

GSM Data

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
GSM850	GPRS	128	824.2	25.32	340.41
		190	836.6	25.99	397.19
		251	848.8	25.54	358.10
	EGPRS	128	824.2	20.91	123.31
		190	836.6	21.54	142.56
		251	848.8	21.16	130.62
GSM1900	GPRS	512	1850.2	25.25	334.97
		661	1880.0	25.45	350.75
		810	1909.8	25.19	330.37
	EGPRS	512	1850.2	23.01	199.99
		661	1880.0	23.23	210.38
		810	1909.8	22.94	196.79

GSM

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

Company: SOMC
 Project #: 16J23633Y
 Date: 09/12/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (GSM/UMTS sample)
 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	31.88	V	5.1	0.7	-1.45	25.32	38.5	-13.1	
824.20	21.91	H	5.1	0.7	-1.45	14.45	38.5	-24.0	
Mid Ch									
836.60	32.61	V	5.2	0.7	-1.45	25.99	38.5	-12.5	
836.60	22.41	H	5.2	0.7	-1.45	15.79	38.5	-22.7	
High Ch									
848.80	32.18	V	5.2	0.7	-1.45	25.54	38.5	-12.9	
848.80	23.95	H	5.2	0.7	-1.45	16.41	38.5	-22.0	

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 #: 16J23633Y
 Date: 09/12/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (GSM/UMTS sample)
 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	27.47	V	5.1	0.7	-1.45	20.91	38.5	-17.5	
824.20	16.85	H	5.1	0.7	-1.45	10.29	38.5	-28.2	
Mid Ch									
836.60	28.16	V	5.2	0.7	-1.45	21.54	38.5	-16.9	
836.60	18.97	H	5.2	0.7	-1.45	11.45	38.5	-27.0	
High Ch									
848.80	27.89	V	5.2	0.7	-1.45	21.16	38.5	-17.3	
848.80	18.65	H	5.2	0.7	-1.45	12.01	38.5	-26.4	

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 #: 16J23633Y
 Date: 09/12/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (GSM/UMTS sample)
 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	28.99	V	8.1	4.4	25.25	33.0	-7.7	
1850.20	21.95	H	8.1	4.4	18.21	33.0	-14.8	
Mid Ch								
1880.00	29.32	V	8.2	4.3	25.45	33.0	-7.5	
1880.00	23.15	H	8.2	4.3	19.28	33.0	-13.7	
High Ch								
1909.80	29.21	V	8.2	4.2	25.19	33.0	-7.8	
1909.80	22.47	H	8.2	4.2	18.45	33.0	-14.6	

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 #: 16J23633Y
 Date: 09/12/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (GSM/UMTS sample)
 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	26.75	V	8.1	4.4	23.01	33.0	-10.0	
1850.20	19.58	H	8.1	4.4	15.84	33.0	-17.2	
Mid Ch								
1880.00	27.10	V	8.2	4.3	23.23	33.0	-9.8	
1880.00	21.05	H	8.2	4.3	17.18	33.0	-15.8	
High Ch								
1909.80	26.96	V	8.2	4.2	22.94	33.0	-10.1	
1909.80	20.41	H	8.2	4.2	16.39	33.0	-16.6	

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

GSM1900 EGPRS

WCDMA Data

Band	Mode	Channel	f(MHz)	ERP/EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	16.61	45.85
		9400	1880	16.61	45.85
		9538	1907.6	17.96	62.53
	HSDPA	9262	1852.4	15.11	32.46
		9400	1880	15.12	32.53
		9538	1907.6	16.53	44.99
Band 4	REL99	1312	1712.4	18.12	64.79
		1413	1732.6	18.23	66.53
		1513	1752.6	17.12	51.57
	HSDPA	1312	1712.4	16.58	45.45
		1413	1732.6	16.71	46.88
		1513	1752.6	15.53	35.76

WCDMA

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/24/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (GSM/UMTS) 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	20.36	V	8.1	4.4	16.61	33.0	-16.4	
1852.40	13.63	H	8.1	4.4	9.88	33.0	-23.1		
Mid Ch	1880.00	20.48	V	8.2	4.3	16.61	33.0	-16.4	
1880.00	14.39	H	8.2	4.3	10.52	33.0	-22.5		
High Ch	1907.60	21.97	V	8.2	4.2	17.96	33.0	-15.0	
1907.60	15.01	H	8.2	4.2	11.00	33.0	-22.0		
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm									
B2 REL99					B2 HSDPA				
Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/24/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (GSM/UMTS sample) 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	18.86	V	8.1	4.4	15.11	33.0	-17.9	
1852.40	12.09	H	8.1	4.4	8.34	33.0	-24.7		
Mid Ch	1880.00	18.99	V	8.2	4.3	15.12	33.0	-17.9	
1880.00	12.90	H	8.2	4.3	9.03	33.0	-24.0		
High Ch	1907.60	20.54	V	8.2	4.2	16.53	33.0	-16.5	
1907.60	13.47	H	8.2	4.2	9.46	33.0	-23.5		
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm									
B4 REL99					B4 HSDPA				
Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/24/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (GSM/UMTS Sample) 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	21.14	V	7.7	4.7	18.12	33.0	-14.9	
1712.40	9.63	H	7.7	4.7	6.61	33.0	-26.4		
Mid Ch	1732.60	21.35	V	7.8	4.6	18.23	33.0	-14.8	
1732.60	11.97	H	7.8	4.6	8.85	33.0	-24.1		
High Ch	1752.60	20.35	V	7.8	4.6	17.12	33.0	-15.9	
1752.60	11.16	H	7.8	4.6	7.93	33.0	-25.1		
Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm									
B4 REL99					B4 HSDPA				

LTE Band 2 Data

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
1.4	QPSK	1/0	1850.7	15.92	39.09
		1/0	1880.0	17.06	50.85
		1/0	1909.3	16.79	47.76
	16QAM	1/0	1850.7	14.99	31.56
		1/0	1880.0	16.25	42.20
		1/0	1909.3	15.90	38.91
3	QPSK	1/0	1851.5	15.49	35.40
		1/0	1880.0	16.91	49.09
		1/0	1908.5	17.16	52.00
	16QAM	1/0	1851.5	14.71	29.58
		1/0	1880.0	16.16	41.30
		1/0	1908.5	16.16	41.30
5	QPSK	1/0	1852.5	16.87	48.66
		1/0	1880.0	16.83	48.23
		1/0	1907.5	16.79	47.76
	16QAM	1/0	1852.5	16.16	41.32
		1/0	1880.0	16.26	42.30
		1/0	1907.5	15.95	39.36
10	QPSK	1/0	1855.0	17.08	51.05
		1/0	1880.0	17.18	52.28
		1/0	1905.0	15.92	39.05
	16QAM	1/0	1855.0	16.31	42.76
		1/0	1880.0	16.32	42.88
		1/0	1905.0	15.03	31.81
15	QPSK	1/0	1857.5	17.64	58.08
		1/0	1880.0	14.61	28.91
		1/0	1902.5	16.47	44.36
	16QAM	1/0	1857.5	16.66	46.34
		1/0	1880.0	13.86	24.32
		1/0	1902.5	15.68	36.98
20	QPSK	1/0	1860.0	15.95	39.39
		1/0	1880.0	15.58	36.17
		1/0	1900.0	15.77	37.71
	16QAM	1/0	1860.0	15.25	33.53
		1/0	1880.0	14.75	29.87
		1/0	1900.0	14.99	31.51

LTE Band 2

<p style="text-align: center;">Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N</p> <p>Company: SOMC Project #: 16J23633Y Date: 08/25/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 2, 1.4M, QPSK</p> <p>Test Equipment: Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr><td colspan="9">Low Ch</td></tr> <tr><td>1850.70</td><td>19.66</td><td>V</td><td>8.1</td><td>4.4</td><td>15.92</td><td>33.0</td><td>-17.1</td><td></td></tr> <tr><td>1850.70</td><td>12.02</td><td>H</td><td>8.1</td><td>4.4</td><td>8.28</td><td>33.0</td><td>-24.7</td><td></td></tr> <tr><td colspan="9">Mid Ch</td></tr> <tr><td>1880.00</td><td>20.93</td><td>V</td><td>8.2</td><td>4.3</td><td>17.06</td><td>33.0</td><td>-15.9</td><td></td></tr> <tr><td>1880.00</td><td>13.69</td><td>H</td><td>8.2</td><td>4.3</td><td>9.82</td><td>33.0</td><td>-23.2</td><td></td></tr> <tr><td colspan="9">High Ch</td></tr> <tr><td>1909.30</td><td>28.81</td><td>V</td><td>8.2</td><td>4.2</td><td>16.79</td><td>33.0</td><td>-16.2</td><td></td></tr> <tr><td>1909.30</td><td>14.32</td><td>H</td><td>8.2</td><td>4.2</td><td>10.30</td><td>33.0</td><td>-22.7</td><td></td></tr> </tbody> </table> <p>Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm</p> <p style="text-align: center;">LTE B2 1.4MHz QPSK</p>	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	19.66	V	8.1	4.4	15.92	33.0	-17.1		1850.70	12.02	H	8.1	4.4	8.28	33.0	-24.7		Mid Ch									1880.00	20.93	V	8.2	4.3	17.06	33.0	-15.9		1880.00	13.69	H	8.2	4.3	9.82	33.0	-23.2		High Ch									1909.30	28.81	V	8.2	4.2	16.79	33.0	-16.2		1909.30	14.32	H	8.2	4.2	10.30	33.0	-22.7		<p style="text-align: center;">Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N</p> <p>Company: SOMC Project #: 16J23633Y Date: 08/25/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 2, 1.4M, 16QAM</p> <p>Test Equipment: Substitution: Horn antenna AT0078, cable CBL055, and signal-source T374</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr><td colspan="9">Low Ch</td></tr> <tr><td>1850.70</td><td>18.73</td><td>V</td><td>8.1</td><td>4.4</td><td>14.99</td><td>33.0</td><td>-18.0</td><td></td></tr> <tr><td>1850.70</td><td>11.09</td><td>H</td><td>8.1</td><td>4.4</td><td>7.35</td><td>33.0</td><td>-25.6</td><td></td></tr> <tr><td colspan="9">Mid Ch</td></tr> <tr><td>1880.00</td><td>20.12</td><td>V</td><td>8.2</td><td>4.3</td><td>16.25</td><td>33.0</td><td>-16.7</td><td></td></tr> <tr><td>1880.00</td><td>12.87</td><td>H</td><td>8.2</td><td>4.3</td><td>9.00</td><td>33.0</td><td>-24.0</td><td></td></tr> <tr><td colspan="9">High Ch</td></tr> <tr><td>1909.30</td><td>19.92</td><td>V</td><td>8.2</td><td>4.2</td><td>15.90</td><td>33.0</td><td>-17.1</td><td></td></tr> <tr><td>1909.30</td><td>13.41</td><td>H</td><td>8.2</td><td>4.2</td><td>9.39</td><td>33.0</td><td>-23.6</td><td></td></tr> </tbody> </table> <p>Rev. 11.02.2015 Note: For Band 4 EIRP limit is 30dBm</p> <p style="text-align: center;">LTE B2 1.4MHz 16QAM</p>	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	18.73	V	8.1	4.4	14.99	33.0	-18.0		1850.70	11.09	H	8.1	4.4	7.35	33.0	-25.6		Mid Ch									1880.00	20.12	V	8.2	4.3	16.25	33.0	-16.7		1880.00	12.87	H	8.2	4.3	9.00	33.0	-24.0		High Ch									1909.30	19.92	V	8.2	4.2	15.90	33.0	-17.1		1909.30	13.41	H	8.2	4.2	9.39	33.0	-23.6	
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Fundamental Substitution Measurement (Fc > 1GHz)
 UL LLC, Chamber N

Company: SOMC
 Project #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 2, 10M, 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								
1855.00	20.84	V	8.1	4.3	17.08	33.0	-15.9	
1855.00	6.92	H	8.1	4.3	3.16	33.0	-29.8	
Mid Ch								
1880.00	21.05	V	8.2	4.3	17.18	33.0	-15.8	
1880.00	12.88	H	8.2	4.3	9.01	33.0	-24.0	
High Ch								
1905.00	19.91	V	8.2	4.2	15.92	33.0	-17.1	
1905.00	13.70	H	8.2	4.2	9.71	33.0	-23.3	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 2, 10M, 16QAM

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								
1855.00	20.07	V	8.1	4.3	16.31	33.0	-16.7	
1855.00	6.18	H	8.1	4.3	2.42	33.0	-30.6	
Mid Ch								
1880.00	20.19	V	8.2	4.3	16.32	33.0	-16.7	
1880.00	12.05	H	8.2	4.3	8.18	33.0	-24.8	
High Ch								
1905.00	19.02	V	8.2	4.2	15.03	33.0	-18.0	
1905.00	12.80	H	8.2	4.2	8.81	33.0	-24.2	

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 #: 16J23633Y
 Date: 09/14/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 2, 15M, 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								
1857.50	21.41	V	8.1	4.3	17.64	33.0	-15.4	
1857.50	12.47	H	8.1	4.3	8.70	33.0	-24.3	
Mid Ch								
1880.00	18.48	V	8.2	4.3	14.61	33.0	-18.4	
1880.00	13.41	H	8.2	4.3	9.54	33.0	-23.5	
High Ch								
1902.50	20.45	V	8.2	4.2	16.47	33.0	-16.5	
1902.50	14.51	H	8.2	4.2	10.53	33.0	-22.5	

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 #: 16J23633Y
 Date: 09/14/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 2, 15M, 16QAM

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								
1857.50	20.43	V	8.1	4.3	16.66	33.0	-16.3	
1857.50	11.53	H	8.1	4.3	7.76	33.0	-25.2	
Mid Ch								
1880.00	17.73	V	8.2	4.3	13.86	33.0	-19.1	
1880.00	12.64	H	8.2	4.3	8.77	33.0	-24.2	
High Ch								
1902.50	19.66	V	8.2	4.2	15.68	33.0	-17.3	
1902.50	13.59	H	8.2	4.2	9.61	33.0	-23.4	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 2, 20M, 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								
1860.00	19.74	V	8.1	4.3	15.95	33.0	-17.0	
1860.00	12.48	H	8.1	4.3	8.69	33.0	-24.3	
Mid Ch								
1880.00	19.45	V	8.2	4.3	15.58	33.0	-17.4	
1880.00	13.52	H	8.2	4.3	9.65	33.0	-23.3	
High Ch								
1900.00	19.73	V	8.2	4.2	15.77	33.0	-17.2	
1900.00	12.29	H	8.2	4.2	8.33	33.0	-24.7	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 2, 20M, 16QAM

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								
1860.00	19.04	V	8.1	4.3	15.25	33.0	-17.7	
1860.00	11.80	H	8.1	4.3	8.01	33.0	-25.0	
Mid Ch								
1880.00	18.62	V	8.2	4.3	14.75	33.0	-18.2	
1880.00	12.65	H	8.2	4.3	8.78	33.0	-24.2	
High Ch								
1900.00	18.95	V	8.2	4.2	14.99	33.0	-18.0	
1900.00	11.47	H	8.2	4.2	7.51	33.0	-25.5	

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

LTE B2 20MHz 16QAM

LTE Band 4 Data

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP	
				dBm	mW
1.4	QPSK	1/0	1710.7	17.47	55.85
		1/0	1732.5	17.16	52.00
		1/0	1754.3	18.14	65.16
	16QAM	1/0	1710.7	16.53	44.98
		1/0	1732.5	16.32	42.85
		1/0	1754.3	17.35	54.33
3	QPSK	1/0	1711.5	16.85	48.42
		1/0	1732.5	17.13	51.64
		1/0	1753.5	18.16	65.46
	16QAM	1/0	1711.5	16.05	40.27
		1/0	1732.5	16.35	43.15
		1/0	1753.5	17.37	54.58
5	QPSK	1/0	1712.5	16.73	47.10
		1/0	1732.5	17.10	51.29
		1/0	1752.5	18.39	69.02
	16QAM	1/0	1712.5	15.88	38.73
		1/0	1732.5	16.51	44.77
		1/0	1752.5	17.55	56.89
10	QPSK	1/0	1715	16.86	48.53
		1/0	1732.5	17.14	51.76
		1/0	1750	17.41	55.08
	16QAM	1/0	1715	16.19	41.59
		1/0	1732.5	16.28	42.46
		1/0	1750	16.60	45.71
15	QPSK	1/0	1717.5	17.51	56.36
		1/0	1732.5	16.68	46.56
		1/0	1747.5	17.52	56.49
	16QAM	1/0	1717.5	16.79	47.75
		1/0	1732.5	16.07	40.46
		1/0	1747.5	16.68	46.56
20	QPSK	1/0	1720	16.64	46.13
		1/0	1732.5	17.15	51.88
		1/0	1745	17.07	50.93
	16QAM	1/0	1720	15.96	39.45
		1/0	1732.5	16.37	43.35
		1/0	1745	16.23	41.98

LTE Band 4

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 09/14/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 4, 1.4M, 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									
1710.70	20.49	V	7.7	4.7	17.47	30.0	-12.5		
1710.70	8.98	H	7.7	4.7	5.96	30.0	-24.0		
Mid Ch									
1732.50	20.28	V	7.8	4.6	17.16	30.0	-12.8		
1732.50	11.94	H	7.8	4.6	8.82	30.0	-21.2		
High Ch									
1754.30	21.38	V	7.8	4.6	18.14	30.0	-11.9		
1754.30	12.75	H	7.8	4.6	9.51	30.0	-20.5		
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 #: 16J23633Y Date: 09/14/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 4, 1.4M, 16QAM 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									
1710.70	19.55	V	7.7	4.7	16.53	30.0	-13.5		
1710.70	8.05	H	7.7	4.7	5.03	30.0	-25.0		
Mid Ch									
1732.50	19.44	V	7.8	4.6	16.32	30.0	-13.7		
1732.50	11.14	H	7.8	4.6	8.02	30.0	-22.0		
High Ch									
1754.30	20.59	V	7.8	4.6	17.35	30.0	-12.6		
1754.30	11.89	H	7.8	4.6	8.65	30.0	-21.3		
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 #: 16J23633Y Date: 08/25/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 4, 3M, 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									
1711.50	19.87	V	7.7	4.7	16.85	30.0	-13.2		
1711.50	8.10	H	7.7	4.7	6.08	30.0	-23.9		
Mid Ch									
1732.50	20.25	V	7.8	4.6	17.13	30.0	-12.9		
1732.50	10.26	H	7.8	4.6	7.14	30.0	-22.9		
High Ch									
1753.50	21.39	V	7.8	4.6	18.16	30.0	-11.8		
1753.50	10.90	H	7.8	4.6	7.67	30.0	-22.3		
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 #: 16J23633Y Date: 08/25/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 4, 3M, 16QAM 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									
1711.50	19.07	V	7.7	4.7	16.05	30.0	-14.0		
1711.50	8.38	H	7.7	4.7	5.36	30.0	-24.6		
Mid Ch									
1732.50	19.47	V	7.8	4.6	16.35	30.0	-13.6		
1732.50	9.52	H	7.8	4.6	6.40	30.0	-23.5		
High Ch									
1753.50	20.60	V	7.8	4.6	17.37	30.0	-12.6		
1753.50	10.10	H	7.8	4.6	6.87	30.0	-23.1		
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 #: 16J23633Y Date: 08/25/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 4, 5M, 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									
1712.50	19.76	V	7.7	4.7	16.73	30.0	-13.3		
1712.50	6.91	H	7.7	4.7	3.88	30.0	-26.1		
Mid Ch									
1732.50	20.22	V	7.8	4.6	17.10	30.0	-12.9		
1732.50	10.36	H	7.8	4.6	7.24	30.0	-22.8		
High Ch									
1752.50	21.62	V	7.8	4.6	18.39	30.0	-11.6		
1752.50	11.24	H	7.8	4.6	8.01	30.0	-22.0		
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 #: 16J23633Y Date: 08/25/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 4, 5M, 16QAM 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									
1712.50	18.91	V	7.7	4.7	15.88	30.0	-14.1		
1712.50	6.15	H	7.7	4.7	3.12	30.0	-26.9		
Mid Ch									
1732.50	19.63	V	7.8	4.6	16.51	30.0	-13.5		
1732.50	9.68	H	7.8	4.6	6.56	30.0	-23.4		
High Ch									
1752.50	20.78	V	7.8	4.6	17.55	30.0	-12.4		
1752.50	10.49	H	7.8	4.6	7.26	30.0	-22.7		
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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 4, 10M, 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								
1715.00	19.90	V	7.7	4.7	16.86	30.0	-13.1	
1715.00	9.01	H	7.7	4.7	5.97	30.0	-24.0	
Mid Ch								
1732.50	20.26	V	7.8	4.6	17.14	30.0	-12.9	
1732.50	12.01	H	7.8	4.6	8.89	30.0	-21.1	
High Ch								
1750.00	20.62	V	7.8	4.6	17.41	30.0	-12.6	
1750.00	10.85	H	7.8	4.6	7.64	30.0	-22.4	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 4, 10M, 16QAM

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								
1715.00	19.23	V	7.7	4.7	16.19	30.0	-13.8	
1715.00	8.29	H	7.7	4.7	5.25	30.0	-24.7	
Mid Ch								
1732.50	19.40	V	7.8	4.6	16.28	30.0	-13.7	
1732.50	11.23	H	7.8	4.6	8.11	30.0	-21.9	
High Ch								
1750.00	19.81	V	7.8	4.6	16.60	30.0	-13.4	
1750.00	10.01	H	7.8	4.6	6.80	30.0	-23.2	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 4, 15M, 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								
1717.50	20.56	V	7.7	4.7	17.51	30.0	-12.5	
1717.50	9.99	H	7.7	4.7	6.94	30.0	-23.1	
Mid Ch								
1732.50	19.89	V	7.8	4.6	16.68	30.0	-13.3	
1732.50	11.55	H	7.8	4.6	8.43	30.0	-21.6	
High Ch								
1747.50	20.72	V	7.8	4.6	17.52	30.0	-12.5	
1747.50	11.38	H	7.8	4.6	8.18	30.0	-21.8	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 4, 15M, 16QAM

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								
1717.50	19.84	V	7.7	4.7	16.79	30.0	-13.2	
1717.50	9.24	H	7.7	4.7	6.19	30.0	-23.8	
Mid Ch								
1732.50	19.19	V	7.8	4.6	16.07	30.0	-13.9	
1732.50	10.86	H	7.8	4.6	7.14	30.0	-22.3	
High Ch								
1747.50	19.88	V	7.8	4.6	16.68	30.0	-13.3	
1747.50	9.68	H	7.8	4.6	6.48	30.0	-23.5	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 4, 20M, 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								
1720.00	19.70	V	7.7	4.7	16.64	30.0	-13.4	
1720.00	9.17	H	7.7	4.7	6.11	30.0	-23.9	
Mid Ch								
1732.50	20.27	V	7.8	4.6	17.15	30.0	-12.8	
1732.50	10.32	H	7.8	4.6	7.20	30.0	-22.8	
High Ch								
1745.00	20.25	V	7.8	4.6	17.07	30.0	-12.9	
1745.00	11.77	H	7.8	4.6	8.59	30.0	-21.4	

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 #: 16J23633Y
 Date: 08/25/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE sample #1)
 Mode: LTE 4, 20M, 16QAM

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								
1720.00	19.02	V	7.7	4.7	15.96	30.0	-14.0	
1720.00	8.50	H	7.7	4.7	5.44	30.0	-24.6	
Mid Ch								
1732.50	19.49	V	7.8	4.6	16.37	30.0	-13.6	
1732.50	9.51	H	7.8	4.6	6.39	30.0	-23.6	
High Ch								
1745.00	19.41	V	7.8	4.6	16.23	30.0	-13.8	
1745.00	10.92	H	7.8	4.6	7.74	30.0	-22.3	

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

LTE B4 20MHz 16QAM

LTE Band 12 Data

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
1.4	QPSK	1/0	699.7	12.54	17.95
		1/0	707.5	13.27	21.23
		1/0	715.3	13.44	22.08
	16QAM	1/0	699.7	11.53	14.22
		1/0	707.5	12.38	17.30
		1/0	715.3	12.41	17.42
3	QPSK	1/0	700.5	12.11	16.26
		1/0	707.5	13.57	22.75
		1/0	714.5	13.57	22.75
	16QAM	1/0	700.5	11.24	13.30
		1/0	707.5	12.66	18.45
		1/0	714.5	12.58	18.11
5	QPSK	1/0	701.5	12.26	16.83
		1/0	707.5	13.84	24.21
		1/0	713.5	13.70	23.44
	16QAM	1/0	701.5	11.36	13.68
		1/0	707.5	12.92	19.59
		1/0	713.5	12.69	18.58
10	QPSK	1/0	704.0	12.53	17.91
		1/0	707.5	13.75	23.71
		1/0	711.0	13.55	22.65
	16QAM	1/0	704.0	11.54	14.26
		1/0	707.5	12.95	19.72
		1/0	711.0	12.54	17.95

LTE Band 12

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N										
Company: SOMC Project #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 12, 1.4MHz, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low										
699.70	17.35	V	4.7	2.0	-0.15	12.54	38.5	-25.9		
699.70	5.80	H	4.7	2.0	-0.15	0.99	38.5	-37.5		
Mid Ch										
707.50	18.20	V	4.7	1.9	-0.24	13.27	38.5	-25.2		
707.50	5.49	H	4.7	1.9	-0.24	0.56	38.5	-37.9		
High Ch										
715.30	18.50	V	4.7	1.8	-0.33	13.44	38.5	-25.0		
715.30	6.87	H	4.7	1.8	-0.33	1.81	38.5	-36.6		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm										
Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N										
Company: SOMC Project #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 12, 1.4MHz, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low										
699.70	16.34	V	4.7	2.0	-0.15	11.53	38.5	-26.9		
699.70	5.01	H	4.7	2.0	-0.15	0.20	38.5	-38.2		
Mid Ch										
707.50	17.31	V	4.7	1.9	-0.24	12.38	38.5	-26.1		
707.50	4.65	H	4.7	1.9	-0.24	-0.28	38.5	-38.7		
High Ch										
715.30	17.47	V	4.7	1.8	-0.33	12.41	38.5	-26.0		
715.30	5.75	H	4.7	1.8	-0.33	0.69	38.5	-37.8		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm										
Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N										
Company: SOMC Project #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 12, 3MHz, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low										
700.50	16.93	V	4.7	2.0	-0.16	12.11	38.5	-26.3		
700.50	5.69	H	4.7	2.0	-0.16	0.78	38.5	-37.7		
Mid Ch										
707.50	18.50	V	4.7	1.9	-0.24	13.57	38.5	-24.9		
707.50	5.79	H	4.7	1.9	-0.24	0.86	38.5	-37.6		
High Ch										
714.50	18.62	V	4.7	1.8	-0.32	13.57	38.5	-24.9		
714.50	6.67	H	4.7	1.8	-0.32	1.62	38.5	-36.8		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm										
Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N										
Company: SOMC Project #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 12, 3MHz, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low										
700.50	16.06	V	4.7	2.0	-0.16	11.24	38.5	-27.2		
700.50	4.73	H	4.7	2.0	-0.16	-0.09	38.5	-38.5		
Mid Ch										
707.50	17.59	V	4.7	1.9	-0.24	12.66	38.5	-25.8		
707.50	4.93	H	4.7	1.9	-0.24	0.00	38.5	-38.4		
High Ch										
714.50	17.63	V	4.7	1.8	-0.32	12.58	38.5	-25.9		
714.50	5.65	H	4.7	1.8	-0.32	0.60	38.5	-37.8		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm										
Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N										
Company: SOMC Project #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 12, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low										
701.50	17.09	V	4.7	2.0	-0.17	12.26	38.5	-26.2		
701.50	5.87	H	4.7	2.0	-0.17	1.04	38.5	-37.4		
Mid Ch										
707.50	18.77	V	4.7	1.9	-0.24	13.84	38.5	-24.6		
707.50	5.25	H	4.7	1.9	-0.24	0.32	38.5	-38.1		
High Ch										
713.50	18.73	V	4.7	1.8	-0.31	13.70	38.5	-24.8		
713.50	6.39	H	4.7	1.8	-0.31	1.36	38.5	-37.1		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm										
Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N										
Company: SOMC Project #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 12, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low										
701.50	16.19	V	4.7	2.0	-0.17	11.36	38.5	-27.1		
701.50	4.93	H	4.7	2.0	-0.17	0.10	38.5	-38.4		
Mid Ch										
707.50	17.85	V	4.7	1.9	-0.24	12.92	38.5	-25.5		
707.50	4.40	H	4.7	1.9	-0.24	-0.53	38.5	-39.0		
High Ch										
713.50	17.72	V	4.7	1.8	-0.31	12.69	38.5	-25.8		
713.50	5.43	H	4.7	1.8	-0.31	0.40	38.5	-38.1		
Rev. 11.02.2015 Note: For Band 13/17 ERP limit is 34.77dBm. For Band 26 limit is 50dBm										

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

Company: SOMC
 Project #: 16J23633Y
 Date: 08/23/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE Sample #1)
 Mode: LTE 12, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low									
704.00	17.40	V	4.7	2.0	-0.20	12.53	38.5	-25.9	
704.00	5.46	H	4.7	2.0	-0.20	0.59	38.5	-37.9	
Mid Ch									
707.50	18.68	V	4.7	1.9	-0.24	13.75	38.5	-24.7	
707.50	6.32	H	4.7	1.9	-0.24	1.39	38.5	-37.1	
High Ch									
711.00	18.54	V	4.7	1.9	-0.28	13.55	38.5	-24.9	
711.00	5.89	H	4.7	1.9	-0.28	0.90	38.5	-37.5	

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 #: 16J23633Y
 Date: 08/23/2016
 Test Engineer: Brian Kiewra / John Manser
 Configuration: Standalone (LTE Sample #1)
 Mode: LTE 12, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low									
704.00	16.41	V	4.7	2.0	-0.20	11.54	38.5	-26.9	
704.00	4.59	H	4.7	2.0	-0.20	-0.28	38.5	-38.7	
Mid Ch									
707.50	17.88	V	4.7	1.9	-0.24	12.95	38.5	-25.5	
707.50	5.46	H	4.7	1.9	-0.24	0.53	38.5	-37.9	
High Ch									
711.00	17.53	V	4.7	1.9	-0.28	12.54	38.5	-25.9	
711.00	4.91	H	4.7	1.9	-0.28	-0.08	38.5	-38.5	

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 17 Data

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
5	QPSK	1/0	706.5	13.99	25.06
		1/0	710.0	13.93	24.72
		1/0	713.5	13.46	22.18
	16QAM	1/0	706.5	13.06	20.23
		1/0	710.0	13.04	20.14
		1/0	713.5	12.72	18.71
10	QPSK	1/0	709.0	14.51	28.25
		1/0	710.0	14.16	26.06
		1/0	711.0	14.04	25.35
	16QAM	1/0	709.0	13.63	23.07
		1/0	710.0	13.38	21.78
		1/0	711.0	13.05	20.18

LTE Band 17

Fundamental Substitution Measurement (Fc < 1GHz) UL LLC, Chamber N										
Company: SOMC Project #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 17, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low	18.90	V	4.7	1.9	-0.23	13.99	34.8	-20.8		
706.50	6.03	H	4.7	1.9	-0.23	1.12	34.8	-33.7		
Mid Ch	18.90	V	4.7	1.9	-0.27	13.93	34.8	-20.8		
710.00	5.51	H	4.7	1.9	-0.27	0.54	34.8	-34.2		
High Ch	18.49	V	4.7	1.8	-0.31	13.46	34.8	-21.3		
713.50	6.49	H	4.7	1.8	-0.31	1.46	34.8	-33.3		
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 #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 17, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low	17.97	V	4.7	1.9	-0.23	13.06	34.8	-21.7		
706.50	5.02	H	4.7	1.9	-0.23	0.11	34.8	-34.7		
Mid Ch	18.01	V	4.7	1.9	-0.27	13.04	34.8	-21.7		
710.00	4.70	H	4.7	1.9	-0.27	-0.27	34.8	-35.0		
High Ch	17.75	V	4.7	1.8	-0.31	12.72	34.8	-22.1		
713.50	5.72	H	4.7	1.8	-0.31	0.69	34.8	-34.1		
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 #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 17, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low	19.47	V	4.7	1.9	-0.26	14.51	34.8	-20.3		
709.00	6.14	H	4.7	1.9	-0.26	1.18	34.8	-33.6		
Mid Ch	19.13	V	4.7	1.9	-0.27	14.16	34.8	-20.6		
710.00	6.26	H	4.7	1.9	-0.27	1.29	34.8	-33.5		
High Ch	19.03	V	4.7	1.9	-0.28	14.04	34.8	-20.7		
711.00	5.76	H	4.7	1.9	-0.28	0.77	34.8	-34.0		
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 #: 16J23633Y Date: 08/23/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE Sample #1) Mode: LTE 17, 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 (dBi)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	
Low	18.59	V	4.7	1.9	-0.26	13.63	34.8	-21.1		
709.00	5.33	H	4.7	1.9	-0.26	0.37	34.8	-34.4		
Mid Ch	18.35	V	4.7	1.9	-0.27	13.38	34.8	-21.4		
710.00	5.52	H	4.7	1.9	-0.27	0.55	34.8	-34.2		
High Ch	18.05	V	4.7	1.9	-0.28	13.06	34.8	-21.7		
711.00	4.73	H	4.7	1.9	-0.28	-0.26	34.8	-35.0		
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 41 Data

BW (MHz)	Mode	RB/RB Size	f(MHz)	EIRP (PEAK)	
				dBm	mW
5	QPSK	1/0	2498.5	21.27	133.97
		1/0	2593	25.88	387.17
		1/0	2687.5	22.08	161.29
	16QAM	1/0	2498.5	21.10	128.82
		1/0	2593	25.74	374.89
		1/0	2687.5	22.01	158.71
10	QPSK	1/0	2501	21.07	127.94
		1/0	2593	26.08	405.42
		1/0	2685	21.97	157.25
	16QAM	1/0	2501	21.02	126.47
		1/0	2593	26.04	401.70
		1/0	2685	21.86	153.32
15	QPSK	1/0	2503.5	20.26	106.19
		1/0	2593	25.66	368.04
		1/0	2682.5	22.86	193.02
	16QAM	1/0	2503.5	20.20	104.74
		1/0	2593	25.55	358.84
		1/0	2682.5	22.73	187.33
20	QPSK	1/0	2506	22.14	163.76
		1/0	2593	26.10	407.29
		1/0	2680	23.03	200.72
	16QAM	1/0	2506	22.02	159.29
		1/0	2593	25.88	387.17
		1/0	2680	22.95	197.06

LTE Band 41

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/29/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 41, 5M, 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									
2498.50	14.67	V	9.6	5.5	10.61	33.0	-22.4	Pk	
2498.50	25.33	H	9.6	5.5	21.27	33.0	-11.7	Pk	
Mid Ch									
2593.00	27.38	V	9.8	5.8	23.35	33.0	-9.7	Pk	
2593.00	29.91	H	9.8	5.8	25.88	33.0	-7.1	Pk	
High Ch									
2687.50	23.33	V	10.0	6.0	19.37	33.0	-13.6	Pk	
2687.50	26.04	H	10.0	6.0	22.08	33.0	-10.9	Pk	
Rev: 11 02 2015 Note: For Band 4 EIRP limit is 30dBm									
LTE B41 5MHz QPSK									

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/29/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 41, 5M, 16QAM 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									
2498.50	14.54	V	9.6	5.5	10.48	33.0	-22.5	Pk	
2498.50	25.16	H	9.6	5.5	21.10	33.0	-11.9	Pk	
Mid Ch									
2593.00	27.33	V	9.8	5.8	23.30	33.0	-9.7	Pk	
2593.00	29.77	H	9.8	5.8	25.74	33.0	-7.3	Pk	
High Ch									
2687.50	22.88	V	10.0	6.0	18.92	33.0	-14.1	Pk	
2687.50	25.97	H	10.0	6.0	22.01	33.0	-11.0	Pk	
Rev: 11 02 2015 Note: For Band 4 EIRP limit is 30dBm									
LTE B41 5MHz 16QAM									

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/29/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 41, 10M, 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									
2501.00	14.27	V	9.6	5.5	10.21	33.0	-22.8	Pk	
2501.00	25.13	H	9.6	5.5	21.07	33.0	-11.9	Pk	
Mid Ch									
2593.00	26.54	V	9.8	5.8	22.51	33.0	-10.5	Pk	
2593.00	30.11	H	9.8	5.8	26.08	33.0	-6.9	Pk	
High Ch									
2685.00	23.80	V	10.0	6.0	19.84	33.0	-13.2	Pk	
2685.00	25.93	H	10.0	6.0	21.97	33.0	-11.0	Pk	
Rev: 11 02 2015 Note: For Band 4 EIRP limit is 30dBm									
LTE B41 10MHz QPSK									

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/29/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 41, 10M, 16QAM 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									
2501.00	14.25	V	9.6	5.5	10.19	33.0	-22.8	Pk	
2501.00	25.08	H	9.6	5.5	21.02	33.0	-12.0	Pk	
Mid Ch									
2593.00	26.50	V	9.8	5.8	22.47	33.0	-10.5	Pk	
2593.00	30.07	H	9.8	5.8	26.04	33.0	-7.0	Pk	
High Ch									
2685.00	23.61	V	10.0	6.0	19.65	33.0	-13.4	Pk	
2685.00	25.82	H	10.0	6.0	21.86	33.0	-11.1	Pk	
Rev: 11 02 2015 Note: For Band 4 EIRP limit is 30dBm									
LTE B41 10MHz 16QAM									

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/29/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 41, 15M, 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									
2503.50	12.31	V	9.6	5.5	8.25	33.0	-24.7	Pk	
2503.50	24.32	H	9.6	5.5	20.26	33.0	-12.7	Pk	
Mid Ch									
2593.00	15.93	V	9.8	5.8	11.90	33.0	-21.1	Pk	
2593.00	29.69	H	9.8	5.8	25.66	33.0	-7.3	Pk	
High Ch									
2682.50	23.54	V	10.0	6.0	19.58	33.0	-13.4	Pk	
2682.50	26.82	H	10.0	6.0	22.86	33.0	-10.1	Pk	
Rev: 11 02 2015 Note: For Band 4 EIRP limit is 30dBm									
LTE B41 15MHz QPSK									

Fundamental Substitution Measurement (Fc > 1GHz) UL LLC, Chamber N									
Company: SOMC Project #: 16J23633Y Date: 08/29/2016 Test Engineer: Brian Kiewra / John Manser Configuration: Standalone (LTE sample #1) Mode: LTE 41, 15M, 16QAM 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									
2503.50	12.22	V	9.6	5.5	8.16	33.0	-24.8	Pk	
2503.50	24.26	H	9.6	5.5	20.20	33.0	-12.8	Pk	
Mid Ch									
2593.00	15.82	V	9.8	5.8	11.79	33.0	-21.2	Pk	
2593.00	29.58	H	9.8	5.8	25.55	33.0	-7.5	Pk	
High Ch									
2682.50	23.39	V	10.0	6.0	19.43	33.0	-13.6	Pk	
2682.50	26.69	H	10.0	6.0	22.73	33.0	-10.3	Pk	
Rev: 11 02 2015 Note: For Band 4 EIRP limit is 30dBm									
LTE B41 15MHz 16QAM									