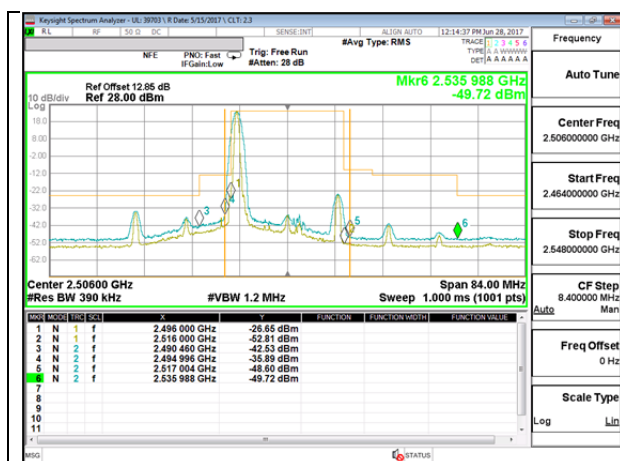
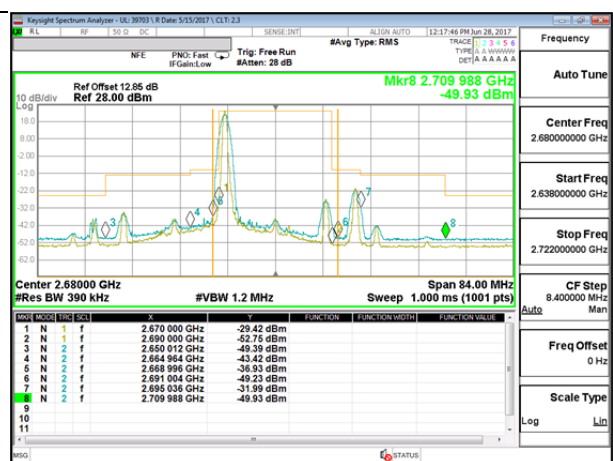
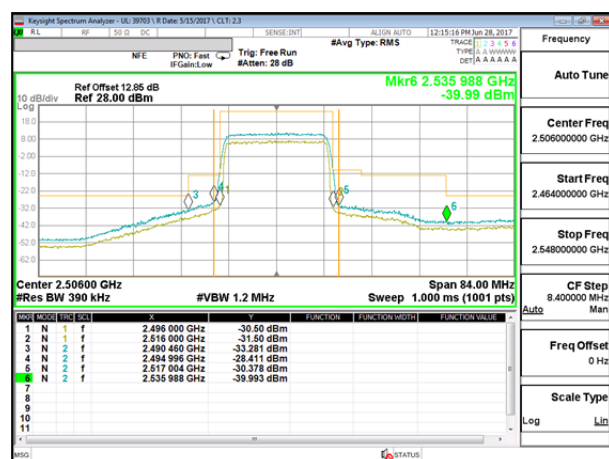




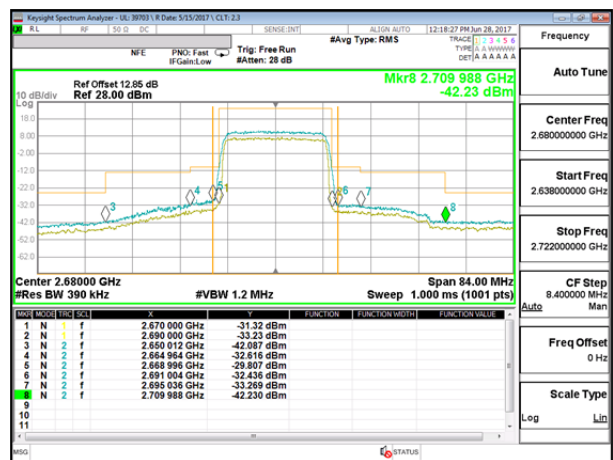
LTE B41 20MHz QPSK Low Channel 1RB



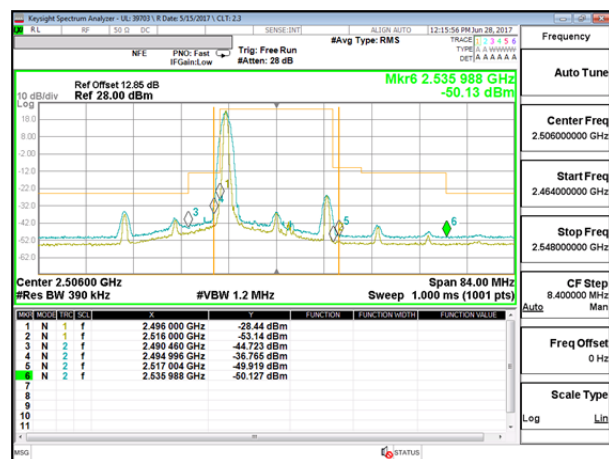
LTE B41 20MHz QPSK High Channel 1RB



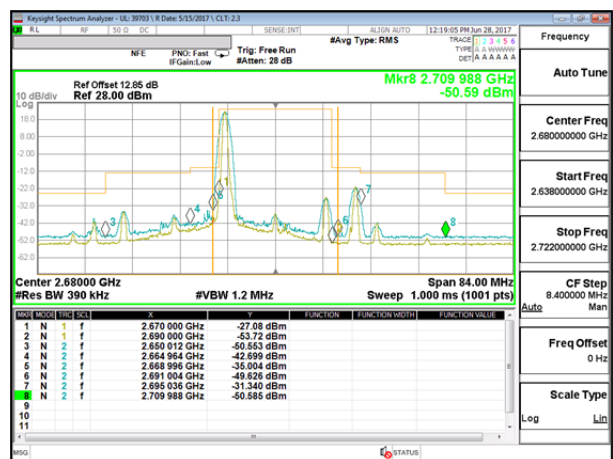
LTE B41 20MHz QPSK Low Channel FRB



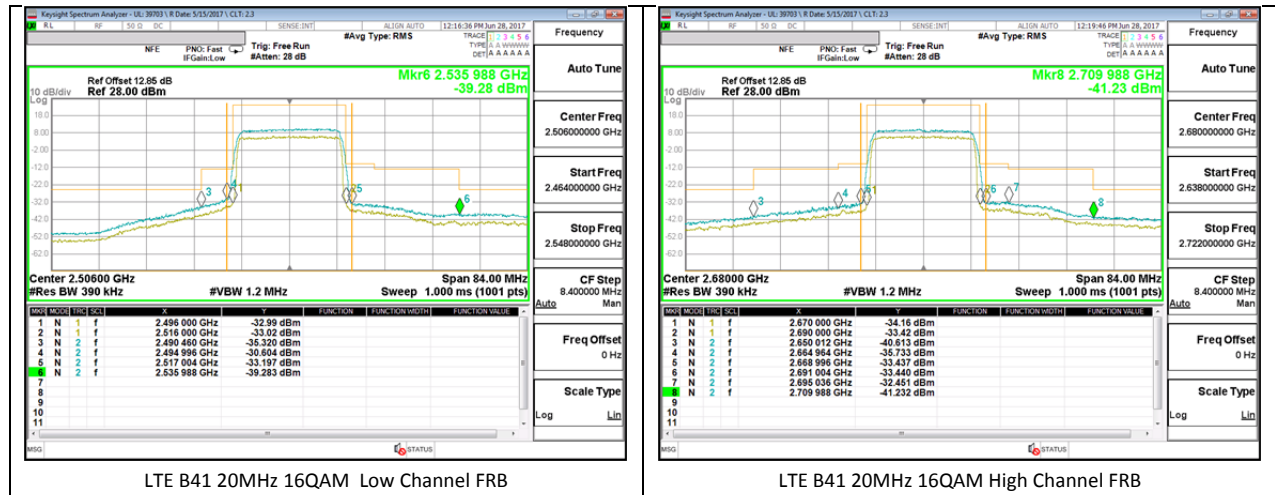
LTE B41 20MHz QPSK High Channel FRB



LTE B41 20MHz 16QAM Low Channel 1RB



LTE B41 20MHz 16QAM High Channel 1RB



## 15. OUT OF BAND EMISSIONS

### RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53

### FCC LIMITS

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.

Part 27: (m)(4) (4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

### TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

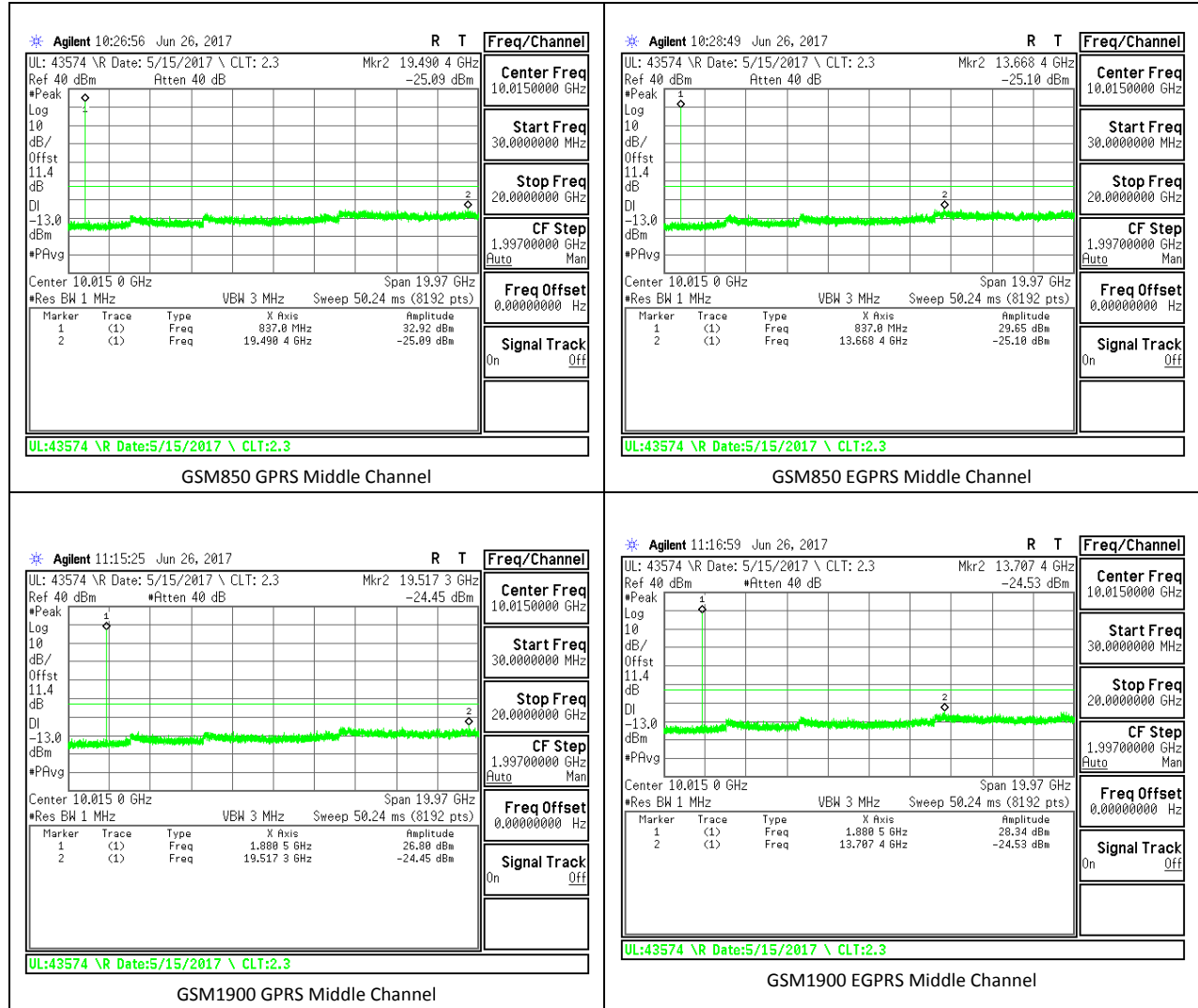
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in a maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

### RESULTS

## 15.1. OUT OF BAND EMISSIONS RESULT AND PLOTS

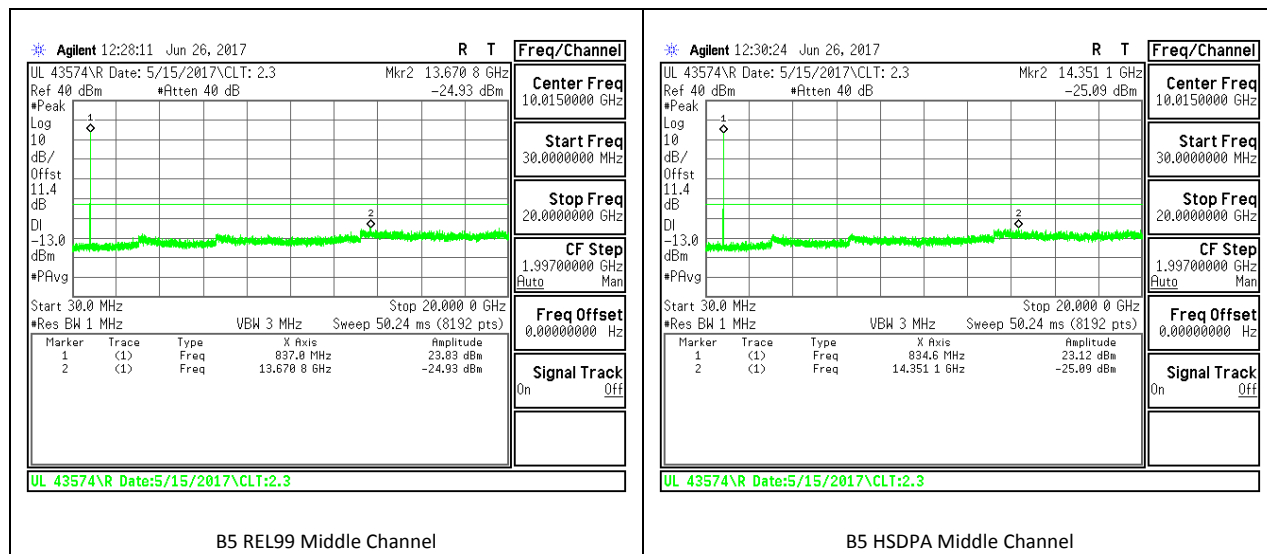
### GSM

| Band     | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|----------|-------|---------|------------|------------|------------|
| GSM 850  | GPRS  | 824.2   | -24.78     | -13        | -11.78     |
|          |       | 836.6   | -25.09     | -13        | -12.09     |
|          |       | 848.8   | -24.64     | -13        | -11.64     |
|          | EGPRS | 824.2   | -24.5      | -13        | -11.5      |
|          |       | 836.6   | -25.10     | -13        | -12.1      |
|          |       | 848.8   | -24.76     | -13        | -11.76     |
| GSM 1900 | GPRS  | 1850.2  | -25.35     | -13        | -12.35     |
|          |       | 1880    | -24.45     | -13        | -11.45     |
|          |       | 1909.8  | -24.84     | -13        | -11.84     |
|          | EGPRS | 1850.2  | -24.59     | -13        | -11.59     |
|          |       | 1880    | -24.53     | -13        | -11.53     |
|          |       | 1909.8  | -25.05     | -13        | -12.05     |



**WCDMA**

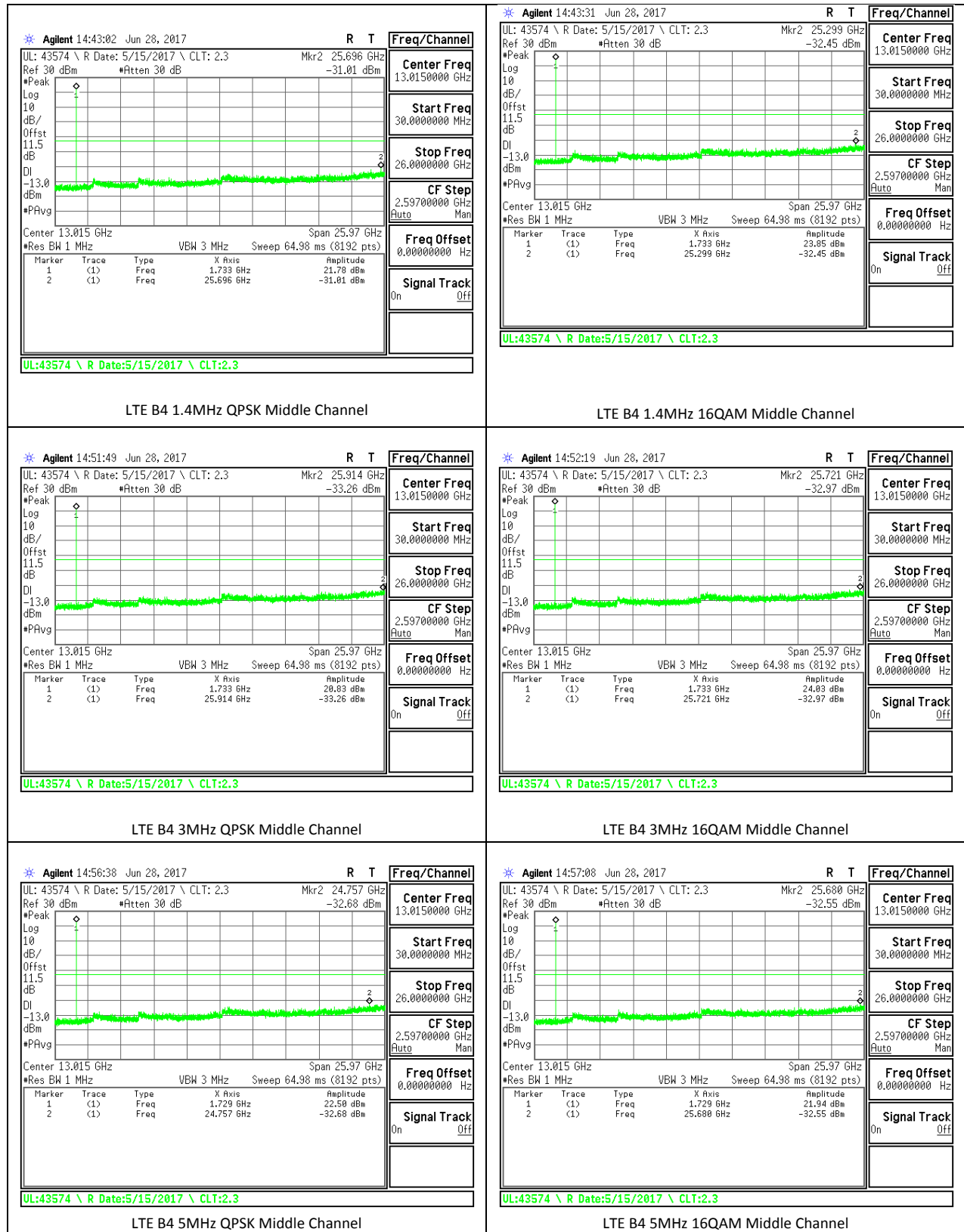
| Band   | Mode  | f (MHz) | Spur (dBm) | 99% BW (MHz) | Delta (dB) |
|--------|-------|---------|------------|--------------|------------|
| Band 5 | REL99 | 826.4   | -24.75     | -13          | -11.75     |
|        |       | 836.6   | -24.93     | -13          | -11.93     |
|        |       | 846.6   | -24.69     | -13          | -11.69     |
|        | HSDPA | 826.4   | -24.64     | -13          | -11.64     |
|        |       | 836.6   | -24.09     | -13          | -11.09     |
|        |       | 846.6   | -24.95     | -13          | -11.95     |

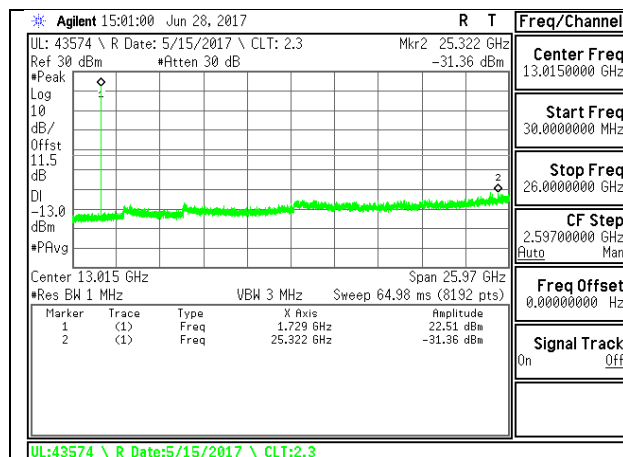


**LTE Band 4**

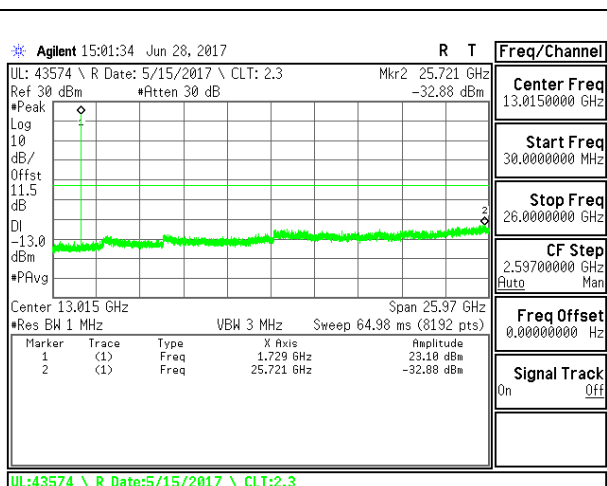
| Band | BW (MHz) | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|------|----------|-------|---------|------------|------------|------------|
| LTE4 | 1.4      | QPSK  | 1710.7  | -32.28     | -13        | -19.28     |
|      |          |       | 1732.5  | -31.01     | -13        | -18.01     |
|      |          |       | 1754.3  | -32.69     | -13        | -19.69     |
|      |          | 16QAM | 1710.7  | -32.72     | -13        | -19.72     |
|      |          |       | 1732.5  | -35.45     | -13        | -22.45     |
|      |          |       | 1754.3  | -32.42     | -13        | -19.42     |
|      | 3        | QPSK  | 1711.5  | -32.40     | -13        | -19.4      |
|      |          |       | 1732.5  | -33.26     | -13        | -20.26     |
|      |          |       | 1753.5  | -33.06     | -13        | -20.06     |
|      |          | 16QAM | 1711.5  | -32.86     | -13        | -19.86     |
|      |          |       | 1732.5  | -32.97     | -13        | -19.97     |
|      |          |       | 1753.5  | -32.08     | -13        | -19.08     |
|      | 5        | QPSK  | 1712.5  | -31.87     | -13        | -18.87     |
|      |          |       | 1732.5  | -32.68     | -13        | -19.68     |
|      |          |       | 1752.5  | -32.32     | -13        | -19.32     |
|      |          | 16QAM | 1712.5  | -32.22     | -13        | -19.22     |
|      |          |       | 1732.5  | -32.55     | -13        | -19.55     |
|      |          |       | 1752.5  | -32.33     | -13        | -19.33     |
|      | 10       | QPSK  | 1715    | -32.55     | -13        | -19.55     |
|      |          |       | 1732.5  | -31.36     | -13        | -18.36     |
|      |          |       | 1750    | -32.98     | -13        | -19.98     |
|      |          | 16QAM | 1715    | -31.82     | -13        | -18.82     |
|      |          |       | 1732.5  | -32.88     | -13        | -19.88     |
|      |          |       | 1750    | -32.73     | -13        | -19.73     |

| Band | BW (MHz) | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|------|----------|-------|---------|------------|------------|------------|
| LTE4 | 15       | QPSK  | 1717.5  | -32.72     | -13        | -19.72     |
|      |          |       | 1732.5  | -32.72     | -13        | -19.72     |
|      |          |       | 1747.5  | -32.44     | -13        | -19.44     |
|      |          | 16QAM | 1717.5  | -32.46     | -13        | -19.46     |
|      |          |       | 1732.5  | -32.45     | -13        | -19.45     |
|      |          |       | 1747.5  | -32.53     | -13        | -19.53     |
|      | 20       | QPSK  | 1720    | -31.35     | -13        | -18.35     |
|      |          |       | 1732.5  | -32.63     | -13        | -19.63     |
|      |          |       | 1745    | -31.77     | -13        | -18.77     |
|      |          | 16QAM | 1720    | -32.87     | -13        | -19.87     |
|      |          |       | 1732.5  | -30.87     | -13        | -17.87     |
|      |          |       | 1745    | -32.97     | -13        | -19.97     |

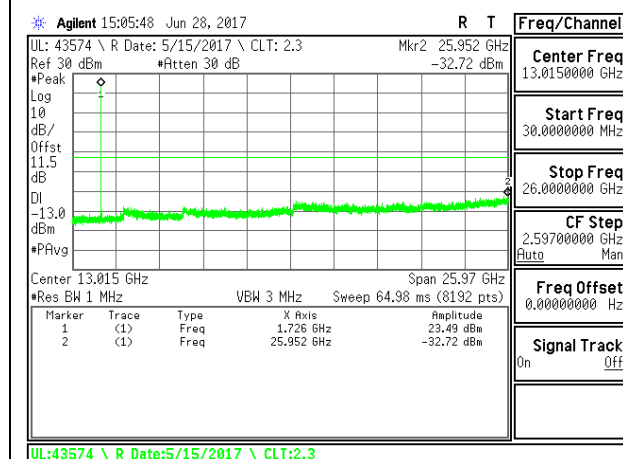




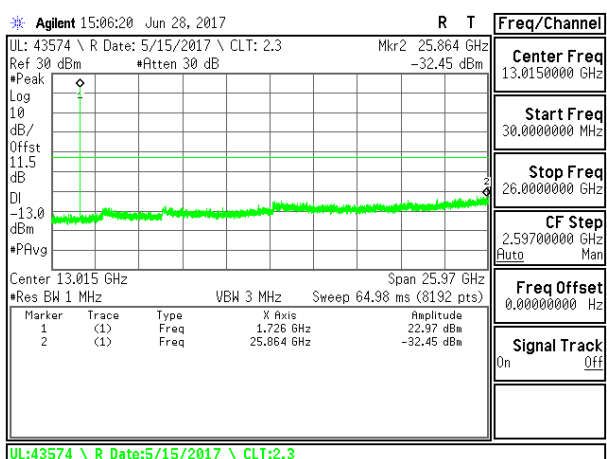
LTE B4 10MHz QPSK Middle Channel



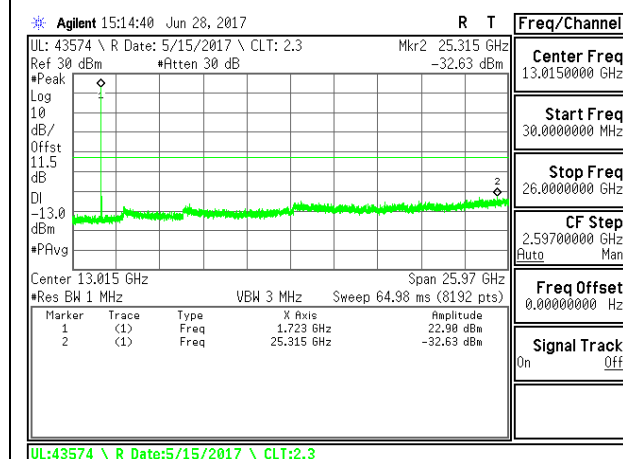
LTE B4 10MHz 16QAM Middle Channel



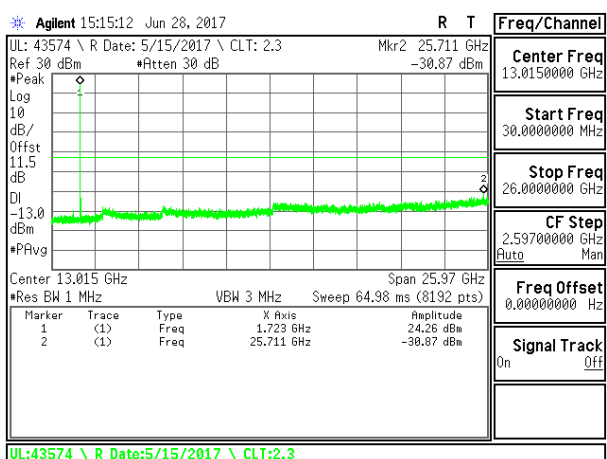
LTE B4 15MHz QPSK Middle Channel



LTE B4 15MHz 16QAM Middle Channel



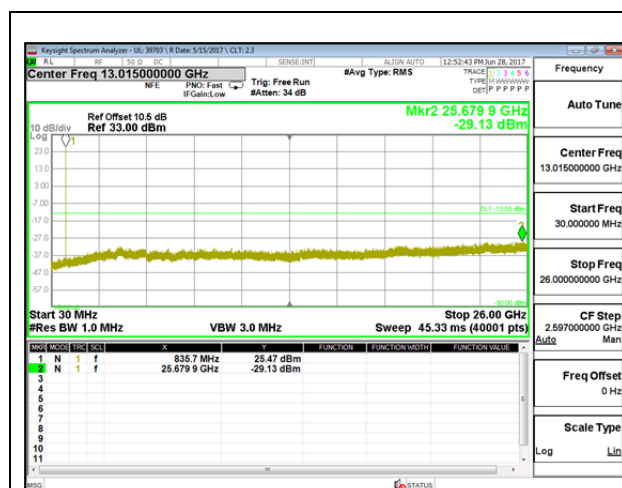
LTE B4 20MHz QPSK Middle Channel



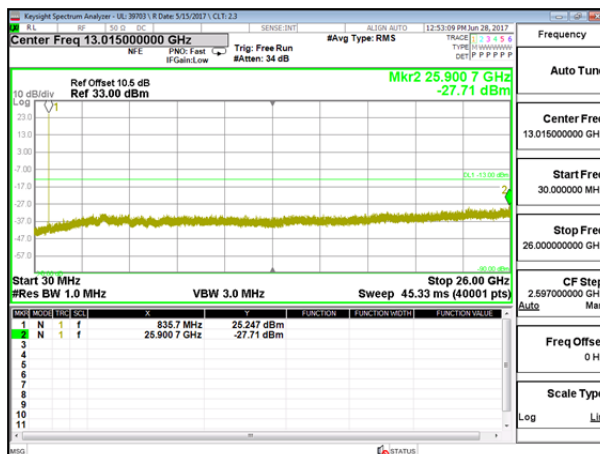
LTE B4 20MHz 16QAM Middle Channel

**LTE Band 5**

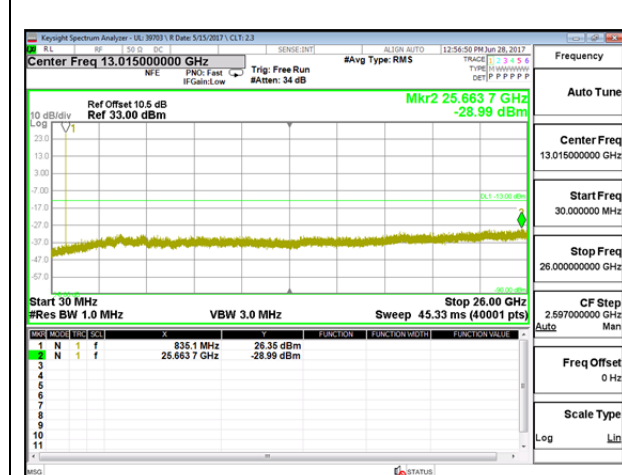
| Band | BW (MHz) | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|------|----------|-------|---------|------------|------------|------------|
| LTE5 | 1.4      | QPSK  | 824.7   | -29.07     | -13        | -16.07     |
|      |          |       | 836.5   | -29.13     | -13        | -16.13     |
|      |          |       | 848.3   | -28.83     | -13        | -15.83     |
|      |          | 16QAM | 824.7   | -28.58     | -13        | -15.58     |
|      |          |       | 836.5   | -27.71     | -13        | -14.71     |
|      |          |       | 848.3   | -28.81     | -13        | -15.81     |
|      | 3        | QPSK  | 825.5   | -28.91     | -13        | -15.91     |
|      |          |       | 836.5   | -28.99     | -13        | -15.99     |
|      |          |       | 847.5   | -29.30     | -13        | -16.3      |
|      |          | 16QAM | 825.5   | -28.83     | -13        | -15.83     |
|      |          |       | 836.5   | -27.69     | -13        | -14.69     |
|      |          |       | 847.5   | -28.61     | -13        | -15.61     |
|      | 5        | QPSK  | 826.5   | -29.47     | -13        | -16.47     |
|      |          |       | 836.5   | -29.12     | -13        | -16.12     |
|      |          |       | 846.5   | -28.59     | -13        | -15.59     |
|      |          | 16QAM | 826.5   | -29.10     | -13        | -16.1      |
|      |          |       | 836.5   | -29.05     | -13        | -16.05     |
|      |          |       | 846.5   | -28.69     | -13        | -15.69     |
|      | 10       | QPSK  | 829     | -28.89     | -13        | -15.89     |
|      |          |       | 836.5   | -28.93     | -13        | -15.93     |
|      |          |       | 844     | -29.10     | -13        | -16.1      |
|      |          | 16QAM | 829     | -28.33     | -13        | -15.33     |
|      |          |       | 836.5   | -29.09     | -13        | -16.09     |
|      |          |       | 844     | -28.42     | -13        | -15.42     |



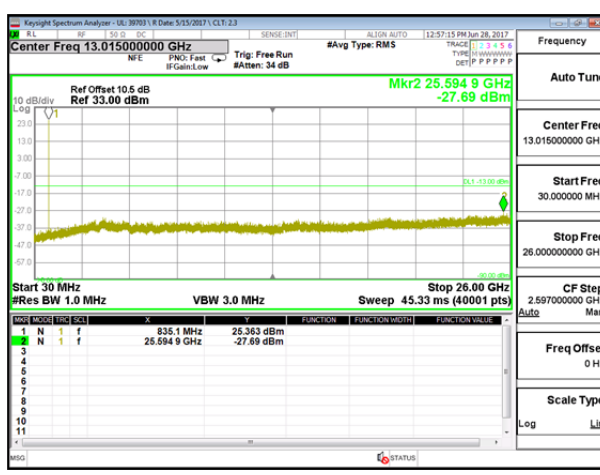
LTE B5 1.4MHz QPSK Middle Channel



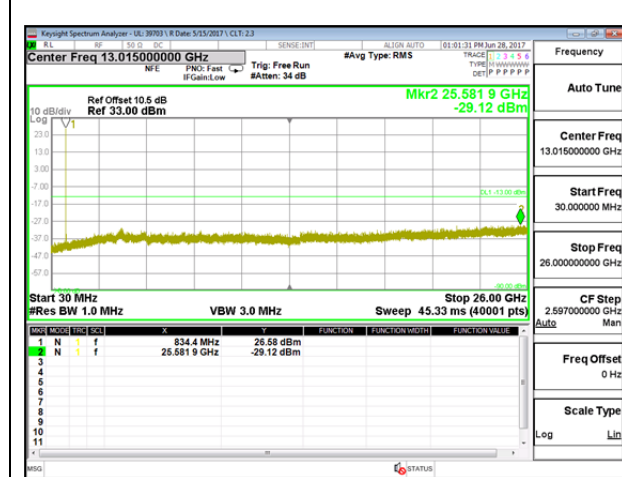
LTE B5 1.4MHz 16QAM Middle Channel



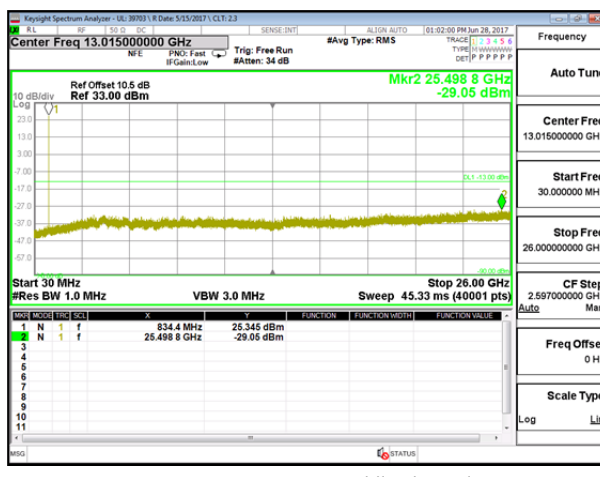
LTE B5 3MHz QPSK Middle Channel



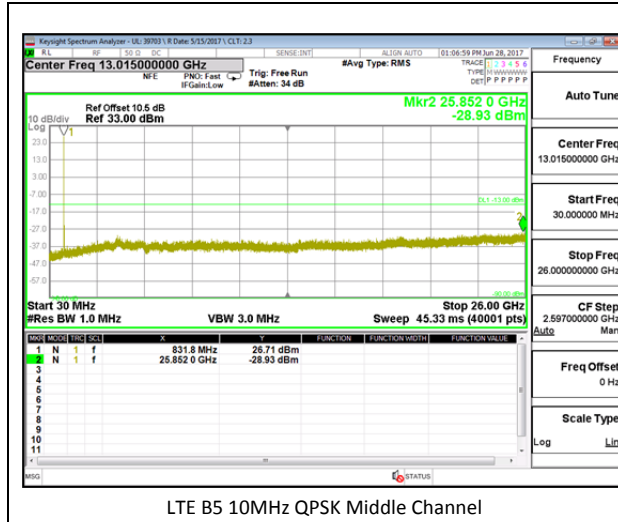
LTE B5 3MHz 16QAM Middle Channel



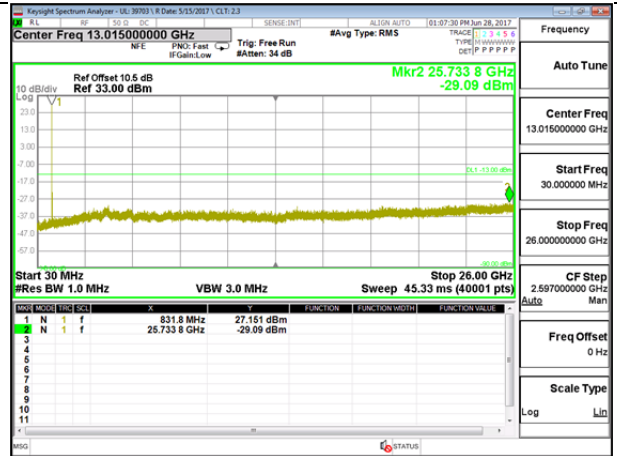
LTE B5 5MHz QPSK Middle Channel



LTE B5 5MHz 16QAM Middle Channel



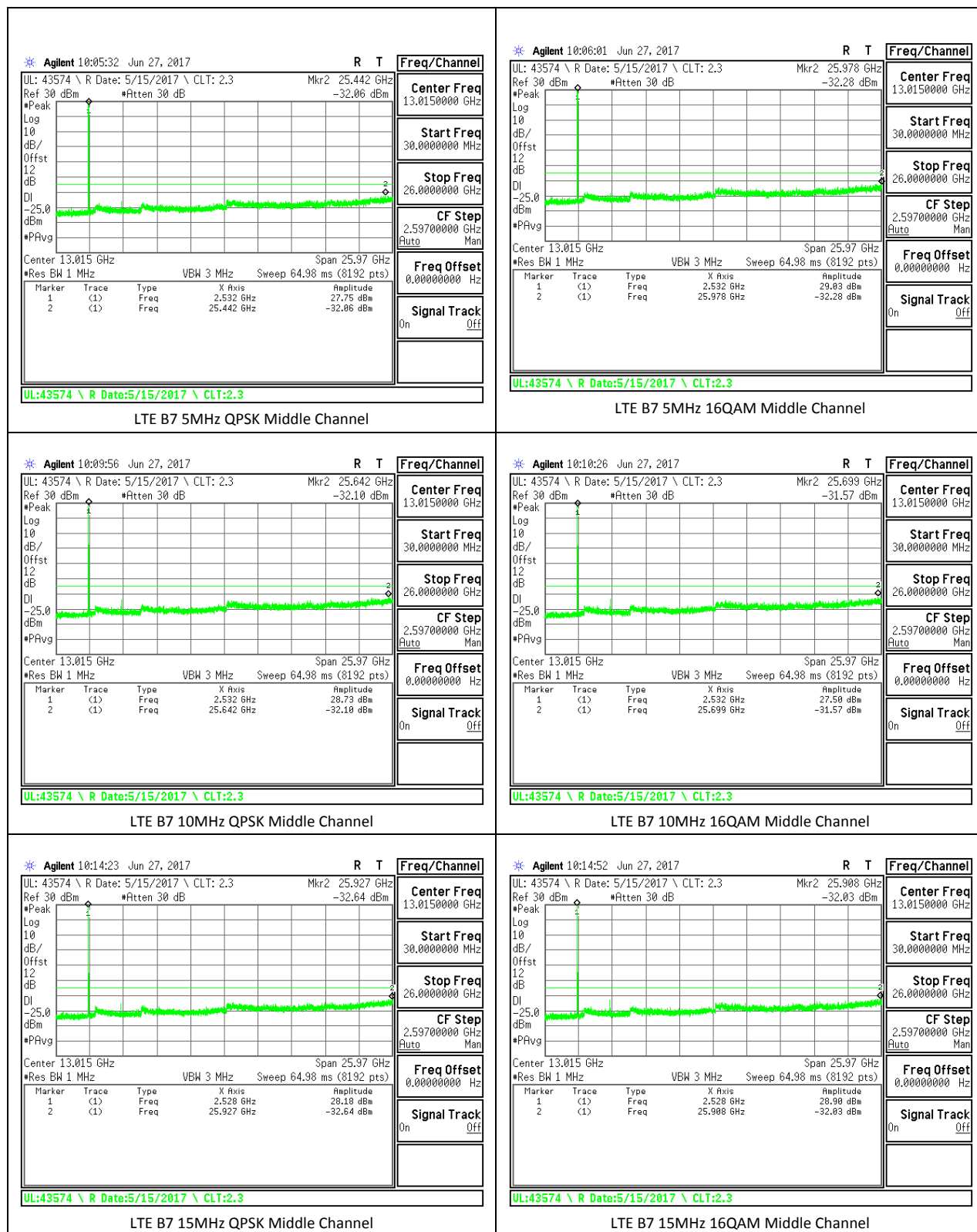
LTE B5 10MHz QPSK Middle Channel

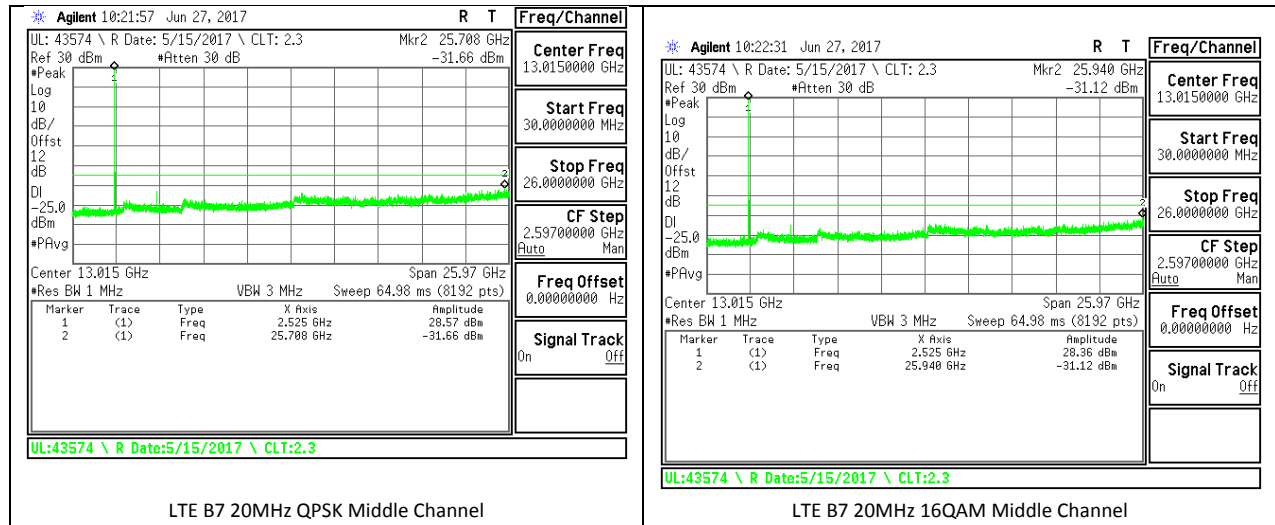


LTE B5 10MHz 16QAM Middle Channel

**LTE Band 7**

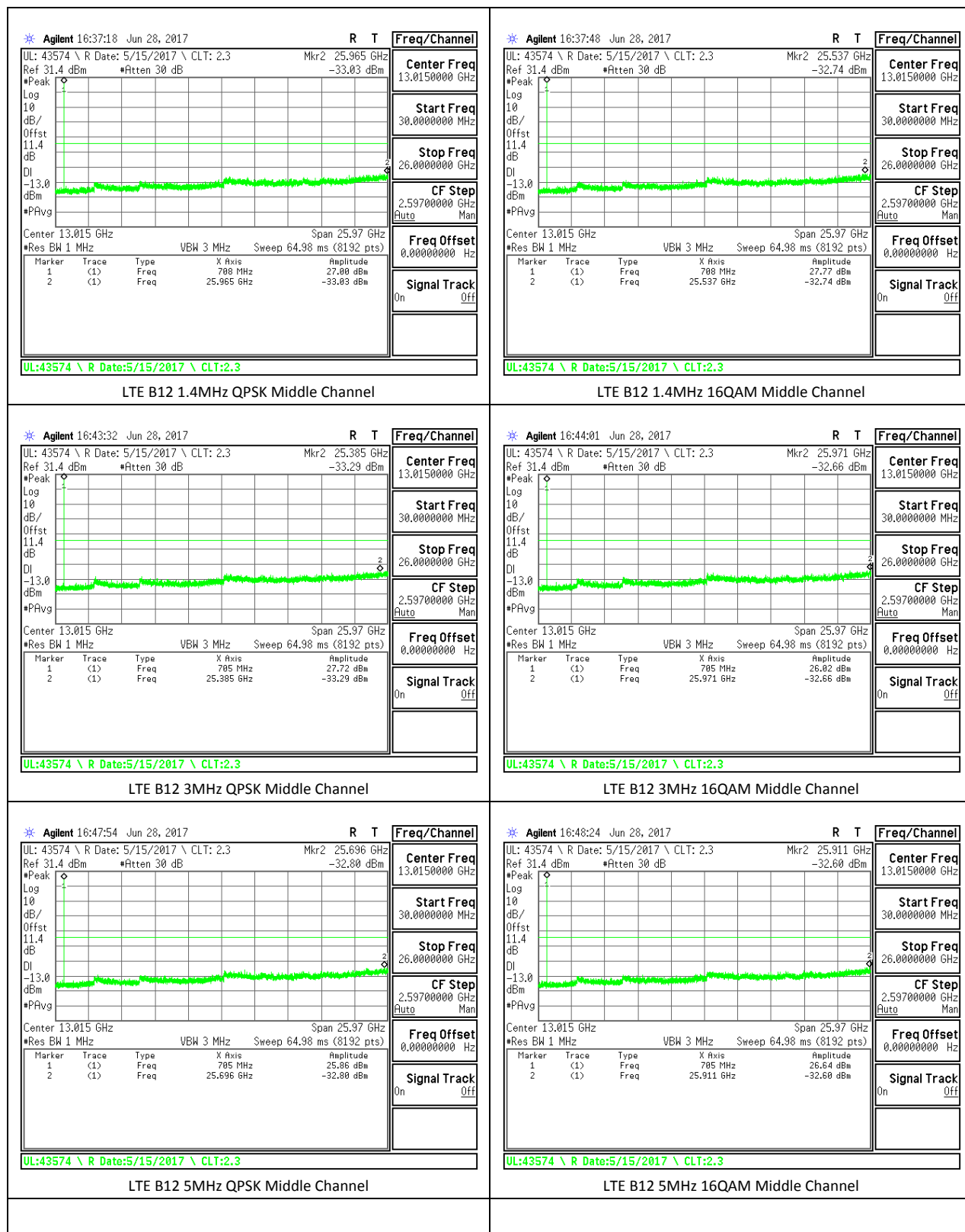
| Band | BW (MHz) | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|------|----------|-------|---------|------------|------------|------------|
| LTE7 | 5        | QPSK  | 2502.5  | -31.78     | -25        | -18.78     |
|      |          |       | 2535    | -32.06     | -25        | -19.06     |
|      |          |       | 2567.5  | -32.44     | -25        | -19.44     |
|      |          | 16QAM | 2502.5  | -32.20     | -25        | -19.2      |
|      |          |       | 2535    | -32.28     | -25        | -19.28     |
|      |          |       | 2567.5  | -31.65     | -25        | -18.65     |
|      | 10       | QPSK  | 2505    | -31.37     | -25        | -18.37     |
|      |          |       | 2535    | -32.10     | -25        | -19.1      |
|      |          |       | 2565    | -31.52     | -25        | -18.52     |
|      |          | 16QAM | 2505    | -31.39     | -25        | -18.39     |
|      |          |       | 2535    | -31.57     | -25        | -18.57     |
|      |          |       | 2565    | -31.70     | -25        | -18.7      |
|      | 15       | QPSK  | 2507.5  | -31.43     | -25        | -18.43     |
|      |          |       | 2535    | -32.64     | -25        | -19.64     |
|      |          |       | 2562.5  | -32.18     | -25        | -19.18     |
|      |          | 16QAM | 2507.5  | -31.44     | -25        | -18.44     |
|      |          |       | 2535    | -32.03     | -25        | -19.03     |
|      |          |       | 2562.5  | -32.36     | -25        | -19.36     |
|      | 20       | QPSK  | 2510    | -31.96     | -25        | -18.96     |
|      |          |       | 2535    | -31.66     | -25        | -18.66     |
|      |          |       | 2560    | -30.74     | -25        | -17.74     |
|      |          | 16QAM | 2510    | -31.70     | -25        | -18.7      |
|      |          |       | 2535    | -31.12     | -25        | -18.12     |
|      |          |       | 2560    | -32.79     | -25        | -19.79     |

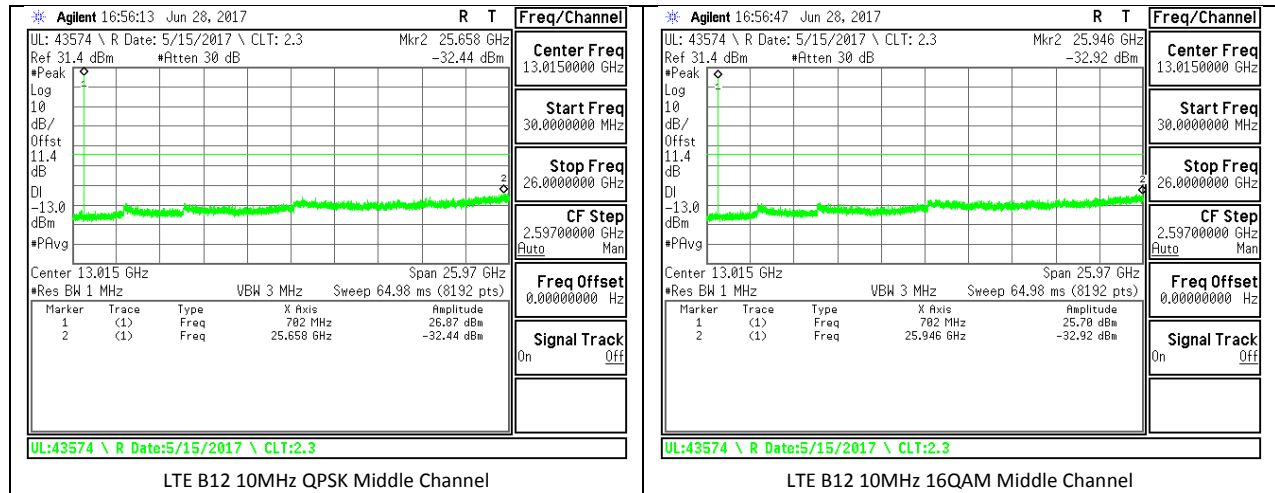




**LTE Band 12**

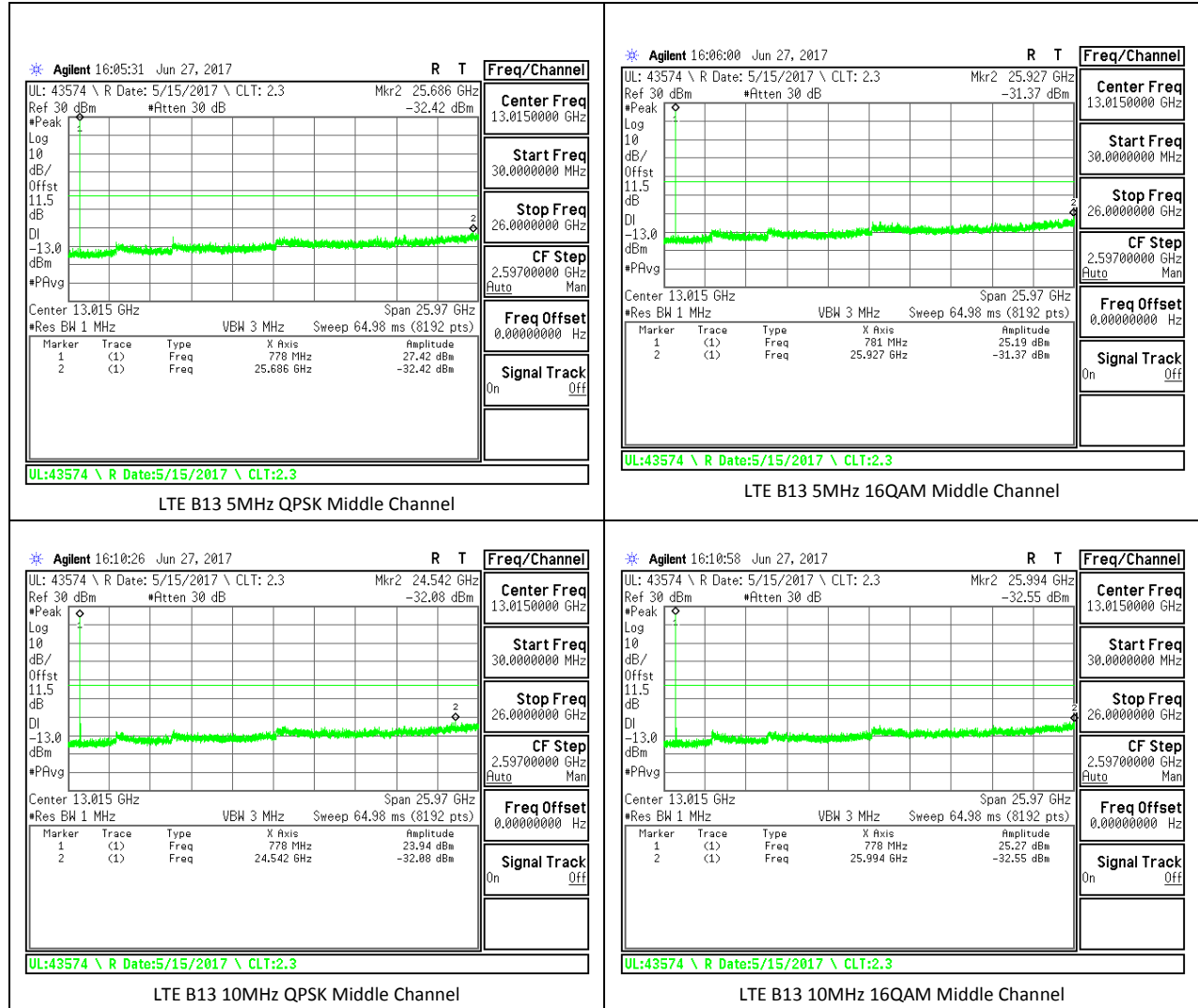
| Band  | BW (MHz) | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|-------|----------|-------|---------|------------|------------|------------|
| LTE12 | 1.4      | QPSK  | 699.7   | -32.47     | -13        | -19.47     |
|       |          |       | 707.5   | -33.03     | -13        | -20.03     |
|       |          |       | 715.3   | -33.12     | -13        | -20.12     |
|       |          | 16QAM | 699.7   | -32.79     | -13        | -19.79     |
|       |          |       | 707.5   | -32.74     | -13        | -19.74     |
|       |          |       | 715.3   | -33.06     | -13        | -20.06     |
|       | 3        | QPSK  | 700.5   | -32.76     | -13        | -19.76     |
|       |          |       | 707.5   | -33.29     | -13        | -20.29     |
|       |          |       | 714.5   | -32.55     | -13        | -19.55     |
|       |          | 16QAM | 700.5   | -33.09     | -13        | -20.09     |
|       |          |       | 707.5   | -32.66     | -13        | -19.66     |
|       |          |       | 714.5   | -32.95     | -13        | -19.95     |
|       | 5        | QPSK  | 701.5   | -33.00     | -13        | -20        |
|       |          |       | 707.5   | -32.80     | -13        | -19.8      |
|       |          |       | 713.5   | -32.69     | -13        | -19.69     |
|       |          | 16QAM | 701.5   | -32.62     | -13        | -19.62     |
|       |          |       | 707.5   | -32.60     | -13        | -19.6      |
|       |          |       | 713.5   | -32.78     | -13        | -19.78     |
|       | 10       | QPSK  | 704     | -31.83     | -13        | -18.83     |
|       |          |       | 707.5   | -32.44     | -13        | -19.44     |
|       |          |       | 711     | -31.56     | -13        | -18.56     |
|       |          | 16QAM | 704     | -32.71     | -13        | -19.71     |
|       |          |       | 707.5   | -32.92     | -13        | -19.92     |
|       |          |       | 711     | -32.76     | -13        | -19.76     |





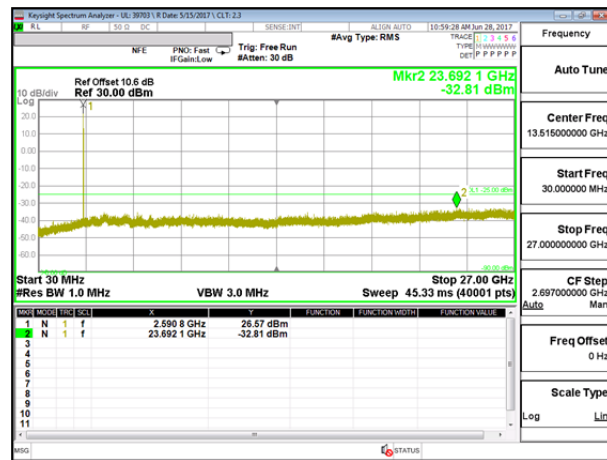
**LTE Band 13**

| Band  | BW (MHz) | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|-------|----------|-------|---------|------------|------------|------------|
| LTE13 | 5        | QPSK  | 779.5   | -32.67     | -13        | -19.67     |
|       |          |       | 782     | -32.42     | -13        | -19.42     |
|       |          |       | 784.5   | -31.57     | -13        | -18.57     |
|       |          | 16QAM | 779.5   | -32.83     | -13        | -19.83     |
|       |          |       | 782     | -31.37     | -13        | -18.37     |
|       |          |       | 784.5   | -32.22     | -13        | -19.22     |
|       | 10       | QPSK  |         |            |            |            |
|       |          |       | 782     | -32.08     | -13        | -19.08     |
|       |          | 16QAM |         |            |            |            |
|       |          |       | 782     | -32.55     | -13        | -19.55     |
|       |          |       |         |            |            |            |

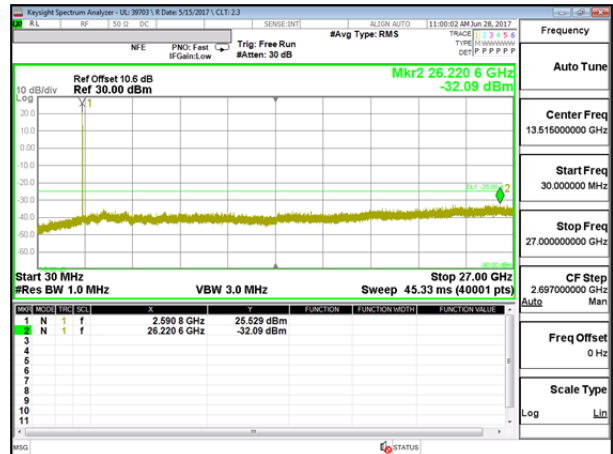


**LTE Band 41**

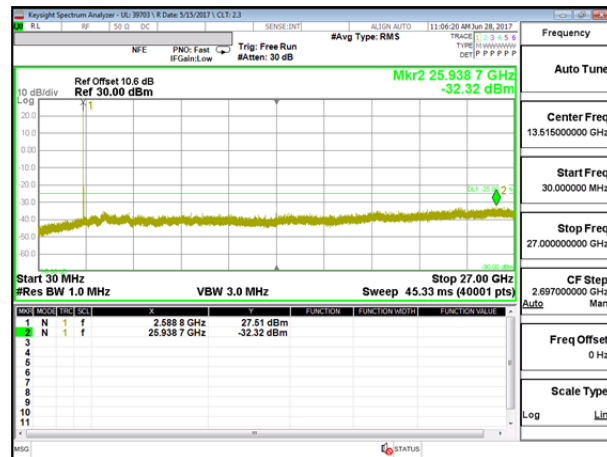
| Band  | BW (MHz) | Mode  | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|-------|----------|-------|---------|------------|------------|------------|
| LTE41 | 5        | QPSK  | 2498.5  | -34.433    | -25        | -21.433    |
|       |          |       | 2593    | -32.81     | -25        | -19.81     |
|       |          |       | 2687.5  | -32.54     | -25        | -19.54     |
|       |          | 16QAM | 2498.5  | -32.29     | -25        | -19.29     |
|       |          |       | 2593    | -32.09     | -25        | -19.09     |
|       |          |       | 2687.5  | -32.23     | -25        | -19.23     |
|       | 10       | QPSK  | 2501    | -32.54     | -25        | -19.54     |
|       |          |       | 2593    | -32.32     | -25        | -19.32     |
|       |          |       | 2685    | -32.34     | -25        | -19.34     |
|       |          | 16QAM | 2501    | -32.66     | -25        | -19.66     |
|       |          |       | 2593    | -31.99     | -25        | -18.99     |
|       |          |       | 2685    | -32.16     | -25        | -19.16     |
|       | 15       | QPSK  | 2503.5  | -32.15     | -25        | -19.15     |
|       |          |       | 2593    | -32.61     | -25        | -19.61     |
|       |          |       | 2682.5  | -32.11     | -25        | -19.11     |
|       |          | 16QAM | 2503.5  | -32.57     | -25        | -19.57     |
|       |          |       | 2593    | -32.63     | -25        | -19.63     |
|       |          |       | 2682.5  | -31.79     | -25        | -18.79     |
|       | 20       | QPSK  | 2506    | -33.02     | -25        | -20.02     |
|       |          |       | 2593    | -32.63     | -25        | -19.63     |
|       |          |       | 2680    | -32.28     | -25        | -19.28     |
|       |          | 16QAM | 2506    | -32.52     | -25        | -19.52     |
|       |          |       | 2593    | -32.63     | -25        | -19.63     |
|       |          |       | 2680    | -31.63     | -25        | -18.63     |



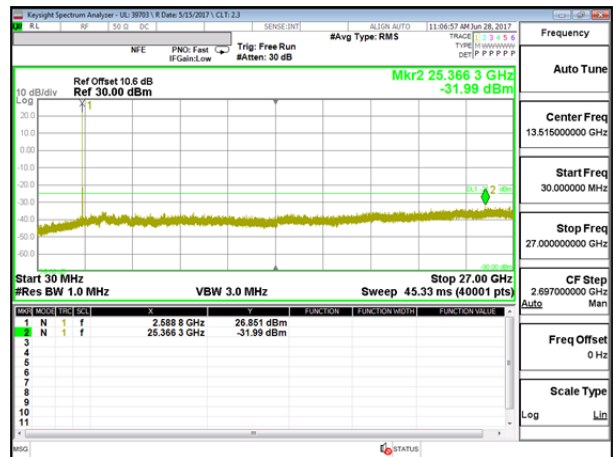
LTE B41 5MHz QPSK Middle Channel



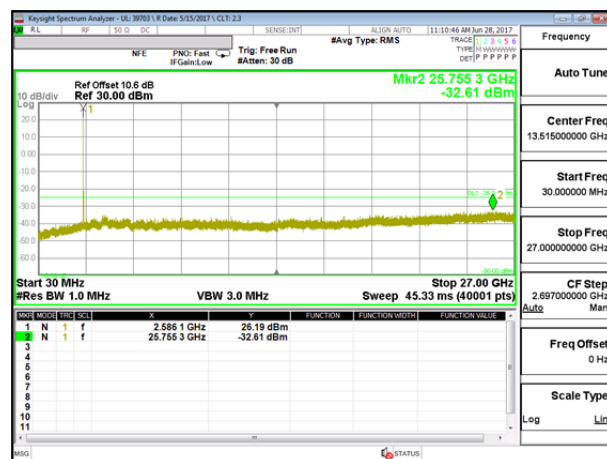
LTE B41 5MHz 16QAM Middle Channel



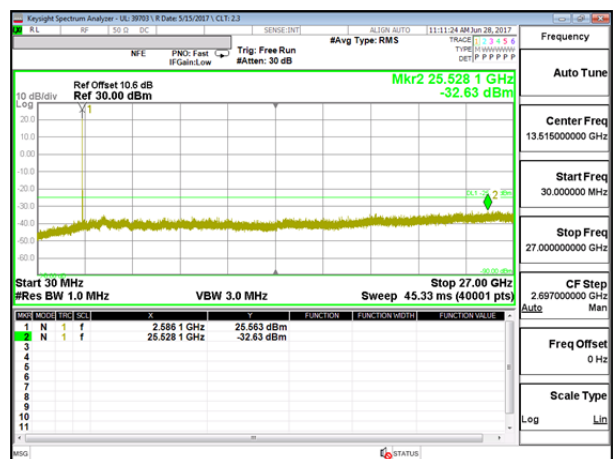
LTE B41 10MHz QPSK Middle Channel



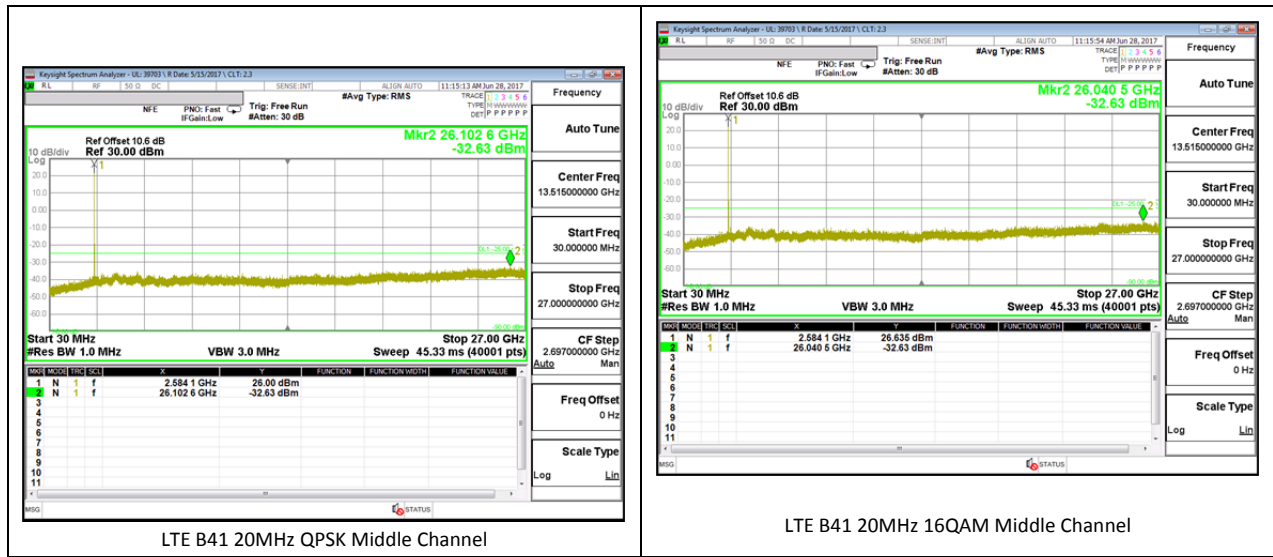
LTE B41 10MHz 16QAM Middle Channel



LTE B41 15MHz QPSK Middle Channel



LTE B41 15MHz 16QAM Middle Channel



## 16. FREQUENCY STABILITY

### RULE PART(S)

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

### FCC LIMITS

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

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

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

### TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

### Results

|           |                |
|-----------|----------------|
| Tested By | Oren Stoelting |
| Date      | 6/29/17        |

### **Note(s):**

#### GSM 850 Band Measured Results

GSM 850 (Frequency range: 824.2-848.8 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) no testing is necessary due to overlapping frequency range.

#### GSM 1900 Band Measured Results

GSM 1900 (Frequency range: 1850.2-1909.8 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) no testing is necessary due to overlapping frequency range.

#### WCDMA Band 5 Measured Results

WCDMA Band 5 (Frequency range: 826.4-846.6 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) no testing is necessary due to overlapping frequency range.

#### WCDMA Band 2 Measured Results

WCDMA Band 2 (Frequency range: 1852.4-1907.6 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) no testing is necessary due to overlapping frequency range.

#### WCDMA Band 4 Measured Results

WCDMA Band 4 (Frequency range: 1712.4-1752.6 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) no testing is necessary due to overlapping frequency range.

## 16.1. FREQUENCY STABILITY RESULTS

### GSM1900

| Reference Frequency: GSM1900 Mid Channel |                                 |                                               | 1880        | MHz @ 20°C  |
|------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: to stay +/- 2.5 ppm =             |                                 |                                               | 4700.000    | Hz          |
| Power Supply<br>(Vdc)                    | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                          |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                     | 50                              | 1880.000032                                   | 0.003       | 2.5         |
| 3.80                                     | 40                              | 1880.000033                                   | 0.003       | 2.5         |
| 3.80                                     | 30                              | 1880.000036                                   | 0.001       | 2.5         |
| <b>3.80</b>                              | <b>20</b>                       | <b>1880.000038</b>                            | <b>0</b>    | <b>2.5</b>  |
| 3.80                                     | 10                              | 1880.000038                                   | 0.000       | 2.5         |
| 3.80                                     | 0                               | 1880.000040                                   | -0.001      | 2.5         |
| 3.80                                     | -10                             | 1880.000041                                   | -0.002      | 2.5         |
| 3.80                                     | -20                             | 1880.000045                                   | -0.004      | 2.5         |
| 3.80                                     | -30                             | 1880.000027                                   | 0.006       | 2.5         |

| Reference Frequency: GSM1900 Mid Channel |                                 |                                               | 1880        | MHz @ 20°C  |
|------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Limit: to stay +/- 2.5 ppm =             |                                 |                                               | 4700.000    | Hz          |
| Power Supply<br>(Vdc)                    | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                          |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                     | 20                              | 1880.000038                                   | 0           | 2.5         |
| 4.37                                     | 20                              | 1880.000039                                   | -0.001      | 2.5         |
| 3.23                                     | 20                              | 1880.000047                                   | -0.005      | 2.5         |

**LTE Band 4**

| Reference Frequency: LTE Band 4 Mid Channel      1732.5      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      4331.250      Hz |                                 |                                               |             |             |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                         | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                               |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                                                                                                          | 50                              | 1732.500016                                   | -0.001      | 2.5         |
| 3.80                                                                                                                          | 40                              | 1732.500014                                   | 0.000       | 2.5         |
| 3.80                                                                                                                          | 30                              | 1732.500016                                   | -0.001      | 2.5         |
| <b>3.80</b>                                                                                                                   | <b>20</b>                       | <b>1732.500014</b>                            | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                                                                                          | 10                              | 1732.500017                                   | -0.002      | 2.5         |
| 3.80                                                                                                                          | 0                               | 1732.500017                                   | -0.002      | 2.5         |
| 3.80                                                                                                                          | -10                             | 1732.500016                                   | -0.001      | 2.5         |
| 3.80                                                                                                                          | -20                             | 1732.500015                                   | -0.001      | 2.5         |
| 3.80                                                                                                                          | -30                             | 1732.500016                                   | -0.001      | 2.5         |

| Reference Frequency: LTE Band 4 Mid Channel      1732.5      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      4331.250      Hz |                                 |                                               |             |             |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                         | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                               |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.80</b>                                                                                                                   | <b>20</b>                       | <b>1732.500014</b>                            | <b>0</b>    | <b>2.5</b>  |
| 4.37                                                                                                                          | 20                              | 1732.500012                                   | 0.001       | 2.5         |
| 3.23                                                                                                                          | 20                              | 1732.500014                                   | 0.000       | 2.5         |

**LTE Band 5**

| Reference Frequency: LTE Band 5 Mid Channel      836.5      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      2091.250      Hz |                                 |                                               |             |             |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                        | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                              |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                                                                                                         | 50                              | 836.499989                                    | 0.003       | 2.5         |
| 3.80                                                                                                                         | 40                              | 836.499991                                    | 0.001       | 2.5         |
| 3.80                                                                                                                         | 30                              | 836.499991                                    | 0.001       | 2.5         |
| <b>3.80</b>                                                                                                                  | <b>20</b>                       | <b>836.499992</b>                             | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                                                                                         | 10                              | 836.499991                                    | 0.001       | 2.5         |
| 3.80                                                                                                                         | 0                               | 836.499993                                    | -0.001      | 2.5         |
| 3.80                                                                                                                         | -10                             | 836.499996                                    | -0.005      | 2.5         |
| 3.80                                                                                                                         | -20                             | 836.499991                                    | 0.001       | 2.5         |
| 3.80                                                                                                                         | -30                             | 836.499992                                    | -0.001      | 2.5         |

| Reference Frequency: LTE Band 5 Mid Channel      836.5      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      2091.250      Hz |                                 |                                               |             |             |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                        | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                              |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.80</b>                                                                                                                  | <b>20</b>                       | <b>836.499992</b>                             | <b>0</b>    | <b>2.5</b>  |
| 4.37                                                                                                                         | 20                              | 836.499991                                    | 0.001       | 2.5         |
| 3.23                                                                                                                         | 20                              | 836.499990                                    | 0.002       | 2.5         |

**LTE Band 7**

| Reference Frequency: LTE Band 7 Mid Channel      2535      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      6337.500      Hz |                                 |                                               |             |             |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                       | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                             |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                                                                                                        | 50                              | 2535.000014                                   | 0.001       | 2.5         |
| 3.80                                                                                                                        | 40                              | 2535.000016                                   | 0.000       | 2.5         |
| 3.80                                                                                                                        | 30                              | 2535.000016                                   | 0.000       | 2.5         |
| <b>3.80</b>                                                                                                                 | <b>20</b>                       | <b>2535.000017</b>                            | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                                                                                        | 10                              | 2535.000015                                   | 0.001       | 2.5         |
| 3.80                                                                                                                        | 0                               | 2535.000016                                   | 0.000       | 2.5         |
| 3.80                                                                                                                        | -10                             | 2535.000015                                   | 0.001       | 2.5         |
| 3.80                                                                                                                        | -20                             | 2535.000014                                   | 0.001       | 2.5         |
| 3.80                                                                                                                        | -30                             | 2535.000016                                   | 0.000       | 2.5         |

| Reference Frequency: LTE Band 7 Mid Channel      2535      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      6337.500      Hz |                                 |                                               |             |             |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                       | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                             |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.80</b>                                                                                                                 | <b>20</b>                       | <b>2535.000017</b>                            | <b>0</b>    | <b>2.5</b>  |
| 4.37                                                                                                                        | 20                              | 2535.000015                                   | 0.001       | 2.5         |
| 3.23                                                                                                                        | 20                              | 2535.000015                                   | 0.001       | 2.5         |

**LTE Band 12**

| Reference Frequency: LTE Band 12 Mid Channel      707.5      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      1768.750      Hz |                                 |                                               |             |             |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                         | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                               |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                                                                                                          | 50                              | 707.499990                                    | -0.002      | 2.5         |
| 3.80                                                                                                                          | 40                              | 707.499990                                    | -0.003      | 2.5         |
| 3.80                                                                                                                          | 30                              | 707.499989                                    | -0.001      | 2.5         |
| <b>3.80</b>                                                                                                                   | <b>20</b>                       | <b>707.499988</b>                             | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                                                                                          | 10                              | 707.499991                                    | -0.004      | 2.5         |
| 3.80                                                                                                                          | 0                               | 707.499991                                    | -0.004      | 2.5         |
| 3.80                                                                                                                          | -10                             | 707.499992                                    | -0.005      | 2.5         |
| 3.80                                                                                                                          | -20                             | 707.499991                                    | -0.003      | 2.5         |
| 3.80                                                                                                                          | -30                             | 707.499990                                    | -0.002      | 2.5         |

| Reference Frequency: LTE Band 12 Mid Channel      707.5      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      1768.750      Hz |                                 |                                               |             |             |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                         | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                               |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.80</b>                                                                                                                   | <b>20</b>                       | <b>707.499988</b>                             | <b>0</b>    | <b>2.5</b>  |
| 4.37                                                                                                                          | 20                              | 707.499988                                    | 0.001       | 2.5         |
| 3.23                                                                                                                          | 20                              | 707.499989                                    | -0.001      | 2.5         |

**LTE Band 13**

| Reference Frequency: LTE Band 13 Mid Channel      782      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      1955.000      Hz |                                 |                                               |             |             |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                       | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                             |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                                                                                                        | 50                              | 781.999987                                    | 0.007       | 2.5         |
| 3.80                                                                                                                        | 40                              | 781.999990                                    | 0.003       | 2.5         |
| 3.80                                                                                                                        | 30                              | 781.999990                                    | 0.004       | 2.5         |
| <b>3.80</b>                                                                                                                 | <b>20</b>                       | <b>781.999992</b>                             | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                                                                                        | 10                              | 781.999991                                    | 0.001       | 2.5         |
| 3.80                                                                                                                        | 0                               | 781.999994                                    | -0.001      | 2.5         |
| 3.80                                                                                                                        | -10                             | 781.999994                                    | -0.002      | 2.5         |
| 3.80                                                                                                                        | -20                             | 781.999991                                    | 0.001       | 2.5         |
| 3.80                                                                                                                        | -30                             | 781.999988                                    | 0.006       | 2.5         |

| Reference Frequency: LTE Band 13 Mid Channel      782      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      1955.000      Hz |                                 |                                               |             |             |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                       | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                             |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.80</b>                                                                                                                 | <b>20</b>                       | <b>781.999992</b>                             | <b>0</b>    | <b>2.5</b>  |
| 4.37                                                                                                                        | 20                              | 781.999994                                    | -0.001      | 2.5         |
| 3.23                                                                                                                        | 20                              | 781.999993                                    | 0.000       | 2.5         |

**LTE Band 41**

| Reference Frequency: LTE Band 41 Mid Channel      2593      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      6482.500      Hz |                                 |                                               |             |             |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                        | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                              |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| 3.80                                                                                                                         | 50                              | 2593.000016                                   | 0.000       | 2.5         |
| 3.80                                                                                                                         | 40                              | 2593.000014                                   | 0.000       | 2.5         |
| 3.80                                                                                                                         | 30                              | 2593.000013                                   | 0.000       | 2.5         |
| <b>3.80</b>                                                                                                                  | <b>20</b>                       | <b>2593.000014</b>                            | <b>0</b>    | <b>2.5</b>  |
| 3.80                                                                                                                         | 10                              | 2593.000016                                   | -0.001      | 2.5         |
| 3.80                                                                                                                         | 0                               | 2593.000015                                   | 0.000       | 2.5         |
| 3.80                                                                                                                         | -10                             | 2593.000015                                   | 0.000       | 2.5         |
| 3.80                                                                                                                         | -20                             | 2593.000015                                   | 0.000       | 2.5         |
| 3.80                                                                                                                         | -30                             | 2593.000016                                   | -0.001      | 2.5         |

| Reference Frequency: LTE Band 41 Mid Channel      2593      MHz @ 20°C<br>Limit: to stay +/- 2.5 ppm =      6482.500      Hz |                                 |                                               |             |             |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|-------------|
| Power Supply<br>(Vdc)                                                                                                        | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |             |
|                                                                                                                              |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm) |
| <b>3.80</b>                                                                                                                  | <b>20</b>                       | <b>2593.000014</b>                            | <b>0</b>    | <b>2.5</b>  |
| 4.37                                                                                                                         | 20                              | 2593.000016                                   | -0.001      | 2.5         |
| 3.23                                                                                                                         | 20                              | 2593.000015                                   | 0.000       | 2.5         |

## 17. RADIATED TEST RESULTS

### 17.1. FIELD STRENGTH OF SPURIOUS RADIATION

#### RULE PART(S)

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

#### FCC LIMIT

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.

Part 27: (m)(4) (4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the Channel edge and 5 megahertz from the Channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the Channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the Channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on Channel BRS Channel 1 on the same terms and conditions as adjacent Channel BRS or EBS licensees.

#### 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.

# 17.1.1. SPURIOUS RADIATION PLOTS

## GSM

| Compliance Certification Services<br>Above 1GHz High Frequency Substitution Measurement |                     |                        |                 |                |                |              |                |               |       |  |
|-----------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company:                                                                                |                     | SOMC                   |                 |                |                |              |                |               |       |  |
| Project #:                                                                              |                     | 11785223               |                 |                |                |              |                |               |       |  |
| Date:                                                                                   |                     | 7/5/2017               |                 |                |                |              |                |               |       |  |
| Test Engineer:                                                                          |                     | 43574 JS               |                 |                |                |              |                |               |       |  |
| Configuration:                                                                          |                     | EUT + AC Charger       |                 |                |                |              |                |               |       |  |
| Location:                                                                               |                     | Chamber C              |                 |                |                |              |                |               |       |  |
| Mode:                                                                                   |                     | GPRS 850 MHz Harmonics |                 |                |                |              |                |               |       |  |
| f<br>MHz                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 824.2                                                                           |                     |                        |                 |                |                |              |                |               |       |  |
| 1648.40                                                                                 | -25.0               | V                      | 3.0             | 37.0           | 1.0            | 61.1         | -13.0          | 48.1          |       |  |
| 2472.60                                                                                 | -22.0               | V                      | 3.0             | 36.4           | 1.0            | 57.4         | -13.0          | 44.4          |       |  |
| 3296.80                                                                                 | -21.6               | V                      | 3.0             | 36.2           | 1.0            | 56.7         | -13.0          | 43.7          |       |  |
| 1648.40                                                                                 | -25.8               | H                      | 3.0             | 37.0           | 1.0            | 61.8         | -13.0          | 48.8          |       |  |
| 2472.60                                                                                 | -25.0               | H                      | 3.0             | 36.4           | 1.0            | 60.4         | -13.0          | 47.4          |       |  |
| 3296.80                                                                                 | -21.6               | H                      | 3.0             | 36.2           | 1.0            | 56.7         | -13.0          | 43.7          |       |  |
| Mid Ch, 836.6                                                                           |                     |                        |                 |                |                |              |                |               |       |  |
| 1673.20                                                                                 | -24.9               | V                      | 3.0             | 37.0           | 1.0            | 60.9         | -13.0          | 47.9          |       |  |
| 2509.80                                                                                 | -22.3               | V                      | 3.0             | 36.4           | 1.0            | 57.7         | -13.0          | 44.7          |       |  |
| 3346.40                                                                                 | -21.7               | V                      | 3.0             | 36.1           | 1.0            | 56.8         | -13.0          | 43.8          |       |  |
| 1673.20                                                                                 | -25.8               | H                      | 3.0             | 37.0           | 1.0            | 61.8         | -13.0          | 48.8          |       |  |
| 2509.80                                                                                 | -25.0               | H                      | 3.0             | 36.4           | 1.0            | 60.4         | -13.0          | 47.4          |       |  |
| 3346.40                                                                                 | -21.6               | H                      | 3.0             | 36.1           | 1.0            | 56.7         | -13.0          | 43.7          |       |  |
| High Ch, 848.8                                                                          |                     |                        |                 |                |                |              |                |               |       |  |
| 1697.60                                                                                 | -24.5               | V                      | 3.0             | 37.0           | 1.0            | 60.4         | -13.0          | 47.4          |       |  |
| 2546.40                                                                                 | -21.9               | V                      | 3.0             | 36.4           | 1.0            | 57.3         | -13.0          | 44.3          |       |  |
| 3395.20                                                                                 | -21.5               | V                      | 3.0             | 36.1           | 1.0            | 56.5         | -13.0          | 43.5          |       |  |
| 1697.60                                                                                 | -25.4               | H                      | 3.0             | 37.0           | 1.0            | 61.4         | -13.0          | 48.4          |       |  |
| 2546.40                                                                                 | -24.9               | H                      | 3.0             | 36.4           | 1.0            | 60.3         | -13.0          | 47.3          |       |  |
| 3395.20                                                                                 | -21.4               | H                      | 3.0             | 36.1           | 1.0            | 56.5         | -13.0          | 43.5          |       |  |

GSM850 GPRS

| Compliance Certification Services<br>Above 1GHz High Frequency Substitution Measurement |                     |                         |                 |                |                |              |                |               |       |  |
|-----------------------------------------------------------------------------------------|---------------------|-------------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company:                                                                                |                     | SOMC                    |                 |                |                |              |                |               |       |  |
| Project #:                                                                              |                     | 11785223                |                 |                |                |              |                |               |       |  |
| Date:                                                                                   |                     | 7/5/2017                |                 |                |                |              |                |               |       |  |
| Test Engineer:                                                                          |                     | 43574 JS                |                 |                |                |              |                |               |       |  |
| Configuration:                                                                          |                     | EUT + AC Charger        |                 |                |                |              |                |               |       |  |
| Location:                                                                               |                     | Chamber C               |                 |                |                |              |                |               |       |  |
| Mode:                                                                                   |                     | EGPRS 850 MHz Harmonics |                 |                |                |              |                |               |       |  |
| f<br>MHz                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)      | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 824.2                                                                           |                     |                         |                 |                |                |              |                |               |       |  |
| 1648.40                                                                                 | -24.9               | V                       | 3.0             | 37.0           | 1.0            | 60.9         | -13.0          | 47.9          |       |  |
| 2472.60                                                                                 | -21.6               | V                       | 3.0             | 36.4           | 1.0            | 57.1         | -13.0          | 44.1          |       |  |
| 3296.80                                                                                 | -21.5               | V                       | 3.0             | 36.2           | 1.0            | 56.6         | -13.0          | 43.6          |       |  |
| 1648.40                                                                                 | -25.6               | H                       | 3.0             | 37.0           | 1.0            | 61.6         | -13.0          | 48.6          |       |  |
| 2472.60                                                                                 | -25.1               | H                       | 3.0             | 36.4           | 1.0            | 60.5         | -13.0          | 47.5          |       |  |
| 3296.80                                                                                 | -19.9               | H                       | 3.0             | 36.2           | 1.0            | 54.0         | -13.0          | 41.0          |       |  |
| Mid Ch, 836.6                                                                           |                     |                         |                 |                |                |              |                |               |       |  |
| 1673.20                                                                                 | -24.6               | V                       | 3.0             | 37.0           | 1.0            | 60.6         | -13.0          | 47.6          |       |  |
| 2509.80                                                                                 | -22.6               | V                       | 3.0             | 36.4           | 1.0            | 58.0         | -13.0          | 45.0          |       |  |
| 3346.40                                                                                 | -21.4               | V                       | 3.0             | 36.1           | 1.0            | 56.5         | -13.0          | 43.5          |       |  |
| 1673.20                                                                                 | -25.7               | H                       | 3.0             | 37.0           | 1.0            | 61.7         | -13.0          | 48.7          |       |  |
| 2509.80                                                                                 | -24.8               | H                       | 3.0             | 36.4           | 1.0            | 60.2         | -13.0          | 47.2          |       |  |
| 3346.40                                                                                 | -21.9               | H                       | 3.0             | 36.1           | 1.0            | 57.0         | -13.0          | 44.0          |       |  |
| High Ch, 848.8                                                                          |                     |                         |                 |                |                |              |                |               |       |  |
| 1697.60                                                                                 | -24.4               | V                       | 3.0             | 37.0           | 1.0            | 60.3         | -13.0          | 47.3          |       |  |
| 2546.40                                                                                 | -21.4               | V                       | 3.0             | 36.4           | 1.0            | 56.8         | -13.0          | 43.8          |       |  |
| 3395.20                                                                                 | -21.2               | V                       | 3.0             | 36.1           | 1.0            | 56.3         | -13.0          | 43.3          |       |  |
| 1697.60                                                                                 | -25.5               | H                       | 3.0             | 37.0           | 1.0            | 61.4         | -13.0          | 48.4          |       |  |
| 2546.40                                                                                 | -24.7               | H                       | 3.0             | 36.4           | 1.0            | 60.1         | -13.0          | 47.1          |       |  |
| 3395.20                                                                                 | -21.6               | H                       | 3.0             | 36.1           | 1.0            | 56.7         | -13.0          | 43.7          |       |  |

GSM850 EGPRS

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                         |                 |                |                |              |                |               |       |  |
|--------------------------------------------------------------------------------------|---------------------|-------------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company:                                                                             |                     | SOMC                    |                 |                |                |              |                |               |       |  |
| Project #:                                                                           |                     | 11785223                |                 |                |                |              |                |               |       |  |
| Date:                                                                                |                     | 7/5/2017                |                 |                |                |              |                |               |       |  |
| Test Engineer:                                                                       |                     | 43574 JS                |                 |                |                |              |                |               |       |  |
| Configuration:                                                                       |                     | EUT + AC Charger        |                 |                |                |              |                |               |       |  |
| Location:                                                                            |                     | Chamber C               |                 |                |                |              |                |               |       |  |
| Mode:                                                                                |                     | GPRS 1900 MHz Harmonics |                 |                |                |              |                |               |       |  |
| f<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)      | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 1850.2                                                                       |                     |                         |                 |                |                |              |                |               |       |  |
| 3700.40                                                                              | -16.3               | V                       | 3.0             | 35.9           | 1.0            | 51.2         | -13.0          | 38.2          |       |  |
| 5550.60                                                                              | -12.1               | V                       | 3.0             | 35.5           | 1.0            | 46.6         | -13.0          | 33.6          |       |  |
| 7400.80                                                                              | -12.3               | V                       | 3.0             | 35.7           | 1.0            | 47.1         | -13.0          | 34.1          |       |  |
| 3700.40                                                                              | -17.1               | H                       | 3.0             | 35.9           | 1.0            | 51.9         | -13.0          | 38.9          |       |  |
| 5550.60                                                                              | -11.7               | H                       | 3.0             | 35.5           | 1.0            | 46.2         | -13.0          | 33.2          |       |  |
| 7400.80                                                                              | -11.5               | H                       | 3.0             | 35.7           | 1.0            | 46.2         | -13.0          | 33.2          |       |  |
| Mid Ch, 1880                                                                         |                     |                         |                 |                |                |              |                |               |       |  |
| 3760.00                                                                              | -16.5               | V                       | 3.0             | 35.8           | 1.0            | 51.3         | -13.0          | 38.3          |       |  |
| 5640.00                                                                              | -12.0               | V                       | 3.0             | 35.5           | 1.0            | 46.5         | -13.0          | 33.5          |       |  |
| 7520.00                                                                              | -12.2               | V                       | 3.0             | 35.7           | 1.0            | 46.9         | -13.0          | 33.9          |       |  |
| 3760.00                                                                              | -17.0               | H                       | 3.0             | 35.8           | 1.0            | 51.8         | -13.0          | 38.8          |       |  |
| 5640.00                                                                              | -12.1               | H                       | 3.0             | 35.5           | 1.0            | 46.5         | -13.0          | 33.5          |       |  |
| 7520.00                                                                              | -11.2               | H                       | 3.0             | 35.7           | 1.0            | 46.0         | -13.0          | 33.0          |       |  |
| High Ch, 1909.8                                                                      |                     |                         |                 |                |                |              |                |               |       |  |
| 3819.60                                                                              | -16.1               | V                       | 3.0             | 35.8           | 1.0            | 50.9         | -13.0          | 37.9          |       |  |
| 5729.40                                                                              | -12.0               | V                       | 3.0             | 35.5           | 1.0            | 46.5         | -13.0          | 33.5          |       |  |
| 7639.20                                                                              | -12.1               | V                       | 3.0             | 35.8           | 1.0            | 46.9         | -13.0          | 33.9          |       |  |
| 3819.60                                                                              | -16.8               | H                       | 3.0             | 35.8           | 1.0            | 51.5         | -13.0          | 38.5          |       |  |
| 5729.40                                                                              | -11.6               | H                       | 3.0             | 35.5           | 1.0            | 46.1         | -13.0          | 33.1          |       |  |
| 7639.20                                                                              | -10.9               | H                       | 3.0             | 35.8           | 1.0            | 45.7         | -13.0          | 32.7          |       |  |

GSM1900 GPRS

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                          |                 |                |                |              |                |               |       |  |
|--------------------------------------------------------------------------------------|---------------------|--------------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company:                                                                             |                     | SOMC                     |                 |                |                |              |                |               |       |  |
| Project #:                                                                           |                     | 11785223                 |                 |                |                |              |                |               |       |  |
| Date:                                                                                |                     | 7/5/2017                 |                 |                |                |              |                |               |       |  |
| Test Engineer:                                                                       |                     | 43574 JS                 |                 |                |                |              |                |               |       |  |
| Configuration:                                                                       |                     | EUT + AC Charger         |                 |                |                |              |                |               |       |  |
| Location:                                                                            |                     | Chamber C                |                 |                |                |              |                |               |       |  |
| Mode:                                                                                |                     | EGPRS 1900 MHz Harmonics |                 |                |                |              |                |               |       |  |
| f<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)       | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 1850.2                                                                       |                     |                          |                 |                |                |              |                |               |       |  |
| 3700.40                                                                              | -16.6               | V                        | 3.0             | 35.9           | 1.0            | 51.4         | -13.0          | 38.4          |       |  |
| 5550.60                                                                              | -13.3               | V                        | 3.0             | 35.5           | 1.0            | 47.8         | -13.0          | 34.8          |       |  |
| 7400.80                                                                              | -12.4               | V                        | 3.0             | 35.7           | 1.0            | 47.1         | -13.0          | 34.1          |       |  |
| 3700.40                                                                              | -17.3               | H                        | 3.0             | 35.9           | 1.0            | 52.2         | -13.0          | 39.2          |       |  |
| 5550.60                                                                              | -12.5               | H                        | 3.0             | 35.5           | 1.0            | 47.0         | -13.0          | 34.0          |       |  |
| 7400.80                                                                              | -11.4               | H                        | 3.0             | 35.7           | 1.0            | 46.1         | -13.0          | 33.1          |       |  |
| Mid Ch, 1880                                                                         |                     |                          |                 |                |                |              |                |               |       |  |
| 3760.00                                                                              | -16.5               | V                        | 3.0             | 35.8           | 1.0            | 51.4         | -13.0          | 38.4          |       |  |
| 5640.00                                                                              | -13.3               | V                        | 3.0             | 35.5           | 1.0            | 47.8         | -13.0          | 34.8          |       |  |
| 7520.00                                                                              | -12.1               | V                        | 3.0             | 35.7           | 1.0            | 46.8         | -13.0          | 33.8          |       |  |
| 3760.00                                                                              | -17.2               | H                        | 3.0             | 35.8           | 1.0            | 52.1         | -13.0          | 39.1          |       |  |
| 5640.00                                                                              | -12.6               | H                        | 3.0             | 35.5           | 1.0            | 47.1         | -13.0          | 34.1          |       |  |
| 7520.00                                                                              | -11.4               | H                        | 3.0             | 35.7           | 1.0            | 46.1         | -13.0          | 33.1          |       |  |
| High Ch, 1909.8                                                                      |                     |                          |                 |                |                |              |                |               |       |  |
| 3819.60                                                                              | -16.2               | V                        | 3.0             | 35.8           | 1.0            | 50.9         | -13.0          | 37.9          |       |  |
| 5729.40                                                                              | -12.6               | V                        | 3.0             | 35.5           | 1.0            | 47.1         | -13.0          | 34.1          |       |  |
| 7639.20                                                                              | -12.1               | V                        | 3.0             | 35.8           | 1.0            | 46.8         | -13.0          | 33.8          |       |  |
| 3819.60                                                                              | -16.9               | H                        | 3.0             | 35.8           | 1.0            | 51.6         | -13.0          | 38.6          |       |  |
| 5729.40                                                                              | -12.6               | H                        | 3.0             | 35.5           | 1.0            | 47.1         | -13.0          | 34.1          |       |  |
| 7639.20                                                                              | -11.4               | H                        | 3.0             | 35.8           | 1.0            | 46.2         | -13.0          | 33.2          |       |  |

GSM1900 EGPRS

# WCDMA

| Compliance Certification Services<br>Above 1GHz High Frequency Substitution Measurement |                     |                        |                 |                |                |              |                |               |       |
|-----------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| Company:                                                                                |                     | SOMC                   |                 |                |                |              |                |               |       |
| Project #:                                                                              |                     | 11785223               |                 |                |                |              |                |               |       |
| Date:                                                                                   |                     | 7/5/2017               |                 |                |                |              |                |               |       |
| Test Engineer:                                                                          |                     | 43574 JS               |                 |                |                |              |                |               |       |
| Configuration:                                                                          |                     | EUT + AC Charger + HS  |                 |                |                |              |                |               |       |
| Location:                                                                               |                     | Chamber C              |                 |                |                |              |                |               |       |
| Mode:                                                                                   |                     | Rel99 Band 5 Harmonics |                 |                |                |              |                |               |       |
| F<br>MHz                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
| Low Ch, 826.4                                                                           |                     |                        |                 |                |                |              |                |               |       |
| 1652.80                                                                                 | -24.8               | V                      | 3.0             | 37.0           | 1.0            | -60.9        | -13.0          | -47.9         |       |
| 2479.20                                                                                 | -21.5               | V                      | 3.0             | 36.4           | 1.0            | -58.9        | -13.0          | -45.9         |       |
| 3365.60                                                                                 | -21.2               | V                      | 3.0             | 36.1           | 1.0            | -56.3        | -13.0          | -43.3         |       |
| 1652.80                                                                                 | -25.6               | H                      | 3.0             | 37.0           | 1.0            | -61.6        | -13.0          | -48.6         |       |
| 2479.20                                                                                 | -24.8               | H                      | 3.0             | 36.4           | 1.0            | -60.2        | -13.0          | -47.2         |       |
| 3365.60                                                                                 | -18.7               | H                      | 3.0             | 36.1           | 1.0            | -53.9        | -13.0          | -40.9         |       |
| Mid Ch, 836.6                                                                           |                     |                        |                 |                |                |              |                |               |       |
| 1673.20                                                                                 | -24.9               | V                      | 3.0             | 37.0           | 1.0            | -60.9        | -13.0          | -47.9         |       |
| 2509.80                                                                                 | -23.4               | V                      | 3.0             | 36.4           | 1.0            | -58.9        | -13.0          | -45.9         |       |
| 3346.40                                                                                 | -21.1               | V                      | 3.0             | 36.1           | 1.0            | -56.2        | -13.0          | -43.2         |       |
| 1673.20                                                                                 | -25.5               | H                      | 3.0             | 37.0           | 1.0            | -61.5        | -13.0          | -48.5         |       |
| 2509.80                                                                                 | -24.6               | H                      | 3.0             | 36.4           | 1.0            | -60.0        | -13.0          | -47.0         |       |
| 3346.40                                                                                 | -21.7               | H                      | 3.0             | 36.1           | 1.0            | -56.8        | -13.0          | -43.8         |       |
| High Ch, 846.6                                                                          |                     |                        |                 |                |                |              |                |               |       |
| 1693.20                                                                                 | -24.8               | V                      | 3.0             | 37.0           | 1.0            | -60.7        | -13.0          | -47.7         |       |
| 2539.80                                                                                 | -23.4               | V                      | 3.0             | 36.4           | 1.0            | -58.8        | -13.0          | -45.8         |       |
| 3386.40                                                                                 | -20.6               | V                      | 3.0             | 36.1           | 1.0            | -55.7        | -13.0          | -42.7         |       |
| 1693.20                                                                                 | -25.1               | H                      | 3.0             | 37.0           | 1.0            | -61.1        | -13.0          | -48.1         |       |
| 2539.80                                                                                 | -24.2               | H                      | 3.0             | 36.4           | 1.0            | -59.6        | -13.0          | -46.6         |       |
| 3386.40                                                                                 | -21.8               | H                      | 3.0             | 36.1           | 1.0            | -56.9        | -13.0          | -43.9         |       |

B5 REL99

| Compliance Certification Services<br>Above 1GHz High Frequency Substitution Measurement |                     |                        |                 |                |                |              |                |               |       |
|-----------------------------------------------------------------------------------------|---------------------|------------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| Company:                                                                                |                     | SOMC                   |                 |                |                |              |                |               |       |
| Project #:                                                                              |                     | 11785223               |                 |                |                |              |                |               |       |
| Date:                                                                                   |                     | 7/5/2017               |                 |                |                |              |                |               |       |
| Test Engineer:                                                                          |                     | 43574 JS               |                 |                |                |              |                |               |       |
| Configuration:                                                                          |                     | EUT + AC Charger + HS  |                 |                |                |              |                |               |       |
| Location:                                                                               |                     | Chamber C              |                 |                |                |              |                |               |       |
| Mode:                                                                                   |                     | HSDPA Band 5 Harmonics |                 |                |                |              |                |               |       |
| F<br>MHz                                                                                | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)     | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
| Low Ch, 826.4                                                                           |                     |                        |                 |                |                |              |                |               |       |
| 1652.80                                                                                 | -25.8               | V                      | 3.0             | 37.0           | 1.0            | -61.9        | -13.0          | -48.9         |       |
| 2479.20                                                                                 | -23.4               | V                      | 3.0             | 36.4           | 1.0            | -58.8        | -13.0          | -45.8         |       |
| 3365.60                                                                                 | -21.4               | V                      | 3.0             | 36.1           | 1.0            | -56.5        | -13.0          | -43.5         |       |
| 1652.80                                                                                 | -26.0               | H                      | 3.0             | 37.0           | 1.0            | -62.1        | -13.0          | -49.1         |       |
| 2479.20                                                                                 | -23.8               | H                      | 3.0             | 36.4           | 1.0            | -59.2        | -13.0          | -46.2         |       |
| 3365.60                                                                                 | -21.8               | H                      | 3.0             | 36.1           | 1.0            | -56.9        | -13.0          | -43.9         |       |
| Mid Ch, 836.6                                                                           |                     |                        |                 |                |                |              |                |               |       |
| 1673.20                                                                                 | -25.7               | V                      | 3.0             | 37.0           | 1.0            | -61.7        | -13.0          | -48.7         |       |
| 2509.80                                                                                 | -23.4               | V                      | 3.0             | 36.4           | 1.0            | -58.8        | -13.0          | -45.8         |       |
| 3346.40                                                                                 | -21.3               | V                      | 3.0             | 36.1           | 1.0            | -56.4        | -13.0          | -43.4         |       |
| 1673.20                                                                                 | -26.1               | H                      | 3.0             | 37.0           | 1.0            | -62.1        | -13.0          | -49.1         |       |
| 2509.80                                                                                 | -23.9               | H                      | 3.0             | 36.4           | 1.0            | -59.3        | -13.0          | -46.3         |       |
| 3346.40                                                                                 | -21.5               | H                      | 3.0             | 36.1           | 1.0            | -56.6        | -13.0          | -43.6         |       |
| High Ch, 846.6                                                                          |                     |                        |                 |                |                |              |                |               |       |
| 1693.20                                                                                 | -25.1               | V                      | 3.0             | 37.0           | 1.0            | -61.1        | -13.0          | -48.1         |       |
| 2539.80                                                                                 | -23.2               | V                      | 3.0             | 36.4           | 1.0            | -58.6        | -13.0          | -45.6         |       |
| 3386.40                                                                                 | -21.0               | V                      | 3.0             | 36.1           | 1.0            | -56.1        | -13.0          | -43.1         |       |
| 1693.20                                                                                 | -25.8               | H                      | 3.0             | 37.0           | 1.0            | -61.9        | -13.0          | -48.9         |       |
| 2539.80                                                                                 | -23.9               | H                      | 3.0             | 36.4           | 1.0            | -59.3        | -13.0          | -46.3         |       |
| 3386.40                                                                                 | -18.7               | H                      | 3.0             | 36.1           | 1.0            | -53.8        | -13.0          | -40.8         |       |

B5 HSDPA







| Above 1GHz High Frequency Substitution Measurement |            |                                              |          |        |        |       |       |       |       |
|----------------------------------------------------|------------|----------------------------------------------|----------|--------|--------|-------|-------|-------|-------|
| Company:                                           |            | SOMC                                         |          |        |        |       |       |       |       |
| Project #:                                         |            | 11785223                                     |          |        |        |       |       |       |       |
| Date:                                              |            | 7/6/2017                                     |          |        |        |       |       |       |       |
| Test Engineer:                                     |            | 43574 JS                                     |          |        |        |       |       |       |       |
| Configuration:                                     |            | EUT + AC Charger + HS                        |          |        |        |       |       |       |       |
| Location:                                          |            | Chamber C                                    |          |        |        |       |       |       |       |
| Mode:                                              |            | LTE_16QPSK Band 5 Harmonics, 10MHz Bandwidth |          |        |        |       |       |       |       |
| f                                                  | SG reading | Ant. Pol.                                    | Distance | Preamp | Filter | ERP   | Limit | Delta | Notes |
| MHz                                                | (dBm)      | (H/V)                                        | (m)      | (dB)   | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 829                                        |            |                                              |          |        |        |       |       |       |       |
| 1658.00                                            | -24.6      | V                                            | 3.0      | 36.4   | 1.0    | -60.0 | -13.0 | -47.0 |       |
| 2487.00                                            | -24.5      | V                                            | 3.0      | 35.0   | 1.0    | -58.4 | -13.0 | -45.4 |       |
| 3316.00                                            | -22.9      | V                                            | 3.0      | 34.3   | 1.0    | -56.1 | -13.0 | -43.1 |       |
| 1658.00                                            | -26.2      | H                                            | 3.0      | 36.4   | 1.0    | -61.5 | -13.0 | -48.5 |       |
| 2487.00                                            | -25.0      | H                                            | 3.0      | 35.0   | 1.0    | -59.0 | -13.0 | -46.0 |       |
| 3316.00                                            | -23.0      | H                                            | 3.0      | 34.3   | 1.0    | -56.2 | -13.0 | -43.2 |       |
| Mid Ch, 836.5                                      |            |                                              |          |        |        |       |       |       |       |
| 1673.00                                            | -24.8      | V                                            | 3.0      | 36.3   | 1.0    | -60.1 | -13.0 | -47.1 |       |
| 2509.50                                            | -24.5      | V                                            | 3.0      | 34.9   | 1.0    | -58.5 | -13.0 | -45.5 |       |
| 3346.00                                            | -23.0      | V                                            | 3.0      | 34.2   | 1.0    | -56.2 | -13.0 | -43.2 |       |
| 1673.00                                            | -26.1      | H                                            | 3.0      | 36.3   | 1.0    | -61.4 | -13.0 | -48.4 |       |
| 2509.50                                            | -24.8      | H                                            | 3.0      | 34.9   | 1.0    | -58.7 | -13.0 | -45.7 |       |
| 3346.00                                            | -22.8      | H                                            | 3.0      | 34.2   | 1.0    | -56.1 | -13.0 | -43.1 |       |
| High Ch, 844                                       |            |                                              |          |        |        |       |       |       |       |
| 1688.00                                            | -24.9      | V                                            | 3.0      | 36.3   | 1.0    | -60.2 | -13.0 | -47.2 |       |
| 2532.00                                            | -21.5      | V                                            | 3.0      | 34.9   | 1.0    | -55.4 | -13.0 | -42.4 |       |
| 3376.00                                            | -22.9      | V                                            | 3.0      | 34.2   | 1.0    | -56.1 | -13.0 | -43.1 |       |
| 1688.00                                            | -26.1      | H                                            | 3.0      | 36.3   | 1.0    | -61.4 | -13.0 | -48.4 |       |
| 2532.00                                            | -24.9      | H                                            | 3.0      | 34.9   | 1.0    | -58.8 | -13.0 | -45.8 |       |
| 3376.00                                            | -22.6      | H                                            | 3.0      | 34.2   | 1.0    | -55.8 | -13.0 | -42.8 |       |
| LTE B5 10MHz QPSK                                  |            |                                              |          |        |        |       |       |       |       |

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |            |                                             |          |        |        |       |       |       |       |
|--------------------------------------------------------------------------------------|------------|---------------------------------------------|----------|--------|--------|-------|-------|-------|-------|
| Company:                                                                             |            | SOMC                                        |          |        |        |       |       |       |       |
| Project #:                                                                           |            | 11785223                                    |          |        |        |       |       |       |       |
| Date:                                                                                |            | 7/6/2017                                    |          |        |        |       |       |       |       |
| Test Engineer:                                                                       |            | 43574 JS                                    |          |        |        |       |       |       |       |
| Configuration:                                                                       |            | EUT + AC Charger + HS                       |          |        |        |       |       |       |       |
| Location:                                                                            |            | Chamber C                                   |          |        |        |       |       |       |       |
| Mode:                                                                                |            | LTE_16QAM Band 5 Harmonics, 10MHz Bandwidth |          |        |        |       |       |       |       |
| f                                                                                    | SG reading | Ant. Pol.                                   | Distance | Preamp | Filter | ERP   | Limit | Delta | Notes |
| MHz                                                                                  | (dBm)      | (H/V)                                       | (m)      | (dB)   | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 829                                                                          |            |                                             |          |        |        |       |       |       |       |
| 1658.00                                                                              | -24.8      | V                                           | 3.0      | 36.4   | 1.0    | -60.2 | -13.0 | -47.2 |       |
| 2487.00                                                                              | -24.3      | V                                           | 3.0      | 35.0   | 1.0    | -56.3 | -13.0 | -43.3 |       |
| 3316.00                                                                              | -22.6      | V                                           | 3.0      | 34.3   | 1.0    | -55.8 | -13.0 | -42.8 |       |
| 1658.00                                                                              | -26.1      | H                                           | 3.0      | 36.4   | 1.0    | -61.5 | -13.0 | -48.5 |       |
| 2487.00                                                                              | -25.1      | H                                           | 3.0      | 35.0   | 1.0    | -59.0 | -13.0 | -46.0 |       |
| 3316.00                                                                              | -22.9      | H                                           | 3.0      | 34.3   | 1.0    | -56.2 | -13.0 | -43.2 |       |
| Mid Ch, 836.5                                                                        |            |                                             |          |        |        |       |       |       |       |
| 1673.00                                                                              | -25.4      | V                                           | 3.0      | 36.3   | 1.0    | -60.8 | -13.0 | -47.8 |       |
| 2509.50                                                                              | -24.2      | V                                           | 3.0      | 34.9   | 1.0    | -58.1 | -13.0 | -45.1 |       |
| 3346.00                                                                              | -22.3      | V                                           | 3.0      | 34.2   | 1.0    | -55.5 | -13.0 | -42.5 |       |
| 1673.00                                                                              | -25.7      | H                                           | 3.0      | 36.3   | 1.0    | -61.1 | -13.0 | -48.1 |       |
| 2509.50                                                                              | -24.2      | H                                           | 3.0      | 34.9   | 1.0    | -58.1 | -13.0 | -45.1 |       |
| 3346.00                                                                              | -23.2      | H                                           | 3.0      | 34.2   | 1.0    | -56.5 | -13.0 | -43.5 |       |
| High Ch, 844                                                                         |            |                                             |          |        |        |       |       |       |       |
| 1688.00                                                                              | -25.0      | V                                           | 3.0      | 36.3   | 1.0    | -60.3 | -13.0 | -47.3 |       |
| 2532.00                                                                              | -21.4      | V                                           | 3.0      | 34.9   | 1.0    | -55.3 | -13.0 | -42.3 |       |
| 3376.00                                                                              | -23.4      | V                                           | 3.0      | 34.2   | 1.0    | -56.6 | -13.0 | -43.6 |       |
| 1688.00                                                                              | -25.8      | H                                           | 3.0      | 36.3   | 1.0    | -61.1 | -13.0 | -48.1 |       |
| 2532.00                                                                              | -24.7      | H                                           | 3.0      | 34.9   | 1.0    | -58.6 | -13.0 | -45.6 |       |
| 3376.00                                                                              | -23.2      | H                                           | 3.0      | 34.2   | 1.0    | -56.4 | -13.0 | -43.4 |       |
| LTE B5 10MHz 16QAM                                                                   |            |                                             |          |        |        |       |       |       |       |



UL Verification Services, Inc.  
Above 1GHz High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

SOMC

11785223

7/5/2017

43575 OS

EUT + HS + Charger

Chamber C

LTE\_QPSK Band 7 Harmonics, 20MHz Bandwidth

| f                | SG reading | Ant. Pol. | Distance | Preampl | Filter | ERP   | Limit | Delta | Notes |
|------------------|------------|-----------|----------|---------|--------|-------|-------|-------|-------|
| MHz              | (dBm)      | (H/V)     | (m)      | (dB)    | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 2510MHz  |            |           |          |         |        |       |       |       |       |
| 5020.00          | -13.9      | V         | 3.0      | 35.5    | 1.0    | -48.3 | -25.0 | -23.3 |       |
| 7530.00          | -13.1      | V         | 3.0      | 35.7    | 1.0    | -47.9 | -25.0 | -22.9 |       |
| 10040.00         | -13.0      | V         | 3.0      | 36.0    | 1.0    | -48.0 | -25.0 | -23.0 |       |
| 5020.00          | -9.1       | H         | 3.0      | 35.5    | 1.0    | -43.6 | -25.0 | -18.6 |       |
| 7530.00          | -13.3      | H         | 3.0      | 35.7    | 1.0    | -48.0 | -25.0 | -23.0 |       |
| 10040.00         | -13.2      | H         | 3.0      | 36.0    | 1.0    | -48.2 | -25.0 | -23.2 |       |
| Mid Ch, 2535MHz  |            |           |          |         |        |       |       |       |       |
| 5070.00          | -14.8      | V         | 3.0      | 35.4    | 1.0    | -49.2 | -25.0 | -24.2 |       |
| 7605.00          | -13.8      | V         | 3.0      | 35.8    | 1.0    | -48.5 | -25.0 | -23.5 |       |
| 10140.00         | -12.7      | V         | 3.0      | 36.0    | 1.0    | -47.7 | -25.0 | -22.7 |       |
| 5070.00          | -15.4      | H         | 3.0      | 35.4    | 1.0    | -49.9 | -25.0 | -24.9 |       |
| 7605.00          | -12.7      | H         | 3.0      | 35.8    | 1.0    | -47.4 | -25.0 | -22.4 |       |
| 10140.00         | -12.3      | H         | 3.0      | 36.0    | 1.0    | -47.2 | -25.0 | -22.2 |       |
| High Ch, 2560MHz |            |           |          |         |        |       |       |       |       |
| 5120.00          | -12.5      | V         | 3.0      | 35.4    | 1.0    | -47.0 | -25.0 | -22.0 |       |
| 7680.00          | -13.1      | V         | 3.0      | 35.8    | 1.0    | -47.9 | -25.0 | -22.9 |       |
| 10240.00         | -12.0      | V         | 3.0      | 35.9    | 1.0    | -47.8 | -25.0 | -22.8 |       |
| 5120.00          | -12.2      | H         | 3.0      | 35.4    | 1.0    | -46.6 | -25.0 | -21.6 |       |
| 7680.00          | -12.9      | H         | 3.0      | 35.8    | 1.0    | -47.6 | -25.0 | -22.6 |       |
| 10240.00         | -13.3      | H         | 3.0      | 35.9    | 1.0    | -48.2 | -25.0 | -23.2 |       |

LTE B7 20MHz QPSK

UL Verification Services, Inc.  
Above 1GHz High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

SOMC

11785223

7/5/2017

43575 OS

EUT + HS + Charger

Chamber C

LTE\_16QAM Band 7 Harmonics, 20MHz Bandwidth

| f                | SG reading | Ant. Pol. | Distance | Preampl | Filter | ERP   | Limit | Delta | Notes |
|------------------|------------|-----------|----------|---------|--------|-------|-------|-------|-------|
| MHz              | (dBm)      | (H/V)     | (m)      | (dB)    | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 2510MHz  |            |           |          |         |        |       |       |       |       |
| 5020.00          | -14.2      | V         | 3.0      | 35.5    | 1.0    | -48.7 | -25.0 | -23.7 |       |
| 7530.00          | -14.0      | V         | 3.0      | 35.7    | 1.0    | -48.8 | -25.0 | -23.8 |       |
| 10040.00         | -13.3      | V         | 3.0      | 36.0    | 1.0    | -48.3 | -25.0 | -23.3 |       |
| 5020.00          | -10.5      | H         | 3.0      | 35.5    | 1.0    | -44.9 | -25.0 | -19.9 |       |
| 7530.00          | -13.0      | H         | 3.0      | 35.7    | 1.0    | -47.7 | -25.0 | -22.7 |       |
| 10040.00         | -12.0      | H         | 3.0      | 36.0    | 1.0    | -47.0 | -25.0 | -22.0 |       |
| Mid Ch, 2535MHz  |            |           |          |         |        |       |       |       |       |
| 5070.00          | -15.1      | V         | 3.0      | 35.4    | 1.0    | -49.5 | -25.0 | -24.5 |       |
| 7605.00          | -12.8      | V         | 3.0      | 35.8    | 1.0    | -47.6 | -25.0 | -22.6 |       |
| 10140.00         | -14.0      | V         | 3.0      | 36.0    | 1.0    | -48.9 | -25.0 | -23.9 |       |
| 5070.00          | -15.0      | H         | 3.0      | 35.4    | 1.0    | -49.4 | -25.0 | -24.4 |       |
| 7605.00          | -11.6      | H         | 3.0      | 35.8    | 1.0    | -46.4 | -25.0 | -21.4 |       |
| 10140.00         | -13.1      | H         | 3.0      | 36.0    | 1.0    | -48.1 | -25.0 | -23.1 |       |
| High Ch, 2560MHz |            |           |          |         |        |       |       |       |       |
| 5120.00          | -12.6      | V         | 3.0      | 35.4    | 1.0    | -47.0 | -25.0 | -22.0 |       |
| 7680.00          | -13.7      | V         | 3.0      | 35.8    | 1.0    | -48.5 | -25.0 | -23.5 |       |
| 10240.00         | -13.1      | V         | 3.0      | 35.9    | 1.0    | -48.0 | -25.0 | -23.0 |       |
| 5120.00          | -12.8      | H         | 3.0      | 35.4    | 1.0    | -47.3 | -25.0 | -22.3 |       |
| 7680.00          | -13.4      | H         | 3.0      | 35.8    | 1.0    | -48.2 | -25.0 | -23.2 |       |
| 10240.00         | -12.1      | H         | 3.0      | 35.9    | 1.0    | -47.0 | -25.0 | -22.0 |       |

LTE B7 20MHz 16QAM

# LTE Band 12

UL Verification Services, Inc.  
Above 1GHz High Frequency Substitution Measurement

Company: SOMC  
Project #: 11785223  
Date: 7/6/2017  
Test Engineer: 43574 JS  
Configuration: EUT + AC Charger + HS  
Location: Chamber C  
Mode: LTE\_QPSK Band 12 Harmonics, 1.4MHz Bandwidth

| f<br>MHz       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|----------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| Low Ch, 699.7  |                     |                    |                 |                |                |              |                |               |       |
| 1399.40        | -28.4               | V                  | 3.0             | 36.5           | 1.0            | -63.9        | -13.0          | -50.9         |       |
| 2099.10        | -21.5               | V                  | 3.0             | 35.6           | 1.0            | -56.1        | -13.0          | -43.1         |       |
| 2798.80        | -23.4               | V                  | 3.0             | 34.7           | 1.0            | -57.1        | -13.0          | -44.1         |       |
| 1399.40        | -28.7               | H                  | 3.0             | 36.5           | 1.0            | -64.2        | -13.0          | -51.2         |       |
| 2099.10        | -21.7               | H                  | 3.0             | 35.6           | 1.0            | -56.3        | -13.0          | -43.3         |       |
| 2798.80        | -23.2               | H                  | 3.0             | 34.7           | 1.0            | -56.9        | -13.0          | -43.9         |       |
| Mid Ch, 707.5  |                     |                    |                 |                |                |              |                |               |       |
| 1415.00        | -28.4               | V                  | 3.0             | 36.5           | 1.0            | -63.9        | -13.0          | -50.9         |       |
| 2122.50        | -21.2               | V                  | 3.0             | 35.6           | 1.0            | -55.8        | -13.0          | -42.8         |       |
| 2830.00        | -22.9               | V                  | 3.0             | 34.7           | 1.0            | -56.6        | -13.0          | -43.6         |       |
| 1415.00        | -28.7               | H                  | 3.0             | 36.5           | 1.0            | -64.2        | -13.0          | -51.2         |       |
| 2122.50        | -21.5               | H                  | 3.0             | 35.6           | 1.0            | -56.1        | -13.0          | -43.1         |       |
| 2830.00        | -23.6               | H                  | 3.0             | 34.7           | 1.0            | -57.3        | -13.0          | -44.3         |       |
| High Ch, 715.3 |                     |                    |                 |                |                |              |                |               |       |
| 1430.60        | -28.3               | V                  | 3.0             | 36.5           | 1.0            | -63.9        | -13.0          | -50.9         |       |
| 2145.90        | -21.7               | V                  | 3.0             | 35.6           | 1.0            | -56.2        | -13.0          | -43.2         |       |
| 2861.20        | -23.0               | V                  | 3.0             | 34.7           | 1.0            | -56.7        | -13.0          | -43.7         |       |
| 1430.60        | -28.8               | H                  | 3.0             | 36.5           | 1.0            | -64.4        | -13.0          | -51.4         |       |
| 2145.90        | -21.7               | H                  | 3.0             | 35.6           | 1.0            | -56.3        | -13.0          | -43.3         |       |
| 2861.20        | -23.3               | H                  | 3.0             | 34.7           | 1.0            | -57.0        | -13.0          | -44.0         |       |

## LTE B12 1.4MHz QPSK

UL Verification Services, Inc.  
Above 1GHz High Frequency Substitution Measurement

Company: SOMAC  
Project #: 11785223  
Date: 7/6/2017  
Test Engineer: 43574 JS  
Configuration: EUT + AC Charger + HS  
Location: Chamber C  
Mode: LTE\_QPSK Band 12 Harmonics, 3MHz Bandwidth

| f<br>MHz       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|----------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| Low Ch, 700.5  |                     |                    |                 |                |                |              |                |               |       |
| 1401.00        | -28.0               | V                  | 3.0             | 36.5           | 1.0            | -63.5        | -13.0          | -50.5         |       |
| 2101.50        | -20.7               | V                  | 3.0             | 35.6           | 1.0            | -55.3        | -13.0          | -42.3         |       |
| 2802.00        | -22.8               | V                  | 3.0             | 34.7           | 1.0            | -56.5        | -13.0          | -43.5         |       |
| 1401.00        | -28.8               | H                  | 3.0             | 36.5           | 1.0            | -64.3        | -13.0          | -51.3         |       |
| 2101.50        | -22.3               | H                  | 3.0             | 35.6           | 1.0            | -56.9        | -13.0          | -43.9         |       |
| 2802.00        | -24.1               | H                  | 3.0             | 34.7           | 1.0            | -57.8        | -13.0          | -44.8         |       |
| Mid Ch, 707.5  |                     |                    |                 |                |                |              |                |               |       |
| 1415.00        | -27.9               | V                  | 3.0             | 36.5           | 1.0            | -63.5        | -13.0          | -50.5         |       |
| 2122.50        | -21.1               | V                  | 3.0             | 35.6           | 1.0            | -55.7        | -13.0          | -42.7         |       |
| 2830.00        | -22.7               | V                  | 3.0             | 34.7           | 1.0            | -56.4        | -13.0          | -43.4         |       |
| 1415.00        | -29.2               | H                  | 3.0             | 36.5           | 1.0            | -64.7        | -13.0          | -51.7         |       |
| 2122.50        | -22.3               | H                  | 3.0             | 35.6           | 1.0            | -56.9        | -13.0          | -43.9         |       |
| 2830.00        | -23.3               | H                  | 3.0             | 34.7           | 1.0            | -57.0        | -13.0          | -44.0         |       |
| High Ch, 714.5 |                     |                    |                 |                |                |              |                |               |       |
| 1429.00        | -28.1               | V                  | 3.0             | 36.5           | 1.0            | -63.6        | -13.0          | -50.6         |       |
| 2143.50        | -21.4               | V                  | 3.0             | 35.6           | 1.0            | -55.9        | -13.0          | -42.9         |       |
| 2858.00        | -22.2               | V                  | 3.0             | 34.7           | 1.0            | -56.8        | -13.0          | -43.8         |       |
| 1429.00        | -28.8               | H                  | 3.0             | 36.5           | 1.0            | -64.3        | -13.0          | -51.3         |       |
| 2143.50        | -22.5               | H                  | 3.0             | 35.6           | 1.0            | -57.0        | -13.0          | -44.0         |       |
| 2858.00        | -22.6               | H                  | 3.0             | 34.7           | 1.0            | -56.3        | -13.0          | -43.3         |       |

## LTE B12 3MHz QPSK

UL Verification Services, Inc.  
Above 1GHz High Frequency Substitution Measurement

Company: SOMC  
Project #: 11785223  
Date: 7/6/2017  
Test Engineer: 43574 JS  
Configuration: EUT + AC Charger + HS  
Location: Chamber C  
Mode: LTE\_QPSK Band 12 Harmonics, 5MHz Bandwidth

| f<br>MHz       | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
|----------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|
| Low Ch, 701.5  |                     |                    |                 |                |                |              |                |               |       |
| 1403.00        | -28.4               | V                  | 3.0             | 36.5           | 1.0            | -64.0        | -13.0          | -51.0         |       |
| 2104.50        | -20.7               | V                  | 3.0             | 35.6           | 1.0            | -55.4        | -13.0          | -42.4         |       |
| 2806.00        | -23.3               | V                  | 3.0             | 34.7           | 1.0            | -57.0        | -13.0          | -44.0         |       |
| 1403.00        | -28.6               | H                  | 3.0             | 36.5           | 1.0            | -64.2        | -13.0          | -51.2         |       |
| 2104.50        | -22.1               | H                  | 3.0             | 35.6           | 1.0            | -56.7        | -13.0          | -43.7         |       |
| 2806.00        | -23.7               | H                  | 3.0             | 34.7           | 1.0            | -57.4        | -13.0          | -44.4         |       |
| Mid Ch, 707.5  |                     |                    |                 |                |                |              |                |               |       |
| 1415.00        | -28.5               | V                  | 3.0             | 36.5           | 1.0            | -64.0        | -13.0          | -51.0         |       |
| 2122.50        | -21.0               | V                  | 3.0             | 35.6           | 1.0            | -55.6        | -13.0          | -42.6         |       |
| 2830.00        | -23.1               | V                  | 3.0             | 34.7           | 1.0            | -56.8        | -13.0          | -43.8         |       |
| 1415.00        | -28.8               | H                  | 3.0             | 36.5           | 1.0            | -64.3        | -13.0          | -51.3         |       |
| 2122.50        | -22.1               | H                  | 3.0             | 35.6           | 1.0            | -56.7        | -13.0          | -43.7         |       |
| 2830.00        | -23.4               | H                  | 3.0             | 34.7           | 1.0            | -57.1        | -13.0          | -44.1         |       |
| High Ch, 713.5 |                     |                    |                 |                |                |              |                |               |       |
| 1427.00        | -28.3               | V                  | 3.0             | 36.5           | 1.0            | -63.9        | -13.0          | -50.9         |       |
| 2140.50        | -20.8               | V                  | 3.0             | 35.6           | 1.0            | -55.4        | -13.0          | -42.4         |       |
| 2854.00        | -23.2               | V                  | 3.0             | 34.7           | 1.0            | -56.9        | -13.0          | -43.9         |       |
| 1427.00        | -28.7               | H                  | 3.0             | 36.5           | 1.0            | -64.2        | -13.0          | -51.2         |       |
| 2140.50        | -22.1               | H                  | 3.0             | 35.6           | 1.0            | -56.6        | -13.0          | -43.6         |       |
| 2854.00        | -23.8               | H                  | 3.0             | 34.7           | 1.0            | -57.5        | -13.0          | -44.5         |       |

## LTE B12 5MHz QPSK

| Above 1GHz High Frequency Substitution Measurement |                     |                                               |                 |                |                |              |                |               |       |  |
|----------------------------------------------------|---------------------|-----------------------------------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company:                                           |                     | SOMC                                          |                 |                |                |              |                |               |       |  |
| Project #:                                         |                     | 11785223                                      |                 |                |                |              |                |               |       |  |
| Date:                                              |                     | 7/6/2017                                      |                 |                |                |              |                |               |       |  |
| Test Engineer:                                     |                     | 43574 JS                                      |                 |                |                |              |                |               |       |  |
| Configuration:                                     |                     | EUT + AC Charger + HS                         |                 |                |                |              |                |               |       |  |
| Location:                                          |                     | Chamber C                                     |                 |                |                |              |                |               |       |  |
| Mode:                                              |                     | LTE_16QAM Band 12 Harmonics, 1.4MHz Bandwidth |                 |                |                |              |                |               |       |  |
| f<br>MHz                                           | SG reading<br>(dBm) | Ant. Pol.<br>(H/V)                            | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 699.7                                      |                     |                                               |                 |                |                |              |                |               |       |  |
| 1399.40                                            | -28.6               | V                                             | 3.0             | 36.5           | 1.0            | -64.2        | -13.0          | -51.2         |       |  |
| 2099.10                                            | -21.7               | V                                             | 3.0             | 35.6           | 1.0            | -56.4        | -13.0          | -43.4         |       |  |
| 2798.80                                            | -23.7               | V                                             | 3.0             | 34.7           | 1.0            | -57.4        | -13.0          | -44.4         |       |  |
| 1399.40                                            | -28.8               | H                                             | 3.0             | 36.5           | 1.0            | -64.3        | -13.0          | -51.3         |       |  |
| 2099.10                                            | -21.8               | H                                             | 3.0             | 35.6           | 1.0            | -56.5        | -13.0          | -43.5         |       |  |
| 2798.80                                            | -23.4               | H                                             | 3.0             | 34.7           | 1.0            | -57.1        | -13.0          | -44.1         |       |  |
| Mid Ch, 707.5                                      |                     |                                               |                 |                |                |              |                |               |       |  |
| 1415.00                                            | -28.7               | V                                             | 3.0             | 36.5           | 1.0            | -64.2        | -13.0          | -51.2         |       |  |
| 2122.50                                            | -21.5               | V                                             | 3.0             | 35.6           | 1.0            | -56.1        | -13.0          | -43.1         |       |  |
| 2830.00                                            | -22.4               | V                                             | 3.0             | 34.7           | 1.0            | -57.1        | -13.0          | -44.1         |       |  |
| 1415.00                                            | -29.2               | H                                             | 3.0             | 36.5           | 1.0            | -64.7        | -13.0          | -51.7         |       |  |
| 2122.50                                            | -22.0               | H                                             | 3.0             | 35.6           | 1.0            | -56.6        | -13.0          | -43.6         |       |  |
| 2830.00                                            | -23.3               | H                                             | 3.0             | 34.7           | 1.0            | -57.0        | -13.0          | -44.0         |       |  |
| High Ch, 715.3                                     |                     |                                               |                 |                |                |              |                |               |       |  |
| 1430.60                                            | -28.5               | V                                             | 3.0             | 36.5           | 1.0            | -64.1        | -13.0          | -51.1         |       |  |
| 2145.90                                            | -21.8               | V                                             | 3.0             | 35.6           | 1.0            | -56.4        | -13.0          | -43.4         |       |  |
| 2861.20                                            | -22.9               | V                                             | 3.0             | 34.7           | 1.0            | -56.6        | -13.0          | -43.6         |       |  |
| 1430.60                                            | -29.0               | H                                             | 3.0             | 36.5           | 1.0            | -64.6        | -13.0          | -51.6         |       |  |
| 2145.90                                            | -22.1               | H                                             | 3.0             | 35.6           | 1.0            | -56.7        | -13.0          | -43.7         |       |  |
| 2861.20                                            | -23.4               | H                                             | 3.0             | 34.7           | 1.0            | -57.1        | -13.0          | -44.1         |       |  |

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |            |                                             |          |         |        |       |       |       |       |
|--------------------------------------------------------------------------------------|------------|---------------------------------------------|----------|---------|--------|-------|-------|-------|-------|
| Company:                                                                             |            | SOMAC                                       |          |         |        |       |       |       |       |
| Project #:                                                                           |            | 11785223                                    |          |         |        |       |       |       |       |
| Date:                                                                                |            | 7/6/2017                                    |          |         |        |       |       |       |       |
| Test Engineer:                                                                       |            | 43574 JS                                    |          |         |        |       |       |       |       |
| Configuration:                                                                       |            | EUT + AC Charger + HS                       |          |         |        |       |       |       |       |
| Location:                                                                            |            | Chamber C                                   |          |         |        |       |       |       |       |
| Mode:                                                                                |            | LTE_QPSK Band 12 Harmonics, 10MHz Bandwidth |          |         |        |       |       |       |       |
| f                                                                                    | SG reading | Ant. Pol.                                   | Distance | Preampl | Filter | ERP   | Limit | Delta | Notes |
| MHz                                                                                  | (dBm)      | (H/V)                                       | (m)      | (dB)    | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 704                                                                          |            |                                             |          |         |        |       |       |       |       |
| 1408.00                                                                              | -28.3      | V                                           | 3.0      | 36.5    | 1.0    | -43.8 | -13.0 | -50.8 |       |
| 2112.00                                                                              | -20.8      | V                                           | 3.0      | 35.6    | 1.0    | -55.5 | -13.0 | -42.5 |       |
| 2816.00                                                                              | -23.0      | V                                           | 3.0      | 34.7    | 1.0    | -56.7 | -13.0 | -43.7 |       |
| 1408.00                                                                              | -28.9      | H                                           | 3.0      | 36.5    | 1.0    | -44.4 | -13.0 | -51.4 |       |
| 2112.00                                                                              | -21.9      | H                                           | 3.0      | 35.6    | 1.0    | -56.6 | -13.0 | -43.6 |       |
| 2816.00                                                                              | -22.6      | H                                           | 3.0      | 34.7    | 1.0    | -56.3 | -13.0 | -43.3 |       |
| Mid Ch, 707.5                                                                        |            |                                             |          |         |        |       |       |       |       |
| 1415.00                                                                              | -28.5      | V                                           | 3.0      | 36.5    | 1.0    | -44.0 | -13.0 | -51.0 |       |
| 2122.50                                                                              | -20.8      | V                                           | 3.0      | 35.6    | 1.0    | -55.5 | -13.0 | -42.5 |       |
| 2830.00                                                                              | -23.1      | V                                           | 3.0      | 34.7    | 1.0    | -56.8 | -13.0 | -43.8 |       |
| 1415.00                                                                              | -29.2      | H                                           | 3.0      | 36.5    | 1.0    | -44.7 | -13.0 | -51.7 |       |
| 2122.50                                                                              | -22.1      | H                                           | 3.0      | 35.6    | 1.0    | -56.7 | -13.0 | -43.7 |       |
| 2830.00                                                                              | -22.7      | H                                           | 3.0      | 34.7    | 1.0    | -56.4 | -13.0 | -43.4 |       |
| High Ch, 711                                                                         |            |                                             |          |         |        |       |       |       |       |
| 1422.00                                                                              | -28.5      | V                                           | 3.0      | 36.5    | 1.0    | -44.0 | -13.0 | -51.0 |       |
| 2133.00                                                                              | -21.0      | V                                           | 3.0      | 35.6    | 1.0    | -55.6 | -13.0 | -42.6 |       |
| 2844.00                                                                              | -22.9      | V                                           | 3.0      | 34.7    | 1.0    | -56.6 | -13.0 | -43.6 |       |
| 1422.00                                                                              | -29.0      | H                                           | 3.0      | 36.5    | 1.0    | -44.6 | -13.0 | -51.6 |       |
| 2133.00                                                                              | -21.7      | H                                           | 3.0      | 35.6    | 1.0    | -56.3 | -13.0 | -43.3 |       |
| 2844.00                                                                              | -22.8      | H                                           | 3.0      | 34.7    | 1.0    | -56.5 | -13.0 | -43.5 |       |
| LTE B12 10MHz QPSK                                                                   |            |                                             |          |         |        |       |       |       |       |

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |            |                                             |          |         |        |       |       |       |       |
|--------------------------------------------------------------------------------------|------------|---------------------------------------------|----------|---------|--------|-------|-------|-------|-------|
| Company:                                                                             |            | SOMAC                                       |          |         |        |       |       |       |       |
| Project #:                                                                           |            | 11785223                                    |          |         |        |       |       |       |       |
| Date:                                                                                |            | 7/6/2017                                    |          |         |        |       |       |       |       |
| Test Engineer:                                                                       |            | 43574 JS                                    |          |         |        |       |       |       |       |
| Configuration:                                                                       |            | EUT + AC Charger + HS                       |          |         |        |       |       |       |       |
| Location:                                                                            |            | Chamber C                                   |          |         |        |       |       |       |       |
| Mode:                                                                                |            | LTE_QPSK Band 12 Harmonics, 10MHz Bandwidth |          |         |        |       |       |       |       |
| f                                                                                    | SG reading | Ant. Pol.                                   | Distance | Preampl | Filter | ERP   | Limit | Delta | Notes |
| MHz                                                                                  | (dBm)      | (H/V)                                       | (m)      | (dB)    | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 704                                                                          |            |                                             |          |         |        |       |       |       |       |
| 1408.00                                                                              | -28.1      | V                                           | 3.0      | 36.5    | 1.0    | -43.7 | -13.0 | -50.7 |       |
| 2112.00                                                                              | -20.9      | V                                           | 3.0      | 35.6    | 1.0    | -55.5 | -13.0 | -42.5 |       |
| 2816.00                                                                              | -23.1      | V                                           | 3.0      | 34.7    | 1.0    | -56.8 | -13.0 | -43.8 |       |
| 1408.00                                                                              | -29.1      | H                                           | 3.0      | 36.5    | 1.0    | -44.6 | -13.0 | -51.6 |       |
| 2112.00                                                                              | -21.9      | H                                           | 3.0      | 35.6    | 1.0    | -56.6 | -13.0 | -43.6 |       |
| 2816.00                                                                              | -22.6      | H                                           | 3.0      | 34.7    | 1.0    | -56.3 | -13.0 | -43.3 |       |
| Mid Ch, 707.5                                                                        |            |                                             |          |         |        |       |       |       |       |
| 1415.00                                                                              | -28.3      | V                                           | 3.0      | 36.5    | 1.0    | -43.8 | -13.0 | -50.8 |       |
| 2122.50                                                                              | -20.9      | V                                           | 3.0      | 35.6    | 1.0    | -55.5 | -13.0 | -42.5 |       |
| 2830.00                                                                              | -23.2      | V                                           | 3.0      | 34.7    | 1.0    | -56.9 | -13.0 | -43.9 |       |
| 1415.00                                                                              | -29.2      | H                                           | 3.0      | 36.5    | 1.0    | -44.7 | -13.0 | -51.7 |       |
| 2122.50                                                                              | -22.2      | H                                           | 3.0      | 35.6    | 1.0    | -56.8 | -13.0 | -43.8 |       |
| 2830.00                                                                              | -23.9      | H                                           | 3.0      | 34.7    | 1.0    | -57.6 | -13.0 | -44.6 |       |
| High Ch, 711                                                                         |            |                                             |          |         |        |       |       |       |       |
| 1422.00                                                                              | -28.6      | V                                           | 3.0      | 36.5    | 1.0    | -44.1 | -13.0 | -51.1 |       |
| 2133.00                                                                              | -21.1      | V                                           | 3.0      | 35.6    | 1.0    | -55.7 | -13.0 | -42.7 |       |
| 2844.00                                                                              | -22.9      | V                                           | 3.0      | 34.7    | 1.0    | -56.6 | -13.0 | -43.6 |       |
| 1422.00                                                                              | -29.2      | H                                           | 3.0      | 36.5    | 1.0    | -44.7 | -13.0 | -51.7 |       |
| 2133.00                                                                              | -21.7      | H                                           | 3.0      | 35.6    | 1.0    | -56.3 | -13.0 | -43.3 |       |
| 2844.00                                                                              | -22.9      | H                                           | 3.0      | 34.7    | 1.0    | -56.6 | -13.0 | -43.6 |       |
| LTE B12 10MHz 16QAM                                                                  |            |                                             |          |         |        |       |       |       |       |

# **LTE Band 13**

| Compliance Certification Services                  |            |                                              |          |        |        |       |       |       |       |
|----------------------------------------------------|------------|----------------------------------------------|----------|--------|--------|-------|-------|-------|-------|
| Above 1GHz High Frequency Substitution Measurement |            |                                              |          |        |        |       |       |       |       |
| Company:                                           |            | SOMC                                         |          |        |        |       |       |       |       |
| Project #:                                         |            | 11785223                                     |          |        |        |       |       |       |       |
| Date:                                              |            | 7/5/2017                                     |          |        |        |       |       |       |       |
| Test Engineer:                                     |            | 43574 JS                                     |          |        |        |       |       |       |       |
| Configuration:                                     |            | EUT + AC Charger                             |          |        |        |       |       |       |       |
| Location:                                          |            | Chamber C                                    |          |        |        |       |       |       |       |
| Mode:                                              |            | LTE_16QPSK Band 13 Harmonics, 5MHz Bandwidth |          |        |        |       |       |       |       |
| f                                                  | SG reading | Ant. Pol.                                    | Distance | Preamp | Filter | ERP   | Limit | Delta | Notes |
| Mhz                                                | (dBm)      | (H/V)                                        | (m)      | (dB)   | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 779.5                                      |            |                                              |          |        |        |       |       |       |       |
| 1559.00                                            | -26.5      | V                                            | 3.0      | 37.1   | 1.0    | -62.6 | -13.0 | -49.6 |       |
| 2338.50                                            | -22.0      | V                                            | 3.0      | 36.5   | 1.0    | -57.5 | -13.0 | -44.5 |       |
| 3118.00                                            | -19.4      | V                                            | 3.0      | 36.3   | 1.0    | -54.7 | -13.0 | -41.7 |       |
| 1559.00                                            | -26.9      | H                                            | 3.0      | 37.1   | 1.0    | -63.0 | -13.0 | -50.0 |       |
| 2338.50                                            | -25.7      | H                                            | 3.0      | 36.5   | 1.0    | -61.2 | -13.0 | -48.2 |       |
| 3118.00                                            | -21.2      | H                                            | 3.0      | 36.3   | 1.0    | -56.5 | -13.0 | -43.5 |       |
| Mid Ch, 782                                        |            |                                              |          |        |        |       |       |       |       |
| 1564.00                                            | -26.1      | V                                            | 3.0      | 37.1   | 1.0    | -62.2 | -13.0 | -49.2 |       |
| 2346.00                                            | -24.2      | V                                            | 3.0      | 36.5   | 1.0    | -59.7 | -13.0 | -46.7 |       |
| 3128.00                                            | -20.4      | V                                            | 3.0      | 36.3   | 1.0    | -55.7 | -13.0 | -42.7 |       |
| 1564.00                                            | -26.2      | H                                            | 3.0      | 37.1   | 1.0    | -62.4 | -13.0 | -49.4 |       |
| 2346.00                                            | -25.2      | H                                            | 3.0      | 36.5   | 1.0    | -60.7 | -13.0 | -47.7 |       |
| 3128.00                                            | -20.5      | H                                            | 3.0      | 36.3   | 1.0    | -55.8 | -13.0 | -42.8 |       |
| High Ch, 784.5                                     |            |                                              |          |        |        |       |       |       |       |
| 1560.00                                            | -26.7      | V                                            | 3.0      | 37.1   | 1.0    | -62.8 | -13.0 | -49.8 |       |
| 2353.50                                            | -22.0      | V                                            | 3.0      | 36.5   | 1.0    | -57.5 | -13.0 | -44.5 |       |
| 3138.00                                            | -19.2      | V                                            | 3.0      | 36.3   | 1.0    | -54.5 | -13.0 | -41.5 |       |
| 1560.00                                            | -26.9      | H                                            | 3.0      | 37.1   | 1.0    | -63.1 | -13.0 | -50.1 |       |
| 2353.50                                            | -25.3      | H                                            | 3.0      | 36.5   | 1.0    | -60.7 | -13.0 | -47.7 |       |
| 3138.00                                            | -21.3      | H                                            | 3.0      | 36.3   | 1.0    | -56.6 | -13.0 | -43.6 |       |

LTE B13 5MHz QPSK

| Compliance Certification Services                  |            |                                             |          |        |        |       |       |       |       |
|----------------------------------------------------|------------|---------------------------------------------|----------|--------|--------|-------|-------|-------|-------|
| Above 1GHz High Frequency Substitution Measurement |            |                                             |          |        |        |       |       |       |       |
| Company:                                           |            | SOMC                                        |          |        |        |       |       |       |       |
| Project #:                                         |            | 11785223                                    |          |        |        |       |       |       |       |
| Date:                                              |            | 7/5/2017                                    |          |        |        |       |       |       |       |
| Test Engineer:                                     |            | 43574 JS                                    |          |        |        |       |       |       |       |
| Configuration:                                     |            | EUT + AC Charger + HS                       |          |        |        |       |       |       |       |
| Location:                                          |            | Chamber C                                   |          |        |        |       |       |       |       |
| Mode:                                              |            | LTE_16QAM Band 13 Harmonics, 5MHz Bandwidth |          |        |        |       |       |       |       |
| f                                                  | SG reading | Ant. Pol.                                   | Distance | Preamp | Filter | ERP   | Limit | Delta | Notes |
| Mhz                                                | (dBm)      | (H/V)                                       | (m)      | (dB)   | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 779.5                                      |            |                                             |          |        |        |       |       |       |       |
| 1559.00                                            | -26.6      | V                                           | 3.0      | 37.1   | 1.0    | -62.8 | -13.0 | -49.8 |       |
| 2338.50                                            | -22.1      | V                                           | 3.0      | 36.5   | 1.0    | -57.6 | -13.0 | -44.6 |       |
| 3118.00                                            | -19.9      | V                                           | 3.0      | 36.3   | 1.0    | -55.2 | -13.0 | -42.2 |       |
| 1559.00                                            | -26.6      | H                                           | 3.0      | 37.1   | 1.0    | -62.8 | -13.0 | -49.8 |       |
| 2338.50                                            | -26.0      | H                                           | 3.0      | 36.5   | 1.0    | -61.5 | -13.0 | -48.5 |       |
| 3118.00                                            | -21.3      | H                                           | 3.0      | 36.3   | 1.0    | -56.6 | -13.0 | -43.6 |       |
| Mid Ch, 782                                        |            |                                             |          |        |        |       |       |       |       |
| 1564.00                                            | -26.3      | V                                           | 3.0      | 37.1   | 1.0    | -62.5 | -13.0 | -49.5 |       |
| 2346.00                                            | -24.1      | V                                           | 3.0      | 36.5   | 1.0    | -59.6 | -13.0 | -46.6 |       |
| 3128.00                                            | -21.1      | V                                           | 3.0      | 36.3   | 1.0    | -56.4 | -13.0 | -43.4 |       |
| 1564.00                                            | -26.0      | H                                           | 3.0      | 37.1   | 1.0    | -62.1 | -13.0 | -49.1 |       |
| 2346.00                                            | -25.4      | H                                           | 3.0      | 36.5   | 1.0    | -60.9 | -13.0 | -47.9 |       |
| 3128.00                                            | -19.9      | H                                           | 3.0      | 36.3   | 1.0    | -55.2 | -13.0 | -42.2 |       |
| High Ch, 784.5                                     |            |                                             |          |        |        |       |       |       |       |
| 1560.00                                            | -26.8      | V                                           | 3.0      | 37.1   | 1.0    | -63.0 | -13.0 | -50.0 |       |
| 2353.50                                            | -22.1      | V                                           | 3.0      | 36.5   | 1.0    | -57.6 | -13.0 | -44.6 |       |
| 3138.00                                            | -19.0      | V                                           | 3.0      | 36.3   | 1.0    | -54.3 | -13.0 | -41.3 |       |
| 1560.00                                            | -27.1      | H                                           | 3.0      | 37.1   | 1.0    | -63.2 | -13.0 | -50.2 |       |
| 2353.50                                            | -25.3      | H                                           | 3.0      | 36.5   | 1.0    | -60.8 | -13.0 | -47.8 |       |
| 3138.00                                            | -21.1      | H                                           | 3.0      | 36.3   | 1.0    | -56.4 | -13.0 | -43.4 |       |

LTE B13 5MHz 16QAM

| UL Verification Services, Inc.                     |            |                                             |          |        |        |       |       |       |       |
|----------------------------------------------------|------------|---------------------------------------------|----------|--------|--------|-------|-------|-------|-------|
| Above 1GHz High Frequency Substitution Measurement |            |                                             |          |        |        |       |       |       |       |
| Company:                                           |            | SOMC                                        |          |        |        |       |       |       |       |
| Project #:                                         |            | 11785223                                    |          |        |        |       |       |       |       |
| Date:                                              |            | 7/5/2017                                    |          |        |        |       |       |       |       |
| Test Engineer:                                     |            | 43574 JS                                    |          |        |        |       |       |       |       |
| Configuration:                                     |            | EUT + AC Charger + HS                       |          |        |        |       |       |       |       |
| Location:                                          |            | Chamber C                                   |          |        |        |       |       |       |       |
| Mode:                                              |            | LTE_QPSK Band 13 Harmonics, 10MHz Bandwidth |          |        |        |       |       |       |       |
| f                                                  | SG reading | Ant. Pol.                                   | Distance | Preamp | Filter | ERP   | Limit | Delta | Notes |
| Mhz                                                | (dBm)      | (H/V)                                       | (m)      | (dB)   | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 782                                        |            |                                             |          |        |        |       |       |       |       |
| 0.0                                                | 0.0        | V                                           | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                           | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                           | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                           | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                           | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                           | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| Mid Ch, 782                                        |            |                                             |          |        |        |       |       |       |       |
| 1564.00                                            | -25.0      | V                                           | 3.0      | 36.5   | 1.0    | -60.5 | -13.0 | -47.5 |       |
| 2346.00                                            | -24.4      | V                                           | 3.0      | 35.2   | 1.0    | -58.6 | -13.0 | -45.6 |       |
| 3128.00                                            | -20.9      | V                                           | 3.0      | 34.4   | 1.0    | -54.4 | -13.0 | -41.4 |       |
| 1564.00                                            | -25.6      | H                                           | 3.0      | 36.5   | 1.0    | -61.1 | -13.0 | -48.1 |       |
| 2346.00                                            | -24.9      | H                                           | 3.0      | 35.2   | 1.0    | -59.1 | -13.0 | -46.1 |       |
| 3128.00                                            | -21.6      | H                                           | 3.0      | 34.4   | 1.0    | -55.1 | -13.0 | -42.1 |       |
| High Ch, 782                                       |            |                                             |          |        |        |       |       |       |       |
| 0.0                                                | 0.0        | V                                           | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                           | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                           | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                           | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                           | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                           | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |

LTE B13 10MHz QPSK

| UL Verification Services, Inc.                     |            |                                              |          |        |        |       |       |       |       |
|----------------------------------------------------|------------|----------------------------------------------|----------|--------|--------|-------|-------|-------|-------|
| Above 1GHz High Frequency Substitution Measurement |            |                                              |          |        |        |       |       |       |       |
| Company:                                           |            | SOMC                                         |          |        |        |       |       |       |       |
| Project #:                                         |            | 11785223                                     |          |        |        |       |       |       |       |
| Date:                                              |            | 7/5/2017                                     |          |        |        |       |       |       |       |
| Test Engineer:                                     |            | 43574 JS                                     |          |        |        |       |       |       |       |
| Configuration:                                     |            | EUT + AC Charger + HS                        |          |        |        |       |       |       |       |
| Location:                                          |            | Chamber C                                    |          |        |        |       |       |       |       |
| Mode:                                              |            | LTE_16QAM Band 13 Harmonics, 10MHz Bandwidth |          |        |        |       |       |       |       |
| f                                                  | SG reading | Ant. Pol.                                    | Distance | Preamp | Filter | ERP   | Limit | Delta | Notes |
| Mhz                                                | (dBm)      | (H/V)                                        | (m)      | (dB)   | (dB)   | (dBm) | (dBm) | (dB)  |       |
| Low Ch, 782                                        |            |                                              |          |        |        |       |       |       |       |
| 0.0                                                | 0.0        | V                                            | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                            | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                            | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                            | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                            | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                            | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| Mid Ch, 782                                        |            |                                              |          |        |        |       |       |       |       |
| 1564.00                                            | -25.4      | V                                            | 3.0      | 36.5   | 1.0    | -60.9 | -13.0 | -47.9 |       |
| 2346.00                                            | -24.4      | V                                            | 3.0      | 35.2   | 1.0    | -58.6 | -13.0 | -45.6 |       |
| 3128.00                                            | -21.0      | V                                            | 3.0      | 34.4   | 1.0    | -54.5 | -13.0 | -41.5 |       |
| 1564.00                                            | -25.9      | H                                            | 3.0      | 36.5   | 1.0    | -61.4 | -13.0 | -48.4 |       |
| 2346.00                                            | -24.6      | H                                            | 3.0      | 35.2   | 1.0    | -58.8 | -13.0 | -45.8 |       |
| 3128.00                                            | -22.0      | H                                            | 3.0      | 34.4   | 1.0    | -55.4 | -13.0 | -42.4 |       |
| High Ch, 782                                       |            |                                              |          |        |        |       |       |       |       |
| 0.0                                                | 0.0        | V                                            | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                            | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | V                                            | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                            | 3.0      | 36.5   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                            | 3.0      | 35.2   | 1.0    | 0.0   | -13.0 | 0.0   |       |
| 0.0                                                | 0.0        | H                                            | 3.0      | 34.4   | 1.0    | 0.0   | -13.0 | 0.0   |       |

LTE B13 10MHz 16QAM

**LTE Band 41**

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |              |                |               |       |  |
|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company: SOMC                                                                        |                     |                    |                 |                |                |              |                |               |       |  |
| Project #: 11785223                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Date: 7/5/2017                                                                       |                     |                    |                 |                |                |              |                |               |       |  |
| Test Engineer: 43575 OS                                                              |                     |                    |                 |                |                |              |                |               |       |  |
| Configuration: EUT + HS + Charger                                                    |                     |                    |                 |                |                |              |                |               |       |  |
| Location: Chamber C                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Mode: LTE_QPSK Band 41 Harmonics, 5MHz Bandwidth                                     |                     |                    |                 |                |                |              |                |               |       |  |
| F<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 2498.5MHz                                                                    |                     |                    |                 |                |                |              |                |               |       |  |
| 4997.00                                                                              | -15.6               | V                  | 3.0             | 35.5           | 1.0            | -50.1        | -25.0          | -25.1         |       |  |
| 7495.50                                                                              | -14.3               | V                  | 3.0             | 35.7           | 1.0            | -49.1        | -25.0          | -24.1         |       |  |
| 9994.00                                                                              | -12.8               | V                  | 3.0             | 36.0           | 1.0            | -47.8        | -25.0          | -22.8         |       |  |
| 4997.00                                                                              | -8.0                | H                  | 3.0             | 35.5           | 1.0            | -42.5        | -25.0          | -17.5         |       |  |
| 7495.50                                                                              | -13.8               | H                  | 3.0             | 35.7           | 1.0            | -48.6        | -25.0          | -23.6         |       |  |
| 9994.00                                                                              | -12.4               | H                  | 3.0             | 36.0           | 1.0            | -47.4        | -25.0          | -22.4         |       |  |
| Mid Ch, 2593MHz                                                                      |                     |                    |                 |                |                |              |                |               |       |  |
| 5186.00                                                                              | -15.0               | V                  | 3.0             | 35.4           | 1.0            | -49.5        | -25.0          | -24.5         |       |  |
| 7779.00                                                                              | -13.6               | V                  | 3.0             | 35.8           | 1.0            | -48.5        | -25.0          | -23.5         |       |  |
| 10372.00                                                                             | -13.4               | V                  | 3.0             | 35.8           | 1.0            | -48.2        | -25.0          | -23.2         |       |  |
| 5186.00                                                                              | -13.4               | H                  | 3.0             | 35.4           | 1.0            | -47.8        | -25.0          | -22.8         |       |  |
| 7779.00                                                                              | -13.0               | H                  | 3.0             | 35.8           | 1.0            | -47.8        | -25.0          | -22.8         |       |  |
| 10372.00                                                                             | -12.5               | H                  | 3.0             | 35.8           | 1.0            | -47.3        | -25.0          | -22.3         |       |  |
| High Ch, 2687.5MHz                                                                   |                     |                    |                 |                |                |              |                |               |       |  |
| 5375.00                                                                              | -15.5               | V                  | 3.0             | 35.4           | 1.0            | -49.9        | -25.0          | -24.9         |       |  |
| 8062.50                                                                              | -12.2               | V                  | 3.0             | 35.8           | 1.0            | -47.0        | -25.0          | -22.0         |       |  |
| 10750.00                                                                             | -12.6               | V                  | 3.0             | 35.7           | 1.0            | -47.2        | -25.0          | -22.2         |       |  |
| 5375.00                                                                              | -14.9               | H                  | 3.0             | 35.4           | 1.0            | -49.4        | -25.0          | -24.4         |       |  |
| 8062.50                                                                              | -12.3               | H                  | 3.0             | 35.8           | 1.0            | -47.1        | -25.0          | -22.1         |       |  |
| 10750.00                                                                             | -11.6               | H                  | 3.0             | 35.7           | 1.0            | -46.3        | -25.0          | -21.3         |       |  |

LTE B41 5MHz QPSK

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |              |                |               |       |  |
|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company: SOMC                                                                        |                     |                    |                 |                |                |              |                |               |       |  |
| Project #: 11785223                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Date: 7/5/2017                                                                       |                     |                    |                 |                |                |              |                |               |       |  |
| Test Engineer: 43575 OS                                                              |                     |                    |                 |                |                |              |                |               |       |  |
| Configuration: EUT + HS + Charger                                                    |                     |                    |                 |                |                |              |                |               |       |  |
| Location: Chamber C                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Mode: LTE_QPSK Band 41 Harmonics, 10MHz Bandwidth                                    |                     |                    |                 |                |                |              |                |               |       |  |
| F<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 2501MHz                                                                      |                     |                    |                 |                |                |              |                |               |       |  |
| 5002.00                                                                              | -14.9               | V                  | 3.0             | 35.5           | 1.0            | -49.3        | -25.0          | -24.3         |       |  |
| 7503.00                                                                              | -14.6               | V                  | 3.0             | 35.7           | 1.0            | -49.3        | -25.0          | -24.3         |       |  |
| 10004.00                                                                             | -13.6               | V                  | 3.0             | 36.0           | 1.0            | -48.7        | -25.0          | -23.7         |       |  |
| 5002.00                                                                              | -11.2               | H                  | 3.0             | 35.5           | 1.0            | -45.6        | -25.0          | -20.6         |       |  |
| 7503.00                                                                              | -12.8               | H                  | 3.0             | 35.7           | 1.0            | -47.6        | -25.0          | -22.6         |       |  |
| 10004.00                                                                             | -12.6               | H                  | 3.0             | 36.0           | 1.0            | -47.6        | -25.0          | -22.6         |       |  |
| Mid Ch, 2593MHz                                                                      |                     |                    |                 |                |                |              |                |               |       |  |
| 5186.00                                                                              | -15.6               | V                  | 3.0             | 35.4           | 1.0            | -50.0        | -25.0          | -25.0         |       |  |
| 7779.00                                                                              | -13.1               | V                  | 3.0             | 35.8           | 1.0            | -47.9        | -25.0          | -22.9         |       |  |
| 10372.00                                                                             | -11.8               | V                  | 3.0             | 35.8           | 1.0            | -46.6        | -25.0          | -21.6         |       |  |
| 5186.00                                                                              | -15.3               | H                  | 3.0             | 35.4           | 1.0            | -49.7        | -25.0          | -24.7         |       |  |
| 7779.00                                                                              | -11.7               | H                  | 3.0             | 35.8           | 1.0            | -46.5        | -25.0          | -21.5         |       |  |
| 10372.00                                                                             | -13.4               | H                  | 3.0             | 35.8           | 1.0            | -48.3        | -25.0          | -23.3         |       |  |
| High Ch, 2685MHz                                                                     |                     |                    |                 |                |                |              |                |               |       |  |
| 5370.00                                                                              | -15.3               | V                  | 3.0             | 35.4           | 1.0            | -49.7        | -25.0          | -24.7         |       |  |
| 8055.00                                                                              | -11.4               | V                  | 3.0             | 35.8           | 1.0            | -48.2        | -25.0          | -23.2         |       |  |
| 10740.00                                                                             | -11.9               | V                  | 3.0             | 35.7           | 1.0            | -46.5        | -25.0          | -21.5         |       |  |
| 5370.00                                                                              | -15.5               | H                  | 3.0             | 35.4           | 1.0            | -49.9        | -25.0          | -24.9         |       |  |
| 8055.00                                                                              | -12.4               | H                  | 3.0             | 35.8           | 1.0            | -47.2        | -25.0          | -22.2         |       |  |
| 10740.00                                                                             | -12.1               | H                  | 3.0             | 35.7           | 1.0            | -46.7        | -25.0          | -21.7         |       |  |

LTE B41 10MHz QPSK

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |              |                |               |       |  |
|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company: SOMC                                                                        |                     |                    |                 |                |                |              |                |               |       |  |
| Project #: 11785223                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Date: 7/5/2017                                                                       |                     |                    |                 |                |                |              |                |               |       |  |
| Test Engineer: 43575 OS                                                              |                     |                    |                 |                |                |              |                |               |       |  |
| Configuration: EUT + HS + Charger                                                    |                     |                    |                 |                |                |              |                |               |       |  |
| Location: Chamber C                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Mode: LTE_QPSK Band 41 Harmonics, 15MHz Bandwidth                                    |                     |                    |                 |                |                |              |                |               |       |  |
| F<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 2503.5MHz                                                                    |                     |                    |                 |                |                |              |                |               |       |  |
| 5007.00                                                                              | -14.6               | V                  | 3.0             | 35.5           | 1.0            | -49.1        | -25.0          | -24.1         |       |  |
| 7510.50                                                                              | -14.6               | V                  | 3.0             | 35.7           | 1.0            | -49.4        | -25.0          | -24.4         |       |  |
| 10014.00                                                                             | -13.2               | V                  | 3.0             | 36.0           | 1.0            | -48.3        | -25.0          | -23.3         |       |  |
| 5007.00                                                                              | -12.2               | H                  | 3.0             | 35.5           | 1.0            | -46.7        | -25.0          | -21.7         |       |  |
| 7510.50                                                                              | -13.4               | H                  | 3.0             | 35.7           | 1.0            | -48.2        | -25.0          | -23.2         |       |  |
| 10014.00                                                                             | -12.5               | H                  | 3.0             | 36.0           | 1.0            | -47.5        | -25.0          | -22.5         |       |  |
| Mid Ch, 2593MHz                                                                      |                     |                    |                 |                |                |              |                |               |       |  |
| 5186.00                                                                              | -15.0               | V                  | 3.0             | 35.4           | 1.0            | -49.5        | -25.0          | -24.5         |       |  |
| 7779.00                                                                              | -13.0               | V                  | 3.0             | 35.8           | 1.0            | -47.8        | -25.0          | -22.8         |       |  |
| 10372.00                                                                             | -13.5               | V                  | 3.0             | 35.8           | 1.0            | -48.3        | -25.0          | -23.3         |       |  |
| 5186.00                                                                              | -14.7               | H                  | 3.0             | 35.4           | 1.0            | -49.1        | -25.0          | -24.1         |       |  |
| 7779.00                                                                              | -12.8               | H                  | 3.0             | 35.8           | 1.0            | -47.6        | -25.0          | -22.6         |       |  |
| 10372.00                                                                             | -13.2               | H                  | 3.0             | 35.8           | 1.0            | -48.1        | -25.0          | -23.1         |       |  |
| High Ch, 2682.5MHz                                                                   |                     |                    |                 |                |                |              |                |               |       |  |
| 5365.00                                                                              | -15.6               | V                  | 3.0             | 35.4           | 1.0            | -50.1        | -25.0          | -25.1         |       |  |
| 8047.50                                                                              | -13.1               | V                  | 3.0             | 35.8           | 1.0            | -47.9        | -25.0          | -22.9         |       |  |
| 10730.00                                                                             | -11.9               | V                  | 3.0             | 35.7           | 1.0            | -46.6        | -25.0          | -21.6         |       |  |
| 5365.00                                                                              | -15.5               | H                  | 3.0             | 35.4           | 1.0            | -50.0        | -25.0          | -25.0         |       |  |
| 8047.50                                                                              | -11.8               | H                  | 3.0             | 35.8           | 1.0            | -46.6        | -25.0          | -21.6         |       |  |
| 10730.00                                                                             | -11.9               | H                  | 3.0             | 35.7           | 1.0            | -46.6        | -25.0          | -21.6         |       |  |

LTE B41 15MHz QPSK

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                |                |              |                |               |       |  |
|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------|----------------|--------------|----------------|---------------|-------|--|
| Company: SOMC                                                                        |                     |                    |                 |                |                |              |                |               |       |  |
| Project #: 11785223                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Date: 7/5/2017                                                                       |                     |                    |                 |                |                |              |                |               |       |  |
| Test Engineer: 43575 OS                                                              |                     |                    |                 |                |                |              |                |               |       |  |
| Configuration: EUT + HS + Charger                                                    |                     |                    |                 |                |                |              |                |               |       |  |
| Location: Chamber C                                                                  |                     |                    |                 |                |                |              |                |               |       |  |
| Mode: LTE_QPSK Band 41 Harmonics, 15MHz Bandwidth                                    |                     |                    |                 |                |                |              |                |               |       |  |
| F<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamp<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |  |
| Low Ch, 2503.5MHz                                                                    |                     |                    |                 |                |                |              |                |               |       |  |
| 5007.00                                                                              | -15.2               | V                  | 3.0             | 35.5           | 1.0            | -49.7        | -25.0          | -24.7         |       |  |
| 7510.50                                                                              | -13.4               | V                  | 3.0             | 35.7           | 1.0            | -48.2        | -25.0          | -23.2         |       |  |
| 10014.00                                                                             | -13.2               | V                  | 3.0             | 36.0           | 1.0            | -48.2        | -25.0          | -23.2         |       |  |
| 5007.00                                                                              | -12.0               | H                  | 3.0             | 35.5           | 1.0            | -46.4        | -25.0          | -21.4         |       |  |
| 7510.50                                                                              | -13.6               | H                  | 3.0             | 35.7           | 1.0            | -48.4        | -25.0          | -23.4         |       |  |
| 10014.00                                                                             | -12.7               | H                  | 3.0             | 36.0           | 1.0            | -47.8        | -25.0          | -22.8         |       |  |
| Mid Ch, 2593MHz                                                                      |                     |                    |                 |                |                |              |                |               |       |  |
| 5186.00                                                                              | -15.2               | V                  | 3.0             | 35.4           | 1.0            | -49.7        | -25.0          | -24.7         |       |  |
| 7779.00                                                                              | -13.9               | V                  | 3.0             | 35.8           | 1.0            | -48.7        | -25.0          | -23.7         |       |  |
| 10372.00                                                                             | -13.2               | V                  | 3.0             | 35.8           | 1.0            | -48.0        | -25.0          | -23.0         |       |  |
| 5186.00                                                                              | -14.8               | H                  | 3.0             | 35.4           | 1.0            | -49.3        | -25.0          | -24.3         |       |  |
| 7779.00                                                                              | -12.9               | H                  | 3.0             | 35.8           | 1.0            | -47.7        | -25.0          | -22.7         |       |  |
| 10372.00                                                                             | -12.9               | H                  | 3.0             | 35.8           | 1.0            | -47.7        | -25.0          | -22.7         |       |  |
| High Ch, 2682.5MHz                                                                   |                     |                    |                 |                |                |              |                |               |       |  |
| 5365.00                                                                              | -15.2               | V                  | 3.0             | 35.4           | 1.0            | -49.6        | -25.0          | -24.6         |       |  |
| 8047.50                                                                              | -13.7               | V                  | 3.0             | 35.8           | 1.0            | -48.5        | -25.0          | -23.5         |       |  |
| 10730.00                                                                             | -12.6               | V                  | 3.0             | 35.7           | 1.0            | -47.3        | -25.0          | -22.3         |       |  |
| 5365.00                                                                              | -14.5               | H                  | 3.0             | 35.4           | 1.0            | -49.0        | -25.0          | -24.0         |       |  |
| 8047.50                                                                              | -13.0               | H                  | 3.0             | 35.8           | 1.0            | -47.8        | -25.0          | -22.8         |       |  |
| 10730.00                                                                             | -12.4               | H                  | 3.0             | 35.7           | 1.0            | -47.1        | -25.0          | -22.1         |       |  |

LTE B41 15MHz 16QAM

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                      |                |              |                |               |       |
|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------------|----------------|--------------|----------------|---------------|-------|
| Company: S/MAC                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| Project #: 11785223                                                                  |                     |                    |                 |                      |                |              |                |               |       |
| Date: 7/5/2017                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| Test Engineer: 43575 OS                                                              |                     |                    |                 |                      |                |              |                |               |       |
| Configuration: EUT + HS + Charger                                                    |                     |                    |                 |                      |                |              |                |               |       |
| Location: Chamber C                                                                  |                     |                    |                 |                      |                |              |                |               |       |
| Mode: LTE_QPSK Band 41 Harmonics, 20MHz Bandwidth                                    |                     |                    |                 |                      |                |              |                |               |       |
| f<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamplifier<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
| Low Ch, 250MHz                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| 5012.00                                                                              | -15.1               | V                  | 3.0             | 35.5                 | 1.0            | -49.5        | -25.0          | -24.5         |       |
| 7518.00                                                                              | -14.0               | V                  | 3.0             | 35.7                 | 1.0            | -48.7        | -25.0          | -23.7         |       |
| 10024.00                                                                             | -12.5               | V                  | 3.0             | 36.0                 | 1.0            | -47.5        | -25.0          | -22.5         |       |
| 5012.00                                                                              | -14.5               | H                  | 3.0             | 35.5                 | 1.0            | -49.0        | -25.0          | -24.0         |       |
| 7518.00                                                                              | -12.8               | H                  | 3.0             | 35.7                 | 1.0            | -47.6        | -25.0          | -22.6         |       |
| 10024.00                                                                             | -11.2               | H                  | 3.0             | 36.0                 | 1.0            | -46.2        | -25.0          | -21.2         |       |
| Mid Ch, 250MHz                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| 5186.00                                                                              | -15.6               | V                  | 3.0             | 35.4                 | 1.0            | -50.1        | -25.0          | -25.1         |       |
| 7779.00                                                                              | -13.5               | V                  | 3.0             | 35.8                 | 1.0            | -48.2        | -25.0          | -23.2         |       |
| 10372.00                                                                             | -13.3               | V                  | 3.0             | 35.8                 | 1.0            | -48.2        | -25.0          | -23.2         |       |
| 5186.00                                                                              | -14.8               | H                  | 3.0             | 35.4                 | 1.0            | -49.2        | -25.0          | -24.2         |       |
| 7779.00                                                                              | -12.1               | H                  | 3.0             | 35.8                 | 1.0            | -46.9        | -25.0          | -21.9         |       |
| 10372.00                                                                             | -12.8               | H                  | 3.0             | 35.8                 | 1.0            | -47.6        | -25.0          | -22.6         |       |
| High Ch, 260MHz                                                                      |                     |                    |                 |                      |                |              |                |               |       |
| 5360.00                                                                              | -15.8               | V                  | 3.0             | 35.4                 | 1.0            | -50.3        | -25.0          | -25.3         |       |
| 8040.00                                                                              | -12.2               | V                  | 3.0             | 35.8                 | 1.0            | -47.0        | -25.0          | -22.0         |       |
| 10720.00                                                                             | -12.9               | V                  | 3.0             | 35.7                 | 1.0            | -47.6        | -25.0          | -22.6         |       |
| 5360.00                                                                              | -15.7               | H                  | 3.0             | 35.4                 | 1.0            | -50.1        | -25.0          | -25.1         |       |
| 8040.00                                                                              | -12.1               | H                  | 3.0             | 35.8                 | 1.0            | -46.9        | -25.0          | -21.9         |       |
| 10720.00                                                                             | -11.4               | H                  | 3.0             | 35.7                 | 1.0            | -46.1        | -25.0          | -21.1         |       |
| LTE B41 20MHz QPSK                                                                   |                     |                    |                 |                      |                |              |                |               |       |

| UL Verification Services, Inc.<br>Above 1GHz High Frequency Substitution Measurement |                     |                    |                 |                      |                |              |                |               |       |
|--------------------------------------------------------------------------------------|---------------------|--------------------|-----------------|----------------------|----------------|--------------|----------------|---------------|-------|
| Company: S/MAC                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| Project #: 11785223                                                                  |                     |                    |                 |                      |                |              |                |               |       |
| Date: 7/5/2017                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| Test Engineer: 43575 OS                                                              |                     |                    |                 |                      |                |              |                |               |       |
| Configuration: EUT + HS + Charger                                                    |                     |                    |                 |                      |                |              |                |               |       |
| Location: Chamber C                                                                  |                     |                    |                 |                      |                |              |                |               |       |
| Mode: LTE_16QAM Band 41 Harmonics, 20MHz Bandwidth                                   |                     |                    |                 |                      |                |              |                |               |       |
| f<br>MHz                                                                             | SG reading<br>(dBm) | Ant. Pol.<br>(H/V) | Distance<br>(m) | Preamplifier<br>(dB) | Filter<br>(dB) | ERP<br>(dBm) | Limit<br>(dBm) | Delta<br>(dB) | Notes |
| Low Ch, 250MHz                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| 5012.00                                                                              | -15.5               | V                  | 3.0             | 35.5                 | 1.0            | -49.9        | -25.0          | -24.9         |       |
| 7518.00                                                                              | -13.3               | V                  | 3.0             | 35.7                 | 1.0            | -48.1        | -25.0          | -23.1         |       |
| 10024.00                                                                             | -12.8               | V                  | 3.0             | 36.0                 | 1.0            | -47.9        | -25.0          | -22.9         |       |
| 5012.00                                                                              | -14.8               | H                  | 3.0             | 35.5                 | 1.0            | -49.2        | -25.0          | -24.2         |       |
| 7518.00                                                                              | -13.5               | H                  | 3.0             | 35.7                 | 1.0            | -48.2        | -25.0          | -23.2         |       |
| 10024.00                                                                             | -12.4               | H                  | 3.0             | 36.0                 | 1.0            | -47.4        | -25.0          | -22.4         |       |
| Mid Ch, 250MHz                                                                       |                     |                    |                 |                      |                |              |                |               |       |
| 5186.00                                                                              | -15.0               | V                  | 3.0             | 35.4                 | 1.0            | -49.4        | -25.0          | -24.4         |       |
| 7779.00                                                                              | -13.6               | V                  | 3.0             | 35.8                 | 1.0            | -48.4        | -25.0          | -23.4         |       |
| 10372.00                                                                             | -12.8               | V                  | 3.0             | 35.8                 | 1.0            | -47.7        | -25.0          | -22.7         |       |
| 5186.00                                                                              | -14.4               | H                  | 3.0             | 35.4                 | 1.0            | -48.8        | -25.0          | -23.8         |       |
| 7779.00                                                                              | -12.9               | H                  | 3.0             | 35.8                 | 1.0            | -47.6        | -25.0          | -22.6         |       |
| 10372.00                                                                             | -12.2               | H                  | 3.0             | 35.8                 | 1.0            | -47.1        | -25.0          | -22.1         |       |
| High Ch, 260MHz                                                                      |                     |                    |                 |                      |                |              |                |               |       |
| 5360.00                                                                              | -15.9               | V                  | 3.0             | 35.4                 | 1.0            | -50.4        | -25.0          | -25.4         |       |
| 8040.00                                                                              | -12.6               | V                  | 3.0             | 35.8                 | 1.0            | -47.4        | -25.0          | -22.4         |       |
| 10720.00                                                                             | -12.4               | V                  | 3.0             | 35.7                 | 1.0            | -47.1        | -25.0          | -22.1         |       |
| 5360.00                                                                              | -14.9               | H                  | 3.0             | 35.4                 | 1.0            | -49.4        | -25.0          | -24.4         |       |
| 8040.00                                                                              | -12.0               | H                  | 3.0             | 35.8                 | 1.0            | -46.8        | -25.0          | -21.8         |       |
| 10720.00                                                                             | -11.9               | H                  | 3.0             | 35.7                 | 1.0            | -46.6        | -25.0          | -21.6         |       |
| LTE B41 20MHz 16QAM                                                                  |                     |                    |                 |                      |                |              |                |               |       |