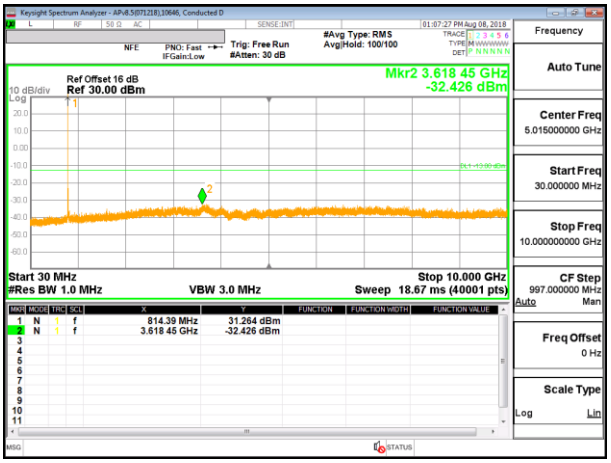
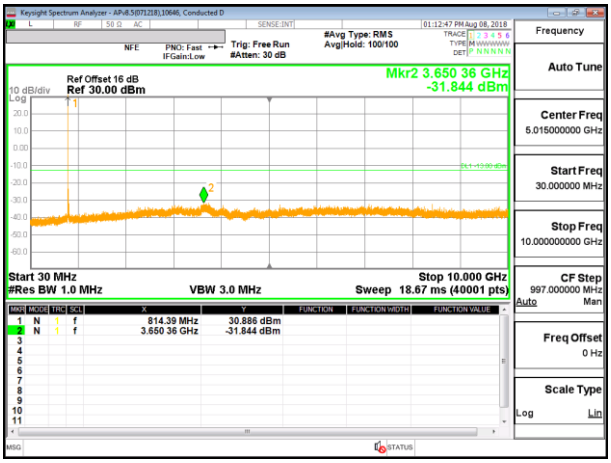


LTE B26 5MHz QPSK Low Channel RB1-0



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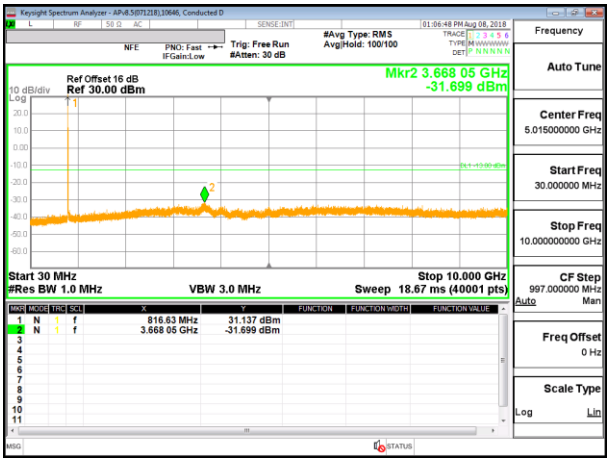

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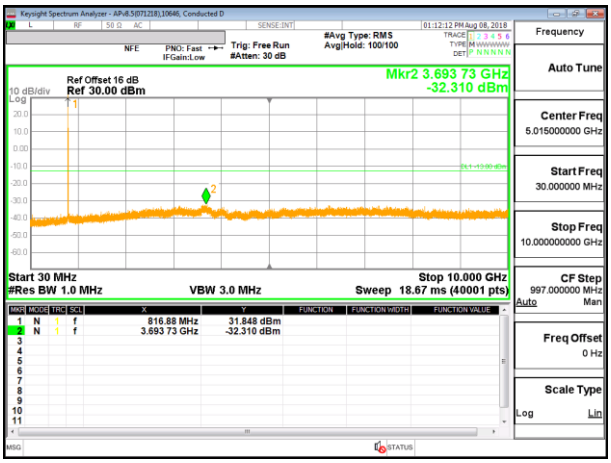

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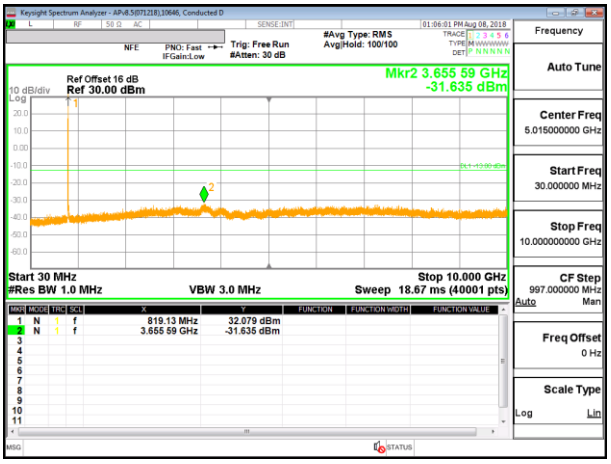

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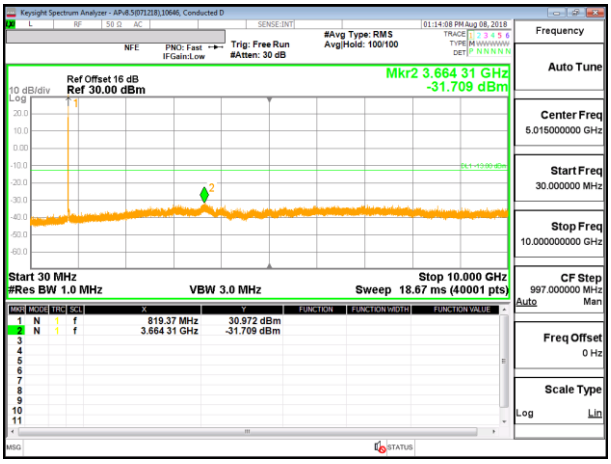

LTE B26 5MHz 16QAM High Channel RB1-0

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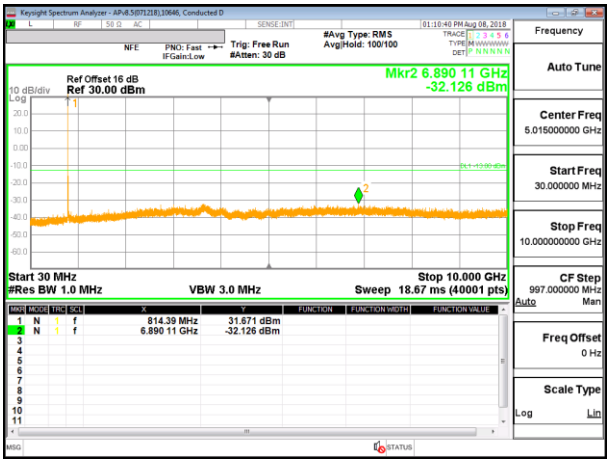
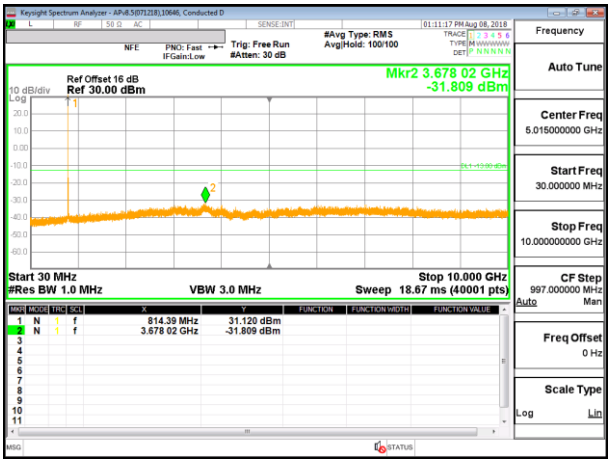


LTE B26 10MHz QPSK Middle Channel RB1-0



LTE B26 10MHz 16QAM Middle Channel RB1-0

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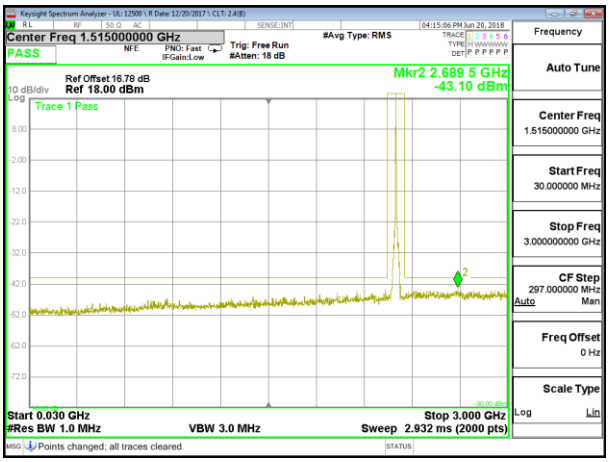
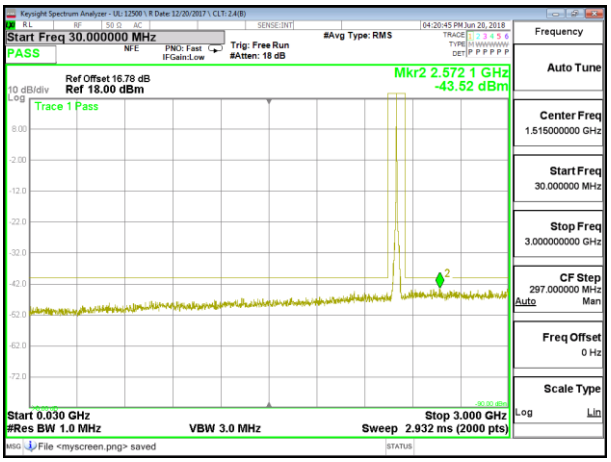
8.3.10. LTE BAND 30



LTE B30 5MHz QPSK Low Channel RB1-0



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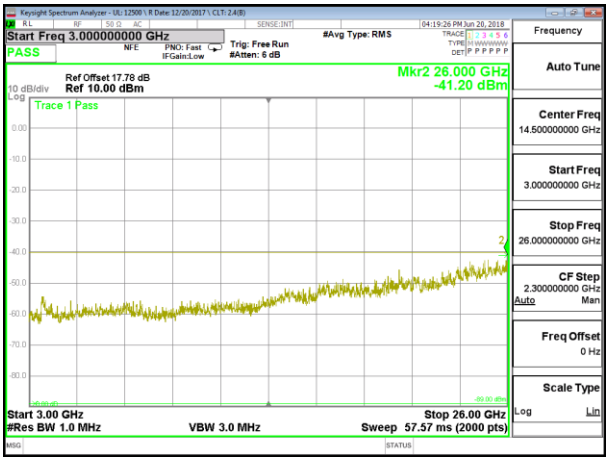

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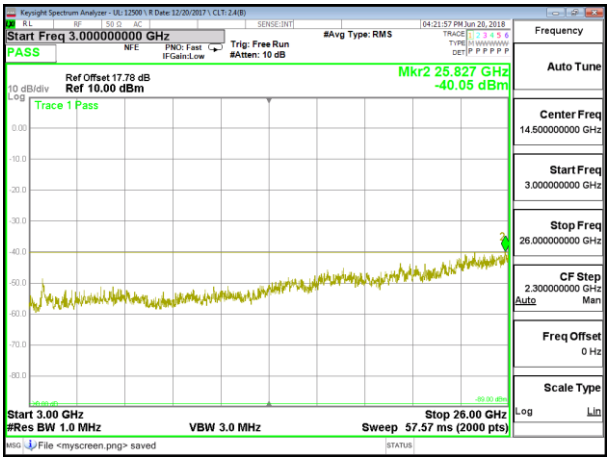
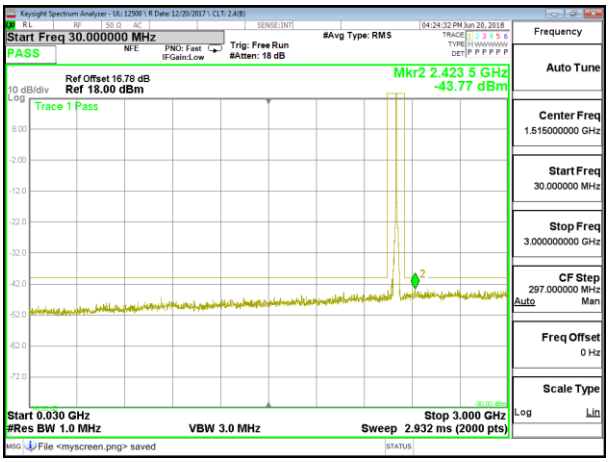
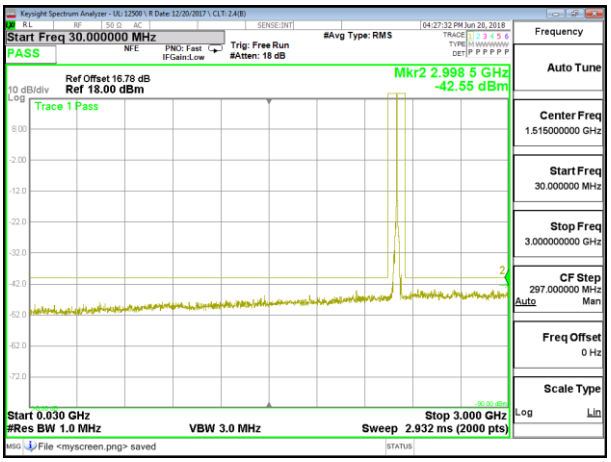


LTE B30 5MHz 16QAM Low Channel RB1-0



LTE B30 5MHz QPSK Middle Channel RB1-0



LTE B30 5MHz 16QAM Middle Channel RB1-0

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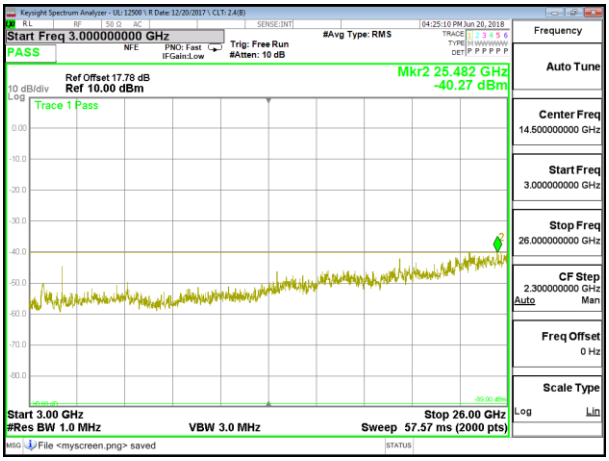
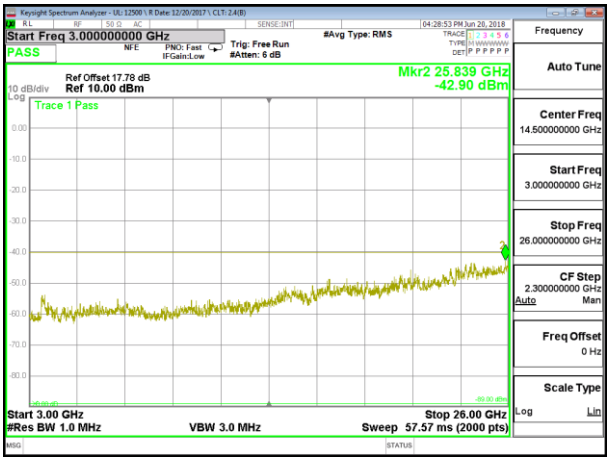
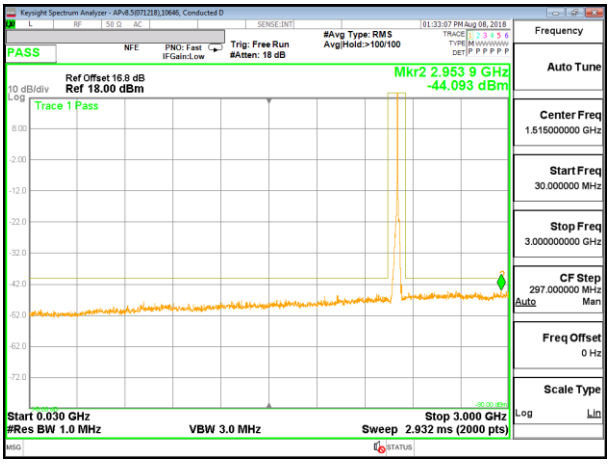


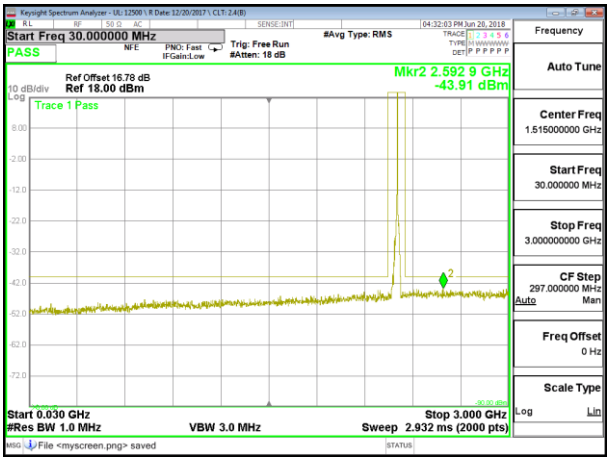
LTE B30 5MHz QPSK Middle Channel RB1-0



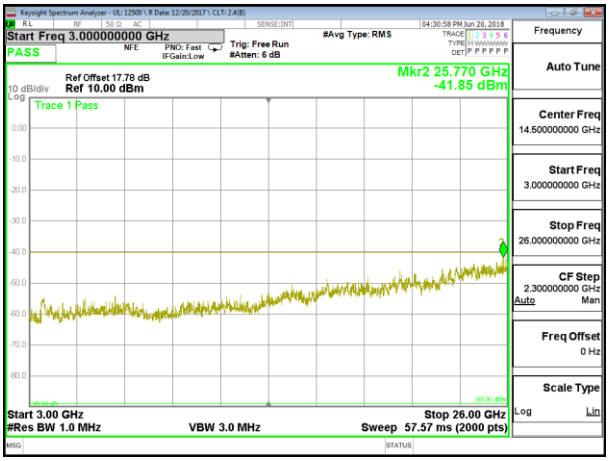
LTE B30 5MHz 16QAM Middle Channel RB1-0



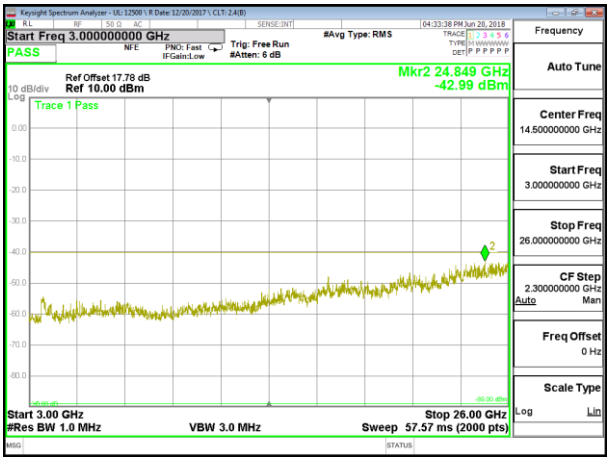
LTE B30 5MHz QPSK High Channel RB1-0



LTE B30 5MHz 16QAM High Channel RB1-0



LTE B30 5MHz QPSK High Channel RB1-0



LTE B30 5MHz 16QAM High Channel RB1-0

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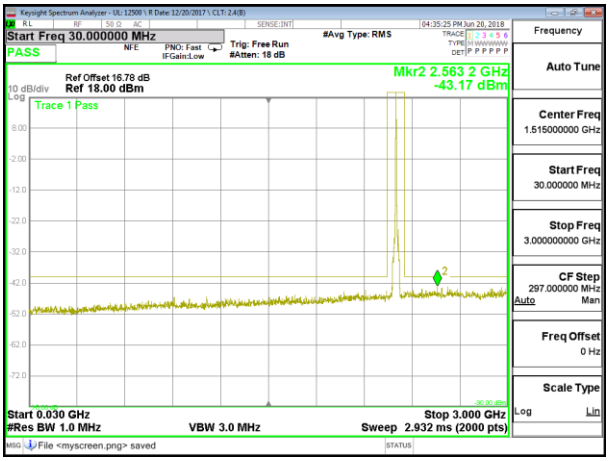
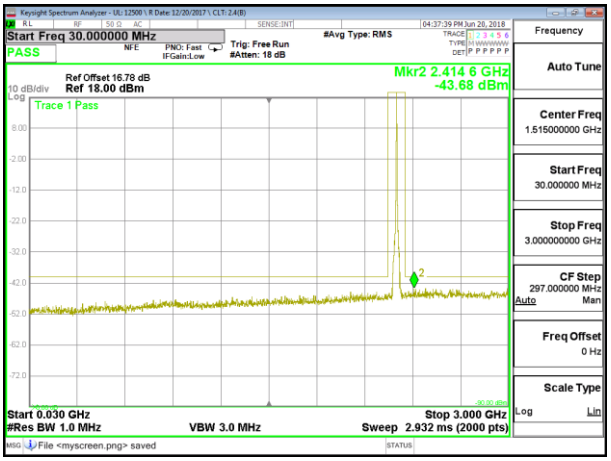
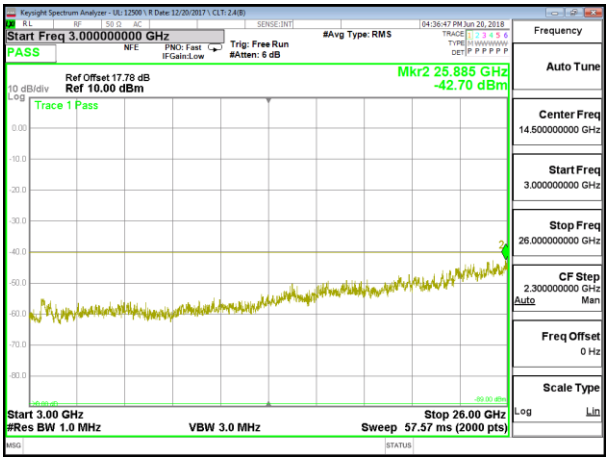


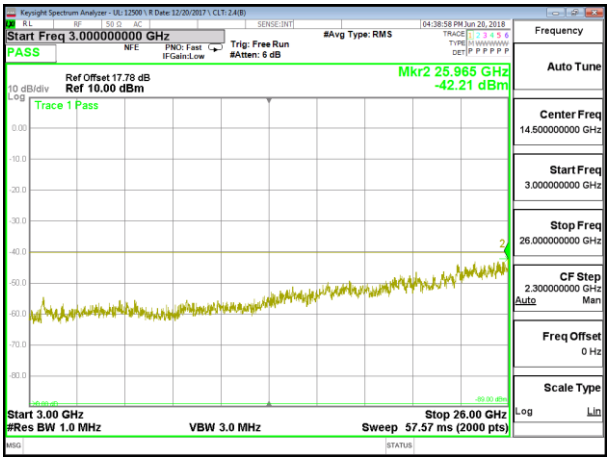
LTE B30 10MHz QPSK Middle Channel RB1-0



LTE B30 10MHz 16QAM Middle Channel RB1-0



LTE B30 10MHz QPSK Middle Channel RB1-0



LTE B30 10MHz 16QAM Middle Channel RB1-0

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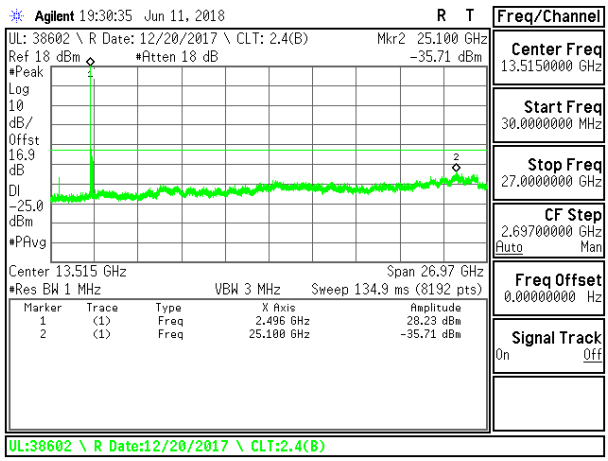
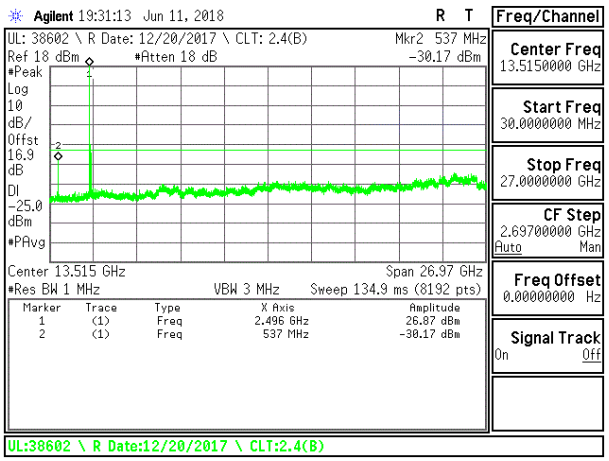
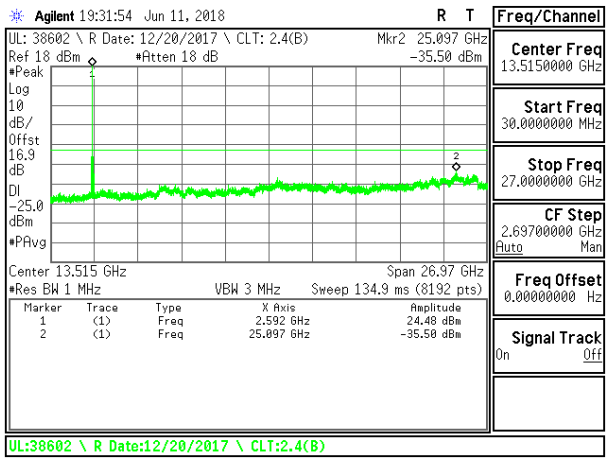
8.3.11. LTE BAND 41



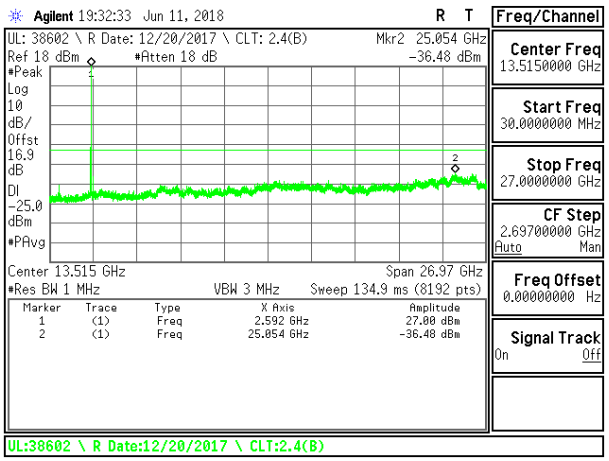
LTE B41 5MHz QPSK Low Channel RB1-0



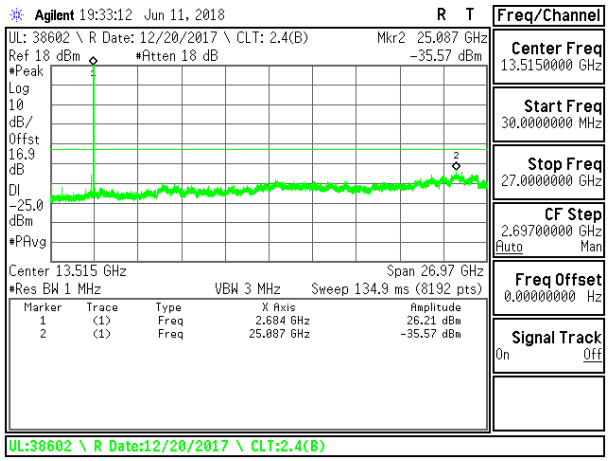
LTE B41 5MHz 16QAM Low Channel RB1-0



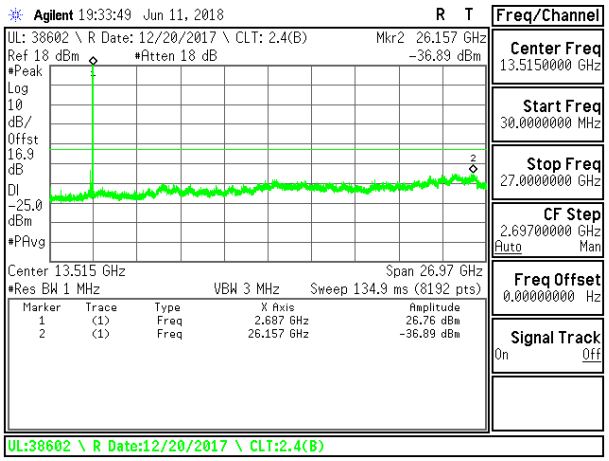
LTE B41 5MHz QPSK Middle Channel RB1-0



LTE B41 5MHz 16QAM Middle Channel RB1-0



LTE B41 5MHz QPSK High Channel RB1-0



LTE B41 5MHz 16QAM High Channel RB1-0

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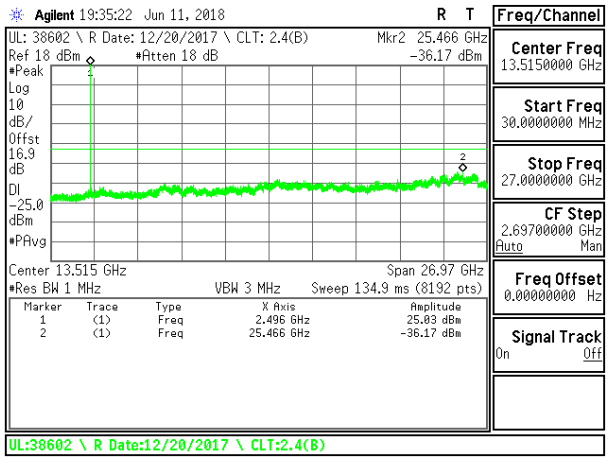
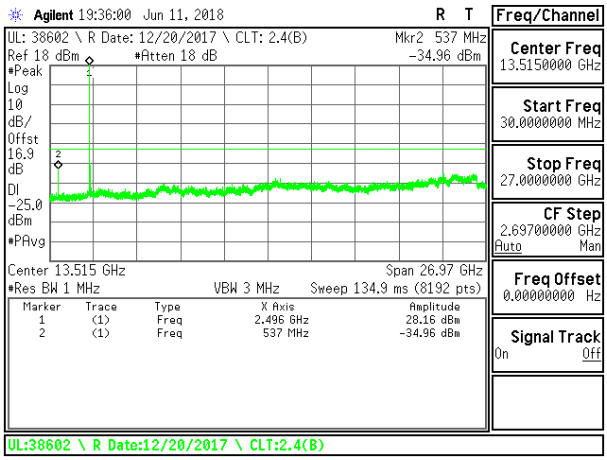
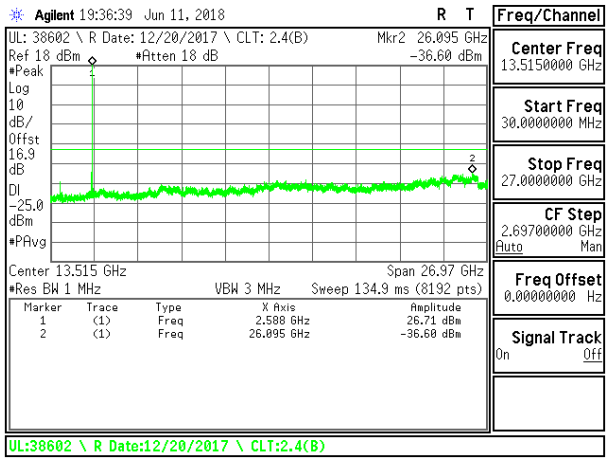


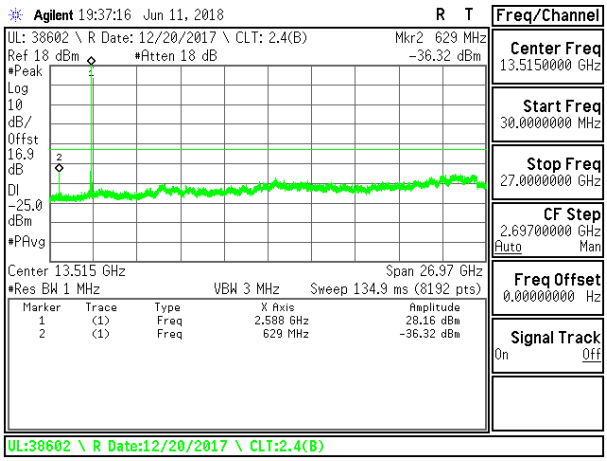
LTE B41 10MHz QPSK Low Channel RB1-0



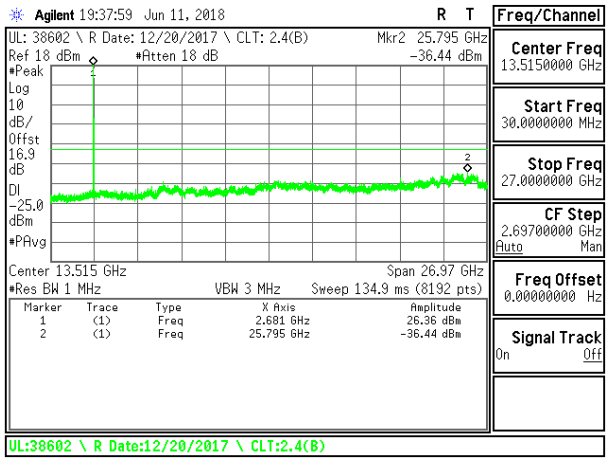
LTE B41 10MHz 16QAM Low Channel RB1-0



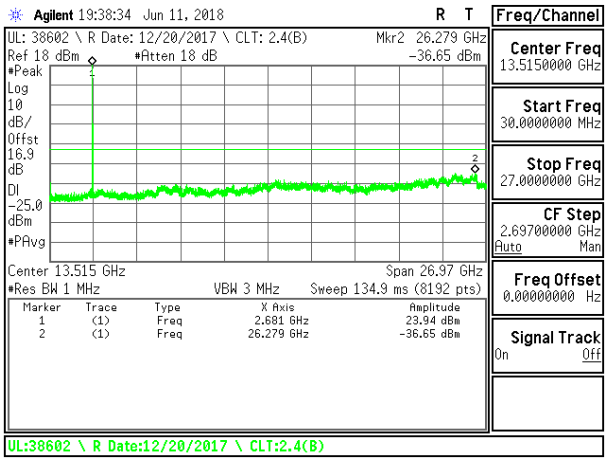
LTE B41 10MHz QPSK Middle Channel RB1-0



LTE B41 10MHz 16QAM Middle Channel RB1-0



LTE B41 10MHz QPSK High Channel RB1-0



LTE B41 10MHz 16QAM High Channel RB1-0

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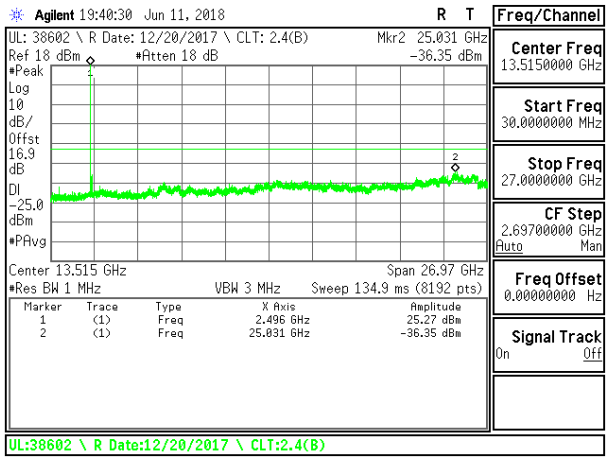
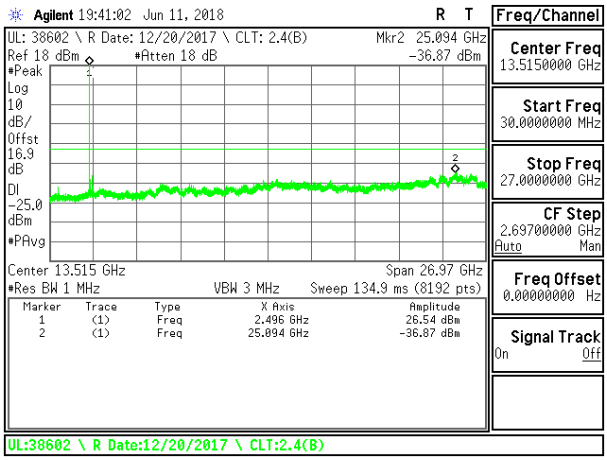
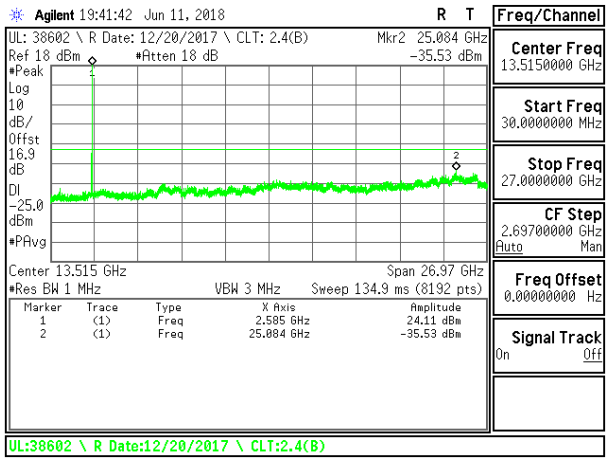


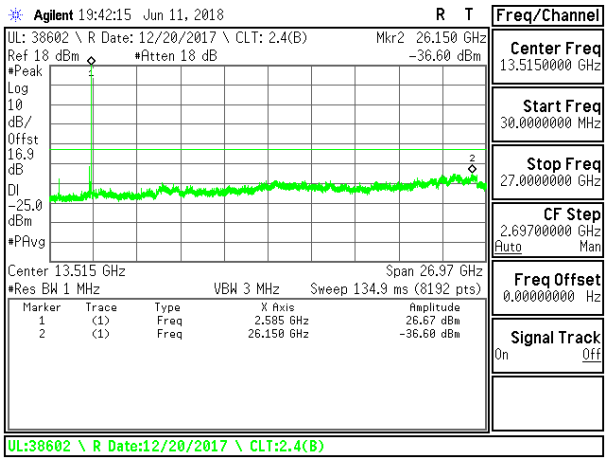
LTE B41 15MHz QPSK Low Channel RB1-0



LTE B41 15MHz 16QAM Low Channel RB1-0



LTE B41 15MHz QPSK Middle Channel RB1-0



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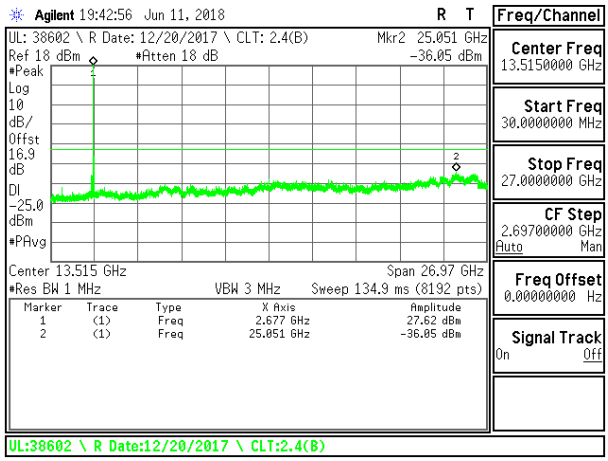
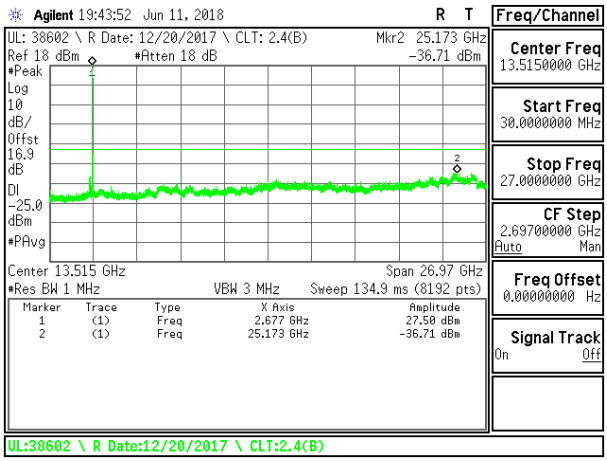


LTE B41 15MHz QPSK High Channel RB1-0



LTE B41 15MHz 16QAM High Channel RB1-0

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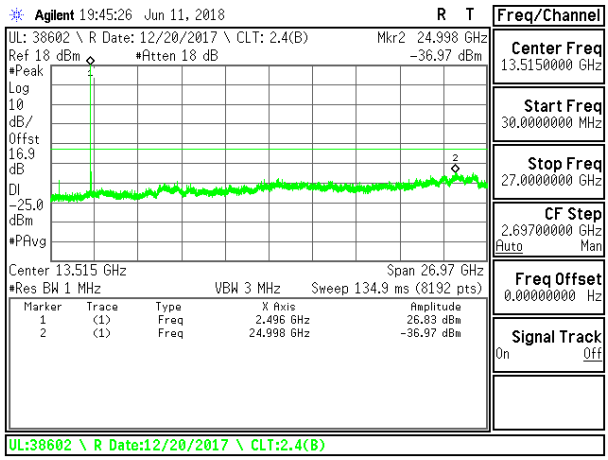
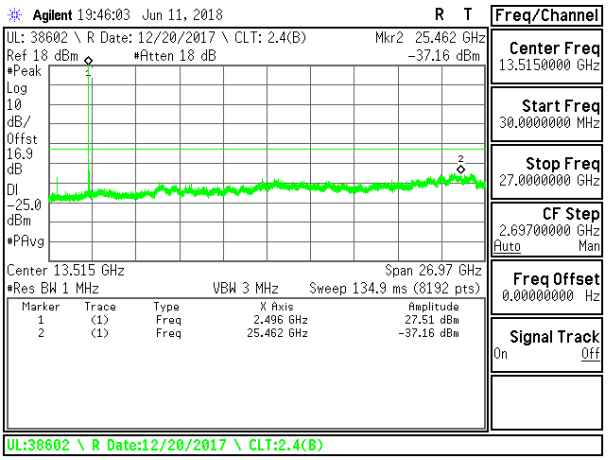
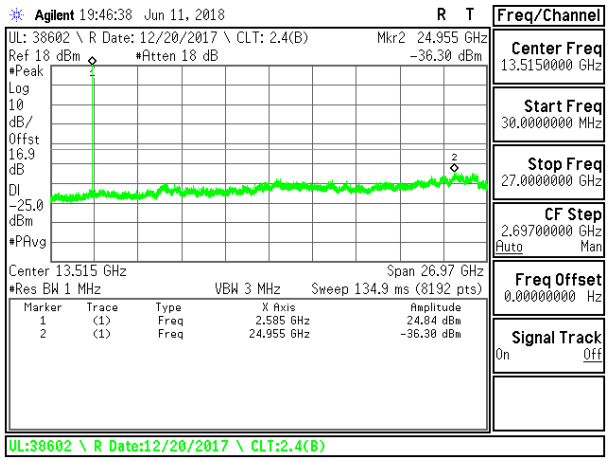


LTE B41 20MHz QPSK Low Channel RB1-0



LTE B41 20MHz 16QAM Low Channel RB1-0



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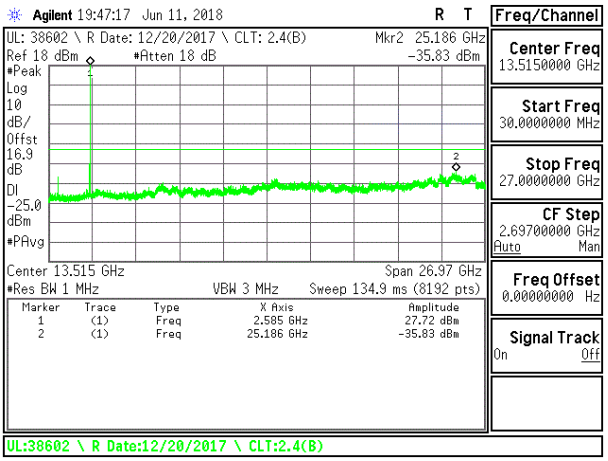

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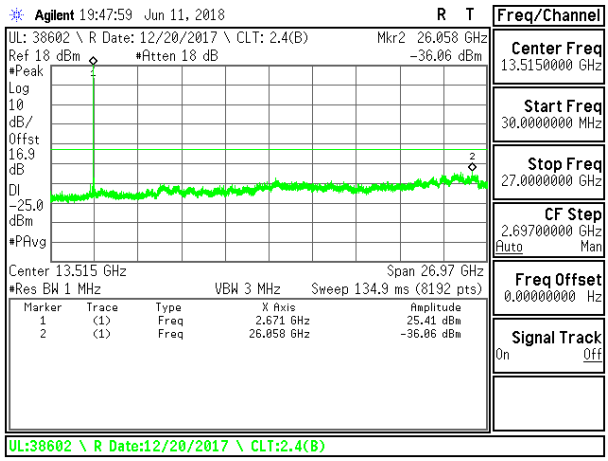
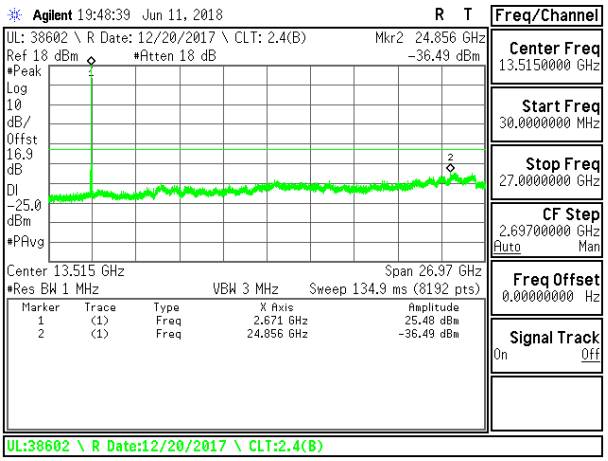


LTE B41 20MHz QPSK High Channel RB1-0



LTE B41 20MHz 16QAM High Channel RB1-0

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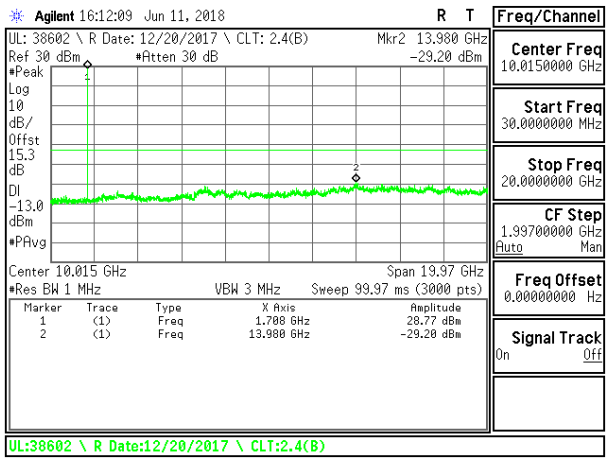
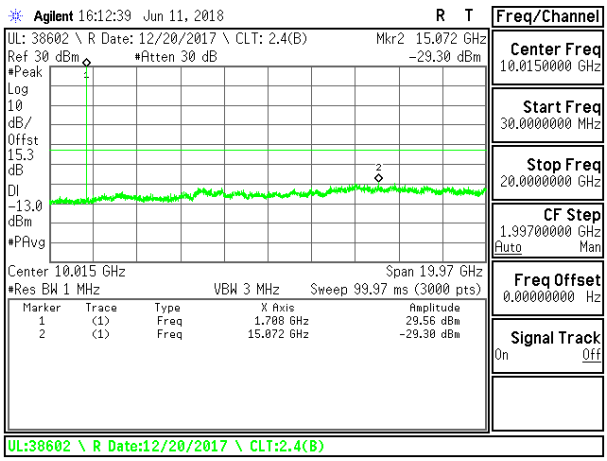
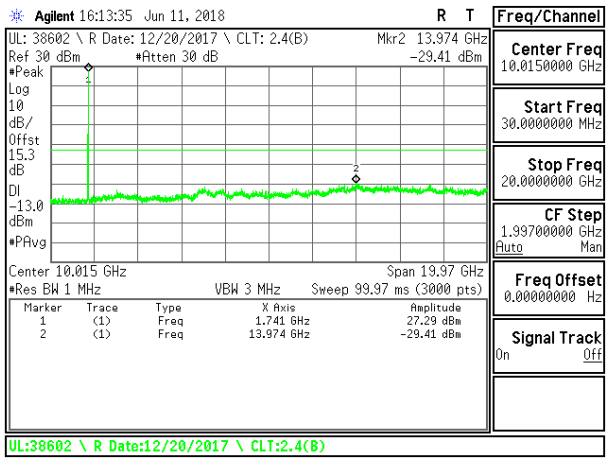
8.3.12. LTE BAND 66



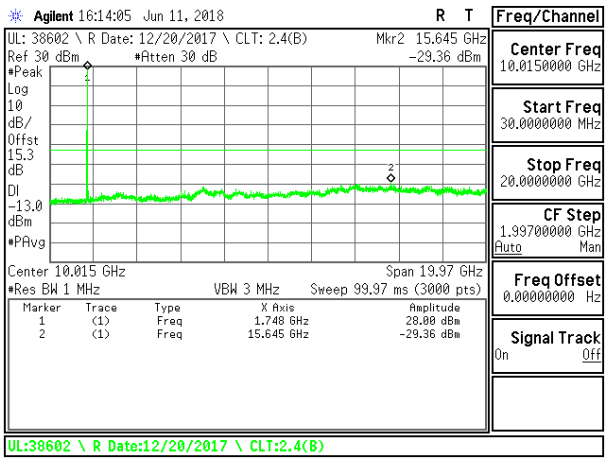
LTE B66 1.4MHz QPSK Low Channel RB1-0



LTE B66 1.4MHz 16QAM Low Channel RB1-0



LTE B66 1.4MHz QPSK Middle Channel RB1-0



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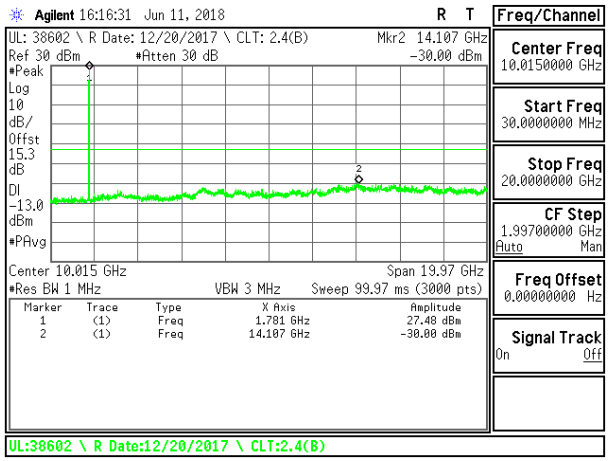
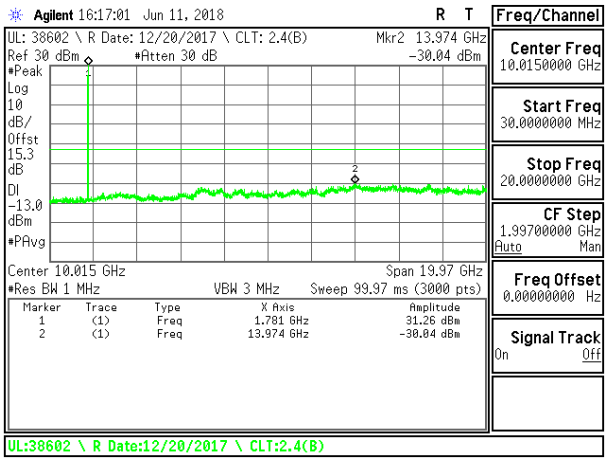


LTE B66 1.4MHz QPSK High Channel RB1-0



LTE B66 1.4MHz 16QAM High Channel RB1-0

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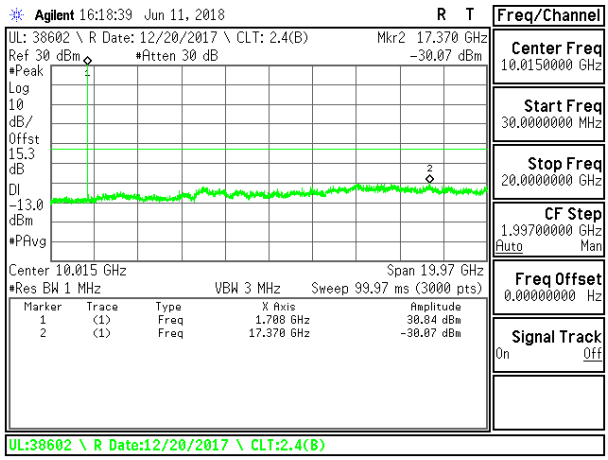
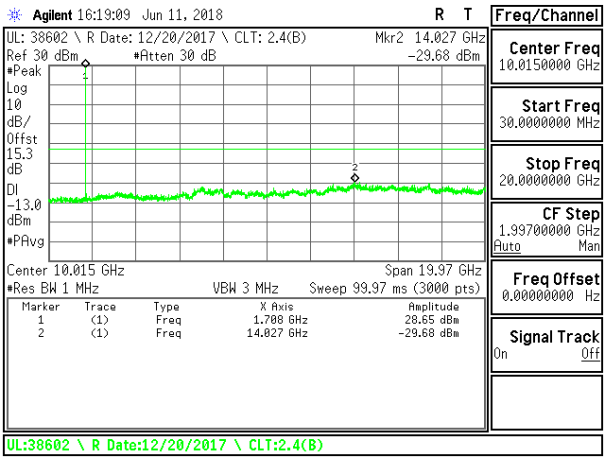


LTE B66 3MHz QPSK Low Channel RB1-0



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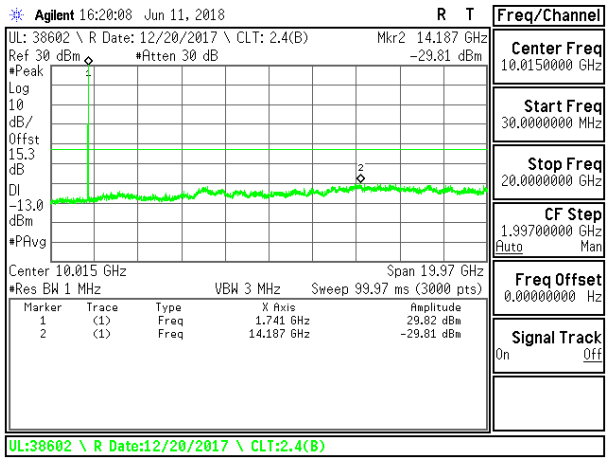

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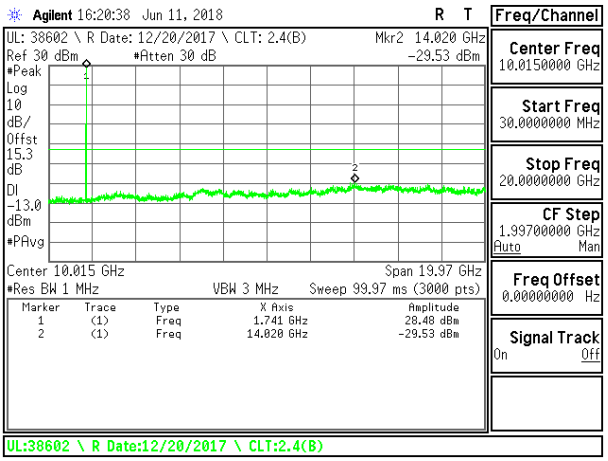

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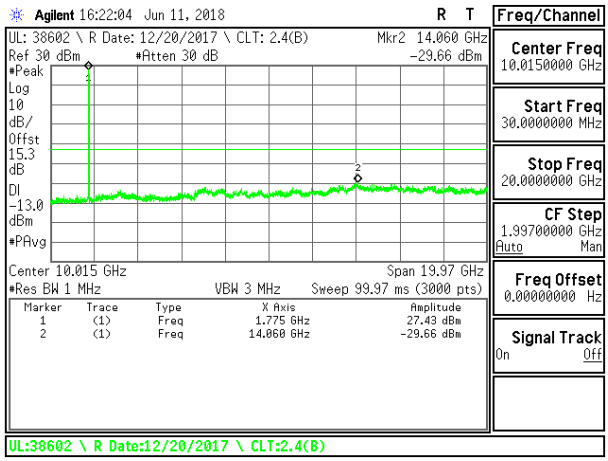
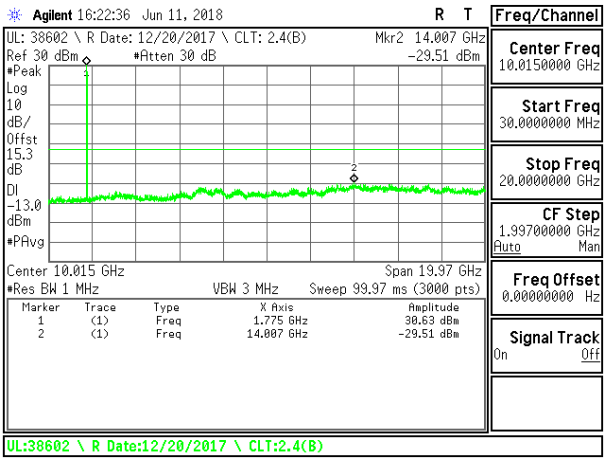


LTE B66 3MHz QPSK High Channel RB1-0



LTE B66 3MHz 16QAM High Channel RB1-0

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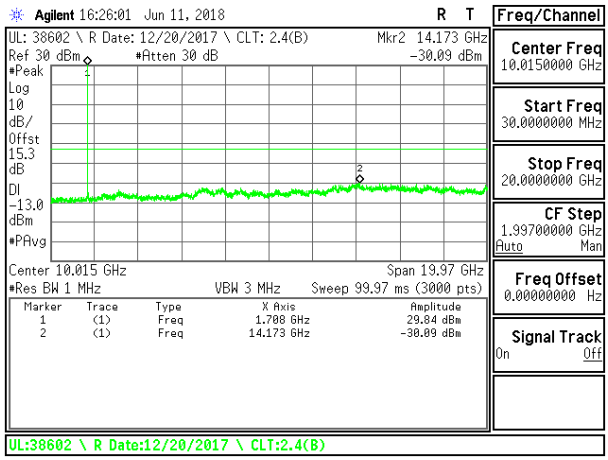
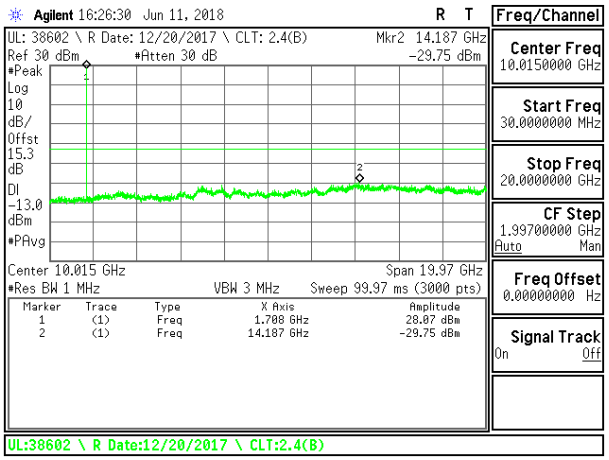
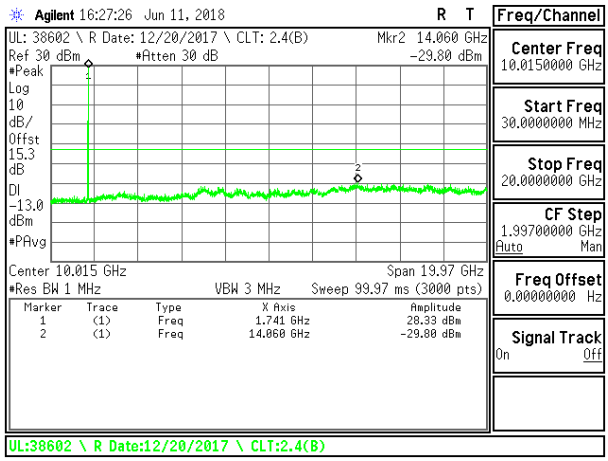


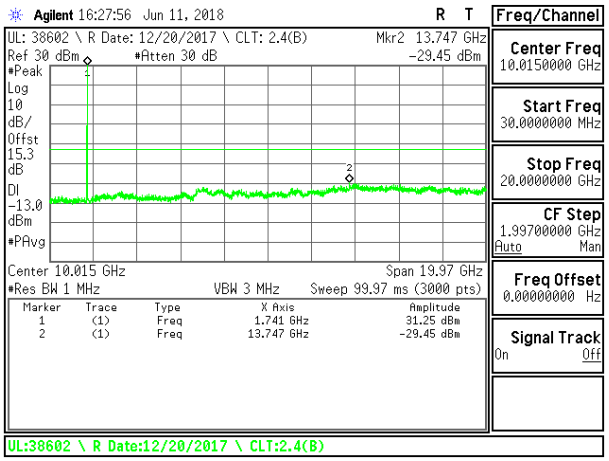
LTE B66 5MHz QPSK Low Channel RB1-0



LTE B66 5MHz 16QAM Low Channel RB1-0



LTE B66 5MHz QPSK Middle Channel RB1-0



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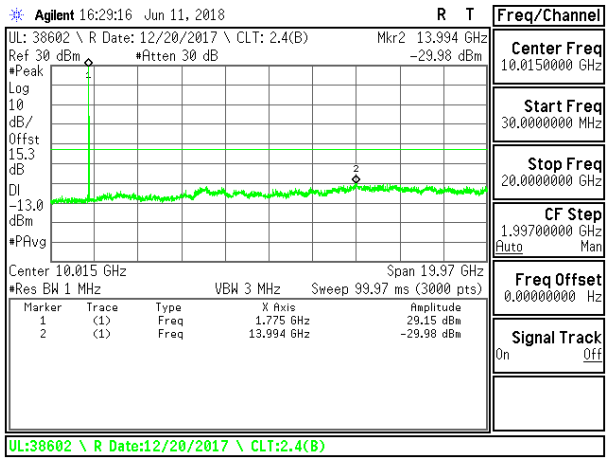
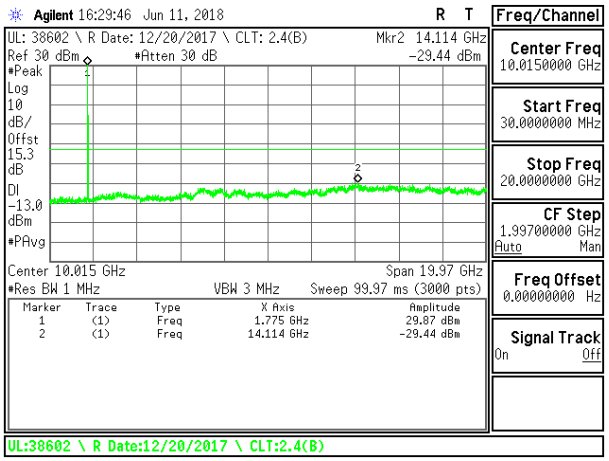


LTE B66 5MHz QPSK High Channel RB1-0



LTE B66 5MHz 16QAM High Channel RB1-0

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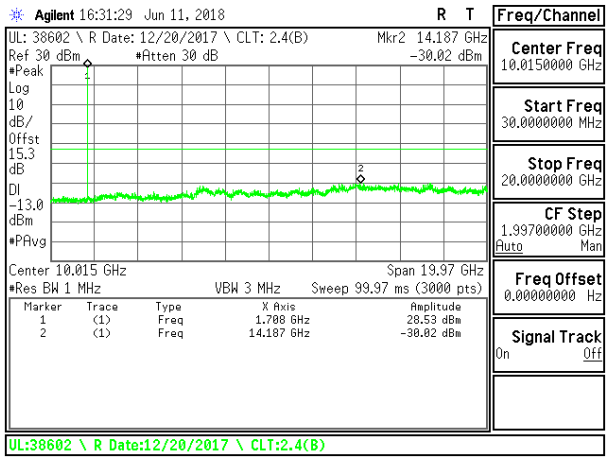
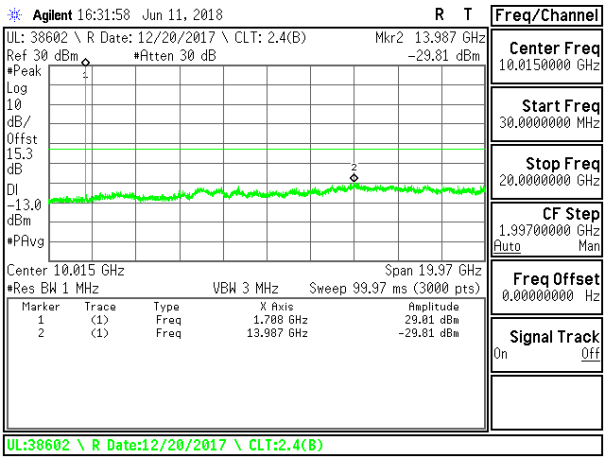


LTE B66 10MHz QPSK Low Channel RB1-0



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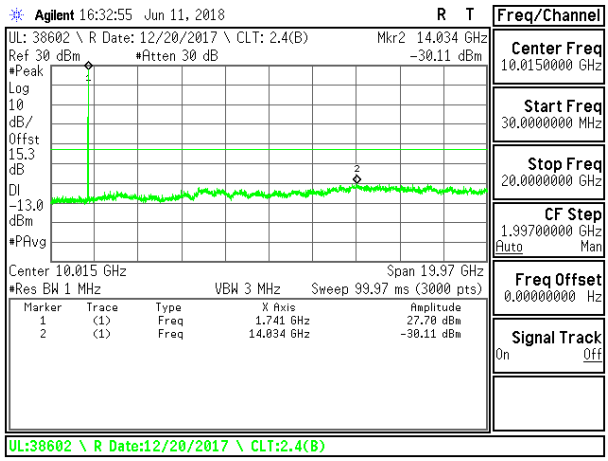

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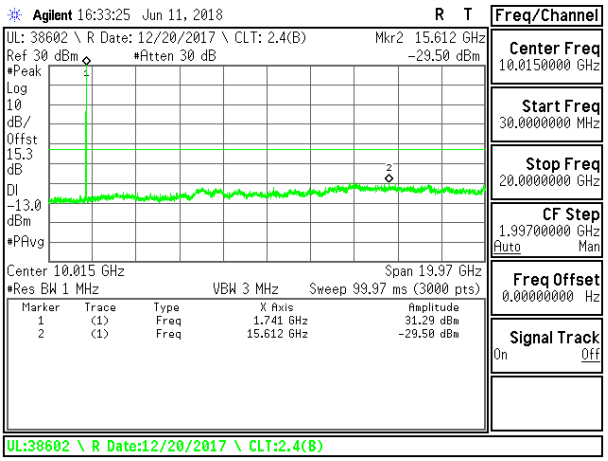

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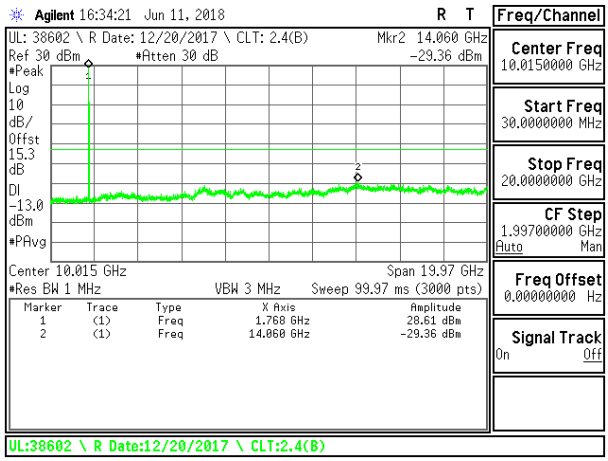
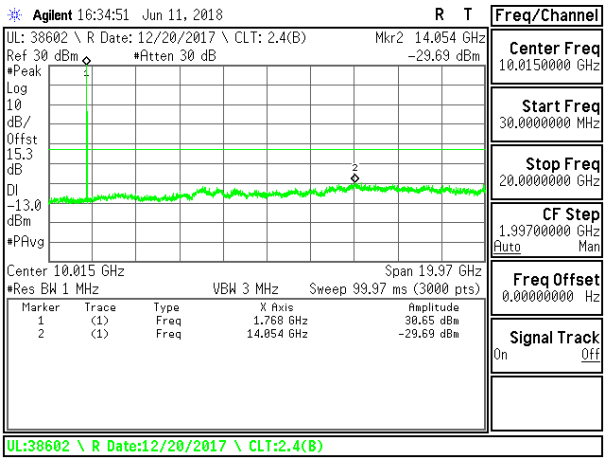


LTE B66 10MHz QPSK High Channel RB1-0



LTE B66 10MHz 16QAM High Channel RB1-0

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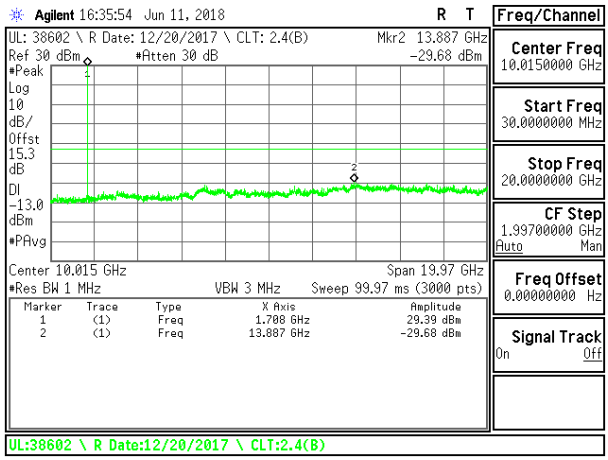
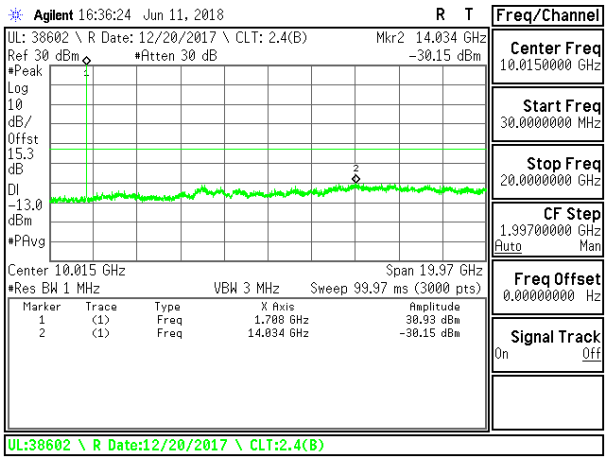
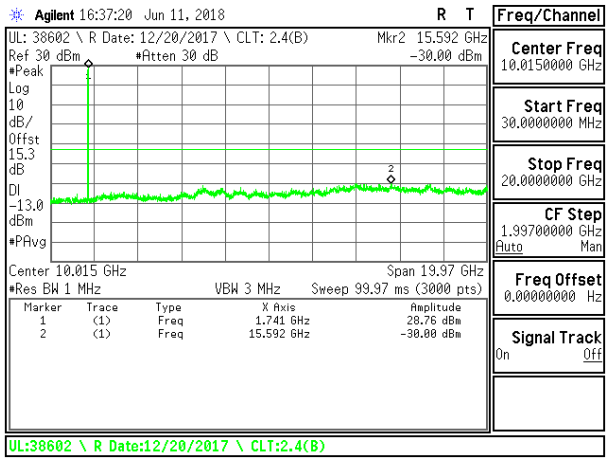


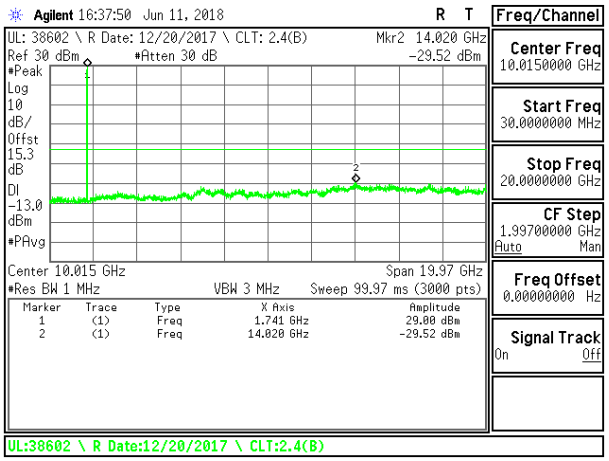
LTE B66 15MHz QPSK Low Channel RB1-0



LTE B66 15MHz 16QAM Low Channel RB1-0



LTE B66 15MHz QPSK Middle Channel RB1-0



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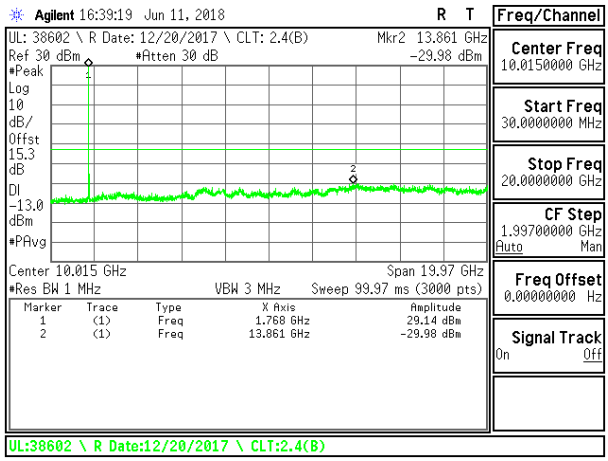

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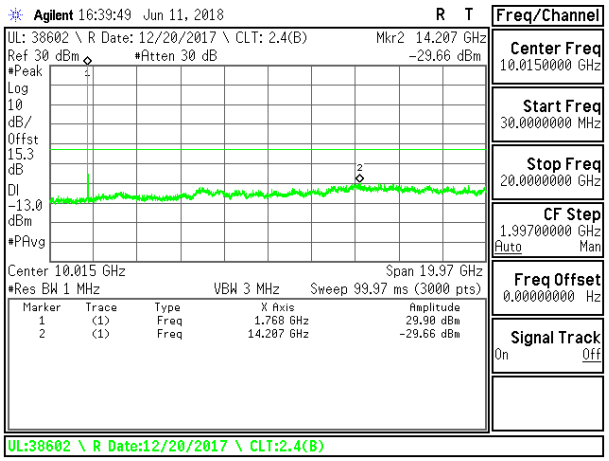

LTE B66 15MHz 16QAM High Channel RB1-0

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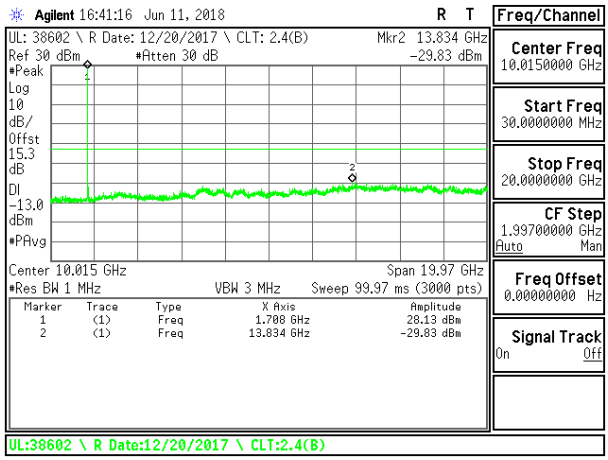
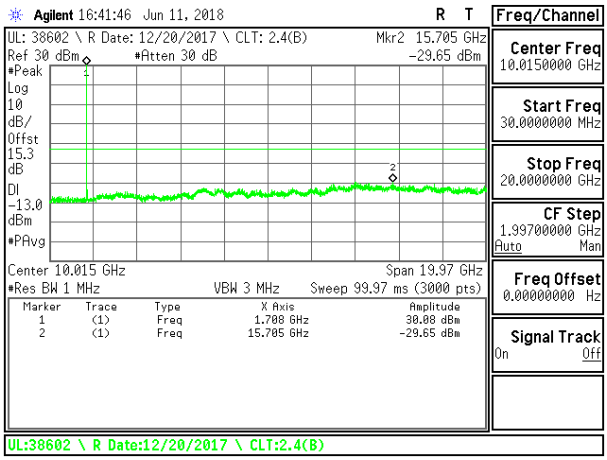
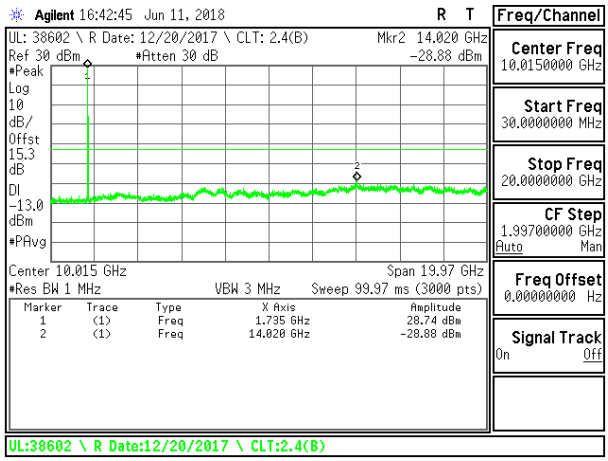


LTE B66 20MHz QPSK Low Channel RB1-0



LTE B66 20MHz 16QAM Low Channel RB1-0



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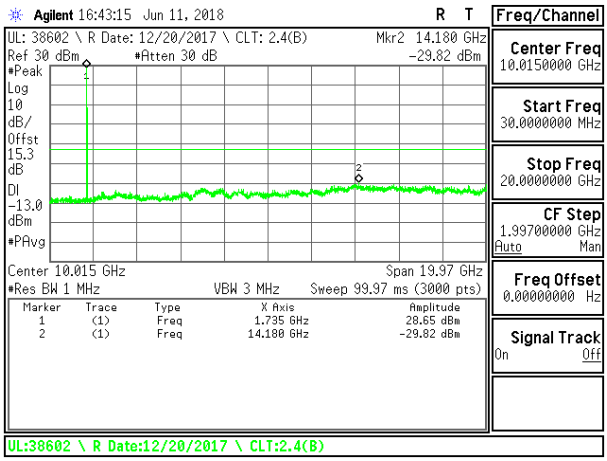

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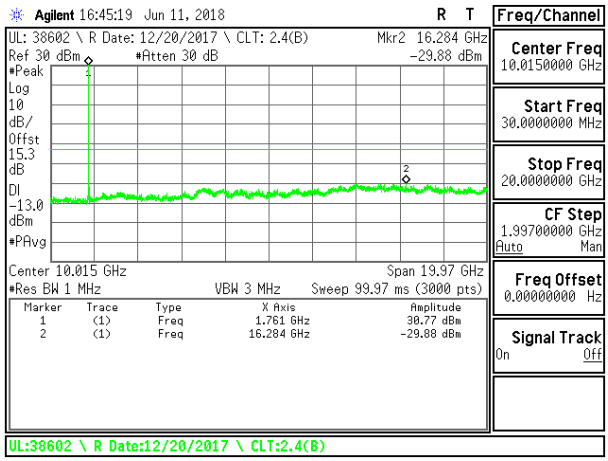

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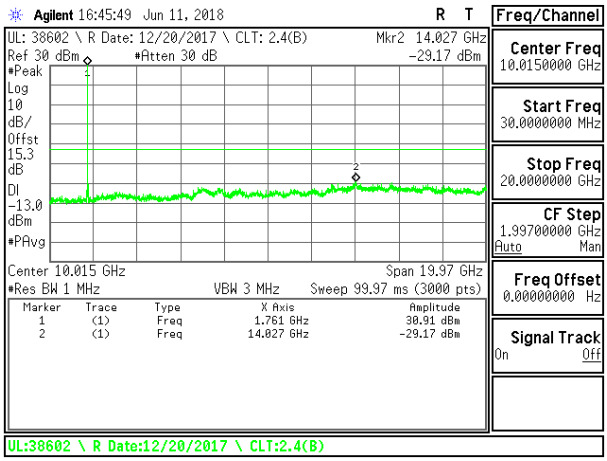

LTE B66 20MHz 16QAM High Channel RB1-0

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8.4. FREQUENCY STABILITY

RULE PART(S)

§2.1055, §22.355, §24.235, §27.54, §90.213 and §90.539

LIMITS

§22.355, §90.213
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§90.539
(e) The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 ppm or better when AFC is locked to a base station, and 5 ppm or better when AFC is not locked.

§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°C to +50°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 place inside a temperature chamber. The temperature is set to 20ºC 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 +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

RESULTS

See the following pages.

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8.4.1. LTE BAND 2

ID:	12492 / 50893	Date:	3/19/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.8242	1909.1318		
Extreme (50C)		1850.8242	1909.1318	-28.8	-0.015
Extreme (40C)		1850.8242	1909.1318	31.5	0.017
Extreme (30C)		1850.8242	1909.1318	24.4	0.013
Extreme (10C)		1850.8242	1909.1318	31.3	0.017
Extreme (0C)		1850.8242	1909.1318	33.1	0.018
Extreme (-10C)		1850.8242	1909.1318	31.2	0.017
Extreme (-20C)		1850.8241	1909.1317	-57.2	-0.030
Extreme (-30C)		1850.8242	1909.1318	29.4	0.016
20C	15%	1850.8242	1909.1318	20.9	0.011
	-15%	1850.8242	1909.1318	23.4	0.012
	End Point	1850.8242	1909.1318	28.5	0.015

8.4.2. LTE BAND 5

ID:	12492 / 50893	Date:	3/19/18

QPSK, (10MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.3099	848.7000		
Extreme (50C)		824.3098	848.6999	-53.1	-0.064
Extreme (40C)		824.3100	848.7001	111.8	0.134
Extreme (30C)		824.3100	848.7001	62.1	0.074
Extreme (10C)		824.3099	848.7000	48.6	0.058
Extreme (0C)		824.3100	848.7001	126.8	0.152
Extreme (-10C)		824.3099	848.7000	40.5	0.048
Extreme (-20C)		824.3099	848.7000	40.4	0.048
Extreme (-30C)		824.3099	848.7000	20.2	0.024
20C	15%	824.3099	848.7000	15.0	0.018
	-15%	824.3099	848.7000	16.1	0.019
	End Point	824.3100	848.7001	127.8	0.153

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8.4.3. LTE BAND 7

ID:	12492 / 50893	Date:	3/19/18

QPSK, (20MHz BANDWIDTH)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2500.5356	2569.4210		
Extreme (50C)		2500.5357	2569.4211	63.3	0.025
Extreme (40C)		2500.5356	2569.4210	23.6	0.009
Extreme (30C)		2500.5356	2569.4210	22.3	0.009
Extreme (10C)		2500.5356	2569.4210	29.3	0.012
Extreme (0C)		2500.5356	2569.4210	29.9	0.012
Extreme (-10C)		2500.5356	2569.4210	24.1	0.010
Extreme (-20C)		2500.5355	2569.4209	-67.1	-0.026
Extreme (-30C)		2500.5356	2569.4210	29.1	0.011
20C	15%	2500.5356	2569.4210	22.4	0.009
	-15%	2500.5356	2569.4210	-22.3	-0.009
	End Point	2500.5356	2569.4210	-30.4	-0.012

8.4.4. LTE BAND 12

ID:	12492 / 50893	Date:	3/19/18

QPSK, (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.8075	715.1294		
Extreme (50C)		699.8076	715.1295	61.6	0.087
Extreme (40C)		699.8076	715.1295	54.8	0.077
Extreme (30C)		699.8076	715.1295	55.8	0.079
Extreme (10C)		699.8076	715.1295	56.2	0.079
Extreme (0C)		699.8076	715.1295	59.5	0.084
Extreme (-10C)		699.8076	715.1295	60.0	0.085
Extreme (-20C)		699.8076	715.1295	77.7	0.110
Extreme (-30C)		699.8075	715.1294	47.7	0.067
20C	15%	699.8075	715.1294	17.3	0.024
	-15%	699.8075	715.1294	19.1	0.027
	End Point	699.8075	715.1294	18.3	0.026

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8.4.5. LTE BAND 13

ID:	12492 / 50893	Date:	3/19/18

QPSK, (10MHz BANDWIDTH)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	777.3563	786.8862		
Extreme (50C)		777.3564	786.8863	72.4	0.093
Extreme (40C)		777.3564	786.8863	69.8	0.089
Extreme (30C)		777.3564	786.8863	53.3	0.068
Extreme (10C)		777.3564	786.8863	54.9	0.070
Extreme (0C)		777.3564	786.8863	73.6	0.094
Extreme (-10C)		777.3564	786.8863	64.7	0.083
Extreme (-20C)		777.3573	786.8872	975.8	1.248
Extreme (-30C)		777.3563	786.8862	38.4	0.049
20C	15%	777.3563	786.8862	16.7	0.021
	-15%	777.3563	786.8862	16.4	0.021
	End Point	777.3563	786.8862	14.6	0.019

8.4.6. LTE BAND 14

ID:	12492 / 50893	Date:	3/19/18

QPSK, (10MHz BANDWIDTH)

Limit		788	798	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	788.3082	797.1827		
Extreme (50C)		788.3082	797.1827	7.6	0.010
Extreme (40C)		788.3082	797.1827	39.9	0.050
Extreme (30C)		788.3083	797.1828	51.5	0.065
Extreme (10C)		788.3083	797.1828	59.3	0.075
Extreme (0C)		788.3083	797.1828	61.2	0.077
Extreme (-10C)		788.3083	797.1828	68.3	0.086
Extreme (-20C)		788.3083	797.1828	73.4	0.093
Extreme (-30C)		788.3082	797.1827	21.7	0.027
20C	15%	788.3082	797.1827	17.6	0.022
	-15%	788.3082	797.1827	15.6	0.020
	End Point	788.3082	797.1827	13.1	0.017

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8.4.7. LTE BAND 17

ID:	12492 / 50893	Date:	3/19/18

QPSK, (10MHz BANDWIDTH)

Limit		704	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	704.3249	715.6693		
Extreme (50C)		704.3250	715.6694	61.6	0.087
Extreme (40C)		704.3250	715.6694	54.8	0.077
Extreme (30C)		704.3250	715.6694	55.8	0.079
Extreme (10C)		704.3250	715.6694	56.2	0.079
Extreme (0C)		704.3250	715.6694	59.5	0.084
Extreme (-10C)		704.3250	715.6694	60.0	0.084
Extreme (-20C)		704.3250	715.6694	77.7	0.109
Extreme (-30C)		704.3249	715.6693	47.7	0.067
20C	15%	704.3249	715.6693	17.3	0.024
	-15%	704.3249	715.6693	19.1	0.027
	End Point	704.3249	715.6693	18.3	0.026

8.4.8. LTE BAND 25

ID:	12492 / 50893	Date:	3/19/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1850.8351	1914.1333		
Extreme (50C)		1850.8351	1914.1333	-28.8	-0.015
Extreme (40C)		1850.8351	1914.1333	31.5	0.017
Extreme (30C)		1850.8351	1914.1333	24.4	0.013
Extreme (10C)		1850.8351	1914.1333	31.3	0.017
Extreme (0C)		1850.8351	1914.1333	33.1	0.018
Extreme (-10C)		1850.8351	1914.1333	31.2	0.017
Extreme (-20C)		1850.8350	1914.1332	-57.2	-0.030
Extreme (-30C)		1850.8351	1914.1333	29.4	0.016
20C	15%	1850.8351	1914.1333	20.9	0.011
	-15%	1850.8351	1914.1333	23.4	0.012
	End Point	1850.8351	1914.1333	28.5	0.015

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8.4.9. LTE BAND 26 (PART 90S)

ID:	12492 / 50893	Date:	3/19/18

QPSK, (10MHz BANDWIDTH)

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	814.3454	823.6518		
Extreme (50C)		814.3453	823.6517	-53.1	-0.065
Extreme (40C)		814.3455	823.6519	111.8	0.137
Extreme (30C)		814.3455	823.6519	62.1	0.076
Extreme (10C)		814.3454	823.6518	48.6	0.059
Extreme (0C)		814.3455	823.6519	126.8	0.155
Extreme (-10C)		814.3454	823.6518	40.5	0.049
Extreme (-20C)		814.3454	823.6518	40.4	0.049
Extreme (-30C)		814.3454	823.6518	20.2	0.025
20C	15%	814.3454	823.6518	15.0	0.018
	-15%	814.3454	823.6518	16.1	0.020
	End Point	814.3455	823.6519	127.8	0.156

8.4.10. LTE BAND 30

ID:	12492 / 50893	Date:	3/19/18

QPSK, (10MHz BANDWIDTH)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2305.3286	2314.6688		
Extreme (50C)		2305.3286	2314.6688	33.2	0.014
Extreme (40C)		2305.3286	2314.6688	31.6	0.014
Extreme (30C)		2305.3286	2314.6688	47.9	0.021
Extreme (10C)		2305.3287	2314.6689	56.4	0.024
Extreme (0C)		2305.3287	2314.6689	66.4	0.029
Extreme (-10C)		2305.3287	2314.6689	59.8	0.026
Extreme (-20C)		2305.3286	2314.6688	34.6	0.015
Extreme (-30C)		2305.3286	2314.6688	39.0	0.017
20C	15%	2305.3286	2314.6688	34.8	0.015
	-15%	2305.3286	2314.6688	37.8	0.016
	End Point	2305.3286	2314.6688	36.1	0.016

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8.4.11. LTE BAND 41

ID:	12492 / 50893	Date:	3/19/18

QPSK, (20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2496.9416	2689.0566		
Extreme (50C)		2496.9416	2689.0566	20.6	0.008
Extreme (40C)		2496.9416	2689.0566	18.7	0.007
Extreme (30C)		2496.9416	2689.0566	18.6	0.007
Extreme (10C)		2496.9416	2689.0566	17.3	0.007
Extreme (0C)		2496.9416	2689.0566	18.5	0.007
Extreme (-10C)		2496.9416	2689.0566	19.5	0.008
Extreme (-20C)		2496.9416	2689.0566	20.6	0.008
Extreme (-30C)		2496.9416	2689.0566	23.9	0.009
20C	15%	2496.9416	2689.0566	19.0	0.007
	-15%	2496.9416	2689.0566	15.7	0.006
	End Point	2496.9416	2689.0566	18.1	0.007

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8.4.12. LTE BAND 66

ID:	12492 / 50893	Date:	3/19/18

QPSK, (20MHz BANDWIDTH)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1710.8022	1779.1557		
Extreme (50C)		1710.8023	1779.1558	57.5	0.033
Extreme (40C)		1710.8021	1779.1556	-55.6	-0.032
Extreme (30C)		1710.8021	1779.1556	-99.4	-0.057
Extreme (10C)		1710.8021	1779.1556	-106.4	-0.061
Extreme (0C)		1710.8023	1779.1558	74.5	0.043
Extreme (-10C)		1710.8022	1779.1557	37.7	0.022
Extreme (-20C)		1710.8022	1779.1557	44.0	0.025
Extreme (-30C)		1710.8022	1779.1557	-44.0	-0.025
20C	15%	1710.8022	1779.1557	40.6	0.023
	-15%	1710.8022	1779.1557	39.7	0.023
	End Point	1710.8022	1779.1557	31.9	0.018

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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.

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

RESULT

Antenna 1 was used to measure as the worst case; 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.

ID:	19467	**Date:**	6/12/18

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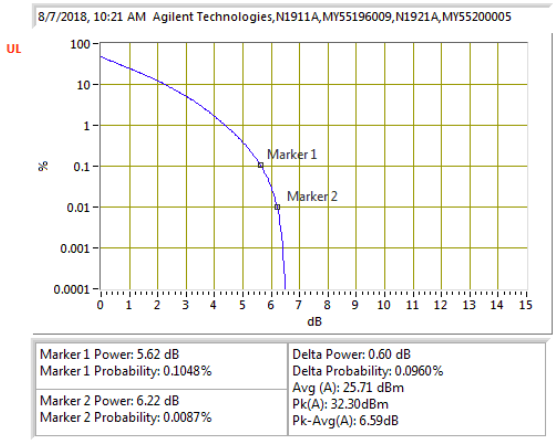
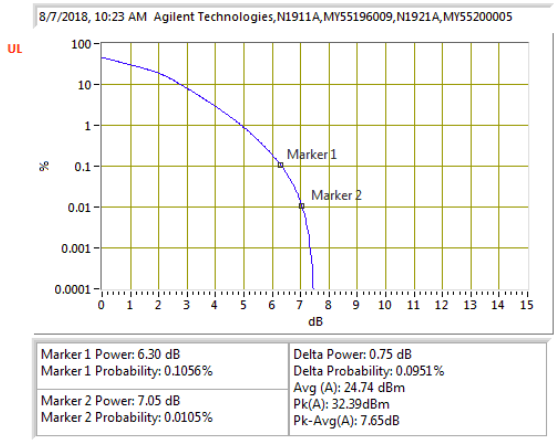
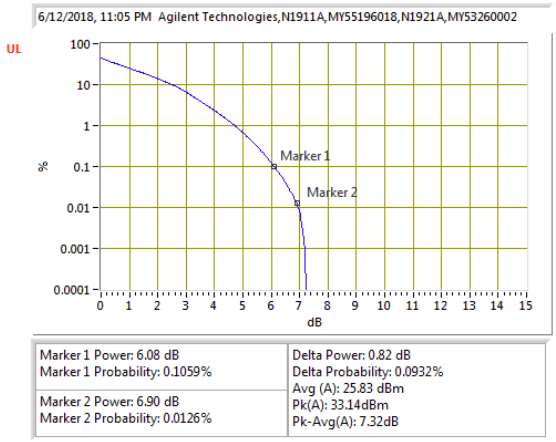
8.5.1. LTE BAND 2



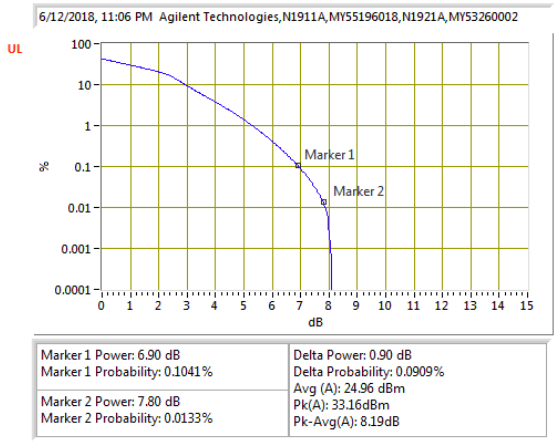
LTE B2 1.4MHz QPSK Middle Channel



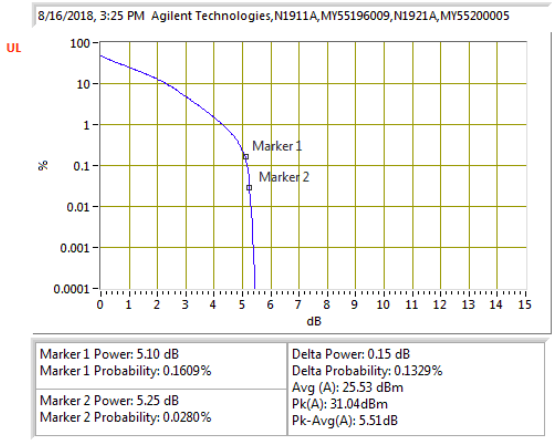
LTE B2 1.4MHz 16QAM Middle Channel



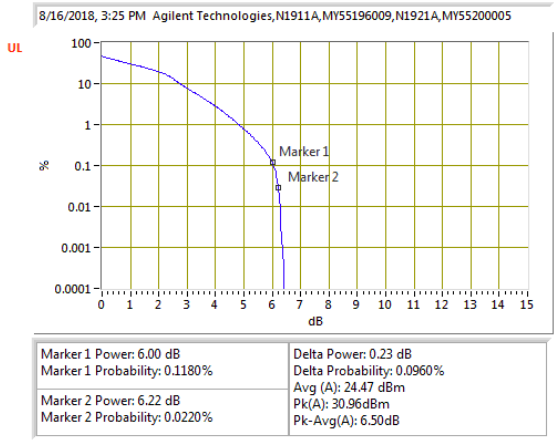
LTE B2 3MHz QPSK Middle Channel



LTE B2 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel



LTE B2 5MHz 16QAM Middle Channel

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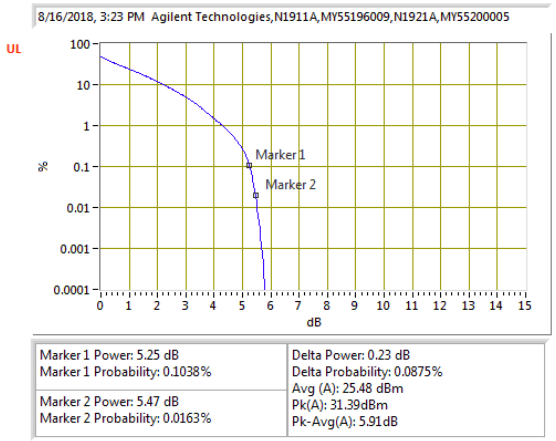
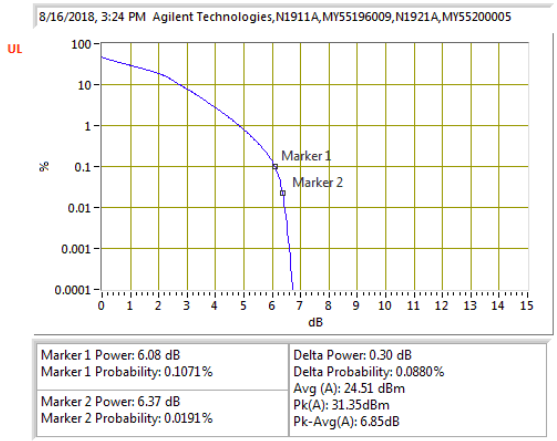
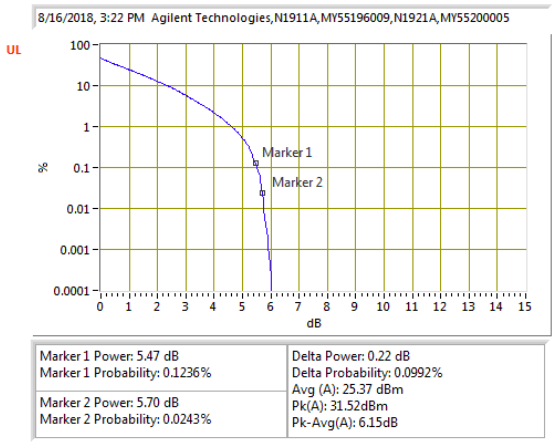


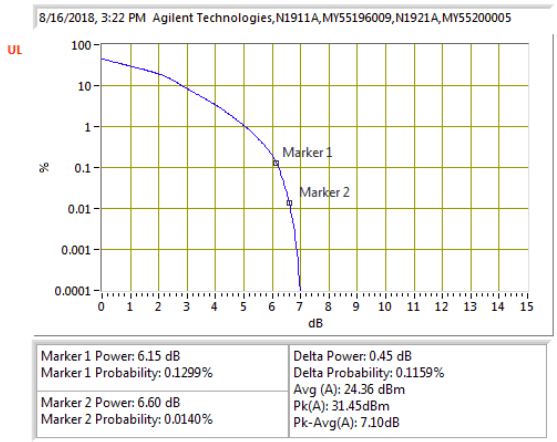
LTE B2 10MHz QPSK Middle Channel



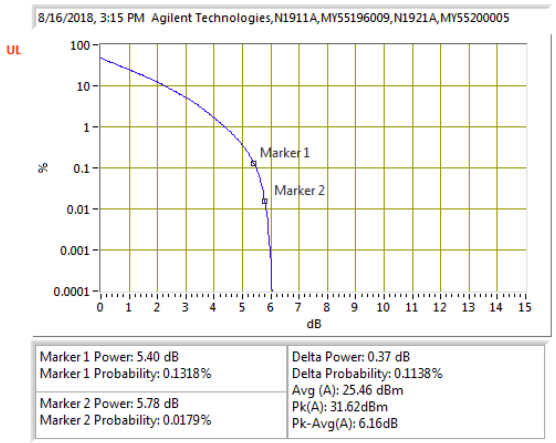
LTE B2 10MHz 16QAM Middle Channel



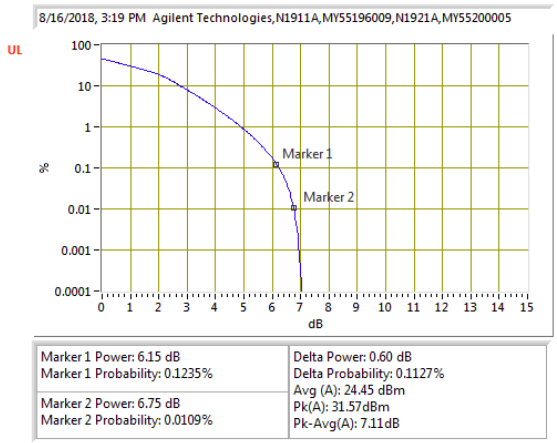
LTE B2 15MHz QPSK Middle Channel



LTE B2 15MHz 16QAM Middle Channel



LTE B2 20MHz QPSK Middle Channel



LTE B2 20MHz 16QAM Middle Channel

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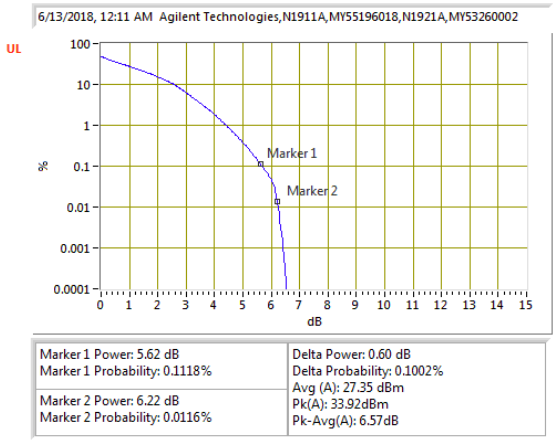
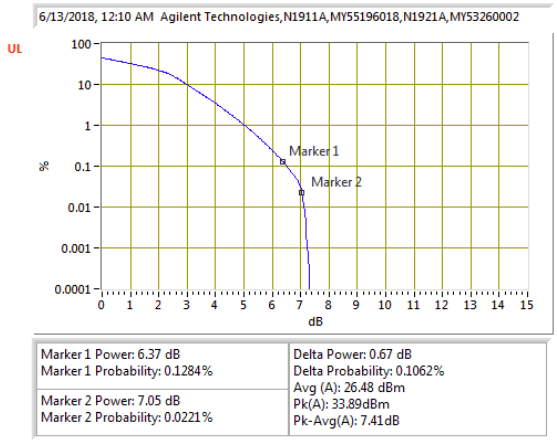
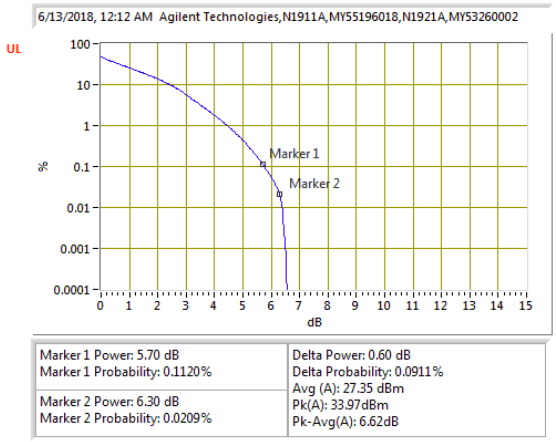
8.5.2. LTE BAND 5



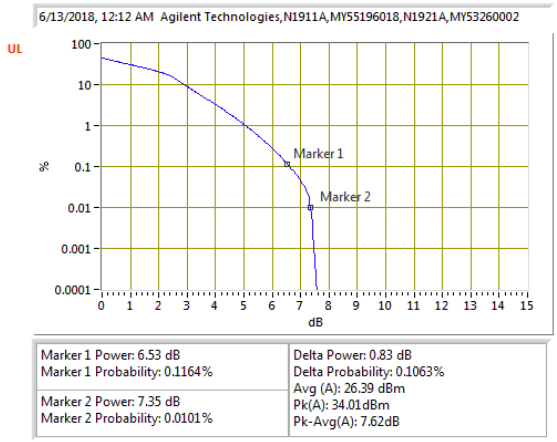
LTE B5 1.4MHz QPSK Middle Channel



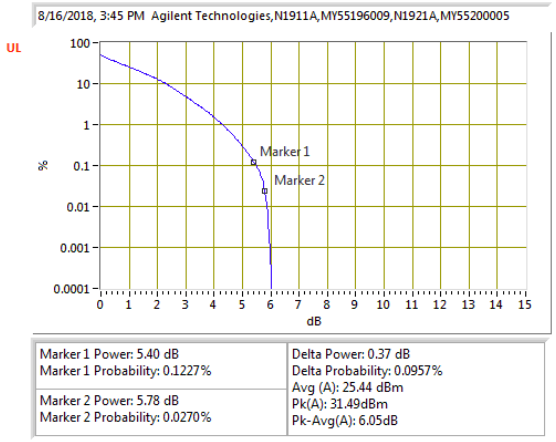
LTE B5 1.4MHz 16QAM Middle Channel



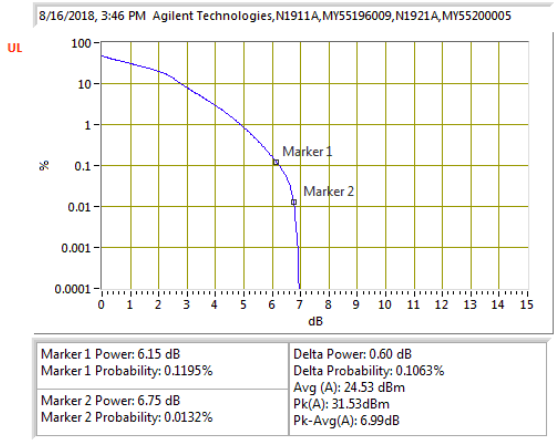
LTE B5 3MHz QPSK Middle Channel



LTE B5 3MHz 16QAM Middle Channel



LTE B5 5MHz QPSK Middle Channel



LTE B5 5MHz 16QAM Middle Channel

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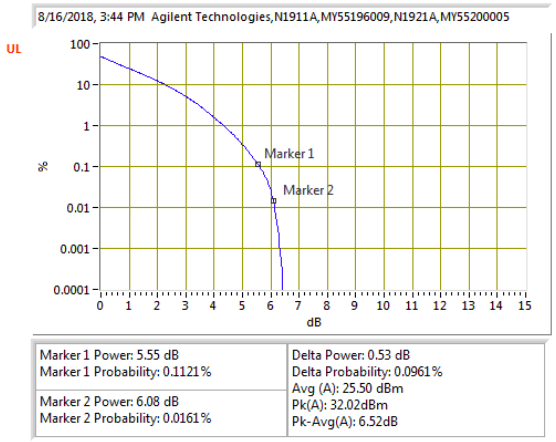
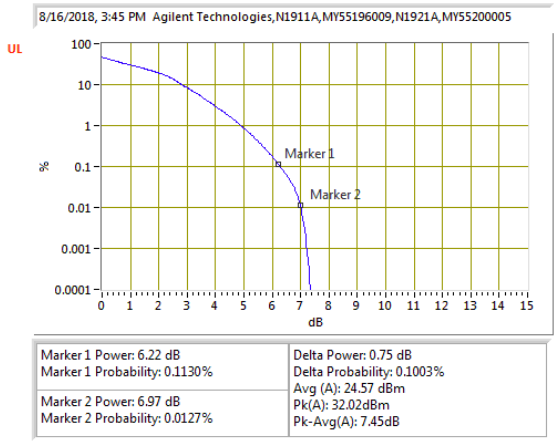


LTE B5 10MHz QPSK Middle Channel



LTE B5 10MHz 16QAM Middle Channel

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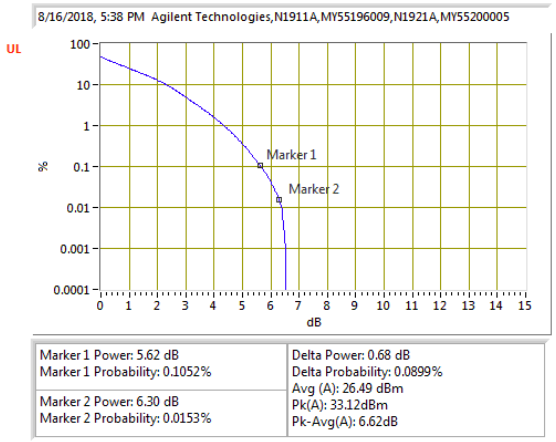
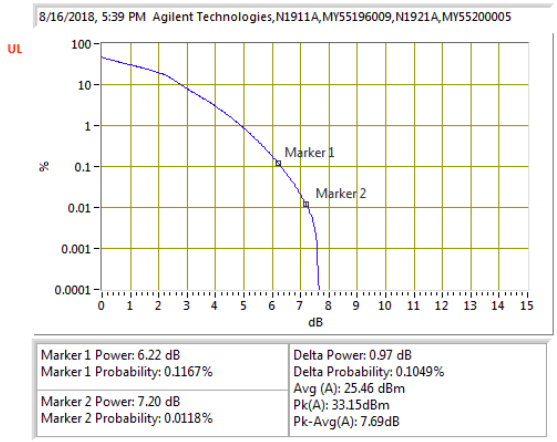
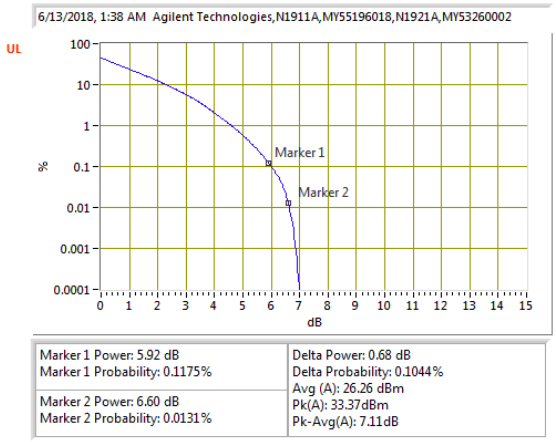
8.5.3. LTE BAND 7



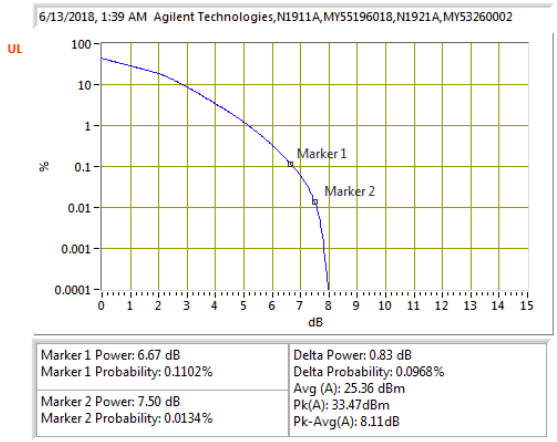
LTE B7 5MHz QPSK Middle Channel



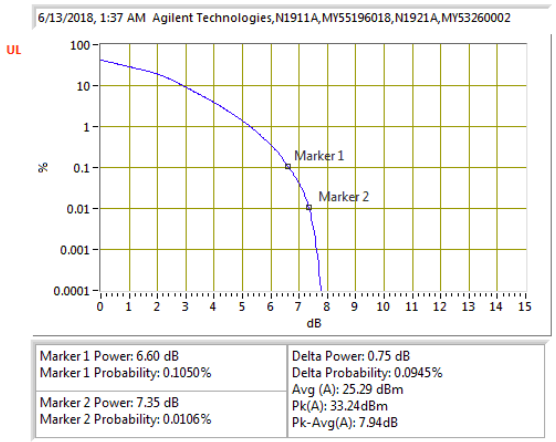
LTE B7 5MHz 16QAM Middle Channel



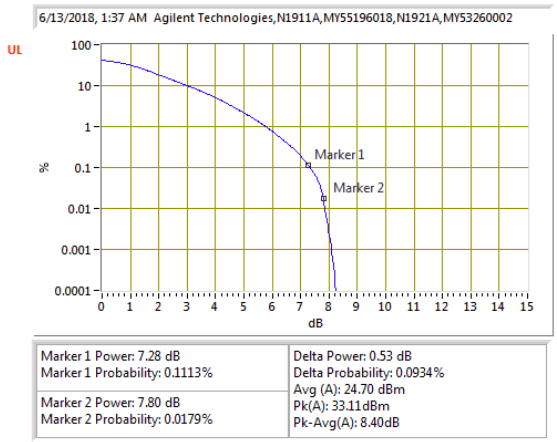
LTE B7 10MHz QPSK Middle Channel



LTE B7 10MHz 16QAM Middle Channel



LTE B7 15MHz QPSK Middle Channel



LTE B7 15MHz 16QAM Middle Channel

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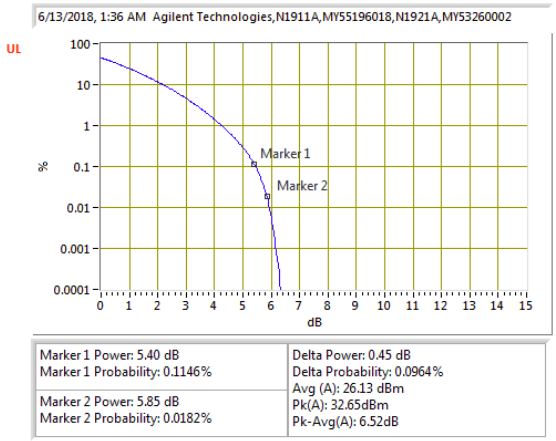
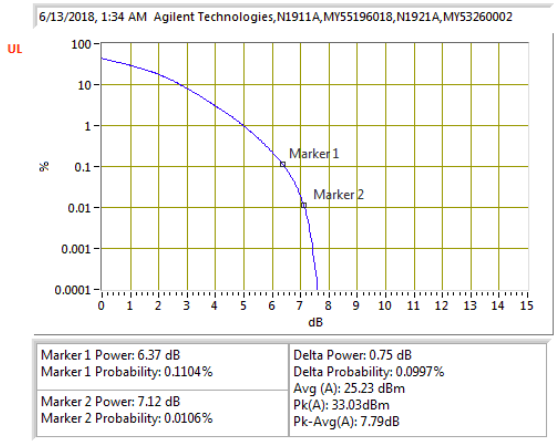


LTE B7 20MHz QPSK Middle Channel



LTE B7 20MHz 16QAM Middle Channel

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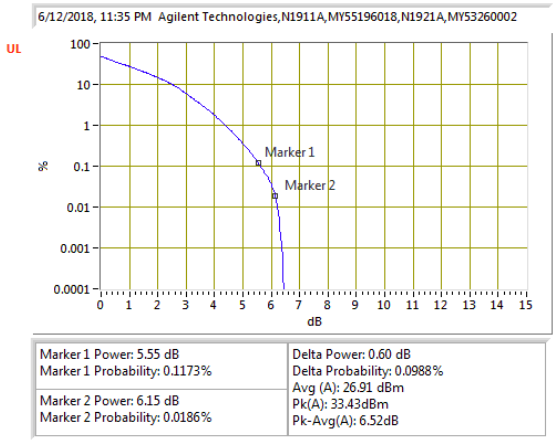
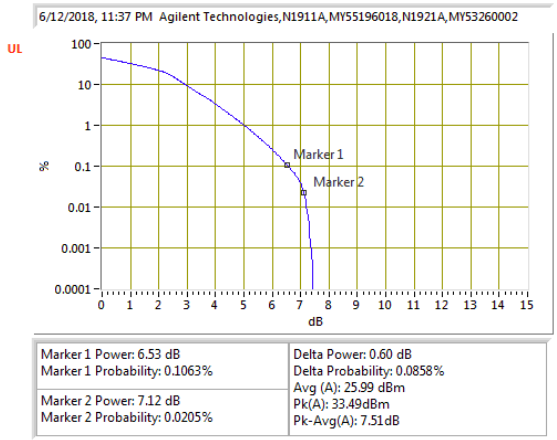
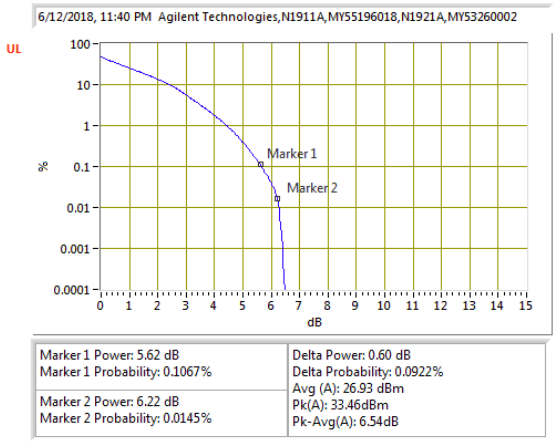
8.5.4. LTE BAND 12



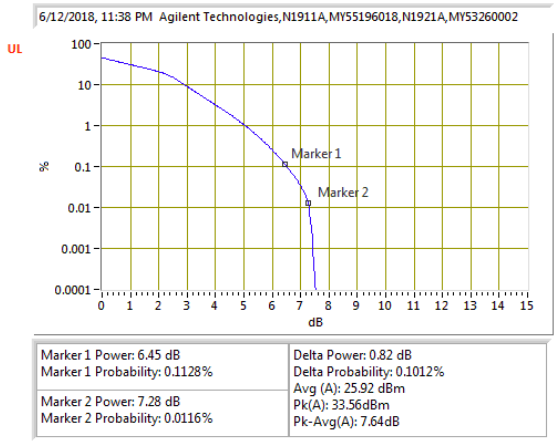
LTE B12 1.4MHz QPSK Middle Channel



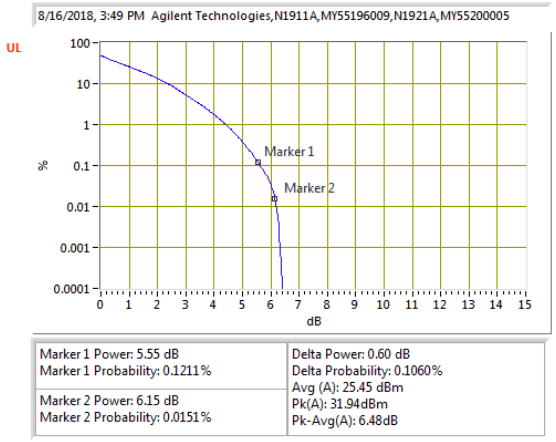
LTE B12 1.4MHz 16QAM Middle Channel



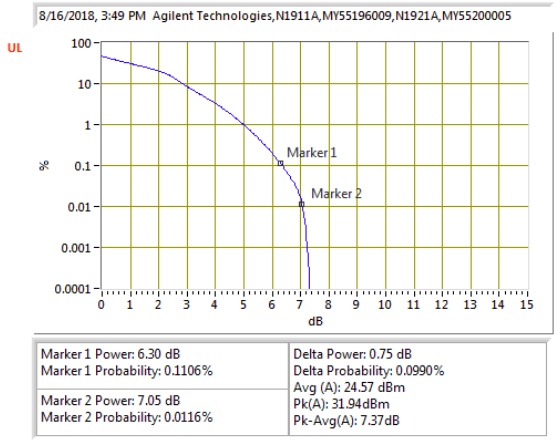
LTE B12 3MHz QPSK Middle Channel



LTE B12 3MHz 16QAM Middle Channel



LTE B12 5MHz QPSK Middle Channel



LTE B12 5MHz 16QAM Middle Channel

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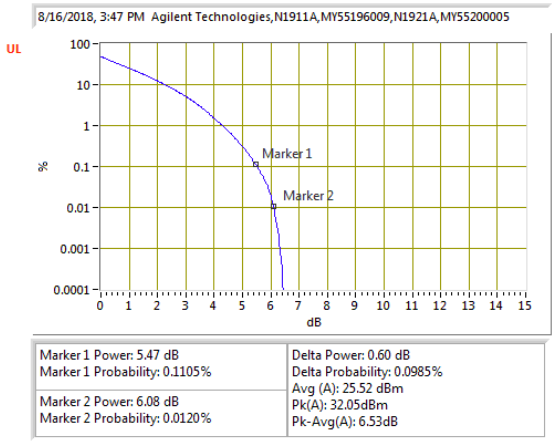
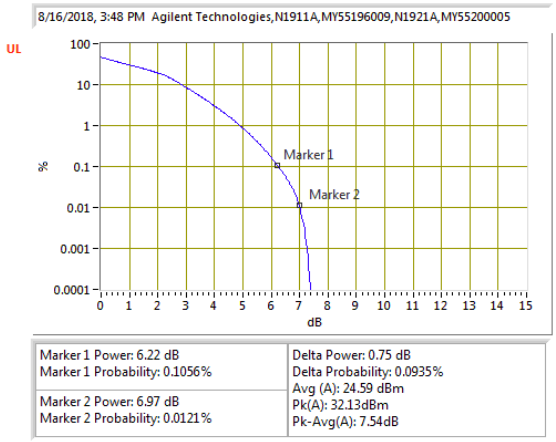


LTE B12 10MHz QPSK Middle Channel



LTE B12 10MHz 16QAM Middle Channel

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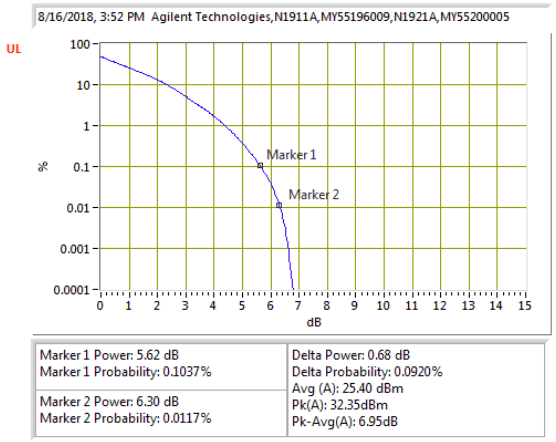
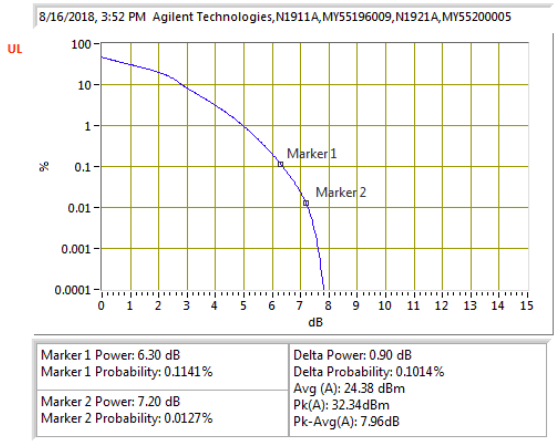
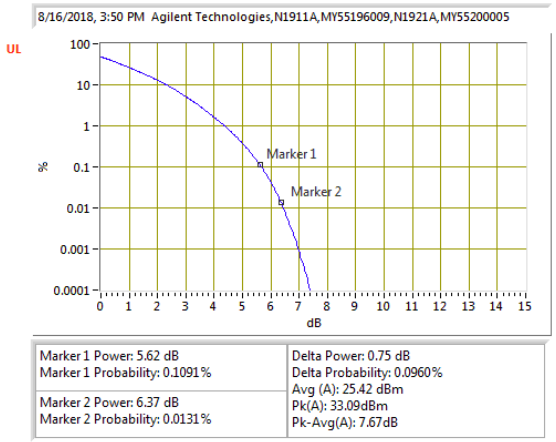
8.5.5. LTE BAND 13



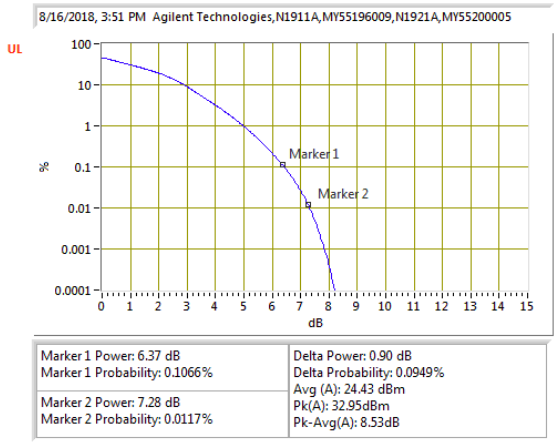
LTE B13 5MHz QPSK Middle Channel



LTE B13 5MHz 16QAM Middle Channel



LTE B13 10MHz QPSK Middle Channel



LTE B13 10MHz 16QAM Middle Channel

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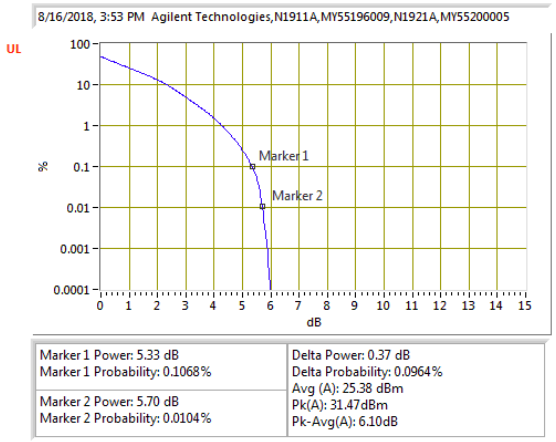
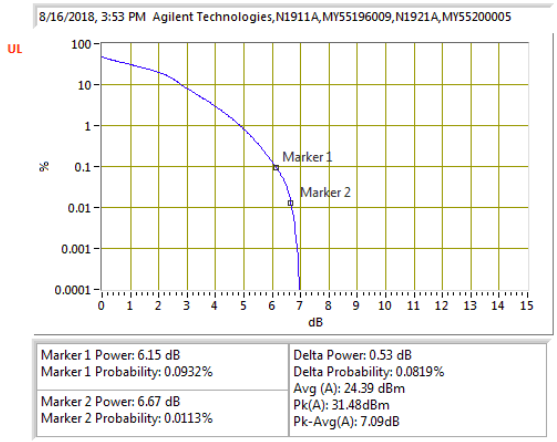
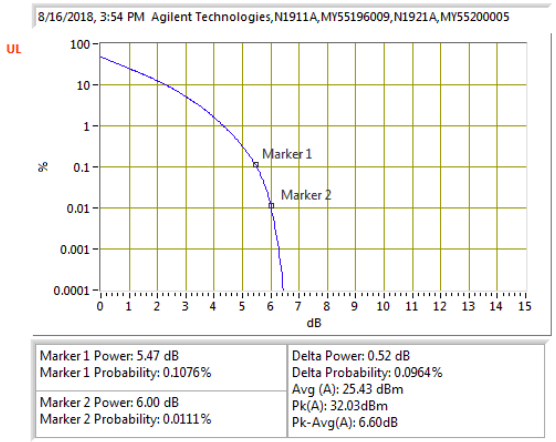
8.5.6. LTE BAND 14



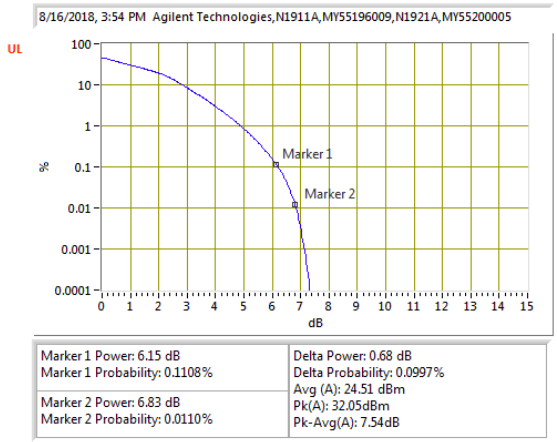
LTE B14 5MHz QPSK Middle Channel



LTE B14 5MHz 16QAM Middle Channel



LTE B14 10MHz QPSK Middle Channel



LTE B14 10MHz 16QAM Middle Channel

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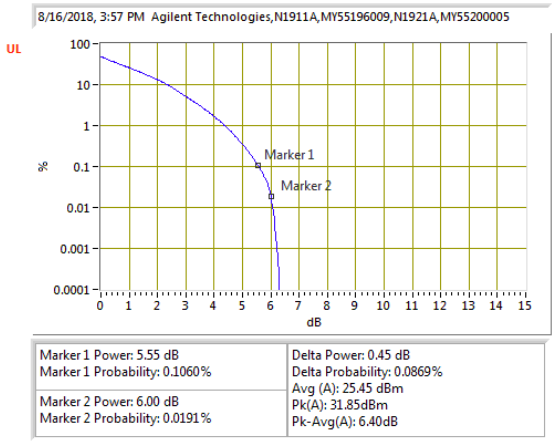
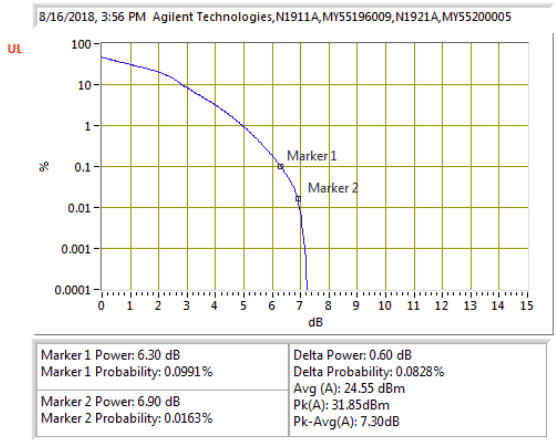
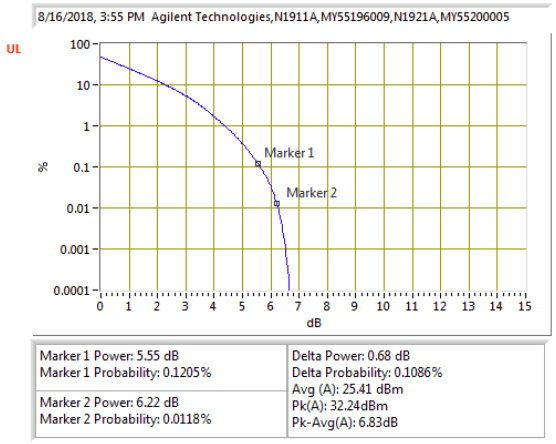
8.5.7. LTE BAND 17



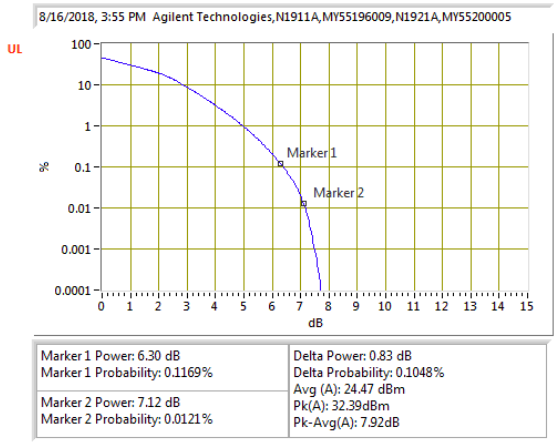
LTE B17 5MHz QPSK Middle Channel



LTE B17 5MHz 16QAM Middle Channel



LTE B17 10MHz QPSK Middle Channel



LTE B17 10MHz 16QAM Middle Channel

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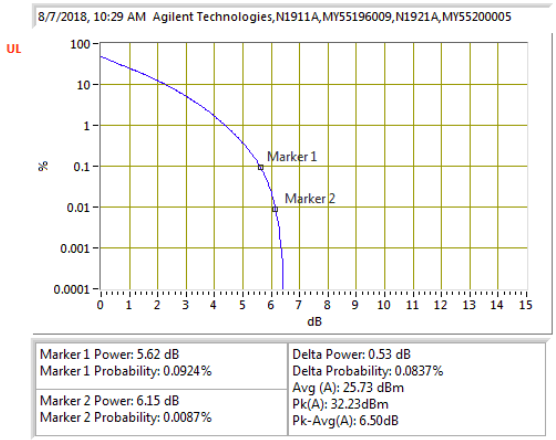
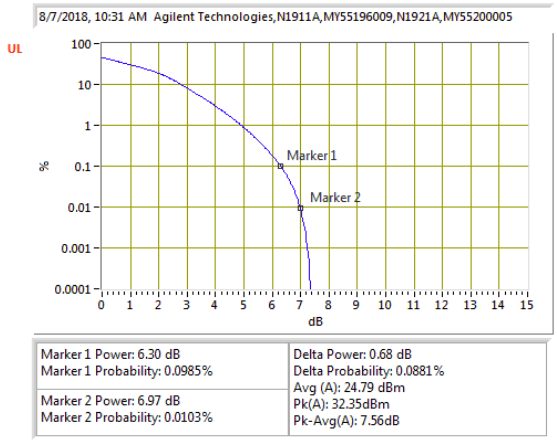
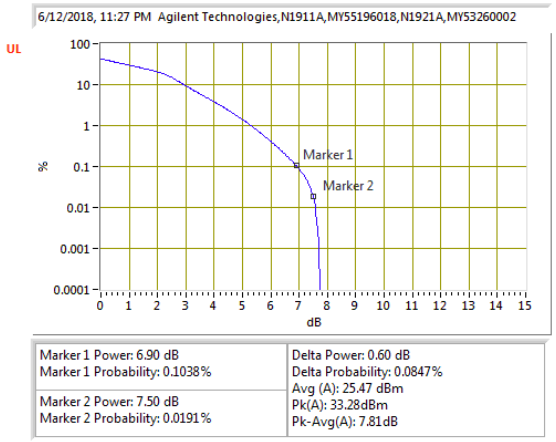
8.5.8. LTE BAND 25



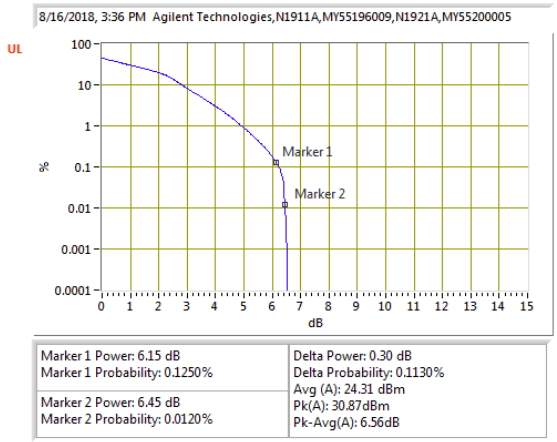
LTE B25 1.4MHz QPSK Middle Channel



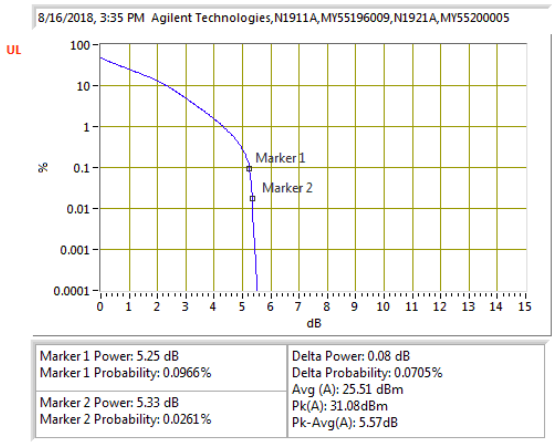
LTE B25 1.4MHz 16QAM Middle Channel



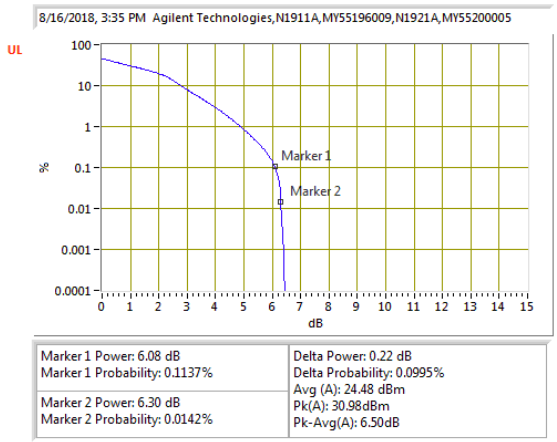
LTE B25 3MHz QPSK Middle Channel



LTE B25 3MHz 16QAM Middle Channel



LTE B25 5MHz QPSK Middle Channel



LTE B25 5MHz 16QAM Middle Channel

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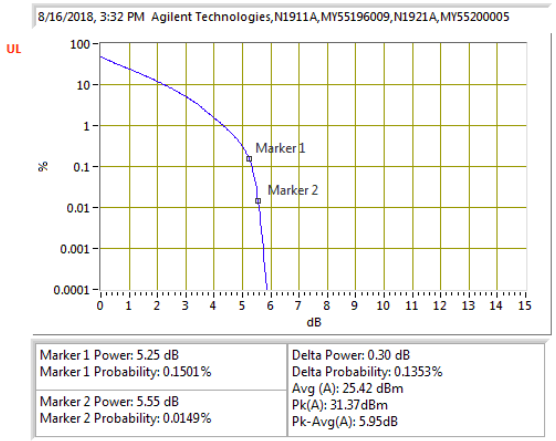
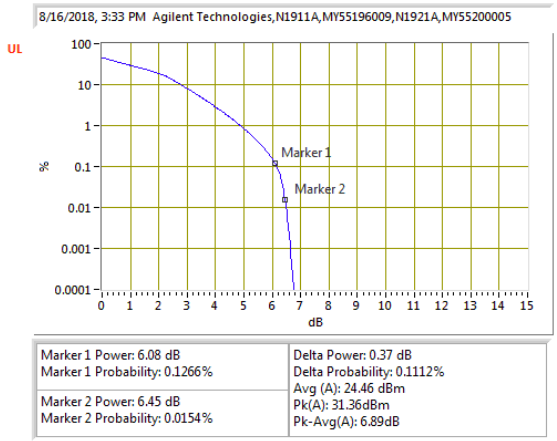
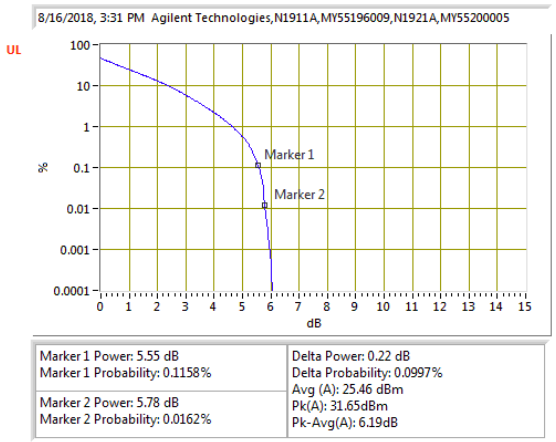


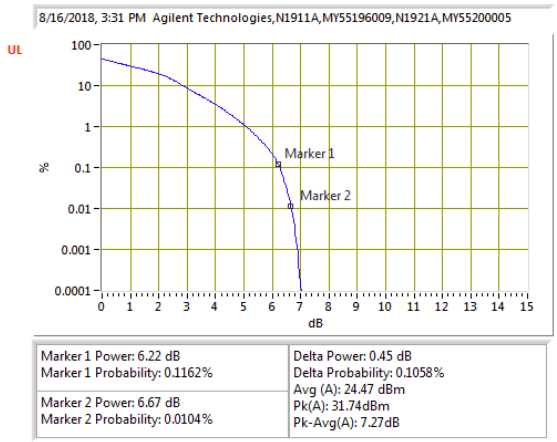
LTE B25 10MHz QPSK Middle Channel



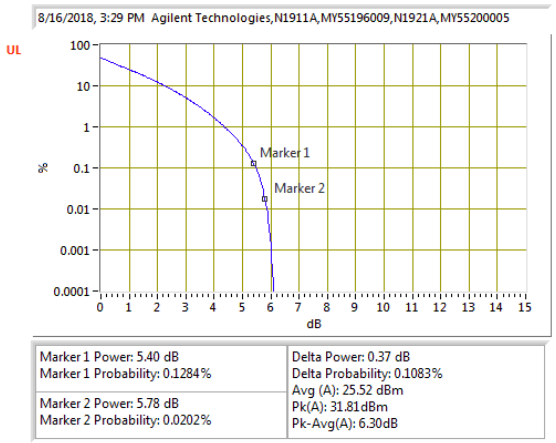
LTE B25 10MHz 16QAM Middle Channel



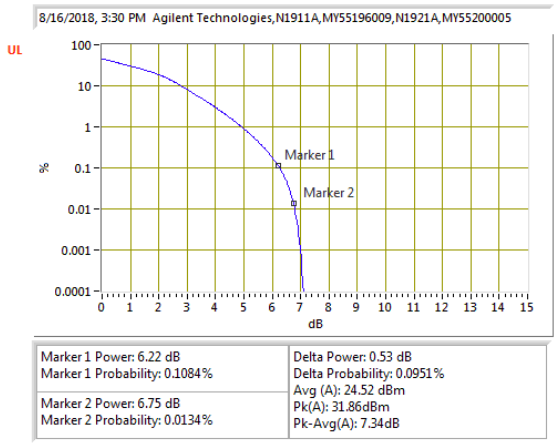
LTE B25 15MHz QPSK Middle Channel



LTE B25 15MHz 16QAM Middle Channel



LTE B25 20MHz QPSK Middle Channel



LTE B25 20MHz 16QAM Middle Channel

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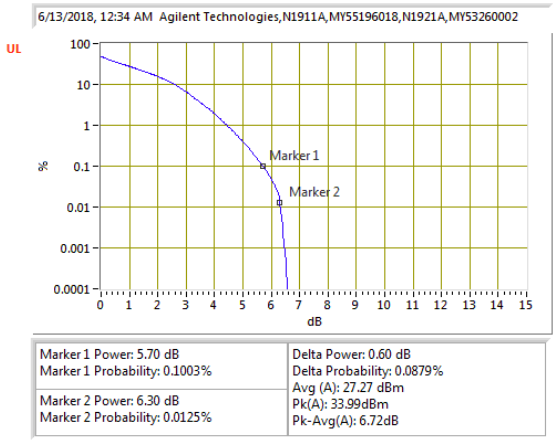
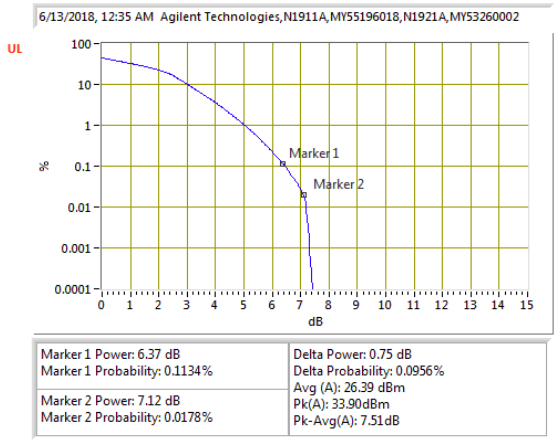
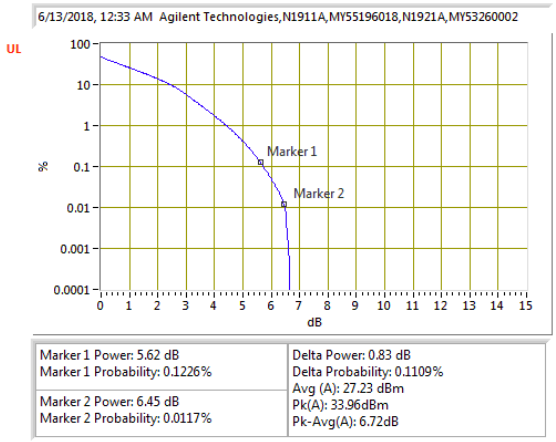
8.5.9. LTE BAND 26 (PART 90S)



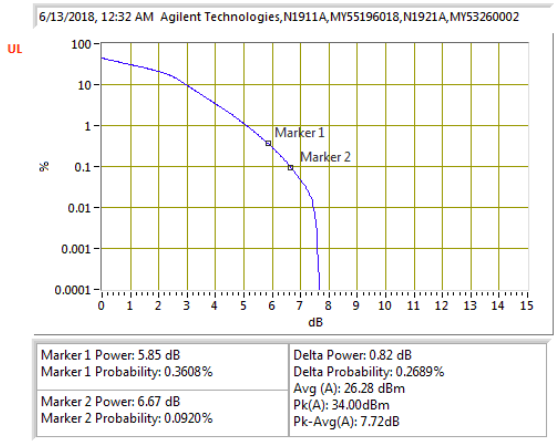
LTE B26 1.4MHz QPSK Middle Channel



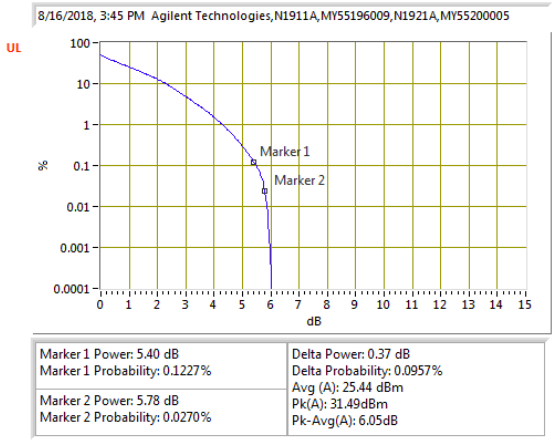
LTE B26 1.4MHz 16QAM Middle Channel



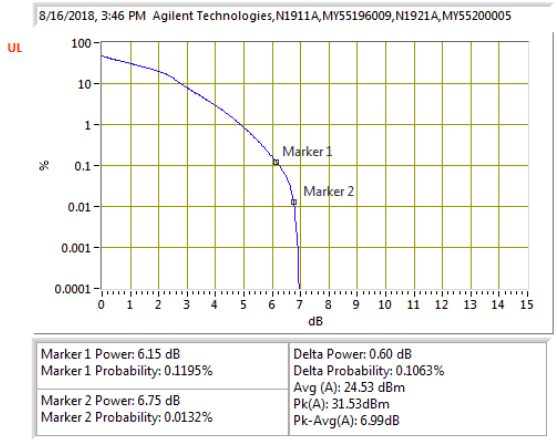
LTE B26 3MHz QPSK Middle Channel



LTE B26 3MHz 16QAM Middle Channel



LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

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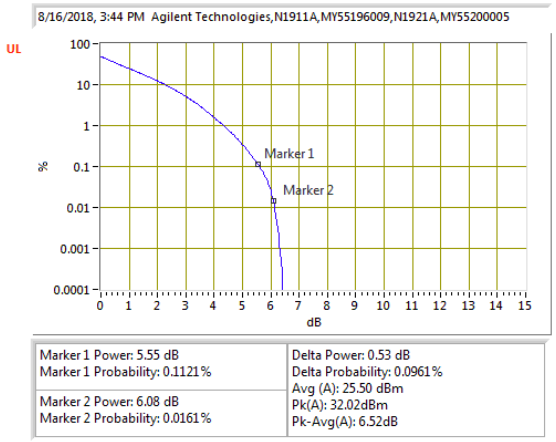
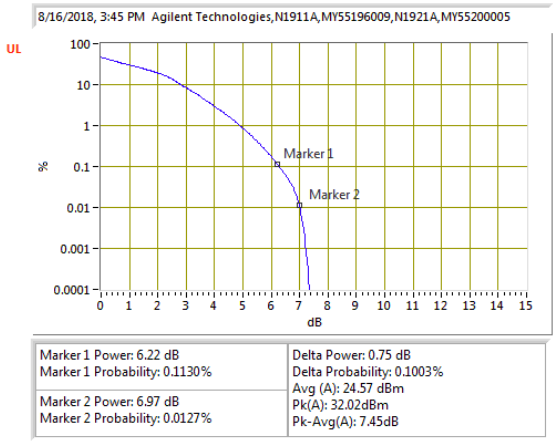


LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel

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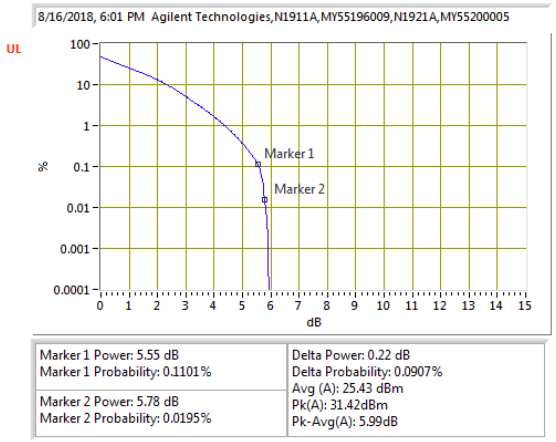
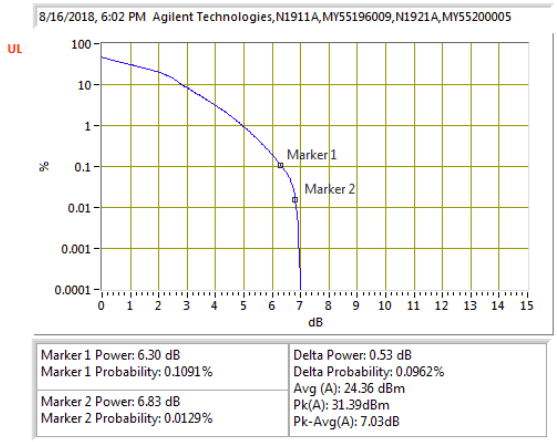
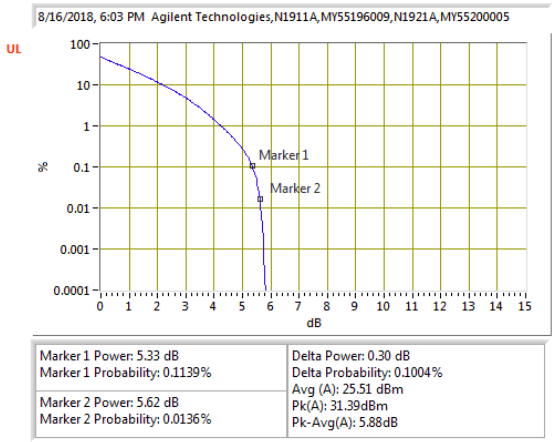
8.5.10. LTE BAND 30



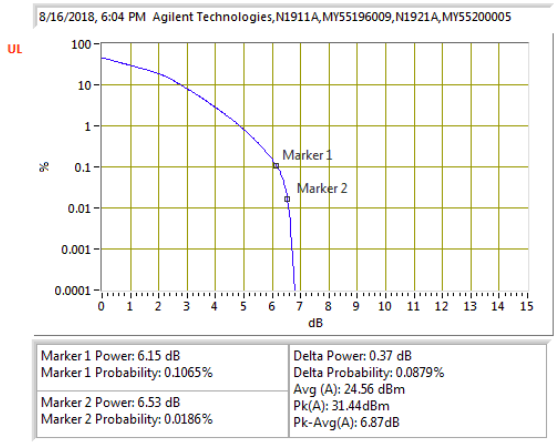
LTE B30 5MHz QPSK Middle Channel



LTE B30 5MHz 16QAM Middle Channel



LTE B30 10MHz QPSK Middle Channel



LTE B30 10MHz 16QAM Middle Channel

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8.5.11. LTE BAND 41

ID:	39004	Date:	7/11/18

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
Band 41	5MHz	2593.0	25	0	QPSK	34.18	19.24	7.95
					16QAM	34.19	19.14	8.06
	10MHz		50	0	QPSK	34.11	20.17	6.95
					16QAM	34.18	19.24	7.95
	15MHz		75	0	QPSK	33.98	20.10	6.89
					16QAM	33.93	19.09	7.85
	20MHz		100	0	QPSK	33.78	20.07	6.72
					16QAM	33.80	19.06	7.75
Duty Cycle Correction Factor (dB) =			6.99					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

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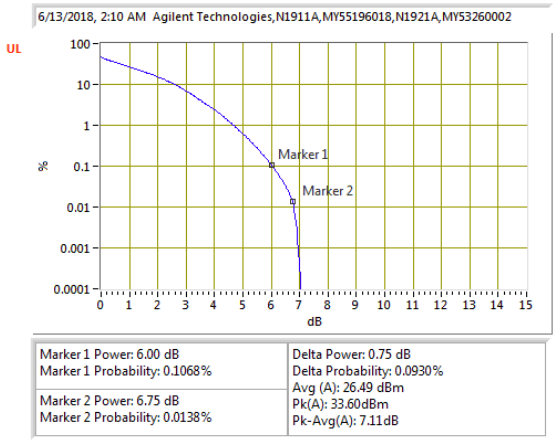
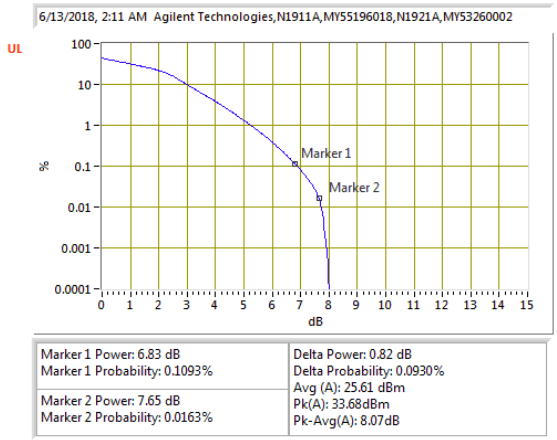
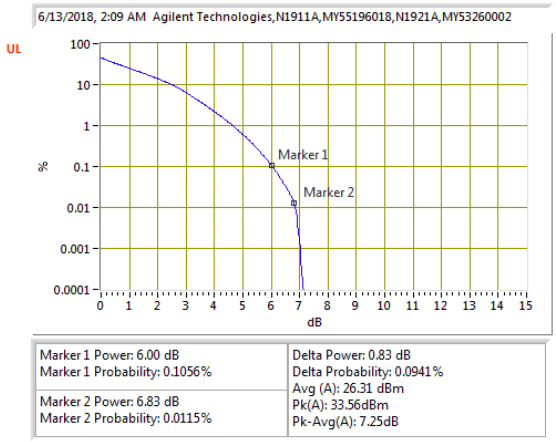
8.5.12. LTE BAND 66



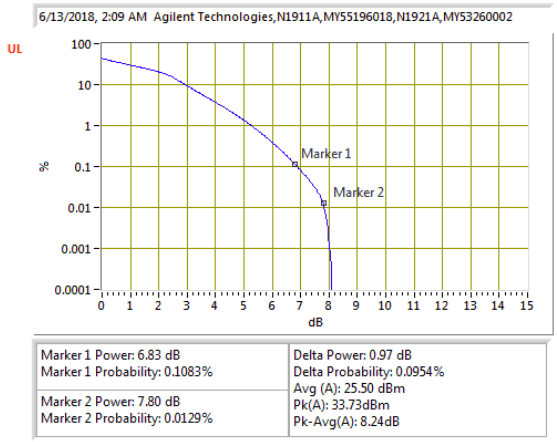
LTE B66 1.4MHz QPSK Middle Channel



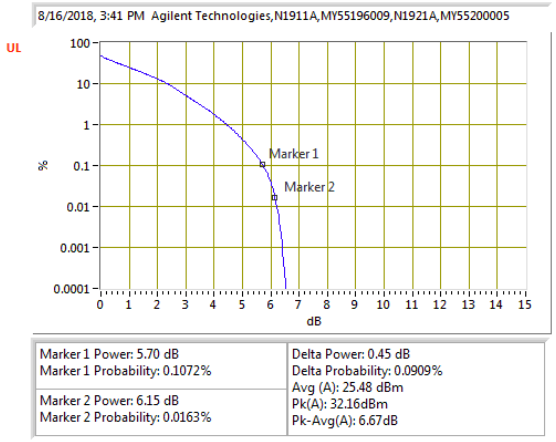
LTE B66 1.4MHz 16QAM Middle Channel



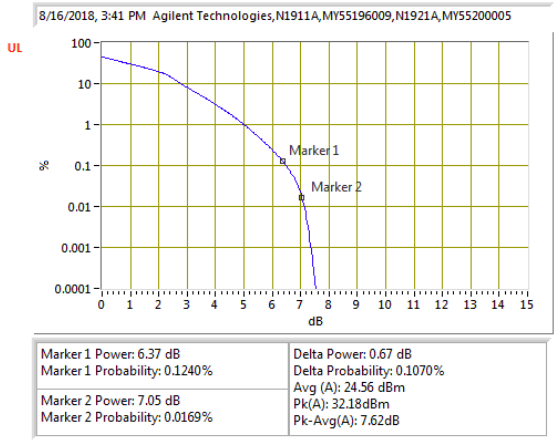
LTE B66 3MHz QPSK Middle Channel



LTE B66 3MHz 16QAM Middle Channel



LTE B66 5MHz QPSK Middle Channel



LTE B66 5MHz 16QAM Middle Channel

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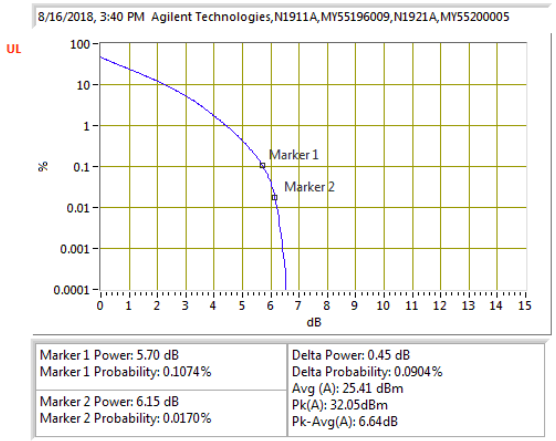
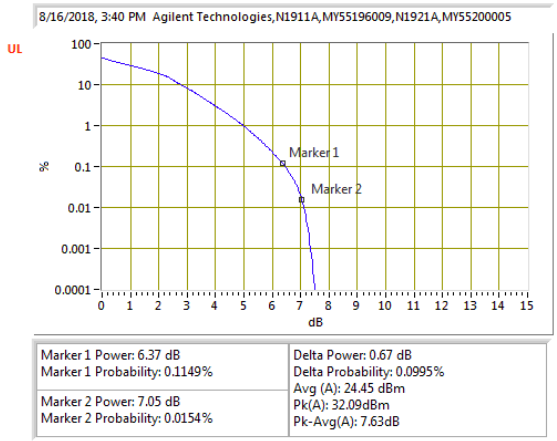
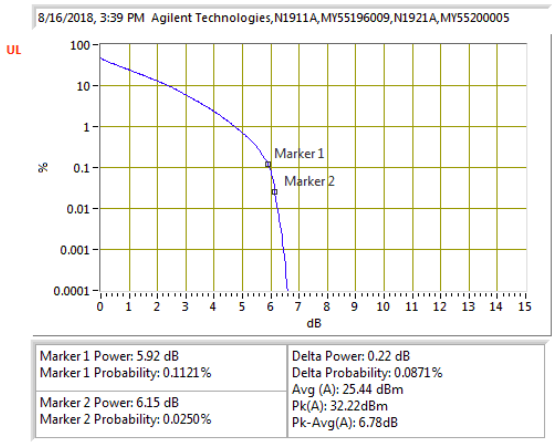


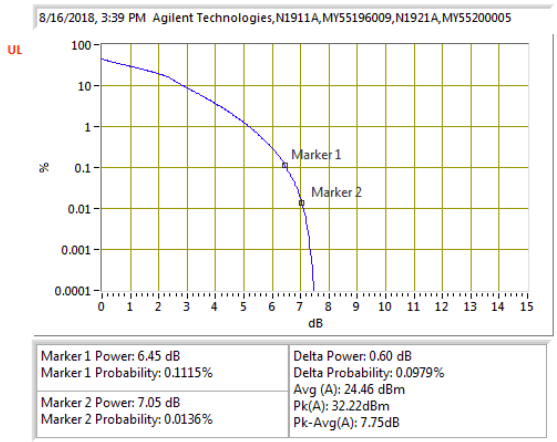
LTE B66 10MHz QPSK Middle Channel



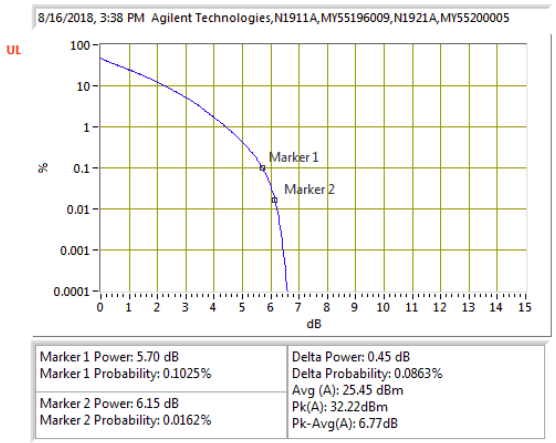
LTE B66 10MHz 16QAM Middle Channel



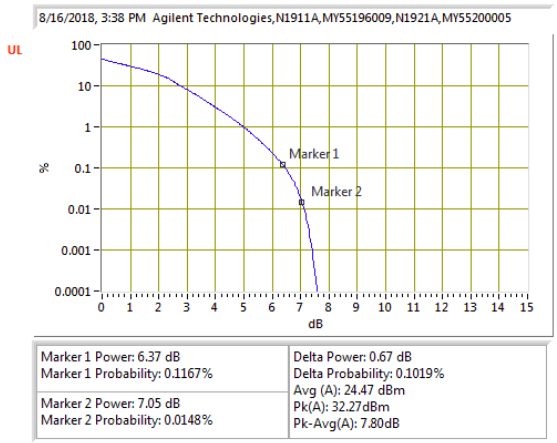
LTE B66 15MHz QPSK Middle Channel



LTE B66 15MHz 16QAM Middle Channel



LTE B66 20MHz QPSK Middle Channel



LTE B66 20MHz 16QAM Middle Channel

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9. RADIATED TEST RESULTS

RULE PART(S)

§2.1053, §22.917, §24.238, §27.53, §90.691, and §90.543.

LIMIT

§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.

§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 = -40dBm/MHz).

§90.543(Band 14)
(e) (3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

§27.53 (a) (Band 30, Band 40)
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.

§27.53 (m) (Band 7, 41)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

TEST PROCEDURE

KDB 971168 D01 v03r01/ D02 v02r01

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

RESULTS

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9.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 1

9.1.1. LTE BAND 2

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-59.6	H	3.0	-9.6	34.1	1.0	-42.7	-13.0	-29.7	
5.58	-60.7	H	3.0	-6.7	33.3	1.0	-39.0	-13.0	-26.0	
7.44	-60.5	H	3.0	-3.0	33.1	1.0	-35.1	-13.0	-22.1	
3.72	-58.5	V	3.0	-8.1	34.1	1.0	-41.3	-13.0	-28.3	
5.58	-59.9	V	3.0	-5.9	33.3	1.0	-38.2	-13.0	-25.2	
7.44	-60.8	V	3.0	-3.3	33.1	1.0	-35.4	-13.0	-22.4	
Mid Channel (1880MHz)										
3.76	-58.9	H	3.0	-8.8	34.1	1.0	-41.9	-13.0	-28.9	
5.64	-60.0	H	3.0	-5.8	33.3	1.0	-38.1	-13.0	-25.1	
7.52	-60.2	H	3.0	-2.6	33.0	1.0	-34.7	-13.0	-21.7	
3.76	-58.0	V	3.0	-7.6	34.1	1.0	-40.6	-13.0	-27.6	
5.64	-60.5	V	3.0	-6.4	33.3	1.0	-38.7	-13.0	-25.7	
7.52	-60.1	V	3.0	-2.5	33.0	1.0	-34.5	-13.0	-21.5	
High Channel (1900MHz)										
3.80	-57.8	H	3.0	-7.6	34.0	1.0	-40.6	-13.0	-27.6	
5.70	-59.2	H	3.0	-4.9	33.3	1.0	-37.2	-13.0	-24.2	
7.60	-61.0	H	3.0	-3.3	33.0	1.0	-35.3	-13.0	-22.3	
3.80	-57.8	V	3.0	-7.3	34.0	1.0	-40.3	-13.0	-27.3	
5.70	-59.9	V	3.0	-5.7	33.3	1.0	-38.0	-13.0	-25.0	
7.60	-61.2	V	3.0	-3.5	33.0	1.0	-35.5	-13.0	-22.5	

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LTE B2 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/13/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 2, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-59.2	H	3.0	-9.2	34.1	1.0	-42.3	-13.0	-29.3	
5.58	-60.2	H	3.0	-6.2	33.3	1.0	-38.5	-13.0	-25.5	
7.44	-60.5	H	3.0	-3.0	33.1	1.0	-35.1	-13.0	-22.1	
3.72	-59.3	V	3.0	-8.9	34.1	1.0	-42.1	-13.0	-29.1	
5.58	-60.5	V	3.0	-6.5	33.3	1.0	-38.8	-13.0	-25.8	
7.44	-60.4	V	3.0	-2.9	33.1	1.0	-35.0	-13.0	-22.0	
Mid Channel (1880MHz)										
3.76	-58.8	H	3.0	-8.7	34.1	1.0	-41.8	-13.0	-28.8	
5.64	-60.7	H	3.0	-6.5	33.3	1.0	-38.8	-13.0	-25.8	
7.52	-59.8	H	3.0	-2.2	33.0	1.0	-34.3	-13.0	-21.3	
3.76	-58.6	V	3.0	-8.2	34.1	1.0	-41.2	-13.0	-28.2	
5.64	-61.0	V	3.0	-6.9	33.3	1.0	-39.2	-13.0	-26.2	
7.52	-59.8	V	3.0	-2.2	33.0	1.0	-34.2	-13.0	-21.2	
High Channel (1900MHz)										
3.80	-57.8	H	3.0	-7.6	34.0	1.0	-40.6	-13.0	-27.6	
5.70	-59.5	H	3.0	-5.2	33.3	1.0	-37.5	-13.0	-24.5	
7.60	-60.5	H	3.0	-2.8	33.0	1.0	-34.8	-13.0	-21.8	
3.80	-57.7	V	3.0	-7.2	34.0	1.0	-40.2	-13.0	-27.2	
5.70	-59.8	V	3.0	-5.6	33.3	1.0	-37.9	-13.0	-24.9	
7.60	-59.9	V	3.0	-2.2	33.0	1.0	-34.2	-13.0	-21.2	

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LTE B2 20MHz 16QAM

9.1.2. LTE BAND 5

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 5, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-61.1	H	3.0	-19.2	36.5	1.0	-54.7	-13.0	-41.7	
2.49	-61.1	H	3.0	-15.3	35.2	1.0	-49.5	-13.0	-36.5	
3.32	-61.0	H	3.0	-12.1	34.6	1.0	-45.7	-13.0	-32.7	
1.66	-61.5	V	3.0	-18.8	36.5	1.0	-54.3	-13.0	-41.3	
2.49	-61.5	V	3.0	-15.7	35.2	1.0	-49.8	-13.0	-36.8	
3.32	-61.5	V	3.0	-12.0	34.6	1.0	-45.6	-13.0	-32.6	
Mid Channel (836.5MHz)										
1.67	-60.8	H	3.0	-18.8	36.5	1.0	-54.3	-13.0	-41.3	
2.51	-60.9	H	3.0	-15.0	35.1	1.0	-49.1	-13.0	-36.1	
3.35	-61.4	H	3.0	-12.4	34.6	1.0	-46.0	-13.0	-33.0	
1.67	-61.8	V	3.0	-19.0	36.5	1.0	-54.5	-13.0	-41.5	
2.51	-60.0	V	3.0	-14.1	35.1	1.0	-48.2	-13.0	-35.2	
3.35	-61.6	V	3.0	-12.0	34.6	1.0	-45.6	-13.0	-32.6	
High Channel (844MHz)										
1.69	-61.4	H	3.0	-19.3	36.4	1.0	-54.7	-13.0	-41.7	
2.53	-61.0	H	3.0	-15.0	35.1	1.0	-49.1	-13.0	-36.1	
3.38	-61.0	H	3.0	-11.9	34.5	1.0	-45.5	-13.0	-32.5	
1.69	-61.7	V	3.0	-18.8	36.4	1.0	-54.2	-13.0	-41.2	
2.53	-61.2	V	3.0	-15.1	35.1	1.0	-49.3	-13.0	-36.3	
3.38	-61.7	V	3.0	-12.1	34.5	1.0	-45.6	-13.0	-32.6	

Rev. 05.21.15

LTE B5 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 5, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-61.7	H	3.0	-19.8	36.5	1.0	-55.3	-13.0	-42.3	
2.49	-60.8	H	3.0	-15.0	35.2	1.0	-49.2	-13.0	-36.2	
3.32	-59.9	H	3.0	-11.0	34.6	1.0	-44.6	-13.0	-31.6	
1.66	-61.3	V	3.0	-18.6	36.5	1.0	-54.1	-13.0	-41.1	
2.49	-61.2	V	3.0	-15.4	35.2	1.0	-49.5	-13.0	-36.5	
3.32	-61.1	V	3.0	-11.6	34.6	1.0	-45.2	-13.0	-32.2	
Mid Channel (836.5MHz)										
1.67	-60.2	H	3.0	-18.2	36.5	1.0	-53.7	-13.0	-40.7	
2.51	-61.3	H	3.0	-15.4	35.1	1.0	-49.5	-13.0	-36.5	
3.35	-61.5	H	3.0	-12.5	34.6	1.0	-46.1	-13.0	-33.1	
1.67	-61.6	V	3.0	-18.8	36.5	1.0	-54.3	-13.0	-41.3	
2.51	-60.2	V	3.0	-14.3	35.1	1.0	-48.4	-13.0	-35.4	
3.35	-61.8	V	3.0	-12.2	34.6	1.0	-45.8	-13.0	-32.8	
High Channel (844MHz)										
1.69	-62.0	H	3.0	-19.9	36.4	1.0	-55.3	-13.0	-42.3	
2.53	-61.1	H	3.0	-15.1	35.1	1.0	-49.2	-13.0	-36.2	
3.38	-60.9	H	3.0	-11.8	34.5	1.0	-45.4	-13.0	-32.4	
1.69	-62.0	V	3.0	-19.1	36.4	1.0	-54.5	-13.0	-41.5	
2.53	-60.5	V	3.0	-14.4	35.1	1.0	-48.6	-13.0	-35.6	
3.38	-61.4	V	3.0	-11.8	34.5	1.0	-45.3	-13.0	-32.3	

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LTE B5 10MHz 16QAM

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9.1.3. LTE BAND 7

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 7, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-59.6	H	3.0	-6.7	33.4	1.0	-39.1	-25.0	-14.1	
7.53	-60.6	H	3.0	-3.0	33.0	1.0	-35.0	-25.0	-10.0	
10.04	-60.1	H	3.0	0.7	32.6	1.0	-30.9	-25.0	-5.9	
5.02	-59.5	V	3.0	-6.6	33.4	1.0	-39.1	-25.0	-14.1	
7.53	-59.3	V	3.0	-1.7	33.0	1.0	-33.7	-25.0	-8.7	
10.04	-60.9	V	3.0	0.2	32.6	1.0	-31.5	-25.0	-6.5	
Mid Channel (2535MHz)										
5.07	-59.1	H	3.0	-6.1	33.4	1.0	-38.5	-25.0	-13.5	
7.61	-60.4	H	3.0	-2.7	33.0	1.0	-34.7	-25.0	-9.7	
10.14	-60.9	H	3.0	0.0	32.6	1.0	-31.6	-25.0	-6.6	
5.07	-60.2	V	3.0	-7.3	33.4	1.0	-39.7	-25.0	-14.7	
7.61	-61.4	V	3.0	-3.7	33.0	1.0	-35.7	-25.0	-10.7	
10.14	-59.7	V	3.0	1.5	32.6	1.0	-30.1	-25.0	-5.1	
High Channel (2560MHz)										
5.12	-59.8	H	3.0	-6.7	33.4	1.0	-39.1	-25.0	-14.1	
7.68	-61.5	H	3.0	-3.7	33.0	1.0	-35.7	-25.0	-10.7	
10.24	-61.0	H	3.0	0.0	32.5	1.0	-31.5	-25.0	-6.5	
5.12	-60.7	V	3.0	-7.7	33.4	1.0	-40.0	-25.0	-15.0	
7.68	-61.7	V	3.0	-3.9	33.0	1.0	-35.9	-25.0	-10.9	
10.24	-60.9	V	3.0	0.3	32.5	1.0	-31.2	-25.0	-6.2	

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LTE B7 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 7, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-60.0	H	3.0	-7.1	33.4	1.0	-39.5	-25.0	-14.5	
7.53	-59.9	H	3.0	-2.3	33.0	1.0	-34.3	-25.0	-9.3	
10.04	-60.9	H	3.0	-0.1	32.6	1.0	-31.7	-25.0	-6.7	
5.02	-59.9	V	3.0	-7.1	33.4	1.0	-39.5	-25.0	-14.5	
7.53	-59.9	V	3.0	-2.3	33.0	1.0	-34.3	-25.0	-9.3	
10.04	-60.5	V	3.0	0.6	32.6	1.0	-31.1	-25.0	-6.1	
Mid Channel (2535MHz)										
5.07	-59.7	H	3.0	-6.7	33.4	1.0	-39.1	-25.0	-14.1	
7.61	-61.4	H	3.0	-3.7	33.0	1.0	-35.7	-25.0	-10.7	
10.14	-60.0	H	3.0	0.9	32.6	1.0	-30.7	-25.0	-5.7	
5.07	-59.9	V	3.0	-7.0	33.4	1.0	-39.4	-25.0	-14.4	
7.61	-61.3	V	3.0	-3.6	33.0	1.0	-35.6	-25.0	-10.6	
10.14	-60.8	V	3.0	0.4	32.6	1.0	-31.2	-25.0	-6.2	
High Channel (2560MHz)										
5.12	-60.0	H	3.0	-6.9	33.4	1.0	-39.3	-25.0	-14.3	
7.68	-61.7	H	3.0	-3.9	33.0	1.0	-35.9	-25.0	-10.9	
10.24	-61.0	H	3.0	0.0	32.5	1.0	-31.5	-25.0	-6.5	
5.12	-59.5	V	3.0	-6.5	33.4	1.0	-38.8	-25.0	-13.8	
7.68	-61.3	V	3.0	-3.5	33.0	1.0	-35.5	-25.0	-10.5	
10.24	-60.4	V	3.0	0.8	32.5	1.0	-30.7	-25.0	-5.7	

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LTE B7 20MHz 16QAM

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9.1.4. LTE BAND 12

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 12, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-61.5	H	3.0	-21.3	36.7	1.0	-57.0	-13.0	-44.0	
2.11	-61.2	H	3.0	-16.3	35.8	1.0	-51.1	-13.0	-38.1	
2.82	-60.8	H	3.0	-13.6	35.0	1.0	-47.6	-13.0	-34.6	
1.41	-61.3	V	3.0	-20.6	36.7	1.0	-56.3	-13.0	-43.3	
2.11	-61.5	V	3.0	-15.8	35.8	1.0	-50.5	-13.0	-37.5	
2.82	-60.5	V	3.0	-12.7	35.0	1.0	-46.8	-13.0	-33.8	
Mid Channel (707.5MHz)										
1.42	-61.6	H	3.0	-21.4	36.7	1.0	-57.0	-13.0	-44.0	
2.12	-61.9	H	3.0	-17.0	35.7	1.0	-51.7	-13.0	-38.7	
2.83	-61.5	H	3.0	-14.2	35.0	1.0	-48.3	-13.0	-35.3	
1.42	-61.4	V	3.0	-20.7	36.7	1.0	-56.3	-13.0	-43.3	
2.12	-61.3	V	3.0	-15.6	35.7	1.0	-50.3	-13.0	-37.3	
2.83	-60.9	V	3.0	-13.1	35.0	1.0	-47.1	-13.0	-34.1	
High Channel (711MHz)										
1.42	-61.9	H	3.0	-21.6	36.7	1.0	-57.3	-13.0	-44.3	
2.13	-62.2	H	3.0	-17.3	35.7	1.0	-52.0	-13.0	-39.0	
2.84	-61.2	H	3.0	-13.9	35.0	1.0	-47.9	-13.0	-34.9	
1.42	-62.0	V	3.0	-21.2	36.7	1.0	-56.9	-13.0	-43.9	
2.13	-62.3	V	3.0	-16.6	35.7	1.0	-51.3	-13.0	-38.3	
2.84	-61.6	V	3.0	-13.7	35.0	1.0	-47.7	-13.0	-34.7	

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LTE B12 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 12, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-61.6	H	3.0	-21.4	36.7	1.0	-57.1	-13.0	-44.1	
2.11	-61.1	H	3.0	-16.2	35.8	1.0	-51.0	-13.0	-38.0	
2.82	-61.0	H	3.0	-13.8	35.0	1.0	-47.8	-13.0	-34.8	
1.41	-60.4	V	3.0	-19.7	36.7	1.0	-55.4	-13.0	-42.4	
2.11	-61.2	V	3.0	-15.5	35.8	1.0	-50.2	-13.0	-37.2	
2.82	-61.2	V	3.0	-13.4	35.0	1.0	-47.5	-13.0	-34.5	
Mid Channel (707.5MHz)										
1.42	-61.8	H	3.0	-21.6	36.7	1.0	-57.2	-13.0	-44.2	
2.12	-61.3	H	3.0	-16.4	35.7	1.0	-51.1	-13.0	-38.1	
2.83	-61.6	H	3.0	-14.3	35.0	1.0	-48.4	-13.0	-35.4	
1.42	-61.4	V	3.0	-20.7	36.7	1.0	-56.3	-13.0	-43.3	
2.12	-62.8	V	3.0	-17.1	35.7	1.0	-51.8	-13.0	-38.8	
2.83	-62.2	V	3.0	-14.4	35.0	1.0	-48.4	-13.0	-35.4	
High Channel (711MHz)										
1.42	-60.9	H	3.0	-20.6	36.7	1.0	-56.3	-13.0	-43.3	
2.13	-61.7	H	3.0	-16.8	35.7	1.0	-51.5	-13.0	-38.5	
2.84	-60.0	H	3.0	-12.7	35.0	1.0	-46.7	-13.0	-33.7	
1.42	-61.6	V	3.0	-20.8	36.7	1.0	-56.5	-13.0	-43.5	
2.13	-61.0	V	3.0	-15.3	35.7	1.0	-50.0	-13.0	-37.0	
2.84	-61.0	V	3.0	-13.1	35.0	1.0	-47.1	-13.0	-34.1	

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LTE B12 10MHz 16QAM

9.1.5. LTE BAND 13

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 13, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-61.6	H	3.0	-20.5	36.6	1.0	-56.2	-40.0	-16.2	
2.35	-61.5	H	3.0	-16.2	35.3	1.0	-50.5	-13.0	-37.5	
3.13	-59.4	H	3.0	-11.0	34.8	1.0	-44.9	-13.0	-31.9	
1.56	-61.8	V	3.0	-20.0	36.6	1.0	-55.6	-40.0	-15.6	
2.35	-61.2	V	3.0	-15.6	35.3	1.0	-49.9	-13.0	-36.9	
3.13	-60.1	V	3.0	-11.0	34.8	1.0	-44.8	-13.0	-31.8	

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LTE B13 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 13, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-61.7	H	3.0	-20.6	36.6	1.0	-56.3	-40.0	-16.3	
2.35	-60.3	H	3.0	-15.0	35.3	1.0	-49.3	-13.0	-36.3	
3.13	-60.9	H	3.0	-12.5	34.8	1.0	-46.4	-13.0	-33.4	
1.56	-61.4	V	3.0	-19.6	36.6	1.0	-55.2	-40.0	-15.2	
2.35	-61.9	V	3.0	-16.3	35.3	1.0	-50.6	-13.0	-37.6	
3.13	-60.4	V	3.0	-11.3	34.8	1.0	-45.1	-13.0	-32.1	

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LTE B13 10MHz 16QAM

UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
FORM NO: CCSUP4031B
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9.1.6. LTE BAND 14

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 14, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-62.0	H	3.0	-20.7	36.6	1.0	-56.3	-40.0	-16.3	
2.38	-61.3	H	3.0	-16.0	35.2	1.0	-50.2	-13.0	-37.2	
3.17	-60.7	H	3.0	-12.2	34.8	1.0	-46.0	-13.0	-33.0	
1.59	-61.6	V	3.0	-19.6	36.6	1.0	-55.2	-40.0	-15.2	
2.38	-62.1	V	3.0	-16.6	35.2	1.0	-50.8	-13.0	-37.8	
3.17	-59.7	V	3.0	-10.4	34.8	1.0	-44.2	-13.0	-31.2	

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LTE B14 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 14, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-61.8	H	3.0	-20.5	36.6	1.0	-56.1	-40.0	-16.1	
2.38	-62.0	H	3.0	-16.6	35.2	1.0	-50.9	-13.0	-37.9	
3.17	-61.0	H	3.0	-12.5	34.8	1.0	-46.3	-13.0	-33.3	
1.59	-61.8	V	3.0	-19.8	36.6	1.0	-55.4	-40.0	-15.4	
2.38	-60.9	V	3.0	-15.4	35.2	1.0	-49.6	-13.0	-36.6	
3.17	-61.6	V	3.0	-12.4	34.8	1.0	-46.2	-13.0	-33.2	

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LTE B14 10MHz 16QAM

9.1.7. LTE BAND 17

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 17, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-61.4	H	3.0	-21.1	36.7	1.0	-56.8	-13.0	-43.8	
2.13	-62.0	H	3.0	-17.1	35.7	1.0	-51.8	-13.0	-38.8	
2.84	-61.5	H	3.0	-14.2	35.0	1.0	-48.2	-13.0	-35.2	
1.42	-61.5	V	3.0	-20.7	35.7	1.0	-56.4	-13.0	-43.4	
2.13	-62.0	V	3.0	-16.3	35.7	1.0	-51.0	-13.0	-38.0	
2.84	-61.2	V	3.0	-13.3	35.0	1.0	-47.3	-13.0	-34.3	

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LTE B17 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 17, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-61.8	H	3.0	-21.5	36.7	1.0	-57.2	-13.0	-44.2	
2.13	-61.3	H	3.0	-16.4	35.7	1.0	-51.1	-13.0	-38.1	
2.84	-61.7	H	3.0	-14.4	35.0	1.0	-48.4	-13.0	-35.4	
1.42	-62.1	V	3.0	-21.3	36.7	1.0	-57.0	-13.0	-44.0	
2.13	-61.5	V	3.0	-15.8	35.7	1.0	-50.5	-13.0	-37.5	
2.84	-60.3	V	3.0	-12.4	35.0	1.0	-46.4	-13.0	-33.4	

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LTE B17 10MHz 16QAM

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9.1.8. LTE BAND 25

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19431
Configuration: EUT only
Mode: LTE Band 25, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-69.2	H	3.0	-19.4	34.4	1.0	-52.8	-13.0	-39.8	
5.58	-70.9	H	3.0	-17.4	34.1	1.0	-50.5	-13.0	-37.5	
7.44	-73.0	H	3.0	-15.6	33.6	1.0	-49.2	-13.0	-36.2	
3.72	-70.0	V	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.58	-70.0	V	3.0	-16.3	34.1	1.0	-49.5	-13.0	-36.5	
7.44	-72.2	V	3.0	-16.1	33.6	1.0	-48.7	-13.0	-35.7	
Mid Channel (1882.5MHz)										
3.77	-70.7	H	3.0	-20.7	34.4	1.0	-54.1	-13.0	-41.1	
5.65	-70.2	H	3.0	-16.6	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.7	H	3.0	-16.2	33.5	1.0	-48.7	-13.0	-35.7	
3.77	-70.5	V	3.0	-20.4	34.4	1.0	-53.8	-13.0	-40.8	
5.65	-70.3	V	3.0	-16.5	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.3	H	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.7	H	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.3	-13.0	-40.3	
5.72	-71.4	V	3.0	-17.6	34.1	1.0	-50.7	-13.0	-37.7	
7.62	-72.5	V	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	

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LTE B25 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19431
Configuration: EUT only
Mode: LTE Band 25, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-67.7	H	3.0	-17.9	34.4	1.0	-51.3	-13.0	-38.3	
5.58	-70.8	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.44	-71.3	H	3.0	-14.9	33.6	1.0	-47.5	-13.0	-34.5	
3.72	-69.8	V	3.0	-19.9	34.4	1.0	-53.3	-13.0	-40.3	
5.58	-69.4	V	3.0	-15.7	34.1	1.0	-48.9	-13.0	-35.9	
7.44	-73.0	V	3.0	-16.8	33.6	1.0	-49.4	-13.0	-36.4	
Mid Channel (1882.5MHz)										
3.77	-69.2	H	3.0	-19.2	34.4	1.0	-52.6	-13.0	-39.6	
5.65	-71.1	H	3.0	-17.5	34.1	1.0	-50.6	-13.0	-37.6	
7.53	-72.2	H	3.0	-15.7	33.5	1.0	-48.2	-13.0	-35.2	
3.77	-70.1	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.65	-70.8	V	3.0	-17.0	34.1	1.0	-50.1	-13.0	-37.1	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.0	H	3.0	-19.8	34.4	1.0	-53.2	-13.0	-40.2	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.9	H	3.0	-16.3	33.4	1.0	-48.7	-13.0	-35.7	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.72	-72.2	V	3.0	-18.4	34.1	1.0	-51.5	-13.0	-38.5	
7.62	-73.0	V	3.0	-16.6	33.4	1.0	-49.0	-13.0	-36.0	

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LTE B25 20MHz 16QAM

9.1.9. LTE BAND 26 (PART 90S)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19431
Configuration: EUT only
Mode: LTE Band 26 (90S), 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-61.3	H	3.0	-19.6	36.5	1.0	-55.1	-13.0	-42.1	
2.46	-61.4	H	3.0	-15.7	35.2	1.0	-49.9	-13.0	-36.9	
3.28	-60.6	H	3.0	-11.8	34.7	1.0	-45.5	-13.0	-32.5	
1.64	-61.8	V	3.0	-19.3	36.5	1.0	-54.8	-13.0	-41.8	
2.46	-61.5	V	3.0	-15.8	35.2	1.0	-50.0	-13.0	-37.0	
3.28	-61.2	V	3.0	-11.8	34.7	1.0	-45.4	-13.0	-32.4	

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LTE B26 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19431
Configuration: EUT only
Mode: LTE Band 26 (90S), 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-61.4	H	3.0	-19.7	36.5	1.0	-55.2	-13.0	-42.2	
2.46	-61.9	H	3.0	-16.2	35.2	1.0	-50.4	-13.0	-37.4	
3.28	-60.6	H	3.0	-11.8	34.7	1.0	-45.5	-13.0	-32.5	
1.64	-61.6	V	3.0	-19.1	36.5	1.0	-54.6	-13.0	-41.6	
2.46	-60.6	V	3.0	-14.9	35.2	1.0	-49.1	-13.0	-36.1	
3.28	-60.4	V	3.0	-11.0	34.7	1.0	-44.6	-13.0	-31.6	

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LTE B26 10MHz 16QAM

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9.1.10. LTE BAND 30

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 30, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-67.7	H	3.0	-13.9	37.9	1.0	-50.8	-40.0	-10.8	
6.93	-68.3	H	3.0	-9.7	36.5	1.0	-45.1	-40.0	-5.1	
9.24	-69.9	H	3.0	-8.4	34.9	1.0	-42.2	-40.0	-2.2	
4.62	-67.8	V	3.0	-14.1	37.9	1.0	-51.0	-40.0	-11.0	
6.93	-68.2	V	3.0	-8.7	36.5	1.0	-44.2	-40.0	-4.2	
9.24	-69.8	V	3.0	-8.0	34.9	1.0	-41.9	-40.0	-1.9	

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LTE B30 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19431
Configuration: EUT only
Mode: LTE Band 30, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-68.1	H	3.0	-14.3	37.9	1.0	-51.2	-40.0	-11.2	
6.93	-68.2	H	3.0	-9.6	36.5	1.0	-45.0	-40.0	-5.0	
9.24	-69.7	H	3.0	-8.2	34.9	1.0	-42.0	-40.0	-2.0	
4.62	-67.8	V	3.0	-14.1	37.9	1.0	-51.0	-40.0	-11.0	
6.93	-68.5	V	3.0	-8.0	36.5	1.0	-44.5	-40.0	-4.5	
9.24	-69.7	V	3.0	-7.9	34.9	1.0	-41.8	-40.0	-1.8	

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LTE B30 10MHz 16QAM

9.1.11. LTE BAND 41

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 41, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-64.2	H	3.0	-11.3	33.4	1.0	-43.8	-25.0	-18.8	
7.52	-64.9	H	3.0	-7.3	33.0	1.0	-39.4	-25.0	-14.4	
10.02	-65.4	H	3.0	-4.7	32.7	1.0	-36.3	-25.0	-11.3	
5.01	-64.5	V	3.0	-11.7	33.4	1.0	-44.1	-25.0	-19.1	
7.52	-64.0	V	3.0	-6.4	33.0	1.0	-38.5	-25.0	-13.5	
10.02	-64.7	V	3.0	-3.6	32.7	1.0	-35.3	-25.0	-10.3	
Mid Channel (2593MHz)										
5.19	-64.2	H	3.0	-10.9	33.4	1.0	-43.3	-25.0	-18.3	
7.78	-65.3	H	3.0	-7.4	33.0	1.0	-39.4	-25.0	-14.4	
10.37	-63.9	H	3.0	-2.8	32.4	1.0	-34.2	-25.0	-9.2	
5.19	-63.9	V	3.0	-10.8	33.4	1.0	-43.1	-25.0	-18.1	
7.78	-65.3	V	3.0	-7.4	33.0	1.0	-39.4	-25.0	-14.4	
10.37	-64.2	V	3.0	-2.9	32.4	1.0	-34.4	-25.0	-9.4	
High Channel (2680MHz)										
5.36	-66.4	H	3.0	-12.8	33.3	1.0	-45.1	-25.0	-20.1	
8.04	-64.1	H	3.0	-5.9	33.0	1.0	-37.8	-25.0	-12.8	
10.72	-65.3	H	3.0	-3.8	32.2	1.0	-35.1	-25.0	-10.1	
5.36	-65.9	V	3.0	-12.4	33.3	1.0	-44.7	-25.0	-19.7	
8.04	-65.5	V	3.0	-7.2	33.0	1.0	-39.2	-25.0	-14.2	
10.72	-65.0	V	3.0	-3.4	32.2	1.0	-34.7	-25.0	-9.7	

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LTE B41 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 41, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-63.8	H	3.0	-10.9	33.4	1.0	-43.3	-25.0	-18.3	
7.52	-65.1	H	3.0	-7.6	33.0	1.0	-39.6	-25.0	-14.6	
10.02	-64.8	H	3.0	-4.0	32.7	1.0	-35.7	-25.0	-10.7	
5.01	-64.6	V	3.0	-11.8	33.4	1.0	-44.2	-25.0	-19.2	
7.52	-64.7	V	3.0	-7.0	33.0	1.0	-39.1	-25.0	-14.1	
10.02	-65.2	V	3.0	-4.1	32.7	1.0	-35.8	-25.0	-10.8	
Mid Channel (2593MHz)										
5.19	-65.0	H	3.0	-11.8	33.4	1.0	-44.1	-25.0	-19.1	
7.78	-65.5	H	3.0	-7.6	33.0	1.0	-39.6	-25.0	-14.6	
10.37	-64.7	H	3.0	-3.5	32.4	1.0	-35.0	-25.0	-10.0	
5.19	-64.6	V	3.0	-11.4	33.4	1.0	-43.8	-25.0	-18.8	
7.78	-65.2	V	3.0	-7.2	33.0	1.0	-39.2	-25.0	-14.2	
10.37	-64.9	V	3.0	-3.6	32.4	1.0	-35.0	-25.0	-10.0	
High Channel (2680MHz)										
5.36	-66.6	H	3.0	-13.0	33.3	1.0	-45.3	-25.0	-20.3	
8.04	-65.2	H	3.0	-6.9	33.0	1.0	-38.9	-25.0	-13.9	
10.72	-65.0	H	3.0	-3.5	32.2	1.0	-34.7	-25.0	-9.7	
5.36	-65.5	V	3.0	-12.0	33.3	1.0	-44.3	-25.0	-19.3	
8.04	-64.9	V	3.0	-6.6	33.0	1.0	-38.6	-25.0	-13.6	
10.72	-64.3	V	3.0	-2.8	32.2	1.0	-34.0	-25.0	-9.0	

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LTE B41 20MHz 16QAM

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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9.1.12. LTE BAND 66

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 66, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-61.2	H	3.0	-12.0	34.5	1.0	-45.4	-13.0	-32.4	
5.16	-59.5	H	3.0	-6.3	33.4	1.0	-38.7	-13.0	-25.7	
6.88	-59.9	H	3.0	-3.2	33.1	1.0	-35.4	-13.0	-22.4	
3.44	-60.6	V	3.0	-10.8	34.5	1.0	-44.3	-13.0	-31.3	
5.16	-59.5	V	3.0	-6.4	33.4	1.0	-38.7	-13.0	-25.7	
6.88	-60.7	V	3.0	-4.1	33.1	1.0	-36.2	-13.0	-23.2	
Mid Channel (1745.0MHz)										
3.49	-61.4	H	3.0	-12.0	34.4	1.0	-45.4	-13.0	-32.4	
5.24	-59.5	H	3.0	-6.1	33.3	1.0	-38.5	-13.0	-25.5	
6.98	-60.0	H	3.0	-3.1	33.1	1.0	-35.2	-13.0	-22.2	
3.49	-61.8	V	3.0	-11.9	34.4	1.0	-45.3	-13.0	-32.3	
5.24	-59.7	V	3.0	-6.4	33.3	1.0	-38.8	-13.0	-25.8	
6.98	-59.7	V	3.0	-2.9	33.1	1.0	-35.0	-13.0	-22.0	
High Channel (1770.0MHz)										
3.54	-61.3	H	3.0	-11.8	34.3	1.0	-45.1	-13.0	-32.1	
5.31	-59.8	H	3.0	-6.3	33.3	1.0	-38.6	-13.0	-25.6	
7.08	-60.8	H	3.0	-3.8	33.1	1.0	-35.9	-13.0	-22.9	
3.54	-60.0	V	3.0	-10.0	34.3	1.0	-43.3	-13.0	-30.3	
5.31	-60.5	V	3.0	-7.1	33.3	1.0	-39.4	-13.0	-26.4	
7.08	-60.5	V	3.0	-3.5	33.1	1.0	-35.6	-13.0	-22.6	

Rev. 02.24.17

LTE B66 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/07/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 66, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-60.4	H	3.0	-11.2	34.5	1.0	-44.6	-13.0	-31.6	
5.16	-60.4	H	3.0	-7.2	33.4	1.0	-39.6	-13.0	-26.6	
6.88	-60.2	H	3.0	-3.5	33.1	1.0	-35.7	-13.0	-22.7	
3.44	-61.6	V	3.0	-11.8	34.5	1.0	-45.3	-13.0	-32.3	
5.16	-60.1	V	3.0	-7.0	33.4	1.0	-39.3	-13.0	-26.3	
6.88	-61.1	V	3.0	-4.5	33.1	1.0	-36.6	-13.0	-23.6	
Mid Channel (1745.0MHz)										
3.49	-61.6	H	3.0	-12.2	34.4	1.0	-45.6	-13.0	-32.6	
5.24	-58.7	H	3.0	-5.3	33.3	1.0	-37.7	-13.0	-24.7	
6.98	-60.4	H	3.0	-3.5	33.1	1.0	-35.6	-13.0	-22.6	
3.49	-61.0	V	3.0	-11.1	34.4	1.0	-44.5	-13.0	-31.5	
5.24	-59.2	V	3.0	-5.9	33.3	1.0	-38.3	-13.0	-25.3	
6.98	-59.9	V	3.0	-3.1	33.1	1.0	-35.2	-13.0	-22.2	
High Channel (1770.0MHz)										
3.54	-61.6	H	3.0	-12.1	34.3	1.0	-45.4	-13.0	-32.4	
5.31	-59.3	H	3.0	-5.8	33.3	1.0	-38.1	-13.0	-25.1	
7.08	-60.8	H	3.0	-3.8	33.1	1.0	-35.9	-13.0	-22.9	
3.54	-61.7	V	3.0	-11.7	34.3	1.0	-45.0	-13.0	-32.0	
5.31	-59.8	V	3.0	-6.4	33.3	1.0	-38.7	-13.0	-25.7	
7.08	-60.7	V	3.0	-3.7	33.1	1.0	-35.8	-13.0	-22.8	

Rev. 02.24.17

LTE B66 20MHz 16QAM

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9.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 2

9.2.1. LTE BAND 2

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-67.7	H	3.0	-17.7	38.6	1.0	-55.3	-13.0	-42.3	
5.58	-69.5	H	3.0	-15.4	38.6	1.0	-53.0	-13.0	-40.0	
7.44	-71.8	H	3.0	-14.1	37.8	1.0	-50.9	-13.0	-37.9	
3.72	-68.9	V	3.0	-18.9	38.6	1.0	-56.6	-13.0	-43.6	
5.58	-70.7	V	3.0	-16.9	38.6	1.0	-54.4	-13.0	-41.4	
7.44	-71.9	V	3.0	-14.4	37.8	1.0	-51.2	-13.0	-38.2	
Mid Channel (1880MHz)										
3.76	-67.7	H	3.0	-17.6	38.6	1.0	-55.2	-13.0	-42.2	
5.64	-69.5	H	3.0	-15.2	38.5	1.0	-52.8	-13.0	-39.8	
7.52	-72.5	H	3.0	-14.7	37.7	1.0	-51.5	-13.0	-38.5	
3.76	-68.7	V	3.0	-18.6	38.6	1.0	-56.3	-13.0	-43.3	
5.64	-68.9	V	3.0	-15.0	38.5	1.0	-52.5	-13.0	-39.5	
7.52	-72.4	V	3.0	-14.8	37.7	1.0	-51.5	-13.0	-38.5	
High Channel (1900MHz)										
3.80	-68.2	H	3.0	-18.0	38.6	1.0	-55.6	-13.0	-42.6	
5.70	-68.6	H	3.0	-14.2	38.5	1.0	-51.7	-13.0	-38.7	
7.60	-73.2	H	3.0	-15.3	37.7	1.0	-52.0	-13.0	-39.0	
3.80	-67.5	V	3.0	-17.3	38.6	1.0	-55.0	-13.0	-42.0	
5.70	-69.9	V	3.0	-15.8	38.5	1.0	-53.3	-13.0	-40.3	
7.60	-72.5	V	3.0	-14.8	37.7	1.0	-51.5	-13.0	-38.5	

Rev. 05.21.15

LTE B2 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 2, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-65.7	H	3.0	-15.7	38.6	1.0	-53.3	-13.0	-40.3	
5.58	-67.0	H	3.0	-12.9	38.6	1.0	-50.4	-13.0	-37.4	
7.44	-69.0	H	3.0	-11.2	37.8	1.0	-48.0	-13.0	-35.0	
3.72	-65.4	V	3.0	-15.4	38.6	1.0	-53.0	-13.0	-40.0	
5.58	-67.0	V	3.0	-13.2	38.6	1.0	-50.8	-13.0	-37.8	
7.44	-68.9	V	3.0	-11.4	37.8	1.0	-48.1	-13.0	-35.1	
Mid Channel (1880MHz)										
3.76	-65.3	H	3.0	-15.2	38.6	1.0	-52.9	-13.0	-39.9	
5.64	-67.1	H	3.0	-12.9	38.5	1.0	-50.4	-13.0	-37.4	
7.52	-69.6	H	3.0	-11.8	37.7	1.0	-48.5	-13.0	-35.5	
3.76	-67.8	V	3.0	-17.8	38.6	1.0	-55.4	-13.0	-42.4	
5.64	-68.9	V	3.0	-15.0	38.5	1.0	-52.5	-13.0	-39.5	
7.52	-71.3	V	3.0	-13.7	37.7	1.0	-50.4	-13.0	-37.4	
High Channel (1900MHz)										
3.80	-66.3	H	3.0	-16.1	38.6	1.0	-53.7	-13.0	-40.7	
5.70	-68.6	H	3.0	-14.2	38.5	1.0	-51.7	-13.0	-38.7	
7.60	-71.1	H	3.0	-13.2	37.7	1.0	-49.9	-13.0	-36.9	
3.80	-66.3	V	3.0	-16.1	38.6	1.0	-53.8	-13.0	-40.8	
5.70	-68.1	V	3.0	-14.0	38.5	1.0	-51.5	-13.0	-38.5	
7.60	-71.0	V	3.0	-13.3	37.7	1.0	-50.0	-13.0	-37.0	

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9.2.2. LTE BAND 5

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 5, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-64.4	H	3.0	-21.9	37.8	1.0	-58.7	-13.0	-45.7	
2.49	-65.3	H	3.0	-20.3	38.5	1.0	-57.8	-13.0	-44.8	
3.32	-64.7	H	3.0	-15.7	38.5	1.0	-53.2	-13.0	-40.2	
1.66	-64.9	V	3.0	-22.8	37.8	1.0	-59.6	-13.0	-46.6	
2.49	-65.2	V	3.0	-19.9	38.5	1.0	-57.5	-13.0	-44.5	
3.32	-65.5	V	3.0	-16.8	38.5	1.0	-54.3	-13.0	-41.3	
Mid Channel (836.5MHz)										
1.67	-64.9	H	3.0	-22.4	37.8	1.0	-59.3	-13.0	-46.3	
2.51	-64.9	H	3.0	-19.7	38.6	1.0	-57.3	-13.0	-44.3	
3.35	-66.5	H	3.0	-17.4	38.5	1.0	-54.9	-13.0	-41.9	
1.67	-65.0	V	3.0	-22.7	37.8	1.0	-59.5	-13.0	-46.5	
2.51	-65.2	V	3.0	-19.8	38.6	1.0	-57.4	-13.0	-44.4	
3.35	-65.8	V	3.0	-17.0	38.5	1.0	-54.5	-13.0	-41.5	
High Channel (844MHz)										
1.69	-64.5	H	3.0	-22.0	37.9	1.0	-58.9	-13.0	-45.9	
2.53	-65.9	H	3.0	-20.5	38.6	1.0	-58.1	-13.0	-45.1	
3.38	-66.0	H	3.0	-16.9	38.5	1.0	-54.4	-13.0	-41.4	
1.69	-64.2	V	3.0	-21.9	37.9	1.0	-58.7	-13.0	-45.7	
2.53	-65.5	V	3.0	-20.1	38.6	1.0	-57.6	-13.0	-44.6	
3.38	-65.0	V	3.0	-16.1	38.5	1.0	-53.6	-13.0	-40.6	

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LTE B5 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 5, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-64.4	H	3.0	-21.9	37.8	1.0	-58.8	-13.0	-45.8	
2.49	-65.3	H	3.0	-20.2	38.5	1.0	-57.7	-13.0	-44.7	
3.32	-64.7	H	3.0	-15.7	38.5	1.0	-53.2	-13.0	-40.2	
1.66	-64.3	V	3.0	-22.1	37.8	1.0	-59.0	-13.0	-46.0	
2.49	-65.9	V	3.0	-20.6	38.5	1.0	-58.2	-13.0	-45.2	
3.32	-65.4	V	3.0	-16.7	38.5	1.0	-54.1	-13.0	-41.1	
Mid Channel (836.5MHz)										
1.67	-66.0	H	3.0	-23.5	37.8	1.0	-60.3	-13.0	-47.3	
2.51	-66.7	H	3.0	-21.5	38.6	1.0	-59.1	-13.0	-46.1	
3.35	-66.8	H	3.0	-17.7	38.5	1.0	-55.2	-13.0	-42.2	
1.67	-66.0	V	3.0	-23.7	37.8	1.0	-60.6	-13.0	-47.6	
2.51	-66.5	V	3.0	-21.1	38.6	1.0	-58.7	-13.0	-45.7	
3.35	-67.2	V	3.0	-18.4	38.5	1.0	-55.9	-13.0	-42.9	
High Channel (844MHz)										
1.69	-63.8	H	3.0	-21.3	37.9	1.0	-58.1	-13.0	-45.1	
2.53	-65.1	H	3.0	-19.8	38.6	1.0	-57.3	-13.0	-44.3	
3.38	-65.9	H	3.0	-16.8	38.5	1.0	-54.3	-13.0	-41.3	
1.69	-64.5	V	3.0	-22.2	37.9	1.0	-59.0	-13.0	-46.0	
2.53	-65.8	V	3.0	-20.3	38.6	1.0	-57.9	-13.0	-44.9	
3.38	-65.6	V	3.0	-16.7	38.5	1.0	-54.2	-13.0	-41.2	

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9.2.3. LTE BAND 7

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 7, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-69.3	H	3.0	-16.4	38.7	1.0	-54.1	-25.0	-29.1	
7.53	-72.6	H	3.0	-14.7	37.7	1.0	-51.5	-25.0	-26.5	
10.04	-74.8	H	3.0	-13.9	36.2	1.0	-49.1	-25.0	-24.1	
5.02	-69.1	V	3.0	-16.5	38.7	1.0	-54.1	-25.0	-29.1	
7.53	-71.9	V	3.0	-14.3	37.7	1.0	-51.0	-25.0	-26.0	
10.04	-75.7	V	3.0	-14.9	36.2	1.0	-50.0	-25.0	-25.0	
Mid Channel (2535MHz)										
5.07	-69.2	H	3.0	-16.2	38.7	1.0	-53.9	-25.0	-28.9	
7.61	-71.8	H	3.0	-13.9	37.7	1.0	-50.6	-25.0	-25.6	
10.14	-75.5	H	3.0	-14.5	36.2	1.0	-49.8	-25.0	-24.8	
5.07	-70.1	V	3.0	-17.4	38.7	1.0	-55.1	-25.0	-30.1	
7.61	-71.1	V	3.0	-13.3	37.7	1.0	-50.0	-25.0	-25.0	
10.14	-75.5	V	3.0	-14.6	36.2	1.0	-49.8	-25.0	-24.8	
High Channel (2560MHz)										
5.12	-68.3	H	3.0	-15.1	38.7	1.0	-52.8	-25.0	-27.8	
7.68	-70.9	H	3.0	-12.9	37.6	1.0	-49.5	-25.0	-24.5	
10.24	-74.0	H	3.0	-13.0	36.3	1.0	-48.3	-25.0	-23.3	
5.12	-69.4	V	3.0	-16.6	38.7	1.0	-54.2	-25.0	-29.2	
7.68	-72.8	V	3.0	-15.0	37.6	1.0	-51.6	-25.0	-26.6	
10.24	-73.1	V	3.0	-12.1	36.3	1.0	-47.4	-25.0	-22.4	

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LTE B7 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 7, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B7

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-69.1	H	3.0	-16.2	38.7	1.0	-53.9	-25.0	-28.9	
7.53	-70.0	H	3.0	-12.2	37.7	1.0	-48.9	-25.0	-23.9	
10.04	-74.2	H	3.0	-13.4	36.2	1.0	-48.6	-25.0	-23.6	
5.02	-68.2	V	3.0	-15.6	38.7	1.0	-53.3	-25.0	-28.3	
7.53	-71.0	V	3.0	-13.4	37.7	1.0	-50.1	-25.0	-25.1	
10.04	-73.9	V	3.0	-13.1	36.2	1.0	-48.2	-25.0	-23.2	
Mid Channel (2535MHz)										
5.07	-69.4	H	3.0	-16.4	38.7	1.0	-54.1	-25.0	-29.1	
7.61	-71.7	H	3.0	-13.8	37.7	1.0	-50.5	-25.0	-25.5	
10.14	-74.3	H	3.0	-13.4	36.2	1.0	-48.6	-25.0	-23.6	
5.07	-68.8	V	3.0	-16.1	38.7	1.0	-53.8	-25.0	-28.8	
7.61	-71.6	V	3.0	-13.8	37.7	1.0	-50.5	-25.0	-25.5	
10.14	-75.3	V	3.0	-14.3	36.2	1.0	-49.6	-25.0	-24.6	
High Channel (2560MHz)										
5.12	-68.9	H	3.0	-15.8	38.7	1.0	-53.5	-25.0	-28.5	
7.68	-73.4	H	3.0	-15.4	37.6	1.0	-52.1	-25.0	-27.1	
10.24	-75.0	H	3.0	-14.0	36.3	1.0	-49.3	-25.0	-24.3	
5.12	-66.8	V	3.0	-14.0	38.7	1.0	-51.7	-25.0	-26.7	
7.68	-71.8	V	3.0	-14.0	37.6	1.0	-50.6	-25.0	-25.6	
10.24	-74.2	V	3.0	-13.2	36.3	1.0	-48.5	-25.0	-23.5	

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9.2.4. LTE BAND 12

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 12, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-64.8	H	3.0	-23.2	38.1	1.0	-60.3	-13.0	-47.3	
2.11	-65.4	H	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.82	-66.3	H	3.0	-19.3	38.4	1.0	-56.7	-13.0	-43.7	
1.41	-64.8	V	3.0	-23.9	38.1	1.0	-60.9	-13.0	-47.9	
2.11	-64.6	V	3.0	-20.5	38.0	1.0	-57.4	-13.0	-44.4	
2.82	-64.5	V	3.0	-17.6	38.4	1.0	-55.0	-13.0	-42.0	
Mid Channel (707.5MHz)										
1.42	-64.1	H	3.0	-22.4	38.0	1.0	-59.5	-13.0	-46.5	
2.12	-65.4	H	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.83	-66.1	H	3.0	-19.0	38.4	1.0	-56.4	-13.0	-43.4	
1.42	-64.5	V	3.0	-23.5	38.0	1.0	-60.5	-13.0	-47.5	
2.12	-66.0	V	3.0	-21.9	38.0	1.0	-58.9	-13.0	-45.9	
2.83	-65.8	V	3.0	-18.8	38.4	1.0	-56.3	-13.0	-43.3	
High Channel (711MHz)										
1.42	-64.1	H	3.0	-22.4	38.0	1.0	-59.4	-13.0	-46.4	
2.13	-65.6	H	3.0	-22.0	38.0	1.0	-59.0	-13.0	-46.0	
2.84	-64.9	H	3.0	-17.6	38.4	1.0	-55.1	-13.0	-42.1	
1.42	-65.3	V	3.0	-24.3	38.0	1.0	-61.3	-13.0	-48.3	
2.13	-65.7	V	3.0	-21.5	38.0	1.0	-58.5	-13.0	-45.5	
2.84	-65.7	V	3.0	-18.7	38.4	1.0	-56.1	-13.0	-43.1	

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LTE B12 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 12, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-65.0	H	3.0	-23.3	38.1	1.0	-60.4	-13.0	-47.4	
2.11	-65.4	H	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.82	-65.1	H	3.0	-18.0	38.4	1.0	-55.5	-13.0	-42.5	
1.41	-65.6	V	3.0	-24.6	38.1	1.0	-61.7	-13.0	-48.7	
2.11	-65.6	V	3.0	-21.4	38.0	1.0	-58.4	-13.0	-45.4	
2.82	-65.9	V	3.0	-19.0	38.4	1.0	-56.5	-13.0	-43.5	
Mid Channel (707.5MHz)										
1.42	-64.6	H	3.0	-22.9	38.0	1.0	-59.9	-13.0	-46.9	
2.12	-65.8	H	3.0	-22.2	38.0	1.0	-59.2	-13.0	-46.2	
2.83	-66.2	H	3.0	-19.1	38.4	1.0	-56.5	-13.0	-43.5	
1.42	-65.4	V	3.0	-24.4	38.0	1.0	-61.5	-13.0	-48.5	
2.12	-65.2	V	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.83	-66.0	V	3.0	-19.1	38.4	1.0	-56.5	-13.0	-43.5	
High Channel (711MHz)										
1.42	-64.8	H	3.0	-23.1	38.0	1.0	-60.1	-13.0	-47.1	
2.13	-66.2	H	3.0	-22.6	38.0	1.0	-59.6	-13.0	-46.6	
2.84	-65.3	H	3.0	-18.0	38.4	1.0	-55.5	-13.0	-42.5	
1.42	-64.1	V	3.0	-23.1	38.0	1.0	-60.1	-13.0	-47.1	
2.13	-64.7	V	3.0	-20.5	38.0	1.0	-57.5	-13.0	-44.5	
2.84	-66.2	V	3.0	-19.1	38.4	1.0	-56.6	-13.0	-43.6	

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9.2.5. LTE BAND 13

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 13, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-64.1	H	3.0	-21.8	37.8	1.0	-58.7	-40.0	-18.7	
2.35	-65.2	H	3.0	-20.7	38.1	1.0	-57.9	-13.0	-44.9	
3.13	-65.4	H	3.0	-16.9	38.4	1.0	-54.3	-13.0	-41.3	
1.56	-64.4	V	3.0	-22.7	37.8	1.0	-59.5	-40.0	-19.5	
2.35	-65.3	V	3.0	-20.7	38.1	1.0	-57.8	-13.0	-44.8	
3.13	-64.5	V	3.0	-16.4	38.4	1.0	-53.8	-13.0	-40.8	

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LTE B13 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 13, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B13

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-65.5	H	3.0	-23.2	37.8	1.0	-60.0	-40.0	-20.0	
2.35	-65.4	H	3.0	-21.0	38.1	1.0	-58.2	-13.0	-45.2	
3.13	-65.3	H	3.0	-16.8	38.4	1.0	-54.2	-13.0	-41.2	
1.56	-64.1	V	3.0	-22.4	37.8	1.0	-59.2	-40.0	-19.2	
2.35	-65.7	V	3.0	-21.1	38.1	1.0	-58.2	-13.0	-45.2	
3.13	-65.5	V	3.0	-17.3	38.4	1.0	-54.7	-13.0	-41.7	

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LTE B13 10MHz 16QAM

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47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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9.2.6. LTE BAND 14

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 14, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-70.4	H	3.0	-29.2	36.6	1.0	-64.8	-40.0	-24.8	
2.38	-70.3	H	3.0	-24.9	35.2	1.0	-59.1	-13.0	-46.1	
3.17	-71.3	H	3.0	-22.8	34.8	1.0	-56.6	-13.0	-43.6	
1.59	-70.0	V	3.0	-28.0	36.6	1.0	-63.6	-40.0	-23.6	
2.38	-72.5	V	3.0	-27.0	35.2	1.0	-61.2	-13.0	-48.2	
3.17	-69.5	V	3.0	-20.3	34.8	1.0	-54.1	-13.0	-41.1	

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LTE B14 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 14, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber C	3m Chamber C	Filter	LTE B14

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-70.5	H	3.0	-29.2	36.6	1.0	-64.8	-40.0	-24.8	
2.38	-72.0	H	3.0	-26.6	35.2	1.0	-60.8	-13.0	-47.8	
3.17	-69.9	H	3.0	-21.5	34.8	1.0	-55.2	-13.0	-42.2	
1.59	-70.9	V	3.0	-28.9	36.6	1.0	-64.5	-40.0	-24.5	
2.38	-72.5	V	3.0	-27.0	35.2	1.0	-61.2	-13.0	-48.2	
3.17	-70.2	V	3.0	-21.0	34.8	1.0	-54.8	-13.0	-41.8	

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LTE B14 10MHz 16QAM

9.2.7. LTE BAND 17

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 17, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-63.6	H	3.0	-21.9	38.0	1.0	-58.9	-13.0	-45.9	
2.13	-64.6	H	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.84	-64.7	H	3.0	-17.4	38.4	1.0	-54.9	-13.0	-41.9	
1.42	-63.8	V	3.0	-22.8	38.0	1.0	-59.8	-13.0	-46.8	
2.13	-65.0	V	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.84	-64.6	V	3.0	-17.6	38.4	1.0	-55.0	-13.0	-42.0	

Rev. 05.21.15

LTE B17 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/19
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 17, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-63.6	H	3.0	-21.9	38.0	1.0	-58.9	-13.0	-45.9	
2.13	-64.9	H	3.0	-21.3	38.0	1.0	-58.3	-13.0	-45.3	
2.84	-64.7	H	3.0	-17.5	38.4	1.0	-55.0	-13.0	-42.0	
1.42	-64.0	V	3.0	-23.0	38.0	1.0	-60.1	-13.0	-47.1	
2.13	-65.1	V	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.84	-64.7	V	3.0	-17.7	38.4	1.0	-55.2	-13.0	-42.2	

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LTE B17 10MHz 16QAM

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
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9.2.8. LTE BAND 25

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/19
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 25, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-69.2	H	3.0	-19.4	34.4	1.0	-52.8	-13.0	-39.8	
5.58	-70.9	H	3.0	-17.4	34.1	1.0	-50.5	-13.0	-37.5	
7.44	-73.0	H	3.0	-15.6	33.6	1.0	-49.2	-13.0	-36.2	
3.72	-70.0	V	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.58	-70.0	V	3.0	-16.3	34.1	1.0	-49.5	-13.0	-36.5	
7.44	-72.2	V	3.0	-16.1	33.6	1.0	-48.7	-13.0	-35.7	
Mid Channel (1882.5MHz)										
3.77	-70.7	H	3.0	-20.7	34.4	1.0	-54.1	-13.0	-41.1	
5.65	-70.2	H	3.0	-16.6	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.7	H	3.0	-16.2	33.5	1.0	-48.7	-13.0	-35.7	
3.77	-70.5	V	3.0	-20.4	34.4	1.0	-53.8	-13.0	-40.8	
5.65	-70.3	V	3.0	-16.5	34.1	1.0	-49.7	-13.0	-36.7	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.3	H	3.0	-20.1	34.4	1.0	-53.5	-13.0	-40.5	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.7	H	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.3	-13.0	-40.3	
5.72	-71.4	V	3.0	-17.6	34.1	1.0	-50.7	-13.0	-37.7	
7.62	-72.5	V	3.0	-16.1	33.4	1.0	-48.5	-13.0	-35.5	

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LTE B25 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/19
Test Engineer: 19459
Configuration: EUT Only
Mode: LTE Band 25, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-67.7	H	3.0	-17.9	34.4	1.0	-51.3	-13.0	-38.3	
5.58	-70.8	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.44	-71.3	H	3.0	-14.9	33.6	1.0	-47.5	-13.0	-34.5	
3.72	-69.8	V	3.0	-19.9	34.4	1.0	-53.3	-13.0	-40.3	
5.58	-69.4	V	3.0	-15.7	34.1	1.0	-48.9	-13.0	-35.9	
7.44	-73.0	V	3.0	-16.8	33.6	1.0	-49.4	-13.0	-36.4	
Mid Channel (1882.5MHz)										
3.77	-69.2	H	3.0	-19.2	34.4	1.0	-52.6	-13.0	-39.6	
5.65	-71.1	H	3.0	-17.5	34.1	1.0	-50.6	-13.0	-37.6	
7.53	-72.2	H	3.0	-15.7	33.5	1.0	-48.2	-13.0	-35.2	
3.77	-70.1	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.65	-70.8	V	3.0	-17.0	34.1	1.0	-50.1	-13.0	-37.1	
7.53	-72.4	V	3.0	-16.1	33.5	1.0	-48.6	-13.0	-35.6	
High Channel (1905MHz)										
3.81	-70.0	H	3.0	-19.8	34.4	1.0	-53.2	-13.0	-40.2	
5.72	-71.0	H	3.0	-17.3	34.1	1.0	-50.4	-13.0	-37.4	
7.62	-72.9	H	3.0	-16.3	33.4	1.0	-48.7	-13.0	-35.7	
3.81	-70.2	V	3.0	-20.0	34.4	1.0	-53.4	-13.0	-40.4	
5.72	-72.2	V	3.0	-18.4	34.1	1.0	-51.5	-13.0	-38.5	
7.62	-73.0	V	3.0	-16.6	33.4	1.0	-49.0	-13.0	-36.0	

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LTE B25 20MHz 16QAM

9.2.9. LTE BAND 26 (PART 90S)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 26 (90S), 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-54.8	H	3.0	-12.4	37.8	1.0	-49.2	-13.0	-36.2	
2.46	-64.3	H	3.0	-19.4	38.4	1.0	-56.8	-13.0	-43.8	
3.28	-64.3	H	3.0	-15.4	38.5	1.0	-52.9	-13.0	-39.9	
1.64	-65.0	V	3.0	-22.9	37.8	1.0	-59.8	-13.0	-46.8	
2.46	-65.8	V	3.0	-20.7	38.4	1.0	-58.1	-13.0	-45.1	
3.28	-65.4	V	3.0	-16.8	38.5	1.0	-54.2	-13.0	-41.2	

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LTE B26 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19459
Configuration: EUT only
Mode: LTE Band 26 (90S), 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-53.5	H	3.0	-11.1	37.8	1.0	-47.9	-13.0	-34.9	
2.46	-65.8	H	3.0	-20.8	38.4	1.0	-58.2	-13.0	-45.2	
3.28	-65.8	H	3.0	-16.9	38.5	1.0	-54.4	-13.0	-41.4	
1.64	-64.1	V	3.0	-22.0	37.8	1.0	-58.8	-13.0	-45.8	
2.46	-65.8	V	3.0	-20.7	38.4	1.0	-58.1	-13.0	-45.1	
3.28	-66.0	V	3.0	-17.4	38.5	1.0	-54.9	-13.0	-41.9	

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LTE B26 10MHz 16QAM

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9.2.10. LTE BAND 30

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 30, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-69.2	H	3.0	-15.4	37.9	1.0	-52.4	-40.0	-12.4	
6.93	-70.9	H	3.0	-12.3	36.5	1.0	-47.7	-40.0	-7.7	
9.24	-73.7	H	3.0	-12.2	34.9	1.0	-46.0	-40.0	-6.0	
4.62	-68.5	V	3.0	-14.8	37.9	1.0	-51.7	-40.0	-11.7	
6.93	-71.1	V	3.0	-11.6	36.5	1.0	-47.1	-40.0	-7.1	
9.24	-73.7	V	3.0	-11.9	34.9	1.0	-45.8	-40.0	-5.8	

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LTE B30 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 30, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B30

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-68.1	H	3.0	-14.5	37.9	1.0	-51.4	-40.0	-11.4	
6.93	-69.7	H	3.0	-11.1	36.5	1.0	-46.6	-40.0	-6.6	
9.24	-73.4	H	3.0	-11.8	34.9	1.0	-45.7	-40.0	-5.7	
4.62	-68.3	V	3.0	-14.6	37.9	1.0	-51.5	-40.0	-11.5	
6.93	-71.2	V	3.0	-11.7	36.5	1.0	-47.2	-40.0	-7.2	
9.24	-72.8	V	3.0	-11.0	34.9	1.0	-44.9	-40.0	-4.9	

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LTE B30 10MHz 16QAM

9.2.11. LTE BAND 41

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 41, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-64.4	H	3.0	-11.6	38.7	1.0	-49.2	-25.0	-24.2	
7.52	-66.6	H	3.0	-8.8	37.7	1.0	-45.5	-25.0	-20.5	
10.02	-68.6	H	3.0	-7.7	36.1	1.0	-42.9	-25.0	-17.9	
5.01	-65.4	V	3.0	-12.8	38.7	1.0	-50.5	-25.0	-25.5	
7.52	-67.4	V	3.0	-9.8	37.7	1.0	-46.5	-25.0	-21.5	
10.02	-67.9	V	3.0	-7.1	36.1	1.0	-42.3	-25.0	-17.3	
Mid Channel (2593MHz)										
5.19	-64.7	H	3.0	-11.4	38.7	1.0	-49.1	-25.0	-24.1	
7.78	-65.5	H	3.0	-7.4	37.6	1.0	-43.9	-25.0	-18.9	
10.37	-67.8	H	3.0	-6.7	36.4	1.0	-42.0	-25.0	-17.0	
5.19	-63.9	V	3.0	-10.9	38.7	1.0	-48.6	-25.0	-23.6	
7.78	-65.5	V	3.0	-7.5	37.6	1.0	-44.1	-25.0	-19.1	
10.37	-66.5	V	3.0	-5.3	36.4	1.0	-40.7	-25.0	-15.7	
High Channel (2680MHz)										
5.36	-66.5	H	3.0	-12.8	38.6	1.0	-50.5	-25.0	-25.5	
8.04	-66.3	H	3.0	-7.9	37.4	1.0	-44.3	-25.0	-19.3	
10.72	-66.9	H	3.0	-5.5	36.6	1.0	-41.1	-25.0	-16.1	
5.36	-65.1	V	3.0	-11.8	38.6	1.0	-49.4	-25.0	-24.4	
8.04	-65.1	V	3.0	-6.9	37.4	1.0	-43.3	-25.0	-18.3	
10.72	-66.8	V	3.0	-5.2	36.6	1.0	-40.8	-25.0	-15.8	

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LTE B41 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 41, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-63.4	H	3.0	-10.5	38.7	1.0	-48.2	-25.0	-23.2	
7.52	-66.2	H	3.0	-8.4	37.7	1.0	-45.1	-25.0	-20.1	
10.02	-67.9	H	3.0	-7.1	36.1	1.0	-42.2	-25.0	-17.2	
5.01	-64.7	V	3.0	-12.1	38.7	1.0	-49.8	-25.0	-24.8	
7.52	-66.9	V	3.0	-9.3	37.7	1.0	-46.0	-25.0	-21.0	
10.02	-67.9	V	3.0	-7.1	36.1	1.0	-42.2	-25.0	-17.2	
Mid Channel (2593MHz)										
5.19	-64.9	H	3.0	-11.6	38.7	1.0	-49.3	-25.0	-24.3	
7.78	-66.5	H	3.0	-8.4	37.6	1.0	-44.9	-25.0	-19.9	
10.37	-68.3	H	3.0	-7.2	36.4	1.0	-42.5	-25.0	-17.5	
5.19	-64.3	V	3.0	-11.3	38.7	1.0	-49.0	-25.0	-24.0	
7.78	-65.7	V	3.0	-7.8	37.6	1.0	-44.3	-25.0	-19.3	
10.37	-67.4	V	3.0	-6.3	36.4	1.0	-41.6	-25.0	-16.6	
High Channel (2680MHz)										
5.36	-66.3	H	3.0	-12.6	38.6	1.0	-50.3	-25.0	-25.3	
8.04	-64.7	H	3.0	-6.3	37.4	1.0	-42.7	-25.0	-17.7	
10.72	-67.4	H	3.0	-6.0	36.6	1.0	-41.6	-25.0	-16.6	
5.36	-66.6	V	3.0	-13.3	38.6	1.0	-50.9	-25.0	-25.9	
8.04	-65.5	V	3.0	-7.2	37.4	1.0	-43.6	-25.0	-18.6	
10.72	-67.9	V	3.0	-6.3	36.6	1.0	-41.9	-25.0	-16.9	

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LTE B41 20MHz 16QAM

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9.2.12. LTE BAND 66

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 66, 20MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-68.3	H	3.0	-19.0	38.5	1.0	-56.5	-13.0	-43.5	
5.16	-67.4	H	3.0	-14.2	38.7	1.0	-51.9	-13.0	-38.9	
6.88	-69.2	H	3.0	-12.3	38.1	1.0	-49.4	-13.0	-36.4	
3.44	-68.9	V	3.0	-19.8	38.5	1.0	-57.4	-13.0	-44.4	
5.16	-68.5	V	3.0	-15.6	38.7	1.0	-53.3	-13.0	-40.3	
6.88	-69.8	V	3.0	-13.2	38.1	1.0	-50.3	-13.0	-37.3	
Mid Channel (1745.0MHz)										
3.4900	-69.2	H	3.0	-19.6	38.5	1.0	-57.2	-13.0	-44.2	
5.2350	-69.0	H	3.0	-15.7	38.7	1.0	-53.3	-13.0	-40.3	
6.9800	-71.6	H	3.0	-13.9	38.1	1.0	-51.0	-13.0	-38.0	
3.4900	-69.0	V	3.0	-19.8	38.5	1.0	-57.3	-13.0	-44.3	
5.2350	-69.0	V	3.0	-16.0	38.7	1.0	-53.7	-13.0	-40.7	
6.9800	-71.1	V	3.0	-14.2	38.1	1.0	-51.3	-13.0	-38.3	
High Channel (1770.0MHz)										
3.54	-68.6	H	3.0	-18.3	38.6	1.0	-55.9	-13.0	-42.9	
5.31	-68.9	H	3.0	-16.1	38.6	1.0	-53.7	-13.0	-40.7	
7.08	-70.8	H	3.0	-14.5	38.0	1.0	-51.5	-13.0	-38.5	
3.54	-67.9	V	3.0	-18.5	38.6	1.0	-56.1	-13.0	-43.1	
5.31	-69.6	V	3.0	-16.4	38.6	1.0	-54.1	-13.0	-41.1	
7.08	-71.8	V	3.0	-14.8	38.0	1.0	-51.8	-13.0	-38.8	

Rev. 02.24.17

LTE B66 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 66, 20MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber E	3m Chamber E	Filter	EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-69.3	H	3.0	-20.0	38.5	1.0	-57.5	-13.0	-44.5	
5.16	-67.1	H	3.0	-13.9	38.7	1.0	-51.6	-13.0	-38.6	
6.88	-69.9	H	3.0	-12.9	38.1	1.0	-50.1	-13.0	-37.1	
3.44	-69.1	V	3.0	-20.0	38.5	1.0	-57.5	-13.0	-44.5	
5.16	-67.5	V	3.0	-14.6	38.7	1.0	-52.3	-13.0	-39.3	
6.88	-67.7	V	3.0	-11.0	38.1	1.0	-48.2	-13.0	-35.2	
Mid Channel (1745.0MHz)										
3.4900	-69.2	H	3.0	-19.8	38.5	1.0	-57.3	-13.0	-44.3	
5.2350	-69.7	H	3.0	-16.4	38.7	1.0	-54.0	-13.0	-41.0	
6.9800	-71.8	H	3.0	-14.6	38.1	1.0	-51.7	-13.0	-38.7	
3.4900	-67.7	V	3.0	-18.5	38.5	1.0	-56.0	-13.0	-43.0	
5.2350	-68.7	V	3.0	-15.7	38.7	1.0	-53.3	-13.0	-40.3	
6.9800	-70.7	V	3.0	-13.8	38.1	1.0	-50.9	-13.0	-37.9	
High Channel (1770.0MHz)										
3.54	-66.3	H	3.0	-16.7	38.6	1.0	-54.3	-13.0	-41.3	
5.31	-68.0	H	3.0	-14.5	38.6	1.0	-52.2	-13.0	-39.2	
7.08	-69.5	H	3.0	-12.2	38.0	1.0	-49.2	-13.0	-36.2	
3.54	-67.5	V	3.0	-18.1	38.6	1.0	-55.6	-13.0	-42.6	
5.31	-68.4	V	3.0	-15.2	38.6	1.0	-52.9	-13.0	-39.9	
7.08	-70.5	V	3.0	-13.5	38.0	1.0	-50.5	-13.0	-37.5	

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END OF REPORT

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4031B
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10. SETUP PHOTOS

Please refer to 12258201-EP1V1

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