

**LTE Band 12**

QPSK, (10MHz BANDWIDTH)

Limit		698	756	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	699.3700	715.6700		
Extreme (50C)		699.3700	715.6700	3.8	0.005
Extreme (40C)		699.3700	715.6700	4.7	0.006
Extreme (30C)		699.3700	715.6700	4.7	0.007
Extreme (10C)		699.3700	715.6700	9.8	0.013
Extreme (0C)		699.3700	715.6700	-4.8	-0.007
Extreme (-10C)		699.3700	715.6700	3.1	0.004
Extreme (-20C)		699.3700	715.6700	-12.1	-0.017
Extreme (-30C)		699.3700	715.6700	3.8	0.005
25C		3.8 Vdc	699.3700	715.6700	0.1
	4.2 Vdc	699.3700	715.6700	1.8	0.002
	3.6 Vdc	699.3700	715.6700	0.4	0.001

16QAM, (10MHz BANDWIDTH)

Limit		698	756	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	699.3700	715.6300		
Extreme (50C)		699.3700	715.6300	3.8	0.005
Extreme (40C)		699.3700	715.6300	4.7	0.006
Extreme (30C)		699.3700	715.6300	4.7	0.007
Extreme (10C)		699.3700	715.6300	9.8	0.013
Extreme (0C)		699.3700	715.6300	-4.8	-0.007
Extreme (-10C)		699.3700	715.6300	3.1	0.004
Extreme (-20C)		699.3700	715.6300	-12.1	-0.017
Extreme (-30C)		699.3700	715.6300	3.8	0.005
25C		3.8 Vdc	699.3700	715.6300	0.1
	4.2 Vdc	699.3700	715.6300	1.8	0.002
	3.6 Vdc	699.3700	715.6300	0.4	0.001

**LTE Band 13**

QPSK, (10MHz BANDWIDTH)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	777.3700	786.6300		
Extreme (50C)		777.3700	786.6300	4.1	0.005
Extreme (40C)		777.3700	786.6300	1.6	0.002
Extreme (30C)		777.3700	786.6300	-5.2	-0.007
Extreme (10C)		777.3700	786.6300	-3.5	-0.004
Extreme (0C)		777.3700	786.6300	4.0	0.005
Extreme (-10C)		777.3700	786.6300	-6.8	-0.009
Extreme (-20C)		777.3700	786.6300	-9.8	-0.013
Extreme (-30C)		777.3700	786.6300	3.1	0.004
25C	3.8 Vdc	777.3700	786.6300	2.0	0.003
	4.2 Vdc	777.3700	786.6300	0.2	0.000
	3.6 Vdc	777.3700	786.6300	0.0	0.000

16QAM, (10MHz BANDWIDTH)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	777.3700	786.6300		
Extreme (50C)		777.3700	786.6300	3.8	0.005
Extreme (40C)		777.3700	786.6300	4.7	0.006
Extreme (30C)		777.3700	786.6300	4.7	0.006
Extreme (10C)		777.3700	786.6300	9.8	0.012
Extreme (0C)		777.3700	786.6300	-4.8	-0.006
Extreme (-10C)		777.3700	786.6300	3.1	0.004
Extreme (-20C)		777.3700	786.6300	-12.1	-0.015
Extreme (-30C)		777.3700	786.6300	3.8	0.005
25C	3.8 Vdc	777.3700	786.6300	0.1	0.000
	4.2 Vdc	777.3700	786.6300	1.8	0.002
	3.6 Vdc	777.3700	786.6300	0.4	0.000

**LTE Band 17**

QPSK, (10MHz BANDWIDTH)

Limit		698	756	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	704.3700	715.6700		
Extreme (50C)		704.3700	715.6700	3.8	0.005
Extreme (40C)		704.3700	715.6700	4.7	0.006
Extreme (30C)		704.3700	715.6700	4.7	0.007
Extreme (10C)		704.3700	715.6700	9.8	0.013
Extreme (0C)		704.3700	715.6700	-4.8	-0.007
Extreme (-10C)		704.3700	715.6700	3.1	0.004
Extreme (-20C)		704.3700	715.6700	-12.1	-0.017
Extreme (-30C)		704.3700	715.6700	3.8	0.005
25C		3.8 Vdc	704.3700	715.6700	0.1
	4.2 Vdc	704.3700	715.6700	1.8	0.002
	3.6 Vdc	704.3700	715.6700	0.4	0.001

16QAM, (10MHz BANDWIDTH)

Limit		698	756	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	704.3700	715.6300		
Extreme (50C)		704.3700	715.6300	3.8	0.005
Extreme (40C)		704.3700	715.6300	4.7	0.006
Extreme (30C)		704.3700	715.6300	4.7	0.007
Extreme (10C)		704.3700	715.6300	9.8	0.013
Extreme (0C)		704.3700	715.6300	-4.8	-0.007
Extreme (-10C)		704.3700	715.6300	3.1	0.004
Extreme (-20C)		704.3700	715.6300	-12.1	-0.017
Extreme (-30C)		704.3700	715.6300	3.8	0.005
25C		3.8 Vdc	704.3700	715.6300	0.1
	4.2 Vdc	704.3700	715.6300	1.8	0.002
	3.6 Vdc	704.3700	715.6300	0.4	0.001

**LTE Band 41**

QPSK, (20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	2496.8000	2689.2700		
Extreme (50C)		2496.8000	2689.2700	12.3	0.005
Extreme (40C)		2496.8000	2689.2700	9.2	0.004
Extreme (30C)		2496.8000	2689.2700	10.3	0.004
Extreme (10C)		2496.8000	2689.2700	-1.7	-0.001
Extreme (0C)		2496.8000	2689.2700	5.5	0.002
Extreme (-10C)		2496.8000	2689.2700	1.2	0.000
Extreme (-20C)		2496.8000	2689.2700	4.7	0.002
Extreme (-30C)		2496.8000	2689.2700	0.2	0.000
25C		3.8 Vdc	2496.8000	2689.2700	0.1
	4.2 Vdc	2496.8000	2689.2700	-1.4	-0.001
	3.6 Vdc	2496.8000	2689.2700	-0.2	0.000

16QAM, (20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	3.8 Vdc	2496.8000	2689.2700		
Extreme (50C)		2496.8000	2689.2700	12.3	0.005
Extreme (40C)		2496.8000	2689.2700	9.2	0.004
Extreme (30C)		2496.8000	2689.2700	10.3	0.004
Extreme (10C)		2496.8000	2689.2700	-1.7	-0.001
Extreme (0C)		2496.8000	2689.2700	5.5	0.002
Extreme (-10C)		2496.8000	2689.2700	1.2	0.000
Extreme (-20C)		2496.8000	2689.2700	4.7	0.002
Extreme (-30C)		2496.8000	2689.2700	0.2	0.000
25C		3.8 Vdc	2496.8000	2689.2700	0.1
	4.2 Vdc	2496.8000	2689.2700	-1.4	-0.001
	3.6 Vdc	2496.8000	2689.2700	-0.2	0.000

## 14. RADIATED TEST RESULTS

### 14.1. RADIATED POWER (ERP & EIRP)

#### RULE PART(S)

FCC: §2. 1046, §22. 913, §24. 232, §27 and § 90.635.

#### LIMITS

22.913 (a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232 (c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

27.50 (b) - (10) Portable stations (handheld devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP. (LTE B13)

27.50 (c) - (10) Portable stations (handheld devices) are limited to 3 watts ERP; (LTE B17/B12)

27.50 (d) - (4) Fixed, mobile, and portable (handheld) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.(Band 4)

27.50 (h) - (2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power. (LTE B41 & 7)

90.635 (b) - The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw). (LTE B26)

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

#### TEST PROCEDURE

ANSI / TIA / EIA 603D Clause 2.2.17; PSA setting reference to 971168 D01 v02r02

For peak power measurement with a PSA:

a) Set the RBW  $\geq$  OBW; b) Set VBW  $\geq 3 \times$  RBW; c) Set span  $\geq 2 \times$  RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points  $\geq$  span/RBW; g) Trace mode = max hold;

For average power measurement with a PSA:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW  $\geq 3 \times$  RBW; d) Set number of points in sweep  $\geq 2 \times$  span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle  $\geq 98$ ; h) Use trigger to capture bursts If burst duty cycle  $< 98$ ; i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.

**14.1.1. ERP/EIRP RESULTS AND TABLE**

**GSM**

Band	Mode	Channel	f(MHz)	ERP		EIRP	
				dBm	mW	dBm	mW
GSM850	GPRS	128	824.2	24.42	276.69	26.57	453.94
GSM850	GPRS	190	836.6	22.94	196.79	25.09	322.85
GSM850	GPRS	251	848.8	24.32	270.40	26.47	443.61
GSM850	EGPRS	128	824.2	20.45	110.92	22.60	181.97
GSM850	EGPRS	190	836.6	18.63	72.95	20.78	119.67
GSM850	EGPRS	251	848.8	19.71	93.54	21.86	153.46
GSM1900	GPRS	512	1850.2			26.50	446.68
GSM1900	GPRS	661	1880			27.92	619.44
GSM1900	GPRS	810	1909.8			28.10	645.65
GSM1900	EGPRS	512	1850.2			22.30	169.82
GSM1900	EGPRS	661	1880			23.44	220.80
GSM1900	EGPRS	810	1909.8			23.80	239.88

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-04-12  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LIMS 2312244 Z-Axis)  
 Mode: GPRS850

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch									
824.20	31.24	V	5.3	0.6	-1.56	24.42	38.5	-14.0	
824.20	17.95	H	5.3	0.6	-1.56	11.13	38.5	-27.3	
Mid Ch									
836.60	29.67	V	5.3	0.7	-1.41	22.94	38.5	-15.5	
836.60	19.47	H	5.3	0.7	-1.41	12.74	38.5	-25.7	
High Ch									
848.80	30.93	V	5.3	0.9	-1.26	24.32	38.5	-14.1	
848.80	18.58	H	5.3	0.9	-1.26	11.97	38.5	-26.5	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

GSM850 GPRS

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-04-12  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LIMS 2312244 Z-Axis)  
 Mode: EGPRS850

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch									
824.20	27.27	V	5.3	0.6	-1.56	20.45	38.5	-18.0	
824.20	14.04	H	5.3	0.6	-1.56	7.22	38.5	-31.2	
Mid Ch									
836.60	25.36	V	5.3	0.7	-1.41	18.63	38.5	-19.8	
836.60	15.15	H	5.3	0.7	-1.41	8.42	38.5	-30.0	
High Ch									
848.80	26.32	V	5.3	0.9	-1.26	19.71	38.5	-18.7	
848.80	14.12	H	5.3	0.9	-1.26	7.51	38.5	-30.9	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

GSM850 EGPRS

**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/24/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LIMS 2312244 Y-Axis)  
 Mode: GPRS1900

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

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	30.45	V	8.3	4.4	26.50	33.0	-6.5	
1850.20	25.26	H	8.3	4.4	21.31	33.0	-11.7	
Mid Ch								
1880.00	31.97	V	8.3	4.3	27.92	33.0	-5.1	
1880.00	24.23	H	8.3	4.3	20.18	33.0	-12.8	
High Ch								
1909.80	32.30	V	8.4	4.2	28.10	33.0	-4.9	
1909.80	24.32	H	8.4	4.2	20.12	33.0	-12.9	

Rev. 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

GSM1900 GPRS

**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/24/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LIMS 2312244 Y-Axis)  
 Mode: EGPRS1900

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

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	26.25	V	8.3	4.4	22.30	33.0	-10.7	
1850.20	21.50	H	8.3	4.4	17.55	33.0	-15.5	
Mid Ch								
1880.00	27.49	V	8.3	4.3	23.44	33.0	-9.6	
1880.00	20.89	H	8.3	4.3	16.84	33.0	-16.2	
High Ch								
1909.80	28.00	V	8.4	4.2	23.80	33.0	-9.2	
1909.80	20.34	H	8.4	4.2	16.14	33.0	-16.9	

Rev. 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

GSM1900 EGPRS

**WCDMA**

Band	Mode	Channel	f(MHz)	ERP		EIRP	
						dBm	mW
Band 2	REL99	9262	1852.4			19.76	94.62
Band 2	REL99	9400	1880			20.86	121.90
Band 2	REL99	9538	1907.6			20.90	123.03
Band 2	HSDPA	9262	1852.4			18.23	66.53
Band 2	HSDPA	9400	1880			19.36	86.30
Band 2	HSDPA	9538	1907.6			19.40	87.10
Band 4	REL99	1312	1712.4			19.51	89.33
Band 4	REL99	1413	1732.6			18.57	71.94
Band 4	REL99	1513	1752.6			18.60	72.44
Band 4	HSDPA	1312	1712.4			18.33	68.08
Band 4	HSDPA	1413	1732.6			18.74	74.82
Band 4	HSDPA	1513	1752.6			18.90	77.62
Band 5	REL99	4132	826.4	18.39	69.02	20.54	113.24
Band 5	REL99	4183	836.6	17.93	62.09	20.08	101.86
Band 5	REL99	4233	846.6	17.62	57.81	19.77	94.84
Band 5	HSDPA	4132	826.4	17.02	50.35	19.17	82.60
Band 5	HSDPA	4183	836.6	16.64	46.13	18.79	75.68
Band 5	HSDPA	4233	846.6	17.22	52.72	19.37	86.50



**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date:  
 Test Engineer:  
 Configuration: Standalone (LIMS 2312244; Y-Axis)  
 Mode: WCDMA2 REL99

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.40	23.73	V	8.3	4.4	19.76	33.0	-13.2	
1852.40	17.10	H	8.3	4.4	13.13	33.0	-19.9	
Mid Ch								
1880.00	24.91	V	8.3	4.3	20.86	33.0	-12.1	
1880.00	17.87	H	8.3	4.3	13.82	33.0	-19.2	
High Ch								
1907.60	25.09	V	8.4	4.2	20.90	33.0	-12.1	
1907.60	17.72	H	8.4	4.2	13.53	33.0	-19.5	

Rev. 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

B2 REL99

**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date:  
 Test Engineer:  
 Configuration: Standalone (LIMS 2312244; Y-Axis)  
 Mode: WCDMA2, HSDPA

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.40	22.20	V	8.3	4.4	18.23	33.0	-14.8	
1852.40	15.49	H	8.3	4.4	11.52	33.0	-21.5	
Mid Ch								
1880.00	23.41	V	8.3	4.3	19.36	33.0	-13.6	
1880.00	16.29	H	8.3	4.3	12.24	33.0	-20.8	
High Ch								
1907.60	23.59	V	8.4	4.2	19.40	33.0	-13.6	
1907.60	16.19	H	8.4	4.2	12.00	33.0	-21.0	

Rev. 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

B2 HSDPA

**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-03-26  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LTE Sample #2 Y-Axis)  
 Mode: WCDMA4 REL99

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1712.40	22.80	V	8.0	4.7	19.51	30.0	-10.5	
1712.40	15.42	H	8.0	4.7	12.13	30.0	-17.9	
Mid Ch								
1732.40	21.92	V	8.0	4.6	18.57	30.0	-11.4	
1732.40	17.86	H	8.0	4.6	14.51	30.0	-15.5	
High Ch								
1752.50	22.07	V	8.1	4.6	18.60	30.0	-11.4	
1752.50	18.74	H	8.1	4.6	15.27	30.0	-14.7	

Rev. 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

B4 REL99

**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-03-26  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LTE Sample #2 Y-Axis)  
 Mode: WCDMA4 HSDPA

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1712.40	21.61	V	8.0	4.7	18.33	30.0	-11.7	
1712.40	17.90	H	8.0	4.7	14.62	30.0	-15.4	
Mid Ch								
1732.40	22.09	V	8.0	4.6	18.74	30.0	-11.3	
1732.40	18.73	H	8.0	4.6	15.37	30.0	-14.6	
High Ch								
1752.50	22.37	V	8.1	4.6	18.90	30.0	-11.1	
1752.50	18.63	H	8.1	4.6	15.16	30.0	-14.8	

Rev. 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

B4 HSDPA

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-03-29  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LIMS 2312244 Z-Axis)  
 Mode: WCDMA5 Rel99

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	25.21	V	5.3	-1.56	18.39	38.5	-20.1	
826.50	13.76	H	5.3	-1.56	6.94	38.5	-31.5	
Mid Ch								
836.60	24.66	V	5.3	-1.41	17.93	38.5	-20.5	
836.60	13.97	H	5.3	-1.41	7.24	38.5	-31.2	
High Ch								
848.80	24.23	V	5.3	-1.26	17.62	38.5	-20.8	
848.80	15.10	H	5.3	-1.26	8.49	38.5	-30.0	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

B5 REL99

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-03-29  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LIMS 2312244 Z-Axis)  
 Mode: WCDMA5 HSDPA

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	23.84	V	5.3	-1.56	17.02	38.5	-21.4	
826.50	13.30	H	5.3	-1.56	6.48	38.5	-32.0	
Mid Ch								
836.60	23.37	V	5.3	-1.41	16.64	38.5	-21.8	
836.60	13.19	H	5.3	-1.41	6.46	38.5	-32.0	
High Ch								
846.60	23.83	V	5.3	-1.26	17.22	38.5	-21.2	
846.60	14.19	H	5.3	-1.26	7.58	38.5	-30.9	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

B5 HSDPA

**LTE Band 2**

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
1.4	QPSK	1/0	1850.7	18.24	66.68
1.4	QPSK	1/0	1880	19.31	85.31
1.4	QPSK	1/0	1909.3	18.90	77.62
1.4	16QAM	1/0	1850.7	17.27	53.33
1.4	16QAM	1/0	1880	18.59	72.28
1.4	16QAM	1/0	1909.3	18.09	64.42
3	QPSK	1/0	1851.5	17.13	51.64
3	QPSK	1/0	1880	18.89	77.45
3	QPSK	1/0	1908.5	18.35	68.39
3	16QAM	1/0	1851.5	16.29	42.56
3	16QAM	1/0	1880	18.31	67.76
3	16QAM	1/0	1908.5	17.29	53.58
5	QPSK	1/0	1852.5	18.12	64.86
5	QPSK	1/0	1880	17.61	57.68
5	QPSK	1/0	1907.5	17.93	62.09
5	16QAM	1/0	1852.5	17.32	53.95
5	16QAM	1/0	1880	16.59	45.60
5	16QAM	1/0	1907.5	17.24	52.97
10	QPSK	1/0	1855	18.14	65.16
10	QPSK	1/0	1880	18.14	65.16
10	QPSK	1/0	1905	18.62	72.78
10	16QAM	1/0	1855	16.90	48.98
10	16QAM	1/0	1880	17.98	62.81
10	16QAM	1/0	1905	17.54	56.75
15	QPSK	1/0	1857.5	17.47	55.85
15	QPSK	1/0	1880	17.48	55.98
15	QPSK	1/0	1902.5	17.67	58.48
15	16QAM	1/0	1857.5	16.93	49.32
15	16QAM	1/0	1880	16.40	43.65
15	16QAM	1/0	1902.5	17.20	52.48
20	QPSK	1/0	1860	18.42	69.50
20	QPSK	1/0	1880	17.52	56.49
20	QPSK	1/0	1900	17.88	61.38
20	16QAM	1/0	1860	17.21	52.60
20	16QAM	1/0	1880	17.24	52.97
20	16QAM	1/0	1900	16.94	49.43

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/23/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 1.4MHz, QPSK								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.70	22.20	V	8.3	4.4	18.24	33.0	-14.8	
1850.70	16.20	H	8.3	4.4	12.25	33.0	-20.8	
Mid Ch								
1880.00	23.36	V	8.3	4.3	19.31	33.0	-13.7	
1880.00	17.70	H	8.3	4.3	13.65	33.0	-19.3	
High Ch								
1909.30	23.10	V	8.4	4.2	18.90	33.0	-14.1	
1909.30	17.07	H	8.4	4.2	12.87	33.0	-20.1	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 1.4MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/23/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 1.4MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.70	21.23	V	8.3	4.4	17.27	33.0	-15.7	
1850.70	15.43	H	8.3	4.4	11.48	33.0	-21.5	
Mid Ch								
1880.00	22.64	V	8.3	4.3	18.59	33.0	-14.4	
1880.00	16.79	H	8.3	4.3	12.74	33.0	-20.3	
High Ch								
1909.30	22.29	V	8.4	4.2	18.09	33.0	-14.9	
1909.30	16.24	H	8.4	4.2	12.04	33.0	-21.0	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 1.4MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 3MHz, QPSK								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1851.50	21.09	V	8.3	4.4	17.13	33.0	-15.9	
1851.50	13.45	H	8.3	4.4	9.49	33.0	-23.5	
Mid Ch								
1880.00	22.94	V	8.3	4.3	18.89	33.0	-14.1	
1880.00	17.28	H	8.3	4.3	13.23	33.0	-19.8	
High Ch								
1908.50	22.54	V	8.4	4.2	18.35	33.0	-14.7	
1908.50	17.00	H	8.4	4.2	12.81	33.0	-20.2	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 3MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 3MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1851.50	20.25	V	8.3	4.4	16.29	33.0	-16.7	
1851.50	15.83	H	8.3	4.4	11.87	33.0	-21.1	
Mid Ch								
1880.00	22.36	V	8.3	4.3	18.31	33.0	-14.7	
1880.00	16.52	H	8.3	4.3	12.47	33.0	-20.5	
High Ch								
1908.50	21.48	V	8.4	4.2	17.29	33.0	-15.7	
1908.50	15.76	H	8.4	4.2	11.57	33.0	-21.4	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 3MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 5MHz, QPSK								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.50	22.09	V	8.3	4.4	18.12	33.0	-14.9	
1852.50	16.04	H	8.3	4.4	12.07	33.0	-20.9	
Mid Ch								
1880.00	21.66	V	8.3	4.3	17.61	33.0	-15.4	
1880.00	17.22	H	8.3	4.3	13.17	33.0	-19.8	
High Ch								
1907.50	22.12	V	8.4	4.2	17.93	33.0	-15.1	
1907.50	15.61	H	8.4	4.2	11.42	33.0	-21.6	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 5MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 5MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.50	21.29	V	8.3	4.4	17.32	33.0	-15.7	
1852.50	15.14	H	8.3	4.4	11.17	33.0	-21.8	
Mid Ch								
1880.00	20.64	V	8.3	4.3	16.59	33.0	-16.4	
1880.00	16.58	H	8.3	4.3	12.53	33.0	-20.5	
High Ch								
1907.50	21.43	V	8.4	4.2	17.24	33.0	-15.8	
1907.50	14.86	H	8.4	4.2	10.67	33.0	-22.3	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 5MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 10MHz, QPSK								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1855.00	22.12	V	8.3	4.3	18.14	33.0	-14.9	
1855.00	17.16	H	8.3	4.3	13.18	33.0	-19.8	
Mid Ch								
1880.00	22.19	V	8.3	4.3	18.14	33.0	-14.9	
1880.00	16.53	H	8.3	4.3	12.48	33.0	-20.5	
High Ch								
1905.00	22.82	V	8.4	4.2	18.62	33.0	-14.4	
1905.00	15.66	H	8.4	4.2	11.46	33.0	-21.5	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 10MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 10MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1855.00	20.88	V	8.3	4.3	16.90	33.0	-16.1	
1855.00	16.16	H	8.3	4.3	12.18	33.0	-20.8	
Mid Ch								
1880.00	22.03	V	8.3	4.3	17.98	33.0	-15.0	
1880.00	15.84	H	8.3	4.3	11.79	33.0	-21.2	
High Ch								
1905.00	21.74	V	8.4	4.2	17.54	33.0	-15.5	
1905.00	14.82	H	8.4	4.2	10.62	33.0	-22.4	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 10MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 15MHz, QPSK								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1857.50	21.42	V	8.3	4.4	17.47	33.0	-15.5	
1857.50	16.26	H	8.3	4.4	12.31	33.0	-20.7	
Mid Ch								
1880.00	21.53	V	8.3	4.3	17.48	33.0	-15.5	
1880.00	15.94	H	8.3	4.3	11.89	33.0	-21.1	
High Ch								
1902.50	21.87	V	8.4	4.2	17.67	33.0	-15.3	
1902.50	15.61	H	8.4	4.2	11.41	33.0	-21.6	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 15MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2 Y-Axis) Mode: LTE2, 15MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1857.50	20.88	V	8.3	4.4	16.93	33.0	-16.1	
1857.50	15.24	H	8.3	4.4	11.29	33.0	-21.7	
Mid Ch								
1880.00	20.45	V	8.3	4.3	16.40	33.0	-16.6	
1880.00	15.68	H	8.3	4.3	11.63	33.0	-21.4	
High Ch								
1902.50	21.40	V	8.4	4.2	17.20	33.0	-15.8	
1902.50	14.36	H	8.4	4.2	10.16	33.0	-22.8	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 15MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 and #2 Y-Axis) Mode: LTE2, 20MHz, QPSK								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1860.00	22.39	V	8.3	4.3	18.42	33.0	-14.6	
1860.00	15.61	H	8.3	4.3	11.64	33.0	-21.4	
Mid Ch								
1880.00	21.57	V	8.3	4.3	17.52	33.0	-15.5	
1880.00	16.45	H	8.3	4.3	12.40	33.0	-20.6	
High Ch								
1900.00	22.09	V	8.5	4.2	17.88	33.0	-15.1	
1900.00	16.20	H	8.5	4.2	11.99	33.0	-21.0	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 20MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 and #2 Y-Axis) Mode: LTE2, 20MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Hom antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1860.00	21.18	V	8.3	4.3	17.21	33.0	-15.8	
1860.00	14.79	H	8.3	4.3	10.82	33.0	-22.2	
Mid Ch								
1880.00	21.29	V	8.3	4.3	17.24	33.0	-15.8	
1880.00	15.48	H	8.3	4.3	11.43	33.0	-21.6	
High Ch								
1900.00	21.15	V	8.5	4.2	16.94	33.0	-16.1	
1900.00	14.96	H	8.5	4.2	10.75	33.0	-22.3	
Rev: 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B2 20MHz 16QAM

**LTE Band 4**

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
1.4	QPSK	1/0	1710.7	19.01	79.62
1.4	QPSK	1/0	1732.5	19.60	91.20
1.4	QPSK	1/0	1754.3	19.31	85.31
1.4	16QAM	1/0	1710.7	17.91	61.80
1.4	16QAM	1/0	1732.5	18.94	78.34
1.4	16QAM	1/0	1754.3	18.52	71.12
3	QPSK	1/0	1711.5	19.08	80.91
3	QPSK	1/0	1732.5	19.56	90.36
3	QPSK	1/0	1753.5	17.95	62.37
3	16QAM	1/0	1711.5	18.16	65.46
3	16QAM	1/0	1732.5	18.72	74.47
3	16QAM	1/0	1753.5	16.92	49.20
5	QPSK	1/0	1712.5	16.81	47.97
5	QPSK	1/0	1732.5	19.65	92.26
5	QPSK	1/0	1752.5	20.87	122.18
5	16QAM	1/0	1712.5	15.83	38.28
5	16QAM	1/0	1732.5	18.83	76.38
5	16QAM	1/0	1752.5	19.71	93.54
10	QPSK	1/0	1715	19.53	89.74
10	QPSK	1/0	1732.5	19.57	90.57
10	QPSK	1/0	1750	19.81	95.72
10	16QAM	1/0	1715	18.38	68.87
10	16QAM	1/0	1732.5	18.77	75.34
10	16QAM	1/0	1750	18.83	76.38
15	QPSK	1/0	1717.5	19.09	81.10
15	QPSK	1/0	1732.5	19.67	92.68
15	QPSK	1/0	1747.5	20.03	100.69
15	16QAM	1/0	1717.5	18.37	68.71
15	16QAM	1/0	1732.5	18.54	71.45
15	16QAM	1/0	1747.5	19.33	85.70
20	QPSK	1/0	1720	19.79	95.28
20	QPSK	1/0	1732.5	19.10	81.28
20	QPSK	1/0	1745	19.26	84.33
20	16QAM	1/0	1720	18.94	78.34
20	16QAM	1/0	1732.5	18.60	72.44
20	16QAM	1/0	1745	18.04	63.68

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 1.4MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1710.70	22.29	V	8.0	4.7	19.01	30.0	-11.0	
1710.70	18.54	H	8.0	4.7	15.26	30.0	-14.7	
Mid Ch								
1732.50	22.95	V	8.0	4.6	19.60	30.0	-10.4	
1732.50	19.54	H	8.0	4.6	16.19	30.0	-13.8	
High Ch								
1754.30	22.79	V	8.1	4.6	19.31	30.0	-10.7	
1754.30	17.78	H	8.1	4.6	14.30	30.0	-15.7	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 1.4MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-24 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 1.4MHz, 16QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1710.70	21.19	V	8.0	4.7	17.91	30.0	-12.1	
1710.70	17.76	H	8.0	4.7	14.48	30.0	-15.5	
Mid Ch								
1732.50	22.29	V	8.0	4.6	18.94	30.0	-11.1	
1732.50	18.56	H	8.0	4.6	15.21	30.0	-14.8	
High Ch								
1754.30	22.00	V	8.1	4.6	18.52	30.0	-11.5	
1754.30	16.87	H	8.1	4.6	13.39	30.0	-16.6	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 1.4MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 3MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1711.50	22.36	V	8.0	4.7	19.08	33.0	-13.9	
1711.50	17.17	H	8.0	4.7	13.89	33.0	-19.1	
Mid Ch								
1732.50	22.91	V	8.0	4.6	19.56	33.0	-13.4	
1732.50	18.60	H	8.0	4.6	15.25	33.0	-17.8	
High Ch								
1753.50	21.43	V	8.1	4.6	17.95	33.0	-15.0	
1753.50	16.15	H	8.1	4.6	12.67	33.0	-20.3	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 3MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 3MHz, 16QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1711.50	21.44	V	8.0	4.7	18.16	30.0	-11.8	
1711.50	18.26	H	8.0	4.7	14.98	30.0	-15.0	
Mid Ch								
1732.50	22.07	V	8.0	4.6	18.72	30.0	-11.3	
1732.50	17.94	H	8.0	4.6	14.59	30.0	-15.4	
High Ch								
1753.50	20.40	V	8.1	4.6	16.92	30.0	-13.1	
1753.50	15.44	H	8.1	4.6	11.96	30.0	-18.0	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 3MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 5MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1712.50	20.89	V	8.0	4.7	16.81	33.0	-16.2	
1712.50	18.87	H	8.0	4.7	15.59	33.0	-17.4	
Mid Ch								
1732.50	23.00	V	8.0	4.6	19.65	33.0	-13.4	
1732.50	20.03	H	8.0	4.6	16.68	33.0	-16.3	
High Ch								
1752.50	24.34	V	8.1	4.6	20.87	33.0	-12.1	
1752.50	19.18	H	8.1	4.6	15.71	33.0	-17.3	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 5MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 5MHz, 16QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1712.50	19.11	V	8.0	4.7	15.83	30.0	-14.2	
1712.50	18.15	H	8.0	4.7	14.87	30.0	-15.1	
Mid Ch								
1732.50	22.18	V	8.0	4.6	18.83	30.0	-11.2	
1732.50	19.42	H	8.0	4.6	16.07	30.0	-13.9	
High Ch								
1752.50	23.18	V	8.1	4.6	19.71	30.0	-10.3	
1752.50	18.29	H	8.1	4.6	14.82	30.0	-15.2	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 5MHz 16QAM



Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Y-Axis) Mode: LTE4, 10MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1715.00	22.81	V	8.0	4.7	19.53	30.0	-10.5	
1715.00	17.76	H	8.0	4.7	14.48	30.0	-15.5	
Mid Ch								
1732.50	22.92	V	8.0	4.6	19.57	30.0	-10.4	
1732.50	16.15	H	8.0	4.6	12.80	30.0	-17.2	
High Ch								
1750.00	23.25	V	8.0	4.6	19.81	30.0	-10.2	
1750.00	20.06	H	8.0	4.6	16.62	30.0	-13.4	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 10MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Y-Axis) Mode: LTE4, 10MHz, 16QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1715.00	21.66	V	8.0	4.7	18.38	30.0	-11.6	
1715.00	17.29	H	8.0	4.7	14.01	30.0	-16.0	
Mid Ch								
1732.50	22.12	V	8.0	4.6	18.77	30.0	-11.2	
1732.50	15.56	H	8.0	4.6	12.21	30.0	-17.8	
High Ch								
1750.00	22.27	V	8.0	4.6	18.83	30.0	-11.2	
1750.00	18.88	H	8.0	4.6	15.44	30.0	-14.6	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 10MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 15MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1717.50	22.39	V	8.0	4.7	19.09	30.0	-10.9	
1717.50	18.81	H	8.0	4.7	15.51	30.0	-14.5	
Mid Ch								
1732.50	23.02	V	8.0	4.6	19.67	30.0	-10.3	
1732.50	19.21	H	8.0	4.6	15.86	30.0	-14.1	
High Ch								
1747.50	23.45	V	8.0	4.6	20.03	30.0	-10.0	
1747.50	19.80	H	8.0	4.6	16.38	30.0	-13.6	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 15MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1) Mode: LTE4, 15MHz, 16QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1717.50	21.67	V	8.0	4.7	18.37	30.0	-11.6	
1717.50	18.25	H	8.0	4.7	14.95	30.0	-15.1	
Mid Ch								
1732.50	21.89	V	8.0	4.6	18.54	30.0	-11.5	
1732.50	18.34	H	8.0	4.6	14.99	30.0	-15.0	
High Ch								
1747.50	22.75	V	8.0	4.6	19.33	30.0	-10.7	
1747.50	19.04	H	8.0	4.6	15.62	30.0	-14.4	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 15MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Y-Axis) Mode: LTE4, 20MHz, 16QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1720.00	23.10	V	8.0	4.7	19.79	30.0	-10.2	
1720.00	16.94	H	8.0	4.7	13.63	30.0	-16.4	
Mid Ch								
1732.50	22.45	V	8.0	4.6	19.10	30.0	-10.9	
1732.50	19.41	H	8.0	4.6	16.06	30.0	-13.9	
High Ch								
1745.00	22.67	V	8.0	4.6	19.26	30.0	-10.7	
1745.00	16.49	H	8.0	4.6	13.08	30.0	-16.9	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 20MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-25 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Y-Axis) Mode: LTE4, 20MHz, 16QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1720.00	22.25	V	8.0	4.7	18.94	30.0	-11.1	
1720.00	16.05	H	8.0	4.7	12.74	30.0	-17.3	
Mid Ch								
1732.50	21.95	V	8.0	4.6	18.60	30.0	-11.4	
1732.50	18.85	H	8.0	4.6	15.50	30.0	-14.5	
High Ch								
1745.00	21.45	V	8.0	4.6	18.04	30.0	-12.0	
1745.00	15.63	H	8.0	4.6	12.22	30.0	-17.8	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B4 20MHz 16QAM

**LTE Band 5**

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP		EIRP	
				dBm	mW	dBm	mW
1.4	QPSK	1/0	824.7	17.42	55.21	19.57	90.57
1.4	QPSK	1/0	836.5	17.38	54.70	19.53	89.74
1.4	QPSK	1/0	848.3	17.71	59.02	19.86	96.83
1.4	16QAM	1/0	824.7	16.49	44.57	18.64	73.11
1.4	16QAM	1/0	836.5	16.50	44.67	18.65	73.28
1.4	16QAM	1/0	848.3	16.97	49.77	19.12	81.66
3	QPSK	1/0	825.5	17.20	52.48	19.35	86.10
3	QPSK	1/0	836.5	17.51	56.36	19.66	92.47
3	QPSK	1/0	847.5	17.32	53.95	19.47	88.51
3	16QAM	1/0	825.5	16.34	43.05	18.49	70.63
3	16QAM	1/0	836.5	16.93	49.32	19.08	80.91
3	16QAM	1/0	847.5	16.46	44.26	18.61	72.61
5	QPSK	1/0	826.5	16.93	49.32	19.08	80.91
5	QPSK	1/0	836.5	17.35	54.33	19.50	89.13
5	QPSK	1/0	846.5	17.51	56.36	19.66	92.47
5	16QAM	1/0	826.5	15.88	38.73	18.03	63.53
5	16QAM	1/0	836.5	16.47	44.36	18.62	72.78
5	16QAM	1/0	846.5	16.54	45.08	18.69	73.96
10	QPSK	1/0	829	17.53	56.62	19.68	92.90
10	QPSK	1/0	836.5	17.92	61.94	20.07	101.62
10	QPSK	1/0	844	18.14	65.16	20.29	106.91
10	16QAM	1/0	829	16.44	44.06	18.59	72.28
10	16QAM	1/0	836.5	17.20	52.48	19.35	86.10
10	16QAM	1/0	844	17.03	50.47	19.18	82.79



Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-29 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, Z-Axis) Mode: LTE5, 1.4MHz, QPSK								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	24.24	V	5.3	-1.55	17.42	38.5	-21.0	
824.70	13.61	H	5.3	-1.55	6.79	38.5	-31.7	
Mid Ch								
836.50	24.11	V	5.3	-1.41	17.38	38.5	-21.1	
836.50	13.81	H	5.3	-1.41	7.08	38.5	-31.4	
High Ch								
848.30	24.32	V	5.3	-1.27	17.71	38.5	-20.7	
848.30	13.75	H	5.3	-1.27	7.14	38.5	-31.3	
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B5 1.4MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-29 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, Z-Axis) Mode: LTE5, 1.4MHz, 16-QAM								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	23.31	V	5.3	-1.55	16.49	38.5	-22.0	
824.70	12.61	H	5.3	-1.55	5.79	38.5	-32.7	
Mid Ch								
836.50	23.23	V	5.3	-1.41	16.50	38.5	-22.0	
836.50	12.92	H	5.3	-1.41	6.19	38.5	-32.3	
High Ch								
848.30	23.58	V	5.3	-1.27	16.97	38.5	-21.5	
848.30	13.07	H	5.3	-1.27	6.46	38.5	-32.0	
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B5 1.4MHz 16QAM

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-29 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, Z-Axis) Mode: LTE5, 3MHz, QPSK								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	24.02	V	5.3	-1.54	17.20	38.5	-21.2	
825.50	13.58	H	5.3	-1.54	6.76	38.5	-31.7	
Mid Ch								
836.50	24.24	V	5.3	-1.41	17.51	38.5	-20.9	
836.50	13.85	H	5.3	-1.41	7.12	38.5	-31.3	
High Ch								
847.50	23.95	V	5.3	-1.28	17.32	38.5	-21.1	
847.50	13.64	H	5.3	-1.28	7.01	38.5	-31.4	
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B5 3MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-29 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, Z-Axis) Mode: LTE5, 3MHz, 16-QAM								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	23.16	V	5.3	-1.54	16.34	38.5	-22.1	
825.50	12.60	H	5.3	-1.54	5.78	38.5	-32.7	
Mid Ch								
836.50	23.66	V	5.3	-1.41	16.93	38.5	-21.5	
836.50	12.86	H	5.3	-1.41	6.13	38.5	-32.3	
High Ch								
847.50	23.09	V	5.3	-1.28	16.46	38.5	-22.0	
847.50	12.83	H	5.3	-1.28	6.20	38.5	-32.2	
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B5 3MHz 16QAM

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-29 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, Z-Axis) Mode: LTE5, 5MHz, QPSK								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	23.74	V	5.3	-1.53	16.93	38.5	-21.5	
826.50	13.51	H	5.3	-1.53	6.70	38.5	-31.8	
Mid Ch								
836.50	24.08	V	5.3	-1.41	17.35	38.5	-21.1	
836.50	13.80	H	5.3	-1.41	7.07	38.5	-31.4	
High Ch								
846.50	24.15	V	5.3	-1.29	17.51	38.5	-20.9	
846.50	13.72	H	5.3	-1.29	7.08	38.5	-31.4	
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B5 5MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 2016-03-29 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, Z-Axis) Mode: LTE5, 5MHz, 16-QAM								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	22.69	V	5.3	-1.53	15.88	38.5	-22.6	
826.50	12.92	H	5.3	-1.53	6.11	38.5	-32.3	
Mid Ch								
836.50	23.20	V	5.3	-1.41	16.47	38.5	-22.0	
836.50	12.86	H	5.3	-1.41	6.13	38.5	-32.3	
High Ch								
846.50	23.18	V	5.3	-1.29	16.54	38.5	-21.9	
846.50	12.82	H	5.3	-1.29	6.18	38.5	-32.3	
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B5 5MHz 16QAM

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-03-29  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LTE Sample #1, Z-Axis)  
 Mode: LTE5, 10MHz, QPSK

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
829.00	24.33	V	5.3	-1.50	17.53	38.5	-20.9	
829.00	13.67	H	5.3	-1.50	6.87	38.5	-31.6	
Mid Ch								
836.60	24.65	V	5.3	-1.41	17.92	38.5	-20.5	
836.60	13.34	H	5.3	-1.41	6.61	38.5	-31.8	
High Ch								
844.00	24.80	V	5.3	-1.32	18.14	38.5	-20.3	
844.00	14.32	H	5.3	-1.32	7.66	38.5	-30.8	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

**LTE B5 10MHz QPSK**

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 2016-03-29  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LTE Sample #1, Z-Axis)  
 Mode: LTE5, 10MHz, 16-QAM

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
829.00	23.24	V	5.3	-1.50	16.44	38.5	-22.0	
829.00	12.63	H	5.3	-1.50	5.83	38.5	-32.6	
Mid Ch								
836.60	23.93	V	5.3	-1.41	17.20	38.5	-21.3	
836.60	12.42	H	5.3	-1.41	5.69	38.5	-32.8	
High Ch								
844.00	23.69	V	5.3	-1.32	17.03	38.5	-21.4	
844.00	13.52	H	5.3	-1.32	6.86	38.5	-31.6	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

**LTE B5 10MHz 16QAM**

**LTE Band 7**

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
5	QPSK	1/0	2502.5	22.52	178.65
5	QPSK	1/0	2535	21.21	132.13
5	QPSK	1/0	2567.5	20.03	100.69
5	16QAM	1/0	2502.5	22.17	164.82
5	16QAM	1/0	2535	21.14	130.02
5	16QAM	1/0	2567.5	19.86	96.83
10	QPSK	1/0	2505	20.76	119.12
10	QPSK	1/0	2535	21.19	131.52
10	QPSK	1/0	2565	20.99	125.60
10	16QAM	1/0	2505	20.51	112.46
10	16QAM	1/0	2535	20.68	116.95
10	16QAM	1/0	2565	20.85	121.62
15	QPSK	1/0	2507.5	21.09	128.53
15	QPSK	1/0	2535	20.43	110.41
15	QPSK	1/0	2562.5	20.28	106.66
15	16QAM	1/0	2507.5	20.93	123.88
15	16QAM	1/0	2535	20.31	107.40
15	16QAM	1/0	2562.5	19.96	99.08
20	QPSK	1/0	2510	21.04	127.06
20	QPSK	1/0	2535	21.86	153.46
20	QPSK	1/0	2560	20.83	121.06
20	16QAM	1/0	2510	20.69	117.22
20	16QAM	1/0	2535	21.41	138.36
20	16QAM	1/0	2560	20.49	111.94

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, X-Axis) Mode: LTE7, 5MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2502.50	26.77	V	9.8	5.5	22.52	33.0	-10.5	PK Detector
2502.50	24.79	H	9.8	5.5	20.54	33.0	-12.5	
Mid Ch								
2535.00	25.45	V	9.8	5.6	21.21	33.0	-11.8	PK Detector
2535.00	23.83	H	9.8	5.6	19.59	33.0	-13.4	
High Ch								
2567.50	23.93	V	9.9	5.7	19.71	33.0	-13.3	PK Detector
2567.50	24.25	H	9.9	5.7	20.03	33.0	-13.0	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B7 5MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, X-Axis) Mode: LTE7, 5MHz, 16-QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2502.50	26.42	V	9.8	5.5	22.17	33.0	-10.8	PK Detector
2502.50	24.00	H	9.8	5.5	19.75	33.0	-13.3	
Mid Ch								
2535.00	25.38	V	9.8	5.6	21.14	33.0	-11.9	PK Detector
2535.00	23.64	H	9.8	5.6	19.40	33.0	-13.6	
High Ch								
2567.50	24.05	V	9.9	5.7	19.83	33.0	-13.2	PK Detector
2567.50	24.08	H	9.9	5.7	19.86	33.0	-13.1	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B7 5MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, X-Axis) Mode: LTE7, 10MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2505.00	25.01	V	9.8	5.5	20.76	33.0	-12.2	PK Detector
2505.00	22.81	H	9.8	5.5	18.56	33.0	-14.4	
Mid Ch								
2535.00	25.43	V	9.8	5.6	21.19	33.0	-11.8	PK Detector
2535.00	23.33	H	9.8	5.6	19.09	33.0	-13.9	
High Ch								
2565.00	25.24	V	9.9	5.7	20.99	33.0	-12.0	PK Detector
2565.00	23.84	H	9.9	5.7	19.59	33.0	-13.4	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B7 10MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, X-Axis) Mode: LTE7, 10MHz, 16-QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2505.00	24.76	V	9.8	5.5	20.51	33.0	-12.5	PK Detector
2505.00	22.67	H	9.8	5.5	18.42	33.0	-14.6	
Mid Ch								
2535.00	24.92	V	9.8	5.6	20.68	33.0	-12.3	PK Detector
2535.00	23.29	H	9.8	5.6	19.05	33.0	-14.0	
High Ch								
2565.00	25.10	V	9.9	5.7	20.85	33.0	-12.2	PK Detector
2565.00	24.11	H	9.9	5.7	19.86	33.0	-13.1	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B7 10MHz 16QAM

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, X-Axis) Mode: LTE7, 15MHz, QPSK <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2507.50	25.35	V	9.8	5.5	21.09	33.0	-11.9	PK Detector
2507.50	23.29	H	9.8	5.5	19.03	33.0	-14.0	
Mid Ch								
2535.00	24.67	V	9.8	5.6	20.43	33.0	-12.6	PK Detector
2535.00	24.59	H	9.8	5.6	20.35	33.0	-12.7	
High Ch								
2562.50	24.56	V	10.0	5.7	20.28	33.0	-12.7	PK Detector
2562.50	23.71	H	10.0	5.7	19.43	33.0	-13.6	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B7 15MHz QPSK

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1, X-Axis) Mode: LTE7, 15MHz, 16-QAM <b>Test Equipment:</b> Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2507.50	25.19	V	9.8	5.5	20.93	33.0	-12.1	PK Detector
2507.50	23.68	H	9.8	5.5	19.42	33.0	-13.6	
Mid Ch								
2535.00	24.00	V	9.8	5.6	19.76	33.0	-13.2	PK Detector
2535.00	24.55	H	9.8	5.6	20.31	33.0	-12.7	
High Ch								
2562.50	24.24	V	10.0	5.7	19.96	33.0	-13.0	PK Detector
2562.50	23.59	H	10.0	5.7	19.31	33.0	-13.7	
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm								

LTE B7 15MHz 16QAM

**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/31/2016  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LTE Sample #1, X-Axis)  
 Mode: LTE7, 20MHz, QPSK

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2510.00	25.30	V	9.8	5.5	21.04	33.0	-12.0	PK Detector
2510.00	23.74	H	9.8	5.5	19.48	33.0	-13.5	
Mid Ch								
2535.00	26.10	V	9.8	5.6	21.86	33.0	-11.1	PK Detector
2535.00	24.54	H	9.8	5.6	20.30	33.0	-12.7	
High Ch								
2560.00	25.13	V	10.0	5.7	20.83	33.0	-12.2	PK Detector
2560.00	24.48	H	10.0	5.7	20.18	33.0	-12.8	

Rev: 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

**LTE B7 20MHz QPSK**

**Fundamental Substitution Measurement (Fc > 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/31/2016  
 Test Engineer: Brian Kiewra  
 Configuration: Standalone (LTE Sample #1, X-Axis)  
 Mode: LTE7, 20MHz, 16-QAM

**Test Equipment:**  
 Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2510.00	24.95	V	9.8	5.5	20.69	33.0	-12.3	PK Detector
2510.00	23.26	H	9.8	5.5	19.00	33.0	-14.0	
Mid Ch								
2535.00	25.65	V	9.8	5.6	21.41	33.0	-11.6	PK Detector
2535.00	24.38	H	9.8	5.6	20.14	33.0	-12.9	
High Ch								
2560.00	24.79	V	10.0	5.7	20.49	33.0	-12.5	PK Detector
2560.00	23.82	H	10.0	5.7	19.52	33.0	-13.5	

Rev: 11.02.2015  
 Note: For Band 4 EIRP limit is 30dBm

**LTE B7 20MHz 16QAM**

**LTE Band 12**

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP		EIRP	
				dBm	mW	dBm	mW
1.4	QPSK	1/0	699.7	15.43	34.91	17.58	57.28
1.4	QPSK	1/0	707.5	15.68	36.98	17.83	60.67
1.4	QPSK	1/0	715.3	15.37	34.43	17.52	56.49
1.4	16QAM	1/0	699.7	14.41	27.61	16.56	45.29
1.4	16QAM	1/0	707.5	14.77	29.99	16.92	49.20
1.4	16QAM	1/0	715.3	14.54	28.44	16.69	46.67
3	QPSK	1/0	700.5	15.29	33.81	17.44	55.46
3	QPSK	1/0	707.5	15.75	37.58	17.90	61.66
3	QPSK	1/0	714.5	15.45	35.08	17.60	57.54
3	16QAM	1/0	700.5	14.53	28.38	16.68	46.56
3	16QAM	1/0	707.5	14.96	31.33	17.11	51.40
3	16QAM	1/0	714.5	14.58	28.71	16.73	47.10
5	QPSK	1/0	701.5	15.62	36.48	17.77	59.84
5	QPSK	1/0	707.5	15.78	37.84	17.93	62.09
5	QPSK	1/0	713.5	15.54	35.81	17.69	58.75
5	16QAM	1/0	701.5	14.70	29.51	16.85	48.42
5	16QAM	1/0	707.5	14.98	31.48	17.13	51.64
5	16QAM	1/0	713.5	14.70	29.51	16.85	48.42
10	QPSK	1/0	704	15.65	36.73	17.80	60.26
10	QPSK	1/0	707.5	15.76	37.67	17.91	61.80
10	QPSK	1/0	711	15.44	34.99	17.59	57.41
10	16QAM	1/0	704	14.75	29.85	16.90	48.98
10	16QAM	1/0	707.5	14.76	29.92	16.91	49.09
10	16QAM	1/0	711	14.44	27.80	16.59	45.60

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/30/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #1, Y-Axis) Mode: LTE12, 1.4MHz, QPSK								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
699.70	15.26	V	4.8	-1.05	9.45	38.5	-29.0	
699.70	21.24	H	4.8	-1.05	15.43	38.5	-23.0	
Mid Ch								
707.50	15.95	V	4.8	-1.11	10.05	38.5	-28.4	
707.50	21.58	H	4.8	-1.11	15.68	38.5	-22.8	
High Ch								
715.30	16.64	V	4.8	-1.17	10.63	38.5	-27.8	
715.30	21.38	H	4.8	-1.17	15.37	38.5	-23.1	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B12 1.4MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/30/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #1, Y-Axis) Mode: LTE12, 1.4MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
699.70	14.25	V	4.8	-1.05	8.44	38.5	-30.0	
699.70	20.22	H	4.8	-1.05	14.41	38.5	-24.0	
Mid Ch								
707.50	14.99	V	4.8	-1.11	9.09	38.5	-29.4	
707.50	20.67	H	4.8	-1.11	14.77	38.5	-23.7	
High Ch								
715.30	15.69	V	4.8	-1.17	9.68	38.5	-28.8	
715.30	20.55	H	4.8	-1.17	14.54	38.5	-23.9	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B12 1.4MHz 16QAM

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/30/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #1, Y-Axis) Mode: LTE12, 3MHz, QPSK								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
700.50	15.56	V	4.8	-1.08	9.71	38.5	-28.7	
700.50	21.14	H	4.8	-1.08	15.29	38.5	-23.2	
Mid Ch								
707.50	16.42	V	4.8	-1.11	10.52	38.5	-27.9	
707.50	21.65	H	4.8	-1.11	15.75	38.5	-22.7	
High Ch								
714.50	16.78	V	4.8	-1.14	10.83	38.5	-27.6	
714.50	21.40	H	4.8	-1.14	15.45	38.5	-23.0	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B12 3MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/30/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #1, Y-Axis) Mode: LTE12, 3MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
700.50	14.63	V	4.8	-1.08	8.78	38.5	-29.7	
700.50	20.38	H	4.8	-1.08	14.53	38.5	-23.9	
Mid Ch								
707.50	15.45	V	4.8	-1.11	9.55	38.5	-28.9	
707.50	20.86	H	4.8	-1.11	14.96	38.5	-23.5	
High Ch								
714.50	15.70	V	4.8	-1.14	9.75	38.5	-28.7	
714.50	20.53	H	4.8	-1.14	14.58	38.5	-23.9	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B12 3MHz 16QAM

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/30/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #1, Y-Axis) Mode: LTE12, 5MHz, QPSK								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
701.50	15.65	V	4.8	-1.06	9.82	38.5	-28.6	
701.50	21.45	H	4.8	-1.06	15.62	38.5	-22.8	
Mid Ch								
707.50	16.55	V	4.8	-1.11	10.65	38.5	-27.8	
707.50	21.68	H	4.8	-1.11	15.78	38.5	-22.7	
High Ch								
713.50	16.80	V	4.8	-1.16	10.81	38.5	-27.6	
713.50	21.56	H	4.8	-1.17	15.54	38.5	-22.9	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B12 5MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz)								
UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/30/2016 Test Engineer: Mark Nolting Configuration: Standalone (LTE Sample #1, Y-Axis) Mode: LTE12, 5MHz, 16QAM								
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
701.50	14.87	V	4.8	-1.06	9.04	38.5	-29.4	
701.50	20.53	H	4.8	-1.06	14.70	38.5	-23.7	
Mid Ch								
707.50	15.69	V	4.8	-1.11	9.79	38.5	-28.7	
707.50	20.88	H	4.8	-1.11	14.98	38.5	-23.5	
High Ch								
713.50	15.93	V	4.8	-1.16	9.94	38.5	-28.5	
713.50	20.72	H	4.8	-1.17	14.70	38.5	-23.7	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

LTE B12 5MHz 16QAM

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/30/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LTE Sample #2, Y-Axis)  
 Mode: LTE12, 10MHz, QPSK

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
704.00	16.23	V	4.8	-1.08	10.38	38.5	-28.1	
704.00	21.50	H	4.8	-1.08	15.65	38.5	-22.8	
Mid Ch								
707.50	16.54	V	4.8	-1.11	10.64	38.5	-27.8	
707.50	21.66	H	4.8	-1.11	15.76	38.5	-22.7	
High Ch								
711.00	16.74	V	4.8	-1.14	10.79	38.5	-27.7	
711.00	21.39	H	4.8	-1.14	15.44	38.5	-23.0	

Rev: 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

**LTE B12 10MHz QPSK**

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/30/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LTE Sample #2, Y-Axis)  
 Mode: LTE12, 10MHz, 16QAM

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
704.00	15.39	V	4.8	-1.08	9.54	38.5	-28.9	
704.00	20.60	H	4.8	-1.08	14.75	38.5	-23.7	
Mid Ch								
707.50	15.59	V	4.8	-1.11	9.69	38.5	-28.8	
707.50	20.66	H	4.8	-1.11	14.76	38.5	-23.7	
High Ch								
711.00	15.82	V	4.8	-1.14	9.87	38.5	-28.6	
711.00	20.39	H	4.8	-1.14	14.44	38.5	-24.0	

Rev: 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

**LTE B12 10MHz 16QAM**



**LTE Band 13**

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP		EIRP	
				dBm	mW	dBm	mW
5	QPSK	1/0	779.5	11.55	14.29	13.70	23.44
5	QPSK	1/0	782	11.35	13.65	13.50	22.39
5	QPSK	1/0	784.5	11.50	14.13	13.65	23.17
5	16QAM	1/0	779.5	10.46	11.12	12.61	18.24
5	16QAM	1/0	782	10.72	11.80	12.87	19.36
5	16QAM	1/0	784.5	10.01	10.02	12.16	16.44
10	QPSK	1/0	782	10.79	11.99	12.94	19.68
10	16QAM	1/0	782	9.70	9.33	11.85	15.31

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2, Y-Axis) Mode: LTE13, 5MHz, QPSK <b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	18.22	V	5.1	-1.59	11.55	34.8	-23.3	
779.50	5.84	H	5.1	-1.59	-0.83	34.8	-35.6	
Mid Ch								
782.00	18.07	V	5.1	-1.61	11.35	34.8	-23.4	
782.00	5.52	H	5.1	-1.61	-1.20	34.8	-36.0	
High Ch								
784.50	18.24	V	5.1	-1.63	11.50	34.8	-23.3	
784.50	5.64	H	5.1	-1.63	-1.10	34.8	-35.9	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm								

LTE B13 5MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2, Y-Axis) Mode: LTE12, 5MHz, 16QAM <b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	17.13	V	5.1	-1.59	10.46	34.8	-24.3	
779.50	3.58	H	5.1	-1.59	-3.09	34.8	-37.9	
Mid Ch								
782.00	17.44	V	5.1	-1.61	10.72	34.8	-24.1	
782.00	4.43	H	5.1	-1.61	-2.29	34.8	-37.1	
High Ch								
784.50	16.75	V	5.1	-1.63	10.01	34.8	-24.8	
784.50	4.29	H	5.1	-1.63	-2.45	34.8	-37.3	
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm								

LTE B13 5MHz 16QAM

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2, Y-Axis) Mode: LTE13, 10MHz, QPSK <b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
	0.00	V		-2.15		34.8		
	0.00	H		-2.15		34.8		
Mid Ch								
782.00	17.48	V	5.1	-1.61	10.79	34.8	-24.0	
782.00	5.70	H	5.1	-1.61	-0.99	34.8	-35.8	
High Ch								
	0.00	V		-2.15		34.8		
	0.00	H		-2.15		34.8		
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm								

LTE B13 10MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N								
Company: SOMC Project #: 11139405 Date: 03/31/2016 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #2, Y-Axis) Mode: LTE13, 10MHz, 16QAM <b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
	0.00	V		-2.15		34.8		
	0.00	H		-2.15		34.8		
Mid Ch								
782.00	16.39	V	5.1	-1.61	9.70	34.8	-25.1	
782.00	4.72	H	5.1	-1.61	-1.97	34.8	-36.8	
High Ch								
	0.00	V		-2.15		34.8		
	0.00	H		-2.15		34.8		
Rev: 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm								

LTE B13 10MHz 16QAM

**LTE Band 17**

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP		EIRP	
				dBm	mW	dBm	mW
5	QPSK	1/0	706.5	14.96	31.33	17.11	51.40
5	QPSK	1/0	710	15.41	34.75	17.56	57.02
5	QPSK	1/0	713.5	14.86	30.62	17.01	50.23
5	16QAM	1/0	706.5	14.19	26.24	16.34	43.05
5	16QAM	1/0	710	14.61	28.91	16.76	47.42
5	16QAM	1/0	713.5	13.92	24.66	16.07	40.46
10	QPSK	1/0	709	15.38	34.51	17.53	56.62
10	QPSK	1/0	710	15.44	34.99	17.59	57.41
10	QPSK	1/0	711	15.30	33.88	17.45	55.59
10	16QAM	1/0	709	14.49	28.12	16.64	46.13
10	16QAM	1/0	710	14.60	28.84	16.75	47.32
10	16QAM	1/0	711	14.32	27.04	16.47	44.36

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/30/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LTE Sample #2, Y-Axis)  
 Mode: LTE17, 5MHz, QPSK

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	16.21	V	4.8	-1.10	10.32	34.8	-24.5	
706.50	20.85	H	4.8	-1.10	14.96	34.8	-19.8	
Mid Ch								
710.00	16.37	V	4.8	-1.13	10.44	34.8	-24.4	
710.00	21.34	H	4.8	-1.13	15.41	34.8	-19.4	
High Ch								
713.50	16.28	V	4.8	-1.16	10.29	34.8	-24.5	
713.50	20.85	H	4.8	-1.16	14.86	34.8	-19.9	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

LTE B17 5MHz QPSK

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/30/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LTE Sample #2, Y-Axis)  
 Mode: LTE17, 5MHz, 16QAM

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
706.50	15.22	V	4.8	-1.10	9.33	34.8	-25.5	
706.50	20.08	H	4.8	-1.10	14.19	34.8	-20.6	
Mid Ch								
710.00	15.57	V	4.8	-1.13	9.64	34.8	-25.2	
710.00	20.54	H	4.8	-1.13	14.61	34.8	-20.2	
High Ch								
713.50	15.49	V	4.8	-1.16	9.50	34.8	-25.3	
713.50	19.91	H	4.8	-1.16	13.92	34.8	-20.9	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

LTE B17 5MHz 16QAM

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/30/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LTE Sample #2, Y-Axis)  
 Mode: LTE17, 10MHz, QPSK

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
709.00	16.77	V	4.8	-1.12	10.85	34.8	-24.0	
709.00	21.30	H	4.8	-1.12	15.38	34.8	-19.4	
Mid Ch								
710.00	16.60	V	4.8	-1.13	10.67	34.8	-24.1	
710.00	21.37	H	4.8	-1.13	15.44	34.8	-19.4	
High Ch								
711.00	16.59	V	4.8	-1.14	10.64	34.8	-24.2	
711.00	21.25	H	4.8	-1.14	15.30	34.8	-19.5	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

LTE B17 10MHz QPSK

**Fundamental Substitution Measurement (Fc < 1GHz)**  
 UL LLC, Chamber N

Company: SOMC  
 Project #: 11139405  
 Date: 03/30/2016  
 Test Engineer: Mark Nolting  
 Configuration: Standalone (LTE Sample #2, Y-Axis)  
 Mode: LTE17, 10MHz, 16QAM

**Test Equipment:**  
 Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
709.00	15.84	V	4.8	-1.12	9.92	34.8	-24.9	
709.00	20.41	H	4.8	-1.12	14.49	34.8	-20.3	
Mid Ch								
710.00	15.64	V	4.8	-1.13	9.71	34.8	-25.1	
710.00	20.53	H	4.8	-1.13	14.60	34.8	-20.2	
High Ch								
711.00	15.60	V	4.8	-1.14	9.65	34.8	-25.1	
711.00	20.27	H	4.8	-1.14	14.32	34.8	-20.5	

Rev. 11.02.2015  
 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm

LTE B17 10MHz 16QAM

**LTE Band 26**

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
1.4	QPSK	1/0	814.7	17.51	56.36
1.4	QPSK	1/0	831.5	17.53	56.62
1.4	QPSK	1/0	848.3	17.52	56.49
1.4	16QAM	1/0	814.7	16.62	45.92
1.4	16QAM	1/0	831.5	16.59	45.60
1.4	16QAM	1/0	848.3	16.55	45.19
3	QPSK	1/0	815.5	17.58	57.28
3	QPSK	1/0	831.5	17.54	56.75
3	QPSK	1/0	847.5	17.56	57.02
3	16QAM	1/0	815.5	16.63	46.03
3	16QAM	1/0	831.5	16.83	48.19
3	16QAM	1/0	847.5	16.42	43.85
5	QPSK	1/0	816.5	17.68	58.61
5	QPSK	1/0	831.5	17.62	57.81
5	QPSK	1/0	846.5	17.65	58.21
5	16QAM	1/0	816.5	16.67	46.45
5	16QAM	1/0	831.5	16.95	49.55
5	16QAM	1/0	846.5	16.38	43.45
10	QPSK	1/0	819	17.26	53.21
10	QPSK	1/0	831.5	17.01	50.23
10	QPSK	1/0	844	17.85	60.95
10	16QAM	1/0	819	16.33	42.95
10	16QAM	1/0	831.5	16.07	40.46
10	16QAM	1/0	844	16.58	45.50
15	QPSK	1/0	831.5	17.67	58.48
15	QPSK	1/0	836.5	17.45	55.59
15	QPSK	1/0	841.5	18.33	68.08
15	16QAM	1/0	831.5	16.55	45.19
15	16QAM	1/0	836.5	16.50	44.67
15	16QAM	1/0	841.5	16.14	41.11

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N									
Company: Sony Project #: 11139405 Date: 2016-03-30 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Z-Axis) Mode: LTE 26, 1.4MHz, QPSK									
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Part 90									
814.70	24.37	V	5.2	-1.63	17.51	50.0	-32.5		
814.70	13.38	H	5.2	-1.63	6.52	50.0	-43.5		
Part 22									
824.70	24.07	V	5.3	-1.55	17.25	38.5	-21.2		
824.70	13.57	H	5.3	-1.55	6.75	38.5	-31.7		
Mid Ch									
831.50	24.32	V	5.3	-1.47	17.53	38.5	-20.9		
831.50	13.66	H	5.3	-1.47	6.87	38.5	-31.6		
High Ch									
848.30	24.13	V	5.3	-1.27	17.52	38.5	-20.9		
848.30	13.26	H	5.3	-1.27	6.65	38.5	-31.8		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm									

LTE B26 1.4MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N									
Company: Sony Project #: 11139405 Date: 2016-03-30 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Z-Axis) Mode: LTE 26, 1.4MHz, 16QAM									
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Part 90									
814.70	23.48	V	5.2	-1.63	16.62	50.0	-33.4		
814.70	12.36	H	5.2	-1.63	5.50	50.0	-44.5		
Part 22									
824.70	23.27	V	5.3	-1.55	16.45	38.5	-22.0		
824.70	12.97	H	5.3	-1.55	6.15	38.5	-32.3		
Mid Ch									
831.50	23.38	V	5.3	-1.47	16.59	38.5	-21.9		
831.50	12.67	H	5.3	-1.47	5.88	38.5	-32.6		
High Ch									
848.30	23.16	V	5.3	-1.27	16.55	38.5	-21.9		
848.30	12.42	H	5.3	-1.27	5.81	38.5	-32.6		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm									

LTE B26 1.4MHz 16QAM

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N									
Company: Sony Project #: 11139405 Date: 2016-03-30 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Z-Axis) Mode: LTE 26, 3MHz, QPSK									
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Part 90									
815.50	24.44	V	5.2	-1.63	17.58	50.0	-32.4		
815.50	13.41	H	5.2	-1.63	6.55	50.0	-43.5		
Part 22									
825.50	24.34	V	5.3	-1.54	17.52	38.5	-20.9		
825.50	13.31	H	5.3	-1.54	6.49	38.5	-32.0		
Mid Ch									
831.50	24.33	V	5.3	-1.47	17.54	38.5	-20.9		
831.50	13.64	H	5.3	-1.47	12.17	38.5	-26.3		
High Ch									
847.50	24.19	V	5.3	-1.28	17.56	38.5	-20.9		
847.50	13.38	H	5.3	-1.28	6.75	38.5	-31.7		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm									

LTE B26 3MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N									
Company: Sony Project #: 11139405 Date: 2016-03-30 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Z-Axis) Mode: LTE 26, 3MHz, 16QAM									
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Part 90									
815.50	23.49	V	5.2	-1.63	16.63	50.0	-33.4		
815.50	12.57	H	5.2	-1.63	5.71	50.0	-44.3		
Part 22									
825.50	23.49	V	5.3	-1.54	16.67	38.5	-21.8		
825.50	12.32	H	5.3	-1.54	5.50	38.5	-32.9		
Mid Ch									
831.50	23.62	V	5.3	-1.47	16.83	38.5	-21.6		
831.50	13.01	H	5.3	-1.47	6.22	38.5	-32.2		
High Ch									
847.50	23.05	V	5.3	-1.28	16.42	38.5	-22.0		
847.50	12.97	H	5.3	-1.28	6.34	38.5	-32.1		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm									

LTE B26 3MHz 16QAM

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N									
Company: Sony Project #: 11139405 Date: 2016-03-30 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Z-Axis) Mode: LTE 26, 5MHz, QPSK									
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Part 90									
816.50	24.54	V	5.2	-1.62	17.68	50.0	-32.3		
816.50	13.21	H	5.2	-1.62	6.35	50.0	-43.6		
Part 22									
826.50	24.25	V	5.3	-1.53	17.44	38.5	-21.0		
826.50	13.39	H	5.3	-1.53	6.58	38.5	-31.9		
Mid Ch									
831.50	24.41	V	5.3	-1.47	17.62	38.5	-20.8		
831.50	13.54	H	5.3	-1.47	6.75	38.5	-31.7		
High Ch									
846.50	24.29	V	5.3	-1.29	17.65	38.5	-20.8		
846.50	13.78	H	5.3	-1.29	7.14	38.5	-31.3		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm									

LTE B26 5MHz QPSK

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N									
Company: Sony Project #: 11139405 Date: 2016-03-30 Test Engineer: Brian Kiewra Configuration: Standalone (LTE Sample #1 Z-Axis) Mode: LTE 26, 5MHz, 16QAM									
<b>Test Equipment:</b> Substitution: Dipole antenna AT0016, cable CBL055, and signal-source T374									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Part 90									
816.50	23.53	V	5.2	-1.62	16.67	50.0	-33.3		
816.50	12.66	H	5.2	-1.62	5.80	50.0	-44.2		
Part 22									
826.50	23.51	V	5.3	-1.53	16.70	38.5	-21.8		
826.50	12.83	H	5.3	-1.53	6.62	38.5	-32.4		
Mid Ch									
831.50	23.74	V	5.3	-1.47	16.95	38.5	-21.5		
831.50	12.73	H	5.3	-1.47	5.94	38.5	-32.5		
High Ch									
846.50	23.02	V	5.3	-1.29	16.38	38.5	-22.1		
846.50	12.82	H	5.3	-1.29	6.18	38.5	-32.3		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm									

LTE B26 5MHz 16QAM