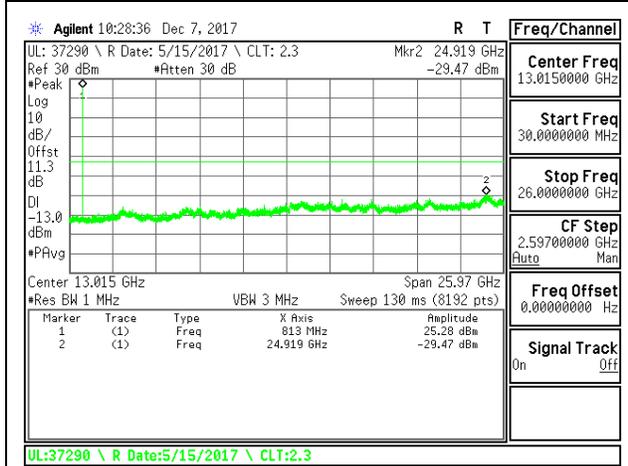
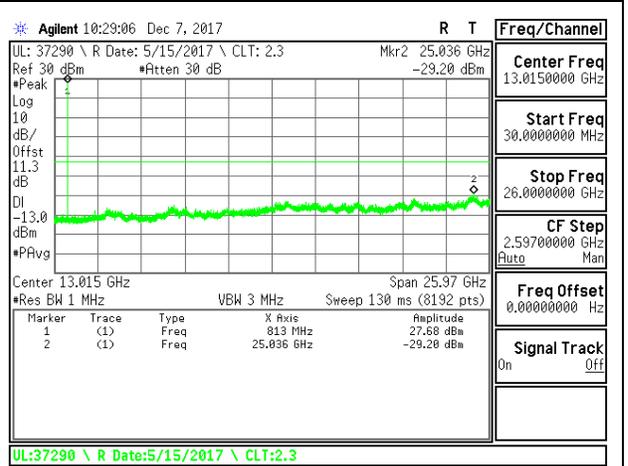


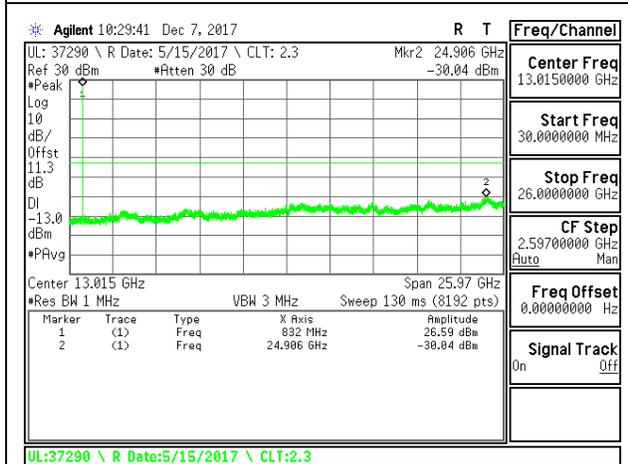
8.3.10. LTE BAND 26



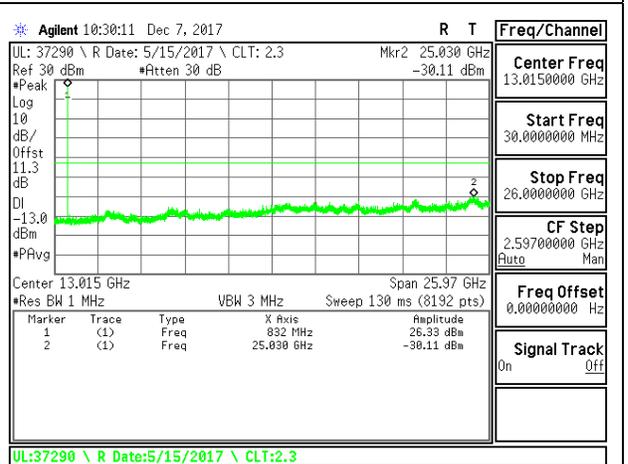
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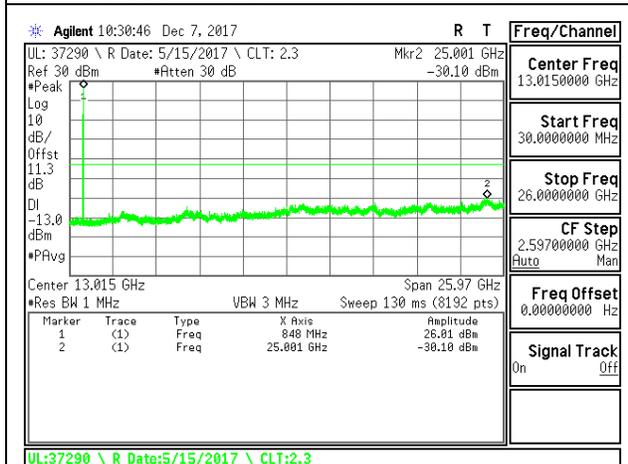
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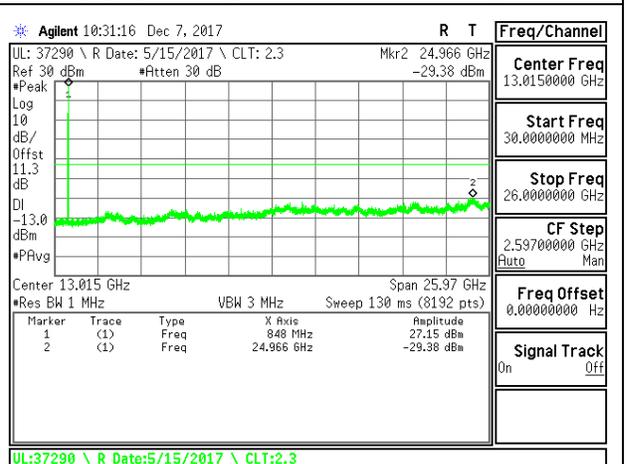
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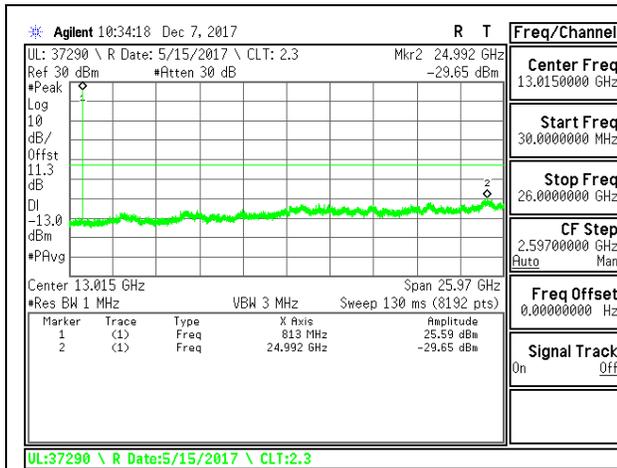
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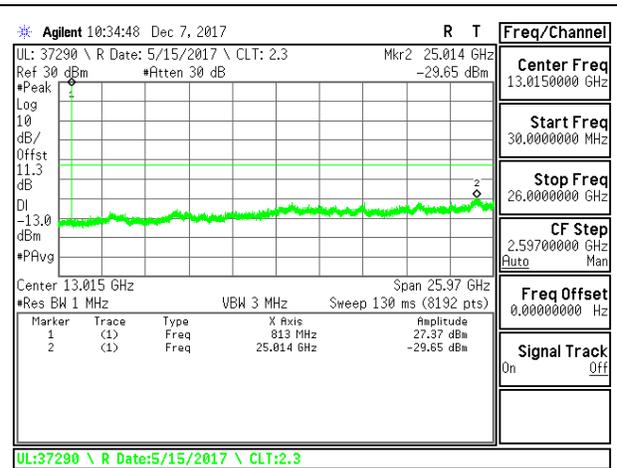
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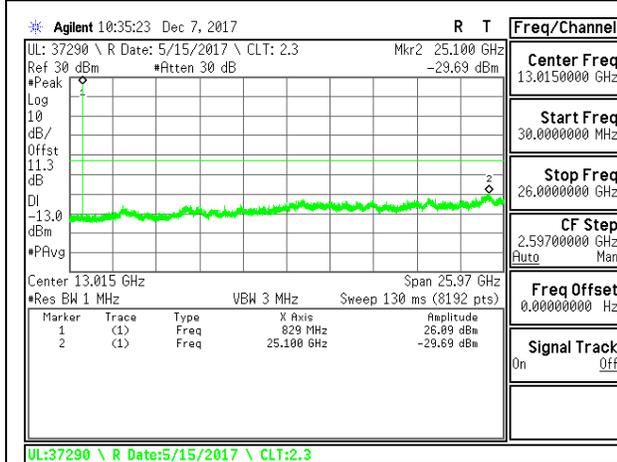
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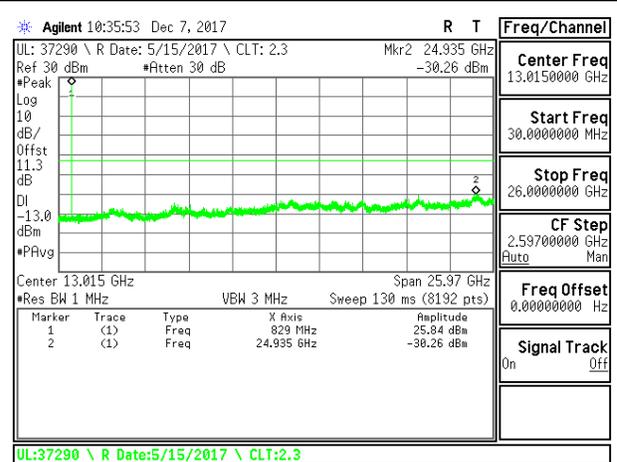
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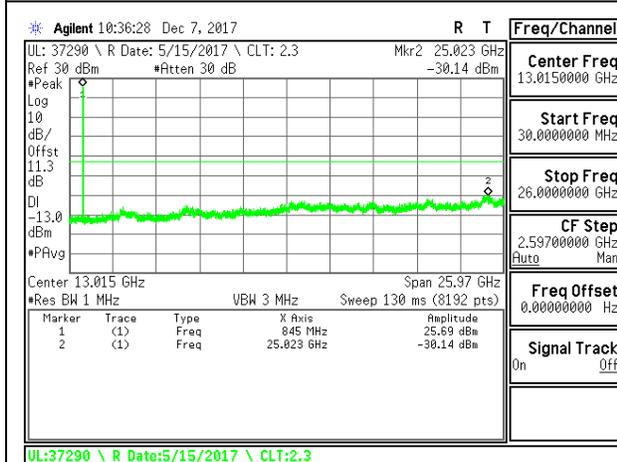
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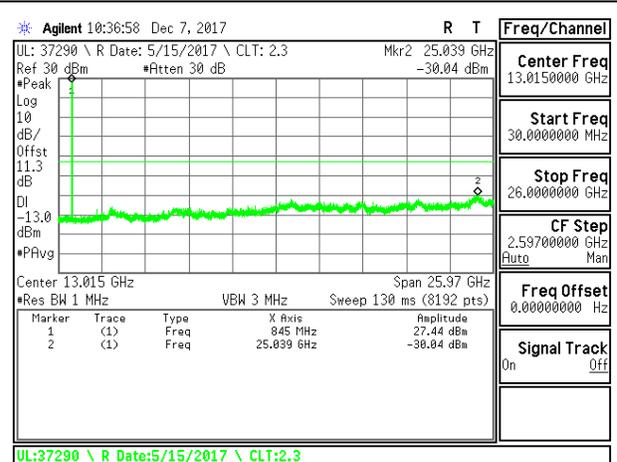
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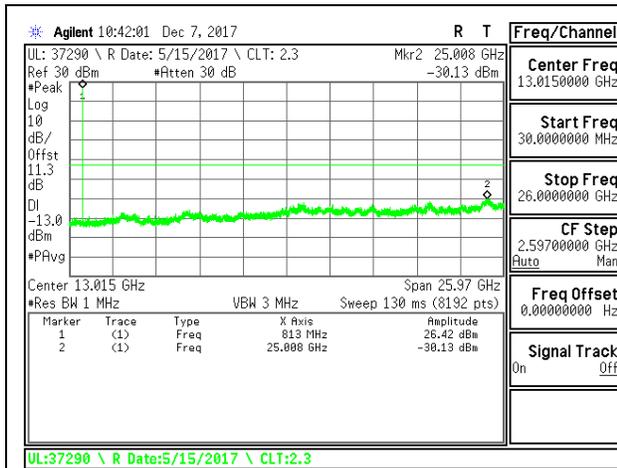
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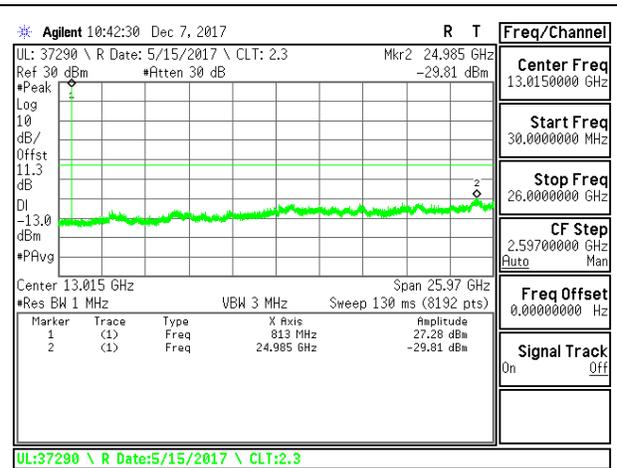
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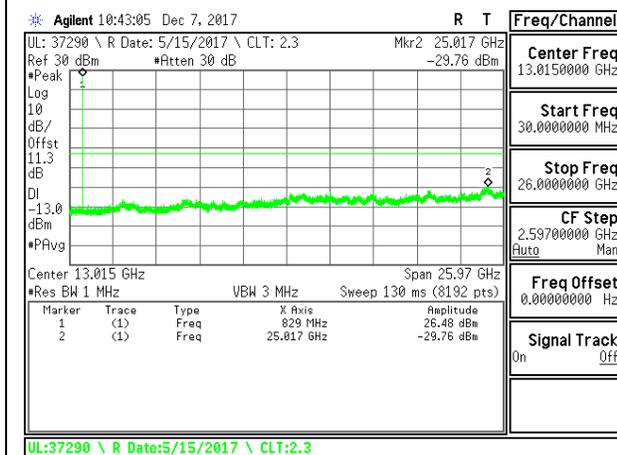
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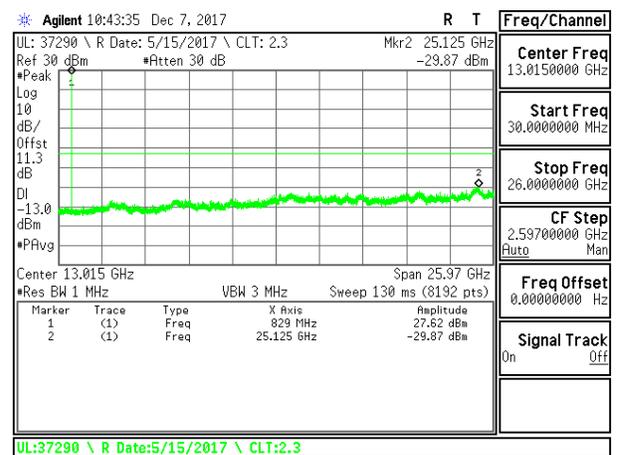
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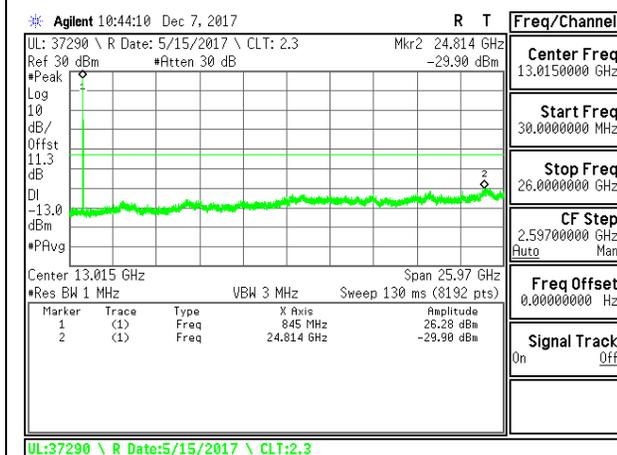
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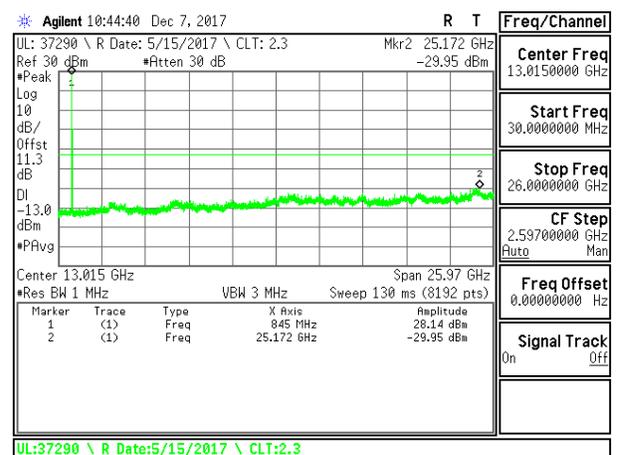
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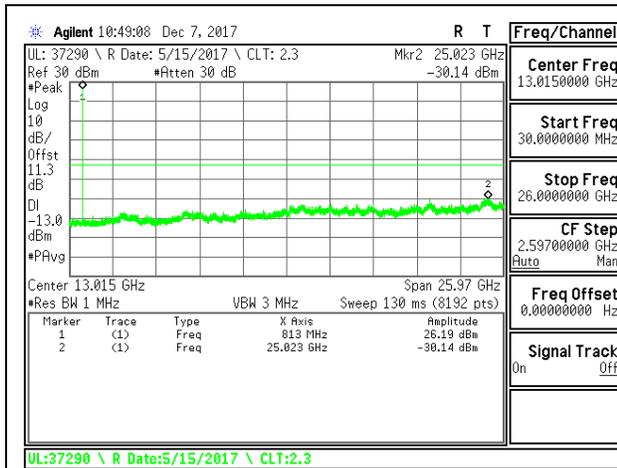
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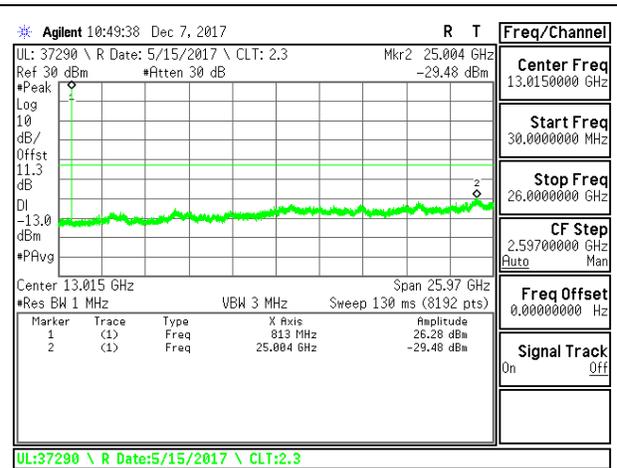
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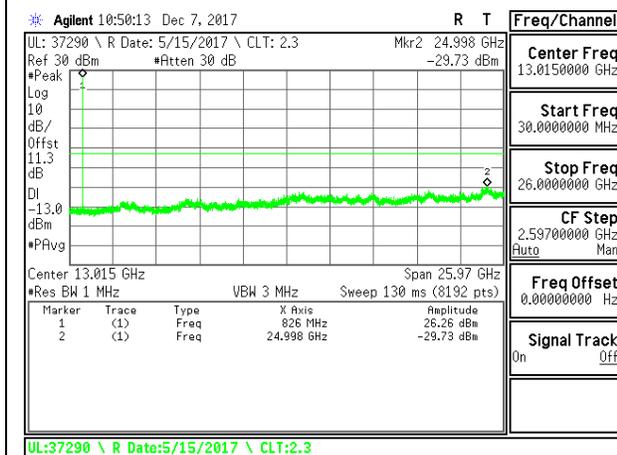
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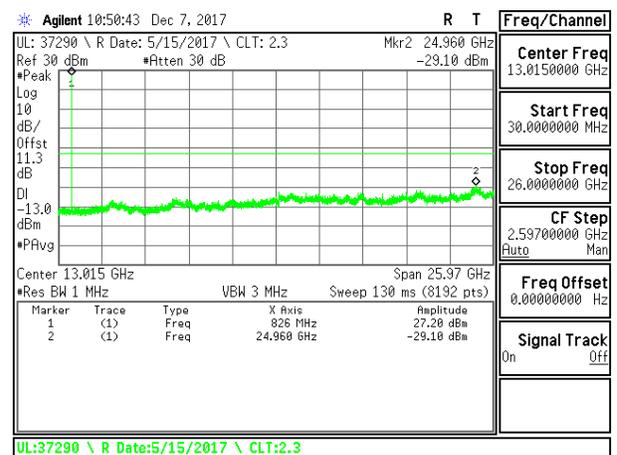
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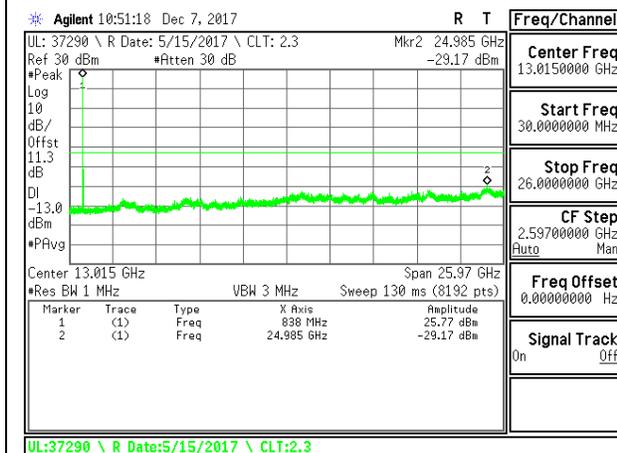
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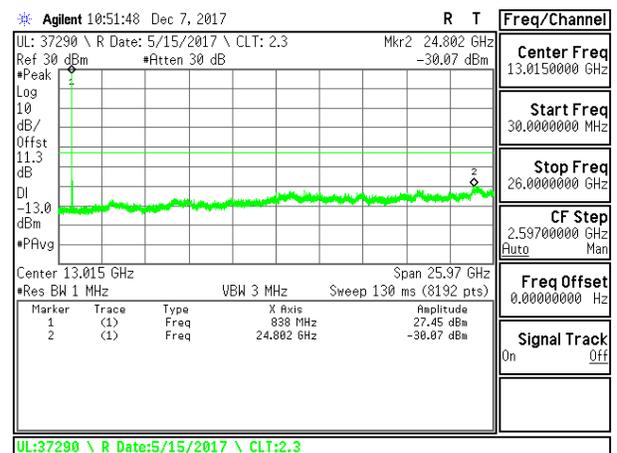
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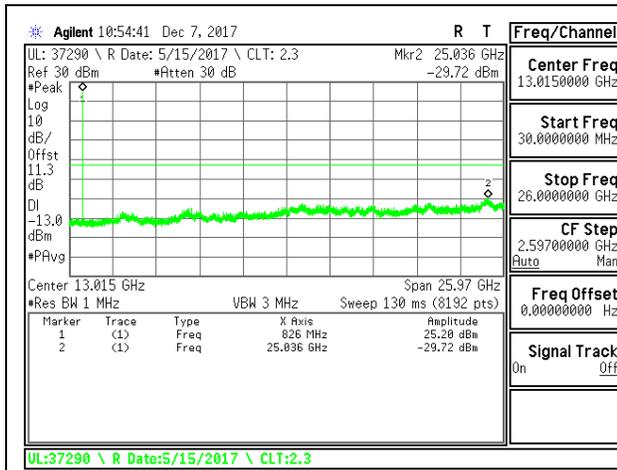
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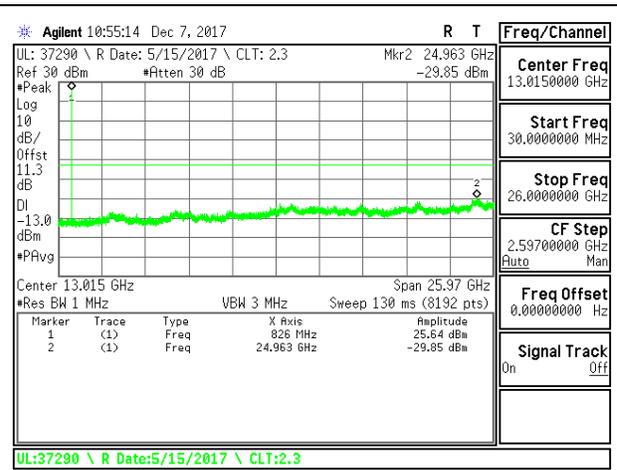
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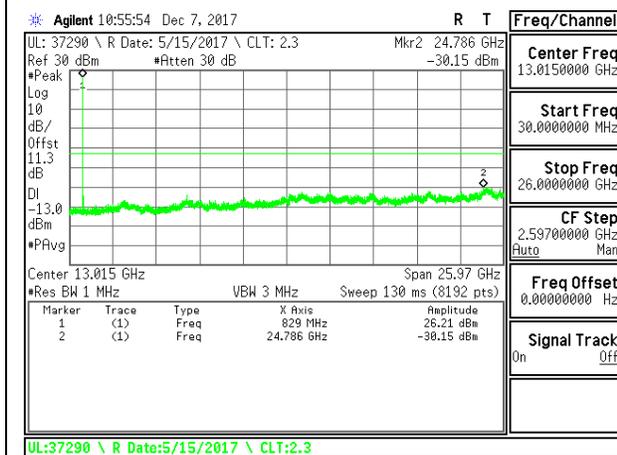
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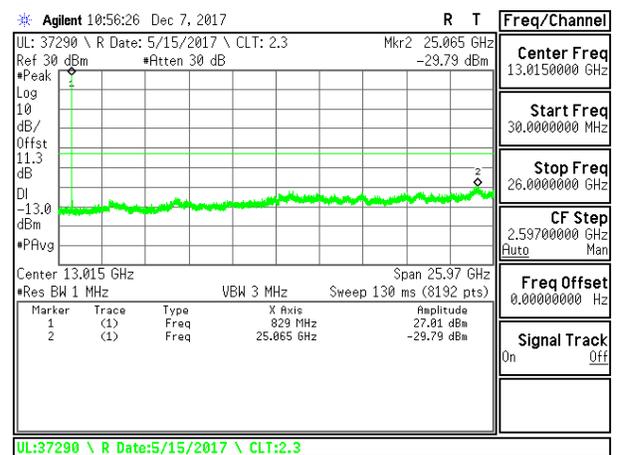
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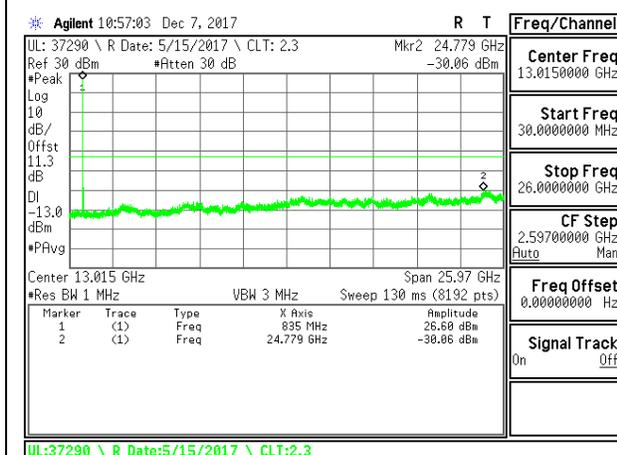
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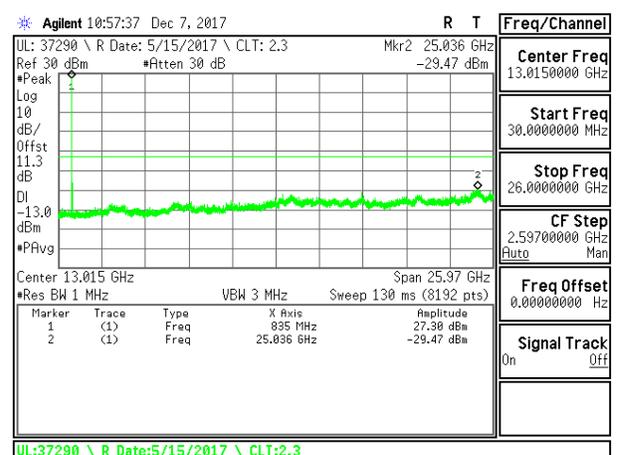
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LTE B26 15MHz 16QAM Middle Channel RB1-0

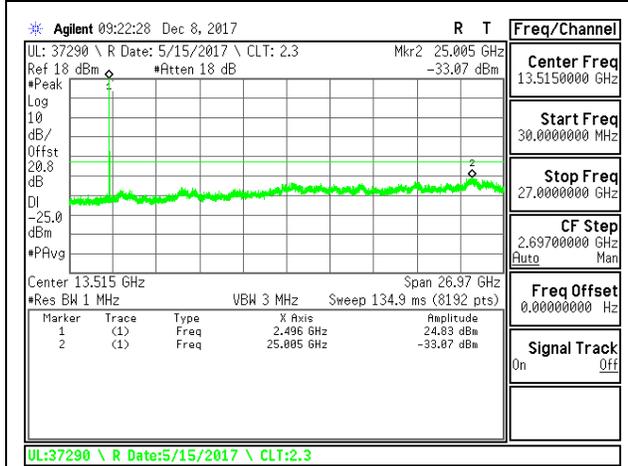


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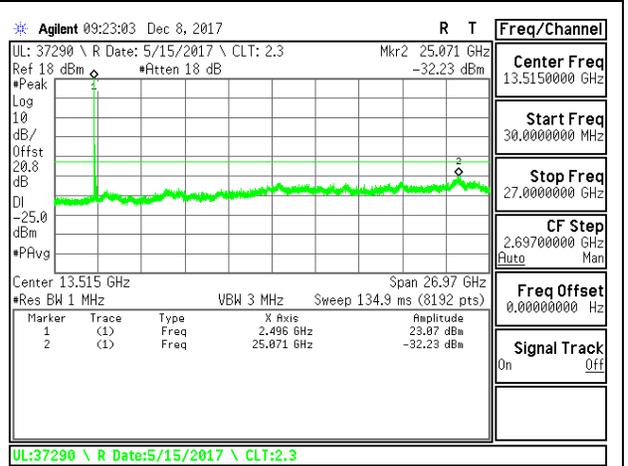


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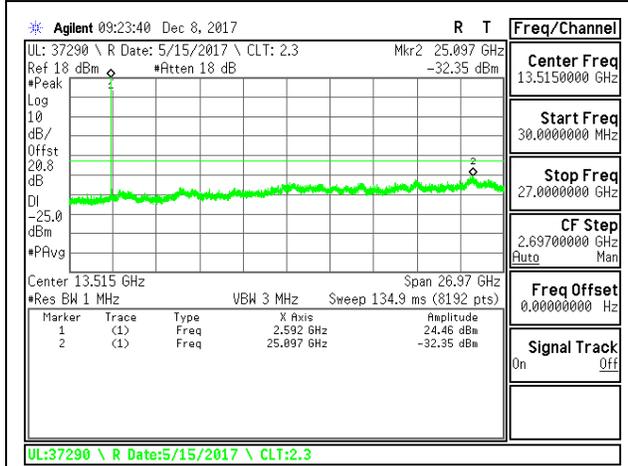
8.3.11. LTE BAND 41



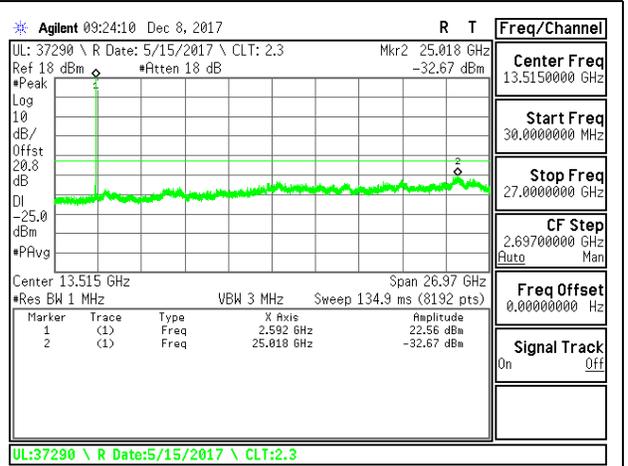
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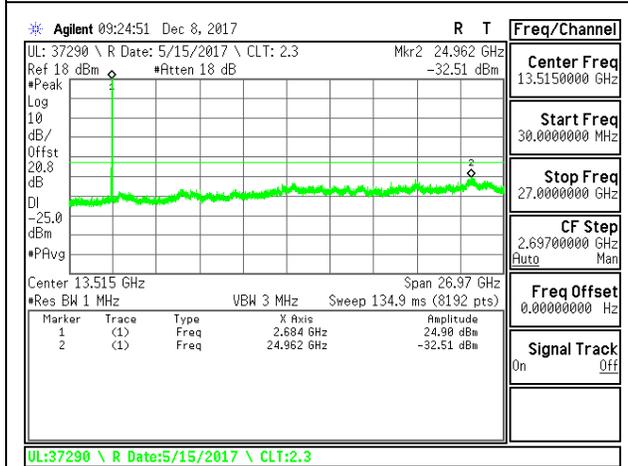
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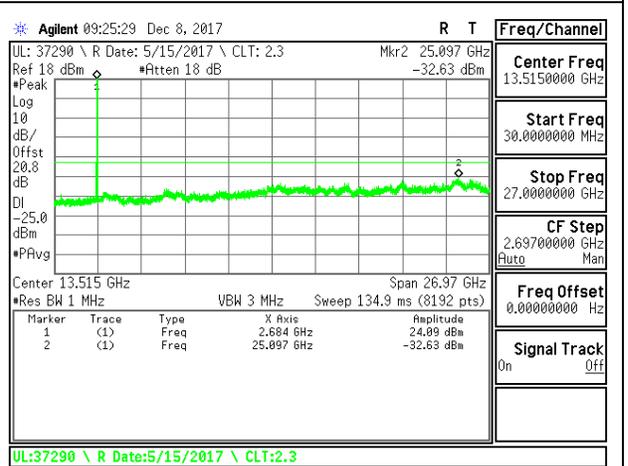
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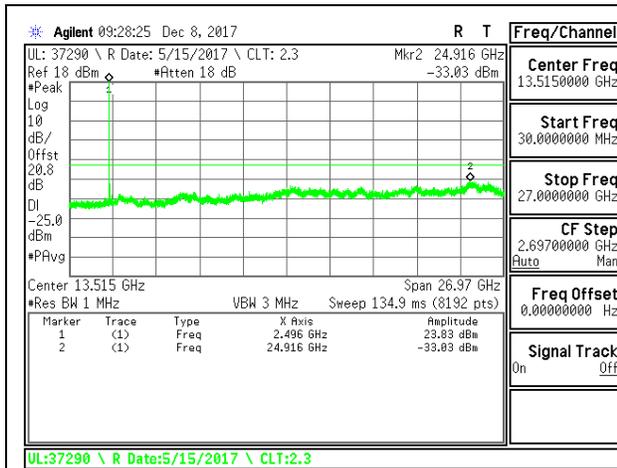
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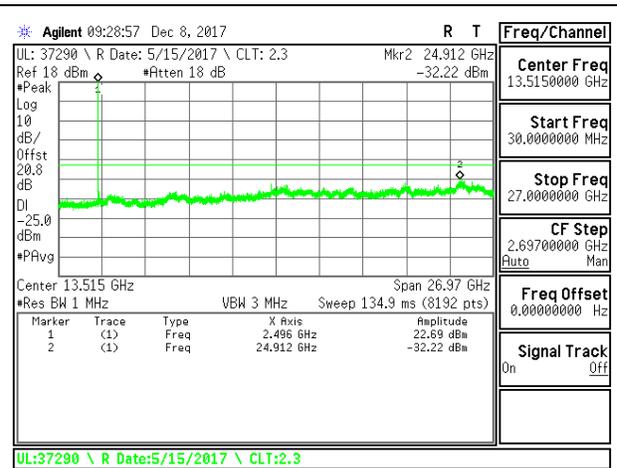
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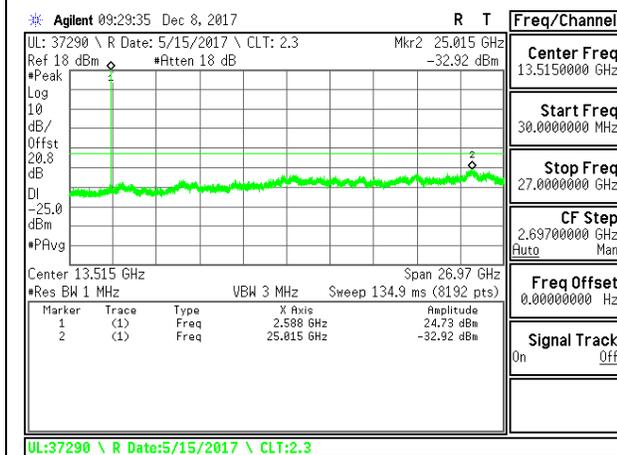
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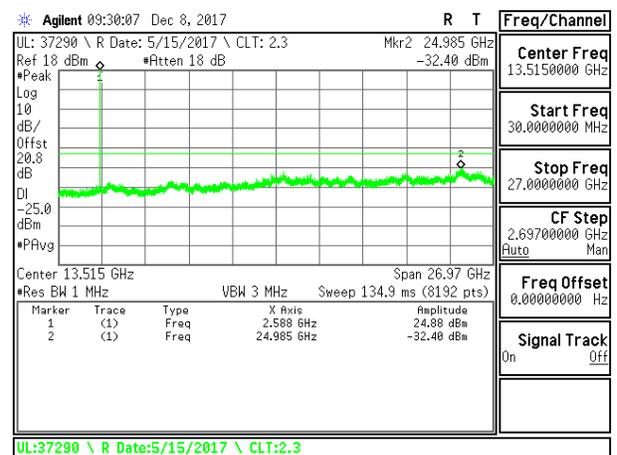
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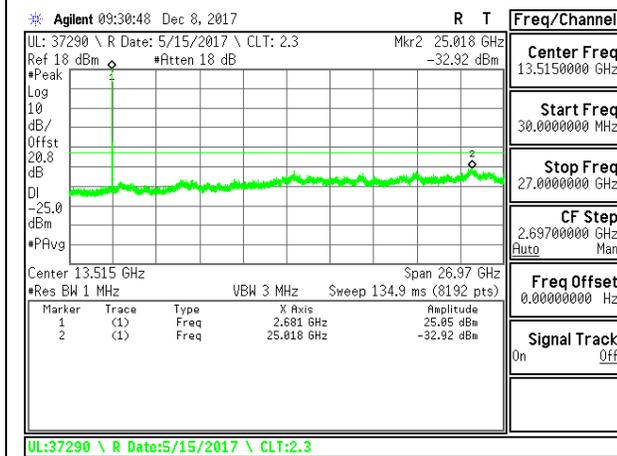
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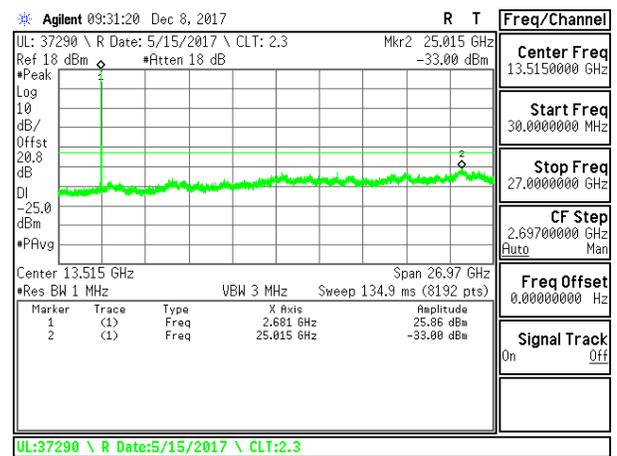
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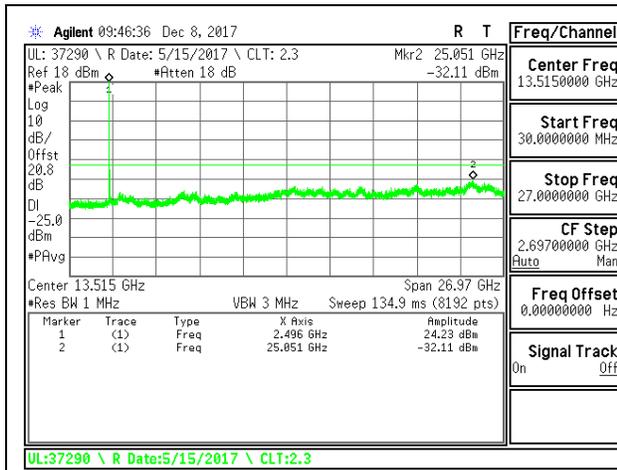
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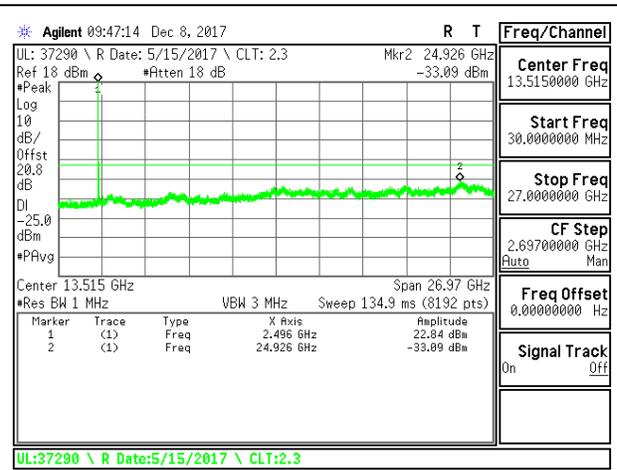
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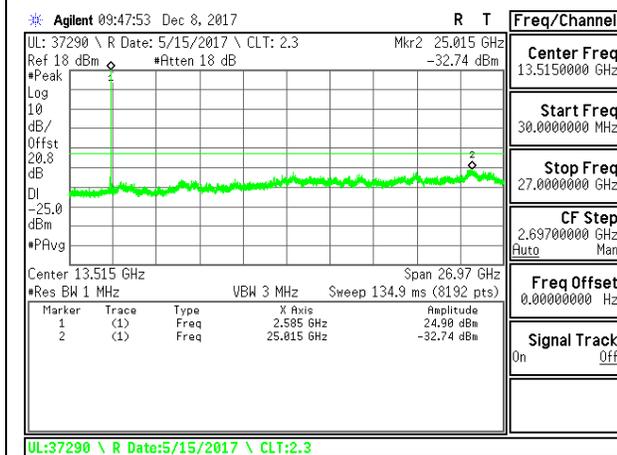
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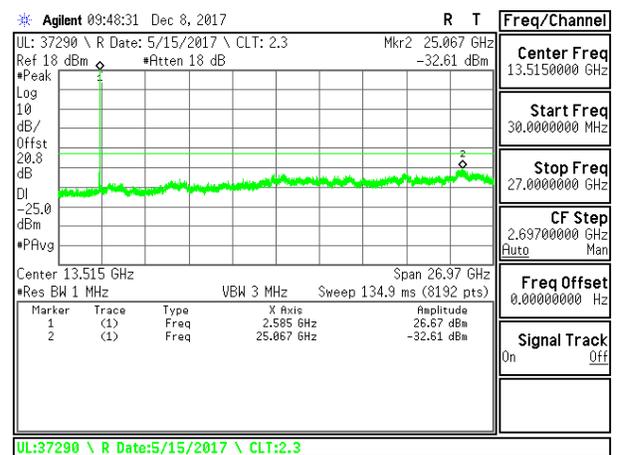
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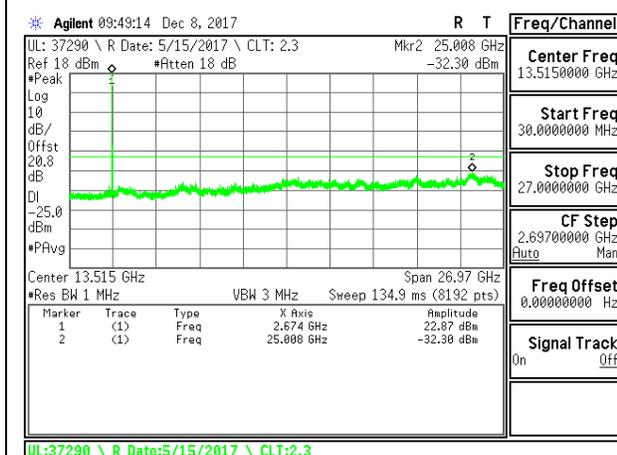
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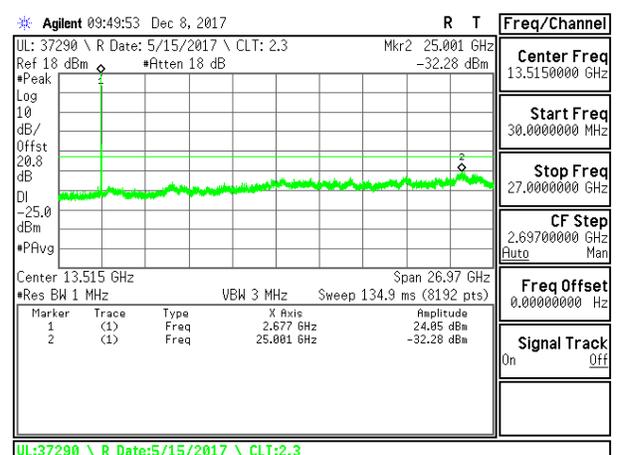
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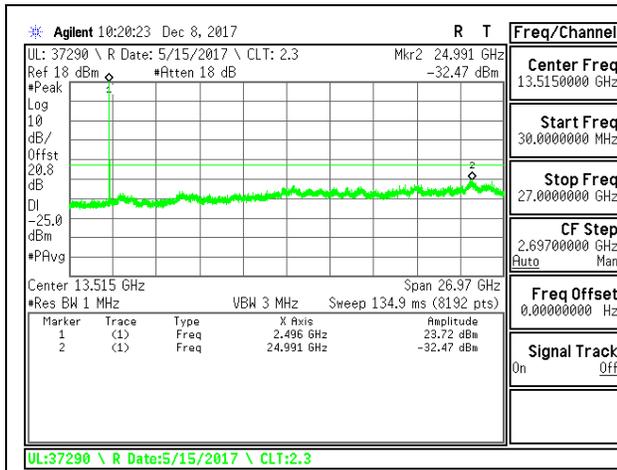
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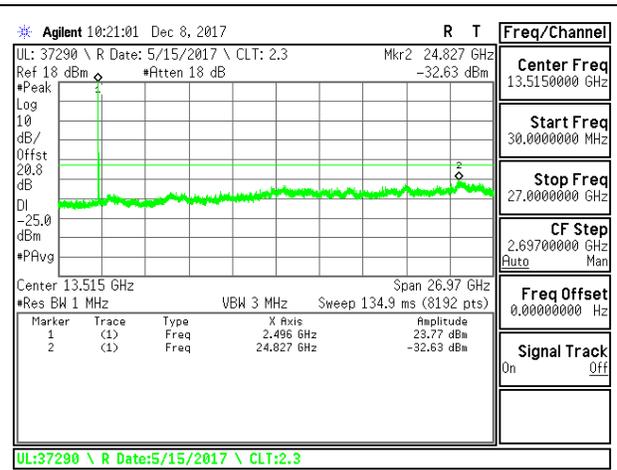
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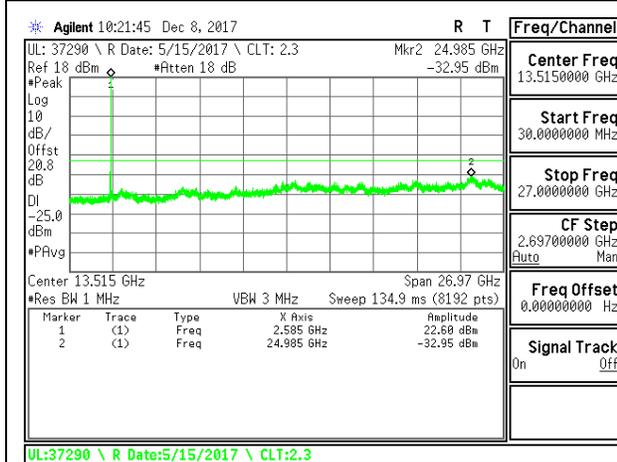
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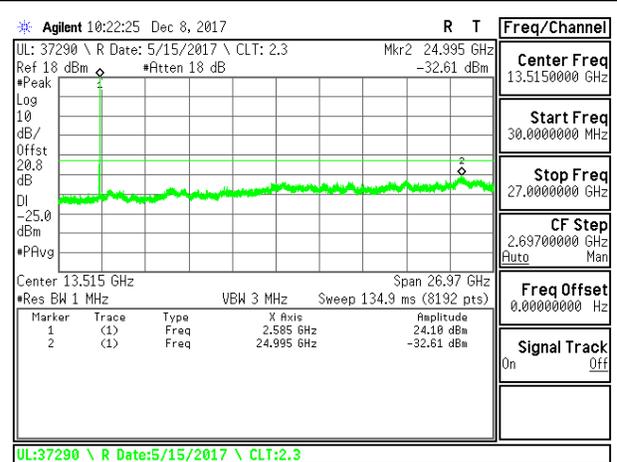
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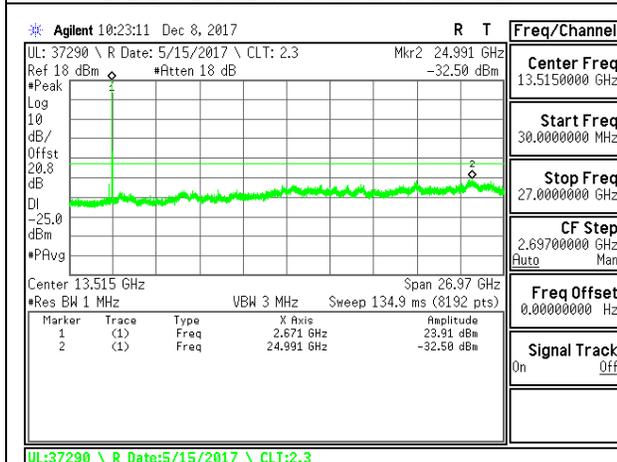
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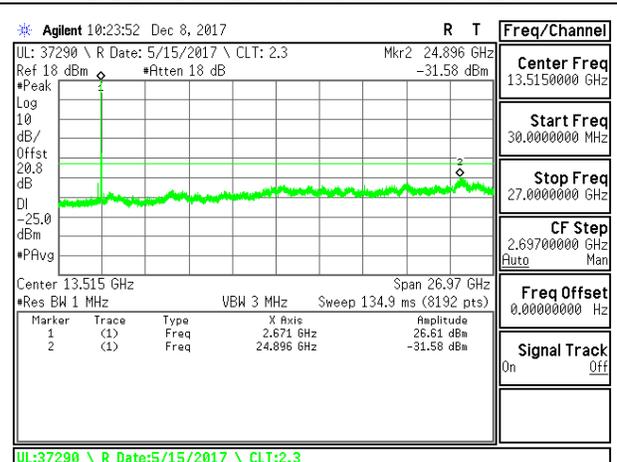
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LTE B41 20MHz 16QAM Middle Channel RB1-0

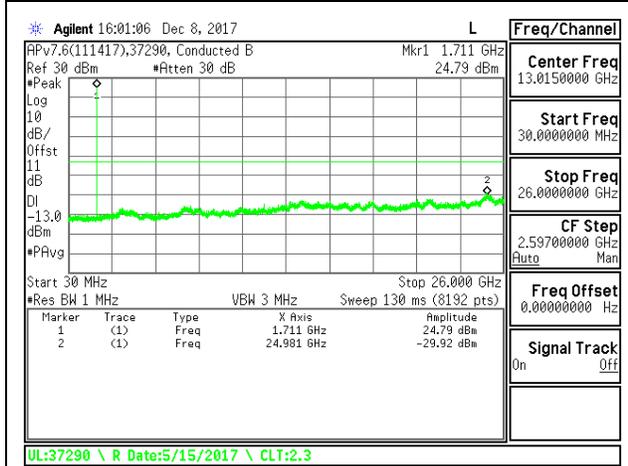


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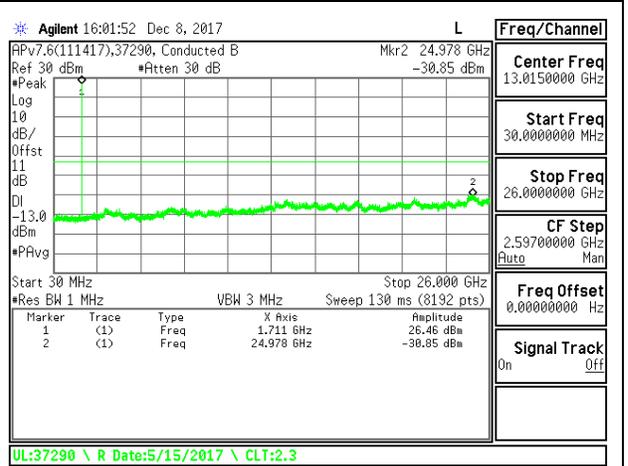


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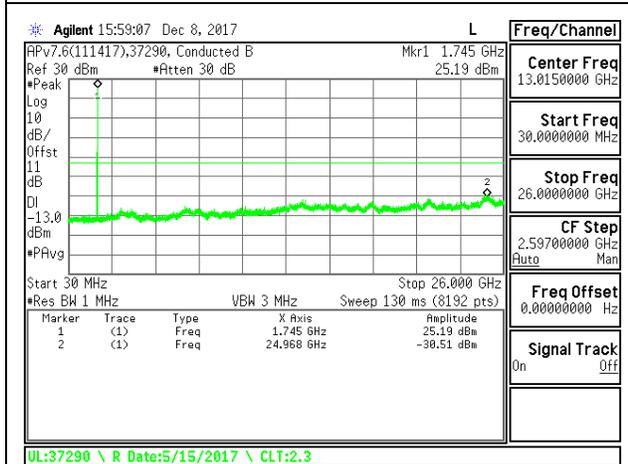
8.3.12. LTE BAND 66



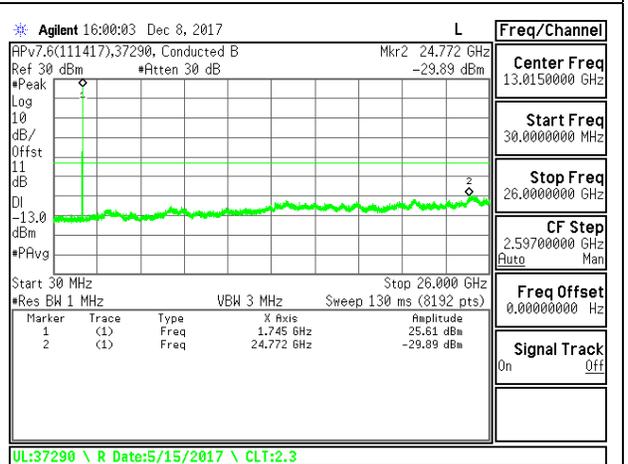
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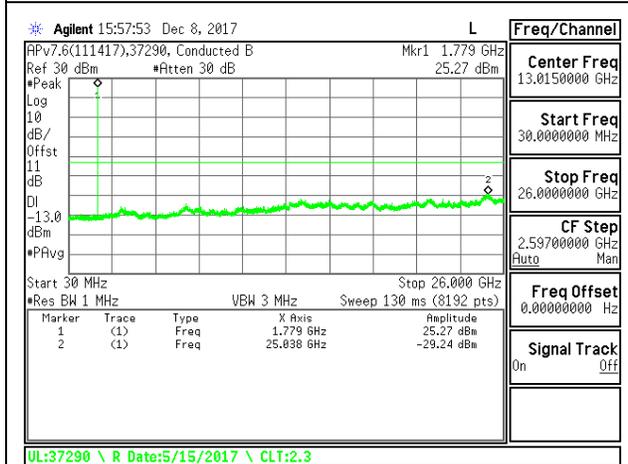
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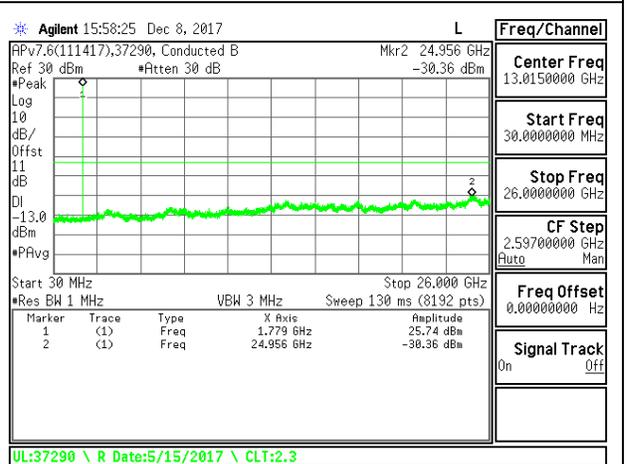
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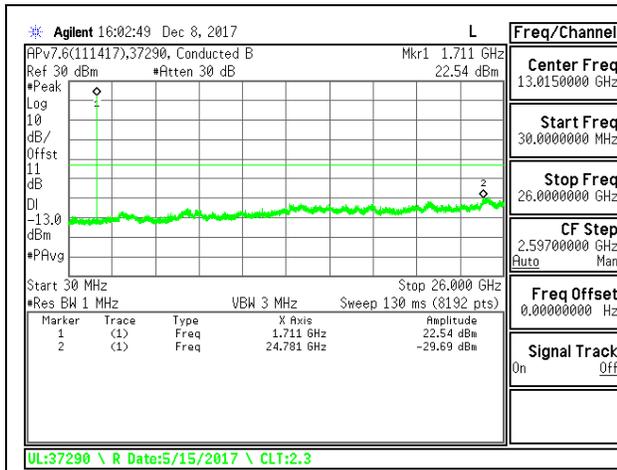
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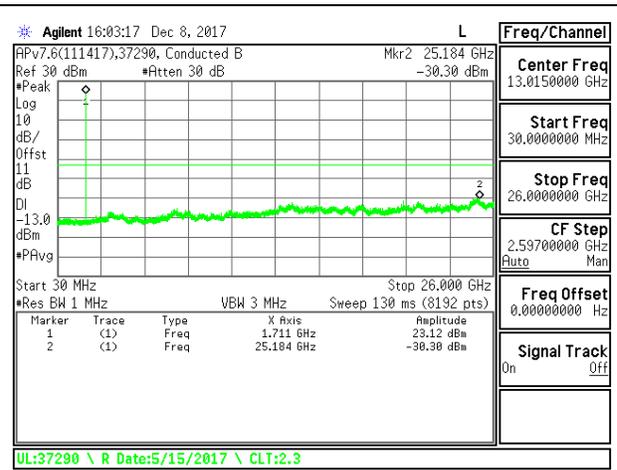
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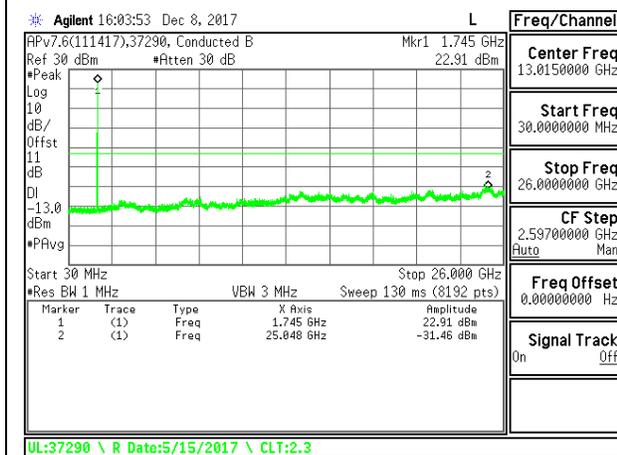
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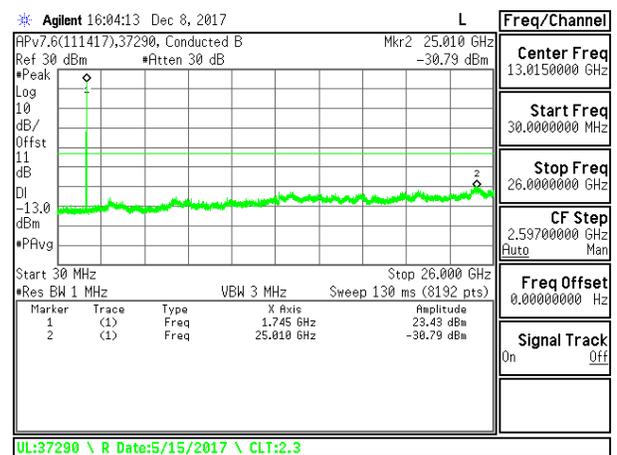
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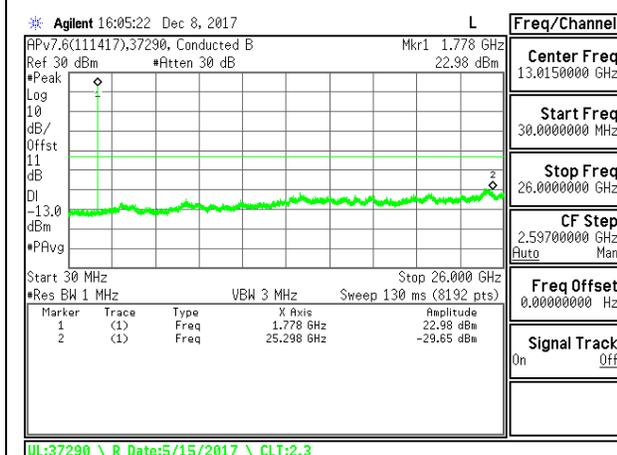
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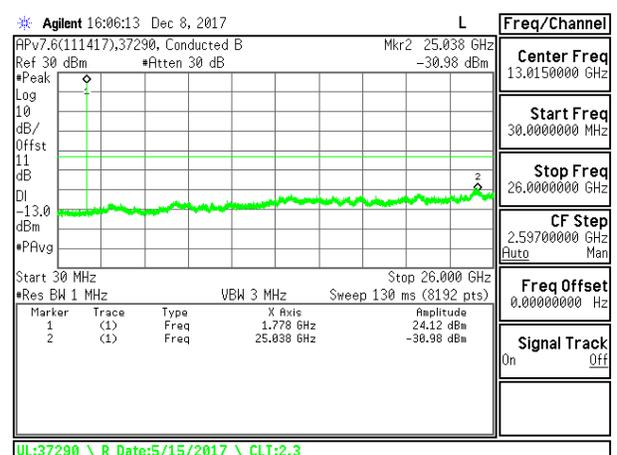
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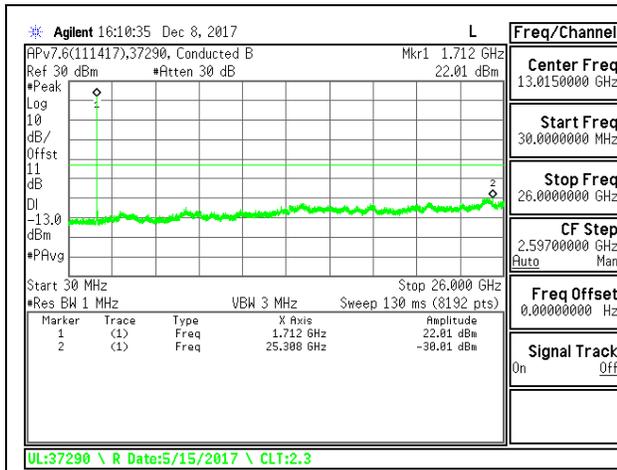
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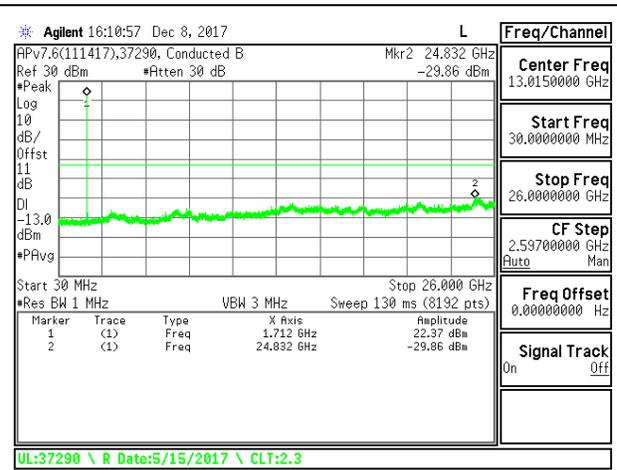
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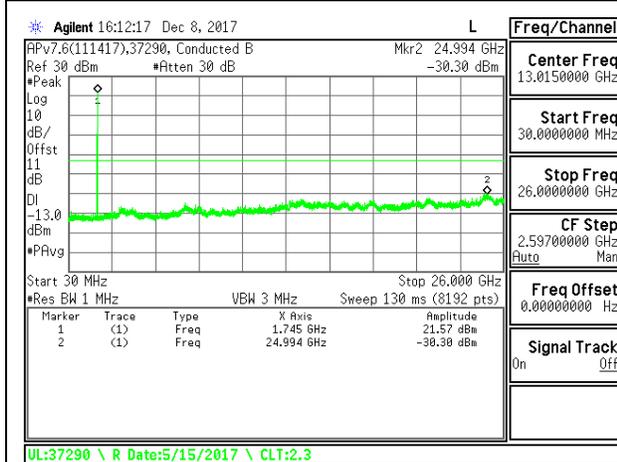
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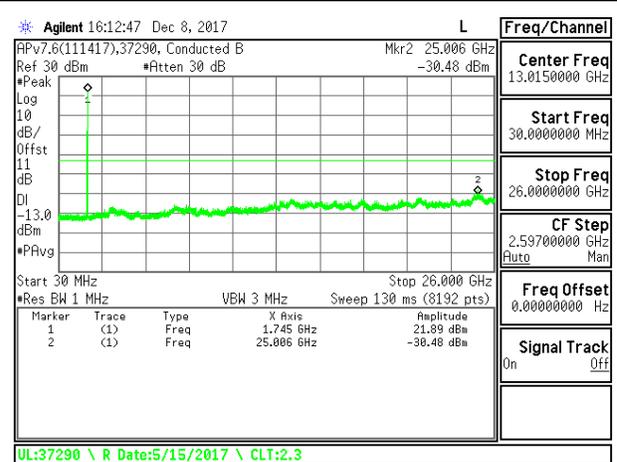
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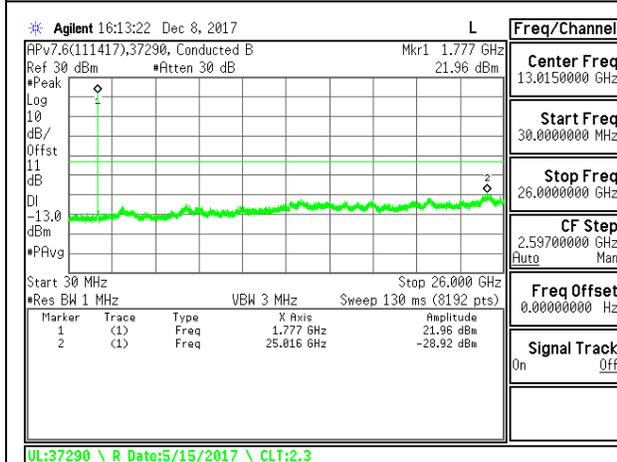
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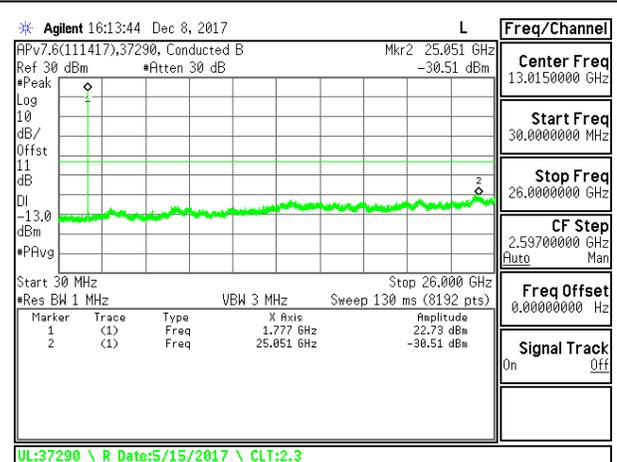
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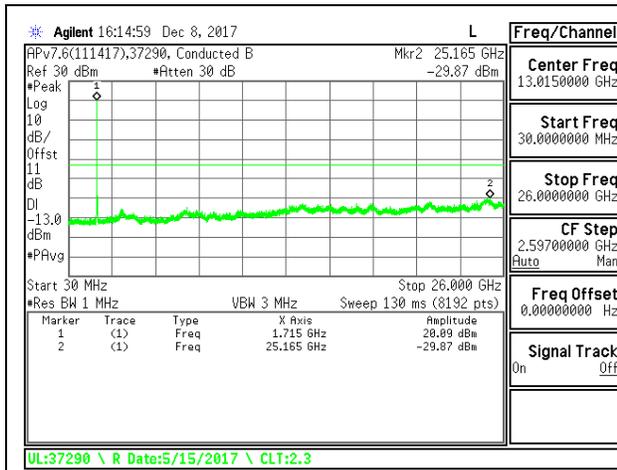
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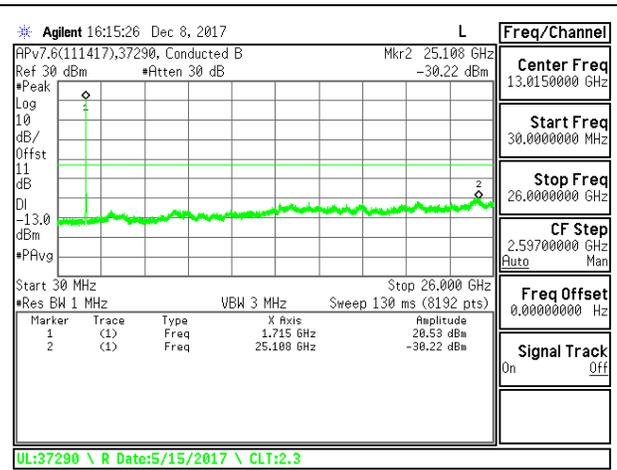
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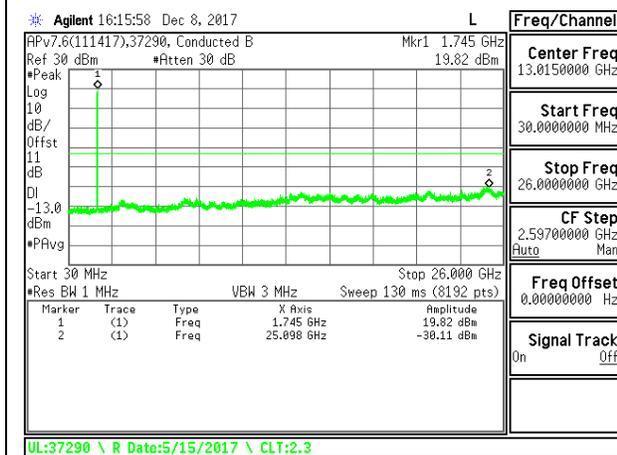
LTE B66 5MHz 16QAM High Channel RB1-0



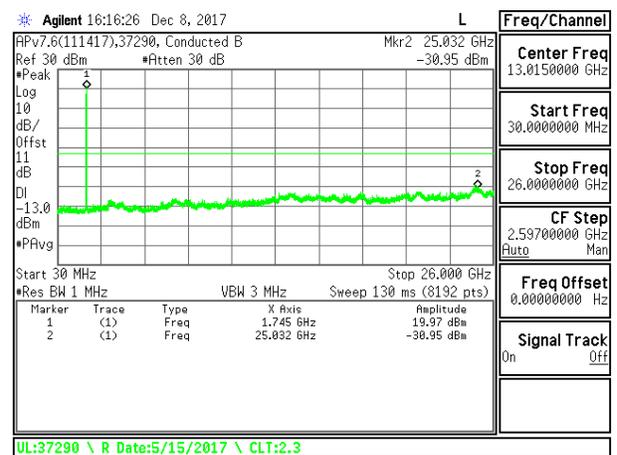
LTE B66 10MHz QPSK Low Channel RB1-0



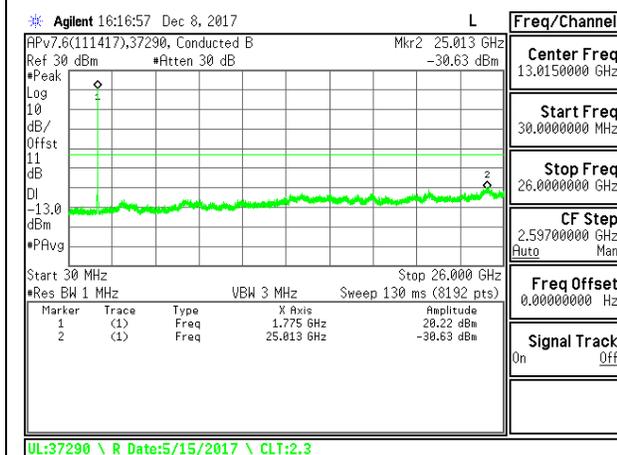
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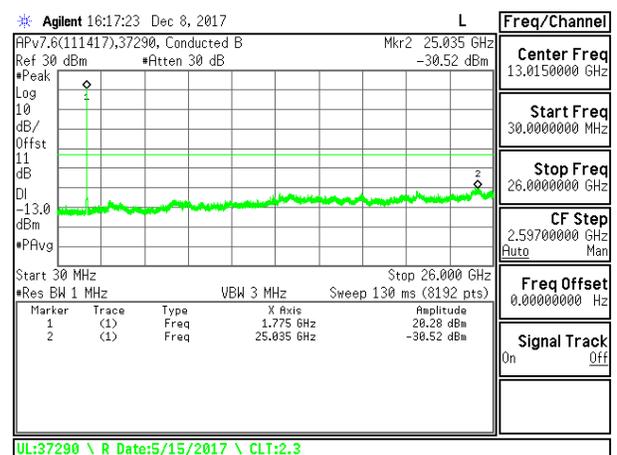
LTE B66 10MHz QPSK Middle Channel RB1-0



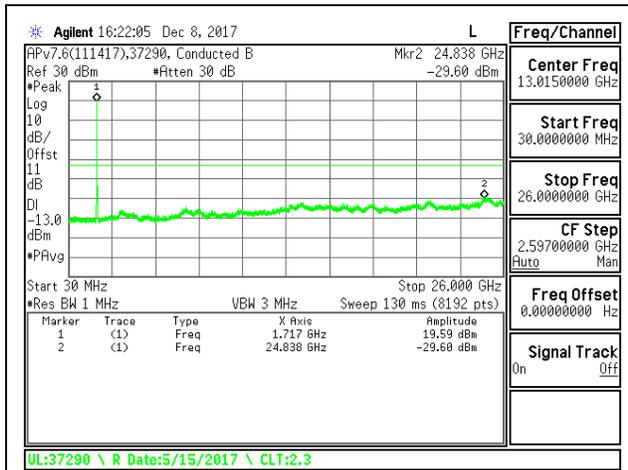
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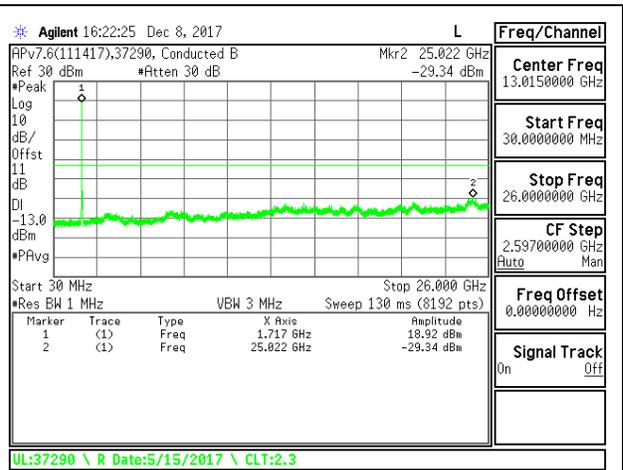
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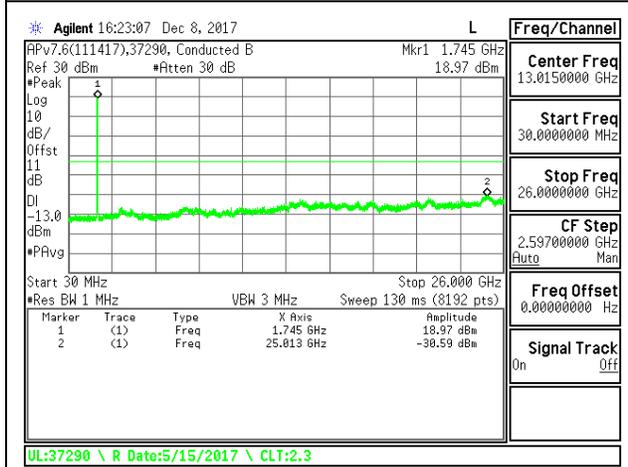
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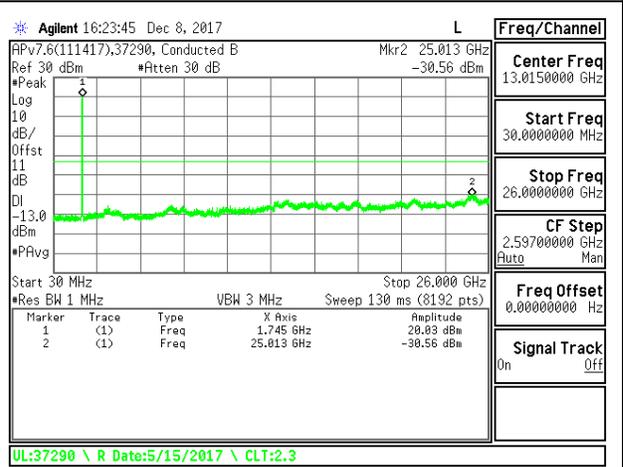
LTE B66 15MHz QPSK Low Channel RB1-0



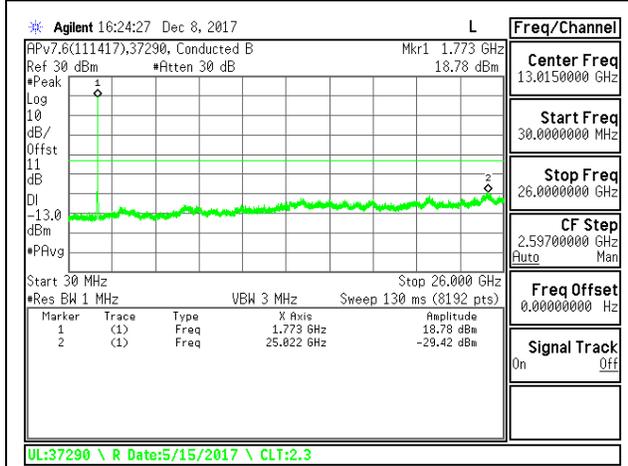
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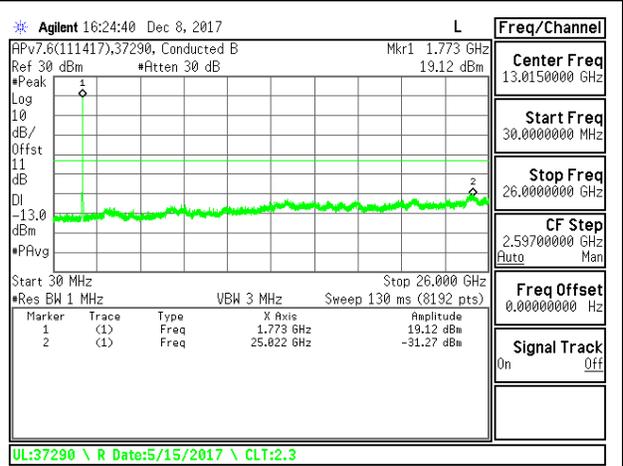
LTE B66 15MHz QPSK Middle Channel RB1-0



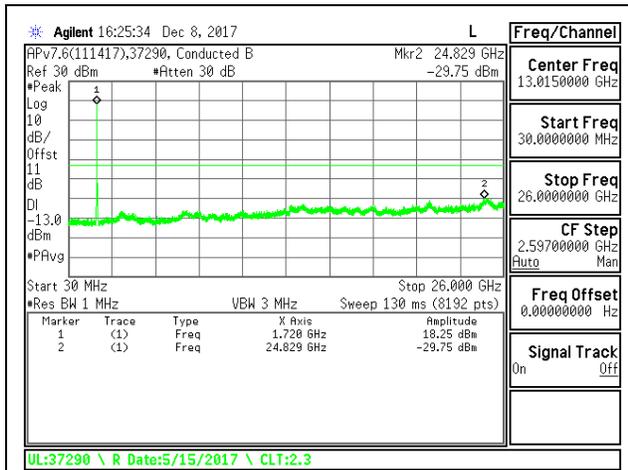
LTE B66 15MHz 16QAM Middle Channel RB1-0



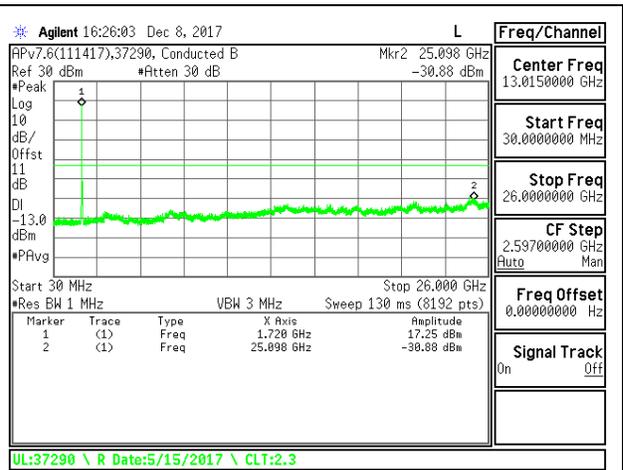
LTE B66 15MHz QPSK High Channel RB1-0



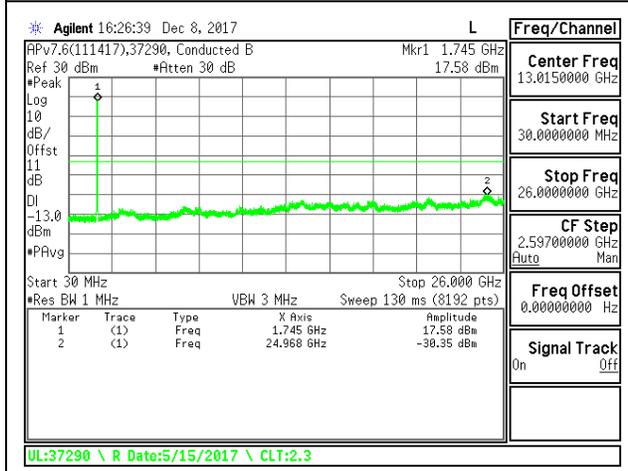
LTE B66 15MHz 16QAM High Channel RB1-0



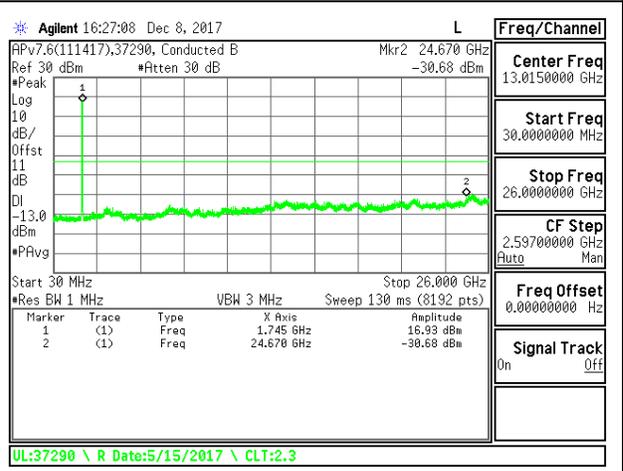
LTE B66 20MHz QPSK Low Channel RB1-0



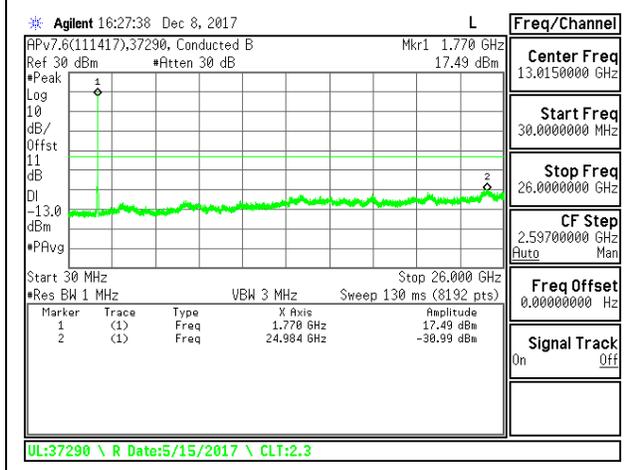
LTE B66 20MHz 16QAM Low Channel RB1-0



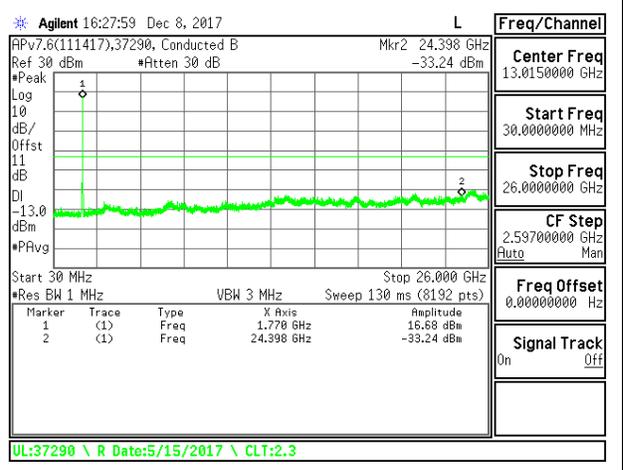
LTE B66 20MHz QPSK Middle Channel RB1-0



LTE B66 20MHz 16QAM Middle Channel RB1-0



LTE B66 20MHz QPSK High Channel RB1-0



LTE B66 20MHz 16QAM High Channel RB1-0

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## 8.4. FREQUENCY STABILITY

### RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54 and §90.213

### LIMITS

FCC: §22.355, §90.213

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

- LTE Band 2
- LTE Band 7
- LTE Band 13
- LTE Band 17
- LTE Band 26
- LTE Band 41
- LTE Band 66

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**RESULTS**

See the following pages.

**Note(s):**

**GSM 850 Band Measured Results**

GSM 850 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) no testing is necessary due to overlapping frequency range.

**GSM 1900 Band Measured Results**

GSM 1900 (Frequency range: 1850-1910 MHz) is covered by LTE Band 2 (Frequency range: 1850-1910 MHz) no testing is necessary due to overlapping frequency range.

**WCDMA Band 5 Measured Results**

WCDMA Band 5 (Frequency range: 826-84 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) no testing is necessary due to overlapping frequency range.

**WCDMA Band 2 Measured Results**

WCDMA Band 2 (Frequency range: 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 66 (Frequency range: 1710-1780 MHz) no testing is necessary due to overlapping frequency range.

**8.4.1. LTE BAND 2**

<b>ID:</b>	43575	<b>Date:</b>	12/20/17
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**QPSK, (20MHz BANDWIDTH)**

Reference Frequency: LTE Band 2 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	1880.000016	0.000	2.5
3.85	40	1880.000016	-0.001	2.5
3.85	30	1880.000015	0.000	2.5
<b>3.85</b>	<b>20</b>	<b>1880.000015</b>	<b>0</b>	<b>2.5</b>
3.85	10	1880.000016	-0.001	2.5
3.85	0	1880.000014	0.001	2.5
3.85	-10	1880.000015	0.000	2.5
3.85	-20	1880.000018	-0.001	2.5
3.85	-30	1880.000017	-0.001	2.5

Reference Frequency: LTE Band 2 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	25	1880.000015	0	2.5
4.25	25	1880.000017	-0.001	2.5
3.65	25	1880.000016	-0.001	2.5

**8.4.2. LTE BAND 7**

<b>ID:</b>	43575	<b>Date:</b>	12/20/17
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**QPSK, (20MHz BANDWIDTH)**

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	0.000	2.5
3.85	40	2534.999984	0.012	2.5
3.85	30	2535.000014	0.001	2.5
<b>3.85</b>	<b>20</b>	<b>2535.000015</b>	<b>0</b>	<b>2.5</b>
3.85	10	2535.000017	-0.001	2.5
3.85	0	2535.000021	-0.002	2.5
3.85	-10	2535.000019	-0.002	2.5
3.85	-20	2535.000014	0.001	2.5
3.85	-30	2535.000013	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)
3.85	25	2535.000015	0	2.5
4.25	25	2535.000019	-0.001	2.5
3.65	25	2535.000020	-0.002	2.5

**8.4.3. LTE BAND 13**

<b>ID:</b>	43575	<b>Date:</b>	12/20/17
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**QPSK, (10MHz BANDWIDTH)**

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	781.999985	0.005	2.5
3.85	40	781.999992	-0.004	2.5
3.85	30	781.999992	-0.003	2.5
<b>3.85</b>	<b>20</b>	<b>781.999989</b>	<b>0</b>	<b>2.5</b>
3.85	10	781.999993	-0.004	2.5
3.85	0	781.999993	-0.004	2.5
3.85	-10	781.999995	-0.008	2.5
3.85	-20	781.999992	-0.003	2.5
3.85	-30	781.999993	-0.005	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>781.999989</b>	<b>0</b>	<b>2.5</b>
4.25	25	781.999989	0.000	2.5
3.65	25	781.999991	-0.002	2.5

**8.4.4. LTE BAND 26**

<b>ID:</b>	43575	<b>Date:</b>	12/20/17
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**QPSK, (10MHz BANDWIDTH)**

Reference Frequency: LTE Band 26 Mid Channel		831.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		2078.750	Hz	
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	831.500010	0.001	2.5
3.85	40	831.500010	0.001	2.5
3.85	30	831.500010	0.000	2.5
<b>3.85</b>	<b>20</b>	<b>831.500011</b>	<b>0</b>	<b>2.5</b>
3.85	10	831.500012	-0.001	2.5
3.85	0	831.500011	-0.001	2.5
3.85	-10	831.500013	-0.003	2.5
3.85	-20	831.500010	0.000	2.5
3.85	-30	831.500010	0.001	2.5

Reference Frequency: LTE Band 26 Mid Channel		831.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		2078.750	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>831.500011</b>	<b>0</b>	<b>2.5</b>
4.25	25	831.500009	0.002	2.5
3.65	25	831.500012	-0.001	2.5

**8.4.5. LTE BAND 66**

<b>ID:</b>	43575	<b>Date:</b>	12/20/17
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**QPSK, (20MHz BANDWIDTH)**

Reference Frequency: LTE Band 66 Mid Channel		1745	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4362.500	Hz	
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.85	50	1745.000010	0.001	2.5
3.85	40	1745.000010	0.001	2.5
3.85	30	1745.000010	0.001	2.5
<b>3.85</b>	<b>20</b>	<b>1745.000011</b>	<b>0</b>	<b>2.5</b>
3.85	10	1745.000011	0.000	2.5
3.85	0	1745.000010	0.001	2.5
3.85	-10	1745.000011	0.000	2.5
3.85	-20	1745.000009	0.001	2.5
3.85	-30	1745.000012	0.000	2.5

Reference Frequency: LTE Band 66 Mid Channel		1745	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4362.500	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>1745.000011</b>	<b>0</b>	<b>2.5</b>
4.25	25	1745.000009	0.002	2.5
3.65	25	1745.000009	0.001	2.5

**8.5. PEAK-TO-AVERAGE POWER RATIO**

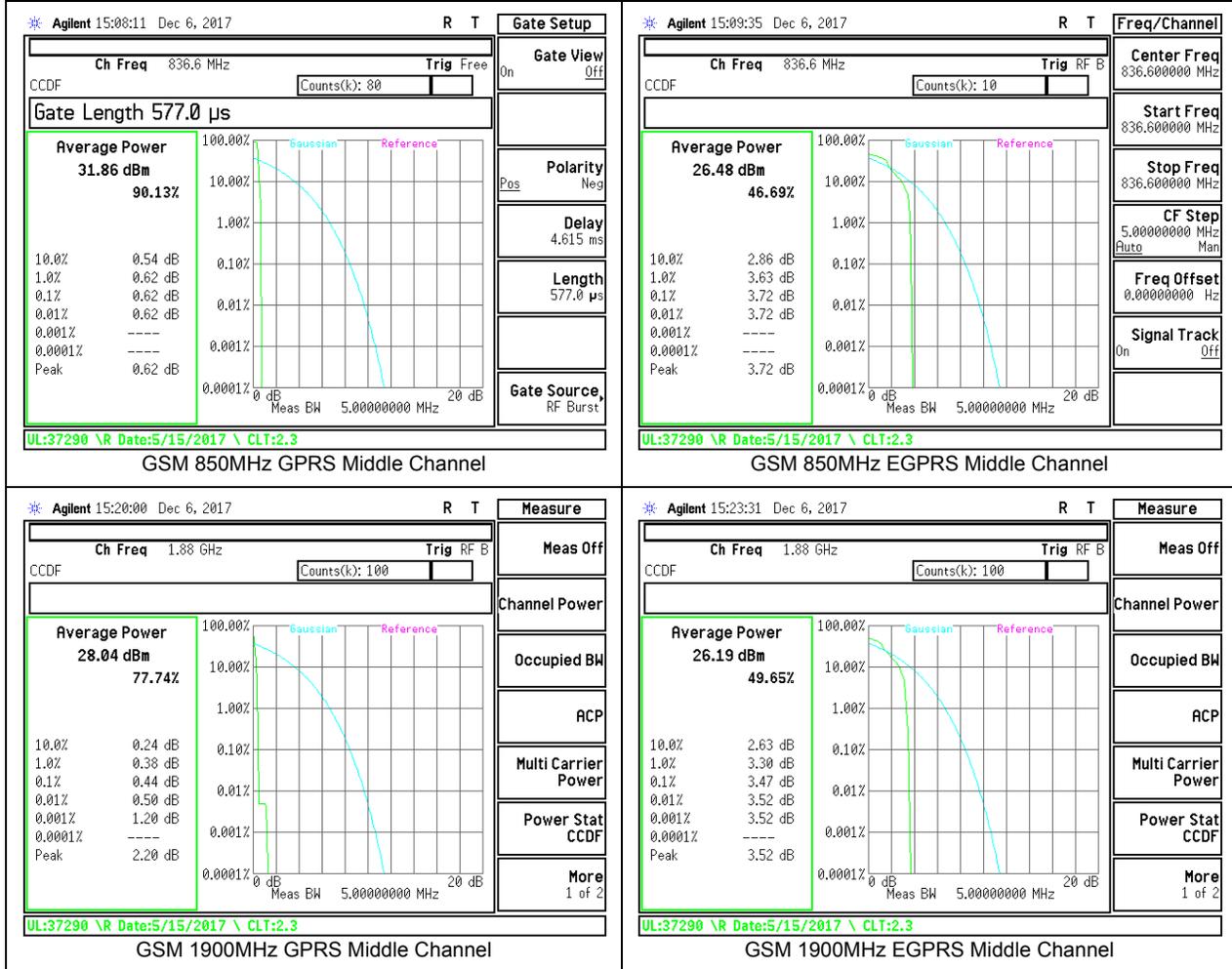
**LIMIT**

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

**RESULT**

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.

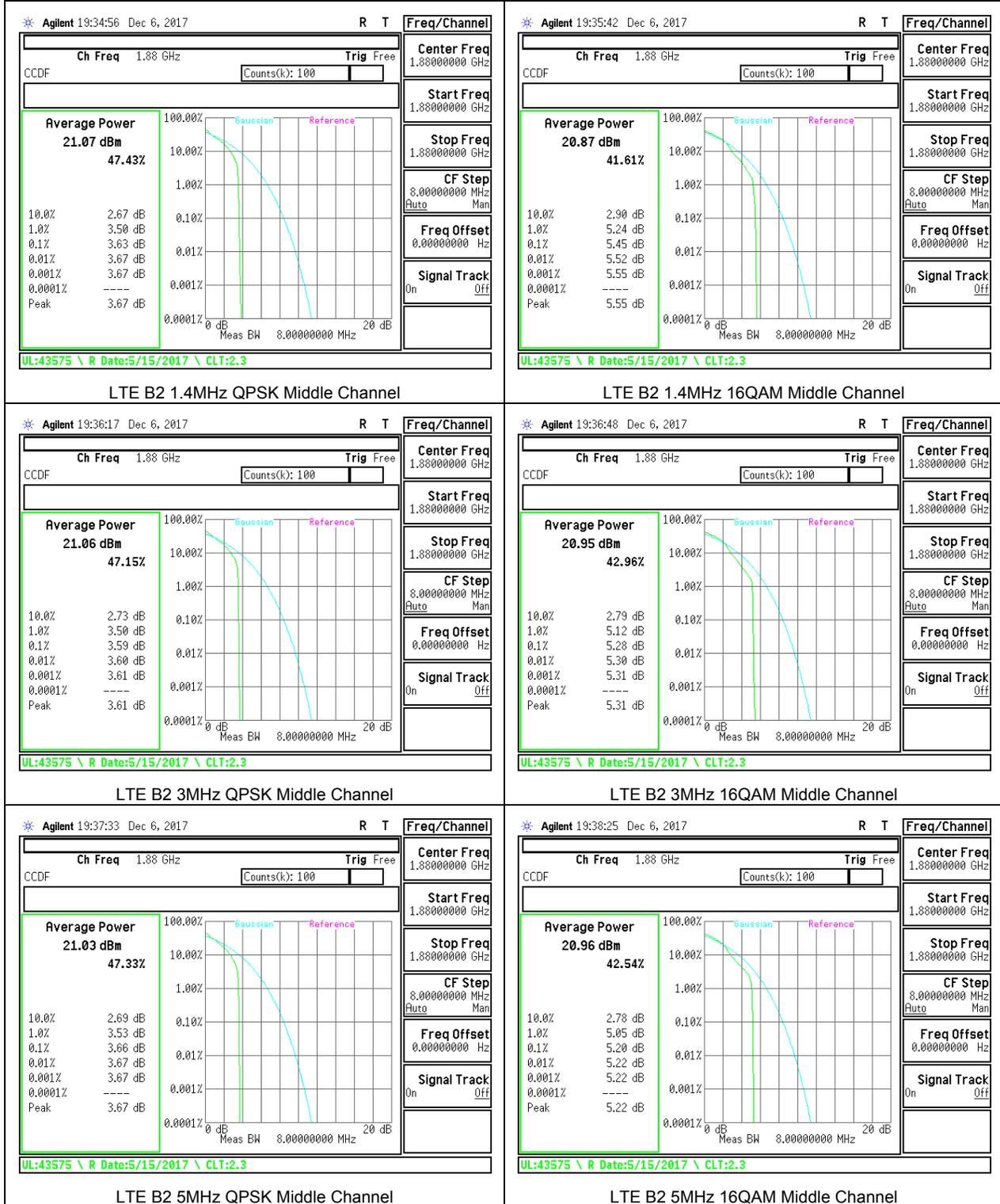
8.5.1. GSM

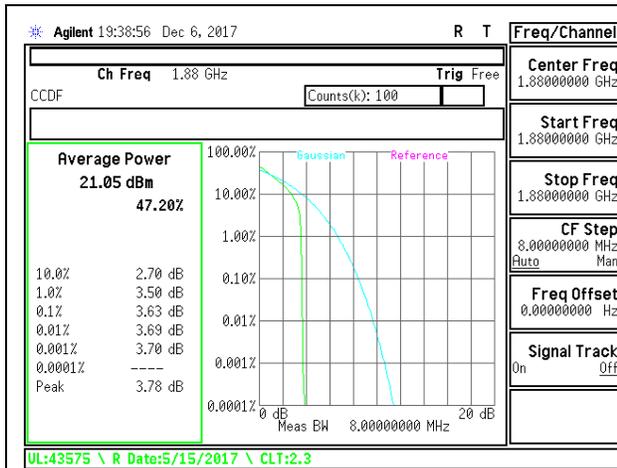


8.5.2. WCDMA

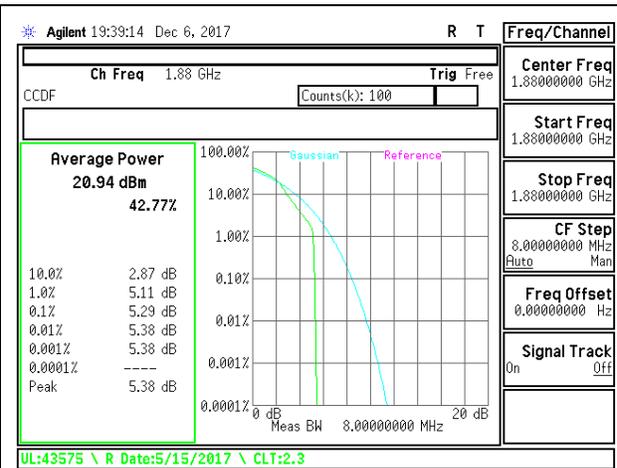


8.5.3. LTE BAND 2

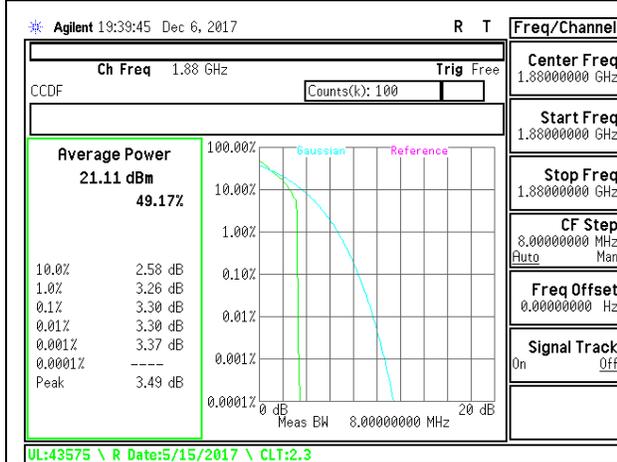




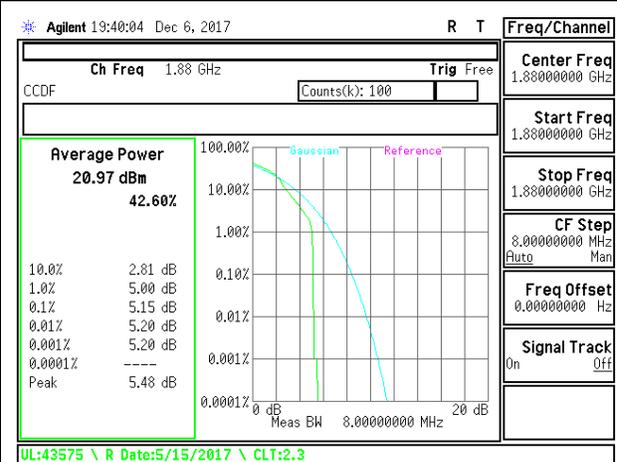
LTE B2 10MHz QPSK Middle Channel



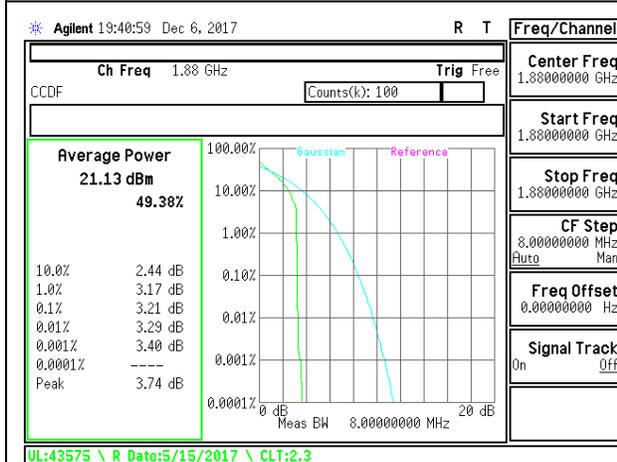
LTE B2 10MHz 16QAM Middle Channel



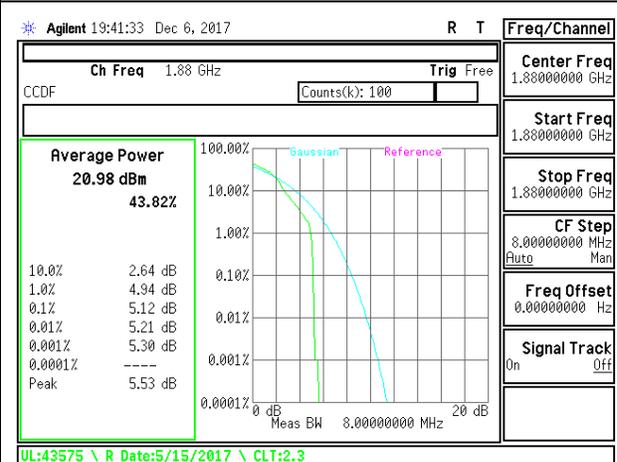
LTE B2 15MHz QPSK Middle Channel



LTE B2 15MHz 16QAM Middle Channel



LTE B2 20MHz QPSK Middle Channel

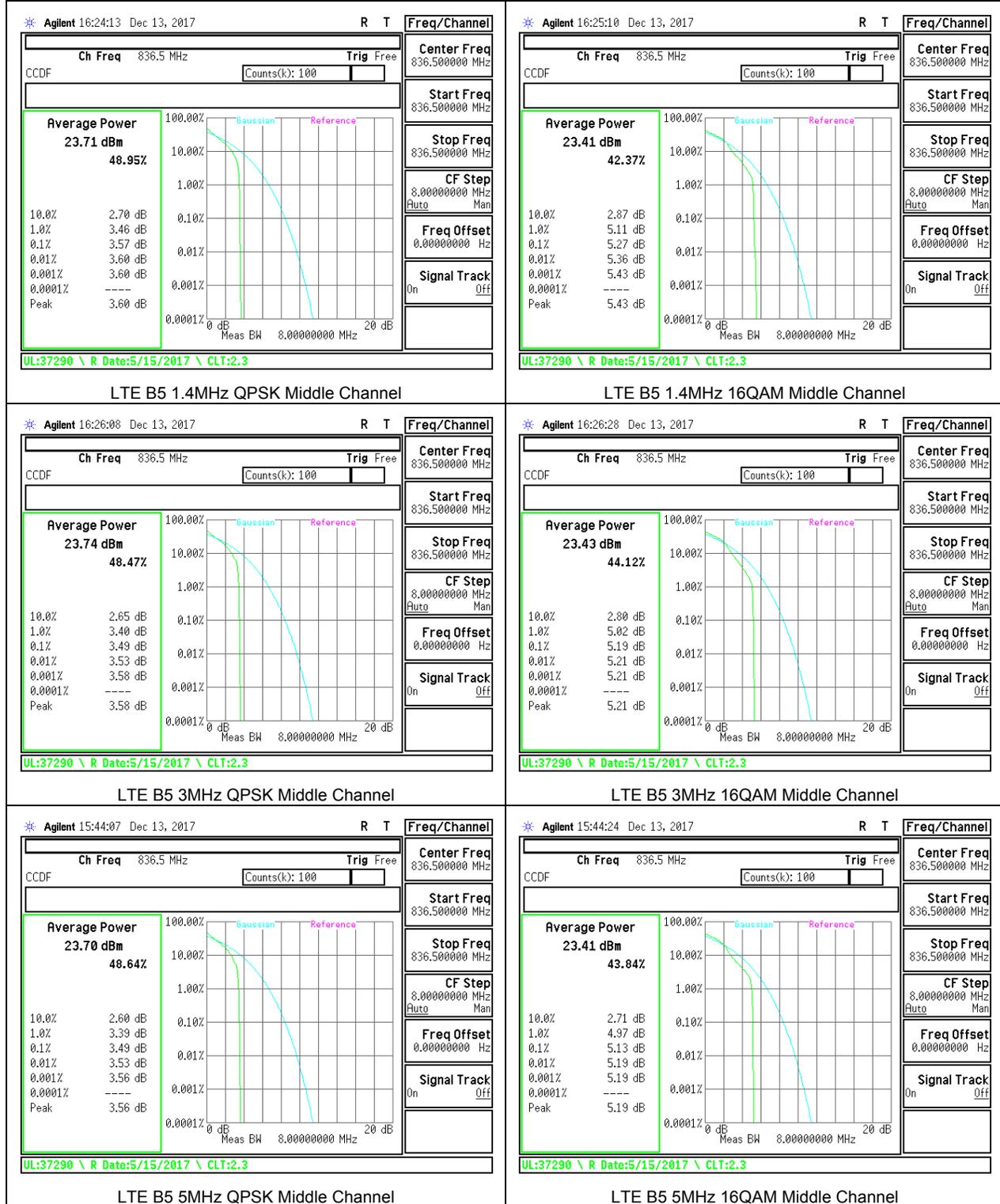


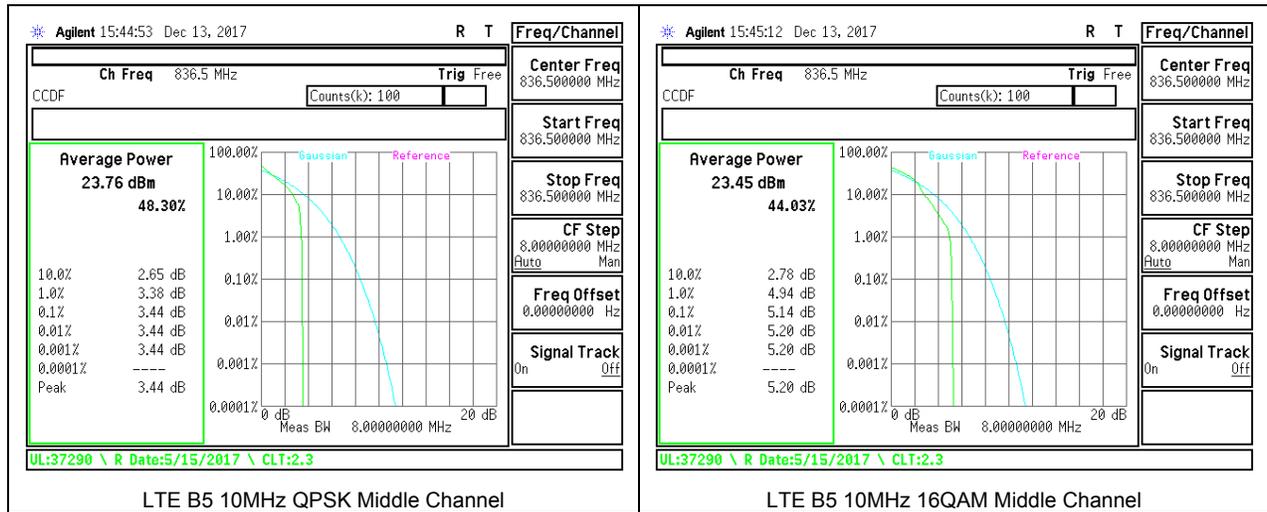
LTE B2 20MHz 16QAM Middle Channel

### 8.5.4. LTE BAND 4

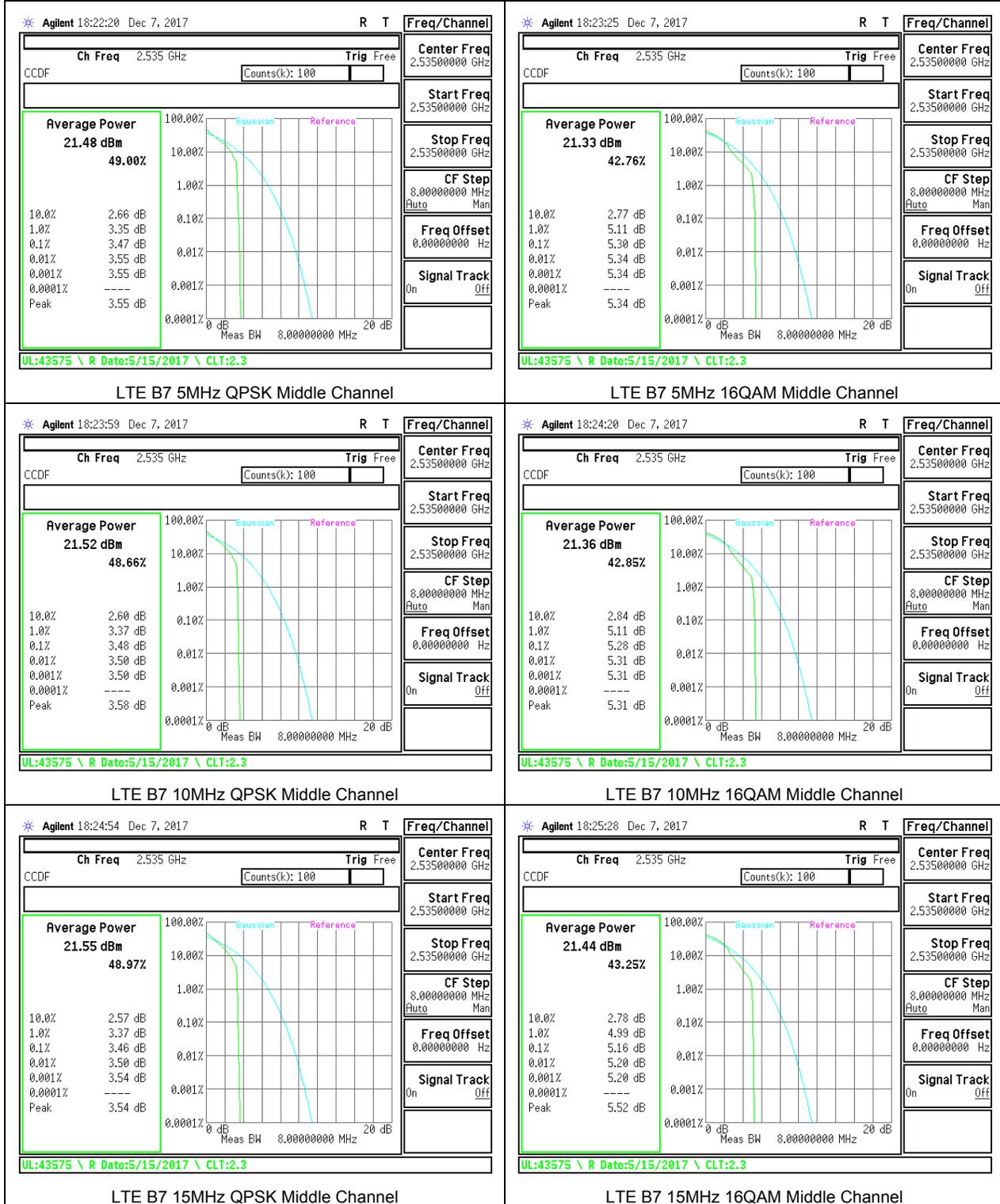
LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

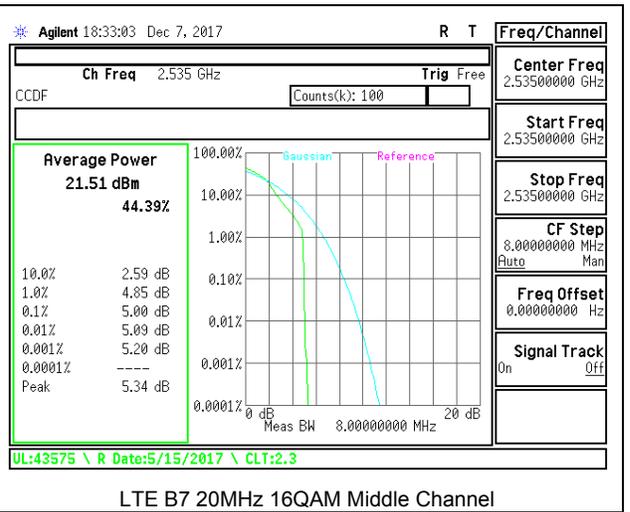
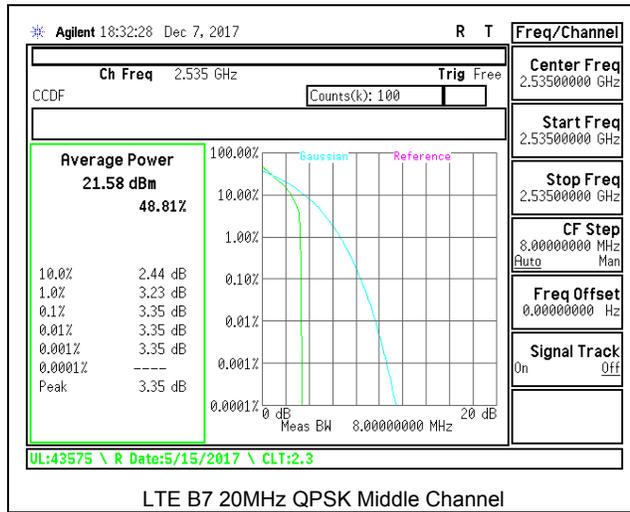
8.5.5. LTE BAND 5



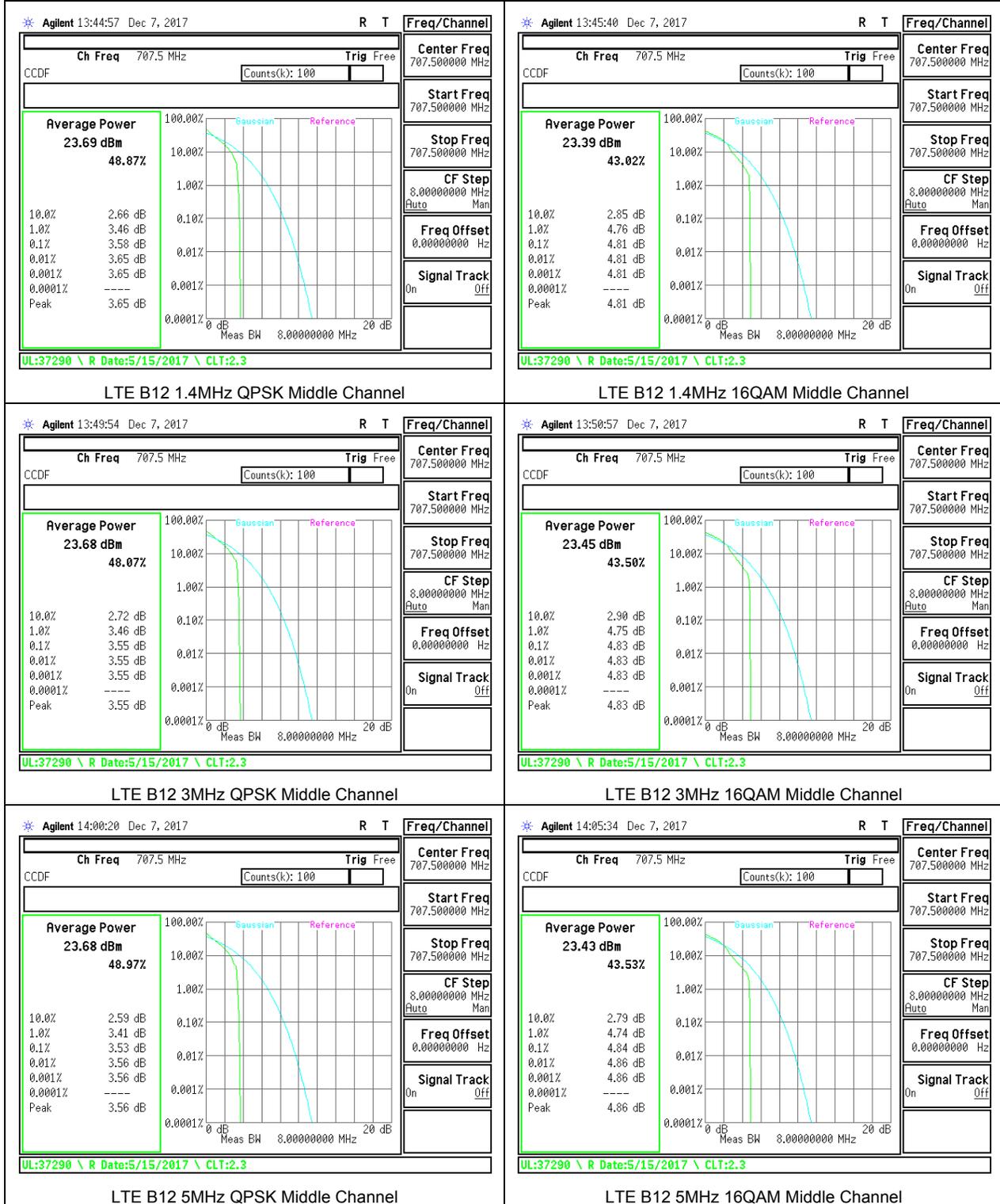


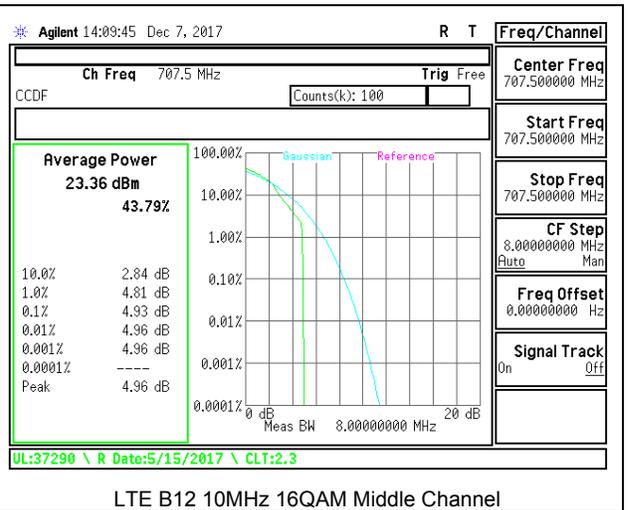
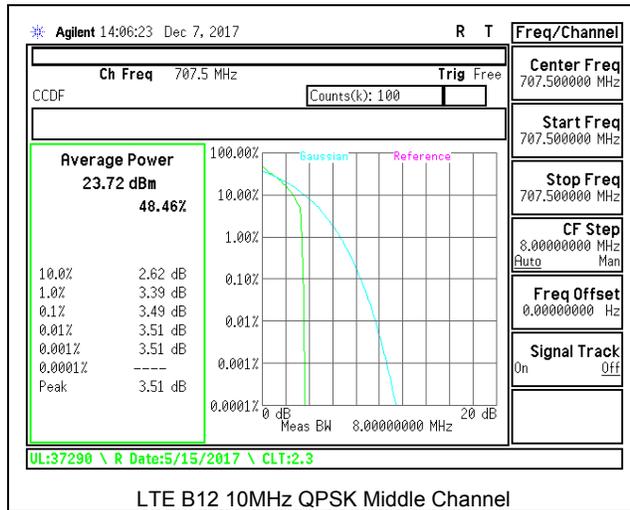
8.5.6. LTE BAND 7



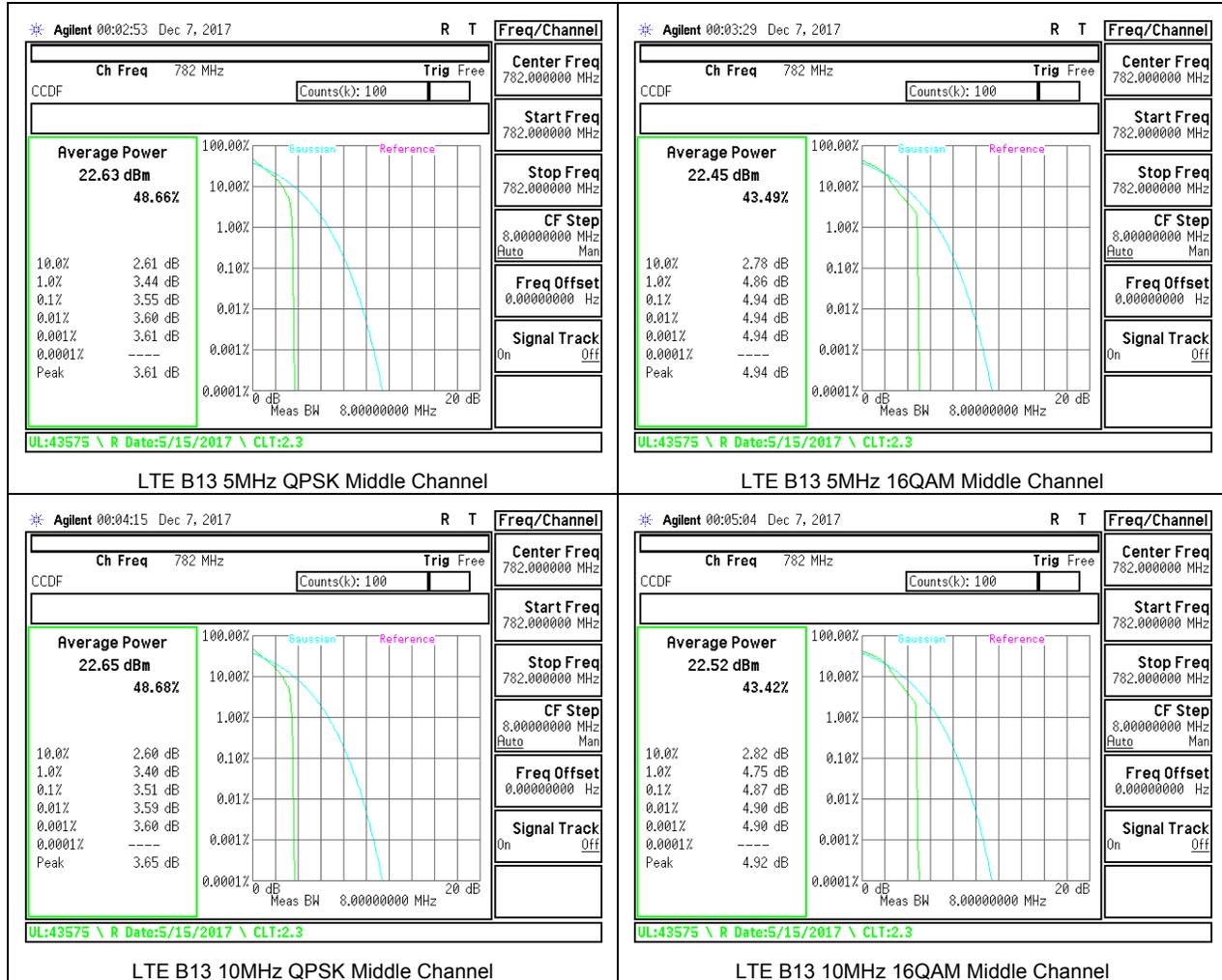


8.5.7. LTE BAND 12





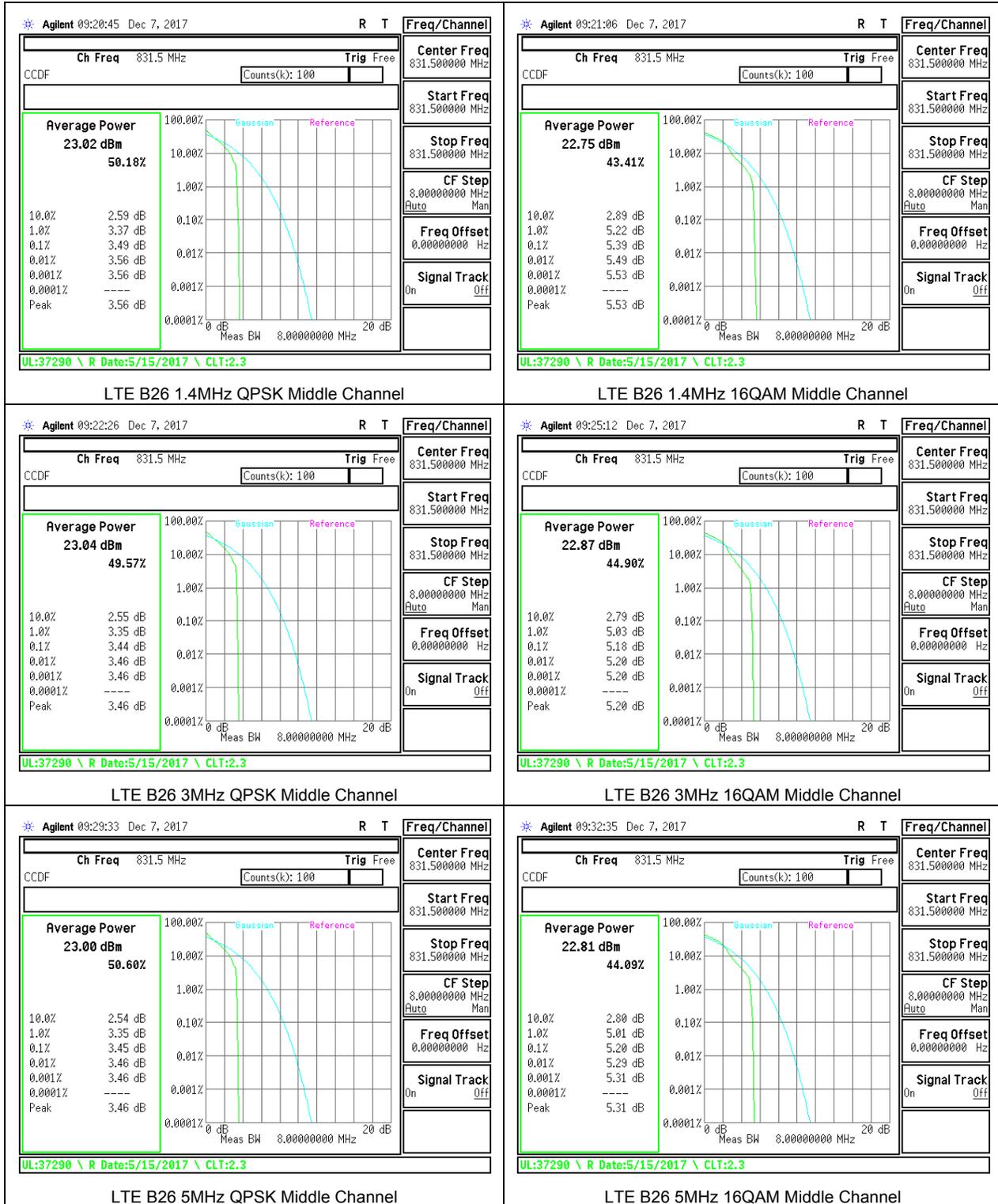
### 8.5.8. LTE BAND 13

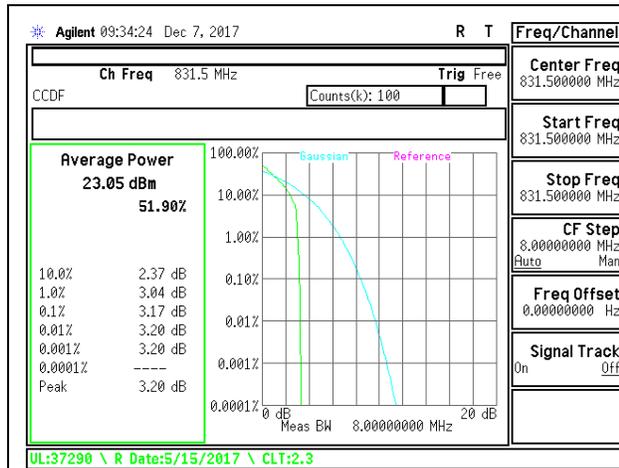


### 8.5.9. LTE BAND 17

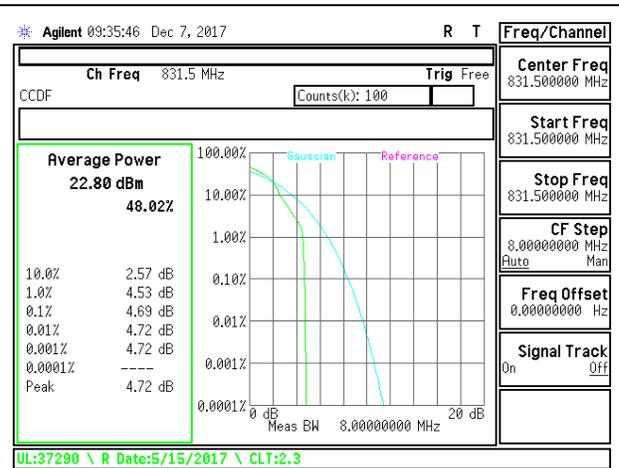
LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to similar frequency range, same maximum tune-up limit and same channel bandwidth (5 & 10 MHz).

8.5.10. LTE BAND 26

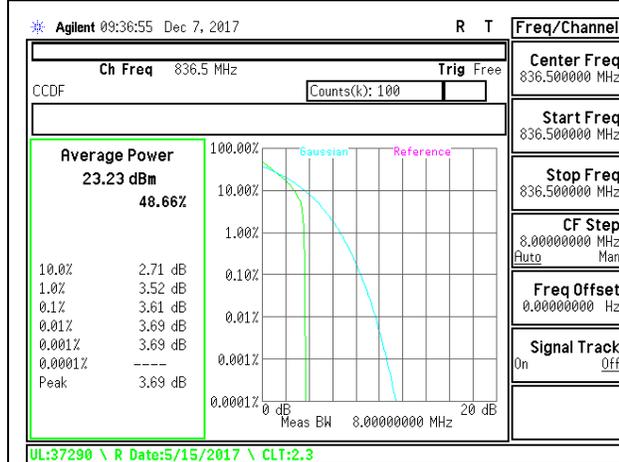




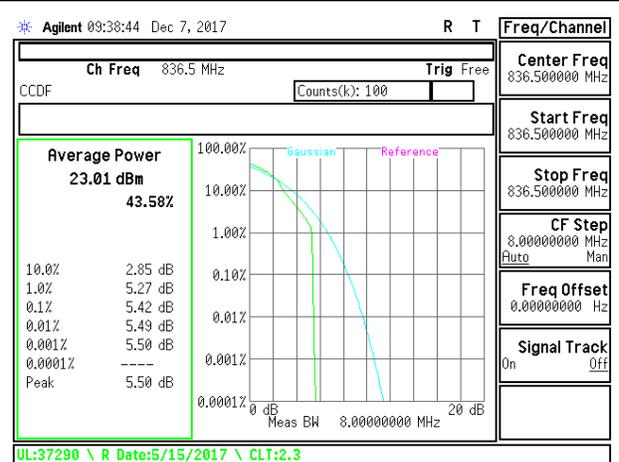
LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel

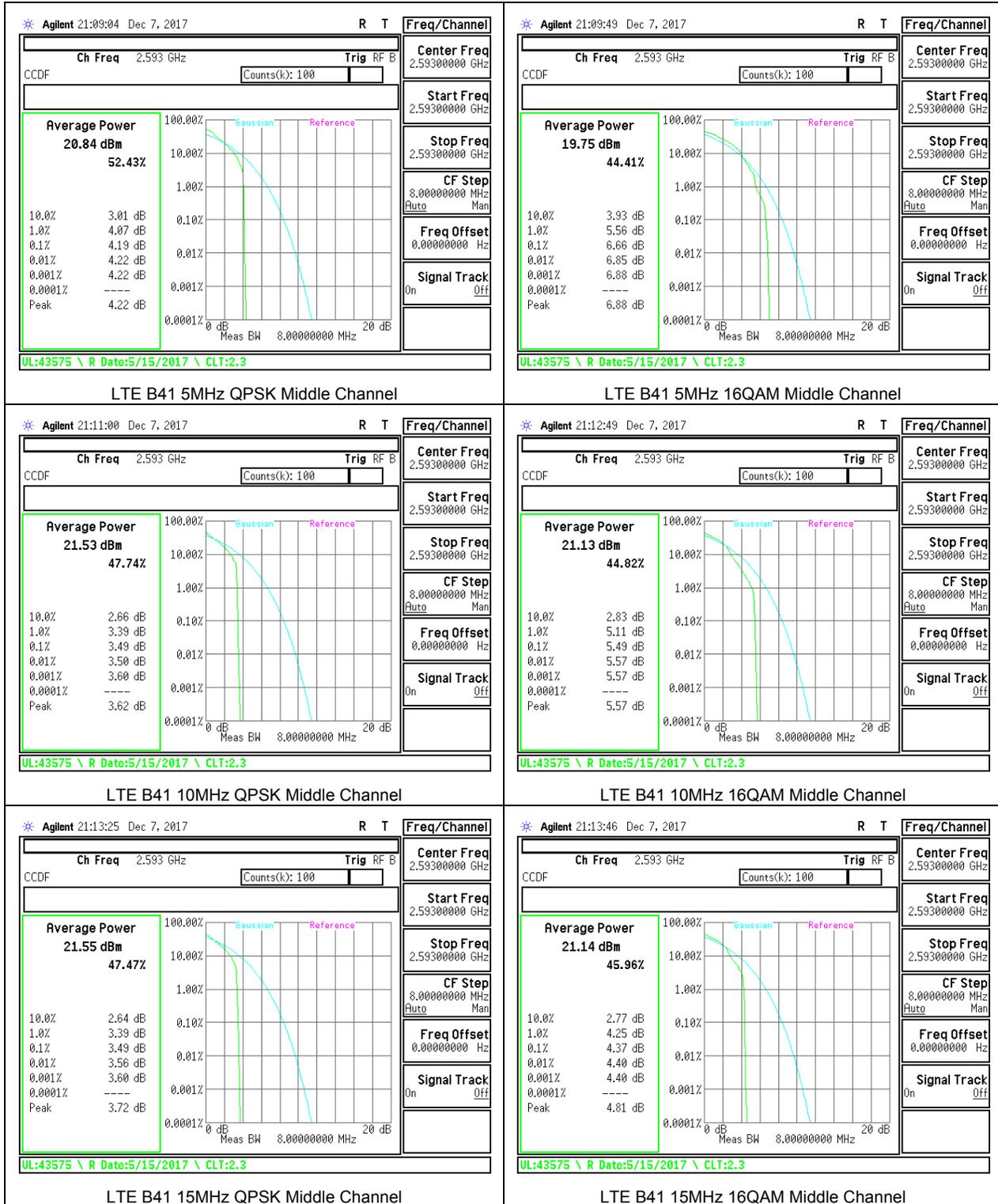


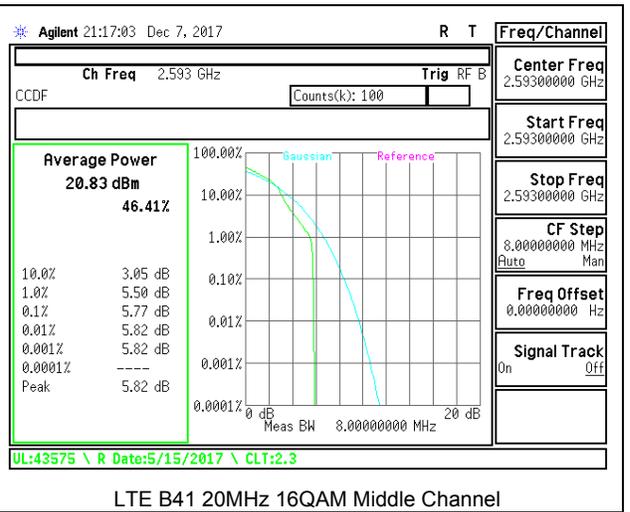
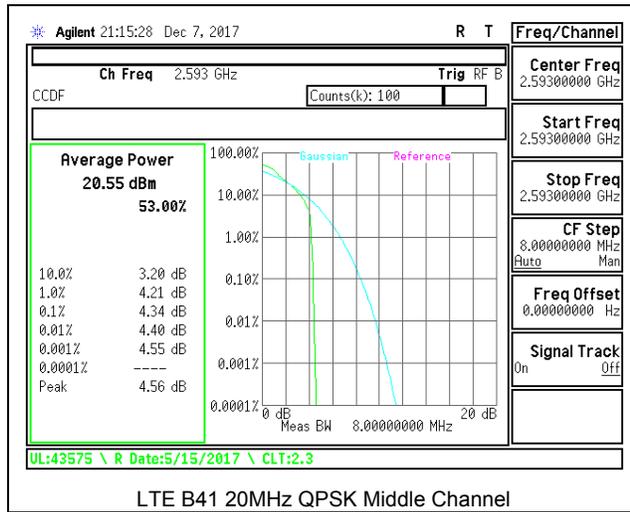
LTE B26 15MHz QPSK Middle Channel



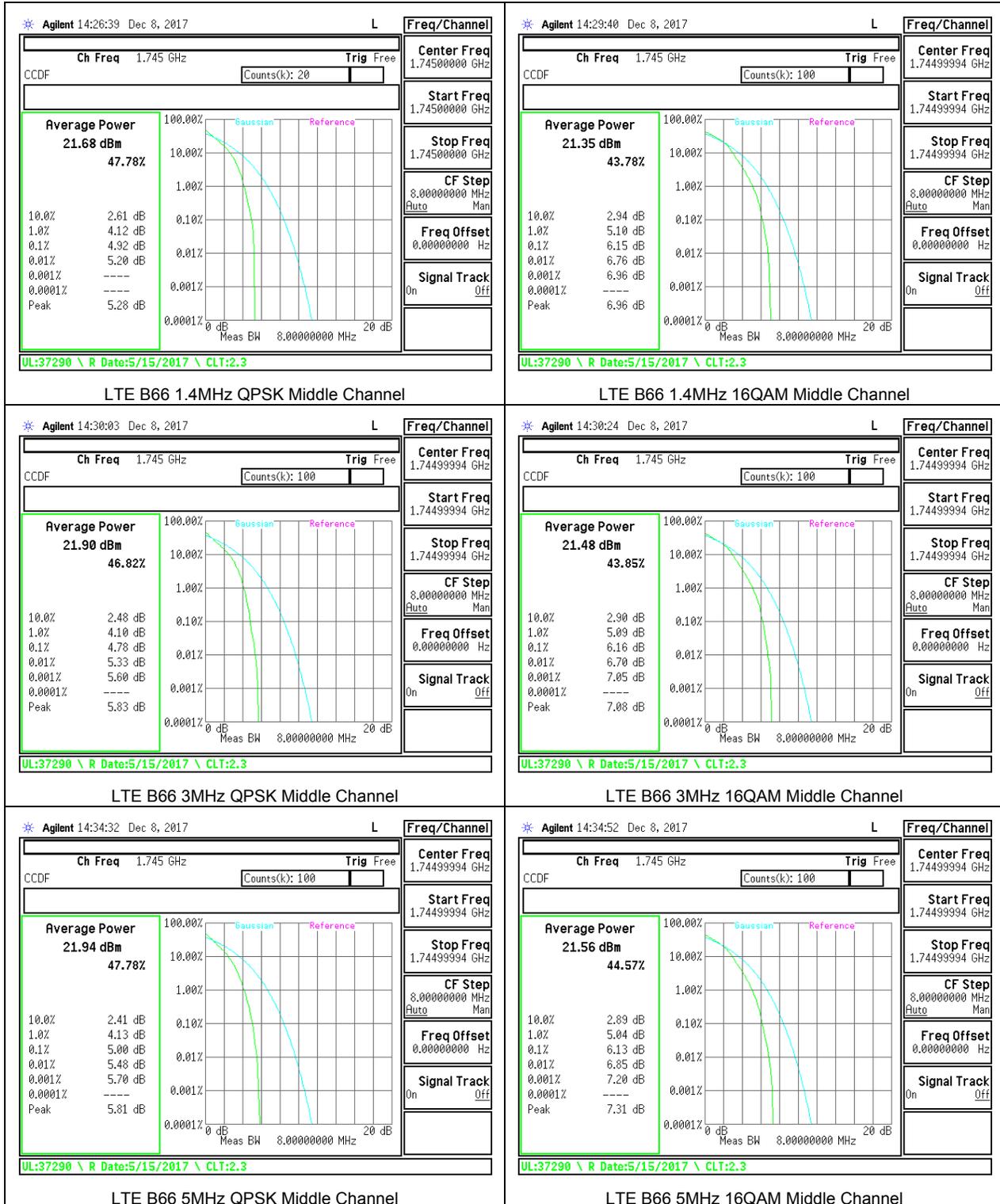
LTE B26 15MHz 16QAM Middle Channel

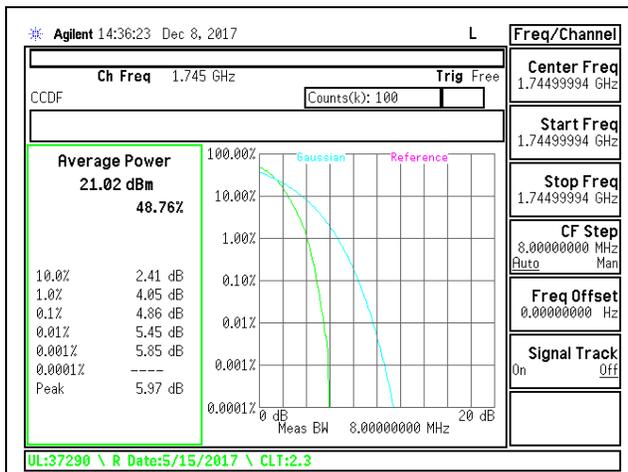
8.5.11. LTE BAND 41



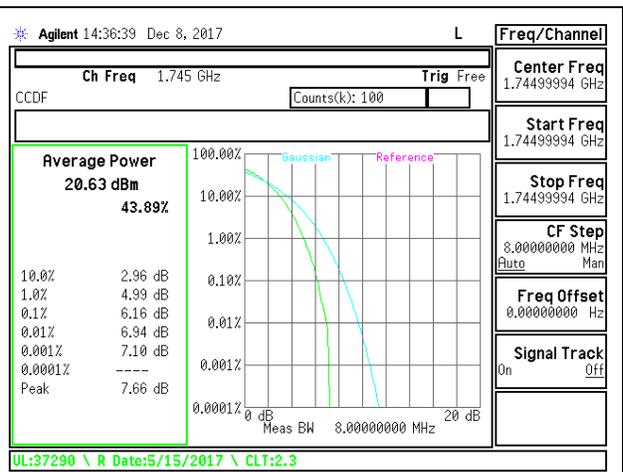


8.5.12. LTE BAND 66

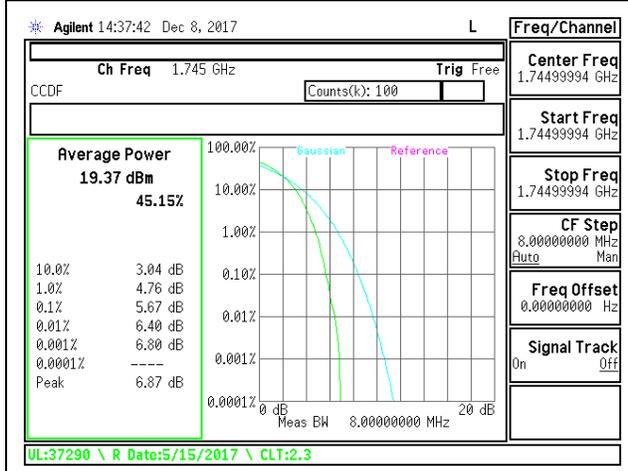




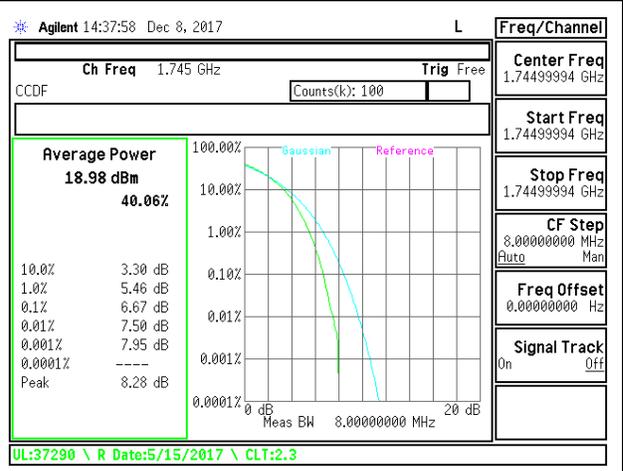
LTE B66 10MHz QPSK Middle Channel



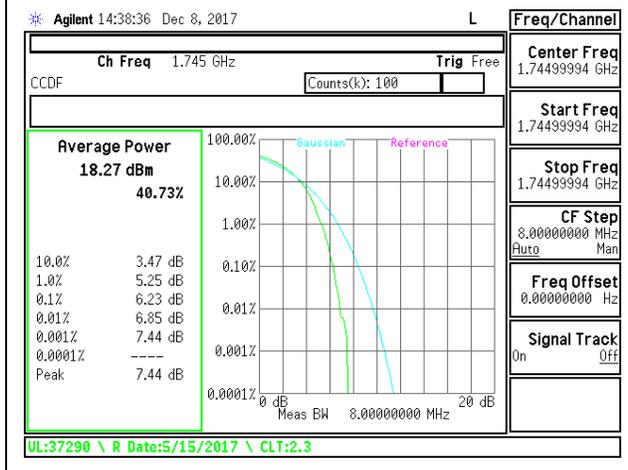
LTE B66 10MHz 16QAM Middle Channel



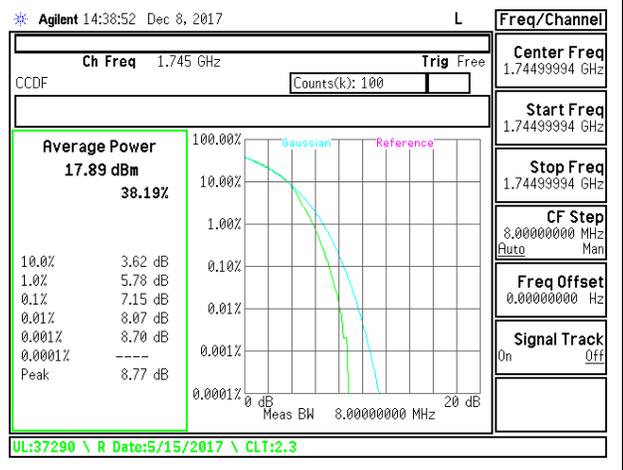
LTE B66 15MHz QPSK Middle Channel



LTE B66 15MHz 16QAM Middle Channel



LTE B66 20MHz QPSK Middle Channel



LTE B66 20MHz 16QAM Middle Channel

## 9. RADIATED TEST RESULTS

### 9.1. FIELD STRENGTH OF SPURIOUS RADIATION

#### RULE PART(S)

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

#### LIMIT

FCC: §22.917(a), §24.238(a), §27.53 (g), (h), §90.691

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

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 (a) (Band 30)

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

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.

FCC: §96.41 (Band 42)

(e) 3.5 GHz Emissions and Interference Limits—

(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed  $-40$  dBm/MHz.

#### TEST PROCEDURE

KDB 971168 D01 v03 / D02 v02r01

TIA-603-E, Section 2.2.12.

#### MODES TESTED

- GSM 850
- GSM 1900
- WCDM Band 2
- WCDM Band 4
- WCDM Band 5
- LTE Band 2
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 26
- LTE Band 41
- LTE Band 66

#### RESULTS

9.1.1. GSM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: GPRS 850 MHz Harmonics

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, 824.2MHz</b>									
1648.40	-25.6	V	3.0	37.0	1.0	-61.6	-13.0	-48.6	
2472.60	-25.9	V	3.0	36.4	1.0	-61.3	-13.0	-48.3	
3296.80	-24.0	V	3.0	36.2	1.0	-59.1	-13.0	-46.1	
1648.40	-25.3	H	3.0	37.0	1.0	-61.3	-13.0	-48.3	
2472.60	-25.9	H	3.0	36.4	1.0	-61.3	-13.0	-48.3	
3296.80	-24.6	H	3.0	36.2	1.0	-59.8	-13.0	-46.8	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-25.9	V	3.0	37.0	1.0	-61.9	-13.0	-48.9	
2509.80	-26.3	V	3.0	36.4	1.0	-61.7	-13.0	-48.7	
3346.40	-24.9	V	3.0	36.1	1.0	-60.9	-13.0	-47.9	
1673.20	-30.2	H	3.0	37.0	1.0	-66.2	-13.0	-53.2	
2509.80	-25.4	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3346.40	-25.0	H	3.0	36.1	1.0	-60.1	-13.0	-47.1	
<b>High Ch, 848.8MHz</b>									
1697.60	-27.1	V	3.0	37.0	1.0	-63.1	-13.0	-50.1	
2546.40	-25.6	V	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3395.20	-25.6	V	3.0	36.1	1.0	-60.7	-13.0	-47.7	
1697.60	-25.7	H	3.0	37.0	1.0	-61.7	-13.0	-48.7	
2546.40	-25.1	H	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3395.20	-24.8	H	3.0	36.1	1.0	-59.9	-13.0	-46.9	

GSM 850MHz GPRS

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: EGPRS 850 MHz Harmonics

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, 824.2MHz</b>									
1648.40	-29.5	V	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2472.60	-26.0	V	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3296.80	-24.1	V	3.0	36.2	1.0	-59.2	-13.0	-46.2	
1648.40	-30.2	H	3.0	37.0	1.0	-66.2	-13.0	-53.2	
2472.60	-26.2	H	3.0	36.4	1.0	-61.6	-13.0	-48.6	
3296.80	-24.5	H	3.0	36.2	1.0	-59.7	-13.0	-46.7	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-28.8	V	3.0	37.0	1.0	-64.8	-13.0	-51.8	
2509.80	-25.5	V	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3346.40	-24.7	V	3.0	36.1	1.0	-59.8	-13.0	-46.8	
1673.20	-29.2	H	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2509.80	-26.0	H	3.0	36.4	1.0	-61.5	-13.0	-48.5	
3346.40	-24.8	H	3.0	36.1	1.0	-59.9	-13.0	-46.9	
<b>High Ch, 848.8MHz</b>									
1697.60	-27.6	V	3.0	37.0	1.0	-63.6	-13.0	-50.6	
2546.40	-22.4	V	3.0	36.4	1.0	-57.9	-13.0	-44.9	
3395.20	-24.6	V	3.0	36.1	1.0	-59.7	-13.0	-46.7	
1697.60	-29.6	H	3.0	37.0	1.0	-65.6	-13.0	-52.6	
2546.40	-26.0	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3395.20	-23.6	H	3.0	36.1	1.0	-58.7	-13.0	-45.7	

GSM 850MHz EGPRS

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: SOMC  
 Project #: 12073310  
 Date: 12/12/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: GPRS 1900 MHz Harmonics

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, 1850.2</b>									
3700.40	-18.0	V	3.0	35.9	1.0	-52.8	-13.0	-39.8	
5560.80	-14.2	V	3.0	35.5	1.0	-48.6	-13.0	-35.6	
7400.80	-13.6	V	3.0	35.7	1.0	-48.4	-13.0	-35.4	
3700.40	-18.1	H	3.0	35.9	1.0	-52.9	-13.0	-39.9	
5560.80	-13.9	H	3.0	35.5	1.0	-48.3	-13.0	-35.3	
7400.80	-12.0	H	3.0	35.7	1.0	-46.7	-13.0	-33.7	
<b>Mid Ch, 1890</b>									
3760.00	-17.5	V	3.0	35.8	1.0	-52.3	-13.0	-39.3	
5640.00	-13.5	V	3.0	35.5	1.0	-48.0	-13.0	-35.0	
7520.00	-13.2	V	3.0	35.7	1.0	-48.4	-13.0	-35.4	
3760.00	-17.9	H	3.0	35.8	1.0	-52.7	-13.0	-39.7	
5640.00	-13.3	H	3.0	35.5	1.0	-47.8	-13.0	-34.8	
7520.00	-11.7	H	3.0	35.7	1.0	-46.4	-13.0	-33.4	
<b>High Ch, 1909.8</b>									
3819.60	-17.4	V	3.0	35.8	1.0	-52.2	-13.0	-39.2	
5729.40	-14.8	V	3.0	35.5	1.0	-49.3	-13.0	-36.3	
7639.20	-12.7	V	3.0	35.8	1.0	-47.5	-13.0	-34.5	
3819.60	-18.9	H	3.0	35.8	1.0	-53.6	-13.0	-40.6	
5729.40	-15.0	H	3.0	35.5	1.0	-48.5	-13.0	-35.5	
7639.20	-12.3	H	3.0	35.8	1.0	-47.0	-13.0	-34.0	

GSM 1900MHz GPRS

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: SOMC  
 Project #: 12073310  
 Date: 12/12/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: EGPRS 1900 MHz Harmonics

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, 1850.2</b>									
3700.40	-17.7	V	3.0	35.9	1.0	-52.5	-13.0	-39.5	
5560.80	-15.6	V	3.0	35.5	1.0	-50.1	-13.0	-37.1	
7400.80	-14.3	V	3.0	35.7	1.0	-49.0	-13.0	-36.0	
3700.40	-19.5	H	3.0	35.9	1.0	-54.4	-13.0	-41.4	
5560.80	-15.0	H	3.0	35.5	1.0	-49.5	-13.0	-36.5	
7400.80	-13.1	H	3.0	35.7	1.0	-47.8	-13.0	-34.8	
<b>Mid Ch, 1890</b>									
3760.00	-18.1	V	3.0	35.8	1.0	-52.9	-13.0	-39.9	
5640.00	-13.1	V	3.0	35.5	1.0	-47.6	-13.0	-34.6	
7520.00	-13.2	V	3.0	35.7	1.0	-48.0	-13.0	-35.0	
3760.00	-17.7	H	3.0	35.8	1.0	-52.5	-13.0	-39.5	
5640.00	-13.0	H	3.0	35.5	1.0	-47.5	-13.0	-34.5	
7520.00	-11.6	H	3.0	35.7	1.0	-46.3	-13.0	-33.3	
<b>High Ch, 1909.8</b>									
3819.60	-16.9	V	3.0	35.8	1.0	-51.7	-13.0	-38.7	
5729.40	-13.4	V	3.0	35.5	1.0	-47.9	-13.0	-34.9	
7639.20	-13.5	V	3.0	35.8	1.0	-48.3	-13.0	-35.3	
3819.60	-18.5	H	3.0	35.8	1.0	-53.3	-13.0	-40.3	
5729.40	-12.7	H	3.0	35.5	1.0	-47.2	-13.0	-34.2	
7639.20	-11.9	H	3.0	35.8	1.0	-46.7	-13.0	-33.7	

GSM 1900MHz EGPRS

9.1.2. WCDMA

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: Rel99 Band 5 Harmonics

f	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 826.4MHz</b>									
1652.80	-29.6	V	3.0	37.0	1.0	-65.6	-13.0	-52.6	
2479.20	-25.8	V	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3305.60	-24.4	V	3.0	36.1	1.0	-59.5	-13.0	-46.5	
1652.80	-29.7	H	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2479.20	-26.2	H	3.0	36.4	1.0	-61.7	-13.0	-48.7	
3305.60	-23.8	H	3.0	36.1	1.0	-59.0	-13.0	-46.0	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-29.6	V	3.0	37.0	1.0	-65.6	-13.0	-52.6	
2509.80	-25.6	V	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3346.40	-24.6	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1673.20	-29.3	H	3.0	37.0	1.0	-65.3	-13.0	-52.3	
2509.80	-26.1	H	3.0	36.4	1.0	-61.5	-13.0	-48.5	
3346.40	-24.5	H	3.0	36.1	1.0	-59.6	-13.0	-46.6	
<b>High Ch, 846.6MHz</b>									
1693.20	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2539.80	-25.8	V	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3386.40	-24.6	V	3.0	36.1	1.0	-59.7	-13.0	-46.7	
1693.20	-28.9	H	3.0	37.0	1.0	-64.8	-13.0	-51.8	
2539.80	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3386.40	-24.6	H	3.0	36.1	1.0	-59.6	-13.0	-46.6	

WCDMA Band 5 Rel 99

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: HSDPA Band 5 Harmonics

f	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 826.4MHz</b>									
1652.80	-29.5	V	3.0	37.0	1.0	-65.5	-13.0	-52.5	
2479.20	-25.7	V	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3305.60	-24.5	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1652.80	-29.7	H	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2479.20	-25.6	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3305.60	-24.6	H	3.0	36.1	1.0	-59.7	-13.0	-46.7	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-29.8	V	3.0	37.0	1.0	-65.8	-13.0	-52.8	
2509.80	-25.3	V	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3346.40	-25.3	V	3.0	36.1	1.0	-60.4	-13.0	-47.4	
1673.20	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2509.80	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3346.40	-24.2	H	3.0	36.1	1.0	-59.3	-13.0	-46.3	
<b>High Ch, 846.6MHz</b>									
1693.20	-28.6	V	3.0	37.0	1.0	-64.6	-13.0	-51.6	
2539.80	-26.4	V	3.0	36.4	1.0	-61.8	-13.0	-48.8	
3386.40	-25.9	V	3.0	36.1	1.0	-60.0	-13.0	-47.0	
1693.20	-29.2	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2539.80	-25.1	H	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3386.40	-24.5	H	3.0	36.1	1.0	-59.6	-13.0	-46.6	

WCDMA Band 5 HSDPA

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: SOMC  
 Project #: 12073310  
 Date: 12/12/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: Rel99 Band 2 Harmonics

f	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1852.4</b>									
3704.80	-18.4	V	3.0	35.9	1.0	-53.3	-13.0	-40.3	
5551.20	-15.5	V	3.0	35.5	1.0	-50.0	-13.0	-37.0	
7409.60	-14.7	V	3.0	35.7	1.0	-49.4	-13.0	-36.4	
3704.80	-18.1	H	3.0	35.9	1.0	-52.9	-13.0	-39.9	
5551.20	-14.9	H	3.0	35.5	1.0	-49.3	-13.0	-36.3	
7409.60	-11.9	H	3.0	35.7	1.0	-46.7	-13.0	-33.7	
<b>Mid Ch, 1890</b>									
3760.00	-18.2	V	3.0	35.8	1.0	-53.0	-13.0	-40.0	
5640.00	-14.5	V	3.0	35.5	1.0	-49.0	-13.0	-36.0	
7520.00	-13.4	V	3.0	35.7	1.0	-48.5	-13.0	-35.5	
3760.00	-18.0	H	3.0	35.8	1.0	-52.8	-13.0	-39.8	
5640.00	-13.7	H	3.0	35.5	1.0	-48.2	-13.0	-35.2	
7520.00	-13.7	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	
<b>High Ch, 1907.6</b>									
3815.20	-17.8	V	3.0	35.8	1.0	-52.6	-13.0	-39.6	
5722.80	-14.5	V	3.0	35.5	1.0	-49.0	-13.0	-36.0	
7630.40	-13.1	V	3.0	35.8	1.0	-47.9	-13.0	-34.9	
3815.20	-18.0	H	3.0	35.8	1.0	-52.8	-13.0	-39.8	
5722.80	-13.8	H	3.0	35.5	1.0	-48.3	-13.0	-35.3	
7630.40	-13.1	H	3.0	35.8	1.0	-47.8	-13.0	-34.8	

WCDMA Band 2 Rel 99

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: SOMC  
 Project #: 12073310  
 Date: 12/12/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: HSDPA Band 2 Harmonics

f	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1852.4</b>									
3704.80	-18.1	V	3.0	35.9	1.0	-53.0	-13.0	-40.0	
5551.20	-15.0	V	3.0	35.5	1.0	-49.4	-13.0	-36.4	
7409.60	-14.0	V	3.0	35.7	1.0	-48.7	-13.0	-35.7	
3704.80	-18.4	H	3.0	35.9	1.0	-53.3	-13.0	-40.3	
5551.20	-12.8	H	3.0	35.5	1.0	-47.3	-13.0	-34.3	
7409.60	-13.2	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	
<b>Mid Ch, 1890</b>									
3760.00	-18.3	V	3.0	35.8	1.0	-53.1	-13.0	-40.1	
5640.00	-15.2	V	3.0	35.5	1.0	-49.7	-13.0	-36.7	
7520.00	-14.0	V	3.0	35.7	1.0	-48.7	-13.0	-35.7	
3760.00	-16.7	H	3.0	35.8	1.0	-51.5	-13.0	-38.5	
5640.00	-14.2	H	3.0	35.5	1.0	-48.6	-13.0	-35.6	
7520.00	-12.2	H	3.0	35.7	1.0	-46.9	-13.0	-33.9	
<b>High Ch, 1907.6</b>									
3815.20	-17.7	V	3.0	35.8	1.0	-52.5	-13.0	-39.5	
5722.80	-14.7	V	3.0	35.5	1.0	-49.2	-13.0	-36.2	
7630.40	-12.9	V	3.0	35.8	1.0	-47.7	-13.0	-34.7	
3815.20	-17.6	H	3.0	35.8	1.0	-52.3	-13.0	-39.3	
5722.80	-12.9	H	3.0	35.5	1.0	-47.4	-13.0	-34.4	
7630.40	-12.6	H	3.0	35.8	1.0	-47.4	-13.0	-34.4	

WCDMA Band 2 HSDPA

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/12/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: Rel99 Band 4 Harmonics

f	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1712.4MHz</b>									
3424.80	-17.6	V	3.0	36.1	1.0	-52.7	-13.0	-39.7	
5137.20	-12.0	V	3.0	35.4	1.0	-46.4	-13.0	-33.4	
6849.60	-10.1	V	3.0	35.7	1.0	-44.8	-13.0	-31.8	
3424.80	-18.5	H	3.0	36.1	1.0	-53.6	-13.0	-40.6	
5137.20	-11.7	H	3.0	35.4	1.0	-46.2	-13.0	-33.2	
6849.60	-8.1	H	3.0	35.7	1.0	-42.8	-13.0	-29.8	
<b>Mid Ch, 1732.6MHz</b>									
3465.20	-16.5	V	3.0	36.0	1.0	-51.5	-13.0	-38.5	
5197.80	-11.2	V	3.0	35.4	1.0	-45.7	-13.0	-32.7	
6930.40	-11.9	V	3.0	35.7	1.0	-46.6	-13.0	-33.6	
3465.20	-16.8	H	3.0	36.0	1.0	-51.8	-13.0	-38.8	
5197.80	-11.1	H	3.0	35.4	1.0	-45.5	-13.0	-32.5	
6930.40	-9.7	H	3.0	35.7	1.0	-44.4	-13.0	-31.4	
<b>High Ch, 1752.8MHz</b>									
3505.20	-16.1	V	3.0	36.0	1.0	-51.1	-13.0	-38.1	
5257.80	-12.1	V	3.0	35.4	1.0	-46.5	-13.0	-33.5	
7010.40	-11.5	V	3.0	35.7	1.0	-46.2	-13.0	-33.2	
3505.20	-16.5	H	3.0	36.0	1.0	-51.5	-13.0	-38.5	
5257.80	-12.3	H	3.0	35.4	1.0	-46.7	-13.0	-33.7	
7010.40	-9.8	H	3.0	35.7	1.0	-44.5	-13.0	-31.5	

WCDMA Band 4 Rel 99

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/12/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: HSDPA Band 4 Harmonics

f	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1712.4MHz</b>									
3424.80	-17.5	V	3.0	36.1	1.0	-52.5	-13.0	-39.5	
5137.20	-12.0	V	3.0	35.4	1.0	-46.4	-13.0	-33.4	
6849.60	-10.4	V	3.0	35.7	1.0	-45.0	-13.0	-32.0	
3424.80	-17.5	H	3.0	36.1	1.0	-52.6	-13.0	-39.6	
5137.20	-11.5	H	3.0	35.4	1.0	-45.9	-13.0	-32.9	
6849.60	-9.2	H	3.0	35.7	1.0	-43.9	-13.0	-30.9	
<b>Mid Ch, 1732.6MHz</b>									
3465.20	-15.8	V	3.0	36.0	1.0	-50.8	-13.0	-37.8	
5197.80	-11.3	V	3.0	35.4	1.0	-45.7	-13.0	-32.7	
6930.40	-11.7	V	3.0	35.7	1.0	-46.4	-13.0	-33.4	
3465.20	-16.4	H	3.0	36.0	1.0	-51.4	-13.0	-38.4	
5197.80	-11.2	H	3.0	35.4	1.0	-45.6	-13.0	-32.6	
6930.40	-11.1	H	3.0	35.7	1.0	-45.8	-13.0	-32.8	
<b>High Ch, 1752.8MHz</b>									
3505.20	-16.4	V	3.0	36.0	1.0	-51.5	-13.0	-38.5	
5257.80	-11.9	V	3.0	35.4	1.0	-46.4	-13.0	-33.4	
7010.40	-10.5	V	3.0	35.7	1.0	-45.2	-13.0	-32.2	
3505.20	-16.6	H	3.0	36.0	1.0	-51.6	-13.0	-38.6	
5257.80	-11.6	H	3.0	35.4	1.0	-46.1	-13.0	-33.1	
7010.40	-9.5	H	3.0	35.7	1.0	-44.2	-13.0	-31.2	

WCDMA Band 4 HSDPA

9.1.3. LTE BAND 2

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 2 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, 1850.7MHz</b>									
3701.40	-11.4	V	3.0	35.9	1.0	-46.3	-13.0	-33.3	
5552.10	-8.6	V	3.0	35.5	1.0	-43.1	-13.0	-30.1	
7402.80	-6.8	V	3.0	35.7	1.0	-41.6	-13.0	-28.6	
3701.40	-11.4	H	3.0	35.9	1.0	-46.3	-13.0	-33.3	
5552.10	-8.6	H	3.0	35.5	1.0	-43.0	-13.0	-30.0	
7402.80	-6.6	H	3.0	35.7	1.0	-41.3	-13.0	-28.3	
<b>Mid Ch, 1800MHz</b>									
3760.00	-12.3	V	3.0	35.8	1.0	-47.2	-13.0	-34.2	
5640.00	-8.7	V	3.0	35.5	1.0	-43.7	-13.0	-30.2	
7520.00	-7.2	V	3.0	35.7	1.0	-41.9	-13.0	-28.9	
3760.00	-10.8	H	3.0	35.8	1.0	-45.6	-13.0	-32.6	
5640.00	-8.1	H	3.0	35.5	1.0	-42.6	-13.0	-29.6	
7520.00	-6.7	H	3.0	35.7	1.0	-41.5	-13.0	-28.5	
<b>High Ch, 1909.3MHz</b>									
3818.60	-11.1	V	3.0	35.8	1.0	-45.9	-13.0	-32.9	
5727.90	-8.3	V	3.0	35.5	1.0	-42.8	-13.0	-29.8	
7637.20	-6.4	V	3.0	35.8	1.0	-41.2	-13.0	-28.2	
3818.60	-11.7	H	3.0	35.8	1.0	-46.5	-13.0	-33.5	
5727.90	-8.6	H	3.0	35.5	1.0	-43.1	-13.0	-30.1	
7637.20	-6.2	H	3.0	35.8	1.0	-41.0	-13.0	-28.0	

LTE B2 1.4MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 2 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, 1850.7MHz</b>									
3701.40	-11.5	V	3.0	35.9	1.0	-46.3	-13.0	-33.3	
5552.10	-8.8	V	3.0	35.5	1.0	-43.2	-13.0	-30.3	
7402.80	-6.1	V	3.0	35.7	1.0	-40.8	-13.0	-27.8	
3701.40	-11.7	H	3.0	35.9	1.0	-46.6	-13.0	-33.6	
5552.10	-9.2	H	3.0	35.5	1.0	-43.6	-13.0	-30.6	
7402.80	-7.8	H	3.0	35.7	1.0	-42.5	-13.0	-29.5	
<b>Mid Ch, 1800MHz</b>									
3760.00	-10.7	V	3.0	35.8	1.0	-45.5	-13.0	-32.5	
5640.00	-9.3	V	3.0	35.5	1.0	-43.7	-13.0	-30.7	
7520.00	-7.1	V	3.0	35.7	1.0	-41.9	-13.0	-28.9	
3760.00	-11.3	H	3.0	35.8	1.0	-46.1	-13.0	-33.1	
5640.00	-9.0	H	3.0	35.5	1.0	-43.5	-13.0	-30.5	
7520.00	-7.7	H	3.0	35.7	1.0	-42.4	-13.0	-29.4	
<b>High Ch, 1909.3MHz</b>									
3818.60	-10.7	V	3.0	35.8	1.0	-45.5	-13.0	-32.5	
5727.90	-8.6	V	3.0	35.5	1.0	-43.1	-13.0	-30.1	
7637.20	-6.6	V	3.0	35.8	1.0	-41.3	-13.0	-28.3	
3818.60	-11.6	H	3.0	35.8	1.0	-46.4	-13.0	-33.4	
5727.90	-8.5	H	3.0	35.5	1.0	-43.0	-13.0	-30.0	
7637.20	-7.2	H	3.0	35.8	1.0	-42.0	-13.0	-29.0	

LTE B2 1.4MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 2 Harmonics, 3MHz 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, 1851.5MHz</b>									
3703.00	-11.9	V	3.0	35.9	1.0	-46.8	-13.0	-33.8	
5554.50	-8.1	V	3.0	35.5	1.0	-42.5	-13.0	-29.5	
7406.00	-7.4	V	3.0	35.7	1.0	-42.1	-13.0	-29.1	
3703.00	-10.6	H	3.0	35.9	1.0	-45.4	-13.0	-32.4	
5554.50	-8.1	H	3.0	35.5	1.0	-43.6	-13.0	-30.6	
7406.00	-7.1	H	3.0	35.7	1.0	-41.9	-13.0	-28.9	
<b>Mid Ch, 1800MHz</b>									
3760.00	-10.4	V	3.0	35.8	1.0	-45.2	-13.0	-32.2	
5640.00	-7.7	V	3.0	35.5	1.0	-42.1	-13.0	-29.1	
7520.00	-5.8	V	3.0	35.7	1.0	-40.5	-13.0	-27.5	
3760.00	-11.3	H	3.0	35.8	1.0	-46.1	-13.0	-33.1	
5640.00	-7.7	H	3.0	35.5	1.0	-42.1	-13.0	-29.1	
7520.00	-6.0	H	3.0	35.7	1.0	-40.8	-13.0	-27.8	
<b>High Ch, 1908.5MHz</b>									
3817.00	-12.3	V	3.0	35.8	1.0	-47.1	-13.0	-34.1	
5725.50	-9.0	V	3.0	35.5	1.0	-43.5	-13.0	-30.5	
7634.00	-6.1	V	3.0	35.8	1.0	-40.9	-13.0	-27.9	
3817.00	-11.8	H	3.0	35.8	1.0	-46.6	-13.0	-33.6	
5725.50	-7.1	H	3.0	35.5	1.0	-41.6	-13.0	-28.6	
7634.00	-6.9	H	3.0	35.8	1.0	-41.2	-13.0	-28.2	

LTE B2 3MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 2 Harmonics, 3MHz 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, 1851.5MHz</b>									
3703.00	-10.8	V	3.0	35.9	1.0	-45.7	-13.0	-32.7	
5554.50	-8.1	V	3.0	35.5	1.0	-42.5	-13.0	-29.5	
7406.00	-6.9	V	3.0	35.7	1.0	-41.7	-13.0	-28.7	
3703.00	-10.8	H	3.0	35.9	1.0	-45.7	-13.0	-32.7	
5554.50	-8.4	H	3.0	35.5	1.0	-42.9	-13.0	-29.9	
7406.00	-7.0	H	3.0	35.7	1.0	-41.7	-13.0	-28.7	
<b>Mid Ch, 1800MHz</b>									
3760.00	-9.4	V	3.0	35.8	1.0	-44.3	-13.0	-31.3	
5640.00	-7.4	V	3.0	35.5	1.0	-41.9	-13.0	-28.9	
7520.00	-6.5	V	3.0	35.7	1.0	-41.2	-13.0	-28.2	
3760.00	-9.4	H	3.0	35.8	1.0	-44.2	-13.0	-31.2	
5640.00	-7.4	H	3.0	35.5	1.0	-41.9	-13.0	-28.9	
7520.00	-5.5	H	3.0	35.7	1.0	-40.3	-13.0	-27.3	
<b>High Ch, 1908.5MHz</b>									
3817.00	-11.4	V	3.0	35.8	1.0	-46.2	-13.0	-33.2	
5725.50	-7.1	V	3.0	35.5	1.0	-41.6	-13.0	-28.6	
7634.00	-6.5	V	3.0	35.8	1.0	-41.2	-13.0	-28.2	
3817.00	-10.7	H	3.0	35.8	1.0	-45.5	-13.0	-32.5	
5725.50	-10.1	H	3.0	35.5	1.0	-44.6	-13.0	-31.6	
7634.00	-6.3	H	3.0	35.8	1.0	-41.1	-13.0	-28.1	

LTE B2 3MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 2 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, 1852.5MHz</b>									
3705.00	-10.6	V	3.0	35.9	1.0	-45.4	-13.0	-32.4	
5557.50	-7.1	V	3.0	35.5	1.0	-41.6	-13.0	-28.6	
7410.00	-5.0	V	3.0	35.7	1.0	-39.7	-13.0	-26.7	
3705.00	-13.0	H	3.0	35.9	1.0	-47.9	-13.0	-34.9	
5557.50	-8.1	H	3.0	35.5	1.0	-43.6	-13.0	-30.6	
7410.00	-7.8	H	3.0	35.7	1.0	-42.5	-13.0	-29.5	
<b>Mid Ch, 1800MHz</b>									
3760.00	-12.0	V	3.0	35.8	1.0	-46.9	-13.0	-33.9	
5640.00	-9.5	V	3.0	35.5	1.0	-44.0	-13.0	-31.0	
7520.00	-7.7	V	3.0	35.7	1.0	-42.5	-13.0	-29.5	
3760.00	-11.3	H	3.0	35.8	1.0	-46.2	-13.0	-33.2	
5640.00	-8.4	H	3.0	35.5	1.0	-42.9	-13.0	-29.9	
7520.00	-6.2	H	3.0	35.7	1.0	-41.0	-13.0	-28.0	
<b>High Ch, 1907.5MHz</b>									
3815.00	-10.1	V	3.0	35.8	1.0	-44.9	-13.0	-31.9	
5722.50	-8.2	V	3.0	35.5	1.0	-42.7	-13.0	-29.7	
7630.00	-6.2	V	3.0	35.8	1.0	-40.9	-13.0	-27.9	
3815.00	-10.6	H	3.0	35.8	1.0	-45.4	-13.0	-32.4	
5722.50	-7.2	H	3.0	35.5	1.0	-41.7	-13.0	-28.7	
7630.00	-5.7	H	3.0	35.8	1.0	-40.5	-13.0	-27.5	

LTE B2 5MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 2 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, 1852.5MHz</b>									
3705.00	-11.5	V	3.0	35.9	1.0	-46.3	-13.0	-33.3	
5557.50	-7.7	V	3.0	35.5	1.0	-42.1	-13.0	-29.1	
7410.00	-6.0	V	3.0	35.7	1.0	-40.7	-13.0	-27.7	
3705.00	-10.6	H	3.0	35.9	1.0	-45.5	-13.0	-32.5	
5557.50	-7.9	H	3.0	35.5	1.0	-42.4	-13.0	-29.4	
7410.00	-6.0	H	3.0	35.7	1.0	-40.7	-13.0	-27.7	
<b>Mid Ch, 1800MHz</b>									
3760.00	-10.2	V	3.0	35.8	1.0	-45.0	-13.0	-32.0	
5640.00	-8.1	V	3.0	35.5	1.0	-42.6	-13.0	-29.6	
7520.00	-5.9	V	3.0	35.7	1.0	-40.7	-13.0	-27.7	
3760.00	-9.6	H	3.0	35.8	1.0	-44.4	-13.0	-31.4	
5640.00	-7.5	H	3.0	35.5	1.0	-42.0	-13.0	-29.0	
7520.00	-5.5	H	3.0	35.7	1.0	-40.3	-13.0	-27.3	
<b>High Ch, 1907.5MHz</b>									
3815.00	-5.9	V	3.0	35.8	1.0	-44.6	-13.0	-31.6	
5722.50	-6.5	V	3.0	35.5	1.0	-41.0	-13.0	-28.0	
7630.00	-5.3	V	3.0	35.8	1.0	-40.1	-13.0	-27.1	
3815.00	-10.3	H	3.0	35.8	1.0	-45.1	-13.0	-32.1	
5722.50	-8.6	H	3.0	35.5	1.0	-43.1	-13.0	-30.1	
7630.00	-6.8	H	3.0	35.8	1.0	-41.6	-13.0	-28.6	

LTE B2 5MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 2 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, 1855MHz</b>									
3710.00	-10.7	V	3.0	35.9	1.0	-45.5	-13.0	-32.5	
5565.00	-7.2	V	3.0	35.5	1.0	-41.7	-13.0	-28.7	
7420.00	-5.7	V	3.0	35.7	1.0	-40.4	-13.0	-27.4	
3710.00	-11.0	H	3.0	35.9	1.0	-45.8	-13.0	-32.8	
5565.00	-8.1	H	3.0	35.5	1.0	-42.6	-13.0	-29.6	
7420.00	-6.4	H	3.0	35.7	1.0	-41.1	-13.0	-28.1	
<b>Mid Ch, 1880MHz</b>									
3760.00	-10.2	V	3.0	35.8	1.0	-45.0	-13.0	-32.0	
5640.00	-7.4	V	3.0	35.5	1.0	-41.9	-13.0	-28.9	
7520.00	-5.5	V	3.0	35.7	1.0	-40.4	-13.0	-27.4	
3760.00	-9.5	H	3.0	35.8	1.0	-44.3	-13.0	-31.3	
5640.00	-7.8	H	3.0	35.5	1.0	-42.3	-13.0	-29.3	
7520.00	-6.3	H	3.0	35.7	1.0	-41.0	-13.0	-28.0	
<b>High Ch, 1905MHz</b>									
3810.00	-11.4	V	3.0	35.8	1.0	-46.2	-13.0	-33.2	
5715.00	-7.8	V	3.0	35.5	1.0	-42.2	-13.0	-29.2	
7620.00	-5.1	V	3.0	35.8	1.0	-39.9	-13.0	-26.9	
3810.00	-10.9	H	3.0	35.8	1.0	-45.7	-13.0	-32.7	
5715.00	-7.7	H	3.0	35.5	1.0	-42.2	-13.0	-29.2	
7620.00	-6.8	H	3.0	35.8	1.0	-41.6	-13.0	-28.6	

LTE B2 10MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 2 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, 1855MHz</b>									
3710.00	-11.2	V	3.0	35.9	1.0	-46.1	-13.0	-33.1	
5565.00	-8.5	V	3.0	35.5	1.0	-43.0	-13.0	-30.0	
7420.00	-7.3	V	3.0	35.7	1.0	-42.1	-13.0	-29.1	
3710.00	-11.9	H	3.0	35.9	1.0	-46.8	-13.0	-33.8	
5565.00	-8.2	H	3.0	35.5	1.0	-42.6	-13.0	-29.6	
7420.00	-6.8	H	3.0	35.7	1.0	-41.6	-13.0	-28.6	
<b>Mid Ch, 1880MHz</b>									
3760.00	-11.2	V	3.0	35.8	1.0	-46.1	-13.0	-33.1	
5640.00	-8.9	V	3.0	35.5	1.0	-41.4	-13.0	-28.4	
7520.00	-5.3	V	3.0	35.7	1.0	-40.0	-13.0	-27.0	
3760.00	-10.2	H	3.0	35.8	1.0	-45.0	-13.0	-32.0	
5640.00	-7.4	H	3.0	35.5	1.0	-41.9	-13.0	-28.9	
7520.00	-5.8	H	3.0	35.7	1.0	-40.6	-13.0	-27.6	
<b>High Ch, 1905MHz</b>									
3810.00	-10.3	V	3.0	35.8	1.0	-45.1	-13.0	-32.1	
5715.00	-8.2	V	3.0	35.5	1.0	-42.2	-13.0	-29.2	
7620.00	-6.3	V	3.0	35.8	1.0	-41.1	-13.0	-28.1	
3810.00	-10.2	H	3.0	35.8	1.0	-45.0	-13.0	-32.0	
5715.00	-8.2	H	3.0	35.5	1.0	-42.2	-13.0	-29.2	
7620.00	-6.2	H	3.0	35.8	1.0	-41.0	-13.0	-28.0	

LTE B2 10MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 2 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
<b>Low Ch, 1857.5MHz</b>									
3715.00	-10.9	V	3.0	35.8	1.0	-45.7	-13.0	-32.7	
5572.50	-7.8	V	3.0	35.5	1.0	-42.3	-13.0	-29.3	
7430.00	-7.2	V	3.0	35.8	1.0	-42.0	-13.0	-29.0	
3715.00	-11.2	H	3.0	35.8	1.0	-46.1	-13.0	-33.1	
5572.50	-8.1	H	3.0	35.5	1.0	-42.6	-13.0	-29.6	
7430.00	-6.8	H	3.0	35.7	1.0	-41.6	-13.0	-28.6	
<b>Mid Ch, 1880MHz</b>									
3760.00	-11.1	V	3.0	35.8	1.0	-45.9	-13.0	-32.9	
5640.00	-8.8	V	3.0	35.5	1.0	-43.3	-13.0	-30.3	
7520.00	-7.0	V	3.0	35.7	1.0	-41.7	-13.0	-28.7	
3760.00	-9.3	H	3.0	35.8	1.0	-44.3	-13.0	-31.3	
5640.00	-7.2	H	3.0	35.5	1.0	-41.7	-13.0	-28.7	
7520.00	-5.9	H	3.0	35.7	1.0	-40.6	-13.0	-27.6	
<b>High Ch, 1902.5MHz</b>									
3805.00	-10.4	V	3.0	35.8	1.0	-45.2	-13.0	-32.2	
5707.50	-7.8	V	3.0	35.5	1.0	-42.3	-13.0	-29.3	
7610.00	-5.3	V	3.0	35.8	1.0	-40.1	-13.0	-27.1	
3805.00	-10.4	H	3.0	35.8	1.0	-45.2	-13.0	-32.2	
5707.50	-7.9	H	3.0	35.5	1.0	-42.4	-13.0	-29.4	
7610.00	-6.4	H	3.0	35.8	1.0	-41.2	-13.0	-28.2	

LTE B2 15MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 2 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
<b>Low Ch, 1857.5MHz</b>									
3715.00	-11.2	V	3.0	35.8	1.0	-46.1	-13.0	-33.1	
5572.50	-8.6	V	3.0	35.5	1.0	-43.0	-13.0	-30.0	
7430.00	-5.6	V	3.0	35.8	1.0	-40.3	-13.0	-27.3	
3715.00	-11.6	H	3.0	35.8	1.0	-46.4	-13.0	-33.4	
5572.50	-8.6	H	3.0	35.5	1.0	-43.1	-13.0	-30.1	
7430.00	-5.6	H	3.0	35.7	1.0	-40.3	-13.0	-27.3	
<b>Mid Ch, 1880MHz</b>									
3760.00	-11.8	V	3.0	35.8	1.0	-46.6	-13.0	-33.6	
5640.00	-9.4	V	3.0	35.5	1.0	-43.8	-13.0	-30.8	
7520.00	-7.6	V	3.0	35.7	1.0	-42.4	-13.0	-29.4	
3760.00	-11.8	H	3.0	35.8	1.0	-46.6	-13.0	-33.6	
5640.00	-9.2	H	3.0	35.5	1.0	-43.6	-13.0	-30.6	
7520.00	-7.5	H	3.0	35.7	1.0	-42.3	-13.0	-29.3	
<b>High Ch, 1902.5MHz</b>									
3805.00	-10.0	V	3.0	35.8	1.0	-44.8	-13.0	-31.8	
5707.50	-7.1	V	3.0	35.5	1.0	-41.6	-13.0	-28.6	
7610.00	-4.8	V	3.0	35.8	1.0	-39.6	-13.0	-26.6	
3805.00	-10.7	H	3.0	35.8	1.0	-45.4	-13.0	-32.4	
5707.50	-7.5	H	3.0	35.5	1.0	-42.0	-13.0	-29.0	
7610.00	-6.2	H	3.0	35.8	1.0	-41.0	-13.0	-28.0	

LTE B2 15MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/14/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 2 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
<b>Low Ch, 1857.5MHz</b>									
3715.00	-16.3	V	3.0	35.8	1.0	-51.1	-13.0	-38.1	
5572.50	-11.4	V	3.0	35.5	1.0	-45.9	-13.0	-32.9	
7430.00	-10.2	V	3.0	35.7	1.0	-44.9	-13.0	-31.9	
3715.00	-15.6	H	3.0	35.8	1.0	-50.4	-13.0	-37.4	
5572.50	-11.5	H	3.0	35.5	1.0	-45.9	-13.0	-32.9	
7430.00	-10.1	H	3.0	35.7	1.0	-44.8	-13.0	-31.8	
<b>Mid Ch, 1880MHz</b>									
3760.00	-16.2	V	3.0	35.8	1.0	-51.0	-13.0	-38.0	
5640.00	-10.9	V	3.0	35.5	1.0	-45.4	-13.0	-32.4	
7520.00	-9.9	V	3.0	35.7	1.0	-44.6	-13.0	-31.6	
3760.00	-15.8	H	3.0	35.8	1.0	-50.6	-13.0	-37.6	
5640.00	-10.5	H	3.0	35.5	1.0	-44.9	-13.0	-31.9	
7520.00	-9.9	H	3.0	35.7	1.0	-44.6	-13.0	-31.6	
<b>High Ch, 1902.5MHz</b>									
3805.00	-16.0	V	3.0	35.8	1.0	-50.8	-13.0	-37.8	
5707.50	-9.8	V	3.0	35.5	1.0	-44.3	-13.0	-31.3	
7610.00	-8.8	V	3.0	35.8	1.0	-43.6	-13.0	-30.6	
3805.00	-15.7	H	3.0	35.8	1.0	-50.5	-13.0	-37.5	
5707.50	-13.0	H	3.0	35.5	1.0	-47.5	-13.0	-34.5	
7610.00	-9.0	H	3.0	35.8	1.0	-43.7	-13.0	-30.7	

LTE B2 20MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/12/2017  
 Test Engineer: 37290  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 2 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, 1860MHz</b>									
3720.00	-15.3	V	3.0	35.8	1.0	-50.1	-13.0	-37.1	
5580.00	-11.2	V	3.0	35.5	1.0	-45.7	-13.0	-32.7	
7440.00	-10.2	V	3.0	35.7	1.0	-44.9	-13.0	-31.9	
3720.00	-16.6	H	3.0	35.8	1.0	-51.5	-13.0	-38.5	
5580.00	-10.9	H	3.0	35.5	1.0	-45.3	-13.0	-32.3	
7440.00	-10.0	H	3.0	35.7	1.0	-44.7	-13.0	-31.7	
<b>Mid Ch, 1880MHz</b>									
3760.00	-15.0	V	3.0	35.8	1.0	-49.8	-13.0	-36.8	
5640.00	-10.4	V	3.0	35.5	1.0	-44.8	-13.0	-31.8	
7520.00	-9.4	V	3.0	35.7	1.0	-44.1	-13.0	-31.1	
3760.00	-15.7	H	3.0	35.8	1.0	-50.5	-13.0	-37.5	
5640.00	-10.4	H	3.0	35.5	1.0	-44.9	-13.0	-31.9	
7520.00	-9.2	H	3.0	35.7	1.0	-43.9	-13.0	-30.9	
<b>High Ch, 1900MHz</b>									
3800.00	-15.0	V	3.0	35.8	1.0	-49.7	-13.0	-36.7	
5700.00	-9.2	V	3.0	35.5	1.0	-43.7	-13.0	-30.7	
7600.00	-8.5	V	3.0	35.8	1.0	-43.2	-13.0	-30.2	
3800.00	-15.4	H	3.0	35.8	1.0	-50.2	-13.0	-37.2	
5700.00	-10.4	H	3.0	35.5	1.0	-44.9	-13.0	-31.9	
7600.00	-9.1	H	3.0	35.8	1.0	-43.9	-13.0	-30.9	

LTE B2 20MHz 16QAM

#### **9.1.4. LTE BAND 4**

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

9.1.5. LTE BAND 5

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 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, 824.7 MHz</b>									
1629.40	-29.8	V	3.0	37.1	1.0	-65.8	-13.0	-52.8	
2444.10	-25.3	V	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3258.00	-24.2	V	3.0	36.2	1.0	-59.4	-13.0	-46.4	
1629.40	-30.4	H	3.0	37.1	1.0	-66.4	-13.0	-53.4	
2444.10	-26.2	H	3.0	36.4	1.0	-61.7	-13.0	-48.7	
3258.00	-24.6	H	3.0	36.2	1.0	-59.8	-13.0	-46.8	
<b>Mid Ch, 836.5 MHz</b>									
1663.00	-29.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2494.50	-25.7	V	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3326.00	-24.8	V	3.0	36.1	1.0	-60.0	-13.0	-47.0	
1663.00	-29.3	H	3.0	37.0	1.0	-65.3	-13.0	-52.3	
2494.50	-25.5	H	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3326.00	-24.5	H	3.0	36.1	1.0	-59.7	-13.0	-46.7	
<b>High Ch, 848.3 MHz</b>									
1696.60	-28.7	V	3.0	37.0	1.0	-64.7	-13.0	-51.7	
2544.90	-23.2	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
3393.20	-24.4	V	3.0	36.1	1.0	-59.5	-13.0	-46.5	
1696.60	-29.1	H	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2544.90	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3393.20	-23.7	H	3.0	36.1	1.0	-58.8	-13.0	-45.8	

LTE B5 1.4MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 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, 824.7 MHz</b>									
1629.40	-30.3	V	3.0	37.1	1.0	-66.4	-13.0	-53.4	
2444.10	-26.5	V	3.0	36.4	1.0	-62.0	-13.0	-49.0	
3258.00	-24.0	V	3.0	36.2	1.0	-59.2	-13.0	-46.2	
1629.40	-30.3	H	3.0	37.1	1.0	-66.3	-13.0	-53.3	
2444.10	-26.0	H	3.0	36.4	1.0	-61.5	-13.0	-48.5	
3258.00	-24.5	H	3.0	36.2	1.0	-59.7	-13.0	-46.7	
<b>Mid Ch, 836.5 MHz</b>									
1663.00	-29.0	V	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2494.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3326.00	-25.1	V	3.0	36.1	1.0	-60.3	-13.0	-47.3	
1663.00	-30.1	H	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2494.50	-24.7	H	3.0	36.4	1.0	-60.1	-13.0	-47.1	
3326.00	-24.2	H	3.0	36.1	1.0	-59.3	-13.0	-46.3	
<b>High Ch, 848.3 MHz</b>									
1696.60	-29.4	V	3.0	37.0	1.0	-65.4	-13.0	-52.4	
2544.90	-23.7	V	3.0	36.4	1.0	-59.2	-13.0	-46.2	
3393.20	-24.9	V	3.0	36.1	1.0	-60.0	-13.0	-47.0	
1696.60	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2544.90	-24.4	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3393.20	-24.1	H	3.0	36.1	1.0	-59.1	-13.0	-46.1	

LTE B5 1.4MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 5 Harmonics, 3MHz 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, 825.5 MHz</b>									
1631.00	-28.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2446.50	-26.5	V	3.0	36.4	1.0	-61.9	-13.0	-48.9	
3262.00	-24.1	V	3.0	36.2	1.0	-59.3	-13.0	-46.3	
1631.00	-30.4	H	3.0	37.0	1.0	-66.4	-13.0	-53.4	
2446.50	-26.1	H	3.0	36.4	1.0	-61.6	-13.0	-48.6	
3262.00	-24.7	H	3.0	36.2	1.0	-59.9	-13.0	-46.9	
<b>Mid Ch, 836.5 MHz</b>									
1663.00	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2494.50	-26.4	V	3.0	36.4	1.0	-61.8	-13.0	-48.8	
3326.00	-24.5	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1663.00	-30.2	H	3.0	37.0	1.0	-66.2	-13.0	-53.2	
2494.50	-25.8	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3326.00	-25.0	H	3.0	36.1	1.0	-60.1	-13.0	-47.1	
<b>High Ch, 847.5 MHz</b>									
1695.00	-28.9	V	3.0	37.0	1.0	-64.9	-13.0	-51.9	
2542.50	-24.5	V	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3390.00	-24.1	V	3.0	36.1	1.0	-59.2	-13.0	-46.2	
1695.00	-29.8	H	3.0	37.0	1.0	-65.8	-13.0	-52.8	
2542.50	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3390.00	-24.6	H	3.0	36.1	1.0	-59.7	-13.0	-46.7	

LTE B5 3MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 5 Harmonics, 3MHz 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, 825.5 MHz</b>									
1631.00	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2446.50	-25.7	V	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3262.00	-24.2	V	3.0	36.2	1.0	-59.9	-13.0	-46.9	
1631.00	-30.7	H	3.0	37.0	1.0	-66.3	-13.0	-53.3	
2446.50	-25.8	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3262.00	-24.2	H	3.0	36.2	1.0	-59.4	-13.0	-46.4	
<b>Mid Ch, 836.5 MHz</b>									
1663.00	-30.1	V	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2494.50	-26.3	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3326.00	-24.4	V	3.0	36.1	1.0	-59.5	-13.0	-46.5	
1663.00	-30.1	H	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2494.50	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3326.00	-25.0	H	3.0	36.1	1.0	-60.1	-13.0	-47.1	
<b>High Ch, 847.5 MHz</b>									
1695.00	-29.1	V	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2542.50	-24.3	V	3.0	36.4	1.0	-59.7	-13.0	-46.7	
3390.00	-24.6	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1695.00	-30.1	H	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2542.50	-26.2	H	3.0	36.4	1.0	-61.6	-13.0	-48.6	
3390.00	-24.2	H	3.0	36.1	1.0	-59.3	-13.0	-46.3	

LTE B5 3MHz 16QAM

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 5 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, 826.5 MHz</b>									
1633.00	-24.2	V	3.0	37.0	1.0	-60.2	-13.0	-47.2	
2449.50	-23.1	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
3266.00	-20.2	V	3.0	36.2	1.0	-55.3	-13.0	-42.3	
1633.00	-6.9	H	3.0	37.0	1.0	-43.0	-13.0	-30.0	
2449.50	-22.9	H	3.0	36.4	1.0	-58.4	-13.0	-45.4	
3266.00	-21.3	H	3.0	36.2	1.0	-56.5	-13.0	-43.5	
<b>Mid Ch, 836.5 MHz</b>									
1663.00	-22.4	V	3.0	37.0	1.0	-58.4	-13.0	-45.4	
2494.50	-22.6	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
3326.00	-21.3	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1663.00	-14.1	H	3.0	37.0	1.0	-50.1	-13.0	-37.1	
2494.50	-24.0	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
3326.00	-20.5	H	3.0	36.1	1.0	-55.6	-13.0	-42.6	
<b>High Ch, 846.5 MHz</b>									
1693.00	-27.0	V	3.0	37.0	1.0	-63.0	-13.0	-50.0	
2539.50	-22.8	V	3.0	36.4	1.0	-58.2	-13.0	-45.2	
3386.00	-19.4	V	3.0	36.1	1.0	-54.5	-13.0	-41.5	
1693.00	-9.6	H	3.0	37.0	1.0	-45.6	-13.0	-32.6	
2539.50	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
3386.00	-20.7	H	3.0	36.1	1.0	-55.8	-13.0	-42.8	

LTE B5 5MHz QPSK

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 5 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, 826.5 MHz</b>									
1633.00	-23.2	V	3.0	37.0	1.0	-59.3	-13.0	-46.3	
2449.50	-22.7	V	3.0	36.4	1.0	-58.1	-13.0	-45.1	
3266.00	-20.4	V	3.0	36.2	1.0	-56.6	-13.0	-43.6	
1633.00	-4.1	H	3.0	37.0	1.0	-40.2	-13.0	-27.2	
2449.50	-21.6	H	3.0	36.4	1.0	-57.0	-13.0	-44.0	
3266.00	-20.7	H	3.0	36.2	1.0	-55.9	-13.0	-42.9	
<b>Mid Ch, 836.5 MHz</b>									
1663.00	-20.6	V	3.0	37.0	1.0	-56.6	-13.0	-43.6	
2494.50	-22.8	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	</

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 5 Harmonics, 10MHz 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, 829MHz</b>									
1638.00	-18.4	V	3.0	37.0	1.0	-54.4	-13.0	-41.4	
2457.00	-23.5	V	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3276.00	-21.1	V	3.0	36.2	1.0	-56.2	-13.0	-43.2	
1638.00	-19.6	H	3.0	37.0	1.0	-55.6	-13.0	-42.6	
2457.00	-24.7	H	3.0	36.4	1.0	-60.1	-13.0	-47.1	
3276.00	-21.5	H	3.0	36.2	1.0	-56.7	-13.0	-43.7	
<b>Mid Ch, 836.5MHz</b>									
1663.00	-25.4	V	3.0	37.0	1.0	-61.4	-13.0	-48.4	
2484.50	-22.4	V	3.0	36.4	1.0	-57.8	-13.0	-44.8	
3326.00	-21.4	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1663.00	-15.6	H	3.0	37.0	1.0	-51.6	-13.0	-38.6	
2484.50	-24.7	H	3.0	36.4	1.0	-60.1	-13.0	-47.1	
3326.00	-21.3	H	3.0	36.1	1.0	-56.4	-13.0	-43.4	
<b>High Ch, 844MHz</b>									
1688.00	-21.1	V	3.0	37.0	1.0	-57.1	-13.0	-44.1	
2532.00	-22.6	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
3376.00	-21.1	V	3.0	36.1	1.0	-56.2	-13.0	-43.2	
1688.00	-12.0	H	3.0	37.0	1.0	-47.9	-13.0	-34.9	
2532.00	-24.0	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
3376.00	-20.9	H	3.0	36.1	1.0	-56.0	-13.0	-43.0	

**LTE B5 10MHz QPSK**

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 26 Harmonics, 10MHz 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, 829MHz</b>									
1638.00	-16.1	V	3.0	37.0	1.0	-52.2	-13.0	-39.2	
2457.00	-22.2	V	3.0	36.4	1.0	-57.7	-13.0	-44.7	
3276.00	-21.4	V	3.0	36.2	1.0	-56.5	-13.0	-43.5	
1638.00	-16.0	H	3.0	37.0	1.0	-52.0	-13.0	-39.0	
2457.00	-24.7	H	3.0	36.4	1.0	-60.2	-13.0	-47.2	
3276.00	-21.2	H	3.0	36.2	1.0	-56.3	-13.0	-43.3	
<b>Mid Ch, 836.5MHz</b>									
1663.00	-24.2	V	3.0	37.0	1.0	-60.2	-13.0	-47.2	
2484.50	-22.9	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
3326.00	-21.0	V	3.0	36.1	1.0	-56.1	-13.0	-43.1	
1663.00	-13.2	H	3.0	37.0	1.0	-49.2	-13.0	-36.2	
2484.50	-24.6	H	3.0	36.4	1.0	-60.0	-13.0	-47.0	
3326.00	-21.2	H	3.0	36.1	1.0	-56.4	-13.0	-43.4	
<b>High Ch, 844MHz</b>									
1688.00	-20.2	V	3.0	37.0	1.0	-56.1	-13.0	-43.1	
2532.00	-22.9	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
3376.00	-20.9	V	3.0	36.1	1.0	-56.0	-13.0	-43.0	
1688.00	-10.0	H	3.0	37.0	1.0	-46.0	-13.0	-33.0	
2532.00	-23.5	H	3.0	36.4	1.0	-59.0	-13.0	-46.0	
3376.00	-21.1	H	3.0	36.1	1.0	-56.2	-13.0	-43.2	

**LTE B5 10MHz 16QAM**

9.1.6. LTE BAND 7

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

Company: SOMC  
 Project #: 11740661  
 Date: 6/15/2017  
 Test Engineer: 37290  
 Configuration: EUT + AC + Headset  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 7 Harmonics, 5MHz Bandwidth

F Mhz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2502.5</b>									
5005.00	-21.5	V	3.0	33.2	1.0	-53.7	-25.0	-28.7	
7507.50	-20.2	V	3.0	32.8	1.0	-52.0	-25.0	-27.0	
10010.00	-20.9	V	3.0	32.8	1.0	-52.6	-25.0	-27.6	
5005.00	-22.9	H	3.0	33.2	1.0	-55.1	-25.0	-30.1	
7507.50	-21.0	H	3.0	32.8	1.0	-52.9	-25.0	-27.9	
10010.00	-21.3	H	3.0	32.8	1.0	-53.1	-25.0	-28.1	
<b>Mid Ch, 2535</b>									
5070.00	-23.2	V	3.0	33.2	1.0	-55.4	-25.0	-30.4	
7605.00	-20.0	V	3.0	32.8	1.0	-51.9	-25.0	-26.9	
10140.00	-20.9	V	3.0	32.7	1.0	-52.6	-25.0	-27.6	
5070.00	-22.4	H	3.0	33.2	1.0	-54.6	-25.0	-29.6	
7605.00	-20.2	H	3.0	32.8	1.0	-52.0	-25.0	-27.0	
10140.00	-22.2	H	3.0	32.7	1.0	-53.8	-25.0	-28.8	
<b>High Ch, 2567.5</b>									
5135.00	-23.4	V	3.0	33.2	1.0	-55.6	-25.0	-30.6	
7702.50	-21.5	V	3.0	32.8	1.0	-53.3	-25.0	-28.3	
10270.00	-22.0	V	3.0	32.6	1.0	-53.5	-25.0	-28.5	
5135.00	-23.1	H	3.0	33.2	1.0	-55.6	-25.0	-30.6	
7702.50	-22.4	H	3.0	32.8	1.0	-54.2	-25.0	-29.2	
10270.00	-23.1	H	3.0	32.6	1.0	-54.7	-25.0	-29.7	

LTE B7 5MHz QPSK

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

Company: SOMC  
 Project #: 11740661  
 Date: 6/15/2017  
 Test Engineer: 37290  
 Configuration: EUT + AC + Headset  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 7 Harmonics, 5MHz Bandwidth

F Mhz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2502.5</b>									
5005.00	-21.9	V	3.0	33.2	1.0	-54.1	-25.0	-29.1	
7507.50	-20.6	V	3.0	32.8	1.0	-52.5	-25.0	-27.5	
10010.00	-21.8	V	3.0	32.8	1.0	-53.5	-25.0	-28.5	
5005.00	-23.6	H	3.0	33.2	1.0	-55.8	-25.0	-30.8	
7507.50	-21.3	H	3.0	32.8	1.0	-53.2	-25.0	-28.2	
10010.00	-21.5	H	3.0	32.8	1.0	-53.3	-25.0	-28.3	
<b>Mid Ch, 2535</b>									
5070.00	-24.0	V	3.0	33.2	1.0	-56.2	-25.0	-31.2	
7605.00	-20.0	V	3.0	32.8	1.0	-51.9	-25.0	-26.9	
10140.00	-21.5	V	3.0	32.7	1.0	-53.1	-25.0	-28.1	
5070.00	-22.9	H	3.0	33.2	1.0	-55.1	-25.0	-30.1	
7605.00	-20.8	H	3.0	32.8	1.0	-52.6	-25.0	-27.6	
10140.00	-23.1	H	3.0	32.7	1.0	-54.7	-25.0	-29.7	
<b>High Ch, 2567.5</b>									
5135.00	-24.3	V	3.0	33.2	1.0	-56.5	-25.0	-31.5	
7702.50	-22.0	V	3.0	32.8	1.0	-53.8	-25.0	-28.8	
10270.00	-22.9	V	3.0	32.6	1.0	-54.5	-25.0	-29.5	
5135.00	-24.1	H	3.0	33.2	1.0	-56.3	-25.0	-31.3	
7702.50	-23.3	H	3.0	32.8	1.0	-55.1	-25.0	-30.1	
10270.00	-23.3	H	3.0	32.6	1.0	-54.9	-25.0	-29.9	

LTE B7 5MHz 16QAM

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

Company: SOMC  
 Project #: 11740661  
 Date: 6/15/2017  
 Test Engineer: 37290  
 Configuration: EUT + AC + Headset  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 7 Harmonics, 10MHz Bandwidth

F Mhz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2505</b>									
5010.00	-21.2	V	3.0	33.2	1.0	-53.5	-25.0	-28.5	
7515.00	-19.4	V	3.0	32.8	1.0	-51.3	-25.0	-26.3	
10020.00	-20.5	V	3.0	32.8	1.0	-52.3	-25.0	-27.3	
5010.00	-22.5	H	3.0	33.2	1.0	-54.7	-25.0	-29.7	
7515.00	-20.6	H	3.0	32.8	1.0	-52.4	-25.0	-27.4	
10020.00	-20.5	H	3.0	32.8	1.0	-52.3	-25.0	-27.3	
<b>Mid Ch, 2535</b>									
5070.00	-22.9	V	3.0	33.2	1.0	-55.1	-25.0	-30.1	
7605.00	-19.2	V	3.0	32.8	1.0	-51.1	-25.0	-26.1	
10140.00	-20.6	V	3.0	32.7	1.0	-52.2	-25.0	-27.2	
5070.00	-21.7	H	3.0	33.2	1.0	-53.9	-25.0	-28.9	
7605.00	-19.2	H	3.0	32.8	1.0	-51.1	-25.0	-26.1	
10140.00	-21.9	H	3.0	32.7	1.0	-53.6	-25.0	-28.6	
<b>High Ch, 2565</b>									
5130.00	-23.0	V	3.0	33.2	1.0	-55.2	-25.0	-30.2	
7695.00	-21.0	V	3.0	32.8	1.0	-52.9	-25.0	-27.9	
10260.00	-21.4	V	3.0	32.6	1.0	-53.0	-25.0	-28.0	
5130.00	-22.5	H	3.0	33.2	1.0	-54.7	-25.0	-29.7	
7695.00	-21.8	H	3.0	32.8	1.0	-53.7	-25.0	-28.7	
10260.00	-23.0	H	3.0	32.6	1.0	-54.6	-25.0	-29.6	

LTE B7 10MHz QPSK

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

Company: SOMC  
 Project #: 11740661  
 Date: 6/15/2017  
 Test Engineer: 37290  
 Configuration: EUT + AC + Headset  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 7 Harmonics, 10MHz Bandwidth

F Mhz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2505</b>									
5010.00	-22.1	V	3.0	33.2	1.0	-54.3	-25.0	-29.3	
7515.00	-19.6	V	3.0	32.8	1.0	-51.4	-25.0	-26.4	
10020.00	-21.3	V	3.0	32.8	1.0	-53.1	-25.0	-28.1	
5010.00	-23.5	H	3.0	33.2	1.0	-55.7	-25.0	-30.7	
7515.00	-21.3	H	3.0	32.8	1.0	-53.2	-25.0	-28.2	
10020.00	-21.3	H	3.0	32.8	1.0	-53.1	-25.0	-28.1	
<b>Mid Ch, 2535</b>									
5070.00	-23.5	V	3.0	33.2	1.0	-55.8	-25.0	-30.8	
7605.00	-19.6	V	3.0	32.8	1.0	-51.5	-25.0	-26.5	
10140.00	-21.2	V	3.0	32.7	1.0	-52.9	-25.0	-27.9	
5070.00	-22.6	H	3.0	33.2	1.0	-54.8	-25.0	-29.8	
7605.00	-20.1	H	3.0	32.8	1.0	-51.9	-25.0	-26.9	
10140.00	-22.8	H	3.0	32.7	1.0	-54.5	-25.0	-29.5	
<b>High Ch, 2565</b>									
5130.00	-23.3	V	3.0	33.2	1.0	-55.5	-25.0	-30.5	
7695.00	-21.7	V	3.0	32.8	1.0	-53.6	-25.0	-28.6	
10260.00	-22.0	V	3.0	32.6	1.0	-53.7	-25.0	-28.7	
5130.00	-22.8	H	3.0	33.2	1.0	-55.0	-25.0	-30.0	
7695.00	-22.2	H	3.0	32.8	1.0	-54.0	-25.0	-29.0	
10260.00	-23.9	H	3.0	32.6	1.0	-55.5	-25.0	-30.5	

LTE B7 10MHz 16QAM

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

Company: SOMC  
 Project #: 11740661  
 Date: 6/15/2017  
 Test Engineer: 37290  
 Configuration: EUT + AC + Headset  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 7 Harmonics, 15MHz Bandwidth

F Mhz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2507.5</b>									
5015.00	-21.5	V	3.0	33.2	1.0	-53.7	-25.0	-28.7	
7522.50	-19.7	V	3.0	32.8	1.0	-51.4	-25.0	-26.4	
10030.00	-21.3	V	3.0	32.8	1.0	-53.1	-25.0	-28.1	
5015.00	-23.3	H	3.0	33.2	1.0	-55.5	-25.0	-30.5	
7522.50	-21.4	H	3.0	32.8	1.0	-53.2	-25.0	-28.2	
10030.00	-21.0	H	3.0	32.8	1.0	-52.7	-25.0	-27.7	
<b>Mid Ch, 2535</b>									
5070.00	-23.1	V	3.0	33.2	1.0	-55.4	-25.0	-30.4	
7605.00	-20.2	V	3.0	32.8	1.0	-52.0	-25.0	-27.0	
10140.00	-20.6	V	3.0	32.7	1.0	-52.2	-25.0	-27.2	
5070.00	-22.4	H	3.0	33.2	1.0	-54.6	-25.0	-29.6	
7605.00	-19.6	H	3.0	32.8	1.0	-51.4	-25.0	-26.4	
10140.00	-22.3	H	3.0	32.7	1.0	-54.0	-25.0	-29.0	
<b>High Ch, 2562.5</b>									
5125.00	-23.3	V	3.0	33.2	1.0	-55.5	-25.0	-30.5	
7687.50	-22.0	V	3.0	32.8	1.0	-53.8	-25.0	-28.8	
10260.00	-21.7	V	3.0	32.6	1.0	-53.3	-25.0	-28.3	
5125.00	-23.4	H	3.0	33.2	1.0	-55.6	-25.0	-30.6	
7687.50	-22.2	H	3.0	32.8	1.0	-54.0	-25.0	-29.0	
10260.00	-23.1	H	3.0	32.6	1.0	-54.7	-25.0	-29.7	

LTE B7 15MHz QPSK

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

Company: SOMC  
 Project #: 11740661  
 Date: 6/15/2017  
 Test Engineer: 37290  
 Configuration: EUT + AC + Headset  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 7 Harmonics, 15MHz Bandwidth

F Mhz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2507.5</b>									
5015.00	-21.5	V	3.0	33.2	1.0	-53.8	-25.0	-28.8	
7522.50	-19.4	V	3.0	32.8	1.0	-51.3	-25.0	-26.3	
10030.00	-20.8	V	3.0	32.8	1.0	-52.6	-25.0	-27.6	
5015.00	-22.8	H	3.0	33.2	1.0	-55.0	-25.0	-30.0	
7522.50	-20.7	H	3.0	32.8	1.0	-52.6	-25.0	-27.6	
10030.00	-21.4	H	3.0	32.8	1.0	-53.2	-25.0	-28.2	
<b>Mid Ch, 2535</b>									
5070.00	-23.0	V	3.0	33.2	1.0	-55.2	-25.0	-30.2	
7605.00	-19.3	V	3.0	32.8	1.0	-51.2	-25.0	-26.2	
10140.00	-21.4	V	3.0	32.7	1.0	-53.1	-25.0	-28.1	
5070.00	-21.9	H	3.0	33.2	1.0	-54.2	-25.0	-29.2	
7605.00	-20.1	H	3.0	32.8	1.0	-52.0	-25.0	-27.0	
10140.00	-22.0	H	3.0	32.7	1.0	-53.6	-25.0	-28.6	
<b>High Ch, 2562.5</b>									
5125.00	-23.3	V	3.0	33.2	1.0	-55.5	-25.0	-30.5	
7687.50	-21.2	V	3.0	32.8	1.0	-53.0	-25.0	-28.0	
10260.00	-22.3	V	3.0	32.6	1.0	-53.9	-25.0	-28.9	
5125.00	-23.4	H	3.0	33.2	1.0	-55.6	-25.0	-30.6	
7687.50	-22.6	H	3.0	32.8	1.0	-54.4	-25.0	-29.4	
10260.00	-23.2	H	3.0	32.6	1.0	-54.9	-25.0	-29.9	

LTE B7 15MHz 16QAM

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

**Company:** SOMC  
**Project #:** 11740661  
**Date:** 6/9/2017  
**Test Engineer:** 43574 JS  
**Configuration:** EUT + AC + Headset  
**Location:** Chamber C  
**Mode:** LTE\_QPSK Band 7 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2510</b>									
5020.00	-22.2	V	3.0	33.2	1.0	-54.4	-25.0	-29.4	
7530.00	-20.6	V	3.0	32.8	1.0	-52.7	-25.0	-27.7	
10040.00	-21.4	V	3.0	32.7	1.0	-53.2	-25.0	-28.2	
5020.00	-23.0	H	3.0	33.2	1.0	-55.3	-25.0	-30.3	
7530.00	-21.6	H	3.0	32.8	1.0	-53.5	-25.0	-28.5	
10040.00	-22.0	H	3.0	32.7	1.0	-53.7	-25.0	-28.7	
<b>Mid Ch, 2535</b>									
5070.00	-23.4	V	3.0	33.2	1.0	-55.6	-25.0	-30.6	
7665.00	-20.7	V	3.0	32.8	1.0	-52.6	-25.0	-27.6	
10140.00	-21.1	V	3.0	32.7	1.0	-52.8	-25.0	-27.8	
5070.00	-23.2	H	3.0	33.2	1.0	-55.4	-25.0	-30.4	
7665.00	-20.5	H	3.0	32.8	1.0	-52.4	-25.0	-27.4	
10140.00	-22.3	H	3.0	32.7	1.0	-54.0	-25.0	-29.0	
<b>High Ch, 2560</b>									
5120.00	-24.2	V	3.0	33.2	1.0	-56.4	-25.0	-31.4	
7680.00	-22.0	V	3.0	32.8	1.0	-53.8	-25.0	-28.8	
10240.00	-22.7	V	3.0	32.6	1.0	-54.3	-25.0	-29.3	
5120.00	-23.5	H	3.0	33.2	1.0	-55.7	-25.0	-30.7	
7680.00	-22.4	H	3.0	32.8	1.0	-54.3	-25.0	-29.3	
10240.00	-23.3	H	3.0	32.6	1.0	-55.0	-25.0	-30.0	

**LTE B7 20MHz QPSK**

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

**Company:** SOMC  
**Project #:** 11740661  
**Date:** 6/9/2017  
**Test Engineer:** 43574 JS  
**Configuration:** EUT + AC + Headset  
**Location:** Chamber C  
**Mode:** LTE\_16QAM Band 7 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2510</b>									
5020.00	-21.0	V	3.0	33.2	1.0	-53.2	-25.0	-28.2	
7530.00	-18.9	V	3.0	32.8	1.0	-50.7	-25.0	-25.7	
10040.00	-19.7	V	3.0	32.7	1.0	-51.4	-25.0	-26.4	
5020.00	-22.0	H	3.0	33.2	1.0	-54.3	-25.0	-29.3	
7530.00	-20.0	H	3.0	32.8	1.0	-51.8	-25.0	-26.8	
10040.00	-20.0	H	3.0	32.7	1.0	-51.7	-25.0	-26.7	
<b>Mid Ch, 2535</b>									
5070.00	-22.2	V	3.0	33.2	1.0	-54.4	-25.0	-29.4	
7665.00	-18.3	V	3.0	32.8	1.0	-50.2	-25.0	-25.2	
10140.00	-19.2	V	3.0	32.7	1.0	-50.9	-25.0	-25.9	
5070.00	-21.8	H	3.0	33.2	1.0	-54.1	-25.0	-29.1	
7665.00	-18.5	H	3.0	32.8	1.0	-50.8	-25.0	-25.8	
10140.00	-19.6	H	3.0	32.7	1.0	-51.3	-25.0	-26.3	
<b>High Ch, 2560</b>									
5120.00	-22.9	V	3.0	33.2	1.0	-55.1	-25.0	-30.1	
7680.00	-20.1	V	3.0	32.8	1.0	-51.9	-25.0	-26.9	
10240.00	-21.0	V	3.0	32.6	1.0	-52.6	-25.0	-27.6	
5120.00	-22.1	H	3.0	33.2	1.0	-54.3	-25.0	-29.3	
7680.00	-21.0	H	3.0	32.8	1.0	-52.8	-25.0	-27.8	
10240.00	-21.0	H	3.0	32.6	1.0	-52.6	-25.0	-27.6	

**LTE B7 20MHz 16QAM**

9.1.7. LTE BAND 12

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 12 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, 699.7MHz</b>									
1399.40	-29.2	V	3.0	37.4	1.0	-65.6	-13.0	-52.6	
2099.10	-15.4	V	3.0	36.6	1.0	-51.0	-13.0	-38.0	
2798.80	-21.7	V	3.0	36.4	1.0	-57.0	-13.0	-44.0	
1399.40	-29.8	H	3.0	37.4	1.0	-66.2	-13.0	-53.2	
2099.10	-21.5	H	3.0	36.6	1.0	-57.1	-13.0	-44.1	
2798.80	-23.4	H	3.0	36.4	1.0	-58.0	-13.0	-45.0	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-31.9	V	3.0	37.4	1.0	-68.2	-13.0	-55.2	
2122.50	-21.0	V	3.0	36.6	1.0	-56.6	-13.0	-43.6	
2830.00	-23.5	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
1415.00	-31.0	H	3.0	37.4	1.0	-67.4	-13.0	-54.4	
2122.50	-21.4	H	3.0	36.6	1.0	-57.0	-13.0	-44.0	
2830.00	-24.8	H	3.0	36.4	1.0	-60.2	-13.0	-47.2	
<b>High Ch, 715.3MHz</b>									
1430.60	-30.1	V	3.0	37.3	1.0	-66.5	-13.0	-53.5	
2145.90	-23.7	V	3.0	36.6	1.0	-59.3	-13.0	-46.3	
2861.20	-22.3	V	3.0	36.4	1.0	-57.6	-13.0	-44.6	
1430.60	-29.7	H	3.0	37.3	1.0	-66.1	-13.0	-53.1	
2145.90	-24.0	H	3.0	36.6	1.0	-59.6	-13.0	-46.6	
2861.20	-23.4	H	3.0	36.4	1.0	-58.0	-13.0	-45.0	

LTE B12 1.4MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 12 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, 699.7MHz</b>									
1399.40	-31.5	V	3.0	37.4	1.0	-67.9	-13.0	-54.9	
2099.10	-15.0	V	3.0	36.6	1.0	-50.5	-13.0	-37.5	
2798.80	-22.5	V	3.0	36.4	1.0	-57.8	-13.0	-44.8	
1399.40	-29.9	H	3.0	37.4	1.0	-66.2	-13.0	-53.2	
2099.10	-21.9	H	3.0	36.6	1.0	-57.5	-13.0	-44.5	
2798.80	-22.9	H	3.0	36.4	1.0	-58.3	-13.0	-45.3	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-30.9	V	3.0	37.4	1.0	-67.2	-13.0	-54.2	
2122.50	-20.2	V	3.0	36.6	1.0	-55.8	-13.0	-42.8	
2830.00	-23.7	V	3.0	36.4	1.0	-59.1	-13.0	-46.1	
1415.00	-31.0	H	3.0	37.4	1.0	-67.3	-13.0	-54.3	
2122.50	-20.3	H	3.0	36.6	1.0	-55.8	-13.0	-42.8	
2830.00	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	-47.4	
<b>High Ch, 715.3MHz</b>									
1430.60	-29.7	V	3.0	37.3	1.0	-66.0	-13.0	-53.0	
2145.90	-23.8	V	3.0	36.6	1.0	-59.4	-13.0	-46.4	
2861.20	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
1430.60	-30.0	H	3.0	37.3	1.0	-66.4	-13.0	-53.4	
2145.90	-24.8	H	3.0	36.6	1.0	-60.3	-13.0	-47.3	
2861.20	-22.3	H	3.0	36.4	1.0	-57.7	-13.0	-44.7	

LTE B12 1.4MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 12 Harmonics, 3MHz 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, 700.5MHz</b>									
1401.00	-28.5	V	3.0	37.4	1.0	-65.9	-13.0	-52.9	
2101.50	-20.3	V	3.0	36.6	1.0	-55.8	-13.0	-42.8	
2802.00	-21.4	V	3.0	36.4	1.0	-56.8	-13.0	-43.8	
1401.00	-30.2	H	3.0	37.4	1.0	-66.6	-13.0	-53.6	
2101.50	-20.9	H	3.0	36.6	1.0	-56.5	-13.0	-43.5	
2802.00	-23.0	H	3.0	36.4	1.0	-58.4	-13.0	-45.4	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-29.6	V	3.0	37.4	1.0	-65.9	-13.0	-52.9	
2122.50	-17.4	V	3.0	36.6	1.0	-52.9	-13.0	-39.9	
2830.00	-21.8	V	3.0	36.4	1.0	-57.1	-13.0	-44.1	
1415.00	-31.2	H	3.0	37.4	1.0	-67.6	-13.0	-54.6	
2122.50	-20.0	H	3.0	36.6	1.0	-55.8	-13.0	-42.8	
2830.00	-23.0	H	3.0	36.4	1.0	-58.4	-13.0	-45.4	
<b>High Ch, 714.5MHz</b>									
1429.00	-30.3	V	3.0	37.3	1.0	-66.6	-13.0	-53.6	
2143.50	-24.5	V	3.0	36.6	1.0	-60.0	-13.0	-47.0	
2858.00	-22.1	V	3.0	36.4	1.0	-57.5	-13.0	-44.5	
1429.00	-30.0	H	3.0	37.3	1.0	-66.3	-13.0	-53.3	
2143.50	-22.0	H	3.0	36.6	1.0	-57.6	-13.0	-44.6	
2858.00	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	

LTE B12 3MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 12 Harmonics, 3MHz 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, 700.5MHz</b>									
1401.00	-30.8	V	3.0	37.4	1.0	-67.2	-13.0	-54.2	
2101.50	-20.0	V	3.0	36.6	1.0	-55.6	-13.0	-42.6	
2802.00	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
1401.00	-30.0	H	3.0	37.4	1.0	-66.4	-13.0	-53.4	
2101.50	-19.7	H	3.0	36.6	1.0	-55.3	-13.0	-42.3	
2802.00	-22.8	H	3.0	36.4	1.0	-58.2	-13.0	-45.2	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-30.0	V	3.0	37.4	1.0	-66.3	-13.0	-53.3	
2122.50	-18.8	V	3.0	36.6	1.0	-54.3	-13.0	-41.3	
2830.00	-22.6	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
1415.00	-29.9	H	3.0	37.4	1.0	-66.3	-13.0	-53.3	
2122.50	-18.8	H	3.0	36.6	1.0	-54.4	-13.0	-41.4	
2830.00	-23.2	H	3.0	36.4	1.0	-58.6	-13.0	-45.6	
<b>High Ch, 714.5MHz</b>									
1429.00	-29.2	V	3.0	37.3	1.0	-65.6	-13.0	-52.6	
2143.50	-23.9	V	3.0	36.6	1.0	-59.5	-13.0	-46.5	
2858.00	-22.5	V	3.0	36.4	1.0	-57.9	-13.0	-44.9	
1429.00	-29.2	H	3.0	37.3	1.0	-65.6	-13.0	-52.6	
2143.50	-20.5	H	3.0	36.6	1.0	-56.1	-13.0	-43.1	
2858.00	-20.5	H	3.0	36.4	1.0	-55.9	-13.0	-42.9	

LTE B12 3MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 12 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, 701.5MHz</b>									
1403.00	-29.8	V	3.0	37.4	1.0	-66.2	-13.0	-53.2	
2104.50	-23.9	V	3.0	36.6	1.0	-59.4	-13.0	-46.4	
2806.00	-22.8	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
1403.00	-29.5	H	3.0	37.4	1.0	-65.9	-13.0	-52.9	
2104.50	-23.8	H	3.0	36.6	1.0	-59.4	-13.0	-46.4	
2806.00	-21.3	H	3.0	36.4	1.0	-56.7	-13.0	-43.7	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-29.3	V	3.0	37.4	1.0	-65.7	-13.0	-52.7	
2122.50	-24.0	V	3.0	36.6	1.0	-59.6	-13.0	-46.6	
2830.00	-22.1	V	3.0	36.4	1.0	-57.5	-13.0	-44.5	
1415.00	-29.6	H	3.0	37.4	1.0	-65.9	-13.0	-52.9	
2122.50	-24.7	H	3.0	36.6	1.0	-60.3	-13.0	-47.3	
2830.00	-22.8	H	3.0	36.4	1.0	-58.2	-13.0	-45.2	
<b>High Ch, 713.5MHz</b>									
1427.00	-29.5	V	3.0	37.3	1.0	-65.8	-13.0	-52.8	
2140.50	-23.1	V	3.0	36.6	1.0	-58.6	-13.0	-45.6	
2854.00	-22.3	V	3.0	36.4	1.0	-57.7	-13.0	-44.7	
1427.00	-29.4	H	3.0	37.3	1.0	-65.7	-13.0	-52.7	
2140.50	-24.5	H	3.0	36.6	1.0	-60.1	-13.0	-47.1	
2854.00	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	

LTE B12 5MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 12 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, 701.5MHz</b>									
1403.00	-29.4	V	3.0	37.4	1.0	-65.8	-13.0	-52.8	
2104.50	-24.2	V	3.0	36.6	1.0	-59.8	-13.0	-46.8	
2806.00	-22.1	V	3.0	36.4	1.0	-57.5	-13.0	-44.5	
1403.00	-30.2	H	3.0	37.4	1.0	-66.6	-13.0	-53.6	
2104.50	-24.3	H	3.0	36.6	1.0	-59.8	-13.0	-46.8	
2806.00	-22.7	H	3.0	36.4	1.0	-58.1	-13.0	-45.1	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-28.9	V	3.0	37.4	1.0	-65.3	-13.0	-52.3	
2122.50	-23.7	V	3.0	36.6	1.0	-59.2	-13.		

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 12 Harmonics, 10MHz 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, 704MHz</b>									
1408.00	-30.6	V	3.0	37.4	1.0	-66.4	-13.0	-53.4	
2112.00	-23.9	V	3.0	36.6	1.0	-59.5	-13.0	-46.5	
2816.00	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
1408.00	-29.9	H	3.0	37.4	1.0	-66.3	-13.0	-53.3	
2112.00	-25.0	H	3.0	36.6	1.0	-60.5	-13.0	-47.5	
2816.00	-23.6	H	3.0	36.4	1.0	-59.0	-13.0	-46.0	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-29.7	V	3.0	37.4	1.0	-66.1	-13.0	-53.1	
2122.50	-23.5	V	3.0	36.6	1.0	-59.1	-13.0	-46.1	
2830.00	-21.7	V	3.0	36.4	1.0	-57.1	-13.0	-44.1	
1415.00	-28.9	H	3.0	37.4	1.0	-65.2	-13.0	-52.2	
2122.50	-24.5	H	3.0	36.6	1.0	-60.0	-13.0	-47.0	
2830.00	-23.0	H	3.0	36.4	1.0	-58.4	-13.0	-45.4	
<b>High Ch, 711MHz</b>									
1422.00	-30.1	V	3.0	37.3	1.0	-66.4	-13.0	-53.4	
2133.00	-23.5	V	3.0	36.6	1.0	-59.0	-13.0	-46.0	
2844.00	-21.5	V	3.0	36.4	1.0	-56.9	-13.0	-43.9	
1422.00	-29.9	H	3.0	37.3	1.0	-66.3	-13.0	-53.3	
2133.00	-25.4	H	3.0	36.6	1.0	-61.0	-13.0	-48.0	
2844.00	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	

**LTE B12 10MHz QPSK**

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 12 Harmonics, 10MHz 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, 704MHz</b>									
1408.00	-30.2	V	3.0	37.4	1.0	-66.5	-13.0	-53.5	
2112.00	-24.2	V	3.0	36.6	1.0	-59.7	-13.0	-46.7	
2816.00	-22.4	V	3.0	36.4	1.0	-57.7	-13.0	-44.7	
1408.00	-29.9	H	3.0	37.4	1.0	-66.2	-13.0	-53.2	
2112.00	-24.3	H	3.0	36.6	1.0	-59.9	-13.0	-46.9	
2816.00	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	
<b>Mid Ch, 707.5MHz</b>									
1415.00	-30.3	V	3.0	37.4	1.0	-66.6	-13.0	-53.6	
2122.50	-23.2	V	3.0	36.6	1.0	-58.7	-13.0	-45.7	
2830.00	-21.8	V	3.0	36.4	1.0	-57.2	-13.0	-44.2	
1415.00	-29.5	H	3.0	37.4	1.0	-65.8	-13.0	-52.8	
2122.50	-24.8	H	3.0	36.6	1.0	-60.4	-13.0	-47.4	
2830.00	-22.7	H	3.0	36.4	1.0	-58.0	-13.0	-45.0	
<b>High Ch, 711MHz</b>									
1422.00	-30.0	V	3.0	37.3	1.0	-66.3	-13.0	-53.3	
2133.00	-23.6	V	3.0	36.6	1.0	-59.2	-13.0	-46.2	
2844.00	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
1422.00	-28.7	H	3.0	37.3	1.0	-65.0	-13.0	-52.0	
2133.00	-24.7	H	3.0	36.6	1.0	-60.3	-13.0	-47.3	
2844.00	-22.8	H	3.0	36.4	1.0	-58.2	-13.0	-45.2	

**LTE B12 10MHz 16QAM**

9.1.8. LTE BAND 13

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 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
Low Ch, 779.5									
1559.00	-29.8	V	3.0	37.1	1.0	-66.0	-13.0	-53.0	
2335.50	-24.3	V	3.0	36.5	1.0	-59.8	-13.0	-46.8	
3118.00	-21.0	V	3.0	36.3	1.0	-56.3	-13.0	-43.3	
1559.00	-28.1	H	3.0	37.1	1.0	-64.3	-13.0	-51.3	
2338.50	-25.3	H	3.0	36.5	1.0	-60.8	-13.0	-47.8	
3118.00	-23.0	H	3.0	36.3	1.0	-58.2	-13.0	-45.2	
Mid Ch, 782									
1564.00	-29.9	V	3.0	37.1	1.0	-66.0	-13.0	-53.0	
2346.00	-25.0	V	3.0	36.5	1.0	-60.5	-13.0	-47.5	
3128.00	-22.6	V	3.0	36.3	1.0	-57.9	-13.0	-44.9	
1564.00	-29.2	H	3.0	37.1	1.0	-65.3	-13.0	-52.3	
2346.00	-25.2	H	3.0	36.5	1.0	-60.7	-13.0	-47.7	
3128.00	-22.4	H	3.0	36.3	1.0	-57.7	-13.0	-44.7	
High Ch, 784.5									
1569.00	-28.8	V	3.0	37.1	1.0	-64.9	-13.0	-51.9	
2353.50	-24.1	V	3.0	36.5	1.0	-59.6	-13.0	-46.6	
3138.00	-23.0	V	3.0	36.3	1.0	-58.3	-13.0	-45.3	
1569.00	-28.3	H	3.0	37.1	1.0	-64.4	-13.0	-51.4	
2353.50	-25.6	H	3.0	36.5	1.0	-61.1	-13.0	-48.1	
3138.00	-22.3	H	3.0	36.3	1.0	-57.6	-13.0	-44.6	

LTE B13 5MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 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
Low Ch, 779.5									
1559.00	-30.7	V	3.0	37.1	1.0	-66.8	-13.0	-53.8	
2338.50	-25.1	V	3.0	36.5	1.0	-60.6	-13.0	-47.6	
3118.00	-21.9	V	3.0	36.3	1.0	-57.2	-13.0	-44.2	
1559.00	-29.0	H	3.0	37.1	1.0	-65.1	-13.0	-52.1	
2338.50	-26.1	H	3.0	36.5	1.0	-61.6	-13.0	-48.6	
3118.00	-23.8	H	3.0	36.3	1.0	-59.1	-13.0	-46.1	
Mid Ch, 782									
1564.00	-30.7	V	3.0	37.1	1.0	-66.9	-13.0	-53.9	
2346.00	-25.8	V	3.0	36.5	1.0	-61.3	-13.0	-48.3	
3128.00	-23.5	V	3.0	36.3	1.0	-58.8	-13.0	-45.8	
1564.00	-30.0	H	3.0	37.1	1.0	-66.2	-13.0	-53.2	
2346.00	-26.1	H	3.0	36.5	1.0	-61.6	-13.0	-48.6	
3128.00	-23.3	H	3.0	36.3	1.0	-58.5	-13.0	-45.5	
High Ch, 784.5									
1569.00	-29.6	V	3.0	37.1	1.0	-65.8	-13.0	-52.8	
2353.50	-24.9	V	3.0	36.5	1.0	-60.4	-13.0	-47.4	
3138.00	-23.9	V	3.0	36.3	1.0	-59.1	-13.0	-46.1	
1569.00	-29.2	H	3.0	37.1	1.0	-65.3	-13.0	-52.3	
2353.50	-26.4	H	3.0	36.5	1.0	-61.9	-13.0	-48.9	
3138.00	-23.2	H	3.0	36.3	1.0	-58.4	-13.0	-45.4	

LTE B13 5MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 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
Mid Ch, 782MHz									
1564.00	-29.1	V	3.0	37.1	1.0	-65.2	-13.0	-52.2	
2346.00	-24.8	V	3.0	36.5	1.0	-60.3	-13.0	-47.3	
3128.00	-21.8	V	3.0	36.3	1.0	-57.0	-13.0	-44.0	
1564.00	-28.9	H	3.0	37.1	1.0	-65.1	-13.0	-52.1	
2346.00	-26.1	H	3.0	36.5	1.0	-61.6	-13.0	-48.6	
3128.00	-21.9	H	3.0	36.3	1.0	-57.2	-13.0	-44.2	

LTE B13 10MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 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
Mid Ch, 782MHz									
1564.00	-30.0	V	3.0	37.1	1.0	-66.1	-13.0	-53.1	
2346.00	-25.7	V	3.0	36.5	1.0	-61.2	-13.0	-48.2	
3128.00	-22.6	V	3.0	36.3	1.0	-57.9	-13.0	-44.9	
1564.00	-29.8	H	3.0	37.1	1.0	-65.9	-13.0	-52.9	
2346.00	-26.9	H	3.0	36.5	1.0	-62.4	-13.0	-49.4	
3128.00	-22.8	H	3.0	36.3	1.0	-58.1	-13.0	-45.1	

LTE B13 10MHz 16QAM

9.1.9. LTE BAND 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to similar frequency range, same maximum tune-up limit and same channel bandwidth (5 & 10 MHz).

9.1.10. LTE BAND 26

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 26 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
Low Ch, B14.7MHz									
1629.40	-29.8	V	3.0	37.1	1.0	-65.8	-13.0	-52.8	
2444.10	-25.3	V	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3258.00	-24.2	V	3.0	36.2	1.0	-59.4	-13.0	-46.4	
1629.40	-30.4	H	3.0	37.1	1.0	-66.4	-13.0	-53.4	
2444.10	-26.2	H	3.0	36.4	1.0	-61.7	-13.0	-48.7	
3258.00	-24.5	H	3.0	36.2	1.0	-59.8	-13.0	-46.8	
Mid Ch, B31.5MHz									
1663.00	-29.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2494.50	-25.7	V	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3326.00	-24.8	V	3.0	36.1	1.0	-60.0	-13.0	-47.0	
1663.00	-29.3	H	3.0	37.0	1.0	-65.3	-13.0	-52.3	
2494.50	-25.5	H	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3326.00	-24.5	H	3.0	36.1	1.0	-59.7	-13.0	-46.7	
High Ch, B48.3MHz									
1696.60	-28.7	V	3.0	37.0	1.0	-64.7	-13.0	-51.7	
2544.90	-23.2	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
3393.20	-24.4	V	3.0	36.1	1.0	-59.5	-13.0	-46.5	
1696.60	-29.1	H	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2544.90	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3393.20	-23.7	H	3.0	36.1	1.0	-58.8	-13.0	-45.8	

LTE B26 1.4MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 26 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
Low Ch, B14.7MHz									
1629.40	-30.3	V	3.0	37.1	1.0	-66.4	-13.0	-53.4	
2444.10	-26.5	V	3.0	36.4	1.0	-62.0	-13.0	-49.0	
3258.00	-24.0	V	3.0	36.2	1.0	-59.2	-13.0	-46.2	
1629.40	-30.3	H	3.0	37.1	1.0	-66.3	-13.0	-53.3	
2444.10	-26.0	H	3.0	36.4	1.0	-61.5	-13.0	-48.5	
3258.00	-24.5	H	3.0	36.2	1.0	-59.7	-13.0	-46.7	
Mid Ch, B31.5MHz									
1663.00	-29.0	V	3.0	37.0	1.0	-65.0	-13.0	-52.0	
2494.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3326.00	-25.1	V	3.0	36.1	1.0	-60.3	-13.0	-47.3	
1663.00	-30.1	H	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2494.50	-24.7	H	3.0	36.4	1.0	-60.1	-13.0	-47.1	
3326.00	-24.2	H	3.0	36.1	1.0	-59.3	-13.0	-46.3	
High Ch, B48.3MHz									
1696.60	-29.4	V	3.0	37.0	1.0	-65.4	-13.0	-52.4	
2544.90	-23.7	V	3.0	36.4	1.0	-59.2	-13.0	-46.2	
3393.20	-24.9	V	3.0	36.1	1.0	-60.0	-13.0	-47.0	
1696.60	-29.1	H	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2544.90	-24.4	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3393.20	-24.1	H	3.0	36.1	1.0	-59.1	-13.0	-46.1	

LTE B26 1.4MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 26 Harmonics, 3MHz 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, B15.5MHz									
1631.00	-28.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2446.50	-26.5	V	3.0	36.4	1.0	-61.9	-13.0	-48.9	
3262.00	-24.1	V	3.0	36.2	1.0	-59.3	-13.0	-46.3	
1631.00	-30.4	H	3.0	37.0	1.0	-66.4	-13.0	-53.4	
2446.50	-26.1	H	3.0	36.4	1.0	-61.6	-13.0	-48.6	
3262.00	-24.7	H	3.0	36.2	1.0	-59.9	-13.0	-46.9	
Mid Ch, B31.5MHz									
1663.00	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2494.50	-26.4	V	3.0	36.4	1.0	-61.8	-13.0	-48.8	
3326.00	-24.5	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1663.00	-30.2	H	3.0	37.0	1.0	-66.2	-13.0	-53.2	
2494.50	-25.8	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3326.00	-25.0	H	3.0	36.1	1.0	-60.1	-13.0	-47.1	
High Ch, B47.5MHz									
1695.00	-28.9	V	3.0	37.0	1.0	-64.9	-13.0	-51.9	
2542.50	-24.5	V	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3390.00	-24.1	V	3.0	36.1	1.0	-59.2	-13.0	-46.2	
1695.00	-29.8	H	3.0	37.0	1.0	-65.8	-13.0	-52.8	
2542.50	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3390.00	-24.6	H	3.0	36.1	1.0	-59.7	-13.0	-46.7	

LTE B26 3MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/16/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 26 Harmonics, 3MHz 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, B15.5MHz									
1631.00	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2446.50	-25.7	V	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3262.00	-24.7	V	3.0	36.2	1.0	-59.9	-13.0	-46.9	
1631.00	-30.2	H	3.0	37.0	1.0	-66.3	-13.0	-53.3	
2446.50	-26.0	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3262.00	-24.2	H	3.0	36.2	1.0	-59.4	-13.0	-46.4	
Mid Ch, B31.5MHz									
1663.00	-30.1	V	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2494.50	-25.3	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3326.00	-24.4	V	3.0	36.1	1.0	-59.5	-13.0	-46.5	
1663.00	-30.1	H	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2494.50	-25.6	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
3326.00	-25.0	H	3.0	36.1	1.0	-60.1	-13.0	-47.1	
High Ch, B47.5MHz									
1695.00	-29.1	V	3.0	37.0	1.0	-65.1	-13.0	-52.1	
2542.50	-24.3	V	3.0	36.4	1.0	-58.4	-13.0	-45.4	
3390.00	-24.6	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1695.00	-30.1	H	3.0	37.0	1.0	-66.1	-13.0	-53.1	
2542.50	-26.2	H	3.0	36.4	1.0	-61.6	-13.0	-48.6	
3390.00	-24.2	H	3.0	36.1	1.0	-59.3	-13.0	-46.3	

LTE B26 3MHz 16QAM

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 26 Harmonics, 5MHz Bandwidth

F (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, B16.5MHz									
1633.00	-24.2	V	3.0	37.0	1.0	-60.2	-13.0	-47.2	
2449.50	-23.1	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
3266.00	-20.2	V	3.0	36.2	1.0	-55.3	-13.0	-42.3	
1633.00	-6.9	H	3.0	37.0	1.0	-43.0	-13.0	-30.0	
2449.50	-22.9	H	3.0	36.4	1.0	-58.4	-13.0	-45.4	
3266.00	-21.3	H	3.0	36.2	1.0	-56.5	-13.0	-43.5	
Mid Ch, B31.5MHz									
1663.00	-22.4	V	3.0	37.0	1.0	-58.4	-13.0	-45.4	
2494.50	-22.6	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
3326.00	-21.3	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1663.00	-14.1	H	3.0	37.0	1.0	-50.1	-13.0	-37.1	
2494.50	-24.0	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
3326.00	-20.5	H	3.0	36.1	1.0	-55.6	-13.0	-42.6	
High Ch, B46.5MHz									
1693.00	-27.0	V	3.0	37.0	1.0	-63.0	-13.0	-50.0	
2539.50	-22.8	V	3.0	36.4	1.0	-58.2	-13.0	-45.2	
3386.00	-19.4	V	3.0	36.1	1.0	-54.5	-13.0	-41.5	
1693.00	-9.6	H	3.0	37.0	1.0	-45.6	-13.0	-32.6	
2539.50	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
3386.00	-20.7	H	3.0	36.1	1.0	-55.8	-13.0	-42.8	

LTE B26 5MHz QPSK

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 26 Harmonics, 5MHz Bandwidth

F (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, B16.5MHz									
1633.00	-23.2	V	3.0	37.0	1.0	-59.3	-13.0	-46.3	
2449.50	-22.7	V	3.0	36.4	1.0	-56.1	-13.0	-43.1	
3266.00	-20.4	V	3.0	36.2	1.0	-55.6	-13.0	-42.6	
1633.00	-4.1	H	3.0	37.0	1.0	-40.2	-13.0	-27.2	
2449.50	-21.6	H	3.0	36.4	1.0	-57.0	-13.0	-44.0	
3266.00	-20.7	H	3.0	36.2	1.0	-55.9	-13.0	-42.9	
Mid Ch, B31.5MHz									
1663.00	-20.6	V	3.0	37.0	1.0	-56.6	-13.0	-43.6	
2494.50	-22.8	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
3326.00	-21.2	V	3.0	36.1	1.0	-56.4	-13.0	-43.4	
1663.00	-11.2	H	3.0	37.0	1.0	-47.2	-13.0	-34.2	
2494.50	-24.4	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3326.00	-20.9	H	3.0	36.1	1.0	-56.0	-13.0	-43.0	
High Ch, B46.5MHz									
1693.00	-27.3	V	3.0	37.0	1.0	-63.3	-13.0	-50.3	
2539.50	-22.1	V	3.0	36.4	1.0	-57.5	-13.0	-44.5	
3386.00	-20.6	V	3.0	36.1	1.0	-55.7	-13.0	-42.7	
1693.00	-6.9	H	3.0	37.0	1.0	-42.9	-13.0	-29.9	
2539.50	-23.7	H	3.0	36.4	1.0	-59.1	-13.0	-46.1	
3386.00	-20.8	H	3.0	36.1	1.0	-55.9	-13.0	-42.9	

LTE B26 5MHz 16QAM

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_QPSK Band 26 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, 819MHz</b>									
1638.00	-18.4	V	3.0	37.0	1.0	-54.4	-13.0	-41.4	
2457.00	-23.5	V	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3276.00	-21.1	V	3.0	36.2	1.0	-56.2	-13.0	-43.2	
1638.00	-19.6	H	3.0	37.0	1.0	-55.6	-13.0	-42.6	
2457.00	-24.7	H	3.0	36.4	1.0	-60.3	-13.0	-47.3	
3276.00	-21.5	H	3.0	36.2	1.0	-56.7	-13.0	-43.7	
<b>Mid Ch, 831.5MHz</b>									
1663.00	-25.4	V	3.0	37.0	1.0	-61.4	-13.0	-48.4	
2494.50	-22.4	V	3.0	36.4	1.0	-57.8	-13.0	-44.8	
3326.00	-21.4	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1663.00	-15.6	H	3.0	37.0	1.0	-51.6	-13.0	-38.6	
2494.50	-24.7	H	3.0	36.4	1.0	-60.1	-13.0	-47.1	
3326.00	-21.3	H	3.0	36.1	1.0	-56.4	-13.0	-43.4	
<b>High Ch, 844MHz</b>									
1688.00	-21.1	V	3.0	37.0	1.0	-57.1	-13.0	-44.1	
2532.00	-22.6	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
3376.00	-21.1	V	3.0	36.1	1.0	-56.2	-13.0	-43.2	
1688.00	-12.0	H	3.0	37.0	1.0	-47.9	-13.0	-34.9	
2532.00	-24.0	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
3376.00	-20.9	H	3.0	36.1	1.0	-56.0	-13.0	-43.0	

LTE B26 10MHz QPSK

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

Company: Sony  
 Project #: 12073310  
 Date: 12/19/2017  
 Test Engineer: 31300 RS  
 Configuration: EUT + HS + Charger  
 Location: Chamber C  
 Mode: LTE\_16QAM Band 26 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, 819MHz</b>									
1638.00	-16.1	V	3.0	37.0	1.0	-52.2	-13.0	-39.2	
2457.00	-22.2	V	3.0	36.4	1.0	-57.7	-13.0	-44.7	
3276.00	-21.4	V	3.0	36.2	1.0	-56.5	-13.0	-43.5	
1638.00	-16.0	H	3.0	37.0	1.0	-52.0	-13.0	-39.0	
2457.00	-24.7	H	3.0	36.4	1.0	-60.2	-13.0	-47.2	
3276.00	-21.2	H	3.0	36.2	1.0	-56.3	-13.0	-43.3	
<b>Mid Ch, 831.5MHz</b>									
1663.00	-24.2	V	3.0	37.0	1.0	-60.2	-13.0	-47.2	
2494.50	-22.9	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
3326.00	-21.0	V	3.0	36.1	1.0	-56.1	-13.0	-43.1	
1663.00	-13.2	H	3.0	37.0	1.0	-49.2	-13.0	-36.2	
2494.50	-24.6	H	3.0	36.4	1.0	-60.0	-13.0	-47.0	
3326.00	-21.2	H	3.0	36.1	1.0	-56.4	-13.0	-43.4	
<b>High Ch, 844MHz</b>									
1688.00	-20.2	V	3.0	37.0	1.0	-56.1	-13.0	-43.1	
2532.00	-22.9	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
3376.00	-20.9	V	3.0	36.1	1.0	-56.0	-13.0	-43.0	
1688.00	-10.0	H	3.0	37.0	1.0	-46.0	-13.0	-33.0	
2532.00	-23.5	H	3.0	36.4	1.0	-59.0	-13.0	-46.0	
3376.00	-21.1	H	3.0	36.1	1.0	-56.2	-13.0	-43.2	

LTE B26 10MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/26/2017  
 Test Engineer: 43075 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 26 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
<b>Low Ch, 821.5MHz</b>									
1663.00	-29.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2494.50	-25.2	V	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3326.00	-24.0	V	3.0	36.1	1.0	-59.2	-13.0	-46.2	
1663.00	-23.1	H	3.0	36.1	1.0	-58.3	-13.0	-45.3	
3326.00	-22.6	H	3.0	36.1	1.0	-57.8	-13.0	-44.8	
3326.00	-24.5	H	3.0	36.1	1.0	-59.7	-13.0	-46.7	
<b>Mid Ch, 831.5MHz</b>									
1673.00	-29.2	V	3.0	37.0	1.0	-65.2	-13.0	-52.2	
2509.50	-25.5	V	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3346.00	-23.9	V	3.0	36.1	1.0	-59.0	-13.0	-46.0	
1673.00	-22.4	H	3.0	36.1	1.0	-57.5	-13.0	-44.5	
3346.00	-23.1	H	3.0	36.1	1.0	-58.2	-13.0	-45.2	
3346.00	-23.6	H	3.0	36.1	1.0	-58.7	-13.0	-45.7	
<b>High Ch, 841.5MHz</b>									
1663.00	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2494.50	-25.7	V	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3326.00	-23.7	V	3.0	36.1	1.0	-58.0	-13.0	-45.0	
1663.00	-22.9	H	3.0	36.1	1.0	-58.1	-13.0	-45.1	
3326.00	-23.4	H	3.0	36.1	1.0	-58.5	-13.0	-45.5	
3326.00	-24.6	H	3.0	36.1	1.0	-59.7	-13.0	-46.7	

LTE B26 15MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/26/2017  
 Test Engineer: 43075 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 26 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
<b>Low Ch, 821.5MHz</b>									
1663.00	-29.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2494.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3326.00	-24.5	V	3.0	36.1	1.0	-59.6	-13.0	-46.6	
1663.00	-22.4	H	3.0	36.1	1.0	-57.6	-13.0	-44.6	
3326.00	-23.0	H	3.0	36.1	1.0	-58.1	-13.0	-45.1	
3326.00	-24.1	H	3.0	36.1	1.0	-59.2	-13.0	-46.2	
<b>Mid Ch, 831.5MHz</b>									
1673.00	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2509.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3346.00	-23.6	V	3.0	36.1	1.0	-58.7	-13.0	-45.7	
1673.00	-22.7	H	3.0	36.1	1.0	-57.8	-13.0	-44.8	
3346.00	-23.5	H	3.0	36.1	1.0	-58.7	-13.0	-45.7	
3346.00	-23.9	H	3.0	36.1	1.0	-59.0	-13.0	-46.0	
<b>High Ch, 841.5MHz</b>									
1663.00	-29.7	V	3.0	37.0	1.0	-65.7	-13.0	-52.7	
2494.50	-25.8	V	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3326.00	-24.2	V	3.0	36.1	1.0	-59.3	-13.0	-46.3	
1663.00	-22.6	H	3.0	36.1	1.0	-57.7	-13.0	-44.7	
3326.00	-23.6	H	3.0	36.1	1.0	-58.8	-13.0	-45.8	
3326.00	-24.3	H	3.0	36.1	1.0	-59.5	-13.0	-46.5	

LTE B26 15MHz 16QAM

9.1.11. LTE BAND 41

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_QPSK Band 41 Harmonics, 5MHz Bandwidth

f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2498.5MHz</b>									
4997.00	-16.7	V	3.0	35.5	1.0	-51.2	-25.0	-26.2	
7495.50	-15.7	V	3.0	35.7	1.0	-50.3	-25.0	-25.5	
9994.00	-13.8	V	3.0	36.0	1.0	-48.9	-25.0	-23.9	
4997.00	-15.2	H	3.0	35.5	1.0	-49.7	-25.0	-24.7	
7495.50	-15.3	H	3.0	35.7	1.0	-50.0	-25.0	-25.0	
9994.00	-12.6	H	3.0	36.0	1.0	-47.6	-25.0	-22.6	
<b>Mid Ch, 2503MHz</b>									
5186.00	-16.7	V	3.0	35.4	1.0	-51.1	-25.0	-26.1	
7779.00	-15.6	V	3.0	35.8	1.0	-50.4	-25.0	-25.4	
10372.00	-12.6	V	3.0	35.8	1.0	-47.4	-25.0	-22.4	
5186.00	-19.0	H	3.0	35.4	1.0	-53.4	-25.0	-28.4	
7779.00	-11.9	H	3.0	35.8	1.0	-46.6	-25.0	-21.6	
10372.00	-11.5	H	3.0	35.8	1.0	-46.4	-25.0	-21.4	
<b>High Ch, 2607.5MHz</b>									
5375.00	-17.0	V	3.0	35.4	1.0	-51.4	-25.0	-26.4	
8062.50	-14.8	V	3.0	35.8	1.0	-49.6	-25.0	-24.6	
10750.00	-11.0	V	3.0	35.7	1.0	-46.5	-25.0	-21.5	
5375.00	-16.3	H	3.0	35.4	1.0	-50.7	-25.0	-25.7	
8062.50	-13.4	H	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10750.00	-11.7	H	3.0	35.7	1.0	-46.4	-25.0	-21.4	

LTE B41 5MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 41 Harmonics, 5MHz Bandwidth

f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2498.5MHz</b>									
4997.00	-17.7	V	3.0	35.5	1.0	-52.2	-25.0	-27.2	
7495.50	-16.7	V	3.0	35.7	1.0	-51.5	-25.0	-26.5	
9994.00	-14.8	V	3.0	36.0	1.0	-49.9	-25.0	-24.9	
4997.00	-16.2	H	3.0	35.5	1.0	-50.7	-25.0	-25.7	
7495.50	-16.3	H	3.0	35.7	1.0	-51.0	-25.0	-26.0	
9994.00	-13.6	H	3.0	36.0	1.0	-48.6	-25.0	-23.6	
<b>Mid Ch, 2503MHz</b>									
5186.00	-17.7	V	3.0	35.4	1.0	-52.1	-25.0	-27.1	
7779.00	-16.6	V	3.0	35.8	1.0	-51.4	-25.0	-26.4	
10372.00	-13.6	V	3.0	35.8	1.0	-48.4	-25.0	-23.4	
5186.00	-20.0	H	3.0	35.4	1.0	-54.4	-25.0	-29.4	
7779.00	-12.9	H	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10372.00	-12.5	H	3.0	35.8	1.0	-47.4	-25.0	-22.4	
<b>High Ch, 2607.5MHz</b>									
5375.00	-18.0	V	3.0	35.4	1.0	-52.4	-25.0	-27.4	
8062.50	-15.8	V	3.0	35.8	1.0	-50.6	-25.0	-25.6	
10750.00	-12.8	V	3.0	35.7	1.0	-47.5	-25.0	-22.5	
5375.00	-17.3	H	3.0	35.4	1.0	-51.7	-25.0	-26.7	
8062.50	-14.4	H	3.0	35.8	1.0	-49.2	-25.0	-24.2	
10750.00	-12.7	H	3.0	35.7	1.0	-47.4	-25.0	-22.4	

LTE B41 5MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_QPSK Band 41 Harmonics, 10MHz Bandwidth

f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2501MHz</b>									
5002.00	-15.9	V	3.0	35.5	1.0	-50.4	-25.0	-25.4	
7503.00	-16.7	V	3.0	35.7	1.0	-51.4	-25.0	-26.4	
10004.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5002.00	-15.2	H	3.0	35.5	1.0	-49.7	-25.0	-24.7	
7503.00	-13.6	H	3.0	35.7	1.0	-48.3	-25.0	-23.3	
10004.00	-12.8	H	3.0	36.0	1.0	-47.8	-25.0	-22.8	
<b>Mid Ch, 2503MHz</b>									
5186.00	-15.8	V	3.0	35.4	1.0	-50.3	-25.0	-25.3	
7779.00	-14.2	V	3.0	35.8	1.0	-49.0	-25.0	-24.0	
10372.00	-12.5	V	3.0	35.8	1.0	-47.3	-25.0	-22.3	
5186.00	-15.1	H	3.0	35.4	1.0	-49.5	-25.0	-24.5	
7779.00	-13.8	H	3.0	35.8	1.0	-48.4	-25.0	-23.4	
10372.00	-13.1	H	3.0	35.8	1.0	-47.9	-25.0	-22.9	
<b>High Ch, 2605MHz</b>									
5370.00	-17.2	V	3.0	35.4	1.0	-51.7	-25.0	-26.7	
8055.00	-14.7	V	3.0	35.8	1.0	-49.5	-25.0	-24.5	
10740.00	-12.9	V	3.0	35.7	1.0	-47.6	-25.0	-22.6	
5370.00	-16.0	H	3.0	35.4	1.0	-50.5	-25.0	-25.5	
8055.00	-11.6	H	3.0	35.8	1.0	-46.4	-25.0	-21.4	
10740.00	-12.3	H	3.0	35.7	1.0	-47.0	-25.0	-22.0	

LTE B41 10MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 41 Harmonics, 10MHz Bandwidth

f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2501MHz</b>									
5002.00	-16.9	V	3.0	35.5	1.0	-51.4	-25.0	-26.4	
7503.00	-17.7	V	3.0	35.7	1.0	-52.4	-25.0	-27.4	
10004.00	-14.3	V	3.0	36.0	1.0	-49.3	-25.0	-24.3	
5002.00	-16.2	H	3.0	35.5	1.0	-50.7	-25.0	-25.7	
7503.00	-14.6	H	3.0	35.7	1.0	-49.3	-25.0	-24.3	
10004.00	-13.8	H	3.0	36.0	1.0	-48.8	-25.0	-23.8	
<b>Mid Ch, 2503MHz</b>									
5186.00	-16.8	V	3.0	35.4	1.0	-51.3	-25.0	-26.3	
7779.00	-15.2	V	3.0	35.8	1.0	-50.0	-25.0	-25.0	
10372.00	-13.5	V	3.0	35.8	1.0	-48.3	-25.0	-23.3	
5186.00	-16.1	H	3.0	35.4	1.0	-50.5	-25.0	-25.5	
7779.00	-14.6	H	3.0	35.8	1.0	-49.4	-25.0	-24.4	
10372.00	-14.1	H	3.0	35.8	1.0	-48.9	-25.0	-23.9	
<b>High Ch, 2605MHz</b>									
5370.00	-18.2	V	3.0	35.4	1.0	-52.7	-25.0	-27.7	
8055.00	-15.7	V	3.0	35.8	1.0	-50.5	-25.0	-25.5	
10740.00	-13.9	V	3.0	35.7	1.0	-48.6	-25.0	-23.6	
5370.00	-17.0	H	3.0	35.4	1.0	-51.5	-25.0	-26.5	
8055.00	-12.6	H	3.0	35.8	1.0	-47.4	-25.0	-22.4	
10740.00	-13.3	H	3.0	35.7	1.0	-48.0	-25.0	-23.0	

LTE B41 10MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_QPSK Band 41 Harmonics, 15MHz Bandwidth

f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2503.5MHz</b>									
5007.00	-16.5	V	3.0	35.5	1.0	-51.0	-25.0	-26.0	
7510.50	-14.6	V	3.0	35.7	1.0	-49.4	-25.0	-24.4	
10014.00	-13.1	V	3.0	36.0	1.0	-48.1	-25.0	-23.1	
5007.00	-15.9	H	3.0	35.5	1.0	-50.3	-25.0	-25.3	
7510.50	-14.0	H	3.0	35.7	1.0	-48.7	-25.0	-23.7	
10014.00	-12.3	H	3.0	36.0	1.0	-47.3	-25.0	-22.3	
<b>Mid Ch, 2503MHz</b>									
5186.00	-15.3	V	3.0	35.4	1.0	-49.7	-25.0	-24.7	
7779.00	-15.0	V	3.0	35.8	1.0	-49.8	-25.0	-24.8	
10372.00	-12.5	V	3.0	35.8	1.0	-47.4	-25.0	-22.4	
5186.00	-16.2	H	3.0	35.4	1.0	-50.6	-25.0	-25.6	
7779.00	-13.8	H	3.0	35.8	1.0	-48.6	-25.0	-23.6	
10372.00	-12.2	H	3.0	35.8	1.0	-47.0	-25.0	-22.0	
<b>High Ch, 2602.5MHz</b>									
5365.00	-17.2	V	3.0	35.4	1.0	-51.7	-25.0	-26.7	
8047.50	-13.4	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10730.00	-12.9	V	3.0	35.7	1.0	-47.6	-25.0	-22.6	
5365.00	-16.5	H	3.0	35.4	1.0	-50.9	-25.0	-25.9	
8047.50	-13.5	H	3.0	35.8	1.0	-48.3	-25.0	-23.3	
10730.00	-12.0	H	3.0	35.7	1.0	-46.6	-25.0	-21.6	

LTE B41 15MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 41 Harmonics, 15MHz Bandwidth

f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2503.5MHz</b>									
5007.00	-17.4	V	3.0	35.5	1.0	-51.9	-25.0	-26.9	
7510.50	-15.5	V	3.0	35.7	1.0	-50.3	-25.0	-25.3	
10014.00	-14.0	V	3.0	36.0	1.0	-49.0	-25.0	-24.0	
5007.00	-16.7	H	3.0	35.5	1.0	-51.2	-25.0	-26.2	
7510.50	-14.9	H	3.0	35.7	1.0	-49.6	-25.0	-24.6	
10014.00	-13.2	H	3.0	36.0	1.0	-48.2	-25.0	-23.2	
<b>Mid Ch, 2503MHz</b>									
5186.00	-16.2	V	3.0	35.4	1.0	-50.6	-25.0	-25.6	
7779.00	-15.9	V	3.0	35.8	1.0	-50.7	-25.0	-25.7	
10372.00	-13.4	V	3.0	35.8	1.0	-48.3	-25.0	-23.3	
5186.00	-17.1	H	3.0	35.4	1.0	-51.5	-25.0	-26.5	
7779.00	-14.7	H	3.0	35.8	1.0	-49.4	-25.0	-24.4	
10372.00	-13.0	H	3.0	35.8	1.0	-47.9	-25.0	-22.9	
<b>High Ch, 2602.5MHz</b>									
5365.00	-18.1	V	3.0	35.4	1.0	-52.6	-25.0	-27.6	
8047.50	-14.3	V	3.0	35.8	1.0	-49.1	-25.0	-24.1	
10730.00	-13.8	V	3.0	35.7	1.0	-48.5	-25.0	-23.5	
5365.00	-17.4	H	3.0	35.4	1.0	-51.8	-25.0	-26.8	
8047.50	-14.4	H	3.0	35.8	1.0	-49.2	-25.0	-24.2	
10730.00	-12.8	H	3.0	35.7	1.0	-47.5	-25.0	-22.5	

LTE B41 15MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_QPSK Band 41 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2506MHz</b>									
5012.00	-15.3	V	3.0	35.5	1.0	-49.8	-35.0	-24.8	
7518.00	-15.8	V	3.0	35.7	1.0	-50.6	-25.0	-25.6	
10024.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5012.00	-15.4	H	3.0	35.5	1.0	-49.9	-25.0	-24.9	
7518.00	-13.3	H	3.0	35.7	1.0	-48.3	-25.0	-23.3	
10024.00	-12.0	H	3.0	36.0	1.0	-47.0	-25.0	-22.0	
<b>Mid Ch, 2593MHz</b>									
5186.00	-15.7	V	3.0	35.4	1.0	-50.1	-25.0	-25.1	
7779.00	-15.4	V	3.0	35.8	1.0	-50.2	-25.0	-25.2	
10372.00	-12.4	V	3.0	35.8	1.0	-47.2	-25.0	-22.2	
5186.00	-15.5	H	3.0	35.4	1.0	-49.9	-25.0	-24.9	
7779.00	-13.5	H	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10372.00	-12.7	H	3.0	35.8	1.0	-47.6	-25.0	-22.6	
<b>High Ch, 2680MHz</b>									
5360.00	-18.1	V	3.0	35.4	1.0	-52.6	-25.0	-27.6	
8040.00	-14.9	V	3.0	35.8	1.0	-49.7	-25.0	-24.7	
10720.00	-12.5	V	3.0	35.7	1.0	-47.2	-25.0	-22.2	
5360.00	-15.9	H	3.0	35.4	1.0	-50.4	-25.0	-25.4	
8040.00	-12.8	H	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10720.00	-12.7	H	3.0	35.7	1.0	-47.4	-25.0	-22.4	

**LTE B41 20MHz QPSK**

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/18/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 41 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2506MHz</b>									
5012.00	-16.3	V	3.0	35.5	1.0	-50.8	-25.0	-25.8	
7518.00	-16.8	V	3.0	35.7	1.0	-51.6	-25.0	-26.6	
10024.00	-14.3	V	3.0	36.0	1.0	-49.3	-25.0	-24.3	
5012.00	-16.4	H	3.0	35.5	1.0	-50.9	-25.0	-25.9	
7518.00	-14.3	H	3.0	35.7	1.0	-49.1	-25.0	-24.1	
10024.00	-13.0	H	3.0	36.0	1.0	-48.0	-25.0	-23.0	
<b>Mid Ch, 2593MHz</b>									
5186.00	-16.7	V	3.0	35.4	1.0	-51.1	-25.0	-26.1	
7779.00	-16.4	V	3.0	35.8	1.0	-51.2	-25.0	-26.2	
10372.00	-13.4	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
5186.00	-16.5	H	3.0	35.4	1.0	-50.9	-25.0	-25.9	
7779.00	-14.5	H	3.0	35.8	1.0	-49.2	-25.0	-24.2	
10372.00	-13.7	H	3.0	35.8	1.0	-48.6	-25.0	-23.6	
<b>High Ch, 2680MHz</b>									
5360.00	-19.1	V	3.0	35.4	1.0	-53.6	-25.0	-28.6	
8040.00	-15.9	V	3.0	35.8	1.0	-50.7	-25.0	-25.7	
10720.00	-13.5	V	3.0	35.7	1.0	-48.2	-25.0	-23.2	
5360.00	-16.9	H	3.0	35.4	1.0	-51.4	-25.0	-26.4	
8040.00	-13.8	H	3.0	35.8	1.0	-48.6	-25.0	-23.6	
10720.00	-13.7	H	3.0	35.7	1.0	-48.4	-25.0	-23.4	

**LTE B41 20MHz 16QAM**

9.1.12. LTE BAND 66

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/20/2017  
 Test Engineer: 39317  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 66 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, 1710.7MHz</b>									
3421.40	-19.5	V	3.0	35.1	1.0	-54.6	-13.0	-41.6	
5132.10	-16.1	V	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6842.80	-14.3	V	3.0	35.7	1.0	-49.0	-13.0	-36.0	
3421.40	-19.2	H	3.0	36.1	1.0	-54.2	-13.0	-41.2	
5132.10	-14.7	H	3.0	35.4	1.0	-49.7	-13.0	-36.2	
6842.80	-13.2	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	
<b>Mid Ch, 1745MHz</b>									
3490.00	-19.5	V	3.0	36.0	1.0	-54.5	-13.0	-41.5	
5235.00	-16.9	V	3.0	35.4	1.0	-51.3	-13.0	-38.3	
6980.00	-15.9	V	3.0	35.7	1.0	-50.6	-13.0	-37.6	
3490.00	-19.2	H	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5235.00	-15.9	H	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6980.00	-14.1	H	3.0	35.7	1.0	-48.8	-13.0	-35.8	
<b>High Ch, 1775.3MHz</b>									
3558.60	-18.8	V	3.0	36.0	1.0	-53.8	-13.0	-40.8	
5337.90	-16.7	V	3.0	35.4	1.0	-51.1	-13.0	-38.1	
7117.20	-14.2	V	3.0	35.7	1.0	-48.9	-13.0	-35.9	
3558.60	-19.1	H	3.0	36.0	1.0	-54.1	-13.0	-41.1	
5337.90	-16.4	H	3.0	35.4	1.0	-50.8	-13.0	-37.8	
7117.20	-12.9	H	3.0	35.7	1.0	-47.6	-13.0	-34.6	

LTE B66 1.4MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/20/2017  
 Test Engineer: 50820  
 Configuration: EUT + HS + Charger  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 66 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, 1710.7MHz</b>									
3421.40	-19.4	V	3.0	36.1	1.0	-54.4	-13.0	-41.4	
5132.10	-16.4	V	3.0	35.4	1.0	-50.9	-13.0	-37.9	
6842.80	-14.4	V	3.0	35.7	1.0	-49.1	-13.0	-36.1	
3421.40	-19.1	H	3.0	36.1	1.0	-54.2	-13.0	-41.2	
5132.10	-15.7	H	3.0	35.4	1.0	-50.1	-13.0	-37.1	
6842.80	-12.4	H	3.0	35.7	1.0	-47.1	-13.0	-34.1	
<b>Mid Ch, 1745MHz</b>									
3490.00	-18.4	V	3.0	36.0	1.0	-53.5	-13.0	-40.5	
5235.00	-16.2	V	3.0	35.4	1.0	-50.6	-13.0	-37.6	
6980.00	-15.0	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3490.00	-19.0	H	3.0	36.0	1.0	-54.0	-13.0	-41.0	
5235.00	-15.9	H	3.0	35.4	1.0	-50.4	-13.0	-37.4	
6980.00	-14.1	H	3.0	35.7	1.0	-48.8	-13.0	-35.8	
<b>High Ch, 1775.3MHz</b>									
3558.60	-19.0	V	3.0	36.0	1.0	-54.0	-13.0	-41.0	
5337.90	-16.5	V	3.0	35.4	1.0	-51.0	-13.0	-38.0	
7117.20	-14.6	V	3.0	35.7	1.0	-49.3	-13.0	-36.3	
3558.60	-19.2	H	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5337.90	-14.9	H	3.0	35.4	1.0	-49.4	-13.0	-36.4	
7117.20	-13.1	H	3.0	35.7	1.0	-47.8	-13.0	-34.8	

LTE B66 1.4MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/20/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber D  
 Mode: LTE\_QPSK Band 66 Harmonics, 3MHz 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, 1711.5MHz</b>									
3423.00	-18.6	V	3.0	36.1	1.0	-53.7	-13.0	-40.7	
5134.50	-15.8	V	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6846.00	-14.6	V	3.0	35.7	1.0	-49.2	-13.0	-36.2	
3423.00	-19.6	H	3.0	36.1	1.0	-54.7	-13.0	-41.7	
5134.50	-16.3	H	3.0	35.4	1.0	-50.8	-13.0	-37.8	
6846.00	-13.0	H	3.0	35.7	1.0	-47.7	-13.0	-34.7	
<b>Mid Ch, 1745MHz</b>									
3490.00	-19.0	V	3.0	36.0	1.0	-54.0	-13.0	-41.0	
5235.00	-16.5	V	3.0	35.4	1.0	-50.9	-13.0	-37.9	
6980.00	-15.2	V	3.0	35.7	1.0	-49.9	-13.0	-36.9	
3490.00	-19.2	H	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5235.00	-15.8	H	3.0	35.4	1.0	-49.9	-13.0	-36.9	
6980.00	-13.0	H	3.0	35.7	1.0	-48.6	-13.0	-35.6	
<b>High Ch, 1778.5MHz</b>									
3557.00	-18.9	V	3.0	36.0	1.0	-53.9	-13.0	-40.9	
5335.50	-16.6	V	3.0	35.4	1.0	-51.0	-13.0	-38.0	
7114.00	-14.1	V	3.0	35.7	1.0	-48.8	-13.0	-35.8	
3557.00	-19.2	H	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5335.50	-16.7	H	3.0	35.4	1.0	-51.1	-13.0	-38.1	
7114.00	-13.0	H	3.0	35.7	1.0	-47.6	-13.0	-34.6	

LTE B66 3MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/20/2017  
 Test Engineer: 43575 OS  
 Configuration: EUT + HS + Charger  
 Location: Chamber D  
 Mode: LTE\_16QAM Band 66 Harmonics, 3MHz 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, 1711.5MHz</b>									
3423.00	-19.5	V	3.0	36.1	1.0	-54.6	-13.0	-41.6	
5134.50	-16.4	V	3.0	35.4	1.0	-50.9	-13.0	-37.9	
6846.00	-14.5	V	3.0	35.7	1.0	-49.2	-13.0	-36.2	
3423.00	-19.1	H	3.0	36.1	1.0	-54.1	-13.0	-41.1	
5134.50	-14.9	H	3.0	35.4	1.0	-49.3	-13.0	-36.3	
6846.00	-13.4	H	3.0	35.7	1.0	-48.0	-13.0	-35.0	
<b>Mid Ch, 1745MHz</b>									
3490.00	-18.5	V	3.0	36.0	1.0	-53.6	-13.0	-40.6	
5235.00	-16.9	V	3.0	35.4	1.0	-51.3	-13.0	-38.3	
6980.00	-14.8	V	3.0	35.7	1.0	-49.5	-13.0	-36.5	
3490.00	-19.5	H	3.0	36.0	1.0	-54.5	-13.0	-41.5	
5235.00	-16.0	H	3.0	35.4	1.0	-50.4	-13.0	-37.4	
6980.00	-13.5	H	3.0	35.7	1.0	-48.2	-13.0	-35.2	
<b>High Ch, 1778.5MHz</b>									
3557.00	-19.3	V	3.0	36.0	1.0	-54.3	-13.0	-41.3	
5335.50	-19.9	V	3.0	35.4	1.0	-50.4	-13.0	-37.4	
7114.00	-14.0	V	3.0	35.7	1.0	-48.7	-13.0	-35.7	
3557.00	-19.3	H	3.0	36.0	1.0	-54.3	-13.0	-41.3	
5335.50	-16.0	H	3.0	35.4	1.0	-50.5	-13.0	-37.5	
7114.00	-13.6	H	3.0	35.7	1.0	-48.3	-13.0	-35.3	

LTE B66 3MHz 16QAM

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/20/17  
 Test Engineer: 50820  
 Configuration: EUT + HS + CHARGER  
 Mode: LTE Band 66, 5MHz QPSK

Test Equipment:  
 Substitution: Horn T39 Substitution, and 8R SMA Cable

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
<b>Low Channel (1712.5MHz)</b>										
3.43	-87.7	H	3.0	-26.6	33.3	10.0	-43.9	-13.0	-30.9	
5.14	-86.3	H	3.0	-19.7	32.9	10.0	-38.6	-13.0	-25.6	
6.85	-87.5	H	3.0	-13.7	31.1	10.0	-34.8	-13.0	-21.8	
3.43	-87.5	V	3.0	-26.5	33.3	10.0	-43.6	-13.0	-30.6	
5.14	-86.1	V	3.0	-19.9	32.9	10.0	-38.8	-13.0	-25.8	
6.85	-87.7	V	3.0	-13.9	31.1	10.0	-34.9	-13.0	-21.9	
<b>Mid Channel (1745.0MHz)</b>										
3.49	-88.8	H	3.0	-21.3	33.4	10.0	-44.6	-13.0	-31.6	
5.24	-87.2	H	3.0	-16.5	32.8	10.0	-39.3	-13.0	-26.3	
6.98	-87.9	H	3.0	-14.1	30.9	10.0	-35.0	-13.0	-22.0	
3.49	-88.9	V	3.0	-21.5	33.4	10.0	-44.9	-13.0	-31.9	
5.24	-87.4	V	3.0	-17.1	32.8	10.0	-39.9	-13.0	-26.9	
6.98	-88.6	V	3.0	-16.5	30.9	10.0	-35.4	-13.0	-22.4	
<b>High Channel (1777.5MHz)</b>										
3.56	-87.2	H	3.0	-19.7	33.4	10.0	-43.1	-13.0	-30.1	
5.33	-87.9	H	3.0	-16.1	32.7	10.0	-38.0	-13.0	-25.0	
7.11	-86.4	H	3.0	-12.4	30.8	10.0	-32.7	-13.0	-20.7	
3.56	-88.0	V	3.0	-20.4	33.4	10.0	-43.8	-13.0	-30.8	
5.33	-86.7	V	3.0	-17.6	32.7	10.0	-40.4	-13.0	-27.4	
7.11	-86.4	V	3.0	-12.1	30.8	10.0	-32.9	-13.0	-19.9	

LTE B66 5MHz QPSK

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

Company: SOMC  
 Project #: 12073310  
 Date: 12/20/17  
 Test Engineer: 50820  
 Configuration: EUT + HS + CHARGER  
 Mode: LTE Band 66, 5MHz QPSK

Test Equipment:  
 Substitution: Horn T39 Substitution, and 8R SMA Cable

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
<b>Low Channel (1712.5MHz)</b>										
3.43	-87.7	H	3.0	-26.6	33.3	10.0	-43.9	-13.0	-30.9	
5.14	-86.3	H	3.0	-19.7	32.9	10.0	-38.6	-13.0	-25.6	
6.85	-87.5	H	3.0	-13.7	31.1	10.0	-34.8	-13.0	-21.8	
3.43	-87.5	V	3.0	-26.5	33.3	10.0	-43.6	-13.0	-30.6	
5.14	-86.1	V	3.0	-19.9	32.9	10.0	-38.8	-13.0	-25.8	
6.85	-87.7	V	3.0	-13.9	31.1	10.0	-34.9	-13.0	-2	

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

Company: SOAC  
 Project #: 12073310  
 Date: 12/20/17  
 Test Engineer: 5020  
 Configuration: EUT + HS + CHARGER  
 Mode: LTE Band 6E, 15MHz QPSK

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

Chamber	Pre-amplifier	Filter	Limit
3m Chamber D	3m Chamber D	10dB Pad	ERP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	ERP @ TX Ant End (dBm)	Preamp	Attenuator	ERP	Limit	Delta	Notes
<b>Low Channel (1715MHz)</b>										
3.43	48.4	H	3.0	21.4	33.3	10.0	44.8	-13.0	-11.8	
5.15	47.1	H	3.0	16.5	32.0	10.0	39.4	-13.0	-26.4	
6.86	48.3	H	3.0	14.5	31.0	10.0	35.7	-13.0	-22.7	
3.43	49.9	V	3.0	21.8	33.3	10.0	45.1	-13.0	-32.1	
5.15	44.7	V	3.0	14.5	32.0	10.0	37.4	-13.0	-24.4	
6.86	48.7	V	3.0	14.8	31.0	10.0	35.9	-13.0	-22.9	
<b>Mid Channel (1745.8MHz)</b>										
3.49	48.9	H	3.0	20.7	33.4	10.0	44.0	-13.0	-31.0	
5.24	46.8	H	3.0	16.1	32.0	10.0	38.9	-13.0	-25.9	
6.98	47.8	H	3.0	14.0	30.9	10.0	34.9	-13.0	-21.9	
3.49	48.7	V	3.0	21.3	33.4	10.0	44.7	-13.0	-31.7	
5.24	47.1	V	3.0	16.0	32.0	10.0	38.6	-13.0	-26.6	
6.99	48.3	V	3.0	14.2	30.9	10.0	35.1	-13.0	-22.1	
<b>High Channel (1775MHz)</b>										
3.55	48.1	H	3.0	20.8	33.4	10.0	44.2	-13.0	-31.2	
5.33	49.1	H	3.0	18.2	32.7	10.0	40.9	-13.0	-27.9	
7.10	46.9	H	3.0	12.9	30.8	10.0	33.7	-13.0	-20.7	
3.55	47.8	V	3.0	19.5	33.4	10.0	42.9	-13.0	-29.9	
5.33	48.5	V	3.0	18.0	32.7	10.0	40.7	-13.0	-27.7	
7.10	47.4	V	3.0	13.5	30.8	10.0	34.1	-13.0	-21.3	

Rev: 02.24.17

LTE B66 10MHz QPSK

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

Company: SOAC  
 Project #: 12073310  
 Date: 12/20/17  
 Test Engineer: 5020  
 Configuration: EUT + HS + CHARGER  
 Mode: LTE Band 6E, 15MHz 16QAM

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

Chamber	Pre-amplifier	Filter	Limit
3m Chamber D	3m Chamber D	10dB Pad	ERP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	ERP @ TX Ant End (dBm)	Preamp	Attenuator	ERP	Limit	Delta	Notes
<b>Low Channel (1715MHz)</b>										
3.43	48.2	H	3.0	21.0	33.3	10.0	44.4	-13.0	-31.4	
5.15	47.1	H	3.0	16.5	32.0	10.0	39.4	-13.0	-26.4	
6.86	47.4	H	3.0	14.0	31.0	10.0	34.0	-13.0	-22.0	
3.43	48.3	V	3.0	21.1	33.3	10.0	44.4	-13.0	-31.4	
5.15	46.5	V	3.0	16.2	32.0	10.0	39.6	-13.0	-26.6	
6.86	48.5	V	3.0	14.6	31.0	10.0	35.7	-13.0	-22.7	
<b>Mid Channel (1745.8MHz)</b>										
3.49	48.8	H	3.0	20.7	33.4	10.0	44.0	-13.0	-31.0	
5.24	47.6	H	3.0	16.9	32.0	10.0	39.7	-13.0	-26.7	
6.98	48.2	H	3.0	14.4	30.9	10.0	34.9	-13.0	-21.9	
3.49	48.8	V	3.0	20.8	33.4	10.0	44.0	-13.0	-31.0	
5.24	47.9	V	3.0	17.6	32.0	10.0	40.4	-13.0	-27.4	
6.99	48.7	V	3.0	14.8	30.9	10.0	35.5	-13.0	-22.5	
<b>High Channel (1775MHz)</b>										
3.55	48.8	H	3.0	19.8	33.4	10.0	43.0	-13.0	-30.0	
5.33	48.4	H	3.0	17.7	32.7	10.0	40.4	-13.0	-27.4	
7.10	46.8	H	3.0	14.0	30.8	10.0	34.0	-13.0	-21.0	
3.55	47.8	V	3.0	19.5	33.4	10.0	43.2	-13.0	-30.2	
5.33	47.8	V	3.0	17.3	32.7	10.0	40.0	-13.0	-27.0	
7.10	47.3	V	3.0	13.6	30.8	10.0	33.8	-13.0	-20.8	

Rev: 02.24.17

LTE B66 10MHz 16QAM

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

Company: SOAC  
 Project #: 12073310  
 Date: 12/20/17  
 Test Engineer: 5020  
 Configuration: EUT + HS + CHARGER  
 Mode: LTE Band 6E, 15MHz QPSK

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

Chamber	Pre-amplifier	Filter	Limit
3m Chamber D	3m Chamber D	10dB Pad	ERP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	ERP @ TX Ant End (dBm)	Preamp	Attenuator	ERP	Limit	Delta	Notes
<b>Low Channel (1715.8MHz)</b>										
3.44	48.4	H	3.0	19.2	33.3	10.0	42.6	-13.0	-29.6	
5.13	45.5	H	3.0	14.0	32.0	10.0	37.0	-13.0	-24.0	
6.87	46.8	H	3.0	13.2	31.0	10.0	34.2	-13.0	-21.2	
3.44	47.5	V	3.0	20.3	33.3	10.0	43.6	-13.0	-30.6	
5.13	47.9	V	3.0	16.8	32.0	10.0	39.7	-13.0	-26.7	
6.87	46.8	V	3.0	12.9	31.0	10.0	33.9	-13.0	-20.9	
<b>Mid Channel (1745.8MHz)</b>										
3.49	47.9	H	3.0	20.6	33.4	10.0	43.9	-13.0	-30.9	
5.24	47.1	H	3.0	16.2	32.0	10.0	39.4	-13.0	-26.4	
6.98	48.1	H	3.0	14.3	30.9	10.0	35.2	-13.0	-22.2	
3.49	47.6	V	3.0	20.2	33.4	10.0	43.6	-13.0	-30.6	
5.24	46.4	V	3.0	16.3	32.0	10.0	39.1	-13.0	-26.1	
6.99	48.9	V	3.0	14.8	30.9	10.0	35.7	-13.0	-22.7	
<b>High Channel (1775.8MHz)</b>										
3.55	47.9	H	3.0	20.4	33.4	10.0	43.8	-13.0	-30.8	
5.32	48.3	H	3.0	17.4	32.7	10.0	40.2	-13.0	-27.2	
7.09	46.3	H	3.0	14.3	30.8	10.0	35.1	-13.0	-22.1	
3.55	48.5	V	3.0	21.9	33.4	10.0	44.4	-13.0	-31.4	
5.32	47.6	V	3.0	17.1	32.7	10.0	39.8	-13.0	-26.8	
7.09	46.7	V	3.0	12.4	30.8	10.0	33.2	-13.0	-20.2	

Rev: 02.24.17

LTE B66 15MHz QPSK

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

Company: SOAC  
 Project #: 12073310  
 Date: 12/20/17  
 Test Engineer: 5020  
 Configuration: EUT + HS + CHARGER  
 Mode: LTE Band 6E, 15MHz 16QAM

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

Chamber	Pre-amplifier	Filter	Limit
3m Chamber D	3m Chamber D	10dB Pad	ERP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	ERP @ TX Ant End (dBm)	Preamp	Attenuator	ERP	Limit	Delta	Notes
<b>Low Channel (1715.8MHz)</b>										
3.44	48.5	H	3.0	21.1	33.3	10.0	44.5	-13.0	-31.5	
5.13	47.5	H	3.0	16.9	32.0	10.0	39.9	-13.0	-26.9	
6.87	48.7	H	3.0	13.1	31.0	10.0	34.1	-13.0	-21.1	
3.44	48.8	V	3.0	20.8	33.3	10.0	44.1	-13.0	-31.1	
5.13	47.6	V	3.0	17.4	32.0	10.0	40.3	-13.0	-27.3	
6.87	47.4	V	3.0	13.7	31.0	10.0	34.7	-13.0	-21.7	
<b>Mid Channel (1745.8MHz)</b>										
3.49	47.4	H	3.0	20.1	33.4	10.0	43.4	-13.0	-30.4	
5.24	48.3	H	3.0	15.6	32.0	10.0	38.4	-13.0	-25.4	
6.98	47.7	H	3.0	13.9	30.9	10.0	34.8	-13.0	-21.8	
3.49	48.6	V	3.0	21.2	33.4	10.0	44.6	-13.0	-31.6	
5.24	46.5	V	3.0	16.2	32.0	10.0	39.0	-13.0	-26.0	
6.99	47.8	V	3.0	13.7	30.9	10.0	34.6	-13.0	-21.6	
<b>High Channel (1775.8MHz)</b>										
3.55	48.5	H	3.0	21.0	33.4	10.0	44.4	-13.0	-31.4	
5.32	48.8	H	3.0	19.7	32.7	10.0	43.0	-13.0	-29.0	
7.09	47.4	H	3.0	13.4	30.8	10.0	34.2	-13.0	-21.2	
3.55	47.4	V	3.0	19.9	33.4	10.0	43.3	-13.0	-30.3	
5.32	48.1	V	3.0	17.6	32.7	10.0	40.9	-13.0	-27.9	
7.09	48.5	V	3.0	14.2	30.8	10.0	35.0	-13.0	-22.0	

Rev: 02.24.17

LTE B66 15MHz 16QAM

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

Company: SOAC  
 Project #: 12073310  
 Date: 12/20/17  
 Test Engineer: 5020  
 Configuration: EUT + HS + CHARGER  
 Mode: LTE Band 6E, 20MHz QPSK

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

Chamber	Pre-amplifier	Filter	Limit
3m Chamber D	3m Chamber D	10dB Pad	ERP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	ERP @ TX Ant End (dBm)	Preamp	Attenuator	ERP	Limit	Delta	Notes
<b>Low Channel (1720.8MHz)</b>										
3.44	49.2	H	3.0	18.0	33.3	10.0	41.3	-13.0	-28.3	
5.16	46.7	H	3.0	16.1	32.0	10.0	39.0	-13.0	-26.0	
6.89	47.7	H	3.0	14.1	31.0	10.0	35.1	-13.0	-22.1	
3.44	47.5	V	3.0	20.3	33.3	10.0	43.6	-13.0	-30.6	
5.16	47.9	V	3.0	17.1	32.0	10.0	40.0	-13.0	-27.0	
6.88	48.5	V	3.0	14.6	31.0	10.0	36.0	-13.0	-23.0	
<b>Mid Channel (1745.8MHz)</b>										
3.49	48.1	H	3.0	18.8	33.4	10.0	42.1	-13.0	-29.1	
5.24	47.4	H	3.0	16.7	32.0	10.0	39.5	-13.0	-26.5	
6.98	47.1	H	3.0	13.3	30.9	10.0	34.2	-13.0	-21.2	
3.49	47.6	V	3.0	20.7	33.4	10.0	43.6	-13.0	-30.6	
5.24	47.9	V	3.0	16.7	32.0	10.0	39.5	-13.0	-26.5	
6.99	47.5	V	3.0	13.3	30.9	10.0	34.2	-13.0	-21.2	
<b>High Channel (1770.8MHz)</b>										
3.54	48.9	H	3.0	19.4	33.4	10.0	42.8	-13.0	-29.8	
5.31	47.1	H	3.0	17.0	32.7	10.0	39.8	-13.0	-26.8	
7.08	47.7	H	3.0	13.8	30.8	10.0	34.5	-13.0	-21.5	
3.54	48.6	V	3.0	19.8	33.4	10.0	42.8	-13.0	-2	