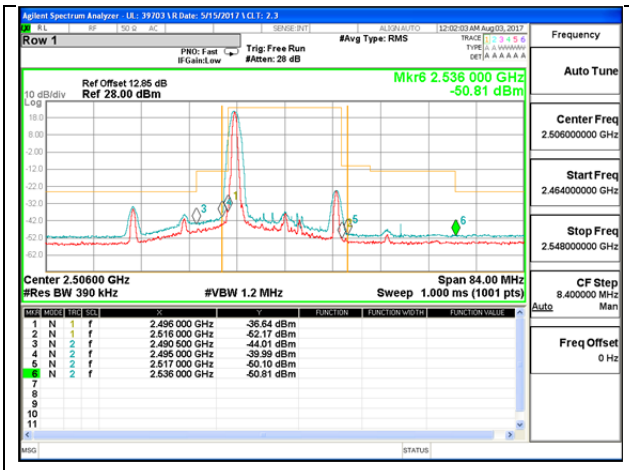
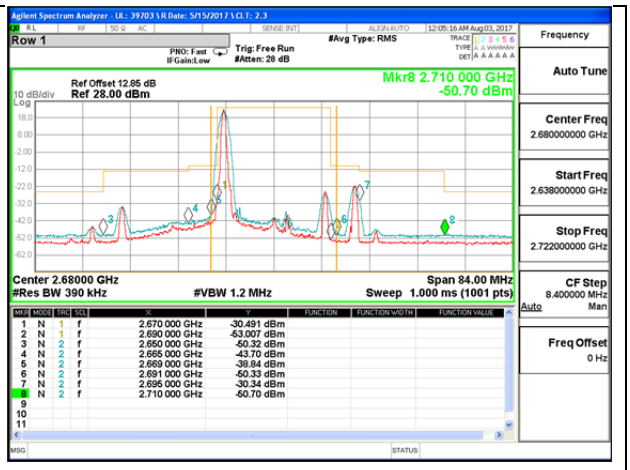
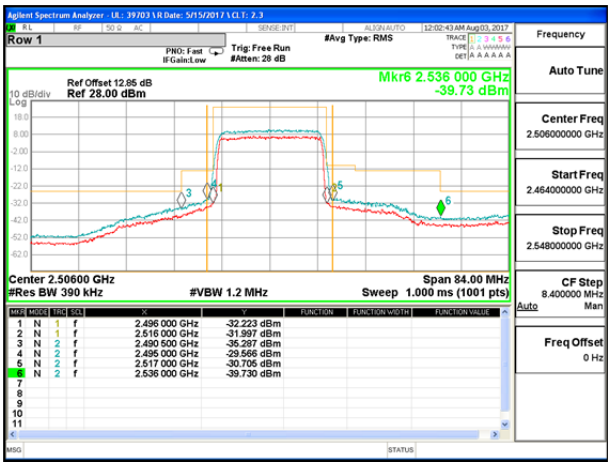


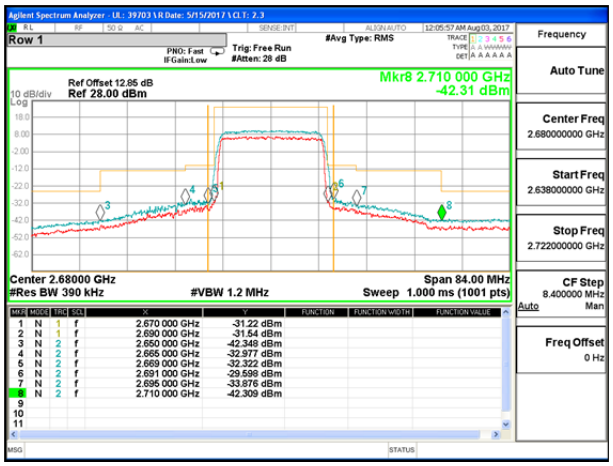
LTE B41 20MHz QPSK Low Channel 1RB



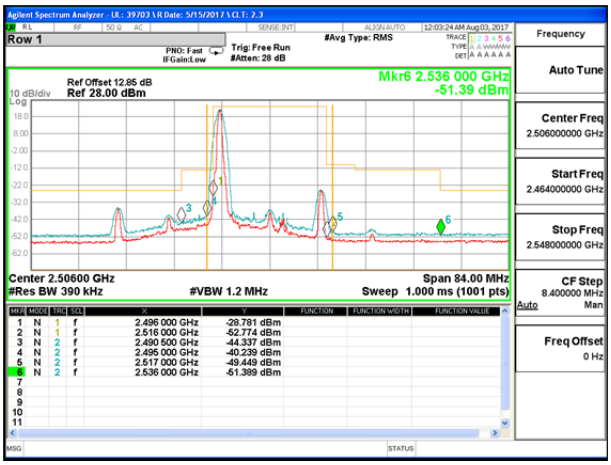
LTE B41 20MHz QPSK High Channel 1RB



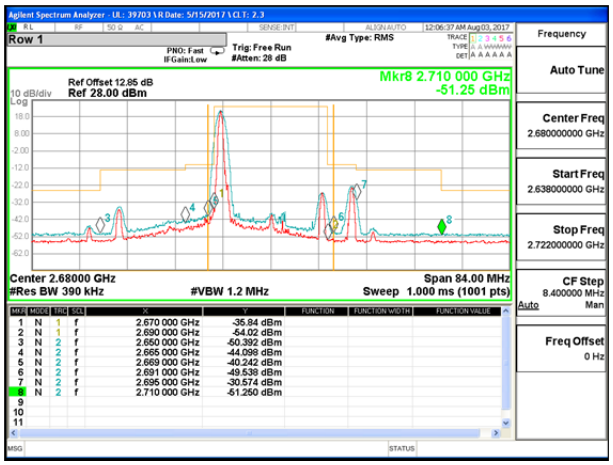
LTE B41 20MHz QPSK Low Channel FRB



LTE B41 20MHz QPSK High Channel FRB



LTE B41 20MHz 16QAM Low Channel 1RB



LTE B41 20MHz 16QAM High Channel 1RB

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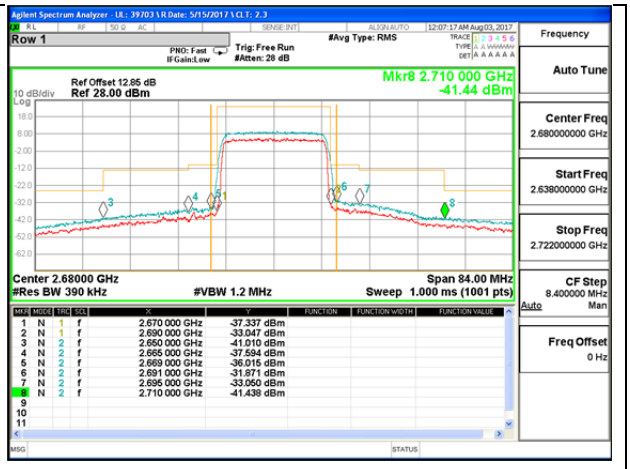
LTE B41 20MHz 16QAM Low Channel FRB



LTE B41 20MHz 16QAM High Channel FRB

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16. OUT OF BAND EMISSIONS

RULE PART(S)

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

FCC 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.

Part 27: (m)(4) (4) 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 that 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

Per KDB 971168 D01 Power Meas License Digital Systems v02r02
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 a maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

RESULTS

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16.1. OUT OF BAND EMISSIONS RESULT AND PLOTS

GSM

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
GSM 1900	GPRS	1850.2	-19.367	-13	-6.367
		1880	-18.124	-13	-5.124
		1909.8	-19.497	-13	-6.497
	EGPRS	1850.2	-19.509	-13	-6.509
		1880	-20.003	-13	-7.003
		1909.8	-19.585	-13	-6.585

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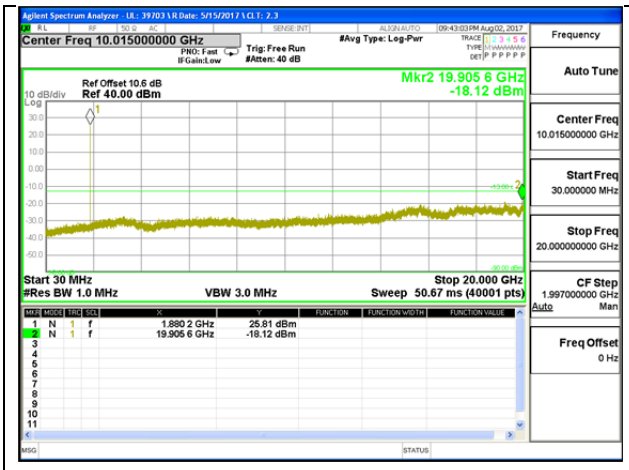
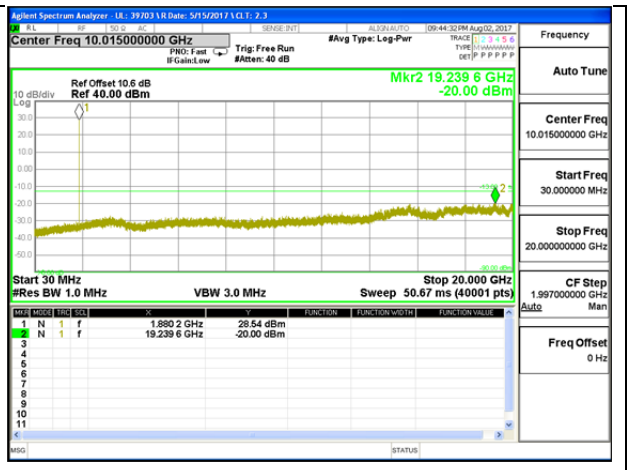


GSM1900 GPRS Middle Channel



GSM1900 EGPRS Middle Channel

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WCDMA

Band	Mode	f (MHz)	Spur (dBm)	99% BW (MHz)	Delta (dB)
Band 2	REL99	1852.4	-29.547	-13	-16.547
		1880	-28.05	-13	-15.05
		1907.6	-29.532	-13	-16.532
	HSDPA	1852.4	-29.112	-13	-16.112
		1880	-28.864	-13	-15.864
		1907.6	-28.912	-13	-15.912
Band 4	REL99	1712.4	-28.979	-13	-15.979
		1732.6	-29.202	-13	-16.202
		1752.6	-28.341	-13	-15.341
	HSDPA	1712.4	-28.391	-13	-15.391
		1732.6	-29.273	-13	-16.273
		1752.6	-29.028	-13	-16.028

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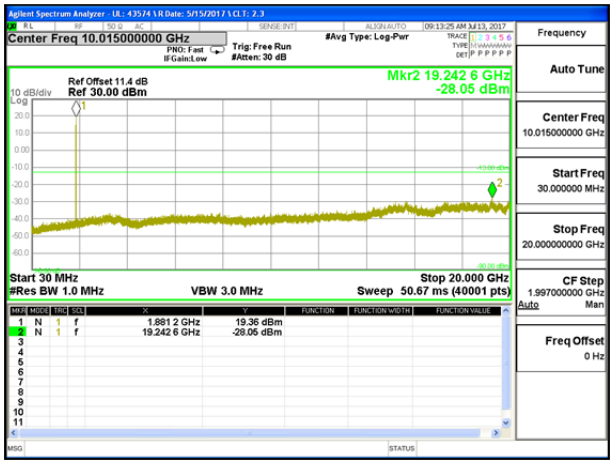
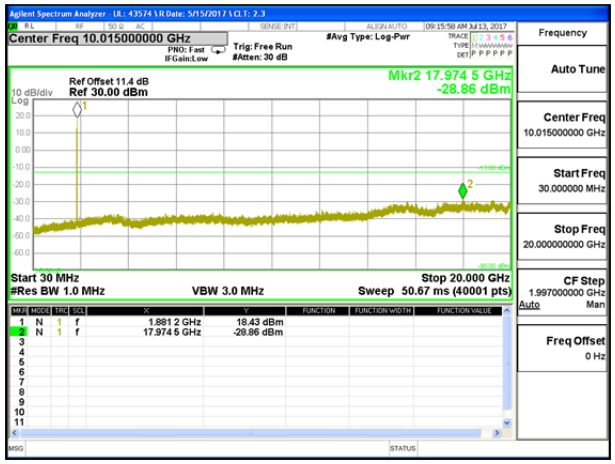
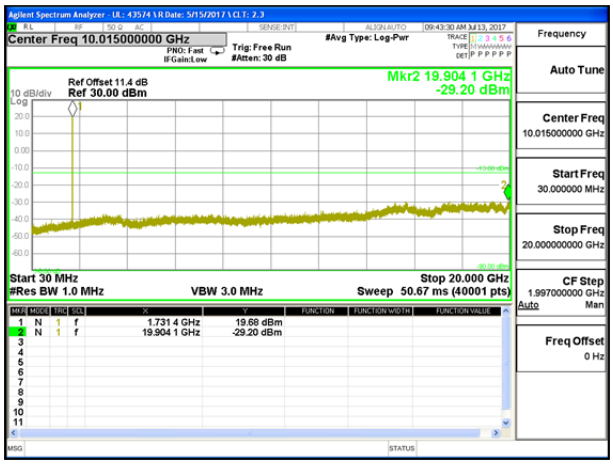


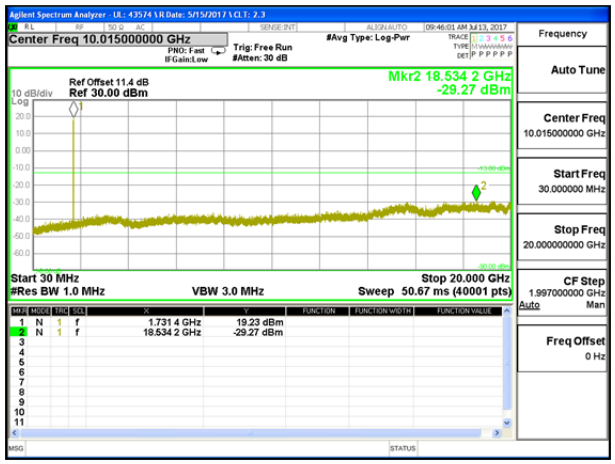
B2 REL99 Middle Channel



B2 HSDPA Middle Channel



B4 REL99 Middle Channel



B4 HSDPA Middle Channel

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LTE Band 2

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	1.4	QPSK	1850.7	-20.87	-13	-7.87
			1880	-20.7	-13	-7.7
			1909.3	-21.61	-13	-8.61
		16QAM	1850.7	-21.89	-13	-8.89
			1880	-19.72	-13	-6.72
			1909.3	-21.66	-13	-8.66
	3	QPSK	1851.5	-21.62	-13	-8.62
			1880	-20.55	-13	-7.55
			1908.5	-21.5	-13	-8.5
		16QAM	1851.5	-21.08	-13	-8.08
			1880	-18.99	-13	-5.99
			1908.5	-21.39	-13	-8.39
	5	QPSK	1852.5	-21.56	-13	-8.56
			1880	-21.36	-13	-8.36
			1907.5	-21.89	-13	-8.89
		16QAM	1852.5	-21.1	-13	-8.1
			1880	-21.78	-13	-8.78
			1907.5	-21.01	-13	-8.01
	10	QPSK	1855	-21.14	-13	-8.14
			1880	-20.94	-13	-7.94
			1905	-20.8	-13	-7.8
		16QAM	1855	-20.82	-13	-7.82
			1880	-21.44	-13	-8.44
			1905	-21.67	-13	-8.67

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Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	15	QPSK	1857.5	-20.84	-13	-7.84
			1880	-21.95	-13	-8.95
			1902.5	-21.41	-13	-8.41
		16QAM	1857.5	-21.34	-13	-8.34
			1880	-20.71	-13	-7.71
			1902.5	-20.69	-13	-7.69
	20	QPSK	1860	-21.49	-13	-8.49
			1880	-20.61	-13	-7.61
			1900	-20.91	-13	-7.91
		16QAM	1860	-21.26	-13	-8.26
			1880	-21.26	-13	-8.26
			1900	-21.34	-13	-8.34

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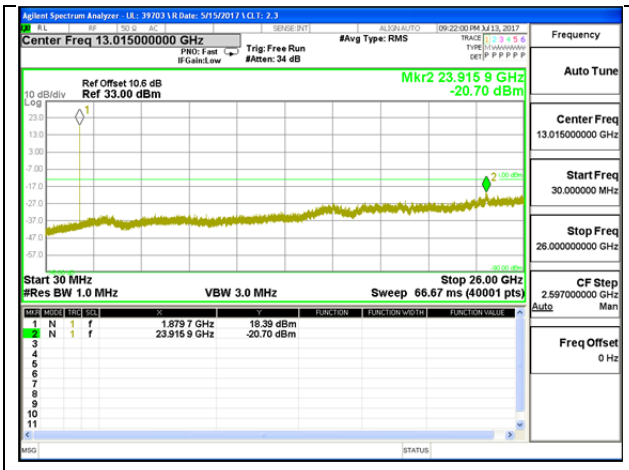
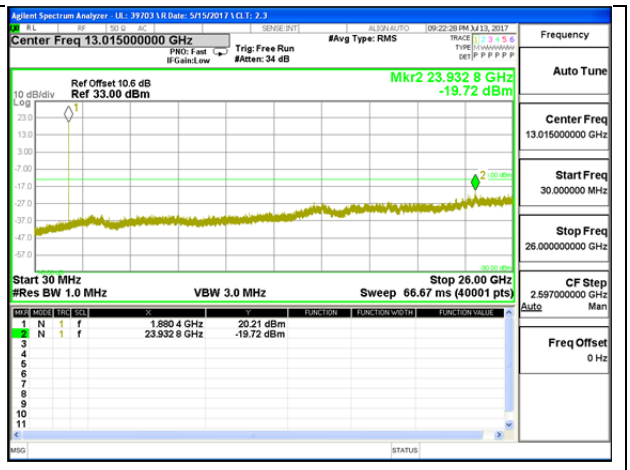
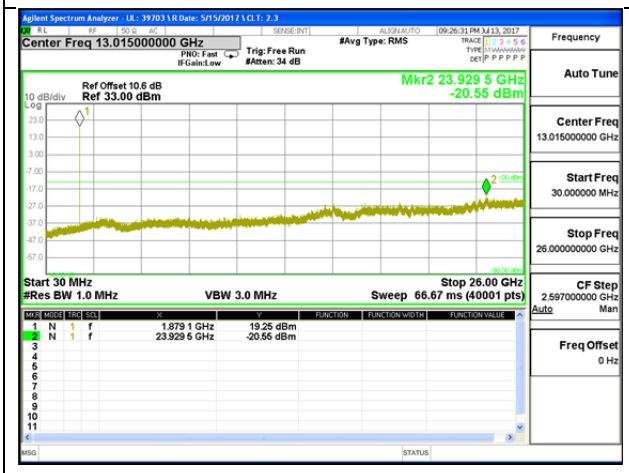


LTE B2 1.4MHz QPSK Middle Channel

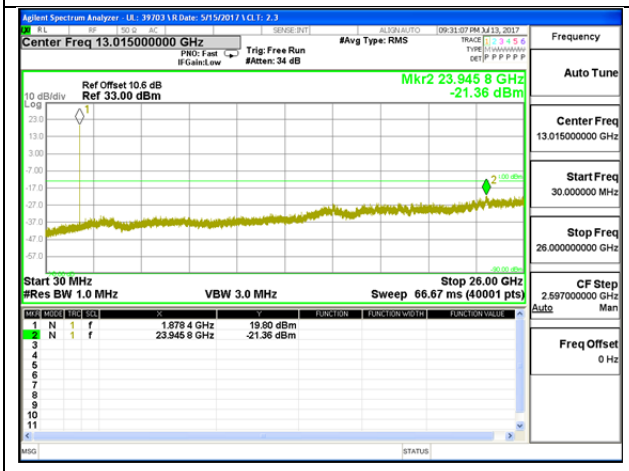


LTE B2 1.4MHz 16QAM Middle Channel

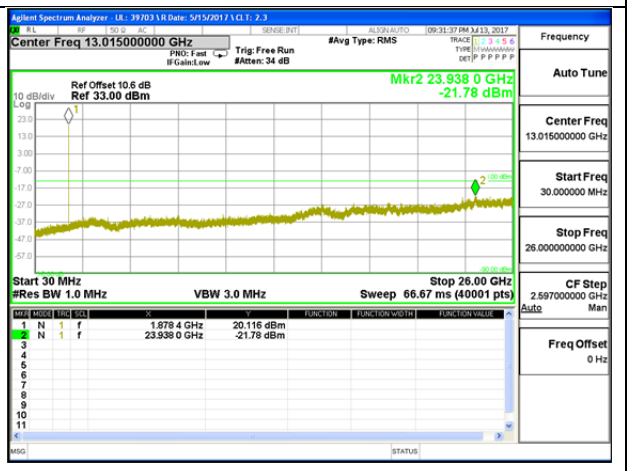


LTE B2 3MHz QPSK Middle Channel

LTE B2 3MHz 16QAM Middle Channel



LTE B2 5MHz QPSK Middle Channel



LTE B2 5MHz 16QAM Middle Channel

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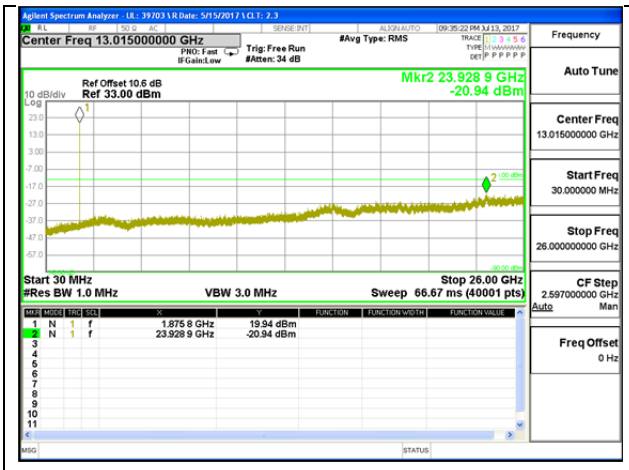
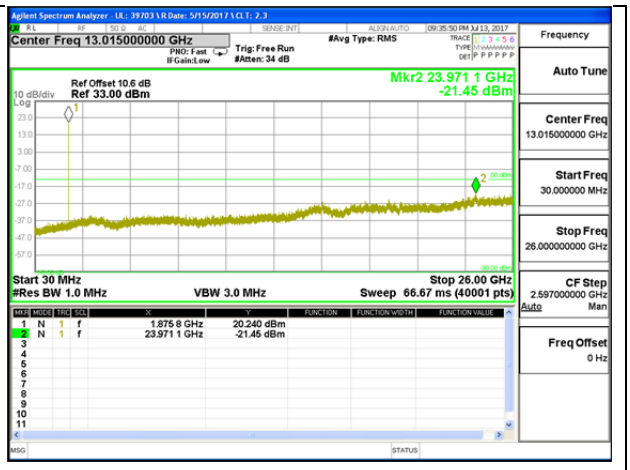
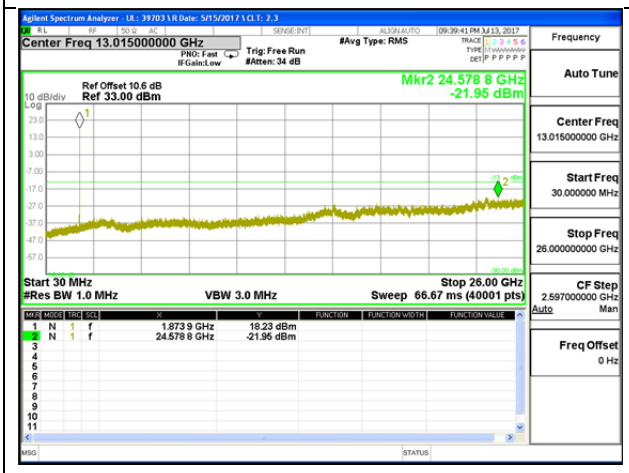


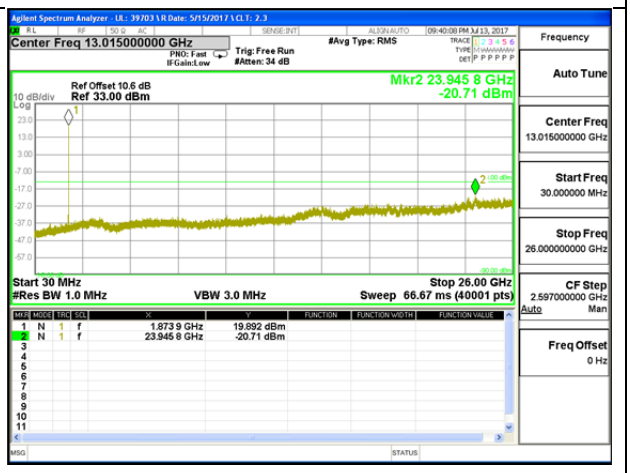
LTE B2 10MHz QPSK Middle Channel



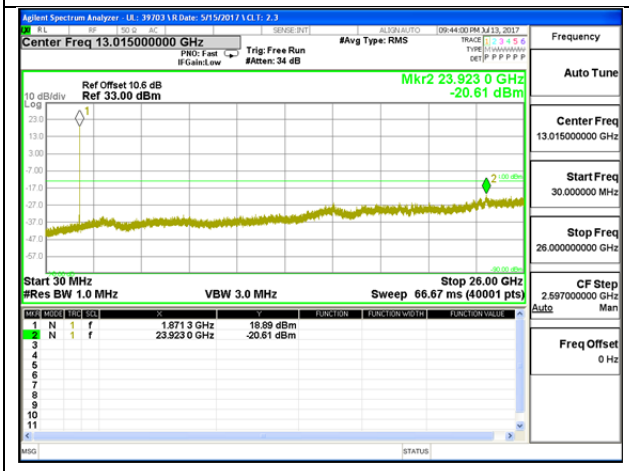
LTE B2 10MHz 16QAM Middle Channel



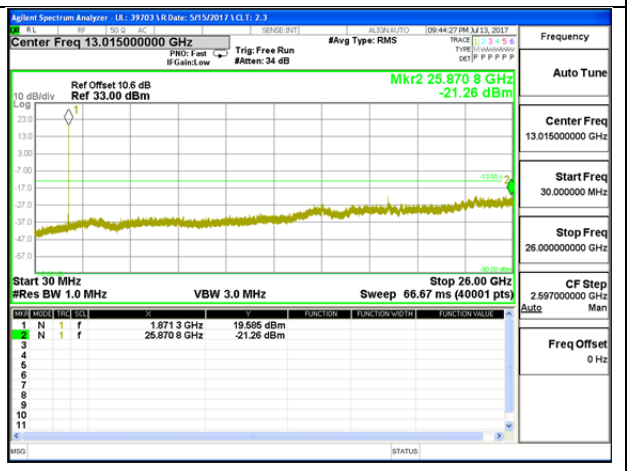
LTE B2 15MHz QPSK Middle Channel



LTE B2 15MHz 16QAM Middle Channel



LTE B2 20MHz QPSK Middle Channel



LTE B2 20MHz 16QAM Middle Channel

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LTE Band 4

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	1.4	QPSK	1710.7	-20.41	-13	-7.41
			1732.5	-21.38	-13	-8.38
			1754.3	-21.3	-13	-8.3
		16QAM	1710.7	-21.43	-13	-8.43
			1732.5	-21.42	-13	-8.42
			1754.3	-20.86	-13	-7.86
	3	QPSK	1711.5	-21.85	-13	-8.85
			1732.5	-20.49	-13	-7.49
			1753.5	-20.92	-13	-7.92
		16QAM	1711.5	-20.62	-13	-7.62
			1732.5	-21.69	-13	-8.69
			1753.5	-21.24	-13	-8.24
	5	QPSK	1712.5	-21.34	-13	-8.34
			1732.5	-21.39	-13	-8.39
			1752.5	-20.22	-13	-7.22
		16QAM	1712.5	-21.73	-13	-8.73
			1732.5	-21.05	-13	-8.05
			1752.5	-20.62	-13	-7.62
	10	QPSK	1715	-21.49	-13	-8.49
			1732.5	-20.4	-13	-7.4
			1750	-20.94	-13	-7.94
		16QAM	1715	-20.92	-13	-7.92
			1732.5	-20.76	-13	-7.76
			1750	-21.36	-13	-8.36

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Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	15	QPSK	1717.5	-21.79	-13	-8.79
			1732.5	-20.61	-13	-7.61
			1747.5	-21.17	-13	-8.17
		16QAM	1717.5	-20.92	-13	-7.92
			1732.5	-21.82	-13	-8.82
			1747.5	-20.54	-13	-7.54
	20	QPSK	1720	-20.74	-13	-7.74
			1732.5	-21.11	-13	-8.11
			1745	-21.09	-13	-8.09
		16QAM	1720	-20.81	-13	-7.81
			1732.5	-21.73	-13	-8.73
			1745	-21.67	-13	-8.67

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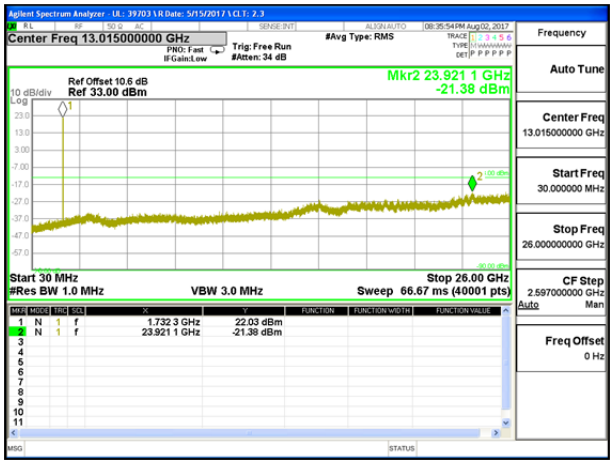
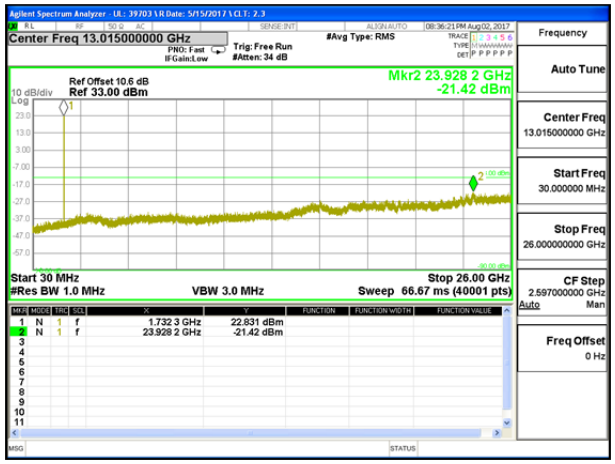
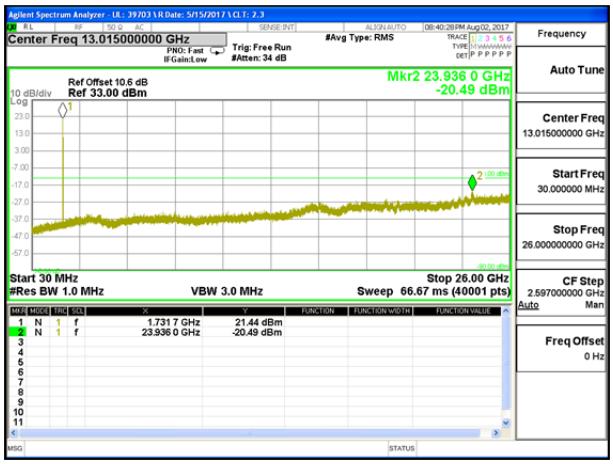


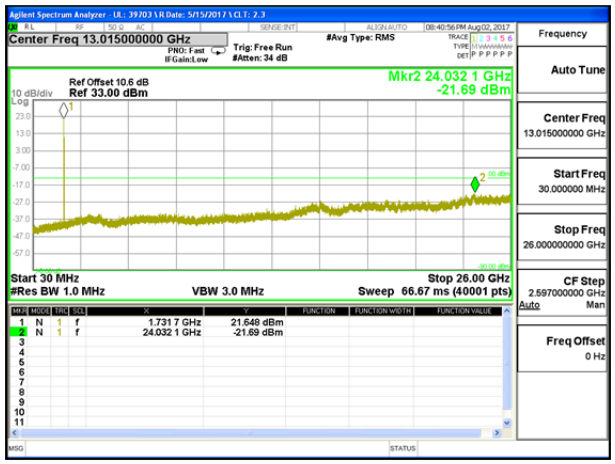
LTE B4 1.4MHz QPSK Middle Channel



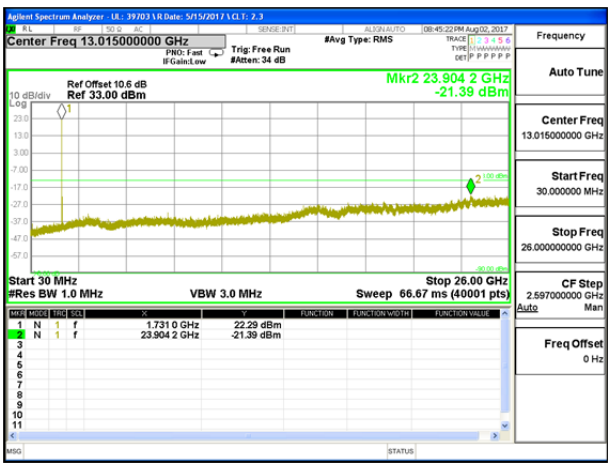
LTE B4 1.4MHz 16QAM Middle Channel



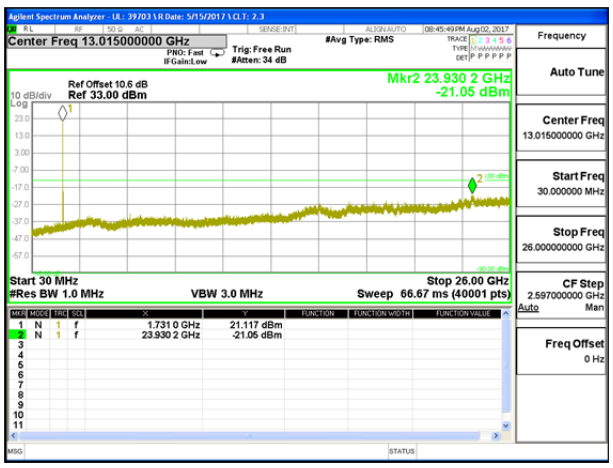
LTE B4 3MHz QPSK Middle Channel



LTE B4 3MHz 16QAM Middle Channel



LTE B4 5MHz QPSK Middle Channel



LTE B4 5MHz 16QAM Middle Channel

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
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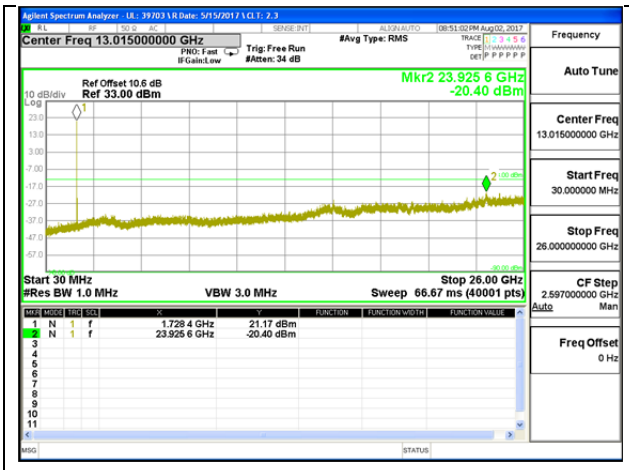
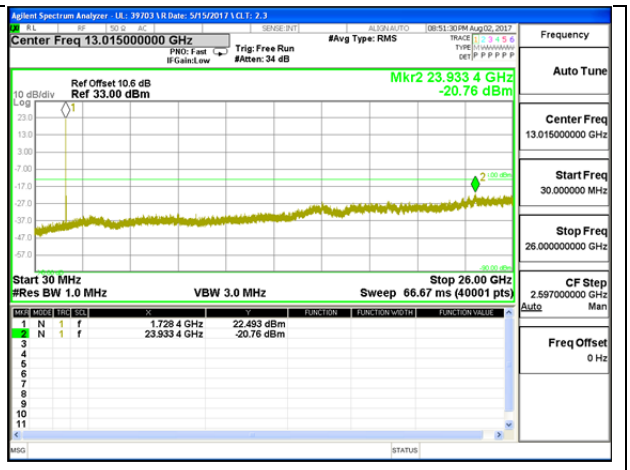
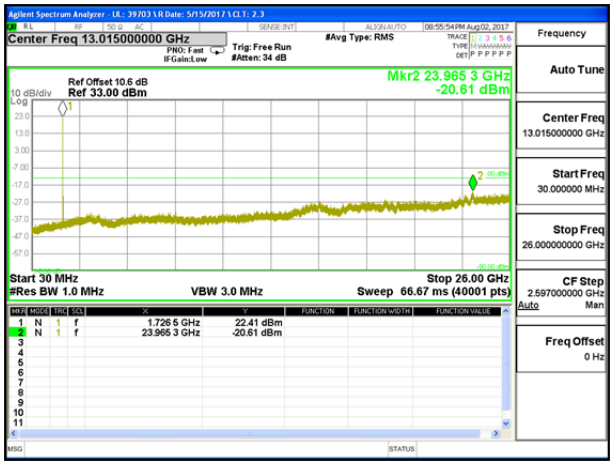


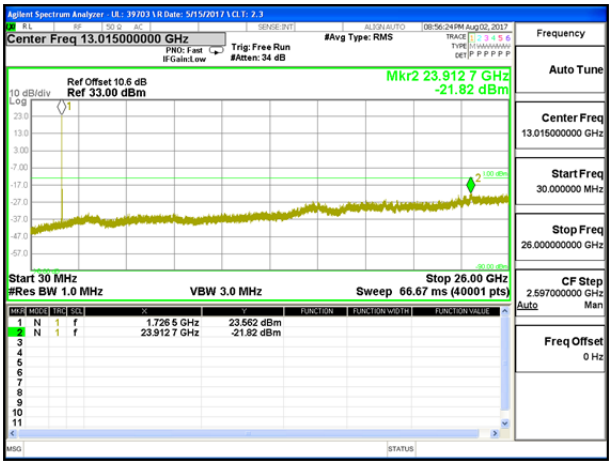
LTE B4 10MHz QPSK Middle Channel



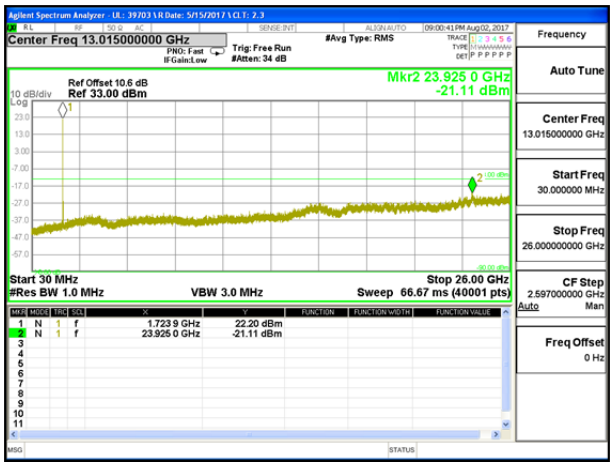
LTE B4 10MHz 16QAM Middle Channel



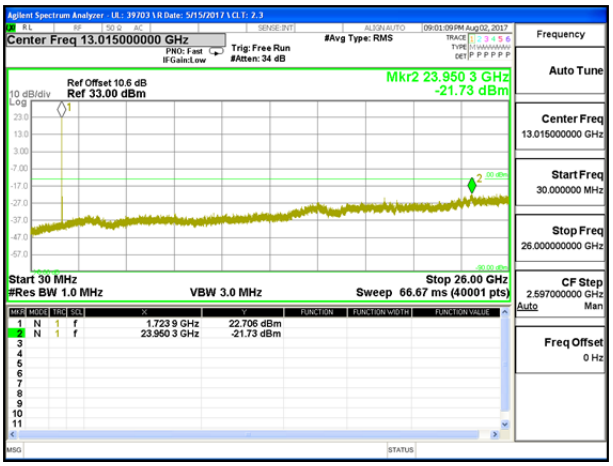
LTE B4 15MHz QPSK Middle Channel



LTE B4 15MHz 16QAM Middle Channel



LTE B4 20MHz QPSK Middle Channel



LTE B4 20MHz 16QAM Middle Channel

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LTE Band 41

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE41	5	QPSK	2498.5	-25.96	-25	-0.96
			2593	-25.46	-25	-0.46
			2687.5	-28.79	-25	-3.79
		16QAM	2498.5	-25.53	-25	-0.53
			2593	-25.3	-25	-0.3
			2687.5	-29.38	-25	-4.38
	10	QPSK	2501	-28.33	-25	-3.33
			2593	-29.47	-25	-4.47
			2685	-29.25	-25	-4.25
		16QAM	2501	-29.43	-25	-4.43
			2593	-29.53	-25	-4.53
			2685	-28.46	-25	-3.46
	15	QPSK	2503.5	-28.83	-25	-3.83
			2593	-29.1	-25	-4.1
			2682.5	-29.38	-25	-4.38
		16QAM	2503.5	-28.39	-25	-3.39
			2593	-29.27	-25	-4.27
			2682.5	-29.25	-25	-4.25
	20	QPSK	2506	-29.25	-25	-4.25
			2593	-29.99	-25	-4.99
			2680	-29.24	-25	-4.24
		16QAM	2506	-29.89	-25	-4.89
			2593	-28.47	-25	-3.47
			2680	-28.95	-25	-3.95

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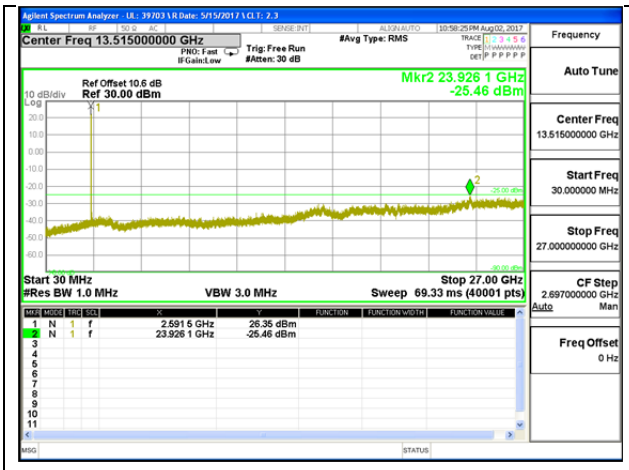
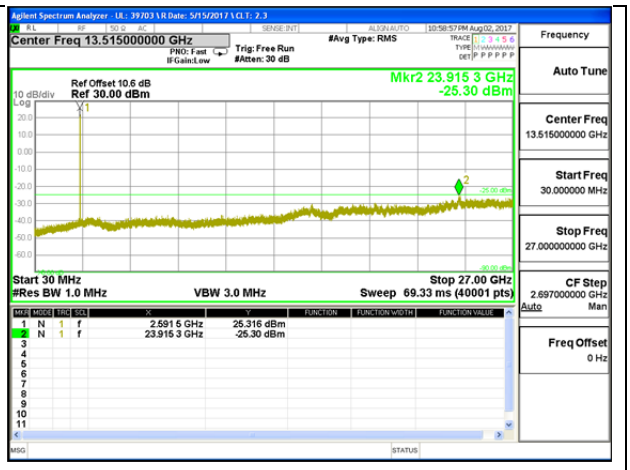
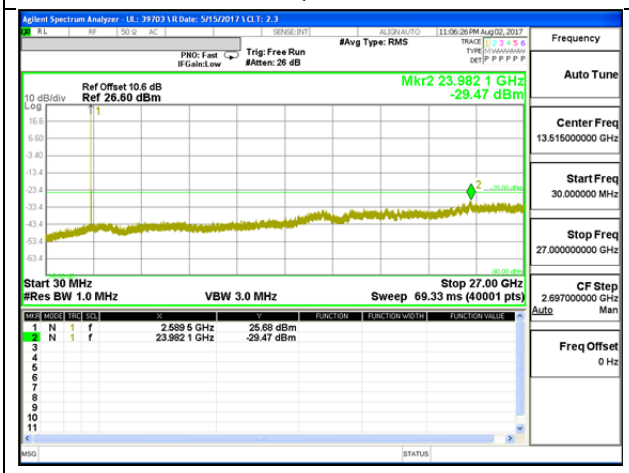


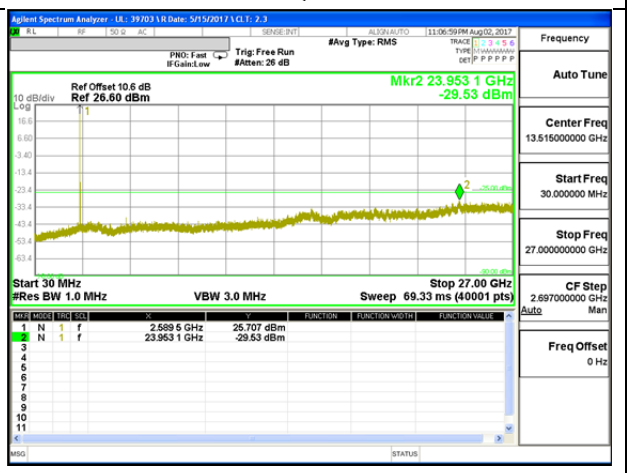
LTE B41 5MHz QPSK Middle Channel



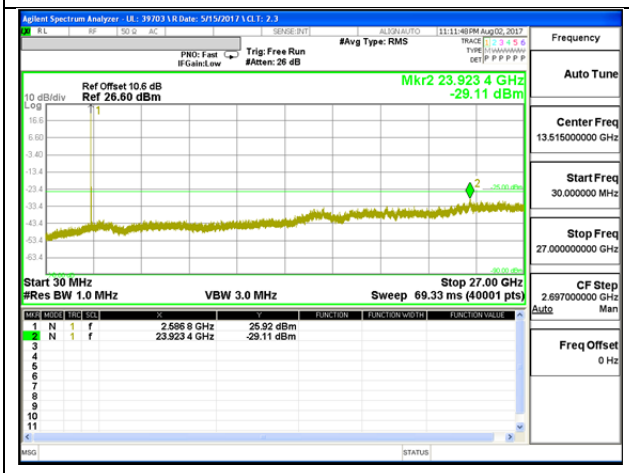
LTE B41 5MHz 16QAM Middle Channel



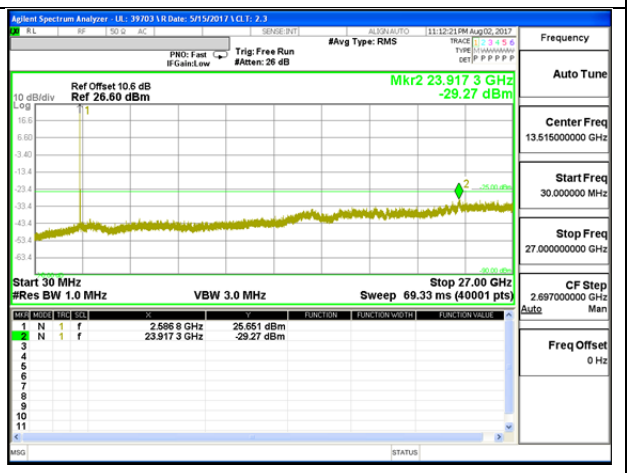
LTE B41 10MHz QPSK Middle Channel



LTE B41 10MHz 16QAM Middle Channel



LTE B41 15MHz QPSK Middle Channel



LTE B41 15MHz 16QAM Middle Channel

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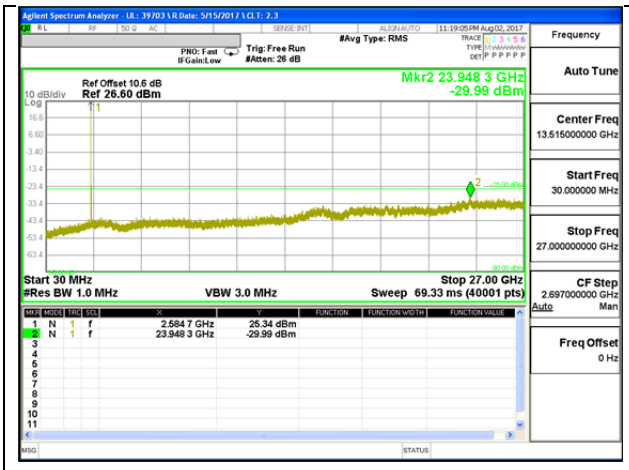
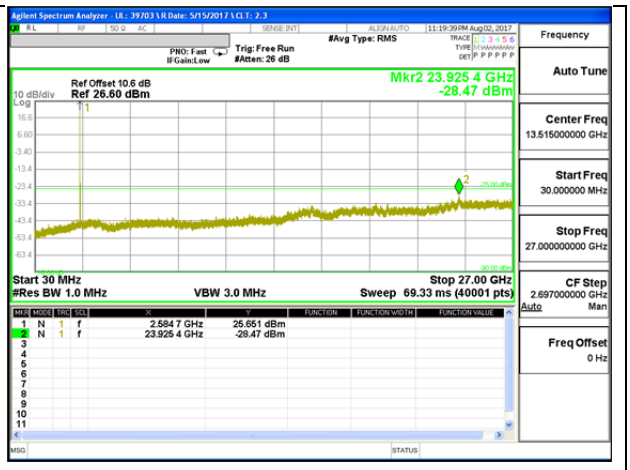


LTE B41 20MHz QPSK Middle Channel



LTE B41 20MHz 16QAM Middle Channel

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18. FREQUENCY STABILITY

RULE PART(S)

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

FCC LIMITS

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

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

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

Results

Tested By	Kiya Kedida
Date	7/19/17

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18.1. FREQUENCY STABILITY RESULTS

WCDMA Band 2

Reference Frequency: LTE Band 2 Mid Channel		1880	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4700.000	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1880.000016	0.000	2.5
3.80	40	1880.000015	0.000	2.5
3.80	30	1880.000014	0.001	2.5
3.80	***20***	**1880.000015**	**0**	***2.5***
3.80	10	1880.000017	-0.001	2.5
3.80	0	1880.000016	0.000	2.5
3.80	-10	1880.000015	0.000	2.5
3.80	-20	1880.000016	0.000	2.5
3.80	-30	1880.000014	0.001	2.5

Reference Frequency: LTE Band 2 Mid Channel		1880	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4700.000	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1880.000015***	***0***	***2.5***
4.37	20	1880.000014	*0.001*	2.5
3.23	20	1880.000015	*0.000*	2.5

WCDMA Band 4

Reference Frequency: LTE Band 4 Mid Channel		1732.6	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4331.500	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1732.599995	0.000	2.5
3.80	40	1732.599995	0.000	2.5
3.80	30	1732.599995	0.000	2.5
3.80	***20***	**1732.599995**	**0**	***2.5***
3.80	10	1732.599995	0.000	2.5
3.80	0	1732.599995	0.000	2.5
3.80	-10	1732.599992	0.002	2.5
3.80	-20	1732.599995	0.000	2.5
3.80	-30	1732.599995	0.000	2.5

Reference Frequency: LTE Band 4 Mid Channel		1732.6	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4331.500	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1732.599995***	***0***	***2.5***
4.37	20	1732.599994	*0.000*	2.5
3.23	20	1732.599995	*0.000*	2.5

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19. RADIATED TEST RESULTS

19.1. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, and §27.53.

FCC LIMIT

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.

Part 27: (m)(4) (4) 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 that 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

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.

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19.1.1. SPURIOUS RADIATION PLOTS

GSM

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

Company: SOMC
Project #: 11783639
Date: 7/28/2017
Test Engineer: 43575 OS
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: GPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2									
1648.40	-12.9	V	3.0	36.4	1.0	-48.2	-13.0	-35.2	
2472.60	-22.3	V	3.0	35.0	1.0	-56.3	-13.0	-43.3	
3296.80	-18.9	V	3.0	34.3	1.0	-52.1	-13.0	-39.1	
1648.40	-15.6	H	3.0	36.4	1.0	-51.0	-13.0	-38.0	
2472.60	-21.7	H	3.0	35.0	1.0	-55.7	-13.0	-42.7	
3296.80	-19.4	H	3.0	34.3	1.0	-52.6	-13.0	-39.6	
Mid Ch, 836.6									
1673.20	-8.4	V	3.0	36.3	1.0	-43.7	-13.0	-30.7	
2509.80	-21.4	V	3.0	34.9	1.0	-55.3	-13.0	-42.3	
3346.40	-19.6	V	3.0	34.2	1.0	-52.8	-13.0	-39.8	
1673.20	-11.1	H	3.0	36.3	1.0	-46.5	-13.0	-33.5	
2509.80	-21.8	H	3.0	34.9	1.0	-55.7	-13.0	-42.7	
3346.40	-19.6	H	3.0	34.2	1.0	-52.8	-13.0	-39.8	
High Ch, 848.8									
1697.60	-18.1	V	3.0	36.3	1.0	-53.4	-13.0	-40.4	
2546.40	-20.5	V	3.0	34.9	1.0	-54.4	-13.0	-41.4	
3395.20	-20.1	V	3.0	34.2	1.0	-53.3	-13.0	-40.3	
1697.60	-23.5	H	3.0	36.3	1.0	-58.8	-13.0	-45.8	
2546.40	-21.6	H	3.0	34.9	1.0	-55.5	-13.0	-42.5	
3395.20	-19.4	H	3.0	34.2	1.0	-52.6	-13.0	-39.6	

GSM850 GPRS

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

Company: SOMC
Project #: 11783639
Date: 7/28/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger
Location: Chamber C
Mode: EGPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2									
1648.40	-24.9	V	3.0	37.0	1.0	-60.9	-13.0	-47.9	
2472.60	-21.6	V	3.0	36.4	1.0	-57.1	-13.0	-44.1	
3296.80	-21.5	V	3.0	36.2	1.0	-56.6	-13.0	-43.6	
1648.40	-25.6	H	3.0	37.0	1.0	-61.6	-13.0	-48.6	
2472.60	-25.1	H	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3296.80	-18.9	H	3.0	36.2	1.0	-54.0	-13.0	-41.0	
Mid Ch, 836.6									
1673.20	-24.6	V	3.0	37.0	1.0	-60.6	-13.0	-47.6	
2509.80	-22.6	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
3346.40	-21.4	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1673.20	-25.7	H	3.0	37.0	1.0	-61.7	-13.0	-48.7	
2509.80	-24.8	H	3.0	36.4	1.0	-60.2	-13.0	-47.2	
3346.40	-21.9	H	3.0	36.1	1.0	-57.0	-13.0	-44.0	
High Ch, 848.8									
1697.60	-24.4	V	3.0	37.0	1.0	-60.3	-13.0	-47.3	
2546.40	-21.4	V	3.0	36.4	1.0	-56.8	-13.0	-43.8	
3395.20	-21.2	V	3.0	36.1	1.0	-56.3	-13.0	-43.3	
1697.60	-25.5	H	3.0	37.0	1.0	-61.4	-13.0	-48.4	
2546.40	-24.7	H	3.0	36.4	1.0	-60.1	-13.0	-47.1	
3395.20	-21.6	H	3.0	36.1	1.0	-56.7	-13.0	-43.7	

GSM850 EGPRS

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

Company: SOMC
Project #: 11783639
Date: 7/28/2017
Test Engineer: 43575 OS
Configuration: EUT + AC + Headset
Location: Chamber B
Mode: GPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2									
3700.40	-19.5	V	3.0	38.4	1.0	-56.9	-13.0	-43.9	
5550.60	-20.2	V	3.0	38.8	1.0	-58.0	-13.0	-45.0	
7400.80	-20.5	V	3.0	38.3	1.0	-57.8	-13.0	-44.8	
3700.40	-20.1	H	3.0	38.4	1.0	-57.6	-13.0	-44.6	
5550.60	-20.0	H	3.0	38.8	1.0	-57.7	-13.0	-44.7	
7400.80	-20.1	H	3.0	38.3	1.0	-57.3	-13.0	-44.3	
Mid Ch, 1880									
3760.00	-19.8	V	3.0	38.4	1.0	-57.3	-13.0	-44.3	
5640.00	-19.6	V	3.0	38.7	1.0	-57.3	-13.0	-44.3	
7520.00	-20.1	V	3.0	38.2	1.0	-57.3	-13.0	-44.3	
3760.00	-18.9	H	3.0	38.4	1.0	-56.3	-13.0	-43.3	
5640.00	-19.2	H	3.0	38.7	1.0	-56.9	-13.0	-43.9	
7520.00	-19.5	H	3.0	38.2	1.0	-56.7	-13.0	-43.7	
High Ch, 1909.8									
3819.60	-18.2	V	3.0	38.4	1.0	-55.6	-13.0	-42.6	
5729.40	-19.9	V	3.0	38.7	1.0	-57.7	-13.0	-44.7	
7639.20	-19.1	V	3.0	38.1	1.0	-56.2	-13.0	-43.2	
3819.60	-20.1	H	3.0	38.4	1.0	-57.5	-13.0	-44.5	
5729.40	-19.2	H	3.0	38.7	1.0	-56.9	-13.0	-43.9	
7639.20	-19.9	H	3.0	38.1	1.0	-57.0	-13.0	-44.0	

GSM1900 GPRS

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

Company: SOMC
Project #: 11783639
Date: 7/28/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger
Location: Chamber C
Mode: EGPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2									
3700.40	-16.6	V	3.0	35.9	1.0	-51.4	-13.0	-38.4	
5550.60	-13.3	V	3.0	35.5	1.0	-47.8	-13.0	-34.8	
7400.80	-12.4	V	3.0	35.7	1.0	-47.1	-13.0	-34.1	
3700.40	-17.3	H	3.0	35.9	1.0	-52.2	-13.0	-39.2	
5550.60	-12.5	H	3.0	35.5	1.0	-47.0	-13.0	-34.0	
7400.80	-11.4	H	3.0	35.7	1.0	-46.1	-13.0	-33.1	
Mid Ch, 1880									
3760.00	-16.5	V	3.0	35.8	1.0	-51.4	-13.0	-38.4	
5640.00	-13.3	V	3.0	35.5	1.0	-47.8	-13.0	-34.8	
7520.00	-12.1	V	3.0	35.7	1.0	-46.8	-13.0	-33.8	
3760.00	-17.2	H	3.0	35.8	1.0	-52.1	-13.0	-39.1	
5640.00	-12.6	H	3.0	35.5	1.0	-47.1	-13.0	-34.1	
7520.00	-11.4	H	3.0	35.7	1.0	-46.1	-13.0	-33.1	
High Ch, 1909.8									
3819.60	-16.2	V	3.0	35.8	1.0	-50.9	-13.0	-37.9	
5729.40	-12.6	V	3.0	35.5	1.0	-47.1	-13.0	-34.1	
7639.20	-12.1	V	3.0	35.8	1.0	-46.8	-13.0	-33.8	
3819.60	-16.9	H	3.0	35.8	1.0	-51.6	-13.0	-38.6	
5729.40	-12.6	H	3.0	35.5	1.0	-47.1	-13.0	-34.1	
7639.20	-11.4	H	3.0	35.8	1.0	-46.2	-13.0	-33.2	

GSM1900 EGPRS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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WCDMA

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

Company: SOMC
Project #: 11783639
Date: 7/11/2017
Test Engineer: 37290
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: Rel99 Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4									
3704.80	-25.9	V	3.0	33.9	1.0	-58.8	-13.0	-45.8	
5557.20	-23.9	V	3.0	33.1	1.0	-56.0	-13.0	-43.0	
7409.60	-24.4	V	3.0	32.9	1.0	-56.2	-13.0	-43.2	
3704.80	-25.0	H	3.0	33.9	1.0	-57.9	-13.0	-44.9	
5557.20	-24.2	H	3.0	33.1	1.0	-56.3	-13.0	-43.3	
7409.60	-24.9	H	3.0	32.9	1.0	-56.7	-13.0	-43.7	
Mid Ch, 1880									
3760.00	-25.9	V	3.0	33.8	1.0	-58.7	-13.0	-45.7	
5640.00	-26.1	V	3.0	33.1	1.0	-58.2	-13.0	-45.2	
7520.00	-23.1	V	3.0	32.8	1.0	-55.0	-13.0	-42.0	
3760.00	-26.0	H	3.0	33.8	1.0	-58.8	-13.0	-45.8	
5640.00	-25.2	H	3.0	33.1	1.0	-57.3	-13.0	-44.3	
7520.00	-24.0	H	3.0	32.8	1.0	-55.9	-13.0	-42.9	
High Ch, 1907.6									
3815.20	-25.4	V	3.0	33.7	1.0	-58.1	-13.0	-45.1	
5722.80	-24.8	V	3.0	33.1	1.0	-56.9	-13.0	-43.9	
7630.40	-23.0	V	3.0	32.8	1.0	-54.8	-13.0	-41.8	
3815.20	-25.0	H	3.0	33.7	1.0	-57.8	-13.0	-44.8	
5722.80	-23.9	H	3.0	33.1	1.0	-56.0	-13.0	-43.0	
7630.40	-24.1	H	3.0	32.8	1.0	-56.0	-13.0	-43.0	

B2 REL99

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

Company: SOMC
Project #: 11783639
Date: 7/11/2017
Test Engineer: 37290
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: HSDPA Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4									
3704.80	-25.7	V	3.0	33.9	1.0	-58.6	-13.0	-45.6	
5557.20	-23.8	V	3.0	33.1	1.0	-55.9	-13.0	-42.9	
7409.60	-24.4	V	3.0	32.9	1.0	-56.2	-13.0	-43.2	
3704.80	-25.0	H	3.0	33.9	1.0	-57.8	-13.0	-44.8	
5557.20	-24.2	H	3.0	33.1	1.0	-56.3	-13.0	-43.3	
7409.60	-24.8	H	3.0	32.9	1.0	-56.7	-13.0	-43.7	
Mid Ch, 1880									
3760.00	-25.8	V	3.0	33.8	1.0	-58.6	-13.0	-45.6	
5640.00	-26.0	V	3.0	33.1	1.0	-58.1	-13.0	-45.1	
7520.00	-23.0	V	3.0	32.8	1.0	-54.9	-13.0	-41.9	
3760.00	-25.9	H	3.0	33.8	1.0	-58.7	-13.0	-45.7	
5640.00	-25.2	H	3.0	33.1	1.0	-57.3	-13.0	-44.3	
7520.00	-24.0	H	3.0	32.8	1.0	-55.8	-13.0	-42.8	
High Ch, 1907.6									
3815.20	-25.3	V	3.0	33.7	1.0	-58.0	-13.0	-45.0	
5722.80	-24.7	V	3.0	33.1	1.0	-56.8	-13.0	-43.8	
7630.40	-22.9	V	3.0	32.8	1.0	-54.8	-13.0	-41.8	
3815.20	-25.0	H	3.0	33.7	1.0	-57.7	-13.0	-44.7	
5722.80	-23.9	H	3.0	33.1	1.0	-55.9	-13.0	-42.9	
7630.40	-24.0	H	3.0	32.8	1.0	-55.9	-13.0	-42.9	

B2 HSDPA

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

Company: SOMC
Project #: 11783639
Date: 7/11/2017
Test Engineer: 37290
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: Rel99 Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4									
3424.80	-27.3	V	3.0	34.1	1.0	-60.5	-13.0	-47.5	
5137.20	-25.1	V	3.0	33.2	1.0	-57.3	-13.0	-44.3	
6849.60	-23.5	V	3.0	32.9	1.0	-55.4	-13.0	-42.4	
3424.80	-27.0	H	3.0	34.1	1.0	-60.2	-13.0	-47.2	
5137.20	-25.1	H	3.0	33.2	1.0	-57.3	-13.0	-44.3	
6849.60	-24.2	H	3.0	32.9	1.0	-56.1	-13.0	-43.1	
Mid Ch, 1732.6									
3465.20	-27.0	V	3.0	34.1	1.0	-60.1	-13.0	-47.1	
5197.80	-25.1	V	3.0	33.2	1.0	-57.3	-13.0	-44.3	
6930.40	-24.5	V	3.0	32.9	1.0	-56.4	-13.0	-43.4	
3465.20	-26.5	H	3.0	34.1	1.0	-59.7	-13.0	-46.7	
5197.80	-24.3	H	3.0	33.2	1.0	-56.5	-13.0	-43.5	
6930.40	-23.4	H	3.0	32.9	1.0	-55.3	-13.0	-42.3	
High Ch, 1752.6									
3505.20	-27.2	V	3.0	34.1	1.0	-60.3	-13.0	-47.3	
5257.80	-26.4	V	3.0	33.2	1.0	-58.6	-13.0	-45.6	
7010.40	-24.3	V	3.0	32.9	1.0	-56.2	-13.0	-43.2	
3505.20	-26.7	H	3.0	34.1	1.0	-59.8	-13.0	-46.8	
5257.80	-26.2	H	3.0	33.2	1.0	-58.3	-13.0	-45.3	
7010.40	-22.2	H	3.0	32.9	1.0	-54.0	-13.0	-41.0	

B4 REL99

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

Company: SOMC
Project #: 11783639
Date: 7/11/2017
Test Engineer: 37290
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: HSDPA Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4									
3424.80	-27.0	V	3.0	34.1	1.0	-60.2	-13.0	-47.2	
5137.20	-24.7	V	3.0	33.2	1.0	-56.9	-13.0	-43.9	
6849.60	-23.4	V	3.0	32.9	1.0	-55.3	-13.0	-42.3	
3424.80	-26.9	H	3.0	34.1	1.0	-60.1	-13.0	-47.1	
5137.20	-24.8	H	3.0	33.2	1.0	-57.0	-13.0	-44.0	
6849.60	-24.1	H	3.0	32.9	1.0	-56.0	-13.0	-43.0	
Mid Ch, 1732.6									
3465.20	-26.7	V	3.0	34.1	1.0	-59.9	-13.0	-46.9	
5197.80	-25.0	V	3.0	33.2	1.0	-57.2	-13.0	-44.2	
6930.40	-24.1	V	3.0	32.9	1.0	-56.0	-13.0	-43.0	
3465.20	-26.4	H	3.0	34.1	1.0	-59.5	-13.0	-46.5	
5197.80	-24.1	H	3.0	33.2	1.0	-56.3	-13.0	-43.3	
6930.40	-22.9	H	3.0	32.9	1.0	-54.8	-13.0	-41.8	
High Ch, 1752.6									
3505.20	-27.0	V	3.0	34.1	1.0	-60.1	-13.0	-47.1	
5257.80	-26.2	V	3.0	33.2	1.0	-58.3	-13.0	-45.3	
7010.40	-24.0	V	3.0	32.9	1.0	-55.9	-13.0	-42.9	
3505.20	-26.4	H	3.0	34.1	1.0	-59.4	-13.0	-46.4	
5257.80	-26.0	H	3.0	33.2	1.0	-58.1	-13.0	-45.1	
7010.40	-22.1	H	3.0	32.9	1.0	-54.0	-13.0	-41.0	

B4 HSDPA

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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LTE Band 2

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 2 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.7									
3701.40	-19.0	V	3.0	33.9	1.0	-51.9	-13.0	-38.9	
5552.10	-18.5	V	3.0	33.1	1.0	-50.6	-13.0	-37.6	
7402.80	-18.0	V	3.0	32.9	1.0	-49.8	-13.0	-36.8	
3701.40	-19.0	H	3.0	33.9	1.0	-51.9	-13.0	-38.9	
5552.10	-18.8	H	3.0	33.1	1.0	-50.9	-13.0	-37.9	
7402.80	-17.8	H	3.0	32.9	1.0	-49.6	-13.0	-36.6	
Mid Ch, 1880									
3760.00	-18.4	V	3.0	33.8	1.0	-51.2	-13.0	-38.2	
5640.00	-17.2	V	3.0	33.1	1.0	-49.3	-13.0	-36.3	
7520.00	-16.9	V	3.0	32.8	1.0	-48.7	-13.0	-35.7	
3760.00	-18.7	H	3.0	33.8	1.0	-51.6	-13.0	-38.6	
5640.00	-16.6	H	3.0	33.1	1.0	-48.7	-13.0	-35.7	
7520.00	-16.7	H	3.0	32.8	1.0	-48.5	-13.0	-35.5	
High Ch, 1909.3									
3818.60	-19.0	V	3.0	33.7	1.0	-51.8	-13.0	-38.8	
5727.90	-18.4	V	3.0	33.1	1.0	-50.5	-13.0	-37.5	
7637.20	-17.6	V	3.0	32.8	1.0	-49.5	-13.0	-36.5	
3818.60	-18.7	H	3.0	33.7	1.0	-51.5	-13.0	-38.5	
5727.90	-18.4	H	3.0	33.1	1.0	-50.5	-13.0	-37.5	
7637.20	-17.3	H	3.0	32.8	1.0	-49.2	-13.0	-36.2	

LTE B2 1.4MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 2 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.7									
3701.40	-18.9	V	3.0	33.9	1.0	-51.7	-13.0	-38.7	
5552.10	-18.4	V	3.0	33.1	1.0	-50.5	-13.0	-37.5	
7402.80	-17.7	V	3.0	32.9	1.0	-49.6	-13.0	-36.6	
3701.40	-18.8	H	3.0	33.9	1.0	-51.7	-13.0	-38.7	
5552.10	-16.6	H	3.0	33.1	1.0	-48.7	-13.0	-35.7	
7402.80	-17.7	H	3.0	32.9	1.0	-49.6	-13.0	-36.6	
Mid Ch, 1880									
3760.00	-18.2	V	3.0	33.8	1.0	-51.0	-13.0	-38.0	
5640.00	-16.8	V	3.0	33.1	1.0	-48.9	-13.0	-35.9	
7520.00	-16.7	V	3.0	32.8	1.0	-48.5	-13.0	-35.5	
3760.00	-18.4	H	3.0	33.8	1.0	-51.2	-13.0	-38.2	
5640.00	-16.3	H	3.0	33.1	1.0	-48.4	-13.0	-35.4	
7520.00	-16.6	H	3.0	32.8	1.0	-48.4	-13.0	-35.4	
High Ch, 1909.3									
3818.60	-18.8	V	3.0	33.7	1.0	-51.5	-13.0	-38.5	
5727.90	-18.3	V	3.0	33.1	1.0	-50.4	-13.0	-37.4	
7637.20	-17.3	V	3.0	32.8	1.0	-49.1	-13.0	-36.1	
3818.60	-18.6	H	3.0	33.7	1.0	-51.4	-13.0	-38.4	
5727.90	-18.3	H	3.0	33.1	1.0	-50.4	-13.0	-37.4	
7637.20	-14.2	H	3.0	32.8	1.0	-46.0	-13.0	-33.0	

LTE B2 1.4MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 2 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5									
3703.00	-18.8	V	3.0	33.9	1.0	-51.6	-13.0	-38.6	
5554.50	-18.6	V	3.0	33.1	1.0	-50.7	-13.0	-37.7	
7406.00	-17.2	V	3.0	32.9	1.0	-49.0	-13.0	-36.0	
3703.00	-18.7	H	3.0	33.9	1.0	-51.6	-13.0	-38.6	
5554.50	-18.7	H	3.0	33.1	1.0	-50.8	-13.0	-37.8	
7406.00	-16.2	H	3.0	32.9	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1880									
3760.00	-17.6	V	3.0	33.8	1.0	-50.4	-13.0	-37.4	
5640.00	-16.6	V	3.0	33.1	1.0	-48.7	-13.0	-35.7	
7520.00	-16.3	V	3.0	32.8	1.0	-48.1	-13.0	-35.1	
3760.00	-18.0	H	3.0	33.8	1.0	-50.8	-13.0	-37.8	
5640.00	-16.8	H	3.0	33.1	1.0	-48.9	-13.0	-35.9	
7520.00	-16.2	H	3.0	32.8	1.0	-48.0	-13.0	-35.0	
High Ch, 1908.5									
3817.00	-18.7	V	3.0	33.7	1.0	-51.4	-13.0	-38.4	
5725.50	-18.6	V	3.0	33.1	1.0	-50.7	-13.0	-37.7	
7634.00	-17.1	V	3.0	32.8	1.0	-48.9	-13.0	-35.9	
3817.00	-18.7	H	3.0	33.7	1.0	-51.4	-13.0	-38.4	
5725.50	-18.4	H	3.0	33.1	1.0	-50.5	-13.0	-37.5	
7634.00	-15.9	H	3.0	32.8	1.0	-47.7	-13.0	-34.7	

LTE B2 3MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 2 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5									
3703.00	-18.8	V	3.0	33.9	1.0	-51.7	-13.0	-38.7	
5554.50	-18.4	V	3.0	33.1	1.0	-50.5	-13.0	-37.5	
7406.00	-16.7	V	3.0	32.9	1.0	-48.6	-13.0	-35.6	
3703.00	-18.9	H	3.0	33.9	1.0	-51.8	-13.0	-38.8	
5554.50	-18.2	H	3.0	33.1	1.0	-50.4	-13.0	-37.4	
7406.00	-16.0	H	3.0	32.9	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1880									
3760.00	-17.6	V	3.0	33.8	1.0	-50.4	-13.0	-37.4	
5640.00	-16.5	V	3.0	33.1	1.0	-48.6	-13.0	-35.6	
7520.00	-16.4	V	3.0	32.8	1.0	-48.2	-13.0	-35.2	
3760.00	-18.6	H	3.0	33.8	1.0	-51.4	-13.0	-38.4	
5640.00	-16.4	H	3.0	33.1	1.0	-48.5	-13.0	-35.5	
7520.00	-16.3	H	3.0	32.8	1.0	-48.2	-13.0	-35.2	
High Ch, 1908.5									
3817.00	-18.5	V	3.0	33.7	1.0	-51.3	-13.0	-38.3	
5725.50	-18.4	V	3.0	33.1	1.0	-50.5	-13.0	-37.5	
7634.00	-17.1	V	3.0	32.8	1.0	-48.9	-13.0	-35.9	
3817.00	-18.5	H	3.0	33.7	1.0	-51.2	-13.0	-38.2	
5725.50	-18.3	H	3.0	33.1	1.0	-50.4	-13.0	-37.4	
7634.00	-15.6	H	3.0	32.8	1.0	-47.5	-13.0	-34.5	

LTE B2 3MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 2 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5									
3705.00	-18.6	V	3.0	33.9	1.0	-51.5	-13.0	-38.5	
5557.50	-18.5	V	3.0	33.1	1.0	-50.6	-13.0	-37.6	
7410.00	-17.8	V	3.0	32.9	1.0	-49.6	-13.0	-36.6	
3705.00	-19.2	H	3.0	33.9	1.0	-52.1	-13.0	-39.1	
5557.50	-18.9	H	3.0	33.1	1.0	-51.0	-13.0	-38.0	
7410.00	-16.7	H	3.0	32.9	1.0	-48.6	-13.0	-35.6	
Mid Ch, 1880									
3760.00	-18.8	V	3.0	33.8	1.0	-51.6	-13.0	-38.6	
5640.00	-16.8	V	3.0	33.1	1.0	-48.9	-13.0	-35.9	
7520.00	-16.9	V	3.0	32.8	1.0	-48.8	-13.0	-35.8	
3760.00	-18.4	H	3.0	33.8	1.0	-51.2	-13.0	-38.2	
5640.00	-16.8	H	3.0	33.1	1.0	-48.9	-13.0	-35.9	
7520.00	-17.0	H	3.0	32.8	1.0	-48.8	-13.0	-35.8	
High Ch, 1907.5									
3815.00	-18.2	V	3.0	33.7	1.0	-51.0	-13.0	-38.0	
5722.50	-18.3	V	3.0	33.1	1.0	-50.3	-13.0	-37.3	
7630.00	-17.5	V	3.0	32.8	1.0	-49.3	-13.0	-36.3	
3815.00	-19.1	H	3.0	33.7	1.0	-51.9	-13.0	-38.9	
5722.50	-18.7	H	3.0	33.1	1.0	-50.7	-13.0	-37.7	
7630.00	-16.3	H	3.0	32.8	1.0	-48.2	-13.0	-35.2	

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 2 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5									
3705.00	-18.9	V	3.0	33.9	1.0	-51.7	-13.0	-38.7	
5557.50	-18.6	V	3.0	33.1	1.0	-50.8	-13.0	-37.8	
7410.00	-17.6	V	3.0	32.9	1.0	-49.5	-13.0	-36.5	
3705.00	-19.1	H	3.0	33.9	1.0	-52.0	-13.0	-39.0	
5557.50	-19.4	H	3.0	33.1	1.0	-51.5	-13.0	-38.5	
7410.00	-16.9	H	3.0	32.9	1.0	-48.7	-13.0	-35.7	
Mid Ch, 1880									
3760.00	-18.1	V	3.0	33.8	1.0	-50.9	-13.0	-37.9	
5640.00	-17.0	V	3.0	33.1	1.0	-49.1	-13.0	-36.1	
7520.00	-16.4	V	3.0	32.8	1.0	-48.3	-13.0	-35.3	
3760.00	-19.2	H	3.0	33.8	1.0	-52.0	-13.0	-39.0	
5640.00	-16.5	H	3.0	33.1	1.0	-48.6	-13.0	-35.6	
7520.00	-16.9	H	3.0	32.8	1.0	-48.7	-13.0	-35.7	
High Ch, 1907.5									
3815.00	-18.4	V	3.0	33.7	1.0	-51.1	-13.0	-38.1	
5722.50	-18.4	V	3.0	33.1	1.0	-50.5	-13.0	-37.5	
7630.00	-17.4	V	3.0	32.8	1.0	-49.2	-13.0	-36.2	
3815.00	-19.2	H	3.0	33.7	1.0	-51.9	-13.0	-38.9	
5722.50	-18.7	H	3.0	33.1	1.0	-50.8	-13.0	-37.8	
7630.00	-16.2	H	3.0	32.8	1.0	-48.0	-13.0	-35.0	

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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LTE B2 5MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 2 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855									
3710.00	-19.3	V	3.0	33.9	1.0	-52.1	-13.0	-39.1	
5565.00	-19.0	V	3.0	33.1	1.0	-51.1	-13.0	-38.1	
7420.00	-17.2	V	3.0	32.9	1.0	-49.1	-13.0	-36.1	
3710.00	-19.6	H	3.0	33.9	1.0	-52.4	-13.0	-39.4	
5565.00	-18.6	H	3.0	33.1	1.0	-50.7	-13.0	-37.7	
7420.00	-17.4	H	3.0	32.9	1.0	-49.3	-13.0	-36.3	
Mid Ch, 1880									
3760.00	-18.3	V	3.0	33.8	1.0	-51.1	-13.0	-38.1	
5640.00	-17.6	V	3.0	33.1	1.0	-49.7	-13.0	-36.7	
7520.00	-16.8	V	3.0	32.8	1.0	-48.7	-13.0	-35.7	
3760.00	-19.1	H	3.0	33.8	1.0	-51.9	-13.0	-38.9	
5640.00	-17.2	H	3.0	33.1	1.0	-49.3	-13.0	-36.3	
7520.00	-17.4	H	3.0	32.8	1.0	-49.2	-13.0	-36.2	
High Ch, 1905									
3810.00	-19.3	V	3.0	33.8	1.0	-52.0	-13.0	-39.0	
5715.00	-18.2	V	3.0	33.1	1.0	-50.3	-13.0	-37.3	
7620.00	-17.4	V	3.0	32.8	1.0	-49.3	-13.0	-36.3	
3810.00	-19.4	H	3.0	33.8	1.0	-52.2	-13.0	-39.2	
5715.00	-17.9	H	3.0	33.1	1.0	-50.0	-13.0	-37.0	
7620.00	-17.4	H	3.0	32.8	1.0	-49.2	-13.0	-36.2	

LTE B2 5MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/21/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 2 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855									
3710.00	-19.3	V	3.0	33.9	1.0	-52.2	-13.0	-39.2	
5565.00	-18.8	V	3.0	33.1	1.0	-51.0	-13.0	-38.0	
7420.00	-14.5	V	3.0	32.9	1.0	-46.4	-13.0	-33.4	
3710.00	-19.8	H	3.0	33.9	1.0	-52.7	-13.0	-39.7	
5565.00	-18.8	H	3.0	33.1	1.0	-50.9	-13.0	-37.9	
7420.00	-14.6	H	3.0	32.9	1.0	-46.4	-13.0	-33.4	
Mid Ch, 1880									
3760.00	-18.5	V	3.0	33.8	1.0	-51.3	-13.0	-38.3	
5640.00	-15.9	V	3.0	33.1	1.0	-48.0	-13.0	-35.0	
7520.00	-16.8	V	3.0	32.8	1.0	-48.6	-13.0	-35.6	
3760.00	-19.4	H	3.0	33.8	1.0	-52.2	-13.0	-39.2	
5640.00	-17.2	H	3.0	33.1	1.0	-49.3	-13.0	-36.3	
7520.00	-17.3	H	3.0	32.8	1.0	-49.2	-13.0	-36.2	
High Ch, 1905									
3810.00	-19.1	V	3.0	33.8	1.0	-51.9	-13.0	-38.9	
5715.00	-18.2	V	3.0	33.1	1.0	-50.3	-13.0	-37.3	
7620.00	-17.3	V	3.0	32.8	1.0	-49.1	-13.0	-36.1	
3810.00	-19.5	H	3.0	33.8	1.0	-52.3	-13.0	-39.3	
5715.00	-18.2	H	3.0	33.1	1.0	-50.2	-13.0	-37.2	
7620.00	-17.5	H	3.0	32.8	1.0	-49.3	-13.0	-36.3	

LTE B2 10MHz QPSK

LTE B2 10MHz 16QAM

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LTE Band 4

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 4 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1710.7									
3421.40	-19.9	V	3.0	34.2	1.0	-53.0	-13.0	-40.0	
5132.10	-19.3	V	3.0	33.2	1.0	-51.4	-13.0	-38.4	
6842.80	-19.1	V	3.0	32.9	1.0	-51.0	-13.0	-38.0	
3421.40	-20.0	H	3.0	34.2	1.0	-53.2	-13.0	-40.2	
5132.10	-18.9	H	3.0	33.2	1.0	-51.1	-13.0	-38.1	
6842.80	-18.4	H	3.0	32.9	1.0	-50.3	-13.0	-37.3	
Mid Ch, 1732.5									
3465.00	-19.7	V	3.0	34.1	1.0	-52.9	-13.0	-39.9	
5197.50	-17.6	V	3.0	33.2	1.0	-49.7	-13.0	-36.7	
6930.00	-17.6	V	3.0	32.9	1.0	-49.5	-13.0	-36.5	
3465.00	-19.8	H	3.0	34.1	1.0	-53.0	-13.0	-40.0	
5197.50	-19.7	H	3.0	33.2	1.0	-51.9	-13.0	-38.9	
6930.00	-17.9	H	3.0	32.9	1.0	-49.8	-13.0	-36.8	
High Ch, 1754.3									
3508.60	-20.1	V	3.0	34.1	1.0	-53.2	-13.0	-40.2	
5262.90	-20.1	V	3.0	33.2	1.0	-52.3	-13.0	-39.3	
7017.20	-19.4	V	3.0	32.9	1.0	-51.2	-13.0	-38.2	
3508.60	-19.8	H	3.0	34.1	1.0	-52.8	-13.0	-39.8	
5262.90	-18.5	H	3.0	33.2	1.0	-50.7	-13.0	-37.7	
7017.20	-18.7	H	3.0	32.9	1.0	-50.6	-13.0	-37.6	

LTE B4 1.4MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 4 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1710.7									
3421.40	-20.3	V	3.0	34.2	1.0	-53.4	-13.0	-40.4	
5132.10	-19.7	V	3.0	33.2	1.0	-51.9	-13.0	-38.9	
6842.80	-17.5	V	3.0	32.9	1.0	-49.4	-13.0	-36.4	
3421.40	-19.7	H	3.0	34.2	1.0	-52.9	-13.0	-39.9	
5132.10	-19.9	H	3.0	33.2	1.0	-52.1	-13.0	-39.1	
6842.80	-18.1	H	3.0	32.9	1.0	-50.0	-13.0	-37.0	
Mid Ch, 1732.5									
3465.00	-18.0	V	3.0	34.1	1.0	-51.1	-13.0	-38.1	
5197.50	-18.3	V	3.0	33.2	1.0	-50.5	-13.0	-37.5	
6930.00	-18.3	V	3.0	32.9	1.0	-50.2	-13.0	-37.2	
3465.00	-18.6	H	3.0	34.1	1.0	-51.7	-13.0	-38.7	
5197.50	-17.9	H	3.0	33.2	1.0	-50.0	-13.0	-37.0	
6930.00	-17.5	H	3.0	32.9	1.0	-49.4	-13.0	-36.4	
High Ch, 1754.3									
3508.60	-19.2	V	3.0	34.1	1.0	-52.3	-13.0	-39.3	
5262.90	-20.3	V	3.0	33.2	1.0	-52.4	-13.0	-39.4	
7017.20	-19.5	V	3.0	32.9	1.0	-51.4	-13.0	-38.4	
3508.60	-20.5	H	3.0	34.1	1.0	-53.5	-13.0	-40.5	
5262.90	-20.4	H	3.0	33.2	1.0	-52.6	-13.0	-39.6	
7017.20	-19.1	H	3.0	32.9	1.0	-51.0	-13.0	-38.0	

LTE B4 1.4MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 4 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5									
3423.00	-18.4	V	3.0	34.1	1.0	-51.5	-13.0	-38.5	
5134.50	-20.4	V	3.0	33.2	1.0	-52.6	-13.0	-39.6	
6846.00	-18.3	V	3.0	32.9	1.0	-50.2	-13.0	-37.2	
3423.00	-19.0	H	3.0	34.1	1.0	-52.2	-13.0	-39.2	
5134.50	-19.4	H	3.0	33.2	1.0	-51.6	-13.0	-38.6	
6846.00	-17.8	H	3.0	32.9	1.0	-49.7	-13.0	-36.7	
Mid Ch, 1732.5									
3465.00	-18.8	V	3.0	34.1	1.0	-51.9	-13.0	-38.9	
5197.50	-19.5	V	3.0	33.2	1.0	-51.6	-13.0	-38.6	
6930.00	-19.2	V	3.0	32.9	1.0	-51.1	-13.0	-38.1	
3465.00	-18.8	H	3.0	34.1	1.0	-51.9	-13.0	-38.9	
5197.50	-19.4	H	3.0	33.2	1.0	-51.6	-13.0	-38.6	
6930.00	-18.2	H	3.0	32.9	1.0	-50.1	-13.0	-37.1	
High Ch, 1753.5									
3507.00	-18.0	V	3.0	34.1	1.0	-51.1	-13.0	-38.1	
5260.50	-16.9	V	3.0	33.2	1.0	-49.0	-13.0	-36.0	
7014.00	-17.0	V	3.0	32.9	1.0	-48.9	-13.0	-35.9	
3507.00	-21.1	H	3.0	34.1	1.0	-54.2	-13.0	-41.2	
5260.50	-19.2	H	3.0	33.2	1.0	-51.3	-13.0	-38.3	
7014.00	-15.1	H	3.0	32.9	1.0	-47.0	-13.0	-34.0	

LTE B4 3MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 4 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5									
3423.00	-22.3	V	3.0	34.1	1.0	-55.4	-13.0	-42.4	
5134.50	-16.7	V	3.0	33.2	1.0	-48.9	-13.0	-35.9	
6846.00	-16.0	V	3.0	32.9	1.0	-47.8	-13.0	-34.8	
3423.00	-20.2	H	3.0	34.1	1.0	-53.4	-13.0	-40.4	
5134.50	-19.0	H	3.0	33.2	1.0	-51.2	-13.0	-38.2	
6846.00	-17.3	H	3.0	32.9	1.0	-49.2	-13.0	-36.2	
Mid Ch, 1732.5									
3465.00	-19.8	V	3.0	34.1	1.0	-52.9	-13.0	-39.9	
5197.50	-19.5	V	3.0	33.2	1.0	-51.6	-13.0	-38.6	
6930.00	-18.5	V	3.0	32.9	1.0	-50.4	-13.0	-37.4	
3465.00	-18.7	H	3.0	34.1	1.0	-51.8	-13.0	-38.8	
5197.50	-17.9	H	3.0	33.2	1.0	-50.1	-13.0	-37.1	
6930.00	-17.9	H	3.0	32.9	1.0	-49.8	-13.0	-36.8	
High Ch, 1753.5									
3507.00	-20.0	V	3.0	34.1	1.0	-53.1	-13.0	-40.1	
5260.50	-16.8	V	3.0	33.2	1.0	-49.0	-13.0	-36.0	
7014.00	-14.6	V	3.0	32.9	1.0	-46.5	-13.0	-33.5	
3507.00	-20.1	H	3.0	34.1	1.0	-53.1	-13.0	-40.1	
5260.50	-21.2	H	3.0	33.2	1.0	-53.4	-13.0	-40.4	
7014.00	-16.9	H	3.0	32.9	1.0	-48.7	-13.0	-35.7	

LTE B4 3MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 4 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.5									
3425.00	-19.8	V	3.0	34.1	1.0	-52.9	-13.0	-39.9	
5137.50	-20.1	V	3.0	33.2	1.0	-52.3	-13.0	-39.3	
6850.00	-18.7	V	3.0	32.9	1.0	-50.6	-13.0	-37.6	
3425.00	-19.9	H	3.0	34.1	1.0	-53.0	-13.0	-40.0	
5137.50	-19.5	H	3.0	33.2	1.0	-51.7	-13.0	-38.7	
6850.00	-19.1	H	3.0	32.9	1.0	-51.0	-13.0	-38.0	
Mid Ch, 1732.5									
3465.00	-18.7	V	3.0	34.1	1.0	-51.8	-13.0	-38.8	
5197.50	-19.2	V	3.0	33.2	1.0	-51.3	-13.0	-38.3	
6930.00	-19.1	V	3.0	32.9	1.0	-51.0	-13.0	-38.0	
3465.00	-19.3	H	3.0	34.1	1.0	-52.4	-13.0	-39.4	
5197.50	-19.3	H	3.0	33.2	1.0	-51.5	-13.0	-38.5	
6930.00	-17.9	H	3.0	32.9	1.0	-49.8	-13.0	-36.8	
High Ch, 1752.5									
3505.00	-19.8	V	3.0	34.1	1.0	-52.9	-13.0	-39.9	
5257.50	-19.6	V	3.0	33.2	1.0	-51.8	-13.0	-38.8	
7010.00	-18.0	V	3.0	32.9	1.0	-49.9	-13.0	-36.9	
3505.00	-19.9	H	3.0	34.1	1.0	-53.0	-13.0	-40.0	
5257.50	-19.1	H	3.0	33.2	1.0	-51.3	-13.0	-38.3	
7010.00	-17.1	H	3.0	32.9	1.0	-49.0	-13.0	-36.0	

LTE B4 5MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 4 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.5									
3425.00	-19.9	V	3.0	34.1	1.0	-53.0	-13.0	-40.0	
5137.50	-19.4	V	3.0	33.2	1.0	-51.6	-13.0	-38.6	
6850.00	-18.9	V	3.0	32.9	1.0	-50.8	-13.0	-37.8	
3425.00	-20.6	H	3.0	34.1	1.0	-53.7	-13.0	-40.7	
5137.50	-20.2	H	3.0	33.2	1.0	-52.4	-13.0	-39.4	
6850.00	-17.9	H	3.0	32.9	1.0	-49.8	-13.0	-36.8	
Mid Ch, 1732.5									
3465.00	-18.9	V	3.0	34.1	1.0	-52.1	-13.0	-39.1	
5197.50	-19.9	V	3.0	33.2	1.0	-52.0	-13.0	-39.0	
6930.00	-18.2	V	3.0	32.9	1.0	-50.1	-13.0	-37.1	
3465.00	-20.3	H	3.0	34.1	1.0	-53.4	-13.0	-40.4	
5197.50	-19.3	H	3.0	33.2	1.0	-51.5	-13.0	-38.5	
6930.00	-18.8	H	3.0	32.9	1.0	-50.7	-13.0	-37.7	
High Ch, 1752.5									
3505.00	-19.5	V	3.0	34.1	1.0	-52.5	-13.0	-39.5	
5257.50	-19.5	V	3.0	33.2	1.0	-51.7	-13.0	-38.7	
7010.00	-17.7	V	3.0	32.9	1.0	-49.6	-13.0	-36.6	
3505.00	-19.5	H	3.0	34.1	1.0	-52.6	-13.0	-39.6	
5257.50	-18.9	H	3.0	33.2	1.0	-51.1	-13.0	-38.1	
7010.00	-17.9	H	3.0	32.9	1.0	-49.7	-13.0	-36.7	

LTE B4 5MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 4 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1715									
3430.00	-18.9	V	3.0	34.1	1.0	-52.0	-13.0	-39.0	
5145.00	-19.3	V	3.0	33.2	1.0	-51.5	-13.0	-38.5	
6860.00	-18.5	V	3.0	32.9	1.0	-50.4	-13.0	-37.4	
3430.00	-20.5	H	3.0	34.1	1.0	-53.7	-13.0	-40.7	
5145.00	-20.1	H	3.0	33.2	1.0	-52.3	-13.0	-39.3	
6860.00	-19.5	H	3.0	32.9	1.0	-51.4	-13.0	-38.4	
Mid Ch, 1732.5									
3465.00	-19.0	V	3.0	34.1	1.0	-52.1	-13.0	-39.1	
5197.50	-19.5	V	3.0	33.2	1.0	-51.7	-13.0	-38.7	
6930.00	-19.1	V	3.0	32.9	1.0	-50.9	-13.0	-37.9	
3465.00	-20.4	H	3.0	34.1	1.0	-53.5	-13.0	-40.5	
5197.50	-19.4	H	3.0	33.2	1.0	-51.6	-13.0	-38.6	
6930.00	-19.1	H	3.0	32.9	1.0	-50.9	-13.0	-37.9	
High Ch, 1750									
3500.00	-19.5	V	3.0	34.1	1.0	-52.6	-13.0	-39.6	
5250.00	-19.8	V	3.0	33.2	1.0	-52.0	-13.0	-39.0	
7000.00	-17.8	V	3.0	32.9	1.0	-49.6	-13.0	-36.6	
3500.00	-20.2	H	3.0	34.1	1.0	-53.3	-13.0	-40.3	
5250.00	-17.1	H	3.0	33.2	1.0	-49.3	-13.0	-36.3	
7000.00	-18.9	H	3.0	32.9	1.0	-50.8	-13.0	-37.8	

LTE B4 10MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 4 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1715									
3430.00	-18.7	V	3.0	34.1	1.0	-51.8	-13.0	-38.8	
5145.00	-19.1	V	3.0	33.2	1.0	-51.3	-13.0	-38.3	
6860.00	-18.7	V	3.0	32.9	1.0	-50.6	-13.0	-37.6	
3430.00	-19.5	H	3.0	34.1	1.0	-52.6	-13.0	-39.6	
5145.00	-18.6	H	3.0	33.2	1.0	-50.8	-13.0	-37.8	
6860.00	-18.9	H	3.0	32.9	1.0	-50.8	-13.0	-37.8	
Mid Ch, 1732.5									
3465.00	-19.7	V	3.0	34.1	1.0	-52.8	-13.0	-39.8	
5197.50	-19.9	V	3.0	33.2	1.0	-52.0	-13.0	-39.0	
6930.00	-17.6	V	3.0	32.9	1.0	-49.5	-13.0	-36.5	
3465.00	-19.8	H	3.0	34.1	1.0	-52.9	-13.0	-39.9	
5197.50	-19.7	H	3.0	33.2	1.0	-51.9	-13.0	-38.9	
6930.00	-18.7	H	3.0	32.9	1.0	-50.5	-13.0	-37.5	
High Ch, 1750									
3500.00	-20.0	V	3.0	34.1	1.0	-53.1	-13.0	-40.1	
5250.00	-18.8	V	3.0	33.2	1.0	-51.0	-13.0	-38.0	
7000.00	-18.6	V	3.0	32.9	1.0	-50.4	-13.0	-37.4	
3500.00	-19.8	H	3.0	34.1	1.0	-52.9	-13.0	-39.9	
5250.00	-19.5	H	3.0	33.2	1.0	-51.7	-13.0	-38.7	
7000.00	-17.9	H	3.0	32.9	1.0	-49.8	-13.0	-36.8	

LTE B4 10MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 4 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5									
3435.00	-18.9	V	3.0	34.1	1.0	-52.0	-13.0	-39.0	
5152.50	-15.8	V	3.0	33.2	1.0	-48.0	-13.0	-35.0	
6870.00	-19.1	V	3.0	32.9	1.0	-50.9	-13.0	-37.9	
3435.00	-19.7	H	3.0	34.1	1.0	-52.9	-13.0	-39.9	
5152.50	-19.3	H	3.0	33.2	1.0	-51.5	-13.0	-38.5	
6870.00	-19.0	H	3.0	32.9	1.0	-50.9	-13.0	-37.9	
Mid Ch, 1732.5									
3465.00	-19.2	V	3.0	34.1	1.0	-52.3	-13.0	-39.3	
5197.50	-19.5	V	3.0	33.2	1.0	-51.7	-13.0	-38.7	
6930.00	-18.6	V	3.0	32.9	1.0	-50.5	-13.0	-37.5	
3465.00	-19.7	H	3.0	34.1	1.0	-52.8	-13.0	-39.8	
5197.50	-19.7	H	3.0	33.2	1.0	-51.8	-13.0	-38.8	
6930.00	-18.3	H	3.0	32.9	1.0	-50.2	-13.0	-37.2	
High Ch, 1747.5									
3495.00	-19.8	V	3.0	34.1	1.0	-52.8	-13.0	-39.8	
5242.50	-18.9	V	3.0	33.2	1.0	-51.1	-13.0	-38.1	
6990.00	-18.0	V	3.0	32.9	1.0	-49.9	-13.0	-36.9	
3495.00	-19.4	H	3.0	34.1	1.0	-52.4	-13.0	-39.4	
5242.50	-19.3	H	3.0	33.2	1.0	-51.5	-13.0	-38.5	
6990.00	-18.2	H	3.0	32.9	1.0	-50.1	-13.0	-37.1	

LTE B4 15MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 4 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5									
3435.00	-18.3	V	3.0	34.1	1.0	-51.5	-13.0	-38.5	
5152.50	-19.3	V	3.0	33.2	1.0	-51.5	-13.0	-38.5	
6870.00	-19.2	V	3.0	32.9	1.0	-51.1	-13.0	-38.1	
3435.00	-20.1	H	3.0	34.1	1.0	-53.3	-13.0	-40.3	
5152.50	-19.3	H	3.0	33.2	1.0	-51.5	-13.0	-38.5	
6870.00	-17.6	H	3.0	32.9	1.0	-49.5	-13.0	-36.5	
Mid Ch, 1732.5									
3465.00	-19.5	V	3.0	34.1	1.0	-52.6	-13.0	-39.6	
5197.50	-20.0	V	3.0	33.2	1.0	-52.2	-13.0	-39.2	
6930.00	-19.1	V	3.0	32.9	1.0	-51.0	-13.0	-38.0	
3465.00	-19.6	H	3.0	34.1	1.0	-52.7	-13.0	-39.7	
5197.50	-18.6	H	3.0	33.2	1.0	-50.8	-13.0	-37.8	
6930.00	-18.1	H	3.0	32.9	1.0	-50.0	-13.0	-37.0	
High Ch, 1747.5									
3495.00	-19.5	V	3.0	34.1	1.0	-52.6	-13.0	-39.6	
5242.50	-19.6	V	3.0	33.2	1.0	-51.8	-13.0	-38.8	
6990.00	-18.7	V	3.0	32.9	1.0	-50.6	-13.0	-37.6	
3495.00	-19.8	H	3.0	34.1	1.0	-52.8	-13.0	-39.8	
5242.50	-19.0	H	3.0	33.2	1.0	-51.2	-13.0	-38.2	
6990.00	-18.3	H	3.0	32.9	1.0	-50.2	-13.0	-37.2	

LTE B4 15MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber A
Mode: LTE_QPSK Band 4 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1720									
3440.00	-19.1	V	3.0	38.0	1.0	-56.1	-13.0	-43.1	
5160.00	-18.0	V	3.0	38.3	1.0	-55.2	-13.0	-42.2	
6880.00	-14.7	V	3.0	37.3	1.0	-51.0	-13.0	-38.0	
3440.00	-18.7	H	3.0	38.0	1.0	-55.7	-13.0	-42.7	
5160.00	-17.5	H	3.0	38.3	1.0	-54.8	-13.0	-41.8	
6880.00	-16.9	H	3.0	37.3	1.0	-53.2	-13.0	-40.2	
Mid Ch, 1732.5									
3465.00	-16.8	V	3.0	37.9	1.0	-53.7	-13.0	-40.7	
5197.50	-17.8	V	3.0	38.3	1.0	-55.1	-13.0	-42.1	
6930.00	-14.6	V	3.0	37.3	1.0	-50.9	-13.0	-37.9	
3465.00	-18.6	H	3.0	37.9	1.0	-55.6	-13.0	-42.6	
5197.50	-17.7	H	3.0	38.3	1.0	-55.0	-13.0	-42.0	
6930.00	-15.7	H	3.0	37.3	1.0	-51.9	-13.0	-38.9	
High Ch, 1745									
3490.00	-18.1	V	3.0	37.9	1.0	-55.0	-13.0	-42.0	
5235.00	-17.0	V	3.0	38.3	1.0	-54.3	-13.0	-41.3	
6980.00	-15.7	V	3.0	37.2	1.0	-51.9	-13.0	-38.9	
3490.00	-18.5	H	3.0	37.9	1.0	-55.4	-13.0	-42.4	
5235.00	-16.5	H	3.0	38.3	1.0	-53.8	-13.0	-40.8	
6980.00	-17.0	H	3.0	37.2	1.0	-53.3	-13.0	-40.3	

LTE B4 20MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/26/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber A
Mode: LTE_16QAM Band 4 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1720									
3440.00	-19.2	V	3.0	38.0	1.0	-56.1	-13.0	-43.1	
5160.00	-18.3	V	3.0	38.3	1.0	-55.5	-13.0	-42.5	
6880.00	-14.8	V	3.0	37.3	1.0	-51.1	-13.0	-38.1	
3440.00	-18.6	H	3.0	38.0	1.0	-55.6	-13.0	-42.6	
5160.00	-16.4	H	3.0	38.3	1.0	-53.7	-13.0	-40.7	
6880.00	-17.0	H	3.0	37.3	1.0	-53.3	-13.0	-40.3	
Mid Ch, 1732.5									
3465.00	-18.3	V	3.0	37.9	1.0	-55.2	-13.0	-42.2	
5197.50	-17.3	V	3.0	38.3	1.0	-54.6	-13.0	-41.6	
6930.00	-14.7	V	3.0	37.3	1.0	-51.0	-13.0	-38.0	
3465.00	-18.0	H	3.0	37.9	1.0	-55.0	-13.0	-42.0	
5197.50	-17.3	H	3.0	38.3	1.0	-54.6	-13.0	-41.6	
6930.00	-17.0	H	3.0	37.3	1.0	-53.3	-13.0	-40.3	
High Ch, 1745									
3490.00	-17.9	V	3.0	37.9	1.0	-54.8	-13.0	-41.8	
5235.00	-17.1	V	3.0	38.3	1.0	-54.4	-13.0	-41.4	
6980.00	-16.4	V	3.0	37.2	1.0	-52.6	-13.0	-39.6	
3490.00	-17.7	H	3.0	37.9	1.0	-54.7	-13.0	-41.7	
5235.00	-17.6	H	3.0	38.3	1.0	-54.8	-13.0	-41.8	
6980.00	-16.9	H	3.0	37.2	1.0	-53.1	-13.0	-40.1	

LTE B4 20MHz 16QAM

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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LTE Band 12

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 12 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 699.7									
1399.40	-31.3	V	3.0	36.5	1.0	-66.8	-13.0	-53.8	
2099.10	-25.3	V	3.0	35.6	1.0	-59.9	-13.0	-46.9	
2798.80	-25.4	V	3.0	34.7	1.0	-59.1	-13.0	-46.1	
1399.40	-28.5	H	3.0	36.5	1.0	-64.0	-13.0	-51.0	
2099.10	-28.4	H	3.0	35.6	1.0	-63.0	-13.0	-50.0	
2798.80	-26.9	H	3.0	34.7	1.0	-60.6	-13.0	-47.6	
Mid Ch, 707.5									
1415.00	-32.0	V	3.0	36.5	1.0	-67.5	-13.0	-54.5	
2122.50	-26.0	V	3.0	35.6	1.0	-60.6	-13.0	-47.6	
2830.00	-26.3	V	3.0	34.7	1.0	-60.0	-13.0	-47.0	
1415.00	-29.8	H	3.0	36.5	1.0	-65.3	-13.0	-52.3	
2122.50	-24.3	H	3.0	35.6	1.0	-58.9	-13.0	-45.9	
2830.00	-26.1	H	3.0	34.7	1.0	-59.8	-13.0	-46.8	
High Ch, 715.3									
1430.60	-31.9	V	3.0	36.5	1.0	-67.4	-13.0	-54.4	
2145.90	-27.1	V	3.0	35.6	1.0	-61.7	-13.0	-48.7	
2861.20	-25.8	V	3.0	34.7	1.0	-59.5	-13.0	-46.5	
1430.60	-30.3	H	3.0	36.5	1.0	-65.8	-13.0	-52.8	
2145.90	-27.1	H	3.0	35.6	1.0	-61.7	-13.0	-48.7	
2861.20	-26.1	H	3.0	34.7	1.0	-59.7	-13.0	-46.7	

LTE B12 1.4MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 12 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 699.7									
1399.40	-32.0	V	3.0	36.5	1.0	-67.5	-13.0	-54.5	
2099.10	-25.9	V	3.0	35.6	1.0	-60.6	-13.0	-47.6	
2798.80	-26.4	V	3.0	34.7	1.0	-60.1	-13.0	-47.1	
1399.40	-30.7	H	3.0	36.5	1.0	-66.2	-13.0	-53.2	
2099.10	-27.2	H	3.0	35.6	1.0	-61.9	-13.0	-48.9	
2798.80	-27.4	H	3.0	34.7	1.0	-61.2	-13.0	-48.2	
Mid Ch, 707.5									
1415.00	-25.2	V	3.0	36.5	1.0	-60.7	-13.0	-47.7	
2122.50	-27.4	V	3.0	35.6	1.0	-62.0	-13.0	-49.0	
2830.00	-26.7	V	3.0	34.7	1.0	-60.4	-13.0	-47.4	
1415.00	-30.3	H	3.0	36.5	1.0	-65.9	-13.0	-52.9	
2122.50	-27.4	H	3.0	35.6	1.0	-62.0	-13.0	-49.0	
2830.00	-26.8	H	3.0	34.7	1.0	-60.5	-13.0	-47.5	
High Ch, 715.3									
1430.60	-31.2	V	3.0	36.5	1.0	-66.7	-13.0	-53.7	
2145.90	-26.1	V	3.0	35.6	1.0	-60.7	-13.0	-47.7	
2861.20	-25.6	V	3.0	34.7	1.0	-59.3	-13.0	-46.3	
1430.60	-30.5	H	3.0	36.5	1.0	-66.1	-13.0	-53.1	
2145.90	-27.7	H	3.0	35.6	1.0	-62.3	-13.0	-49.3	
2861.20	-26.5	H	3.0	34.7	1.0	-60.2	-13.0	-47.2	

LTE B12 1.4MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 12 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 700.5									
1401.00	-26.5	V	3.0	36.5	1.0	-62.0	-13.0	-49.0	
2101.50	-21.6	V	3.0	35.6	1.0	-56.2	-13.0	-43.2	
2802.00	-26.0	V	3.0	34.7	1.0	-59.8	-13.0	-46.8	
1401.00	-25.5	H	3.0	36.5	1.0	-61.0	-13.0	-48.0	
2101.50	-21.8	H	3.0	35.6	1.0	-56.5	-13.0	-43.5	
2802.00	-26.9	H	3.0	34.7	1.0	-60.6	-13.0	-47.6	
Mid Ch, 707.5									
1415.00	-25.5	V	3.0	36.5	1.0	-61.1	-13.0	-48.1	
2122.50	-21.5	V	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2830.00	-26.1	V	3.0	34.7	1.0	-59.8	-13.0	-46.8	
1415.00	-24.0	H	3.0	36.5	1.0	-59.5	-13.0	-46.5	
2122.50	-22.2	H	3.0	35.6	1.0	-56.8	-13.0	-43.8	
2830.00	-26.9	H	3.0	34.7	1.0	-60.6	-13.0	-47.6	
High Ch, 714.5									
1429.00	-26.0	V	3.0	36.5	1.0	-61.6	-13.0	-48.6	
2143.50	-21.6	V	3.0	35.6	1.0	-56.2	-13.0	-43.2	
2858.00	-25.6	V	3.0	34.7	1.0	-59.3	-13.0	-46.3	
1429.00	-25.5	H	3.0	36.5	1.0	-61.0	-13.0	-48.0	
2143.50	-21.9	H	3.0	35.6	1.0	-56.5	-13.0	-43.5	
2858.00	-26.6	H	3.0	34.7	1.0	-60.3	-13.0	-47.3	

LTE B12 3MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 12 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 700.5									
1401.00	-24.2	V	3.0	36.5	1.0	-59.7	-13.0	-46.7	
2101.50	-21.3	V	3.0	35.6	1.0	-55.9	-13.0	-42.9	
2802.00	-26.9	V	3.0	34.7	1.0	-60.6	-13.0	-47.6	
1401.00	-20.8	H	3.0	36.5	1.0	-56.3	-13.0	-43.3	
2101.50	-22.4	H	3.0	35.6	1.0	-57.0	-13.0	-44.0	
2802.00	-27.2	H	3.0	34.7	1.0	-60.9	-13.0	-47.9	
Mid Ch, 707.5									
1415.00	-24.3	V	3.0	36.5	1.0	-59.8	-13.0	-46.8	
2122.50	-20.7	V	3.0	35.6	1.0	-55.3	-13.0	-42.3	
2830.00	-25.3	V	3.0	34.7	1.0	-59.0	-13.0	-46.0	
1415.00	-21.0	H	3.0	36.5	1.0	-56.5	-13.0	-43.5	
2122.50	-21.9	H	3.0	35.6	1.0	-56.5	-13.0	-43.5	
2830.00	-26.2	H	3.0	34.7	1.0	-59.9	-13.0	-46.9	
High Ch, 714.5									
1429.00	-24.2	V	3.0	36.5	1.0	-59.8	-13.0	-46.8	
2143.50	-20.8	V	3.0	35.6	1.0	-55.4	-13.0	-42.4	
2858.00	-25.8	V	3.0	34.7	1.0	-59.5	-13.0	-46.5	
1429.00	-20.8	H	3.0	36.5	1.0	-56.3	-13.0	-43.3	
2143.50	-21.8	H	3.0	35.6	1.0	-56.3	-13.0	-43.3	
2858.00	-26.9	H	3.0	34.7	1.0	-60.5	-13.0	-47.5	

LTE B12 3MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 12 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 701.5									
1403.00	-27.4	V	3.0	36.5	1.0	-62.9	-13.0	-49.9	
2104.50	-21.4	V	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2806.00	-26.7	V	3.0	34.7	1.0	-60.4	-13.0	-47.4	
1403.00	-27.1	H	3.0	36.5	1.0	-62.6	-13.0	-49.6	
2104.50	-23.4	H	3.0	35.6	1.0	-58.0	-13.0	-45.0	
2806.00	-26.8	H	3.0	34.7	1.0	-60.5	-13.0	-47.5	
Mid Ch, 707.5									
1415.00	-27.9	V	3.0	36.5	1.0	-63.4	-13.0	-50.4	
2122.50	-20.6	V	3.0	35.6	1.0	-55.2	-13.0	-42.2	
2830.00	-26.5	V	3.0	34.7	1.0	-60.2	-13.0	-47.2	
1415.00	-27.3	H	3.0	36.5	1.0	-62.9	-13.0	-49.9	
2122.50	-23.3	H	3.0	35.6	1.0	-57.9	-13.0	-44.9	
2830.00	-25.9	H	3.0	34.7	1.0	-59.6	-13.0	-46.6	
High Ch, 713.5									
1427.00	-28.0	V	3.0	36.5	1.0	-63.6	-13.0	-50.6	
2140.50	-21.5	V	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2854.00	-25.8	V	3.0	34.7	1.0	-59.5	-13.0	-46.5	
1427.00	-27.4	H	3.0	36.5	1.0	-62.9	-13.0	-49.9	
2140.50	-22.9	H	3.0	35.6	1.0	-57.5	-13.0	-44.5	
2854.00	-27.1	H	3.0	34.7	1.0	-60.8	-13.0	-47.8	

LTE B12 5MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 12 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 701.5									
1403.00	-28.3	V	3.0	36.5	1.0	-63.8	-13.0	-50.8	
2104.50	-21.3	V	3.0	35.6	1.0	-55.9	-13.0	-42.9	
2806.00	-26.3	V	3.0	34.7	1.0	-60.1	-13.0	-47.1	
1403.00	-27.5	H	3.0	36.5	1.0	-63.0	-13.0	-50.0	
2104.50	-24.0	H	3.0	35.6	1.0	-58.7	-13.0	-45.7	
2806.00	-27.1	H	3.0	34.7	1.0	-60.9	-13.0	-47.9	
Mid Ch, 707.5									
1415.00	-28.9	V	3.0	36.5	1.0	-64.4	-13.0	-51.4	
2122.50	-21.5	V	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2830.00	-26.3	V	3.0	34.7	1.0	-60.0	-13.0	-47.0	
1415.00	-29.8	H	3.0	36.5	1.0	-65.3	-13.0	-52.3	
2122.50	-24.0	H	3.0	35.6	1.0	-58.7	-13.0	-45.7	
2830.00	-27.6	H	3.0	34.7	1.0	-61.3	-13.0	-48.3	
High Ch, 713.5									
1427.00	-28.4	V	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2140.50	-21.2	V	3.0	35.6	1.0	-55.8	-13.0	-42.8	
2854.00	-26.0	V	3.0	34.7	1.0	-59.7	-13.0	-46.7	
1427.00	-29.9	H	3.0	36.5	1.0	-65.4	-13.0	-52.4	
2140.50	-23.8	H	3.0	35.6	1.0	-58.4	-13.0	-45.4	
2854.00	-26.9	H	3.0	34.7	1.0	-60.5	-13.0	-47.5	

LTE B12 5MHz 16QAM

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 12 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 704									
1408.00	-23.2	V	3.0	36.5	1.0	-58.7	-13.0	-45.7	
2112.00	-24.8	V	3.0	35.6	1.0	-59.4	-13.0	-46.4	
2816.00	-26.0	V	3.0	34.7	1.0	-59.7	-13.0	-46.7	
1408.00	-26.4	H	3.0	36.5	1.0	-61.9	-13.0	-48.9	
2112.00	-23.9	H	3.0	35.6	1.0	-58.5	-13.0	-45.5	
2816.00	-27.2	H	3.0	34.7	1.0	-60.9	-13.0	-47.9	
Mid Ch, 707.5									
1415.00	-30.4	V	3.0	36.5	1.0	-66.0	-13.0	-53.0	
2122.50	-24.6	V	3.0	35.6	1.0	-59.2	-13.0	-46.2	
2830.00	-25.1	V	3.0	34.7	1.0	-58.8	-13.0	-45.8	
1415.00	-29.1	H	3.0	36.5	1.0	-64.6	-13.0	-51.6	
2122.50	-23.6	H	3.0	35.6	1.0	-58.2	-13.0	-45.2	
2830.00	-26.6	H	3.0	34.7	1.0	-60.3	-13.0	-47.3	
High Ch, 711									
1422.00	-31.3	V	3.0	36.5	1.0	-66.8	-13.0	-53.8	
2133.00	-24.6	V	3.0	35.6	1.0	-59.2	-13.0	-46.2	
2844.00	-26.2	V	3.0	34.7	1.0	-59.9	-13.0	-46.9	
1422.00	-28.0	H	3.0	36.5	1.0	-63.5	-13.0	-50.5	
2133.00	-23.7	H	3.0	35.6	1.0	-58.3	-13.0	-45.3	
2844.00	-26.5	H	3.0	34.7	1.0	-60.2	-13.0	-47.2	

LTE B12 10MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 12 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 704									
1408.00	-31.4	V	3.0	36.5	1.0	-66.9	-13.0	-53.9	
2112.00	-24.6	V	3.0	35.6	1.0	-59.2	-13.0	-46.2	
2816.00	-26.3	V	3.0	34.7	1.0	-60.0	-13.0	-47.0	
1408.00	-28.4	H	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2112.00	-18.7	H	3.0	35.6	1.0	-53.3	-13.0	-40.3	
2816.00	-26.8	H	3.0	34.7	1.0	-60.5	-13.0	-47.5	
Mid Ch, 707.5									
1415.00	-31.0	V	3.0	36.5	1.0	-66.5	-13.0	-53.5	
2122.50	-24.6	V	3.0	35.6	1.0	-59.2	-13.0	-46.2	
2830.00	-26.2	V	3.0	34.7	1.0	-59.9	-13.0	-46.9	
1415.00	-30.1	H	3.0	36.5	1.0	-65.6	-13.0	-52.6	
2122.50	-18.7	H	3.0	35.6	1.0	-53.3	-13.0	-40.3	
2830.00	-27.0	H	3.0	34.7	1.0	-60.7	-13.0	-47.7	
High Ch, 711									
1422.00	-30.8	V	3.0	36.5	1.0	-66.4	-13.0	-53.4	
2133.00	-24.6	V	3.0	35.6	1.0	-59.1	-13.0	-46.1	
2844.00	-26.3	V	3.0	34.7	1.0	-60.0	-13.0	-47.0	
1422.00	-29.4	H	3.0	36.5	1.0	-64.9	-13.0	-51.9	
2133.00	-18.9	H	3.0	35.6	1.0	-53.5	-13.0	-40.5	
2844.00	-25.9	H	3.0	34.7	1.0	-59.5	-13.0	-46.5	

LTE B12 10MHz 16QAM

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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LTE Band 41

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 41 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2498.5									
4997.00	-22.1	V	3.0	33.2	1.0	-54.4	-25.0	-29.4	
7495.50	-22.9	V	3.0	32.8	1.0	-54.7	-25.0	-29.7	
9994.00	-23.5	V	3.0	32.8	1.0	-55.3	-25.0	-30.3	
4997.00	-22.3	H	3.0	33.2	1.0	-54.6	-25.0	-29.6	
7495.50	-21.9	H	3.0	32.8	1.0	-53.7	-25.0	-28.7	
9994.00	-23.3	H	3.0	32.8	1.0	-55.0	-25.0	-30.0	
Mid Ch, 2593									
5186.00	-23.9	V	3.0	33.2	1.0	-56.1	-25.0	-31.1	
7779.00	-22.6	V	3.0	32.8	1.0	-54.4	-25.0	-29.4	
10372.00	-24.2	V	3.0	32.5	1.0	-55.7	-25.0	-30.7	
5186.00	-22.9	H	3.0	33.2	1.0	-55.1	-25.0	-30.1	
7779.00	-21.9	H	3.0	32.8	1.0	-53.7	-25.0	-28.7	
10372.00	-22.4	H	3.0	32.5	1.0	-53.9	-25.0	-28.9	
High Ch, 2687.5									
5375.00	-23.4	V	3.0	33.1	1.0	-55.6	-25.0	-30.6	
8062.50	-21.4	V	3.0	32.8	1.0	-53.2	-25.0	-28.2	
10750.00	-23.2	V	3.0	32.3	1.0	-54.5	-25.0	-29.5	
5375.00	-22.7	H	3.0	33.1	1.0	-54.8	-25.0	-29.8	
8062.50	-21.8	H	3.0	32.8	1.0	-53.6	-25.0	-28.6	
10750.00	-17.4	H	3.0	32.3	1.0	-48.6	-25.0	-23.6	

LTE B41 5MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 41 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2498.5									
4997.00	-24.5	V	3.0	33.2	1.0	-56.8	-25.0	-31.8	
7495.50	-22.1	V	3.0	32.8	1.0	-54.0	-25.0	-29.0	
9994.00	-24.2	V	3.0	32.8	1.0	-56.0	-25.0	-31.0	
4997.00	-22.8	H	3.0	33.2	1.0	-55.0	-25.0	-30.0	
7495.50	-23.6	H	3.0	32.8	1.0	-55.5	-25.0	-30.5	
9994.00	-24.3	H	3.0	32.8	1.0	-56.1	-25.0	-31.1	
Mid Ch, 2593									
5186.00	-23.9	V	3.0	33.2	1.0	-56.1	-25.0	-31.1	
7779.00	-22.1	V	3.0	32.8	1.0	-53.9	-25.0	-28.9	
10372.00	-24.0	V	3.0	32.5	1.0	-55.5	-25.0	-30.5	
5186.00	-24.0	H	3.0	33.2	1.0	-56.1	-25.0	-31.1	
7779.00	-22.8	H	3.0	32.8	1.0	-54.6	-25.0	-29.6	
10372.00	-22.3	H	3.0	32.5	1.0	-53.8	-25.0	-28.8	
High Ch, 2687.5									
5375.00	-24.2	V	3.0	33.1	1.0	-56.3	-25.0	-31.3	
8062.50	-22.7	V	3.0	32.8	1.0	-54.5	-25.0	-29.5	
10750.00	-23.5	V	3.0	32.3	1.0	-54.8	-25.0	-29.8	
5375.00	-23.4	H	3.0	33.1	1.0	-55.6	-25.0	-30.6	
8062.50	-22.2	H	3.0	32.8	1.0	-54.1	-25.0	-29.1	
10750.00	-23.1	H	3.0	32.3	1.0	-54.4	-25.0	-29.4	

LTE B41 5MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 41 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2501									
5002.00	-22.6	V	3.0	33.2	1.0	-54.9	-25.0	-29.9	
7503.00	-22.9	V	3.0	32.8	1.0	-54.7	-25.0	-29.7	
10004.00	-24.7	V	3.0	32.8	1.0	-56.4	-25.0	-31.4	
5002.00	-23.2	H	3.0	33.2	1.0	-55.4	-25.0	-30.4	
7503.00	-22.8	H	3.0	32.8	1.0	-54.7	-25.0	-29.7	
10004.00	-24.0	H	3.0	32.8	1.0	-55.7	-25.0	-30.7	
Mid Ch, 2593									
5186.00	-24.8	V	3.0	33.2	1.0	-56.9	-25.0	-31.9	
7779.00	-22.8	V	3.0	32.8	1.0	-54.7	-25.0	-29.7	
10372.00	-22.5	V	3.0	32.5	1.0	-54.0	-25.0	-29.0	
5186.00	-23.7	H	3.0	33.2	1.0	-55.9	-25.0	-30.9	
7779.00	-22.6	H	3.0	32.8	1.0	-54.5	-25.0	-29.5	
10372.00	-23.2	H	3.0	32.5	1.0	-54.7	-25.0	-29.7	
High Ch, 2685									
5370.00	-24.1	V	3.0	33.1	1.0	-56.3	-25.0	-31.3	
8055.00	-23.0	V	3.0	32.8	1.0	-54.9	-25.0	-29.9	
10740.00	-23.1	V	3.0	32.3	1.0	-54.4	-25.0	-29.4	
5370.00	-23.9	H	3.0	33.1	1.0	-56.1	-25.0	-31.1	
8055.00	-23.0	H	3.0	32.8	1.0	-54.9	-25.0	-29.9	
10740.00	-22.4	H	3.0	32.3	1.0	-53.7	-25.0	-28.7	

LTE B41 10MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 41 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2501									
5002.00	-24.8	V	3.0	33.2	1.0	-57.1	-25.0	-32.1	
7503.00	-23.2	V	3.0	32.8	1.0	-55.1	-25.0	-30.1	
10004.00	-22.9	V	3.0	32.8	1.0	-54.6	-25.0	-29.6	
5002.00	-22.8	H	3.0	33.2	1.0	-55.0	-25.0	-30.0	
7503.00	-23.1	H	3.0	32.8	1.0	-55.0	-25.0	-30.0	
10004.00	-23.6	H	3.0	32.8	1.0	-55.4	-25.0	-30.4	
Mid Ch, 2593									
5186.00	-24.8	V	3.0	33.2	1.0	-57.0	-25.0	-32.0	
7779.00	-23.5	V	3.0	32.8	1.0	-55.3	-25.0	-30.3	
10372.00	-23.3	V	3.0	32.5	1.0	-54.8	-25.0	-29.8	
5186.00	-24.1	H	3.0	33.2	1.0	-56.3	-25.0	-31.3	
7779.00	-22.1	H	3.0	32.8	1.0	-53.9	-25.0	-28.9	
10372.00	-23.5	H	3.0	32.5	1.0	-55.0	-25.0	-30.0	
High Ch, 2685									
5370.00	-24.3	V	3.0	33.1	1.0	-56.4	-25.0	-31.4	
8055.00	-22.9	V	3.0	32.8	1.0	-54.7	-25.0	-29.7	
10740.00	-23.0	V	3.0	32.3	1.0	-54.3	-25.0	-29.3	
5370.00	-23.7	H	3.0	33.1	1.0	-55.9	-25.0	-30.9	
8055.00	-22.2	H	3.0	32.8	1.0	-54.0	-25.0	-29.0	
10740.00	-22.9	H	3.0	32.3	1.0	-54.1	-25.0	-29.1	

LTE B41 10MHz 16QAM

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 41 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2503.5									
5007.00	-24.9	V	3.0	33.2	1.0	-57.1	-25.0	-32.1	
7510.50	-22.9	V	3.0	32.8	1.0	-54.8	-25.0	-29.8	
10014.00	-23.9	V	3.0	32.8	1.0	-55.6	-25.0	-30.6	
5007.00	-22.7	H	3.0	33.2	1.0	-54.9	-25.0	-29.9	
7510.50	-23.0	H	3.0	32.8	1.0	-54.9	-25.0	-29.9	
10014.00	-24.3	H	3.0	32.8	1.0	-56.1	-25.0	-31.1	
Mid Ch, 2593									
5186.00	-25.1	V	3.0	33.2	1.0	-57.2	-25.0	-32.2	
7779.00	-22.7	V	3.0	32.8	1.0	-54.6	-25.0	-29.6	
10372.00	-24.2	V	3.0	32.5	1.0	-55.7	-25.0	-30.7	
5186.00	-24.0	H	3.0	33.2	1.0	-56.2	-25.0	-31.2	
7779.00	-22.7	H	3.0	32.8	1.0	-54.5	-25.0	-29.5	
10372.00	-23.9	H	3.0	32.5	1.0	-55.4	-25.0	-30.4	
High Ch, 2682.5									
5365.00	-23.8	V	3.0	33.1	1.0	-55.9	-25.0	-30.9	
8047.50	-22.8	V	3.0	32.8	1.0	-54.6	-25.0	-29.6	
10730.00	-21.8	V	3.0	32.3	1.0	-53.1	-25.0	-28.1	
5365.00	-24.0	H	3.0	33.1	1.0	-56.1	-25.0	-31.1	
8047.50	-21.6	H	3.0	32.8	1.0	-53.4	-25.0	-28.4	
10730.00	-22.4	H	3.0	32.3	1.0	-53.7	-25.0	-28.7	

LTE B41 15MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 41 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2503.5									
5007.00	-23.2	V	3.0	33.2	1.0	-55.5	-25.0	-30.5	
7510.50	-23.1	V	3.0	32.8	1.0	-54.9	-25.0	-29.9	
10014.00	-24.3	V	3.0	32.8	1.0	-56.0	-25.0	-31.0	
5007.00	-21.9	H	3.0	33.2	1.0	-54.2	-25.0	-29.2	
7510.50	-23.4	H	3.0	32.8	1.0	-55.2	-25.0	-30.2	
10014.00	-23.5	H	3.0	32.8	1.0	-55.3	-25.0	-30.3	
Mid Ch, 2593									
5186.00	-24.8	V	3.0	33.2	1.0	-57.0	-25.0	-32.0	
7779.00	-22.9	V	3.0	32.8	1.0	-54.7	-25.0	-29.7	
10372.00	-23.3	V	3.0	32.5	1.0	-54.8	-25.0	-29.8	
5186.00	-24.0	H	3.0	33.2	1.0	-56.1	-25.0	-31.1	
7779.00	-22.9	H	3.0	32.8	1.0	-54.7	-25.0	-29.7	
10372.00	-23.6	H	3.0	32.5	1.0	-55.1	-25.0	-30.1	
High Ch, 2682.5									
5365.00	-23.0	V	3.0	33.1	1.0	-55.1	-25.0	-30.1	
8047.50	-22.1	V	3.0	32.8	1.0	-54.0	-25.0	-29.0	
10730.00	-23.3	V	3.0	32.3	1.0	-54.6	-25.0	-29.6	
5365.00	-22.7	H	3.0	33.1	1.0	-54.8	-25.0	-29.8	
8047.50	-22.9	H	3.0	32.8	1.0	-54.7	-25.0	-29.7	
10730.00	-23.2	H	3.0	32.3	1.0	-54.5	-25.0	-29.5	

LTE B41 15MHz 16QAM

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_QPSK Band 41 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2506									
5012.00	-24.0	V	3.0	33.2	1.0	-56.2	-25.0	-31.2	
7518.00	-21.7	V	3.0	32.8	1.0	-53.6	-25.0	-28.6	
10024.00	-24.4	V	3.0	32.8	1.0	-56.1	-25.0	-31.1	
5012.00	-24.5	H	3.0	33.2	1.0	-56.8	-25.0	-31.8	
7518.00	-23.3	H	3.0	32.8	1.0	-55.2	-25.0	-30.2	
10024.00	-23.9	H	3.0	32.8	1.0	-55.7	-25.0	-30.7	
Mid Ch, 2593									
5186.00	-23.7	V	3.0	33.2	1.0	-55.9	-25.0	-30.9	
7779.00	-22.1	V	3.0	32.8	1.0	-54.0	-25.0	-29.0	
10372.00	-23.0	V	3.0	32.5	1.0	-54.5	-25.0	-29.5	
5186.00	-23.5	H	3.0	33.2	1.0	-55.7	-25.0	-30.7	
7779.00	-23.4	H	3.0	32.8	1.0	-55.2	-25.0	-30.2	
10372.00	-23.4	H	3.0	32.5	1.0	-54.9	-25.0	-29.9	
High Ch, 2680									
5360.00	-23.4	V	3.0	33.1	1.0	-55.6	-25.0	-30.6	
8040.00	-22.7	V	3.0	32.8	1.0	-54.5	-25.0	-29.5	
10720.00	-21.8	V	3.0	32.3	1.0	-53.1	-25.0	-28.1	
5360.00	-23.0	H	3.0	33.1	1.0	-55.2	-25.0	-30.2	
8040.00	-22.6	H	3.0	32.8	1.0	-54.5	-25.0	-29.5	
10720.00	-22.9	H	3.0	32.3	1.0	-54.2	-25.0	-29.2	

LTE B41 20MHz QPSK

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

Company: SOMC
Project #: 11783639
Date: 7/27/2017
Test Engineer: 45256 JB
Configuration: EUT + AC + Headset
Location: Chamber C
Mode: LTE_16QAM Band 41 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2506									
5012.00	-23.4	V	3.0	33.2	1.0	-55.6	-25.0	-30.6	
7518.00	-22.3	V	3.0	32.8	1.0	-54.2	-25.0	-29.2	
10024.00	-23.4	V	3.0	32.8	1.0	-55.2	-25.0	-30.2	
5012.00	-24.3	H	3.0	33.2	1.0	-56.6	-25.0	-31.6	
7518.00	-23.2	H	3.0	32.8	1.0	-55.1	-25.0	-30.1	
10024.00	-24.6	H	3.0	32.8	1.0	-56.4	-25.0	-31.4	
Mid Ch, 2593									
5186.00	-22.8	V	3.0	33.2	1.0	-55.0	-25.0	-30.0	
7779.00	-22.6	V	3.0	32.8	1.0	-54.4	-25.0	-29.4	
10372.00	-23.6	V	3.0	32.5	1.0	-55.1	-25.0	-30.1	
5186.00	-24.4	H	3.0	33.2	1.0	-56.5	-25.0	-31.5	
7779.00	-22.7	H	3.0	32.8	1.0	-54.5	-25.0	-29.5	
10372.00	-24.3	H	3.0	32.5	1.0	-55.8	-25.0	-30.8	
High Ch, 2680									
5360.00	-23.8	V	3.0	33.1	1.0	-56.0	-25.0	-31.0	
8040.00	-21.9	V	3.0	32.8	1.0	-53.8	-25.0	-28.8	
10720.00	-22.8	V	3.0	32.3	1.0	-54.1	-25.0	-29.1	
5360.00	-23.5	H	3.0	33.1	1.0	-55.7	-25.0	-30.7	
8040.00	-23.1	H	3.0	32.8	1.0	-54.9	-25.0	-29.9	
10720.00	-24.0	H	3.0	32.3	1.0	-55.2	-25.0	-30.2	

LTE B41 20MHz 16QAM

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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