Fundamental Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: GPRS 850 MHz Fundamentals

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273 , SMA Cable (SN # 506392) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	21.56	V	0.9	0.0	20.66	38.5	-17.8	
824.20	26.83	H	0.9	0.0	25.93	38.5	-12.6	
Mid Ch								
836.60	20.18	V	0.9	0.0	19.28	38.5	-19.2	
836.60	27.39	H	0.9	0.0	26.49	38.5	-12.0	
High Ch								
848.80	19.60	V	0.9	0.0	18.70	38.5	-19.8	
848.80	26.79	H	0.9	0.0	25.89	38.5	-12.6	

GSM850 GPRS

Fundamental Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: EGPRS 850 MHz Fundamentals

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273 , SMA Cable (SN # 506392) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	17.17	V	0.9	0.0	16.27	38.5	-22.2	
824.20	22.35	H	0.9	0.0	21.45	38.5	-17.1	
Mid Ch								
836.60	15.94	V	0.9	0.0	15.04	38.5	-23.5	
836.60	22.14	H	0.9	0.0	21.24	38.5	-17.3	
High Ch								
848.80	13.90	V	0.9	0.0	13.00	38.5	-25.5	
848.80	22.70	H	0.9	0.0	21.80	38.5	-16.7	

GSM850 EGPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber C

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43574 JS
Configuration: EUT Only
Location: Chamber B
Mode: GPRS 1900

Test Equipment:
Receiving: Horn T345 and Chamber B SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	9.10	V	0.9	7.2	15.40	33.0	-17.6	
1850.20	21.67	H	0.9	7.2	27.97	33.0	-5.0	
Mid Ch								
1880.00	9.00	V	0.9	7.2	15.30	33.0	-17.7	
1880.00	23.16	H	0.9	7.2	29.46	33.0	-3.5	
High Ch								
1909.80	8.04	V	0.9	7.2	14.34	33.0	-18.7	
1909.80	22.73	H	0.9	7.2	29.03	33.0	-4.0	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

GSM1900 GPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber C

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43574 JS
Configuration: EUT Only
Location: Chamber B
Mode: EGPRS 1900

Test Equipment:
Receiving: Horn T345 and Chamber B SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	7.70	V	0.9	7.2	14.00	33.0	-19.0	
1850.20	19.80	H	0.9	7.2	26.10	33.0	-6.9	
Mid Ch								
1880.00	7.50	V	0.9	7.2	13.80	33.0	-19.2	
1880.00	21.06	H	0.9	7.2	27.36	33.0	-5.6	
High Ch								
1909.80	6.80	V	0.9	7.2	13.10	33.0	-19.9	
1909.80	20.44	H	0.9	7.2	26.74	33.0	-6.3	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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WCDMA

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	26.26	422.67
		9400	1880	23.70	234.42
		9538	1907.6	25.62	364.75
	HSDPA	9262	1852.4	24.83	304.09
		9400	1880	23.80	239.88
		9538	1907.6	24.60	288.40
Band 4	REL99	1312	1712.4	20.68	116.95
		1413	1732.6	22.25	167.88
		1513	1752.6	22.70	186.21
	HSDPA	1312	1712.4	21.27	133.97
		1413	1732.6	22.01	158.85
		1513	1752.6	22.64	183.65
Band 5	REL99	4132	826.4	16.46	44.26
		4183	836.6	15.56	35.97
		4233	846.6	16.64	46.13
	HSDPA	4132	826.4	17.75	59.57
		4183	836.6	17.08	51.05
		4233	846.6	17.46	55.72

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: Rel99 Band 2 Fundamentals

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	15.50	V	0.5	8.6	23.55	33.0	-9.4	
1852.40	18.20	H	0.5	8.6	26.26	33.0	-6.7	
Mid Ch								
1880.00	15.61	V	0.5	8.6	23.70	33.0	-9.3	
1880.00	14.18	H	0.5	8.6	22.26	33.0	-10.7	
High Ch								
1907.60	16.49	V	0.6	8.6	24.53	33.0	-8.5	
1907.60	17.58	H	0.6	8.6	25.62	33.0	-7.4	

B2 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: HSDPA Band 2 Fundamentals

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	8.26	V	0.5	8.6	16.31	33.0	-16.7	
1852.40	16.77	H	0.5	8.6	24.83	33.0	-8.2	
Mid Ch								
1880.00	13.45	V	0.5	8.6	21.54	33.0	-11.5	
1880.00	15.71	H	0.5	8.6	23.80	33.0	-9.2	
High Ch								
1907.60	14.81	V	0.6	8.6	22.86	33.0	-10.1	
1907.60	16.55	H	0.6	8.6	24.60	33.0	-8.4	

B2 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/5/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: Rel99 Band 4 Fundamentals

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	11.52	V	0.5	8.7	19.73	30.0	-10.3	
1712.40	12.47	H	0.5	8.7	20.68	30.0	-9.3	
Mid Ch								
1732.60	12.44	V	0.5	8.7	20.60	30.0	-9.4	
1732.60	14.09	H	0.5	8.7	22.25	30.0	-7.7	
High Ch								
1752.60	11.85	V	0.5	8.7	19.99	30.0	-10.0	
1752.60	14.56	H	0.5	8.7	22.70	30.0	-7.3	

B4 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/5/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: HSDPA Band 4 Fundamentals

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	10.11	V	0.5	8.7	18.32	30.0	-11.7	
1712.40	13.06	H	0.5	8.7	21.27	30.0	-8.7	
Mid Ch								
1732.60	10.14	V	0.5	8.7	18.30	30.0	-11.7	
1732.60	13.85	H	0.5	8.7	22.01	30.0	-8.0	
High Ch								
1752.60	9.54	V	0.5	8.7	17.68	30.0	-12.3	
1752.60	14.50	H	0.5	8.7	22.64	30.0	-7.4	

B4 HSDPA

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: Rel99 Band 5 Fundamentals

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	7.57	V	0.4	0.0	7.20	38.5	-31.3	
826.40	16.83	H	0.4	0.0	16.46	38.5	-22.0	
Mid Ch								
836.60	7.12	V	0.4	0.0	6.74	38.5	-31.8	
836.60	16.94	H	0.4	0.0	16.56	38.5	-21.9	
High Ch								
846.60	8.87	V	0.4	0.0	8.49	38.5	-30.0	
846.60	17.02	H	0.4	0.0	16.64	38.5	-21.9	

Version 1.2.4 updated 3/13/17

B5 REL99

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: HSDPA Band 5 Fundamentals

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	5.91	V	0.4	0.0	5.54	38.5	-33.0	
826.40	18.12	H	0.4	0.0	17.75	38.5	-20.7	
Mid Ch								
836.60	3.75	V	0.4	0.0	3.37	38.5	-35.1	
836.60	17.46	H	0.4	0.0	17.08	38.5	-21.4	
High Ch								
846.60	5.80	V	0.4	0.0	5.42	38.5	-33.1	
846.60	17.84	H	0.4	0.0	17.46	38.5	-21.0	

Version 1.2.4 updated 3/13/17

B5 HSDPA

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LTE Band 2

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
1.4	QPSK	1/0	1850.7	25.91	389.94
		1/0	1880	24.85	305.49
		1/0	1909.3	25.76	376.70
	16QAM	1/0	1850.7	24.95	312.61
		1/0	1880	23.85	242.66
		1/0	1909.3	24.97	314.05
3	QPSK	1/0	1851.5	26.10	407.38
		1/0	1880	24.94	311.89
		1/0	1908.5	25.85	384.59
	16QAM	1/0	1851.5	25.36	343.56
		1/0	1880	24.13	258.82
		1/0	1908.5	25.17	328.85
5	QPSK	1/0	1852.5	25.97	395.37
		1/0	1880	24.64	291.07
		1/0	1907.5	26.02	399.94
	16QAM	1/0	1852.5	25.27	336.51
		1/0	1880	24.12	258.23
		1/0	1907.5	25.26	335.74
10	QPSK	1/0	1855	25.99	397.19
		1/0	1880	24.94	311.89
		1/0	1905	26.02	399.94
	16QAM	1/0	1855	25.11	324.34
		1/0	1880	24.10	257.04
		1/0	1905	25.25	334.97
15	QPSK	1/0	1857.5	25.51	355.63
		1/0	1880	24.69	294.44
		1/0	1902.5	25.40	346.74
	16QAM	1/0	1857.5	24.67	293.09
		1/0	1880	23.80	239.88
		1/0	1902.5	24.68	293.76
20	QPSK	1/0	1860	24.38	274.16
		1/0	1880	24.73	297.17
		1/0	1900	24.58	287.08
	16QAM	1/0	1860	23.55	226.46
		1/0	1880	24.15	260.02
		1/0	1900	23.85	242.66

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	16.52	V	0.6	8.6	24.57	33.0	-8.4	
1850.70	17.86	H	0.6	8.6	25.91	33.0	-7.1	
Mid Ch								
1880.00	14.95	V	0.5	8.6	23.04	33.0	-10.0	
1880.00	16.76	H	0.5	8.6	24.85	33.0	-8.2	
High Ch								
1909.30	15.90	V	0.6	8.6	23.94	33.0	-9.1	
1909.30	17.72	H	0.6	8.6	25.76	33.0	-7.2	

LTE B2 1.4MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	15.78	V	0.6	8.6	23.83	33.0	-9.2	
1850.70	16.90	H	0.6	8.6	24.95	33.0	-8.0	
Mid Ch								
1880.00	14.19	V	0.5	8.6	22.28	33.0	-10.7	
1880.00	15.76	H	0.5	8.6	23.85	33.0	-9.2	
High Ch								
1909.30	15.06	V	0.6	8.6	23.10	33.0	-9.9	
1909.30	16.93	H	0.6	8.6	24.97	33.0	-8.0	

LTE B2 1.4MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	16.78	V	0.5	8.6	24.84	33.0	-8.2	
1851.50	18.05	H	0.5	8.6	26.10	33.0	-6.9	
Mid Ch								
1880.00	15.06	V	0.5	8.6	23.15	33.0	-9.9	
1880.00	16.85	H	0.5	8.6	24.94	33.0	-8.1	
High Ch								
1908.50	16.11	V	0.6	8.6	24.15	33.0	-8.8	
1908.50	17.81	H	0.6	8.6	25.85	33.0	-7.2	

LTE B2 3MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	15.86	V	0.5	8.6	23.92	33.0	-9.1	
1851.50	17.31	H	0.5	8.6	25.36	33.0	-7.6	
Mid Ch								
1880.00	14.35	V	0.5	8.6	22.44	33.0	-10.6	
1880.00	16.04	H	0.5	8.6	24.13	33.0	-8.9	
High Ch								
1908.50	15.41	V	0.6	8.6	23.45	33.0	-9.5	
1908.50	17.13	H	0.6	8.6	25.17	33.0	-7.8	

LTE B2 3MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	16.38	V	0.5	8.6	24.44	33.0	-8.6	
1852.50	17.91	H	0.5	8.6	25.97	33.0	-7.0	
Mid Ch								
1880.00	15.06	V	0.5	8.6	23.15	33.0	-9.9	
1880.00	16.55	H	0.5	8.6	24.64	33.0	-8.4	
High Ch								
1907.50	14.54	V	0.6	8.6	22.59	33.0	-10.4	
1907.50	17.98	H	0.6	8.6	26.02	33.0	-7.0	

LTE B2 5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	15.61	V	0.5	8.6	23.67	33.0	-9.3	
1852.50	17.21	H	0.5	8.6	25.27	33.0	-7.7	
Mid Ch								
1880.00	14.19	V	0.5	8.6	22.28	33.0	-10.7	
1880.00	16.03	H	0.5	8.6	24.12	33.0	-8.9	
High Ch								
1907.50	13.81	V	0.6	8.6	21.86	33.0	-11.1	
1907.50	17.22	H	0.6	8.6	25.26	33.0	-7.7	

LTE B2 5MHz 16QAM

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	16.07	V	0.5	8.6	24.14	33.0	-8.9	
1855.00	17.92	H	0.5	8.6	25.99	33.0	-7.0	
Mid Ch								
1880.00	14.93	V	0.5	8.6	23.02	33.0	-10.0	
1880.00	16.85	H	0.5	8.6	24.94	33.0	-8.1	
High Ch								
1905.00	14.89	V	0.6	8.6	22.94	33.0	-10.1	
1905.00	17.97	H	0.6	8.6	26.02	33.0	-7.0	

LTE B2 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	15.24	V	0.5	8.6	23.31	33.0	-9.7	
1855.00	17.04	H	0.5	8.6	25.11	33.0	-7.9	
Mid Ch								
1880.00	14.26	V	0.5	8.6	22.35	33.0	-10.7	
1880.00	16.01	H	0.5	8.6	24.10	33.0	-8.9	
High Ch								
1905.00	14.10	V	0.6	8.6	22.15	33.0	-10.8	
1905.00	17.20	H	0.6	8.6	25.25	33.0	-7.8	

LTE B2 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	15.14	V	0.5	8.6	23.21	33.0	-9.8	
1857.50	17.44	H	0.5	8.6	25.51	33.0	-7.5	
Mid Ch								
1880.00	14.92	V	0.5	8.6	23.01	33.0	-10.0	
1880.00	16.60	H	0.5	8.6	24.69	33.0	-8.3	
High Ch								
1902.50	15.39	V	0.5	8.6	23.45	33.0	-9.5	
1902.50	17.34	H	0.5	8.6	25.40	33.0	-7.6	

LTE B2 15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	14.40	V	0.5	8.6	22.47	33.0	-10.5	
1857.50	16.60	H	0.5	8.6	24.67	33.0	-8.3	
Mid Ch								
1880.00	14.12	V	0.5	8.6	22.21	33.0	-10.8	
1880.00	15.71	H	0.5	8.6	23.80	33.0	-9.2	
High Ch								
1902.50	14.50	V	0.5	8.6	22.56	33.0	-10.4	
1902.50	16.62	H	0.5	8.6	24.68	33.0	-8.3	

LTE B2 15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	14.35	V	0.5	8.6	22.43	33.0	-10.6	
1860.00	16.30	H	0.5	8.6	24.38	33.0	-8.6	
Mid Ch								
1880.00	15.16	V	0.5	8.6	23.25	33.0	-9.8	
1880.00	16.64	H	0.5	8.6	24.73	33.0	-8.3	
High Ch								
1900.00	15.73	V	0.5	8.6	23.81	33.0	-9.2	
1900.00	16.51	H	0.5	8.6	24.58	33.0	-8.4	

LTE B2 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	13.68	V	0.5	8.6	21.76	33.0	-11.2	
1860.00	15.47	H	0.5	8.6	23.55	33.0	-9.5	
Mid Ch								
1880.00	14.43	V	0.5	8.6	22.52	33.0	-10.5	
1880.00	16.06	H	0.5	8.6	24.15	33.0	-8.9	
High Ch								
1900.00	15.01	V	0.5	8.6	23.09	33.0	-9.9	
1900.00	15.78	H	0.5	8.6	23.85	33.0	-9.2	

LTE B2 20MHz 16QAM

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LTE Band 4

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
1.4	QPSK	1/0	1710.7	23.31	214.29
		1/0	1732.5	23.20	208.93
		1/0	1754.3	23.51	224.39
	16QAM	1/0	1710.7	22.45	175.79
		1/0	1732.5	22.37	172.58
		1/0	1754.3	22.61	182.39
3	QPSK	1/0	1711.5	22.77	189.23
		1/0	1732.5	23.26	211.84
		1/0	1753.5	23.24	210.86
	16QAM	1/0	1711.5	21.86	153.46
		1/0	1732.5	22.53	179.06
		1/0	1753.5	22.43	174.98
5	QPSK	1/0	1712.5	22.87	193.64
		1/0	1732.5	23.14	206.06
		1/0	1752.5	22.95	197.24
	16QAM	1/0	1712.5	22.08	161.44
		1/0	1732.5	22.36	172.19
		1/0	1752.5	22.30	169.82
10	QPSK	1/0	1715	23.51	224.39
		1/0	1732.5	23.02	200.45
		1/0	1750	23.17	207.49
	16QAM	1/0	1715	22.82	191.43
		1/0	1732.5	22.27	168.66
		1/0	1750	22.59	181.55
15	QPSK	1/0	1717.5	23.50	223.87
		1/0	1732.5	22.96	197.70
		1/0	1747.5	23.27	212.32
	16QAM	1/0	1717.5	22.72	187.07
		1/0	1732.5	22.07	161.06
		1/0	1747.5	22.49	177.42
20	QPSK	1/0	1720	22.19	165.58
		1/0	1732.5	22.58	181.13
		1/0	1745	22.76	188.80
	16QAM	1/0	1720	21.42	138.68
		1/0	1732.5	21.95	156.68
		1/0	1745	22.03	159.59

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	13.74	V	0.5	8.6	21.81	30.0	-8.2	
1710.70	15.24	H	0.5	8.6	23.31	30.0	-6.7	
Mid Ch								
1732.50	12.36	V	0.5	8.6	20.42	30.0	-9.6	
1732.50	15.15	H	0.5	8.6	23.20	30.0	-6.8	
High Ch								
1754.30	13.56	V	0.5	8.6	21.62	30.0	-8.4	
1754.30	15.44	H	0.5	8.6	23.51	30.0	-6.5	

LTE B4 1.4MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	12.99	V	0.5	8.6	21.06	30.0	-8.9	
1710.70	14.38	H	0.5	8.6	22.45	30.0	-7.5	
Mid Ch								
1732.50	11.50	V	0.5	8.6	19.56	30.0	-10.4	
1732.50	14.32	H	0.5	8.6	22.37	30.0	-7.6	
High Ch								
1754.30	12.69	V	0.5	8.6	20.75	30.0	-9.2	
1754.30	14.54	H	0.5	8.6	22.61	30.0	-7.4	

LTE B4 1.4MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	14.14	V	0.5	8.6	22.21	30.0	-7.8	
1711.50	14.70	H	0.5	8.6	22.77	30.0	-7.2	
Mid Ch								
1732.50	12.55	V	0.5	8.6	20.61	30.0	-9.4	
1732.50	15.21	H	0.5	8.6	23.26	30.0	-6.7	
High Ch								
1753.50	13.82	V	0.5	8.6	21.88	30.0	-8.1	
1753.50	15.17	H	0.5	8.6	23.24	30.0	-6.8	

LTE B4 3MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	13.28	V	0.5	8.6	21.35	30.0	-8.6	
1711.50	13.79	H	0.5	8.6	21.86	30.0	-8.1	
Mid Ch								
1732.50	11.77	V	0.5	8.6	19.83	30.0	-10.2	
1732.50	14.48	H	0.5	8.6	22.53	30.0	-7.5	
High Ch								
1753.50	12.99	V	0.5	8.6	21.05	30.0	-8.9	
1753.50	14.36	H	0.5	8.6	22.43	30.0	-7.6	

LTE B4 3MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	13.95	V	0.5	8.6	22.02	30.0	-8.0	
1712.50	14.80	H	0.5	8.6	22.87	30.0	-7.1	
Mid Ch								
1732.50	12.63	V	0.5	8.6	20.69	30.0	-9.3	
1732.50	15.09	H	0.5	8.6	23.14	30.0	-6.9	
High Ch								
1752.50	13.80	V	0.5	8.6	21.86	30.0	-8.1	
1752.50	14.88	H	0.5	8.6	22.95	30.0	-7.1	

LTE B4 5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	13.31	V	0.5	8.6	21.38	30.0	-8.6	
1712.50	14.01	H	0.5	8.6	22.08	30.0	-7.9	
Mid Ch								
1732.50	11.65	V	0.5	8.6	19.71	30.0	-10.3	
1732.50	14.31	H	0.5	8.6	22.36	30.0	-7.6	
High Ch								
1752.50	13.09	V	0.5	8.6	21.15	30.0	-8.8	
1752.50	14.23	H	0.5	8.6	22.30	30.0	-7.7	

LTE B4 5MHz 16QAM

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	10.70	V	0.5	8.6	18.77	30.0	-11.2	
1715.00	15.44	H	0.5	8.6	23.51	30.0	-6.5	
Mid Ch								
1732.50	12.56	V	0.5	8.6	20.62	30.0	-9.4	
1732.50	14.97	H	0.5	8.6	23.02	30.0	-7.0	
High Ch								
1750.00	13.51	V	0.5	8.6	21.58	30.0	-8.4	
1750.00	15.09	H	0.5	8.6	23.17	30.0	-6.8	

LTE B4 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	9.76	V	0.5	8.6	17.83	30.0	-12.2	
1715.00	14.75	H	0.5	8.6	22.82	30.0	-7.2	
Mid Ch								
1732.50	11.75	V	0.5	8.6	19.81	30.0	-10.2	
1732.50	14.22	H	0.5	8.6	22.27	30.0	-7.7	
High Ch								
1750.00	12.93	V	0.5	8.6	21.00	30.0	-9.0	
1750.00	14.51	H	0.5	8.6	22.59	30.0	-7.4	

LTE B4 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	14.08	V	0.5	8.6	22.14	30.0	-7.9	
1717.50	15.44	H	0.5	8.6	23.50	30.0	-6.5	
Mid Ch								
1732.50	12.11	V	0.5	8.6	20.17	30.0	-9.8	
1732.50	14.91	H	0.5	8.6	22.96	30.0	-7.0	
High Ch								
1747.50	13.32	V	0.5	8.6	21.40	30.0	-8.6	
1747.50	15.18	H	0.5	8.6	23.27	30.0	-6.7	

LTE B4 15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	13.31	V	0.5	8.6	21.37	30.0	-8.6	
1717.50	14.66	H	0.5	8.6	22.72	30.0	-7.3	
Mid Ch								
1732.50	11.34	V	0.5	8.6	19.40	30.0	-10.6	
1732.50	14.02	H	0.5	8.6	22.07	30.0	-7.9	
High Ch								
1747.50	12.49	V	0.5	8.6	20.57	30.0	-9.4	
1747.50	14.40	H	0.5	8.6	22.49	30.0	-7.5	

LTE B4 15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	13.46	V	0.6	8.6	21.51	30.0	-8.5	
1720.00	14.14	H	0.6	8.6	22.19	30.0	-7.8	
Mid Ch								
1732.50	12.19	V	0.5	8.6	20.25	30.0	-9.8	
1732.50	14.53	H	0.5	8.6	22.58	30.0	-7.4	
High Ch								
1745.00	12.27	V	0.5	8.6	20.36	30.0	-9.6	
1745.00	14.66	H	0.5	8.6	22.76	30.0	-7.2	

LTE B4 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/31/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-position)
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T712, and Chamber C SMA Cables
Substitution: Horn T59, 6ft N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	12.69	V	0.6	8.6	20.74	30.0	-9.3	
1720.00	13.37	H	0.6	8.6	21.42	30.0	-8.6	
Mid Ch								
1732.50	11.48	V	0.5	8.6	19.54	30.0	-10.5	
1732.50	13.90	H	0.5	8.6	21.95	30.0	-8.1	
High Ch								
1745.00	11.66	V	0.5	8.6	19.75	30.0	-10.2	
1745.00	13.93	H	0.5	8.6	22.03	30.0	-8.0	

LTE B4 20MHz 16QAM

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

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LTE Band 5

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
1.4	QPSK	1/0	824.7	17.24	52.97
		1/0	836.5	17.87	61.24
		1/0	848.3	19.22	83.56
	16QAM	1/0	824.7	16.42	43.85
		1/0	836.5	17.07	50.93
		1/0	848.3	18.40	69.18
3	QPSK	1/0	825.5	17.81	60.39
		1/0	836.5	17.52	56.49
		1/0	847.5	18.34	68.23
	16QAM	1/0	825.5	17.08	51.05
		1/0	836.5	16.73	47.10
		1/0	847.5	17.72	59.16
5	QPSK	1/0	826.5	17.57	57.15
		1/0	836.5	18.43	69.66
		1/0	846.5	17.78	59.98
	16QAM	1/0	826.5	17.00	50.12
		1/0	836.5	17.65	58.21
		1/0	846.5	16.92	49.20
10	QPSK	1/0	829	17.68	58.61
		1/0	836.5	17.73	59.29
		1/0	844	18.29	67.45
	16QAM	1/0	829	17.10	51.29
		1/0	836.5	17.02	50.35
		1/0	844	17.47	55.85

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UL Verification Services, Inc.
Fudnamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 5 Fundamentals, 1MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	12.28	V	0.4	0.0	11.91	38.5	-26.6	
824.70	17.61	H	0.4	0.0	17.24	38.5	-21.3	
Mid Ch								
836.50	12.44	V	0.4	0.0	12.06	38.5	-26.4	
836.50	18.25	H	0.4	0.0	17.87	38.5	-20.6	
High Ch								
848.30	12.18	V	0.4	0.0	11.80	38.5	-26.7	
848.30	19.60	H	0.4	0.0	19.22	38.5	-19.3	

Version 1.2.3 updated 4/15/16

LTE B5 1.4MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 5 Fundamentals, 1MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	11.25	V	0.4	0.0	10.88	38.5	-27.6	
824.70	16.79	H	0.4	0.0	16.42	38.5	-22.1	
Mid Ch								
836.50	11.66	V	0.4	0.0	11.28	38.5	-27.2	
836.50	17.45	H	0.4	0.0	17.07	38.5	-21.4	
High Ch								
848.30	11.37	V	0.4	0.0	10.99	38.5	-27.5	
848.30	18.78	H	0.4	0.0	18.40	38.5	-20.1	

Version 1.2.3 updated 4/15/16

LTE B5 1.4MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	11.59	V	0.4	0.0	11.22	38.5	-27.3	
825.50	18.18	H	0.4	0.0	17.81	38.5	-20.7	
Mid Ch								
836.50	12.98	V	0.4	0.0	12.60	38.5	-25.9	
836.50	17.90	H	0.4	0.0	17.52	38.5	-21.0	
High Ch								
847.50	12.16	V	0.4	0.0	11.78	38.5	-26.7	
847.50	18.72	H	0.4	0.0	18.34	38.5	-20.2	

Version 1.2.3 updated 4/15/16

LTE B5 3MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	10.85	V	0.4	0.0	10.48	38.5	-28.0	
825.50	17.45	H	0.4	0.0	17.08	38.5	-21.4	
Mid Ch								
836.50	12.21	V	0.4	0.0	11.83	38.5	-26.7	
836.50	17.11	H	0.4	0.0	16.73	38.5	-21.8	
High Ch								
847.50	11.57	V	0.4	0.0	11.19	38.5	-27.3	
847.50	18.10	H	0.4	0.0	17.72	38.5	-20.8	

Version 1.2.3 updated 4/15/16

LTE B5 3MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	12.01	V	0.4	0.0	11.64	38.5	-26.9	
826.50	17.94	H	0.4	0.0	17.57	38.5	-20.9	
Mid Ch								
836.50	12.64	V	0.4	0.0	12.26	38.5	-26.2	
836.50	18.81	H	0.4	0.0	18.43	38.5	-20.1	
High Ch								
846.50	12.14	V	0.4	0.0	11.76	38.5	-26.7	
846.50	18.16	H	0.4	0.0	17.78	38.5	-20.7	

Version 1.2.3 updated 4/15/16

LTE B5 5MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	11.35	V	0.4	0.0	10.98	38.5	-27.5	
826.50	17.37	H	0.4	0.0	17.00	38.5	-21.5	
Mid Ch								
836.50	11.82	V	0.4	0.0	11.44	38.5	-27.1	
836.50	18.03	H	0.4	0.0	17.65	38.5	-20.8	
High Ch								
846.50	11.41	V	0.4	0.0	11.03	38.5	-27.5	
846.50	17.30	H	0.4	0.0	16.92	38.5	-21.6	

Version 1.2.3 updated 4/15/16

LTE B5 5MHz 16QAM

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UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	12.74	V	0.4	0.0	12.37	38.5	-26.1	
829.00	18.05	H	0.4	0.0	17.68	38.5	-20.8	
Mid Ch								
836.50	12.70	V	0.4	0.0	12.32	38.5	-26.2	
836.50	18.11	H	0.4	0.0	17.73	38.5	-20.8	
High Ch								
844.00	12.67	V	0.4	0.0	12.29	38.5	-26.2	
844.00	18.67	H	0.4	0.0	18.29	38.5	-20.2	

Version 1.2.3 updated 4/15/16

LTE B5 10MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T477, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	11.94	V	0.4	0.0	11.57	38.5	-26.9	
829.00	17.47	H	0.4	0.0	17.10	38.5	-21.4	
Mid Ch								
836.50	12.00	V	0.4	0.0	11.62	38.5	-26.9	
836.50	17.40	H	0.4	0.0	17.02	38.5	-21.5	
High Ch								
844.00	12.04	V	0.4	0.0	11.66	38.5	-26.8	
844.00	17.85	H	0.4	0.0	17.47	38.5	-21.0	

Version 1.2.3 updated 4/15/16

LTE B5 10MHz 16QAM

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LTE Band 7

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
5	QPSK	1/0	2502.5	26.50	446.68
		1/0	2535	27.06	508.16
		1/0	2567.5	26.67	464.52
	16QAM	1/0	2502.5	26.21	417.83
		1/0	2535	26.54	450.82
		1/0	2567.5	26.03	400.87
10	QPSK	1/0	2505	26.88	487.53
		1/0	2535	27.39	548.28
		1/0	2565	26.30	426.58
	16QAM	1/0	2505	25.92	390.84
		1/0	2535	26.76	474.24
		1/0	2565	25.65	367.28
15	QPSK	1/0	2507.5	27.02	503.50
		1/0	2535	27.77	598.41
		1/0	2562.5	26.31	427.56
	16QAM	1/0	2507.5	26.29	425.60
		1/0	2535	26.91	490.91
		1/0	2562.5	25.50	354.81
20	QPSK	1/0	2510	27.05	506.99
		1/0	2535	27.78	599.79
		1/0	2560	26.15	412.10
	16QAM	1/0	2510	26.33	429.54
		1/0	2535	27.10	512.86
		1/0	2560	25.47	352.37

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 7 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2502.50	17.47	V	0.7	9.5	26.30	33.0	-6.7	
2502.50	17.67	H	0.7	9.5	26.50	33.0	-6.5	
Mid Ch								
2535.00	18.28	V	0.7	9.5	27.06	33.0	-5.9	
2535.00	18.23	H	0.7	9.5	27.01	33.0	-6.0	
High Ch								
2567.50	17.83	V	0.7	9.5	26.67	33.0	-6.3	
2567.50	17.54	H	0.7	9.5	26.39	33.0	-6.6	

LTE B7 5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 7 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2502.50	17.38	V	0.7	9.5	26.21	33.0	-6.8	
2502.50	16.93	H	0.7	9.5	25.76	33.0	-7.2	
Mid Ch								
2535.00	17.16	V	0.7	9.5	25.94	33.0	-7.1	
2535.00	17.76	H	0.7	9.5	26.54	33.0	-6.5	
High Ch								
2567.50	16.72	V	0.7	9.5	25.56	33.0	-7.4	
2567.50	17.18	H	0.7	9.5	26.03	33.0	-7.0	

LTE B7 5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 7 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2505.00	18.04	V	0.7	9.5	26.88	33.0	-6.1	
2505.00	17.37	H	0.7	9.5	26.22	33.0	-6.8	
Mid Ch								
2535.00	17.41	V	0.7	9.5	26.19	33.0	-6.8	
2535.00	18.61	H	0.7	9.5	27.39	33.0	-5.6	
High Ch								
2565.00	17.06	V	0.7	9.5	25.90	33.0	-7.1	
2565.00	17.46	H	0.7	9.5	26.30	33.0	-6.7	

LTE B7 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 7 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2505.00	17.08	V	0.7	9.5	25.92	33.0	-7.1	
2505.00	16.62	H	0.7	9.5	25.47	33.0	-7.5	
Mid Ch								
2535.00	16.79	V	0.7	9.5	25.57	33.0	-7.4	
2535.00	17.98	H	0.7	9.5	26.76	33.0	-6.2	
High Ch								
2565.00	16.29	V	0.7	9.5	25.13	33.0	-7.9	
2565.00	16.81	H	0.7	9.5	25.65	33.0	-7.3	

LTE B7 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 7 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2507.50	18.16	V	0.6	9.5	27.02	33.0	-6.0	
2507.50	17.46	H	0.6	9.5	26.32	33.0	-6.7	
Mid Ch								
2535.00	18.19	V	0.7	9.5	26.97	33.0	-6.0	
2535.00	18.99	H	0.7	9.5	27.77	33.0	-5.2	
High Ch								
2562.50	16.55	V	0.7	9.5	25.39	33.0	-7.6	
2562.50	17.47	H	0.7	9.5	26.31	33.0	-6.7	

LTE B7 15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 7 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2507.50	17.43	V	0.6	9.5	26.29	33.0	-6.7	
2507.50	16.63	H	0.6	9.5	25.49	33.0	-7.5	
Mid Ch								
2535.00	17.28	V	0.7	9.5	26.06	33.0	-6.9	
2535.00	18.13	H	0.7	9.5	26.91	33.0	-6.1	
High Ch								
2562.50	15.77	V	0.7	9.5	24.61	33.0	-8.4	
2562.50	16.66	H	0.7	9.5	25.50	33.0	-7.5	

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_QPSK Band 7 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2510.00	18.19	V	0.6	9.5	27.05	33.0	-5.9	
2510.00	17.21	H	0.6	9.5	26.08	33.0	-6.9	
Mid Ch								
2535.00	17.92	V	0.7	9.5	26.70	33.0	-6.3	
2535.00	19.00	H	0.7	9.5	27.78	33.0	-5.2	
High Ch								
2560.00	17.33	V	0.7	9.5	26.15	33.0	-6.8	
2560.00	16.83	H	0.7	9.5	25.66	33.0	-7.3	

LTE B7 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/29/2017
Test Engineer: 43675 OS
Configuration: EUT Only (X-Pos)
Location: Chamber B
Mode: LTE_16QAM Band 7 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2510.00	17.47	V	0.6	9.5	26.33	33.0	-6.7	
2510.00	16.62	H	0.6	9.5	25.49	33.0	-7.5	
Mid Ch								
2535.00	17.22	V	0.7	9.5	26.00	33.0	-7.0	
2535.00	18.32	H	0.7	9.5	27.10	33.0	-5.9	
High Ch								
2560.00	16.65	V	0.7	9.5	25.47	33.0	-7.5	
2560.00	16.15	H	0.7	9.5	24.98	33.0	-8.0	

LTE B7 20MHz 16QAM

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LTE Band 12

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
1.4	QPSK	1/0	699.7	14.85	30.55
		1/0	707.5	15.99	39.72
		1/0	715.3	15.91	38.99
	16QAM	1/0	699.7	14.15	26.00
		1/0	707.5	15.07	32.14
		1/0	715.3	15.11	32.43
3	QPSK	1/0	700.5	15.10	32.36
		1/0	707.5	16.41	43.75
		1/0	714.5	15.94	39.26
	16QAM	1/0	700.5	14.47	27.99
		1/0	707.5	15.71	37.24
		1/0	714.5	15.14	32.66
5	QPSK	1/0	701.5	15.35	34.28
		1/0	707.5	16.39	43.55
		1/0	713.5	15.19	33.04
	16QAM	1/0	701.5	14.48	28.05
		1/0	707.5	15.72	37.33
		1/0	713.5	14.53	28.38
10	QPSK	1/0	704	15.37	34.43
		1/0	707.5	16.38	43.45
		1/0	711	16.22	41.88
	16QAM	1/0	704	14.61	28.91
		1/0	707.5	15.49	35.40
		1/0	711	15.52	35.65

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UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
699.70	8.29	V	0.4	0.0	7.93	34.8	-26.9	
699.70	15.20	H	0.4	0.0	14.85	34.8	-20.0	
Mid Ch								
707.50	7.80	V	0.3	0.0	7.45	34.8	-27.3	
707.50	16.34	H	0.3	0.0	15.99	34.8	-18.8	
High Ch								
715.30	7.65	V	0.3	0.0	7.31	34.8	-27.5	
715.30	16.26	H	0.3	0.0	15.91	34.8	-18.9	

Version 1.2.3 updated 4/15/16

LTE B12 1.4MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
699.70	7.46	V	0.4	0.0	7.10	34.8	-27.7	
699.70	14.50	H	0.4	0.0	14.15	34.8	-20.7	
Mid Ch								
707.50	6.95	V	0.3	0.0	6.60	34.8	-28.2	
707.50	15.42	H	0.3	0.0	15.07	34.8	-19.7	
High Ch								
715.30	6.82	V	0.3	0.0	6.48	34.8	-28.3	
715.30	15.46	H	0.3	0.0	15.11	34.8	-19.7	

Version 1.2.3 updated 4/15/16

LTE B12 1.4MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
700.50	7.34	V	0.4	0.0	6.98	34.8	-27.8	
700.50	15.45	H	0.4	0.0	15.10	34.8	-19.7	
Mid Ch								
707.50	8.15	V	0.3	0.0	7.80	34.8	-27.0	
707.50	16.76	H	0.3	0.0	16.41	34.8	-18.4	
High Ch								
714.50	7.35	V	0.3	0.0	7.01	34.8	-27.8	
714.50	16.29	H	0.3	0.0	15.94	34.8	-18.9	

Version 1.2.3 updated 4/15/16

LTE B12 3MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
700.50	6.37	V	0.4	0.0	6.01	34.8	-28.8	
700.50	14.82	H	0.4	0.0	14.47	34.8	-20.3	
Mid Ch								
707.50	7.36	V	0.3	0.0	7.01	34.8	-27.8	
707.50	16.06	H	0.3	0.0	15.71	34.8	-19.1	
High Ch								
714.50	6.47	V	0.3	0.0	6.13	34.8	-28.7	
714.50	15.49	H	0.3	0.0	15.14	34.8	-19.7	

Version 1.2.3 updated 4/15/16

LTE B12 3MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	7.08	V	0.4	0.0	6.72	34.8	-28.1	
701.50	15.70	H	0.4	0.0	15.35	34.8	-19.5	
Mid Ch								
707.50	7.96	V	0.3	0.0	7.61	34.8	-27.2	
707.50	16.74	H	0.3	0.0	16.39	34.8	-18.4	
High Ch								
713.50	6.73	V	0.3	0.0	6.39	34.8	-28.4	
713.50	15.53	H	0.3	0.0	15.19	34.8	-19.6	

Version 1.2.3 updated 4/15/16

LTE B12 5MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	6.71	V	0.4	0.0	6.35	34.8	-28.4	
701.50	14.83	H	0.4	0.0	14.48	34.8	-20.3	
Mid Ch								
707.50	7.32	V	0.3	0.0	6.97	34.8	-27.8	
707.50	16.07	H	0.3	0.0	15.72	34.8	-19.1	
High Ch								
713.50	6.06	V	0.3	0.0	5.72	34.8	-29.1	
713.50	14.87	H	0.3	0.0	14.53	34.8	-20.3	

Version 1.2.3 updated 4/15/16

LTE B12 5MHz 16QAM

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UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	7.76	V	0.4	0.0	7.41	34.8	-27.4	
704.00	15.72	H	0.4	0.0	15.37	34.8	-19.4	
Mid Ch								
707.50	8.08	V	0.3	0.0	7.73	34.8	-27.1	
707.50	16.73	H	0.3	0.0	16.38	34.8	-18.4	
High Ch								
711.00	7.90	V	0.3	0.0	7.56	34.8	-27.2	
711.00	16.56	H	0.3	0.0	16.22	34.8	-18.6	

Version 1.2.3 updated 4/15/16

LTE B12 10MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	6.87	V	0.4	0.0	6.52	34.8	-28.3	
704.00	14.96	H	0.4	0.0	14.61	34.8	-20.2	
Mid Ch								
707.50	7.18	V	0.3	0.0	6.83	34.8	-28.0	
707.50	15.84	H	0.3	0.0	15.49	34.8	-19.3	
High Ch								
711.00	7.07	V	0.3	0.0	6.73	34.8	-28.1	
711.00	15.86	H	0.3	0.0	15.52	34.8	-19.3	

Version 1.2.3 updated 4/15/16

LTE B12 10MHz 16QAM

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LTE Band 13

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
5	QPSK	1/0	777.7	16.36	43.25
		1/0	782	16.41	43.75
		1/0	786.3	15.89	38.82
	16QAM	1/0	777.7	15.77	37.76
		1/0	782	15.49	35.40
		1/0	786.3	15.08	32.21
10	QPSK	1/0	782	16.16	41.30
	16QAM	1/0	782	15.35	34.28

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UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
779.50	10.86	V	0.4	0.0	10.49	34.8	-24.3	
779.50	16.73	H	0.4	0.0	16.36	34.8	-18.4	
Mid Ch								
782.00	10.83	V	0.4	0.0	10.46	34.8	-24.3	
782.00	16.78	H	0.4	0.0	16.41	34.8	-18.4	
High Ch								
784.50	10.53	V	0.4	0.0	10.16	34.8	-24.6	
784.50	16.26	H	0.4	0.0	15.89	34.8	-18.9	

Version 1.2.3 updated 4/15/16

LTE B13 5MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
779.50	10.27	V	0.4	0.0	9.90	34.8	-24.9	
779.50	16.14	H	0.4	0.0	15.77	34.8	-19.0	
Mid Ch								
782.00	10.06	V	0.4	0.0	9.69	34.8	-25.1	
782.00	15.86	H	0.4	0.0	15.49	34.8	-19.3	
High Ch								
784.50	9.78	V	0.4	0.0	9.41	34.8	-25.4	
784.50	15.45	H	0.4	0.0	15.08	34.8	-19.7	

Version 1.2.3 updated 4/15/16

LTE B13 5MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	10.94	V	0.4	0.0	10.57	34.8	-24.2	
782.00	16.53	H	0.4	0.0	16.16	34.8	-18.6	

Version 1.2.3 updated 4/15/16

LTE B13 10MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 3/30/2017
Test Engineer: 43575 OS
Configuration: EUT Only (Y-Pos)
Location: Chamber C
Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T273, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	10.09	V	0.4	0.0	9.72	34.8	-25.0	
782.00	15.72	H	0.4	0.0	15.35	34.8	-19.4	

Version 1.2.3 updated 4/15/16

LTE B13 10MHz 16QAM

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LTE Band 17

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
5	QPSK	1/0	706.5	18.08	64.27
		1/0	710	18.42	69.50
		1/0	713.5	17.95	62.37
	16QAM	1/0	706.5	17.36	54.45
		1/0	710	17.80	60.26
		1/0	713.5	17.31	53.83
10	QPSK	1/0	709	18.07	64.12
		1/0	710	18.44	69.82
		1/0	711	18.40	69.18
	16QAM	1/0	709	17.35	54.33
		1/0	710	17.55	56.89
		1/0	711	17.56	57.02

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UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 17 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	10.24	V	0.3	0.0	9.90	34.8	-24.9	
706.50	18.43	H	0.3	0.0	18.08	34.8	-16.7	
Mid Ch								
710.00	9.65	V	0.3	0.0	9.31	34.8	-25.5	
710.00	18.77	H	0.3	0.0	18.42	34.8	-16.3	
High Ch								
713.50	8.67	V	0.3	0.0	8.33	34.8	-26.4	
713.50	18.29	H	0.3	0.0	17.95	34.8	-16.8	

Version 1.2.4 updated 3/13/17

LTE B17 5MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 17 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	9.49	V	0.3	0.0	9.15	34.8	-25.6	
706.50	17.71	H	0.3	0.0	17.36	34.8	-17.4	
Mid Ch								
710.00	9.05	V	0.3	0.0	8.71	34.8	-26.1	
710.00	18.15	H	0.3	0.0	17.80	34.8	-17.0	
High Ch								
713.50	8.11	V	0.3	0.0	7.77	34.8	-27.0	
713.50	17.65	H	0.3	0.0	17.31	34.8	-17.5	

Version 1.2.4 updated 3/13/17

LTE B17 5MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 17 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	9.99	V	0.3	0.0	9.65	34.8	-25.1	
709.00	18.41	H	0.3	0.0	18.07	34.8	-16.7	
Mid Ch								
710.00	9.67	V	0.3	0.0	9.33	34.8	-25.4	
710.00	18.79	H	0.3	0.0	18.44	34.8	-16.3	
High Ch								
711.00	9.21	V	0.3	0.0	8.87	34.8	-25.9	
711.00	18.74	H	0.3	0.0	18.40	34.8	-16.4	

Version 1.2.4 updated 3/13/17

LTE B17 10MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/4/2017
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 17 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	9.02	V	0.3	0.0	8.68	34.8	-26.1	
709.00	17.69	H	0.3	0.0	17.35	34.8	-17.4	
Mid Ch								
710.00	8.74	V	0.3	0.0	8.40	34.8	-26.4	
710.00	17.90	H	0.3	0.0	17.55	34.8	-17.2	
High Ch								
711.00	8.35	V	0.3	0.0	8.01	34.8	-26.8	
711.00	17.90	H	0.3	0.0	17.56	34.8	-17.2	

Version 1.2.4 updated 3/13/17

LTE B17 10MHz 16QAM

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LTE Band 26-Part 90

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
1.4	QPSK	1/0	814.7	16.85	48.42
		1/0	831.5	18.08	64.27
		1/0	848.3	19.29	84.92
	16QAM	1/0	814.7	16.05	40.27
		1/0	831.5	17.22	52.72
		1/0	848.3	18.51	70.96
3	QPSK	1/0	815.5	17.49	56.10
		1/0	831.5	18.10	64.57
		1/0	847.5	19.09	81.10
	16QAM	1/0	815.5	16.62	45.92
		1/0	831.5	17.03	50.47
		1/0	847.5	18.12	64.86
5	QPSK	1/0	816.5	17.00	50.12
		1/0	831.5	18.43	69.66
		1/0	846.5	18.37	68.71
	16QAM	1/0	816.5	16.19	41.59
		1/0	831.5	17.61	57.68
		1/0	846.5	17.62	57.81
10	QPSK	1/0	819	17.61	57.68
		1/0	831.5	17.87	61.24
		1/0	844	19.83	96.16
	16QAM	1/0	819	16.67	46.45
		1/0	831.5	16.99	50.00
		1/0	844	18.92	77.98

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LTE Band 26-Part 22

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
1.4	QPSK	1/0	814.7	16.85	48.42
		1/0	831.5	18.08	64.27
		1/0	848.3	19.29	84.92
	16QAM	1/0	814.7	16.05	40.27
		1/0	831.5	17.22	52.72
		1/0	848.3	18.51	70.96
3	QPSK	1/0	815.5	17.49	56.10
		1/0	831.5	18.10	64.57
		1/0	847.5	19.09	81.10
	16QAM	1/0	815.5	16.62	45.92
		1/0	831.5	17.03	50.47
		1/0	847.5	18.12	64.86
5	QPSK	1/0	816.5	17.00	50.12
		1/0	831.5	18.43	69.66
		1/0	846.5	18.37	68.71
	16QAM	1/0	816.5	16.19	41.59
		1/0	831.5	17.61	57.68
		1/0	846.5	17.62	57.81
10	QPSK	1/0	819	17.61	57.68
		1/0	831.5	17.87	61.24
		1/0	844	19.83	96.16
	16QAM	1/0	819	16.67	46.45
		1/0	831.5	16.99	50.00
		1/0	844	18.92	77.98
15	QPSK	1/0	831.5	18.75	74.99
		1/0	836.5	16.08	40.55
		1/0	841.5	19.17	82.60
	16QAM	1/0	831.5	18.06	63.97
		1/0	836.5	15.37	34.43
		1/0	841.5	18.35	68.39

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UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	14.65	V	0.4	0.0	14.28	50.0	-35.7	Part 90
814.70	17.22	H	0.4	0.0	16.85	50.0	-33.1	Part 90
Mid Ch								
831.50	14.00	V	0.4	0.0	13.62	38.5	-24.9	
831.50	18.45	H	0.4	0.0	18.08	38.5	-20.4	
High Ch								
848.30	13.18	V	0.4	0.0	12.80	38.5	-25.7	
848.30	19.67	H	0.4	0.0	19.29	38.5	-19.2	

Version 1.2.4 updated 3/13/17

LTE B26 1.4MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	13.75	V	0.4	0.0	13.38	50.0	-36.6	Part 90
814.70	16.42	H	0.4	0.0	16.05	50.0	-33.9	Part 90
Mid Ch								
831.50	13.16	V	0.4	0.0	12.78	38.5	-25.7	
831.50	17.59	H	0.4	0.0	17.22	38.5	-21.3	
High Ch								
848.30	12.36	V	0.4	0.0	11.98	38.5	-26.5	
848.30	18.89	H	0.4	0.0	18.51	38.5	-20.0	

Version 1.2.4 updated 3/13/17

LTE B26 1.4MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	14.49	V	0.4	0.0	14.12	50.0	-35.9	Part 90
815.50	17.86	H	0.4	0.0	17.49	50.0	-32.5	Part 90
Mid Ch								
831.50	14.05	V	0.4	0.0	13.67	38.5	-24.8	
831.50	18.47	H	0.4	0.0	18.10	38.5	-20.4	
High Ch								
847.50	13.83	V	0.4	0.0	13.45	38.5	-25.0	
847.50	19.47	H	0.4	0.0	19.09	38.5	-19.4	

Version 1.2.4 updated 3/13/17

LTE B26 3MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	13.57	V	0.4	0.0	13.20	50.0	-36.8	Part 90
815.50	16.99	H	0.4	0.0	16.62	50.0	-33.4	Part 90
Mid Ch								
831.50	13.15	V	0.4	0.0	12.77	38.5	-25.7	
831.50	17.40	H	0.4	0.0	17.03	38.5	-21.5	
High Ch								
847.50	12.98	V	0.4	0.0	12.60	38.5	-25.9	
847.50	18.50	H	0.4	0.0	18.12	38.5	-20.4	

Version 1.2.4 updated 3/13/17

LTE B26 3MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	14.54	V	0.4	0.0	14.17	50.0	-35.8	Part 90
816.50	17.37	H	0.4	0.0	17.00	50.0	-33.0	Part 90
Mid Ch								
831.50	13.56	V	0.4	0.0	13.18	38.5	-25.3	
831.50	18.80	H	0.4	0.0	18.43	38.5	-20.1	
High Ch								
846.50	13.18	V	0.4	0.0	12.81	38.5	-25.7	
846.50	18.75	H	0.4	0.0	18.37	38.5	-20.1	

Version 1.2.4 updated 3/13/17

LTE B26 5MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	13.75	V	0.4	0.0	13.38	50.0	-36.6	Part 90
816.50	16.56	H	0.4	0.0	16.19	50.0	-33.8	Part 90
Mid Ch								
831.50	12.92	V	0.4	0.0	12.54	38.5	-26.0	
831.50	17.98	H	0.4	0.0	17.61	38.5	-20.9	
High Ch								
846.50	12.24	V	0.4	0.0	11.87	38.5	-26.6	
846.50	18.00	H	0.4	0.0	17.62	38.5	-20.9	

Version 1.2.4 updated 3/13/17

LTE B26 5MHz 16QAM

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UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	14.53	V	0.4	0.0	14.16	50.0	-35.8	Part 90
819.00	17.98	H	0.4	0.0	17.61	50.0	-32.4	Part 90
Mid Ch								
831.50	14.79	V	0.4	0.0	14.41	38.5	-24.1	
831.50	18.24	H	0.4	0.0	17.87	38.5	-20.6	
High Ch								
844.00	14.89	V	0.4	0.0	14.52	38.5	-24.0	
844.00	20.21	H	0.4	0.0	19.83	38.5	-18.7	

Version 1.2.4 updated 3/13/17

LTE B26 10MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	13.82	V	0.4	0.0	13.45	50.0	-36.5	Part 90
819.00	17.04	H	0.4	0.0	16.67	50.0	-33.3	Part 90
Mid Ch								
831.50	13.86	V	0.4	0.0	13.48	38.5	-25.0	
831.50	17.36	H	0.4	0.0	16.99	38.5	-21.5	
High Ch								
844.00	14.13	V	0.4	0.0	13.76	38.5	-24.7	
844.00	19.30	H	0.4	0.0	18.92	38.5	-19.6	

Version 1.2.4 updated 3/13/17

LTE B26 10MHz 16QAM

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	14.45	V	0.4	0.0	14.07	38.5	-24.4	
831.50	19.12	H	0.4	0.0	18.75	38.5	-19.8	
Mid Ch								
836.50	13.57	V	0.4	0.0	13.19	38.5	-25.3	
836.50	16.46	H	0.4	0.0	16.08	38.5	-22.4	
High Ch								
841.50	14.82	V	0.4	0.0	14.45	38.5	-24.1	
841.50	19.55	H	0.4	0.0	19.17	38.5	-19.3	

Version 1.2.4 updated 3/13/17

LTE B26 15MHz QPSK

UL Verification Services, Inc.
Fundamental Substitution Measurement

Company: SOMC
Project #: 11626381
Date: 4/3/2017
Test Engineer: 43575 OS
Configuration: EUT Only (X-Position)
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Hybrid T408, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	13.62	V	0.4	0.0	13.24	38.5	-25.3	
831.50	18.43	H	0.4	0.0	18.06	38.5	-20.4	
Mid Ch								
836.50	12.71	V	0.4	0.0	12.33	38.5	-26.2	
836.50	15.75	H	0.4	0.0	15.37	38.5	-23.1	
High Ch								
841.50	13.92	V	0.4	0.0	13.55	38.5	-25.0	
841.50	18.73	H	0.4	0.0	18.35	38.5	-20.2	

Version 1.2.4 updated 3/13/17

LTE B26 15MHz 16QAM

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LTE Band 41

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
5	QPSK	1/0	2498.5	24.60	288.40
		1/0	2593	25.35	342.77
		1/0	2687.5	23.31	214.29
	16QAM	1/0	2498.5	24.39	274.79
		1/0	2593	25.37	344.35
		1/0	2687.5	23.81	240.44
10	QPSK	1/0	2501	23.32	214.78
		1/0	2593	24.48	280.54
		1/0	2685	24.07	255.27
	16QAM	1/0	2501	23.61	229.61
		1/0	2593	25.07	321.37
		1/0	2685	24.11	257.63
15	QPSK	1/0	2503.5	24.14	259.42
		1/0	2593	24.67	293.09
		1/0	2682.5	23.52	224.91
	16QAM	1/0	2503.5	24.24	265.46
		1/0	2593	24.47	279.90
		1/0	2682.5	23.72	235.50
20	QPSK	1/0	2506	23.75	237.14
		1/0	2593	25.37	344.35
		1/0	2680	26.11	408.32
	16QAM	1/0	2506	24.02	252.35
		1/0	2593	25.64	366.44
		1/0	2680	26.17	414.00

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	9.11	V	0.7	9.5	17.92	33.0	-15.1	
2498.50	15.79	H	0.7	9.5	24.60	33.0	-8.4	
Mid Ch								
2593.00	7.38	V	0.7	9.5	16.15	33.0	-16.8	
2593.00	16.58	H	0.7	9.5	25.35	33.0	-7.6	
High Ch								
2687.50	5.20	V	0.7	9.5	14.01	33.0	-19.0	
2687.50	14.50	H	0.7	9.5	23.31	33.0	-9.7	

LTE B41 5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	6.60	V	0.7	9.5	15.41	33.0	-17.6	
2498.50	15.58	H	0.7	9.5	24.39	33.0	-8.6	
Mid Ch								
2593.00	7.20	V	0.7	9.5	15.97	33.0	-17.0	
2593.00	16.60	H	0.7	9.5	25.37	33.0	-7.6	
High Ch								
2687.50	4.70	V	0.7	9.5	13.51	33.0	-19.5	
2687.50	15.00	H	0.7	9.5	23.81	33.0	-9.2	

LTE B41 5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	5.50	V	0.7	9.5	14.32	33.0	-18.7	
2501.00	14.50	H	0.7	9.5	23.32	33.0	-9.7	
Mid Ch								
2593.00	6.20	V	0.7	9.5	14.97	33.0	-18.0	
2593.00	15.71	H	0.7	9.5	24.48	33.0	-8.5	
High Ch								
2685.00	6.30	V	0.7	9.5	15.11	33.0	-17.9	
2685.00	15.26	H	0.7	9.5	24.07	33.0	-8.9	

LTE B41 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	5.40	V	0.7	9.5	14.22	33.0	-18.8	
2501.00	14.79	H	0.7	9.5	23.61	33.0	-9.4	
Mid Ch								
2593.00	7.40	V	0.7	9.5	16.17	33.0	-16.8	
2593.00	16.30	H	0.7	9.5	25.07	33.0	-7.9	
High Ch								
2685.00	6.48	V	0.7	9.5	15.29	33.0	-17.7	
2685.00	15.30	H	0.7	9.5	24.11	33.0	-8.9	

LTE B41 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	6.00	V	0.7	9.5	14.84	33.0	-18.2	
2503.50	15.30	H	0.7	9.5	24.14	33.0	-8.9	
Mid Ch								
2593.00	6.90	V	0.7	9.5	15.67	33.0	-17.3	
2593.00	15.90	H	0.7	9.5	24.67	33.0	-8.3	
High Ch								
2682.50	5.20	V	0.7	9.5	14.02	33.0	-19.0	
2682.50	14.70	H	0.7	9.5	23.52	33.0	-9.5	

LTE B41 15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	5.83	V	0.7	9.5	14.67	33.0	-18.3	
2503.50	15.40	H	0.7	9.5	24.24	33.0	-8.8	
Mid Ch								
2593.00	6.97	V	0.7	9.5	15.74	33.0	-17.3	
2593.00	15.70	H	0.7	9.5	24.47	33.0	-8.5	
High Ch								
2682.50	5.60	V	0.7	9.5	14.42	33.0	-18.6	
2682.50	14.90	H	0.7	9.5	23.72	33.0	-9.3	

LTE B41 15MHz 16QAM

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UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	5.08	V	0.6	9.5	13.93	33.0	-19.1	
2506.00	14.90	H	0.6	9.5	23.75	33.0	-9.2	
Mid Ch								
2593.00	6.60	V	0.7	9.5	15.37	33.0	-17.6	
2593.00	16.60	H	0.7	9.5	25.37	33.0	-7.6	
High Ch								
2680.00	7.50	V	0.7	9.5	16.31	33.0	-16.7	
2680.00	17.30	H	0.7	9.5	26.11	33.0	-6.9	

LTE B41 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: SOMC
Project #: 11626381 (PY7-08618T)
Date: 4/5/2017
Test Engineer: 43674 JS
Configuration: EUT Only
Location: Chamber B
Mode: LTE_16QAM Band 41 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T72, 6ft N-type Cable T1096

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	5.50	V	0.6	9.5	14.35	33.0	-18.6	
2506.00	15.17	H	0.6	9.5	24.02	33.0	-9.0	
Mid Ch								
2593.00	6.90	V	0.7	9.5	15.67	33.0	-17.3	
2593.00	16.87	H	0.7	9.5	25.64	33.0	-7.4	
High Ch								
2680.00	7.90	V	0.7	9.5	16.71	33.0	-16.3	
2680.00	17.36	H	0.7	9.5	26.17	33.0	-6.8	

LTE B41 20MHz 16QAM

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

RULE PART(S)

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

FCC LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

Part 27: (m)(4) (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the Channel edge and 5 megahertz from the Channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the Channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the Channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on Channel BRS Channel 1 on the same terms and conditions as adjacent Channel BRS or EBS licensees.

TEST PROCEDURE

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

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

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