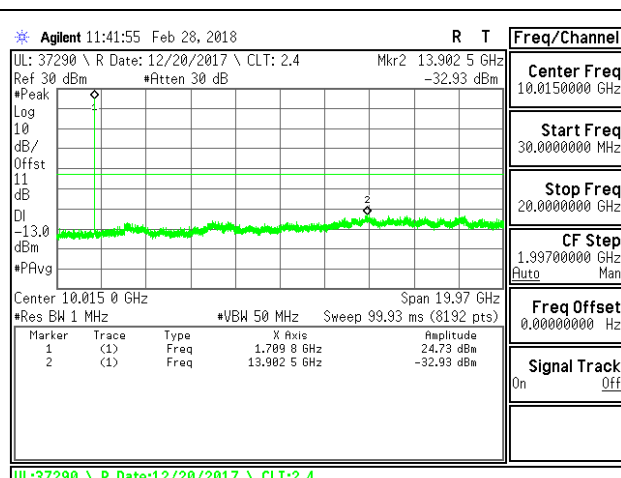
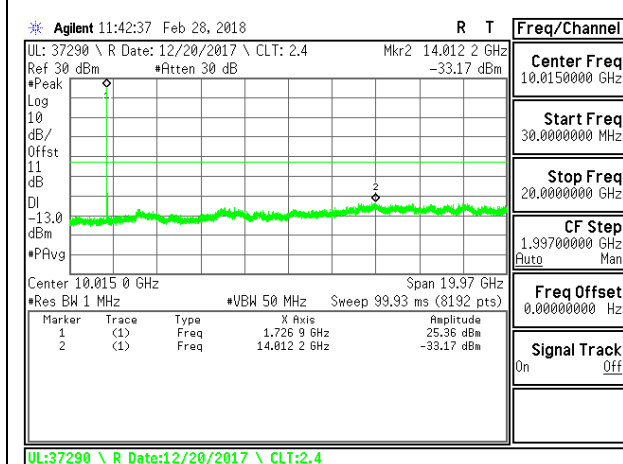


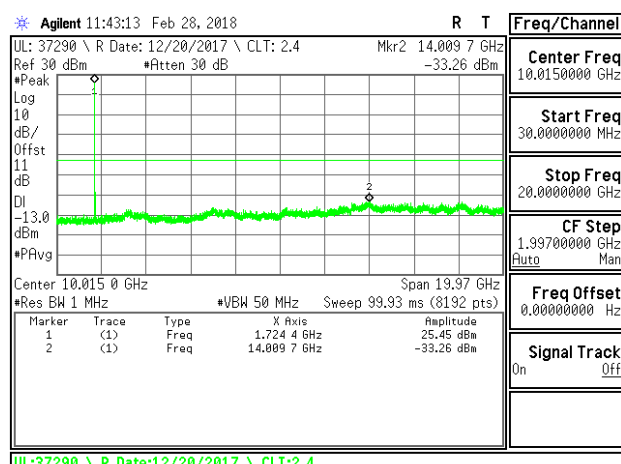
LTE B4 15MHz QPSK Low Channel RB1-0



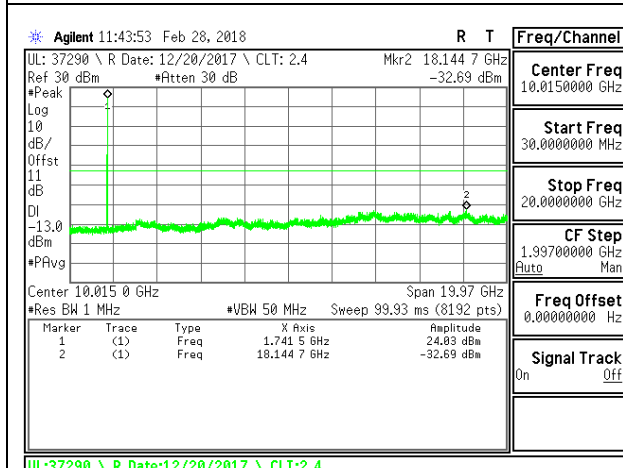
LTE B4 15MHz 16QAM Low Channel RB1-0



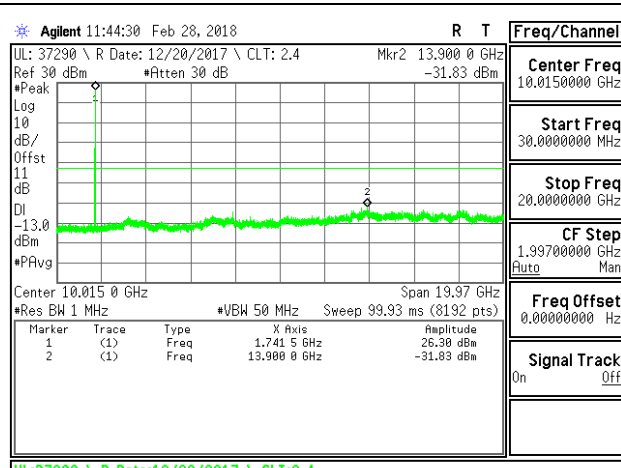
LTE B4 15MHz QPSK Middle Channel RB1-0



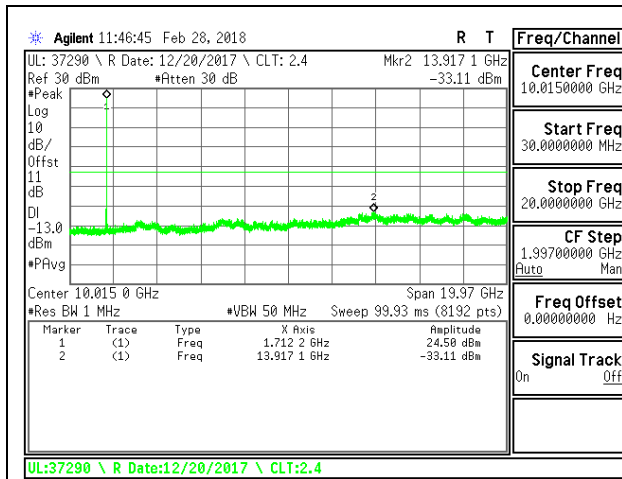
LTE B4 15MHz 16QAM Middle Channel RB1-0



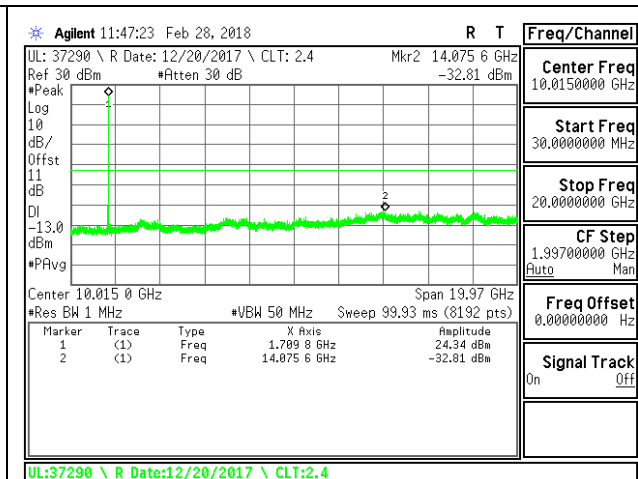
LTE B4 15MHz QPSK High Channel RB1-0



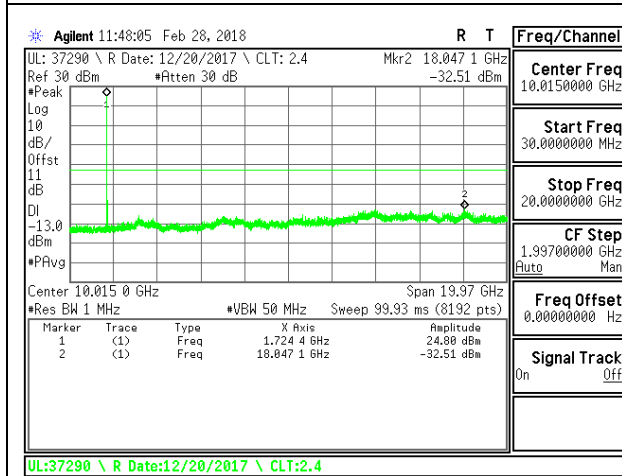
LTE B4 15MHz 16QAM High Channel RB1-0



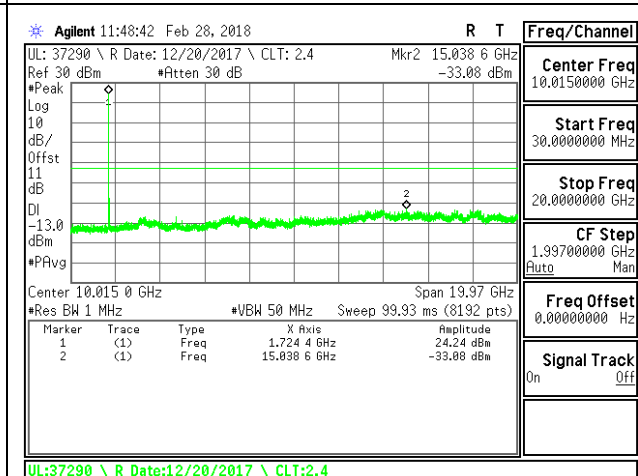
LTE B4 20MHz QPSK Low Channel RB1-0



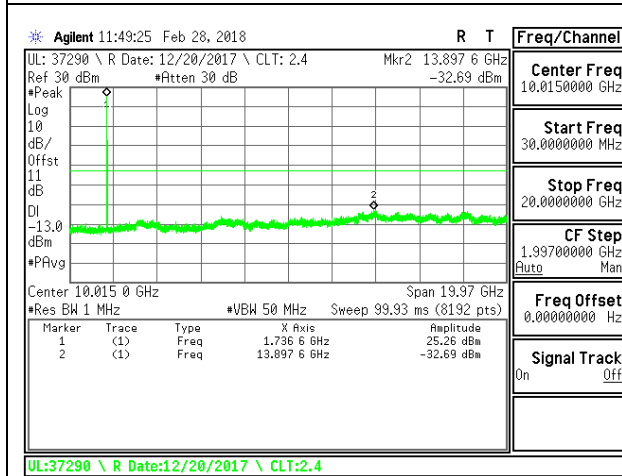
LTE B4 20MHz 16QAM Low Channel RB1-0



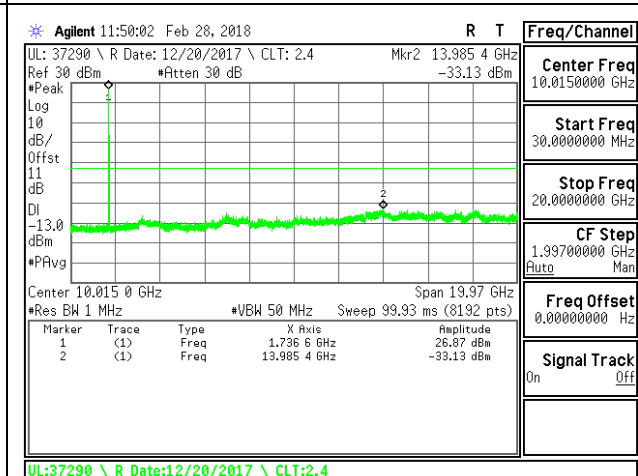
LTE B4 20MHz QPSK Middle Channel RB1-0



LTE B4 20MHz 16QAM Middle Channel RB1-0

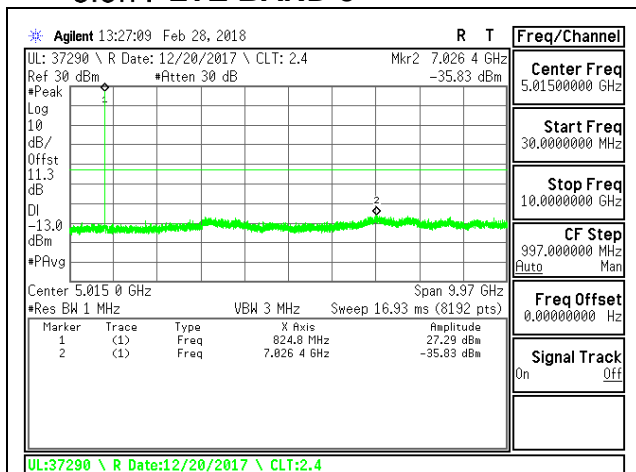


LTE B4 20MHz QPSK High Channel RB1-0

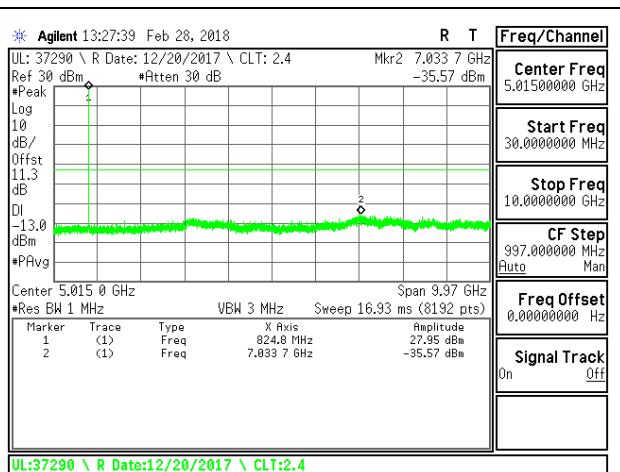


LTE B4 20MHz 16QAM High Channel RB1-0

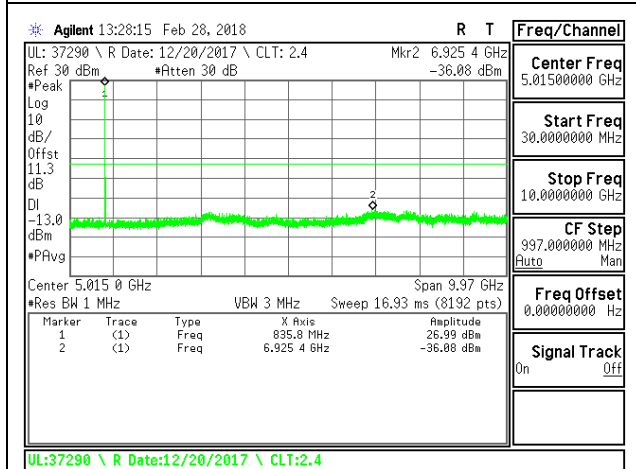
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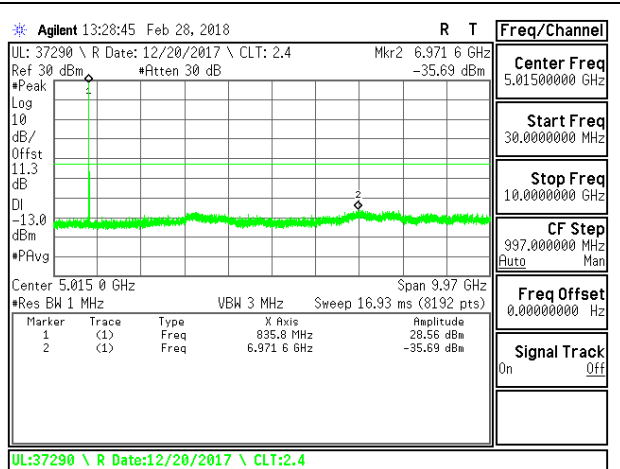
LTE B5 1.4MHz QPSK Low Channel RB1-0



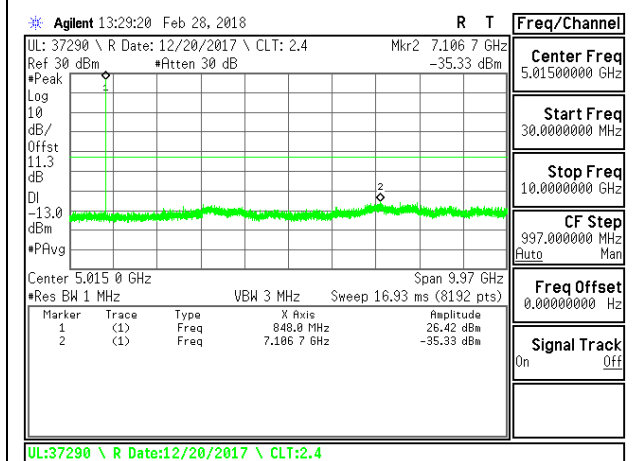
LTE B5 1.4MHz 16QAM Low Channel RB1-0



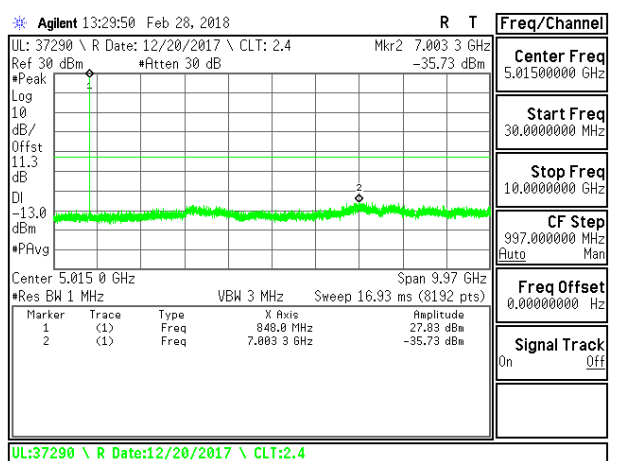
LTE B5 1.4MHz QPSK Middle Channel RB1-0



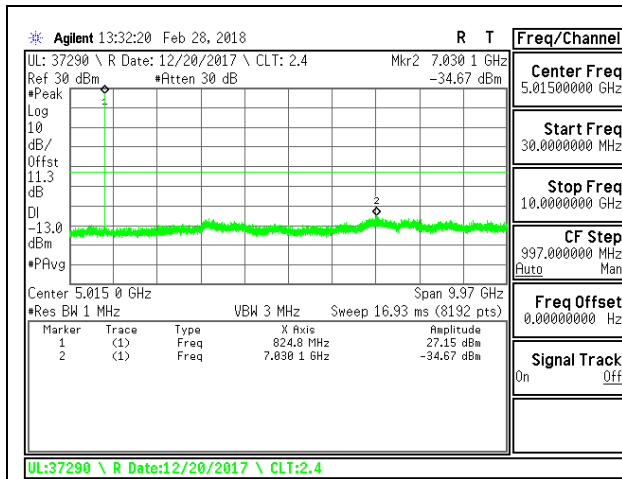
LTE B5 1.4MHz 16QAM Middle Channel RB1-0



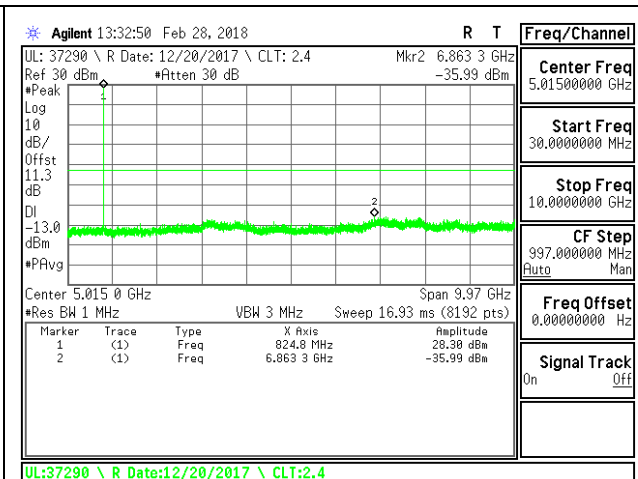
LTE B5 1.4MHz QPSK High Channel RB1-0



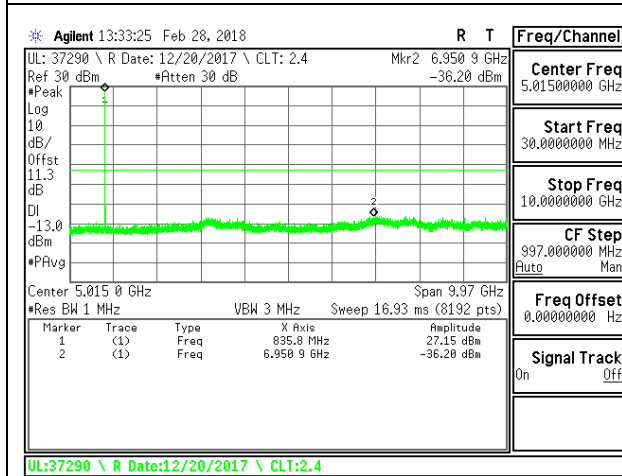
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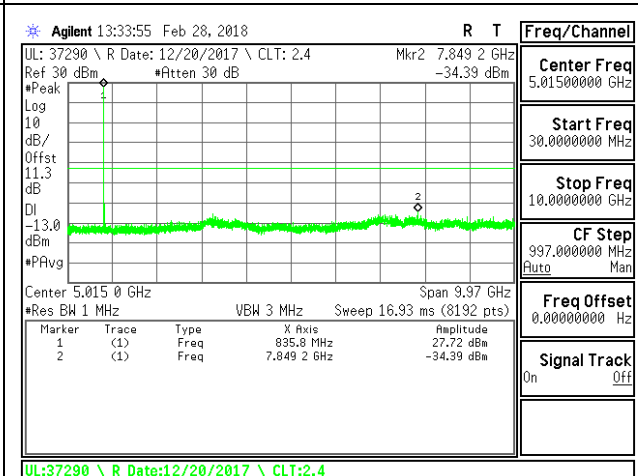
LTE B5 3MHz QPSK Low Channel RB1-0



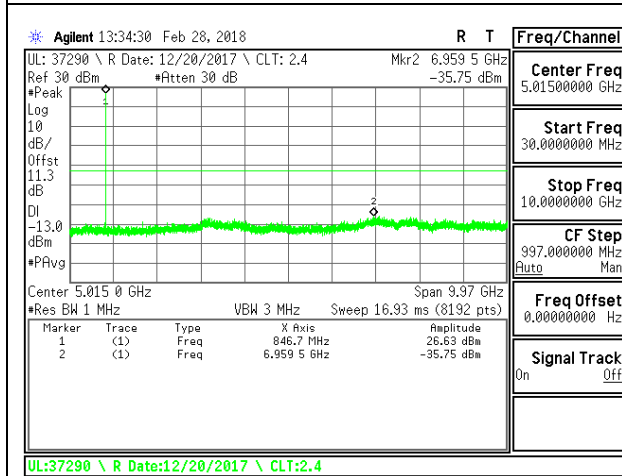
LTE B5 3MHz 16QAM Low Channel RB1-0



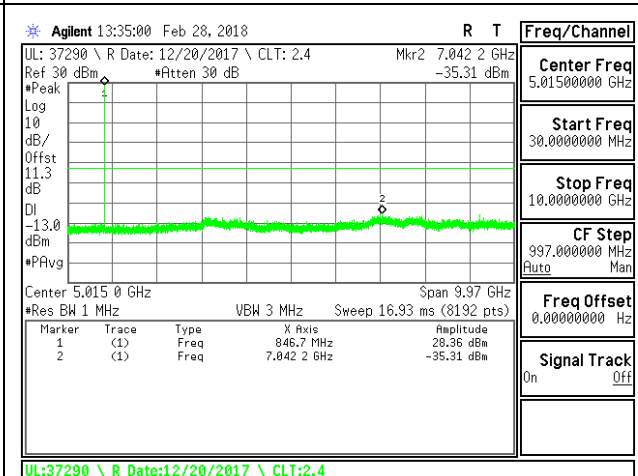
LTE B5 3MHz QPSK Middle Channel RB1-0



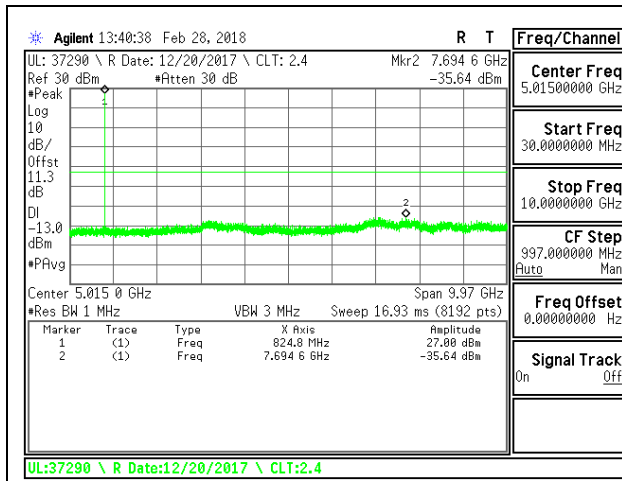
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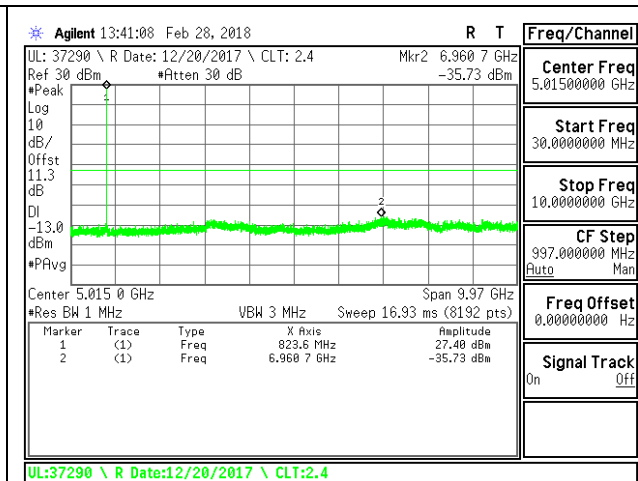
LTE B5 3MHz QPSK High Channel RB1-0



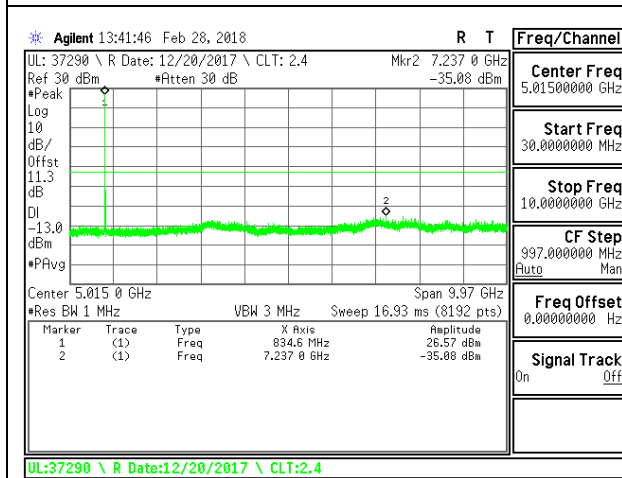
LTE B5 3MHz 16QAM High Channel RB1-0



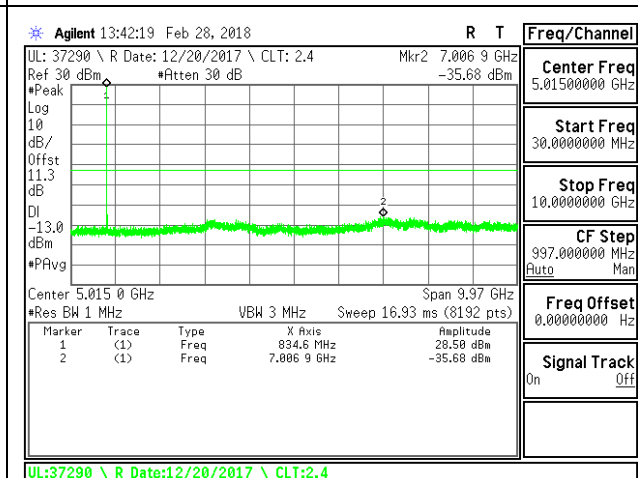
LTE B5 5MHz QPSK Low Channel RB1-0



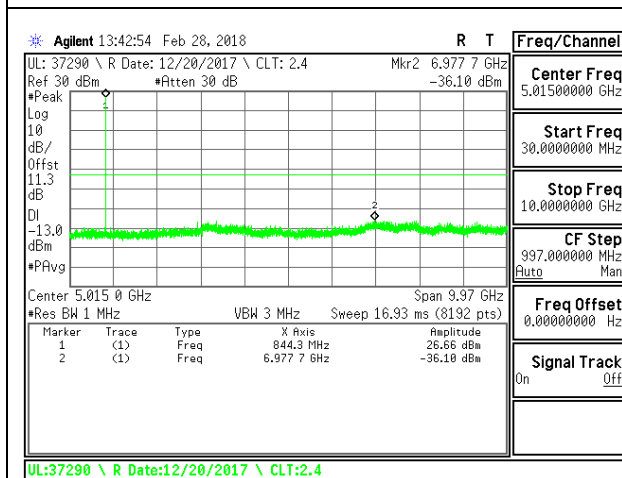
LTE B5 5MHz 16QAM Low Channel RB1-0



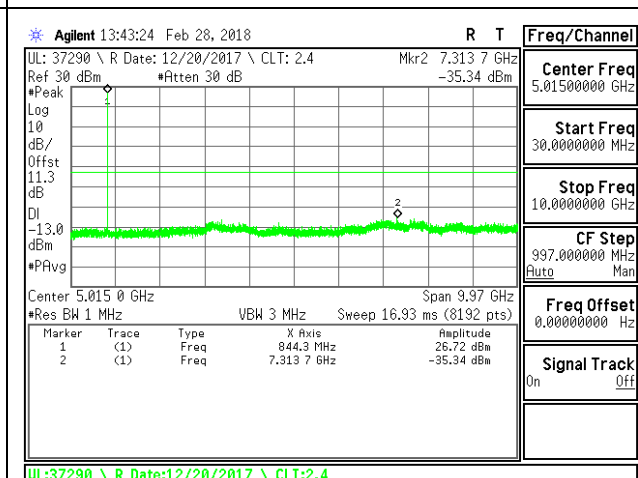
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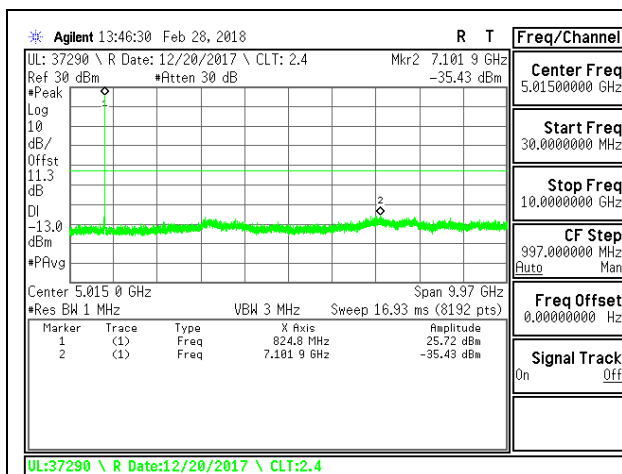
LTE B5 5MHz 16QAM Middle Channel RB1-0



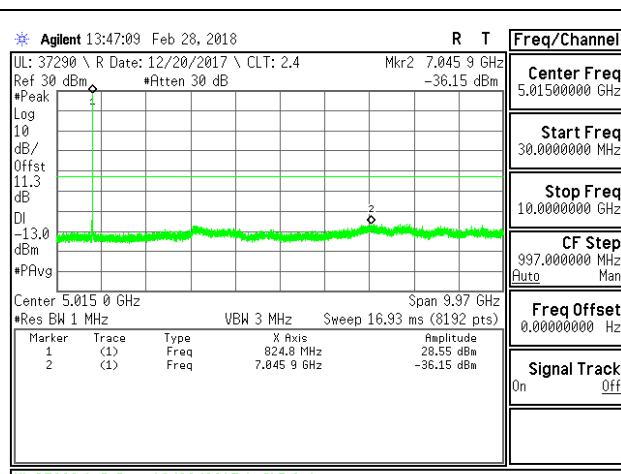
LTE B5 5MHz QPSK High Channel RB1-0



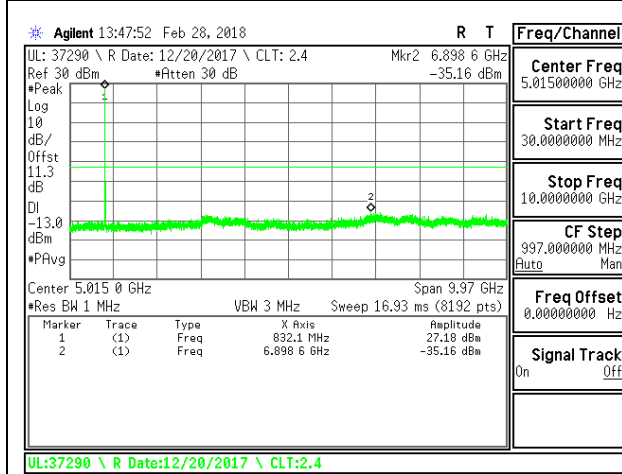
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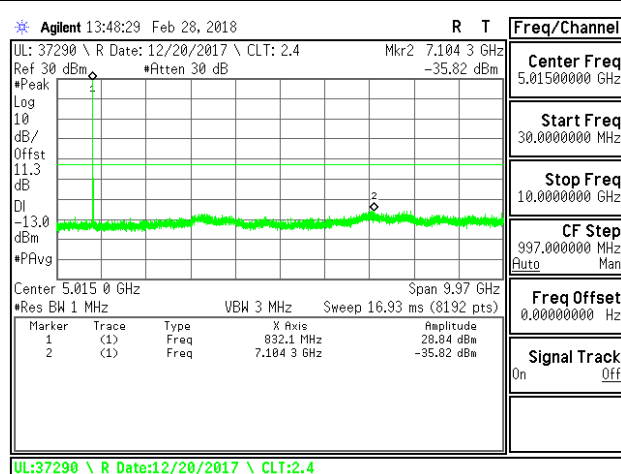
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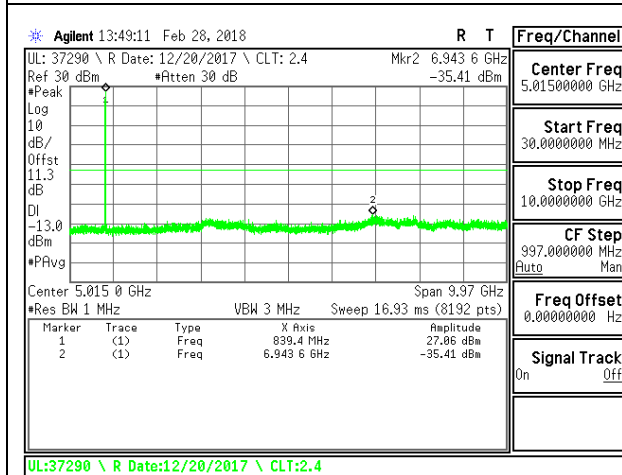
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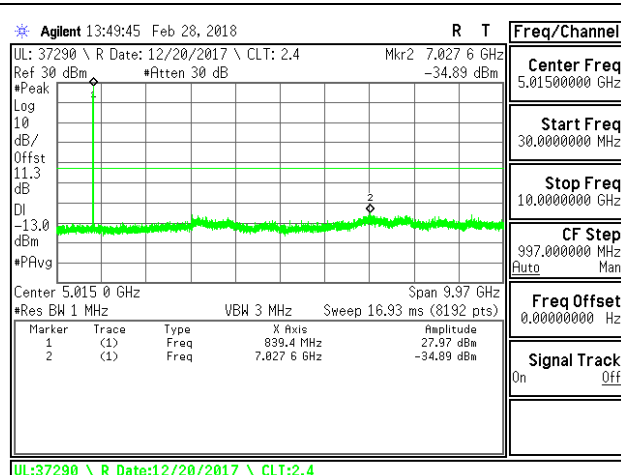
LTE B5 10MHz QPSK Middle Channel RB1-0



LTE B5 10MHz 16QAM Middle Channel RB1-0

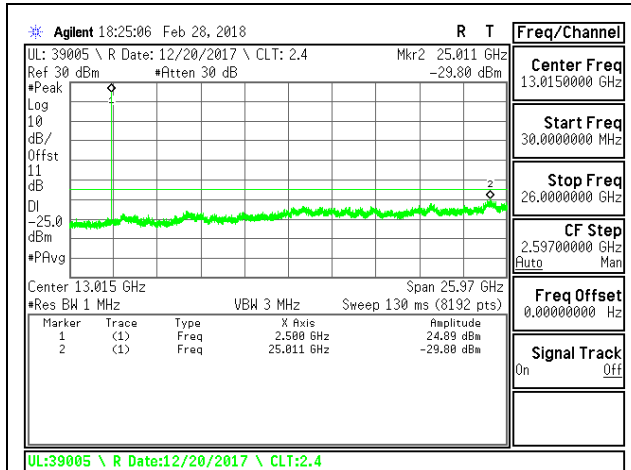


LTE B5 10MHz QPSK High Channel RB1-0

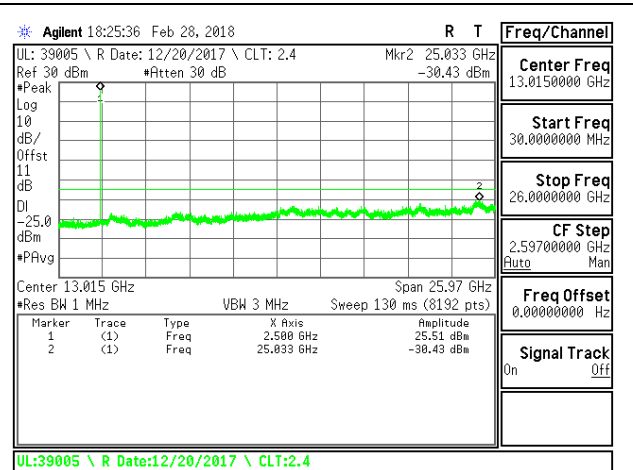


LTE B5 10MHz 16QAM High Channel RB1-0

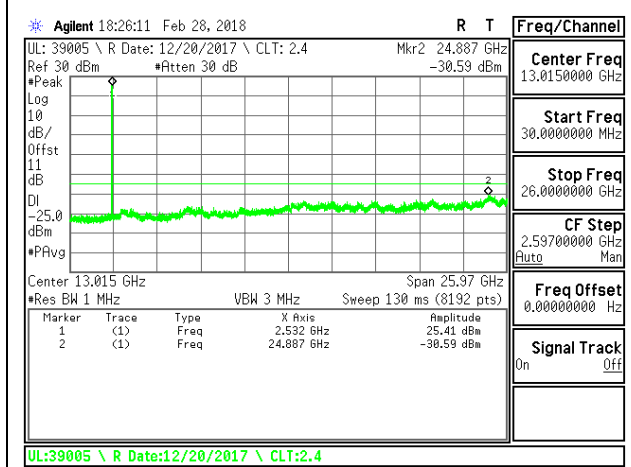
8.3.8. LTE BAND 7



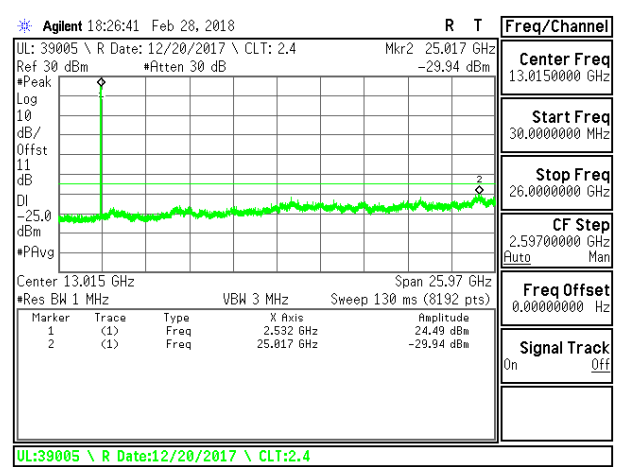
LTE B7 5MHz QPSK Low Channel RB1-0



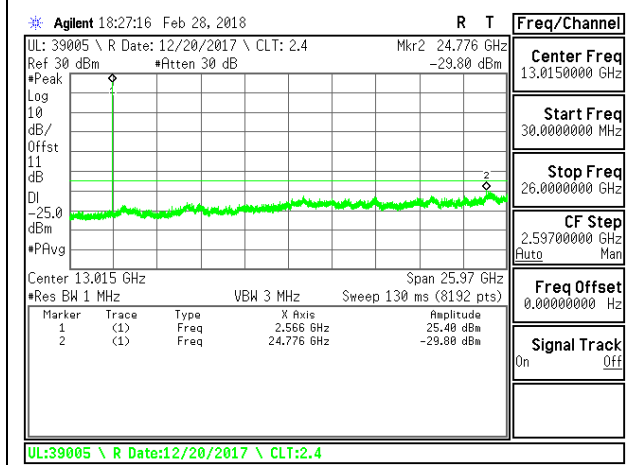
LTE B7 5MHz 16QAM Low Channel RB1-0



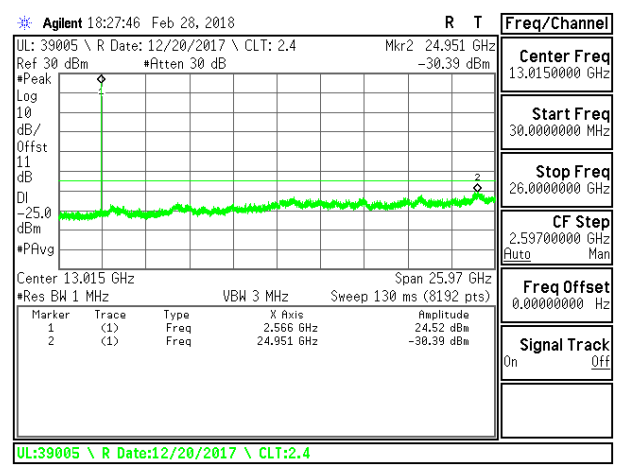
LTE B7 5MHz QPSK Middle Channel RB1-0



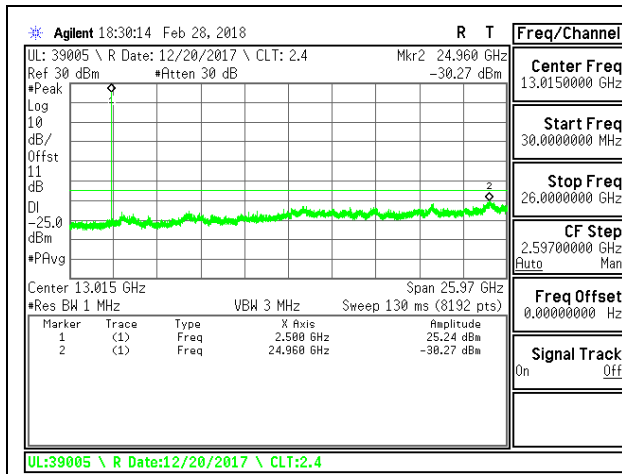
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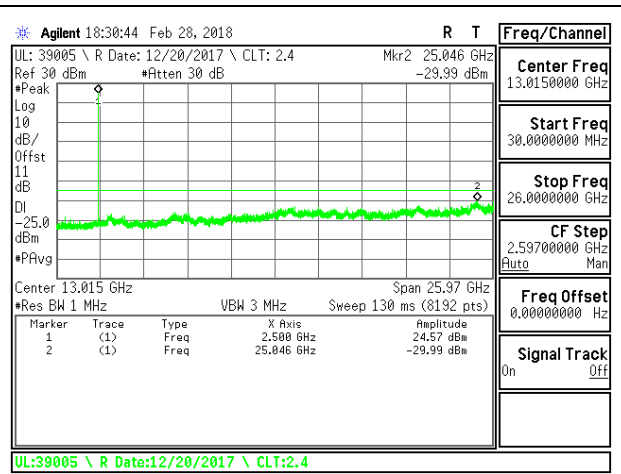
LTE B7 5MHz QPSK High Channel RB1-0



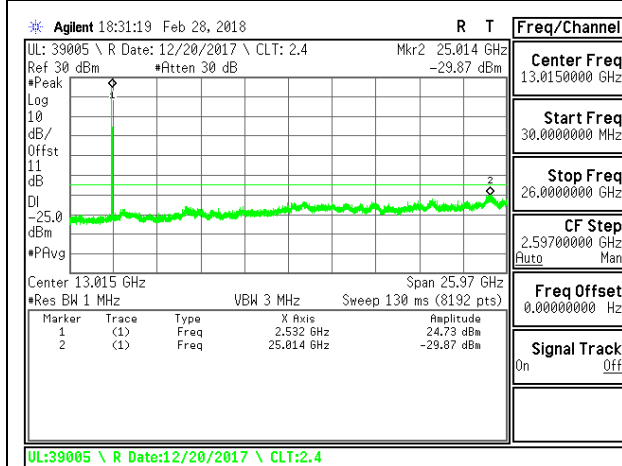
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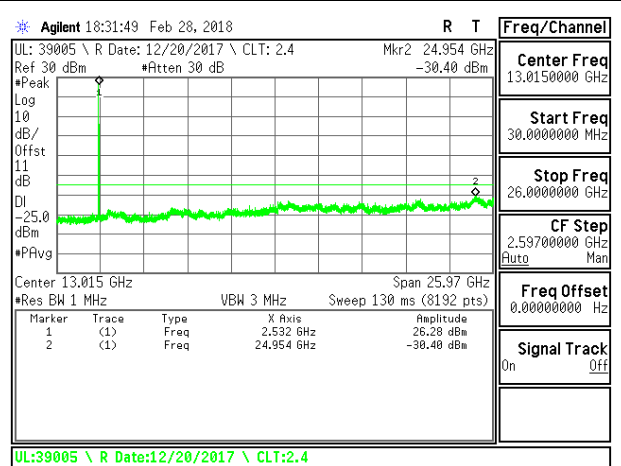
LTE B7 10MHz QPSK Low Channel RB1-0



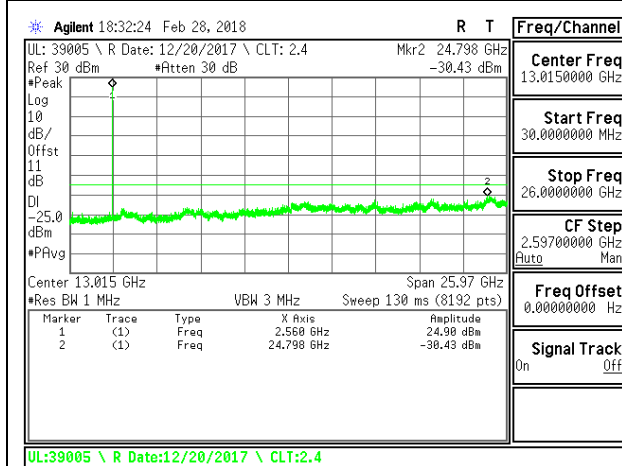
LTE B7 10MHz 16QAM Low Channel RB1-0



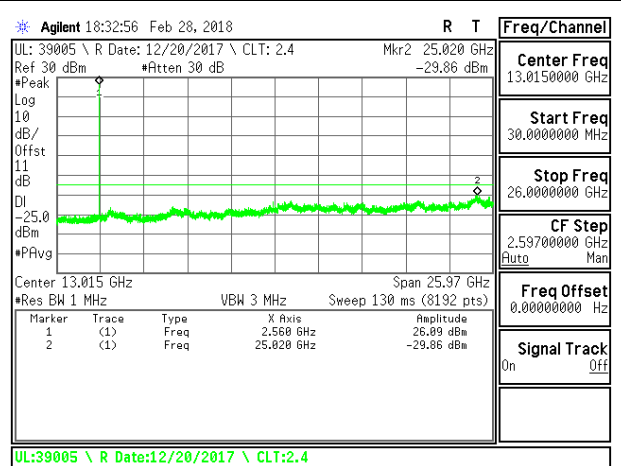
LTE B7 10MHz QPSK Middle Channel RB1-0



LTE B7 10MHz 16QAM Middle Channel RB1-0

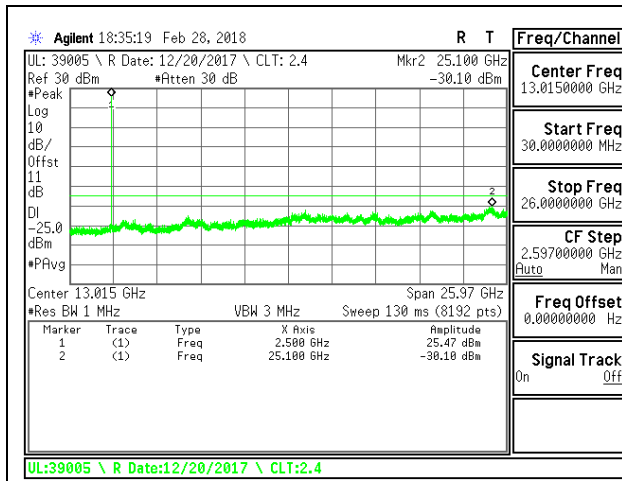


LTE B7 10MHz QPSK High Channel RB1-0

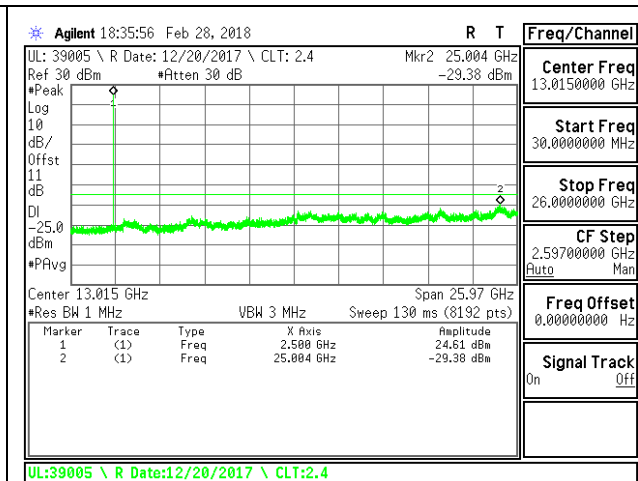


LTE B7 10MHz 16QAM High Channel RB1-0

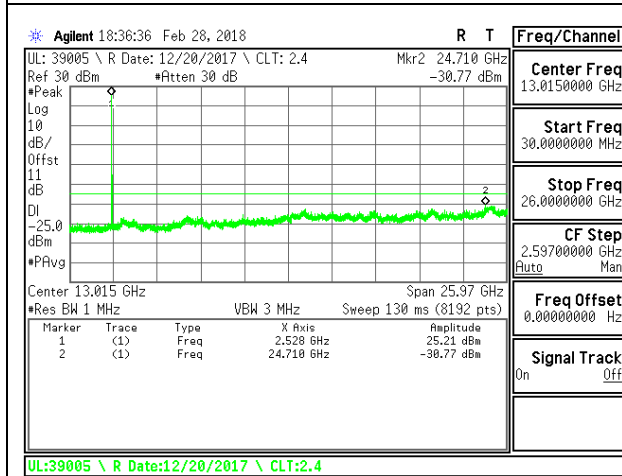




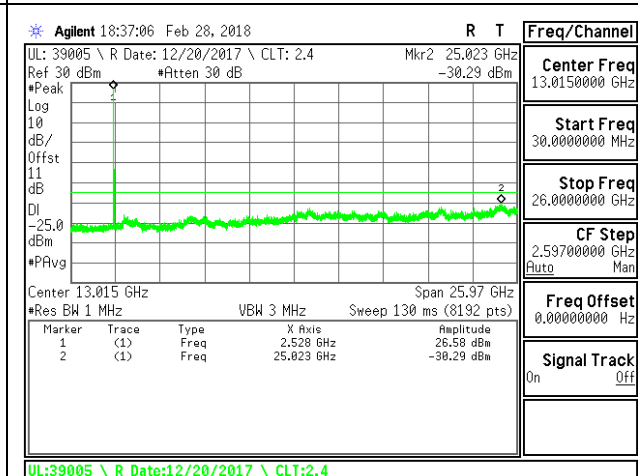
LTE B7 15MHz QPSK Low Channel RB1-0



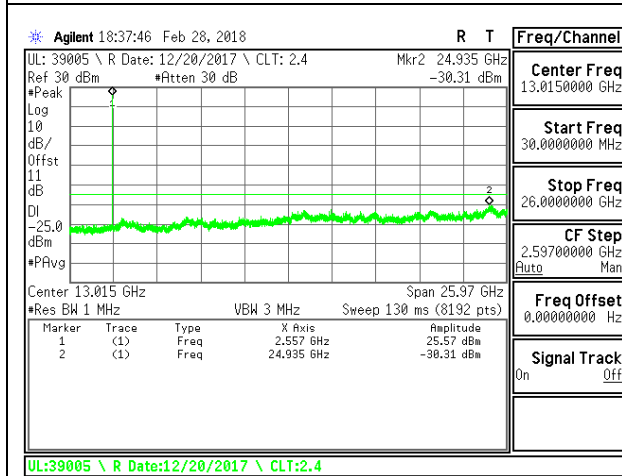
LTE B7 15MHz 16QAM Low Channel RB1-0



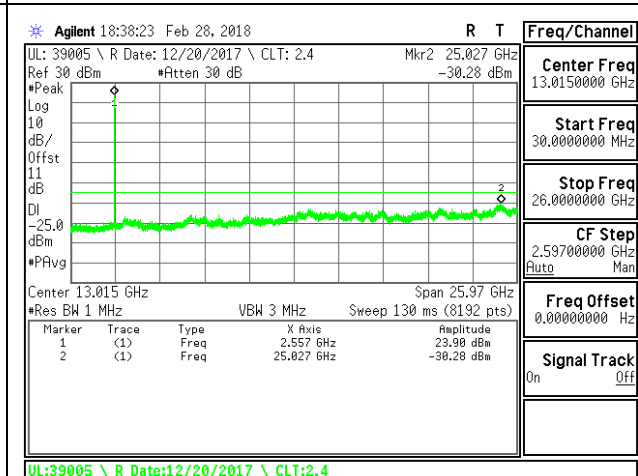
LTE B7 15MHz QPSK Middle Channel RB1-0



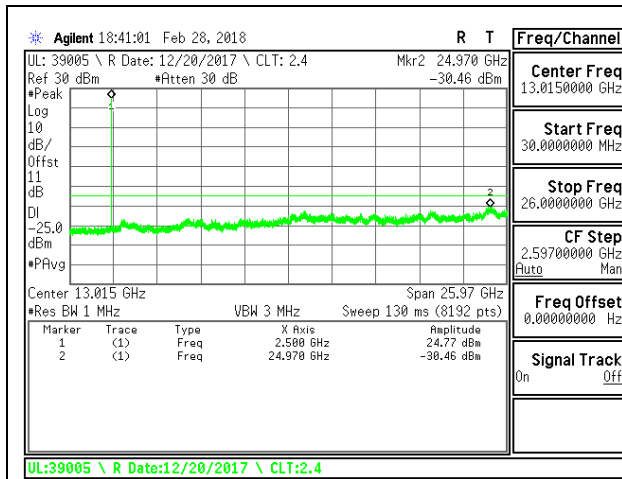
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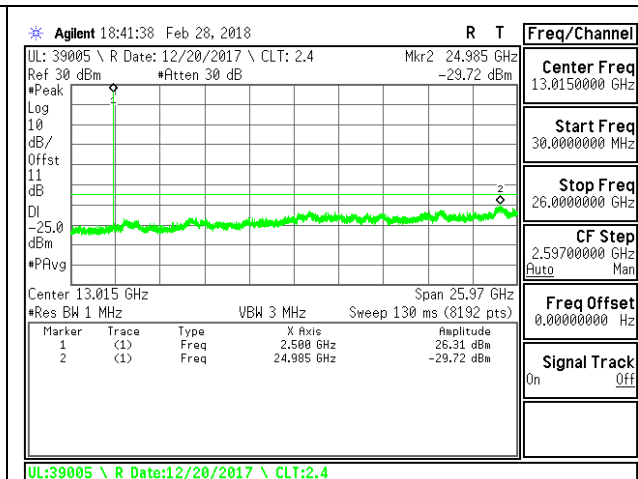
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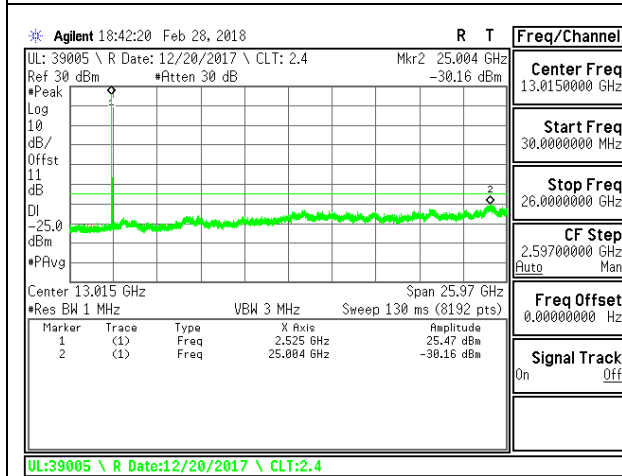
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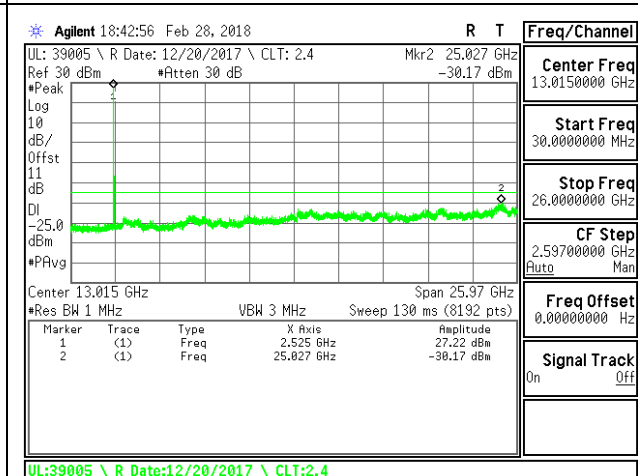
LTE B7 20MHz QPSK Low Channel RB1-0



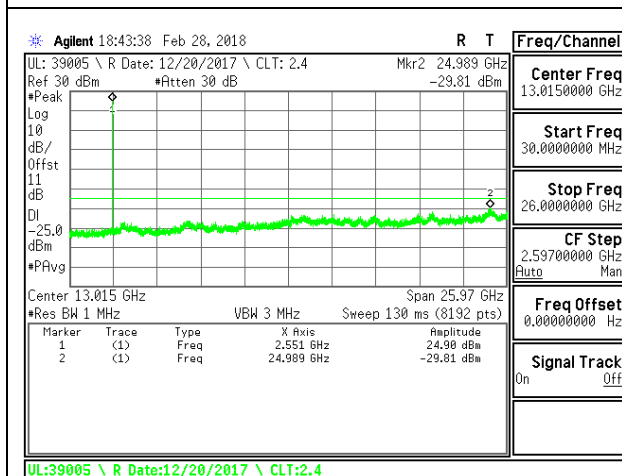
LTE B7 20MHz 16QAM Low Channel RB1-0



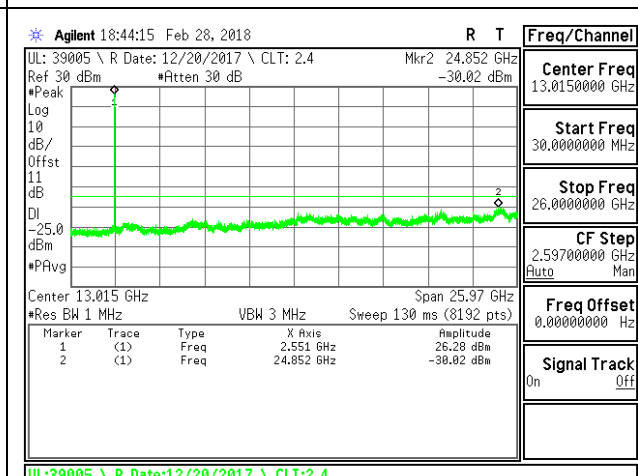
LTE B7 20MHz QPSK Middle Channel RB1-0



LTE B7 20MHz 16QAM Middle Channel RB1-0

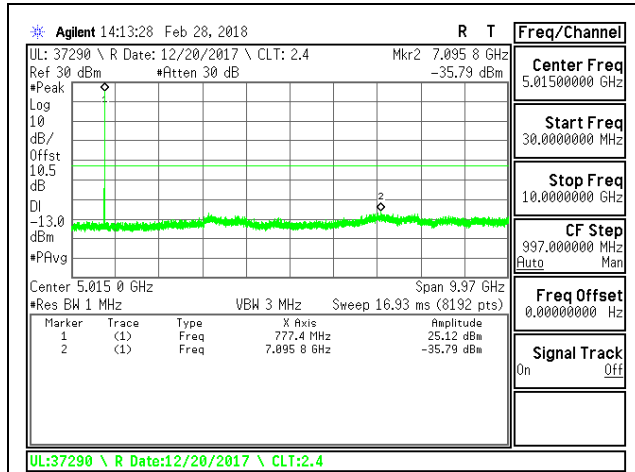


LTE B7 20MHz QPSK High Channel RB1-0

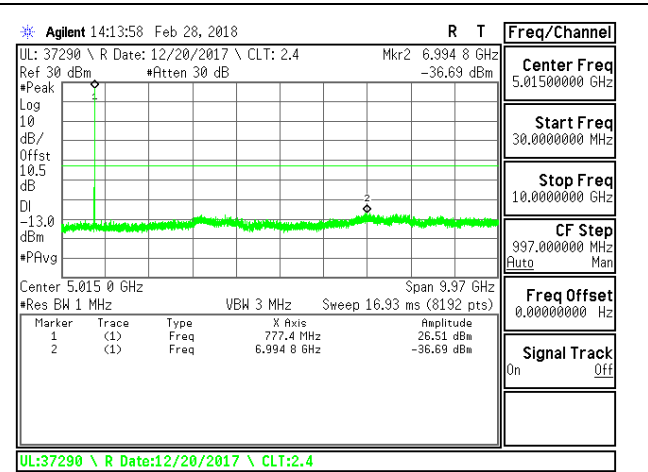


LTE B7 20MHz 16QAM High Channel RB1-0

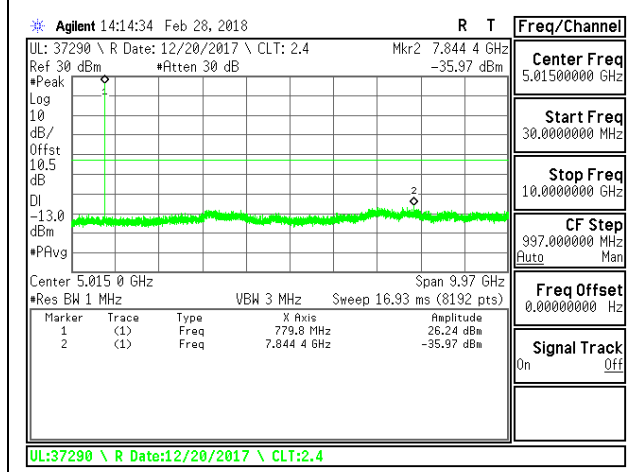
8.3.9. LTE BAND 13



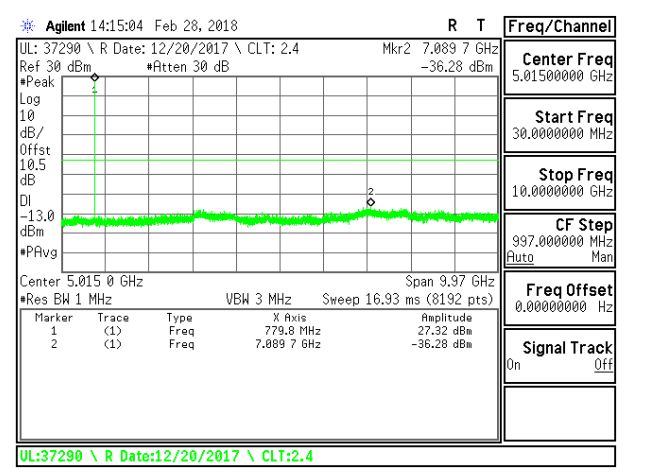
LTE B13 5MHz QPSK Low Channel RB1-0



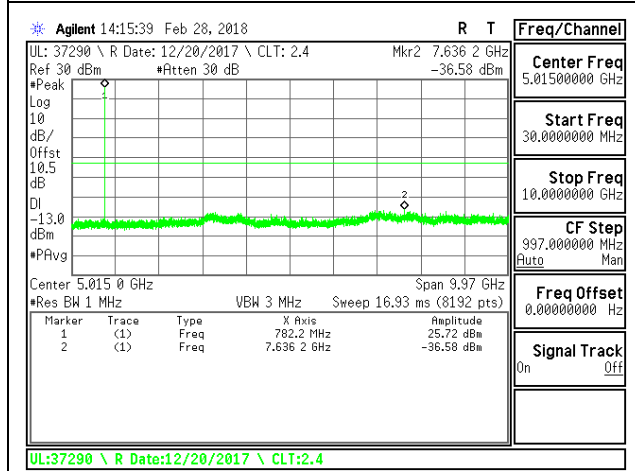
LTE B13 5MHz 16QAM Low Channel RB1-0



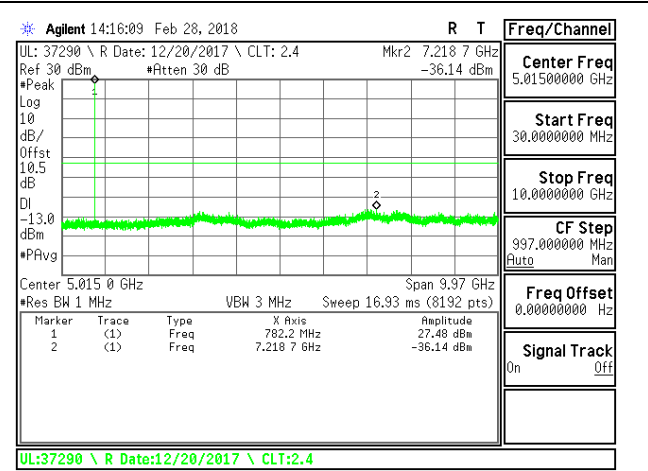
LTE B13 5MHz QPSK Middle Channel RB1-0



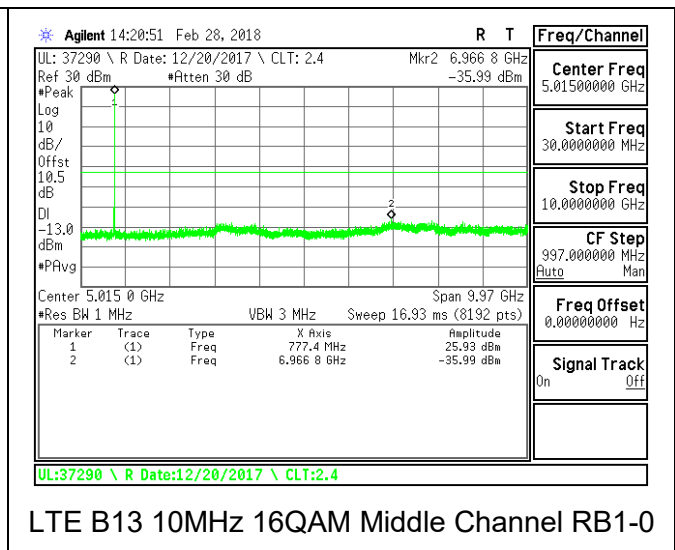
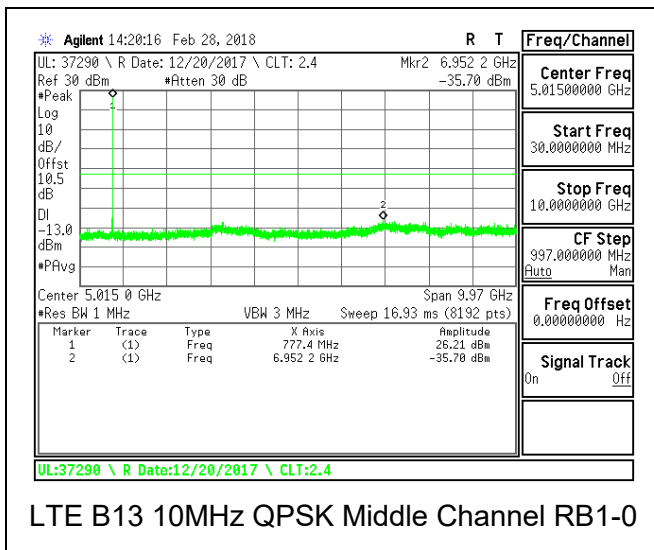
LTE B13 5MHz 16QAM Middle Channel RB1-0



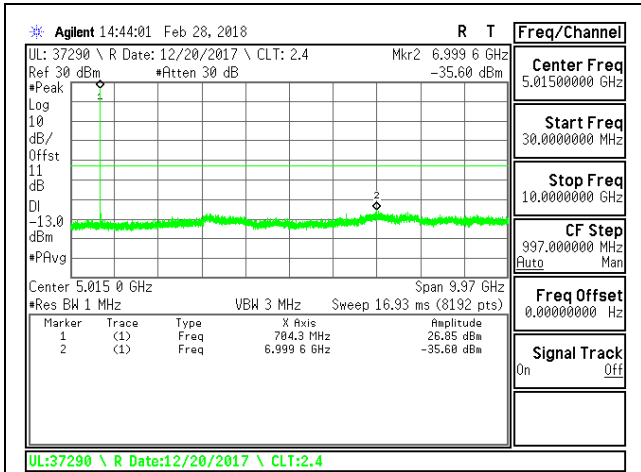
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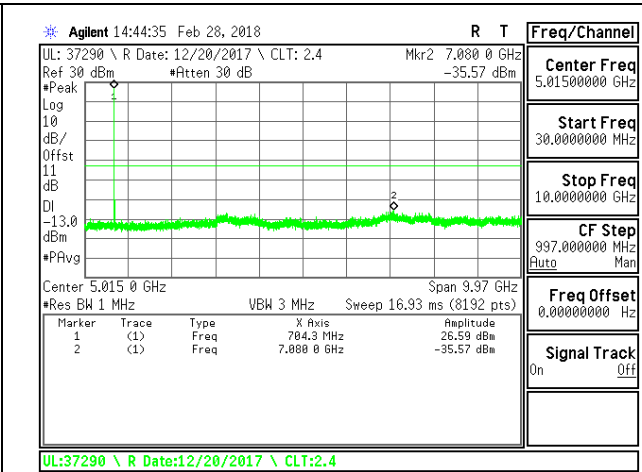
LTE B13 5MHz 16QAM High Channel RB1-0



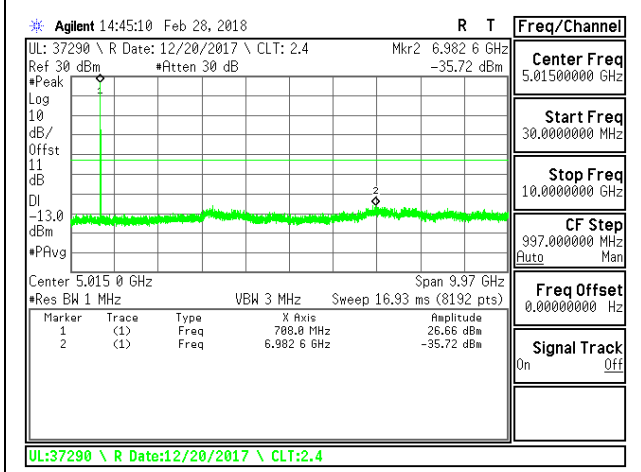
8.3.10. LTE BAND 17



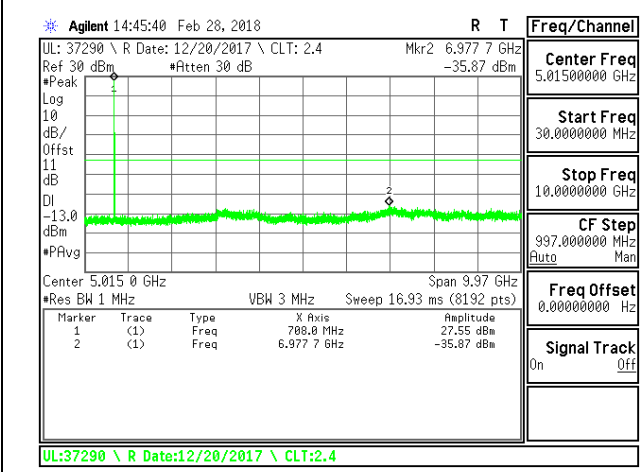
LTE B17 5MHz QPSK Low Channel RB1-0



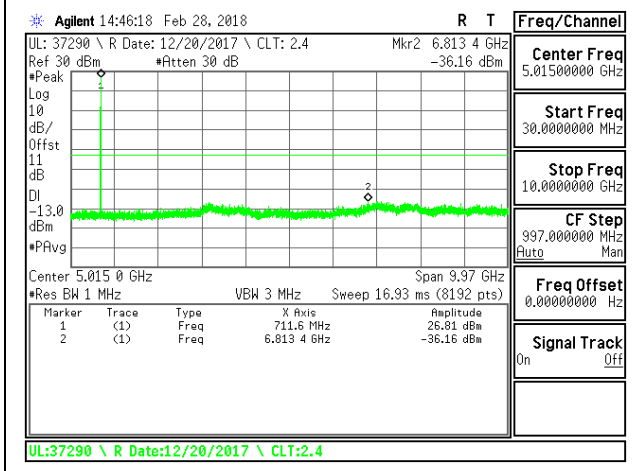
LTE B17 5MHz 16QAM Low Channel RB1-0



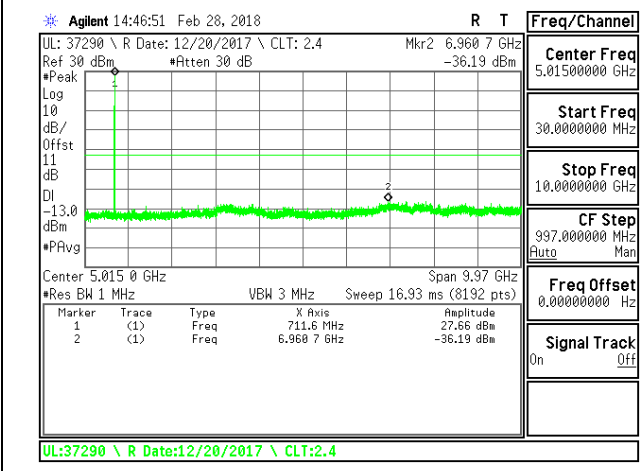
LTE B17 5MHz QPSK Middle Channel RB1-0



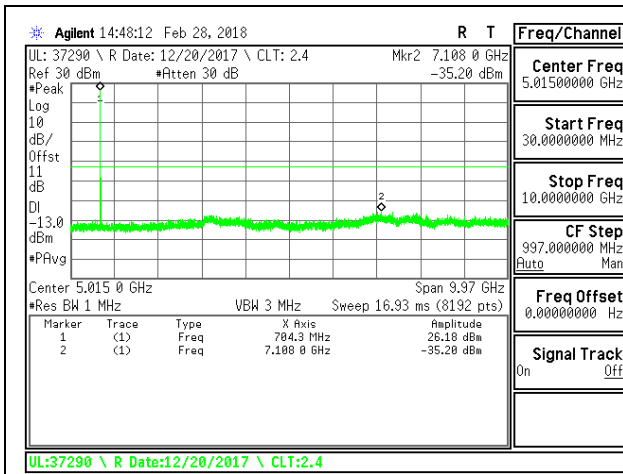
LTE B17 5MHz 16QAM Middle Channel RB1-0



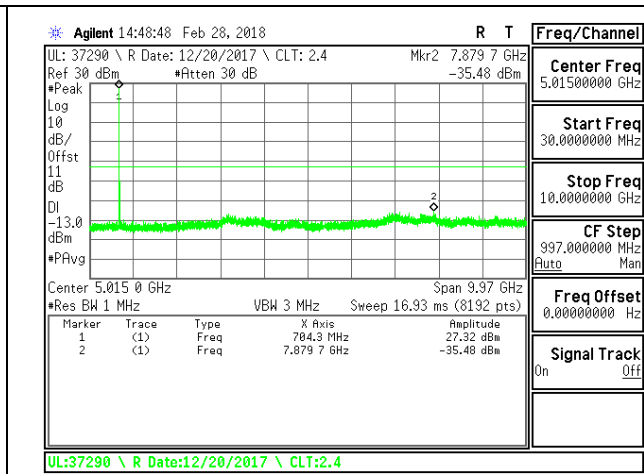
LTE B17 5MHz QPSK High Channel RB1-0



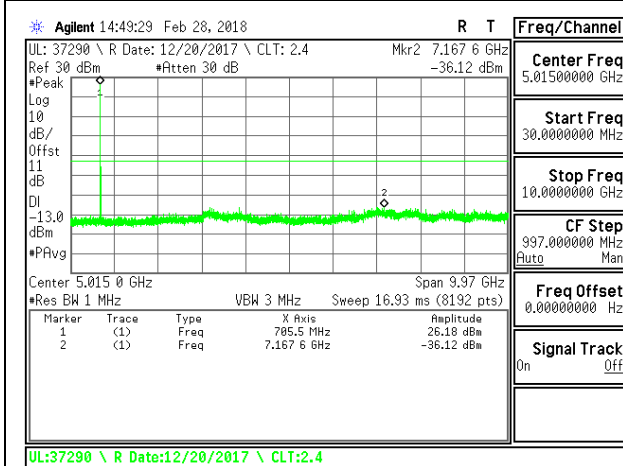
LTE B17 5MHz 16QAM High Channel RB1-0



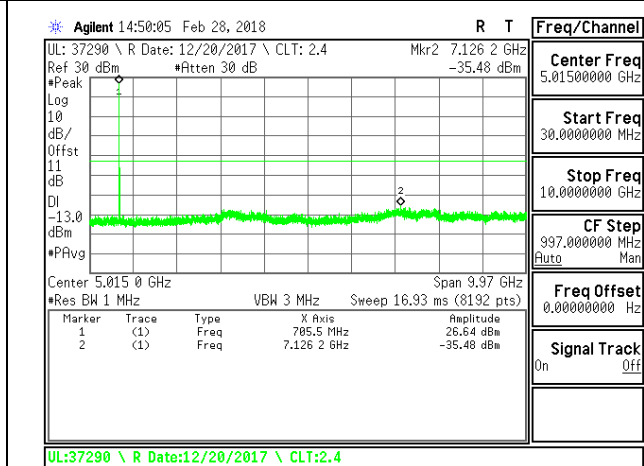
LTE B17 10MHz QPSK Low Channel RB1-0



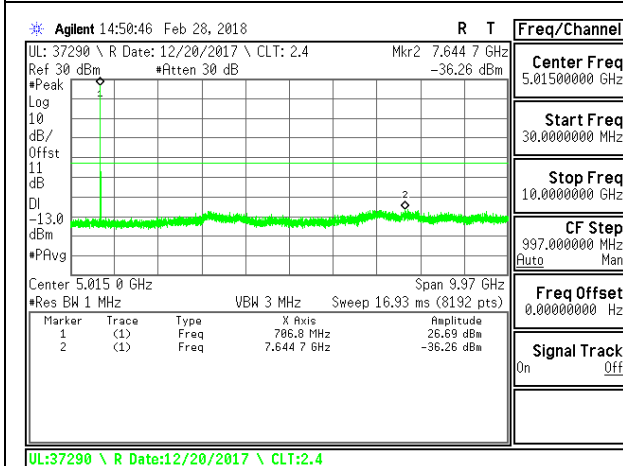
LTE B17 10MHz 16QAM Low Channel RB1-0



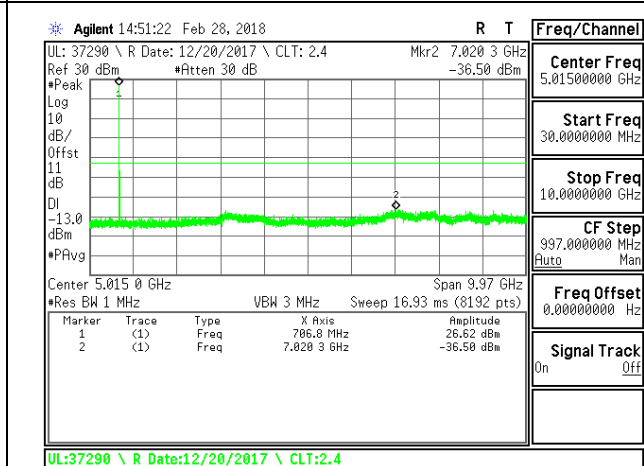
LTE B17 10MHz QPSK Middle Channel RB1-0



LTE B17 10MHz 16QAM Middle Channel RB1-0

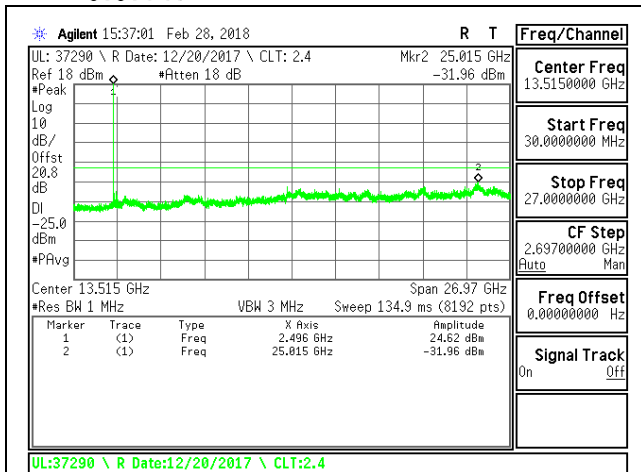


LTE B17 10MHz QPSK High Channel RB1-0

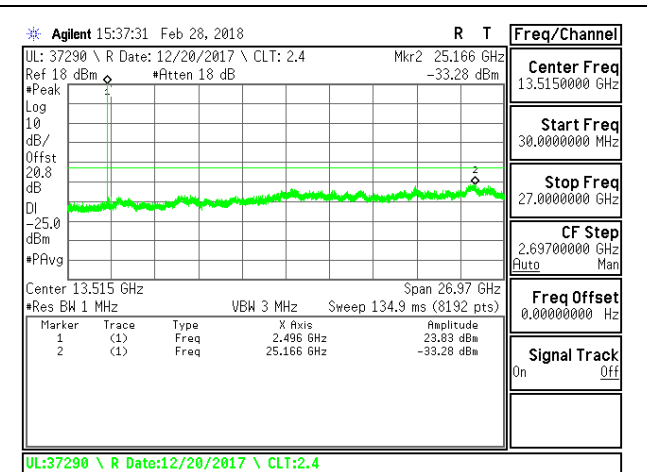


LTE B17 10MHz 16QAM High Channel RB1-0

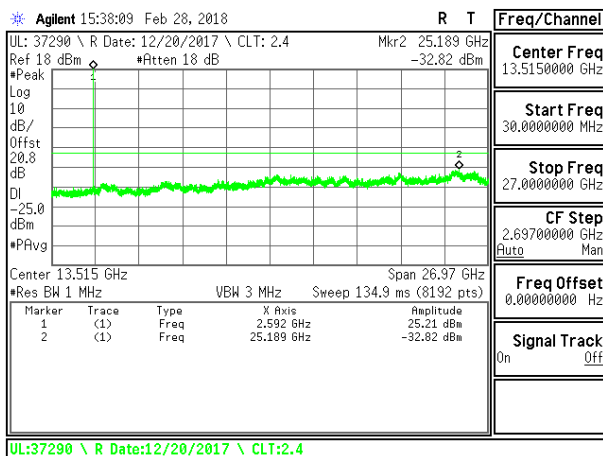
8.3.11. LTE BAND 41



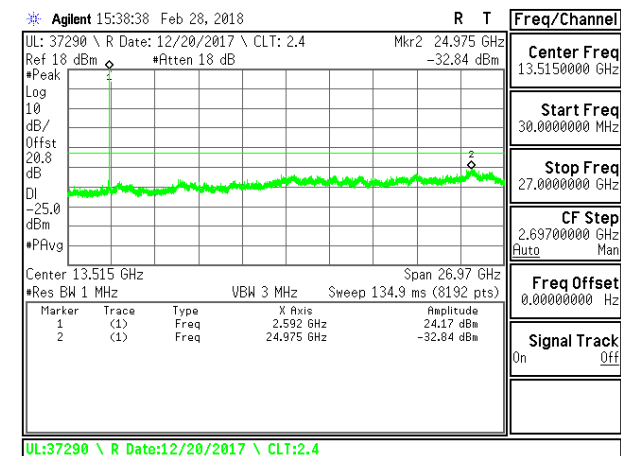
LTE B41 5MHz QPSK Low Channel RB1-0



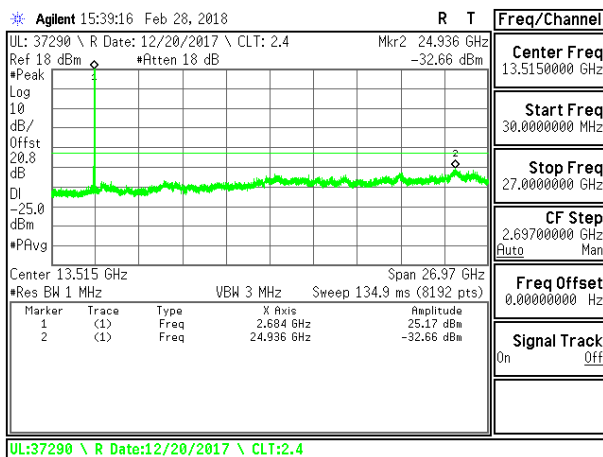
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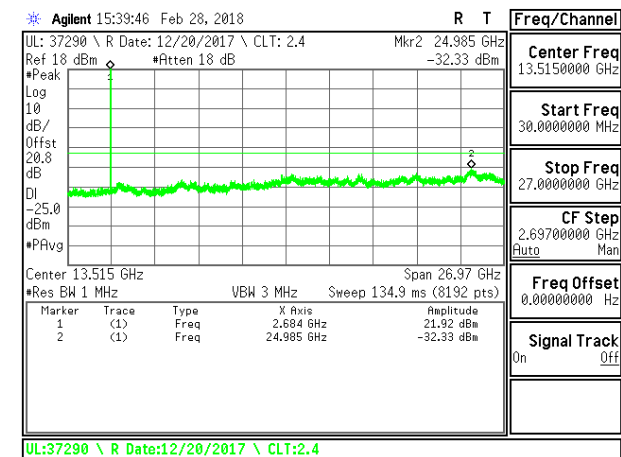
LTE B41 5MHz QPSK Middle Channel RB1-0



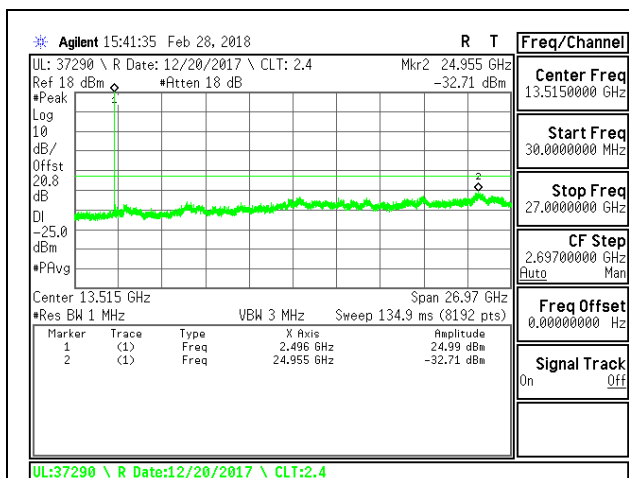
LTE B41 5MHz 16QAM Middle Channel RB1-0



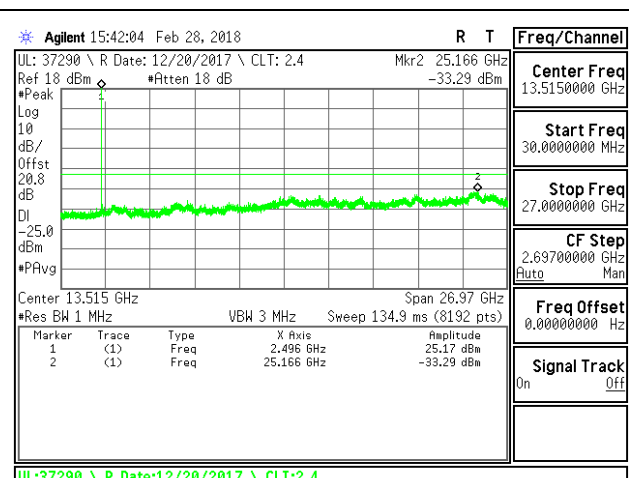
LTE B41 5MHz QPSK High Channel RB1-0



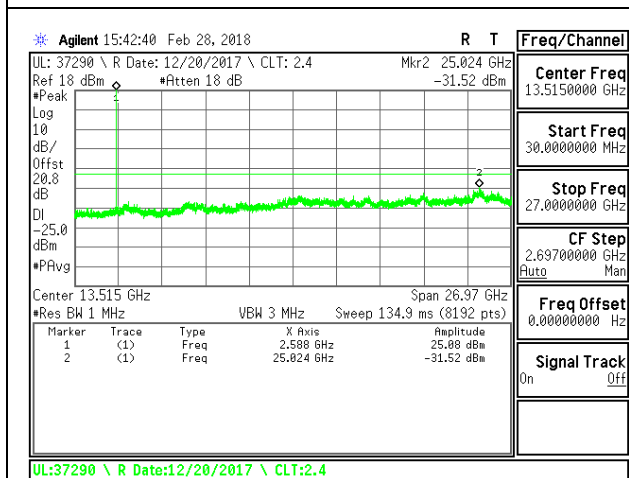
LTE B41 5MHz 16QAM High Channel RB1-0



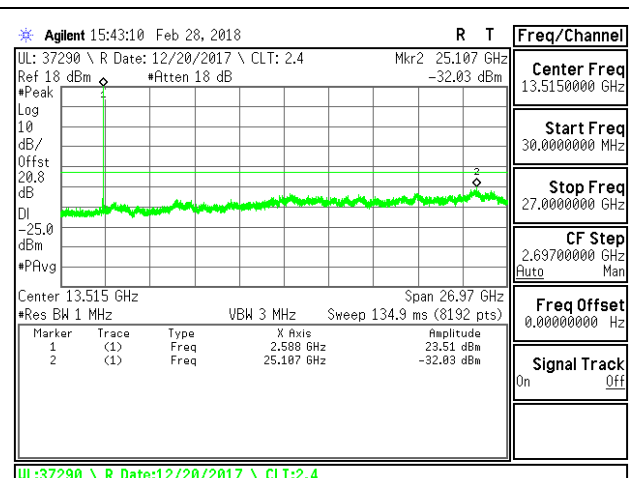
LTE B41 10MHz QPSK Low Channel RB1-0



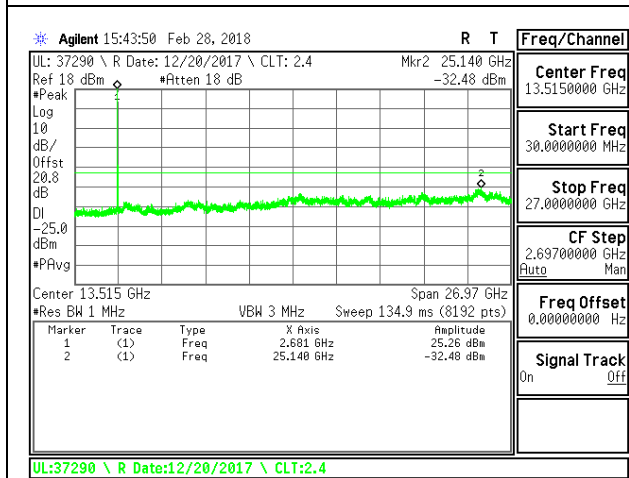
LTE B41 10MHz 16QAM Low Channel RB1-0



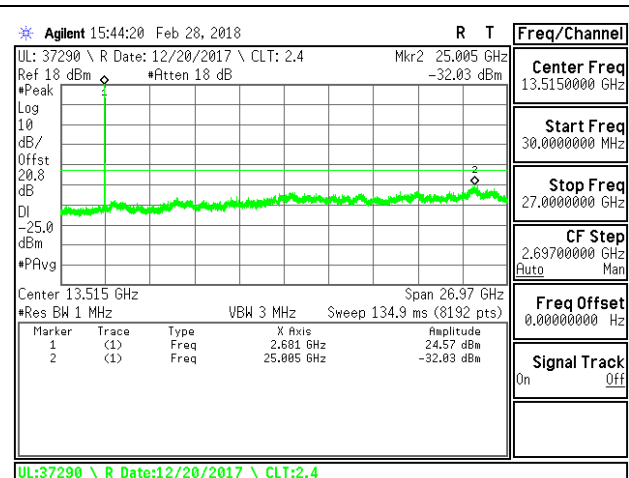
LTE B41 10MHz QPSK Middle Channel RB1-0



LTE B41 10MHz 16QAM Middle Channel RB1-0

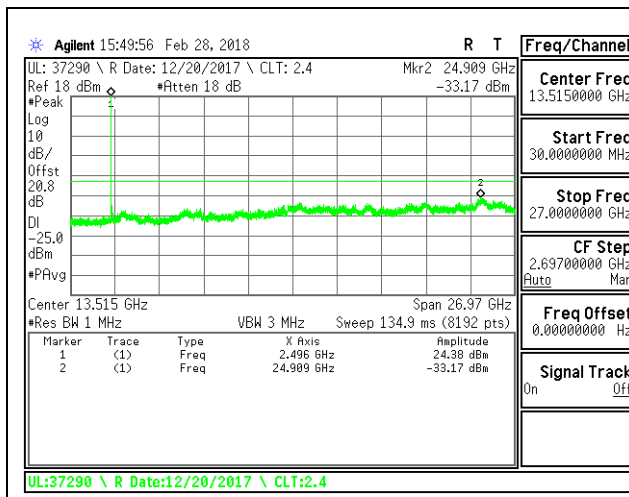


LTE B41 10MHz QPSK High Channel RB1-0

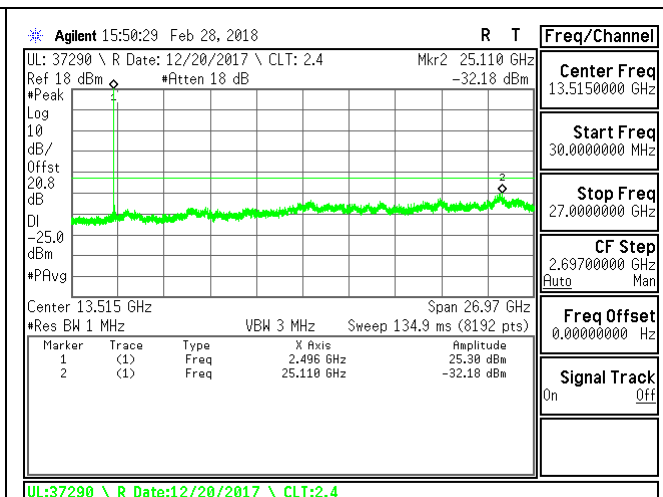


LTE B41 10MHz 16QAM High Channel RB1-0

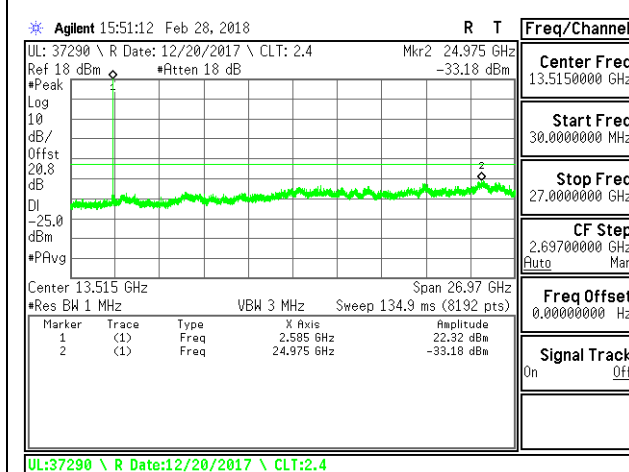




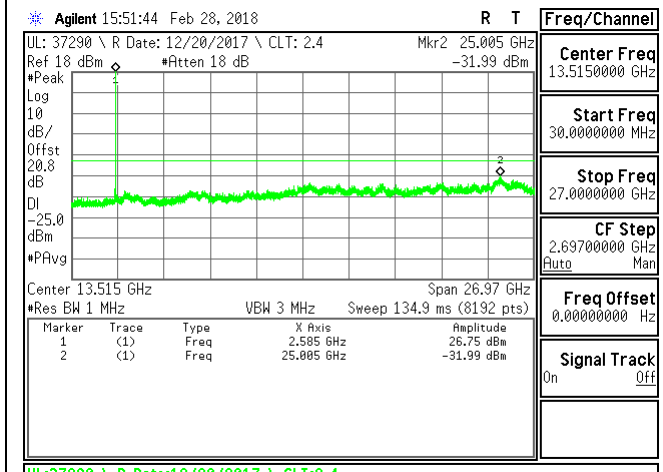
LTE B41 15MHz QPSK Low Channel RB1-0



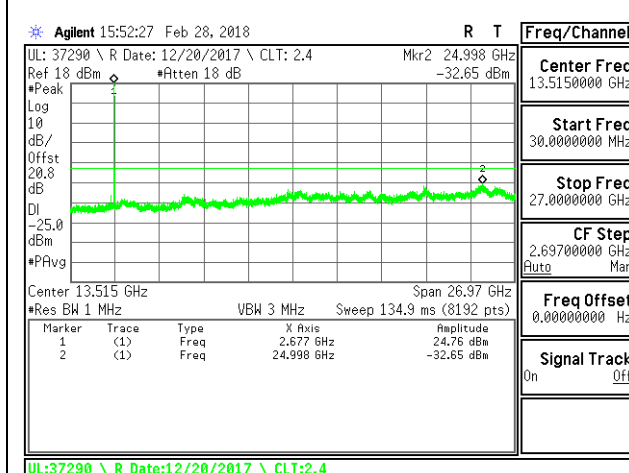
LTE B41 15MHz 16QAM Low Channel RB1-0



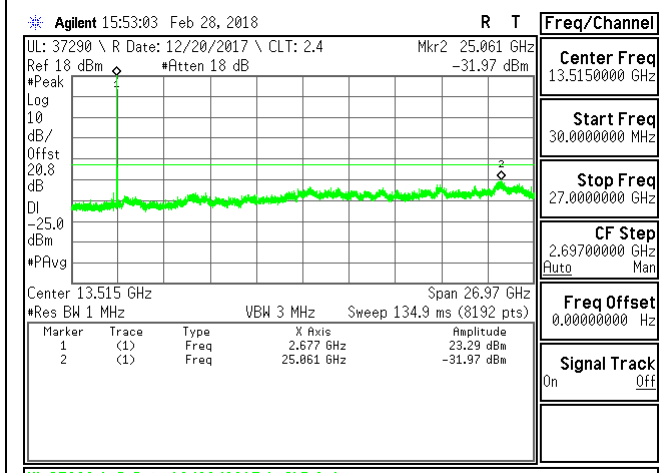
LTE B41 15MHz QPSK Middle Channel RB1-0



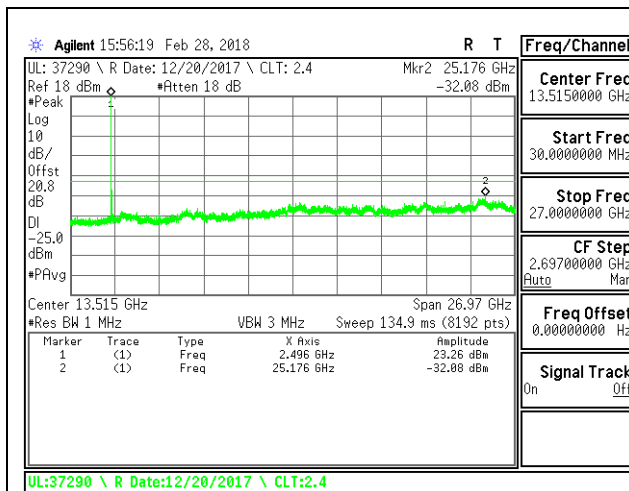
LTE B41 15MHz 16QAM Middle Channel RB1-0



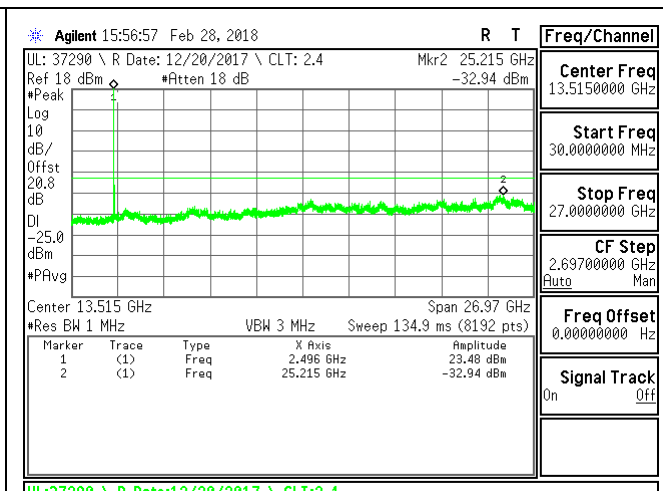
LTE B41 15MHz QPSK High Channel RB1-0



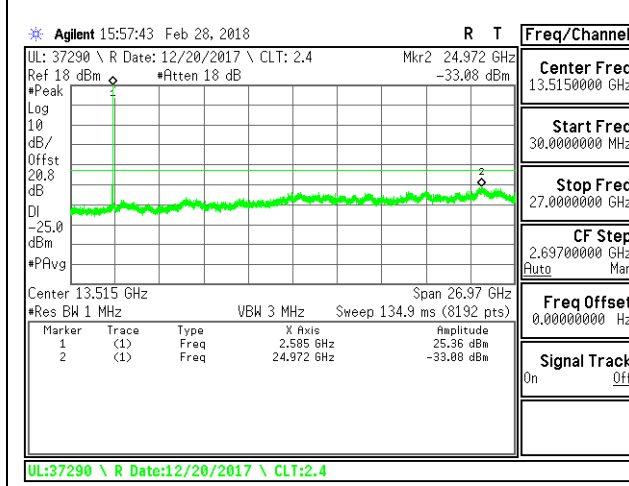
LTE B41 15MHz 16QAM High Channel RB1-0



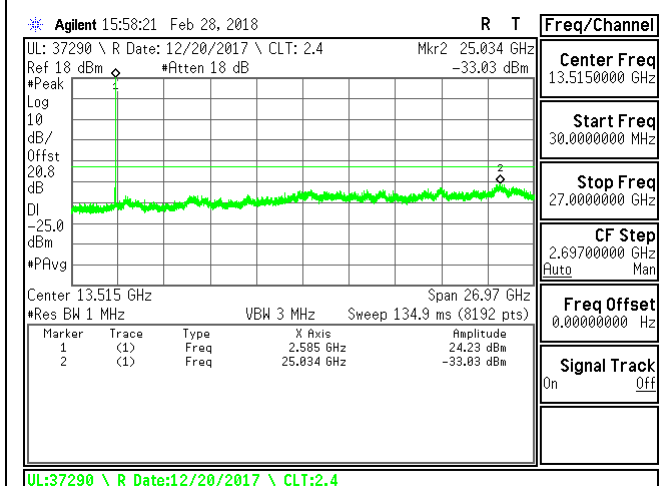
LTE B41 20MHz QPSK Low Channel RB1-0



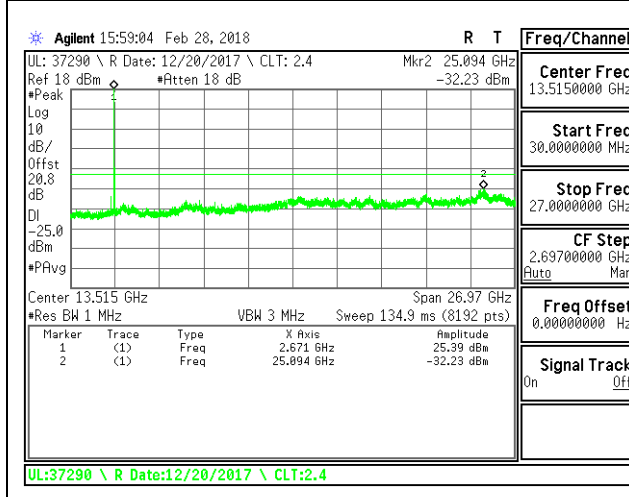
LTE B41 20MHz 16QAM Low Channel RB1-0



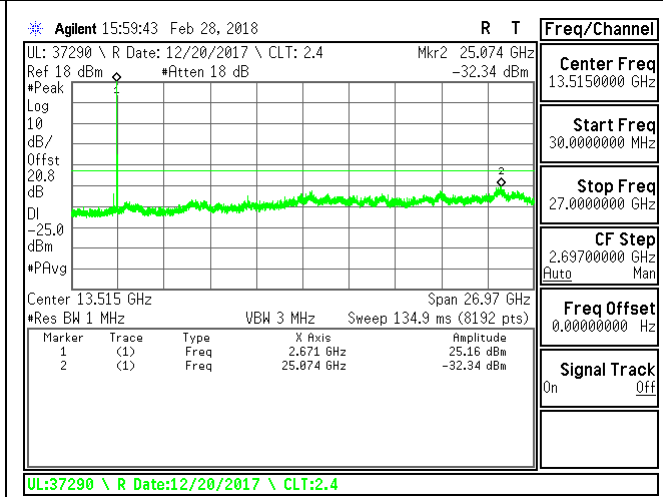
LTE B41 20MHz QPSK Middle Channel RB1-0



LTE B41 20MHz 16QAM Middle Channel RB1-0



LTE B41 20MHz QPSK High Channel RB1-0



LTE B41 20MHz 16QAM High Channel RB1-0

## **8.4. FREQUENCY STABILITY**

### **RULE PART(S)**

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

### **LIMITS**

FCC §22.355

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

FCC §24.235 & §27.54

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

### **TEST PROCEDURE**

Use CMW 500 with Frequency Error measurement capability.

- Temp. =  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$
- Voltage = (85% - 115%)
- Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC. End Voltage, 3.2VDC.

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

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

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

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

### **MODES TESTED**

- GSM1900
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 13
- LTE Band 17
- LTE Band 41

### **RESULTS**

See the following pages.

**Note(s):**

**GSM 850 Band Measured Results**

GSM 850 (Frequency range: 824-849 MHz) is covered by LTE Band 5 (Frequency range: 824-849 MHz) no testing is necessary due to overlapping frequency range.

**WCDMA Band 5 Measured Results**

WCDMA Band 5 (Frequency range: 824-84 MHz) is covered by LTE Band 5 (Frequency range: 824-849 MHz) no testing is necessary due to overlapping frequency range.

**WCDMA Band 2 Measured Results**

WCDMA Band 2 (Frequency range: 1850-1910 MHz) is covered by LTE Band 2 (Frequency range: 1850-1910 MHz) no testing is necessary due to overlapping frequency range.

**WCDMA Band 4 Measured Results**

WCDMA Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 4 (Frequency range: 1710-1755 MHz) no testing is necessary due to overlapping frequency range.

8.4.1. GSM 1900

Reference Frequency: GSM1900 Mid Channel 1880 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	1880.000017	-0.002	2.5
3.85	40	1880.000017	-0.002	2.5
3.85	30	1880.000015	-0.001	2.5
<b>3.85</b>	<b>20</b>	<b>1880.000013</b>	<b>0</b>	<b>2.5</b>
3.85	10	1880.000013	0.000	2.5
3.85	0	1880.000012	0.001	2.5
3.85	-10	1880.000013	0.000	2.5
3.85	-20	1880.000013	0.000	2.5
3.85	-30	1880.000014	-0.001	2.5

Reference Frequency: GSM1900 Mid Channel 1880 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.85</b>	<b>25</b>	<b>1880.000013</b>	<b>0</b>	<b>2.5</b>
4.25	25	1880.000015	-0.001	2.5
3.65	25	1880.000016	-0.002	2.5

8.4.2. LTE BAND 4

Reference Frequency: LTE Band 4 Mid Channel 1732.5 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	1732.500014	-0.001	2.5
3.85	40	1732.500013	-0.001	2.5
3.85	30	1732.500013	-0.001	2.5
<b>3.85</b>	<b>20</b>	<b>1732.500012</b>	<b>0</b>	<b>2.5</b>
3.85	10	1732.500011	0.000	2.5
3.85	0	1732.500010	0.001	2.5
3.85	-10	1732.500011	0.000	2.5
3.85	-20	1732.500010	0.001	2.5
3.85	-30	1732.500010	0.001	2.5

Reference Frequency: LTE Band 4 Mid Channel 1732.5 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 4331.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.85</b>	<b>25</b>	<b>1732.500012</b>	<b>0</b>	<b>2.5</b>
4.25	25	1732.500010	0.001	2.5
3.65	25	1732.500010	0.001	2.5

8.4.3. LTE BAND 5

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	836.499993	0.001	2.5
3.85	40	836.499993	0.001	2.5
3.85	30	836.499993	0.001	2.5
<b>3.85</b>	<b>20</b>	<b>836.499994</b>	<b>0</b>	<b>2.5</b>
3.85	10	836.499993	0.001	2.5
3.85	0	836.499995	-0.001	2.5
3.85	-10	836.499995	-0.001	2.5
3.85	-20	836.499994	-0.001	2.5
3.85	-30	836.499995	-0.002	2.5

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.85</b>	<b>25</b>	<b>836.499994</b>	<b>0</b>	<b>2.5</b>
4.25	25	836.499994	0.000	2.5
3.65	25	836.499993	0.001	2.5

8.4.4. LTE BAND 7

Reference Frequency: LTE Band 7 Mid Channel 2535 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 6337.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	2535.000016	-0.002	2.5
3.85	40	2535.000014	-0.001	2.5
3.85	30	2535.000012	0.000	2.5
<b>3.85</b>	<b>20</b>	<b>2535.000012</b>	<b>0</b>	<b>2.5</b>
3.85	10	2535.000012	0.000	2.5
3.85	0	2535.000012	0.000	2.5
3.85	-10	2535.000014	-0.001	2.5
3.85	-20	2535.000014	-0.001	2.5
3.85	-30	2535.000014	-0.001	2.5

Reference Frequency: LTE Band 7 Mid Channel 2535 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 6337.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.85</b>	<b>25</b>	<b>2535.000012</b>	<b>0</b>	<b>2.5</b>
4.25	25	2535.000013	0.000	2.5
3.65	25	2535.000013	-0.001	2.5

**8.4.5. LTE BAND 13**

Reference Frequency: LTE Band 13 Mid Channel 782 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	781.999994	-0.001	2.5
3.85	40	781.999993	0.000	2.5
3.85	30	781.999993	0.000	2.5
<b>3.85</b>	<b>20</b>	<b>781.999993</b>	<b>0</b>	<b>2.5</b>
3.85	10	781.999992	0.001	2.5
3.85	0	781.999992	0.002	2.5
3.85	-10	781.999992	0.002	2.5
3.85	-20	781.999995	-0.002	2.5
3.85	-30	781.999995	-0.002	2.5

Reference Frequency: LTE Band 13 Mid Channel 782 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 1955.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.85</b>	<b>25</b>	<b>781.999993</b>	<b>0</b>	<b>2.5</b>
4.25	25	781.999993	0.000	2.5
3.65	25	781.999992	0.001	2.5

**8.4.6. LTE BAND 17**

Reference Frequency: LTE Band 17 Mid Channel 710 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	710.000011	-0.003	2.5
3.85	40	710.000010	-0.001	2.5
3.85	30	710.000008	0.001	2.5
<b>3.85</b>	<b>20</b>	<b>710.000009</b>	<b>0</b>	<b>2.5</b>
3.85	10	710.000010	-0.001	2.5
3.85	0	710.000010	0.000	2.5
3.85	-10	710.000009	0.000	2.5
3.85	-20	710.000007	0.003	2.5
3.85	-30	710.000007	0.004	2.5

Reference Frequency: LTE Band 17 Mid Channel 710 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 1775.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.85</b>	<b>25</b>	<b>710.000009</b>	<b>0</b>	<b>2.5</b>
4.25	25	710.000007	0.002	2.5
3.65	25	710.000008	0.001	2.5

8.4.7. LTE BAND 41

Reference Frequency: LTE Band 41 Mid Channel 2593 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 6482.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	2593.000016	0.000	2.5
3.85	40	2592.999984	0.012	2.5
3.85	30	2593.000014	0.001	2.5
<b>3.85</b>	<b>20</b>	<b>2593.000016</b>	<b>0</b>	<b>2.5</b>
3.85	10	2593.000016	0.000	2.5
3.85	0	2593.000021	-0.002	2.5
3.85	-10	2593.000019	-0.001	2.5
3.85	-20	2593.000015	0.000	2.5
3.85	-30	2593.000014	0.001	2.5

Reference Frequency: LTE Band 41 Mid Channel 2593 MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 6482.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	25	2593.000016	0	2.5
4.25	25	2593.000019	-0.001	2.5
3.65	25	2593.000020	-0.002	2.5



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## 8.5. PEAK TO AVERAGE RATIO

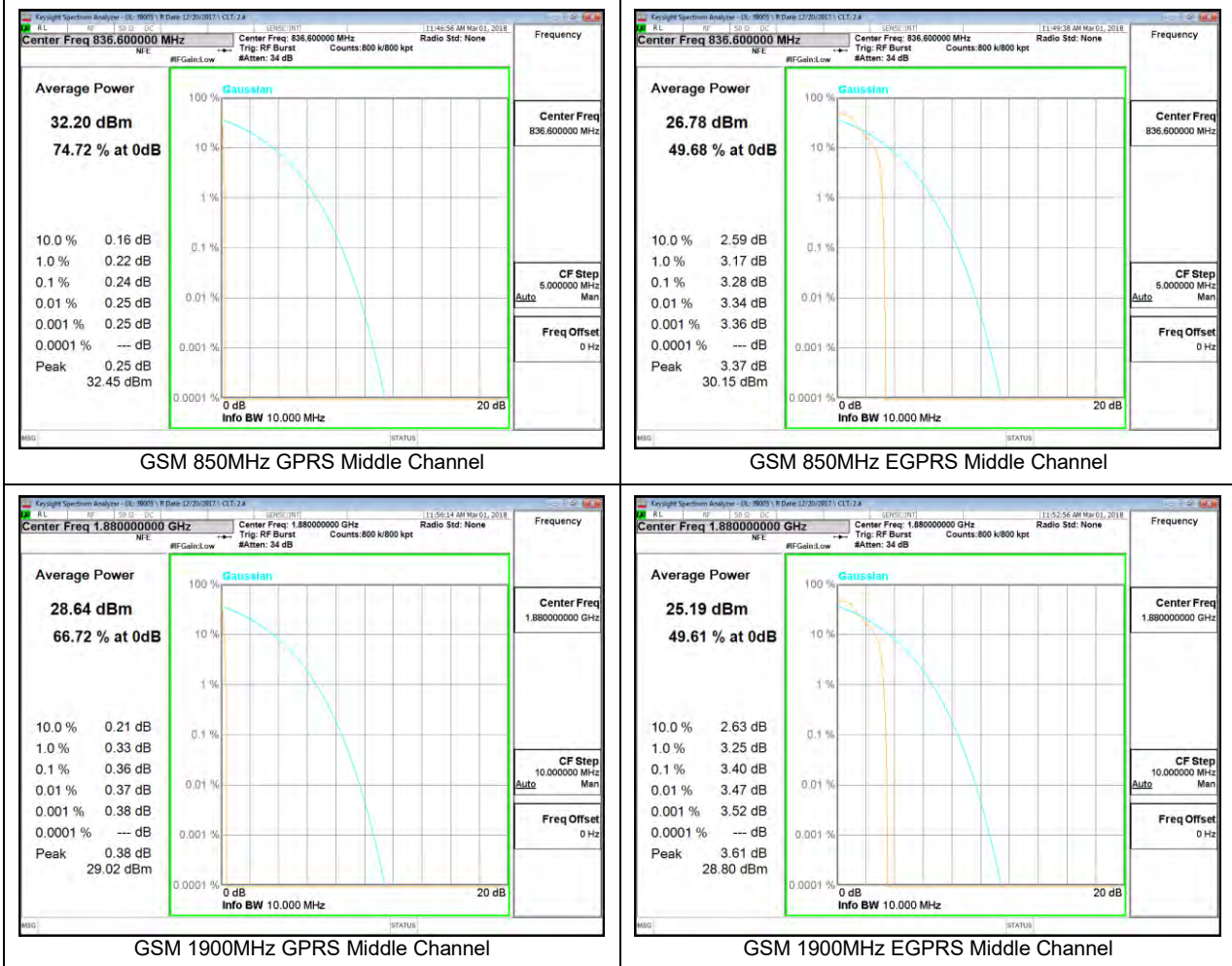
### LIMITS

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

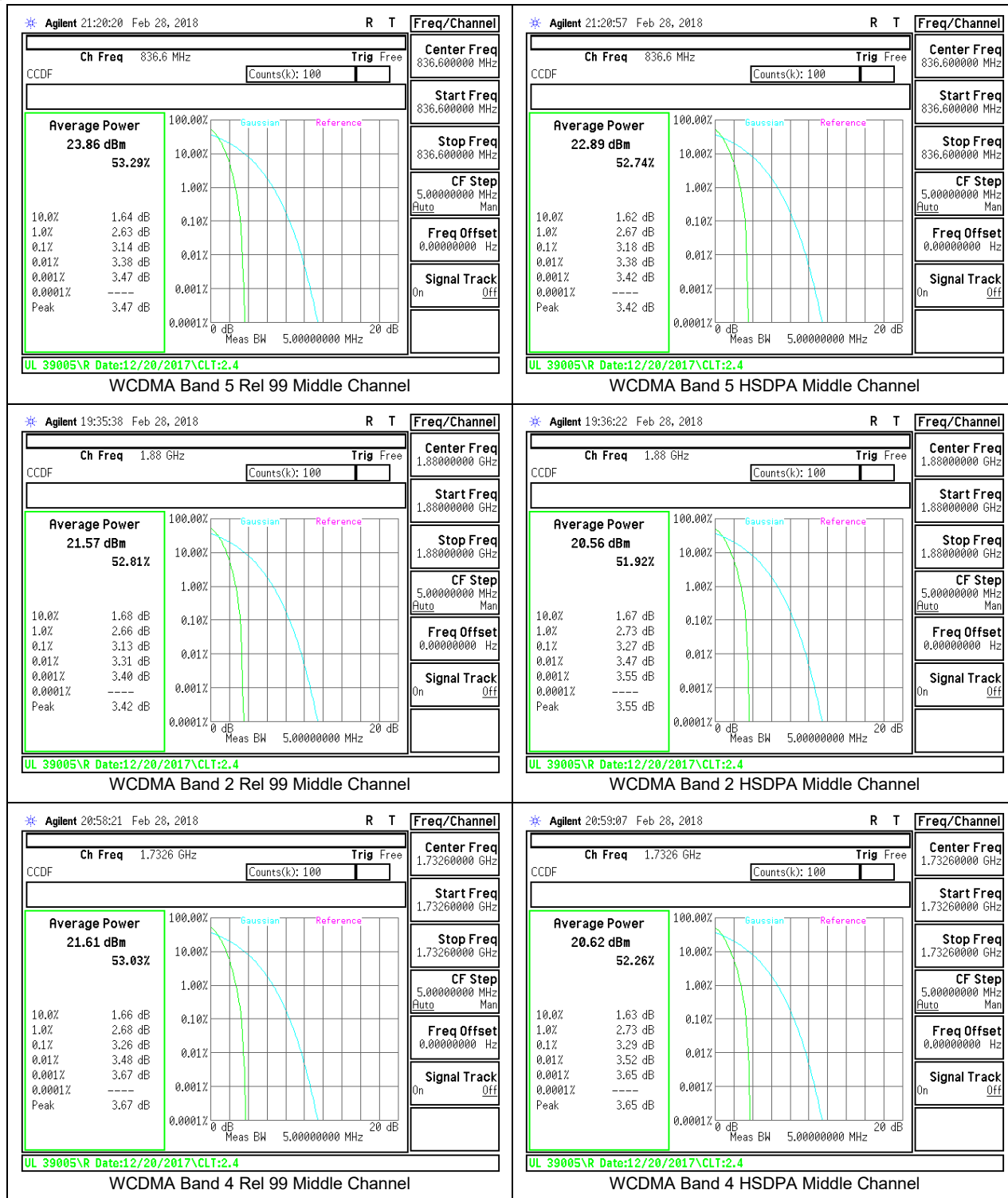
### RESULT

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

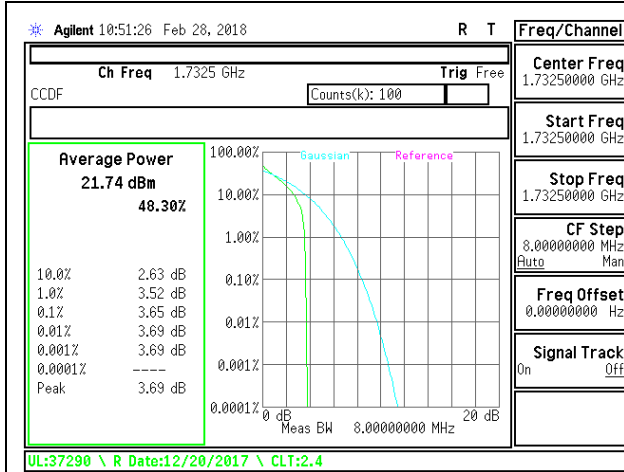
8.5.1. GSM



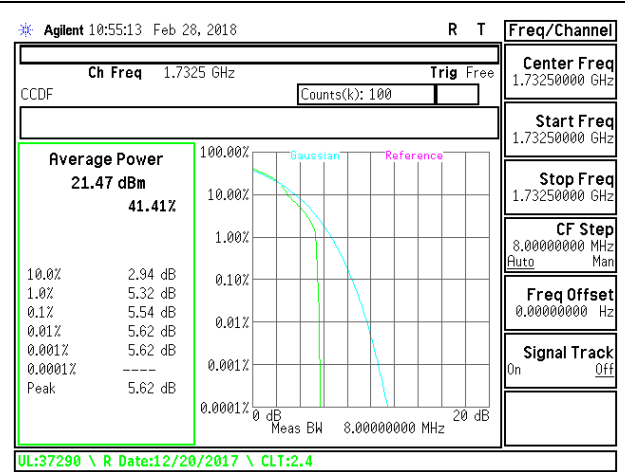
8.5.2. WCDMA



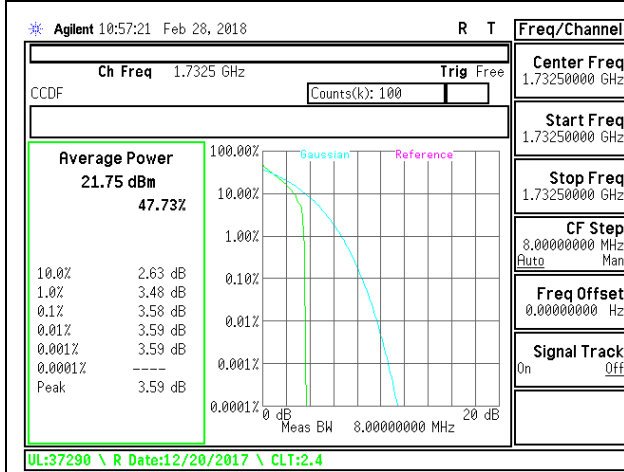
8.5.3. LTE BAND 4



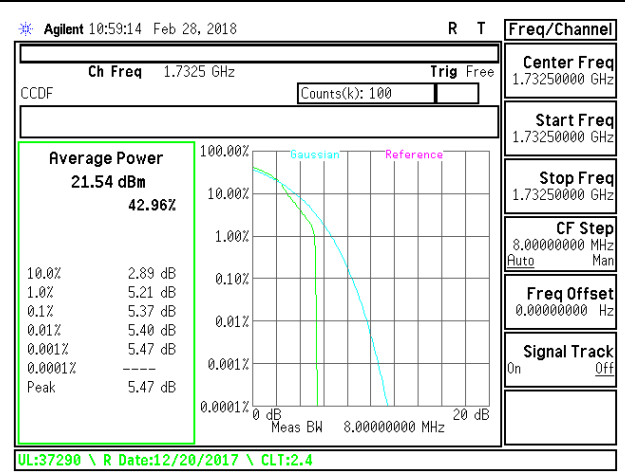
LTE B4 1.4MHz QPSK Mid Channel



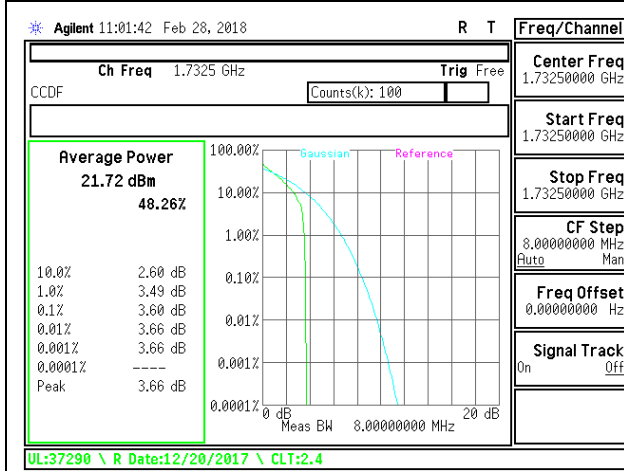
LTE B4 1.4MHz 16QAM Mid Channel



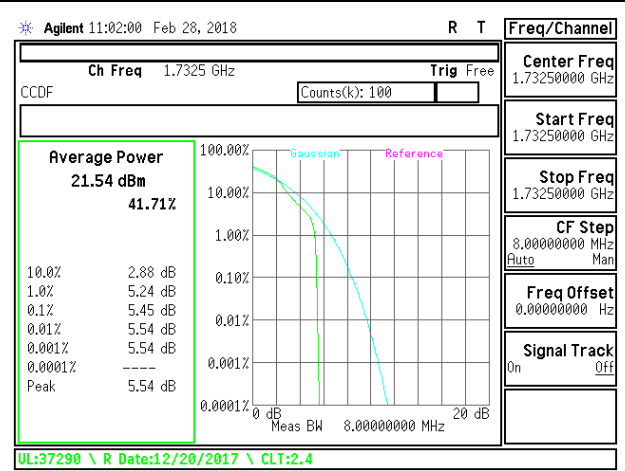
LTE B4 3MHz QPSK Mid Channel



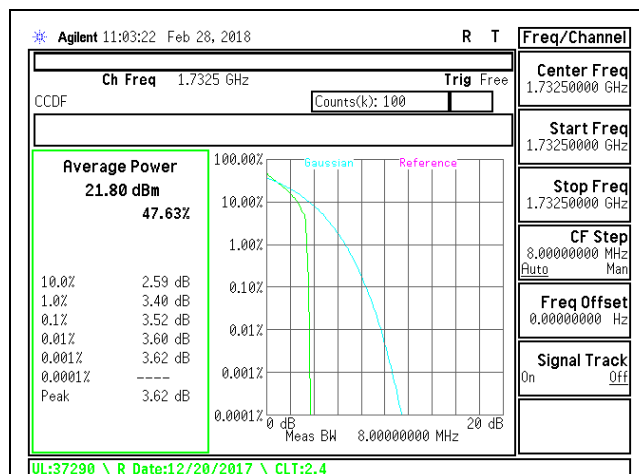
LTE B4 3MHz 16QAM Mid Channel



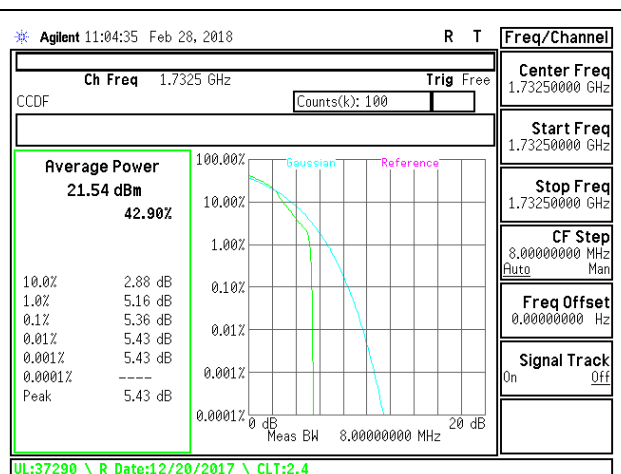
LTE B4 5MHz QPSK Mid Channel



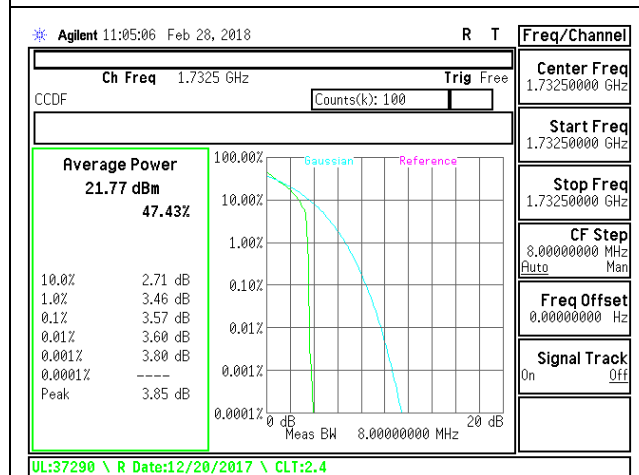
LTE B4 5MHz 16QAM Mid Channel



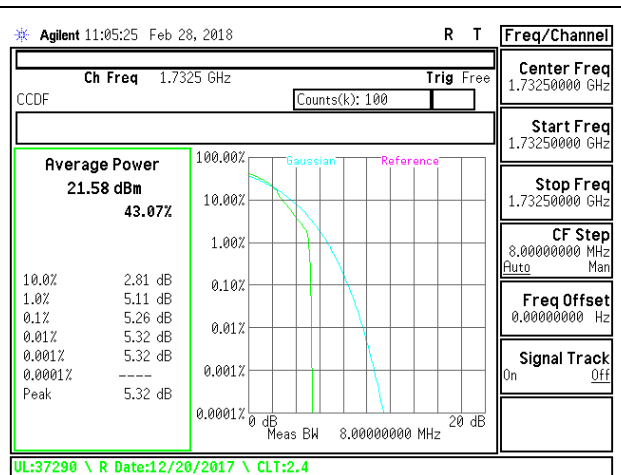
LTE B4 10MHz QPSK Mid Channel



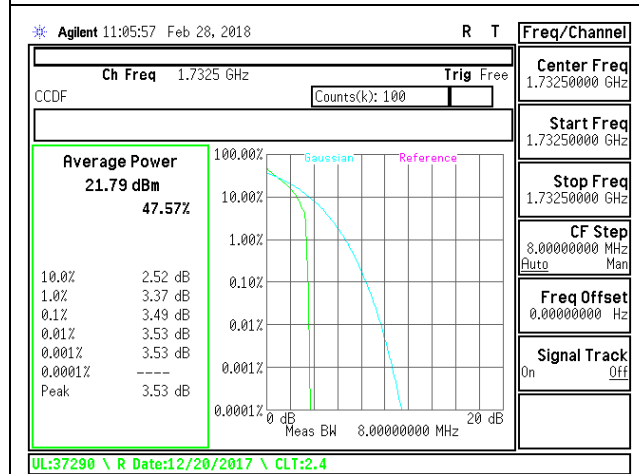
LTE B4 10MHz 16QAM Mid Channel



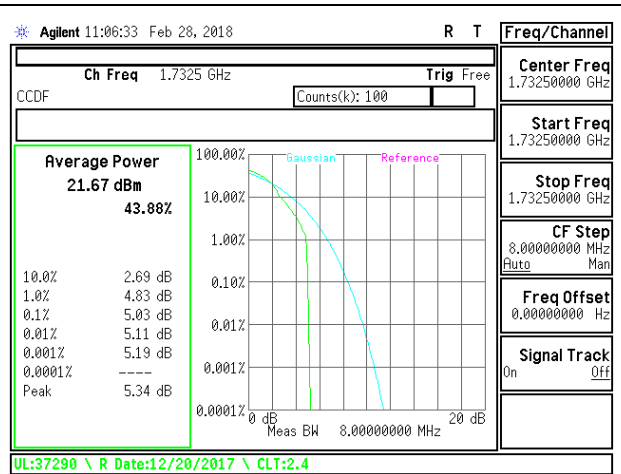
LTE B4 15MHz QPSK Mid Channel



LTE B4 15MHz 16QAM Mid Channel

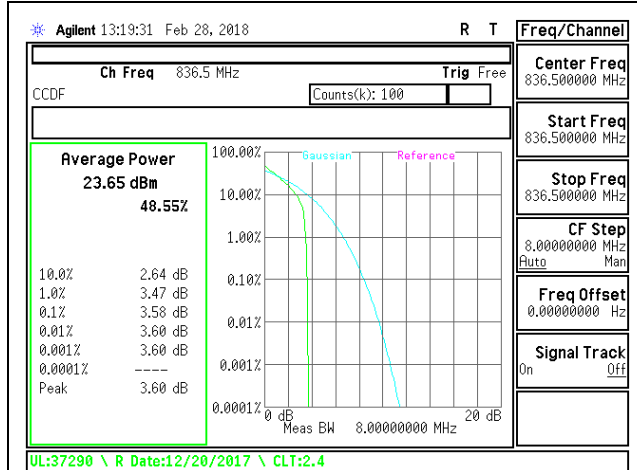


LTE B4 20MHz QPSK Mid Channel

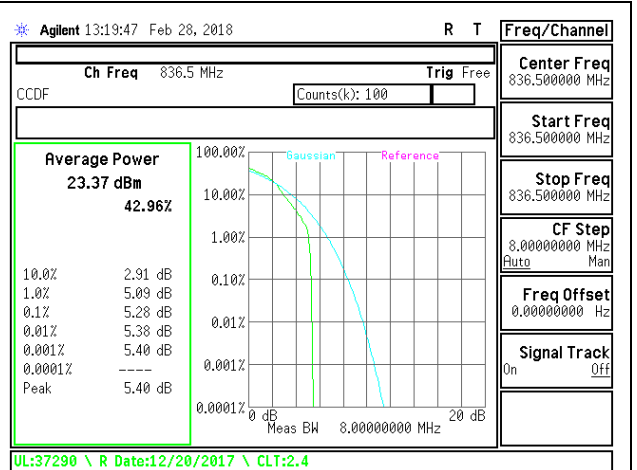


LTE B4 20MHz 16QAM Mid Channel

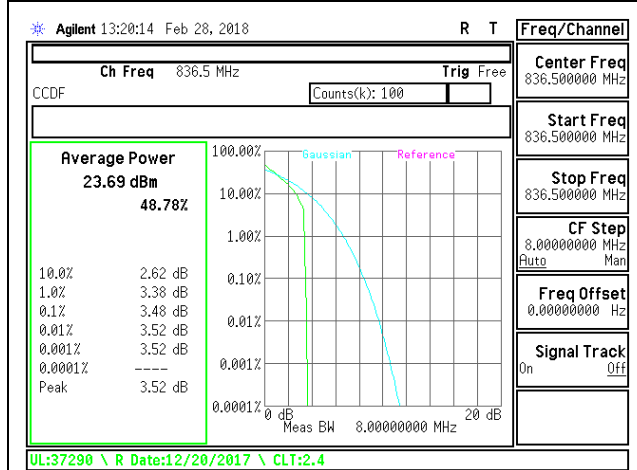
8.5.4. LTE BAND 5



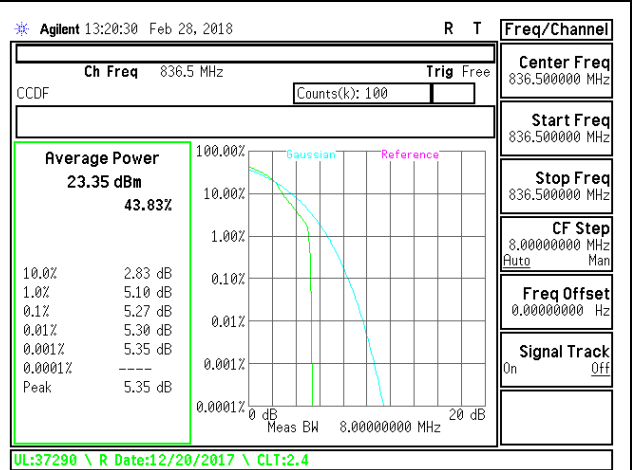
LTE B5 1.4MHz QPSK Mid Channel



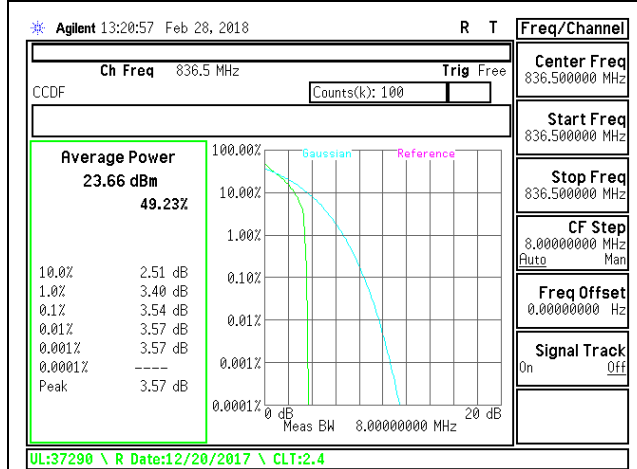
LTE B5 1.4MHz 16QAM Mid Channel



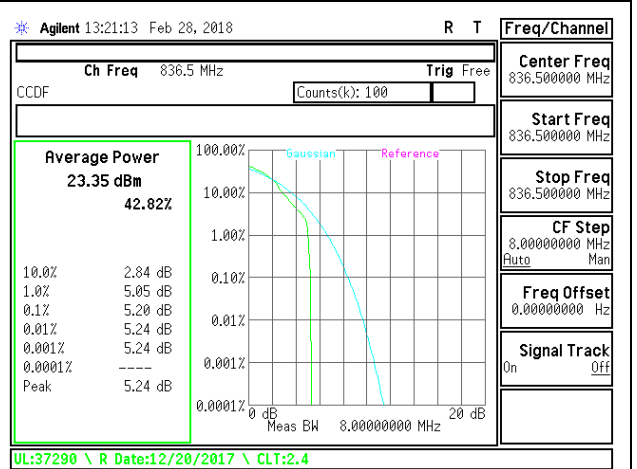
LTE B5 3MHz QPSK Mid Channel



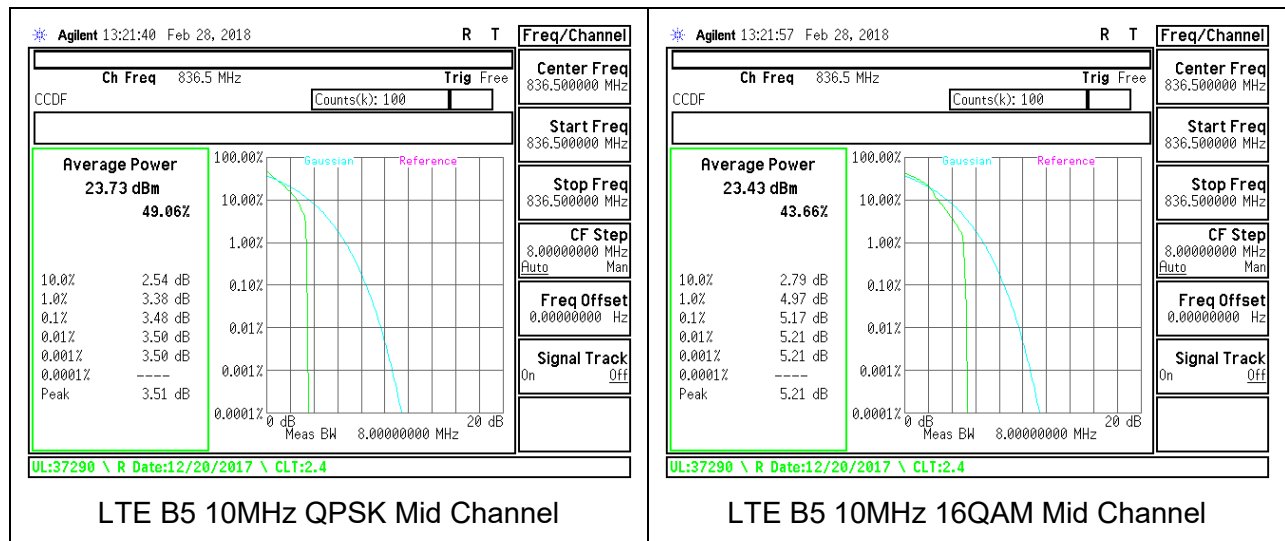
LTE B5 3MHz 16QAM Mid Channel



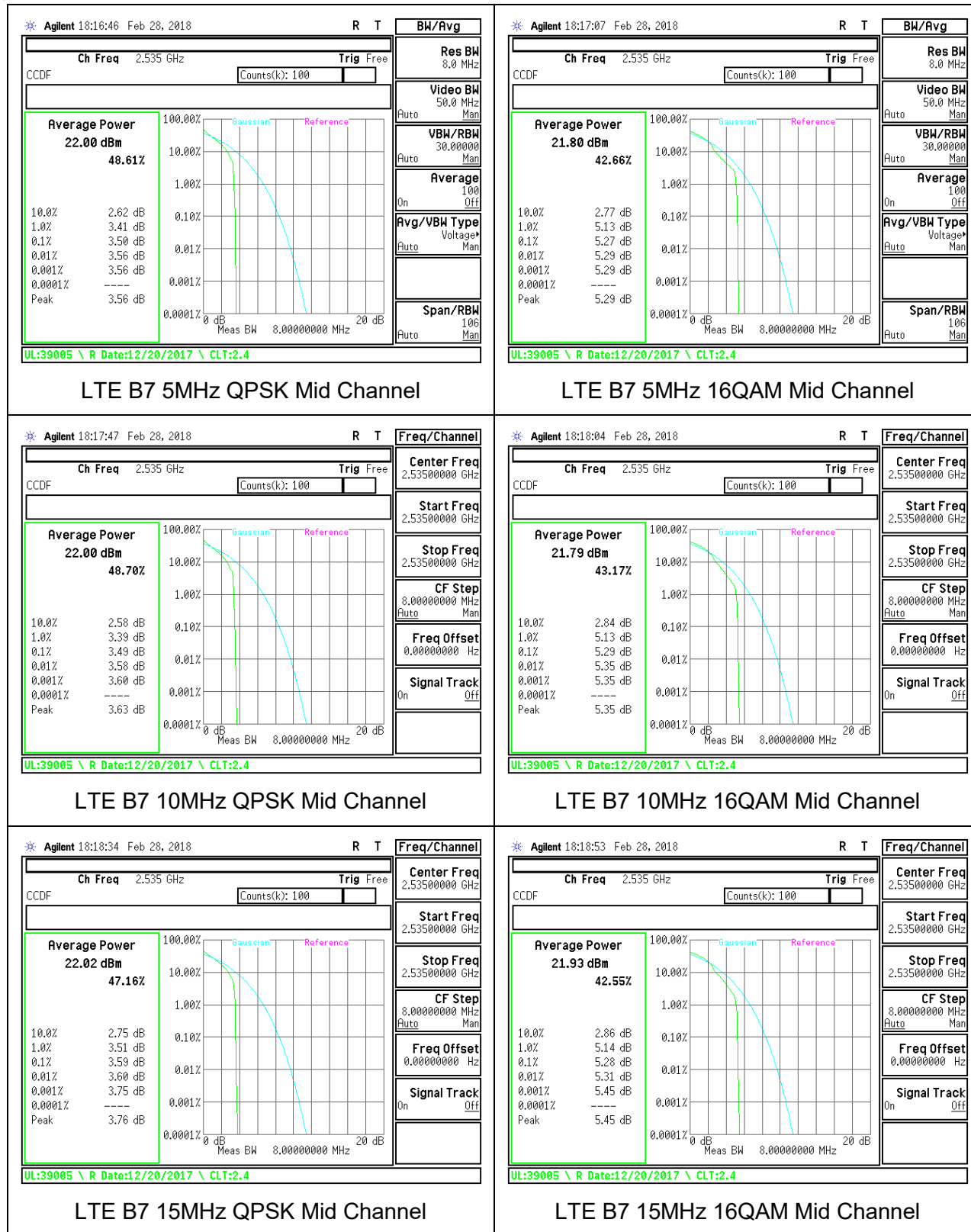
LTE B5 5MHz QPSK Mid Channel



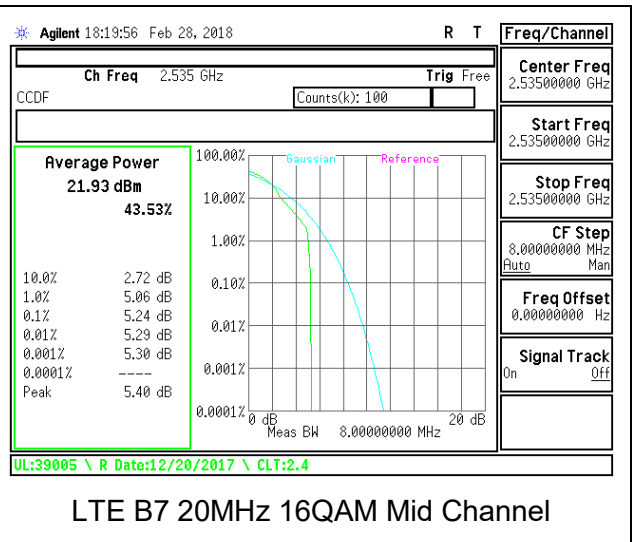
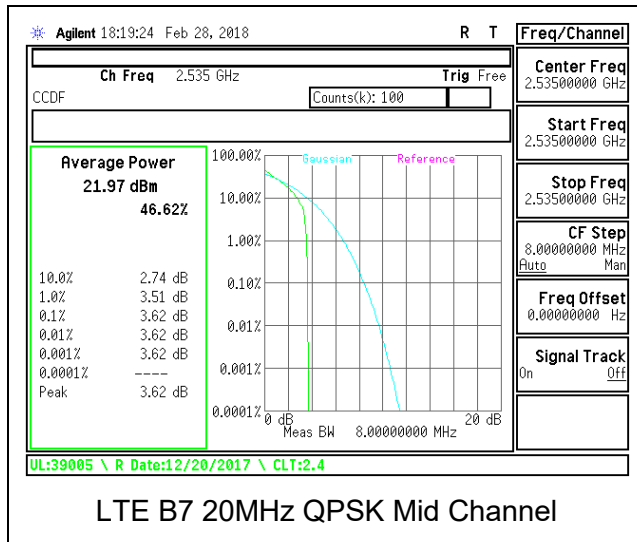
LTE B5 5MHz 16QAM Mid Channel



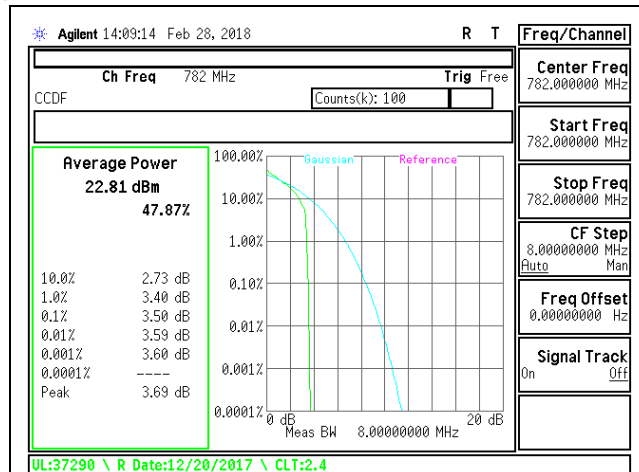
8.5.5. LTE BAND 7



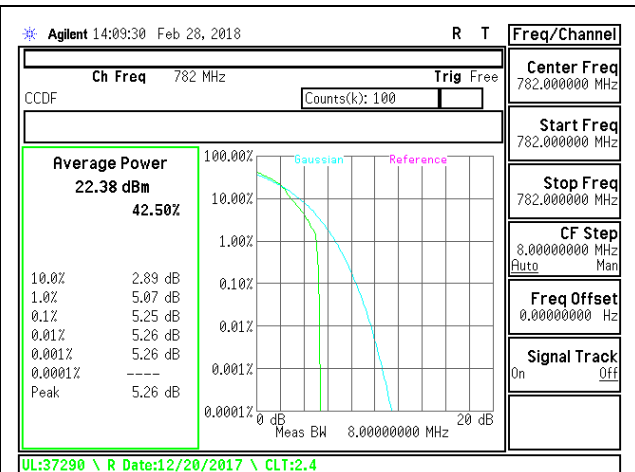




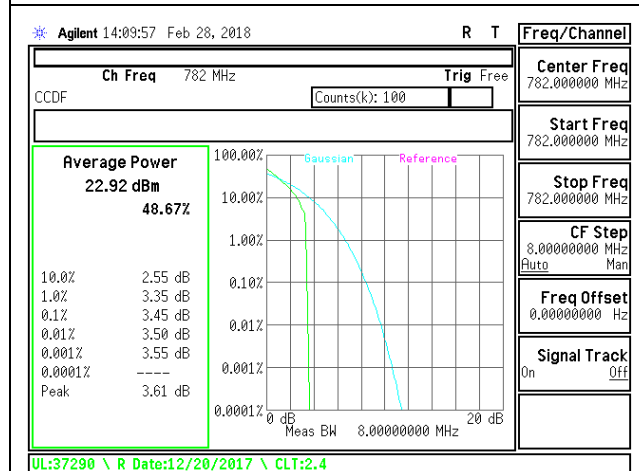
8.5.6. LTE BAND 13



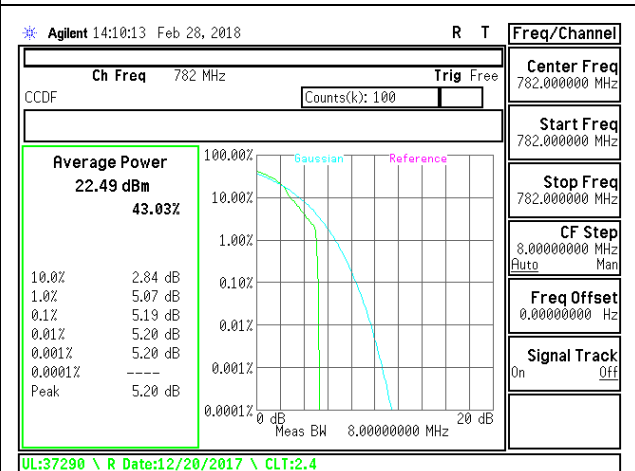
LTE B13 5MHz QPSK Mid Channel



LTE B13 5MHz 16QAM Mid Channel

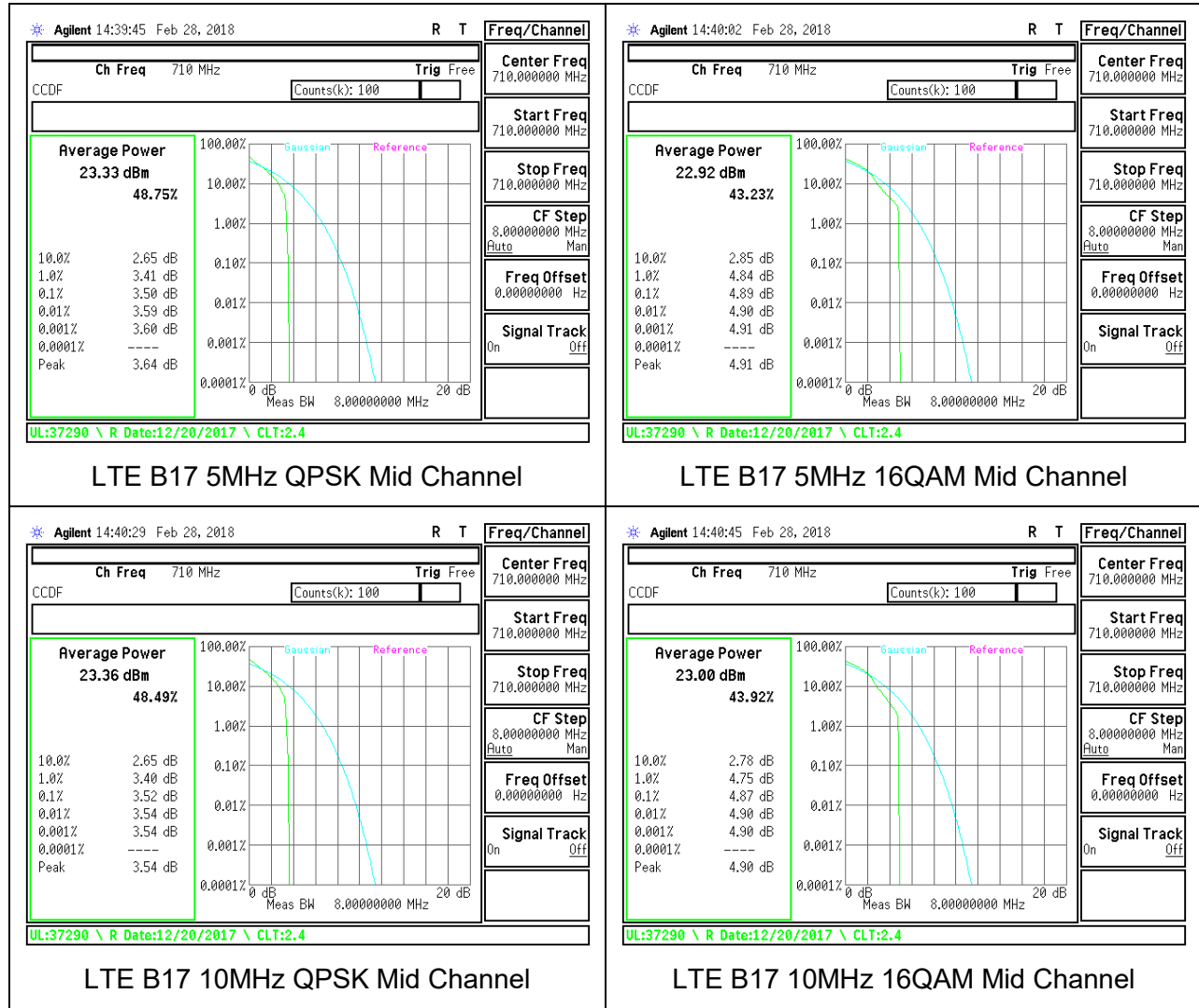


LTE B13 10MHz QPSK Mid Channel

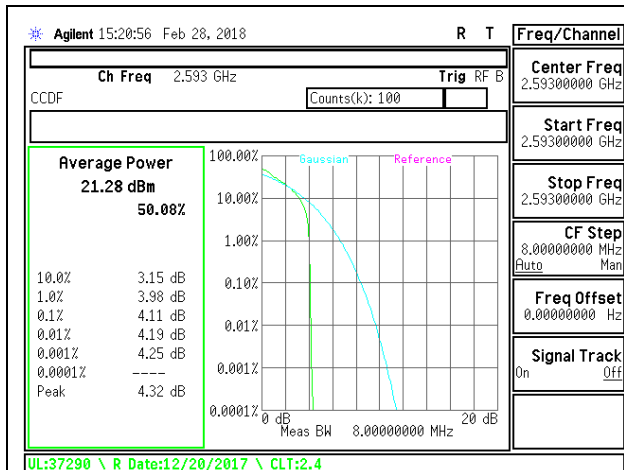


LTE B13 10MHz 16QAM Mid Channel

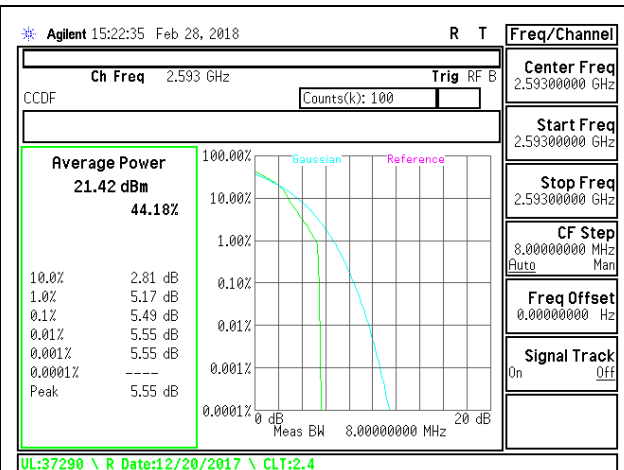
8.5.7. LTE BAND 17



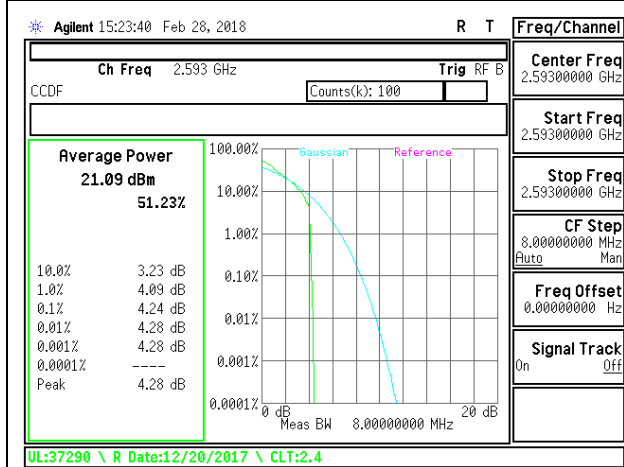
8.5.8. LTE BAND 41



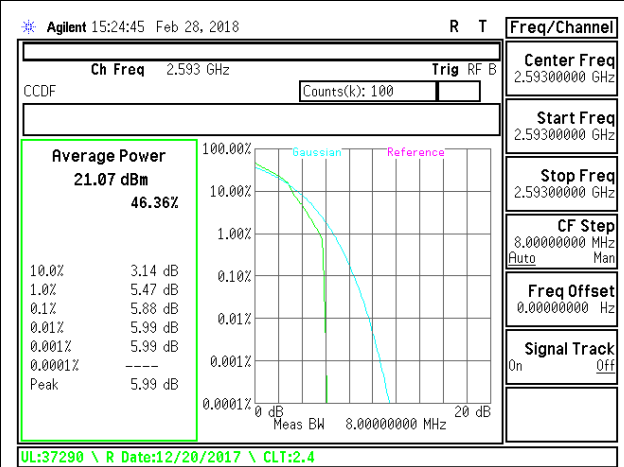
LTE B41 5MHz QPSK Middle Channel



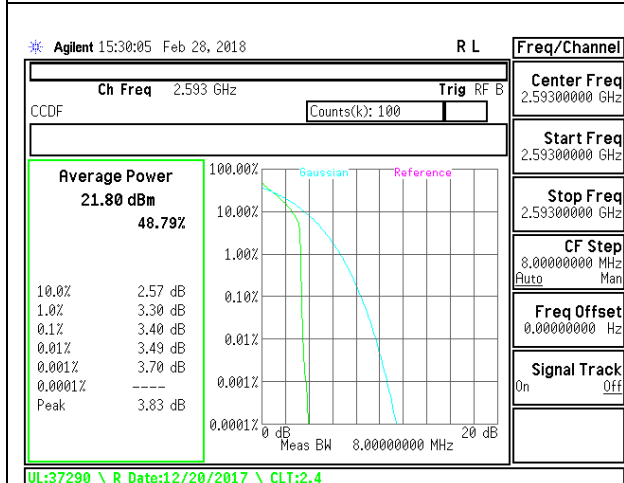
LTE B41 5MHz 16QAM Middle Channel



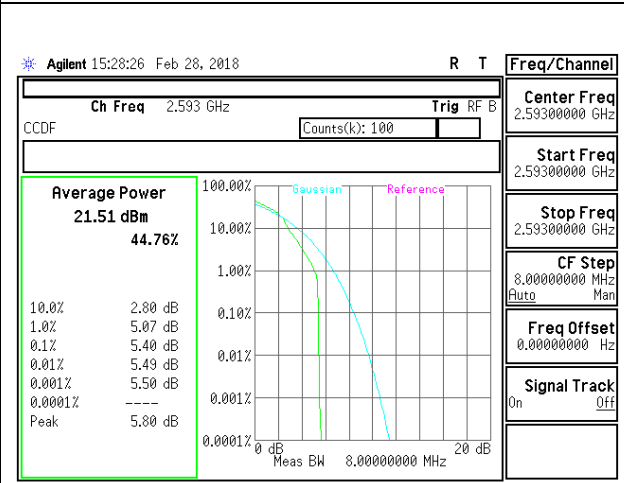
LTE B41 10MHz QPSK Middle Channel



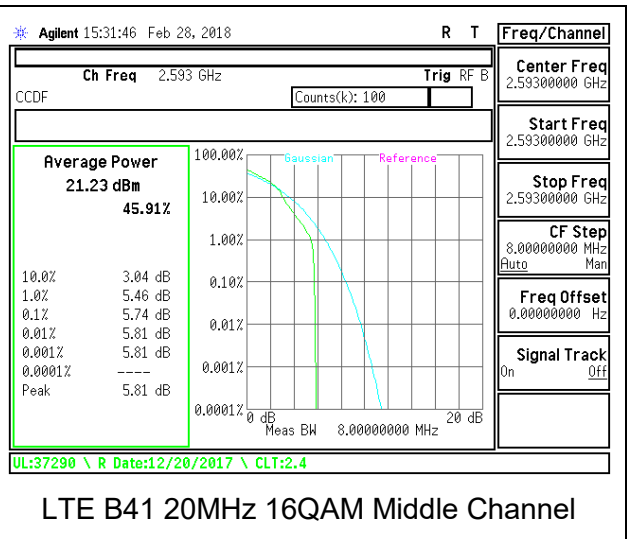
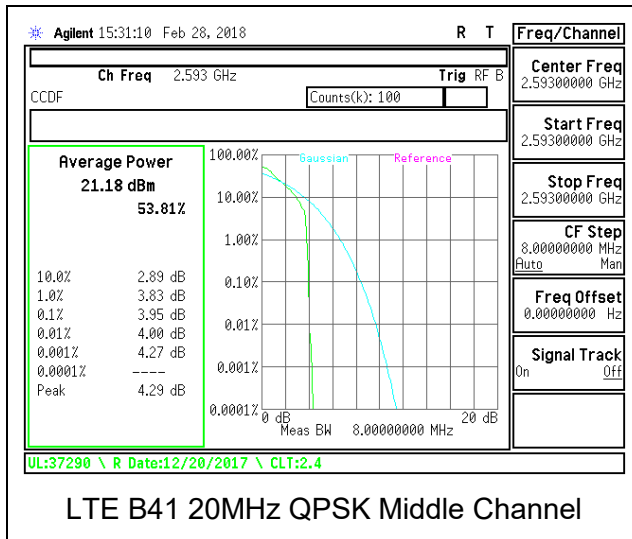
LTE B41 10MHz 16QAM Middle Channel



LTE B41 15MHz QPSK Middle Channel



LTE B41 15MHz 16QAM Middle Channel



## 9. RADIATED TEST RESULTS

### 9.1. FIELD STRENGTH OF SPURIOUS RADIATION

#### RULE PART(S)

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

#### LIMITS

FCC: §22.917(a), §24.238(a), §27.53 (g), (h)

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

FCC: §27.53 (Band 13)

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

(f) Emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals. ( $-70$  dBW/MHz =  $-40$  dBm/MHz).

FCC: §27.53 (m) (Band 7, 41)

At least  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

#### TEST PROCEDURE

KDB 971168 D01 v02r02/D02 v01

#### MODES TESTED

- GSM
- WCDMA
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 13
- LTE Band 17
- LTE Band 41

#### RESULTS

9.1.1. GSM

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/3/2018  
**Test Engineer:** 43575 OS  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** GPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 824.2MHz</b>									
1648.40	-29.8	V	3.0	37.0	1.0	-65.8	-13.0	-52.8	
2472.60	-23.8	V	3.0	36.4	1.0	-59.2	-13.0	-46.2	
3296.80	-24.6	V	3.0	36.2	1.0	-59.7	-13.0	-46.7	
1648.40	-29.3	H	3.0	37.0	1.0	-65.3	-13.0	-52.3	
2472.60	-25.3	H	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3296.80	-24.1	H	3.0	36.2	1.0	-59.2	-13.0	-46.2	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-29.0	V	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2509.80	-22.8	V	3.0	36.4	1.0	-58.2	-13.0	-45.2	
3346.40	-24.9	V	3.0	36.1	1.0	-59.1	-13.0	-46.1	
1673.20	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2509.80	-25.5	H	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3346.40	-23.6	H	3.0	36.1	1.0	-58.7	-13.0	-45.7	
<b>High Ch, 848.8MHz</b>									
1697.60	-27.7	V	3.0	37.0	1.0	-63.6	-13.0	-50.6	
2546.40	-24.9	V	3.0	36.4	1.0	-60.3	-13.0	-47.3	
3395.20	-23.9	V	3.0	36.1	1.0	-58.9	-13.0	-45.9	
1697.60	-26.5	H	3.0	37.0	1.0	-64.5	-13.0	-51.5	
2546.40	-20.4	H	3.0	36.4	1.0	-55.8	-13.0	-42.8	
3395.20	-23.9	H	3.0	36.1	1.0	-59.0	-13.0	-46.0	

GSM 850MHz GPRS

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/3/2018  
**Test Engineer:** 43575 OS  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** EGPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 824.2MHz</b>									
1648.40	-28.8	V	3.0	37.0	1.0	-64.9	-13.0	-51.9	
2472.60	-25.5	V	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3296.80	-24.3	V	3.0	36.2	1.0	-59.4	-13.0	-46.4	
1648.40	-28.9	H	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2472.60	-25.2	H	3.0	36.4	1.0	-60.6	-13.0	-47.6	
3296.80	-24.1	H	3.0	36.2	1.0	-59.2	-13.0	-46.2	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-29.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2509.80	-25.2	V	3.0	36.4	1.0	-60.6	-13.0	-47.6	
3346.40	-24.9	V	3.0	36.1	1.0	-59.1	-13.0	-46.1	
1673.20	-29.0	H	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2509.80	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3346.40	-23.8	H	3.0	36.1	1.0	-58.9	-13.0	-45.9	
<b>High Ch, 848.8MHz</b>									
1697.60	-29.2	V	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2546.40	-25.1	V	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3395.20	-23.6	V	3.0	36.1	1.0	-58.7	-13.0	-45.7	
1697.60	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2546.40	-24.6	H	3.0	36.4	1.0	-60.0	-13.0	-47.0	
3395.20	-23.4	H	3.0	36.1	1.0	-58.5	-13.0	-45.5	

GSM 850MHz EGPRS

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/2/2018  
**Test Engineer:** 39005 RA  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** GPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1850.2MHz</b>									
3700.40	-21.9	V	3.0	35.9	1.0	-56.7	-13.0	-43.7	
5550.60	-19.4	V	3.0	35.5	1.0	-53.8	-13.0	-40.8	
7400.80	-18.1	V	3.0	35.7	1.0	-52.8	-13.0	-39.8	
3700.40	-20.7	H	3.0	35.9	1.0	-55.6	-13.0	-42.6	
5550.60	-19.1	H	3.0	35.5	1.0	-53.5	-13.0	-40.5	
7400.80	-17.3	H	3.0	35.7	1.0	-52.1	-13.0	-39.1	
<b>Mid Ch, 1800MHz</b>									
3760.00	-20.7	V	3.0	35.8	1.0	-55.5	-13.0	-42.5	
5640.00	-19.7	V	3.0	35.5	1.0	-54.1	-13.0	-41.1	
7520.00	-17.1	V	3.0	35.7	1.0	-51.9	-13.0	-38.9	
3760.00	-20.6	H	3.0	35.8	1.0	-55.4	-13.0	-42.4	
5640.00	-19.9	H	3.0	35.5	1.0	-54.4	-13.0	-41.4	
7520.00	-18.4	H	3.0	35.7	1.0	-53.2	-13.0	-40.2	
<b>High Ch, 1909.8MHz</b>									
3819.60	-21.6	V	3.0	35.8	1.0	-56.4	-13.0	-43.4	
5729.40	-18.8	V	3.0	35.5	1.0	-53.3	-13.0	-40.3	
7639.20	-15.6	V	3.0	35.8	1.0	-50.4	-13.0	-37.4	
3819.60	-20.7	H	3.0	35.8	1.0	-55.4	-13.0	-42.4	
5729.40	-20.1	H	3.0	35.5	1.0	-54.6	-13.0	-41.6	
7639.20	-17.1	H	3.0	35.8	1.0	-51.8	-13.0	-38.8	

GSM 1900MHz GPRS

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/2/2018  
**Test Engineer:** 39005 RA  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** EGPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1850.2MHz</b>									
3700.40	-21.6	V	3.0	35.9	1.0	-56.5	-13.0	-43.5	
5550.60	-19.0	V	3.0	35.5	1.0	-53.5	-13.0	-40.5	
7400.80	-17.1	V	3.0	35.7	1.0	-51.9	-13.0	-38.9	
3700.40	-22.7	H	3.0	35.9	1.0	-57.6	-13.0	-44.6	
5550.60	-19.3	H	3.0	35.5	1.0	-53.8	-13.0	-40.8	
7400.80	-17.9	H	3.0	35.7	1.0	-51.8	-13.0	-38.8	
<b>Mid Ch, 1800MHz</b>									
3760.00	-21.6	V	3.0	35.8	1.0	-56.4	-13.0	-43.4	
5640.00	-19.3	V	3.0	35.5	1.0	-53.8	-13.0	-40.8	
7520.00	-17.6	V	3.0	35.7	1.0	-52.3	-13.0	-39.3	
3760.00	-20.5	H	3.0	35.8	1.0	-55.3	-13.0	-42.3	
5640.00	-19.1	H	3.0	35.5	1.0	-53.6	-13.0	-40.6	
7520.00	-18.0	H	3.0	35.7	1.0	-52.7	-13.0	-39.7	
<b>High Ch, 1909.8MHz</b>									
3819.60	-20.9	V	3.0	35.8	1.0	-55.7	-13.0	-42.7	
5729.40	-19.4	V	3.0	35.5	1.0	-53.9	-13.0	-40.9	
7639.20	-16.9	V	3.0	35.8	1.0	-51.6	-13.0	-38.6	
3819.60	-21.9	H	3.0	35.8	1.0	-56.6	-13.0	-43.6	
5729.40	-19.5	H	3.0	35.5	1.0	-54.0	-13.0	-41.0	
7639.20	-17.0	H	3.0	35.8	1.0	-51.8	-13.0	-38.8	

GSM 1900MHz EGPRS

### 9.1.2. WCDMA

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<b>Company:</b> SOMC										
<b>Project #:</b> 12132730										
<b>Date:</b> 3/2/2018										
<b>Test Engineer:</b> 39005 RA										
<b>Configuration:</b> EUT + Support Equipment										
<b>Location:</b> Chamber A										
<b>Mode:</b> Rel99 Band 5 Harmonics										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch, 826.4MHz</b>										
1652.80	-29.2	V	3.0	37.0	1.0	-65.2	-13.0	-52.2		
2479.20	-24.3	V	3.0	36.4	1.0	-60.3	-13.0	-47.3		
3305.60	-22.5	V	3.0	36.1	1.0	-58.7	-13.0	-45.7		
1652.80	-29.2	H	3.0	37.0	1.0	-65.2	-13.0	-52.2		
2479.20	-25.4	H	3.0	36.4	1.0	-60.9	-13.0	-47.9		
3305.60	-24.9	H	3.0	36.1	1.0	-59.1	-13.0	-46.1		
<b>Mid Ch, 836.6MHz</b>										
1673.20	-28.7	V	3.0	37.0	1.0	-64.7	-13.0	-51.7		
2509.80	-25.7	V	3.0	36.4	1.0	-60.6	-13.0	-47.6		
3346.40	-24.3	V	3.0	36.1	1.0	-58.7	-13.0	-45.7		
1673.20	-29.7	H	3.0	37.0	1.0	-65.7	-13.0	-52.7		
2509.80	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	-47.4		
3346.40	-23.6	H	3.0	36.1	1.0	-58.7	-13.0	-45.7		
<b>High Ch, 846.6MHz</b>										
1693.20	-28.2	V	3.0	37.0	1.0	-65.2	-13.0	-52.2		
2539.80	-24.7	V	3.0	36.4	1.0	-60.1	-13.0	-47.1		
3386.40	-23.3	V	3.0	36.1	1.0	-58.7	-13.0	-45.7		
1693.20	-28.8	H	3.0	37.0	1.0	-64.8	-13.0	-51.8		
2539.80	-25.1	H	3.0	36.4	1.0	-60.5	-13.0	-47.5		
3386.40	-23.8	H	3.0	36.1	1.0	-58.9	-13.0	-45.9		

#### WCDMA Band 5 Rel 99

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<b>Company:</b> SOMC										
<b>Project #:</b> 12132730										
<b>Date:</b> 3/2/2018										
<b>Test Engineer:</b> 39005 RA										
<b>Configuration:</b> EUT + Support Equipment										
<b>Location:</b> Chamber A										
<b>Mode:</b> Rel99 Band 2 Harmonics										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch, 1852.4MHz</b>										
3704.80	-21.5	V	3.0	35.9	1.0	-56.4	-13.0	-43.4		
5557.20	-17.5	V	3.0	35.5	1.0	-51.9	-13.0	-38.9		
7409.60	-17.0	V	3.0	35.7	1.0	-51.6	-13.0	-38.6		
3704.80	-22.7	H	3.0	35.9	1.0	-57.5	-13.0	-44.5		
5557.20	-17.9	H	3.0	35.5	1.0	-52.4	-13.0	-39.4		
7409.60	-17.3	H	3.0	35.7	1.0	-52.0	-13.0	-39.0		
<b>Mid Ch, 1800MHz</b>										
3760.00	-21.6	V	3.0	35.8	1.0	-56.4	-13.0	-43.4		
5640.00	-18.6	V	3.0	35.5	1.0	-53.0	-13.0	-40.0		
7520.00	-16.6	V	3.0	35.7	1.0	-51.7	-13.0	-38.7		
3760.00	-20.2	H	3.0	35.8	1.0	-55.0	-13.0	-42.0		
5640.00	-17.2	H	3.0	35.5	1.0	-51.7	-13.0	-38.7		
7520.00	-17.0	H	3.0	35.7	1.0	-51.7	-13.0	-38.7		
<b>High Ch, 1907.6MHz</b>										
3815.20	-22.2	V	3.0	35.8	1.0	-57.0	-13.0	-44.0		
5722.80	-18.8	V	3.0	35.5	1.0	-53.3	-13.0	-40.3		
7630.40	-17.4	V	3.0	35.8	1.0	-52.2	-13.0	-39.2		
3815.20	-20.9	H	3.0	35.8	1.0	-56.6	-13.0	-43.6		
5722.80	-19.9	H	3.0	35.5	1.0	-54.4	-13.0	-41.4		
7630.40	-17.5	H	3.0	35.8	1.0	-52.2	-13.0	-39.2		

#### WCDMA Band 2 Rel 99

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<b>Company:</b> SOMC										
<b>Project #:</b> 12132730										
<b>Date:</b> 3/2/2018										
<b>Test Engineer:</b> 39005 RA										
<b>Configuration:</b> EUT + Support Equipment										
<b>Location:</b> Chamber A										
<b>Mode:</b> Rel99 Band 4 Harmonics										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch, 1712.4MHz</b>										
3424.80	-22.0	V	3.0	36.1	1.0	-57.1	-13.0	-44.1		
5137.20	-19.0	V	3.0	35.4	1.0	-53.5	-13.0	-40.5		
6849.60	-18.7	V	3.0	35.7	1.0	-53.4	-13.0	-40.4		
3424.80	-22.5	H	3.0	36.1	1.0	-57.5	-13.0	-44.5		
5137.20	-20.0	H	3.0	35.4	1.0	-54.4	-13.0	-41.4		
6849.60	-17.2	H	3.0	35.7	1.0	-51.9	-13.0	-38.9		
<b>Mid Ch, 1732.6MHz</b>										
3465.20	-22.0	V	3.0	36.0	1.0	-57.0	-13.0	-44.0		
5197.80	-19.4	V	3.0	35.4	1.0	-53.8	-13.0	-40.8		
6930.40	-17.5	V	3.0	35.7	1.0	-52.1	-13.0	-39.1		
3465.20	-22.6	H	3.0	36.0	1.0	-57.6	-13.0	-44.6		
5197.80	-19.0	H	3.0	35.4	1.0	-53.4	-13.0	-40.4		
6930.40	-19.0	H	3.0	35.7	1.0	-53.6	-13.0	-40.6		
<b>High Ch, 1752.6MHz</b>										
3505.20	-22.3	V	3.0	36.0	1.0	-57.3	-13.0	-44.3		
5257.80	-19.8	V	3.0	35.4	1.0	-54.3	-13.0	-41.3		
7010.40	-18.1	V	3.0	35.7	1.0	-52.8	-13.0	-39.8		
3505.20	-22.8	H	3.0	36.0	1.0	-57.8	-13.0	-44.8		
5257.80	-18.5	H	3.0	35.4	1.0	-52.9	-13.0	-39.9		
7010.40	-17.4	H	3.0	35.7	1.0	-52.1	-13.0	-39.1		

#### WCDMA Band 4 Rel 99

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<b>Company:</b> SOMC										
<b>Project #:</b> 12132730										
<b>Date:</b> 3/2/2018										
<b>Test Engineer:</b> 39005 RA										
<b>Configuration:</b> EUT + Support Equipment										
<b>Location:</b> Chamber A										
<b>Mode:</b> HSDPA Band 5 Harmonics										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch, 826.4MHz</b>										
1652.80	-30.0	V	3.0	37.0	1.0	-66.0	-13.0	-53.0		
2479.20	-25.6	V	3.0	36.4	1.0	-61.0	-13.0	-48.0		
3305.60	-24.1	V	3.0	36.1	1.0	-59.3	-13.0	-46.3		
1652.80	-29.6	H	3.0	37.0	1.0	-65.6	-13.0	-52.6		
2479.20	-25.1	H	3.0	36.4	1.0	-60.5	-13.0	-47.5		
3305.60	-23.7	H	3.0	36.1	1.0	-58.8	-13.0	-45.8		
<b>Mid Ch, 836.6MHz</b>										
1673.20	-28.9	V	3.0	37.0	1.0	-64.9	-13.0	-51.9		
2509.80	-25.8	V	3.0	36.4	1.0	-61.2	-13.0	-48.2		
3346.40	-24.3	V	3.0	36.1	1.0	-59.4	-13.0	-46.4		
1673.20	-29.3	H	3.0	37.0	1.0	-65.3	-13.0	-52.3		
2509.80	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0		
3346.40	-24.1	H	3.0	36.1	1.0	-59.2	-13.0	-46.2		
<b>High Ch, 846.6MHz</b>										
1693.20	-29.5	V	3.0	37.0	1.0	-65.5	-13.0	-52.5		
2539.80	-26.0	V	3.0	36.4	1.0	-61.4	-13.0	-48.4		
3386.40	-24.7	V	3.0	36.1	1.0	-59.7	-13.0	-46.7		
1693.20	-29.0	H	3.0	37.0	1.0	-65.0	-13.0	-52.0		
2539.80	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	-47.4		
3386.40	-23.9	H	3.0	36.1	1.0	-59.0	-13.0	-46.0		

#### WCDMA Band 5 HSDPA

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<b>Company:</b> SOMC										
<b>Project #:</b> 12132730										
<b>Date:</b> 3/2/2018										
<b>Test Engineer:</b> 39005 RA										
<b>Configuration:</b> EUT + Support Equipment										
<b>Location:</b> Chamber A										
<b>Mode:</b> HSDPA Band 2 Harmonics										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch, 1852.4MHz</b>										
3704.80	-22.3	V	3.0	35.9	1.0	-57.1	-13.0	-44.1		
5557.20	-18.9	V	3.0	35.5	1.0	-53.4	-13.0	-40.4		
7409.60	-17.1	V	3.0	35.7	1.0	-51.9	-13.0	-38.9		
3704.80	-21.1	H	3.0	35.9	1.0	-56.0	-13.0	-43.0		
5557.20	-18.6	H	3.0	35.5	1.0	-53.1	-13.0	-40.1		
7409.60	-17.1	H	3.0	35.7	1.0	-51.9	-13.0	-38.9		
<b>Mid Ch, 1800MHz</b>										
3760.00	-20.5	V	3.0	35.8	1.0	-56.3	-13.0	-43.3		
5640.00	-16.9	V	3.0	35.5	1.0	-51.4	-13.0	-38.4		
7520.00	-17.6	V	3.0	35.7	1.0	-52.2	-13.0	-39.2		
3760.00	-21.4	H	3.0	35.8	1.0	-56.2	-13.0	-43.2		
5640.00	-18.7	H	3.0	35.5	1.0	-53.2	-13.0	-40.2		
7520.00	-17.6	H	3.0	35.7	1.0	-52.3	-13.0	-39.3		
<b>High Ch, 1907.6MHz</b>										
3815.20	-20.9	V	3.0	35.8	1.0	-55.7	-13.0	-42.7		
5722.80	-18.8	V	3.0	35.5	1.0	-53.3	-13.0	-40.3		
7630.40	-17.6	V	3.0	35.8	1.0	-52.7	-13.0	-39.7		
3815.20	-21.4	H	3.0	35.8	1.0	-56.1	-13.0	-43.1		
5722.80	-19.6	H	3.0	35.5	1.0	-54.1	-13.0	-41.1		
7630.40	-17.5	H	3.0	35.8	1.0	-51.8	-13.0	-38.8		

#### WCDMA Band 2 HSDPA

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<b>Company:</b> SOMC										
<b>Project #:</b> 12132730										
<b>Date:</b> 3/2/2018										
<b>Test Engineer:</b> 39005 RA										
<b>Configuration:</b> EUT + Support Equipment										
<b>Location:</b> Chamber A										
<b>Mode:</b> HSDPA Band 4 Harmonics										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch, 1712.4MHz</b>										
3424.80	-22.9	V	3.0	36.1	1.0	-58.0	-13.0	-45.0		
5137.20	-19.1	V	3.0	35.4	1.0	-53.5	-13.0	-40.5		
6849.60	-17.6	V	3.0	35.7	1.0	-52.2	-13.0	-39.2		
3424.80	-22.5	H	3.0	36.1	1.0	-57.6	-13.0	-44.6		
5137.20	-18.9	H	3.0	35.4	1.0	-53.4	-13.0	-40.4		
6849.60	-18.3	H	3.0	35.7	1.0	-53.0	-13.0	-40.0		
<b>Mid Ch, 1732.6MHz</b>										
3465.20	-22.9	V	3.0	36.0	1.0	-57.9	-13.0	-44.9		
5197.80	-19.2	V	3.0	35.4	1.0	-53.6	-13.0	-40.6		
6930.40	-18.7	V	3.0	35.7	1.0	-52.4	-13.0	-39.4		
3465.20	-22.5	H	3.0	36.0	1.0	-57.5	-13.0	-44.5		
5197.80	-19.5	H	3.0	35.4	1.0	-54.0				



### 9.1.3. LTE BAND 4

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT+ Support Equipment  
 Location: Chamber B  
 Mode: LTE\_OPSK Band 4 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 1710.7MHz</b>									
3421.40	-20.4	V	3.0	36.1	1.0	-55.5	-13.0	-42.5	
5132.10	-18.2	V	3.0	35.4	1.0	-50.6	-13.0	-37.6	
6842.80	-15.3	V	3.0	35.7	1.0	-50.0	-13.0	-37.0	
3421.40	-20.7	H	3.0	36.1	1.0	-55.7	-13.0	-42.7	
5132.10	-18.1	H	3.0	35.4	1.0	-50.5	-13.0	-37.5	
6842.80	-14.2	H	3.0	35.7	1.0	-48.9	-13.0	-35.9	
<b>Mid Ch. 1732.5MHz</b>									
3465.00	-20.6	V	3.0	36.0	1.0	-55.7	-13.0	-42.7	
5197.50	-15.2	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6930.00	-15.5	V	3.0	35.7	1.0	-50.2	-13.0	-37.2	
3465.00	-20.8	H	3.0	36.0	1.0	-55.9	-13.0	-42.9	
5197.50	-15.9	H	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6930.00	-14.1	H	3.0	35.7	1.0	-48.8	-13.0	-35.8	
<b>High Ch. 1754.3MHz</b>									
3508.60	-19.9	V	3.0	36.0	1.0	-54.9	-13.0	-41.9	
5262.90	-17.5	V	3.0	35.4	1.0	-51.8	-13.0	-38.8	
7017.20	-16.4	V	3.0	35.7	1.0	-51.1	-13.0	-38.1	
3508.60	-20.5	H	3.0	36.0	1.0	-55.5	-13.0	-42.5	
5262.90	-18.3	H	3.0	35.4	1.0	-50.7	-13.0	-37.7	
7017.20	-12.7	H	3.0	35.7	1.0	-47.4	-13.0	-34.4	

LTE B4 1.4MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT+ Support Equipment  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 4 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 1710.7MHz</b>									
3421.40	-20.7	V	3.0	36.1	1.0	-55.8	-13.0	-42.8	
5132.10	-18.2	V	3.0	35.4	1.0	-50.6	-13.0	-37.6	
6842.80	-14.7	V	3.0	35.7	1.0	-49.4	-13.0	-36.4	
3421.40	-20.7	H	3.0	36.1	1.0	-55.8	-13.0	-42.8	
5132.10	-15.9	H	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6842.80	-13.7	H	3.0	35.7	1.0	-48.3	-13.0	-35.3	
<b>Mid Ch. 1732.5MHz</b>									
3465.00	-19.8	V	3.0	36.0	1.0	-54.8	-13.0	-41.8	
5197.50	-15.7	V	3.0	35.4	1.0	-49.1	-13.0	-37.1	
6930.00	-15.7	V	3.0	35.7	1.0	-50.3	-13.0	-37.3	
3465.00	-20.7	H	3.0	36.0	1.0	-55.8	-13.0	-42.8	
5197.50	-15.7	H	3.0	35.4	1.0	-50.2	-13.0	-37.2	
6930.00	-13.5	H	3.0	35.7	1.0	-48.2	-13.0	-35.2	
<b>High Ch. 1754.3MHz</b>									
3508.60	-20.1	V	3.0	36.0	1.0	-55.1	-13.0	-42.1	
5262.90	-17.4	V	3.0	35.4	1.0	-51.8	-13.0	-38.8	
7017.20	-15.5	V	3.0	35.7	1.0	-50.2	-13.0	-37.2	
3508.60	-20.2	H	3.0	36.0	1.0	-55.2	-13.0	-42.2	
5262.90	-16.3	H	3.0	35.4	1.0	-51.0	-13.0	-38.0	
7017.20	-14.4	H	3.0	35.7	1.0	-49.1	-13.0	-36.1	

LTE B4 1.4MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT+ Support Equipment  
 Location: Chamber B  
 Mode: LTE\_OPSK Band 4 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 1711.5MHz</b>									
3423.00	-20.9	V	3.0	36.1	1.0	-55.9	-13.0	-42.9	
5134.50	-17.7	V	3.0	35.4	1.0	-52.1	-13.0	-39.1	
6846.00	-15.1	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3423.00	-19.9	H	3.0	36.1	1.0	-54.9	-13.0	-41.9	
5134.50	-16.3	H	3.0	35.4	1.0	-50.7	-13.0	-37.7	
6846.00	-12.7	H	3.0	35.7	1.0	-47.3	-13.0	-34.3	
<b>Mid Ch. 1732.5MHz</b>									
3465.00	-20.1	V	3.0	36.0	1.0	-55.1	-13.0	-42.1	
5197.50	-17.3	V	3.0	35.4	1.0	-51.7	-13.0	-38.7	
6930.00	-15.7	V	3.0	35.7	1.0	-50.4	-13.0	-37.4	
3465.00	-20.4	H	3.0	36.0	1.0	-55.5	-13.0	-42.5	
5197.50	-16.6	H	3.0	35.4	1.0	-51.0	-13.0	-38.0	
6930.00	-13.5	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
<b>High Ch. 1753.5MHz</b>									
3507.00	-20.1	V	3.0	36.0	1.0	-55.1	-13.0	-42.1	
5260.50	-17.0	V	3.0	35.4	1.0	-51.4	-13.0	-38.4	
7014.00	-15.4	V	3.0	35.7	1.0	-50.1	-13.0	-37.1	
3507.00	-20.3	H	3.0	36.0	1.0	-55.3	-13.0	-42.3	
5260.50	-17.0	H	3.0	35.4	1.0	-51.4	-13.0	-38.4	
7014.00	-13.0	H	3.0	35.7	1.0	-47.6	-13.0	-34.6	

LTE B4 3MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT+ Support Equipment  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 4 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 1711.5MHz</b>									
3423.00	-19.8	V	3.0	36.1	1.0	-54.8	-13.0	-41.8	
5134.50	-16.4	V	3.0	35.4	1.0	-50.8	-13.0	-37.8	
6846.00	-15.2	V	3.0	35.7	1.0	-49.9	-13.0	-36.9	
3423.00	-20.4	H	3.0	36.1	1.0	-55.4	-13.0	-42.4	
5134.50	-16.3	H	3.0	35.4	1.0	-50.7	-13.0	-37.7	
6846.00	-14.5	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
<b>Mid Ch. 1732.5MHz</b>									
3465.00	-20.7	V	3.0	36.0	1.0	-55.7	-13.0	-42.7	
5197.50	-16.6	V	3.0	35.4	1.0	-51.1	-13.0	-38.1	
6930.00	-16.1	V	3.0	35.7	1.0	-50.8	-13.0	-37.8	
3465.00	-20.0	H	3.0	36.0	1.0	-55.1	-13.0	-42.1	
5197.50	-16.8	H	3.0	35.4	1.0	-51.2	-13.0	-38.2	
6930.00	-13.1	H	3.0	35.7	1.0	-49.7	-13.0	-36.7	
<b>High Ch. 1753.5MHz</b>									
3507.00	-20.8	V	3.0	36.0	1.0	-55.8	-13.0	-42.8	
5260.50	-17.1	V	3.0	35.4	1.0	-51.6	-13.0	-38.6	
7014.00	-15.4	V	3.0	35.7	1.0	-50.1	-13.0	-37.1	
3507.00	-20.2	H	3.0	36.0	1.0	-55.2	-13.0	-42.2	
5260.50	-16.0	H	3.0	35.4	1.0	-50.4	-13.0	-37.4	
7014.00	-14.8	H	3.0	35.7	1.0	-49.3	-13.0	-36.3	

LTE B4 3MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT+ Support Equipment  
 Location: Chamber B  
 Mode: LTE\_OPSK Band 4 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 1712.5MHz</b>									
3425.00	-21.0	V	3.0	36.1	1.0	-56.1	-13.0	-43.1	
5137.50	-15.2	V	3.0	35.4	1.0	-49.7	-13.0	-36.7	
6850.00	-16.7	V	3.0	35.7	1.0	-51.4	-13.0	-38.4	
3425.00	-21.4	H	3.0	36.1	1.0	-56.4	-13.0	-43.4	
5137.50	-15.3	H	3.0	35.4	1.0	-49.7	-13.0	-36.7	
6850.00	-14.4	H	3.0	35.7	1.0	-49.0	-13.0	-36.0	
<b>Mid Ch. 1732.5MHz</b>									
3465.00	-20.6	V	3.0	36.0	1.0	-55.6	-13.0	-42.6	
5197.50	-16.4	V	3.0	35.4	1.0	-50.8	-13.0	-37.8	
6930.00	-16.6	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3465.00	-20.4	H	3.0	36.0	1.0	-55.4	-13.0	-42.4	
5197.50	-15.5	H	3.0	35.4	1.0	-49.9	-13.0	-36.9	
6930.00	-14.2	H	3.0	35.7	1.0	-49.0	-13.0	-36.0	
<b>High Ch. 1752.5MHz</b>									
3505.00	-19.9	V	3.0	36.0	1.0	-54.9	-13.0	-41.9	
5257.50	-16.8	V	3.0	35.4	1.0	-51.2	-13.0	-38.2	
7010.00	-16.0	V	3.0	35.7	1.0	-50.7	-13.0	-37.7	
3505.00	-20.5	H	3.0	36.0	1.0	-55.5	-13.0	-42.5	
5257.50	-16.4	H	3.0	35.4	1.0	-50.9	-13.0	-37.9	
7010.00	-14.6	H	3.0	35.7	1.0	-49.3	-13.0	-36.3	

LTE B4 5MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT+ Support Equipment  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 4 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 1712.5MHz</b>									
3425.00	-20.3	V	3.0	36.1	1.0	-55.4	-13.0	-42.4	
5137.50	-16.9	V	3.0	35.4	1.0	-51.3	-13.0	-38.3	
6850.00	-14.7	V	3.0	35.7	1.0	-49.4	-13.0	-36.4	
3425.00	-20.0	H	3.0	36.1	1.0	-55.0	-13.0	-42.0	
5137.50	-16.5	H	3.0	35.4	1.0	-50.9	-13.0	-37.9	
6850.00	-15.7	H	3.0	35.7	1.0	-50.3	-13.0	-37.3	
<b>Mid Ch. 1732.5MHz</b>									
3465.00	-20.0	V	3.0	36.0	1.0	-55.1	-13.0	-42.1	
5197.50	-16.7	V	3.0	35.4	1.0	-51.1	-13.0	-38.1	
6930.00	-15.1	V	3.0	35.7	1.0	-49.8	-13.0	-36.8	
3465.00	-20.1	H	3.0	36.0	1.0	-55.1	-13.0	-42.1	
5197.50	-16.1	H	3.0	35.4	1.0	-50.5	-13.0	-37.5	
6930.00	-15.2	H	3.0	35.7	1.0	-49.8	-13.0	-36.8	
<b>High Ch. 1752.5MHz</b>									
3505.00	-19.6	V	3.0	36.0	1.0	-54.6	-13.0	-41.6	
5257.50	-16.2	V	3.0	35.4	1.0	-50.6	-13.0	-37.6	
7010.00	-15.0	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3505.00	-19.9	H	3.0	36.0	1.0	-54.9	-13.0	-41.9	
5257.50	-15.7	H	3.0	35.4	1.0	-50.2	-13.0	-37.2	
7010.00	-13.7	H	3.0	35.7	1.0	-48.4	-13.0	-35.4	

LTE B4 5MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 37290 RZ  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_OPSK Band 4 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, 1715MHz									
3435.00	-14.2	V	3.0	35.1	1.0	-49.3	-13.0	-36.3	
5145.00	-9.9	V	3.0	35.4	1.0	-44.4	-13.0	-31.4	
6860.00	-10.7	V	3.0	35.7	1.0	-45.4	-13.0	-32.4	
3435.00	-14.1	H	3.0	36.1	1.0	-49.1	-13.0	-36.1	
5145.00	-11.0	H	3.0	35.4	1.0	-45.4	-13.0	-32.4	
6860.00	-8.0	H	3.0	35.7	1.0	-42.6	-13.0	-29.6	
Mid Ch, 1732.5MHz									
3465.00	-12.7	V	3.0	36.0	1.0	-47.7	-13.0	-34.7	
5197.50	-7.5	V	3.0	35.4	1.0	-41.9	-13.0	-28.9	
6930.00	-6.6	V	3.0	35.7	1.0	-40.3	-13.0	-27.3	
3465.00	-11.7	H	3.0	36.0	1.0	-46.8	-13.0	-33.8	
5197.50	-8.2	H	3.0	35.4	1.0	-42.6	-13.0	-29.6	
6930.00	-4.8	H	3.0	35.7	1.0	-39.4	-13.0	-26.4	
High Ch, 1750MHz									
3500.00	-15.6	V	3.0	36.0	1.0	-50.6	-13.0	-37.6	
5250.00	-10.8	V	3.0	35.4	1.0	-45.2	-13.0	-32.2	
7000.00	-8.7	V	3.0	35.7	1.0	-43.4	-13.0	-30.4	
3500.00	-13.6	H	3.0	36.0	1.0	-48.6	-13.0	-35.6	
5250.00	-11.3	H	3.0	35.4	1.0	-45.7	-13.0	-32.7	
7000.00	-8.3	H	3.0	35.7	1.0	-42.9	-13.0	-29.9	

LTE B4 10MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 37290 RZ  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 4 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, 1715MHz									
3435.00	-14.3	V	3.0	36.1	1.0	-49.4	-13.0	-36.4	
5145.00	-10.0	V	3.0	35.4	1.0	-44.4	-13.0	-31.4	
6860.00	-10.4	V	3.0	35.7	1.0	-45.1	-13.0	-32.1	
3435.00	-14.1	H	3.0	36.1	1.0	-49.1	-13.0	-36.1	
5145.00	-11.1	H	3.0	35.4	1.0	-45.5	-13.0	-32.5	
6860.00	-8.8	H	3.0	35.7	1.0	-43.4	-13.0	-30.4	
Mid Ch, 1732.5MHz									
3465.00	-13.0	V	3.0	36.0	1.0	-48.0	-13.0	-35.0	
5197.50	-7.7	V	3.0	35.4	1.0	-42.1	-13.0	-29.1	
6930.00	-6.2	V	3.0	35.7	1.0	-40.8	-13.0	-27.8	
3465.00	-12.2	H	3.0	36.0	1.0	-47.3	-13.0	-34.3	
5197.50	-7.9	H	3.0	35.4	1.0	-42.3	-13.0	-29.3	
6930.00	-5.5	H	3.0	35.7	1.0	-40.1	-13.0	-27.1	
High Ch, 1750MHz									
3500.00	-15.5	V	3.0	36.0	1.0	-50.5	-13.0	-37.5	
5250.00	-11.0	V	3.0	35.4	1.0	-45.5	-13.0	-32.5	
7000.00	-8.7	V	3.0	35.7	1.0	-43.4	-13.0	-30.4	
3500.00	-14.0	H	3.0	36.0	1.0	-49.0	-13.0	-36.0	
5250.00	-11.3	H	3.0	35.4	1.0	-45.7	-13.0	-32.7	
7000.00	-8.3	H	3.0	35.7	1.0	-42.9	-13.0	-29.9	

LTE B4 10MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/6/2018  
 Test Engineer: 37290  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_OPSK Band 4 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, 1717.5MHz									
3435.00	-15.3	V	3.0	36.1	1.0	-50.3	-13.0	-37.3	
5152.50	-10.1	V	3.0	35.4	1.0	-44.5	-13.0	-31.5	
6870.00	-10.6	V	3.0	35.7	1.0	-45.2	-13.0	-32.2	
3435.00	-15.0	H	3.0	36.1	1.0	-50.1	-13.0	-37.1	
5152.50	-11.1	H	3.0	35.4	1.0	-45.5	-13.0	-32.5	
6870.00	-8.7	H	3.0	35.7	1.0	-43.4	-13.0	-30.4	
Mid Ch, 1732.5MHz									
3465.00	-12.8	V	3.0	36.0	1.0	-47.8	-13.0	-34.8	
5197.50	-8.5	V	3.0	35.4	1.0	-43.0	-13.0	-30.0	
6930.00	-7.9	V	3.0	35.7	1.0	-42.6	-13.0	-29.6	
3465.00	-13.3	H	3.0	36.0	1.0	-48.4	-13.0	-35.4	
5197.50	-9.1	H	3.0	35.4	1.0	-43.5	-13.0	-30.5	
6930.00	-7.1	H	3.0	35.7	1.0	-41.7	-13.0	-28.7	
High Ch, 1747.5MHz									
3485.00	-15.8	V	3.0	36.0	1.0	-50.8	-13.0	-37.8	
5242.50	-11.1	V	3.0	35.4	1.0	-45.5	-13.0	-32.5	
6990.00	-8.8	V	3.0	35.7	1.0	-43.5	-13.0	-30.5	
3485.00	-14.0	H	3.0	36.0	1.0	-49.1	-13.0	-36.1	
5242.50	-11.3	H	3.0	35.4	1.0	-45.7	-13.0	-32.7	
6990.00	-8.3	H	3.0	35.7	1.0	-42.9	-13.0	-29.9	

LTE B4 15MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/6/2018  
 Test Engineer: 37290  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 4 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, 1717.5MHz									
3435.00	-15.7	V	3.0	36.1	1.0	-50.8	-13.0	-37.8	
5152.50	-11.5	V	3.0	35.4	1.0	-46.0	-13.0	-33.0	
6870.00	-10.2	V	3.0	35.7	1.0	-44.9	-13.0	-31.9	
3435.00	-15.9	H	3.0	36.1	1.0	-51.0	-13.0	-38.0	
5152.50	-10.7	H	3.0	35.4	1.0	-45.1	-13.0	-32.1	
6870.00	-8.9	H	3.0	35.7	1.0	-43.6	-13.0	-30.6	
Mid Ch, 1732.5MHz									
3465.00	-13.4	V	3.0	36.0	1.0	-48.4	-13.0	-35.4	
5197.50	-10.0	V	3.0	35.4	1.0	-44.4	-13.0	-31.4	
6930.00	-10.7	V	3.0	35.7	1.0	-45.4	-13.0	-32.4	
3465.00	-14.5	H	3.0	36.0	1.0	-49.5	-13.0	-36.5	
5197.50	-10.1	H	3.0	35.4	1.0	-44.8	-13.0	-31.8	
6930.00	-8.0	H	3.0	35.7	1.0	-43.6	-13.0	-30.6	
High Ch, 1747.5MHz									
3485.00	-15.5	V	3.0	36.0	1.0	-50.5	-13.0	-37.5	
5242.50	-10.6	V	3.0	35.4	1.0	-45.0	-13.0	-32.0	
6990.00	-8.8	V	3.0	35.7	1.0	-44.4	-13.0	-31.4	
3485.00	-15.2	H	3.0	36.0	1.0	-50.3	-13.0	-37.3	
5242.50	-10.8	H	3.0	35.4	1.0	-45.3	-13.0	-32.3	
6990.00	-8.0	H	3.0	35.7	1.0	-43.7	-13.0	-30.7	

LTE B4 15MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_OPSK Band 4 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, 1720MHz									
3440.00	-20.7	V	3.0	36.0	1.0	-55.8	-13.0	-42.8	
5160.00	-17.3	V	3.0	35.4	1.0	-51.7	-13.0	-38.7	
6880.00	-16.1	V	3.0	35.7	1.0	-50.8	-13.0	-37.8	
3440.00	-20.9	H	3.0	36.0	1.0	-56.0	-13.0	-43.0	
5160.00	-16.7	H	3.0	35.4	1.0	-51.1	-13.0	-38.1	
6880.00	-14.6	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
Mid Ch, 1732.5MHz									
3465.00	-21.4	V	3.0	36.0	1.0	-56.4	-13.0	-43.4	
5197.50	-16.9	V	3.0	35.4	1.0	-51.3	-13.0	-38.3	
6930.00	-15.6	V	3.0	35.7	1.0	-50.3	-13.0	-37.3	
3465.00	-20.0	H	3.0	36.0	1.0	-55.0	-13.0	-42.0	
5197.50	-15.9	H	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6930.00	-13.4	H	3.0	35.7	1.0	-48.1	-13.0	-35.1	
High Ch, 1745MHz									
3480.00	-20.3	V	3.0	36.0	1.0	-55.3	-13.0	-42.3	
5235.00	-17.1	V	3.0	35.4	1.0	-51.5	-13.0	-38.5	
6880.00	-15.6	V	3.0	35.7	1.0	-50.3	-13.0	-37.3	
3480.00	-19.9	H	3.0	36.0	1.0	-55.0	-13.0	-42.0	
5235.00	-16.2	H	3.0	35.4	1.0	-50.6	-13.0	-37.6	
6880.00	-14.8	H	3.0	35.7	1.0	-49.5	-13.0	-36.5	

LTE B4 20MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 4 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, 1720MHz									
3440.00	-19.7	V	3.0	36.0	1.0	-54.8	-13.0	-41.8	
5160.00	-16.2	V	3.0	35.4	1.0	-50.6	-13.0	-37.6	
6880.00	-14.7	V	3.0	35.7	1.0	-49.4	-13.0	-36.4	
3440.00	-19.9	H	3.0	36.0	1.0	-54.9	-13.0	-41.9	
5160.00	-15.9	H	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6880.00	-13.6	H	3.0	35.7	1.0	-48.2	-13.0	-35.2	
Mid Ch, 1732.5MHz									
3465.00	-20.4	V	3.0	36.0	1.0	-55.4	-13.0	-42.4	
5197.50	-16.9	V	3.0	35.4	1.0	-51.3	-13.0	-38.3	
6930.00	-15.1	V	3.0	35.7	1.0	-49.8	-13.0	-36.8	
3465.00	-20.0	H	3.0	36.0	1.0	-55.0	-13.0	-42.0	
5197.50	-16.0	H	3.0	35.4	1.0	-50.5	-13.0	-37.5	
6930.00	-14.7	H	3.0	35.7	1.0	-49.4	-13.0	-36.4	
High Ch, 1745MHz									
3480.00	-19.8	V	3.0	36.0	1.0	-54.8	-13.0	-41.8	
5235.00	-16.8	V	3.0	35.4	1.0	-51.2	-13.0	-38.2	
6880.00	-16.6	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3480.00	-19.4	H	3.0	36.0	1.0	-54.4	-13.0	-41.4	
5235.00	-15.3	H	3.0	35.4	1.0	-49.7	-13.0	-36.7	
6880.00	-13.5	H	3.0	35.7	1.0	-48.2	-13.0	-35.2	

LTE B4 20MHz 16QAM

9.1.4. LTE BAND 5

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_OPSK Band 5 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (dBi)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 825.5MHz</b>									
1651.00	-29.5	V	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2476.50	-29.0	V	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3302.00	-24.1	V	3.0	36.2	1.0	-59.2	-13.0	-46.2	
1651.00	-29.0	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2476.50	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
3302.00	-23.9	H	3.0	36.2	1.0	-59.1	-13.0	-46.1	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-29.1	V	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2599.50	-25.9	V	3.0	36.4	1.0	-61.3	-13.0	-48.3	
3346.00	-23.4	V	3.0	36.1	1.0	-58.5	-13.0	-45.5	
1673.00	-29.5	H	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2599.50	-26.0	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3346.00	-23.8	H	3.0	36.1	1.0	-58.9	-13.0	-45.9	
<b>High Ch, 847.5MHz</b>									
1695.00	-29.1	V	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2542.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3390.00	-23.4	V	3.0	36.1	1.0	-58.4	-13.0	-45.4	
1695.00	-28.9	H	3.0	37.0	1.0	-64.8	-13.0	-51.8	
2542.50	-25.2	H	3.0	36.4	1.0	-60.6	-13.0	-47.6	
3390.00	-23.5	H	3.0	36.1	1.0	-58.6	-13.0	-45.6	

LTE B5 3MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 5 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (dBi)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 825.5MHz</b>									
1651.00	-29.5	V	3.0	37.0	1.0	-65.6	-13.0	-52.6	
2476.50	-25.3	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3302.00	-24.8	V	3.0	36.2	1.0	-59.7	-13.0	-46.7	
1651.00	-28.8	H	3.0	37.0	1.0	-64.8	-13.0	-51.8	
2476.50	-25.3	H	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3302.00	-24.0	H	3.0	36.2	1.0	-59.2	-13.0	-46.2	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-29.0	V	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2599.50	-25.5	V	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3346.00	-23.8	V	3.0	36.1	1.0	-58.9	-13.0	-45.9	
1673.00	-29.5	H	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2599.50	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3346.00	-24.4	H	3.0	36.1	1.0	-59.5	-13.0	-46.5	
<b>High Ch, 847.5MHz</b>									
1695.00	-28.9	V	3.0	37.0	1.0	-64.9	-13.0	-51.9	
2542.50	-25.6	V	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3390.00	-24.1	V	3.0	36.1	1.0	-59.2	-13.0	-46.2	
1695.00	-29.3	H	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2542.50	-25.5	H	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3390.00	-23.6	H	3.0	36.1	1.0	-58.6	-13.0	-45.6	

LTE B5 3MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_OPSK Band 5 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (dBi)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 826.5MHz</b>									
1653.00	-29.6	V	3.0	37.0	1.0	-65.6	-13.0	-52.6	
2479.50	-26.0	V	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3306.00	-24.3	V	3.0	36.1	1.0	-59.4	-13.0	-46.4	
1653.00	-29.8	H	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2479.50	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3306.00	-23.8	H	3.0	36.1	1.0	-59.0	-13.0	-46.0	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-29.2	V	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2599.50	-25.7	V	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3346.00	-24.1	V	3.0	36.1	1.0	-59.2	-13.0	-46.2	
1673.00	-29.3	H	3.0	37.0	1.0	-65.3	-13.0	-52.3	
2599.50	-25.4	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3346.00	-23.9	H	3.0	36.1	1.0	-59.1	-13.0	-46.1	
<b>High Ch, 846.5MHz</b>									
1693.00	-28.5	V	3.0	37.0	1.0	-64.4	-13.0	-51.4	
2539.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3386.00	-23.9	V	3.0	36.1	1.0	-59.0	-13.0	-46.0	
1693.00	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2539.50	-24.9	H	3.0	36.4	1.0	-60.3	-13.0	-47.3	
3386.00	-24.2	H	3.0	36.1	1.0	-59.3	-13.0	-46.3	

LTE B5 5MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 5 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (dBi)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 826.5MHz</b>									
1653.00	-29.4	V	3.0	37.0	1.0	-65.4	-13.0	-52.4	
2479.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3306.00	-24.4	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1653.00	-29.5	H	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2479.50	-26.0	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3306.00	-24.7	H	3.0	36.1	1.0	-59.8	-13.0	-46.8	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-29.4	V	3.0	37.0	1.0	-65.4	-13.0	-52.4	
2599.50	-25.6	V	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3346.00	-24.2	V	3.0	36.1	1.0	-59.3	-13.0	-46.3	
1673.00	-29.9	H	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2599.50	-25.3	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3346.00	-23.8	H	3.0	36.1	1.0	-59.0	-13.0	-46.0	
<b>High Ch, 846.5MHz</b>									
1693.00	-29.0	V	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2539.50	-25.7	V	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3386.00	-23.4	V	3.0	36.1	1.0	-58.5	-13.0	-45.5	
1693.00	-28.9	H	3.0	37.0	1.0	-64.9	-13.0	-51.9	
2539.50	-25.4	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3386.00	-24.0	H	3.0	36.1	1.0	-59.1	-13.0	-46.1	

LTE B5 5MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_OPSK Band 5 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (dBi)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 829MHz</b>									
1658.00	-29.6	V	3.0	37.0	1.0	-65.8	-13.0	-52.8	
2487.00	-25.8	V	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3316.00	-23.9	V	3.0	36.1	1.0	-59.1	-13.0	-46.1	
1658.00	-29.6	H	3.0	37.0	1.0	-65.8	-13.0	-52.8	
2487.00	-26.0	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3316.00	-24.2	H	3.0	36.1	1.0	-59.3	-13.0	-46.3	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-29.0	V	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2599.50	-25.2	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3346.00	-24.3	V	3.0	36.1	1.0	-59.4	-13.0	-46.4	
1673.00	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2599.50	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3346.00	-23.9	H	3.0	36.1	1.0	-58.9	-13.0	-45.9	
<b>High Ch, 844MHz</b>									
1688.00	-29.1	V	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2532.00	-25.8	V	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3376.00	-23.7	V	3.0	36.1	1.0	-58.7	-13.0	-45.7	
1688.00	-29.0	H	3.0	37.0	1.0	-64.9	-13.0	-51.9	
2532.00	-25.4	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3376.00	-23.9	H	3.0	36.1	1.0	-58.9	-13.0	-45.9	

LTE B5 10MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 5 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (dBi)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 829MHz</b>									
1658.00	-29.2	V	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2487.00	-25.2	V	3.0	36.4	1.0	-60.6	-13.0	-47.6	
3316.00	-23.9	V	3.0	36.1	1.0	-59.0	-13.0	-46.0	
1658.00	-29.6	H	3.0	37.0	1.0	-65.6	-13.0	-52.6	
2487.00	-26.4	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3316.00	-23.8	H	3.0	36.1	1.0	-58.8	-13.0	-45.8	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-28.7	V	3.0	37.0	1.0	-64.7	-13.0	-51.7	
2599.50	-25.4	V	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3346.00	-24.0	V	3.0	36.1	1.0				

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43376 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 5 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 824.7MHz</b>									
1648.40	-29.5	V	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2474.10	-25.6	V	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3298.80	-24.1	V	3.0	36.2	1.0	-59.3	-13.0	-46.3	
1648.40	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2474.10	-25.8	H	3.0	36.4	1.0	-61.3	-13.0	-48.3	
3298.80	-22.6	H	3.0	36.2	1.0	-57.8	-13.0	-44.8	
<b>Mid Ch. 836.5MHz</b>									
1673.00	-29.8	V	3.0	37.0	1.0	-65.8	-13.0	-52.8	
2509.50	-25.2	V	3.0	36.4	1.0	-60.6	-13.0	-47.6	
3346.00	-24.0	V	3.0	36.1	1.0	-59.1	-13.0	-46.1	
1673.00	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2509.50	-25.8	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3346.00	-23.9	H	3.0	36.1	1.0	-59.0	-13.0	-46.0	
<b>High Ch. 848.3MHz</b>									
1698.60	-28.3	V	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2544.90	-25.3	V	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3393.20	-23.4	V	3.0	36.1	1.0	-58.5	-13.0	-45.5	
1698.60	-28.5	H	3.0	37.0	1.0	-64.5	-13.0	-51.5	
2544.90	-24.9	H	3.0	36.4	1.0	-60.3	-13.0	-47.3	
3393.20	-23.6	H	3.0	36.1	1.0	-58.7	-13.0	-45.7	

**LTE B5 1.4MHz QPSK**

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43376 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 5 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 824.7MHz</b>									
1648.40	-29.0	V	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2474.10	-26.1	V	3.0	36.4	1.0	-61.6	-13.0	-48.6	
3298.80	-23.8	V	3.0	36.2	1.0	-59.0	-13.0	-46.0	
1648.40	-28.7	H	3.0	37.0	1.0	-64.7	-13.0	-51.7	
2474.10	-26.0	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3298.80	-23.6	H	3.0	36.2	1.0	-58.8	-13.0	-45.8	
<b>Mid Ch. 836.5MHz</b>									
1673.00	-29.1	V	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2509.50	-26.1	V	3.0	36.4	1.0	-61.5	-13.0	-48.5	
3346.00	-23.8	V	3.0	36.1	1.0	-58.9	-13.0	-45.9	
1673.00	-29.6	H	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2509.50	-25.9	H	3.0	36.4	1.0	-61.3	-13.0	-48.3	
3346.00	-23.5	H	3.0	36.1	1.0	-58.7	-13.0	-45.7	
<b>High Ch. 848.3MHz</b>									
1698.60	-28.8	V	3.0	37.0	1.0	-64.8	-13.0	-51.8	
2544.90	-25.3	V	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3393.20	-23.5	V	3.0	36.1	1.0	-58.6	-13.0	-45.6	
1698.60	-29.3	H	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2544.90	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3393.20	-23.2	H	3.0	36.1	1.0	-58.2	-13.0	-45.2	

**LTE B5 1.4MHz 16QAM**

9.1.5. LTE BAND 7

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<p>Company: SOMC Project #: 12132730 Date: 3/5/2018 Test Engineer: 39005 RA Configuration: EUT + Support Equipment Location: Chamber B Mode: LTE_OPK Band 7 Harmonics, 5MHz Bandwidth</p>											<p>Company: SOMC Project #: 12132730 Date: 3/5/2018 Test Engineer: 39005 RA Configuration: EUT + Support Equipment Location: Chamber B Mode: LTE_16QAM Band 7 Harmonics, 5MHz Bandwidth</p>										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes		
<b>Low Ch, 2502.5MHz</b>										<b>Low Ch, 2502.5MHz</b>											
9005.00	-16.7	V	3.0	35.5	1.0	-51.2	-25.0	-26.2		9005.00	-17.6	V	3.0	35.5	1.0	-52.1	-25.0	-27.1			
7957.50	-14.7	V	3.0	35.7	1.0	-49.4	-25.0	-24.4		7957.50	-15.5	V	3.0	35.7	1.0	-50.2	-25.0	-25.2			
10010.00	-12.6	V	3.0	36.0	1.0	-47.7	-25.0	-22.7		10010.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3			
9005.00	-15.9	H	3.0	35.5	1.0	-50.1	-25.0	-25.1		9005.00	-15.3	H	3.0	35.5	1.0	-49.8	-25.0	-24.8			
7957.50	-13.8	H	3.0	35.7	1.0	-48.3	-25.0	-23.3		7957.50	-13.2	H	3.0	35.7	1.0	-47.9	-25.0	-22.9			
10010.00	-11.8	H	3.0	36.0	1.0	-46.8	-25.0	-21.8		10010.00	-11.4	H	3.0	36.0	1.0	-46.4	-25.0	-21.4			
<b>Mid Ch, 2535MHz</b>										<b>Mid Ch, 2535MHz</b>											
9070.00	-16.4	V	3.0	35.4	1.0	-50.9	-25.0	-25.9		9070.00	-16.1	V	3.0	35.4	1.0	-50.5	-25.0	-25.5			
7695.00	-14.6	V	3.0	35.8	1.0	-49.3	-25.0	-24.3		7695.00	-15.2	V	3.0	35.8	1.0	-49.9	-25.0	-24.9			
10140.00	-11.8	V	3.0	36.0	1.0	-46.8	-25.0	-21.8		10140.00	-12.1	V	3.0	36.0	1.0	-47.0	-25.0	-22.0			
9070.00	-16.0	H	3.0	35.4	1.0	-50.4	-25.0	-25.4		9070.00	-15.9	H	3.0	35.4	1.0	-50.4	-25.0	-25.4			
7695.00	-12.8	H	3.0	35.8	1.0	-47.6	-25.0	-22.6		7695.00	-13.8	H	3.0	35.8	1.0	-48.5	-25.0	-23.5			
10140.00	-11.3	H	3.0	36.0	1.0	-46.2	-25.0	-21.2		10140.00	-11.9	H	3.0	36.0	1.0	-46.8	-25.0	-21.8			
<b>High Ch, 2567.5MHz</b>										<b>High Ch, 2567.5MHz</b>											
9125.00	-16.1	V	3.0	35.4	1.0	-50.5	-25.0	-25.5		9125.00	-16.2	V	3.0	35.4	1.0	-50.6	-25.0	-25.6			
7782.50	-14.2	V	3.0	35.8	1.0	-48.9	-25.0	-23.9		7782.50	-14.1	V	3.0	35.8	1.0	-48.9	-25.0	-23.9			
10270.00	-12.3	V	3.0	35.9	1.0	-47.2	-25.0	-22.2		10270.00	-12.0	V	3.0	35.9	1.0	-46.9	-25.0	-21.9			
9125.00	-15.3	H	3.0	35.4	1.0	-49.8	-25.0	-24.8		9125.00	-15.7	H	3.0	35.4	1.0	-50.1	-25.0	-25.1			
7782.50	-13.0	H	3.0	35.8	1.0	-47.7	-25.0	-22.7		7782.50	-12.7	H	3.0	35.8	1.0	-47.4	-25.0	-22.4			
10270.00	-11.4	H	3.0	35.9	1.0	-46.3	-25.0	-21.3		10270.00	-11.7	H	3.0	35.9	1.0	-46.6	-25.0	-21.6			

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<p>Company: SOMC Project #: 12132730 Date: 3/5/2018 Test Engineer: 39005 RA Configuration: EUT + Support Equipment Location: Chamber B Mode: LTE_OPK Band 7 Harmonics, 10MHz Bandwidth</p>											<p>Company: SOMC Project #: 12132730 Date: 3/5/2018 Test Engineer: 39005 RA Configuration: EUT + Support Equipment Location: Chamber B Mode: LTE_16QAM Band 7 Harmonics, 10MHz Bandwidth</p>										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes		
<b>Low Ch, 2505MHz</b>										<b>Low Ch, 2505MHz</b>											
9010.00	-16.9	V	3.0	35.5	1.0	-51.4	-25.0	-26.4		9010.00	-17.6	V	3.0	35.5	1.0	-52.1	-25.0	-27.1			
7515.00	-14.6	V	3.0	35.7	1.0	-49.4	-25.0	-24.4		7515.00	-15.5	V	3.0	35.7	1.0	-50.2	-25.0	-25.2			
10020.00	-12.7	V	3.0	36.0	1.0	-47.7	-25.0	-22.7		10020.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3			
9010.00	-15.8	H	3.0	35.5	1.0	-50.0	-25.0	-25.0		9010.00	-15.2	H	3.0	35.5	1.0	-49.7	-25.0	-24.7			
7515.00	-13.5	H	3.0	35.7	1.0	-48.3	-25.0	-23.3		7515.00	-13.2	H	3.0	35.7	1.0	-47.9	-25.0	-22.9			
10020.00	-11.7	H	3.0	36.0	1.0	-46.7	-25.0	-21.7		10020.00	-11.4	H	3.0	36.0	1.0	-46.4	-25.0	-21.4			
<b>Mid Ch, 2535MHz</b>										<b>Mid Ch, 2535MHz</b>											
9070.00	-16.4	V	3.0	35.4	1.0	-50.9	-25.0	-25.9		9070.00	-16.2	V	3.0	35.4	1.0	-50.6	-25.0	-25.6			
7695.00	-14.7	V	3.0	35.8	1.0	-49.4	-25.0	-24.4		7695.00	-15.2	V	3.0	35.8	1.0	-49.9	-25.0	-24.9			
10140.00	-11.5	V	3.0	36.0	1.0	-46.5	-25.0	-21.5		10140.00	-12.1	V	3.0	36.0	1.0	-47.1	-25.0	-22.1			
9070.00	-16.1	H	3.0	35.4	1.0	-50.5	-25.0	-25.5		9070.00	-16.2	H	3.0	35.4	1.0	-50.6	-25.0	-25.6			
7695.00	-13.0	H	3.0	35.8	1.0	-47.8	-25.0	-22.8		7695.00	-13.8	H	3.0	35.8	1.0	-48.6	-25.0	-23.6			
10140.00	-11.1	H	3.0	36.0	1.0	-46.6	-25.0	-21.6		10140.00	-11.9	H	3.0	36.0	1.0	-46.8	-25.0	-21.8			
<b>High Ch, 2565MHz</b>										<b>High Ch, 2565MHz</b>											
9130.00	-16.2	V	3.0	35.4	1.0	-50.7	-25.0	-25.7		9130.00	-16.2	V	3.0	35.4	1.0	-50.7	-25.0	-25.7			
7695.00	-14.7	V	3.0	35.8	1.0	-49.0	-25.0	-24.0		7695.00	-14.1	V	3.0	35.8	1.0	-48.9	-25.0	-23.9			
10260.00	-12.4	V	3.0	35.9	1.0	-47.3	-25.0	-22.3		10260.00	-12.0	V	3.0	35.9	1.0	-46.9	-25.0	-21.9			
9130.00	-15.2	H	3.0	35.4	1.0	-49.7	-25.0	-24.7		9130.00	-15.6	H	3.0	35.4	1.0	-50.1	-25.0	-25.1			
7695.00	-12.9	H	3.0	35.8	1.0	-47.6	-25.0	-22.6		7695.00	-12.8	H	3.0	35.8	1.0	-47.4	-25.0	-22.4			
10260.00	-11.4	H	3.0	35.9	1.0	-46.3	-25.0	-21.3		10260.00	-11.6	H	3.0	35.9	1.0	-46.5	-25.0	-21.5			

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
<p>Company: SOMC Project #: 12132730 Date: 3/5/2018 Test Engineer: 39005 RA Configuration: EUT + Support Equipment Location: Chamber B Mode: LTE_OPK Band 7 Harmonics, 15MHz Bandwidth</p>											<p>Company: SOMC Project #: 12132730 Date: 3/5/2018 Test Engineer: 39005 RA Configuration: EUT + Support Equipment Location: Chamber B Mode: LTE_16QAM Band 7 Harmonics, 15MHz Bandwidth</p>										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes		
<b>Low Ch, 2507.5MHz</b>										<b>Low Ch, 2507.5MHz</b>											
9015.00	-17.9	V	3.0	35.5	1.0	-52.3	-25.0	-27.3		9015.00	-16.9	V	3.0	35.5	1.0	-51.3	-25.0	-26.3			
7322.50	-15.7	V	3.0	35.7	1.0	-50.5	-25.0	-25.5		7322.50	-14.9	V	3.0	35.7	1.0	-49.7	-25.0	-24.7			
10030.00	-12.7	V	3.0	36.0	1.0	-47.7	-25.0	-22.7		10030.00	-12.5	V	3.0	36.0	1.0	-47.5	-25.0	-22.5			
9015.00	-15.4	H	3.0	35.5	1.0	-49.9	-25.0	-24.9		9015.00	-16.9	H	3.0	35.5	1.0	-51.3	-25.0	-26.3			
7322.50	-13.9	H	3.0	35.7	1.0	-48.6	-25.0	-23.6		7322.50	-14.2	H	3.0	35.7	1.0	-48.9	-25.0	-23.9			
10030.00	-11.1	H	3.0	36.0	1.0	-46.1	-25.0	-21.1		10030.00	-12.0	H	3.0	36.0	1.0	-47.1	-25.0	-22.1			
<b>Mid Ch, 2535MHz</b>										<b>Mid Ch, 2535MHz</b>											
9070.00	-16.7	V	3.0	35.4	1.0	-51.2	-25.0	-26.2		9070.00	-16.7	V	3.0	35.4	1.0	-51.1	-25.0	-26.1			
7695.00	-14.7	V	3.0	35.8	1.0	-49.5	-25.0	-24.5		7695.00	-15.7	V	3.0	35.8	1.0	-50.5	-25.0	-25.5			
10140.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3		10140.00	-13.8	V	3.0	36.0	1.0	-48.8	-25.0	-23.8			
9070.00	-17.6	H	3.0	35.4	1.0	-52.0	-25.0	-27.0		9070.00	-17.2	H	3.0	35.4	1.0	-51.7	-25.0	-26.7			
7695.00	-14.0	H	3.0	35.8	1.0	-48.7	-25.0	-23.7		7695.00	-13.3	H	3.0	35.8	1.0	-48.0	-25.0	-23.0			
10140.00	-11.8	H	3.0	36.0	1.0	-46.7	-25.0	-21.7		10140.00	-11.6	H	3.0	36.0	1.0	-46.5	-25.0	-21.5			
<b>High Ch, 2562.5MHz</b>										<b>High Ch, 2562.5MHz</b>											
9125.00	-15.0	V	3.0	35.4	1.0	-49.4	-25.0	-24.4		9125.00	-16.0	V	3.0	35.4	1.0	-50.5	-25.0	-25.5			
7887.50	-15.4	V	3.0	35.8	1.0	-50.1	-25.0	-25.1		7887.50	-15.6	V	3.0	35.8	1.0	-50.4	-25.0	-25.4			
10250.00	-13.8	V	3.0	35.9	1.0	-48.7	-25.0	-23.7		10250.00	-11.5	V	3.0	35.9	1.0	-46.4	-25.0	-21.4			
9125.00	-16.6	H	3.0	35.4	1.0	-51.0	-25.0	-26.0		9125.00	-15.5	H	3.0	35.4	1.0	-49.9	-25.0	-24.9			
7887.50	-12.1	H	3.0	35.8	1.0	-48.8	-25.0	-23.8		7887.50	-11.7	H	3.0	35.8	1.0	-48.4	-25.0	-23.4			
10250.00	-10.9	H	3.0	35.9	1.0	-44.9	-25.0	-19.9		10250.00	-11.8	H	3.0	35.9	1.0	-48.7	-25.0	-23.7			

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 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
<b>Low Ch, 2510MHz</b>									
5020.00	-16.8	V	3.0	35.5	1.0	-51.2	-25.0	-26.2	
7530.00	-15.7	V	3.0	35.7	1.0	-50.5	-25.0	-25.5	
10040.00	-13.4	V	3.0	36.0	1.0	-48.4	-25.0	-23.4	
5020.00	-16.2	H	3.0	35.5	1.0	-50.6	-25.0	-25.6	
7530.00	-14.2	H	3.0	35.7	1.0	-48.9	-25.0	-23.9	
10040.00	-11.8	H	3.0	36.0	1.0	-46.8	-25.0	-21.8	
<b>Mid Ch, 2535MHz</b>									
5070.00	-16.3	V	3.0	35.4	1.0	-50.8	-25.0	-25.8	
7605.00	-16.3	V	3.0	35.8	1.0	-51.0	-25.0	-26.0	
10140.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5070.00	-17.0	H	3.0	35.4	1.0	-51.4	-25.0	-26.4	
7605.00	-14.1	H	3.0	35.8	1.0	-48.8	-25.0	-23.8	
10140.00	-12.6	H	3.0	36.0	1.0	-47.6	-25.0	-22.6	
<b>High Ch, 2560MHz</b>									
5120.00	-16.4	V	3.0	35.4	1.0	-50.8	-25.0	-25.8	
7680.00	-15.5	V	3.0	35.8	1.0	-50.3	-25.0	-25.3	
10240.00	-12.9	V	3.0	35.9	1.0	-47.8	-25.0	-22.8	
5120.00	-15.8	H	3.0	35.4	1.0	-50.2	-25.0	-25.2	
7680.00	-14.3	H	3.0	35.8	1.0	-49.1	-25.0	-24.1	
10240.00	-10.0	H	3.0	35.9	1.0	-44.9	-25.0	-19.9	

**LTE B7 20MHz QPSK**

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/5/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 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
<b>Low Ch, 2510MHz</b>									
5020.00	-17.1	V	3.0	35.5	1.0	-51.6	-25.0	-26.6	
7530.00	-14.8	V	3.0	35.7	1.0	-49.6	-25.0	-24.6	
10040.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5020.00	-16.2	H	3.0	35.5	1.0	-50.6	-25.0	-25.6	
7530.00	-14.3	H	3.0	35.7	1.0	-49.1	-25.0	-24.1	
10040.00	-13.1	H	3.0	36.0	1.0	-48.1	-25.0	-23.1	
<b>Mid Ch, 2535MHz</b>									
5070.00	-17.2	V	3.0	35.4	1.0	-51.7	-25.0	-26.7	
7605.00	-15.1	V	3.0	35.8	1.0	-49.0	-25.0	-24.0	
10140.00	-13.8	V	3.0	36.0	1.0	-48.8	-25.0	-23.8	
5070.00	-16.7	H	3.0	35.4	1.0	-51.1	-25.0	-26.1	
7605.00	-14.4	H	3.0	35.8	1.0	-49.2	-25.0	-24.2	
10140.00	-11.4	H	3.0	36.0	1.0	-46.4	-25.0	-21.4	
<b>High Ch, 2560MHz</b>									
5120.00	-16.1	V	3.0	35.4	1.0	-50.5	-25.0	-25.5	
7680.00	-15.4	V	3.0	35.8	1.0	-50.1	-25.0	-25.1	
10240.00	-12.9	V	3.0	35.9	1.0	-47.8	-25.0	-22.8	
5120.00	-16.0	H	3.0	35.4	1.0	-50.4	-25.0	-25.4	
7680.00	-14.2	H	3.0	35.8	1.0	-48.9	-25.0	-23.9	
10240.00	-13.1	H	3.0	35.9	1.0	-48.0	-25.0	-23.0	

**LTE B7 20MHz 16QAM**

9.1.6. LTE BAND 13

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/3/2018  
**Test Engineer:** 43575 OS  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** LTE\_QPSK Band 13 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
<b>Low Ch, 779.5MHz</b>									
1559.00	-30.1	V	3.0	37.1	1.0	-66.2	-40.0	-26.2	
2338.50	-25.2	V	3.0	36.5	1.0	-61.7	-13.0	-48.7	
3118.00	-24.4	V	3.0	36.3	1.0	-59.7	-13.0	-46.7	
1559.00	-30.0	H	3.0	37.1	1.0	-66.2	-40.0	-26.2	
2338.50	-25.5	H	3.0	36.5	1.0	-61.0	-13.0	-48.0	
3118.00	-24.6	H	3.0	36.3	1.0	-59.8	-13.0	-46.8	
<b>Mid Ch, 782MHz</b>									
1564.00	-30.4	V	3.0	37.1	1.0	-66.5	-40.0	-26.5	
2346.00	-25.9	V	3.0	36.5	1.0	-61.4	-13.0	-48.4	
3128.00	-24.7	V	3.0	36.3	1.0	-60.0	-13.0	-47.0	
1564.00	-30.5	H	3.0	37.1	1.0	-66.7	-40.0	-26.7	
2346.00	-25.9	H	3.0	36.5	1.0	-61.4	-13.0	-48.4	
3128.00	-24.8	H	3.0	36.3	1.0	-59.7	-13.0	-46.7	
<b>High Ch, 784.5MHz</b>									
1569.00	-30.8	V	3.0	37.1	1.0	-66.7	-40.0	-26.7	
2353.50	-25.7	V	3.0	36.5	1.0	-61.2	-13.0	-48.2	
3138.00	-24.1	V	3.0	36.3	1.0	-59.4	-13.0	-46.4	
1569.00	-30.3	H	3.0	37.1	1.0	-61.0	-40.0	-27.0	
2353.50	-26.2	H	3.0	36.5	1.0	-61.7	-13.0	-48.7	
3138.00	-24.1	H	3.0	36.3	1.0	-59.4	-13.0	-46.4	

LTE B13 5MHz QPSK

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/3/2018  
**Test Engineer:** 43575 OS  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** LTE\_16QAM Band 13 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
<b>Low Ch, 779.5MHz</b>									
1559.00	-30.5	V	3.0	37.1	1.0	-66.6	-40.0	-26.6	
2338.50	-25.5	V	3.0	36.5	1.0	-61.9	-13.0	-48.9	
3118.00	-24.6	V	3.0	36.3	1.0	-59.9	-13.0	-46.9	
1559.00	-30.7	H	3.0	37.1	1.0	-66.9	-40.0	-26.9	
2338.50	-25.6	H	3.0	36.5	1.0	-61.1	-13.0	-48.1	
3118.00	-23.9	H	3.0	36.3	1.0	-59.2	-13.0	-46.2	
<b>Mid Ch, 782MHz</b>									
1564.00	-30.4	V	3.0	37.1	1.0	-66.6	-40.0	-26.6	
2346.00	-25.9	V	3.0	36.5	1.0	-61.4	-13.0	-48.4	
3128.00	-24.3	V	3.0	36.3	1.0	-59.6	-13.0	-46.6	
1564.00	-30.7	H	3.0	37.1	1.0	-66.8	-40.0	-26.8	
2346.00	-26.4	H	3.0	36.5	1.0	-61.9	-13.0	-48.9	
3128.00	-24.9	H	3.0	36.3	1.0	-60.2	-13.0	-47.2	
<b>High Ch, 784.5MHz</b>									
1569.00	-30.2	V	3.0	37.1	1.0	-66.4	-40.0	-26.4	
2353.50	-26.1	V	3.0	36.5	1.0	-61.6	-13.0	-48.6	
3138.00	-24.1	V	3.0	36.3	1.0	-59.4	-13.0	-46.4	
1569.00	-30.4	H	3.0	37.1	1.0	-66.5	-40.0	-26.5	
2353.50	-25.6	H	3.0	36.5	1.0	-61.0	-13.0	-48.0	
3138.00	-24.7	H	3.0	36.3	1.0	-60.0	-13.0	-47.0	

LTE B13 5MHz 16QAM

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/3/2018  
**Test Engineer:** 43575 OS  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** LTE\_QPSK Band 13 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
<b>Mid Ch, 782MHz</b>									
1564.00	-30.4	V	3.0	37.1	1.0	-66.5	-40.0	-26.5	
2346.00	-25.9	V	3.0	36.5	1.0	-61.4	-13.0	-48.4	
3128.00	-25.0	V	3.0	36.3	1.0	-60.3	-13.0	-47.3	
1564.00	-30.5	H	3.0	37.1	1.0	-66.6	-40.0	-26.6	
2346.00	-26.4	H	3.0	36.5	1.0	-61.8	-13.0	-48.8	
3128.00	-24.7	H	3.0	36.3	1.0	-60.0	-13.0	-47.0	

LTE B13 10MHz QPSK

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

**Company:** SOMC  
**Project #:** 12132730  
**Date:** 3/3/2018  
**Test Engineer:** 43575 OS  
**Configuration:** EUT + Support Equipment  
**Location:** Chamber A  
**Mode:** LTE\_16QAM Band 13 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
<b>Mid Ch, 782MHz</b>									
1564.00	-29.9	V	3.0	37.1	1.0	-66.0	-40.0	-26.0	
2346.00	-26.1	V	3.0	36.5	1.0	-61.6	-13.0	-48.6	
3128.00	-24.0	V	3.0	36.3	1.0	-59.3	-13.0	-46.3	
1564.00	-31.1	H	3.0	37.1	1.0	-67.2	-40.0	-27.2	
2346.00	-25.3	H	3.0	36.5	1.0	-60.8	-13.0	-47.8	
3128.00	-24.2	H	3.0	36.3	1.0	-59.5	-13.0	-46.5	

LTE B13 10MHz 16QAM

9.1.7. LTE BAND 17

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_OPSK Band 17 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
<b>Low Ch, 706.5MHz</b>									
1413.00	-12.9	V	3.0	37.4	1.0	-49.3	-13.0	-36.3	
2119.50	-25.1	V	3.0	36.6	1.0	-49.6	-13.0	-47.6	
2826.00	-23.8	V	3.0	36.4	1.0	-59.2	-13.0	-46.2	
1413.00	-25.4	H	3.0	37.4	1.0	-61.7	-13.0	-48.7	
2119.50	-25.4	H	3.0	36.6	1.0	-61.0	-13.0	-48.0	
2826.00	-24.0	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
<b>Mid Ch, 710MHz</b>									
1420.00	-9.3	V	3.0	37.3	1.0	-45.6	-13.0	-32.6	
2130.00	-25.1	V	3.0	36.6	1.0	-49.6	-13.0	-47.6	
2840.00	-23.7	V	3.0	36.4	1.0	-59.1	-13.0	-46.1	
1420.00	-24.6	H	3.0	37.3	1.0	-61.0	-13.0	-48.0	
2130.00	-25.3	H	3.0	36.6	1.0	-60.9	-13.0	-47.9	
2840.00	-24.1	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
<b>High Ch, 713.5MHz</b>									
1427.00	-7.4	V	3.0	37.3	1.0	-43.7	-13.0	-30.7	
2140.50	-23.1	V	3.0	36.6	1.0	-48.6	-13.0	-45.6	
2854.00	-24.0	V	3.0	36.4	1.0	-59.4	-13.0	-46.4	
1427.00	-24.6	H	3.0	37.3	1.0	-61.0	-13.0	-48.0	
2140.50	-25.3	H	3.0	36.6	1.0	-60.9	-13.0	-47.9	
2854.00	-23.1	H	3.0	36.4	1.0	-58.5	-13.0	-45.5	

LTE B17 5MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 17 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
<b>Low Ch, 706.5MHz</b>									
1413.00	-11.2	V	3.0	37.4	1.0	-47.6	-13.0	-34.6	
2119.50	-25.3	V	3.0	36.6	1.0	-49.8	-13.0	-47.8	
2826.00	-24.3	V	3.0	36.4	1.0	-59.7	-13.0	-46.7	
1413.00	-24.4	H	3.0	37.4	1.0	-60.8	-13.0	-47.8	
2119.50	-25.5	H	3.0	36.6	1.0	-61.0	-13.0	-48.0	
2826.00	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
<b>Mid Ch, 710MHz</b>									
1420.00	-7.9	V	3.0	37.3	1.0	-44.2	-13.0	-31.2	
2130.00	-24.7	V	3.0	36.6	1.0	-49.3	-13.0	-47.3	
2840.00	-23.4	V	3.0	36.4	1.0	-58.8	-13.0	-45.8	
1420.00	-23.7	H	3.0	37.3	1.0	-60.1	-13.0	-47.1	
2130.00	-24.8	H	3.0	36.6	1.0	-60.4	-13.0	-47.4	
2840.00	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
<b>High Ch, 713.5MHz</b>									
1427.00	-6.4	V	3.0	37.3	1.0	-42.7	-13.0	-29.7	
2140.50	-23.0	V	3.0	36.6	1.0	-48.6	-13.0	-45.6	
2854.00	-23.7	V	3.0	36.4	1.0	-59.1	-13.0	-46.1	
1427.00	-23.6	H	3.0	37.3	1.0	-59.9	-13.0	-46.9	
2140.50	-24.8	H	3.0	36.6	1.0	-60.3	-13.0	-47.3	
2854.00	-24.1	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	

LTE B17 5MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_OPSK Band 17 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
<b>Low Ch, 709MHz</b>									
1418.00	-7.9	V	3.0	37.4	1.0	-44.3	-13.0	-31.3	
2127.00	-24.2	V	3.0	36.6	1.0	-59.7	-13.0	-46.7	
2836.00	-23.8	V	3.0	36.4	1.0	-59.2	-13.0	-46.2	
1418.00	-28.4	H	3.0	37.4	1.0	-64.7	-13.0	-51.7	
2127.00	-25.1	H	3.0	36.6	1.0	-60.6	-13.0	-47.6	
2836.00	-23.8	H	3.0	36.4	1.0	-59.1	-13.0	-46.1	
<b>Mid Ch, 710MHz</b>									
1420.00	-7.7	V	3.0	37.3	1.0	-44.0	-13.0	-31.0	
2130.00	-23.2	V	3.0	36.6	1.0	-58.7	-13.0	-45.7	
2840.00	-24.1	V	3.0	36.4	1.0	-59.5	-13.0	-46.5	
1420.00	-27.4	H	3.0	37.3	1.0	-63.8	-13.0	-50.8	
2130.00	-25.5	H	3.0	36.6	1.0	-61.1	-13.0	-48.1	
2840.00	-23.7	H	3.0	36.4	1.0	-59.1	-13.0	-46.1	
<b>High Ch, 711MHz</b>									
1422.00	-25.0	V	3.0	37.3	1.0	-61.4	-13.0	-48.4	
2133.00	-25.3	V	3.0	36.6	1.0	-60.8	-13.0	-47.8	
2844.00	-23.9	V	3.0	36.4	1.0	-59.3	-13.0	-46.3	
1422.00	-27.1	H	3.0	37.3	1.0	-63.5	-13.0	-50.5	
2133.00	-25.8	H	3.0	36.6	1.0	-61.3	-13.0	-48.3	
2844.00	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	

LTE B17 10MHz QPSK

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/3/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 17 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
<b>Low Ch, 709MHz</b>									
1418.00	-6.1	V	3.0	37.4	1.0	-42.4	-13.0	-29.4	
2127.00	-23.4	V	3.0	36.6	1.0	-58.9	-13.0	-45.9	
2836.00	-24.0	V	3.0	36.4	1.0	-59.4	-13.0	-46.4	
1418.00	-27.0	H	3.0	37.4	1.0	-63.3	-13.0	-50.3	
2127.00	-24.6	H	3.0	36.6	1.0	-60.1	-13.0	-47.1	
2836.00	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
<b>Mid Ch, 710MHz</b>									
1420.00	-6.0	V	3.0	37.3	1.0	-42.4	-13.0	-29.4	
2130.00	-23.3	V	3.0	36.6	1.0	-58.9	-13.0	-45.9	
2840.00	-24.3	V	3.0	36.4	1.0	-59.7	-13.0	-46.7	
1420.00	-27.2	H	3.0	37.3	1.0	-63.6	-13.0	-50.6	
2130.00	-25.6	H	3.0	36.6	1.0	-61.1	-13.0	-48.1	
2840.00	-24.0	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
<b>High Ch, 711MHz</b>									
1422.00	-25.3	V	3.0	37.3	1.0	-61.6	-13.0	-48.6	
2133.00	-25.4	V	3.0	36.6	1.0	-61.0	-13.0	-48.0	
2844.00	-23.7	V	3.0	36.4	1.0	-59.0	-13.0	-46.0	
1422.00	-27.6	H	3.0	37.3	1.0	-64.0	-13.0	-51.0	
2133.00	-25.2	H	3.0	36.6	1.0	-60.7	-13.0	-47.7	
2844.00	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	

LTE B17 10MHz 16QAM



9.1.8. LTE BAND 41

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: SOMC Project #: 12132730 Date: 3/7/2018 Test Engineer: 18089 OG Configuration: EUT+ SUPPORT EQUIPMENT Location: Chamber A Mode: LTE_OPSK Band 41 Harmonics, 5MHz Bandwidth										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch. 2498.5MHz</b>										
4997.00	-17.8	V	3.0	35.5	1.0	-52.0	-25.0	-27.0		
7485.50	-15.8	V	3.0	35.7	1.0	-50.6	-25.0	-25.6		
9984.00	-12.9	V	3.0	36.0	1.0	-47.8	-25.0	-22.9		
4997.00	-16.5	H	3.0	35.5	1.0	-51.0	-25.0	-26.0		
7485.50	-16.4	H	3.0	35.7	1.0	-51.2	-25.0	-26.2		
9984.00	-12.8	H	3.0	36.0	1.0	-47.8	-25.0	-22.8		
<b>Mid Ch. 2593MHz</b>										
5186.00	-18.3	V	3.0	35.4	1.0	-52.7	-25.0	-27.7		
7778.00	-15.1	V	3.0	35.8	1.0	-49.8	-25.0	-24.8		
10372.00	-11.8	V	3.0	35.8	1.0	-46.7	-25.0	-21.7		
5186.00	-16.9	H	3.0	35.4	1.0	-51.3	-25.0	-26.3		
7778.00	-15.6	H	3.0	35.8	1.0	-50.3	-25.0	-25.3		
10372.00	-12.6	H	3.0	35.8	1.0	-47.6	-25.0	-22.6		
<b>High Ch. 2687.5MHz</b>										
5375.00	-18.1	V	3.0	35.4	1.0	-52.5	-25.0	-27.5		
8062.50	-15.9	V	3.0	35.7	1.0	-49.8	-25.0	-24.8		
10750.00	-10.9	V	3.0	35.7	1.0	-45.8	-25.0	-20.8		
5375.00	-17.5	H	3.0	35.4	1.0	-52.0	-25.0	-27.0		
8062.50	-14.3	H	3.0	35.8	1.0	-49.1	-25.0	-24.1		
10750.00	-10.2	H	3.0	35.7	1.0	-44.8	-25.0	-19.8		

LTE B41 5MHz QPSK

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: SOMC Project #: 12132730 Date: 3/7/2018 Test Engineer: 18089 OG Configuration: EUT+ SUPPORT EQUIPMENT Location: Chamber A Mode: LTE_16QAM Band 41 Harmonics, 5MHz Bandwidth										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch. 2498.5MHz</b>										
4997.00	-17.2	V	3.0	35.5	1.0	-51.7	-25.0	-26.7		
7485.50	-16.0	V	3.0	35.7	1.0	-50.7	-25.0	-25.7		
9984.00	-13.5	V	3.0	36.0	1.0	-48.5	-25.0	-23.5		
4997.00	-16.8	H	3.0	35.5	1.0	-51.3	-25.0	-26.3		
7485.50	-16.5	H	3.0	35.7	1.0	-51.3	-25.0	-26.3		
9984.00	-11.9	H	3.0	36.0	1.0	-47.0	-25.0	-22.0		
<b>Mid Ch. 2593MHz</b>										
5186.00	-16.3	V	3.0	35.4	1.0	-50.7	-25.0	-25.7		
7778.00	-15.1	V	3.0	35.8	1.0	-49.8	-25.0	-24.8		
10372.00	-12.0	V	3.0	35.8	1.0	-46.8	-25.0	-21.8		
5186.00	-17.6	H	3.0	35.4	1.0	-52.0	-25.0	-27.0		
7778.00	-15.8	H	3.0	35.8	1.0	-50.6	-25.0	-25.6		
10372.00	-12.4	H	3.0	35.8	1.0	-47.3	-25.0	-22.3		
<b>High Ch. 2687.5MHz</b>										
5375.00	-18.2	V	3.0	35.4	1.0	-52.7	-25.0	-27.7		
8062.50	-14.3	V	3.0	35.8	1.0	-49.1	-25.0	-24.1		
10750.00	-12.4	V	3.0	35.7	1.0	-47.0	-25.0	-22.0		
5375.00	-18.0	H	3.0	35.4	1.0	-52.5	-25.0	-27.5		
8062.50	-14.3	H	3.0	35.8	1.0	-49.1	-25.0	-24.1		
10750.00	-11.2	H	3.0	35.7	1.0	-45.9	-25.0	-20.9		

LTE B41 5MHz 16QAM

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: SOMC Project #: 12132730 Date: 3/7/2018 Test Engineer: 18089 OG Configuration: EUT+ SUPPORT EQUIPMENT Location: Chamber A Mode: LTE_OPSK Band 41 Harmonics, 10MHz Bandwidth										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch. 2501MHz</b>										
5002.00	-17.3	V	3.0	35.5	1.0	-51.8	-25.0	-26.8		
7503.00	-18.1	V	3.0	35.7	1.0	-50.8	-25.0	-25.8		
10004.00	-13.1	V	3.0	36.0	1.0	-48.1	-25.0	-23.1		
5002.00	-17.5	H	3.0	35.5	1.0	-52.0	-25.0	-27.0		
7503.00	-16.5	H	3.0	35.7	1.0	-51.2	-25.0	-26.2		
10004.00	-11.7	H	3.0	36.0	1.0	-46.7	-25.0	-21.7		
<b>Mid Ch. 2593MHz</b>										
5186.00	-17.2	V	3.0	35.4	1.0	-51.8	-25.0	-26.8		
7778.00	-16.2	V	3.0	35.8	1.0	-51.0	-25.0	-26.0		
10372.00	-13.2	V	3.0	35.8	1.0	-48.1	-25.0	-23.1		
5186.00	-17.6	H	3.0	35.4	1.0	-52.0	-25.0	-27.0		
7778.00	-15.9	H	3.0	35.8	1.0	-50.6	-25.0	-25.6		
10372.00	-11.4	H	3.0	35.8	1.0	-46.5	-25.0	-21.5		
<b>High Ch. 2685MHz</b>										
5370.00	-18.8	V	3.0	35.4	1.0	-53.2	-25.0	-28.2		
8055.00	-14.4	V	3.0	35.8	1.0	-49.2	-25.0	-24.2		
10740.00	-10.6	V	3.0	35.7	1.0	-45.3	-25.0	-20.3		
5370.00	-18.0	H	3.0	35.4	1.0	-52.5	-25.0	-27.5		
8055.00	-14.7	H	3.0	35.8	1.0	-49.5	-25.0	-24.5		
10740.00	-11.3	H	3.0	35.7	1.0	-46.0	-25.0	-21.0		

LTE B41 10MHz QPSK

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: SOMC Project #: 12132730 Date: 3/7/2018 Test Engineer: 18089 OG Configuration: EUT+ SUPPORT EQUIPMENT Location: Chamber A Mode: LTE_16QAM Band 41 Harmonics, 10MHz Bandwidth										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch. 2501MHz</b>										
5002.00	-18.2	V	3.0	35.5	1.0	-52.6	-25.0	-27.6		
7503.00	-16.3	V	3.0	35.7	1.0	-51.1	-25.0	-26.1		
10004.00	-12.8	V	3.0	36.0	1.0	-47.9	-25.0	-22.9		
5002.00	-17.4	H	3.0	35.5	1.0	-51.9	-25.0	-26.9		
7503.00	-16.4	H	3.0	35.7	1.0	-51.1	-25.0	-26.1		
10004.00	-12.3	H	3.0	36.0	1.0	-47.3	-25.0	-22.3		
<b>Mid Ch. 2593MHz</b>										
5186.00	-17.3	V	3.0	35.4	1.0	-51.7	-25.0	-26.7		
7778.00	-16.1	V	3.0	35.8	1.0	-50.9	-25.0	-25.9		
10372.00	-12.5	V	3.0	35.8	1.0	-47.3	-25.0	-22.3		
5186.00	-17.4	H	3.0	35.4	1.0	-51.8	-25.0	-26.8		
7778.00	-16.3	H	3.0	35.8	1.0	-51.1	-25.0	-26.1		
10372.00	-11.9	H	3.0	35.8	1.0	-46.8	-25.0	-21.8		
<b>High Ch. 2685MHz</b>										
5370.00	-19.0	V	3.0	35.4	1.0	-53.5	-25.0	-28.5		
8055.00	-16.0	V	3.0	35.8	1.0	-50.8	-25.0	-25.8		
10740.00	-12.4	V	3.0	35.7	1.0	-47.1	-25.0	-22.1		
5370.00	-17.8	H	3.0	35.4	1.0	-52.2	-25.0	-27.2		
8055.00	-15.2	H	3.0	35.8	1.0	-50.0	-25.0	-25.0		
10740.00	-11.5	H	3.0	35.7	1.0	-46.2	-25.0	-21.2		

LTE B41 10MHz 16QAM

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: SOMC Project #: 12132730 Date: 3/7/2018 Test Engineer: 18089 OG Configuration: EUT+ SUPPORT EQUIPMENT Location: Chamber A Mode: LTE_OPSK Band 41 Harmonics, 15MHz Bandwidth										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch. 2503.5MHz</b>										
5007.00	-17.4	V	3.0	35.5	1.0	-51.8	-25.0	-26.8		
7510.50	-18.8	V	3.0	35.7	1.0	-51.5	-25.0	-26.5		
10014.00	-12.0	V	3.0	36.0	1.0	-47.0	-25.0	-22.0		
5007.00	-17.5	H	3.0	35.5	1.0	-52.0	-25.0	-27.0		
7510.50	-16.9	H	3.0	35.7	1.0	-51.6	-25.0	-26.6		
10014.00	-12.4	H	3.0	36.0	1.0	-47.4	-25.0	-22.4		
<b>Mid Ch. 2593MHz</b>										
5186.00	-16.4	V	3.0	35.4	1.0	-50.8	-25.0	-25.8		
7778.00	-15.5	V	3.0	35.8	1.0	-50.3	-25.0	-25.3		
10372.00	-11.8	V	3.0	35.8	1.0	-46.7	-25.0	-21.7		
5186.00	-17.7	H	3.0	35.4	1.0	-52.1	-25.0	-27.1		
7778.00	-15.1	H	3.0	35.8	1.0	-49.8	-25.0	-24.8		
10372.00	-12.4	H	3.0	35.8	1.0	-47.2	-25.0	-22.2		
<b>High Ch. 2682.5MHz</b>										
5365.00	-18.2	V	3.0	35.4	1.0	-52.7	-25.0	-27.7		
8047.50	-14.2	V	3.0	35.8	1.0	-49.0	-25.0	-24.0		
10730.00	-11.8	V	3.0	35.7	1.0	-46.5	-25.0	-21.5		
5365.00	-18.0	H	3.0	35.4	1.0	-52.5	-25.0	-27.5		
8047.50	-13.9	H	3.0	35.8	1.0	-48.7	-25.0	-23.7		
10730.00	-10.5	H	3.0	35.7	1.0	-45.2	-25.0	-20.2		

LTE B41 15MHz QPSK

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: SOMC Project #: 12132730 Date: 3/7/2018 Test Engineer: 18089 OG Configuration: EUT+ SUPPORT EQUIPMENT Location: Chamber A Mode: LTE_16QAM Band 41 Harmonics, 15MHz Bandwidth										
f	SG reading	Ant. Pol.	Distance	Preamp	Filter	ERP	Limit	Delta	Notes	
MHz	(dBm)	(HV)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)		
<b>Low Ch. 2503.5MHz</b>										
5007.00	-17.4	V	3.0	35.5	1.0	-51.8	-25.0	-26.8		
7510.50	-16.3	V	3.0	35.7	1.0	-51.0	-25.0	-26.0		
10014.00	-12.2	V	3.0	36.0	1.0	-47.2	-25.0	-22.2		
5007.00	-17.0	H	3.0	35.5	1.0	-51.5	-25.0	-26.5		
7510.50	-16.2	H	3.0	35.7	1.0	-51.0	-25.0	-26.0		
10014.00	-13.4	H	3.0	36.0	1.0	-48.4	-25.0	-23.4		
<b>Mid Ch. 2593MHz</b>										
5186.00	-18.0	V	3.0	35.4	1.0	-52.4	-25.0	-27.4		
7778.00	-16.2	V	3.0	35.8	1.0	-50.9	-25.0	-25.9		
10372.00	-12.9	V	3.0	35.8	1.0	-47.8	-25.0	-22.8		
5186.00	-17.6	H	3.0	35.4	1.0	-52.0	-25.0	-27.0		
7778.00	-16.0	H	3.0	35.8	1.0	-50.7	-25.0	-25.7		
10372.00	-12.8	H	3.0	35.8	1.0	-47.7	-25.0	-22.7		
<b>High Ch. 2682.5MHz</b>										
5365.00	-18.3	V	3.0	35.4	1.0	-52.7	-25.0	-27.7		
8047.50	-15.6	V	3.0	35.8	1.0	-50.4	-25.0	-25.4		
10730.00	-10.6	V	3.0	35.7	1.0	-45.3	-25.0	-20.3		
5365.00	-17.7	H	3.0	35.4	1.0	-52.2	-25.0	-27.2		
8047.50	-14.1	H	3.0	35.8	1.0	-48.9	-25.0	-23.9		
10730.00	-11.8	H	3.0	35.7	1.0	-46.5	-25.0	-21.5		

LTE B41 15MHz 16QAM

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/7/2018  
 Test Engineer: 16099 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 Location: Chamber A  
 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
<b>Low Ch, 2506MHz</b>									
5012.00	-17.0	V	3.0	35.5	1.0	-51.5	-25.0	-26.5	
7518.00	-15.8	V	3.0	35.7	1.0	-50.6	-25.0	-25.6	
10024.00	-12.8	V	3.0	36.0	1.0	-47.8	-25.0	-22.8	
5012.00	-16.6	H	3.0	35.5	1.0	-51.0	-25.0	-26.0	
7518.00	-16.8	H	3.0	35.7	1.0	-51.5	-25.0	-26.5	
10024.00	-13.0	H	3.0	36.0	1.0	-48.1	-25.0	-23.1	
<b>Mid Ch, 2593MHz</b>									
5186.00	-17.4	V	3.0	35.4	1.0	-51.8	-25.0	-26.8	
7779.00	-15.7	V	3.0	35.8	1.0	-50.4	-25.0	-25.4	
10372.00	-12.2	V	3.0	35.8	1.0	-47.1	-25.0	-22.1	
5186.00	-18.0	H	3.0	35.4	1.0	-52.4	-25.0	-27.4	
7779.00	-15.7	H	3.0	35.8	1.0	-50.5	-25.0	-25.5	
10372.00	-13.0	H	3.0	35.8	1.0	-47.9	-25.0	-22.9	
<b>High Ch, 2680MHz</b>									
5360.00	-17.7	V	3.0	35.4	1.0	-52.1	-25.0	-27.1	
8040.00	-14.8	V	3.0	35.8	1.0	-49.6	-25.0	-24.6	
10720.00	-10.5	V	3.0	35.7	1.0	-45.2	-25.0	-20.2	
5360.00	-17.2	H	3.0	35.4	1.0	-51.7	-25.0	-26.7	
8040.00	-14.5	H	3.0	35.8	1.0	-49.3	-25.0	-24.3	
10720.00	-9.8	H	3.0	35.7	1.0	-44.4	-25.0	-19.4	

**LTE B41 20MHz QPSK**

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

Company: SOMC  
 Project #: 12132730  
 Date: 3/7/2018  
 Test Engineer: 16099 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 Location: Chamber A  
 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
<b>Low Ch, 2506MHz</b>									
5012.00	-16.6	V	3.0	35.5	1.0	-51.1	-25.0	-26.1	
7518.00	-15.7	V	3.0	35.7	1.0	-50.4	-25.0	-25.4	
10024.00	-13.4	V	3.0	36.0	1.0	-48.4	-25.0	-23.4	
5012.00	-16.4	H	3.0	35.5	1.0	-50.8	-25.0	-25.8	
7518.00	-15.9	H	3.0	35.7	1.0	-50.7	-25.0	-25.7	
10024.00	-13.9	H	3.0	36.0	1.0	-48.9	-25.0	-23.9	
<b>Mid Ch, 2593MHz</b>									
5186.00	-18.5	V	3.0	35.4	1.0	-52.9	-25.0	-27.9	
7779.00	-15.0	V	3.0	35.8	1.0	-49.8	-25.0	-24.8	
10372.00	-12.6	V	3.0	35.8	1.0	-47.5	-25.0	-22.5	
5186.00	-18.2	H	3.0	35.4	1.0	-52.7	-25.0	-27.7	
7779.00	-14.6	H	3.0	35.8	1.0	-49.5	-25.0	-24.5	
10372.00	-11.9	H	3.0	35.8	1.0	-46.8	-25.0	-21.8	
<b>High Ch, 2680MHz</b>									
5360.00	-17.5	V	3.0	35.4	1.0	-52.0	-25.0	-27.0	
8040.00	-14.1	V	3.0	35.8	1.0	-48.9	-25.0	-23.9	
10720.00	-12.0	V	3.0	35.7	1.0	-46.7	-25.0	-21.7	
5360.00	-18.6	H	3.0	35.4	1.0	-53.1	-25.0	-28.1	
8040.00	-14.9	H	3.0	35.8	1.0	-49.7	-25.0	-24.7	
10720.00	-10.8	H	3.0	35.7	1.0	-45.5	-25.0	-20.5	

**LTE B41 20MHz 16QAM**