8.4.1. LTE BAND 2

ID:	38602	Date:	5/16/17

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	1851.0944	1908.9412		
Extreme (50C)		1851.0944	1908.9412	16.1	0.009
Extreme (40C)		1851.0944	1908.9412	18.3	0.010
Extreme (30C)		1851.0944	1908.9412	15.8	0.008
Extreme (10C)		1851.0944	1908.9412	17.2	0.009
Extreme (0C)		1851.0944	1908.9412	18.2	0.010
Extreme (-10C)		1851.0944	1908.9412	18.6	0.010
Extreme (-20C)		1851.0944	1908.9412	17.9	0.010
Extreme (-30C)		1851.0944	1908.9412	18.8	0.010
20C	15%	1851.0944	1908.9412	14.6	0.008
	-15%	1851.0944	1908.9412	15.1	0.008
	End Point	1851.0944	1908.9412	15.6	0.008

8.4.2. LTE BAND 4

ID:	38602	Date:	5/8/17

QPSK, (3.0MHz BANDWIDTH)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1710.1453	1754.8482		
Extreme (50C)		1710.1453	1754.8483	19.9	0.011
Extreme (40C)		1710.1453	1754.8483	19.5	0.011
Extreme (30C)		1710.1453	1754.8483	19.1	0.011
Extreme (10C)		1710.1453	1754.8483	18.0	0.010
Extreme (0C)		1710.1453	1754.8483	18.8	0.011
Extreme (-10C)		1710.1453	1754.8483	19.0	0.011
Extreme (-20C)		1710.1453	1754.8483	20.5	0.012
Extreme (-30C)		1710.1453	1754.8483	19.9	0.011
20C	15%	1710.1453	1754.8483	13.8	0.008
	-15%	1710.1453	1754.8483	13.4	0.008
	End Point	1710.1453	1754.8483	13.7	0.008

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8.4.3. LTE BAND 5

ID:	38602	Date:	5/16/17

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	824.5283	848.4923		
Extreme (50C)		824.5283	848.4923	-8.7	-0.010
Extreme (40C)		824.5283	848.4923	-7.8	-0.009
Extreme (30C)		824.5283	848.4923	-14.5	-0.017
Extreme (10C)		824.5283	848.4923	-17.4	-0.021
Extreme (0C)		824.5283	848.4923	-21.0	-0.025
Extreme (-10C)		824.5283	848.4923	-18.3	-0.022
Extreme (-20C)		824.5283	848.4923	-10.4	-0.012
Extreme (-30C)		824.5283	848.4923	-7.8	-0.009
20C	15%	824.5283	848.4923	-13.7	-0.016
	-15%	824.5283	848.4923	-13.7	-0.016
	End Point	824.5283	848.4923	-13.6	-0.016

8.4.4. LTE BAND 7

ID:	38602	Date:	5/16/17

QPSK, (20MHz BANDWIDTH)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2501.0896	2568.9439		
Extreme (50C)		2501.0896	2568.9439	30.2	0.012
Extreme (40C)		2501.0896	2568.9439	-28.1	-0.011
Extreme (30C)		2501.0896	2568.9439	-28.7	-0.011
Extreme (10C)		2501.0896	2568.9439	26.9	0.011
Extreme (0C)		2501.0896	2568.9439	-32.9	-0.013
Extreme (-10C)		2501.0896	2568.9439	-31.8	-0.013
Extreme (-20C)		2501.0896	2568.9439	-33.5	-0.013
Extreme (-30C)		2501.0896	2568.9439	-35.1	-0.014
20C	15%	2501.0896	2568.9439	-19.2	-0.008
	-15%	2501.0896	2568.9439	-17.7	-0.007
	End Point	2501.0896	2568.9439	-15.9	-0.006

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8.4.5. LTE BAND 12

ID:	29446	Date:	5/16/17

QPSK, (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	699.5358	715.4723		
Extreme (50C)		699.5358	715.4723	-11.6	-0.02
Extreme (40C)		699.5358	715.4723	-13.3	-0.02
Extreme (30C)		699.5358	715.4723	-10.6	-0.01
Extreme (10C)		699.5358	715.4723	-9.8	-0.01
Extreme (0C)		699.5358	715.4723	-8.8	-0.01
Extreme (-10C)		699.5358	715.4723	-8.9	-0.01
Extreme (-20C)		699.5358	715.4723	-9.3	-0.01
Extreme (-30C)		699.5358	715.4723	-9.5	-0.01
20C	15%	699.5358	715.4723	-15.1	-0.02
	-15%	699.5358	715.4723	-16.1	-0.02
	End Point	699.5358	715.4723	-17.2	-0.02

8.4.6. LTE BAND 13

ID:	29446	Date:	5/16/17

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	777.5447	786.4786		
Extreme (50C)		777.5447	786.4786	-14.1	-0.018
Extreme (40C)		777.5447	786.4786	-13.9	-0.018
Extreme (30C)		777.5447	786.4786	-13.2	-0.017
Extreme (10C)		777.5447	786.4786	-12.9	-0.016
Extreme (0C)		777.5447	786.4786	-10.6	-0.014
Extreme (-10C)		777.5447	786.4786	-11.3	-0.014
Extreme (-20C)		777.5447	786.4786	-11.4	-0.015
Extreme (-30C)		777.5447	786.4786	-9.2	-0.012
20C	15%	777.5447	786.4786	-15.7	-0.020
	-15%	777.5447	786.4786	-16.8	-0.022
	End Point	777.5447	786.4786	-16.5	-0.021

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8.4.7. LTE BAND 17

ID:	29446	Date:	5/16/17

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	704.5212	715.4716		
Extreme (50C)		704.5212	715.4716	8.9	0.012
Extreme (40C)		704.5212	715.4716	7.2	0.010
Extreme (30C)		704.5212	715.4716	5.7	0.008
Extreme (10C)		704.5212	715.4716	8.0	0.011
Extreme (0C)		704.5212	715.4716	9.6	0.014
Extreme (-10C)		704.5212	715.4716	8.2	0.012
Extreme (-20C)		704.5212	715.4716	9.5	0.013
Extreme (-30C)		704.5212	715.4716	10.7	0.015
20C	15%	704.5212	715.4716	9.8	0.014
	-15%	704.5212	715.4716	8.9	0.013
	End Point	704.5212	715.4716	9.2	0.013

8.4.8. LTE BAND 25

ID:	29446	Date:	5/16/17

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	1851.0799	1913.9616		
Extreme (50C)		1851.0799	1913.9616	-26.5	-0.014
Extreme (40C)		1851.0799	1913.9616	-21.6	-0.011
Extreme (30C)		1851.0799	1913.9616	-22.9	-0.012
Extreme (10C)		1851.0799	1913.9616	-28.1	-0.015
Extreme (0C)		1851.0799	1913.9616	-31.9	-0.017
Extreme (-10C)		1851.0799	1913.9616	-31.9	-0.017
Extreme (-20C)		1851.0799	1913.9616	-43.5	-0.023
Extreme (-30C)		1851.0798	1913.9615	-57.4	-0.030
20C	15%	1851.0799	1913.9616	-20.5	-0.011
	-15%	1851.0799	1913.9616	-20.3	-0.011
	End Point	1851.0799	1913.9616	-21.0	-0.011

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8.4.9. LTE BAND 26

ID:	29446	Date:	5/16/17

QPSK, (10MHz BANDWIDTH)

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	814.5401	823.4723		
Extreme (50C)		814.5401	823.4723	8.4	0.010
Extreme (40C)		814.5401	823.4723	6.8	0.008
Extreme (30C)		814.5401	823.4723	9.6	0.012
Extreme (10C)		814.5401	823.4723	8.0	0.010
Extreme (0C)		814.5401	823.4723	8.8	0.011
Extreme (-10C)		814.5401	823.4723	8.8	0.011
Extreme (-20C)		814.5401	823.4723	11.5	0.014
Extreme (-30C)		814.5401	823.4723	10.8	0.013
20C	15%	814.5401	823.4723	8.7	0.011
	-15%	814.5401	823.4723	8.6	0.010
	End Point	814.5401	823.4723	8.3	0.010

8.4.10. LTE BAND 30

ID:	29446	Date:	5/16/17

QPSK, (10MHz BANDWIDTH)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2305.5221	2314.5033		
Extreme (50C)		2305.5221	2314.5033	28.7	0.012
Extreme (40C)		2305.5221	2314.5033	24.0	0.010
Extreme (30C)		2305.5221	2314.5033	22.4	0.010
Extreme (10C)		2305.5221	2314.5033	28.4	0.012
Extreme (0C)		2305.5221	2314.5033	27.6	0.012
Extreme (-10C)		2305.5221	2314.5033	-32.1	-0.014
Extreme (-20C)		2305.5221	2314.5033	-34.2	-0.015
Extreme (-30C)		2305.5221	2314.5033	-39.4	-0.017
20C	15%	2305.5221	2314.5033	21.7	0.009
	-15%	2305.5221	2314.5033	21.8	0.009
	End Point	2305.5221	2314.5033	21.1	0.009

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8.4.11. LTE BAND 41

ID:	29446	Date:	5/16/17

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	2496.8392	2689.3259		
Extreme (50C)		2496.8392	2689.3259	32.2	0.012
Extreme (40C)		2496.8392	2689.3259	22.5	0.009
Extreme (30C)		2496.8392	2689.3259	22.0	0.008
Extreme (10C)		2496.8392	2689.3259	15.4	0.006
Extreme (0C)		2496.8392	2689.3259	15.1	0.006
Extreme (-10C)		2496.8392	2689.3259	16.4	0.006
Extreme (-20C)		2496.8392	2689.3259	13.2	0.005
Extreme (-30C)		2496.8392	2689.3259	15.4	0.006
20C	15%	2496.8392	2689.3259	26.8	0.010
	-15%	2496.8392	2689.3259	23.9	0.009
	End Point	2496.8392	2689.3259	23.1	0.009

8.4.12. LTE BAND 66

ID:	29446	Date:	5/16/17

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	1711.0937	1778.8888		
Extreme (50C)		1711.0937	1778.8888	-16.6	-0.010
Extreme (40C)		1711.0937	1778.8888	-15.4	-0.009
Extreme (30C)		1711.0937	1778.8888	-17.0	-0.010
Extreme (10C)		1711.0937	1778.8888	-17.9	-0.010
Extreme (0C)		1711.0937	1778.8888	-19.3	-0.011
Extreme (-10C)		1711.0937	1778.8888	16.5	0.009
Extreme (-20C)		1711.0937	1778.8888	20.1	0.012
Extreme (-30C)		1711.0937	1778.8888	19.7	0.011
20C	15%	1711.0937	1778.8888	15.7	0.009
	-15%	1711.0937	1778.8888	13.5	0.008
	End Point	1711.0937	1778.8888	13.8	0.008

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8.5. PEAK-TO-AVERAGE RATIO

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

RESULT

Test was performed on LAT 1 antenna; full resource block (FRB) for each bandwidth combination was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average ratio criteria.

ID:	40813	**Date:**	5/13/17

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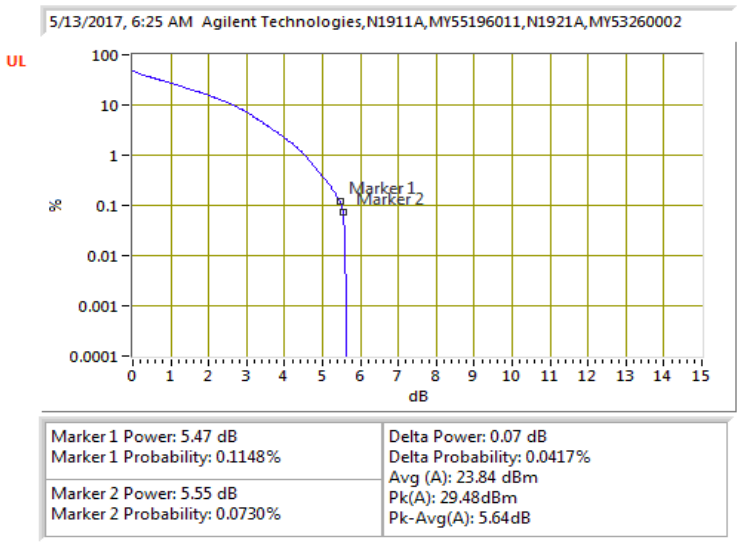
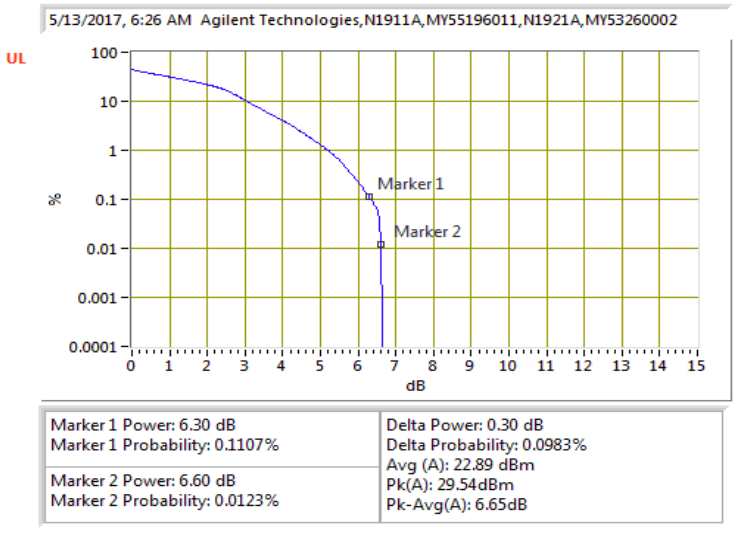
8.5.1. LTE BAND 2

QPSK, (1.4 MHz BAND WIDTH)



16QAM, (1.4 MHz BAND WIDTH)



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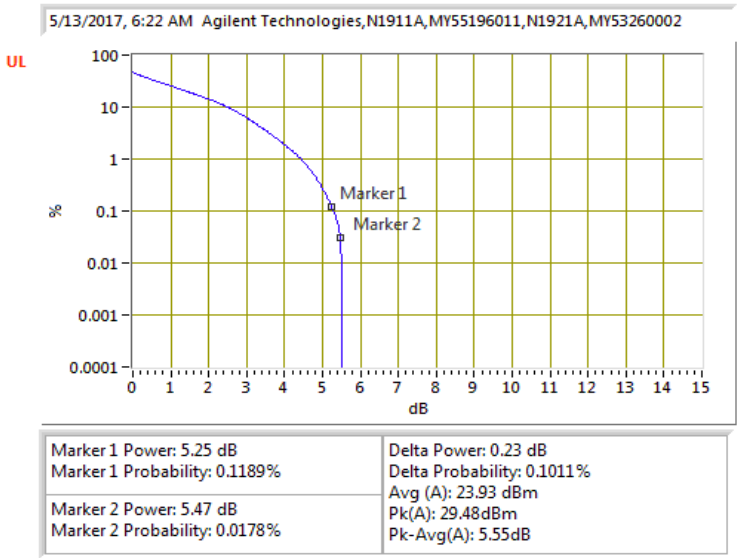
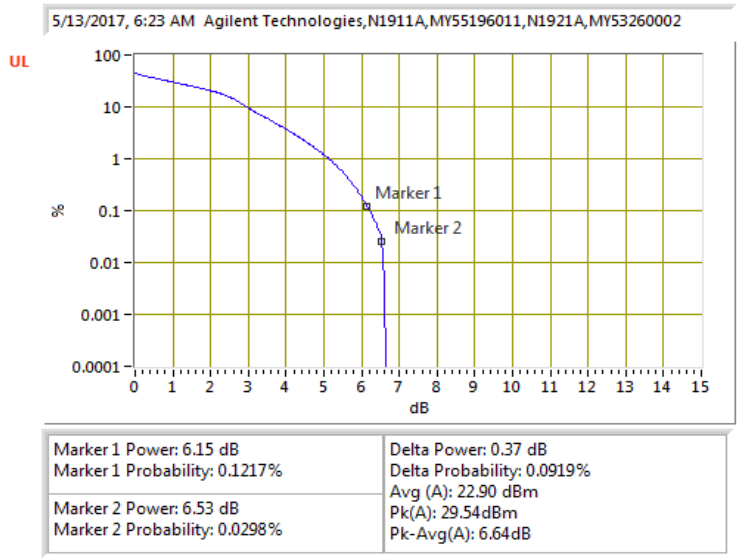
QPSK, (3.0 MHz BAND WIDTH)



16QAM, (3.0 MHz BAND WIDTH)



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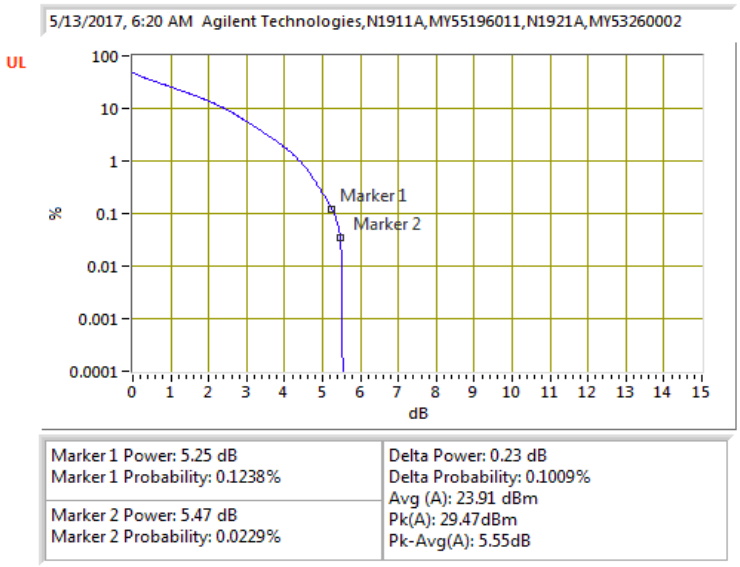
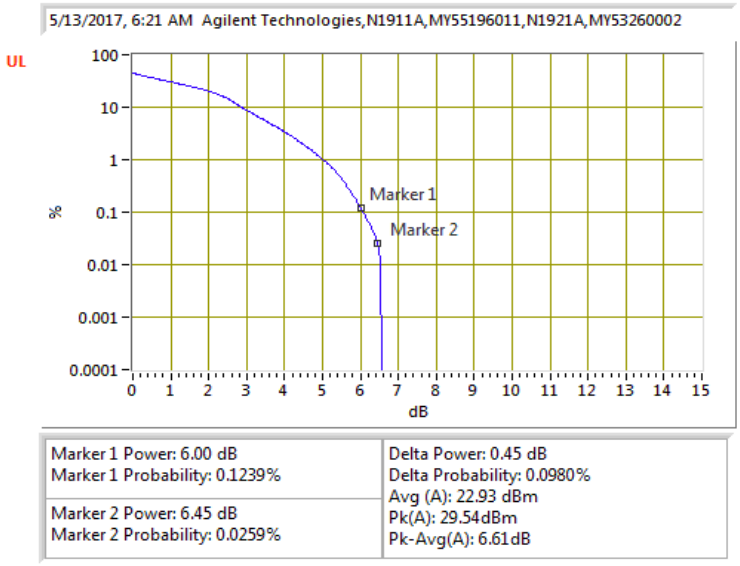
QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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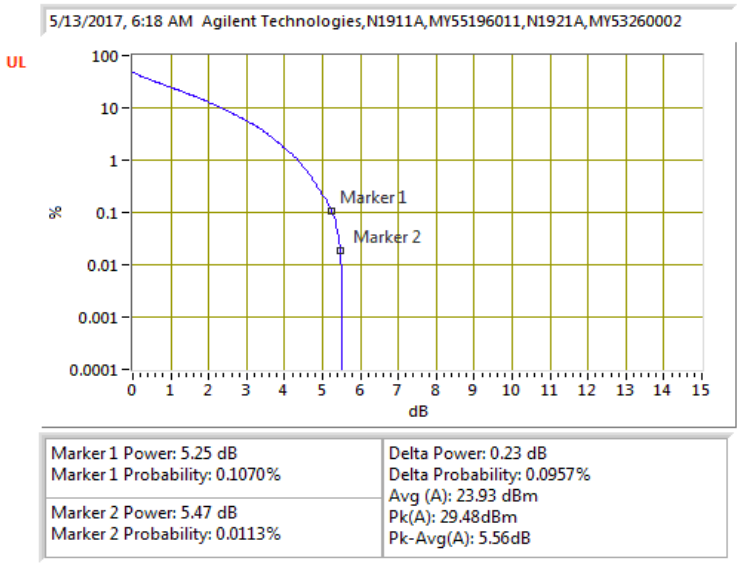
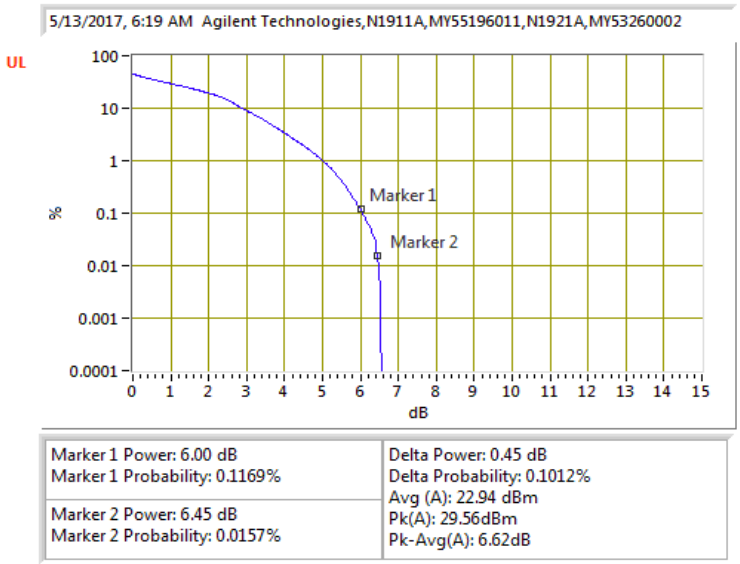
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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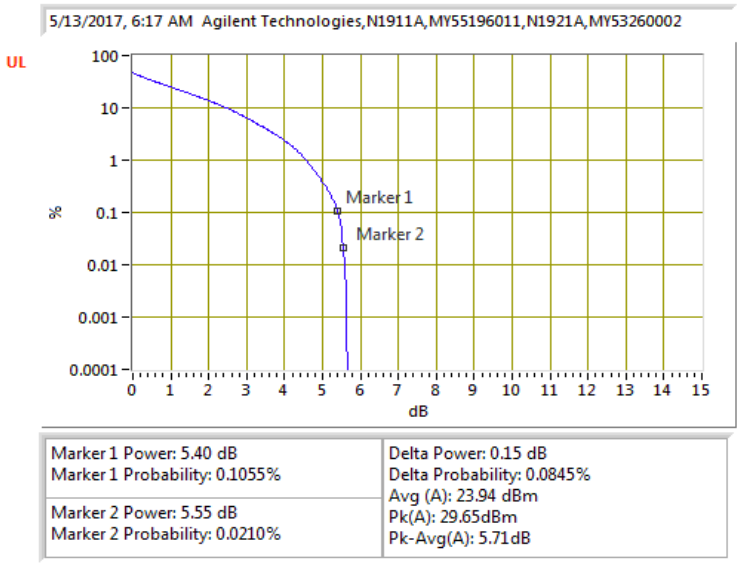
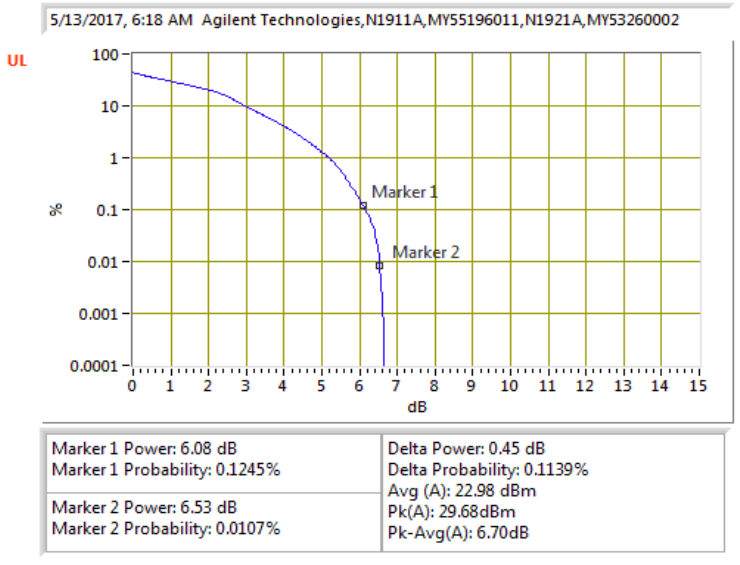
QPSK, (15.0 MHz BAND WIDTH)



16QAM, (15.0 MHz BAND WIDTH)



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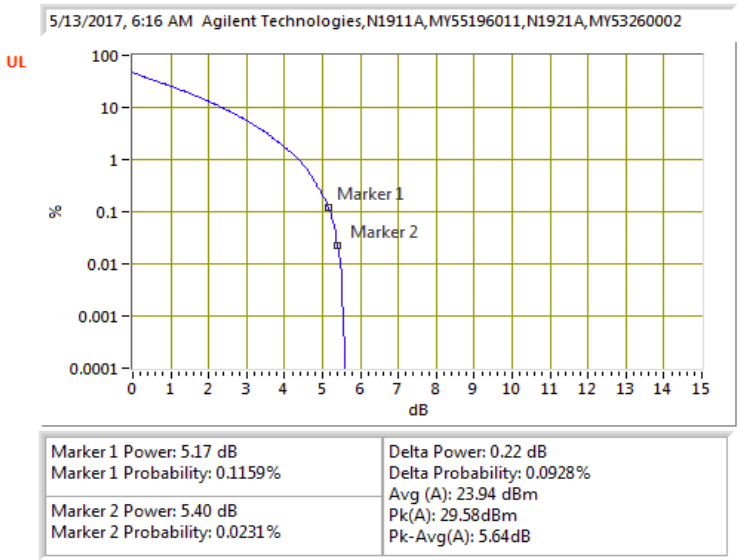
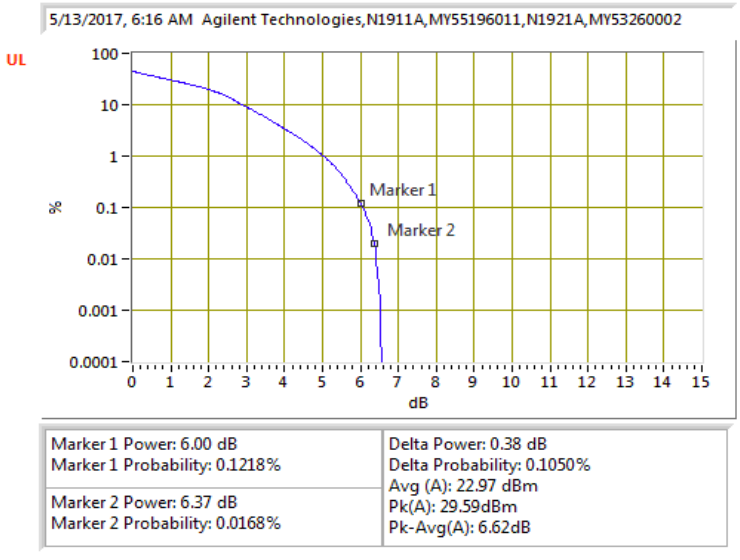
QPSK, (20.0 MHz BAND WIDTH)



16QAM, (20.0 MHz BAND WIDTH)



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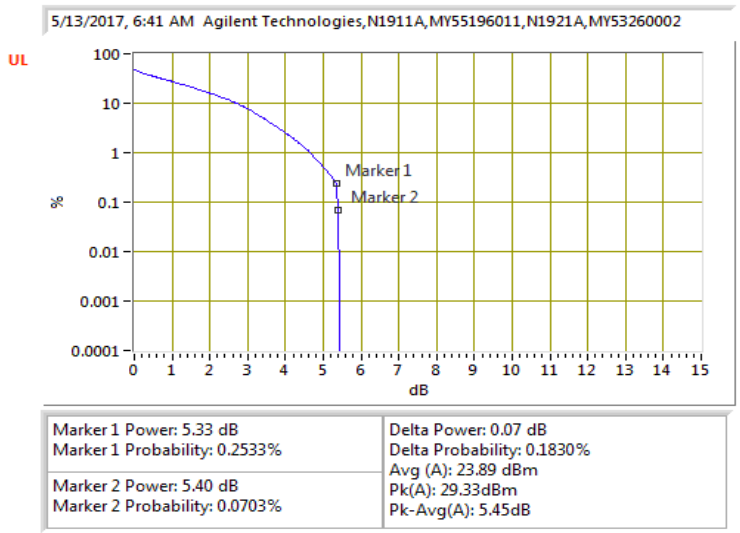
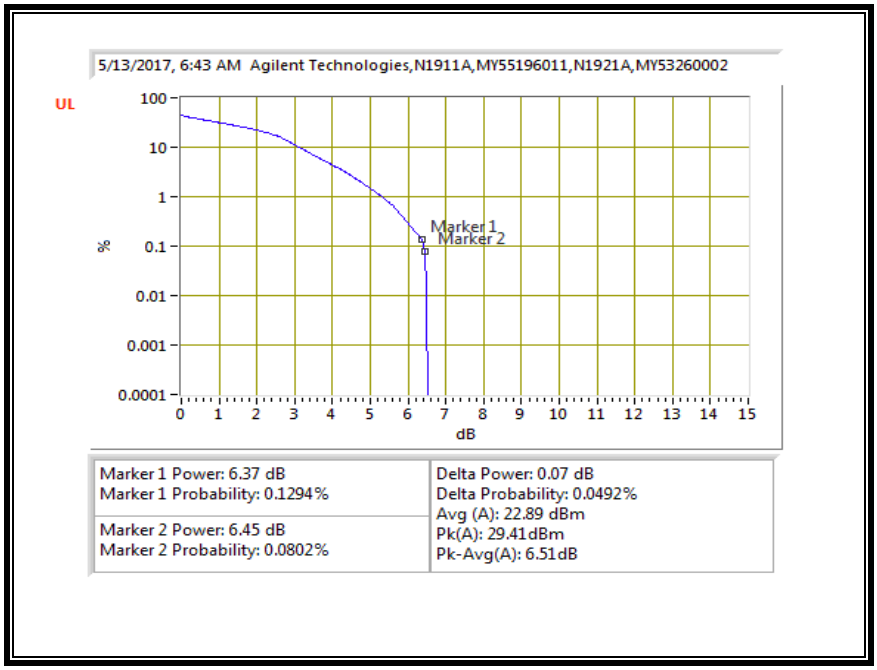
8.5.2. LTE BAND 4

QPSK, (1.4 MHz BAND WIDTH)



16QAM, (1.4 MHz BAND WIDTH)



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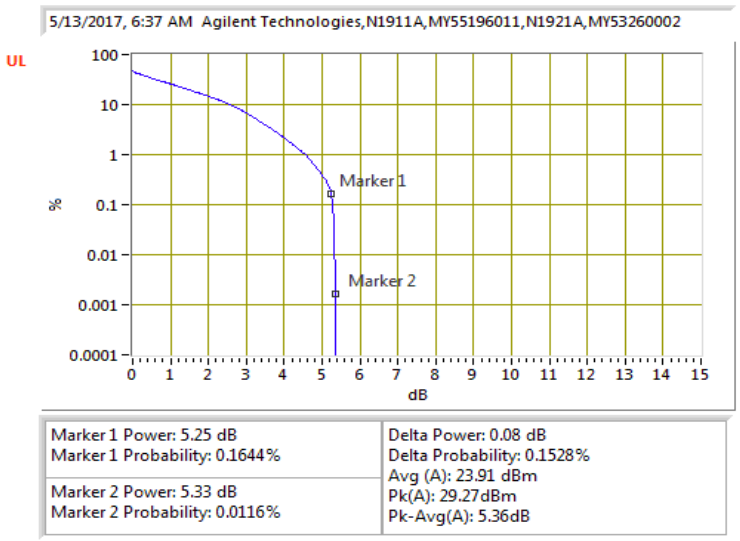
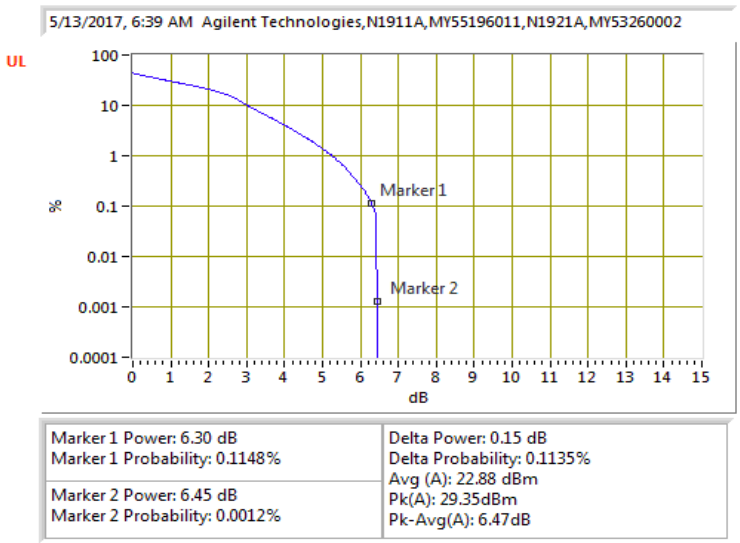
QPSK, (3.0 MHz BAND WIDTH)



16QAM, (3.0 MHz BAND WIDTH)



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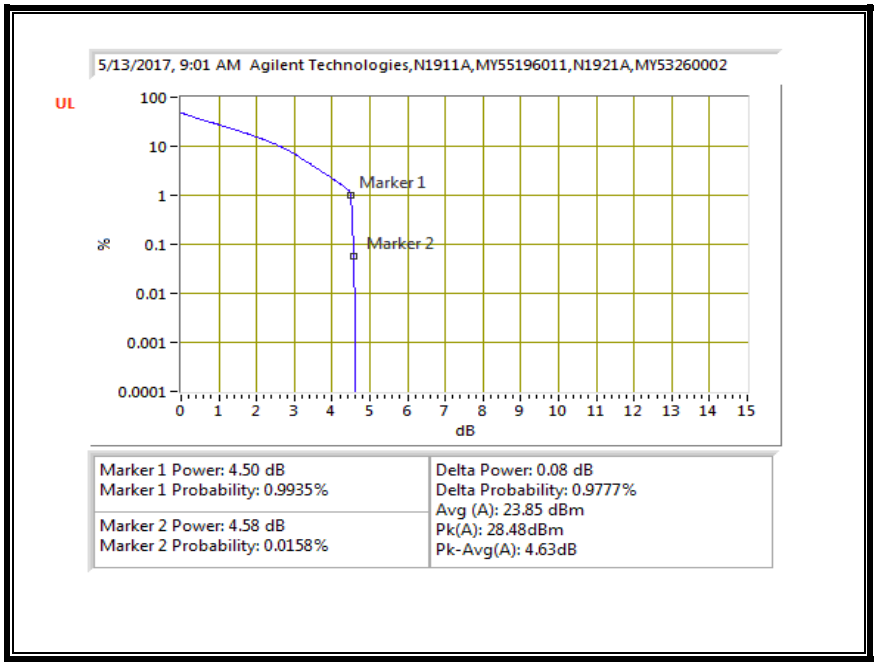
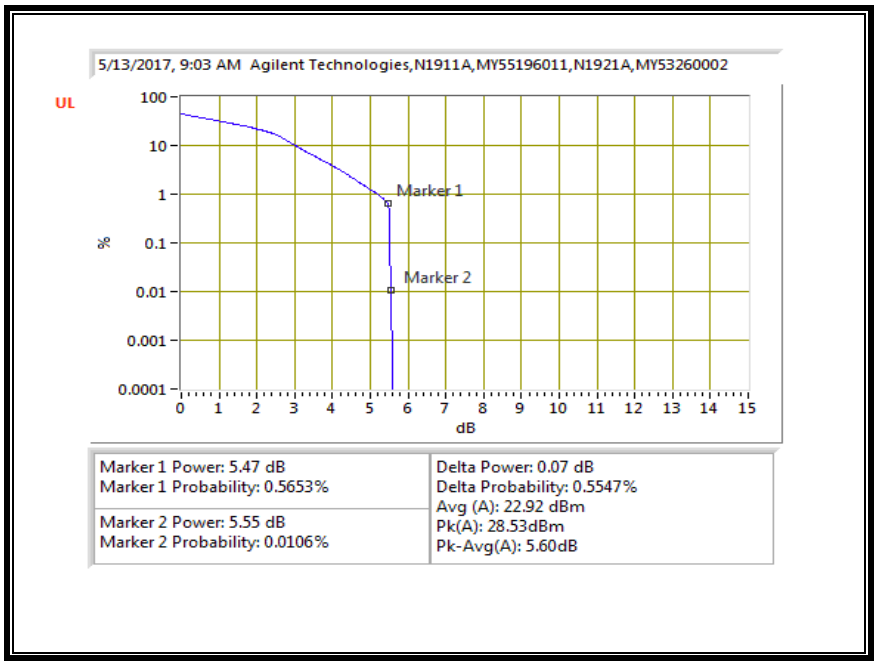
8.5.3. LTE BAND 5

QPSK, (1.4 MHz BAND WIDTH)



16QAM, (1.4 MHz BAND WIDTH)



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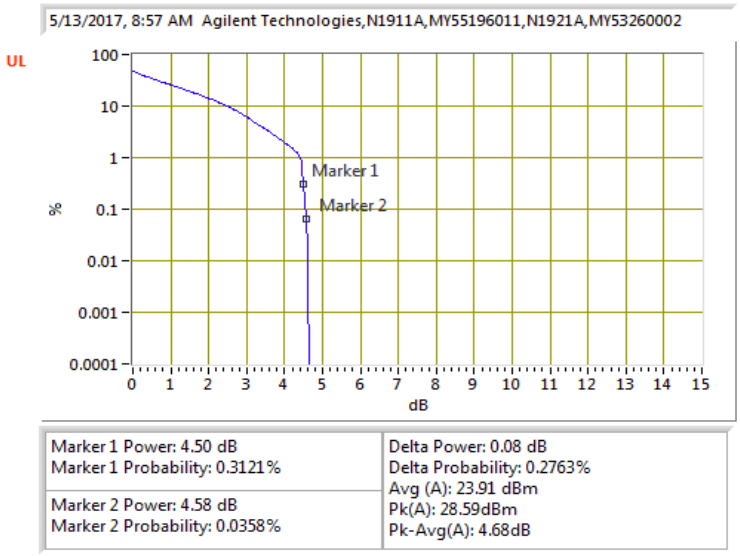
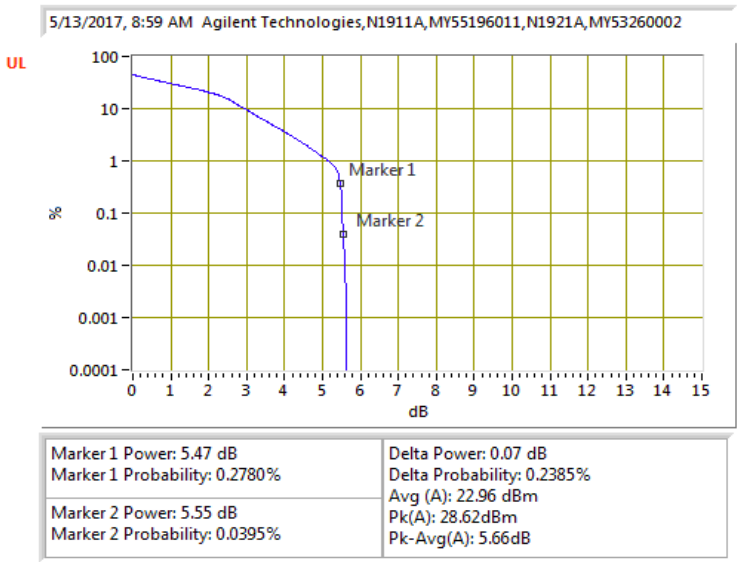
QPSK, (3.0 MHz BAND WIDTH)



16QAM, (3.0 MHz BAND WIDTH)



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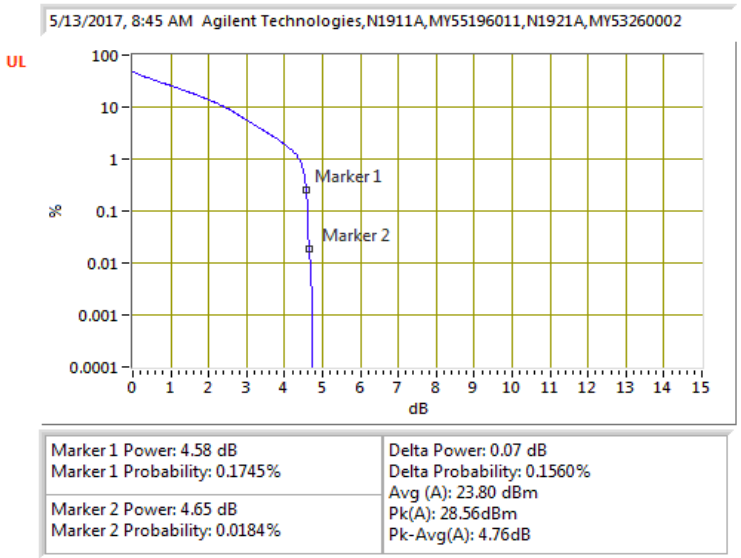
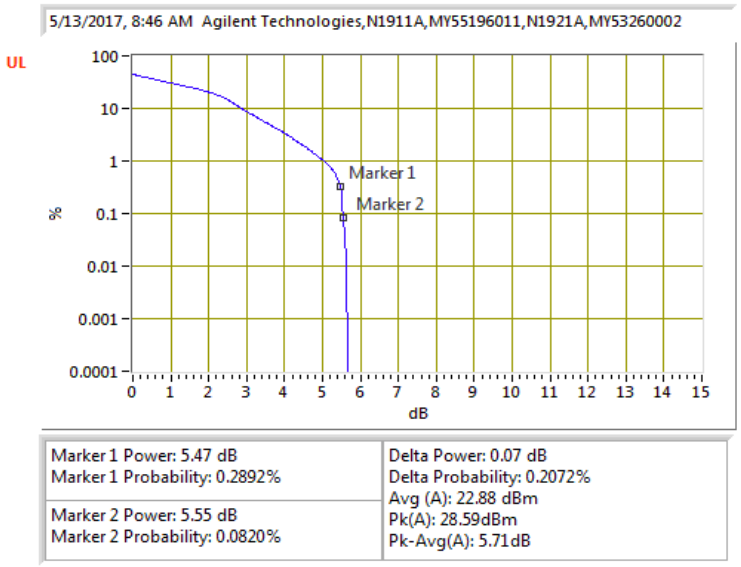
QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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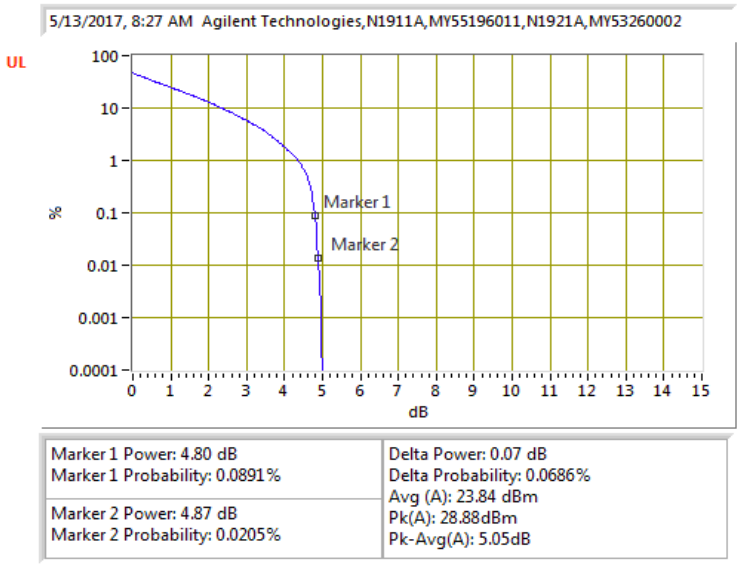
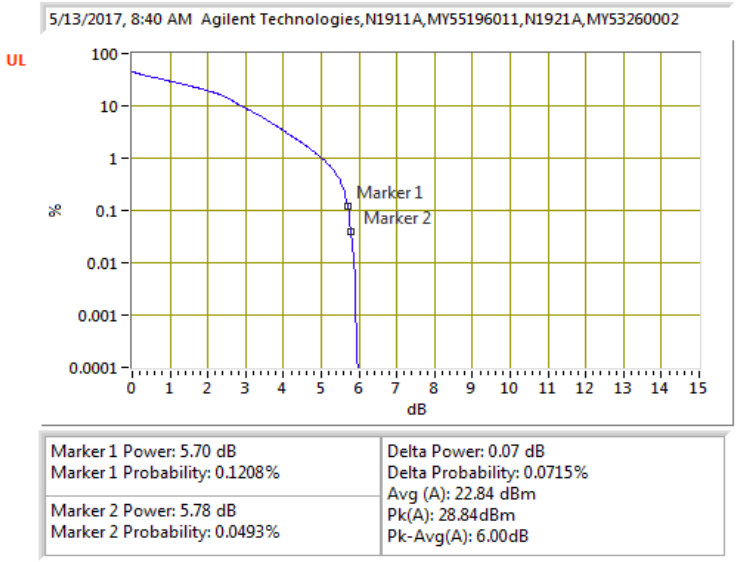
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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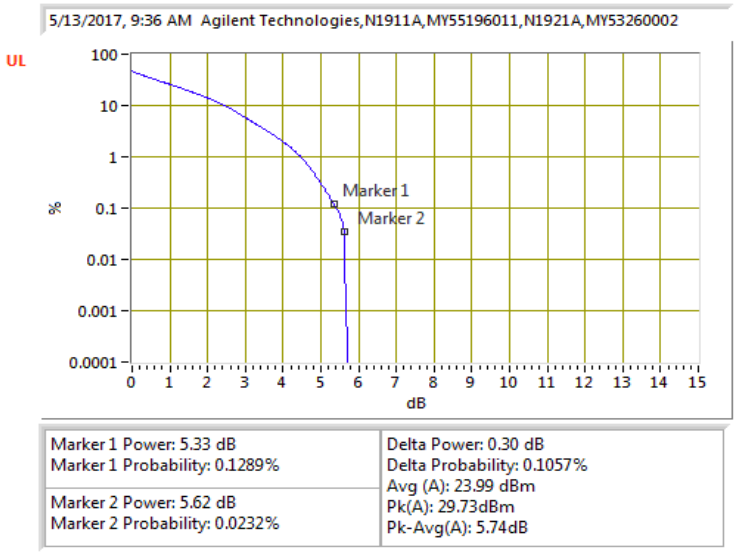
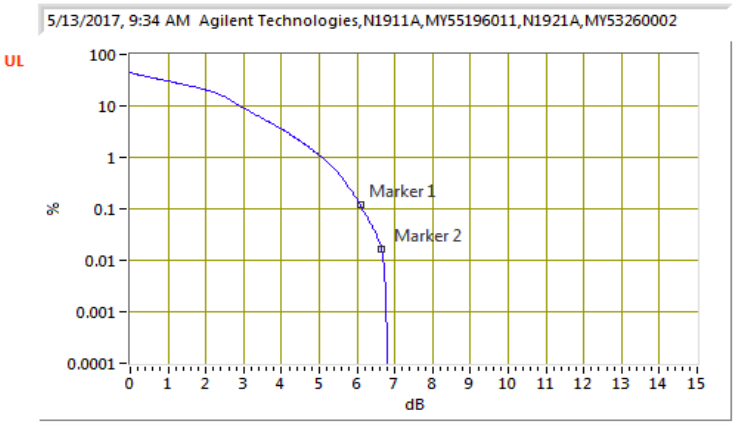
8.5.4. LTE BAND 7

QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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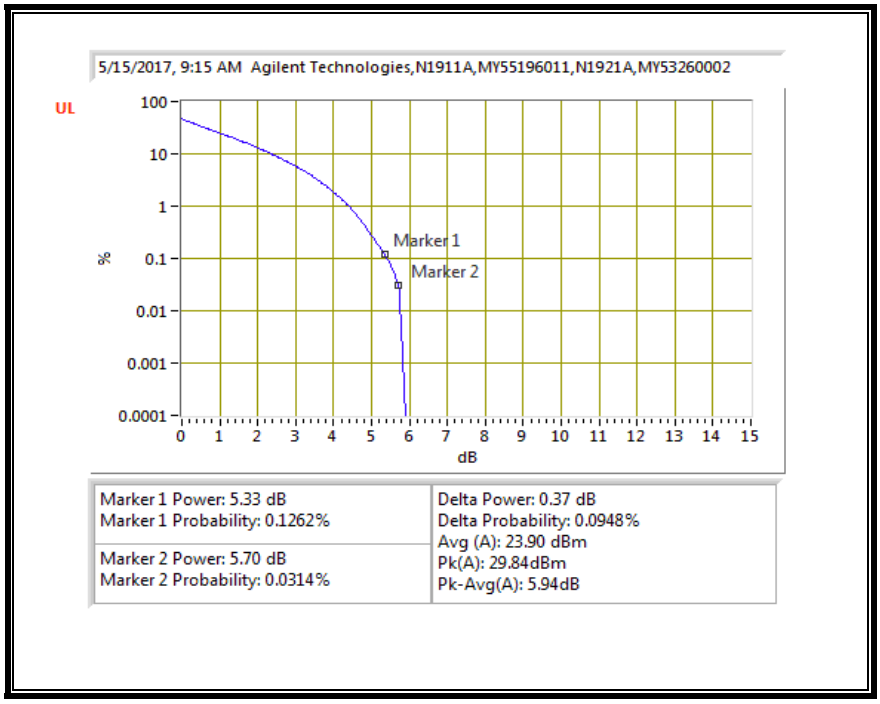
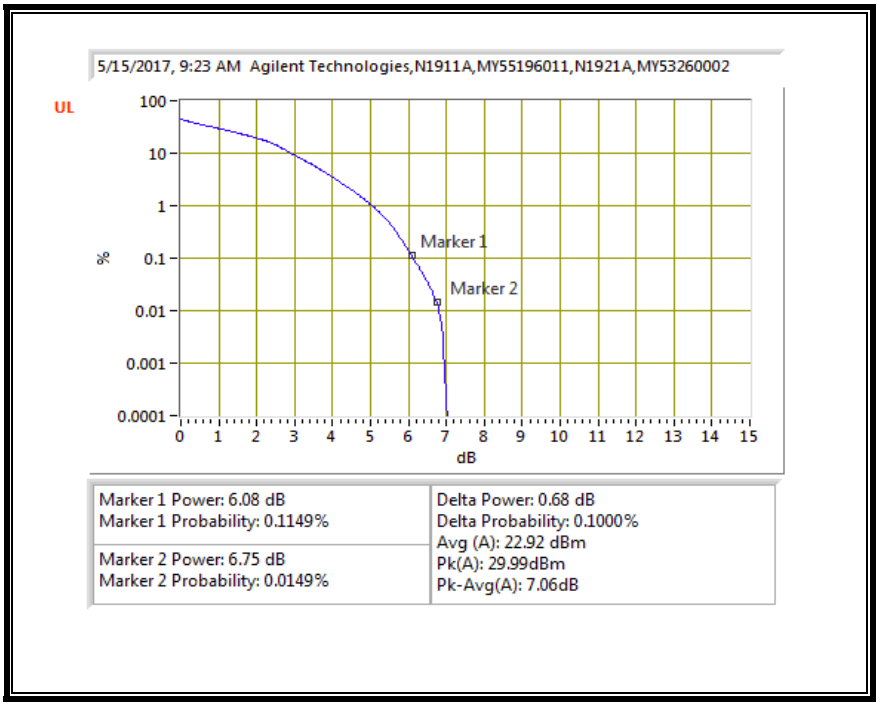
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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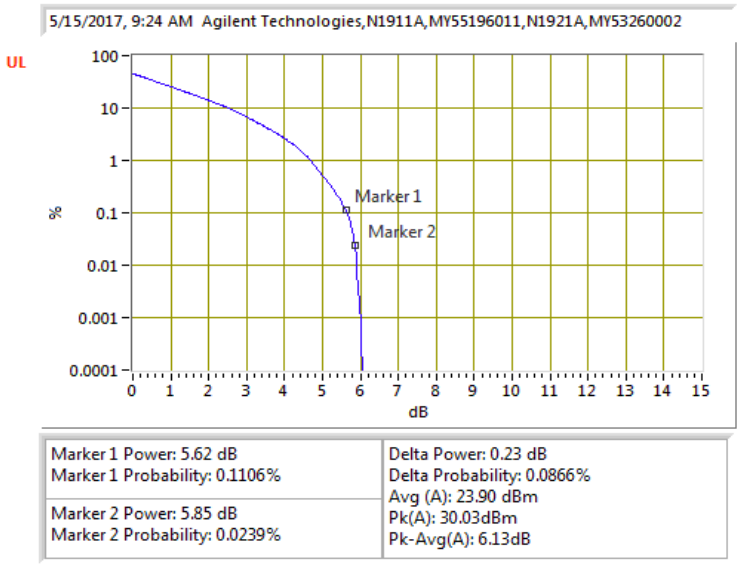
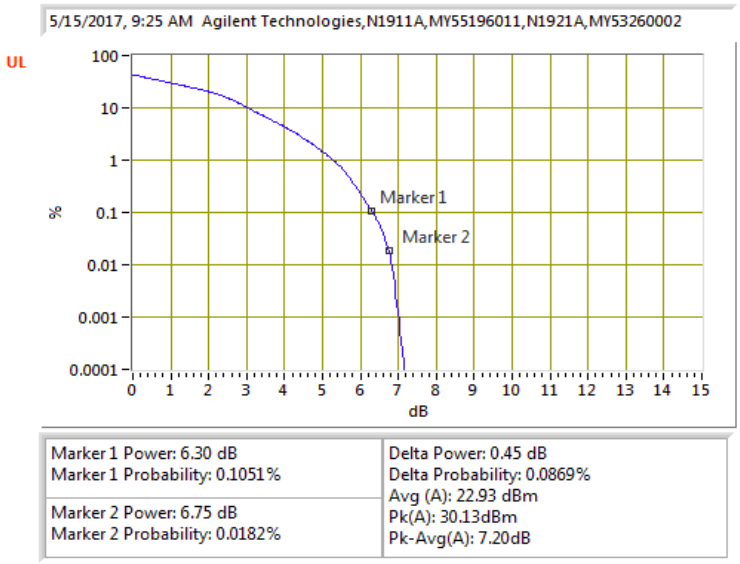
QPSK, (15.0 MHz BAND WIDTH)



16QAM, (15.0 MHz BAND WIDTH)



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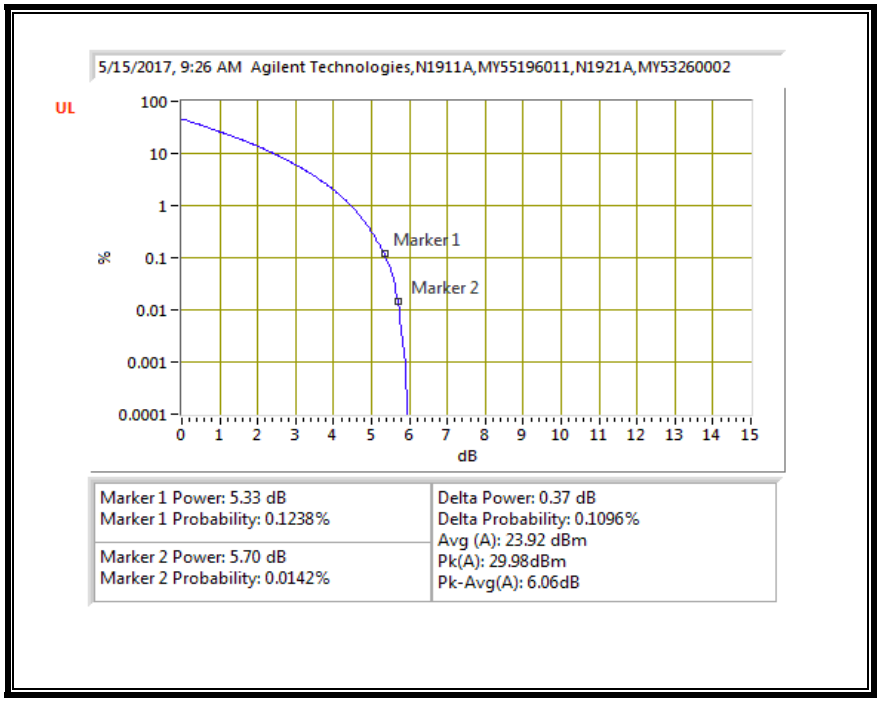
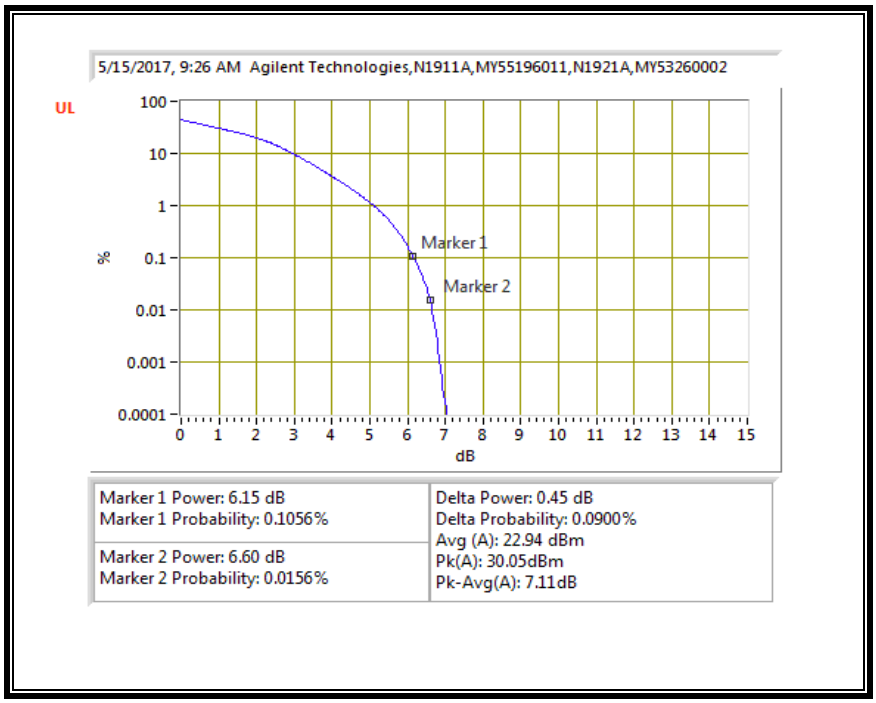
QPSK, (20.0 MHz BAND WIDTH)



16QAM, (20.0 MHz BAND WIDTH)



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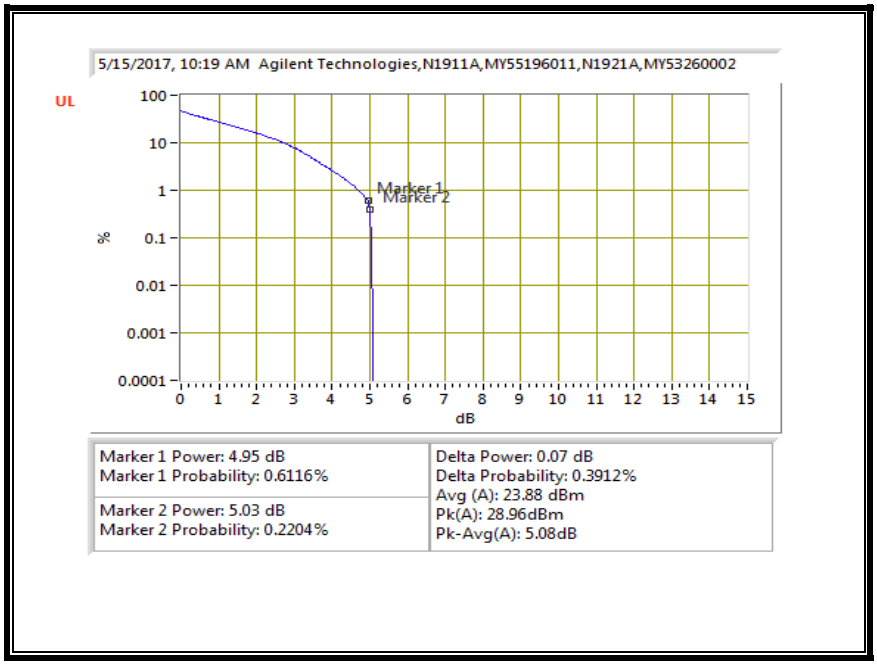
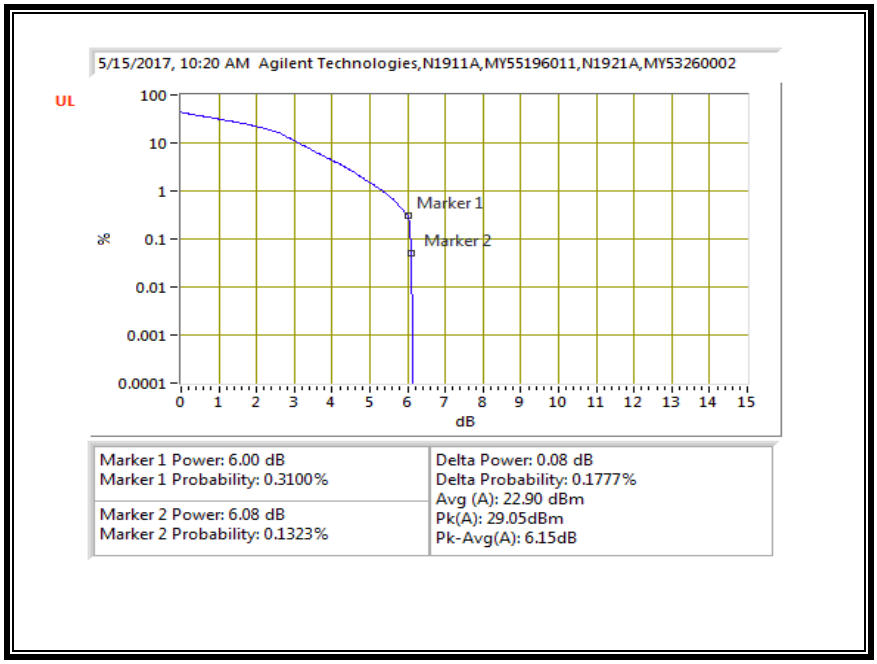
8.5.5. LTE BAND 12

QPSK, (1.4 MHz BAND WIDTH)



16QAM, (1.4 MHz BAND WIDTH)



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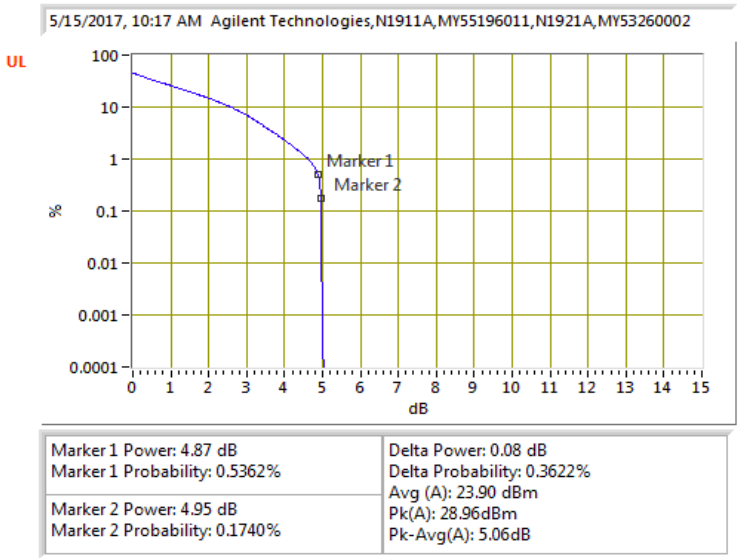
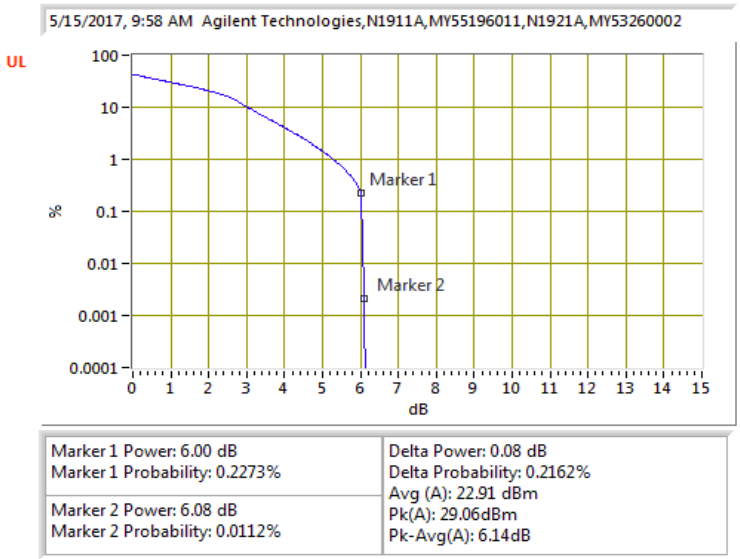
QPSK, (3.0 MHz BAND WIDTH)



16QAM, (3.0 MHz BAND WIDTH)



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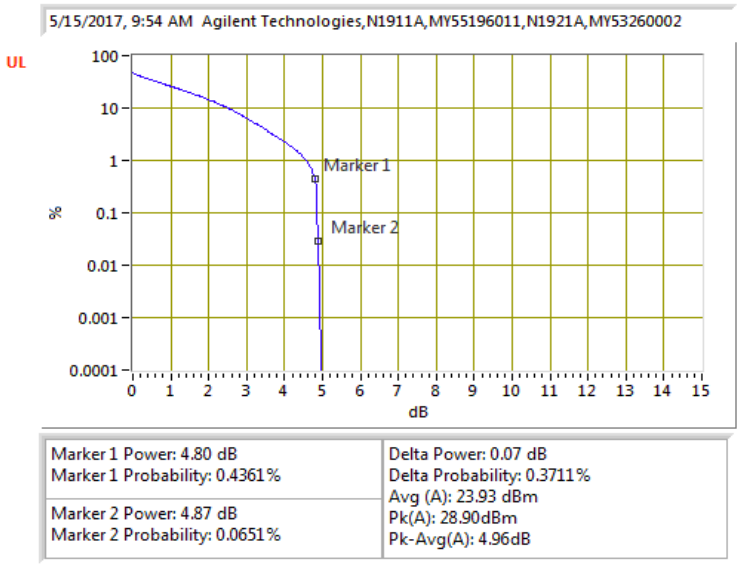
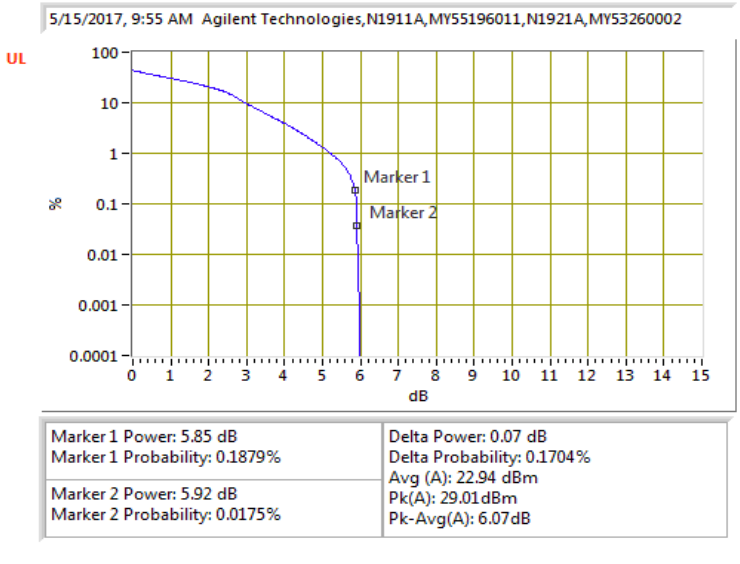
QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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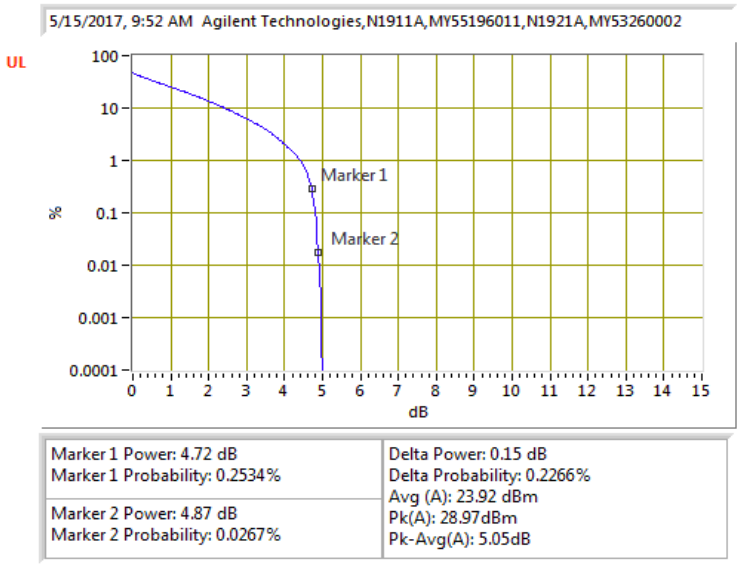
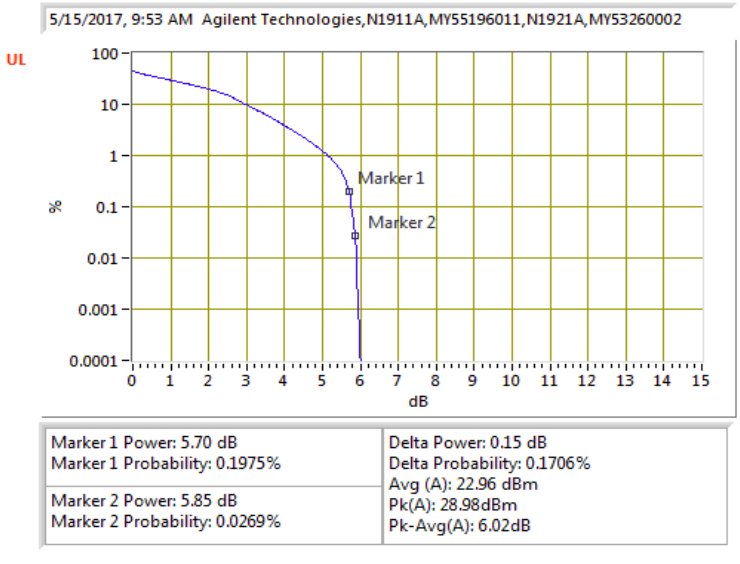
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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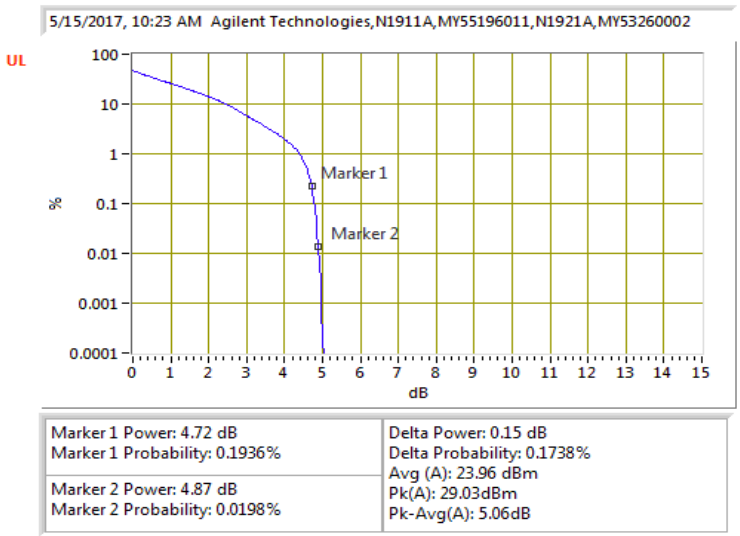
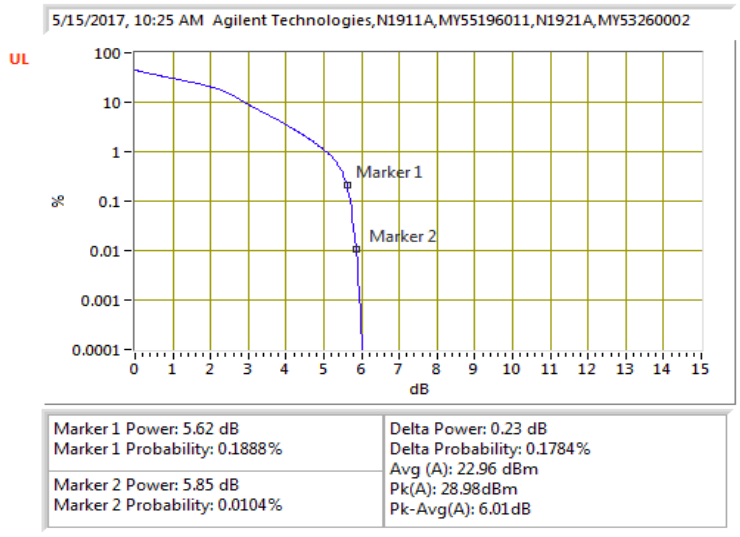
8.5.6. LTE BAND 13

QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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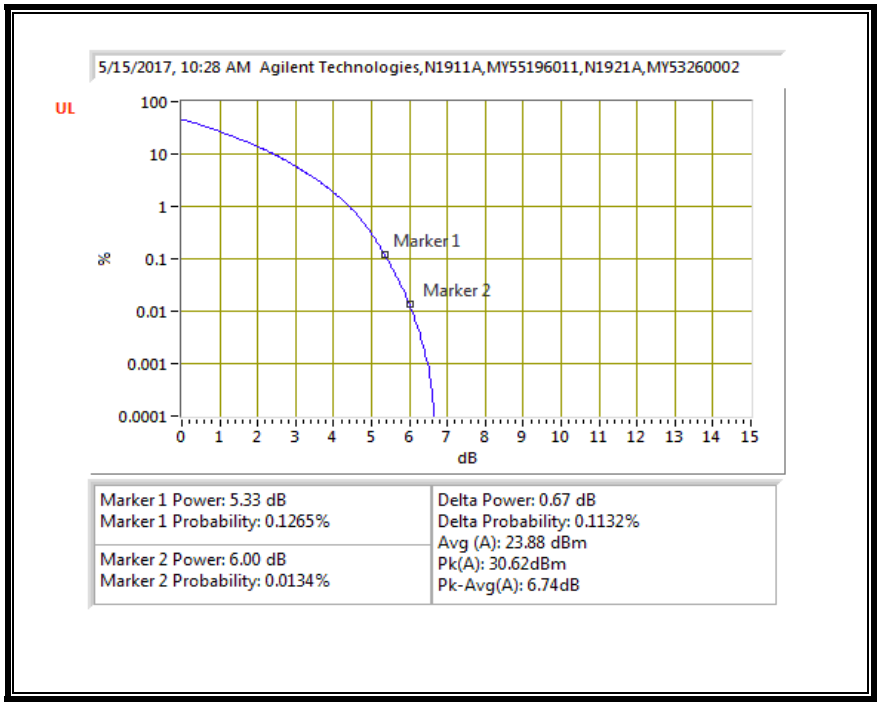
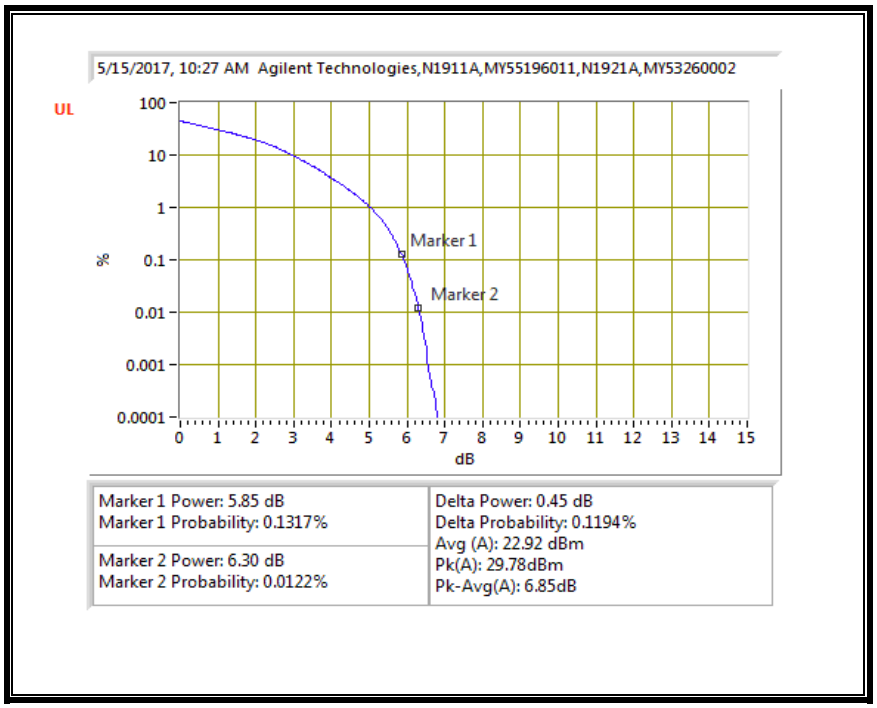
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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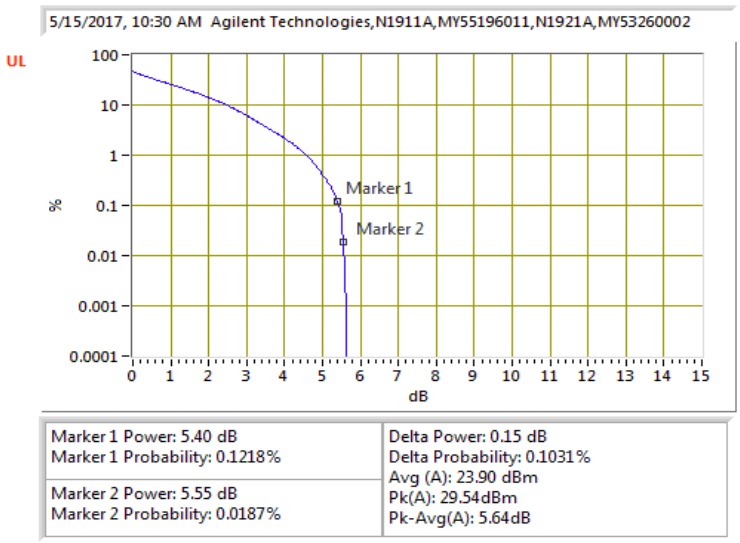
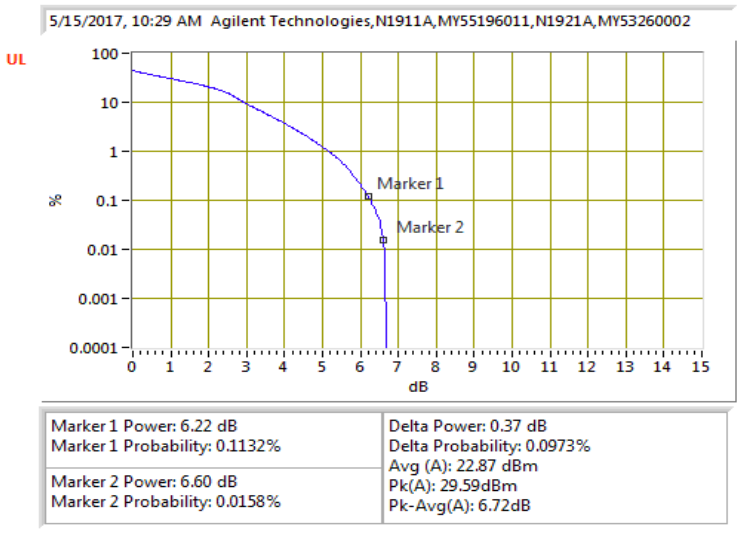
8.5.7. LTE BAND 17

QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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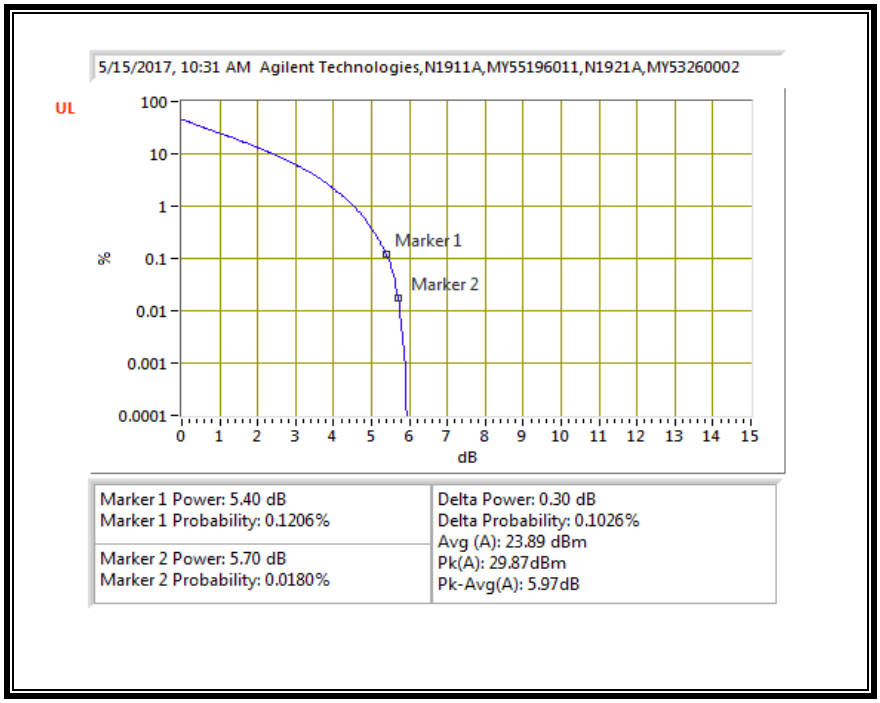
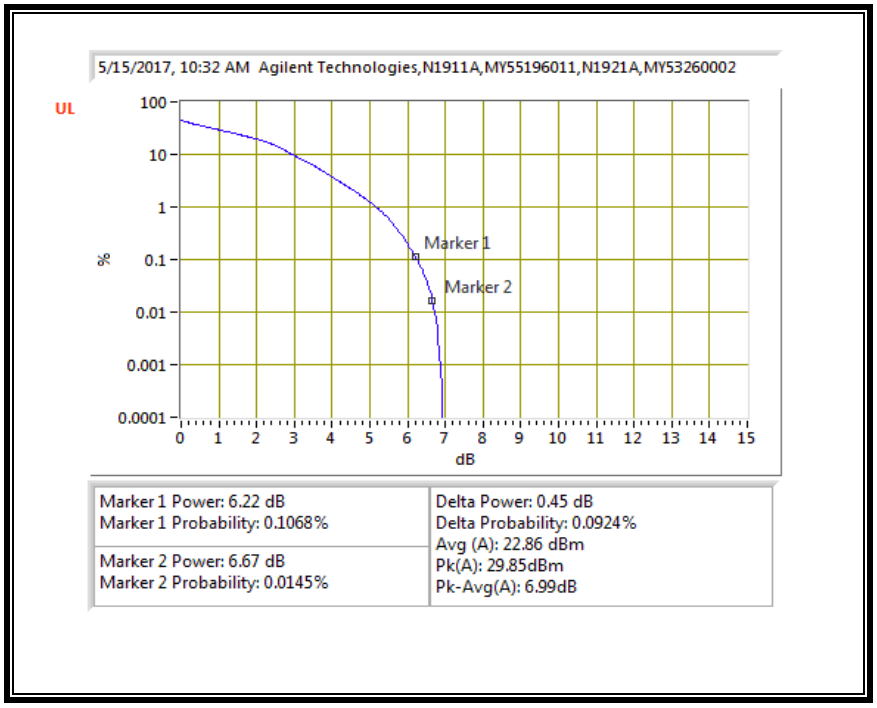
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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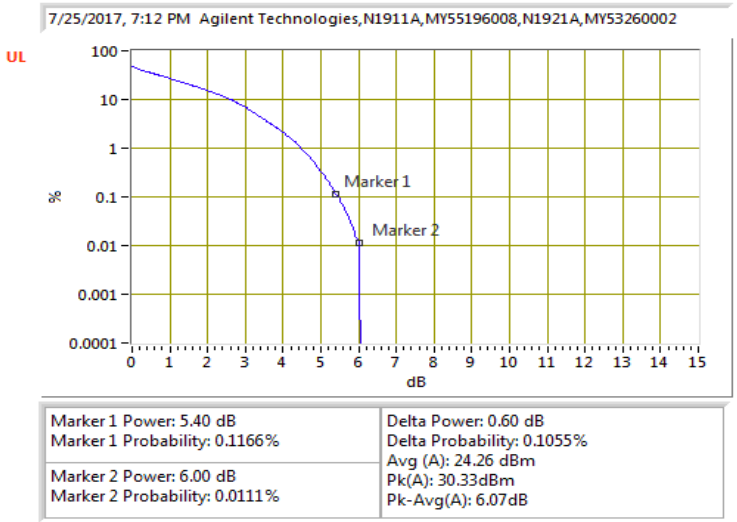
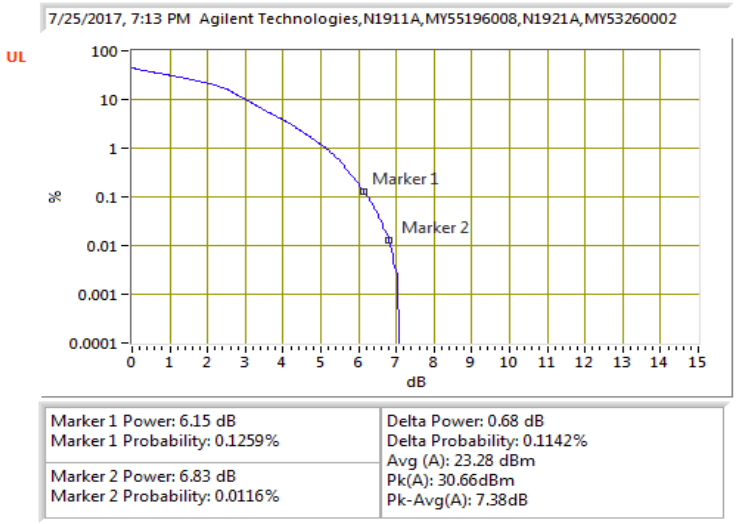
8.5.8. LTE BAND 25

QPSK, (1.4 MHz BAND WIDTH)



16QAM, (1.4 MHz BAND WIDTH)



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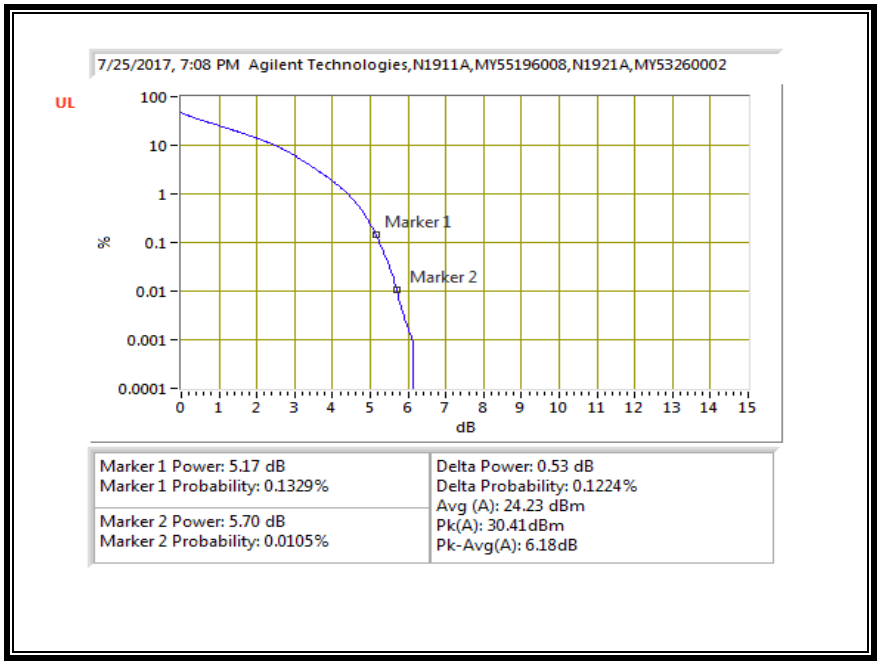
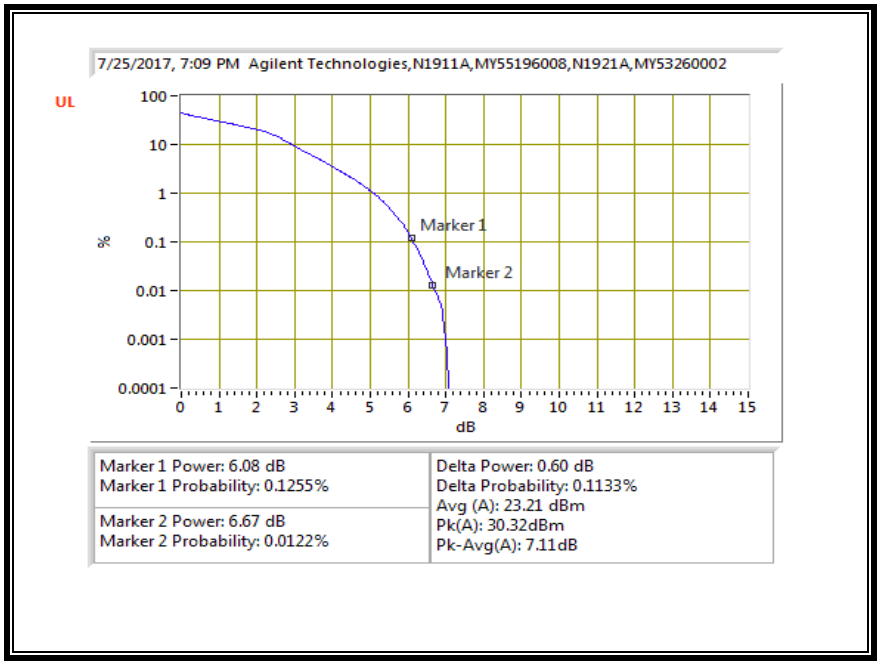
QPSK, (3.0 MHz BAND WIDTH)



16QAM, (3.0 MHz BAND WIDTH)



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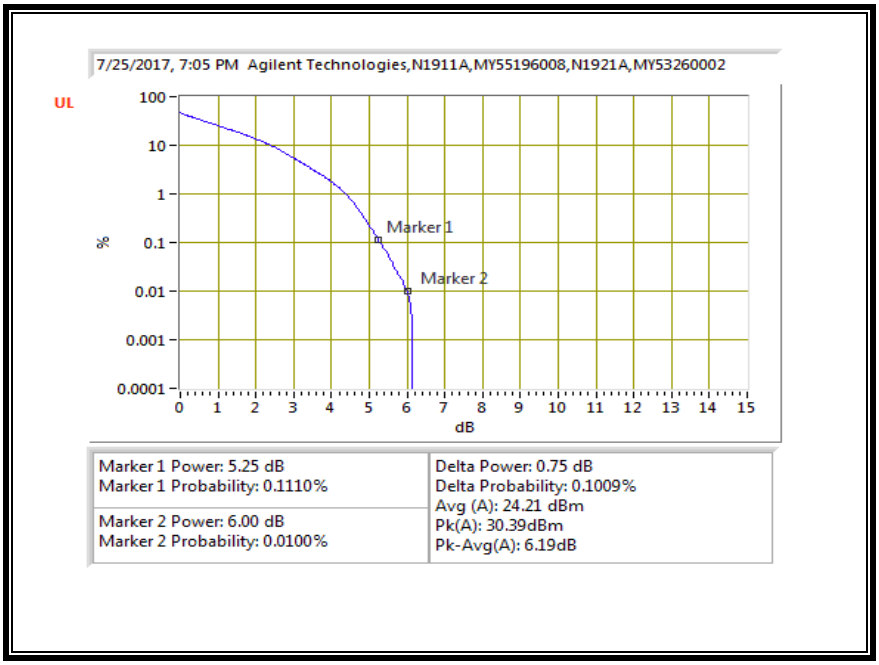
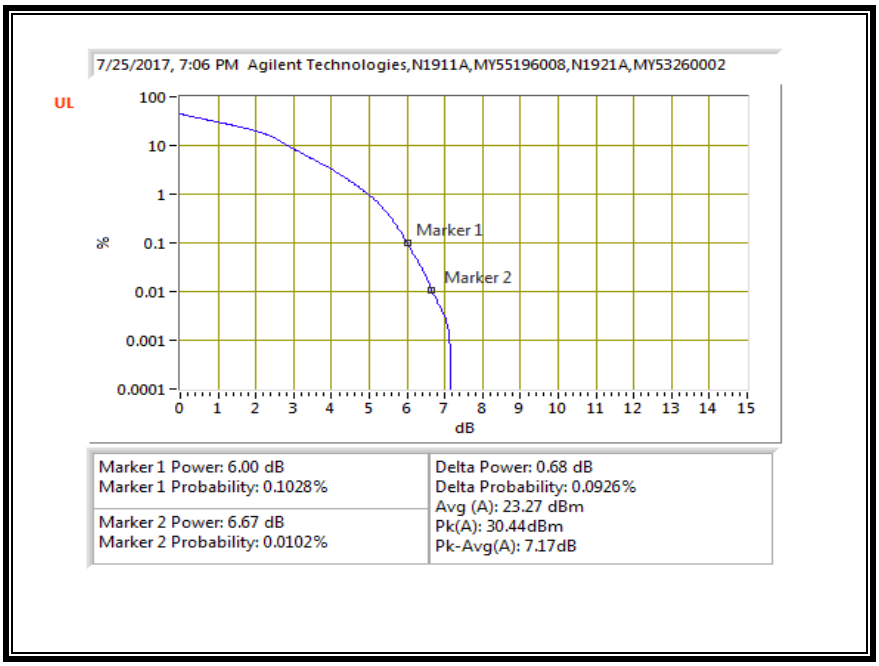
QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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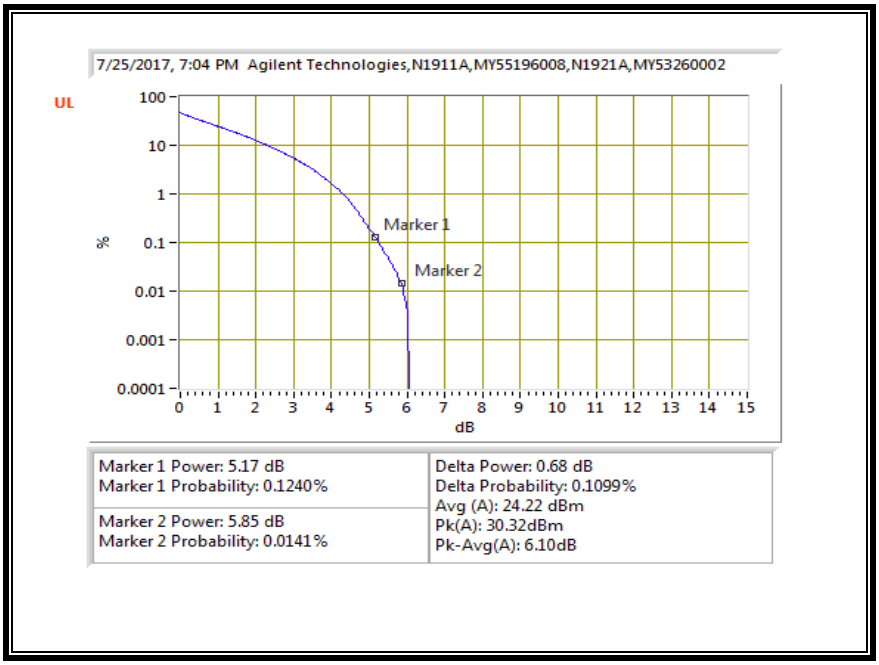
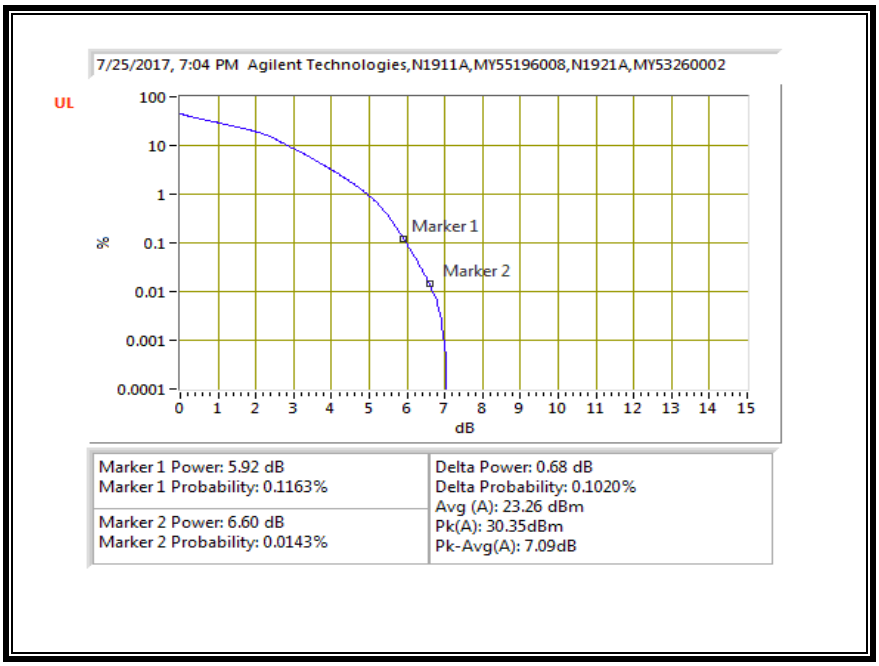
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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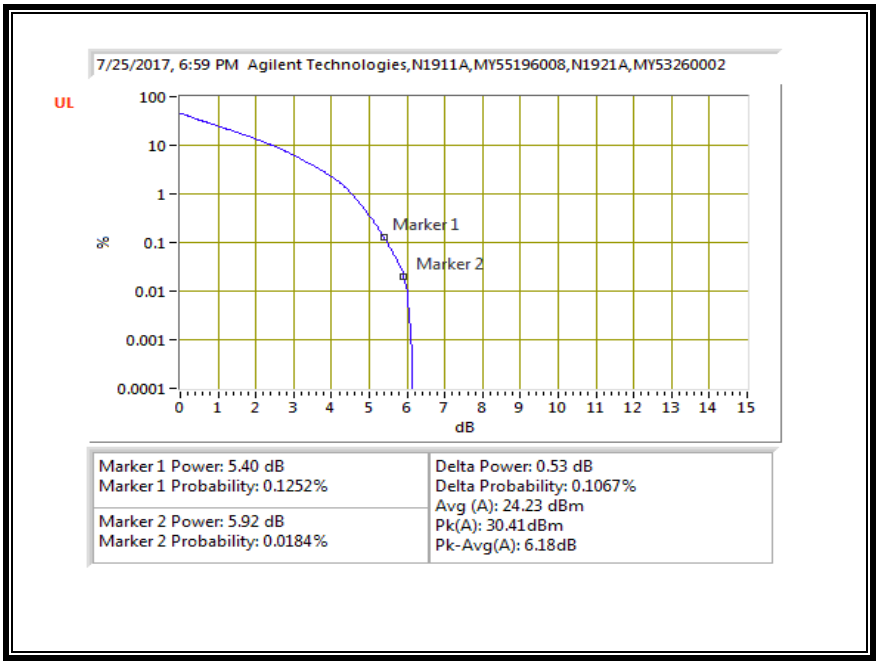
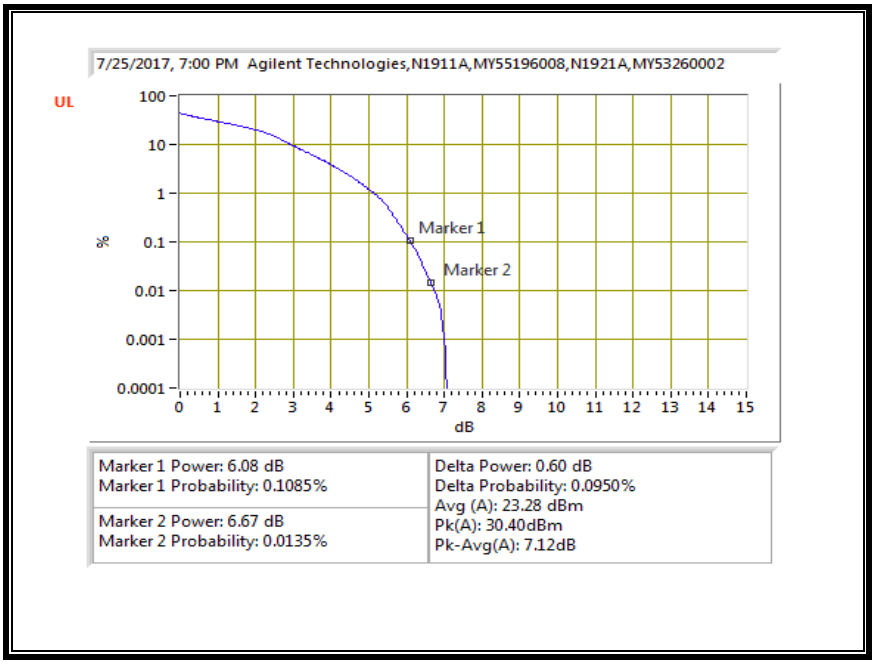
QPSK, (15.0 MHz BAND WIDTH)



16QAM, (15.0 MHz BAND WIDTH)



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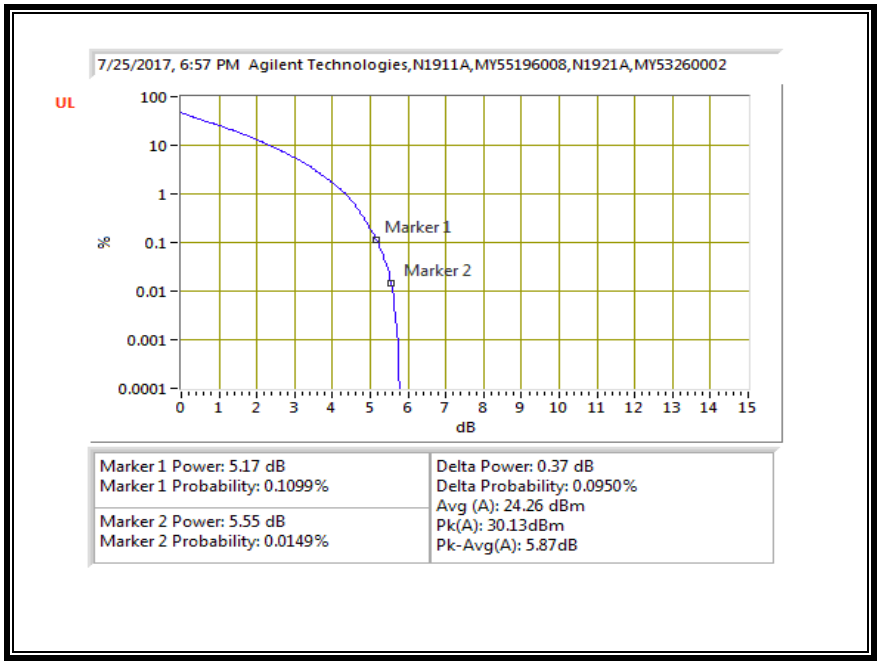
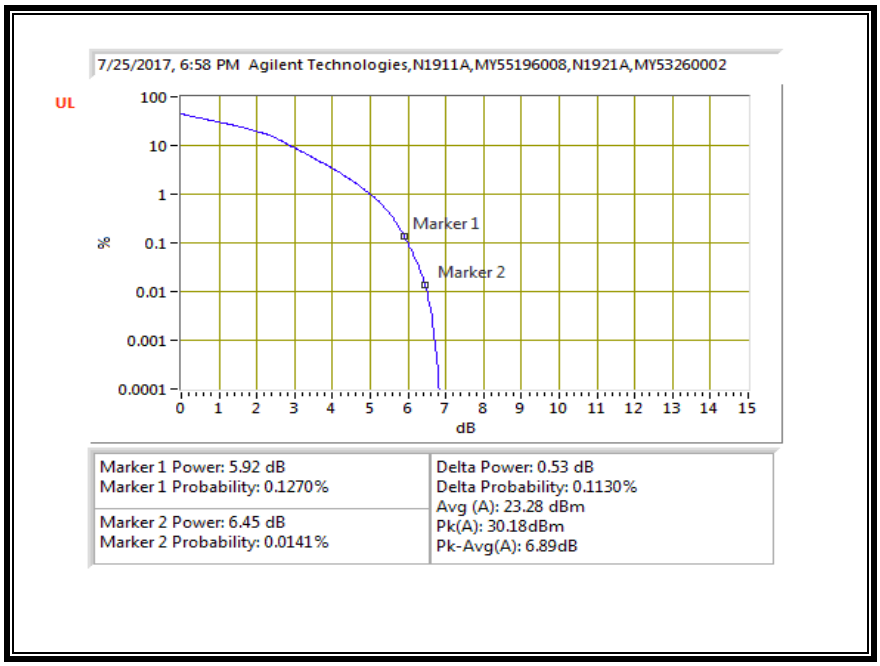
QPSK, (20.0 MHz BAND WIDTH)



16QAM, (20.0 MHz BAND WIDTH)



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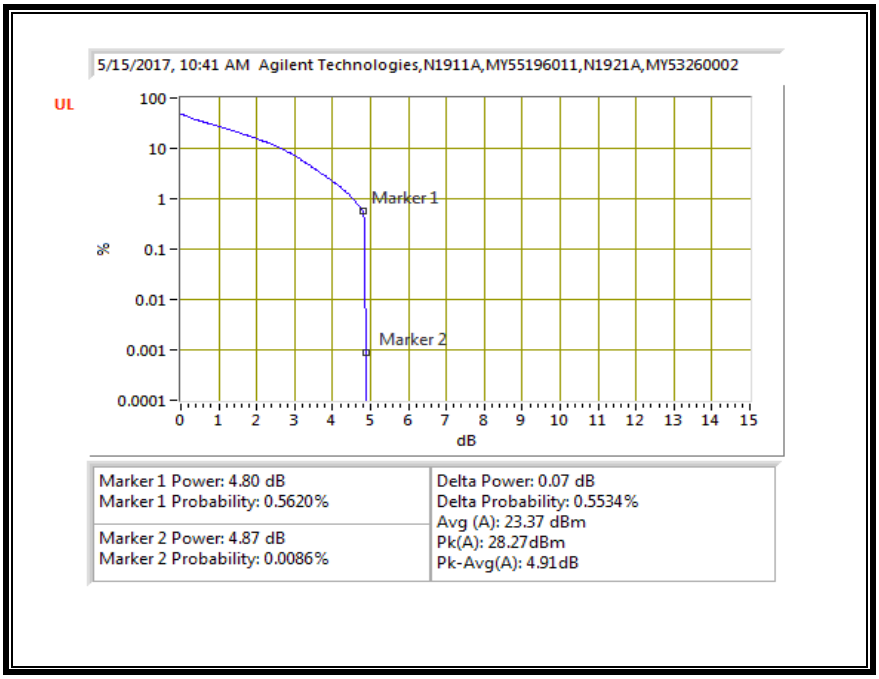
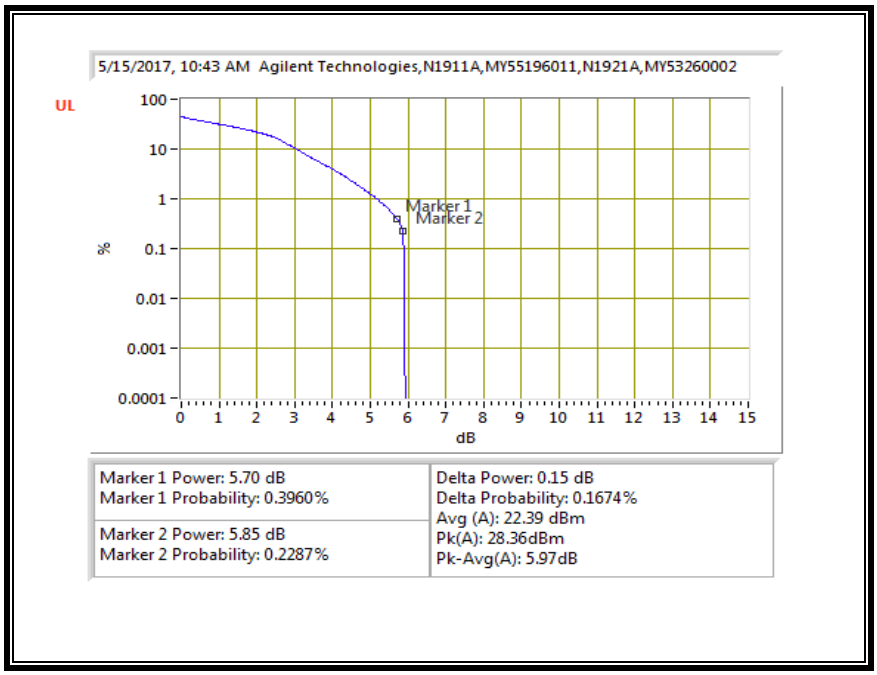
8.5.9. LTE BAND 26

QPSK, (1.4 MHz BAND WIDTH)



16QAM, (1.4 MHz BAND WIDTH)



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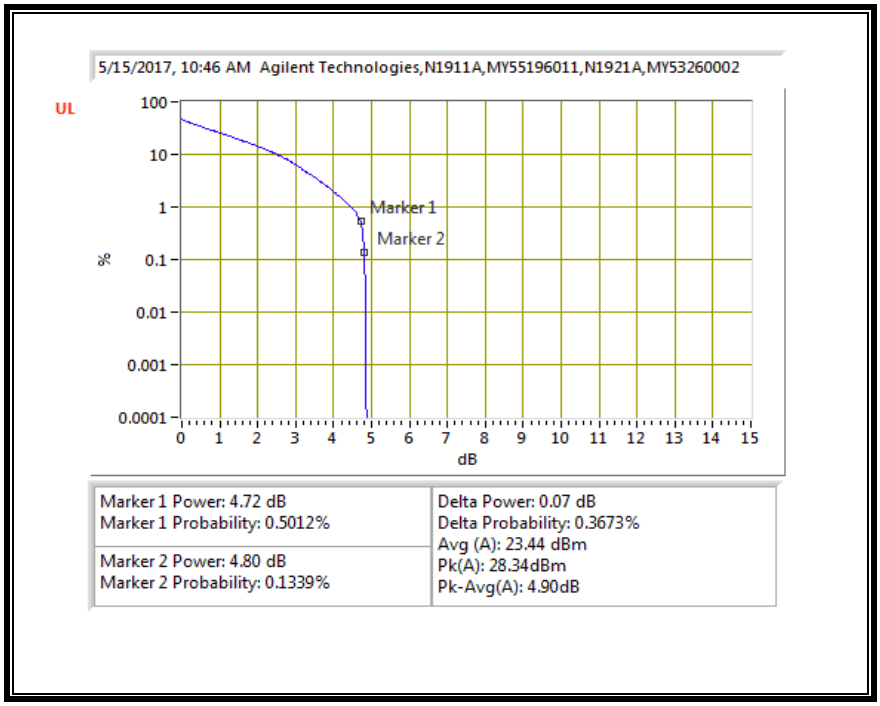
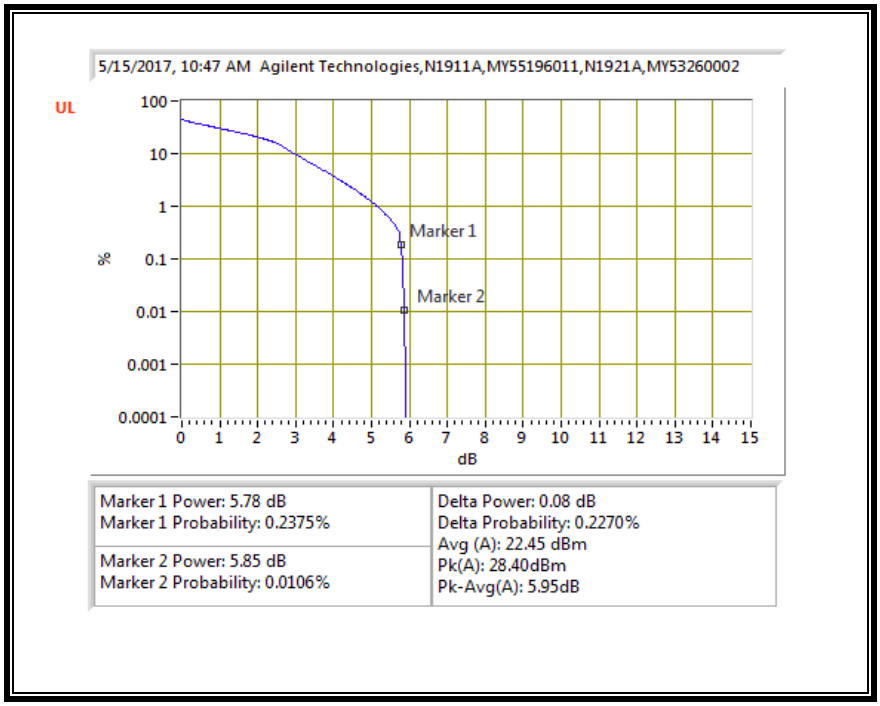
QPSK, (3.0 MHz BAND WIDTH)



16QAM, (3.0 MHz BAND WIDTH)



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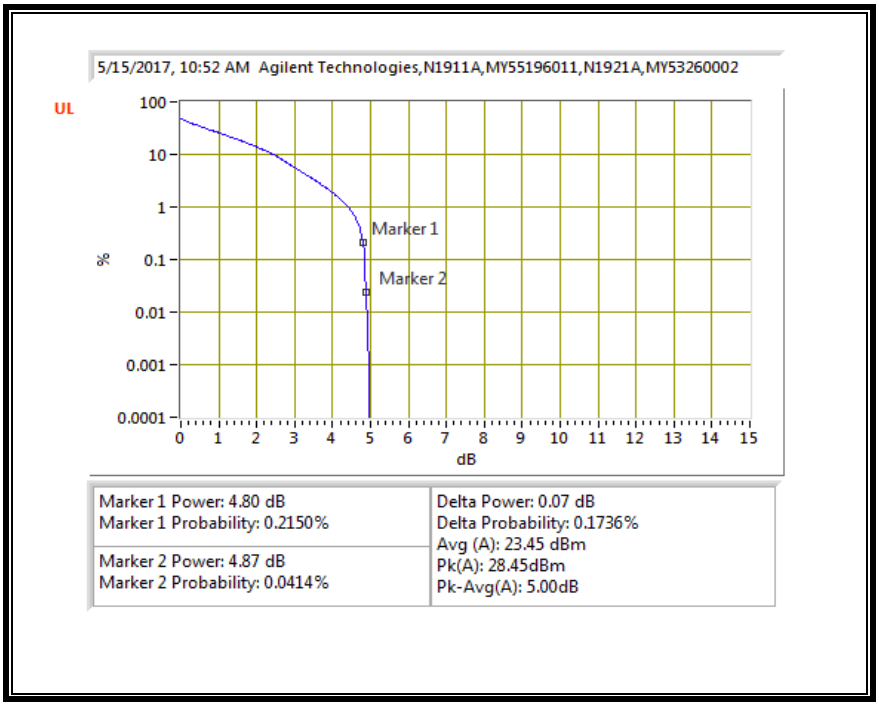
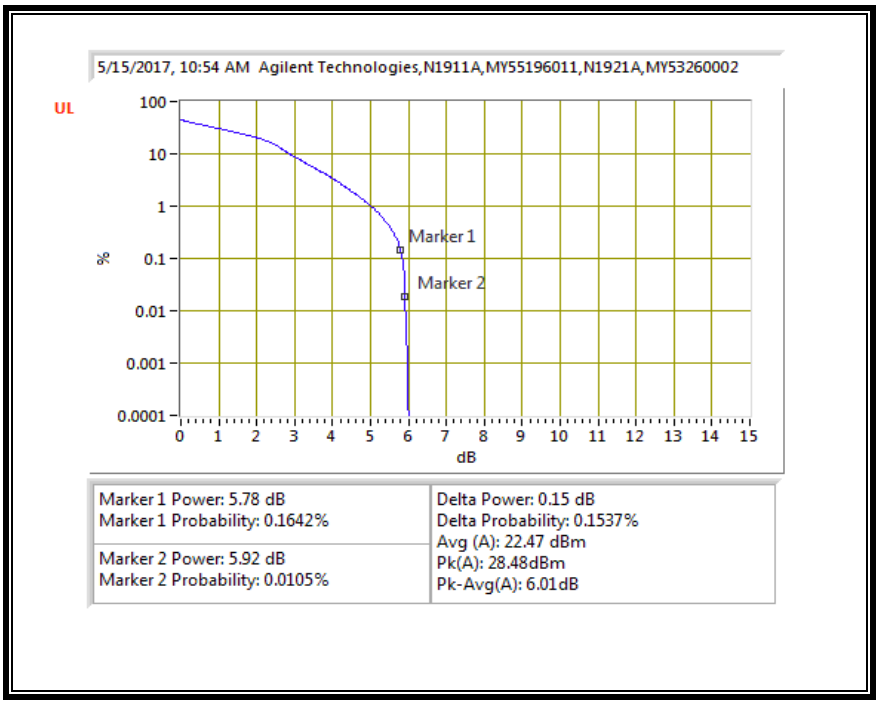
QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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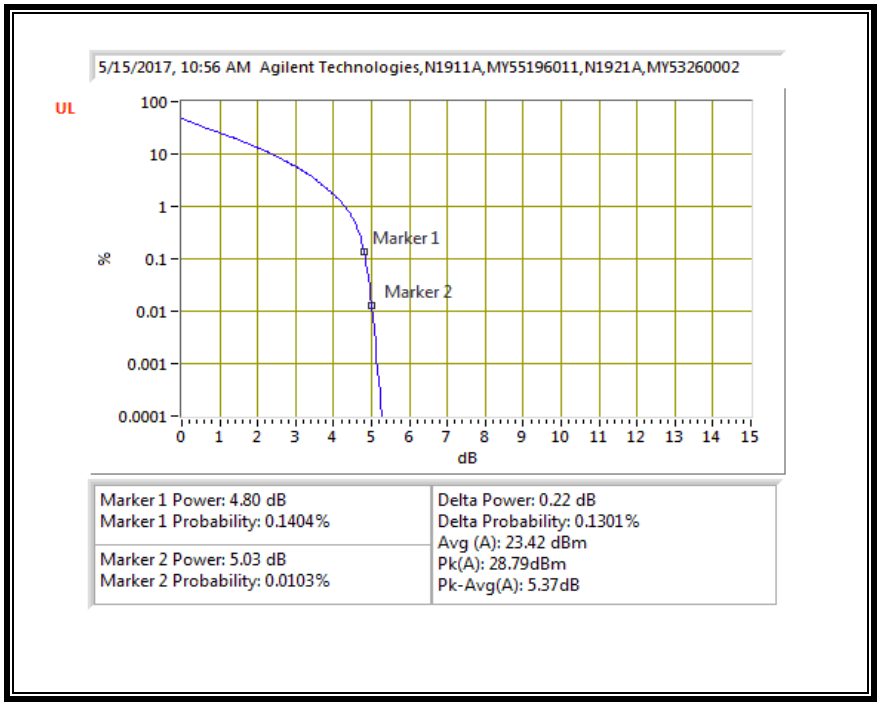
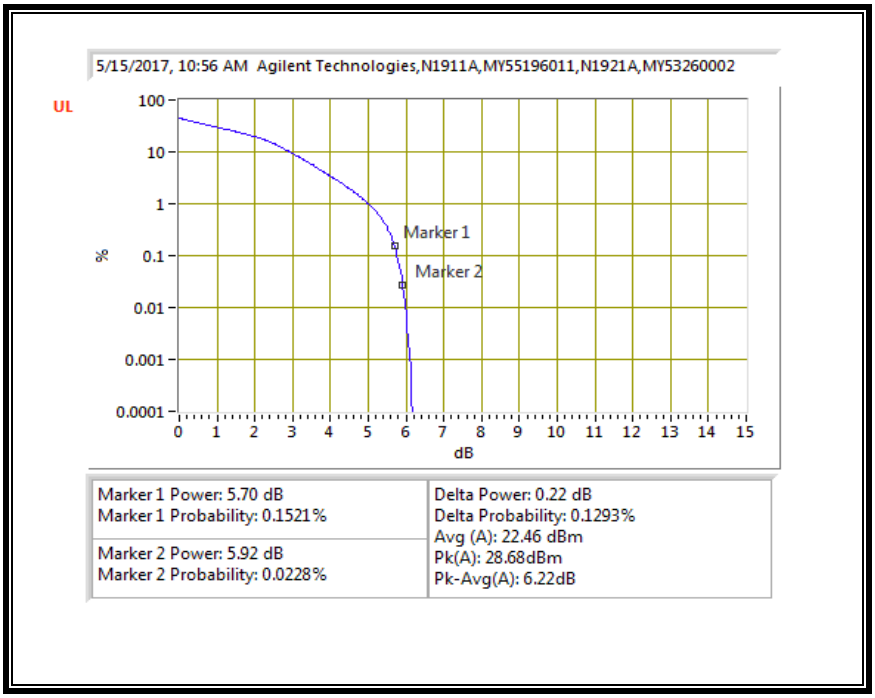
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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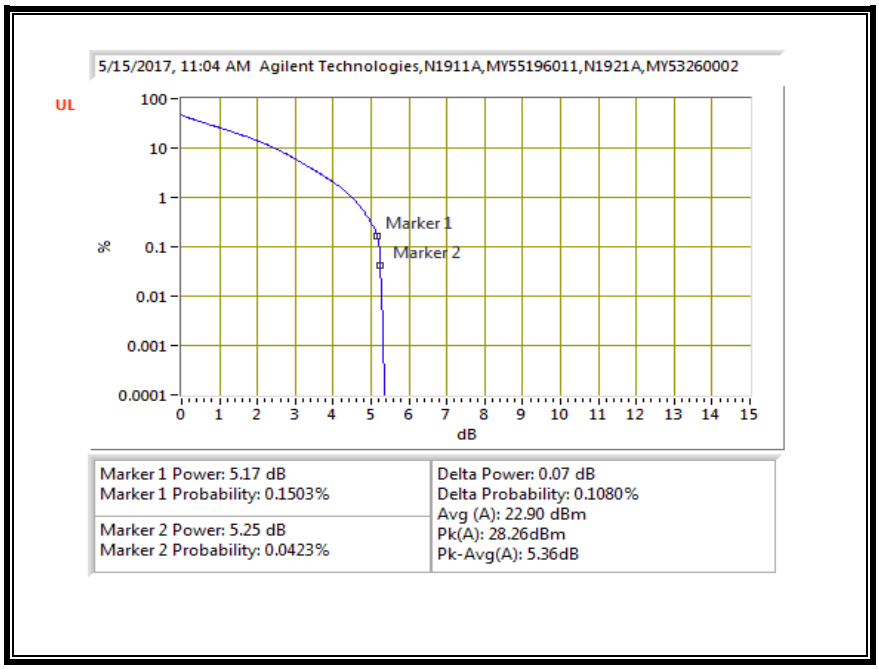
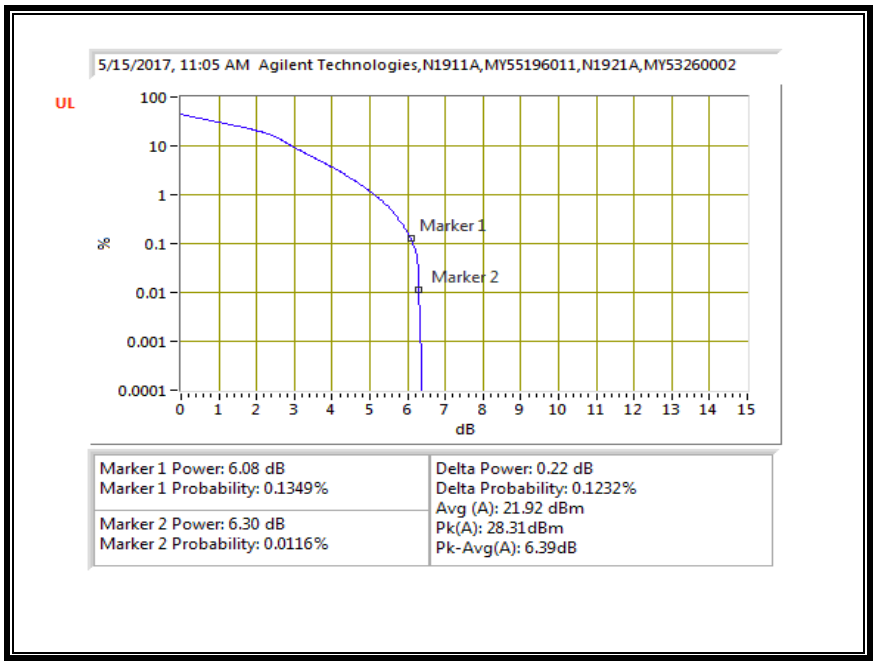
8.5.10. LTE BAND 30

QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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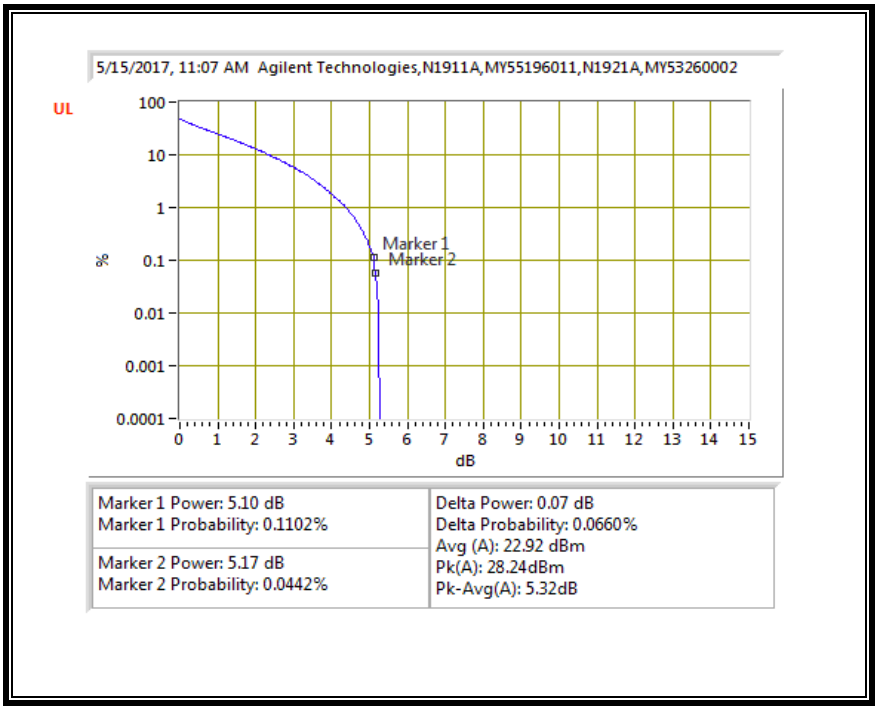
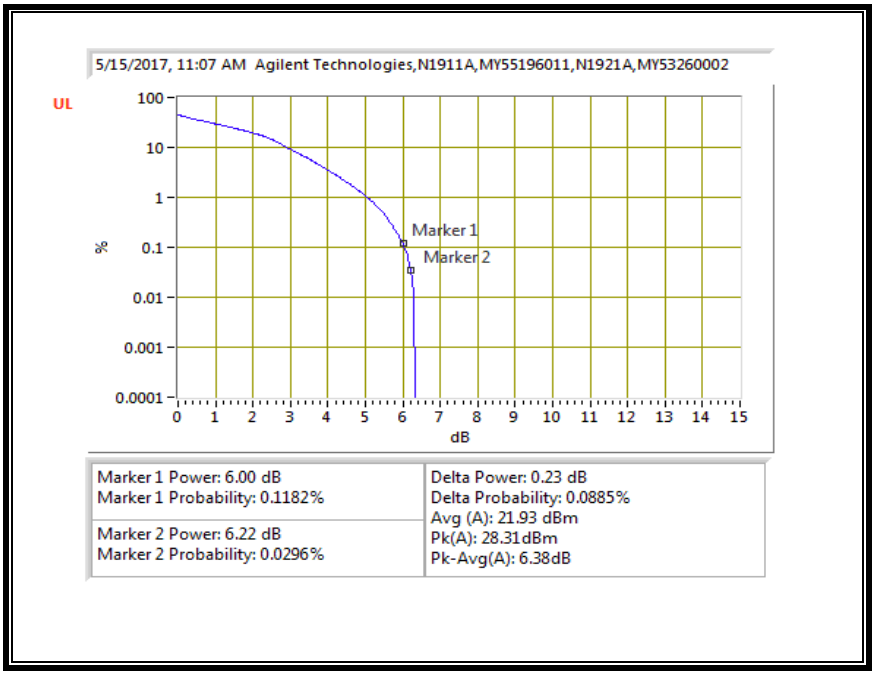
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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8.5.11. LTE BAND 41

ID:	50820	Date:	5/15/17

Mode	Channel Band-	Frequency (MHz)	RB Size	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio
						Peak	Average	
LTE Band 41	5MHz	2593.0	25	0	QPSK	26.82	16.92	2.91
					16QAM	26.84	15.92	3.93
	10MHz		50	0	QPSK	26.82	16.96	2.87
					16QAM	26.85	15.99	3.87
	15MHz		75	0	QPSK	26.79	16.93	2.87
					16QAM	26.82	15.95	3.88
	20MHz		100	0	QPSK	26.71	16.97	2.75
					16QAM	26.76	15.99	3.78
Duty Cycle Correction Factor (dB)=			6.99					
Peak to Average Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

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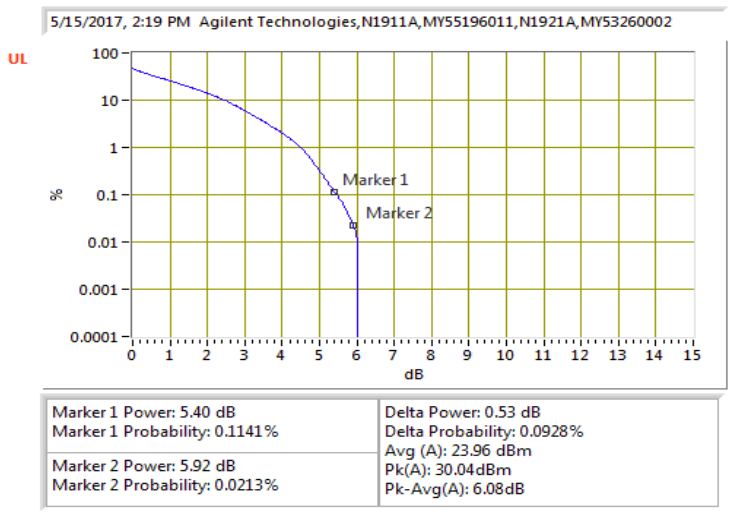
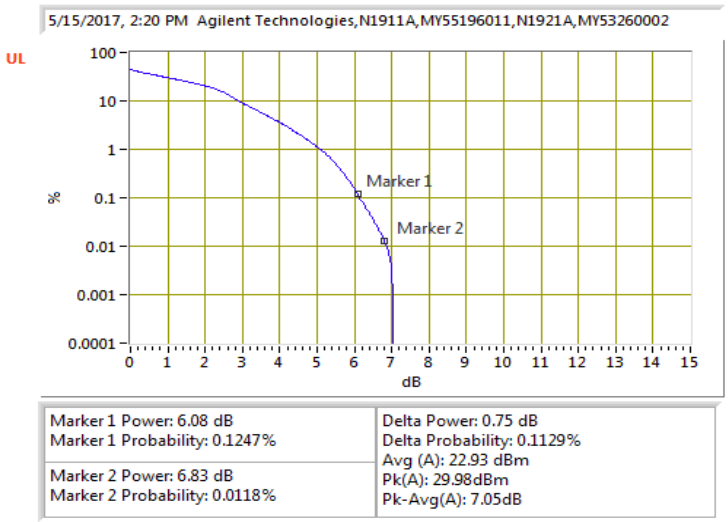
8.5.12. LTE BAND 66

QPSK, (5.0 MHz BAND WIDTH)



16QAM, (5.0 MHz BAND WIDTH)



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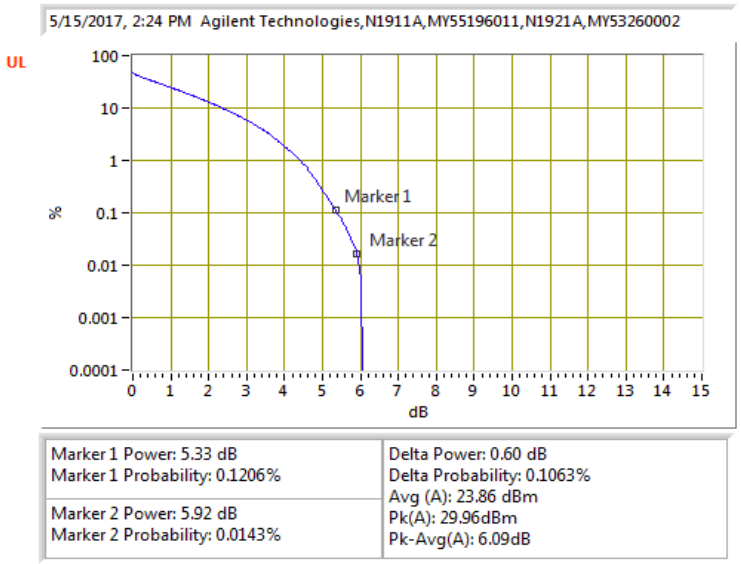
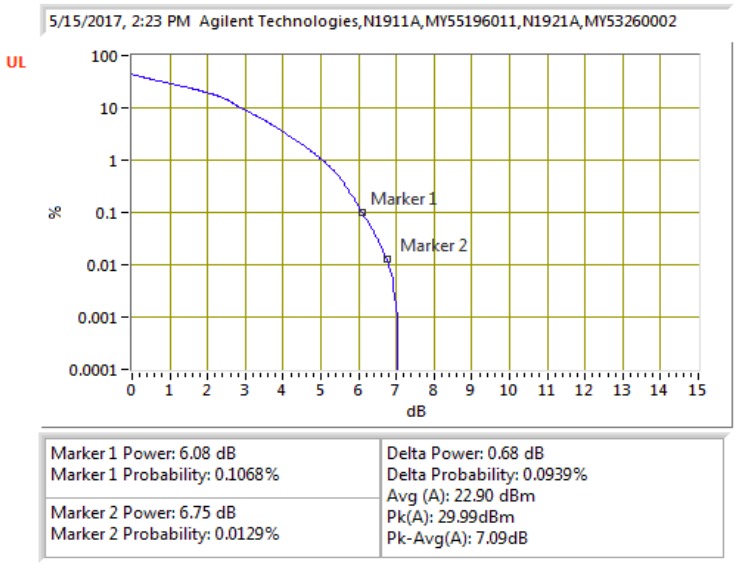
QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



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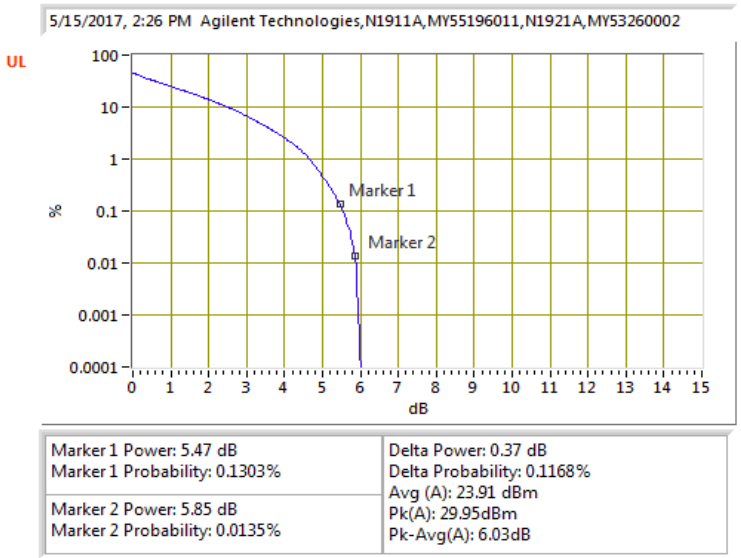
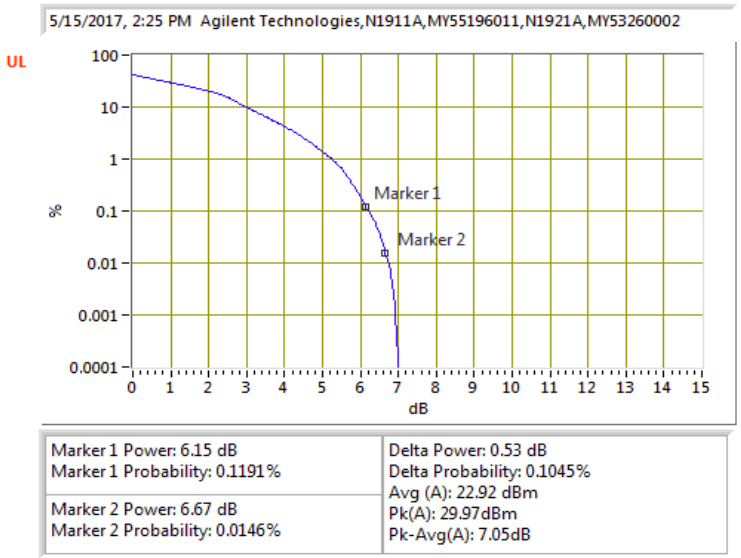
QPSK, (15.0 MHz BAND WIDTH)



16QAM, (15.0 MHz BAND WIDTH)



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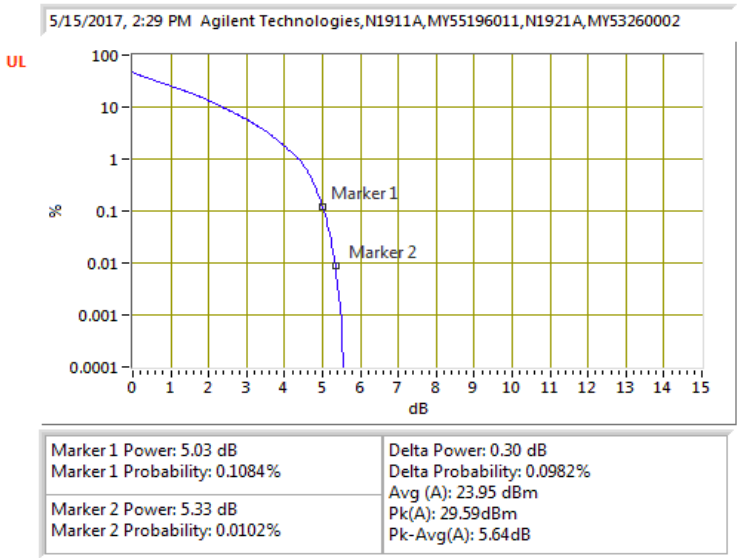
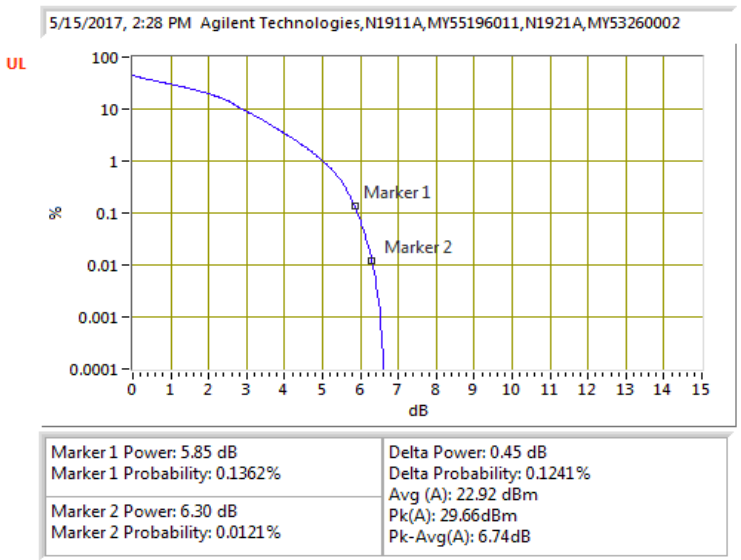
QPSK, (20.0 MHz BAND WIDTH)



16QAM, (20.0 MHz BAND WIDTH)



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9. RADIATED TEST RESULTS

9.1. FIELD STRENGTH OF SPURIOUS RADIATION, LAT 1

RULE PART(S)

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

LIMIT

FCC: §22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

FCC: §27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

FCC: §27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10 (f/6.1) decibels or 50 + 10 Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

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TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:

a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB; and

b. for mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB at the channel edges and 55 + 10 Log10 (p) at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

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MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66

RESULTS

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9.1.1. LTE BAND 2

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-63.6	H	3.0	-13.6	38.6	1.0	-51.2	-13.0	-38.2	
5.58	-65.7	H	3.0	-11.6	38.6	1.0	-49.1	-13.0	-36.1	
7.44	-66.4	H	3.0	-8.6	37.8	1.0	-45.4	-13.0	-32.4	
3.72	-63.5	V	3.0	-13.5	38.6	1.0	-51.1	-13.0	-38.1	
5.58	-65.9	V	3.0	-12.1	38.6	1.0	-49.6	-13.0	-36.6	
7.44	-66.5	V	3.0	-9.0	37.8	1.0	-45.8	-13.0	-32.8	
Mid Channel (1880MHz)										
3.76	-64.4	H	3.0	-14.3	38.6	1.0	-51.9	-13.0	-38.9	
5.64	-65.1	H	3.0	-10.9	38.5	1.0	-48.4	-13.0	-35.4	
7.52	-66.3	H	3.0	-8.4	37.7	1.0	-45.2	-13.0	-32.2	
3.76	-64.3	V	3.0	-14.3	38.6	1.0	-51.9	-13.0	-38.9	
5.64	-65.2	V	3.0	-11.3	38.5	1.0	-48.8	-13.0	-35.8	
7.52	-66.3	V	3.0	-8.6	37.7	1.0	-45.4	-13.0	-32.4	
High Channel (1900MHz)										
3.80	-64.1	H	3.0	-13.9	38.6	1.0	-51.6	-13.0	-38.6	
5.70	-65.5	H	3.0	-11.1	38.5	1.0	-48.6	-13.0	-35.6	
7.60	-66.6	H	3.0	-8.6	37.7	1.0	-45.3	-13.0	-32.3	
3.80	-63.9	V	3.0	-13.7	38.6	1.0	-51.4	-13.0	-38.4	
5.70	-65.1	V	3.0	-11.0	38.5	1.0	-48.5	-13.0	-35.5	
7.60	-66.2	V	3.0	-8.5	37.7	1.0	-45.2	-13.0	-32.2	

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16QAM LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-64.1	H	3.0	-14.0	38.6	1.0	-51.7	-13.0	-38.7	
5.58	-65.7	H	3.0	-11.6	38.6	1.0	-49.1	-13.0	-36.1	
7.44	-66.9	H	3.0	-9.2	37.8	1.0	-46.0	-13.0	-33.0	
3.72	-64.3	V	3.0	-14.3	38.6	1.0	-51.9	-13.0	-38.9	
5.58	-65.5	V	3.0	-11.7	38.6	1.0	-49.2	-13.0	-36.2	
7.44	-66.2	V	3.0	-8.7	37.8	1.0	-45.5	-13.0	-32.5	
Mid Channel (1880MHz)										
3.76	-64.4	H	3.0	-14.2	38.6	1.0	-51.9	-13.0	-38.9	
5.64	-65.9	H	3.0	-11.6	38.5	1.0	-49.2	-13.0	-36.2	
7.52	-66.8	H	3.0	-8.9	37.7	1.0	-45.7	-13.0	-32.7	
3.76	-63.9	V	3.0	-13.8	38.6	1.0	-51.5	-13.0	-38.5	
5.64	-65.5	V	3.0	-11.6	38.5	1.0	-49.2	-13.0	-36.2	
7.52	-66.5	V	3.0	-8.8	37.7	1.0	-45.6	-13.0	-32.6	
High Channel (1900MHz)										
3.80	-64.2	H	3.0	-13.9	38.6	1.0	-51.6	-13.0	-38.6	
5.70	-65.4	H	3.0	-11.0	38.5	1.0	-48.5	-13.0	-35.5	
7.60	-66.6	H	3.0	-8.7	37.7	1.0	-45.4	-13.0	-32.4	
3.80	-64.1	V	3.0	-13.9	38.6	1.0	-51.6	-13.0	-38.6	
5.70	-65.7	V	3.0	-11.6	38.5	1.0	-49.2	-13.0	-36.2	
7.60	-66.9	V	3.0	-9.2	37.7	1.0	-45.9	-13.0	-32.9	

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9.1.2. LTE BAND 4

QPSK LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 4, 3.0MHz 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 (1711.5MHz)										
3.44	-66.7	H	3.0	-17.4	38.5	1.0	-54.9	-13.0	-41.9	
5.16	-66.0	H	3.0	-12.8	38.7	1.0	-50.5	-13.0	-37.5	
6.88	-66.8	H	3.0	-9.9	38.1	1.0	-47.0	-13.0	-34.0	
3.44	-66.2	V	3.0	-17.1	38.5	1.0	-54.6	-13.0	-41.6	
5.16	-66.2	V	3.0	-13.3	38.7	1.0	-51.0	-13.0	-38.0	
6.88	-66.5	V	3.0	-9.9	38.1	1.0	-47.0	-13.0	-34.0	
Mid Channel (1732.5MHz)										
3.47	-66.3	H	3.0	-17.0	38.5	1.0	-54.5	-13.0	-41.5	
5.20	-66.0	H	3.0	-12.7	38.7	1.0	-50.4	-13.0	-37.4	
6.93	-66.4	H	3.0	-9.3	38.1	1.0	-46.5	-13.0	-33.5	
3.47	-65.9	V	3.0	-16.8	38.5	1.0	-54.3	-13.0	-41.3	
5.20	-66.1	V	3.0	-13.2	38.7	1.0	-50.9	-13.0	-37.9	
6.93	-66.5	V	3.0	-9.7	38.1	1.0	-46.9	-13.0	-33.9	
High Channel (1753.5MHz)										
3.49	-65.3	H	3.0	-15.9	38.5	1.0	-53.4	-13.0	-40.4	
5.24	-65.8	H	3.0	-12.4	38.7	1.0	-50.1	-13.0	-37.1	
6.98	-66.2	H	3.0	-9.1	38.1	1.0	-46.2	-13.0	-33.2	
3.49	-65.2	V	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
5.24	-66.9	V	3.0	-13.8	38.7	1.0	-51.5	-13.0	-38.5	
6.98	-66.3	V	3.0	-9.4	38.1	1.0	-46.5	-13.0	-33.5	

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16QAM LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 4, 3.0MHz 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 (1711.5MHz)										
3.44	-65.0	H	3.0	-15.7	38.5	1.0	-53.2	-13.0	-40.2	
5.16	-65.9	H	3.0	-12.7	38.7	1.0	-50.4	-13.0	-37.4	
6.88	-66.3	H	3.0	-9.4	38.1	1.0	-46.5	-13.0	-33.5	
3.44	-65.2	V	3.0	-16.1	38.5	1.0	-53.6	-13.0	-40.6	
5.16	-65.9	V	3.0	-13.0	38.7	1.0	-50.7	-13.0	-37.7	
6.88	-66.1	V	3.0	-9.4	38.1	1.0	-46.6	-13.0	-33.6	
Mid Channel (1732.5MHz)										
3.47	-64.9	H	3.0	-15.5	38.5	1.0	-53.0	-13.0	-40.0	
5.20	-65.4	H	3.0	-12.1	38.7	1.0	-49.8	-13.0	-36.8	
6.93	-66.4	H	3.0	-9.3	38.1	1.0	-46.4	-13.0	-33.4	
3.47	-65.3	V	3.0	-16.2	38.5	1.0	-53.7	-13.0	-40.7	
5.20	-66.1	V	3.0	-13.2	38.7	1.0	-50.9	-13.0	-37.9	
6.93	-66.5	V	3.0	-9.7	38.1	1.0	-46.9	-13.0	-33.9	
High Channel (1753.5MHz)										
3.49	-65.2	H	3.0	-15.8	38.5	1.0	-53.3	-13.0	-40.3	
5.24	-65.8	H	3.0	-12.5	38.7	1.0	-50.1	-13.0	-37.1	
6.98	-66.4	H	3.0	-9.2	38.1	1.0	-46.3	-13.0	-33.3	
3.49	-65.1	V	3.0	-15.8	38.5	1.0	-53.3	-13.0	-40.3	
5.24	-65.8	V	3.0	-12.8	38.7	1.0	-50.4	-13.0	-37.4	
6.98	-66.5	V	3.0	-9.5	38.1	1.0	-46.6	-13.0	-33.6	

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9.1.3. LTE BAND 5

QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-63.1	H	3.0	-20.6	37.8	1.0	-57.5	-13.0	-44.5	
2.49	-65.7	H	3.0	-20.7	38.5	1.0	-58.2	-13.0	-45.2	
3.32	-66.9	H	3.0	-17.9	38.5	1.0	-55.4	-13.0	-42.4	
1.66	-64.2	V	3.0	-22.0	37.8	1.0	-58.9	-13.0	-45.9	
2.49	-65.6	V	3.0	-20.4	38.5	1.0	-57.9	-13.0	-44.9	
3.32	-66.7	V	3.0	-18.0	38.5	1.0	-55.5	-13.0	-42.5	
Mid Channel (836.5MHz)										
1.67	-63.1	H	3.0	-20.6	37.8	1.0	-57.5	-13.0	-44.5	
2.51	-65.2	H	3.0	-20.0	38.6	1.0	-57.6	-13.0	-44.6	
3.35	-66.6	H	3.0	-17.6	38.5	1.0	-55.0	-13.0	-42.0	
1.67	-64.3	V	3.0	-22.0	37.8	1.0	-58.8	-13.0	-45.8	
2.51	-65.4	V	3.0	-20.0	38.6	1.0	-57.6	-13.0	-44.6	
3.35	-66.5	V	3.0	-17.6	38.5	1.0	-55.1	-13.0	-42.1	
High Channel (844MHz)										
1.69	-64.2	H	3.0	-21.7	37.9	1.0	-58.6	-13.0	-45.6	
2.53	-66.1	H	3.0	-20.8	38.6	1.0	-58.3	-13.0	-45.3	
3.38	-66.9	H	3.0	-17.7	38.5	1.0	-55.2	-13.0	-42.2	
1.69	-64.2	V	3.0	-21.9	37.9	1.0	-58.8	-13.0	-45.8	
2.53	-65.8	V	3.0	-20.4	38.6	1.0	-57.9	-13.0	-44.9	
3.38	-66.7	V	3.0	-17.8	38.5	1.0	-55.3	-13.0	-42.3	

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16QAM LTE BAND 5 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-63.9	H	3.0	-22.5	37.8	1.0	-59.3	-13.0	-46.3	
2.49	-65.8	H	3.0	-22.6	38.5	1.0	-60.1	-13.0	-47.1	
3.32	-66.4	H	3.0	-20.4	38.5	1.0	-57.9	-13.0	-44.9	
1.66	-64.1	V	3.0	-22.4	37.8	1.0	-59.2	-13.0	-46.2	
2.49	-65.9	V	3.0	-21.7	38.5	1.0	-59.3	-13.0	-46.3	
3.32	-66.7	V	3.0	-20.8	38.5	1.0	-58.3	-13.0	-45.3	
Mid Channel (836.5MHz)										
1.67	-64.3	H	3.0	-22.8	37.8	1.0	-59.7	-13.0	-46.7	
2.51	-65.9	H	3.0	-22.7	38.6	1.0	-60.2	-13.0	-47.2	
3.35	-66.8	H	3.0	-20.7	38.5	1.0	-58.2	-13.0	-45.2	
1.67	-64.1	V	3.0	-22.4	37.8	1.0	-59.2	-13.0	-46.2	
2.51	-65.7	V	3.0	-21.4	38.6	1.0	-59.0	-13.0	-46.0	
3.35	-66.8	V	3.0	-20.7	38.5	1.0	-58.2	-13.0	-45.2	
High Channel (844MHz)										
1.69	-64.4	H	3.0	-22.8	37.9	1.0	-59.7	-13.0	-46.7	
2.53	-65.9	H	3.0	-22.6	38.6	1.0	-60.1	-13.0	-47.1	
3.38	-66.9	H	3.0	-20.8	38.5	1.0	-58.3	-13.0	-45.3	
1.69	-64.4	V	3.0	-22.6	37.9	1.0	-59.4	-13.0	-46.4	
2.53	-65.4	V	3.0	-21.2	38.6	1.0	-58.7	-13.0	-45.7	
3.38	-66.7	V	3.0	-20.5	38.5	1.0	-58.0	-13.0	-45.0	

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9.1.4. LTE BAND 7

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-65.7	H	3.0	-12.8	38.7	1.0	-50.4	-25.0	-25.4	
7.53	-65.2	H	3.0	-7.4	37.7	1.0	-44.1	-25.0	-19.1	
10.04	-67.2	H	3.0	-6.4	36.2	1.0	-41.5	-25.0	-16.5	
5.02	-65.3	V	3.0	-12.7	38.7	1.0	-50.4	-25.0	-25.4	
7.53	-65.9	V	3.0	-8.2	37.7	1.0	-45.0	-25.0	-20.0	
10.04	-66.9	V	3.0	-6.1	36.2	1.0	-41.2	-25.0	-16.2	
Mid Channel (2535MHz)										
5.07	-65.2	H	3.0	-12.1	38.7	1.0	-49.8	-25.0	-24.8	
7.61	-65.8	H	3.0	-7.9	37.7	1.0	-44.6	-25.0	-19.6	
10.14	-66.4	H	3.0	-5.5	36.2	1.0	-40.7	-25.0	-15.7	
5.07	-65.2	V	3.0	-12.5	38.7	1.0	-50.2	-25.0	-25.2	
7.61	-65.8	V	3.0	-8.1	37.7	1.0	-44.8	-25.0	-19.8	
10.14	-66.5	V	3.0	-5.6	36.2	1.0	-40.8	-25.0	-15.8	
High Channel (2560MHz)										
5.12	-65.6	H	3.0	-12.4	38.7	1.0	-50.1	-25.0	-25.1	
7.68	-65.9	H	3.0	-7.9	37.6	1.0	-44.6	-25.0	-19.6	
10.24	-66.8	H	3.0	-5.8	36.3	1.0	-41.1	-25.0	-16.1	
5.12	-65.2	V	3.0	-12.4	38.7	1.0	-50.1	-25.0	-25.1	
7.68	-65.8	V	3.0	-8.0	37.6	1.0	-44.6	-25.0	-19.6	
10.24	-66.7	V	3.0	-5.6	36.3	1.0	-40.9	-25.0	-15.9	

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16QAM LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-65.6	H	3.0	-12.7	38.7	1.0	-50.4	-25.0	-25.4	
7.53	-66.1	H	3.0	-8.2	37.7	1.0	-45.0	-25.0	-20.0	
10.04	-66.9	H	3.0	-6.1	36.2	1.0	-41.2	-25.0	-16.2	
5.02	-65.3	V	3.0	-12.7	38.7	1.0	-50.4	-25.0	-25.4	
7.53	-66.2	V	3.0	-8.6	37.7	1.0	-45.3	-25.0	-20.3	
10.04	-66.9	V	3.0	-6.1	36.2	1.0	-41.2	-25.0	-16.2	
Mid Channel (2535MHz)										
5.07	-65.2	-65.4	3.0	-12.5	38.7	1.0	-50.2	-25.0	-25.2	
7.61	-65.9	-66.6	3.0	-8.2	37.7	1.0	-44.9	-25.0	-19.9	
10.14	-66.5	H	3.0	-5.6	36.2	1.0	-40.8	-25.0	-15.8	
5.07	-65.4	V	3.0	-12.7	38.7	1.0	-50.4	-25.0	-25.4	
7.61	-65.9	V	3.0	-8.1	37.7	1.0	-44.8	-25.0	-19.8	
10.14	-66.7	V	3.0	-5.8	36.2	1.0	-41.0	-25.0	-16.0	
High Channel (2560MHz)										
5.12	-65.3	H	3.0	-12.2	38.7	1.0	-49.9	-25.0	-24.9	
7.68	-65.8	H	3.0	-7.7	37.6	1.0	-44.4	-25.0	-19.4	
10.24	-66.6	H	3.0	-5.5	36.3	1.0	-40.8	-25.0	-15.8	
5.12	-65.2	V	3.0	-12.4	38.7	1.0	-50.1	-25.0	-25.1	
7.68	-65.7	V	3.0	-7.9	37.6	1.0	-44.6	-25.0	-19.6	
10.24	-66.4	V	3.0	-5.3	36.3	1.0	-40.6	-25.0	-15.6	

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9.1.5. LTE BAND 12

QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-64.9	H	3.0	-23.2	38.1	1.0	-60.3	-13.0	-47.3	
2.11	-65.4	H	3.0	-21.9	38.0	1.0	-58.8	-13.0	-45.8	
2.82	-66.2	H	3.0	-19.1	38.4	1.0	-56.5	-13.0	-43.5	
1.41	-64.2	V	3.0	-23.3	38.1	1.0	-60.4	-13.0	-47.4	
2.11	-65.2	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.82	-66.4	V	3.0	-19.5	38.4	1.0	-57.0	-13.0	-44.0	
Mid Channel (707.5MHz)										
1.42	-63.9	H	3.0	-22.2	38.0	1.0	-59.2	-13.0	-46.2	
2.12	-64.6	H	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.83	-66.0	H	3.0	-18.8	38.4	1.0	-56.2	-13.0	-43.2	
1.42	-63.2	V	3.0	-22.2	38.0	1.0	-59.3	-13.0	-46.3	
2.12	-65.2	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.83	-66.4	V	3.0	-19.4	38.4	1.0	-56.8	-13.0	-43.8	
High Channel (711MHz)										
1.42	-64.6	H	3.0	-22.9	38.0	1.0	-59.9	-13.0	-46.9	
2.13	-65.9	H	3.0	-22.2	38.0	1.0	-59.2	-13.0	-46.2	
2.84	-66.4	H	3.0	-19.1	38.4	1.0	-56.5	-13.0	-43.5	
1.42	-64.1	V	3.0	-23.1	38.0	1.0	-60.1	-13.0	-47.1	
2.13	-65.3	V	3.0	-21.2	38.0	1.0	-58.1	-13.0	-45.1	
2.84	-66.1	V	3.0	-19.0	38.4	1.0	-56.5	-13.0	-43.5	

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16QAM LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-63.9	H	3.0	-22.3	38.1	1.0	-59.4	-13.0	-46.4	
2.11	-65.4	H	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.82	-66.7	H	3.0	-19.6	38.4	1.0	-57.1	-13.0	-44.1	
1.41	-64.2	V	3.0	-23.3	38.1	1.0	-60.4	-13.0	-47.4	
2.11	-65.8	V	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.82	-66.4	V	3.0	-19.5	38.4	1.0	-56.9	-13.0	-43.9	
Mid Channel (707.5MHz)										
1.42	-64.3	H	3.0	-22.6	38.0	1.0	-59.7	-13.0	-46.7	
2.12	-65.9	H	3.0	-22.3	38.0	1.0	-59.3	-13.0	-46.3	
2.83	-66.9	H	3.0	-19.7	38.4	1.0	-57.2	-13.0	-44.2	
1.42	-64.2	V	3.0	-23.2	38.0	1.0	-60.3	-13.0	-47.3	
2.12	-65.8	V	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.83	-67.0	V	3.0	-20.1	38.4	1.0	-57.5	-13.0	-44.5	
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	-66.8	H	3.0	-19.5	38.4	1.0	-57.0	-13.0	-44.0	
1.42	-64.2	V	3.0	-23.2	38.0	1.0	-60.2	-13.0	-47.2	
2.13	-65.9	V	3.0	-21.7	38.0	1.0	-58.7	-13.0	-45.7	
2.84	-66.7	V	3.0	-19.7	38.4	1.0	-57.1	-13.0	-44.1	

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9.1.6. LTE BAND 13

QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-64.0	H	3.0	-21.7	37.8	1.0	-58.5	-40.0	-18.5	
2.35	-65.6	H	3.0	-21.2	38.1	1.0	-58.4	-13.0	-45.4	
3.13	-65.9	H	3.0	-17.3	38.4	1.0	-54.8	-13.0	-41.8	
1.56	-63.9	V	3.0	-22.1	37.8	1.0	-59.0	-40.0	-19.0	
2.35	-65.4	V	3.0	-20.7	38.1	1.0	-57.8	-13.0	-44.8	
3.13	-65.8	V	3.0	-17.6	38.4	1.0	-55.0	-13.0	-42.0	

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16QAM LTE BAND 13 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-64.1	H	3.0	-21.8	37.8	1.0	-58.7	-40.0	-18.7	
2.35	-65.7	H	3.0	-21.2	38.1	1.0	-58.4	-13.0	-45.4	
3.13	-65.9	H	3.0	-17.4	38.4	1.0	-54.8	-13.0	-41.8	
1.56	-63.8	V	3.0	-22.1	37.8	1.0	-58.9	-40.0	-18.9	
2.35	-65.9	V	3.0	-21.2	38.1	1.0	-58.4	-13.0	-45.4	
3.13	-66.1	V	3.0	-17.9	38.4	1.0	-55.4	-13.0	-42.4	

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9.1.7. LTE BAND 17

QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 07/21/17
Test Engineer: 10641
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
Low Channel (709MHz)										
1.418	-65.5	H	3.0	-23.8	38.0	1.0	-60.8	-13.0	-47.8	
2.127	-64.5	H	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.836	-65.4	H	3.0	-18.2	38.4	1.0	-55.7	-13.0	-42.7	
1.418	-65.0	V	3.0	-24.0	38.0	1.0	-61.0	-13.0	-48.0	
2.127	-64.3	V	3.0	-20.2	38.0	1.0	-57.2	-13.0	-44.2	
2.836	-64.4	V	3.0	-17.4	38.4	1.0	-54.8	-13.0	-41.8	
Mid Channel (710MHz)										
1.420	-64.4	H	3.0	-22.7	38.0	1.0	-59.7	-13.0	-46.7	
2.130	-65.2	H	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.840	-65.9	H	3.0	-18.6	38.4	1.0	-56.1	-13.0	-43.1	
1.420	-64.0	V	3.0	-23.0	38.0	1.0	-60.1	-13.0	-47.1	
2.130	-65.1	V	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.840	-65.8	V	3.0	-18.8	38.4	1.0	-56.2	-13.0	-43.2	
High Channel (711MHz)										
1.422	-63.1	H	3.0	-21.4	38.0	1.0	-58.4	-13.0	-45.4	
2.133	-65.1	H	3.0	-21.4	38.0	1.0	-58.4	-13.0	-45.4	
2.844	-65.2	H	3.0	-17.9	38.4	1.0	-55.4	-13.0	-42.4	
1.422	-64.0	V	3.0	-22.9	38.0	1.0	-60.0	-13.0	-47.0	
2.133	-64.8	V	3.0	-20.7	38.0	1.0	-57.7	-13.0	-44.7	
2.844	-64.5	V	3.0	-17.5	38.4	1.0	-54.9	-13.0	-41.9	

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16QAM LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 07/21/17
Test Engineer: 10641
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
Low Channel (709MHz)										
1.418	-64.9	H	3.0	-23.2	38.0	1.0	-60.3	-13.0	-47.3	
2.127	-64.4	H	3.0	-20.7	38.0	1.0	-57.7	-13.0	-44.7	
2.836	-65.4	H	3.0	-18.2	38.4	1.0	-55.6	-13.0	-42.6	
1.418	-64.9	V	3.0	-23.9	38.0	1.0	-61.0	-13.0	-48.0	
2.127	-64.4	V	3.0	-20.2	38.0	1.0	-57.2	-13.0	-44.2	
2.836	-64.5	V	3.0	-17.5	38.4	1.0	-54.9	-13.0	-41.9	
Mid Channel (710MHz)										
1.420	-64.2	H	3.0	-22.5	38.0	1.0	-59.5	-13.0	-46.5	
2.130	-65.6	H	3.0	-21.9	38.0	1.0	-58.9	-13.0	-45.9	
2.840	-65.9	H	3.0	-18.6	38.4	1.0	-56.1	-13.0	-43.1	
1.420	-64.4	V	3.0	-23.3	38.0	1.0	-60.4	-13.0	-47.4	
2.130	-65.7	V	3.0	-21.5	38.0	1.0	-58.5	-13.0	-45.5	
2.840	-65.9	V	3.0	-18.9	38.4	1.0	-56.4	-13.0	-43.4	
High Channel (711MHz)										
1.422	-63.8	H	3.0	-22.0	38.0	1.0	-59.1	-13.0	-46.1	
2.133	-64.1	H	3.0	-20.4	38.0	1.0	-57.4	-13.0	-44.4	
2.844	-64.9	H	3.0	-17.7	38.4	1.0	-55.1	-13.0	-42.1	
1.422	-64.5	V	3.0	-23.5	38.0	1.0	-60.6	-13.0	-47.6	
2.133	-65.1	V	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.844	-66.2	V	3.0	-19.2	38.4	1.0	-56.6	-13.0	-43.6	

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9.1.8. LTE BAND 25

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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 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	-63.9	H	3.0	-13.9	38.6	1.0	-51.5	-13.0	-38.5	
5.58	-65.8	H	3.0	-11.7	38.6	1.0	-49.3	-13.0	-36.3	
7.44	-66.5	H	3.0	-8.8	37.8	1.0	-45.6	-13.0	-32.6	
3.72	-63.8	V	3.0	-13.8	38.6	1.0	-51.5	-13.0	-38.5	
5.58	-65.6	V	3.0	-11.8	38.6	1.0	-49.4	-13.0	-36.4	
7.44	-66.4	V	3.0	-8.9	37.8	1.0	-45.7	-13.0	-32.7	
Mid Channel (1882.5MHz)										
3.77	-63.6	H	3.0	-13.5	38.6	1.0	-51.1	-13.0	-38.1	
5.65	-65.7	H	3.0	-11.4	38.5	1.0	-48.9	-13.0	-35.9	
7.53	-66.4	H	3.0	-8.5	37.7	1.0	-45.3	-13.0	-32.3	
3.77	-63.6	V	3.0	-13.6	38.6	1.0	-51.2	-13.0	-38.2	
5.65	-65.7	V	3.0	-11.7	38.5	1.0	-49.3	-13.0	-36.3	
7.53	-66.5	V	3.0	-8.9	37.7	1.0	-45.7	-13.0	-32.7	
High Channel (1905MHz)										
3.81	-64.1	H	3.0	-13.8	38.6	1.0	-51.5	-13.0	-38.5	
5.72	-65.7	H	3.0	-11.3	38.5	1.0	-48.8	-13.0	-35.8	
7.62	-66.3	H	3.0	-8.4	37.7	1.0	-45.1	-13.0	-32.1	
3.81	-63.9	V	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3	
5.72	-65.5	V	3.0	-11.4	38.5	1.0	-48.9	-13.0	-35.9	
7.62	-66.4	V	3.0	-8.6	37.7	1.0	-45.3	-13.0	-32.3	

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16QAM LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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 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	-64.1	H	3.0	-14.1	38.6	1.0	-51.7	-13.0	-38.7	
5.58	-65.4	H	3.0	-11.2	38.6	1.0	-48.8	-13.0	-35.8	
7.44	-66.3	H	3.0	-8.6	37.8	1.0	-45.4	-13.0	-32.4	
3.72	-64.2	V	3.0	-14.3	38.6	1.0	-51.9	-13.0	-38.9	
5.58	-65.4	V	3.0	-11.6	38.6	1.0	-49.1	-13.0	-36.1	
7.44	-66.3	V	3.0	-8.8	37.8	1.0	-45.6	-13.0	-32.6	
Mid Channel (1882.5MHz)										
3.77	-64.2	H	3.0	-14.1	38.6	1.0	-51.7	-13.0	-38.7	
5.65	-65.5	H	3.0	-11.2	38.5	1.0	-48.7	-13.0	-35.7	
7.53	-66.3	H	3.0	-8.5	37.7	1.0	-45.2	-13.0	-32.2	
3.77	-64.0	V	3.0	-14.0	38.6	1.0	-51.6	-13.0	-38.6	
5.65	-65.4	V	3.0	-11.4	38.5	1.0	-49.0	-13.0	-36.0	
7.53	-66.6	V	3.0	-8.9	37.7	1.0	-45.7	-13.0	-32.7	
High Channel (1905MHz)										
3.81	-64.2	H	3.0	-14.0	38.6	1.0	-51.6	-13.0	-38.6	
5.72	-65.4	H	3.0	-11.0	38.5	1.0	-48.5	-13.0	-35.5	
7.62	-66.4	H	3.0	-8.4	37.7	1.0	-45.1	-13.0	-32.1	
3.81	-64.0	V	3.0	-13.8	38.6	1.0	-51.5	-13.0	-38.5	
5.72	-65.4	V	3.0	-11.3	38.5	1.0	-48.8	-13.0	-35.8	
7.62	-66.5	V	3.0	-8.8	37.7	1.0	-45.5	-13.0	-32.5	

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9.1.9. LTE BAND 26

QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-64.6	H	3.0	-22.1	37.8	1.0	-59.0	-13.0	-46.0	
2.46	-65.9	H	3.0	-21.0	38.4	1.0	-58.4	-13.0	-45.4	
3.28	-66.3	H	3.0	-17.4	38.5	1.0	-54.9	-13.0	-41.9	
1.64	-64.3	V	3.0	-22.2	37.8	1.0	-59.0	-13.0	-46.0	
2.46	-65.6	V	3.0	-20.5	38.4	1.0	-58.0	-13.0	-45.0	
3.28	-66.8	V	3.0	-18.1	38.5	1.0	-55.6	-13.0	-42.6	

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16QAM LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 05/31/17
Test Engineer: 39004
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	-64.6	H	3.0	-22.1	37.8	1.0	-59.0	-13.0	-46.0	
2.46	-65.7	H	3.0	-20.8	38.4	1.0	-58.2	-13.0	-45.2	
3.28	-66.8	H	3.0	-17.9	38.5	1.0	-55.4	-13.0	-42.4	
1.64	-64.2	V	3.0	-22.2	37.8	1.0	-59.0	-13.0	-46.0	
2.46	-65.4	V	3.0	-20.3	38.4	1.0	-57.7	-13.0	-44.7	
3.28	-66.3	V	3.0	-17.7	38.5	1.0	-55.2	-13.0	-42.2	

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9.1.10. LTE BAND 30

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-68.4	H	3.0	-14.6	37.9	1.0	-51.6	-40.0	-11.6	
6.93	-70.4	H	3.0	-11.8	36.5	1.0	-47.2	-40.0	-7.2	
9.24	-72.2	H	3.0	-10.6	34.9	1.0	-44.5	-40.0	-4.5	
4.62	-69.2	V	3.0	-15.5	37.9	1.0	-52.4	-40.0	-12.4	
6.93	-69.8	V	3.0	-10.3	36.5	1.0	-45.8	-40.0	-5.8	
9.24	-73.0	V	3.0	-11.2	34.9	1.0	-45.0	-40.0	-5.0	

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16QAM LTE BAND 30 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-69.1	H	3.0	-15.3	37.9	1.0	-52.2	-40.0	-12.2	
6.93	-69.3	H	3.0	-10.7	36.5	1.0	-46.1	-40.0	-6.1	
9.24	-72.1	H	3.0	-10.6	34.9	1.0	-44.5	-40.0	-4.5	
4.62	-68.4	V	3.0	-14.7	37.9	1.0	-51.6	-40.0	-11.6	
6.93	-69.7	V	3.0	-10.2	36.5	1.0	-45.6	-40.0	-5.6	
9.24	-71.4	V	3.0	-9.6	34.9	1.0	-43.5	-40.0	-3.5	

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9.1.11. LTE BAND 41

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-65.0	H	3.0	-12.1	38.7	1.0	-49.8	-25.0	-24.8	
7.52	-67.6	H	3.0	-9.8	37.7	1.0	-46.6	-25.0	-21.6	
10.02	-68.8	H	3.0	-8.0	36.1	1.0	-43.1	-25.0	-18.1	
5.01	-65.0	V	3.0	-12.4	38.7	1.0	-50.1	-25.0	-25.1	
7.52	-67.5	V	3.0	-9.9	37.7	1.0	-46.7	-25.0	-21.7	
10.02	-67.6	V	3.0	-6.8	36.1	1.0	-42.0	-25.0	-17.0	
Mid Channel (2593MHz)										
5.19	-67.2	H	3.0	-14.0	38.7	1.0	-51.7	-25.0	-26.7	
7.78	-67.7	H	3.0	-9.6	37.6	1.0	-46.2	-25.0	-21.2	
10.37	-67.2	H	3.0	-6.1	36.4	1.0	-41.4	-25.0	-16.4	
5.19	-67.2	V	3.0	-14.3	38.7	1.0	-52.0	-25.0	-27.0	
7.78	-66.8	V	3.0	-8.9	37.6	1.0	-45.5	-25.0	-20.5	
10.37	-67.4	V	3.0	-6.2	36.4	1.0	-41.6	-25.0	-16.6	
High Channel (2680MHz)										
5.36	-67.4	H	3.0	-13.8	38.6	1.0	-51.4	-25.0	-26.4	
8.04	-66.1	H	3.0	-7.6	37.4	1.0	-44.0	-25.0	-19.0	
10.72	-68.1	H	3.0	-6.7	36.6	1.0	-42.3	-25.0	-17.3	
5.36	-66.2	V	3.0	-12.9	38.6	1.0	-50.6	-25.0	-25.6	
8.04	-66.6	V	3.0	-8.4	37.4	1.0	-44.8	-25.0	-19.8	
10.72	-67.4	V	3.0	-5.8	36.6	1.0	-41.4	-25.0	-16.4	

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16QAM LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-65.9	H	3.0	-13.0	38.7	1.0	-50.7	-25.0	-25.7	
7.52	-66.2	H	3.0	-8.3	37.7	1.0	-45.1	-25.0	-20.1	
10.02	-67.1	H	3.0	-6.3	36.1	1.0	-41.4	-25.0	-16.4	
5.01	-65.1	V	3.0	-12.5	38.7	1.0	-50.2	-25.0	-25.2	
7.52	-66.0	V	3.0	-8.4	37.7	1.0	-45.1	-25.0	-20.1	
10.02	-68.3	V	3.0	-7.5	36.1	1.0	-42.7	-25.0	-17.7	
Mid Channel (2593MHz)										
5.19	-66.0	H	3.0	-12.7	38.7	1.0	-50.4	-25.0	-25.4	
7.78	-67.1	H	3.0	-8.9	37.6	1.0	-45.5	-25.0	-20.5	
10.37	-67.2	H	3.0	-6.1	36.4	1.0	-41.4	-25.0	-16.4	
5.19	-63.8	V	3.0	-10.8	38.7	1.0	-48.5	-25.0	-23.5	
7.78	-66.8	V	3.0	-8.9	37.6	1.0	-45.4	-25.0	-20.4	
10.37	-66.7	V	3.0	-5.5	36.4	1.0	-40.9	-25.0	-15.9	
High Channel (2680MHz)										
5.36	-58.5	H	3.0	-4.8	38.6	1.0	-42.5	-25.0	-17.5	
8.04	-66.7	H	3.0	-8.3	37.4	1.0	-44.7	-25.0	-19.7	
10.72	-68.0	H	3.0	-6.6	36.6	1.0	-42.2	-25.0	-17.2	
5.36	-57.0	V	3.0	-3.7	38.6	1.0	-41.3	-25.0	-16.3	
8.04	-66.5	V	3.0	-8.3	37.4	1.0	-44.7	-25.0	-19.7	
10.72	-67.1	V	3.0	-5.5	36.6	1.0	-41.1	-25.0	-16.1	

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9.1.12. LTE BAND 66

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-66.0	H	3.0	-16.7	38.5	1.0	-54.2	-13.0	-41.2	
5.16	-66.4	H	3.0	-13.2	38.7	1.0	-50.9	-13.0	-37.9	
6.88	-65.4	H	3.0	-8.5	38.1	1.0	-45.6	-13.0	-32.6	
3.44	-66.5	V	3.0	-17.4	38.5	1.0	-54.9	-13.0	-41.9	
5.16	-66.3	V	3.0	-13.4	38.7	1.0	-51.1	-13.0	-38.1	
6.88	-66.4	V	3.0	-9.7	38.1	1.0	-46.8	-13.0	-33.8	
Mid Channel (1745.0MHz)										
3.49	-65.8	H	3.0	-16.4	38.5	1.0	-53.9	-13.0	-40.9	
5.23	-66.3	H	3.0	-13.0	38.7	1.0	-50.7	-13.0	-37.7	
6.98	-65.6	H	3.0	-8.4	38.1	1.0	-45.5	-13.0	-32.5	
3.49	-66.2	V	3.0	-16.9	38.5	1.0	-54.5	-13.0	-41.5	
5.23	-66.2	V	3.0	-13.2	38.7	1.0	-50.9	-13.0	-37.9	
6.98	-65.5	V	3.0	-8.6	38.1	1.0	-45.7	-13.0	-32.7	
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	-66.7	H	3.0	-13.2	38.6	1.0	-50.8	-13.0	-37.8	
7.08	-66.5	H	3.0	-9.2	38.0	1.0	-46.2	-13.0	-33.2	
3.54	-66.6	V	3.0	-17.2	38.6	1.0	-54.8	-13.0	-41.8	
5.31	-67.2	V	3.0	-14.0	38.6	1.0	-51.7	-13.0	-38.7	
7.08	-67.1	V	3.0	-10.1	38.0	1.0	-47.1	-13.0	-34.1	

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16QAM LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-65.3	H	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
5.16	-64.6	H	3.0	-11.4	38.7	1.0	-49.1	-13.0	-36.1	
6.88	-64.9	H	3.0	-8.0	38.1	1.0	-45.1	-13.0	-32.1	
3.44	-65.7	V	3.0	-16.6	38.5	1.0	-54.1	-13.0	-41.1	
5.16	-66.7	V	3.0	-13.9	38.7	1.0	-51.5	-13.0	-38.5	
6.88	-65.8	V	3.0	-9.2	38.1	1.0	-46.3	-13.0	-33.3	
Mid Channel (1745.0MHz)										
3.49	-65.9	H	3.0	-16.4	38.5	1.0	-54.0	-13.0	-41.0	
5.23	-66.6	H	3.0	-13.3	38.7	1.0	-51.0	-13.0	-38.0	
6.98	-66.1	H	3.0	-9.0	38.1	1.0	-46.1	-13.0	-33.1	
3.49	-66.3	V	3.0	-17.1	38.5	1.0	-54.6	-13.0	-41.6	
5.23	-67.7	V	3.0	-14.7	38.7	1.0	-52.4	-13.0	-39.4	
6.98	-66.4	V	3.0	-9.5	38.1	1.0	-46.6	-13.0	-33.6	
High Channel (1770.0MHz)										
3.54	-66.1	H	3.0	-16.5	38.6	1.0	-54.1	-13.0	-41.1	
5.31	-67.5	H	3.0	-14.0	38.6	1.0	-51.6	-13.0	-38.6	
7.08	-67.2	H	3.0	-9.9	38.0	1.0	-47.0	-13.0	-34.0	
3.54	-65.4	V	3.0	-16.0	38.6	1.0	-53.5	-13.0	-40.5	
5.31	-67.1	V	3.0	-13.9	38.6	1.0	-51.6	-13.0	-38.6	
7.08	-67.2	V	3.0	-10.2	38.0	1.0	-47.2	-13.0	-34.2	

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9.2. FIELD STRENGTH OF SPURIOUS RADIATION, UAT 1

9.2.1. LTE BAND 2

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-64.3	H	3.0	-14.3	38.6	1.0	-51.9	-13.0	-38.9	
5.58	-67.1	H	3.0	-13.0	38.6	1.0	-50.6	-13.0	-37.6	
7.44	-64.9	H	3.0	-7.2	37.8	1.0	-44.0	-13.0	-31.0	
3.72	-64.1	V	3.0	-14.2	38.6	1.0	-51.8	-13.0	-38.8	
5.58	-66.1	V	3.0	-12.3	38.6	1.0	-49.8	-13.0	-36.8	
7.44	-65.7	V	3.0	-8.1	37.8	1.0	-44.9	-13.0	-31.9	
Mid Channel (1880MHz)										
3.76	-64.6	H	3.0	-14.5	38.6	1.0	-52.1	-13.0	-39.1	
5.64	-65.9	H	3.0	-11.6	38.5	1.0	-49.2	-13.0	-36.2	
7.52	-67.0	H	3.0	-9.2	37.7	1.0	-45.9	-13.0	-32.9	
3.76	-64.8	V	3.0	-14.8	38.6	1.0	-52.4	-13.0	-39.4	
5.64	-66.8	V	3.0	-12.9	38.5	1.0	-50.4	-13.0	-37.4	
7.52	-67.5	V	3.0	-9.9	37.7	1.0	-46.6	-13.0	-33.6	
High Channel (1900MHz)										
3.80	-64.5	H	3.0	-14.3	38.6	1.0	-52.0	-13.0	-39.0	
5.70	-66.3	H	3.0	-11.9	38.5	1.0	-49.5	-13.0	-36.5	
7.60	-67.1	H	3.0	-9.1	37.7	1.0	-45.8	-13.0	-32.8	
3.80	-63.9	V	3.0	-13.7	38.6	1.0	-51.4	-13.0	-38.4	
5.70	-67.0	V	3.0	-12.9	38.5	1.0	-50.5	-13.0	-37.5	
7.60	-67.1	V	3.0	-9.4	37.7	1.0	-46.1	-13.0	-33.1	

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16QAM LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-64.8	H	3.0	-14.8	38.6	1.0	-52.4	-13.0	-39.4	
5.58	-66.0	H	3.0	-11.9	38.6	1.0	-49.5	-13.0	-36.5	
7.44	-65.4	H	3.0	-7.7	37.8	1.0	-44.5	-13.0	-31.5	
3.72	-64.7	V	3.0	-14.8	38.6	1.0	-52.4	-13.0	-39.4	
5.58	-67.0	V	3.0	-13.2	38.6	1.0	-50.7	-13.0	-37.7	
7.44	-65.2	V	3.0	-7.7	37.8	1.0	-44.5	-13.0	-31.5	
Mid Channel (1880MHz)										
3.76	-64.4	H	3.0	-14.3	38.6	1.0	-51.9	-13.0	-38.9	
5.64	-66.3	H	3.0	-12.0	38.5	1.0	-49.6	-13.0	-36.6	
7.52	-67.1	H	3.0	-9.3	37.7	1.0	-46.1	-13.0	-33.1	
3.76	-63.3	V	3.0	-13.3	38.6	1.0	-50.9	-13.0	-37.9	
5.64	-66.6	V	3.0	-12.7	38.5	1.0	-50.2	-13.0	-37.2	
7.52	-66.1	V	3.0	-8.5	37.7	1.0	-45.2	-13.0	-32.2	
High Channel (1900MHz)										
3.80	-63.9	H	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3	
5.70	-66.8	H	3.0	-12.4	38.5	1.0	-49.9	-13.0	-36.9	
7.60	-65.3	H	3.0	-7.4	37.7	1.0	-44.1	-13.0	-31.1	
3.80	-64.7	V	3.0	-14.6	38.6	1.0	-52.2	-13.0	-39.2	
5.70	-66.6	V	3.0	-12.6	38.5	1.0	-50.1	-13.0	-37.1	
7.60	-67.0	V	3.0	-9.3	37.7	1.0	-46.0	-13.0	-33.0	

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9.2.2. LTE BAND 4

QPSK LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
Configuration: EUT Only
Mode: LTE Band 4, 3.0MHz 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 (1711.5MHz)										
3.44	-66.7	H	3.0	-17.4	38.5	1.0	-54.9	-13.0	-41.9	
5.16	-66.1	H	3.0	-12.9	38.7	1.0	-50.6	-13.0	-37.6	
6.88	-65.3	H	3.0	-8.4	38.1	1.0	-45.5	-13.0	-32.5	
3.44	-65.5	V	3.0	-16.4	38.5	1.0	-53.9	-13.0	-40.9	
5.16	-65.9	V	3.0	-13.0	38.7	1.0	-50.7	-13.0	-37.7	
6.88	-65.5	V	3.0	-8.9	38.1	1.0	-46.0	-13.0	-33.0	
Mid Channel (1732.5MHz)										
3.47	-66.4	H	3.0	-17.0	38.5	1.0	-54.6	-13.0	-41.6	
5.20	-66.7	H	3.0	-13.4	38.7	1.0	-51.1	-13.0	-38.1	
6.93	-65.8	H	3.0	-8.8	38.1	1.0	-45.9	-13.0	-32.9	
3.47	-65.3	V	3.0	-16.1	38.5	1.0	-53.6	-13.0	-40.6	
5.20	-65.2	V	3.0	-12.2	38.7	1.0	-49.9	-13.0	-36.9	
6.93	-64.7	V	3.0	-7.9	38.1	1.0	-45.0	-13.0	-32.0	
High Channel (1753.5MHz)										
3.49	-66.2	H	3.0	-16.8	38.5	1.0	-54.3	-13.0	-41.3	
5.24	-67.3	H	3.0	-13.9	38.7	1.0	-51.6	-13.0	-38.6	
6.98	-66.3	H	3.0	-9.1	38.1	1.0	-46.2	-13.0	-33.2	
3.49	-66.0	V	3.0	-16.7	38.5	1.0	-54.3	-13.0	-41.3	
5.24	-66.8	V	3.0	-13.8	38.7	1.0	-51.5	-13.0	-38.5	
6.98	-65.7	V	3.0	-8.8	38.1	1.0	-45.9	-13.0	-32.9	

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16QAM LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
Configuration: EUT Only
Mode: LTE Band 4, 3.0MHz 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 (1711.5MHz)										
3.44	-66.2	H	3.0	-16.9	38.5	1.0	-54.4	-13.0	-41.4	
5.16	-66.6	H	3.0	-13.4	38.7	1.0	-51.1	-13.0	-38.1	
6.88	-64.8	H	3.0	-7.9	38.1	1.0	-45.0	-13.0	-32.0	
3.44	-66.7	V	3.0	-17.6	38.5	1.0	-55.2	-13.0	-42.2	
5.16	-65.3	V	3.0	-12.4	38.7	1.0	-50.1	-13.0	-37.1	
6.88	-65.8	V	3.0	-9.2	38.1	1.0	-46.3	-13.0	-33.3	
Mid Channel (1732.5MHz)										
3.47	-66.3	H	3.0	-16.9	38.5	1.0	-54.4	-13.0	-41.4	
5.20	-66.4	H	3.0	-13.1	38.7	1.0	-50.8	-13.0	-37.8	
6.93	-66.2	H	3.0	-9.1	38.1	1.0	-46.2	-13.0	-33.2	
3.47	-66.6	V	3.0	-17.4	38.5	1.0	-55.0	-13.0	-42.0	
5.20	-65.7	V	3.0	-12.7	38.7	1.0	-50.4	-13.0	-37.4	
6.93	-65.3	V	3.0	-8.5	38.1	1.0	-45.6	-13.0	-32.6	
High Channel (1753.5MHz)										
3.49	-64.9	H	3.0	-15.4	38.5	1.0	-53.0	-13.0	-40.0	
5.24	-65.9	H	3.0	-12.5	38.7	1.0	-50.2	-13.0	-37.2	
6.98	-65.1	H	3.0	-7.9	38.1	1.0	-45.0	-13.0	-32.0	
3.49	-66.4	V	3.0	-17.2	38.5	1.0	-54.7	-13.0	-41.7	
5.24	-66.5	V	3.0	-13.5	38.7	1.0	-51.2	-13.0	-38.2	
6.98	-66.3	V	3.0	-9.4	38.1	1.0	-46.4	-13.0	-33.4	

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9.2.3. LTE BAND 5

QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-64.6	H	3.0	-22.1	37.8	1.0	-59.0	-13.0	-46.0	
2.49	-65.1	H	3.0	-20.0	38.5	1.0	-57.5	-13.0	-44.5	
3.32	-66.6	H	3.0	-17.6	38.5	1.0	-55.1	-13.0	-42.1	
1.66	-63.8	V	3.0	-21.6	37.8	1.0	-58.4	-13.0	-45.4	
2.49	-65.2	V	3.0	-19.9	38.5	1.0	-57.4	-13.0	-44.4	
3.32	-67.0	V	3.0	-18.3	38.5	1.0	-55.8	-13.0	-42.8	
Mid Channel (836.5MHz)										
1.67	-65.2	H	3.0	-22.7	37.8	1.0	-59.5	-13.0	-46.5	
2.51	-66.1	H	3.0	-20.9	38.6	1.0	-58.5	-13.0	-45.5	
3.35	-66.4	H	3.0	-17.3	38.5	1.0	-54.8	-13.0	-41.8	
1.67	-65.8	V	3.0	-23.6	37.8	1.0	-60.4	-13.0	-47.4	
2.51	-67.0	V	3.0	-21.6	38.6	1.0	-59.2	-13.0	-46.2	
3.35	-66.1	V	3.0	-17.2	38.5	1.0	-54.7	-13.0	-41.7	
High Channel (844MHz)										
1.69	-66.7	H	3.0	-24.2	37.9	1.0	-61.0	-13.0	-48.0	
2.53	-67.6	H	3.0	-22.3	38.6	1.0	-59.8	-13.0	-46.8	
3.38	-65.8	H	3.0	-16.7	38.5	1.0	-54.2	-13.0	-41.2	
1.69	-66.8	V	3.0	-24.4	37.9	1.0	-61.3	-13.0	-48.3	
2.53	-67.3	V	3.0	-21.8	38.6	1.0	-59.4	-13.0	-46.4	
3.38	-66.1	V	3.0	-17.2	38.5	1.0	-54.7	-13.0	-41.7	

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16QAM LTE BAND 5 (10.0MHZ BANDWIDTH)

UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-65.7	H	3.0	-24.2	37.8	1.0	-61.0	-13.0	-48.0	
2.49	-66.8	H	3.0	-23.7	38.5	1.0	-61.2	-13.0	-48.2	
3.32	-67.4	H	3.0	-21.4	38.5	1.0	-58.9	-13.0	-45.9	
1.66	-64.6	V	3.0	-22.8	37.8	1.0	-59.7	-13.0	-46.7	
2.49	-64.2	V	3.0	-20.1	38.5	1.0	-57.6	-13.0	-44.6	
3.32	-64.6	V	3.0	-18.7	38.5	1.0	-56.1	-13.0	-43.1	
Mid Channel (836.5MHz)										
1.67	-64.9	H	3.0	-23.5	37.8	1.0	-60.3	-13.0	-47.3	
2.51	-65.7	H	3.0	-22.5	38.6	1.0	-60.1	-13.0	-47.1	
3.35	-66.3	H	3.0	-20.3	38.5	1.0	-57.8	-13.0	-44.8	
1.67	-65.7	V	3.0	-23.9	37.8	1.0	-60.8	-13.0	-47.8	
2.51	-66.8	V	3.0	-22.6	38.6	1.0	-60.1	-13.0	-47.1	
3.35	-65.9	V	3.0	-19.9	38.5	1.0	-57.3	-13.0	-44.3	
High Channel (844MHz)										
1.69	-66.0	H	3.0	-24.5	37.9	1.0	-61.4	-13.0	-48.4	
2.53	-67.1	H	3.0	-23.8	38.6	1.0	-61.4	-13.0	-48.4	
3.38	-65.4	H	3.0	-19.3	38.5	1.0	-56.8	-13.0	-43.8	
1.69	-66.1	V	3.0	-24.4	37.9	1.0	-61.2	-13.0	-48.2	
2.53	-67.3	V	3.0	-23.0	38.6	1.0	-60.6	-13.0	-47.6	
3.38	-67.0	V	3.0	-20.9	38.5	1.0	-58.4	-13.0	-45.4	

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9.2.4. LTE BAND 7

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-67.2	H	3.0	-14.3	38.7	1.0	-52.0	-25.0	-27.0	
7.53	-68.7	H	3.0	-10.8	37.7	1.0	-47.6	-25.0	-22.6	
10.04	-68.5	H	3.0	-7.6	36.2	1.0	-42.8	-25.0	-17.8	
5.02	-67.5	V	3.0	-14.9	38.7	1.0	-52.5	-25.0	-27.5	
7.53	-68.2	V	3.0	-10.6	37.7	1.0	-47.3	-25.0	-22.3	
10.04	-68.2	V	3.0	-7.4	36.2	1.0	-42.5	-25.0	-17.5	
Mid Channel (2535MHz)										
5.07	-66.5	H	3.0	-13.5	38.7	1.0	-51.2	-25.0	-26.2	
7.61	-68.3	H	3.0	-10.4	37.7	1.0	-47.1	-25.0	-22.1	
10.14	-68.2	H	3.0	-7.3	36.2	1.0	-42.5	-25.0	-17.5	
5.07	-65.1	V	3.0	-12.4	38.7	1.0	-50.0	-25.0	-25.0	
7.61	-68.6	V	3.0	-10.9	37.7	1.0	-47.5	-25.0	-22.5	
10.14	-68.3	V	3.0	-7.4	36.2	1.0	-42.6	-25.0	-17.6	
High Channel (2560MHz)										
5.12	-67.3	H	3.0	-14.2	38.7	1.0	-51.9	-25.0	-26.9	
7.68	-68.0	H	3.0	-10.0	37.6	1.0	-46.6	-25.0	-21.6	
10.24	-67.4	H	3.0	-6.4	36.3	1.0	-41.7	-25.0	-16.7	
5.12	-66.9	V	3.0	-14.1	38.7	1.0	-51.8	-25.0	-26.8	
7.68	-68.2	V	3.0	-10.4	37.6	1.0	-47.1	-25.0	-22.1	
10.24	-68.0	V	3.0	-7.0	36.3	1.0	-42.2	-25.0	-17.2	

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16QAM LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-65.5	H	3.0	-12.6	38.7	1.0	-50.3	-25.0	-25.3	
7.53	-67.8	H	3.0	-10.0	37.7	1.0	-46.7	-25.0	-21.7	
10.04	-68.1	H	3.0	-7.2	36.2	1.0	-42.4	-25.0	-17.4	
5.02	-66.0	V	3.0	-13.4	38.7	1.0	-51.1	-25.0	-26.1	
7.53	-68.6	V	3.0	-11.0	37.7	1.0	-47.7	-25.0	-22.7	
10.04	-68.7	V	3.0	-7.9	36.2	1.0	-43.1	-25.0	-18.1	
Mid Channel (2535MHz)										
5.07	-66.4	H	3.0	-13.4	38.7	1.0	-51.0	-25.0	-26.0	
7.61	-68.1	H	3.0	-10.2	37.7	1.0	-46.9	-25.0	-21.9	
10.14	-67.4	H	3.0	-6.5	36.2	1.0	-41.7	-25.0	-16.7	
5.07	-66.4	V	3.0	-13.7	38.7	1.0	-51.4	-25.0	-26.4	
7.61	-67.5	V	3.0	-9.8	37.7	1.0	-46.5	-25.0	-21.5	
10.14	-67.3	V	3.0	-6.4	36.2	1.0	-41.6	-25.0	-16.6	
High Channel (2560MHz)										
5.12	-66.0	H	3.0	-12.9	38.7	1.0	-50.6	-25.0	-25.6	
7.68	-67.1	H	3.0	-9.1	37.6	1.0	-45.7	-25.0	-20.7	
10.24	-68.0	H	3.0	-7.0	36.3	1.0	-42.3	-25.0	-17.3	
5.12	-66.2	V	3.0	-13.4	38.7	1.0	-51.1	-25.0	-26.1	
7.68	-67.9	V	3.0	-10.1	37.6	1.0	-46.7	-25.0	-21.7	
10.24	-67.8	V	3.0	-6.8	36.3	1.0	-42.0	-25.0	-17.0	

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9.2.5. LTE BAND 12

QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-65.3	H	3.0	-23.7	38.1	1.0	-60.7	-13.0	-47.7	
2.11	-66.9	H	3.0	-23.3	38.0	1.0	-60.3	-13.0	-47.3	
2.82	-66.1	H	3.0	-19.0	38.4	1.0	-56.5	-13.0	-43.5	
1.41	-66.1	V	3.0	-25.1	38.1	1.0	-62.2	-13.0	-49.2	
2.11	-67.3	V	3.0	-23.2	38.0	1.0	-60.2	-13.0	-47.2	
2.82	-65.5	V	3.0	-18.6	38.4	1.0	-56.1	-13.0	-43.1	
Mid Channel (707.5MHz)										
1.42	-64.8	H	3.0	-23.1	38.0	1.0	-60.2	-13.0	-47.2	
2.12	-66.1	H	3.0	-22.5	38.0	1.0	-59.4	-13.0	-46.4	
2.83	-64.4	H	3.0	-17.2	38.4	1.0	-54.7	-13.0	-41.7	
1.42	-64.9	V	3.0	-23.9	38.0	1.0	-61.0	-13.0	-48.0	
2.12	-66.1	V	3.0	-22.0	38.0	1.0	-59.0	-13.0	-46.0	
2.83	-65.4	V	3.0	-18.4	38.4	1.0	-55.9	-13.0	-42.9	
High Channel (711MHz)										
1.42	-65.3	H	3.0	-23.6	38.0	1.0	-60.6	-13.0	-47.6	
2.13	-66.5	H	3.0	-22.9	38.0	1.0	-59.9	-13.0	-46.9	
2.84	-67.3	H	3.0	-20.1	38.4	1.0	-57.5	-13.0	-44.5	
1.42	-65.1	V	3.0	-24.1	38.0	1.0	-61.1	-13.0	-48.1	
2.13	-66.7	V	3.0	-22.5	38.0	1.0	-59.5	-13.0	-46.5	
2.84	-66.4	V	3.0	-19.4	38.4	1.0	-56.8	-13.0	-43.8	

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16QAM LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/01/17
Test Engineer: 10645
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	-65.7	H	3.0	-24.0	38.1	1.0	-61.1	-13.0	-48.1	
2.11	-66.1	H	3.0	-22.5	38.0	1.0	-59.5	-13.0	-46.5	
2.82	-66.3	H	3.0	-19.2	38.4	1.0	-56.7	-13.0	-43.7	
1.41	-64.9	V	3.0	-23.9	38.1	1.0	-61.0	-13.0	-48.0	
2.11	-65.8	V	3.0	-21.7	38.0	1.0	-58.7	-13.0	-45.7	
2.82	-66.6	V	3.0	-19.7	38.4	1.0	-57.2	-13.0	-44.2	
Mid Channel (707.5MHz)										
1.42	-65.7	H	3.0	-24.0	38.0	1.0	-61.1	-13.0	-48.1	
2.12	-66.6	H	3.0	-22.9	38.0	1.0	-59.9	-13.0	-46.9	
2.83	-65.7	H	3.0	-18.6	38.4	1.0	-56.0	-13.0	-43.0	
1.42	-65.7	V	3.0	-24.8	38.0	1.0	-61.8	-13.0	-48.8	
2.12	-65.3	V	3.0	-21.2	38.0	1.0	-58.1	-13.0	-45.1	
2.83	-66.1	V	3.0	-19.2	38.4	1.0	-56.6	-13.0	-43.6	
High Channel (711MHz)										
1.42	-65.0	H	3.0	-23.3	38.0	1.0	-60.3	-13.0	-47.3	
2.13	-67.1	H	3.0	-23.4	38.0	1.0	-60.4	-13.0	-47.4	
2.84	-65.8	H	3.0	-18.6	38.4	1.0	-56.0	-13.0	-43.0	
1.42	-64.7	V	3.0	-23.6	38.0	1.0	-60.7	-13.0	-47.7	
2.13	-64.6	V	3.0	-20.4	38.0	1.0	-57.4	-13.0	-44.4	
2.84	-65.0	V	3.0	-18.0	38.4	1.0	-55.5	-13.0	-42.5	

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9.2.6. LTE BAND 13

QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-66.1	H	3.0	-23.8	37.8	1.0	-60.6	-40.0	-20.6	
2.35	-67.8	H	3.0	-23.4	38.1	1.0	-60.5	-13.0	-47.5	
3.13	-66.3	H	3.0	-17.8	38.4	1.0	-55.2	-13.0	-42.2	
1.56	-66.1	V	3.0	-24.4	37.8	1.0	-61.2	-40.0	-21.2	
2.35	-66.9	V	3.0	-22.2	38.1	1.0	-59.4	-13.0	-46.4	
3.13	-67.6	V	3.0	-19.4	38.4	1.0	-56.8	-13.0	-43.8	

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16QAM LTE BAND 13 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-65.0	H	3.0	-22.7	37.8	1.0	-59.6	-40.0	-19.6	
2.35	-67.8	H	3.0	-23.3	38.1	1.0	-60.5	-13.0	-47.5	
3.13	-67.7	H	3.0	-19.2	38.4	1.0	-56.6	-13.0	-43.6	
1.56	-66.8	V	3.0	-25.1	37.8	1.0	-61.9	-40.0	-21.9	
2.35	-68.3	V	3.0	-23.7	38.1	1.0	-60.8	-13.0	-47.8	
3.13	-66.8	V	3.0	-18.7	38.4	1.0	-56.1	-13.0	-43.1	

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9.2.7. LTE BAND 17

QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 07/21/17
Test Engineer: 10641
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
Low Channel (709MHz)										
1.418	-63.5	H	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.127	-64.2	H	3.0	-20.6	38.0	1.0	-57.6	-13.0	-44.6	
2.836	-65.6	H	3.0	-18.4	38.4	1.0	-55.8	-13.0	-42.8	
1.418	-64.1	V	3.0	-23.1	38.0	1.0	-60.1	-13.0	-47.1	
2.127	-64.0	V	3.0	-19.8	38.0	1.0	-56.8	-13.0	-43.8	
2.836	-64.6	V	3.0	-17.6	38.4	1.0	-55.1	-13.0	-42.1	
Mid Channel (710MHz)										
1.420	-64.3	H	3.0	-22.6	38.0	1.0	-59.7	-13.0	-46.7	
2.130	-65.3	H	3.0	-21.7	38.0	1.0	-58.7	-13.0	-45.7	
2.840	-66.0	H	3.0	-18.8	38.4	1.0	-56.2	-13.0	-43.2	
1.420	-65.0	V	3.0	-24.0	38.0	1.0	-61.0	-13.0	-48.0	
2.130	-65.2	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.840	-66.3	V	3.0	-19.3	38.4	1.0	-56.7	-13.0	-43.7	
High Channel (711MHz)										
1.422	-64.1	H	3.0	-22.4	38.0	1.0	-59.5	-13.0	-46.5	
2.133	-65.0	H	3.0	-21.3	38.0	1.0	-58.3	-13.0	-45.3	
2.844	-65.9	H	3.0	-18.6	38.4	1.0	-56.1	-13.0	-43.1	
1.422	-64.0	V	3.0	-23.0	38.0	1.0	-60.0	-13.0	-47.0	
2.133	-65.0	V	3.0	-20.8	38.0	1.0	-57.8	-13.0	-44.8	
2.844	-64.4	V	3.0	-17.4	38.4	1.0	-54.8	-13.0	-41.8	

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16QAM LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 07/21/17
Test Engineer: 10641
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
Low Channel (709MHz)										
1.418	-64.3	H	3.0	-22.6	38.0	1.0	-59.6	-13.0	-46.6	
2.127	-63.7	H	3.0	-20.0	38.0	1.0	-57.0	-13.0	-44.0	
2.836	-65.3	H	3.0	-18.1	38.4	1.0	-55.6	-13.0	-42.6	
1.418	-64.8	V	3.0	-23.8	38.0	1.0	-60.8	-13.0	-47.8	
2.127	-65.5	V	3.0	-21.4	38.0	1.0	-58.3	-13.0	-45.3	
2.836	-64.8	V	3.0	-17.8	38.4	1.0	-55.2	-13.0	-42.2	
Mid Channel (710MHz)										
1.420	-64.3	H	3.0	-22.5	38.0	1.0	-59.6	-13.0	-46.6	
2.130	-65.3	H	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.840	-65.8	H	3.0	-18.5	38.4	1.0	-56.0	-13.0	-43.0	
1.420	-64.5	V	3.0	-23.5	38.0	1.0	-60.5	-13.0	-47.5	
2.130	-65.3	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.840	-65.4	V	3.0	-18.4	38.4	1.0	-55.8	-13.0	-42.8	
High Channel (711MHz)										
1.422	-64.4	H	3.0	-22.7	38.0	1.0	-59.7	-13.0	-46.7	
2.133	-64.1	H	3.0	-20.4	38.0	1.0	-57.4	-13.0	-44.4	
2.844	-65.5	H	3.0	-18.2	38.4	1.0	-55.7	-13.0	-42.7	
1.422	-64.5	V	3.0	-23.5	38.0	1.0	-60.5	-13.0	-47.5	
2.133	-65.3	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.844	-64.8	V	3.0	-17.8	38.4	1.0	-55.2	-13.0	-42.2	

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9.2.8. LTE BAND 25

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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 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	-65.6	H	3.0	-15.5	38.6	1.0	-53.2	-13.0	-40.2	
5.58	-67.2	H	3.0	-13.1	38.6	1.0	-50.7	-13.0	-37.7	
7.44	-68.2	H	3.0	-10.4	37.8	1.0	-47.2	-13.0	-34.2	
3.72	-66.6	V	3.0	-16.7	38.6	1.0	-54.3	-13.0	-41.3	
5.58	-68.0	V	3.0	-14.2	38.6	1.0	-51.8	-13.0	-38.8	
7.44	-67.5	V	3.0	-9.9	37.8	1.0	-46.7	-13.0	-33.7	
Mid Channel (1882.5MHz)										
3.77	-66.0	H	3.0	-15.8	38.6	1.0	-53.5	-13.0	-40.5	
5.65	-66.6	H	3.0	-12.3	38.5	1.0	-49.9	-13.0	-36.9	
7.53	-68.9	H	3.0	-11.0	37.7	1.0	-47.8	-13.0	-34.8	
3.77	-65.1	V	3.0	-15.0	38.6	1.0	-52.7	-13.0	-39.7	
5.65	-67.0	V	3.0	-13.0	38.5	1.0	-50.6	-13.0	-37.6	
7.53	-67.5	V	3.0	-9.9	37.7	1.0	-46.6	-13.0	-33.6	
High Channel (1905MHz)										
3.81	-65.6	H	3.0	-15.4	38.6	1.0	-53.0	-13.0	-40.0	
5.72	-66.9	H	3.0	-12.5	38.5	1.0	-50.0	-13.0	-37.0	
7.62	-68.1	H	3.0	-10.2	37.7	1.0	-46.9	-13.0	-33.9	
3.81	-66.0	V	3.0	-15.8	38.6	1.0	-53.5	-13.0	-40.5	
5.72	-68.5	V	3.0	-14.4	38.5	1.0	-51.9	-13.0	-38.9	
7.62	-67.8	V	3.0	-10.1	37.7	1.0	-46.8	-13.0	-33.8	

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16QAM LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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 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	-66.1	H	3.0	-16.1	38.6	1.0	-53.7	-13.0	-40.7	
5.58	-66.4	H	3.0	-12.3	38.6	1.0	-49.9	-13.0	-36.9	
7.44	-67.8	H	3.0	-10.1	37.8	1.0	-46.9	-13.0	-33.9	
3.72	-65.6	V	3.0	-15.7	38.6	1.0	-53.3	-13.0	-40.3	
5.58	-66.8	V	3.0	-13.0	38.6	1.0	-50.6	-13.0	-37.6	
7.44	-68.3	V	3.0	-10.8	37.8	1.0	-47.6	-13.0	-34.6	
Mid Channel (1882.5MHz)										
3.77	-65.6	H	3.0	-15.5	38.6	1.0	-53.1	-13.0	-40.1	
5.65	-67.3	H	3.0	-13.1	38.5	1.0	-50.6	-13.0	-37.6	
7.53	-67.0	H	3.0	-9.2	37.7	1.0	-45.9	-13.0	-32.9	
3.77	-65.6	V	3.0	-15.5	38.6	1.0	-53.2	-13.0	-40.2	
5.65	-67.3	V	3.0	-13.4	38.5	1.0	-50.9	-13.0	-37.9	
7.53	-67.8	V	3.0	-10.2	37.7	1.0	-46.9	-13.0	-33.9	
High Channel (1905MHz)										
3.81	-66.0	H	3.0	-15.8	38.6	1.0	-53.4	-13.0	-40.4	
5.72	-68.0	H	3.0	-13.6	38.5	1.0	-51.1	-13.0	-38.1	
7.62	-67.9	H	3.0	-9.9	37.7	1.0	-46.6	-13.0	-33.6	
3.81	-65.3	V	3.0	-15.1	38.6	1.0	-52.7	-13.0	-39.7	
5.72	-68.1	V	3.0	-14.0	38.5	1.0	-51.5	-13.0	-38.5	
7.62	-68.0	V	3.0	-10.3	37.7	1.0	-47.0	-13.0	-34.0	

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9.2.9. LTE BAND 26

QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-66.5	H	3.0	-24.1	37.8	1.0	-60.9	-13.0	-47.9	
2.46	-65.4	H	3.0	-20.5	38.4	1.0	-57.9	-13.0	-44.9	
3.28	-67.1	H	3.0	-18.2	38.5	1.0	-55.7	-13.0	-42.7	
1.64	-66.8	V	3.0	-24.7	37.8	1.0	-61.5	-13.0	-48.5	
2.46	-66.4	V	3.0	-21.3	38.4	1.0	-58.7	-13.0	-45.7	
3.28	-67.4	V	3.0	-18.8	38.5	1.0	-56.2	-13.0	-43.2	

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16QAM LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-66.5	H	3.0	-24.1	37.8	1.0	-60.9	-13.0	-47.9	
2.46	-66.0	H	3.0	-21.0	38.4	1.0	-58.5	-13.0	-45.5	
3.28	-67.7	H	3.0	-18.8	38.5	1.0	-56.3	-13.0	-43.3	
1.64	-66.6	V	3.0	-24.5	37.8	1.0	-61.3	-13.0	-48.3	
2.46	-66.7	V	3.0	-21.6	38.4	1.0	-59.1	-13.0	-46.1	
3.28	-67.7	V	3.0	-19.0	38.5	1.0	-56.5	-13.0	-43.5	

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9.2.10. LTE BAND 30

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-69.0	H	3.0	-15.3	37.9	1.0	-52.2	-40.0	-12.2	
6.93	-70.2	H	3.0	-11.6	36.5	1.0	-47.1	-40.0	-7.1	
9.24	-71.3	H	3.0	-9.8	34.9	1.0	-43.7	-40.0	-3.7	
4.62	-69.2	V	3.0	-15.4	37.9	1.0	-52.3	-40.0	-12.3	
6.93	-69.3	V	3.0	-9.8	36.5	1.0	-45.3	-40.0	-5.3	
9.24	-70.6	V	3.0	-8.8	34.9	1.0	-42.7	-40.0	-2.7	

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16QAM LTE BAND 30 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-70.6	H	3.0	-16.8	37.9	1.0	-53.7	-40.0	-13.7	
6.93	-69.0	H	3.0	-10.4	36.5	1.0	-45.8	-40.0	-5.8	
9.24	-71.8	H	3.0	-10.3	34.9	1.0	-44.1	-40.0	-4.1	
4.62	-71.1	V	3.0	-17.4	37.9	1.0	-54.3	-40.0	-14.3	
6.93	-70.2	V	3.0	-10.7	36.5	1.0	-46.2	-40.0	-6.2	
9.24	-71.6	V	3.0	-9.8	34.9	1.0	-43.6	-40.0	-3.6	

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9.2.11. LTE BAND 41

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-65.5	H	3.0	-12.7	38.7	1.0	-50.3	-25.0	-25.3	
7.52	-66.1	H	3.0	-8.3	37.7	1.0	-45.1	-25.0	-20.1	
10.02	-68.2	H	3.0	-7.3	36.1	1.0	-42.5	-25.0	-17.5	
5.01	-66.1	V	3.0	-13.5	38.7	1.0	-51.2	-25.0	-26.2	
7.52	-67.3	V	3.0	-9.7	37.7	1.0	-46.4	-25.0	-21.4	
10.02	-68.1	V	3.0	-7.3	36.1	1.0	-42.5	-25.0	-17.5	
Mid Channel (2593MHz)										
5.19	-67.1	H	3.0	-13.9	38.7	1.0	-51.5	-25.0	-26.5	
7.78	-67.3	H	3.0	-9.2	37.6	1.0	-45.8	-25.0	-20.8	
10.37	-67.5	H	3.0	-6.4	36.4	1.0	-41.7	-25.0	-16.7	
5.19	-67.7	V	3.0	-14.8	38.7	1.0	-52.4	-25.0	-27.4	
7.78	-66.4	V	3.0	-8.4	37.6	1.0	-45.0	-25.0	-20.0	
10.37	-65.8	V	3.0	-4.7	36.4	1.0	-40.0	-25.0	-15.0	
High Channel (2680MHz)										
5.36	-67.3	H	3.0	-13.7	38.6	1.0	-51.3	-25.0	-26.3	
8.04	-67.4	H	3.0	-8.9	37.4	1.0	-45.3	-25.0	-20.3	
10.72	-66.7	H	3.0	-5.3	36.6	1.0	-40.9	-25.0	-15.9	
5.36	-67.1	V	3.0	-13.8	38.6	1.0	-51.4	-25.0	-26.4	
8.04	-67.5	V	3.0	-9.2	37.4	1.0	-45.6	-25.0	-20.6	
10.72	-65.8	V	3.0	-4.2	36.6	1.0	-39.8	-25.0	-14.8	

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16QAM LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-65.4	H	3.0	-12.5	38.7	1.0	-50.2	-25.0	-25.2	
7.52	-67.3	H	3.0	-9.5	37.7	1.0	-46.2	-25.0	-21.2	
10.02	-67.9	H	3.0	-7.1	36.1	1.0	-42.2	-25.0	-17.2	
5.01	-66.3	V	3.0	-13.7	38.7	1.0	-51.4	-25.0	-26.4	
7.52	-67.1	V	3.0	-9.5	37.7	1.0	-46.2	-25.0	-21.2	
10.02	-67.1	V	3.0	-6.3	36.1	1.0	-41.4	-25.0	-16.4	
Mid Channel (2593MHz)										
5.19	-67.3	H	3.0	-14.1	38.7	1.0	-51.8	-25.0	-26.8	
7.78	-66.3	H	3.0	-8.1	37.6	1.0	-44.7	-25.0	-19.7	
10.37	-66.8	H	3.0	-5.7	36.4	1.0	-41.0	-25.0	-16.0	
5.19	-66.8	V	3.0	-13.9	38.7	1.0	-51.6	-25.0	-26.6	
7.78	-66.7	V	3.0	-8.7	37.6	1.0	-45.3	-25.0	-20.3	
10.37	-66.3	V	3.0	-5.1	36.4	1.0	-40.4	-25.0	-15.4	
High Channel (2680MHz)										
5.36	-67.8	H	3.0	-14.1	38.6	1.0	-51.8	-25.0	-26.8	
8.04	-66.5	H	3.0	-8.1	37.4	1.0	-44.5	-25.0	-19.5	
10.72	-66.5	H	3.0	-5.1	36.6	1.0	-40.7	-25.0	-15.7	
5.36	-67.3	V	3.0	-14.0	38.6	1.0	-51.6	-25.0	-26.6	
8.04	-67.8	V	3.0	-9.5	37.4	1.0	-45.9	-25.0	-20.9	
10.72	-66.4	V	3.0	-4.8	36.6	1.0	-40.4	-25.0	-15.4	

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9.2.12. LTE BAND 66

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-66.0	H	3.0	-16.7	38.5	1.0	-54.2	-13.0	-41.2	
5.16	-64.8	H	3.0	-11.6	38.7	1.0	-49.3	-13.0	-36.3	
6.88	-64.9	H	3.0	-8.0	38.1	1.0	-45.1	-13.0	-32.1	
3.44	-65.9	V	3.0	-16.8	38.5	1.0	-54.3	-13.0	-41.3	
5.16	-66.0	V	3.0	-13.1	38.7	1.0	-50.8	-13.0	-37.8	
6.88	-65.2	V	3.0	-8.5	38.1	1.0	-45.6	-13.0	-32.6	
Mid Channel (1745.0MHz)										
3.49	-65.8	H	3.0	-16.4	38.5	1.0	-53.9	-13.0	-40.9	
5.23	-66.2	H	3.0	-12.8	38.7	1.0	-50.5	-13.0	-37.5	
6.98	-66.1	H	3.0	-8.9	38.1	1.0	-46.0	-13.0	-33.0	
3.49	-66.5	V	3.0	-17.2	38.5	1.0	-54.8	-13.0	-41.8	
5.23	-66.1	V	3.0	-13.0	38.7	1.0	-50.7	-13.0	-37.7	
6.98	-66.5	V	3.0	-9.6	38.1	1.0	-46.7	-13.0	-33.7	
High Channel (1770.0MHz)										
3.54	-66.8	H	3.0	-17.2	38.6	1.0	-54.8	-13.0	-41.8	
5.31	-66.6	H	3.0	-13.0	38.6	1.0	-50.7	-13.0	-37.7	
7.08	-65.8	H	3.0	-8.5	38.0	1.0	-45.6	-13.0	-32.6	
3.54	-66.8	V	3.0	-17.4	38.6	1.0	-55.0	-13.0	-42.0	
5.31	-66.3	V	3.0	-13.1	38.6	1.0	-50.8	-13.0	-37.8	
7.08	-66.4	V	3.0	-9.3	38.0	1.0	-46.3	-13.0	-33.3	

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16QAM LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 11792114
Date: 06/02/17
Test Engineer: 10641
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	-66.9	H	3.0	-17.6	38.5	1.0	-55.1	-13.0	-42.1	
5.16	-66.8	H	3.0	-13.6	38.7	1.0	-51.3	-13.0	-38.3	
6.88	-65.0	H	3.0	-8.1	38.1	1.0	-45.2	-13.0	-32.2	
3.44	-67.2	V	3.0	-18.1	38.5	1.0	-55.6	-13.0	-42.6	
5.16	-65.5	V	3.0	-12.6	38.7	1.0	-50.3	-13.0	-37.3	
6.88	-65.5	V	3.0	-8.8	38.1	1.0	-46.0	-13.0	-33.0	
Mid Channel (1745.0MHz)										
3.49	-65.4	H	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
5.23	-64.3	H	3.0	-10.9	38.7	1.0	-48.6	-13.0	-35.6	
6.98	-65.1	H	3.0	-7.9	38.1	1.0	-45.0	-13.0	-32.0	
3.49	-66.6	V	3.0	-17.3	38.5	1.0	-54.9	-13.0	-41.9	
5.23	-65.3	V	3.0	-12.3	38.7	1.0	-49.9	-13.0	-36.9	
6.98	-65.1	V	3.0	-8.2	38.1	1.0	-45.3	-13.0	-32.3	
High Channel (1770.0MHz)										
3.54	-66.9	H	3.0	-17.3	38.6	1.0	-54.9	-13.0	-41.9	
5.31	-66.1	H	3.0	-12.6	38.6	1.0	-50.2	-13.0	-37.2	
7.08	-65.2	H	3.0	-7.9	38.0	1.0	-45.0	-13.0	-32.0	
3.54	-66.5	V	3.0	-17.1	38.6	1.0	-54.7	-13.0	-41.7	
5.31	-66.9	V	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3	
7.08	-65.4	V	3.0	-8.4	38.0	1.0	-45.4	-13.0	-32.4	

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