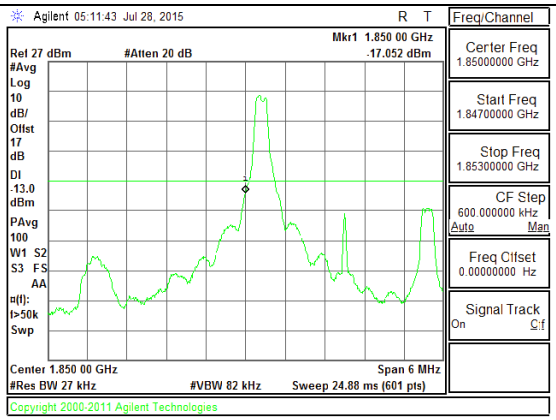
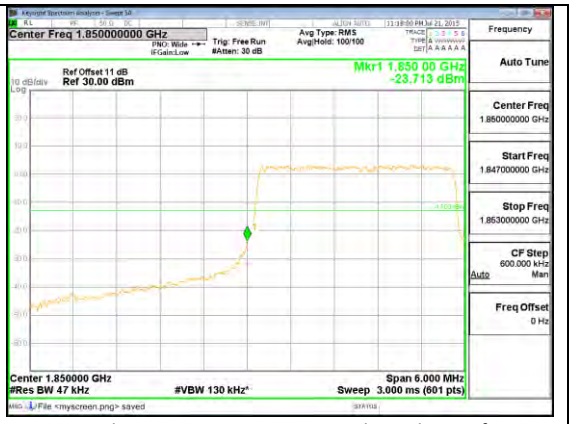
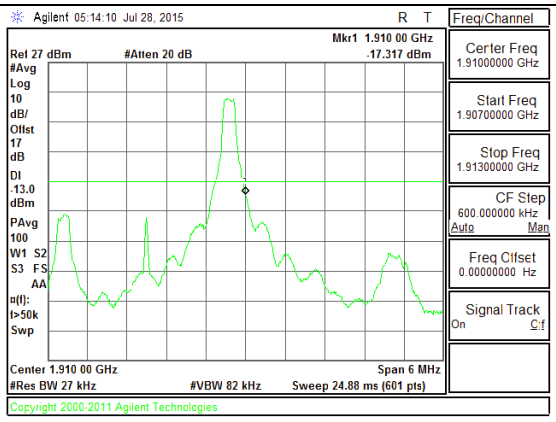
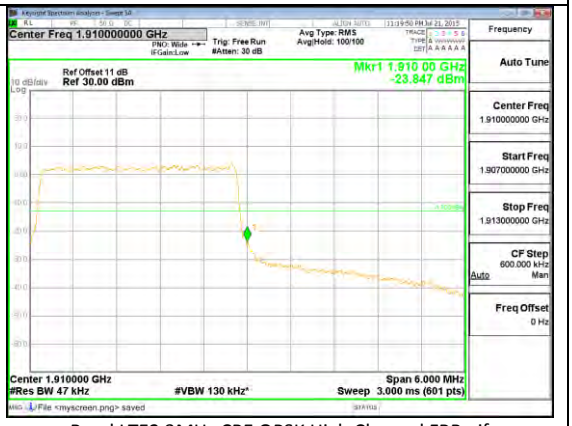
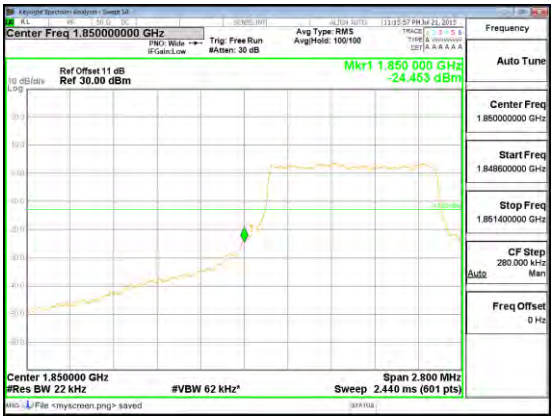
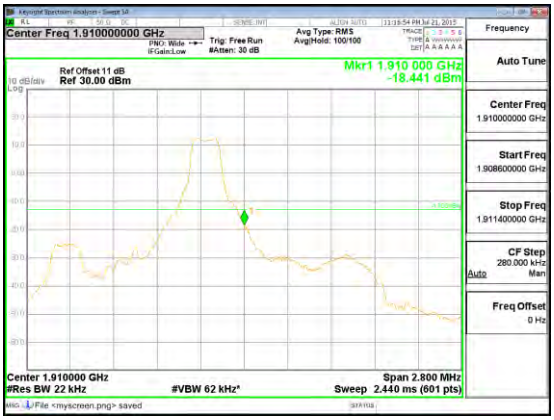
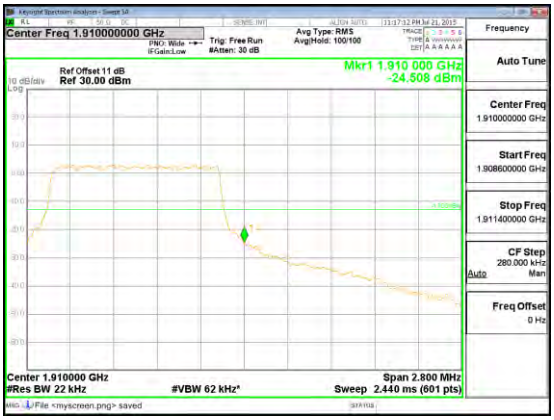
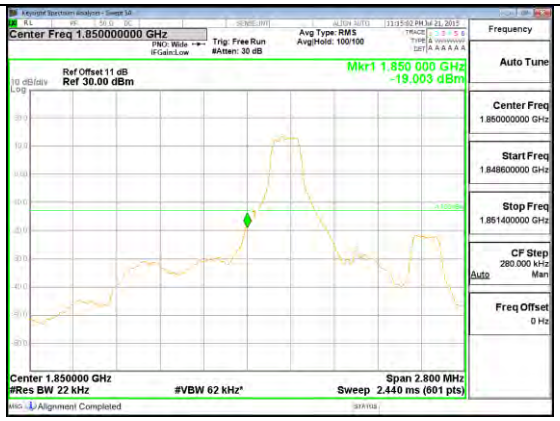
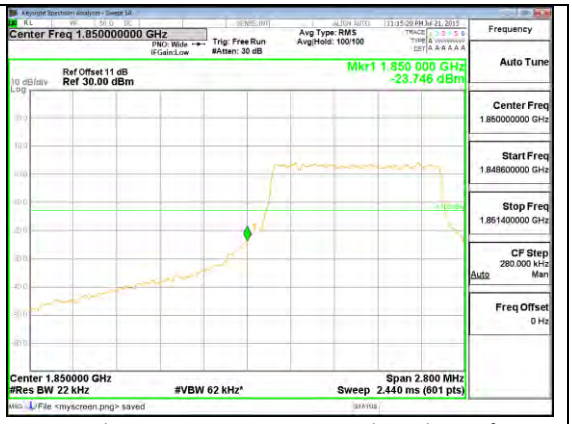
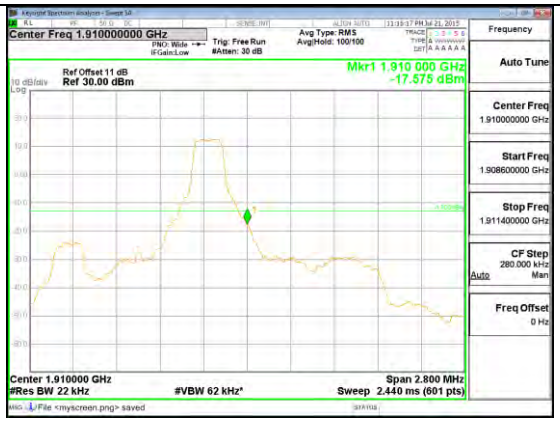
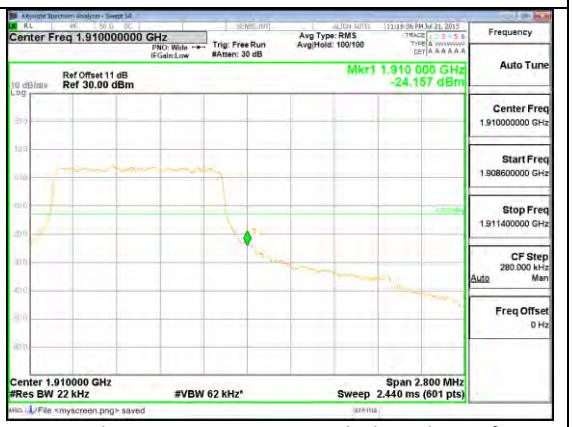
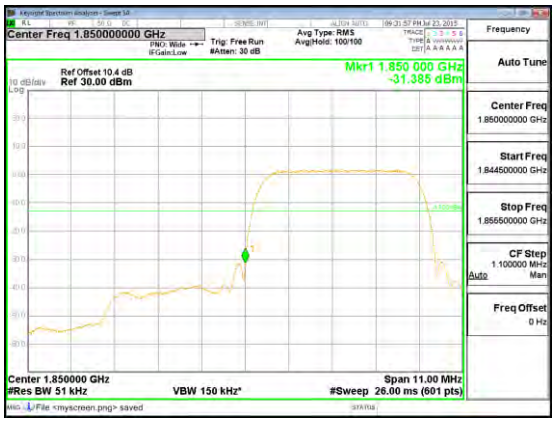
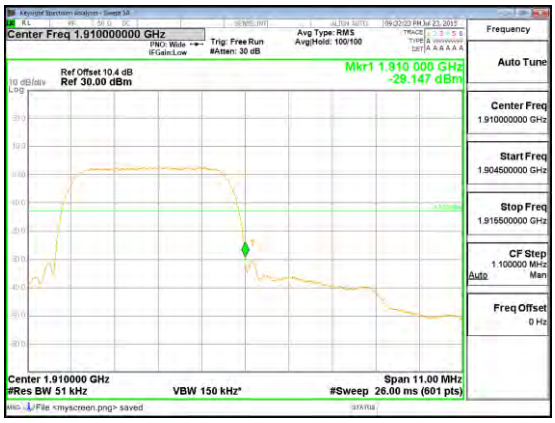
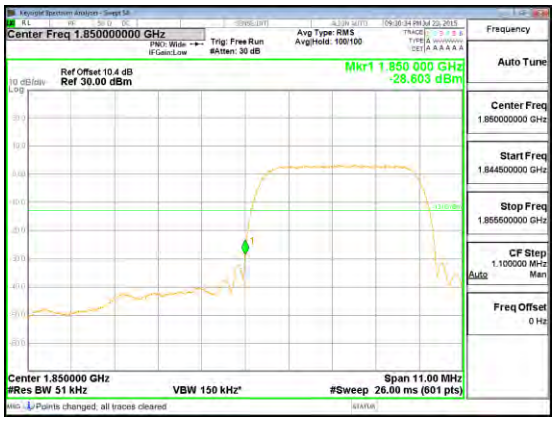
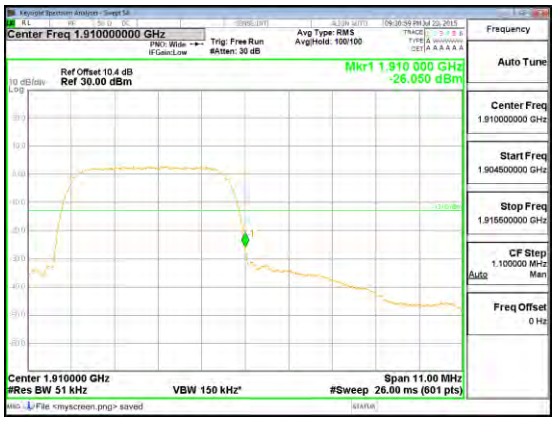
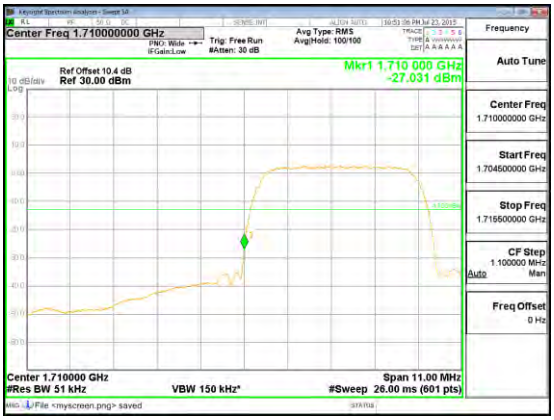
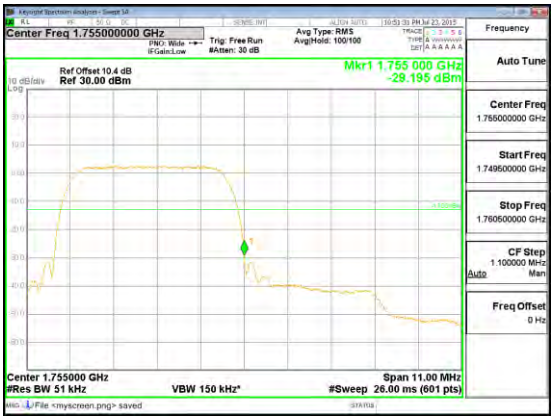
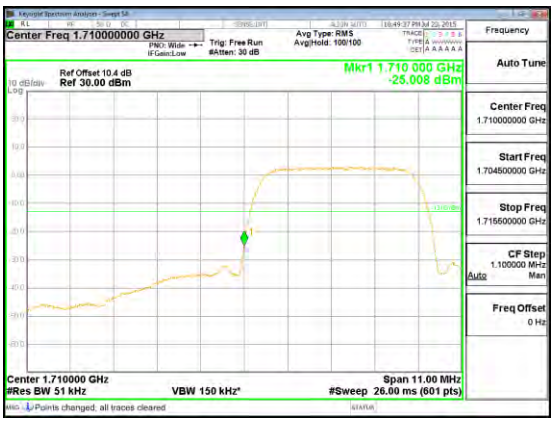
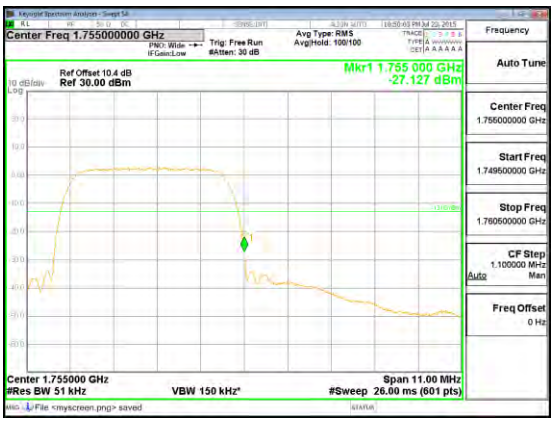
Band LTE2 3MHz QPSK	 Band LTE2 3MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 3MHz CBE QPSK Low Channel FRB.gif
Band LTE2 3MHz QPSK	 Band LTE2 3MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 3MHz CBE QPSK High Channel FRB.gif

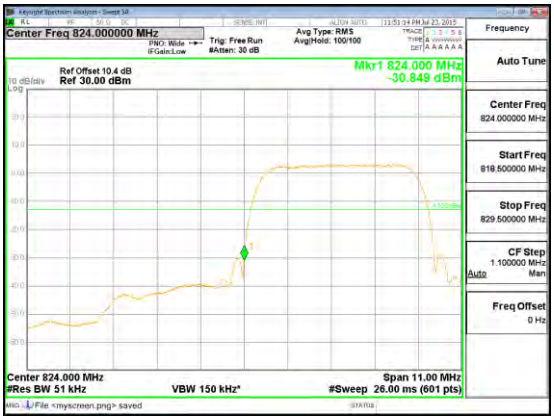
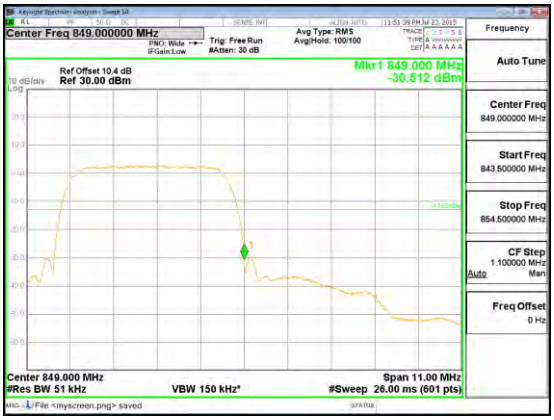
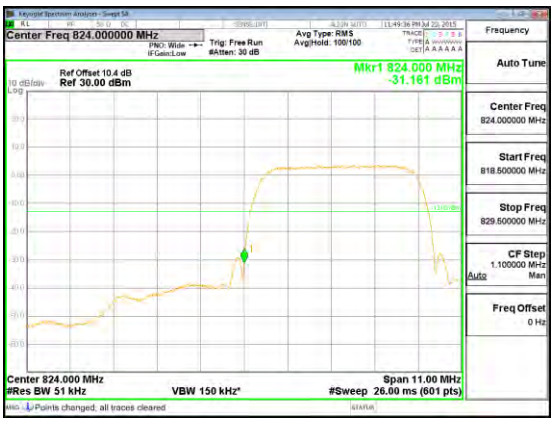
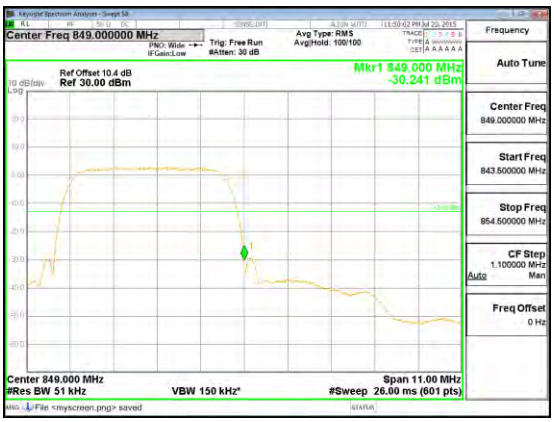
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 1.4MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 1.4MHz CBE 16QAM High Channel FRB.gif

Band LTE2 1.4MHz QPSK	 Band LTE2 1.4MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 1.4MHz CBE QPSK Low Channel FRB.gif
Band LTE2 1.4MHz QPSK	 Band LTE2 1.4MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 1.4MHz CBE QPSK High Channel FRB.gif

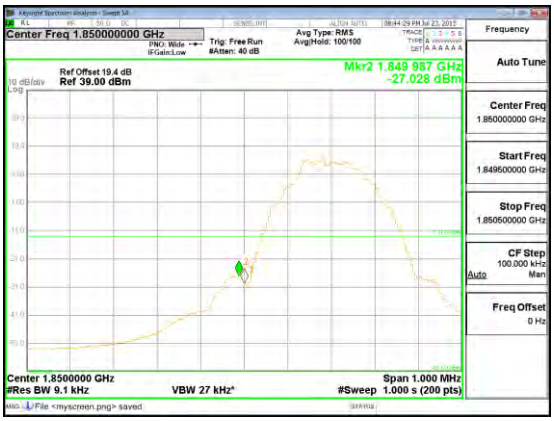
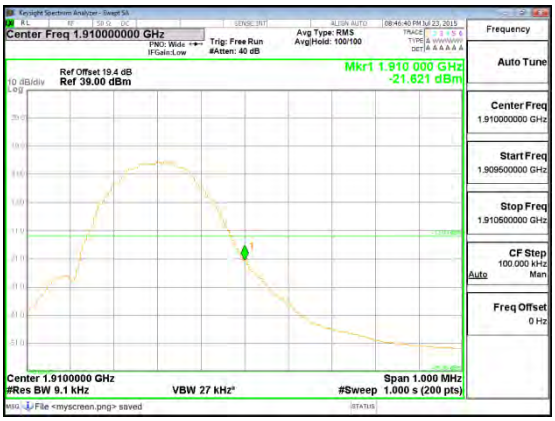
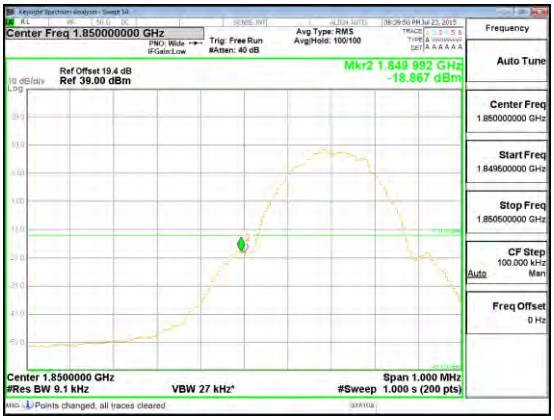
WCDMA

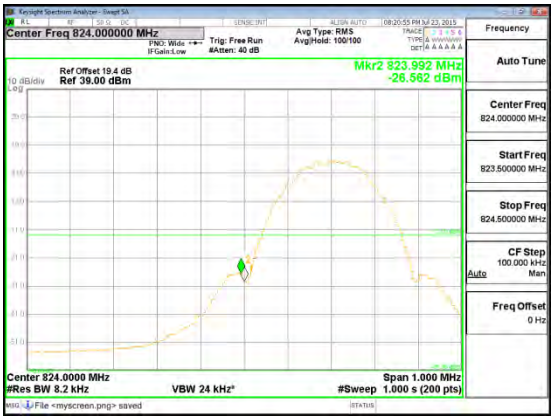
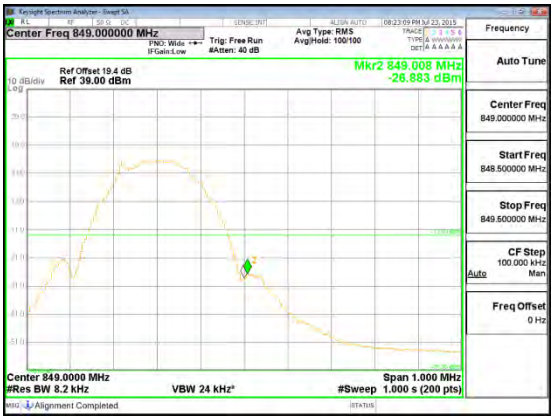
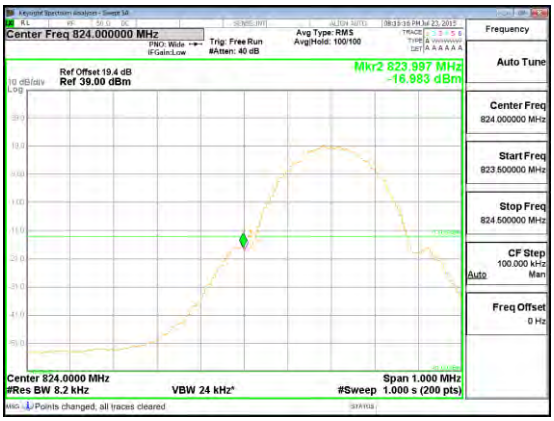
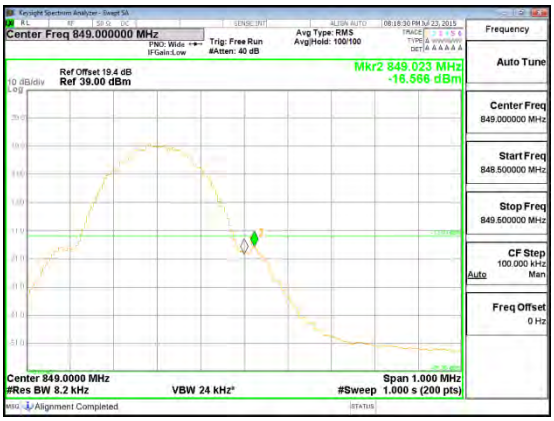
Band Band 2 HSDPA	 Band WCDMA B2 HSDPA CBE	 Band WCDMA B2 HSDPA CBE
Band Band 2 REL99	 Band WCDMA B2 REL99 CBE	 Band WCDMA B2 REL99 CBE

Band Band 4 HSDPA	 Band WCDMA B4 HSDPA CBE	 Band WCDMA B4 HSDPA CBE
Band Band 4 REL99	 Band WCDMA B4 REL99 CBE	 Band WCDMA B4 REL99 CBE

Band Band 5 HSDPA	 Band WCDMA B5 HSDPA CBE	 Band WCDMA B5 HSDPA CBE
Band Band 5 REL99	 Band WCDMA B5 REL99 CBE	 Band WCDMA B5 REL99 CBE

GSM

Band GSM1900 EGPRS	 Band GSM1900 EGPRS CBE Low channel	 Band GSM1900 EGPRS CBE High channel
Band GSM1900 GPRS	 Band GSM1900 GPRS CBE Low channel	 Band GSM1900 GPRS CBE High channel

Band GSM850 EGPRS	 Band GSM850 EGPRS CBE Low channel	 Band GSM850 EGPRS CBE High channel
Band GSM850 GPRS	 Band GSM850 GPRS CBE Low channel	 Band GSM850 GPRS CBE High channel

10.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

MODES TESTED

GSM, WCDMA, and LTE

RESULTS

10.3.1. OUT OF BAND EMISSIONS RESULT

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE17	10	QPSK	709	-28.22	-13	-15.22
			710	-28.17	-13	-15.17
			711	-27.64	-13	-14.64
		16QAM	709	-28.34	-13	-15.34
			710	-28.00	-13	-15.00
			711	-27.59	-13	-14.59

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE17	5	QPSK	706.5	-24.07	-13	-11.07
			710	-27.73	-13	-14.73
			713.5	-27.95	-13	-14.95
		16QAM	706.5	-23.11	-13	-10.11
			710	-27.44	-13	-14.44
			713.5	-27.22	-13	-14.22

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	10	QPSK	829	-27.47	-13	-14.47
			836.5	-27.20	-13	-14.20
			844	-27.13	-13	-14.13
		16QAM	829	-27.43	-13	-14.43
			836.5	-27.01	-13	-14.01
			844	-28.26	-13	-15.26

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	5	QPSK	826.5	-23.88	-13	-10.88
			836.5	-27.75	-13	-14.75
			846.5	-28.23	-13	-15.23
		16QAM	826.5	-26.01	-13	-13.01
			836.5	-27.65	-13	-14.65
			846.5	-27.85	-13	-14.85

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	3	QPSK	825.5	-23.89	-13	-10.89
			836.5	-28.58	-13	-15.58
			847.5	-27.50	-13	-14.50
		16QAM	825.5	23.62	-13	-10.62
			836.5	-27.97	-13	-14.97
			847.5	-27.94	-13	-14.94

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	1.4	QPSK	824.7	-26.75	-13	-13.75
			836.5	-27.60	-13	-14.60
			848.3	-27.59	-13	-14.59
		16QAM	824.7	-27.45	-13	-14.45
			836.5	-27.55	-13	-14.55
			848.3	-27.58	-13	-14.58

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	20	QPSK	1720	-28.04	-13	-15.04
			1732.5	-27.81	-13	-14.81
			1745	-28.03	-13	-15.03
		16QAM	1720	-27.27	-13	-14.27
			1732.5	-27.47	-13	-14.47
			1745	-27.64	-13	-14.64

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	15	QPSK	1717.5	-27.36	-13	-14.36
			1732.5	-27.85	-13	-14.85
			1747.5	-26.88	-13	-13.88
		16QAM	1717.5	-25.92	-13	-13.88
			1732.5	-27.72	-13	-14.72
			1747.5	-27.43	-13	-14.43

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	10	QPSK	1715	-27.68	-13	-14.68
			1732.5	-27.71	-13	-14.71
			1750	-26.45	-13	-13.45
		16QAM	1715	-28.12	-13	-15.12
			1732.5	-27.91	-13	-14.91
			1750	-27.82	-13	-14.82

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	5	QPSK	1712.5	-27.42	-13	-14.42
			1732.5	-27.53	-13	-14.53
			1752.5	-27.14	-13	-14.14
		16QAM	1712.5	-27.79	-13	-14.79
			1732.5	-27.73	-13	-14.73
			1752.5	-28.19	-13	-15.19

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	3	QPSK	1711.5	-27.73	-13	-14.73
			1732.5	-27.85	-13	-14.85
			1753.5	-26.57	-13	-13.57
		16QAM	1711.5	-27.86	-13	-14.86
			1732.5	-28.05	-13	-15.05
			1753.5	-17.17	-13	-14.17

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	1.4	QPSK	1710.7	-27.68	-13	-14.68
			1732.5	-27.21	-13	-14.21
			1754.3	-25.75	-13	-12.75
		16QAM	1710.7	-22.62	-13	-9.62
			1732.5	-27.19	-13	-14.19
			1754.3	-27.94	-13	-14.94

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	20	QPSK	1860	-28.08	-13	-15.08
			1880	-28.13	-13	-15.13
			1900	-27.42	-13	-14.42
		16QAM	1860	-27.60	-13	-14.60
			1880	-27.76	-13	-14.76
			1900	-27.98	-13	-14.98

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	15	QPSK	1857.5	-27.72	-13	-14.72
			1880	-27.84	-13	-14.84
			1902.5	-27.87	-13	-14.87
		16QAM	1857.5	-28.17	-13	-15.17
			1880	-28.31	-13	-15.31
			1902.5	-27.33	-13	-14.33

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	10	QPSK	1855	-27.43	-13	-14.43
			1880	-27.75	-13	-14.75
			1905	-27.06	-13	-14.06
		16QAM	1855	-28.05	-13	-15.05
			1880	-27.38	-13	-14.38
			1905	-26.56	-13	-13.56

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	5	QPSK	1852.5	-27.99	-13	-14.99
			1880	-27.02	-13	-14.02
			1907.5	-26.50	-13	-13.50
		16QAM	1852.5	-27.84	-13	-14.84
			1880	-26.13	-13	-13.13
			1907.5	-27.80	-13	-14.80

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	3	QPSK	1851.5	-27.76	-13	-14.76
			1880	-27.66	-13	-14.66
			1908.5	-27.19	-13	-14.19
		16QAM	1851.5	-27.60	-13	-14.60
			1880	-27.85	-13	-14.85
			1908.5	-27.17	-13	-14.17

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	1.4	QPSK	1850.7	-26.00	-13	-13.00
			1880	-27.56	-13	-14.56
			1909.3	-28.03	-13	-15.03
		16QAM	1850.7	-26.82	-13	-13.82
			1880	-27.13	-13	-14.13
			1909.3	-23.81	-13	-10.81

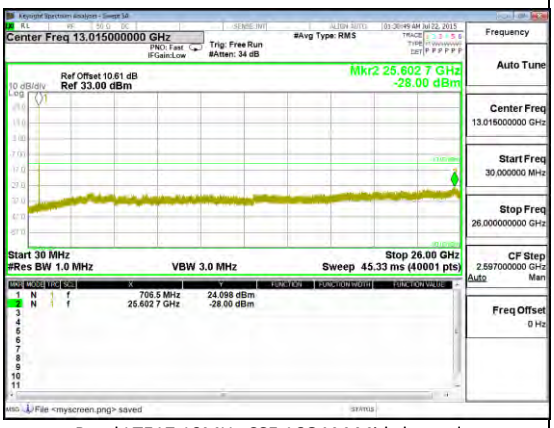
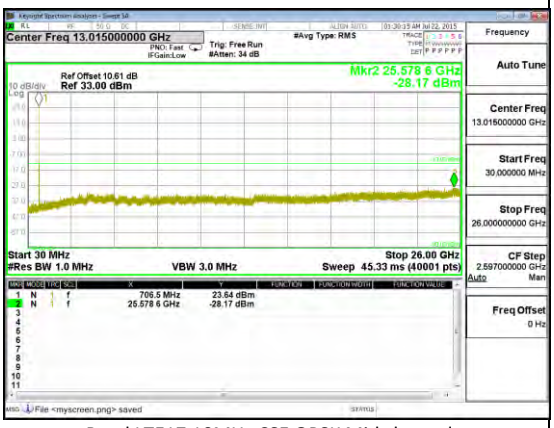
Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
GSM850	GPRS	824.2	-25.539	-13	-12.539
		836.6	-25.2	-13	-12.2
		848.8	-25.16	-13	-12.16
	EGPRS	824.2	-25.02	-13	-12.02
		836.6	-25.22	-13	-12.22
		848.8	-24.316	-13	-11.316
GSM1900	GPRS	1850.2	-24.693	-13	-11.693
		1880	-24.404	-13	-11.404
		1909.8	-25.196	-13	-12.196
	EGPRS	1850.2	-24.738	-13	-11.738
		1880	-24.808	-13	-11.808
		1909.8	-24.516	-13	-11.516

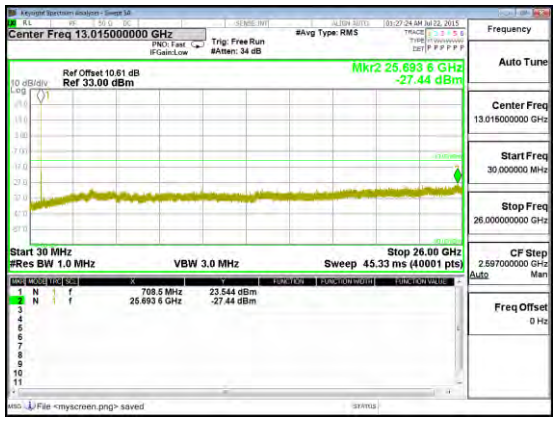
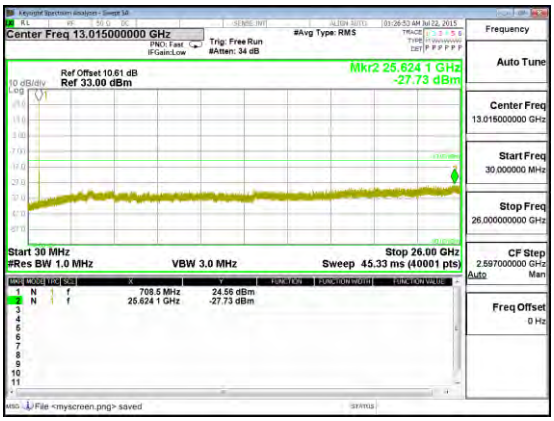
Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
Band 5	REL99	826.4	-34.52	-13	-21.52
		836.6	-34.78	-13	-21.78
		846.6	-35.02	-13	-22.02
	HSDPA	826.4	-34.93	-13	-21.93
		836.6	-34.71	-13	-21.71
		846.6	-34.97	-13	-21.97
Band 2	REL99	1852.4	-34.97	-13	-21.97
		1880	-34.33	-13	-21.33
		1907.6	-34.52	-13	-21.52
	HSDPA	1852.4	-35.17	-13	-22.17
		1880	-34.82	-13	-21.82
		1907.6	-34.85	-13	-21.85

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
Band 4	REL99	1712.4	-34.63	-13	-21.63
		1732.6	-34.82	-13	-21.82
		1752.6	-34.76	-13	-21.76
	HSDPA	1712.4	-34.81	-13	-21.81
		1732.6	-34.53	-13	-21.53
		1752.6	-34.82	-13	-21.82

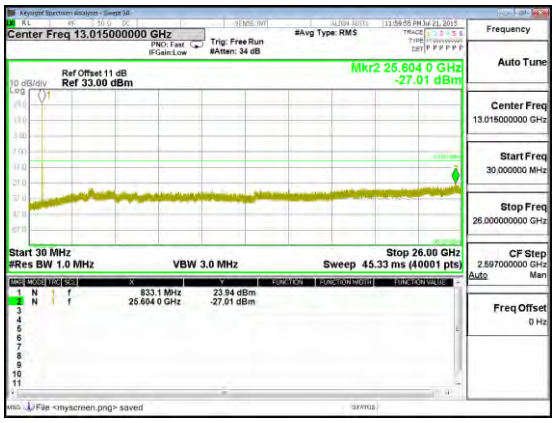
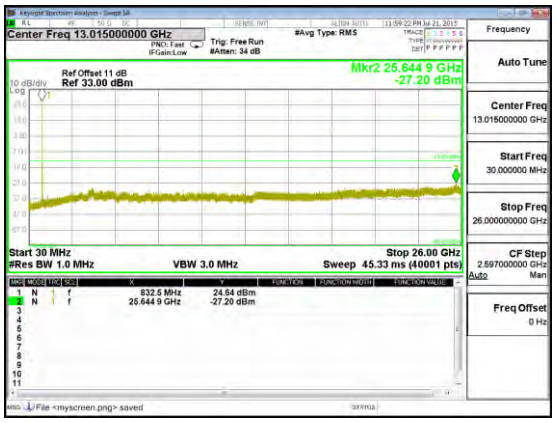
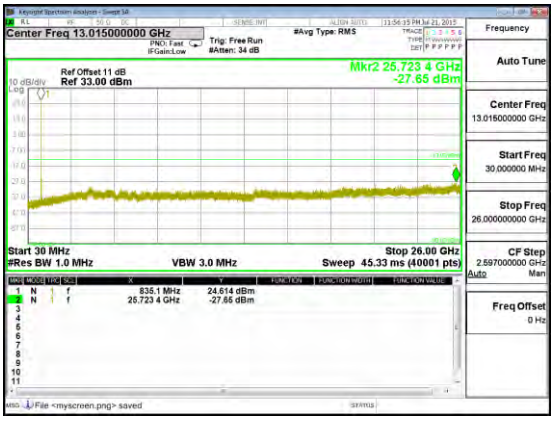
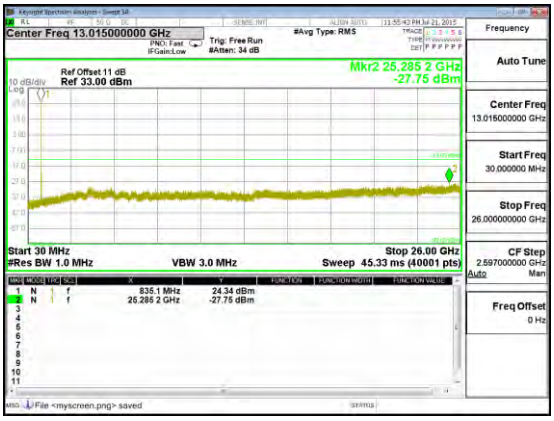
10.3.2. OUT OF BAND EMISSIONS PLOTS

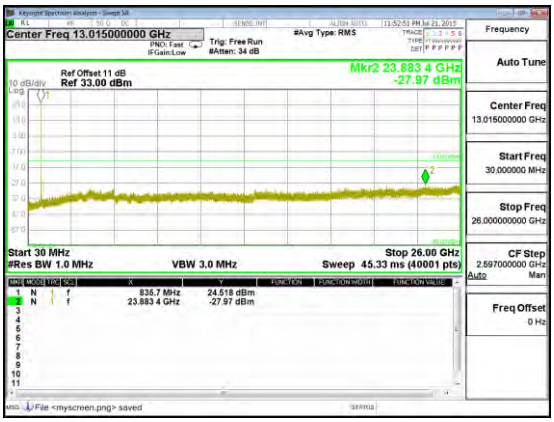
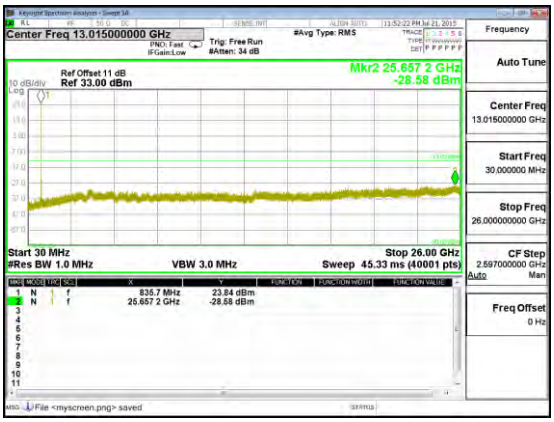
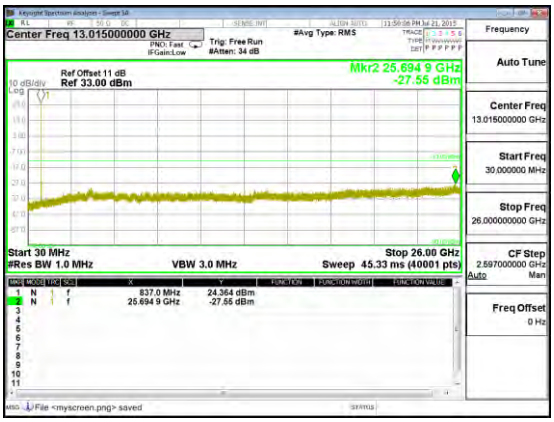
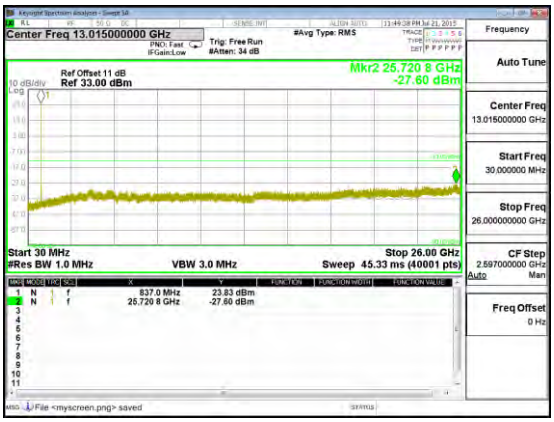
LTE17

Band LTE17 10MHz 16QAM	 Band LTE17 10MHz CSE 16QAM Mid channel	 Band LTE17 10MHz CSE QPSK Mid channel

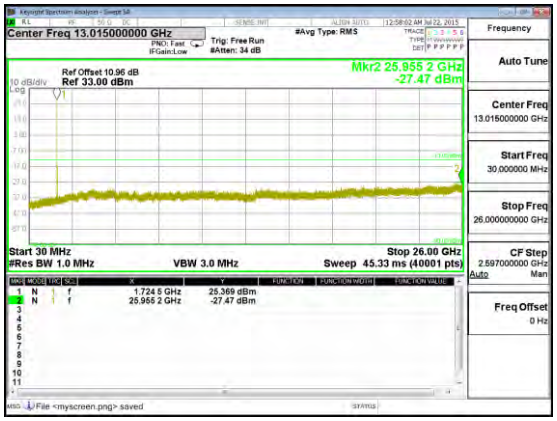
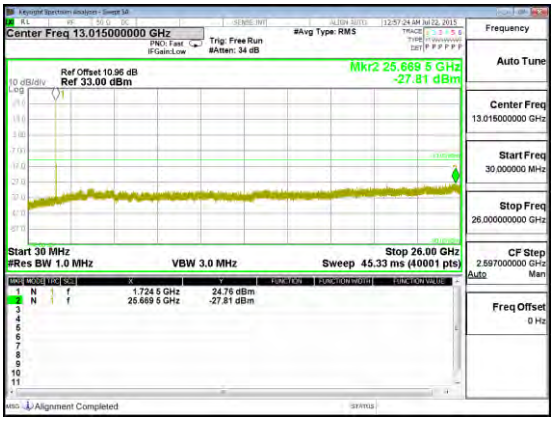
Band LTE17 5MHz 16QAM	 Band LTE17 5MHz CSE 16QAM Mid channel	 Band LTE17 5MHz CSE QPSK Mid channel

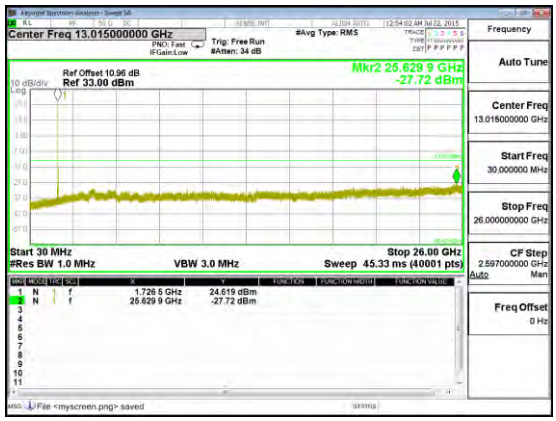
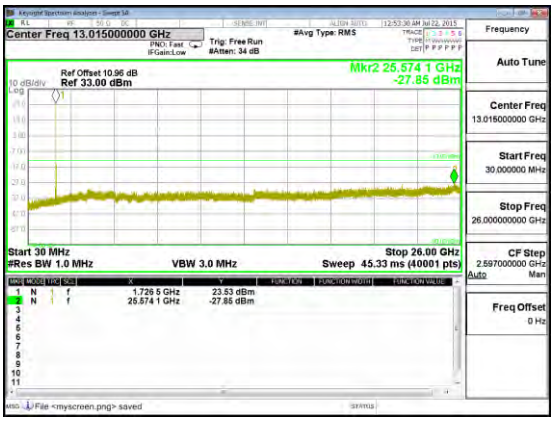
LTE5

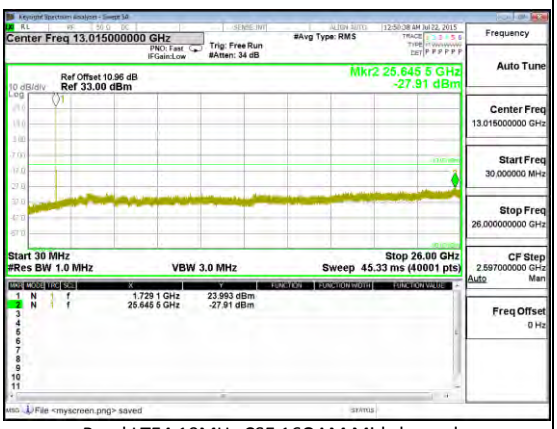
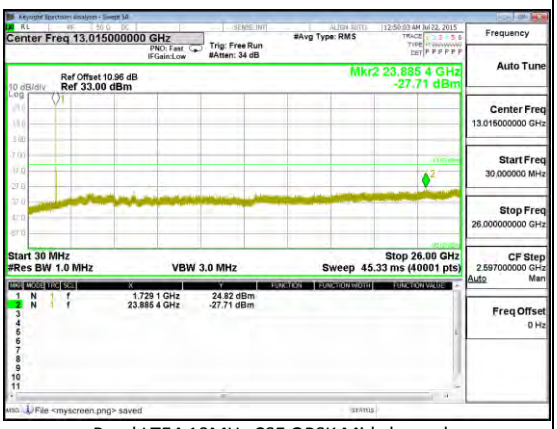
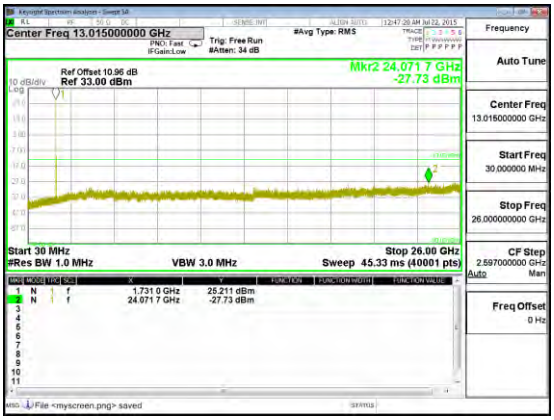
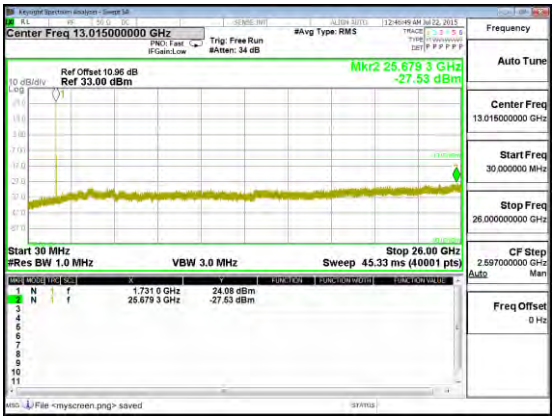
Band LTE5 10MHz 16QAM	 Band LTE5 10MHz CSE 16QAM Mid channel	 Band LTE5 10MHz CSE QPSK Mid channel
Band LTE5 5MHz 16QAM	 Band LTE5 5MHz CSE 16QAM Mid channel	 Band LTE5 5MHz CSE QPSK Mid channel

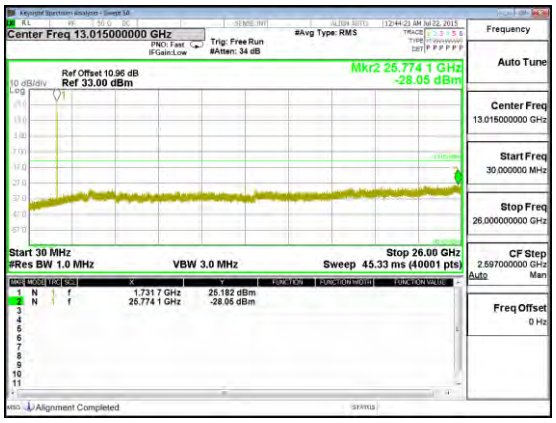
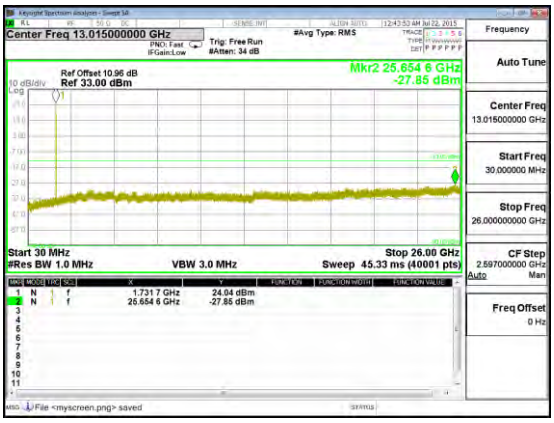
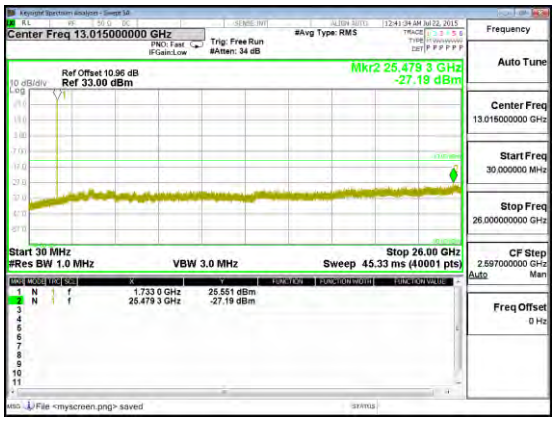
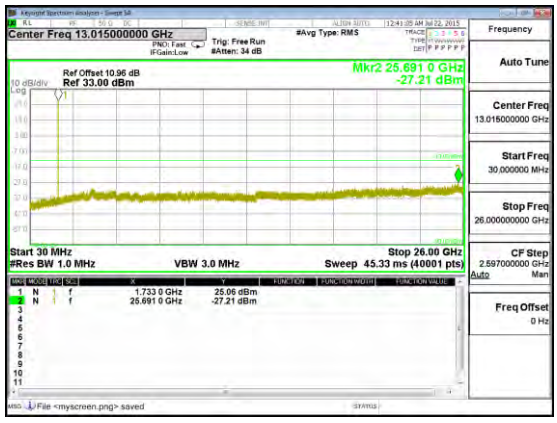
Band LTE5 3MHz 16QAM	 Band LTE5 3MHz CSE 16QAM Mid channel	 Band LTE5 3MHz CSE QPSK Mid channel
Band LTE5 1.4MHz 16QAM	 Band LTE5 1.4MHz CSE 16QAM Mid channel	 Band LTE5 1.4MHz CSE QPSK Mid channel

LTE4

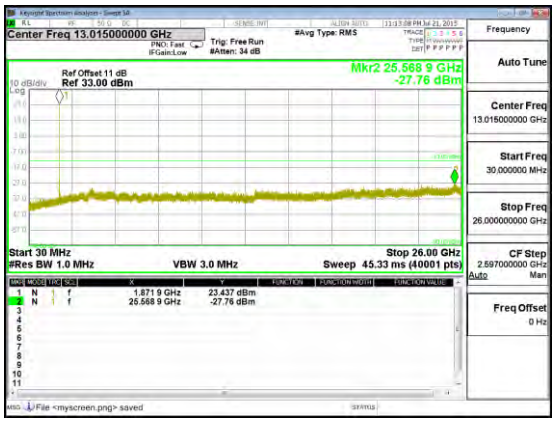
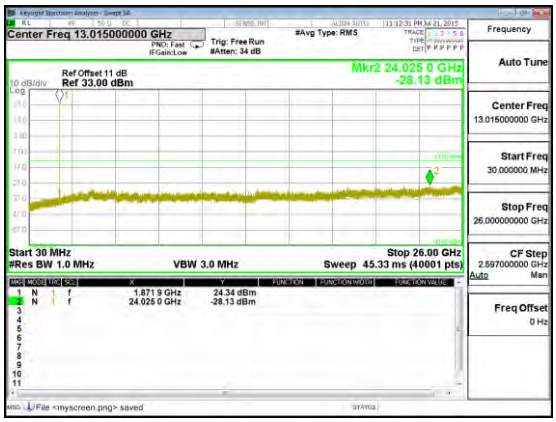
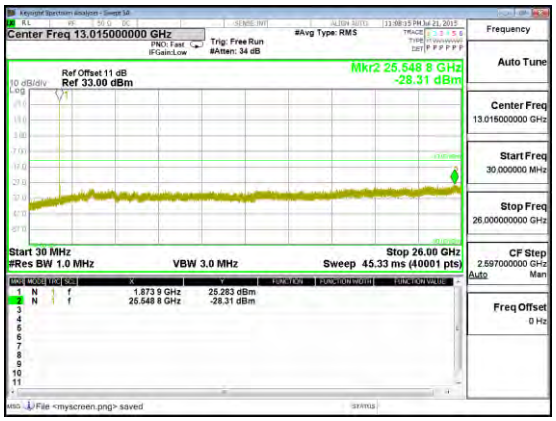
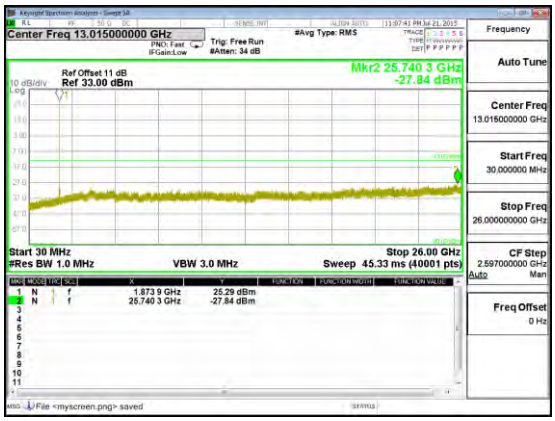
Band LTE4 20MHz 16QAM	 Band LTE4 20MHz CSE 16QAM Mid channel	 Band LTE4 20MHz CSE QPSK Mid channel

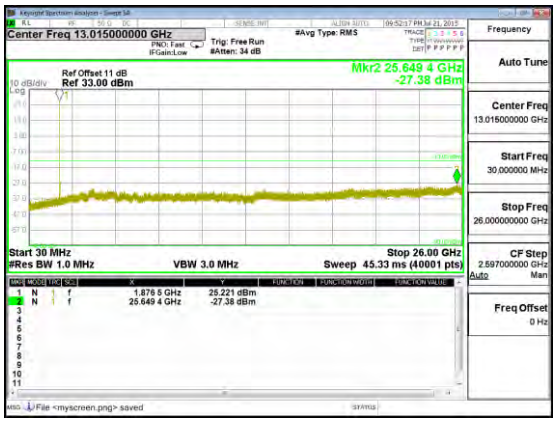
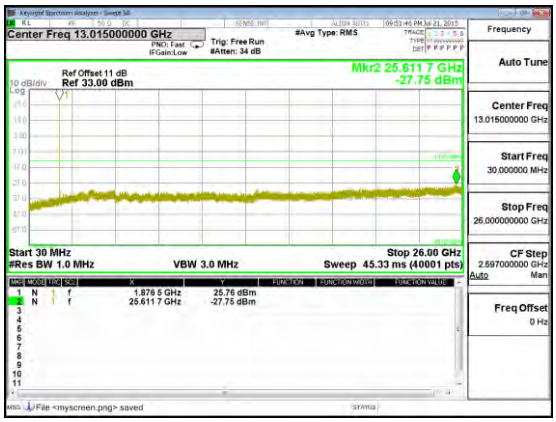
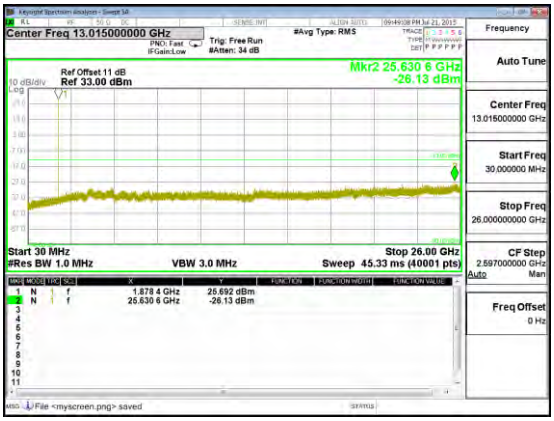
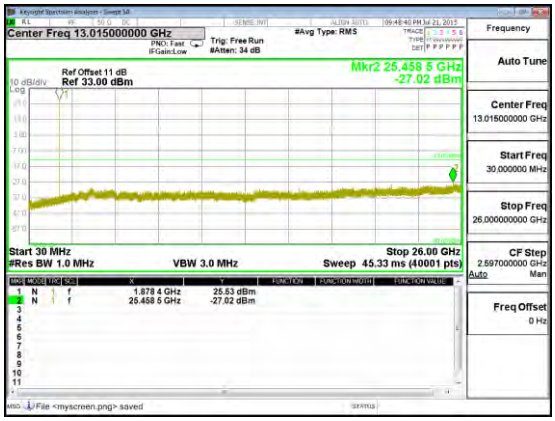
Band LTE4 15MHz 16QAM	 Band LTE4 15MHz CSE 16QAM Mid channel	 Band LTE4 15MHz CSE QPSK Mid channel

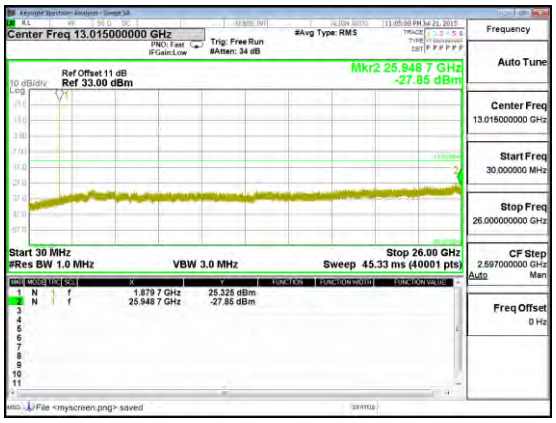
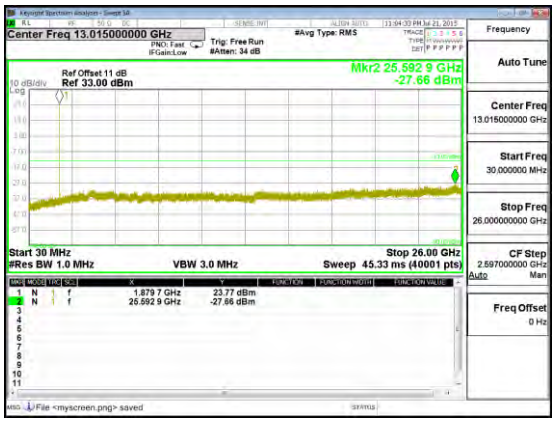
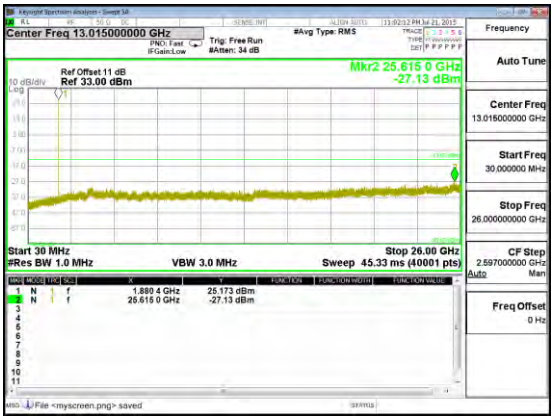
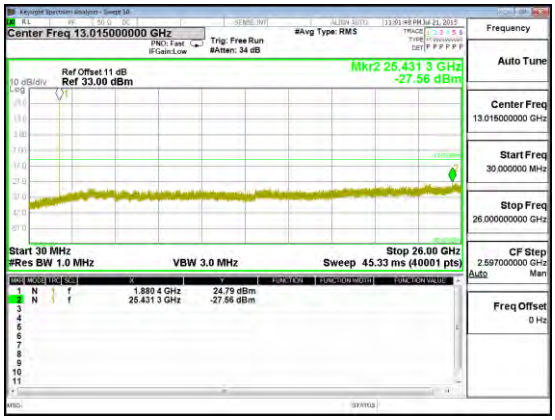
Band LTE4 10MHz 16QAM	 Band LTE4 10MHz CSE 16QAM Mid channel	 Band LTE4 10MHz CSE QPSK Mid channel
Band LTE4 5MHz 16QAM	 Band LTE4 5MHz CSE 16QAM Mid channel	 Band LTE4 5MHz CSE QPSK Mid channel

Band LTE4 3MHz 16QAM	 Band LTE4 3MHz CSE 16QAM Mid channel	 Band LTE4 3MHz CSE QPSK Mid channel
Band LTE4 1.4MHz 16QAM	 Band LTE4 1.4MHz CSE 16QAM Mid channel	 Band LTE4 1.4MHz CSE QPSK Mid channel

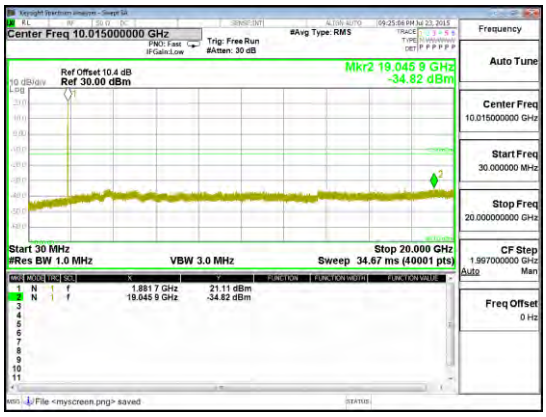
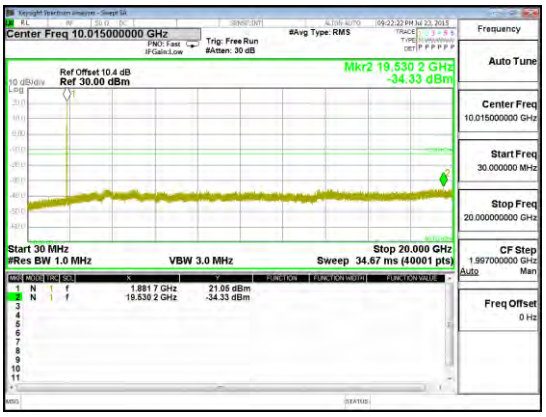
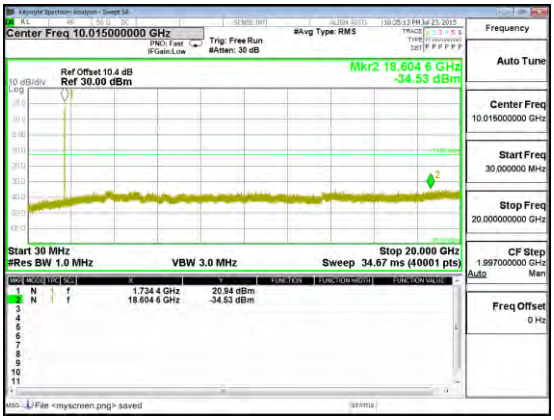
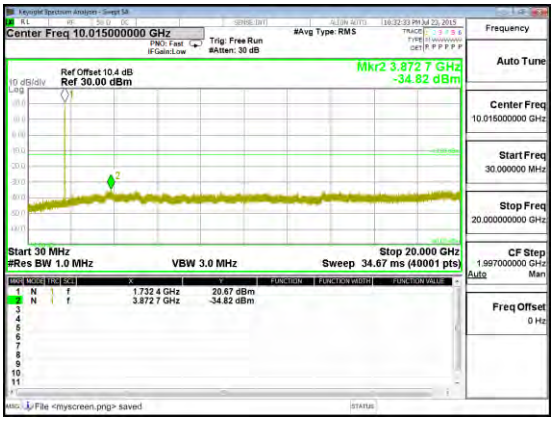
LTE2

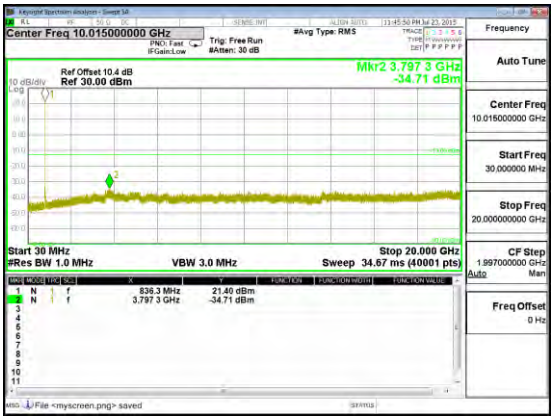
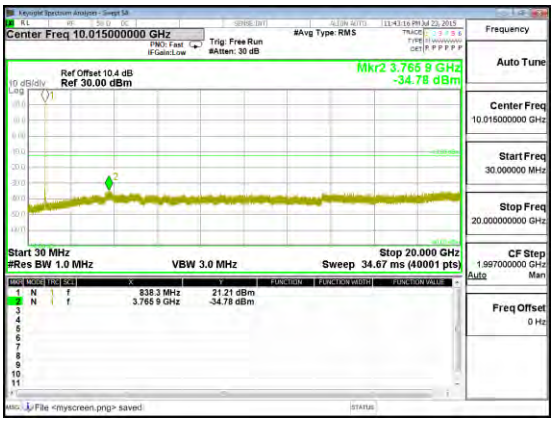
Band LTE2 20MHz 16QAM	 Band LTE2 20MHz CSE 16QAM Mid channel	 Band LTE2 20MHz CSE QPSK Mid channel
Band LTE2 15MHz 16QAM	 Band LTE2 15MHz CSE 16QAM Mid channel	 Band LTE2 15MHz CSE QPSK Mid channel

Band LTE2 10MHz 16QAM	 Band LTE2 10MHz CSE 16QAM Mid channel	 Band LTE2 10MHz CSE QPSK Mid channel
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz CSE 16QAM Mid channel	 Band LTE2 5MHz CSE QPSK Mid channel

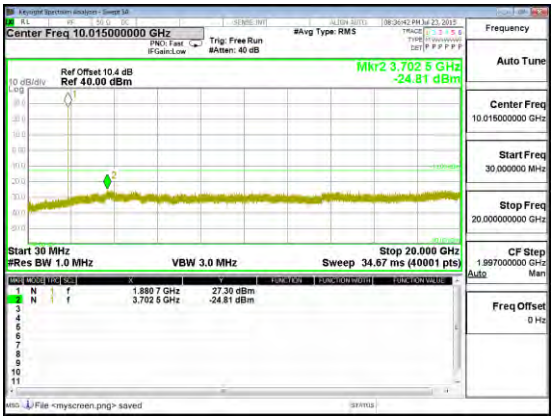
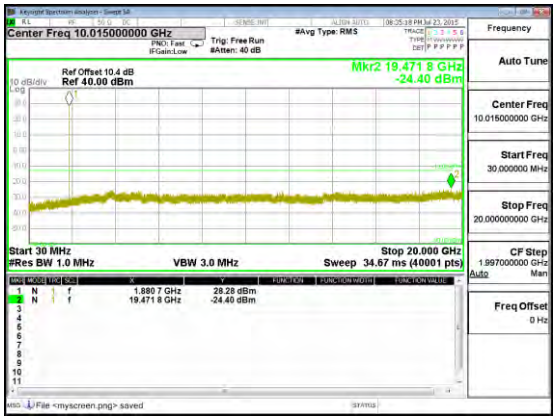
Band LTE2 3MHz 16QAM	 Band LTE2 3MHz CSE 16QAM Mid channel	 Band LTE2 3MHz CSE QPSK Mid channel
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz CSE 16QAM Mid channel	 Band LTE2 1.4MHz CSE QPSK Mid channel

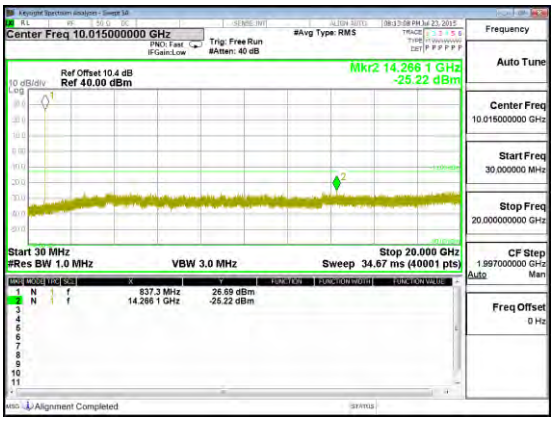
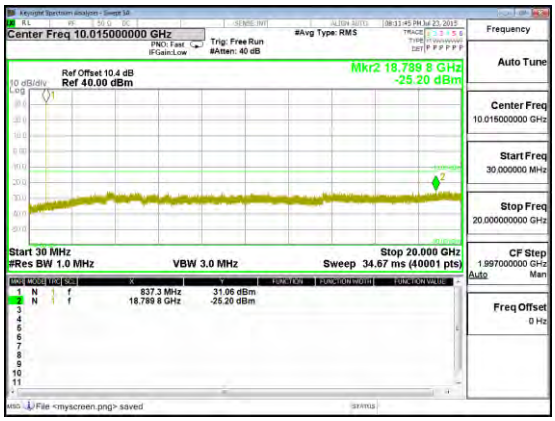
WCDMA

Band Band 2 HSDPA	 Band WCDMA B2 HSDPA CSE	 Band WCDMA B2 REL99 CSE
Band Band 4 HSDPA	 Band WCDMA B4 HSDPA CSE	 Band WCDMA B4 REL99 CSE

Band Band 5 HSDPA	 Band WCDMA B5 HSDPA CSE	 Band WCDMA B5 REL99 CSE

GSM

Band GSM1900 EGPRS	 Band GSM1900 EGPRS CSE Mid channel	 Band GSM1900 GPRS CSE Mid channel

Band GSM850 EGPRS	 Band GSM850 EGPRS CSE Mid channel	 Band GSM850 GPRS CSE Mid channel

10.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

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

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems

MODES TESTED

GSM and LTE

RESULTS

See the following pages.

10.4.1. FREQUENCY STABILITY RESULTS

LTE Band 4, Freq: 1732.5MHz– MID CHANNEL

Reference Frequency: PCS Mid Channel		1732.5	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		4331.250	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1732.499982	0.004	2.5
3.80	40	1732.499993	-0.002	2.5
3.80	30	1732.499985	0.002	2.5
3.80	***20***	**1732.499989**	**0**	***2.5***
3.80	10	1732.500014	-0.014	2.5
3.80	0	1732.499979	0.006	2.5
3.80	-10	1732.499990	-0.001	2.5
3.80	-20	1732.500017	-0.016	2.5
3.80	-30	1732.500010	-0.012	2.5

Reference Frequency: PCS Mid Channel		1732.5	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		4331.250	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1732.499989***	***0***	***2.5***
4.37	20	1732.500009	*-0.012*	2.5
3.23(End of volt)	20	1732.500015	*-0.015*	2.5

LTE Band 17, Freq: 710 MHz– MID CHANNEL

Reference Frequency: PCS Mid Channel		710	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		1775.000	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	709.999992	-0.001	2.5
3.80	40	709.999989	0.004	2.5
3.80	30	709.999989	0.003	2.5
3.80	***20***	**709.999992**	**0**	***2.5***
3.80	10	709.999994	-0.003	2.5
3.80	0	709.999991	0.001	2.5
3.80	-10	709.999989	0.004	2.5
3.80	-20	709.999988	0.006	2.5
3.80	-30	709.999988	0.005	2.5

Reference Frequency: PCS Mid Channel		710	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		1775.000	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***709.999992***	***0***	***2.5***
4.37	20	709.9999939	*-0.003*	2.5
3.23(End of volt)	20	709.9999904	*0.002*	2.5

GPRS 1900, Channel 661 Freq: 1880MHz– MID CHANNEL

Reference Frequency: PCS Mid Channel		1880	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		4700.000	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1880.000227	-0.048	2.5
3.80	40	1879.999870	0.142	2.5
3.80	30	1880.000142	-0.003	2.5
3.80	***20***	**1880.000137**	**0**	***2.5***
3.80	10	1880.000083	0.029	2.5
3.80	0	1880.000142	-0.003	2.5
3.80	-10	1880.000094	0.023	2.5
3.80	-20	1880.000092	0.024	2.5
3.80	-30	1879.999857	0.149	2.5

Reference Frequency: PCS Mid Channel		1880	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		4700.000	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1880.000137***	***0***	***2.5***
4.37	20	1880.000121	*0.008*	2.5
3.23(End of Volt)	20	1879.999899	*0.126*	2.5

GPRS 850 CELL BAND, – MID CHANNEL190, Frequency 836.6MHz

Reference Frequency: PCS Mid Channel		836.6	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		2091.500	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.599731	0.126	2.5
3.80	40	836.600166	-0.394	2.5
3.80	30	836.599834	0.004	2.5
3.80	***20***	**836.599837**	**0**	***2.5***
3.80	10	836.599810	0.032	2.5
3.80	0	836.599923	-0.103	2.5
3.80	-10	836.600181	-0.412	2.5
3.80	-20	836.600297	-0.550	2.5
3.80	-30	836.599720	0.140	2.5

Reference Frequency: PCS Mid Channel		836.6	MHz @ 20°C
Limit: to stay +- 2.5 ppm =		2091.500	Hz
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***836.599837***	***0***	***2.5***
4.37	20	836.6001373	*-0.359*	2.5
3.23(End of Volt)	20	836.6001506	*-0.375*	2.5

11. RADIATED TEST RESULTS

11.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27

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(c) - (10) Portable stations (hand-held devices) are limited to 3 watts ERP; (LTE B17)

27.50(d) - (4) Fixed, mobile, and portable (hand-held) 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)

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 603C Clause 2.2.17; PSA setting reference to 971168 D01

For peak power measurement with a PSA:

a) Set the RBW ≥ OBW; b) Set VBW ≥ 3 × RBW; c) Set span ≥ 2 x RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points ≥ 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 ≥ 3 x RBW; d) Set number of points in sweep ≥ 2 × span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 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.

MODES TESTED

GSM, WCDMA, and LTE

TEST RESULTS

11.1.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
GSM1900	GPRS	512	1850.2	32.32	1706.08
		661	1880	31.33	1358.31
		810	1909.8	30.14	1032.76
	EGPRS	512	1850.2	28.36	685.49
		661	1880	27.38	547.02
		810	1909.8	26.26	422.67

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
GSM850	GPRS	128	824.2	30.44	1106.88
		190	836.6	30.68	1169.77
		251	848.8	30.83	1210.88
	EGPRS	128	824.2	25.60	363.16
		190	836.6	25.49	354.08
		251	848.8	25.82	382.03

WCDMA

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	24.21	263.63
		9400	1880	24.61	289.07
		9538	1907.6	22.76	188.8
	HSDPA	9262	1852.4	24.09	256.45
		9400	1880	24.47	279.9
		9538	1907.6	22.34	171.4

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
Band 4	REL99	1312	1712.4	24.44	278.04
		1413	1732.6	24.80	302.07
		1513	1752.6	24.92	310.55
	HSDPA	1312	1712.4	24.43	277.4
		1413	1732.6	24.78	300.68
		1513	1752.6	24.86	306.29

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
Band 5	REL99	4132	826.4	20.05	101.18
		4183	836.6	20.13	103.06
		4233	846.6	20.45	110.94
	HSDPA	4132	826.4	19.96	99.11
		4183	836.6	20.12	102.83
		4233	846.6	20.42	110.18

11.1.2. LTE ERP/EIRP Results

LTE2

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	20	QPSK	1/0	1860	24.94	311.89
			1/0	1880	24.2	263.03
			1/0	1900	23.77	238.23
		16QAM	1/0	1860	24.27	267.3
			1/0	1880	23.43	220.29
			1/0	1900	23.24	210.86

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	15	QPSK	1/0	1857.5	24.92	310.46
			1/0	1880	24.13	258.82
			1/0	1902.5	23.75	237.14
		16QAM	1/0	1857.5	24.26	266.69
			1/0	1880	23.42	219.79
			1/0	1902.5	23.18	207.97

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	10	QPSK	1/0	1855	24.9	309.03
			1/0	1880	23.93	247.17
			1/0	1905	23.74	236.59
		16QAM	1/0	1855	24.22	264.24
			1/0	1880	23.24	210.86
			1/0	1905	23.03	200.91

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	5	QPSK	1/0	1852.5	24.79	301.3
			1/0	1880	23.74	236.59
			1/0	1907.5	23.82	240.99
		16QAM	1/0	1852.5	24.15	260.02
			1/0	1880	23.13	205.59
			1/0	1907.5	23.1	204.17

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	3	QPSK	1/0	1851.5	24.91	309.74
			1/0	1880	23.64	231.21
			1/0	1908.5	23.79	239.33
		16QAM	1/0	1851.5	24.24	265.46
			1/0	1880	23.18	207.97
			1/0	1908.5	23.13	205.59

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	1.4	QPSK	1/0	1850.7	24.86	306.2
			1/0	1880	23.65	231.74
			1/0	1909.3	23.83	241.55
		16QAM	1/0	1850.7	24.21	263.63
			1/0	1880	23.01	199.99
			1/0	1909.3	23.22	209.89

LTE4

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	20	QPSK	1/0	1720	24.79	301.6
			1/0	1732.5	24.86	306.27
			1/0	1745	24.95	312.45
		16QAM	1/0	1720	24.07	255.52
			1/0	1732.5	24.06	254.74
			1/0	1745	24.25	265.94

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	15	QPSK	1/0	1717.5	24.70	294.98
			1/0	1732.5	24.82	303.46
			1/0	1747.5	24.36	273.16
		16QAM	1/0	1717.5	23.88	244.23
			1/0	1732.5	24.00	251.25
			1/0	1747.5	23.70	234.65

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	10	QPSK	1/0	1715	24.57	286.49
			1/0	1732.5	24.63	290.47
			1/0	1750	24.34	271.72
		16QAM	1/0	1715	23.83	241.6
			1/0	1732.5	23.97	249.52
			1/0	1750	23.731	236.12

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	5	QPSK	1/0	1712.5	24.67	293.38
			1/0	1732.5	24.66	292.49
			1/0	1752.5	24.37	273.39
		16QAM	1/0	1712.5	23.92	246.85
			1/0	1732.5	23.99	250.67
			1/0	1752.5	23.78	238.66

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	3	QPSK	1/0	1711.5	24.57	286.28
			1/0	1732.5	24.70	295.19
			1/0	1753.5	24.36	273.16
		16QAM	1/0	1711.5	23.89	244.79
			1/0	1732.5	23.98	250.09
			1/0	1753.5	23.74	236.82

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	1.4	QPSK	1/0	1710.7	24.60	288.47
			1/0	1732.5	24.71	295.87
			1/0	1754.3	24.23	264.93
		16QAM	1/0	1710.7	23.87	243.84
			1/0	1732.5	24.01	251.83
			1/0	1754.3	23.73	236.12

LTE5

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	10	QPSK	1/0	829	20.14	103.28
			1/0	836.5	20.03	100.69
			1/0	844	20.39	109.4
		16QAM	1/0	829	19.47	88.51
			1/0	836.5	19.35	86.1
			1/0	844	19.72	93.76

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	5	QPSK	1/0	826.5	20.16	103.75
			1/0	836.5	20.04	100.93
			1/0	846.5	20.41	109.9
		16QAM	1/0	826.5	19.52	89.54
			1/0	836.5	19.37	86.5
			1/0	846.5	19.7	93.33

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	3	QPSK	1/0	825.5	20.15	103.51
			1/0	836.5	20.1	102.33
			1/0	847.5	20.42	110.15
		16QAM	1/0	825.5	19.48	88.72
			1/0	836.5	19.43	87.7
			1/0	847.5	19.74	94.19

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	1.4	QPSK	1/0	824.7	20.16	103.75
			1/0	836.5	20.16	103.75
			1/0	848.3	20.3	107.15
		16QAM	1/0	824.7	19.5	89.13
			1/0	836.5	19.4	87.1
			1/0	848.3	19.64	92.04

LTE17

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE17	10	QPSK	1/0	709	16.83	48.19
			1/0	710	17.2	52.48
			1/0	711	17.28	53.46
		16QAM	1/0	709	16.13	41.02
			1/0	710	16.37	43.35
			1/0	711	16.41	43.75

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE17	5	QPSK	1/0	706.5	16.84	48.31
			1/0	710	17.1	51.29
			1/0	713.5	17.31	53.83
		16QAM	1/0	706.5	16.11	40.83
			1/0	710	16.27	42.36
			1/0	713.5	16.45	44.16

11.1.3. ERP/EIRP DATA

GSM

Band

GSM1900

EGPRS

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

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Mode: EGPRS1900

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	8.68	V	0.9	8.0	15.79	33.0	-17.2	
1850.20	21.25	H	0.9	8.0	28.36	33.0	-4.6	
Mid Ch								
1880.00	7.48	V	0.9	8.0	14.59	33.0	-18.4	
1880.00	20.27	H	0.9	8.0	27.38	33.0	-5.6	
High Ch								
1909.80	6.45	V	0.9	8.0	13.56	33.0	-19.4	
1909.80	19.15	H	0.9	8.0	26.26	33.0	-6.7	

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

Band

GSM1900

GPRS

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

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Mode: GPRS1900

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	12.78	V	0.9	8.0	19.89	33.0	-13.1	
1850.20	25.21	H	0.9	8.0	32.32	33.0	-0.7	
Mid Ch								
1880.00	11.31	V	0.9	8.0	18.42	33.0	-14.6	
1880.00	24.22	H	0.9	8.0	31.33	33.0	-1.7	
High Ch								
1909.80	10.61	V	0.9	8.0	17.72	33.0	-15.3	
1909.80	23.03	H	0.9	8.0	30.14	33.0	-2.9	

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

Band

GSM850

EGPRS

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Mode: EGPRS850

Test Equipment:
Receiving: Sunol T185, and 3m Chamber C N-type Cable
Substitution: Dipole T416, 4ft SMA Cable (SN: 506392) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.20	26.50	V	0.9	0.0	25.60	38.5	-12.8	
824.20	12.18	H	0.9	0.0	11.28	38.5	-27.2	
Mid Ch								
836.60	26.39	V	0.9	0.0	25.49	38.5	-13.0	
836.60	12.08	H	0.9	0.0	11.18	38.5	-27.3	
High Ch								
848.80	26.72	V	0.9	0.0	25.82	38.5	-12.6	
848.80	12.56	H	0.9	0.0	11.66	38.5	-26.8	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

Band

GSM850

GPRS

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Mode: GPRS850

Test Equipment:
Receiving: Sunol T185, and 3m Chamber C N-type Cable
Substitution: Dipole T416, 4ft SMA Cable (SN: 506392) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.20	31.34	V	0.9	0.0	30.44	38.5	-8.0	
824.20	17.34	H	0.9	0.0	16.44	38.5	-22.0	
Mid Ch								
836.60	31.58	V	0.9	0.0	30.68	38.5	-7.8	
836.60	17.06	H	0.9	0.0	16.16	38.5	-22.3	
High Ch								
848.80	31.73	V	0.9	0.0	30.83	38.5	-7.6	
848.80	17.57	H	0.9	0.0	16.67	38.5	-21.8	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

WCDMA

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

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Mode: HSDPA B2

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

Band: Band 2 HSDPA

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	8.37	V	0.9	8.0	15.48	33.0	-17.5	
1852.40	16.98	H	0.9	8.0	24.09	33.0	-8.9	
Mid Ch								
1880.00	8.37	V	0.9	8.0	15.48	33.0	-17.5	
1880.00	17.36	H	0.9	8.0	24.47	33.0	-8.5	
High Ch								
1907.60	8.28	V	0.9	8.0	15.39	33.0	-17.6	
1907.60	15.23	H	0.9	8.0	22.34	33.0	-10.7	

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

Band

Band 2

REL99

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

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Mode: Rel99 B2

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.40	8.44	V	0.9	8.0	15.55	33.0	-17.5	
1852.40	17.10	H	0.9	8.0	24.21	33.0	-8.8	
Mid Ch								
1880.00	8.54	V	0.9	8.0	15.65	33.0	-17.4	
1880.00	17.50	H	0.9	8.0	24.61	33.0	-8.4	
High Ch								
1907.60	8.48	V	0.9	8.0	15.59	33.0	-17.4	
1907.60	15.65	H	0.9	8.0	22.76	33.0	-10.2	

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

Band

Band 4

HSDPA

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company:	Samsung
Project #:	15I21298
Date:	7/22/2015
Test Engineer:	R.Alegre
Configuration:	EUT Only
Location:	Chamber C
Mode:	HSDPA B4

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	12.05	V	0.9	8.2	19.32	30.0	-10.7	
1712.40	17.16	H	0.9	8.2	24.43	30.0	-5.6	
Mid Ch								
1732.60	12.20	V	0.9	8.2	19.47	30.0	-10.5	
1732.60	17.51	H	0.9	8.2	24.78	30.0	-5.2	
High Ch								
1752.60	12.06	V	0.9	8.1	19.25	30.0	-10.7	
1752.60	17.67	H	0.9	8.1	24.86	30.0	-5.1	

Band

Band 4

REL99

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: Rel99 B4

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	12.20	V	0.9	8.2	19.47	30.0	-10.5	
1712.40	17.17	H	0.9	8.2	24.44	30.0	-5.6	
Mid Ch								
1732.60	12.30	V	0.9	8.2	19.57	30.0	-10.4	
1732.60	17.53	H	0.9	8.2	24.80	30.0	-5.2	
High Ch								
1752.60	12.12	V	0.9	8.1	19.31	30.0	-10.7	
1752.60	17.73	H	0.9	8.1	24.92	30.0	-5.1	

Band

Band 5

HSDPA

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

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Mode: WCDMA Band 5 HSDPA

Test Equipment:
Receiving: Sunol T185, and 3m Chamber C N-type Cable
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	20.86	V	0.9	0.0	19.96	38.5	-18.5	
826.40	6.80	H	0.9	0.0	5.90	38.5	-32.5	
Mid Ch								
836.60	21.02	V	0.9	0.0	20.12	38.5	-18.3	
836.60	5.99	H	0.9	0.0	5.09	38.5	-33.4	
High Ch								
846.60	21.32	V	0.9	0.0	20.42	38.5	-18.0	
846.60	6.40	H	0.9	0.0	5.50	38.5		

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

Band

Band 5

REL99

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

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Mode: REL99 B5 FUND

Test Equipment:
Receiving: Sunol T185, and 3m Chamber C N-type Cable
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	20.95	V	0.9	0.0	20.05	38.5	-18.4	
826.40	7.46	H	0.9	0.0	6.56	38.5	-31.9	
Mid Ch								
836.60	21.03	V	0.9	0.0	20.13	38.5	-18.3	
836.60	6.73	H	0.9	0.0	5.83	38.5	-32.6	
High Ch								
846.60	21.35	V	0.9	0.0	20.45	38.5	-18.0	
846.60	7.09	H	0.9	0.0	6.19	38.5	-32.3	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

LTE2

Band

LTE2

20MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	4.72	V	0.9	8.0	11.83	33.0	-21.2	
1860.00	17.16	H	0.9	8.0	24.27	33.0	-8.7	
Mid Ch								
1880.00	5.44	V	0.9	8.0	12.55	33.0	-20.5	
1880.00	16.32	H	0.9	8.0	23.43	33.0	-9.6	
High Ch								
1900.00	5.85	V	0.9	8.0	12.96	33.0	-20.0	
1900.00	16.13	H	0.9	8.0	23.24	33.0	-9.8	

Band

LTE2

20MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	5.35	V	0.9	8.0	12.46	33.0	-20.5	
1860.00	17.83	H	0.9	8.0	24.94	33.0	-8.1	
Mid Ch								
1880.00	6.30	V	0.9	8.0	13.41	33.0	-19.6	
1880.00	17.09	H	0.9	8.0	24.20	33.0	-8.8	
High Ch								
1900.00	6.41	V	0.9	8.0	13.52	33.0	-19.5	
1900.00	16.66	H	0.9	8.0	23.77	33.0	-9.2	

Band

LTE2

15MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	4.70	V	0.9	8.0	11.81	33.0	-21.2	
1857.50	17.15	H	0.9	8.0	24.26	33.0	-8.7	
Mid Ch								
1880.00	5.54	V	0.9	8.0	12.65	33.0	-20.4	
1880.00	16.31	H	0.9	8.0	23.42	33.0	-9.6	
High Ch								
1902.50	5.82	V	0.9	8.0	12.93	33.0	-20.1	
1902.50	16.07	H	0.9	8.0	23.18	33.0	-9.8	

Band

LTE2

15MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	5.20	V	0.9	8.0	12.31	33.0	-20.7	
1857.50	17.81	H	0.9	8.0	24.92	33.0	-8.1	
Mid Ch								
1880.00	6.30	V	0.9	8.0	13.41	33.0	-19.6	
1880.00	17.02	H	0.9	8.0	24.13	33.0	-8.9	
High Ch								
1902.50	6.38	V	0.9	8.0	13.49	33.0	-19.5	
1902.50	16.64	H	0.9	8.0	23.75	33.0	-9.3	

Band

LTE2

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	4.67	V	0.9	8.0	11.78	33.0	-21.2	
1855.00	17.11	H	0.9	8.0	24.22	33.0	-8.8	
Mid Ch								
1880.00	5.53	V	0.9	8.0	12.64	33.0	-20.4	
1880.00	16.13	H	0.9	8.0	23.24	33.0	-9.8	
High Ch								
1905.00	5.78	V	0.9	8.0	12.89	33.0	-20.1	
1905.00	15.92	H	0.9	8.0	23.03	33.0	-10.0	

Band

LTE2

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	5.29	V	0.9	8.0	12.40	33.0	-20.6	
1855.00	17.79	H	0.9	8.0	24.90	33.0	-8.1	
Mid Ch								
1880.00	6.36	V	0.9	8.0	13.47	33.0	-19.5	
1880.00	16.82	H	0.9	8.0	23.93	33.0	-9.1	
High Ch								
1905.00	6.35	V	0.9	8.0	13.46	33.0	-19.5	
1905.00	16.63	H	0.9	8.0	23.74	33.0	-9.3	

Band

LTE2

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	4.68	V	0.9	8.0	11.79	33.0	-21.2	
1852.50	17.04	H	0.9	8.0	24.15	33.0	-8.9	
Mid Ch								
1880.00	5.57	V	0.9	8.0	12.68	33.0	-20.3	
1880.00	16.02	H	0.9	8.0	23.13	33.0	-9.9	
High Ch								
1907.50	5.85	V	0.9	8.0	12.96	33.0	-20.0	
1907.50	15.99	H	0.9	8.0	23.10	33.0	-9.9	

Band

LTE2

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	5.31	V	0.9	8.0	12.42	33.0	-20.6	
1852.50	17.68	H	0.9	8.0	24.79	33.0	-8.2	
Mid Ch								
1880.00	6.32	V	0.9	8.0	13.43	33.0	-19.6	
1880.00	16.63	H	0.9	8.0	23.74	33.0	-9.3	
High Ch								
1907.50	6.42	V	0.9	8.0	13.53	33.0	-19.5	
1907.50	16.71	H	0.9	8.0	23.82	33.0	-9.2	

Band

LTE2

3MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	4.65	V	0.9	8.0	11.76	33.0	-21.2	
1851.50	17.13	H	0.9	8.0	24.24	33.0	-8.8	
Mid Ch								
1880.00	5.43	V	0.9	8.0	12.54	33.0	-20.5	
1880.00	16.07	H	0.9	8.0	23.18	33.0	-9.8	
High Ch								
1908.50	5.88	V	0.9	8.0	12.99	33.0	-20.0	
1908.50	16.02	H	0.9	8.0	23.13	33.0	-9.9	

Band

LTE2

3MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	5.24	V	0.9	8.0	12.35	33.0	-20.7	
1851.50	17.80	H	0.9	8.0	24.91	33.0	-8.1	
Mid Ch								
1880.00	6.28	V	0.9	8.0	13.39	33.0	-19.6	
1880.00	16.53	H	0.9	8.0	23.64	33.0	-9.4	
High Ch								
1908.50	6.45	V	0.9	8.0	13.56	33.0	-19.4	
1908.50	16.68	H	0.9	8.0	23.79	33.0	-9.2	

Band

LTE2

1.4MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	4.64	V	0.9	8.0	11.75	33.0	-21.3	
1850.70	17.10	H	0.9	8.0	24.21	33.0	-8.8	
Mid Ch								
1880.00	5.59	V	0.9	8.0	12.70	33.0	-20.3	
1880.00	15.90	H	0.9	8.0	23.01	33.0	-10.0	
High Ch								
1909.30	5.90	V	0.9	8.0	13.01	33.0	-20.0	
1909.30	16.11	H	0.9	8.0	23.22	33.0	-9.8	

Band

LTE2

1.4MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/23/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	5.26	V	0.9	8.0	12.37	33.0	-20.6	
1850.70	17.75	H	0.9	8.0	24.86	33.0	-8.1	
Mid Ch								
1880.00	6.29	V	0.9	8.0	13.40	33.0	-19.6	
1880.00	16.54	H	0.9	8.0	23.65	33.0	-9.4	
High Ch								
1909.30	6.45	V	0.9	8.0	13.56	33.0	-19.4	
1909.30	16.72	H	0.9	8.0	23.83	33.0	-9.2	

LTE4

Band

LTE4

20MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	9.13	V	0.9	8.2	16.47	30.0	-13.5	
1720.00	16.73	H	0.9	8.2	24.07	30.0	-5.9	
Mid Ch								
1732.50	8.76	V	0.9	8.2	16.03	30.0	-14.0	
1732.50	16.79	H	0.9	8.2	24.06	30.0	-5.9	
High Ch								
1745.00	9.58	V	0.9	8.1	16.78	30.0	-13.2	
1745.00	17.05	H	0.9	8.1	24.25	30.0	-5.8	

Band

LTE4

20MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	9.78	V	0.9	8.2	17.12	30.0	-12.9	
1720.00	17.45	H	0.9	8.2	24.79	30.0	-5.2	
Mid Ch								
1732.50	9.40	V	0.9	8.2	16.67	30.0	-13.3	
1732.50	17.59	H	0.9	8.2	24.86	30.0	-5.1	
High Ch								
1745.00	10.23	V	0.9	8.1	17.43	30.0	-12.6	
1745.00	17.75	H	0.9	8.1	24.95	30.0	-5.1	

Band

LTE4

15MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	9.07	V	0.9	8.2	16.42	30.0	-13.6	
1717.50	16.53	H	0.9	8.2	23.88	30.0	-6.1	
Mid Ch								
1732.50	8.69	V	0.9	8.2	15.96	30.0	-14.0	
1732.50	16.73	H	0.9	8.2	24.00	30.0	-6.0	
High Ch								
1747.50	9.47	V	0.9	8.1	16.66	30.0	-13.3	
1747.50	16.51	H	0.9	8.1	23.70	30.0	-6.3	

Band

LTE4

15MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	9.74	V	0.9	8.2	17.09	30.0	-12.9	
1717.50	17.35	H	0.9	8.2	24.70	30.0	-5.3	
Mid Ch								
1732.50	9.32	V	0.9	8.2	16.59	30.0	-13.4	
1732.50	17.55	H	0.9	8.2	24.82	30.0	-5.2	
High Ch								
1747.50	10.12	V	0.9	8.1	17.31	30.0	-12.7	
1747.50	17.17	H	0.9	8.1	24.36	30.0	-5.6	

Band

LTE4

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	9.03	V	0.9	8.2	16.30	30.0	-13.7	
1715.00	16.56	H	0.9	8.2	23.83	30.0	-6.2	
Mid Ch								
1732.50	8.57	V	0.9	8.2	15.84	30.0	-14.2	
1732.50	16.70	H	0.9	8.2	23.97	30.0	-6.0	
High Ch								
1750.00	9.45	V	0.9	8.1	16.64	30.0	-13.4	
1750.00	16.54	H	0.9	8.1	23.73	30.0	-6.3	

Band

LTE4

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	9.67	V	0.9	8.2	16.94	30.0	-13.1	
1715.00	17.30	H	0.9	8.2	24.57	30.0	-5.4	
Mid Ch								
1732.50	9.25	V	0.9	8.2	16.52	30.0	-13.5	
1732.50	17.36	H	0.9	8.2	24.63	30.0	-5.4	
High Ch								
1750.00	10.09	V	0.9	8.1	17.28	30.0	-12.7	
1750.00	17.15	H	0.9	8.1	24.34	30.0	-5.7	

Band

LTE4

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	9.01	V	0.9	8.2	16.35	30.0	-13.6	
1712.50	16.58	H	0.9	8.2	23.92	30.0	-6.1	
Mid Ch								
1732.50	8.57	V	0.9	8.2	15.84	30.0	-14.2	
1732.50	16.72	H	0.9	8.2	23.99	30.0	-6.0	
High Ch								
1752.50	9.40	V	0.9	8.1	16.60	30.0	-13.4	
1752.50	16.58	H	0.9	8.1	23.78	30.0	-6.2	

Band

LTE4

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	9.54	V	0.9	8.2	16.88	30.0	-13.1	
1712.50	17.33	H	0.9	8.2	24.67	30.0	-5.3	
Mid Ch								
1732.50	9.16	V	0.9	8.2	16.43	30.0	-13.6	
1732.50	17.39	H	0.9	8.2	24.66	30.0	-5.3	
High Ch								
1752.50	10.06	V	0.9	8.1	17.26	30.0	-12.7	
1752.50	17.17	H	0.9	8.1	24.37	30.0	-5.6	

Band

LTE4

3MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	8.90	V	0.9	8.2	16.25	30.0	-13.8	
1711.50	16.54	H	0.9	8.2	23.89	30.0	-6.1	
Mid Ch								
1732.50	8.30	V	0.9	8.2	15.57	30.0	-14.4	
1732.50	16.71	H	0.9	8.2	23.98	30.0	-6.0	
High Ch								
1753.50	9.46	V	0.9	8.1	16.65	30.0	-13.3	
1753.50	16.55	H	0.9	8.1	23.74	30.0	-6.3	

Band

LTE4

3MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 4 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	9.55	V	0.9	8.2	16.90	30.0	-13.1	
1711.50	17.22	H	0.9	8.2	24.57	30.0	-5.4	
Mid Ch								
1732.50	8.97	V	0.9	8.2	16.24	30.0	-13.8	
1732.50	17.43	H	0.9	8.2	24.70	30.0	-5.3	
High Ch								
1753.50	10.12	V	0.9	8.1	17.31	30.0	-12.7	
1753.50	17.17	H	0.9	8.1	24.36	30.0	-5.6	

Band

LTE4

1.4MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/22/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	9.03	V	0.9	8.2	16.30	30.0	-13.7	
1710.70	16.60	H	0.9	8.2	23.87	30.0	-6.1	
Mid Ch								
1732.50	8.57	V	0.9	8.2	15.84	30.0	-14.2	
1732.50	16.74	H	0.9	8.2	24.01	30.0	-6.0	
High Ch								
1754.30	9.46	V	0.9	8.1	16.65	30.0	-13.3	
1754.30	16.54	H	0.9	8.1	23.73	30.0	-6.3	

Band

LTE4

1.4MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company:	Samsung
Project #:	15I21298
Date:	7/22/2015
Test Engineer:	R.Alegre
Configuration:	EUT Only
Location:	Chamber C
Mode:	LTE_QPSK Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	9.66	V	0.9	8.2	16.93	30.0	-13.1	
1710.70	17.33	H	0.9	8.2	24.60	30.0	-5.4	
Mid Ch								
1732.50	9.22	V	0.9	8.2	16.49	30.0	-13.5	
1732.50	17.44	H	0.9	8.2	24.71	30.0	-5.3	
High Ch								
1754.30	10.13	V	0.9	8.1	17.32	30.0	-12.7	
1754.30	17.04	H	0.9	8.1	24.23	30.0	-5.8	

LTE5

Band

LTE5

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	20.37	V	0.9	0.0	19.47	38.5	-19.0	
829.00	5.88	H	0.9	0.0	4.98	38.5	-33.5	
Mid Ch								
836.50	20.25	V	0.9	0.0	19.35	38.5	-19.2	
836.50	5.87	H	0.9	0.0	4.97	38.5	-33.5	
High Ch								
844.00	20.62	V	0.9	0.0	19.72	38.5	-18.8	
844.00	5.82	H	0.9	0.0	4.92	38.5	-33.6	

Band

LTE5

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_QPSK Band 5 Fundamentals, 10 MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	21.04	V	0.9	0.0	20.14	38.5	-18.4	
829.00	6.71	H	0.9	0.0	5.81	38.5	-32.7	
Mid Ch								
836.50	20.93	V	0.9	0.0	20.03	38.5	-18.5	
836.50	6.61	H	0.9	0.0	5.71	38.5	-32.8	
High Ch								
844.00	21.29	V	0.9	0.0	20.39	38.5	-18.1	
844.00	6.70	H	0.9	0.0	5.80	38.5	-32.7	

Band

LTE5

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	20.42	V	0.9	0.0	19.52	38.5	-19.0	
826.50	5.80	H	0.9	0.0	4.90	38.5	-33.6	
Mid Ch								
836.50	20.27	V	0.9	0.0	19.37	38.5	-19.1	
836.50	5.85	H	0.9	0.0	4.95	38.5	-33.6	
High Ch								
846.50	20.60	V	0.9	0.0	19.70	38.5	-18.8	
846.50	5.86	H	0.9	0.0	4.96	38.5	-33.5	

Band

LTE5

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	21.06	V	0.9	0.0	20.16	38.5	-18.3	
826.50	6.71	H	0.9	0.0	5.81	38.5	-32.7	
Mid Ch								
836.50	20.94	V	0.9	0.0	20.04	38.5	-18.5	
836.50	6.60	H	0.9	0.0	5.70	38.5	-32.8	
High Ch								
846.50	21.31	V	0.9	0.0	20.41	38.5	-18.1	
846.50	6.74	H	0.9	0.0	5.84	38.5	-32.7	

Band

LTE5

3MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	20.38	V	0.9	0.0	19.48	38.5	-19.0	
825.50	5.95	H	0.9	0.0	5.05	38.5	-33.5	
Mid Ch								
836.50	20.33	V	0.9	0.0	19.43	38.5	-19.1	
836.50	5.84	H	0.9	0.0	4.94	38.5	-33.6	
High Ch								
847.50	20.64	V	0.9	0.0	19.74	38.5	-18.8	
847.50	5.75	H	0.9	0.0	4.85	38.5	-33.7	

Band

LTE5

3MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	21.05	V	0.9	0.0	20.15	38.5	-18.4	
825.50	6.67	H	0.9	0.0	5.77	38.5	-32.7	
Mid Ch								
836.50	21.00	V	0.9	0.0	20.10	38.5	-18.4	
836.50	6.74	H	0.9	0.0	5.84	38.5	-32.7	
High Ch								
847.50	21.32	V	0.9	0.0	20.42	38.5	-18.1	
847.50	6.69	H	0.9	0.0	5.79	38.5	-32.7	

Band

LTE5

1.4MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	20.40	V	0.9	0.0	19.50	38.5	-19.0	
824.70	5.84	H	0.9	0.0	4.94	38.5	-33.6	
Mid Ch								
836.50	20.30	V	0.9	0.0	19.40	38.5	-19.1	
836.50	5.74	H	0.9	0.0	4.84	38.5	-33.7	
High Ch								
848.30	20.54	V	0.9	0.0	19.64	38.5	-18.9	
848.30	5.82	H	0.9	0.0	4.92	38.5	-33.6	

Band

LTE5

1.4MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 07/20/15
Test Engineer: R.Alegre
Configuration: EUT only
Location: Chamber C
Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	21.06	V	0.9	0.0	20.16	38.5	-18.3	
824.70	6.69	H	0.9	0.0	5.79	38.5	-32.7	
Mid Ch								
836.50	21.06	V	0.9	0.0	20.16	38.5	-18.3	
836.50	6.72	H	0.9	0.0	5.82	38.5	-32.7	
High Ch								
848.30	21.20	V	0.9	0.0	20.30	38.5	-18.2	
848.30	6.68	H	0.9	0.0	5.78	38.5	-32.7	

LTE17

Band

LTE17

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 17 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	17.03	V	0.9	0.0	16.13	34.8	-18.6	
709.00	-0.22	H	0.9	0.0	-1.12	34.8	-35.9	
Mid Ch								
710.00	17.27	V	0.9	0.0	16.37	34.8	-18.4	
710.00	-0.31	H	0.9	0.0	-1.21	34.8	-36.0	
High Ch								
711.00	17.31	V	0.9	0.0	16.41	34.8	-18.4	
711.00	-0.23	H	0.9	0.0	-1.13	34.8	-35.9	

Band

LTE17

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 17 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	17.73	V	0.9	0.0	16.83	34.8	-17.9	
709.00	0.56	H	0.9	0.0	-0.34	34.8	-35.1	
Mid Ch								
710.00	18.10	V	0.9	0.0	17.20	34.8	-17.6	
710.00	0.46	H	0.9	0.0	-0.44	34.8	-35.2	
High Ch								
711.00	18.18	V	0.9	0.0	17.28	34.8	-17.5	
711.00	0.58	H	0.9	0.0	-0.32	34.8	-35.1	

Band

LTE17

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 17 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	17.01	V	0.9	0.0	16.11	34.8	-18.7	
706.50	-0.23	H	0.9	0.0	-1.13	34.8	-35.9	
Mid Ch								
710.00	17.17	V	0.9	0.0	16.27	34.8	-18.5	
710.00	-0.29	H	0.9	0.0	-1.19	34.8	-36.0	
High Ch								
713.50	17.35	V	0.9	0.0	16.45	34.8	-18.3	
713.50	-0.17	H	0.9	0.0	-1.07	34.8	-35.8	

Band

LTE17

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 17 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, Xft SMA Cable (SN # SERIALNUMBER) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	17.74	V	0.9	0.0	16.84	34.8	-17.9	
706.50	0.47	H	0.9	0.0	-0.43	34.8	-35.2	
Mid Ch								
710.00	18.00	V	0.9	0.0	17.10	34.8	-17.7	
710.00	0.45	H	0.9	0.0	-0.45	34.8	-35.2	
High Ch								
713.50	18.21	V	0.9	0.0	17.31	34.8	-17.5	
713.50	0.69	H	0.9	0.0	-0.21	34.8	-35.0	

11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMIT

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

TEST PROCEDURE

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

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

MODES TESTED

GSM, WCDMA, and LTE

RESULTS

11.2.1. SPURIOUS RADIATION DATA

LTE4

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_16QAM Band 4 Harmonics, 20MHz Bandwidth

Band LTE4 20MHz 16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1720									
3440.00	-24.8	V	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5160.00	-18.8	V	3.0	35.4	1.0	-53.3	-13.0	-40.3	
6880.00	-17.2	V	3.0	35.7	1.0	-51.9	-13.0	-38.9	
3440.00	-24.9	H	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5160.00	-18.5	H	3.0	35.4	1.0	-53.0	-13.0	-40.0	
6880.00	-14.8	H	3.0	35.7	1.0	-49.5	-13.0	-36.5	
Mid Ch, 1732.5									
3465.00	-24.9	V	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5197.50	-18.2	V	3.0	35.4	1.0	-52.7	-13.0	-39.7	
6930.00	-16.6	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3465.00	-24.6	H	3.0	36.0	1.0	-59.6	-13.0	-46.6	
5197.50	-16.8	H	3.0	35.4	1.0	-51.2	-13.0	-38.2	
6930.00	-14.6	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
High Ch, 1745									
3490.00	-24.7	V	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5235.00	-19.1	V	3.0	35.4	1.0	-53.5	-13.0	-40.5	
6980.00	-16.7	V	3.0	35.7	1.0	-51.4	-13.0	-38.4	
3490.00	-24.5	H	3.0	36.0	1.0	-59.5	-13.0	-46.5	
5235.00	-17.5	H	3.0	35.4	1.0	-51.9	-13.0	-38.9	
6980.00	-13.7	H	3.0	35.7	1.0	-48.4	-13.0	-35.4	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	EUT + Charger + Headset
Location:	Chamber A
Mode:	LTE_QPSK Band 4 Harmonics, 20MHz Bandwidth

Band LTE4 20MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1720									
3440.00	-24.9	V	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5160.00	-18.4	V	3.0	35.4	1.0	-52.8	-13.0	-39.8	
6880.00	-16.9	V	3.0	35.7	1.0	-51.6	-13.0	-38.6	
3440.00	-24.9	H	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5160.00	-17.8	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
6880.00	-14.8	H	3.0	35.7	1.0	-49.5	-13.0	-36.5	
Mid Ch, 1732.5									
3465.00	-25.0	V	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5197.50	-18.4	V	3.0	35.4	1.0	-52.9	-13.0	-39.9	
6930.00	-17.2	V	3.0	35.7	1.0	-51.8	-13.0	-38.8	
3465.00	-24.6	H	3.0	36.0	1.0	-59.6	-13.0	-46.6	
5197.50	-17.4	H	3.0	35.4	1.0	-51.8	-13.0	-38.8	
6930.00	-14.4	H	3.0	35.7	1.0	-49.1	-13.0	-36.1	
High Ch, 1745									
3490.00	-24.4	V	3.0	36.0	1.0	-59.5	-13.0	-46.5	
5235.00	-18.4	V	3.0	35.4	1.0	-52.8	-13.0	-39.8	
6980.00	-16.6	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3490.00	-24.9	H	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5235.00	-17.2	H	3.0	35.4	1.0	-51.6	-13.0	-38.6	
6980.00	-13.8	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_16QAM Band 4 Harmonics, 15MHz Bandwidth

Band LTE4 15MHz 16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5									
3435.00	-24.2	V	3.0	36.1	1.0	-59.3	-13.0	-46.3	
5152.50	-16.5	V	3.0	35.4	1.0	-50.9	-13.0	-37.9	
6870.00	-16.6	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3435.00	-21.6	H	3.0	36.1	1.0	-56.6	-13.0	-43.6	
5152.50	-17.5	H	3.0	35.4	1.0	-51.9	-13.0	-38.9	
6870.00	-15.0	H	3.0	35.7	1.0	-49.7	-13.0	-36.7	
Mid Ch, 1732.5									
3465.00	-24.2	V	3.0	36.0	1.0	-59.2	-13.0	-46.2	
5197.50	-18.5	V	3.0	35.4	1.0	-52.9	-13.0	-39.9	
6930.00	-16.4	V	3.0	35.7	1.0	-51.1	-13.0	-38.1	
3465.00	-23.9	H	3.0	36.0	1.0	-58.9	-13.0	-45.9	
5197.50	-17.9	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
6930.00	-15.5	H	3.0	35.7	1.0	-50.2	-13.0	-37.2	
High Ch, 1747.5									
3495.00	-23.4	V	3.0	36.0	1.0	-58.4	-13.0	-45.4	
5242.50	-18.3	V	3.0	35.4	1.0	-52.7	-13.0	-39.7	
6990.00	-17.2	V	3.0	35.7	1.0	-51.9	-13.0	-38.9	
3495.00	-23.4	H	3.0	36.0	1.0	-58.4	-13.0	-45.4	
5242.50	-18.5	H	3.0	35.4	1.0	-52.9	-13.0	-39.9	
6990.00	-14.6	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_QPSK Band 4 Harmonics, 15MHz Bandwidth

Band
LTE4
15MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5									
3435.00	-24.2	V	3.0	36.1	1.0	-59.3	-13.0	-46.3	
5152.50	-16.7	V	3.0	35.4	1.0	-51.1	-13.0	-38.1	
6870.00	-16.8	V	3.0	35.7	1.0	-51.5	-13.0	-38.5	
3435.00	-24.8	H	3.0	36.1	1.0	-59.9	-13.0	-46.9	
5152.50	-16.1	H	3.0	35.4	1.0	-50.6	-13.0	-37.6	
6870.00	-15.3	H	3.0	35.7	1.0	-49.9	-13.0	-36.9	
Mid Ch, 1732.5									
3465.00	-24.4	V	3.0	36.0	1.0	-59.4	-13.0	-46.4	
5197.50	-18.7	V	3.0	35.4	1.0	-53.1	-13.0	-40.1	
6930.00	-16.6	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3465.00	-24.0	H	3.0	36.0	1.0	-59.0	-13.0	-46.0	
5197.50	-17.6	H	3.0	35.4	1.0	-52.1	-13.0	-39.1	
6930.00	-15.3	H	3.0	35.7	1.0	-50.0	-13.0	-37.0	
High Ch, 1747.5									
3495.00	-23.5	V	3.0	36.0	1.0	-58.5	-13.0	-45.5	
5242.50	-18.6	V	3.0	35.4	1.0	-53.0	-13.0	-40.0	
6990.00	-16.3	V	3.0	35.7	1.0	-51.0	-13.0	-38.0	
3495.00	-23.4	H	3.0	36.0	1.0	-58.4	-13.0	-45.4	
5242.50	-17.9	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
6990.00	-15.0	H	3.0	35.7	1.0	-49.7	-13.0	-36.7	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_16QAM Band 4 Harmonics, 10MHz Bandwidth

Band
LTE4
10MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1715									
3430.00	-23.7	V	3.0	36.1	1.0	-58.7	-13.0	-45.7	
5145.00	-17.7	V	3.0	35.4	1.0	-52.2	-13.0	-39.2	
6860.00	-17.0	V	3.0	35.7	1.0	-51.6	-13.0	-38.6	
3430.00	-25.3	H	3.0	36.1	1.0	-60.4	-13.0	-47.4	
5145.00	-16.9	H	3.0	35.4	1.0	-51.3	-13.0	-38.3	
6860.00	-15.0	H	3.0	35.7	1.0	-49.6	-13.0	-36.6	
Mid Ch, 1732.5									
3465.00	-24.8	V	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5197.50	-18.2	V	3.0	35.4	1.0	-52.7	-13.0	-39.7	
6930.00	-17.2	V	3.0	35.7	1.0	-51.8	-13.0	-38.8	
3465.00	-25.1	H	3.0	36.0	1.0	-60.1	-13.0	-47.1	
5197.50	-16.9	H	3.0	35.4	1.0	-51.3	-13.0	-38.3	
6930.00	-16.4	H	3.0	35.7	1.0	-51.0	-13.0	-38.0	
High Ch, 1750									
3500.00	-24.6	V	3.0	36.0	1.0	-59.6	-13.0	-46.6	
5250.00	-18.5	V	3.0	35.4	1.0	-52.9	-13.0	-39.9	
7000.00	-17.0	V	3.0	35.7	1.0	-51.7	-13.0	-38.7	
3500.00	-24.9	H	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5250.00	-18.2	H	3.0	35.4	1.0	-52.6	-13.0	-39.6	
7000.00	-14.6	H	3.0	35.7	1.0	-49.3	-13.0	-36.3	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_QPSK Band 4 Harmonics, 10MHz Bandwidth

Band LTE4 10MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1715									
3430.00	-23.8	V	3.0	36.1	1.0	-58.9	-13.0	-45.9	
5145.00	-17.9	V	3.0	35.4	1.0	-52.3	-13.0	-39.3	
6860.00	-17.3	V	3.0	35.7	1.0	-51.9	-13.0	-38.9	
3430.00	-25.5	H	3.0	36.1	1.0	-60.5	-13.0	-47.5	
5145.00	-17.2	H	3.0	35.4	1.0	-51.6	-13.0	-38.6	
6860.00	-15.1	H	3.0	35.7	1.0	-49.8	-13.0	-36.8	
Mid Ch, 1732.5									
3465.00	-24.9	V	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5197.50	-18.3	V	3.0	35.4	1.0	-52.7	-13.0	-39.7	
6930.00	-16.5	V	3.0	35.7	1.0	-51.2	-13.0	-38.2	
3465.00	-24.7	H	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5197.50	-17.2	H	3.0	35.4	1.0	-51.7	-13.0	-38.7	
6930.00	-15.7	H	3.0	35.7	1.0	-50.3	-13.0	-37.3	
High Ch, 1750									
3500.00	-24.7	V	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5250.00	-18.6	V	3.0	35.4	1.0	-53.0	-13.0	-40.0	
7000.00	-17.2	V	3.0	35.7	1.0	-51.9	-13.0	-38.9	
3500.00	-25.0	H	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5250.00	-18.7	H	3.0	35.4	1.0	-53.1	-13.0	-40.1	
7000.00	-15.3	H	3.0	35.7	1.0	-50.0	-13.0	-37.0	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_16QAM Band 4 Harmonics, 5MHz Bandwidth

Band
LTE4
5MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.5									
3425.00	-23.7	V	3.0	36.1	1.0	-58.8	-13.0	-45.8	
5137.50	-17.5	V	3.0	35.4	1.0	-51.9	-13.0	-38.9	
6850.00	-16.7	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3425.00	-25.2	H	3.0	36.1	1.0	-60.2	-13.0	-47.2	
5137.50	-17.8	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
6850.00	-13.9	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	
Mid Ch, 1732.5									
3465.00	-24.8	V	3.0	36.0	1.0	-59.8	-13.0	-46.8	
5197.50	-18.0	V	3.0	35.4	1.0	-52.5	-13.0	-39.5	
6930.00	-16.8	V	3.0	35.7	1.0	-51.5	-13.0	-38.5	
3465.00	-24.6	H	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5197.50	-17.3	H	3.0	35.4	1.0	-51.7	-13.0	-38.7	
6930.00	-15.6	H	3.0	35.7	1.0	-50.2	-13.0	-37.2	
High Ch, 1752.5									
3505.00	-24.5	V	3.0	36.0	1.0	-59.5	-13.0	-46.5	
5257.50	-17.7	V	3.0	35.4	1.0	-52.1	-13.0	-39.1	
7010.00	-17.2	V	3.0	35.7	1.0	-51.8	-13.0	-38.8	
3505.00	-25.3	H	3.0	36.0	1.0	-60.3	-13.0	-47.3	
5257.50	-17.2	H	3.0	35.4	1.0	-51.7	-13.0	-38.7	
7010.00	-15.4	H	3.0	35.7	1.0	-50.1	-13.0	-37.1	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_QPSK Band 4 Harmonics, 5MHz Bandwidth

Band LTE4 5MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.5									
3425.00	-23.6	V	3.0	36.1	1.0	-58.6	-13.0	-45.6	
5137.50	-17.6	V	3.0	35.4	1.0	-52.0	-13.0	-39.0	
6850.00	-16.9	V	3.0	35.7	1.0	-51.6	-13.0	-38.6	
3425.00	-25.2	H	3.0	36.1	1.0	-60.3	-13.0	-47.3	
5137.50	-17.0	H	3.0	35.4	1.0	-51.5	-13.0	-38.5	
6850.00	-15.6	H	3.0	35.7	1.0	-50.2	-13.0	-37.2	
Mid Ch, 1732.5									
3465.00	-24.6	V	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5197.50	-18.3	V	3.0	35.4	1.0	-52.7	-13.0	-39.7	
6930.00	-17.0	V	3.0	35.7	1.0	-51.7	-13.0	-38.7	
3465.00	-24.7	H	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5197.50	-17.4	H	3.0	35.4	1.0	-51.8	-13.0	-38.8	
6930.00	-16.0	H	3.0	35.7	1.0	-50.7	-13.0	-37.7	
High Ch, 1752.5									
3505.00	-25.1	V	3.0	36.0	1.0	-60.1	-13.0	-47.1	
5257.50	-18.4	V	3.0	35.4	1.0	-52.8	-13.0	-39.8	
7010.00	-16.3	V	3.0	35.7	1.0	-51.0	-13.0	-38.0	
3505.00	-25.2	H	3.0	36.0	1.0	-60.2	-13.0	-47.2	
5257.50	-17.6	H	3.0	35.4	1.0	-52.0	-13.0	-39.0	
7010.00	-15.4	H	3.0	35.7	1.0	-50.1	-13.0	-37.1	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_16QAM Band 4 Harmonics, 3MHz Bandwidth

Band
LTE4
3MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5									
3423.00	-25.0	V	3.0	36.1	1.0	-60.0	-13.0	-47.0	
5134.50	-18.5	V	3.0	35.4	1.0	-52.9	-13.0	-39.9	
6846.00	-16.7	V	3.0	35.7	1.0	-51.4	-13.0	-38.4	
3423.00	-25.4	H	3.0	36.1	1.0	-60.5	-13.0	-47.5	
5134.50	-18.0	H	3.0	35.4	1.0	-52.4	-13.0	-39.4	
6846.00	-15.7	H	3.0	35.7	1.0	-50.4	-13.0	-37.4	
Mid Ch, 1732.5									
3465.00	-24.7	V	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5197.50	-19.1	V	3.0	35.4	1.0	-53.5	-13.0	-40.5	
6930.00	-16.4	V	3.0	35.7	1.0	-51.0	-13.0	-38.0	
3465.00	-24.9	H	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5197.50	-17.2	H	3.0	35.4	1.0	-51.6	-13.0	-38.6	
6930.00	-15.5	H	3.0	35.7	1.0	-50.2	-13.0	-37.2	
High Ch, 1753.5									
3507.00	-24.7	V	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5260.50	-18.4	V	3.0	35.4	1.0	-52.8	-13.0	-39.8	
7014.00	-17.2	V	3.0	35.7	1.0	-51.8	-13.0	-38.8	
3507.00	-24.4	H	3.0	36.0	1.0	-59.4	-13.0	-46.4	
5260.50	-17.9	H	3.0	35.4	1.0	-52.4	-13.0	-39.4	
7014.00	-15.4	H	3.0	35.7	1.0	-50.1	-13.0	-37.1	

Band
LTE4
3MHz
QPSK

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_QPSK Band 4 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5									
3423.00	-25.1	V	3.0	36.1	1.0	-60.2	-13.0	-47.2	
5134.50	-18.6	V	3.0	35.4	1.0	-53.0	-13.0	-40.0	
6846.00	-17.1	V	3.0	35.7	1.0	-51.8	-13.0	-38.8	
3423.00	-25.1	H	3.0	36.1	1.0	-60.1	-13.0	-47.1	
5134.50	-17.9	H	3.0	35.4	1.0	-52.4	-13.0	-39.4	
6846.00	-15.1	H	3.0	35.7	1.0	-49.8	-13.0	-36.8	
Mid Ch, 1732.5									
3465.00	-24.8	V	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5197.50	-18.3	V	3.0	35.4	1.0	-52.7	-13.0	-39.7	
6930.00	-17.0	V	3.0	35.7	1.0	-51.7	-13.0	-38.7	
3465.00	-24.9	H	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5197.50	-17.3	H	3.0	35.4	1.0	-51.7	-13.0	-38.7	
6930.00	-15.0	H	3.0	35.7	1.0	-49.7	-13.0	-36.7	
High Ch, 1753.5									
3507.00	-24.8	V	3.0	36.0	1.0	-59.8	-13.0	-46.8	
5260.50	-18.4	V	3.0	35.4	1.0	-52.8	-13.0	-39.8	
7014.00	-16.5	V	3.0	35.7	1.0	-51.2	-13.0	-38.2	
3507.00	-24.7	H	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5260.50	-17.7	H	3.0	35.4	1.0	-52.1	-13.0	-39.1	
7014.00	-14.5	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_16QAM Band 4 Harmonics, 1.4MHz Bandwidth

Band
LTE4
1.4MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1710.7									
3421.40	-25.1	V	3.0	36.1	1.0	-60.2	-13.0	-47.2	
5132.10	-19.3	V	3.0	35.4	1.0	-53.7	-13.0	-40.7	
6842.80	-16.9	V	3.0	35.7	1.0	-51.6	-13.0	-38.6	
3421.40	-25.5	H	3.0	36.1	1.0	-60.6	-13.0	-47.6	
5132.10	-18.0	H	3.0	35.4	1.0	-52.4	-13.0	-39.4	
6842.80	-15.7	H	3.0	35.7	1.0	-50.3	-13.0	-37.3	
Mid Ch, 1732.5									
3465.00	-24.9	V	3.0	36.0	1.0	-59.9	-13.0	-46.9	
5197.50	-18.5	V	3.0	35.4	1.0	-52.9	-13.0	-39.9	
6930.00	-16.4	V	3.0	35.7	1.0	-51.0	-13.0	-38.0	
3465.00	-25.1	H	3.0	36.0	1.0	-60.1	-13.0	-47.1	
5197.50	-17.7	H	3.0	35.4	1.0	-52.2	-13.0	-39.2	
6930.00	-15.5	H	3.0	35.7	1.0	-50.2	-13.0	-37.2	
High Ch, 1754.3									
3508.60	-24.7	V	3.0	36.0	1.0	-59.7	-13.0	-46.7	
5262.90	-19.1	V	3.0	35.4	1.0	-53.5	-13.0	-40.5	
7017.20	-16.6	V	3.0	35.7	1.0	-51.3	-13.0	-38.3	
3508.60	-24.8	H	3.0	36.0	1.0	-59.8	-13.0	-46.8	
5262.90	-18.4	H	3.0	35.4	1.0	-52.8	-13.0	-39.8	
7017.20	-14.7	H	3.0	35.7	1.0	-49.4	-13.0	-36.4	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + Charger + Headset
Location: Chamber A
Mode: LTE_QPSK Band 4 Harmonics, 1.4MHz Bandwidth

Band LTE4 1.4MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1710.7									
3421.40	-24.9	V	3.0	36.1	1.0	-60.0	-13.0	-47.0	
5132.10	-18.7	V	3.0	35.4	1.0	-53.1	-13.0	-40.1	
6842.80	-17.3	V	3.0	35.7	1.0	-52.0	-13.0	-39.0	
3421.40	-25.3	H	3.0	36.1	1.0	-60.4	-13.0	-47.4	
5132.10	-18.3	H	3.0	35.4	1.0	-52.8	-13.0	-39.8	
6842.80	-15.1	H	3.0	35.7	1.0	-49.7	-13.0	-36.7	
Mid Ch, 1732.5									
3465.00	-24.8	V	3.0	36.0	1.0	-59.8	-13.0	-46.8	
5197.50	-19.0	V	3.0	35.4	1.0	-53.4	-13.0	-40.4	
6930.00	-16.4	V	3.0	35.7	1.0	-51.0	-13.0	-38.0	
3465.00	-25.3	H	3.0	36.0	1.0	-60.4	-13.0	-47.4	
5197.50	-17.9	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
6930.00	-15.5	H	3.0	35.7	1.0	-50.1	-13.0	-37.1	
High Ch, 1754.3									
3508.60	-25.0	V	3.0	36.0	1.0	-60.0	-13.0	-47.0	
5262.90	-19.1	V	3.0	35.4	1.0	-53.5	-13.0	-40.5	
7017.20	-16.7	V	3.0	35.7	1.0	-51.4	-13.0	-38.4	
3508.60	-24.4	H	3.0	36.0	1.0	-59.4	-13.0	-46.4	
5262.90	-18.3	H	3.0	35.4	1.0	-52.8	-13.0	-39.8	
7017.20	-14.7	H	3.0	35.7	1.0	-49.4	-13.0	-36.4	

LTE2

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: X-pos EUT, Ac Charger, Headset
Location: Chamber A
Mode: LTE_16QAM Band 2 Harmonics, 20MHz Bandwidth

Band
LTE2
20MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1860									
3720.00	-18.5	V	3.0	35.8	1.0	-53.3	-13.0	-40.3	
5580.00	-17.3	V	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7440.00	-14.9	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3720.00	-20.9	H	3.0	35.8	1.0	-55.7	-13.0	-42.7	
5580.00	-17.1	H	3.0	35.5	1.0	-51.6	-13.0	-38.6	
7440.00	-14.9	H	3.0	35.7	1.0	-49.6	-13.0	-36.6	
Mid Ch, 1880									
3760.00	-19.6	V	3.0	35.8	1.0	-54.4	-13.0	-41.4	
5640.00	-18.2	V	3.0	35.5	1.0	-52.7	-13.0	-39.7	
7520.00	-15.5	V	3.0	35.7	1.0	-50.3	-13.0	-37.3	
3760.00	-17.8	H	3.0	35.8	1.0	-52.6	-13.0	-39.6	
5640.00	-16.9	H	3.0	35.5	1.0	-51.4	-13.0	-38.4	
7520.00	-14.5	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
High Ch, 1900									
3800.00	-18.8	V	3.0	35.8	1.0	-53.6	-13.0	-40.6	
5700.00	-18.0	V	3.0	35.5	1.0	-52.5	-13.0	-39.5	
7600.00	-15.3	V	3.0	35.8	1.0	-50.1	-13.0	-37.1	
3800.00	-20.0	H	3.0	35.8	1.0	-54.7	-13.0	-41.7	
5700.00	-17.6	H	3.0	35.5	1.0	-52.1	-13.0	-39.1	
7600.00	-14.7	H	3.0	35.8	1.0	-49.4	-13.0	-36.4	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_QPSK Band 2 Harmonics, 20MHz Bandwidth

Band
LTE2
20MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1860									
3720.00	-18.9	V	3.0	35.8	1.0	-53.7	-13.0	-40.7	
5580.00	-16.9	V	3.0	35.5	1.0	-51.4	-13.0	-38.4	
7440.00	-14.9	V	3.0	35.7	1.0	-49.6	-13.0	-36.6	
3720.00	-20.0	H	3.0	35.8	1.0	-54.8	-13.0	-41.8	
5580.00	-16.3	H	3.0	35.5	1.0	-50.7	-13.0	-37.7	
7440.00	-14.9	H	3.0	35.7	1.0	-49.6	-13.0	-36.6	
Mid Ch, 1880									
3760.00	-19.1	V	3.0	35.8	1.0	-53.9	-13.0	-40.9	
5640.00	-18.3	V	3.0	35.5	1.0	-52.8	-13.0	-39.8	
7520.00	-15.3	V	3.0	35.7	1.0	-50.1	-13.0	-37.1	
3760.00	-17.9	H	3.0	35.8	1.0	-52.7	-13.0	-39.7	
5640.00	-16.6	H	3.0	35.5	1.0	-51.1	-13.0	-38.1	
7520.00	-13.9	H	3.0	35.7	1.0	-48.6	-13.0	-35.6	
High Ch, 1900									
3800.00	-19.4	V	3.0	35.8	1.0	-54.2	-13.0	-41.2	
5700.00	-17.7	V	3.0	35.5	1.0	-52.2	-13.0	-39.2	
7600.00	-15.6	V	3.0	35.8	1.0	-50.3	-13.0	-37.3	
3800.00	-19.4	H	3.0	35.8	1.0	-54.2	-13.0	-41.2	
5700.00	-17.8	H	3.0	35.5	1.0	-52.3	-13.0	-39.3	
7600.00	-15.6	H	3.0	35.8	1.0	-50.3	-13.0	-37.3	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_QPSK Band 2 Harmonics, 15MHz Bandwidth

Band
LTE2
15MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1857.5									
3715.00	-19.3	V	3.0	35.8	1.0	-54.1	-13.0	-41.1	
5572.50	-18.0	V	3.0	35.5	1.0	-52.5	-13.0	-39.5	
7430.00	-15.8	V	3.0	35.7	1.0	-50.6	-13.0	-37.6	
3715.00	-19.3	H	3.0	35.8	1.0	-54.2	-13.0	-41.2	
5572.50	-17.8	H	3.0	35.5	1.0	-52.3	-13.0	-39.3	
7430.00	-14.1	H	3.0	35.7	1.0	-48.8	-13.0	-35.8	
Mid Ch, 1880									
3760.00	-19.1	V	3.0	35.8	1.0	-53.9	-13.0	-40.9	
5640.00	-18.1	V	3.0	35.5	1.0	-52.6	-13.0	-39.6	
7520.00	-16.4	V	3.0	35.7	1.0	-51.2	-13.0	-38.2	
3760.00	-22.2	H	3.0	35.8	1.0	-57.0	-13.0	-44.0	
5640.00	-17.6	H	3.0	35.5	1.0	-52.1	-13.0	-39.1	
7520.00	0.0	H	3.0	35.7	1.0	-34.7	-13.0	-21.7	
High Ch, 1902.5									
3805.00	-19.1	V	3.0	35.8	1.0	-53.9	-13.0	-40.9	
5707.50	-18.5	V	3.0	35.5	1.0	-53.0	-13.0	-40.0	
7610.00	-15.5	V	3.0	35.8	1.0	-50.2	-13.0	-37.2	
3805.00	-18.0	H	3.0	35.8	1.0	-52.8	-13.0	-39.8	
5707.50	-15.0	H	3.0	35.5	1.0	-49.5	-13.0	-36.5	
7610.00	-14.0	H	3.0	35.8	1.0	-48.7	-13.0	-35.7	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_QPSK Band 2 Harmonics, 15MHz Bandwidth

Band
LTE2
15MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1857.5									
3715.00	-19.6	V	3.0	35.8	1.0	-54.4	-13.0	-41.4	
5572.50	-17.9	V	3.0	35.5	1.0	-52.4	-13.0	-39.4	
7430.00	-15.2	V	3.0	35.7	1.0	-49.9	-13.0	-36.9	
3715.00	-19.6	H	3.0	35.8	1.0	-54.4	-13.0	-41.4	
5572.50	-17.4	H	3.0	35.5	1.0	-51.9	-13.0	-38.9	
7430.00	-14.7	H	3.0	35.7	1.0	-49.4	-13.0	-36.4	
Mid Ch, 1880									
3760.00	-18.9	V	3.0	35.8	1.0	-53.7	-13.0	-40.7	
5640.00	-17.9	V	3.0	35.5	1.0	-52.4	-13.0	-39.4	
7520.00	-16.4	V	3.0	35.7	1.0	-51.2	-13.0	-38.2	
3760.00	-19.1	H	3.0	35.8	1.0	-53.9	-13.0	-40.9	
5640.00	-17.1	H	3.0	35.5	1.0	-51.6	-13.0	-38.6	
7520.00	-14.5	H	3.0	35.7	1.0	-49.3	-13.0	-36.3	
High Ch, 1902.5									
3805.00	-18.9	V	3.0	35.8	1.0	-53.7	-13.0	-40.7	
5707.50	-17.7	V	3.0	35.5	1.0	-52.2	-13.0	-39.2	
7610.00	-15.2	V	3.0	35.8	1.0	-50.0	-13.0	-37.0	
3805.00	-19.8	H	3.0	35.8	1.0	-54.6	-13.0	-41.6	
5707.50	-17.3	H	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7610.00	-14.2	H	3.0	35.8	1.0	-49.0	-13.0	-36.0	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_QPSK Band 2 Harmonics, 10MHz Bandwidth

Band
LTE2
10MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855									
3710.00	-18.3	V	3.0	35.9	1.0	-53.1	-13.0	-40.1	
5565.00	-18.0	V	3.0	35.5	1.0	-52.5	-13.0	-39.5	
7420.00	-16.1	V	3.0	35.7	1.0	-50.9	-13.0	-37.9	
3710.00	-18.5	H	3.0	35.9	1.0	-53.4	-13.0	-40.4	
5565.00	-17.3	H	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7420.00	-14.2	H	3.0	35.7	1.0	-49.0	-13.0	-36.0	
Mid Ch, 1880									
3760.00	-19.0	V	3.0	35.8	1.0	-53.8	-13.0	-40.8	
5640.00	-17.1	V	3.0	35.5	1.0	-51.6	-13.0	-38.6	
7520.00	-15.6	V	3.0	35.7	1.0	-50.4	-13.0	-37.4	
3760.00	-18.8	H	3.0	35.8	1.0	-53.6	-13.0	-40.6	
5640.00	-17.3	H	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7520.00	-13.5	H	3.0	35.7	1.0	-48.3	-13.0	-35.3	
High Ch, 1905									
3810.00	-18.5	V	3.0	35.8	1.0	-53.3	-13.0	-40.3	
5715.00	-17.7	V	3.0	35.5	1.0	-52.2	-13.0	-39.2	
7620.00	-14.5	V	3.0	35.8	1.0	-49.3	-13.0	-36.3	
3810.00	-18.1	H	3.0	35.8	1.0	-52.9	-13.0	-39.9	
5715.00	-17.4	H	3.0	35.5	1.0	-51.9	-13.0	-38.9	
7620.00	-13.7	H	3.0	35.8	1.0	-48.5	-13.0	-35.5	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: X-pos EUT, Ac Charger, Headset
Location: Chamber A
Mode: LTE_QPSK Band 2 Harmonics, 10MHz Bandwidth

Band
LTE2
10MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855									
3710.00	-18.5	V	3.0	35.9	1.0	-53.4	-13.0	-40.4	
5565.00	-18.2	V	3.0	35.5	1.0	-52.7	-13.0	-39.7	
7420.00	-16.5	V	3.0	35.7	1.0	-51.2	-13.0	-38.2	
3710.00	-18.7	H	3.0	35.9	1.0	-53.6	-13.0	-40.6	
5565.00	-17.3	H	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7420.00	-14.4	H	3.0	35.7	1.0	-49.1	-13.0	-36.1	
Mid Ch, 1880									
3760.00	-19.1	V	3.0	35.8	1.0	-53.9	-13.0	-40.9	
5640.00	-16.7	V	3.0	35.5	1.0	-51.2	-13.0	-38.2	
7520.00	-15.2	V	3.0	35.7	1.0	-50.0	-13.0	-37.0	
3760.00	-18.5	H	3.0	35.8	1.0	-53.3	-13.0	-40.3	
5640.00	-17.6	H	3.0	35.5	1.0	-52.1	-13.0	-39.1	
7520.00	-13.3	H	3.0	35.7	1.0	-48.1	-13.0	-35.1	
High Ch, 1905									
3810.00	-17.9	V	3.0	35.8	1.0	-52.7	-13.0	-39.7	
5715.00	-18.1	V	3.0	35.5	1.0	-52.6	-13.0	-39.6	
7620.00	-14.3	V	3.0	35.8	1.0	-49.1	-13.0	-36.1	
3810.00	-18.2	H	3.0	35.8	1.0	-53.0	-13.0	-40.0	
5715.00	-17.9	H	3.0	35.5	1.0	-52.4	-13.0	-39.4	
7620.00	-13.9	H	3.0	35.8	1.0	-48.7	-13.0	-35.7	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_16QAM Band 2 Harmonics, 5MHz Bandwidth

Band
LTE2
5MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5									
3705.00	-19.1	V	3.0	35.9	1.0	-53.9	-13.0	-40.9	
5557.50	-16.9	V	3.0	35.5	1.0	-51.4	-13.0	-38.4	
7410.00	-14.6	V	3.0	35.7	1.0	-49.3	-13.0	-36.3	
3705.00	-19.4	H	3.0	35.9	1.0	-54.2	-13.0	-41.2	
5557.50	-16.6	H	3.0	35.5	1.0	-51.1	-13.0	-38.1	
7410.00	-14.2	H	3.0	35.7	1.0	-49.0	-13.0	-36.0	
Mid Ch, 1880									
3760.00	-18.3	V	3.0	35.8	1.0	-53.1	-13.0	-40.1	
5640.00	-17.5	V	3.0	35.5	1.0	-52.0	-13.0	-39.0	
7520.00	-15.5	V	3.0	35.7	1.0	-50.3	-13.0	-37.3	
3760.00	-18.7	H	3.0	35.8	1.0	-53.5	-13.0	-40.5	
5640.00	-17.0	H	3.0	35.5	1.0	-51.5	-13.0	-38.5	
7520.00	-13.9	H	3.0	35.7	1.0	-48.6	-13.0	-35.6	
High Ch, 1907.5									
3815.00	-17.3	V	3.0	35.8	1.0	-52.0	-13.0	-39.0	
5722.50	-17.6	V	3.0	35.5	1.0	-52.1	-13.0	-39.1	
7630.00	-14.1	V	3.0	35.8	1.0	-48.9	-13.0	-35.9	
3815.00	-18.2	H	3.0	35.8	1.0	-52.9	-13.0	-39.9	
5722.50	-16.4	H	3.0	35.5	1.0	-50.9	-13.0	-37.9	
7630.00	-13.0	H	3.0	35.8	1.0	-47.7	-13.0	-34.7	

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: X-pos EUT, Ac Charger, Headset
Location: Chamber A
Mode: LTE_QPSK Band 2 Harmonics, 5MHz Bandwidth

Band
LTE2
5MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5									
3705.00	-19.6	V	3.0	35.9	1.0	-54.5	-13.0	-41.5	
5557.50	-17.5	V	3.0	35.5	1.0	-52.0	-13.0	-39.0	
7410.00	-14.8	V	3.0	35.7	1.0	-49.5	-13.0	-36.5	
3705.00	-19.6	H	3.0	35.9	1.0	-54.4	-13.0	-41.4	
5557.50	-16.4	H	3.0	35.5	1.0	-50.9	-13.0	-37.9	
7410.00	-14.3	H	3.0	35.7	1.0	-49.0	-13.0	-36.0	
Mid Ch, 1880									
3760.00	-18.6	V	3.0	35.8	1.0	-53.4	-13.0	-40.4	
5640.00	-17.5	V	3.0	35.5	1.0	-52.0	-13.0	-39.0	
7520.00	-15.0	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3760.00	-18.4	H	3.0	35.8	1.0	-53.2	-13.0	-40.2	
5640.00	-16.5	H	3.0	35.5	1.0	-51.0	-13.0	-38.0	
7520.00	-14.1	H	3.0	35.7	1.0	-48.9	-13.0	-35.9	
High Ch, 1907.5									
3815.00	-17.0	V	3.0	35.8	1.0	-51.8	-13.0	-38.8	
5722.50	-17.8	V	3.0	35.5	1.0	-52.3	-13.0	-39.3	
7630.00	-13.8	V	3.0	35.8	1.0	-48.6	-13.0	-35.6	
3815.00	-18.3	H	3.0	35.8	1.0	-53.1	-13.0	-40.1	
5722.50	-16.8	H	3.0	35.5	1.0	-51.3	-13.0	-38.3	
7630.00	-13.4	H	3.0	35.8	1.0	-48.2	-13.0	-35.2	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_16QAM Band 2 Harmonics, 3MHz Bandwidth

Band LTE2 3MHz 16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5									
3703.00	-19.7	V	3.0	35.9	1.0	-54.5	-13.0	-41.5	
5554.50	-15.9	V	3.0	35.5	1.0	-50.3	-13.0	-37.3	
7406.00	-13.6	V	3.0	35.7	1.0	-48.3	-13.0	-35.3	
3703.00	-14.9	H	3.0	35.9	1.0	-49.7	-13.0	-36.7	
5554.50	-16.6	H	3.0	35.5	1.0	-51.1	-13.0	-38.1	
7406.00	-12.9	H	3.0	35.7	1.0	-47.6	-13.0	-34.6	
Mid Ch, 1880									
3760.00	-20.7	V	3.0	35.8	1.0	-55.5	-13.0	-42.5	
5640.00	-17.1	V	3.0	35.5	1.0	-51.6	-13.0	-38.6	
7520.00	-13.5	V	3.0	35.7	1.0	-48.3	-13.0	-35.3	
3760.00	-21.7	H	3.0	35.8	1.0	-56.6	-13.0	-43.6	
5640.00	-17.1	H	3.0	35.5	1.0	-51.6	-13.0	-38.6	
7520.00	-12.7	H	3.0	35.7	1.0	-47.5	-13.0	-34.5	
High Ch, 1908.5									
3817.00	-19.7	V	3.0	35.8	1.0	-54.5	-13.0	-41.5	
5725.50	-16.4	V	3.0	35.5	1.0	-50.9	-13.0	-37.9	
7634.00	-11.4	V	3.0	35.8	1.0	-46.2	-13.0	-33.2	
3817.00	-20.3	H	3.0	35.8	1.0	-55.0	-13.0	-42.0	
5725.50	-16.1	H	3.0	35.5	1.0	-50.6	-13.0	-37.6	
7634.00	-11.6	H	3.0	35.8	1.0	-46.4	-13.0	-33.4	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_QPSK Band 2 Harmonics, 3MHz Bandwidth

Band LTE2 3MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5									
3703.00	-18.8	V	3.0	35.9	1.0	-53.7	-13.0	-40.7	
5554.50	-16.4	V	3.0	35.5	1.0	-50.8	-13.0	-37.8	
7406.00	-12.8	V	3.0	35.7	1.0	-47.6	-13.0	-34.6	
3703.00	-16.1	H	3.0	35.9	1.0	-50.9	-13.0	-37.9	
5554.50	-17.0	H	3.0	35.5	1.0	-51.5	-13.0	-38.5	
7406.00	-13.4	H	3.0	35.7	1.0	-48.1	-13.0	-35.1	
Mid Ch, 1880									
3760.00	-20.3	V	3.0	35.8	1.0	-55.1	-13.0	-42.1	
5640.00	-17.2	V	3.0	35.5	1.0	-51.7	-13.0	-38.7	
7520.00	-13.1	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
3760.00	-21.1	H	3.0	35.8	1.0	-55.9	-13.0	-42.9	
5640.00	-16.7	H	3.0	35.5	1.0	-51.2	-13.0	-38.2	
7520.00	-12.5	H	3.0	35.7	1.0	-47.3	-13.0	-34.3	
High Ch, 1908.5									
3817.00	-18.3	V	3.0	35.8	1.0	-53.1	-13.0	-40.1	
5725.50	-15.0	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
7634.00	-11.3	V	3.0	35.8	1.0	-46.0	-13.0	-33.0	
3817.00	-20.7	H	3.0	35.8	1.0	-55.5	-13.0	-42.5	
5725.50	-14.9	H	3.0	35.5	1.0	-49.4	-13.0	-36.4	
7634.00	-12.8	H	3.0	35.8	1.0	-47.5	-13.0	-34.5	

Band

LTE2

1.4MHz

16QAM

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: X-pos EUT, Ac Charger, Headset
Location: Chamber A
Mode: LTE_16QAM Band 2 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.7									
3701.40	-20.1	V	3.0	35.9	1.0	-54.9	-13.0	-41.9	
5552.10	-17.4	V	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7402.80	-15.2	V	3.0	35.7	1.0	-50.0	-13.0	-37.0	
3701.40	-18.9	H	3.0	35.9	1.0	-53.8	-13.0	-40.8	
5552.10	-16.5	H	3.0	35.5	1.0	-51.0	-13.0	-38.0	
7402.80	-14.2	H	3.0	35.7	1.0	-48.9	-13.0	-35.9	
Mid Ch, 1880									
3760.00	-17.5	V	3.0	35.8	1.0	-44.7	-13.0	-31.7	
5640.00	-17.1	V	3.0	35.5	1.0	-51.6	-13.0	-38.6	
7520.00	-16.7	V	3.0	35.7	1.0	-51.4	-13.0	-38.4	
3760.00	-19.5	H	3.0	35.8	1.0	-54.3	-13.0	-41.3	
5640.00	-16.8	H	3.0	35.5	1.0	-51.3	-13.0	-38.3	
7520.00	-14.6	H	3.0	35.7	1.0	-49.4	-13.0	-36.4	
High Ch, 1909.3									
3818.60	-19.6	V	3.0	35.8	1.0	-54.4	-13.0	-41.4	
5727.90	-18.2	V	3.0	35.5	1.0	-52.7	-13.0	-39.7	
7637.20	-15.0	V	3.0	35.8	1.0	-49.8	-13.0	-36.8	
3818.60	-18.2	H	3.0	35.8	1.0	-53.0	-13.0	-40.0	
5727.90	-16.4	H	3.0	35.5	1.0	-50.9	-13.0	-37.9	
7637.20	-11.0	H	3.0	35.8	1.0	-45.8	-13.0	-32.8	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	X-pos EUT, Ac Charger, Headset
Location:	Chamber A
Mode:	LTE_QPSK Band 2 Harmonics, 1.4MHz Bandwidth

Band LTE2 1.4MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.7									
3701.40	-19.5	V	3.0	35.9	1.0	-54.3	-13.0	-41.3	
5552.10	-17.3	V	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7402.80	-15.0	V	3.0	35.7	1.0	-49.8	-13.0	-36.8	
3701.40	-19.3	H	3.0	35.9	1.0	-54.2	-13.0	-41.2	
5552.10	-17.3	H	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7402.80	-14.7	H	3.0	35.7	1.0	-49.5	-13.0	-36.5	
Mid Ch, 1880									
3760.00	-17.7	V	3.0	35.8	1.0	-52.5	-13.0	-39.5	
5640.00	-17.5	V	3.0	35.5	1.0	-52.0	-13.0	-39.0	
7520.00	-15.9	V	3.0	35.7	1.0	-50.6	-13.0	-37.6	
3760.00	-19.3	H	3.0	35.8	1.0	-54.1	-13.0	-41.1	
5640.00	-16.9	H	3.0	35.5	1.0	-51.4	-13.0	-38.4	
7520.00	-14.5	H	3.0	35.7	1.0	-49.3	-13.0	-36.3	
High Ch, 1909.3									
3818.60	-18.8	V	3.0	35.8	1.0	-53.6	-13.0	-40.6	
5727.90	-17.6	V	3.0	35.5	1.0	-52.1	-13.0	-39.1	
7637.20	-14.9	V	3.0	35.8	1.0	-49.7	-13.0	-36.7	
3818.60	-18.5	H	3.0	35.8	1.0	-53.3	-13.0	-40.3	
5727.90	-16.9	H	3.0	35.5	1.0	-51.4	-13.0	-38.4	
7637.20	-13.5	H	3.0	35.8	1.0	-48.2	-13.0	-35.2	

GSM

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

Company: Samsung
Project #: 15I21298
Date: 07/26/15
Test Engineer: D. Mun
Configuration: EUT w/ AC Adaptor and HS
Mode: EGPRS1900 Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 24

Band

GSM1900

EGPRS

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3.700	-19.8	V	3.0	35.4	1.0	-54.2	-13.0	-41.2	
5.551	-17.8	V	3.0	34.7	1.0	-51.6	-13.0	-38.6	
7.401	-15.9	V	3.0	34.9	1.0	-49.8	-13.0	-36.8	
3.700	-18.0	H	3.0	35.4	1.0	-52.4	-13.0	-39.4	
5.551	-16.6	H	3.0	34.7	1.0	-50.3	-13.0	-37.3	
7.401	-14.9	H	3.0	34.9	1.0	-48.9	-13.0	-35.9	
Mid Ch, 1880.0MHz									
3.760	-18.6	V	3.0	35.3	1.0	-52.9	-13.0	-39.9	
5.640	-16.9	V	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.520	-15.9	V	3.0	34.9	1.0	-49.9	-13.0	-36.9	
3.760	-18.1	H	3.0	35.3	1.0	-52.4	-13.0	-39.4	
5.640	-16.9	H	3.0	34.7	1.0	-50.7	-13.0	-37.7	
7.520	-14.3	H	3.0	34.9	1.0	-48.2	-13.0	-35.2	
High Ch, 1909.8MHz									
3.820	-18.2	V	3.0	35.3	1.0	-52.5	-13.0	-39.5	
5.729	-17.5	V	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.639	-13.6	V	3.0	35.0	1.0	-47.6	-13.0	-34.6	
3.820	-17.9	H	3.0	35.3	1.0	-52.2	-13.0	-39.2	
5.729	-17.2	H	3.0	34.7	1.0	-50.9	-13.0	-37.9	
7.639	-13.1	H	3.0	35.0	1.0	-47.0	-13.0	-34.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: Samsung
Project #: 15I21298
Date: 07/26/15
Test Engineer: D. Mun
Configuration: EUT w/ AC Adaptor and HS
Mode: GPRS1900 Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 24

Band

GSM1900

GPRS

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3.700	-19.9	V	3.0	35.4	1.0	-54.3	-13.0	-41.3	
5.551	-18.0	V	3.0	34.7	1.0	-51.8	-13.0	-38.8	
7.401	-16.1	V	3.0	34.9	1.0	-50.0	-13.0	-37.0	
3.700	-18.1	H	3.0	35.4	1.0	-52.5	-13.0	-39.5	
5.551	-16.8	H	3.0	34.7	1.0	-50.5	-13.0	-37.5	
7.401	-14.9	H	3.0	34.9	1.0	-48.8	-13.0	-35.8	
Mid Ch, 1880.0MHz									
3.760	-18.7	V	3.0	35.3	1.0	-53.1	-13.0	-40.1	
5.640	-17.1	V	3.0	34.7	1.0	-50.9	-13.0	-37.9	
7.520	-15.8	V	3.0	34.9	1.0	-49.7	-13.0	-36.7	
3.760	-18.7	H	3.0	35.3	1.0	-53.1	-13.0	-40.1	
5.640	-17.0	H	3.0	34.7	1.0	-50.8	-13.0	-37.8	
7.520	-14.9	H	3.0	34.9	1.0	-48.9	-13.0	-35.9	
High Ch, 1909.8MHz									
3.820	-18.8	V	3.0	35.3	1.0	-53.1	-13.0	-40.1	
5.729	-17.7	V	3.0	34.7	1.0	-51.5	-13.0	-38.5	
7.639	-13.8	V	3.0	35.0	1.0	-47.8	-13.0	-34.8	
3.820	-18.6	H	3.0	35.3	1.0	-52.9	-13.0	-39.9	
5.729	-17.3	H	3.0	34.7	1.0	-51.1	-13.0	-38.1	
7.639	-13.6	H	3.0	35.0	1.0	-47.5	-13.0	-34.5	

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Note: No other emissions were detected above the system noise floor.

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: EGPRS 850 MHz Harmonics

Band

GSM850

EGPRS

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2									
1648.40	-18.8	V	3.0	37.0	1.0	-54.9	-13.0	-41.9	
2472.60	-17.2	V	3.0	36.4	1.0	-52.7	-13.0	-39.7	
3296.80	-19.2	V	3.0	36.2	1.0	-54.3	-13.0	-41.3	
1648.40	-19.4	H	3.0	37.0	1.0	-55.4	-13.0	-42.4	
2472.60	-18.4	H	3.0	36.4	1.0	-53.8	-13.0	-40.8	
3296.80	-19.3	H	3.0	36.2	1.0	-54.4	-13.0	-41.4	
Mid Ch, 836.6									
1673.20	-19.4	V	3.0	37.0	1.0	-55.4	-13.0	-42.4	
2509.80	-17.2	V	3.0	36.4	1.0	-52.6	-13.0	-39.6	
3346.40	-20.0	V	3.0	36.1	1.0	-55.2	-13.0	-42.2	
1673.20	-19.3	H	3.0	37.0	1.0	-55.3	-13.0	-42.3	
2509.80	-17.8	H	3.0	36.4	1.0	-53.2	-13.0	-40.2	
3346.40	-19.2	H	3.0	36.1	1.0	-54.4	-13.0	-41.4	
High Ch, 848.8									
1697.60	-21.0	V	3.0	37.0	1.0	-57.0	-13.0	-44.0	
2546.40	-20.2	V	3.0	36.4	1.0	-55.6	-13.0	-42.6	
3395.20	-8.3	V	3.0	36.1	1.0	-43.4	-13.0	-30.4	
1697.60	-17.3	H	3.0	37.0	1.0	-53.3	-13.0	-40.3	
2546.40	-20.7	H	3.0	36.4	1.0	-56.1	-13.0	-43.1	
3395.20	-17.1	H	3.0	36.1	1.0	-52.2	-13.0	-39.2	

Band

GSM850

GPRS

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: GPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2									
1648.40	-10.9	V	3.0	37.0	1.0	-46.9	-13.0	-33.9	
2472.60	-14.7	V	3.0	36.4	1.0	-50.1	-13.0	-37.1	
3296.80	-18.7	V	3.0	36.2	1.0	-53.8	-13.0	-40.8	
1648.40	-18.7	H	3.0	37.0	1.0	-54.8	-13.0	-41.8	
2472.60	-17.8	H	3.0	36.4	1.0	-53.2	-13.0	-40.2	
3296.80	-19.0	H	3.0	36.2	1.0	-54.2	-13.0	-41.2	
Mid Ch, 836.6									
1673.20	-18.1	V	3.0	37.0	1.0	-54.1	-13.0	-41.1	
2509.80	-16.7	V	3.0	36.4	1.0	-52.1	-13.0	-39.1	
3346.40	-20.2	V	3.0	36.1	1.0	-55.3	-13.0	-42.3	
1673.20	-18.8	H	3.0	37.0	1.0	-54.8	-13.0	-41.8	
2509.80	-17.0	H	3.0	36.4	1.0	-52.4	-13.0	-39.4	
3346.40	-18.7	H	3.0	36.1	1.0	-53.9	-13.0	-40.9	
High Ch, 848.8									
1697.60	-20.6	V	3.0	37.0	1.0	-56.5	-13.0	-43.5	
2546.40	-19.8	V	3.0	36.4	1.0	-55.2	-13.0	-42.2	
3395.20	-17.6	V	3.0	36.1	1.0	-52.7	-13.0	-39.7	
1697.60	-16.9	H	3.0	37.0	1.0	-52.9	-13.0	-39.9	
2546.40	-19.9	H	3.0	36.4	1.0	-55.3	-13.0	-42.3	
3395.20	-16.5	H	3.0	36.1	1.0	-51.6	-13.0	-38.6	

WCDMA

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT w/ Earphones and AC Adapter
Mode: HSDPA B2

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 24

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Band 2	Low Ch, 1852.4MHz									
	3.705	-19.2	V	3.0	35.4	1.0	-53.6	-13.0	-40.6	
	5.557	-18.2	V	3.0	34.7	1.0	-51.9	-13.0	-38.9	
HSDPA	7.410	-16.4	V	3.0	34.9	1.0	-50.4	-13.0	-37.4	
	3.705	-19.0	H	3.0	35.4	1.0	-53.4	-13.0	-40.4	
	5.557	-17.4	H	3.0	34.7	1.0	-51.2	-13.0	-38.2	
	7.410	-16.0	H	3.0	34.9	1.0	-49.9	-13.0	-36.9	
	Mid Ch, 1880MHz									
	3.760	-19.0	V	3.0	35.3	1.0	-53.4	-13.0	-40.4	
	5.640	-17.8	V	3.0	34.7	1.0	-51.5	-13.0	-38.5	
	7.520	-15.6	V	3.0	34.9	1.0	-49.5	-13.0	-36.5	
	3.760	-19.7	H	3.0	35.3	1.0	-54.1	-13.0	-41.1	
	5.640	-17.2	H	3.0	34.7	1.0	-50.9	-13.0	-37.9	
	7.520	-14.8	H	3.0	34.9	1.0	-48.7	-13.0	-35.7	
	High Ch, 1907.6MHz									
	3.815	-18.4	V	3.0	35.3	1.0	-52.6	-13.0	-39.6	
	5.723	-17.9	V	3.0	34.7	1.0	-51.7	-13.0	-38.7	
	7.630	-14.1	V	3.0	34.9	1.0	-48.0	-13.0	-35.0	
	3.815	-18.8	H	3.0	35.3	1.0	-53.1	-13.0	-40.1	
	5.723	-17.5	H	3.0	34.7	1.0	-51.2	-13.0	-38.2	
	7.630	-14.3	H	3.0	34.9	1.0	-48.3	-13.0	-35.3	

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

Company:	Samsung
Project #:	15I21298
Date:	7/26/2015
Test Engineer:	D. Mun
Configuration:	EUT w/ Earphones and AC Adapter
Mode:	HSDPA B2

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 24

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Band 2	Low Ch, 1852.4MHz									
REL99	3.705	-19.2	V	3.0	35.4	1.0	-53.6	-13.0	-40.6	
	5.557	-18.0	V	3.0	34.7	1.0	-51.8	-13.0	-38.8	
	7.410	-16.3	V	3.0	34.9	1.0	-50.2	-13.0	-37.2	
	3.705	-18.9	H	3.0	35.4	1.0	-53.3	-13.0	-40.3	
	5.557	-17.3	H	3.0	34.7	1.0	-51.1	-13.0	-38.1	
	7.410	-16.1	H	3.0	34.9	1.0	-50.0	-13.0	-37.0	
	Mid Ch, 1880MHz									
	3.760	-18.9	V	3.0	35.3	1.0	-53.2	-13.0	-40.2	
	5.640	-18.1	V	3.0	34.7	1.0	-51.8	-13.0	-38.8	
	7.520	-15.5	V	3.0	34.9	1.0	-49.4	-13.0	-36.4	
	3.760	-19.5	H	3.0	35.3	1.0	-53.9	-13.0	-40.9	
	5.640	-17.2	H	3.0	34.7	1.0	-50.9	-13.0	-37.9	
	7.520	-15.2	H	3.0	34.9	1.0	-49.1	-13.0	-36.1	
	High Ch, 1907.6MHz									
	3.815	-18.2	V	3.0	35.3	1.0	-52.5	-13.0	-39.5	
	5.723	-17.6	V	3.0	34.7	1.0	-51.3	-13.0	-38.3	
	7.630	-13.9	V	3.0	34.9	1.0	-47.9	-13.0	-34.9	
	3.815	-19.0	H	3.0	35.3	1.0	-53.3	-13.0	-40.3	
	5.723	-17.3	H	3.0	34.7	1.0	-51.0	-13.0	-38.0	
	7.630	-13.9	H	3.0	34.9	1.0	-47.9	-13.0	-34.9	

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Band

Band 4

HSDPA

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + AC Adapter + Earphones
Location: Chamber A
Mode: HSDPA Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4									
3424.80	-24.6	V	3.0	35.9	1.0	-59.5	-13.0	-46.5	
5137.20	-17.7	V	3.0	35.5	1.0	-52.1	-13.0	-39.1	
6849.60	-15.8	V	3.0	35.7	1.0	-50.6	-13.0	-37.6	
3424.80	-24.3	H	3.0	35.9	1.0	-59.1	-13.0	-46.1	
5137.20	-16.8	H	3.0	35.5	1.0	-51.3	-13.0	-38.3	
6849.60	-14.5	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
Mid Ch, 1732.6									
3465.20	-23.0	V	3.0	35.8	1.0	-57.8	-13.0	-44.8	
5197.80	-17.3	V	3.0	35.5	1.0	-51.8	-13.0	-38.8	
6930.04	-15.0	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3465.20	-25.0	H	3.0	35.8	1.0	-59.8	-13.0	-46.8	
5197.80	-16.7	H	3.0	35.5	1.0	-51.2	-13.0	-38.2	
6930.04	-14.1	H	3.0	35.7	1.0	-48.9	-13.0	-35.9	
High Ch, 1752.6									
3505.20	-24.6	V	3.0	35.8	1.0	-59.4	-13.0	-46.4	
5257.80	-18.1	V	3.0	35.5	1.0	-52.6	-13.0	-39.6	
7010.40	-15.0	V	3.0	35.8	1.0	-49.8	-13.0	-36.8	
3505.20	-24.7	H	3.0	35.8	1.0	-59.5	-13.0	-46.5	
5257.80	-16.9	H	3.0	35.5	1.0	-51.4	-13.0	-38.4	
7010.40	-14.5	H	3.0	35.8	1.0	-49.3	-13.0	-36.3	

Band

Band 4

REL99

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

Company: Samsung
Project #: 15I21298
Date: 7/26/2015
Test Engineer: D. Mun
Configuration: EUT + AC Adapter + Earphones
Location: Chamber A
Mode: Rel 99 Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4									
3424.80	-24.5	V	3.0	35.9	1.0	-59.4	-13.0	-46.4	
5137.20	-17.3	V	3.0	35.5	1.0	-51.8	-13.0	-38.8	
6849.60	-14.9	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3424.80	-23.9	H	3.0	35.9	1.0	-58.7	-13.0	-45.7	
5137.20	-16.7	H	3.0	35.5	1.0	-51.2	-13.0	-38.2	
6849.60	-13.9	H	3.0	35.7	1.0	-48.7	-13.0	-35.7	
Mid Ch, 1732.6									
3465.20	-22.9	V	3.0	35.8	1.0	-57.7	-13.0	-44.7	
5197.80	-17.3	V	3.0	35.5	1.0	-51.7	-13.0	-38.7	
6930.04	-15.3	V	3.0	35.7	1.0	-50.1	-13.0	-37.1	
3465.20	-24.9	H	3.0	35.8	1.0	-59.7	-13.0	-46.7	
5197.80	-16.6	H	3.0	35.5	1.0	-51.1	-13.0	-38.1	
6930.04	-13.8	H	3.0	35.7	1.0	-48.5	-13.0	-35.5	
High Ch, 1752.6									
3505.20	-24.5	V	3.0	35.8	1.0	-59.3	-13.0	-46.3	
5257.80	-17.8	V	3.0	35.5	1.0	-52.3	-13.0	-39.3	
7010.40	-14.6	V	3.0	35.8	1.0	-49.4	-13.0	-36.4	
3505.20	-24.4	H	3.0	35.8	1.0	-59.2	-13.0	-46.2	
5257.80	-16.1	H	3.0	35.5	1.0	-50.6	-13.0	-37.6	
7010.40	-14.4	H	3.0	35.8	1.0	-49.1	-13.0	-36.1	

Band

Band 5

HSDPA

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: HSDPA Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4									
1652.80	-25.1	V	3.0	37.0	1.0	-61.1	-13.0	-48.1	
2479.20	-19.3	V	3.0	36.4	1.0	-54.7	-13.0	-41.7	
3305.60	-18.9	V	3.0	36.1	1.0	-54.0	-13.0	-41.0	
1652.80	-24.7	H	3.0	37.0	1.0	-60.7	-13.0	-47.7	
2479.20	-21.4	H	3.0	36.4	1.0	-56.8	-13.0	-43.8	
3305.60	-18.7	H	3.0	36.1	1.0	-53.9	-13.0	-40.9	
Mid Ch, 836.6									
1673.20	-23.8	V	3.0	37.0	1.0	-59.8	-13.0	-46.8	
2509.80	-18.3	V	3.0	36.4	1.0	-53.7	-13.0	-40.7	
3346.40	-18.2	V	3.0	36.1	1.0	-53.3	-13.0	-40.3	
1673.20	-24.9	H	3.0	37.0	1.0	-60.9	-13.0	-47.9	
2509.80	-20.8	H	3.0	36.4	1.0	-56.2	-13.0	-43.2	
3346.40	-18.0	H	3.0	36.1	1.0	-53.2	-13.0	-40.2	
High Ch, 846.6									
1693.20	-23.7	V	3.0	37.0	1.0	-59.7	-13.0	-46.7	
2539.80	-19.7	V	3.0	36.4	1.0	-55.1	-13.0	-42.1	
3386.40	-18.9	V	3.0	36.1	1.0	-54.0	-13.0	-41.0	
1693.20	-21.4	H	3.0	37.0	1.0	-57.3	-13.0	-44.3	
2539.80	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	
3386.40	-18.5	H	3.0	36.1	1.0	-53.6	-13.0	-40.6	

Band

Band 5

REL99

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: Rel99 Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4									
1652.80	-24.9	V	3.0	37.0	1.0	-60.9	-13.0	-47.9	
2479.20	-18.7	V	3.0	36.4	1.0	-54.1	-13.0	-41.1	
3305.60	-18.6	V	3.0	36.1	1.0	-53.7	-13.0	-40.7	
1652.80	-24.2	H	3.0	37.0	1.0	-60.2	-13.0	-47.2	
2479.20	-21.0	H	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3305.60	-18.3	H	3.0	36.1	1.0	-53.4	-13.0	-40.4	
Mid Ch, 836.6									
1673.20	-23.5	V	3.0	37.0	1.0	-59.5	-13.0	-46.5	
2509.80	-17.4	V	3.0	36.4	1.0	-52.8	-13.0	-39.8	
3346.40	-17.7	V	3.0	36.1	1.0	-52.8	-13.0	-39.8	
1673.20	-24.3	H	3.0	37.0	1.0	-60.3	-13.0	-47.3	
2509.80	-20.1	H	3.0	36.4	1.0	-55.6	-13.0	-42.6	
3346.40	-17.7	H	3.0	36.1	1.0	-52.9	-13.0	-39.9	
High Ch, 846.6									
1693.20	-23.2	V	3.0	37.0	1.0	-59.2	-13.0	-46.2	
2539.80	-19.1	V	3.0	36.4	1.0	-54.6	-13.0	-41.6	
3386.40	-18.7	V	3.0	36.1	1.0	-53.7	-13.0	-40.7	
1693.20	-20.8	H	3.0	37.0	1.0	-56.7	-13.0	-43.7	
2539.80	-21.9	H	3.0	36.4	1.0	-57.3	-13.0	-44.3	
3386.40	-18.0	H	3.0	36.1	1.0	-53.1	-13.0	-40.1	

LTE5

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_16QAM Band 5 Harmonics, 10MHz Bandwidth

Band
LTE5
10MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 829									
1658.00	-24.0	V	3.0	37.0	1.0	-60.0	-13.0	-47.0	
2487.00	-19.7	V	3.0	36.4	1.0	-55.1	-13.0	-42.1	
3316.00	-19.9	V	3.0	36.1	1.0	-55.1	-13.0	-42.1	
1658.00	-23.2	H	3.0	37.0	1.0	-59.2	-13.0	-46.2	
2487.00	-20.4	H	3.0	36.4	1.0	-55.8	-13.0	-42.8	
3316.00	-19.8	H	3.0	36.1	1.0	-54.9	-13.0	-41.9	
Mid Ch, 836.5									
1673.00	-22.5	V	3.0	37.0	1.0	-58.5	-13.0	-45.5	
2509.50	-18.3	V	3.0	36.4	1.0	-53.7	-13.0	-40.7	
3346.00	-17.4	V	3.0	36.1	1.0	-52.5	-13.0	-39.5	
1673.00	-22.7	H	3.0	37.0	1.0	-58.7	-13.0	-45.7	
2509.50	-20.3	H	3.0	36.4	1.0	-55.7	-13.0	-42.7	
3346.00	-19.8	H	3.0	36.1	1.0	-54.9	-13.0	-41.9	
High Ch, 844									
1688.00	-23.5	V	3.0	37.0	1.0	-59.5	-13.0	-46.5	
2532.00	-21.2	V	3.0	36.4	1.0	-56.6	-13.0	-43.6	
3376.00	-18.4	V	3.0	36.1	1.0	-53.5	-13.0	-40.5	
1688.00	-22.2	H	3.0	37.0	1.0	-58.1	-13.0	-45.1	
2532.00	-20.8	H	3.0	36.4	1.0	-56.2	-13.0	-43.2	
3376.00	-18.8	H	3.0	36.1	1.0	-53.9	-13.0	-40.9	

Band

LTE5

10MHz

QPSK

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_QPSK Band 5 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 829									
1658.00	-23.3	V	3.0	37.0	1.0	-59.3	-13.0	-46.3	
2487.00	-19.0	V	3.0	36.4	1.0	-54.4	-13.0	-41.4	
3316.00	-19.1	V	3.0	36.1	1.0	-54.2	-13.0	-41.2	
1658.00	-20.1	H	3.0	37.0	1.0	-56.1	-13.0	-43.1	
2487.00	-19.4	H	3.0	36.4	1.0	-54.8	-13.0	-41.8	
3316.00	-19.2	H	3.0	36.1	1.0	-54.3	-13.0	-41.3	
Mid Ch, 836.5									
1673.00	-21.3	V	3.0	37.0	1.0	-57.3	-13.0	-44.3	
2509.50	-17.5	V	3.0	36.4	1.0	-52.9	-13.0	-39.9	
3346.00	-16.9	V	3.0	36.1	1.0	-52.0	-13.0	-39.0	
1673.00	-21.9	H	3.0	37.0	1.0	-57.9	-13.0	-44.9	
2509.50	-19.8	H	3.0	36.4	1.0	-55.2	-13.0	-42.2	
3346.00	-19.3	H	3.0	36.1	1.0	-54.4	-13.0	-41.4	
High Ch, 844									
1688.00	-23.1	V	3.0	37.0	1.0	-59.0	-13.0	-46.0	
2532.00	-20.4	V	3.0	36.4	1.0	-55.8	-13.0	-42.8	
3376.00	-17.9	V	3.0	36.1	1.0	-53.0	-13.0	-40.0	
1688.00	-21.9	H	3.0	37.0	1.0	-57.9	-13.0	-44.9	
2532.00	-20.4	H	3.0	36.4	1.0	-55.8	-13.0	-42.8	
3376.00	-18.1	H	3.0	36.1	1.0	-53.2	-13.0	-40.2	

Band

LTE5

5MHz

16QAM

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_16QAM Band 5 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.5									
1653.00	-24.8	V	3.0	37.0	1.0	-60.8	-13.0	-47.8	
2479.50	-19.2	V	3.0	36.4	1.0	-54.6	-13.0	-41.6	
3306.00	-17.9	V	3.0	36.1	1.0	-53.0	-13.0	-40.0	
1653.00	-23.5	H	3.0	37.0	1.0	-59.6	-13.0	-46.6	
2479.50	-20.1	H	3.0	36.4	1.0	-55.5	-13.0	-42.5	
3306.00	-17.4	H	3.0	36.1	1.0	-52.5	-13.0	-39.5	
Mid Ch, 836.5									
1673.00	-23.9	V	3.0	37.0	1.0	-59.9	-13.0	-46.9	
2509.50	-18.3	V	3.0	36.4	1.0	-53.7	-13.0	-40.7	
3346.00	-16.8	V	3.0	36.1	1.0	-51.9	-13.0	-38.9	
1673.00	-22.7	H	3.0	37.0	1.0	-58.7	-13.0	-45.7	
2509.50	-21.7	H	3.0	36.4	1.0	-57.1	-13.0	-44.1	
3346.00	-16.1	H	3.0	36.1	1.0	-51.3	-13.0	-38.3	
High Ch, 846.5									
1693.00	-22.6	V	3.0	37.0	1.0	-58.5	-13.0	-45.5	
2539.50	-19.0	V	3.0	36.4	1.0	-54.4	-13.0	-41.4	
3386.00	-17.5	V	3.0	36.1	1.0	-52.6	-13.0	-39.6	
1693.00	-22.4	H	3.0	37.0	1.0	-58.4	-13.0	-45.4	
2539.50	-20.1	H	3.0	36.4	1.0	-55.5	-13.0	-42.5	
3386.00	-19.5	H	3.0	36.1	1.0	-54.6	-13.0	-41.6	

Band

LTE5

5MHz

QPSK

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_QPSK Band 5 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.5									
1653.00	-24.4	V	3.0	37.0	1.0	-60.4	-13.0	-47.4	
2479.50	-18.4	V	3.0	36.4	1.0	-53.8	-13.0	-40.8	
3306.00	-16.7	V	3.0	36.1	1.0	-51.9	-13.0	-38.9	
1653.00	-22.2	H	3.0	37.0	1.0	-58.2	-13.0	-45.2	
2479.50	-19.3	H	3.0	36.4	1.0	-54.7	-13.0	-41.7	
3306.00	-16.7	H	3.0	36.1	1.0	-51.9	-13.0	-38.9	
Mid Ch, 836.5									
1673.00	-23.5	V	3.0	37.0	1.0	-59.5	-13.0	-46.5	
2509.50	-17.4	V	3.0	36.4	1.0	-52.9	-13.0	-39.9	
3346.00	-16.4	V	3.0	36.1	1.0	-51.5	-13.0	-38.5	
1673.00	-22.2	H	3.0	37.0	1.0	-58.2	-13.0	-45.2	
2509.50	-21.0	H	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3346.00	-15.7	H	3.0	36.1	1.0	-50.8	-13.0	-37.8	
High Ch, 846.5									
1693.00	-21.9	V	3.0	37.0	1.0	-57.9	-13.0	-44.9	
2539.50	-18.6	V	3.0	36.4	1.0	-54.0	-13.0	-41.0	
3386.00	-16.9	V	3.0	36.1	1.0	-52.0	-13.0	-39.0	
1693.00	-20.9	H	3.0	37.0	1.0	-56.9	-13.0	-43.9	
2539.50	-19.6	H	3.0	36.4	1.0	-55.1	-13.0	-42.1	
3386.00	-18.9	H	3.0	36.1	1.0	-54.0	-13.0	-41.0	

Band

LTE5

3MHz

16QAM

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_16QAM Band 5 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 825.5									
1651.00	-23.7	V	3.0	37.0	1.0	-59.7	-13.0	-46.7	
2476.50	-19.3	V	3.0	36.4	1.0	-54.7	-13.0	-41.7	
3302.00	-17.3	V	3.0	36.2	1.0	-52.4	-13.0	-39.4	
1651.00	-23.5	H	3.0	37.0	1.0	-59.5	-13.0	-46.5	
2476.50	-21.0	H	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3302.00	-19.3	H	3.0	36.2	1.0	-54.5	-13.0	-41.5	
Mid Ch, 836.5									
1673.00	-23.7	V	3.0	37.0	1.0	-59.7	-13.0	-46.7	
2509.50	-18.3	V	3.0	36.4	1.0	-53.7	-13.0	-40.7	
3346.00	-17.2	V	3.0	36.1	1.0	-52.3	-13.0	-39.3	
1673.00	-22.6	H	3.0	37.0	1.0	-58.5	-13.0	-45.5	
2509.50	-22.7	H	3.0	36.4	1.0	-58.1	-13.0	-45.1	
3346.00	-19.2	H	3.0	36.1	1.0	-54.3	-13.0	-41.3	
High Ch, 847.5									
1695.00	-22.7	V	3.0	37.0	1.0	-58.7	-13.0	-45.7	
2542.50	-21.2	V	3.0	36.4	1.0	-56.6	-13.0	-43.6	
3390.00	-18.1	V	3.0	36.1	1.0	-53.2	-13.0	-40.2	
1695.00	-22.8	H	3.0	37.0	1.0	-58.8	-13.0	-45.8	
2542.50	-20.5	H	3.0	36.4	1.0	-55.9	-13.0	-42.9	
3390.00	-19.4	H	3.0	36.1	1.0	-54.5	-13.0	-41.5	

Band

LTE5

3MHz

QPSK

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_QPSK Band 5 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 825.5									
1651.00	-23.3	V	3.0	37.0	1.0	-59.4	-13.0	-46.4	
2476.50	-18.4	V	3.0	36.4	1.0	-53.8	-13.0	-40.8	
3302.00	-16.2	V	3.0	36.2	1.0	-51.3	-13.0	-38.3	
1651.00	-22.9	H	3.0	37.0	1.0	-58.9	-13.0	-45.9	
2476.50	-20.2	H	3.0	36.4	1.0	-55.6	-13.0	-42.6	
3302.00	-18.4	H	3.0	36.2	1.0	-53.5	-13.0	-40.5	
Mid Ch, 836.5									
1673.00	-22.9	V	3.0	37.0	1.0	-58.9	-13.0	-45.9	
2509.50	-17.5	V	3.0	36.4	1.0	-52.9	-13.0	-39.9	
3346.00	-16.6	V	3.0	36.1	1.0	-51.7	-13.0	-38.7	
1673.00	-21.6	H	3.0	37.0	1.0	-57.6	-13.0	-44.6	
2509.50	-21.9	H	3.0	36.4	1.0	-57.3	-13.0	-44.3	
3346.00	-18.9	H	3.0	36.1	1.0	-54.0	-13.0	-41.0	
High Ch, 847.5									
1695.00	-22.2	V	3.0	37.0	1.0	-58.2	-13.0	-45.2	
2542.50	-21.0	V	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3390.00	-17.6	V	3.0	36.1	1.0	-52.7	-13.0	-39.7	
1695.00	-21.7	H	3.0	37.0	1.0	-57.7	-13.0	-44.7	
2542.50	-19.9	H	3.0	36.4	1.0	-55.3	-13.0	-42.3	
3390.00	-18.7	H	3.0	36.1	1.0	-53.8	-13.0	-40.8	

Band

LTE5

1.4MHz

16QAM

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_16QAM Band 5 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.7									
1649.40	-24.0	V	3.0	37.0	1.0	-60.0	-13.0	-47.0	
2474.10	-18.5	V	3.0	36.4	1.0	-54.0	-13.0	-41.0	
3298.80	-17.6	V	3.0	36.2	1.0	-52.7	-13.0	-39.7	
1649.40	-23.0	H	3.0	37.0	1.0	-59.0	-13.0	-46.0	
2474.10	-21.1	H	3.0	36.4	1.0	-56.6	-13.0	-43.6	
3298.80	-19.3	H	3.0	36.2	1.0	-54.4	-13.0	-41.4	
Mid Ch, 836.5									
1673.00	-25.9	V	3.0	37.0	1.0	-61.9	-13.0	-48.9	
2509.50	-19.7	V	3.0	36.4	1.0	-55.1	-13.0	-42.1	
3346.00	-17.2	V	3.0	36.1	1.0	-52.3	-13.0	-39.3	
1673.00	-23.5	H	3.0	37.0	1.0	-59.5	-13.0	-46.5	
2509.50	-21.5	H	3.0	36.4	1.0	-56.9	-13.0	-43.9	
3346.00	-18.8	H	3.0	36.1	1.0	-53.9	-13.0	-40.9	
High Ch, 848.3									
1696.60	-22.9	V	3.0	37.0	1.0	-58.9	-13.0	-45.9	
2544.90	-19.4	V	3.0	36.4	1.0	-54.8	-13.0	-41.8	
3393.20	-17.8	V	3.0	36.1	1.0	-52.9	-13.0	-39.9	
1696.60	-21.8	H	3.0	37.0	1.0	-57.7	-13.0	-44.7	
2544.90	-21.3	H	3.0	36.4	1.0	-56.7	-13.0	-43.7	
3393.20	-17.4	H	3.0	36.1	1.0	-52.4	-13.0	-39.4	

Band

LTE5

1.4MHz

QPSK

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

Company: LIONS
Project #: 15I21298
Date: 7/27/2015
Test Engineer: G. Escano
Configuration: EUT + AC Adapter + HS
Location: Chamber A
Mode: LTE_QPSK Band 5 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.7									
1649.40	-23.5	V	3.0	37.0	1.0	-59.6	-13.0	-46.6	
2474.10	-17.7	V	3.0	36.4	1.0	-53.1	-13.0	-40.1	
3298.80	-16.7	V	3.0	36.2	1.0	-51.9	-13.0	-38.9	
1649.40	-22.3	H	3.0	37.0	1.0	-58.4	-13.0	-45.4	
2474.10	-20.6	H	3.0	36.4	1.0	-56.1	-13.0	-43.1	
3298.80	-19.1	H	3.0	36.2	1.0	-54.2	-13.0	-41.2	
Mid Ch, 836.5									
1673.00	-25.5	V	3.0	37.0	1.0	-61.5	-13.0	-48.5	
2509.50	-18.9	V	3.0	36.4	1.0	-54.3	-13.0	-41.3	
3346.00	-16.5	V	3.0	36.1	1.0	-51.7	-13.0	-38.7	
1673.00	-22.6	H	3.0	37.0	1.0	-58.6	-13.0	-45.6	
2509.50	-21.0	H	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3346.00	-18.1	H	3.0	36.1	1.0	-53.2	-13.0	-40.2	
High Ch, 848.3									
1696.60	-22.4	V	3.0	37.0	1.0	-58.4	-13.0	-45.4	
2544.90	-18.9	V	3.0	36.4	1.0	-54.3	-13.0	-41.3	
3393.20	-17.1	V	3.0	36.1	1.0	-52.2	-13.0	-39.2	
1696.60	-21.1	H	3.0	37.0	1.0	-57.1	-13.0	-44.1	
2544.90	-20.8	H	3.0	36.4	1.0	-56.2	-13.0	-43.2	
3393.20	-16.7	H	3.0	36.1	1.0	-51.8	-13.0	-38.8	

LTE17

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

Company:	Samsung
Project #:	15I21298
Date:	7/24/2015
Test Engineer:	R.Alegre
Configuration:	EUT + Charger + Headset
Location:	Chamber C
Mode:	LTE_16QAM Band 17 Harmonics, 10MHz Bandwidth

Band

LTE17

10MHz

16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 709									
1418.00	-27.3	V	3.0	37.4	1.0	-63.7	-13.0	-50.7	
2127.00	-21.7	V	3.0	36.6	1.0	-57.2	-13.0	-44.2	
2836.00	-20.4	V	3.0	36.4	1.0	-55.8	-13.0	-42.8	
1418.00	-26.8	H	3.0	37.4	1.0	-63.2	-13.0	-50.2	
2127.00	-23.5	H	3.0	36.6	1.0	-59.0	-13.0	-46.0	
2836.00	-21.7	H	3.0	36.4	1.0	-57.1	-13.0	-44.1	
Mid Ch, 710									
1420.00	-28.1	V	3.0	37.3	1.0	-64.5	-13.0	-51.5	
2130.00	-21.9	V	3.0	36.6	1.0	-57.5	-13.0	-44.5	
2840.00	-19.9	V	3.0	36.4	1.0	-55.3	-13.0	-42.3	
1420.00	-27.2	H	3.0	37.3	1.0	-63.6	-13.0	-50.6	
2130.00	-22.7	H	3.0	36.6	1.0	-58.3	-13.0	-45.3	
2840.00	-22.0	H	3.0	36.4	1.0	-57.4	-13.0	-44.4	
High Ch, 711									
1422.00	-27.3	V	3.0	37.3	1.0	-63.7	-13.0	-50.7	
2133.00	-21.6	V	3.0	36.6	1.0	-57.2	-13.0	-44.2	
2844.00	-19.8	V	3.0	36.4	1.0	-55.2	-13.0	-42.2	
1422.00	-28.1	H	3.0	37.3	1.0	-64.5	-13.0	-51.5	
2133.00	-23.6	H	3.0	36.6	1.0	-59.2	-13.0	-46.2	
2844.00	-22.1	H	3.0	36.4	1.0	-57.5	-13.0	-44.5	

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

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT + Charger + Headset
Location: Chamber C
Mode: LTE_QPSK Band 17 Harmonics, 10MHz Bandwidth

Band LTE17 10MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 709									
1418.00	-27.2	V	3.0	37.4	1.0	-63.6	-13.0	-50.6	
2127.00	-21.7	V	3.0	36.6	1.0	-57.3	-13.0	-44.3	
2836.00	-20.2	V	3.0	36.4	1.0	-55.6	-13.0	-42.6	
1418.00	-26.5	H	3.0	37.4	1.0	-62.9	-13.0	-49.9	
2127.00	-23.4	H	3.0	36.6	1.0	-58.9	-13.0	-45.9	
2836.00	-21.8	H	3.0	36.4	1.0	-57.2	-13.0	-44.2	
Mid Ch, 710									
1420.00	-27.7	V	3.0	37.3	1.0	-64.0	-13.0	-51.0	
2130.00	-21.6	V	3.0	36.6	1.0	-57.2	-13.0	-44.2	
2840.00	-19.7	V	3.0	36.4	1.0	-55.1	-13.0	-42.1	
1420.00	-27.1	H	3.0	37.3	1.0	-63.4	-13.0	-50.4	
2130.00	-22.5	H	3.0	36.6	1.0	-58.1	-13.0	-45.1	
2840.00	-21.4	H	3.0	36.4	1.0	-56.8	-13.0	-43.8	
High Ch, 711									
1422.00	-27.2	V	3.0	37.3	1.0	-63.6	-13.0	-50.6	
2133.00	-21.6	V	3.0	36.6	1.0	-57.1	-13.0	-44.1	
2844.00	-19.1	V	3.0	36.4	1.0	-54.5	-13.0	-41.5	
1422.00	-27.7	H	3.0	37.3	1.0	-64.0	-13.0	-51.0	
2133.00	-23.3	H	3.0	36.6	1.0	-58.8	-13.0	-45.8	
2844.00	-21.8	H	3.0	36.4	1.0	-57.2	-13.0	-44.2	

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

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT + Charger + Headset
Location: Chamber C
Mode: LTE_16QAM Band 17 Harmonics, 5MHz Bandwidth

Band
LTE17
5MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 706.5									
1413.00	-27.5	V	3.0	37.4	1.0	-63.8	-13.0	-50.8	
2119.50	-21.8	V	3.0	36.6	1.0	-57.4	-13.0	-44.4	
2826.00	-20.0	V	3.0	36.4	1.0	-55.4	-13.0	-42.4	
1413.00	-27.1	H	3.0	37.4	1.0	-63.5	-13.0	-50.5	
2119.50	-23.8	H	3.0	36.6	1.0	-59.4	-13.0	-46.4	
2826.00	-21.9	H	3.0	36.4	1.0	-57.3	-13.0	-44.3	
Mid Ch, 710									
1420.00	-27.9	V	3.0	37.3	1.0	-64.3	-13.0	-51.3	
2130.00	-21.9	V	3.0	36.6	1.0	-57.5	-13.0	-44.5	
2840.00	-19.9	V	3.0	36.4	1.0	-55.3	-13.0	-42.3	
1420.00	-27.2	H	3.0	37.3	1.0	-63.5	-13.0	-50.5	
2130.00	-22.9	H	3.0	36.6	1.0	-58.5	-13.0	-45.5	
2840.00	-21.8	H	3.0	36.4	1.0	-57.2	-13.0	-44.2	
High Ch, 713.5									
1427.00	-27.2	V	3.0	37.3	1.0	-63.6	-13.0	-50.6	
2140.50	-21.7	V	3.0	36.6	1.0	-57.3	-13.0	-44.3	
2854.00	-19.1	V	3.0	36.4	1.0	-54.5	-13.0	-41.5	
1427.00	-27.6	H	3.0	37.3	1.0	-64.0	-13.0	-51.0	
2140.50	-23.6	H	3.0	36.6	1.0	-59.1	-13.0	-46.1	
2854.00	-21.8	H	3.0	36.4	1.0	-57.1	-13.0	-44.1	

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

Company: Samsung
Project #: 15I21298
Date: 7/24/2015
Test Engineer: R.Alegre
Configuration: EUT + Charger + Headset
Location: Chamber C
Mode: LTE_QPSK Band 17 Harmonics, 5MHz Bandwidth

Band	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 706.5									
LTE17	1413.00	-27.3	V	3.0	37.4	1.0	-63.6	-13.0	-50.6	
	2119.50	-21.8	V	3.0	36.6	1.0	-57.3	-13.0	-44.3	
5MHz	2826.00	-20.2	V	3.0	36.4	1.0	-55.6	-13.0	-42.6	
	1413.00	-26.7	H	3.0	37.4	1.0	-63.1	-13.0	-50.1	
	2119.50	-23.3	H	3.0	36.6	1.0	-58.9	-13.0	-45.9	
QPSK	2826.00	-21.8	H	3.0	36.4	1.0	-57.2	-13.0	-44.2	
	Mid Ch, 710									
	1420.00	-27.7	V	3.0	37.3	1.0	-64.1	-13.0	-51.1	
	2130.00	-21.8	V	3.0	36.6	1.0	-57.4	-13.0	-44.4	
	2840.00	-19.6	V	3.0	36.4	1.0	-55.0	-13.0	-42.0	
	1420.00	-27.1	H	3.0	37.3	1.0	-63.5	-13.0	-50.5	
	2130.00	-22.7	H	3.0	36.6	1.0	-58.3	-13.0	-45.3	
	2840.00	-21.5	H	3.0	36.4	1.0	-56.9	-13.0	-43.9	
	High Ch, 713.5									
	1427.00	-27.3	V	3.0	37.3	1.0	-63.6	-13.0	-50.6	
	2140.50	-21.5	V	3.0	36.6	1.0	-57.1	-13.0	-44.1	
	2854.00	-19.3	V	3.0	36.4	1.0	-54.7	-13.0	-41.7	
	1427.00	-27.7	H	3.0	37.3	1.0	-64.0	-13.0	-51.0	
	2140.50	-23.1	H	3.0	36.6	1.0	-58.7	-13.0	-45.7	
	2854.00	-21.7	H	3.0	36.4	1.0	-57.0	-13.0	-44.0	