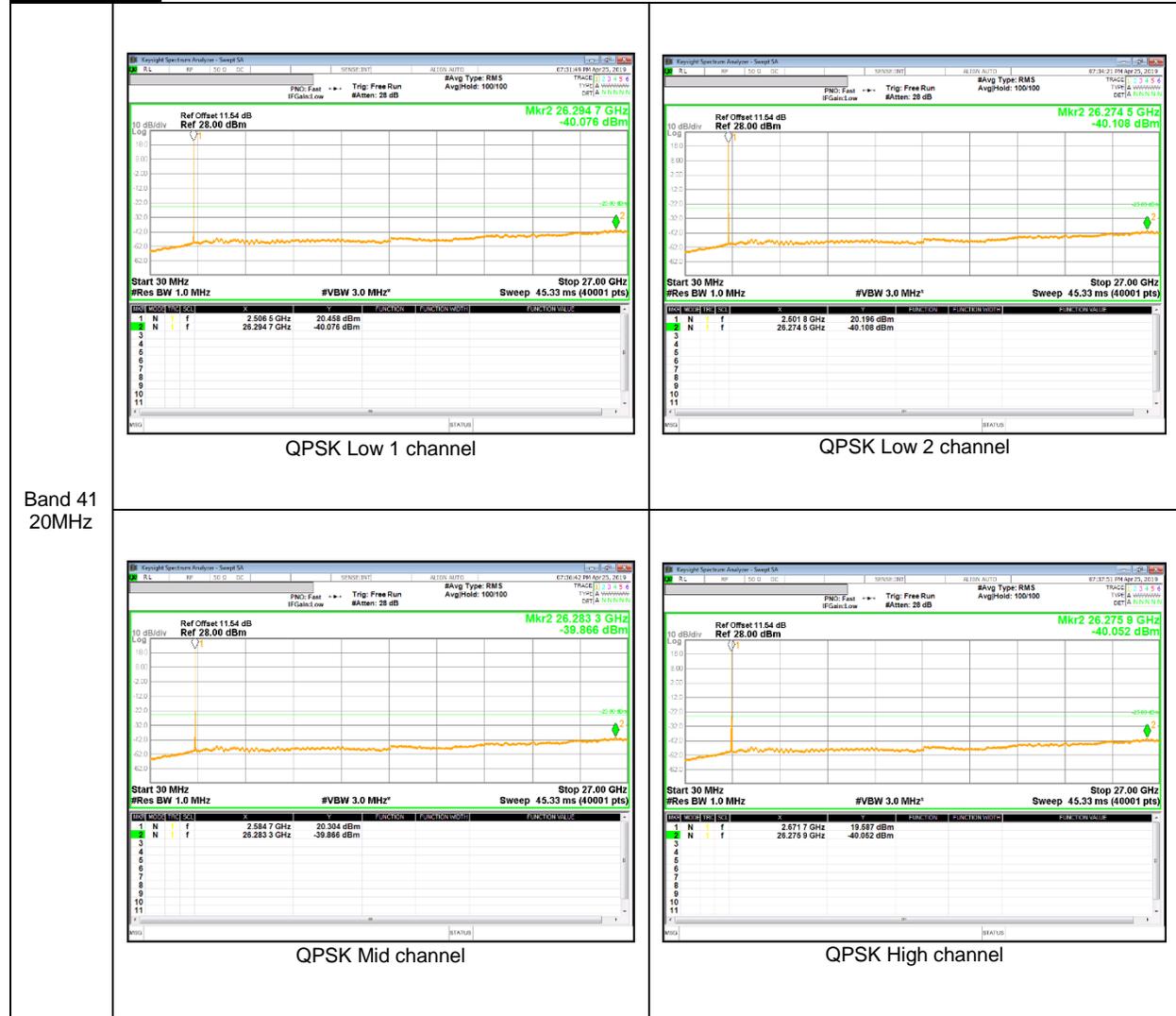


LTE Band 41



LTE Band 66



LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 38

LTE Band 38 (Frequency range: 2570-2620 MHz) is covered by LTE Band 41 (Frequency range: 2496-2690 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

9.4. FREQUENCY STABILITY

RULE PART(S)

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

IC : RSS-130 (4.5), RSS-132 (5.3), RSS-133 (6.3), RSS-139 (6.4), RSS-195 (5.4), RSS-199 (4.3)

LIMITS

§22.355, §90.213 - 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.

§90.539(e) - The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

9.4.1. FREQUENCY STABILITY RESULTS

GSM 850, Channel 128/251, Frequency 824.2/848.8 MHz

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.85	50	824.19998380	-0.001	848.79999000	-0.001	2.5	
3.85	40	824.19999005	-0.009	848.79998117	0.009	2.5	
3.85	30	824.19998083	0.002	848.79998988	-0.001	2.5	
3.85	20	824.19998261	0.000	848.79998916	0.000	2.5	
3.85	10	824.19998579	-0.004	848.79998848	0.001	2.5	
3.85	0	824.19999041	-0.009	848.79998532	0.005	2.5	
3.85	-10	824.19998636	-0.005	848.79998035	0.010	2.5	
3.85	-20	824.19998004	0.003	848.79998485	0.005	2.5	
3.85	-30	824.19998633	-0.005	848.79998134	0.009	2.5	

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.85	20	824.19998261	0	848.79998916	0	2.5	
4.40	20	824.19998459	-0.002	848.79999100	-0.002	2.5	
3.60	20	824.19998408	-0.002	848.79998920	0.000	2.5	

GSM 1900, Channel 512/810, Frequency 1850.0/1910.0 MHz

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0751	1909.9243		
Extreme (50C)		1850.0750	1909.9243	-21.9	-0.012
Extreme (40C)		1850.0750	1909.9243	-26.5	-0.014
Extreme (30C)		1850.0750	1909.9243	-25.1	-0.013
Extreme (10C)		1850.0750	1909.9243	-20.0	-0.011
Extreme (0C)		1850.0750	1909.9243	-21.9	-0.012
Extreme (-10C)		1850.0750	1909.9243	-29.7	-0.016
Extreme (-20C)		1850.0750	1909.9243	-19.5	-0.010
Extreme (-30C)		1850.0750	1909.9243	-19.3	-0.010
20C		15%	1850.0750	1909.9243	-23.3
	-15%	1850.0750	1909.9243	-22.1	-0.012
	End Point	1850.0750	1909.9243	-23.6	-0.013

WCDMA Band 5 (Rel. 99)

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2066.000	Hz	High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse					Limit [ppm]
		Low Channel		High Channel		Limit [ppm]	
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.85	50	826.39998654	0.000	846.59998608	0.001	2.5	
3.85	40	826.39998163	0.006	846.59998448	0.003	2.5	
3.85	30	826.39998948	-0.004	846.59998442	0.003	2.5	
3.85	20	826.39998636	0.000	846.59998720	0.000	2.5	
3.85	10	826.39998871	-0.003	846.59998624	0.001	2.5	
3.85	0	826.39998442	0.002	846.59998412	0.004	2.5	
3.85	-10	826.39998887	-0.003	846.59998412	0.004	2.5	
3.85	-20	826.39998949	-0.004	846.59998815	-0.001	2.5	
3.85	-30	826.39998473	0.002	846.59998182	0.006	2.5	

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2066.000	Hz	High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse					Limit [ppm]
		Low Channel		High Channel		Limit [ppm]	
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.85	20	826.39998636	0	846.59998720	0	2.5	
4.40	20	826.39998946	-0.004	846.59998866	-0.002	2.5	
3.60	20	826.39998957	-0.004	846.59998726	0.000	2.5	

WCDMA Band 4 (Rel. 99)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1712.3979	1752.6021		
Extreme (50C)		1712.3979	1752.6021	-23.5	-0.014
Extreme (40C)		1712.3979	1752.6021	-26.2	-0.015
Extreme (30C)		1712.3979	1752.6020	-29.6	-0.017
Extreme (10C)		1712.3979	1752.6021	-24.1	-0.014
Extreme (0C)		1712.3979	1752.6021	-21.7	-0.012
Extreme (-10C)		1712.3979	1752.6021	-21.8	-0.013
Extreme (-20C)		1712.3979	1752.6020	-29.6	-0.017
Extreme (-30C)		1712.3979	1752.6021	-21.4	-0.012
20C		15%	1712.3979	1752.6021	-21.4
	-15%	1712.3979	1752.6021	-21.7	-0.013
	End Point	1712.3979	1752.6021	-26.4	-0.015

WCDMA Band 2 (HSDPA)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1852.3979	1907.6021		
Extreme (50C)		1852.3979	1907.6021	-26.0	-0.014
Extreme (40C)		1852.3979	1907.6021	-21.4	-0.011
Extreme (30C)		1852.3979	1907.6021	-27.6	-0.015
Extreme (10C)		1852.3979	1907.6021	-29.2	-0.016
Extreme (0C)		1852.3979	1907.6021	-21.6	-0.011
Extreme (-10C)		1852.3979	1907.6021	-20.8	-0.011
Extreme (-20C)		1852.3979	1907.6021	-20.3	-0.011
Extreme (-30C)		1852.3979	1907.6021	-30.0	-0.016
20C	15%	1852.3979	1907.6021	-22.4	-0.012
	-15%	1852.3979	1907.6021	-24.2	-0.013
	End Point	1852.3979	1907.6021	-27.6	-0.015

LTE Band 2 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.6995	1909.3005		
Extreme (50C)		1850.6994	1909.3005	-20.6	-0.011
Extreme (40C)		1850.6994	1909.3005	-20.7	-0.011
Extreme (30C)		1850.6994	1909.3005	-19.6	-0.010
Extreme (10C)		1850.6994	1909.3005	-29.4	-0.016
Extreme (0C)		1850.6994	1909.3005	-25.4	-0.014
Extreme (-10C)		1850.6994	1909.3005	-26.0	-0.014
Extreme (-20C)		1850.6994	1909.3005	-29.8	-0.016
Extreme (-30C)		1850.6994	1909.3005	-20.2	-0.011
20C		15%	1850.6994	1909.3005	-27.0
	-15%	1850.6994	1909.3005	-22.6	-0.012
	End Point	1850.6994	1909.3005	-20.0	-0.011

LTE Band 5 (QPSK)

Reference Frequency : LTE Band 5 Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2061.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.85	50	824.69998737	-0.007	848.29998279	0.007	2.5	
3.85	40	824.69998845	-0.009	848.29998503	0.005	2.5	
3.85	30	824.69999023	-0.011	848.29998413	0.006	2.5	
3.85	20	824.69998144	0.000	848.29998909	0.000	2.5	
3.85	10	824.69999090	-0.011	848.29998737	0.002	2.5	
3.85	0	824.69998826	-0.008	848.29998376	0.006	2.5	
3.85	-10	824.69998669	-0.006	848.29998671	0.003	2.5	
3.85	-20	824.69998331	-0.002	848.29998684	0.003	2.5	
3.85	-30	824.69998809	-0.008	848.29998574	0.004	2.5	

Reference Frequency : LTE Band 5 Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20°C							
Limit: +/- 2.5 ppm =		Low Channel	2061.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse				Limit [ppm]	
		Low Channel		High Channel			
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]		
3.85	20	824.69998144	0	848.29998909	0	2.5	
4.40	20	824.69998063	0.001	848.29998137	0.009	2.5	
3.60	20	824.69998004	0.002	848.29998736	0.002	2.5	

LTE Band 7 (Lowest Frequency: QPSK / Highest Frequency: 16QAM)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2502.4978	2567.5023		
Extreme (50C)		2502.4977	2567.5022	-29.7	-0.012
Extreme (40C)		2502.4977	2567.5022	-20.1	-0.008
Extreme (30C)		2502.4977	2567.5022	-20.5	-0.008
Extreme (10C)		2502.4977	2567.5022	-23.0	-0.009
Extreme (0C)		2502.4977	2567.5022	-20.8	-0.008
Extreme (-10C)		2502.4977	2567.5022	-29.7	-0.012
Extreme (-20C)		2502.4977	2567.5022	-22.9	-0.009
Extreme (-30C)		2502.4977	2567.5022	-21.0	-0.008
20C		15%	2502.4977	2567.5022	-29.4
	-15%	2502.4977	2567.5022	-19.3	-0.008
	End Point	2502.4977	2567.5022	-27.3	-0.011

LTE Band 12 (QPSK)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW (MHz)	F high @ End of OBW (MHz)		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.6995	715.3005		
Extreme (50C)		699.6994	715.3005	-10.7	-0.015
Extreme (40C)		699.6994	715.3005	-11.8	-0.017
Extreme (30C)		699.6994	715.3005	-13.4	-0.019
Extreme (10C)		699.6994	715.3005	-12.2	-0.017
Extreme (0C)		699.6994	715.3005	-10.7	-0.015
Extreme (-10C)		699.6994	715.3005	-17.2	-0.024
Extreme (-20C)		699.6994	715.3005	-16.3	-0.023
Extreme (-30C)		699.6994	715.3005	-10.0	-0.014
20C		15%	699.6994	715.3005	-14.5
	-15%	699.6994	715.3005	-11.4	-0.016
	End Point	699.6994	715.3005	-10.1	-0.014

LTE Band 13 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

LTE Band 41 (QPSK)

LTE Band 66 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 38

LTE Band 38 (Frequency range: 2570-2620 MHz) is covered by LTE Band 41 (Frequency range: 2496-2690 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

10. RADIATED TEST RESULTS

10.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232 and §27.50

IC : RSS-130 (4.6), RSS-132 (5.4), RSS-133 (6.4), RSS-139 (6.5). RSS-195 (5.5), RSS-199 (4.4)

LIMITS

Part 22.913(a)(5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Part 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.

Part 27.50:

(a) The following power limits and related requirements apply to stations transmitting in the 2305-2320 MHz band or the 2345-2360 MHz band.

(3) Mobile and portable stations. (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(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.

(h)(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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 603 E Clause 2.2.17; ESU40 setting reference to 971168 D01 v03r01

For radiated output power measurement with a ESU40:

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

TEST RESULTS

10.1.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	128	824.2	26.12	409.26
		190	836.6	26.66	463.45
		251	848.8	24.73	297.17
	EGPRS	128	824.2	19.91	97.95
		190	836.6	21.07	127.94
		251	848.8	19.27	84.53
GSM1900	GPRS	512	1850.2	26.46	442.59
		661	1880	28.56	717.79
		810	1909.8	30.01	1002.31
	EGPRS	512	1850.2	23.01	199.99
		661	1880	24.78	300.61
		810	1909.8	26.22	418.79

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	18.23	66.53
		4183	836.6	18.57	71.94
		4233	846.6	18.71	74.30
	HSDPA	4132	826.4	16.74	47.21
		4183	836.6	17.06	50.82
		4233	846.6	17.14	51.76
Band 4	REL99	1312	1712.4	22.29	169.43
		1413	1732.6	22.94	196.79
		1513	1752.6	22.30	169.82
	HSDPA	1312	1712.4	22.22	166.72
		1413	1732.6	22.43	174.98
		1513	1752.6	22.27	168.66
Band 2	REL99	9262	1852.4	22.43	174.98
		9400	1880.0	23.16	207.01
		9538	1907.6	22.68	185.35
	HSDPA	9262	1852.4	22.10	162.18
		9400	1880.0	22.91	195.43
		9538	1907.6	22.36	172.19

LTE Band 2

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 2	20	QPSK	1 / 99	1860.0	21.17	130.92
			1 / 0	1880.0	21.74	149.28
			1 / 49	1900.0	19.38	86.70
		16QAM	1 / 99	1860.0	19.96	99.08
			1 / 0	1880.0	20.69	117.22
			1 / 99	1900.0	20.20	104.71
	15	QPSK	1 / 37	1857.5	20.39	109.40
			1 / 0	1880.0	21.56	143.22
			1 / 37	1902.5	21.03	126.77
		16QAM	1 / 37	1857.5	19.17	82.60
			1 / 0	1880.0	20.03	100.69
			1 / 74	1902.5	20.31	107.40
	10	QPSK	1 / 0	1855.0	18.05	63.83
			1 / 49	1880.0	21.53	142.23
			1 / 49	1905.0	19.41	87.30
		16QAM	1 / 49	1855.0	18.11	64.71
			1 / 49	1880.0	19.84	96.38
			1 / 49	1905.0	18.73	74.64
	5	QPSK	1 / 24	1852.5	17.96	62.52
			1 / 24	1880.0	20.73	118.30
			1 / 24	1907.5	19.57	90.57
		16QAM	1 / 24	1852.5	16.48	44.46
			1 / 24	1880.0	19.44	87.90
			1 / 24	1907.5	18.37	68.71
	3	QPSK	1 / 8	1851.5	19.18	82.79
			1 / 14	1880.0	21.16	130.62
			1 / 14	1908.5	20.74	118.58
		16QAM	1 / 8	1851.5	18.12	64.86
			1 / 14	1880.0	20.14	103.28
			1 / 8	1908.5	19.62	91.62
1.4	QPSK	1 / 5	1850.7	17.49	56.10	
		1 / 5	1880.0	20.77	119.40	
		1 / 5	1909.3	19.15	82.22	
	16QAM	1 / 5	1850.7	16.17	41.40	
		1 / 0	1880.0	19.88	97.27	
		1 / 0	1909.3	17.87	61.24	

LTE Band 5

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 5	10	QPSK	1 / 0	829.0	18.54	71.45
			1 / 0	836.5	18.56	71.78
			1 / 25	844.0	18.38	68.87
		16QAM	1 / 0	829.0	17.23	52.84
			1 / 0	836.5	17.24	52.97
			1 / 0	844.0	17.44	55.46
	5	QPSK	1 / 0	826.5	18.04	63.68
			1 / 0	836.5	18.47	70.31
			1 / 24	846.5	17.65	58.21
		16QAM	1 / 0	826.5	16.92	49.20
			1 / 0	836.5	17.07	50.93
			1 / 0	846.5	16.37	43.35
	3	QPSK	1 / 0	825.5	18.10	64.57
			1 / 14	836.5	18.39	69.02
			1 / 14	847.5	17.30	53.70
		16QAM	1 / 14	825.5	16.38	43.45
			1 / 8	836.5	17.15	51.88
			1 / 0	847.5	16.16	41.30
	1.4	QPSK	1 / 0	824.7	17.72	59.16
			1 / 0	836.5	18.59	72.28
			1 / 0	848.3	17.22	52.72
		16QAM	1 / 5	824.7	16.59	45.60
			1 / 3	836.5	18.47	70.31
			1 / 5	848.3	15.90	38.90

LTE Band 7

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 7	20	QPSK	1 / 0	2510.0	19.49	88.92
			1 / 0	2535.0	19.11	81.47
			1 / 0	2560.0	20.62	115.35
		16QAM	1 / 0	2510.0	18.11	64.71
			1 / 0	2535.0	17.70	58.88
			1 / 0	2560.0	19.34	85.90
	15	QPSK	1 / 0	2507.5	19.75	94.41
			1 / 0	2535.0	19.57	90.57
			1 / 0	2562.5	20.75	118.85
		16QAM	1 / 0	2507.5	18.67	73.62
			1 / 0	2535.0	18.51	70.96
			1 / 0	2562.5	19.39	86.90
	10	QPSK	1 / 0	2505.0	19.62	91.62
			1 / 0	2535.0	19.89	97.50
			1 / 0	2565.0	20.67	116.68
		16QAM	1 / 0	2505.0	18.60	72.44
			1 / 49	2535.0	18.13	65.01
			1 / 0	2565.0	19.69	93.11
	5	QPSK	1 / 12	2502.5	19.77	94.84
			1 / 12	2535.0	19.79	95.28
			1 / 0	2567.5	20.25	105.93
		16QAM	1 / 0	2502.5	18.67	73.62
			1 / 12	2535.0	18.39	69.02
			1 / 0	2567.5	18.93	78.16

LTE Band 12

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 12	10	QPSK	1 / 0	704.0	17.34	54.20
			1 / 0	707.5	17.37	54.58
			1 / 0	711.0	17.15	51.88
		16QAM	1 / 0	704.0	16.29	42.56
			1 / 0	707.5	15.90	38.90
			1 / 0	711.0	16.02	39.99
	5	QPSK	1 / 0	701.5	17.20	52.48
			1 / 12	707.5	17.15	51.88
			1 / 0	713.5	16.91	49.09
		16QAM	1 / 24	701.5	15.91	38.99
			1 / 12	707.5	15.98	39.63
			1 / 0	713.5	15.70	37.15
	3	QPSK	1 / 0	700.5	17.46	55.72
			1 / 0	707.5	17.23	52.84
			1 / 8	714.5	16.77	47.53
		16QAM	1 / 0	700.5	16.30	42.66
			1 / 0	707.5	16.11	40.83
			1 / 0	714.5	15.47	35.24
	1.4	QPSK	1 / 0	699.7	17.25	53.09
			1 / 5	707.5	17.31	53.83
			1 / 5	715.3	16.43	43.95
		16QAM	1 / 3	699.7	16.27	42.36
			1 / 5	707.5	15.90	38.90
			1 / 5	715.3	15.13	32.58

LTE Band 13

Band	BW	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP	
	[MHz]				[dBm]	[mW]
Band 13	10	QPSK	1 / 0	782.0	21.30	134.90
		16QAM	1 / 0	782.0	20.00	100.00
	5	QPSK	1 / 0	779.5	21.37	137.09
			1 / 0	782.0	21.43	139.00
			1 / 0	784.5	21.26	133.66
		16QAM	1 / 0	779.5	20.31	107.40
			1 / 0	782.0	19.94	98.63
			1 / 0	784.5	19.93	98.40

LTE Band 41

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 41	20	QPSK	1 / 49	2506.0	20.54	113.24
			1 / 0	2510.0	21.76	149.97
			1 / 0	2593.0	20.19	104.47
			1 / 0	2680.0	22.31	170.22
		16QAM	1 / 0	2506.0	19.37	86.50
			1 / 0	2510.0	20.23	105.44
			1 / 0	2593.0	19.50	89.13
			1 / 0	2680.0	21.99	158.12
	15	QPSK	1 / 0	2503.5	20.07	101.62
			1 / 0	2507.5	21.57	143.55
			1 / 0	2593.0	21.02	126.47
			1 / 0	2682.5	22.15	164.06
		16QAM	1 / 74	2503.5	20.51	112.46
			1 / 37	2507.5	20.63	115.61
			1 / 74	2593.0	20.04	100.93
			1 / 37	2682.5	22.46	176.20
	10	QPSK	1 / 0	2501.0	18.80	75.86
			1 / 0	2505.0	19.26	84.33
			1 / 0	2593.0	20.04	100.93
			1 / 0	2685.0	19.65	92.26
		16QAM	1 / 0	2501.0	18.06	63.97
			1 / 0	2505.0	18.70	74.13
			1 / 0	2593.0	19.36	86.30
			1 / 0	2685.0	19.25	84.14
	5	QPSK	1 / 0	2498.5	18.98	79.07
			1 / 0	2502.5	19.17	82.60
			1 / 0	2593.0	19.95	98.86
			1 / 0	2687.5	19.24	83.95
		16QAM	1 / 0	2498.5	18.11	64.71
			1 / 0	2502.5	18.22	66.37
			1 / 0	2593.0	19.07	80.72
			1 / 0	2687.5	18.38	68.87

LTE Band 66

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 66	20	QPSK	1 / 49	1720.0	21.98	157.76
			1 / 0	1745.0	21.16	130.62
			1 / 0	1770.0	17.76	59.70
		16QAM	1 / 0	1720.0	21.32	135.52
			1 / 49	1745.0	20.57	114.02
			1 / 0	1770.0	16.65	46.24
	15	QPSK	1 / 0	1717.5	20.71	117.76
			1 / 0	1747.5	21.85	153.11
			1 / 0	1772.5	21.54	142.56
		16QAM	1 / 37	1717.5	19.43	87.70
			1 / 0	1747.5	20.58	114.29
			1 / 0	1772.5	20.32	107.65
	10	QPSK	1 / 25	1715.0	22.80	190.55
			1 / 25	1745.0	22.04	159.96
			1 / 0	1775.0	17.97	62.66
		16QAM	1 / 0	1715.0	21.77	150.31
			1 / 25	1745.0	20.52	112.72
			1 / 0	1775.0	16.82	48.08
	5	QPSK	1 / 0	1712.5	20.64	115.88
			1 / 24	1745.0	21.71	148.25
			1 / 0	1777.5	21.74	149.28
		16QAM	1 / 12	1712.5	19.15	82.22
			1 / 12	1745.0	20.64	115.88
			1 / 12	1777.5	20.42	110.15
	3	QPSK	1 / 8	1711.5	20.50	112.20
			1 / 8	1745.0	21.62	145.21
			1 / 8	1710.7	21.57	143.55
		16QAM	1 / 14	1711.5	19.31	85.31
			1 / 0	1745.0	20.28	106.66
			1 / 0	1710.7	20.36	108.64
1.4	QPSK	1 / 5	1710.7	19.39	86.90	
		1 / 0	1745.0	21.54	142.56	
		1 / 5	1779.3	21.55	142.89	
	16QAM	1 / 3	1710.7	21.44	139.32	
		1 / 5	1745.0	20.28	106.66	
		1 / 3	1779.3	20.29	106.91	

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 38

LTE Band 38 (Frequency range: 2570-2620 MHz) is covered by LTE Band 41 (Frequency range: 2496-2690 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

10.1.2. ERP/EIRP DATA

GSM850

GSM850 GPRS	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT, X-Position Location: Chamber 1 Mode: GPRS 850 MHz Fundamentals <u>Test Equipment:</u> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	824.20	24.11	V	3.0	-1.5	19.62	38.5	-18.9	
	824.20	30.61	H	3.0	-1.5	26.12	38.5	-12.4	
	Mid Ch								
	836.60	24.82	V	3.0	-1.4	20.36	38.5	-18.1	
	836.60	31.13	H	3.0	-1.4	26.66	38.5	-11.8	
	High Ch								
	848.80	22.73	V	3.1	-1.4	18.29	38.5	-20.2	
	848.80	29.17	H	3.1	-1.4	24.73	38.5	-13.8	
GSM850 EGPRS	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT, X-Position Location: Chamber 1 Mode: EGPRS 850 MHz Fundamentals <u>Test Equipment:</u> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
	Low Ch								
	824.20	18.50	V	3.0	-1.5	14.01	38.5	-24.5	
	824.20	24.40	H	3.0	-1.5	19.91	38.5	-18.6	
	Mid Ch								
	836.60	18.78	V	3.0	-1.4	14.32	38.5	-24.2	
	836.60	25.54	H	3.0	-1.4	21.07	38.5	-17.4	
	High Ch								
	848.80	17.55	V	3.1	-1.4	13.11	38.5	-25.4	
	848.80	23.71	H	3.1	-1.4	19.27	38.5	-19.2	

GSM1900

GSM1900 GPRS	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																										
	Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 1 Mode: GPRS 1900 MHz Fundamentals <u>Test Equipment:</u> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable																																																																																										
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WCDMA Band 5

WCDMA Band 5 REL99	<p>UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: Rel99 Band 5 Fundamentals</p> <p><u>Test Equipment:</u> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>826.40</td> <td>22.71</td> <td>V</td> <td>3.0</td> <td>-1.5</td> <td>18.23</td> <td>38.5</td> <td>-20.3</td> <td></td> </tr> <tr> <td>826.40</td> <td>9.59</td> <td>H</td> <td>3.0</td> <td>-1.5</td> <td>5.11</td> <td>38.5</td> <td>-33.4</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.60</td> <td>23.03</td> <td>V</td> <td>3.0</td> <td>-1.4</td> <td>18.57</td> <td>38.5</td> <td>-19.9</td> <td></td> </tr> <tr> <td>836.60</td> <td>8.91</td> <td>H</td> <td>3.0</td> <td>-1.4</td> <td>4.44</td> <td>38.5</td> <td>-34.1</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>846.60</td> <td>23.16</td> <td>V</td> <td>3.1</td> <td>-1.4</td> <td>18.71</td> <td>38.5</td> <td>-19.8</td> <td></td> </tr> <tr> <td>846.60</td> <td>9.08</td> <td>H</td> <td>3.1</td> <td>-1.4</td> <td>4.63</td> <td>38.5</td> <td>-33.9</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									826.40	22.71	V	3.0	-1.5	18.23	38.5	-20.3		826.40	9.59	H	3.0	-1.5	5.11	38.5	-33.4		Mid Ch									836.60	23.03	V	3.0	-1.4	18.57	38.5	-19.9		836.60	8.91	H	3.0	-1.4	4.44	38.5	-34.1		High Ch									846.60	23.16	V	3.1	-1.4	18.71	38.5	-19.8		846.60	9.08	H	3.1	-1.4	4.63	38.5	-33.9	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																		
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826.40	22.71	V	3.0	-1.5	18.23	38.5	-20.3																																																																																				
826.40	9.59	H	3.0	-1.5	5.11	38.5	-33.4																																																																																				
Mid Ch																																																																																											
836.60	23.03	V	3.0	-1.4	18.57	38.5	-19.9																																																																																				
836.60	8.91	H	3.0	-1.4	4.44	38.5	-34.1																																																																																				
High Ch																																																																																											
846.60	23.16	V	3.1	-1.4	18.71	38.5	-19.8																																																																																				
846.60	9.08	H	3.1	-1.4	4.63	38.5	-33.9																																																																																				
WCDMA Band 5 HSDPA	<p>UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: HSDPA Band 5 Fundamentals</p> <p><u>Test Equipment:</u> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>826.40</td> <td>21.22</td> <td>V</td> <td>3.0</td> <td>-1.5</td> <td>16.74</td> <td>38.5</td> <td>-21.8</td> <td></td> </tr> <tr> <td>826.40</td> <td>8.19</td> <td>H</td> <td>3.0</td> <td>-1.5</td> <td>3.71</td> <td>38.5</td> <td>-34.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.60</td> <td>21.52</td> <td>V</td> <td>3.0</td> <td>-1.4</td> <td>17.06</td> <td>38.5</td> <td>-21.4</td> <td></td> </tr> <tr> <td>836.60</td> <td>7.70</td> <td>H</td> <td>3.0</td> <td>-1.4</td> <td>3.23</td> <td>38.5</td> <td>-35.3</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>846.60</td> <td>21.59</td> <td>V</td> <td>3.1</td> <td>-1.4</td> <td>17.14</td> <td>38.5</td> <td>-21.4</td> <td></td> </tr> <tr> <td>846.60</td> <td>7.77</td> <td>H</td> <td>3.1</td> <td>-1.4</td> <td>3.32</td> <td>38.5</td> <td>-35.2</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									826.40	21.22	V	3.0	-1.5	16.74	38.5	-21.8		826.40	8.19	H	3.0	-1.5	3.71	38.5	-34.8		Mid Ch									836.60	21.52	V	3.0	-1.4	17.06	38.5	-21.4		836.60	7.70	H	3.0	-1.4	3.23	38.5	-35.3		High Ch									846.60	21.59	V	3.1	-1.4	17.14	38.5	-21.4		846.60	7.77	H	3.1	-1.4	3.32	38.5	-35.2	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																			
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WCDMA Band 4

WCDMA Band 4 REL99	<p style="text-align: center;">UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, X-Position Location: Chamber 1 Mode: Rel99 Band 4 Fundamentals</p> <p><u>Test Equipment:</u> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1712.40</td> <td>11.68</td> <td>V</td> <td>4.3</td> <td>9.4</td> <td>16.77</td> <td>30.0</td> <td>-13.2</td> <td></td> </tr> <tr> <td>1712.40</td> <td>17.21</td> <td>H</td> <td>4.3</td> <td>9.4</td> <td>22.29</td> <td>30.0</td> <td>-7.7</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1732.60</td> <td>12.58</td> <td>V</td> <td>4.3</td> <td>9.5</td> <td>17.72</td> <td>30.0</td> <td>-12.3</td> <td></td> </tr> <tr> <td>1732.60</td> <td>17.81</td> <td>H</td> <td>4.3</td> <td>9.5</td> <td>22.94</td> <td>30.0</td> <td>-7.1</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1752.60</td> <td>15.38</td> <td>V</td> <td>4.4</td> <td>9.5</td> <td>20.55</td> <td>30.0</td> <td>-9.4</td> <td></td> </tr> <tr> <td>1752.60</td> <td>17.13</td> <td>H</td> <td>4.4</td> <td>9.5</td> <td>22.30</td> <td>30.0</td> <td>-7.7</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1712.40	11.68	V	4.3	9.4	16.77	30.0	-13.2		1712.40	17.21	H	4.3	9.4	22.29	30.0	-7.7		Mid Ch									1732.60	12.58	V	4.3	9.5	17.72	30.0	-12.3		1732.60	17.81	H	4.3	9.5	22.94	30.0	-7.1		High Ch									1752.60	15.38	V	4.4	9.5	20.55	30.0	-9.4		1752.60	17.13	H	4.4	9.5	22.30	30.0	-7.7	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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1732.60	12.58	V	4.3	9.5	17.72	30.0	-12.3																																																																																												
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1752.60	15.38	V	4.4	9.5	20.55	30.0	-9.4																																																																																												
1752.60	17.13	H	4.4	9.5	22.30	30.0	-7.7																																																																																												
WCDMA Band 4 HSDPA	<p style="text-align: center;">UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, X-Position Location: Chamber 1 Mode: HSDPA Band 4 Fundamentals</p> <p><u>Test Equipment:</u> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1712.40</td> <td>11.79</td> <td>V</td> <td>4.3</td> <td>9.4</td> <td>16.88</td> <td>30.0</td> <td>-13.1</td> <td></td> </tr> <tr> <td>1712.40</td> <td>17.14</td> <td>H</td> <td>4.3</td> <td>9.4</td> <td>22.22</td> <td>30.0</td> <td>-7.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1732.60</td> <td>12.47</td> <td>V</td> <td>4.3</td> <td>9.5</td> <td>17.61</td> <td>30.0</td> <td>-12.4</td> <td></td> </tr> <tr> <td>1732.60</td> <td>17.30</td> <td>H</td> <td>4.3</td> <td>9.5</td> <td>22.43</td> <td>30.0</td> <td>-7.6</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1752.60</td> <td>15.51</td> <td>V</td> <td>4.4</td> <td>9.5</td> <td>20.68</td> <td>30.0</td> <td>-9.3</td> <td></td> </tr> <tr> <td>1752.60</td> <td>17.10</td> <td>H</td> <td>4.4</td> <td>9.5</td> <td>22.27</td> <td>30.0</td> <td>-7.7</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1712.40	11.79	V	4.3	9.4	16.88	30.0	-13.1		1712.40	17.14	H	4.3	9.4	22.22	30.0	-7.8		Mid Ch									1732.60	12.47	V	4.3	9.5	17.61	30.0	-12.4		1732.60	17.30	H	4.3	9.5	22.43	30.0	-7.6		High Ch									1752.60	15.51	V	4.4	9.5	20.68	30.0	-9.3		1752.60	17.10	H	4.4	9.5	22.27	30.0	-7.7	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																											
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1712.40	11.79	V	4.3	9.4	16.88	30.0	-13.1																																																																																												
1712.40	17.14	H	4.3	9.4	22.22	30.0	-7.8																																																																																												
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1732.60	12.47	V	4.3	9.5	17.61	30.0	-12.4																																																																																												
1732.60	17.30	H	4.3	9.5	22.43	30.0	-7.6																																																																																												
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1752.60	15.51	V	4.4	9.5	20.68	30.0	-9.3																																																																																												
1752.60	17.10	H	4.4	9.5	22.27	30.0	-7.7																																																																																												

WCDMA Band 2

WCDMA Band 2 REL99	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 1 Mode: Rel99 Band 2 Fundamentals <u>Test Equipment:</u> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1852.40	14.57	V	4.5	9.5	19.57	33.0	-13.4	
	1852.40	17.43	H	4.5	9.5	22.43	33.0	-10.6	
	Mid Ch								
	1880.00	7.60	V	4.5	9.3	12.38	33.0	-20.6	
	1880.00	18.39	H	4.5	9.3	23.16	33.0	-9.8	
	High Ch								
	1907.60	9.42	V	4.6	9.1	13.93	33.0	-19.1	
	1907.60	18.16	H	4.6	9.1	22.68	33.0	-10.3	
WCDMA Band 2 HSDPA	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 1 Mode: HSDPA Band 2 Fundamentals <u>Test Equipment:</u> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1852.40	14.27	V	4.5	9.5	19.27	33.0	-13.7	
	1852.40	17.10	H	4.5	9.5	22.10	33.0	-10.9	
	Mid Ch								
	1880.00	7.43	V	4.5	9.3	12.21	33.0	-20.8	
	1880.00	18.14	H	4.5	9.3	22.91	33.0	-10.1	
	High Ch								
	1907.60	9.08	V	4.6	9.1	13.59	33.0	-19.4	
	1907.60	17.84	H	4.6	9.1	22.36	33.0	-10.6	

LTE Band 2

LTE Band 2 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1860.00	11.71	V	4.5	9.3	16.55	33.0	-16.5	
	1860.00	16.33	H	4.5	9.3	21.17	33.0	-11.8	
	Mid Ch								
	1880.00	13.20	V	4.5	9.2	17.86	33.0	-15.1	
	1880.00	17.07	H	4.5	9.2	21.74	33.0	-11.3	
High Ch									
1900.00	14.65	V	4.6	9.0	19.15	33.0	-13.9		
1900.00	14.88	H	4.6	9.0	19.38	33.0	-13.6		
LTE Band 2 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1860.00	10.51	V	4.5	9.3	15.35	33.0	-17.7	
	1860.00	15.12	H	4.5	9.3	19.96	33.0	-13.0	
	Mid Ch								
	1880.00	12.10	V	4.5	9.2	16.76	33.0	-16.2	
	1880.00	16.02	H	4.5	9.2	20.69	33.0	-12.3	
High Ch									
1900.00	12.33	V	4.6	9.0	16.83	33.0	-16.2		
1900.00	15.70	H	4.6	9.0	20.20	33.0	-12.8		

LTE Band 2 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Postion Location: Chamber 2 Mode: LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth									
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Low Ch									
	1857.50	11.27	V	4.5	9.4	16.13	33.0	-16.9		
	1857.50	15.53	H	4.5	9.4	20.39	33.0	-12.6		
	Mid Ch									
	1880.00	4.00	V	4.5	9.2	8.66	33.0	-24.3		
	1880.00	16.89	H	4.5	9.2	21.56	33.0	-11.4		
High Ch										
1902.50	6.05	V	4.6	9.0	10.51	33.0	-22.5			
1902.50	16.58	H	4.6	9.0	21.03	33.0	-12.0			
LTE Band 2 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Postion Location: Chamber 2 Mode: LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth									
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Low Ch									
	1857.50	8.62	V	4.5	9.4	13.48	33.0	-19.5		
	1857.50	14.31	H	4.5	9.4	19.17	33.0	-13.8		
	Mid Ch									
	1880.00	2.49	V	4.5	9.2	7.15	33.0	-25.9		
	1880.00	15.36	H	4.5	9.2	20.03	33.0	-13.0		
High Ch										
1902.50	6.93	V	4.6	9.0	11.39	33.0	-21.6			
1902.50	15.86	H	4.6	9.0	20.31	33.0	-12.7			

LTE Band 2 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1855.00	10.61	V	4.5	9.4	15.49	33.0	-17.5	
	1855.00	13.17	H	4.5	9.4	18.05	33.0	-14.9	
	Mid Ch								
	1880.00	5.44	V	4.5	9.2	10.10	33.0	-22.9	
	1880.00	16.86	H	4.5	9.2	21.53	33.0	-11.5	
High Ch									
1905.00	4.22	V	4.6	9.0	8.64	33.0	-24.4		
1905.00	14.98	H	4.6	9.0	19.41	33.0	-13.6		
LTE Band 2 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1855.00	9.99	V	4.5	9.4	14.87	33.0	-18.1	
	1855.00	13.23	H	4.5	9.4	18.11	33.0	-14.9	
	Mid Ch								
	1880.00	4.13	V	4.5	9.2	8.79	33.0	-24.2	
	1880.00	15.17	H	4.5	9.2	19.84	33.0	-13.2	
High Ch									
1905.00	3.57	V	4.6	9.0	7.99	33.0	-25.0		
1905.00	14.30	H	4.6	9.0	18.73	33.0	-14.3		

LTE Band 2 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1852.50	9.13	V	4.5	9.4	14.03	33.0	-19.0	
	1852.50	13.06	H	4.5	9.4	17.96	33.0	-15.0	
	Mid Ch								
	1880.00	3.80	V	4.5	9.2	8.46	33.0	-24.5	
	1880.00	16.06	H	4.5	9.2	20.73	33.0	-12.3	
High Ch									
1907.50	4.35	V	4.6	9.0	8.74	33.0	-24.3		
1907.50	15.18	H	4.6	9.0	19.57	33.0	-13.4		
LTE Band 2 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 2 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1852.50	8.14	V	4.5	9.4	13.04	33.0	-20.0	
	1852.50	11.58	H	4.5	9.4	16.48	33.0	-16.5	
	Mid Ch								
	1880.00	2.46	V	4.5	9.2	7.12	33.0	-25.9	
	1880.00	14.77	H	4.5	9.2	19.44	33.0	-13.6	
High Ch									
1907.50	3.18	V	4.6	9.0	7.57	33.0	-25.4		
1907.50	13.98	H	4.6	9.0	18.37	33.0	-14.6		

LTE Band 2 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1851.50	10.59	V	4.5	9.4	15.50	33.0	-17.5	
	1851.50	14.27	H	4.5	9.4	19.18	33.0	-13.8	
	Mid Ch								
	1880.00	3.91	V	4.5	9.2	8.57	33.0	-24.4	
	1880.00	16.49	H	4.5	9.2	21.16	33.0	-11.8	
High Ch									
1908.50	7.47	V	4.6	8.9	11.84	33.0	-21.2		
1908.50	16.36	H	4.6	8.9	20.74	33.0	-12.3		
LTE Band 2 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1851.50	9.68	V	4.5	9.4	14.59	33.0	-18.4	
	1851.50	13.21	H	4.5	9.4	18.12	33.0	-14.9	
	Mid Ch								
	1880.00	4.07	V	4.5	9.2	8.73	33.0	-24.3	
	1880.00	15.47	H	4.5	9.2	20.14	33.0	-12.9	
High Ch									
1908.50	2.78	V	4.6	8.9	7.15	33.0	-25.8		
1908.50	15.24	H	4.6	8.9	19.62	33.0	-13.4		

LTE Band 2 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 2 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1850.70	8.88	V	4.5	9.4	13.80	33.0	-19.2	
	1850.70	12.57	H	4.5	9.4	17.49	33.0	-15.5	
	Mid Ch								
	1880.00	6.43	V	4.5	9.2	11.09	33.0	-21.9	
	1880.00	16.10	H	4.5	9.2	20.77	33.0	-12.2	
High Ch									
1909.30	3.85	V	4.6	8.9	8.22	33.0	-24.8		
1909.30	14.78	H	4.6	8.9	19.15	33.0	-13.9		
LTE Band 2 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1850.70	7.67	V	4.5	9.4	12.59	33.0	-20.4	
	1850.70	11.25	H	4.5	9.4	16.17	33.0	-16.8	
	Mid Ch								
	1880.00	5.15	V	4.5	9.2	9.81	33.0	-23.2	
	1880.00	15.21	H	4.5	9.2	19.88	33.0	-13.1	
High Ch									
1909.30	2.89	V	4.6	8.9	7.26	33.0	-25.7		
1909.30	13.50	H	4.6	8.9	17.87	33.0	-15.1		

LTE Band 5

LTE Band 5 10MHz QPSK	<p>UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth</p> <p><u>Test Equipment:</u> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>829.00</td> <td>18.67</td> <td>V</td> <td>3.0</td> <td>-1.5</td> <td>14.19</td> <td>38.5</td> <td>-24.3</td> <td></td> </tr> <tr> <td>829.00</td> <td>23.02</td> <td>H</td> <td>3.0</td> <td>-1.5</td> <td>18.54</td> <td>38.5</td> <td>-20.0</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.50</td> <td>18.95</td> <td>V</td> <td>3.0</td> <td>-1.4</td> <td>14.49</td> <td>38.5</td> <td>-24.0</td> <td></td> </tr> <tr> <td>836.50</td> <td>23.02</td> <td>H</td> <td>3.0</td> <td>-1.4</td> <td>18.56</td> <td>38.5</td> <td>-19.9</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>844.00</td> <td>18.71</td> <td>V</td> <td>3.1</td> <td>-1.4</td> <td>14.26</td> <td>38.5</td> <td>-24.2</td> <td></td> </tr> <tr> <td>844.00</td> <td>22.83</td> <td>H</td> <td>3.1</td> <td>-1.4</td> <td>18.38</td> <td>38.5</td> <td>-20.1</td> <td></td> </tr> </tbody> </table>	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	18.67	V	3.0	-1.5	14.19	38.5	-24.3		829.00	23.02	H	3.0	-1.5	18.54	38.5	-20.0		Mid Ch									836.50	18.95	V	3.0	-1.4	14.49	38.5	-24.0		836.50	23.02	H	3.0	-1.4	18.56	38.5	-19.9		High Ch									844.00	18.71	V	3.1	-1.4	14.26	38.5	-24.2		844.00	22.83	H	3.1	-1.4	18.38	38.5	-20.1	
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LTE Band 5 10MHz 16QAM	<p>UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p>Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth</p> <p><u>Test Equipment:</u> Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable</p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>829.00</td> <td>17.51</td> <td>V</td> <td>3.0</td> <td>-1.5</td> <td>13.03</td> <td>38.5</td> <td>-25.5</td> <td></td> </tr> <tr> <td>829.00</td> <td>21.71</td> <td>H</td> <td>3.0</td> <td>-1.5</td> <td>17.23</td> <td>38.5</td> <td>-21.3</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.50</td> <td>17.54</td> <td>V</td> <td>3.0</td> <td>-1.4</td> <td>13.08</td> <td>38.5</td> <td>-25.4</td> <td></td> </tr> <tr> <td>836.50</td> <td>21.70</td> <td>H</td> <td>3.0</td> <td>-1.4</td> <td>17.24</td> <td>38.5</td> <td>-21.3</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>844.00</td> <td>17.46</td> <td>V</td> <td>3.1</td> <td>-1.4</td> <td>13.01</td> <td>38.5</td> <td>-25.5</td> <td></td> </tr> <tr> <td>844.00</td> <td>21.89</td> <td>H</td> <td>3.1</td> <td>-1.4</td> <td>17.44</td> <td>38.5</td> <td>-21.1</td> <td></td> </tr> </tbody> </table>	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	17.51	V	3.0	-1.5	13.03	38.5	-25.5		829.00	21.71	H	3.0	-1.5	17.23	38.5	-21.3		Mid Ch									836.50	17.54	V	3.0	-1.4	13.08	38.5	-25.4		836.50	21.70	H	3.0	-1.4	17.24	38.5	-21.3		High Ch									844.00	17.46	V	3.1	-1.4	13.01	38.5	-25.5		844.00	21.89	H	3.1	-1.4	17.44	38.5	-21.1	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																			
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844.00	17.46	V	3.1	-1.4	13.01	38.5	-25.5																																																																																				
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LTE Band 5 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	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	18.18	V	3.0	-1.5	13.70	38.5	-24.8	
	826.50	22.52	H	3.0	-1.5	18.04	38.5	-20.5	
	Mid Ch								
	836.50	18.91	V	3.0	-1.4	14.45	38.5	-24.1	
	836.50	22.93	H	3.0	-1.4	18.47	38.5	-20.0	
High Ch									
846.50	17.99	V	3.1	-1.4	13.54	38.5	-25.0		
846.50	22.10	H	3.1	-1.4	17.65	38.5	-20.9		
LTE Band 5 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	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	17.17	V	3.0	-1.5	12.69	38.5	-25.8	
	826.50	21.40	H	3.0	-1.5	16.92	38.5	-21.6	
	Mid Ch								
	836.50	17.51	V	3.0	-1.4	13.05	38.5	-25.5	
	836.50	21.53	H	3.0	-1.4	17.07	38.5	-21.4	
High Ch									
846.50	16.70	V	3.1	-1.4	12.25	38.5	-26.2		
846.50	20.82	H	3.1	-1.4	16.37	38.5	-22.1		

LTE Band 5 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth									
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable									
	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	17.95	V	3.0	-1.5	13.47	38.5	-25.0		
	825.50	22.58	H	3.0	-1.5	18.10	38.5	-20.4		
	Mid Ch									
	836.50	18.74	V	3.0	-1.4	14.28	38.5	-24.2		
	836.50	22.85	H	3.0	-1.4	18.39	38.5	-20.1		
High Ch										
847.50	17.68	V	3.1	-1.4	13.24	38.5	-25.3			
847.50	21.75	H	3.1	-1.4	17.30	38.5	-21.2			
LTE Band 5 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth									
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable									
	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	16.46	V	3.0	-1.5	11.98	38.5	-26.5		
	825.50	20.86	H	3.0	-1.5	16.38	38.5	-22.1		
	Mid Ch									
	836.50	17.44	V	3.0	-1.4	12.98	38.5	-25.5		
	836.50	21.61	H	3.0	-1.4	17.15	38.5	-21.4		
High Ch										
847.50	16.30	V	3.1	-1.4	11.86	38.5	-26.6			
847.50	20.61	H	3.1	-1.4	16.16	38.5	-22.3			

LTE Band 5 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	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	17.70	V	3.0	-1.5	13.21	38.5	-25.3	
	824.70	22.21	H	3.0	-1.5	17.72	38.5	-20.8	
	Mid Ch								
	836.50	18.70	V	3.0	-1.4	14.24	38.5	-24.3	
	836.50	23.05	H	3.0	-1.4	18.59	38.5	-19.9	
High Ch									
848.30	17.60	V	3.1	-1.4	13.16	38.5	-25.3		
848.30	21.66	H	3.1	-1.4	17.22	38.5	-21.3		
LTE Band 5 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	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	16.32	V	3.0	-1.5	11.83	38.5	-26.7	
	824.70	21.08	H	3.0	-1.5	16.59	38.5	-21.9	
	Mid Ch								
	836.50	17.53	V	3.0	-1.4	13.07	38.5	-25.4	
	836.50	22.93	H	3.0	-1.4	18.47	38.5	-20.0	
High Ch									
848.30	16.18	V	3.1	-1.4	11.74	38.5	-26.8		
848.30	20.34	H	3.1	-1.4	15.90	38.5	-22.6		

LTE Band 7

LTE Band 7 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-08 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_QPSK Band 7 Fundamentals, 20MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2510.00	11.59	V	5.3	10.1	16.41	33.0	-16.6	
	2510.00	14.67	H	5.3	10.1	19.49	33.0	-13.5	
	Mid Ch								
	2535.00	10.97	V	5.3	10.0	15.73	33.0	-17.3	
	2535.00	14.34	H	5.3	10.0	19.11	33.0	-13.9	
High Ch									
2560.00	12.56	V	5.3	10.0	17.27	33.0	-15.7		
2560.00	15.92	H	5.3	10.0	20.62	33.0	-12.4		
LTE Band 7 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-08 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_16QAM Band 7 Fundamentals, 20MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2510.00	10.30	V	5.3	10.1	15.12	33.0	-17.9	
	2510.00	13.29	H	5.3	10.1	18.11	33.0	-14.9	
	Mid Ch								
	2535.00	9.59	V	5.3	10.0	14.35	33.0	-18.6	
	2535.00	12.93	H	5.3	10.0	17.70	33.0	-15.3	
High Ch									
2560.00	11.14	V	5.3	10.0	15.85	33.0	-17.1		
2560.00	14.64	H	5.3	10.0	19.34	33.0	-13.7		

LTE Band 7 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-08 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_QPSK Band 7 Fundamentals, 15MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2507.50	12.44	V	5.3	10.1	17.27	33.0	-15.7	
	2507.50	14.92	H	5.3	10.1	19.75	33.0	-13.3	
	Mid Ch								
	2535.00	11.57	V	5.3	10.0	16.33	33.0	-16.7	
	2535.00	14.80	H	5.3	10.0	19.57	33.0	-13.4	
High Ch									
2562.50	12.75	V	5.3	10.0	17.45	33.0	-15.5		
2562.50	16.04	H	5.3	10.0	20.75	33.0	-12.3		
LTE Band 7 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-08 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_16QAM Band 7 Fundamentals, 15MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2507.50	11.28	V	5.3	10.1	16.11	33.0	-16.9	
	2507.50	13.84	H	5.3	10.1	18.67	33.0	-14.3	
	Mid Ch								
	2535.00	10.41	V	5.3	10.0	15.17	33.0	-17.8	
	2535.00	13.74	H	5.3	10.0	18.51	33.0	-14.5	
High Ch									
2562.50	11.53	V	5.3	10.0	16.23	33.0	-16.8		
2562.50	14.68	H	5.3	10.0	19.39	33.0	-13.6		

LTE Band 7 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-09 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_QPSK Band 7 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2505.00	11.31	V	5.2	10.1	16.14	33.0	-16.9	
	2505.00	14.79	H	5.2	10.1	19.62	33.0	-13.4	
	Mid Ch								
	2535.00	11.77	V	5.3	10.0	16.53	33.0	-16.5	
	2535.00	15.12	H	5.3	10.0	19.89	33.0	-13.1	
High Ch									
2565.00	12.55	V	5.3	10.0	17.25	33.0	-15.7		
2565.00	15.97	H	5.3	10.0	20.67	33.0	-12.3		
LTE Band 7 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-09 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_16QAM Band 7 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2505.00	10.01	V	5.2	10.1	14.84	33.0	-18.2	
	2505.00	13.77	H	5.2	10.1	18.60	33.0	-14.4	
	Mid Ch								
	2535.00	10.57	V	5.3	10.0	15.33	33.0	-17.7	
	2535.00	13.36	H	5.3	10.0	18.13	33.0	-14.9	
High Ch									
2565.00	11.60	V	5.3	10.0	16.30	33.0	-16.7		
2565.00	14.99	H	5.3	10.0	19.69	33.0	-13.3		

LTE Band 7 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-09 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_QPSK Band 7 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2502.50	11.07	V	5.2	10.1	15.91	33.0	-17.1	
	2502.50	14.93	H	5.2	10.1	19.77	33.0	-13.2	
	Mid Ch								
	2535.00	11.58	V	5.3	10.0	16.34	33.0	-16.7	
	2535.00	15.02	H	5.3	10.0	19.79	33.0	-13.2	
High Ch									
2567.50	12.30	V	5.3	10.0	16.99	33.0	-16.0		
2567.50	15.56	H	5.3	10.0	20.25	33.0	-12.7		
LTE Band 7 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-05-09 Test Engineer: 45585 Configuration: EUT, Y-Position Location: Chamber 2 Mode: LTE_16QAM Band 7 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2502.50	10.19	V	5.2	10.1	15.03	33.0	-18.0	
	2502.50	13.83	H	5.2	10.1	18.67	33.0	-14.3	
	Mid Ch								
	2535.00	10.37	V	5.3	10.0	15.13	33.0	-17.9	
	2535.00	13.62	H	5.3	10.0	18.39	33.0	-14.6	
High Ch									
2567.50	10.83	V	5.3	10.0	15.52	33.0	-17.5		
2567.50	14.24	H	5.3	10.0	18.93	33.0	-14.1		

LTE Band 12

LTE Band 12 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	704.00	21.72	V	2.8	-1.6	17.34	34.8	-17.5	
	704.00	4.48	H	2.8	-1.6	0.10	34.8	-34.7	
	Mid Ch								
	707.50	21.76	V	2.8	-1.6	17.37	34.8	-17.4	
	707.50	6.21	H	2.8	-1.6	1.83	34.8	-33.0	
	High Ch								
	711.00	21.55	V	2.8	-1.6	17.15	34.8	-17.6	
711.00	6.05	H	2.8	-1.6	1.66	34.8	-33.1		
LTE Band 12 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	704.00	20.67	V	2.8	-1.6	16.29	34.8	-18.5	
	704.00	3.47	H	2.8	-1.6	-0.91	34.8	-35.7	
	Mid Ch								
	707.50	20.29	V	2.8	-1.6	15.90	34.8	-18.9	
	707.50	5.14	H	2.8	-1.6	0.76	34.8	-34.0	
	High Ch								
	711.00	20.42	V	2.8	-1.6	16.02	34.8	-18.8	
711.00	4.76	H	2.8	-1.6	0.37	34.8	-34.4		

LTE Band 12 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	701.50	21.58	V	2.8	-1.6	17.20	34.8	-17.6	
	701.50	5.56	H	2.8	-1.6	1.18	34.8	-33.6	
	Mid Ch								
	707.50	21.54	V	2.8	-1.6	17.15	34.8	-17.6	
	707.50	6.26	H	2.8	-1.6	1.88	34.8	-32.9	
High Ch									
713.50	21.31	V	2.8	-1.6	16.91	34.8	-17.9		
713.50	5.87	H	2.8	-1.6	1.47	34.8	-33.3		
LTE Band 12 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	701.50	20.29	V	2.8	-1.6	15.91	34.8	-18.9	
	701.50	4.70	H	2.8	-1.6	0.32	34.8	-34.5	
	Mid Ch								
	707.50	20.37	V	2.8	-1.6	15.98	34.8	-18.8	
	707.50	5.11	H	2.8	-1.6	0.73	34.8	-34.1	
High Ch									
713.50	20.10	V	2.8	-1.6	15.70	34.8	-19.1		
713.50	4.82	H	2.8	-1.6	0.42	34.8	-34.4		

LTE Band 12 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	700.50	21.84	V	2.8	-1.6	17.46	34.8	-17.3	
	700.50	5.98	H	2.8	-1.6	1.60	34.8	-33.2	
	Mid Ch								
	707.50	21.62	V	2.8	-1.6	17.23	34.8	-17.6	
	707.50	6.31	H	2.8	-1.6	1.93	34.8	-32.9	
High Ch									
714.50	21.16	V	2.8	-1.6	16.77	34.8	-18.0		
714.50	5.50	H	2.8	-1.6	1.10	34.8	-33.7		
LTE Band 12 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-23 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	700.50	20.68	V	2.8	-1.6	16.30	34.8	-18.5	
	700.50	4.60	H	2.8	-1.6	0.22	34.8	-34.6	
	Mid Ch								
	707.50	20.50	V	2.8	-1.6	16.11	34.8	-18.7	
	707.50	5.12	H	2.8	-1.6	0.74	34.8	-34.1	
High Ch									
714.50	19.86	V	2.8	-1.6	15.47	34.8	-19.3		
714.50	4.41	H	2.8	-1.6	0.01	34.8	-34.8		

LTE Band 12 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT , Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	699.70	21.63	V	2.8	-1.6	17.25	34.8	-17.5	
	699.70	5.74	H	2.8	-1.6	1.36	34.8	-33.4	
	Mid Ch								
	707.50	21.70	V	2.8	-1.6	17.31	34.8	-17.5	
	707.50	6.21	H	2.8	-1.6	1.83	34.8	-33.0	
High Ch									
715.30	20.83	V	2.8	-1.6	16.43	34.8	-18.4		
715.30	5.11	H	2.8	-1.6	0.71	34.8	-34.1		
LTE Band 12 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT , Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	699.70	20.65	V	2.8	-1.6	16.27	34.8	-18.5	
	699.70	4.87	H	2.8	-1.6	0.49	34.8	-34.3	
	Mid Ch								
	707.50	20.29	V	2.8	-1.6	15.90	34.8	-18.9	
	707.50	5.00	H	2.8	-1.6	0.62	34.8	-34.2	
High Ch									
715.30	19.53	V	2.8	-1.6	15.13	34.8	-19.7		
715.30	3.96	H	2.8	-1.6	-0.44	34.8	-35.2		

LTE Band 13

LTE Band 13 10MHz QPSK	<p style="text-align: center;">UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p> Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth </p> <p> Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>782.00</td> <td>25.81</td> <td>V</td> <td>2.9</td> <td>-1.6</td> <td>21.30</td> <td>34.8</td> <td>-13.5</td> <td></td> </tr> <tr> <td>782.00</td> <td>9.82</td> <td>H</td> <td>2.9</td> <td>-1.6</td> <td>5.32</td> <td>34.8</td> <td>-29.5</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									782.00	25.81	V	2.9	-1.6	21.30	34.8	-13.5		782.00	9.82	H	2.9	-1.6	5.32	34.8	-29.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																				
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782.00	25.81	V	2.9	-1.6	21.30	34.8	-13.5																																						
782.00	9.82	H	2.9	-1.6	5.32	34.8	-29.5																																						
LTE Band 13 10MHz 16QAM	<p style="text-align: center;">UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p> Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth </p> <p> Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>782.00</td> <td>24.51</td> <td>V</td> <td>2.9</td> <td>-1.6</td> <td>20.00</td> <td>34.8</td> <td>-14.8</td> <td></td> </tr> <tr> <td>782.00</td> <td>8.66</td> <td>H</td> <td>2.9</td> <td>-1.6</td> <td>4.16</td> <td>34.8</td> <td>-30.6</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									782.00	24.51	V	2.9	-1.6	20.00	34.8	-14.8		782.00	8.66	H	2.9	-1.6	4.16	34.8	-30.6	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																					
Mid Ch																																													
782.00	24.51	V	2.9	-1.6	20.00	34.8	-14.8																																						
782.00	8.66	H	2.9	-1.6	4.16	34.8	-30.6																																						

LTE Band 13 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	779.50	25.87	V	2.9	-1.6	21.37	34.8	-13.4	
	779.50	9.92	H	2.9	-1.6	5.42	34.8	-29.4	
	Mid Ch								
	782.00	25.94	V	2.9	-1.6	21.43	34.8	-13.3	
	782.00	9.82	H	2.9	-1.6	5.32	34.8	-29.5	
High Ch									
784.50	25.77	V	2.9	-1.6	21.26	34.8	-13.5		
784.50	9.84	H	2.9	-1.6	5.33	34.8	-29.4		
LTE Band 13 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	779.50	24.81	V	2.9	-1.6	20.31	34.8	-14.5	
	779.50	8.74	H	2.9	-1.6	4.24	34.8	-30.5	
	Mid Ch								
	782.00	24.45	V	2.9	-1.6	19.94	34.8	-14.8	
	782.00	8.67	H	2.9	-1.6	4.17	34.8	-30.6	
High Ch									
784.50	24.44	V	2.9	-1.6	19.93	34.8	-14.8		
784.50	8.40	H	2.9	-1.6	3.89	34.8	-30.9		

LTE Band 41

LTE Band 41 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																																													
	Company: Samsung																																																																																																																													
	Project #: 4788962183																																																																																																																													
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	Configuration: EUT / Y-Position																																																																																																																													
	Location: Chamber 1																																																																																																																													
	Mode: LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth																																																																																																																													
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable																																																																																																																													
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2593.00	12.56	V	5.3	9.8	17.02	33.0	-16.0																																																																																																																							
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	Test Engineer: 45585																																																																																																																													
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	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable																																																																																																																													
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	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																																																					
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2510.00	11.78	V	5.3	9.9	16.44	33.0	-16.6																																																																																																																							
2510.00	15.57	H	5.3	9.9	20.23	33.0	-12.8																																																																																																																							
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2593.00	11.37	V	5.3	9.8	15.83	33.0	-17.2																																																																																																																							
2593.00	15.03	H	5.3	9.8	19.50	33.0	-13.5																																																																																																																							
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2680.00	14.89	V	5.4	9.8	19.26	33.0	-13.7																																																																																																																							
2680.00	17.62	H	5.4	9.8	21.99	33.0	-11.0																																																																																																																							

LTE Band 41 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2503.50	11.60	V	5.2	9.9	16.27	33.0	-16.7	
	2503.50	15.40	H	5.2	9.9	20.07	33.0	-12.9	
	Low Ch								
	2507.50	13.35	V	5.3	9.9	18.02	33.0	-15.0	
	2507.50	16.90	H	5.3	9.9	21.57	33.0	-11.4	
Mid Ch									
2593.00	12.65	V	5.3	9.8	17.11	33.0	-15.9		
2593.00	16.55	H	5.3	9.8	21.02	33.0	-12.0		
High Ch									
2682.50	15.44	V	5.4	9.8	19.82	33.0	-13.2		
2682.50	17.78	H	5.4	9.8	22.15	33.0	-10.8		
LTE Band 41 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT/Y-Position Location: Chamber 1 Mode: LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2503.50	12.99	V	5.2	9.9	17.66	33.0	-15.3	
	2503.50	15.83	H	5.2	9.9	20.51	33.0	-12.5	
	Low Ch								
	2507.50	11.56	V	5.3	9.9	16.23	33.0	-16.8	
	2507.50	15.96	H	5.3	9.9	20.63	33.0	-12.4	
Mid Ch									
2510.00	12.85	V	5.3	9.9	17.51	33.0	-15.5		
2510.00	15.38	H	5.3	9.9	20.04	33.0	-13.0		
High Ch									
2682.50	14.30	V	5.4	9.8	18.68	33.0	-14.3		
2682.50	18.09	H	5.4	9.8	22.46	33.0	-10.5		

LTE Band 41 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-25 Test Engineer: 45585 Configuration: EUT / Y-Position Location: Chamber 1 Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2501.00	11.67	V	5.2	9.9	16.36	33.0	-16.6	
	2501.00	14.12	H	5.2	9.9	18.80	33.0	-14.2	
	Low Ch								
	2505.00	11.54	V	5.2	9.9	16.21	33.0	-16.8	
	2505.00	14.59	H	5.2	9.9	19.26	33.0	-13.7	
	Mid Ch								
	2593.00	10.67	V	5.3	9.8	15.13	33.0	-17.9	
	2593.00	15.57	H	5.3	9.8	20.04	33.0	-13.0	
	High Ch								
	2685.00	11.61	V	5.4	9.8	15.98	33.0	-17.0	
2685.00	15.29	H	5.4	9.8	19.65	33.0	-13.3		
LTE Band 41 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 209-04-25 Test Engineer: 45585 Configuration: EUT/Y-Position Location: Chamber 1 Mode: LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2501.00	10.68	V	5.2	9.9	15.36	33.0	-17.6	
	2501.00	13.37	H	5.2	9.9	18.06	33.0	-14.9	
	Low Ch								
	2505.00	10.98	V	5.2	9.9	15.65	33.0	-17.3	
	2505.00	14.03	H	5.2	9.9	18.70	33.0	-14.3	
	Mid Ch								
	2593.00	9.95	V	5.3	9.8	14.41	33.0	-18.6	
	2593.00	14.89	H	5.3	9.8	19.36	33.0	-13.6	
	High Ch								
	2685.00	11.02	V	5.4	9.8	15.39	33.0	-17.6	
2685.00	14.89	H	5.4	9.8	19.25	33.0	-13.7		

LTE Band 41 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company:		Samsung						
	Project #:		4788962183						
	Date:		2019-04-25						
	Test Engineer:		45585						
	Configuration:		EUT / Y-Position						
	Location:		Chamber 1						
	Mode:		LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth						
	<u>Test Equipment:</u>		Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable						
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2498.50	11.64	V	5.2	9.9	16.33	33.0	-16.7	
	2498.50	14.29	H	5.2	9.9	18.98	33.0	-14.0	
	Low Ch								
	2502.50	11.92	V	5.2	9.9	16.60	33.0	-16.4	
2502.50	14.49	H	5.2	9.9	19.17	33.0	-13.8		
Mid Ch									
2593.00	10.41	V	5.3	9.8	14.87	33.0	-18.1		
2593.00	15.48	H	5.3	9.8	19.95	33.0	-13.1		
High Ch									
2687.50	11.58	V	5.4	9.8	15.95	33.0	-17.0		
2687.50	14.87	H	5.4	9.8	19.24	33.0	-13.8		
LTE Band 41 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company:		Samsung						
	Project #:		4788962183						
	Date:		2019-04-25						
	Test Engineer:		45585						
	Configuration:		EUT / Y-Position						
	Location:		Chamber 1						
	Mode:		LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth						
	<u>Test Equipment:</u>		Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable						
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	2498.50	10.67	V	5.2	9.9	15.36	33.0	-17.6	
	2498.50	13.42	H	5.2	9.9	18.11	33.0	-14.9	
	Low Ch								
	2502.50	10.62	V	5.2	9.9	15.30	33.0	-17.7	
2502.50	13.54	H	5.2	9.9	18.22	33.0	-14.8		
Mid Ch									
2593.00	9.79	V	5.3	9.8	14.25	33.0	-18.7		
2593.00	14.60	H	5.3	9.8	19.07	33.0	-13.9		
High Ch									
2687.50	11.24	V	5.4	9.8	15.61	33.0	-17.4		
2687.50	14.01	H	5.4	9.8	18.38	33.0	-14.6		

LTE Band 66

LTE Band 66 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 66 Fundamentals, 20MHz Bandwidth <u>Test Equipment:</u> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1720.00	12.73	V	4.3	9.4	17.75	30.0	-12.2	
	1720.00	16.95	H	4.3	9.4	21.98	30.0	-8.0	
	Mid Ch								
	1745.00	12.56	V	4.4	9.4	17.65	30.0	-12.4	
	1745.00	16.08	H	4.4	9.4	21.16	30.0	-8.8	
	High Ch								
	1770.00	10.91	V	4.4	9.5	16.01	30.0	-14.0	
	1770.00	12.66	H	4.4	9.5	17.76	30.0	-12.2	
LTE Band 66 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 66 Fundamentals, 20MHz Bandwidth <u>Test Equipment:</u> Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1720.00	13.29	V	4.3	9.4	18.31	30.0	-11.7	
	1720.00	16.29	H	4.3	9.4	21.32	30.0	-8.7	
	Mid Ch								
	1745.00	13.61	V	4.4	9.4	18.70	30.0	-11.3	
	1745.00	15.49	H	4.4	9.4	20.57	30.0	-9.4	
	High Ch								
	1770.00	9.76	V	4.4	9.5	14.86	30.0	-15.1	
	1770.00	11.55	H	4.4	9.5	16.65	30.0	-13.4	

LTE Band 66 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 66 Fundamentals, 15MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1717.50	10.76	V	4.3	9.3	15.79	30.0	-14.2	
	1717.50	15.69	H	4.3	9.3	20.71	30.0	-9.3	
	Mid Ch								
	1745.00	6.93	V	4.4	9.4	12.02	30.0	-18.0	
	1745.00	16.77	H	4.4	9.4	21.85	30.0	-8.1	
High Ch									
1772.50	12.98	V	4.4	9.5	18.07	30.0	-11.9		
1772.50	16.45	H	4.4	9.5	21.54	30.0	-8.5		
LTE Band 66 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 66 Fundamentals, 15MHz Bandwidth								
	Test Equipment Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1717.50	9.97	V	4.3	9.3	15.00	30.0	-15.0	
	1717.50	14.41	H	4.3	9.3	19.43	30.0	-10.6	
	Mid Ch								
	1745.00	5.40	V	4.4	9.4	10.49	30.0	-19.5	
	1745.00	15.50	H	4.4	9.4	20.58	30.0	-9.4	
High Ch									
1772.50	11.66	V	4.4	9.5	16.75	30.0	-13.2		
1772.50	15.23	H	4.4	9.5	20.32	30.0	-9.7		

LTE Band 66 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 66 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1715.00	14.13	V	4.3	9.3	19.15	30.0	-10.9	
	1715.00	17.78	H	4.3	9.3	22.80	30.0	-7.2	
	Mid Ch								
	1745.00	14.94	V	4.4	9.4	20.03	30.0	-10.0	
	1745.00	16.96	H	4.4	9.4	22.04	30.0	-8.0	
High Ch									
1775.00	10.12	V	4.4	9.5	15.22	30.0	-14.8		
1775.00	12.88	H	4.4	9.5	17.97	30.0	-12.0		
LTE Band 66 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 66 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1715.00	10.78	V	4.3	9.3	15.80	30.0	-14.2	
	1715.00	16.75	H	4.3	9.3	21.77	30.0	-8.2	
	Mid Ch								
	1745.00	13.51	V	4.4	9.4	18.60	30.0	-11.4	
	1745.00	15.44	H	4.4	9.4	20.52	30.0	-9.5	
High Ch									
1775.00	8.99	V	4.4	9.5	14.09	30.0	-15.9		
1775.00	11.73	H	4.4	9.5	16.82	30.0	-13.2		

LTE Band 66 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 66 Fundamentals, 5MHz Bandwidth									
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Low Ch									
	1712.50	9.98	V	4.3	9.3	15.00	30.0	-15.0		
	1712.50	15.62	H	4.3	9.3	20.64	30.0	-9.4		
	Mid Ch									
	1745.00	6.09	V	4.4	9.4	11.18	30.0	-18.8		
	1745.00	16.63	H	4.4	9.4	21.71	30.0	-8.3		
High Ch										
1777.50	12.92	V	4.4	9.5	18.02	30.0	-12.0			
1777.50	16.64	H	4.4	9.5	21.74	30.0	-8.3			
LTE Band 66 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 66 Fundamentals, 5MHz Bandwidth									
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Low Ch									
	1712.50	9.05	V	4.3	9.3	14.07	30.0	-15.9		
	1712.50	14.13	H	4.3	9.3	19.15	30.0	-10.9		
	Mid Ch									
	1745.00	4.98	V	4.4	9.4	10.07	30.0	-19.9		
	1745.00	15.56	H	4.4	9.4	20.64	30.0	-9.4		
High Ch										
1777.50	11.46	V	4.4	9.5	16.56	30.0	-13.4			
1777.50	15.32	H	4.4	9.5	20.42	30.0	-9.6			

LTE Band 66 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 66 Fundamentals, 3MHz Bandwidth									
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Low Ch									
	1711.50	12.16	V	4.3	9.3	17.17	30.0	-12.8		
	1711.50	15.49	H	4.3	9.3	20.50	30.0	-9.5		
	Mid Ch									
	1745.00	13.96	V	4.4	9.4	19.05	30.0	-11.0		
	1745.00	16.54	H	4.4	9.4	21.62	30.0	-8.4		
High Ch										
1778.50	12.07	V	4.4	9.5	17.16	30.0	-12.8			
1778.50	16.47	H	4.4	9.5	21.57	30.0	-8.4			
LTE Band 66 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 66 Fundamentals, 3MHz Bandwidth									
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Low Ch									
	1711.50	9.27	V	4.3	9.3	14.28	30.0	-15.7		
	1711.50	14.30	H	4.3	9.3	19.31	30.0	-10.7		
	Mid Ch									
	1745.00	10.89	V	4.4	9.4	15.98	30.0	-14.0		
	1745.00	15.20	H	4.4	9.4	20.28	30.0	-9.7		
High Ch										
1778.50	10.25	V	4.4	9.5	15.34	30.0	-14.7			
1778.50	15.26	H	4.4	9.5	20.36	30.0	-9.6			

LTE Band 66 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 66 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1710.70	10.14	V	4.3	9.3	15.15	30.0	-14.9	
	1710.70	14.38	H	4.3	9.3	19.39	30.0	-10.6	
	Mid Ch								
	1745.00	13.96	V	4.4	9.4	19.05	30.0	-11.0	
	1745.00	16.46	H	4.4	9.4	21.54	30.0	-8.5	
High Ch									
1779.30	10.91	V	4.4	9.5	16.01	30.0	-14.0		
1779.30	16.46	H	4.4	9.5	21.55	30.0	-8.4		
LTE Band 66 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 66 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 8.5m SMA-type Cable								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1710.70	11.12	V	4.3	9.3	16.13	30.0	-13.9	
	1710.70	16.43	H	4.3	9.3	21.44	30.0	-8.6	
	Mid Ch								
	1745.00	13.57	V	4.4	9.4	18.66	30.0	-11.3	
	1745.00	15.20	H	4.4	9.4	20.28	30.0	-9.7	
High Ch									
1779.30	10.02	V	4.4	9.5	15.12	30.0	-14.9		
1779.30	15.20	H	4.4	9.5	20.29	30.0	-9.7		

10.2. RADIATED SPURIOUS EMISSION

RULE PART(S)

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

IC : RSS-130 (4.7), RSS-132 (5.5), RSS-133 (6.5), RSS-139 (6.6). RSS-195 (5.6), RSS-199 (4.5)

LIMIT

Part 22.917(a) & Part 24.238(a) & Part 27.53(h) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

Part 27.53:

(a)(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz;

(iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz.

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

(h) The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

(m)(4) For mobile station, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge and $(55 + 10 \log (P))$ dB at the 5.5 MHz from the channel edges.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03

For peak power measurement with a ESU40:

- a) Set the RBW = 100 KHz for emission below 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points \geq span/RBW;
- g) Trace mode = average(WCDMA, LTE), Maxhold(GSM, LTE Band 40,41);

NOTE 1: Radiated spurious emissions were investigated below 30MHz, 30MHz – 1GHz and above 1GHz. There were no emissions found on below 30MHz and 30MHz – 1GHz.

NOTE 2: Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

RESULTS

See the following pages.

10.2.1. SPURIOUS RADIATION PLOTS

GSM850

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company:	Samsung							
		Project #:	4788962183							
		Date:	2019-04-25							
		Test Engineer:	45585							
		Configuration:	EUT / AC Adapter/ Earphone,							
		Location:	Chamber 1							
		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, 824.2MHz										
1648.40	3.0	V	3.0	43.6	1.0	-39.6	-13.0	-26.6		
2472.60	-3.1	V	3.0	43.4	1.0	-45.5	-13.0	-32.5		
3296.80	-7.6	V	3.0	43.6	1.0	-50.3	-13.0	-37.3		
1648.40	2.3	H	3.0	43.6	1.0	-40.2	-13.0	-27.2		
2472.60	-5.1	H	3.0	43.4	1.0	-47.6	-13.0	-34.6		
3296.80	-8.3	H	3.0	43.6	1.0	-50.9	-13.0	-37.9		
Mid Ch, 836.6MHz										
1673.20	-2.4	V	3.0	43.6	1.0	-45.0	-13.0	-32.0		
2509.80	-11.6	V	3.0	43.4	1.0	-54.0	-13.0	-41.0		
3346.40	-9.3	V	3.0	43.6	1.0	-52.0	-13.0	-39.0		
1673.20	-2.5	H	3.0	43.6	1.0	-45.1	-13.0	-32.1		
2509.80	-12.1	H	3.0	43.4	1.0	-54.5	-13.0	-41.5		
3346.40	-9.5	H	3.0	43.6	1.0	-52.1	-13.0	-39.1		
High Ch, 848.8MHz										
1697.60	-3.7	V	3.0	43.6	1.0	-46.3	-13.0	-33.3		
2546.40	-11.1	V	3.0	43.4	1.0	-53.6	-13.0	-40.6		
3395.20	-9.2	V	3.0	43.7	1.0	-51.9	-13.0	-38.9		
1697.60	-4.5	H	3.0	43.6	1.0	-47.1	-13.0	-34.1		
2546.40	-13.0	H	3.0	43.4	1.0	-55.4	-13.0	-42.4		
3395.20	-10.2	H	3.0	43.7	1.0	-52.8	-13.0	-39.8		

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company:	Samsung							
		Project #:	4788962183							
		Date:	2019-04-25							
		Test Engineer:	45585							
		Configuration:	EUT / AC Adapter/ Earphone, Z-Position							
		Location:	Chamber 1							
		Mode:	EGPRS 850 MHz Harmonics							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Low Ch, 824.2MHz										
1648.40	-2.4	V	3.0	43.6	1.0	-45.0	-13.0	-32.0		
2472.60	-11.4	V	3.0	43.4	1.0	-53.9	-13.0	-40.9		
3296.80	-9.3	V	3.0	43.6	1.0	-51.9	-13.0	-38.9		
1648.40	-9.1	H	3.0	43.6	1.0	-51.7	-13.0	-38.7		
2472.60	-12.0	H	3.0	43.4	1.0	-54.4	-13.0	-41.4		
3296.80	-9.9	H	3.0	43.6	1.0	-52.5	-13.0	-39.5		
Mid Ch, 836.6MHz										
1673.20	-9.0	V	3.0	43.6	1.0	-51.6	-13.0	-38.6		
2509.80	-11.5	V	3.0	43.4	1.0	-53.9	-13.0	-40.9		
3346.40	-9.4	V	3.0	43.6	1.0	-52.0	-13.0	-39.0		
1673.20	-12.3	H	3.0	43.6	1.0	-54.9	-13.0	-41.9		
2509.80	-12.1	H	3.0	43.4	1.0	-54.5	-13.0	-41.5		
3346.40	-9.6	H	3.0	43.6	1.0	-52.2	-13.0	-39.2		
High Ch, 848.8MHz										
1697.60	-12.0	V	3.0	43.6	1.0	-54.6	-13.0	-41.6		
2546.40	-11.3	V	3.0	43.4	1.0	-53.7	-13.0	-40.7		
3395.20	-8.9	V	3.0	43.7	1.0	-51.6	-13.0	-38.6		
1697.60	-13.8	H	3.0	43.6	1.0	-56.4	-13.0	-43.4		
2546.40	-12.0	H	3.0	43.4	1.0	-54.4	-13.0	-41.4		
3395.20	-9.2	H	3.0	43.7	1.0	-51.8	-13.0	-38.8		

GSM1900

UL Verification Services, Inc.									
Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788962183							
Date:		2019-04-25							
Test Engineer:		45585							
Configuration:		EUT / AC Adaptor / Earphone / Y-Position							
Location:		Chamber 1							
Mode:		GPRS 1900 MHz Harmonics							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-9.2	V	3.0	43.8	1.0	-51.9	-13.0	-38.9	
5550.60	-7.6	V	3.0	43.7	1.0	-50.3	-13.0	-37.3	
7400.80	-4.7	V	3.0	42.5	1.0	-46.2	-13.0	-33.2	
3700.40	-4.0	H	3.0	43.8	1.0	-46.8	-13.0	-33.8	
5550.60	-7.8	H	3.0	43.7	1.0	-50.5	-13.0	-37.5	
7400.80	-4.7	H	3.0	42.5	1.0	-46.3	-13.0	-33.3	
Mid Ch, 1880MHz									
3760.00	-8.3	V	3.0	43.8	1.0	-51.0	-13.0	-38.0	
5640.00	-7.1	V	3.0	43.7	1.0	-49.8	-13.0	-36.8	
7520.00	-4.7	V	3.0	42.5	1.0	-46.1	-13.0	-33.1	
3760.00	-2.2	H	3.0	43.8	1.0	-45.0	-13.0	-32.0	
5640.00	-7.3	H	3.0	43.7	1.0	-50.0	-13.0	-37.0	
7520.00	-4.7	H	3.0	42.5	1.0	-46.2	-13.0	-33.2	
High Ch, 1909.8MHz									
3819.60	-8.3	V	3.0	43.8	1.0	-51.1	-13.0	-38.1	
5729.40	-7.3	V	3.0	43.7	1.0	-50.0	-13.0	-37.0	
7639.20	-4.5	V	3.0	42.4	1.0	-45.9	-13.0	-32.9	
3819.60	-3.2	H	3.0	43.8	1.0	-46.1	-13.0	-33.1	
5729.40	-7.4	H	3.0	43.7	1.0	-50.1	-13.0	-37.1	
7639.20	-4.5	H	3.0	42.4	1.0	-45.9	-13.0	-32.9	

UL Verification Services, Inc.									
Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788962183							
Date:		2019-04-25							
Test Engineer:		45585							
Configuration:		EUT / AC Adaptor / Earphone / Y-Position							
Location:		Chamber 1							
Mode:		EGPRS 1900 MHz Harmonics							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.1	V	3.0	43.8	1.0	-52.8	-13.0	-39.8	
5550.60	-7.6	V	3.0	43.7	1.0	-50.3	-13.0	-37.3	
7400.80	-4.7	V	3.0	42.5	1.0	-46.2	-13.0	-33.2	
3700.40	-6.6	H	3.0	43.8	1.0	-49.3	-13.0	-36.3	
5550.60	-7.6	H	3.0	43.7	1.0	-50.3	-13.0	-37.3	
7400.80	-4.7	H	3.0	42.5	1.0	-46.2	-13.0	-33.2	
Mid Ch, 1880MHz									
3760.00	-10.1	V	3.0	43.8	1.0	-52.9	-13.0	-39.9	
5640.00	-7.0	V	3.0	43.7	1.0	-49.7	-13.0	-36.7	
7520.00	-4.9	V	3.0	42.5	1.0	-46.3	-13.0	-33.3	
3760.00	-4.2	H	3.0	43.8	1.0	-47.0	-13.0	-34.0	
5640.00	-7.3	H	3.0	43.7	1.0	-50.0	-13.0	-37.0	
7520.00	-4.6	H	3.0	42.5	1.0	-46.0	-13.0	-33.0	
High Ch, 1909.8MHz									
3819.60	-10.1	V	3.0	43.8	1.0	-52.9	-13.0	-39.9	
5729.40	-7.3	V	3.0	43.7	1.0	-50.0	-13.0	-37.0	
7639.20	-4.6	V	3.0	42.4	1.0	-46.0	-13.0	-33.0	
3819.60	-6.9	H	3.0	43.8	1.0	-49.7	-13.0	-36.7	
5729.40	-7.6	H	3.0	43.7	1.0	-50.3	-13.0	-37.3	
7639.20	-4.5	H	3.0	42.4	1.0	-45.9	-13.0	-32.9	

WCDMA Band 5

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
		Company:	Samsung										
		Project #:	4788962183										
		Date:	2019-04-25										
		Test Engineer:	45585										
		Configuration:	EUT / AC Adapter/ Earphone, Z-Position										
		Location:	Chamber 1										
		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		
WCDMA Band 5 REL99	Low Ch, 826.4MHz												
	1652.80	-15.0	V	3.0	43.6	1.0	-57.6	-13.0	-44.6				
	2479.20	-12.1	V	3.0	43.4	1.0	-54.6	-13.0	-41.6				
	3305.60	-10.6	V	3.0	43.6	1.0	-53.2	-13.0	-40.2				
	1652.80	-16.2	H	3.0	43.6	1.0	-58.8	-13.0	-45.8				
	2479.20	-12.8	H	3.0	43.4	1.0	-55.2	-13.0	-42.2				
	3305.60	-10.6	H	3.0	43.6	1.0	-53.2	-13.0	-40.2				
	Mid Ch, 836.6MHz												
	1673.20	-15.0	V	3.0	43.6	1.0	-57.6	-13.0	-44.6				
	2509.80	-12.3	V	3.0	43.4	1.0	-54.7	-13.0	-41.7				
	3346.40	-10.1	V	3.0	43.6	1.0	-52.7	-13.0	-39.7				
	1673.20	-16.2	H	3.0	43.6	1.0	-58.8	-13.0	-45.8				
	2509.80	-13.0	H	3.0	43.4	1.0	-55.4	-13.0	-42.4				
	3346.40	-10.5	H	3.0	43.6	1.0	-53.1	-13.0	-40.1				
	High Ch, 846.6MHz												
	1693.20	-15.2	V	3.0	43.6	1.0	-57.7	-13.0	-44.7				
	2539.80	-12.4	V	3.0	43.4	1.0	-54.9	-13.0	-41.9				
	3386.40	-10.1	V	3.0	43.7	1.0	-52.8	-13.0	-39.8				
	1693.20	-16.3	H	3.0	43.6	1.0	-58.8	-13.0	-45.8				
	2539.80	-13.0	H	3.0	43.4	1.0	-55.4	-13.0	-42.4				
	3386.40	-10.3	H	3.0	43.7	1.0	-53.0	-13.0	-40.0				
	WCDMA Band 5 HSDPA	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
				Company:	Samsung								
				Project #:	4788962183								
		Date:	2019-04-25										
		Test Engineer:	45585										
		Configuration:	EUT / AC Adapter / Earphone, Z-Position										
		Location:	Chamber 1										
		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		
WCDMA Band 5 HSDPA		Low Ch, 826.4MHz											
		1652.80	-15.3	V	3.0	43.6	1.0	-57.9	-13.0	-44.9			
		2479.20	-12.4	V	3.0	43.4	1.0	-54.8	-13.0	-41.8			
		3305.60	-10.6	V	3.0	43.6	1.0	-53.2	-13.0	-40.2			
		1652.80	-16.4	H	3.0	43.6	1.0	-59.0	-13.0	-46.0			
		2479.20	-13.1	H	3.0	43.4	1.0	-55.5	-13.0	-42.5			
		3305.60	-10.6	H	3.0	43.6	1.0	-53.2	-13.0	-40.2			
		Mid Ch, 836.6MHz											
		1673.20	-15.0	V	3.0	43.6	1.0	-57.5	-13.0	-44.5			
		2509.80	-12.2	V	3.0	43.4	1.0	-54.6	-13.0	-41.6			
		3346.40	-10.2	V	3.0	43.6	1.0	-52.9	-13.0	-39.9			
		1673.20	-16.1	H	3.0	43.6	1.0	-58.6	-13.0	-45.6			
		2509.80	-13.2	H	3.0	43.4	1.0	-55.6	-13.0	-42.6			
		3346.40	-10.2	H	3.0	43.6	1.0	-52.9	-13.0	-39.9			
		High Ch, 846.6MHz											
	1693.20	-15.0	V	3.0	43.6	1.0	-57.6	-13.0	-44.6				
	2539.80	-12.3	V	3.0	43.4	1.0	-54.7	-13.0	-41.7				
	3386.40	-10.1	V	3.0	43.7	1.0	-52.8	-13.0	-39.8				
	1693.20	-16.0	H	3.0	43.6	1.0	-58.6	-13.0	-45.6				
	2539.80	-12.7	H	3.0	43.4	1.0	-55.2	-13.0	-42.2				
	3386.40	-10.1	H	3.0	43.7	1.0	-52.7	-13.0	-39.7				

WCDMA Band 4

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
WCDMA Band 4 REL99	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 1 Mode: Rel99 Band 4 Harmonics										
	Low Ch, 1712.4MHz										
	3424.80	-7.8	V	3.0	43.7	1.0	-50.5	-13.0	-37.5		
	5137.20	-8.7	V	3.0	43.8	1.0	-51.5	-13.0	-38.5		
	6849.60	-5.9	V	3.0	42.9	1.0	-47.8	-13.0	-34.8		
	3424.80	-7.4	H	3.0	43.7	1.0	-50.1	-13.0	-37.1		
	5137.20	-9.1	H	3.0	43.8	1.0	-51.9	-13.0	-38.9		
	6849.60	-6.1	H	3.0	42.9	1.0	-48.0	-13.0	-35.0		
	Mid Ch, 1732.6MHz										
	3465.20	-8.6	V	3.0	43.7	1.0	-51.3	-13.0	-38.3		
	5197.80	-8.7	V	3.0	43.8	1.0	-51.4	-13.0	-38.4		
	6930.40	-6.0	V	3.0	42.8	1.0	-47.8	-13.0	-34.8		
	3465.20	-9.2	H	3.0	43.7	1.0	-51.9	-13.0	-38.9		
	5197.80	-8.8	H	3.0	43.8	1.0	-51.6	-13.0	-38.6		
	6930.40	-6.1	H	3.0	42.8	1.0	-47.9	-13.0	-34.9		
	High Ch, 1752.6MHz										
	3505.20	-8.8	V	3.0	43.7	1.0	-51.5	-13.0	-38.5		
	5257.80	-8.8	V	3.0	43.8	1.0	-51.6	-13.0	-38.6		
	7010.40	-5.7	V	3.0	42.7	1.0	-47.4	-13.0	-34.4		
	3505.20	-9.2	H	3.0	43.7	1.0	-51.9	-13.0	-38.9		
	5257.80	-8.9	H	3.0	43.8	1.0	-51.6	-13.0	-38.6		
	7010.40	-5.6	H	3.0	42.7	1.0	-47.3	-13.0	-34.3		
	WCDMA Band 4 HSDPA	Company: Samsung Project #: 4788962183 Date: 2019-04-24 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 1 Mode: HSDPA Band 4 Harmonics									
		Low Ch, 1712.4MHz									
		3424.80	-7.6	V	3.0	43.7	1.0	-50.2	-13.0	-37.2	
		5137.20	-9.1	V	3.0	43.8	1.0	-51.9	-13.0	-38.9	
		6849.60	-6.1	V	3.0	42.9	1.0	-48.0	-13.0	-35.0	
		3424.80	-7.1	H	3.0	43.7	1.0	-49.8	-13.0	-36.8	
		5137.20	-9.0	H	3.0	43.8	1.0	-51.7	-13.0	-38.7	
		6849.60	-6.1	H	3.0	42.9	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1732.6MHz											
3465.20		-8.7	V	3.0	43.7	1.0	-51.4	-13.0	-38.4		
5197.80		-8.8	V	3.0	43.8	1.0	-51.5	-13.0	-38.5		
6930.40		-6.0	V	3.0	42.8	1.0	-47.8	-13.0	-34.8		
3465.20		-9.2	H	3.0	43.7	1.0	-51.9	-13.0	-38.9		
5197.80		-8.8	H	3.0	43.8	1.0	-51.6	-13.0	-38.6		
6930.40		-6.1	H	3.0	42.8	1.0	-47.9	-13.0	-34.9		
High Ch, 1752.6MHz											
3505.20		-8.7	V	3.0	43.7	1.0	-51.4	-13.0	-38.4		
5257.80		-8.7	V	3.0	43.8	1.0	-51.5	-13.0	-38.5		
7010.40		-5.6	V	3.0	42.7	1.0	-47.3	-13.0	-34.3		
3505.20		-9.1	H	3.0	43.7	1.0	-51.8	-13.0	-38.8		
5257.80		-8.8	H	3.0	43.8	1.0	-51.5	-13.0	-38.5		
7010.40		-5.6	H	3.0	42.7	1.0	-47.3	-13.0	-34.3		