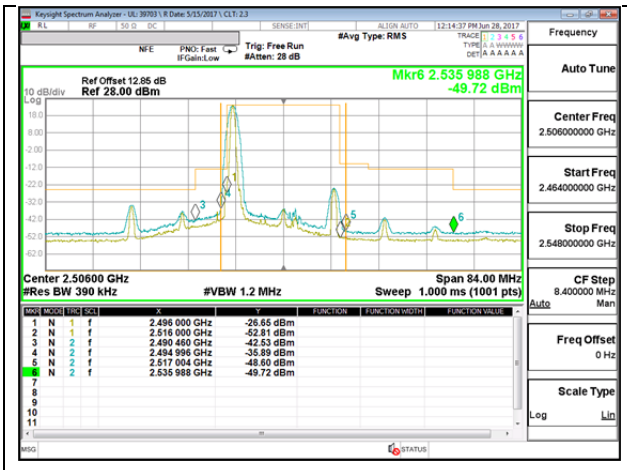
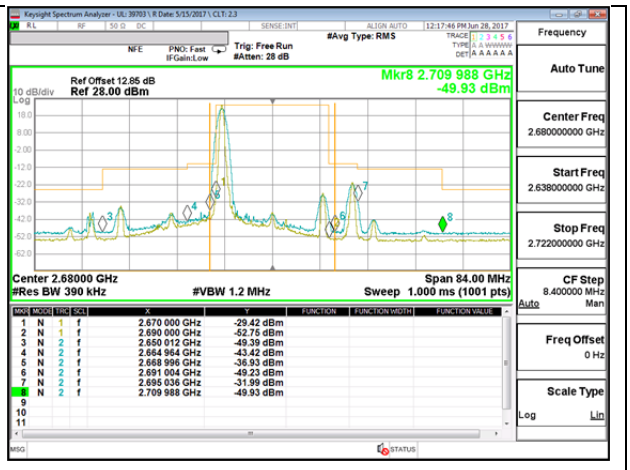
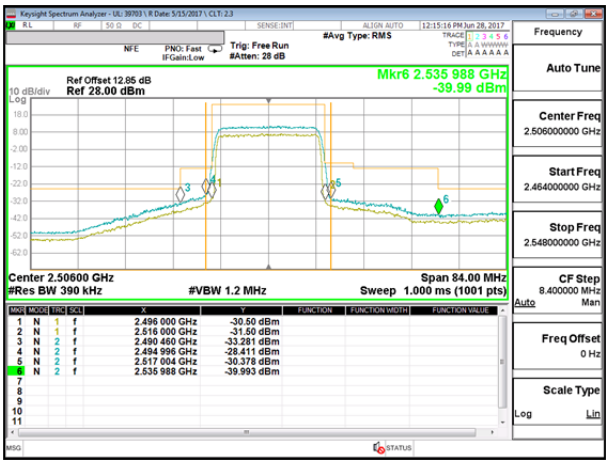


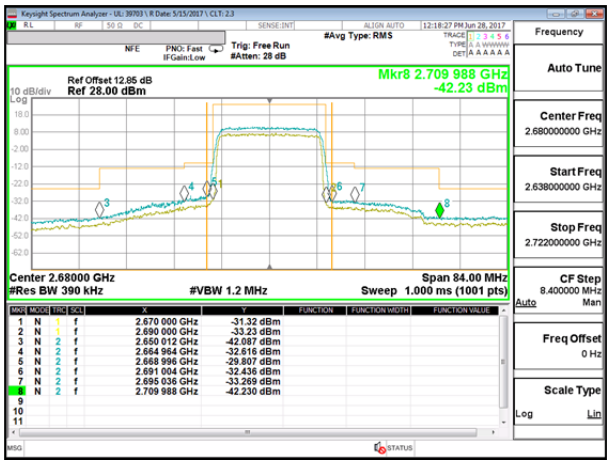
LTE B41 20MHz QPSK Low Channel 1RB



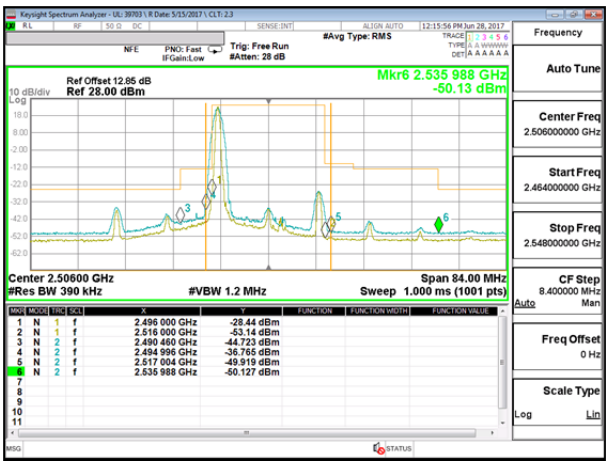
LTE B41 20MHz QPSK High Channel 1RB



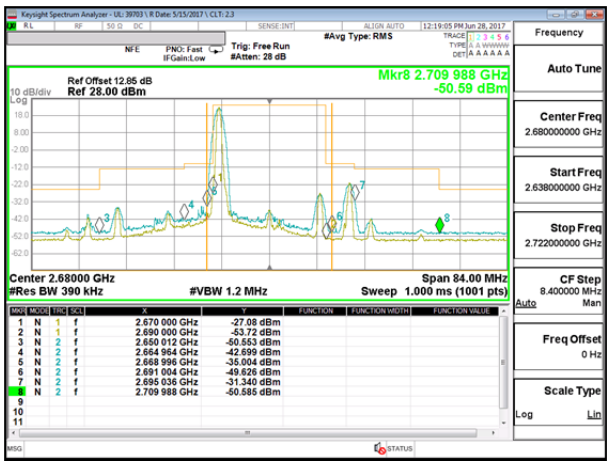
LTE B41 20MHz QPSK Low Channel FRB



LTE B41 20MHz QPSK High Channel FRB



LTE B41 20MHz 16QAM Low Channel 1RB

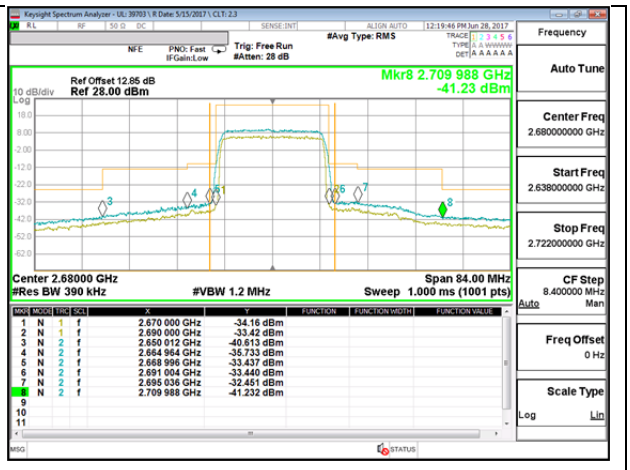


LTE B41 20MHz 16QAM High Channel 1RB

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE B41 20MHz 16QAM Low Channel FRB



LTE B41 20MHz 16QAM High Channel FRB

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

15. OUT OF BAND EMISSIONS

RULE PART(S)

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

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

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

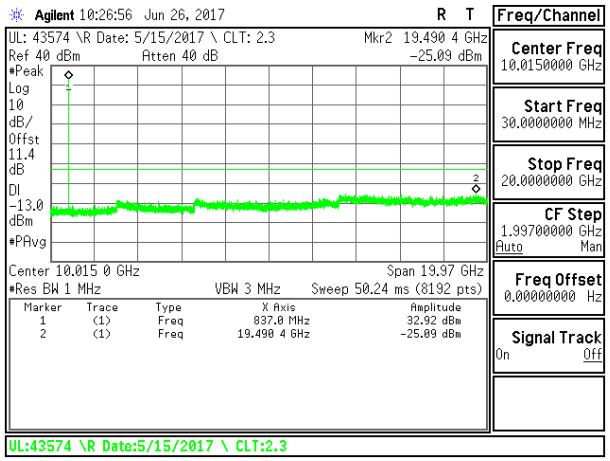
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

15.1. OUT OF BAND EMISSIONS RESULT AND PLOTS

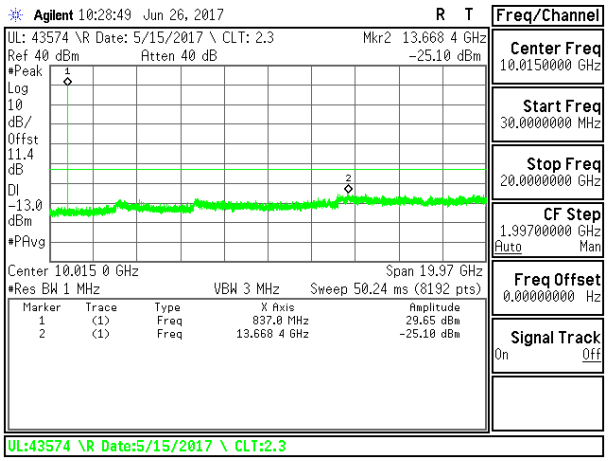
GSM

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
GSM 850	GPRS	824.2	-24.78	-13	-11.78
		836.6	-25.09	-13	-12.09
		848.8	-24.64	-13	-11.64
	EGPRS	824.2	-24.5	-13	-11.5
		836.6	-25.10	-13	-12.1
		848.8	-24.76	-13	-11.76
GSM 1900	GPRS	1850.2	-25.35	-13	-12.35
		1880	-24.45	-13	-11.45
		1909.8	-24.84	-13	-11.84
	EGPRS	1850.2	-24.59	-13	-11.59
		1880	-24.53	-13	-11.53
		1909.8	-25.05	-13	-12.05

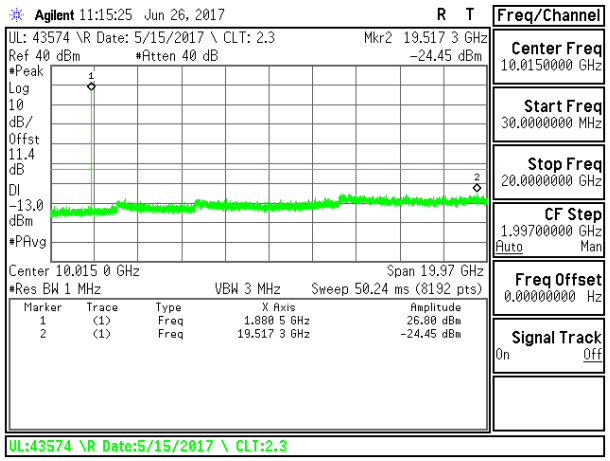
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



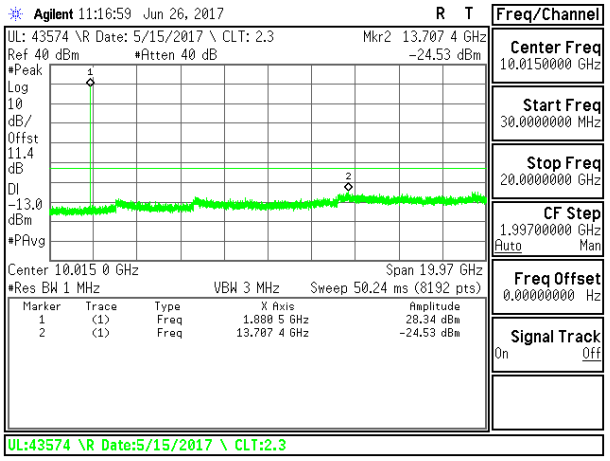
GSM850 GPRS Middle Channel



GSM850 EGPRS Middle Channel



GSM1900 GPRS Middle Channel



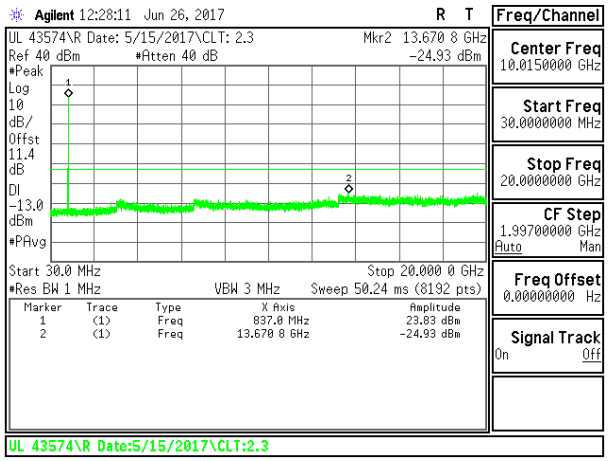
GSM1900 EGPRS Middle Channel

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

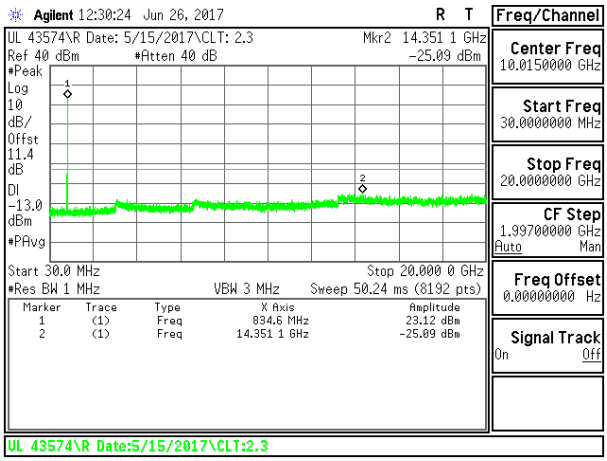
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

WCDMA

Band	Mode	f (MHz)	Spur (dBm)	99% BW (MHz)	Delta (dB)
Band 5	REL99	826.4	-24.75	-13	-11.75
		836.6	-24.93	-13	-11.93
		846.6	-24.69	-13	-11.69
	HSDPA	826.4	-24.64	-13	-11.64
		836.6	-24.09	-13	-11.09
		846.6	-24.95	-13	-11.95



B5 REL99 Middle Channel



B5 HSDPA Middle Channel

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

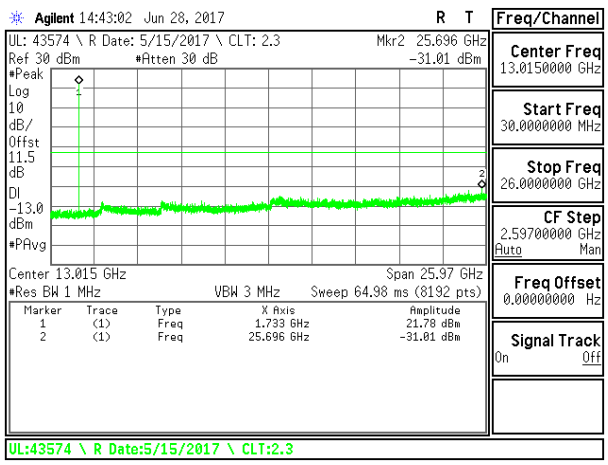
LTE Band 4

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	1.4	QPSK	1710.7	-32.28	-13	-19.28
			1732.5	-31.01	-13	-18.01
			1754.3	-32.69	-13	-19.69
		16QAM	1710.7	-32.72	-13	-19.72
			1732.5	-35.45	-13	-22.45
			1754.3	-32.42	-13	-19.42
	3	QPSK	1711.5	-32.40	-13	-19.4
			1732.5	-33.26	-13	-20.26
			1753.5	-33.06	-13	-20.06
		16QAM	1711.5	-32.86	-13	-19.86
			1732.5	-32.97	-13	-19.97
			1753.5	-32.08	-13	-19.08
	5	QPSK	1712.5	-31.87	-13	-18.87
			1732.5	-32.68	-13	-19.68
			1752.5	-32.32	-13	-19.32
		16QAM	1712.5	-32.22	-13	-19.22
			1732.5	-32.55	-13	-19.55
			1752.5	-32.33	-13	-19.33
	10	QPSK	1715	-32.55	-13	-19.55
			1732.5	-31.36	-13	-18.36
			1750	-32.98	-13	-19.98
		16QAM	1715	-31.82	-13	-18.82
			1732.5	-32.88	-13	-19.88
			1750	-32.73	-13	-19.73

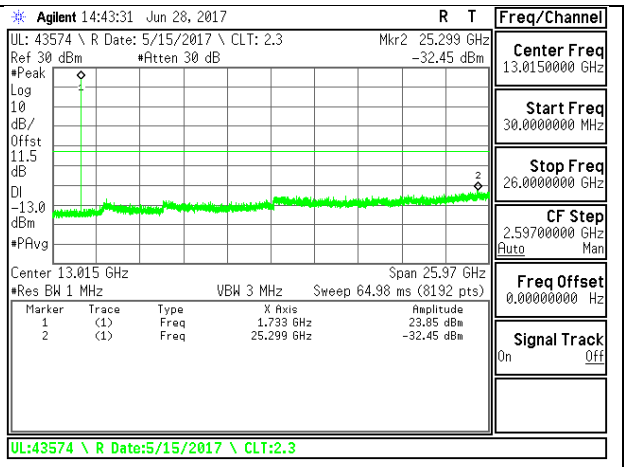
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	15	QPSK	1717.5	-32.72	-13	-19.72
			1732.5	-32.72	-13	-19.72
			1747.5	-32.44	-13	-19.44
		16QAM	1717.5	-32.46	-13	-19.46
			1732.5	-32.45	-13	-19.45
			1747.5	-32.53	-13	-19.53
	20	QPSK	1720	-31.35	-13	-18.35
			1732.5	-32.63	-13	-19.63
			1745	-31.77	-13	-18.77
		16QAM	1720	-32.87	-13	-19.87
			1732.5	-30.87	-13	-17.87
			1745	-32.97	-13	-19.97

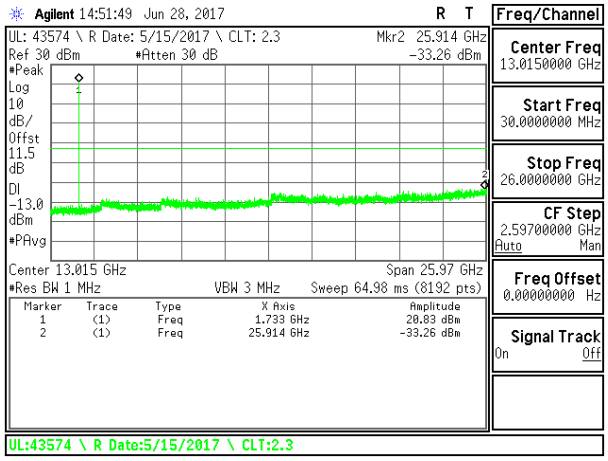
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



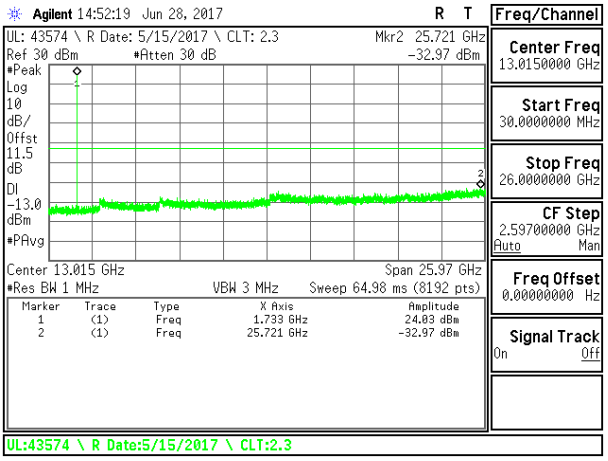
LTE B4 1.4MHz QPSK Middle Channel



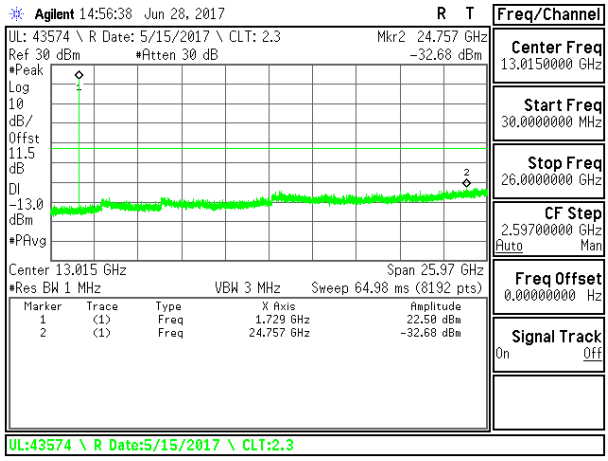
LTE B4 1.4MHz 16QAM Middle Channel



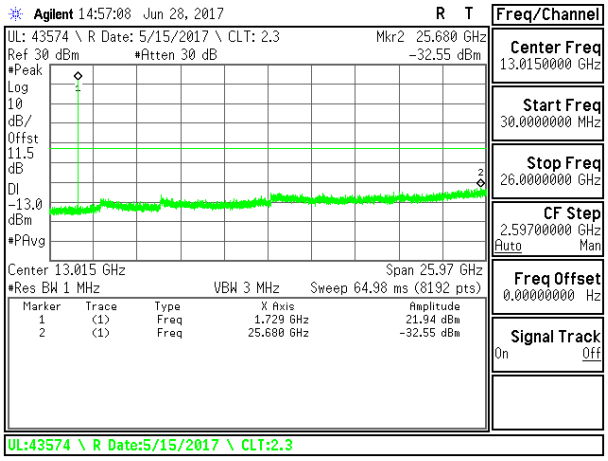
LTE B4 3MHz QPSK Middle Channel



LTE B4 3MHz 16QAM Middle Channel



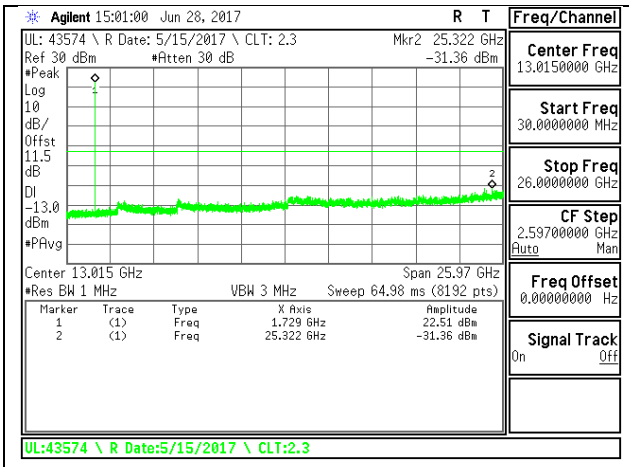
LTE B4 5MHz QPSK Middle Channel



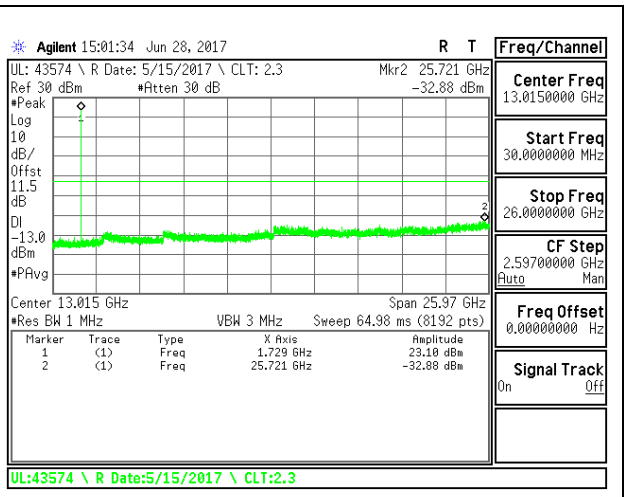
LTE B4 5MHz 16QAM Middle Channel

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

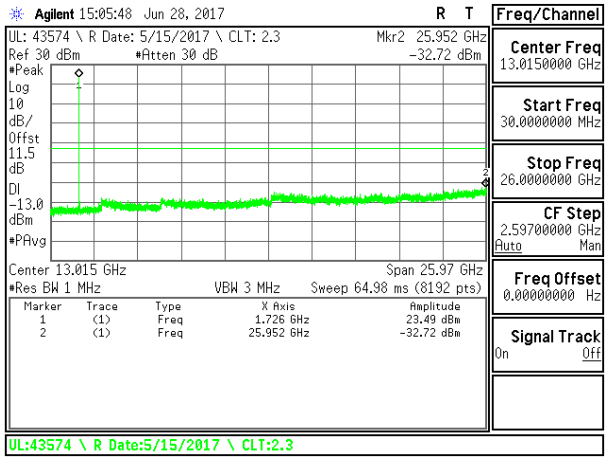
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



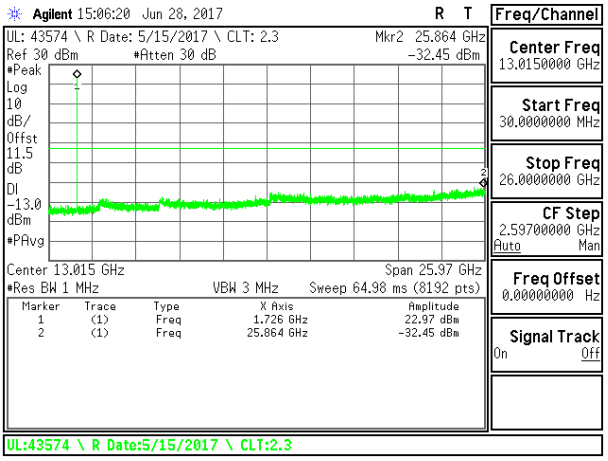
LTE B4 10MHz QPSK Middle Channel



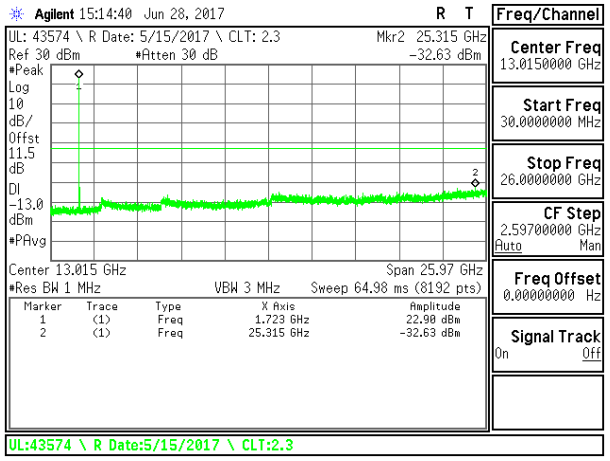
LTE B4 10MHz 16QAM Middle Channel



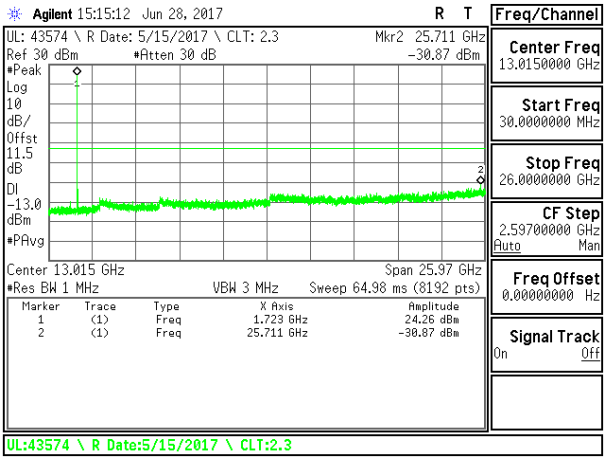
LTE B4 15MHz QPSK Middle Channel



LTE B4 15MHz 16QAM Middle Channel



LTE B4 20MHz QPSK Middle Channel



LTE B4 20MHz 16QAM Middle Channel

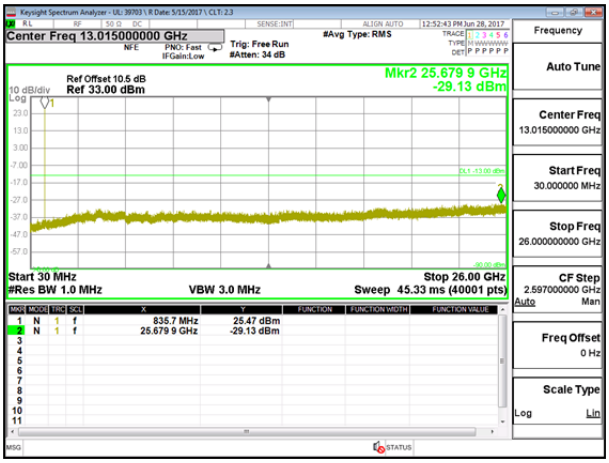
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

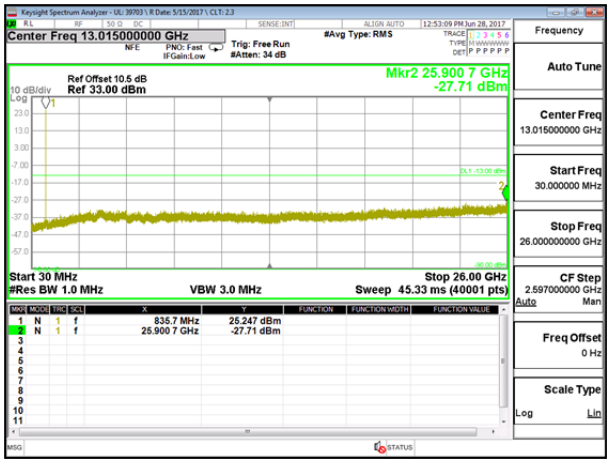
LTE Band 5

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	1.4	QPSK	824.7	-29.07	-13	-16.07
			836.5	-29.13	-13	-16.13
			848.3	-28.83	-13	-15.83
		16QAM	824.7	-28.58	-13	-15.58
			836.5	-27.71	-13	-14.71
			848.3	-28.81	-13	-15.81
	3	QPSK	825.5	-28.91	-13	-15.91
			836.5	-28.99	-13	-15.99
			847.5	-29.30	-13	-16.3
		16QAM	825.5	-28.83	-13	-15.83
			836.5	-27.69	-13	-14.69
			847.5	-28.61	-13	-15.61
	5	QPSK	826.5	-29.47	-13	-16.47
			836.5	-29.12	-13	-16.12
			846.5	-28.59	-13	-15.59
		16QAM	826.5	-29.10	-13	-16.1
			836.5	-29.05	-13	-16.05
			846.5	-28.69	-13	-15.69
	10	QPSK	829	-28.89	-13	-15.89
			836.5	-28.93	-13	-15.93
			844	-29.10	-13	-16.1
		16QAM	829	-28.33	-13	-15.33
			836.5	-29.09	-13	-16.09
			844	-28.42	-13	-15.42

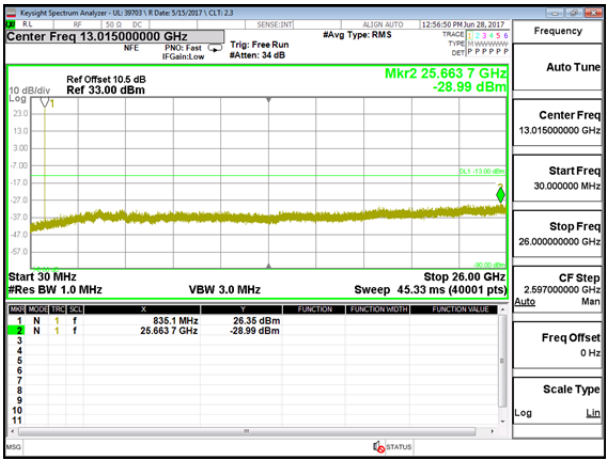
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



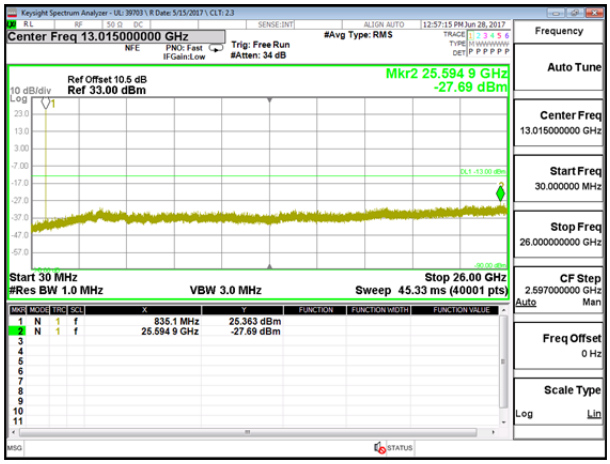
LTE B5 1.4MHz QPSK Middle Channel



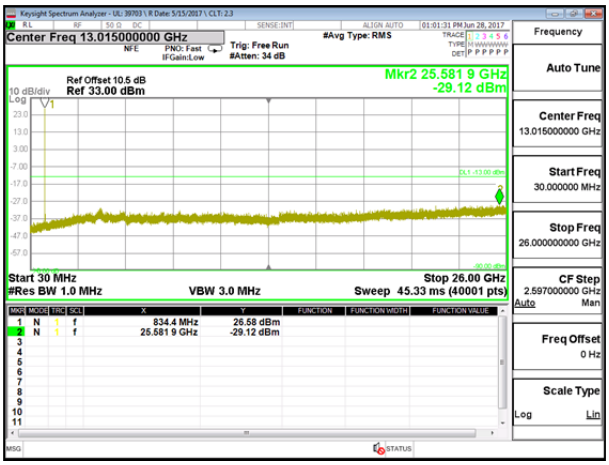
LTE B5 1.4MHz 16QAM Middle Channel



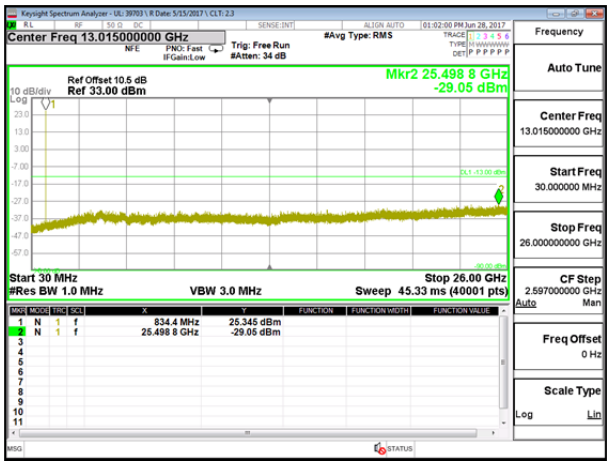
LTE B5 3MHz QPSK Middle Channel



LTE B5 3MHz 16QAM Middle Channel

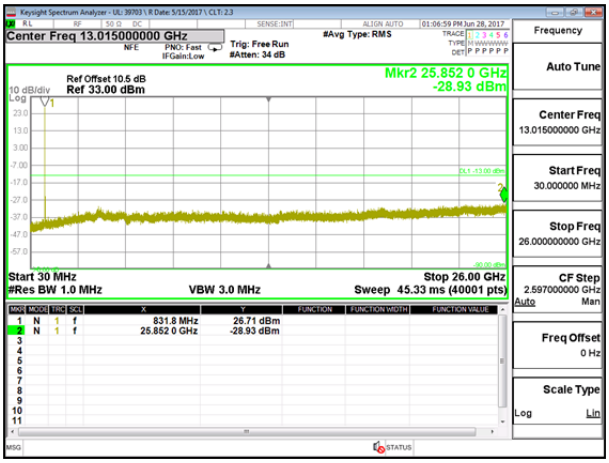


LTE B5 5MHz QPSK Middle Channel

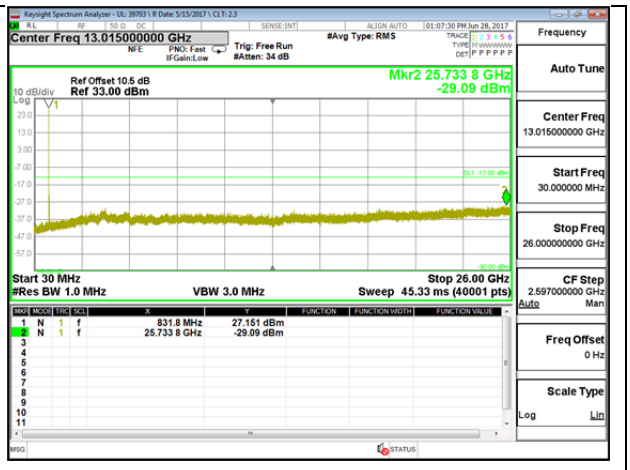


LTE B5 5MHz 16QAM Middle Channel

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B5 10MHz QPSK Middle Channel



LTE B5 10MHz 16QAM Middle Channel

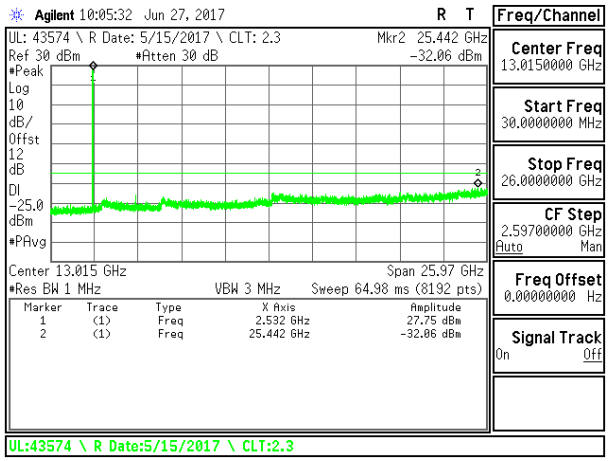
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

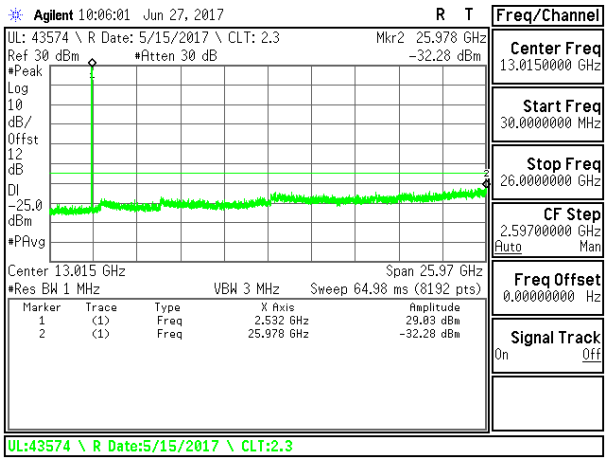
LTE Band 7

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE7	5	QPSK	2502.5	-31.78	-25	-18.78
			2535	-32.06	-25	-19.06
			2567.5	-32.44	-25	-19.44
		16QAM	2502.5	-32.20	-25	-19.2
			2535	-32.28	-25	-19.28
			2567.5	-31.65	-25	-18.65
	10	QPSK	2505	-31.37	-25	-18.37
			2535	-32.10	-25	-19.1
			2565	-31.52	-25	-18.52
		16QAM	2505	-31.39	-25	-18.39
			2535	-31.57	-25	-18.57
			2565	-31.70	-25	-18.7
	15	QPSK	2507.5	-31.43	-25	-18.43
			2535	-32.64	-25	-19.64
			2562.5	-32.18	-25	-19.18
		16QAM	2507.5	-31.44	-25	-18.44
			2535	-32.03	-25	-19.03
			2562.5	-32.36	-25	-19.36
	20	QPSK	2510	-31.96	-25	-18.96
			2535	-31.66	-25	-18.66
			2560	-30.74	-25	-17.74
		16QAM	2510	-31.70	-25	-18.7
			2535	-31.12	-25	-18.12
			2560	-32.79	-25	-19.79

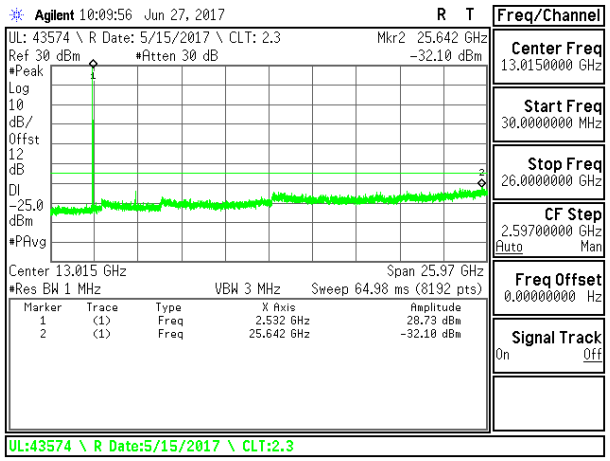
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



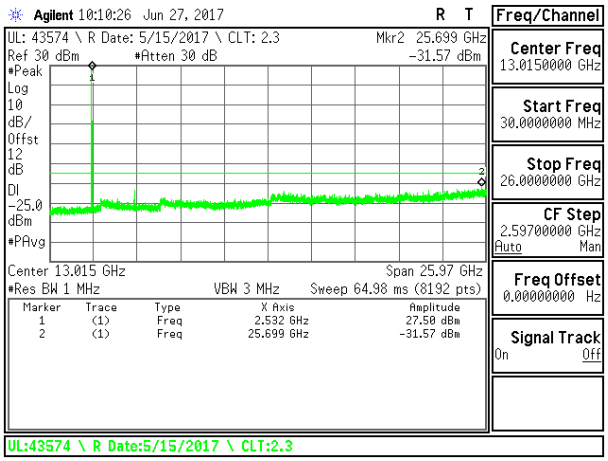
LTE B7 5MHz QPSK Middle Channel



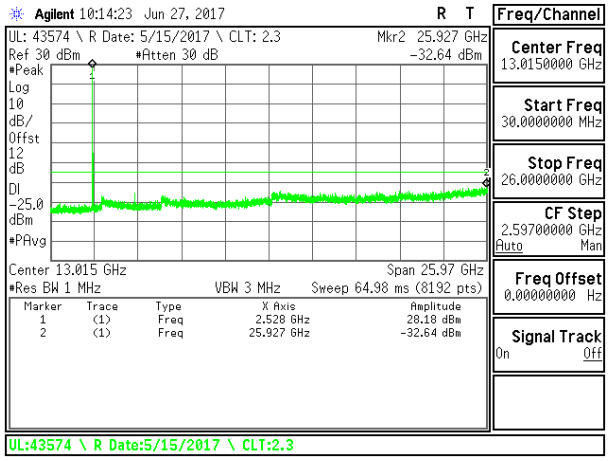
LTE B7 5MHz 16QAM Middle Channel



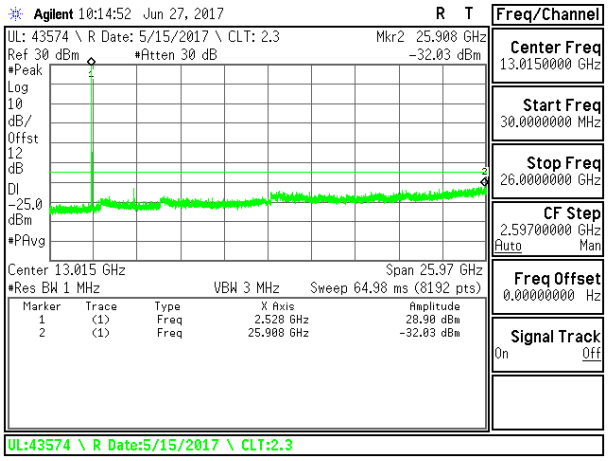
LTE B7 10MHz QPSK Middle Channel



LTE B7 10MHz 16QAM Middle Channel



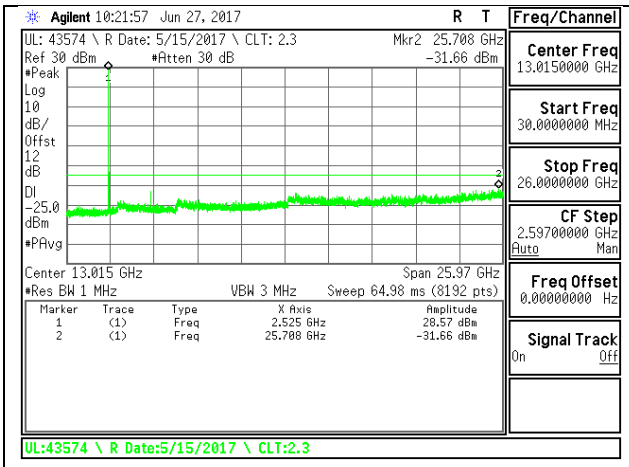
LTE B7 15MHz QPSK Middle Channel



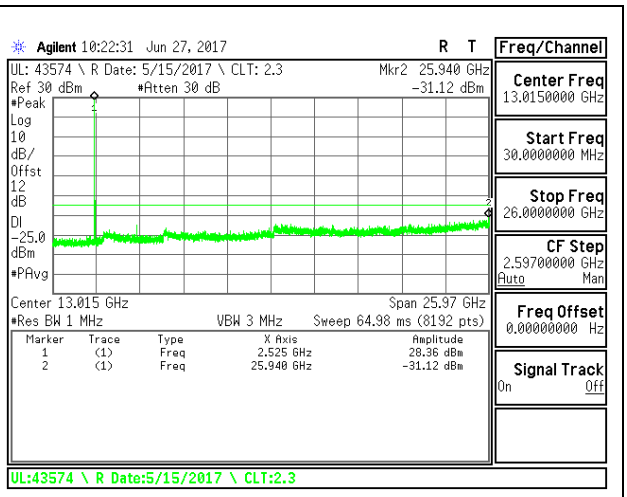
LTE B7 15MHz 16QAM Middle Channel

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B7 20MHz QPSK Middle Channel



LTE B7 20MHz 16QAM Middle Channel

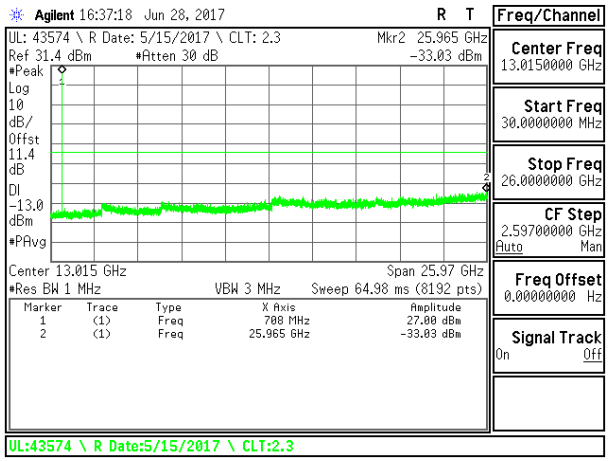
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

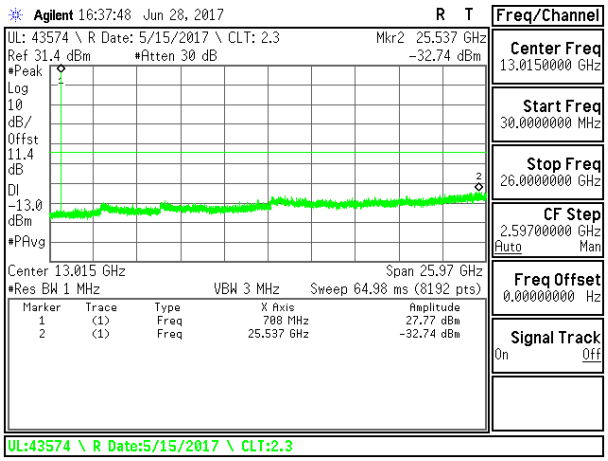
LTE Band 12

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE12	1.4	QPSK	699.7	-32.47	-13	-19.47
			707.5	-33.03	-13	-20.03
			715.3	-33.12	-13	-20.12
		16QAM	699.7	-32.79	-13	-19.79
			707.5	-32.74	-13	-19.74
			715.3	-33.06	-13	-20.06
	3	QPSK	700.5	-32.76	-13	-19.76
			707.5	-33.29	-13	-20.29
			714.5	-32.55	-13	-19.55
		16QAM	700.5	-33.09	-13	-20.09
			707.5	-32.66	-13	-19.66
			714.5	-32.95	-13	-19.95
	5	QPSK	701.5	-33.00	-13	-20
			707.5	-32.80	-13	-19.8
			713.5	-32.69	-13	-19.69
		16QAM	701.5	-32.62	-13	-19.62
			707.5	-32.60	-13	-19.6
			713.5	-32.78	-13	-19.78
	10	QPSK	704	-31.83	-13	-18.83
			707.5	-32.44	-13	-19.44
			711	-31.56	-13	-18.56
		16QAM	704	-32.71	-13	-19.71
			707.5	-32.92	-13	-19.92
			711	-32.76	-13	-19.76

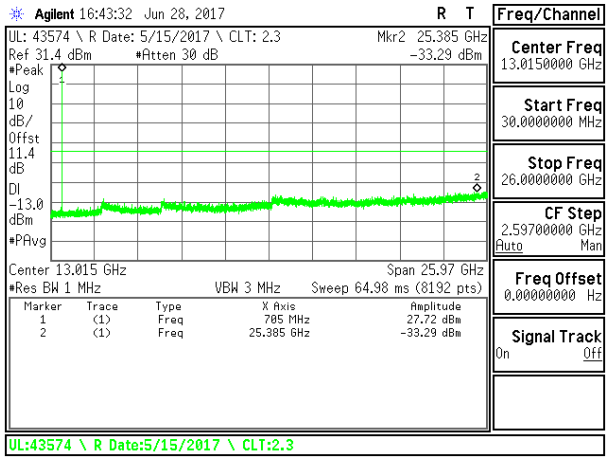
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



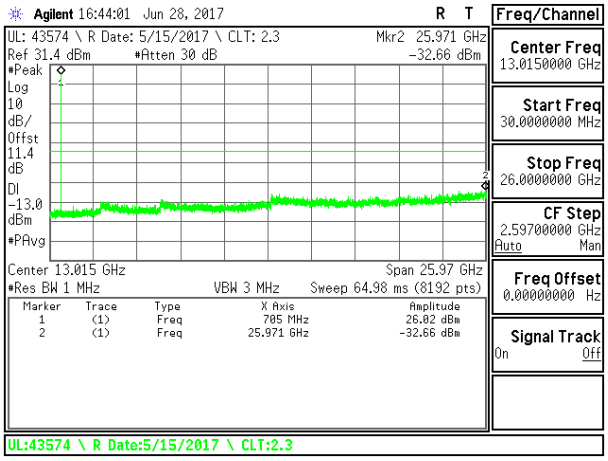
LTE B12 1.4MHz QPSK Middle Channel



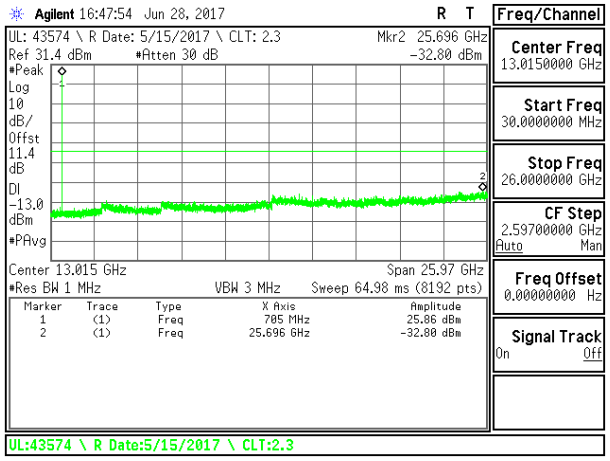
LTE B12 1.4MHz 16QAM Middle Channel



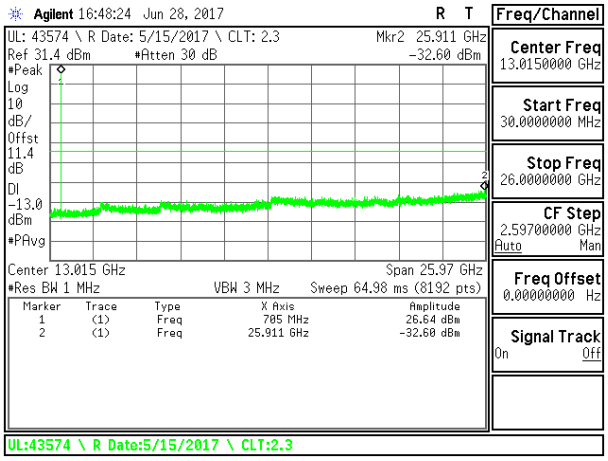
LTE B12 3MHz QPSK Middle Channel



LTE B12 3MHz 16QAM Middle Channel

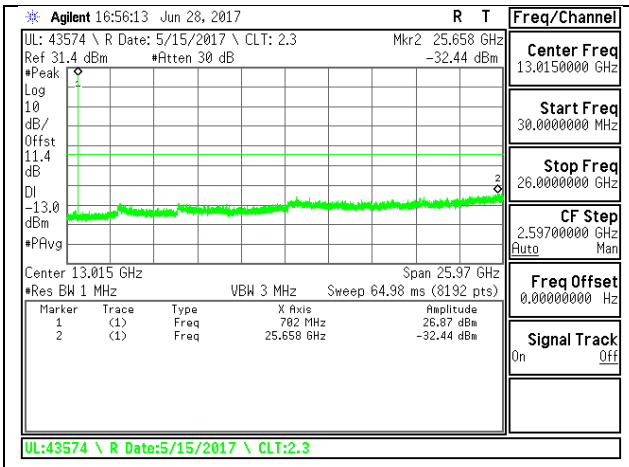


LTE B12 5MHz QPSK Middle Channel

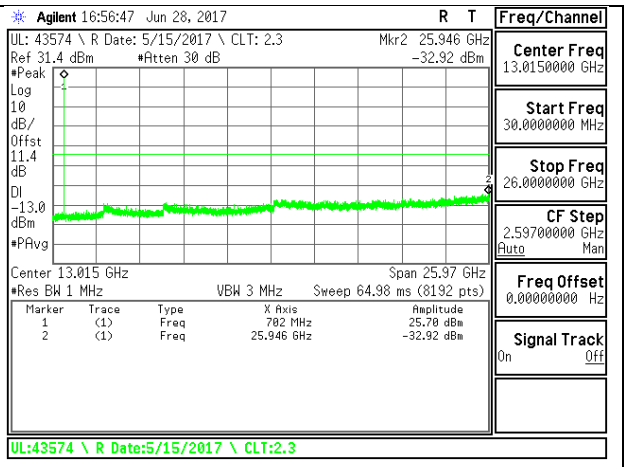


LTE B12 5MHz 16QAM Middle Channel

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B12 10MHz QPSK Middle Channel



LTE B12 10MHz 16QAM Middle Channel

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

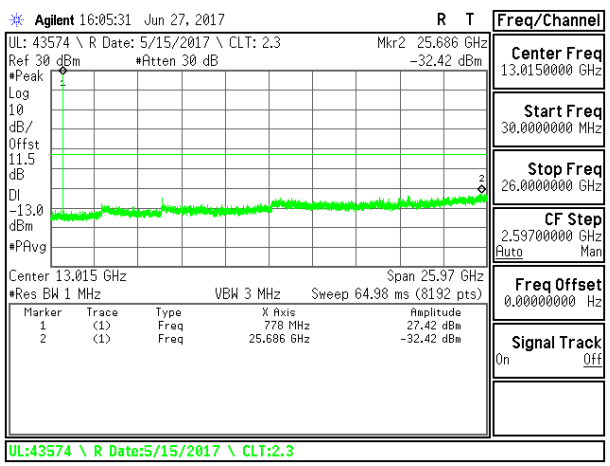
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 13

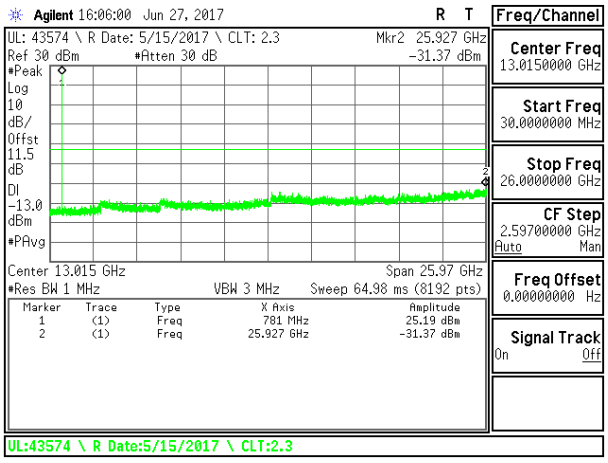
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE13	5	QPSK	779.5	-32.67	-13	-19.67
			782	-32.42	-13	-19.42
			784.5	-31.57	-13	-18.57
		16QAM	779.5	-32.83	-13	-19.83
			782	-31.37	-13	-18.37
			784.5	-32.22	-13	-19.22
	10	QPSK				
			782	-32.08	-13	-19.08
		16QAM	782	-32.55	-13	-19.55

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

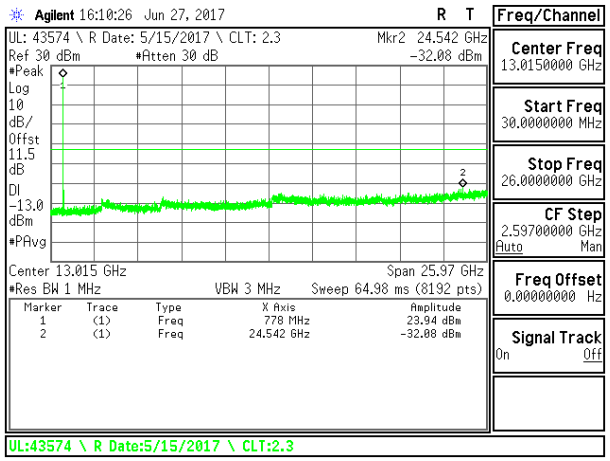
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



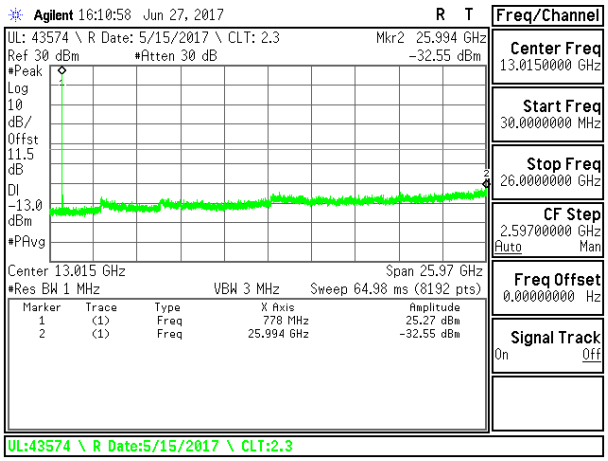
LTE B13 5MHz QPSK Middle Channel



LTE B13 5MHz 16QAM Middle Channel



LTE B13 10MHz QPSK Middle Channel



LTE B13 10MHz 16QAM Middle Channel

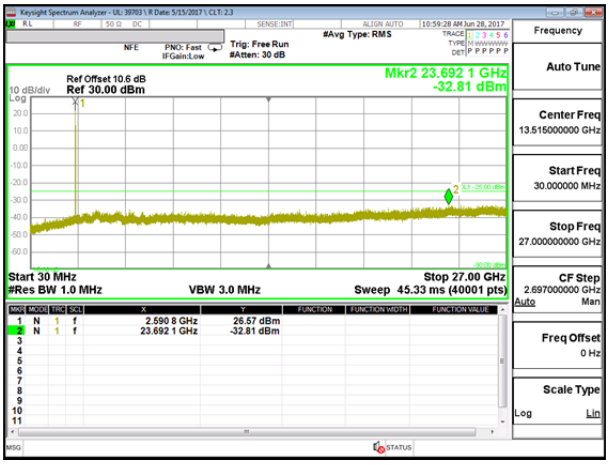
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

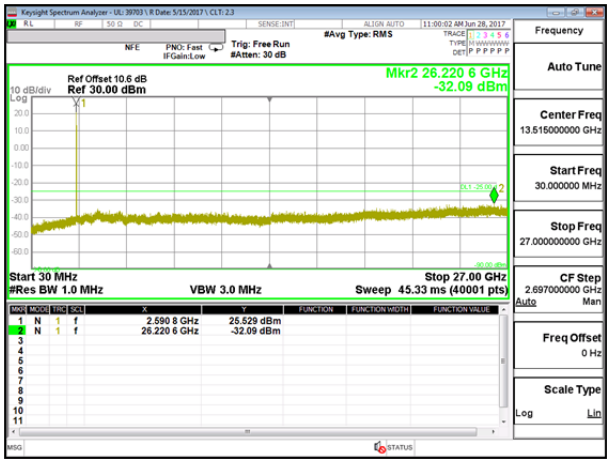
LTE Band 41

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE41	5	QPSK	2498.5	-34.433	-25	-21.433
			2593	-32.81	-25	-19.81
			2687.5	-32.54	-25	-19.54
		16QAM	2498.5	-32.29	-25	-19.29
			2593	-32.09	-25	-19.09
			2687.5	-32.23	-25	-19.23
	10	QPSK	2501	-32.54	-25	-19.54
			2593	-32.32	-25	-19.32
			2685	-32.34	-25	-19.34
		16QAM	2501	-32.66	-25	-19.66
			2593	-31.99	-25	-18.99
			2685	-32.16	-25	-19.16
	15	QPSK	2503.5	-32.15	-25	-19.15
			2593	-32.61	-25	-19.61
			2682.5	-32.11	-25	-19.11
		16QAM	2503.5	-32.57	-25	-19.57
			2593	-32.63	-25	-19.63
			2682.5	-31.79	-25	-18.79
	20	QPSK	2506	-33.02	-25	-20.02
			2593	-32.63	-25	-19.63
			2680	-32.28	-25	-19.28
		16QAM	2506	-32.52	-25	-19.52
			2593	-32.63	-25	-19.63
			2680	-31.63	-25	-18.63

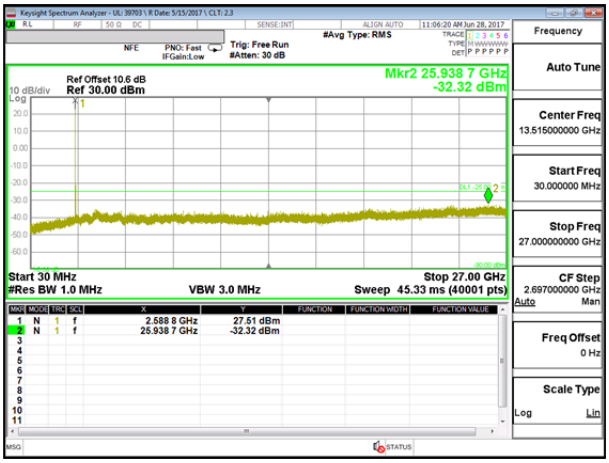
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



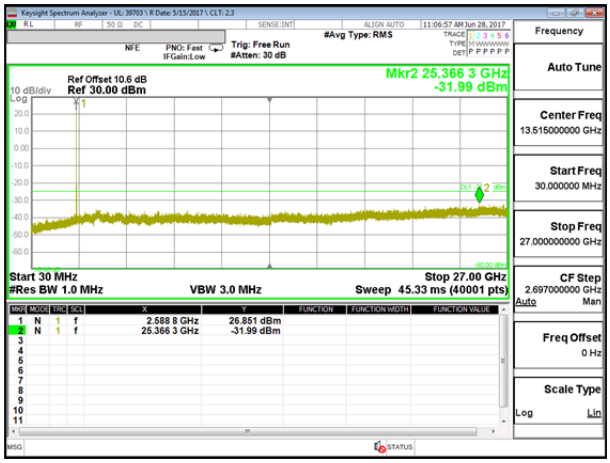
LTE B41 5MHz QPSK Middle Channel



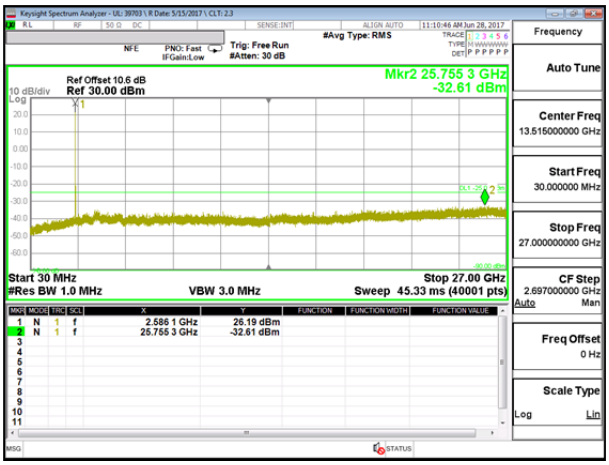
LTE B41 5MHz 16QAM Middle Channel



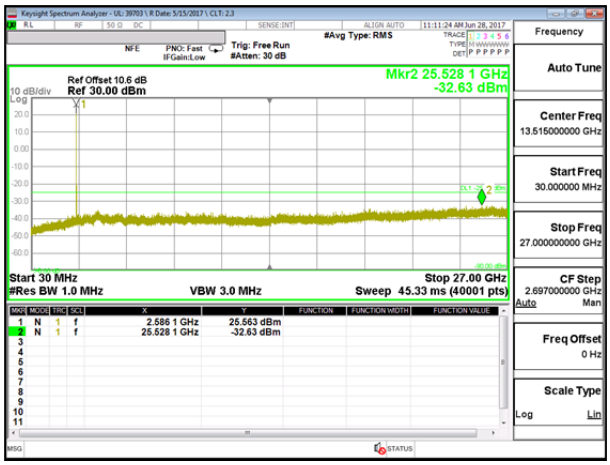
LTE B41 10MHz QPSK Middle Channel



LTE B41 10MHz 16QAM Middle Channel



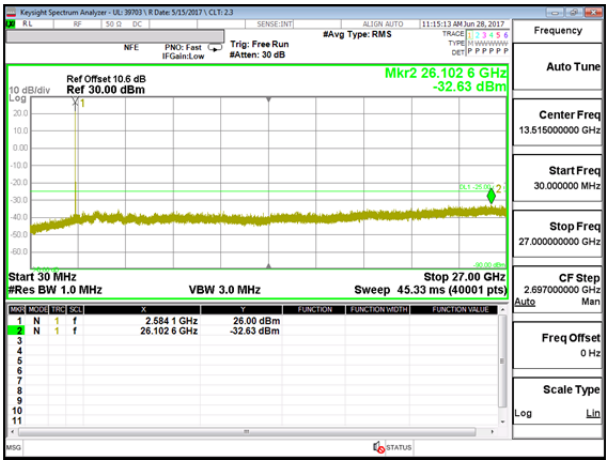
LTE B41 15MHz QPSK Middle Channel



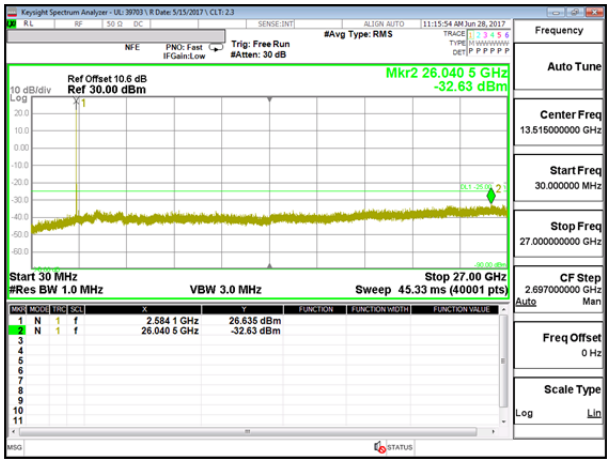
LTE B41 15MHz 16QAM Middle Channel

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.



LTE B41 20MHz QPSK Middle Channel



LTE B41 20MHz 16QAM Middle Channel

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

16. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §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	Oren Stoelting
Date	6/29/17

Note(s):

GSM 850 Band Measured Results
GSM 850 (Frequency range: 824.2-848.8 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) no testing is necessary due to overlapping frequency range.

GSM 1900 Band Measured Results
GSM 1900 (Frequency range: 1850.2-1909.8 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) no testing is necessary due to overlapping frequency range.

WCDMA Band 5 Measured Results
WCDMA Band 5 (Frequency range: 826.4-846.6 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) no testing is necessary due to overlapping frequency range.

WCDMA Band 2 Measured Results
WCDMA Band 2 (Frequency range: 1852.4-1907.6 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) no testing is necessary due to overlapping frequency range.

WCDMA Band 4 Measured Results
WCDMA Band 4 (Frequency range: 1712.4-1752.6 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) no testing is necessary due to overlapping frequency range.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

16.1. FREQUENCY STABILITY RESULTS

GSM1900

Reference Frequency: GSM1900 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	1880.000032	0.003	2.5
3.80	40	1880.000033	0.003	2.5
3.80	30	1880.000036	0.001	2.5
3.80	***20***	**1880.000038**	**0**	***2.5***
3.80	10	1880.000038	0.000	2.5
3.80	0	1880.000040	-0.001	2.5
3.80	-10	1880.000041	-0.002	2.5
3.80	-20	1880.000045	-0.004	2.5
3.80	-30	1880.000027	0.006	2.5

Reference Frequency: GSM1900 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***	***1880.000038***	***0***	***2.5***
4.37	20	1880.000039	*-0.001*	2.5
3.23	20	1880.000047	*-0.005*	2.5

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 4

Reference Frequency: LTE Band 4 Mid Channel		1732.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4331.250	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1732.500016	-0.001	2.5
3.80	40	1732.500014	0.000	2.5
3.80	30	1732.500016	-0.001	2.5
3.80	***20***	**1732.500014**	**0**	***2.5***
3.80	10	1732.500017	-0.002	2.5
3.80	0	1732.500017	-0.002	2.5
3.80	-10	1732.500016	-0.001	2.5
3.80	-20	1732.500015	-0.001	2.5
3.80	-30	1732.500016	-0.001	2.5

Reference Frequency: LTE Band 4 Mid Channel		1732.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4331.250	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1732.500014***	***0***	***2.5***
4.37	20	1732.500012	*0.001*	2.5
3.23	20	1732.500014	*0.000*	2.5

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 5

Reference Frequency: LTE Band 5 Mid Channel		836.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		2091.250	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.499989	0.003	2.5
3.80	40	836.499991	0.001	2.5
3.80	30	836.499991	0.001	2.5
3.80	***20***	**836.499992**	**0**	***2.5***
3.80	10	836.499991	0.001	2.5
3.80	0	836.499993	-0.001	2.5
3.80	-10	836.499996	-0.005	2.5
3.80	-20	836.499991	0.001	2.5
3.80	-30	836.499992	-0.001	2.5

Reference Frequency: LTE Band 5 Mid Channel		836.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		2091.250	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***836.499992***	***0***	***2.5***
4.37	20	836.499991	*0.001*	2.5
3.23	20	836.499990	*0.002*	2.5

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 7

Reference Frequency: LTE Band 7 Mid Channel		2535	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		6337.500	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	2535.000014	0.001	2.5
3.80	40	2535.000016	0.000	2.5
3.80	30	2535.000016	0.000	2.5
3.80	***20***	**2535.000017**	**0**	***2.5***
3.80	10	2535.000015	0.001	2.5
3.80	0	2535.000016	0.000	2.5
3.80	-10	2535.000015	0.001	2.5
3.80	-20	2535.000014	0.001	2.5
3.80	-30	2535.000016	0.000	2.5

Reference Frequency: LTE Band 7 Mid Channel		2535	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		6337.500	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***2535.000017***	***0***	***2.5***
4.37	20	2535.000015	*0.001*	2.5
3.23	20	2535.000015	*0.001*	2.5

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 12

Reference Frequency: LTE Band 12 Mid Channel		707.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		1768.750	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	707.499990	-0.002	2.5
3.80	40	707.499990	-0.003	2.5
3.80	30	707.499989	-0.001	2.5
3.80	***20***	**707.499988**	**0**	***2.5***
3.80	10	707.499991	-0.004	2.5
3.80	0	707.499991	-0.004	2.5
3.80	-10	707.499992	-0.005	2.5
3.80	-20	707.499991	-0.003	2.5
3.80	-30	707.499990	-0.002	2.5

Reference Frequency: LTE Band 12 Mid Channel		707.5	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		1768.750	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***707.499988***	***0***	***2.5***
4.37	20	707.499988	*0.001*	2.5
3.23	20	707.499989	*-0.001*	2.5

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 13

Reference Frequency: LTE Band 13 Mid Channel		782	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		1955.000	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	781.999987	0.007	2.5
3.80	40	781.999990	0.003	2.5
3.80	30	781.999990	0.004	2.5
3.80	***20***	**781.999992**	**0**	***2.5***
3.80	10	781.999991	0.001	2.5
3.80	0	781.999994	-0.001	2.5
3.80	-10	781.999994	-0.002	2.5
3.80	-20	781.999991	0.001	2.5
3.80	-30	781.999988	0.006	2.5

Reference Frequency: LTE Band 13 Mid Channel		782	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		1955.000	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***781.999992***	***0***	***2.5***
4.37	20	781.999994	*-0.001*	2.5
3.23	20	781.999993	*0.000*	2.5

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 41

Reference Frequency: LTE Band 41 Mid Channel		2593	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		6482.500	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	2593.000016	0.000	2.5
3.80	40	2593.000014	0.000	2.5
3.80	30	2593.000013	0.000	2.5
3.80	***20***	**2593.000014**	**0**	***2.5***
3.80	10	2593.000016	-0.001	2.5
3.80	0	2593.000015	0.000	2.5
3.80	-10	2593.000015	0.000	2.5
3.80	-20	2593.000015	0.000	2.5
3.80	-30	2593.000016	-0.001	2.5

Reference Frequency: LTE Band 41 Mid Channel		2593	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		6482.500	Hz	
Power Supply	Environment	Frequency Deviation Measured with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***2593.000014***	***0***	***2.5***
4.37	20	2593.000016	*-0.001*	2.5
3.23	20	2593.000015	*0.000*	2.5

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

17. RADIATED TEST RESULTS

17.1. 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.

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

17.1.1. SPURIOUS RADIATION PLOTS

GSM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger
Location: Chamber C
Mode: GPRS 850 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, 824.2									
1648.40	-25.0	V	3.0	37.0	1.0	-61.1	-13.0	48.1	
2472.60	-22.0	V	3.0	36.4	1.0	-57.4	-13.0	44.4	
3296.80	-21.6	V	3.0	36.2	1.0	-56.7	-13.0	43.7	
1648.40	-25.8	H	3.0	37.0	1.0	-61.8	-13.0	48.8	
2472.60	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	47.4	
3296.80	-21.6	H	3.0	36.2	1.0	-56.7	-13.0	43.7	
Mid Ch, 836.6									
1673.20	-24.9	V	3.0	37.0	1.0	-60.9	-13.0	47.9	
2509.80	-22.3	V	3.0	36.4	1.0	-57.7	-13.0	44.7	
3346.40	-21.7	V	3.0	36.1	1.0	-56.8	-13.0	43.8	
1673.20	-25.8	H	3.0	37.0	1.0	-61.8	-13.0	48.8	
2509.80	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	47.4	
3346.40	-21.6	H	3.0	36.1	1.0	-56.7	-13.0	43.7	
High Ch, 848.8									
1697.60	-24.5	V	3.0	37.0	1.0	-60.4	-13.0	47.4	
2546.40	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	44.3	
3395.20	-21.5	V	3.0	36.1	1.0	-56.5	-13.0	43.5	
1697.60	-25.4	H	3.0	37.0	1.0	-61.4	-13.0	48.4	
2546.40	-24.9	H	3.0	36.4	1.0	-60.3	-13.0	47.3	
3395.20	-21.4	H	3.0	36.1	1.0	-56.5	-13.0	43.5	

GSM850 GPRS

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/5/2017
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)	EIRP (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 #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger
Location: Chamber C
Mode: GPRS 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	-16.3	V	3.0	35.9	1.0	-51.2	-13.0	38.2	
5550.60	-12.1	V	3.0	35.5	1.0	-46.6	-13.0	33.6	
7400.80	-12.3	V	3.0	35.7	1.0	-47.1	-13.0	34.1	
3700.40	-17.1	H	3.0	35.9	1.0	-51.9	-13.0	38.9	
5550.60	-11.7	H	3.0	35.5	1.0	-46.2	-13.0	33.2	
7400.80	-11.5	H	3.0	35.7	1.0	-46.2	-13.0	33.2	
Mid Ch, 1880									
3760.00	-16.5	V	3.0	35.8	1.0	-51.3	-13.0	38.3	
5640.00	-12.0	V	3.0	35.5	1.0	-46.5	-13.0	33.5	
7520.00	-12.2	V	3.0	35.7	1.0	-46.9	-13.0	33.9	
3760.00	-17.0	H	3.0	35.8	1.0	-51.8	-13.0	38.8	
5640.00	-12.1	H	3.0	35.5	1.0	-46.5	-13.0	33.5	
7520.00	-11.2	H	3.0	35.7	1.0	-46.0	-13.0	33.0	
High Ch, 1909.8									
3819.60	-16.1	V	3.0	35.8	1.0	-50.9	-13.0	-37.9	
5729.40	-12.0	V	3.0	35.5	1.0	-46.5	-13.0	33.5	
7639.20	-12.1	V	3.0	35.8	1.0	-46.9	-13.0	-33.9	
3819.60	-16.8	H	3.0	35.8	1.0	-51.5	-13.0	38.5	
5729.40	-11.6	H	3.0	35.5	1.0	-46.1	-13.0	33.1	
7639.20	-10.9	H	3.0	35.8	1.0	-45.7	-13.0	32.7	

GSM1900 GPRS

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

WCDMA

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: Rel99 Band 5 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, 826.4									
1652.80	-24.8	V	3.0	37.0	1.0	-60.9	-13.0	-47.9	
2479.20	-23.5	V	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3305.60	-21.2	V	3.0	36.1	1.0	-56.3	-13.0	-43.3	
1652.80	-25.6	H	3.0	37.0	1.0	-61.6	-13.0	-48.6	
2479.20	-24.8	H	3.0	36.4	1.0	-60.2	-13.0	-47.2	
3305.60	-18.7	H	3.0	36.1	1.0	-53.9	-13.0	-40.9	
Mid Ch, 836.6									
1673.20	-24.9	V	3.0	37.0	1.0	-60.9	-13.0	-47.9	
2509.80	-23.4	V	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3346.40	-21.1	V	3.0	36.1	1.0	-56.2	-13.0	-43.2	
1673.20	-25.5	H	3.0	37.0	1.0	-61.5	-13.0	-48.5	
2509.80	-24.6	H	3.0	36.4	1.0	-60.0	-13.0	-47.0	
3346.40	-21.7	H	3.0	36.1	1.0	-56.8	-13.0	-43.8	
High Ch, 846.6									
1693.20	-24.8	V	3.0	37.0	1.0	-60.7	-13.0	-47.7	
2539.80	-23.4	V	3.0	36.4	1.0	-58.8	-13.0	-45.8	
3386.40	-20.6	V	3.0	36.1	1.0	-55.7	-13.0	-42.7	
1693.20	-25.1	H	3.0	37.0	1.0	-61.1	-13.0	-48.1	
2539.80	-24.2	H	3.0	36.4	1.0	-59.6	-13.0	-46.6	
3386.40	-21.8	H	3.0	36.1	1.0	-56.9	-13.0	-43.9	

B5 REL99

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: HSDPA Band 5 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, 826.4									
1652.80	-25.8	V	3.0	37.0	1.0	-61.9	-13.0	-48.9	
2479.20	-23.4	V	3.0	36.4	1.0	-58.8	-13.0	-45.8	
3305.60	-21.4	V	3.0	36.1	1.0	-56.5	-13.0	-43.5	
1652.80	-26.0	H	3.0	37.0	1.0	-62.1	-13.0	-49.1	
2479.20	-23.8	H	3.0	36.4	1.0	-59.2	-13.0	-46.2	
3305.60	-21.8	H	3.0	36.1	1.0	-56.9	-13.0	-43.9	
Mid Ch, 836.6									
1673.20	-25.7	V	3.0	37.0	1.0	-61.7	-13.0	-48.7	
2509.80	-23.4	V	3.0	36.4	1.0	-58.8	-13.0	-45.8	
3346.40	-21.3	V	3.0	36.1	1.0	-56.4	-13.0	-43.4	
1673.20	-26.1	H	3.0	37.0	1.0	-62.1	-13.0	-49.1	
2509.80	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
3346.40	-21.5	H	3.0	36.1	1.0	-56.6	-13.0	-43.6	
High Ch, 846.6									
1693.20	-25.1	V	3.0	37.0	1.0	-61.1	-13.0	-48.1	
2539.80	-23.2	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
3386.40	-21.0	V	3.0	36.1	1.0	-56.1	-13.0	-43.1	
1693.20	99.8	H	3.0	37.0	1.0	63.9	-13.0	76.9	
2539.80	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
3386.40	-18.7	H	3.0	36.1	1.0	-53.8	-13.0	-40.8	

B5 HSDPA

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 4

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1710.7MHz									
3421.40	-18.6	V	3.0	36.1	1.0	-53.7	-13.0	-40.7	
5132.10	-15.2	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6842.80	-13.8	V	3.0	35.7	1.0	-48.4	-13.0	-35.4	
3421.40	-19.3	H	3.0	36.1	1.0	-54.3	-13.0	-41.3	
5132.10	-14.6	H	3.0	35.4	1.0	-49.1	-13.0	-36.1	
6842.80	-12.6	H	3.0	35.7	1.0	-47.3	-13.0	-34.3	
Mid Ch, 1732.5MHz									
3465.00	-18.5	V	3.0	36.0	1.0	-53.5	-13.0	-40.5	
5197.50	-15.0	V	3.0	35.4	1.0	-49.4	-13.0	-36.4	
6930.00	-13.1	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
3465.00	-18.8	H	3.0	36.0	1.0	-53.8	-13.0	-40.8	
5197.50	-14.9	H	3.0	35.4	1.0	-49.3	-13.0	-36.3	
6930.00	-13.0	H	3.0	35.7	1.0	-47.7	-13.0	-34.7	
High Ch, 1754.3MHz									
3508.60	-19.1	V	3.0	36.0	1.0	-54.1	-13.0	-41.1	
5262.90	-13.6	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
7017.20	-14.3	V	3.0	35.7	1.0	-49.0	-13.0	-36.0	
3508.60	-19.5	H	3.0	36.0	1.0	-54.5	-13.0	-41.5	
5262.90	-15.2	H	3.0	35.4	1.0	-49.7	-13.0	-36.7	
7017.20	-13.8	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	

LTE B4 1.4MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1710.7MHz									
3421.40	-18.9	V	3.0	36.1	1.0	-54.0	-13.0	-41.0	
5132.10	-14.6	V	3.0	35.4	1.0	-49.0	-13.0	-36.0	
6842.80	-14.4	V	3.0	35.7	1.0	-49.1	-13.0	-36.1	
3421.40	-19.2	H	3.0	36.1	1.0	-54.3	-13.0	-41.3	
5132.10	-14.7	H	3.0	35.4	1.0	-49.1	-13.0	-36.1	
6842.80	-12.4	H	3.0	35.7	1.0	-47.0	-13.0	-34.0	
Mid Ch, 1732.5MHz									
3465.00	-18.6	V	3.0	36.0	1.0	-53.7	-13.0	-40.7	
5197.50	-14.1	V	3.0	35.4	1.0	-48.5	-13.0	-35.5	
6930.00	-14.5	V	3.0	35.7	1.0	-49.2	-13.0	-36.2	
3465.00	-18.9	H	3.0	36.0	1.0	-54.0	-13.0	-41.0	
5197.50	-14.5	H	3.0	35.4	1.0	-48.9	-13.0	-35.9	
6930.00	-13.1	H	3.0	35.7	1.0	-47.7	-13.0	-34.7	
High Ch, 1754.3MHz									
3508.60	-19.0	V	3.0	36.0	1.0	-54.0	-13.0	-41.0	
5262.90	-16.0	V	3.0	35.4	1.0	-50.4	-13.0	-37.4	
7017.20	-14.9	V	3.0	35.7	1.0	-49.5	-13.0	-36.5	
3508.60	-19.1	H	3.0	36.0	1.0	-54.1	-13.0	-41.1	
5262.90	-14.8	H	3.0	35.4	1.0	-49.3	-13.0	-36.3	
7017.20	-13.6	H	3.0	35.7	1.0	-48.2	-13.0	-35.2	

LTE B4 1.4MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1711.5MHz									
3423.00	-18.9	V	3.0	36.1	1.0	-53.9	-13.0	-40.9	
5134.50	-15.8	V	3.0	35.4	1.0	-50.2	-13.0	-37.2	
6846.00	-14.2	V	3.0	35.7	1.0	-48.9	-13.0	-35.9	
3423.00	-18.7	H	3.0	36.1	1.0	-53.8	-13.0	-40.8	
5134.50	-14.2	H	3.0	35.4	1.0	-48.7	-13.0	-35.7	
6846.00	-12.8	H	3.0	35.7	1.0	-47.4	-13.0	-34.4	
Mid Ch, 1732.5MHz									
3465.00	-18.2	V	3.0	36.0	1.0	-53.2	-13.0	-40.2	
5197.50	-15.1	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6930.00	-14.5	V	3.0	35.7	1.0	-49.1	-13.0	-36.1	
3465.00	-17.9	H	3.0	36.0	1.0	-53.0	-13.0	-40.0	
5197.50	-15.0	H	3.0	35.4	1.0	-49.5	-13.0	-36.5	
6930.00	-13.4	H	3.0	35.7	1.0	-48.1	-13.0	-35.1	
High Ch, 1753.5MHz									
3507.00	-18.8	V	3.0	36.0	1.0	-53.8	-13.0	-40.8	
5260.50	-16.1	V	3.0	35.4	1.0	-50.5	-13.0	-37.5	
7014.00	-14.9	V	3.0	35.7	1.0	-49.6	-13.0	-36.6	
3507.00	-19.4	H	3.0	36.0	1.0	-54.4	-13.0	-41.4	
5260.50	-14.6	H	3.0	35.4	1.0	-49.0	-13.0	-36.0	
7014.00	-14.1	H	3.0	35.7	1.0	-48.7	-13.0	-35.7	

LTE B4 3MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1711.5MHz									
3423.00	-19.2	V	3.0	36.1	1.0	-54.2	-13.0	-41.2	
5134.50	-15.3	V	3.0	35.4	1.0	-49.7	-13.0	-36.7	
6846.00	-14.1	V	3.0	35.7	1.0	-48.7	-13.0	-35.7	
3423.00	-19.2	H	3.0	36.1	1.0	-54.3	-13.0	-41.3	
5134.50	-14.6	H	3.0	35.4	1.0	-49.0	-13.0	-36.0	
6846.00	-13.3	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1732.5MHz									
3465.00	-18.4	V	3.0	36.0	1.0	-53.4	-13.0	-40.4	
5197.50	-15.1	V	3.0	35.4	1.0	-49.5	-13.0	-36.5	
6930.00	-14.7	V	3.0	35.7	1.0	-49.4	-13.0	-36.4	
3465.00	-18.3	H	3.0	36.0	1.0	-53.4	-13.0	-40.4	
5197.50	-15.1	H	3.0	35.4	1.0	-49.5	-13.0	-36.5	
6930.00	-13.4	H	3.0	35.7	1.0	-48.1	-13.0	-35.1	
High Ch, 1753.5MHz									
3507.00	-18.7	V	3.0	36.0	1.0	-53.7	-13.0	-40.7	
5260.50	-13.5	V	3.0	35.4	1.0	-47.9	-13.0	-34.9	
7014.00	-15.1	V	3.0	35.7	1.0	-49.8	-13.0	-36.8	
3507.00	-19.2	H	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5260.50	-15.8	H	3.0	35.4	1.0	-50.3	-13.0	-37.3	
7014.00	-12.7	H	3.0	35.7	1.0	-47.3	-13.0	-34.3	

LTE B4 3MHz 16QAM

Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1712.5MHz									
3425.00	-19.0	V	3.0	36.1	1.0	-54.1	-13.0	-41.1	
5137.50	-15.1	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6850.00	-14.1	V	3.0	35.7	1.0	-48.7	-13.0	-35.7	
3425.00	-19.2	H	3.0	36.1	1.0	-54.2	-13.0	-41.2	
5137.50	-14.6	H	3.0	35.4	1.0	-49.1	-13.0	-36.1	
6850.00	-13.1	H	3.0	35.7	1.0	-47.8	-13.0	-34.8	
Mid Ch, 1732.5MHz									
3465.00	-18.9	V	3.0	36.0	1.0	-53.9	-13.0	-40.9	
5197.50	-15.8	V	3.0	35.4	1.0	-50.3	-13.0	-37.3	
6930.00	-14.3	V	3.0	35.7	1.0	-49.0	-13.0	-36.0	
3465.00	-19.1	H	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5197.50	-15.4	H	3.0	35.4	1.0	-49.8	-13.0	-36.8	
6930.00	-13.5	H	3.0	35.7	1.0	-48.2	-13.0	-35.2	
High Ch, 1752.5MHz									
3505.00	-18.6	V	3.0	36.0	1.0	-53.6	-13.0	-40.6	
5257.50	-15.9	V	3.0	35.4	1.0	-50.3	-13.0	-37.3	
7010.00	-14.7	V	3.0	35.7	1.0	-49.4	-13.0	-36.4	
3505.00	-18.8	H	3.0	36.0	1.0	-53.8	-13.0	-40.8	
5257.50	-14.6	H	3.0	35.4	1.0	-49.0	-13.0	-36.0	
7010.00	-13.3	H	3.0	35.7	1.0	-48.0	-13.0	-35.0	

LTE B4 5MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1712.5MHz									
3425.00	-18.6	V	3.0	36.1	1.0	-53.7	-13.0	-40.7	
5137.50	-15.1	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6850.00	-14.6	V	3.0	35.7	1.0	-49.2	-13.0	-36.2	
3425.00	-18.9	H	3.0	36.1	1.0	-54.0	-13.0	-41.0	
5137.50	-14.2	H	3.0	35.4	1.0	-48.6	-13.0	-35.6	
6850.00	-12.8	H	3.0	35.7	1.0	-47.5	-13.0	-34.5	
Mid Ch, 1732.5MHz									
3465.00	-18.3	V	3.0	36.0	1.0	-53.3	-13.0	-40.3	
5197.50	-15.4	V	3.0	35.4	1.0	-49.9	-13.0	-36.9	
6930.00	-14.5	V	3.0	35.7	1.0	-49.1	-13.0	-36.1	
3465.00	-19.2	H	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5197.50	-14.0	H	3.0	35.4	1.0	-48.5	-13.0	-35.5	
6930.00	-13.8	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	
High Ch, 1752.5MHz									
3505.00	-18.4	V	3.0	36.0	1.0	-53.5	-13.0	-40.5	
5257.50	-16.0	V	3.0	35.4	1.0	-50.5	-13.0	-37.5	
7010.00	-14.1	V	3.0	35.7	1.0	-48.8	-13.0	-35.8	
3505.00	-19.4	H	3.0	36.0	1.0	-54.4	-13.0	-41.4	
5257.50	-15.9	H	3.0	35.4	1.0	-50.4	-13.0	-37.4	
7010.00	-14.2	H	3.0	35.7	1.0	-48.9	-13.0	-35.9	

LTE B4 5MHz 16QAM

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1715MHz									
3430.00	-19.2	V	3.0	36.1	1.0	-54.2	-13.0	-41.2	
5145.00	-15.4	V	3.0	35.4	1.0	-49.8	-13.0	-36.8	
6860.00	-13.9	V	3.0	35.7	1.0	-48.6	-13.0	-35.6	
3430.00	-19.3	H	3.0	36.1	1.0	-54.4	-13.0	-41.4	
5145.00	-13.7	H	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6860.00	-13.0	H	3.0	35.7	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1732.5MHz									
3465.00	-18.7	V	3.0	36.0	1.0	-53.8	-13.0	-40.8	
5197.50	-15.8	V	3.0	35.4	1.0	-50.2	-13.0	-37.2	
6930.00	-14.2	V	3.0	35.7	1.0	-48.9	-13.0	-35.9	
3465.00	-18.8	H	3.0	36.0	1.0	-53.9	-13.0	-40.9	
5197.50	-13.5	H	3.0	35.4	1.0	-47.9	-13.0	-34.9	
6930.00	-13.5	H	3.0	35.7	1.0	-48.2	-13.0	-35.2	
High Ch, 1750MHz									
3500.00	-18.6	V	3.0	36.0	1.0	-53.6	-13.0	-40.6	
5250.00	-15.0	V	3.0	35.4	1.0	-49.5	-13.0	-36.5	
7000.00	-14.6	V	3.0	35.7	1.0	-49.3	-13.0	-36.3	
3500.00	-18.9	H	3.0	36.0	1.0	-53.9	-13.0	-40.9	
5250.00	-14.5	H	3.0	35.4	1.0	-48.9	-13.0	-35.9	
7000.00	-13.3	H	3.0	35.7	1.0	-48.0	-13.0	-35.0	

LTE B4 10MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1715MHz									
3430.00	-18.9	V	3.0	36.1	1.0	-53.9	-13.0	-40.9	
5145.00	-15.6	V	3.0	35.4	1.0	-50.0	-13.0	-37.0	
6860.00	-14.4	V	3.0	35.7	1.0	-49.1	-13.0	-36.1	
3430.00	-18.9	H	3.0	36.1	1.0	-53.9	-13.0	-40.9	
5145.00	-13.7	H	3.0	35.4	1.0	-48.2	-13.0	-35.2	
6860.00	-13.0	H	3.0	35.7	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1732.5MHz									
3465.00	-18.6	V	3.0	36.0	1.0	-53.6	-13.0	-40.6	
5197.50	-15.3	V	3.0	35.4	1.0	-49.7	-13.0	-36.7	
6930.00	-14.4	V	3.0	35.7	1.0	-49.1	-13.0	-36.1	
3465.00	-18.5	H	3.0	36.0	1.0	-53.5	-13.0	-40.5	
5197.50	-14.2	H	3.0	35.4	1.0	-48.6	-13.0	-35.6	
6930.00	-13.8	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	
High Ch, 1750MHz									
3500.00	-18.7	V	3.0	36.0	1.0	-53.7	-13.0	-40.7	
5250.00	-16.6	V	3.0	35.4	1.0	-51.1	-13.0	-38.1	
7000.00	-15.0	V	3.0	35.7	1.0	-49.6	-13.0	-36.6	
3500.00	-19.1	H	3.0	36.0	1.0	-54.1	-13.0	-41.1	
5250.00	-13.4	H	3.0	35.4	1.0	-47.9	-13.0	-34.9	
7000.00	-13.9	H	3.0	35.7	1.0	-48.6	-13.0	-35.6	

LTE B4 10MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1717.5MHz									
3435.00	-19.0	V	3.0	36.1	1.0	-54.0	-13.0	-41.0	
5152.50	-15.4	V	3.0	35.4	1.0	-49.8	-13.0	-36.8	
6870.00	-13.6	V	3.0	35.7	1.0	-48.3	-13.0	-35.3	
3435.00	-18.6	H	3.0	36.1	1.0	-53.6	-13.0	-40.6	
5152.50	-13.7	H	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6870.00	-13.3	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1732.5MHz									
3465.00	-18.9	V	3.0	36.0	1.0	-54.0	-13.0	-41.0	
5197.50	-15.5	V	3.0	35.4	1.0	-49.9	-13.0	-36.9	
6930.00	-14.6	V	3.0	35.7	1.0	-49.3	-13.0	-36.3	
3465.00	-18.6	H	3.0	36.0	1.0	-53.7	-13.0	-40.7	
5197.50	-10.8	H	3.0	35.4	1.0	-45.2	-13.0	-32.2	
6930.00	-13.9	H	3.0	35.7	1.0	-48.6	-13.0	-35.6	
High Ch, 1747.5MHz									
3495.00	-19.2	V	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5242.50	-15.2	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6990.00	-14.2	V	3.0	35.7	1.0	-48.9	-13.0	-35.9	
3495.00	-18.9	H	3.0	36.0	1.0	-53.9	-13.0	-40.9	
5242.50	-14.7	H	3.0	35.4	1.0	-49.1	-13.0	-36.1	
6990.00	-13.6	H	3.0	35.7	1.0	-48.3	-13.0	-35.3	

LTE B4 15MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 1717.5MHz									
3435.00	-18.9	V	3.0	36.1	1.0	-54.0	-13.0	-41.0	
5152.50	-15.1	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6870.00	-13.0	V	3.0	35.7	1.0	-47.6	-13.0	-34.6	
3435.00	-18.7	H	3.0	36.1	1.0	-53.8	-13.0	-40.8	
5152.50	-14.4	H	3.0	35.4	1.0	-48.8	-13.0	-35.8	
6870.00	-12.4	H	3.0	35.7	1.0	-47.1	-13.0	-34.1	
Mid Ch, 1732.5MHz									
3465.00	-18.4	V	3.0	36.0	1.0	-53.4	-13.0	-40.4	
5197.50	-16.3	V	3.0	35.4	1.0	-50.7	-13.0	-37.7	
6930.00	-14.9	V	3.0	35.7	1.0	-49.6	-13.0	-36.6	
3465.00	-18.2	H	3.0	36.0	1.0	-53.3	-13.0	-40.3	
5197.50	-14.6	H	3.0	35.4	1.0	-49.1	-13.0	-36.1	
6930.00	-13.1	H	3.0	35.7	1.0	-47.8	-13.0	-34.8	
High Ch, 1747.5MHz									
3495.00	-18.5	V	3.0	36.0	1.0	-53.5	-13.0	-40.5	
5242.50	-16.1	V	3.0	35.4	1.0	-50.5	-13.0	-37.5	
6990.00	-14.7	V	3.0	35.7	1.0	-49.4	-13.0	-36.4	
3495.00	-18.7	H	3.0	36.0	1.0	-53.7	-13.0	-40.7	
5242.50	-13.2	H	3.0	35.4	1.0	-47.6	-13.0	-34.6	
6990.00	-13.9	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	

LTE B4 15MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
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, 1720MHz									
3440.00	-19.2	V	3.0	36.0	1.0	-54.2	-13.0	-41.2	
5160.00	-15.2	V	3.0	35.4	1.0	-49.7	-13.0	-36.7	
6880.00	-13.9	V	3.0	35.7	1.0	-48.6	-13.0	-35.6	
3440.00	-19.0	H	3.0	36.0	1.0	-54.0	-13.0	-41.0	
5160.00	-15.0	H	3.0	35.4	1.0	-49.4	-13.0	-36.4	
6880.00	-13.2	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1732.5MHz									
3465.00	-18.6	V	3.0	36.0	1.0	-53.6	-13.0	-40.6	
5197.50	-15.1	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6930.00	-14.6	V	3.0	35.7	1.0	-49.3	-13.0	-36.3	
3465.00	-18.9	H	3.0	36.0	1.0	-53.9	-13.0	-40.9	
5197.50	-14.6	H	3.0	35.4	1.0	-49.0	-13.0	-36.0	
6930.00	-12.9	H	3.0	35.7	1.0	-47.6	-13.0	-34.6	
High Ch, 1745MHz									
3490.00	-18.7	V	3.0	36.0	1.0	-53.7	-13.0	-40.7	
5235.00	-14.9	V	3.0	35.4	1.0	-49.3	-13.0	-36.3	
6980.00	-14.6	V	3.0	35.7	1.0	-49.3	-13.0	-36.3	
3490.00	-17.8	H	3.0	36.0	1.0	-52.8	-13.0	-39.8	
5235.00	-14.8	H	3.0	35.4	1.0	-49.3	-13.0	-36.3	
6980.00	-14.2	H	3.0	35.7	1.0	-48.9	-13.0	-35.9	

LTE B4 20MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
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, 1720MHz									
3440.00	-18.6	V	3.0	36.0	1.0	-53.7	-13.0	-40.7	
5160.00	-15.5	V	3.0	35.4	1.0	-49.9	-13.0	-36.9	
6880.00	-14.5	V	3.0	35.7	1.0	-49.2	-13.0	-36.2	
3440.00	-18.8	H	3.0	36.0	1.0	-53.8	-13.0	-40.8	
5160.00	-14.7	H	3.0	35.4	1.0	-49.1	-13.0	-36.1	
6880.00	-12.8	H	3.0	35.7	1.0	-47.5	-13.0	-34.5	
Mid Ch, 1732.5MHz									
3465.00	-18.3	V	3.0	36.0	1.0	-53.3	-13.0	-40.3	
5197.50	-15.2	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
6930.00	-14.6	V	3.0	35.7	1.0	-49.3	-13.0	-36.3	
3465.00	-17.9	H	3.0	36.0	1.0	-52.9	-13.0	-39.9	
5197.50	-15.6	H	3.0	35.4	1.0	-50.1	-13.0	-37.1	
6930.00	-12.4	H	3.0	35.7	1.0	-47.1	-13.0	-34.1	
High Ch, 1745MHz									
3490.00	-18.4	V	3.0	36.0	1.0	-53.5	-13.0	-40.5	
5235.00	-15.5	V	3.0	35.4	1.0	-50.0	-13.0	-37.0	
6980.00	-14.5	V	3.0	35.7	1.0	-49.1	-13.0	-36.1	
3490.00	-18.8	H	3.0	36.0	1.0	-53.8	-13.0	-40.8	
5235.00	-15.0	H	3.0	35.4	1.0	-49.5	-13.0	-36.5	
6980.00	-14.0	H	3.0	35.7	1.0	-48.7	-13.0	-35.7	

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 5

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 5 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, 824.7									
1649.40	-25.3	V	3.0	36.4	1.0	-60.6	-13.0	-47.6	
2474.10	-25.1	V	3.0	35.0	1.0	-59.1	-13.0	-46.1	
3298.80	-22.1	V	3.0	34.3	1.0	-55.4	-13.0	-42.4	
1649.40	-25.9	H	3.0	36.4	1.0	-61.3	-13.0	-48.3	
2474.10	-24.6	H	3.0	35.0	1.0	-58.5	-13.0	-45.5	
3298.80	-22.5	H	3.0	34.3	1.0	-55.8	-13.0	-42.8	
Mid Ch, 836.5									
1673.00	-24.9	V	3.0	36.3	1.0	-60.3	-13.0	-47.3	
2509.50	-24.7	V	3.0	34.9	1.0	-58.6	-13.0	-45.6	
3346.00	-22.3	V	3.0	34.2	1.0	-55.6	-13.0	-42.6	
1673.00	-25.2	H	3.0	36.3	1.0	-60.5	-13.0	-47.5	
2509.50	-24.3	H	3.0	34.9	1.0	-58.2	-13.0	-45.2	
3346.00	-23.1	H	3.0	34.2	1.0	-56.3	-13.0	-43.3	
High Ch, 848.3									
1696.60	-24.7	V	3.0	36.3	1.0	-60.0	-13.0	-47.0	
2544.90	-24.8	V	3.0	34.9	1.0	-58.7	-13.0	-45.7	
3393.20	-22.0	V	3.0	34.2	1.0	-55.1	-13.0	-42.1	
1696.60	-25.2	H	3.0	36.3	1.0	-60.5	-13.0	-47.5	
2544.90	-24.3	H	3.0	34.9	1.0	-58.2	-13.0	-45.2	
3393.20	-22.3	H	3.0	34.2	1.0	-55.4	-13.0	-42.4	

LTE B5 1.4MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 5 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, 824.7									
1649.40	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
2474.10	-25.2	V	3.0	35.0	1.0	-59.2	-13.0	-46.2	
3298.80	-22.3	V	3.0	34.3	1.0	-55.6	-13.0	-42.6	
1649.40	-25.7	H	3.0	36.4	1.0	-61.0	-13.0	-48.0	
2474.10	-24.7	H	3.0	35.0	1.0	-58.7	-13.0	-45.7	
3298.80	-22.6	H	3.0	34.3	1.0	-55.8	-13.0	-42.8	
Mid Ch, 836.5									
1673.00	-25.2	V	3.0	36.3	1.0	-60.5	-13.0	-47.5	
2509.50	-24.7	V	3.0	34.9	1.0	-58.7	-13.0	-45.7	
3346.00	-22.7	V	3.0	34.2	1.0	-56.0	-13.0	-43.0	
1673.00	-26.0	H	3.0	36.3	1.0	-61.3	-13.0	-48.3	
2509.50	-24.3	H	3.0	34.9	1.0	-58.2	-13.0	-45.2	
3346.00	-22.8	H	3.0	34.2	1.0	-56.1	-13.0	-43.1	
High Ch, 848.3									
1696.60	-24.8	V	3.0	36.3	1.0	-60.1	-13.0	-47.1	
2544.90	-25.0	V	3.0	34.9	1.0	-58.9	-13.0	-45.9	
3393.20	-22.1	V	3.0	34.2	1.0	-55.3	-13.0	-42.3	
1696.60	-25.4	H	3.0	36.3	1.0	-60.7	-13.0	-47.7	
2544.90	-24.5	H	3.0	34.9	1.0	-58.4	-13.0	-45.4	
3393.20	-22.4	H	3.0	34.2	1.0	-55.6	-13.0	-42.6	

LTE B5 1.4MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 5 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, 825.5									
1651.00	-25.3	V	3.0	36.4	1.0	-60.6	-13.0	-47.6	
2476.50	-24.5	V	3.0	35.0	1.0	-58.4	-13.0	-45.4	
3302.00	-22.2	V	3.0	34.3	1.0	-55.5	-13.0	-42.5	
1651.00	-25.5	H	3.0	36.4	1.0	-60.9	-13.0	-47.9	
2476.50	-24.0	H	3.0	35.0	1.0	-58.0	-13.0	-45.0	
3302.00	-23.0	H	3.0	34.3	1.0	-56.3	-13.0	-43.3	
Mid Ch, 836.5									
1673.00	-25.0	V	3.0	36.3	1.0	-60.3	-13.0	-47.3	
2509.50	-24.5	V	3.0	34.9	1.0	-58.4	-13.0	-45.4	
3346.00	-22.0	V	3.0	34.2	1.0	-55.3	-13.0	-42.3	
1673.00	-25.2	H	3.0	36.3	1.0	-60.5	-13.0	-47.5	
2509.50	-24.0	H	3.0	34.9	1.0	-58.0	-13.0	-45.0	
3346.00	-22.8	H	3.0	34.2	1.0	-56.1	-13.0	-43.1	
High Ch, 847.5									
1695.00	-24.6	V	3.0	36.3	1.0	-59.9	-13.0	-46.9	
2542.50	-24.3	V	3.0	34.9	1.0	-58.2	-13.0	-45.2	
3390.00	-22.0	V	3.0	34.2	1.0	-55.2	-13.0	-42.2	
1695.00	-25.0	H	3.0	36.3	1.0	-60.3	-13.0	-47.3	
2542.50	-24.0	H	3.0	34.9	1.0	-57.9	-13.0	-44.9	
3390.00	-22.8	H	3.0	34.2	1.0	-56.0	-13.0	43.0	

LTE B5 3MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 5 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, 825.5									
1651.00	-25.4	V	3.0	36.4	1.0	-60.8	-13.0	-47.8	
2476.50	-24.6	V	3.0	35.0	1.0	-58.5	-13.0	-45.5	
3302.00	-22.4	V	3.0	34.3	1.0	-55.7	-13.0	-42.7	
1651.00	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
2476.50	-24.2	H	3.0	35.0	1.0	-58.1	-13.0	-45.1	
3302.00	-22.9	H	3.0	34.3	1.0	-56.2	-13.0	-43.2	
Mid Ch, 836.5									
1673.00	-25.4	V	3.0	36.3	1.0	-60.7	-13.0	-47.7	
2509.50	-24.8	V	3.0	34.9	1.0	-58.7	-13.0	-45.7	
3346.00	-22.1	V	3.0	34.2	1.0	-55.4	-13.0	-42.4	
1673.00	-25.1	H	3.0	36.3	1.0	-60.4	-13.0	-47.4	
2509.50	-24.2	H	3.0	34.9	1.0	-58.2	-13.0	-45.2	
3346.00	-23.0	H	3.0	34.2	1.0	-56.2	-13.0	-43.2	
High Ch, 847.5									
1695.00	-24.8	V	3.0	36.3	1.0	-60.1	-13.0	-47.1	
2542.50	-24.4	V	3.0	34.9	1.0	-58.3	-13.0	-45.3	
3390.00	-22.3	V	3.0	34.2	1.0	-55.5	-13.0	-42.5	
1695.00	-24.9	H	3.0	36.3	1.0	-60.2	-13.0	-47.2	
2542.50	-23.9	H	3.0	34.9	1.0	-57.8	-13.0	-44.8	
3390.00	-22.9	H	3.0	34.2	1.0	-56.1	-13.0	-43.1	

LTE B5 3MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 5 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, 826.5									
1653.00	-24.6	V	3.0	36.4	1.0	-59.9	-13.0	-46.9	
2479.50	-23.5	V	3.0	35.0	1.0	-57.5	-13.0	-44.5	
3306.00	-22.7	V	3.0	34.3	1.0	-55.9	-13.0	-42.9	
1653.00	-25.5	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
2479.50	-23.7	H	3.0	35.0	1.0	-57.7	-13.0	-44.7	
3306.00	-23.2	H	3.0	34.3	1.0	-56.5	-13.0	-43.5	
Mid Ch, 836.5									
1673.00	-24.5	V	3.0	36.3	1.0	-59.8	-13.0	-46.8	
2509.50	-24.7	V	3.0	34.9	1.0	-58.6	-13.0	-45.6	
3346.00	-22.5	V	3.0	34.2	1.0	-55.7	-13.0	-42.7	
1673.00	-25.3	H	3.0	36.3	1.0	-60.7	-13.0	-47.7	
2509.50	-24.5	H	3.0	34.9	1.0	-58.5	-13.0	-45.5	
3346.00	-23.1	H	3.0	34.2	1.0	-56.3	-13.0	-43.3	
High Ch, 846.5									
1693.00	-23.7	V	3.0	36.3	1.0	-59.0	-13.0	-46.0	
2539.50	-24.6	V	3.0	34.9	1.0	-58.5	-13.0	-45.5	
3386.00	-22.3	V	3.0	34.2	1.0	-55.5	-13.0	-42.5	
1693.00	-24.7	H	3.0	36.3	1.0	-60.0	-13.0	-47.0	
2539.50	-23.4	H	3.0	34.9	1.0	-57.3	-13.0	-44.3	
3386.00	-22.8	H	3.0	34.2	1.0	-56.0	-13.0	43.0	

LTE B5 5MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 5 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, 826.5									
1653.00	-24.5	V	3.0	36.4	1.0	-59.9	-13.0	-46.9	
2479.50	-23.6	V	3.0	35.0	1.0	-57.5	-13.0	-44.5	
3306.00	-22.7	V	3.0	34.3	1.0	-56.0	-13.0	-43.0	
1653.00	-25.4	H	3.0	36.4	1.0	-60.7	-13.0	-47.7	
2479.50	-24.1	H	3.0	35.0	1.0	-58.1	-13.0	-45.1	
3306.00	-23.3	H	3.0	34.3	1.0	-56.5	-13.0	-43.5	
Mid Ch, 836.5									
1673.00	-24.2	V	3.0	36.3	1.0	-59.5	-13.0	-46.5	
2509.50	-24.7	V	3.0	34.9	1.0	-58.6	-13.0	-45.6	
3346.00	-22.7	V	3.0	34.2	1.0	-56.0	-13.0	-43.0	
1673.00	-25.5	H	3.0	36.3	1.0	-60.8	-13.0	-47.8	
2509.50	-24.1	H	3.0	34.9	1.0	-58.0	-13.0	-45.0	
3346.00	-23.2	H	3.0	34.2	1.0	-56.4	-13.0	-43.4	
High Ch, 846.5									
1693.00	-23.8	V	3.0	36.3	1.0	-59.1	-13.0	-46.1	
2539.50	-24.8	V	3.0	34.9	1.0	-58.7	-13.0	-45.7	
3386.00	-22.4	V	3.0	34.2	1.0	-55.5	-13.0	-42.5	
1693.00	-24.7	H	3.0	36.3	1.0	-60.0	-13.0	-47.0	
2539.50	-23.5	H	3.0	34.9	1.0	-57.4	-13.0	-44.4	
3386.00	-22.9	H	3.0	34.2	1.0	-56.1	-13.0	-43.1	

LTE B5 5MHz 16QAM

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QPSK Band 5 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, 829									
1658.00	-24.6	V	3.0	36.4	1.0	-60.0	-13.0	-47.0	
2487.00	-24.5	V	3.0	35.0	1.0	-58.4	-13.0	-45.4	
3316.00	-22.9	V	3.0	34.3	1.0	-56.1	-13.0	-43.1	
1658.00	-26.2	H	3.0	36.4	1.0	-61.5	-13.0	-48.5	
2487.00	-25.0	H	3.0	35.0	1.0	-59.0	-13.0	-46.0	
3316.00	-23.0	H	3.0	34.3	1.0	-56.2	-13.0	-43.2	
Mid Ch, 836.5									
1673.00	-24.8	V	3.0	36.3	1.0	-60.1	-13.0	-47.1	
2509.50	-24.5	V	3.0	34.9	1.0	-58.5	-13.0	-45.5	
3346.00	-23.0	V	3.0	34.2	1.0	-56.2	-13.0	-43.2	
1673.00	-26.1	H	3.0	36.3	1.0	-61.4	-13.0	-48.4	
2509.50	-24.8	H	3.0	34.9	1.0	-58.7	-13.0	-45.7	
3346.00	-22.8	H	3.0	34.2	1.0	-56.1	-13.0	-43.1	
High Ch, 844									
1688.00	-24.9	V	3.0	36.3	1.0	-60.2	-13.0	-47.2	
2532.00	-21.5	V	3.0	34.9	1.0	-55.4	-13.0	-42.4	
3376.00	-22.9	V	3.0	34.2	1.0	-56.1	-13.0	-43.1	
1688.00	-26.1	H	3.0	36.3	1.0	-61.4	-13.0	-48.4	
2532.00	-24.9	H	3.0	34.9	1.0	-58.8	-13.0	-45.8	
3376.00	-22.6	H	3.0	34.2	1.0	-55.8	-13.0	-42.8	

LTE B5 10MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 5 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, 829									
1658.00	-24.8	V	3.0	36.4	1.0	-60.2	-13.0	-47.2	
2487.00	-24.3	V	3.0	35.0	1.0	-58.3	-13.0	-45.3	
3316.00	-22.6	V	3.0	34.3	1.0	-55.8	-13.0	-42.8	
1658.00	-26.1	H	3.0	36.4	1.0	-61.5	-13.0	-48.5	
2487.00	-25.1	H	3.0	35.0	1.0	-59.0	-13.0	-46.0	
3316.00	-22.9	H	3.0	34.3	1.0	-56.2	-13.0	-43.2	
Mid Ch, 836.5									
1673.00	-25.4	V	3.0	36.3	1.0	-60.8	-13.0	-47.8	
2509.50	-24.2	V	3.0	34.9	1.0	-58.1	-13.0	-45.1	
3346.00	-22.3	V	3.0	34.2	1.0	-55.5	-13.0	-42.5	
1673.00	-25.7	H	3.0	36.3	1.0	-61.1	-13.0	-48.1	
2509.50	-24.2	H	3.0	34.9	1.0	-58.1	-13.0	-45.1	
3346.00	-23.2	H	3.0	34.2	1.0	-56.5	-13.0	-43.5	
High Ch, 844									
1688.00	-25.0	V	3.0	36.3	1.0	-60.3	-13.0	-47.3	
2532.00	-21.4	V	3.0	34.9	1.0	-55.3	-13.0	-42.3	
3376.00	-23.4	V	3.0	34.2	1.0	-56.6	-13.0	-43.6	
1688.00	-25.8	H	3.0	36.3	1.0	-61.1	-13.0	-48.1	
2532.00	-24.7	H	3.0	34.9	1.0	-58.6	-13.0	-45.6	
3376.00	-23.2	H	3.0	34.2	1.0	-56.4	-13.0	-43.4	

LTE B5 10MHz 16QAM

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 7

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_QPSK Band 7 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, 2502.5MHz									
5005.00	-15.1	V	3.0	35.5	1.0	-49.6	-25.0	-24.6	
7507.50	-13.5	V	3.0	35.7	1.0	-48.2	-25.0	-23.2	
10010.00	-12.8	V	3.0	36.0	1.0	-47.8	-25.0	-22.8	
5005.00	-12.5	H	3.0	35.5	1.0	-47.0	-25.0	-22.0	
7507.50	-12.9	H	3.0	35.7	1.0	-47.7	-25.0	-22.7	
10010.00	-12.4	H	3.0	36.0	1.0	-47.4	-25.0	-22.4	
Mid Ch, 2535MHz									
5070.00	-13.8	V	3.0	35.4	1.0	-48.2	-25.0	-23.2	
7605.00	-13.2	V	3.0	35.8	1.0	-48.0	-25.0	-23.0	
10140.00	-13.8	V	3.0	36.0	1.0	-48.7	-25.0	-23.7	
5070.00	-12.5	H	3.0	35.4	1.0	-46.9	-25.0	-21.9	
7605.00	-13.1	H	3.0	35.8	1.0	-47.9	-25.0	-22.9	
10140.00	-12.7	H	3.0	36.0	1.0	-47.7	-25.0	-22.7	
High Ch, 2567.5MHz									
5135.00	-15.2	V	3.0	35.4	1.0	-49.7	-25.0	-24.7	
7702.50	-13.5	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10270.00	-12.7	V	3.0	35.9	1.0	-47.6	-25.0	-22.6	
5135.00	-13.3	H	3.0	35.4	1.0	-47.7	-25.0	-22.7	
7702.50	-12.8	H	3.0	35.8	1.0	-47.5	-25.0	-22.5	
10270.00	-12.8	H	3.0	35.9	1.0	-47.7	-25.0	-22.7	

LTE B7 5MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_16QAM Band 7 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, 2502.5MHz									
5005.00	-14.1	V	3.0	35.5	1.0	-48.5	-25.0	-23.5	
7507.50	-13.8	V	3.0	35.7	1.0	-48.6	-25.0	-23.6	
10010.00	-12.2	V	3.0	36.0	1.0	-47.2	-25.0	-22.2	
5005.00	-13.6	H	3.0	35.5	1.0	-48.0	-25.0	-23.0	
7507.50	-12.9	H	3.0	35.7	1.0	-47.6	-25.0	-22.6	
10010.00	-12.4	H	3.0	36.0	1.0	-47.5	-25.0	-22.5	
Mid Ch, 2535MHz									
5070.00	-13.9	V	3.0	35.4	1.0	-48.4	-25.0	-23.4	
7605.00	-14.2	V	3.0	35.8	1.0	-49.0	-25.0	-24.0	
10140.00	-13.8	V	3.0	36.0	1.0	-48.7	-25.0	-23.7	
5070.00	-11.5	H	3.0	35.4	1.0	-46.0	-25.0	-21.0	
7605.00	-13.0	H	3.0	35.8	1.0	-47.8	-25.0	-22.8	
10140.00	-12.3	H	3.0	36.0	1.0	-47.3	-25.0	-22.3	
High Ch, 2567.5MHz									
5135.00	-15.2	V	3.0	35.4	1.0	-49.6	-25.0	-24.6	
7702.50	-13.7	V	3.0	35.8	1.0	-48.5	-25.0	-23.5	
10270.00	-13.3	V	3.0	35.9	1.0	-48.2	-25.0	-23.2	
5135.00	-13.0	H	3.0	35.4	1.0	-47.4	-25.0	-22.4	
7702.50	-13.6	H	3.0	35.8	1.0	-48.3	-25.0	-23.3	
10270.00	-11.2	H	3.0	35.9	1.0	-46.1	-25.0	-21.1	

LTE B7 5MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_QPSK Band 7 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, 2505MHz									
5010.00	-12.7	V	3.0	35.5	1.0	-47.1	-25.0	-22.1	
7515.00	-14.3	V	3.0	35.7	1.0	-49.1	-25.0	-24.1	
10020.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5010.00	-12.6	H	3.0	35.5	1.0	-47.0	-25.0	-22.0	
7515.00	-13.7	H	3.0	35.7	1.0	-48.4	-25.0	-23.4	
10020.00	-12.5	H	3.0	36.0	1.0	-47.5	-25.0	-22.5	
Mid Ch, 2535MHz									
5070.00	-15.6	V	3.0	35.4	1.0	-50.1	-25.0	-25.1	
7605.00	-13.5	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10140.00	-13.5	V	3.0	36.0	1.0	-48.5	-25.0	-23.5	
5070.00	-15.1	H	3.0	35.4	1.0	-49.5	-25.0	-24.5	
7605.00	-12.0	H	3.0	35.8	1.0	-46.7	-25.0	-21.7	
10140.00	-12.0	H	3.0	36.0	1.0	-47.0	-25.0	-22.0	
High Ch, 2565MHz									
5130.00	-12.9	V	3.0	35.4	1.0	-47.4	-25.0	-22.4	
7695.00	-14.6	V	3.0	35.8	1.0	-49.4	-25.0	-24.4	
10260.00	-13.0	V	3.0	35.9	1.0	-47.9	-25.0	-22.9	
5130.00	-13.4	H	3.0	35.4	1.0	-47.8	-25.0	-22.8	
7695.00	-13.1	H	3.0	35.8	1.0	-47.9	-25.0	-22.9	
10260.00	-12.4	H	3.0	35.9	1.0	-47.3	-25.0	-22.3	

LTE B7 10MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_16QAM Band 7 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, 2505MHz									
5010.00	-11.9	V	3.0	35.5	1.0	-46.4	-25.0	-21.4	
7515.00	-13.7	V	3.0	35.7	1.0	-48.5	-25.0	-23.5	
10020.00	-13.2	V	3.0	36.0	1.0	-48.2	-25.0	-23.2	
5010.00	-12.1	H	3.0	35.5	1.0	-46.6	-25.0	-21.6	
7515.00	-12.8	H	3.0	35.7	1.0	-47.6	-25.0	-22.6	
10020.00	-12.1	H	3.0	36.0	1.0	-47.1	-25.0	-22.1	
Mid Ch, 2535MHz									
5070.00	-14.1	V	3.0	35.4	1.0	-48.6	-25.0	-23.6	
7605.00	-13.7	V	3.0	35.8	1.0	-48.4	-25.0	-23.4	
10140.00	-12.3	V	3.0	36.0	1.0	-47.3	-25.0	-22.3	
5070.00	-14.0	H	3.0	35.4	1.0	-48.4	-25.0	-23.4	
7605.00	-11.4	H	3.0	35.8	1.0	-46.2	-25.0	-21.2	
10140.00	-13.2	H	3.0	36.0	1.0	-48.2	-25.0	-23.2	
High Ch, 2565MHz									
5130.00	-12.9	V	3.0	35.4	1.0	-47.3	-25.0	-22.3	
7695.00	-14.6	V	3.0	35.8	1.0	-49.4	-25.0	-24.4	
10260.00	-12.9	V	3.0	35.9	1.0	-47.8	-25.0	-22.8	
5130.00	-13.4	H	3.0	35.4	1.0	-47.8	-25.0	-22.8	
7695.00	-13.1	H	3.0	35.8	1.0	-47.8	-25.0	-22.8	
10260.00	-12.7	H	3.0	35.9	1.0	-47.6	-25.0	-22.6	

LTE B7 10MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_QPSK Band 7 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, 2507.5MHz									
5015.00	-14.0	V	3.0	35.5	1.0	-48.5	-25.0	-23.5	
7522.50	-14.5	V	3.0	35.7	1.0	-49.3	-25.0	-24.3	
10030.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5015.00	-8.4	H	3.0	35.5	1.0	-42.9	-25.0	-17.9	
7522.50	-12.9	H	3.0	35.7	1.0	-47.6	-25.0	-22.6	
10030.00	-11.5	H	3.0	36.0	1.0	-46.5	-25.0	-21.5	
Mid Ch, 2535MHz									
5070.00	-15.3	V	3.0	35.4	1.0	-49.8	-25.0	-24.8	
7605.00	-13.2	V	3.0	35.8	1.0	-48.0	-25.0	-23.0	
10140.00	-13.6	V	3.0	36.0	1.0	-48.6	-25.0	-23.6	
5070.00	-14.6	H	3.0	35.4	1.0	-49.0	-25.0	-24.0	
7605.00	-12.4	H	3.0	35.8	1.0	-47.1	-25.0	-22.1	
10140.00	-13.1	H	3.0	36.0	1.0	-48.1	-25.0	-23.1	
High Ch, 2562.5MHz									
5125.00	-12.3	V	3.0	35.4	1.0	-46.8	-25.0	-21.8	
7687.50	-14.7	V	3.0	35.8	1.0	-49.4	-25.0	-24.4	
10250.00	-13.0	V	3.0	35.9	1.0	-47.9	-25.0	-22.9	
5125.00	-12.7	H	3.0	35.4	1.0	-47.1	-25.0	-22.1	
7687.50	-13.8	H	3.0	35.8	1.0	-48.6	-25.0	-23.6	
10250.00	-12.4	H	3.0	35.9	1.0	-47.3	-25.0	-22.3	

LTE B7 15MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_16QAM Band 7 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, 2507.5MHz									
5015.00	-14.4	V	3.0	35.5	1.0	-48.8	-25.0	-23.8	
7522.50	-13.8	V	3.0	35.7	1.0	-48.5	-25.0	-23.5	
10030.00	-12.6	V	3.0	36.0	1.0	-47.6	-25.0	-22.6	
5015.00	-7.8	H	3.0	35.5	1.0	-42.2	-25.0	-17.2	
7522.50	-12.6	H	3.0	35.7	1.0	-47.4	-25.0	-22.4	
10030.00	-12.8	H	3.0	36.0	1.0	-47.8	-25.0	-22.8	
Mid Ch, 2535MHz									
5070.00	-15.9	V	3.0	35.4	1.0	-50.3	-25.0	-25.3	
7605.00	-13.7	V	3.0	35.8	1.0	-48.4	-25.0	-23.4	
10140.00	-13.4	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5070.00	-15.4	H	3.0	35.4	1.0	-49.8	-25.0	-24.8	
7605.00	-13.0	H	3.0	35.8	1.0	-47.8	-25.0	-22.8	
10140.00	-13.3	H	3.0	36.0	1.0	-48.3	-25.0	-23.3	
High Ch, 2562.5MHz									
5125.00	-11.4	V	3.0	35.4	1.0	-45.8	-25.0	-20.8	
7687.50	-13.6	V	3.0	35.8	1.0	-48.4	-25.0	-23.4	
10250.00	-13.3	V	3.0	35.9	1.0	-48.2	-25.0	-23.2	
5125.00	-12.9	H	3.0	35.4	1.0	-47.3	-25.0	-22.3	
7687.50	-12.4	H	3.0	35.8	1.0	-47.2	-25.0	-22.2	
10250.00	-12.0	H	3.0	35.9	1.0	-46.9	-25.0	-21.9	

LTE B7 15MHz 16QAM

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_QPSK Band 7 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, 2510MHz									
5020.00	-13.9	V	3.0	35.5	1.0	-48.3	-25.0	-23.3	
7530.00	-13.1	V	3.0	35.7	1.0	-47.9	-25.0	-22.9	
10040.00	-13.0	V	3.0	36.0	1.0	-48.0	-25.0	-23.0	
5020.00	-9.1	H	3.0	35.5	1.0	-43.6	-25.0	-18.6	
7530.00	-13.3	H	3.0	35.7	1.0	-48.0	-25.0	-23.0	
10040.00	-13.2	H	3.0	36.0	1.0	-48.2	-25.0	-23.2	
Mid Ch, 2535MHz									
5070.00	-14.8	V	3.0	35.4	1.0	-49.2	-25.0	-24.2	
7605.00	-13.8	V	3.0	35.8	1.0	-48.5	-25.0	-23.5	
10140.00	-12.7	V	3.0	36.0	1.0	-47.7	-25.0	-22.7	
5070.00	-15.4	H	3.0	35.4	1.0	-49.9	-25.0	-24.9	
7605.00	-12.7	H	3.0	35.8	1.0	-47.4	-25.0	-22.4	
10140.00	-12.3	H	3.0	36.0	1.0	-47.2	-25.0	-22.2	
High Ch, 2560MHz									
5120.00	-12.5	V	3.0	35.4	1.0	-47.0	-25.0	-22.0	
7680.00	-13.1	V	3.0	35.8	1.0	-47.9	-25.0	-22.9	
10240.00	-12.9	V	3.0	35.9	1.0	-47.8	-25.0	-22.8	
5120.00	-12.2	H	3.0	35.4	1.0	-46.6	-25.0	-21.6	
7680.00	-12.9	H	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10240.00	-13.3	H	3.0	35.9	1.0	-48.2	-25.0	-23.2	

LTE B7 20MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
Location: Chamber C
Mode: LTE_16QAM Band 7 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, 2510MHz									
5020.00	-14.2	V	3.0	35.5	1.0	-48.7	-25.0	-23.7	
7530.00	-14.0	V	3.0	35.7	1.0	-48.8	-25.0	-23.8	
10040.00	-13.3	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5020.00	-10.5	H	3.0	35.5	1.0	-44.9	-25.0	-19.9	
7530.00	-13.0	H	3.0	35.7	1.0	-47.7	-25.0	-22.7	
10040.00	-12.0	H	3.0	36.0	1.0	-47.0	-25.0	-22.0	
Mid Ch, 2535MHz									
5070.00	-15.1	V	3.0	35.4	1.0	-49.5	-25.0	-24.5	
7605.00	-12.8	V	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10140.00	-14.0	V	3.0	36.0	1.0	-48.9	-25.0	-23.9	
5070.00	-15.0	H	3.0	35.4	1.0	-49.4	-25.0	-24.4	
7605.00	-11.6	H	3.0	35.8	1.0	-46.4	-25.0	-21.4	
10140.00	-13.1	H	3.0	36.0	1.0	-48.1	-25.0	-23.1	
High Ch, 2560MHz									
5120.00	-12.6	V	3.0	35.4	1.0	-47.0	-25.0	-22.0	
7680.00	-13.7	V	3.0	35.8	1.0	-48.5	-25.0	-23.5	
10240.00	-13.1	V	3.0	35.9	1.0	-48.0	-25.0	-23.0	
5120.00	-12.8	H	3.0	35.4	1.0	-47.3	-25.0	-22.3	
7680.00	-13.4	H	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10240.00	-12.1	H	3.0	35.9	1.0	-47.0	-25.0	-22.0	

LTE B7 20MHz 16QAM

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 12

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 699.7									
1399.40	-28.4	V	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2099.10	-21.5	V	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2798.80	-23.4	V	3.0	34.7	1.0	-57.1	-13.0	-44.1	
1399.40	-28.7	H	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2099.10	-21.7	H	3.0	35.6	1.0	-56.3	-13.0	-43.3	
2798.80	-23.2	H	3.0	34.7	1.0	-56.9	-13.0	-43.9	
Mid Ch, 707.5									
1415.00	-28.4	V	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2122.50	-21.2	V	3.0	35.6	1.0	-55.8	-13.0	-42.8	
2830.00	-22.9	V	3.0	34.7	1.0	-56.6	-13.0	-43.6	
1415.00	-28.7	H	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2122.50	-21.5	H	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2830.00	-23.6	H	3.0	34.7	1.0	-57.3	-13.0	-44.3	
High Ch, 715.3									
1430.60	-28.3	V	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2145.90	-21.7	V	3.0	35.6	1.0	-56.2	-13.0	-43.2	
2861.20	-23.0	V	3.0	34.7	1.0	-56.7	-13.0	-43.7	
1430.60	-28.8	H	3.0	36.5	1.0	-64.4	-13.0	-51.4	
2145.90	-21.7	H	3.0	35.6	1.0	-56.3	-13.0	-43.3	
2861.20	-23.3	H	3.0	34.7	1.0	-57.0	-13.0	-44.0	

LTE B12 1.4MHz QPSK

Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 699.7									
1399.40	-28.6	V	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2099.10	-21.7	V	3.0	35.6	1.0	-56.4	-13.0	-43.4	
2798.80	-23.7	V	3.0	34.7	1.0	-57.4	-13.0	-44.4	
1399.40	-28.8	H	3.0	36.5	1.0	-64.3	-13.0	-51.3	
2099.10	-21.8	H	3.0	35.6	1.0	-56.5	-13.0	-43.5	
2798.80	-23.4	H	3.0	34.7	1.0	-57.1	-13.0	-44.1	
Mid Ch, 707.5									
1415.00	-28.7	V	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2122.50	-21.5	V	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2830.00	-23.4	V	3.0	34.7	1.0	-57.1	-13.0	-44.1	
1415.00	-29.2	H	3.0	36.5	1.0	-64.7	-13.0	-51.7	
2122.50	-22.0	H	3.0	35.6	1.0	-56.6	-13.0	-43.6	
2830.00	-23.3	H	3.0	34.7	1.0	-57.0	-13.0	-44.0	
High Ch, 715.3									
1430.60	-28.5	V	3.0	36.5	1.0	-64.1	-13.0	-51.1	
2145.90	-21.8	V	3.0	35.6	1.0	-56.4	-13.0	-43.4	
2861.20	-22.9	V	3.0	34.7	1.0	-56.6	-13.0	-43.6	
1430.60	-29.0	H	3.0	36.5	1.0	-64.6	-13.0	-51.6	
2145.90	-22.1	H	3.0	35.6	1.0	-56.7	-13.0	-43.7	
2861.20	-23.4	H	3.0	34.7	1.0	-57.1	-13.0	-44.1	

LTE B12 1.4MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 700.5									
1401.00	-28.0	V	3.0	36.5	1.0	-63.5	-13.0	-50.5	
2101.50	-20.7	V	3.0	35.6	1.0	-55.3	-13.0	-42.3	
2802.00	-22.8	V	3.0	34.7	1.0	-56.5	-13.0	-43.5	
1401.00	-28.8	H	3.0	36.5	1.0	-64.3	-13.0	-51.3	
2101.50	-22.3	H	3.0	35.6	1.0	-56.9	-13.0	-43.9	
2802.00	-24.1	H	3.0	34.7	1.0	-57.8	-13.0	-44.8	
Mid Ch, 707.5									
1415.00	-27.9	V	3.0	36.5	1.0	-63.5	-13.0	-50.5	
2122.50	-21.1	V	3.0	35.6	1.0	-55.7	-13.0	-42.7	
2830.00	-22.7	V	3.0	34.7	1.0	-56.4	-13.0	-43.4	
1415.00	-29.2	H	3.0	36.5	1.0	-64.7	-13.0	-51.7	
2122.50	-22.3	H	3.0	35.6	1.0	-56.9	-13.0	-43.9	
2830.00	-23.3	H	3.0	34.7	1.0	-57.0	-13.0	-44.0	
High Ch, 714.5									
1429.00	-28.1	V	3.0	36.5	1.0	-63.6	-13.0	-50.6	
2143.50	-21.4	V	3.0	35.6	1.0	-55.9	-13.0	-42.9	
2858.00	-22.2	V	3.0	34.7	1.0	-55.8	-13.0	-42.8	
1429.00	-28.8	H	3.0	36.5	1.0	-64.3	-13.0	-51.3	
2143.50	-22.5	H	3.0	35.6	1.0	-57.0	-13.0	-44.0	
2858.00	-22.6	H	3.0	34.7	1.0	-56.3	-13.0	-43.3	

LTE B12 3MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 700.5									
1401.00	-28.2	V	3.0	36.5	1.0	-63.7	-13.0	-50.7	
2101.50	-21.0	V	3.0	35.6	1.0	-55.6	-13.0	-42.6	
2802.00	-22.9	V	3.0	34.7	1.0	-56.7	-13.0	-43.7	
1401.00	-29.0	H	3.0	36.5	1.0	-64.5	-13.0	-51.5	
2101.50	-22.4	H	3.0	35.6	1.0	-57.1	-13.0	-44.1	
2802.00	-24.3	H	3.0	34.7	1.0	-58.0	-13.0	-45.0	
Mid Ch, 707.5									
1415.00	-28.7	V	3.0	36.5	1.0	-64.3	-13.0	-51.3	
2122.50	-21.3	V	3.0	35.6	1.0	-55.9	-13.0	-42.9	
2830.00	-22.9	V	3.0	34.7	1.0	-56.6	-13.0	-43.6	
1415.00	-28.5	H	3.0	36.5	1.0	-64.0	-13.0	-51.0	
2122.50	-21.8	H	3.0	35.6	1.0	-56.4	-13.0	-43.4	
2830.00	-23.3	H	3.0	34.7	1.0	-57.0	-13.0	-44.0	
High Ch, 714.5									
1429.00	-28.3	V	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2143.50	-21.5	V	3.0	35.6	1.0	-56.1	-13.0	-43.1	
2858.00	-22.5	V	3.0	34.7	1.0	-56.2	-13.0	-43.2	
1429.00	-29.0	H	3.0	36.5	1.0	-64.5	-13.0	-51.5	
2143.50	-22.7	H	3.0	35.6	1.0	-57.3	-13.0	-44.3	
2858.00	-22.8	H	3.0	34.7	1.0	-56.4	-13.0	-43.4	

LTE B12 3MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 701.5									
1403.00	-28.4	V	3.0	36.5	1.0	-64.0	-13.0	-51.0	
2104.50	-20.7	V	3.0	35.6	1.0	-55.4	-13.0	-42.4	
2806.00	-23.3	V	3.0	34.7	1.0	-57.0	-13.0	-44.0	
1403.00	-28.6	H	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2104.50	-22.1	H	3.0	35.6	1.0	-56.7	-13.0	-43.7	
2806.00	-23.7	H	3.0	34.7	1.0	-57.4	-13.0	-44.4	
Mid Ch, 707.5									
1415.00	-28.5	V	3.0	36.5	1.0	-64.0	-13.0	-51.0	
2122.50	-21.0	V	3.0	35.6	1.0	-55.6	-13.0	-42.6	
2830.00	-23.1	V	3.0	34.7	1.0	-56.8	-13.0	-43.8	
1415.00	-28.8	H	3.0	36.5	1.0	-64.3	-13.0	-51.3	
2122.50	-22.1	H	3.0	35.6	1.0	-56.7	-13.0	-43.7	
2830.00	-23.4	H	3.0	34.7	1.0	-57.1	-13.0	-44.1	
High Ch, 713.5									
1427.00	-28.3	V	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2140.50	-20.8	V	3.0	35.6	1.0	-55.4	-13.0	-42.4	
2854.00	-23.2	V	3.0	34.7	1.0	-56.9	-13.0	-43.9	
1427.00	-28.7	H	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2140.50	-22.1	H	3.0	35.6	1.0	-56.6	-13.0	-43.6	
2854.00	-23.8	H	3.0	34.7	1.0	-57.5	-13.0	-44.5	

LTE B12 5MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 701.5									
1403.00	-28.7	V	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2104.50	-20.9	V	3.0	35.6	1.0	-55.5	-13.0	-42.5	
2806.00	-23.2	V	3.0	34.7	1.0	-56.9	-13.0	-43.9	
1403.00	-28.7	H	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2104.50	-21.8	H	3.0	35.6	1.0	-56.5	-13.0	-43.5	
2806.00	-24.4	H	3.0	34.7	1.0	-58.2	-13.0	-45.2	
Mid Ch, 707.5									
1415.00	-28.4	V	3.0	36.5	1.0	-63.9	-13.0	-50.9	
2122.50	-20.1	V	3.0	35.6	1.0	-54.7	-13.0	-41.7	
2830.00	-23.1	V	3.0	34.7	1.0	-56.8	-13.0	-43.8	
1415.00	-28.9	H	3.0	36.5	1.0	-64.4	-13.0	-51.4	
2122.50	-22.1	H	3.0	35.6	1.0	-56.7	-13.0	-43.7	
2830.00	-23.8	H	3.0	34.7	1.0	-57.5	-13.0	-44.5	
High Ch, 713.5									
1427.00	-28.5	V	3.0	36.5	1.0	-64.1	-13.0	-51.1	
2140.50	-21.0	V	3.0	35.6	1.0	-55.5	-13.0	-42.5	
2854.00	-23.4	V	3.0	34.7	1.0	-57.1	-13.0	-44.1	
1427.00	-28.7	H	3.0	36.5	1.0	-64.2	-13.0	-51.2	
2140.50	-22.3	H	3.0	35.6	1.0	-56.9	-13.0	-43.9	
2854.00	-24.0	H	3.0	34.7	1.0	-57.6	-13.0	-44.6	

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
This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 704									
1408.00	-28.3	V	3.0	36.5	1.0	-63.8	-13.0	-50.8	
2112.00	-20.8	V	3.0	35.6	1.0	-55.4	-13.0	-42.4	
2816.00	-23.0	V	3.0	34.7	1.0	-56.7	-13.0	-43.7	
1408.00	-28.9	H	3.0	36.5	1.0	-64.4	-13.0	-51.4	
2112.00	-21.9	H	3.0	35.6	1.0	-56.5	-13.0	-43.5	
2816.00	-22.6	H	3.0	34.7	1.0	-56.3	-13.0	-43.3	
Mid Ch, 707.5									
1415.00	-28.5	V	3.0	36.5	1.0	-64.0	-13.0	-51.0	
2122.50	-20.8	V	3.0	35.6	1.0	-55.5	-13.0	-42.5	
2830.00	-23.1	V	3.0	34.7	1.0	-56.8	-13.0	-43.8	
1415.00	-29.2	H	3.0	36.5	1.0	-64.7	-13.0	-51.7	
2122.50	-22.1	H	3.0	35.6	1.0	-56.7	-13.0	-43.7	
2830.00	-22.7	H	3.0	34.7	1.0	-56.4	-13.0	-43.4	
High Ch, 711									
1422.00	-28.5	V	3.0	36.5	1.0	-64.0	-13.0	-51.0	
2133.00	-21.0	V	3.0	35.6	1.0	-55.6	-13.0	-42.6	
2844.00	-22.9	V	3.0	34.7	1.0	-56.6	-13.0	-43.6	
1422.00	-29.0	H	3.0	36.5	1.0	-64.6	-13.0	-51.6	
2133.00	-21.7	H	3.0	35.6	1.0	-56.3	-13.0	-43.3	
2844.00	-22.8	H	3.0	34.7	1.0	-56.5	-13.0	-43.5	

LTE B12 10MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/6/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 704									
1408.00	-28.1	V	3.0	36.5	1.0	-63.7	-13.0	-50.7	
2112.00	-20.9	V	3.0	35.6	1.0	-55.5	-13.0	-42.5	
2816.00	-23.1	V	3.0	34.7	1.0	-56.8	-13.0	-43.8	
1408.00	-29.1	H	3.0	36.5	1.0	-64.6	-13.0	-51.6	
2112.00	-21.9	H	3.0	35.6	1.0	-56.6	-13.0	-43.6	
2816.00	-22.6	H	3.0	34.7	1.0	-56.3	-13.0	-43.3	
Mid Ch, 707.5									
1415.00	-28.3	V	3.0	36.5	1.0	-63.8	-13.0	-50.8	
2122.50	-20.9	V	3.0	35.6	1.0	-55.5	-13.0	-42.5	
2830.00	-23.2	V	3.0	34.7	1.0	-56.9	-13.0	-43.9	
1415.00	-29.2	H	3.0	36.5	1.0	-64.7	-13.0	-51.7	
2122.50	-22.2	H	3.0	35.6	1.0	-56.8	-13.0	-43.8	
2830.00	-23.9	H	3.0	34.7	1.0	-57.6	-13.0	-44.6	
High Ch, 711									
1422.00	-28.6	V	3.0	36.5	1.0	-64.1	-13.0	-51.1	
2133.00	-21.1	V	3.0	35.6	1.0	-55.7	-13.0	-42.7	
2844.00	-22.9	V	3.0	34.7	1.0	-56.6	-13.0	-43.6	
1422.00	-29.2	H	3.0	36.5	1.0	-64.7	-13.0	-51.7	
2133.00	-21.7	H	3.0	35.6	1.0	-56.3	-13.0	-43.3	
2844.00	-22.9	H	3.0	34.7	1.0	-56.6	-13.0	-43.6	

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 13

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger
Location: Chamber C
Mode: LTE_16QPSK Band 13 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, 779.5									
1559.00	-26.5	V	3.0	37.1	1.0	-62.6	-13.0	-49.6	
2338.50	-22.0	V	3.0	36.5	1.0	-57.5	-13.0	-44.5	
3118.00	-19.4	V	3.0	36.3	1.0	-54.7	-13.0	-41.7	
1559.00	-26.9	H	3.0	37.1	1.0	-63.0	-13.0	-50.0	
2338.50	-25.7	H	3.0	36.5	1.0	-61.2	-13.0	-48.2	
3118.00	-21.2	H	3.0	36.3	1.0	-56.5	-13.0	-43.5	
Mid Ch, 782									
1564.00	-26.1	V	3.0	37.1	1.0	-62.2	-13.0	-49.2	
2346.00	-24.2	V	3.0	36.5	1.0	-59.7	-13.0	-46.7	
3128.00	-20.4	V	3.0	36.3	1.0	-55.7	-13.0	-42.7	
1564.00	-26.2	H	3.0	37.1	1.0	-62.4	-13.0	-49.4	
2346.00	-25.2	H	3.0	36.5	1.0	-60.7	-13.0	-47.7	
3128.00	-20.5	H	3.0	36.3	1.0	-55.8	-13.0	-42.8	
High Ch, 784.5									
1569.00	-26.7	V	3.0	37.1	1.0	-62.8	-13.0	-49.8	
2353.50	-22.0	V	3.0	36.5	1.0	-57.5	-13.0	-44.5	
3138.00	-19.2	V	3.0	36.3	1.0	-54.5	-13.0	-41.5	
1569.00	-26.9	H	3.0	37.1	1.0	-63.1	-13.0	-50.1	
2353.50	-25.3	H	3.0	36.5	1.0	-60.7	-13.0	-47.7	
3138.00	-21.3	H	3.0	36.3	1.0	-56.6	-13.0	-43.6	

LTE B13 5MHz QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 13 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, 779.5									
1559.00	-26.6	V	3.0	37.1	1.0	-62.8	-13.0	-49.8	
2338.50	-22.1	V	3.0	36.5	1.0	-57.6	-13.0	-44.6	
3118.00	-19.9	V	3.0	36.3	1.0	-55.2	-13.0	-42.2	
1559.00	-26.6	H	3.0	37.1	1.0	-62.8	-13.0	-49.8	
2338.50	-26.0	H	3.0	36.5	1.0	-61.5	-13.0	-48.5	
3118.00	-21.3	H	3.0	36.3	1.0	-56.6	-13.0	-43.6	
Mid Ch, 782									
1564.00	-26.3	V	3.0	37.1	1.0	-62.5	-13.0	-49.5	
2346.00	-24.1	V	3.0	36.5	1.0	-59.6	-13.0	-46.6	
3128.00	-21.1	V	3.0	36.3	1.0	-56.4	-13.0	-43.4	
1564.00	-26.0	H	3.0	37.1	1.0	-62.1	-13.0	-49.1	
2346.00	-25.4	H	3.0	36.5	1.0	-60.9	-13.0	-47.9	
3128.00	-19.9	H	3.0	36.3	1.0	-55.2	-13.0	-42.2	
High Ch, 784.5									
1569.00	-26.8	V	3.0	37.1	1.0	-63.0	-13.0	-50.0	
2353.50	-22.1	V	3.0	36.5	1.0	-57.6	-13.0	-44.6	
3138.00	-19.0	V	3.0	36.3	1.0	-54.3	-13.0	-41.3	
1569.00	-27.1	H	3.0	37.1	1.0	-63.2	-13.0	-50.2	
2353.50	-25.3	H	3.0	36.5	1.0	-60.8	-13.0	-47.8	
3138.00	-21.1	H	3.0	36.3	1.0	-56.4	-13.0	-43.4	

LTE B13 5MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_QPSK Band 13 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, 782									
	0.0	V	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	34.4	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	34.4	1.0	0.0	-13.0	0.0	
Mid Ch, 782									
1564.00	-25.0	V	3.0	36.5	1.0	-60.5	-13.0	-47.5	
2346.00	-24.4	V	3.0	35.2	1.0	-58.6	-13.0	-45.6	
3128.00	-20.9	V	3.0	34.4	1.0	-54.4	-13.0	-41.4	
1564.00	-25.6	H	3.0	36.5	1.0	-61.1	-13.0	-48.1	
2346.00	-24.9	H	3.0	35.2	1.0	-59.1	-13.0	-46.1	
3128.00	-21.6	H	3.0	34.4	1.0	-55.1	-13.0	-42.1	
High Ch, 782									
	0.0	V	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	34.4	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	34.4	1.0	0.0	-13.0	0.0	

LTE B13 10MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43574 JS
Configuration: EUT + AC Charger + HS
Location: Chamber C
Mode: LTE_16QAM Band 13 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, 782									
	0.0	V	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	34.4	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	34.4	1.0	0.0	-13.0	0.0	
Mid Ch, 782									
1564.00	-25.4	V	3.0	36.5	1.0	-60.9	-13.0	-47.9	
2346.00	-24.4	V	3.0	35.2	1.0	-58.6	-13.0	-45.6	
3128.00	-21.0	V	3.0	34.4	1.0	-54.5	-13.0	-41.5	
1564.00	-25.9	H	3.0	36.5	1.0	-61.4	-13.0	-48.4	
2346.00	-24.6	H	3.0	35.2	1.0	-58.8	-13.0	-45.8	
3128.00	-22.0	H	3.0	34.4	1.0	-55.4	-13.0	-42.4	
High Ch, 782									
	0.0	V	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	V	3.0	34.4	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	36.5	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	35.2	1.0	0.0	-13.0	0.0	
	0.0	H	3.0	34.4	1.0	0.0	-13.0	0.0	

LTE B13 10MHz 16QAM

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

LTE Band 41

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2498.5MHz									
4997.00	-15.6	V	3.0	35.5	1.0	-50.1	-25.0	-25.1	
7495.50	-14.3	V	3.0	35.7	1.0	-49.1	-25.0	-24.1	
9994.00	-12.8	V	3.0	36.0	1.0	-47.8	-25.0	-22.8	
4997.00	-8.0	H	3.0	35.5	1.0	-42.5	-25.0	-17.5	
7495.50	-13.8	H	3.0	35.7	1.0	-48.6	-25.0	-23.6	
9994.00	-12.4	H	3.0	36.0	1.0	-47.4	-25.0	-22.4	
Mid Ch, 2593MHz									
5186.00	-15.0	V	3.0	35.4	1.0	-49.5	-25.0	-24.5	
7779.00	-13.6	V	3.0	35.8	1.0	-48.3	-25.0	-23.3	
10372.00	-13.4	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
5186.00	-13.4	H	3.0	35.4	1.0	-47.8	-25.0	-22.8	
7779.00	-13.0	H	3.0	35.8	1.0	-47.8	-25.0	-22.8	
10372.00	-12.5	H	3.0	35.8	1.0	-47.3	-25.0	-22.3	
High Ch, 2687.5MHz									
5375.00	-15.5	V	3.0	35.4	1.0	-49.9	-25.0	-24.9	
8062.50	-12.2	V	3.0	35.8	1.0	-47.0	-25.0	-22.0	
10750.00	-12.6	V	3.0	35.7	1.0	-47.2	-25.0	-22.2	
5375.00	-15.0	H	3.0	35.4	1.0	-49.4	-25.0	-24.4	
8062.50	-12.3	H	3.0	35.8	1.0	-47.1	-25.0	-22.1	
10750.00	-11.6	H	3.0	35.7	1.0	-46.3	-25.0	-21.3	

LTE B41 5MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2498.5MHz									
4997.00	-15.5	V	3.0	35.5	1.0	-49.9	-25.0	-24.9	
7495.50	-14.7	V	3.0	35.7	1.0	-49.5	-25.0	-24.5	
9994.00	-13.1	V	3.0	36.0	1.0	-48.1	-25.0	-23.1	
4997.00	-7.6	H	3.0	35.5	1.0	-42.1	-25.0	-17.1	
7495.50	-13.0	H	3.0	35.7	1.0	-47.7	-25.0	-22.7	
9994.00	-12.5	H	3.0	36.0	1.0	-47.5	-25.0	-22.5	
Mid Ch, 2593MHz									
5186.00	-15.6	V	3.0	35.4	1.0	-50.0	-25.0	-25.0	
7779.00	-12.9	V	3.0	35.8	1.0	-47.7	-25.0	-22.7	
10372.00	-13.0	V	3.0	35.8	1.0	-47.8	-25.0	-22.8	
5186.00	-13.4	H	3.0	35.4	1.0	-47.8	-25.0	-22.8	
7779.00	-12.7	H	3.0	35.8	1.0	-47.5	-25.0	-22.5	
10372.00	-13.3	H	3.0	35.8	1.0	-48.1	-25.0	-23.1	
High Ch, 2687.5MHz									
5375.00	-15.3	V	3.0	35.4	1.0	-49.8	-25.0	-24.8	
8062.50	-13.0	V	3.0	35.8	1.0	-47.8	-25.0	-22.8	
10750.00	-12.3	V	3.0	35.7	1.0	-47.0	-25.0	-22.0	
5375.00	-14.9	H	3.0	35.4	1.0	-49.4	-25.0	-24.4	
8062.50	-12.0	H	3.0	35.8	1.0	-46.8	-25.0	-21.8	
10750.00	-12.2	H	3.0	35.7	1.0	-46.9	-25.0	-21.9	

LTE B41 5MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2501MHz									
5002.00	-14.9	V	3.0	35.5	1.0	-49.3	-25.0	-24.3	
7503.00	-14.6	V	3.0	35.7	1.0	-49.3	-25.0	-24.3	
10004.00	-13.6	V	3.0	36.0	1.0	-48.6	-25.0	-23.6	
5002.00	-11.2	H	3.0	35.5	1.0	-45.6	-25.0	-20.6	
7503.00	-12.8	H	3.0	35.7	1.0	-47.6	-25.0	-22.6	
10004.00	-12.6	H	3.0	36.0	1.0	-47.6	-25.0	-22.6	
Mid Ch, 2593MHz									
5186.00	-15.6	V	3.0	35.4	1.0	-50.0	-25.0	-25.0	
7779.00	-13.1	V	3.0	35.8	1.0	-47.9	-25.0	-22.9	
10372.00	-11.8	V	3.0	35.8	1.0	-46.6	-25.0	-21.6	
5186.00	-15.3	H	3.0	35.4	1.0	-49.7	-25.0	-24.7	
7779.00	-11.7	H	3.0	35.8	1.0	-46.5	-25.0	-21.5	
10372.00	-13.4	H	3.0	35.8	1.0	-48.3	-25.0	-23.3	
High Ch, 2685MHz									
5370.00	-15.3	V	3.0	35.4	1.0	-49.7	-25.0	-24.7	
8055.00	-13.4	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10740.00	-11.9	V	3.0	35.7	1.0	-46.5	-25.0	-21.5	
5370.00	-15.5	H	3.0	35.4	1.0	-49.9	-25.0	-24.9	
8055.00	-12.4	H	3.0	35.8	1.0	-47.2	-25.0	-22.2	
10740.00	-12.1	H	3.0	35.7	1.0	-46.7	-25.0	-21.7	

LTE B41 10MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2501MHz									
5002.00	-13.5	V	3.0	35.5	1.0	-47.9	-25.0	-22.9	
7503.00	-14.9	V	3.0	35.7	1.0	-49.6	-25.0	-24.6	
10004.00	-13.6	V	3.0	36.0	1.0	-48.6	-25.0	-23.6	
5002.00	-10.9	H	3.0	35.5	1.0	-45.4	-25.0	-20.4	
7503.00	-13.2	H	3.0	35.7	1.0	-48.0	-25.0	-23.0	
10004.00	-11.3	H	3.0	36.0	1.0	-46.4	-25.0	-21.4	
Mid Ch, 2593MHz									
5186.00	-15.3	V	3.0	35.4	1.0	-49.7	-25.0	-24.7	
7779.00	-13.9	V	3.0	35.8	1.0	-48.7	-25.0	-23.7	
10372.00	-13.1	V	3.0	35.8	1.0	-47.9	-25.0	-22.9	
5186.00	-14.3	H	3.0	35.4	1.0	-48.7	-25.0	-23.7	
7779.00	-12.1	H	3.0	35.8	1.0	-46.9	-25.0	-21.9	
10372.00	-12.9	H	3.0	35.8	1.0	-47.7	-25.0	-22.7	
High Ch, 2685MHz									
5370.00	-15.2	V	3.0	35.4	1.0	-49.7	-25.0	-24.7	
8055.00	-12.8	V	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10740.00	-12.4	V	3.0	35.7	1.0	-47.1	-25.0	-22.1	
5370.00	-15.3	H	3.0	35.4	1.0	-49.8	-25.0	-24.8	
8055.00	-12.3	H	3.0	35.8	1.0	-47.1	-25.0	-22.1	
10740.00	-12.7	H	3.0	35.7	1.0	-47.4	-25.0	-22.4	

LTE B41 10MHz 16QAM

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2503.5MHz									
5007.00	-14.6	V	3.0	35.5	1.0	-49.1	-25.0	-24.1	
7510.50	-14.6	V	3.0	35.7	1.0	-49.4	-25.0	-24.4	
10014.00	-13.2	V	3.0	36.0	1.0	-48.3	-25.0	-23.3	
5007.00	-12.2	H	3.0	35.5	1.0	-46.7	-25.0	-21.7	
7510.50	-13.4	H	3.0	35.7	1.0	-48.2	-25.0	-23.2	
10014.00	-12.5	H	3.0	36.0	1.0	-47.5	-25.0	-22.5	
Mid Ch, 2593MHz									
5186.00	-15.0	V	3.0	35.4	1.0	-49.5	-25.0	-24.5	
7779.00	-13.0	V	3.0	35.8	1.0	-47.8	-25.0	-22.8	
10372.00	-13.5	V	3.0	35.8	1.0	-48.3	-25.0	-23.3	
5186.00	-14.7	H	3.0	35.4	1.0	-49.1	-25.0	-24.1	
7779.00	-12.8	H	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10372.00	-13.2	H	3.0	35.8	1.0	-48.1	-25.0	-23.1	
High Ch, 2682.5MHz									
5365.00	-15.6	V	3.0	35.4	1.0	-50.1	-25.0	-25.1	
8047.50	-13.1	V	3.0	35.8	1.0	-47.9	-25.0	-22.9	
10730.00	-11.9	V	3.0	35.7	1.0	-46.6	-25.0	-21.6	
5365.00	-15.5	H	3.0	35.4	1.0	-50.0	-25.0	-25.0	
8047.50	-11.8	H	3.0	35.8	1.0	-46.6	-25.0	-21.6	
10730.00	-11.9	H	3.0	35.7	1.0	-46.6	-25.0	-21.6	

LTE B41 15MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2503.5MHz									
5007.00	-15.2	V	3.0	35.5	1.0	-49.7	-25.0	-24.7	
7510.50	-13.4	V	3.0	35.7	1.0	-48.2	-25.0	-23.2	
10014.00	-13.2	V	3.0	36.0	1.0	-48.2	-25.0	-23.2	
5007.00	-12.0	H	3.0	35.5	1.0	-46.4	-25.0	-21.4	
7510.50	-13.6	H	3.0	35.7	1.0	-48.4	-25.0	-23.4	
10014.00	-12.7	H	3.0	36.0	1.0	-47.8	-25.0	-22.8	
Mid Ch, 2593MHz									
5186.00	-15.2	V	3.0	35.4	1.0	-49.7	-25.0	-24.7	
7779.00	-13.9	V	3.0	35.8	1.0	-48.7	-25.0	-23.7	
10372.00	-13.2	V	3.0	35.8	1.0	-48.0	-25.0	-23.0	
5186.00	-14.8	H	3.0	35.4	1.0	-49.2	-25.0	-24.2	
7779.00	-12.9	H	3.0	35.8	1.0	-47.7	-25.0	-22.7	
10372.00	-12.9	H	3.0	35.8	1.0	-47.7	-25.0	-22.7	
High Ch, 2682.5MHz									
5365.00	-15.2	V	3.0	35.4	1.0	-49.6	-25.0	-24.6	
8047.50	-13.7	V	3.0	35.8	1.0	-48.5	-25.0	-23.5	
10730.00	-12.6	V	3.0	35.7	1.0	-47.3	-25.0	-22.3	
5365.00	-14.5	H	3.0	35.4	1.0	-49.0	-25.0	-24.0	
8047.50	-13.0	H	3.0	35.8	1.0	-47.8	-25.0	-22.8	
10730.00	-12.4	H	3.0	35.7	1.0	-47.1	-25.0	-22.1	

LTE B41 15MHz 16QAM

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2506MHz									
5012.00	-15.1	V	3.0	35.5	1.0	-49.5	-25.0	-24.5	
7518.00	-14.0	V	3.0	35.7	1.0	-48.7	-25.0	-23.7	
10024.00	-12.5	V	3.0	36.0	1.0	-47.5	-25.0	-22.5	
5012.00	-14.5	H	3.0	35.5	1.0	-49.0	-25.0	-24.0	
7518.00	-12.8	H	3.0	35.7	1.0	-47.6	-25.0	-22.6	
10024.00	-11.2	H	3.0	36.0	1.0	-46.2	-25.0	-21.2	
Mid Ch, 2593MHz									
5186.00	-15.6	V	3.0	35.4	1.0	-50.1	-25.0	-25.1	
7779.00	-13.5	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
10372.00	-13.3	V	3.0	35.8	1.0	-48.2	-25.0	-23.2	
5186.00	-14.8	H	3.0	35.4	1.0	-49.2	-25.0	-24.2	
7779.00	-12.1	H	3.0	35.8	1.0	-46.9	-25.0	-21.9	
10372.00	-12.8	H	3.0	35.8	1.0	-47.6	-25.0	-22.6	
High Ch, 2680MHz									
5360.00	-15.8	V	3.0	35.4	1.0	-50.3	-25.0	-25.3	
8040.00	-12.2	V	3.0	35.8	1.0	-47.0	-25.0	-22.0	
10720.00	-12.9	V	3.0	35.7	1.0	-47.6	-25.0	-22.6	
5360.00	-15.7	H	3.0	35.4	1.0	-50.1	-25.0	-25.1	
8040.00	-12.1	H	3.0	35.8	1.0	-46.9	-25.0	-21.9	
10720.00	-11.4	H	3.0	35.7	1.0	-46.1	-25.0	-21.1	

LTE B41 20MHz QPSK

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

Company: SOMC
Project #: 11785223
Date: 7/5/2017
Test Engineer: 43575 OS
Configuration: EUT + HS + Charger
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, 2506MHz									
5012.00	-15.5	V	3.0	35.5	1.0	-49.9	-25.0	-24.9	
7518.00	-13.3	V	3.0	35.7	1.0	-48.1	-25.0	-23.1	
10024.00	-12.8	V	3.0	36.0	1.0	-47.9	-25.0	-22.9	
5012.00	-14.8	H	3.0	35.5	1.0	-49.2	-25.0	-24.2	
7518.00	-13.5	H	3.0	35.7	1.0	-48.2	-25.0	-23.2	
10024.00	-12.4	H	3.0	36.0	1.0	-47.4	-25.0	-22.4	
Mid Ch, 2593MHz									
5186.00	-15.0	V	3.0	35.4	1.0	-49.4	-25.0	-24.4	
7779.00	-13.6	V	3.0	35.8	1.0	-48.4	-25.0	-23.4	
10372.00	-12.8	V	3.0	35.8	1.0	-47.7	-25.0	-22.7	
5186.00	-14.4	H	3.0	35.4	1.0	-48.8	-25.0	-23.8	
7779.00	-12.9	H	3.0	35.8	1.0	-47.6	-25.0	-22.6	
10372.00	-12.2	H	3.0	35.8	1.0	-47.1	-25.0	-22.1	
High Ch, 2680MHz									
5360.00	-15.9	V	3.0	35.4	1.0	-50.4	-25.0	-25.4	
8040.00	-12.6	V	3.0	35.8	1.0	-47.4	-25.0	-22.4	
10720.00	-12.4	V	3.0	35.7	1.0	-47.1	-25.0	-22.1	
5360.00	-14.9	H	3.0	35.4	1.0	-49.4	-25.0	-24.4	
8040.00	-12.0	H	3.0	35.8	1.0	-46.8	-25.0	-21.8	
10720.00	-11.9	H	3.0	35.7	1.0	-46.6	-25.0	-21.6	

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

This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.