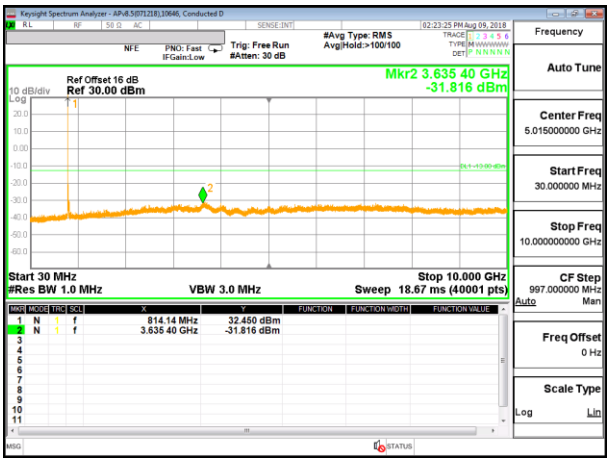
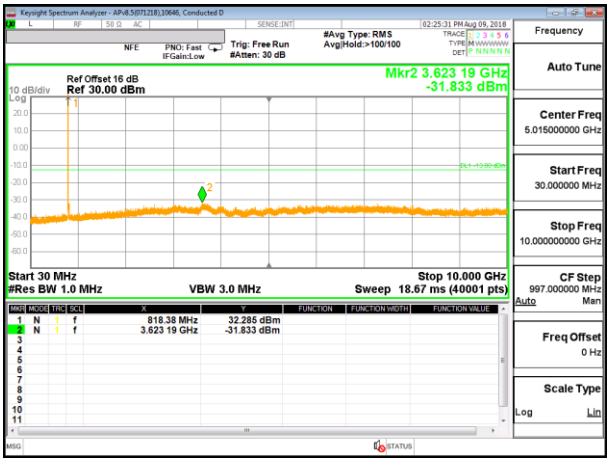
8.3.9. LTE BAND 26 (PART 90S)

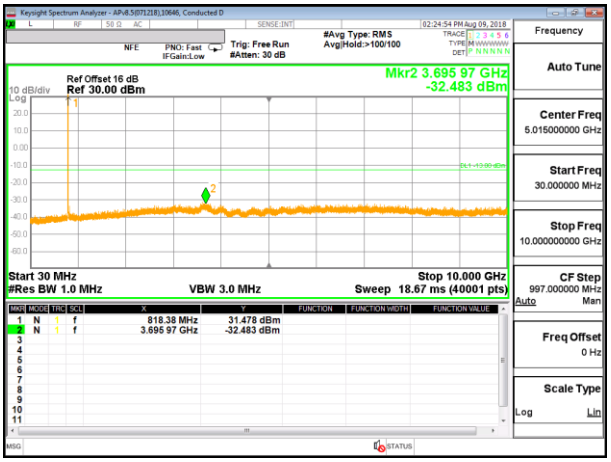


LTE B26 1.4MHz QPSK Low Channel RB1-0

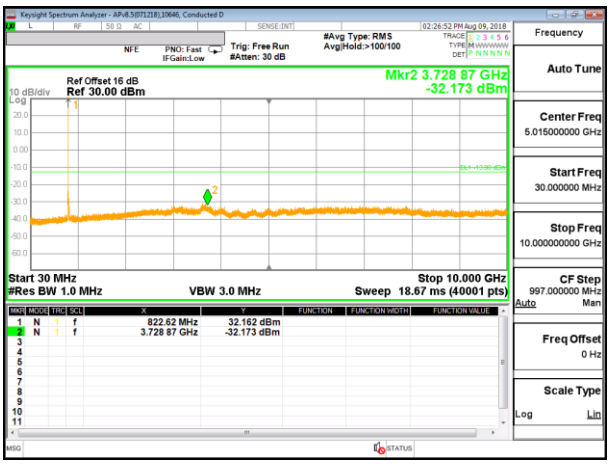
LTE B26 1.4MHz 16QAM Low Channel RB1-0



LTE B26 1.4MHz QPSK Middle Channel RB1-0



LTE B26 1.4MHz 16QAM Middle Channel RB1-0



LTE B26 1.4MHz QPSK High Channel RB1-0

LTE B26 1.4MHz 16QAM High Channel RB1-0

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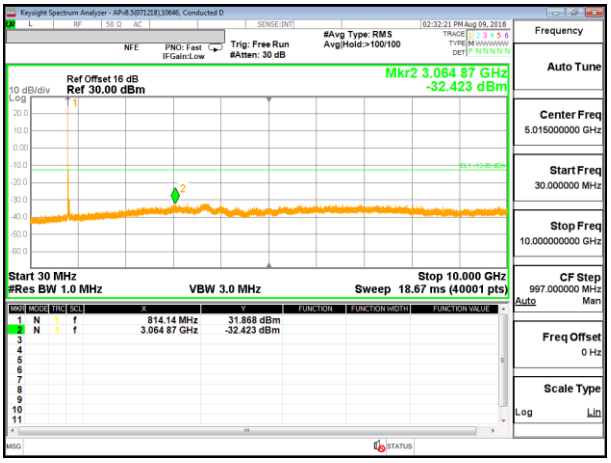

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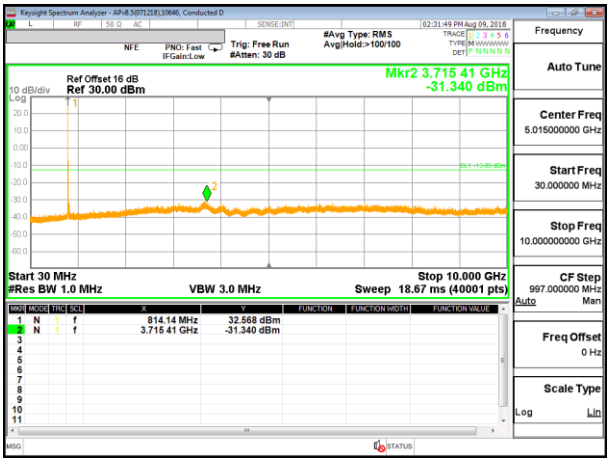
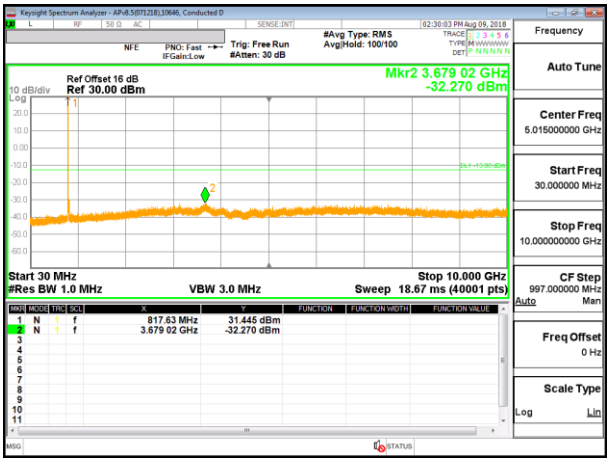
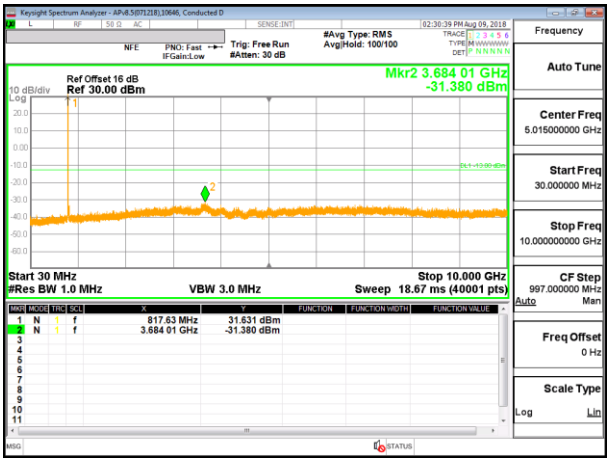


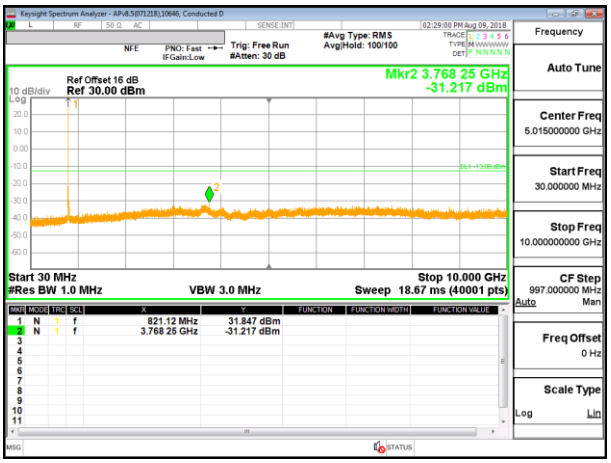
LTE B26 3MHz 16QAM Low Channel RB1-0



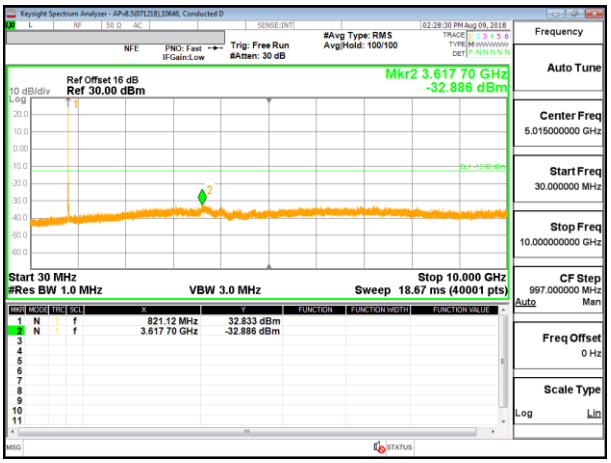
LTE B26 3MHz QPSK Middle Channel RB1-0



LTE B26 3MHz 16QAM Middle Channel RB1-0



LTE B26 3MHz QPSK High Channel RB1-0



LTE B26 3MHz 16QAM High Channel RB1-0

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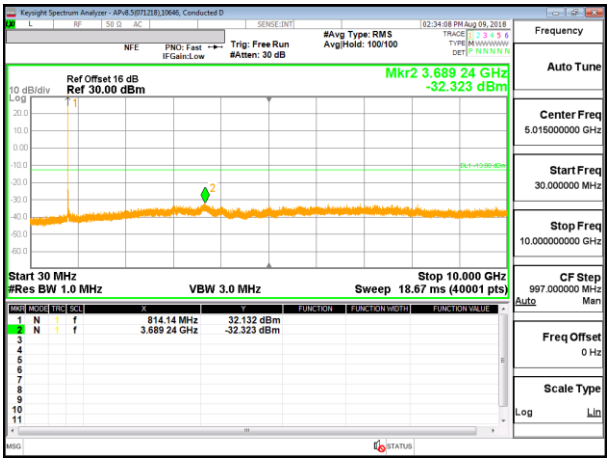
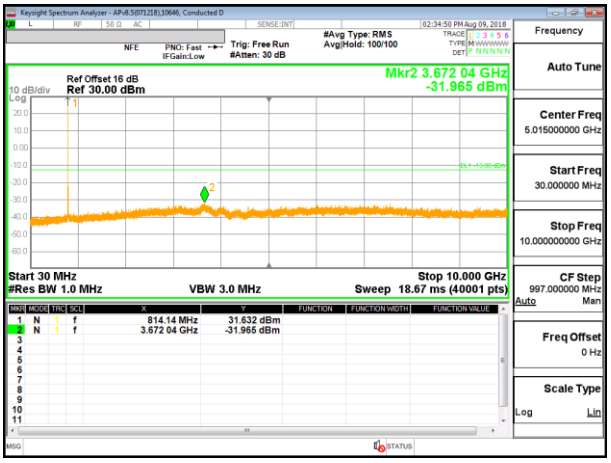
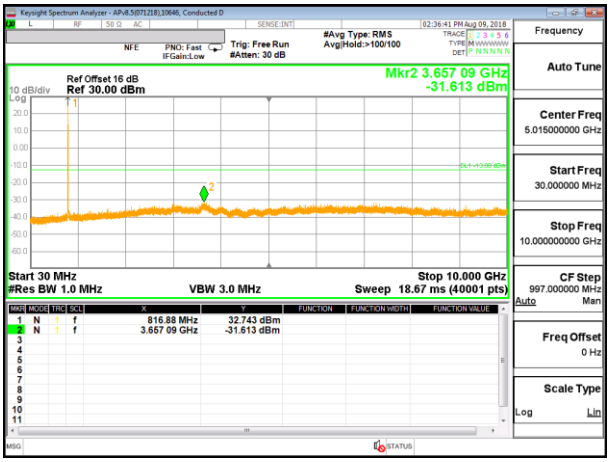


LTE B26 5MHz QPSK Low Channel RB1-0

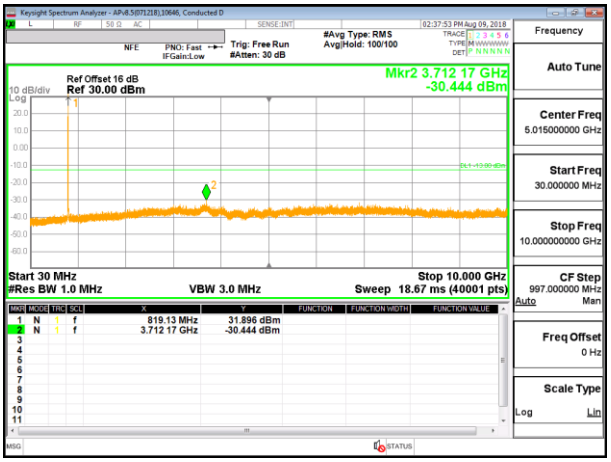


LTE B26 5MHz 16QAM Low Channel RB1-0

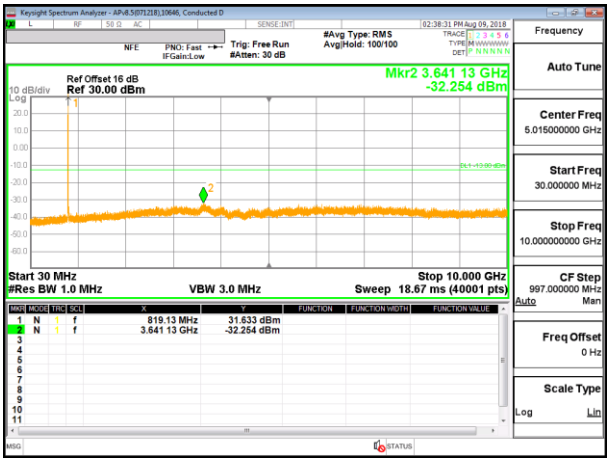


LTE B26 5MHz QPSK Middle Channel RB1-0

LTE B26 5MHz 16QAM Middle Channel RB1-0



LTE B26 5MHz QPSK High Channel RB1-0



LTE B26 5MHz 16QAM High Channel RB1-0

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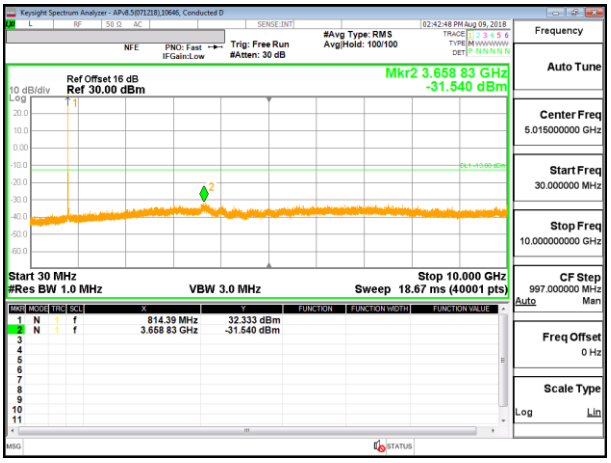
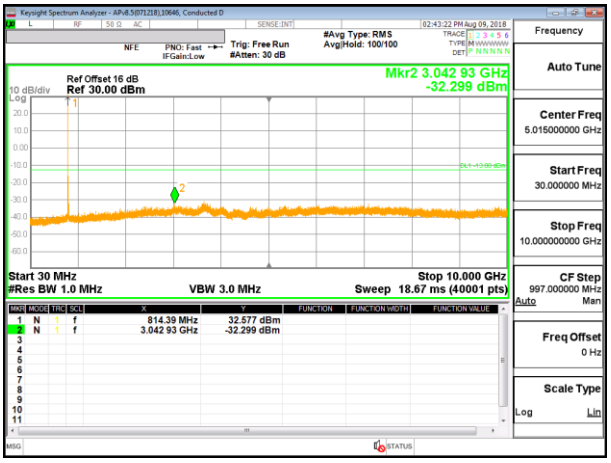


LTE B26 10MHz QPSK Middle Channel RB1-0



LTE B26 10MHz 16QAM Middle Channel RB1-0

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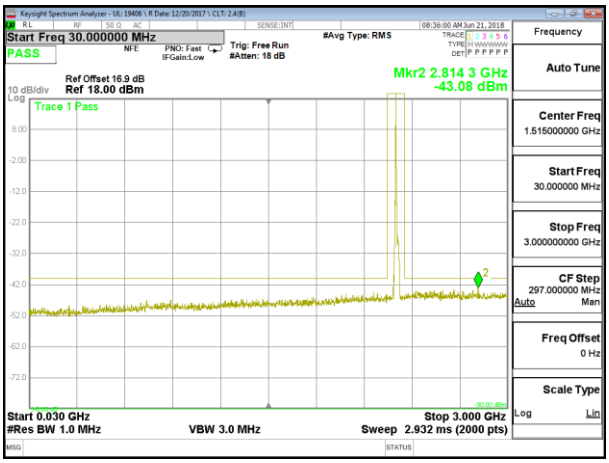
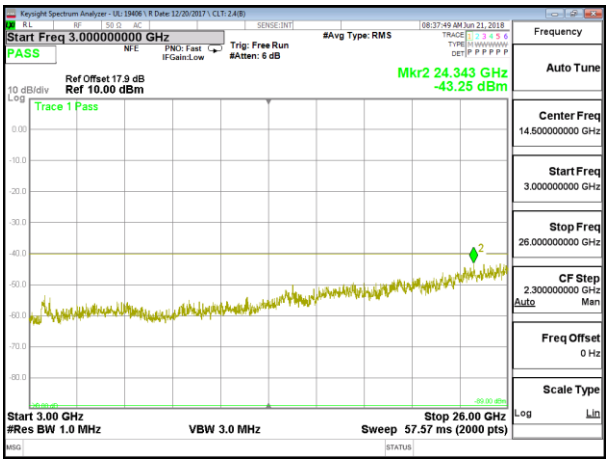
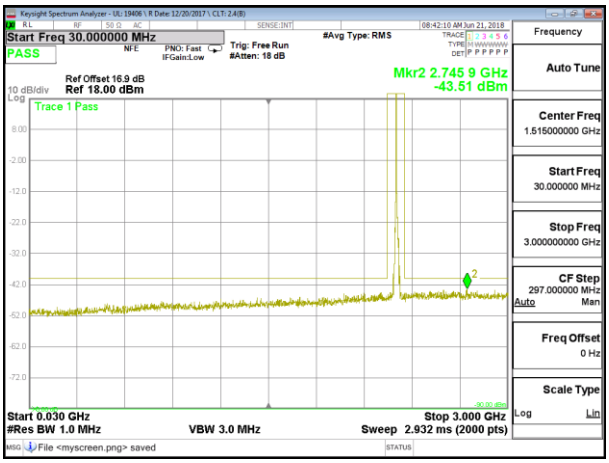
8.3.10. LTE BAND 30



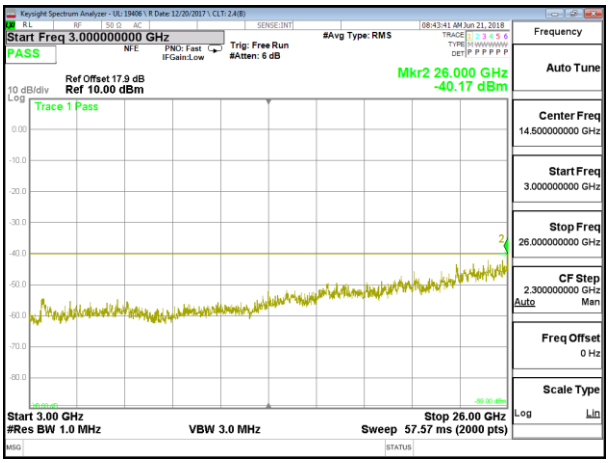
LTE B30 5MHz QPSK Low Channel RB1-0 30MHz-3GHz



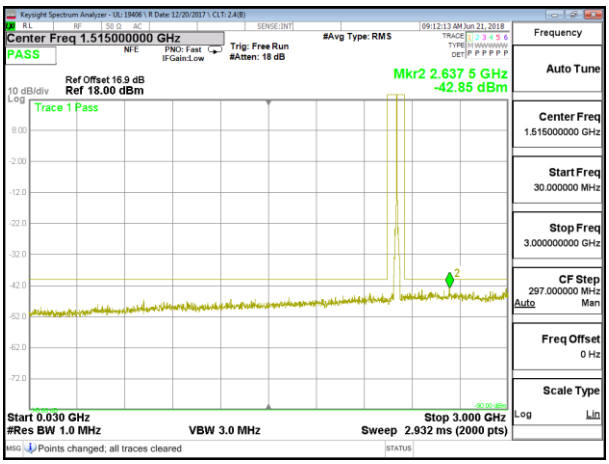
LTE B30 5MHz QPSK Low Channel RB1-0 3GHz-26GHz



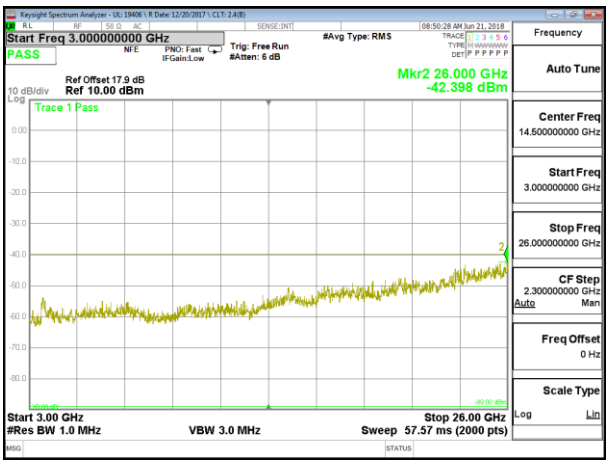
LTE B30 5MHz QPSK Middle Channel RB1-0 30MHz-3GHz



LTE B30 5MHz QPSK Middle Channel RB1-0 3GHz-26GHz



LTE B30 5MHz QPSK High Channel RB1-0 30MHz-3GHz



LTE B30 5MHz QPSK High Channel RB1-0 3GHz-26GHz

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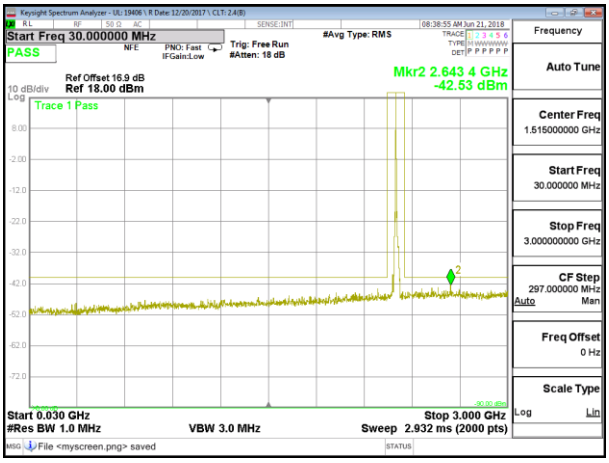
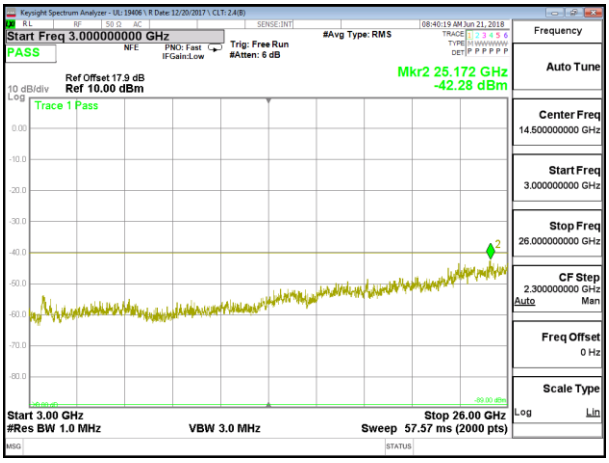
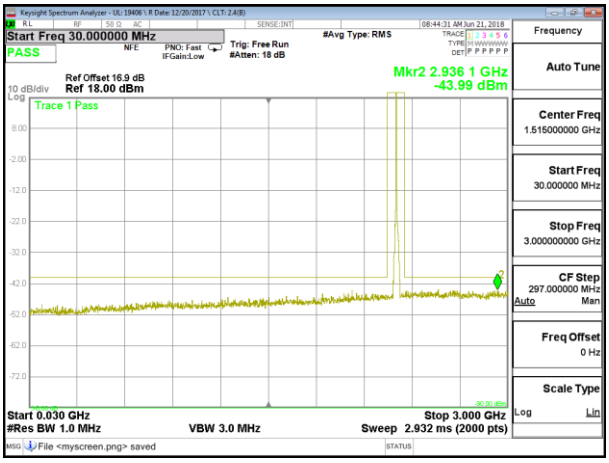


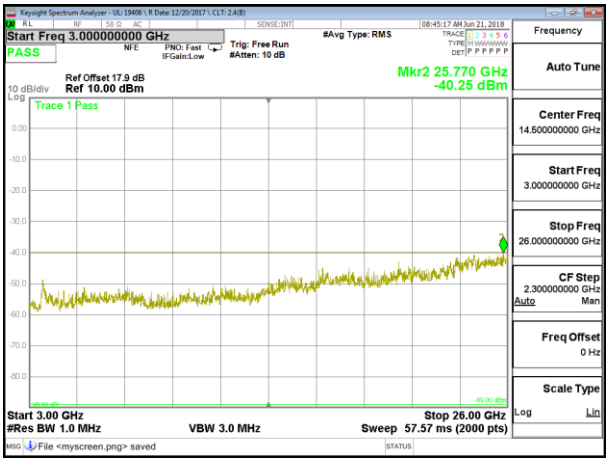
LTE B30 5MHz 16QAM Low Channel RB1-0 30MHz-3GHz



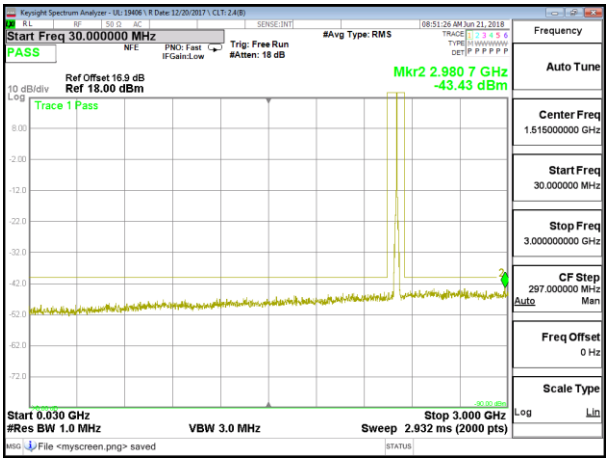
LTE B30 5MHz 16QAM Low Channel RB1-0 3GHz-26GHz



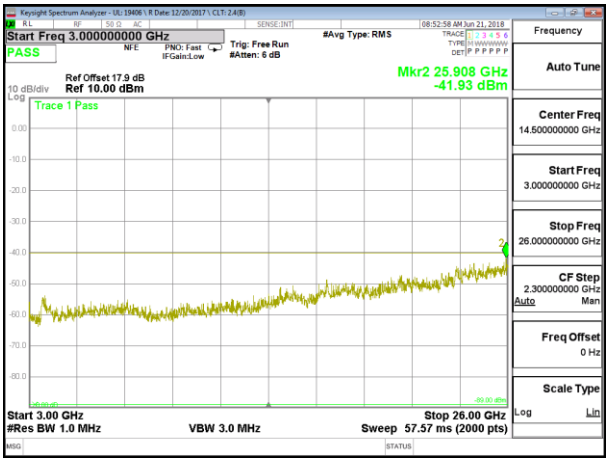
LTE B30 5MHz 16QAM Middle Channel RB1-0 30MHz-3GHz



LTE B30 5MHz 16QAM Middle Channel RB1-0 3GHz-26GHz



LTE B30 5MHz 16QAM High Channel RB1-0 30MHz-3GHz



LTE B30 5MHz 16QAM High Channel RB1-0 3GHz-26GHz

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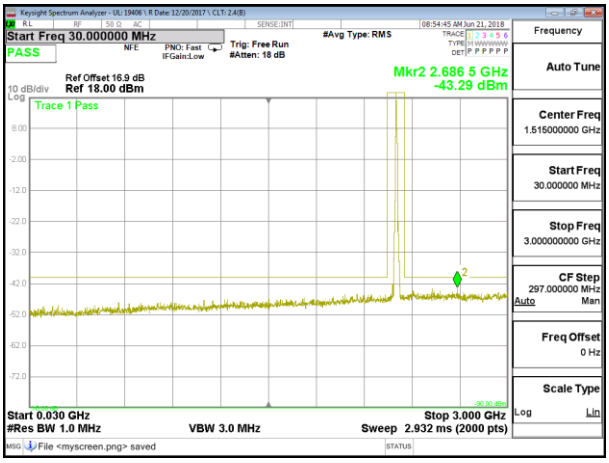
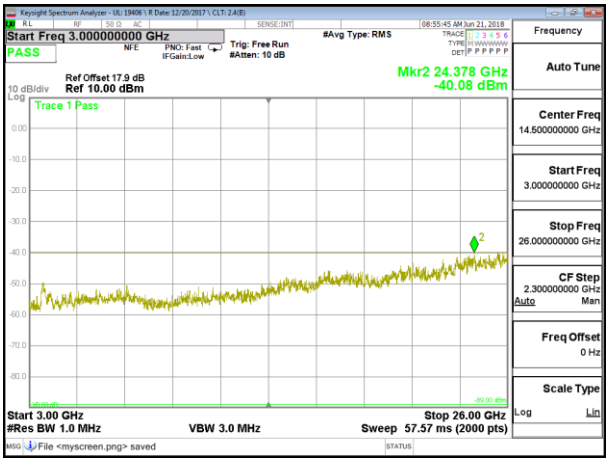
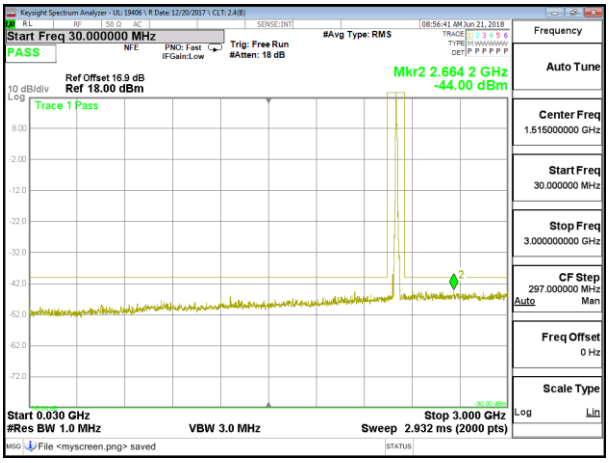


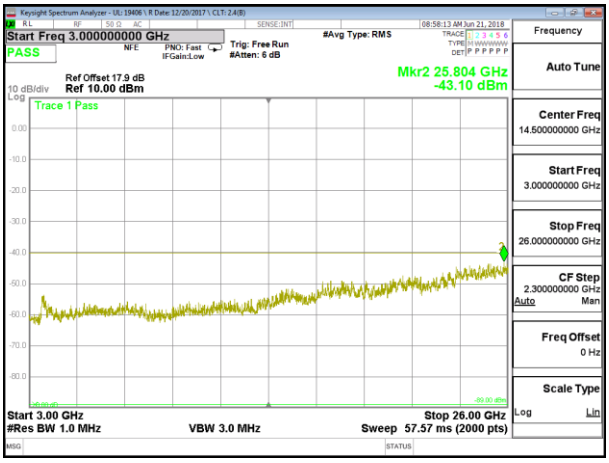
LTE B30 10MHz QPSK Middle Channel RB1-0 30MHz-3GHz



LTE B30 10MHz QPSK Middle Channel RB1-0 3GHz-26GHz



LTE B30 10MHz 16QAM Middle Channel RB1-0 30MHz-3GHz



LTE B30 10MHz 16QAM Middle Channel RB1-0 3GHz-26GHz

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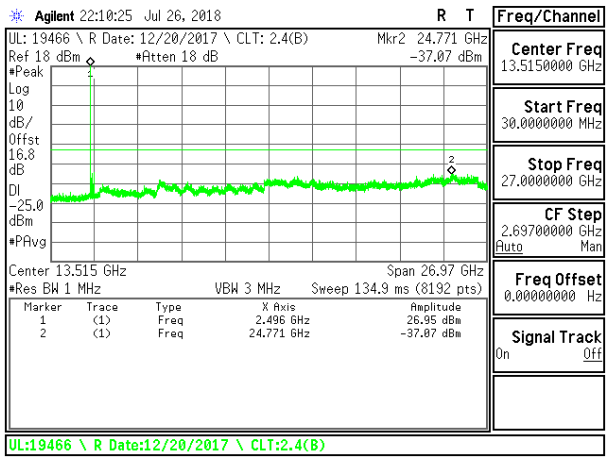
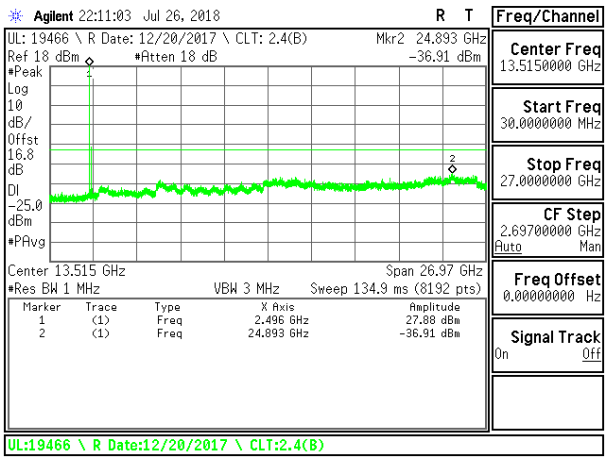
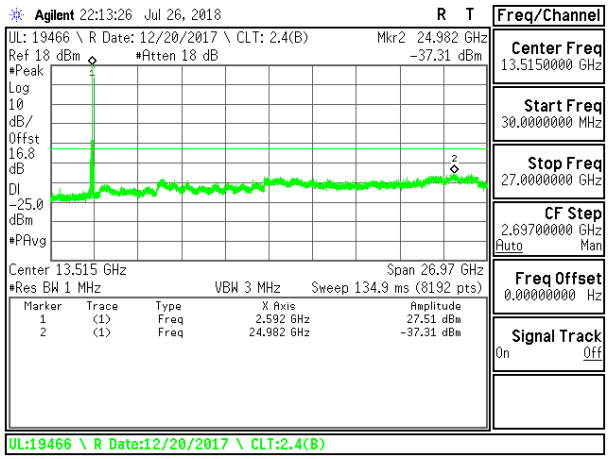
8.3.11. LTE BAND 41



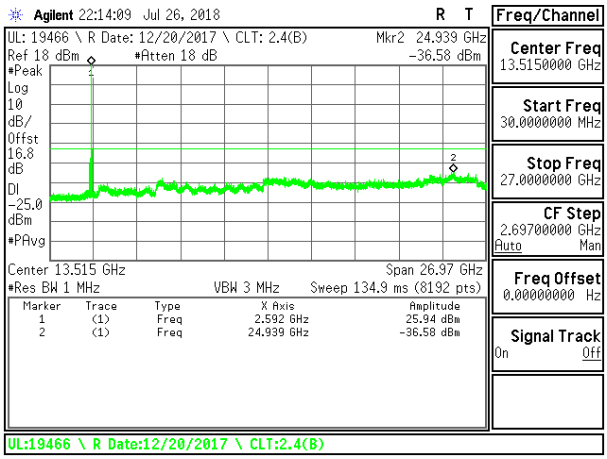
LTE B41 5MHz QPSK Low Channel RB1-0



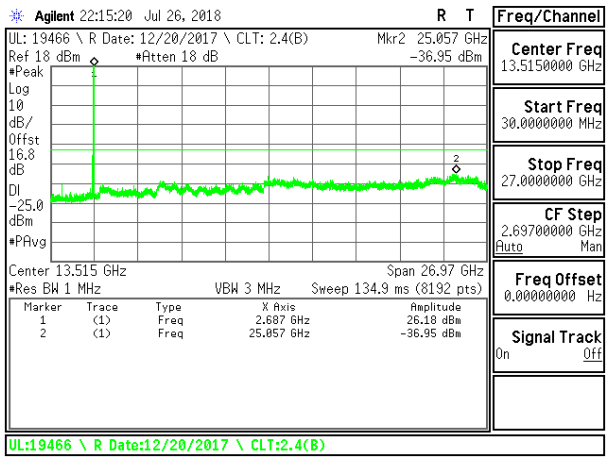
LTE B41 5MHz 16QAM Low Channel RB1-0



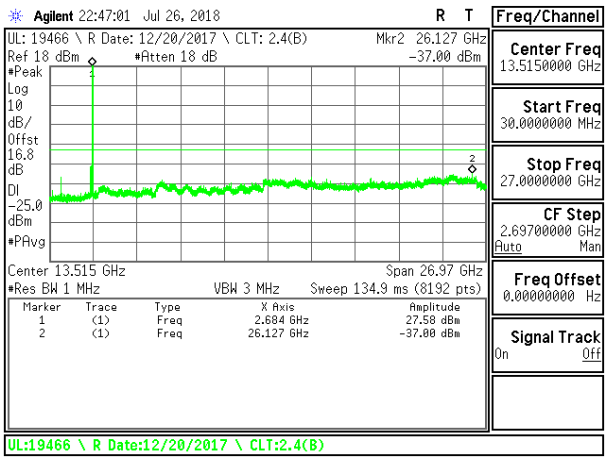
LTE B41 5MHz QPSK Middle Channel RB1-0



LTE B41 5MHz 16QAM Middle Channel RB1-0



LTE B41 5MHz QPSK High Channel RB1-0



LTE B41 5MHz 16QAM High Channel RB1-0

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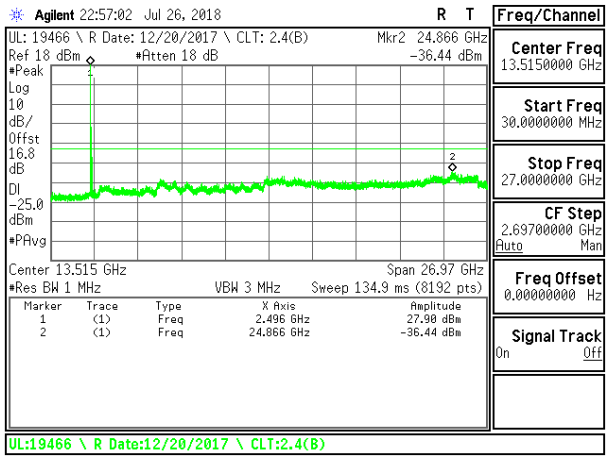
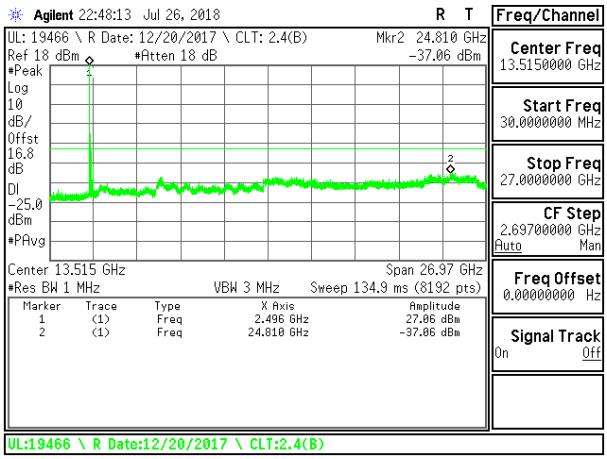
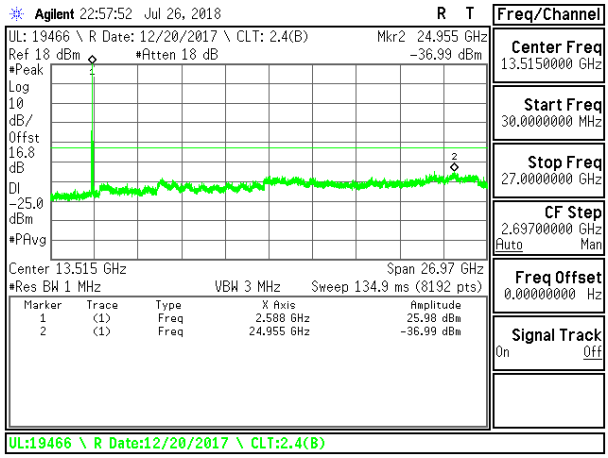


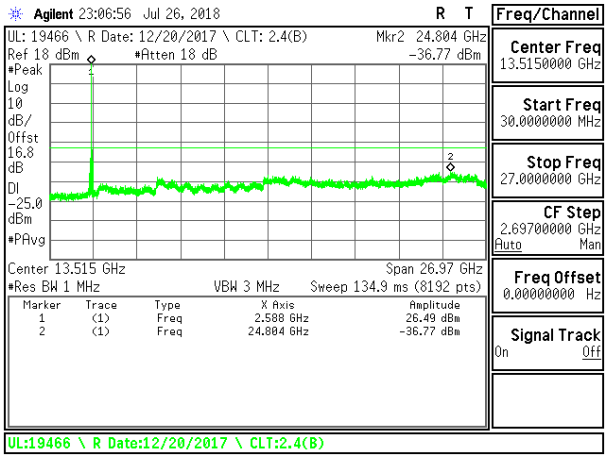
LTE B41 10MHz QPSK Low Channel RB1-0



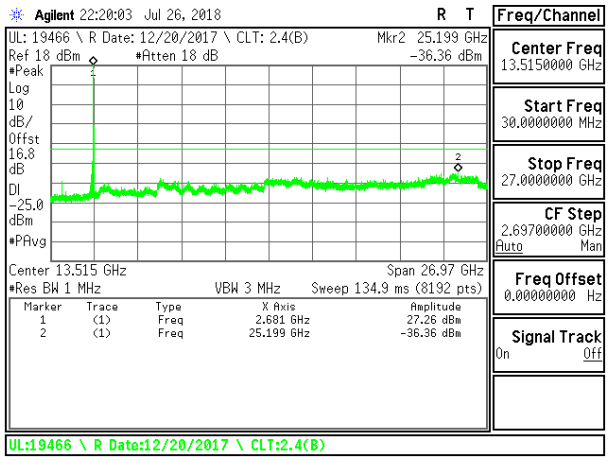
LTE B41 10MHz 16QAM Low Channel RB1-0



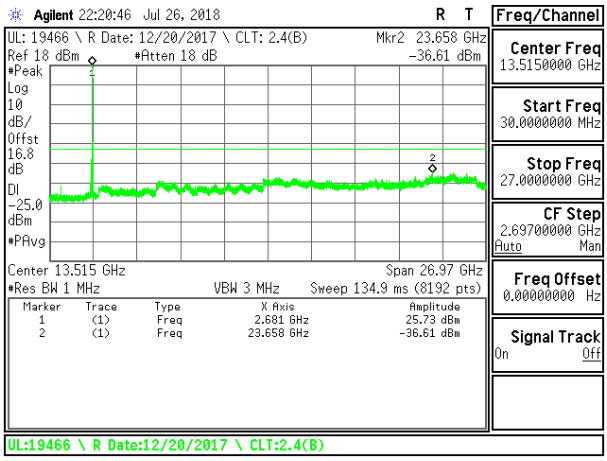
LTE B41 10MHz QPSK Middle Channel RB1-0



LTE B41 10MHz 16QAM Middle Channel RB1-0



LTE B41 10MHz QPSK High Channel RB1-0



LTE B41 10MHz 16QAM High Channel RB1-0

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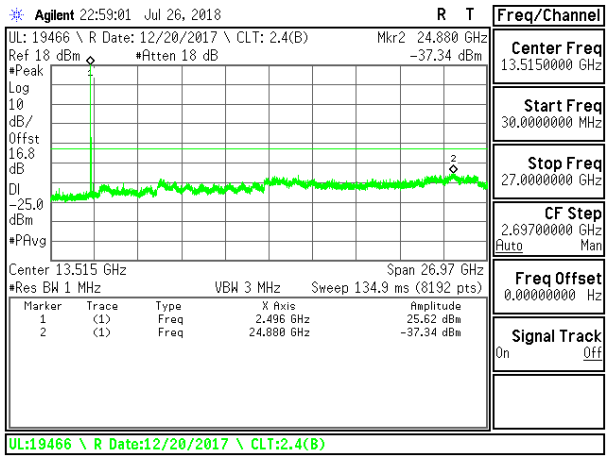
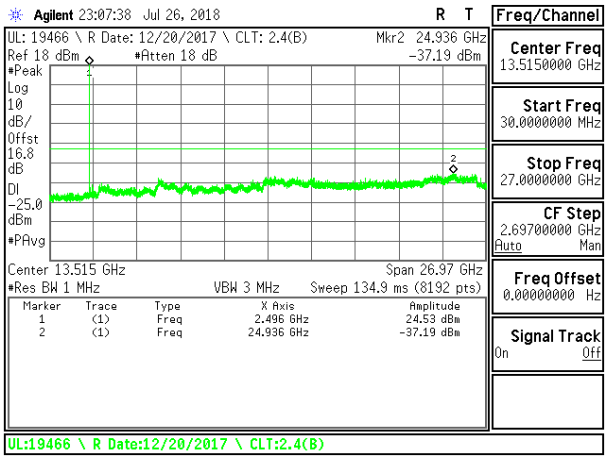
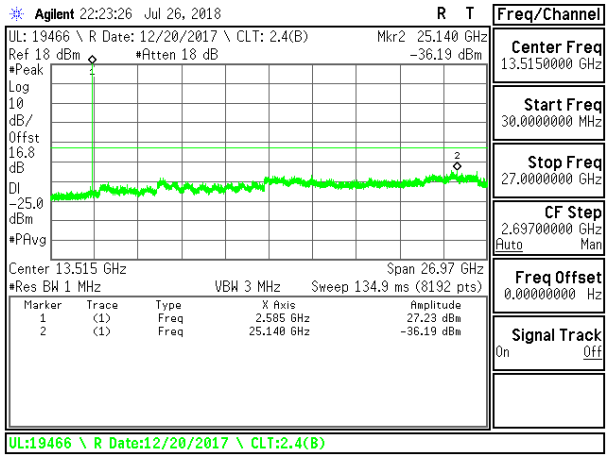


LTE B41 15MHz QPSK Low Channel RB1-0



LTE B41 15MHz 16QAM Low Channel RB1-0



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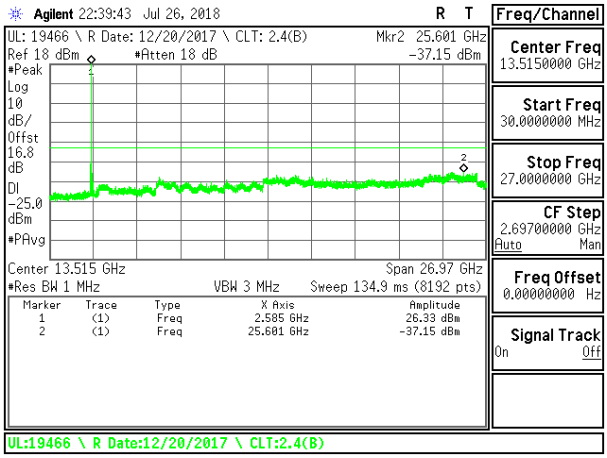

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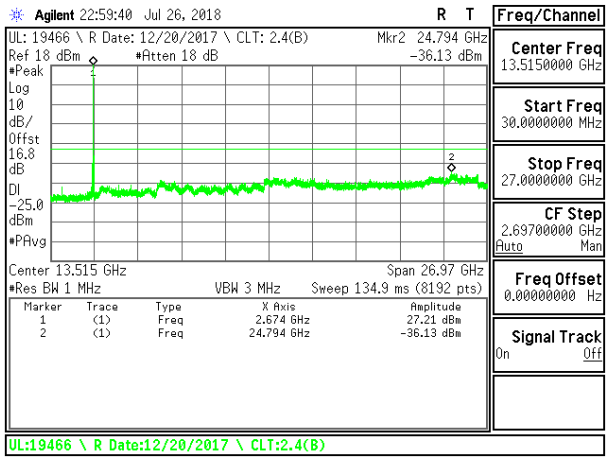

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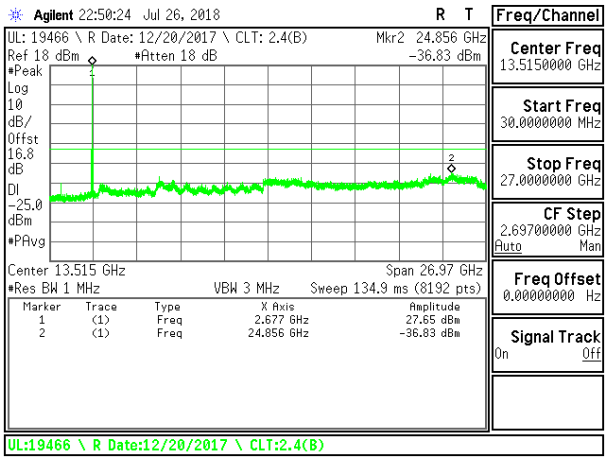

LTE B41 15MHz 16QAM High Channel RB1-0

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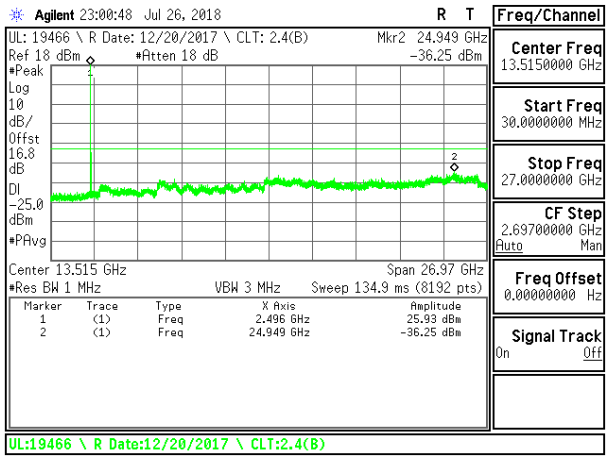

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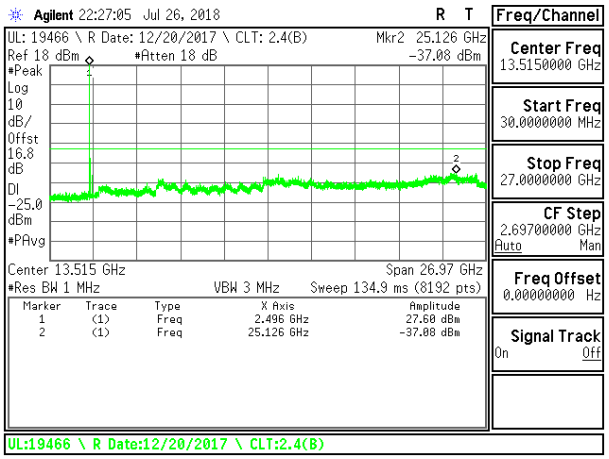

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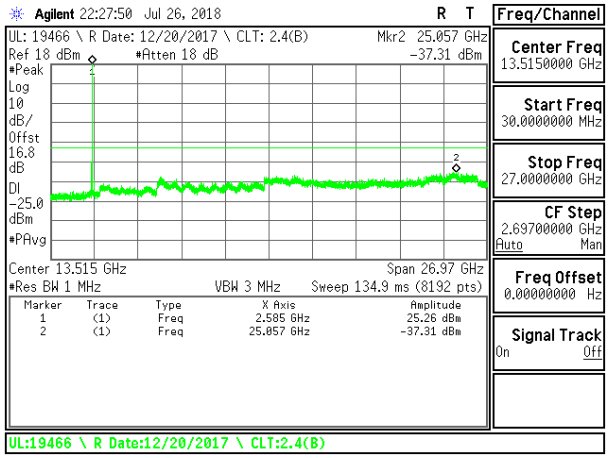

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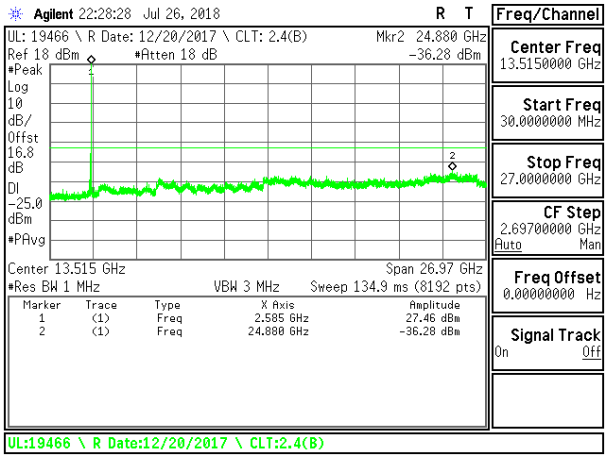

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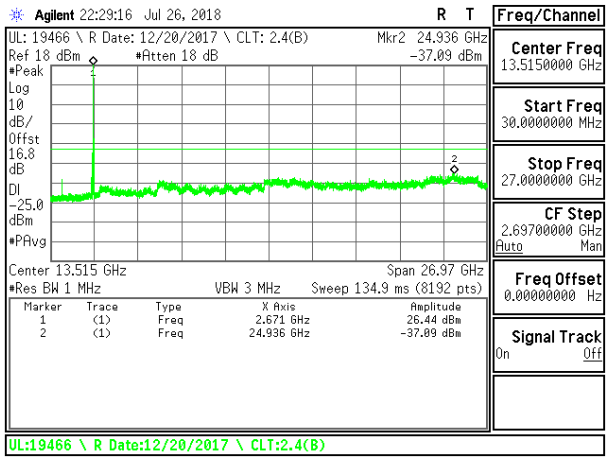

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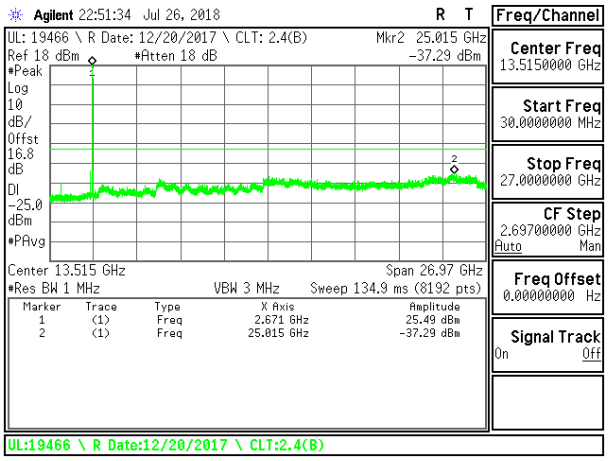

LTE B41 20MHz 16QAM High Channel RB1-0

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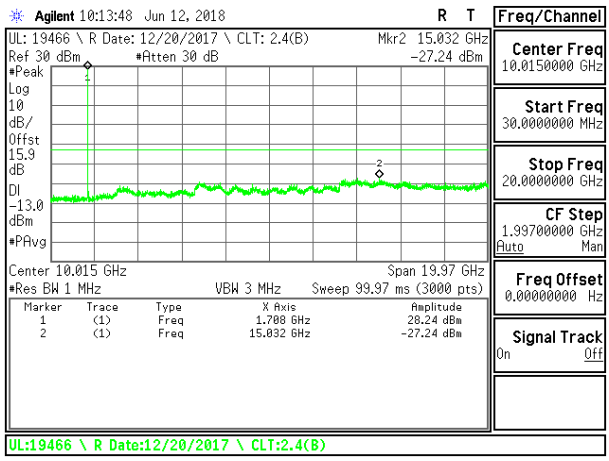
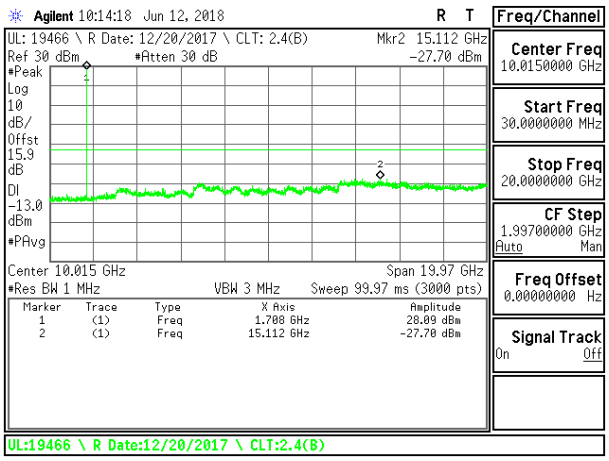
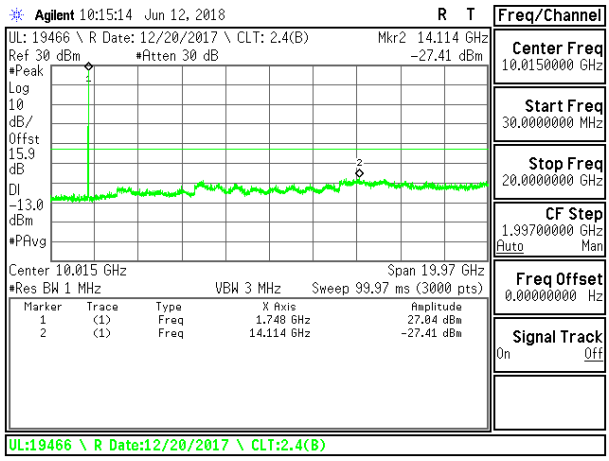
8.3.12. LTE BAND 66



LTE B66 1.4MHz QPSK Low Channel RB1-0



LTE B66 1.4MHz 16QAM Low Channel RB1-0



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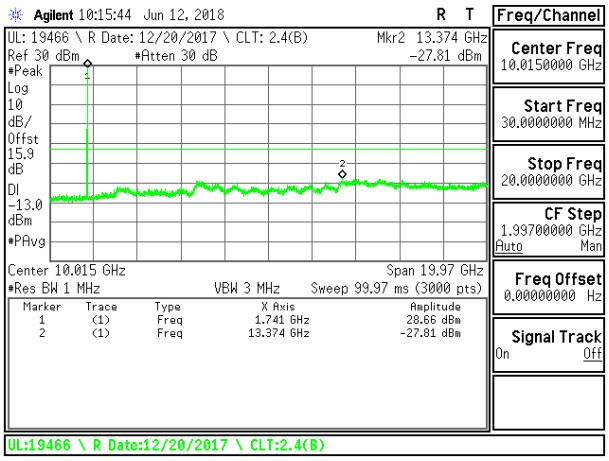

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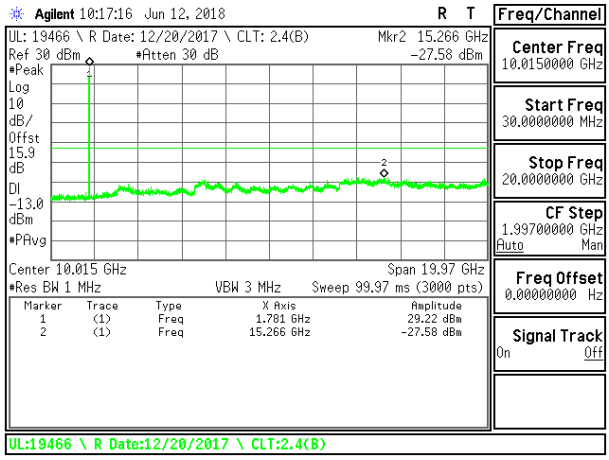
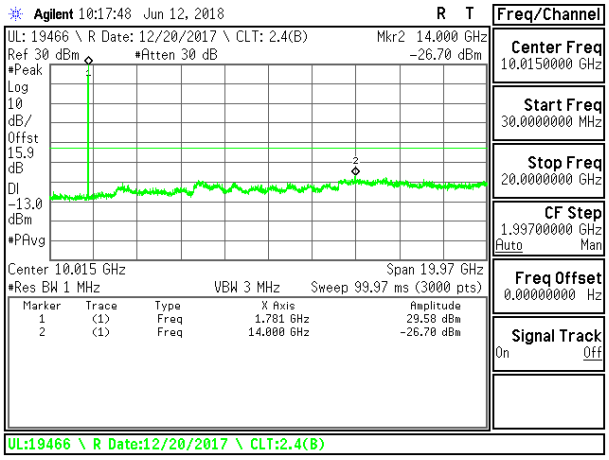


LTE B66 1.4MHz QPSK High Channel RB1-0



LTE B66 1.4MHz 16QAM High Channel RB1-0

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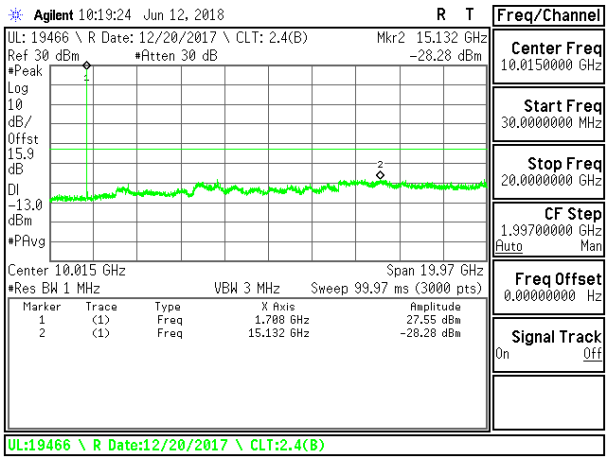
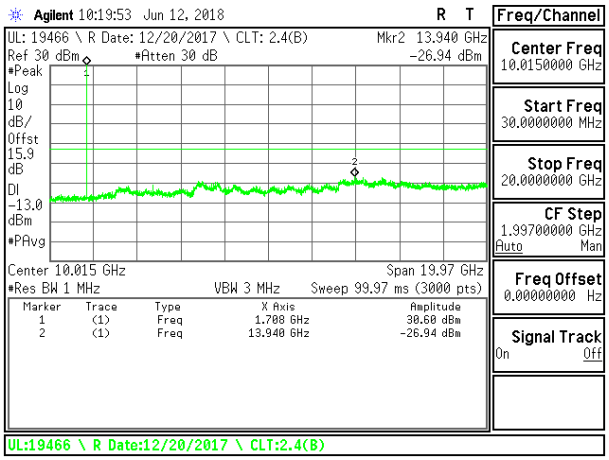


LTE B66 3MHz QPSK Low Channel RB1-0



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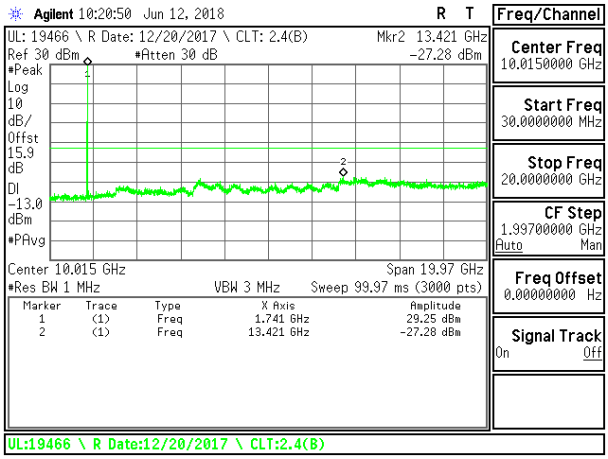
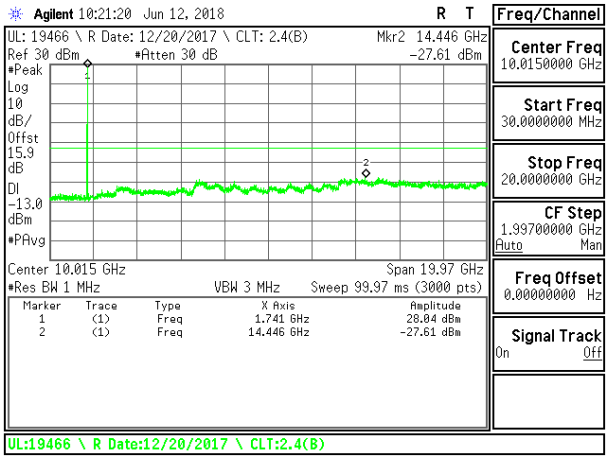
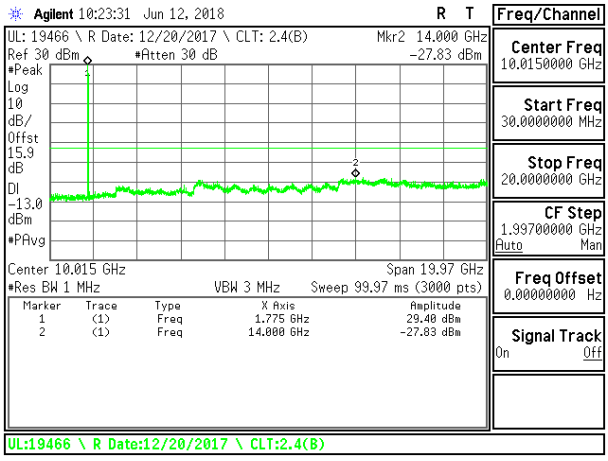


LTE B66 3MHz QPSK Middle Channel RB1-0



LTE B66 3MHz 16QAM Middle Channel RB1-0



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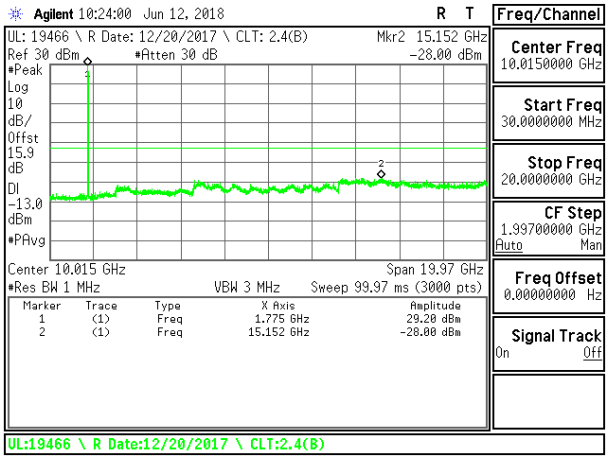

LTE B66 3MHz 16QAM High Channel RB1-0

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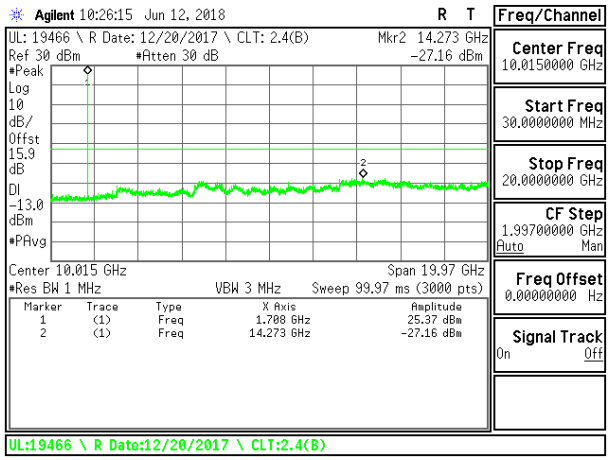
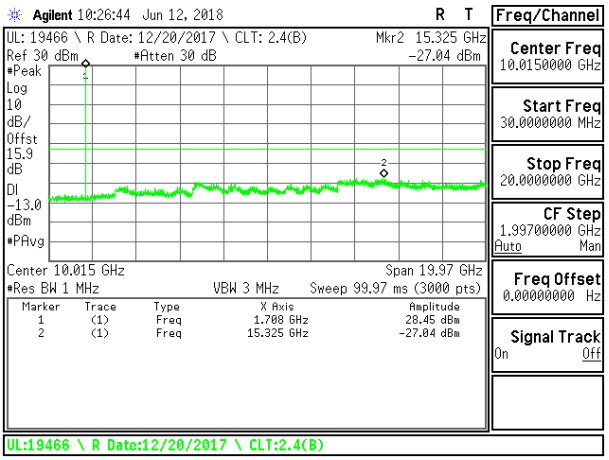
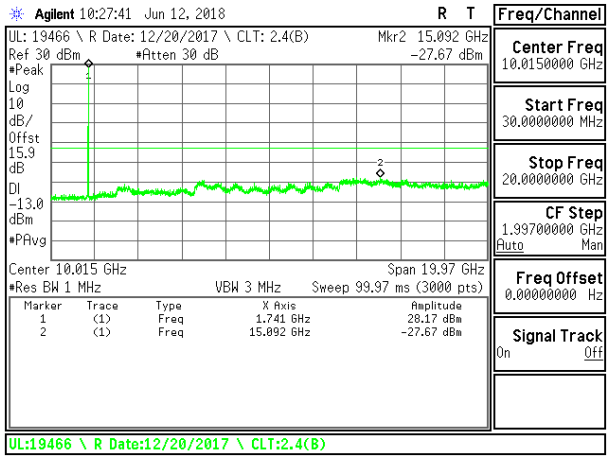


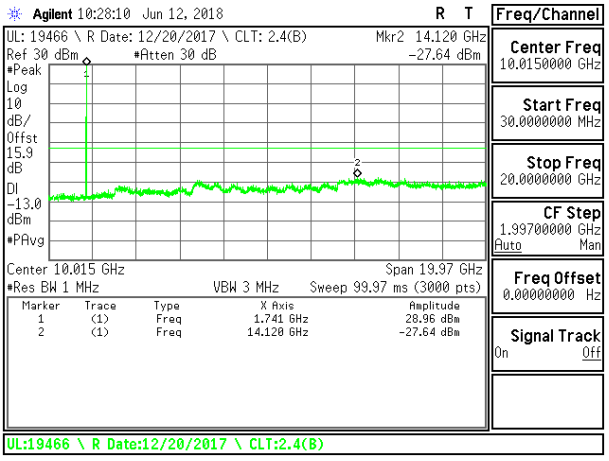
LTE B66 5MHz QPSK Low Channel RB1-0



LTE B66 5MHz 16QAM Low Channel RB1-0



LTE B66 5MHz QPSK Middle Channel RB1-0



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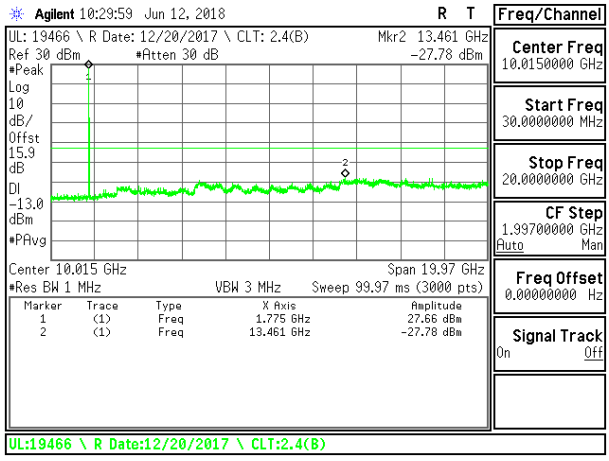

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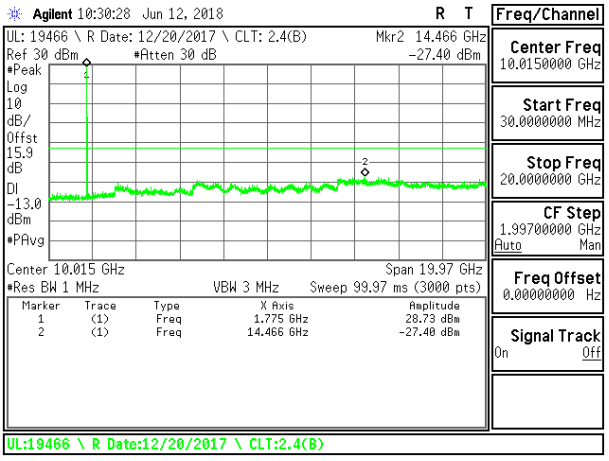

LTE B66 5MHz 16QAM High Channel RB1-0

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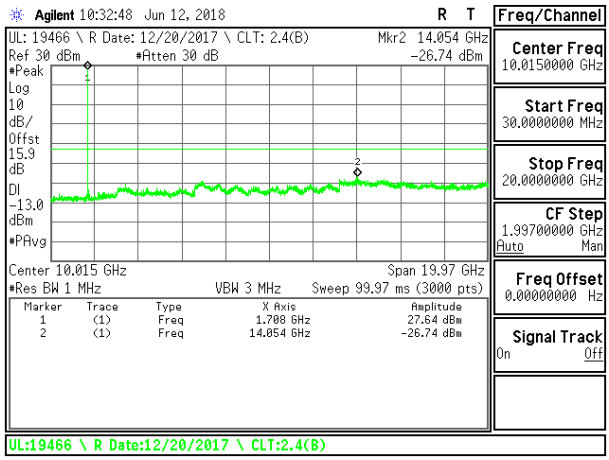
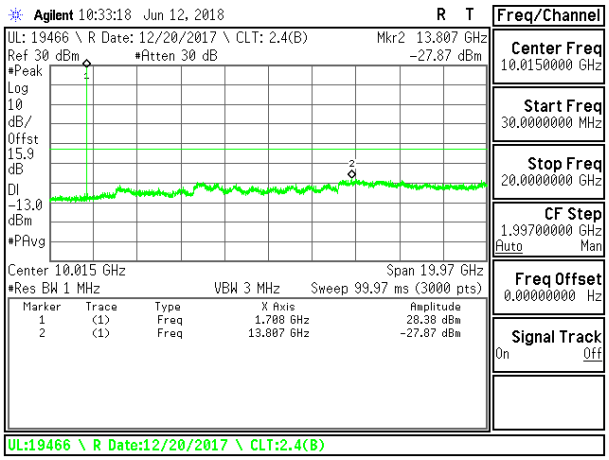
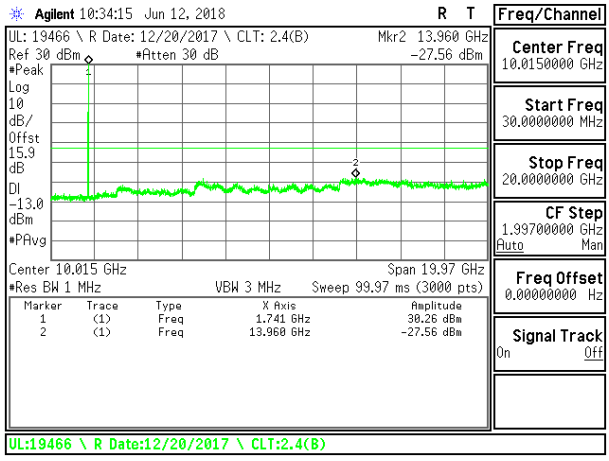


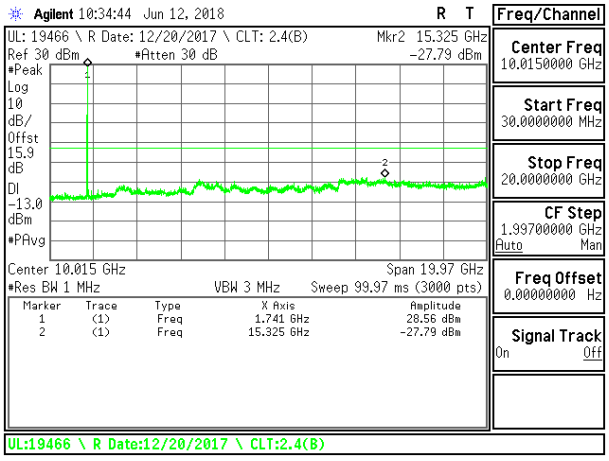
LTE B66 10MHz QPSK Low Channel RB1-0



LTE B66 10MHz 16QAM Low Channel RB1-0



LTE B66 10MHz QPSK Middle Channel RB1-0



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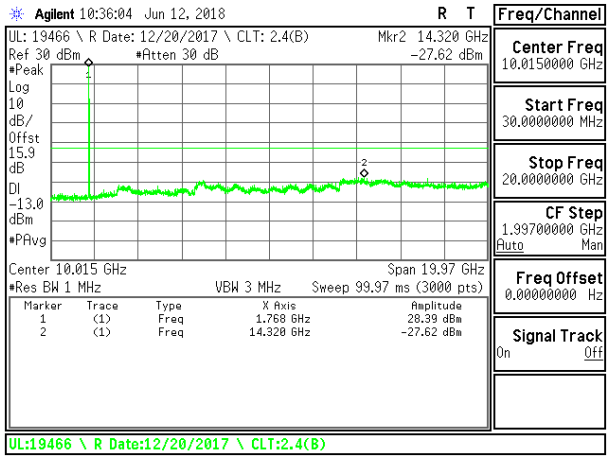
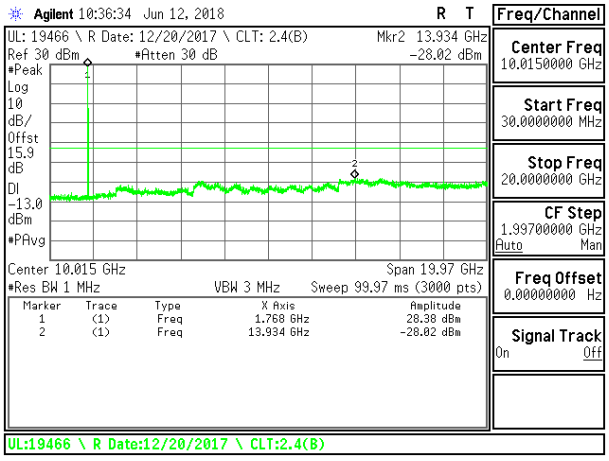


LTE B66 10MHz QPSK High Channel RB1-0



LTE B66 10MHz 16QAM High Channel RB1-0

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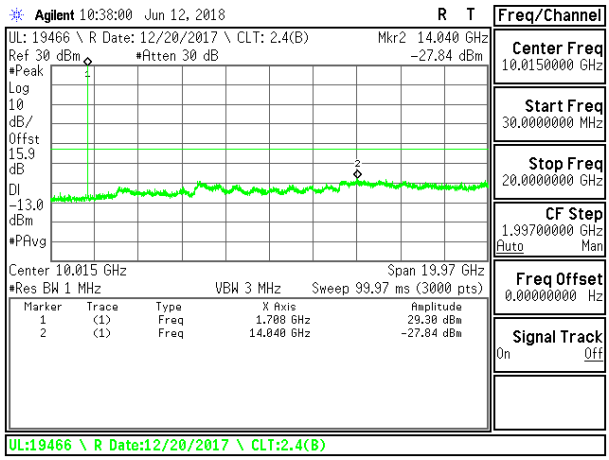
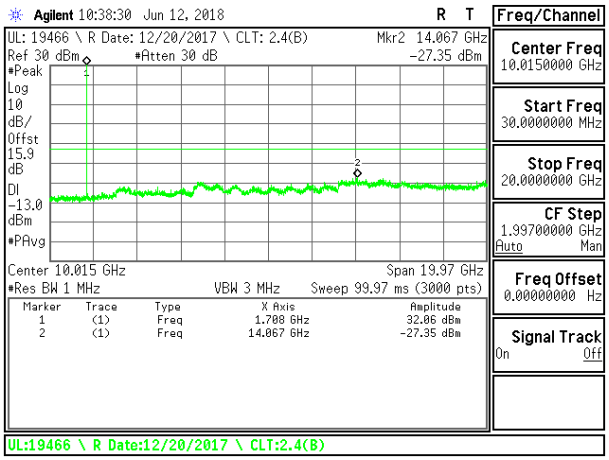
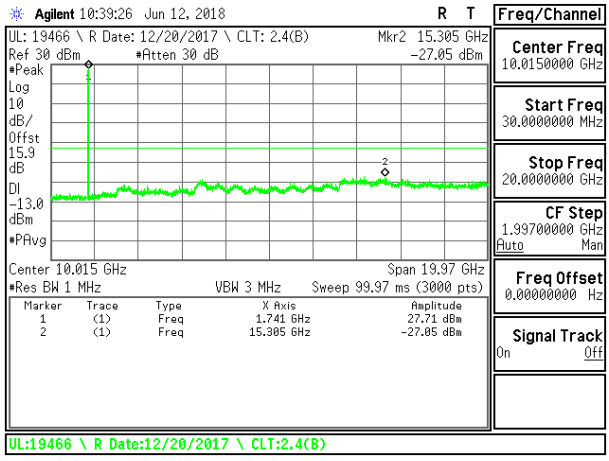


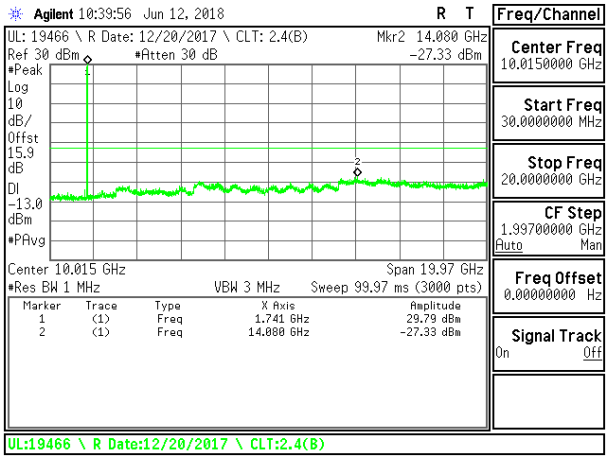
LTE B66 15MHz QPSK Low Channel RB1-0



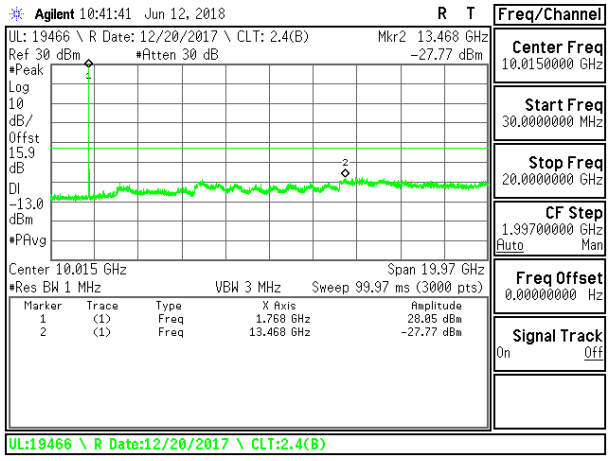
LTE B66 15MHz 16QAM Low Channel RB1-0



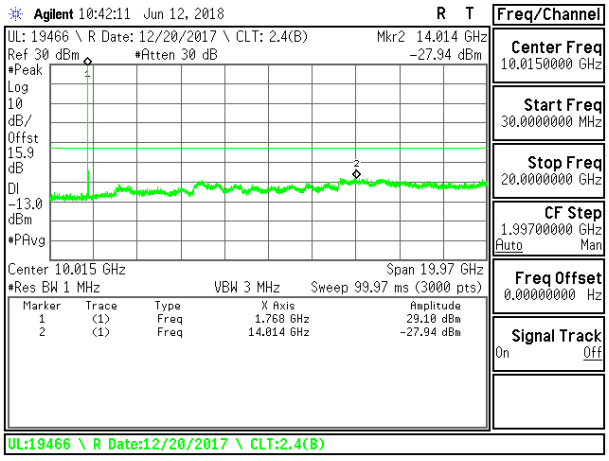
LTE B66 15MHz QPSK Middle Channel RB1-0



LTE B66 15MHz 16QAM Middle Channel RB1-0



LTE B66 15MHz QPSK High Channel RB1-0



LTE B66 15MHz 16QAM High Channel RB1-0

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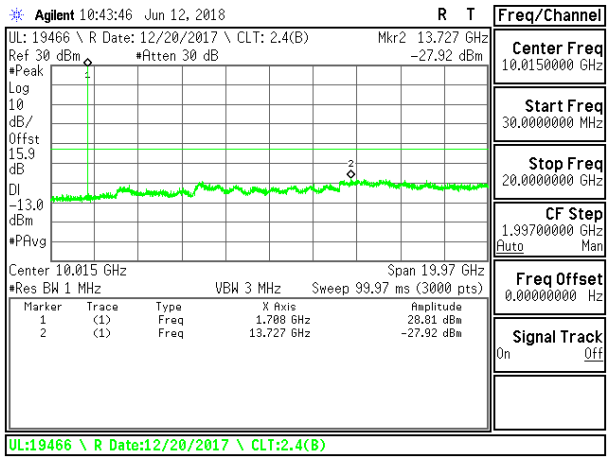
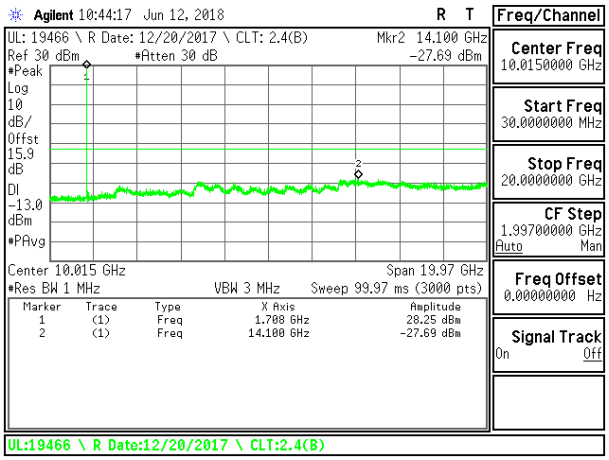
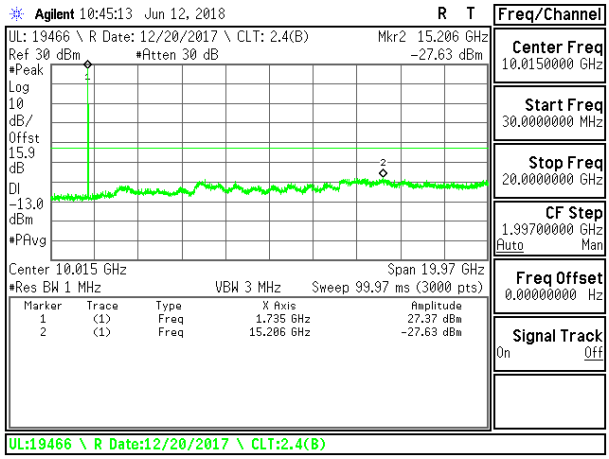


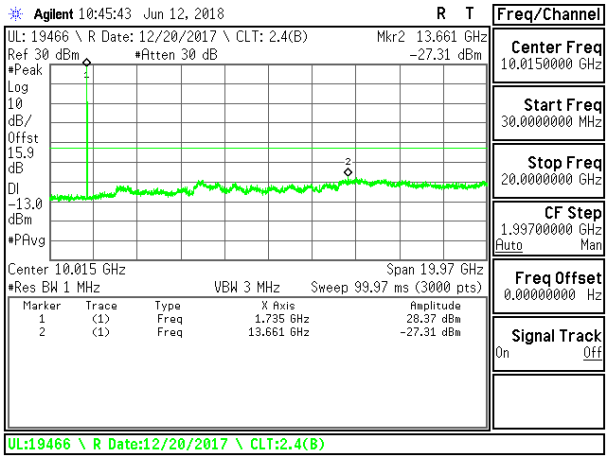
LTE B66 20MHz QPSK Low Channel RB1-0



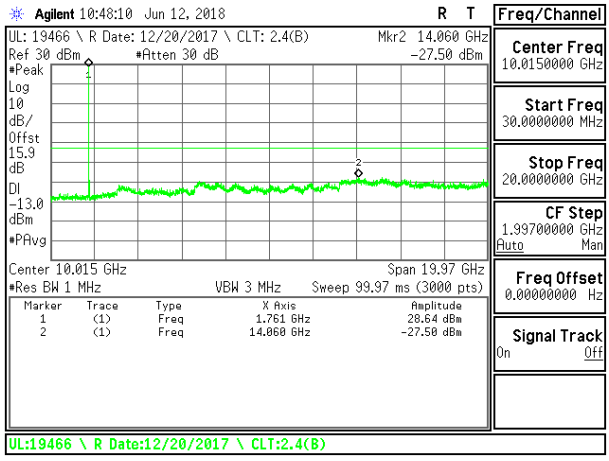
LTE B66 20MHz 16QAM Low Channel RB1-0



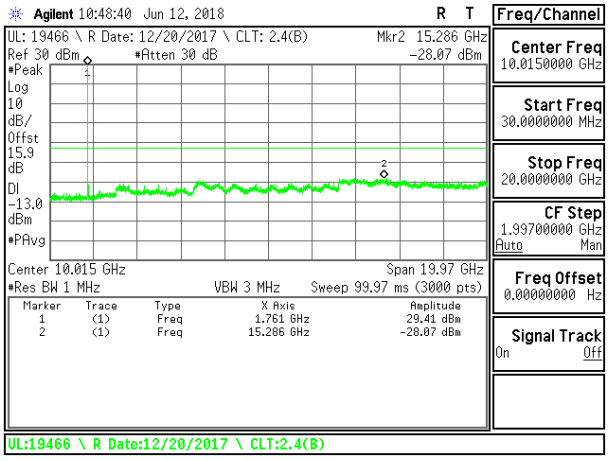
LTE B66 20MHz QPSK Middle Channel RB1-0



LTE B66 20MHz 16QAM Middle Channel RB1-0



LTE B66 20MHz QPSK High Channel RB1-0



LTE B66 20MHz 16QAM High Channel RB1-0

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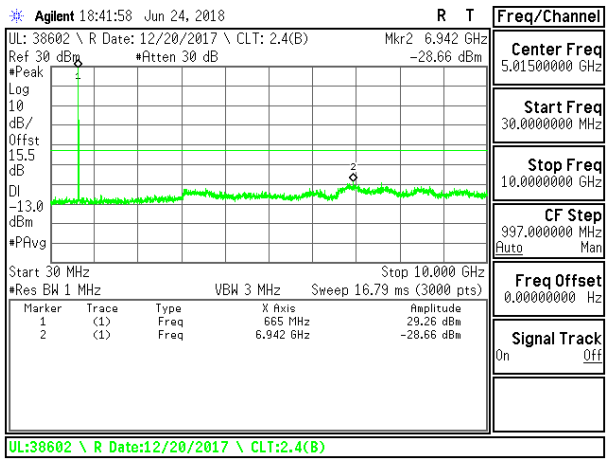
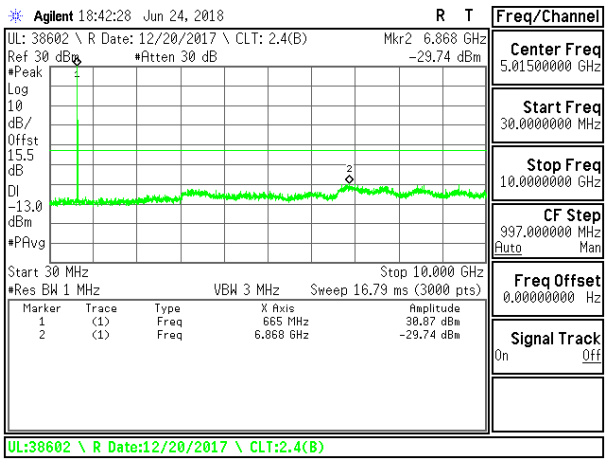
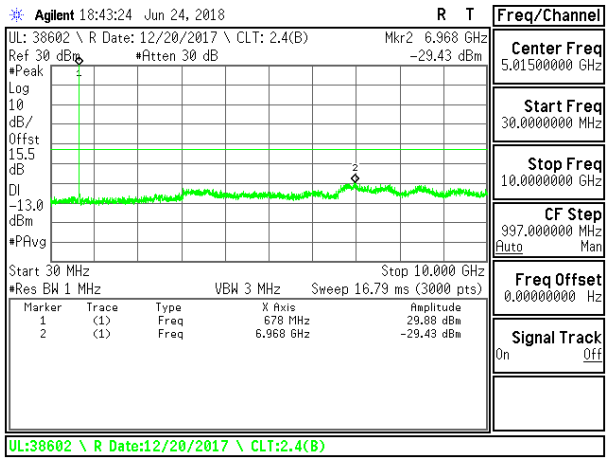
8.3.13. LTE BAND 71



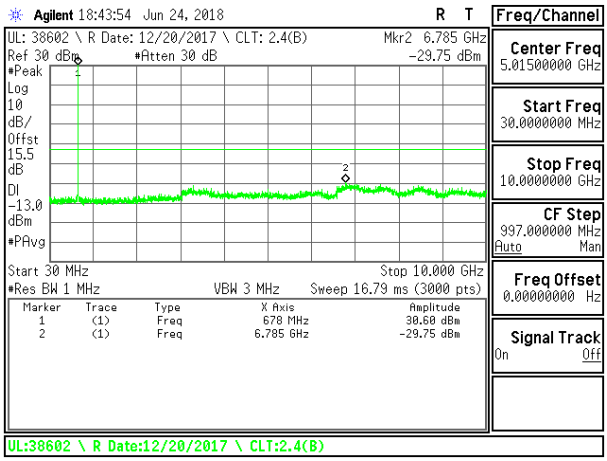
LTE B71 5MHz QPSK Low Channel RB1-0



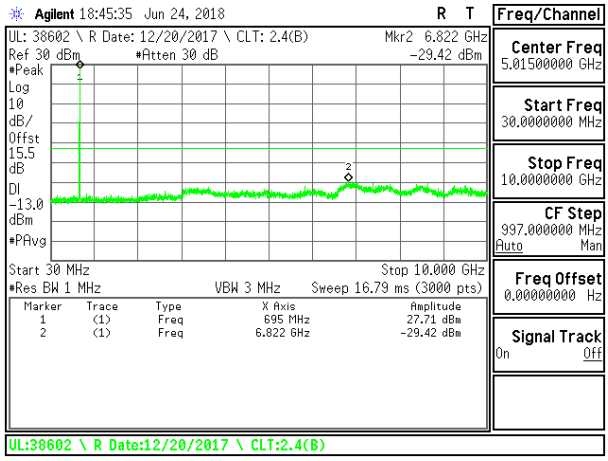
LTE B71 5MHz 16QAM Low Channel RB1-0



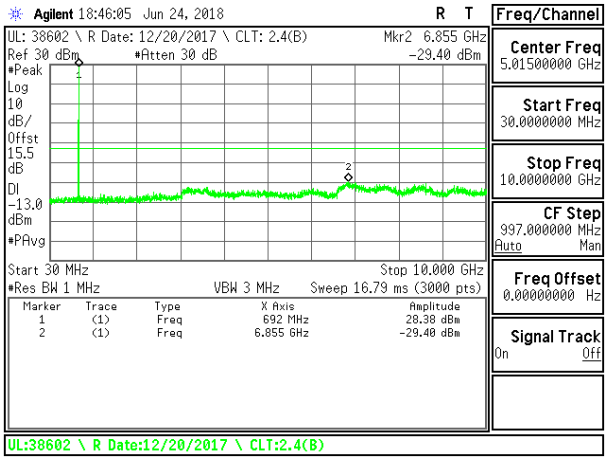
LTE B71 5MHz QPSK Middle Channel RB1-0



LTE B71 5MHz 16QAM Middle Channel RB1-0



LTE B71 5MHz QPSK High Channel RB1-0



LTE B71 5MHz 16QAM High Channel RB1-0

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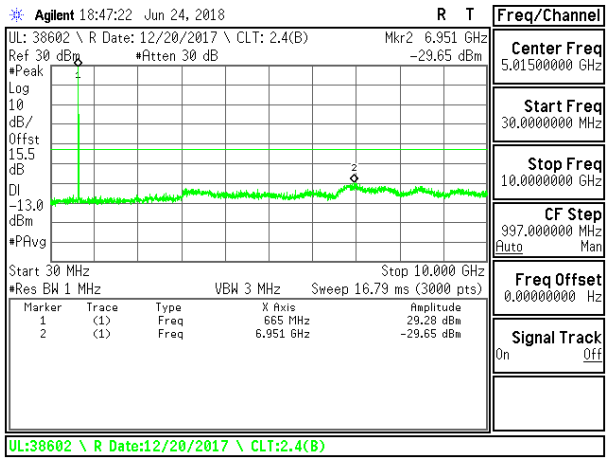
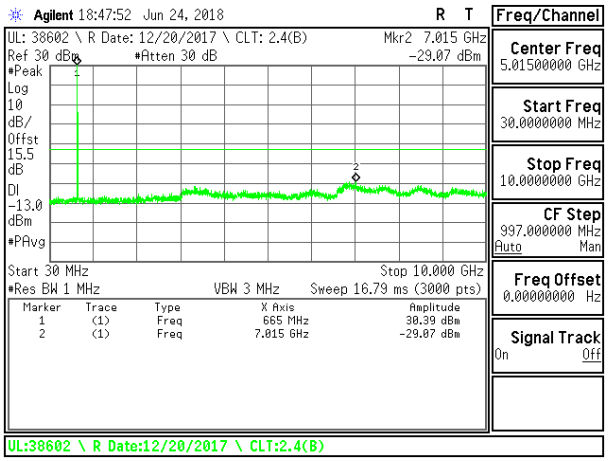
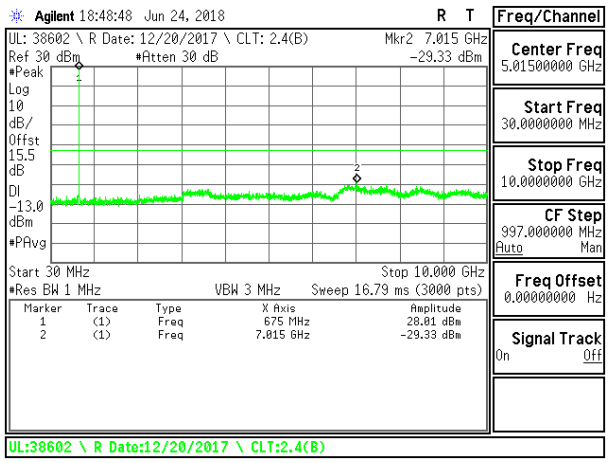


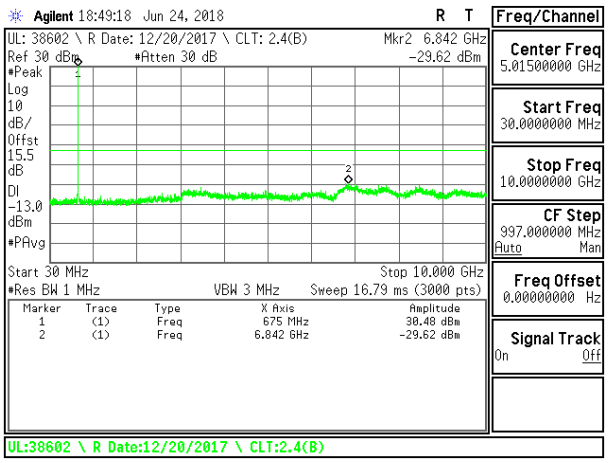
LTE B71 10MHz QPSK Low Channel RB1-0



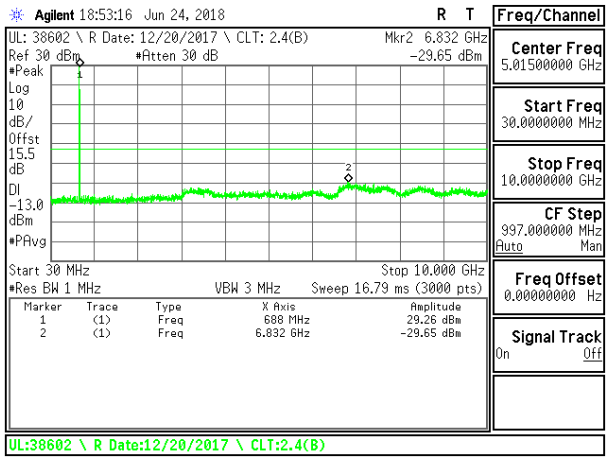
LTE B71 10MHz 16QAM Low Channel RB1-0



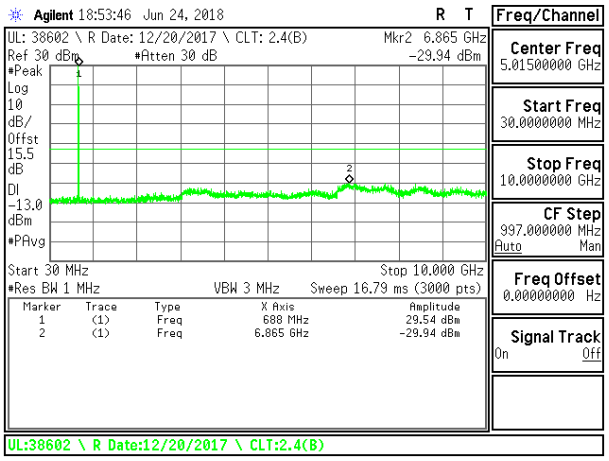
LTE B71 10MHz QPSK Middle Channel RB1-0



LTE B71 10MHz 16QAM Middle Channel RB1-0



LTE 71 10MHz QPSK High Channel RB1-0



LTE B71 10MHz 16QAM High Channel RB1-0

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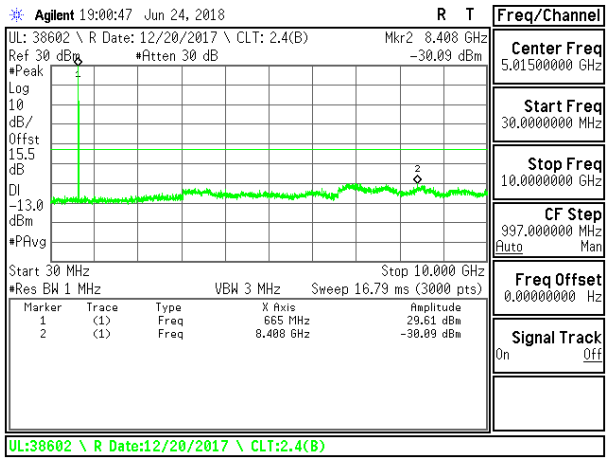
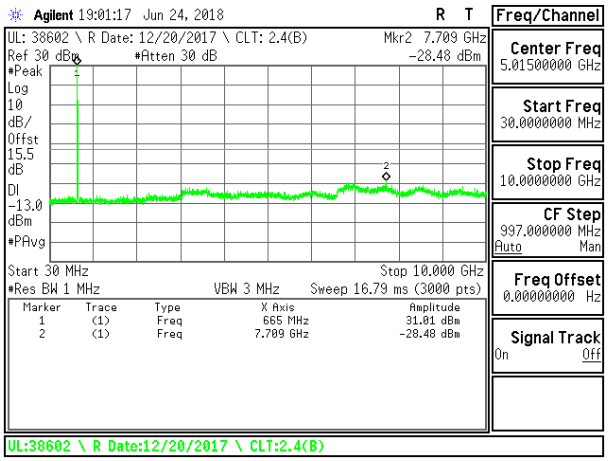
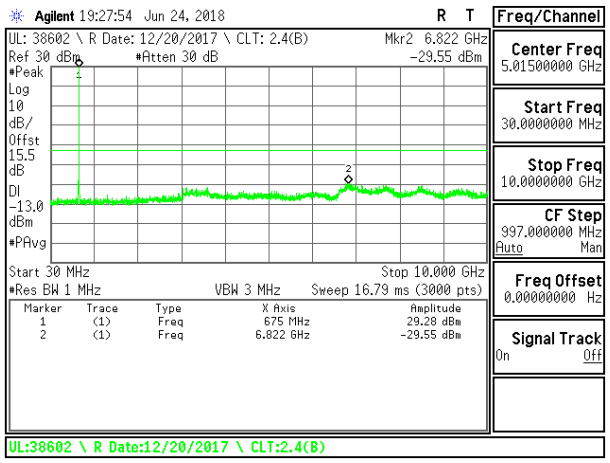


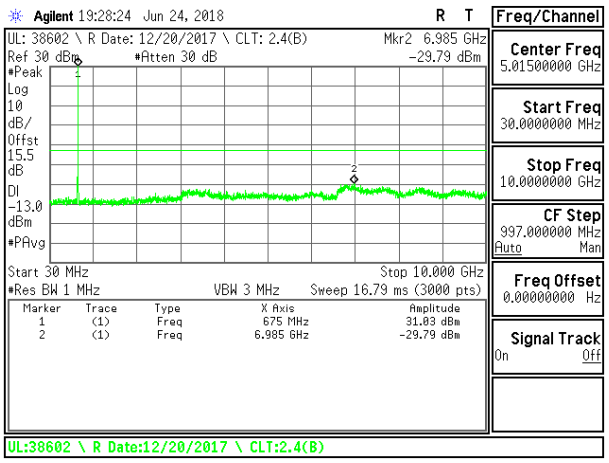
LTE B71 15MHz QPSK Low Channel RB1-0



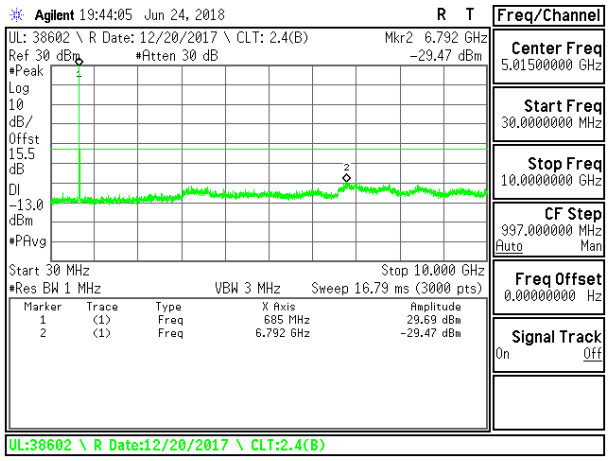
LTE B71 15MHz 16QAM Low Channel RB1-0



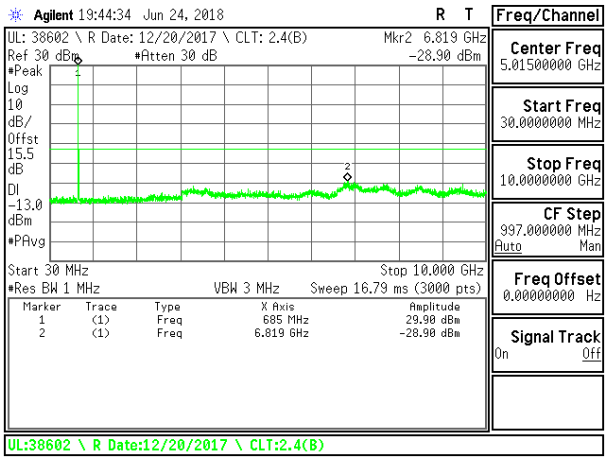
LTE B71 15MHz QPSK Middle Channel RB1-0



LTE B71 15MHz 16QAM Middle Channel RB1-0



LTE B71 15MHz QPSK High Channel RB1-0



LTE B71 15MHz 16QAM High Channel RB1-0

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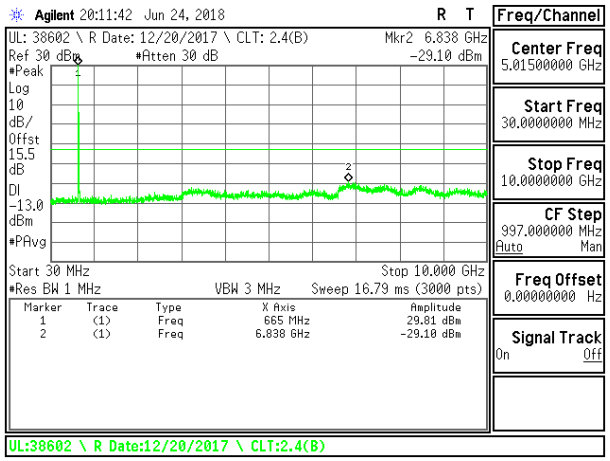
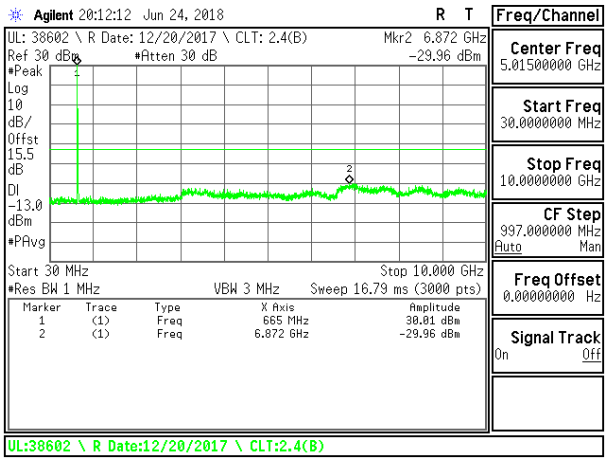
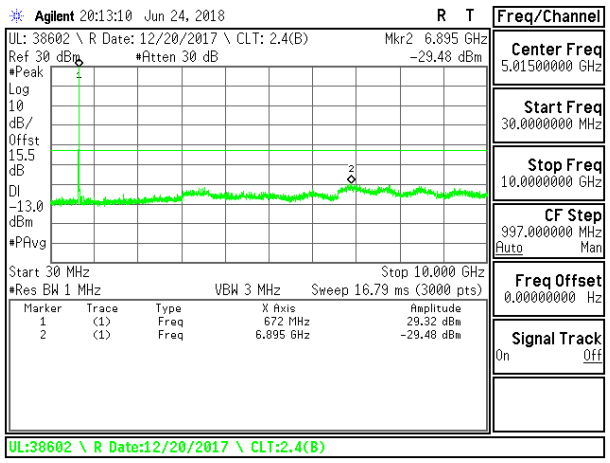


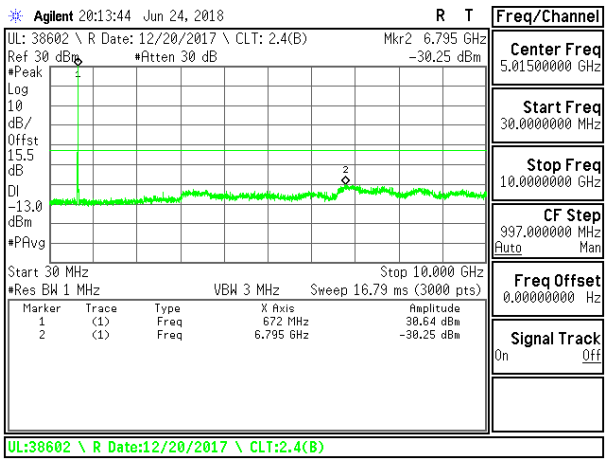
LTE B71 20MHz QPSK Low Channel RB1-0



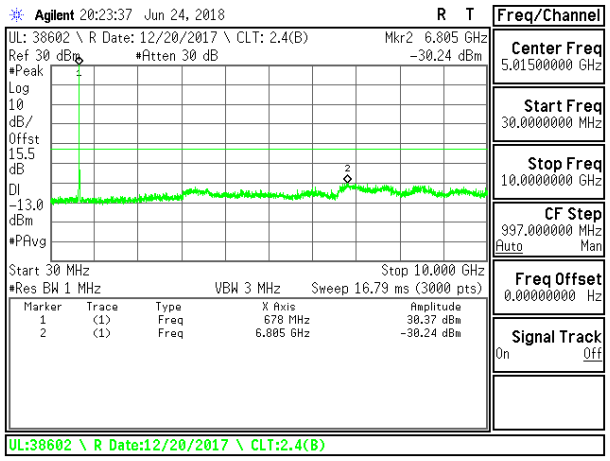
LTE B71 20MHz 16QAM Low Channel RB1-0



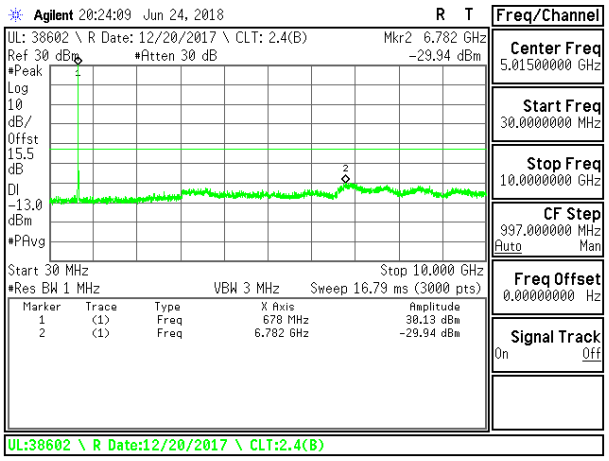
LTE B71 20MHz QPSK Middle Channel RB1-0



LTE B71 20MHz 16QAM Middle Channel RB1-0



LTE B71 20MHz QPSK High Channel RB1-0



LTE B71 20MHz 16QAM High Channel RB1-0

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8.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

§24.235 & §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.
  End Voltage, 3.2VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

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

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66
- LTE Band 71

RESULTS

See the following pages.

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8.4.1. LTE BAND 2

ID:	44410 / 50893	Date:	3/8/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.8090	1909.1940		
Extreme (50C)		1850.8090	1909.1940	37.5	0.020
Extreme (40C)		1850.8090	1909.1940	33.3	0.018
Extreme (30C)		1850.8090	1909.1940	11.0	0.006
Extreme (10C)		1850.8090	1909.1940	34.0	0.018
Extreme (0C)		1850.8091	1909.1941	67.0	0.036
Extreme (-10C)		1850.8089	1909.1939	-78.1	-0.042
Extreme (-20C)		1850.8091	1909.1941	116.1	0.062
Extreme (-30C)		1850.8088	1909.1938	-204.0	-0.108
20C	15%	1850.8090	1909.1940	49.7	0.026
	-15%	1850.8090	1909.1940	47.2	0.025
	End Point	1850.8090	1909.1940	45.4	0.024

8.4.2. LTE BAND 5

ID:	44410 / 50893	Date:	3/8/18

QPSK, (10MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.3071	848.7052		
Extreme (50C)		824.3071	848.7052	12.0	0.014
Extreme (40C)		824.3071	848.7052	11.5	0.014
Extreme (30C)		824.3071	848.7052	10.3	0.012
Extreme (10C)		824.3071	848.7052	11.7	0.014
Extreme (0C)		824.3071	848.7052	12.0	0.014
Extreme (-10C)		824.3071	848.7052	16.5	0.020
Extreme (-20C)		824.3071	848.7052	13.4	0.016
Extreme (-30C)		824.3071	848.7052	13.8	0.016
20C	15%	824.3071	848.7052	11.0	0.013
	-15%	824.3071	848.7052	15.7	0.019
	End Point	824.3071	848.7052	11.2	0.013

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8.4.3. LTE BAND 7

ID:	44410 / 50893	Date:	3/8/18

QPSK, (20MHz BANDWIDTH)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2500.8477	2569.1289		
Extreme (50C)		2500.8477	2569.1289	23.9	0.009
Extreme (40C)		2500.8477	2569.1289	22.2	0.009
Extreme (30C)		2500.8477	2569.1289	18.4	0.007
Extreme (10C)		2500.8477	2569.1289	16.8	0.007
Extreme (0C)		2500.8477	2569.1289	22.7	0.009
Extreme (-10C)		2500.8477	2569.1289	20.5	0.008
Extreme (-20C)		2500.8477	2569.1289	17.8	0.007
Extreme (-30C)		2500.8477	2569.1289	19.3	0.008
20C	15%	2500.8477	2569.1289	22.2	0.009
	-15%	2500.8477	2569.1289	23.4	0.009
	End Point	2500.8477	2569.1289	26.8	0.011

8.4.4. LTE BAND 12

ID:	44410 / 50893	Date:	3/8/18

QPSK, (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.8591	715.6711		
Extreme (50C)		699.8591	715.6711	27.4	0.039
Extreme (40C)		699.8591	715.6711	25.3	0.036
Extreme (30C)		699.8591	715.6711	9.2	0.013
Extreme (10C)		699.8591	715.6711	20.7	0.029
Extreme (0C)		699.8591	715.6711	31.6	0.045
Extreme (-10C)		699.8591	715.6711	28.4	0.040
Extreme (-20C)		699.8591	715.6711	30.1	0.043
Extreme (-30C)		699.8591	715.6711	33.0	0.047
20C	15%	699.8591	715.6711	19.2	0.027
	-15%	699.8591	715.6711	17.6	0.025
	End Point	699.8591	715.6711	18.5	0.026

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8.4.5. LTE BAND 13

ID:	44410 / 50893	Date:	3/8/18

QPSK, (10MHz BANDWIDTH)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	777.1143	786.9004		
Extreme (50C)		777.1143	786.9004	38.6	0.049
Extreme (40C)		777.1143	786.9004	-29.8	-0.038
Extreme (30C)		777.1143	786.9004	16.3	0.021
Extreme (10C)		777.1143	786.9004	26.4	0.034
Extreme (0C)		777.1143	786.9004	-30.8	-0.039
Extreme (-10C)		777.1143	786.9004	37.5	0.048
Extreme (-20C)		777.1143	786.9004	-30.2	-0.039
Extreme (-30C)		777.1143	786.9004	33.0	0.042
20C	15%	777.1143	786.9004	26.0	0.033
	-15%	777.1143	786.9004	23.1	0.030
	End Point	777.1143	786.9004	25.4	0.032

8.4.6. LTE BAND 14

ID:	44410 / 50893	Date:	3/8/18

QPSK, (10MHz BANDWIDTH)

Limit		788	798	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	788.1201	797.8906		
Extreme (50C)		788.1201	797.8906	22.2	0.028
Extreme (40C)		788.1201	797.8906	19.1	0.024
Extreme (30C)		788.1201	797.8906	15.0	0.019
Extreme (10C)		788.1201	797.8906	21.4	0.027
Extreme (0C)		788.1201	797.8906	27.7	0.035
Extreme (-10C)		788.1202	797.8907	95.5	0.120
Extreme (-20C)		788.1201	797.8906	23.6	0.030
Extreme (-30C)		788.1201	797.8906	27.9	0.035
20C	15%	788.1201	797.8906	26.7	0.034
	-15%	788.1201	797.8906	-29.2	-0.037
	End Point	788.1202	797.8907	50.4	0.064

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8.4.7. LTE BAND 17

ID:	44410 / 50893	Date:	3/8/18

QPSK, (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.2908	715.7033		
Extreme (50C)		699.2908	715.7033	27.4	0.039
Extreme (40C)		699.2908	715.7033	25.3	0.036
Extreme (30C)		699.2908	715.7033	9.2	0.013
Extreme (10C)		699.2908	715.7033	20.7	0.029
Extreme (0C)		699.2908	715.7033	31.6	0.045
Extreme (-10C)		699.2908	715.7033	28.4	0.040
Extreme (-20C)		699.2908	715.7033	30.1	0.043
Extreme (-30C)		699.2908	715.7033	33.0	0.047
20C	15%	699.2908	715.7033	19.2	0.027
	-15%	699.2908	715.7033	17.6	0.025
	End Point	699.2908	715.7033	18.5	0.026

8.4.8. LTE BAND 25

ID:	44410 / 50893	Date:	3/8/18

QPSK, (20MHz BANDWIDTH)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1859.8429	1909.1552		
Extreme (50C)		1859.8429	1909.1552	37.5	0.020
Extreme (40C)		1859.8429	1909.1552	33.3	0.018
Extreme (30C)		1859.8429	1909.1552	11.0	0.006
Extreme (10C)		1859.8429	1909.1552	34.0	0.018
Extreme (0C)		1859.8430	1909.1553	67.0	0.036
Extreme (-10C)		1859.8428	1909.1551	-78.1	-0.042
Extreme (-20C)		1859.8430	1909.1553	116.1	0.062
Extreme (-30C)		1859.8427	1909.1550	-204.0	-0.108
20C	15%	1859.8429	1909.1552	49.7	0.026
	-15%	1859.8429	1909.1552	47.2	0.025
	End Point	1859.8429	1909.1552	45.4	0.024

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8.4.9. LTE BAND 26 (PART 90S)

ID:	44410 / 50893	Date:	3/8/18

QPSK, (10MHz BANDWIDTH)

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	814.3176	823.7120		
Extreme (50C)		814.3176	823.7120	12.0	0.015
Extreme (40C)		814.3176	823.7120	11.5	0.014
Extreme (30C)		814.3176	823.7120	10.3	0.013
Extreme (10C)		814.3176	823.7120	11.7	0.014
Extreme (0C)		814.3176	823.7120	12.0	0.015
Extreme (-10C)		814.3176	823.7121	16.5	0.020
Extreme (-20C)		814.3176	823.7120	13.4	0.016
Extreme (-30C)		814.3176	823.7120	13.8	0.017
20C	15%	814.3176	823.7120	11.0	0.013
	-15%	814.3176	823.7121	15.7	0.019
	End Point	814.3176	823.7120	11.2	0.014

8.4.10. LTE BAND 30

ID:	44410 / 50893	Date:	3/8/18

QPSK, (10MHz BANDWIDTH)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2305.3139	2314.6762		
Extreme (50C)		2305.3138	2314.6761	-115.8	-0.050
Extreme (40C)		2305.3140	2314.6763	121.8	0.053
Extreme (30C)		2305.3139	2314.6762	47.7	0.021
Extreme (10C)		2305.3140	2314.6763	135.2	0.059
Extreme (0C)		2305.3141	2314.6764	237.4	0.103
Extreme (-10C)		2305.3144	2314.6767	515.6	0.223
Extreme (-20C)		2305.3143	2314.6766	432.3	0.187
Extreme (-30C)		2305.3140	2314.6763	147.3	0.064
20C	15%	2305.3140	2314.6763	69.9	0.030
	-15%	2305.3140	2314.6763	66.2	0.029
	End Point	2305.3139	2314.6762	48.6	0.021

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8.4.11. LTE BAND 41

ID:	50893	Date:	3/8/18

QPSK, (20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.8593	2689.1013		
Extreme (50C)		2496.8593	2689.1013	-40.4	-0.016
Extreme (40C)		2496.8593	2689.1013	-44.0	-0.017
Extreme (30C)		2496.8593	2689.1013	-42.1	-0.016
Extreme (10C)		2496.8593	2689.1013	-33.8	-0.013
Extreme (0C)		2496.8593	2689.1013	-36.5	-0.014
Extreme (-10C)		2496.8593	2689.1013	-38.3	-0.015
Extreme (-20C)		2496.8593	2689.1013	-37.4	-0.014
Extreme (-30C)		2496.8593	2689.1013	-33.1	-0.013
20C	15%	2496.8592	2689.1012	-56.4	-0.022
	-15%	2496.8592	2689.1012	-52.8	-0.020
	End Point	2496.8593	2689.1013	47.0	0.018

8.4.12. LTE BAND 66

ID:	44410 / 50893	Date:	3/8/18

QPSK, (20MHz BANDWIDTH)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.8300	1779.1717		
Extreme (50C)		1710.8300	1779.1717	26.2	0.015
Extreme (40C)		1710.8300	1779.1717	21.5	0.012
Extreme (30C)		1710.8300	1779.1717	16.1	0.009
Extreme (10C)		1710.8300	1779.1717	24.7	0.014
Extreme (0C)		1710.8300	1779.1717	21.7	0.012
Extreme (-10C)		1710.8300	1779.1717	21.4	0.012
Extreme (-20C)		1710.8300	1779.1717	23.8	0.014
Extreme (-30C)		1710.8300	1779.1717	25.1	0.014
20C	15%	1710.8300	1779.1717	16.8	0.010
	-15%	1710.8300	1779.1717	19.9	0.011
	End Point	1710.8300	1779.1717	22.6	0.013

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8.4.13. LTE BAND 71

ID:	44410 / 50893	Date:	3/8/18

QPSK, (20MHz BANDWIDTH)

Limit		663	698	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	663.8816	697.1902		
Extreme (50C)		663.8816	697.1902	18.9	0.028
Extreme (40C)		663.8816	697.1902	17.6	0.026
Extreme (30C)		663.8816	697.1902	15.1	0.022
Extreme (10C)		663.8816	697.1902	-20.8	-0.031
Extreme (0C)		663.8816	697.1902	26.0	0.038
Extreme (-10C)		663.8816	697.1902	-25.9	-0.038
Extreme (-20C)		663.8816	697.1902	23.0	0.034
Extreme (-30C)		663.8816	697.1902	-33.8	-0.050
20C	15%	663.8816	697.1902	30.8	0.045
	-15%	663.8816	697.1902	-22.3	-0.033
	End Point	663.8816	697.1902	-23.5	-0.035

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8.5. PEAK-TO-AVERAGE POWER RATIO

LIMIT

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

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66
- LTE Band 71

RESULT

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

ID:	9467	**Date:**	6/6/18

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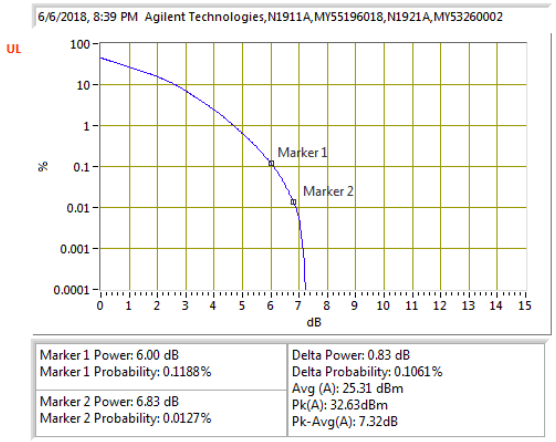
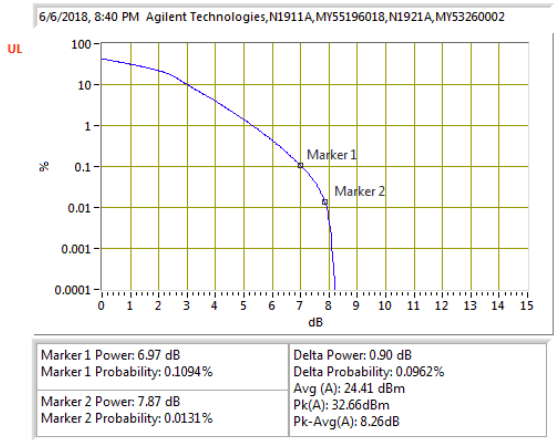
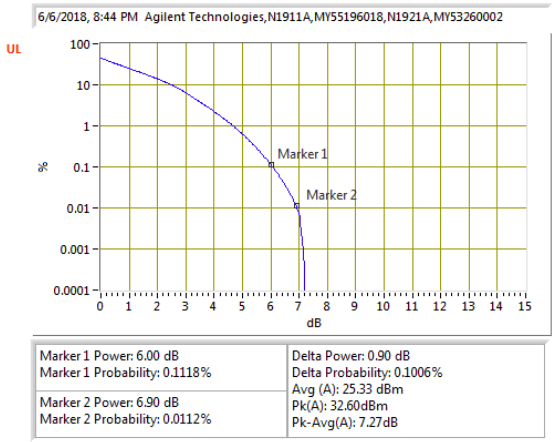
8.5.1. LTE BAND 2



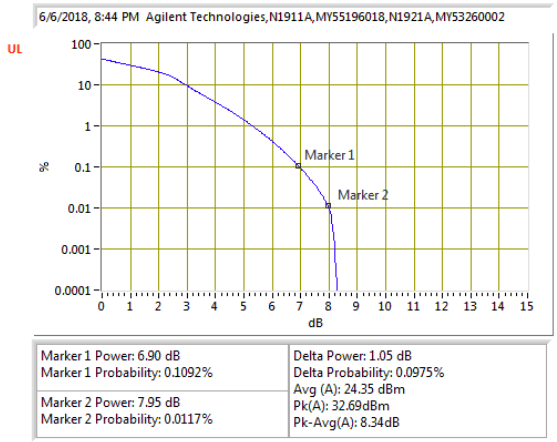
LTE B2 1.4MHz QPSK Middle Channel



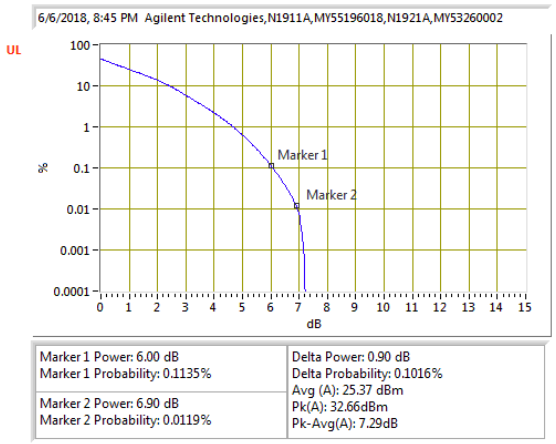
LTE B2 1.4MHz 16QAM Middle Channel



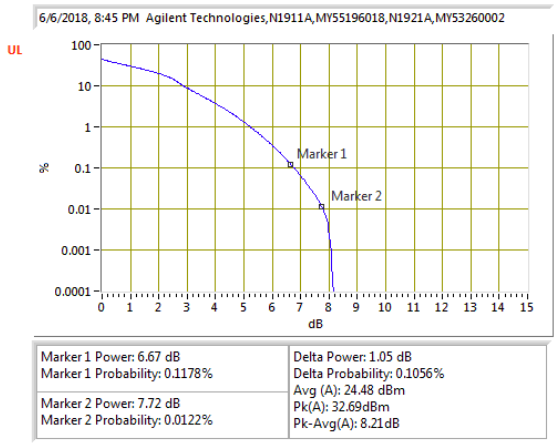
LTE B2 3MHz QPSK Middle Channel



LTE B2 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel



LTE B2 5MHz 16QAM Middle Channel

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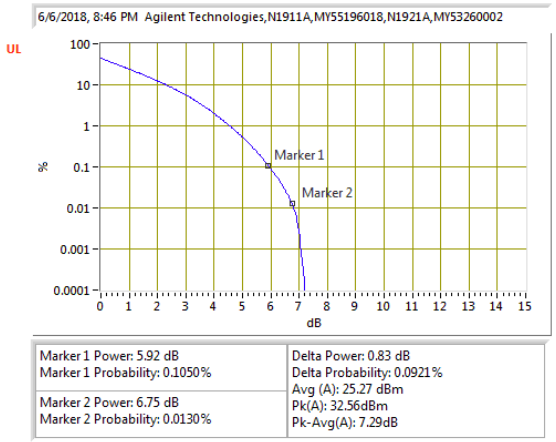
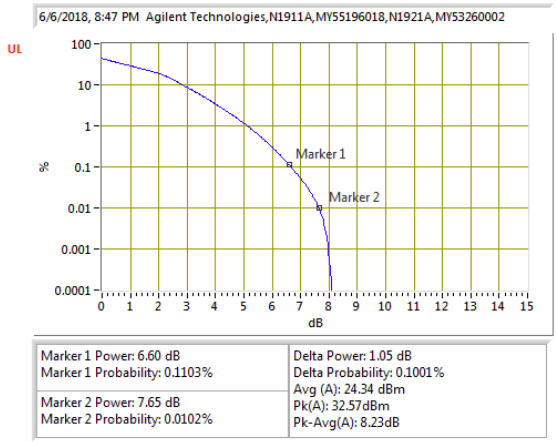
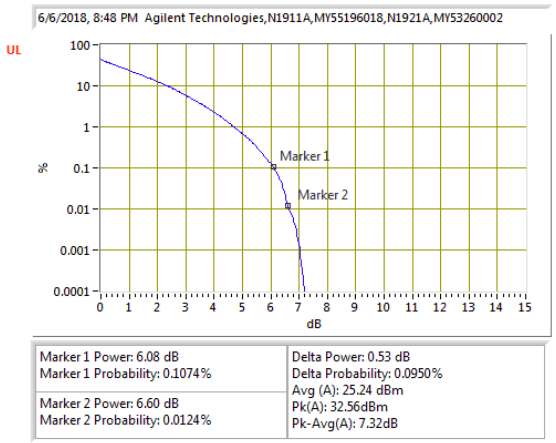


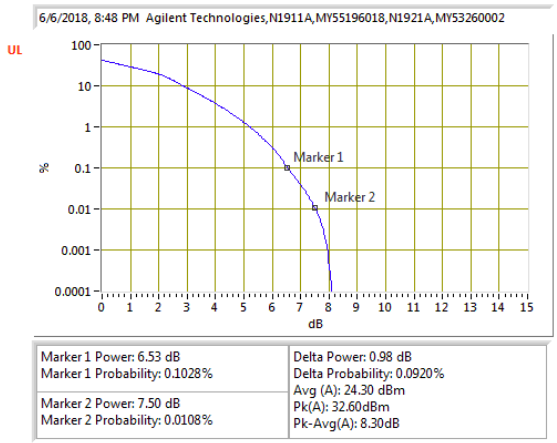
LTE B2 10MHz QPSK Middle Channel



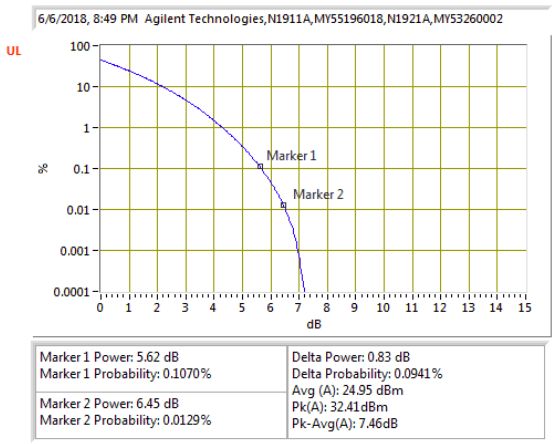
LTE B2 10MHz 16QAM Middle Channel



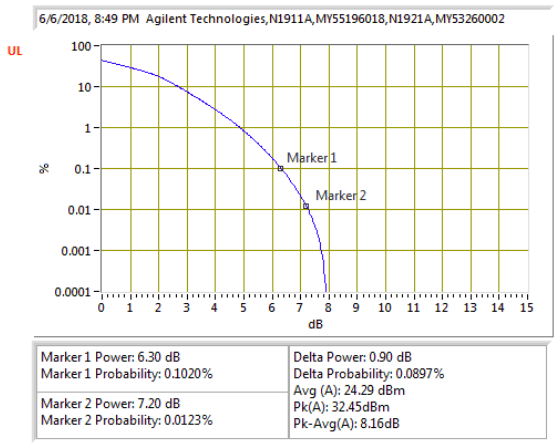
LTE B2 15MHz QPSK Middle Channel



LTE B2 15MHz 16QAM Middle Channel



LTE B2 20MHz QPSK Middle Channel



LTE B2 20MHz 16QAM Middle Channel

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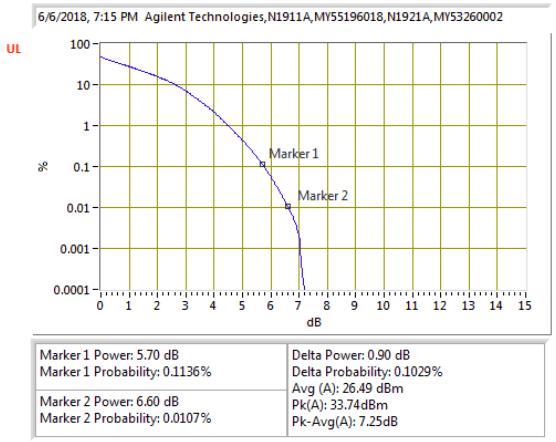
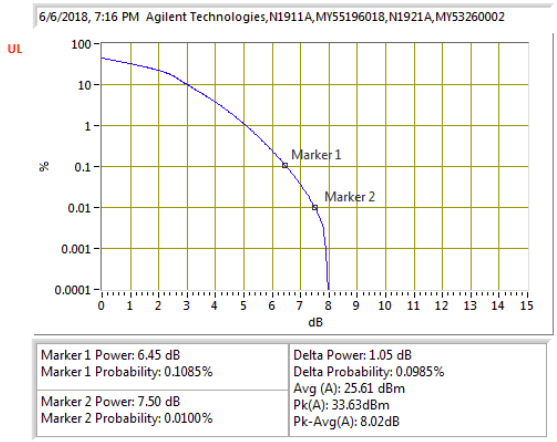
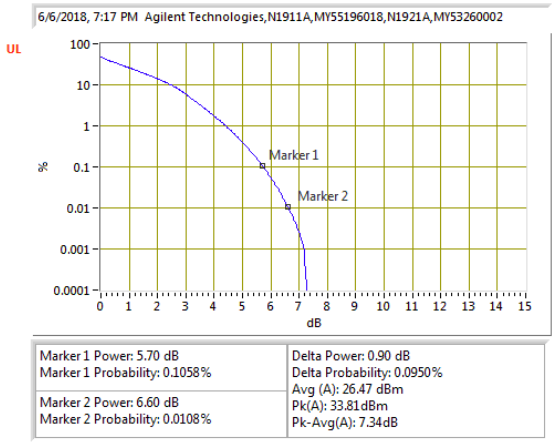
8.5.2. LTE BAND 5



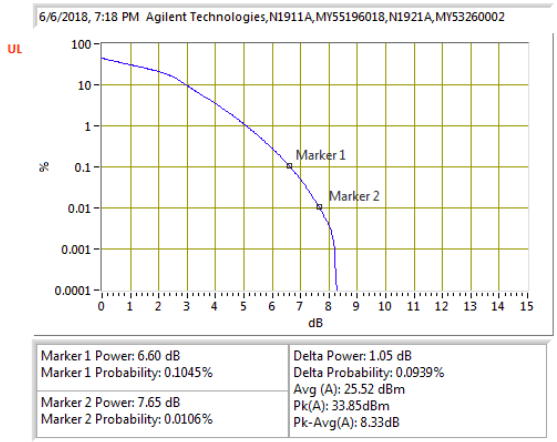
LTE B5 1.4MHz QPSK Middle Channel



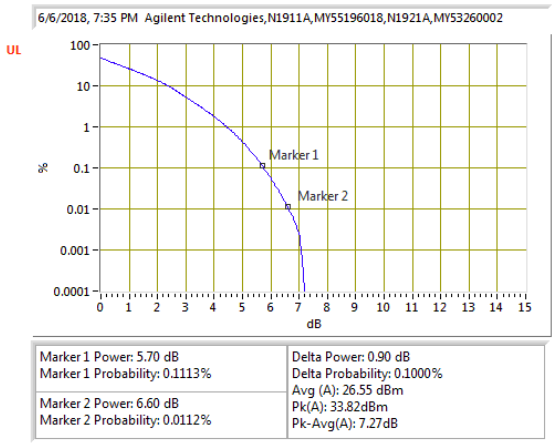
LTE B5 1.4MHz 16QAM Middle Channel



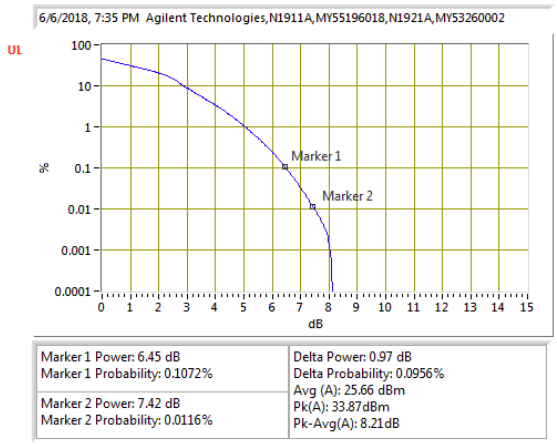
LTE B5 3MHz QPSK Middle Channel



LTE B5 3MHz 16QAM Middle Channel



LTE B5 5MHz QPSK Middle Channel



LTE B5 5MHz 16QAM Middle Channel

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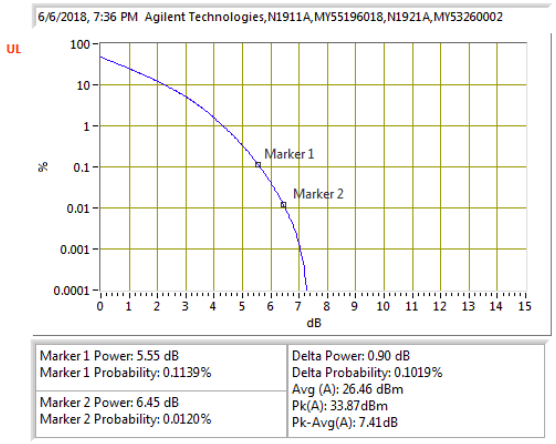
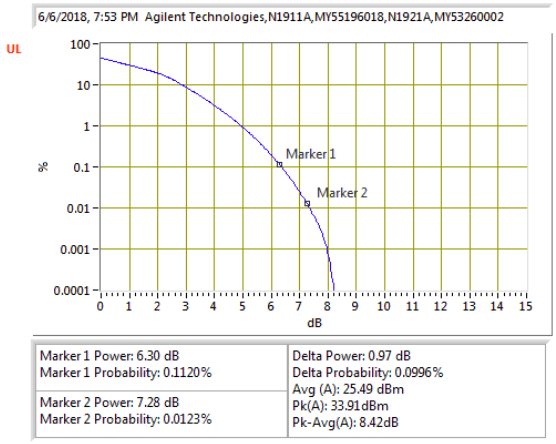


LTE B5 10MHz QPSK Middle Channel



LTE B5 10MHz 16QAM Middle Channel

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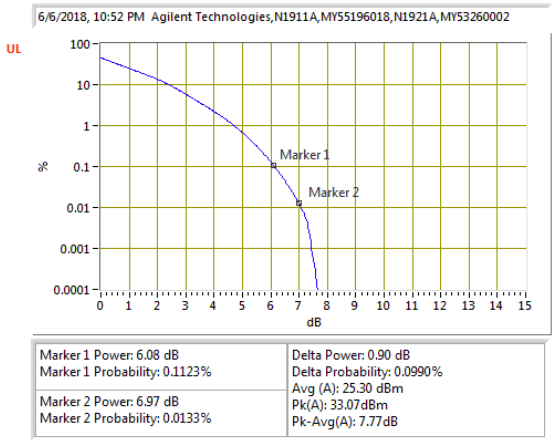
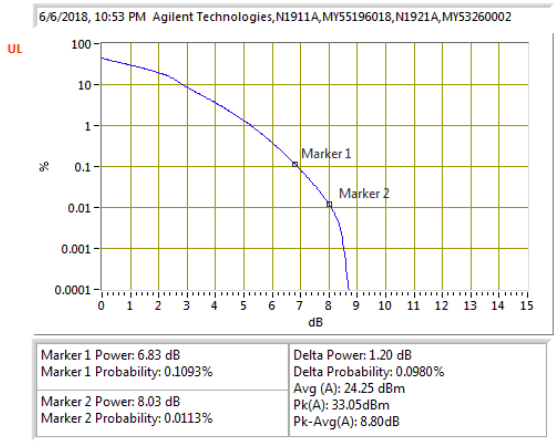
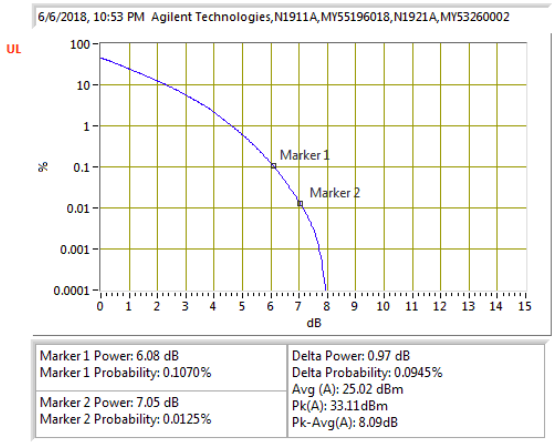
8.5.3. LTE BAND 7



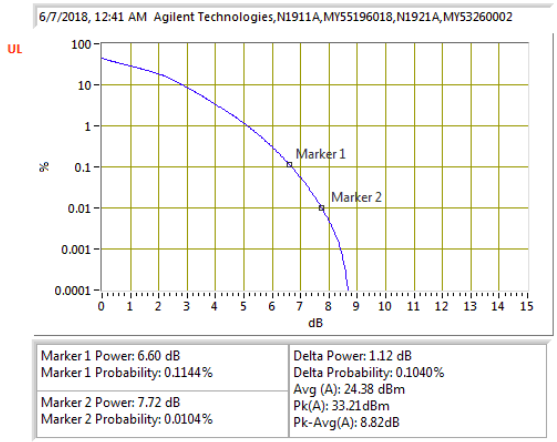
LTE B7 5MHz QPSK Middle Channel



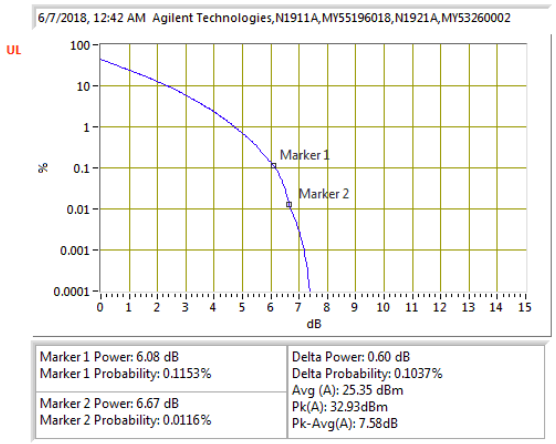
LTE B7 5MHz 16QAM Middle Channel



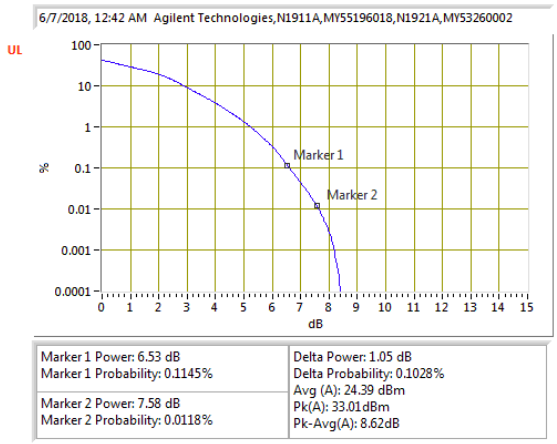
LTE B7 10MHz QPSK Middle Channel



LTE B7 10MHz 16QAM Middle Channel



LTE B7 15MHz QPSK Middle Channel



LTE B7 15MHz 16QAM Middle Channel

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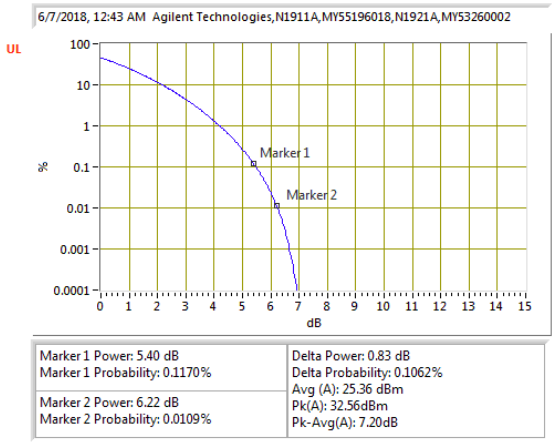
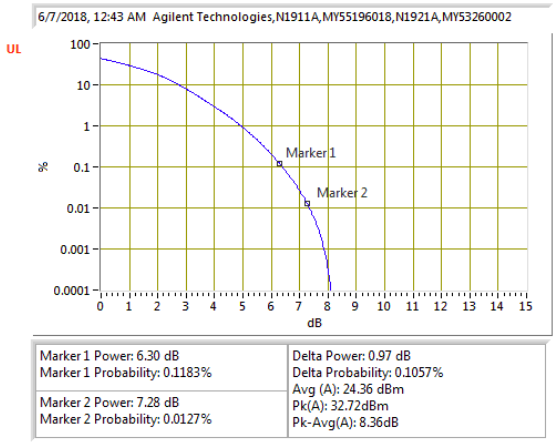


LTE B7 20MHz QPSK Middle Channel



LTE B7 20MHz 16QAM Middle Channel

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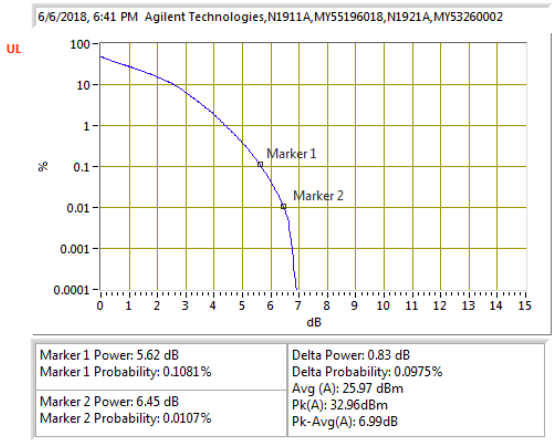
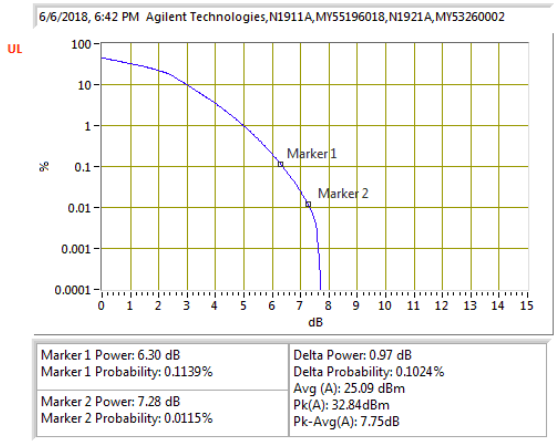
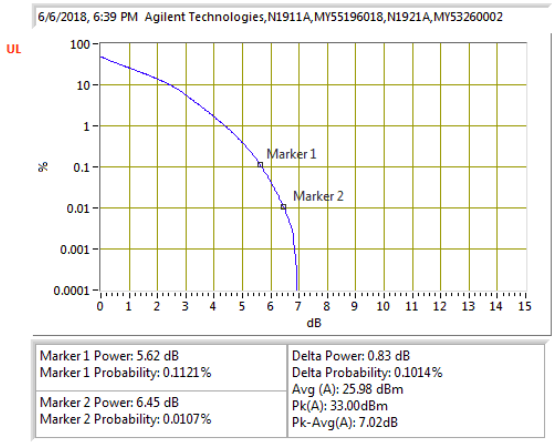
8.5.4. LTE BAND 12



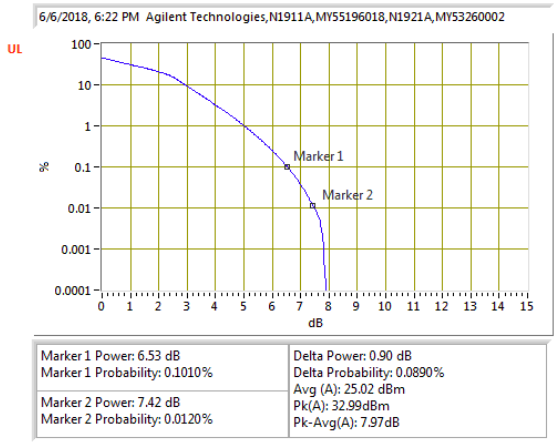
LTE B12 1.4MHz QPSK Middle Channel



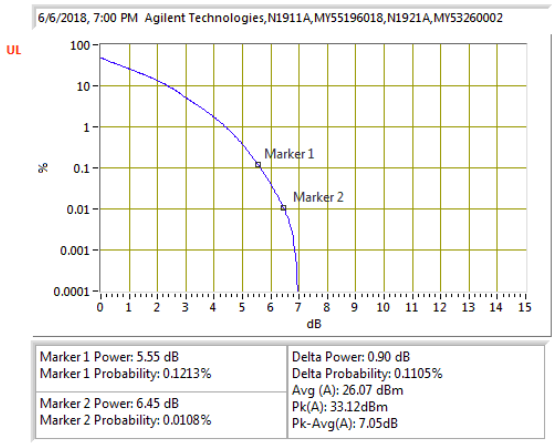
LTE B12 1.4MHz 16QAM Middle Channel



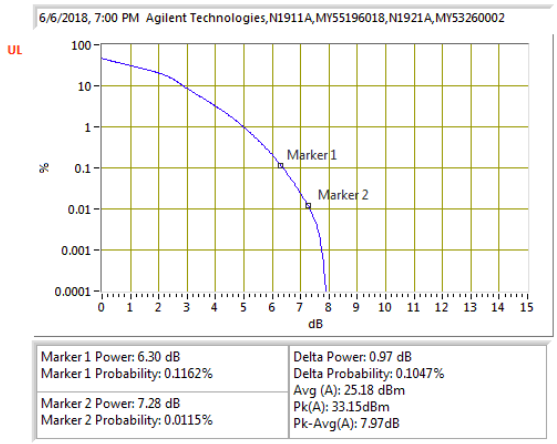
LTE B12 3MHz QPSK Middle Channel



LTE B12 3MHz 16QAM Middle Channel



LTE B12 5MHz QPSK Middle Channel



LTE B12 5MHz 16QAM Middle Channel

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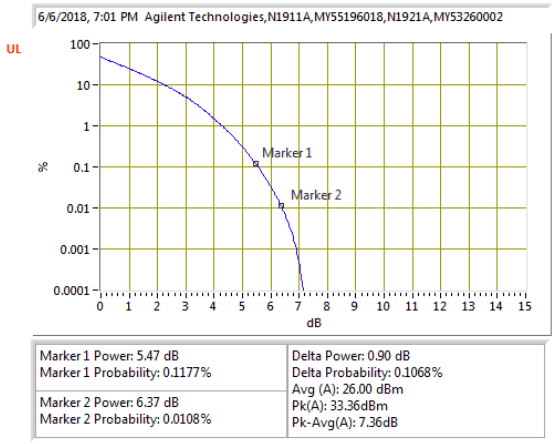
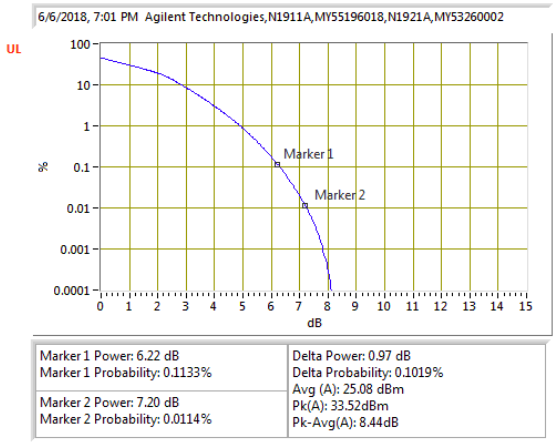


LTE B12 10MHz QPSK Middle Channel



LTE B12 10MHz 16QAM Middle Channel

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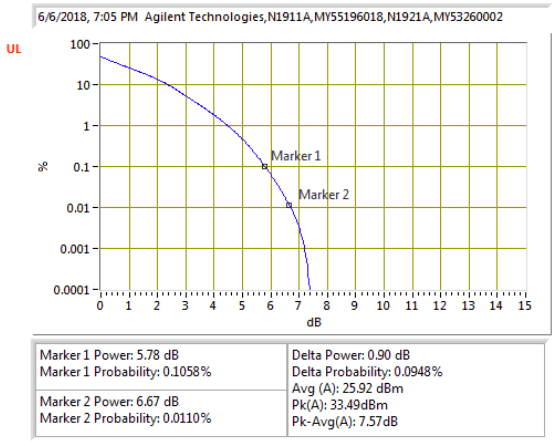
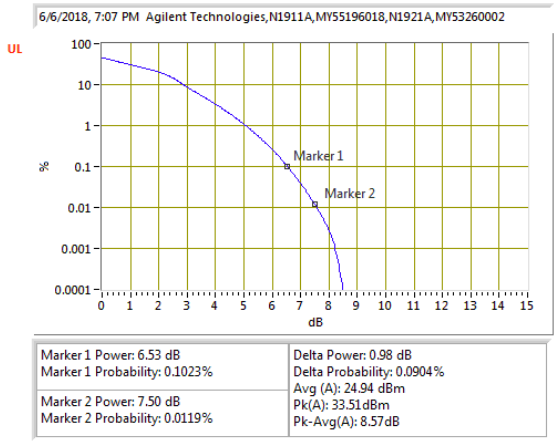
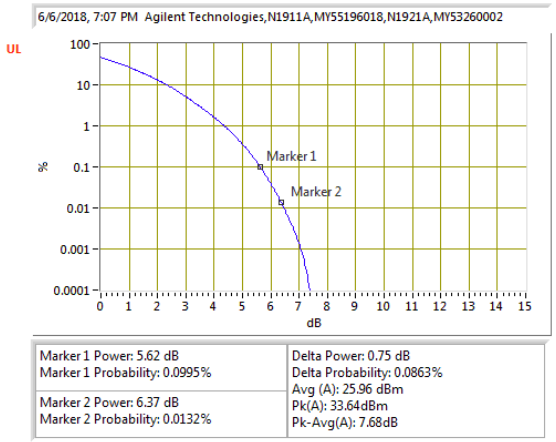
8.5.5. LTE BAND 13



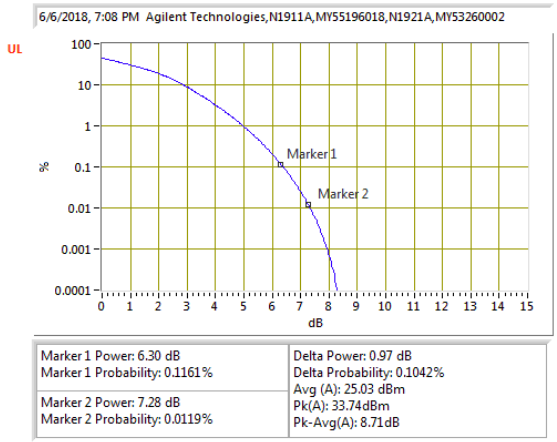
LTE B13 5MHz QPSK Middle Channel



LTE B13 5MHz 16QAM Middle Channel



LTE B13 10MHz QPSK Middle Channel



LTE B13 10MHz 16QAM Middle Channel

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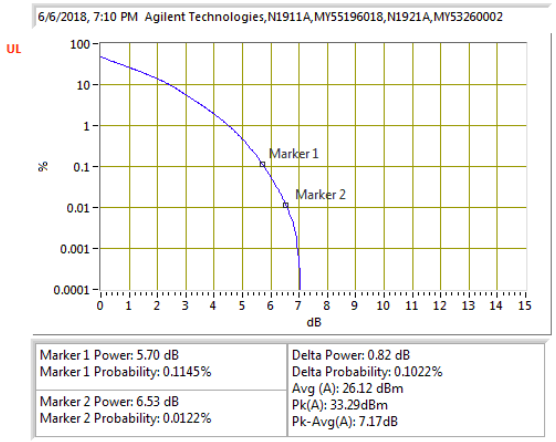
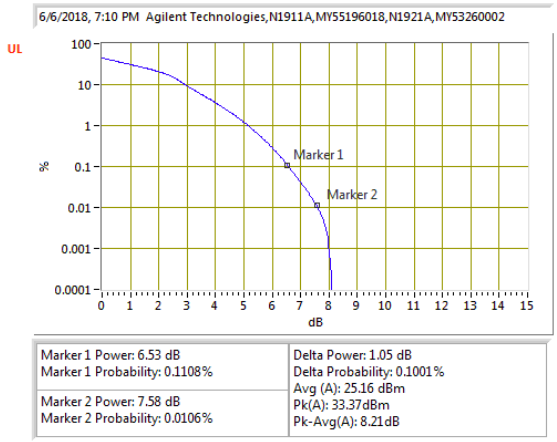
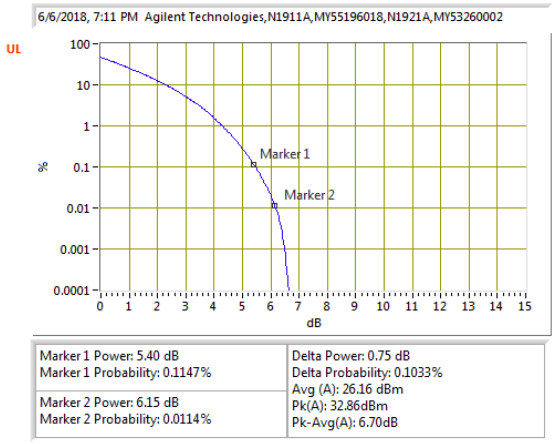
8.5.6. LTE BAND 14



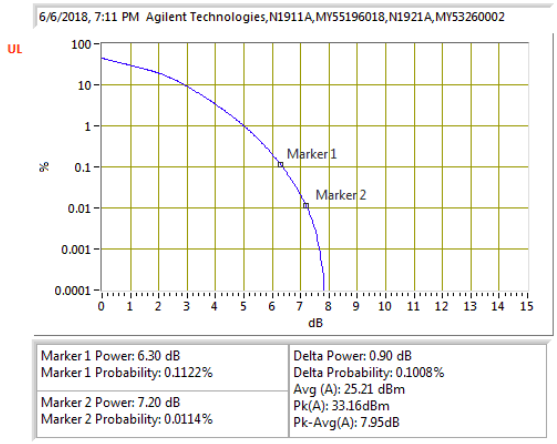
LTE B14 5MHz QPSK Middle Channel



LTE B14 5MHz 16QAM Middle Channel



LTE B14 10MHz QPSK Middle Channel



LTE B14 10MHz 16QAM Middle Channel

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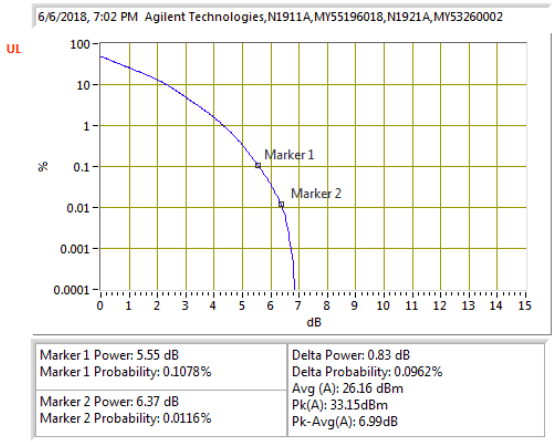
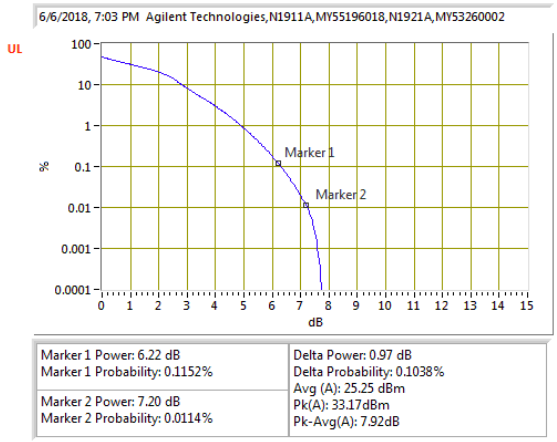
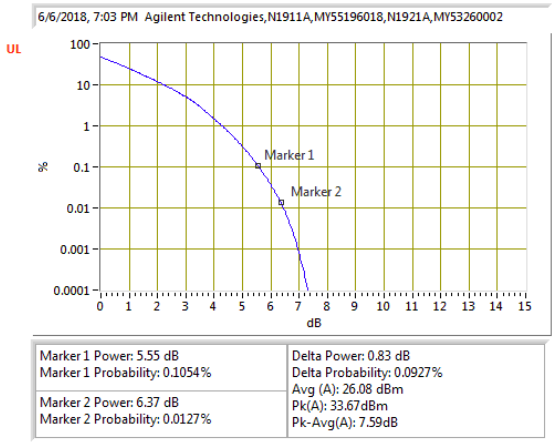
8.5.7. LTE BAND 17



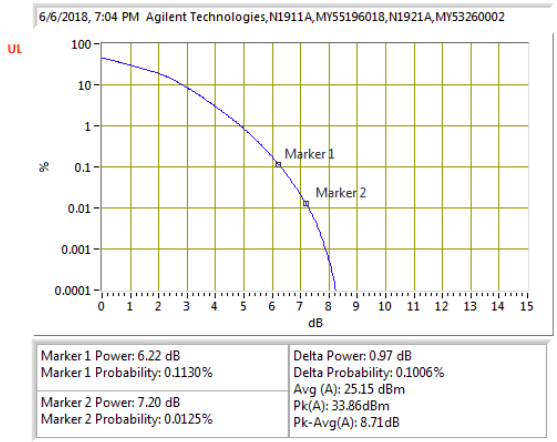
LTE B17 5MHz QPSK Middle Channel



LTE B17 5MHz 16QAM Middle Channel



LTE B17 10MHz QPSK Middle Channel



LTE B17 10MHz 16QAM Middle Channel

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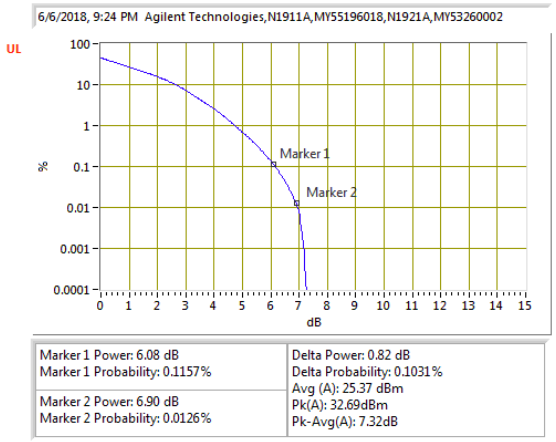
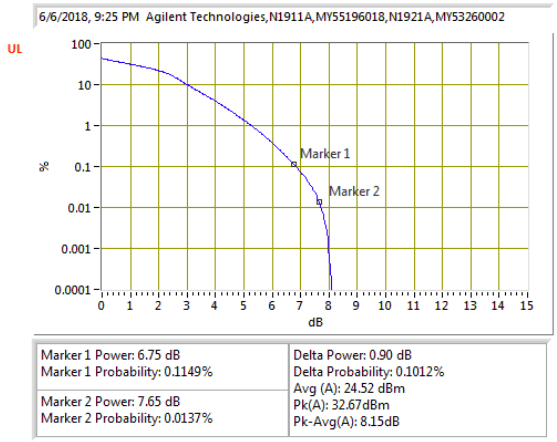
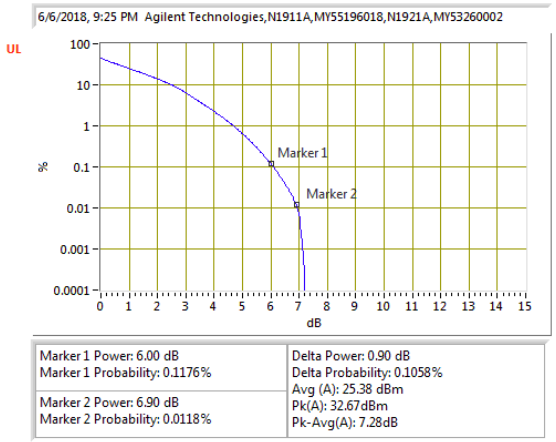
8.5.8. LTE BAND 25



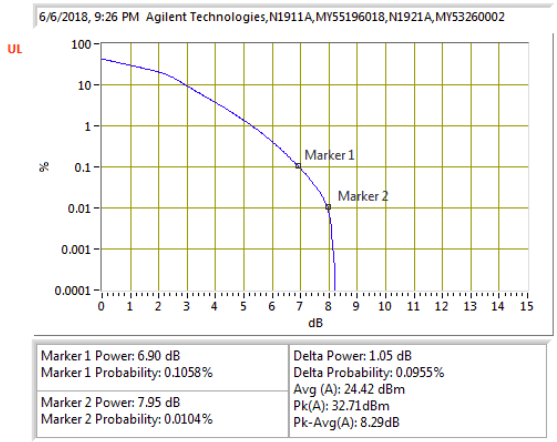
LTE B25 1.4MHz QPSK Middle Channel



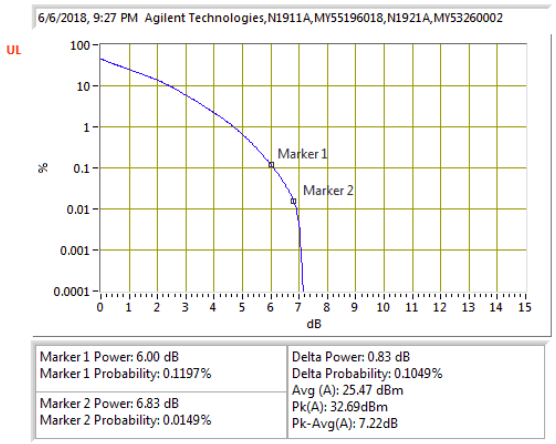
LTE B25 1.4MHz 16QAM Middle Channel



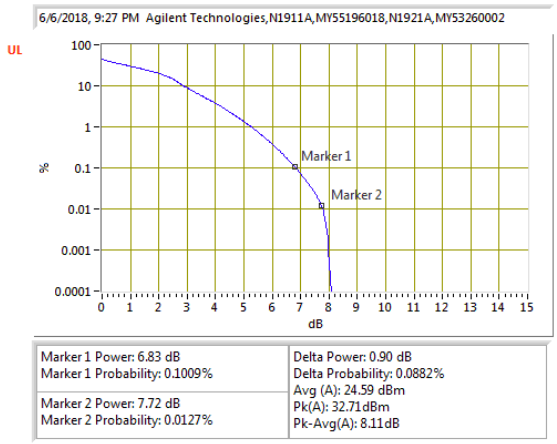
LTE B25 3MHz QPSK Middle Channel



LTE B25 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel



LTE B2 5MHz 16QAM Middle Channel

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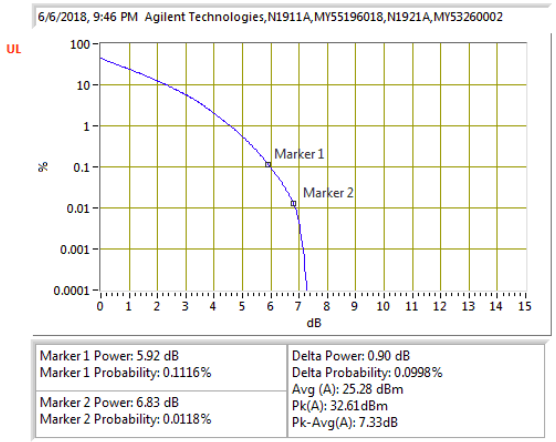
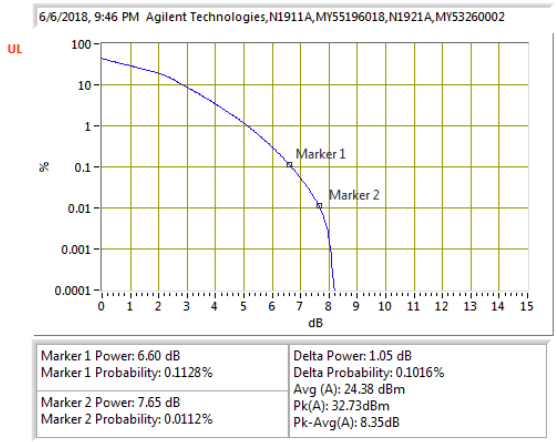
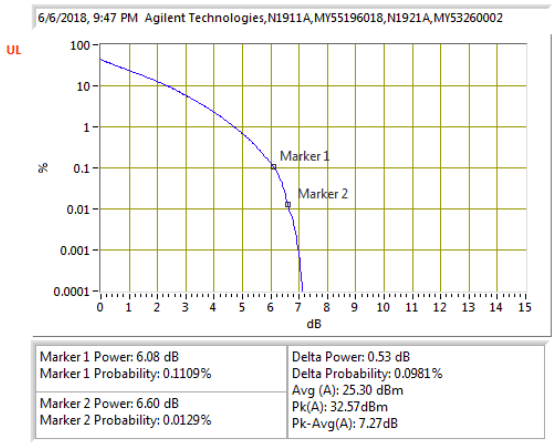


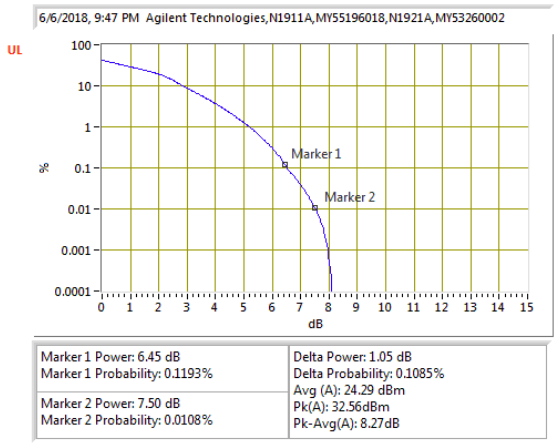
LTE B25 10MHz QPSK Middle Channel



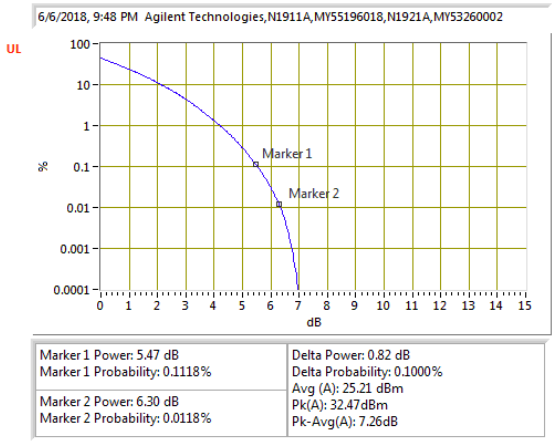
LTE B25 10MHz 16QAM Middle Channel



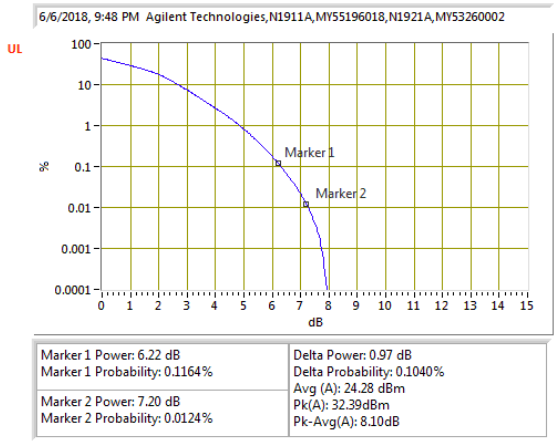
LTE B25 15MHz QPSK Middle Channel



LTE B25 15MHz 16QAM Middle Channel



LTE B25 20MHz QPSK Middle Channel



LTE B25 20MHz 16QAM Middle Channel

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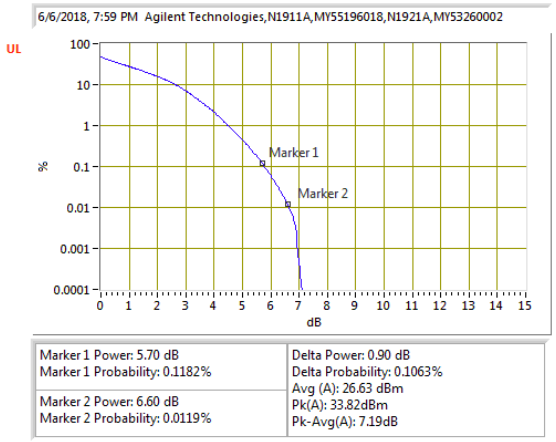
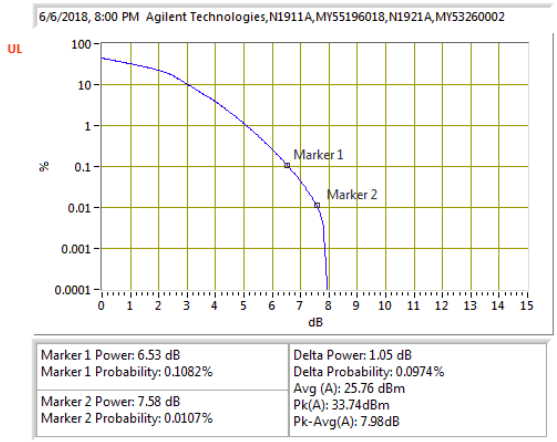
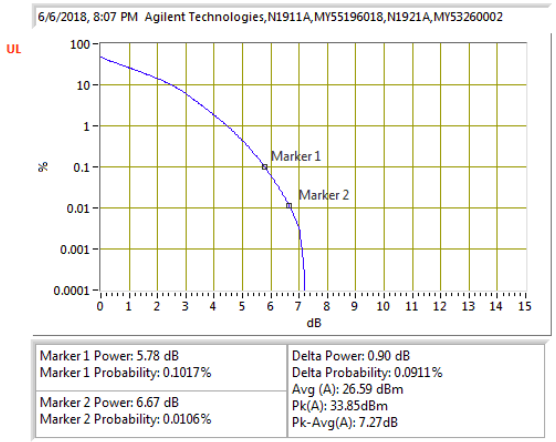
8.5.9. LTE BAND 26 (PART 90S)



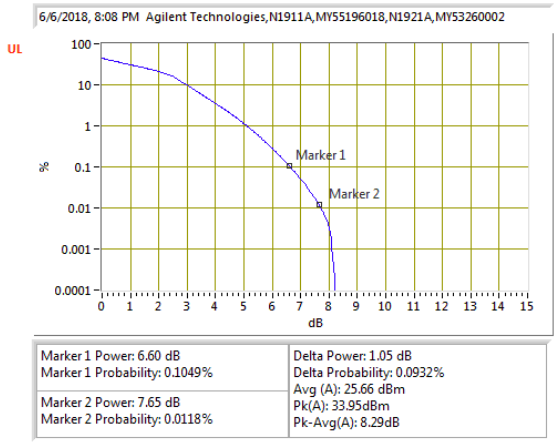
LTE B26 1.4MHz QPSK Middle Channel



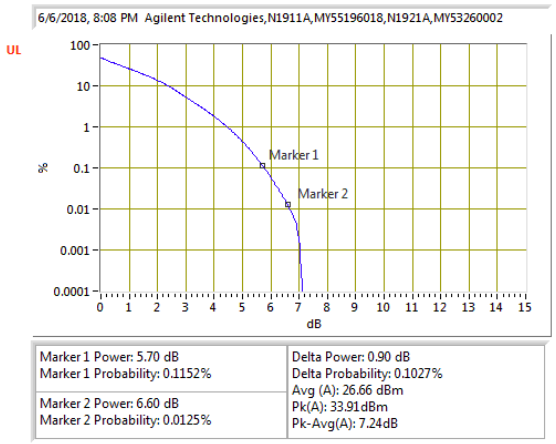
LTE B26 1.4MHz 16QAM Middle Channel



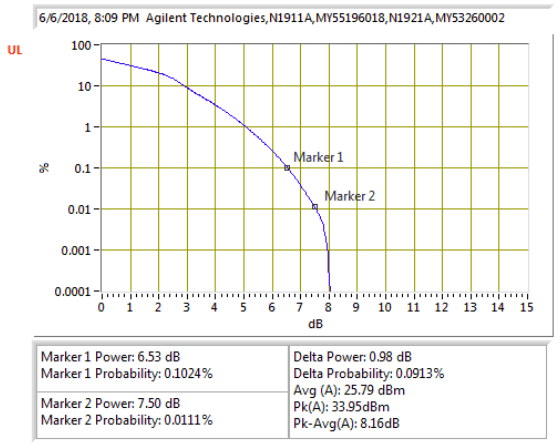
LTE B26 3MHz QPSK Middle Channel



LTE B26 3MHz 16QAM Middle Channel



LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

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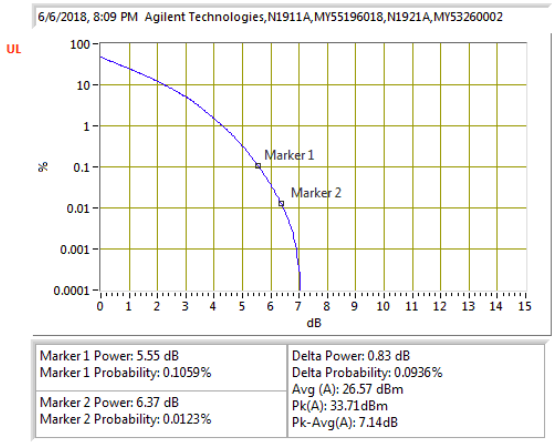
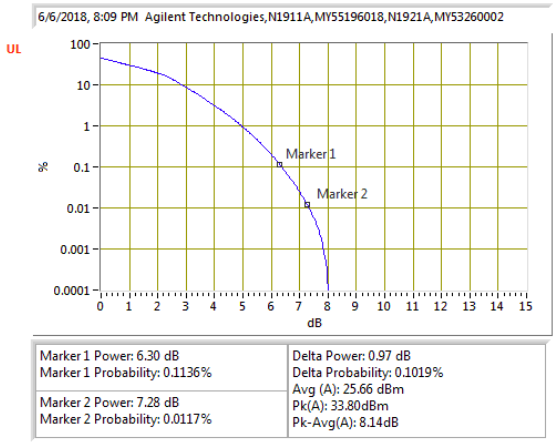


LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel

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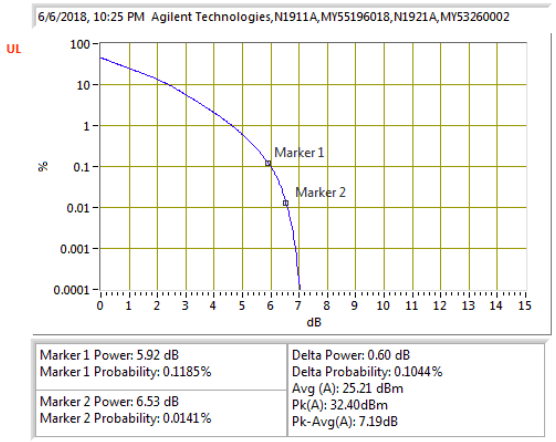
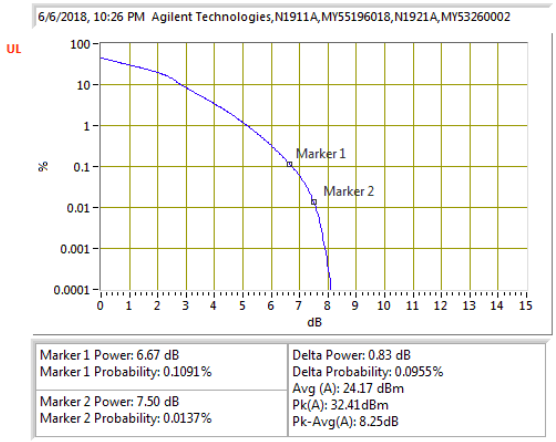
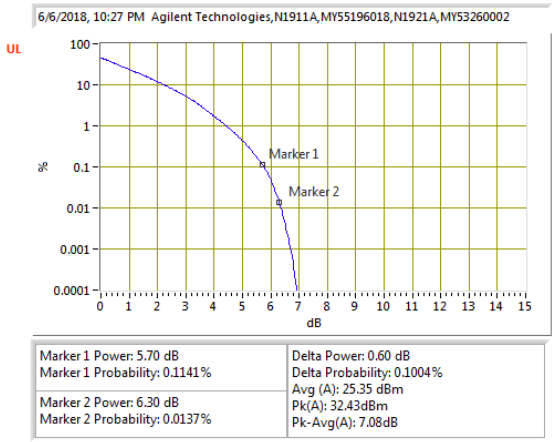
8.5.10. LTE BAND 30



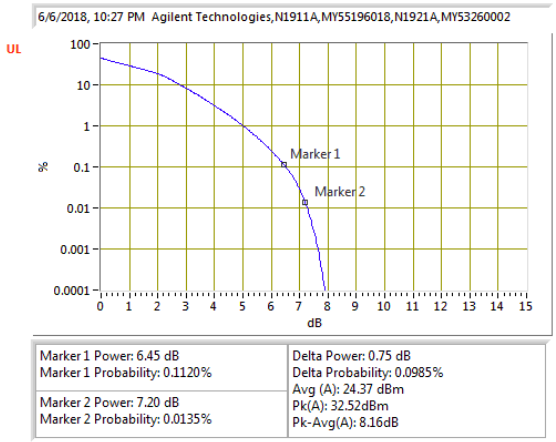
LTE B30 5MHz QPSK Middle Channel



LTE B30 5MHz 16QAM Middle Channel



LTE B30 10MHz QPSK Middle Channel



LTE B30 10MHz 16QAM Middle Channel

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8.5.11. LTE BAND 41

ID:	10646	Date:	6/6/18

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
Band 41	5MHz	2593.0	25	0	QPSK	34.17	20.04	7.14
					16QAM	34.13	19.04	8.10
	10MHz		50	0	QPSK	33.98	20.04	6.95
					16QAM	33.92	19.13	7.80
	15MHz		75	0	QPSK	33.90	19.46	7.45
					16QAM	33.88	19.01	7.88
	20MHz		100	0	QPSK	33.63	19.93	6.71
					16QAM	33.50	18.96	7.55
Duty Cycle Correction Factor (dB) =			6.99					
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

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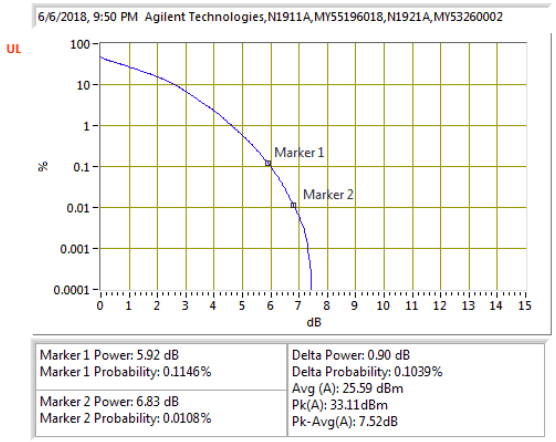
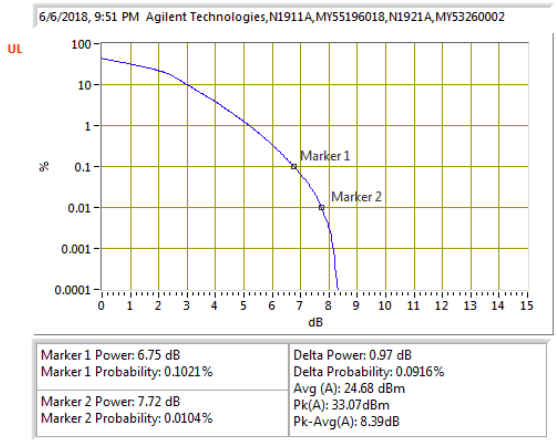
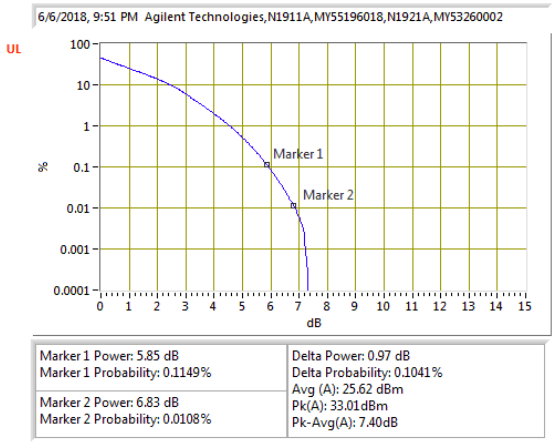
8.5.12. LTE BAND 66



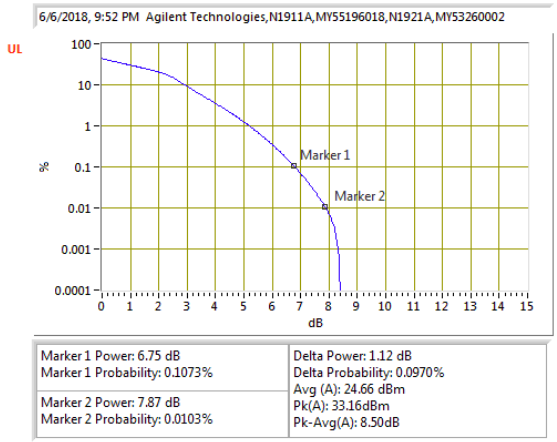
LTE B66 1.4MHz QPSK Middle Channel



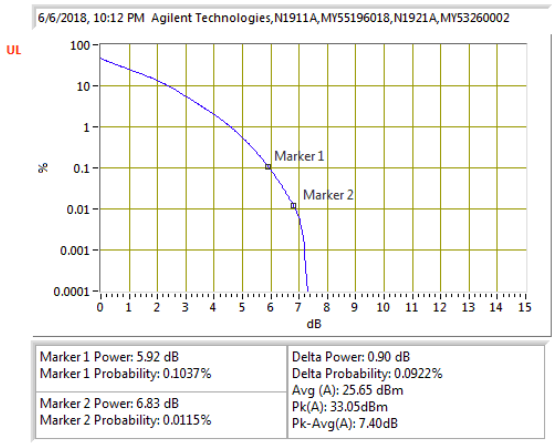
LTE B66 1.4MHz 16QAM Middle Channel



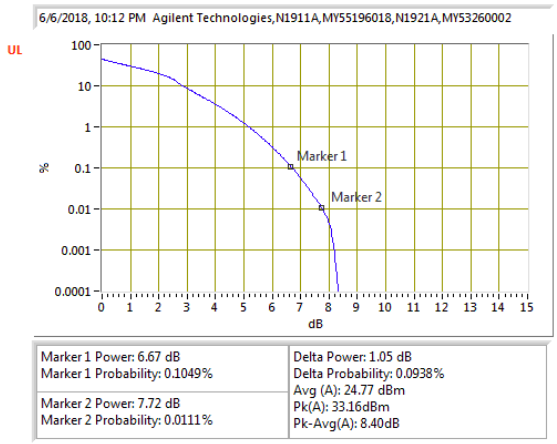
LTE B66 3MHz QPSK Middle Channel



LTE B66 3MHz 16QAM Middle Channel



LTE B66 5MHz QPSK Middle Channel



LTE B66 5MHz 16QAM Middle Channel

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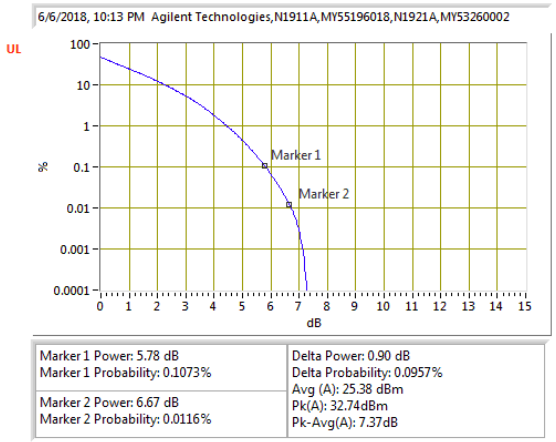
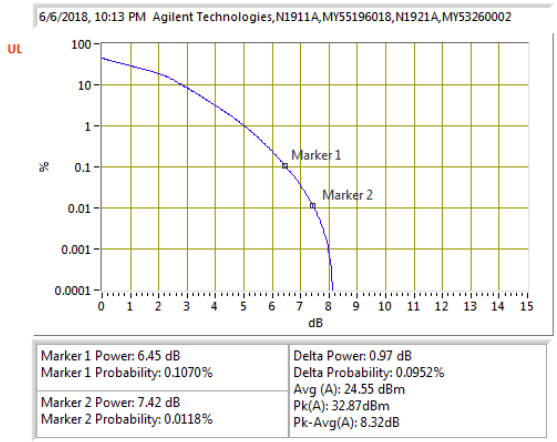
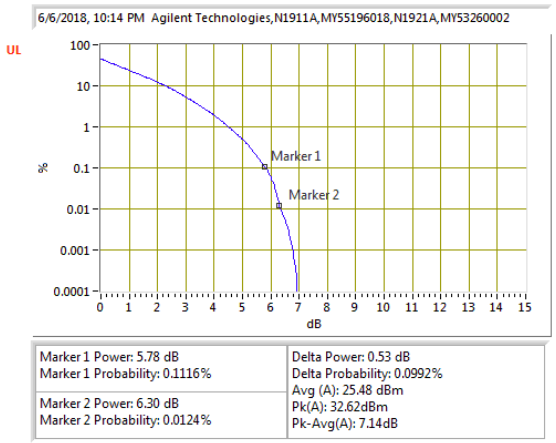


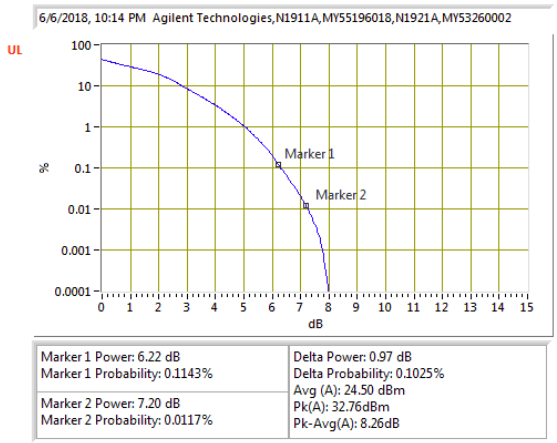
LTE B66 10MHz QPSK Middle Channel



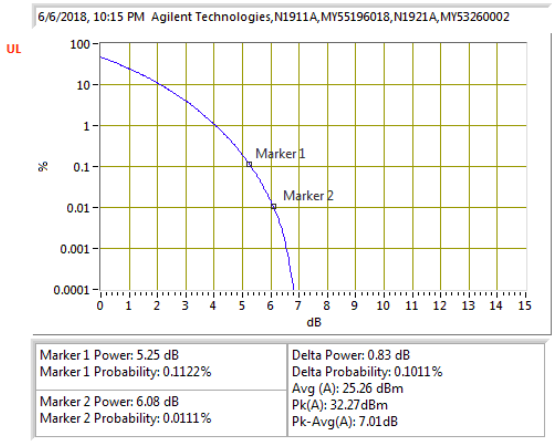
LTE B66 10MHz 16QAM Middle Channel



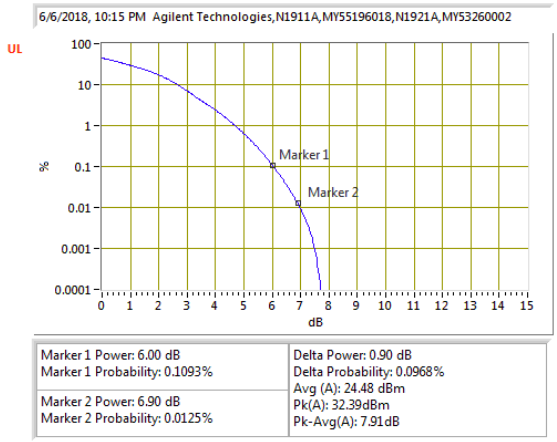
LTE B66 15MHz QPSK Middle Channel



LTE B66 15MHz 16QAM Middle Channel



LTE B66 20MHz QPSK Middle Channel



LTE B66 20MHz 16QAM Middle Channel

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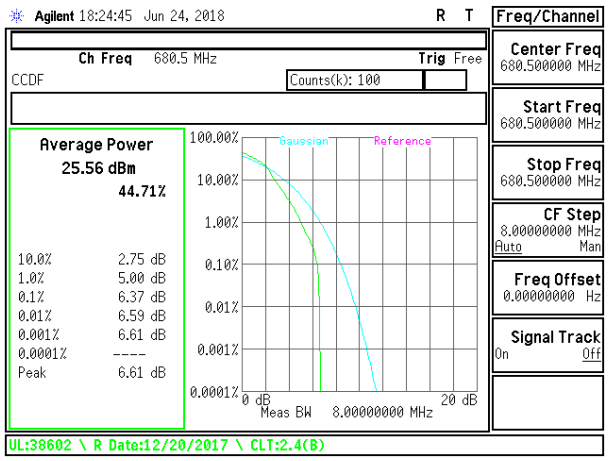
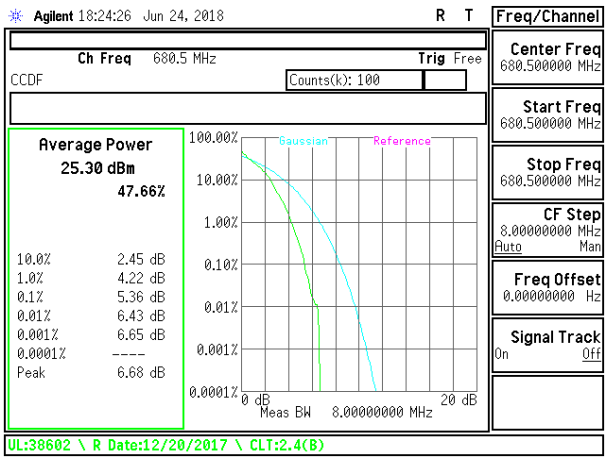
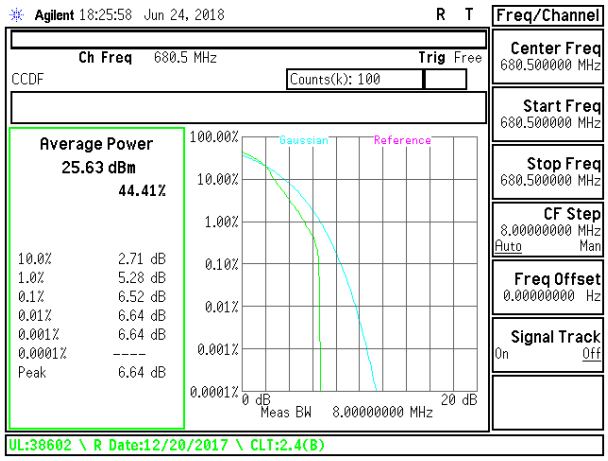
8.5.13. LTE BAND 71



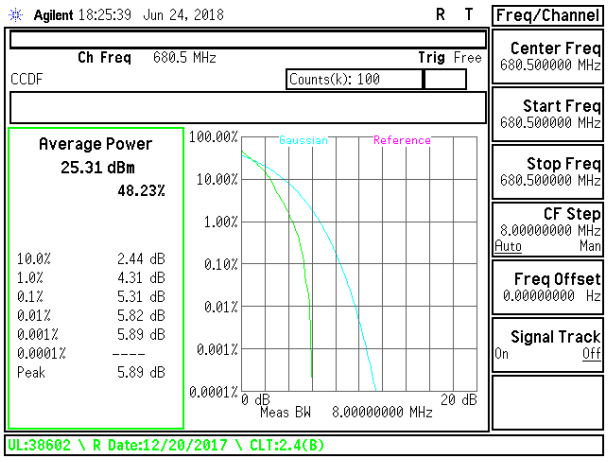
LTE B71 5MHz QPSK Middle Channel



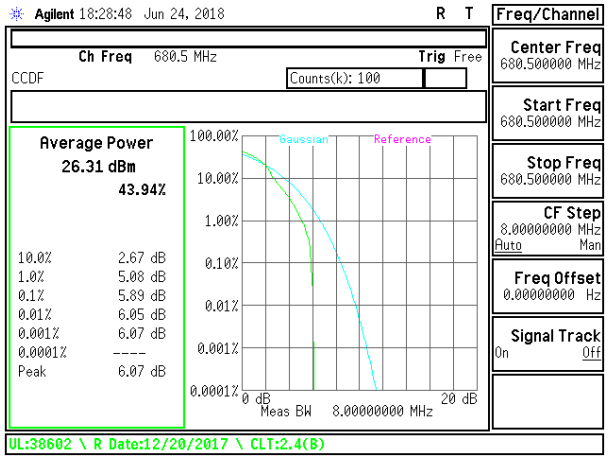
LTE B71 5MHz 16QAM Middle Channel



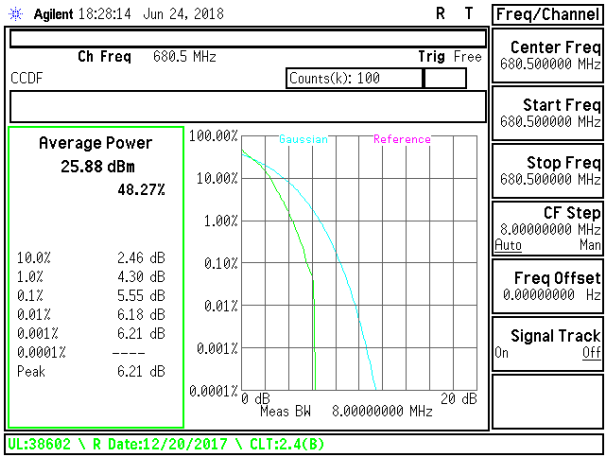
LTE B71 10MHz QPSK Middle Channel



LTE B71 10MHz 16QAM Middle Channel



LTE B71 15MHz QPSK Middle Channel



LTE B71 15MHz 16QAM Middle Channel

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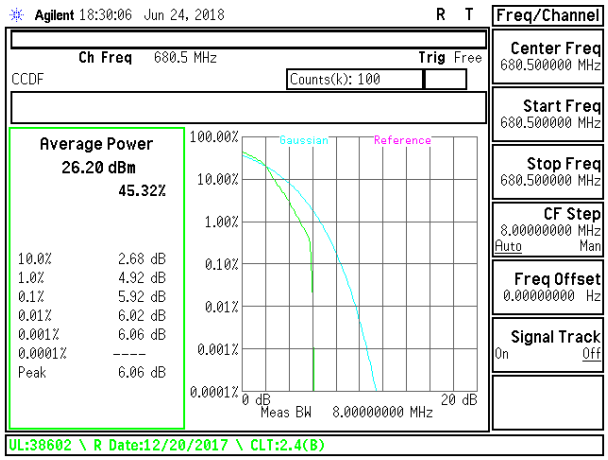
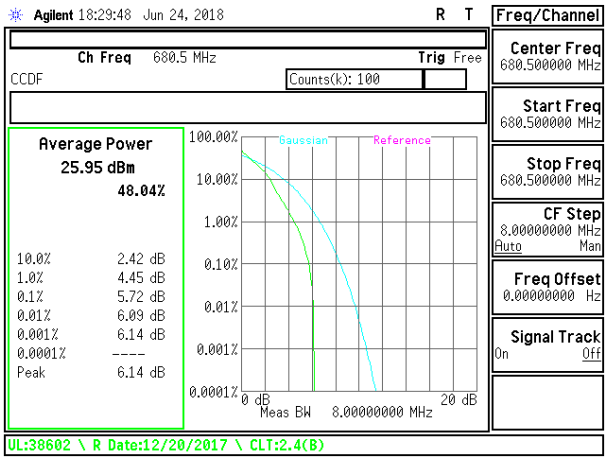


LTE B71 20MHz QPSK Middle Channel



LTE B71 20MHz 16QAM Middle Channel

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9. RADIATED TEST RESULTS

RULE PART(S)

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

LIMIT

§22.917(a), §24.238(a), §27.53 (g), (h), §90.691
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

§27.53 (Band 13)
(c) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
(f) Emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals. (-70 dBW/MHz = -40dBm/MHz).

§90.543 Emission Limitations. (Band 14)
(e) For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the 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, in accordance with the following:
(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

§27.53 (a) (Band 30, Band 40)
For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

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

TEST PROCEDURE

KDB 971168 D01 v03r01/ D02 v02r01

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 14
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 66
- LTE Band 71

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RESULTS

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9.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 1

9.1.1. LTE BAND 2

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 52277
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

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

Chamber: 3m Chamber C | Pre-amplifer: 3m Chamber C | Filter: Filter | Limit: 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	-70.3	H	3.0	-20.3	34.1	1.0	-53.4	-13.0	-40.4	
5.58	-72.2	H	3.0	-18.2	33.3	1.0	-50.5	-13.0	-37.5	
7.44	-72.8	H	3.0	-15.4	33.1	1.0	-47.4	-13.0	-34.4	
3.72	-69.7	V	3.0	-19.3	34.1	1.0	-52.4	-13.0	-39.4	
5.58	-71.5	V	3.0	-17.6	33.3	1.0	-49.9	-13.0	-36.9	
7.44	-71.5	V	3.0	-14.0	33.1	1.0	-46.1	-13.0	-33.1	
Mid Channel (1880MHz)										
3.76	-70.1	H	3.0	-19.9	34.1	1.0	-53.0	-13.0	-40.0	
5.64	-71.2	H	3.0	-17.0	33.3	1.0	-49.3	-13.0	-36.3	
7.52	-71.8	H	3.0	-14.2	33.0	1.0	-46.2	-13.0	-33.2	
3.76	-70.6	V	3.0	-20.1	34.1	1.0	-53.2	-13.0	-40.2	
5.64	-68.7	V	3.0	-14.6	33.3	1.0	-46.9	-13.0	-33.9	
7.52	-72.5	V	3.0	-14.9	33.0	1.0	-47.0	-13.0	-34.0	
High Channel (1900MHz)										
3.80	-70.3	H	3.0	-20.0	34.0	1.0	-53.1	-13.0	-40.1	
5.70	-71.9	H	3.0	-17.6	33.3	1.0	-49.9	-13.0	-36.9	
7.60	-73.4	H	3.0	-15.7	33.0	1.0	-47.7	-13.0	-34.7	
3.80	-69.3	V	3.0	-18.8	34.0	1.0	-51.8	-13.0	-38.8	
5.70	-71.3	V	3.0	-17.1	33.3	1.0	-49.4	-13.0	-36.4	
7.60	-72.9	V	3.0	-15.2	33.0	1.0	-47.2	-13.0	-34.2	

Rev. 05.21.15

LTE B2 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 52277
Configuration: EUT Only
Mode: LTE Band 2, 20MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-69.4	H	3.0	-19.4	34.1	1.0	-52.5	-13.0	-39.5	
5.58	-72.3	H	3.0	-18.2	33.3	1.0	-50.5	-13.0	-37.5	
7.44	-73.7	H	3.0	-16.2	33.1	1.0	-48.3	-13.0	-35.3	
3.72	-70.2	V	3.0	-19.8	34.1	1.0	-52.9	-13.0	-39.9	
5.58	-71.5	V	3.0	-17.6	33.3	1.0	-49.9	-13.0	-36.9	
7.44	-73.8	V	3.0	-16.3	33.1	1.0	-48.4	-13.0	-35.4	
Mid Channel (1880MHz)										
3.76	-70.9	H	3.0	-20.8	34.1	1.0	-53.9	-13.0	-40.9	
5.64	-69.0	H	3.0	-14.8	33.3	1.0	-47.1	-13.0	-34.1	
7.52	-72.4	H	3.0	-14.8	33.0	1.0	-46.9	-13.0	-33.9	
3.76	-71.7	V	3.0	-21.3	34.1	1.0	-54.4	-13.0	-41.4	
5.64	-71.3	V	3.0	-17.2	33.3	1.0	-49.5	-13.0	-36.5	
7.52	-72.1	V	3.0	-14.5	33.0	1.0	-46.5	-13.0	-33.5	
High Channel (1900MHz)										
3.80	-70.4	H	3.0	-20.1	34.0	1.0	-53.2	-13.0	-40.2	
5.70	-71.7	H	3.0	-17.4	33.3	1.0	-49.7	-13.0	-36.7	
7.60	-73.4	H	3.0	-15.7	33.0	1.0	-47.8	-13.0	-34.8	
3.80	-71.0	V	3.0	-20.5	34.0	1.0	-53.5	-13.0	-40.5	
5.70	-71.4	V	3.0	-17.1	33.3	1.0	-49.4	-13.0	-36.4	
7.60	-73.2	V	3.0	-15.5	33.0	1.0	-47.5	-13.0	-34.5	

Rev. 05.21.15

LTE B2 20MHz 16QAM

9.1.2. LTE BAND 5

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 5, 10MHz QPSK

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

Chamber: 3m Chamber C | Pre-amplifer: 3m Chamber C | Filter: Filter | Limit: 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	-67.3	H	3.0	-25.4	36.5	1.0	-60.9	-13.0	-47.9	
2.49	-66.6	H	3.0	-20.8	35.2	1.0	-55.0	-13.0	-42.0	
3.32	-67.9	H	3.0	-19.0	34.6	1.0	-52.6	-13.0	-39.6	
1.66	-66.4	V	3.0	-23.7	36.5	1.0	-59.2	-13.0	-46.2	
2.49	-65.2	V	3.0	-19.4	35.2	1.0	-53.5	-13.0	-40.5	
3.32	-67.1	V	3.0	-17.5	34.6	1.0	-51.1	-13.0	-38.1	
Mid Channel (836.5MHz)										
1.67	-67.0	H	3.0	-25.0	36.5	1.0	-60.4	-13.0	-47.4	
2.51	-66.3	H	3.0	-20.4	35.1	1.0	-54.5	-13.0	-41.5	
3.35	-67.3	H	3.0	-18.4	34.6	1.0	-51.9	-13.0	-38.9	
1.67	-66.7	V	3.0	-23.9	36.5	1.0	-59.4	-13.0	-46.4	
2.51	-67.0	V	3.0	-21.1	35.1	1.0	-55.2	-13.0	-42.2	
3.35	-66.6	V	3.0	-17.1	34.6	1.0	-50.6	-13.0	-37.6	
High Channel (844MHz)										
1.69	-67.7	H	3.0	-25.6	36.4	1.0	-61.0	-13.0	-48.0	
2.53	-66.4	H	3.0	-20.4	35.1	1.0	-54.5	-13.0	-41.5	
3.38	-67.0	H	3.0	-18.0	34.5	1.0	-51.5	-13.0	-38.5	
1.69	-66.5	V	3.0	-23.6	36.4	1.0	-59.0	-13.0	-46.0	
2.53	-65.7	V	3.0	-19.6	35.1	1.0	-53.8	-13.0	-40.8	
3.38	-66.0	V	3.0	-16.3	34.5	1.0	-49.9	-13.0	-36.9	

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LTE B5 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 5, 10MHz 16QAM

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

Chamber: 3m Chamber C | Pre-amplifer: 3m Chamber C | Filter: Filter | Limit: 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	-66.9	H	3.0	-25.1	36.5	1.0	-60.6	-13.0	-47.6	
2.49	-65.8	H	3.0	-20.0	35.2	1.0	-54.2	-13.0	-41.2	
3.32	-66.1	H	3.0	-17.2	34.6	1.0	-50.8	-13.0	-37.8	
1.66	-66.2	V	3.0	-23.5	36.5	1.0	-59.0	-13.0	-46.0	
2.49	-65.2	V	3.0	-19.4	35.2	1.0	-53.5	-13.0	-40.5	
3.32	-65.9	V	3.0	-16.3	34.6	1.0	-49.9	-13.0	-36.9	
Mid Channel (836.5MHz)										
1.67	-67.1	H	3.0	-25.1	36.5	1.0	-60.5	-13.0	-47.5	
2.51	-66.5	H	3.0	-20.5	35.1	1.0	-54.7	-13.0	-41.7	
3.35	-66.8	H	3.0	-17.9	34.6	1.0	-51.4	-13.0	-38.4	
1.67	-66.1	V	3.0	-23.3	36.5	1.0	-58.8	-13.0	-45.8	
2.51	-64.6	V	3.0	-18.7	35.1	1.0	-52.8	-13.0	-39.8	
3.35	-65.9	V	3.0	-16.3	34.6	1.0	-49.9	-13.0	-36.9	
High Channel (844MHz)										
1.69	-67.5	H	3.0	-25.4	36.4	1.0	-60.9	-13.0	-47.9	
2.53	-66.7	H	3.0	-20.7	35.1	1.0	-54.9	-13.0	-41.9	
3.38	-66.7	H	3.0	-17.6	34.5	1.0	-51.1	-13.0	-38.1	
1.69	-65.6	V	3.0	-22.6	36.4	1.0	-58.1	-13.0	-45.1	
2.53	-65.5	V	3.0	-19.4	35.1	1.0	-53.6	-13.0	-40.6	
3.38	-65.5	V	3.0	-15.8	34.5	1.0	-49.4	-13.0	-36.4	

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LTE B5 10MHz 16QAM

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9.1.3. LTE BAND 7

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	EIRP

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	-72.5	H	3.0	-19.6	38.7	1.0	-57.3	-13.0	-44.3	
7.53	-75.7	H	3.0	-17.9	37.7	1.0	-54.6	-13.0	-41.6	
10.04	-77.8	H	3.0	-17.0	36.2	1.0	-52.1	-13.0	-39.1	
5.02	-69.9	V	3.0	-17.3	38.7	1.0	-55.0	-13.0	-42.0	
7.53	-75.6	V	3.0	-17.9	37.7	1.0	-54.7	-13.0	-41.7	
10.04	-77.5	V	3.0	-16.7	36.2	1.0	-51.8	-13.0	-38.8	
Mid Channel (2535MHz)										
5.07	-70.5	H	3.0	-16.9	38.7	1.0	-54.6	-13.0	-41.6	
7.61	-74.0	H	3.0	-17.6	37.7	1.0	-54.3	-13.0	-41.3	
10.14	-77.5	H	3.0	-16.6	36.2	1.0	-51.8	-13.0	-38.8	
5.07	-72.2	V	3.0	-19.4	38.7	1.0	-57.1	-13.0	-44.1	
7.61	-73.8	V	3.0	-16.1	37.7	1.0	-52.8	-13.0	-39.8	
10.14	-77.7	V	3.0	-16.8	36.2	1.0	-52.0	-13.0	-39.0	
High Channel (2560MHz)										
5.12	-70.6	H	3.0	-17.5	38.7	1.0	-55.1	-13.0	-42.1	
7.68	-72.3	H	3.0	-14.3	37.6	1.0	-51.0	-13.0	-38.0	
10.24	-76.1	H	3.0	-15.1	36.3	1.0	-50.4	-13.0	-37.4	
5.12	-70.6	V	3.0	-17.8	38.7	1.0	-55.5	-13.0	-42.5	
7.68	-74.4	V	3.0	-16.6	37.6	1.0	-53.3	-13.0	-40.3	
10.24	-77.0	V	3.0	-15.9	36.3	1.0	-51.2	-13.0	-38.2	

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LTE B7 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	EIRP

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	-70.3	H	3.0	-17.4	38.7	1.0	-55.1	-13.0	-42.1	
7.53	-73.0	H	3.0	-15.2	37.7	1.0	-51.9	-13.0	-38.9	
10.04	-76.8	H	3.0	-15.9	36.2	1.0	-51.1	-13.0	-38.1	
5.02	-70.9	V	3.0	-18.3	38.7	1.0	-56.0	-13.0	-43.0	
7.53	-74.9	V	3.0	-17.3	37.7	1.0	-54.0	-13.0	-41.0	
10.04	-76.0	V	3.0	-15.2	36.2	1.0	-50.3	-13.0	-37.3	
Mid Channel (2535MHz)										
5.07	-69.6	H	3.0	-16.6	38.7	1.0	-54.3	-13.0	-41.3	
7.61	-73.0	H	3.0	-15.0	37.7	1.0	-51.7	-13.0	-38.7	
10.14	-74.8	H	3.0	-13.9	36.2	1.0	-49.1	-13.0	-36.1	
5.07	-70.3	V	3.0	-17.6	38.7	1.0	-55.3	-13.0	-42.3	
7.61	-73.9	V	3.0	-16.2	37.7	1.0	-52.9	-13.0	-39.9	
10.14	-76.8	V	3.0	-15.9	36.2	1.0	-51.1	-13.0	-38.1	
High Channel (2560MHz)										
5.12	-70.3	H	3.0	-17.2	38.7	1.0	-54.9	-13.0	-41.9	
7.68	-72.6	H	3.0	-14.6	37.6	1.0	-51.2	-13.0	-38.2	
10.24	-76.3	H	3.0	-15.3	36.3	1.0	-50.6	-13.0	-37.6	
5.12	-70.4	V	3.0	-17.6	38.7	1.0	-55.3	-13.0	-42.3	
7.68	-74.3	V	3.0	-16.5	37.6	1.0	-53.2	-13.0	-40.2	
10.24	-76.5	V	3.0	-15.5	36.3	1.0	-50.7	-13.0	-37.7	

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LTE B7 20MHz 16QAM

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9.1.4. LTE BAND 12

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 12, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-67.5	H	3.0	-27.2	36.7	1.0	-62.9	-13.0	-49.9	
2.11	-68.0	H	3.0	-23.1	35.8	1.0	-57.9	-13.0	-44.9	
2.82	-66.4	H	3.0	-19.2	35.0	1.0	-53.2	-13.0	-40.2	
1.41	-66.1	V	3.0	-25.4	36.7	1.0	-61.1	-13.0	-48.1	
2.11	-67.7	V	3.0	-22.0	35.8	1.0	-56.8	-13.0	-43.8	
2.82	-65.1	V	3.0	-17.3	35.0	1.0	-51.4	-13.0	-38.4	
Mid Channel (707.5MHz)										
1.42	-67.7	H	3.0	-27.4	36.7	1.0	-63.1	-13.0	-50.1	
2.12	-67.4	H	3.0	-22.4	35.7	1.0	-57.2	-13.0	-44.2	
2.83	-66.9	H	3.0	-19.6	35.0	1.0	-53.6	-13.0	-40.6	
1.42	-65.6	V	3.0	-24.9	36.7	1.0	-60.5	-13.0	-47.5	
2.12	-66.9	V	3.0	-21.2	35.7	1.0	-55.9	-13.0	-42.9	
2.83	-66.5	V	3.0	-18.6	35.0	1.0	-52.7	-13.0	-39.7	
High Channel (711MHz)										
1.42	-67.0	H	3.0	-26.8	36.7	1.0	-62.4	-13.0	-49.4	
2.13	-67.1	H	3.0	-22.2	35.7	1.0	-56.9	-13.0	-43.9	
2.84	-65.3	H	3.0	-18.0	35.0	1.0	-52.0	-13.0	-39.0	
1.42	-66.5	V	3.0	-25.8	36.7	1.0	-61.5	-13.0	-48.5	
2.13	-67.0	V	3.0	-21.3	35.7	1.0	-56.0	-13.0	-43.0	
2.84	-67.3	V	3.0	-19.3	35.0	1.0	-53.4	-13.0	-40.4	

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LTE B12 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 12, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-65.6	H	3.0	-25.4	36.7	1.0	-61.1	-13.0	-48.1	
2.11	-67.1	H	3.0	-22.2	35.8	1.0	-57.0	-13.0	-44.0	
2.82	-66.9	H	3.0	-19.7	35.0	1.0	-53.7	-13.0	-40.7	
1.41	-66.7	V	3.0	-26.0	36.7	1.0	-61.7	-13.0	-48.7	
2.11	-67.3	V	3.0	-21.5	35.8	1.0	-56.3	-13.0	-43.3	
2.82	-67.3	V	3.0	-19.5	35.0	1.0	-53.6	-13.0	-40.6	
Mid Channel (707.5MHz)										
1.42	-66.4	H	3.0	-26.1	36.7	1.0	-61.8	-13.0	-48.8	
2.12	-66.8	H	3.0	-21.9	35.7	1.0	-56.6	-13.0	-43.6	
2.83	-65.6	H	3.0	-18.3	35.0	1.0	-52.3	-13.0	-39.3	
1.42	-67.6	V	3.0	-26.9	36.7	1.0	-62.6	-13.0	-49.6	
2.12	-67.7	V	3.0	-22.0	35.7	1.0	-56.7	-13.0	-43.7	
2.83	-67.4	V	3.0	-19.6	35.0	1.0	-53.6	-13.0	-40.6	
High Channel (711MHz)										
1.42	-67.2	H	3.0	-26.9	36.7	1.0	-62.6	-13.0	-49.6	
2.13	-66.1	H	3.0	-21.2	35.7	1.0	-55.9	-13.0	-42.9	
2.84	-66.0	H	3.0	-18.6	35.0	1.0	-52.7	-13.0	-39.7	
1.42	-68.2	V	3.0	-27.5	36.7	1.0	-63.1	-13.0	-50.1	
2.13	-67.3	V	3.0	-21.6	35.7	1.0	-56.3	-13.0	-43.3	
2.84	-66.4	V	3.0	-18.5	35.0	1.0	-52.5	-13.0	-39.5	

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9.1.5. LTE BAND 13

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 13, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-66.9	H	3.0	-25.8	36.6	1.0	-61.5	-40.0	-21.5	
2.35	-66.0	H	3.0	-20.7	35.3	1.0	-55.0	-13.0	-42.0	
3.13	-66.5	H	3.0	-18.1	34.8	1.0	-51.9	-13.0	-38.9	
1.56	-66.5	V	3.0	-24.7	36.6	1.0	-60.4	-40.0	-20.4	
2.35	-67.0	V	3.0	-21.5	35.3	1.0	-55.8	-13.0	-42.8	
3.13	-66.1	V	3.0	-16.9	34.8	1.0	-50.8	-13.0	-37.8	

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LTE B13 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 13, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-66.3	H	3.0	-25.2	36.6	1.0	-60.8	-40.0	-20.8	
2.35	-66.7	H	3.0	-21.4	35.3	1.0	-55.7	-13.0	-42.7	
3.13	-66.0	H	3.0	-17.6	34.8	1.0	-51.4	-13.0	-38.4	
1.56	-67.5	V	3.0	-25.7	36.6	1.0	-61.3	-40.0	-21.3	
2.35	-67.5	V	3.0	-22.0	35.3	1.0	-56.3	-13.0	-43.3	
3.13	-66.4	V	3.0	-17.3	34.8	1.0	-51.1	-13.0	-38.1	

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LTE B13 10MHz 16QAM

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9.1.6. LTE BAND 14

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 14, 10MHz QPSK

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber 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 (793MHz)										
1.59	-66.2	H	3.0	-23.9	37.8	1.0	-60.7	-40.0	-20.7	
2.38	-65.7	H	3.0	-21.2	38.2	1.0	-58.3	-13.0	-45.3	
3.17	-66.4	H	3.0	-17.8	38.4	1.0	-55.2	-13.0	-42.2	
1.59	-66.5	V	3.0	-24.7	37.8	1.0	-61.5	-40.0	-21.5	
2.38	-66.3	V	3.0	-21.6	38.2	1.0	-58.7	-13.0	-45.7	
3.17	-65.7	V	3.0	-17.4	38.4	1.0	-54.8	-13.0	-41.8	

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LTE B14 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 14, 10MHz 16QAM

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

Chamber	Pre-amplifer	Filter	Limit
3m Chamber 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 (793MHz)										
1.59	-66.3	H	3.0	-24.0	37.8	1.0	-60.8	-40.0	-20.8	
2.38	-65.6	H	3.0	-21.1	38.2	1.0	-58.2	-13.0	-45.2	
3.17	-65.5	H	3.0	-16.9	38.4	1.0	-54.3	-13.0	-41.3	
1.59	-65.8	V	3.0	-24.0	37.8	1.0	-60.8	-40.0	-20.8	
2.38	-65.7	V	3.0	-21.0	38.2	1.0	-58.1	-13.0	-45.1	
3.17	-64.6	V	3.0	-16.3	38.4	1.0	-53.7	-13.0	-40.7	

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LTE B14 10MHz 16QAM

9.1.7. LTE BAND 17

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 17, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-68.1	H	3.0	-27.8	36.7	1.0	-63.5	-13.0	-50.5	
2.13	-67.3	H	3.0	-22.4	35.7	1.0	-57.1	-13.0	-44.1	
2.84	-67.3	H	3.0	-20.0	35.0	1.0	-54.0	-13.0	-41.0	
1.42	-67.2	V	3.0	-26.5	36.7	1.0	-62.2	-13.0	-49.2	
2.13	-66.0	V	3.0	-20.3	35.7	1.0	-55.0	-13.0	-42.0	
2.84	-66.6	V	3.0	-18.7	35.0	1.0	-52.7	-13.0	-39.7	

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LTE B17 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 17, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-66.4	H	3.0	-26.2	36.7	1.0	-61.9	-13.0	-48.9	
2.13	-67.6	H	3.0	-22.7	35.7	1.0	-57.4	-13.0	-44.4	
2.84	-66.1	H	3.0	-18.7	35.0	1.0	-52.8	-13.0	-39.8	
1.42	-67.3	V	3.0	-26.5	36.7	1.0	-62.2	-13.0	-49.2	
2.13	-67.6	V	3.0	-21.8	35.7	1.0	-56.6	-13.0	-43.6	
2.84	-66.6	V	3.0	-18.7	35.0	1.0	-52.8	-13.0	-39.8	

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LTE B17 10MHz 16QAM

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9.1.8. LTE BAND 25

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 25, 20MHz QPSK

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

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

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

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LTE B25 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/15/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 25, 20MHz 16QAM

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

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

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

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LTE B25 20MHz 16QAM

9.1.9. LTE BAND 26 (PART 90S)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	-61.8	H	3.0	-19.4	37.8	1.0	-56.2	-13.0	-43.2	
2.46	-64.2	H	3.0	-19.3	38.4	1.0	-56.7	-13.0	-43.7	
3.28	-63.0	H	3.0	-14.1	38.5	1.0	-51.5	-13.0	-38.5	
1.64	-62.5	V	3.0	-20.4	37.8	1.0	-57.2	-13.0	-44.2	
2.46	-62.8	V	3.0	-17.7	38.4	1.0	-55.1	-13.0	-42.1	
3.28	-63.3	V	3.0	-14.7	38.5	1.0	-52.2	-13.0	-39.2	

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LTE B26 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	-62.5	H	3.0	-20.1	37.8	1.0	-56.9	-13.0	-43.9	
2.46	-63.1	H	3.0	-18.2	38.4	1.0	-55.6	-13.0	-42.6	
3.28	-63.4	H	3.0	-14.5	38.5	1.0	-52.0	-13.0	-39.0	
1.64	-62.7	V	3.0	-20.7	37.8	1.0	-57.5	-13.0	-44.5	
2.46	-62.0	V	3.0	-16.9	38.4	1.0	-54.3	-13.0	-41.3	
3.28	-63.5	V	3.0	-14.9	38.5	1.0	-52.4	-13.0	-39.4	

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LTE B26 10MHz 16QAM

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9.1.10. LTE BAND 30

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	EIRP

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	-70.2	H	3.0	-16.4	37.9	1.0	-53.3	-13.0	-40.3	
6.93	-73.1	H	3.0	-14.5	36.5	1.0	-49.9	-13.0	-36.9	
9.24	-75.9	H	3.0	-14.4	34.9	1.0	-48.2	-13.0	-35.2	
4.62	-68.1	V	3.0	-14.4	37.9	1.0	-51.3	-13.0	-38.3	
6.93	-72.1	V	3.0	-12.6	36.5	1.0	-48.1	-13.0	-35.1	
9.24	-74.1	V	3.0	-12.4	34.9	1.0	-46.2	-13.0	-33.2	

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LTE B30 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	EIRP

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	-69.6	H	3.0	-15.8	37.9	1.0	-52.8	-13.0	-39.8	
6.93	-73.8	H	3.0	-15.1	36.5	1.0	-50.6	-13.0	-37.6	
9.24	-75.4	H	3.0	-13.9	34.9	1.0	-47.7	-13.0	-34.7	
4.62	-69.1	V	3.0	-15.4	37.9	1.0	-52.3	-13.0	-39.3	
6.93	-72.7	V	3.0	-13.2	36.5	1.0	-48.7	-13.0	-35.7	
9.24	-76.2	V	3.0	-14.4	34.9	1.0	-48.3	-13.0	-35.3	

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LTE B30 10MHz 16QAM

9.1.11. LTE BAND 41

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	-61.9	H	3.0	-9.0	38.7	1.0	-46.7	-25.0	-21.7	
7.52	-63.7	H	3.0	-5.9	37.7	1.0	-42.6	-25.0	-17.6	
10.02	-65.6	H	3.0	-4.8	36.1	1.0	-39.9	-25.0	-14.9	
5.01	-60.6	V	3.0	-8.0	38.7	1.0	-45.7	-25.0	-20.7	
7.52	-64.0	V	3.0	-6.4	37.7	1.0	-43.1	-25.0	-18.1	
10.02	-65.2	V	3.0	-4.4	36.1	1.0	-39.5	-25.0	-14.5	
Mid Channel (2593MHz)										
5.19	-62.0	H	3.0	-8.7	38.7	1.0	-46.4	-25.0	-21.4	
7.78	-63.5	H	3.0	-5.4	37.6	1.0	-42.0	-25.0	-17.0	
10.37	-64.2	H	3.0	-3.1	36.4	1.0	-38.5	-25.0	-13.5	
5.19	-62.0	V	3.0	-9.1	38.7	1.0	-46.8	-25.0	-21.8	
7.78	-63.5	V	3.0	-5.6	37.6	1.0	-42.2	-25.0	-17.2	
10.37	-64.7	V	3.0	-3.6	36.4	1.0	-38.9	-25.0	-13.9	
High Channel (2680MHz)										
5.36	-62.4	H	3.0	-8.8	38.6	1.0	-46.4	-25.0	-21.4	
8.04	-63.4	H	3.0	-5.0	37.4	1.0	-41.4	-25.0	-16.4	
10.72	-65.1	H	3.0	-3.7	36.6	1.0	-39.3	-25.0	-14.3	
5.36	-62.7	V	3.0	-9.4	38.6	1.0	-47.0	-25.0	-22.0	
8.04	-63.5	V	3.0	-5.2	37.4	1.0	-41.6	-25.0	-16.6	
10.72	-65.2	V	3.0	-3.6	36.6	1.0	-39.2	-25.0	-14.2	

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LTE B41 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	-61.9	H	3.0	-9.0	38.7	1.0	-46.7	-25.0	-21.7	
7.52	-64.1	H	3.0	-6.3	37.7	1.0	-43.0	-25.0	-18.0	
10.02	-64.5	H	3.0	-3.7	36.1	1.0	-38.8	-25.0	-13.8	
5.01	-61.2	V	3.0	-8.5	38.7	1.0	-46.2	-25.0	-21.2	
7.52	-63.5	V	3.0	-5.9	37.7	1.0	-42.7	-25.0	-17.7	
10.02	-65.6	V	3.0	-4.8	36.1	1.0	-39.9	-25.0	-14.9	
Mid Channel (2593MHz)										
5.19	-62.2	H	3.0	-8.9	38.7	1.0	-46.6	-25.0	-21.6	
7.78	-62.9	H	3.0	-4.8	37.6	1.0	-41.4	-25.0	-16.4	
10.37	-64.7	H	3.0	-3.6	36.4	1.0	-39.0	-25.0	-14.0	
5.19	-61.7	V	3.0	-8.8	38.7	1.0	-46.5	-25.0	-21.5	
7.78	-63.4	V	3.0	-5.4	37.6	1.0	-42.0	-25.0	-17.0	
10.37	-64.7	V	3.0	-3.5	36.4	1.0	-38.9	-25.0	-13.9	
High Channel (2680MHz)										
5.36	-63.3	H	3.0	-9.7	38.6	1.0	-47.3	-25.0	-22.3	
8.04	-62.6	H	3.0	-4.1	37.4	1.0	-40.5	-25.0	-15.5	
10.72	-65.0	H	3.0	-3.6	36.6	1.0	-39.2	-25.0	-14.2	
5.36	-63.0	V	3.0	-9.7	38.6	1.0	-47.4	-25.0	-22.4	
8.04	-63.2	V	3.0	-4.9	37.4	1.0	-41.4	-25.0	-16.4	
10.72	-64.5	V	3.0	-2.9	36.6	1.0	-38.5	-25.0	-13.5	

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LTE B41 20MHz 16QAM

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9.1.12. LTE BAND 66

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	-63.3	H	3.0	-14.0	38.5	1.0	-51.6	-13.0	-38.6	
5.16	-61.4	H	3.0	-8.2	38.7	1.0	-45.8	-13.0	-32.8	
6.88	-63.4	H	3.0	-6.5	38.1	1.0	-43.6	-13.0	-30.6	
3.44	-63.5	V	3.0	-14.4	38.5	1.0	-51.9	-13.0	-38.9	
5.16	-61.5	V	3.0	-8.6	38.7	1.0	-46.3	-13.0	-33.3	
6.88	-61.7	V	3.0	-5.1	38.1	1.0	-42.2	-13.0	-29.2	
Mid Channel (1745.0MHz)										
3.49	-64.0	H	3.0	-14.6	38.5	1.0	-52.1	-13.0	-39.1	
5.24	-61.5	H	3.0	-8.2	38.7	1.0	-45.8	-13.0	-32.8	
6.98	-62.0	H	3.0	-4.9	38.1	1.0	-42.0	-13.0	-29.0	
3.49	-64.3	V	3.0	-15.1	38.5	1.0	-52.6	-13.0	-39.6	
5.24	-62.2	V	3.0	-9.1	38.7	1.0	-46.8	-13.0	-33.8	
6.98	-62.9	V	3.0	-6.0	38.1	1.0	-43.1	-13.0	-30.1	
High Channel (1770.0MHz)										
3.54	-63.8	H	3.0	-14.3	38.6	1.0	-51.8	-13.0	-38.8	
5.31	-63.6	H	3.0	-10.1	38.6	1.0	-47.7	-13.0	-34.7	
7.08	-62.5	H	3.0	-5.2	38.0	1.0	-42.2	-13.0	-29.2	
3.54	-63.3	V	3.0	-13.9	38.6	1.0	-51.5	-13.0	-38.5	
5.31	-63.9	V	3.0	-10.7	38.6	1.0	-48.4	-13.0	-35.4	
7.08	-63.7	V	3.0	-6.6	38.0	1.0	-43.7	-13.0	-30.7	

Rev. 02.24.17

LTE B66 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/16/18
Test Engineer: 19429
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	-64.0	H	3.0	-14.7	38.5	1.0	-52.2	-13.0	-39.2	
5.16	-61.7	H	3.0	-8.5	38.7	1.0	-46.2	-13.0	-33.2	
6.88	-63.3	H	3.0	-6.3	38.1	1.0	-43.5	-13.0	-30.5	
3.44	-63.3	V	3.0	-14.2	38.5	1.0	-51.7	-13.0	-38.7	
5.16	-62.2	V	3.0	-9.3	38.7	1.0	-47.0	-13.0	-34.0	
6.88	-63.0	V	3.0	-6.3	38.1	1.0	-43.4	-13.0	-30.4	
Mid Channel (1745.0MHz)										
3.49	-63.9	H	3.0	-14.5	38.5	1.0	-52.0	-13.0	-39.0	
5.24	-63.8	H	3.0	-10.5	38.7	1.0	-48.2	-13.0	-35.2	
6.98	-63.1	H	3.0	-6.0	38.1	1.0	-43.1	-13.0	-30.1	
3.49	-64.0	V	3.0	-14.7	38.5	1.0	-52.3	-13.0	-39.3	
5.24	-63.7	V	3.0	-10.7	38.7	1.0	-48.4	-13.0	-35.4	
6.98	-63.7	V	3.0	-6.8	38.1	1.0	-43.9	-13.0	-30.9	
High Channel (1770.0MHz)										
3.54	-63.8	H	3.0	-14.3	38.6	1.0	-51.8	-13.0	-38.8	
5.31	-63.6	H	3.0	-10.1	38.6	1.0	-47.7	-13.0	-34.7	
7.08	-63.1	H	3.0	-5.8	38.0	1.0	-42.8	-13.0	-29.8	
3.54	-62.5	V	3.0	-13.1	38.6	1.0	-50.6	-13.0	-37.6	
5.31	-63.1	V	3.0	-9.9	38.6	1.0	-47.6	-13.0	-34.6	
7.08	-62.9	V	3.0	-5.8	38.0	1.0	-42.9	-13.0	-29.9	

Rev. 02.24.17

LTE B66 20MHz 16QAM

9.1.13. LTE BAND 71

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 12500
Configuration: EUT only
Mode: LTE Band 71, 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 (673MHz)										
1.35	-65.1	H	3.0	-23.8	38.2	1.0	-61.0	-13.0	-48.0	
2.02	-66.0	H	3.0	-22.8	37.9	1.0	-59.7	-13.0	-46.7	
2.69	-64.5	H	3.0	-18.2	38.5	1.0	-55.7	-13.0	-42.7	
1.35	-67.0	V	3.0	-26.4	38.2	1.0	-63.6	-13.0	-50.6	
2.02	-67.1	V	3.0	-23.2	37.9	1.0	-60.1	-13.0	-47.1	
2.69	-66.5	V	3.0	-20.2	38.5	1.0	-57.7	-13.0	-44.7	
Mid Channel (680.5MHz)										
1.36	-66.3	H	3.0	-24.9	38.2	1.0	-62.1	-13.0	-49.1	
2.04	-66.8	H	3.0	-23.5	37.9	1.0	-60.4	-13.0	-47.4	
2.72	-66.5	H	3.0	-20.0	38.5	1.0	-57.5	-13.0	-44.5	
1.36	-66.0	V	3.0	-25.3	38.2	1.0	-62.5	-13.0	-49.5	
2.04	-66.3	V	3.0	-22.3	37.9	1.0	-59.3	-13.0	-46.3	
2.72	-66.8	V	3.0	-20.4	38.5	1.0	-57.9	-13.0	-44.9	
High Channel (688MHz)										
1.38	-66.6	H	3.0	-25.1	38.2	1.0	-62.3	-13.0	-49.3	
2.06	-66.8	H	3.0	-23.4	38.0	1.0	-60.3	-13.0	-47.3	
2.75	-66.6	H	3.0	-19.9	38.5	1.0	-57.4	-13.0	-44.4	
1.38	-67.2	V	3.0	-26.4	38.2	1.0	-63.6	-13.0	-50.6	
2.06	-66.7	V	3.0	-22.7	38.0	1.0	-59.6	-13.0	-46.6	
2.75	-67.4	V	3.0	-20.8	38.5	1.0	-58.3	-13.0	-45.3	

Rev. 12.18.15

LTE B71 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/17/18
Test Engineer: 12500
Configuration: EUT only
Mode: LTE Band 71, 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 (673MHz)										
1.35	-67.0	H	3.0	-25.7	38.2	1.0	-62.9	-13.0	-49.9	
2.02	-66.8	H	3.0	-23.6	37.9	1.0	-60.5	-13.0	-47.5	
2.69	-66.9	H	3.0	-20.6	38.5	1.0	-58.1	-13.0	-45.1	
1.35	-66.0	V	3.0	-25.4	38.2	1.0	-62.6	-13.0	-49.6	
2.02	-65.8	V	3.0	-21.9	37.9	1.0	-58.8	-13.0	-45.8	
2.69	-66.5	V	3.0	-20.2	38.5	1.0	-57.7	-13.0	-44.7	
Mid Channel (680.5MHz)										
1.36	-66.5	H	3.0	-25.1	38.2	1.0	-62.3	-13.0	-49.3	
2.04	-66.9	H	3.0	-23.6	37.9	1.0	-60.5	-13.0	-47.5	
2.72	-66.8	H	3.0	-20.3	38.5	1.0	-57.8	-13.0	-44.8	
1.36	-66.3	V	3.0	-25.6	38.2	1.0	-62.8	-13.0	-49.8	
2.04	-66.5	V	3.0	-22.5	37.9	1.0	-59.5	-13.0	-46.5	
2.72	-65.2	V	3.0	-18.8	38.5	1.0	-56.3	-13.0	-43.3	
High Channel (688MHz)										
1.38	-67.6	H	3.0	-26.1	38.2	1.0	-63.3	-13.0	-50.3	
2.06	-66.4	H	3.0	-23.0	38.0	1.0	-59.9	-13.0	-46.9	
2.75	-66.9	H	3.0	-20.2	38.5	1.0	-57.7	-13.0	-44.7	
1.38	-66.3	V	3.0	-25.5	38.2	1.0	-62.7	-13.0	-49.7	
2.06	-66.7	V	3.0	-22.7	38.0	1.0	-59.6	-13.0	-46.6	
2.75	-67.4	V	3.0	-20.8	38.5	1.0	-58.3	-13.0	-45.3	

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LTE B71 20MHz 16QAM

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9.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 2

9.2.1. LTE BAND 2

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-63.4	H	3.0	-13.4	34.1	1.0	-46.5	-13.0	-33.5	
5.58	-65.5	H	3.0	-11.5	33.3	1.0	-43.8	-13.0	-30.8	
7.44	-65.6	H	3.0	-8.2	33.1	1.0	-40.2	-13.0	-27.2	
3.72	-65.4	V	3.0	-15.1	34.1	1.0	-48.2	-13.0	-35.2	
5.58	-65.9	V	3.0	-12.0	33.3	1.0	-44.3	-13.0	-31.3	
7.44	-65.6	V	3.0	-8.1	33.1	1.0	-40.2	-13.0	-27.2	
Mid Channel (1880MHz)										
3.76	-63.8	H	3.0	-13.7	34.1	1.0	-46.8	-13.0	-33.8	
5.64	-65.2	H	3.0	-11.0	33.3	1.0	-43.3	-13.0	-30.3	
7.52	-64.7	H	3.0	-7.1	33.0	1.0	-39.1	-13.0	-26.1	
3.76	-63.5	V	3.0	-13.0	34.1	1.0	-46.1	-13.0	-33.1	
5.64	-65.6	V	3.0	-11.5	33.3	1.0	-43.8	-13.0	-30.8	
7.52	-67.8	V	3.0	-10.2	33.0	1.0	-42.2	-13.0	-29.2	
High Channel (1900MHz)										
3.80	-63.4	H	3.0	-13.2	34.0	1.0	-46.2	-13.0	-33.2	
5.70	-65.1	H	3.0	-10.8	33.3	1.0	-43.1	-13.0	-30.1	
7.60	-65.9	H	3.0	-8.2	33.0	1.0	-40.2	-13.0	-27.2	
3.80	-63.1	V	3.0	-12.5	34.0	1.0	-45.6	-13.0	-32.6	
5.70	-65.1	V	3.0	-10.8	33.3	1.0	-43.1	-13.0	-30.1	
7.60	-66.6	V	3.0	-8.9	33.0	1.0	-40.9	-13.0	-27.9	

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LTE B2 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 2, 20MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1860MHz)										
3.72	-63.7	H	3.0	-13.7	34.1	1.0	-46.8	-13.0	-33.8	
5.58	-66.0	H	3.0	-12.0	33.3	1.0	-44.3	-13.0	-31.3	
7.44	-66.3	H	3.0	-8.8	33.1	1.0	-40.8	-13.0	-27.8	
3.72	-64.1	V	3.0	-13.7	34.1	1.0	-46.9	-13.0	-33.9	
5.58	-65.2	V	3.0	-11.2	33.3	1.0	-43.5	-13.0	-30.5	
7.44	-65.9	V	3.0	-8.4	33.1	1.0	-40.4	-13.0	-27.4	
Mid Channel (1880MHz)										
3.76	-63.1	H	3.0	-13.0	34.1	1.0	-46.1	-13.0	-33.1	
5.64	-66.1	H	3.0	-11.9	33.3	1.0	-44.2	-13.0	-31.2	
7.52	-66.0	H	3.0	-8.4	33.0	1.0	-40.5	-13.0	-27.5	
3.76	-63.3	V	3.0	-12.8	34.1	1.0	-45.9	-13.0	-32.9	
5.64	-64.2	V	3.0	-10.1	33.3	1.0	-42.4	-13.0	-29.4	
7.52	-65.5	V	3.0	-7.9	33.0	1.0	-40.0	-13.0	-27.0	
High Channel (1900MHz)										
3.80	-63.6	H	3.0	-13.4	34.0	1.0	-46.4	-13.0	-33.4	
5.70	-65.5	H	3.0	-11.2	33.3	1.0	-43.5	-13.0	-30.5	
7.60	-66.1	H	3.0	-8.5	33.0	1.0	-40.5	-13.0	-27.5	
3.80	-63.9	V	3.0	-13.4	34.0	1.0	-46.4	-13.0	-33.4	
5.70	-66.2	V	3.0	-12.0	33.3	1.0	-44.3	-13.0	-31.3	
7.60	-66.9	V	3.0	-9.2	33.0	1.0	-41.2	-13.0	-28.2	

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LTE B2 20MHz 16QAM

9.2.2. LTE BAND 5

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 10649
Configuration: EUT Only
Mode: LTE Band 5, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-66.7	H	3.0	-24.9	36.5	1.0	-60.4	-13.0	-47.4	
2.49	-66.2	H	3.0	-20.3	35.2	1.0	-54.5	-13.0	-41.5	
3.32	-66.9	H	3.0	-18.0	34.6	1.0	-51.6	-13.0	-38.6	
1.66	-67.3	V	3.0	-24.6	36.5	1.0	-60.1	-13.0	-47.1	
2.49	-66.7	V	3.0	-20.9	35.2	1.0	-55.0	-13.0	-42.0	
3.32	-67.5	V	3.0	-18.0	34.6	1.0	-51.6	-13.0	-38.6	
Mid Channel (836.5MHz)										
1.67	-66.5	H	3.0	-24.6	36.5	1.0	-60.0	-13.0	-47.0	
2.51	-65.9	H	3.0	-20.0	35.1	1.0	-54.2	-13.0	-41.2	
3.35	-66.6	H	3.0	-17.6	34.6	1.0	-51.2	-13.0	-38.2	
1.67	-66.1	V	3.0	-23.3	36.5	1.0	-58.8	-13.0	-45.8	
2.51	-66.2	V	3.0	-20.2	35.1	1.0	-54.4	-13.0	-41.4	
3.35	-66.5	V	3.0	-16.9	34.6	1.0	-50.4	-13.0	-37.4	
High Channel (844MHz)										
1.69	-67.0	H	3.0	-24.9	36.4	1.0	-60.3	-13.0	-47.3	
2.53	-65.1	H	3.0	-19.1	35.1	1.0	-53.3	-13.0	-40.3	
3.38	-66.7	H	3.0	-17.7	34.5	1.0	-51.2	-13.0	-38.2	
1.69	-67.1	V	3.0	-24.1	36.4	1.0	-59.6	-13.0	-46.6	
2.53	-66.5	V	3.0	-20.4	35.1	1.0	-54.5	-13.0	-41.5	
3.38	-67.0	V	3.0	-17.4	34.5	1.0	-50.9	-13.0	-37.9	

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LTE B5 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 5, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (829MHz)										
1.66	-66.1	H	3.0	-24.3	36.5	1.0	-59.7	-13.0	-46.7	
2.49	-65.5	H	3.0	-19.7	35.2	1.0	-53.9	-13.0	-40.9	
3.32	-65.6	H	3.0	-16.7	34.6	1.0	-50.3	-13.0	-37.3	
1.66	-66.1	V	3.0	-23.4	36.5	1.0	-58.9	-13.0	-45.9	
2.49	-66.6	V	3.0	-20.8	35.2	1.0	-54.9	-13.0	-41.9	
3.32	-66.5	V	3.0	-17.0	34.6	1.0	-50.6	-13.0	-37.6	
Mid Channel (836.5MHz)										
1.67	-67.5	H	3.0	-25.5	36.5	1.0	-61.0	-13.0	-48.0	
2.51	-67.3	H	3.0	-21.4	35.1	1.0	-55.6	-13.0	-42.6	
3.35	-66.2	H	3.0	-17.3	34.6	1.0	-50.8	-13.0	-37.8	
1.67	-65.8	V	3.0	-23.0	36.5	1.0	-58.5	-13.0	-45.5	
2.51	-65.6	V	3.0	-19.7	35.1	1.0	-53.8	-13.0	-40.8	
3.35	-66.4	V	3.0	-16.8	34.6	1.0	-50.3	-13.0	-37.3	
High Channel (844MHz)										
1.69	-66.1	H	3.0	-24.0	36.4	1.0	-59.5	-13.0	-46.5	
2.53	-66.0	H	3.0	-20.0	35.1	1.0	-54.2	-13.0	-41.2	
3.38	-65.4	H	3.0	-16.4	34.5	1.0	-49.9	-13.0	-36.9	
1.69	-67.2	V	3.0	-24.2	36.4	1.0	-59.7	-13.0	-46.7	
2.53	-66.9	V	3.0	-20.8	35.1	1.0	-55.0	-13.0	-42.0	
3.38	-66.0	V	3.0	-16.3	34.5	1.0	-49.8	-13.0	-36.8	

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LTE B5 10MHz 16QAM

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9.2.3. LTE BAND 7

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 7, 20MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-65.3	H	3.0	-12.4	33.4	1.0	-44.8	-25.0	-19.8	
7.53	-66.0	H	3.0	-8.4	33.0	1.0	-40.4	-25.0	-15.4	
10.04	-65.3	H	3.0	-4.5	32.6	1.0	-36.2	-25.0	-11.2	
5.02	-65.3	V	3.0	-12.4	33.4	1.0	-44.8	-25.0	-19.8	
7.53	-64.9	V	3.0	-7.3	33.0	1.0	-39.4	-25.0	-14.4	
10.04	-65.2	V	3.0	-4.1	32.6	1.0	-35.7	-25.0	-10.7	
Mid Channel (2535MHz)										
5.07	-65.1	H	3.0	-12.1	33.4	1.0	-44.5	-25.0	-19.5	
7.61	-65.1	H	3.0	-7.4	33.0	1.0	-39.4	-25.0	-14.4	
10.14	-65.2	H	3.0	-4.3	32.6	1.0	-35.9	-25.0	-10.9	
5.07	-65.0	V	3.0	-12.0	33.4	1.0	-44.4	-25.0	-19.4	
7.61	-65.6	V	3.0	-7.9	33.0	1.0	-39.9	-25.0	-14.9	
10.14	-65.4	V	3.0	-4.2	32.6	1.0	-35.8	-25.0	-10.8	
High Channel (2560MHz)										
5.12	-64.9	H	3.0	-11.8	33.4	1.0	-44.2	-25.0	-19.2	
7.68	-66.4	H	3.0	-8.7	33.0	1.0	-40.7	-25.0	-15.7	
10.24	-66.7	H	3.0	-5.7	32.5	1.0	-37.2	-25.0	-12.2	
5.12	-65.9	V	3.0	-12.9	33.4	1.0	-45.2	-25.0	-20.2	
7.68	-66.6	V	3.0	-8.7	33.0	1.0	-40.8	-25.0	-15.8	
10.24	-66.7	V	3.0	-5.5	32.5	1.0	-37.0	-25.0	-12.0	

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LTE B7 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 7, 20MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2510MHz)										
5.02	-64.4	H	3.0	-11.5	33.4	1.0	-44.0	-25.0	-19.0	
7.53	-65.6	H	3.0	-8.0	33.0	1.0	-40.0	-25.0	-15.0	
10.04	-66.3	H	3.0	-5.5	32.6	1.0	-37.1	-25.0	-12.1	
5.02	-64.8	V	3.0	-11.9	33.4	1.0	-44.3	-25.0	-19.3	
7.53	-65.7	V	3.0	-8.1	33.0	1.0	-40.1	-25.0	-15.1	
10.04	-66.1	V	3.0	-5.0	32.6	1.0	-36.7	-25.0	-11.7	
Mid Channel (2535MHz)										
5.07	-66.0	H	3.0	-13.0	33.4	1.0	-45.4	-25.0	-20.4	
7.61	-65.9	H	3.0	-8.2	33.0	1.0	-40.3	-25.0	-15.3	
10.14	-66.4	H	3.0	-5.5	32.6	1.0	-37.0	-25.0	-12.0	
5.07	-65.3	V	3.0	-12.4	33.4	1.0	-44.8	-25.0	-19.8	
7.61	-64.8	V	3.0	-7.1	33.0	1.0	-39.1	-25.0	-14.1	
10.14	-65.7	V	3.0	-4.6	32.6	1.0	-36.1	-25.0	-11.1	
High Channel (2560MHz)										
5.12	-64.8	H	3.0	-11.7	33.4	1.0	-44.1	-25.0	-19.1	
7.68	-65.5	H	3.0	-7.7	33.0	1.0	-39.7	-25.0	-14.7	
10.24	-66.7	H	3.0	-5.7	32.5	1.0	-37.2	-25.0	-12.2	
5.12	-66.0	V	3.0	-13.0	33.4	1.0	-45.4	-25.0	-20.4	
7.68	-66.4	V	3.0	-8.6	33.0	1.0	-40.6	-25.0	-15.6	
10.24	-65.2	V	3.0	-4.0	32.5	1.0	-35.5	-25.0	-10.5	

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LTE B7 20MHz 16QAM

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9.2.4. LTE BAND 12

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 12, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-66.4	H	3.0	-26.2	36.7	1.0	-61.9	-13.0	-48.9	
2.11	-67.4	H	3.0	-22.5	35.8	1.0	-57.3	-13.0	-44.3	
2.82	-66.6	H	3.0	-19.4	35.0	1.0	-53.4	-13.0	-40.4	
1.41	-66.4	V	3.0	-25.7	36.7	1.0	-61.4	-13.0	-48.4	
2.11	-67.0	V	3.0	-21.3	35.8	1.0	-56.1	-13.0	-43.1	
2.82	-66.2	V	3.0	-18.5	35.0	1.0	-52.5	-13.0	-39.5	
Mid Channel (707.5MHz)										
1.42	-66.2	H	3.0	-26.0	36.7	1.0	-61.7	-13.0	-48.7	
2.12	-67.0	H	3.0	-22.1	35.7	1.0	-56.9	-13.0	-43.9	
2.83	-66.2	H	3.0	-19.0	35.0	1.0	-53.0	-13.0	-40.0	
1.42	-66.3	V	3.0	-25.6	36.7	1.0	-61.3	-13.0	-48.3	
2.12	-66.5	V	3.0	-20.8	35.7	1.0	-55.5	-13.0	-42.5	
2.83	-66.5	V	3.0	-18.6	35.0	1.0	-52.7	-13.0	-39.7	
High Channel (711MHz)										
1.42	-66.1	H	3.0	-25.8	36.7	1.0	-61.5	-13.0	-48.5	
2.13	-66.6	H	3.0	-21.6	35.7	1.0	-56.4	-13.0	-43.4	
2.84	-66.1	H	3.0	-18.7	35.0	1.0	-52.7	-13.0	-39.7	
1.42	-66.0	V	3.0	-25.2	36.7	1.0	-60.9	-13.0	-47.9	
2.13	-66.1	V	3.0	-20.4	35.7	1.0	-55.1	-13.0	-42.1	
2.84	-66.3	V	3.0	-18.3	35.0	1.0	-52.4	-13.0	-39.4	

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LTE B12 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 12, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (704MHz)										
1.41	-66.1	H	3.0	-25.9	36.7	1.0	-61.6	-13.0	-48.6	
2.11	-66.8	H	3.0	-21.9	35.8	1.0	-56.6	-13.0	-43.6	
2.82	-66.7	H	3.0	-19.4	35.0	1.0	-53.5	-13.0	-40.5	
1.41	-66.5	V	3.0	-25.8	36.7	1.0	-61.5	-13.0	-48.5	
2.11	-67.3	V	3.0	-21.6	35.8	1.0	-56.3	-13.0	-43.3	
2.82	-67.0	V	3.0	-19.2	35.0	1.0	-53.3	-13.0	-40.3	
Mid Channel (707.5MHz)										
1.42	-65.3	H	3.0	-25.1	36.7	1.0	-60.8	-13.0	-47.8	
2.12	-66.6	H	3.0	-21.6	35.7	1.0	-56.4	-13.0	-43.4	
2.83	-65.4	H	3.0	-18.1	35.0	1.0	-52.1	-13.0	-39.1	
1.42	-65.5	V	3.0	-24.8	36.7	1.0	-60.4	-13.0	-47.4	
2.12	-66.4	V	3.0	-20.6	35.7	1.0	-55.4	-13.0	-42.4	
2.83	-65.7	V	3.0	-17.8	35.0	1.0	-51.9	-13.0	-38.9	
High Channel (711MHz)										
1.42	-66.5	H	3.0	-26.3	36.7	1.0	-62.0	-13.0	-49.0	
2.13	-66.6	H	3.0	-21.6	35.7	1.0	-56.4	-13.0	-43.4	
2.84	-66.6	H	3.0	-19.2	35.0	1.0	-53.3	-13.0	-40.3	
1.42	-66.7	V	3.0	-25.9	36.7	1.0	-61.6	-13.0	-48.6	
2.13	-67.0	V	3.0	-21.3	35.7	1.0	-56.0	-13.0	-43.0	
2.84	-65.6	V	3.0	-17.6	35.0	1.0	-51.7	-13.0	-38.7	

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LTE B12 10MHz 16QAM

9.2.5. LTE BAND 13

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 13, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-66.9	H	3.0	-25.8	36.6	1.0	-61.5	-40.0	-21.5	
2.35	-66.0	H	3.0	-20.7	35.3	1.0	-55.0	-13.0	-42.0	
3.13	-65.8	H	3.0	-17.4	34.8	1.0	-51.3	-13.0	-38.3	
1.56	-66.5	V	3.0	-24.7	36.6	1.0	-60.4	-40.0	-20.4	
2.35	-66.8	V	3.0	-21.2	35.3	1.0	-55.5	-13.0	-42.5	
3.13	-66.1	V	3.0	-17.0	34.8	1.0	-50.8	-13.0	-37.8	

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LTE B13 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 13, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (782MHz)										
1.56	-65.5	H	3.0	-24.4	36.6	1.0	-60.0	-40.0	-20.0	
2.35	-66.2	H	3.0	-20.9	35.3	1.0	-55.2	-13.0	-42.2	
3.13	-65.3	H	3.0	-16.9	34.8	1.0	-50.7	-13.0	-37.7	
1.56	-67.3	V	3.0	-25.5	36.6	1.0	-61.1	-40.0	-21.1	
2.35	-66.5	V	3.0	-20.9	35.3	1.0	-55.2	-13.0	-42.2	
3.13	-65.9	V	3.0	-16.8	34.8	1.0	-50.6	-13.0	-37.6	

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LTE B13 10MHz 16QAM

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9.2.6. LTE BAND 14

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 14, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-68.3	H	3.0	-27.0	36.6	1.0	-62.6	-40.0	-22.6	
2.38	-69.8	H	3.0	-24.4	35.2	1.0	-58.6	-13.0	-45.6	
3.17	-68.7	H	3.0	-20.2	34.8	1.0	-54.0	-13.0	-41.0	
1.59	-68.1	V	3.0	-26.1	36.6	1.0	-61.7	-40.0	-21.7	
2.38	-69.4	V	3.0	-23.9	35.2	1.0	-58.1	-13.0	-45.1	
3.17	-69.7	V	3.0	-20.5	34.8	1.0	-54.3	-13.0	-41.3	

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LTE B14 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 14, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (793MHz)										
1.59	-68.4	H	3.0	-27.1	36.6	1.0	-62.7	-40.0	-22.7	
2.38	-69.6	H	3.0	-24.2	35.2	1.0	-58.4	-13.0	-45.4	
3.17	-68.8	H	3.0	-20.3	34.8	1.0	-54.1	-13.0	-41.1	
1.59	-68.2	V	3.0	-26.2	36.6	1.0	-61.8	-40.0	-21.8	
2.38	-70.8	V	3.0	-25.3	35.2	1.0	-59.5	-13.0	-46.5	
3.17	-69.3	V	3.0	-20.1	34.8	1.0	-53.9	-13.0	-40.9	

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LTE B14 10MHz 16QAM

9.2.7. LTE BAND 17

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 17, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-67.2	H	3.0	-26.9	36.7	1.0	-62.6	-13.0	-49.6	
2.13	-66.9	H	3.0	-22.0	35.7	1.0	-56.7	-13.0	-43.7	
2.84	-65.3	H	3.0	-18.0	35.0	1.0	-52.0	-13.0	-39.0	
1.42	-66.7	V	3.0	-25.9	36.7	1.0	-61.6	-13.0	-48.6	
2.13	-67.3	V	3.0	-21.6	35.7	1.0	-56.3	-13.0	-43.3	
2.84	-65.9	V	3.0	-18.0	35.0	1.0	-52.0	-13.0	-39.0	

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LTE B17 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 17, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (710MHz)										
1.42	-65.3	H	3.0	-25.1	36.7	1.0	-60.7	-13.0	-47.7	
2.13	-66.8	H	3.0	-21.9	35.7	1.0	-56.6	-13.0	-43.6	
2.84	-66.9	H	3.0	-19.5	35.0	1.0	-53.6	-13.0	-40.6	
1.42	-67.0	V	3.0	-26.3	36.7	1.0	-62.0	-13.0	-49.0	
2.13	-66.8	V	3.0	-21.1	35.7	1.0	-55.8	-13.0	-42.8	
2.84	-67.1	V	3.0	-19.2	35.0	1.0	-53.2	-13.0	-40.2	

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LTE B17 10MHz 16QAM

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9.2.8. LTE BAND 25

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 25, 20MHz QPSK

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

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

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

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LTE B25 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 25, 20MHz 16QAM

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

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

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

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LTE B25 20MHz 16QAM

9.2.9. LTE BAND 26 (PART 90S)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 26 (90S), 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-66.0	H	3.0	-24.3	36.5	1.0	-59.8	-13.0	-46.8	
2.46	-66.2	H	3.0	-20.5	35.2	1.0	-54.7	-13.0	-41.7	
3.28	-65.3	H	3.0	-16.5	34.7	1.0	-50.2	-13.0	-37.2	
1.64	-67.1	V	3.0	-24.6	36.5	1.0	-60.1	-13.0	-47.1	
2.46	-66.7	V	3.0	-21.0	35.2	1.0	-55.2	-13.0	-42.2	
3.28	-65.7	V	3.0	-16.2	34.7	1.0	-49.9	-13.0	-36.9	

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LTE B26 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/25/18
Test Engineer: 19429
Configuration: EUT Only
Mode: LTE Band 26 (90S), 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (819MHz)										
1.64	-67.2	H	3.0	-25.5	36.5	1.0	-61.0	-13.0	-48.0	
2.46	-66.2	H	3.0	-20.6	35.2	1.0	-54.7	-13.0	-41.7	
3.28	-65.2	H	3.0	-16.5	34.7	1.0	-50.1	-13.0	-37.1	
1.64	-66.7	V	3.0	-24.2	36.5	1.0	-59.8	-13.0	-46.8	
2.46	-66.6	V	3.0	-20.9	35.2	1.0	-55.1	-13.0	-42.1	
3.28	-66.1	V	3.0	-16.6	34.7	1.0	-50.3	-13.0	-37.3	

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LTE B26 10MHz 16QAM

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9.2.10. LTE BAND 30

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT only
Mode: LTE Band 30, 10MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-69.2	H	3.0	-15.4	37.9	1.0	-52.3	-40.0	-12.3	
6.93	-68.8	H	3.0	-10.2	36.5	1.0	-45.6	-40.0	-5.6	
9.24	-69.8	H	3.0	-8.3	34.9	1.0	-42.1	-40.0	-2.1	
4.62	-68.7	V	3.0	-15.0	37.9	1.0	-51.9	-40.0	-11.9	
6.93	-68.6	V	3.0	-9.1	36.5	1.0	-44.6	-40.0	-4.6	
9.24	-70.1	V	3.0	-8.3	34.9	1.0	-42.2	-40.0	-2.2	

Rev. 05.21.15

LTE B30 10MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT only
Mode: LTE Band 30, 10MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-69.1	H	3.0	-15.3	37.9	1.0	-52.2	-40.0	-12.2	
6.93	-67.5	H	3.0	-8.9	36.5	1.0	-44.3	-40.0	-4.3	
9.24	-69.7	H	3.0	-8.2	34.9	1.0	-42.0	-40.0	-2.0	
4.62	-69.1	V	3.0	-15.4	37.9	1.0	-52.3	-40.0	-12.3	
6.93	-68.4	V	3.0	-8.9	36.5	1.0	-44.4	-40.0	-4.4	
9.24	-69.5	V	3.0	-7.7	34.9	1.0	-41.6	-40.0	-1.6	

Rev. 05.21.15

LTE B30 10MHz 16QAM

9.2.11. LTE BAND 41

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 41, 20MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-68.1	H	3.0	-15.2	33.4	1.0	-47.6	-25.0	-22.6	
7.52	-68.0	H	3.0	-10.4	33.0	1.0	-42.5	-25.0	-17.5	
10.02	-69.0	H	3.0	-8.2	32.7	1.0	-39.9	-25.0	-14.9	
5.01	-68.7	V	3.0	-15.9	33.4	1.0	-48.3	-25.0	-23.3	
7.52	-69.5	V	3.0	-11.9	33.0	1.0	-43.9	-25.0	-18.9	
10.02	-68.9	V	3.0	-7.8	32.7	1.0	-39.5	-25.0	-14.5	
Mid Channel (2593MHz)										
5.19	-68.0	H	3.0	-14.8	33.4	1.0	-47.1	-25.0	-22.1	
7.78	-68.2	H	3.0	-10.3	33.0	1.0	-42.3	-25.0	-17.3	
10.37	-68.1	H	3.0	-7.0	32.4	1.0	-38.4	-25.0	-13.4	
5.19	-67.5	V	3.0	-14.3	33.4	1.0	-46.7	-25.0	-21.7	
7.78	-67.8	V	3.0	-9.8	33.0	1.0	-41.8	-25.0	-16.8	
10.37	-68.5	V	3.0	-7.2	32.4	1.0	-38.6	-25.0	-13.6	
High Channel (2680MHz)										
5.36	-69.5	H	3.0	-15.9	33.3	1.0	-48.2	-25.0	-23.2	
8.04	-66.9	H	3.0	-8.6	33.0	1.0	-40.6	-25.0	-15.6	
10.72	-68.8	H	3.0	-7.3	32.2	1.0	-38.5	-25.0	-13.5	
5.36	-67.9	V	3.0	-14.4	33.3	1.0	-46.7	-25.0	-21.7	
8.04	-67.3	V	3.0	-9.0	33.0	1.0	-40.9	-25.0	-15.9	
10.72	-68.7	V	3.0	-7.2	32.2	1.0	-38.4	-25.0	-13.4	

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LTE B41 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 41, 20MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-68.2	H	3.0	-15.3	33.4	1.0	-47.7	-25.0	-22.7	
7.52	-69.0	H	3.0	-11.4	33.0	1.0	-43.5	-25.0	-18.5	
10.02	-69.4	H	3.0	-8.6	32.7	1.0	-40.3	-25.0	-15.3	
5.01	-68.4	V	3.0	-15.6	33.4	1.0	-48.0	-25.0	-23.0	
7.52	-69.1	V	3.0	-11.5	33.0	1.0	-43.5	-25.0	-18.5	
10.02	-69.3	V	3.0	-8.2	32.7	1.0	-39.9	-25.0	-14.9	
Mid Channel (2593MHz)										
5.19	-67.1	H	3.0	-13.9	33.4	1.0	-46.2	-25.0	-21.2	
7.78	-69.4	H	3.0	-11.5	33.0	1.0	-43.5	-25.0	-18.5	
10.37	-67.1	H	3.0	-6.0	32.4	1.0	-37.4	-25.0	-12.4	
5.19	-69.1	V	3.0	-15.9	33.4	1.0	-48.3	-25.0	-23.3	
7.78	-68.8	V	3.0	-10.8	33.0	1.0	-42.8	-25.0	-17.8	
10.37	-68.0	V	3.0	-6.7	32.4	1.0	-38.1	-25.0	-13.1	
High Channel (2680MHz)										
5.36	-68.1	H	3.0	-14.5	33.3	1.0	-46.8	-25.0	-21.8	
8.04	-68.0	H	3.0	-9.7	33.0	1.0	-41.7	-25.0	-16.7	
10.72	-65.9	H	3.0	-4.4	32.2	1.0	-35.6	-25.0	-10.6	
5.36	-69.4	V	3.0	-15.9	33.3	1.0	-48.2	-25.0	-23.2	
8.04	-69.5	V	3.0	-11.2	33.0	1.0	-43.1	-25.0	-18.1	
10.72	-68.1	V	3.0	-6.6	32.2	1.0	-37.8	-25.0	-12.8	

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LTE B41 20MHz 16QAM

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9.2.12. LTE BAND 66

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 66, 20MHz QPSK

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-70.9	H	3.0	-21.7	34.5	1.0	-55.1	-13.0	-42.1	
5.16	-69.1	H	3.0	-15.9	33.4	1.0	-48.3	-13.0	-35.3	
6.88	-67.5	H	3.0	-10.8	33.1	1.0	-43.0	-13.0	-30.0	
3.44	-69.6	V	3.0	-19.8	34.5	1.0	-53.3	-13.0	-40.3	
5.16	-68.0	V	3.0	-14.9	33.4	1.0	-47.2	-13.0	-34.2	
6.88	-67.1	V	3.0	-10.5	33.1	1.0	-42.6	-13.0	-29.6	
Mid Channel (1745.0MHz)										
3.49	-71.6	H	3.0	-22.2	34.4	1.0	-55.6	-13.0	-42.6	
5.24	-66.5	H	3.0	-13.1	33.3	1.0	-45.5	-13.0	-32.5	
6.98	-68.2	H	3.0	-11.3	33.1	1.0	-43.4	-13.0	-30.4	
3.49	-71.7	V	3.0	-21.8	34.4	1.0	-55.2	-13.0	-42.2	
5.24	-68.1	V	3.0	-14.8	33.3	1.0	-47.2	-13.0	-34.2	
6.98	-68.3	V	3.0	-11.5	33.1	1.0	-43.6	-13.0	-30.6	
High Channel (1770.0MHz)										
3.54	-70.8	H	3.0	-21.3	34.3	1.0	-54.6	-13.0	-41.6	
5.31	-67.7	H	3.0	-14.2	33.3	1.0	-46.5	-13.0	-33.5	
7.08	-69.7	H	3.0	-12.7	33.1	1.0	-44.8	-13.0	-31.8	
3.54	-71.3	V	3.0	-21.3	34.3	1.0	-54.6	-13.0	-41.6	
5.31	-68.1	V	3.0	-14.7	33.3	1.0	-47.0	-13.0	-34.0	
7.08	-70.1	V	3.0	-13.1	33.1	1.0	-45.2	-13.0	-32.2	

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LTE B66 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/26/18
Test Engineer: 19431
Configuration: EUT Only
Mode: LTE Band 66, 20MHz 16QAM

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

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

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-70.8	H	3.0	-21.6	34.5	1.0	-55.0	-13.0	-42.0	
5.16	-69.2	H	3.0	-16.0	33.4	1.0	-48.4	-13.0	-35.4	
6.88	-69.2	H	3.0	-12.5	33.1	1.0	-44.7	-13.0	-31.7	
3.44	-69.1	V	3.0	-19.3	34.5	1.0	-52.8	-13.0	-39.8	
5.16	-68.6	V	3.0	-15.5	33.4	1.0	-47.8	-13.0	-34.8	
6.88	-66.8	V	3.0	-10.2	33.1	1.0	-42.3	-13.0	-29.3	
Mid Channel (1745.0MHz)										
3.49	-69.6	H	3.0	-20.2	34.4	1.0	-53.6	-13.0	-40.6	
5.24	-67.4	H	3.0	-14.0	33.3	1.0	-46.4	-13.0	-33.4	
6.98	-69.2	H	3.0	-12.3	33.1	1.0	-44.4	-13.0	-31.4	
3.49	-71.0	V	3.0	-21.1	34.4	1.0	-54.5	-13.0	-41.5	
5.24	-66.5	V	3.0	-13.2	33.3	1.0	-45.6	-13.0	-32.6	
6.98	-69.6	V	3.0	-12.8	33.1	1.0	-44.9	-13.0	-31.9	
High Channel (1770.0MHz)										
3.54	-71.1	H	3.0	-21.6	34.3	1.0	-54.9	-13.0	-41.9	
5.31	-66.6	H	3.0	-13.1	33.3	1.0	-45.4	-13.0	-32.4	
7.08	-70.1	H	3.0	-13.1	33.1	1.0	-45.2	-13.0	-32.2	
3.54	-71.0	V	3.0	-21.0	34.3	1.0	-54.3	-13.0	-41.3	
5.31	-68.1	V	3.0	-14.7	33.3	1.0	-47.0	-13.0	-34.0	
7.08	-69.8	V	3.0	-12.8	33.1	1.0	-44.9	-13.0	-31.9	

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LTE B66 20MHz 16QAM

9.2.13. LTE BAND 71

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/12/18
Test Engineer: 10643
Configuration: EUT Only
Mode: LTE Band 71, 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 (673MHz)										
1.35	-68.7	H	3.0	-27.4	38.2	1.0	-64.6	-13.0	-51.6	
2.02	-68.5	H	3.0	-25.3	37.9	1.0	-62.2	-13.0	-49.2	
2.69	-71.0	H	3.0	-24.7	38.5	1.0	-62.2	-13.0	-49.2	
1.35	-69.7	V	3.0	-29.1	38.2	1.0	-66.3	-13.0	-53.3	
2.02	-68.6	V	3.0	-24.7	37.9	1.0	-61.6	-13.0	-48.6	
2.69	-70.5	V	3.0	-24.2	38.5	1.0	-61.7	-13.0	-48.7	
Mid Channel (680.5MHz)										
1.36	-68.3	H	3.0	-27.9	38.2	1.0	-65.1	-13.0	-52.1	
2.04	-69.0	H	3.0	-25.7	37.9	1.0	-62.6	-13.0	-49.6	
2.72	-70.9	H	3.0	-24.4	38.5	1.0	-61.9	-13.0	-48.9	
1.36	-69.6	V	3.0	-28.9	38.2	1.0	-66.1	-13.0	-53.1	
2.04	-69.0	V	3.0	-25.0	37.9	1.0	-62.0	-13.0	-49.0	
2.72	-70.3	V	3.0	-23.9	38.5	1.0	-61.4	-13.0	-48.4	
High Channel (688MHz)										
1.38	-69.4	H	3.0	-27.9	38.2	1.0	-65.1	-13.0	-52.1	
2.06	-69.4	H	3.0	-26.0	38.0	1.0	-63.0	-13.0	-50.0	
2.75	-70.7	H	3.0	-24.0	38.5	1.0	-61.4	-13.0	-48.4	
1.38	-69.4	V	3.0	-28.6	38.2	1.0	-65.8	-13.0	-52.8	
2.06	-68.9	V	3.0	-24.9	38.0	1.0	-61.9	-13.0	-48.9	
2.75	-70.4	V	3.0	-23.8	38.5	1.0	-61.3	-13.0	-48.3	

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LTE B71 20MHz QPSK

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 06/12/18
Test Engineer: 10643
Configuration: EUT Only
Mode: LTE Band 71, 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 (673MHz)										
1.35	-69.2	H	3.0	-27.9	38.2	1.0	-65.1	-13.0	-52.1	
2.02	-68.3	H	3.0	-25.0	37.9	1.0	-61.9	-13.0	-48.9	
2.69	-71.4	H	3.0	-25.1	38.5	1.0	-62.6	-13.0	-49.6	
1.35	-70.2	V	3.0	-29.6	38.2	1.0	-66.8	-13.0	-53.8	
2.02	-68.4	V	3.0	-24.5	37.9	1.0	-61.4	-13.0	-48.4	
2.69	-70.6	V	3.0	-24.3	38.5	1.0	-61.8	-13.0	-48.8	
Mid Channel (680.5MHz)										
1.36	-69.6	H	3.0	-28.2	38.2	1.0	-65.4	-13.0	-52.4	
2.04	-68.4	H	3.0	-25.0	37.9	1.0	-62.0	-13.0	-49.0	
2.72	-71.1	H	3.0	-24.6	38.5	1.0	-62.1	-13.0	-49.1	
1.36	-69.2	V	3.0	-28.5	38.2	1.0	-65.7	-13.0	-52.7	
2.04	-68.1	V	3.0	-24.1	37.9	1.0	-61.0	-13.0	-48.0	
2.72	-71.4	V	3.0	-25.0	38.5	1.0	-62.5	-13.0	-49.5	
High Channel (688MHz)										
1.38	-68.3	H	3.0	-26.8	38.2	1.0	-63.9	-13.0	-50.9	
2.06	-69.5	H	3.0	-26.1	38.0	1.0	-63.1	-13.0	-50.1	
2.75	-71.3	H	3.0	-24.6	38.5	1.0	-62.1	-13.0	-49.1	
1.38	-69.2	V	3.0	-28.4	38.2	1.0	-65.6	-13.0	-52.6	
2.06	-68.9	V	3.0	-24.9	38.0	1.0	-61.9	-13.0	-48.9	
2.75	-71.1	V	3.0	-24.5	38.5	1.0	-62.0	-13.0	-49.0	

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LTE B71 20MHz 16QAM

END OF REPORT

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10. SETUP PHOTOS

Please refers to 12162294-EP1V1

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