58                                                                                                                                                                           | -65.9            | V               | 3.0           | -12.1                   | 38.6   | 1.0        | -49.6 | -13.0 | -36.6 |       |  |
| 7.44                                                                                                                                                                           | -66.5            | V               | 3.0           | -9.0                    | 37.8   | 1.0        | -45.8 | -13.0 | -32.8 |       |  |
| <b>Mid Channel (1880MHz)</b>                                                                                                                                                   |                  |                 |               |                         |        |            |       |       |       |       |  |
| 3.76                                                                                                                                                                           | -64.4            | H               | 3.0           | -14.3                   | 38.6   | 1.0        | -51.9 | -13.0 | -38.9 |       |  |
| 5.64                                                                                                                                                                           | -65.1            | H               | 3.0           | -10.9                   | 38.5   | 1.0        | -48.4 | -13.0 | -35.4 |       |  |
| 7.52                                                                                                                                                                           | -66.3            | H               | 3.0           | -8.4                    | 37.7   | 1.0        | -45.2 | -13.0 | -32.2 |       |  |
| 3.76                                                                                                                                                                           | -64.3            | V               | 3.0           | -14.3                   | 38.6   | 1.0        | -51.9 | -13.0 | -38.9 |       |  |
| 5.64                                                                                                                                                                           | -65.2            | V               | 3.0           | -11.3                   | 38.5   | 1.0        | -48.8 | -13.0 | -35.8 |       |  |
| 7.52                                                                                                                                                                           | -66.3            | V               | 3.0           | -8.6                    | 37.7   | 1.0        | -45.4 | -13.0 | -32.4 |       |  |
| <b>High Channel (1900MHz)</b>                                                                                                                                                  |                  |                 |               |                         |        |            |       |       |       |       |  |
| 3.80                                                                                                                                                                           | -64.1            | H               | 3.0           | -13.9                   | 38.6   | 1.0        | -51.6 | -13.0 | -38.6 |       |  |
| 5.70                                                                                                                                                                           | -65.5            | H               | 3.0           | -11.1                   | 38.5   | 1.0        | -48.6 | -13.0 | -35.6 |       |  |
| 7.60                                                                                                                                                                           | -66.6            | H               | 3.0           | -8.6                    | 37.7   | 1.0        | -45.3 | -13.0 | -32.3 |       |  |
| 3.80                                                                                                                                                                           | -63.9            | V               | 3.0           | -13.7                   | 38.6   | 1.0        | -51.4 | -13.0 | -38.4 |       |  |
| 5.70                                                                                                                                                                           | -65.1            | V               | 3.0           | -11.0                   | 38.5   | 1.0        | -48.5 | -13.0 | -35.5 |       |  |
| 7.60                                                                                                                                                                           | -66.2            | V               | 3.0           | -8.5                    | 37.7   | 1.0        | -45.2 | -13.0 | -32.2 |       |  |
| Rev. 05.21.15                                                                                                                                                                  |                  |                 |               |                         |        |            |       |       |       |       |  |

**16QAM LTE BAND 2 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 05/31/17

**Test Engineer:** 39004

**Configuration:** EUT Only

**Mode:** LTE Band 2, 20MHz 16QAM

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1860MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.72                          | -64.1               | H                  | 3.0      | -14.0                         | 38.6   | 1.0        | -51.7 | -13.0 | -38.7 |       |
| 5.58                          | -65.7               | H                  | 3.0      | -11.6                         | 38.6   | 1.0        | -49.1 | -13.0 | -36.1 |       |
| 7.44                          | -66.9               | H                  | 3.0      | -9.2                          | 37.8   | 1.0        | -46.0 | -13.0 | -33.0 |       |
| 3.72                          | -64.3               | V                  | 3.0      | -14.3                         | 38.6   | 1.0        | -51.9 | -13.0 | -38.9 |       |
| 5.58                          | -65.5               | V                  | 3.0      | -11.7                         | 38.6   | 1.0        | -49.2 | -13.0 | -36.2 |       |
| 7.44                          | -66.2               | V                  | 3.0      | -8.7                          | 37.8   | 1.0        | -45.5 | -13.0 | -32.5 |       |
| <b>Mid Channel (1880MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.76                          | -64.4               | H                  | 3.0      | -14.2                         | 38.6   | 1.0        | -51.9 | -13.0 | -38.9 |       |
| 5.64                          | -65.9               | H                  | 3.0      | -11.6                         | 38.5   | 1.0        | -49.2 | -13.0 | -36.2 |       |
| 7.52                          | -66.8               | H                  | 3.0      | -8.9                          | 37.7   | 1.0        | -45.7 | -13.0 | -32.7 |       |
| 3.76                          | -63.9               | V                  | 3.0      | -13.8                         | 38.6   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 5.64                          | -65.5               | V                  | 3.0      | -11.6                         | 38.5   | 1.0        | -49.2 | -13.0 | -36.2 |       |
| 7.52                          | -66.5               | V                  | 3.0      | -8.8                          | 37.7   | 1.0        | -45.6 | -13.0 | -32.6 |       |
| <b>High Channel (1900MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 3.80                          | -64.2               | H                  | 3.0      | -13.9                         | 38.6   | 1.0        | -51.6 | -13.0 | -38.6 |       |
| 5.70                          | -65.4               | H                  | 3.0      | -11.0                         | 38.5   | 1.0        | -48.5 | -13.0 | -35.5 |       |
| 7.60                          | -66.6               | H                  | 3.0      | -8.7                          | 37.7   | 1.0        | -45.4 | -13.0 | -32.4 |       |
| 3.80                          | -64.1               | V                  | 3.0      | -13.9                         | 38.6   | 1.0        | -51.6 | -13.0 | -38.6 |       |
| 5.70                          | -65.7               | V                  | 3.0      | -11.6                         | 38.5   | 1.0        | -49.2 | -13.0 | -36.2 |       |
| 7.60                          | -66.9               | V                  | 3.0      | -9.2                          | 37.7   | 1.0        | -45.9 | -13.0 | -32.9 |       |

Rev. 05.21.15

## 9.1.2. LTE BAND 4

### QPSK LTE BAND 4 (3.0MHZ BANDWIDTH)

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                          |                  |                 |          |                         |        |            |       |       |       |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Company:</b><br><b>Project #:</b> 11792114<br><b>Date:</b> 05/31/17<br><b>Test Engineer:</b> 39004<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 4, 3.0MHz QPSK |                  |                 |          |                         |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                |                  |                 |          |                         |        |            |       |       |       |       |
| Chamber                                                                                                                                                                         |                  | Pre-amplifier   |          | Filter                  |        | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                                    |                  | 3m Chamber E    |          | Filter                  |        | EIRP       |       |       |       |       |
| Frequency (GHz)                                                                                                                                                                 | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (1711.5MHz)</b>                                                                                                                                                  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.44                                                                                                                                                                            | -66.7            | H               | 3.0      | -17.4                   | 38.5   | 1.0        | -54.9 | -13.0 | -41.9 |       |
| 5.16                                                                                                                                                                            | -66.0            | H               | 3.0      | -12.8                   | 38.7   | 1.0        | -50.5 | -13.0 | -37.5 |       |
| 6.88                                                                                                                                                                            | -66.8            | H               | 3.0      | -9.9                    | 38.1   | 1.0        | -47.0 | -13.0 | -34.0 |       |
| 3.44                                                                                                                                                                            | -66.2            | V               | 3.0      | -17.1                   | 38.5   | 1.0        | -54.6 | -13.0 | -41.6 |       |
| 5.16                                                                                                                                                                            | -66.2            | V               | 3.0      | -13.3                   | 38.7   | 1.0        | -51.0 | -13.0 | -38.0 |       |
| 6.88                                                                                                                                                                            | -66.5            | V               | 3.0      | -9.9                    | 38.1   | 1.0        | -47.0 | -13.0 | -34.0 |       |
| <b>Mid Channel (1732.5MHz)</b>                                                                                                                                                  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.47                                                                                                                                                                            | -66.3            | H               | 3.0      | -17.0                   | 38.5   | 1.0        | -54.5 | -13.0 | -41.5 |       |
| 5.20                                                                                                                                                                            | -66.0            | H               | 3.0      | -12.7                   | 38.7   | 1.0        | -50.4 | -13.0 | -37.4 |       |
| 6.93                                                                                                                                                                            | -66.4            | H               | 3.0      | -9.3                    | 38.1   | 1.0        | -46.5 | -13.0 | -33.5 |       |
| 3.47                                                                                                                                                                            | -65.9            | V               | 3.0      | -16.8                   | 38.5   | 1.0        | -54.3 | -13.0 | -41.3 |       |
| 5.20                                                                                                                                                                            | -66.1            | V               | 3.0      | -13.2                   | 38.7   | 1.0        | -50.9 | -13.0 | -37.9 |       |
| 6.93                                                                                                                                                                            | -66.5            | V               | 3.0      | -9.7                    | 38.1   | 1.0        | -46.9 | -13.0 | -33.9 |       |
| <b>High Channel (1753.5MHz)</b>                                                                                                                                                 |                  |                 |          |                         |        |            |       |       |       |       |
| 3.49                                                                                                                                                                            | -65.3            | H               | 3.0      | -15.9                   | 38.5   | 1.0        | -53.4 | -13.0 | -40.4 |       |
| 5.24                                                                                                                                                                            | -65.8            | H               | 3.0      | -12.4                   | 38.7   | 1.0        | -50.1 | -13.0 | -37.1 |       |
| 6.98                                                                                                                                                                            | -66.2            | H               | 3.0      | -9.1                    | 38.1   | 1.0        | -46.2 | -13.0 | -33.2 |       |
| 3.49                                                                                                                                                                            | -65.2            | V               | 3.0      | -16.0                   | 38.5   | 1.0        | -53.5 | -13.0 | -40.5 |       |
| 5.24                                                                                                                                                                            | -66.9            | V               | 3.0      | -13.8                   | 38.7   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 6.98                                                                                                                                                                            | -66.3            | V               | 3.0      | -9.4                    | 38.1   | 1.0        | -46.5 | -13.0 | -33.5 |       |
| Rev. 05.21.15                                                                                                                                                                   |                  |                 |          |                         |        |            |       |       |       |       |

**16QAM LTE BAND 4 (3.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

Company:  
 Project #: 11792114  
 Date: 05/31/17  
 Test Engineer: 39004  
 Configuration: EUT Only  
 Mode: LTE Band 4, 3.0MHz 16QAM

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)              | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|---------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1711.5MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.44                            | -65.0               | H                  | 3.0      | -15.7                         | 38.5   | 1.0        | -53.2 | -13.0 | -40.2 |       |
| 5.16                            | -65.9               | H                  | 3.0      | -12.7                         | 38.7   | 1.0        | -50.4 | -13.0 | -37.4 |       |
| 6.88                            | -66.3               | H                  | 3.0      | -9.4                          | 38.1   | 1.0        | -46.5 | -13.0 | -33.5 |       |
| 3.44                            | -65.2               | V                  | 3.0      | -16.1                         | 38.5   | 1.0        | -53.6 | -13.0 | -40.6 |       |
| 5.16                            | -65.9               | V                  | 3.0      | -13.0                         | 38.7   | 1.0        | -50.7 | -13.0 | -37.7 |       |
| 6.88                            | -66.1               | V                  | 3.0      | -9.4                          | 38.1   | 1.0        | -46.6 | -13.0 | -33.6 |       |
| <b>Mid Channel (1732.5MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.47                            | -64.9               | H                  | 3.0      | -15.5                         | 38.5   | 1.0        | -53.0 | -13.0 | -40.0 |       |
| 5.20                            | -65.4               | H                  | 3.0      | -12.1                         | 38.7   | 1.0        | -49.8 | -13.0 | -36.8 |       |
| 6.93                            | -66.4               | H                  | 3.0      | -9.3                          | 38.1   | 1.0        | -46.4 | -13.0 | -33.4 |       |
| 3.47                            | -65.3               | V                  | 3.0      | -16.2                         | 38.5   | 1.0        | -53.7 | -13.0 | -40.7 |       |
| 5.20                            | -66.1               | V                  | 3.0      | -13.2                         | 38.7   | 1.0        | -50.9 | -13.0 | -37.9 |       |
| 6.93                            | -66.5               | V                  | 3.0      | -9.7                          | 38.1   | 1.0        | -46.9 | -13.0 | -33.9 |       |
| <b>High Channel (1753.5MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 3.49                            | -65.2               | H                  | 3.0      | -15.8                         | 38.5   | 1.0        | -53.3 | -13.0 | -40.3 |       |
| 5.24                            | -65.8               | H                  | 3.0      | -12.5                         | 38.7   | 1.0        | -50.1 | -13.0 | -37.1 |       |
| 6.98                            | -66.4               | H                  | 3.0      | -9.2                          | 38.1   | 1.0        | -46.3 | -13.0 | -33.3 |       |
| 3.49                            | -65.1               | V                  | 3.0      | -15.8                         | 38.5   | 1.0        | -53.3 | -13.0 | -40.3 |       |
| 5.24                            | -65.8               | V                  | 3.0      | -12.8                         | 38.7   | 1.0        | -50.4 | -13.0 | -37.4 |       |
| 6.98                            | -66.5               | V                  | 3.0      | -9.5                          | 38.1   | 1.0        | -46.6 | -13.0 | -33.6 |       |

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### 9.1.3. LTE BAND 5

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 05/31/17

**Test Engineer:** 39004

**Configuration:** EUT Only

**Mode:** LTE Band 5, 10MHz QPSK

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (829MHz)</b>   |                     |                    |          |                               |        |            |       |       |       |       |
| 1.66                          | -63.1               | H                  | 3.0      | -20.6                         | 37.8   | 1.0        | -57.5 | -13.0 | -44.5 |       |
| 2.49                          | -65.7               | H                  | 3.0      | -20.7                         | 38.5   | 1.0        | -58.2 | -13.0 | -45.2 |       |
| 3.32                          | -66.9               | H                  | 3.0      | -17.9                         | 38.5   | 1.0        | -55.4 | -13.0 | -42.4 |       |
| 1.66                          | -64.2               | V                  | 3.0      | -22.0                         | 37.8   | 1.0        | -58.9 | -13.0 | -45.9 |       |
| 2.49                          | -65.6               | V                  | 3.0      | -20.4                         | 38.5   | 1.0        | -57.9 | -13.0 | -44.9 |       |
| 3.32                          | -66.7               | V                  | 3.0      | -18.0                         | 38.5   | 1.0        | -55.5 | -13.0 | -42.5 |       |
| <b>Mid Channel (836.5MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 1.67                          | -63.1               | H                  | 3.0      | -20.6                         | 37.8   | 1.0        | -57.5 | -13.0 | -44.5 |       |
| 2.51                          | -65.2               | H                  | 3.0      | -20.0                         | 38.6   | 1.0        | -57.6 | -13.0 | -44.6 |       |
| 3.35                          | -66.6               | H                  | 3.0      | -17.6                         | 38.5   | 1.0        | -55.0 | -13.0 | -42.0 |       |
| 1.67                          | -64.3               | V                  | 3.0      | -22.0                         | 37.8   | 1.0        | -58.8 | -13.0 | -45.8 |       |
| 2.51                          | -65.4               | V                  | 3.0      | -20.0                         | 38.6   | 1.0        | -57.6 | -13.0 | -44.6 |       |
| 3.35                          | -66.5               | V                  | 3.0      | -17.6                         | 38.5   | 1.0        | -55.1 | -13.0 | -42.1 |       |
| <b>High Channel (844MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 1.69                          | -64.2               | H                  | 3.0      | -21.7                         | 37.9   | 1.0        | -58.6 | -13.0 | -45.6 |       |
| 2.53                          | -66.1               | H                  | 3.0      | -20.8                         | 38.6   | 1.0        | -58.3 | -13.0 | -45.3 |       |
| 3.38                          | -66.9               | H                  | 3.0      | -17.7                         | 38.5   | 1.0        | -55.2 | -13.0 | -42.2 |       |
| 1.69                          | -64.2               | V                  | 3.0      | -21.9                         | 37.9   | 1.0        | -58.8 | -13.0 | -45.8 |       |
| 2.53                          | -65.8               | V                  | 3.0      | -20.4                         | 38.6   | 1.0        | -57.9 | -13.0 | -44.9 |       |
| 3.38                          | -66.7               | V                  | 3.0      | -17.8                         | 38.5   | 1.0        | -55.3 | -13.0 | -42.3 |       |

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**16QAM LTE BAND 5 (10.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                    |          |                               |        |            |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <div style="display: flex; justify-content: space-between;"> <div> <b>Company:</b><br/> <b>Project #:</b> 11792114<br/> <b>Date:</b> 05/31/17<br/> <b>Test Engineer:</b> 39004<br/> <b>Configuration:</b> EUT Only<br/> <b>Mode:</b> LTE Band 5, 10MHz 16QAM         </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                    |          |                               |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |                    |          |                               |        |            |       |       |       |       |
| <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> <span style="background-color: #e0f7fa; padding: 2px 10px; border: 1px solid black;">Chamber</span> <span style="background-color: #e0f7fa; padding: 2px 10px; border: 1px solid black;">Pre-amplifier</span> <span style="background-color: #e0f7fa; padding: 2px 10px; border: 1px solid black;">Filter</span> <span style="background-color: #e0f7fa; padding: 2px 10px; border: 1px solid black;">Limit</span> </div> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px; background-color: #fff9c4;">3m Chamber E</div> <div style="border: 1px solid black; padding: 2px; background-color: #fff9c4;">3m Chamber E</div> <div style="border: 1px solid black; padding: 2px; background-color: #fff9c4;">Filter</div> <div style="border: 1px solid black; padding: 2px; background-color: #fff9c4;">EIRP</div> </div> |                     |                    |          |                               |        |            |       |       |       |       |
| Frequency<br>(GHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (829MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |                    |          |                               |        |            |       |       |       |       |
| 1.66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -63.9               | H                  | 3.0      | -22.5                         | 37.8   | 1.0        | -59.3 | -13.0 | -46.3 |       |
| 2.49                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -65.8               | H                  | 3.0      | -22.6                         | 38.5   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 3.32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -66.4               | H                  | 3.0      | -20.4                         | 38.5   | 1.0        | -57.9 | -13.0 | -44.9 |       |
| 1.66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -64.1               | V                  | 3.0      | -22.4                         | 37.8   | 1.0        | -59.2 | -13.0 | -46.2 |       |
| 2.49                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -65.9               | V                  | 3.0      | -21.7                         | 38.5   | 1.0        | -59.3 | -13.0 | -46.3 |       |
| 3.32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -66.7               | V                  | 3.0      | -20.8                         | 38.5   | 1.0        | -58.3 | -13.0 | -45.3 |       |
| <b>Mid Channel (836.5MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |                    |          |                               |        |            |       |       |       |       |
| 1.67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -64.3               | H                  | 3.0      | -22.8                         | 37.8   | 1.0        | -59.7 | -13.0 | -46.7 |       |
| 2.51                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -65.9               | H                  | 3.0      | -22.7                         | 38.6   | 1.0        | -60.2 | -13.0 | -47.2 |       |
| 3.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -66.8               | H                  | 3.0      | -20.7                         | 38.5   | 1.0        | -58.2 | -13.0 | -45.2 |       |
| 1.67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -64.1               | V                  | 3.0      | -22.4                         | 37.8   | 1.0        | -59.2 | -13.0 | -46.2 |       |
| 2.51                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -65.7               | V                  | 3.0      | -21.4                         | 38.6   | 1.0        | -59.0 | -13.0 | -46.0 |       |
| 3.35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -66.8               | V                  | 3.0      | -20.7                         | 38.5   | 1.0        | -58.2 | -13.0 | -45.2 |       |
| <b>High Channel (844MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                    |          |                               |        |            |       |       |       |       |
| 1.69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -64.4               | H                  | 3.0      | -22.8                         | 37.9   | 1.0        | -59.7 | -13.0 | -46.7 |       |
| 2.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -65.9               | H                  | 3.0      | -22.6                         | 38.6   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 3.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -66.9               | H                  | 3.0      | -20.8                         | 38.5   | 1.0        | -58.3 | -13.0 | -45.3 |       |
| 1.69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -64.4               | V                  | 3.0      | -22.6                         | 37.9   | 1.0        | -59.4 | -13.0 | -46.4 |       |
| 2.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -65.4               | V                  | 3.0      | -21.2                         | 38.6   | 1.0        | -58.7 | -13.0 | -45.7 |       |
| 3.38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -66.7               | V                  | 3.0      | -20.5                         | 38.5   | 1.0        | -58.0 | -13.0 | -45.0 |       |
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## 9.1.4. LTE BAND 7

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 05/31/17

**Test Engineer:** 39004

**Configuration:** EUT Only

**Mode:** LTE Band 7, 20MHz QPSK

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B7

| Frequency (GHz)               | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (2510MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.02                          | -65.7            | H               | 3.0      | -12.8                   | 38.7   | 1.0        | -50.4 | -25.0 | -25.4 |       |
| 7.53                          | -65.2            | H               | 3.0      | -7.4                    | 37.7   | 1.0        | -44.1 | -25.0 | -19.1 |       |
| 10.04                         | -67.2            | H               | 3.0      | -6.4                    | 36.2   | 1.0        | -41.5 | -25.0 | -16.5 |       |
| 5.02                          | -65.3            | V               | 3.0      | -12.7                   | 38.7   | 1.0        | -50.4 | -25.0 | -25.4 |       |
| 7.53                          | -65.9            | V               | 3.0      | -8.2                    | 37.7   | 1.0        | -45.0 | -25.0 | -20.0 |       |
| 10.04                         | -66.9            | V               | 3.0      | -6.1                    | 36.2   | 1.0        | -41.2 | -25.0 | -16.2 |       |
| <b>Mid Channel (2535MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.07                          | -65.2            | H               | 3.0      | -12.1                   | 38.7   | 1.0        | -49.8 | -25.0 | -24.8 |       |
| 7.61                          | -65.8            | H               | 3.0      | -7.9                    | 37.7   | 1.0        | -44.6 | -25.0 | -19.6 |       |
| 10.14                         | -66.4            | H               | 3.0      | -5.5                    | 36.2   | 1.0        | -40.7 | -25.0 | -15.7 |       |
| 5.07                          | -65.2            | V               | 3.0      | -12.5                   | 38.7   | 1.0        | -50.2 | -25.0 | -25.2 |       |
| 7.61                          | -65.8            | V               | 3.0      | -8.1                    | 37.7   | 1.0        | -44.8 | -25.0 | -19.8 |       |
| 10.14                         | -66.5            | V               | 3.0      | -5.6                    | 36.2   | 1.0        | -40.8 | -25.0 | -15.8 |       |
| <b>High Channel (2560MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 5.12                          | -65.6            | H               | 3.0      | -12.4                   | 38.7   | 1.0        | -50.1 | -25.0 | -25.1 |       |
| 7.68                          | -65.9            | H               | 3.0      | -7.9                    | 37.6   | 1.0        | -44.6 | -25.0 | -19.6 |       |
| 10.24                         | -66.8            | H               | 3.0      | -5.8                    | 36.3   | 1.0        | -41.1 | -25.0 | -16.1 |       |
| 5.12                          | -65.2            | V               | 3.0      | -12.4                   | 38.7   | 1.0        | -50.1 | -25.0 | -25.1 |       |
| 7.68                          | -65.8            | V               | 3.0      | -8.0                    | 37.6   | 1.0        | -44.6 | -25.0 | -19.6 |       |
| 10.24                         | -66.7            | V               | 3.0      | -5.6                    | 36.3   | 1.0        | -40.9 | -25.0 | -15.9 |       |

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**16QAM LTE BAND 7 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 05/31/17

**Test Engineer:** 39004

**Configuration:** EUT Only

**Mode:** LTE Band 7, 20MHz 16QAM

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B7

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (2510MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 5.02                          | -65.6               | H                  | 3.0      | -12.7                         | 38.7   | 1.0        | -50.4 | -25.0 | -25.4 |       |
| 7.53                          | -66.1               | H                  | 3.0      | -8.2                          | 37.7   | 1.0        | -45.0 | -25.0 | -20.0 |       |
| 10.04                         | -66.9               | H                  | 3.0      | -6.1                          | 36.2   | 1.0        | -41.2 | -25.0 | -16.2 |       |
| 5.02                          | -65.3               | V                  | 3.0      | -12.7                         | 38.7   | 1.0        | -50.4 | -25.0 | -25.4 |       |
| 7.53                          | -66.2               | V                  | 3.0      | -8.6                          | 37.7   | 1.0        | -45.3 | -25.0 | -20.3 |       |
| 10.04                         | -66.9               | V                  | 3.0      | -6.1                          | 36.2   | 1.0        | -41.2 | -25.0 | -16.2 |       |
| <b>Mid Channel (2535MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 5.07                          | -65.2               | -65.4              | 3.0      | -12.5                         | 38.7   | 1.0        | -50.2 | -25.0 | -25.2 |       |
| 7.61                          | -65.9               | -66.6              | 3.0      | -8.2                          | 37.7   | 1.0        | -44.9 | -25.0 | -19.9 |       |
| 10.14                         | -66.5               | H                  | 3.0      | -5.6                          | 36.2   | 1.0        | -40.8 | -25.0 | -15.8 |       |
| 5.07                          | -65.4               | V                  | 3.0      | -12.7                         | 38.7   | 1.0        | -50.4 | -25.0 | -25.4 |       |
| 7.61                          | -65.9               | V                  | 3.0      | -8.1                          | 37.7   | 1.0        | -44.8 | -25.0 | -19.8 |       |
| 10.14                         | -66.7               | V                  | 3.0      | -5.8                          | 36.2   | 1.0        | -41.0 | -25.0 | -16.0 |       |
| <b>High Channel (2560MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 5.12                          | -65.3               | H                  | 3.0      | -12.2                         | 38.7   | 1.0        | -49.9 | -25.0 | -24.9 |       |
| 7.68                          | -65.8               | H                  | 3.0      | -7.7                          | 37.6   | 1.0        | -44.4 | -25.0 | -19.4 |       |
| 10.24                         | -66.6               | H                  | 3.0      | -5.5                          | 36.3   | 1.0        | -40.8 | -25.0 | -15.8 |       |
| 5.12                          | -65.2               | V                  | 3.0      | -12.4                         | 38.7   | 1.0        | -50.1 | -25.0 | -25.1 |       |
| 7.68                          | -65.7               | V                  | 3.0      | -7.9                          | 37.6   | 1.0        | -44.6 | -25.0 | -19.6 |       |
| 10.24                         | -66.4               | V                  | 3.0      | -5.3                          | 36.3   | 1.0        | -40.6 | -25.0 | -15.6 |       |

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## 9.1.5. LTE BAND 12

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 05/31/17  
**Test Engineer:** 39004  
**Configuration:** EUT Only  
**Mode:** LTE Band 12, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (704MHz)</b>   |                     |                    |          |                               |        |            |       |       |       |       |
| 1.41                          | -64.9               | H                  | 3.0      | -23.2                         | 38.1   | 1.0        | -60.3 | -13.0 | -47.3 |       |
| 2.11                          | -65.4               | H                  | 3.0      | -21.9                         | 38.0   | 1.0        | -58.8 | -13.0 | -45.8 |       |
| 2.82                          | -66.2               | H                  | 3.0      | -19.1                         | 38.4   | 1.0        | -56.5 | -13.0 | -43.5 |       |
| 1.41                          | -64.2               | V                  | 3.0      | -23.3                         | 38.1   | 1.0        | -60.4 | -13.0 | -47.4 |       |
| 2.11                          | -65.2               | V                  | 3.0      | -21.1                         | 38.0   | 1.0        | -58.1 | -13.0 | -45.1 |       |
| 2.82                          | -66.4               | V                  | 3.0      | -19.5                         | 38.4   | 1.0        | -57.0 | -13.0 | -44.0 |       |
| <b>Mid Channel (707.5MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 1.42                          | -63.9               | H                  | 3.0      | -22.2                         | 38.0   | 1.0        | -59.2 | -13.0 | -46.2 |       |
| 2.12                          | -64.6               | H                  | 3.0      | -21.0                         | 38.0   | 1.0        | -58.0 | -13.0 | -45.0 |       |
| 2.83                          | -66.0               | H                  | 3.0      | -18.8                         | 38.4   | 1.0        | -56.2 | -13.0 | -43.2 |       |
| 1.42                          | -63.2               | V                  | 3.0      | -22.2                         | 38.0   | 1.0        | -59.3 | -13.0 | -46.3 |       |
| 2.12                          | -65.2               | V                  | 3.0      | -21.1                         | 38.0   | 1.0        | -58.1 | -13.0 | -45.1 |       |
| 2.83                          | -66.4               | V                  | 3.0      | -19.4                         | 38.4   | 1.0        | -56.8 | -13.0 | -43.8 |       |
| <b>High Channel (711MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 1.42                          | -64.6               | H                  | 3.0      | -22.9                         | 38.0   | 1.0        | -59.9 | -13.0 | -46.9 |       |
| 2.13                          | -65.9               | H                  | 3.0      | -22.2                         | 38.0   | 1.0        | -59.2 | -13.0 | -46.2 |       |
| 2.84                          | -66.4               | H                  | 3.0      | -19.1                         | 38.4   | 1.0        | -56.5 | -13.0 | -43.5 |       |
| 1.42                          | -64.1               | V                  | 3.0      | -23.1                         | 38.0   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 2.13                          | -65.3               | V                  | 3.0      | -21.2                         | 38.0   | 1.0        | -58.1 | -13.0 | -45.1 |       |
| 2.84                          | -66.1               | V                  | 3.0      | -19.0                         | 38.4   | 1.0        | -56.5 | -13.0 | -43.5 |       |

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**16QAM LTE BAND 12 (10.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                 |          |                         |        |            |       |       |       |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <div style="display: flex; justify-content: space-between;"> <div> <b>Company:</b><br/> <b>Project #:</b> 11792114<br/> <b>Date:</b> 05/31/17<br/> <b>Test Engineer:</b> 39004<br/> <b>Configuration:</b> EUT Only<br/> <b>Mode:</b> LTE Band 12, 10MHz 16QAM </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                 |          |                         |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                 |          |                         |        |            |       |       |       |       |
| <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> <span style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">Chamber</span> <span style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">Pre-amplifier</span> <span style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">Filter</span> <span style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">Limit</span> </div> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">3m Chamber E</div> <div style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">3m Chamber E</div> <div style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">Filter</div> <div style="border: 1px solid black; padding: 2px 10px; background-color: #e0f7fa;">EIRP</div> </div> |                  |                 |          |                         |        |            |       |       |       |       |
| Frequency (GHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (704MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                 |          |                         |        |            |       |       |       |       |
| 1.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -63.9            | H               | 3.0      | -22.3                   | 38.1   | 1.0        | -59.4 | -13.0 | -46.4 |       |
| 2.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -65.4            | H               | 3.0      | -21.8                   | 38.0   | 1.0        | -58.8 | -13.0 | -45.8 |       |
| 2.82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -66.7            | H               | 3.0      | -19.6                   | 38.4   | 1.0        | -57.1 | -13.0 | -44.1 |       |
| 1.41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -64.2            | V               | 3.0      | -23.3                   | 38.1   | 1.0        | -60.4 | -13.0 | -47.4 |       |
| 2.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -65.8            | V               | 3.0      | -21.6                   | 38.0   | 1.0        | -58.6 | -13.0 | -45.6 |       |
| 2.82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -66.4            | V               | 3.0      | -19.5                   | 38.4   | 1.0        | -56.9 | -13.0 | -43.9 |       |
| <b>Mid Channel (707.5MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                 |          |                         |        |            |       |       |       |       |
| 1.42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -64.3            | H               | 3.0      | -22.6                   | 38.0   | 1.0        | -59.7 | -13.0 | -46.7 |       |
| 2.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -65.9            | H               | 3.0      | -22.3                   | 38.0   | 1.0        | -59.3 | -13.0 | -46.3 |       |
| 2.83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -66.9            | H               | 3.0      | -19.7                   | 38.4   | 1.0        | -57.2 | -13.0 | -44.2 |       |
| 1.42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -64.2            | V               | 3.0      | -23.2                   | 38.0   | 1.0        | -60.3 | -13.0 | -47.3 |       |
| 2.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -65.8            | V               | 3.0      | -21.6                   | 38.0   | 1.0        | -58.6 | -13.0 | -45.6 |       |
| 2.83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -67.0            | V               | 3.0      | -20.1                   | 38.4   | 1.0        | -57.5 | -13.0 | -44.5 |       |
| <b>High Channel (711MHz)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                 |          |                         |        |            |       |       |       |       |
| 1.42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -64.8            | H               | 3.0      | -23.1                   | 38.0   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 2.13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -66.2            | H               | 3.0      | -22.6                   | 38.0   | 1.0        | -59.6 | -13.0 | -46.6 |       |
| 2.84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -66.8            | H               | 3.0      | -19.5                   | 38.4   | 1.0        | -57.0 | -13.0 | -44.0 |       |
| 1.42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -64.2            | V               | 3.0      | -23.2                   | 38.0   | 1.0        | -60.2 | -13.0 | -47.2 |       |
| 2.13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -65.9            | V               | 3.0      | -21.7                   | 38.0   | 1.0        | -58.7 | -13.0 | -45.7 |       |
| 2.84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -66.7            | V               | 3.0      | -19.7                   | 38.4   | 1.0        | -57.1 | -13.0 | -44.1 |       |
| Rev. 05.21.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                 |          |                         |        |            |       |       |       |       |

## 9.1.6. LTE BAND 13

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

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                          |                     |                    |               |                               |        |            |       |       |         |       |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|---------------|-------------------------------|--------|------------|-------|-------|---------|-------|--|
| <b>Company:</b><br><b>Project #:</b> 11792114<br><b>Date:</b> 05/31/17<br><b>Test Engineer:</b> 39004<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 13, 10MHz QPSK |                     |                    |               |                               |        |            |       |       |         |       |  |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                |                     |                    |               |                               |        |            |       |       |         |       |  |
| Chamber                                                                                                                                                                         |                     |                    | Pre-amplifier |                               |        | Filter     |       |       | Limit   |       |  |
| 3m Chamber E                                                                                                                                                                    |                     |                    | 3m Chamber E  |                               |        | Filter     |       |       | LTE B13 |       |  |
| Frequency<br>(GHz)                                                                                                                                                              | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance      | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta   | Notes |  |
| Mid Channel (782MHz)                                                                                                                                                            |                     |                    |               |                               |        |            |       |       |         |       |  |
| 1.56                                                                                                                                                                            | -64.0               | H                  | 3.0           | -21.7                         | 37.8   | 1.0        | -58.5 | -40.0 | -18.5   |       |  |
| 2.35                                                                                                                                                                            | -65.6               | H                  | 3.0           | -21.2                         | 38.1   | 1.0        | -58.4 | -13.0 | -45.4   |       |  |
| 3.13                                                                                                                                                                            | -65.9               | H                  | 3.0           | -17.3                         | 38.4   | 1.0        | -54.8 | -13.0 | -41.8   |       |  |
| 1.56                                                                                                                                                                            | -63.9               | V                  | 3.0           | -22.1                         | 37.8   | 1.0        | -59.0 | -40.0 | -19.0   |       |  |
| 2.35                                                                                                                                                                            | -65.4               | V                  | 3.0           | -20.7                         | 38.1   | 1.0        | -57.8 | -13.0 | -44.8   |       |  |
| 3.13                                                                                                                                                                            | -65.8               | V                  | 3.0           | -17.6                         | 38.4   | 1.0        | -55.0 | -13.0 | -42.0   |       |  |
| Rev. 05.21.15                                                                                                                                                                   |                     |                    |               |                               |        |            |       |       |         |       |  |

**16QAM LTE BAND 13 (10.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 05/31/17  
**Test Engineer:** 39004  
**Configuration:** EUT Only  
**Mode:** LTE Band 13, 10MHz 16QAM

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B13

| Frequency (GHz)      | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX<br>Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|----------------------|------------------|-----------------|----------|----------------------------|--------|------------|-------|-------|-------|-------|
| Mid Channel (782MHz) |                  |                 |          |                            |        |            |       |       |       |       |
| 1.56                 | -64.1            | H               | 3.0      | -21.8                      | 37.8   | 1.0        | -58.7 | -40.0 | -18.7 |       |
| 2.35                 | -65.7            | H               | 3.0      | -21.2                      | 38.1   | 1.0        | -58.4 | -13.0 | -45.4 |       |
| 3.13                 | -65.9            | H               | 3.0      | -17.4                      | 38.4   | 1.0        | -54.8 | -13.0 | -41.8 |       |
| 1.56                 | -63.8            | V               | 3.0      | -22.1                      | 37.8   | 1.0        | -58.9 | -40.0 | -18.9 |       |
| 2.35                 | -65.9            | V               | 3.0      | -21.2                      | 38.1   | 1.0        | -58.4 | -13.0 | -45.4 |       |
| 3.13                 | -66.1            | V               | 3.0      | -17.9                      | 38.4   | 1.0        | -55.4 | -13.0 | -42.4 |       |
|                      |                  |                 |          |                            |        |            |       |       |       |       |
|                      |                  |                 |          |                            |        |            |       |       |       |       |
|                      |                  |                 |          |                            |        |            |       |       |       |       |

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## 9.1.7. LTE BAND 17

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:**  
**Date:** 07/21/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 17, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)           | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (709MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 1.418                        | -65.5               | H                  | 3.0      | -23.8                         | 38.0   | 1.0        | -60.8 | -13.0 | -47.8 |       |
| 2.127                        | -64.5               | H                  | 3.0      | -20.9                         | 38.0   | 1.0        | -57.9 | -13.0 | -44.9 |       |
| 2.836                        | -65.4               | H                  | 3.0      | -18.2                         | 38.4   | 1.0        | -55.7 | -13.0 | -42.7 |       |
| 1.418                        | -65.0               | V                  | 3.0      | -24.0                         | 38.0   | 1.0        | -61.0 | -13.0 | -48.0 |       |
| 2.127                        | -64.3               | V                  | 3.0      | -20.2                         | 38.0   | 1.0        | -57.2 | -13.0 | -44.2 |       |
| 2.836                        | -64.4               | V                  | 3.0      | -17.4                         | 38.4   | 1.0        | -54.8 | -13.0 | -41.8 |       |
| <b>Mid Channel (710MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 1.420                        | -64.4               | H                  | 3.0      | -22.7                         | 38.0   | 1.0        | -59.7 | -13.0 | -46.7 |       |
| 2.130                        | -65.2               | H                  | 3.0      | -21.6                         | 38.0   | 1.0        | -58.6 | -13.0 | -45.6 |       |
| 2.840                        | -65.9               | H                  | 3.0      | -18.6                         | 38.4   | 1.0        | -56.1 | -13.0 | -43.1 |       |
| 1.420                        | -64.0               | V                  | 3.0      | -23.0                         | 38.0   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 2.130                        | -65.1               | V                  | 3.0      | -21.0                         | 38.0   | 1.0        | -58.0 | -13.0 | -45.0 |       |
| 2.840                        | -65.8               | V                  | 3.0      | -18.8                         | 38.4   | 1.0        | -56.2 | -13.0 | -43.2 |       |
| <b>High Channel (711MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 1.422                        | -63.1               | H                  | 3.0      | -21.4                         | 38.0   | 1.0        | -58.4 | -13.0 | -45.4 |       |
| 2.133                        | -65.1               | H                  | 3.0      | -21.4                         | 38.0   | 1.0        | -58.4 | -13.0 | -45.4 |       |
| 2.844                        | -65.2               | H                  | 3.0      | -17.9                         | 38.4   | 1.0        | -55.4 | -13.0 | -42.4 |       |
| 1.422                        | -64.0               | V                  | 3.0      | -22.9                         | 38.0   | 1.0        | -60.0 | -13.0 | -47.0 |       |
| 2.133                        | -64.8               | V                  | 3.0      | -20.7                         | 38.0   | 1.0        | -57.7 | -13.0 | -44.7 |       |
| 2.844                        | -64.5               | V                  | 3.0      | -17.5                         | 38.4   | 1.0        | -54.9 | -13.0 | -41.9 |       |

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**16QAM LTE BAND 17 (10.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                  |                  |                 |          |                         |        |            |       |       |       |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Company:</b><br><b>Project #:</b><br><b>Date:</b> 07/21/17<br><b>Test Engineer:</b> 10641<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 17, 10MHz 16QAM |                  |                 |          |                         |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                        |                  |                 |          |                         |        |            |       |       |       |       |
| Chamber                                                                                                                                                                 |                  | Pre-amplifier   |          | Filter                  |        | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                            |                  | 3m Chamber E    |          | Filter                  |        | EIRP       |       |       |       |       |
| Frequency (GHz)                                                                                                                                                         | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (709MHz)</b>                                                                                                                                             |                  |                 |          |                         |        |            |       |       |       |       |
| 1.418                                                                                                                                                                   | -64.9            | H               | 3.0      | -23.2                   | 38.0   | 1.0        | -60.3 | -13.0 | -47.3 |       |
| 2.127                                                                                                                                                                   | -64.4            | H               | 3.0      | -20.7                   | 38.0   | 1.0        | -57.7 | -13.0 | -44.7 |       |
| 2.836                                                                                                                                                                   | -65.4            | H               | 3.0      | -18.2                   | 38.4   | 1.0        | -55.6 | -13.0 | -42.6 |       |
| 1.418                                                                                                                                                                   | -64.9            | V               | 3.0      | -23.9                   | 38.0   | 1.0        | -61.0 | -13.0 | -48.0 |       |
| 2.127                                                                                                                                                                   | -64.4            | V               | 3.0      | -20.2                   | 38.0   | 1.0        | -57.2 | -13.0 | -44.2 |       |
| 2.836                                                                                                                                                                   | -64.5            | V               | 3.0      | -17.5                   | 38.4   | 1.0        | -54.9 | -13.0 | -41.9 |       |
| <b>Mid Channel (710MHz)</b>                                                                                                                                             |                  |                 |          |                         |        |            |       |       |       |       |
| 1.420                                                                                                                                                                   | -64.2            | H               | 3.0      | -22.5                   | 38.0   | 1.0        | -59.5 | -13.0 | -46.5 |       |
| 2.130                                                                                                                                                                   | -65.6            | H               | 3.0      | -21.9                   | 38.0   | 1.0        | -58.9 | -13.0 | -45.9 |       |
| 2.840                                                                                                                                                                   | -65.9            | H               | 3.0      | -18.6                   | 38.4   | 1.0        | -56.1 | -13.0 | -43.1 |       |
| 1.420                                                                                                                                                                   | -64.4            | V               | 3.0      | -23.3                   | 38.0   | 1.0        | -60.4 | -13.0 | -47.4 |       |
| 2.130                                                                                                                                                                   | -65.7            | V               | 3.0      | -21.5                   | 38.0   | 1.0        | -58.5 | -13.0 | -45.5 |       |
| 2.840                                                                                                                                                                   | -65.9            | V               | 3.0      | -18.9                   | 38.4   | 1.0        | -56.4 | -13.0 | -43.4 |       |
| <b>High Channel (711MHz)</b>                                                                                                                                            |                  |                 |          |                         |        |            |       |       |       |       |
| 1.422                                                                                                                                                                   | -63.8            | H               | 3.0      | -22.0                   | 38.0   | 1.0        | -59.1 | -13.0 | -46.1 |       |
| 2.133                                                                                                                                                                   | -64.1            | H               | 3.0      | -20.4                   | 38.0   | 1.0        | -57.4 | -13.0 | -44.4 |       |
| 2.844                                                                                                                                                                   | -64.9            | H               | 3.0      | -17.7                   | 38.4   | 1.0        | -55.1 | -13.0 | -42.1 |       |
| 1.422                                                                                                                                                                   | -64.5            | V               | 3.0      | -23.5                   | 38.0   | 1.0        | -60.6 | -13.0 | -47.6 |       |
| 2.133                                                                                                                                                                   | -65.1            | V               | 3.0      | -20.9                   | 38.0   | 1.0        | -57.9 | -13.0 | -44.9 |       |
| 2.844                                                                                                                                                                   | -66.2            | V               | 3.0      | -19.2                   | 38.4   | 1.0        | -56.6 | -13.0 | -43.6 |       |
| Rev. 05.21.15                                                                                                                                                           |                  |                 |          |                         |        |            |       |       |       |       |

## 9.1.8. LTE BAND 25

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

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                                                                                                                     |  |  |               |  |  |        |  |  |       |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------|--|--|--------|--|--|-------|--|--|
| <div style="display: flex; justify-content: space-between;"> <div> <b>Company:</b><br/> <b>Project #:</b> 11792114<br/> <b>Date:</b> 05/31/17<br/> <b>Test Engineer:</b> 39004<br/> <b>Configuration:</b> EUT Only<br/> <b>Mode:</b> LTE Band 25, 20MHz QPSK </div> </div> |  |  |               |  |  |        |  |  |       |  |  |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                                                                                                           |  |  |               |  |  |        |  |  |       |  |  |
| Chamber                                                                                                                                                                                                                                                                    |  |  | Pre-amplifier |  |  | Filter |  |  | Limit |  |  |
| 3m Chamber E                                                                                                                                                                                                                                                               |  |  | 3m Chamber E  |  |  | Filter |  |  | EIRP  |  |  |

| Frequency (GHz)                | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|--------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1860MHz)</b>   |                  |                 |          |                         |        |            |       |       |       |       |
| 3.72                           | -63.9            | H               | 3.0      | -13.9                   | 38.6   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 5.58                           | -65.8            | H               | 3.0      | -11.7                   | 38.6   | 1.0        | -49.3 | -13.0 | -36.3 |       |
| 7.44                           | -66.5            | H               | 3.0      | -8.8                    | 37.8   | 1.0        | -45.6 | -13.0 | -32.6 |       |
| 3.72                           | -63.8            | V               | 3.0      | -13.8                   | 38.6   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 5.58                           | -65.6            | V               | 3.0      | -11.8                   | 38.6   | 1.0        | -49.4 | -13.0 | -36.4 |       |
| 7.44                           | -66.4            | V               | 3.0      | -8.9                    | 37.8   | 1.0        | -45.7 | -13.0 | -32.7 |       |
| <b>Mid Channel (1882.5MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 3.77                           | -63.6            | H               | 3.0      | -13.5                   | 38.6   | 1.0        | -51.1 | -13.0 | -38.1 |       |
| 5.65                           | -65.7            | H               | 3.0      | -11.4                   | 38.5   | 1.0        | -48.9 | -13.0 | -35.9 |       |
| 7.53                           | -66.4            | H               | 3.0      | -8.5                    | 37.7   | 1.0        | -45.3 | -13.0 | -32.3 |       |
| 3.77                           | -63.6            | V               | 3.0      | -13.6                   | 38.6   | 1.0        | -51.2 | -13.0 | -38.2 |       |
| 5.65                           | -65.7            | V               | 3.0      | -11.7                   | 38.5   | 1.0        | -49.3 | -13.0 | -36.3 |       |
| 7.53                           | -66.5            | V               | 3.0      | -8.9                    | 37.7   | 1.0        | -45.7 | -13.0 | -32.7 |       |
| <b>High Channel (1905MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.81                           | -64.1            | H               | 3.0      | -13.8                   | 38.6   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 5.72                           | -65.7            | H               | 3.0      | -11.3                   | 38.5   | 1.0        | -48.8 | -13.0 | -35.8 |       |
| 7.62                           | -66.3            | H               | 3.0      | -8.4                    | 37.7   | 1.0        | -45.1 | -13.0 | -32.1 |       |
| 3.81                           | -63.9            | V               | 3.0      | -13.7                   | 38.6   | 1.0        | -51.3 | -13.0 | -38.3 |       |
| 5.72                           | -65.5            | V               | 3.0      | -11.4                   | 38.5   | 1.0        | -48.9 | -13.0 | -35.9 |       |
| 7.62                           | -66.4            | V               | 3.0      | -8.6                    | 37.7   | 1.0        | -45.3 | -13.0 | -32.3 |       |

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**16QAM LTE BAND 25 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 05/31/17  
**Test Engineer:** 39004  
**Configuration:** EUT Only  
**Mode:** LTE Band 25, 20MHz 16QAM

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)             | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|--------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1860MHz)</b>   |                     |                    |          |                               |        |            |       |       |       |       |
| 3.72                           | -64.1               | H                  | 3.0      | -14.1                         | 38.6   | 1.0        | -51.7 | -13.0 | -38.7 |       |
| 5.58                           | -65.4               | H                  | 3.0      | -11.2                         | 38.6   | 1.0        | -48.8 | -13.0 | -35.8 |       |
| 7.44                           | -66.3               | H                  | 3.0      | -8.6                          | 37.8   | 1.0        | -45.4 | -13.0 | -32.4 |       |
| 3.72                           | -64.2               | V                  | 3.0      | -14.3                         | 38.6   | 1.0        | -51.9 | -13.0 | -38.9 |       |
| 5.58                           | -65.4               | V                  | 3.0      | -11.6                         | 38.6   | 1.0        | -49.1 | -13.0 | -36.1 |       |
| 7.44                           | -66.3               | V                  | 3.0      | -8.8                          | 37.8   | 1.0        | -45.6 | -13.0 | -32.6 |       |
| <b>Mid Channel (1882.5MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 3.77                           | -64.2               | H                  | 3.0      | -14.1                         | 38.6   | 1.0        | -51.7 | -13.0 | -38.7 |       |
| 5.65                           | -65.5               | H                  | 3.0      | -11.2                         | 38.5   | 1.0        | -48.7 | -13.0 | -35.7 |       |
| 7.53                           | -66.3               | H                  | 3.0      | -8.5                          | 37.7   | 1.0        | -45.2 | -13.0 | -32.2 |       |
| 3.77                           | -64.0               | V                  | 3.0      | -14.0                         | 38.6   | 1.0        | -51.6 | -13.0 | -38.6 |       |
| 5.65                           | -65.4               | V                  | 3.0      | -11.4                         | 38.5   | 1.0        | -49.0 | -13.0 | -36.0 |       |
| 7.53                           | -66.6               | V                  | 3.0      | -8.9                          | 37.7   | 1.0        | -45.7 | -13.0 | -32.7 |       |
| <b>High Channel (1905MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.81                           | -64.2               | H                  | 3.0      | -14.0                         | 38.6   | 1.0        | -51.6 | -13.0 | -38.6 |       |
| 5.72                           | -65.4               | H                  | 3.0      | -11.0                         | 38.5   | 1.0        | -48.5 | -13.0 | -35.5 |       |
| 7.62                           | -66.4               | H                  | 3.0      | -8.4                          | 37.7   | 1.0        | -45.1 | -13.0 | -32.1 |       |
| 3.81                           | -64.0               | V                  | 3.0      | -13.8                         | 38.6   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 5.72                           | -65.4               | V                  | 3.0      | -11.3                         | 38.5   | 1.0        | -48.8 | -13.0 | -35.8 |       |
| 7.62                           | -66.5               | V                  | 3.0      | -8.8                          | 37.7   | 1.0        | -45.5 | -13.0 | -32.5 |       |

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### 9.1.9. LTE BAND 26

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 05/31/17  
**Test Engineer:** 39004  
**Configuration:** EUT Only  
**Mode:** LTE Band 26 (90S), 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency<br>(GHz)   | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|----------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| Mid Channel (819MHz) |                     |                    |          |                               |        |            |       |       |       |       |
| 1.64                 | -64.6               | H                  | 3.0      | -22.1                         | 37.8   | 1.0        | -59.0 | -13.0 | -46.0 |       |
| 2.46                 | -65.9               | H                  | 3.0      | -21.0                         | 38.4   | 1.0        | -58.4 | -13.0 | -45.4 |       |
| 3.28                 | -66.3               | H                  | 3.0      | -17.4                         | 38.5   | 1.0        | -54.9 | -13.0 | -41.9 |       |
| 1.64                 | -64.3               | V                  | 3.0      | -22.2                         | 37.8   | 1.0        | -59.0 | -13.0 | -46.0 |       |
| 2.46                 | -65.6               | V                  | 3.0      | -20.5                         | 38.4   | 1.0        | -58.0 | -13.0 | -45.0 |       |
| 3.28                 | -66.8               | V                  | 3.0      | -18.1                         | 38.5   | 1.0        | -55.6 | -13.0 | -42.6 |       |

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**16QAM LTE BAND 26 (10.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                                 |                     |                    |          |                               |        |            |       |       |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Company:</b><br><b>Project #:</b> 11792114<br><b>Date:</b> 05/31/17<br><b>Test Engineer:</b> 39004<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 26 (90S), 10MHz 16QAM |                     |                    |          |                               |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                       |                     |                    |          |                               |        |            |       |       |       |       |
| Chamber                                                                                                                                                                                |                     | Pre-amplifier      |          | Filter                        |        | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                                           |                     | 3m Chamber E       |          | Filter                        |        | EIRP       |       |       |       |       |
| Frequency<br>(GHz)                                                                                                                                                                     | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| Mid Channel (819MHz)                                                                                                                                                                   |                     |                    |          |                               |        |            |       |       |       |       |
| 1.64                                                                                                                                                                                   | -64.6               | H                  | 3.0      | -22.1                         | 37.8   | 1.0        | -59.0 | -13.0 | -46.0 |       |
| 2.46                                                                                                                                                                                   | -65.7               | H                  | 3.0      | -20.8                         | 38.4   | 1.0        | -58.2 | -13.0 | -45.2 |       |
| 3.28                                                                                                                                                                                   | -66.8               | H                  | 3.0      | -17.9                         | 38.5   | 1.0        | -55.4 | -13.0 | -42.4 |       |
| 1.64                                                                                                                                                                                   | -64.2               | V                  | 3.0      | -22.2                         | 37.8   | 1.0        | -59.0 | -13.0 | -46.0 |       |
| 2.46                                                                                                                                                                                   | -65.4               | V                  | 3.0      | -20.3                         | 38.4   | 1.0        | -57.7 | -13.0 | -44.7 |       |
| 3.28                                                                                                                                                                                   | -66.3               | V                  | 3.0      | -17.7                         | 38.5   | 1.0        | -55.2 | -13.0 | -42.2 |       |
| Rev. 05.21.15                                                                                                                                                                          |                     |                    |          |                               |        |            |       |       |       |       |

## 9.1.10. LTE BAND 30

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT only  
**Mode:** LTE Band 30, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  

3m Chamber E

**Pre-amplifier**  

3m Chamber E

**Filter**  

Filter

**Limit**  

LTE B30

| Frequency (GHz)              | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Mid Channel (2310MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 4.62                         | -68.4            | H               | 3.0      | -14.6                   | 37.9   | 1.0        | -51.6 | -40.0 | -11.6 |       |
| 6.93                         | -70.4            | H               | 3.0      | -11.8                   | 36.5   | 1.0        | -47.2 | -40.0 | -7.2  |       |
| 9.24                         | -72.2            | H               | 3.0      | -10.6                   | 34.9   | 1.0        | -44.5 | -40.0 | -4.5  |       |
| 4.62                         | -69.2            | V               | 3.0      | -15.5                   | 37.9   | 1.0        | -52.4 | -40.0 | -12.4 |       |
| 6.93                         | -69.8            | V               | 3.0      | -10.3                   | 36.5   | 1.0        | -45.8 | -40.0 | -5.8  |       |
| 9.24                         | -73.0            | V               | 3.0      | -11.2                   | 34.9   | 1.0        | -45.0 | -40.0 | -5.0  |       |

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**16QAM LTE BAND 30 (10.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT Only  
**Mode:** LTE Band 30, 10MHz 16QAM

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B30

| Frequency<br>(GHz)           | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Mid Channel (2310MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 4.62                         | -69.1               | H                  | 3.0      | -15.3                         | 37.9   | 1.0        | -52.2 | -40.0 | -12.2 |       |
| 6.93                         | -69.3               | H                  | 3.0      | -10.7                         | 36.5   | 1.0        | -46.1 | -40.0 | -6.1  |       |
| 9.24                         | -72.1               | H                  | 3.0      | -10.6                         | 34.9   | 1.0        | -44.5 | -40.0 | -4.5  |       |
| 4.62                         | -68.4               | V                  | 3.0      | -14.7                         | 37.9   | 1.0        | -51.6 | -40.0 | -11.6 |       |
| 6.93                         | -69.7               | V                  | 3.0      | -10.2                         | 36.5   | 1.0        | -45.6 | -40.0 | -5.6  |       |
| 9.24                         | -71.4               | V                  | 3.0      | -9.6                          | 34.9   | 1.0        | -43.5 | -40.0 | -3.5  |       |

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## 9.1.11. LTE BAND 41

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT Only  
**Mode:** LTE Band 41, 20MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 LTE B41

| Frequency (GHz)               | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (2506MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.01                          | -65.0            | H               | 3.0      | -12.1                   | 38.7   | 1.0        | -49.8 | -25.0 | -24.8 |       |
| 7.52                          | -67.6            | H               | 3.0      | -9.8                    | 37.7   | 1.0        | -46.6 | -25.0 | -21.6 |       |
| 10.02                         | -68.8            | H               | 3.0      | -8.0                    | 36.1   | 1.0        | -43.1 | -25.0 | -18.1 |       |
| 5.01                          | -65.0            | V               | 3.0      | -12.4                   | 38.7   | 1.0        | -50.1 | -25.0 | -25.1 |       |
| 7.52                          | -67.5            | V               | 3.0      | -9.9                    | 37.7   | 1.0        | -46.7 | -25.0 | -21.7 |       |
| 10.02                         | -67.6            | V               | 3.0      | -6.8                    | 36.1   | 1.0        | -42.0 | -25.0 | -17.0 |       |
| <b>Mid Channel (2593MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.19                          | -67.2            | H               | 3.0      | -14.0                   | 38.7   | 1.0        | -51.7 | -25.0 | -26.7 |       |
| 7.78                          | -67.7            | H               | 3.0      | -9.6                    | 37.6   | 1.0        | -46.2 | -25.0 | -21.2 |       |
| 10.37                         | -67.2            | H               | 3.0      | -6.1                    | 36.4   | 1.0        | -41.4 | -25.0 | -16.4 |       |
| 5.19                          | -67.2            | V               | 3.0      | -14.3                   | 38.7   | 1.0        | -52.0 | -25.0 | -27.0 |       |
| 7.78                          | -66.8            | V               | 3.0      | -8.9                    | 37.6   | 1.0        | -45.5 | -25.0 | -20.5 |       |
| 10.37                         | -67.4            | V               | 3.0      | -6.2                    | 36.4   | 1.0        | -41.6 | -25.0 | -16.6 |       |
| <b>High Channel (2680MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 5.36                          | -67.4            | H               | 3.0      | -13.8                   | 38.6   | 1.0        | -51.4 | -25.0 | -26.4 |       |
| 8.04                          | -66.1            | H               | 3.0      | -7.6                    | 37.4   | 1.0        | -44.0 | -25.0 | -19.0 |       |
| 10.72                         | -68.1            | H               | 3.0      | -6.7                    | 36.6   | 1.0        | -42.3 | -25.0 | -17.3 |       |
| 5.36                          | -66.2            | V               | 3.0      | -12.9                   | 38.6   | 1.0        | -50.6 | -25.0 | -25.6 |       |
| 8.04                          | -66.6            | V               | 3.0      | -8.4                    | 37.4   | 1.0        | -44.8 | -25.0 | -19.8 |       |
| 10.72                         | -67.4            | V               | 3.0      | -5.8                    | 36.6   | 1.0        | -41.4 | -25.0 | -16.4 |       |

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**16QAM LTE BAND 41 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT Only  
**Mode:** LTE Band 41, 20MHz 16QAM

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 LTE B41

| Frequency (GHz)               | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (2506MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.01                          | -65.9            | H               | 3.0      | -13.0                   | 38.7   | 1.0        | -50.7 | -25.0 | -25.7 |       |
| 7.52                          | -66.2            | H               | 3.0      | -8.3                    | 37.7   | 1.0        | -45.1 | -25.0 | -20.1 |       |
| 10.02                         | -67.1            | H               | 3.0      | -6.3                    | 36.1   | 1.0        | -41.4 | -25.0 | -16.4 |       |
| 5.01                          | -65.1            | V               | 3.0      | -12.5                   | 38.7   | 1.0        | -50.2 | -25.0 | -25.2 |       |
| 7.52                          | -66.0            | V               | 3.0      | -8.4                    | 37.7   | 1.0        | -45.1 | -25.0 | -20.1 |       |
| 10.02                         | -68.3            | V               | 3.0      | -7.5                    | 36.1   | 1.0        | -42.7 | -25.0 | -17.7 |       |
| <b>Mid Channel (2593MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.19                          | -66.0            | H               | 3.0      | -12.7                   | 38.7   | 1.0        | -50.4 | -25.0 | -25.4 |       |
| 7.78                          | -67.1            | H               | 3.0      | -8.9                    | 37.6   | 1.0        | -45.5 | -25.0 | -20.5 |       |
| 10.37                         | -67.2            | H               | 3.0      | -6.1                    | 36.4   | 1.0        | -41.4 | -25.0 | -16.4 |       |
| 5.19                          | -63.8            | V               | 3.0      | -10.8                   | 38.7   | 1.0        | -48.5 | -25.0 | -23.5 |       |
| 7.78                          | -66.8            | V               | 3.0      | -8.9                    | 37.6   | 1.0        | -45.4 | -25.0 | -20.4 |       |
| 10.37                         | -66.7            | V               | 3.0      | -5.5                    | 36.4   | 1.0        | -40.9 | -25.0 | -15.9 |       |
| <b>High Channel (2680MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 5.36                          | -58.5            | H               | 3.0      | -4.8                    | 38.6   | 1.0        | -42.5 | -25.0 | -17.5 |       |
| 8.04                          | -66.7            | H               | 3.0      | -8.3                    | 37.4   | 1.0        | -44.7 | -25.0 | -19.7 |       |
| 10.72                         | -68.0            | H               | 3.0      | -6.6                    | 36.6   | 1.0        | -42.2 | -25.0 | -17.2 |       |
| 5.36                          | -57.0            | V               | 3.0      | -3.7                    | 38.6   | 1.0        | -41.3 | -25.0 | -16.3 |       |
| 8.04                          | -66.5            | V               | 3.0      | -8.3                    | 37.4   | 1.0        | -44.7 | -25.0 | -19.7 |       |
| 10.72                         | -67.1            | V               | 3.0      | -5.5                    | 36.6   | 1.0        | -41.1 | -25.0 | -16.1 |       |

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## 9.1.12. LTE BAND 66

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT Only  
**Mode:** LTE Band 66, 20MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency (GHz)                 | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|---------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1720.0MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.44                            | -66.0            | H               | 3.0      | -16.7                   | 38.5   | 1.0        | -54.2 | -13.0 | -41.2 |       |
| 5.16                            | -66.4            | H               | 3.0      | -13.2                   | 38.7   | 1.0        | -50.9 | -13.0 | -37.9 |       |
| 6.88                            | -65.4            | H               | 3.0      | -8.5                    | 38.1   | 1.0        | -45.6 | -13.0 | -32.6 |       |
| 3.44                            | -66.5            | V               | 3.0      | -17.4                   | 38.5   | 1.0        | -54.9 | -13.0 | -41.9 |       |
| 5.16                            | -66.3            | V               | 3.0      | -13.4                   | 38.7   | 1.0        | -51.1 | -13.0 | -38.1 |       |
| 6.88                            | -66.4            | V               | 3.0      | -9.7                    | 38.1   | 1.0        | -46.8 | -13.0 | -33.8 |       |
| <b>Mid Channel (1745.0MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.49                            | -65.8            | H               | 3.0      | -16.4                   | 38.5   | 1.0        | -53.9 | -13.0 | -40.9 |       |
| 5.23                            | -66.3            | H               | 3.0      | -13.0                   | 38.7   | 1.0        | -50.7 | -13.0 | -37.7 |       |
| 6.98                            | -65.6            | H               | 3.0      | -8.4                    | 38.1   | 1.0        | -45.5 | -13.0 | -32.5 |       |
| 3.49                            | -66.2            | V               | 3.0      | -16.9                   | 38.5   | 1.0        | -54.5 | -13.0 | -41.5 |       |
| 5.23                            | -66.2            | V               | 3.0      | -13.2                   | 38.7   | 1.0        | -50.9 | -13.0 | -37.9 |       |
| 6.98                            | -65.5            | V               | 3.0      | -8.6                    | 38.1   | 1.0        | -45.7 | -13.0 | -32.7 |       |
| <b>High Channel (1770.0MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 3.54                            | -66.3            | H               | 3.0      | -16.7                   | 38.6   | 1.0        | -54.3 | -13.0 | -41.3 |       |
| 5.31                            | -66.7            | H               | 3.0      | -13.2                   | 38.6   | 1.0        | -50.8 | -13.0 | -37.8 |       |
| 7.08                            | -66.5            | H               | 3.0      | -9.2                    | 38.0   | 1.0        | -46.2 | -13.0 | -33.2 |       |
| 3.54                            | -66.6            | V               | 3.0      | -17.2                   | 38.6   | 1.0        | -54.8 | -13.0 | -41.8 |       |
| 5.31                            | -67.2            | V               | 3.0      | -14.0                   | 38.6   | 1.0        | -51.7 | -13.0 | -38.7 |       |
| 7.08                            | -67.1            | V               | 3.0      | -10.1                   | 38.0   | 1.0        | -47.1 | -13.0 | -34.1 |       |

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**16QAM LTE BAND 66 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT Only  
**Mode:** LTE Band 66, 20MHz 16QAM

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)              | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|---------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1720.0MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.44                            | -65.3               | H                  | 3.0      | -16.0                         | 38.5   | 1.0        | -53.5 | -13.0 | -40.5 |       |
| 5.16                            | -64.6               | H                  | 3.0      | -11.4                         | 38.7   | 1.0        | -49.1 | -13.0 | -36.1 |       |
| 6.88                            | -64.9               | H                  | 3.0      | -8.0                          | 38.1   | 1.0        | -45.1 | -13.0 | -32.1 |       |
| 3.44                            | -65.7               | V                  | 3.0      | -16.6                         | 38.5   | 1.0        | -54.1 | -13.0 | -41.1 |       |
| 5.16                            | -66.7               | V                  | 3.0      | -13.9                         | 38.7   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 6.88                            | -65.8               | V                  | 3.0      | -9.2                          | 38.1   | 1.0        | -46.3 | -13.0 | -33.3 |       |
| <b>Mid Channel (1745.0MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.49                            | -65.9               | H                  | 3.0      | -16.4                         | 38.5   | 1.0        | -54.0 | -13.0 | -41.0 |       |
| 5.23                            | -66.6               | H                  | 3.0      | -13.3                         | 38.7   | 1.0        | -51.0 | -13.0 | -38.0 |       |
| 6.98                            | -66.1               | H                  | 3.0      | -9.0                          | 38.1   | 1.0        | -46.1 | -13.0 | -33.1 |       |
| 3.49                            | -66.3               | V                  | 3.0      | -17.1                         | 38.5   | 1.0        | -54.6 | -13.0 | -41.6 |       |
| 5.23                            | -67.7               | V                  | 3.0      | -14.7                         | 38.7   | 1.0        | -52.4 | -13.0 | -39.4 |       |
| 6.98                            | -66.4               | V                  | 3.0      | -9.5                          | 38.1   | 1.0        | -46.6 | -13.0 | -33.6 |       |
| <b>High Channel (1770.0MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 3.54                            | -66.1               | H                  | 3.0      | -16.5                         | 38.6   | 1.0        | -54.1 | -13.0 | -41.1 |       |
| 5.31                            | -67.5               | H                  | 3.0      | -14.0                         | 38.6   | 1.0        | -51.6 | -13.0 | -38.6 |       |
| 7.08                            | -67.2               | H                  | 3.0      | -9.9                          | 38.0   | 1.0        | -47.0 | -13.0 | -34.0 |       |
| 3.54                            | -65.4               | V                  | 3.0      | -16.0                         | 38.6   | 1.0        | -53.5 | -13.0 | -40.5 |       |
| 5.31                            | -67.1               | V                  | 3.0      | -13.9                         | 38.6   | 1.0        | -51.6 | -13.0 | -38.6 |       |
| 7.08                            | -67.2               | V                  | 3.0      | -10.2                         | 38.0   | 1.0        | -47.2 | -13.0 | -34.2 |       |

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## 9.2. FIELD STRENGTH OF SPURIOUS RADIATION, UAT 1

### 9.2.1. LTE BAND 2

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 2, 20MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1860MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.72                          | -64.3               | H                  | 3.0      | -14.3                         | 38.6   | 1.0        | -51.9 | -13.0 | -38.9 |       |
| 5.58                          | -67.1               | H                  | 3.0      | -13.0                         | 38.6   | 1.0        | -50.6 | -13.0 | -37.6 |       |
| 7.44                          | -64.9               | H                  | 3.0      | -7.2                          | 37.8   | 1.0        | -44.0 | -13.0 | -31.0 |       |
| 3.72                          | -64.1               | V                  | 3.0      | -14.2                         | 38.6   | 1.0        | -51.8 | -13.0 | -38.8 |       |
| 5.58                          | -66.1               | V                  | 3.0      | -12.3                         | 38.6   | 1.0        | -49.8 | -13.0 | -36.8 |       |
| 7.44                          | -65.7               | V                  | 3.0      | -8.1                          | 37.8   | 1.0        | -44.9 | -13.0 | -31.9 |       |
| <b>Mid Channel (1880MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.76                          | -64.6               | H                  | 3.0      | -14.5                         | 38.6   | 1.0        | -52.1 | -13.0 | -39.1 |       |
| 5.64                          | -65.9               | H                  | 3.0      | -11.6                         | 38.5   | 1.0        | -49.2 | -13.0 | -36.2 |       |
| 7.52                          | -67.0               | H                  | 3.0      | -9.2                          | 37.7   | 1.0        | -45.9 | -13.0 | -32.9 |       |
| 3.76                          | -64.8               | V                  | 3.0      | -14.8                         | 38.6   | 1.0        | -52.4 | -13.0 | -39.4 |       |
| 5.64                          | -66.8               | V                  | 3.0      | -12.9                         | 38.5   | 1.0        | -50.4 | -13.0 | -37.4 |       |
| 7.52                          | -67.5               | V                  | 3.0      | -9.9                          | 37.7   | 1.0        | -46.6 | -13.0 | -33.6 |       |
| <b>High Channel (1900MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 3.80                          | -64.5               | H                  | 3.0      | -14.3                         | 38.6   | 1.0        | -52.0 | -13.0 | -39.0 |       |
| 5.70                          | -66.3               | H                  | 3.0      | -11.9                         | 38.5   | 1.0        | -49.5 | -13.0 | -36.5 |       |
| 7.60                          | -67.1               | H                  | 3.0      | -9.1                          | 37.7   | 1.0        | -45.8 | -13.0 | -32.8 |       |
| 3.80                          | -63.9               | V                  | 3.0      | -13.7                         | 38.6   | 1.0        | -51.4 | -13.0 | -38.4 |       |
| 5.70                          | -67.0               | V                  | 3.0      | -12.9                         | 38.5   | 1.0        | -50.5 | -13.0 | -37.5 |       |
| 7.60                          | -67.1               | V                  | 3.0      | -9.4                          | 37.7   | 1.0        | -46.1 | -13.0 | -33.1 |       |

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**16QAM LTE BAND 2 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 06/02/17

**Test Engineer:** 10641

**Configuration:** EUT Only

**Mode:** LTE Band 2, 20MHz 16QAM

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
3m Chamber E

**Pre-amplifier**  
3m Chamber E

**Filter**  
Filter

**Limit**  
EIRP

| Frequency (GHz)               | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1860MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.72                          | -64.8            | H               | 3.0      | -14.8                   | 38.6   | 1.0        | -52.4 | -13.0 | -39.4 |       |
| 5.58                          | -66.0            | H               | 3.0      | -11.9                   | 38.6   | 1.0        | -49.5 | -13.0 | -36.5 |       |
| 7.44                          | -65.4            | H               | 3.0      | -7.7                    | 37.8   | 1.0        | -44.5 | -13.0 | -31.5 |       |
| 3.72                          | -64.7            | V               | 3.0      | -14.8                   | 38.6   | 1.0        | -52.4 | -13.0 | -39.4 |       |
| 5.58                          | -67.0            | V               | 3.0      | -13.2                   | 38.6   | 1.0        | -50.7 | -13.0 | -37.7 |       |
| 7.44                          | -65.2            | V               | 3.0      | -7.7                    | 37.8   | 1.0        | -44.5 | -13.0 | -31.5 |       |
| <b>Mid Channel (1880MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.76                          | -64.4            | H               | 3.0      | -14.3                   | 38.6   | 1.0        | -51.9 | -13.0 | -38.9 |       |
| 5.64                          | -66.3            | H               | 3.0      | -12.0                   | 38.5   | 1.0        | -49.6 | -13.0 | -36.6 |       |
| 7.52                          | -67.1            | H               | 3.0      | -9.3                    | 37.7   | 1.0        | -46.1 | -13.0 | -33.1 |       |
| 3.76                          | -63.3            | V               | 3.0      | -13.3                   | 38.6   | 1.0        | -50.9 | -13.0 | -37.9 |       |
| 5.64                          | -66.6            | V               | 3.0      | -12.7                   | 38.5   | 1.0        | -50.2 | -13.0 | -37.2 |       |
| 7.52                          | -66.1            | V               | 3.0      | -8.5                    | 37.7   | 1.0        | -45.2 | -13.0 | -32.2 |       |
| <b>High Channel (1900MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 3.80                          | -63.9            | H               | 3.0      | -13.7                   | 38.6   | 1.0        | -51.3 | -13.0 | -38.3 |       |
| 5.70                          | -66.8            | H               | 3.0      | -12.4                   | 38.5   | 1.0        | -49.9 | -13.0 | -36.9 |       |
| 7.60                          | -65.3            | H               | 3.0      | -7.4                    | 37.7   | 1.0        | -44.1 | -13.0 | -31.1 |       |
| 3.80                          | -64.7            | V               | 3.0      | -14.6                   | 38.6   | 1.0        | -52.2 | -13.0 | -39.2 |       |
| 5.70                          | -66.6            | V               | 3.0      | -12.6                   | 38.5   | 1.0        | -50.1 | -13.0 | -37.1 |       |
| 7.60                          | -67.0            | V               | 3.0      | -9.3                    | 37.7   | 1.0        | -46.0 | -13.0 | -33.0 |       |

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## 9.2.2. LTE BAND 4

### QPSK LTE BAND 4 (3.0MHZ BANDWIDTH)

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 4, 3.0MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency<br>(GHz)              | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|---------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1711.5MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.44                            | -66.7               | H                  | 3.0      | -17.4                         | 38.5   | 1.0        | -54.9 | -13.0 | -41.9 |       |
| 5.16                            | -66.1               | H                  | 3.0      | -12.9                         | 38.7   | 1.0        | -50.6 | -13.0 | -37.6 |       |
| 6.88                            | -65.3               | H                  | 3.0      | -8.4                          | 38.1   | 1.0        | -45.5 | -13.0 | -32.5 |       |
| 3.44                            | -65.5               | V                  | 3.0      | -16.4                         | 38.5   | 1.0        | -53.9 | -13.0 | -40.9 |       |
| 5.16                            | -65.9               | V                  | 3.0      | -13.0                         | 38.7   | 1.0        | -50.7 | -13.0 | -37.7 |       |
| 6.88                            | -65.5               | V                  | 3.0      | -8.9                          | 38.1   | 1.0        | -46.0 | -13.0 | -33.0 |       |
| <b>Mid Channel (1732.5MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.47                            | -66.4               | H                  | 3.0      | -17.0                         | 38.5   | 1.0        | -54.6 | -13.0 | -41.6 |       |
| 5.20                            | -66.7               | H                  | 3.0      | -13.4                         | 38.7   | 1.0        | -51.1 | -13.0 | -38.1 |       |
| 6.93                            | -65.8               | H                  | 3.0      | -8.8                          | 38.1   | 1.0        | -45.9 | -13.0 | -32.9 |       |
| 3.47                            | -65.3               | V                  | 3.0      | -16.1                         | 38.5   | 1.0        | -53.6 | -13.0 | -40.6 |       |
| 5.20                            | -65.2               | V                  | 3.0      | -12.2                         | 38.7   | 1.0        | -49.9 | -13.0 | -36.9 |       |
| 6.93                            | -64.7               | V                  | 3.0      | -7.9                          | 38.1   | 1.0        | -45.0 | -13.0 | -32.0 |       |
| <b>High Channel (1753.5MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 3.49                            | -66.2               | H                  | 3.0      | -16.8                         | 38.5   | 1.0        | -54.3 | -13.0 | -41.3 |       |
| 5.24                            | -67.3               | H                  | 3.0      | -13.9                         | 38.7   | 1.0        | -51.6 | -13.0 | -38.6 |       |
| 6.98                            | -66.3               | H                  | 3.0      | -9.1                          | 38.1   | 1.0        | -46.2 | -13.0 | -33.2 |       |
| 3.49                            | -66.0               | V                  | 3.0      | -16.7                         | 38.5   | 1.0        | -54.3 | -13.0 | -41.3 |       |
| 5.24                            | -66.8               | V                  | 3.0      | -13.8                         | 38.7   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 6.98                            | -65.7               | V                  | 3.0      | -8.8                          | 38.1   | 1.0        | -45.9 | -13.0 | -32.9 |       |

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**16QAM LTE BAND 4 (3.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                           |                     |                    |          |                               |        |            |       |       |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Company:</b><br><b>Project #:</b> 11792114<br><b>Date:</b> 06/02/17<br><b>Test Engineer:</b> 10641<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 4, 3.0MHz 16QAM |                     |                    |          |                               |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                 |                     |                    |          |                               |        |            |       |       |       |       |
| Chamber                                                                                                                                                                          |                     | Pre-amplifier      |          | Filter                        |        | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                                     |                     | 3m Chamber E       |          | Filter                        |        | EIRP       |       |       |       |       |
| Frequency<br>(GHz)                                                                                                                                                               | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (1711.5MHz)</b>                                                                                                                                                   |                     |                    |          |                               |        |            |       |       |       |       |
| 3.44                                                                                                                                                                             | -66.2               | H                  | 3.0      | -16.9                         | 38.5   | 1.0        | -54.4 | -13.0 | -41.4 |       |
| 5.16                                                                                                                                                                             | -66.6               | H                  | 3.0      | -13.4                         | 38.7   | 1.0        | -51.1 | -13.0 | -38.1 |       |
| 6.88                                                                                                                                                                             | -64.8               | H                  | 3.0      | -7.9                          | 38.1   | 1.0        | -45.0 | -13.0 | -32.0 |       |
| 3.44                                                                                                                                                                             | -66.7               | V                  | 3.0      | -17.6                         | 38.5   | 1.0        | -55.2 | -13.0 | -42.2 |       |
| 5.16                                                                                                                                                                             | -65.3               | V                  | 3.0      | -12.4                         | 38.7   | 1.0        | -50.1 | -13.0 | -37.1 |       |
| 6.88                                                                                                                                                                             | -65.8               | V                  | 3.0      | -9.2                          | 38.1   | 1.0        | -46.3 | -13.0 | -33.3 |       |
| <b>Mid Channel (1732.5MHz)</b>                                                                                                                                                   |                     |                    |          |                               |        |            |       |       |       |       |
| 3.47                                                                                                                                                                             | -66.3               | H                  | 3.0      | -16.9                         | 38.5   | 1.0        | -54.4 | -13.0 | -41.4 |       |
| 5.20                                                                                                                                                                             | -66.4               | H                  | 3.0      | -13.1                         | 38.7   | 1.0        | -50.8 | -13.0 | -37.8 |       |
| 6.93                                                                                                                                                                             | -66.2               | H                  | 3.0      | -9.1                          | 38.1   | 1.0        | -46.2 | -13.0 | -33.2 |       |
| 3.47                                                                                                                                                                             | -66.6               | V                  | 3.0      | -17.4                         | 38.5   | 1.0        | -55.0 | -13.0 | -42.0 |       |
| 5.20                                                                                                                                                                             | -65.7               | V                  | 3.0      | -12.7                         | 38.7   | 1.0        | -50.4 | -13.0 | -37.4 |       |
| 6.93                                                                                                                                                                             | -65.3               | V                  | 3.0      | -8.5                          | 38.1   | 1.0        | -45.6 | -13.0 | -32.6 |       |
| <b>High Channel (1753.5MHz)</b>                                                                                                                                                  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.49                                                                                                                                                                             | -64.9               | H                  | 3.0      | -15.4                         | 38.5   | 1.0        | -53.0 | -13.0 | -40.0 |       |
| 5.24                                                                                                                                                                             | -65.9               | H                  | 3.0      | -12.5                         | 38.7   | 1.0        | -50.2 | -13.0 | -37.2 |       |
| 6.98                                                                                                                                                                             | -65.1               | H                  | 3.0      | -7.9                          | 38.1   | 1.0        | -45.0 | -13.0 | -32.0 |       |
| 3.49                                                                                                                                                                             | -66.4               | V                  | 3.0      | -17.2                         | 38.5   | 1.0        | -54.7 | -13.0 | -41.7 |       |
| 5.24                                                                                                                                                                             | -66.5               | V                  | 3.0      | -13.5                         | 38.7   | 1.0        | -51.2 | -13.0 | -38.2 |       |
| 6.98                                                                                                                                                                             | -66.3               | V                  | 3.0      | -9.4                          | 38.1   | 1.0        | -46.4 | -13.0 | -33.4 |       |
| Rev. 05.21.15                                                                                                                                                                    |                     |                    |          |                               |        |            |       |       |       |       |

### 9.2.3. LTE BAND 5

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT Only  
**Mode:** LTE Band 5, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (829MHz)</b>   |                     |                    |          |                               |        |            |       |       |       |       |
| 1.66                          | -64.6               | H                  | 3.0      | -22.1                         | 37.8   | 1.0        | -59.0 | -13.0 | -46.0 |       |
| 2.49                          | -65.1               | H                  | 3.0      | -20.0                         | 38.5   | 1.0        | -57.5 | -13.0 | -44.5 |       |
| 3.32                          | -66.6               | H                  | 3.0      | -17.6                         | 38.5   | 1.0        | -55.1 | -13.0 | -42.1 |       |
| 1.66                          | -63.8               | V                  | 3.0      | -21.6                         | 37.8   | 1.0        | -58.4 | -13.0 | -45.4 |       |
| 2.49                          | -65.2               | V                  | 3.0      | -19.9                         | 38.5   | 1.0        | -57.4 | -13.0 | -44.4 |       |
| 3.32                          | -67.0               | V                  | 3.0      | -18.3                         | 38.5   | 1.0        | -55.8 | -13.0 | -42.8 |       |
| <b>Mid Channel (836.5MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 1.67                          | -65.2               | H                  | 3.0      | -22.7                         | 37.8   | 1.0        | -59.5 | -13.0 | -46.5 |       |
| 2.51                          | -66.1               | H                  | 3.0      | -20.9                         | 38.6   | 1.0        | -58.5 | -13.0 | -45.5 |       |
| 3.35                          | -66.4               | H                  | 3.0      | -17.3                         | 38.5   | 1.0        | -54.8 | -13.0 | -41.8 |       |
| 1.67                          | -65.8               | V                  | 3.0      | -23.6                         | 37.8   | 1.0        | -60.4 | -13.0 | -47.4 |       |
| 2.51                          | -67.0               | V                  | 3.0      | -21.6                         | 38.6   | 1.0        | -59.2 | -13.0 | -46.2 |       |
| 3.35                          | -66.1               | V                  | 3.0      | -17.2                         | 38.5   | 1.0        | -54.7 | -13.0 | -41.7 |       |
| <b>High Channel (844MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 1.69                          | -66.7               | H                  | 3.0      | -24.2                         | 37.9   | 1.0        | -61.0 | -13.0 | -48.0 |       |
| 2.53                          | -67.6               | H                  | 3.0      | -22.3                         | 38.6   | 1.0        | -59.8 | -13.0 | -46.8 |       |
| 3.38                          | -65.8               | H                  | 3.0      | -16.7                         | 38.5   | 1.0        | -54.2 | -13.0 | -41.2 |       |
| 1.69                          | -66.8               | V                  | 3.0      | -24.4                         | 37.9   | 1.0        | -61.3 | -13.0 | -48.3 |       |
| 2.53                          | -67.3               | V                  | 3.0      | -21.8                         | 38.6   | 1.0        | -59.4 | -13.0 | -46.4 |       |
| 3.38                          | -66.1               | V                  | 3.0      | -17.2                         | 38.5   | 1.0        | -54.7 | -13.0 | -41.7 |       |

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**16QAM LTE BAND 5 (10.0MHZ BANDWIDTH)**

**UL Fremont Radiated Chamber**

Company:  
 Project #: 11792114  
 Date: 06/01/17  
 Test Engineer: 10645  
 Configuration: EUT Only  
 Mode: LTE Band 5, 10MHz 16QAM

Test Equipment:  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency (GHz)               | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (829MHz)</b>   |                  |                 |          |                         |        |            |       |       |       |       |
| 1.66                          | -65.7            | H               | 3.0      | -24.2                   | 37.8   | 1.0        | -61.0 | -13.0 | -48.0 |       |
| 2.49                          | -66.8            | H               | 3.0      | -23.7                   | 38.5   | 1.0        | -61.2 | -13.0 | -48.2 |       |
| 3.32                          | -67.4            | H               | 3.0      | -21.4                   | 38.5   | 1.0        | -58.9 | -13.0 | -45.9 |       |
| 1.66                          | -64.6            | V               | 3.0      | -22.8                   | 37.8   | 1.0        | -59.7 | -13.0 | -46.7 |       |
| 2.49                          | -64.2            | V               | 3.0      | -20.1                   | 38.5   | 1.0        | -57.6 | -13.0 | -44.6 |       |
| 3.32                          | -64.6            | V               | 3.0      | -18.7                   | 38.5   | 1.0        | -56.1 | -13.0 | -43.1 |       |
| <b>Mid Channel (836.5MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 1.67                          | -64.9            | H               | 3.0      | -23.5                   | 37.8   | 1.0        | -60.3 | -13.0 | -47.3 |       |
| 2.51                          | -65.7            | H               | 3.0      | -22.5                   | 38.6   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 3.35                          | -66.3            | H               | 3.0      | -20.3                   | 38.5   | 1.0        | -57.8 | -13.0 | -44.8 |       |
| 1.67                          | -65.7            | V               | 3.0      | -23.9                   | 37.8   | 1.0        | -60.8 | -13.0 | -47.8 |       |
| 2.51                          | -66.8            | V               | 3.0      | -22.6                   | 38.6   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 3.35                          | -65.9            | V               | 3.0      | -19.9                   | 38.5   | 1.0        | -57.3 | -13.0 | -44.3 |       |
| <b>High Channel (844MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 1.69                          | -66.0            | H               | 3.0      | -24.5                   | 37.9   | 1.0        | -61.4 | -13.0 | -48.4 |       |
| 2.53                          | -67.1            | H               | 3.0      | -23.8                   | 38.6   | 1.0        | -61.4 | -13.0 | -48.4 |       |
| 3.38                          | -65.4            | H               | 3.0      | -19.3                   | 38.5   | 1.0        | -56.8 | -13.0 | -43.8 |       |
| 1.69                          | -66.1            | V               | 3.0      | -24.4                   | 37.9   | 1.0        | -61.2 | -13.0 | -48.2 |       |
| 2.53                          | -67.3            | V               | 3.0      | -23.0                   | 38.6   | 1.0        | -60.6 | -13.0 | -47.6 |       |
| 3.38                          | -67.0            | V               | 3.0      | -20.9                   | 38.5   | 1.0        | -58.4 | -13.0 | -45.4 |       |

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## 9.2.4. LTE BAND 7

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 06/02/17

**Test Engineer:** 10641

**Configuration:** EUT Only

**Mode:** LTE Band 7, 20MHz QPSK

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B7

| Frequency (GHz)               | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (2510MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.02                          | -67.2            | H               | 3.0      | -14.3                   | 38.7   | 1.0        | -52.0 | -25.0 | -27.0 |       |
| 7.53                          | -68.7            | H               | 3.0      | -10.8                   | 37.7   | 1.0        | -47.6 | -25.0 | -22.6 |       |
| 10.04                         | -68.5            | H               | 3.0      | -7.6                    | 36.2   | 1.0        | -42.8 | -25.0 | -17.8 |       |
| 5.02                          | -67.5            | V               | 3.0      | -14.9                   | 38.7   | 1.0        | -52.5 | -25.0 | -27.5 |       |
| 7.53                          | -68.2            | V               | 3.0      | -10.6                   | 37.7   | 1.0        | -47.3 | -25.0 | -22.3 |       |
| 10.04                         | -68.2            | V               | 3.0      | -7.4                    | 36.2   | 1.0        | -42.5 | -25.0 | -17.5 |       |
| <b>Mid Channel (2535MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 5.07                          | -66.5            | H               | 3.0      | -13.5                   | 38.7   | 1.0        | -51.2 | -25.0 | -26.2 |       |
| 7.61                          | -68.3            | H               | 3.0      | -10.4                   | 37.7   | 1.0        | -47.1 | -25.0 | -22.1 |       |
| 10.14                         | -68.2            | H               | 3.0      | -7.3                    | 36.2   | 1.0        | -42.5 | -25.0 | -17.5 |       |
| 5.07                          | -65.1            | V               | 3.0      | -12.4                   | 38.7   | 1.0        | -50.0 | -25.0 | -25.0 |       |
| 7.61                          | -68.6            | V               | 3.0      | -10.9                   | 37.7   | 1.0        | -47.5 | -25.0 | -22.5 |       |
| 10.14                         | -68.3            | V               | 3.0      | -7.4                    | 36.2   | 1.0        | -42.6 | -25.0 | -17.6 |       |
| <b>High Channel (2560MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 5.12                          | -67.3            | H               | 3.0      | -14.2                   | 38.7   | 1.0        | -51.9 | -25.0 | -26.9 |       |
| 7.68                          | -68.0            | H               | 3.0      | -10.0                   | 37.6   | 1.0        | -46.6 | -25.0 | -21.6 |       |
| 10.24                         | -67.4            | H               | 3.0      | -6.4                    | 36.3   | 1.0        | -41.7 | -25.0 | -16.7 |       |
| 5.12                          | -66.9            | V               | 3.0      | -14.1                   | 38.7   | 1.0        | -51.8 | -25.0 | -26.8 |       |
| 7.68                          | -68.2            | V               | 3.0      | -10.4                   | 37.6   | 1.0        | -47.1 | -25.0 | -22.1 |       |
| 10.24                         | -68.0            | V               | 3.0      | -7.0                    | 36.3   | 1.0        | -42.2 | -25.0 | -17.2 |       |

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**16QAM LTE BAND 7 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 06/02/17

**Test Engineer:** 10641

**Configuration:** EUT Only

**Mode:** LTE Band 7, 20MHz 16QAM

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B7

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (2510MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 5.02                          | -65.5               | H                  | 3.0      | -12.6                         | 38.7   | 1.0        | -50.3 | -25.0 | -25.3 |       |
| 7.53                          | -67.8               | H                  | 3.0      | -10.0                         | 37.7   | 1.0        | -46.7 | -25.0 | -21.7 |       |
| 10.04                         | -68.1               | H                  | 3.0      | -7.2                          | 36.2   | 1.0        | -42.4 | -25.0 | -17.4 |       |
| 5.02                          | -66.0               | V                  | 3.0      | -13.4                         | 38.7   | 1.0        | -51.1 | -25.0 | -26.1 |       |
| 7.53                          | -68.6               | V                  | 3.0      | -11.0                         | 37.7   | 1.0        | -47.7 | -25.0 | -22.7 |       |
| 10.04                         | -68.7               | V                  | 3.0      | -7.9                          | 36.2   | 1.0        | -43.1 | -25.0 | -18.1 |       |
| <b>Mid Channel (2535MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 5.07                          | -66.4               | H                  | 3.0      | -13.4                         | 38.7   | 1.0        | -51.0 | -25.0 | -26.0 |       |
| 7.61                          | -68.1               | H                  | 3.0      | -10.2                         | 37.7   | 1.0        | -46.9 | -25.0 | -21.9 |       |
| 10.14                         | -67.4               | H                  | 3.0      | -6.5                          | 36.2   | 1.0        | -41.7 | -25.0 | -16.7 |       |
| 5.07                          | -66.4               | V                  | 3.0      | -13.7                         | 38.7   | 1.0        | -51.4 | -25.0 | -26.4 |       |
| 7.61                          | -67.5               | V                  | 3.0      | -9.8                          | 37.7   | 1.0        | -46.5 | -25.0 | -21.5 |       |
| 10.14                         | -67.3               | V                  | 3.0      | -6.4                          | 36.2   | 1.0        | -41.6 | -25.0 | -16.6 |       |
| <b>High Channel (2560MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 5.12                          | -66.0               | H                  | 3.0      | -12.9                         | 38.7   | 1.0        | -50.6 | -25.0 | -25.6 |       |
| 7.68                          | -67.1               | H                  | 3.0      | -9.1                          | 37.6   | 1.0        | -45.7 | -25.0 | -20.7 |       |
| 10.24                         | -68.0               | H                  | 3.0      | -7.0                          | 36.3   | 1.0        | -42.3 | -25.0 | -17.3 |       |
| 5.12                          | -66.2               | V                  | 3.0      | -13.4                         | 38.7   | 1.0        | -51.1 | -25.0 | -26.1 |       |
| 7.68                          | -67.9               | V                  | 3.0      | -10.1                         | 37.6   | 1.0        | -46.7 | -25.0 | -21.7 |       |
| 10.24                         | -67.8               | V                  | 3.0      | -6.8                          | 36.3   | 1.0        | -42.0 | -25.0 | -17.0 |       |

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## 9.2.5. LTE BAND 12

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/01/17  
**Test Engineer:** 10645  
**Configuration:** EUT Only  
**Mode:** LTE Band 12, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency<br>(GHz)            | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (704MHz)</b>   |                     |                    |          |                               |        |            |       |       |       |       |
| 1.41                          | -65.3               | H                  | 3.0      | -23.7                         | 38.1   | 1.0        | -60.7 | -13.0 | -47.7 |       |
| 2.11                          | -66.9               | H                  | 3.0      | -23.3                         | 38.0   | 1.0        | -60.3 | -13.0 | -47.3 |       |
| 2.82                          | -66.1               | H                  | 3.0      | -19.0                         | 38.4   | 1.0        | -56.5 | -13.0 | -43.5 |       |
| 1.41                          | -66.1               | V                  | 3.0      | -25.1                         | 38.1   | 1.0        | -62.2 | -13.0 | -49.2 |       |
| 2.11                          | -67.3               | V                  | 3.0      | -23.2                         | 38.0   | 1.0        | -60.2 | -13.0 | -47.2 |       |
| 2.82                          | -65.5               | V                  | 3.0      | -18.6                         | 38.4   | 1.0        | -56.1 | -13.0 | -43.1 |       |
| <b>Mid Channel (707.5MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 1.42                          | -64.8               | H                  | 3.0      | -23.1                         | 38.0   | 1.0        | -60.2 | -13.0 | -47.2 |       |
| 2.12                          | -66.1               | H                  | 3.0      | -22.5                         | 38.0   | 1.0        | -59.4 | -13.0 | -46.4 |       |
| 2.83                          | -64.4               | H                  | 3.0      | -17.2                         | 38.4   | 1.0        | -54.7 | -13.0 | -41.7 |       |
| 1.42                          | -64.9               | V                  | 3.0      | -23.9                         | 38.0   | 1.0        | -61.0 | -13.0 | -48.0 |       |
| 2.12                          | -66.1               | V                  | 3.0      | -22.0                         | 38.0   | 1.0        | -59.0 | -13.0 | -46.0 |       |
| 2.83                          | -65.4               | V                  | 3.0      | -18.4                         | 38.4   | 1.0        | -55.9 | -13.0 | -42.9 |       |
| <b>High Channel (711MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 1.42                          | -65.3               | H                  | 3.0      | -23.6                         | 38.0   | 1.0        | -60.6 | -13.0 | -47.6 |       |
| 2.13                          | -66.5               | H                  | 3.0      | -22.9                         | 38.0   | 1.0        | -59.9 | -13.0 | -46.9 |       |
| 2.84                          | -67.3               | H                  | 3.0      | -20.1                         | 38.4   | 1.0        | -57.5 | -13.0 | -44.5 |       |
| 1.42                          | -65.1               | V                  | 3.0      | -24.1                         | 38.0   | 1.0        | -61.1 | -13.0 | -48.1 |       |
| 2.13                          | -66.7               | V                  | 3.0      | -22.5                         | 38.0   | 1.0        | -59.5 | -13.0 | -46.5 |       |
| 2.84                          | -66.4               | V                  | 3.0      | -19.4                         | 38.4   | 1.0        | -56.8 | -13.0 | -43.8 |       |

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**16QAM LTE BAND 12 (10.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                                                                                                                      |                  |                 |          |                         |        |            |       |       |       |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <div style="display: flex; justify-content: space-between;"> <div> <b>Company:</b><br/> <b>Project #:</b> 11792114<br/> <b>Date:</b> 06/01/17<br/> <b>Test Engineer:</b> 10645<br/> <b>Configuration:</b> EUT Only<br/> <b>Mode:</b> LTE Band 12, 10MHz 16QAM </div> </div> |                  |                 |          |                         |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                                                                                                            |                  |                 |          |                         |        |            |       |       |       |       |
| Chamber                                                                                                                                                                                                                                                                     |                  | Pre-amplifier   |          | Filter                  |        | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                                                                                                                                |                  | 3m Chamber E    |          | Filter                  |        | EIRP       |       |       |       |       |
| Frequency (GHz)                                                                                                                                                                                                                                                             | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (704MHz)</b>                                                                                                                                                                                                                                                 |                  |                 |          |                         |        |            |       |       |       |       |
| 1.41                                                                                                                                                                                                                                                                        | -65.7            | H               | 3.0      | -24.0                   | 38.1   | 1.0        | -61.1 | -13.0 | -48.1 |       |
| 2.11                                                                                                                                                                                                                                                                        | -66.1            | H               | 3.0      | -22.5                   | 38.0   | 1.0        | -59.5 | -13.0 | -46.5 |       |
| 2.82                                                                                                                                                                                                                                                                        | -66.3            | H               | 3.0      | -19.2                   | 38.4   | 1.0        | -56.7 | -13.0 | -43.7 |       |
| 1.41                                                                                                                                                                                                                                                                        | -64.9            | V               | 3.0      | -23.9                   | 38.1   | 1.0        | -61.0 | -13.0 | -48.0 |       |
| 2.11                                                                                                                                                                                                                                                                        | -65.8            | V               | 3.0      | -21.7                   | 38.0   | 1.0        | -58.7 | -13.0 | -45.7 |       |
| 2.82                                                                                                                                                                                                                                                                        | -66.6            | V               | 3.0      | -19.7                   | 38.4   | 1.0        | -57.2 | -13.0 | -44.2 |       |
| <b>Mid Channel (707.5MHz)</b>                                                                                                                                                                                                                                               |                  |                 |          |                         |        |            |       |       |       |       |
| 1.42                                                                                                                                                                                                                                                                        | -65.7            | H               | 3.0      | -24.0                   | 38.0   | 1.0        | -61.1 | -13.0 | -48.1 |       |
| 2.12                                                                                                                                                                                                                                                                        | -66.6            | H               | 3.0      | -22.9                   | 38.0   | 1.0        | -59.9 | -13.0 | -46.9 |       |
| 2.83                                                                                                                                                                                                                                                                        | -65.7            | H               | 3.0      | -18.6                   | 38.4   | 1.0        | -56.0 | -13.0 | -43.0 |       |
| 1.42                                                                                                                                                                                                                                                                        | -65.7            | V               | 3.0      | -24.8                   | 38.0   | 1.0        | -61.8 | -13.0 | -48.8 |       |
| 2.12                                                                                                                                                                                                                                                                        | -65.3            | V               | 3.0      | -21.2                   | 38.0   | 1.0        | -58.1 | -13.0 | -45.1 |       |
| 2.83                                                                                                                                                                                                                                                                        | -66.1            | V               | 3.0      | -19.2                   | 38.4   | 1.0        | -56.6 | -13.0 | -43.6 |       |
| <b>High Channel (711MHz)</b>                                                                                                                                                                                                                                                |                  |                 |          |                         |        |            |       |       |       |       |
| 1.42                                                                                                                                                                                                                                                                        | -65.0            | H               | 3.0      | -23.3                   | 38.0   | 1.0        | -60.3 | -13.0 | -47.3 |       |
| 2.13                                                                                                                                                                                                                                                                        | -67.1            | H               | 3.0      | -23.4                   | 38.0   | 1.0        | -60.4 | -13.0 | -47.4 |       |
| 2.84                                                                                                                                                                                                                                                                        | -65.8            | H               | 3.0      | -18.6                   | 38.4   | 1.0        | -56.0 | -13.0 | -43.0 |       |
| 1.42                                                                                                                                                                                                                                                                        | -64.7            | V               | 3.0      | -23.6                   | 38.0   | 1.0        | -60.7 | -13.0 | -47.7 |       |
| 2.13                                                                                                                                                                                                                                                                        | -64.6            | V               | 3.0      | -20.4                   | 38.0   | 1.0        | -57.4 | -13.0 | -44.4 |       |
| 2.84                                                                                                                                                                                                                                                                        | -65.0            | V               | 3.0      | -18.0                   | 38.4   | 1.0        | -55.5 | -13.0 | -42.5 |       |
| Rev. 05.21.15                                                                                                                                                                                                                                                               |                  |                 |          |                         |        |            |       |       |       |       |

## 9.2.6. LTE BAND 13

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 13, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B13

| Frequency<br>(GHz)   | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|----------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| Mid Channel (782MHz) |                     |                    |          |                               |        |            |       |       |       |       |
| 1.56                 | -66.1               | H                  | 3.0      | -23.8                         | 37.8   | 1.0        | -60.6 | -40.0 | -20.6 |       |
| 2.35                 | -67.8               | H                  | 3.0      | -23.4                         | 38.1   | 1.0        | -60.5 | -13.0 | -47.5 |       |
| 3.13                 | -66.3               | H                  | 3.0      | -17.8                         | 38.4   | 1.0        | -55.2 | -13.0 | -42.2 |       |
| 1.56                 | -66.1               | V                  | 3.0      | -24.4                         | 37.8   | 1.0        | -61.2 | -40.0 | -21.2 |       |
| 2.35                 | -66.9               | V                  | 3.0      | -22.2                         | 38.1   | 1.0        | -59.4 | -13.0 | -46.4 |       |
| 3.13                 | -67.6               | V                  | 3.0      | -19.4                         | 38.4   | 1.0        | -56.8 | -13.0 | -43.8 |       |
|                      |                     |                    |          |                               |        |            |       |       |       |       |
|                      |                     |                    |          |                               |        |            |       |       |       |       |
|                      |                     |                    |          |                               |        |            |       |       |       |       |

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**16QAM LTE BAND 13 (10.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 06/02/17

**Test Engineer:** 10641

**Configuration:** EUT Only

**Mode:** LTE Band 13, 10MHz 16QAM

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B13

| Frequency (GHz)             | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|-----------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Mid Channel (782MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 1.56                        | -65.0            | H               | 3.0      | -22.7                   | 37.8   | 1.0        | -59.6 | -40.0 | -19.6 |       |
| 2.35                        | -67.8            | H               | 3.0      | -23.3                   | 38.1   | 1.0        | -60.5 | -13.0 | -47.5 |       |
| 3.13                        | -67.7            | H               | 3.0      | -19.2                   | 38.4   | 1.0        | -56.6 | -13.0 | -43.6 |       |
| 1.56                        | -66.8            | V               | 3.0      | -25.1                   | 37.8   | 1.0        | -61.9 | -40.0 | -21.9 |       |
| 2.35                        | -68.3            | V               | 3.0      | -23.7                   | 38.1   | 1.0        | -60.8 | -13.0 | -47.8 |       |
| 3.13                        | -66.8            | V               | 3.0      | -18.7                   | 38.4   | 1.0        | -56.1 | -13.0 | -43.1 |       |
|                             |                  |                 |          |                         |        |            |       |       |       |       |
|                             |                  |                 |          |                         |        |            |       |       |       |       |
|                             |                  |                 |          |                         |        |            |       |       |       |       |

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## 9.2.7. LTE BAND 17

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:**  
**Date:** 07/21/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 17, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency (GHz)              | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (709MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 1.418                        | -63.5            | H               | 3.0      | -21.8                   | 38.0   | 1.0        | -58.8 | -13.0 | -45.8 |       |
| 2.127                        | -64.2            | H               | 3.0      | -20.6                   | 38.0   | 1.0        | -57.6 | -13.0 | -44.6 |       |
| 2.836                        | -65.6            | H               | 3.0      | -18.4                   | 38.4   | 1.0        | -55.8 | -13.0 | -42.8 |       |
| 1.418                        | -64.1            | V               | 3.0      | -23.1                   | 38.0   | 1.0        | -60.1 | -13.0 | -47.1 |       |
| 2.127                        | -64.0            | V               | 3.0      | -19.8                   | 38.0   | 1.0        | -56.8 | -13.0 | -43.8 |       |
| 2.836                        | -64.6            | V               | 3.0      | -17.6                   | 38.4   | 1.0        | -55.1 | -13.0 | -42.1 |       |
| <b>Mid Channel (710MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 1.420                        | -64.3            | H               | 3.0      | -22.6                   | 38.0   | 1.0        | -59.7 | -13.0 | -46.7 |       |
| 2.130                        | -65.3            | H               | 3.0      | -21.7                   | 38.0   | 1.0        | -58.7 | -13.0 | -45.7 |       |
| 2.840                        | -66.0            | H               | 3.0      | -18.8                   | 38.4   | 1.0        | -56.2 | -13.0 | -43.2 |       |
| 1.420                        | -65.0            | V               | 3.0      | -24.0                   | 38.0   | 1.0        | -61.0 | -13.0 | -48.0 |       |
| 2.130                        | -65.2            | V               | 3.0      | -21.1                   | 38.0   | 1.0        | -58.1 | -13.0 | -45.1 |       |
| 2.840                        | -66.3            | V               | 3.0      | -19.3                   | 38.4   | 1.0        | -56.7 | -13.0 | -43.7 |       |
| <b>High Channel (711MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 1.422                        | -64.1            | H               | 3.0      | -22.4                   | 38.0   | 1.0        | -59.5 | -13.0 | -46.5 |       |
| 2.133                        | -65.0            | H               | 3.0      | -21.3                   | 38.0   | 1.0        | -58.3 | -13.0 | -45.3 |       |
| 2.844                        | -65.9            | H               | 3.0      | -18.6                   | 38.4   | 1.0        | -56.1 | -13.0 | -43.1 |       |
| 1.422                        | -64.0            | V               | 3.0      | -23.0                   | 38.0   | 1.0        | -60.0 | -13.0 | -47.0 |       |
| 2.133                        | -65.0            | V               | 3.0      | -20.8                   | 38.0   | 1.0        | -57.8 | -13.0 | -44.8 |       |
| 2.844                        | -64.4            | V               | 3.0      | -17.4                   | 38.4   | 1.0        | -54.8 | -13.0 | -41.8 |       |

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**16QAM LTE BAND 17 (10.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                  |                  |                 |          |                         |        |            |       |       |       |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Company:</b><br><b>Project #:</b><br><b>Date:</b> 07/21/17<br><b>Test Engineer:</b> 10641<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 17, 10MHz 16QAM |                  |                 |          |                         |        |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                        |                  |                 |          |                         |        |            |       |       |       |       |
| Chamber                                                                                                                                                                 |                  | Pre-amplifier   |          | Filter                  |        | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                            |                  | 3m Chamber E    |          | Filter                  |        | EIRP       |       |       |       |       |
| Frequency (GHz)                                                                                                                                                         | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (709MHz)</b>                                                                                                                                             |                  |                 |          |                         |        |            |       |       |       |       |
| 1.418                                                                                                                                                                   | -64.3            | H               | 3.0      | -22.6                   | 38.0   | 1.0        | -59.6 | -13.0 | -46.6 |       |
| 2.127                                                                                                                                                                   | -63.7            | H               | 3.0      | -20.0                   | 38.0   | 1.0        | -57.0 | -13.0 | -44.0 |       |
| 2.836                                                                                                                                                                   | -65.3            | H               | 3.0      | -18.1                   | 38.4   | 1.0        | -55.6 | -13.0 | -42.6 |       |
| 1.418                                                                                                                                                                   | -64.8            | V               | 3.0      | -23.8                   | 38.0   | 1.0        | -60.8 | -13.0 | -47.8 |       |
| 2.127                                                                                                                                                                   | -65.5            | V               | 3.0      | -21.4                   | 38.0   | 1.0        | -58.3 | -13.0 | -45.3 |       |
| 2.836                                                                                                                                                                   | -64.8            | V               | 3.0      | -17.8                   | 38.4   | 1.0        | -55.2 | -13.0 | -42.2 |       |
| <b>Mid Channel (710MHz)</b>                                                                                                                                             |                  |                 |          |                         |        |            |       |       |       |       |
| 1.420                                                                                                                                                                   | -64.3            | H               | 3.0      | -22.5                   | 38.0   | 1.0        | -59.6 | -13.0 | -46.6 |       |
| 2.130                                                                                                                                                                   | -65.3            | H               | 3.0      | -21.6                   | 38.0   | 1.0        | -58.6 | -13.0 | -45.6 |       |
| 2.840                                                                                                                                                                   | -65.8            | H               | 3.0      | -18.5                   | 38.4   | 1.0        | -56.0 | -13.0 | -43.0 |       |
| 1.420                                                                                                                                                                   | -64.5            | V               | 3.0      | -23.5                   | 38.0   | 1.0        | -60.5 | -13.0 | -47.5 |       |
| 2.130                                                                                                                                                                   | -65.3            | V               | 3.0      | -21.1                   | 38.0   | 1.0        | -58.1 | -13.0 | -45.1 |       |
| 2.840                                                                                                                                                                   | -65.4            | V               | 3.0      | -18.4                   | 38.4   | 1.0        | -55.8 | -13.0 | -42.8 |       |
| <b>High Channel (711MHz)</b>                                                                                                                                            |                  |                 |          |                         |        |            |       |       |       |       |
| 1.422                                                                                                                                                                   | -64.4            | H               | 3.0      | -22.7                   | 38.0   | 1.0        | -59.7 | -13.0 | -46.7 |       |
| 2.133                                                                                                                                                                   | -64.1            | H               | 3.0      | -20.4                   | 38.0   | 1.0        | -57.4 | -13.0 | -44.4 |       |
| 2.844                                                                                                                                                                   | -65.5            | H               | 3.0      | -18.2                   | 38.4   | 1.0        | -55.7 | -13.0 | -42.7 |       |
| 1.422                                                                                                                                                                   | -64.5            | V               | 3.0      | -23.5                   | 38.0   | 1.0        | -60.5 | -13.0 | -47.5 |       |
| 2.133                                                                                                                                                                   | -65.3            | V               | 3.0      | -21.1                   | 38.0   | 1.0        | -58.1 | -13.0 | -45.1 |       |
| 2.844                                                                                                                                                                   | -64.8            | V               | 3.0      | -17.8                   | 38.4   | 1.0        | -55.2 | -13.0 | -42.2 |       |
| Rev. 05.21.15                                                                                                                                                           |                  |                 |          |                         |        |            |       |       |       |       |

## 9.2.8. LTE BAND 25

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 25, 20MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency (GHz)                | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|--------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1860MHz)</b>   |                  |                 |          |                         |        |            |       |       |       |       |
| 3.72                           | -65.6            | H               | 3.0      | -15.5                   | 38.6   | 1.0        | -53.2 | -13.0 | -40.2 |       |
| 5.58                           | -67.2            | H               | 3.0      | -13.1                   | 38.6   | 1.0        | -50.7 | -13.0 | -37.7 |       |
| 7.44                           | -68.2            | H               | 3.0      | -10.4                   | 37.8   | 1.0        | -47.2 | -13.0 | -34.2 |       |
| 3.72                           | -66.6            | V               | 3.0      | -16.7                   | 38.6   | 1.0        | -54.3 | -13.0 | -41.3 |       |
| 5.58                           | -68.0            | V               | 3.0      | -14.2                   | 38.6   | 1.0        | -51.8 | -13.0 | -38.8 |       |
| 7.44                           | -67.5            | V               | 3.0      | -9.9                    | 37.8   | 1.0        | -46.7 | -13.0 | -33.7 |       |
| <b>Mid Channel (1882.5MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 3.77                           | -66.0            | H               | 3.0      | -15.8                   | 38.6   | 1.0        | -53.5 | -13.0 | -40.5 |       |
| 5.65                           | -66.6            | H               | 3.0      | -12.3                   | 38.5   | 1.0        | -49.9 | -13.0 | -36.9 |       |
| 7.53                           | -68.9            | H               | 3.0      | -11.0                   | 37.7   | 1.0        | -47.8 | -13.0 | -34.8 |       |
| 3.77                           | -65.1            | V               | 3.0      | -15.0                   | 38.6   | 1.0        | -52.7 | -13.0 | -39.7 |       |
| 5.65                           | -67.0            | V               | 3.0      | -13.0                   | 38.5   | 1.0        | -50.6 | -13.0 | -37.6 |       |
| 7.53                           | -67.5            | V               | 3.0      | -9.9                    | 37.7   | 1.0        | -46.6 | -13.0 | -33.6 |       |
| <b>High Channel (1905MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.81                           | -65.6            | H               | 3.0      | -15.4                   | 38.6   | 1.0        | -53.0 | -13.0 | -40.0 |       |
| 5.72                           | -66.9            | H               | 3.0      | -12.5                   | 38.5   | 1.0        | -50.0 | -13.0 | -37.0 |       |
| 7.62                           | -68.1            | H               | 3.0      | -10.2                   | 37.7   | 1.0        | -46.9 | -13.0 | -33.9 |       |
| 3.81                           | -66.0            | V               | 3.0      | -15.8                   | 38.6   | 1.0        | -53.5 | -13.0 | -40.5 |       |
| 5.72                           | -68.5            | V               | 3.0      | -14.4                   | 38.5   | 1.0        | -51.9 | -13.0 | -38.9 |       |
| 7.62                           | -67.8            | V               | 3.0      | -10.1                   | 37.7   | 1.0        | -46.8 | -13.0 | -33.8 |       |

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**16QAM LTE BAND 25 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 25, 20MHz 16QAM

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency (GHz)                | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|--------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1860MHz)</b>   |                  |                 |          |                         |        |            |       |       |       |       |
| 3.72                           | -66.1            | H               | 3.0      | -16.1                   | 38.6   | 1.0        | -53.7 | -13.0 | -40.7 |       |
| 5.58                           | -66.4            | H               | 3.0      | -12.3                   | 38.6   | 1.0        | -49.9 | -13.0 | -36.9 |       |
| 7.44                           | -67.8            | H               | 3.0      | -10.1                   | 37.8   | 1.0        | -46.9 | -13.0 | -33.9 |       |
| 3.72                           | -65.6            | V               | 3.0      | -15.7                   | 38.6   | 1.0        | -53.3 | -13.0 | -40.3 |       |
| 5.58                           | -66.8            | V               | 3.0      | -13.0                   | 38.6   | 1.0        | -50.6 | -13.0 | -37.6 |       |
| 7.44                           | -68.3            | V               | 3.0      | -10.8                   | 37.8   | 1.0        | -47.6 | -13.0 | -34.6 |       |
| <b>Mid Channel (1882.5MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 3.77                           | -65.6            | H               | 3.0      | -15.5                   | 38.6   | 1.0        | -53.1 | -13.0 | -40.1 |       |
| 5.65                           | -67.3            | H               | 3.0      | -13.1                   | 38.5   | 1.0        | -50.6 | -13.0 | -37.6 |       |
| 7.53                           | -67.0            | H               | 3.0      | -9.2                    | 37.7   | 1.0        | -45.9 | -13.0 | -32.9 |       |
| 3.77                           | -65.6            | V               | 3.0      | -15.5                   | 38.6   | 1.0        | -53.2 | -13.0 | -40.2 |       |
| 5.65                           | -67.3            | V               | 3.0      | -13.4                   | 38.5   | 1.0        | -50.9 | -13.0 | -37.9 |       |
| 7.53                           | -67.8            | V               | 3.0      | -10.2                   | 37.7   | 1.0        | -46.9 | -13.0 | -33.9 |       |
| <b>High Channel (1905MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.81                           | -66.0            | H               | 3.0      | -15.8                   | 38.6   | 1.0        | -53.4 | -13.0 | -40.4 |       |
| 5.72                           | -68.0            | H               | 3.0      | -13.6                   | 38.5   | 1.0        | -51.1 | -13.0 | -38.1 |       |
| 7.62                           | -67.9            | H               | 3.0      | -9.9                    | 37.7   | 1.0        | -46.6 | -13.0 | -33.6 |       |
| 3.81                           | -65.3            | V               | 3.0      | -15.1                   | 38.6   | 1.0        | -52.7 | -13.0 | -39.7 |       |
| 5.72                           | -68.1            | V               | 3.0      | -14.0                   | 38.5   | 1.0        | -51.5 | -13.0 | -38.5 |       |
| 7.62                           | -68.0            | V               | 3.0      | -10.3                   | 37.7   | 1.0        | -47.0 | -13.0 | -34.0 |       |

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## 9.2.9. LTE BAND 26

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 26 (90S), 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency<br>(GHz)   | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|----------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| Mid Channel (819MHz) |                     |                    |          |                               |        |            |       |       |       |       |
| 1.64                 | -66.5               | H                  | 3.0      | -24.1                         | 37.8   | 1.0        | -60.9 | -13.0 | -47.9 |       |
| 2.46                 | -65.4               | H                  | 3.0      | -20.5                         | 38.4   | 1.0        | -57.9 | -13.0 | -44.9 |       |
| 3.28                 | -67.1               | H                  | 3.0      | -18.2                         | 38.5   | 1.0        | -55.7 | -13.0 | -42.7 |       |
| 1.64                 | -66.8               | V                  | 3.0      | -24.7                         | 37.8   | 1.0        | -61.5 | -13.0 | -48.5 |       |
| 2.46                 | -66.4               | V                  | 3.0      | -21.3                         | 38.4   | 1.0        | -58.7 | -13.0 | -45.7 |       |
| 3.28                 | -67.4               | V                  | 3.0      | -18.8                         | 38.5   | 1.0        | -56.2 | -13.0 | -43.2 |       |

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 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888  
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**16QAM LTE BAND 26 (10.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 06/02/17

**Test Engineer:** 10641

**Configuration:** EUT Only

**Mode:** LTE Band 26 (90S), 10MHz 16QAM

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency<br>(GHz)   | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|----------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| Mid Channel (819MHz) |                     |                    |          |                               |        |            |       |       |       |       |
| 1.64                 | -66.5               | H                  | 3.0      | -24.1                         | 37.8   | 1.0        | -60.9 | -13.0 | -47.9 |       |
| 2.46                 | -66.0               | H                  | 3.0      | -21.0                         | 38.4   | 1.0        | -58.5 | -13.0 | -45.5 |       |
| 3.28                 | -67.7               | H                  | 3.0      | -18.8                         | 38.5   | 1.0        | -56.3 | -13.0 | -43.3 |       |
| 1.64                 | -66.6               | V                  | 3.0      | -24.5                         | 37.8   | 1.0        | -61.3 | -13.0 | -48.3 |       |
| 2.46                 | -66.7               | V                  | 3.0      | -21.6                         | 38.4   | 1.0        | -59.1 | -13.0 | -46.1 |       |
| 3.28                 | -67.7               | V                  | 3.0      | -19.0                         | 38.5   | 1.0        | -56.5 | -13.0 | -43.5 |       |

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## 9.2.10. LTE BAND 30

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

**High Frequency Substitution Measurement  
UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT only  
**Mode:** LTE Band 30, 10MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 LTE B30

| Frequency<br>(GHz)           | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Mid Channel (2310MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 4.62                         | -69.0               | H                  | 3.0      | -15.3                         | 37.9   | 1.0        | -52.2 | -40.0 | -12.2 |       |
| 6.93                         | -70.2               | H                  | 3.0      | -11.6                         | 36.5   | 1.0        | -47.1 | -40.0 | -7.1  |       |
| 9.24                         | -71.3               | H                  | 3.0      | -9.8                          | 34.9   | 1.0        | -43.7 | -40.0 | -3.7  |       |
| 4.62                         | -69.2               | V                  | 3.0      | -15.4                         | 37.9   | 1.0        | -52.3 | -40.0 | -12.3 |       |
| 6.93                         | -69.3               | V                  | 3.0      | -9.8                          | 36.5   | 1.0        | -45.3 | -40.0 | -5.3  |       |
| 9.24                         | -70.6               | V                  | 3.0      | -8.8                          | 34.9   | 1.0        | -42.7 | -40.0 | -2.7  |       |

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**16QAM LTE BAND 30 (10.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                           |                     |                    |          |                               |         |            |       |       |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|----------|-------------------------------|---------|------------|-------|-------|-------|-------|
| <b>Company:</b><br><b>Project #:</b> 11792114<br><b>Date:</b> 06/02/17<br><b>Test Engineer:</b> 10641<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 30, 10MHz 16QAM |                     |                    |          |                               |         |            |       |       |       |       |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                 |                     |                    |          |                               |         |            |       |       |       |       |
| Chamber                                                                                                                                                                          |                     | Pre-amplifier      |          | Filter                        |         | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                                     |                     | 3m Chamber E       |          | Filter                        |         | LTE B30    |       |       |       |       |
| Frequency<br>(GHz)                                                                                                                                                               | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preampl | Attenuator | EIRP  | Limit | Delta | Notes |
| Mid Channel (2310MHz)                                                                                                                                                            |                     |                    |          |                               |         |            |       |       |       |       |
| 4.62                                                                                                                                                                             | -70.6               | H                  | 3.0      | -16.8                         | 37.9    | 1.0        | -53.7 | -40.0 | -13.7 |       |
| 6.93                                                                                                                                                                             | -69.0               | H                  | 3.0      | -10.4                         | 36.5    | 1.0        | -45.8 | -40.0 | -5.8  |       |
| 9.24                                                                                                                                                                             | -71.8               | H                  | 3.0      | -10.3                         | 34.9    | 1.0        | -44.1 | -40.0 | -4.1  |       |
| 4.62                                                                                                                                                                             | -71.1               | V                  | 3.0      | -17.4                         | 37.9    | 1.0        | -54.3 | -40.0 | -14.3 |       |
| 6.93                                                                                                                                                                             | -70.2               | V                  | 3.0      | -10.7                         | 36.5    | 1.0        | -46.2 | -40.0 | -6.2  |       |
| 9.24                                                                                                                                                                             | -71.6               | V                  | 3.0      | -9.8                          | 34.9    | 1.0        | -43.6 | -40.0 | -3.6  |       |
| Rev. 05.21.15                                                                                                                                                                    |                     |                    |          |                               |         |            |       |       |       |       |

## 9.2.11. LTE BAND 41

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

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                                                                                                                                                                                                                                               |                  |                 |          |                         |        |            |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <div style="display: flex; justify-content: space-between;"> <div> <p><b>Company:</b></p> <p><b>Project #:</b> 11792114</p> <p><b>Date:</b> 06/02/17</p> <p><b>Test Engineer:</b> 10641</p> <p><b>Configuration:</b> EUT Only</p> <p><b>Mode:</b> LTE Band 41, 20MHz QPSK</p> </div> <div> <p><b>Test Equipment:</b></p> <p>Substitution: Horn T59 Substitution, and 8ft SMA Cable</p> </div> </div> |                  |                 |          |                         |        |            |       |       |       |       |
| Chamber                                                                                                                                                                                                                                                                                                                                                                                              |                  | Pre-amplifier   |          | Filter                  |        | Limit      |       |       |       |       |
| 3m Chamber E                                                                                                                                                                                                                                                                                                                                                                                         |                  | 3m Chamber E    |          | Filter                  |        | LTE B41    |       |       |       |       |
| Frequency (GHz)                                                                                                                                                                                                                                                                                                                                                                                      | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
| <b>Low Channel (2506MHz)</b>                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |          |                         |        |            |       |       |       |       |
| 5.01                                                                                                                                                                                                                                                                                                                                                                                                 | -65.5            | H               | 3.0      | -12.7                   | 38.7   | 1.0        | -50.3 | -25.0 | -25.3 |       |
| 7.52                                                                                                                                                                                                                                                                                                                                                                                                 | -66.1            | H               | 3.0      | -8.3                    | 37.7   | 1.0        | -45.1 | -25.0 | -20.1 |       |
| 10.02                                                                                                                                                                                                                                                                                                                                                                                                | -68.2            | H               | 3.0      | -7.3                    | 36.1   | 1.0        | -42.5 | -25.0 | -17.5 |       |
| 5.01                                                                                                                                                                                                                                                                                                                                                                                                 | -66.1            | V               | 3.0      | -13.5                   | 38.7   | 1.0        | -51.2 | -25.0 | -26.2 |       |
| 7.52                                                                                                                                                                                                                                                                                                                                                                                                 | -67.3            | V               | 3.0      | -9.7                    | 37.7   | 1.0        | -46.4 | -25.0 | -21.4 |       |
| 10.02                                                                                                                                                                                                                                                                                                                                                                                                | -68.1            | V               | 3.0      | -7.3                    | 36.1   | 1.0        | -42.5 | -25.0 | -17.5 |       |
| <b>Mid Channel (2593MHz)</b>                                                                                                                                                                                                                                                                                                                                                                         |                  |                 |          |                         |        |            |       |       |       |       |
| 5.19                                                                                                                                                                                                                                                                                                                                                                                                 | -67.1            | H               | 3.0      | -13.9                   | 38.7   | 1.0        | -51.5 | -25.0 | -26.5 |       |
| 7.78                                                                                                                                                                                                                                                                                                                                                                                                 | -67.3            | H               | 3.0      | -9.2                    | 37.6   | 1.0        | -45.8 | -25.0 | -20.8 |       |
| 10.37                                                                                                                                                                                                                                                                                                                                                                                                | -67.5            | H               | 3.0      | -6.4                    | 36.4   | 1.0        | -41.7 | -25.0 | -16.7 |       |
| 5.19                                                                                                                                                                                                                                                                                                                                                                                                 | -67.7            | V               | 3.0      | -14.8                   | 38.7   | 1.0        | -52.4 | -25.0 | -27.4 |       |
| 7.78                                                                                                                                                                                                                                                                                                                                                                                                 | -66.4            | V               | 3.0      | -8.4                    | 37.6   | 1.0        | -45.0 | -25.0 | -20.0 |       |
| 10.37                                                                                                                                                                                                                                                                                                                                                                                                | -65.8            | V               | 3.0      | -4.7                    | 36.4   | 1.0        | -40.0 | -25.0 | -15.0 |       |
| <b>High Channel (2680MHz)</b>                                                                                                                                                                                                                                                                                                                                                                        |                  |                 |          |                         |        |            |       |       |       |       |
| 5.36                                                                                                                                                                                                                                                                                                                                                                                                 | -67.3            | H               | 3.0      | -13.7                   | 38.6   | 1.0        | -51.3 | -25.0 | -26.3 |       |
| 8.04                                                                                                                                                                                                                                                                                                                                                                                                 | -67.4            | H               | 3.0      | -8.9                    | 37.4   | 1.0        | -45.3 | -25.0 | -20.3 |       |
| 10.72                                                                                                                                                                                                                                                                                                                                                                                                | -66.7            | H               | 3.0      | -5.3                    | 36.6   | 1.0        | -40.9 | -25.0 | -15.9 |       |
| 5.36                                                                                                                                                                                                                                                                                                                                                                                                 | -67.1            | V               | 3.0      | -13.8                   | 38.6   | 1.0        | -51.4 | -25.0 | -26.4 |       |
| 8.04                                                                                                                                                                                                                                                                                                                                                                                                 | -67.5            | V               | 3.0      | -9.2                    | 37.4   | 1.0        | -45.6 | -25.0 | -20.6 |       |
| 10.72                                                                                                                                                                                                                                                                                                                                                                                                | -65.8            | V               | 3.0      | -4.2                    | 36.6   | 1.0        | -39.8 | -25.0 | -14.8 |       |
| Rev. 05.21.15                                                                                                                                                                                                                                                                                                                                                                                        |                  |                 |          |                         |        |            |       |       |       |       |

**16QAM LTE BAND 41 (20.0MHZ BANDWIDTH)**

| High Frequency Substitution Measurement<br>UL Fremont Radiated Chamber                                                                                                           |                     |                    |          |                               |        |            |       |       |       |       |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|--|
| <b>Company:</b><br><b>Project #:</b> 11792114<br><b>Date:</b> 06/02/17<br><b>Test Engineer:</b> 10641<br><b>Configuration:</b> EUT Only<br><b>Mode:</b> LTE Band 41, 20MHz 16QAM |                     |                    |          |                               |        |            |       |       |       |       |  |
| <b>Test Equipment:</b><br>Substitution: Horn T59 Substitution, and 8ft SMA Cable                                                                                                 |                     |                    |          |                               |        |            |       |       |       |       |  |
| Chamber                                                                                                                                                                          |                     | Pre-amplifier      |          | Filter                        |        | Limit      |       |       |       |       |  |
| 3m Chamber E                                                                                                                                                                     |                     | 3m Chamber E       |          | Filter                        |        | LTE B41    |       |       |       |       |  |
| Frequency<br>(GHz)                                                                                                                                                               | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |  |
| <b>Low Channel (2506MHz)</b>                                                                                                                                                     |                     |                    |          |                               |        |            |       |       |       |       |  |
| 5.01                                                                                                                                                                             | -65.4               | H                  | 3.0      | -12.5                         | 38.7   | 1.0        | -50.2 | -25.0 | -25.2 |       |  |
| 7.52                                                                                                                                                                             | -67.3               | H                  | 3.0      | -9.5                          | 37.7   | 1.0        | -46.2 | -25.0 | -21.2 |       |  |
| 10.02                                                                                                                                                                            | -67.9               | H                  | 3.0      | -7.1                          | 36.1   | 1.0        | -42.2 | -25.0 | -17.2 |       |  |
| 5.01                                                                                                                                                                             | -66.3               | V                  | 3.0      | -13.7                         | 38.7   | 1.0        | -51.4 | -25.0 | -26.4 |       |  |
| 7.52                                                                                                                                                                             | -67.1               | V                  | 3.0      | -9.5                          | 37.7   | 1.0        | -46.2 | -25.0 | -21.2 |       |  |
| 10.02                                                                                                                                                                            | -67.1               | V                  | 3.0      | -6.3                          | 36.1   | 1.0        | -41.4 | -25.0 | -16.4 |       |  |
| <b>Mid Channel (2593MHz)</b>                                                                                                                                                     |                     |                    |          |                               |        |            |       |       |       |       |  |
| 5.19                                                                                                                                                                             | -67.3               | H                  | 3.0      | -14.1                         | 38.7   | 1.0        | -51.8 | -25.0 | -26.8 |       |  |
| 7.78                                                                                                                                                                             | -66.3               | H                  | 3.0      | -8.1                          | 37.6   | 1.0        | -44.7 | -25.0 | -19.7 |       |  |
| 10.37                                                                                                                                                                            | -66.8               | H                  | 3.0      | -5.7                          | 36.4   | 1.0        | -41.0 | -25.0 | -16.0 |       |  |
| 5.19                                                                                                                                                                             | -66.8               | V                  | 3.0      | -13.9                         | 38.7   | 1.0        | -51.6 | -25.0 | -26.6 |       |  |
| 7.78                                                                                                                                                                             | -66.7               | V                  | 3.0      | -8.7                          | 37.6   | 1.0        | -45.3 | -25.0 | -20.3 |       |  |
| 10.37                                                                                                                                                                            | -66.3               | V                  | 3.0      | -5.1                          | 36.4   | 1.0        | -40.4 | -25.0 | -15.4 |       |  |
| <b>High Channel (2680MHz)</b>                                                                                                                                                    |                     |                    |          |                               |        |            |       |       |       |       |  |
| 5.36                                                                                                                                                                             | -67.8               | H                  | 3.0      | -14.1                         | 38.6   | 1.0        | -51.8 | -25.0 | -26.8 |       |  |
| 8.04                                                                                                                                                                             | -66.5               | H                  | 3.0      | -8.1                          | 37.4   | 1.0        | -44.5 | -25.0 | -19.5 |       |  |
| 10.72                                                                                                                                                                            | -66.5               | H                  | 3.0      | -5.1                          | 36.6   | 1.0        | -40.7 | -25.0 | -15.7 |       |  |
| 5.36                                                                                                                                                                             | -67.3               | V                  | 3.0      | -14.0                         | 38.6   | 1.0        | -51.6 | -25.0 | -26.6 |       |  |
| 8.04                                                                                                                                                                             | -67.8               | V                  | 3.0      | -9.5                          | 37.4   | 1.0        | -45.9 | -25.0 | -20.9 |       |  |
| 10.72                                                                                                                                                                            | -66.4               | V                  | 3.0      | -4.8                          | 36.6   | 1.0        | -40.4 | -25.0 | -15.4 |       |  |
| Rev. 05.21.15                                                                                                                                                                    |                     |                    |          |                               |        |            |       |       |       |       |  |

## 9.2.12. LTE BAND 66

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

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**  
**Project #:** 11792114  
**Date:** 06/02/17  
**Test Engineer:** 10641  
**Configuration:** EUT Only  
**Mode:** LTE Band 66, 20MHz QPSK

**Test Equipment:**  
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

**Chamber**  
 3m Chamber E

**Pre-amplifier**  
 3m Chamber E

**Filter**  
 Filter

**Limit**  
 EIRP

| Frequency (GHz)                 | SA reading (dBm) | Ant. Pol. (H/V) | Distance | EIRP @ TX Ant End (dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|---------------------------------|------------------|-----------------|----------|-------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1720.0MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.44                            | -66.0            | H               | 3.0      | -16.7                   | 38.5   | 1.0        | -54.2 | -13.0 | -41.2 |       |
| 5.16                            | -64.8            | H               | 3.0      | -11.6                   | 38.7   | 1.0        | -49.3 | -13.0 | -36.3 |       |
| 6.88                            | -64.9            | H               | 3.0      | -8.0                    | 38.1   | 1.0        | -45.1 | -13.0 | -32.1 |       |
| 3.44                            | -65.9            | V               | 3.0      | -16.8                   | 38.5   | 1.0        | -54.3 | -13.0 | -41.3 |       |
| 5.16                            | -66.0            | V               | 3.0      | -13.1                   | 38.7   | 1.0        | -50.8 | -13.0 | -37.8 |       |
| 6.88                            | -65.2            | V               | 3.0      | -8.5                    | 38.1   | 1.0        | -45.6 | -13.0 | -32.6 |       |
| <b>Mid Channel (1745.0MHz)</b>  |                  |                 |          |                         |        |            |       |       |       |       |
| 3.49                            | -65.8            | H               | 3.0      | -16.4                   | 38.5   | 1.0        | -53.9 | -13.0 | -40.9 |       |
| 5.23                            | -66.2            | H               | 3.0      | -12.8                   | 38.7   | 1.0        | -50.5 | -13.0 | -37.5 |       |
| 6.98                            | -66.1            | H               | 3.0      | -8.9                    | 38.1   | 1.0        | -46.0 | -13.0 | -33.0 |       |
| 3.49                            | -66.5            | V               | 3.0      | -17.2                   | 38.5   | 1.0        | -54.8 | -13.0 | -41.8 |       |
| 5.23                            | -66.1            | V               | 3.0      | -13.0                   | 38.7   | 1.0        | -50.7 | -13.0 | -37.7 |       |
| 6.98                            | -66.5            | V               | 3.0      | -9.6                    | 38.1   | 1.0        | -46.7 | -13.0 | -33.7 |       |
| <b>High Channel (1770.0MHz)</b> |                  |                 |          |                         |        |            |       |       |       |       |
| 3.54                            | -66.8            | H               | 3.0      | -17.2                   | 38.6   | 1.0        | -54.8 | -13.0 | -41.8 |       |
| 5.31                            | -66.6            | H               | 3.0      | -13.0                   | 38.6   | 1.0        | -50.7 | -13.0 | -37.7 |       |
| 7.08                            | -65.8            | H               | 3.0      | -8.5                    | 38.0   | 1.0        | -45.6 | -13.0 | -32.6 |       |
| 3.54                            | -66.8            | V               | 3.0      | -17.4                   | 38.6   | 1.0        | -55.0 | -13.0 | -42.0 |       |
| 5.31                            | -66.3            | V               | 3.0      | -13.1                   | 38.6   | 1.0        | -50.8 | -13.0 | -37.8 |       |
| 7.08                            | -66.4            | V               | 3.0      | -9.3                    | 38.0   | 1.0        | -46.3 | -13.0 | -33.3 |       |

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**16QAM LTE BAND 66 (20.0MHZ BANDWIDTH)**

**High Frequency Substitution Measurement**  
**UL Fremont Radiated Chamber**

**Company:**

**Project #:** 11792114

**Date:** 06/02/17

**Test Engineer:** 10641

**Configuration:** EUT Only

**Mode:** LTE Band 66, 20MHz 16QAM

**Test Equipment:**

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

| Frequency<br>(GHz)              | SA reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance | EIRP @ TX<br>Ant End<br>(dBm) | Preamp | Attenuator | EIRP  | Limit | Delta | Notes |
|---------------------------------|---------------------|--------------------|----------|-------------------------------|--------|------------|-------|-------|-------|-------|
| <b>Low Channel (1720.0MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.44                            | -66.9               | H                  | 3.0      | -17.6                         | 38.5   | 1.0        | -55.1 | -13.0 | -42.1 |       |
| 5.16                            | -66.8               | H                  | 3.0      | -13.6                         | 38.7   | 1.0        | -51.3 | -13.0 | -38.3 |       |
| 6.88                            | -65.0               | H                  | 3.0      | -8.1                          | 38.1   | 1.0        | -45.2 | -13.0 | -32.2 |       |
| 3.44                            | -67.2               | V                  | 3.0      | -18.1                         | 38.5   | 1.0        | -55.6 | -13.0 | -42.6 |       |
| 5.16                            | -65.5               | V                  | 3.0      | -12.6                         | 38.7   | 1.0        | -50.3 | -13.0 | -37.3 |       |
| 6.88                            | -65.5               | V                  | 3.0      | -8.8                          | 38.1   | 1.0        | -46.0 | -13.0 | -33.0 |       |
| <b>Mid Channel (1745.0MHz)</b>  |                     |                    |          |                               |        |            |       |       |       |       |
| 3.49                            | -65.4               | H                  | 3.0      | -16.0                         | 38.5   | 1.0        | -53.5 | -13.0 | -40.5 |       |
| 5.23                            | -64.3               | H                  | 3.0      | -10.9                         | 38.7   | 1.0        | -48.6 | -13.0 | -35.6 |       |
| 6.98                            | -65.1               | H                  | 3.0      | -7.9                          | 38.1   | 1.0        | -45.0 | -13.0 | -32.0 |       |
| 3.49                            | -66.6               | V                  | 3.0      | -17.3                         | 38.5   | 1.0        | -54.9 | -13.0 | -41.9 |       |
| 5.23                            | -65.3               | V                  | 3.0      | -12.3                         | 38.7   | 1.0        | -49.9 | -13.0 | -36.9 |       |
| 6.98                            | -65.1               | V                  | 3.0      | -8.2                          | 38.1   | 1.0        | -45.3 | -13.0 | -32.3 |       |
| <b>High Channel (1770.0MHz)</b> |                     |                    |          |                               |        |            |       |       |       |       |
| 3.54                            | -66.9               | H                  | 3.0      | -17.3                         | 38.6   | 1.0        | -54.9 | -13.0 | -41.9 |       |
| 5.31                            | -66.1               | H                  | 3.0      | -12.6                         | 38.6   | 1.0        | -50.2 | -13.0 | -37.2 |       |
| 7.08                            | -65.2               | H                  | 3.0      | -7.9                          | 38.0   | 1.0        | -45.0 | -13.0 | -32.0 |       |
| 3.54                            | -66.5               | V                  | 3.0      | -17.1                         | 38.6   | 1.0        | -54.7 | -13.0 | -41.7 |       |
| 5.31                            | -66.9               | V                  | 3.0      | -13.7                         | 38.6   | 1.0        | -51.3 | -13.0 | -38.3 |       |
| 7.08                            | -65.4               | V                  | 3.0      | -8.4                          | 38.0   | 1.0        | -45.4 | -13.0 | -32.4 |       |

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