

8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53, §90.691

LIMITS

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.

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

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ 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. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

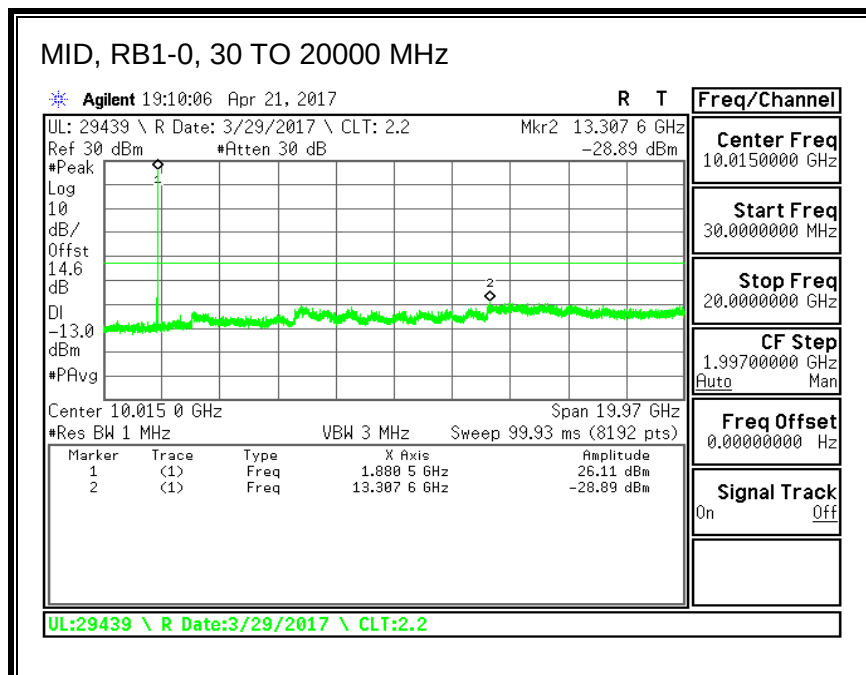
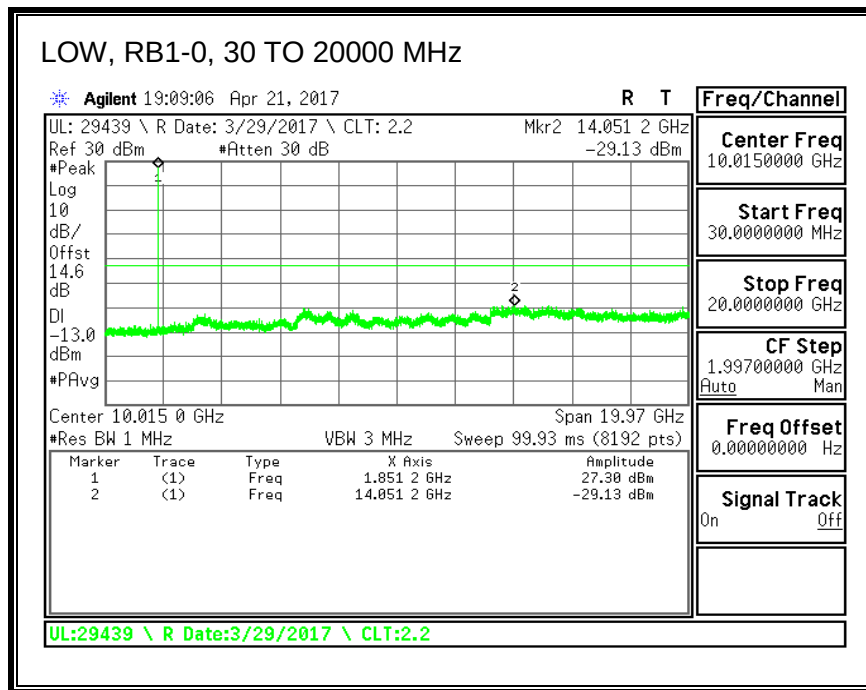
- Set display line at -13 dBm, -25dBm and -40dBm according to the band Limit
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

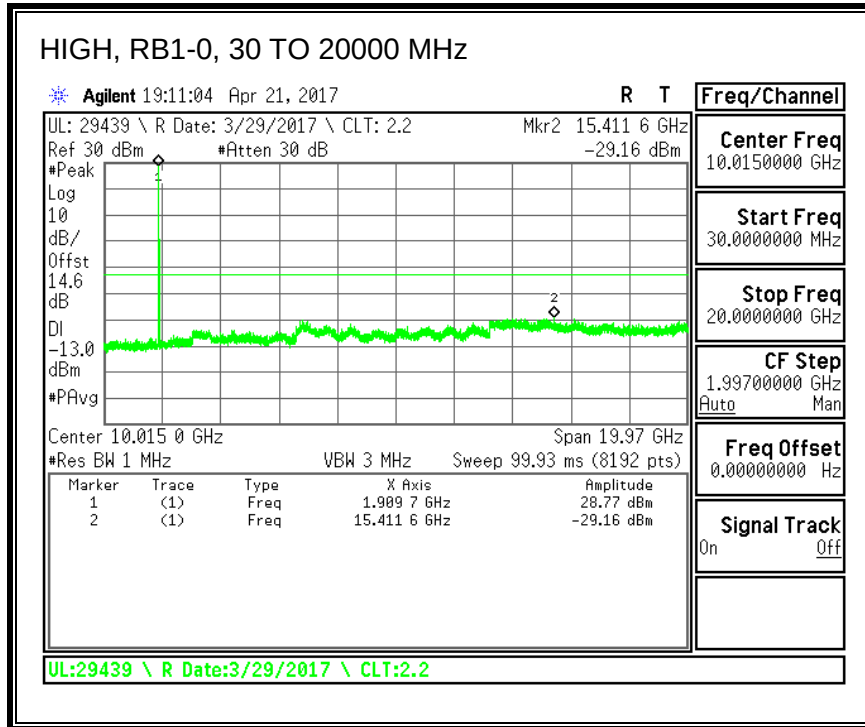
MODES TESTED

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

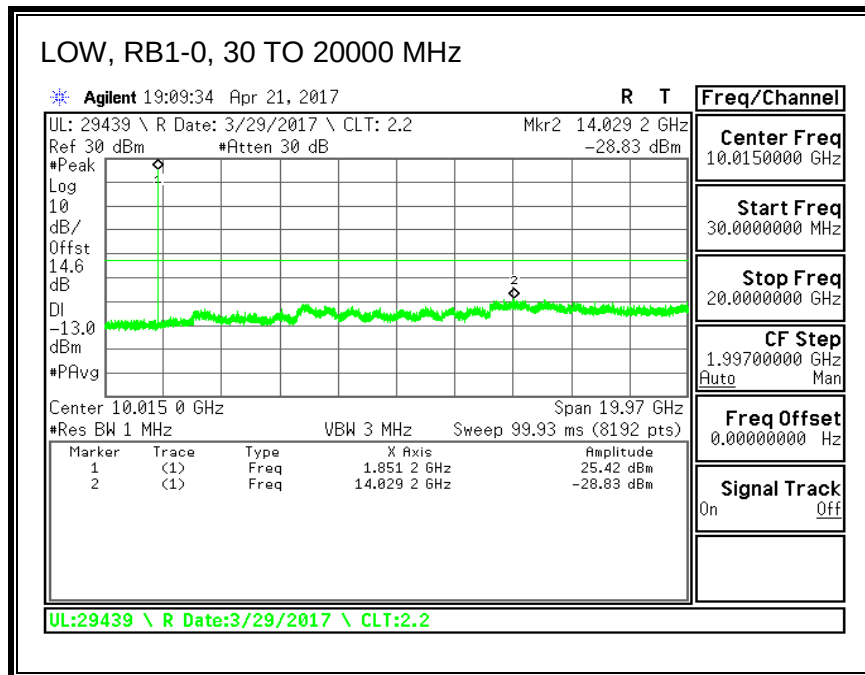
8.3.1. LTE BAND 2

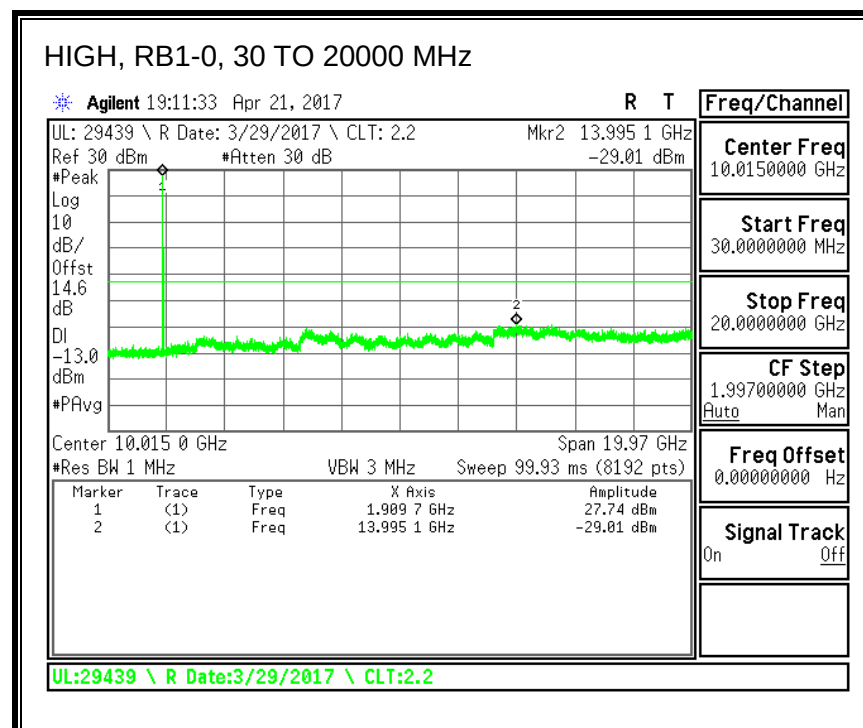
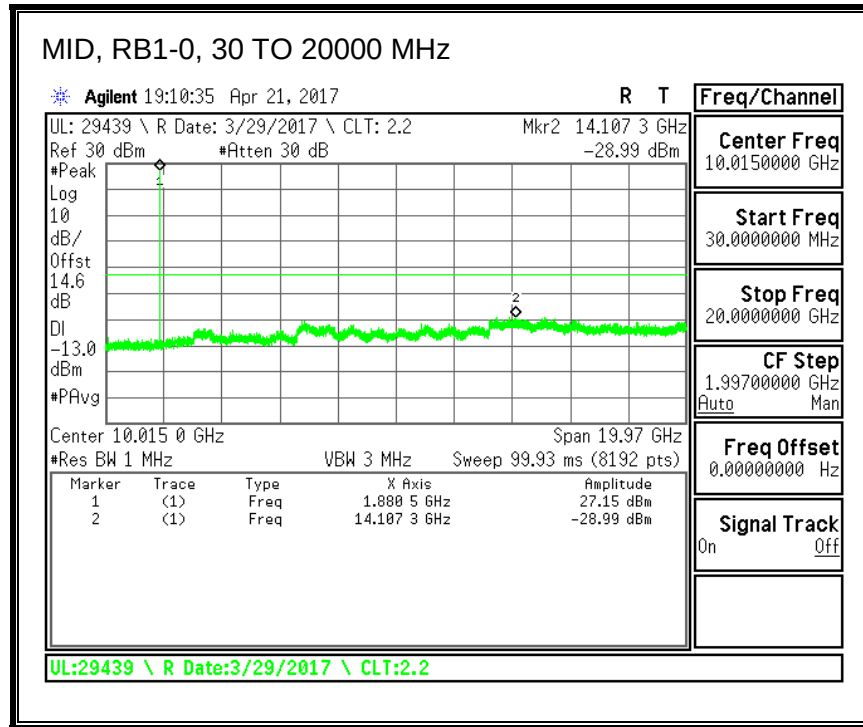
QPSK, (1.4 MHz BAND WIDTH)



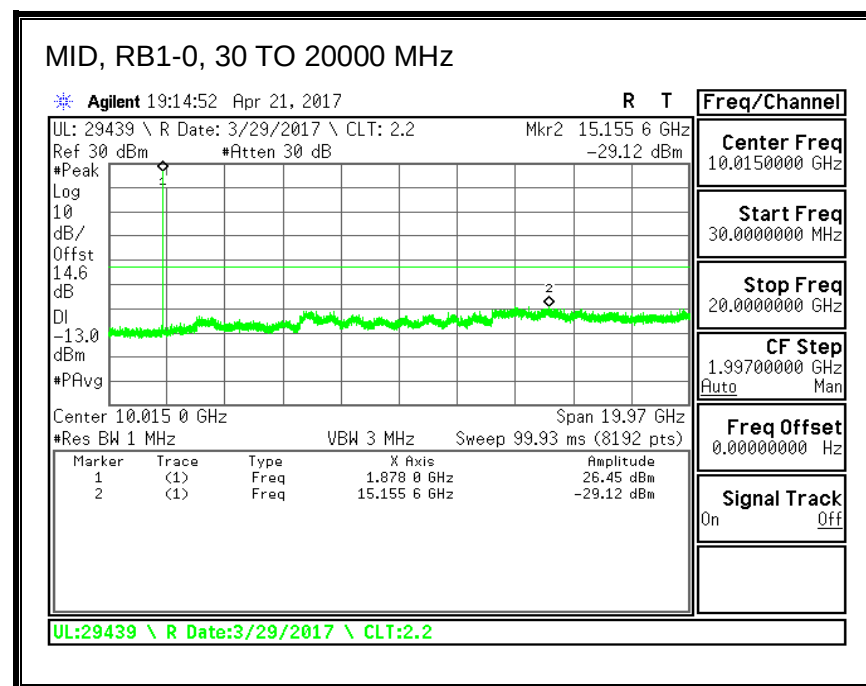
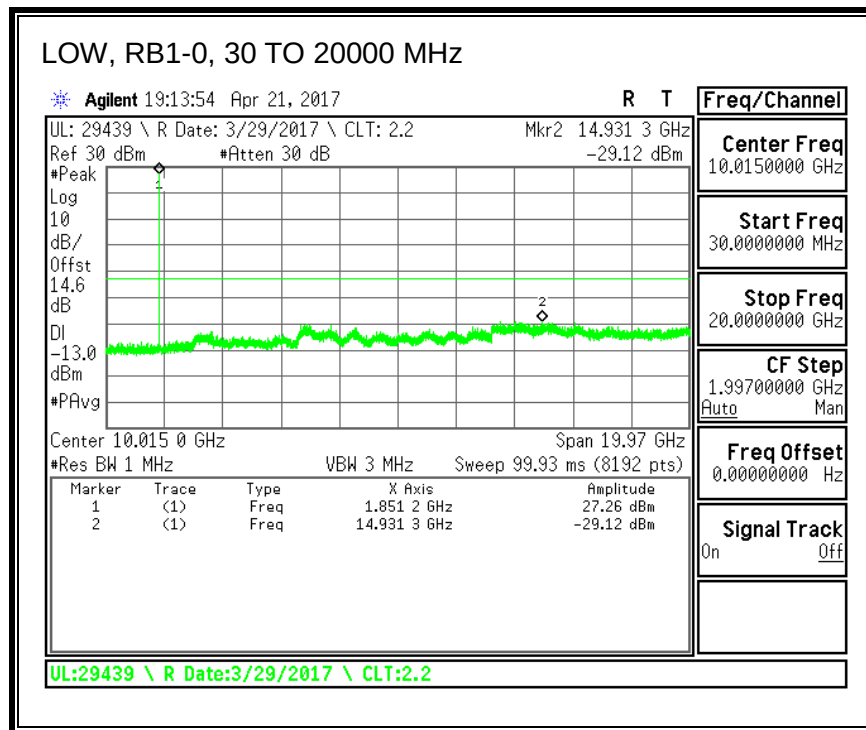


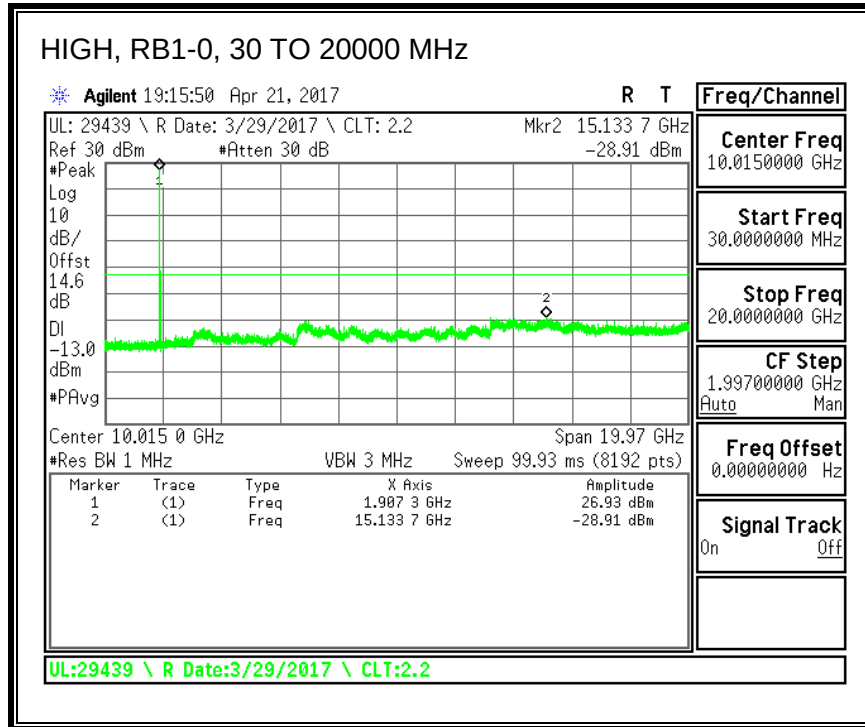
16QAM, (1.4 MHz BAND WIDTH)



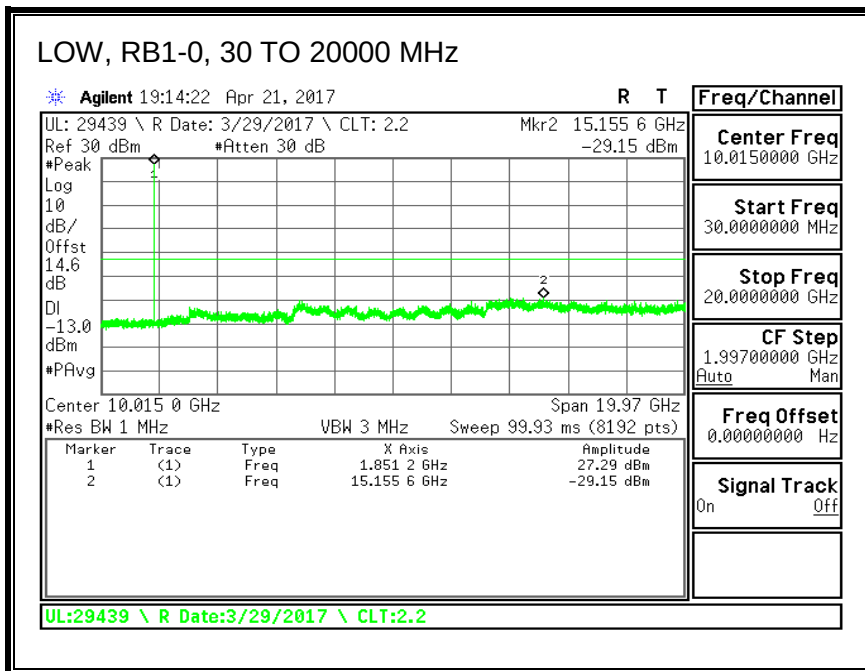


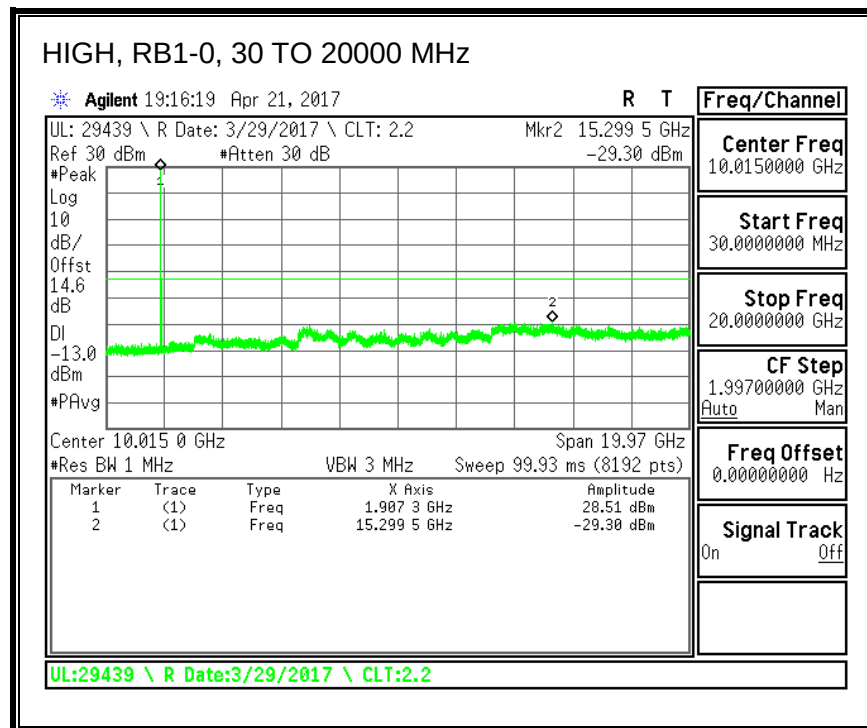
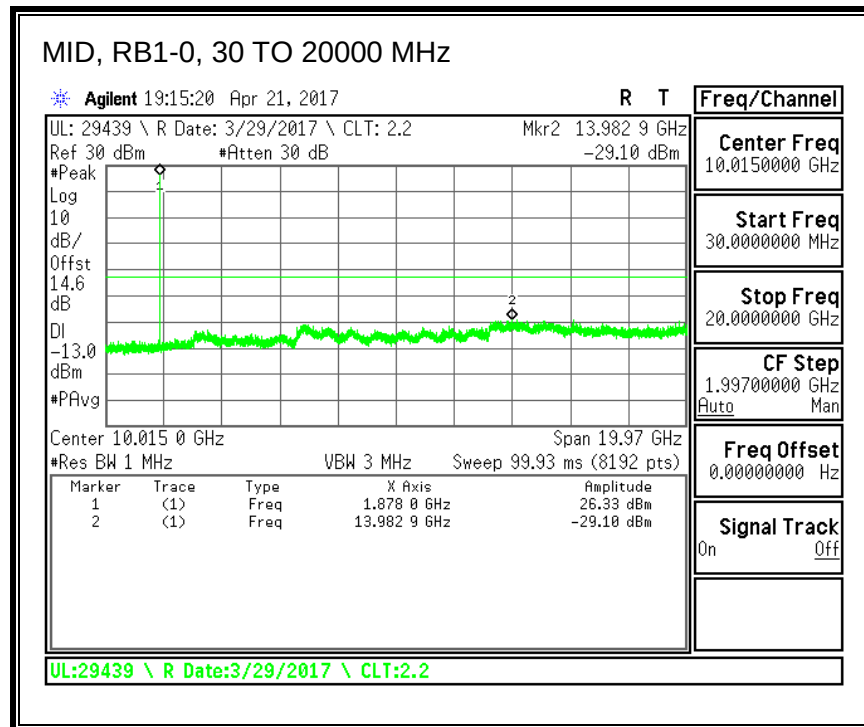
QPSK, (3.0 MHz BAND WIDTH)



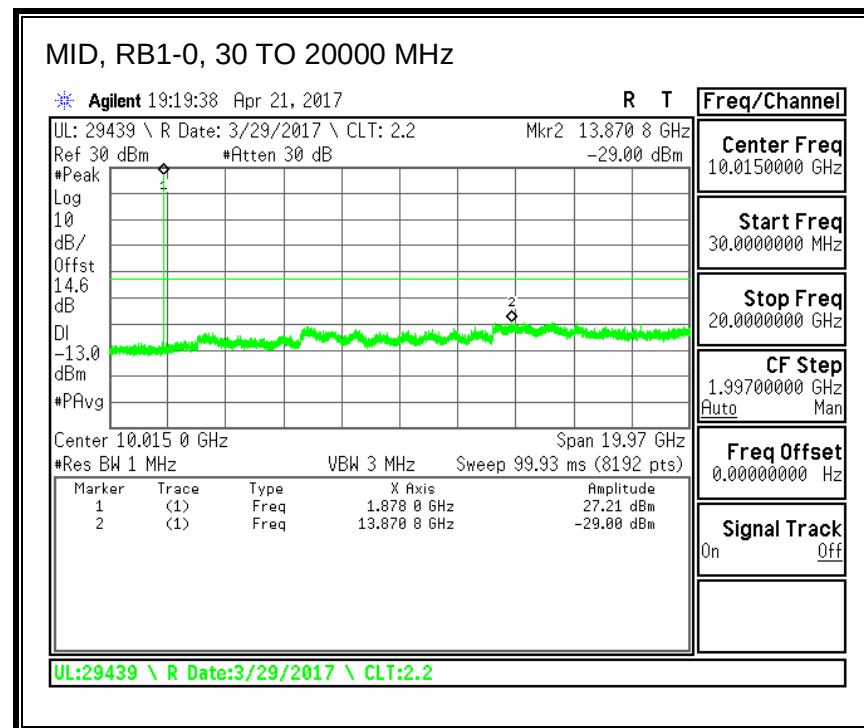
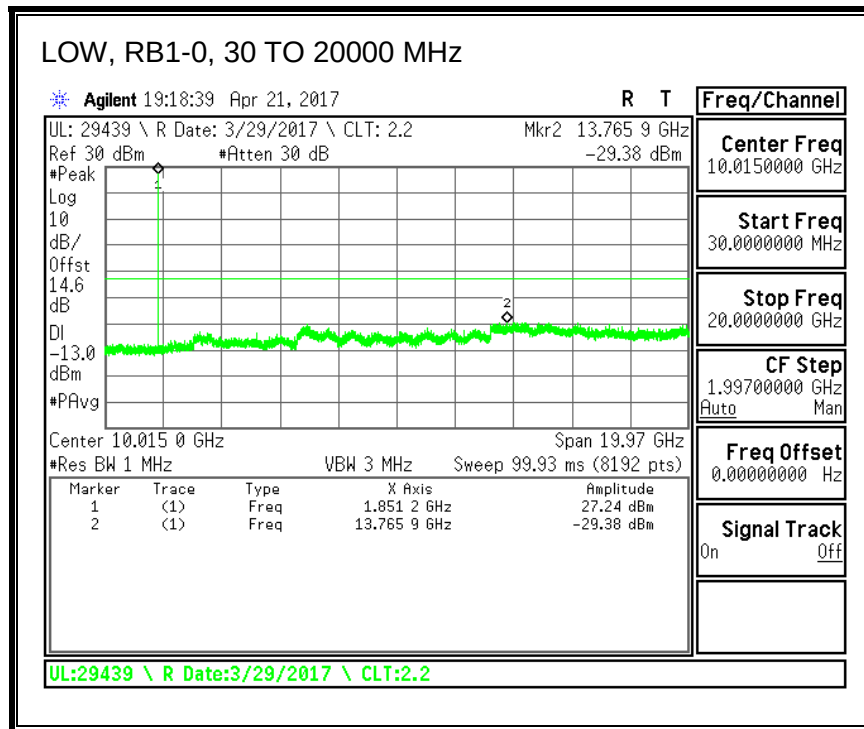


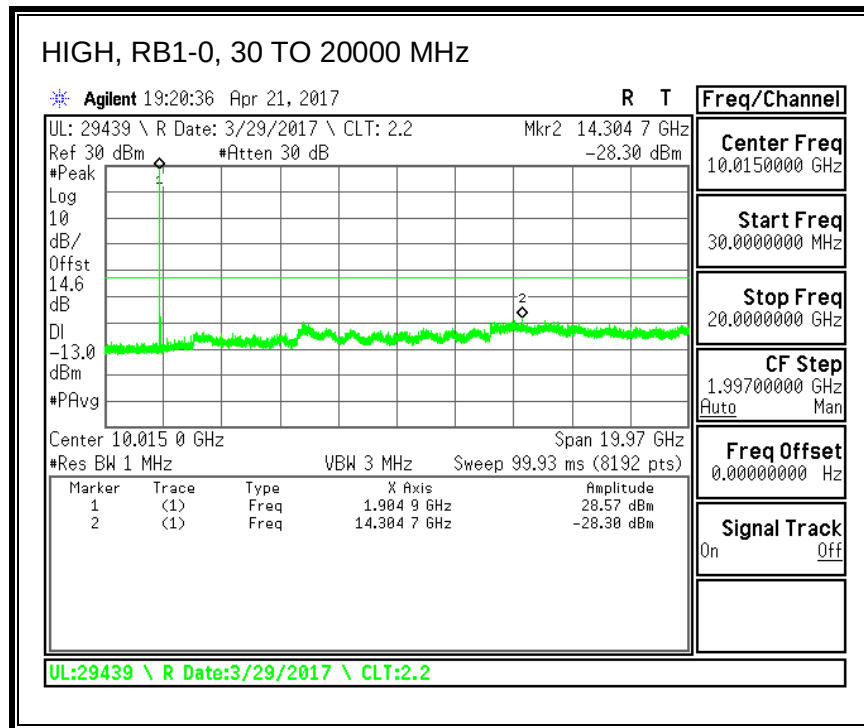
16QAM, (3.0 MHz BAND WIDTH)



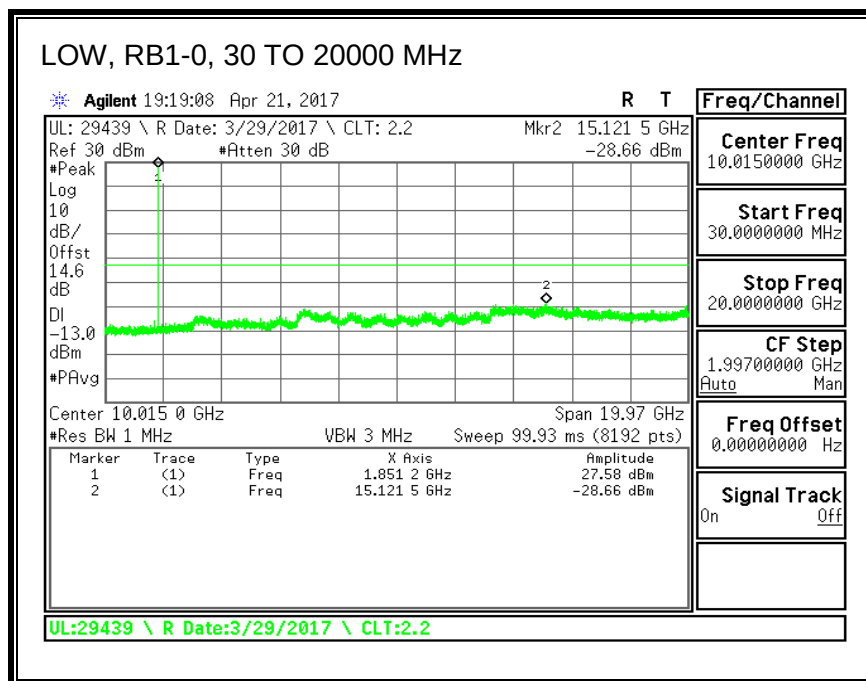


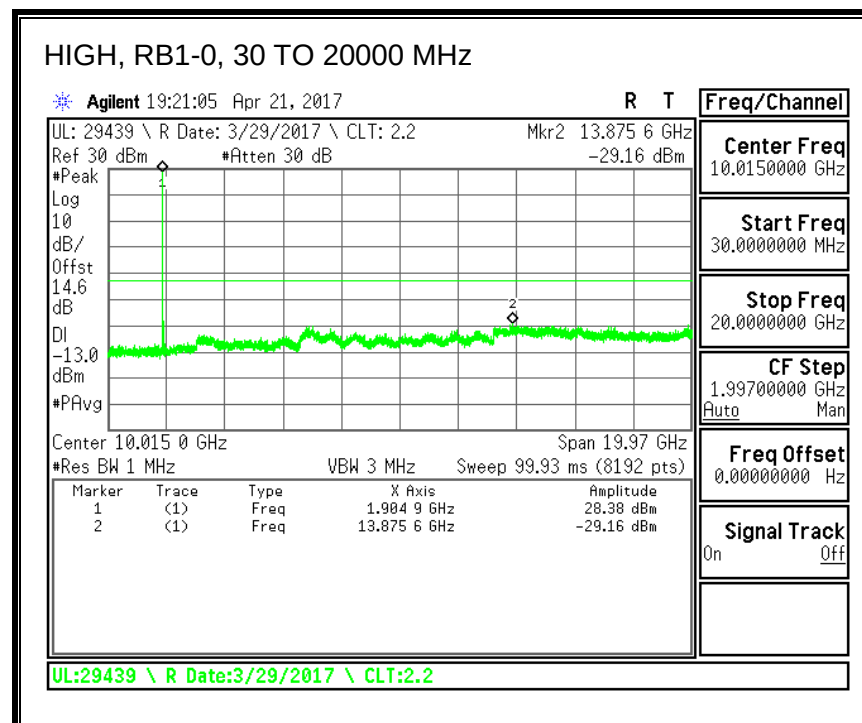
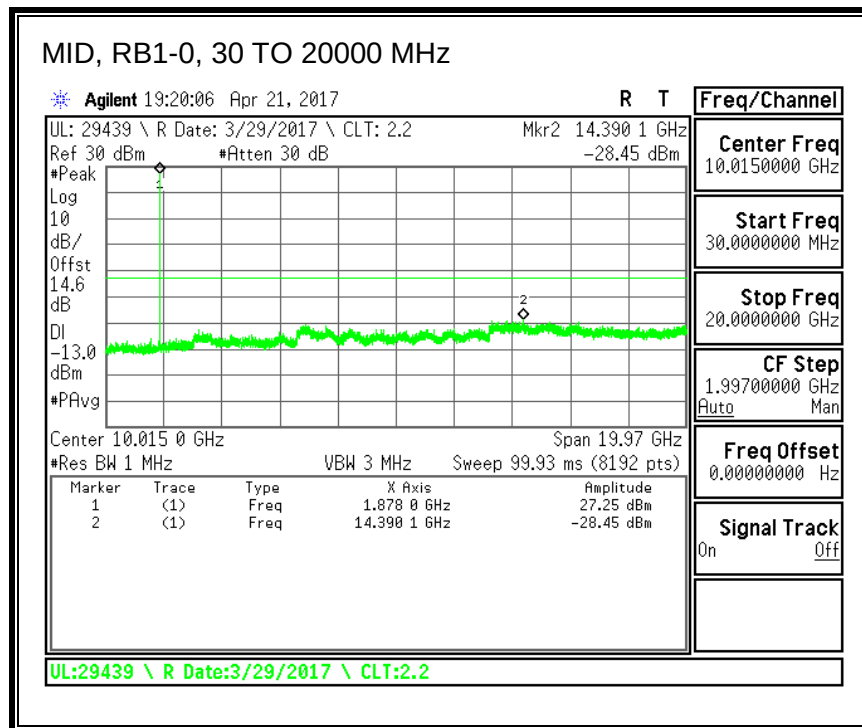
QPSK, (5.0 MHz BAND WIDTH)



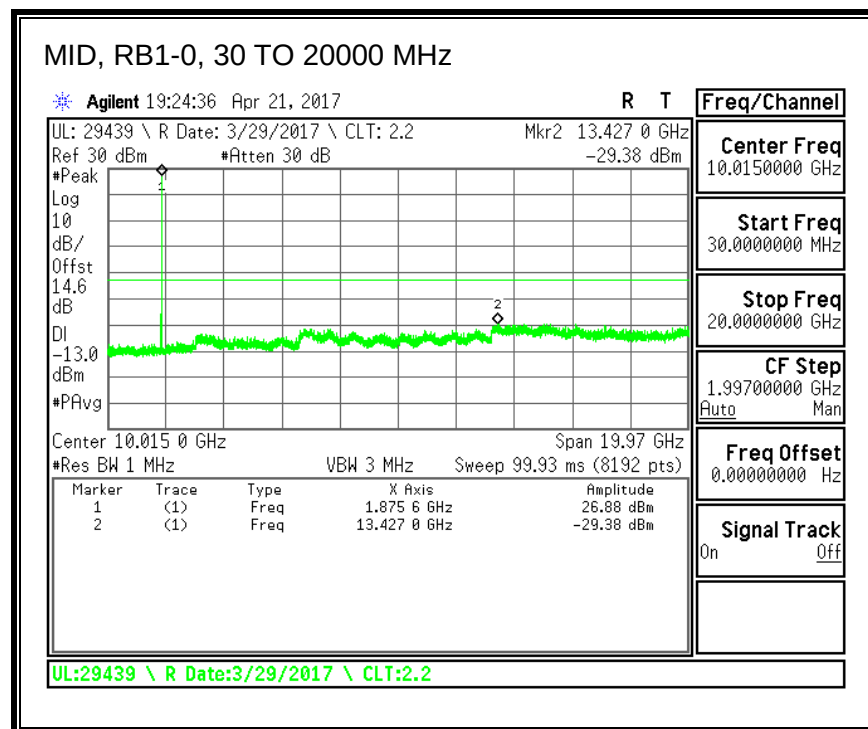
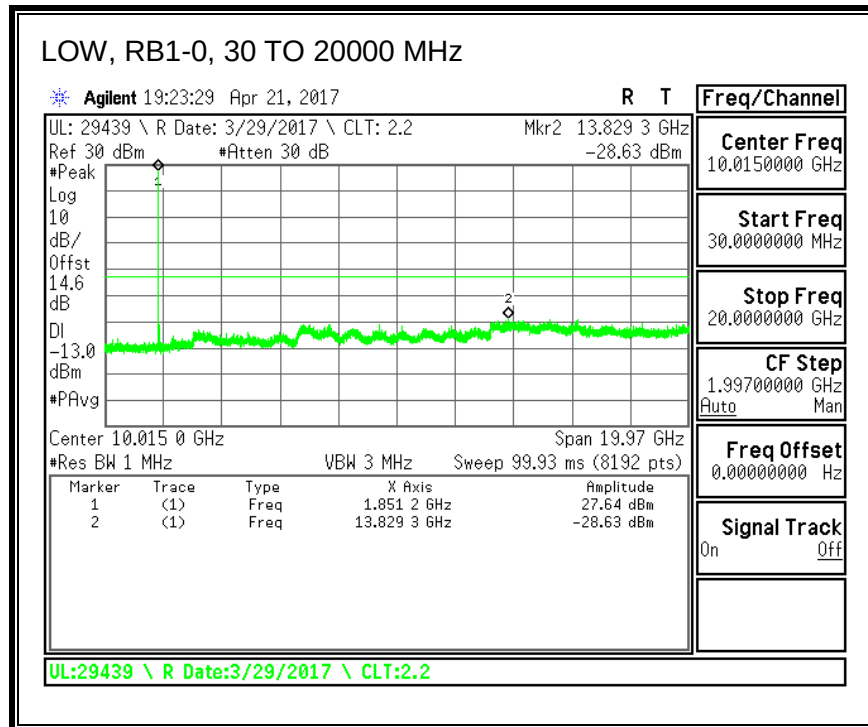


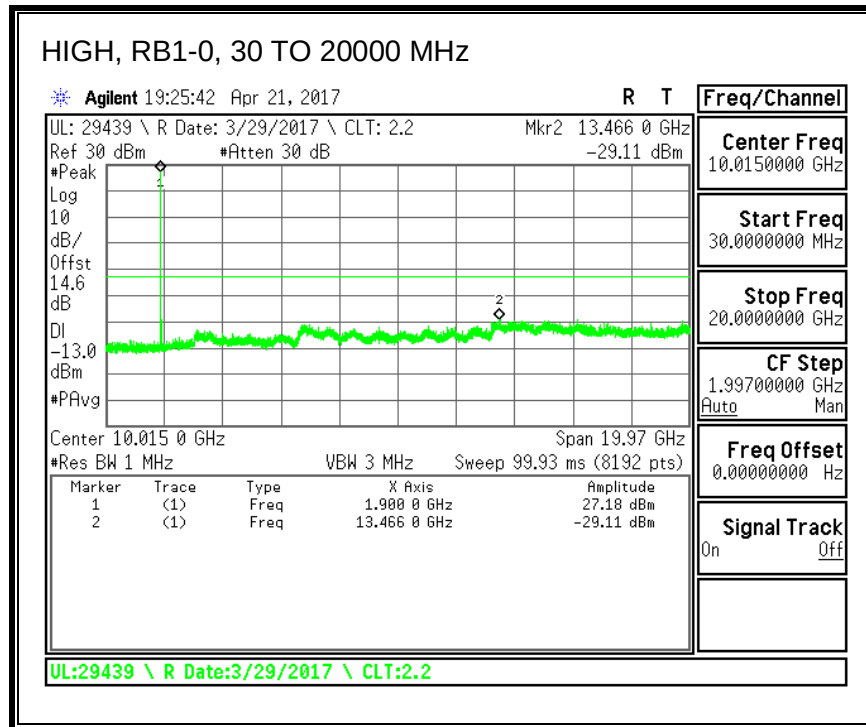
16QAM, (5.0 MHz BAND WIDTH)



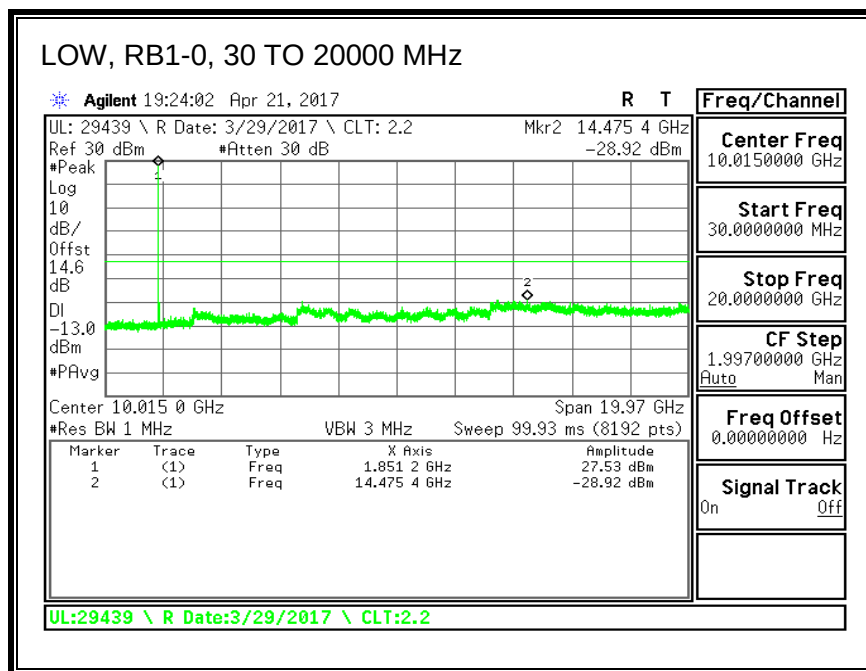


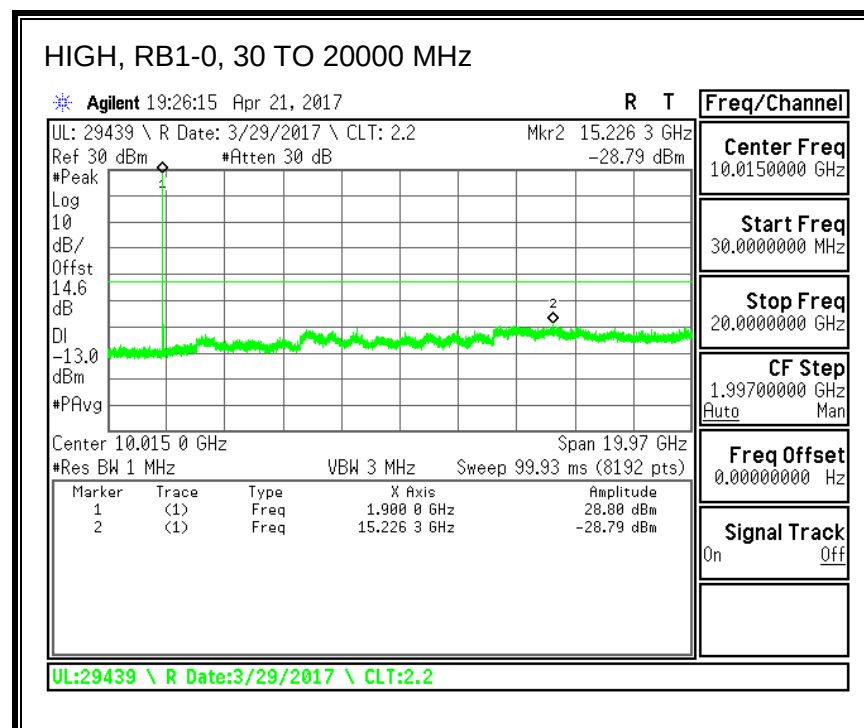
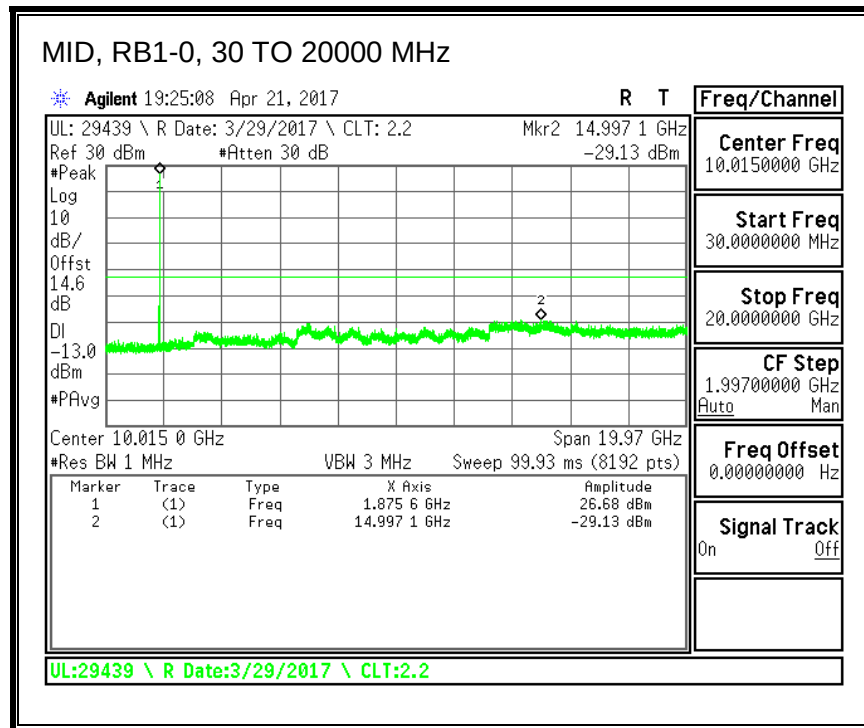
QPSK, (10.0 MHz BAND WIDTH)



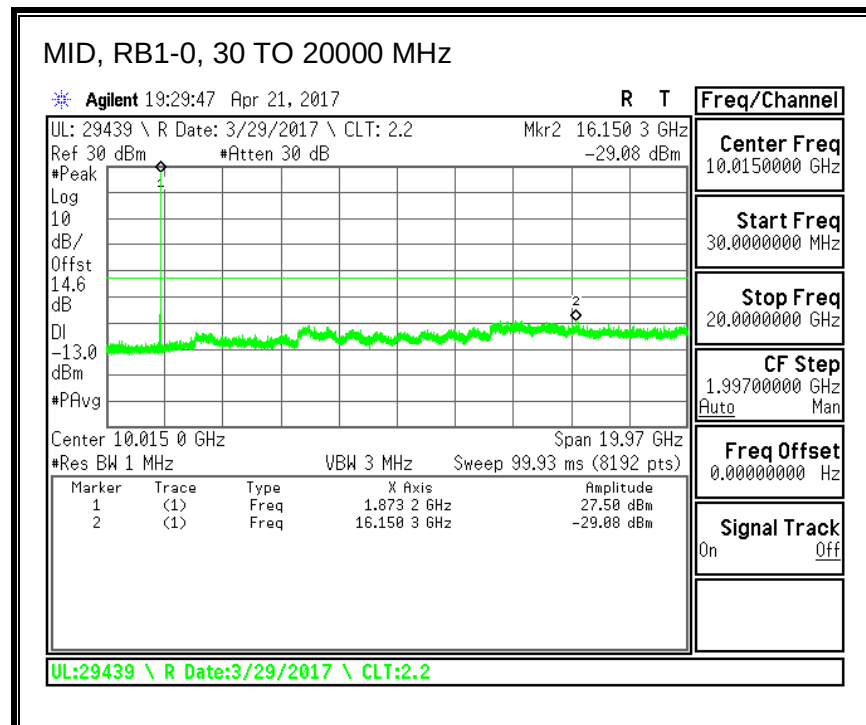
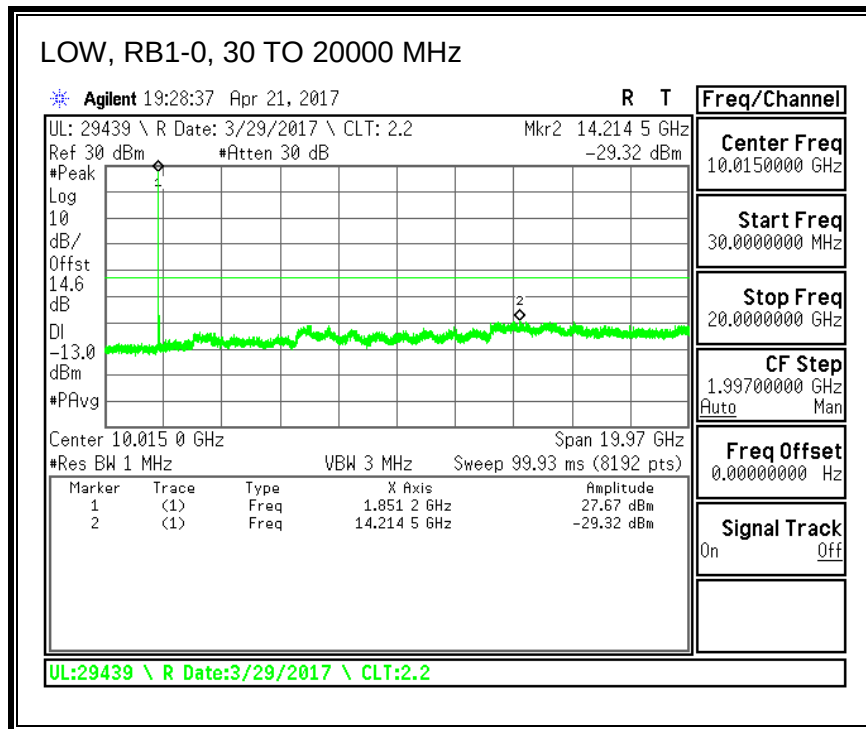


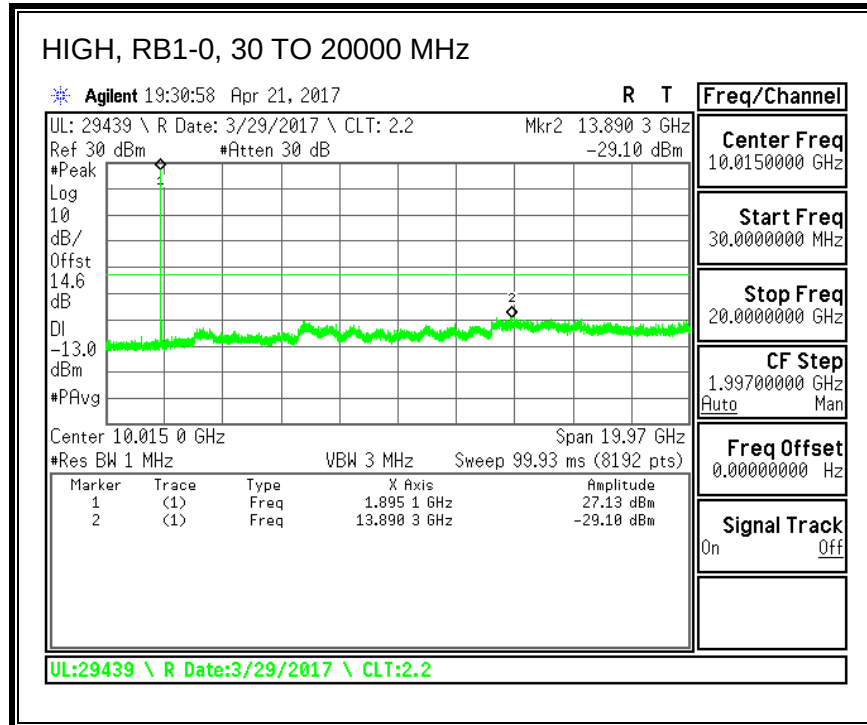
16QAM, (10.0 MHz BAND WIDTH)



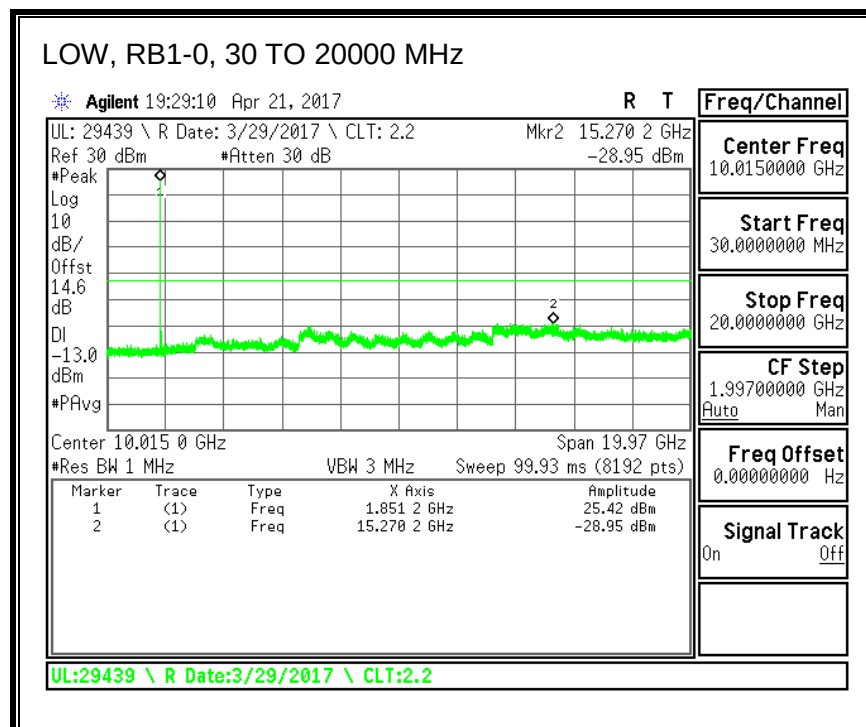


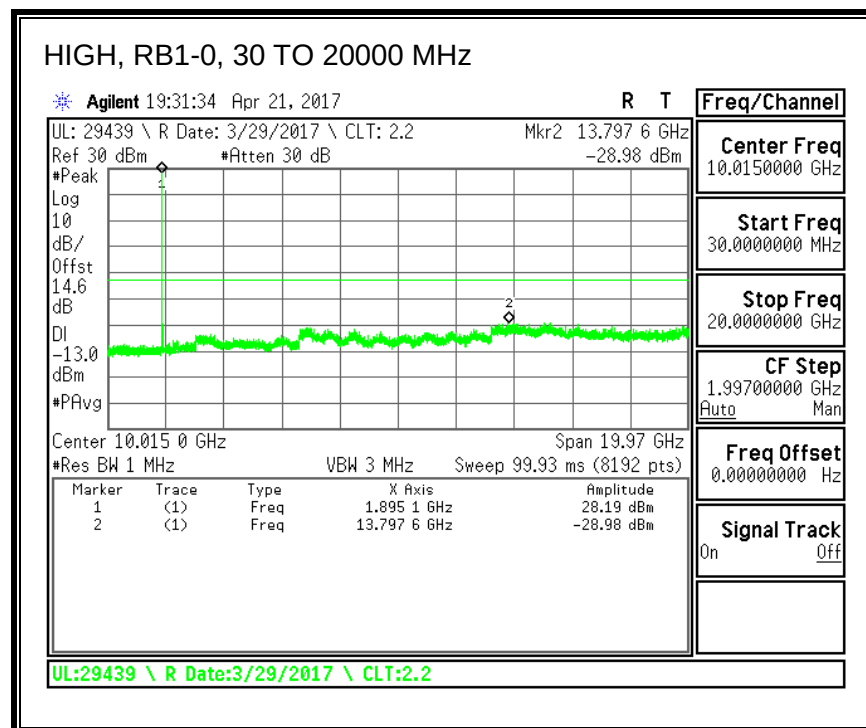
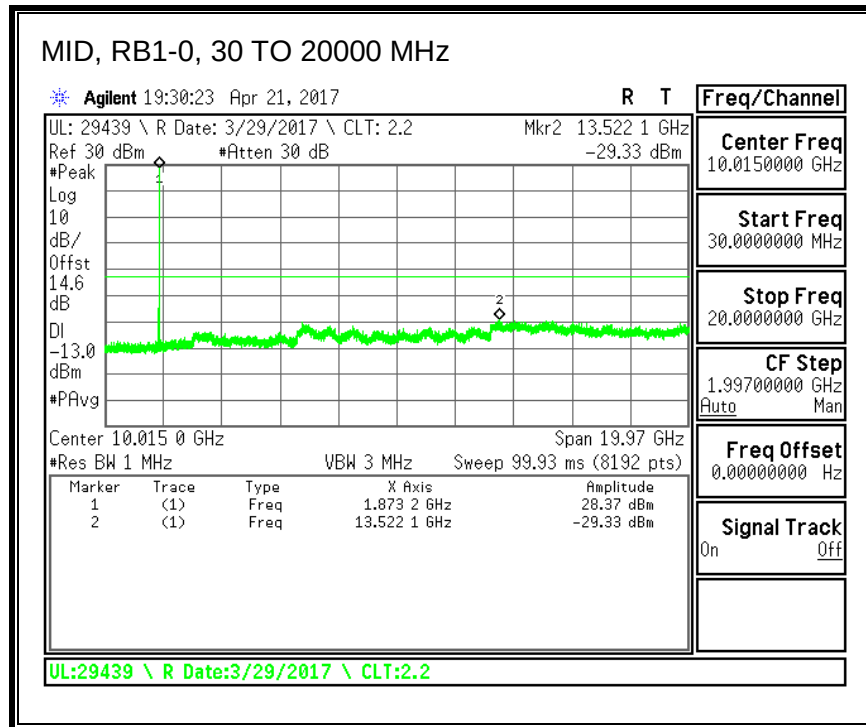
QPSK, (15.0 MHz BAND WIDTH)



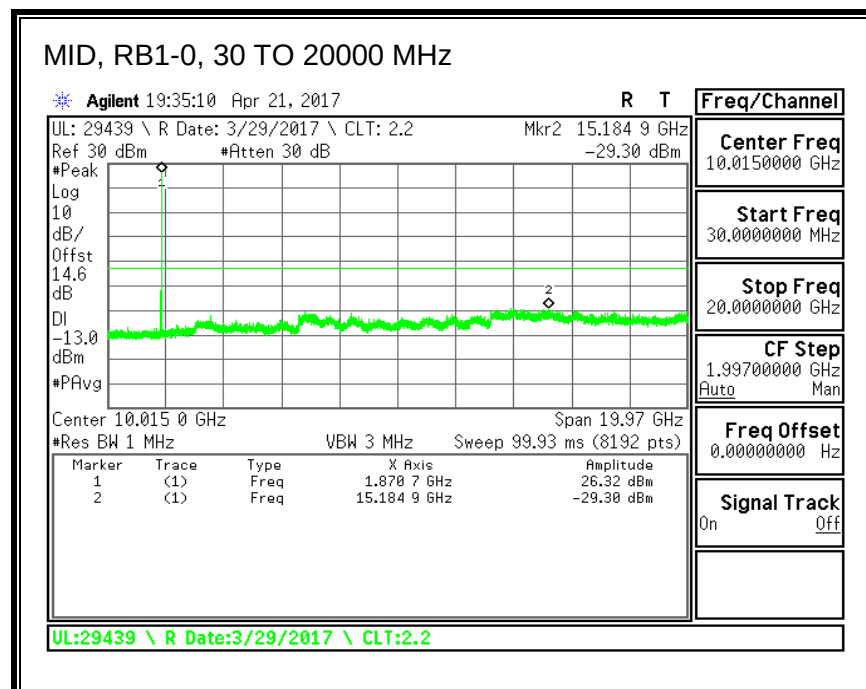
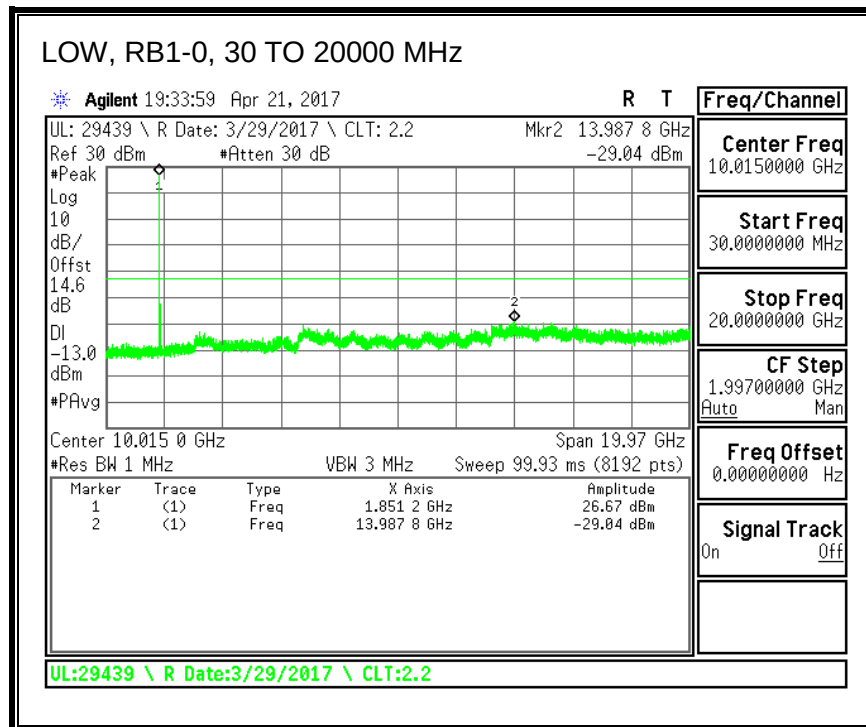


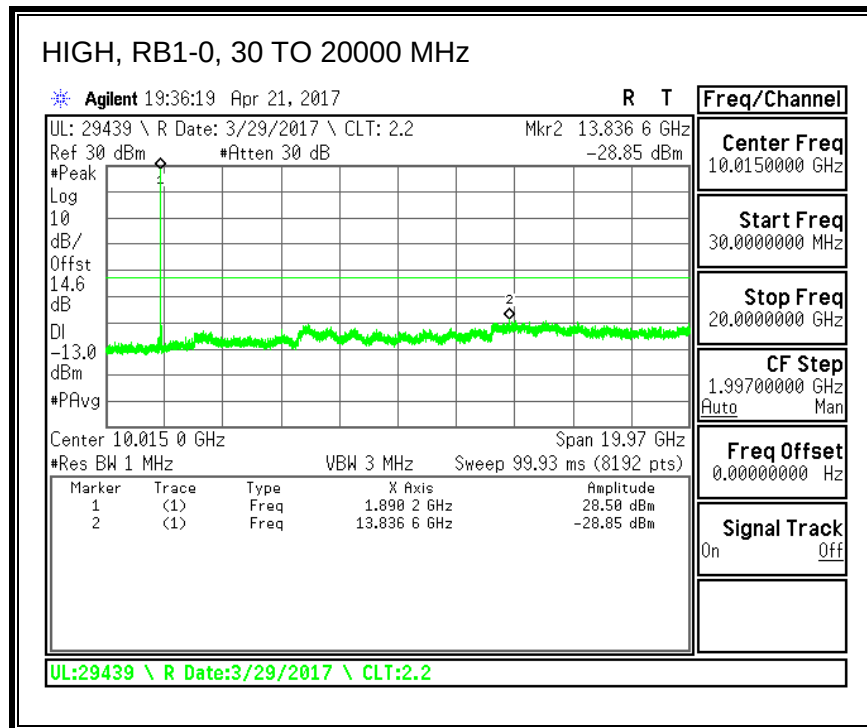
16QAM, (15.0 MHz BAND WIDTH)



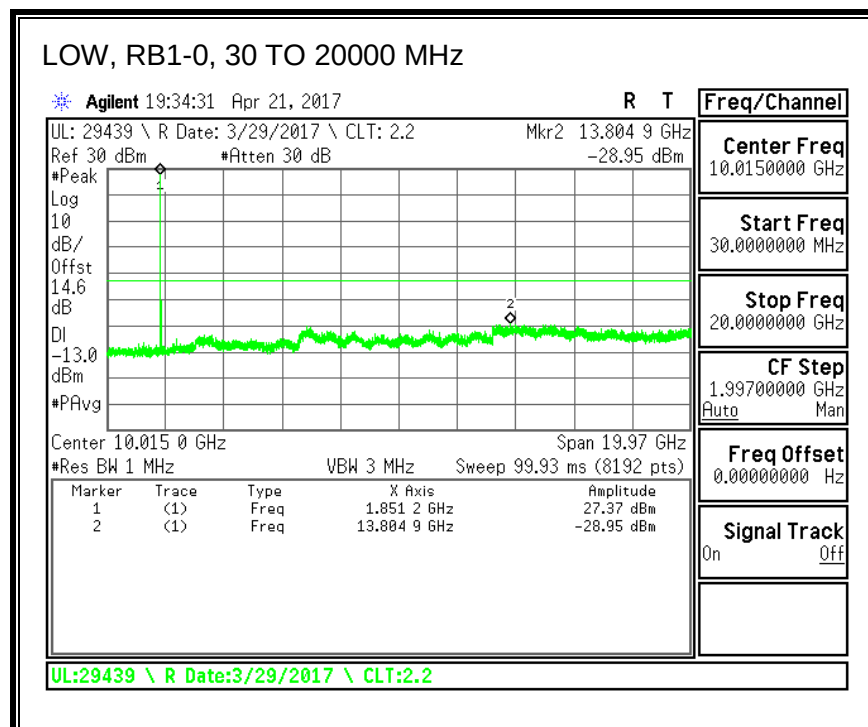


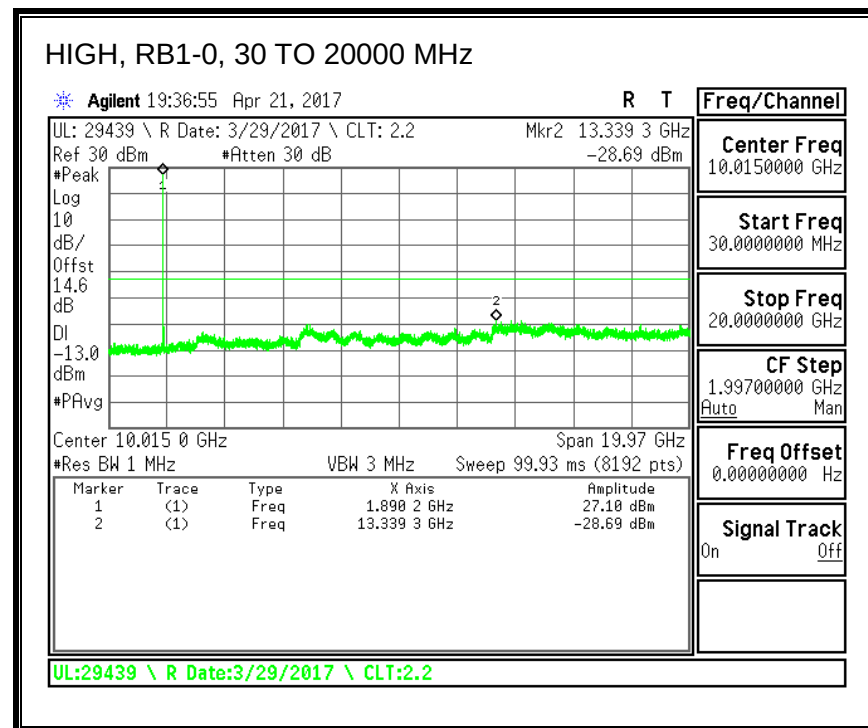
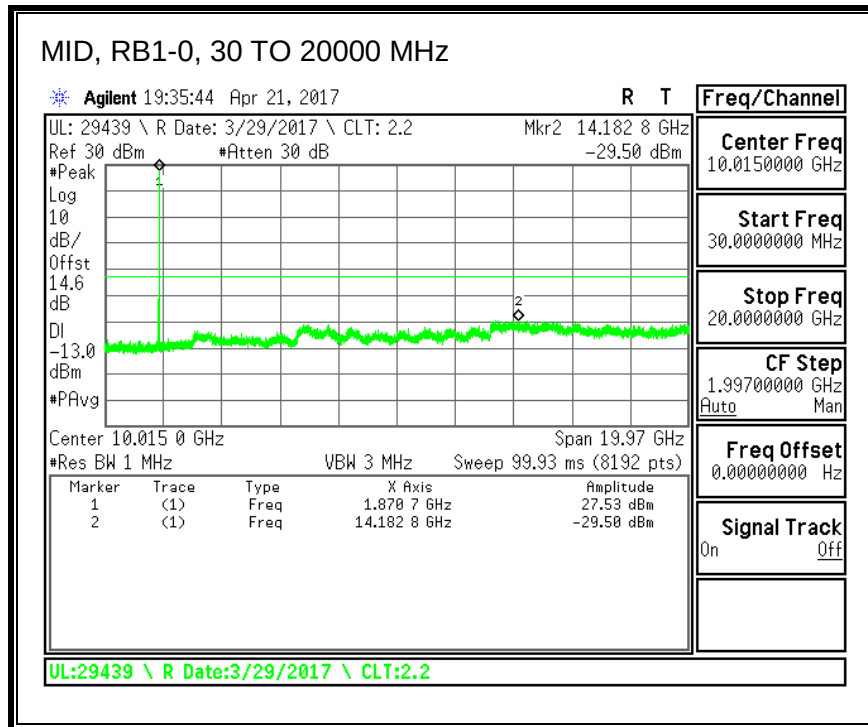
QPSK, (20.0 MHz BAND WIDTH)





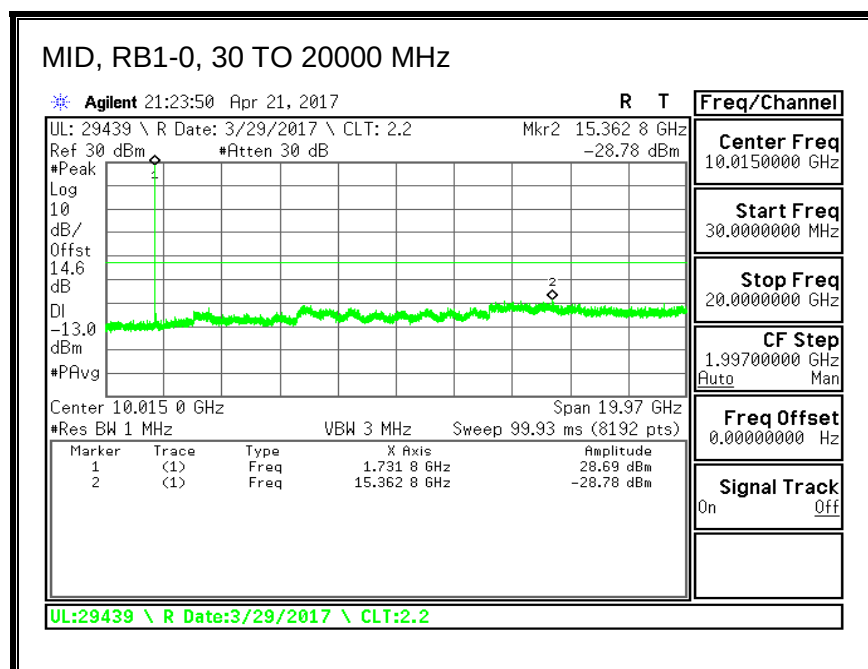
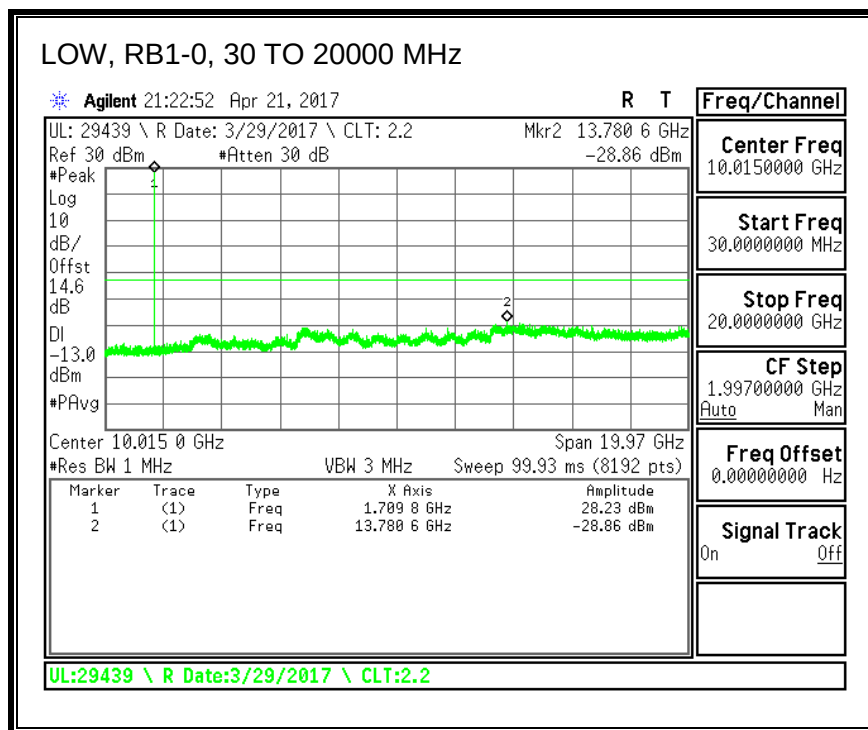
16QAM, (20.0 MHz BAND WIDTH)

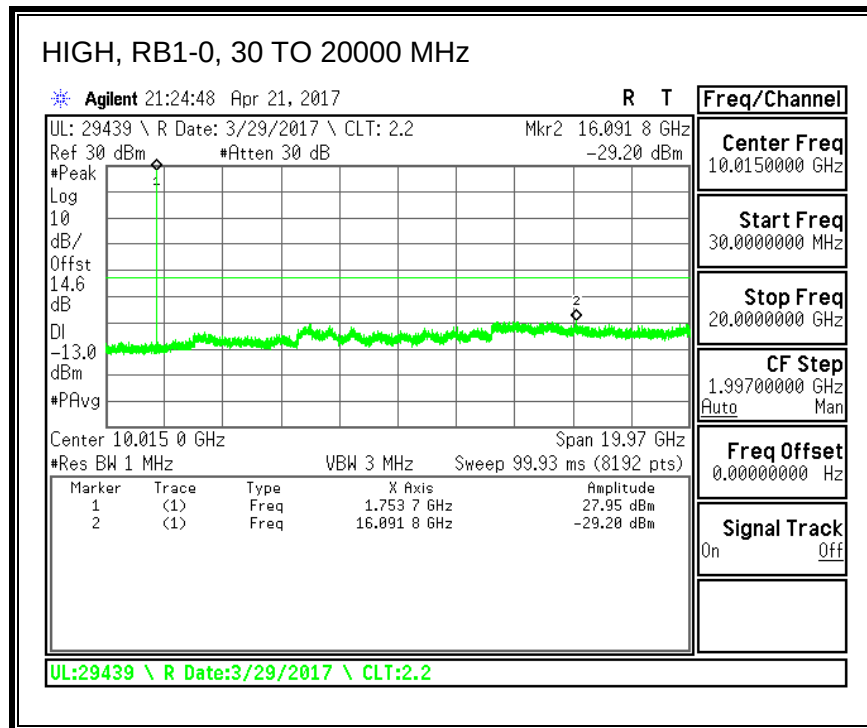




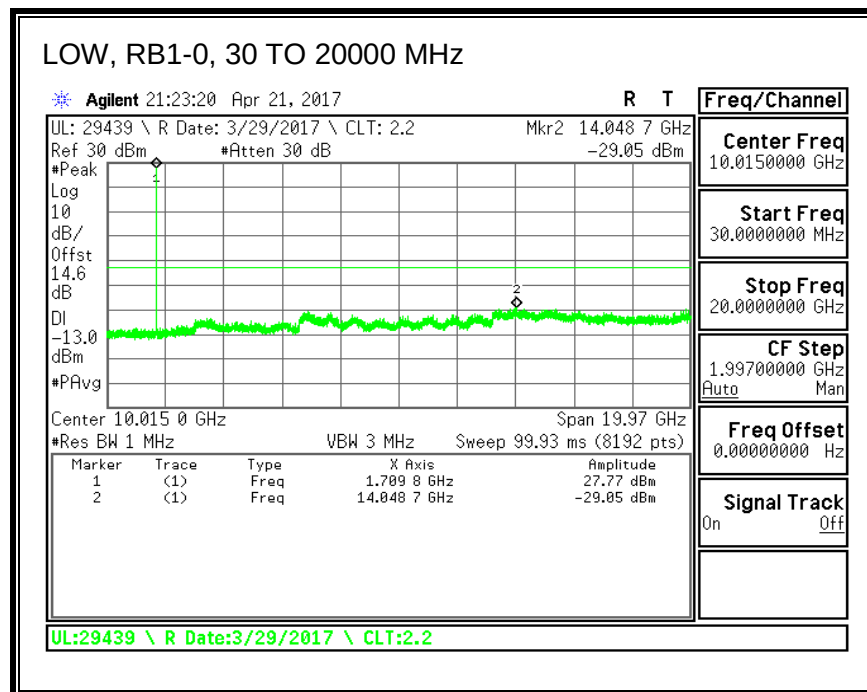
8.3.2. LTE BAND 4

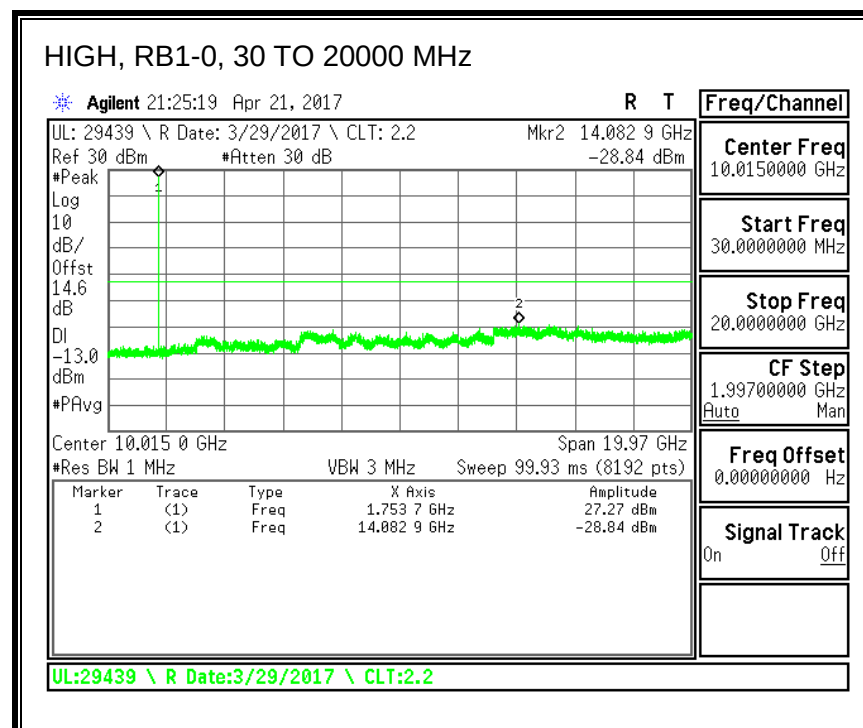
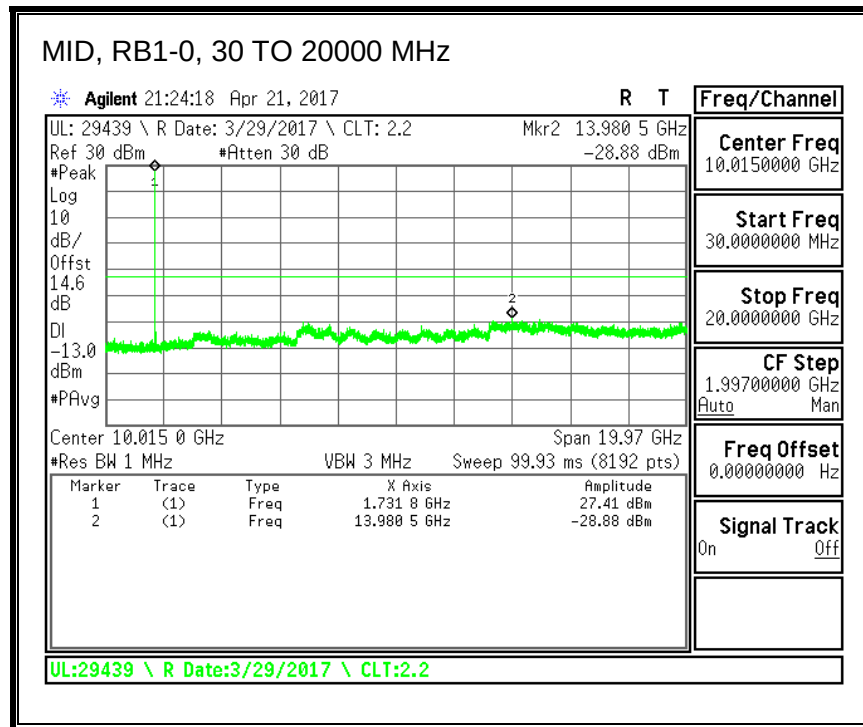
QPSK, (1.4 MHz BAND WIDTH)



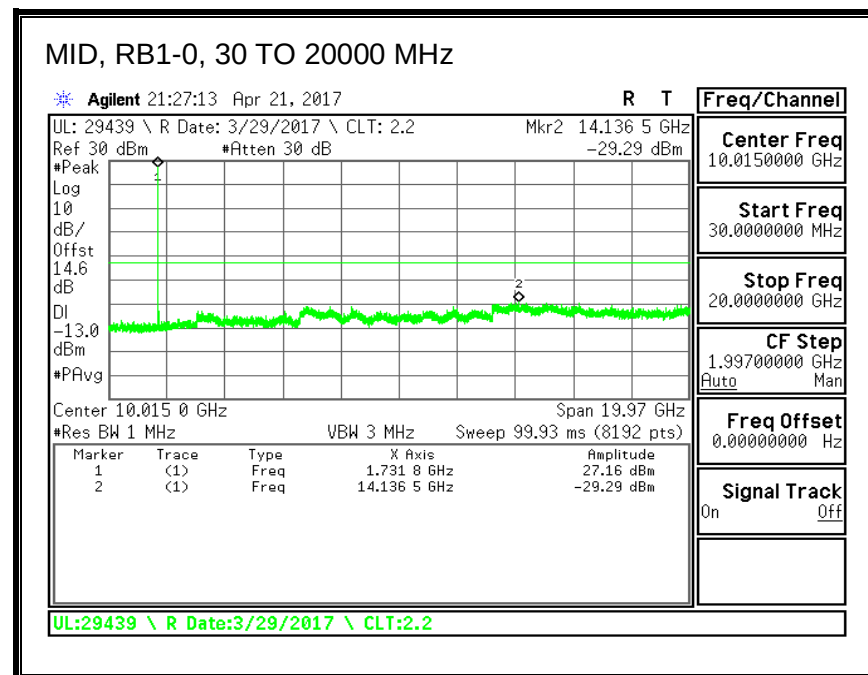
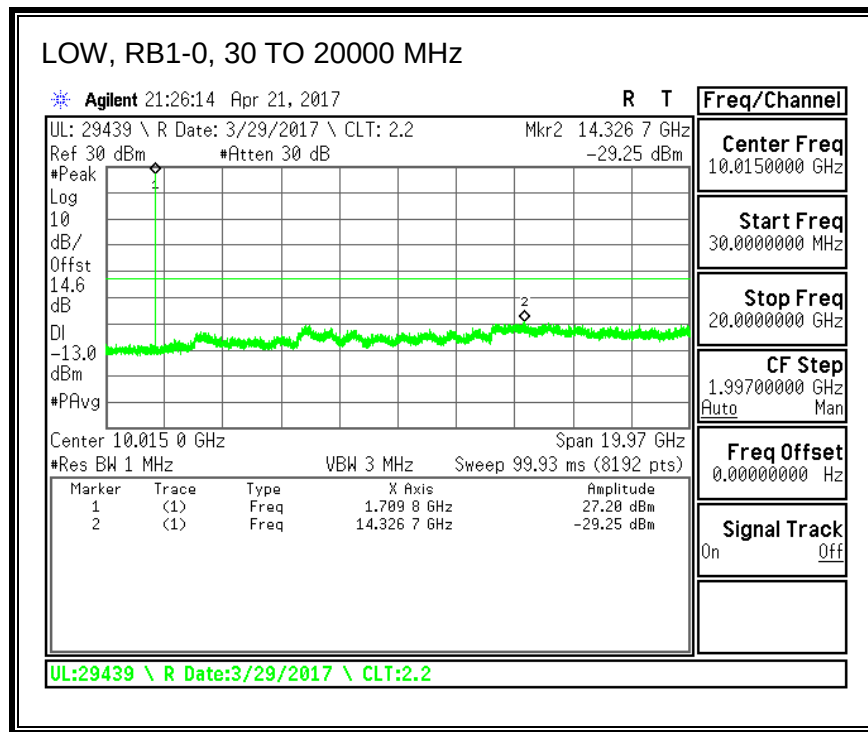


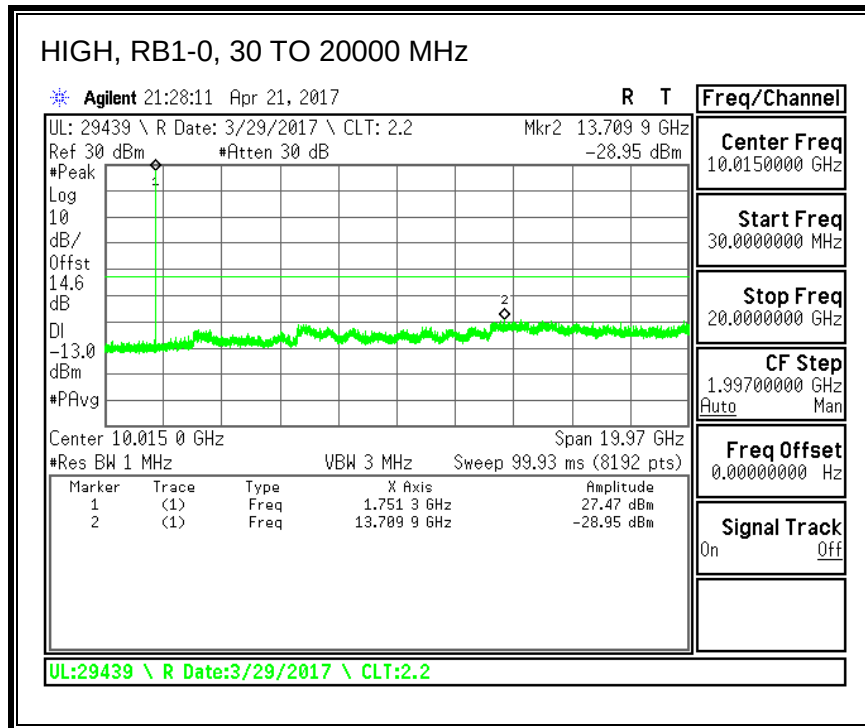
16QAM, (1.4 MHz BAND WIDTH)



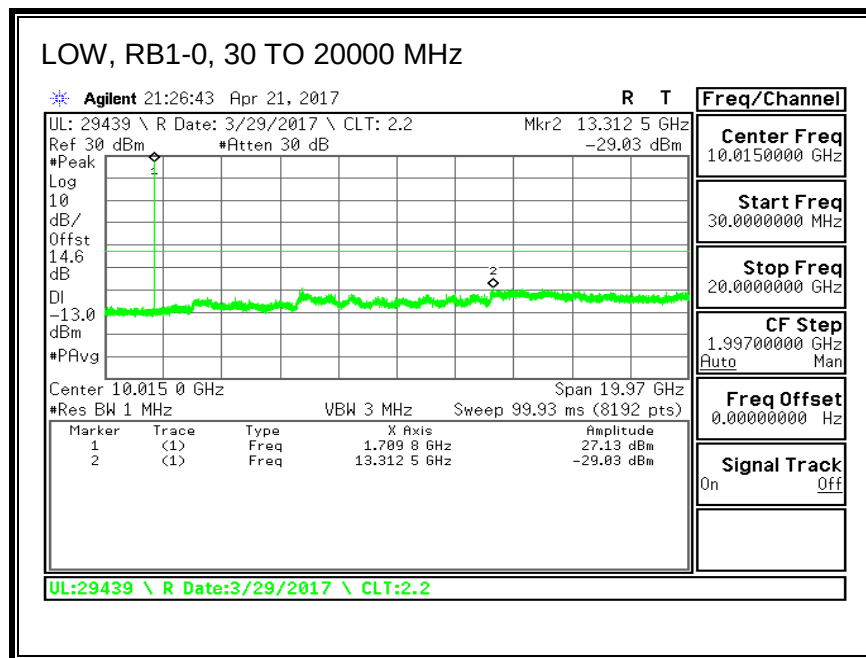


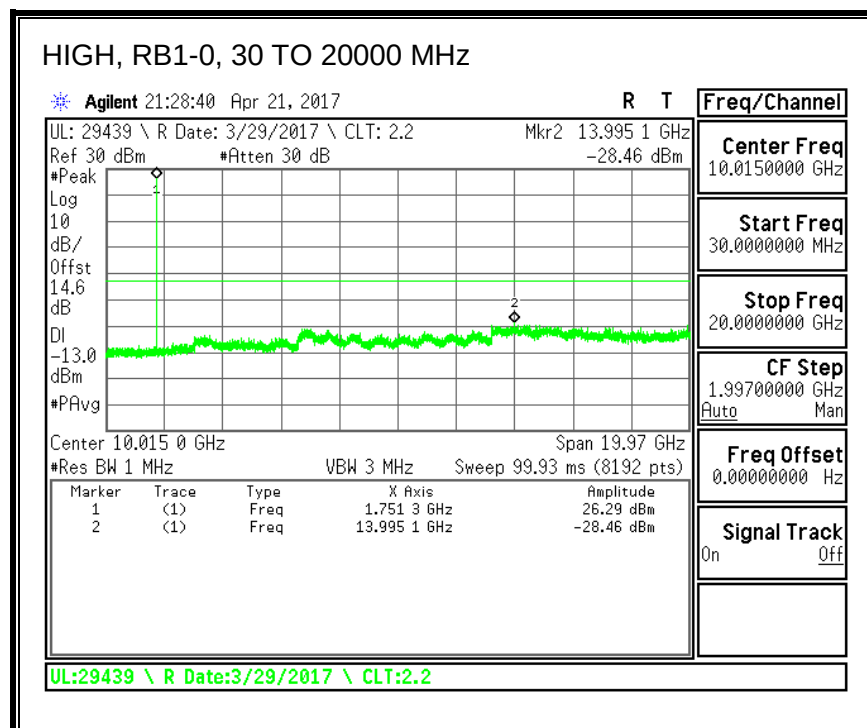
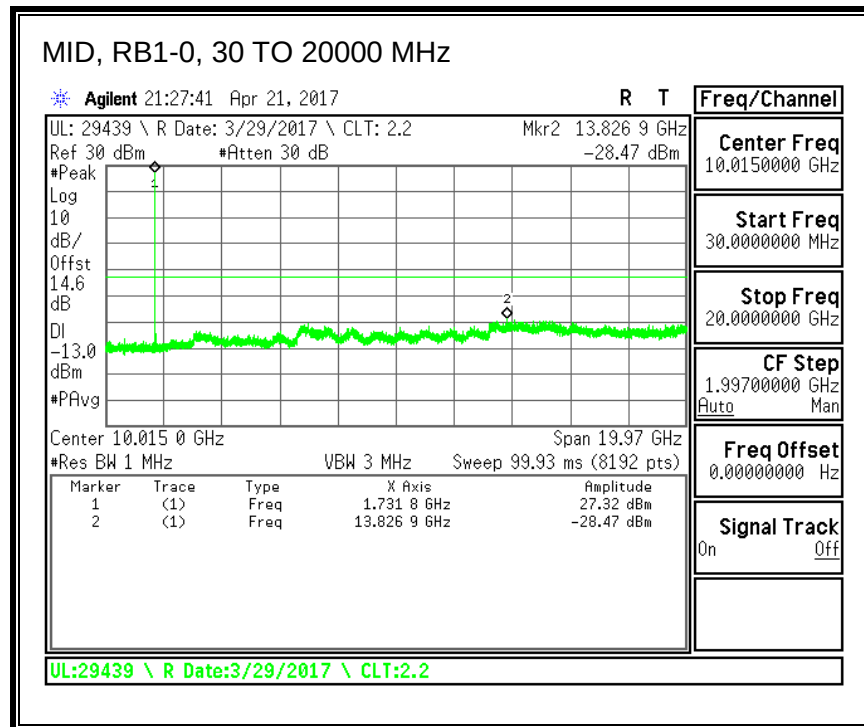
QPSK, (3.0 MHz BAND WIDTH)





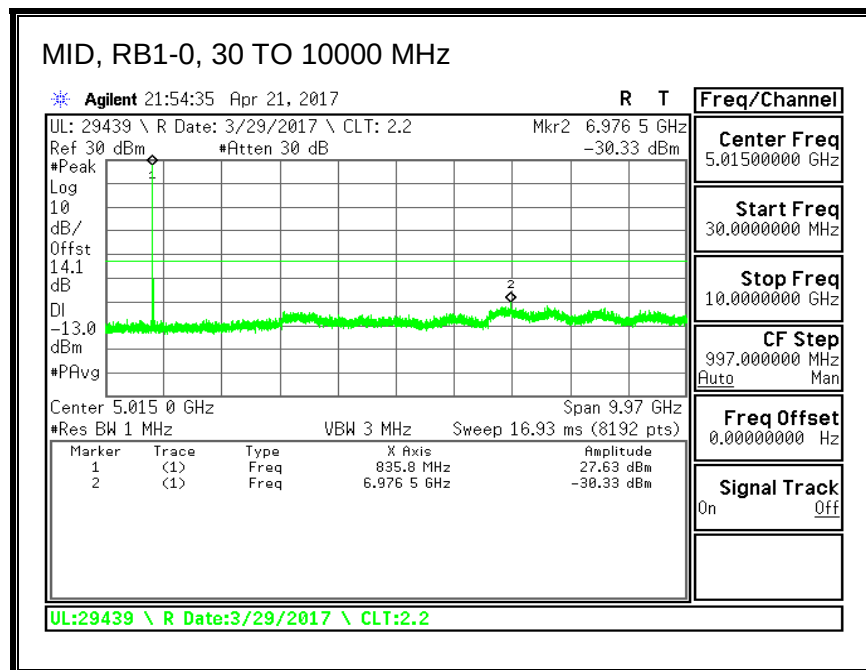
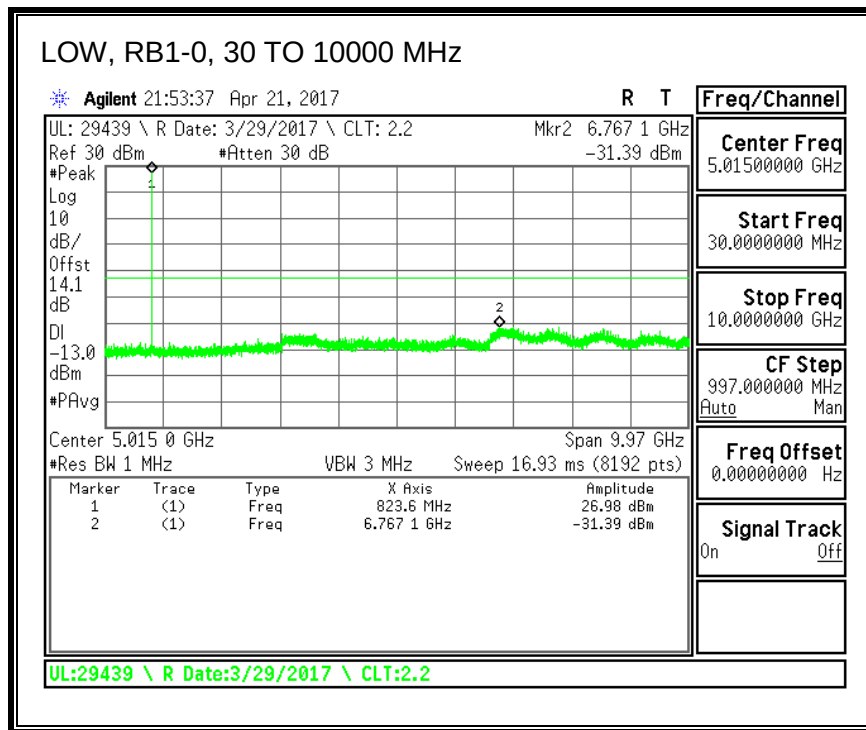
16QAM, (3.0 MHz BAND WIDTH)

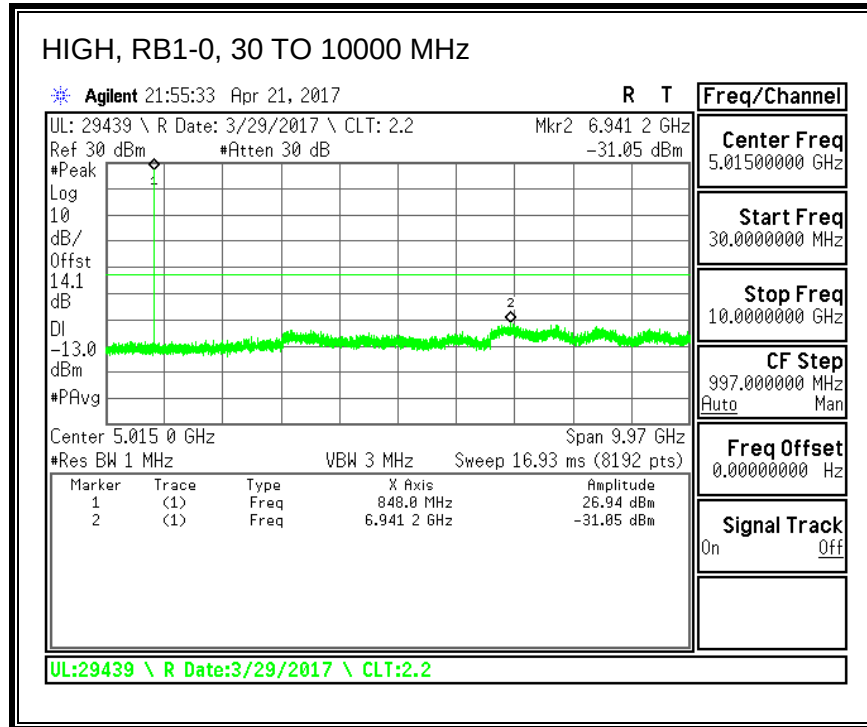




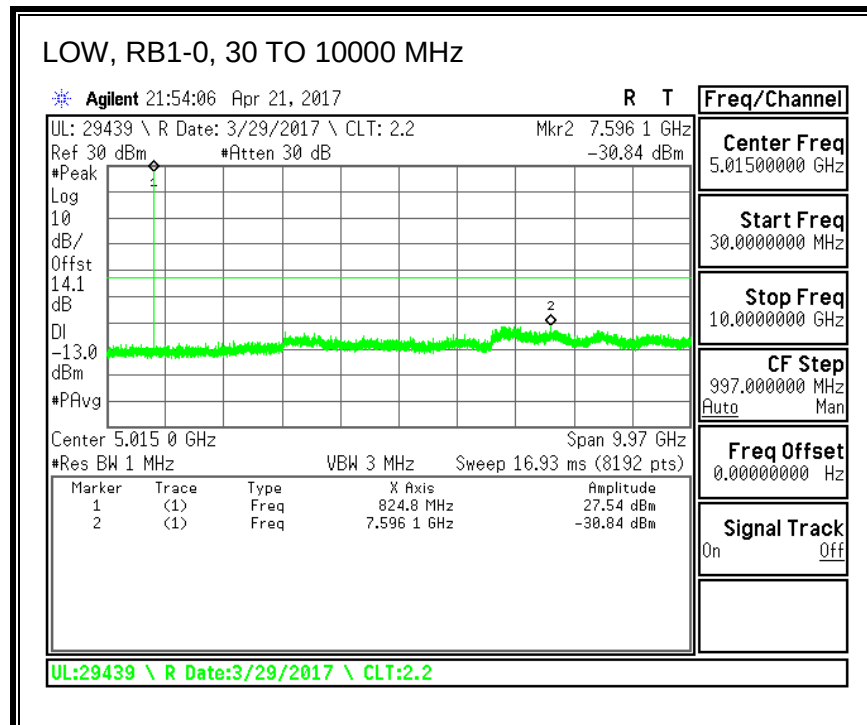
8.3.3. LTE BAND 5

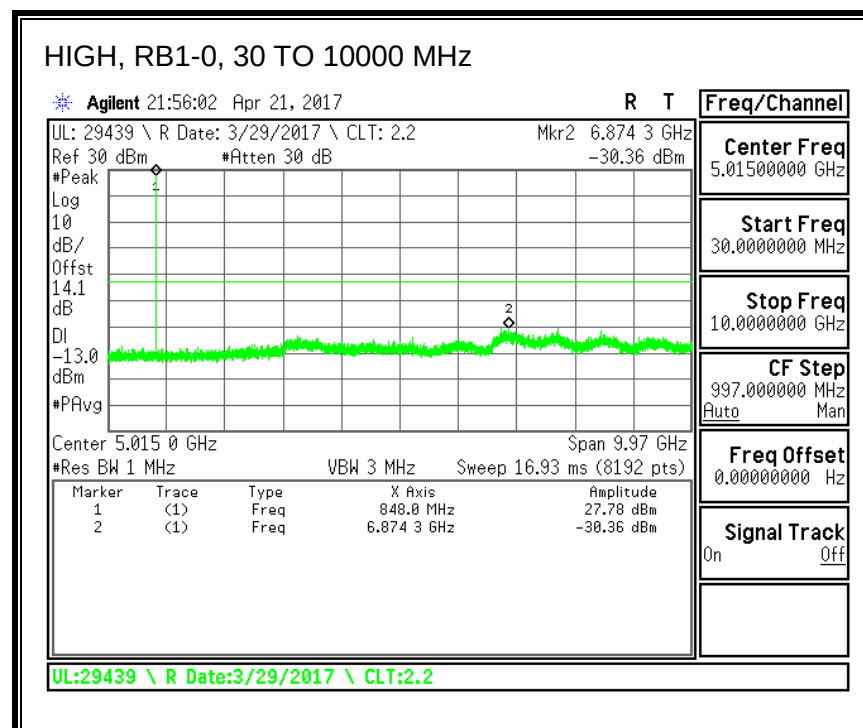
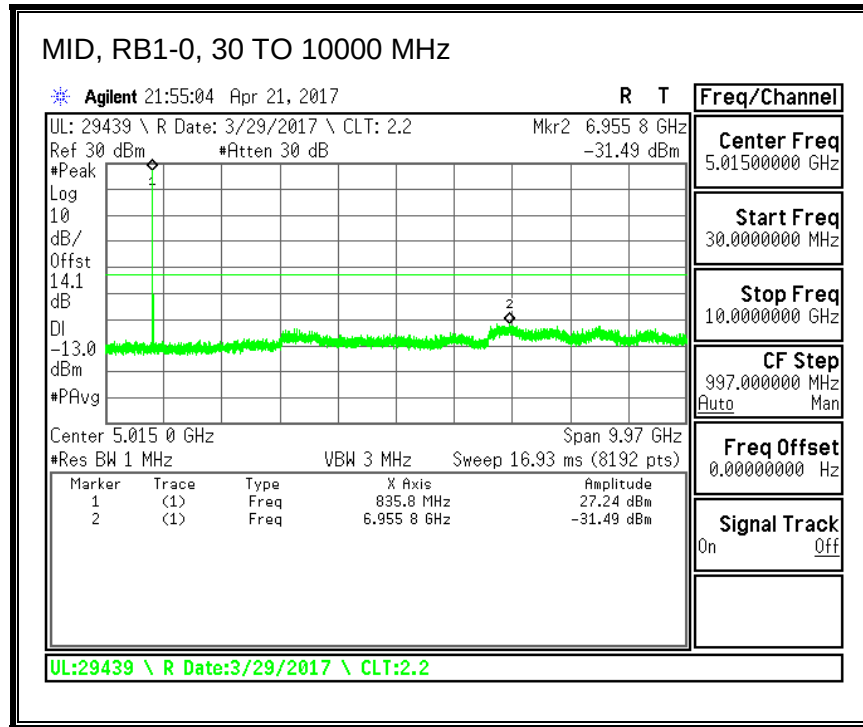
QPSK, (1.4 MHz BAND WIDTH)



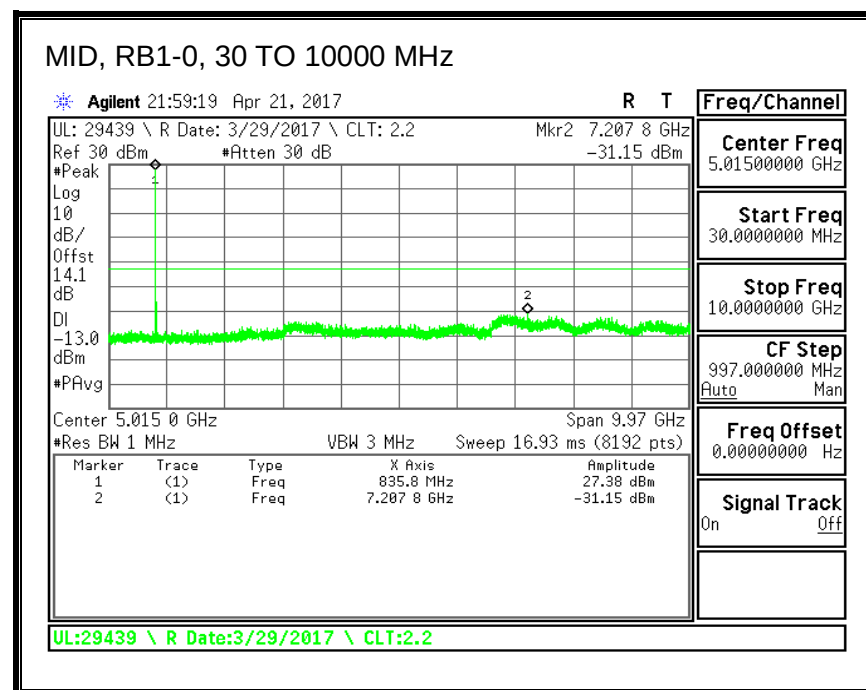
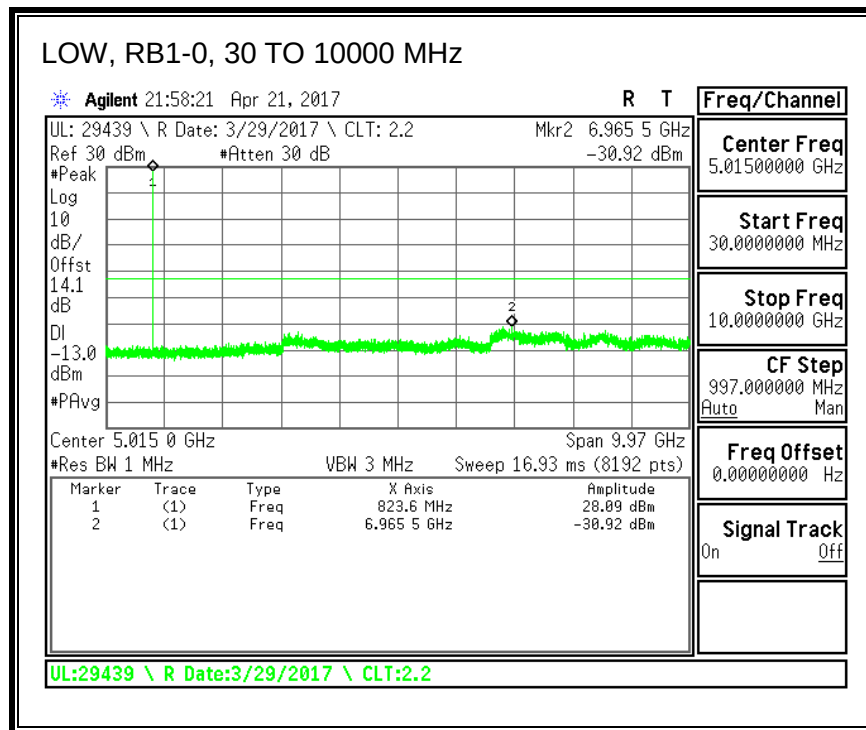


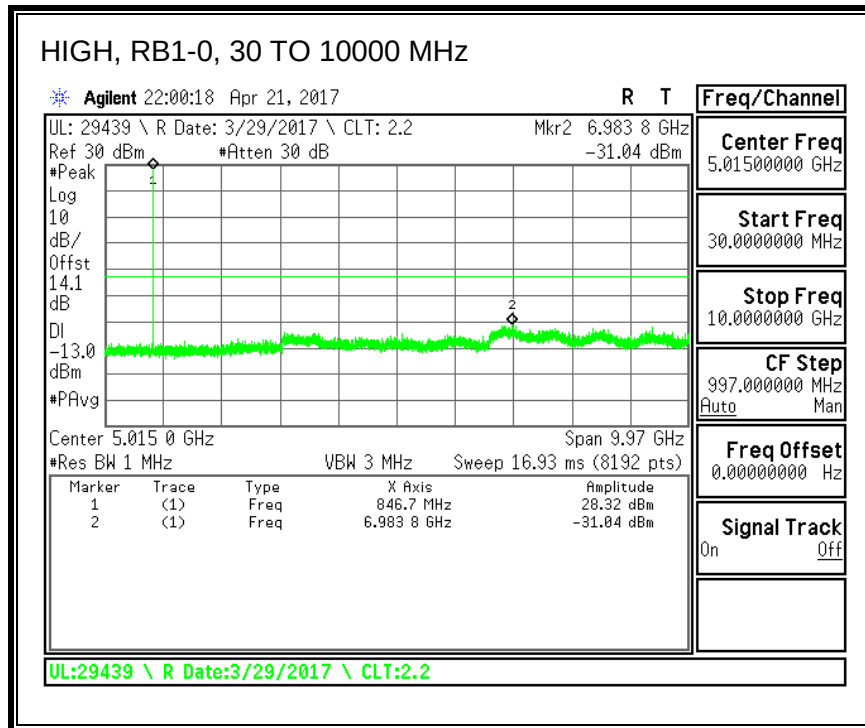
16QAM, (1.4 MHz BAND WIDTH)



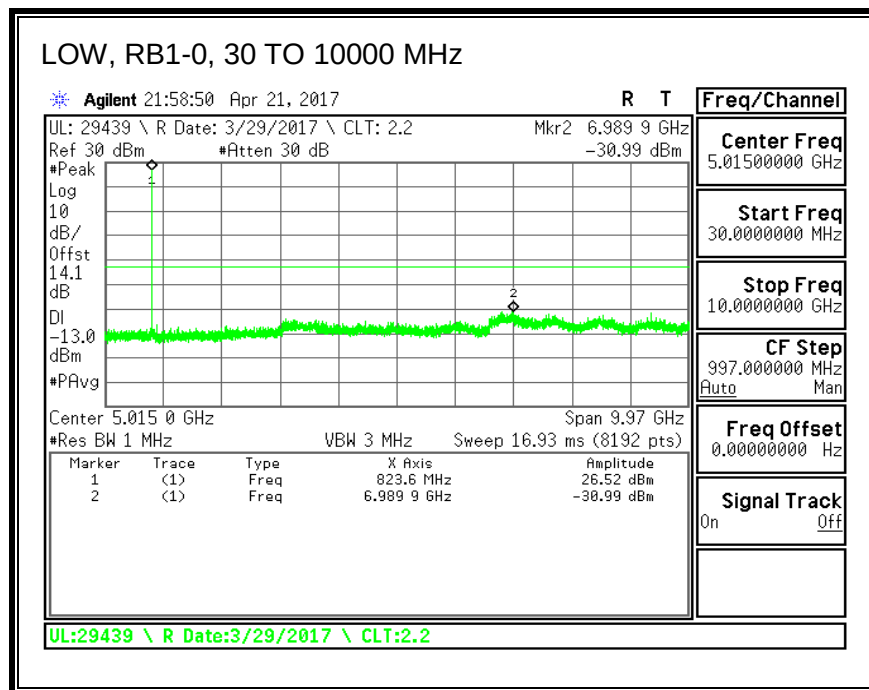


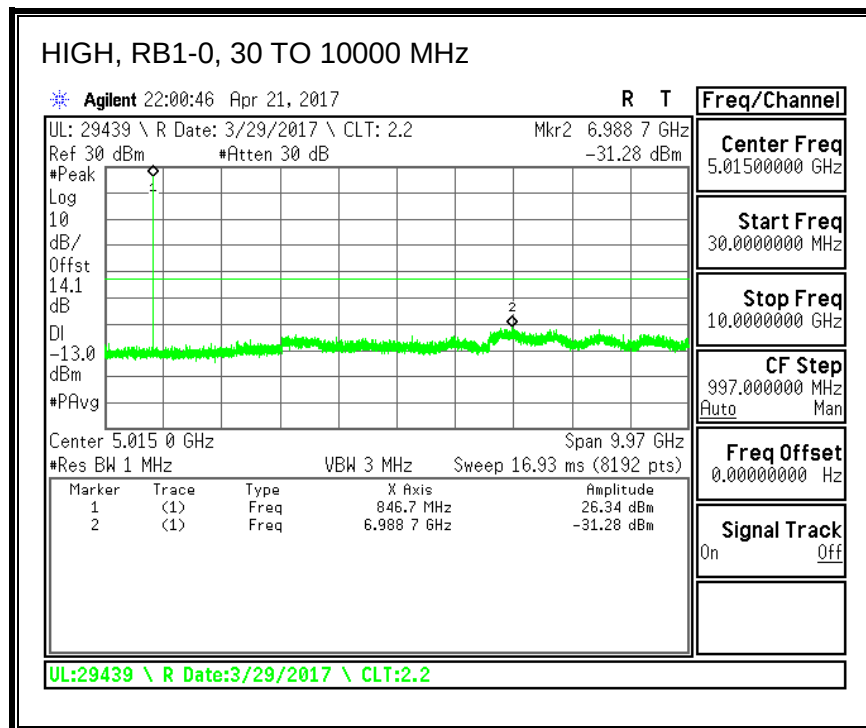
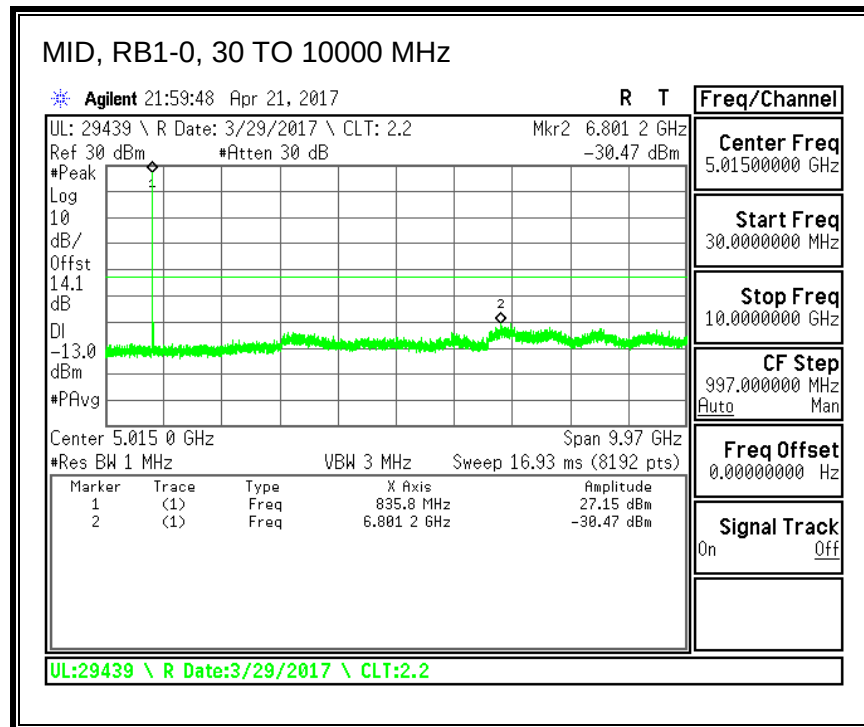
QPSK, (3.0 MHz BAND WIDTH)



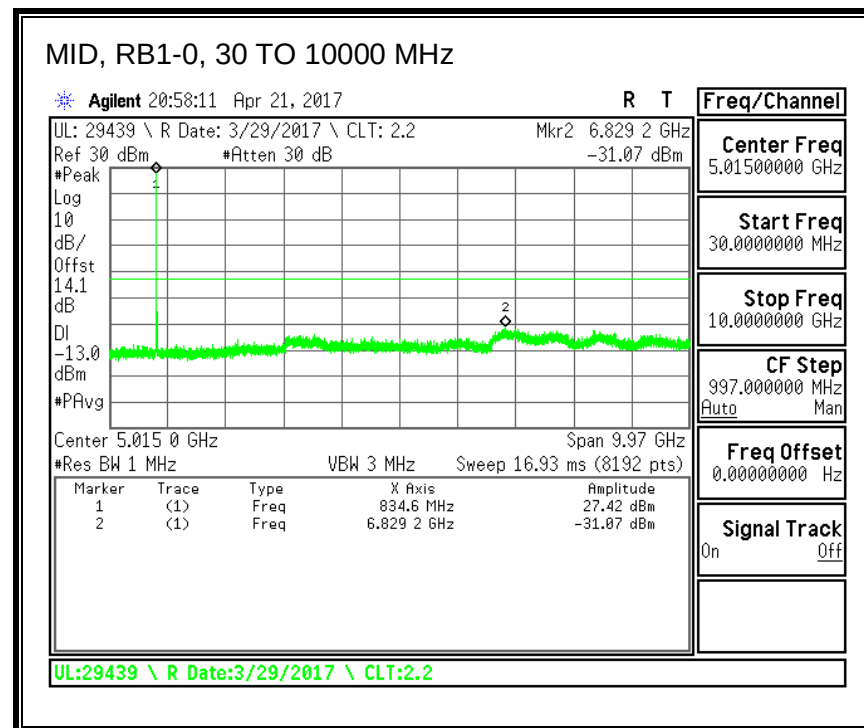
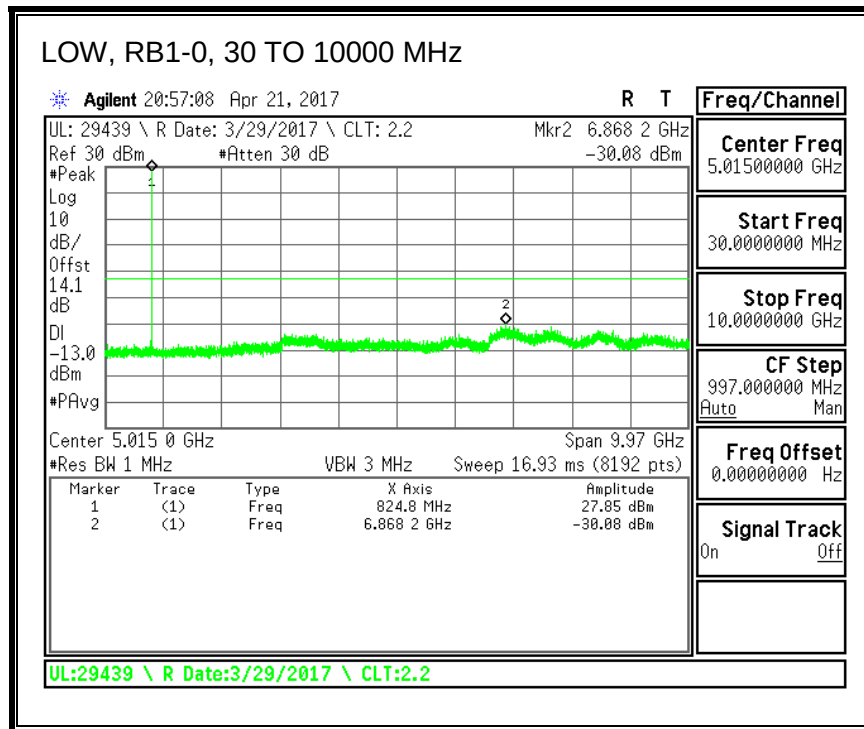


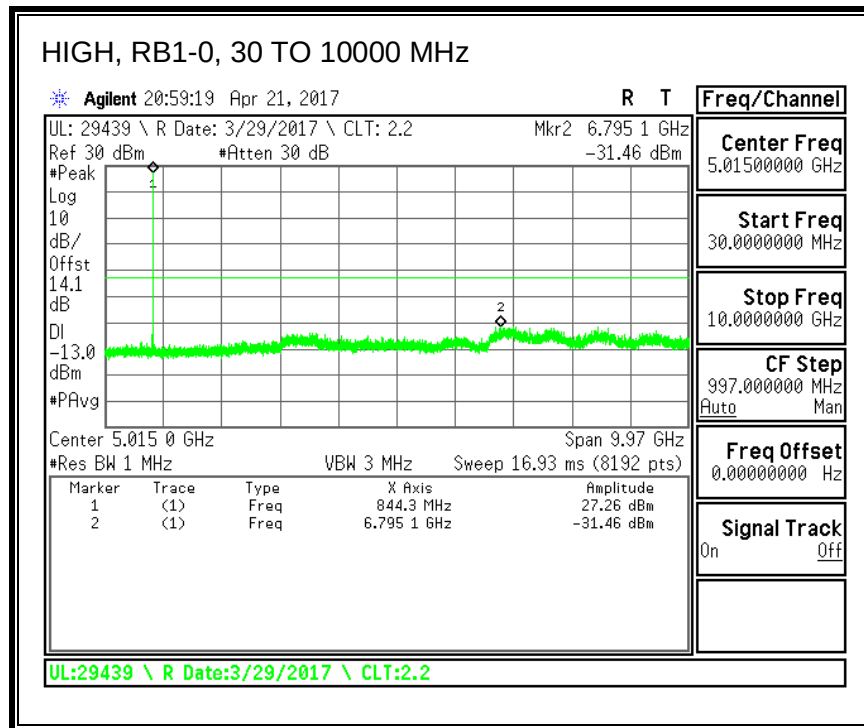
16QAM, (3.0 MHz BAND WIDTH)



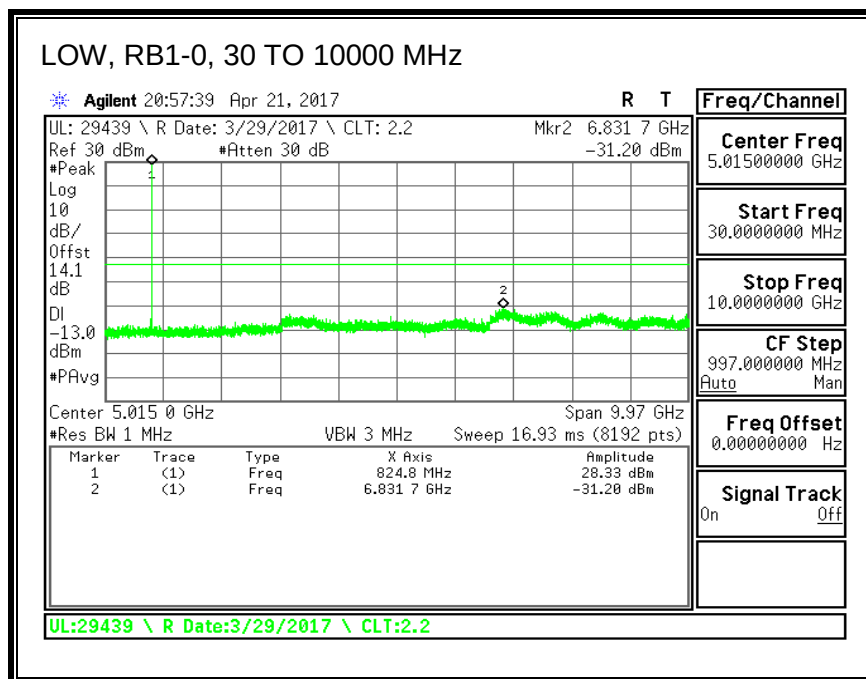


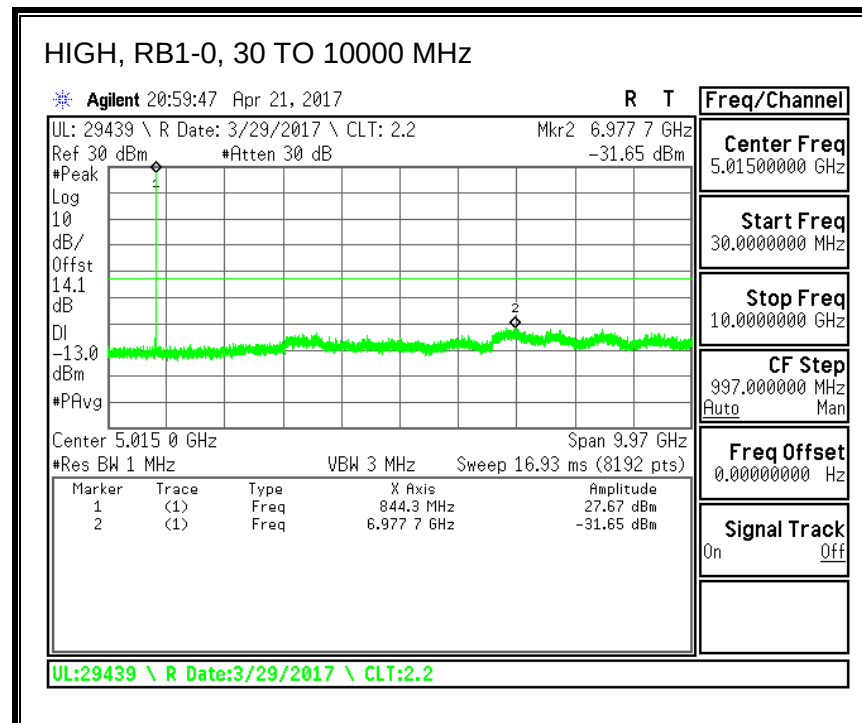
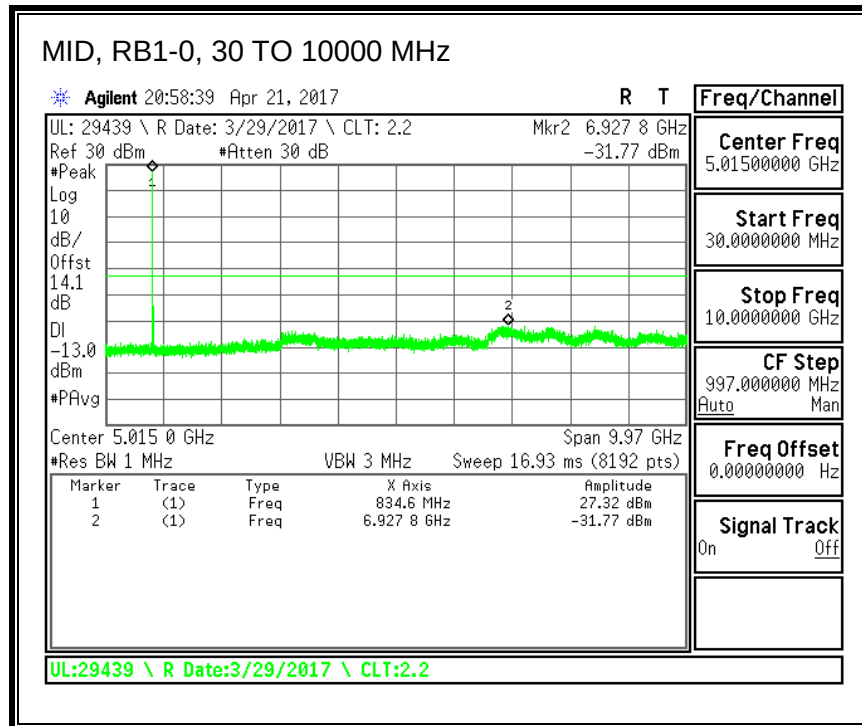
QPSK, (5.0 MHz BAND WIDTH)



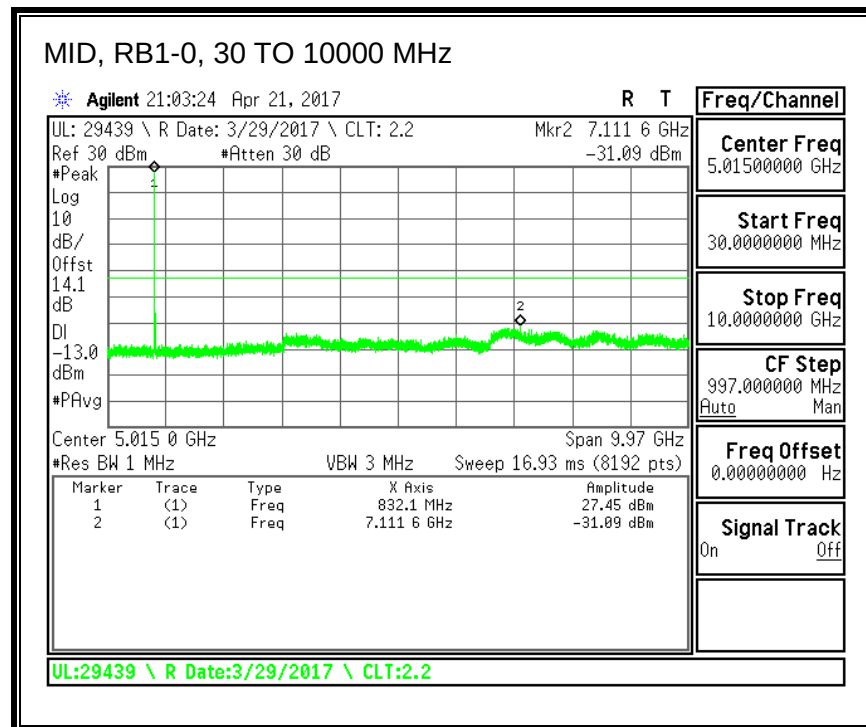
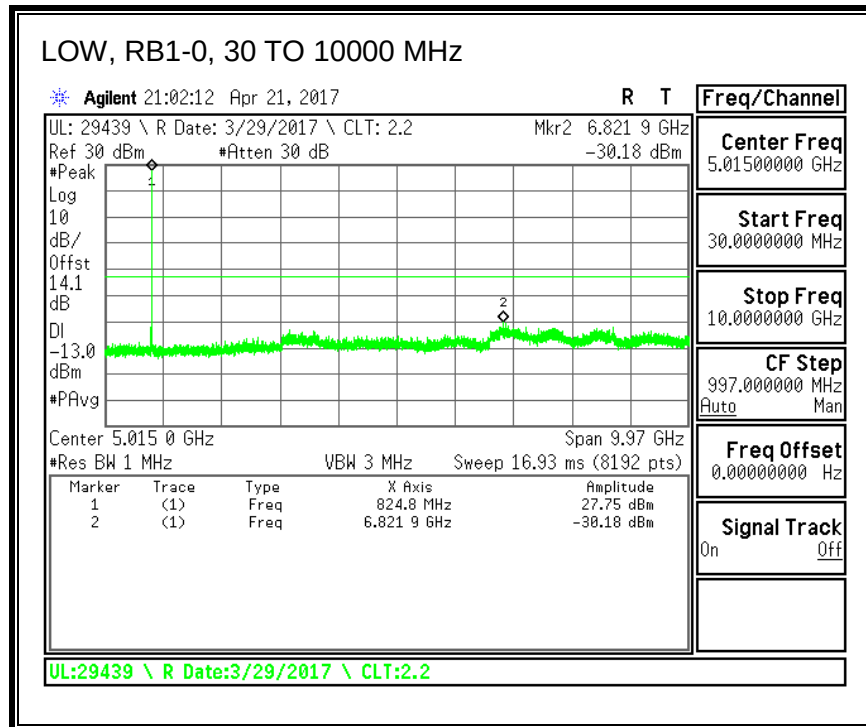


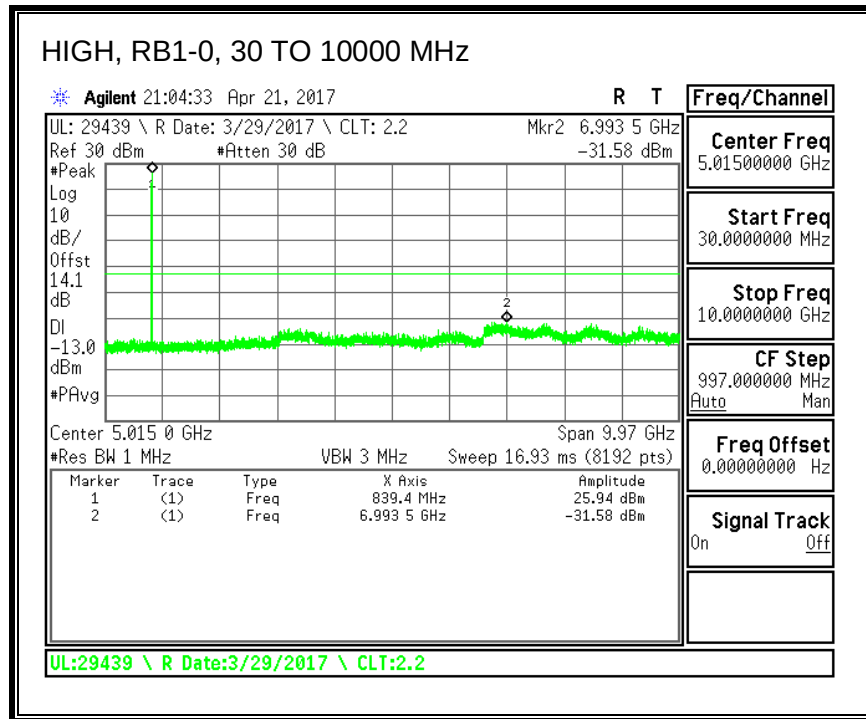
16QAM, (5.0 MHz BAND WIDTH)



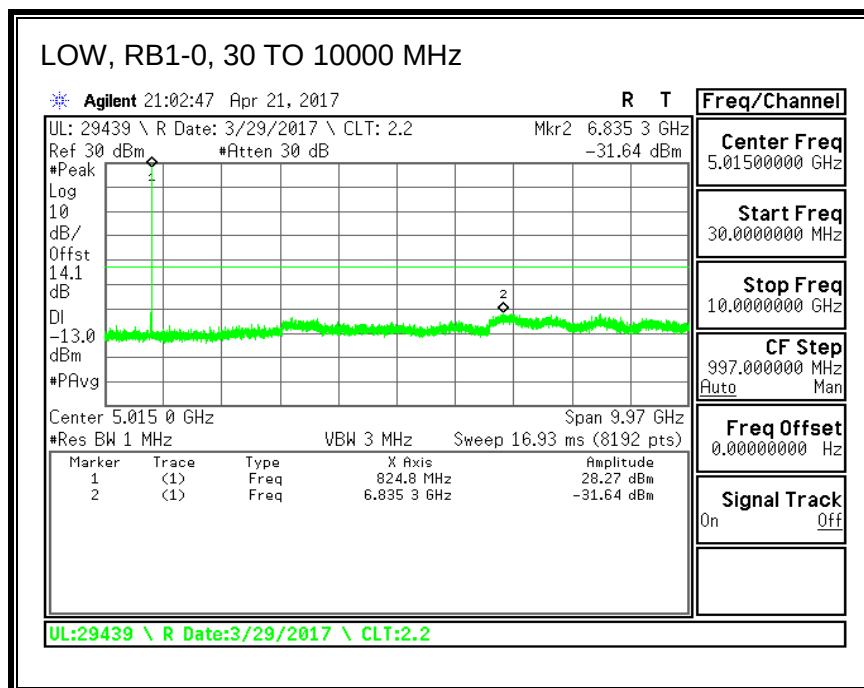


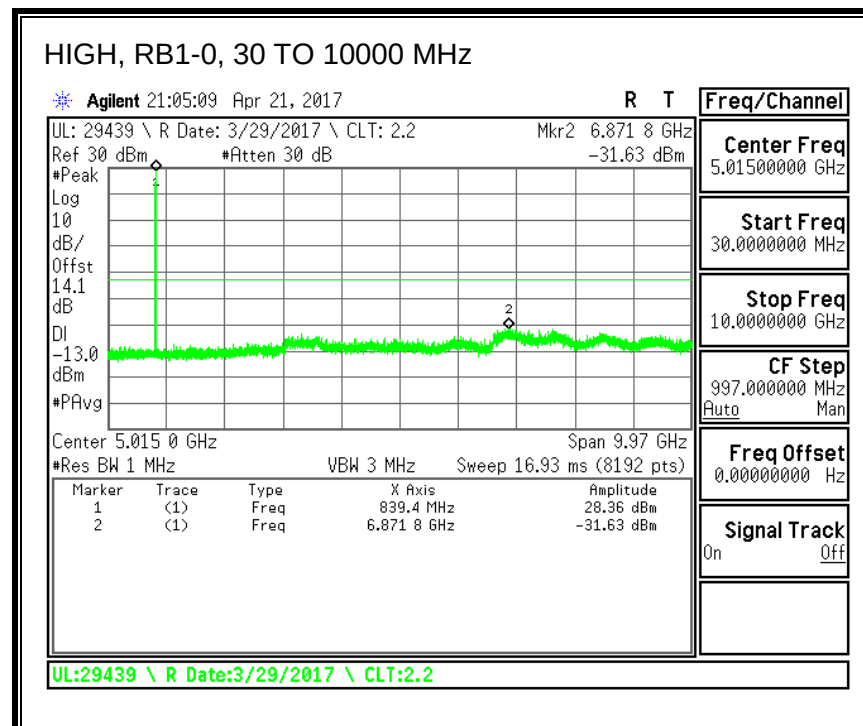
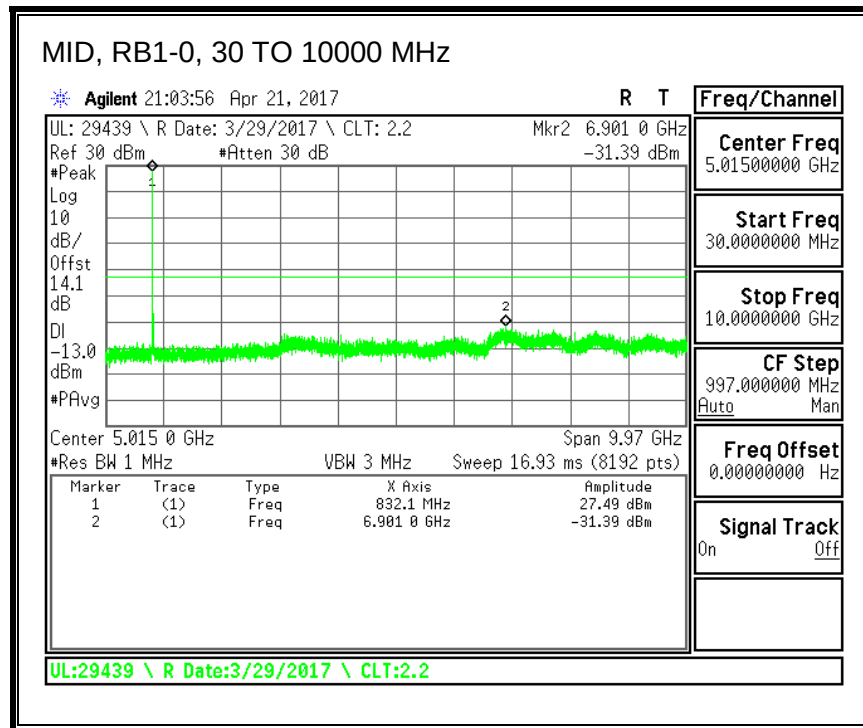
QPSK, (10.0 MHz BAND WIDTH)





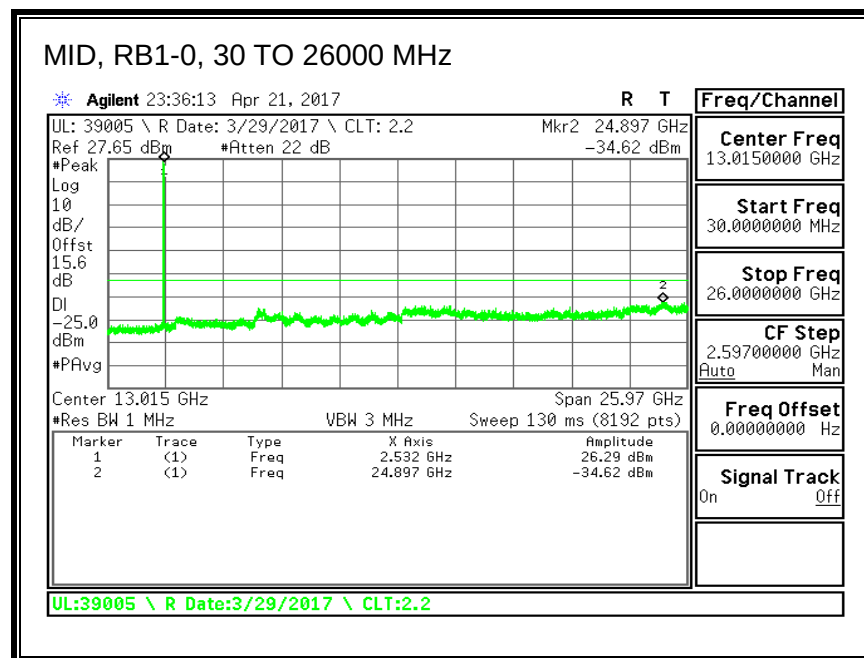
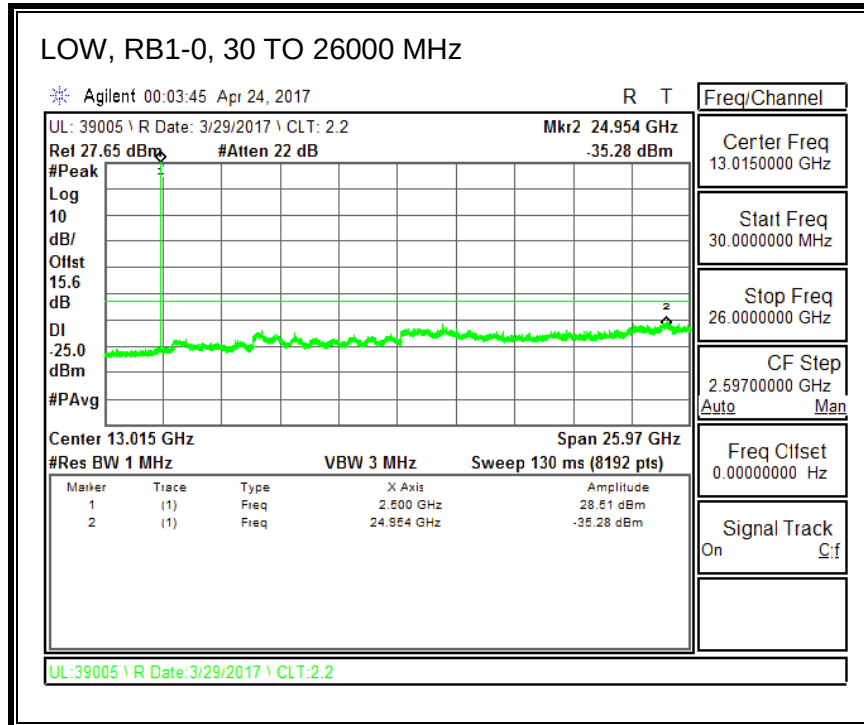
16QAM, (10.0 MHz BAND WIDTH)

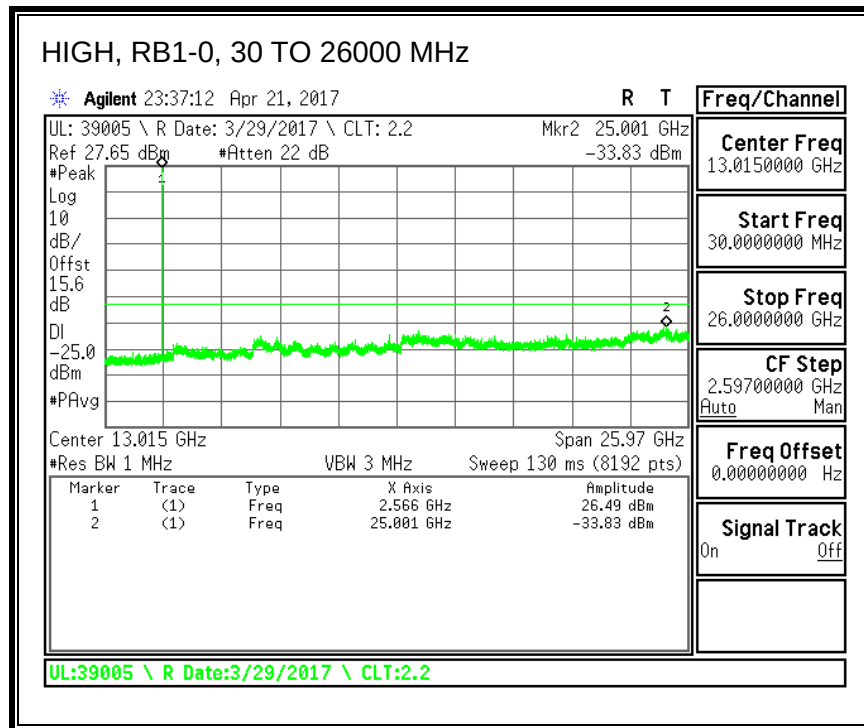




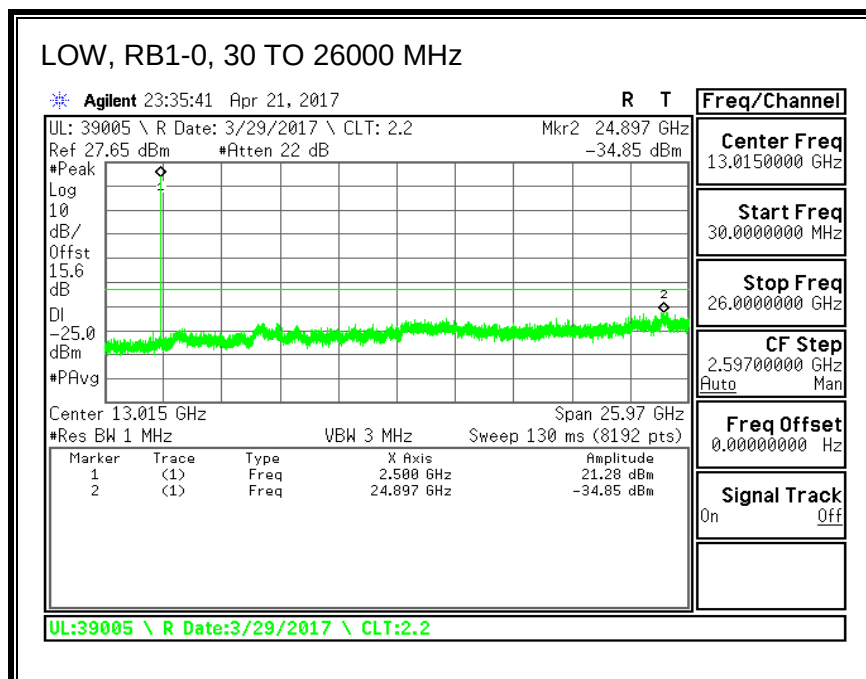
8.3.4. LTE BAND 7

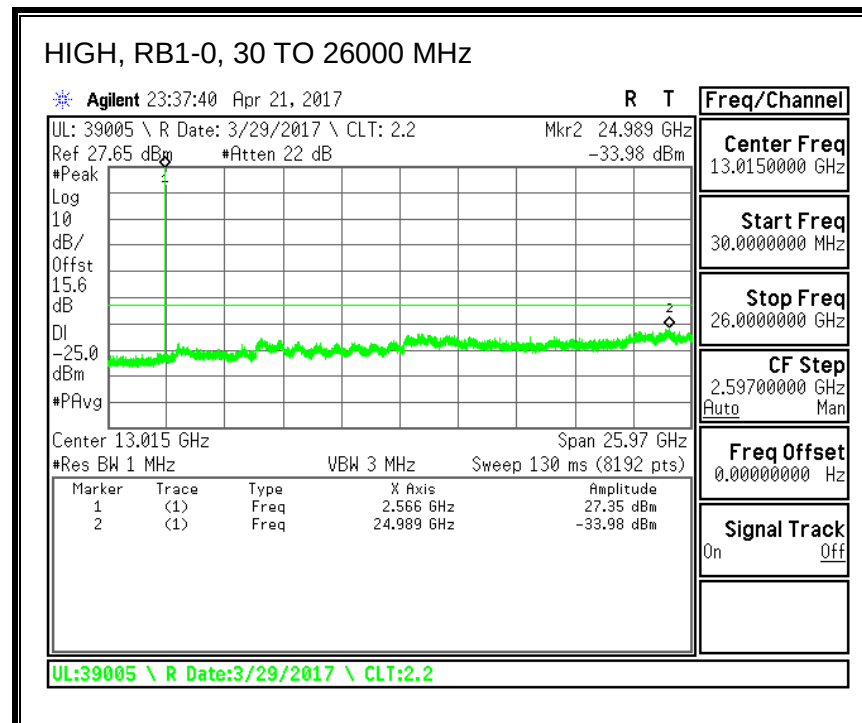
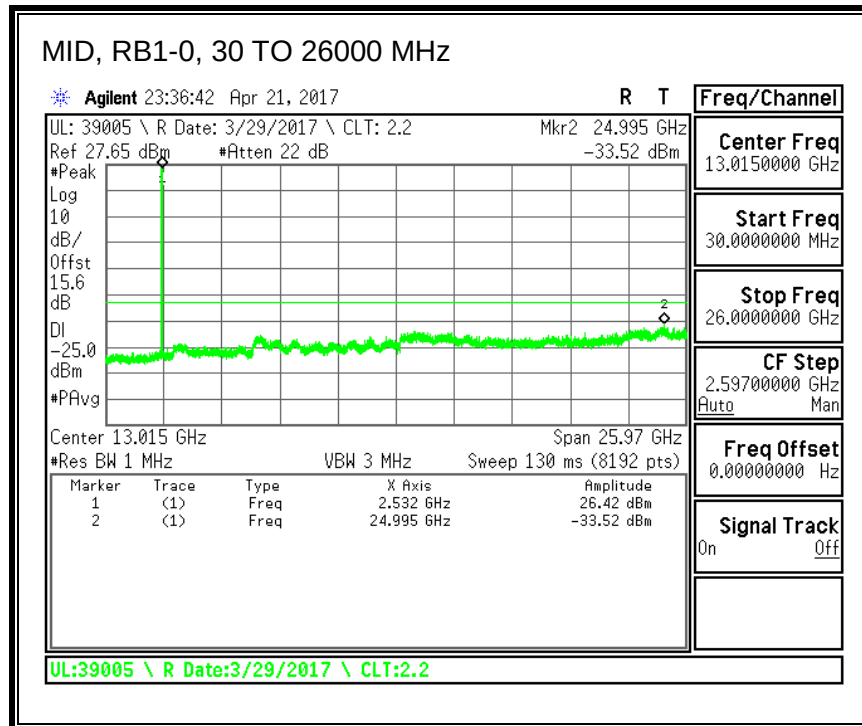
QPSK, (5.0 MHz BAND WIDTH)



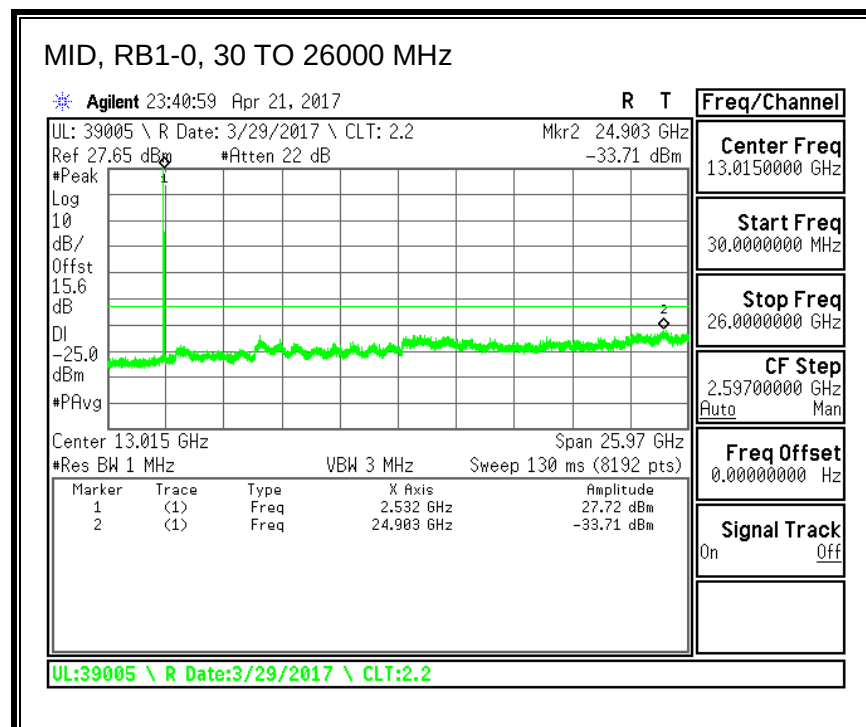
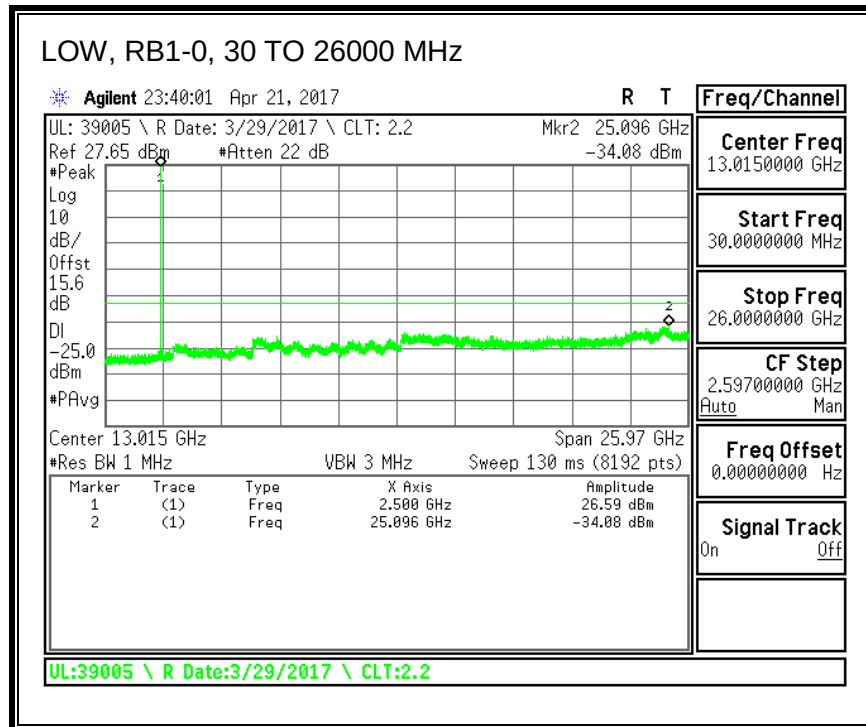


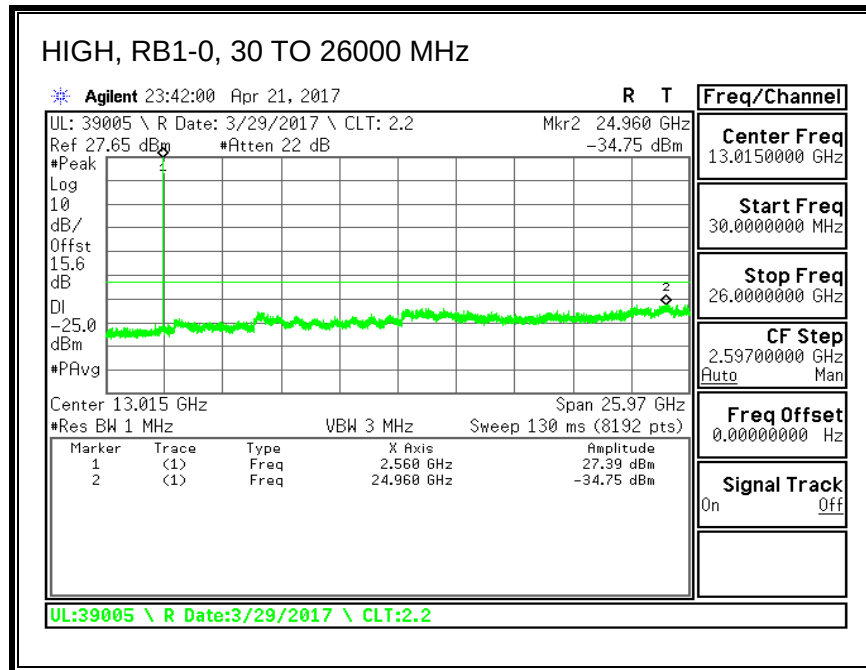
16QAM, (5.0 MHz BAND WIDTH)



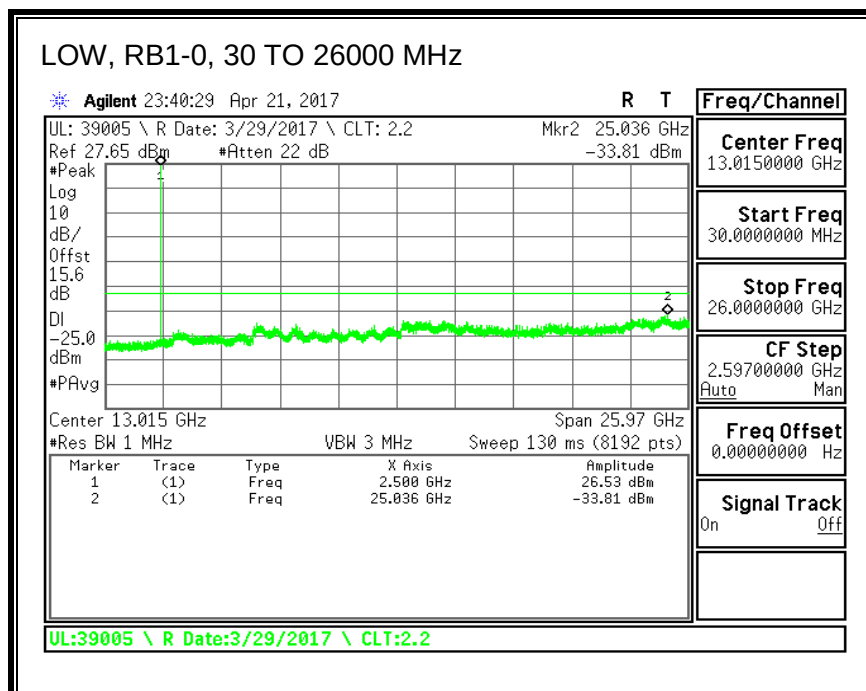


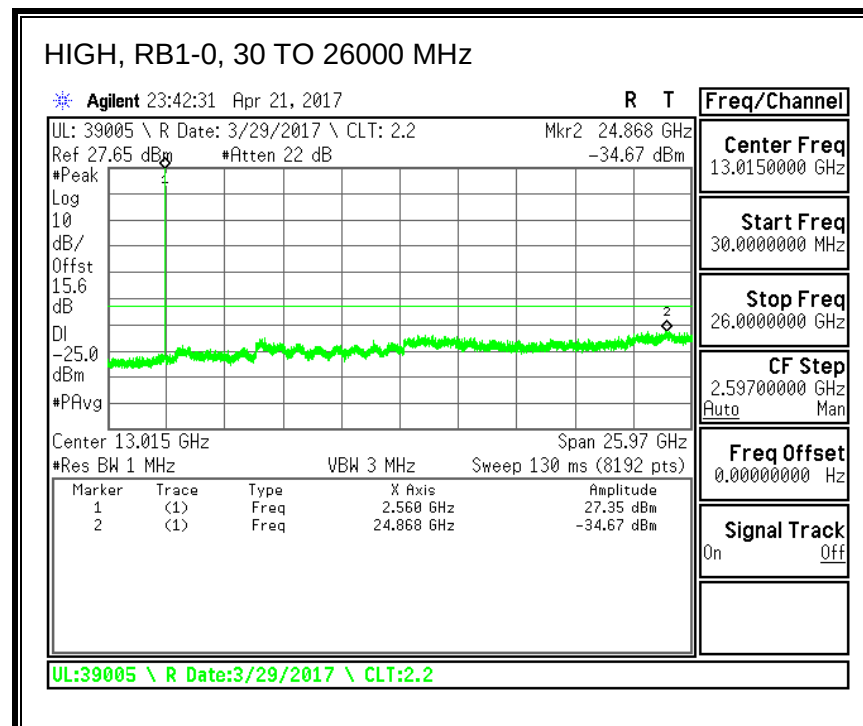
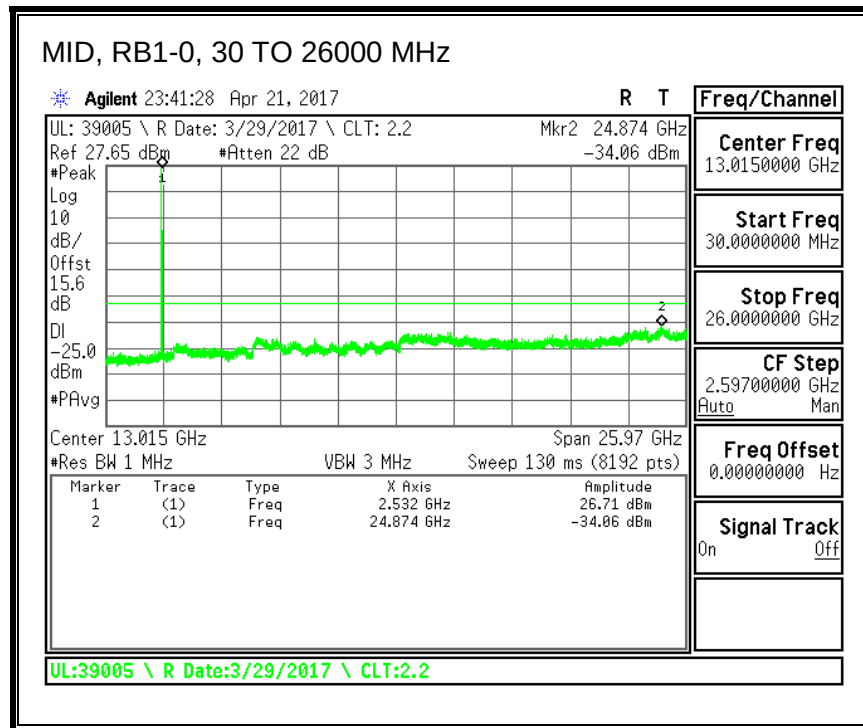
QPSK, (10.0 MHz BAND WIDTH)



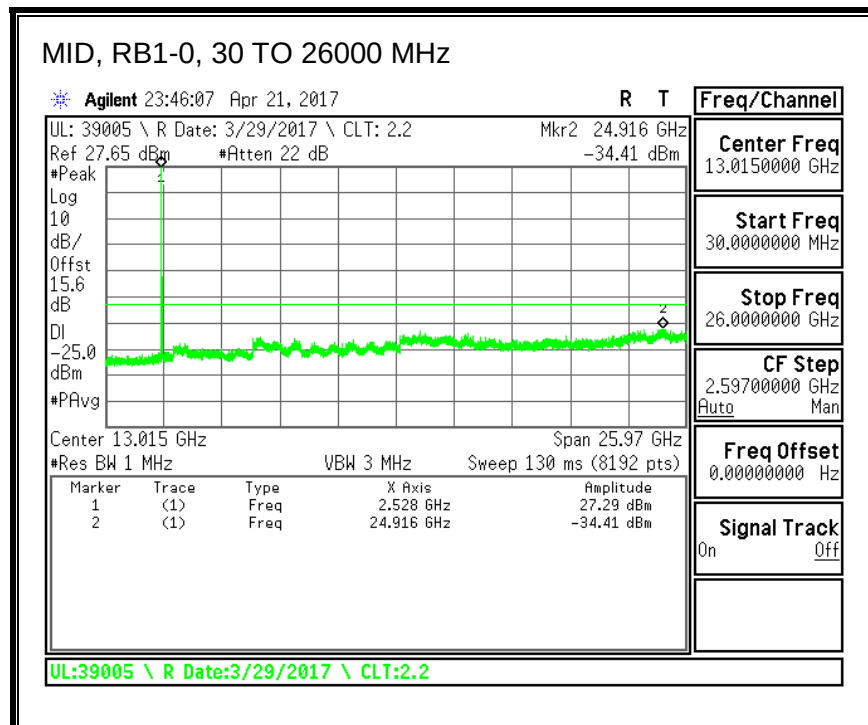
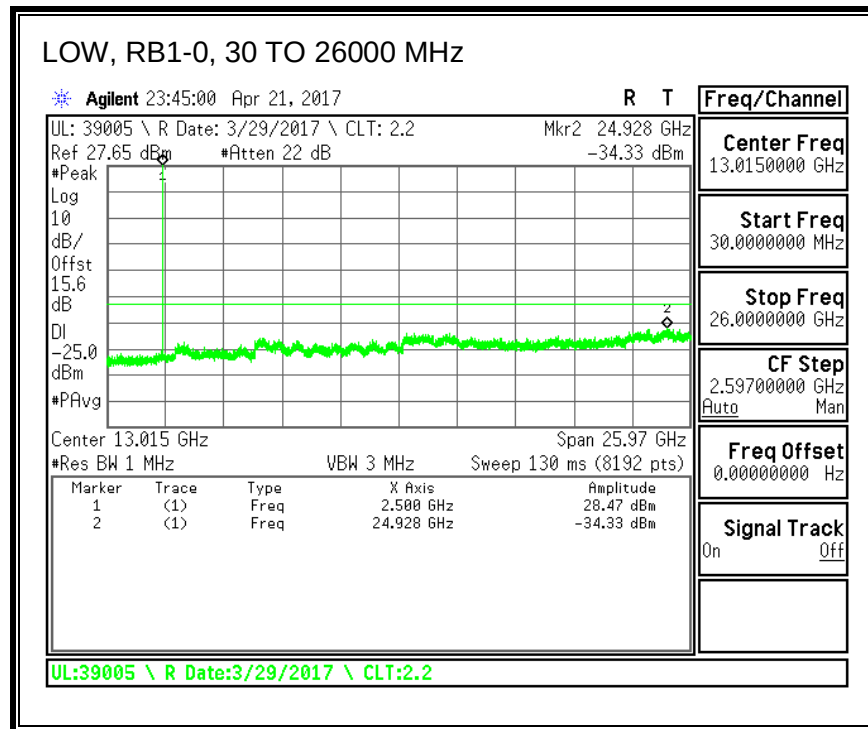


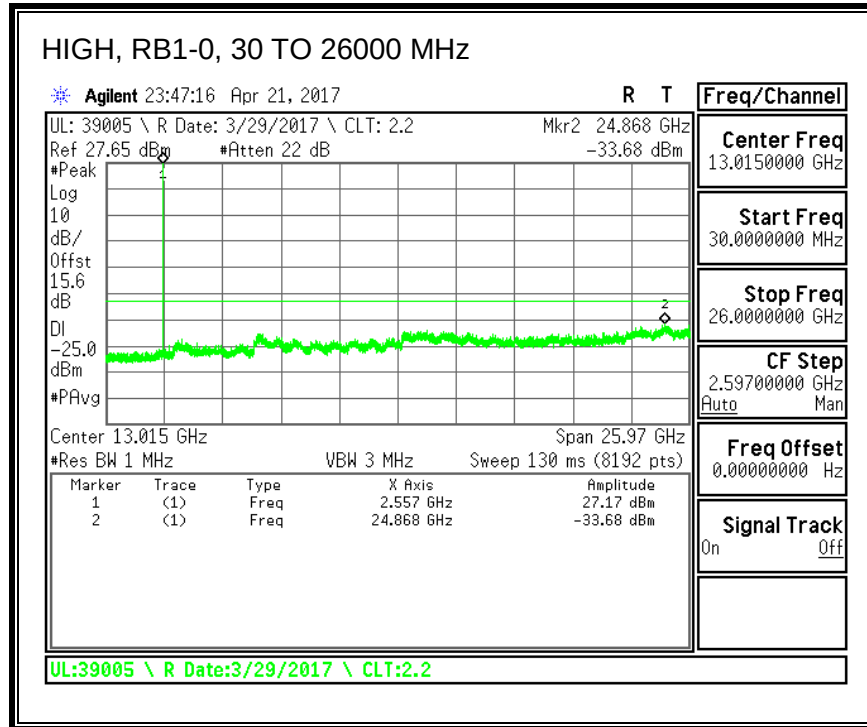
16QAM, (10.0 MHz BAND WIDTH)



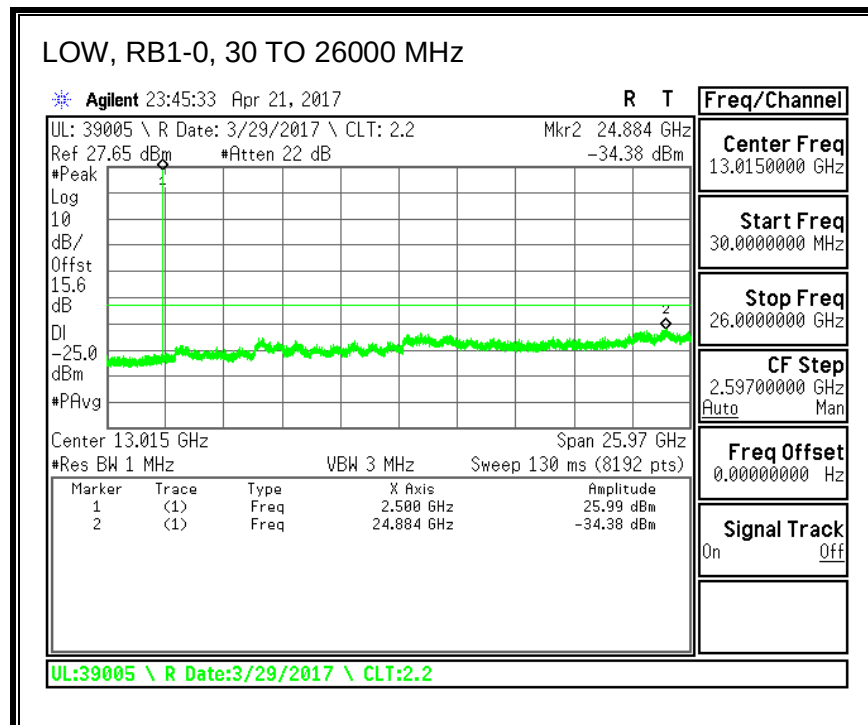


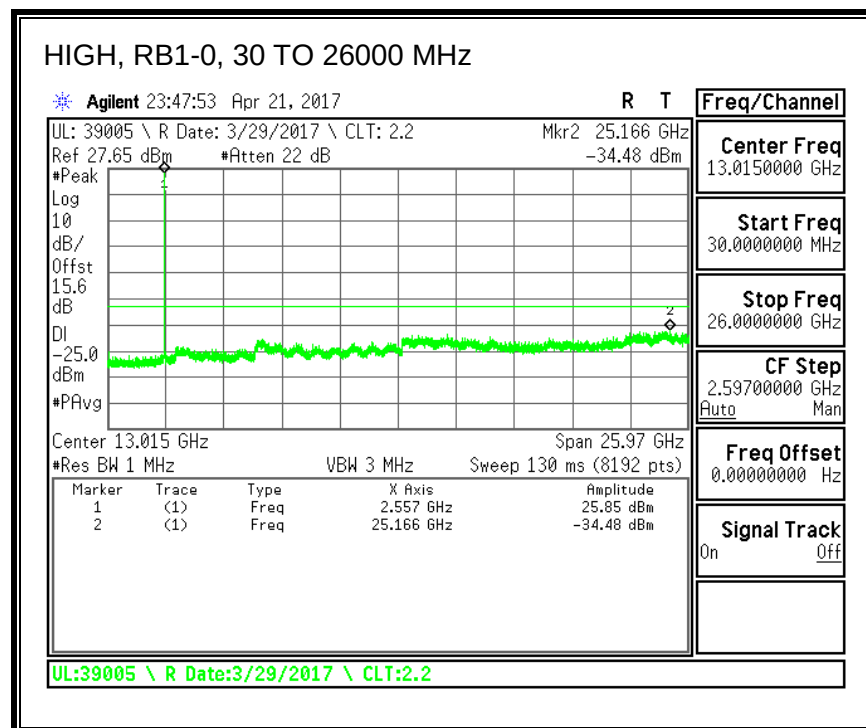
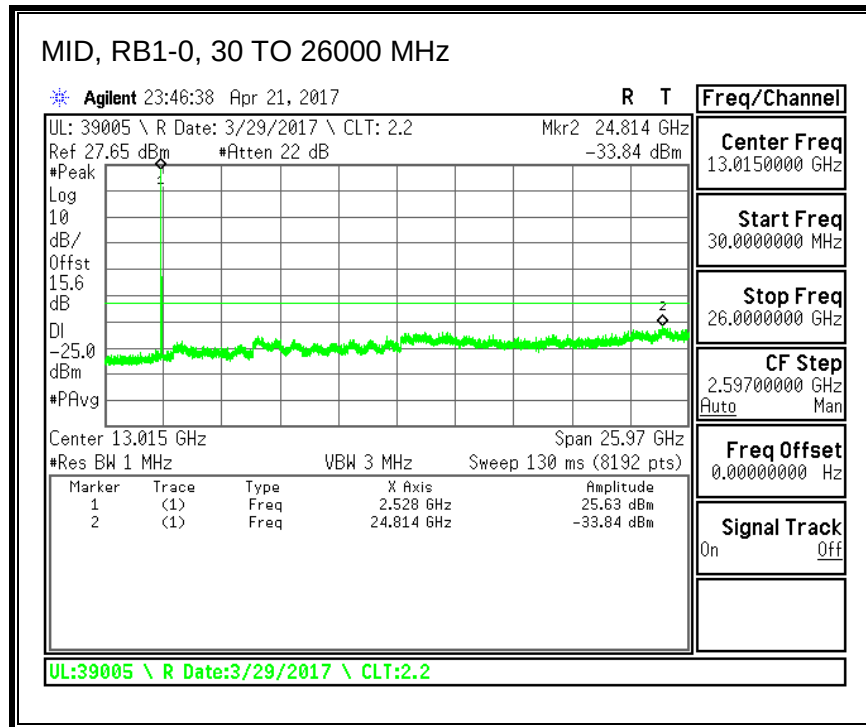
QPSK, (15.0 MHz BAND WIDTH)



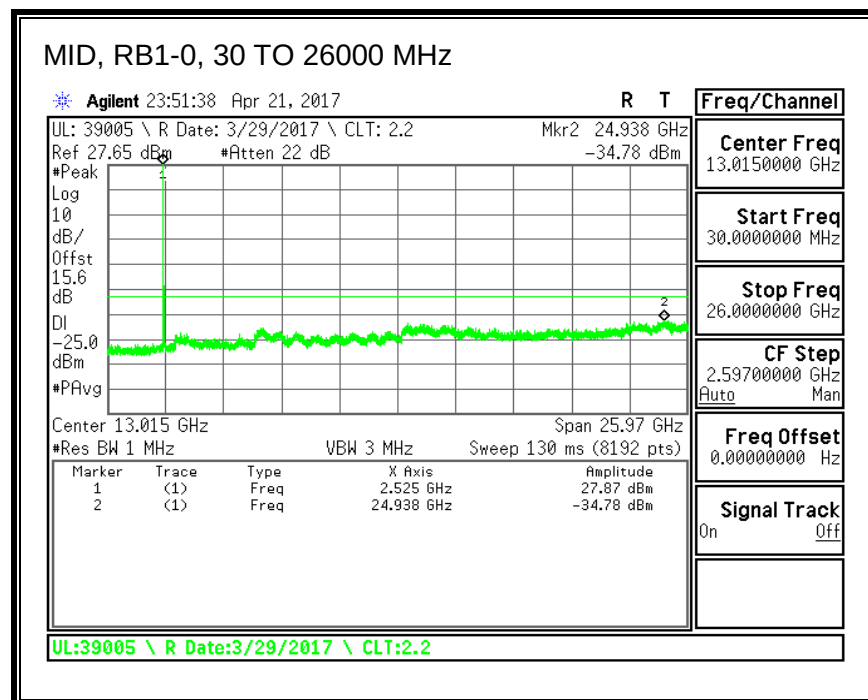
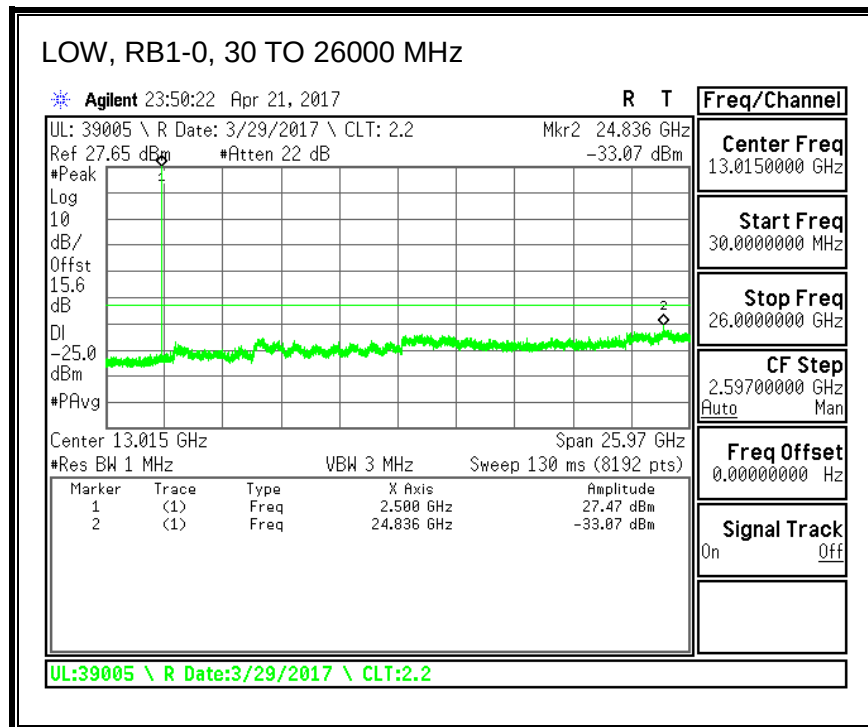


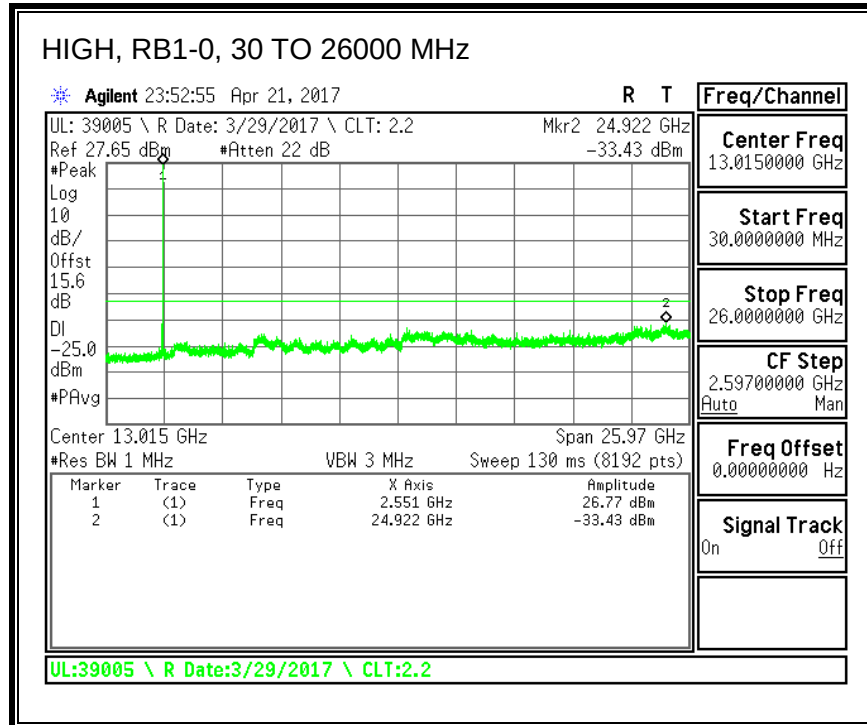
16QAM, (15.0 MHz BAND WIDTH)



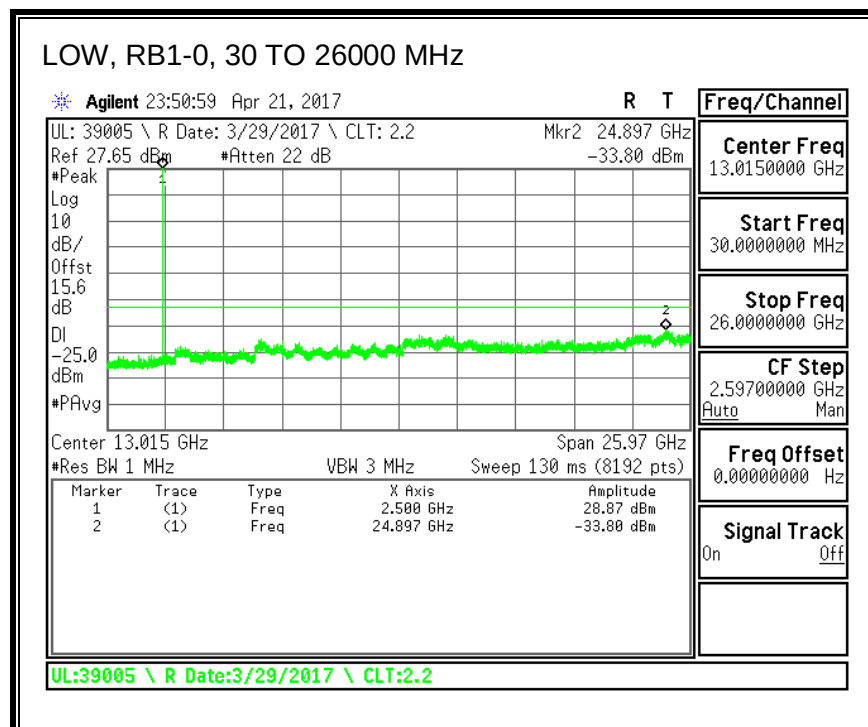


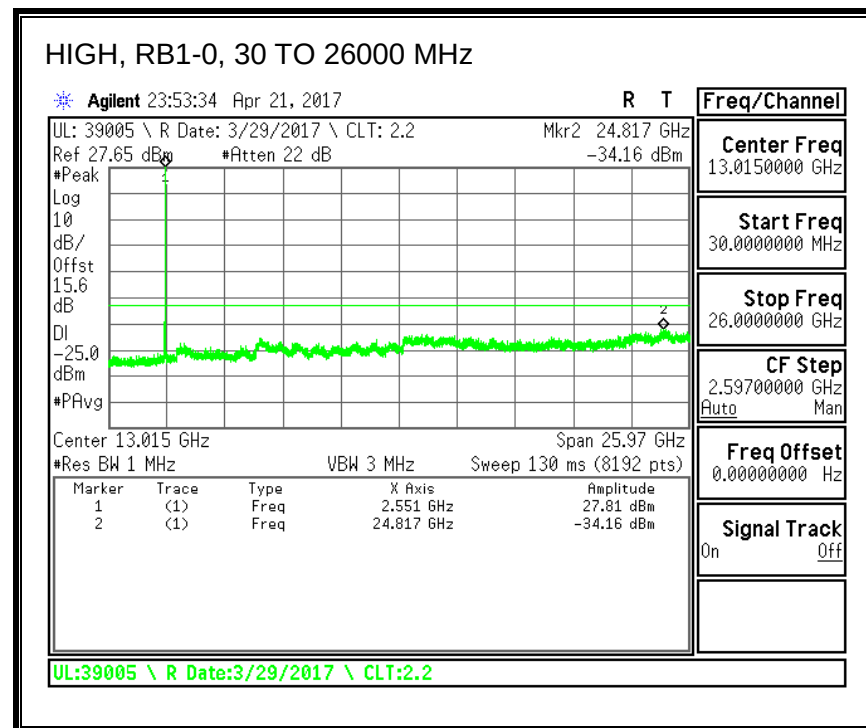
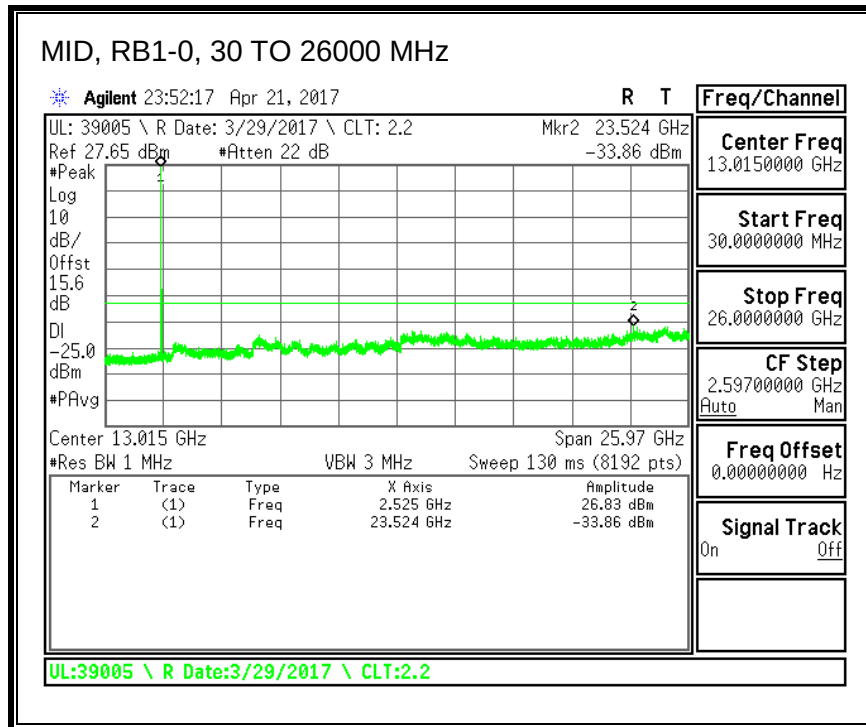
QPSK, (20.0 MHz BAND WIDTH)





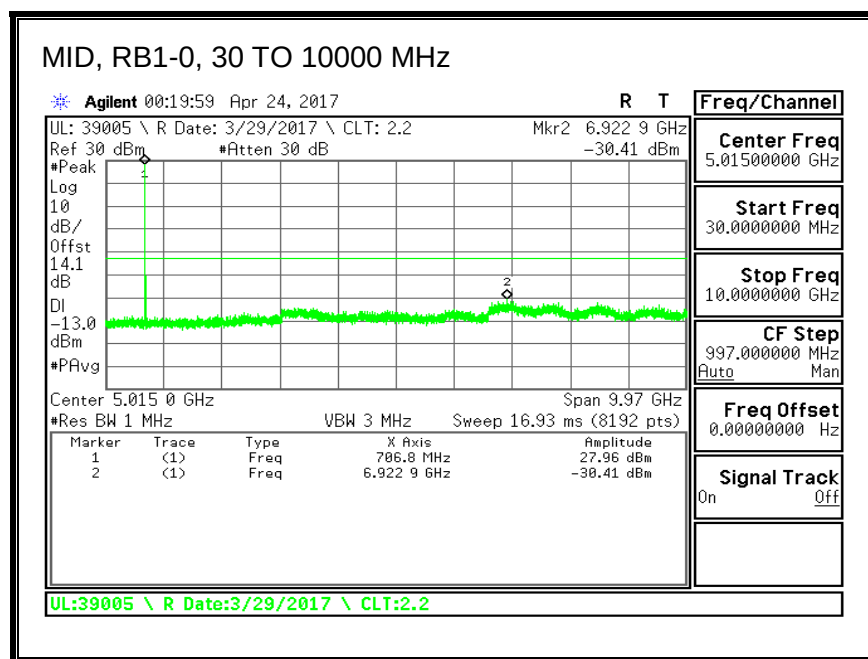
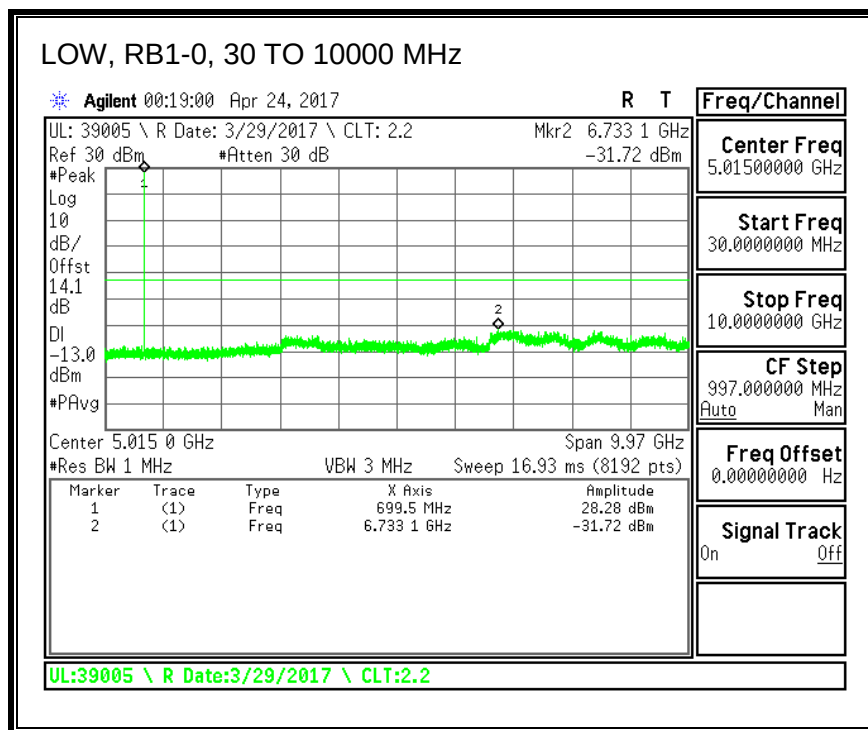
16QAM, (20.0 MHz BAND WIDTH)

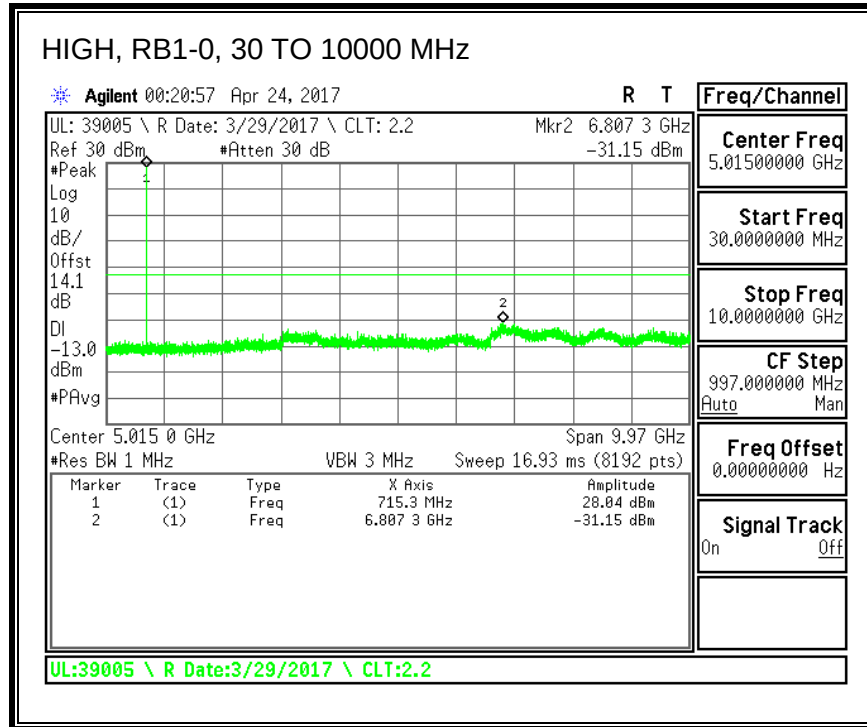




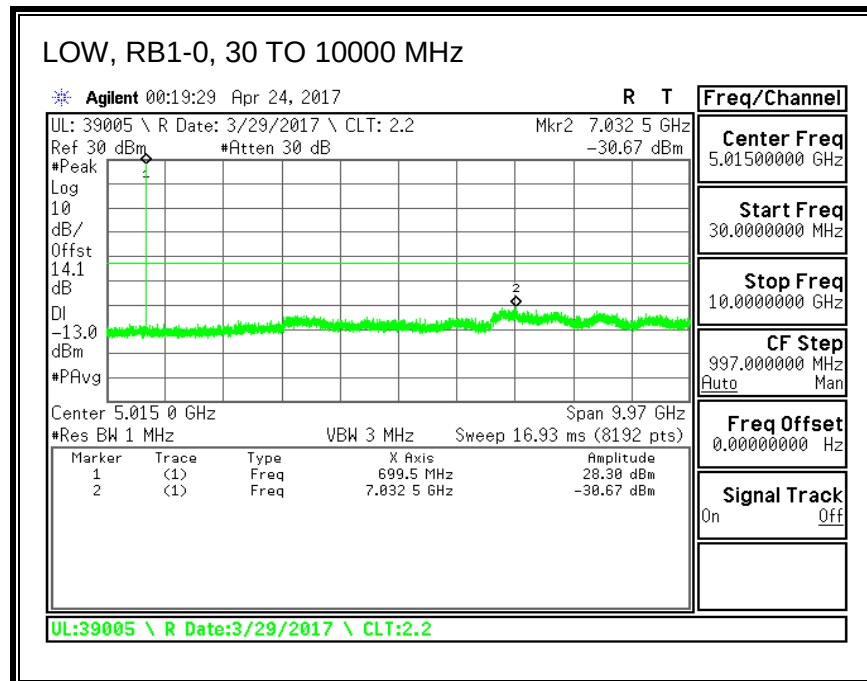
8.3.5. LTE BAND 12

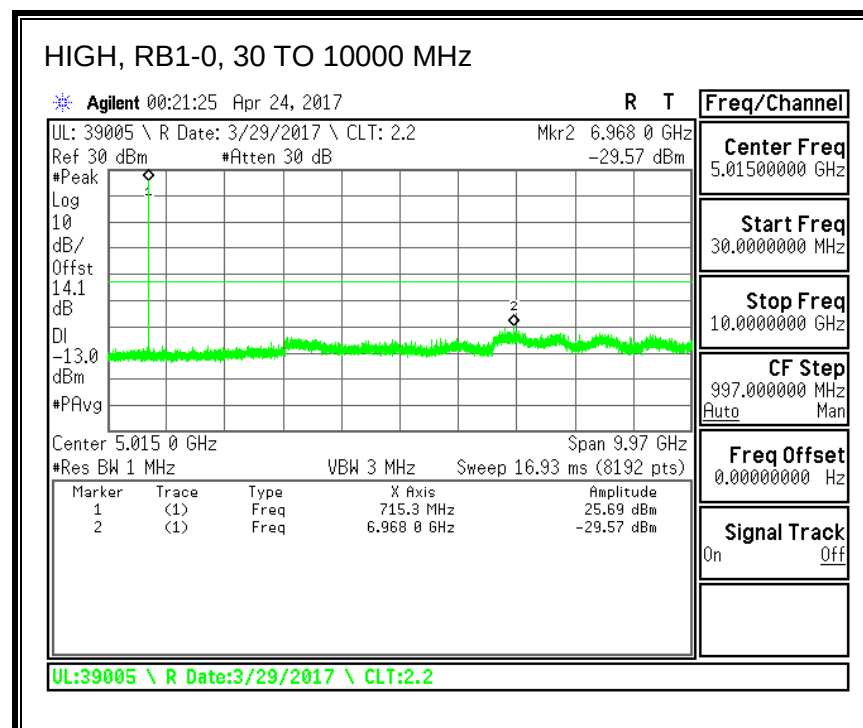
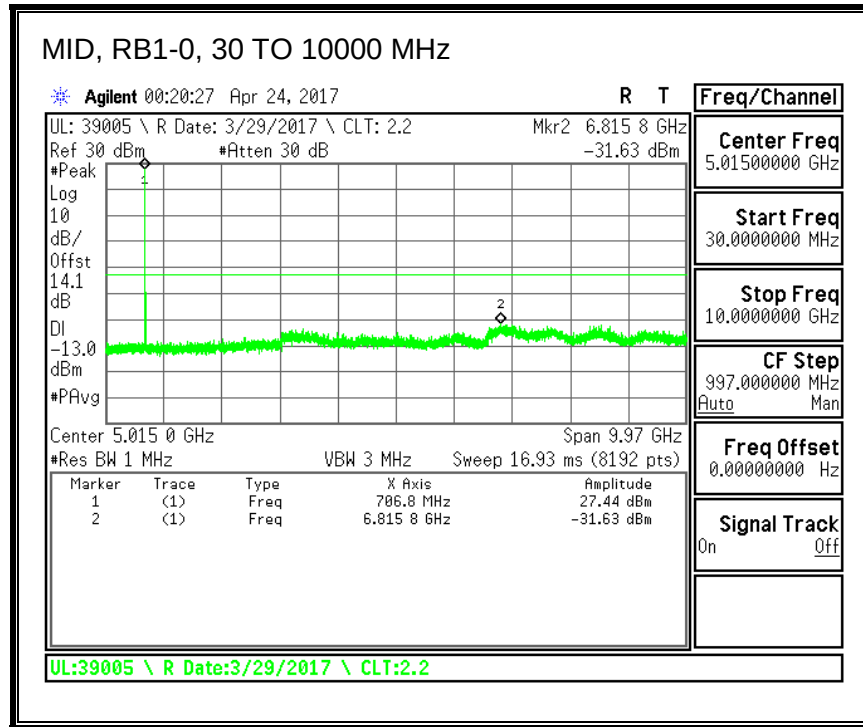
QPSK, (1.4 MHz BAND WIDTH)



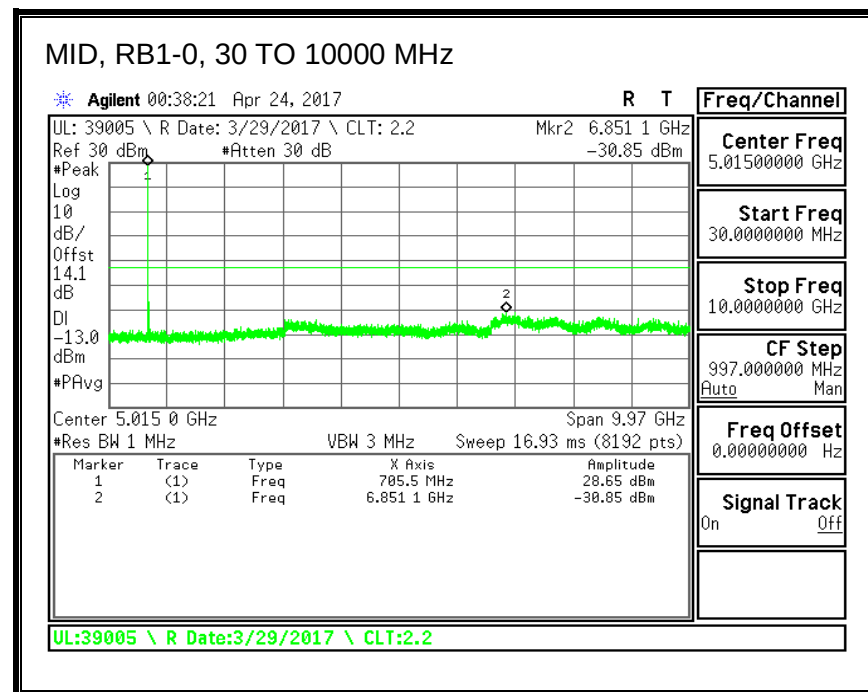
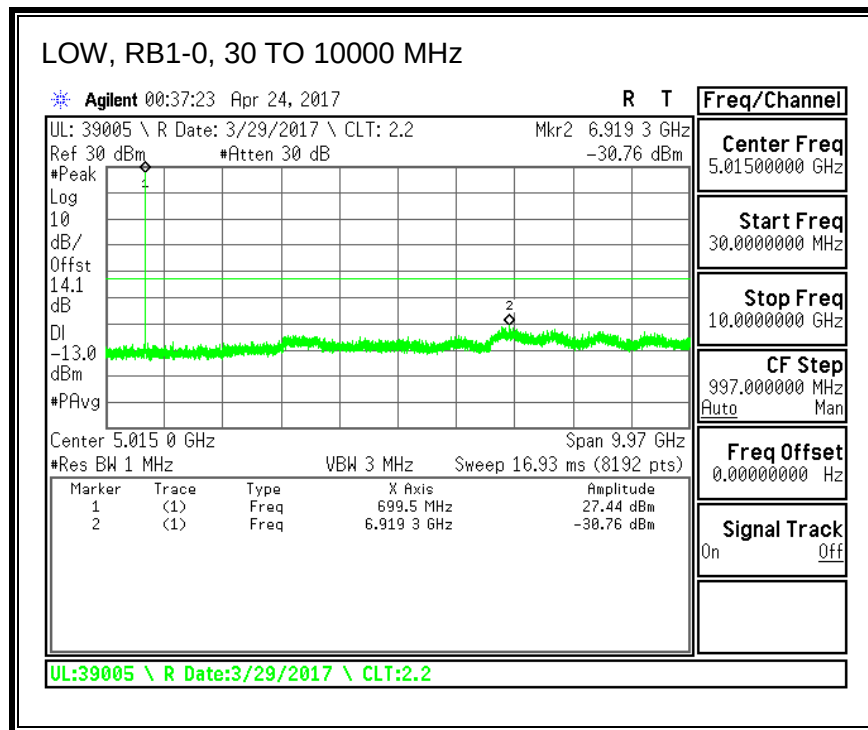


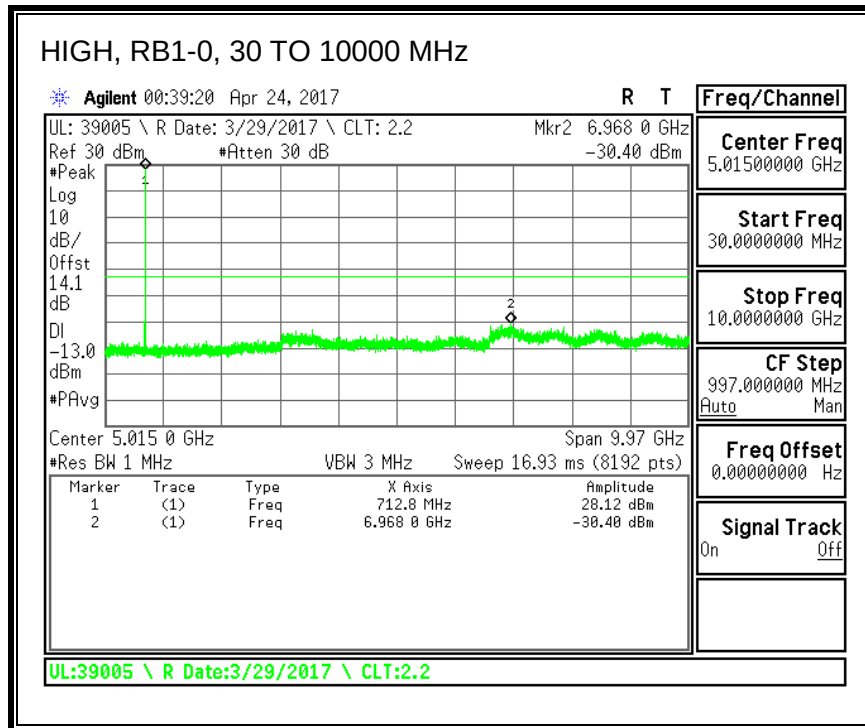
16QAM, (1.4 MHz BAND WIDTH)



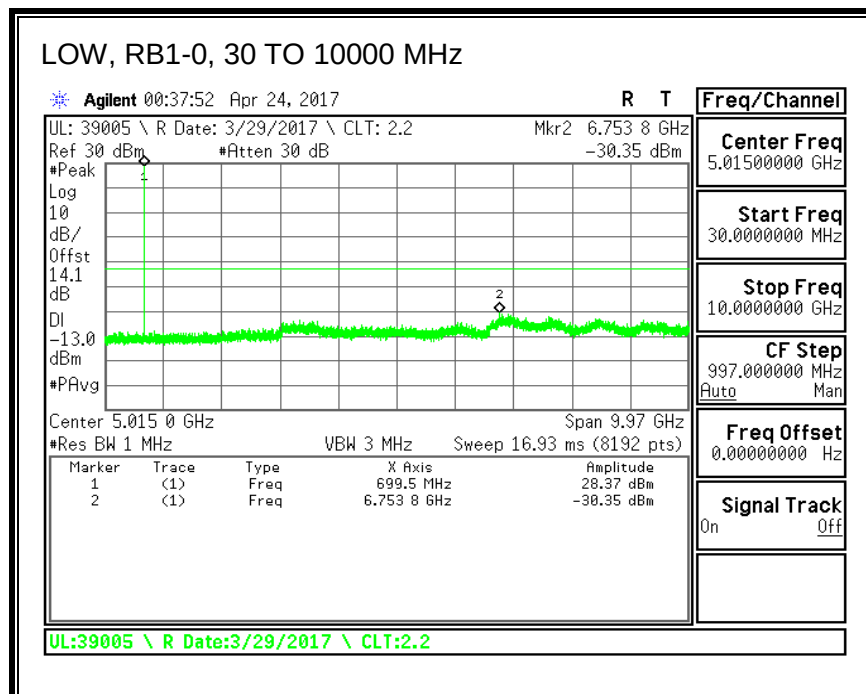


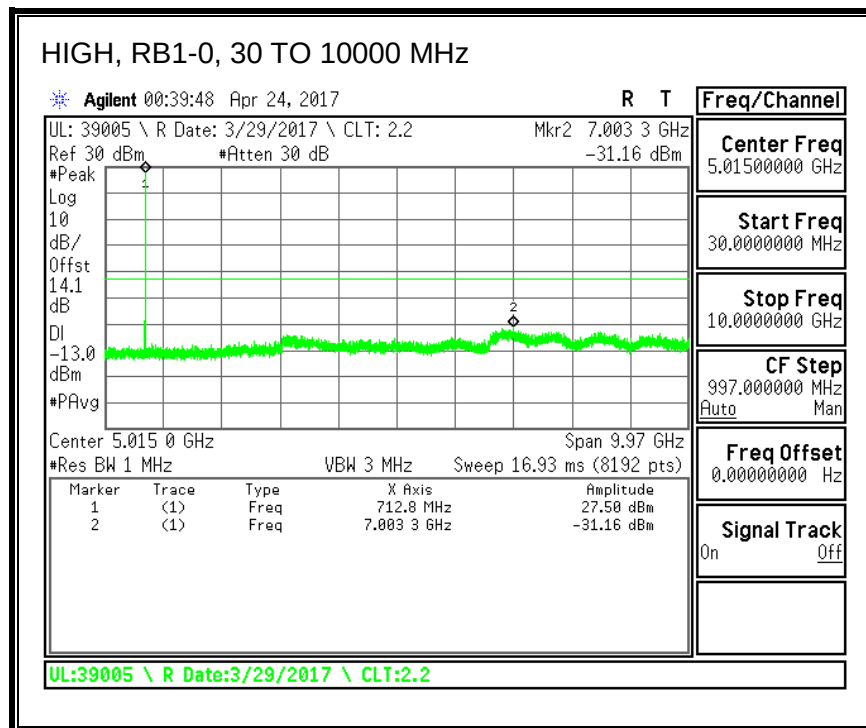
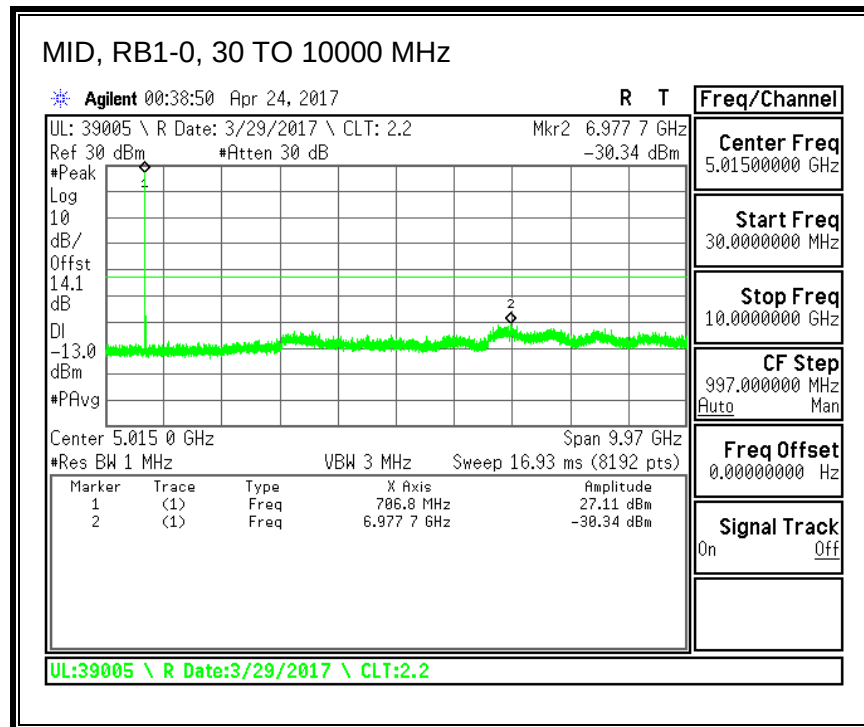
QPSK, (3.0 MHz BAND WIDTH)



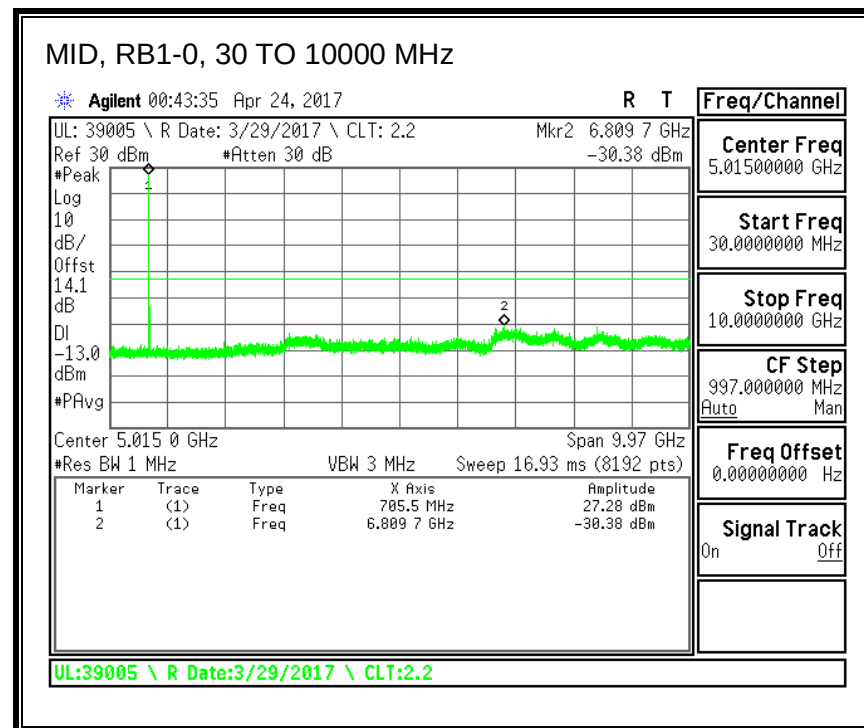
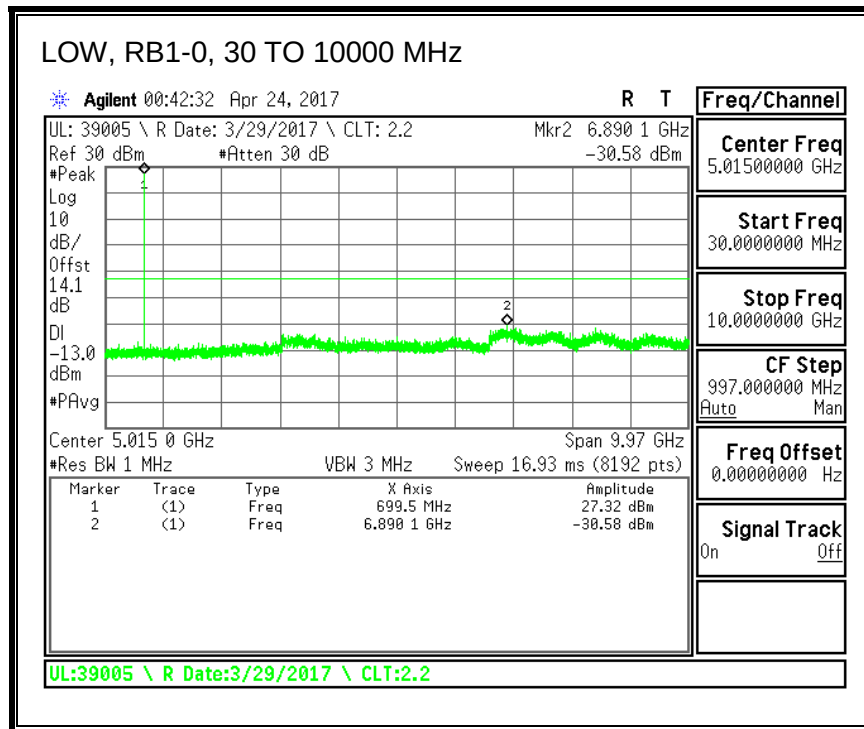


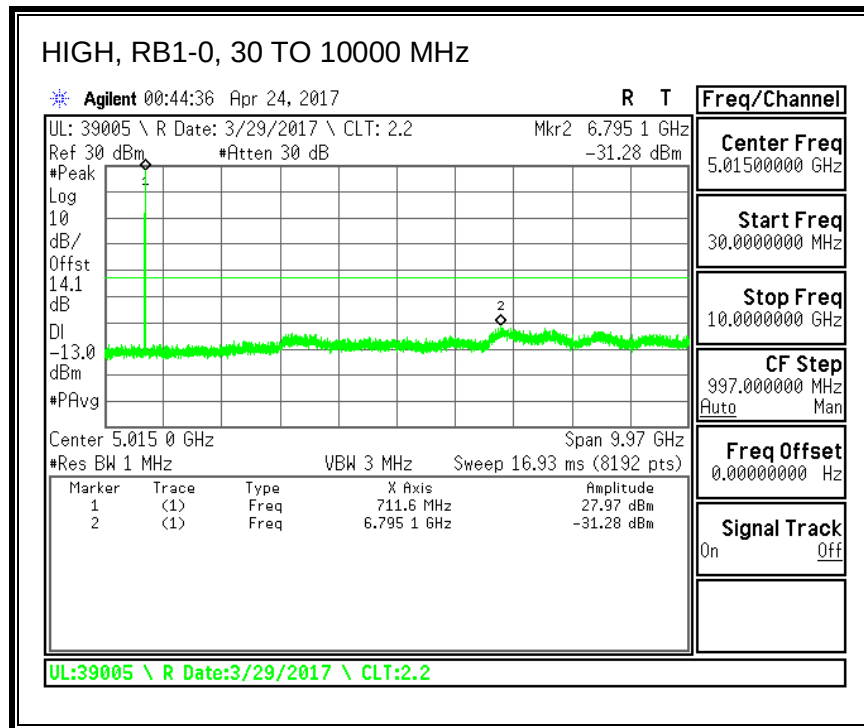
16QAM, (3.0 MHz BAND WIDTH)



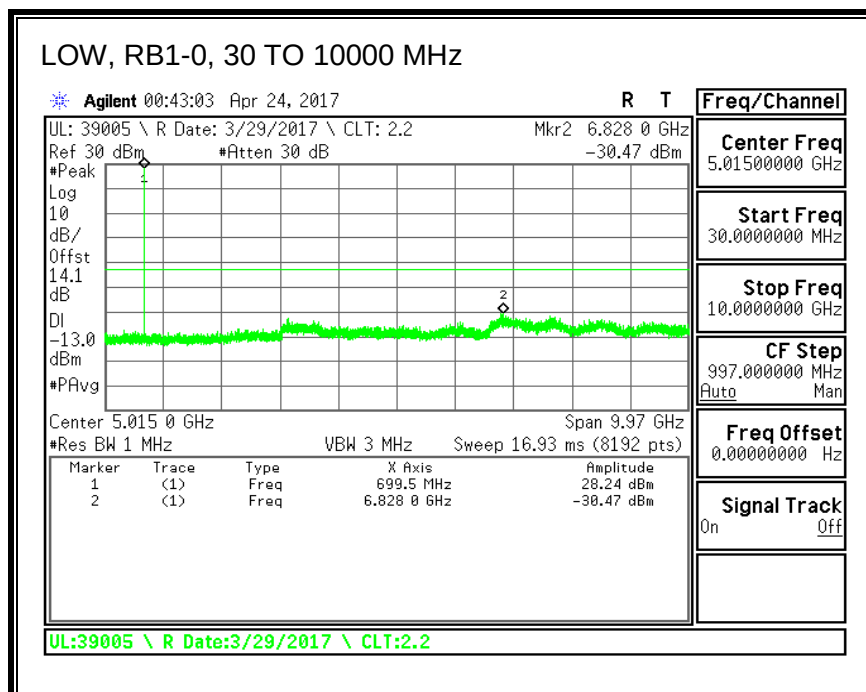


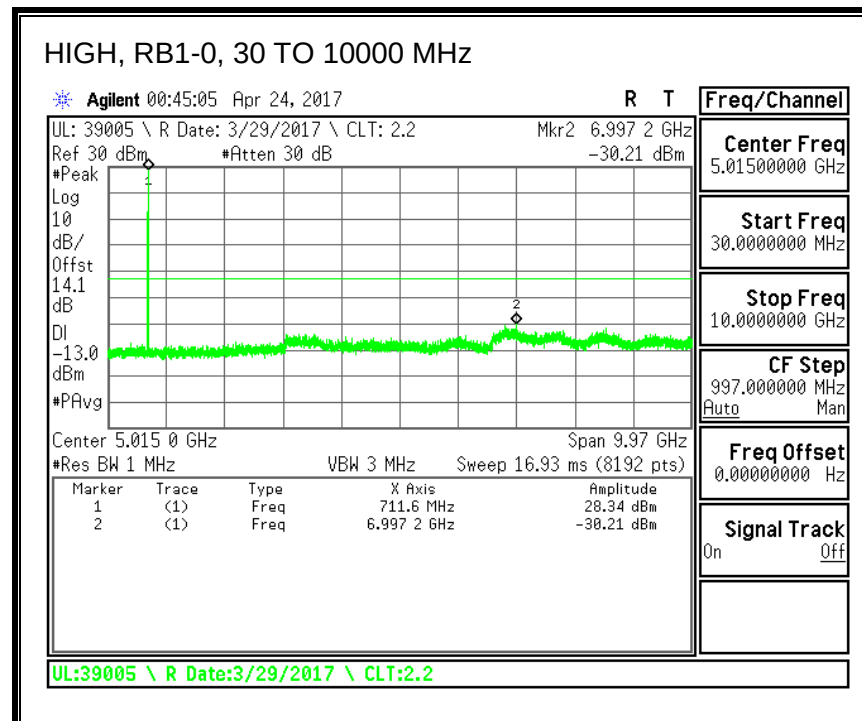
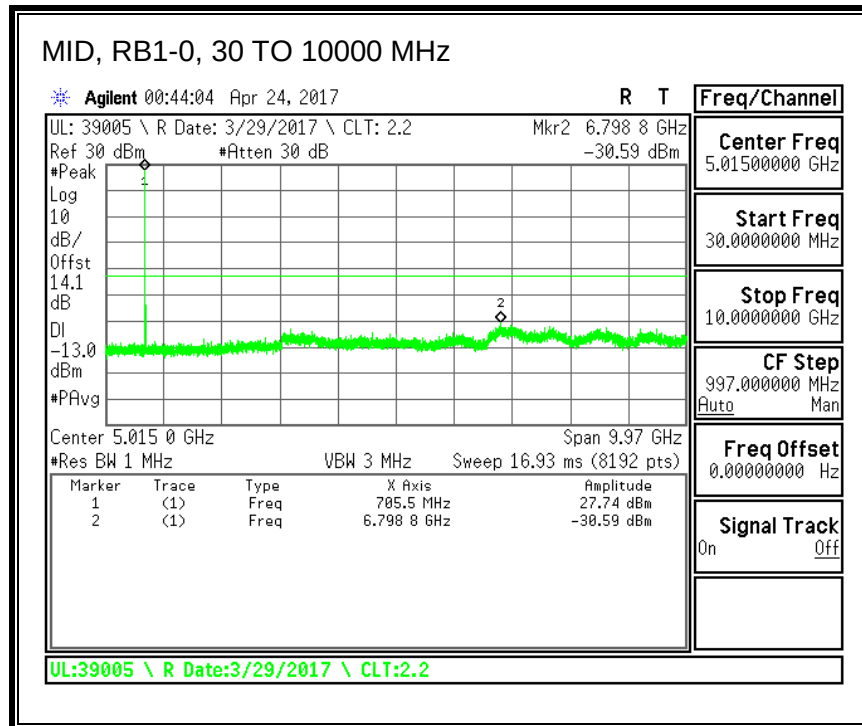
QPSK, (5.0 MHz BAND WIDTH)



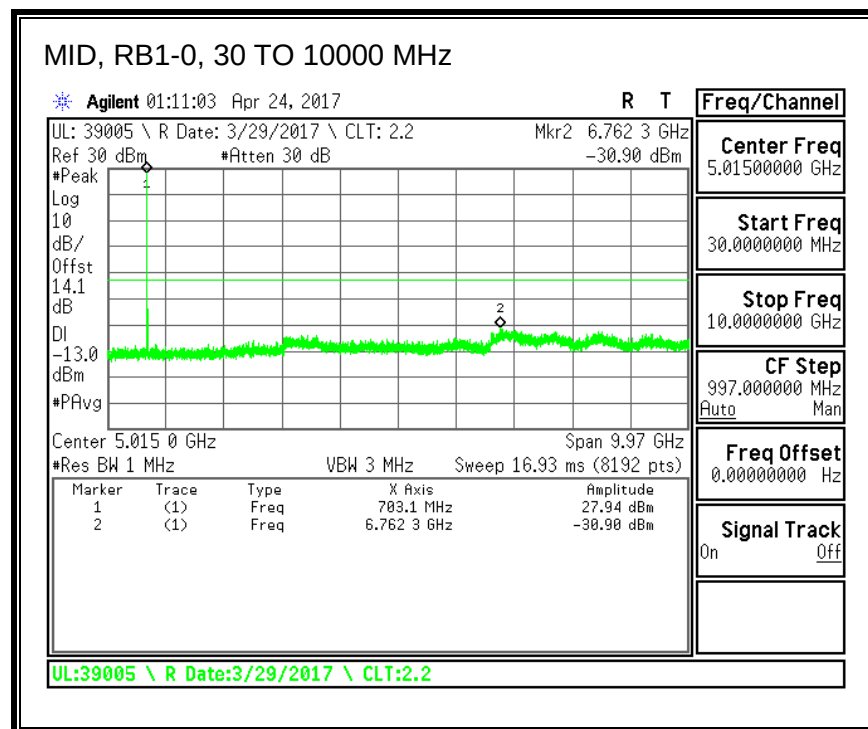
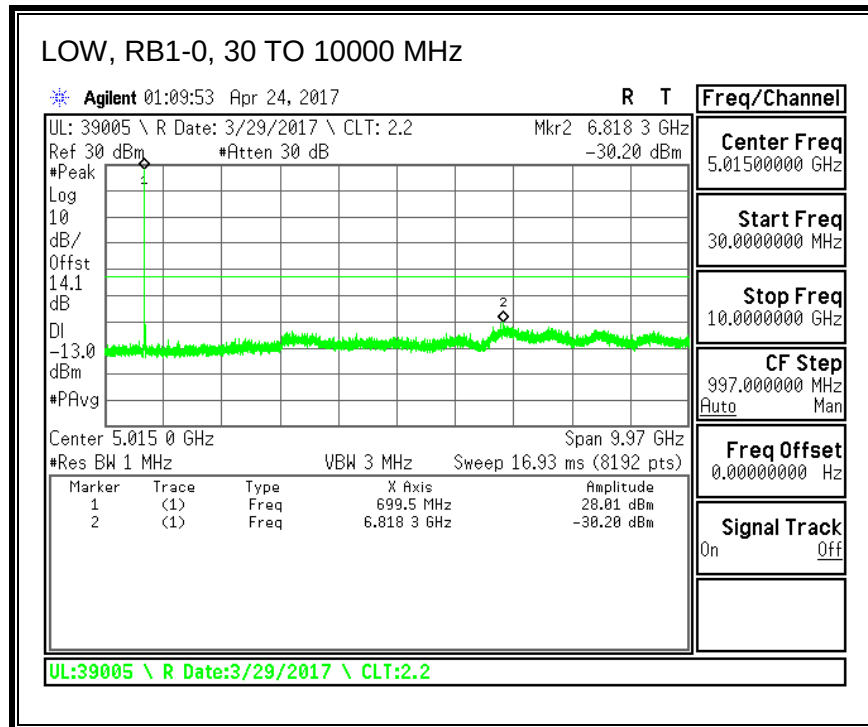


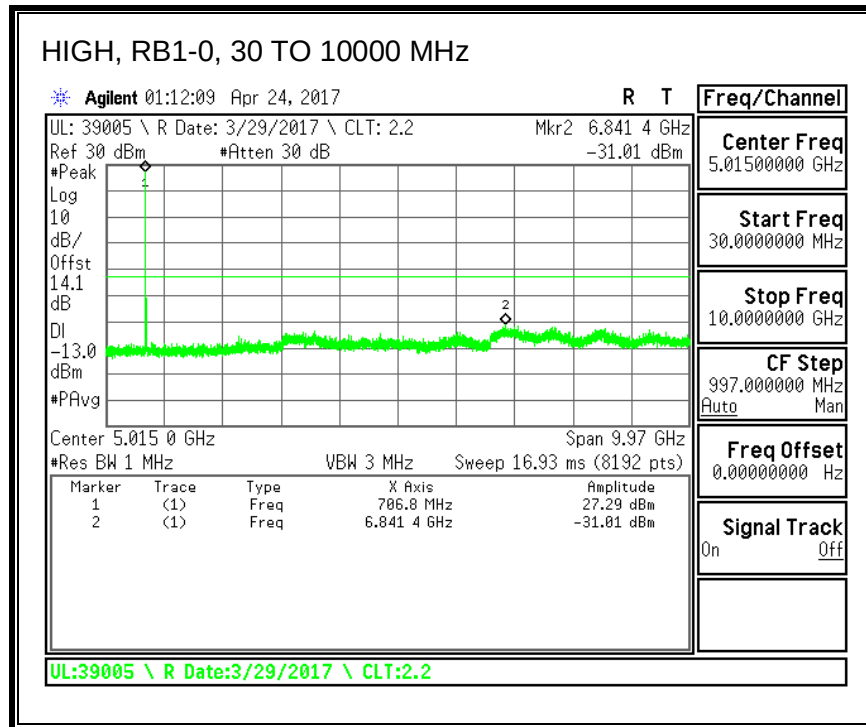
16QAM, (5.0 MHz BAND WIDTH)



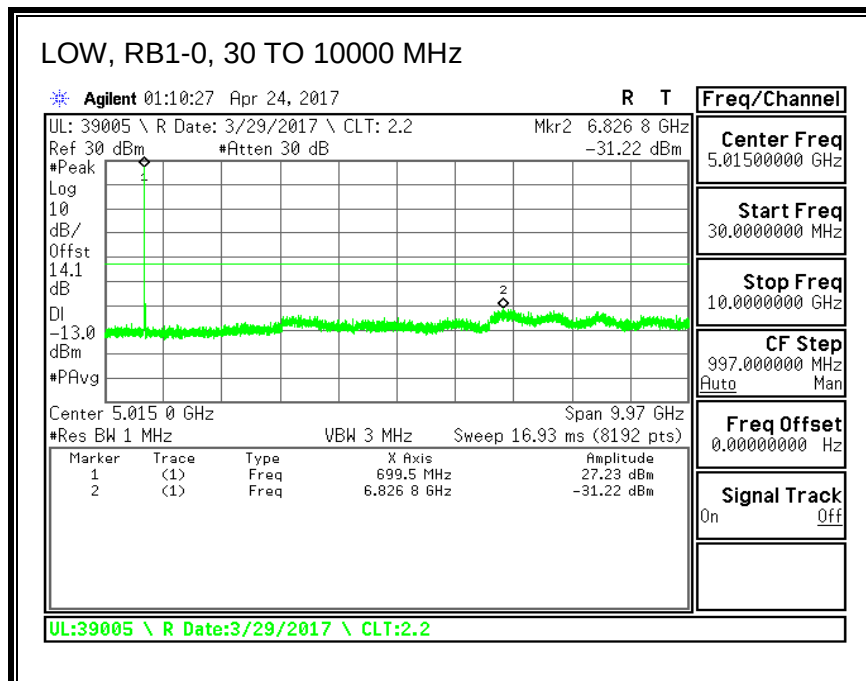


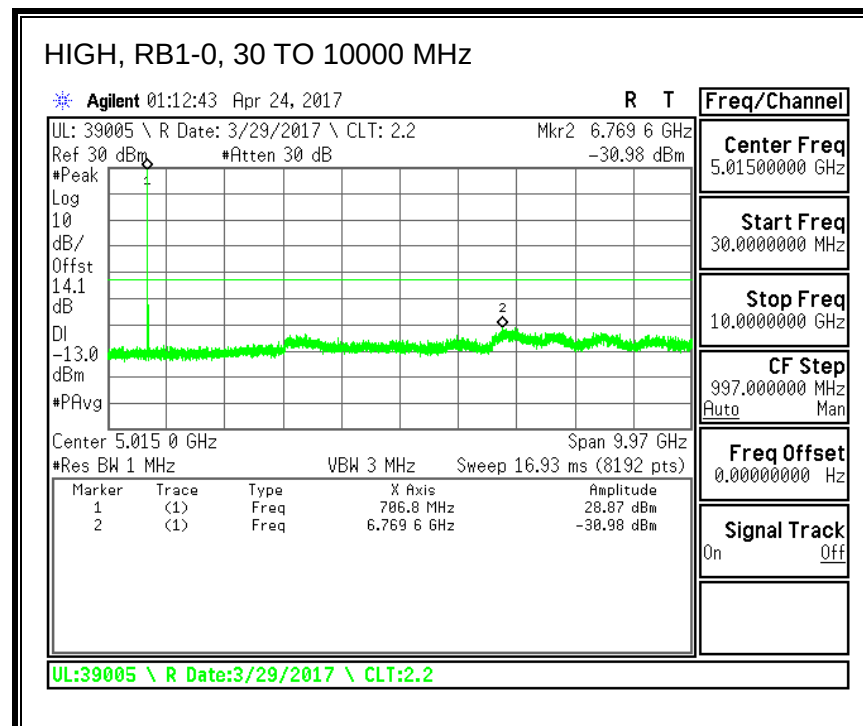
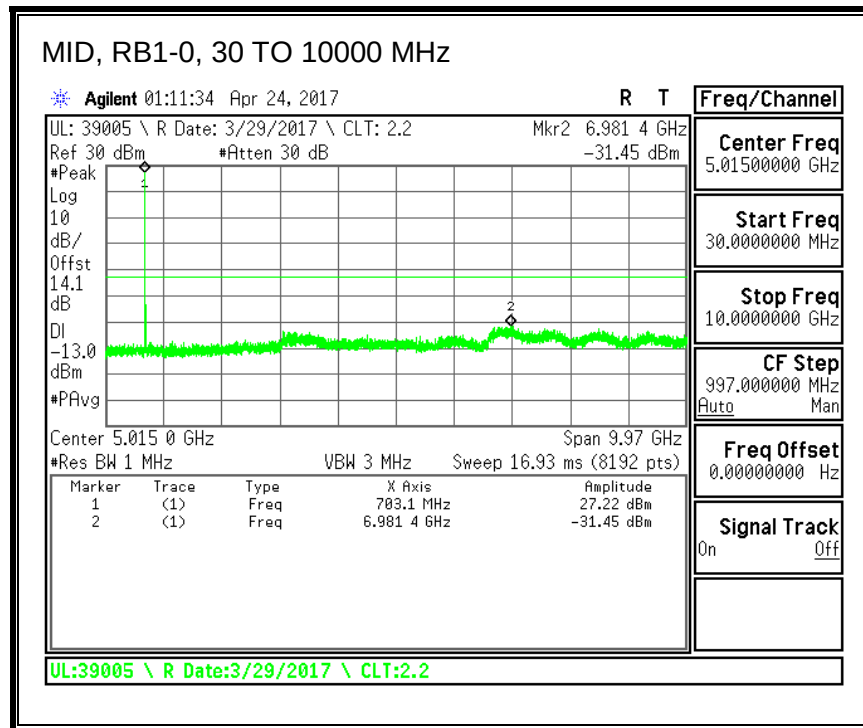
QPSK, (10.0 MHz BAND WIDTH)





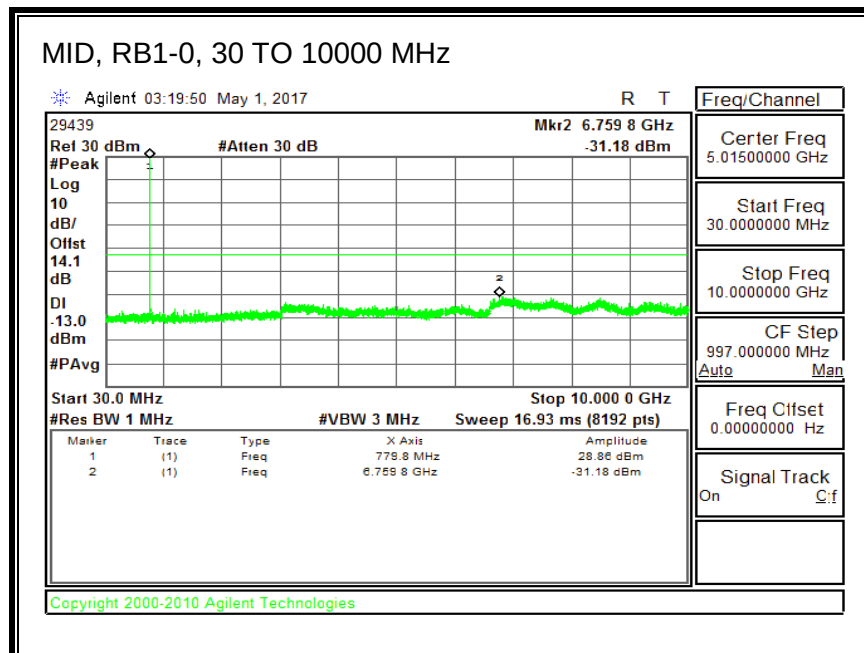
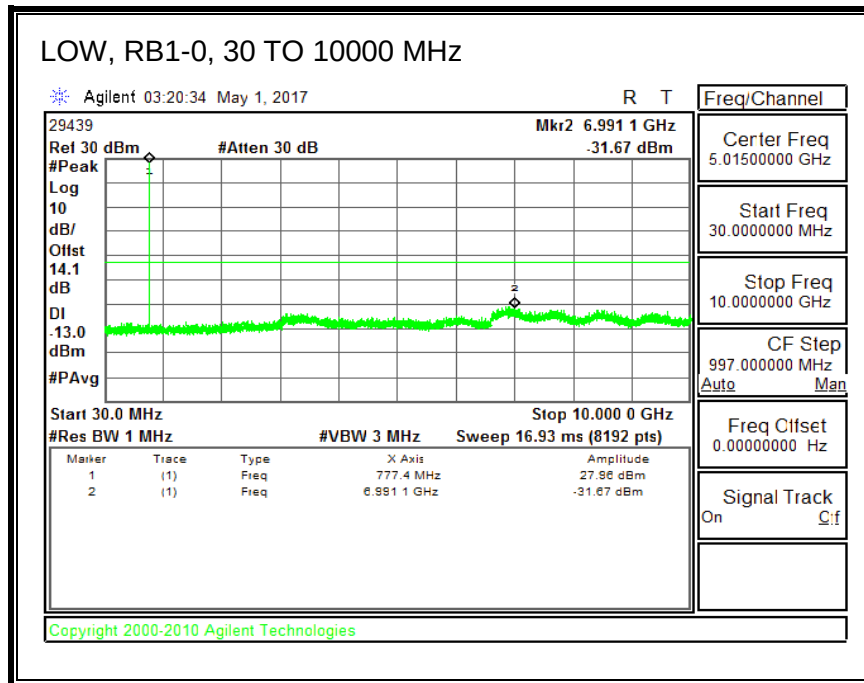
16QAM, (10.0 MHz BAND WIDTH)

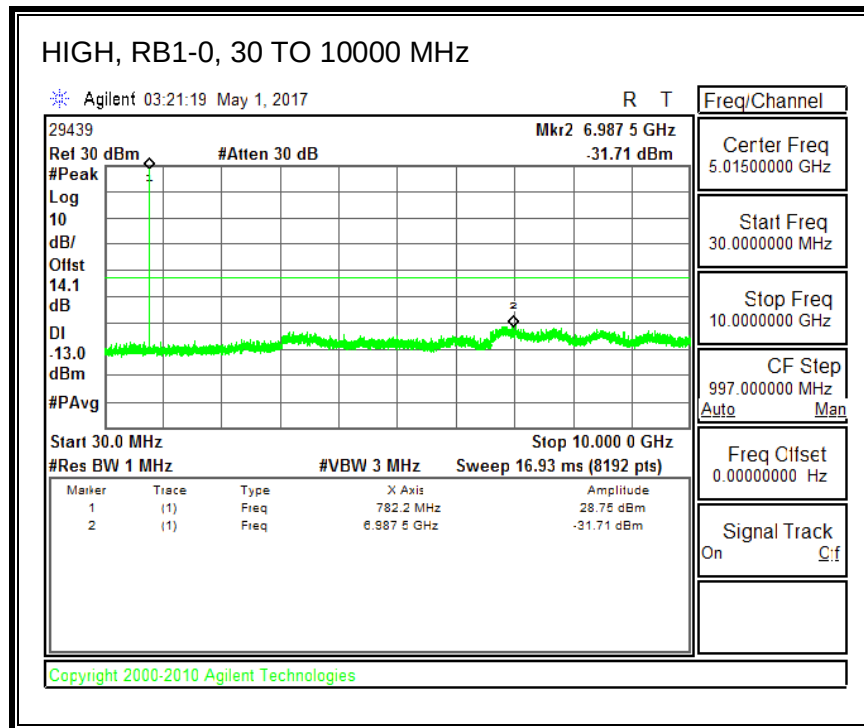




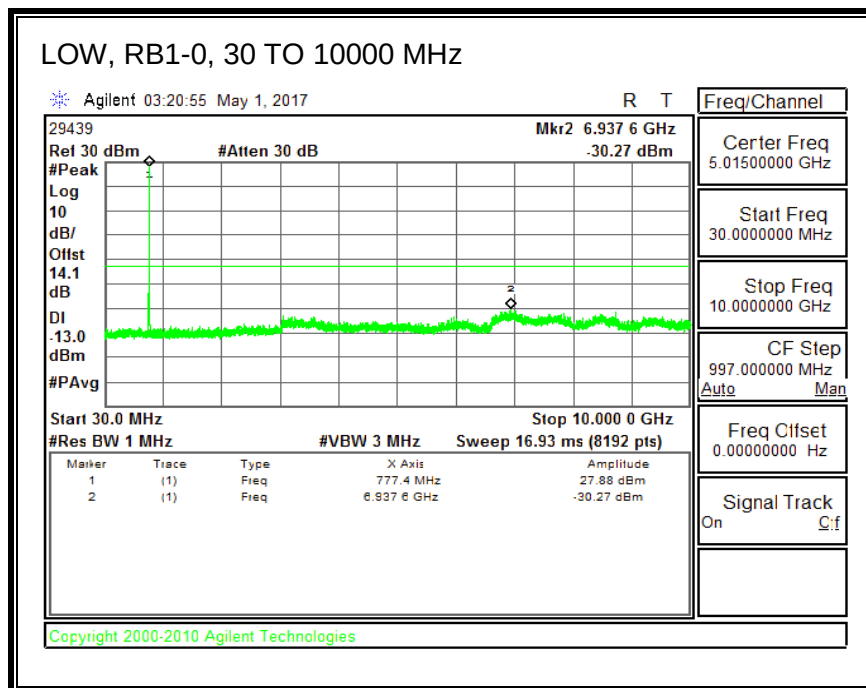
8.3.6. LTE BAND 13

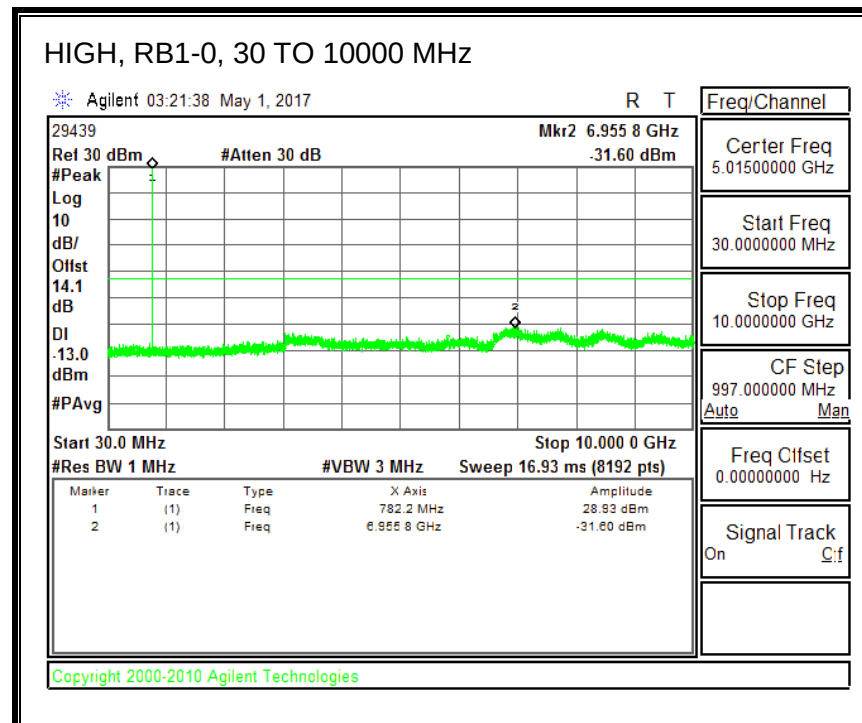
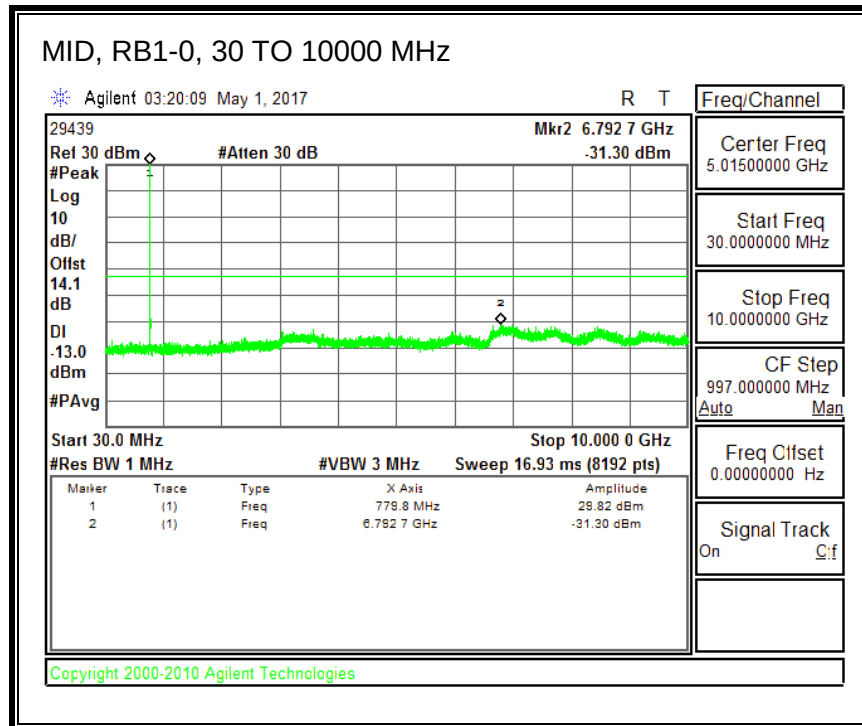
QPSK, (5.0 MHz BAND WIDTH)



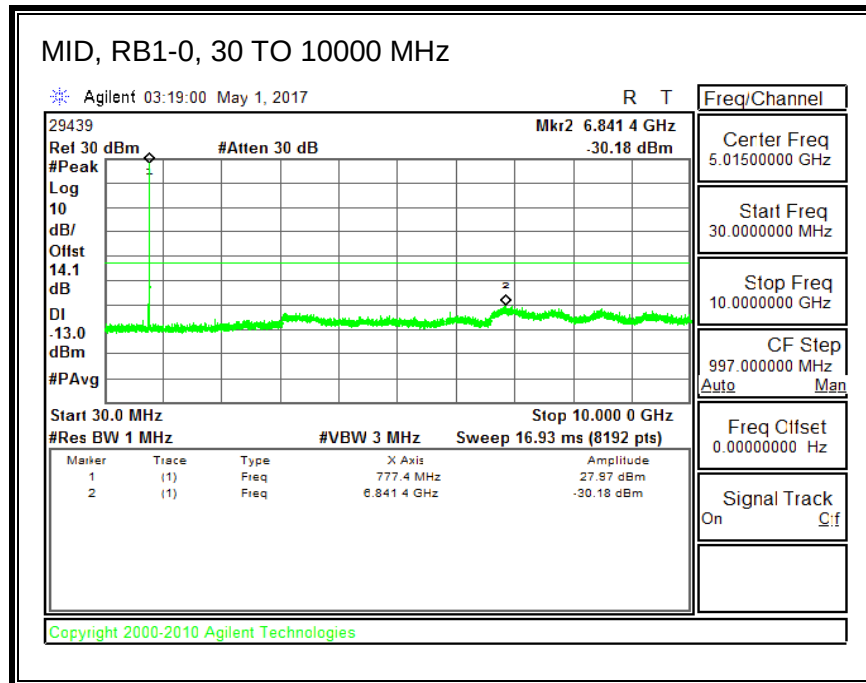


16QAM, (5.0 MHz BAND WIDTH)

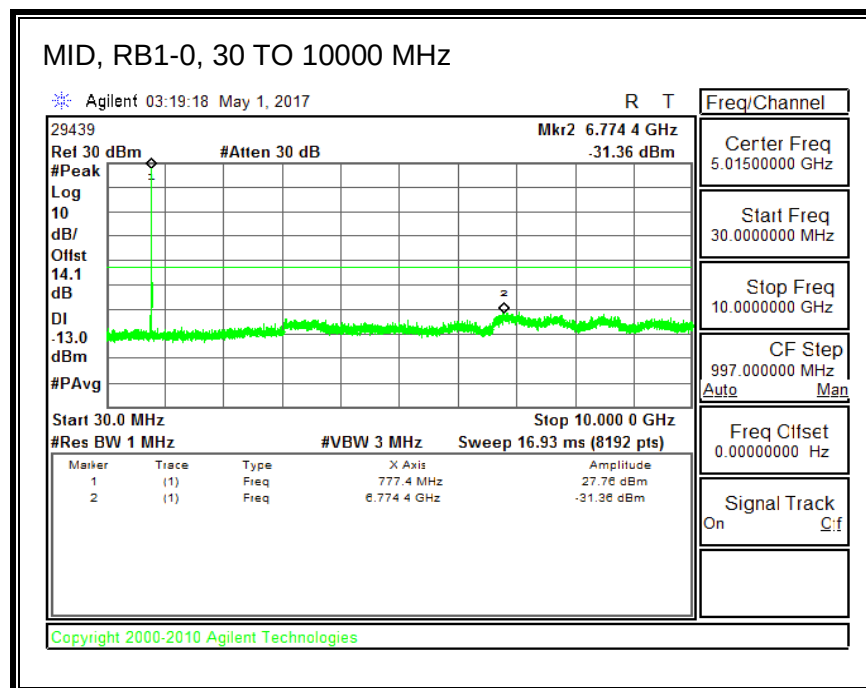




QPSK, (10.0 MHz BAND WIDTH)

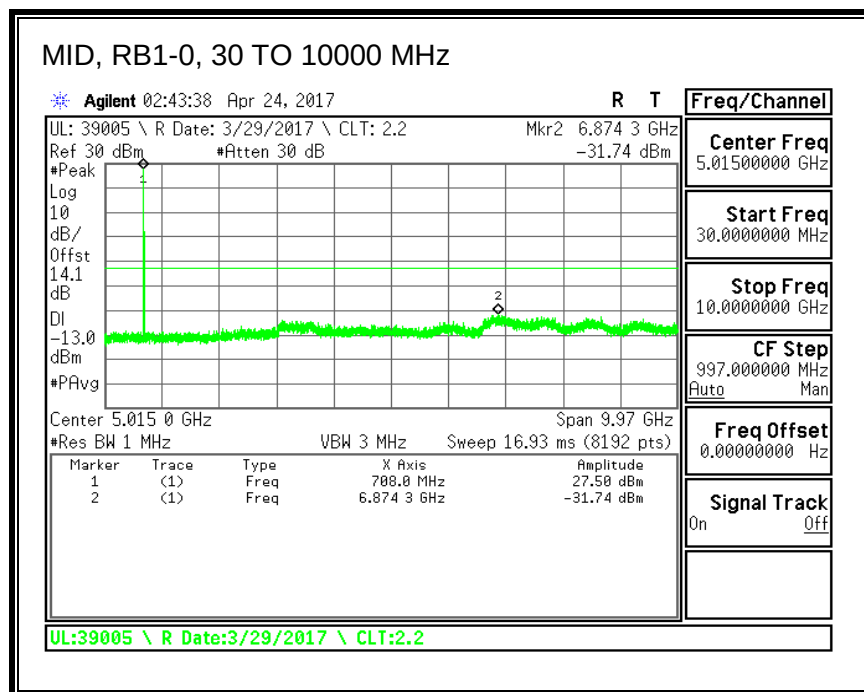
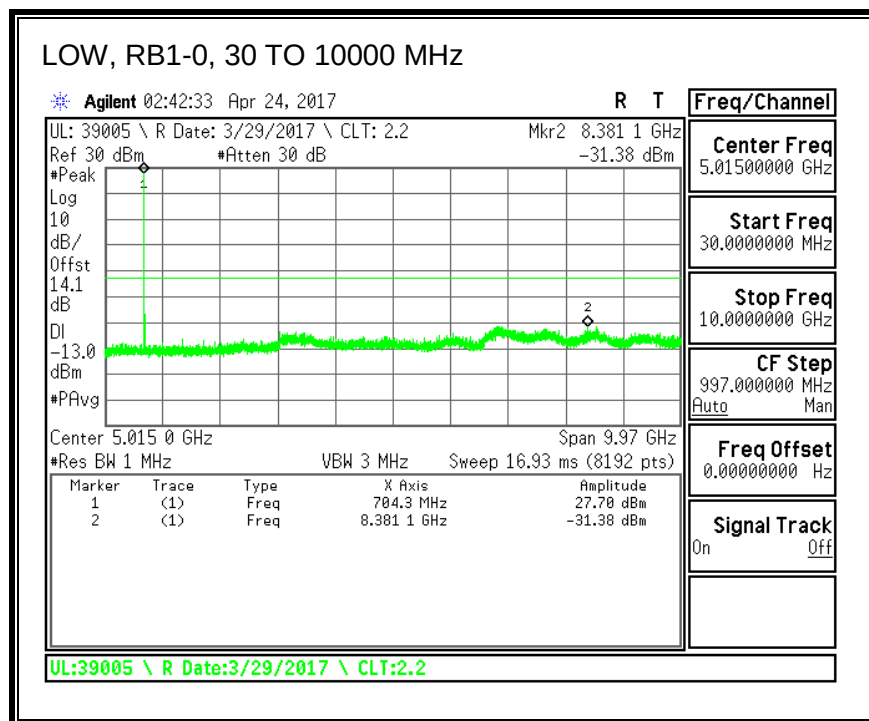


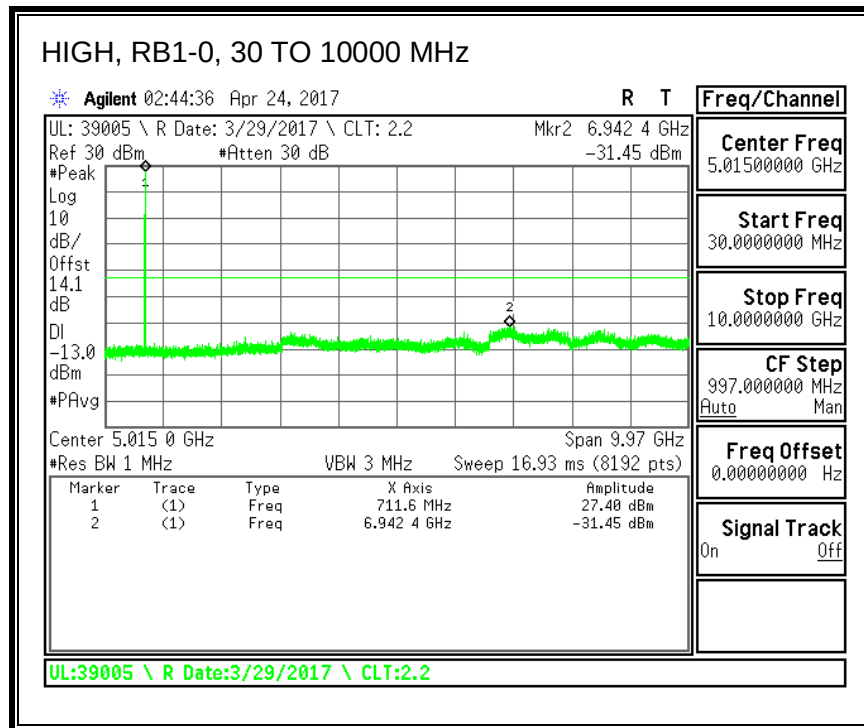
16QAM, (10.0 MHz BAND WIDTH)



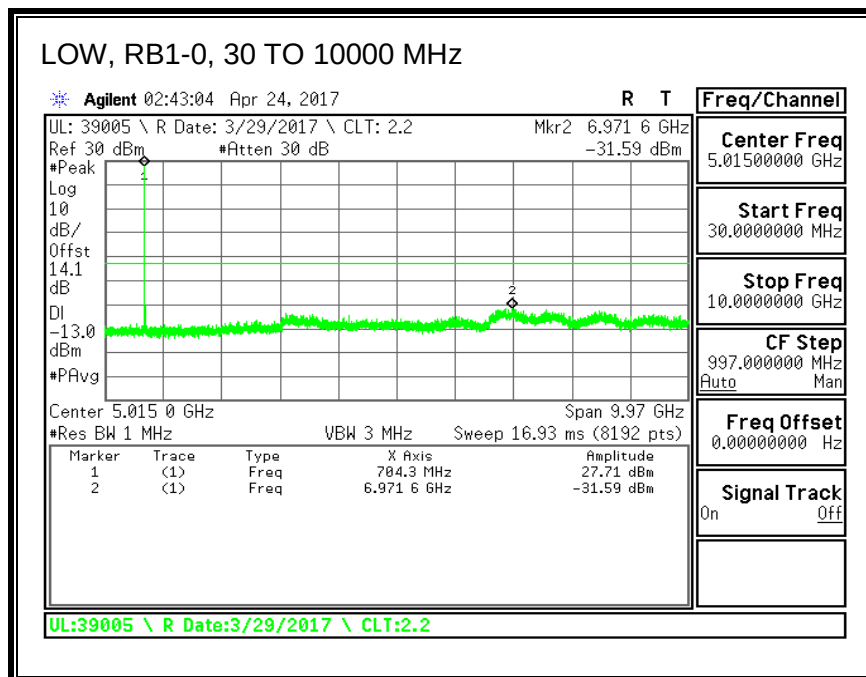
8.3.7. LTE BAND 17

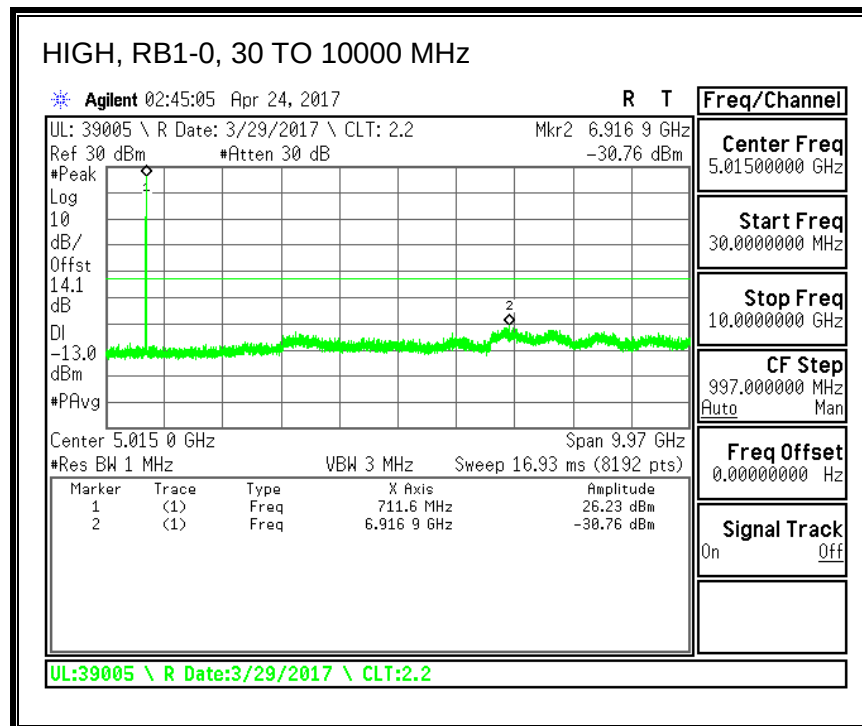
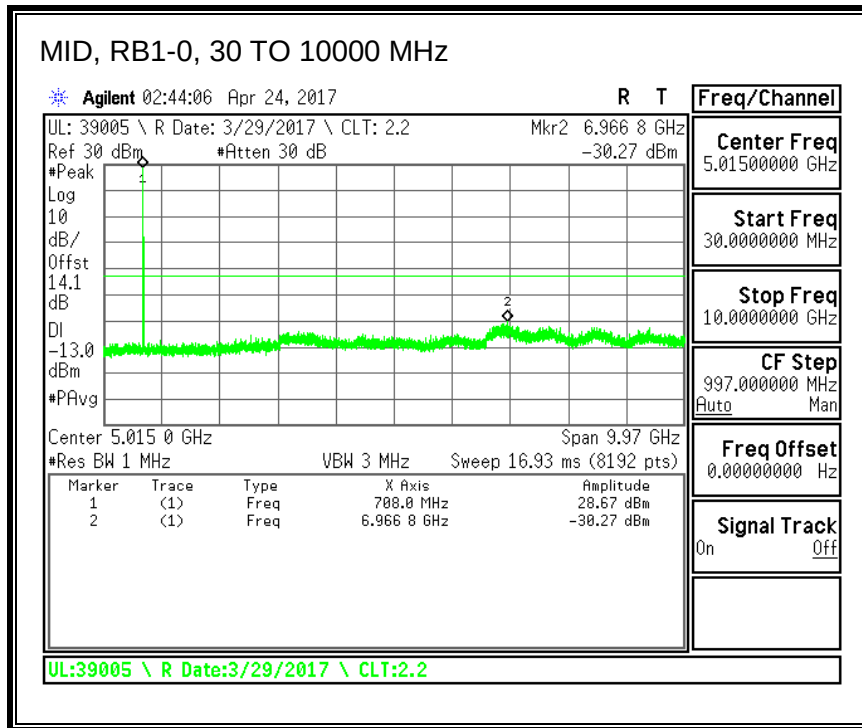
QPSK, (5.0 MHz BAND WIDTH)



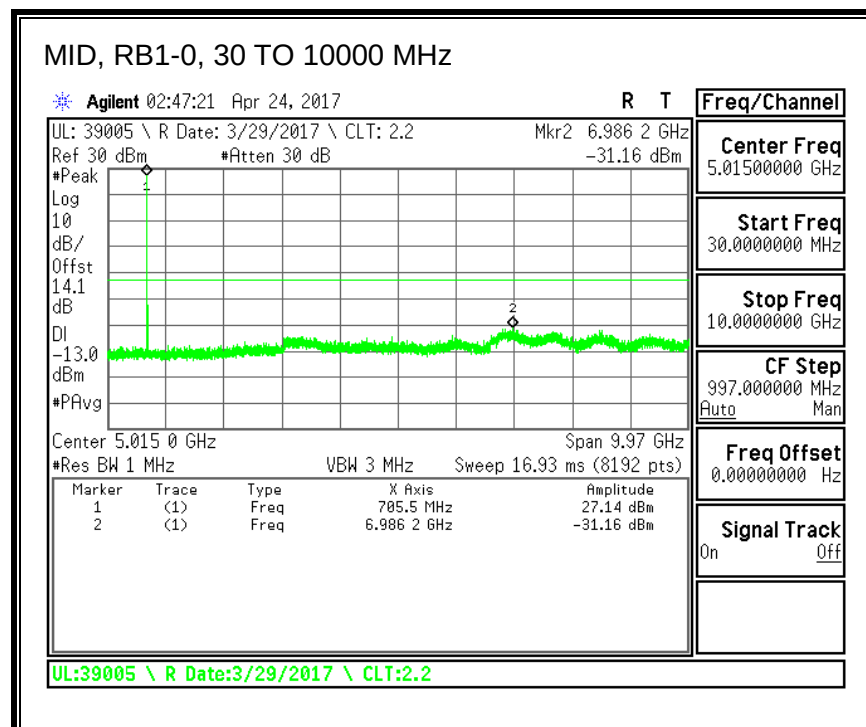
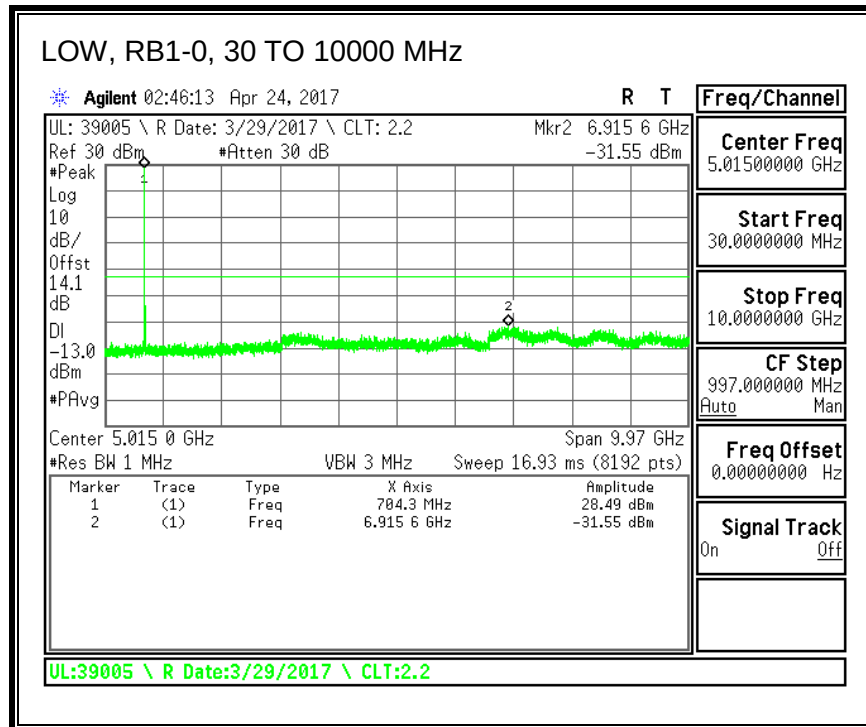


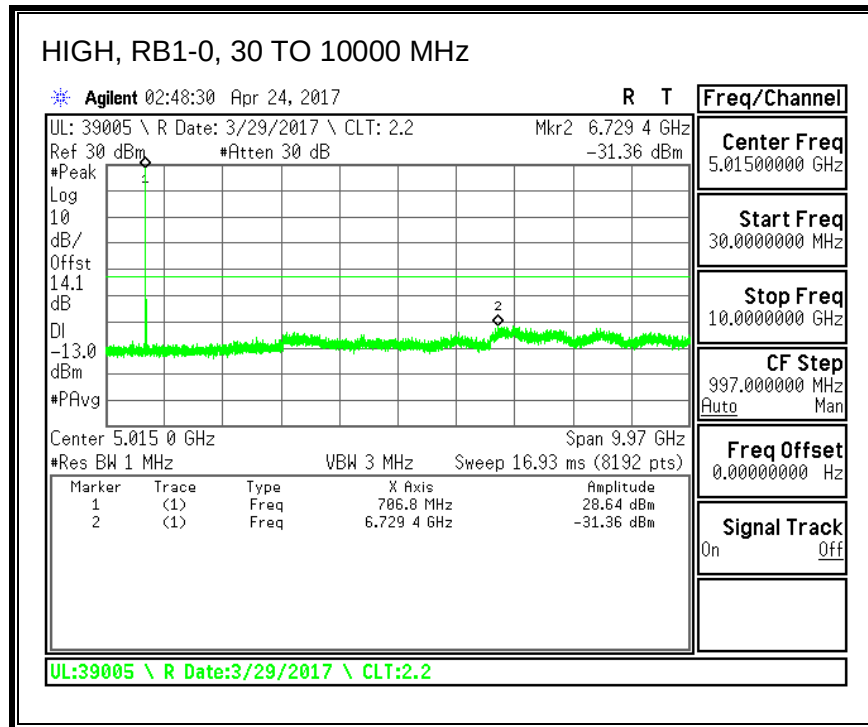
16QAM, (5.0 MHz BAND WIDTH)



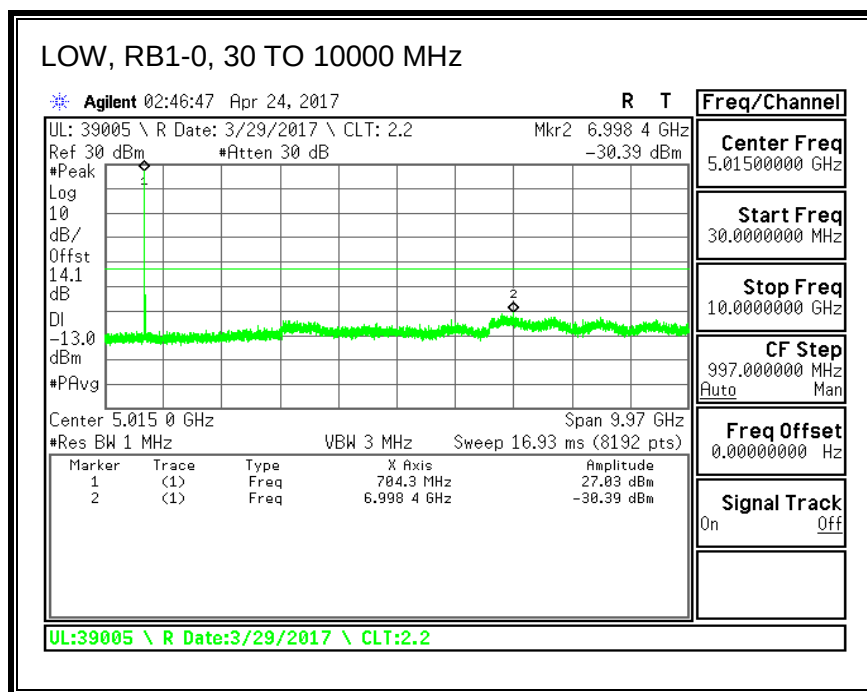


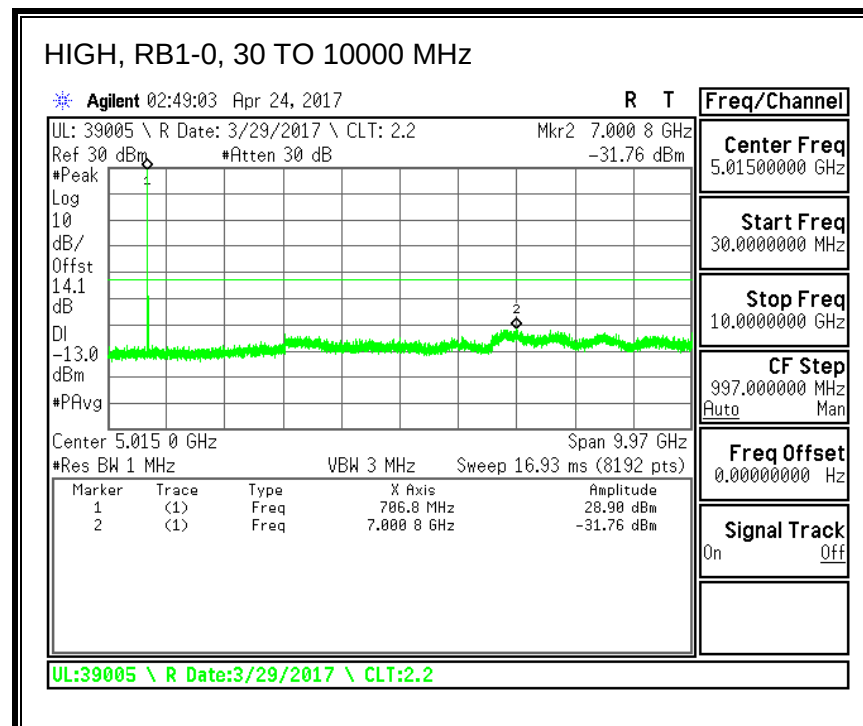
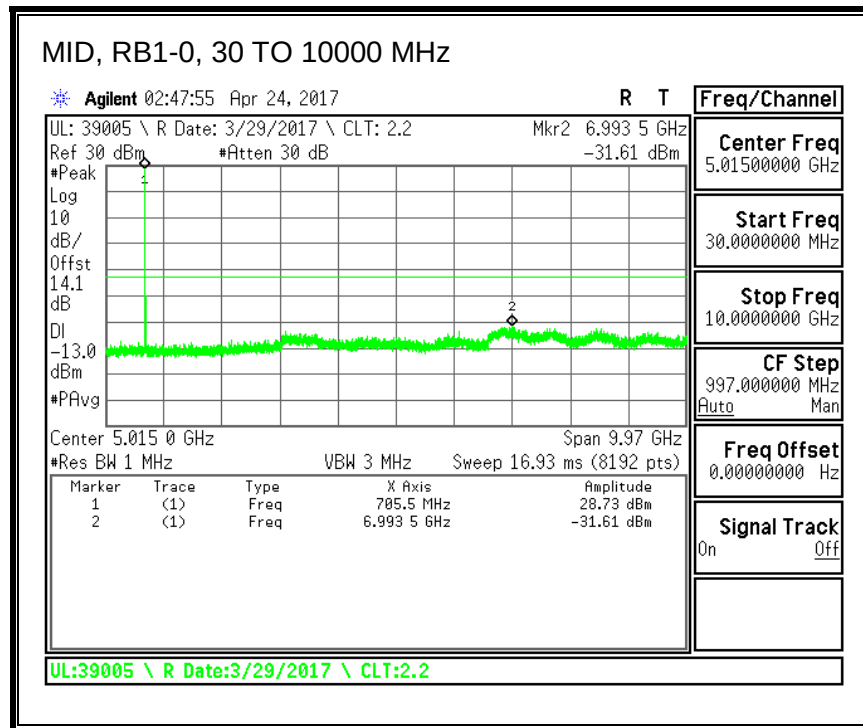
QPSK, (10.0 MHz BAND WIDTH)





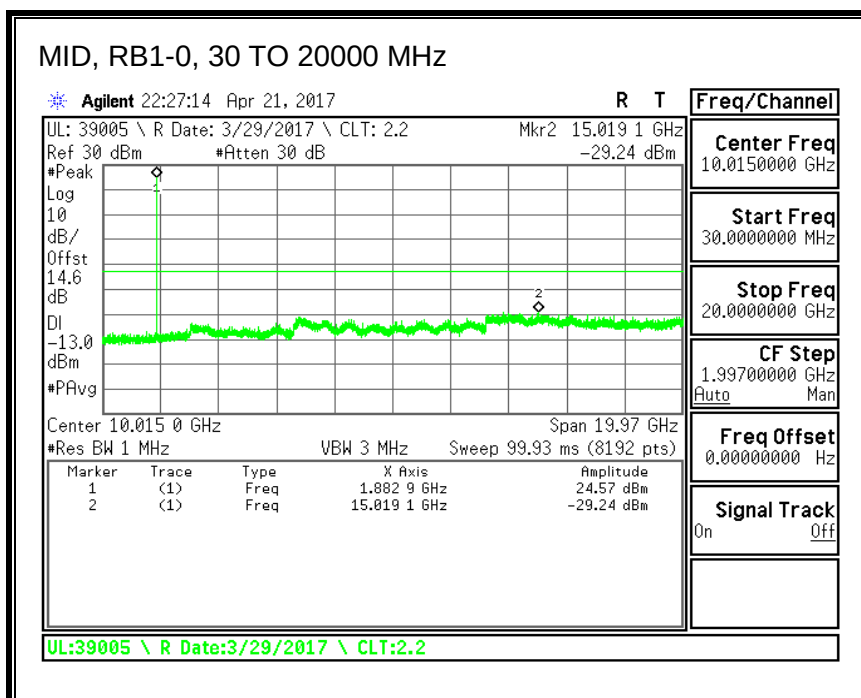
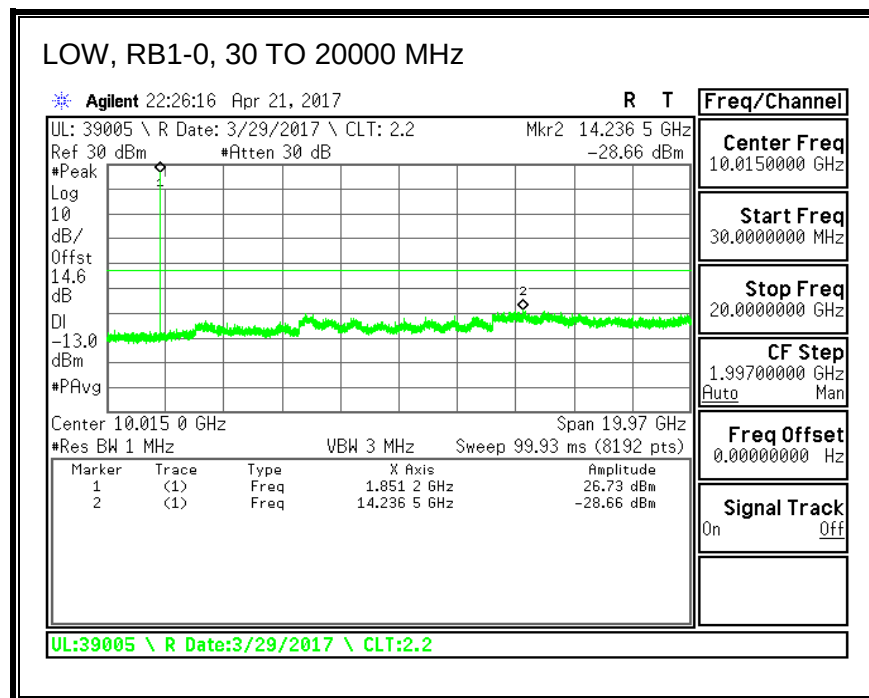
16QAM, (10.0 MHz BAND WIDTH)

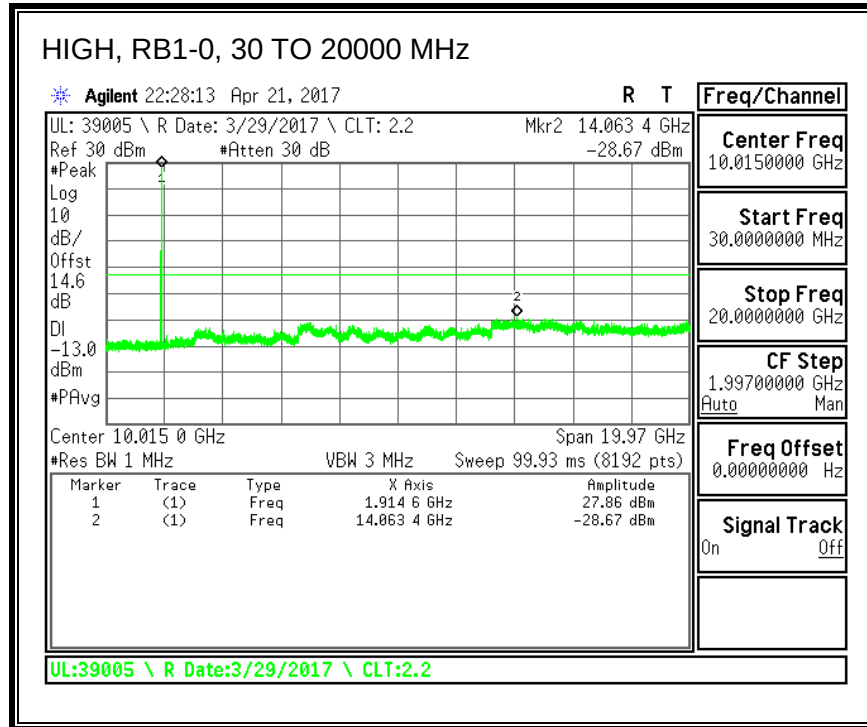




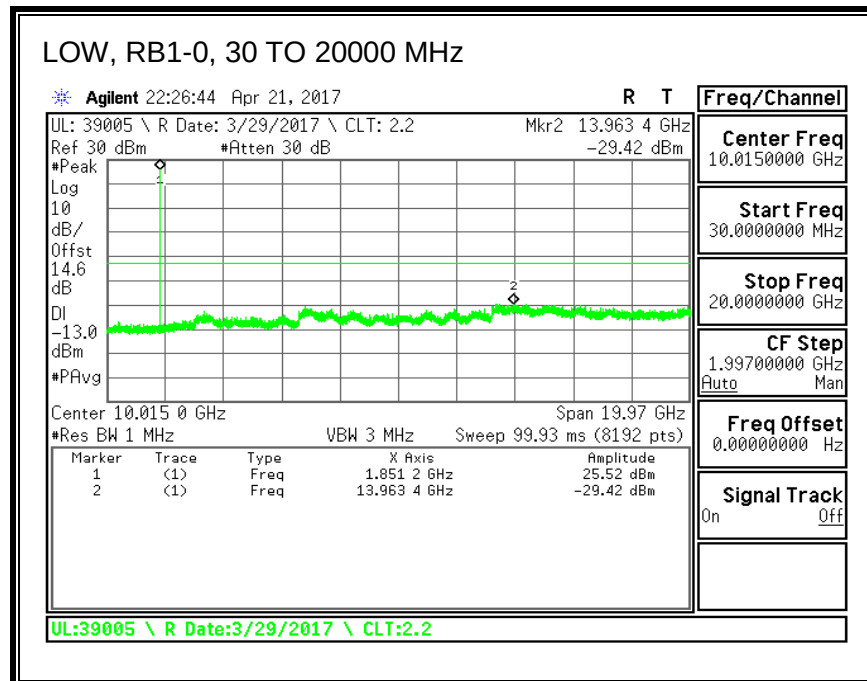
8.3.8. LTE BAND 25

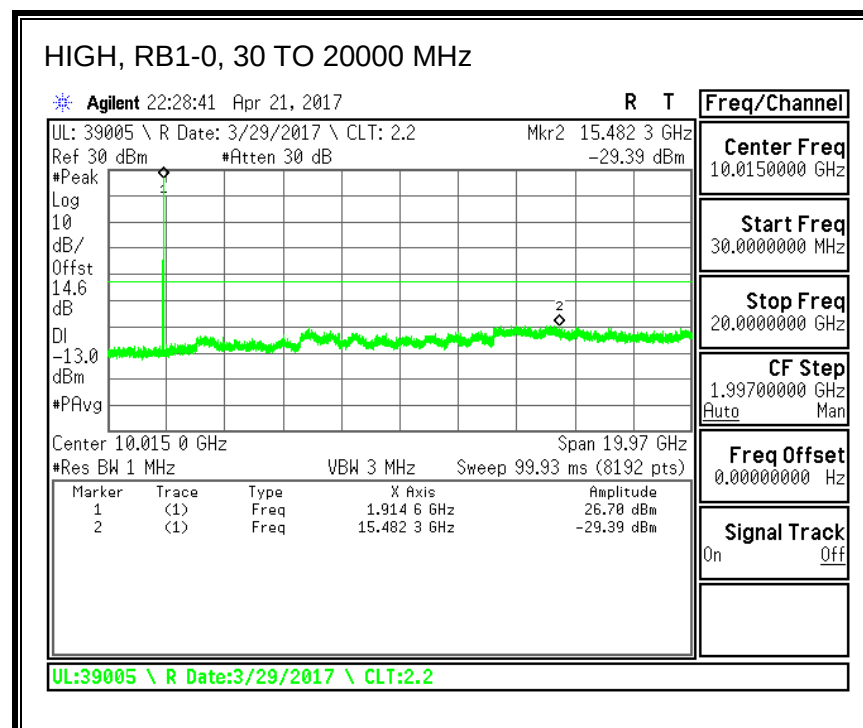
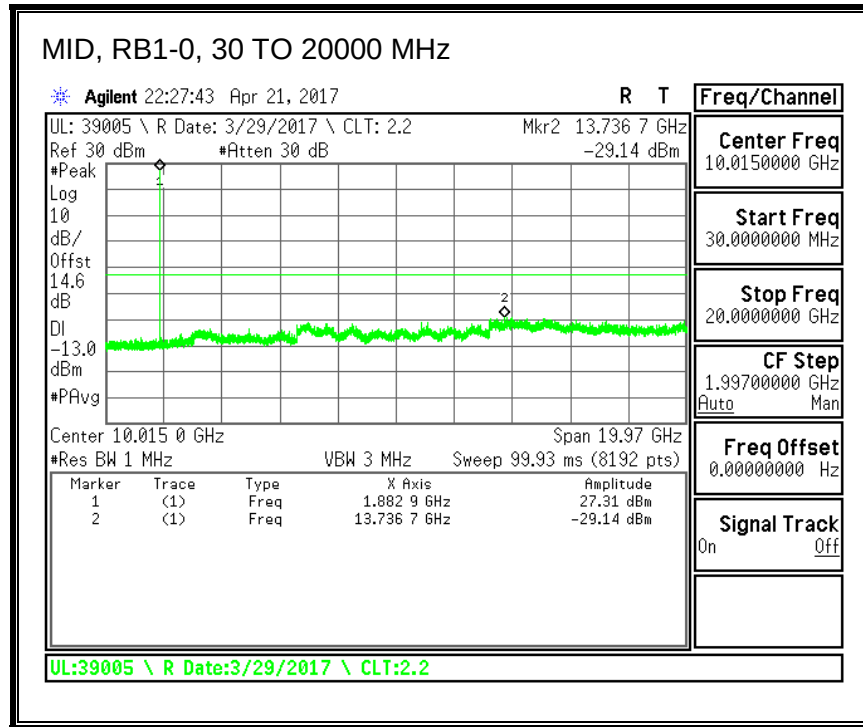
QPSK, (1.4 MHz BAND WIDTH)



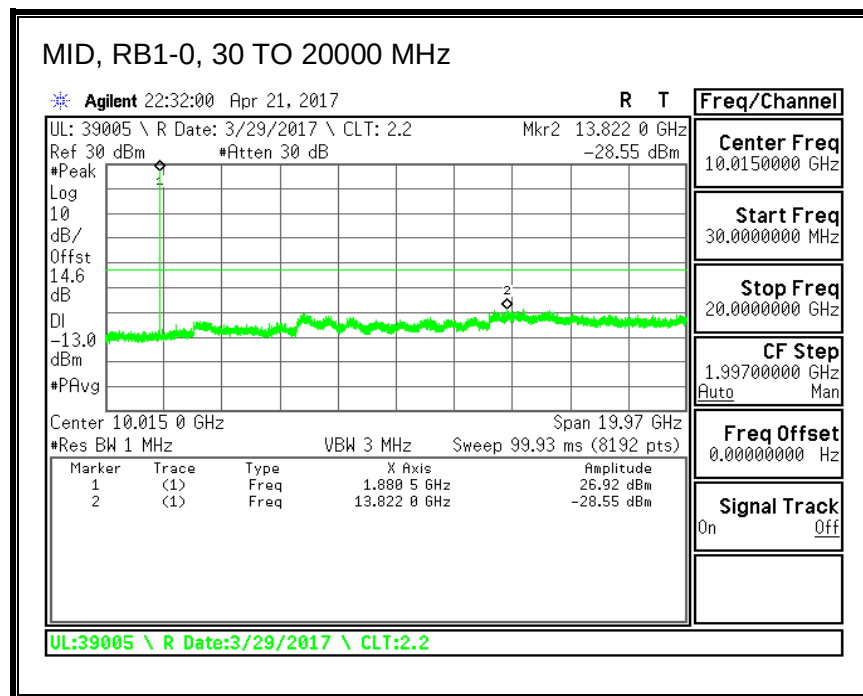
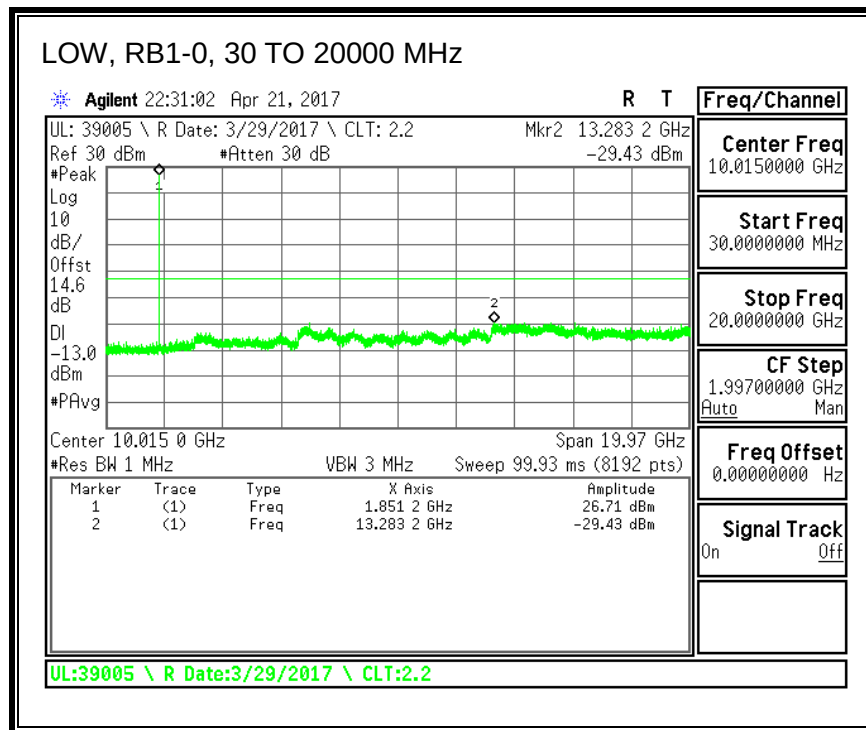


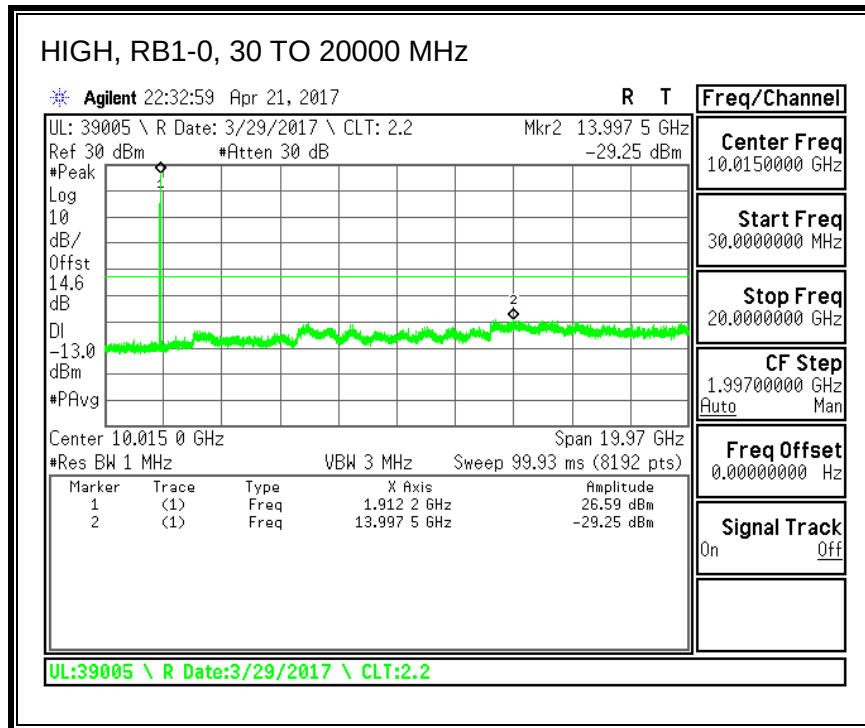
16QAM, (1.4 MHz BAND WIDTH)



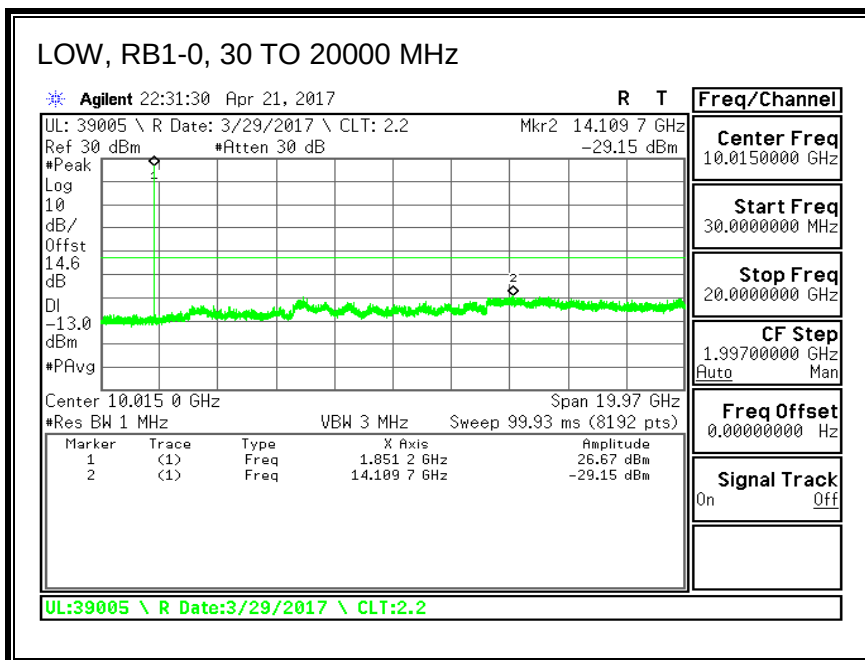


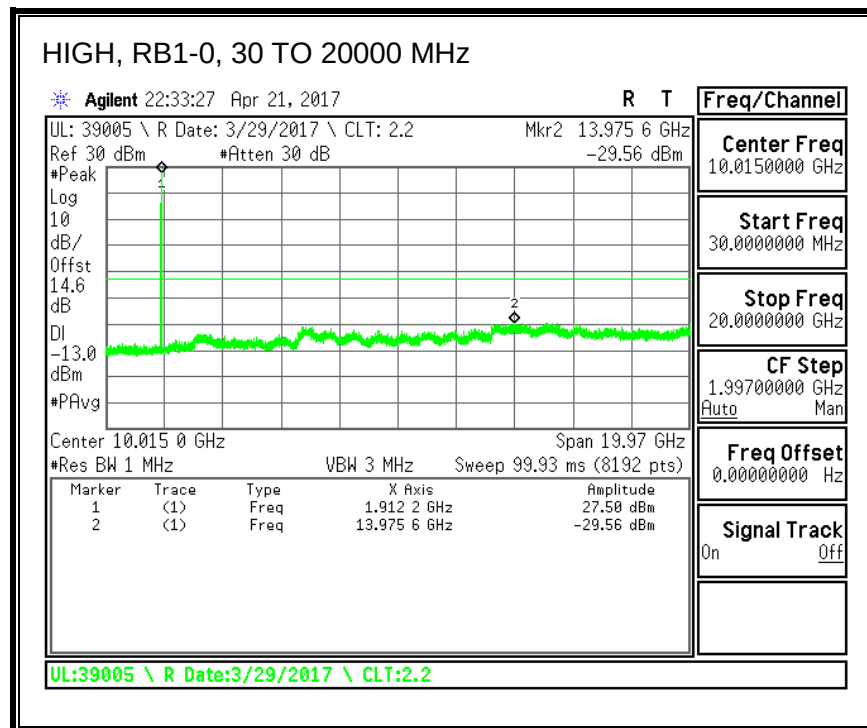
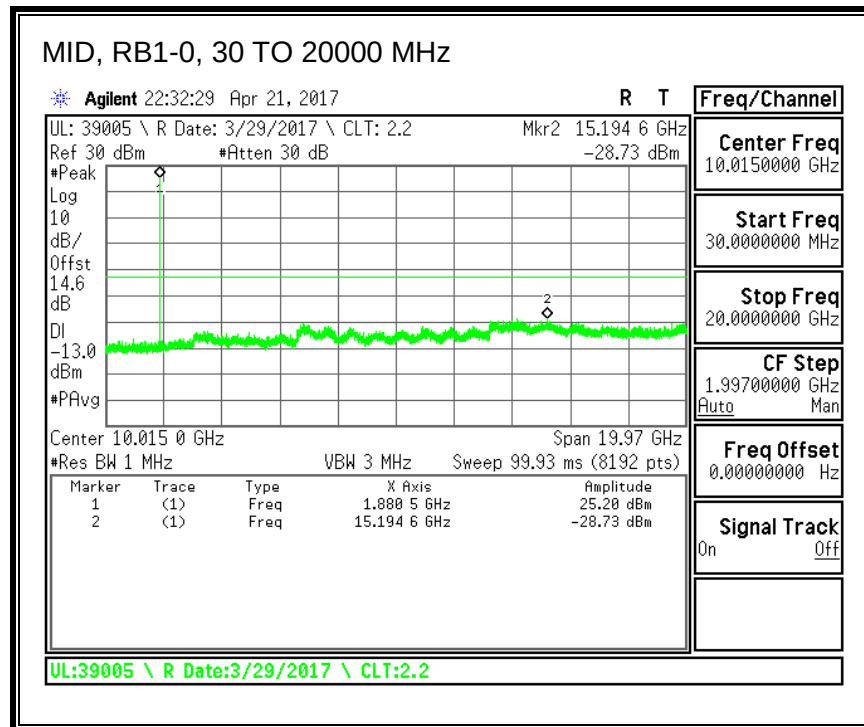
QPSK, (3.0 MHz BAND WIDTH)



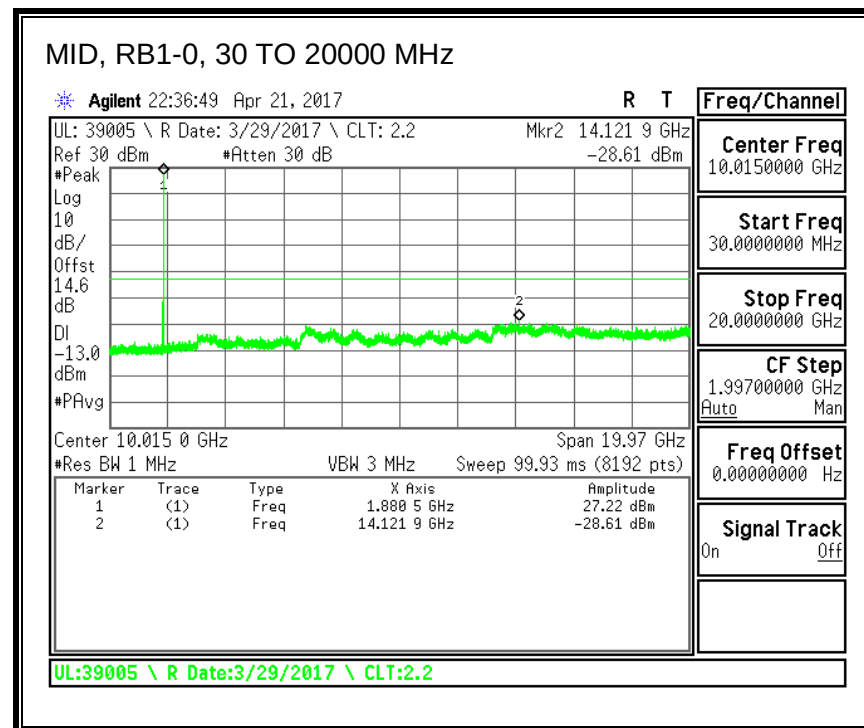
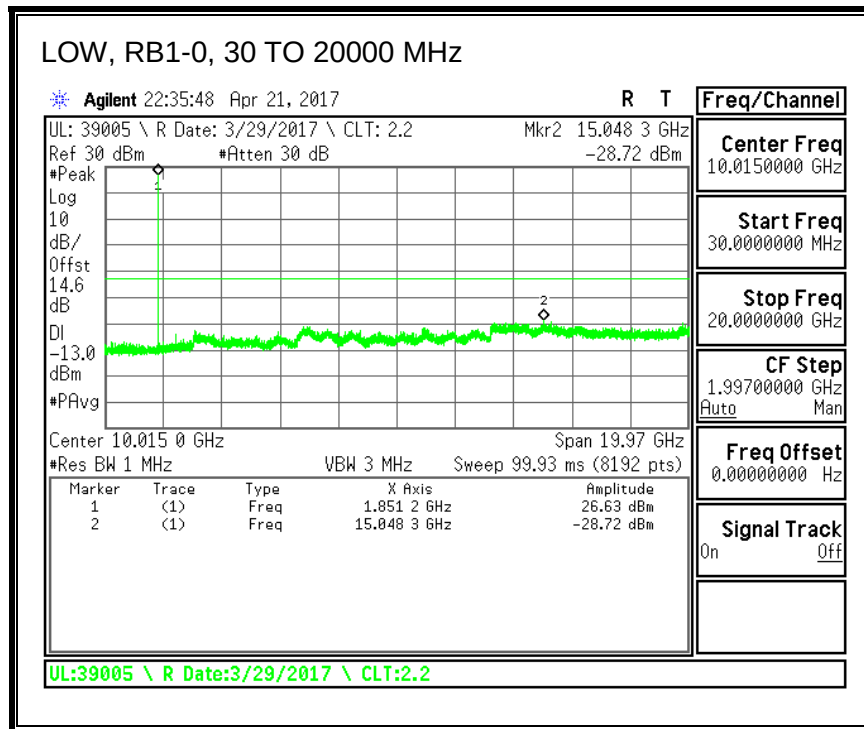


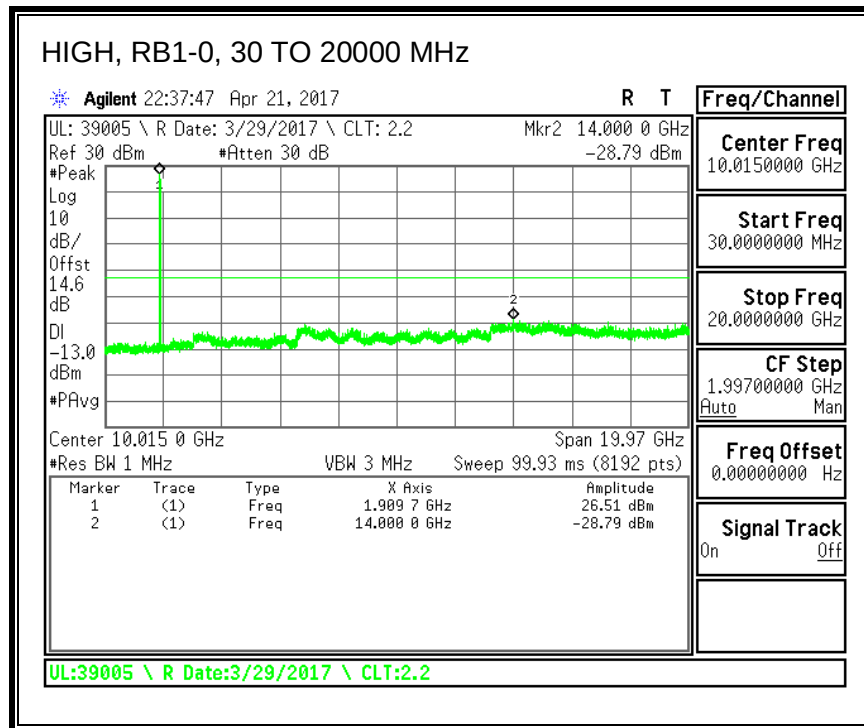
16QAM, (3.0 MHz BAND WIDTH)



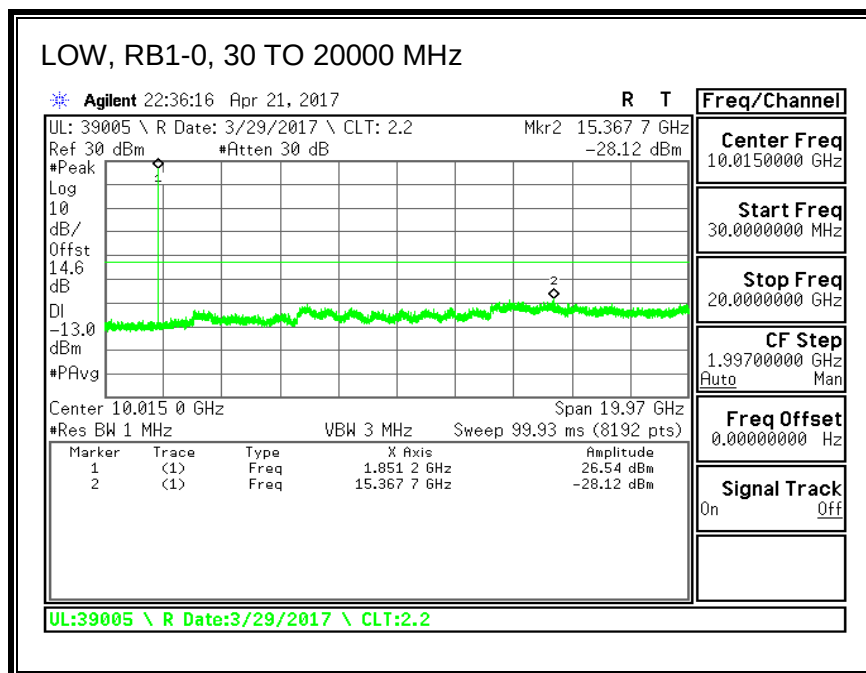


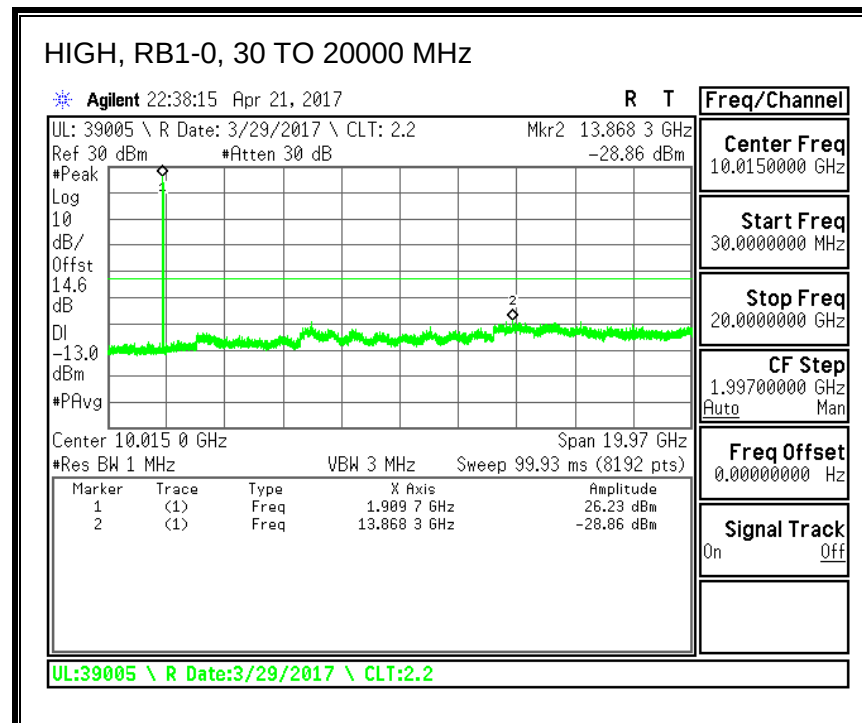
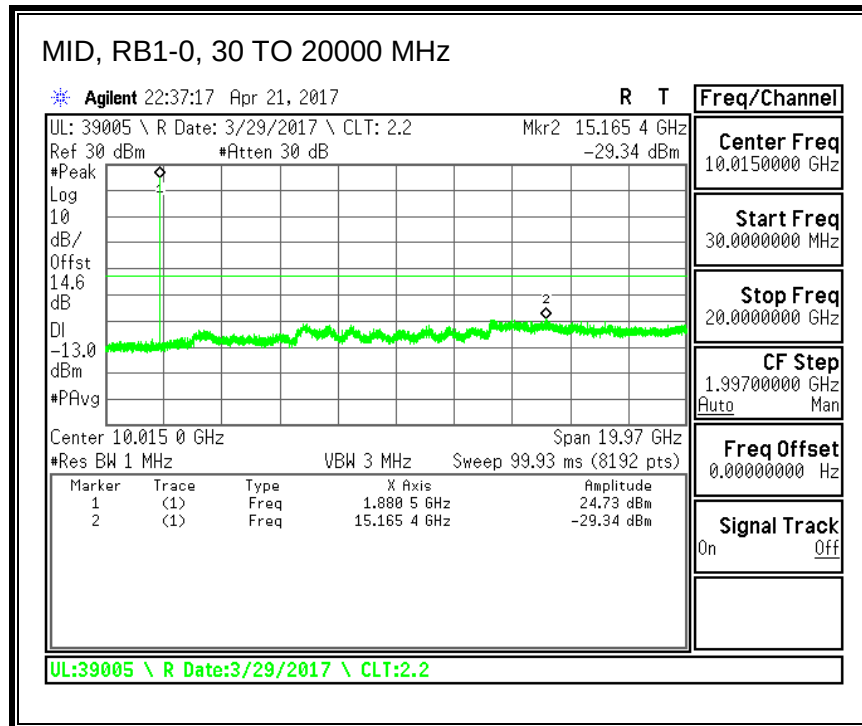
QPSK, (5.0 MHz BAND WIDTH)



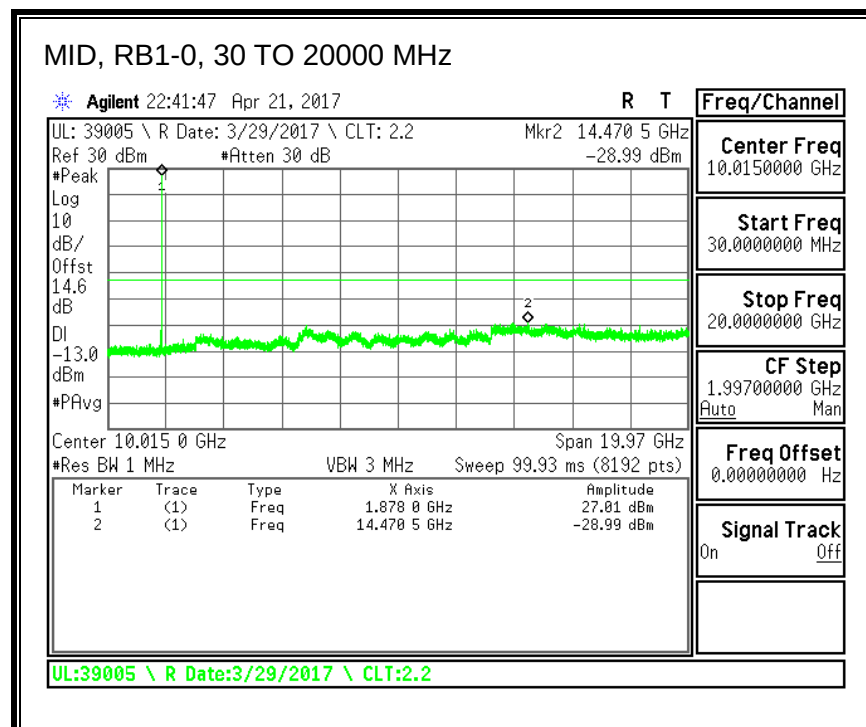
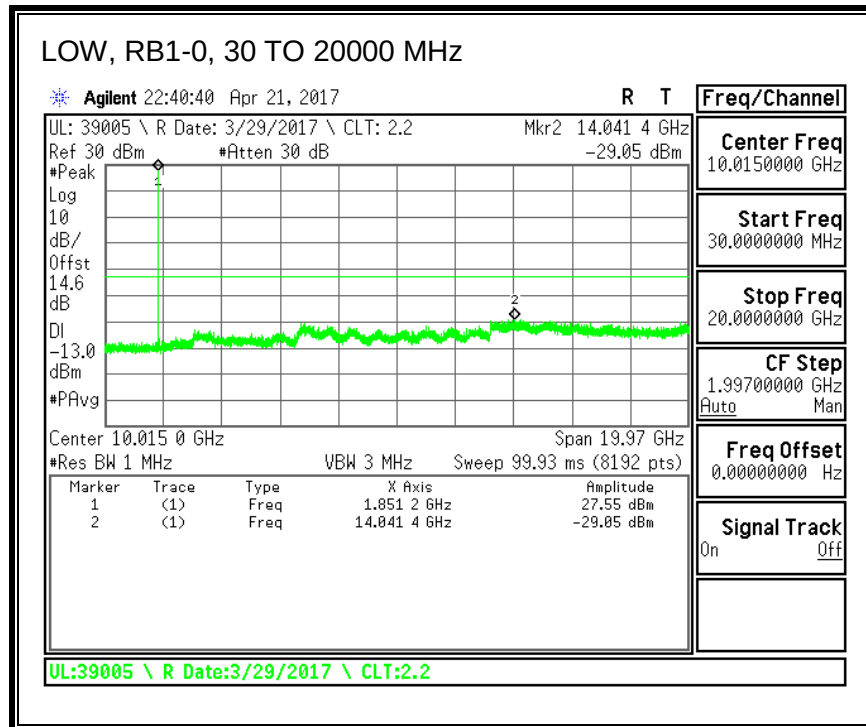


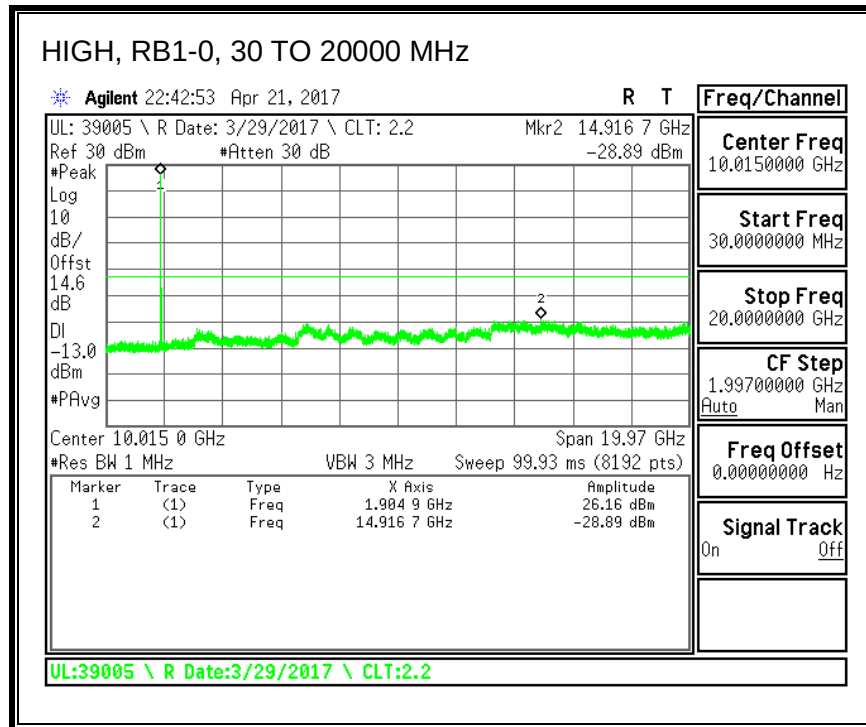
16QAM, (5.0 MHz BAND WIDTH)



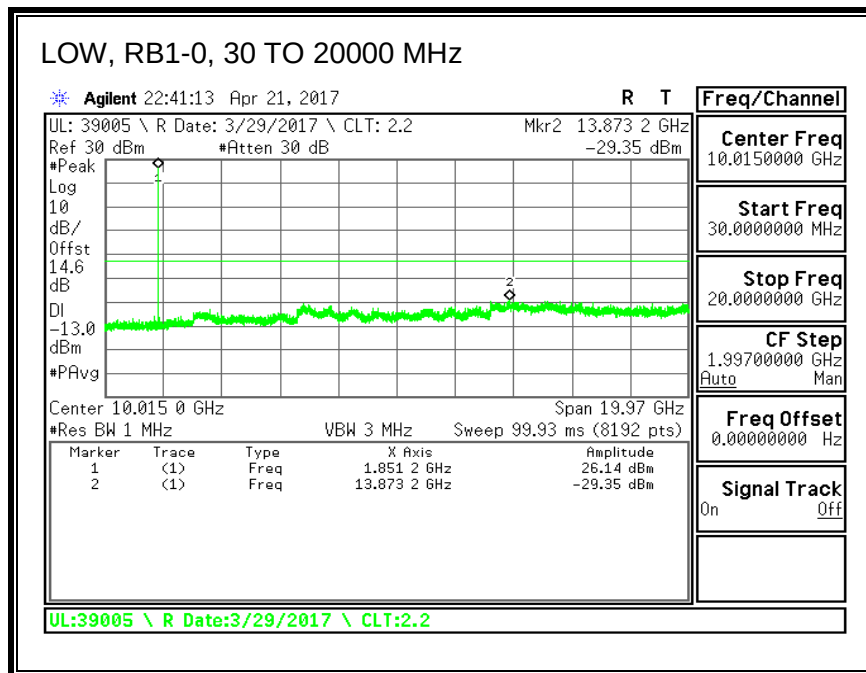


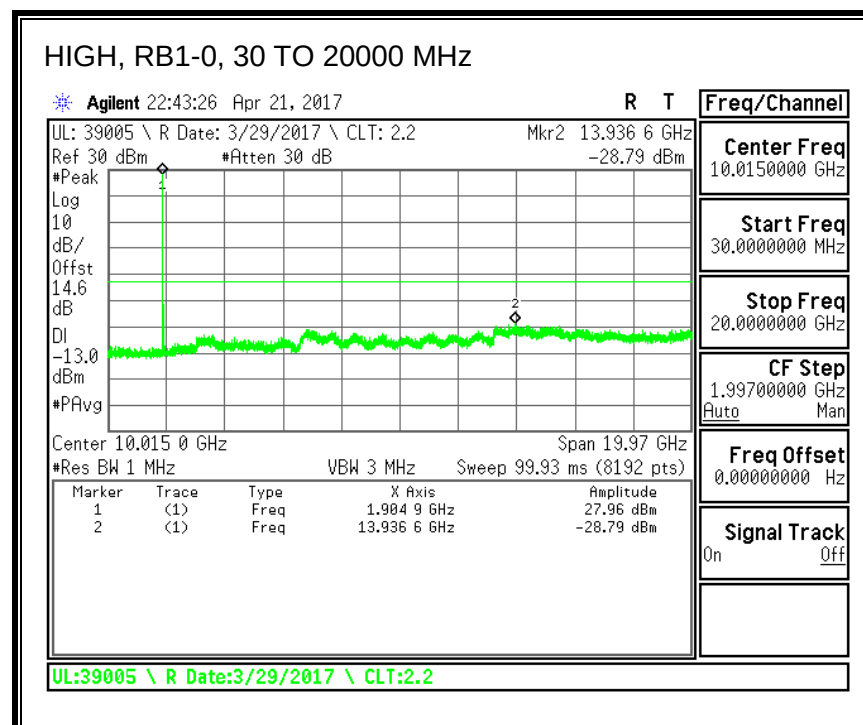
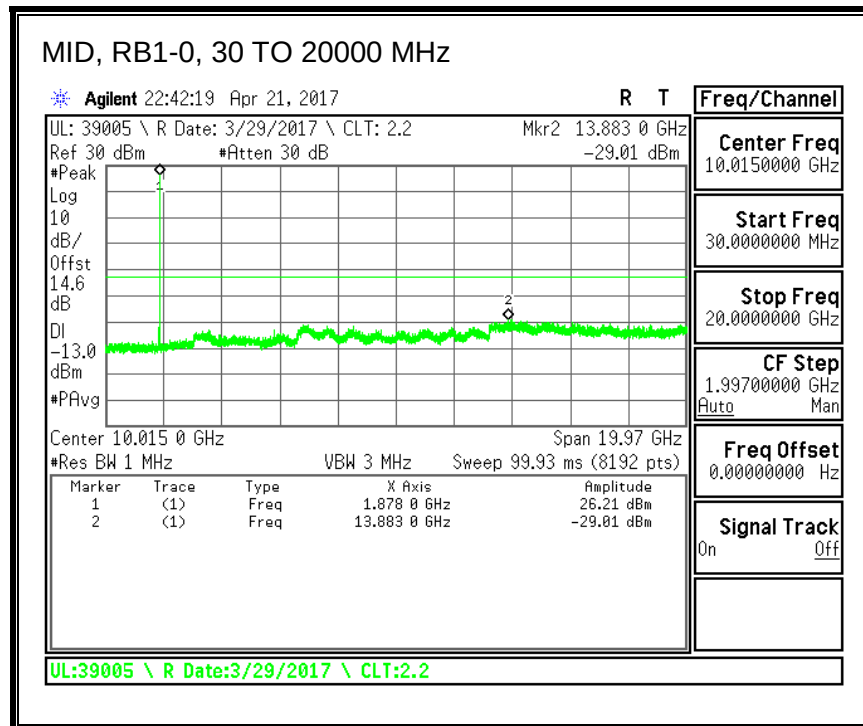
QPSK, (10.0 MHz BAND WIDTH)



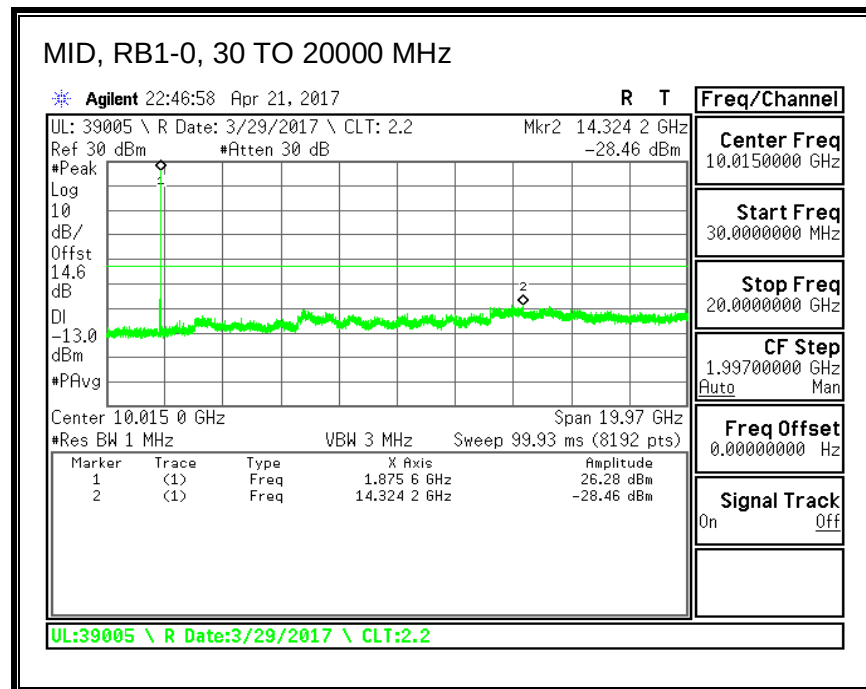
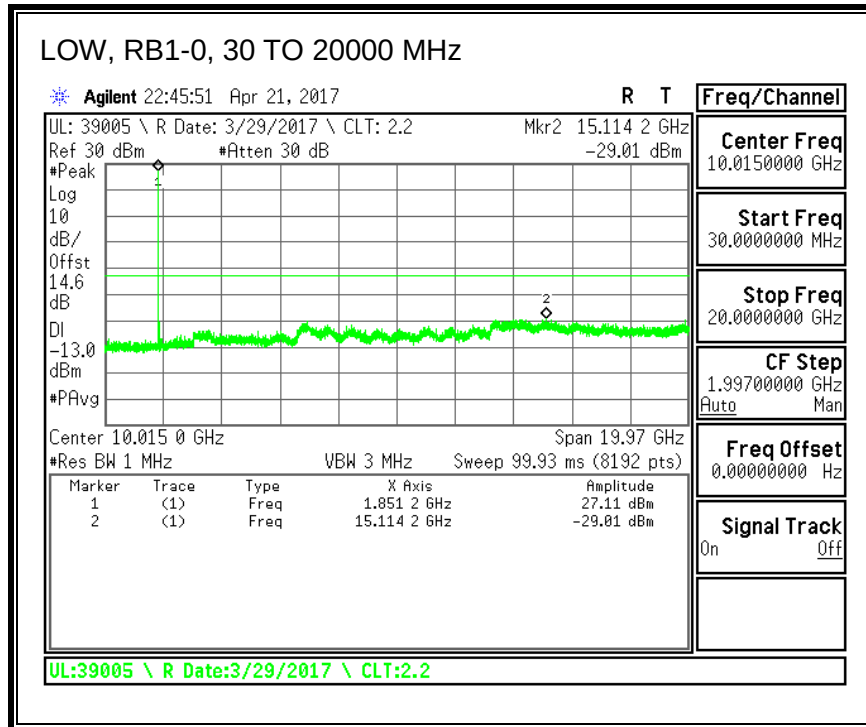


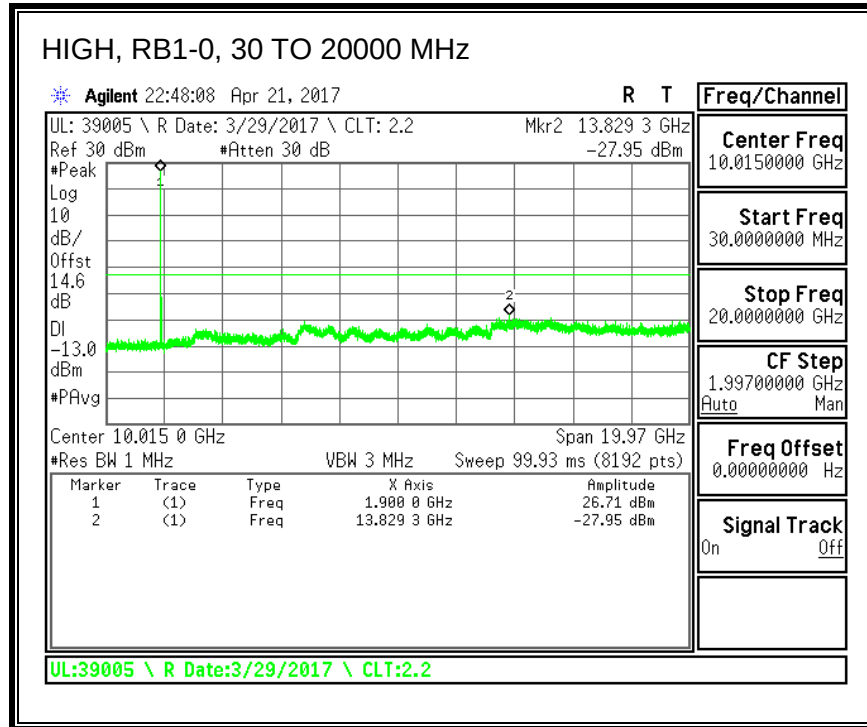
16QAM, (10.0 MHz BAND WIDTH)



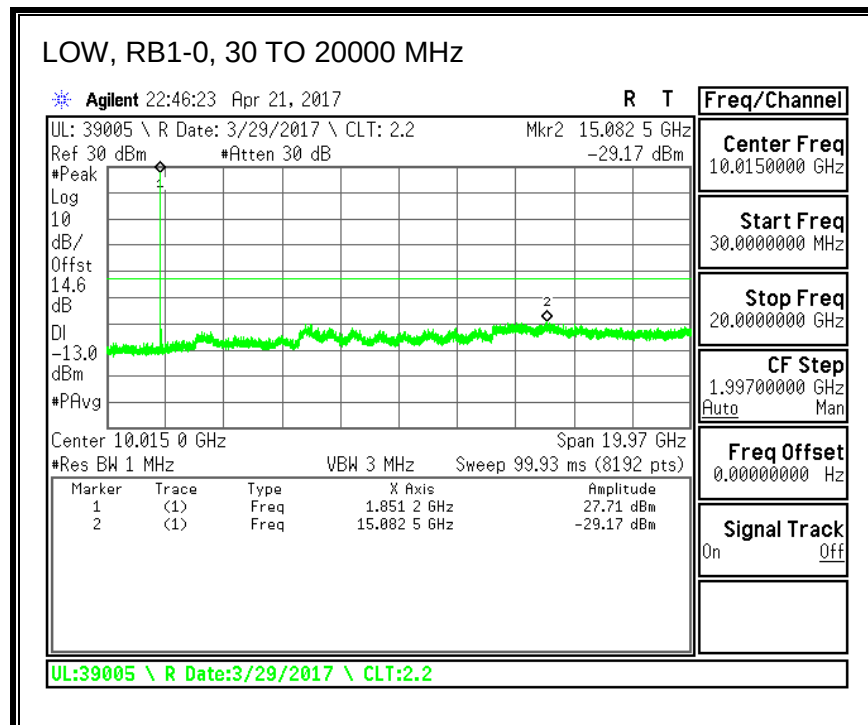


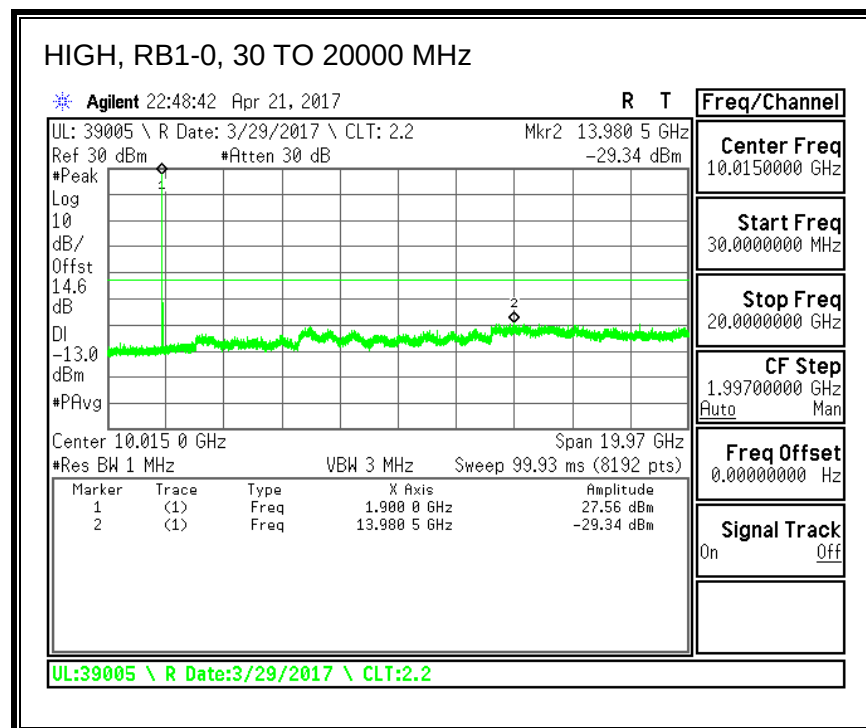
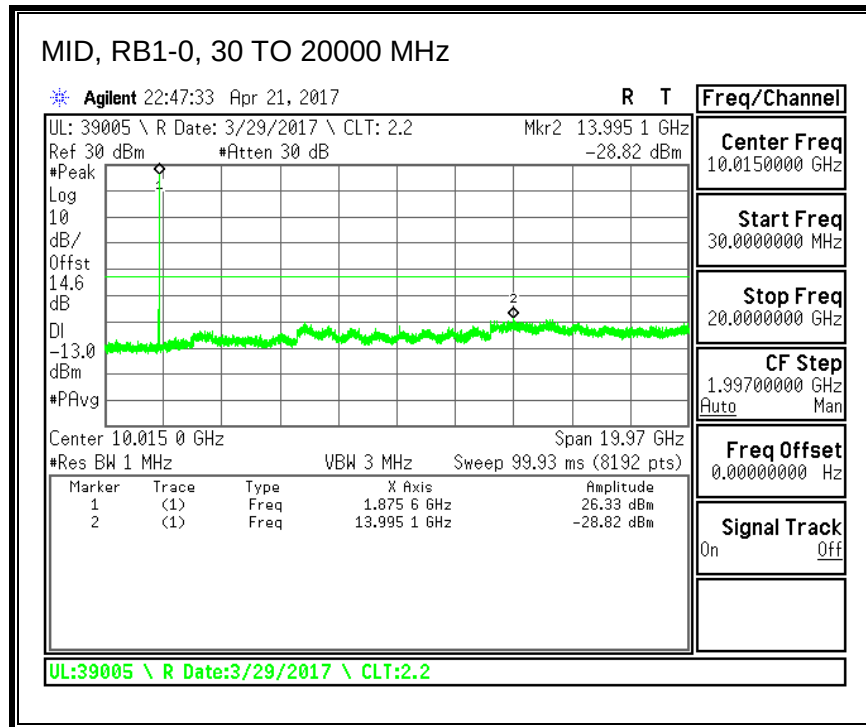
QPSK, (15.0 MHz BAND WIDTH)



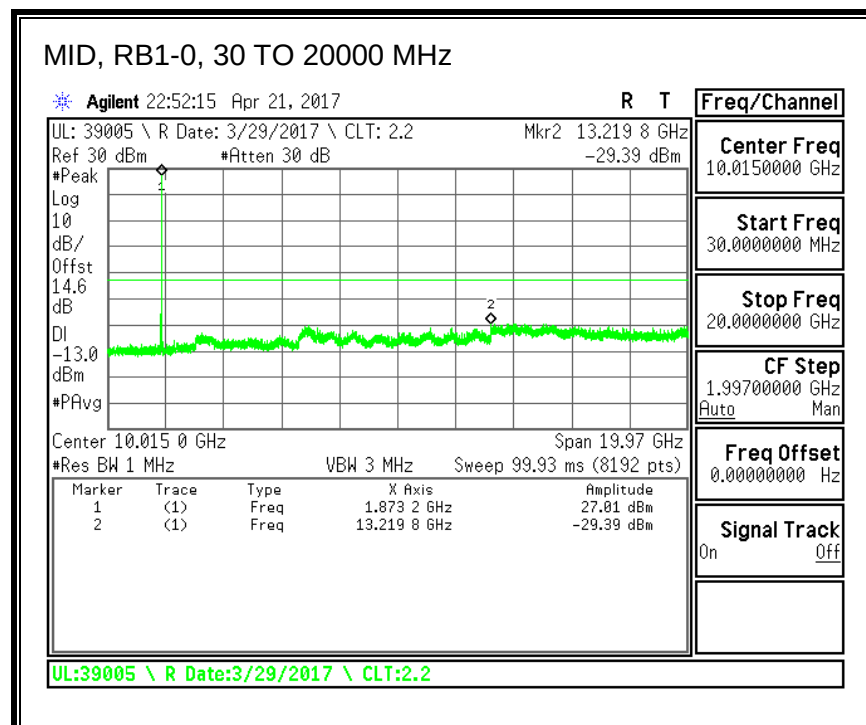
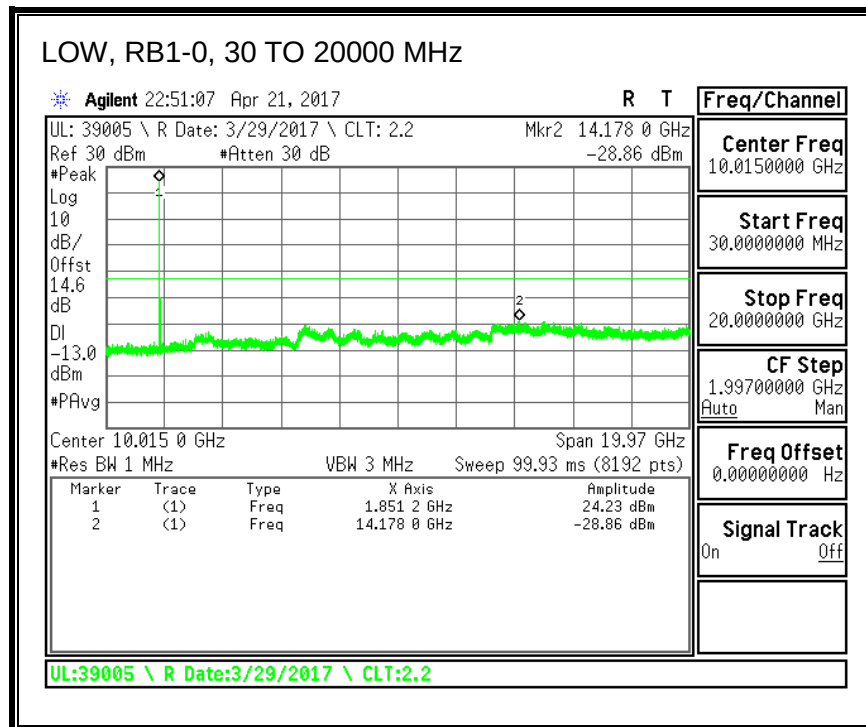


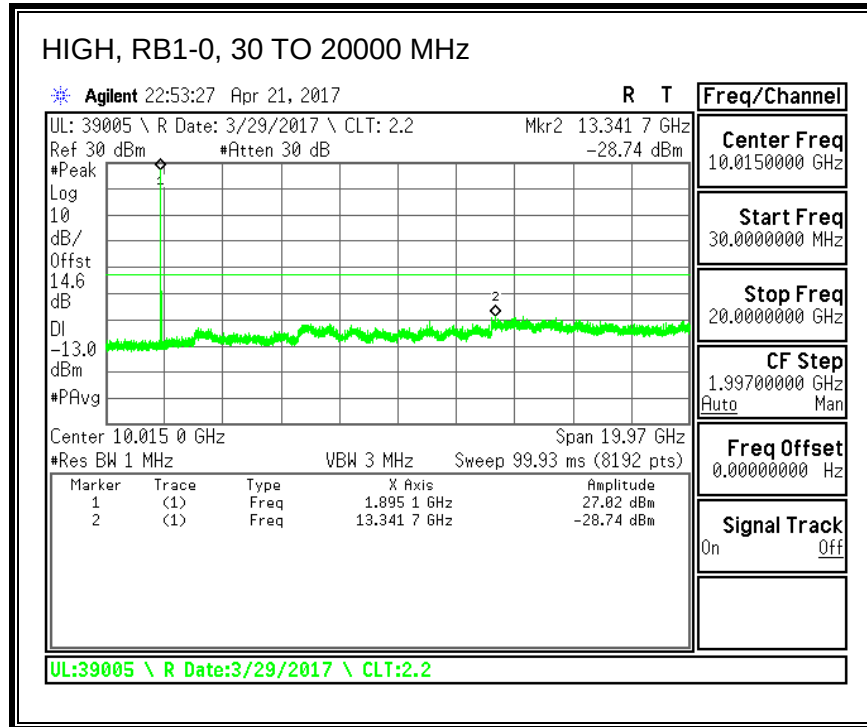
16QAM, (15.0 MHz BAND WIDTH)



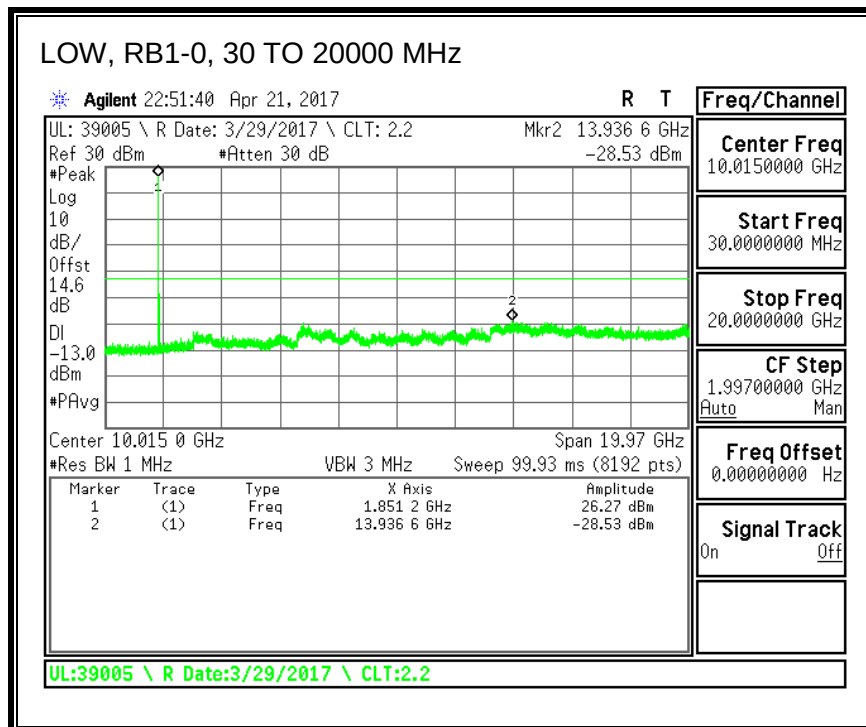


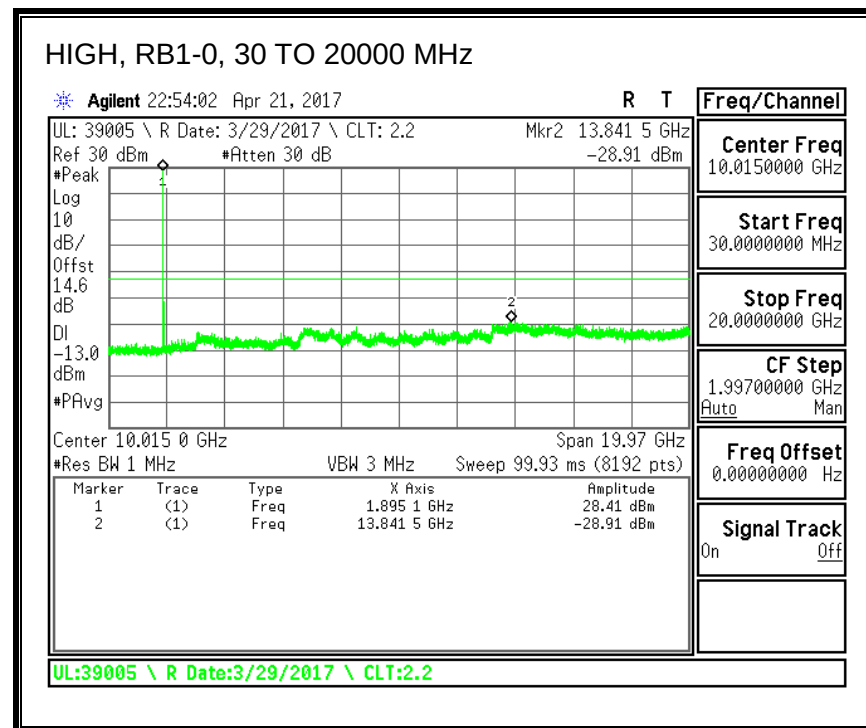
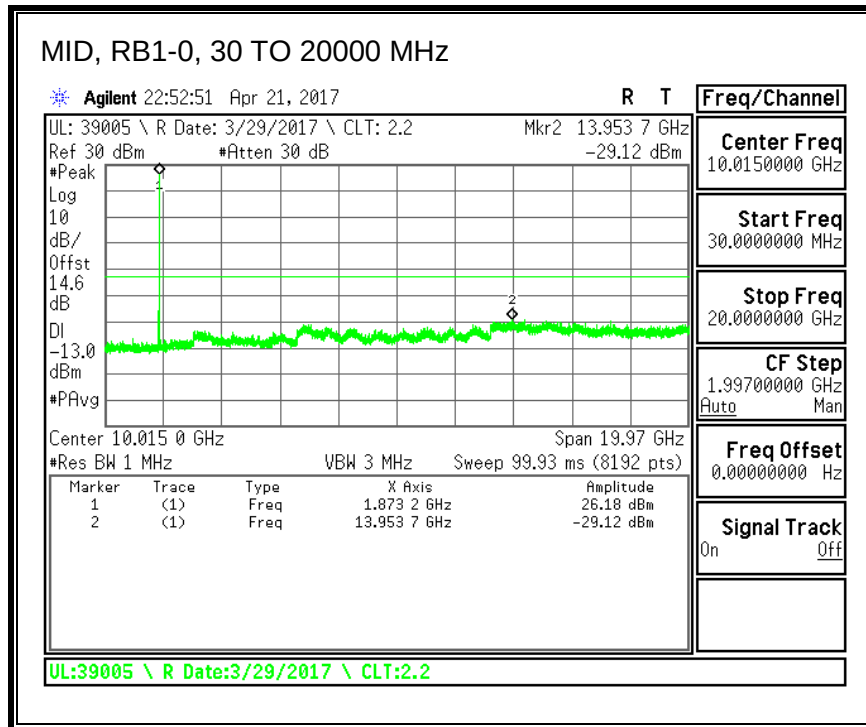
QPSK, (20.0 MHz BAND WIDTH)





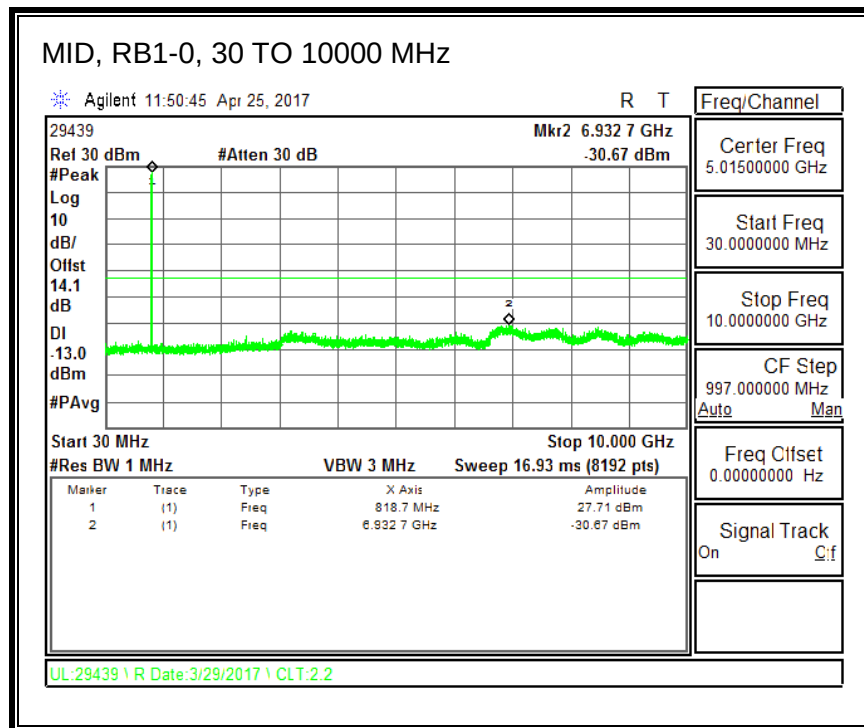
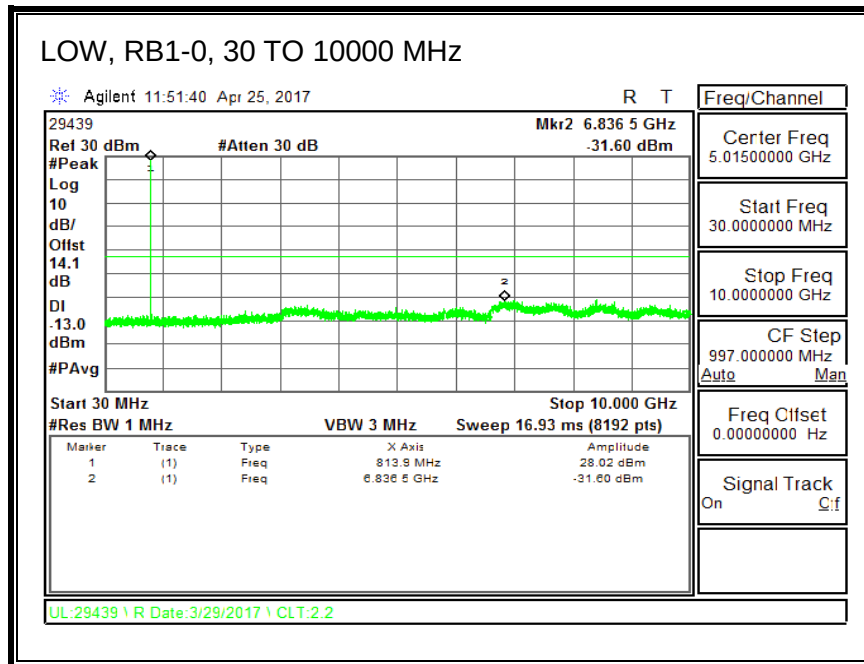
16QAM, (20.0 MHz BAND WIDTH)

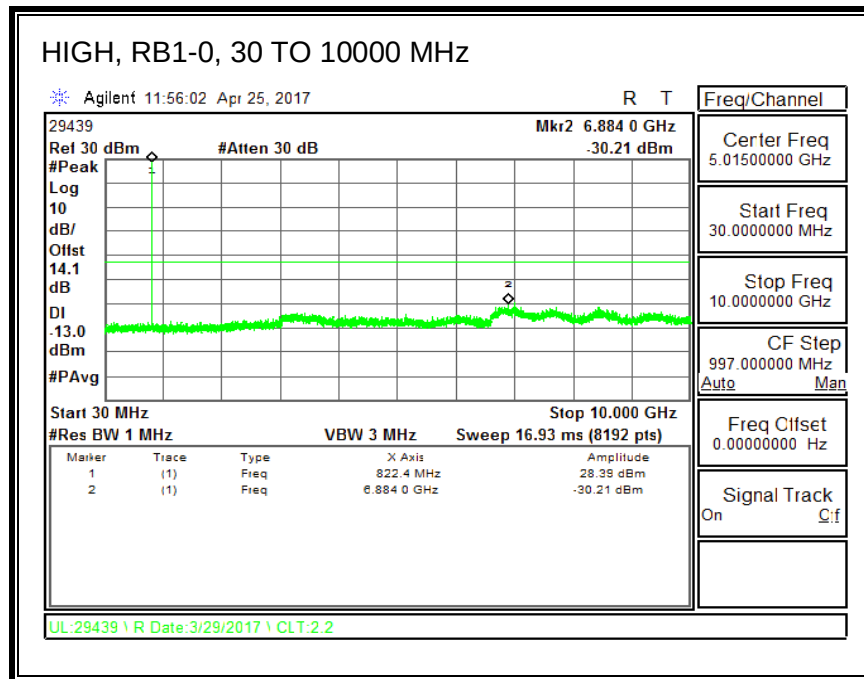




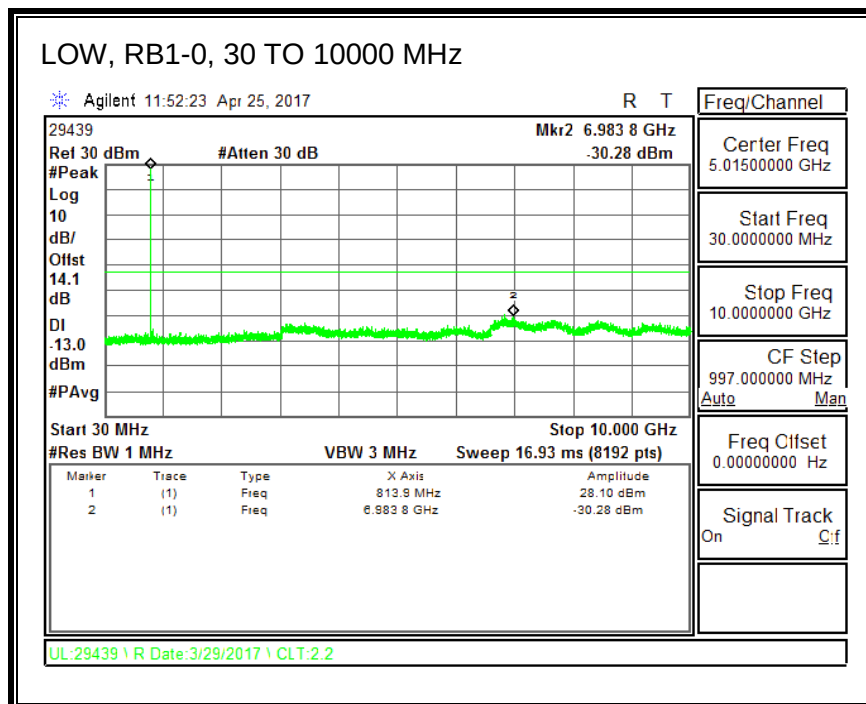
8.3.9. LTE BAND 26

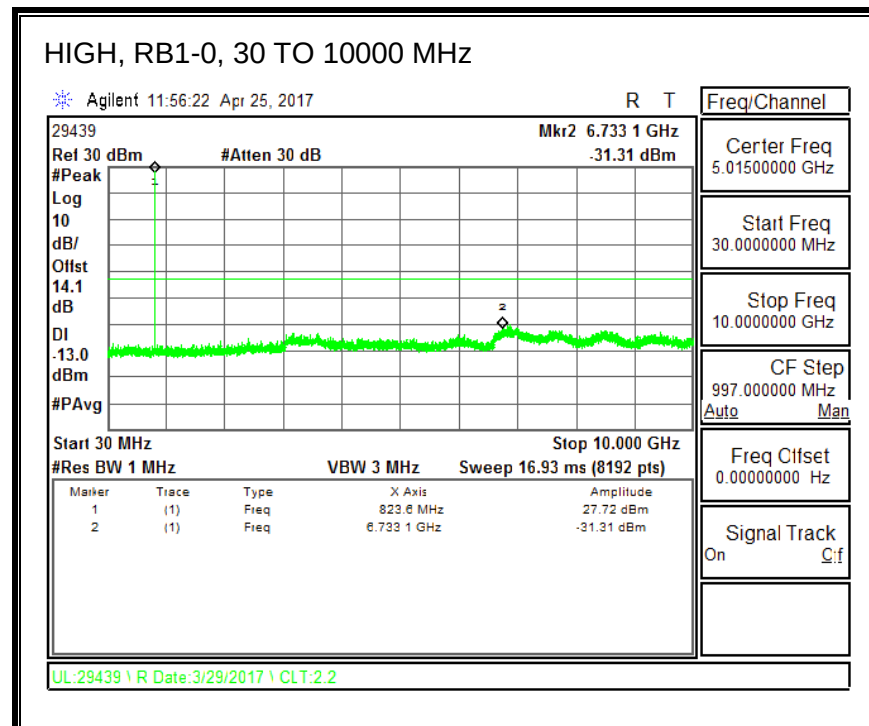
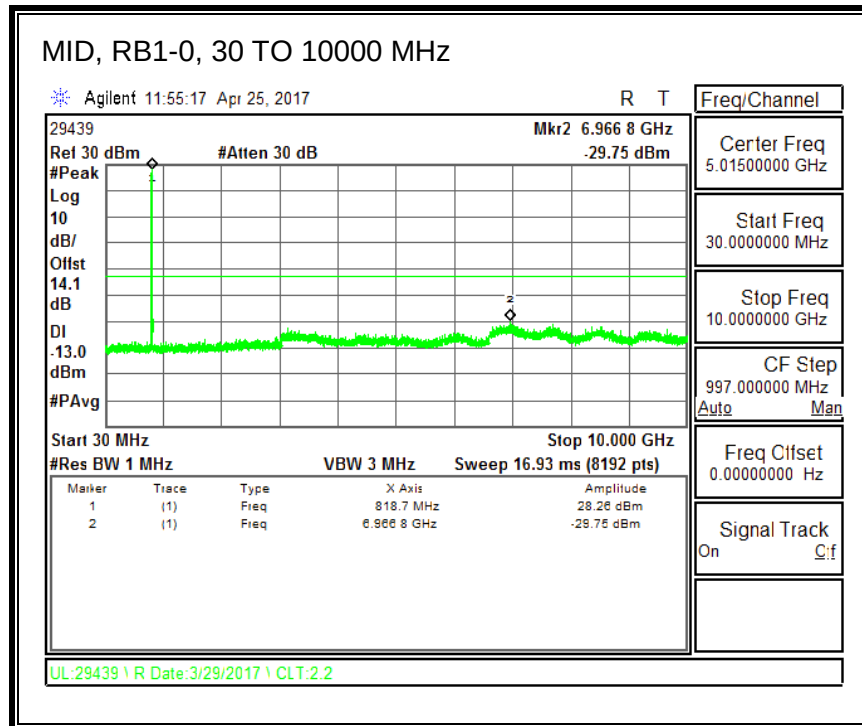
QPSK, (1.4 MHz BAND WIDTH)



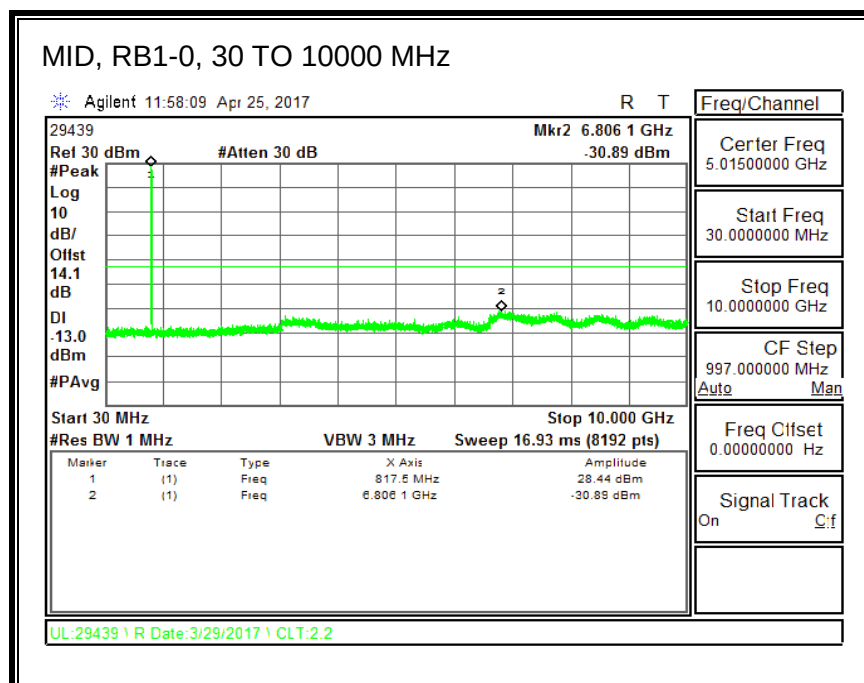
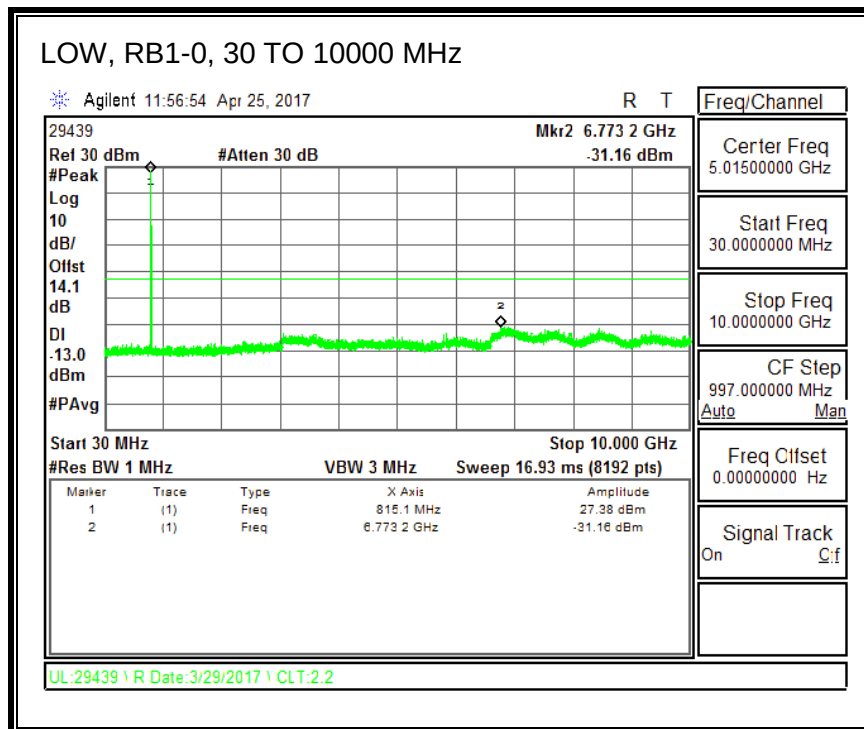


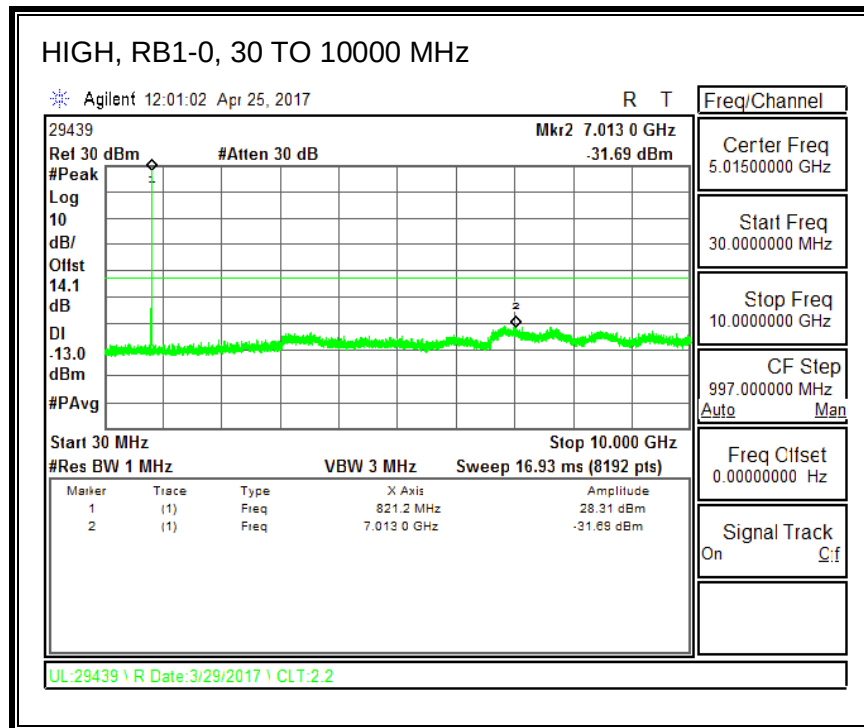
16QAM, (1.4 MHz BAND WIDTH)



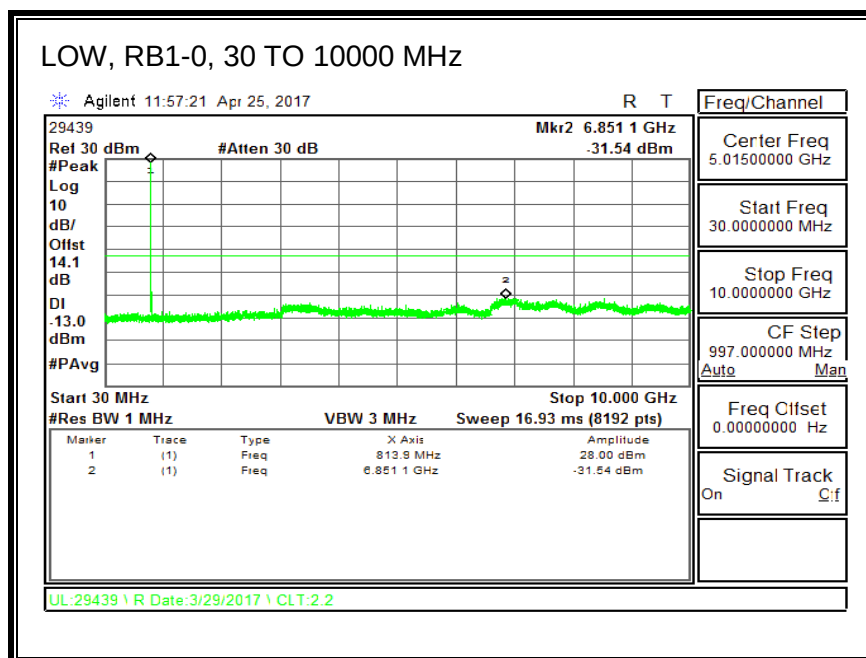


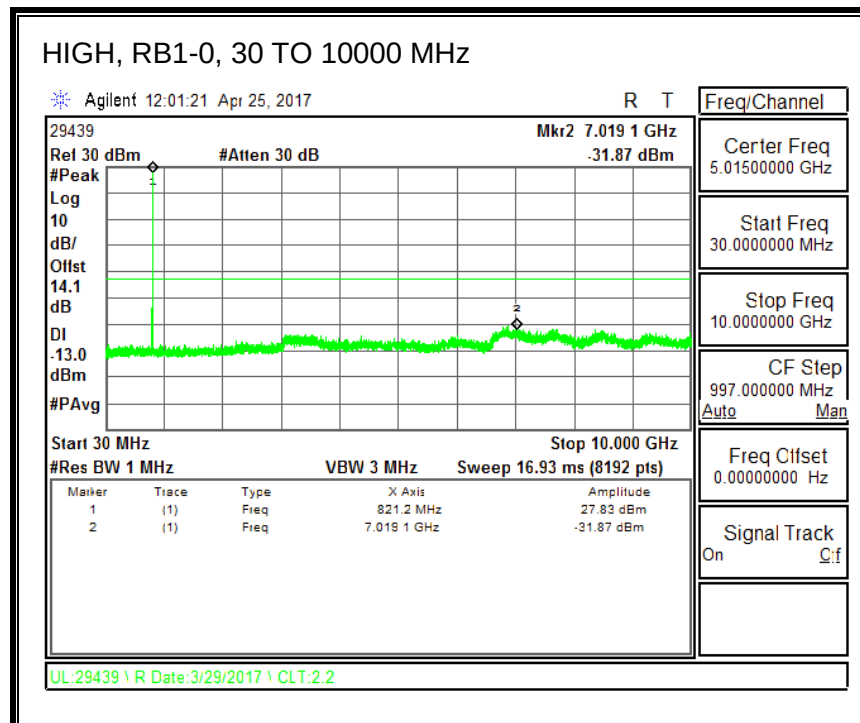
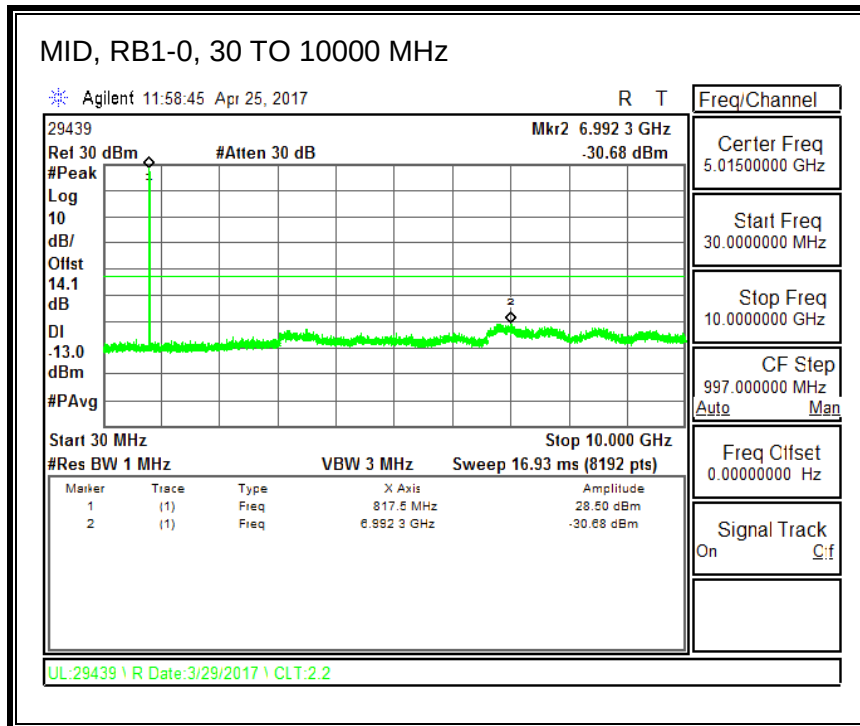
QPSK, (3.0 MHz BAND WIDTH)



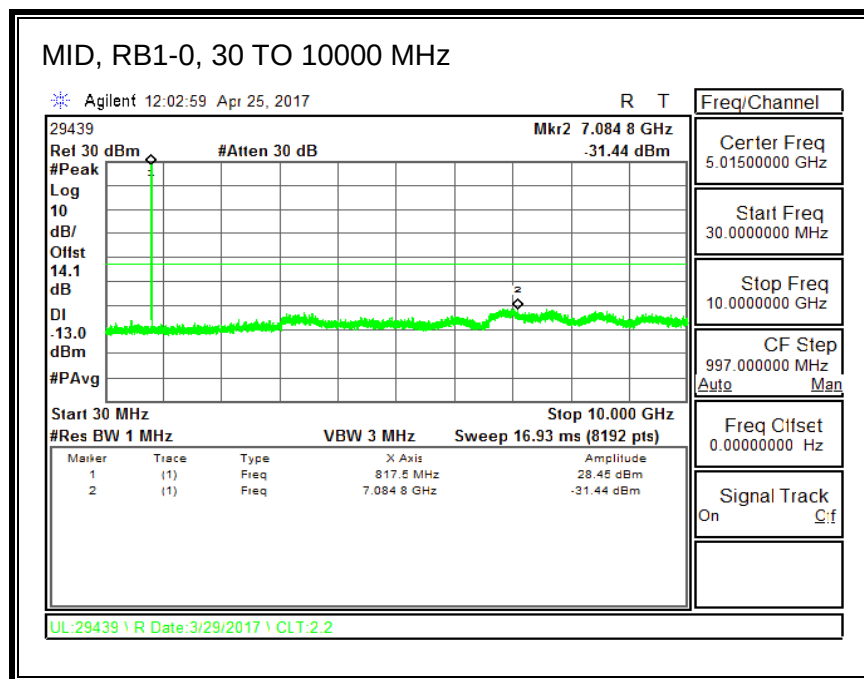
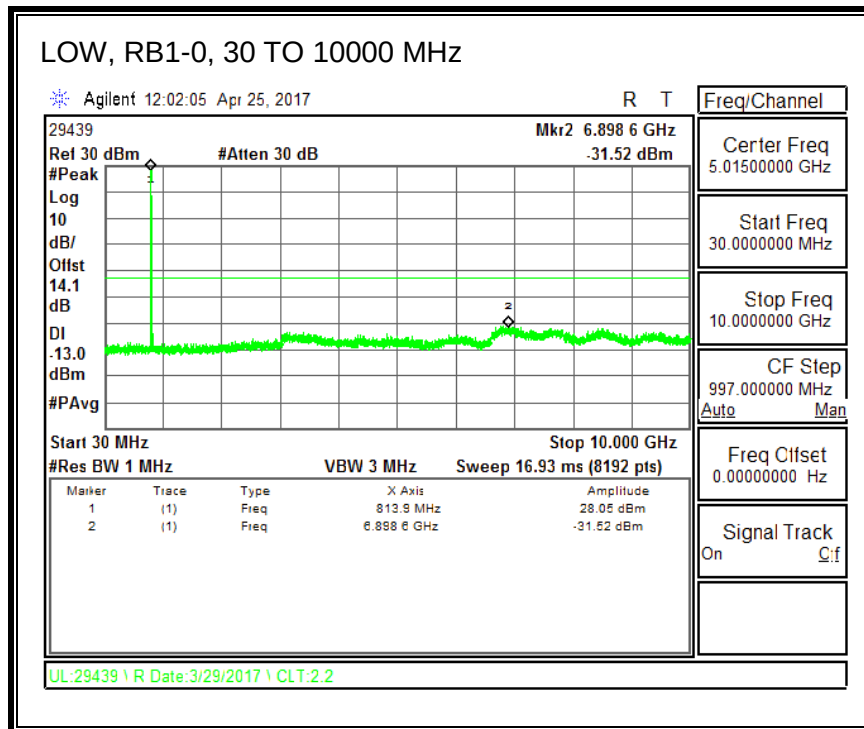


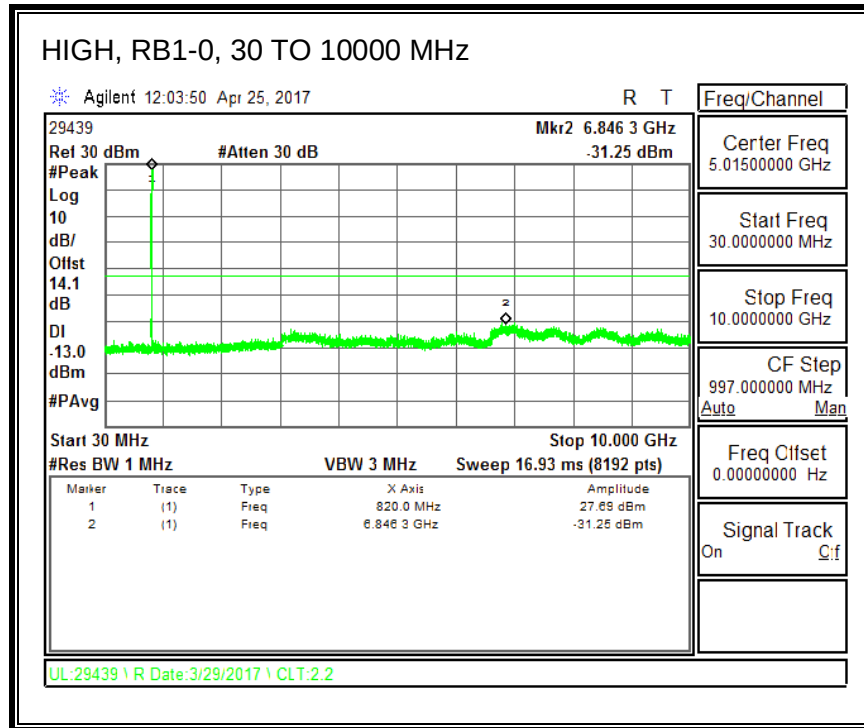
16QAM, (3.0 MHz BAND WIDTH)



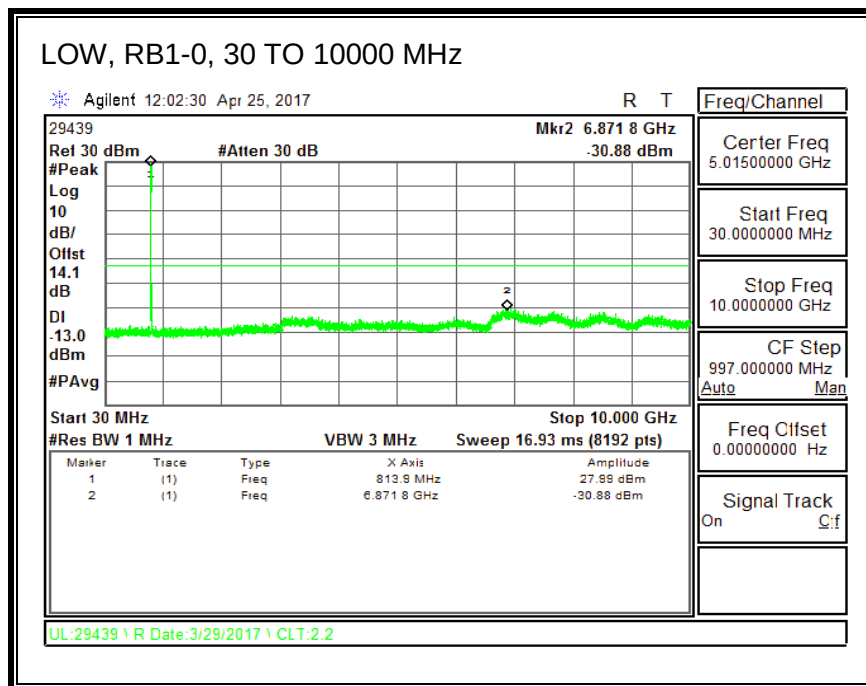


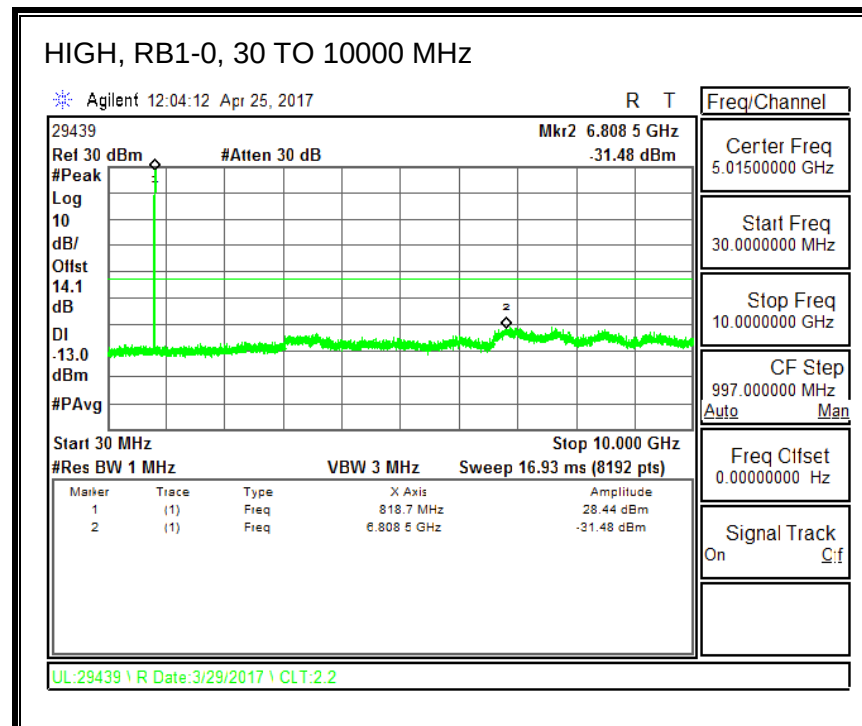
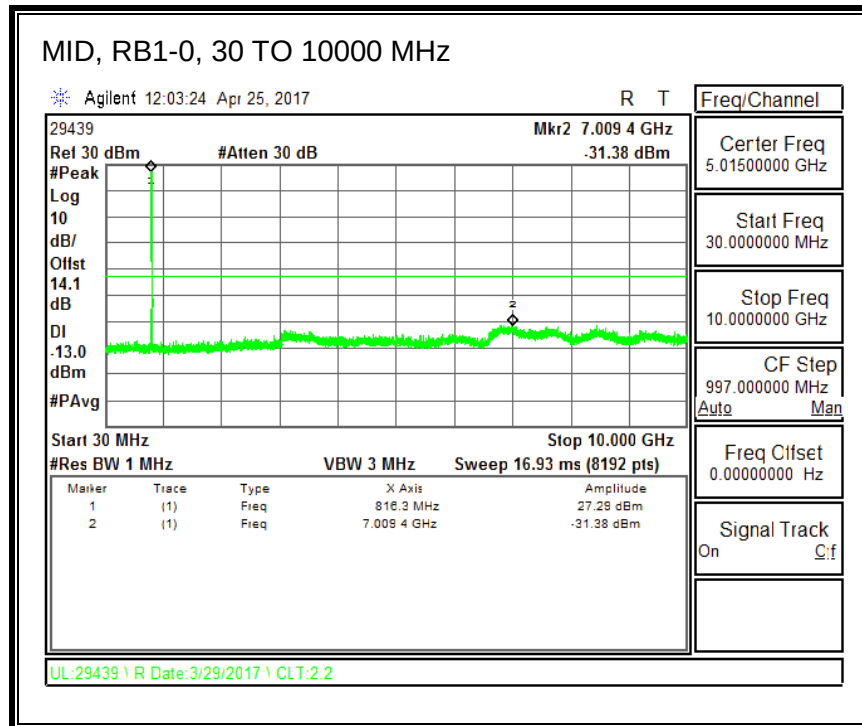
QPSK, (5.0 MHz BAND WIDTH)



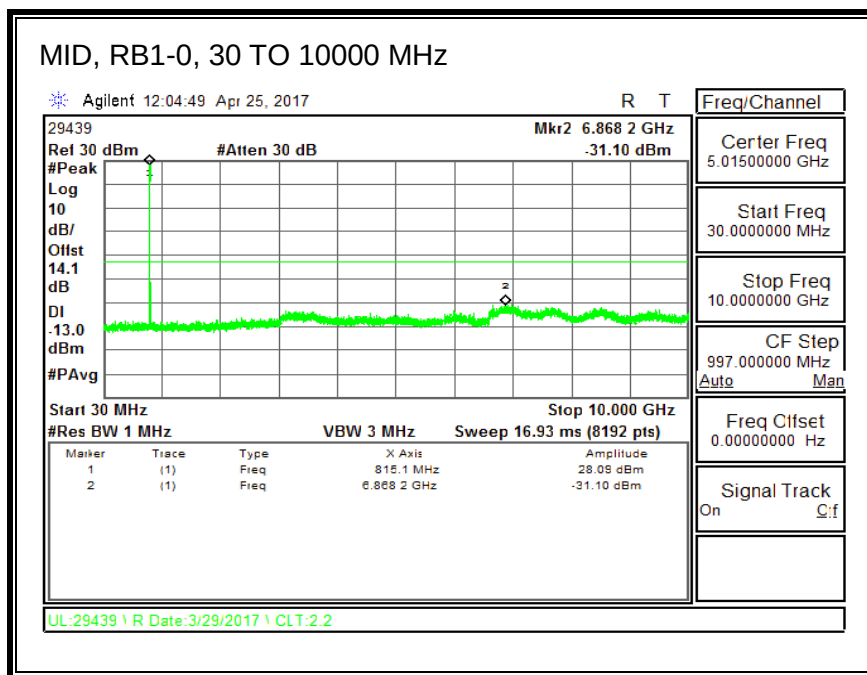


16QAM, (5.0 MHz BAND WIDTH)

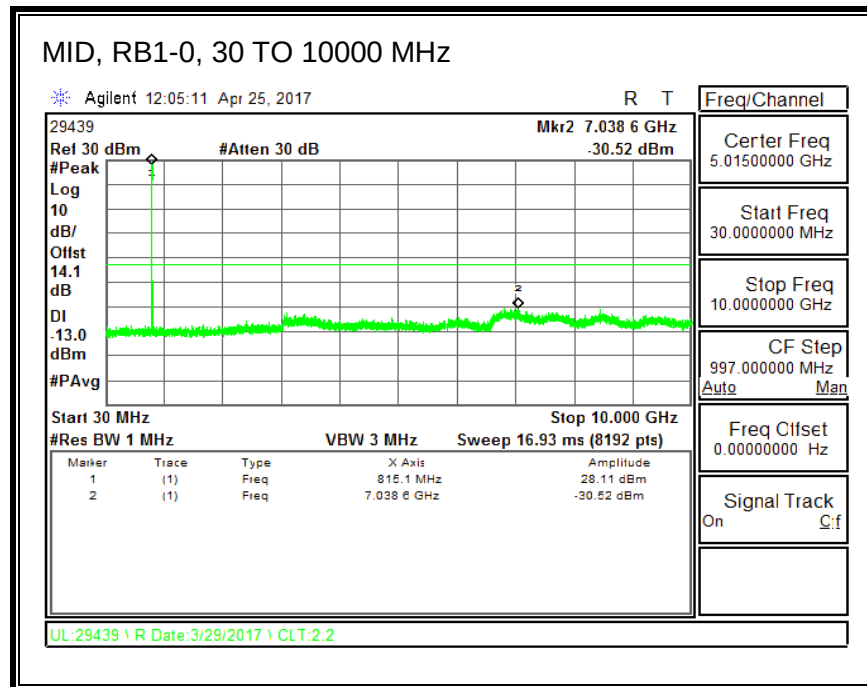




QPSK, (10.0 MHz BAND WIDTH)

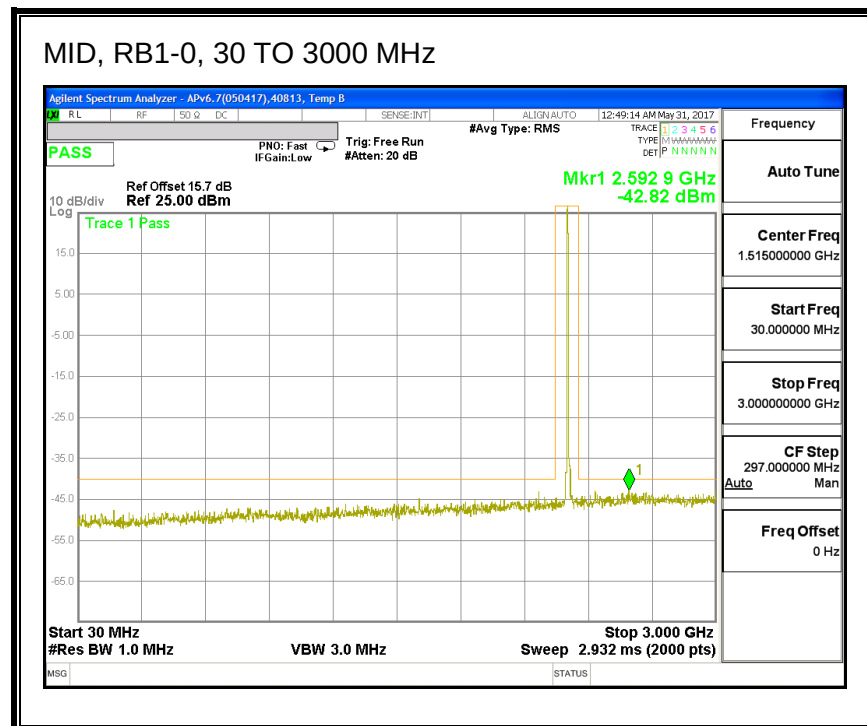
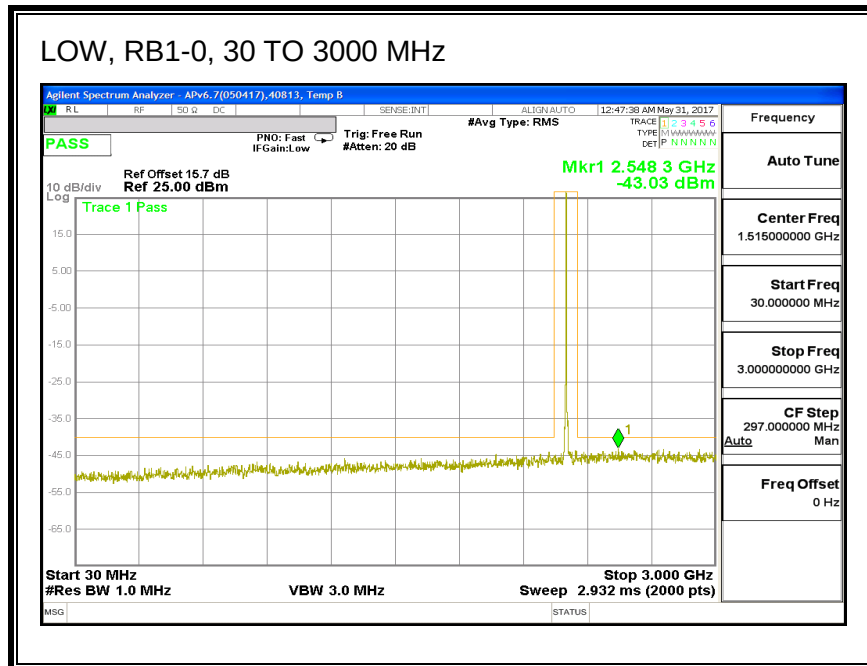


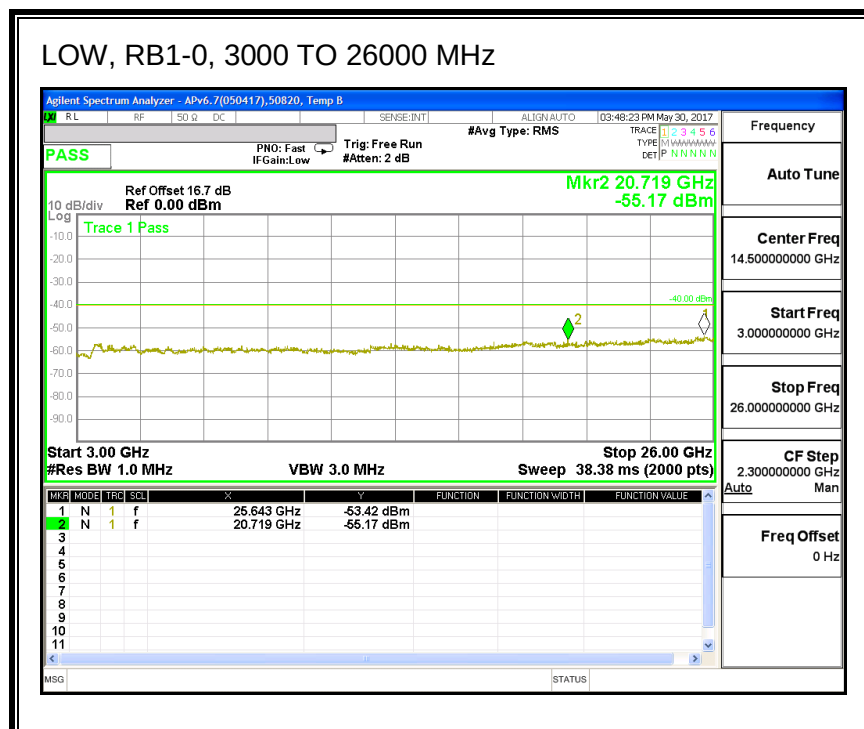
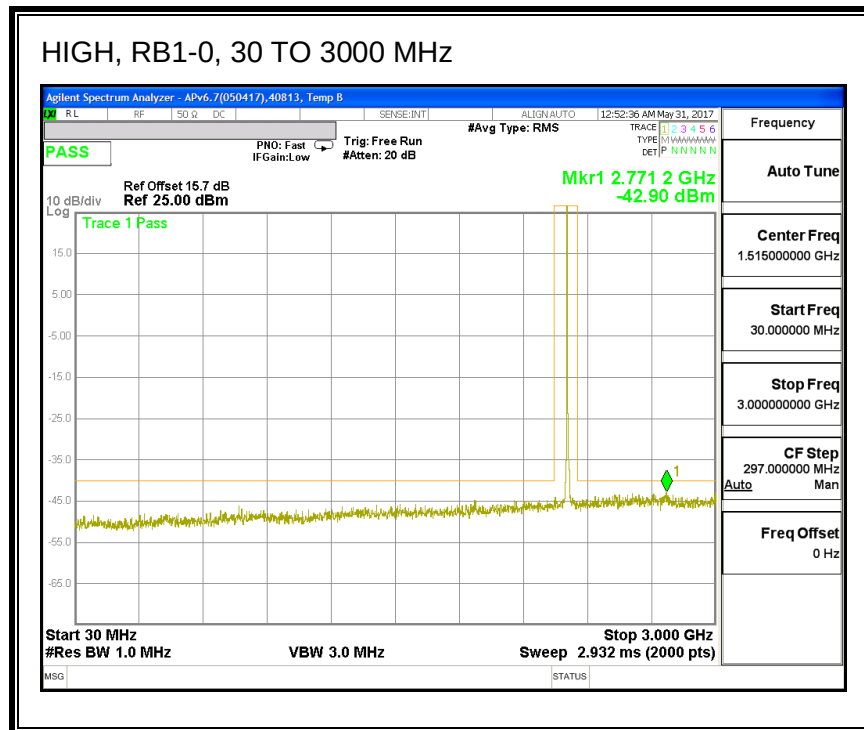
16QAM, (10.0 MHz BAND WIDTH)

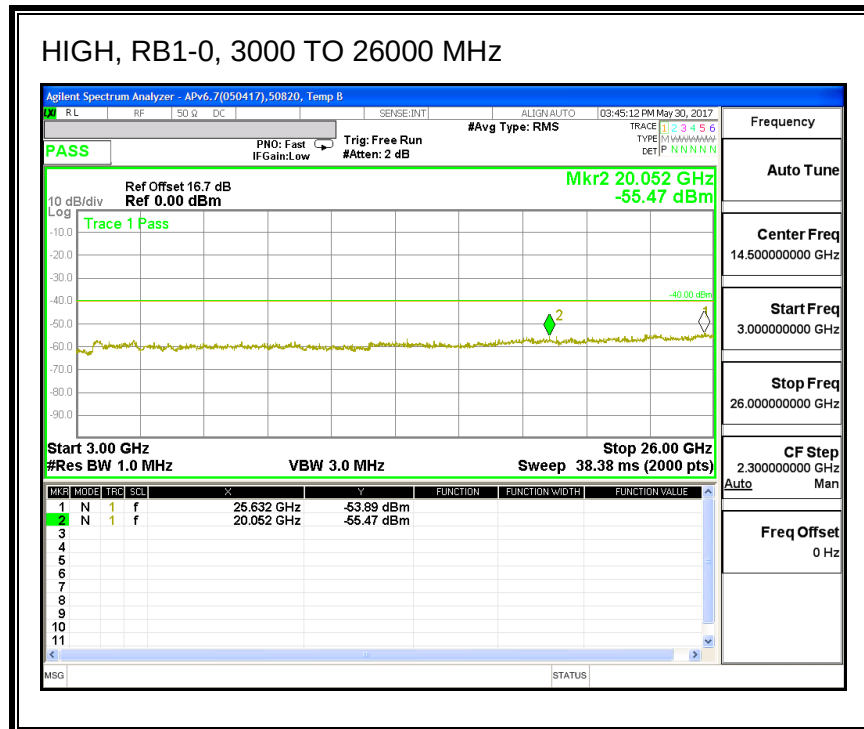
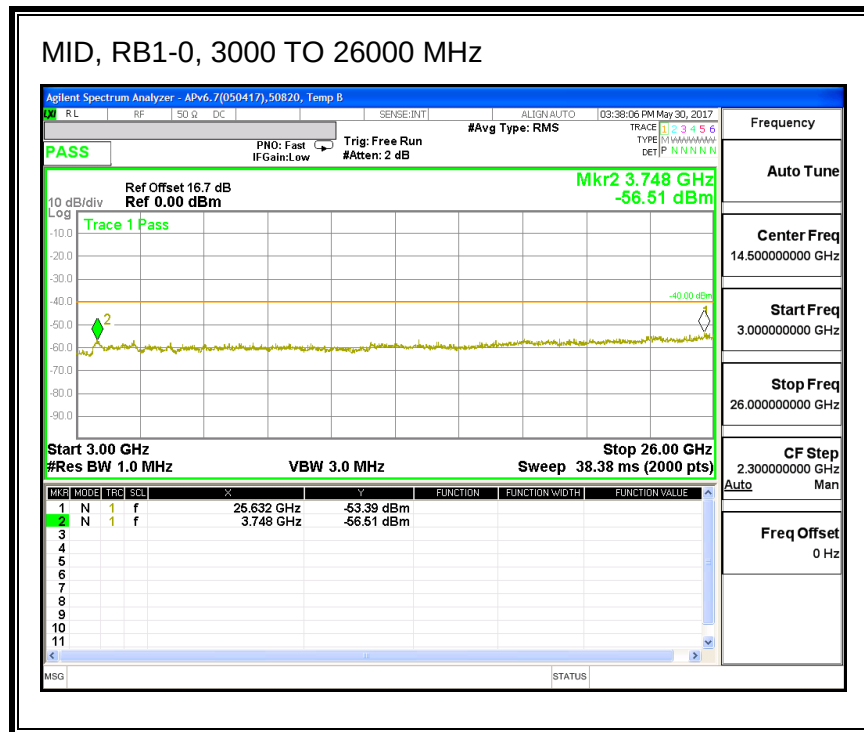


8.3.10. LTE BAND 30

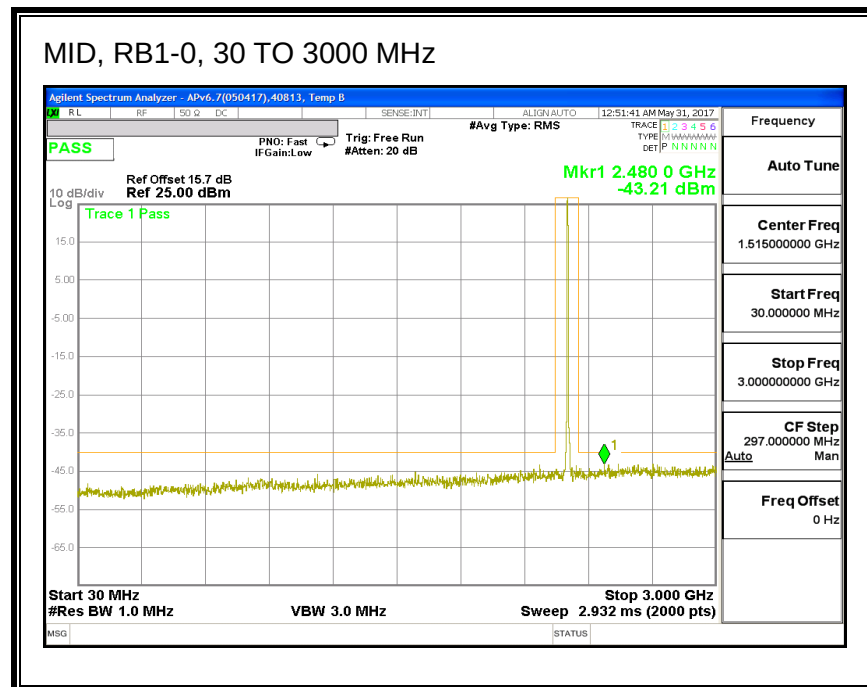
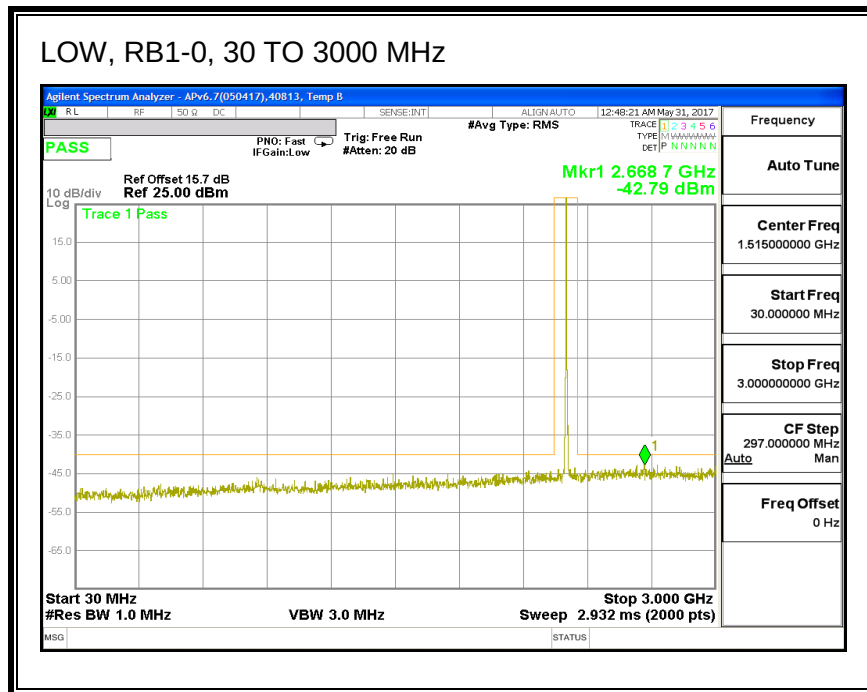
QPSK, (5.0 MHz BAND WIDTH)

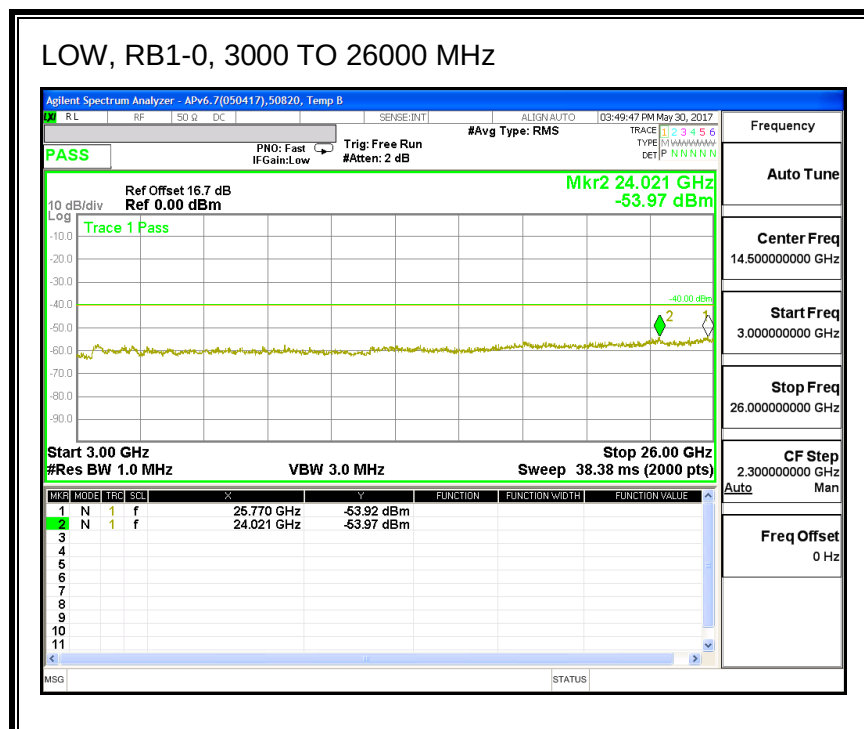
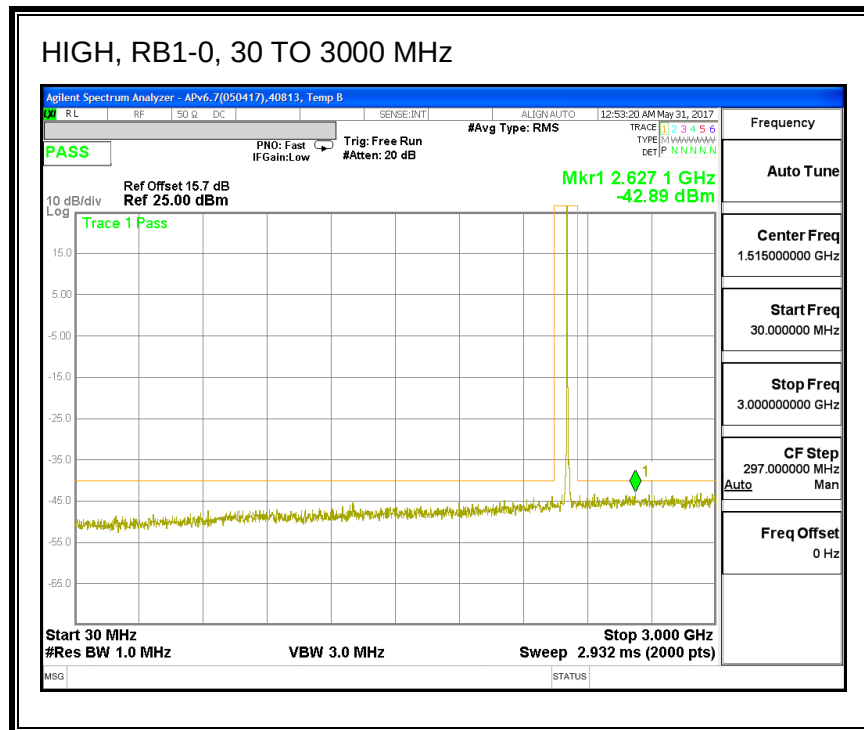




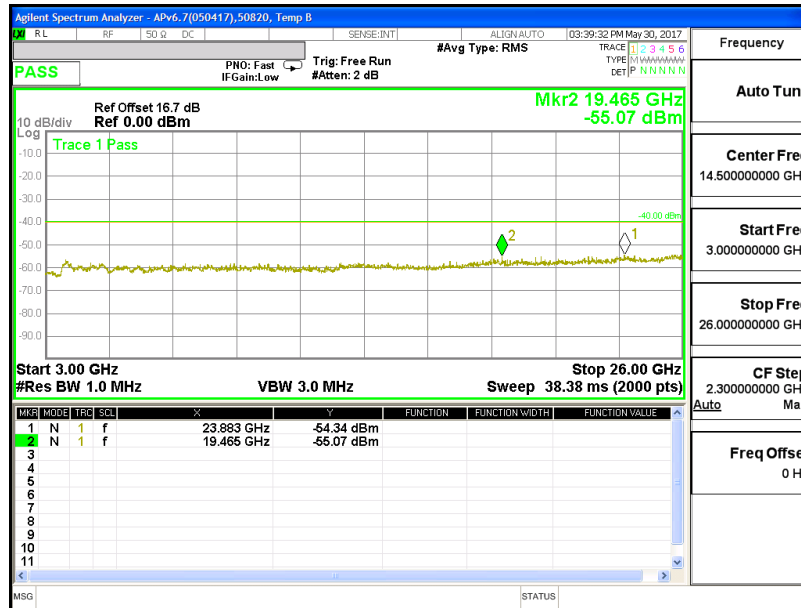


16QAM, (5.0 MHz BAND WIDTH)

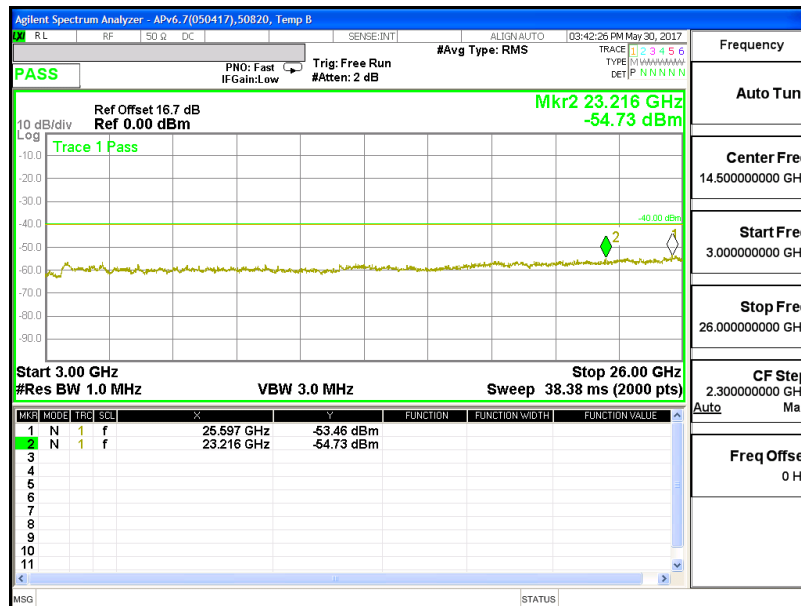




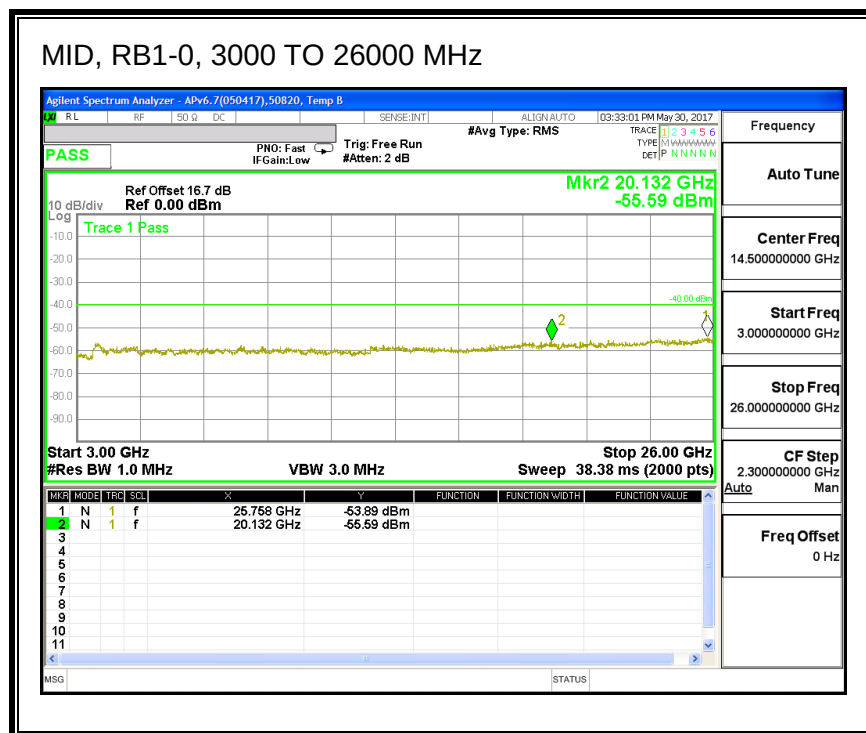
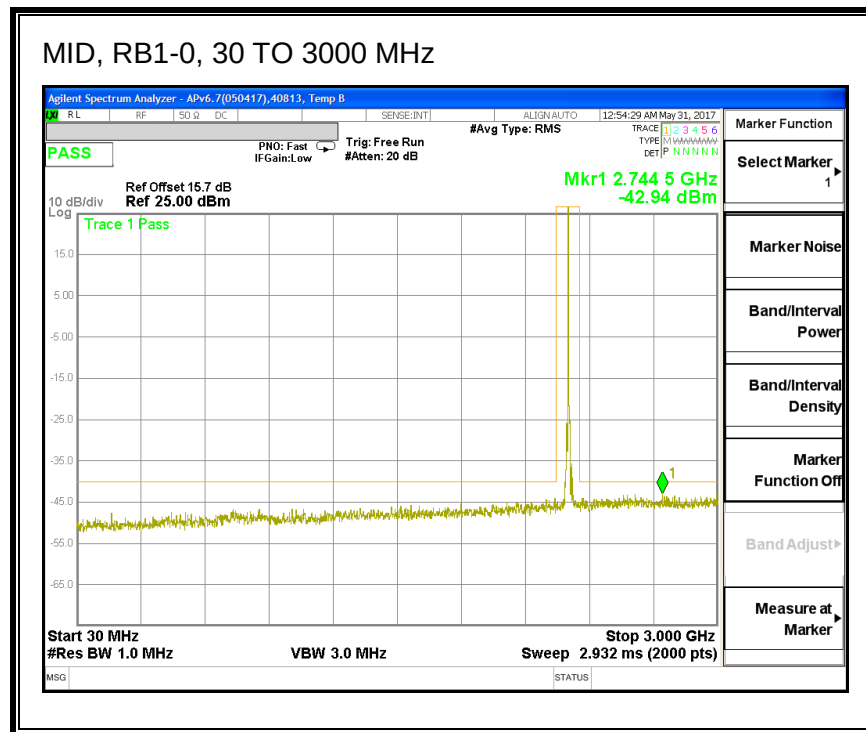
MID, RB1-0, 3000 TO 26000 MHz



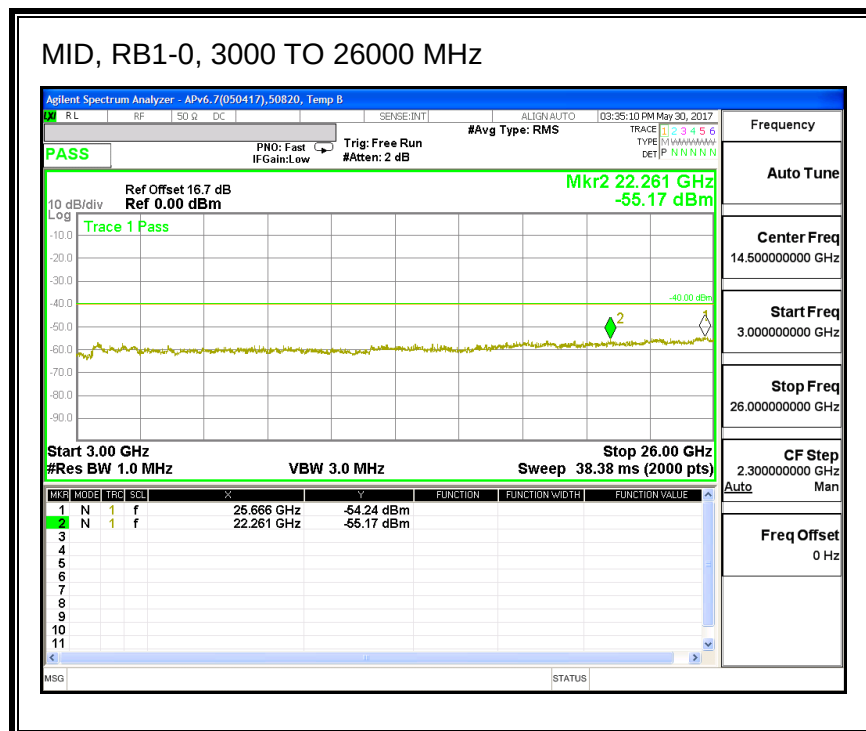
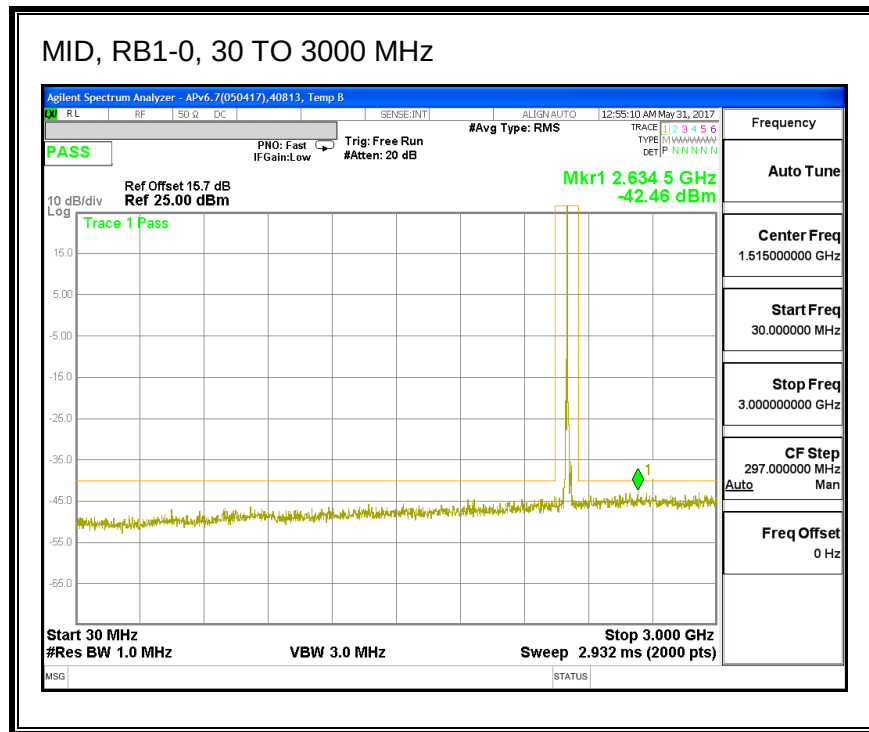
HIGH, RB1-0, 3000 TO 26000 MHz



QPSK, (10.0 MHz BAND WIDTH)

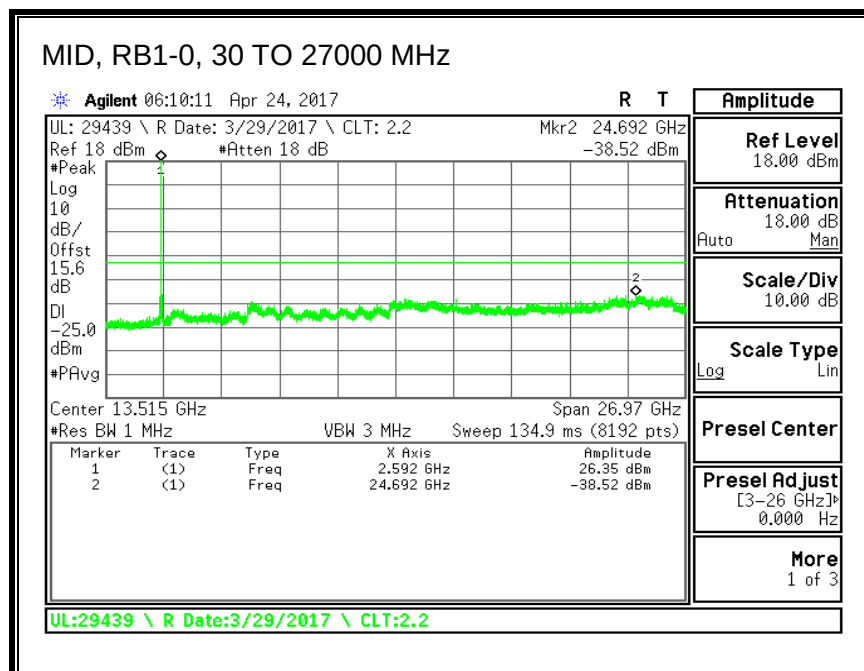
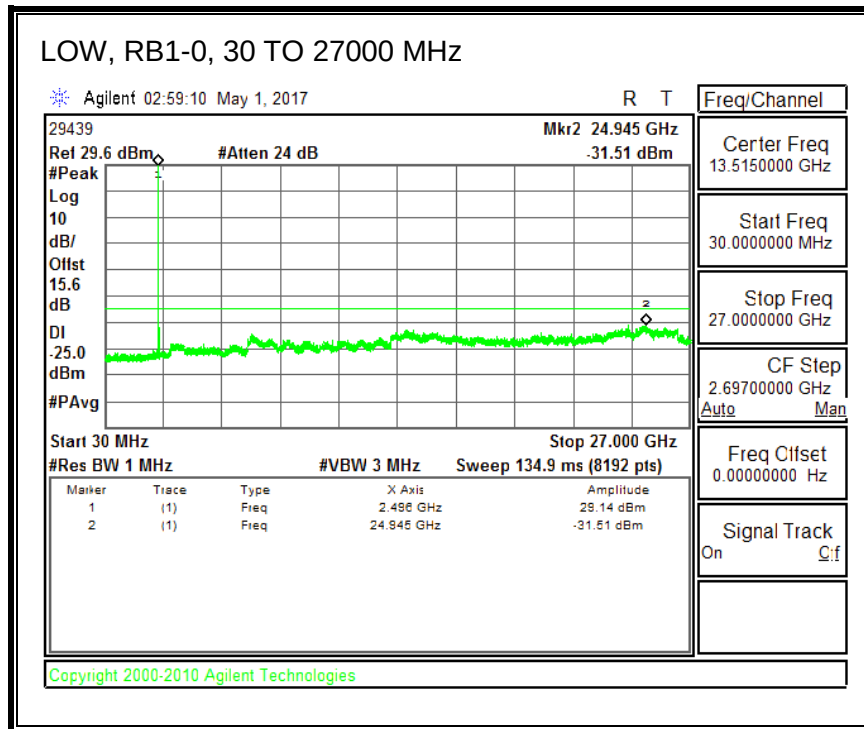


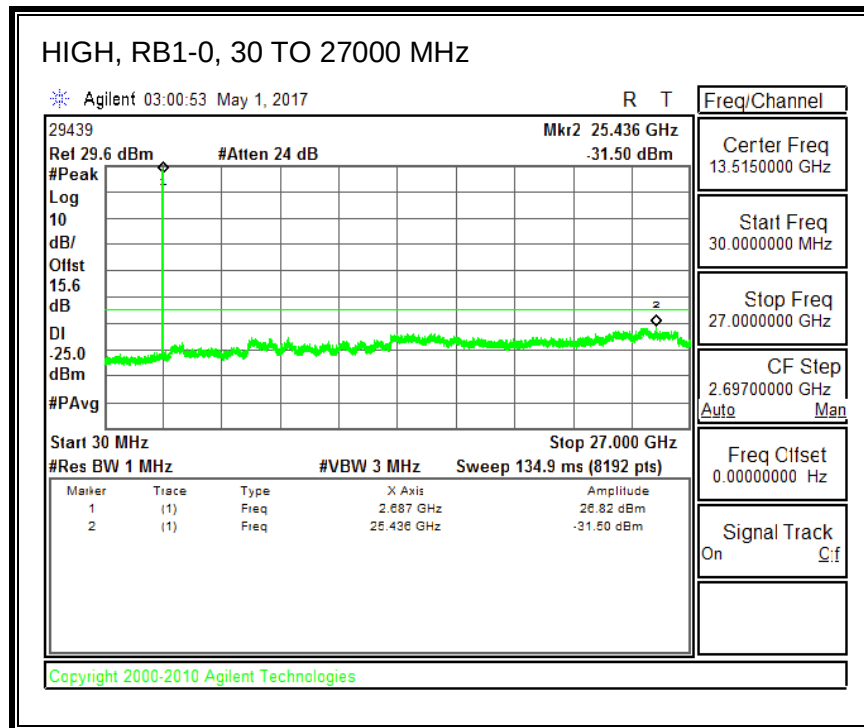
16QAM, (10.0 MHz BAND WIDTH)



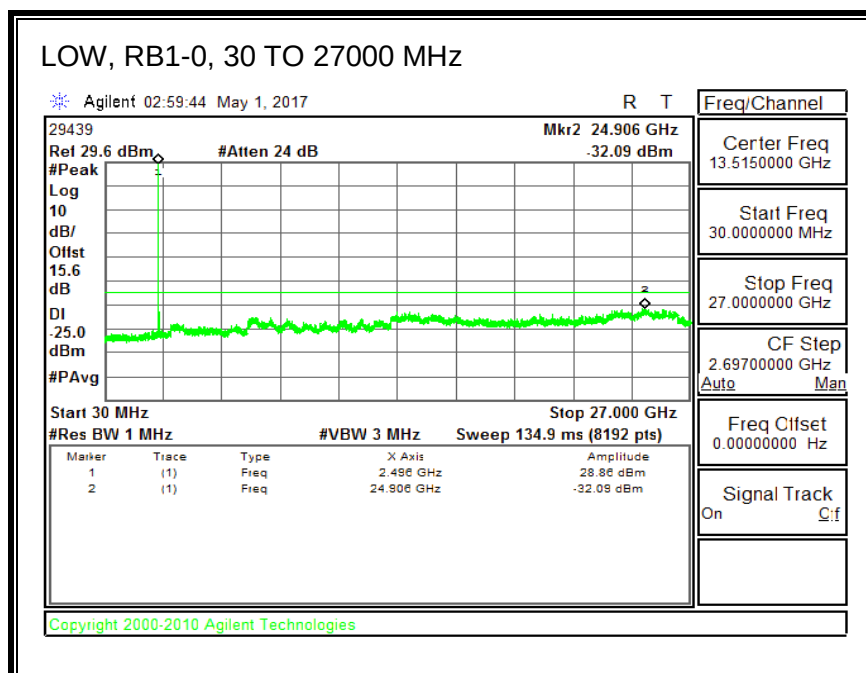
8.3.11. LTE BAND 41

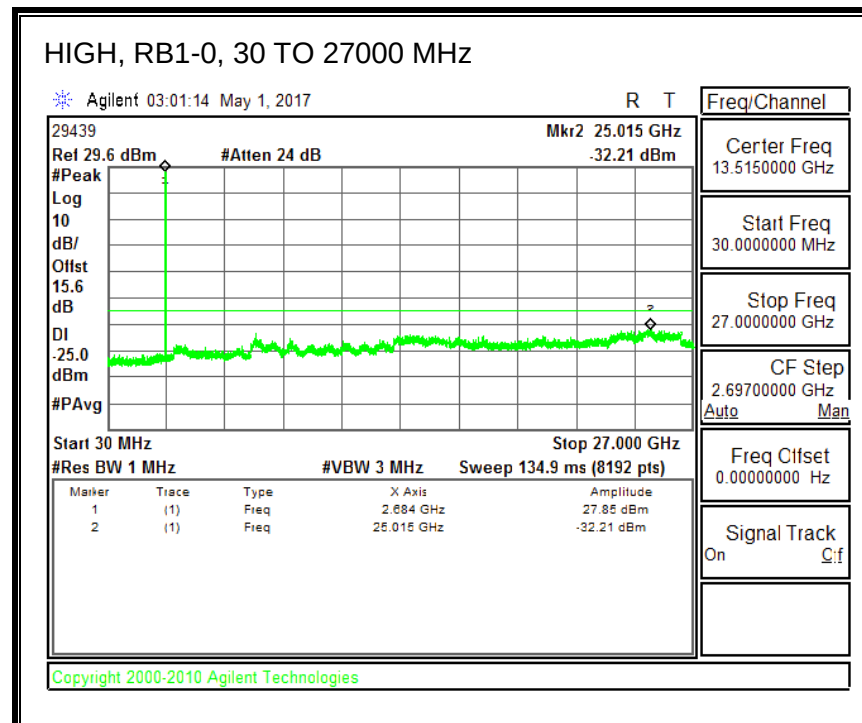
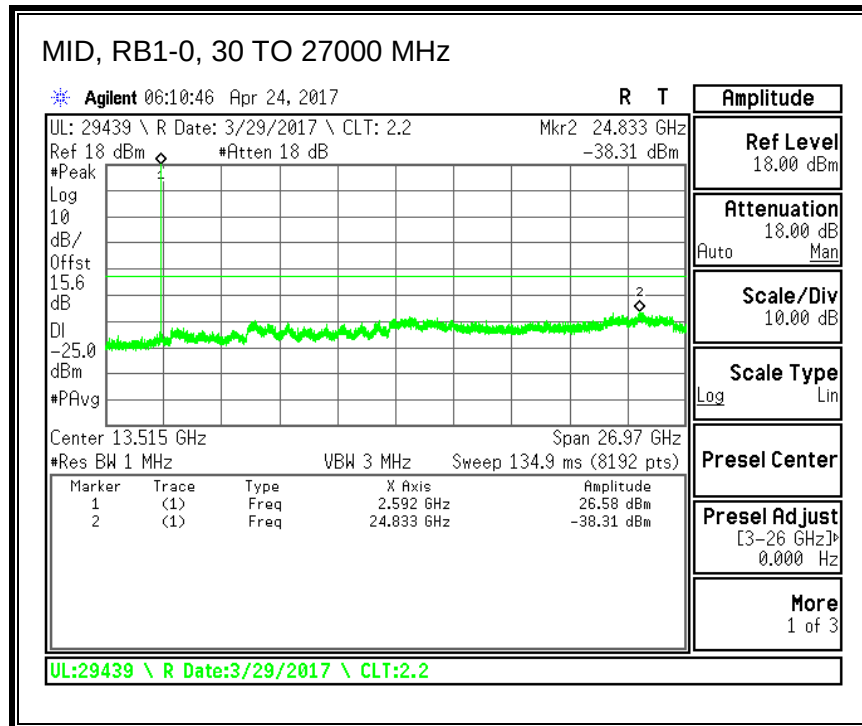
QPSK, (5.0 MHz BAND WIDTH)



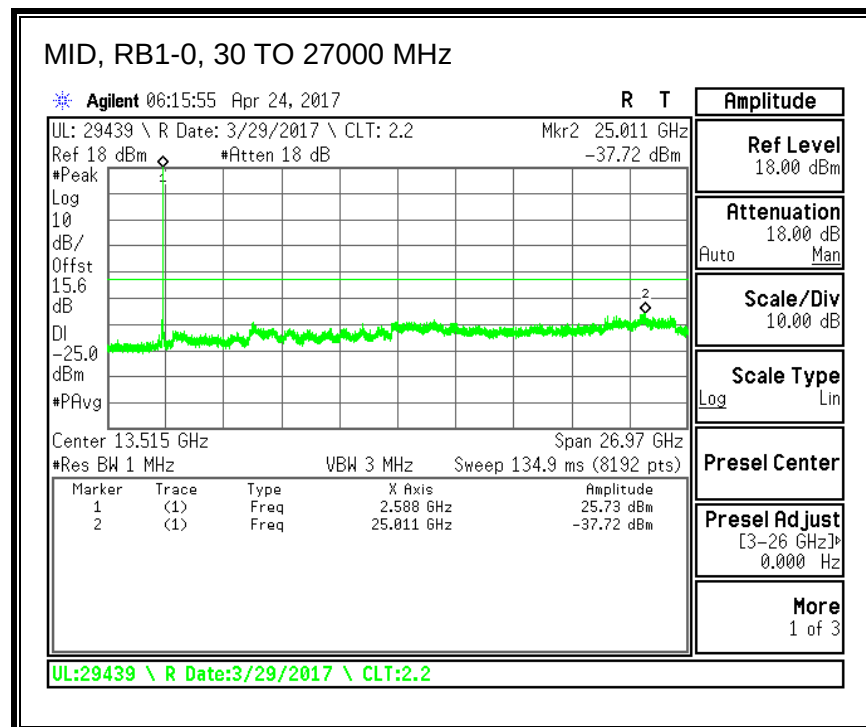
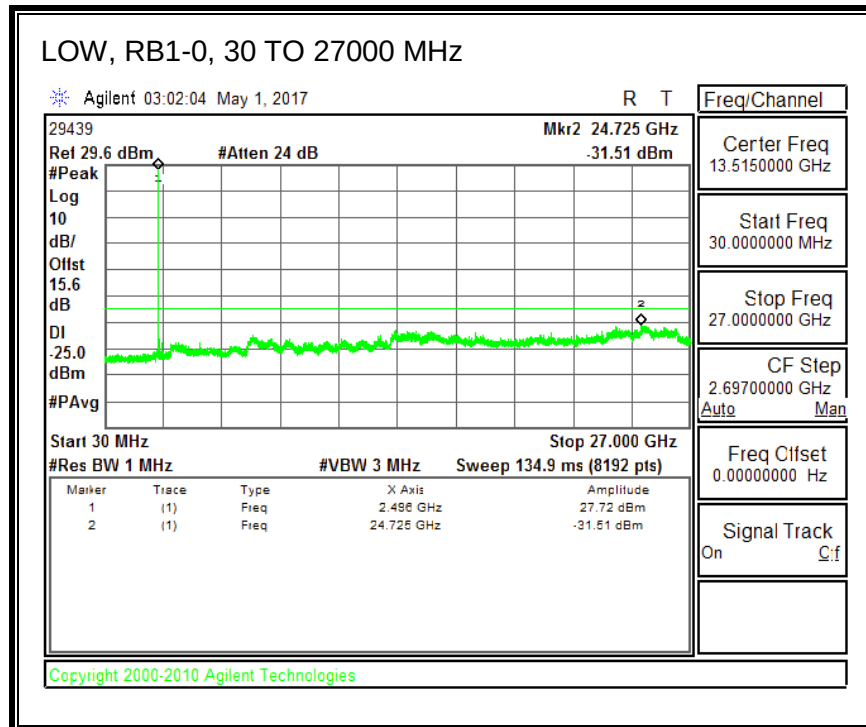


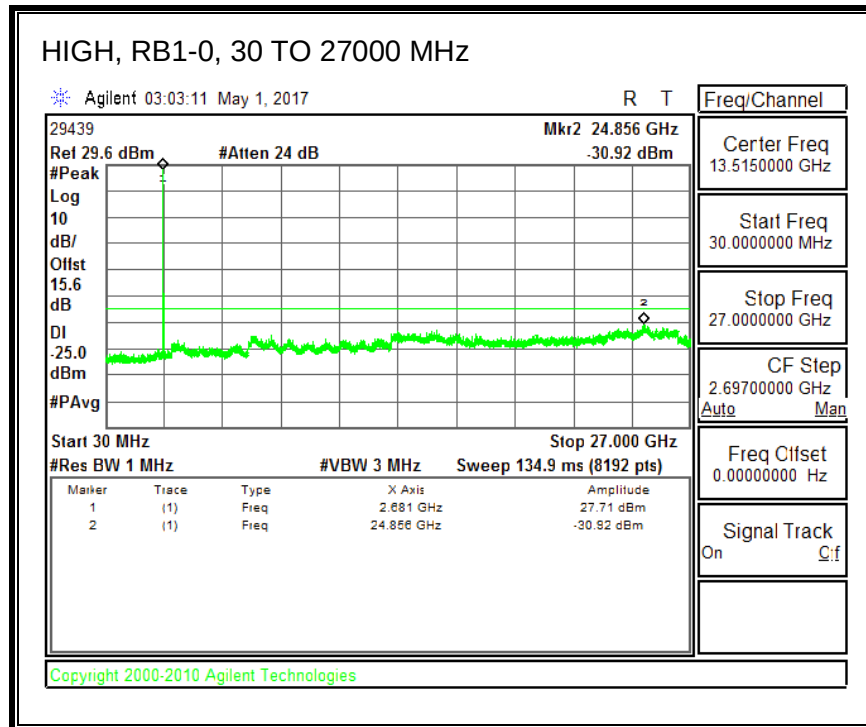
16QAM, (5.0 MHz BAND WIDTH)



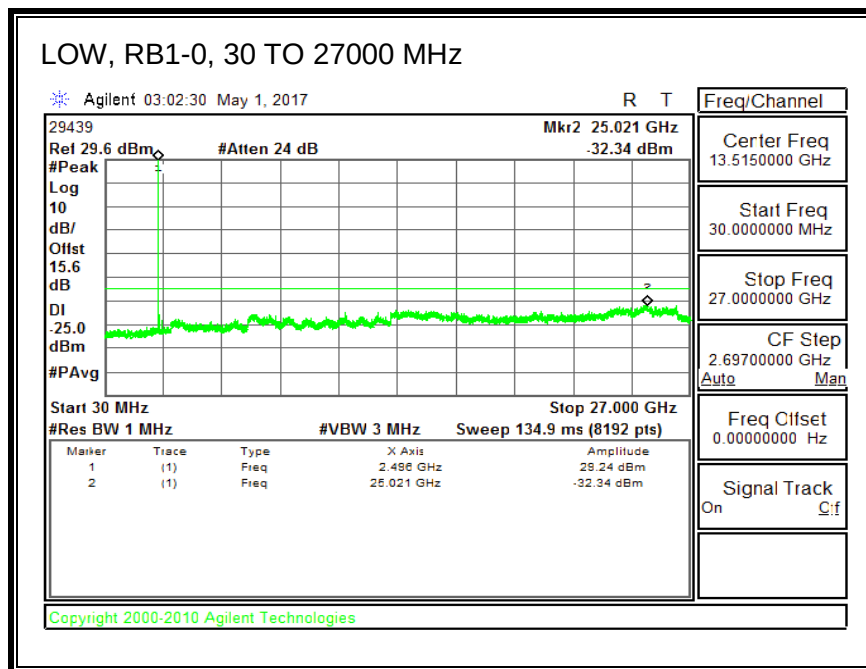


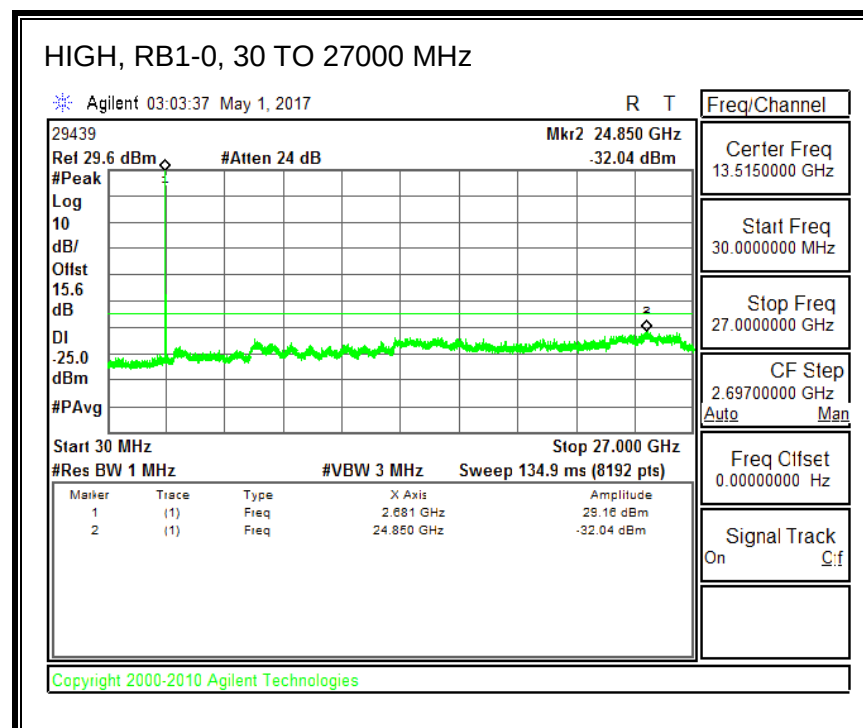
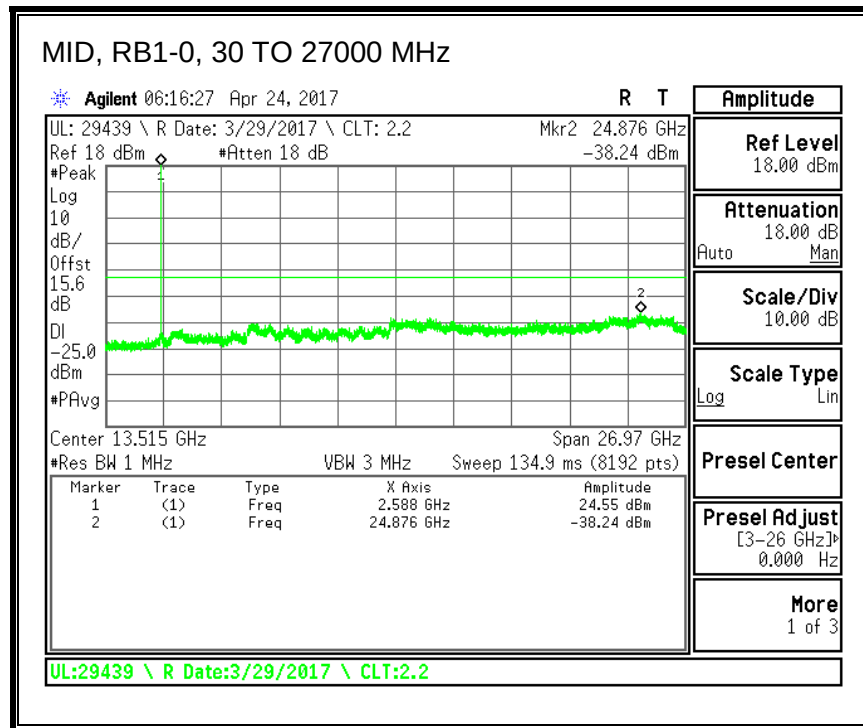
QPSK, (10.0 MHz BAND WIDTH)



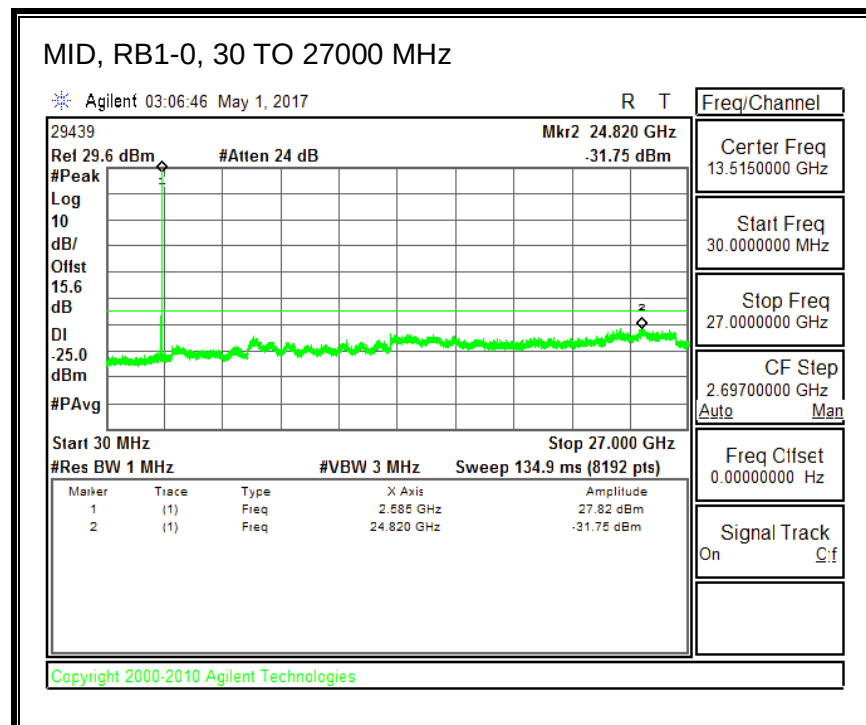
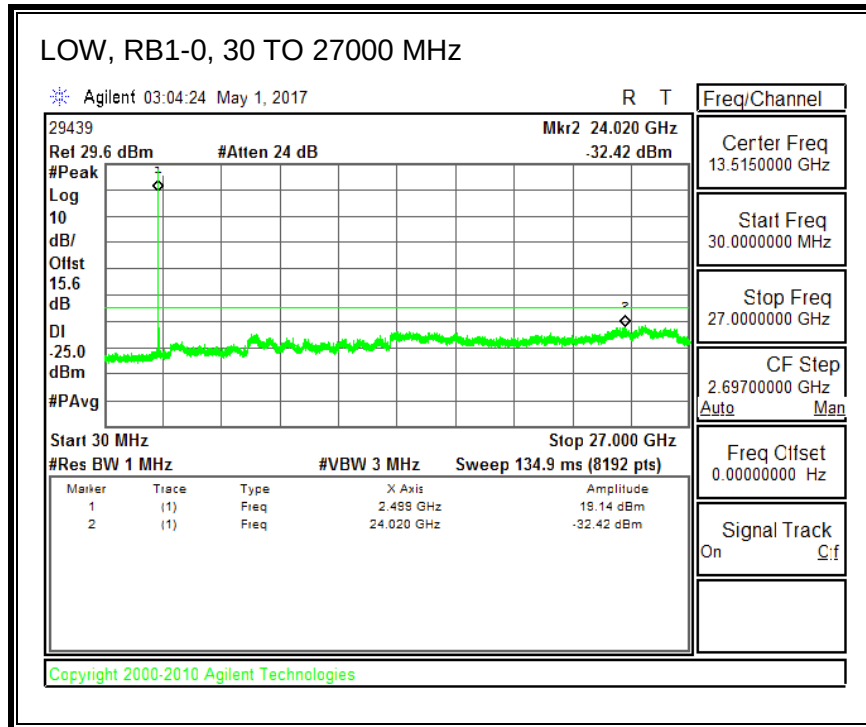


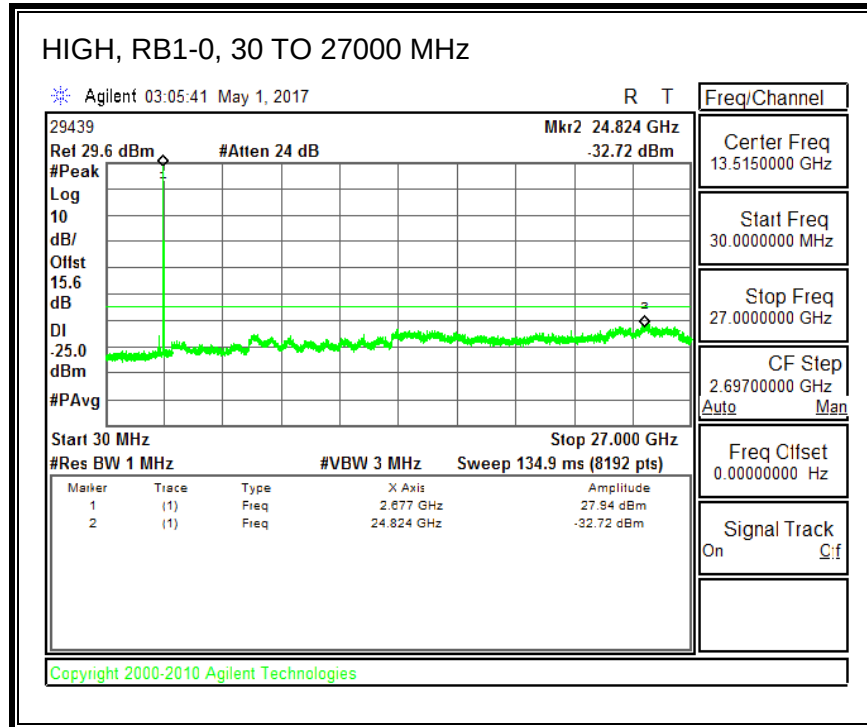
16QAM, (10.0 MHz BAND WIDTH)



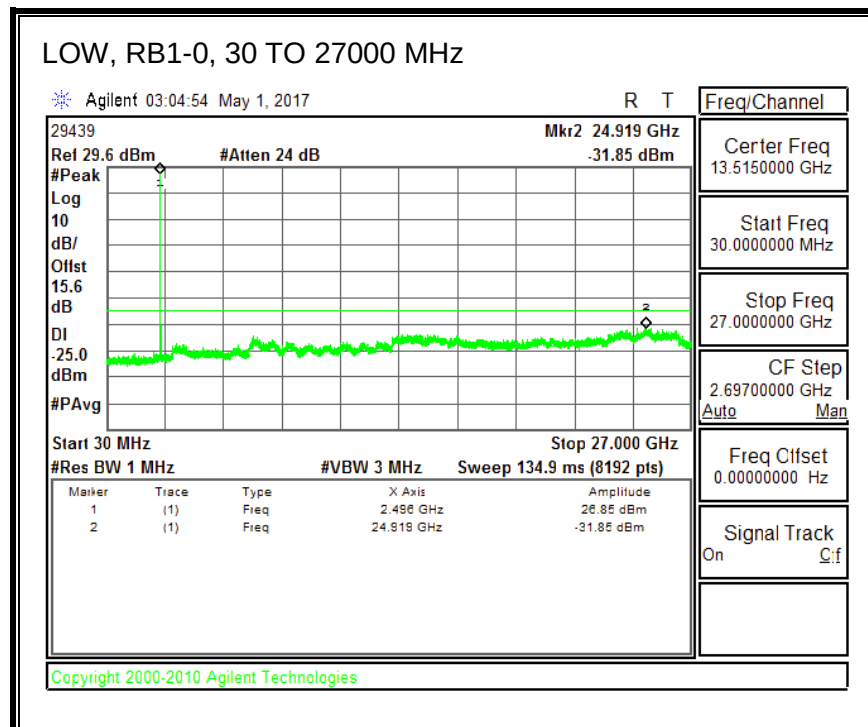


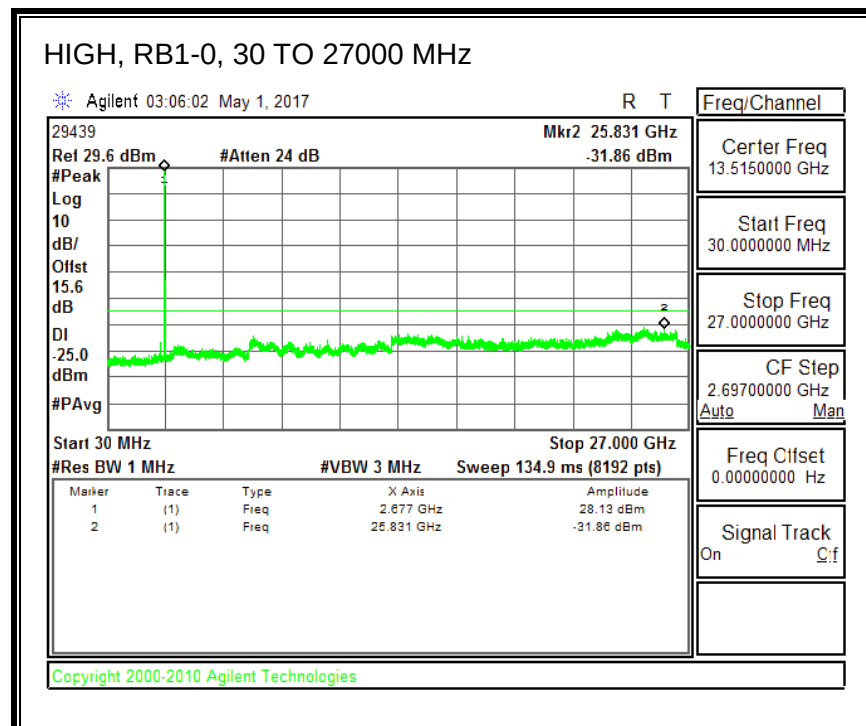
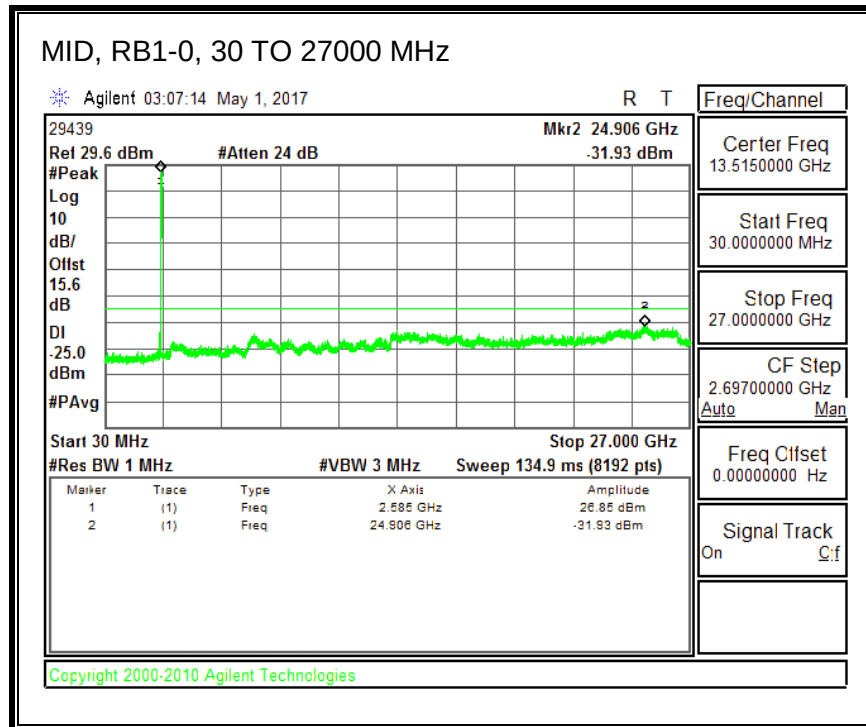
QPSK, (15.0 MHz BAND WIDTH)



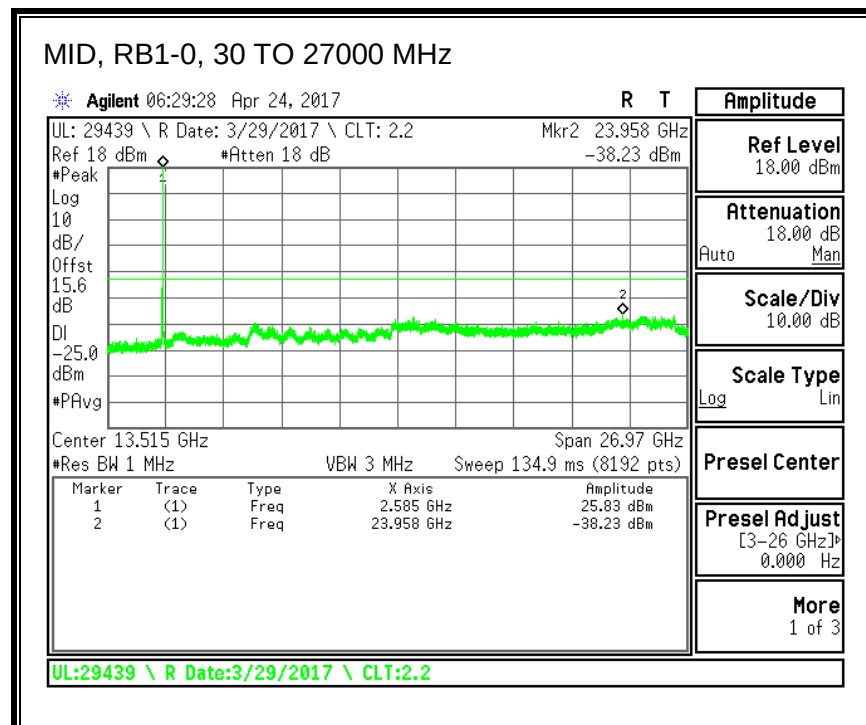
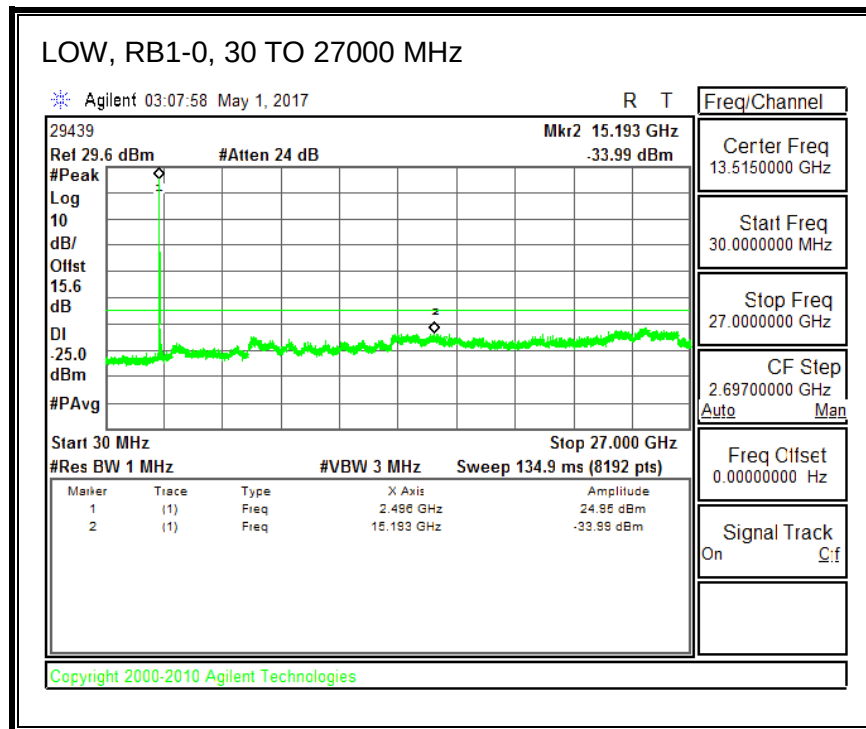


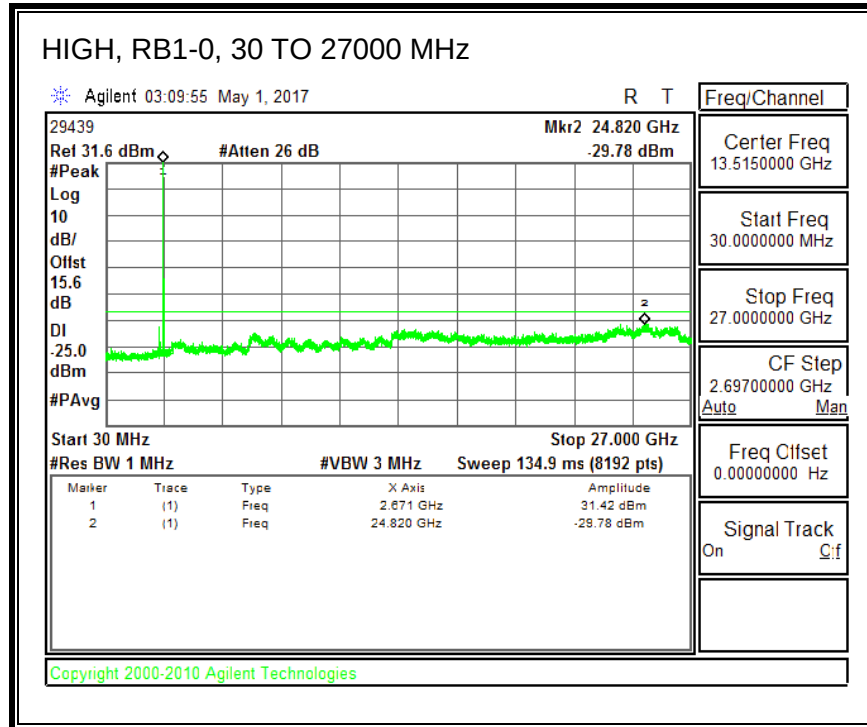
16QAM, (15.0 MHz BAND WIDTH)



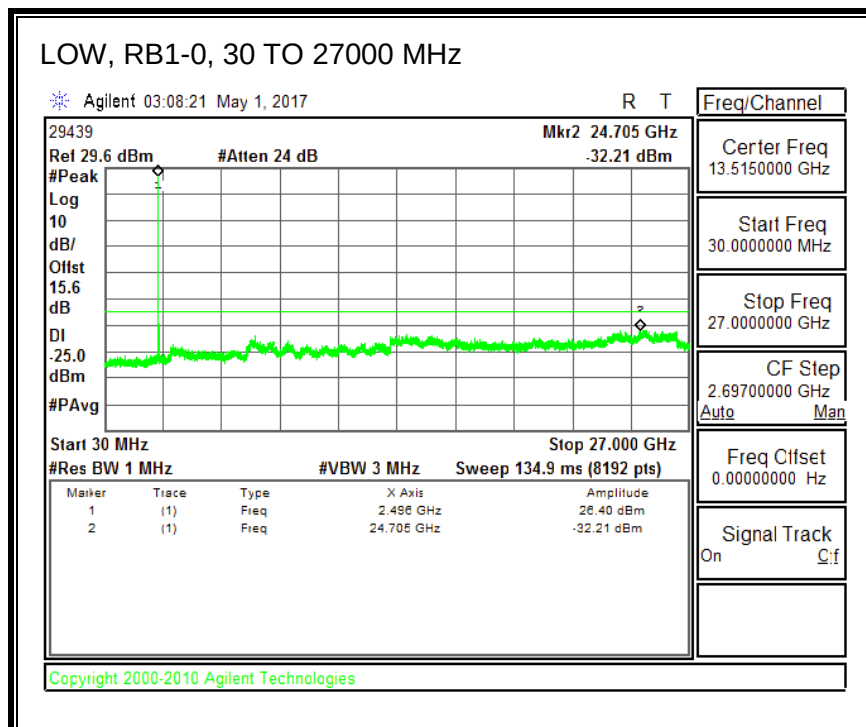


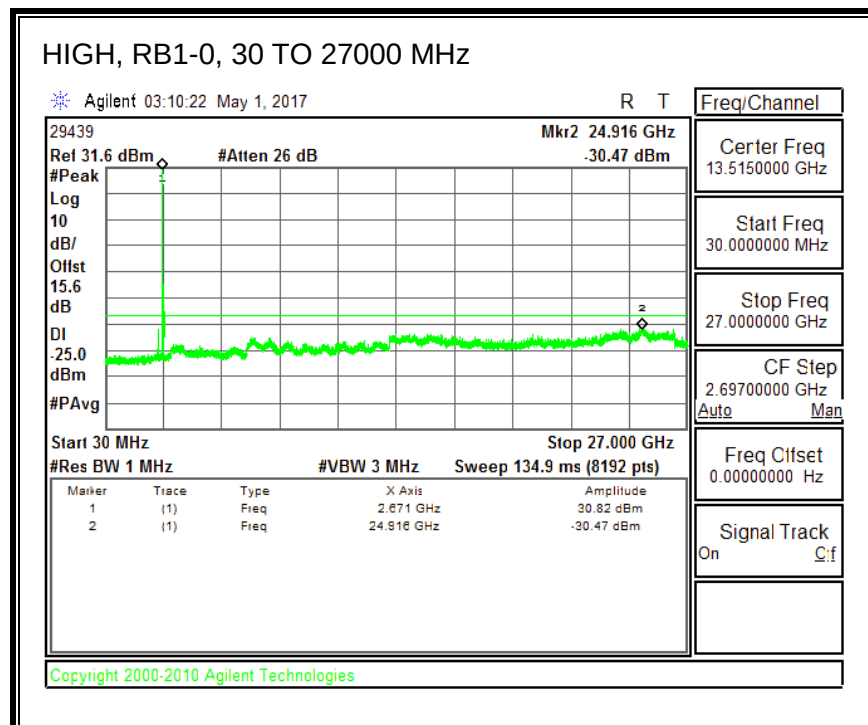
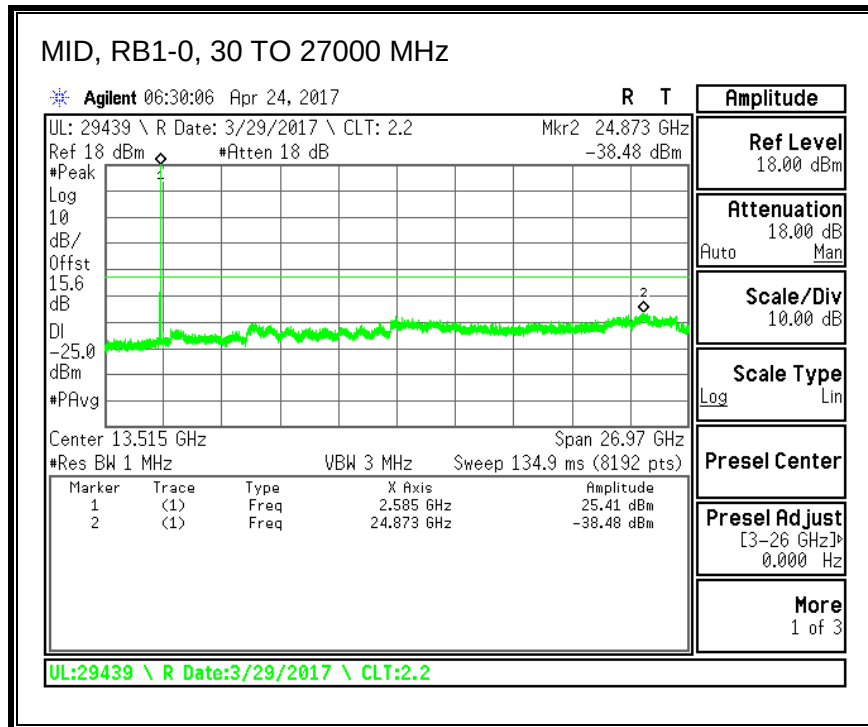
QPSK, (20.0 MHz BAND WIDTH)





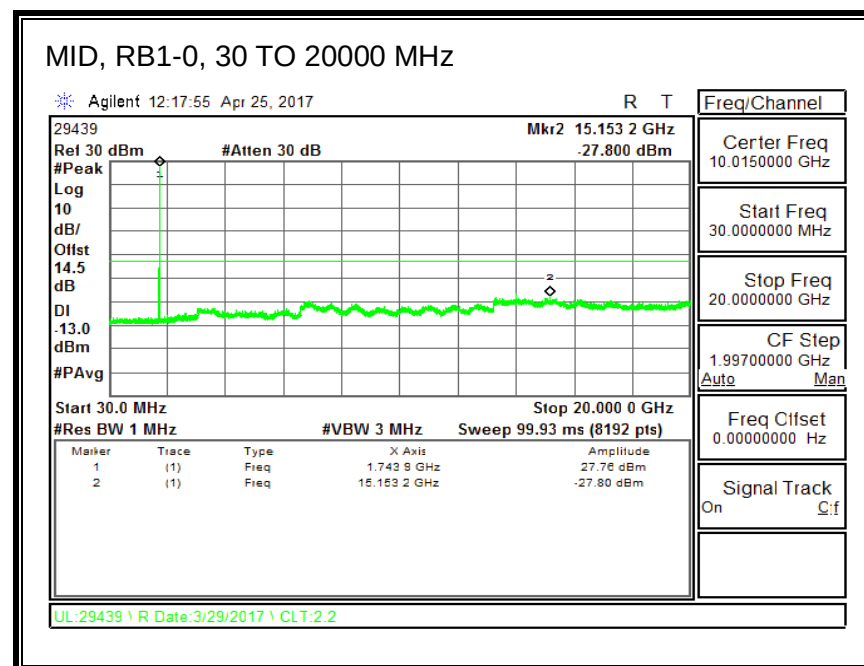
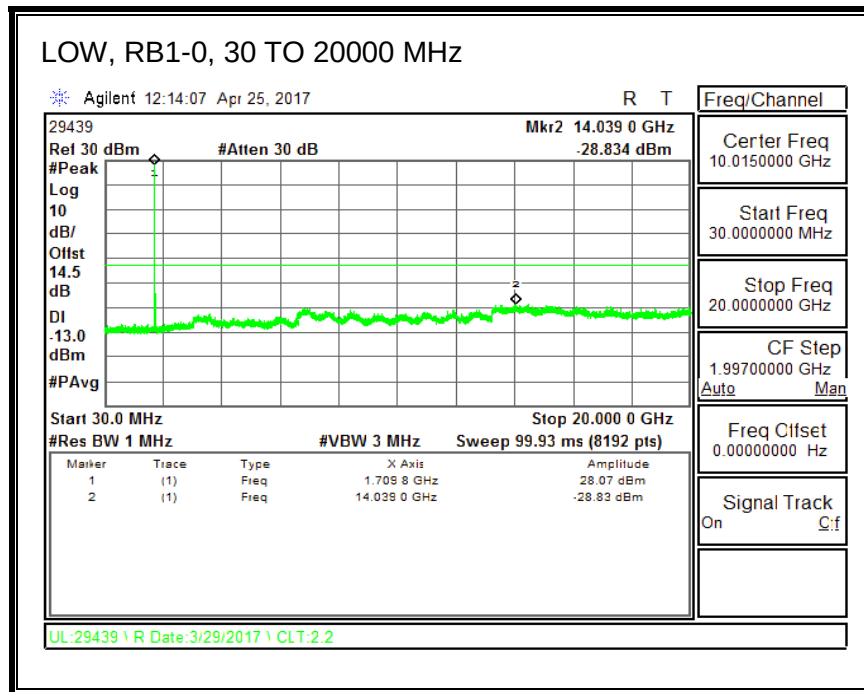
16QAM, (20.0 MHz BAND WIDTH)

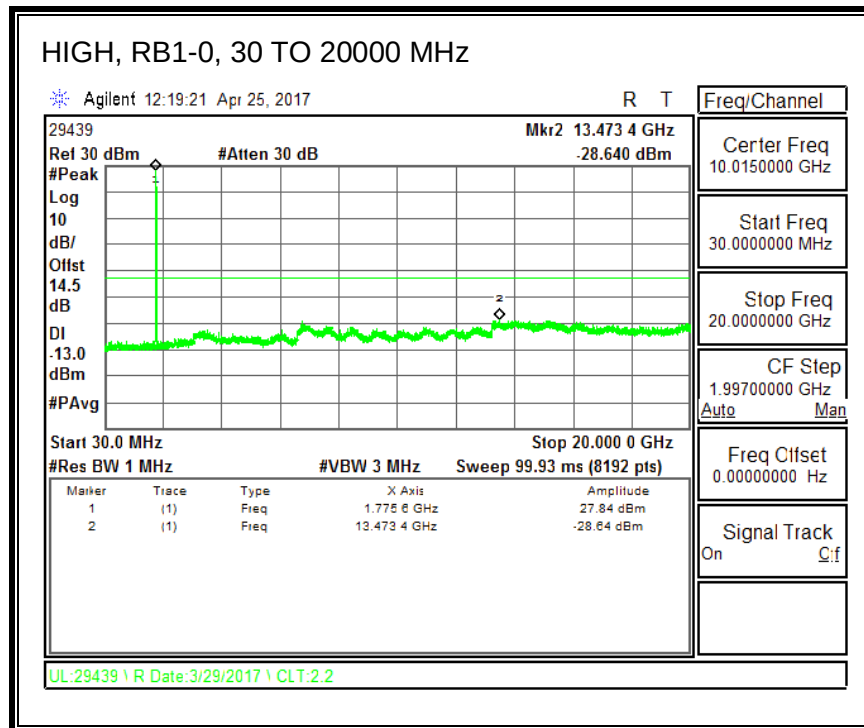




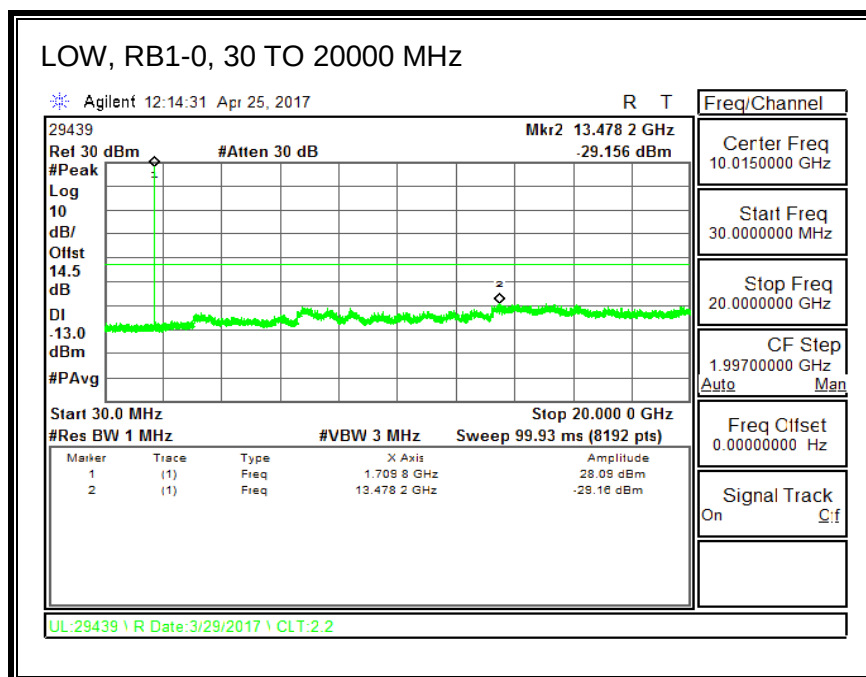
8.3.12. LTE BAND 66

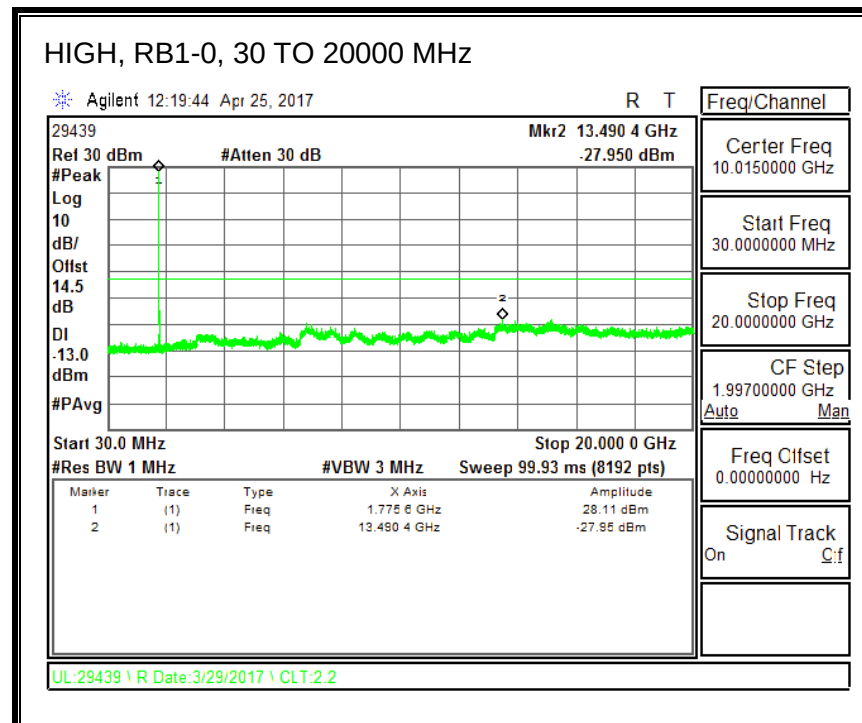
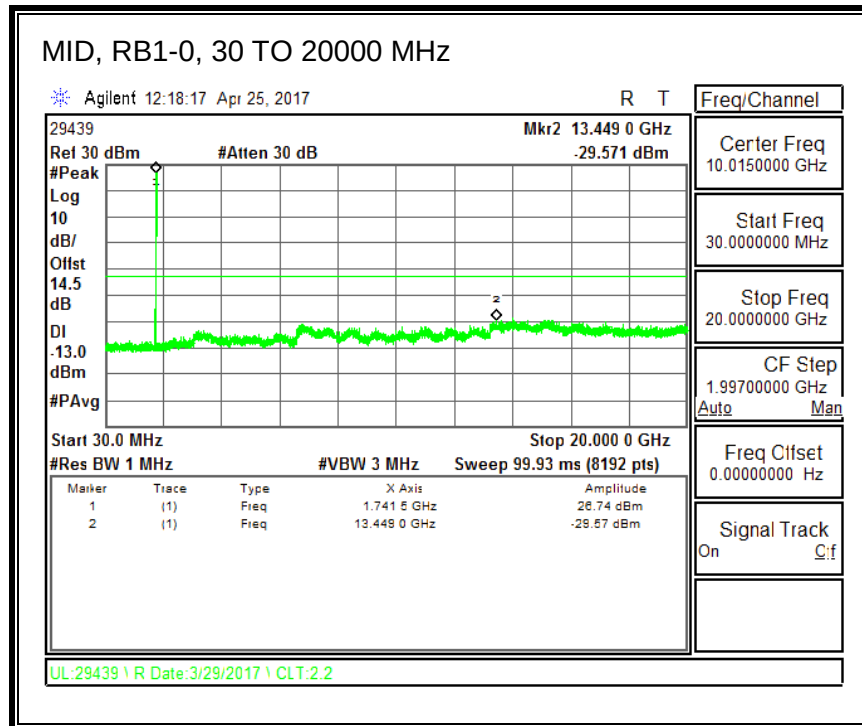
QPSK, (5.0 MHz BAND WIDTH)



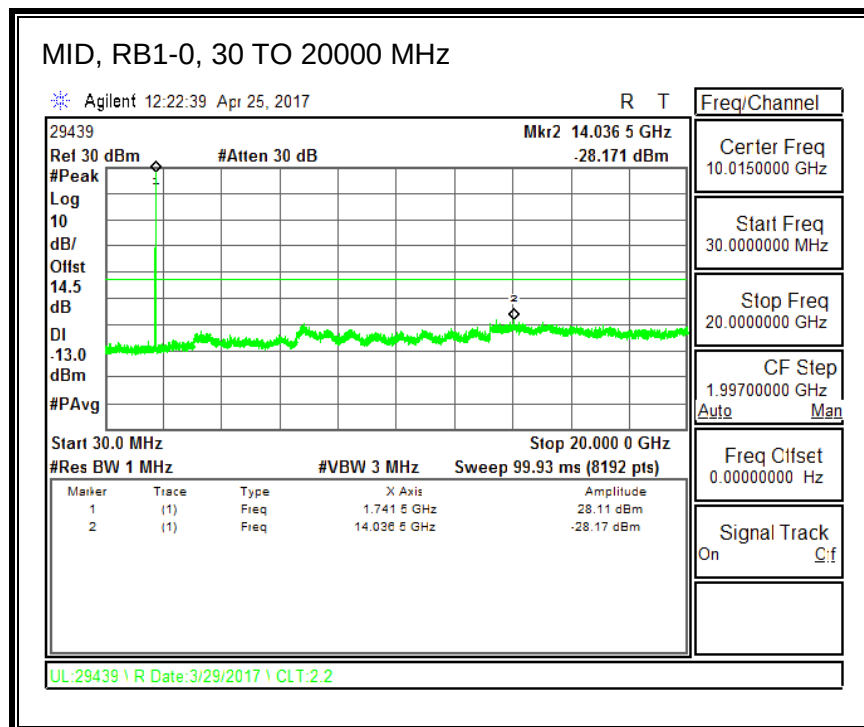
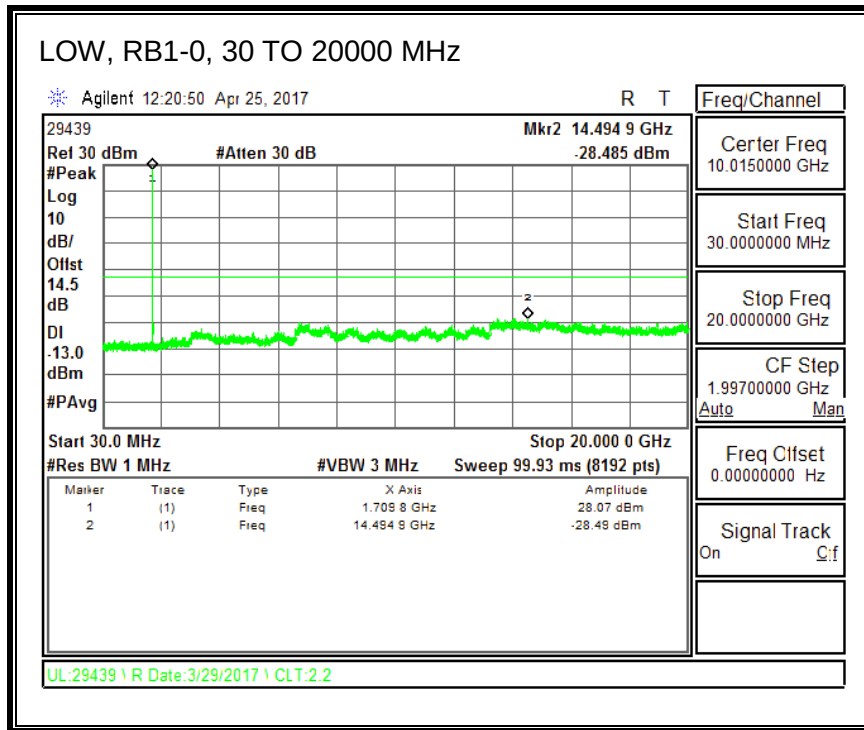


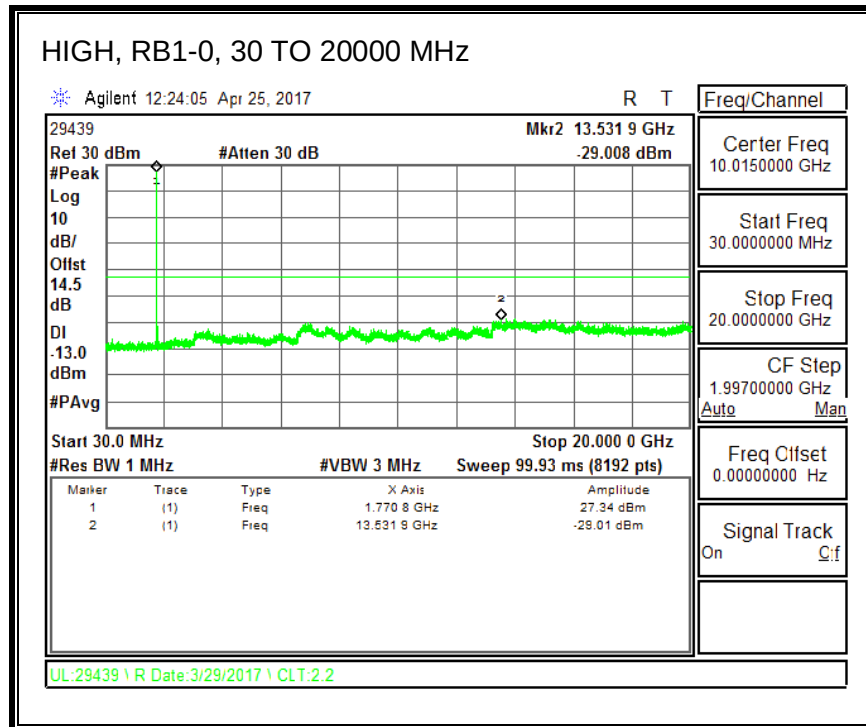
16QAM, (5.0 MHz BAND WIDTH)



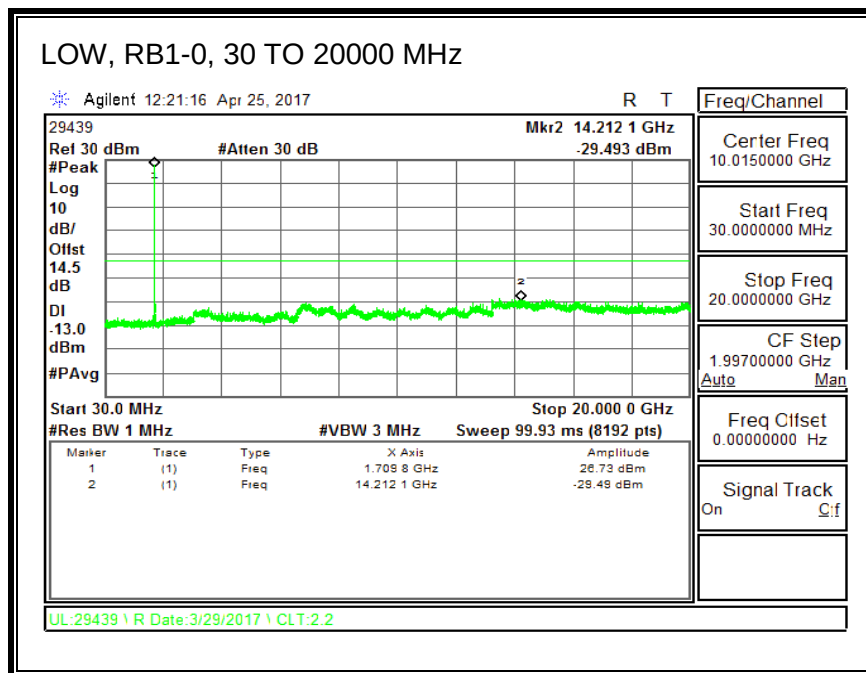


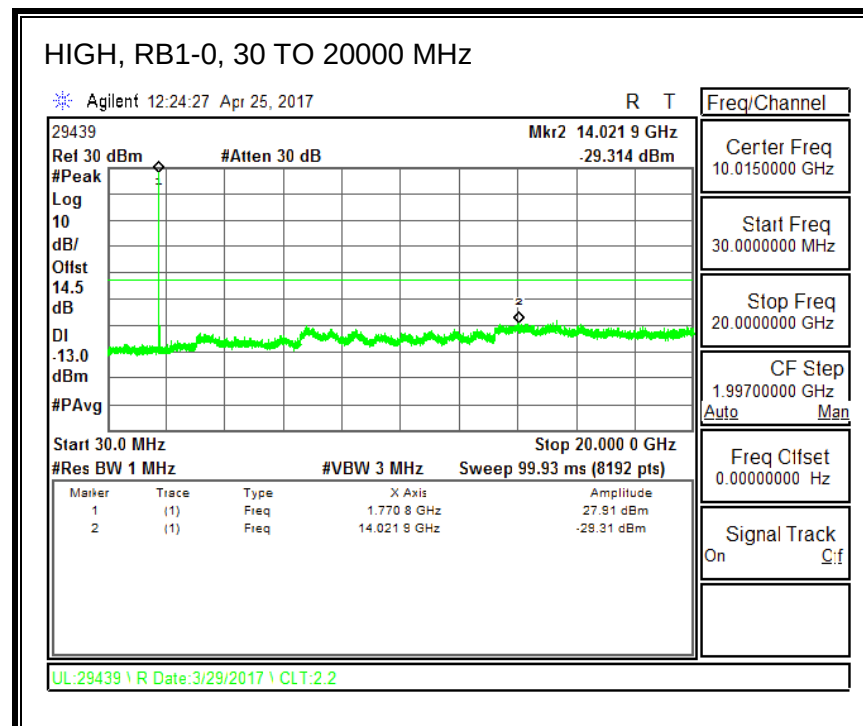
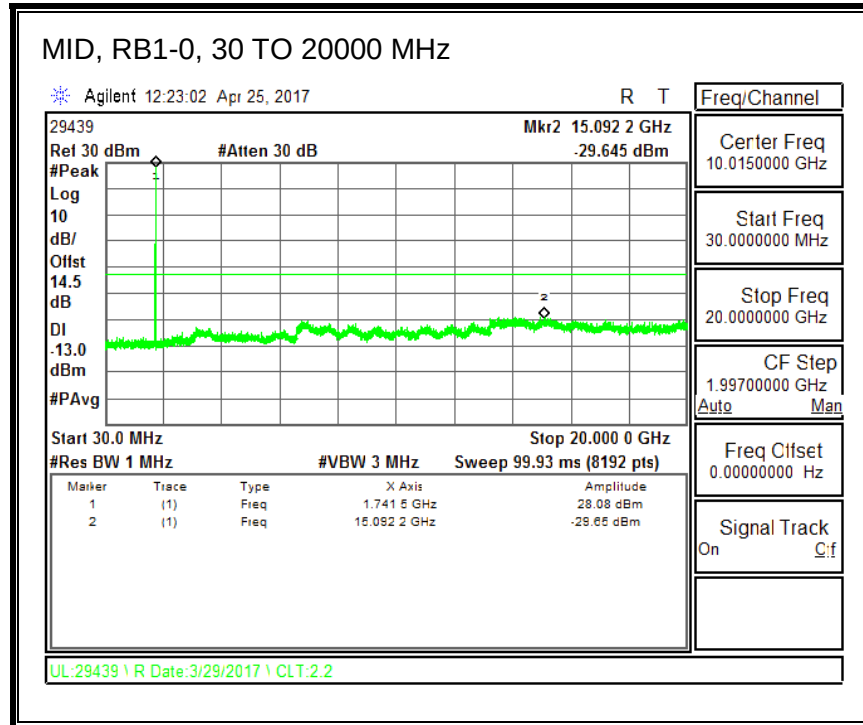
QPSK, (10.0 MHz BAND WIDTH)



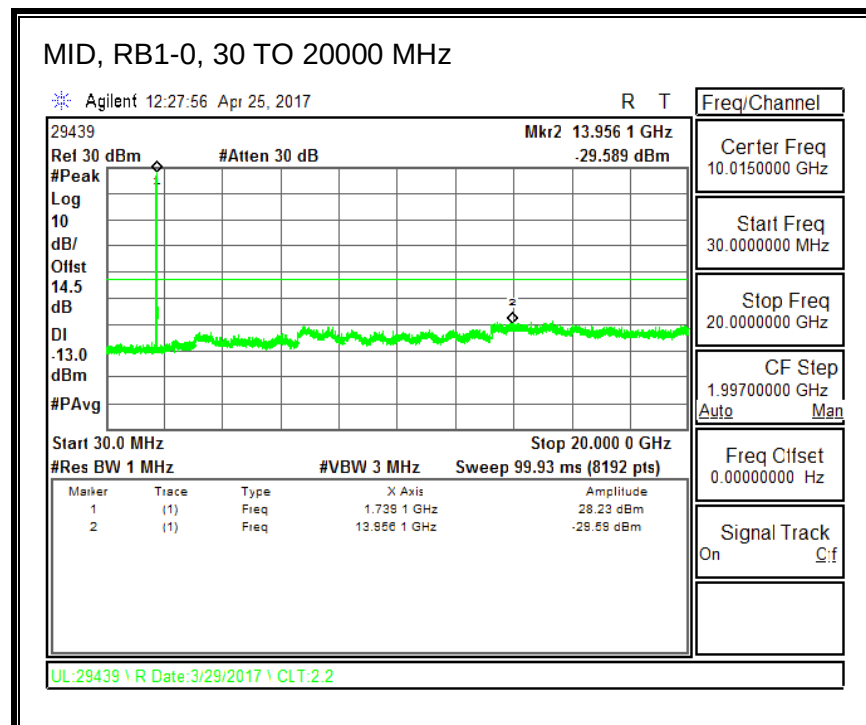
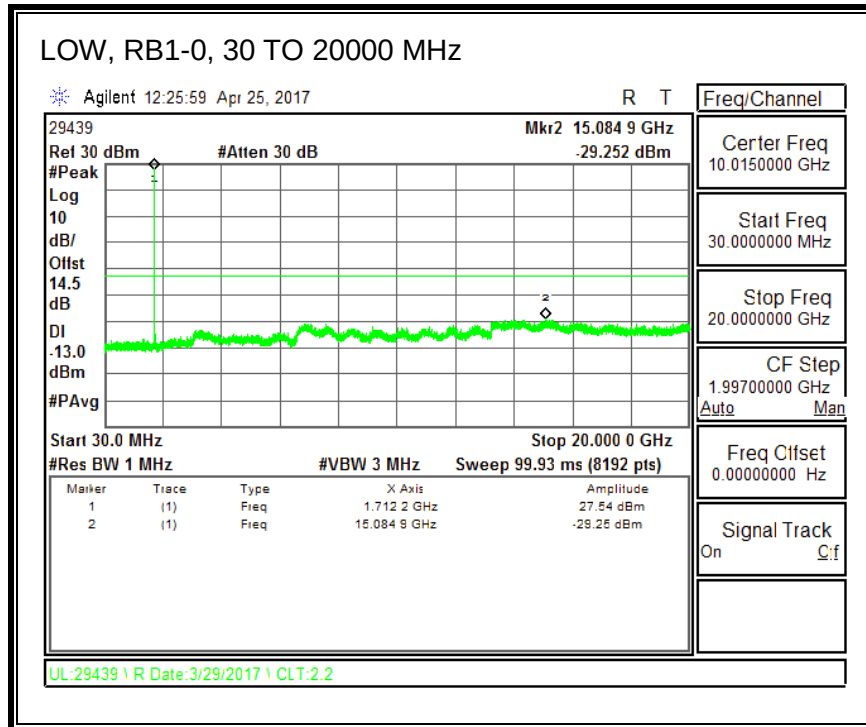


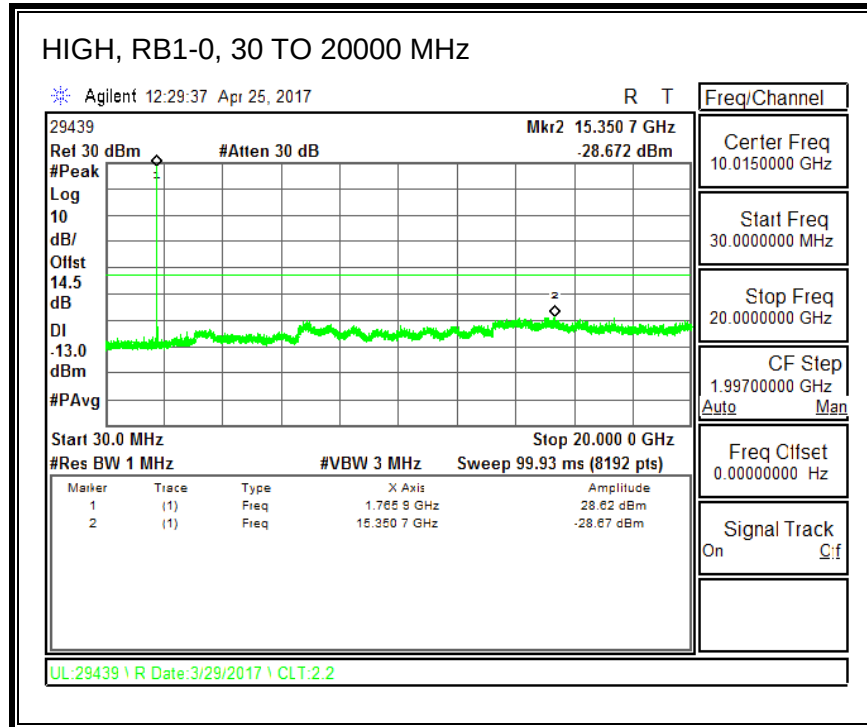
16QAM, (10.0 MHz BAND WIDTH)



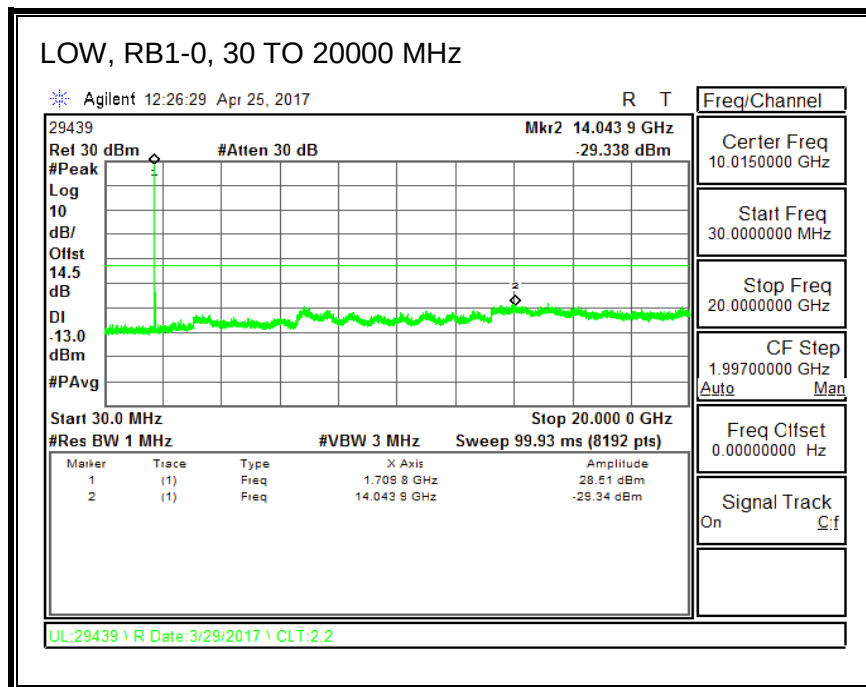


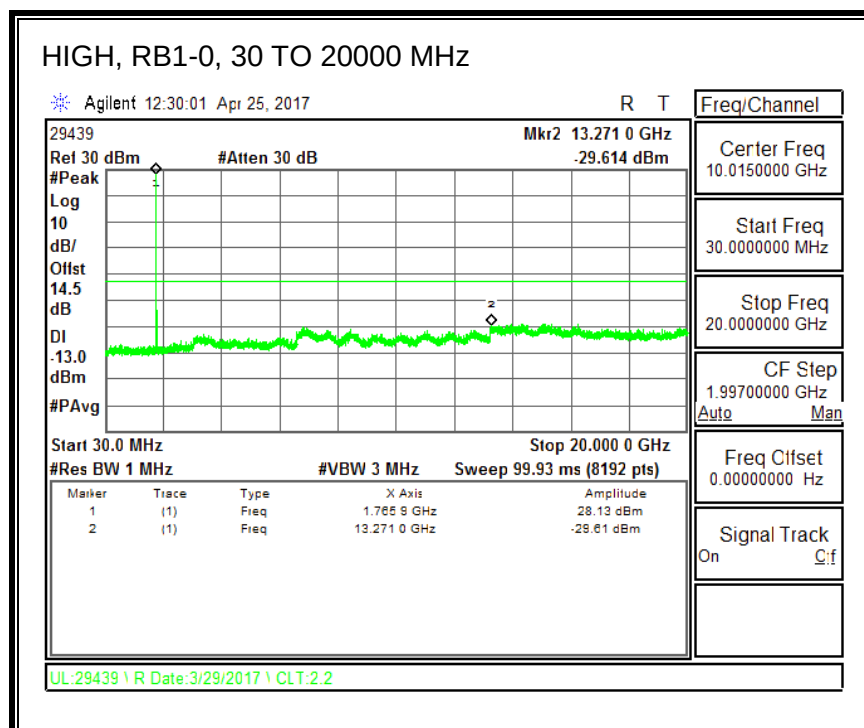
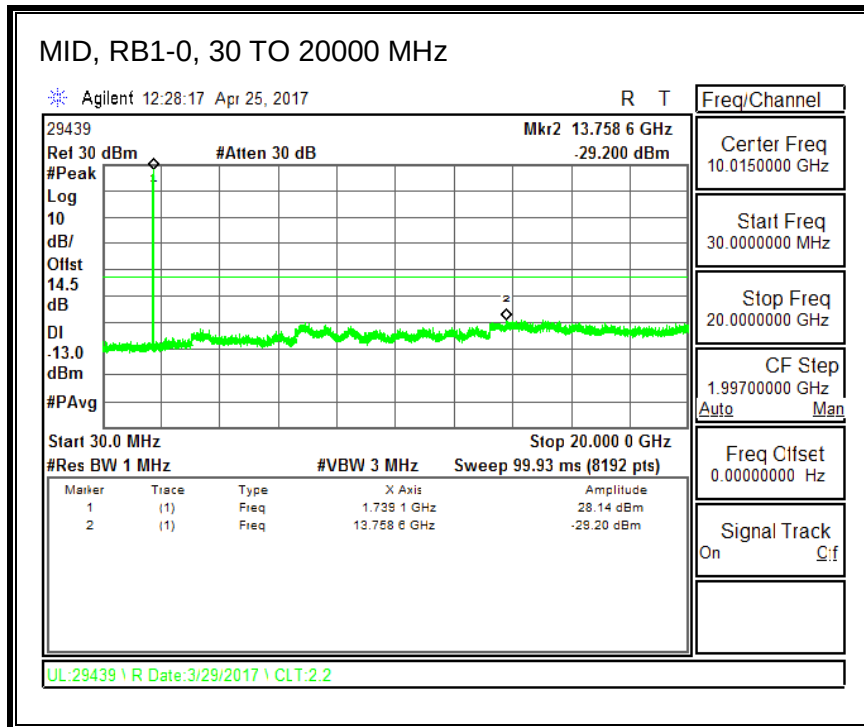
QPSK, (15.0 MHz BAND WIDTH)



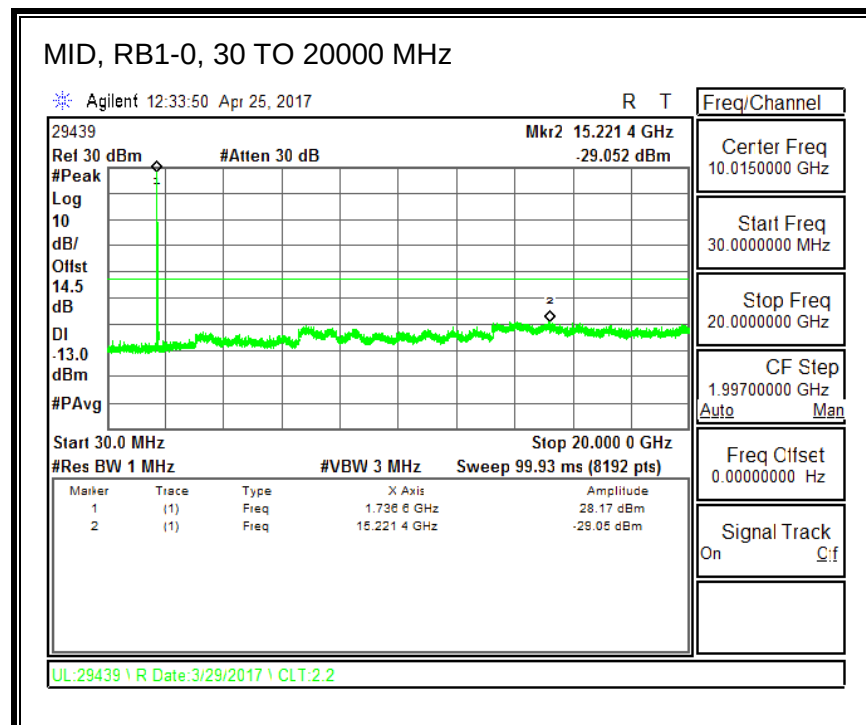
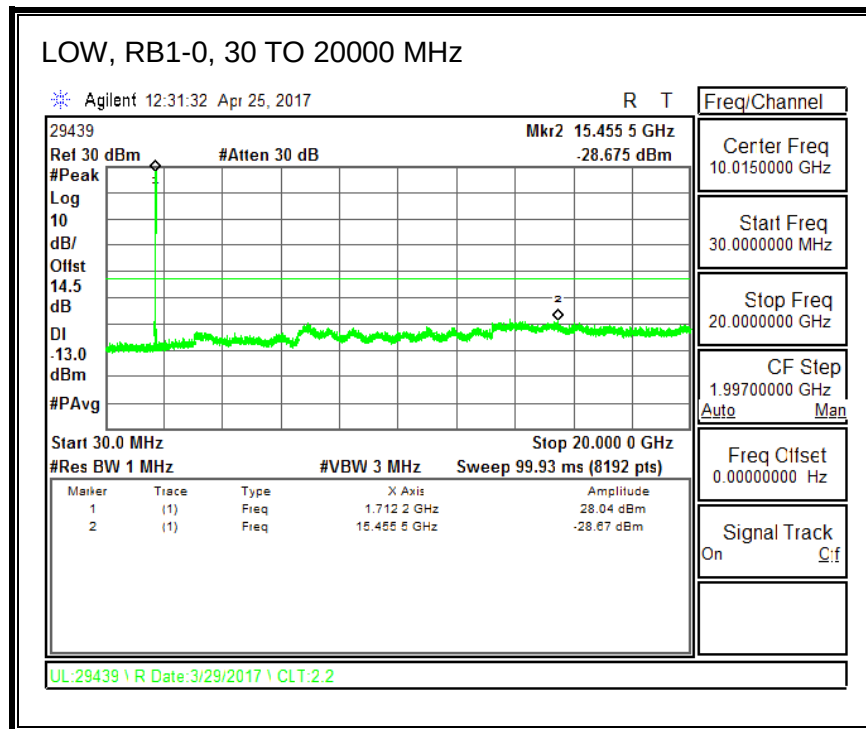


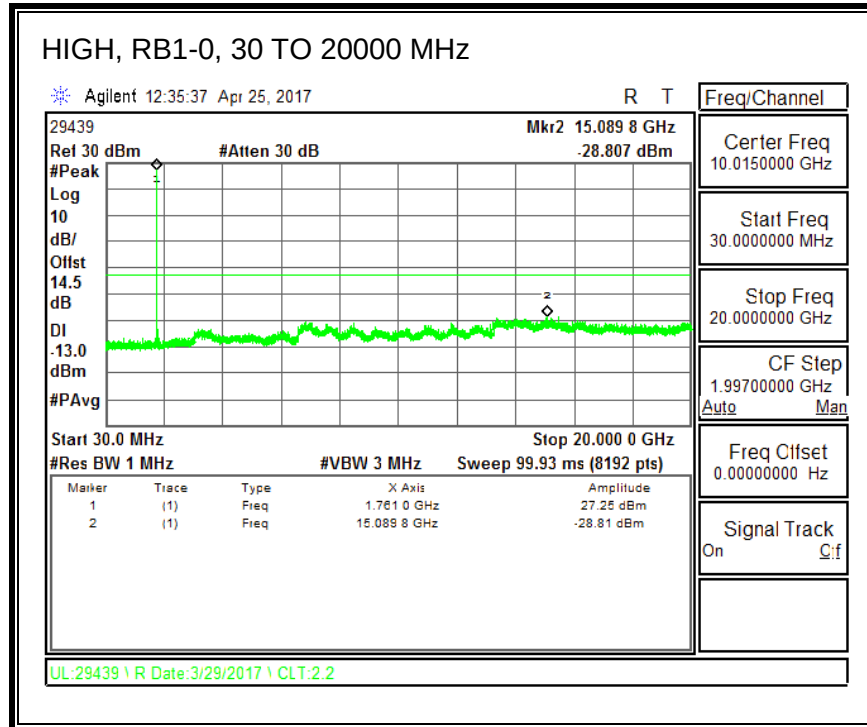
16QAM, (15.0 MHz BAND WIDTH)



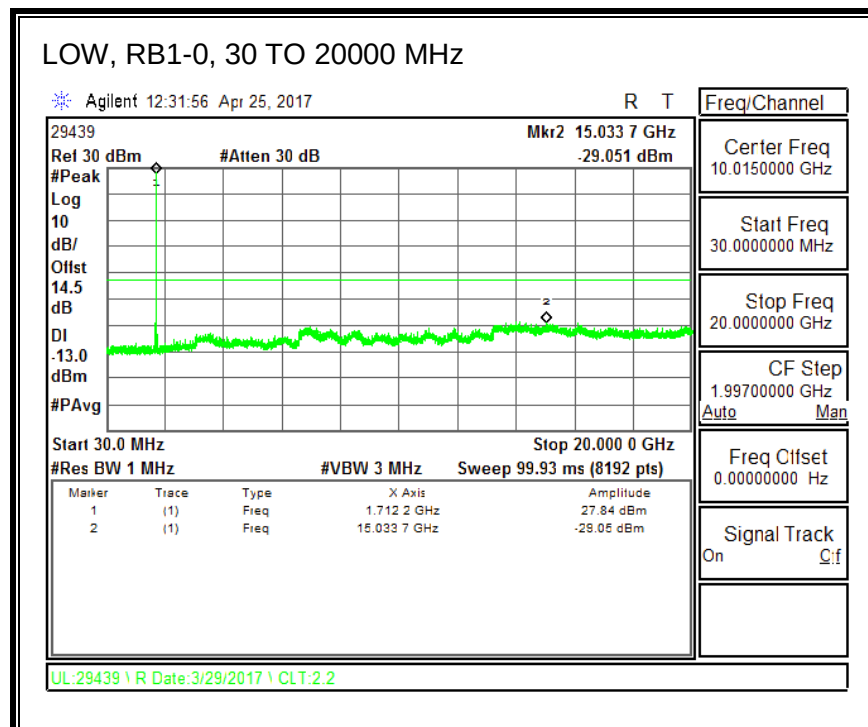


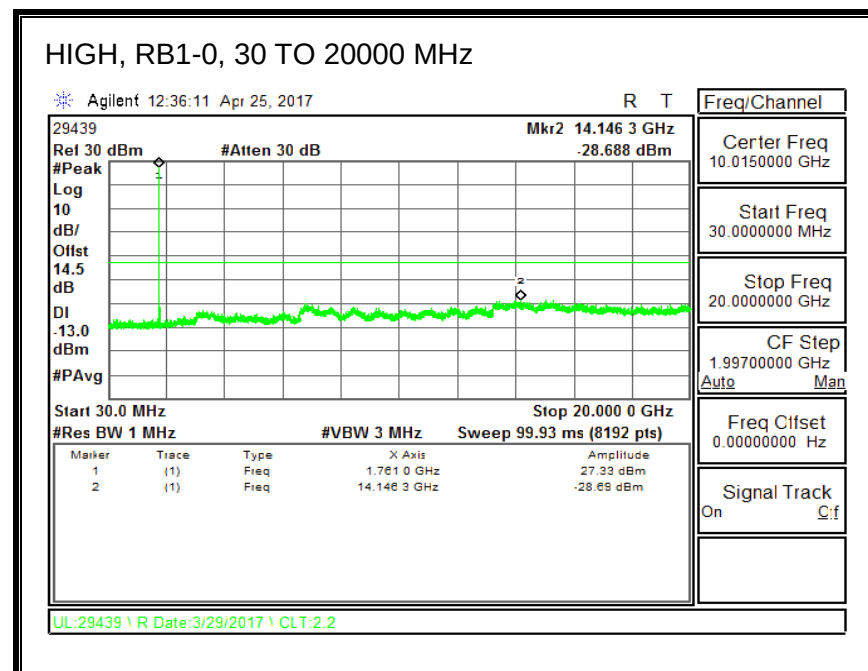
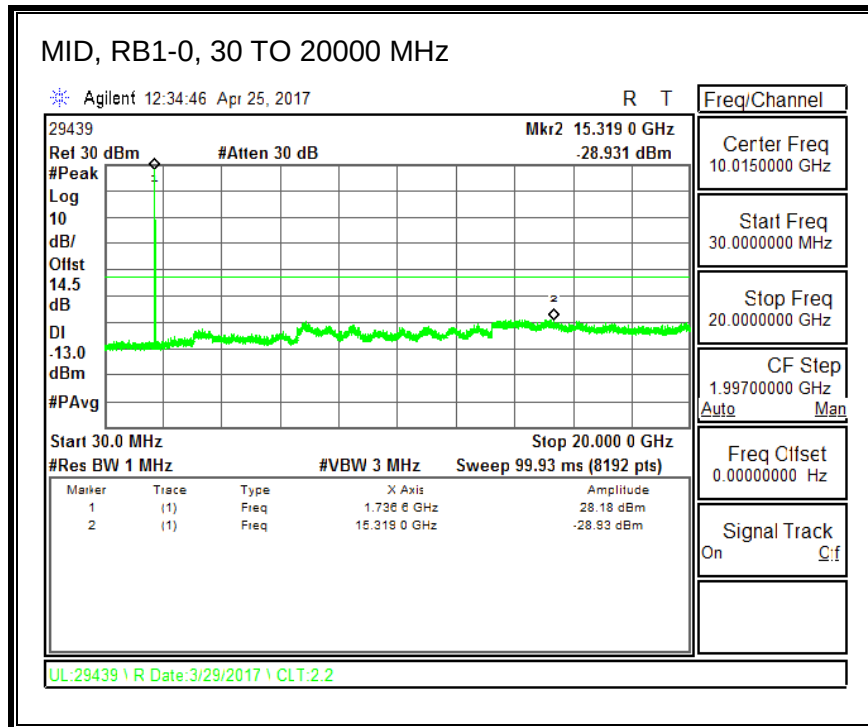
QPSK, (20.0 MHz BAND WIDTH)





16QAM, (20.0 MHz BAND WIDTH)





8.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

FCC: §22.355

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

FCC: §24.235 & §27.54

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

FCC: §90.213

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = -30° to $+50^{\circ}\text{C}$
- Voltage = (85% - 115%)
 - Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.
 - End Voltage, 3.2VDC.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

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

RESULTS

See the following pages.

8.4.1. LTE BAND 2

ID:	38602	Date:	4/24/17
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QPSK, (20MHz BANDWIDTH)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1851.0710	1908.9512		
Extreme (50C)		1851.0710	1908.9512	8.5	0.005
Extreme (40C)		1851.0710	1908.9512	8.1	0.004
Extreme (30C)		1851.0710	1908.9512	8.2	0.004
Extreme (10C)		1851.0710	1908.9512	8.9	0.005
Extreme (0C)		1851.0710	1908.9512	8.3	0.004
Extreme (-10C)		1851.0710	1908.9512	8.5	0.005
Extreme (-20C)		1851.0710	1908.9512	8.7	0.005
Extreme (-30C)		1851.0710	1908.9512	9.3	0.005
20C	15%	1851.0710	1908.9512	8.0	0.004
	-15%	1851.0710	1908.9512	8.4	0.004
	End Point	1851.0710	1908.9512	8.8	0.005

8.4.2. LTE BAND 4

ID:	38602	Date:	4/24/17
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QPSK, (3.0MHz BANDWIDTH)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1710.1575	1754.8422		
Extreme (50C)		1710.1575	1754.8422	19.2	0.011
Extreme (40C)		1710.1575	1754.8422	18.6	0.011
Extreme (30C)		1710.1575	1754.8422	20.3	0.012
Extreme (10C)		1710.1575	1754.8422	20.0	0.012
Extreme (0C)		1710.1575	1754.8422	19.1	0.011
Extreme (-10C)		1710.1575	1754.8422	18.2	0.011
Extreme (-20C)		1710.1575	1754.8422	18.0	0.010
Extreme (-30C)		1710.1575	1754.8422	18.7	0.011
20C	15%	1710.1575	1754.8422	18.8	0.011
	-15%	1710.1575	1754.8422	19.3	0.011
	End Point	1710.1575	1754.8422	19.5	0.011

8.4.3. LTE BAND 5

ID:	38602	Date:	4/21/17
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QPSK, (10MHz BANDWIDTH)

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.5429	848.4815		
Extreme (50C)		824.5429	848.4815	-3.3	-0.004
Extreme (40C)		824.5429	848.4815	-3.5	-0.004
Extreme (30C)		824.5429	848.4815	-3.8	-0.005
Extreme (10C)		824.5429	848.4815	-3.7	-0.004
Extreme (0C)		824.5429	848.4815	-3.9	-0.005
Extreme (-10C)		824.5429	848.4815	-3.3	-0.004
Extreme (-20C)		824.5429	848.4815	-2.7	-0.003
Extreme (-30C)		824.5429	848.4815	-3.0	-0.004
20C	15%	824.5429	848.4815	-4.0	-0.005
	-15%	824.5429	848.4815	-3.8	-0.005
	End Point	824.5429	848.4815	-4.1	-0.005

8.4.4. LTE BAND 7

ID:	38602	Date:	4/20/17
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QPSK, (20MHz BANDWIDTH)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2501.0841	2568.9506		
Extreme (50C)		2501.0841	2568.9506	2.7	0.001
Extreme (40C)		2501.0841	2568.9506	2.9	0.001
Extreme (30C)		2501.0841	2568.9506	3.2	0.001
Extreme (10C)		2501.0841	2568.9506	-2.8	-0.001
Extreme (0C)		2501.0841	2568.9506	-2.2	-0.001
Extreme (-10C)		2501.0841	2568.9506	3.3	0.001
Extreme (-20C)		2501.0841	2568.9506	-2.6	-0.001
Extreme (-30C)		2501.0841	2568.9506	-2.5	-0.001
20C	15%	2501.0841	2568.9506	3.1	0.001
	-15%	2501.0841	2568.9506	-2.5	-0.001
	End Point	2501.0841	2568.9506	-2.3	-0.001

8.4.5. LTE BAND 12

ID:	38602	Date:	4/20/17
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QPSK, (10MHz BANDWIDTH)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	699.5449	715.4657		
Extreme (50C)		699.5449	715.4657	-3.9	-0.01
Extreme (40C)		699.5449	715.4657	-3.4	0.00
Extreme (30C)		699.5449	715.4657	-3.1	0.00
Extreme (10C)		699.5449	715.4657	-3.2	0.00
Extreme (0C)		699.5449	715.4657	-2.9	0.00
Extreme (-10C)		699.5449	715.4657	-3.1	0.00
Extreme (-20C)		699.5449	715.4657	-2.9	0.00
Extreme (-30C)		699.5449	715.4657	-3.1	0.00
20C	15%	699.5449	715.4657	-3.2	0.00
	-15%	699.5449	715.4657	-3.0	0.00
	End Point	699.5449	715.4657	-3.3	0.00

8.4.6. LTE BAND 13

ID:	38602	Date:	4/20/17
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QPSK, (10MHz BANDWIDTH)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	777.5538	786.4601		
Extreme (50C)		777.5538	786.4601	-4.1	-0.005
Extreme (40C)		777.5538	786.4601	-4.4	-0.006
Extreme (30C)		777.5538	786.4601	-4.1	-0.005
Extreme (10C)		777.5538	786.4601	-3.8	-0.005
Extreme (0C)		777.5538	786.4601	-2.9	-0.004
Extreme (-10C)		777.5538	786.4601	-2.2	-0.003
Extreme (-20C)		777.5538	786.4601	-2.5	-0.003
Extreme (-30C)		777.5538	786.4601	-2.3	-0.003
20C	15%	777.5538	786.4601	-4.2	-0.005
	-15%	777.5538	786.4601	-3.6	-0.005
	End Point	777.5538	786.4601	-3.3	-0.004

8.4.7. LTE BAND 17

ID:	38602	Date:	4/20/17
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QPSK, (10MHz BANDWIDTH)

Limit		704	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	704.5482	715.4658		
Extreme (50C)		704.5482	715.4658	-3.9	-0.005
Extreme (40C)		704.5482	715.4658	-3.4	-0.005
Extreme (30C)		704.5482	715.4658	-3.1	-0.004
Extreme (10C)		704.5482	715.4658	-3.2	-0.005
Extreme (0C)		704.5482	715.4658	-2.9	-0.004
Extreme (-10C)		704.5482	715.4658	-3.1	-0.004
Extreme (-20C)		704.5482	715.4658	-2.9	-0.004
Extreme (-30C)		704.5482	715.4658	-3.1	-0.004
20C	15%	704.5482	715.4658	-3.2	-0.005
	-15%	704.5482	715.4658	-3.0	-0.004
	End Point	704.5482	715.4658	-3.3	-0.005

8.4.8. LTE BAND 25

ID:	38602	Date:	4/20/17
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QPSK, (20MHz BANDWIDTH)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1851.0657	1913.9527		
Extreme (50C)		1851.0657	1913.9527	-8.0	-0.004
Extreme (40C)		1851.0657	1913.9527	-8.2	-0.004
Extreme (30C)		1851.0657	1913.9527	-6.9	-0.004
Extreme (10C)		1851.0657	1913.9527	-6.3	-0.003
Extreme (0C)		1851.0657	1913.9527	-6.6	-0.004
Extreme (-10C)		1851.0657	1913.9527	-6.7	-0.004
Extreme (-20C)		1851.0657	1913.9527	-6.2	-0.003
Extreme (-30C)		1851.0657	1913.9527	-6.4	-0.003
20C	15%	1851.0657	1913.9527	-6.1	-0.003
	-15%	1851.0657	1913.9527	-6.3	-0.003
	End Point	1851.0657	1913.9527	-6.3	-0.003

8.4.9. LTE BAND 26

ID:	38602	Date:	4/20/17
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QPSK, (10MHz BANDWIDTH)

Limit		814	824	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	814.5381	823.4785		
Extreme (50C)		814.5381	823.4785	2.1	0.003
Extreme (40C)		814.5381	823.4785	3.2	0.004
Extreme (30C)		814.5381	823.4785	3.0	0.004
Extreme (10C)		814.5381	823.4785	3.1	0.004
Extreme (0C)		814.5381	823.4785	3.3	0.004
Extreme (-10C)		814.5381	823.4785	3.5	0.004
Extreme (-20C)		814.5381	823.4785	3.7	0.005
Extreme (-30C)		814.5381	823.4785	3.4	0.004
20C	15%	814.5381	823.4785	3.3	0.004
	-15%	814.5381	823.4785	3.6	0.004
	End Point	814.5381	823.4785	3.5	0.004

8.4.10. LTE BAND 30

ID:	38602	Date:	4/21/17
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QPSK, (10MHz BANDWIDTH)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2305.5372	2314.4788		
Extreme (50C)		2305.5372	2314.4788	13.8	0.006
Extreme (40C)		2305.5372	2314.4788	14.3	0.006
Extreme (30C)		2305.5372	2314.4788	14.7	0.006
Extreme (10C)		2305.5372	2314.4788	14.2	0.006
Extreme (0C)		2305.5372	2314.4788	12.3	0.005
Extreme (-10C)		2305.5372	2314.4788	12.4	0.005
Extreme (-20C)		2305.5372	2314.4788	13.0	0.006
Extreme (-30C)		2305.5372	2314.4788	13.3	0.006
20C	15%	2305.5372	2314.4788	14.2	0.006
	-15%	2305.5372	2314.4788	14.0	0.006
	End Point	2305.5372	2314.4788	14.3	0.006

8.4.11. LTE BAND 41

ID:	38602	Date:	4/24/17
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QPSK, (20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2496.9565	2688.9601		
Extreme (50C)		2496.9565	2688.9601	-2.9	-0.001
Extreme (40C)		2496.9565	2688.9601	-3.3	-0.001
Extreme (30C)		2496.9565	2688.9601	-2.0	-0.001
Extreme (10C)		2496.9565	2688.9601	-2.3	-0.001
Extreme (0C)		2496.9565	2688.9601	-2.5	-0.001
Extreme (-10C)		2496.9565	2688.9601	-2.2	-0.001
Extreme (-20C)		2496.9565	2688.9601	-2.3	-0.001
Extreme (-30C)		2496.9565	2688.9601	-1.9	-0.001
20C	15%	2496.9565	2688.9601	-3.9	-0.002
	-15%	2496.9565	2688.9601	-2.2	-0.001
	End Point	2496.9565	2688.9601	-2.5	-0.001

8.4.12. LTE BAND 66

ID:	38602	Date:	4/24/17
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QPSK, (20MHz BANDWIDTH)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1711.0472	1778.9692		
Extreme (50C)		1711.0472	1778.9692	12.7	0.007
Extreme (40C)		1711.0472	1778.9692	13.1	0.008
Extreme (30C)		1711.0472	1778.9692	12.5	0.007
Extreme (10C)		1711.0472	1778.9692	13.0	0.007
Extreme (0C)		1711.0472	1778.9692	12.5	0.007
Extreme (-10C)		1711.0472	1778.9692	13.1	0.008
Extreme (-20C)		1711.0472	1778.9692	12.7	0.007
Extreme (-30C)		1711.0472	1778.9692	13.3	0.008
20C	15%	1711.0472	1778.9692	12.6	0.007
	-15%	1711.0472	1778.9692	12.0	0.007
	End Point	1711.0472	1778.9692	12.1	0.007

8.5. PEAK-TO-AVERAGE RATIO

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

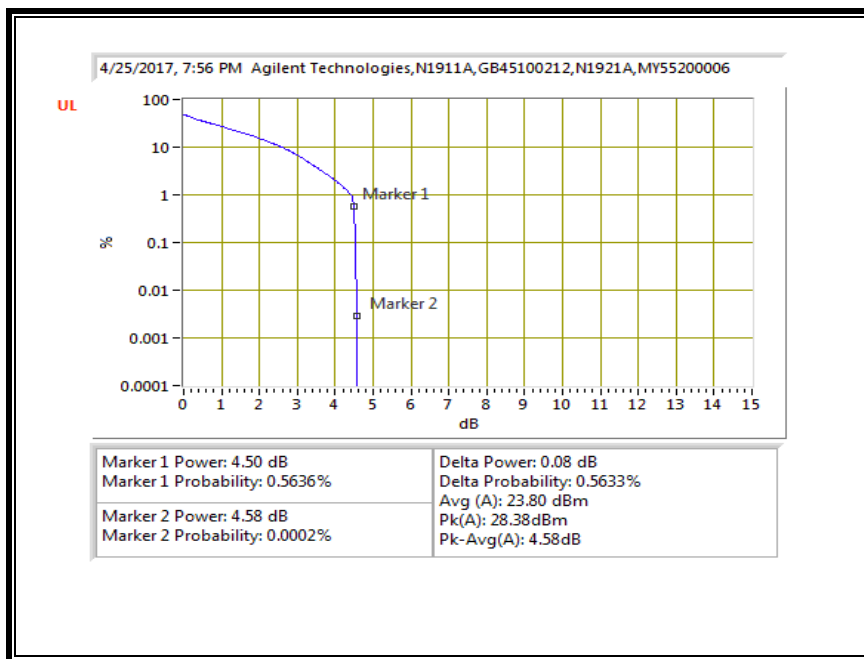
RESULT

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

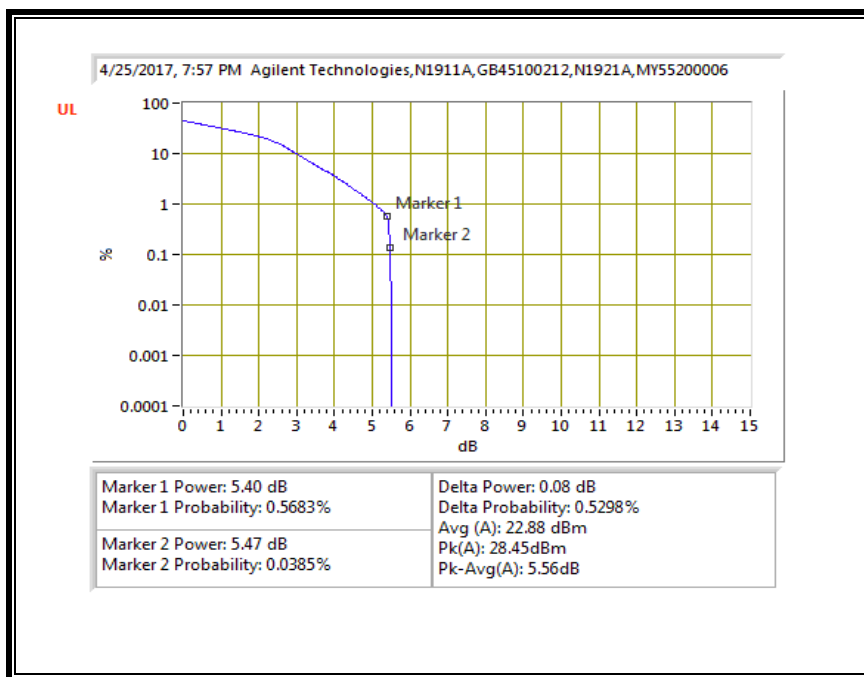
ID:	50820	Date:	4/25/17
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8.5.1. LTE BAND 2

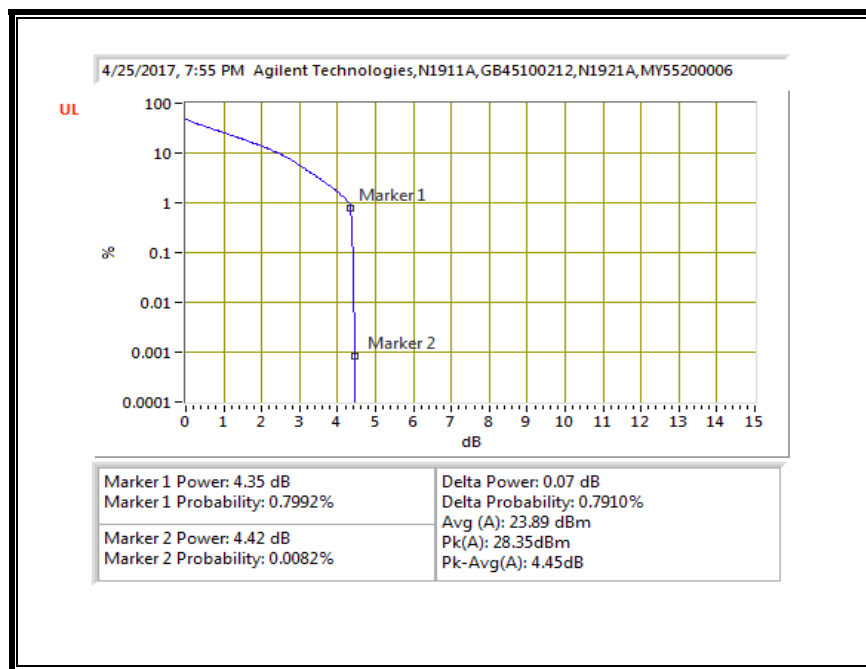
QPSK, (1.4 MHz BAND WIDTH)



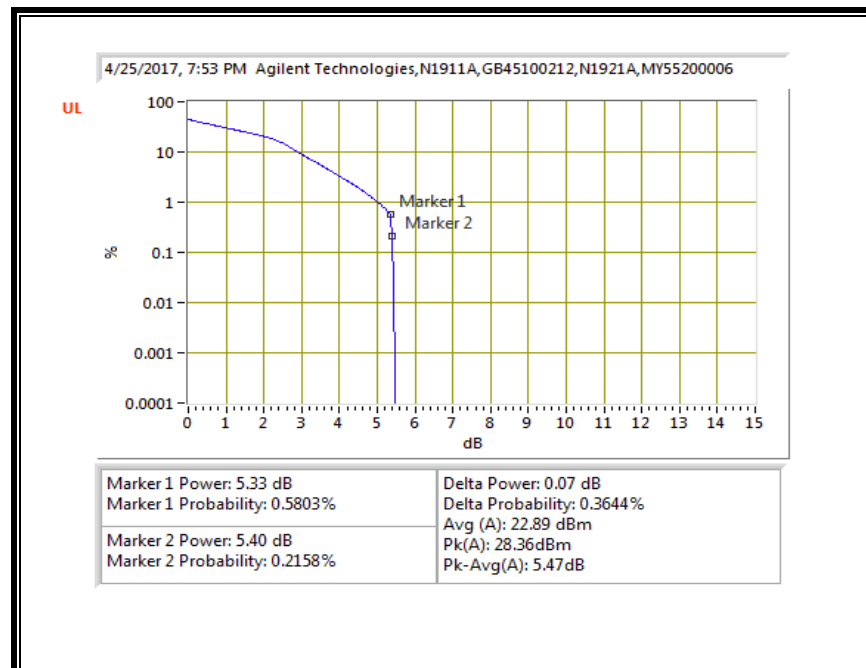
16QAM, (1.4 MHz BAND WIDTH)



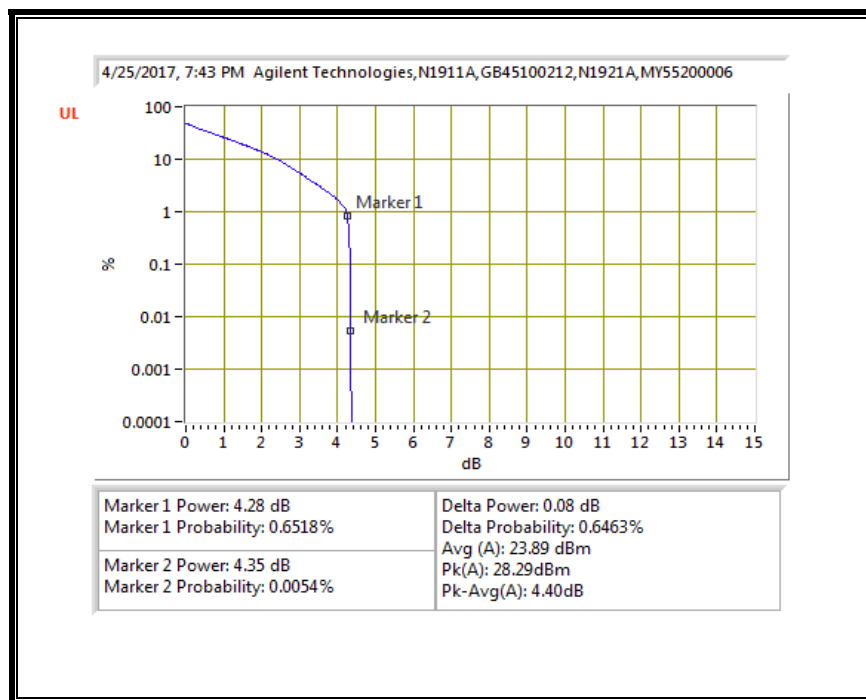
QPSK, (3.0 MHz BAND WIDTH)



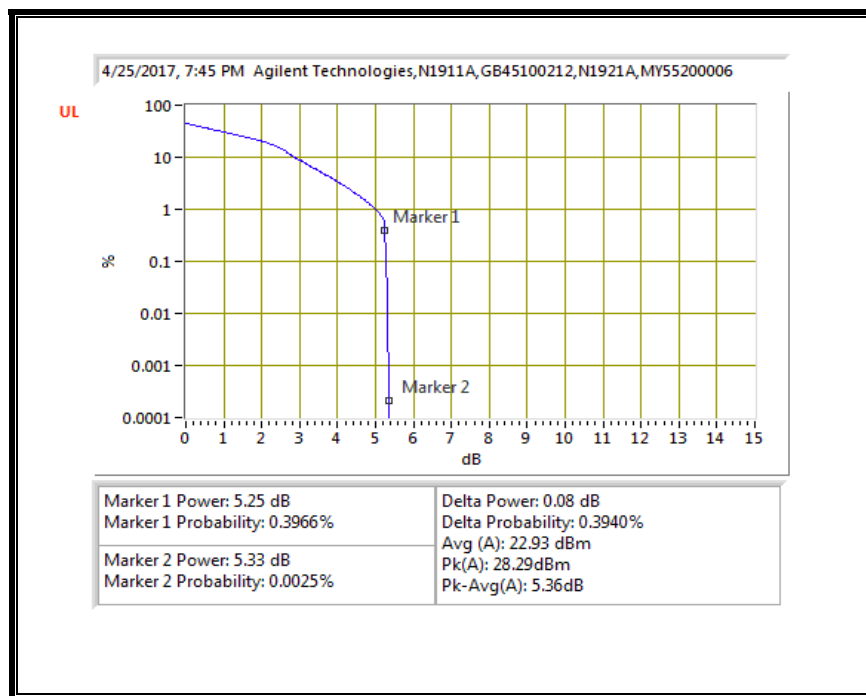
16QAM, (3.0 MHz BAND WIDTH)



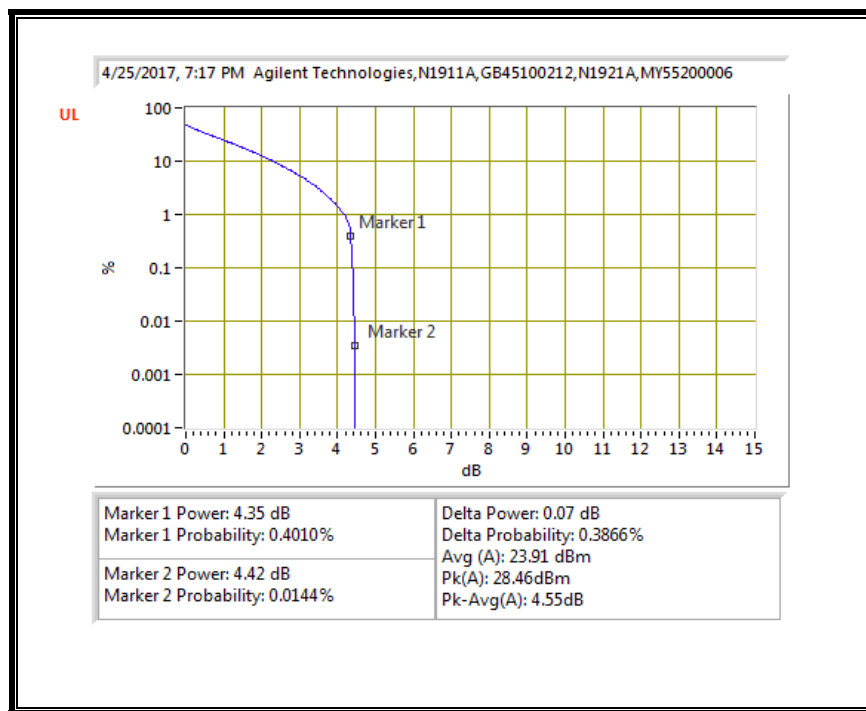
QPSK, (5.0 MHz BAND WIDTH)



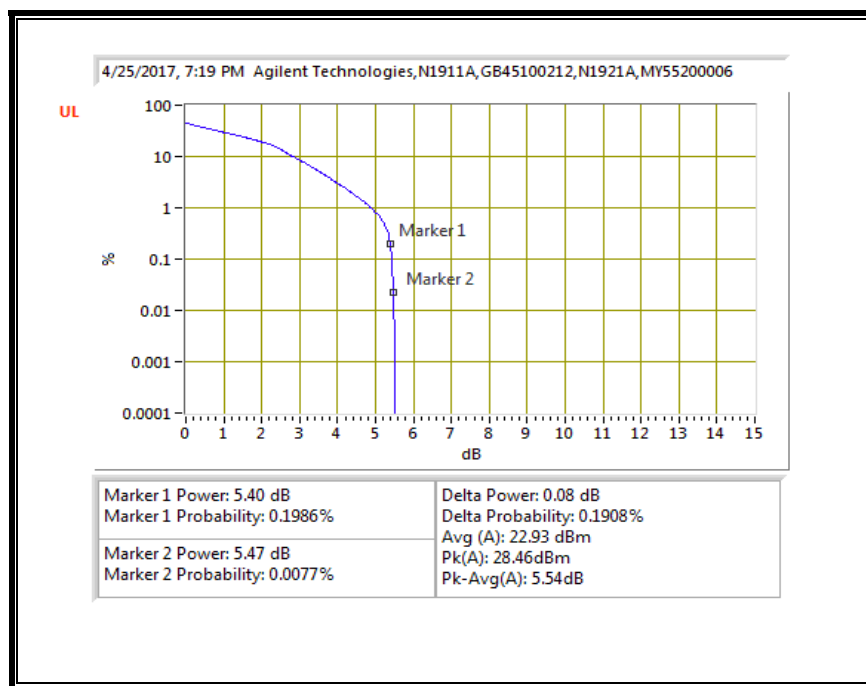
16QAM, (5.0 MHz BAND WIDTH)



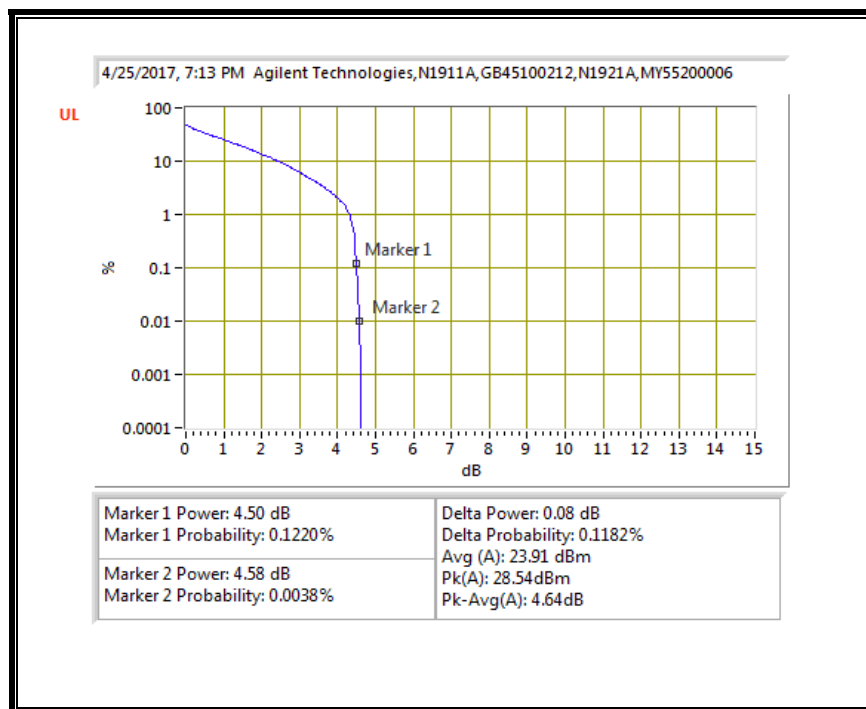
QPSK, (10.0 MHz BAND WIDTH)



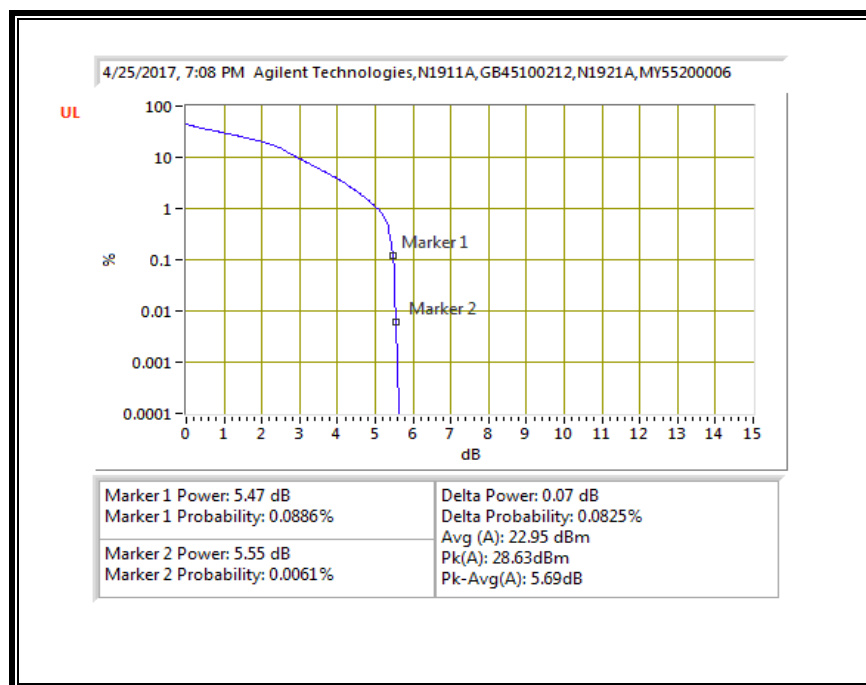
16QAM, (10.0 MHz BAND WIDTH)



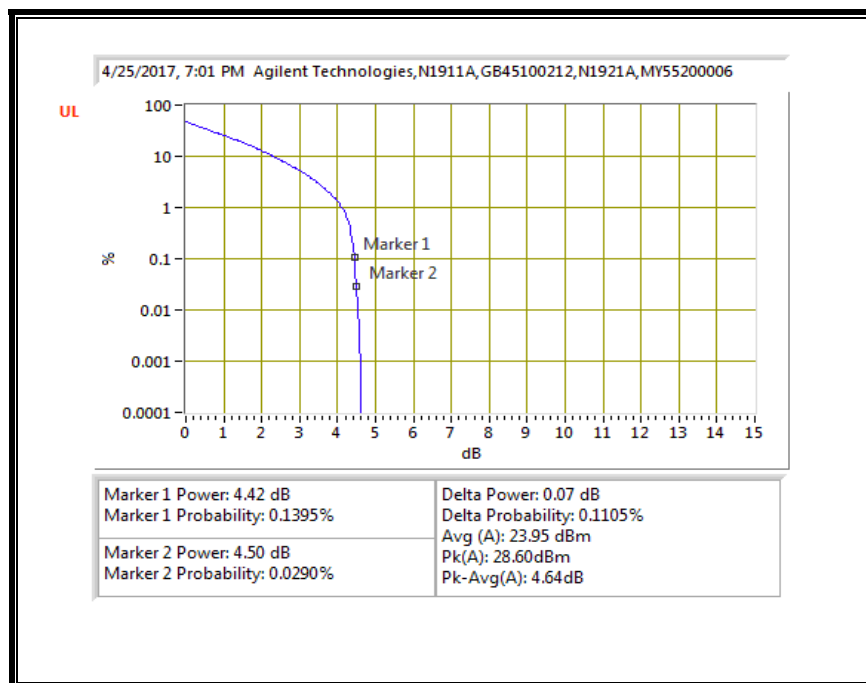
QPSK, (15.0 MHz BAND WIDTH)



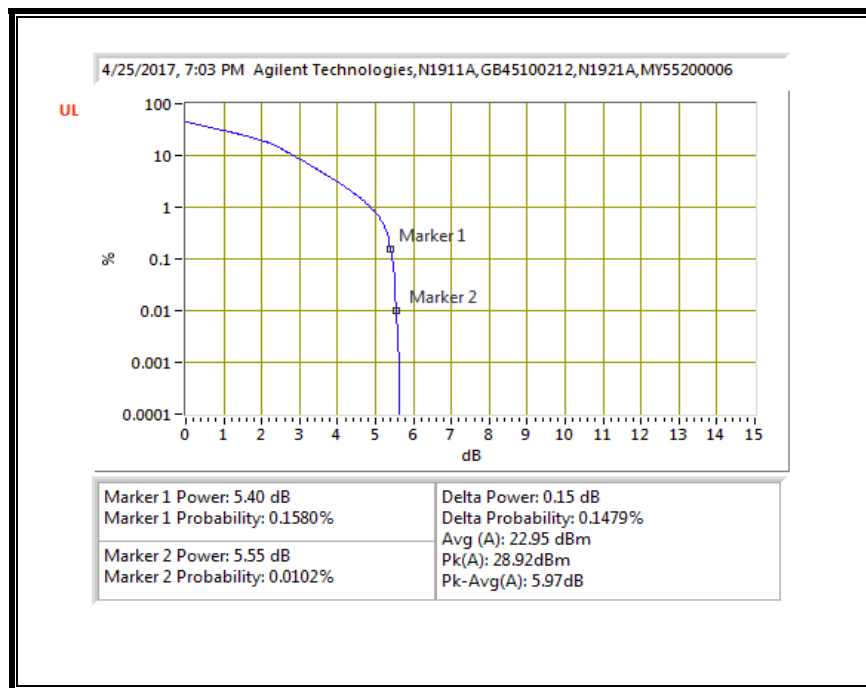
16QAM, (15.0 MHz BAND WIDTH)



QPSK, (20.0 MHz BAND WIDTH)

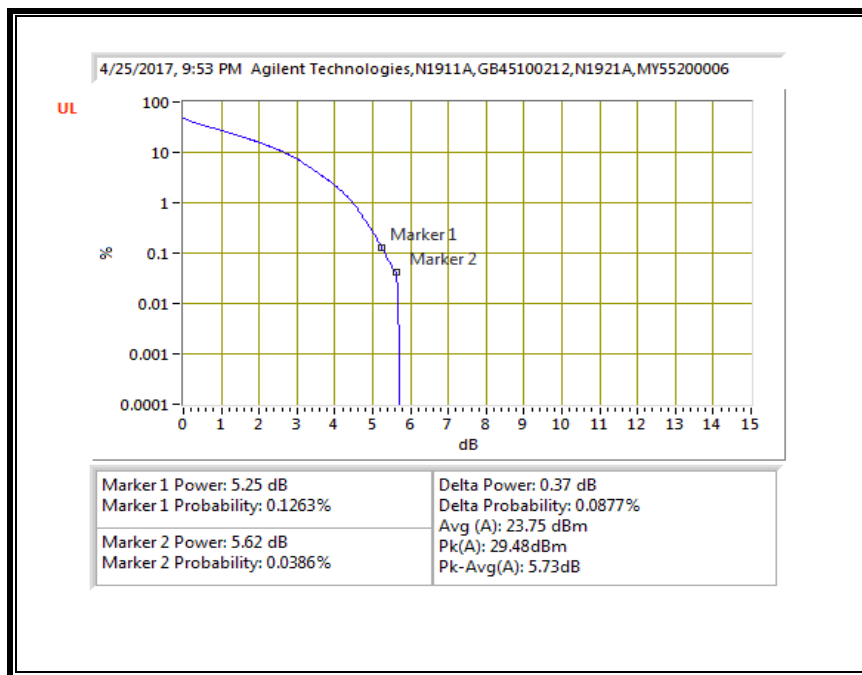


16QAM, (20.0 MHz BAND WIDTH)

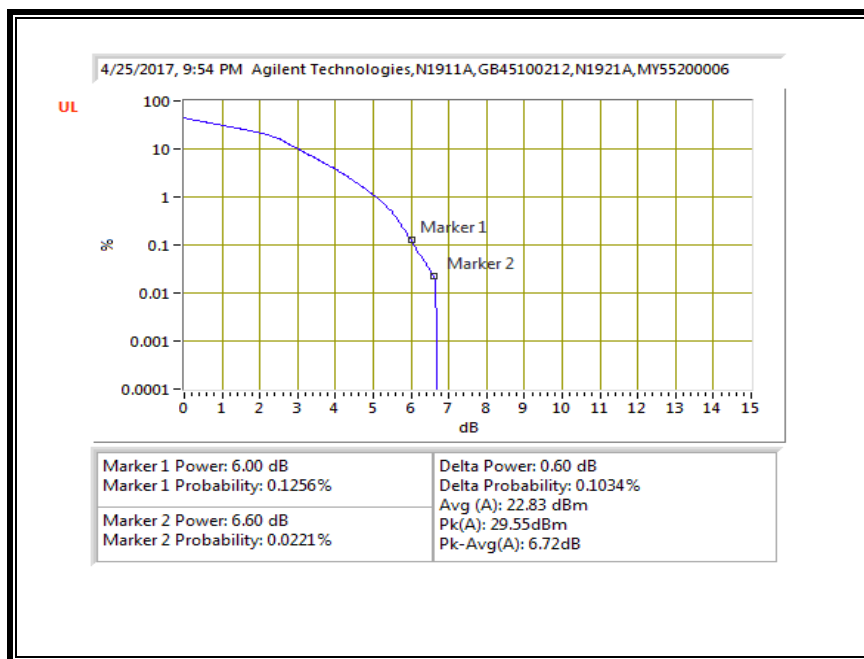


8.5.2. LTE BAND 4

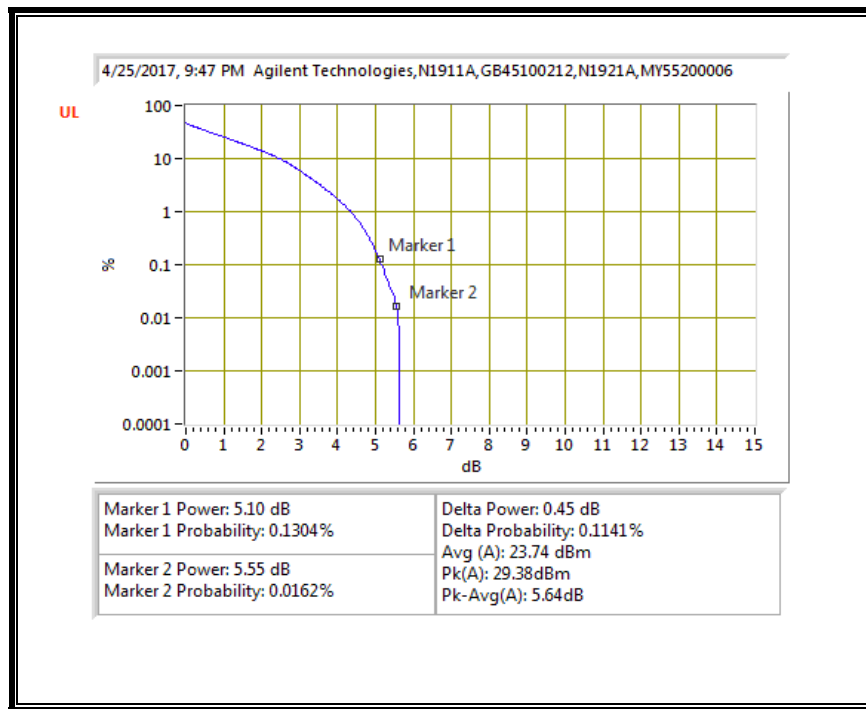
QPSK, (1.4 MHz BAND WIDTH)



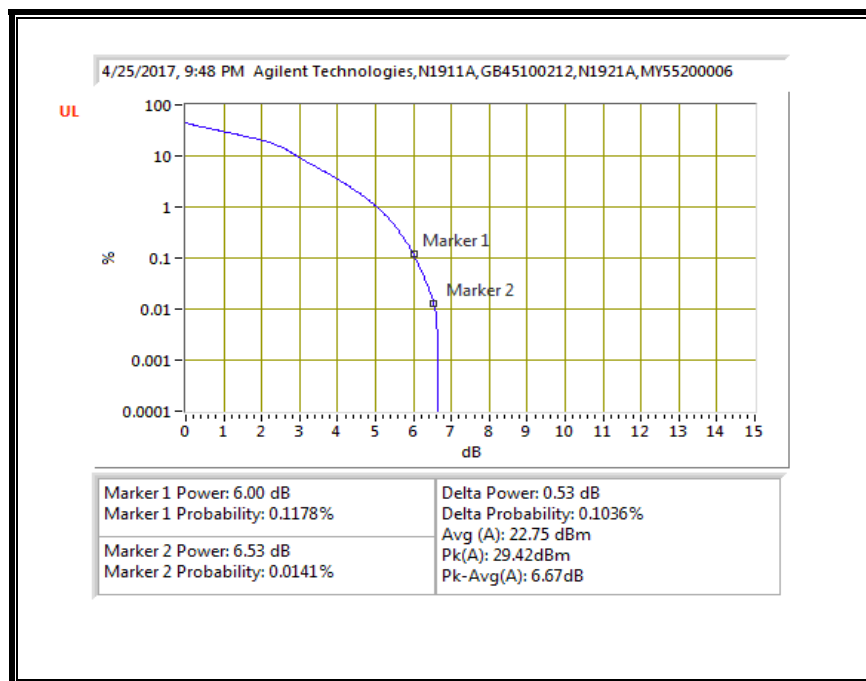
16QAM, (1.4 MHz BAND WIDTH)



QPSK, (3.0 MHz BAND WIDTH)

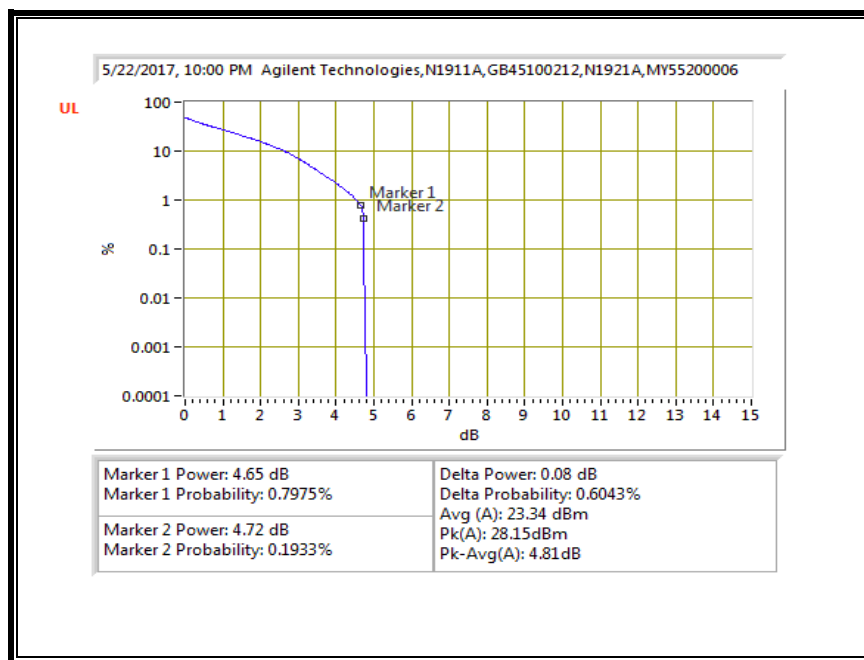


16QAM, (3.0 MHz BAND WIDTH)

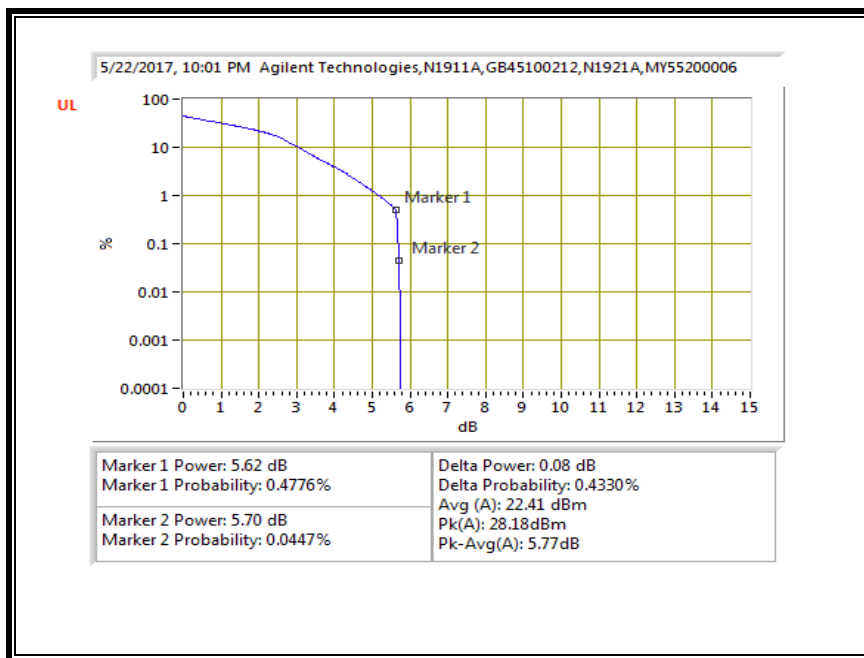


8.5.3. LTE BAND 5

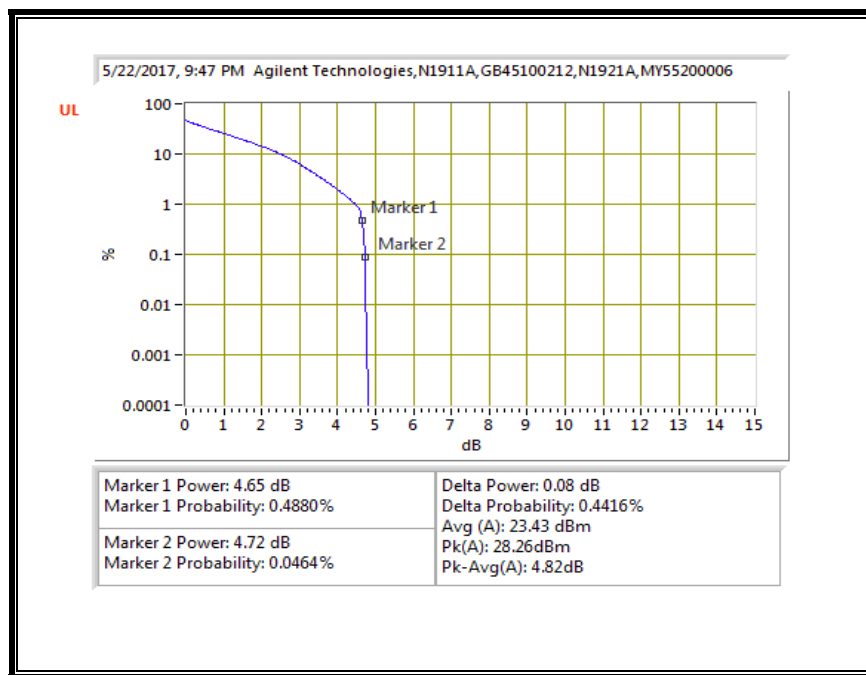
QPSK, (1.4 MHz BAND WIDTH)



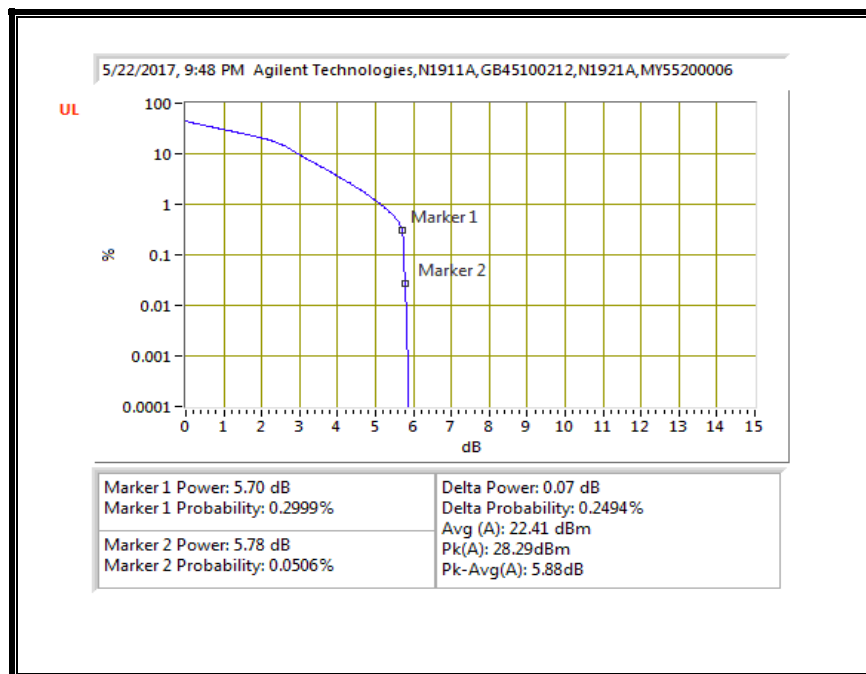
16QAM, (1.4 MHz BAND WIDTH)



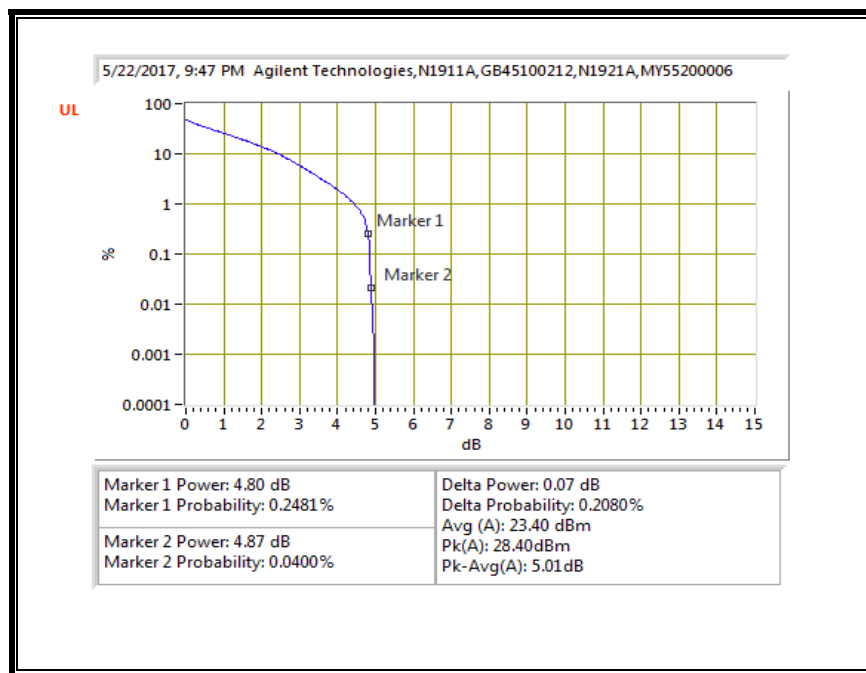
QPSK, (3.0 MHz BAND WIDTH)



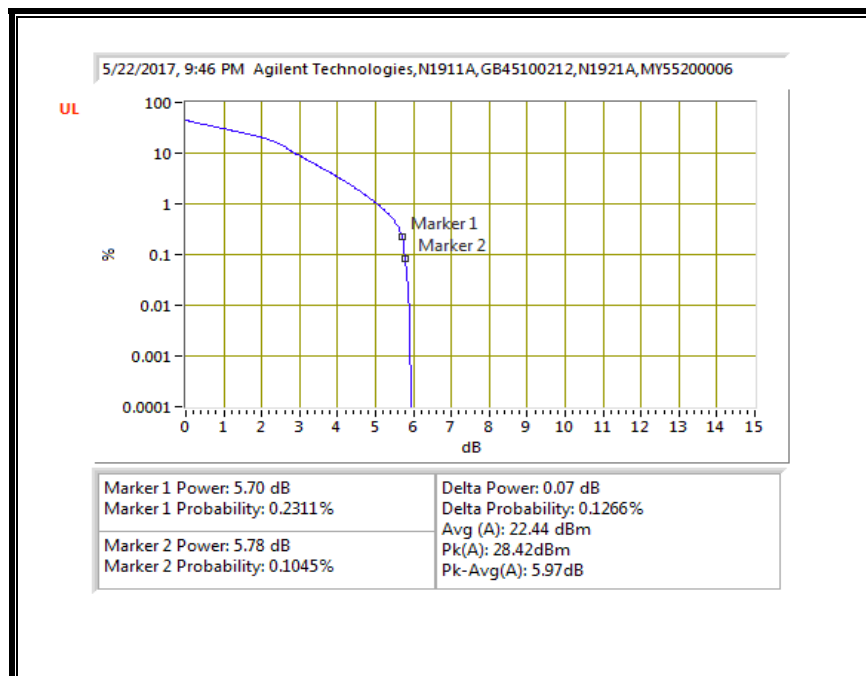
16QAM, (3.0 MHz BAND WIDTH)



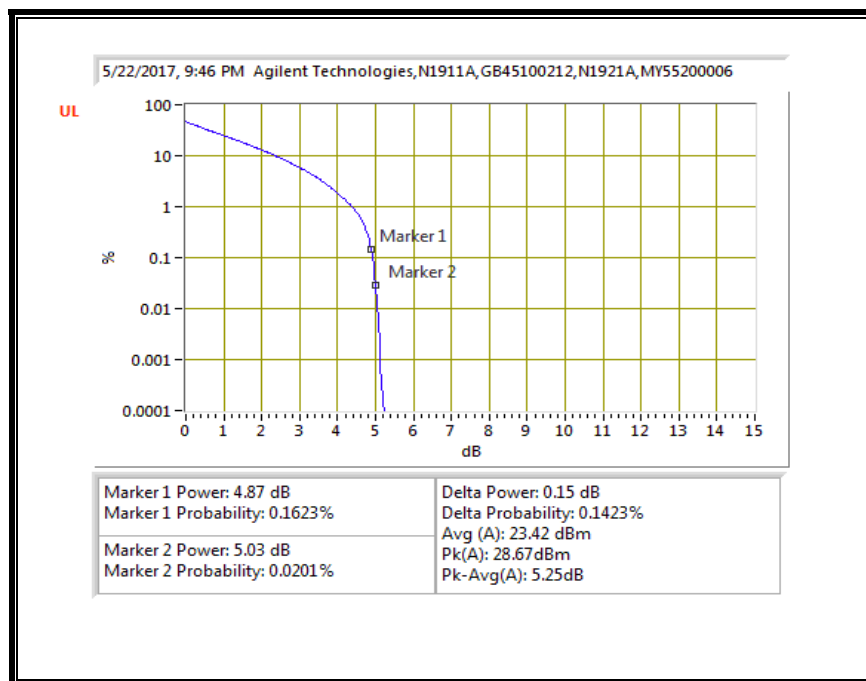
QPSK, (5.0 MHz BAND WIDTH)



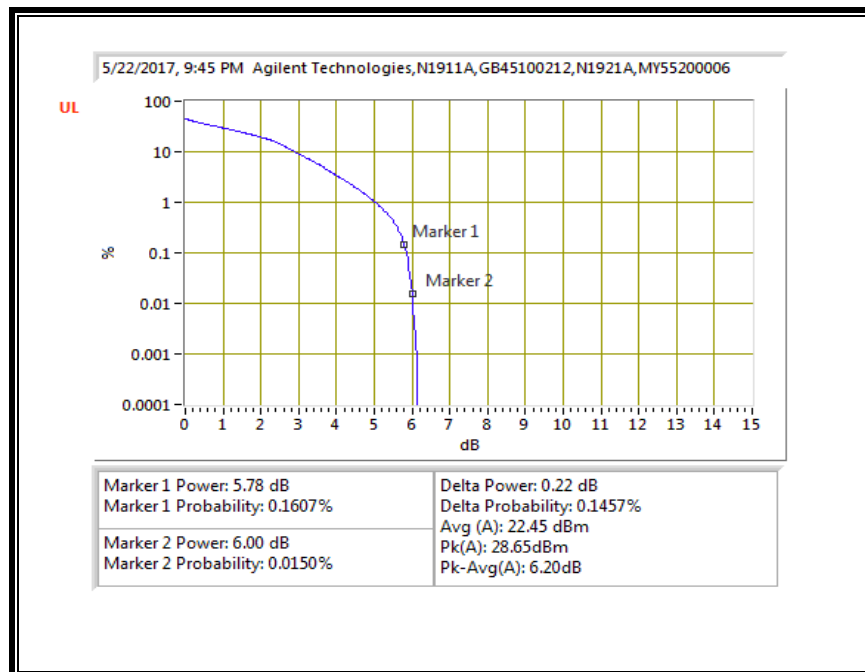
16QAM, (5.0 MHz BAND WIDTH)



QPSK, (10.0 MHz BAND WIDTH)

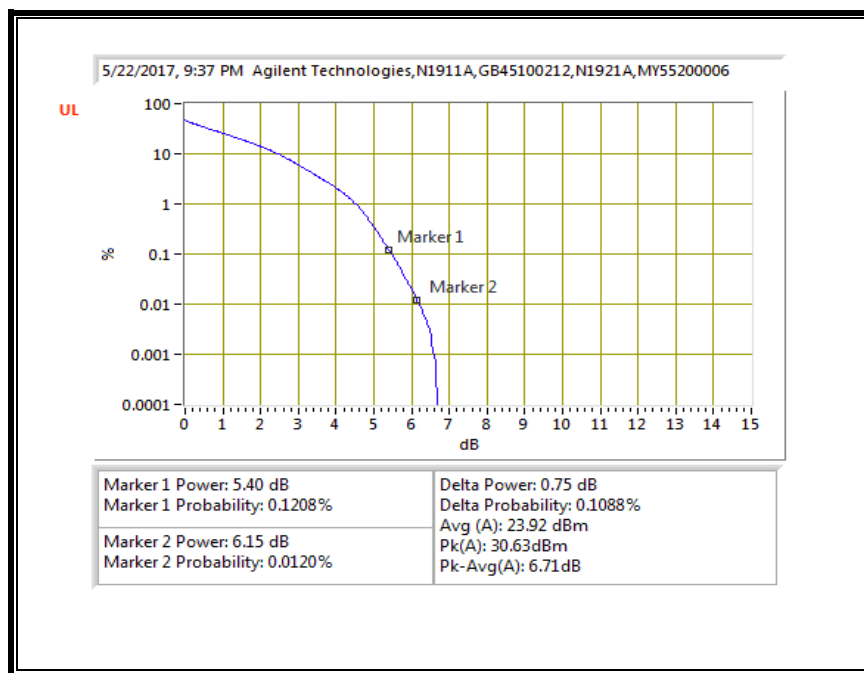


16QAM, (10.0 MHz BAND WIDTH)

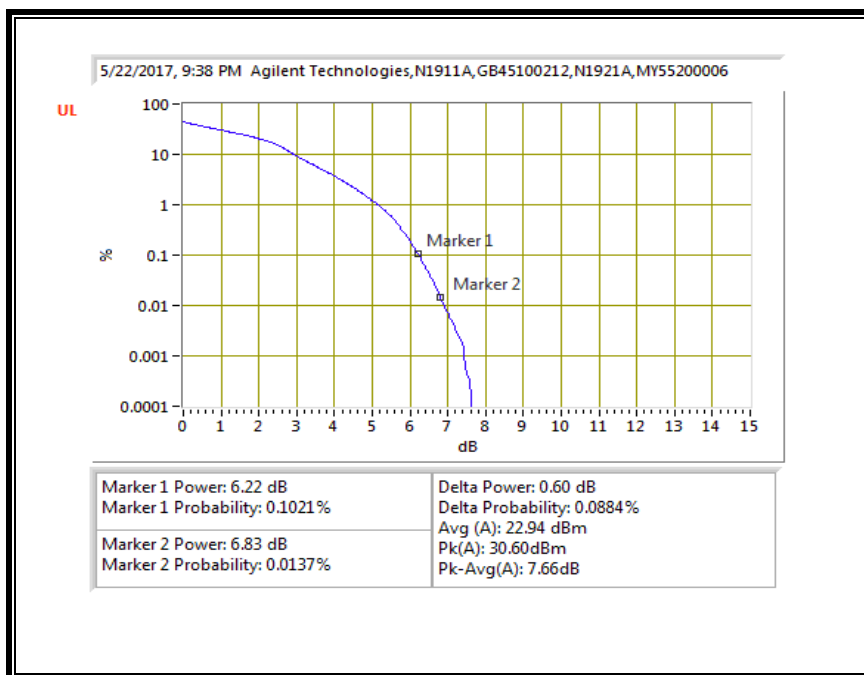


8.5.4. LTE BAND 7

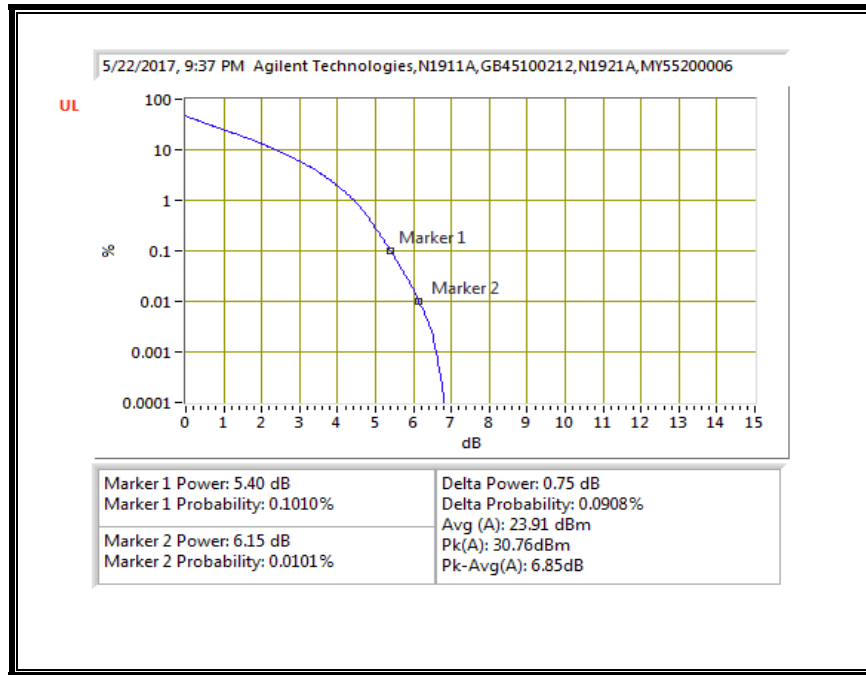
QPSK, (5.0 MHz BAND WIDTH)



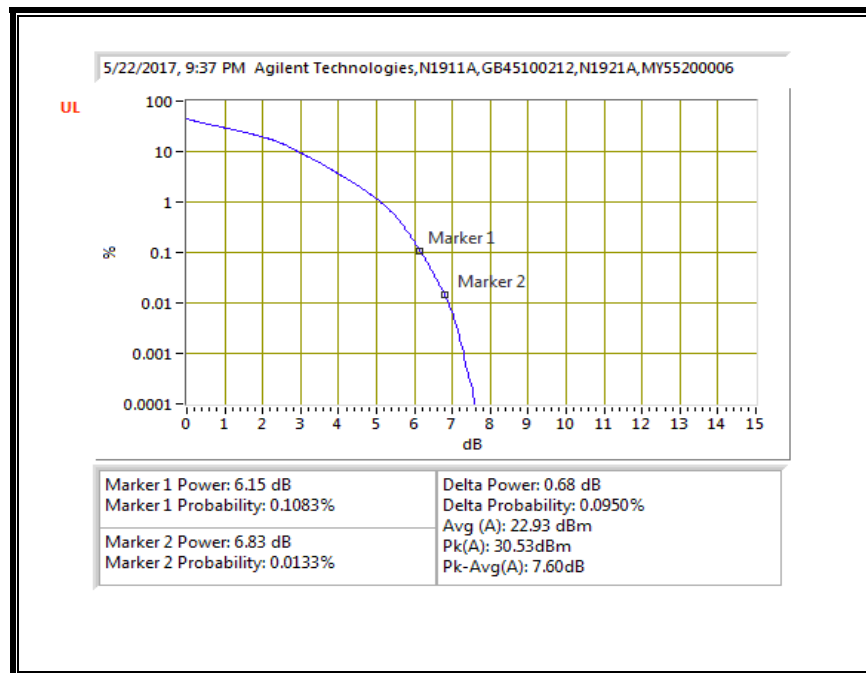
16QAM, (5.0 MHz BAND WIDTH)



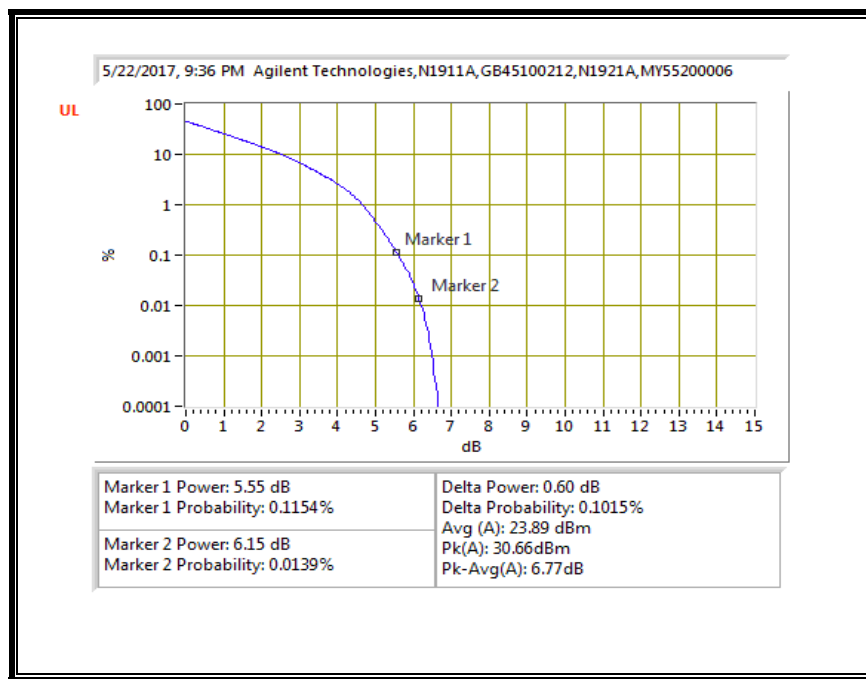
QPSK, (10.0 MHz BAND WIDTH)



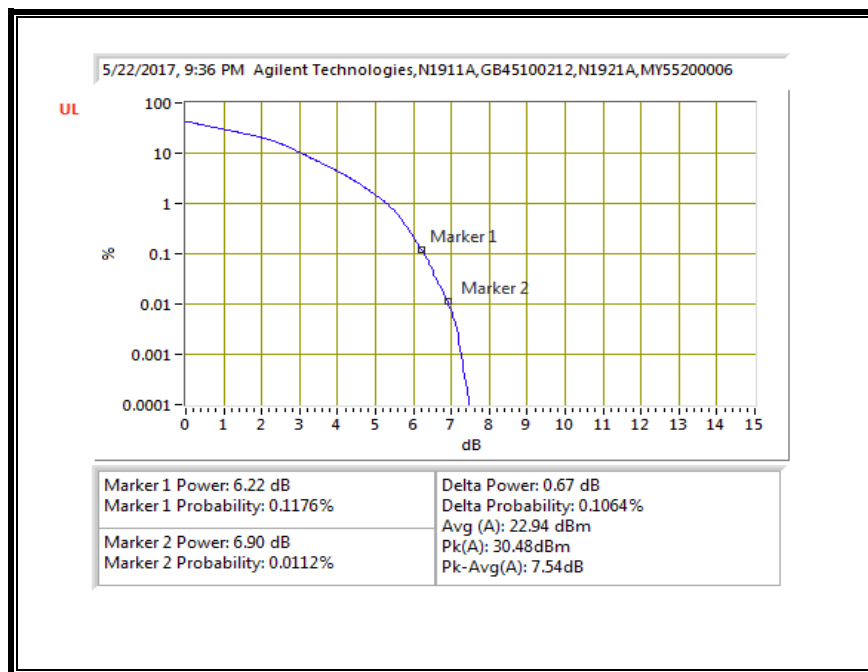
16QAM, (10.0 MHz BAND WIDTH)



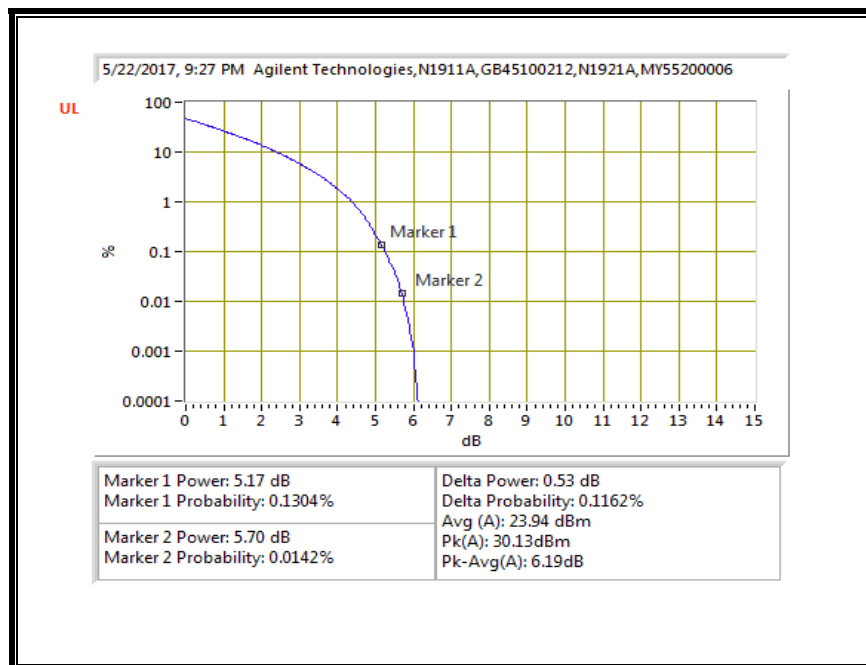
QPSK, (15.0 MHz BAND WIDTH)



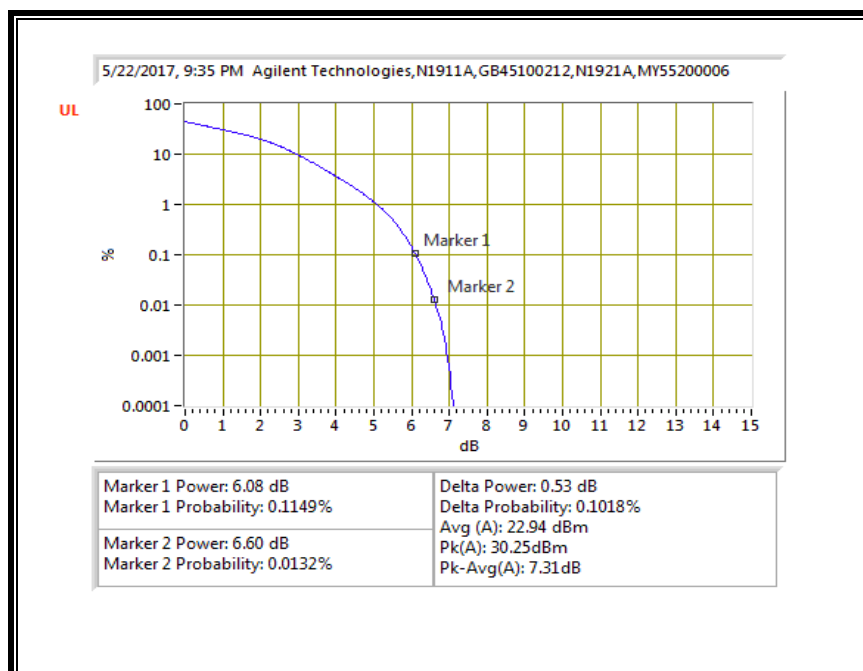
16QAM, (15.0 MHz BAND WIDTH)



QPSK, (20.0 MHz BAND WIDTH)

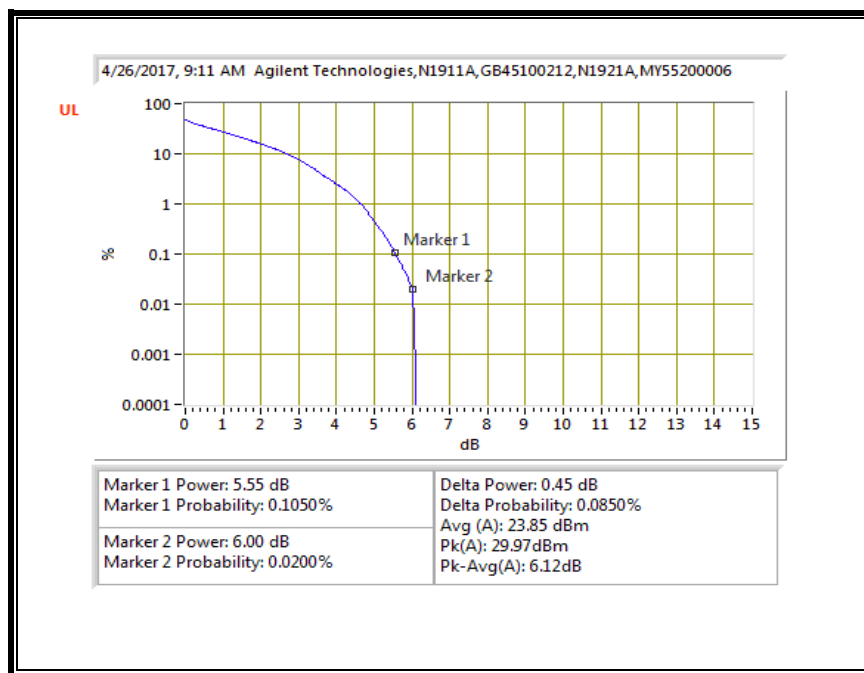


16QAM, (20.0 MHz BAND WIDTH)

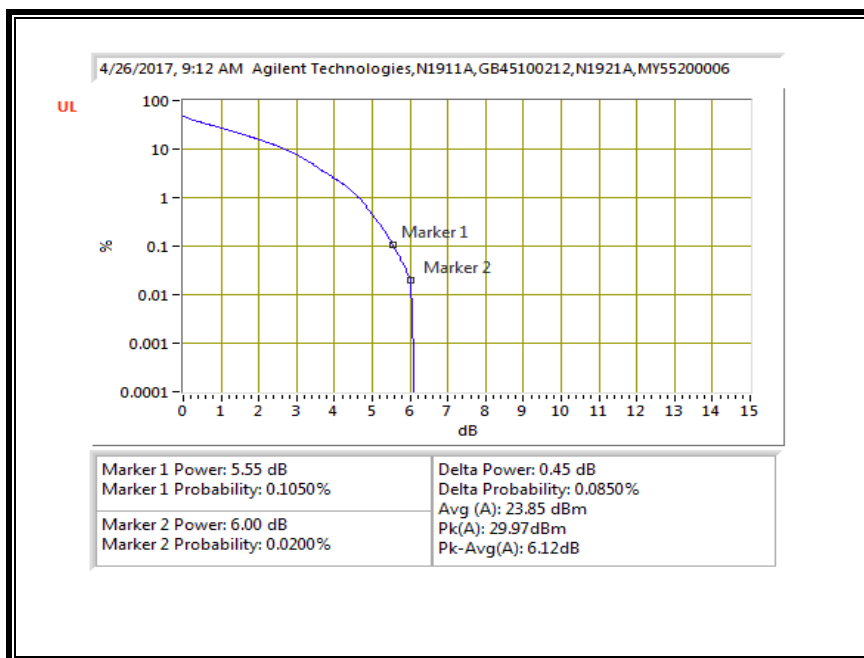


8.5.5. LTE BAND 12

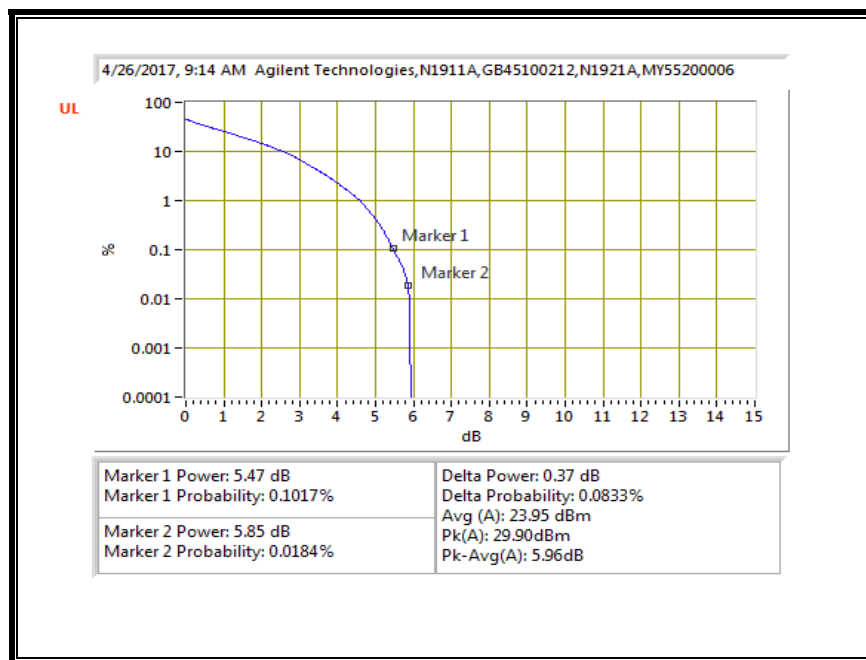
QPSK, (1.4 MHz BAND WIDTH)



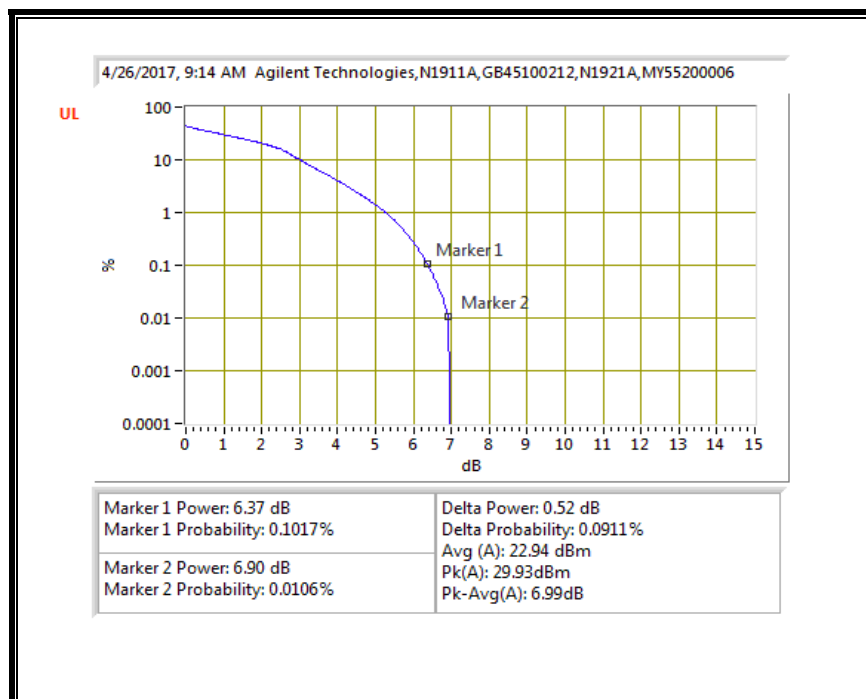
16QAM, (1.4 MHz BAND WIDTH)



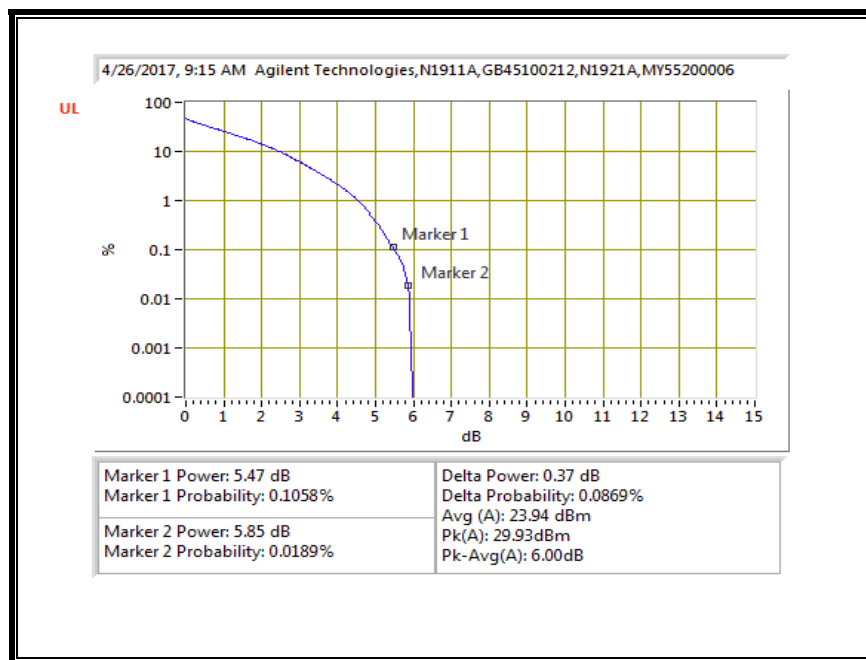
QPSK, (3.0 MHz BAND WIDTH)



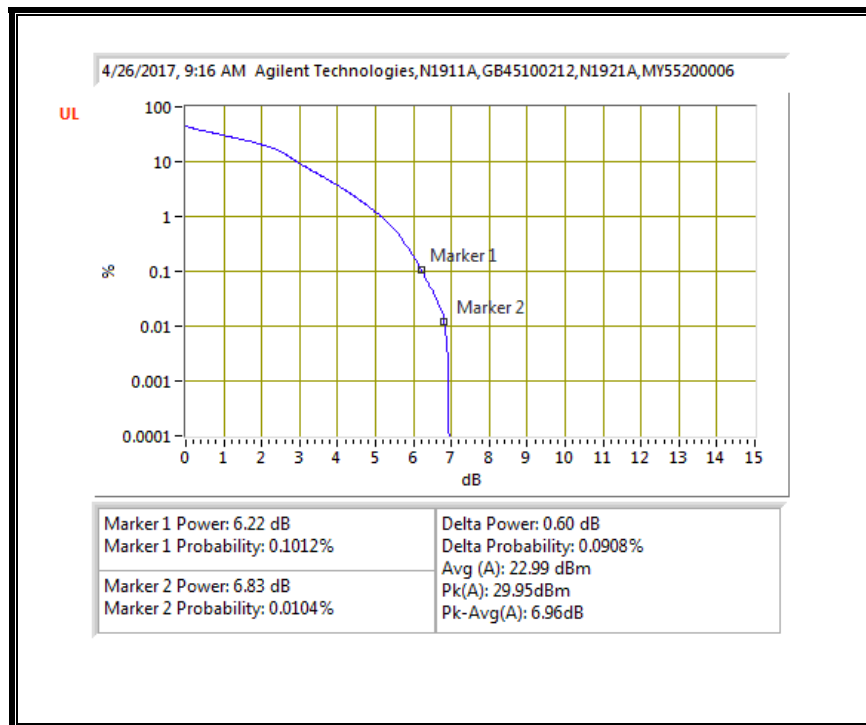
16QAM, (3.0 MHz BAND WIDTH)



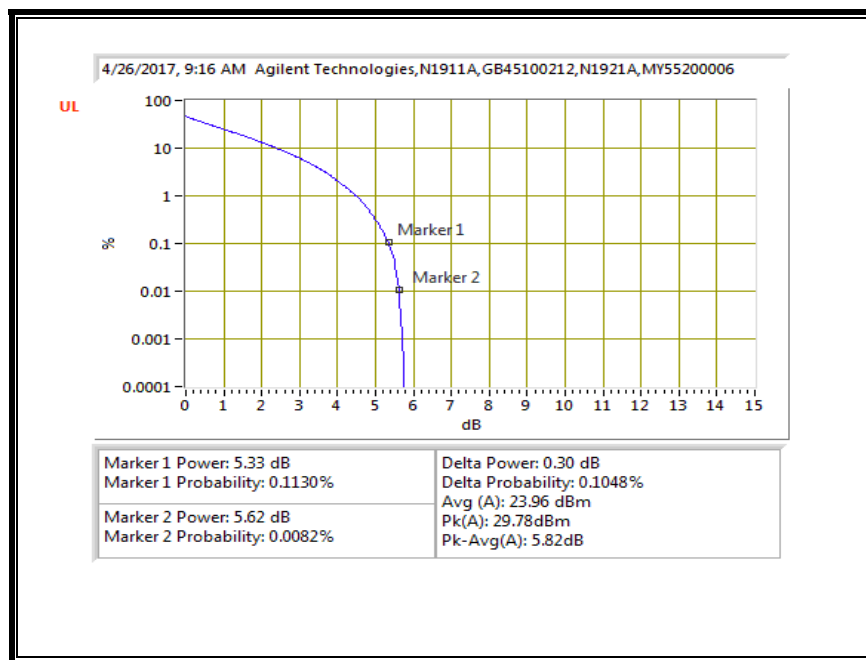
QPSK, (5.0 MHz BAND WIDTH)



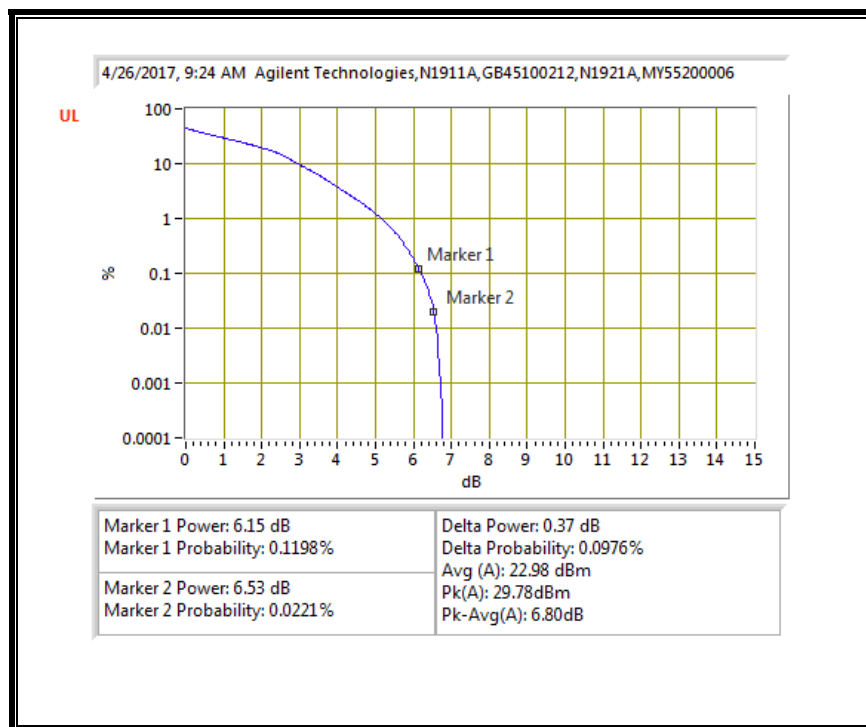
16QAM, (5.0 MHz BAND WIDTH)



QPSK, (10.0 MHz BAND WIDTH)

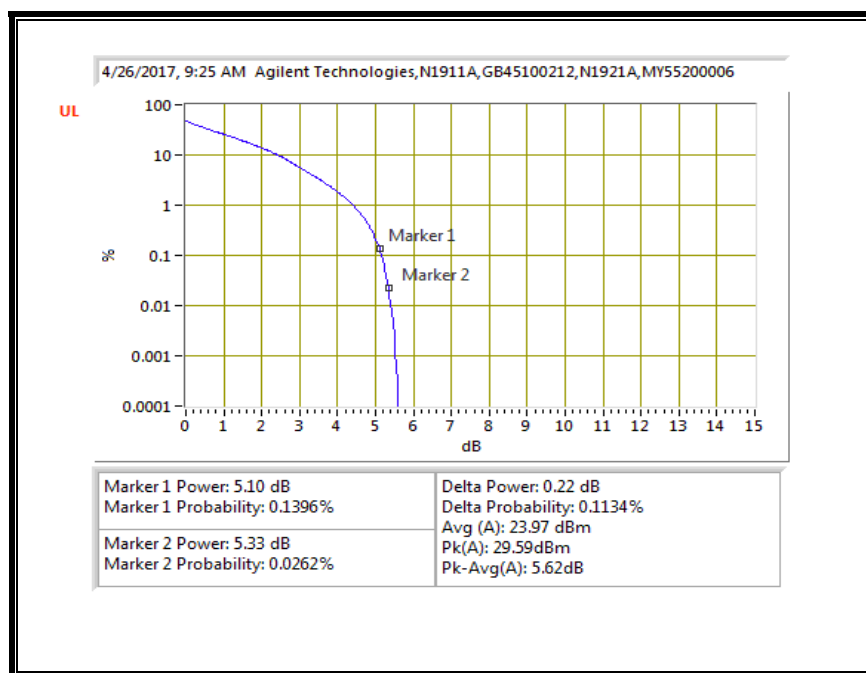


16QAM, (10.0 MHz BAND WIDTH)

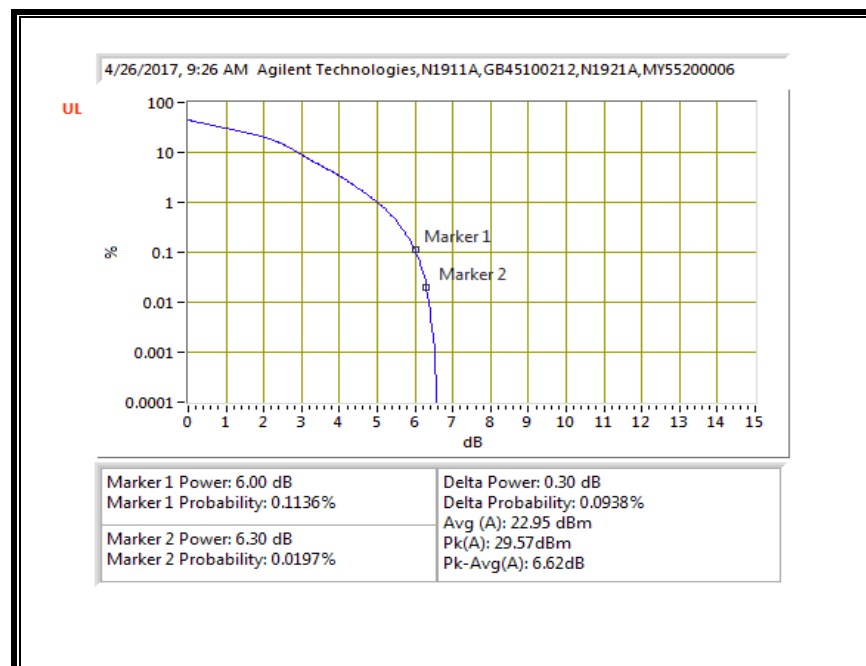


8.5.6. LTE BAND 13

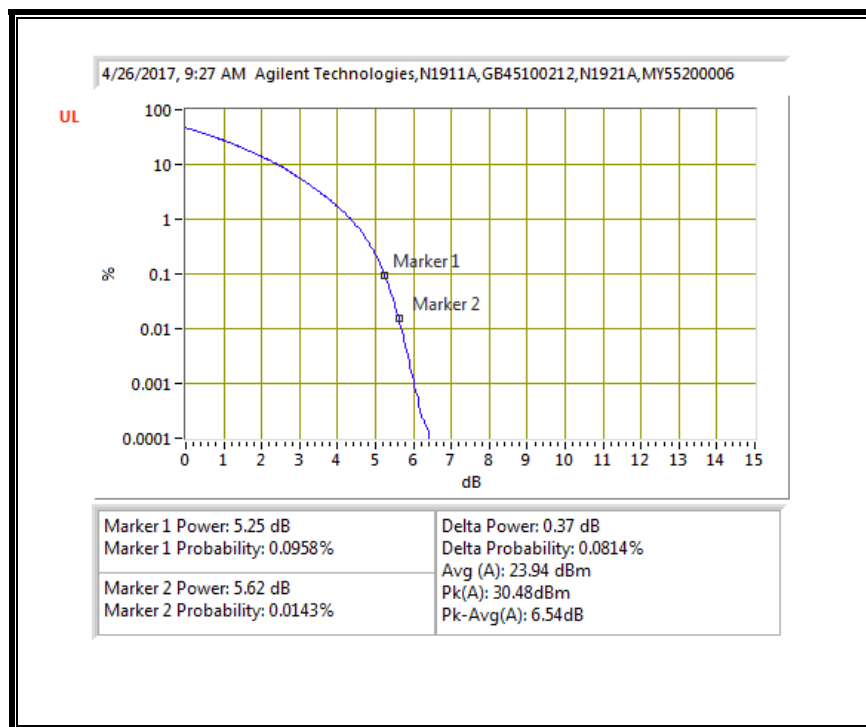
QPSK, (5.0 MHz BAND WIDTH)



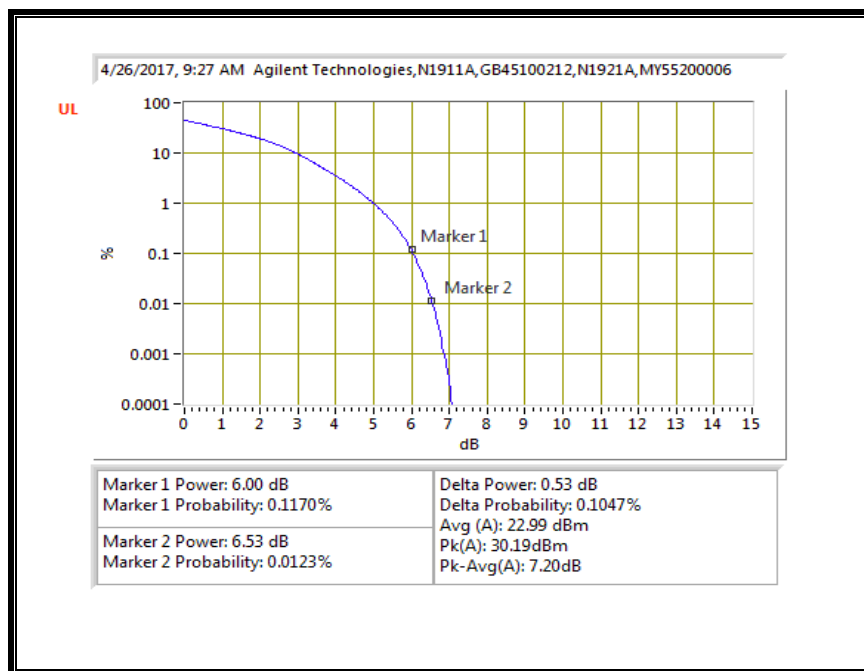
16QAM, (5.0 MHz BAND WIDTH)



QPSK, (10.0 MHz BAND WIDTH)

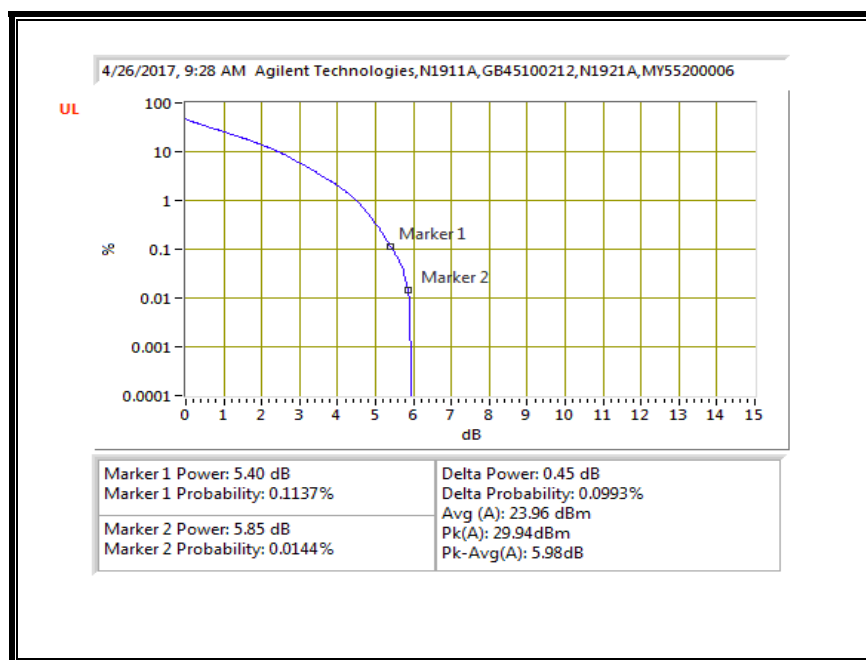


16QAM, (10.0 MHz BAND WIDTH)

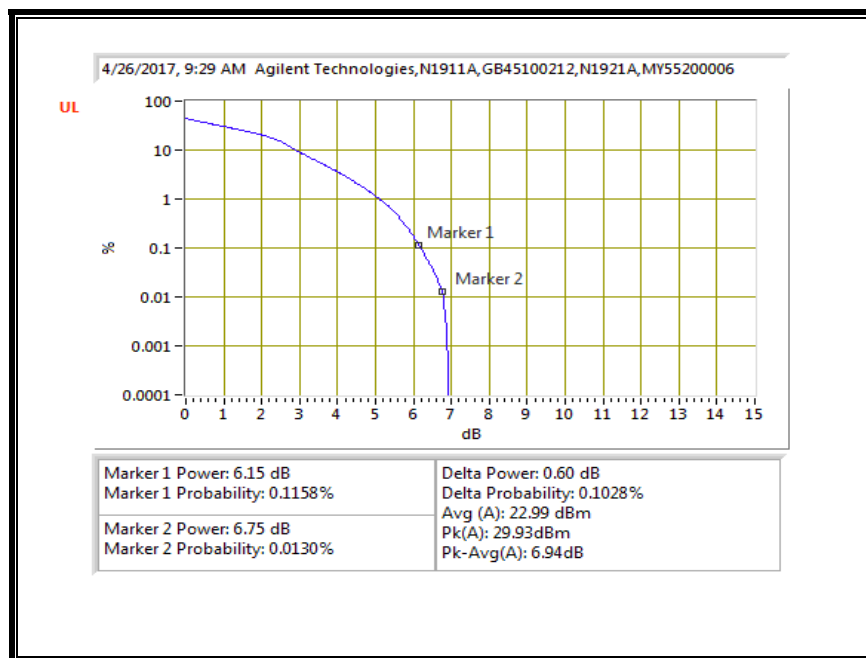


8.5.7. LTE BAND 17

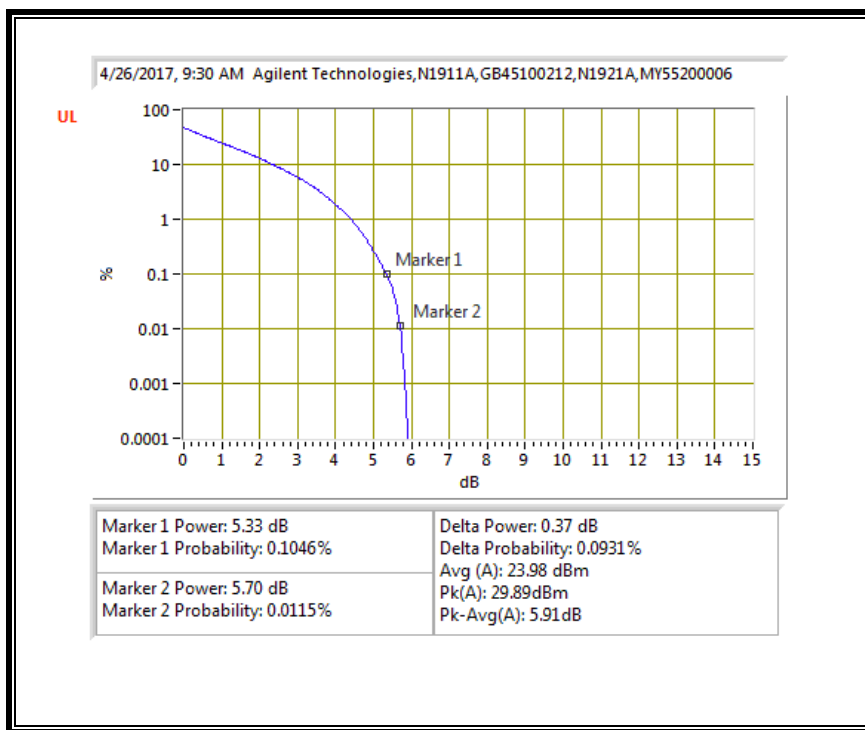
QPSK, (5.0 MHz BAND WIDTH)



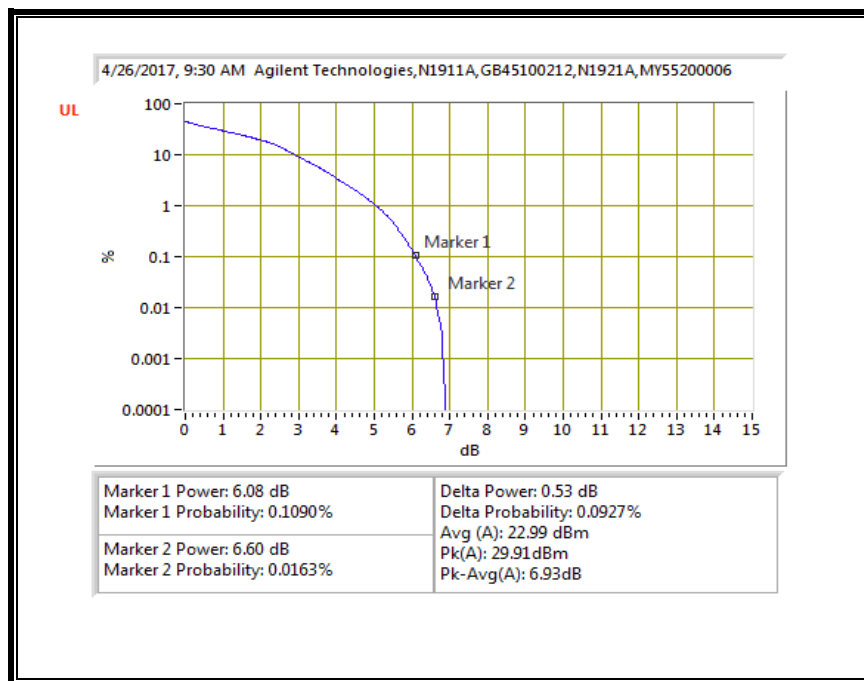
16QAM, (5.0 MHz BAND WIDTH)



QPSK, (10.0 MHz BAND WIDTH)

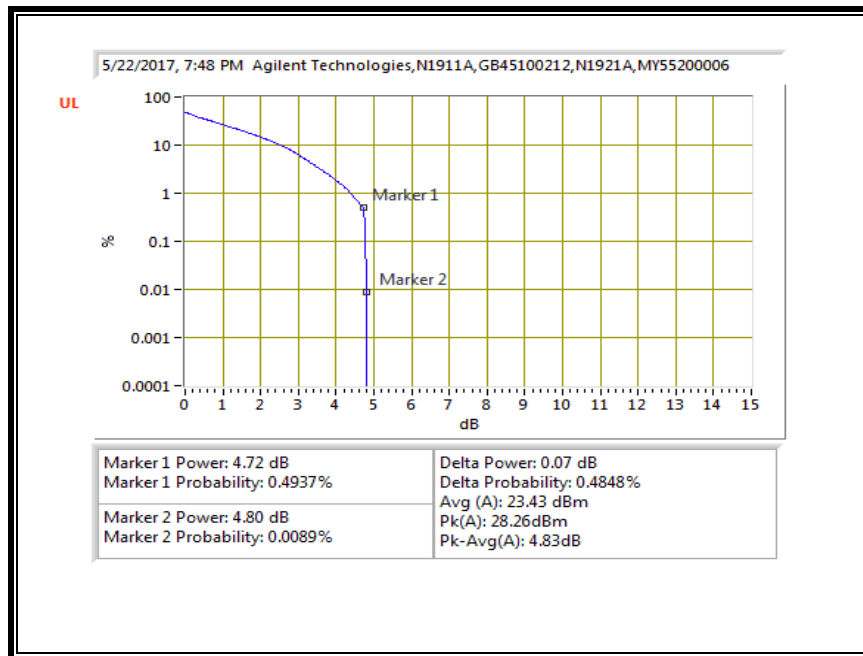


16QAM, (10.0 MHz BAND WIDTH)

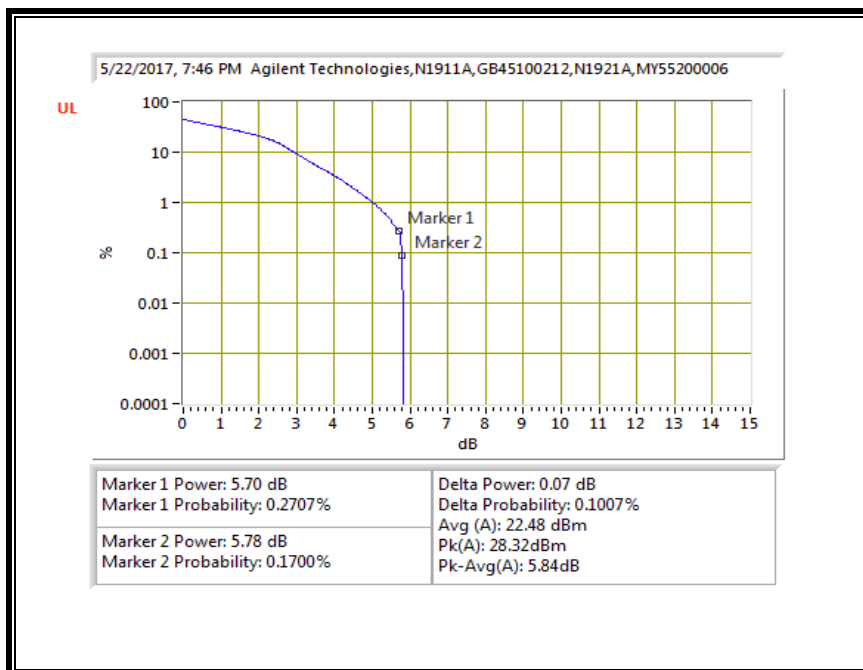


8.5.8. LTE BAND 25

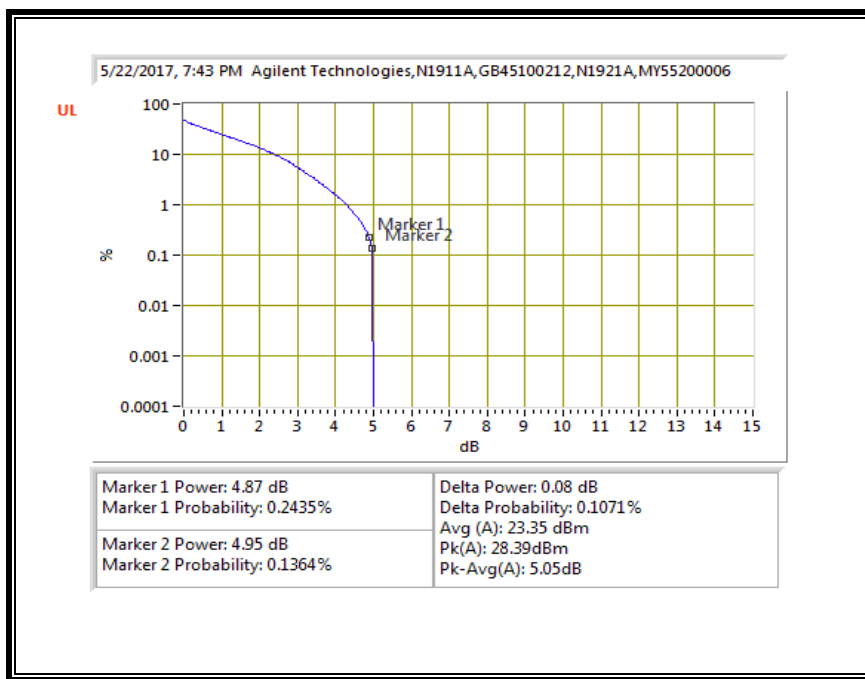
QPSK, (1.4 MHz BAND WIDTH)



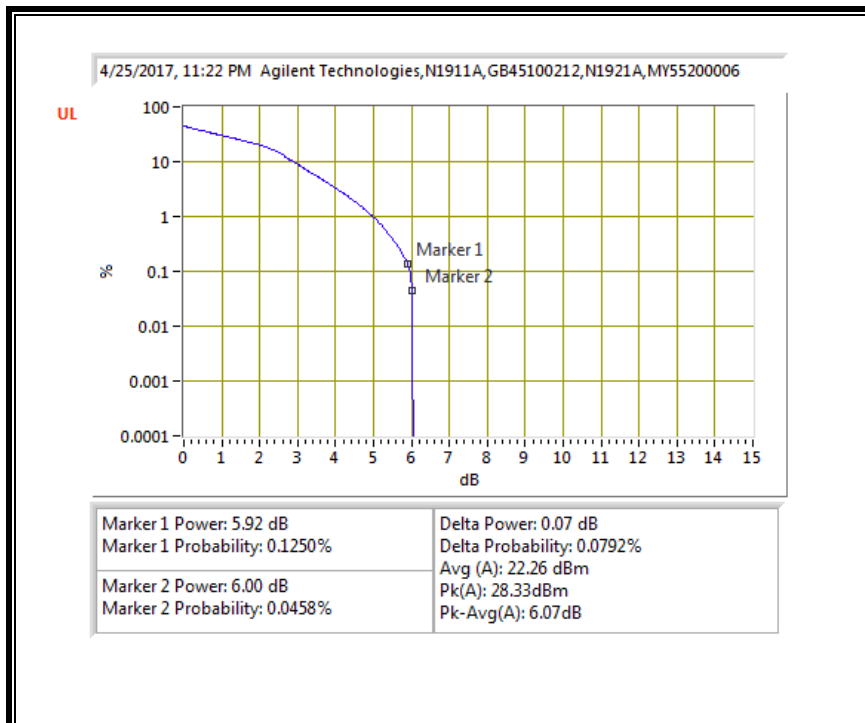
16QAM, (1.4 MHz BAND WIDTH)



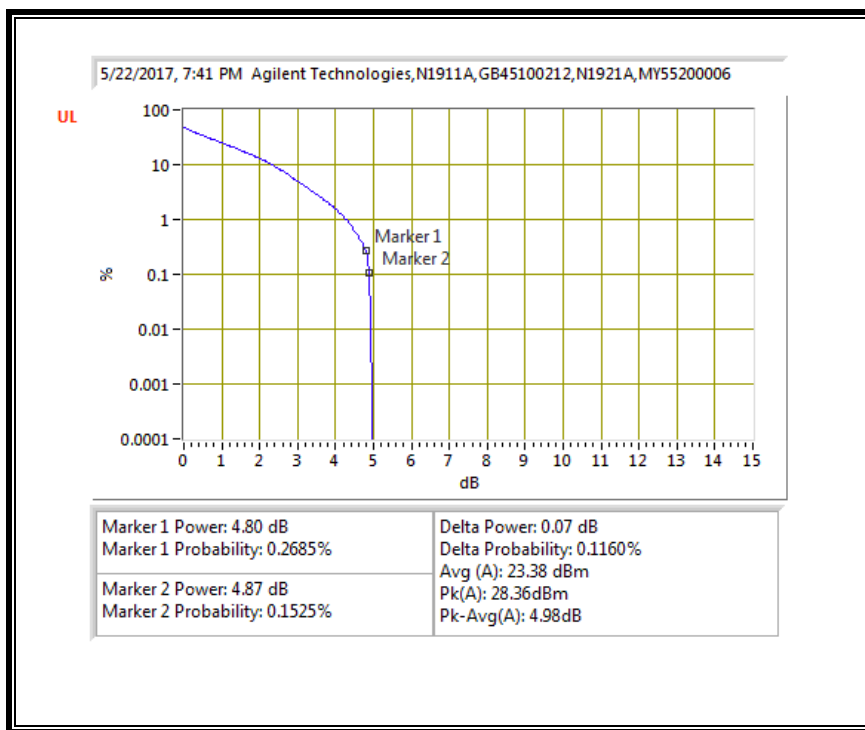
QPSK, (3.0 MHz BAND WIDTH)



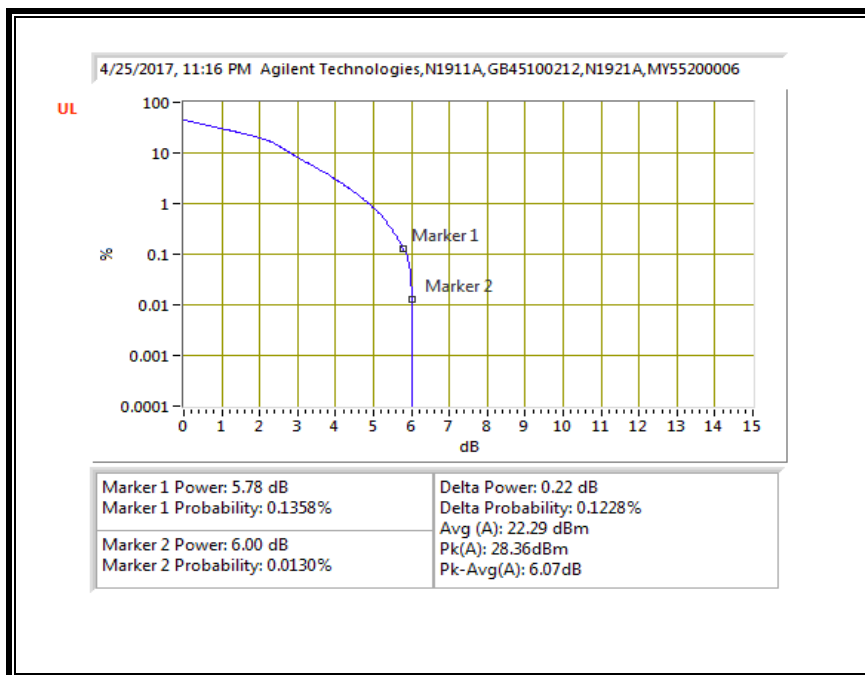
16QAM, (3.0 MHz BAND WIDTH)



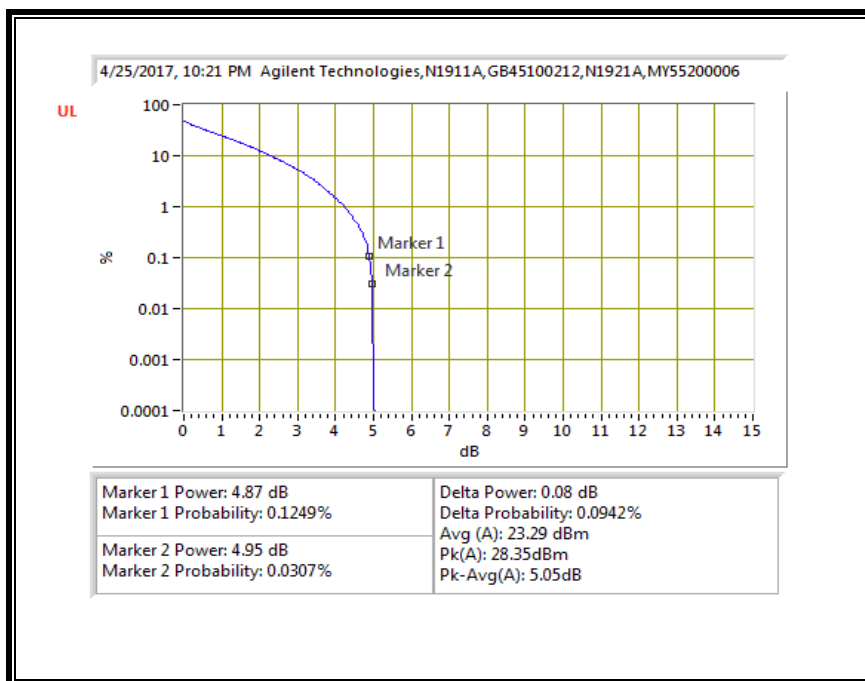
QPSK, (5.0 MHz BAND WIDTH)



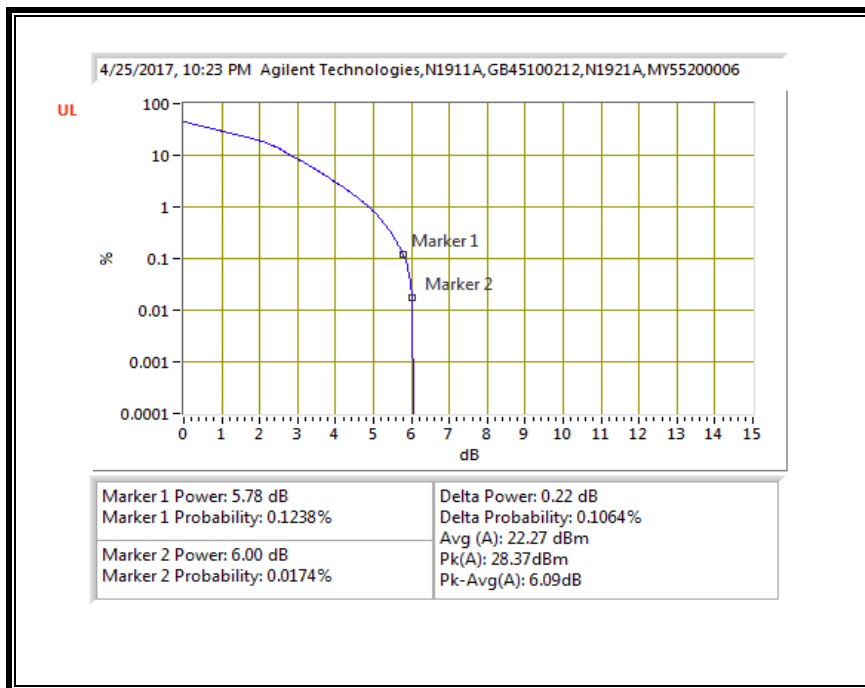
16QAM, (5.0 MHz BAND WIDTH)



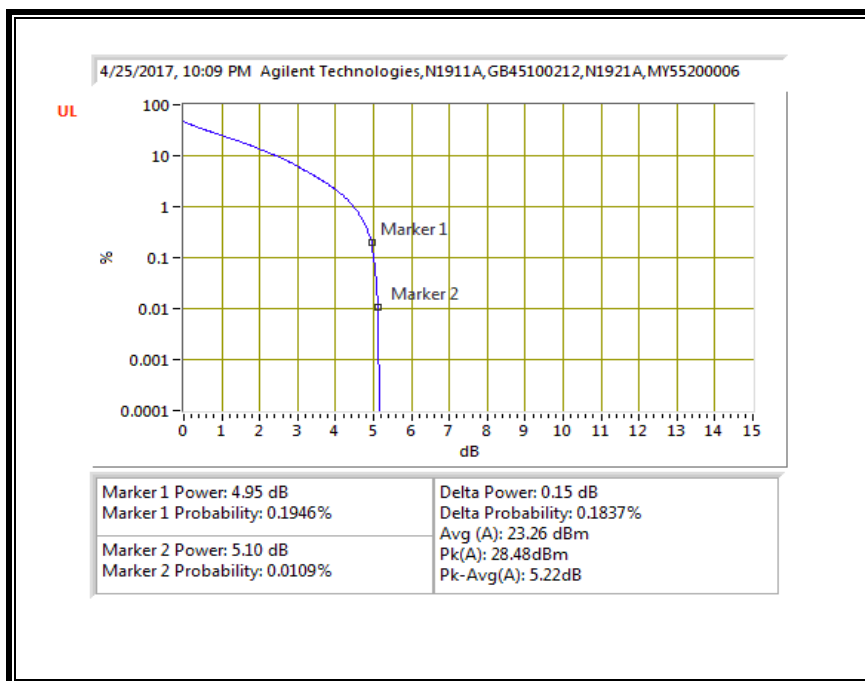
QPSK, (10.0 MHz BAND WIDTH)



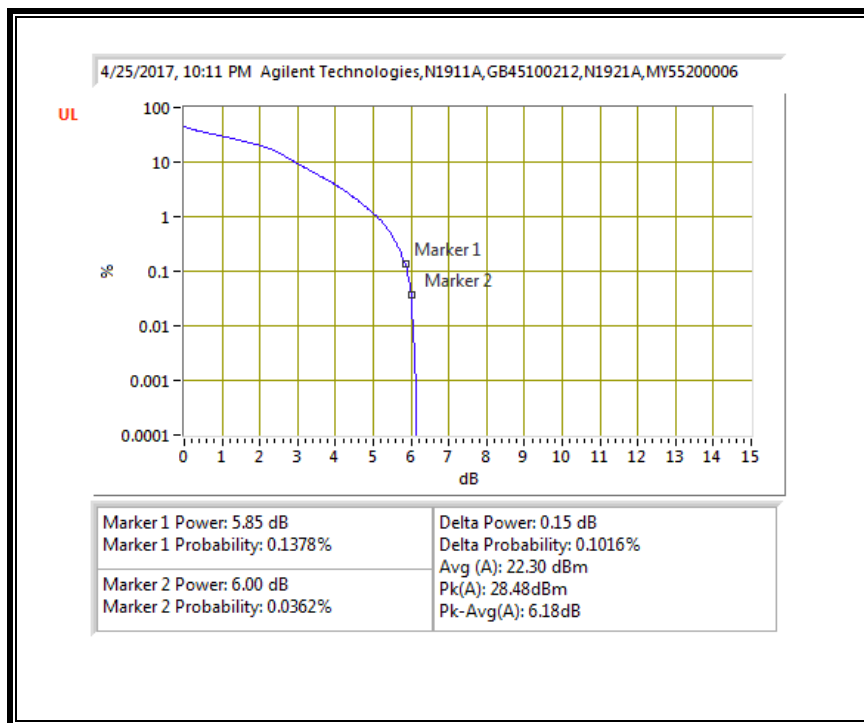
16QAM, (10.0 MHz BAND WIDTH)



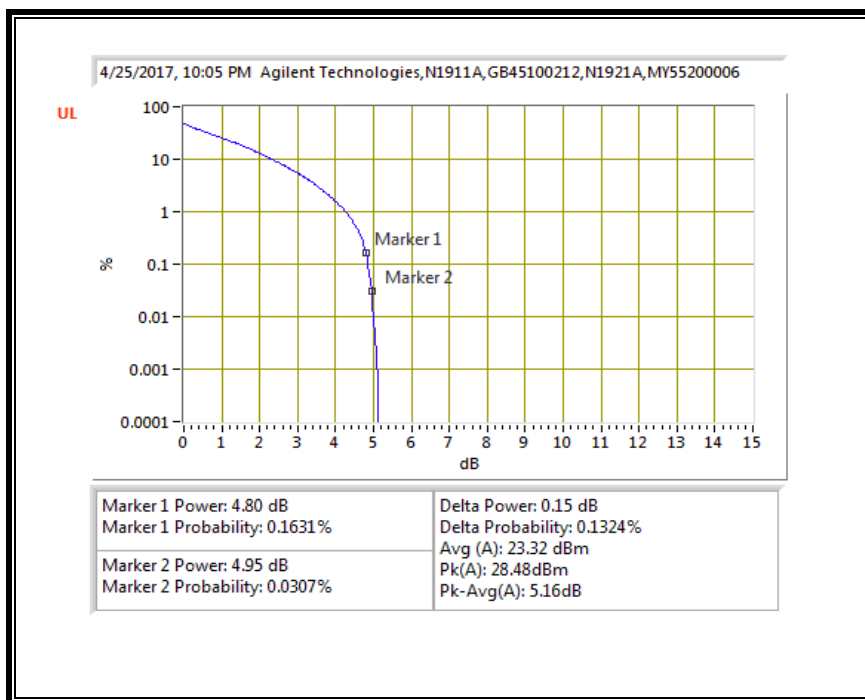
QPSK, (15.0 MHz BAND WIDTH)



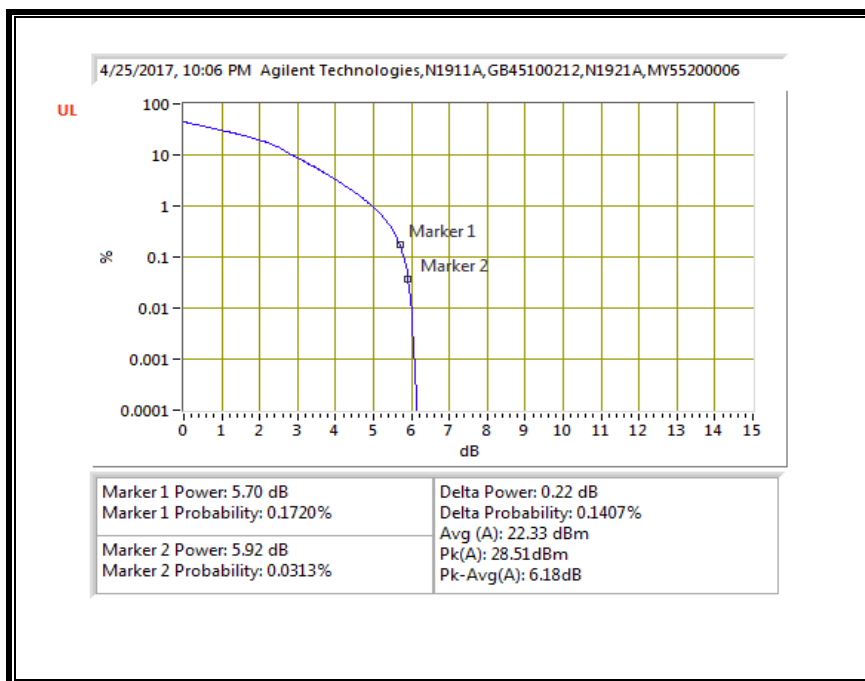
16QAM, (15.0 MHz BAND WIDTH)



QPSK, (20.0 MHz BAND WIDTH)

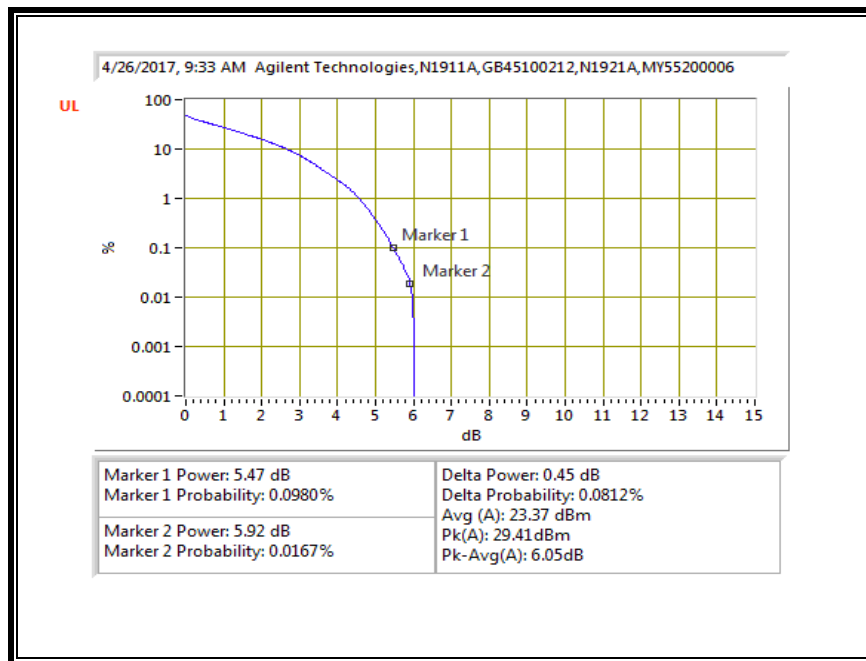


16QAM, (20.0 MHz BAND WIDTH)

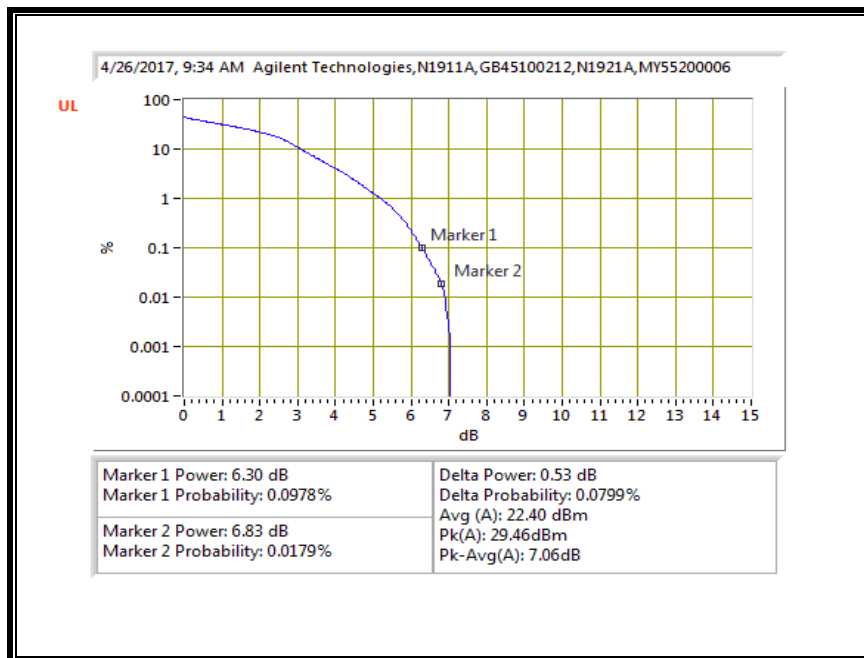


8.5.9. LTE BAND 26

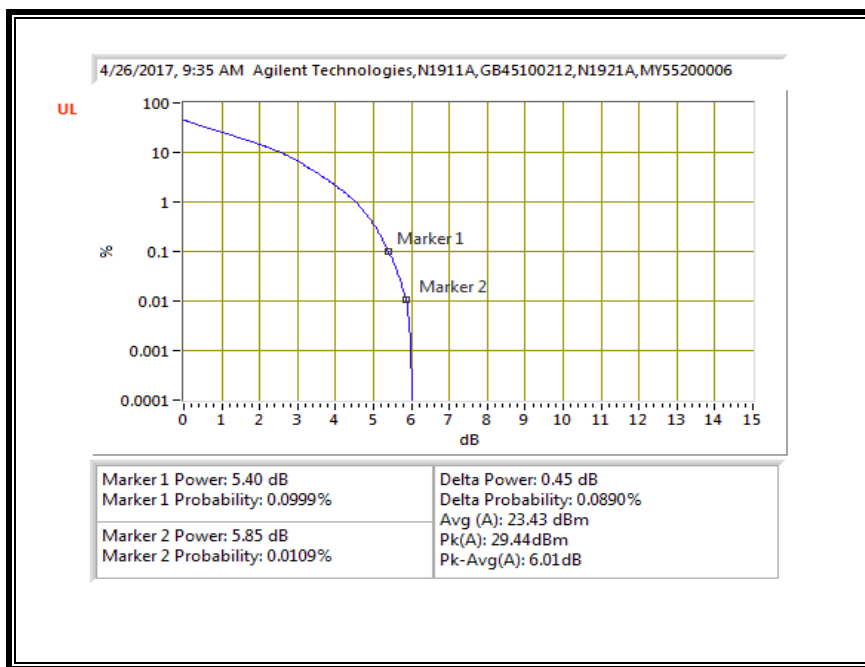
QPSK, (1.4 MHz BAND WIDTH)



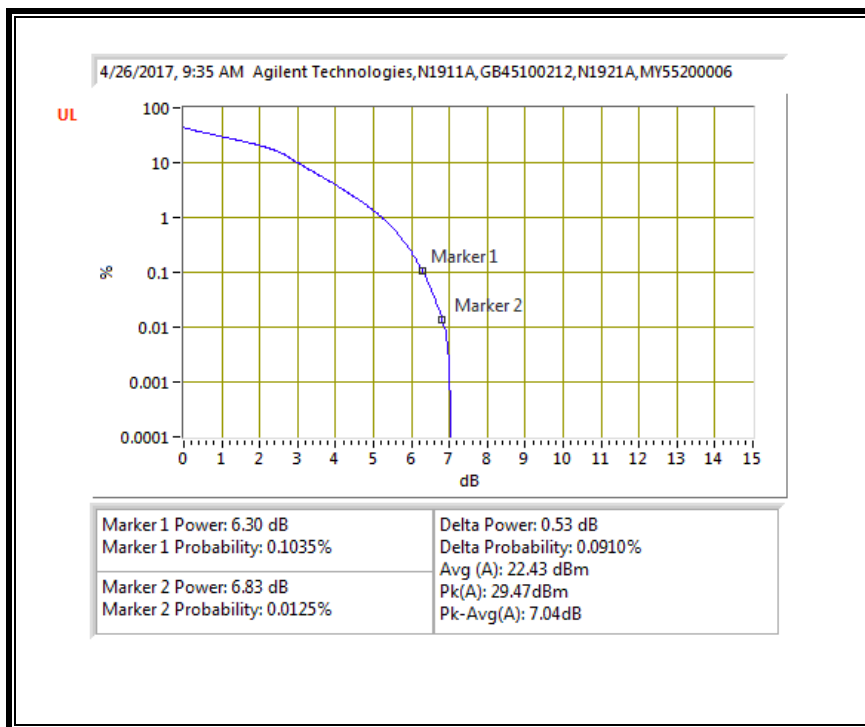
16QAM, (1.4 MHz BAND WIDTH)



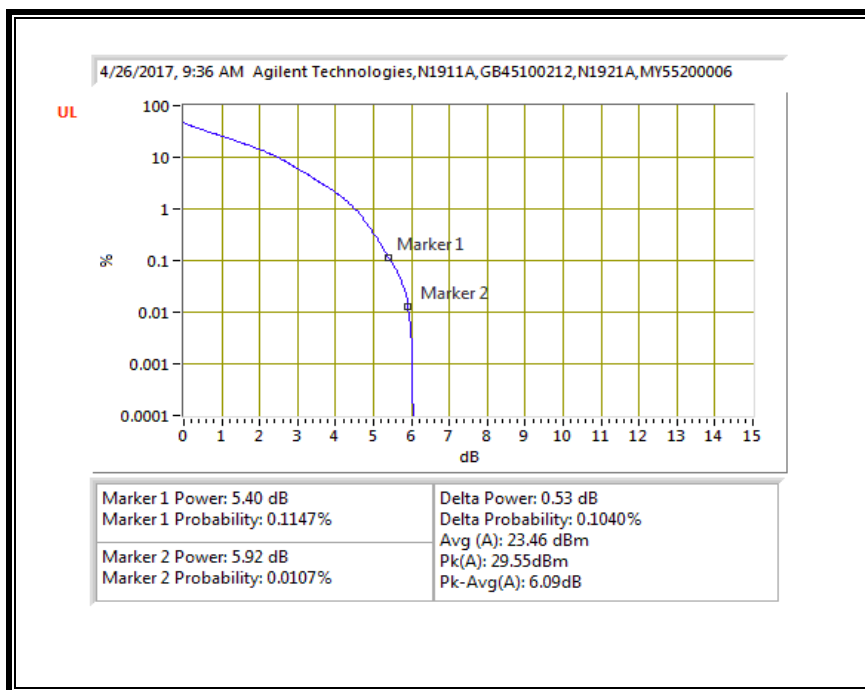
QPSK, (3.0 MHz BAND WIDTH)



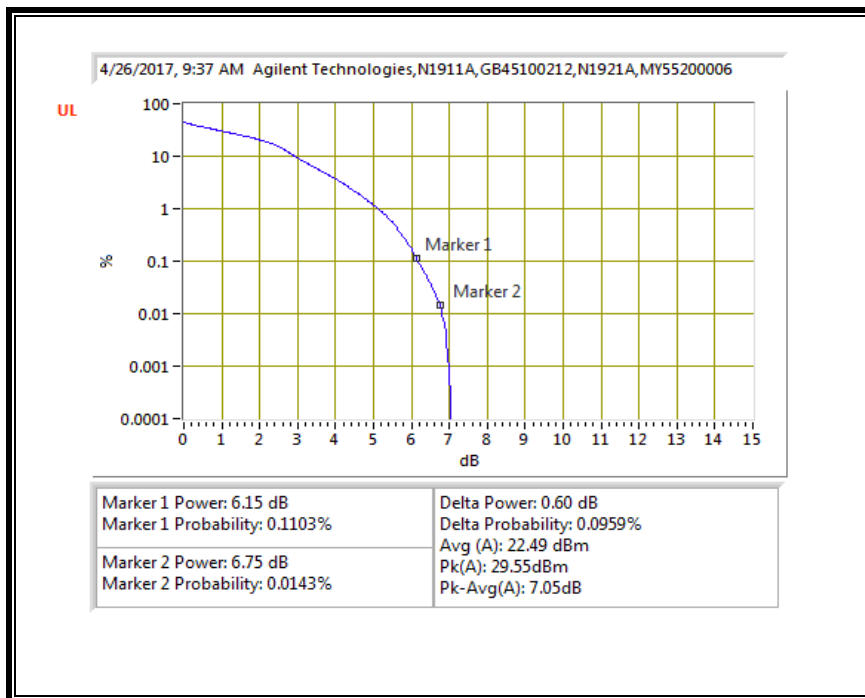
16QAM, (3.0 MHz BAND WIDTH)



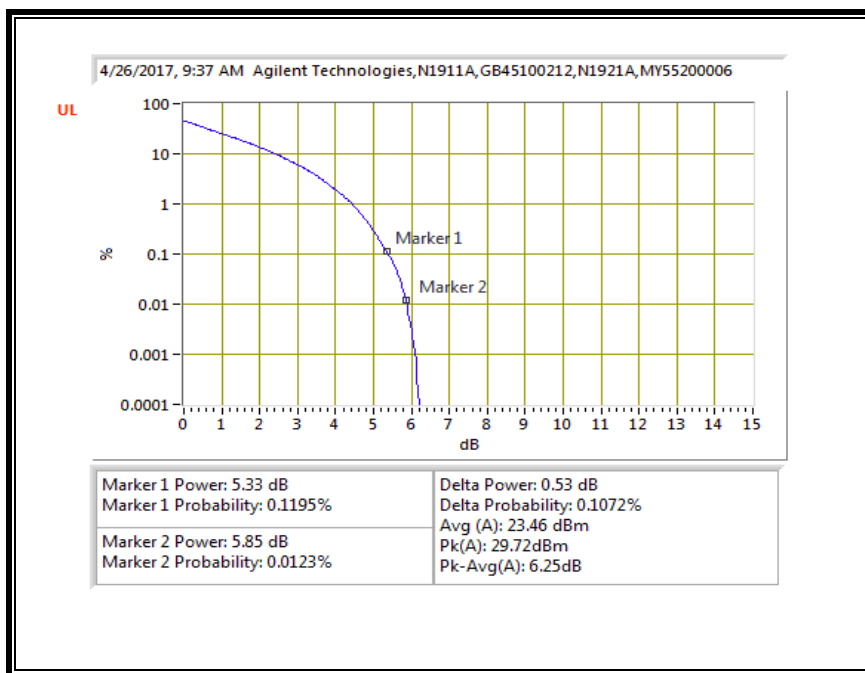
QPSK, (5.0 MHz BAND WIDTH)



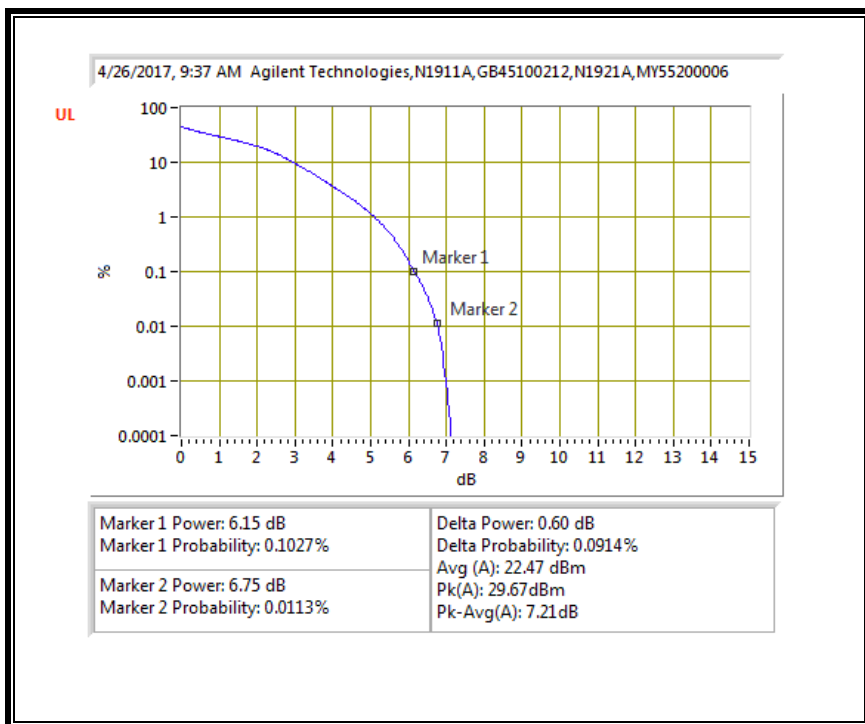
16QAM, (5.0 MHz BAND WIDTH)



QPSK, (10.0 MHz BAND WIDTH)

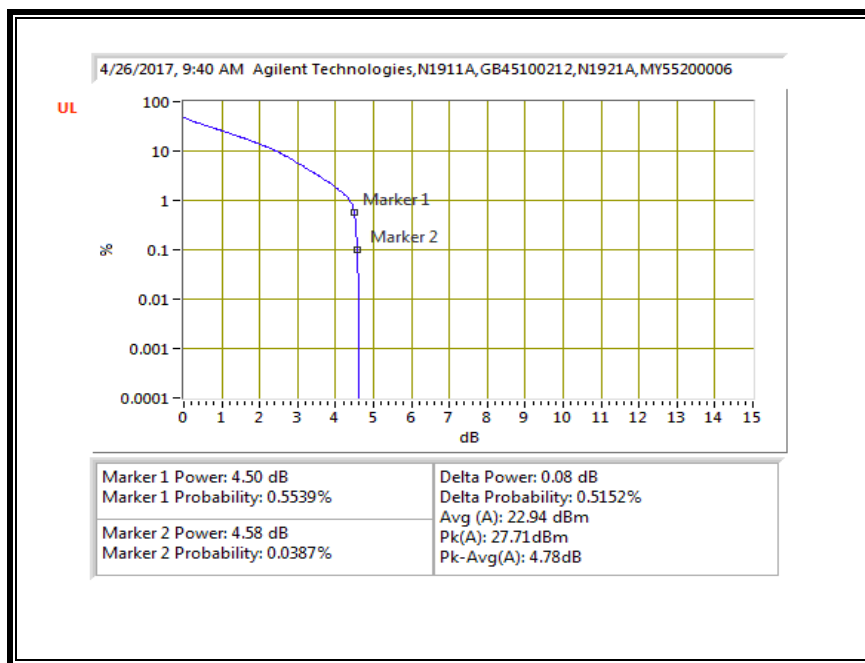


16QAM, (10.0 MHz BAND WIDTH)

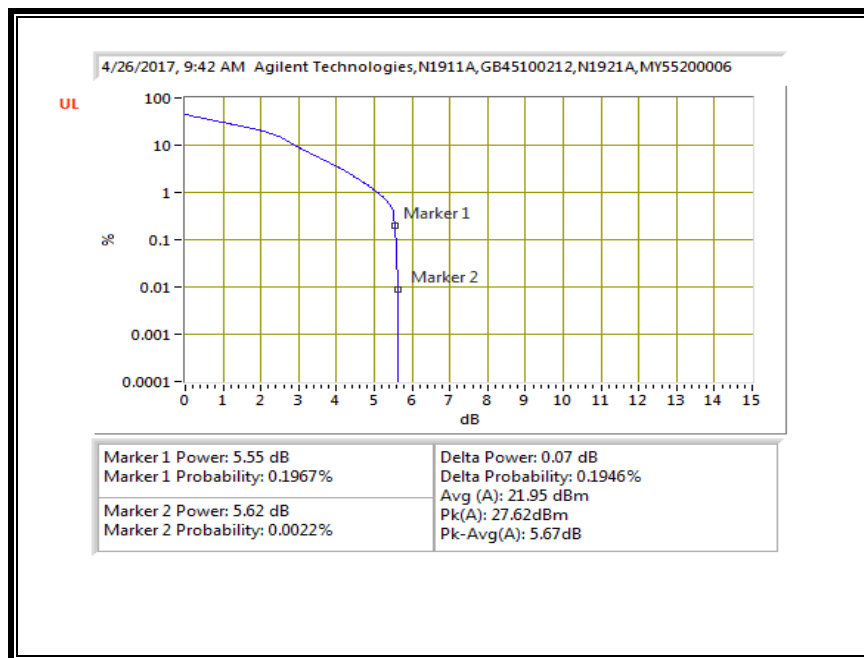


8.5.10. LTE BAND 30

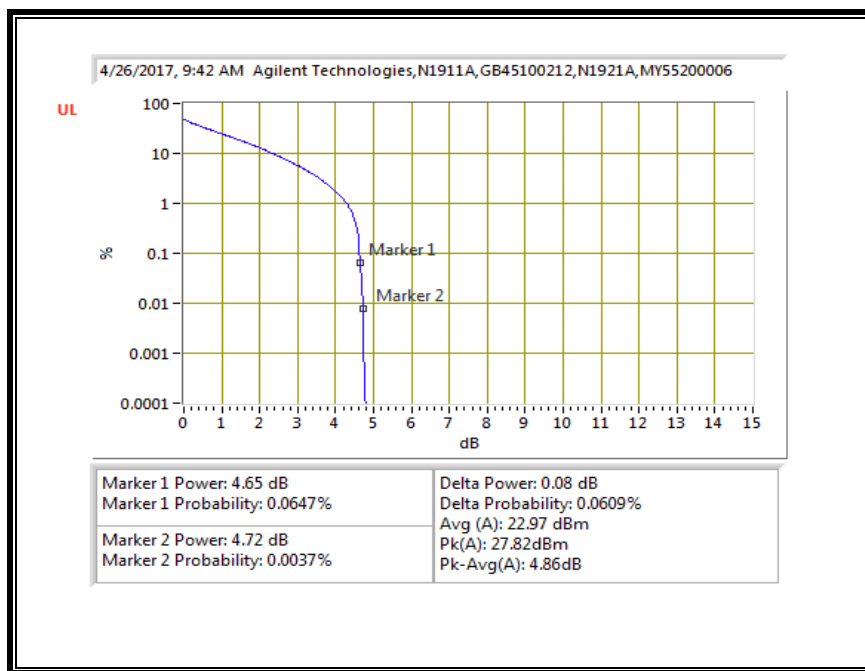
QPSK, (5.0 MHz BAND WIDTH)



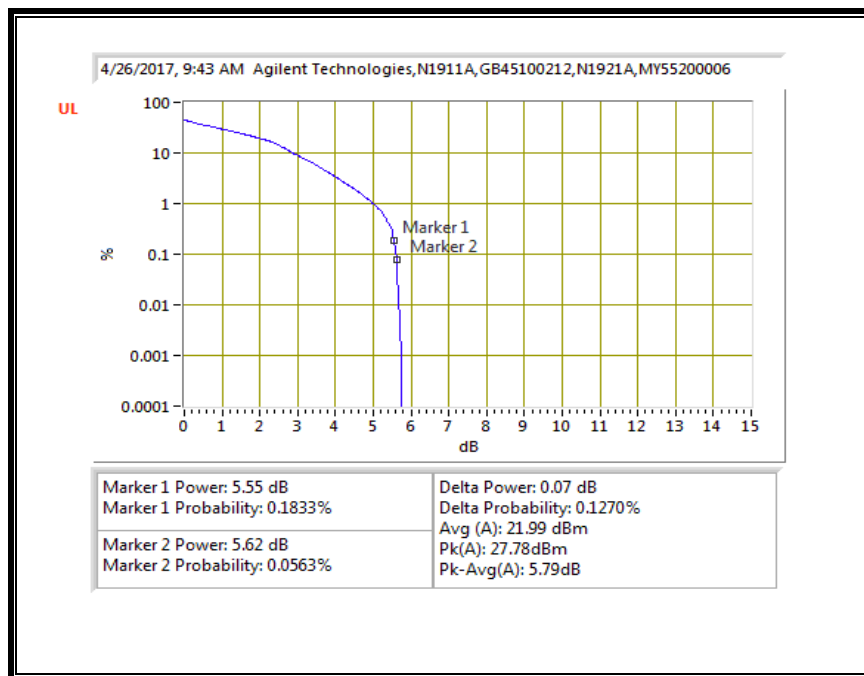
16QAM, (5.0 MHz BAND WIDTH)



QPSK, (10.0 MHz BAND WIDTH)



16QAM, (10.0 MHz BAND WIDTH)



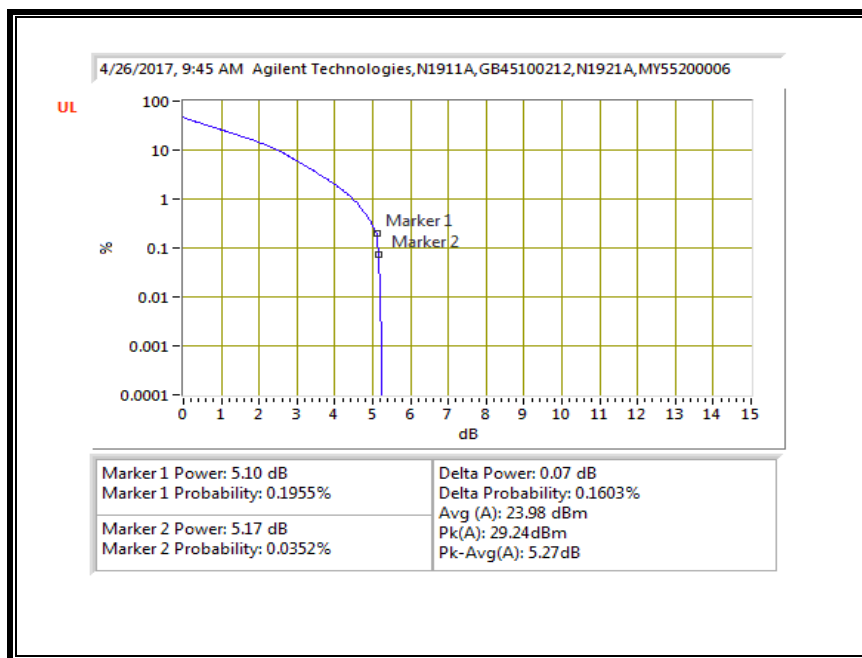
8.5.11. LTE BAND 41

ID:	29439	Date:	4/26/17
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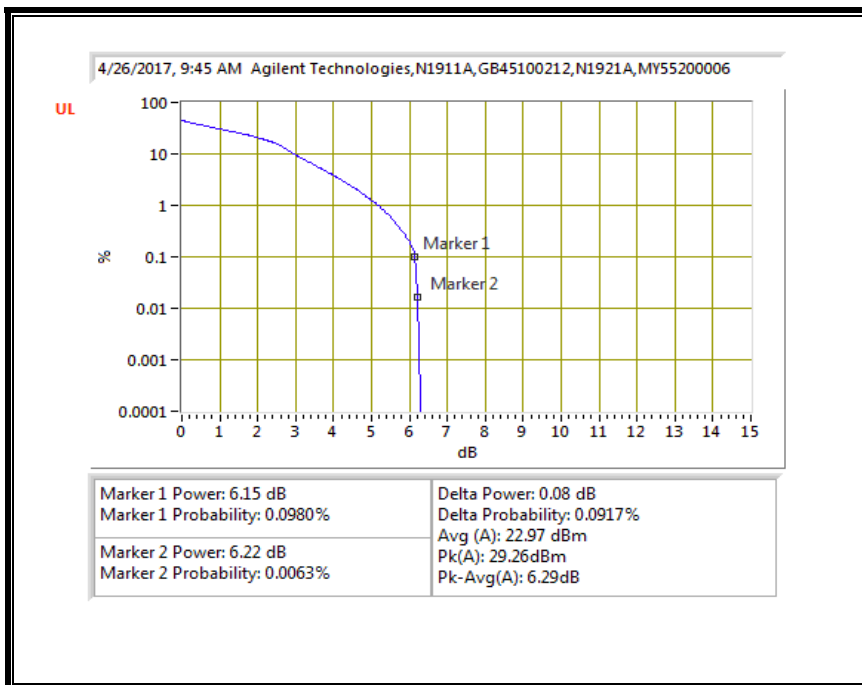
Mode	Channel Band-	Frequency (MHz)	RB Size	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio
						Peak	Average	
LTE Band 41	5MHz	2593.0	25	0	QPSK	30.68	16.87	6.79
					16QAM	30.51	15.92	7.57
	10MHz		50	0	QPSK	29.00	16.91	5.07
					16QAM	28.99	15.90	6.07
	15MHz		75	0	QPSK	28.96	16.88	5.06
					16QAM	28.95	15.88	6.05
	20MHz		100	0	QPSK	30.75	16.94	6.79
					16QAM	30.56	15.88	7.66
Duty Cycle Correction Factor (dB)=			7.02					
Peak to Average Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor								

8.5.12. LTE BAND 66

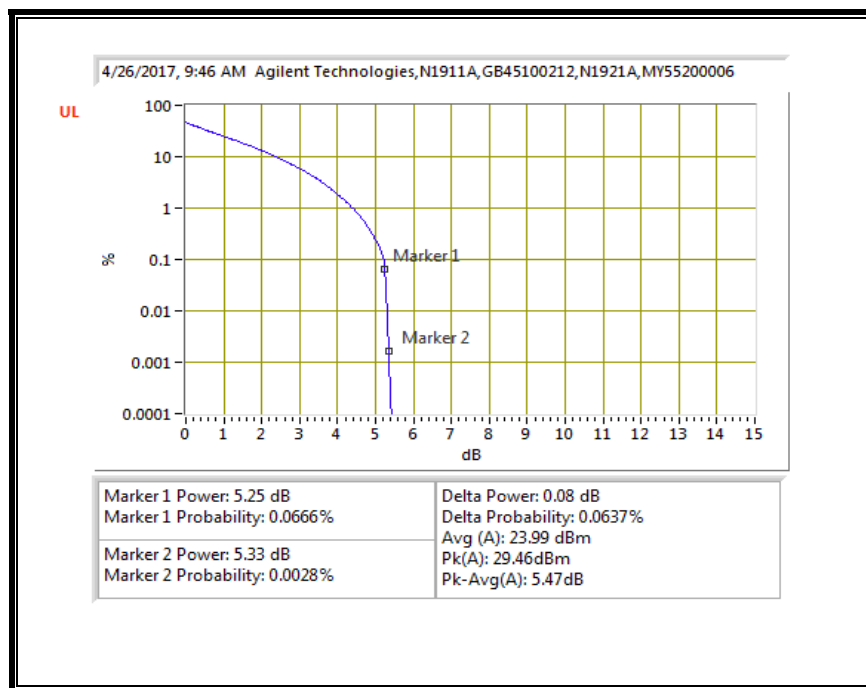
QPSK, (5.0 MHz BAND WIDTH)



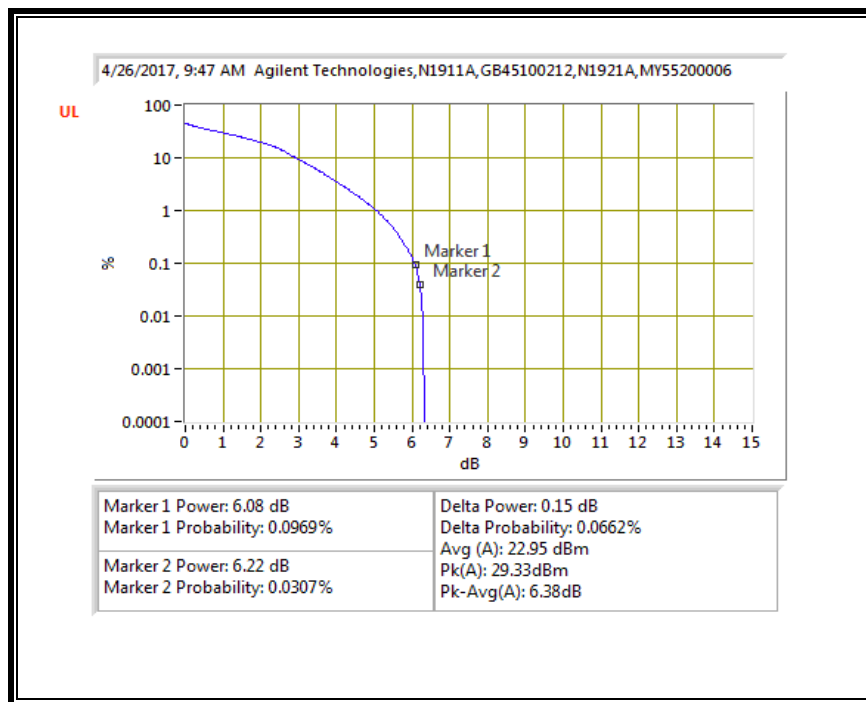
16QAM, (5.0 MHz BAND WIDTH)



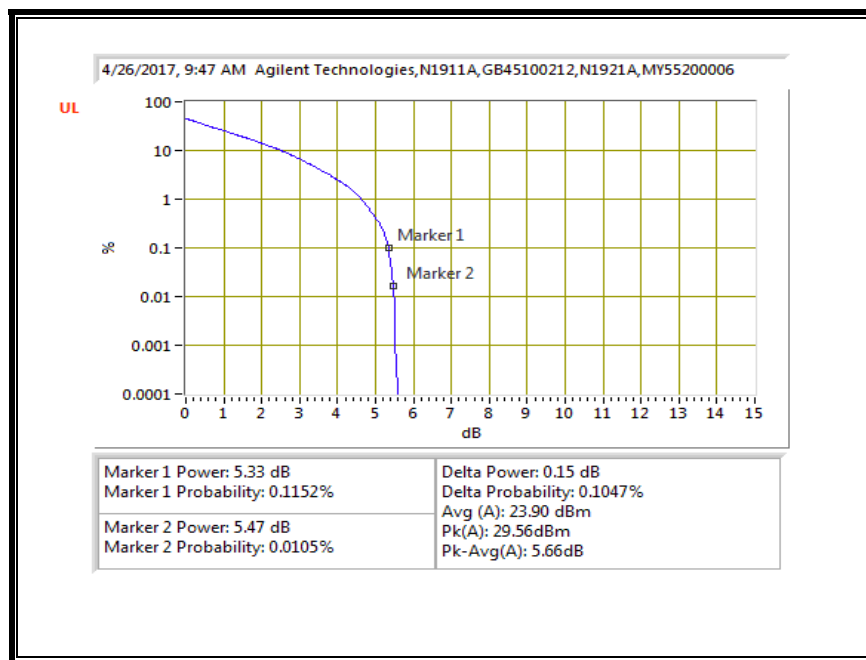
QPSK, (10.0 MHz BAND WIDTH)



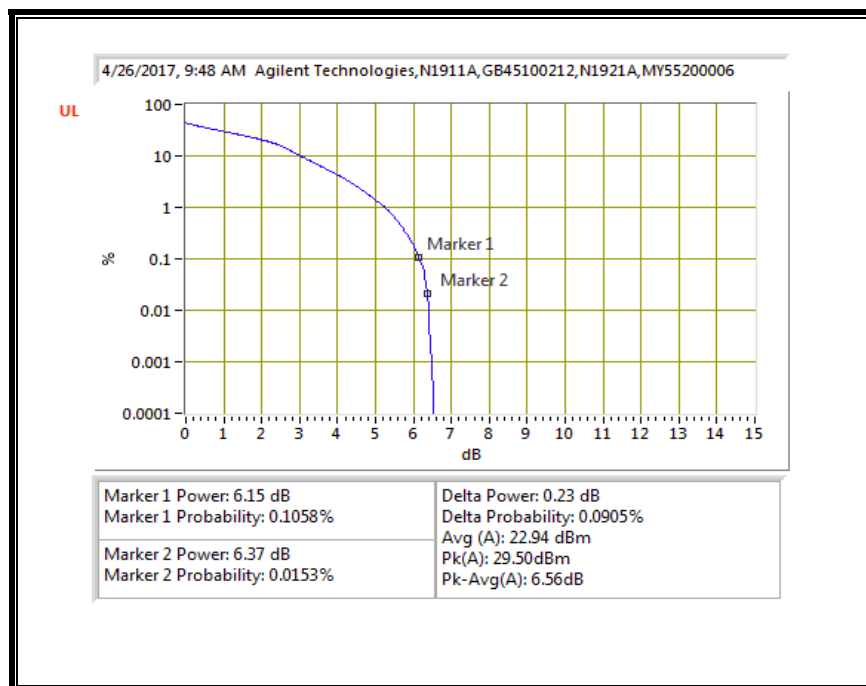
16QAM, (10.0 MHz BAND WIDTH)



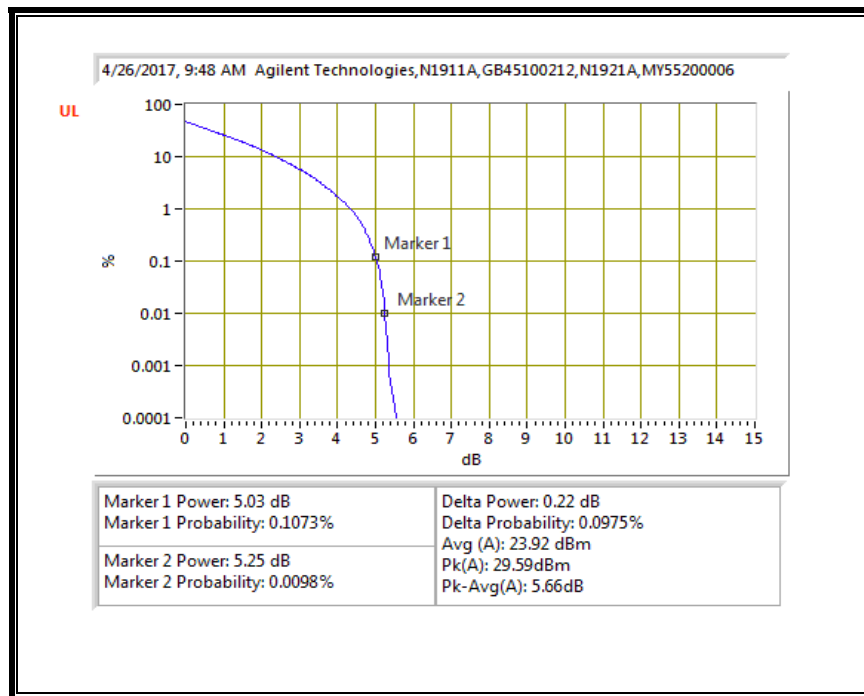
QPSK, (15.0 MHz BAND WIDTH)



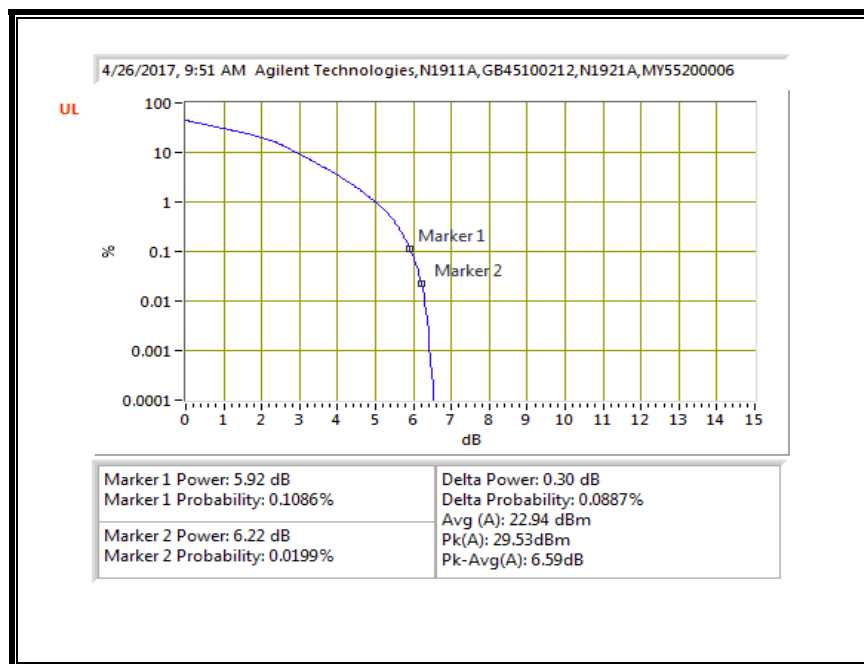
16QAM, (15.0 MHz BAND WIDTH)



QPSK, (20.0 MHz BAND WIDTH)



16QAM, (20.0 MHz BAND WIDTH)



9. RADIATED TEST RESULTS

9.1. FIELD STRENGTH OF SPURIOUS RADIATION, LAT 1

RULE PART(S)

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

LIMIT

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

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

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

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

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

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

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

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

TEST PROCEDURE

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

frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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

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

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

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB at the channel edges and $55 + 10 \log_{10}(p)$ at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

MODES TESTED

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

RESULTS

9.1.1. LTE BAND 2

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/07/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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	-63.7	H	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3	
5.58	-65.5	H	3.0	-11.4	38.6	1.0	-48.9	-13.0	-35.9	
7.44	-65.9	H	3.0	-8.2	37.8	1.0	-45.0	-13.0	-32.0	
3.72	-63.5	V	3.0	-13.6	38.6	1.0	-51.2	-13.0	-38.2	
5.58	-65.6	V	3.0	-11.8	38.6	1.0	-49.4	-13.0	-36.4	
7.44	-66.2	V	3.0	-8.7	37.8	1.0	-45.5	-13.0	-32.5	
Mid Channel (1880MHz)										
3.76	-63.2	H	3.0	-13.1	38.6	1.0	-50.7	-13.0	-37.7	
5.64	-64.7	H	3.0	-10.5	38.5	1.0	-48.0	-13.0	-35.0	
7.52	-66.1	H	3.0	-8.3	37.7	1.0	-45.0	-13.0	-32.0	
3.76	-63.7	V	3.0	-13.6	38.6	1.0	-51.3	-13.0	-38.3	
5.64	-66.7	V	3.0	-12.8	38.5	1.0	-50.3	-13.0	-37.3	
7.52	-66.3	V	3.0	-8.7	37.7	1.0	-45.4	-13.0	-32.4	
High Channel (1900MHz)										
3.80	-63.5	H	3.0	-13.2	38.6	1.0	-50.9	-13.0	-37.9	
5.70	-64.5	H	3.0	-10.2	38.5	1.0	-47.7	-13.0	-34.7	
7.60	-65.7	H	3.0	-7.8	37.7	1.0	-44.5	-13.0	-31.5	
3.80	-63.8	V	3.0	-13.6	38.6	1.0	-51.3	-13.0	-38.3	
5.70	-64.6	V	3.0	-10.6	38.5	1.0	-48.1	-13.0	-35.1	
7.60	-66.4	V	3.0	-8.7	37.7	1.0	-45.4	-13.0	-32.4	

Rev. 05.21.15

16QAM LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber											
Company: Project #: Date: 04/07/17 Test Engineer: 39004 Configuration: EUT Only Mode: LTE Band 2, 20MHz 16QAM											
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable											
Chamber		Pre-amplifier		Filter		Limit					
3m Chamber E		3m Chamber E		Filter		EIRP					
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes	
Low Channel (1860MHz)											
3.72	-63.7	H	3.0	-13.6	38.6	1.0	-51.3	-13.0	-38.3		
5.58	-65.5	H	3.0	-11.4	38.6	1.0	-49.0	-13.0	-36.0		
7.44	-65.8	H	3.0	-8.1	37.8	1.0	-44.9	-13.0	-31.9		
3.72	-63.6	V	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3		
5.58	-65.7	V	3.0	-12.0	38.6	1.0	-49.5	-13.0	-36.5		
7.44	-66.3	V	3.0	-8.8	37.8	1.0	-45.6	-13.0	-32.6		
Mid Channel (1880MHz)											
3.76	-63.3	H	3.0	-13.2	38.6	1.0	-50.9	-13.0	-37.9		
5.64	-64.7	H	3.0	-10.5	38.5	1.0	-48.0	-13.0	-35.0		
7.52	-66.2	H	3.0	-8.4	37.7	1.0	-45.2	-13.0	-32.2		
3.76	-63.8	V	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3		
5.64	-66.7	V	3.0	-12.7	38.5	1.0	-50.3	-13.0	-37.3		
7.52	-66.6	V	3.0	-9.0	37.7	1.0	-45.7	-13.0	-32.7		
High Channel (1900MHz)											
3.80	-63.4	H	3.0	-13.2	38.6	1.0	-50.9	-13.0	-37.9		
5.70	-64.6	H	3.0	-10.2	38.5	1.0	-47.7	-13.0	-34.7		
7.60	-65.7	H	3.0	-7.8	37.7	1.0	-44.5	-13.0	-31.5		
3.80	-63.8	V	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3		
5.70	-64.6	V	3.0	-10.5	38.5	1.0	-48.0	-13.0	-35.0		
7.60	-66.4	V	3.0	-8.7	37.7	1.0	-45.4	-13.0	-32.4		
Rev. 05.21.15											

9.1.2. LTE BAND 4

QPSK LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 05/10/17
Test Engineer: 10641
Configuration: EUT Only
Mode: LTE Band 4, 3MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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 (1720MHz)										
3.44	-61.9	H	3.0	-12.6	38.5	1.0	-50.1	-13.0	-37.1	
5.16	-60.0	H	3.0	-6.8	38.7	1.0	-44.5	-13.0	-31.5	
6.88	-59.4	H	3.0	-2.4	38.1	1.0	-39.6	-13.0	-26.6	
3.44	-62.4	V	3.0	-13.3	38.5	1.0	-50.9	-13.0	-37.9	
5.16	-60.4	V	3.0	-7.6	38.7	1.0	-45.2	-13.0	-32.2	
6.88	-60.4	V	3.0	-3.7	38.1	1.0	-40.8	-13.0	-27.8	
Mid Channel (1732.5MHz)										
3.47	-62.5	H	3.0	-13.1	38.5	1.0	-50.7	-13.0	-37.7	
5.20	-59.6	H	3.0	-6.3	38.7	1.0	-44.0	-13.0	-31.0	
6.93	-60.3	H	3.0	-3.3	38.1	1.0	-40.4	-13.0	-27.4	
3.47	-62.0	V	3.0	-12.8	38.5	1.0	-50.4	-13.0	-37.4	
5.20	-60.5	V	3.0	-7.5	38.7	1.0	-45.2	-13.0	-32.2	
6.93	-61.4	V	3.0	-4.6	38.1	1.0	-41.7	-13.0	-28.7	
High Channel (1745MHz)										
3.49	-62.9	H	3.0	-13.5	38.5	1.0	-51.0	-13.0	-38.0	
5.24	-61.5	H	3.0	-8.1	38.7	1.0	-45.8	-13.0	-32.8	
6.98	-60.9	H	3.0	-3.7	38.1	1.0	-40.8	-13.0	-27.8	
3.49	-62.2	V	3.0	-12.9	38.5	1.0	-50.5	-13.0	-37.5	
5.24	-60.1	V	3.0	-7.0	38.7	1.0	-44.7	-13.0	-31.7	
6.98	-61.0	V	3.0	-4.1	38.1	1.0	-41.2	-13.0	-28.2	

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16QAM LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 05/10/17
Test Engineer: 10641
Configuration: EUT Only
Mode: LTE Band 4, 3MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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 (1720MHz)										
3.44	-61.1	H	3.0	-11.8	38.5	1.0	-49.3	-13.0	-36.3	
5.16	-59.4	H	3.0	-6.2	38.7	1.0	-43.9	-13.0	-30.9	
6.88	-60.4	H	3.0	-3.5	38.1	1.0	-40.6	-13.0	-27.6	
3.44	-61.4	V	3.0	-12.3	38.5	1.0	-49.8	-13.0	-36.8	
5.16	-60.0	V	3.0	-7.1	38.7	1.0	-44.8	-13.0	-31.8	
6.88	-61.1	V	3.0	-4.5	38.1	1.0	-41.6	-13.0	-28.6	
Mid Channel (1732.5MHz)										
3.47	-61.5	H	3.0	-12.1	38.5	1.0	-49.7	-13.0	-36.7	
5.20	-59.0	H	3.0	-5.7	38.7	1.0	-43.4	-13.0	-30.4	
6.93	-60.8	H	3.0	-3.8	38.1	1.0	-40.9	-13.0	-27.9	
3.47	-61.4	V	3.0	-12.2	38.5	1.0	-49.7	-13.0	-36.7	
5.20	-58.5	V	3.0	-5.6	38.7	1.0	-43.3	-13.0	-30.3	
6.93	-59.8	V	3.0	-3.1	38.1	1.0	-40.2	-13.0	-27.2	
High Channel (1745MHz)										
3.49	-61.6	H	3.0	-12.1	38.5	1.0	-49.7	-13.0	-36.7	
5.24	-60.7	H	3.0	-7.3	38.7	1.0	-45.0	-13.0	-32.0	
6.98	-60.8	H	3.0	-3.6	38.1	1.0	-40.7	-13.0	-27.7	
3.49	-62.1	V	3.0	-12.8	38.5	1.0	-50.3	-13.0	-37.3	
5.24	-59.9	V	3.0	-6.8	38.7	1.0	-44.5	-13.0	-31.5	
6.98	-61.6	V	3.0	-4.7	38.1	1.0	-41.8	-13.0	-28.8	

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9.1.3. LTE BAND 5

QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/08/17

Test Engineer: 39004

Configuration: EUT Only

Mode: LTE Band 5, 10MHz QPSK

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

Chamber
3m Chamber E

Pre-amplifier
3m Chamber E

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	-56.6	H	3.0	-14.1	37.8	1.0	-51.0	-13.0	-38.0	
2.49	-64.2	H	3.0	-19.1	38.5	1.0	-56.7	-13.0	-43.7	
3.32	-64.5	H	3.0	-15.5	38.5	1.0	-52.9	-13.0	-39.9	
1.66	-56.9	V	3.0	-14.7	37.8	1.0	-51.6	-13.0	-38.6	
2.49	-64.6	V	3.0	-19.3	38.5	1.0	-56.8	-13.0	-43.8	
3.32	-64.8	V	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
Mid Channel (836.5MHz)										
1.67	-58.0	H	3.0	-15.5	37.8	1.0	-52.4	-13.0	-39.4	
2.51	-64.3	H	3.0	-19.1	38.6	1.0	-56.6	-13.0	-43.6	
3.35	-64.7	H	3.0	-15.6	38.5	1.0	-53.1	-13.0	-40.1	
1.67	-57.8	V	3.0	-15.6	37.8	1.0	-52.4	-13.0	-39.4	
2.51	-64.2	V	3.0	-18.8	38.6	1.0	-56.4	-13.0	-43.4	
3.35	-64.6	V	3.0	-15.7	38.5	1.0	-53.2	-13.0	-40.2	
High Channel (844MHz)										
1.69	-59.0	H	3.0	-16.5	37.9	1.0	-53.3	-13.0	-40.3	
2.53	-65.3	H	3.0	-19.9	38.6	1.0	-57.5	-13.0	-44.5	
3.38	-66.4	H	3.0	-17.2	38.5	1.0	-54.7	-13.0	-41.7	
1.69	-59.4	V	3.0	-17.1	37.9	1.0	-54.0	-13.0	-41.0	
2.53	-64.9	V	3.0	-19.4	38.6	1.0	-57.0	-13.0	-44.0	
3.38	-65.9	V	3.0	-17.0	38.5	1.0	-54.5	-13.0	-41.5	

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16QAM LTE BAND 5 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber											
Company: Project #: Date: 04/08/17 Test Engineer: 39004 Configuration: EUT Only Mode: LTE Band 5, 10MHz 16QAM											
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable											
Chamber			Pre-amplifier			Filter			Limit		
3m Chamber E			3m Chamber E			Filter			EIRP		
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes	
Low Channel (829MHz)											
1.66	-57.0	H	3.0	-15.5	37.8	1.0	-52.4	-13.0	-39.4		
2.49	-64.4	H	3.0	-21.2	38.5	1.0	-58.7	-13.0	-45.7		
3.32	-64.5	H	3.0	-18.6	38.5	1.0	-56.0	-13.0	-43.0		
1.66	-56.9	V	3.0	-15.1	37.8	1.0	-52.0	-13.0	-39.0		
2.49	-64.5	V	3.0	-20.4	38.5	1.0	-57.9	-13.0	-44.9		
3.32	-64.7	V	3.0	-18.8	38.5	1.0	-56.3	-13.0	-43.3		
Mid Channel (836.5MHz)											
1.67	-58.1	H	3.0	-16.6	37.8	1.0	-53.5	-13.0	-40.5		
2.51	-64.4	H	3.0	-21.2	38.6	1.0	-58.7	-13.0	-45.7		
3.35	-64.7	H	3.0	-18.7	38.5	1.0	-56.2	-13.0	-43.2		
1.67	-57.8	V	3.0	-16.0	37.8	1.0	-52.8	-13.0	-39.8		
2.51	-64.4	V	3.0	-20.1	38.6	1.0	-57.7	-13.0	-44.7		
3.35	-64.5	V	3.0	-18.5	38.5	1.0	-56.0	-13.0	-43.0		
High Channel (844MHz)											
1.69	-58.4	H	3.0	-16.8	37.9	1.0	-53.7	-13.0	-40.7		
2.53	-65.2	H	3.0	-21.9	38.6	1.0	-59.5	-13.0	-46.5		
3.38	-66.2	H	3.0	-20.1	38.5	1.0	-57.6	-13.0	-44.6		
1.69	-59.1	V	3.0	-17.3	37.9	1.0	-54.2	-13.0	-41.2		
2.53	-64.8	V	3.0	-20.6	38.6	1.0	-58.1	-13.0	-45.1		
3.38	-65.9	V	3.0	-19.8	38.5	1.0	-57.3	-13.0	-44.3		
Rev. 05.21.15											

9.1.4. LTE BAND 7

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/07/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 7, 20MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

Filter
 Filter

Limit
 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	-63.0	H	3.0	-10.1	38.7	1.0	-47.8	-25.0	-22.8	
7.53	-65.6	H	3.0	-7.8	37.7	1.0	-44.5	-25.0	-19.5	
10.04	-66.1	H	3.0	-5.2	36.2	1.0	-40.4	-25.0	-15.4	
5.02	-63.7	V	3.0	-11.1	38.7	1.0	-48.7	-25.0	-23.7	
7.53	-65.0	V	3.0	-7.4	37.7	1.0	-44.1	-25.0	-19.1	
10.04	-66.8	V	3.0	-5.9	36.2	1.0	-41.1	-25.0	-16.1	
Mid Channel (2535MHz)										
5.07	-64.0	H	3.0	-11.0	38.7	1.0	-48.6	-25.0	-23.6	
7.61	-65.1	H	3.0	-7.2	37.7	1.0	-43.9	-25.0	-18.9	
10.14	-66.2	H	3.0	-5.3	36.2	1.0	-40.5	-25.0	-15.5	
5.07	-63.7	V	3.0	-11.0	38.7	1.0	-48.7	-25.0	-23.7	
7.61	-65.0	V	3.0	-7.3	37.7	1.0	-44.0	-25.0	-19.0	
10.14	-65.3	V	3.0	-4.4	36.2	1.0	-39.6	-25.0	-14.6	
High Channel (2560MHz)										
5.12	-63.8	H	3.0	-10.6	38.7	1.0	-48.3	-25.0	-23.3	
7.68	-65.5	H	3.0	-7.4	37.6	1.0	-44.1	-25.0	-19.1	
10.24	-66.3	H	3.0	-5.3	36.3	1.0	-40.6	-25.0	-15.6	
5.12	-64.1	V	3.0	-11.3	38.7	1.0	-49.0	-25.0	-24.0	
7.68	-65.8	V	3.0	-7.9	37.6	1.0	-44.6	-25.0	-19.6	
10.24	-66.5	V	3.0	-5.4	36.3	1.0	-40.7	-25.0	-15.7	

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16QAM LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/07/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 7, 20MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

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	-63.5	H	3.0	-10.6	38.7	1.0	-48.2	-25.0	-23.2	
7.53	-65.7	H	3.0	-7.9	37.7	1.0	-44.7	-25.0	-19.7	
10.04	-66.3	H	3.0	-5.5	36.2	1.0	-40.6	-25.0	-15.6	
5.02	-63.8	V	3.0	-11.2	38.7	1.0	-48.9	-25.0	-23.9	
7.53	-65.4	V	3.0	-7.7	37.7	1.0	-44.5	-25.0	-19.5	
10.04	-66.8	V	3.0	-6.0	36.2	1.0	-41.2	-25.0	-16.2	
Mid Channel (2535MHz)										
5.07	-63.9	H	3.0	-10.9	38.7	1.0	-48.6	-25.0	-23.6	
7.61	-65.5	H	3.0	-7.6	37.7	1.0	-44.3	-25.0	-19.3	
10.14	-66.3	H	3.0	-5.3	36.2	1.0	-40.6	-25.0	-15.6	
5.07	-63.7	V	3.0	-11.0	38.7	1.0	-48.7	-25.0	-23.7	
7.61	-65.6	V	3.0	-7.9	37.7	1.0	-44.6	-25.0	-19.6	
10.14	-65.3	V	3.0	-4.4	36.2	1.0	-39.6	-25.0	-14.6	
High Channel (2560MHz)										
5.12	-63.8	H	3.0	-10.7	38.7	1.0	-48.4	-25.0	-23.4	
7.68	-65.6	H	3.0	-7.6	37.6	1.0	-44.2	-25.0	-19.2	
10.24	-66.4	H	3.0	-5.4	36.3	1.0	-40.7	-25.0	-15.7	
5.12	-64.8	V	3.0	-12.0	38.7	1.0	-49.7	-25.0	-24.7	
7.68	-65.7	V	3.0	-7.8	37.6	1.0	-44.5	-25.0	-19.5	
10.24	-66.6	V	3.0	-5.6	36.3	1.0	-40.9	-25.0	-15.9	

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9.1.5. LTE BAND 12

QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/08/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 12, 10MHz QPSK

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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 (704MHz)										
1.41	-64.2	H	3.0	-22.6	38.1	1.0	-59.6	-13.0	-46.6	
2.11	-64.0	H	3.0	-20.4	38.0	1.0	-57.4	-13.0	-44.4	
2.82	-65.6	H	3.0	-18.5	38.4	1.0	-56.0	-13.0	-43.0	
1.41	-63.8	V	3.0	-22.9	38.1	1.0	-59.9	-13.0	-46.9	
2.11	-65.0	V	3.0	-20.9	38.0	1.0	-57.8	-13.0	-44.8	
2.82	-65.3	V	3.0	-18.4	38.4	1.0	-55.9	-13.0	-42.9	
Mid Channel (707.5MHz)										
1.42	-63.1	H	3.0	-21.4	38.0	1.0	-58.5	-13.0	-45.5	
2.12	-64.5	H	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.83	-65.2	H	3.0	-18.1	38.4	1.0	-55.5	-13.0	-42.5	
1.42	-62.8	V	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.12	-64.1	V	3.0	-20.0	38.0	1.0	-57.0	-13.0	-44.0	
2.83	-65.0	V	3.0	-18.0	38.4	1.0	-55.5	-13.0	-42.5	
High Channel (711MHz)										
1.42	-63.5	H	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.13	-64.6	H	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.84	-65.1	H	3.0	-17.9	38.4	1.0	-55.3	-13.0	-42.3	
1.42	-63.9	V	3.0	-22.9	38.0	1.0	-60.0	-13.0	-47.0	
2.13	-65.0	V	3.0	-20.8	38.0	1.0	-57.8	-13.0	-44.8	
2.84	-65.2	V	3.0	-18.2	38.4	1.0	-55.6	-13.0	-42.6	

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16QAM LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/08/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 12, 10MHz 16QAM

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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 (704MHz)										
1.41	-64.3	H	3.0	-22.7	38.1	1.0	-59.7	-13.0	-46.7	
2.11	-64.1	H	3.0	-20.5	38.0	1.0	-57.5	-13.0	-44.5	
2.82	-65.7	H	3.0	-18.6	38.4	1.0	-56.0	-13.0	-43.0	
1.41	-63.9	V	3.0	-23.0	38.1	1.0	-60.1	-13.0	-47.1	
2.11	-64.9	V	3.0	-20.7	38.0	1.0	-57.7	-13.0	-44.7	
2.82	-65.4	V	3.0	-18.5	38.4	1.0	-56.0	-13.0	-43.0	
Mid Channel (707.5MHz)										
1.42	-63.5	H	3.0	-21.8	38.0	1.0	-58.9	-13.0	-45.9	
2.12	-64.6	H	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.83	-65.3	H	3.0	-18.1	38.4	1.0	-55.6	-13.0	-42.6	
1.42	-62.8	V	3.0	-21.8	38.0	1.0	-58.9	-13.0	-45.9	
2.12	-64.2	V	3.0	-20.1	38.0	1.0	-57.1	-13.0	-44.1	
2.83	-64.9	V	3.0	-17.9	38.4	1.0	-55.3	-13.0	-42.3	
High Channel (711MHz)										
1.42	-63.4	H	3.0	-21.7	38.0	1.0	-58.7	-13.0	-45.7	
2.13	-64.5	H	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.84	-65.2	H	3.0	-17.9	38.4	1.0	-55.4	-13.0	-42.4	
1.42	-63.8	V	3.0	-22.7	38.0	1.0	-59.8	-13.0	-46.8	
2.13	-65.2	V	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.84	-65.3	V	3.0	-18.3	38.4	1.0	-55.7	-13.0	-42.7	

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9.1.6. LTE BAND 13

QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber											
Company: Project #: Date: 04/08/17 Test Engineer: 39004 Configuration: EUT Only Mode: LTE Band 13, 10MHz QPSK											
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable											
Chamber			Pre-amplifier			Filter			Limit		
3m Chamber E			3m Chamber E			Filter			LTE B13		
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes	
Mid Channel (782MHz)											
1.56	-62.5	H	3.0	-20.2	37.8	1.0	-57.1	-40.0	-17.1		
2.35	-64.2	H	3.0	-19.8	38.1	1.0	-56.9	-13.0	-43.9		
3.13	-65.2	H	3.0	-16.7	38.4	1.0	-54.1	-13.0	-41.1		
1.56	-62.7	V	3.0	-20.9	37.8	1.0	-57.8	-40.0	-17.8		
2.35	-64.1	V	3.0	-19.5	38.1	1.0	-56.6	-13.0	-43.6		
3.13	-65.4	V	3.0	-17.2	38.4	1.0	-54.6	-13.0	-41.6		
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16QAM LTE BAND 13 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/08/17

Test Engineer: 39004

Configuration: EUT Only

Mode: LTE Band 13, 10MHz 16QAM

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

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	-62.4	H	3.0	-20.2	37.8	1.0	-57.0	-40.0	-17.0	
2.35	-64.3	H	3.0	-19.9	38.1	1.0	-57.1	-13.0	-44.1	
3.13	-65.3	H	3.0	-16.7	38.4	1.0	-54.1	-13.0	-41.1	
1.56	-62.5	V	3.0	-20.8	37.8	1.0	-57.6	-40.0	-17.6	
2.35	-64.2	V	3.0	-19.5	38.1	1.0	-56.6	-13.0	-43.6	
3.13	-65.3	V	3.0	-17.1	38.4	1.0	-54.6	-13.0	-41.6	

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9.1.7. LTE BAND 17

QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 07/21/17
Test Engineer: 10641
Configuration: EUT Only
Mode: LTE Band 17, 10MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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 (709MHz)										
1.418	-64.1	H	3.0	-22.4	38.0	1.0	-59.5	-13.0	-46.5	
2.127	-65.1	H	3.0	-21.5	38.0	1.0	-58.5	-13.0	-45.5	
2.836	-65.4	H	3.0	-18.2	38.4	1.0	-55.6	-13.0	-42.6	
1.418	-64.6	V	3.0	-23.6	38.0	1.0	-60.7	-13.0	-47.7	
2.127	-64.0	V	3.0	-19.8	38.0	1.0	-56.8	-13.0	-43.8	
2.836	-65.8	V	3.0	-18.8	38.4	1.0	-56.2	-13.0	-43.2	
Mid Channel (710MHz)										
1.420	-62.0	H	3.0	-20.3	38.0	1.0	-57.4	-13.0	-44.4	
2.130	-65.4	H	3.0	-21.7	38.0	1.0	-58.7	-13.0	-45.7	
2.840	-65.5	H	3.0	-18.3	38.4	1.0	-55.7	-13.0	-42.7	
1.420	-62.3	V	3.0	-21.3	38.0	1.0	-58.3	-13.0	-45.3	
2.130	-65.1	V	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.840	-65.4	V	3.0	-18.3	38.4	1.0	-55.8	-13.0	-42.8	
High Channel (711MHz)										
1.422	-64.3	H	3.0	-22.6	38.0	1.0	-59.6	-13.0	-46.6	
2.133	-65.7	H	3.0	-22.1	38.0	1.0	-59.1	-13.0	-46.1	
2.844	-65.2	H	3.0	-17.9	38.4	1.0	-55.4	-13.0	-42.4	
1.422	-64.3	V	3.0	-23.3	38.0	1.0	-60.3	-13.0	-47.3	
2.133	-65.3	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.844	-65.1	V	3.0	-18.1	38.4	1.0	-55.5	-13.0	-42.5	

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16QAM LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 07/21/17
Test Engineer: 10641
Configuration: EUT Only
Mode: LTE Band 17, 10MHz 16QAM

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

Chamber

3m Chamber E ▼

Pre-amplifier

3m Chamber E ▼

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 (709MHz)										
1.418	-64.6	H	3.0	-23.0	38.0	1.0	-60.0	-13.0	-47.0	
2.127	-64.3	H	3.0	-20.6	38.0	1.0	-57.6	-13.0	-44.6	
2.836	-65.8	H	3.0	-18.6	38.4	1.0	-56.0	-13.0	-43.0	
1.418	-64.1	V	3.0	-23.1	38.0	1.0	-60.1	-13.0	-47.1	
2.127	-65.2	V	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.836	-65.6	V	3.0	-18.6	38.4	1.0	-56.1	-13.0	-43.1	
Mid Channel (710MHz)										
1.420	-62.3	H	3.0	-20.5	38.0	1.0	-57.6	-13.0	-44.6	
2.130	-65.3	H	3.0	-21.7	38.0	1.0	-58.7	-13.0	-45.7	
2.840	-65.4	H	3.0	-18.1	38.4	1.0	-55.6	-13.0	-42.6	
1.420	-62.4	V	3.0	-21.4	38.0	1.0	-58.4	-13.0	-45.4	
2.130	-65.2	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.840	-65.4	V	3.0	-18.4	38.4	1.0	-55.8	-13.0	-42.8	
High Channel (711MHz)										
1.422	-64.6	H	3.0	-22.9	38.0	1.0	-59.9	-13.0	-46.9	
2.133	-65.1	H	3.0	-21.4	38.0	1.0	-58.4	-13.0	-45.4	
2.844	-65.8	H	3.0	-18.5	38.4	1.0	-56.0	-13.0	-43.0	
1.422	-62.6	V	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.133	-64.8	V	3.0	-20.6	38.0	1.0	-57.6	-13.0	-44.6	
2.844	-65.1	V	3.0	-18.0	38.4	1.0	-55.5	-13.0	-42.5	

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9.1.8. LTE BAND 25

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/07/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 25, 20MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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	-62.3	H	3.0	-12.3	38.6	1.0	-49.9	-13.0	-36.9	
5.58	-63.8	H	3.0	-9.7	38.6	1.0	-47.3	-13.0	-34.3	
7.44	-64.6	H	3.0	-6.8	37.8	1.0	-43.6	-13.0	-30.6	
3.72	-62.2	H	3.0	-12.2	38.6	1.0	-49.8	-13.0	-36.8	
5.58	-64.3	H	3.0	-10.1	38.6	1.0	-47.7	-13.0	-34.7	
7.44	-64.4	V	3.0	-6.9	37.8	1.0	-43.7	-13.0	-30.7	
Mid Channel (1882.5MHz)										
3.77	-62.3	H	3.0	-12.2	38.6	1.0	-49.8	-13.0	-36.8	
5.65	-63.2	H	3.0	-8.9	38.5	1.0	-46.5	-13.0	-33.5	
7.53	-64.4	H	3.0	-6.6	37.7	1.0	-43.3	-13.0	-30.3	
3.77	-62.5	V	3.0	-12.4	38.6	1.0	-50.1	-13.0	-37.1	
5.65	-64.6	V	3.0	-10.7	38.5	1.0	-48.2	-13.0	-35.2	
7.53	-64.7	V	3.0	-7.1	37.7	1.0	-43.8	-13.0	-30.8	
High Channel (1905MHz)										
3.81	-62.4	H	3.0	-12.2	38.6	1.0	-49.8	-13.0	-36.8	
5.72	-64.3	H	3.0	-9.9	38.5	1.0	-47.4	-13.0	-34.4	
7.62	-64.8	H	3.0	-6.9	37.7	1.0	-43.6	-13.0	-30.6	
3.81	-62.1	V	3.0	-11.9	38.6	1.0	-49.6	-13.0	-36.6	
5.72	-64.2	V	3.0	-10.1	38.5	1.0	-47.6	-13.0	-34.6	
7.62	-64.8	V	3.0	-7.0	37.7	1.0	-43.7	-13.0	-30.7	

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16QAM LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/07/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 25, 20MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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	-62.8	H	3.0	-12.8	38.6	1.0	-50.4	-13.0	-37.4	
5.58	-64.4	H	3.0	-10.2	38.6	1.0	-47.8	-13.0	-34.8	
7.44	-64.7	H	3.0	-6.9	37.8	1.0	-43.7	-13.0	-30.7	
3.72	-62.6	V	3.0	-12.6	38.6	1.0	-50.2	-13.0	-37.2	
5.58	-64.4	V	3.0	-10.6	38.6	1.0	-48.2	-13.0	-35.2	
7.44	-65.3	V	3.0	-7.8	37.8	1.0	-44.6	-13.0	-31.6	
Mid Channel (1882.5MHz)										
3.77	-62.4	H	3.0	-12.3	38.6	1.0	-50.0	-13.0	-37.0	
5.65	-63.5	H	3.0	-9.3	38.5	1.0	-46.8	-13.0	-33.8	
7.53	-65.3	H	3.0	-7.5	37.7	1.0	-44.2	-13.0	-31.2	
3.77	-62.1	V	3.0	-12.0	38.6	1.0	-49.7	-13.0	-36.7	
5.65	-63.8	V	3.0	-9.8	38.5	1.0	-47.4	-13.0	-34.4	
7.53	-64.6	V	3.0	-7.0	37.7	1.0	-43.8	-13.0	-30.8	
High Channel (1905MHz)										
3.81	-62.5	H	3.0	-12.2	38.6	1.0	-49.9	-13.0	-36.9	
5.72	-63.7	H	3.0	-9.3	38.5	1.0	-46.9	-13.0	-33.9	
7.62	-64.7	H	3.0	-6.7	37.7	1.0	-43.4	-13.0	-30.4	
3.81	-62.5	V	3.0	-12.3	38.6	1.0	-49.9	-13.0	-36.9	
5.72	-63.6	V	3.0	-9.5	38.5	1.0	-47.0	-13.0	-34.0	
7.62	-64.3	V	3.0	-6.6	37.7	1.0	-43.3	-13.0	-30.3	

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9.1.9. LTE BAND 26

QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/08/17

Test Engineer: 39004

Configuration: EUT Only

Mode: LTE Band 26 (90S), 10MHz QPSK

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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
Mid Channel (819MHz)										
1.64	-65.8	H	3.0	-23.4	37.8	1.0	-60.2	-13.0	-47.2	
2.46	-66.1	H	3.0	-21.2	38.4	1.0	-58.6	-13.0	-45.6	
3.28	-66.8	H	3.0	-17.9	38.5	1.0	-55.4	-13.0	-42.4	
1.64	-66.0	V	3.0	-23.9	37.8	1.0	-60.8	-13.0	-47.8	
2.46	-66.4	V	3.0	-21.3	38.4	1.0	-58.8	-13.0	-45.8	
3.28	-65.9	V	3.0	-17.3	38.5	1.0	-54.8	-13.0	-41.8	

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16QAM LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/08/17

Test Engineer: 39004

Configuration: EUT Only

Mode: LTE Band 26 (90S), 10MHz 16QAM

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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
Mid Channel (819MHz)										
1.64	-65.8	H	3.0	-23.4	37.8	1.0	-60.2	-13.0	-47.2	
2.46	-65.4	H	3.0	-20.5	38.4	1.0	-57.9	-13.0	-44.9	
3.28	-65.4	H	3.0	-16.5	38.5	1.0	-54.0	-13.0	-41.0	
1.64	-65.5	V	3.0	-23.4	37.8	1.0	-60.3	-13.0	-47.3	
2.46	-65.3	V	3.0	-20.2	38.4	1.0	-57.6	-13.0	-44.6	
3.28	-65.1	V	3.0	-16.5	38.5	1.0	-54.0	-13.0	-41.0	

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9.1.10. LTE BAND 30

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

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

Company:
Project #:
Date: 04/08/17
Test Engineer: 39004
Configuration: EUT only
Mode: LTE Band 30, 10MHz QPSK

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

Chamber
3m Chamber E

Pre-amplifier
3m Chamber E

Filter
Filter

Limit
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	-66.4	H	3.0	-12.6	37.9	1.0	-49.6	-40.0	-9.6	
6.93	-68.4	H	3.0	-9.7	36.5	1.0	-45.2	-40.0	-5.2	
9.24	-71.3	H	3.0	-9.7	34.9	1.0	-43.6	-40.0	-3.6	
4.62	-66.6	V	3.0	-12.9	37.9	1.0	-49.8	-40.0	-9.8	
6.93	-68.6	V	3.0	-9.1	36.5	1.0	-44.5	-40.0	-4.5	
9.24	-71.3	V	3.0	-9.5	34.9	1.0	-43.4	-40.0	-3.4	

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16QAM LTE BAND 30 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber										
Company: Project #: Date: 04/08/17 Test Engineer: 39004 Configuration: EUT only Mode: LTE Band 30, 10MHz 16QAM										
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable										
Chamber		Pre-amplifier		Filter		Limit				
3m Chamber E		3m Chamber E		Filter		LTE B30				
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-66.7	H	3.0	-12.9	37.9	1.0	-49.8	-40.0	-9.8	
6.93	-68.5	H	3.0	-9.9	36.5	1.0	-45.3	-40.0	-5.3	
9.24	-71.4	H	3.0	-9.9	34.9	1.0	-43.8	-40.0	-3.8	
4.62	-66.8	V	3.0	-13.1	37.9	1.0	-50.0	-40.0	-10.0	
6.93	-68.4	V	3.0	-9.0	36.5	1.0	-44.4	-40.0	-4.4	
9.24	-71.2	V	3.0	-9.4	34.9	1.0	-43.3	-40.0	-3.3	
Rev. 05.21.15										

9.1.11. LTE BAND 41

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/07/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 41, 20MHz QPSK

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-63.8	H	3.0	-10.9	38.7	1.0	-48.6	-25.0	-23.6	
7.52	-65.7	H	3.0	-7.9	37.7	1.0	-44.6	-25.0	-19.6	
10.02	-65.8	H	3.0	-5.0	36.1	1.0	-40.1	-25.0	-15.1	
5.01	-64.0	V	3.0	-11.4	38.7	1.0	-49.1	-25.0	-24.1	
7.52	-65.8	V	3.0	-8.1	37.7	1.0	-44.9	-25.0	-19.9	
10.02	-65.9	V	3.0	-5.1	36.1	1.0	-40.3	-25.0	-15.3	
Mid Channel (2593MHz)										
5.19	-64.9	H	3.0	-11.6	38.7	1.0	-49.3	-25.0	-24.3	
7.78	-65.9	H	3.0	-7.8	37.6	1.0	-44.3	-25.0	-19.3	
10.37	-66.0	H	3.0	-4.9	36.4	1.0	-40.3	-25.0	-15.3	
5.19	-64.4	V	3.0	-11.4	38.7	1.0	-49.1	-25.0	-24.1	
7.78	-65.8	V	3.0	-7.8	37.6	1.0	-44.4	-25.0	-19.4	
10.37	-66.1	V	3.0	-4.9	36.4	1.0	-40.3	-25.0	-15.3	
High Channel (2680MHz)										
5.36	-60.2	H	3.0	-6.6	38.6	1.0	-44.2	-25.0	-19.2	
8.04	-66.1	H	3.0	-7.7	37.4	1.0	-44.1	-25.0	-19.1	
10.72	-66.6	H	3.0	-5.2	36.6	1.0	-40.8	-25.0	-15.8	
5.36	-60.5	V	3.0	-7.2	38.6	1.0	-44.8	-25.0	-19.8	
8.04	-65.9	V	3.0	-7.6	37.4	1.0	-44.0	-25.0	-19.0	
10.72	-66.2	V	3.0	-4.7	36.6	1.0	-40.2	-25.0	-15.2	

Rev. 05.21.15

16QAM LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber											
Company: Project #: Date: 04/07/17 Test Engineer: 39004 Configuration: EUT Only Mode: LTE Band 41, 20MHz 16QAM											
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable											
Chamber		Pre-amplifier		Filter		Limit					
3m Chamber E		3m Chamber E		Filter		LTE B41					
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes	
Low Channel (2506MHz)											
5.01	-63.5	H	3.0	-10.7	38.7	1.0	-48.3	-25.0	-23.3		
7.52	-65.6	H	3.0	-7.8	37.7	1.0	-44.6	-25.0	-19.6		
10.02	-65.7	H	3.0	-4.9	36.1	1.0	-40.1	-25.0	-15.1		
5.01	-64.3	V	3.0	-11.7	38.7	1.0	-49.4	-25.0	-24.4		
7.52	-65.7	V	3.0	-8.1	37.7	1.0	-44.9	-25.0	-19.9		
10.02	-65.9	V	3.0	-5.1	36.1	1.0	-40.2	-25.0	-15.2		
Mid Channel (2593MHz)											
5.19	-64.8	H	3.0	-11.6	38.7	1.0	-49.3	-25.0	-24.3		
7.78	-65.9	H	3.0	-7.8	37.6	1.0	-44.3	-25.0	-19.3		
10.37	-66.1	H	3.0	-5.0	36.4	1.0	-40.4	-25.0	-15.4		
5.19	-64.4	V	3.0	-11.5	38.7	1.0	-49.2	-25.0	-24.2		
7.78	-65.7	V	3.0	-7.8	37.6	1.0	-44.4	-25.0	-19.4		
10.37	-66.1	V	3.0	-4.9	36.4	1.0	-40.3	-25.0	-15.3		
High Channel (2680MHz)											
5.36	-60.3	H	3.0	-6.6	38.6	1.0	-44.3	-25.0	-19.3		
8.04	-66.2	H	3.0	-7.7	37.4	1.0	-44.1	-25.0	-19.1		
10.72	-66.5	H	3.0	-5.1	36.6	1.0	-40.6	-25.0	-15.6		
5.36	-60.5	V	3.0	-7.2	38.6	1.0	-44.8	-25.0	-19.8		
8.04	-65.9	V	3.0	-7.6	37.4	1.0	-44.0	-25.0	-19.0		
10.72	-66.3	V	3.0	-4.7	36.6	1.0	-40.3	-25.0	-15.3		
Rev. 05.21.15											

9.1.12. LTE BAND 66

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/13/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 66, 20MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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 (1720.0MHz)										
3.44	-62.2	H	3.0	-12.9	38.5	1.0	-50.5	-13.0	-37.5	
5.16	-63.4	H	3.0	-10.2	38.7	1.0	-47.9	-13.0	-34.9	
6.88	-65.8	H	3.0	-8.8	38.1	1.0	-46.0	-13.0	-33.0	
3.44	-62.4	V	3.0	-13.3	38.5	1.0	-50.8	-13.0	-37.8	
5.16	-63.6	V	3.0	-10.7	38.7	1.0	-48.4	-13.0	-35.4	
6.88	-65.2	V	3.0	-8.5	38.1	1.0	-45.7	-13.0	-32.7	
Mid Channel (1745.0MHz)										
3.49	-65.6	H	3.0	-16.2	38.5	1.0	-53.7	-13.0	-40.7	
5.24	-65.2	H	3.0	-11.9	38.7	1.0	-49.5	-13.0	-36.5	
6.98	-64.9	H	3.0	-7.7	38.1	1.0	-44.8	-13.0	-31.8	
3.49	-65.2	V	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
5.24	-65.4	V	3.0	-12.3	38.7	1.0	-50.0	-13.0	-37.0	
6.98	-64.7	V	3.0	-7.8	38.1	1.0	-44.9	-13.0	-31.9	
High Channel (1770.0MHz)										
3.54	-64.6	H	3.0	-15.1	38.6	1.0	-52.6	-13.0	-39.6	
5.31	-65.4	H	3.0	-11.9	38.6	1.0	-49.5	-13.0	-36.5	
7.08	-65.3	H	3.0	-8.0	38.0	1.0	-45.0	-13.0	-32.0	
3.54	-64.2	V	3.0	-14.8	38.6	1.0	-52.4	-13.0	-39.4	
5.31	-65.2	V	3.0	-12.0	38.6	1.0	-49.7	-13.0	-36.7	
7.08	-65.5	V	3.0	-8.4	38.0	1.0	-45.5	-13.0	-32.5	

Rev. 02.24.17

16QAM LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/13/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 66, 20MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

EIRP

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamplifier	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1720.0MHz)										
3.44	-62.4	H	3.0	-13.1	38.5	1.0	-50.6	-13.0	-37.6	
5.16	-63.6	H	3.0	-10.4	38.7	1.0	-48.1	-13.0	-35.1	
6.88	-66.7	H	3.0	-9.7	38.1	1.0	-46.9	-13.0	-33.9	
3.44	-62.6	V	3.0	-13.5	38.5	1.0	-51.0	-13.0	-38.0	
5.16	-63.7	V	3.0	-10.9	38.7	1.0	-48.6	-13.0	-35.6	
6.88	-65.5	V	3.0	-8.8	38.1	1.0	-45.9	-13.0	-32.9	
Mid Channel (1745.0MHz)										
3.49	-65.8	H	3.0	-16.4	38.5	1.0	-53.9	-13.0	-40.9	
5.24	-65.3	H	3.0	-11.9	38.7	1.0	-49.6	-13.0	-36.6	
6.98	-65.0	H	3.0	-7.9	38.1	1.0	-44.9	-13.0	-31.9	
3.49	-65.5	V	3.0	-16.2	38.5	1.0	-53.8	-13.0	-40.8	
5.24	-65.8	V	3.0	-12.8	38.7	1.0	-50.4	-13.0	-37.4	
6.98	-65.0	V	3.0	-8.1	38.1	1.0	-45.2	-13.0	-32.2	
High Channel (1770.0MHz)										
3.54	-65.3	H	3.0	-15.8	38.6	1.0	-53.3	-13.0	-40.3	
5.31	-65.7	H	3.0	-12.2	38.6	1.0	-49.8	-13.0	-36.8	
7.08	-65.9	H	3.0	-8.7	38.0	1.0	-45.7	-13.0	-32.7	
3.54	-64.7	V	3.0	-15.3	38.6	1.0	-52.9	-13.0	-39.9	
5.31	-65.8	V	3.0	-12.6	38.6	1.0	-50.3	-13.0	-37.3	
7.08	-66.2	V	3.0	-9.2	38.0	1.0	-46.2	-13.0	-33.2	

Rev. 02.24.17

9.2. FIELD STRENGTH OF SPURIOUS RADIATION, UAT 1

9.2.1. LTE BAND 2

QPSK LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/12/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 2, 20MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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	-63.4	H	3.0	-13.4	38.6	1.0	-51.1	-13.0	-38.1	
5.58	-64.6	H	3.0	-10.4	38.6	1.0	-48.0	-13.0	-35.0	
7.44	-65.2	H	3.0	-7.4	37.8	1.0	-44.2	-13.0	-31.2	
3.72	-63.5	V	3.0	-13.6	38.6	1.0	-51.2	-13.0	-38.2	
5.58	-64.8	V	3.0	-11.0	38.6	1.0	-48.5	-13.0	-35.5	
7.44	-65.2	V	3.0	-7.7	37.8	1.0	-44.5	-13.0	-31.5	
Mid Channel (1880MHz)										
3.76	-63.8	H	3.0	-13.7	38.6	1.0	-51.4	-13.0	-38.4	
5.64	-64.8	H	3.0	-10.6	38.5	1.0	-48.1	-13.0	-35.1	
7.52	-66.0	H	3.0	-8.2	37.7	1.0	-44.9	-13.0	-31.9	
3.76	-63.6	V	3.0	-13.5	38.6	1.0	-51.1	-13.0	-38.1	
5.64	-64.6	V	3.0	-10.7	38.5	1.0	-48.2	-13.0	-35.2	
7.52	-65.9	V	3.0	-8.3	37.7	1.0	-45.0	-13.0	-32.0	
High Channel (1900MHz)										
3.80	-63.4	H	3.0	-13.2	38.6	1.0	-50.9	-13.0	-37.9	
5.70	-65.0	H	3.0	-10.6	38.5	1.0	-48.2	-13.0	-35.2	
7.60	-65.8	H	3.0	-7.9	37.7	1.0	-44.6	-13.0	-31.6	
3.80	-63.3	V	3.0	-13.1	38.6	1.0	-50.8	-13.0	-37.8	
5.70	-65.1	V	3.0	-11.1	38.5	1.0	-48.6	-13.0	-35.6	
7.60	-65.7	V	3.0	-8.0	37.7	1.0	-44.7	-13.0	-31.7	

Rev. 05.21.15

16QAM LTE BAND 2 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber											
Company: Project #: Date: 04/12/17 Test Engineer: 39004 Configuration: EUT Only Mode: LTE Band 2, 20MHz 16QAM											
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable											
Chamber		Pre-amplifier		Filter		Limit					
3m Chamber E		3m Chamber E		Filter		EIRP					
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes	
Low Channel (1860MHz)											
3.72	-63.6	H	3.0	-13.6	38.6	1.0	-51.2	-13.0	-38.2		
5.58	-64.8	H	3.0	-10.7	38.6	1.0	-48.3	-13.0	-35.3		
7.44	-65.3	H	3.0	-7.6	37.8	1.0	-44.4	-13.0	-31.4		
3.72	-63.6	V	3.0	-13.7	38.6	1.0	-51.3	-13.0	-38.3		
5.58	-64.9	V	3.0	-11.1	38.6	1.0	-48.6	-13.0	-35.6		
7.44	-65.3	V	3.0	-7.8	37.8	1.0	-44.6	-13.0	-31.6		
Mid Channel (1880MHz)											
3.76	-63.6	H	3.0	-13.5	38.6	1.0	-51.2	-13.0	-38.2		
5.64	-64.7	H	3.0	-10.5	38.5	1.0	-48.0	-13.0	-35.0		
7.52	-65.9	H	3.0	-8.1	37.7	1.0	-44.8	-13.0	-31.8		
3.76	-63.7	V	3.0	-13.6	38.6	1.0	-51.2	-13.0	-38.2		
5.64	-64.7	V	3.0	-10.8	38.5	1.0	-48.3	-13.0	-35.3		
7.52	-65.8	V	3.0	-8.2	37.7	1.0	-45.0	-13.0	-32.0		
High Channel (1900MHz)											
3.80	-63.5	H	3.0	-13.3	38.6	1.0	-50.9	-13.0	-37.9		
5.70	-65.1	H	3.0	-10.7	38.5	1.0	-48.2	-13.0	-35.2		
7.60	-65.7	H	3.0	-7.8	37.7	1.0	-44.5	-13.0	-31.5		
3.80	-63.4	V	3.0	-13.2	38.6	1.0	-50.8	-13.0	-37.8		
5.70	-65.2	V	3.0	-11.2	38.5	1.0	-48.7	-13.0	-35.7		
7.60	-65.6	V	3.0	-7.9	37.7	1.0	-44.6	-13.0	-31.6		
Rev. 05.21.15											

9.2.2. LTE BAND 4

QPSK LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber										
Company: Project #: Date: 05/10/17 Test Engineer: 39004 Configuration: EUT Only Mode: LTE Band 4, 3MHz QPSK										
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable										
Chamber		Pre-amplifier		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 (1720MHz)										
3.44	-61.7	H	3.0	-12.3	38.5	1.0	-49.9	-13.0	-36.9	
5.16	-60.1	H	3.0	-6.9	38.7	1.0	-44.6	-13.0	-31.6	
6.88	-59.8	H	3.0	-2.9	38.1	1.0	-40.0	-13.0	-27.0	
3.44	-62.3	V	3.0	-13.2	38.5	1.0	-50.7	-13.0	-37.7	
5.16	-60.4	V	3.0	-7.6	38.7	1.0	-45.2	-13.0	-32.2	
6.88	-60.3	V	3.0	-3.6	38.1	1.0	-40.7	-13.0	-27.7	
Mid Channel (1732.5MHz)										
3.47	-62.1	H	3.0	-12.8	38.5	1.0	-50.3	-13.0	-37.3	
5.20	-59.9	H	3.0	-6.6	38.7	1.0	-44.3	-13.0	-31.3	
6.93	-60.2	H	3.0	-3.2	38.1	1.0	-40.3	-13.0	-27.3	
3.47	-62.1	V	3.0	-12.9	38.5	1.0	-50.5	-13.0	-37.5	
5.20	-60.4	V	3.0	-7.5	38.7	1.0	-45.2	-13.0	-32.2	
6.93	-61.4	V	3.0	-4.6	38.1	1.0	-41.7	-13.0	-28.7	
High Channel (1745MHz)										
3.49	-62.7	H	3.0	-13.3	38.5	1.0	-50.9	-13.0	-37.9	
5.24	-61.6	H	3.0	-8.2	38.7	1.0	-45.9	-13.0	-32.9	
6.98	-60.8	H	3.0	-3.6	38.1	1.0	-40.7	-13.0	-27.7	
3.49	-62.2	V	3.0	-12.9	38.5	1.0	-50.5	-13.0	-37.5	
5.24	-60.2	V	3.0	-7.2	38.7	1.0	-44.9	-13.0	-31.9	
6.98	-60.9	V	3.0	-4.0	38.1	1.0	-41.1	-13.0	-28.1	
Rev. 05.21.15										

16QAM LTE BAND 4 (3.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 05/10/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 4, 3MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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 (1720MHz)										
3.44	-61.5	H	3.0	-12.2	38.5	1.0	-49.8	-13.0	-36.8	
5.16	-60.0	H	3.0	-6.8	38.7	1.0	-44.5	-13.0	-31.5	
6.88	-60.7	H	3.0	-3.7	38.1	1.0	-40.8	-13.0	-27.8	
3.44	-61.7	V	3.0	-12.6	38.5	1.0	-50.1	-13.0	-37.1	
5.16	-59.9	V	3.0	-7.0	38.7	1.0	-44.7	-13.0	-31.7	
6.88	-61.3	V	3.0	-4.6	38.1	1.0	-41.7	-13.0	-28.7	
Mid Channel (1732.5MHz)										
3.47	-61.4	H	3.0	-12.1	38.5	1.0	-49.6	-13.0	-36.6	
5.20	-59.6	H	3.0	-6.3	38.7	1.0	-44.0	-13.0	-31.0	
6.93	-60.6	H	3.0	-3.5	38.1	1.0	-40.6	-13.0	-27.6	
3.47	-61.4	V	3.0	-12.2	38.5	1.0	-49.8	-13.0	-36.8	
5.20	-59.5	V	3.0	-6.6	38.7	1.0	-44.3	-13.0	-31.3	
6.93	-59.8	V	3.0	-3.0	38.1	1.0	-40.1	-13.0	-27.1	
High Channel (1745MHz)										
3.49	-61.5	H	3.0	-12.0	38.5	1.0	-49.6	-13.0	-36.6	
5.24	-60.7	H	3.0	-7.3	38.7	1.0	-45.0	-13.0	-32.0	
6.98	-60.9	H	3.0	-3.7	38.1	1.0	-40.8	-13.0	-27.8	
3.49	-62.2	V	3.0	-12.9	38.5	1.0	-50.4	-13.0	-37.4	
5.24	-59.9	V	3.0	-6.9	38.7	1.0	-44.5	-13.0	-31.5	
6.98	-61.6	V	3.0	-4.7	38.1	1.0	-41.8	-13.0	-28.8	

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9.2.3. LTE BAND 5

QPSK LTE BAND 5 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/12/17

Test Engineer: 40813

Configuration: EUT Only

Mode: LTE Band 5, 10MHz QPSK

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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	-64.3	H	3.0	-21.8	37.8	1.0	-58.7	-13.0	-45.7	
2.49	-64.3	H	3.0	-19.2	38.5	1.0	-56.7	-13.0	-43.7	
3.32	-64.6	H	3.0	-15.6	38.5	1.0	-53.1	-13.0	-40.1	
1.66	-64.0	V	3.0	-21.9	37.8	1.0	-58.7	-13.0	-45.7	
2.49	-63.2	V	3.0	-18.0	38.5	1.0	-55.5	-13.0	-42.5	
3.32	-63.9	V	3.0	-15.2	38.5	1.0	-52.7	-13.0	-39.7	
Mid Channel (836.5MHz)										
1.67	-64.5	H	3.0	-22.0	37.8	1.0	-58.9	-13.0	-45.9	
2.51	-63.7	H	3.0	-18.5	38.6	1.0	-56.1	-13.0	-43.1	
3.35	-63.9	H	3.0	-14.8	38.5	1.0	-52.3	-13.0	-39.3	
1.67	-64.9	V	3.0	-22.7	37.8	1.0	-59.5	-13.0	-46.5	
2.51	-64.2	V	3.0	-18.8	38.6	1.0	-56.4	-13.0	-43.4	
3.35	-64.0	V	3.0	-15.2	38.5	1.0	-52.6	-13.0	-39.6	
High Channel (844MHz)										
1.69	-63.1	H	3.0	-20.5	37.9	1.0	-57.4	-13.0	-44.4	
2.53	-64.6	H	3.0	-19.3	38.6	1.0	-56.8	-13.0	-43.8	
3.38	-64.1	H	3.0	-15.0	38.5	1.0	-52.5	-13.0	-39.5	
1.69	-64.7	V	3.0	-22.3	37.9	1.0	-59.2	-13.0	-46.2	
2.53	-63.9	V	3.0	-18.4	38.6	1.0	-56.0	-13.0	-43.0	
3.38	-64.1	V	3.0	-15.1	38.5	1.0	-52.6	-13.0	-39.6	

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16QAM LTE BAND 5 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/12/17

Test Engineer: 40813

Configuration: EUT Only

Mode: LTE Band 5, 10MHz 16QAM

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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	-65.2	H	3.0	-23.7	37.8	1.0	-60.6	-13.0	-47.6	
2.49	-64.8	H	3.0	-21.7	38.5	1.0	-59.2	-13.0	-46.2	
3.32	-63.8	H	3.0	-17.8	38.5	1.0	-55.3	-13.0	-42.3	
1.66	-63.8	V	3.0	-22.1	37.8	1.0	-58.9	-13.0	-45.9	
2.49	-64.6	V	3.0	-20.4	38.5	1.0	-58.0	-13.0	-45.0	
3.32	-64.1	V	3.0	-18.1	38.5	1.0	-55.6	-13.0	-42.6	
Mid Channel (836.5MHz)										
1.67	-64.1	H	3.0	-22.6	37.8	1.0	-59.4	-13.0	-46.4	
2.51	-65.4	H	3.0	-22.2	38.6	1.0	-59.8	-13.0	-46.8	
3.35	-64.0	H	3.0	-18.0	38.5	1.0	-55.5	-13.0	-42.5	
1.67	-64.5	V	3.0	-22.7	37.8	1.0	-59.6	-13.0	-46.6	
2.51	-64.7	V	3.0	-20.5	38.6	1.0	-58.1	-13.0	-45.1	
3.35	-64.3	V	3.0	-18.3	38.5	1.0	-55.8	-13.0	-42.8	
High Channel (844MHz)										
1.69	-64.4	H	3.0	-22.9	37.9	1.0	-59.7	-13.0	-46.7	
2.53	-64.2	H	3.0	-20.9	38.6	1.0	-58.5	-13.0	-45.5	
3.38	-63.9	H	3.0	-17.8	38.5	1.0	-55.3	-13.0	-42.3	
1.69	-64.2	V	3.0	-22.4	37.9	1.0	-59.2	-13.0	-46.2	
2.53	-63.7	V	3.0	-19.5	38.6	1.0	-57.0	-13.0	-44.0	
3.38	-64.0	V	3.0	-17.9	38.5	1.0	-55.4	-13.0	-42.4	

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9.2.4. LTE BAND 7

QPSK LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/12/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 7, 20MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

Filter
 Filter

Limit
 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	-64.0	H	3.0	-11.1	38.7	1.0	-48.8	-25.0	-23.8	
7.53	-65.6	H	3.0	-7.8	37.7	1.0	-44.5	-25.0	-19.5	
10.04	-65.9	H	3.0	-5.1	36.2	1.0	-40.2	-25.0	-15.2	
5.02	-63.7	V	3.0	-11.1	38.7	1.0	-48.8	-25.0	-23.8	
7.53	-65.2	V	3.0	-7.6	37.7	1.0	-44.4	-25.0	-19.4	
10.04	-65.9	V	3.0	-5.1	36.2	1.0	-40.2	-25.0	-15.2	
Mid Channel (2535MHz)										
5.07	-63.0	H	3.0	-10.0	38.7	1.0	-47.7	-25.0	-22.7	
7.61	-66.0	H	3.0	-8.1	37.7	1.0	-44.8	-25.0	-19.8	
10.14	-65.9	H	3.0	-5.0	36.2	1.0	-40.2	-25.0	-15.2	
5.07	-63.1	V	3.0	-10.4	38.7	1.0	-48.1	-25.0	-23.1	
7.61	-65.2	V	3.0	-7.4	37.7	1.0	-44.1	-25.0	-19.1	
10.14	-65.7	V	3.0	-4.7	36.2	1.0	-40.0	-25.0	-15.0	
High Channel (2560MHz)										
5.12	-63.3	H	3.0	-10.2	38.7	1.0	-47.9	-25.0	-22.9	
7.68	-64.9	H	3.0	-6.9	37.6	1.0	-43.5	-25.0	-18.5	
10.24	-64.9	H	3.0	-3.9	36.3	1.0	-39.2	-25.0	-14.2	
5.12	-63.2	V	3.0	-10.4	38.7	1.0	-48.1	-25.0	-23.1	
7.68	-65.3	V	3.0	-7.5	37.6	1.0	-44.1	-25.0	-19.1	
10.24	-65.1	V	3.0	-4.1	36.3	1.0	-39.4	-25.0	-14.4	

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16QAM LTE BAND 7 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/12/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 7, 20MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

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	-63.6	H	3.0	-10.7	38.7	1.0	-48.4	-25.0	-23.4	
7.53	-65.5	H	3.0	-7.6	37.7	1.0	-44.4	-25.0	-19.4	
10.04	-65.8	H	3.0	-4.9	36.2	1.0	-40.1	-25.0	-15.1	
5.02	-63.6	V	3.0	-11.0	38.7	1.0	-48.7	-25.0	-23.7	
7.53	-65.5	V	3.0	-7.8	37.7	1.0	-44.6	-25.0	-19.6	
10.04	-65.9	V	3.0	-5.0	36.2	1.0	-40.2	-25.0	-15.2	
Mid Channel (2535MHz)										
5.07	-63.3	H	3.0	-10.3	38.7	1.0	-48.0	-25.0	-23.0	
7.61	-65.9	H	3.0	-8.0	37.7	1.0	-44.7	-25.0	-19.7	
10.14	-65.8	H	3.0	-4.9	36.2	1.0	-40.1	-25.0	-15.1	
5.07	-63.2	V	3.0	-10.5	38.7	1.0	-48.2	-25.0	-23.2	
7.61	-65.4	V	3.0	-7.7	37.7	1.0	-44.4	-25.0	-19.4	
10.14	-65.6	V	3.0	-4.7	36.2	1.0	-39.9	-25.0	-14.9	
High Channel (2560MHz)										
5.12	-63.5	H	3.0	-10.4	38.7	1.0	-48.0	-25.0	-23.0	
7.68	-64.9	H	3.0	-6.9	37.6	1.0	-43.5	-25.0	-18.5	
10.24	-64.8	H	3.0	-3.8	36.3	1.0	-39.0	-25.0	-14.0	
5.12	-63.3	V	3.0	-10.5	38.7	1.0	-48.2	-25.0	-23.2	
7.68	-65.5	V	3.0	-7.7	37.6	1.0	-44.4	-25.0	-19.4	
10.24	-65.3	V	3.0	-4.2	36.3	1.0	-39.5	-25.0	-14.5	

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9.2.5. LTE BAND 12

QPSK LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/12/17
Test Engineer: 40813
Configuration: EUT Only
Mode: LTE Band 12, 10MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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 (704MHz)										
1.41	-63.8	H	3.0	-22.1	38.1	1.0	-59.2	-13.0	-46.2	
2.11	-64.5	H	3.0	-20.9	38.0	1.0	-57.9	-13.0	-44.9	
2.82	-65.3	H	3.0	-18.2	38.4	1.0	-55.7	-13.0	-42.7	
1.41	-63.9	V	3.0	-22.9	38.1	1.0	-60.0	-13.0	-47.0	
2.11	-64.8	V	3.0	-20.7	38.0	1.0	-57.7	-13.0	-44.7	
2.82	-64.2	V	3.0	-17.3	38.4	1.0	-54.8	-13.0	-41.8	
Mid Channel (707.5MHz)										
1.42	-63.3	H	3.0	-21.6	38.0	1.0	-58.7	-13.0	-45.7	
2.12	-63.2	H	3.0	-19.6	38.0	1.0	-56.6	-13.0	-43.6	
2.83	-64.9	H	3.0	-17.7	38.4	1.0	-55.2	-13.0	-42.2	
1.42	-63.5	V	3.0	-22.5	38.0	1.0	-59.5	-13.0	-46.5	
2.12	-64.0	V	3.0	-19.8	38.0	1.0	-56.8	-13.0	-43.8	
2.83	-64.6	V	3.0	-17.6	38.4	1.0	-55.1	-13.0	-42.1	
High Channel (711MHz)										
1.42	-63.3	H	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.13	-61.7	H	3.0	-18.0	38.0	1.0	-55.0	-13.0	-42.0	
2.84	-64.2	H	3.0	-16.9	38.4	1.0	-54.4	-13.0	-41.4	
1.42	-63.6	V	3.0	-22.6	38.0	1.0	-59.6	-13.0	-46.6	
2.13	-63.3	V	3.0	-19.1	38.0	1.0	-56.1	-13.0	-43.1	
2.84	-65.2	V	3.0	-18.1	38.4	1.0	-55.6	-13.0	-42.6	

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16QAM LTE BAND 12 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/12/17
Test Engineer: 40813
Configuration: EUT Only
Mode: LTE Band 12, 10MHz 16QAM

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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 (704MHz)										
1.41	-63.5	H	3.0	-21.9	38.1	1.0	-58.9	-13.0	-45.9	
2.11	-63.3	H	3.0	-19.7	38.0	1.0	-56.7	-13.0	-43.7	
2.82	-63.7	H	3.0	-16.7	38.4	1.0	-54.1	-13.0	-41.1	
1.41	-62.8	V	3.0	-21.9	38.1	1.0	-59.0	-13.0	-46.0	
2.11	-64.2	V	3.0	-20.1	38.0	1.0	-57.1	-13.0	-44.1	
2.82	-64.6	V	3.0	-17.7	38.4	1.0	-55.2	-13.0	-42.2	
Mid Channel (707.5MHz)										
1.42	-64.2	H	3.0	-22.5	38.0	1.0	-59.6	-13.0	-46.6	
2.12	-62.2	H	3.0	-18.6	38.0	1.0	-55.6	-13.0	-42.6	
2.83	-64.9	H	3.0	-17.7	38.4	1.0	-55.1	-13.0	-42.1	
1.42	-63.7	V	3.0	-22.7	38.0	1.0	-59.8	-13.0	-46.8	
2.12	-65.4	V	3.0	-21.3	38.0	1.0	-58.3	-13.0	-45.3	
2.83	-66.0	V	3.0	-19.0	38.4	1.0	-56.4	-13.0	-43.4	
High Channel (711MHz)										
1.42	-63.2	H	3.0	-21.5	38.0	1.0	-58.5	-13.0	-45.5	
2.13	-63.9	H	3.0	-20.2	38.0	1.0	-57.2	-13.0	-44.2	
2.84	-64.7	H	3.0	-17.4	38.4	1.0	-54.9	-13.0	-41.9	
1.42	-63.6	V	3.0	-22.6	38.0	1.0	-59.6	-13.0	-46.6	
2.13	-64.9	V	3.0	-20.7	38.0	1.0	-57.7	-13.0	-44.7	
2.84	-65.8	V	3.0	-18.8	38.4	1.0	-56.2	-13.0	-43.2	

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9.2.6. LTE BAND 13

QPSK LTE BAND 13 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/13/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 13, 10MHz QPSK

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

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	-63.5	H	3.0	-21.2	37.8	1.0	-58.0	-40.0	-18.0	
2.35	-65.6	H	3.0	-21.2	38.1	1.0	-58.3	-13.0	-45.3	
3.13	-65.5	H	3.0	-17.0	38.4	1.0	-54.4	-13.0	-41.4	
1.56	-63.7	V	3.0	-22.0	37.8	1.0	-58.8	-40.0	-18.8	
2.35	-65.4	V	3.0	-20.8	38.1	1.0	-57.9	-13.0	-44.9	
3.13	-65.7	V	3.0	-17.5	38.4	1.0	-54.9	-13.0	-41.9	

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High Frequency Substitution Measurement

UL Fremont Radiated Chamber

Company:
Project #:
Date:
Test Engineer:
Configuration:
Mode:

04/13/17
39004
EUT Only
LTE Band 13, 10MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

Filter

Filter

Limit

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	-63.3	H	3.0	-21.0	37.8	1.0	-57.9	-40.0	-17.9	
2.35	-65.4	H	3.0	-21.0	38.1	1.0	-58.1	-13.0	-45.1	
3.13	-65.6	H	3.0	-17.1	38.4	1.0	-54.5	-13.0	-41.5	
1.56	-63.6	V	3.0	-21.9	37.8	1.0	-58.7	-40.0	-18.7	
2.35	-65.5	V	3.0	-20.9	38.1	1.0	-58.0	-13.0	-45.0	
3.13	-65.6	V	3.0	-17.4	38.4	1.0	-54.8	-13.0	-41.8	

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9.2.7. LTE BAND 17

QPSK LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 07/21/17
Test Engineer: 10641
Configuration: EUT Only
Mode: LTE Band 17, 10MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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 (709MHz)										
1.418	-65.4	H	3.0	-23.7	38.0	1.0	-60.7	-13.0	-47.7	
2.127	-63.5	H	3.0	-19.9	38.0	1.0	-56.9	-13.0	-43.9	
2.836	-65.7	H	3.0	-18.5	38.4	1.0	-55.9	-13.0	-42.9	
1.418	-63.6	V	3.0	-22.6	38.0	1.0	-59.6	-13.0	-46.6	
2.127	-65.4	V	3.0	-21.3	38.0	1.0	-58.3	-13.0	-45.3	
2.836	-66.0	V	3.0	-19.0	38.4	1.0	-56.4	-13.0	-43.4	
Mid Channel (710MHz)										
1.420	-63.6	H	3.0	-21.9	38.0	1.0	-58.9	-13.0	-45.9	
2.130	-65.0	H	3.0	-21.4	38.0	1.0	-58.4	-13.0	-45.4	
2.840	-65.6	H	3.0	-18.4	38.4	1.0	-55.8	-13.0	-42.8	
1.420	-63.7	V	3.0	-22.7	38.0	1.0	-59.7	-13.0	-46.7	
2.130	-65.3	V	3.0	-21.2	38.0	1.0	-58.2	-13.0	-45.2	
2.840	-65.7	V	3.0	-18.7	38.4	1.0	-56.2	-13.0	-43.2	
High Channel (711MHz)										
1.422	-65.4	H	3.0	-23.7	38.0	1.0	-60.7	-13.0	-47.7	
2.133	-65.3	H	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.844	-66.1	H	3.0	-18.8	38.4	1.0	-56.3	-13.0	-43.3	
1.422	-65.4	V	3.0	-24.3	38.0	1.0	-61.4	-13.0	-48.4	
2.133	-65.3	V	3.0	-21.1	38.0	1.0	-58.1	-13.0	-45.1	
2.844	-65.1	V	3.0	-18.1	38.4	1.0	-55.5	-13.0	-42.5	

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16QAM LTE BAND 17 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 07/21/17

Test Engineer: 10641

Configuration: EUT Only

Mode: LTE Band 17, 10MHz 16QAM

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
3m Chamber E

Pre-amplifier
3m Chamber E

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 (709MHz)										
1.418	-63.5	H	3.0	-21.8	38.0	1.0	-58.8	-13.0	-45.8	
2.127	-65.2	H	3.0	-21.6	38.0	1.0	-58.6	-13.0	-45.6	
2.836	-65.6	H	3.0	-18.4	38.4	1.0	-55.9	-13.0	-42.9	
1.418	-64.7	V	3.0	-23.7	38.0	1.0	-60.8	-13.0	-47.8	
2.127	-65.4	V	3.0	-21.2	38.0	1.0	-58.2	-13.0	-45.2	
2.836	-65.7	V	3.0	-18.7	38.4	1.0	-56.2	-13.0	-43.2	
Mid Channel (710MHz)										
1.420	-63.4	H	3.0	-21.7	38.0	1.0	-58.8	-13.0	-45.8	
2.130	-65.1	H	3.0	-21.5	38.0	1.0	-58.5	-13.0	-45.5	
2.840	-65.8	H	3.0	-18.6	38.4	1.0	-56.0	-13.0	-43.0	
1.420	-63.5	V	3.0	-22.5	38.0	1.0	-59.5	-13.0	-46.5	
2.130	-65.5	V	3.0	-21.3	38.0	1.0	-58.3	-13.0	-45.3	
2.840	-65.6	V	3.0	-18.6	38.4	1.0	-56.1	-13.0	-43.1	
High Channel (711MHz)										
1.422	-64.5	H	3.0	-22.8	38.0	1.0	-59.8	-13.0	-46.8	
2.133	-65.2	H	3.0	-21.5	38.0	1.0	-58.5	-13.0	-45.5	
2.844	-65.6	H	3.0	-18.4	38.4	1.0	-55.8	-13.0	-42.8	
1.422	-64.4	V	3.0	-23.4	38.0	1.0	-60.4	-13.0	-47.4	
2.133	-65.2	V	3.0	-21.0	38.0	1.0	-58.0	-13.0	-45.0	
2.844	-65.2	V	3.0	-18.2	38.4	1.0	-55.6	-13.0	-42.6	

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9.2.8. LTE BAND 25

QPSK LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/12/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 25, 20MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

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	-63.9	H	3.0	-13.9	38.6	1.0	-51.5	-13.0	-38.5	
5.58	-64.7	H	3.0	-10.6	38.6	1.0	-48.2	-13.0	-35.2	
7.44	-65.7	H	3.0	-8.0	37.8	1.0	-44.8	-13.0	-31.8	
3.72	-63.8	H	3.0	-13.8	38.6	1.0	-51.5	-13.0	-38.5	
5.58	-64.8	H	3.0	-10.7	38.6	1.0	-48.3	-13.0	-35.3	
7.44	-65.6	V	3.0	-8.1	37.8	1.0	-44.9	-13.0	-31.9	
Mid Channel (1882.5MHz)										
3.77	-63.4	H	3.0	-13.3	38.6	1.0	-50.9	-13.0	-37.9	
5.65	-65.8	H	3.0	-11.5	38.5	1.0	-49.0	-13.0	-36.0	
7.53	-66.0	H	3.0	-8.2	37.7	1.0	-44.9	-13.0	-31.9	
3.77	-63.5	V	3.0	-13.4	38.6	1.0	-51.1	-13.0	-38.1	
5.65	-65.4	V	3.0	-11.4	38.5	1.0	-48.9	-13.0	-35.9	
7.53	-66.1	V	3.0	-8.5	37.7	1.0	-45.2	-13.0	-32.2	
High Channel (1905MHz)										
3.81	-62.9	H	3.0	-12.6	38.6	1.0	-50.3	-13.0	-37.3	
5.72	-65.5	H	3.0	-11.1	38.5	1.0	-48.6	-13.0	-35.6	
7.62	-65.7	H	3.0	-7.8	37.7	1.0	-44.4	-13.0	-31.4	
3.81	-63.0	V	3.0	-12.8	38.6	1.0	-50.5	-13.0	-37.5	
5.72	-65.4	V	3.0	-11.3	38.5	1.0	-48.8	-13.0	-35.8	
7.62	-65.5	V	3.0	-7.8	37.7	1.0	-44.5	-13.0	-31.5	

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16QAM LTE BAND 25 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/12/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 25, 20MHz 16QAM

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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	-63.8	H	3.0	-13.7	38.6	1.0	-51.4	-13.0	-38.4	
5.58	-64.6	H	3.0	-10.5	38.6	1.0	-48.1	-13.0	-35.1	
7.44	-65.8	H	3.0	-8.1	37.8	1.0	-44.9	-13.0	-31.9	
3.72	-63.7	V	3.0	-13.8	38.6	1.0	-51.4	-13.0	-38.4	
5.58	-64.7	V	3.0	-10.9	38.6	1.0	-48.5	-13.0	-35.5	
7.44	-65.8	V	3.0	-8.3	37.8	1.0	-45.1	-13.0	-32.1	
Mid Channel (1882.5MHz)										
3.77	-63.5	H	3.0	-13.4	38.6	1.0	-51.1	-13.0	-38.1	
5.65	-65.7	H	3.0	-11.5	38.5	1.0	-49.0	-13.0	-36.0	
7.53	-65.9	H	3.0	-8.1	37.7	1.0	-44.8	-13.0	-31.8	
3.77	-63.6	V	3.0	-13.5	38.6	1.0	-51.1	-13.0	-38.1	
5.65	-65.5	V	3.0	-11.5	38.5	1.0	-49.0	-13.0	-36.0	
7.53	-66.2	V	3.0	-8.6	37.7	1.0	-45.3	-13.0	-32.3	
High Channel (1905MHz)										
3.81	-63.2	H	3.0	-13.0	38.6	1.0	-50.6	-13.0	-37.6	
5.72	-65.6	H	3.0	-11.2	38.5	1.0	-48.7	-13.0	-35.7	
7.62	-65.6	H	3.0	-7.7	37.7	1.0	-44.4	-13.0	-31.4	
3.81	-63.1	V	3.0	-12.9	38.6	1.0	-50.6	-13.0	-37.6	
5.72	-65.4	V	3.0	-11.3	38.5	1.0	-48.8	-13.0	-35.8	
7.62	-65.9	V	3.0	-8.1	37.7	1.0	-44.8	-13.0	-31.8	

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9.2.9. LTE BAND 26

QPSK LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/12/17

Test Engineer: 40813

Configuration: EUT Only

Mode: LTE Band 26 (90S), 10MHz QPSK

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E ▼

Pre-amplifier

3m Chamber E ▼

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
Mid Channel (819MHz)										
1.64	-64.7	H	3.0	-22.3	37.8	1.0	-59.2	-13.0	-46.2	
2.46	-64.4	H	3.0	-19.5	38.4	1.0	-56.9	-13.0	-43.9	
3.28	-64.1	H	3.0	-15.2	38.5	1.0	-52.7	-13.0	-39.7	
1.64	-63.8	V	3.0	-21.7	37.8	1.0	-58.6	-13.0	-45.6	
2.46	-64.7	V	3.0	-19.6	38.4	1.0	-57.0	-13.0	-44.0	
3.28	-64.2	V	3.0	-15.6	38.5	1.0	-53.1	-13.0	-40.1	

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16QAM LTE BAND 26 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:

Project #:

Date: 04/12/17

Test Engineer: 40813

Configuration: EUT Only

Mode: LTE Band 26 (90S), 10MHz 16QAM

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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
Mid Channel (819MHz)										
1.64	-63.5	H	3.0	-21.1	37.8	1.0	-57.9	-13.0	-44.9	
2.46	-63.1	H	3.0	-18.2	38.4	1.0	-55.6	-13.0	-42.6	
3.28	-63.9	H	3.0	-15.0	38.5	1.0	-52.4	-13.0	-39.4	
1.64	-63.2	V	3.0	-21.1	37.8	1.0	-57.9	-13.0	-44.9	
2.46	-64.9	V	3.0	-19.8	38.4	1.0	-57.2	-13.0	-44.2	
3.28	-64.2	V	3.0	-15.6	38.5	1.0	-53.1	-13.0	-40.1	

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9.2.10. LTE BAND 30

QPSK LTE BAND 30 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber										
Company: Project #: Date: 04/12/17 Test Engineer: 39004 Configuration: EUT only Mode: LTE Band 30, 10MHz QPSK										
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable										
Chamber		Pre-amplifier		Filter		Limit				
3m Chamber E		3m Chamber E		Filter		LTE B30				
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-66.7	H	3.0	-12.9	37.9	1.0	-49.8	-40.0	-9.8	
6.93	-67.7	H	3.0	-9.0	36.5	1.0	-44.5	-40.0	-4.5	
9.24	-70.9	H	3.0	-9.3	34.9	1.0	-43.2	-40.0	-3.2	
4.62	-66.6	V	3.0	-12.8	37.9	1.0	-49.8	-40.0	-9.8	
6.93	-67.9	V	3.0	-8.4	36.5	1.0	-43.8	-40.0	-3.8	
9.24	-71.0	V	3.0	-9.2	34.9	1.0	-43.1	-40.0	-3.1	
Rev. 05.21.15										

16QAM LTE BAND 30 (10.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber										
Company: Project #: Date: 04/12/17 Test Engineer: 39004 Configuration: EUT only Mode: LTE Band 30, 10MHz 16QAM										
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable										
Chamber		Pre-amplifier		Filter		Limit				
3m Chamber E		3m Chamber E		Filter		LTE B30				
Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Mid Channel (2310MHz)										
4.62	-66.5	H	3.0	-12.8	37.9	1.0	-49.7	-40.0	-9.7	
6.93	-67.8	H	3.0	-9.2	36.5	1.0	-44.7	-40.0	-4.7	
9.24	-70.8	H	3.0	-9.2	34.9	1.0	-43.1	-40.0	-3.1	
4.62	-66.7	V	3.0	-12.9	37.9	1.0	-49.8	-40.0	-9.8	
6.93	-68.0	V	3.0	-8.5	36.5	1.0	-44.0	-40.0	-4.0	
9.24	-71.2	V	3.0	-9.4	34.9	1.0	-43.2	-40.0	-3.2	
Rev. 05.21.15										

9.2.11. LTE BAND 41

QPSK LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/13/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 41, 20MHz QPSK

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

Filter
 Filter

Limit
 LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-63.6	H	3.0	-10.8	38.7	1.0	-48.4	-25.0	-23.4	
7.52	-65.5	H	3.0	-7.7	37.7	1.0	-44.4	-25.0	-19.4	
10.02	-66.1	H	3.0	-5.3	36.1	1.0	-40.5	-25.0	-15.5	
5.01	-63.4	V	3.0	-10.8	38.7	1.0	-48.5	-25.0	-23.5	
7.52	-65.6	V	3.0	-8.0	37.7	1.0	-44.8	-25.0	-19.8	
10.02	-66.2	V	3.0	-5.4	36.1	1.0	-40.6	-25.0	-15.6	
Mid Channel (2593MHz)										
5.19	-63.1	H	3.0	-9.9	38.7	1.0	-47.6	-25.0	-22.6	
7.78	-65.3	H	3.0	-7.2	37.6	1.0	-43.8	-25.0	-18.8	
10.37	-65.5	H	3.0	-4.3	36.4	1.0	-39.7	-25.0	-14.7	
5.19	-63.4	V	3.0	-10.4	38.7	1.0	-48.1	-25.0	-23.1	
7.78	-65.4	V	3.0	-7.5	37.6	1.0	-44.1	-25.0	-19.1	
10.37	-65.7	V	3.0	-4.5	36.4	1.0	-39.9	-25.0	-14.9	
High Channel (2680MHz)										
5.36	-64.5	H	3.0	-10.8	38.6	1.0	-48.5	-25.0	-23.5	
8.04	-65.8	H	3.0	-7.3	37.4	1.0	-43.7	-25.0	-18.7	
10.72	-66.1	H	3.0	-4.7	36.6	1.0	-40.3	-25.0	-15.3	
5.36	-64.2	V	3.0	-10.9	38.6	1.0	-48.6	-25.0	-23.6	
8.04	-65.5	V	3.0	-7.2	37.4	1.0	-43.6	-25.0	-18.6	
10.72	-65.9	V	3.0	-4.3	36.6	1.0	-39.9	-25.0	-14.9	

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16QAM LTE BAND 41 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/13/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 41, 20MHz 16QAM

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

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

Filter
 Filter

Limit
 LTE B41

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	EIRP @ TX Ant End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (2506MHz)										
5.01	-63.5	H	3.0	-10.6	38.7	1.0	-48.3	-25.0	-23.3	
7.52	-65.6	H	3.0	-7.8	37.7	1.0	-44.5	-25.0	-19.5	
10.02	-66.2	H	3.0	-5.4	36.1	1.0	-40.6	-25.0	-15.6	
5.01	-63.7	V	3.0	-11.1	38.7	1.0	-48.8	-25.0	-23.8	
7.52	-65.7	V	3.0	-8.0	37.7	1.0	-44.8	-25.0	-19.8	
10.02	-66.1	V	3.0	-5.3	36.1	1.0	-40.4	-25.0	-15.4	
Mid Channel (2593MHz)										
5.19	-63.3	H	3.0	-10.1	38.7	1.0	-47.8	-25.0	-22.8	
7.78	-65.4	H	3.0	-7.3	37.6	1.0	-43.9	-25.0	-18.9	
10.37	-65.4	H	3.0	-4.2	36.4	1.0	-39.6	-25.0	-14.6	
5.19	-63.5	V	3.0	-10.6	38.7	1.0	-48.3	-25.0	-23.3	
7.78	-65.4	V	3.0	-7.5	37.6	1.0	-44.0	-25.0	-19.0	
10.37	-65.9	V	3.0	-4.7	36.4	1.0	-40.0	-25.0	-15.0	
High Channel (2680MHz)										
5.36	-64.4	H	3.0	-10.7	38.6	1.0	-48.4	-25.0	-23.4	
8.04	-65.7	H	3.0	-7.2	37.4	1.0	-43.6	-25.0	-18.6	
10.72	-66.2	H	3.0	-4.8	36.6	1.0	-40.4	-25.0	-15.4	
5.36	-64.2	V	3.0	-10.9	38.6	1.0	-48.6	-25.0	-23.6	
8.04	-65.4	V	3.0	-7.2	37.4	1.0	-43.6	-25.0	-18.6	
10.72	-65.8	V	3.0	-4.3	36.6	1.0	-39.9	-25.0	-14.9	

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9.2.12. LTE BAND 66

QPSK LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #:
Date: 04/13/17
Test Engineer: 39004
Configuration: EUT Only
Mode: LTE Band 66, 20MHz QPSK

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

Chamber

3m Chamber E

Pre-amplifier

3m Chamber E

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 (1720.0MHz)										
3.44	-60.5	H	3.0	-11.2	38.5	1.0	-48.7	-13.0	-35.7	
5.16	-63.6	H	3.0	-10.4	38.7	1.0	-48.1	-13.0	-35.1	
6.88	-66.0	H	3.0	-9.1	38.1	1.0	-46.2	-13.0	-33.2	
3.44	-60.2	V	3.0	-11.1	38.5	1.0	-48.6	-13.0	-35.6	
5.16	-63.9	V	3.0	-11.0	38.7	1.0	-48.7	-13.0	-35.7	
6.88	-65.8	V	3.0	-9.1	38.1	1.0	-46.2	-13.0	-33.2	
Mid Channel (1745.0MHz)										
3.49	-65.4	H	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
5.24	-64.7	H	3.0	-11.3	38.7	1.0	-49.0	-13.0	-36.0	
6.98	-65.0	H	3.0	-7.8	38.1	1.0	-44.9	-13.0	-31.9	
3.49	-65.2	V	3.0	-16.0	38.5	1.0	-53.5	-13.0	-40.5	
5.24	-64.8	V	3.0	-11.8	38.7	1.0	-49.5	-13.0	-36.5	
6.98	-65.1	V	3.0	-8.2	38.1	1.0	-45.3	-13.0	-32.3	
High Channel (1770.0MHz)										
3.54	-64.0	H	3.0	-14.5	38.6	1.0	-52.0	-13.0	-39.0	
5.31	-65.2	H	3.0	-11.7	38.6	1.0	-49.4	-13.0	-36.4	
7.08	-65.2	H	3.0	-7.9	38.0	1.0	-44.9	-13.0	-31.9	
3.54	-63.7	V	3.0	-14.3	38.6	1.0	-51.9	-13.0	-38.9	
5.31	-65.4	V	3.0	-12.2	38.6	1.0	-49.8	-13.0	-36.8	
7.08	-65.2	V	3.0	-8.2	38.0	1.0	-45.2	-13.0	-32.2	

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16QAM LTE BAND 66 (20.0MHZ BANDWIDTH)

High Frequency Substitution Measurement UL Fremont Radiated Chamber											
Company: Project #: Date: 04/13/17 Test Engineer: 39004 Configuration: EUT Only Mode: LTE Band 66, 20MHz 16QAM											
Test Equipment: Substitution: Horn T59 Substitution, and 8ft SMA Cable											
Chamber		Pre-amplifier		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)	Preamplifier	Attenuator	EIRP	Limit	Delta	Notes	
Low Channel (1720.0MHz)											
3.44	-61.2	H	3.0	-11.9	38.5	1.0	-49.4	-13.0	-36.4		
5.16	-64.5	H	3.0	-11.3	38.7	1.0	-48.9	-13.0	-35.9		
6.88	-66.7	H	3.0	-9.7	38.1	1.0	-46.8	-13.0	-33.9		
3.44	-61.2	V	3.0	-12.0	38.5	1.0	-49.6	-13.0	-36.6		
5.16	-64.8	V	3.0	-11.9	38.7	1.0	-49.6	-13.0	-36.6		
6.88	-66.5	V	3.0	-9.8	38.1	1.0	-47.0	-13.0	-34.0		
Mid Channel (1745.0MHz)											
3.49	-66.1	H	3.0	-16.7	38.5	1.0	-54.2	-13.0	-41.2		
5.24	-65.4	H	3.0	-12.1	38.7	1.0	-49.7	-13.0	-36.7		
6.98	-65.9	H	3.0	-8.7	38.1	1.0	-45.8	-13.0	-32.8		
3.49	-66.2	V	3.0	-16.9	38.5	1.0	-54.5	-13.0	-41.5		
5.24	-65.7	V	3.0	-12.6	38.7	1.0	-50.3	-13.0	-37.3		
6.98	-66.5	V	3.0	-9.6	38.1	1.0	-46.7	-13.0	-33.7		
High Channel (1770.0MHz)											
3.54	-64.7	H	3.0	-15.2	38.6	1.0	-52.7	-13.0	-39.7		
5.31	-65.9	H	3.0	-12.4	38.6	1.0	-50.0	-13.0	-37.0		
7.08	-66.1	H	3.0	-8.8	38.0	1.0	-45.9	-13.0	-32.9		
3.54	-64.4	V	3.0	-15.0	38.6	1.0	-52.6	-13.0	-39.6		
5.31	-66.3	V	3.0	-13.1	38.6	1.0	-50.8	-13.0	-37.8		
7.08	-66.0	V	3.0	-9.0	38.0	1.0	-46.0	-13.0	-33.0		
Rev. 02.24.17											