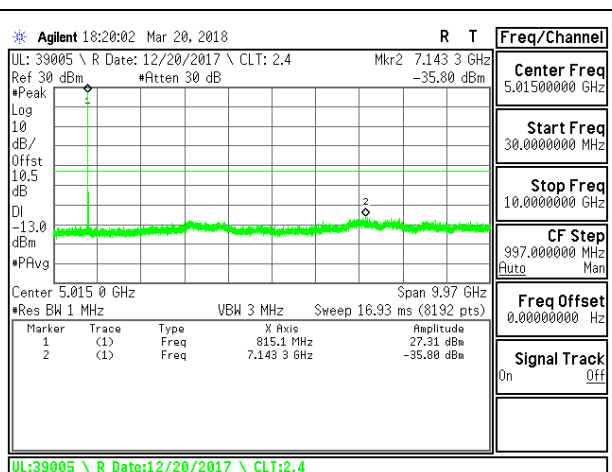
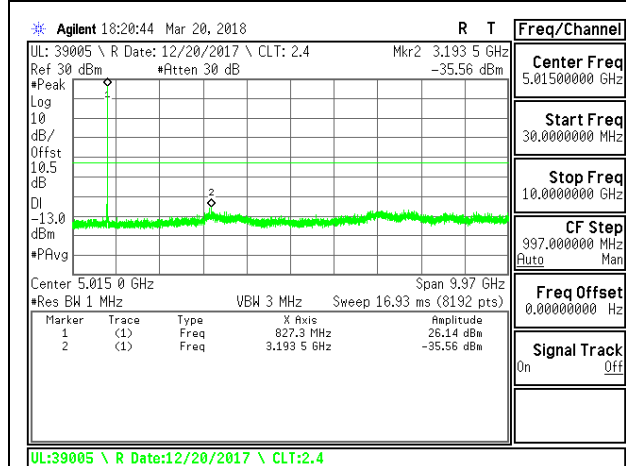


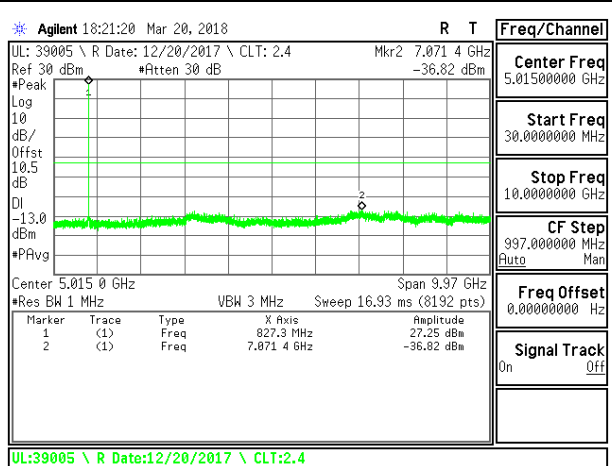
LTE B26 10MHz QPSK Low Channel RB1-0



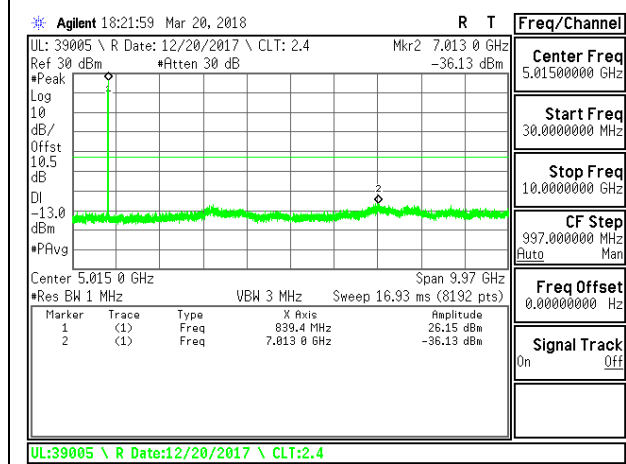
LTE B26 10MHz 16QAM Low Channel RB1-0



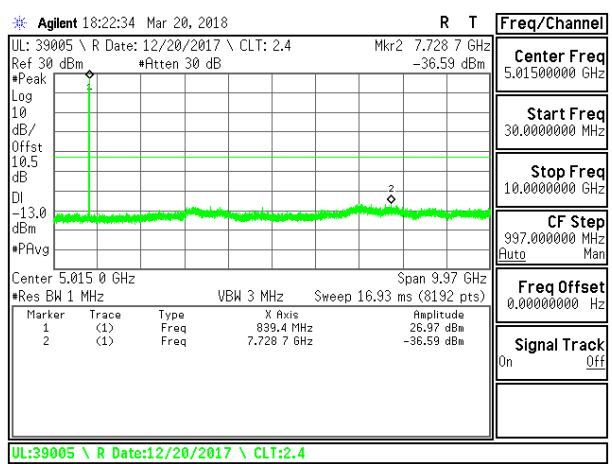
LTE B26 10MHz QPSK Middle Channel RB1-0



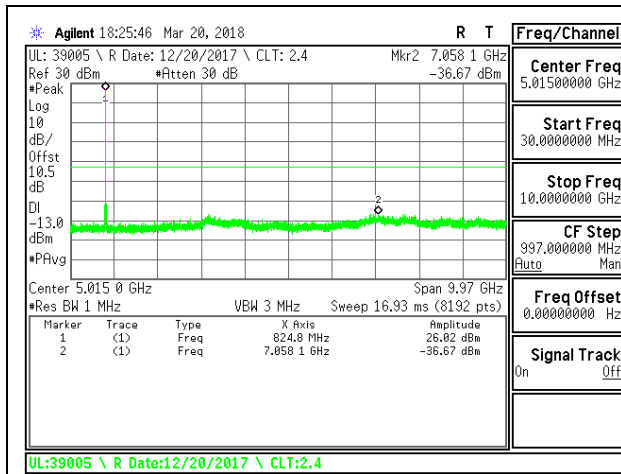
LTE B26 10MHz 16QAM Middle Channel RB1-0



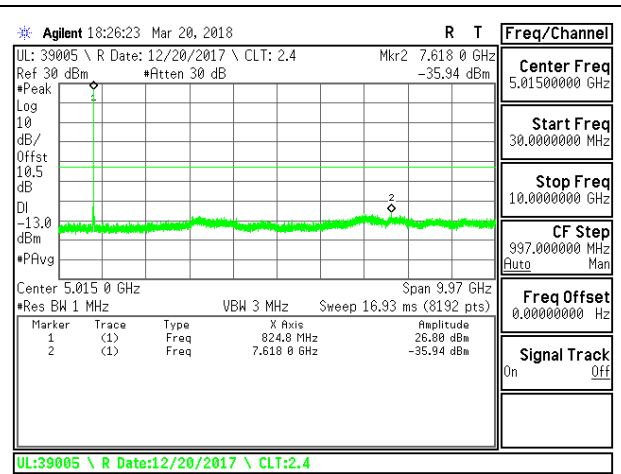
LTE B26 10MHz QPSK High Channel RB1-0



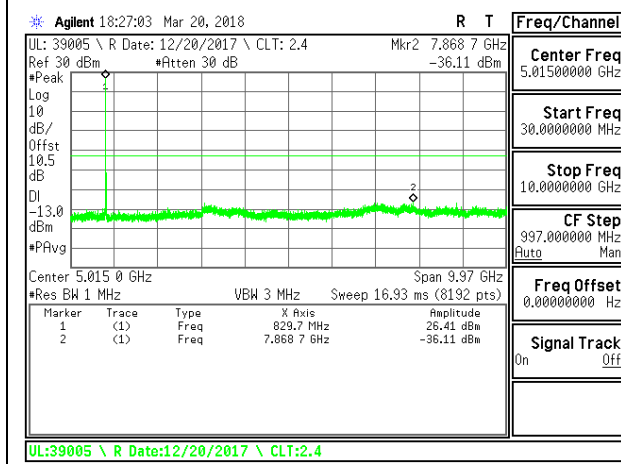
LTE B26 10MHz 16QAM High Channel RB1-0



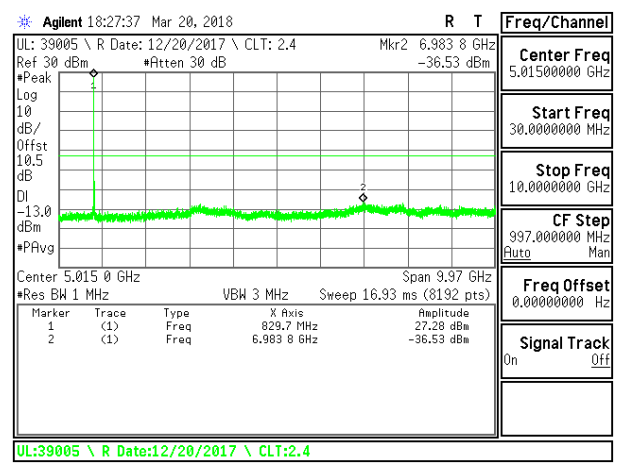
LTE B26 15MHz QPSK Low Channel RB1-0



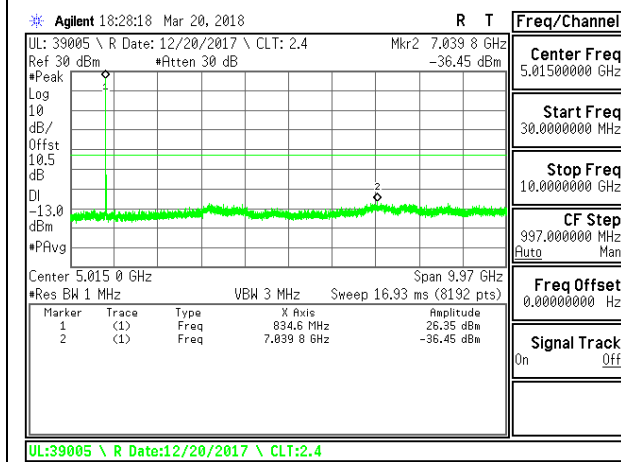
LTE B26 15MHz 16QAM Low Channel RB1-0



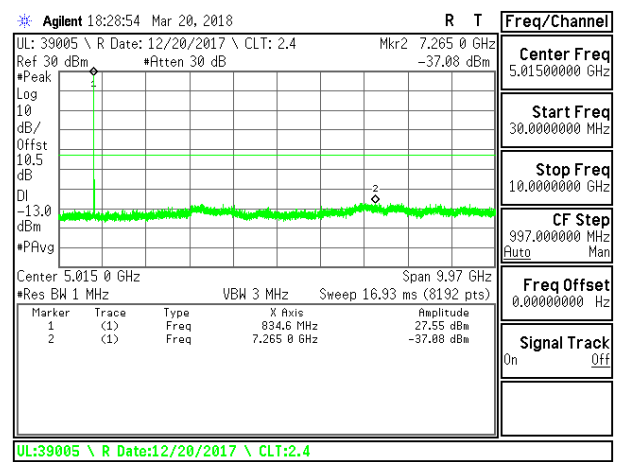
LTE B26 15MHz QPSK Middle Channel RB1-0



LTE B26 15MHz 16QAM Middle Channel RB1-0

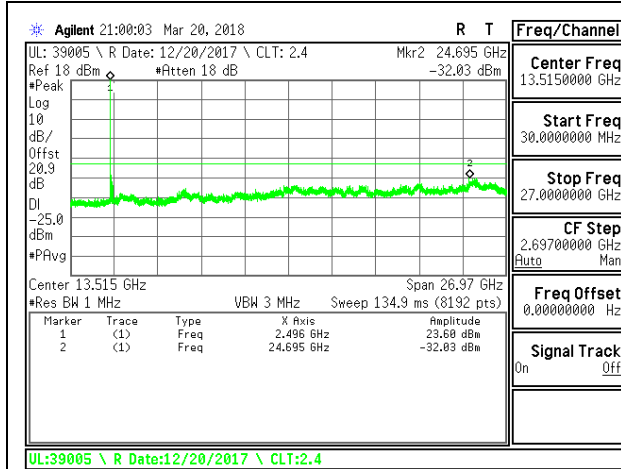


LTE B26 15MHz QPSK High Channel RB1-0

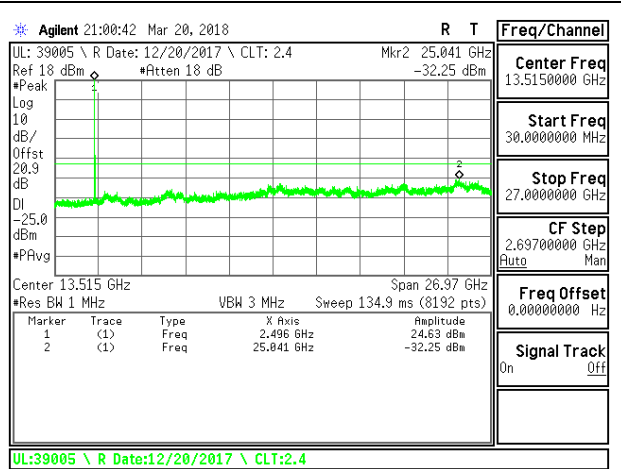


LTE B26 15MHz 16QAM High Channel RB1-0

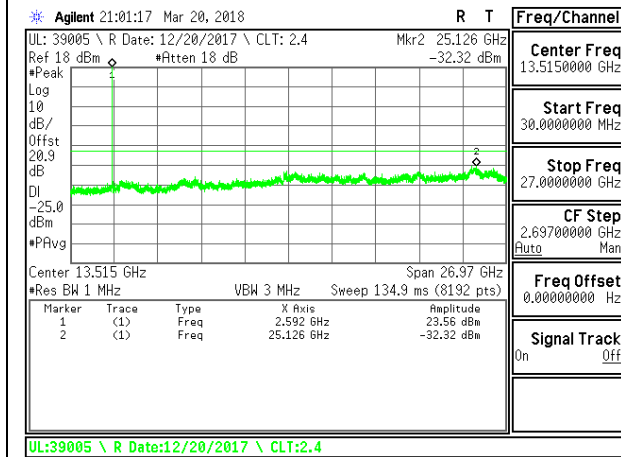
8.3.12. LTE BAND 41



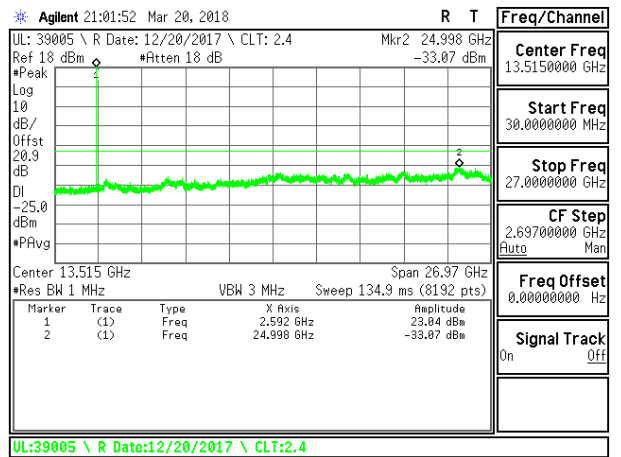
LTE B41 5MHz QPSK Low Channel RB1-0



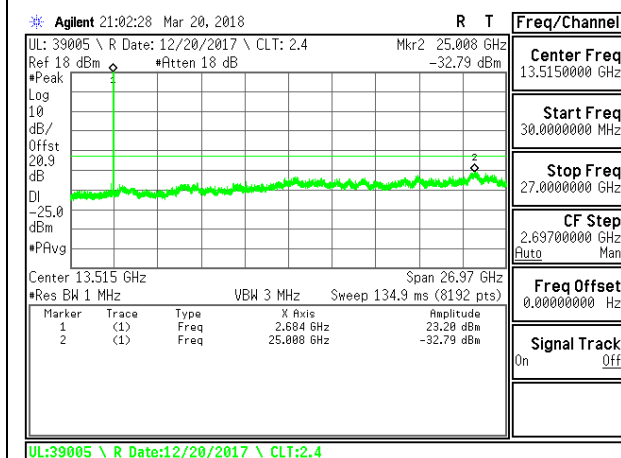
LTE B41 5MHz 16QAM Low Channel RB1-0



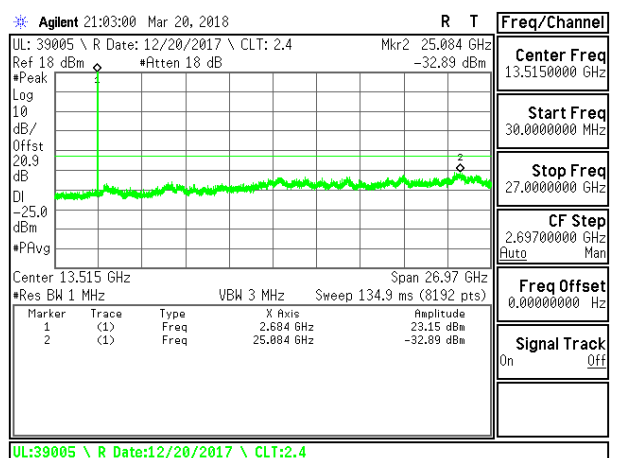
LTE B41 5MHz QPSK Middle Channel RB1-0



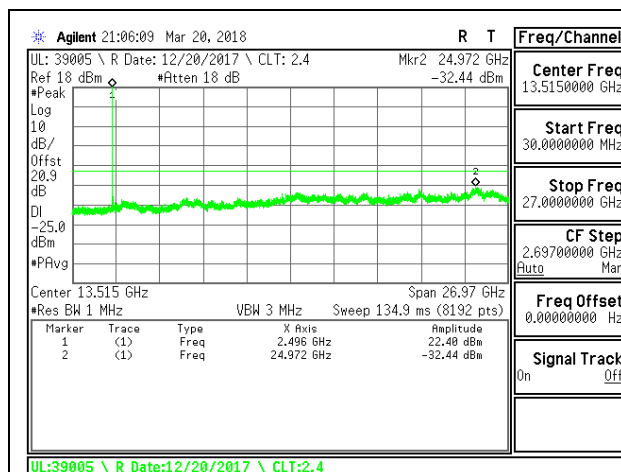
LTE B41 5MHz 16QAM Middle Channel RB1-0



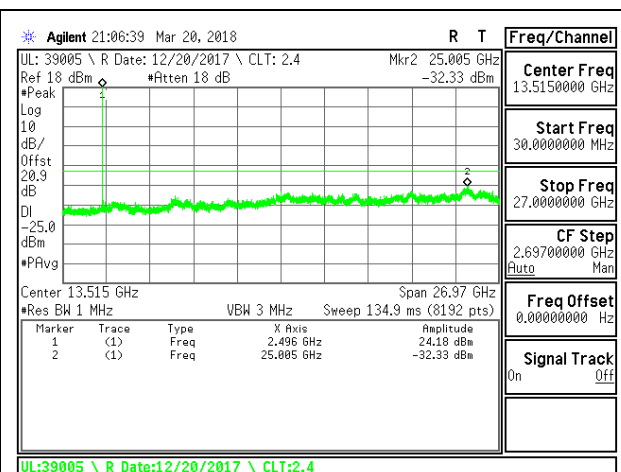
LTE B41 5MHz QPSK High Channel RB1-0



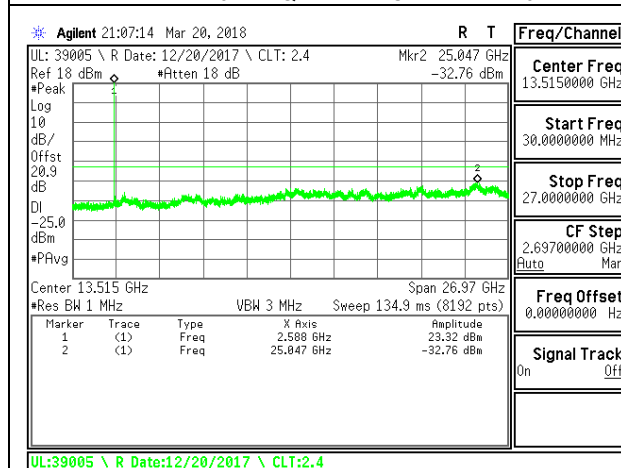
LTE B41 5MHz 16QAM High Channel RB1-0



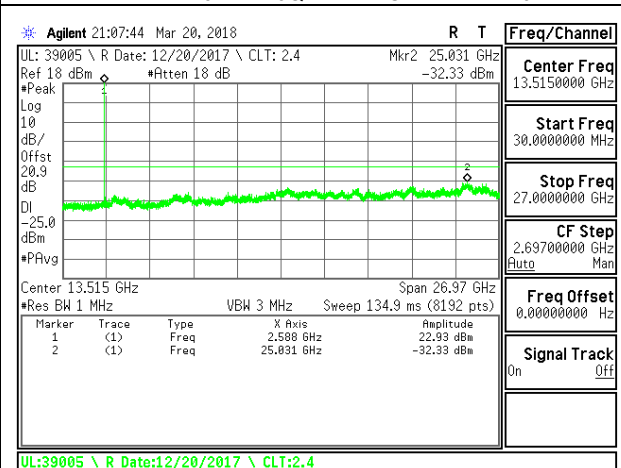
LTE B41 10MHz QPSK Low Channel RB1-0



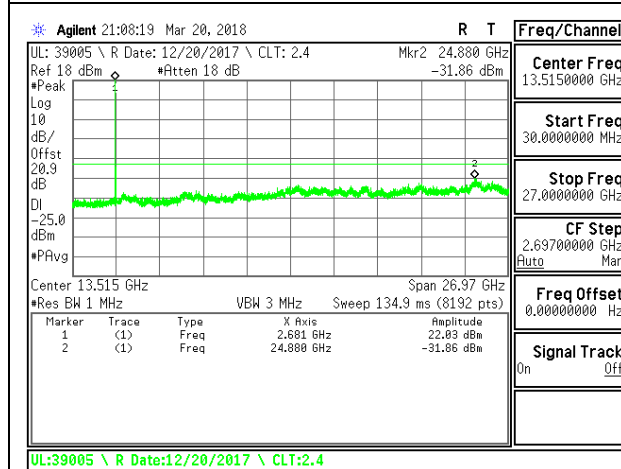
LTE B41 10MHz 16QAM Low Channel RB1-0



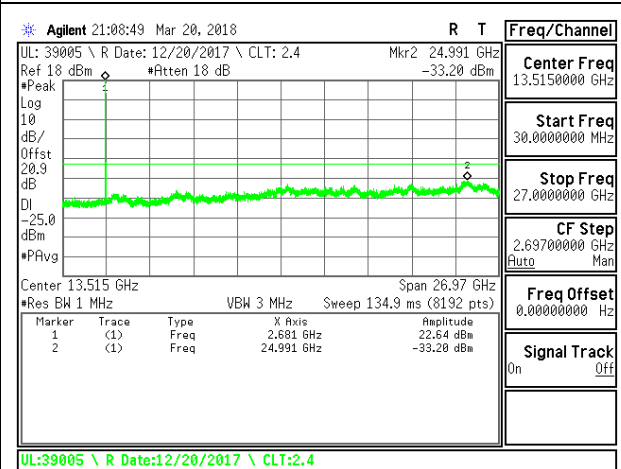
LTE B41 10MHz QPSK Middle Channel RB1-0



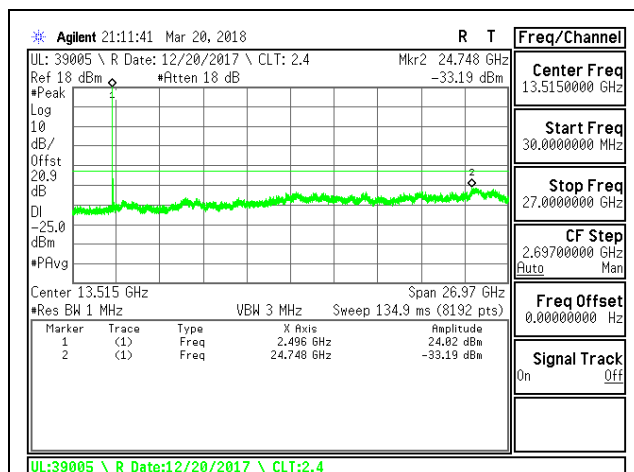
LTE B41 10MHz 16QAM Middle Channel RB1-0



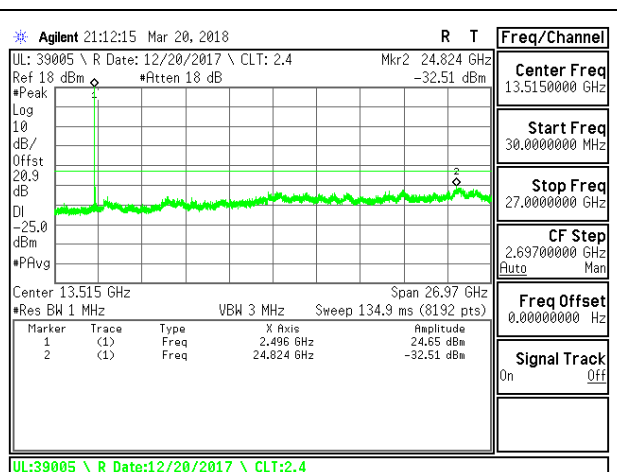
LTE B41 10MHz QPSK High Channel RB1-0



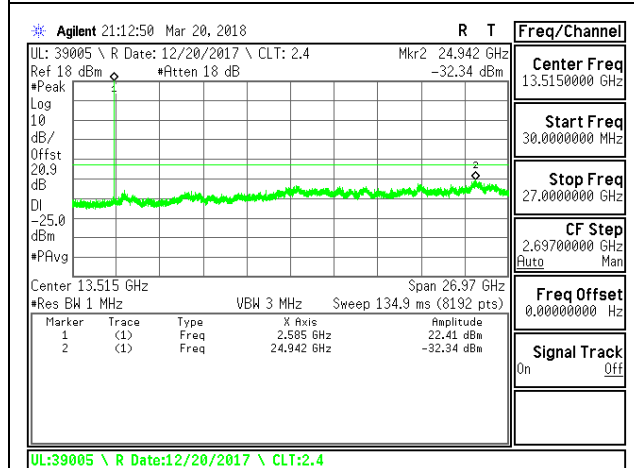
LTE B41 10MHz 16QAM High Channel RB1-0



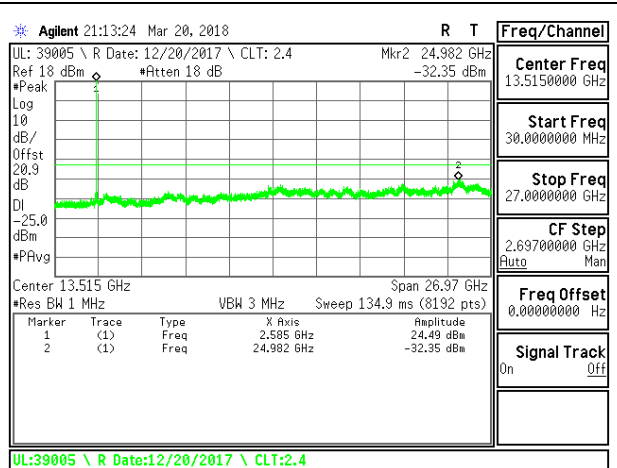
LTE B41 15MHz QPSK Low Channel RB1-0



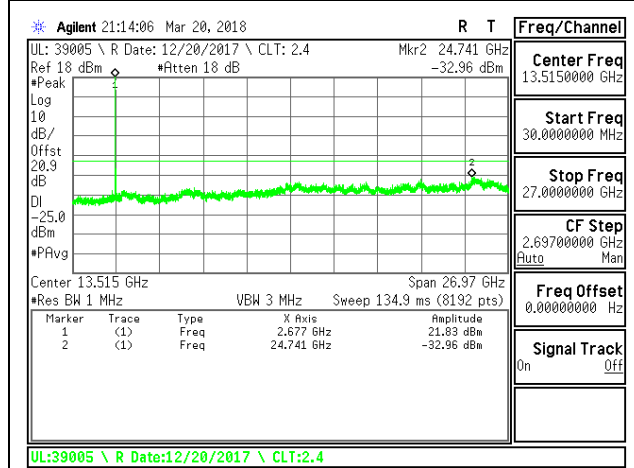
LTE B41 15MHz 16QAM Low Channel RB1-0



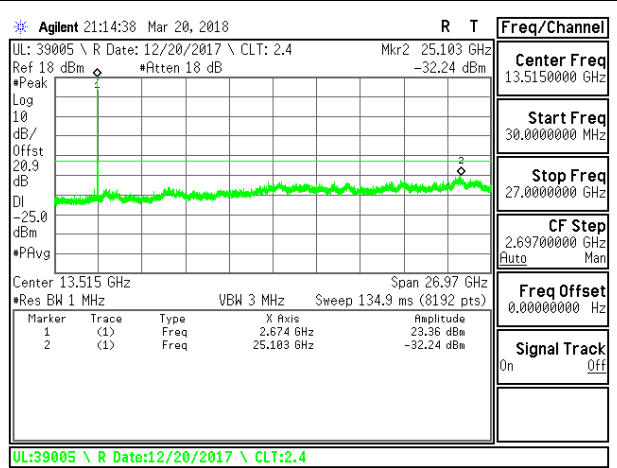
LTE B41 15MHz QPSK Middle Channel RB1-0



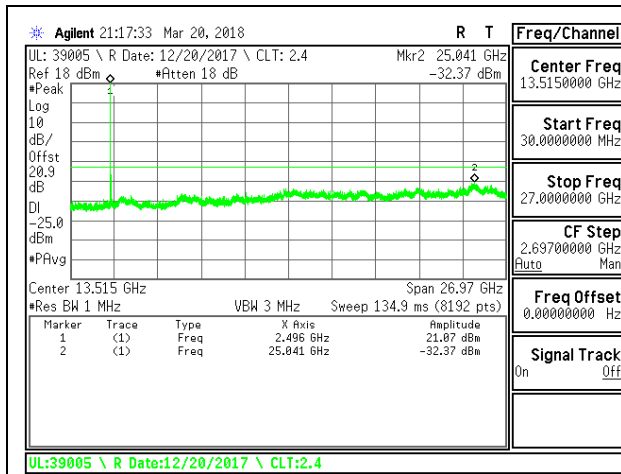
LTE B41 15MHz 16QAM Middle Channel RB1-0



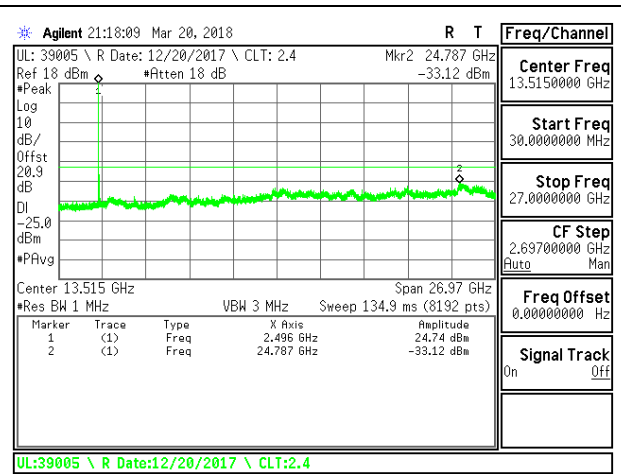
LTE B41 15MHz QPSK High Channel RB1-0



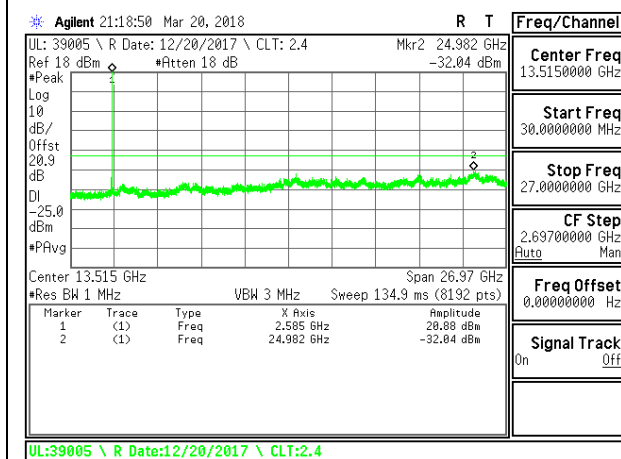
LTE B41 15MHz 16QAM High Channel RB1-0



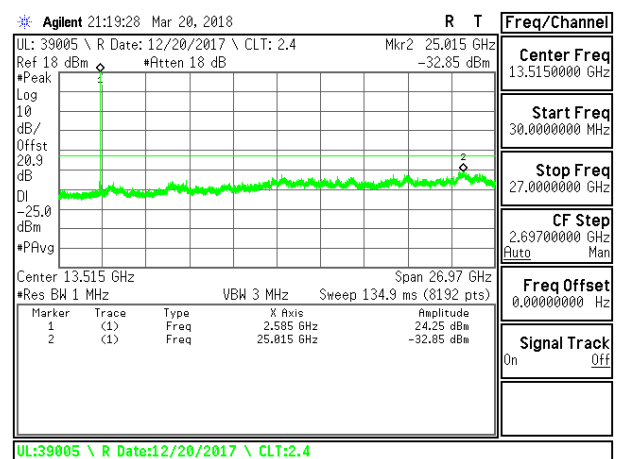
LTE B41 20MHz QPSK Low Channel RB1-0



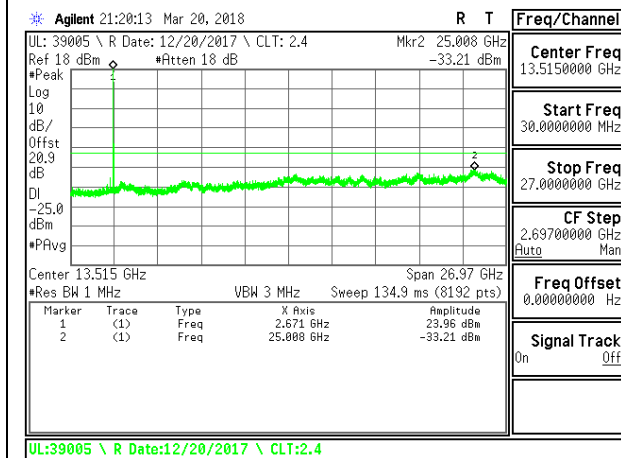
LTE B41 20MHz 16QAM Low Channel RB1-0



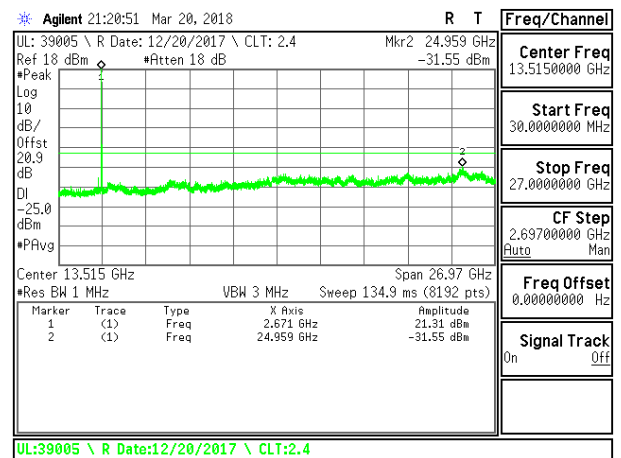
LTE B41 20MHz QPSK Middle Channel RB1-0



LTE B41 20MHz 16QAM Middle Channel RB1-0

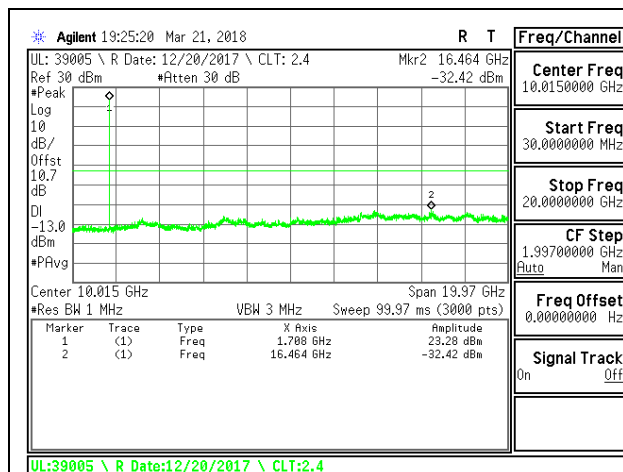


LTE B41 20MHz QPSK High Channel RB1-0

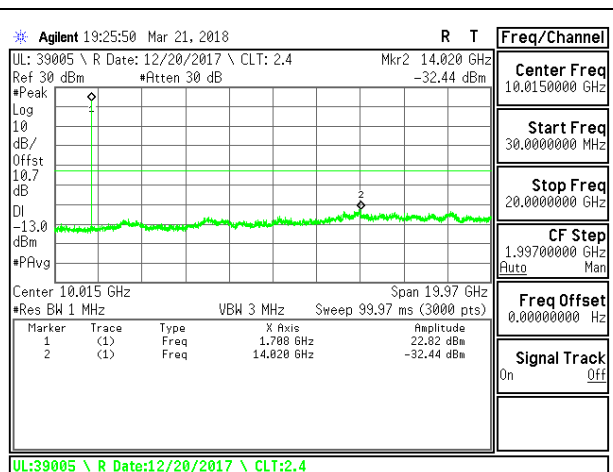


LTE B41 20MHz 16QAM High Channel RB1-0

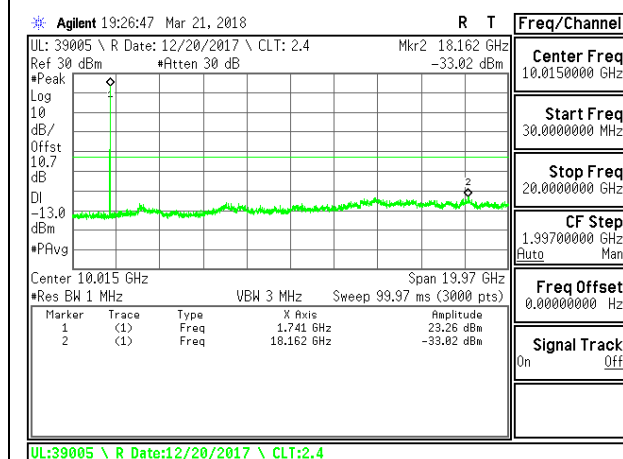
8.3.13. LTE BAND 66



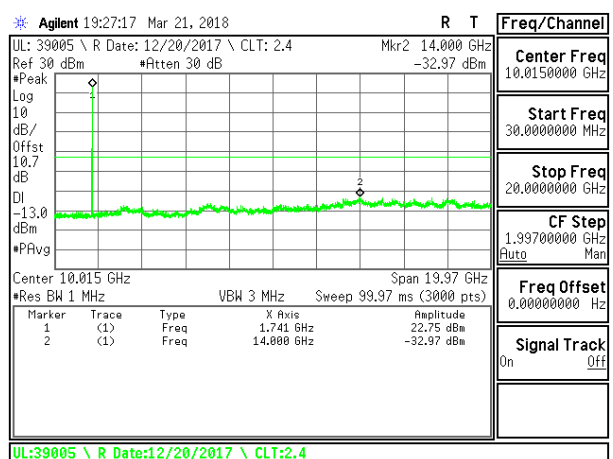
LTE B66 1.4MHz QPSK Low Channel RB1-0



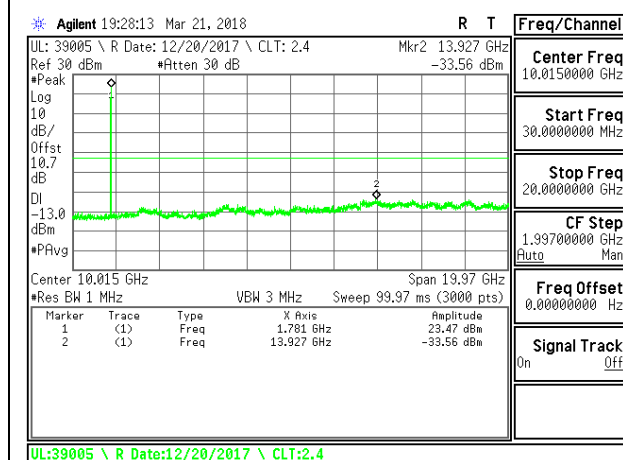
LTE B66 1.4MHz 16QAM Low Channel RB1-0



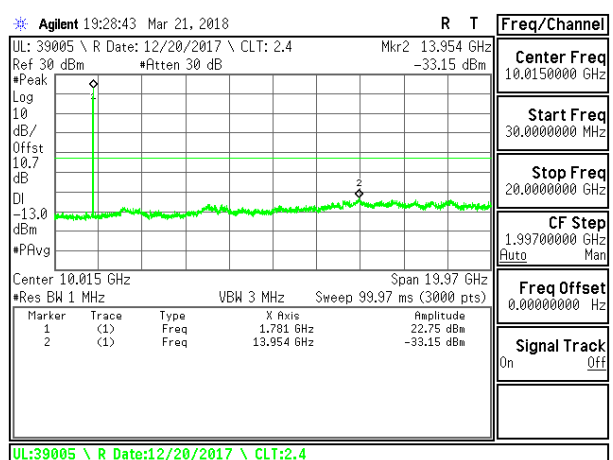
LTE B66 1.4MHz QPSK Middle Channel RB1-0



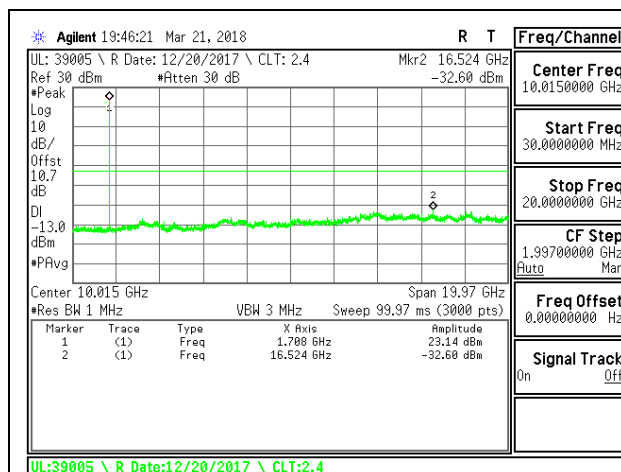
LTE B66 1.4MHz 16QAM Middle Channel RB1-0



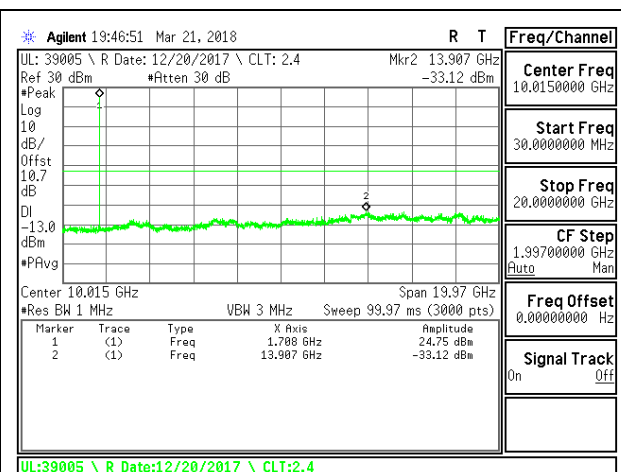
LTE B66 1.4MHz QPSK High Channel RB1-0



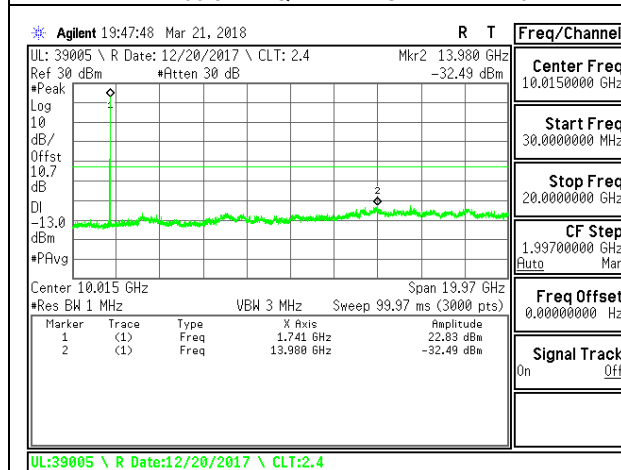
LTE B66 1.4MHz 16QAM High Channel RB1-0



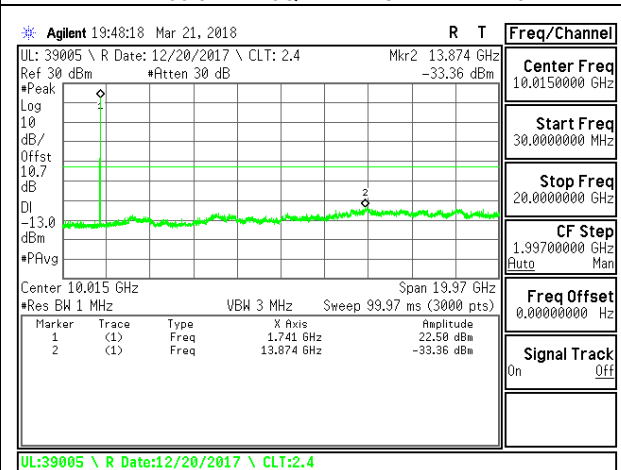
LTE B66 3MHz QPSK Low Channel RB1-0



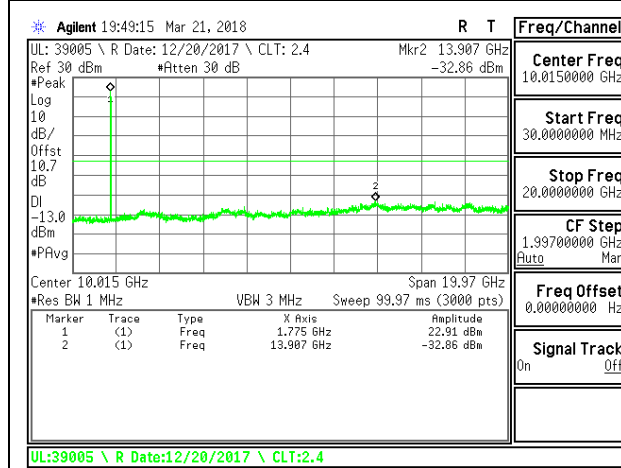
LTE B66 3MHz 16QAM Low Channel RB1-0



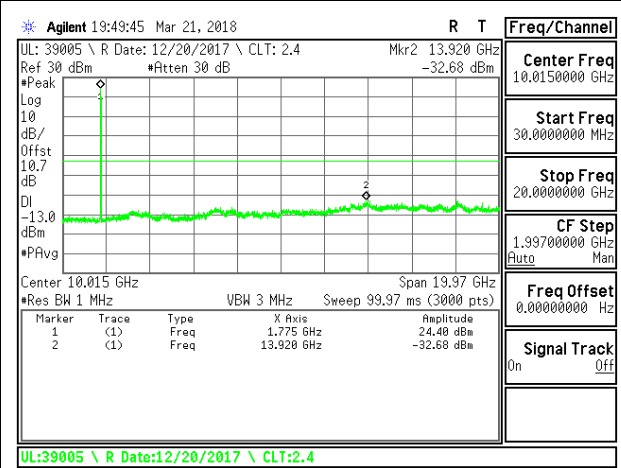
LTE B66 3MHz QPSK Middle Channel RB1-0



LTE B66 3MHz 16QAM Middle Channel RB1-0

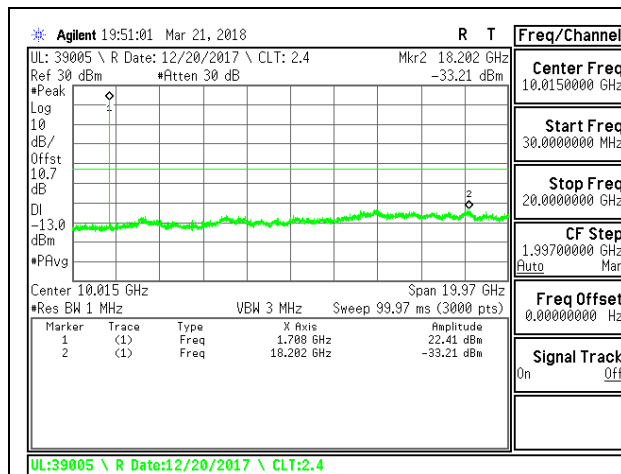


LTE B66 3MHz QPSK High Channel RB1-0

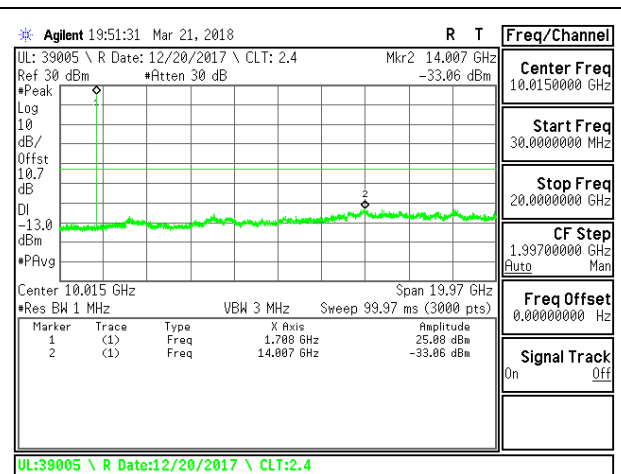


LTE B66 3MHz 16QAM High Channel RB1-0

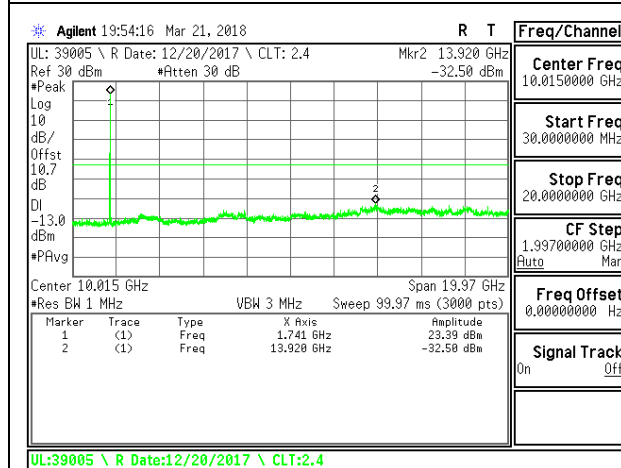




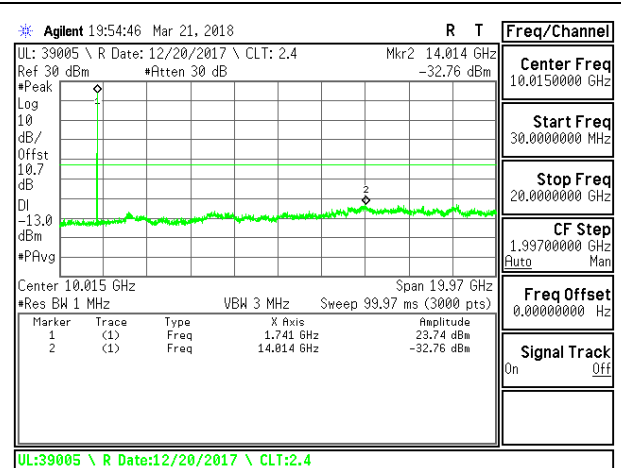
LTE B66 5MHz QPSK Low Channel RB1-0



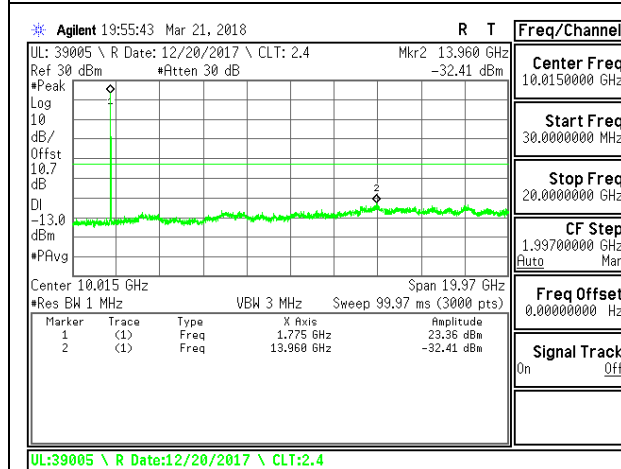
LTE B66 5MHz 16QAM Low Channel RB1-0



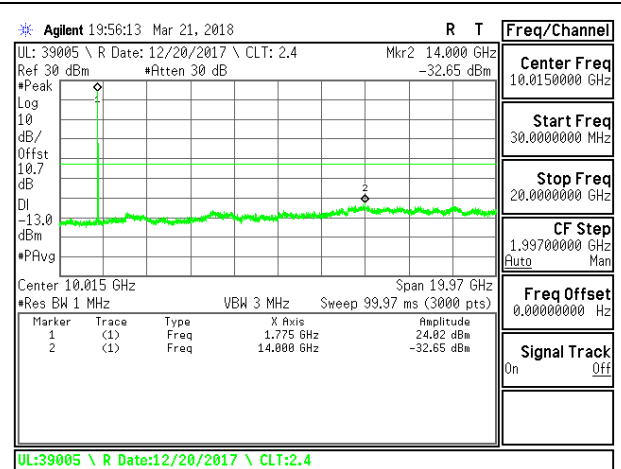
LTE B66 5MHz QPSK Middle Channel RB1-0



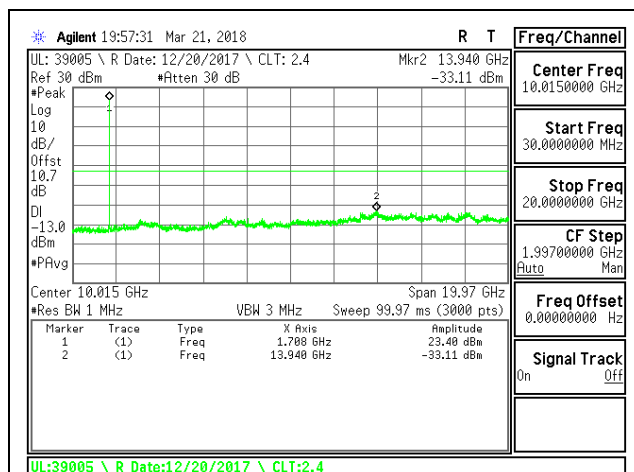
LTE B66 5MHz 16QAM Middle Channel RB1-0



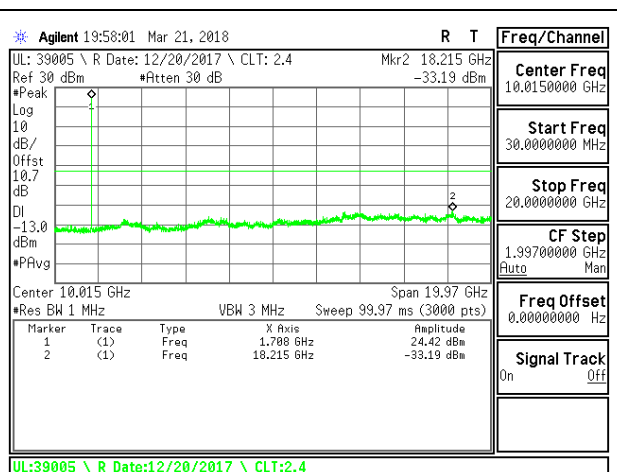
LTE B66 5MHz QPSK High Channel RB1-0



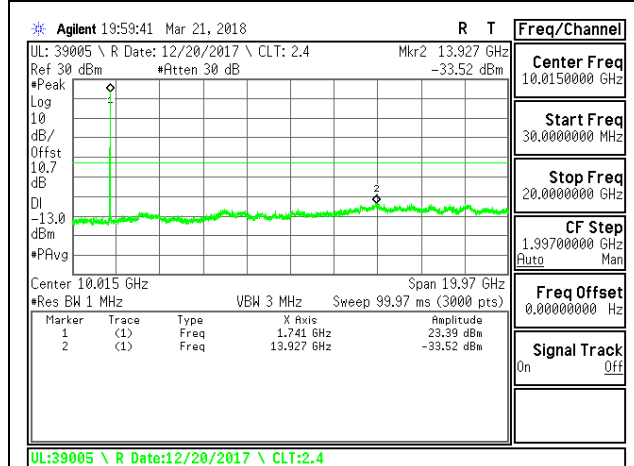
LTE B66 5MHz 16QAM High Channel RB1-0



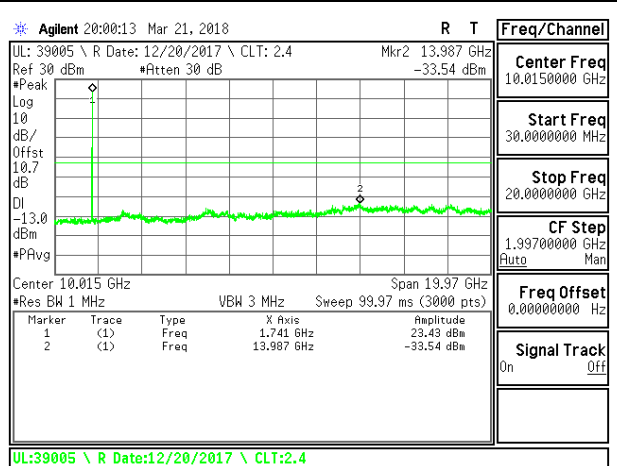
LTE B66 10MHz QPSK Low Channel RB1-0



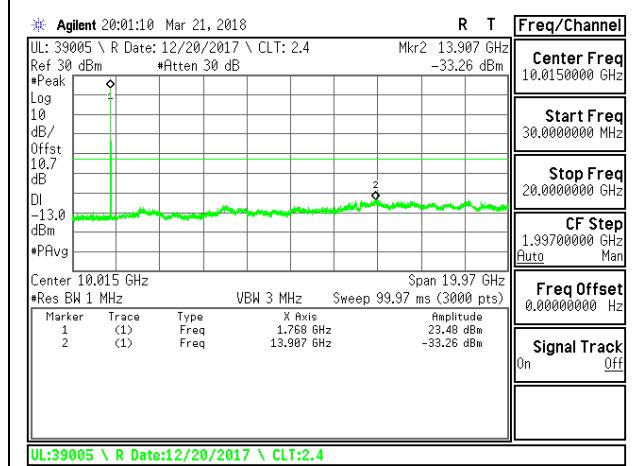
LTE B66 10MHz 16QAM Low Channel RB1-0



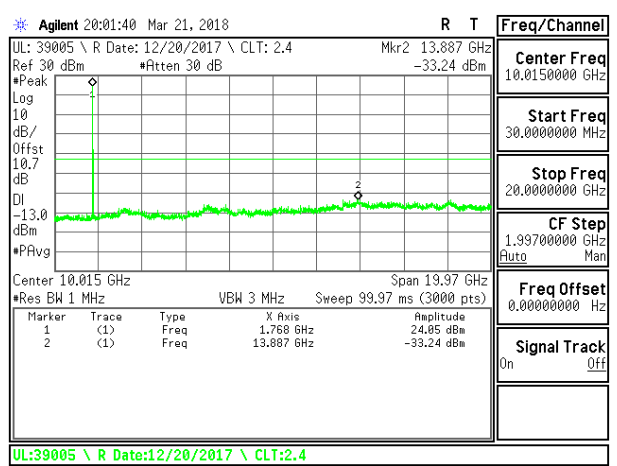
LTE B66 10MHz QPSK Middle Channel RB1-0



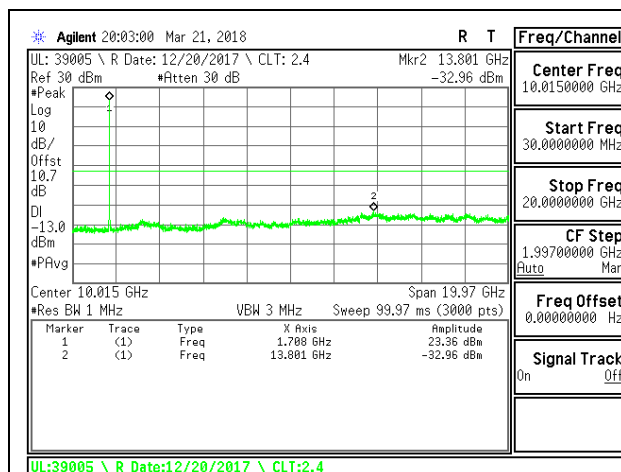
LTE B66 10MHz 16QAM Middle Channel RB1-0



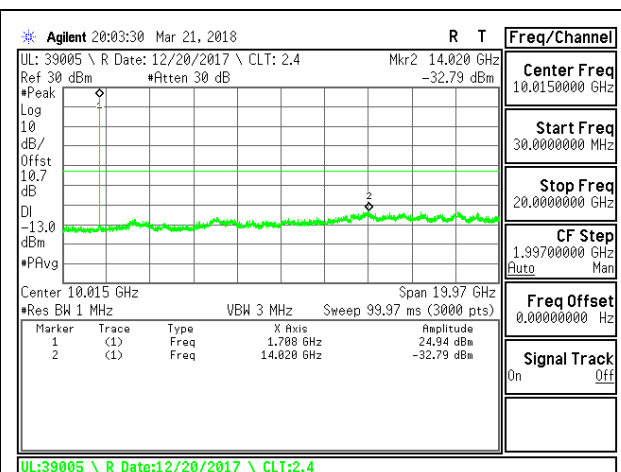
LTE B66 10MHz QPSK High Channel RB1-0



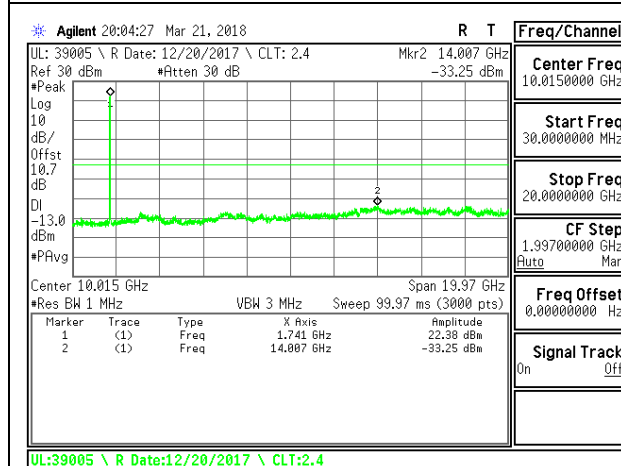
LTE B66 10MHz 16QAM High Channel RB1-0



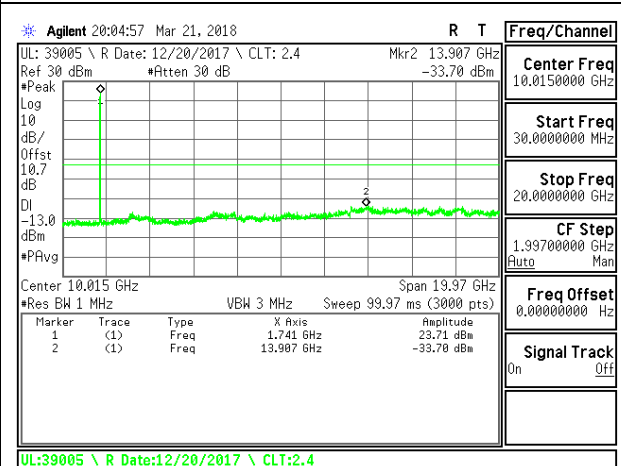
LTE B66 15MHz QPSK Low Channel RB1-0



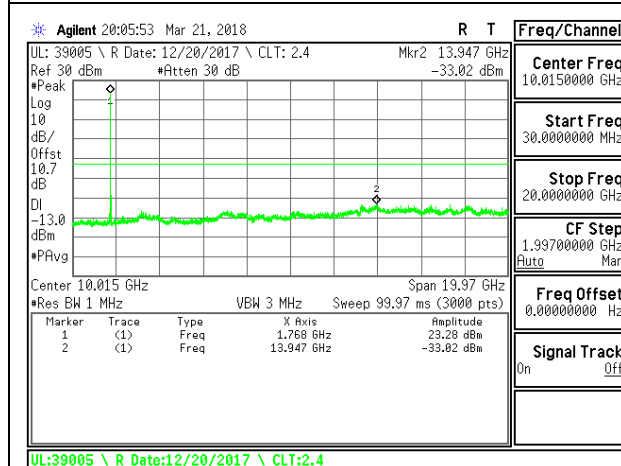
LTE B66 15MHz 16QAM Low Channel RB1-0



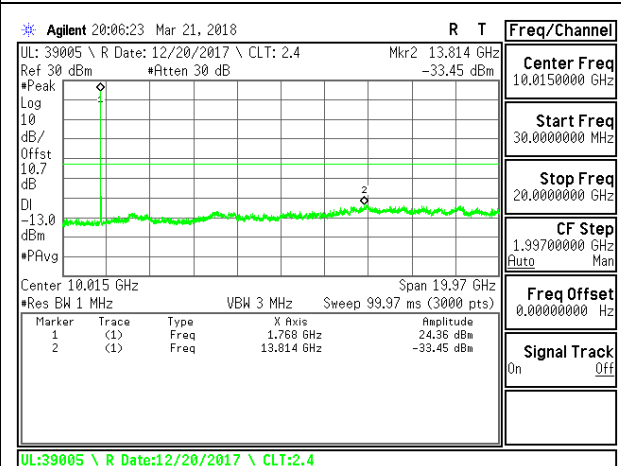
LTE B66 15MHz QPSK Middle Channel RB1-0



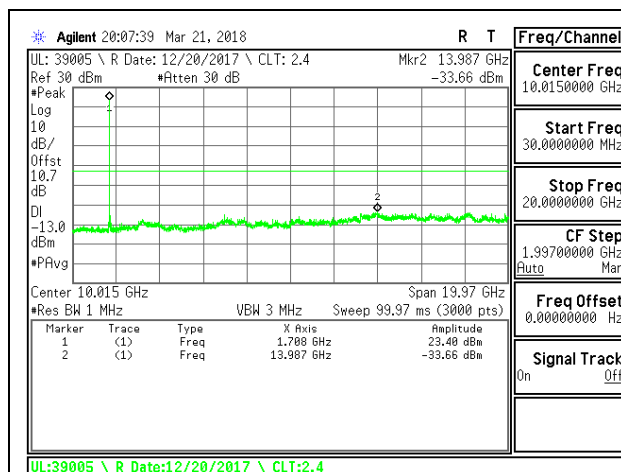
LTE B66 15MHz 16QAM Middle Channel RB1-0



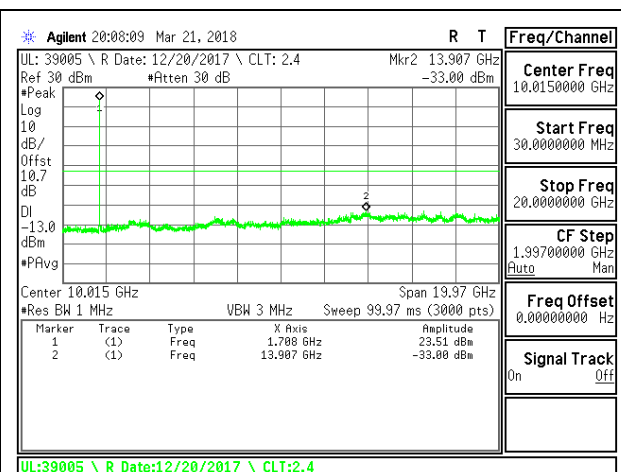
LTE B66 15MHz QPSK High Channel RB1-0



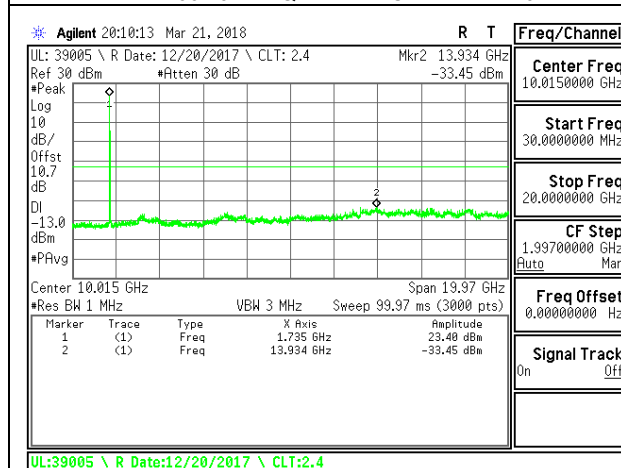
LTE B66 15MHz 16QAM High Channel RB1-0



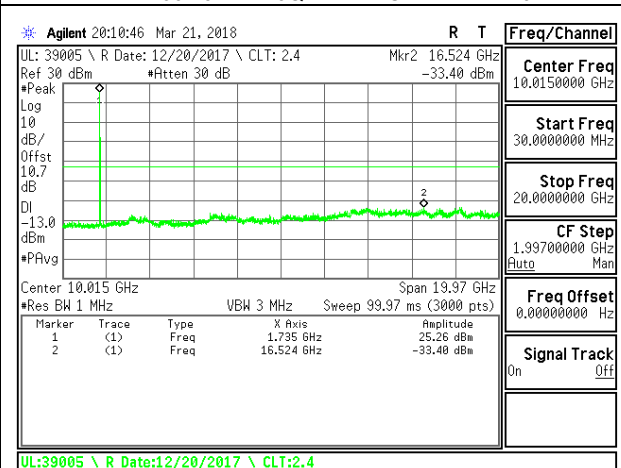
LTE B66 20MHz QPSK Low Channel RB1-0



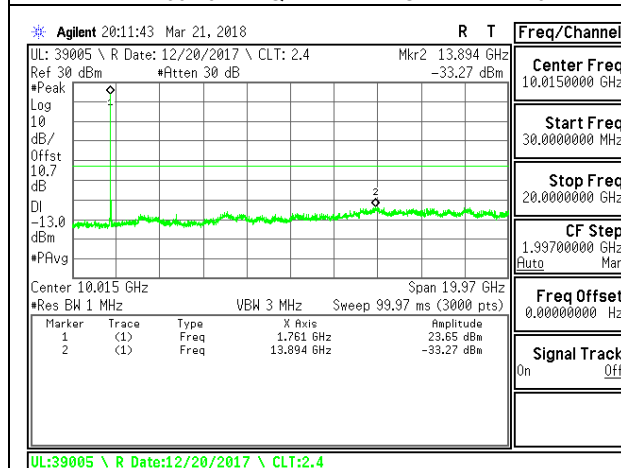
LTE B66 20MHz 16QAM Low Channel RB1-0



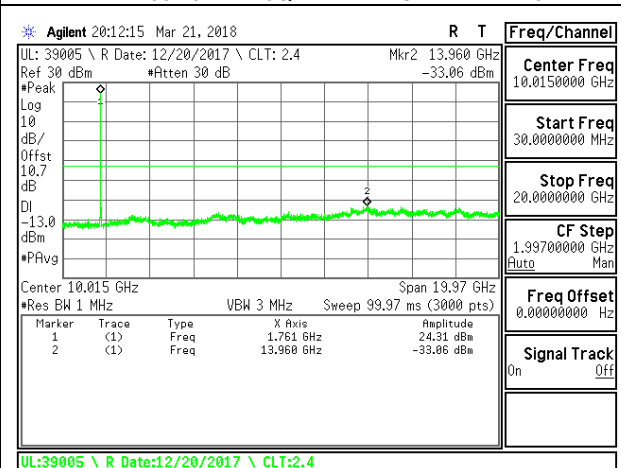
LTE B66 20MHz QPSK Middle Channel RB1-0



LTE B66 20MHz 16QAM Middle Channel RB1-0



LTE B66 20MHz QPSK High Channel RB1-0



LTE B66 20MHz 16QAM High Channel RB1-0

## 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

- GSM 850
- GSM 1900
- WCDM Band 2
- WCDM Band 4
- WCDM Band 5
- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 26
- LTE Band 41
- LTE Band 66

### RESULTS

**8.4.1. GSM 850MHz**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.0322	848.9772		
Extreme (50C)		824.0322	848.9772	10.2	0.01
Extreme (40C)		824.0322	848.9772	12.3	0.01
Extreme (30C)		824.0322	848.9772	12.1	0.01
Extreme (10C)		824.0322	848.9772	9.6	0.01
Extreme (0C)		824.0322	848.9772	14.2	0.02
Extreme (-10C)		824.0322	848.9772	12.5	0.01
Extreme (-20C)		824.0322	848.9772	13.3	0.02
Extreme (-30C)		824.0322	848.9772	12.2	0.01
20C	15%	824.0322	848.9772	12.5	0.01
	-15%	824.0322	848.9772	10.3	0.01
	End Point	824.0322	848.9772	12.2	0.01

**8.4.2. GSM 1900MHz**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.0285	1909.9702		
Extreme (50C)		1850.0285	1909.9703	15.5	0.01
Extreme (40C)		1850.0285	1909.9703	16.3	0.01
Extreme (30C)		1850.0285	1909.9703	17.3	0.01
Extreme (10C)		1850.0285	1909.9703	10.2	0.01
Extreme (0C)		1850.0285	1909.9703	11.5	0.01
Extreme (-10C)		1850.0285	1909.9703	15.2	0.01
Extreme (-20C)		1850.0285	1909.9703	18.3	0.01
Extreme (-30C)		1850.0285	1909.9703	18.0	0.01
20C	15%	1850.0285	1909.9703	13.5	0.01
	-15%	1850.0285	1909.9703	14.4	0.01
	End Point	1850.0285	1909.9703	15.4	0.01

**8.4.3. WCDMA BAND 2**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.1809	1909.8300		
Extreme (50C)		1850.1809	1909.8300	9.0	0.00
Extreme (40C)		1850.1809	1909.8300	8.7	0.00
Extreme (30C)		1850.1809	1909.8300	8.3	0.00
Extreme (10C)		1850.1809	1909.8300	8.3	0.00
Extreme (0C)		1850.1809	1909.8300	6.6	0.00
Extreme (-10C)		1850.1809	1909.8300	7.2	0.00
Extreme (-20C)		1850.1809	1909.8300	9.3	0.00
Extreme (-30C)		1850.1809	1909.8300	7.4	0.00
20C	15%	1850.1809	1909.8300	10.0	0.01
	-15%	1850.1809	1909.8300	6.6	0.00
	End Point	1850.1809	1909.8300	7.2	0.00

**8.4.4. WCDMA BAND 4**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1710.1734	1754.8275		
Extreme (50C)		1710.1734	1754.8275	-4.9	0.00
Extreme (40C)		1710.1734	1754.8275	-7.2	0.00
Extreme (30C)		1710.1734	1754.8275	-6.5	0.00
Extreme (10C)		1710.1734	1754.8275	-6.3	0.00
Extreme (0C)		1710.1734	1754.8275	-11.0	-0.01
Extreme (-10C)		1710.1734	1754.8275	-7.4	0.00
Extreme (-20C)		1710.1734	1754.8275	-6.2	0.00
Extreme (-30C)		1710.1734	1754.8275	-7.0	0.00
20C	15%	1710.1734	1754.8275	-10.3	-0.01
	-15%	1710.1734	1754.8275	-8.5	0.00
	End Point	1710.1734	1754.8275	-8.2	0.00

**8.4.5. WCDMA BAND 5**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.1467	848.8566		
Extreme (50C)		824.1467	848.8566	12.0	0.01
Extreme (40C)		824.1467	848.8566	11.4	0.01
Extreme (30C)		824.1467	848.8566	8.3	0.01
Extreme (10C)		824.1467	848.8566	11.3	0.01
Extreme (0C)		824.1467	848.8566	9.0	0.01
Extreme (-10C)		824.1467	848.8566	7.7	0.01
Extreme (-20C)		824.1467	848.8566	6.9	0.01
Extreme (-30C)		824.1467	848.8566	2.5	0.00
20C	15%	824.1467	848.8566	10.4	0.01
	-15%	824.1467	848.8566	12.3	0.01
	End Point	824.1467	848.8566	9.9	0.01

**8.4.6. LTE BAND 2**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.8890	1909.1530		
Extreme (50C)		1850.8890	1909.1530	13.6	0.007
Extreme (40C)		1850.8890	1909.1530	15.2	0.008
Extreme (30C)		1850.8890	1909.1530	15.9	0.008
Extreme (10C)		1850.8890	1909.1530	13.6	0.007
Extreme (0C)		1850.8890	1909.1530	14.8	0.008
Extreme (-10C)		1850.8890	1909.1530	17.7	0.009
Extreme (-20C)		1850.8890	1909.1530	13.6	0.007
Extreme (-30C)		1850.8890	1909.1530	18.6	0.010
20C	15%	1850.8890	1909.1530	15.8	0.008
	-15%	1850.8890	1909.1530	15.3	0.008
	End Point	1850.8890	1909.1530	14.8	0.008





### 8.4.7. LTE BAND 4

ID:	38005	Date:	3/29/18
-----	-------	-------	---------

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1710.8670	1754.1270	7.0	0.004
Extreme (50C)		1710.8670	1754.1270		
Extreme (40C)		1710.8670	1754.1270		
Extreme (30C)		1710.8670	1754.1270		
Extreme (10C)		1710.8670	1754.1270		
Extreme (0C)		1710.8670	1754.1270		
Extreme (-10C)		1710.8670	1754.1270		
Extreme (-20C)		1710.8670	1754.1270		
Extreme (-30C)		1710.8670	1754.1270		
20C		15%	1710.8670		
	-15%	1710.8670	1754.1270	6.5	0.004
	End Point	1710.8670	1754.1270	6.4	0.004

### 8.4.8. LTE BAND 5

ID:	38005	Date:	3/29/18
-----	-------	-------	---------

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.4300	848.5730	-8.3	-0.010
Extreme (50C)		824.4300	848.5730		
Extreme (40C)		824.4300	848.5730		
Extreme (30C)		824.4300	848.5730		
Extreme (10C)		824.4300	848.5730		
Extreme (0C)		824.4300	848.5730		
Extreme (-10C)		824.4300	848.5730		
Extreme (-20C)		824.4300	848.5730		
Extreme (-30C)		824.4300	848.5730		
20C		15%	824.4300		
	-15%	824.4300	848.5730	-6.7	-0.008
	End Point	824.4300	848.5730	-8.2	-0.010

**8.4.9. LTE BAND 7**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2500.9000	2569.0930		
Extreme (50C)		2500.9000	2569.0930	-12.8	-0.005
Extreme (40C)		2500.9000	2569.0930	12.4	0.005
Extreme (30C)		2500.9000	2569.0930	-14.2	-0.006
Extreme (10C)		2500.9000	2569.0930	11.6	0.005
Extreme (0C)		2500.9000	2569.0930	12.6	0.005
Extreme (-10C)		2500.9000	2569.0930	11.1	0.004
Extreme (-20C)		2500.9000	2569.0930	-12.1	-0.005
Extreme (-30C)		2500.9000	2569.0930	12.3	0.005
20C	15%	2500.9000	2569.0930	-12.9	-0.005
	-15%	2500.9000	2569.0930	10.9	0.004
	End Point	2500.9000	2569.0930	13.0	0.005

**8.4.10. LTE BAND 12**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	699.3300	715.6670		
Extreme (50C)		699.3300	715.6670	-3.5	0.00
Extreme (40C)		699.3300	715.6670	-2.4	0.00
Extreme (30C)		699.3300	715.6670	-3.6	-0.01
Extreme (10C)		699.3300	715.6670	-6.7	-0.01
Extreme (0C)		699.3300	715.6670	-6.4	-0.01
Extreme (-10C)		699.3300	715.6670	-5.2	-0.01
Extreme (-20C)		699.3300	715.6670	-6.2	-0.01
Extreme (-30C)		699.3300	715.6670	-6.3	-0.01
20C	15%	699.3300	715.6670	-6.9	-0.01
	-15%	699.3300	715.6670	-5.7	-0.01
	End Point	699.3300	715.6670	-5.1	-0.01

**8.4.11. LTE BAND 13**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	777.1634	786.8400		
Extreme (50C)		777.1634	786.8400	-9.3	-0.012
Extreme (40C)		777.1634	786.8400	-7.9	-0.010
Extreme (30C)		777.1634	786.8400	-8.3	-0.011
Extreme (10C)		777.1634	786.8400	-6.9	-0.009
Extreme (0C)		777.1634	786.8400	-8.1	-0.010
Extreme (-10C)		777.1634	786.8400	-9.0	-0.011
Extreme (-20C)		777.1634	786.8400	-5.5	-0.007
Extreme (-30C)		777.1634	786.8400	-7.7	-0.010
20C	15%	777.1634	786.8400	-9.3	-0.012
	-15%	777.1634	786.8400	-8.0	-0.010
	End Point	777.1634	786.8400	-8.3	-0.011

**8.4.12. LTE BAND 17**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		704	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	704.4230	715.5770		
Extreme (50C)		704.4230	715.5770	9.2	0.013
Extreme (40C)		704.4230	715.5770	7.7	0.011
Extreme (30C)		704.4230	715.5770	8.6	0.012
Extreme (10C)		704.4230	715.5770	10.6	0.015
Extreme (0C)		704.4230	715.5770	9.9	0.014
Extreme (-10C)		704.4230	715.5770	9.8	0.014
Extreme (-20C)		704.4230	715.5770	6.9	0.010
Extreme (-30C)		704.4230	715.5770	8.6	0.012
20C	15%	704.4230	715.5770	8.4	0.012
	-15%	704.4230	715.5770	9.6	0.014
	End Point	704.4230	715.5770	8.6	0.012

**8.4.13. LTE BAND 26(FCC PART 90S)**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	814.1642	823.8333		
Extreme (50C)		814.1642	823.8333	7.2	0.009
Extreme (40C)		814.1642	823.8333	8.9	0.011
Extreme (30C)		814.1642	823.8333	8.1	0.010
Extreme (10C)		814.1642	823.8333	10.4	0.013
Extreme (0C)		814.1642	823.8333	8.6	0.011
Extreme (-10C)		814.1642	823.8333	10.1	0.012
Extreme (-20C)		814.1642	823.8333	10.2	0.012
Extreme (-30C)		814.1642	823.8333	10.8	0.013
20C	15%	814.1642	823.8333	8.3	0.010
	-15%	814.1642	823.8333	9.3	0.011
	End Point	814.1642	823.8333	7.3	0.009

**8.4.14. LTE BAND 26(FCC PART 22)**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.5900	848.4050		
Extreme (50C)		824.5900	848.4050	8.2	0.010
Extreme (40C)		824.5900	848.4050	8.9	0.011
Extreme (30C)		824.5900	848.4050	8.1	0.010
Extreme (10C)		824.5900	848.4050	9.0	0.011
Extreme (0C)		824.5900	848.4050	8.6	0.010
Extreme (-10C)		824.5900	848.4050	12.2	0.015
Extreme (-20C)		824.5900	848.4050	13.0	0.016
Extreme (-30C)		824.5900	848.4050	11.2	0.013
20C	15%	824.5900	848.4050	8.1	0.010
	-15%	824.5900	848.4050	9.0	0.011
	End Point	824.5900	848.4050	9.3	0.011

**8.4.15. LTE BAND 41**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2496.5730	2689.5530		
Extreme (50C)		2496.5730	2689.5530	10.7	0.004
Extreme (40C)		2496.5730	2689.5530	8.6	0.003
Extreme (30C)		2496.5730	2689.5530	12.2	0.005
Extreme (10C)		2496.5730	2689.5530	12.7	0.005
Extreme (0C)		2496.5730	2689.5530	10.8	0.004
Extreme (-10C)		2496.5730	2689.5530	10.3	0.004
Extreme (-20C)		2496.5730	2689.5530	11.3	0.004
Extreme (-30C)		2496.5730	2689.5530	12.4	0.005
20C	15%	2496.5730	2689.5530	11.5	0.004
	-15%	2496.5730	2689.5530	13.0	0.005
	End Point	2496.5730	2689.5530	11.6	0.004

**8.4.16. LTE BAND 66**

<b>ID:</b>	38005	<b>Date:</b>	3/29/18
------------	-------	--------------	---------

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1710.8730	1779.1200		
Extreme (50C)		1710.8730	1779.1200	7.7	0.004
Extreme (40C)		1710.8730	1779.1200	7.2	0.004
Extreme (30C)		1710.8730	1779.1200	7.8	0.004
Extreme (10C)		1710.8730	1779.1200	9.0	0.005
Extreme (0C)		1710.8730	1779.1200	9.5	0.005
Extreme (-10C)		1710.8730	1779.1200	11.1	0.006
Extreme (-20C)		1710.8730	1779.1200	9.8	0.006
Extreme (-30C)		1710.8730	1779.1200	9.0	0.005
20C	15%	1710.8730	1779.1200	9.3	0.005
	-15%	1710.8730	1779.1200	9.4	0.005
	End Point	1710.8730	1779.1200	9.0	0.005

---

## 8.5. PEAK-TO-AVERAGE POWER RATIO

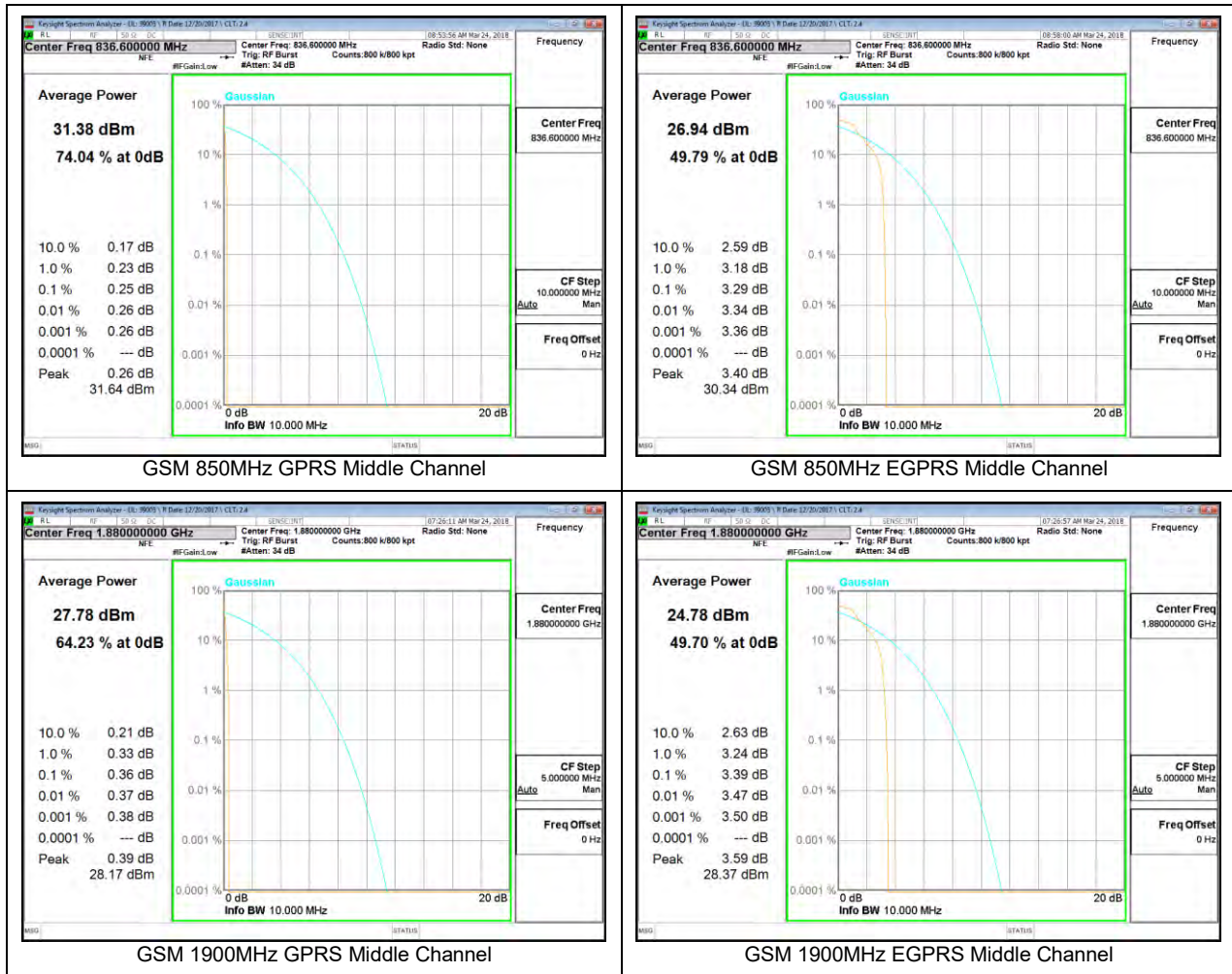
### LIMIT

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

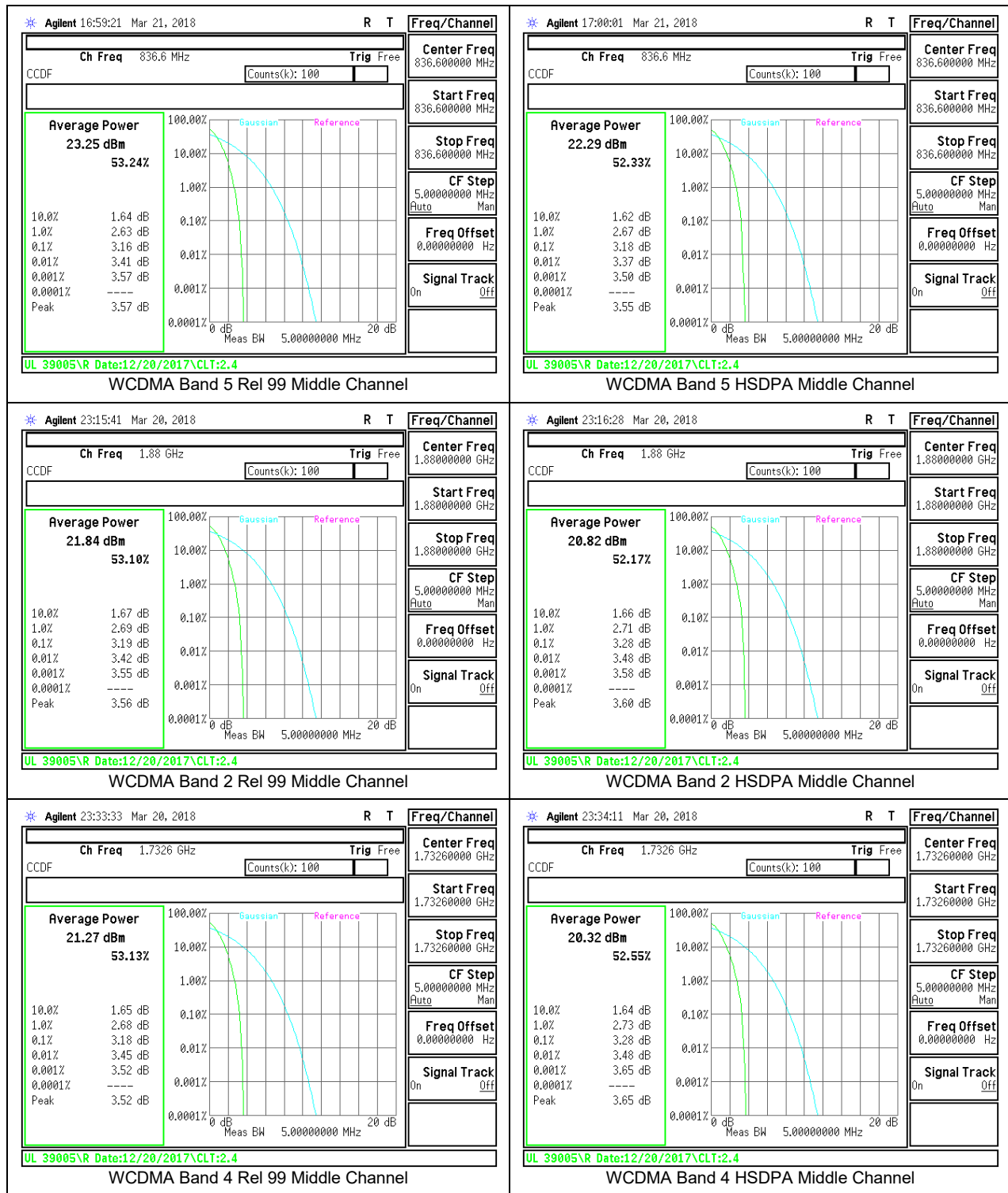
Full resource block (FRB) for each bandwidth was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average power ratio criteria.

8.5.1. GSM

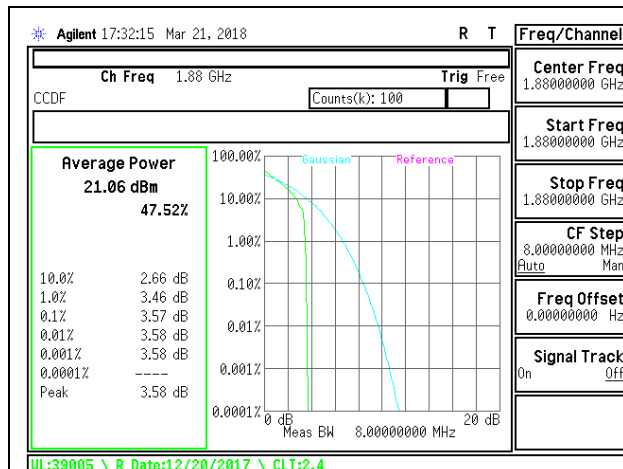




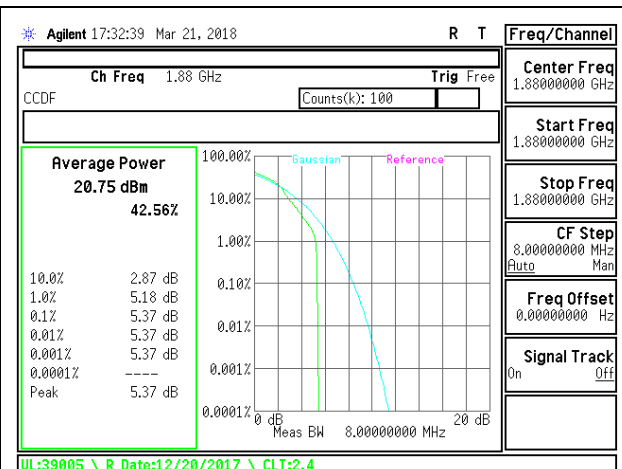
8.5.2. WCDMA



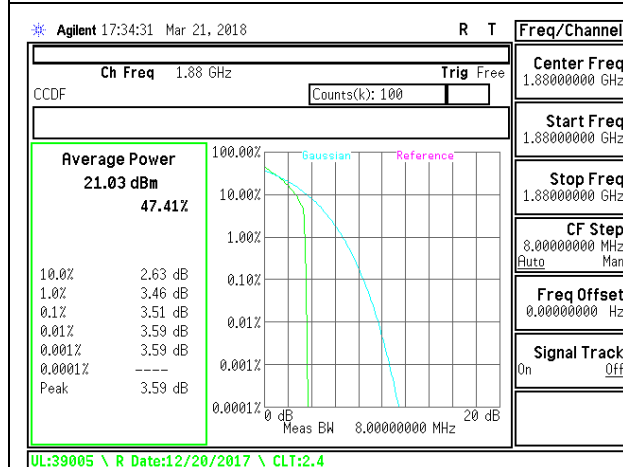
8.5.3. LTE BAND 2



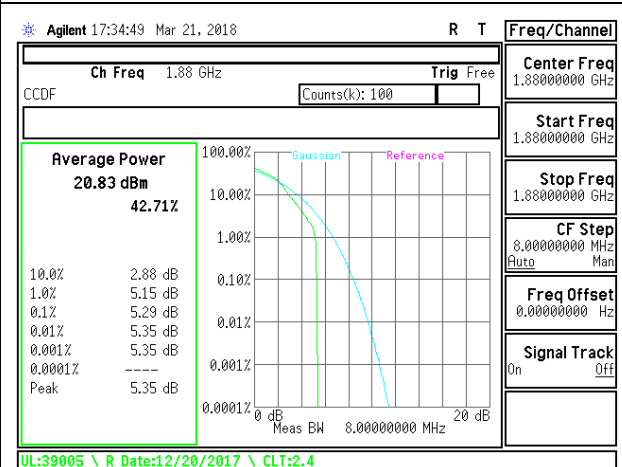
LTE B2 1.4MHz QPSK Middle Channel



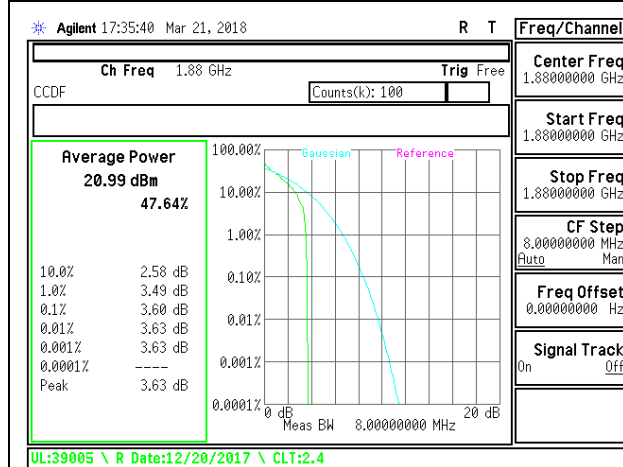
LTE B2 1.4MHz 16QAM Middle Channel



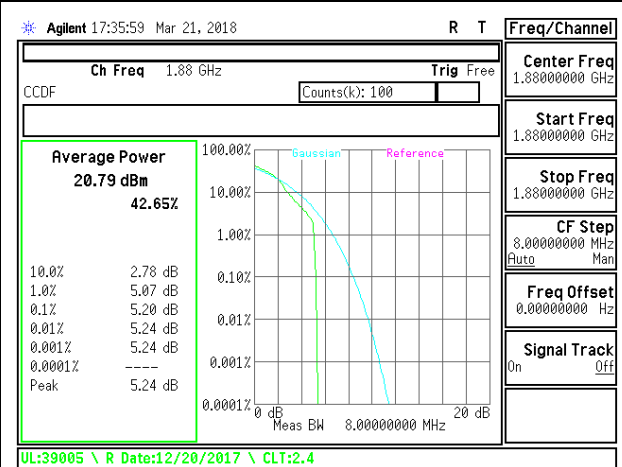
LTE B2 3MHz QPSK Middle Channel



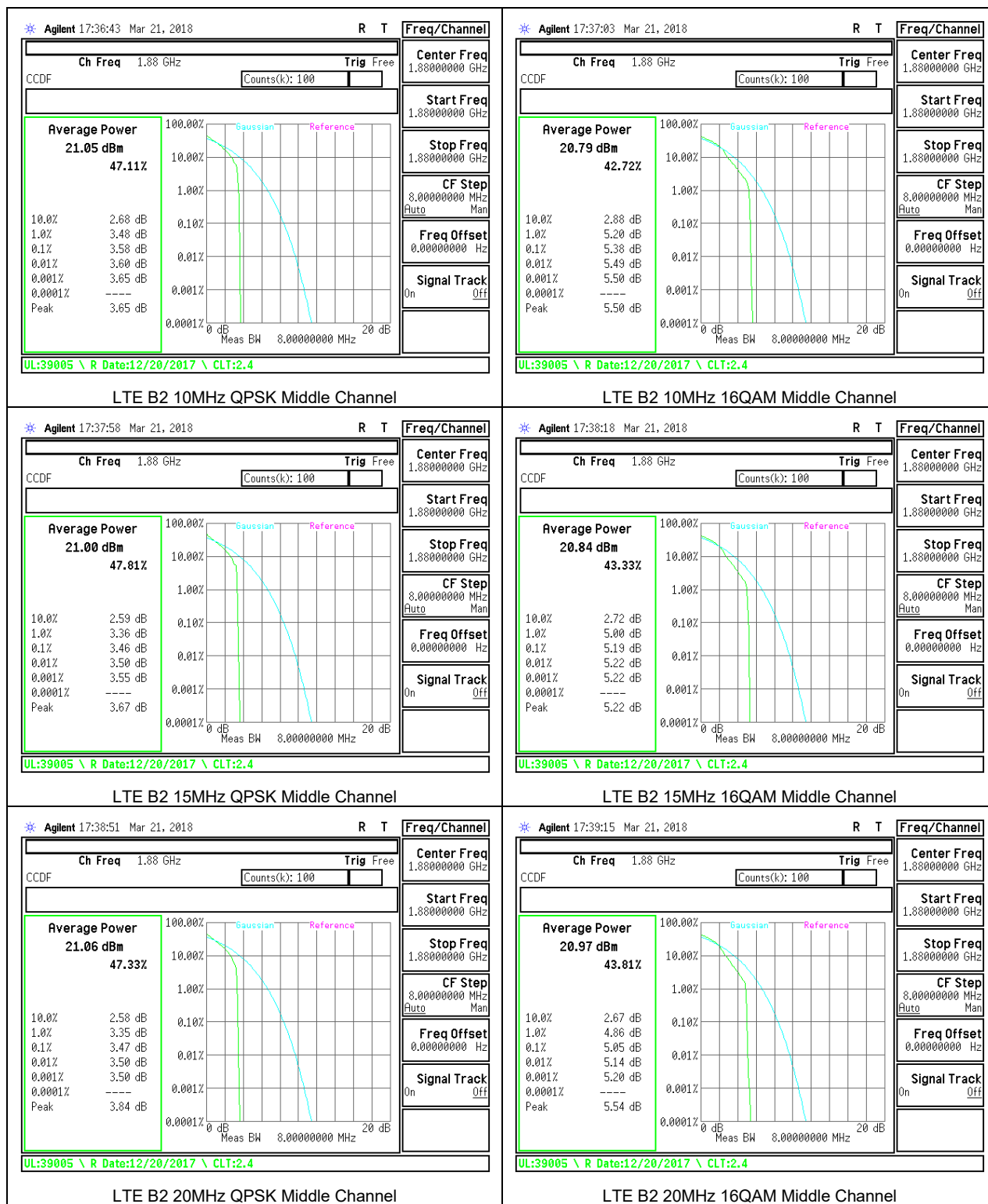
LTE B2 3MHz 16QAM Middle Channel



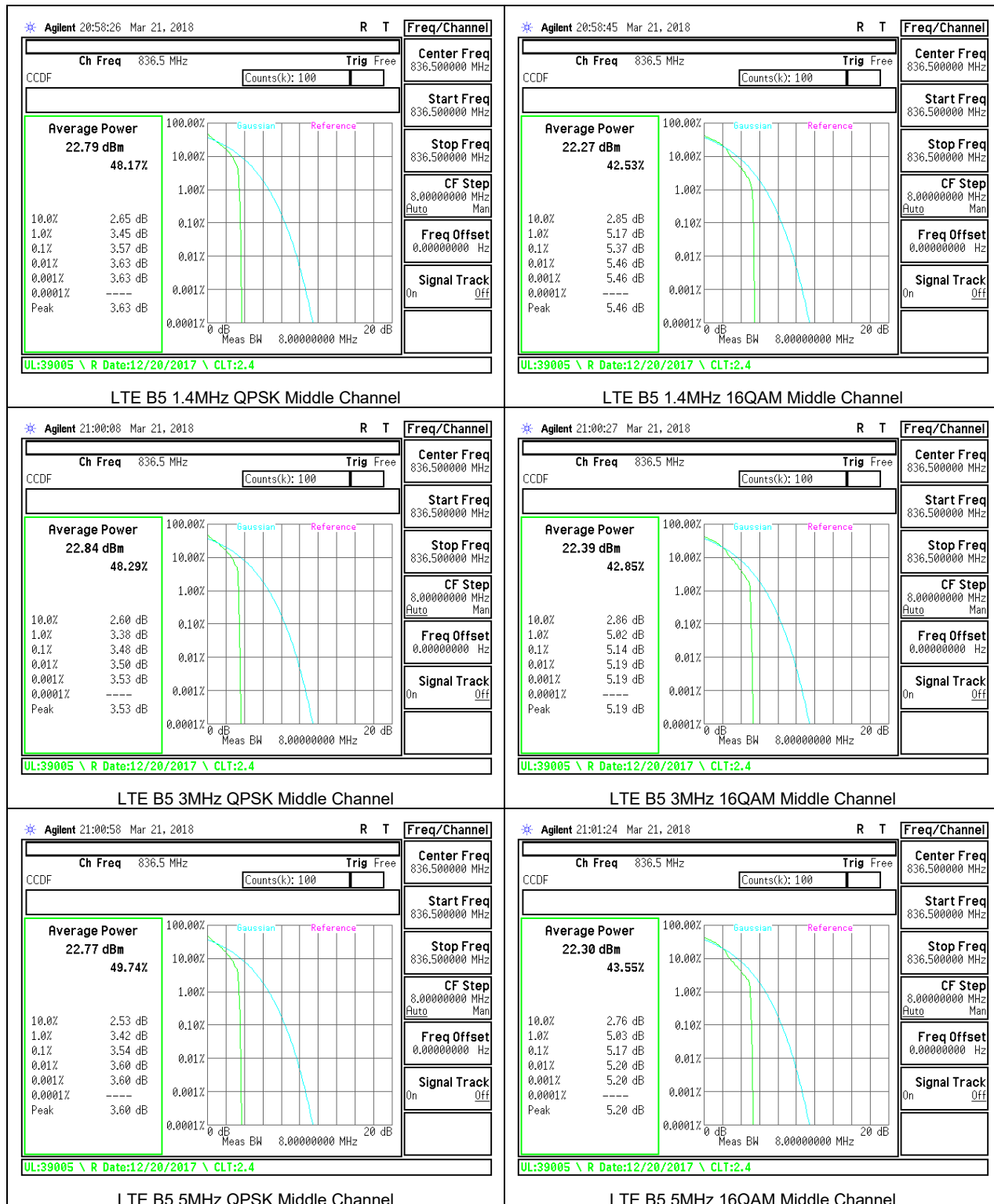
LTE B2 5MHz QPSK Middle Channel

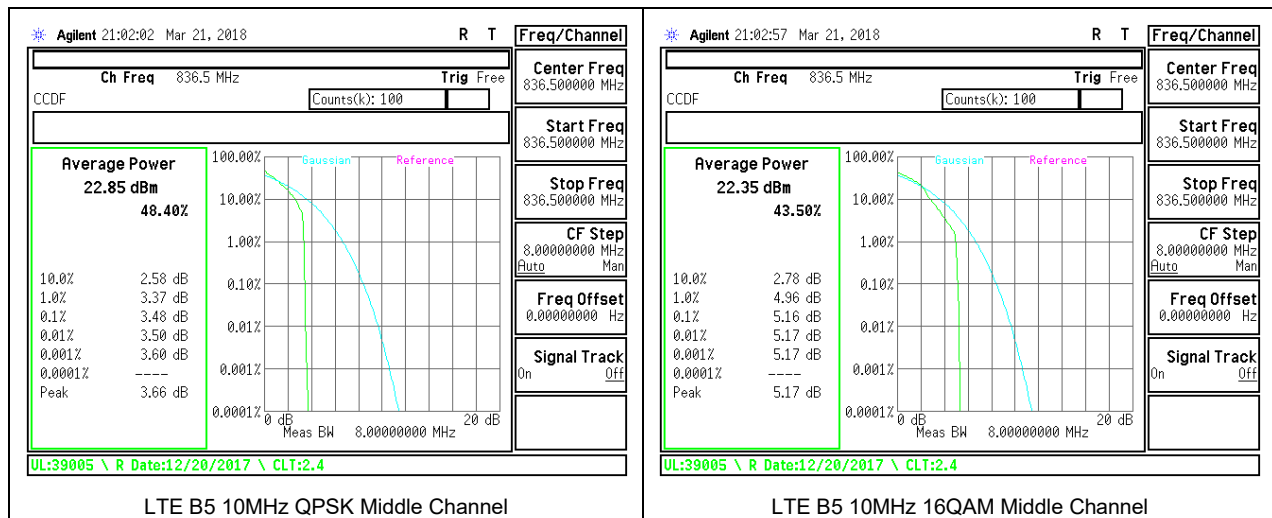


LTE B2 5MHz 16QAM Middle Channel

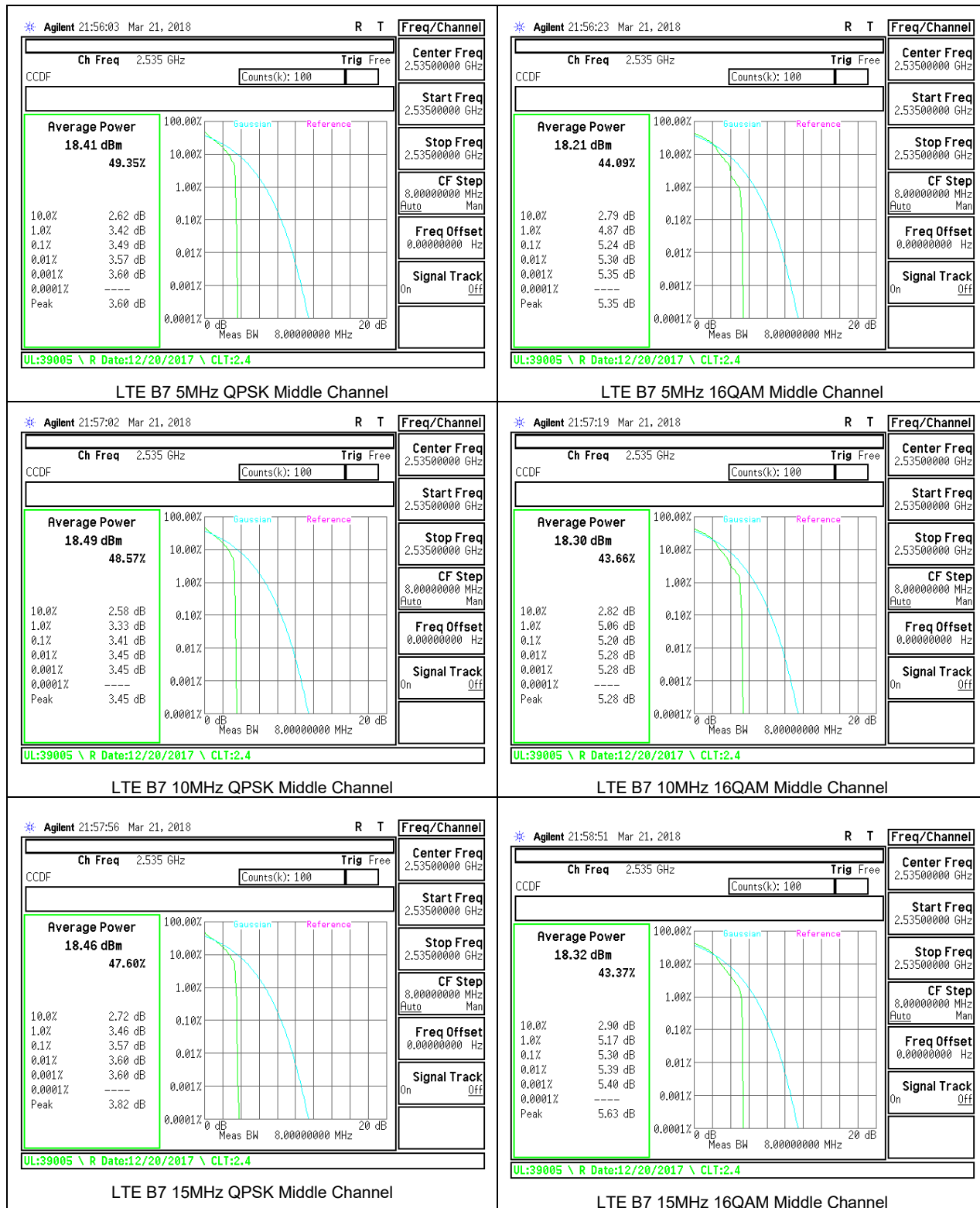


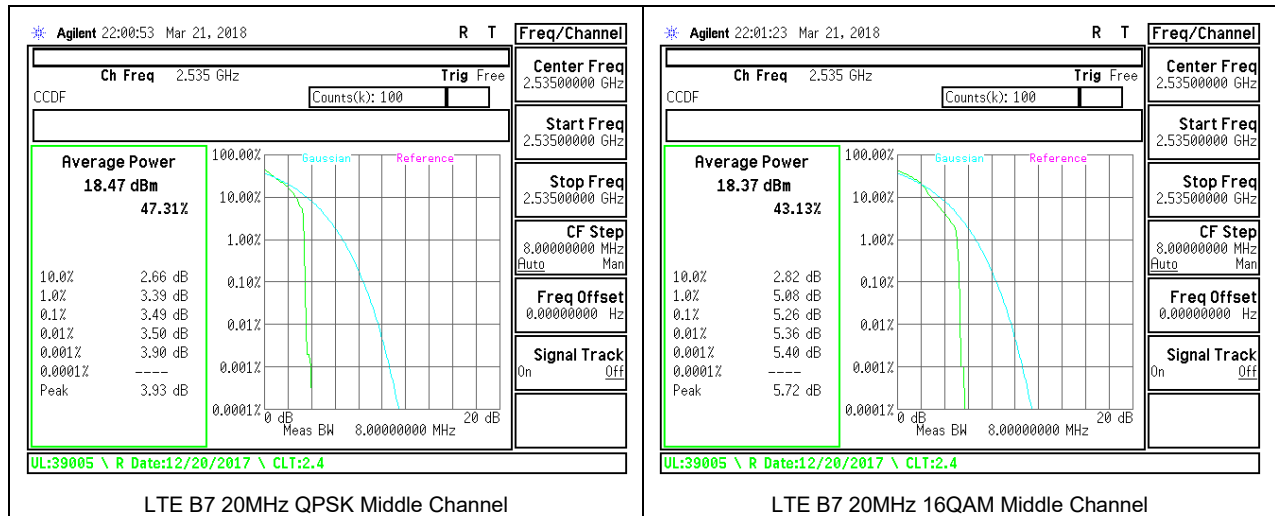
8.5.4. LTE BAND 5



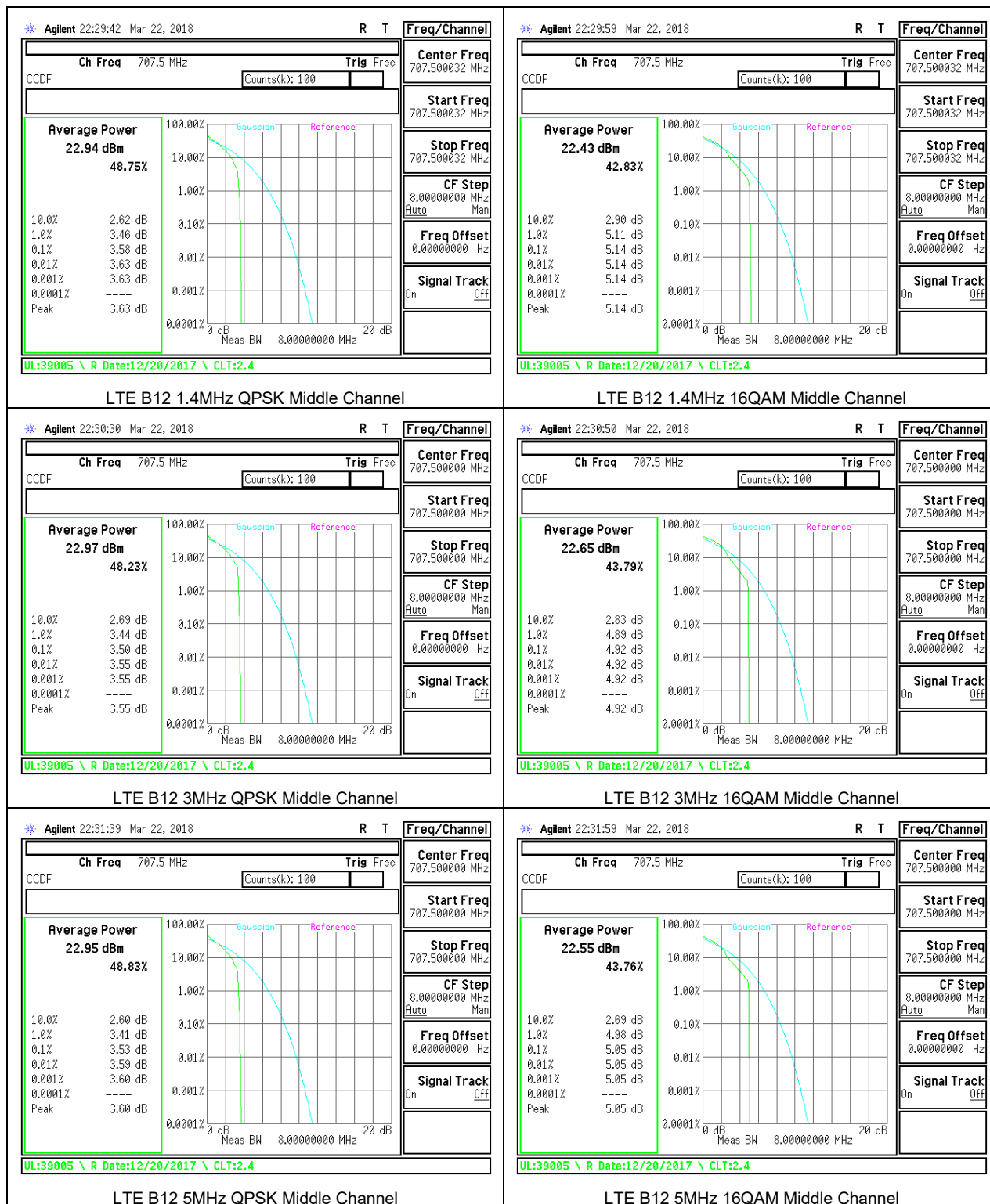


8.5.5. LTE BAND 7

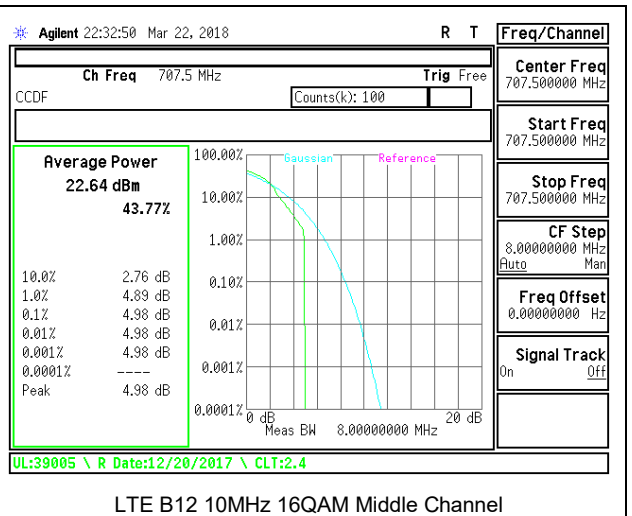
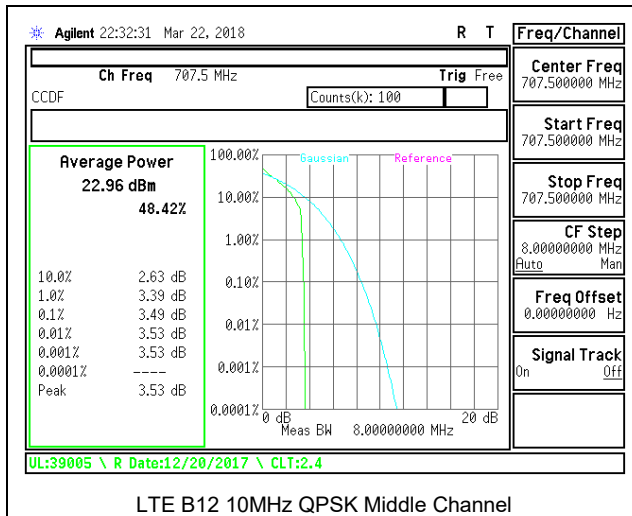




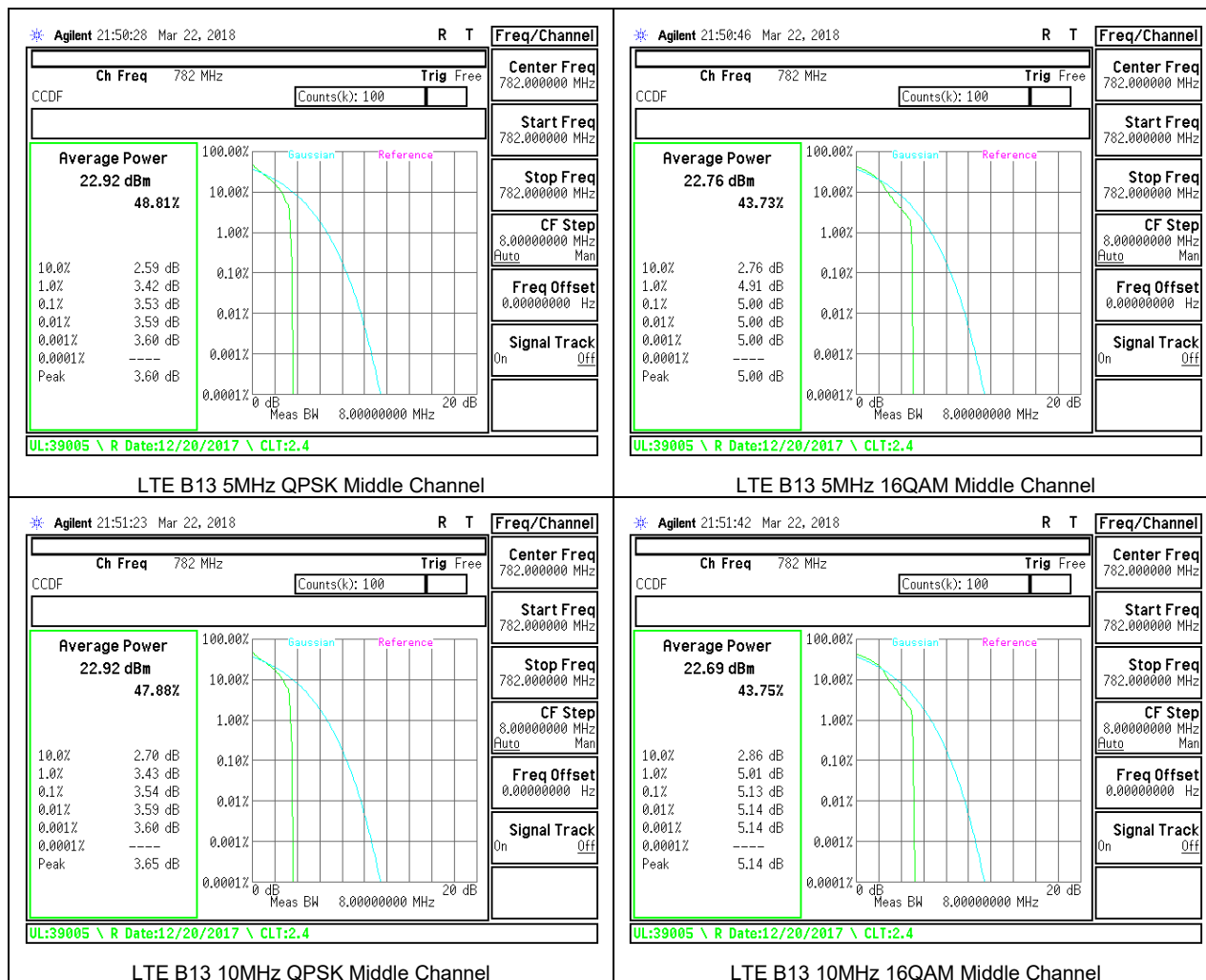
8.5.6. LTE BAND 12



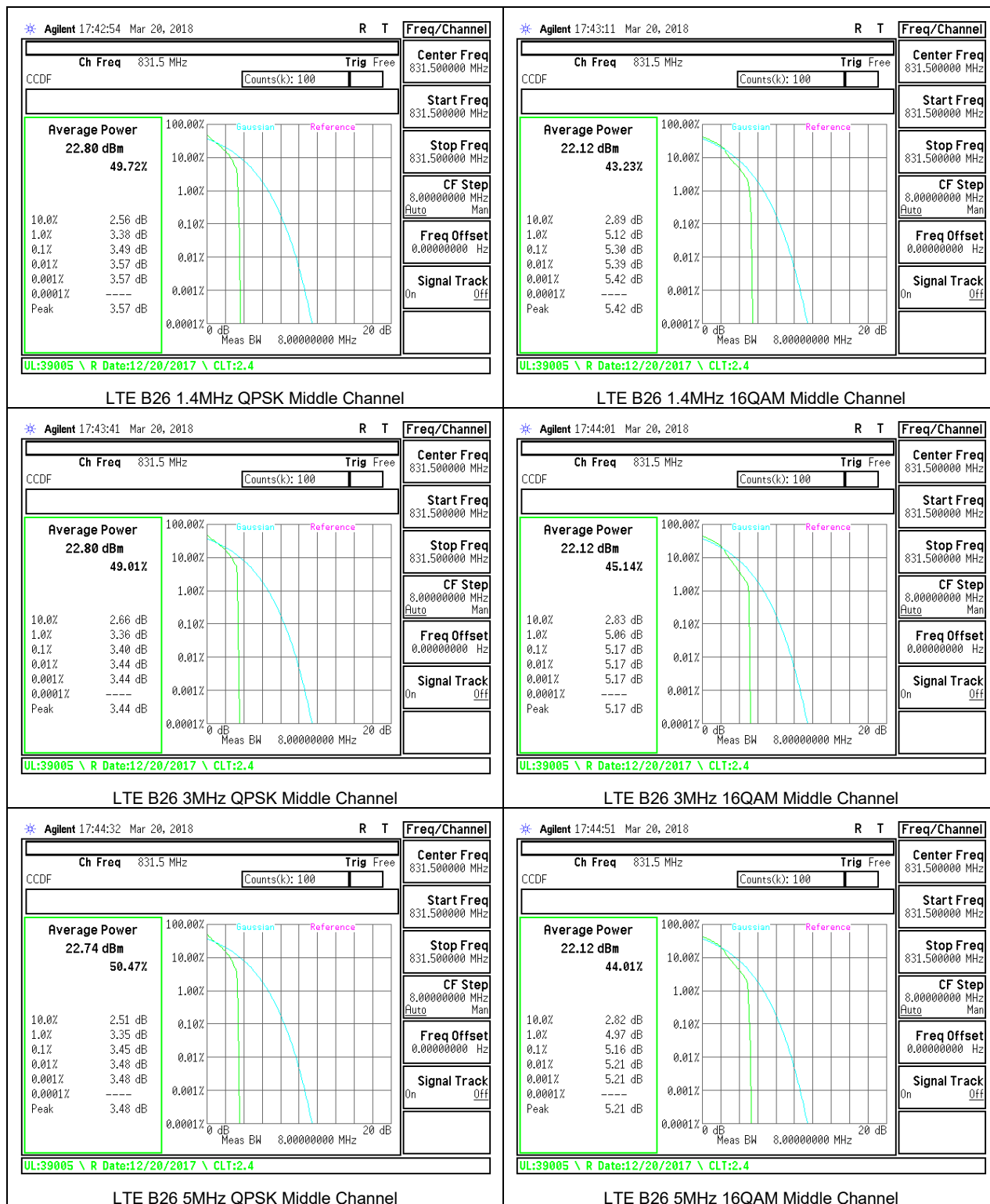


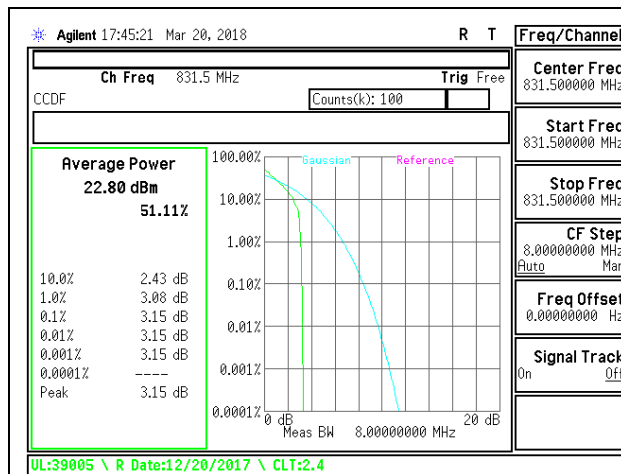


8.5.7. LTE BAND 13

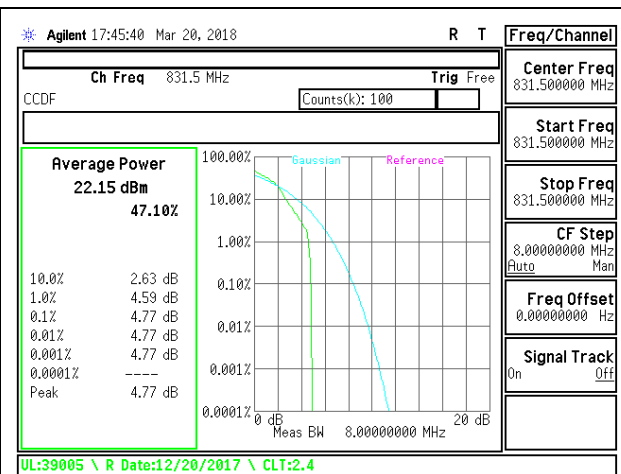


8.5.8. LTE BAND 26

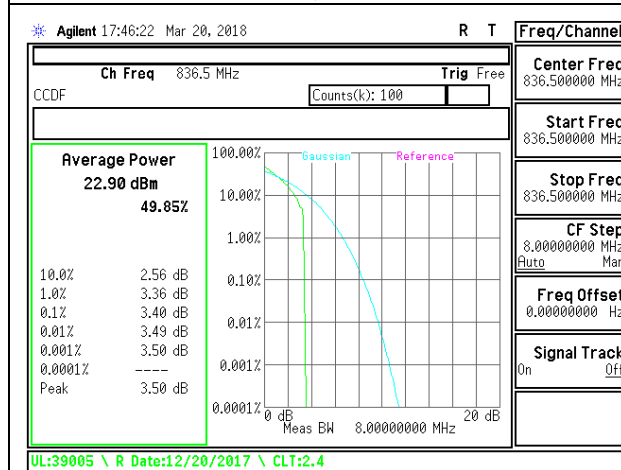




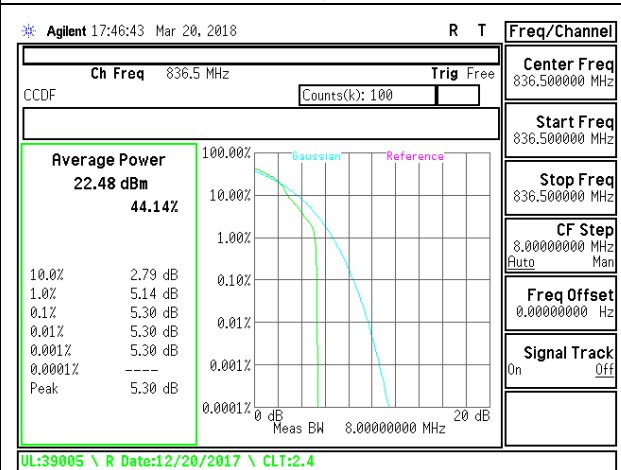
LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel

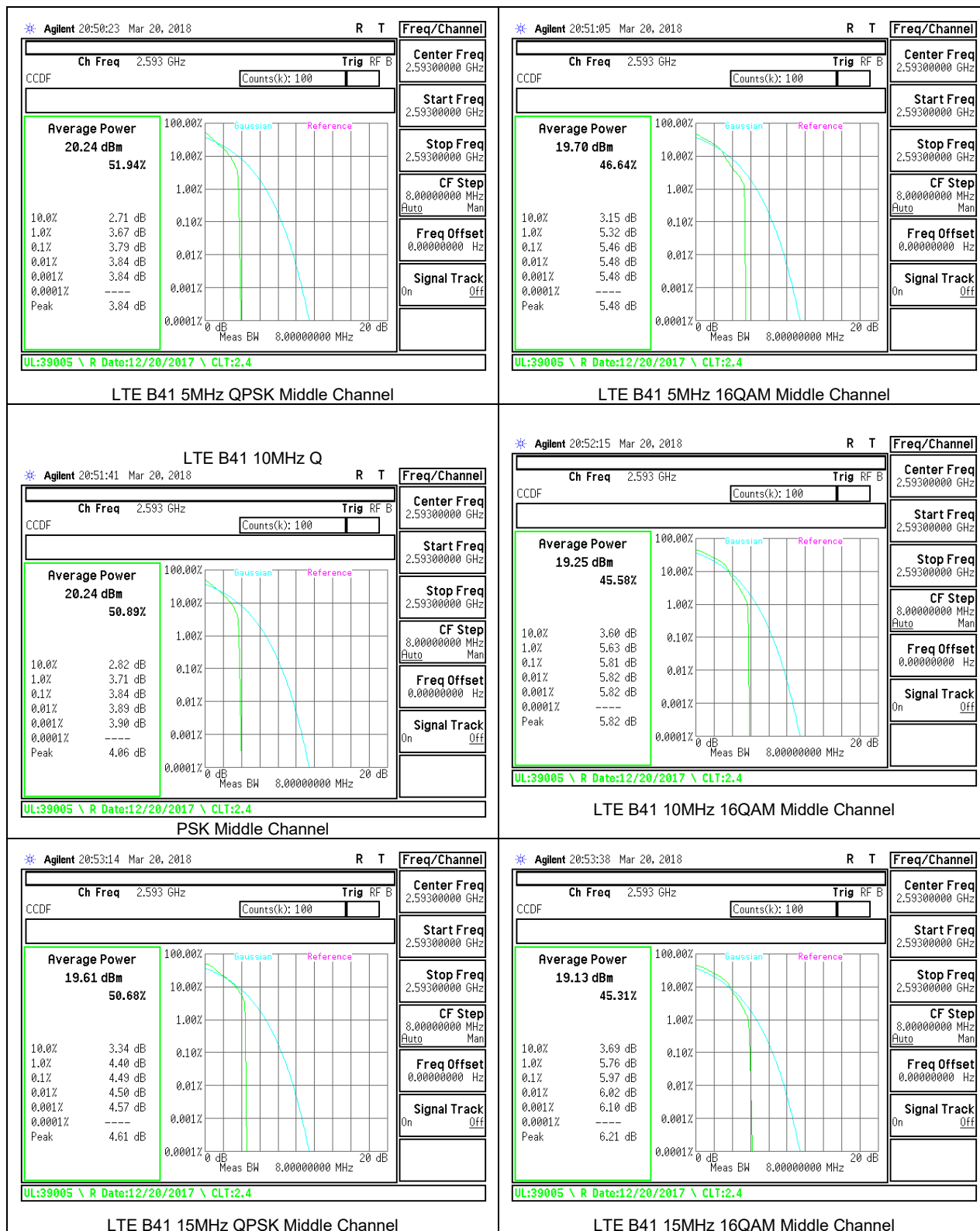


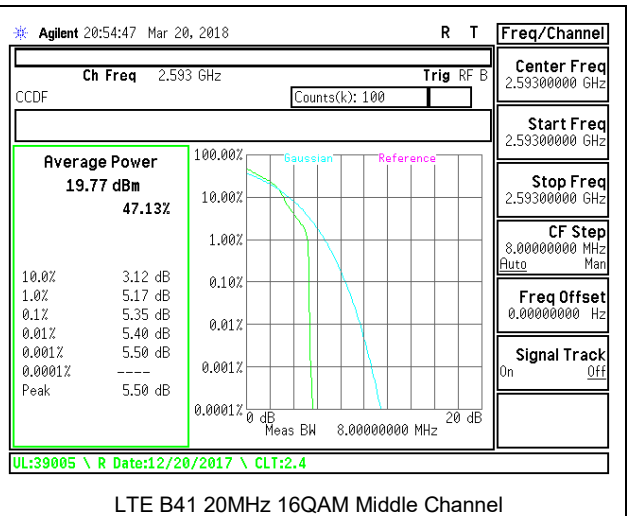
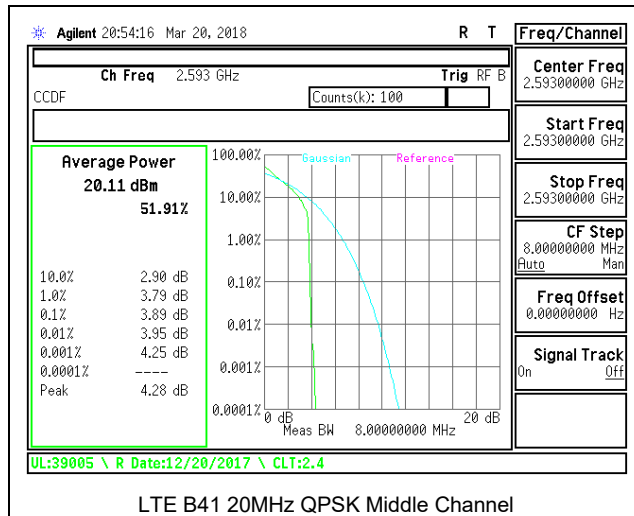
LTE B26 15MHz QPSK Middle Channel



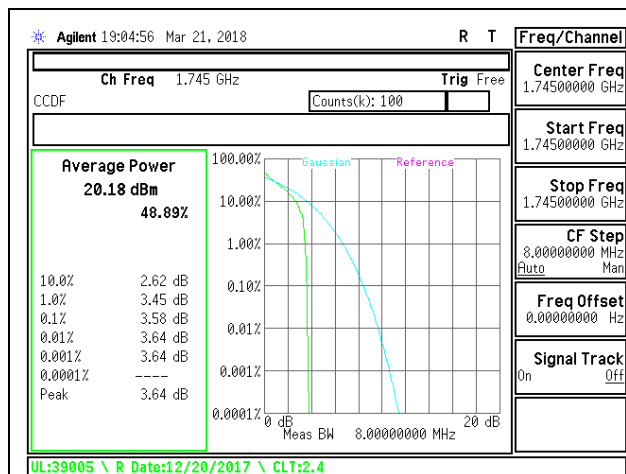
LTE B26 15MHz 16QAM Middle Channel

8.5.9. LTE BAND 41

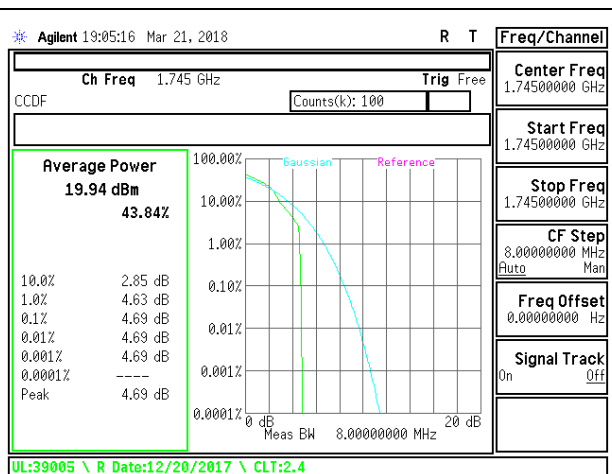




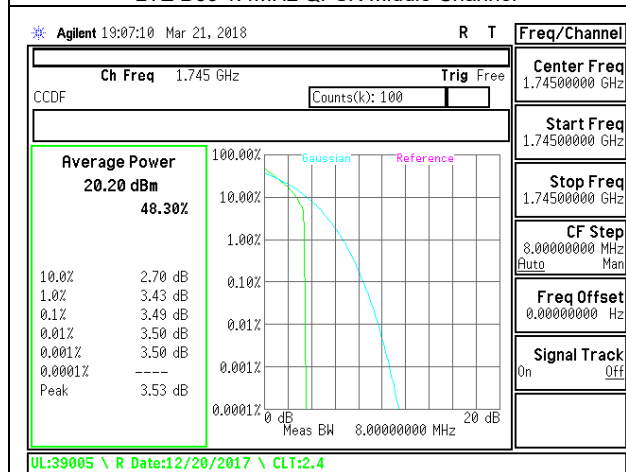
8.5.10. LTE BAND 66



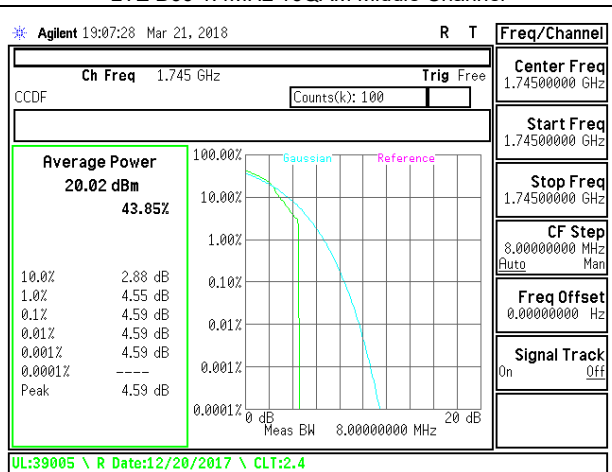
LTE B66 1.4MHz QPSK Middle Channel



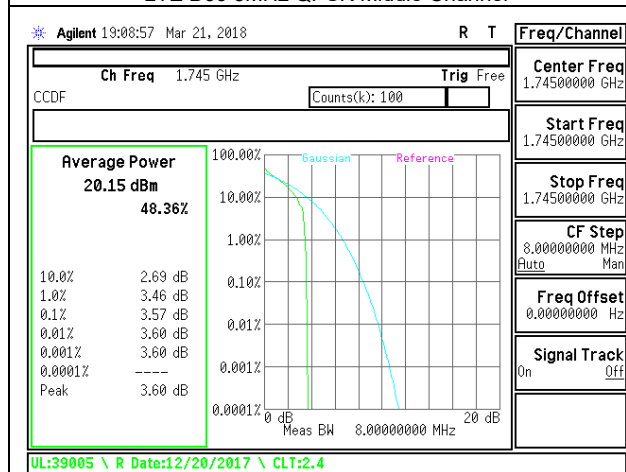
LTE B66 1.4MHz 16QAM Middle Channel



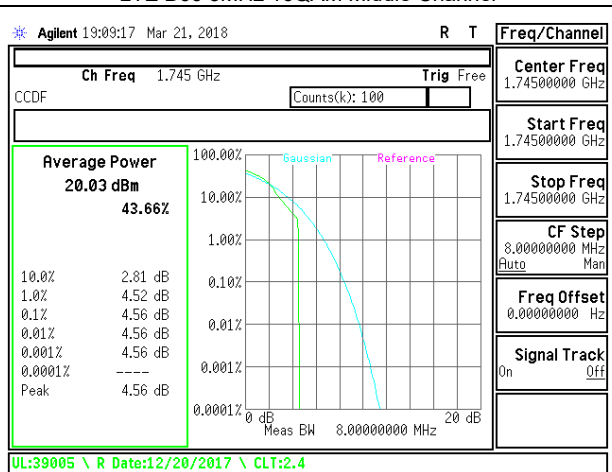
LTE B66 3MHz QPSK Middle Channel



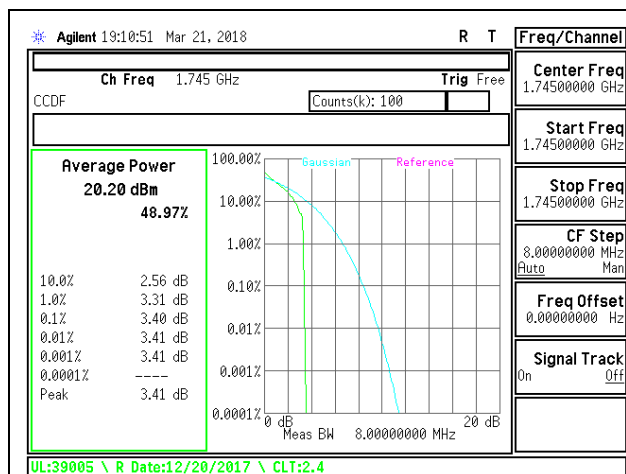
LTE B66 3MHz 16QAM Middle Channel



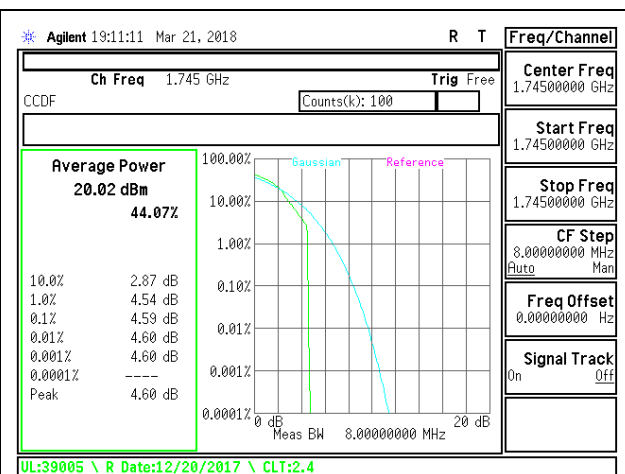
LTE B66 5MHz QPSK Middle Channel



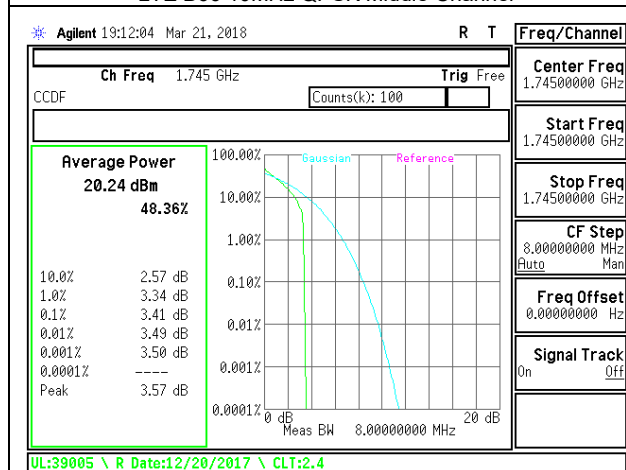
LTE B66 5MHz 16QAM Middle Channel



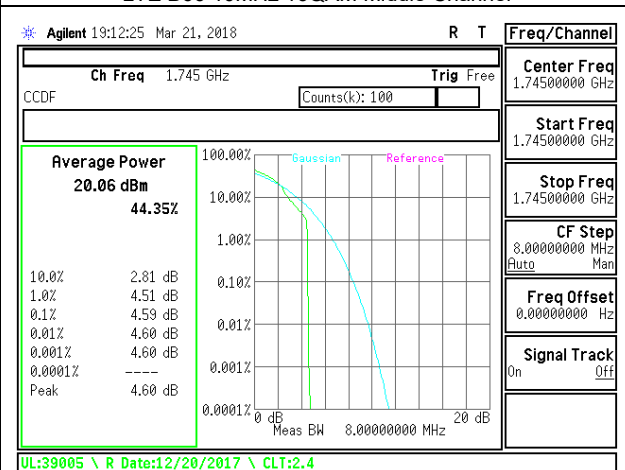
LTE B66 10MHz QPSK Middle Channel



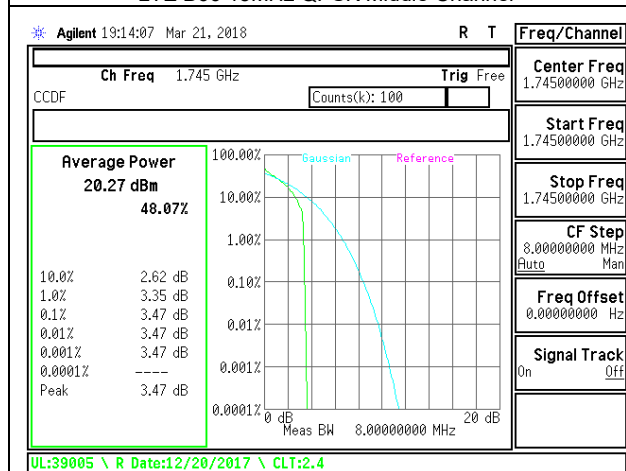
LTE B66 10MHz 16QAM Middle Channel



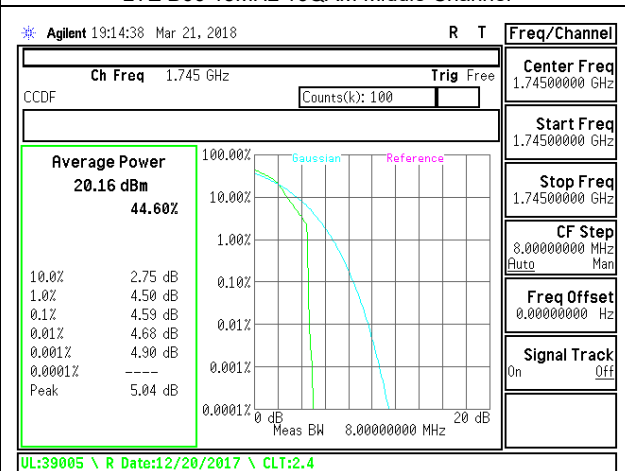
LTE B66 15MHz QPSK Middle Channel



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 (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 v02r02/D02 v01

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 5
- 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 #: 12118543  
 Date: 3/19/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber C  
 Mode: GPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (HV)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 824.2MHz</b>									
1648.40	-28.3	V	3.0	37.0	1.0	-64.4	-13.0	-51.4	
2472.60	-25.7	V	3.0	36.4	1.0	-61.5	-13.0	-48.1	
3296.80	-24.1	V	3.0	36.2	1.0	-59.3	-13.0	-46.3	
1648.40	-27.9	H	3.0	37.0	1.0	-63.9	-13.0	-50.9	
2472.60	-25.4	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
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	-30.6	V	3.0	37.0	1.0	-66.6	-13.0	-53.6	
2509.80	-25.3	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3346.40	-23.8	V	3.0	36.1	1.0	-58.9	-13.0	-45.9	
1673.20	-28.9	H	3.0	37.0	1.0	-64.9	-13.0	-51.9	
2509.80	-23.6	H	3.0	36.4	1.0	-59.0	-13.0	-46.0	
3346.40	-23.7	H	3.0	36.1	1.0	-58.9	-13.0	-45.9	
<b>High Ch, 848.8MHz</b>									
1697.60	-29.9	V	3.0	37.0	1.0	-65.9	-13.0	-52.9	
2546.40	-25.1	V	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3395.20	-23.4	V	3.0	36.1	1.0	-58.5	-13.0	-45.5	
1697.60	-28.9	H	3.0	37.0	1.0	-64.8	-13.0	-51.8	
2546.40	-23.7	H	3.0	36.4	1.0	-59.1	-13.0	-46.1	
3395.20	-23.6	H	3.0	36.1	1.0	-58.7	-13.0	-45.7	

GSM 850MHz GPRS

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/23/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: EGPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (HV)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 824.2MHz</b>									
1648.40	-28.6	V	3.0	37.0	1.0	-64.6	-13.0	-51.6	
2472.60	-24.3	V	3.0	36.4	1.0	-59.7	-13.0	-46.7	
3296.80	-21.5	V	3.0	36.2	1.0	-56.7	-13.0	-43.7	
1648.40	-28.1	H	3.0	37.0	1.0	-64.1	-13.0	-51.1	
2472.60	-27.8	H	3.0	36.4	1.0	-63.2	-13.0	-50.2	
3296.80	-21.6	H	3.0	36.2	1.0	-56.5	-13.0	-43.5	
<b>Mid Ch, 836.6MHz</b>									
1673.20	-28.3	V	3.0	37.0	1.0	-64.3	-13.0	-51.3	
2509.80	-24.4	V	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3346.40	-21.7	V	3.0	36.1	1.0	-56.8	-13.0	-43.8	
1673.20	-28.0	H	3.0	37.0	1.0	-64.0	-13.0	-51.0	
2509.80	-26.0	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3346.40	-21.7	H	3.0	36.1	1.0	-56.9	-13.0	-43.9	
<b>High Ch, 848.8MHz</b>									
1697.60	-28.2	V	3.0	37.0	1.0	-64.1	-13.0	-51.1	
2546.40	-24.4	V	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3395.20	-21.6	V	3.0	36.1	1.0	-56.7	-13.0	-43.7	
1697.60	-27.3	H	3.0	37.0	1.0	-63.2	-13.0	-50.2	
2546.40	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3395.20	-21.5	H	3.0	36.1	1.0	-56.6	-13.0	-43.6	

GSM 850MHz EGPRS

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/22/2018  
 Test Engineer: 16059 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 Location: Chamber C  
 Mode: GPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (HV)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1850.2MHz</b>									
3700.40	-21.6	V	3.0	35.9	1.0	-56.5	-13.0	-43.5	
5550.60	-17.6	V	3.0	35.5	1.0	-52.1	-13.0	-39.1	
7400.80	-17.3	V	3.0	35.7	1.0	-52.1	-13.0	-39.1	
3700.40	-21.4	H	3.0	35.9	1.0	-56.2	-13.0	-43.2	
5550.60	-18.2	H	3.0	35.5	1.0	-52.6	-13.0	-39.6	
7400.80	-15.1	H	3.0	35.7	1.0	-49.8	-13.0	-36.8	
<b>Mid Ch, 1880MHz</b>									
3760.00	-22.3	V	3.0	35.8	1.0	-57.1	-13.0	-44.1	
5640.00	-19.7	V	3.0	35.5	1.0	-54.1	-13.0	-41.1	
7520.00	-16.8	V	3.0	35.7	1.0	-51.5	-13.0	-38.5	
3760.00	-20.9	H	3.0	35.8	1.0	-55.7	-13.0	-42.7	
5640.00	-17.6	H	3.0	35.5	1.0	-52.1	-13.0	-39.1	
7520.00	-14.4	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
<b>High Ch, 1909.8MHz</b>									
3819.60	-20.0	V	3.0	35.8	1.0	-54.8	-13.0	-41.8	
5729.40	-17.4	V	3.0	35.5	1.0	-51.9	-13.0	-38.9	
7639.20	-16.0	V	3.0	35.8	1.0	-50.8	-13.0	-37.8	
3819.60	-17.5	H	3.0	35.8	1.0	-52.3	-13.0	-39.3	
5729.40	-13.5	H	3.0	35.5	1.0	-48.0	-13.0	-35.0	
7639.20	-12.8	H	3.0	35.8	1.0	-47.5	-13.0	-34.5	

GSM 1900MHz GPRS

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/23/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: EGPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (HV)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 1850.2MHz</b>									
3700.40	-20.3	V	3.0	35.9	1.0	-55.2	-13.0	-42.2	
5550.60	-16.5	V	3.0	35.5	1.0	-50.9	-13.0	-37.9	
7400.80	-14.2	V	3.0	35.7	1.0	-48.9	-13.0	-35.9	
3700.40	-19.8	H	3.0	35.9	1.0	-54.4	-13.0	-41.4	
5550.60	-16.0	H	3.0	35.5	1.0	-50.4	-13.0	-37.4	
7400.80	-12.6	H	3.0	35.7	1.0	-47.3	-13.0	-34.3	
<b>Mid Ch, 1880MHz</b>									
3760.00	-19.8	V	3.0	35.8	1.0	-54.7	-13.0	-41.7	
5640.00	-16.7	V	3.0	35.5	1.0	-51.2	-13.0	-38.2	
7520.00	-14.9	V	3.0	35.7	1.0	-49.6	-13.0	-36.6	
3760.00	-19.9	H	3.0	35.8	1.0	-54.7	-13.0	-41.7	
5640.00	-15.7	H	3.0	35.5	1.0	-50.1	-13.0	-37.1	
7520.00	-12.8	H	3.0	35.7	1.0	-47.5	-13.0	-34.5	
<b>High Ch, 1909.8MHz</b>									
3819.60	-18.4	V	3.0	35.8	1.0	-54.1	-13.0	-41.1	
5729.40	-16.1	V	3.0	35.5	1.0	-50.6	-13.0	-37.6	
7639.20	-14.4	V	3.0	35.8	1.0	-49.2	-13.0	-36.2	
3819.60	-18.8	H	3.0	35.8	1.0	-53.6	-13.0	-40.6	
5729.40	-15.4	H	3.0	35.5	1.0	-49.9	-13.0	-36.9	
7639.20	-12.5	H	3.0	35.8	1.0	-47.2	-13.0	-34.2	

GSM 1900MHz EGPRS









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

Company: SOMC  
 Project #: 12118543  
 Date: 3/23/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_QPSK Band 5 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, 829MHz</b>									
1658.00	-28.3	V	3.0	37.0	1.0	-64.3	-13.0	-51.3	
2487.00	-25.5	V	3.0	36.4	1.0	-60.9	-13.0	-47.9	
3316.00	-21.1	V	3.0	36.1	1.0	-56.2	-13.0	-43.2	
1658.00	-28.3	H	3.0	37.0	1.0	-64.3	-13.0	-51.3	
2487.00	-27.8	H	3.0	36.4	1.0	-63.2	-13.0	-50.2	
3316.00	-20.6	H	3.0	36.1	1.0	-55.7	-13.0	-42.7	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-26.8	V	3.0	37.0	1.0	-64.8	-13.0	-51.8	
2509.50	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
3346.00	-19.9	V	3.0	36.1	1.0	-55.0	-13.0	-42.0	
1673.00	-28.0	H	3.0	37.0	1.0	-64.0	-13.0	-51.0	
2509.50	-27.4	H	3.0	36.4	1.0	-62.8	-13.0	-49.8	
3346.00	-20.2	H	3.0	36.1	1.0	-55.3	-13.0	-42.3	
<b>High Ch, 844MHz</b>									
1688.00	-28.3	V	3.0	37.0	1.0	-64.3	-13.0	-51.3	
2532.00	-26.0	V	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3376.00	-20.4	V	3.0	36.1	1.0	-55.5	-13.0	-42.5	
1688.00	-27.3	H	3.0	37.0	1.0	-63.3	-13.0	-50.3	
2532.00	-26.2	H	3.0	36.4	1.0	-63.6	-13.0	-50.6	
3376.00	-21.5	H	3.0	36.1	1.0	-56.6	-13.0	-43.6	

**LTE B5 10MHz QPSK**

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/23/2018  
 Test Engineer: 39005 RA  
 Configuration: EUT + Support Equipment  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 5 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, 829MHz</b>									
1658.00	-28.0	V	3.0	37.0	1.0	-64.0	-13.0	-51.0	
2487.00	-24.9	V	3.0	36.4	1.0	-60.3	-13.0	-47.3	
3316.00	-21.4	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1658.00	-28.4	H	3.0	37.0	1.0	-64.4	-13.0	-51.4	
2487.00	-27.8	H	3.0	36.4	1.0	-63.2	-13.0	-50.2	
3316.00	-21.2	H	3.0	36.1	1.0	-56.3	-13.0	-43.3	
<b>Mid Ch, 836.5MHz</b>									
1673.00	-27.6	V	3.0	37.0	1.0	-63.6	-13.0	-50.6	
2509.50	-25.0	V	3.0	36.4	1.0	-60.4	-13.0	-47.4	
3346.00	-21.4	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1673.00	-28.0	H	3.0	37.0	1.0	-64.0	-13.0	-51.0	
2509.50	-27.5	H	3.0	36.4	1.0	-62.9	-13.0	-49.9	
3346.00	-20.3	H	3.0	36.1	1.0	-55.4	-13.0	-42.4	
<b>High Ch, 844MHz</b>									
1688.00	-28.5	V	3.0	37.0	1.0	-64.5	-13.0	-51.5	
2532.00	-26.0	V	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3376.00	-20.7	V	3.0	36.1	1.0	-55.8	-13.0	-42.8	
1688.00	-27.4	H	3.0	37.0	1.0	-63.4	-13.0	-50.4	
2532.00	-28.3	H	3.0	36.4	1.0	-63.7	-13.0	-50.7	
3376.00	-21.5	H	3.0	36.1	1.0	-56.6	-13.0	-43.6	

**LTE B5 10MHz 16QAM**





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

Company: SOMC  
 Project #: 12118543  
 Date: 3/20/2018  
 Test Engineer: 16069 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 Location: Chamber B  
 Mode: LTE\_QPSK Band 7 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2510MHz</b>									
5020.00	-15.2	V	3.0	35.5	1.0	-49.6	-25.0	-24.6	
7530.00	-13.3	V	3.0	35.7	1.0	-48.0	-25.0	-23.0	
10040.00	-11.4	V	3.0	36.0	1.0	-46.4	-25.0	-21.4	
5020.00	-14.2	H	3.0	35.5	1.0	-48.6	-25.0	-23.6	
7530.00	-12.8	H	3.0	35.7	1.0	-47.6	-25.0	-22.6	
10040.00	-9.9	H	3.0	36.0	1.0	-44.9	-25.0	-19.9	
<b>Mid Ch, 2535MHz</b>									
5070.00	-14.1	V	3.0	35.4	1.0	-48.6	-25.0	-23.6	
7695.00	-14.2	V	3.0	35.8	1.0	-49.0	-25.0	-24.0	
10140.00	-12.2	V	3.0	36.0	1.0	-47.1	-25.0	-22.1	
5070.00	-15.2	H	3.0	35.4	1.0	-49.7	-25.0	-24.7	
7695.00	-13.6	H	3.0	35.8	1.0	-48.4	-25.0	-23.4	
10140.00	-9.5	H	3.0	36.0	1.0	-44.5	-25.0	-19.5	
<b>High Ch, 2560MHz</b>									
5120.00	-13.6	V	3.0	35.4	1.0	-48.6	-25.0	-23.6	
7680.00	-14.2	V	3.0	35.8	1.0	-49.0	-25.0	-24.0	
10240.00	-10.2	V	3.0	35.9	1.0	-45.1	-25.0	-20.1	
5120.00	-15.0	H	3.0	35.4	1.0	-49.5	-25.0	-24.5	
7680.00	-12.1	H	3.0	35.8	1.0	-46.8	-25.0	-21.8	
10240.00	-10.2	H	3.0	35.9	1.0	-45.1	-25.0	-20.1	

**LTE B7 20MHz QPSK**

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/20/2018  
 Test Engineer: 16069 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 Location: Chamber B  
 Mode: LTE\_16QAM Band 7 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 2510MHz</b>									
5020.00	-16.1	V	3.0	35.5	1.0	-50.5	-25.0	-25.5	
7530.00	-13.1	V	3.0	35.7	1.0	-47.9	-25.0	-22.9	
10040.00	-11.1	V	3.0	36.0	1.0	-46.1	-25.0	-21.1	
5020.00	-18.2	H	3.0	35.5	1.0	-50.7	-25.0	-25.7	
7530.00	-13.3	H	3.0	35.7	1.0	-48.0	-25.0	-23.0	
10040.00	-9.0	H	3.0	36.0	1.0	-44.0	-25.0	-19.0	
<b>Mid Ch, 2535MHz</b>									
5070.00	-15.0	V	3.0	35.4	1.0	-49.4	-25.0	-24.4	
7695.00	-12.8	V	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10140.00	-10.7	V	3.0	36.0	1.0	-45.7	-25.0	-20.7	
5070.00	-14.9	H	3.0	35.4	1.0	-49.4	-25.0	-24.4	
7695.00	-11.2	H	3.0	35.8	1.0	-46.0	-25.0	-21.0	
10140.00	-8.3	H	3.0	36.0	1.0	-44.2	-25.0	-19.2	
<b>High Ch, 2560MHz</b>									
5120.00	-15.0	V	3.0	35.4	1.0	-49.5	-25.0	-24.5	
7680.00	-13.8	V	3.0	35.8	1.0	-48.6	-25.0	-23.6	
10240.00	-10.2	V	3.0	35.9	1.0	-45.1	-25.0	-20.1	
5120.00	-13.7	H	3.0	35.4	1.0	-48.1	-25.0	-23.1	
7680.00	-12.4	H	3.0	35.8	1.0	-47.1	-25.0	-22.1	
10240.00	-8.2	H	3.0	35.9	1.0	-44.1	-25.0	-19.1	

**LTE B7 20MHz 16QAM**



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

Company: SOMC  
 Project #: 12118543  
 Date: 3/20/2018  
 Test Engineer: 16069 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 704MHz</b>									
1408.00	-31.8	V	3.0	37.4	1.0	-68.1	-13.0	-55.1	
2112.00	-24.6	V	3.0	36.6	1.0	-60.2	-13.0	-47.2	
2816.00	-24.3	V	3.0	36.4	1.0	-59.7	-13.0	-46.7	
1408.00	-31.8	H	3.0	37.4	1.0	-68.0	-13.0	-55.0	
2112.00	-26.5	H	3.0	36.6	1.0	-62.1	-13.0	-49.1	
2816.00	-25.9	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
<b>Mid Ch. 707.5MHz</b>									
1415.00	-33.1	V	3.0	37.4	1.0	-69.5	-13.0	-56.5	
2122.50	-26.0	V	3.0	36.6	1.0	-61.6	-13.0	-48.6	
2830.00	-24.4	V	3.0	36.4	1.0	-59.8	-13.0	-46.8	
1415.00	-31.4	H	3.0	37.4	1.0	-67.8	-13.0	-54.8	
2122.50	-26.6	H	3.0	36.6	1.0	-62.2	-13.0	-49.2	
2830.00	-25.8	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
<b>High Ch. 711MHz</b>									
1422.00	-33.5	V	3.0	37.3	1.0	-69.8	-13.0	-56.8	
2133.00	-25.4	V	3.0	36.6	1.0	-61.0	-13.0	-48.0	
2844.00	-24.7	V	3.0	36.4	1.0	-60.1	-13.0	-47.1	
1422.00	-32.8	H	3.0	37.3	1.0	-69.2	-13.0	-56.2	
2133.00	-26.4	H	3.0	36.6	1.0	-61.8	-13.0	-48.8	
2844.00	-26.0	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	

**LTE B12 10MHz QPSK**

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/20/2018  
 Test Engineer: 16069 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. 704MHz</b>									
1408.00	-33.3	V	3.0	37.4	1.0	-69.6	-13.0	-56.6	
2112.00	-25.9	V	3.0	36.6	1.0	-61.4	-13.0	-48.4	
2816.00	-24.7	V	3.0	36.4	1.0	-60.1	-13.0	-47.1	
1408.00	-31.1	H	3.0	37.4	1.0	-67.5	-13.0	-54.5	
2112.00	-26.4	H	3.0	36.6	1.0	-62.0	-13.0	-49.0	
2816.00	-25.8	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
<b>Mid Ch. 707.5MHz</b>									
1415.00	-33.3	V	3.0	37.4	1.0	-69.7	-13.0	-56.7	
2122.50	-26.3	V	3.0	36.6	1.0	-61.9	-13.0	-48.9	
2830.00	-23.7	V	3.0	36.4	1.0	-59.1	-13.0	-46.1	
1415.00	-32.0	H	3.0	37.4	1.0	-68.4	-13.0	-55.4	
2122.50	-26.5	H	3.0	36.6	1.0	-62.0	-13.0	-49.0	
2830.00	-25.4	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
<b>High Ch. 711MHz</b>									
1422.00	-34.1	V	3.0	37.3	1.0	-70.5	-13.0	-57.5	
2133.00	-26.2	V	3.0	36.6	1.0	-61.7	-13.0	-48.7	
2844.00	-24.9	V	3.0	36.4	1.0	-60.3	-13.0	-47.3	
1422.00	-33.0	H	3.0	37.3	1.0	-69.4	-13.0	-56.4	
2133.00	-27.2	H	3.0	36.6	1.0	-62.8	-13.0	-49.8	
2844.00	-25.9	H	3.0	36.4	1.0	-61.3	-13.0	-48.3	

**LTE B12 10MHz 16QAM**

9.1.7. LTE BAND 13

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/19/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 13 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 779.5MHz</b>									
1559.00	-31.0	V	3.0	37.1	1.0	-67.2	-40.0	-27.2	
2338.50	-26.3	V	3.0	36.5	1.0	-61.8	-13.0	-48.8	
3118.00	-24.4	V	3.0	36.3	1.0	-59.6	-13.0	-46.6	
1559.00	-30.7	H	3.0	37.1	1.0	-66.9	-40.0	-26.9	
2338.50	-26.5	H	3.0	36.5	1.0	-62.0	-13.0	-49.0	
3118.00	-23.2	H	3.0	36.3	1.0	-58.5	-13.0	-45.5	
<b>Mid Ch, 782MHz</b>									
1564.00	-30.8	V	3.0	37.1	1.0	-67.0	-40.0	-27.0	
2346.00	-26.5	V	3.0	36.5	1.0	-62.0	-13.0	-49.0	
3128.00	-23.8	V	3.0	36.3	1.0	-59.0	-13.0	-46.0	
1564.00	-30.9	H	3.0	37.1	1.0	-67.0	-40.0	-27.0	
2346.00	-26.6	H	3.0	36.5	1.0	-62.1	-13.0	-49.1	
3128.00	-25.0	H	3.0	36.3	1.0	-60.2	-13.0	-47.2	
<b>High Ch, 784.5MHz</b>									
1569.00	-30.3	V	3.0	37.1	1.0	-66.4	-40.0	-26.4	
2353.50	-26.2	V	3.0	36.5	1.0	-61.6	-13.0	-48.6	
3138.00	-25.0	V	3.0	36.3	1.0	-60.3	-13.0	-47.3	
1569.00	-30.5	H	3.0	37.1	1.0	-66.7	-40.0	-26.7	
2353.50	-26.0	H	3.0	36.5	1.0	-61.5	-13.0	-48.5	
3138.00	-24.5	H	3.0	36.3	1.0	-59.8	-13.0	-46.8	

LTE B13 5MHz QPSK

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/19/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 13 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, 779.5MHz</b>									
1559.00	-30.5	V	3.0	37.1	1.0	-66.6	-40.0	-26.6	
2338.50	-26.3	V	3.0	36.5	1.0	-61.8	-13.0	-48.8	
3118.00	-24.0	V	3.0	36.3	1.0	-59.3	-13.0	-46.3	
1559.00	-30.7	H	3.0	37.1	1.0	-66.8	-40.0	-26.8	
2338.50	-26.8	H	3.0	36.5	1.0	-62.3	-13.0	-49.3	
3118.00	-24.5	H	3.0	36.3	1.0	-59.6	-13.0	-46.6	
<b>Mid Ch, 782MHz</b>									
1564.00	-30.4	V	3.0	37.1	1.0	-66.5	-40.0	-26.5	
2346.00	-26.8	V	3.0	36.5	1.0	-62.3	-13.0	-49.3	
3128.00	-24.4	V	3.0	36.3	1.0	-59.7	-13.0	-46.7	
1564.00	-30.5	H	3.0	37.1	1.0	-66.6	-40.0	-26.6	
2346.00	-26.9	H	3.0	36.5	1.0	-62.4	-13.0	-49.4	
3128.00	-24.5	H	3.0	36.3	1.0	-59.8	-13.0	-46.8	
<b>High Ch, 784.5MHz</b>									
1569.00	-30.6	V	3.0	37.1	1.0	-66.8	-40.0	-26.8	
2353.50	-26.8	V	3.0	36.5	1.0	-62.3	-13.0	-49.3	
3138.00	-24.7	V	3.0	36.3	1.0	-60.0	-13.0	-47.0	
1569.00	-30.9	H	3.0	37.1	1.0	-67.0	-40.0	-27.0	
2353.50	-26.4	H	3.0	36.5	1.0	-61.9	-13.0	-48.9	
3138.00	-24.7	H	3.0	36.3	1.0	-60.0	-13.0	-47.0	

LTE B13 5MHz 16QAM

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/19/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_QPSK Band 13 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Mid Ch, 782MHz</b>									
1564.00	-30.5	V	3.0	37.1	1.0	-66.6	-40.0	-26.6	
2346.00	-26.2	V	3.0	36.5	1.0	-61.7	-13.0	-48.7	
3128.00	-24.0	V	3.0	36.3	1.0	-59.3	-13.0	-46.3	
1564.00	-30.5	H	3.0	37.1	1.0	-66.7	-40.0	-26.7	
2346.00	-26.0	H	3.0	36.5	1.0	-61.5	-13.0	-48.5	
3128.00	-25.2	H	3.0	36.3	1.0	-60.4	-13.0	-47.4	

LTE B13 10MHz QPSK

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/19/2018  
 Test Engineer: 43575 OS  
 Configuration: EUT + Support Equipment  
 Location: Chamber A  
 Mode: LTE\_16QAM Band 13 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Mid Ch, 782MHz</b>									
1564.00	-30.7	V	3.0	37.1	1.0	-66.8	-40.0	-26.8	
2346.00	-26.2	V	3.0	36.5	1.0	-61.7	-13.0	-48.7	
3128.00	-24.9	V	3.0	36.3	1.0	-60.2	-13.0	-47.2	
1564.00	-29.9	H	3.0	37.1	1.0	-66.1	-40.0	-26.1	
2346.00	-26.3	H	3.0	36.5	1.0	-61.8	-13.0	-48.8	
3128.00	-24.0	H	3.0	36.3	1.0	-59.3	-13.0	-46.3	

LTE B13 10MHz 16QAM







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

Company: SOMC  
 Project #: 12118543  
 Date: 3/22/2018  
 Test Engineer: 16069 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 Location: Chamber C  
 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	-15.0	V	3.0	35.5	1.0	-49.5	-25.0	-24.5	
7518.00	-14.9	V	3.0	35.7	1.0	-49.6	-25.0	-24.6	
10024.00	-11.5	V	3.0	36.0	1.0	-46.5	-25.0	-21.5	
5012.00	-15.4	H	3.0	35.5	1.0	-49.8	-25.0	-24.8	
7518.00	-12.7	H	3.0	35.7	1.0	-47.5	-25.0	-22.5	
10024.00	-10.7	H	3.0	36.0	1.0	-45.7	-25.0	-20.7	
<b>Mid Ch, 2593MHz</b>									
5186.00	-15.9	V	3.0	35.4	1.0	-50.4	-25.0	-25.4	
7779.00	-14.0	V	3.0	35.8	1.0	-48.8	-25.0	-23.8	
10372.00	-10.2	V	3.0	35.8	1.0	-45.0	-25.0	-20.0	
5186.00	-14.2	H	3.0	35.4	1.0	-48.7	-25.0	-23.7	
7779.00	-12.1	H	3.0	35.8	1.0	-46.9	-25.0	-21.9	
10372.00	-8.1	H	3.0	35.8	1.0	-42.9	-25.0	-17.9	
<b>High Ch, 2680MHz</b>									
5360.00	-17.2	V	3.0	35.4	1.0	-51.7	-25.0	-26.7	
8040.00	-13.2	V	3.0	35.8	1.0	-48.0	-25.0	-23.0	
10720.00	-9.3	V	3.0	35.7	1.0	-43.9	-25.0	-18.9	
5360.00	-16.1	H	3.0	35.4	1.0	-50.6	-25.0	-25.6	
8040.00	-12.0	H	3.0	35.8	1.0	-46.8	-25.0	-21.8	
10720.00	-9.8	H	3.0	35.7	1.0	-44.5	-25.0	-19.5	

**LTE B41 20MHz QPSK**

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

Company: SOMC  
 Project #: 12118543  
 Date: 3/22/2018  
 Test Engineer: 16069 OG  
 Configuration: EUT + SUPPORT EQUIPMENT  
 Location: Chamber C  
 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	-15.7	V	3.0	35.5	1.0	-50.2	-25.0	-25.2	
7518.00	-15.0	V	3.0	35.7	1.0	-49.8	-25.0	-24.8	
10024.00	-12.6	V	3.0	36.0	1.0	-47.6	-25.0	-22.6	
5012.00	-18.9	H	3.0	35.5	1.0	-51.4	-25.0	-26.4	
7518.00	-13.3	H	3.0	35.7	1.0	-49.0	-25.0	-23.0	
10024.00	-10.6	H	3.0	36.0	1.0	-45.6	-25.0	-20.6	
<b>Mid Ch, 2593MHz</b>									
5186.00	-16.5	V	3.0	35.4	1.0	-50.9	-25.0	-25.9	
7779.00	-14.8	V	3.0	35.8	1.0	-49.5	-25.0	-24.5	
10372.00	-11.1	V	3.0	35.8	1.0	-46.0	-25.0	-21.0	
5186.00	-18.7	H	3.0	35.4	1.0	-51.2	-25.0	-26.2	
7779.00	-11.7	H	3.0	35.8	1.0	-46.5	-25.0	-21.5	
10372.00	-8.7	H	3.0	35.8	1.0	-44.6	-25.0	-19.6	
<b>High Ch, 2680MHz</b>									
5360.00	-17.4	V	3.0	35.4	1.0	-51.8	-25.0	-26.8	
8040.00	-14.5	V	3.0	35.8	1.0	-49.3	-25.0	-24.3	
10720.00	-9.1	V	3.0	35.7	1.0	-43.8	-25.0	-18.8	
5360.00	-16.6	H	3.0	35.4	1.0	-51.1	-25.0	-26.1	
8040.00	-11.6	H	3.0	35.8	1.0	-46.4	-25.0	-21.4	
10720.00	-8.9	H	3.0	35.7	1.0	-43.6	-25.0	-18.6	

**LTE B41 20MHz 16QAM**







---

## 10. VERIFICATION AND VALIDATION OF USING MOBILE COUNTRY CODE

### RESULTS

- Appendix A

---

## **Appendix A**

For this product when the Mobile Country Code (=MCC) is set to US MCC, the below bands will be disabled.

- LTE B19
- LTE B38
- LTE B40
- LTE B46

The following pages show that when US MCC is connected on the base station, LTE B19/38/40/46 cannot be registered and no capability (i.e. disabled). On the other hand, when non-US MCC is connected, the above bands are able to register and have capability.

## UE cannot register B19 at US MCC (310)

Phone1  
LTE  
30.60 #060

UL Channel: 24075 ch  
TPC Pattern: All +3dB  
Input Level: 30.0 dBm  
Operation Band: B19  
Channel Bandwidth: 10 MHz  
Output Level: 57.2 dBm

MT8821C  
2018/04/12 16:07  
RF Output: On

UE Power: -22.2 dBm

Common: General, Base Station Identity, Cell ID, MCC: 310, MNC, TAC, Mobile Station Identity, Authentication / Integrity, SIM Model Number, Authentication, Authentication Algorithm, Band Definition, External Loss, System Config

SequenceMonitor: Off, Idle, Detach, Registration, Idle(Regist), UE Origination, NW Origination, Connected, Handover, UE Release, NW Release

UE Report: IMSI(DEC), IMEI, IMEI (Check Digit), UE Category, UE CategoryDL, UE CategoryUL, PDN Type

Signaling Trace: U-S Message, Description, Time at RRC

U-S	Message	Description	Time at RRC
-->	RRCConnectionSetupComplete	ATTACH REQUEST(Combined)	01:03:11.232 (00:00.017)
<--	DLInformationTransfer	AUTHENTICATION REQUEST	01:03:11.233 (00:00.001)
<--	ULInformationTransfer	AUTHENTICATION RESPONSE	01:03:11.296 (00:00.063)
<--	DLInformationTransfer	SECURITY MODE COMMAND	01:03:11.306 (00:00.010)
<--	ULInformationTransfer	SECURITY MODE COMPLETE	01:03:11.319 (00:00.013)
<--	SecurityModeCommand		01:03:11.319 (00:00.000)
<--	SecurityModeComplete		01:03:11.335 (00:00.016)
<--	RRCConnReconfiguration	ATTACH ACCEPT	01:03:11.350 (00:00.015)
<--	RRCConnReconfigurationComplete		01:03:11.371 (00:00.021)
<--	ULInformationTransfer	ATTACH COMPLETE	01:03:11.379 (00:00.008)
<--	Paging	SFN : 277 Subframe : 9	01:03:11.582 (00:00.203)
<--	IP message	ICMPv6 (Router Solicitation)	01:03:11.884 (00:00.302)
<--	IP message	ICMPv6 (Router Advertisement)	01:03:11.884 (00:00.000)

Function: Home, Preset, Reference Signal not found, Single, Continuous, Start Call, End Call, Menu

## UE cannot register B38 at US MCC (310)

Phone1  
LTE  
30.60 #060

UL Channel: 38000 ch  
TPC Pattern: All +3dB  
Input Level: 30.0 dBm  
Operation Band: B38  
Channel Bandwidth: 10 MHz  
Output Level: 57.2 dBm

MT8821C  
2018/04/12 16:08  
RF Output: On

UE Power: -19.2 dBm

Common: General, Base Station Identity, Cell ID, MCC: 310, MNC, TAC, Mobile Station Identity, Authentication / Integrity, SIM Model Number, Authentication, Authentication Algorithm, Band Definition, External Loss, System Config

SequenceMonitor: Off, Idle, Detach, Registration, Idle(Regist), UE Origination, NW Origination, Connected, Handover, UE Release, NW Release

UE Report: IMSI(DEC), IMEI, IMEI (Check Digit), UE Category, UE CategoryDL, UE CategoryUL, PDN Type

Signaling Trace: U-S Message, Description, Time at RRC

U-S	Message	Description	Time at RRC
-->	RRCConnectionSetupComplete	ATTACH REQUEST(Combined)	01:03:11.232 (00:00.017)
<--	DLInformationTransfer	AUTHENTICATION REQUEST	01:03:11.233 (00:00.001)
<--	ULInformationTransfer	AUTHENTICATION RESPONSE	01:03:11.296 (00:00.063)
<--	DLInformationTransfer	SECURITY MODE COMMAND	01:03:11.306 (00:00.010)
<--	ULInformationTransfer	SECURITY MODE COMPLETE	01:03:11.319 (00:00.013)
<--	SecurityModeCommand		01:03:11.319 (00:00.000)
<--	SecurityModeComplete		01:03:11.335 (00:00.016)
<--	RRCConnReconfiguration	ATTACH ACCEPT	01:03:11.350 (00:00.015)
<--	RRCConnReconfigurationComplete		01:03:11.371 (00:00.021)
<--	ULInformationTransfer	ATTACH COMPLETE	01:03:11.379 (00:00.008)
<--	Paging	SFN : 277 Subframe : 9	01:03:11.582 (00:00.203)
<--	IP message	ICMPv6 (Router Solicitation)	01:03:11.884 (00:00.302)
<--	IP message	ICMPv6 (Router Advertisement)	01:03:11.884 (00:00.000)

Function: Home, Preset, Reference Signal not found, Single, Continuous, Start Call, End Call, Menu

### UE cannot register B40 at US MCC (310)

Phone1 LTE 30.60 #060

UL Channel -39150 ch TPC Pattern All +3dB Input Level 30.0 dBm

Operation Band 40 Channel Bandwidth 10 MHz Output Level -57.2 dBm

MT8821C 2018/04/12 16:08 RF Output: On

PCC SCC1 SCC2 SCC3 >>

Measurement Signaling UE Power: -19.7 dBm

SequenceMonitor

UE Report

IMSI(DEC)	IMEI	IMEI (Check Digit)	UE Category	UE CategoryDL	UE CategoryUL	PDN Type
	004402458417880	004402458417882	11	15	5	IPv4v6

Signaling Trace

U-S	Message	Description	Time at RRC
->	RRCConnectionSetupComplete	ATTACH REQUEST(Combined)	01:03:11.232 (00:00.017)
->	DLInformationTransfer	AUTHENTICATION REQUEST	01:03:11.233 (00:00.001)
->	ULInformationTransfer	AUTHENTICATION RESPONSE	01:03:11.296 (00:00.063)
->	DLInformationTransfer	SECURITY MODE COMMAND	01:03:11.306 (00:00.010)
->	ULInformationTransfer	SECURITY MODE COMPLETE	01:03:11.319 (00:00.013)
->	SecurityModeCommand		01:03:11.319 (00:00.000)
->	SecurityModeComplete		01:03:11.335 (00:00.016)
->	RRCConnReconfiguration	ATTACH ACCEPT	01:03:11.350 (00:00.015)
->	RRCConnReconfigurationComplete		01:03:11.371 (00:00.021)
->	ULInformationTransfer	ATTACH COMPLETE	01:03:11.379 (00:00.008)
->	Paging	SRN: 277 Subframe: 9	01:03:11.582 (00:00.203)
->	IP message	ICMPv6 (Router Solicitation)	01:03:11.884 (00:00.302)
->	IP message	ICMPv6 (Router Advertisement)	01:03:11.884 (00:00.000)

Function

Idle

Reference Signal not found

### UE cannot register B46 at US MCC (310) PCC\_B3[CA\_3A-46A]

Phone2 LTE 30.60 #050

Phone1 LTE 30.60 #060

DL Channel 1575 ch TPC Pattern All +3dB Input Level 30.0 dBm

Operation Band 3 Channel Bandwidth 20 MHz Output Level -54.2 dBm

Channel Coding [LxC] CHCODING

MT8821C 2018/04/12 18:19 RF Output: On DL 2CCs

PCC SCC1 SCC2 SCC3 >>

Measurement Signaling UE Power: -20.3 dBm

Fundamental Throughput

MAC DL total: 7884 kbps (100.00 %)

MAC UL total: 10296 kbps (100.00 %)

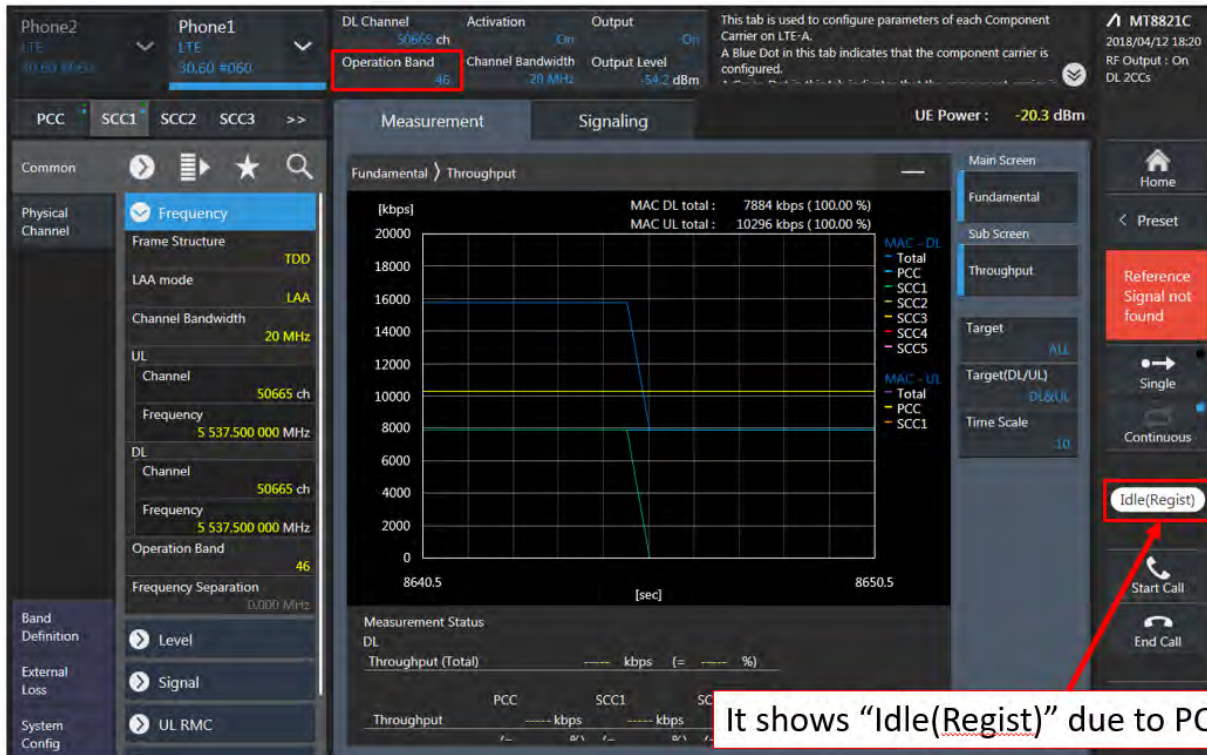
Throughput

Idle(Regist)

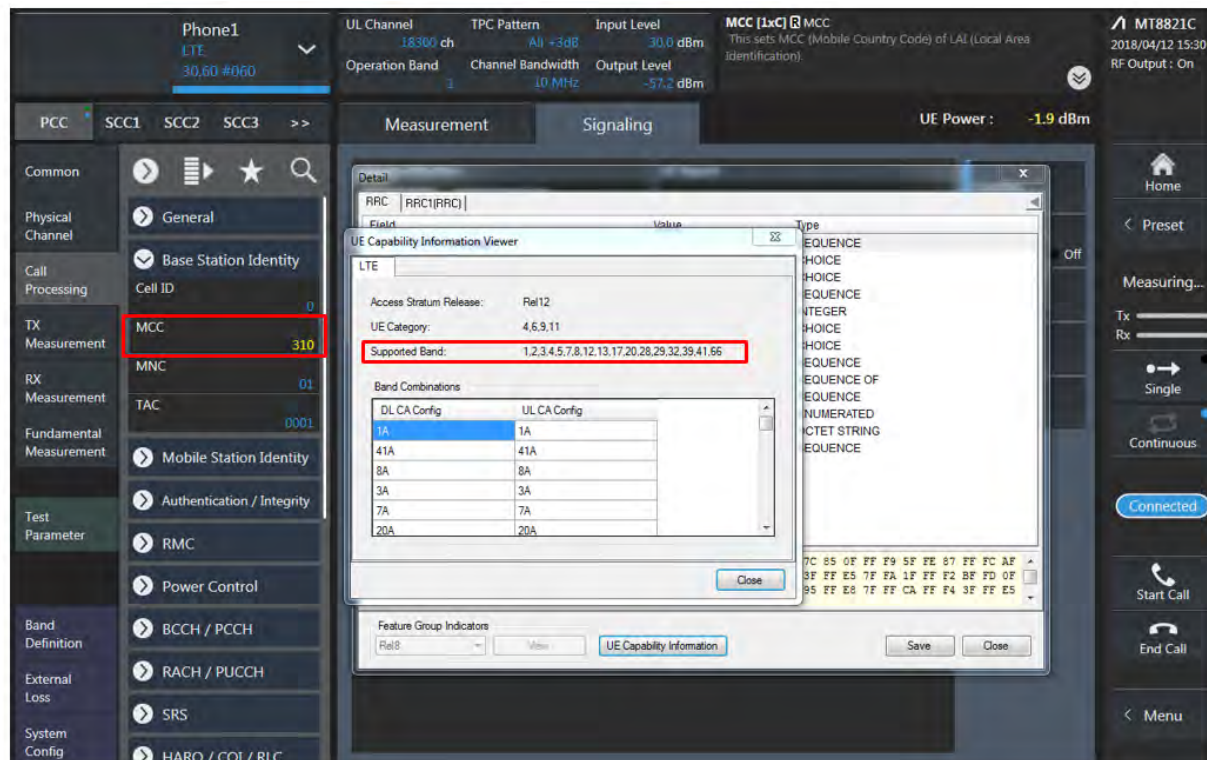
Reference Signal not found

It shows "Idle(Regist)" due to PCC Band

### UE cannot register B46 at US MCC (310) SCC\_B46[CA\_3A-46A]



### UE capability does not have B19/38/40/46 at US MCC (310)



# UE capability does have B19/38/40/46 at Non-US MCC (525)

The screenshot shows a software interface for mobile network analysis. A central window titled 'UE Capability Information Viewer' is open, displaying the following information:

- Access Stratum Release: Rel12
- UE Category: 4,7,10,12
- Supported Band: 1,2,3,4,5,7,8,12,13,17,19,20,26,28,29,32,38,39,40,41,46,66 (highlighted with a red box)
- Band Combinations table:

DL CA Config	UL CA Config
1A	1A
41A	41A
8A	8A
26A	26A
3A	3A
7A	7A

Other visible details in the interface include MCC: 525, UE Power: 22.6 dBm, and various network parameters like UL Channel (L8300 ch) and TPC Pattern (All +3dB).

**END OF REPORT**