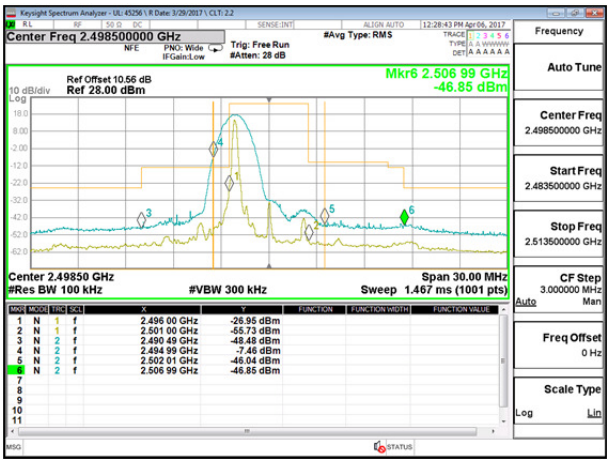
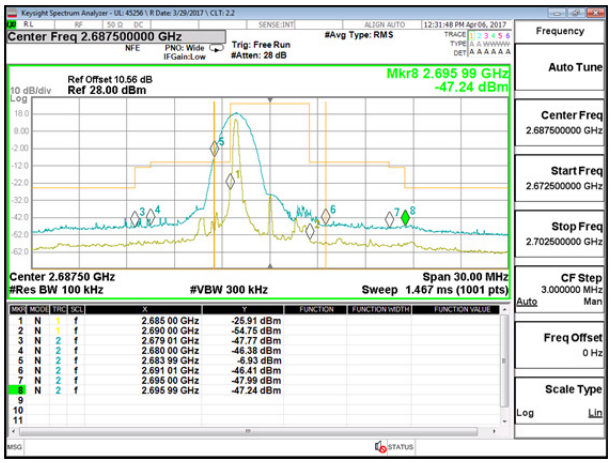
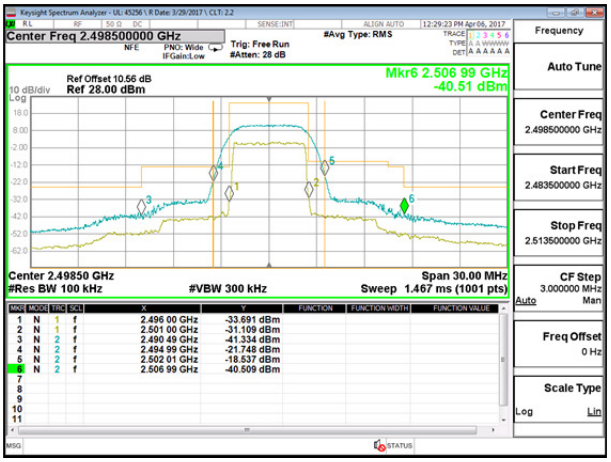
## LTE Band 41



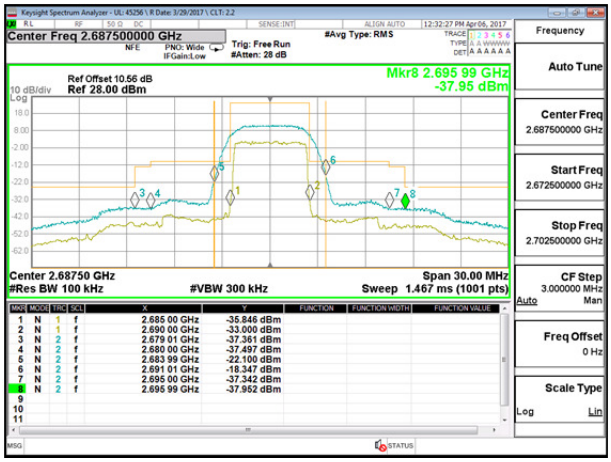

LTE B41 5MHz QPSK Low Channel 1RB



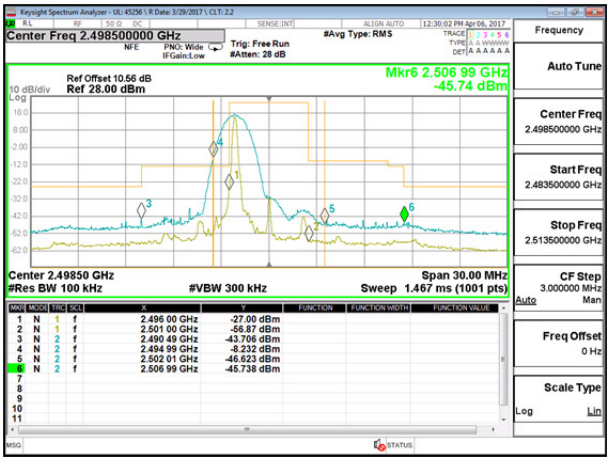

LTE B41 5MHz QPSK High Channel 1RB



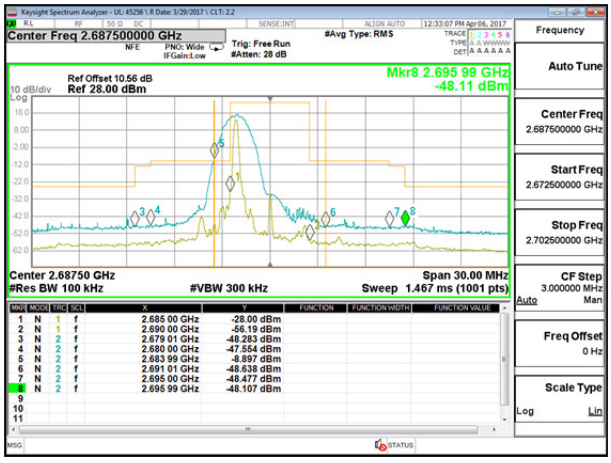

LTE B41 5MHz QPSK Low Channel FRB




LTE B41 5MHz QPSK High Channel FRB




LTE B41 5MHz 16QAM Low Channel 1RB




LTE B41 5MHz 16QAM High Channel 1RB



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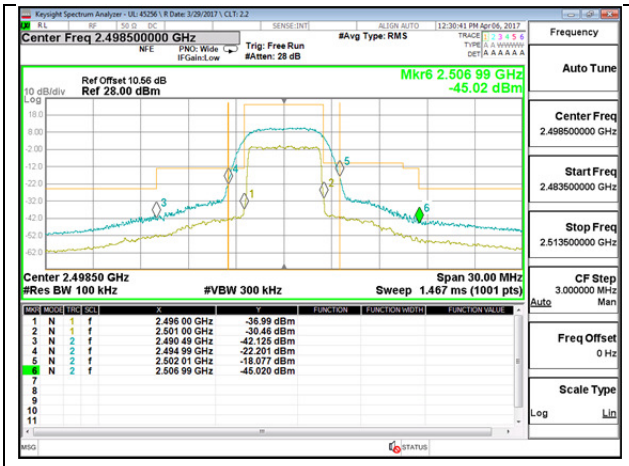
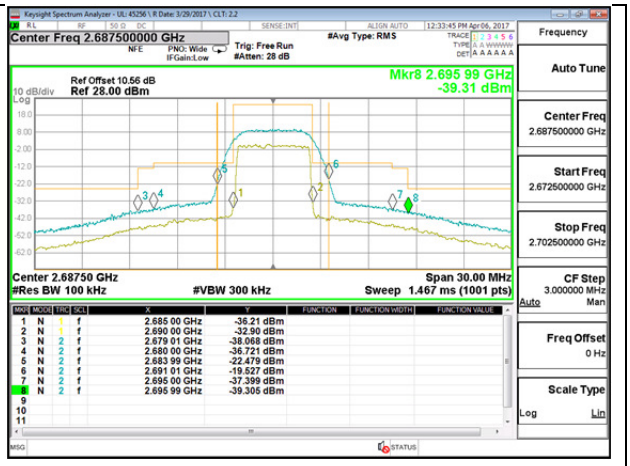
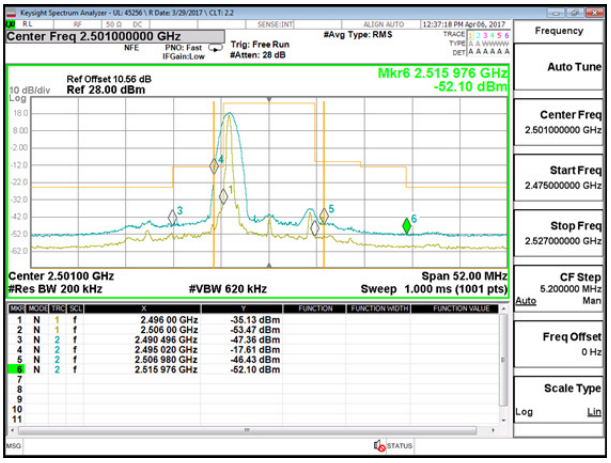


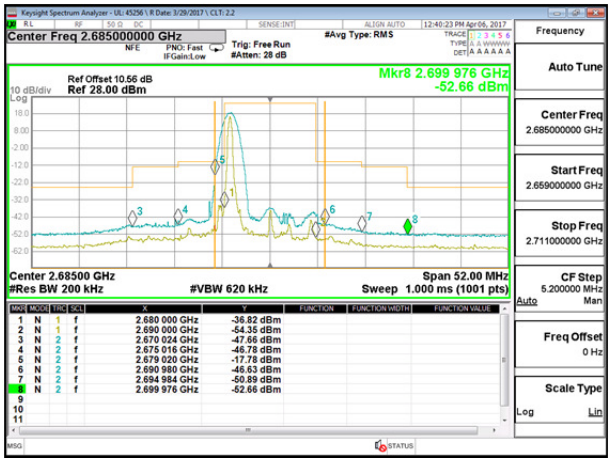

LTE B41 5MHz 16QAM Low Channel FRB



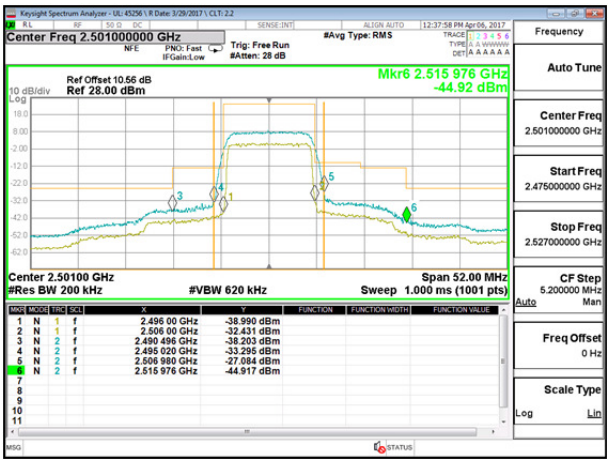

LTE B41 5MHz 16QAM High Channel FRB



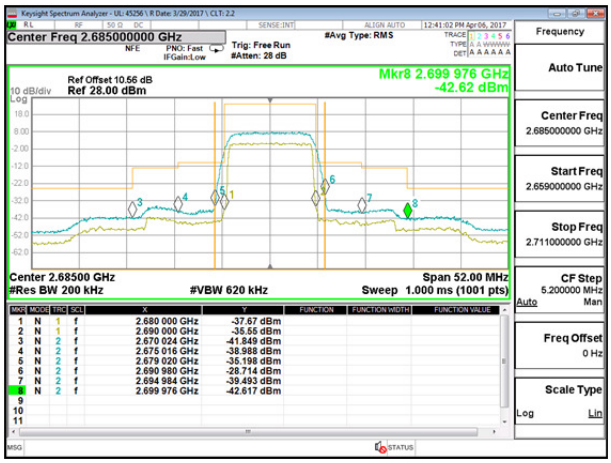

LTE B41 10MHz QPSK Low Channel 1RB




LTE B41 10MHz QPSK High Channel 1RB




LTE B41 10MHz QPSK Low Channel FRB




LTE B41 10MHz QPSK High Channel FRB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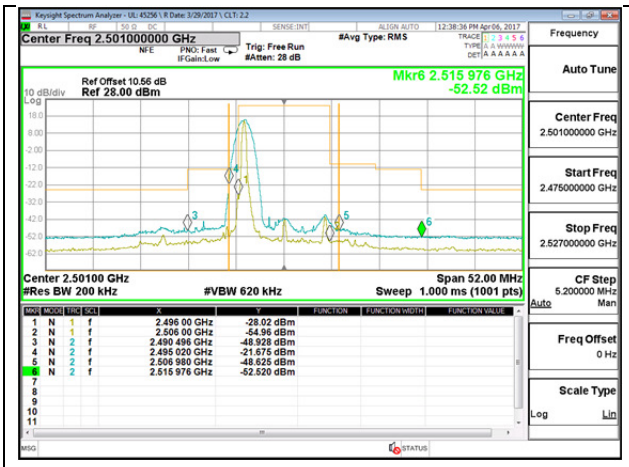
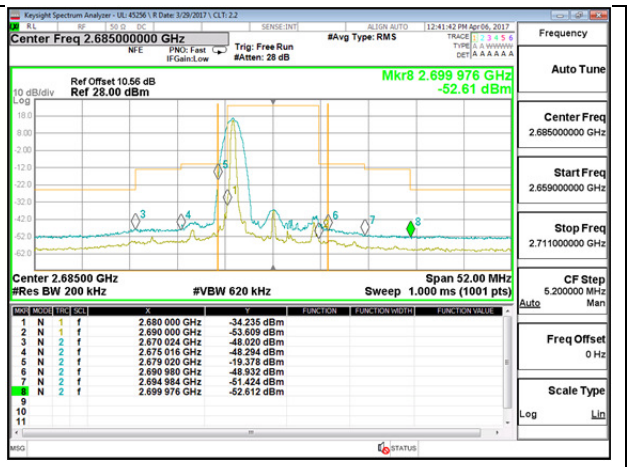
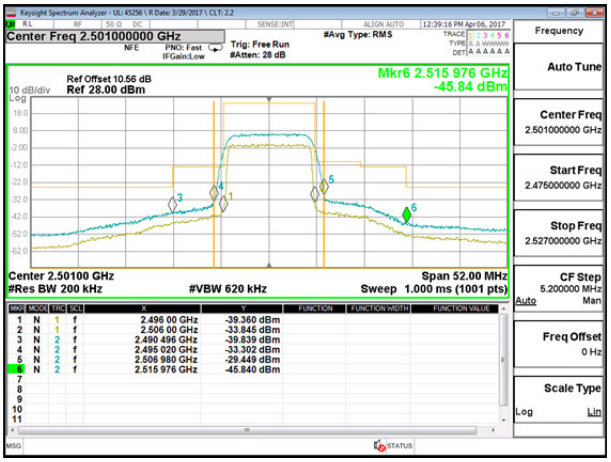


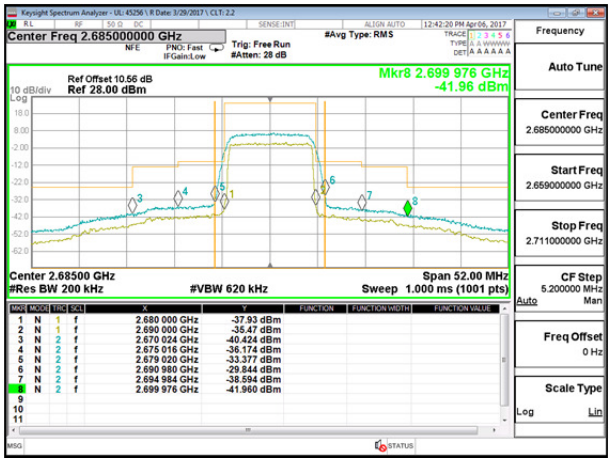

LTE B41 10MHz 16QAM Low Channel 1RB



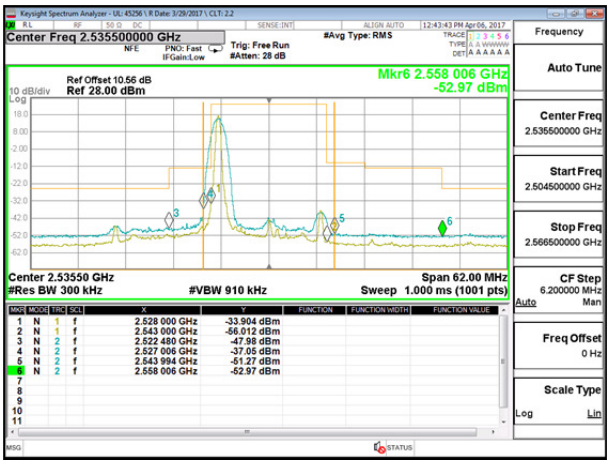

LTE B41 10MHz 16QAM High Channel 1RB



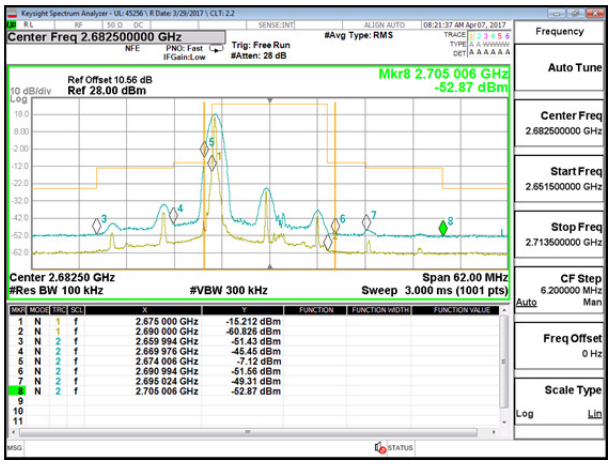

LTE B41 10MHz 16QAM Low Channel FRB




LTE B41 10MHz 16QAM High Channel FRB




LTE B41 15MHz QPSK Low Channel 1RB




LTE B41 15MHz QPSK High Channel 1RB



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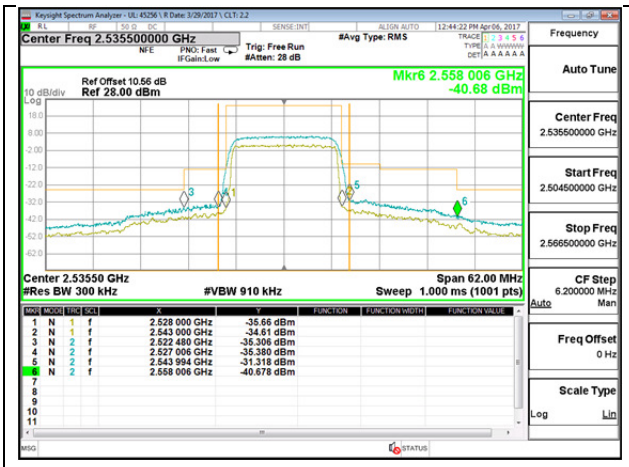
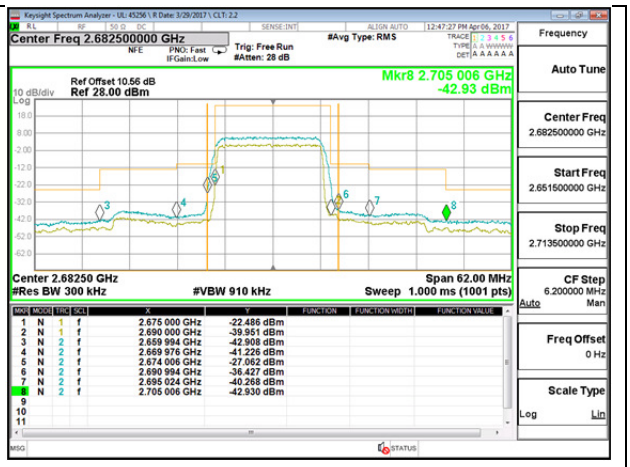
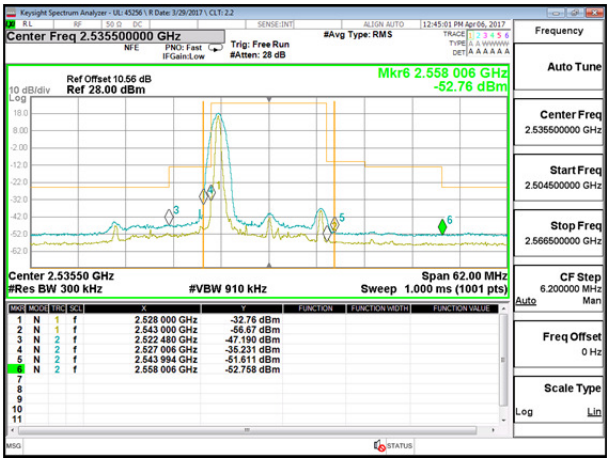


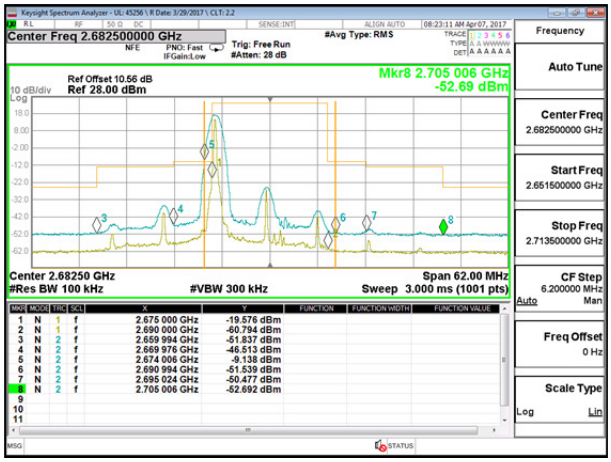

LTE B41 15MHz QPSK Low Channel FRB



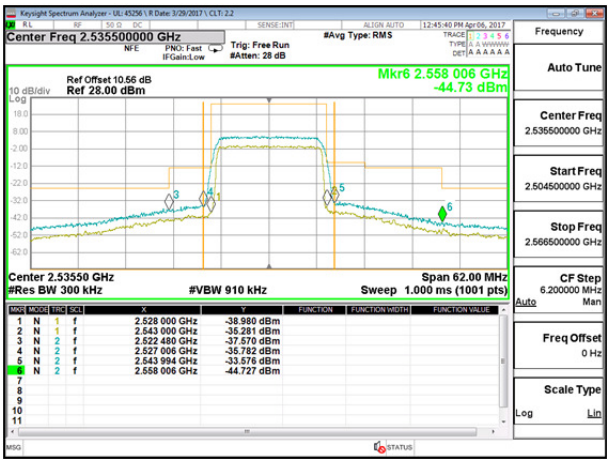

LTE B41 15MHz QPSK High Channel FRB



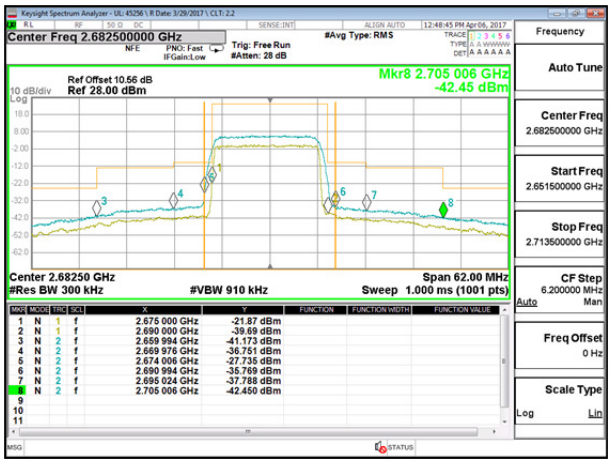

LTE B41 15MHz 16QAM Low Channel 1RB




LTE B41 15MHz 16QAM High Channel 1RB




LTE B41 15MHz 16QAM Low Channel FRB




LTE B41 15MHz 16QAM High Channel FRB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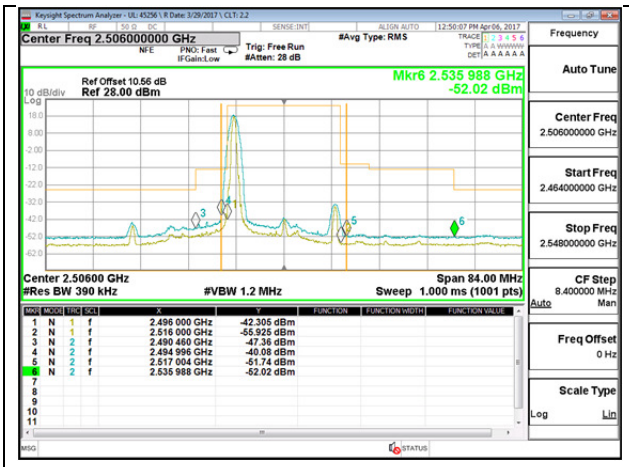
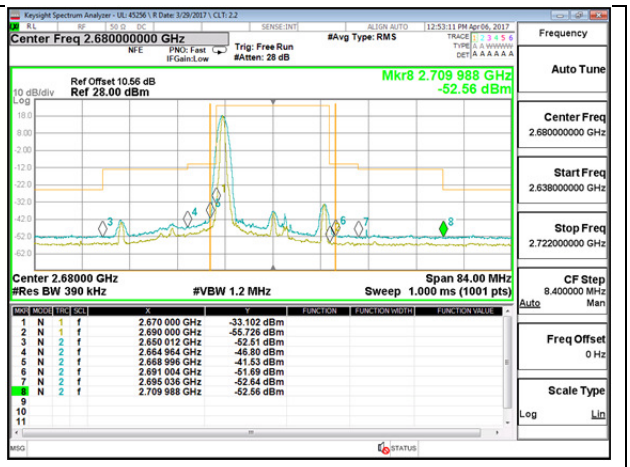
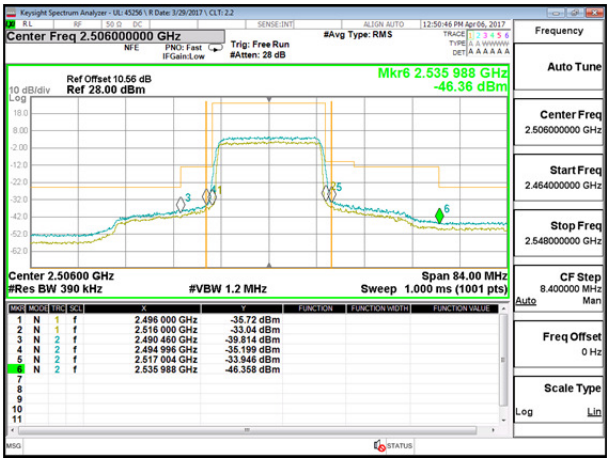


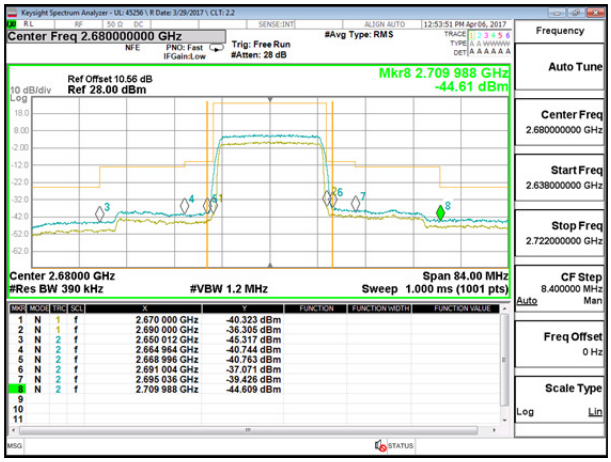

LTE B41 20MHz QPSK Low Channel 1RB



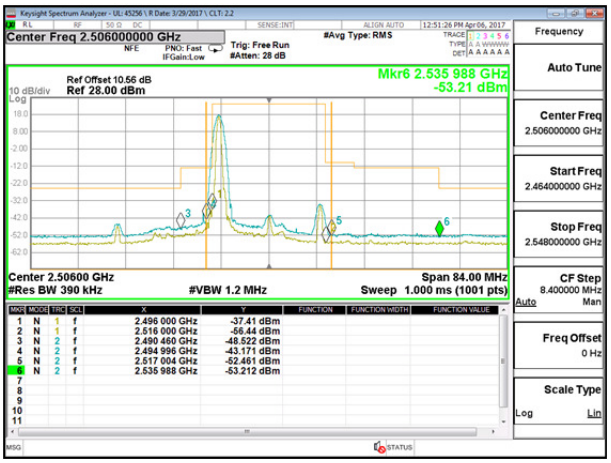

LTE B41 20MHz QPSK High Channel 1RB



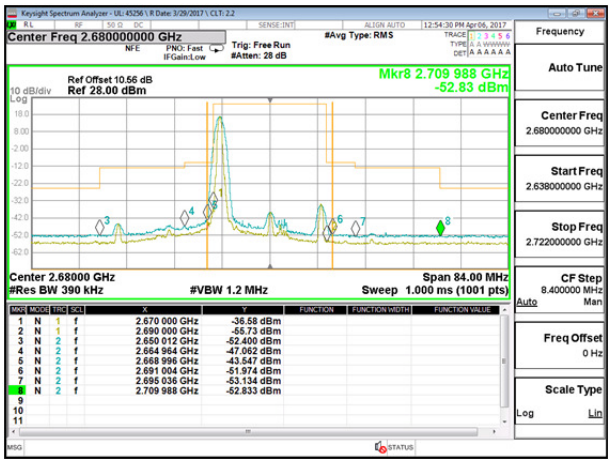

LTE B41 20MHz QPSK Low Channel FRB




LTE B41 20MHz QPSK High Channel FRB




LTE B41 20MHz 16QAM Low Channel 1RB




LTE B41 20MHz 16QAM High Channel 1RB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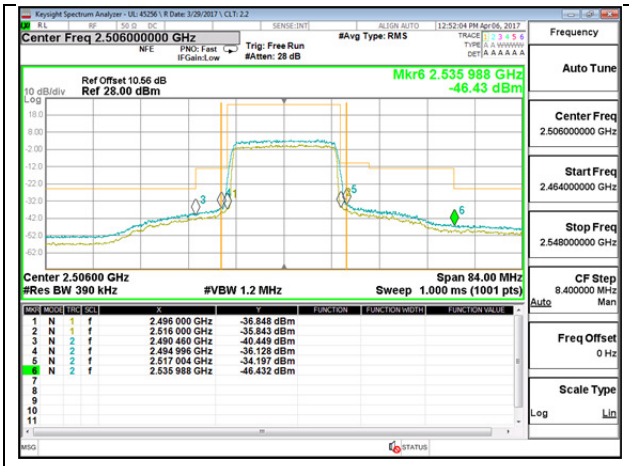
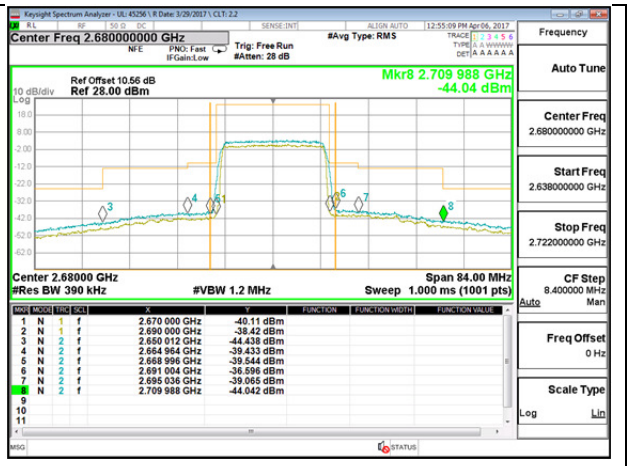



LTE B41 20MHz 16QAM Low Channel FRB




LTE B41 20MHz 16QAM High Channel FRB





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# 15. OUT OF BAND EMISSIONS

**RULE PART(S)**

FCC: §27.53

**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 that 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**



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## 15.1. OUT OF BAND EMISSIONS RESULT AND PLOTS

**LTE Band 7**

| Band | BW (MHz) | Mode | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|---|---|---|---|---|---|---|
| LTE7 | 20 | 16QAM | 2510 | -29.58 | -25 | -4.58 |
| | | | 2535 | -29.64 | -25 | -4.64 |
| | | | 2560 | -29.69 | -25 | -4.69 |
| | | QPSK | 2510 | -28.65 | -25 | -3.65 |
| | | | 2535 | -30.34 | -25 | -5.34 |
| | | | 2560 | -30.01 | -25 | -5.01 |
| | 15 | 16QAM | 2507.5 | -30.38 | -25 | -5.38 |
| | | | 2535 | -30.42 | -25 | -5.42 |
| | | | 2562.5 | -30.59 | -25 | -5.59 |
| | | QPSK | 2507.5 | -28.66 | -25 | -3.66 |
| | | | 2535 | -30.05 | -25 | -5.05 |
| | | | 2562.5 | -29.89 | -25 | -4.89 |
| | 10 | 16QAM | 2505 | -29.92 | -25 | -4.92 |
| | | | 2535 | -29.22 | -25 | -4.22 |
| | | | 2565 | -30.17 | -25 | -5.17 |
| | | QPSK | 2505 | -29.99 | -25 | -4.99 |
| | | | 2535 | -30.6 | -25 | -5.6 |
| | | | 2565 | -29.42 | -25 | -4.42 |
| | 5 | 16QAM | 2502.5 | -29.27 | -25 | -4.27 |
| | | | 2535 | -30.72 | -25 | -5.72 |
| | | | 2567.5 | -29.83 | -25 | -4.83 |
| | | QPSK | 2502.5 | -29.8 | -25 | -4.8 |
| | | | 2535 | -29.95 | -25 | -4.95 |
| | | | 2567.5 | -30.27 | -25 | -5.27 |


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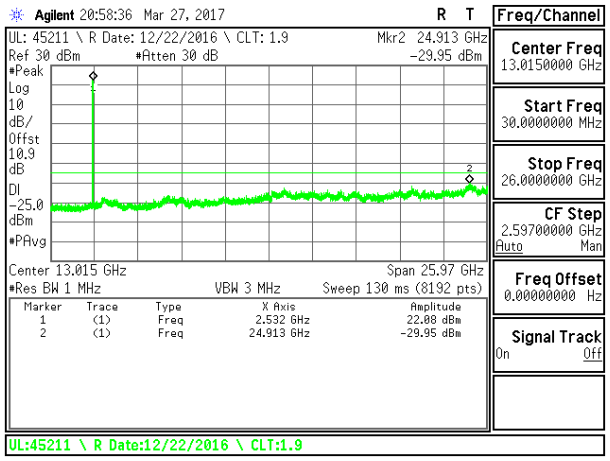
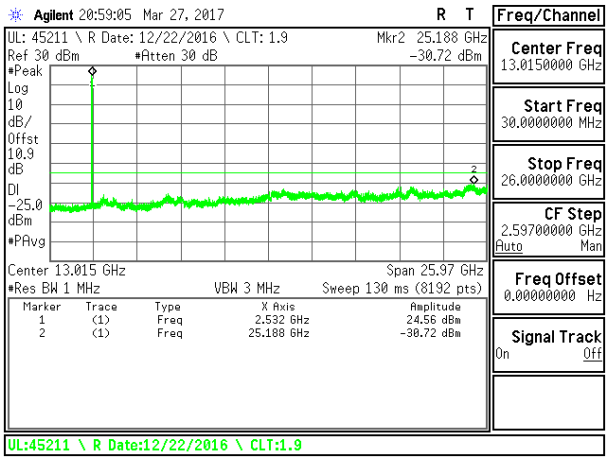
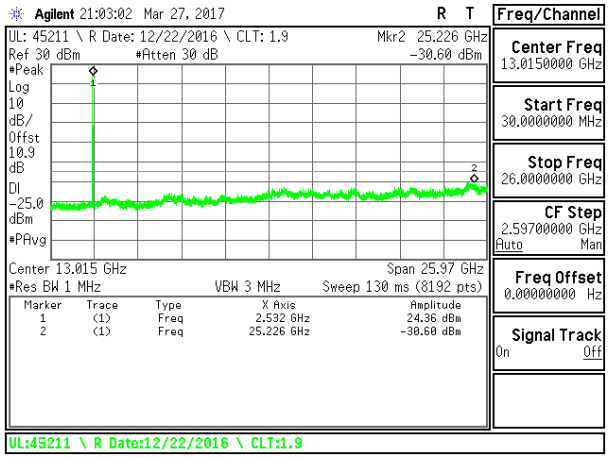


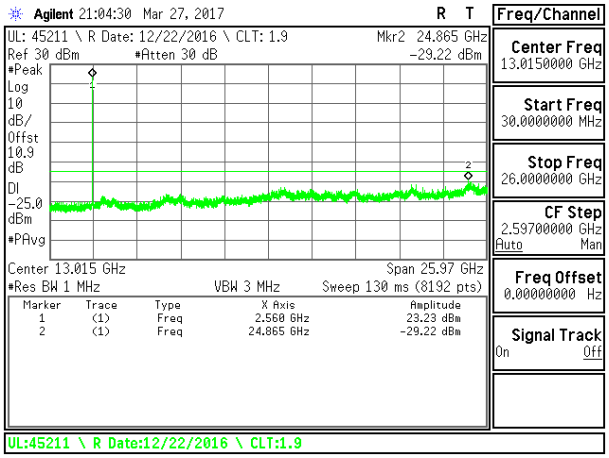

LTE B7 5MHz QPSK Middle Channel



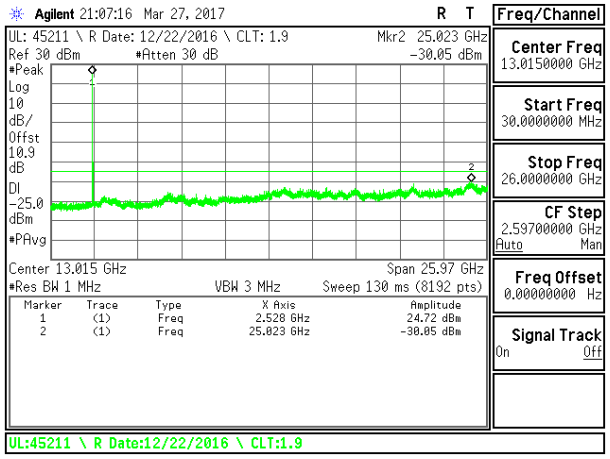

LTE B7 5MHz 16QAM Middle Channel



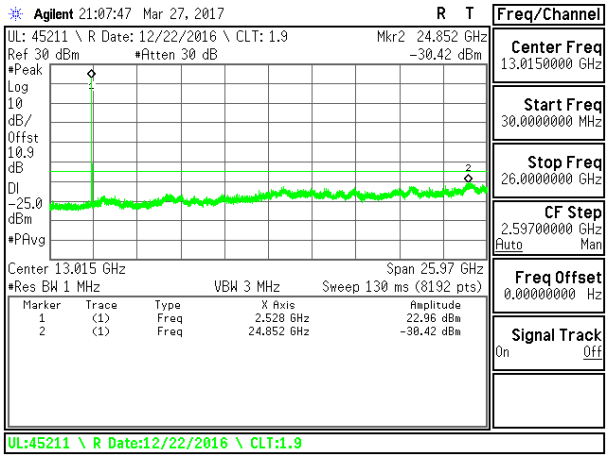

LTE B7 10MHz QPSK Middle Channel




LTE B7 10MHz 16QAM Middle Channel




LTE B7 15MHz QPSK Middle Channel




LTE B7 15MHz 16QAM Middle Channel



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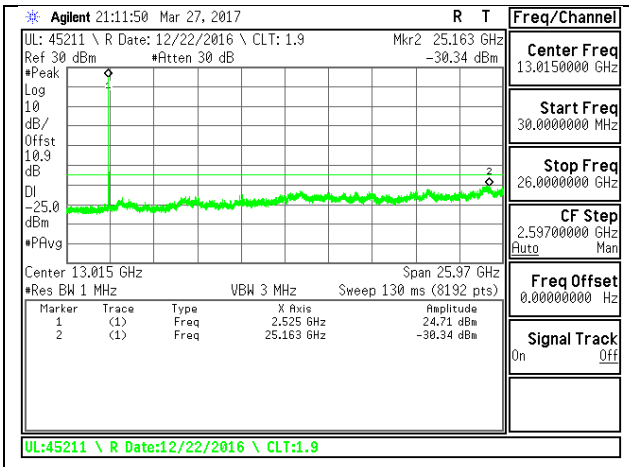
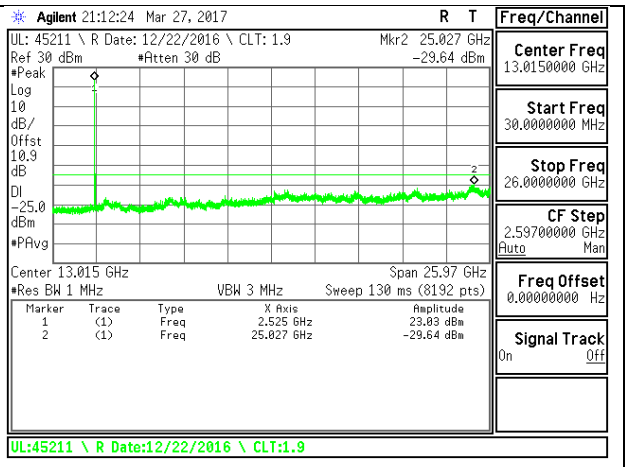



LTE B7 20MHz QPSK Middle Channel




LTE B7 20MHz 16QAM Middle Channel



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**LTE Band 41**

| Band | BW (MHz) | Mode | f (MHz) | Spur (dBm) | Spec (dBm) | Delta (dB) |
|---|---|---|---|---|---|---|
| LTE41 | 20 | 16QAM | 2506 | -32.45 | -25 | -7.45 |
| | | | 2593 | -32.82 | -25 | -7.82 |
| | | | 2680 | -32.34 | -25 | -7.34 |
| | | QPSK | 2506 | -32.64 | -25 | -7.64 |
| | | | 2593 | -32.55 | -25 | -7.55 |
| | | | 2680 | -32.62 | -25 | -7.62 |
| | 15 | 16QAM | 2503.5 | -32.55 | -25 | -7.55 |
| | | | 2593 | -32.34 | -25 | -7.34 |
| | | | 2682.5 | -32.69 | -25 | -7.69 |
| | | QPSK | 2503.5 | -32.12 | -25 | -7.12 |
| | | | 2593 | -32.92 | -25 | -7.92 |
| | | | 2682.5 | -31.58 | -25 | -6.58 |
| | 10 | 16QAM | 2501 | -32.56 | -25 | -7.56 |
| | | | 2593 | -32.09 | -25 | -7.09 |
| | | | 2685 | -32.65 | -25 | -7.65 |
| | | QPSK | 2501 | -32.13 | -25 | -7.13 |
| | | | 2593 | -32.19 | -25 | -7.19 |
| | | | 2685 | -32.72 | -25 | -7.72 |
| | 5 | 16QAM | 2498.5 | -32.79 | -25 | -7.79 |
| | | | 2593 | -31.35 | -25 | -6.35 |
| | | | 2687.5 | -32.94 | -25 | -7.94 |
| | | QPSK | 2498.5 | -32.68 | -25 | -7.68 |
| | | | 2593 | -32.65 | -25 | -7.65 |
| | | | 2687.5 | -32.91 | -25 | -7.91 |


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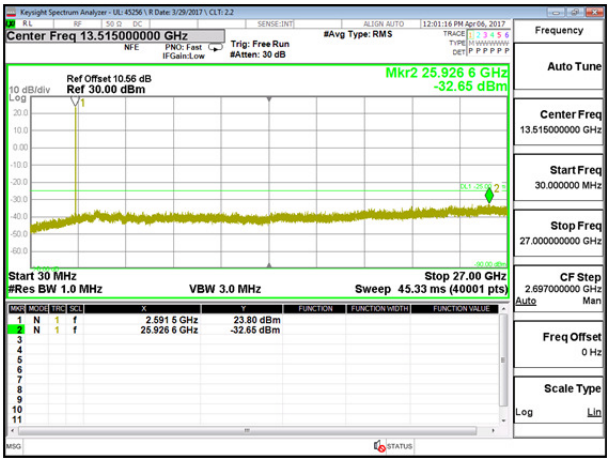
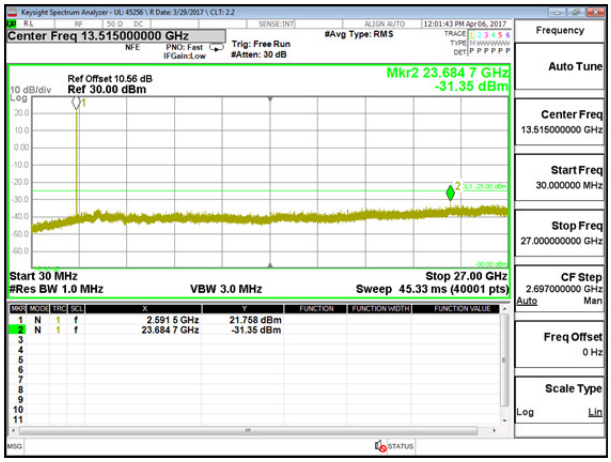
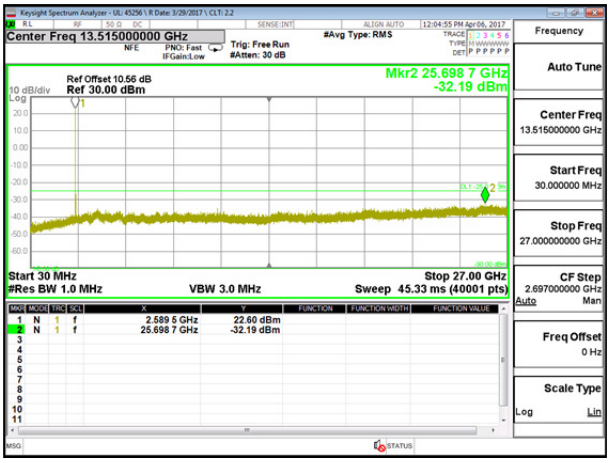


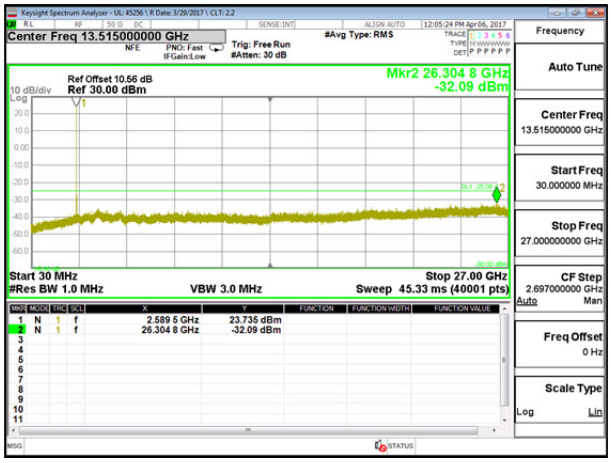

LTE B41 5MHz QPSK Middle Channel



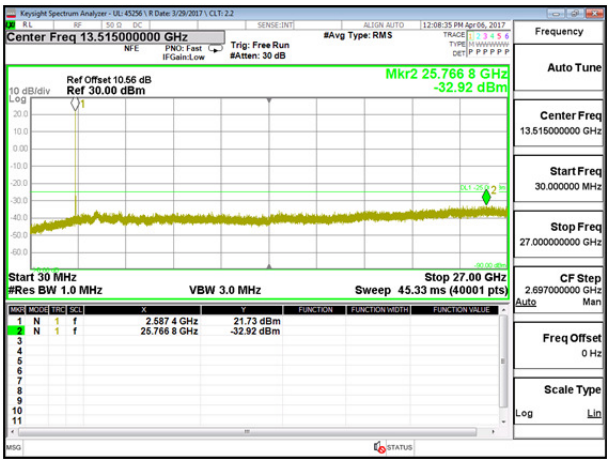

LTE B41 5MHz 16QAM Middle Channel



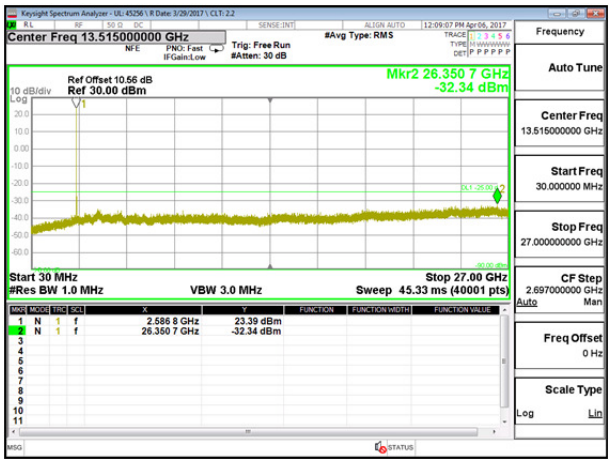

LTE B41 10MHz QPSK Middle Channel




LTE B41 10MHz 16QAM Middle Channel




LTE B41 15MHz QPSK Middle Channel




LTE B41 15MHz 16QAM Middle Channel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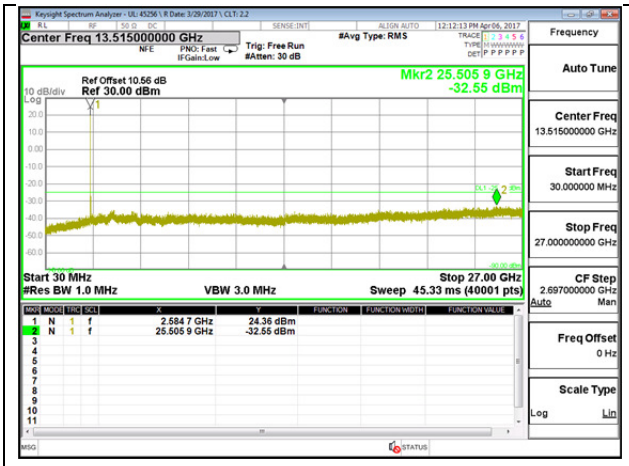
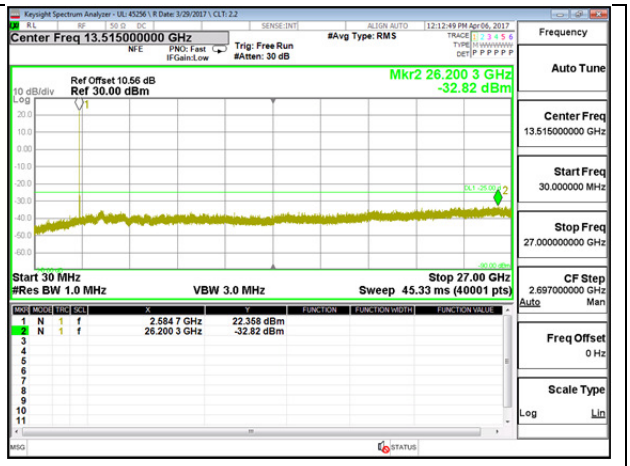



LTE B41 20MHz QPSK Middle Channel




LTE B41 20MHz 16QAM Middle Channel



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# 16. FREQUENCY STABILITY

**RULE PART(S)**

FCC: §27.54

**LIMITS**

§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**



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## 16.1. FREQUENCY STABILITY RESULTS

| | |
|---|---|
| Tested By | 42250 |
| Date | 4/12/2017 |

**LTE Band 7**

| Reference Frequency: Mid Channel 2535.000019 MHz @ 20°C<br>Limit: to stay +- 2.5 ppm = 6337.500 Hz | | | | |
|---|---|---|---|---|
| Power Supply (Vdc) | Environment Temperature (°C) | Frequency Deviation Measureed with Time Elapse (MHz) | Delta (ppm) | Limit (ppm) |
| 3.80 | 55 | 2535.000008 | -0.007 | 2.5 |
| 3.80 | 40 | 2534.999995 | -0.002 | 2.5 |
| 3.80 | 30 | 2534.999992 | -0.001 | 2.5 |
| ***3.80*** | ***20*** | 2534.999989 | ***0*** | ***2.5*** |
| 3.80 | 10 | 2535.000013 | -0.009 | 2.5 |
| 3.80 | 0 | 2535.000013 | -0.009 | 2.5 |
| 3.80 | -10 | 2535.000010 | -0.008 | 2.5 |
| 3.80 | -20 | 2535.000012 | -0.009 | 2.5 |
| 3.80 | -30 | 2535.000012 | -0.009 | 2.5 |

| Reference Frequency: Cellular Mid Channel 2535.000019 MHz @ 20°C<br>Limit: to stay +- 2.5 ppm = 6337.500 Hz | | | | |
|---|---|---|---|---|
| Power Supply (Vdc) | Environment Temperature (°C) | Frequency Deviation Measureed with Time Elapse (MHz) | Delta (ppm) | Limit (ppm) |
| ***3.80*** | ***20*** | ***2534.999989*** | ***0*** | ***2.5*** |
| 4.20 | 20 | 2534.999989 | *0.000* | 2.5 |
| 3.6 | 20 | 2534.999990 | 0 | 2.5 |



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# 17. RADIATED TEST RESULTS

## 17.1. RADIATED POWER (ERP & EIRP)

**RULE PART(S)**

FCC: §27

**LIMITS**

27.50 (h) - (2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power. (LTE B41 & 7)

**TEST PROCEDURE**

ANSI / TIA / EIA 603D Clause 2.2.17; PSA setting reference to 971168 D01 v02r02

For peak power measurement with a PSA:

a) Set the RBW ≥ OBW; b) Set VBW ≥ 3 × RBW; c) Set span ≥ 2 x RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points ≥ span/RBW; g) Trace mode = max hold;

For average power measurement with a PSA:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW ≥ 3 x RBW; d) Set number of points in sweep ≥ 2 × span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 98; h) Use trigger to capture bursts If burst duty cycle < 98; i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.



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### 17.1.1. ERP/EIRP RESULTS AND TABLE

**LTE Band 7**

| BW (MHz) | Mode | RB/RB Size | f(MHz) | EIRP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| 5 | QPSK | 1/0 | 2502.5 | 28.04 | 636.80 |
| | | 1/0 | 2535 | 26.29 | 425.60 |
| | | 1/0 | 2567.5 | 27.50 | 562.34 |
| | 16QAM | 1/0 | 2502.5 | 28.00 | 630.96 |
| | | 1/0 | 2535 | 26.20 | 416.87 |
| | | 1/0 | 2567.5 | 27.52 | 564.94 |
| 10 | QPSK | 1/0 | 2505 | 26.58 | 454.99 |
| | | 1/0 | 2535 | 26.57 | 453.94 |
| | | 1/0 | 2565 | 27.56 | 570.16 |
| | 16QAM | 1/0 | 2505 | 27.13 | 516.42 |
| | | 1/0 | 2535 | 26.81 | 479.73 |
| | | 1/0 | 2565 | 27.71 | 590.20 |
| 15 | QPSK | 1/0 | 2507.5 | 26.78 | 476.43 |
| | | 1/0 | 2535 | 26.09 | 406.44 |
| | | 1/0 | 2562.5 | 26.06 | 403.65 |
| | 16QAM | 1/0 | 2507.5 | 27.31 | 538.27 |
| | | 1/0 | 2535 | 26.41 | 437.52 |
| | | 1/0 | 2562.5 | 26.15 | 412.10 |
| 20 | QPSK | 1/0 | 2510 | 26.56 | 452.90 |
| | | 1/0 | 2535 | 26.50 | 446.68 |
| | | 1/0 | 2560 | 26.61 | 458.14 |
| | 16QAM | 1/0 | 2510 | 26.51 | 447.71 |
| | | 1/0 | 2535 | 26.37 | 433.51 |
| | | 1/0 | 2560 | 26.67 | 464.52 |


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**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_QPSK Band 7 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2502.50 | 11.75 | V | 0.7 | 9.5 | 20.58 | 33.0 | -12.4 | |
| 2502.50 | 19.21 | H | 0.7 | 9.5 | 28.04 | 33.0 | -5.0 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 7.53 | V | 0.7 | 9.5 | 16.31 | 33.0 | -16.7 | |
| 2535.00 | 17.51 | H | 0.7 | 9.5 | 26.29 | 33.0 | -6.7 | |
| High Ch | | | | | | | | |
| 2567.50 | 16.89 | V | 0.7 | 9.5 | 25.73 | 33.0 | -7.3 | |
| 2567.50 | 18.66 | H | 0.7 | 9.5 | 27.50 | 33.0 | -5.5 | |

LTE B7 5MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_16QAM Band 7 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2502.50 | 11.92 | V | 0.7 | 9.5 | 20.75 | 33.0 | -12.2 | |
| 2502.50 | 19.17 | H | 0.7 | 9.5 | 28.00 | 33.0 | -5.0 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 7.68 | V | 0.7 | 9.5 | 16.46 | 33.0 | -16.5 | |
| 2535.00 | 17.42 | H | 0.7 | 9.5 | 26.20 | 33.0 | -6.8 | |
| High Ch | | | | | | | | |
| 2567.50 | 16.88 | V | 0.7 | 9.5 | 25.72 | 33.0 | -7.3 | |
| 2567.50 | 18.68 | H | 0.7 | 9.5 | 27.52 | 33.0 | -5.5 | |

LTE B7 5MHz 16QAM

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_QPSK Band 7 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2505.00 | 12.69 | V | 0.7 | 9.5 | 21.54 | 33.0 | -11.5 | |
| 2505.00 | 17.73 | H | 0.7 | 9.5 | 26.58 | 33.0 | -6.4 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 15.68 | V | 0.7 | 9.5 | 24.46 | 33.0 | -8.5 | |
| 2535.00 | 17.79 | H | 0.7 | 9.5 | 26.57 | 33.0 | -6.4 | |
| High Ch | | | | | | | | |
| 2565.00 | 16.35 | V | 0.7 | 9.5 | 25.19 | 33.0 | -7.8 | |
| 2565.00 | 18.72 | H | 0.7 | 9.5 | 27.56 | 33.0 | -5.4 | |

LTE B7 10MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_16QAM Band 7 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2505.00 | 12.94 | V | 0.7 | 9.5 | 21.79 | 33.0 | -11.2 | |
| 2505.00 | 18.28 | H | 0.7 | 9.5 | 27.13 | 33.0 | -5.9 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 16.10 | V | 0.7 | 9.5 | 24.88 | 33.0 | -8.1 | |
| 2535.00 | 18.03 | H | 0.7 | 9.5 | 26.81 | 33.0 | -6.2 | |
| High Ch | | | | | | | | |
| 2565.00 | 16.54 | V | 0.7 | 9.5 | 25.38 | 33.0 | -7.6 | |
| 2565.00 | 18.87 | H | 0.7 | 9.5 | 27.71 | 33.0 | -5.3 | |

LTE B7 10MHz 16QAM

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_QPSK Band 7 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2507.50 | 11.31 | V | 0.6 | 9.5 | 20.17 | 33.0 | -12.8 | |
| 2507.50 | 17.92 | H | 0.6 | 9.5 | 26.78 | 33.0 | -6.2 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 14.47 | V | 0.7 | 9.5 | 23.25 | 33.0 | -9.8 | |
| 2535.00 | 17.31 | H | 0.7 | 9.5 | 26.09 | 33.0 | -6.9 | |
| High Ch | | | | | | | | |
| 2562.50 | 17.15 | V | 0.7 | 9.5 | 25.98 | 33.0 | -7.0 | |
| 2562.50 | 17.23 | H | 0.7 | 9.5 | 26.06 | 33.0 | -6.9 | |

LTE B7 15MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_16QAM Band 7 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2507.50 | 11.55 | V | 0.6 | 9.5 | 20.41 | 33.0 | -12.6 | |
| 2507.50 | 18.45 | H | 0.6 | 9.5 | 27.31 | 33.0 | -5.7 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 14.76 | V | 0.7 | 9.5 | 23.54 | 33.0 | -9.5 | |
| 2535.00 | 17.63 | H | 0.7 | 9.5 | 26.41 | 33.0 | -6.6 | |
| High Ch | | | | | | | | |
| 2562.50 | 17.27 | V | 0.7 | 9.5 | 26.10 | 33.0 | -6.9 | |
| 2562.50 | 17.32 | H | 0.7 | 9.5 | 26.15 | 33.0 | -6.8 | |

LTE B7 15MHz 16QAM


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**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_QPSK Band 7 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2510.00 | 10.42 | V | 0.6 | 9.5 | 19.29 | 33.0 | -13.7 | |
| 2510.00 | 17.69 | H | 0.6 | 9.5 | 26.56 | 33.0 | -6.4 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 15.77 | V | 0.7 | 9.5 | 24.55 | 33.0 | -8.5 | |
| 2535.00 | 17.72 | H | 0.7 | 9.5 | 26.50 | 33.0 | -6.5 | |
| High Ch | | | | | | | | |
| 2560.00 | 16.64 | V | 0.7 | 9.5 | 25.46 | 33.0 | -7.5 | |
| 2560.00 | 17.79 | H | 0.7 | 9.5 | 26.61 | 33.0 | -6.4 | |

LTE B7 20MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only (X-Pos)
**Location:** Chamber B
**Mode:** LTE_16QAM Band 7 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2510.00 | 10.73 | V | 0.6 | 9.5 | 19.60 | 33.0 | -13.4 | |
| 2510.00 | 17.64 | H | 0.6 | 9.5 | 26.51 | 33.0 | -6.5 | |
| Mid Ch | | | | | | | | |
| 2535.00 | 15.91 | V | 0.7 | 9.5 | 24.69 | 33.0 | -8.3 | |
| 2535.00 | 17.59 | H | 0.7 | 9.5 | 26.37 | 33.0 | -6.6 | |
| High Ch | | | | | | | | |
| 2560.00 | 16.76 | V | 0.7 | 9.5 | 25.58 | 33.0 | -7.4 | |
| 2560.00 | 17.85 | H | 0.7 | 9.5 | 26.67 | 33.0 | -6.3 | |

LTE B7 20MHz 16QAM



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**LTE Band 41**

| BW (MHz) | Mode | RB/RB Size | f(MHz) | EIRP | |
|---|---|---|---|---|---|
| | | | | dBm | mW |
| 5 | QPSK | 1/0 | 2498.5 | 28.55 | 716.14 |
| | | 1/0 | 2593 | 25.66 | 368.13 |
| | | 1/0 | 2687.5 | 27.35 | 543.25 |
| | 16QAM | 1/0 | 2498.5 | 28.83 | 763.84 |
| | | 1/0 | 2593 | 25.49 | 354.00 |
| | | 1/0 | 2687.5 | 27.31 | 538.27 |
| 10 | QPSK | 1/0 | 2501 | 27.82 | 605.34 |
| | | 1/0 | 2593 | 26.46 | 442.59 |
| | | 1/0 | 2685 | 28.02 | 633.87 |
| | 16QAM | 1/0 | 2501 | 27.71 | 590.20 |
| | | 1/0 | 2593 | 26.86 | 485.29 |
| | | 1/0 | 2685 | 28.04 | 636.80 |
| 15 | QPSK | 1/0 | 2503.5 | 27.03 | 504.66 |
| | | 1/0 | 2593 | 26.24 | 420.73 |
| | | 1/0 | 2682.5 | 26.15 | 412.10 |
| | 16QAM | 1/0 | 2503.5 | 27.21 | 526.02 |
| | | 1/0 | 2593 | 26.66 | 463.45 |
| | | 1/0 | 2682.5 | 26.37 | 433.51 |
| 20 | QPSK | 1/0 | 2506 | 27.30 | 537.03 |
| | | 1/0 | 2593 | 26.21 | 417.83 |
| | | 1/0 | 2680 | 29.42 | 874.98 |
| | 16QAM | 1/0 | 2506 | 27.40 | 549.54 |
| | | 1/0 | 2593 | 26.45 | 441.57 |
| | | 1/0 | 2680 | 29.66 | 924.70 |


UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2498.50 | 17.37 | V | 0.7 | 9.5 | 26.18 | 33.0 | -6.8 | |
| 2498.50 | 19.74 | H | 0.7 | 9.5 | 28.55 | 33.0 | -4.5 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 16.89 | V | 0.7 | 9.5 | 25.66 | 33.0 | -7.3 | |
| 2593.00 | 15.79 | H | 0.7 | 9.5 | 24.57 | 33.0 | -8.4 | |
| High Ch | | | | | | | | |
| 2687.50 | 13.84 | V | 0.7 | 9.5 | 22.65 | 33.0 | -10.3 | |
| 2687.50 | 18.54 | H | 0.7 | 9.5 | 27.35 | 33.0 | -5.6 | |

LTE B41 5MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2498.50 | 17.73 | V | 0.7 | 9.5 | 26.54 | 33.0 | -6.5 | |
| 2498.50 | 20.02 | H | 0.7 | 9.5 | 28.83 | 33.0 | -4.2 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 16.72 | V | 0.7 | 9.5 | 25.49 | 33.0 | -7.5 | |
| 2593.00 | 15.54 | H | 0.7 | 9.5 | 24.32 | 33.0 | -8.7 | |
| High Ch | | | | | | | | |
| 2687.50 | 13.74 | V | 0.7 | 9.5 | 22.55 | 33.0 | -10.4 | |
| 2687.50 | 18.50 | H | 0.7 | 9.5 | 27.31 | 33.0 | -5.7 | |

LTE B41 5MHz 16QAM

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2501.00 | 16.08 | V | 0.7 | 9.5 | 24.90 | 33.0 | -8.1 | |
| 2501.00 | 19.00 | H | 0.7 | 9.5 | 27.82 | 33.0 | -5.2 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 12.63 | V | 0.7 | 9.5 | 21.40 | 33.0 | -11.6 | |
| 2593.00 | 17.68 | H | 0.7 | 9.5 | 26.46 | 33.0 | -6.5 | |
| High Ch | | | | | | | | |
| 2685.00 | 17.11 | V | 0.7 | 9.5 | 25.93 | 33.0 | -7.1 | |
| 2685.00 | 19.20 | H | 0.7 | 9.5 | 28.02 | 33.0 | -5.0 | |

LTE B41 10MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2501.00 | 16.08 | V | 0.7 | 9.5 | 24.90 | 33.0 | -8.1 | |
| 2501.00 | 18.89 | H | 0.7 | 9.5 | 27.71 | 33.0 | -5.3 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 12.95 | V | 0.7 | 9.5 | 21.72 | 33.0 | -11.3 | |
| 2593.00 | 18.08 | H | 0.7 | 9.5 | 26.86 | 33.0 | -6.1 | |
| High Ch | | | | | | | | |
| 2685.00 | 17.47 | V | 0.7 | 9.5 | 26.29 | 33.0 | -6.7 | |
| 2685.00 | 19.22 | H | 0.7 | 9.5 | 28.04 | 33.0 | -5.0 | |

LTE B41 10MHz 16QAM

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2503.50 | 13.42 | V | 0.7 | 9.5 | 22.26 | 33.0 | -10.7 | |
| 2503.50 | 18.19 | H | 0.7 | 9.5 | 27.03 | 33.0 | -6.0 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 16.59 | V | 0.7 | 9.5 | 25.36 | 33.0 | -7.6 | |
| 2593.00 | 17.46 | H | 0.7 | 9.5 | 26.24 | 33.0 | -6.8 | |
| High Ch | | | | | | | | |
| 2682.50 | 16.35 | V | 0.7 | 9.5 | 25.17 | 33.0 | -7.8 | |
| 2682.50 | 17.33 | H | 0.7 | 9.5 | 26.15 | 33.0 | -6.9 | |

LTE B41 15MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2503.50 | 13.53 | V | 0.7 | 9.5 | 22.37 | 33.0 | -10.6 | |
| 2503.50 | 18.37 | H | 0.7 | 9.5 | 27.21 | 33.0 | -5.8 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 17.01 | V | 0.7 | 9.5 | 25.78 | 33.0 | -7.2 | |
| 2593.00 | 17.88 | H | 0.7 | 9.5 | 26.66 | 33.0 | -6.3 | |
| High Ch | | | | | | | | |
| 2682.50 | 16.56 | V | 0.7 | 9.5 | 25.38 | 33.0 | -7.6 | |
| 2682.50 | 17.55 | H | 0.7 | 9.5 | 26.37 | 33.0 | -6.6 | |

LTE B41 15MHz 16QAM


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**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2506.00 | 16.21 | V | 0.6 | 9.5 | 25.06 | 33.0 | -7.9 | |
| 2506.00 | 18.45 | H | 0.6 | 9.5 | 27.30 | 33.0 | -5.7 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 16.71 | V | 0.7 | 9.5 | 25.48 | 33.0 | -7.5 | |
| 2593.00 | 17.43 | H | 0.7 | 9.5 | 26.21 | 33.0 | -6.8 | |
| High Ch | | | | | | | | |
| 2680.00 | 18.17 | V | 0.7 | 9.5 | 26.99 | 33.0 | -6.0 | |
| 2680.00 | 20.60 | H | 0.7 | 9.5 | 29.42 | 33.0 | -3.6 | |

LTE B41 20MHz QPSK

**UL Verification Services, Inc.**
**High Frequency Substitution Measurement**

**Company:** SOMC
**Project #:** 11626381
**Date:** 4/7/2017
**Test Engineer:** 43675 OS
**Configuration:** EUT Only
**Location:** Chamber C
**Mode:** LTE_16QAM Band 41 Fundamentals, 20MHz Bandwidth

**Test Equipment:**
**Receiving: Horn T712, and Chamber C SMA Cables**
**Substitution: Horn T59, 6ft N-type Cable T1096**

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Cable Loss (dB) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | |
| 2506.00 | 16.50 | V | 0.6 | 9.5 | 25.35 | 33.0 | -7.6 | |
| 2506.00 | 18.55 | H | 0.6 | 9.5 | 27.40 | 33.0 | -5.6 | |
| Mid Ch | | | | | | | | |
| 2593.00 | 16.69 | V | 0.7 | 9.5 | 25.46 | 33.0 | -7.5 | |
| 2593.00 | 17.67 | H | 0.7 | 9.5 | 26.45 | 33.0 | -6.6 | |
| High Ch | | | | | | | | |
| 2680.00 | 18.44 | V | 0.7 | 9.5 | 27.26 | 33.0 | -5.7 | |
| 2680.00 | 20.84 | H | 0.7 | 9.5 | 29.66 | 33.0 | -3.3 | |

LTE B41 20MHz 16QAM



UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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## 17.2. FIELD STRENGTH OF SPURIOUS RADIATION

**RULE PART(S)**

FCC: §27.53

**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 that 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.



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## 17.2.1. SPURIOUS RADIATION PLOTS

**LTE Band 7**

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_QPSK Band 7 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2502.5 | | | | | | | | | |
| 5005.00 | -18.8 | V | 3.0 | 33.2 | 1.0 | -51.0 | -25.0 | -26.0 | |
| 7507.50 | -16.7 | V | 3.0 | 32.8 | 1.0 | -48.6 | -25.0 | -23.6 | |
| 10010.00 | -16.4 | V | 3.0 | 32.8 | 1.0 | -48.2 | -25.0 | -23.2 | |
| 5005.00 | -18.4 | H | 3.0 | 33.2 | 1.0 | -50.6 | -25.0 | -25.6 | |
| 7507.50 | -15.2 | H | 3.0 | 32.8 | 1.0 | -47.1 | -25.0 | -22.1 | |
| 10010.00 | -16.6 | H | 3.0 | 32.8 | 1.0 | -48.4 | -25.0 | -23.4 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -16.2 | V | 3.0 | 33.2 | 1.0 | -48.4 | -25.0 | -23.4 | |
| 7605.00 | -16.5 | V | 3.0 | 32.8 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 10140.00 | -16.9 | V | 3.0 | 32.7 | 1.0 | -48.5 | -25.0 | -23.5 | |
| 5070.00 | -16.1 | H | 3.0 | 33.2 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 7605.00 | -16.3 | H | 3.0 | 32.8 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 10140.00 | -16.8 | H | 3.0 | 32.7 | 1.0 | -48.5 | -25.0 | -23.5 | |
| High Ch, 2567.5 | | | | | | | | | |
| 5135.00 | -18.5 | V | 3.0 | 33.2 | 1.0 | -50.6 | -25.0 | -25.6 | |
| 7702.50 | -16.3 | V | 3.0 | 32.8 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 10270.00 | -16.3 | V | 3.0 | 32.6 | 1.0 | -47.9 | -25.0 | -22.9 | |
| 5135.00 | -18.2 | H | 3.0 | 33.2 | 1.0 | -50.4 | -25.0 | -25.4 | |
| 7702.50 | -15.1 | H | 3.0 | 32.8 | 1.0 | -47.0 | -25.0 | -22.0 | |
| 10270.00 | -16.1 | H | 3.0 | 32.6 | 1.0 | -47.7 | -25.0 | -22.7 | |

LTE B7 5MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_16QAM Band 7 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2502.5 | | | | | | | | | |
| 5005.00 | -17.3 | V | 3.0 | 33.2 | 1.0 | -49.5 | -25.0 | -24.5 | |
| 7507.50 | -14.3 | V | 3.0 | 32.8 | 1.0 | -46.2 | -25.0 | -21.2 | |
| 10010.00 | -14.7 | V | 3.0 | 32.8 | 1.0 | -46.5 | -25.0 | -21.5 | |
| 5005.00 | -16.7 | H | 3.0 | 33.2 | 1.0 | -49.0 | -25.0 | -24.0 | |
| 7507.50 | -13.5 | H | 3.0 | 32.8 | 1.0 | -45.4 | -25.0 | -20.4 | |
| 10010.00 | -14.7 | H | 3.0 | 32.8 | 1.0 | -46.5 | -25.0 | -21.5 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -14.7 | V | 3.0 | 33.2 | 1.0 | -46.9 | -25.0 | -21.9 | |
| 7605.00 | -14.2 | V | 3.0 | 32.8 | 1.0 | -46.0 | -25.0 | -21.0 | |
| 10140.00 | -15.3 | V | 3.0 | 32.7 | 1.0 | -46.9 | -25.0 | -21.9 | |
| 5070.00 | -14.8 | H | 3.0 | 33.2 | 1.0 | -47.0 | -25.0 | -22.0 | |
| 7605.00 | -15.2 | H | 3.0 | 32.8 | 1.0 | -47.0 | -25.0 | -22.0 | |
| 10140.00 | -15.1 | H | 3.0 | 32.7 | 1.0 | -46.8 | -25.0 | -21.8 | |
| High Ch, 2567.5 | | | | | | | | | |
| 5135.00 | -17.1 | V | 3.0 | 33.2 | 1.0 | -49.3 | -25.0 | -24.3 | |
| 7702.50 | -14.0 | V | 3.0 | 32.8 | 1.0 | -45.8 | -25.0 | -20.8 | |
| 10270.00 | -14.9 | V | 3.0 | 32.6 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 5135.00 | -16.5 | H | 3.0 | 33.2 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 7702.50 | -13.4 | H | 3.0 | 32.8 | 1.0 | -45.2 | -25.0 | -20.2 | |
| 10270.00 | -14.7 | H | 3.0 | 32.6 | 1.0 | -46.2 | -25.0 | -21.2 | |

LTE B7 5MHz 16QAM

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_QPSK Band 7 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2502.5 | | | | | | | | | |
| 5005.00 | -18.8 | V | 3.0 | 33.2 | 1.0 | -51.0 | -25.0 | -26.0 | |
| 7507.50 | -16.2 | V | 3.0 | 32.8 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 10010.00 | -15.5 | V | 3.0 | 32.8 | 1.0 | -47.3 | -25.0 | -22.3 | |
| 5005.00 | -19.0 | H | 3.0 | 33.2 | 1.0 | -51.3 | -25.0 | -26.3 | |
| 7507.50 | -16.3 | H | 3.0 | 32.8 | 1.0 | -48.2 | -25.0 | -23.2 | |
| 10010.00 | -16.1 | H | 3.0 | 32.8 | 1.0 | -47.9 | -25.0 | -22.9 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -15.7 | V | 3.0 | 33.2 | 1.0 | -47.9 | -25.0 | -22.9 | |
| 7605.00 | -16.4 | V | 3.0 | 32.8 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 10140.00 | -15.4 | V | 3.0 | 32.7 | 1.0 | -47.1 | -25.0 | -22.1 | |
| 5070.00 | -16.4 | H | 3.0 | 33.2 | 1.0 | -48.6 | -25.0 | -23.6 | |
| 7605.00 | -16.3 | H | 3.0 | 32.8 | 1.0 | -48.2 | -25.0 | -23.2 | |
| 10140.00 | -16.7 | H | 3.0 | 32.7 | 1.0 | -48.4 | -25.0 | -23.4 | |
| High Ch, 2567.5 | | | | | | | | | |
| 5135.00 | -18.6 | V | 3.0 | 33.2 | 1.0 | -50.8 | -25.0 | -25.8 | |
| 7702.50 | -15.8 | V | 3.0 | 32.8 | 1.0 | -47.6 | -25.0 | -22.6 | |
| 10270.00 | -14.9 | V | 3.0 | 32.6 | 1.0 | -46.5 | -25.0 | -21.5 | |
| 5135.00 | -19.1 | H | 3.0 | 33.2 | 1.0 | -51.3 | -25.0 | -26.3 | |
| 7702.50 | -16.2 | H | 3.0 | 32.8 | 1.0 | -48.0 | -25.0 | -23.0 | |
| 10270.00 | -15.4 | H | 3.0 | 32.6 | 1.0 | -46.9 | -25.0 | -21.9 | |

LTE B7 10MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_16QAM Band 7 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2505 | | | | | | | | | |
| 5010.00 | -17.4 | V | 3.0 | 33.2 | 1.0 | -49.6 | -25.0 | -24.6 | |
| 7515.00 | -13.7 | V | 3.0 | 32.8 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 10020.00 | -14.1 | V | 3.0 | 32.8 | 1.0 | -45.9 | -25.0 | -20.9 | |
| 5010.00 | -17.4 | H | 3.0 | 33.2 | 1.0 | -49.6 | -25.0 | -24.6 | |
| 7515.00 | -14.7 | H | 3.0 | 32.8 | 1.0 | -46.5 | -25.0 | -21.5 | |
| 10020.00 | -14.5 | H | 3.0 | 32.8 | 1.0 | -46.3 | -25.0 | -21.3 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -14.2 | V | 3.0 | 33.2 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 7605.00 | -14.0 | V | 3.0 | 32.8 | 1.0 | -45.8 | -25.0 | -20.8 | |
| 10140.00 | -14.0 | V | 3.0 | 32.7 | 1.0 | -45.7 | -25.0 | -20.7 | |
| 5070.00 | -14.8 | H | 3.0 | 33.2 | 1.0 | -47.0 | -25.0 | -22.0 | |
| 7605.00 | -14.5 | H | 3.0 | 32.8 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 10140.00 | -15.0 | H | 3.0 | 32.7 | 1.0 | -46.7 | -25.0 | -21.7 | |
| High Ch, 2565 | | | | | | | | | |
| 5130.00 | -17.1 | V | 3.0 | 33.2 | 1.0 | -49.3 | -25.0 | -24.3 | |
| 7695.00 | -13.4 | V | 3.0 | 32.8 | 1.0 | -45.2 | -25.0 | -20.2 | |
| 10260.00 | -13.4 | V | 3.0 | 32.6 | 1.0 | -45.0 | -25.0 | -20.0 | |
| 5130.00 | -19.3 | H | 3.0 | 33.2 | 1.0 | -51.5 | -25.0 | -26.5 | |
| 7695.00 | -14.6 | H | 3.0 | 32.8 | 1.0 | -46.5 | -25.0 | -21.5 | |
| 10260.00 | -13.6 | H | 3.0 | 32.6 | 1.0 | -45.2 | -25.0 | -20.2 | |

LTE B7 10MHz 16QAM


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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_QPSK Band 7 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2507.5 | | | | | | | | | |
| 5015.00 | -17.7 | V | 3.0 | 33.2 | 1.0 | -50.0 | -25.0 | -25.0 | |
| 7522.50 | -16.3 | V | 3.0 | 32.8 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 10030.00 | -15.6 | V | 3.0 | 32.8 | 1.0 | -47.3 | -25.0 | -22.3 | |
| 5015.00 | -17.7 | H | 3.0 | 33.2 | 1.0 | -50.0 | -25.0 | -25.0 | |
| 7522.50 | -16.3 | H | 3.0 | 32.8 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 10030.00 | -15.7 | H | 3.0 | 32.8 | 1.0 | -47.4 | -25.0 | -22.4 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -15.8 | V | 3.0 | 33.2 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 7605.00 | -16.1 | V | 3.0 | 32.8 | 1.0 | -47.9 | -25.0 | -22.9 | |
| 10140.00 | -15.9 | V | 3.0 | 32.7 | 1.0 | -47.6 | -25.0 | -22.6 | |
| 5070.00 | -15.8 | H | 3.0 | 33.2 | 1.0 | -48.0 | -25.0 | -23.0 | |
| 7605.00 | -15.8 | H | 3.0 | 32.8 | 1.0 | -47.7 | -25.0 | -22.7 | |
| 10140.00 | -15.7 | H | 3.0 | 32.7 | 1.0 | -47.4 | -25.0 | -22.4 | |
| High Ch, 2562.5 | | | | | | | | | |
| 5125.00 | -17.6 | V | 3.0 | 33.2 | 1.0 | -49.8 | -25.0 | -24.8 | |
| 7687.50 | -16.0 | V | 3.0 | 32.8 | 1.0 | -47.9 | -25.0 | -22.9 | |
| 10250.00 | -15.8 | V | 3.0 | 32.6 | 1.0 | -47.4 | -25.0 | -22.4 | |
| 5125.00 | -17.7 | H | 3.0 | 33.2 | 1.0 | -49.9 | -25.0 | -24.9 | |
| 7687.50 | -16.0 | H | 3.0 | 32.8 | 1.0 | -47.9 | -25.0 | -22.9 | |
| 10250.00 | -15.7 | H | 3.0 | 32.6 | 1.0 | -47.3 | -25.0 | -22.3 | |

LTE B7 15MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_16QAM Band 7 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2507.5 | | | | | | | | | |
| 5015.00 | -16.3 | V | 3.0 | 33.2 | 1.0 | -48.5 | -25.0 | -23.5 | |
| 7522.50 | -14.0 | V | 3.0 | 32.8 | 1.0 | -45.8 | -25.0 | -20.8 | |
| 10030.00 | -14.2 | V | 3.0 | 32.8 | 1.0 | -46.0 | -25.0 | -21.0 | |
| 5015.00 | -16.0 | H | 3.0 | 33.2 | 1.0 | -48.2 | -25.0 | -23.2 | |
| 7522.50 | -14.5 | H | 3.0 | 32.8 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 10030.00 | -14.1 | H | 3.0 | 32.8 | 1.0 | -45.8 | -25.0 | -20.8 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -14.3 | V | 3.0 | 33.2 | 1.0 | -46.5 | -25.0 | -21.5 | |
| 7605.00 | -13.4 | V | 3.0 | 32.8 | 1.0 | -45.2 | -25.0 | -20.2 | |
| 10140.00 | -14.5 | V | 3.0 | 32.7 | 1.0 | -46.2 | -25.0 | -21.2 | |
| 5070.00 | -13.9 | H | 3.0 | 33.2 | 1.0 | -46.1 | -25.0 | -21.1 | |
| 7605.00 | -14.1 | H | 3.0 | 32.8 | 1.0 | -46.0 | -25.0 | -21.0 | |
| 10140.00 | -14.2 | H | 3.0 | 32.7 | 1.0 | -45.9 | -25.0 | -20.9 | |
| High Ch, 2562.5 | | | | | | | | | |
| 5125.00 | -16.0 | V | 3.0 | 33.2 | 1.0 | -48.2 | -25.0 | -23.2 | |
| 7687.50 | -13.7 | V | 3.0 | 32.8 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 10250.00 | -14.4 | V | 3.0 | 32.6 | 1.0 | -46.0 | -25.0 | -21.0 | |
| 5125.00 | -16.0 | H | 3.0 | 33.2 | 1.0 | -48.2 | -25.0 | -23.2 | |
| 7687.50 | -14.7 | H | 3.0 | 32.8 | 1.0 | -46.5 | -25.0 | -21.5 | |
| 10250.00 | -13.8 | H | 3.0 | 32.6 | 1.0 | -45.4 | -25.0 | -20.4 | |

LTE B7 15MHz 16QAM

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_QPSK Band 7 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2510 | | | | | | | | | |
| 5020.00 | -17.9 | V | 3.0 | 33.2 | 1.0 | -50.1 | -25.0 | -25.1 | |
| 7530.00 | -16.3 | V | 3.0 | 32.8 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 10040.00 | -14.9 | V | 3.0 | 32.7 | 1.0 | -46.6 | -25.0 | -21.6 | |
| 5020.00 | -17.7 | H | 3.0 | 33.2 | 1.0 | -50.0 | -25.0 | -25.0 | |
| 7530.00 | -17.1 | H | 3.0 | 32.8 | 1.0 | -48.9 | -25.0 | -23.9 | |
| 10040.00 | -15.6 | H | 3.0 | 32.7 | 1.0 | -47.3 | -25.0 | -22.3 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -16.2 | V | 3.0 | 33.2 | 1.0 | -48.4 | -25.0 | -23.4 | |
| 7605.00 | -15.8 | V | 3.0 | 32.8 | 1.0 | -47.7 | -25.0 | -22.7 | |
| 10140.00 | -16.0 | V | 3.0 | 32.7 | 1.0 | -47.7 | -25.0 | -22.7 | |
| 5070.00 | -15.8 | H | 3.0 | 33.2 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 7605.00 | -16.5 | H | 3.0 | 32.8 | 1.0 | -48.4 | -25.0 | -23.4 | |
| 10140.00 | -16.4 | H | 3.0 | 32.7 | 1.0 | -48.1 | -25.0 | -23.1 | |
| High Ch, 2560 | | | | | | | | | |
| 5120.00 | -17.8 | V | 3.0 | 33.2 | 1.0 | -50.0 | -25.0 | -25.0 | |
| 7680.00 | -16.2 | V | 3.0 | 32.8 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 10240.00 | -15.0 | V | 3.0 | 32.6 | 1.0 | -46.6 | -25.0 | -21.6 | |
| 5120.00 | -17.6 | H | 3.0 | 33.2 | 1.0 | -49.8 | -25.0 | -24.8 | |
| 7680.00 | -16.8 | H | 3.0 | 32.8 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 10240.00 | -15.7 | H | 3.0 | 32.6 | 1.0 | -47.3 | -25.0 | -22.3 | |

LTE B7 20MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber C
**Mode:** LTE_16QAM Band 7 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2510 | | | | | | | | | |
| 5020.00 | -16.4 | V | 3.0 | 33.2 | 1.0 | -48.6 | -25.0 | -23.6 | |
| 7530.00 | -13.9 | V | 3.0 | 32.8 | 1.0 | -45.8 | -25.0 | -20.8 | |
| 10040.00 | -13.6 | V | 3.0 | 32.7 | 1.0 | -45.4 | -25.0 | -20.4 | |
| 5020.00 | -16.0 | H | 3.0 | 33.2 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 7530.00 | -15.5 | H | 3.0 | 32.8 | 1.0 | -47.3 | -25.0 | -22.3 | |
| 10040.00 | -14.0 | H | 3.0 | 32.7 | 1.0 | -45.8 | -25.0 | -20.8 | |
| Mid Ch, 2535 | | | | | | | | | |
| 5070.00 | -14.7 | V | 3.0 | 33.2 | 1.0 | -46.9 | -25.0 | -21.9 | |
| 7605.00 | -13.5 | V | 3.0 | 32.8 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 10140.00 | -14.6 | V | 3.0 | 32.7 | 1.0 | -46.3 | -25.0 | -21.3 | |
| 5070.00 | -14.2 | H | 3.0 | 33.2 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 7605.00 | -14.7 | H | 3.0 | 32.8 | 1.0 | -46.5 | -25.0 | -21.5 | |
| 10140.00 | -14.8 | H | 3.0 | 32.7 | 1.0 | -46.4 | -25.0 | -21.4 | |
| High Ch, 2560 | | | | | | | | | |
| 5120.00 | -16.4 | V | 3.0 | 33.2 | 1.0 | -48.6 | -25.0 | -23.6 | |
| 7680.00 | -13.8 | V | 3.0 | 32.8 | 1.0 | -45.7 | -25.0 | -20.7 | |
| 10240.00 | -13.4 | V | 3.0 | 32.6 | 1.0 | -45.0 | -25.0 | -20.0 | |
| 5120.00 | -16.1 | H | 3.0 | 33.2 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 7680.00 | -15.0 | H | 3.0 | 32.8 | 1.0 | -46.9 | -25.0 | -21.9 | |
| 10240.00 | -14.1 | H | 3.0 | 32.6 | 1.0 | -45.7 | -25.0 | -20.7 | |

LTE B7 20MHz 16QAM



UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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## LTE Band 41

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_QPSK Band 41 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2498.50 | | | | | | | | | |
| 4997.00 | -15.1 | V | 3.0 | 35.5 | 1.0 | -49.6 | -25.0 | -24.6 | |
| 7495.50 | -11.1 | V | 3.0 | 35.7 | 1.0 | -45.8 | -25.0 | -20.8 | |
| 9994.00 | -10.3 | V | 3.0 | 36.0 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 4997.00 | -13.9 | H | 3.0 | 35.5 | 1.0 | -48.4 | -25.0 | -23.4 | |
| 7495.50 | -9.6 | H | 3.0 | 35.7 | 1.0 | -44.4 | -25.0 | -19.4 | |
| 9994.00 | -9.2 | H | 3.0 | 36.0 | 1.0 | -44.2 | -25.0 | -19.2 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -15.5 | V | 3.0 | 35.4 | 1.0 | -49.9 | -25.0 | -24.9 | |
| 7779.00 | -11.5 | V | 3.0 | 35.8 | 1.0 | -46.2 | -25.0 | -21.2 | |
| 10372.00 | -10.7 | V | 3.0 | 35.8 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 5186.00 | -14.3 | H | 3.0 | 35.4 | 1.0 | -48.8 | -25.0 | -23.8 | |
| 7779.00 | -10.6 | H | 3.0 | 35.8 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 10372.00 | -10.6 | H | 3.0 | 35.8 | 1.0 | -45.5 | -25.0 | -20.5 | |
| High Ch, 2687.50 | | | | | | | | | |
| 5375.00 | -14.3 | V | 3.0 | 35.4 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 8062.50 | -10.3 | V | 3.0 | 35.8 | 1.0 | -45.1 | -25.0 | -20.1 | |
| 10750.00 | -9.8 | V | 3.0 | 35.7 | 1.0 | -44.5 | -25.0 | -19.5 | |
| 5375.00 | -13.1 | H | 3.0 | 35.4 | 1.0 | -47.6 | -25.0 | -22.6 | |
| 8062.50 | -8.8 | H | 3.0 | 35.8 | 1.0 | -43.6 | -25.0 | -18.6 | |
| 10750.00 | -9.7 | H | 3.0 | 35.7 | 1.0 | -44.3 | -25.0 | -19.3 | |

LTE B41 5MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_16QAM Band 41 Harmonics, 5MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2498.50 | | | | | | | | | |
| 4997.00 | -15.7 | V | 3.0 | 35.5 | 1.0 | -50.1 | -25.0 | -25.1 | |
| 7495.50 | -11.6 | V | 3.0 | 35.7 | 1.0 | -46.3 | -25.0 | -21.3 | |
| 9994.00 | -10.3 | V | 3.0 | 36.0 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 4997.00 | -13.9 | H | 3.0 | 35.5 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 7495.50 | -9.8 | H | 3.0 | 35.7 | 1.0 | -44.5 | -25.0 | -19.5 | |
| 9994.00 | -9.2 | H | 3.0 | 36.0 | 1.0 | -44.2 | -25.0 | -19.2 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -15.9 | V | 3.0 | 35.4 | 1.0 | -50.3 | -25.0 | -25.3 | |
| 7779.00 | -11.3 | V | 3.0 | 35.8 | 1.0 | -46.0 | -25.0 | -21.0 | |
| 10372.00 | -11.6 | V | 3.0 | 35.8 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 5186.00 | -15.2 | H | 3.0 | 35.4 | 1.0 | -49.6 | -25.0 | -24.6 | |
| 7779.00 | -10.2 | H | 3.0 | 35.8 | 1.0 | -45.0 | -25.0 | -20.0 | |
| 10372.00 | -10.5 | H | 3.0 | 35.8 | 1.0 | -45.4 | -25.0 | -20.4 | |
| High Ch, 2687.50 | | | | | | | | | |
| 5375.00 | -14.3 | V | 3.0 | 35.4 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 8062.50 | -10.5 | V | 3.0 | 35.8 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 10750.00 | -10.1 | V | 3.0 | 35.7 | 1.0 | -44.8 | -25.0 | -19.8 | |
| 5375.00 | -13.2 | H | 3.0 | 35.4 | 1.0 | -47.7 | -25.0 | -22.7 | |
| 8062.50 | -8.5 | H | 3.0 | 35.8 | 1.0 | -43.3 | -25.0 | -18.3 | |
| 10750.00 | -12.8 | H | 3.0 | 35.7 | 1.0 | -47.5 | -25.0 | -22.5 | |

LTE B41 5MHz 16QAM

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_QPSK Band 41 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2501 | | | | | | | | | |
| 5002.00 | -15.0 | V | 3.0 | 35.5 | 1.0 | -49.4 | -25.0 | -24.4 | |
| 7503.00 | -11.7 | V | 3.0 | 35.7 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 10040.00 | -9.8 | V | 3.0 | 36.0 | 1.0 | -44.8 | -25.0 | -19.8 | |
| 5002.00 | -14.0 | H | 3.0 | 35.5 | 1.0 | -48.5 | -25.0 | -23.5 | |
| 7503.00 | -9.4 | H | 3.0 | 35.7 | 1.0 | -44.2 | -25.0 | -19.2 | |
| 10040.00 | -9.6 | H | 3.0 | 36.0 | 1.0 | -44.6 | -25.0 | -19.6 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -15.3 | V | 3.0 | 35.4 | 1.0 | -49.7 | -25.0 | -24.7 | |
| 7779.00 | -10.8 | V | 3.0 | 35.8 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 10372.00 | -10.8 | V | 3.0 | 35.8 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 5186.00 | -15.0 | H | 3.0 | 35.4 | 1.0 | -49.4 | -25.0 | -24.4 | |
| 7779.00 | -10.8 | H | 3.0 | 35.8 | 1.0 | -45.5 | -25.0 | -20.5 | |
| 10372.00 | -10.1 | H | 3.0 | 35.8 | 1.0 | -45.0 | -25.0 | -20.0 | |
| High Ch, 2685 | | | | | | | | | |
| 5370.00 | -14.1 | V | 3.0 | 35.4 | 1.0 | -48.6 | -25.0 | -23.6 | |
| 8055.00 | -10.5 | V | 3.0 | 35.8 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 10740.00 | -9.4 | V | 3.0 | 35.7 | 1.0 | -44.1 | -25.0 | -19.1 | |
| 5370.00 | -13.0 | H | 3.0 | 35.4 | 1.0 | -47.4 | -25.0 | -22.4 | |
| 8055.00 | -8.9 | H | 3.0 | 35.8 | 1.0 | -43.7 | -25.0 | -18.7 | |
| 10740.00 | -10.6 | H | 3.0 | 35.7 | 1.0 | -45.3 | -25.0 | -20.3 | |

LTE B41 10MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_16QAM Band 41 Harmonics, 10MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2501 | | | | | | | | | |
| 5002.00 | -15.3 | V | 3.0 | 35.5 | 1.0 | -49.8 | -25.0 | -24.8 | |
| 7503.00 | -11.9 | V | 3.0 | 35.7 | 1.0 | -46.7 | -25.0 | -21.7 | |
| 10040.00 | -10.2 | V | 3.0 | 36.0 | 1.0 | -45.2 | -25.0 | -20.2 | |
| 5002.00 | -14.4 | H | 3.0 | 35.5 | 1.0 | -48.8 | -25.0 | -23.8 | |
| 7503.00 | -9.7 | H | 3.0 | 35.7 | 1.0 | -44.4 | -25.0 | -19.4 | |
| 10040.00 | -9.9 | H | 3.0 | 36.0 | 1.0 | -44.9 | -25.0 | -19.9 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -15.4 | V | 3.0 | 35.4 | 1.0 | -49.9 | -25.0 | -24.9 | |
| 7779.00 | -10.9 | V | 3.0 | 35.8 | 1.0 | -45.7 | -25.0 | -20.7 | |
| 10372.00 | -11.2 | V | 3.0 | 35.8 | 1.0 | -46.0 | -25.0 | -21.0 | |
| 5186.00 | -15.2 | H | 3.0 | 35.4 | 1.0 | -49.6 | -25.0 | -24.6 | |
| 7779.00 | -10.7 | H | 3.0 | 35.8 | 1.0 | -45.5 | -25.0 | -20.5 | |
| 10372.00 | -10.1 | H | 3.0 | 35.8 | 1.0 | -44.9 | -25.0 | -19.9 | |
| High Ch, 2685 | | | | | | | | | |
| 5370.00 | -14.2 | V | 3.0 | 35.4 | 1.0 | -48.7 | -25.0 | -23.7 | |
| 8055.00 | -10.4 | V | 3.0 | 35.8 | 1.0 | -45.2 | -25.0 | -20.2 | |
| 10740.00 | -9.3 | V | 3.0 | 35.7 | 1.0 | -44.0 | -25.0 | -19.0 | |
| 5370.00 | -13.3 | H | 3.0 | 35.4 | 1.0 | -47.8 | -25.0 | -22.8 | |
| 8055.00 | -9.1 | H | 3.0 | 35.8 | 1.0 | -43.9 | -25.0 | -18.9 | |
| 10740.00 | -10.6 | H | 3.0 | 35.7 | 1.0 | -45.3 | -25.0 | -20.3 | |

LTE B41 10MHz 16QAM

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_QPSK Band 41 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2503 | | | | | | | | | |
| 5006.00 | -15.3 | V | 3.0 | 35.5 | 1.0 | -49.8 | -25.0 | -24.8 | |
| 7509.00 | -12.5 | V | 3.0 | 35.7 | 1.0 | -47.3 | -25.0 | -22.3 | |
| 10012.00 | -10.9 | V | 3.0 | 36.0 | 1.0 | -45.9 | -25.0 | -20.9 | |
| 5006.00 | -13.7 | H | 3.0 | 35.5 | 1.0 | -48.2 | -25.0 | -23.2 | |
| 7509.00 | -9.5 | H | 3.0 | 35.7 | 1.0 | -44.2 | -25.0 | -19.2 | |
| 10012.00 | -9.7 | H | 3.0 | 36.0 | 1.0 | -44.7 | -25.0 | -19.7 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -15.7 | V | 3.0 | 35.4 | 1.0 | -50.1 | -25.0 | -25.1 | |
| 7779.00 | -11.6 | V | 3.0 | 35.8 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 10372.00 | -11.5 | V | 3.0 | 35.8 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 5186.00 | -14.8 | H | 3.0 | 35.4 | 1.0 | -49.3 | -25.0 | -24.3 | |
| 7779.00 | -10.2 | H | 3.0 | 35.8 | 1.0 | -45.0 | -25.0 | -20.0 | |
| 10372.00 | -10.8 | H | 3.0 | 35.8 | 1.0 | -45.7 | -25.0 | -20.7 | |
| High Ch, 2682.50 | | | | | | | | | |
| 5365.00 | -14.5 | V | 3.0 | 35.4 | 1.0 | -49.0 | -25.0 | -24.0 | |
| 8047.50 | -11.8 | V | 3.0 | 35.8 | 1.0 | -46.6 | -25.0 | -21.6 | |
| 10730.00 | -9.2 | V | 3.0 | 35.7 | 1.0 | -43.9 | -25.0 | -18.9 | |
| 5365.00 | -12.8 | H | 3.0 | 35.4 | 1.0 | -47.3 | -25.0 | -22.3 | |
| 8047.50 | -8.7 | H | 3.0 | 35.8 | 1.0 | -43.5 | -25.0 | -18.5 | |
| 10730.00 | -9.9 | H | 3.0 | 35.7 | 1.0 | -44.6 | -25.0 | -19.6 | |

LTE B41 15MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_16QAM Band 41 Harmonics, 15MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2503 | | | | | | | | | |
| 5006.00 | -15.7 | V | 3.0 | 35.5 | 1.0 | -50.1 | -25.0 | -25.1 | |
| 7509.00 | -12.7 | V | 3.0 | 35.7 | 1.0 | -47.5 | -25.0 | -22.5 | |
| 10012.00 | -10.9 | V | 3.0 | 36.0 | 1.0 | -45.9 | -25.0 | -20.9 | |
| 5006.00 | -13.8 | H | 3.0 | 35.5 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 7509.00 | -9.7 | H | 3.0 | 35.7 | 1.0 | -44.5 | -25.0 | -19.5 | |
| 10012.00 | -9.8 | H | 3.0 | 36.0 | 1.0 | -44.8 | -25.0 | -19.8 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -15.8 | V | 3.0 | 35.4 | 1.0 | -50.3 | -25.0 | -25.3 | |
| 7779.00 | -11.9 | V | 3.0 | 35.8 | 1.0 | -46.7 | -25.0 | -21.7 | |
| 10372.00 | -11.5 | V | 3.0 | 35.8 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 5186.00 | -14.9 | H | 3.0 | 35.4 | 1.0 | -49.3 | -25.0 | -24.3 | |
| 7779.00 | -10.5 | H | 3.0 | 35.8 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 10372.00 | -11.1 | H | 3.0 | 35.8 | 1.0 | -45.9 | -25.0 | -20.9 | |
| High Ch, 2682.50 | | | | | | | | | |
| 5365.00 | -14.4 | V | 3.0 | 35.4 | 1.0 | -48.8 | -25.0 | -23.8 | |
| 8047.50 | -12.0 | V | 3.0 | 35.8 | 1.0 | -46.8 | -25.0 | -21.8 | |
| 10730.00 | -9.5 | V | 3.0 | 35.7 | 1.0 | -44.2 | -25.0 | -19.2 | |
| 5365.00 | -12.8 | H | 3.0 | 35.4 | 1.0 | -47.2 | -25.0 | -22.2 | |
| 8047.50 | -9.1 | H | 3.0 | 35.8 | 1.0 | -43.9 | -25.0 | -18.9 | |
| 10730.00 | -10.1 | H | 3.0 | 35.7 | 1.0 | -44.7 | -25.0 | -19.7 | |

LTE B41 15MHz 16QAM





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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_QPSK Band 41 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2506 | | | | | | | | | |
| 5012.00 | -14.7 | V | 3.0 | 35.5 | 1.0 | -49.2 | -25.0 | -24.2 | |
| 7518.00 | -12.1 | V | 3.0 | 35.7 | 1.0 | -46.8 | -25.0 | -21.8 | |
| 10024.00 | -11.4 | V | 3.0 | 36.0 | 1.0 | -46.4 | -25.0 | -21.4 | |
| 5012.00 | -14.6 | H | 3.0 | 35.5 | 1.0 | -49.0 | -25.0 | -24.0 | |
| 7518.00 | -10.5 | H | 3.0 | 35.7 | 1.0 | -45.3 | -25.0 | -20.3 | |
| 10024.00 | -10.4 | H | 3.0 | 36.0 | 1.0 | -45.4 | -25.0 | -20.4 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -15.1 | V | 3.0 | 35.4 | 1.0 | -49.5 | -25.0 | -24.5 | |
| 7779.00 | -11.6 | V | 3.0 | 35.8 | 1.0 | -46.3 | -25.0 | -21.3 | |
| 10372.00 | -11.0 | V | 3.0 | 35.8 | 1.0 | -45.9 | -25.0 | -20.9 | |
| 5186.00 | -14.6 | H | 3.0 | 35.4 | 1.0 | -49.0 | -25.0 | -24.0 | |
| 7779.00 | -10.8 | H | 3.0 | 35.8 | 1.0 | -45.5 | -25.0 | -20.5 | |
| 10372.00 | -10.7 | H | 3.0 | 35.8 | 1.0 | -45.6 | -25.0 | -20.6 | |
| High Ch, 2680 | | | | | | | | | |
| 5360.00 | -13.3 | V | 3.0 | 35.4 | 1.0 | -47.8 | -25.0 | -22.8 | |
| 8040.00 | -11.3 | V | 3.0 | 35.8 | 1.0 | -46.1 | -25.0 | -21.1 | |
| 10720.00 | -11.0 | V | 3.0 | 35.7 | 1.0 | -45.7 | -25.0 | -20.7 | |
| 5360.00 | -13.7 | H | 3.0 | 35.4 | 1.0 | -48.1 | -25.0 | -23.1 | |
| 8040.00 | -9.7 | H | 3.0 | 35.8 | 1.0 | -44.5 | -25.0 | -19.5 | |
| 10720.00 | -10.5 | H | 3.0 | 35.7 | 1.0 | -45.2 | -25.0 | -20.2 | |

LTE B41 20MHz QPSK

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

**Company:** SOMC
**Project #:** 11626381 (PY7-66475M)
**Date:** 4/11/2017
**Test Engineer:** 43574 JS
**Configuration:** EUT + AC Charger + HS
**Location:** Chamber B
**Mode:** LTE_16QAM Band 41 Harmonics, 20MHz Bandwidth

| f MHz | SG reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Low Ch, 2506 | | | | | | | | | |
| 5012.00 | -15.6 | V | 3.0 | 35.5 | 1.0 | -50.1 | -25.0 | -25.1 | |
| 7518.00 | -12.0 | V | 3.0 | 35.7 | 1.0 | -46.7 | -25.0 | -21.7 | |
| 10024.00 | -10.6 | V | 3.0 | 36.0 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 5012.00 | -14.5 | H | 3.0 | 35.5 | 1.0 | -48.9 | -25.0 | -23.9 | |
| 7518.00 | -10.3 | H | 3.0 | 35.7 | 1.0 | -45.0 | -25.0 | -20.0 | |
| 10024.00 | -10.7 | H | 3.0 | 36.0 | 1.0 | -45.7 | -25.0 | -20.7 | |
| Mid Ch, 2593 | | | | | | | | | |
| 5186.00 | -16.0 | V | 3.0 | 35.4 | 1.0 | -50.4 | -25.0 | -25.4 | |
| 7779.00 | -11.5 | V | 3.0 | 35.8 | 1.0 | -46.2 | -25.0 | -21.2 | |
| 10372.00 | -10.3 | V | 3.0 | 35.8 | 1.0 | -45.1 | -25.0 | -20.1 | |
| 5186.00 | -15.4 | H | 3.0 | 35.4 | 1.0 | -49.8 | -25.0 | -24.8 | |
| 7779.00 | -10.8 | H | 3.0 | 35.8 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 10372.00 | -10.5 | H | 3.0 | 35.8 | 1.0 | -45.4 | -25.0 | -20.4 | |
| High Ch, 2680 | | | | | | | | | |
| 5360.00 | -14.0 | V | 3.0 | 35.4 | 1.0 | -48.5 | -25.0 | -23.5 | |
| 8040.00 | -11.1 | V | 3.0 | 35.8 | 1.0 | -45.9 | -25.0 | -20.9 | |
| 10720.00 | -10.9 | V | 3.0 | 35.7 | 1.0 | -45.6 | -25.0 | -20.6 | |
| 5360.00 | -13.9 | H | 3.0 | 35.4 | 1.0 | -48.3 | -25.0 | -23.3 | |
| 8040.00 | -10.0 | H | 3.0 | 35.8 | 1.0 | -44.8 | -25.0 | -19.8 | |
| 10720.00 | -10.8 | H | 3.0 | 35.7 | 1.0 | -45.5 | -25.0 | -20.5 | |

LTE B41 20MHz 16QAM



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