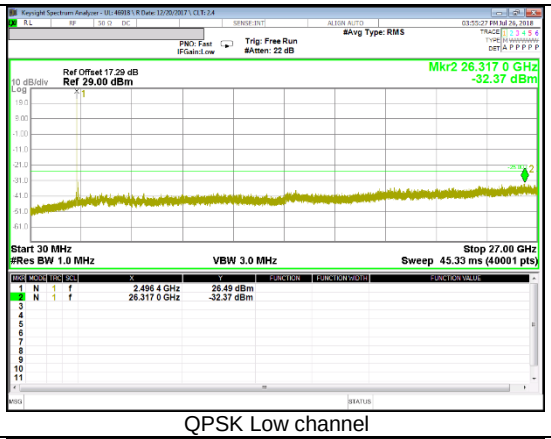
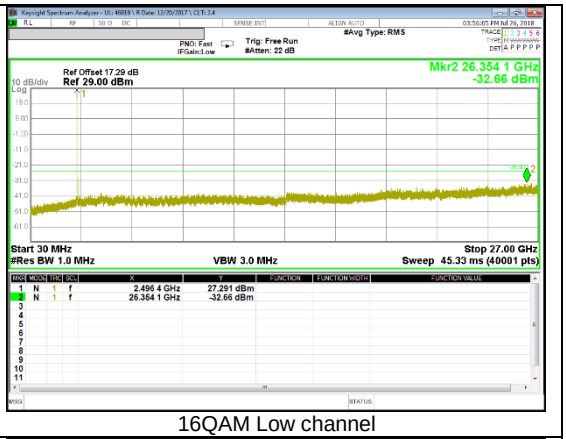
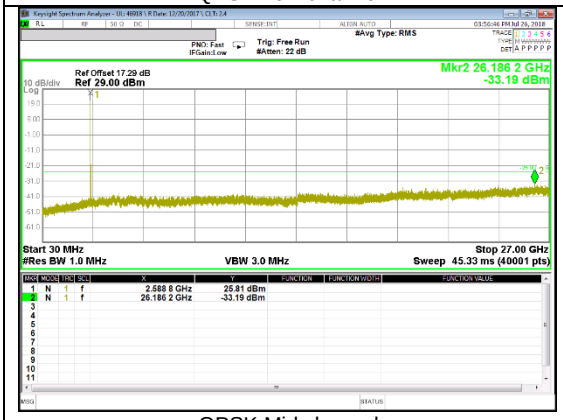
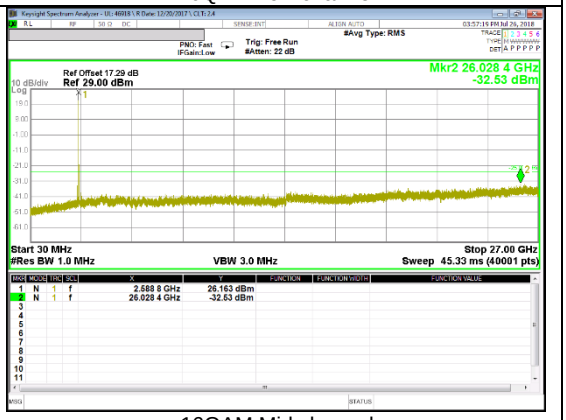
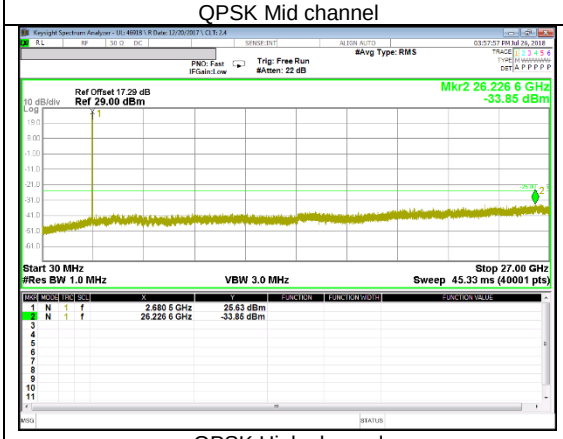
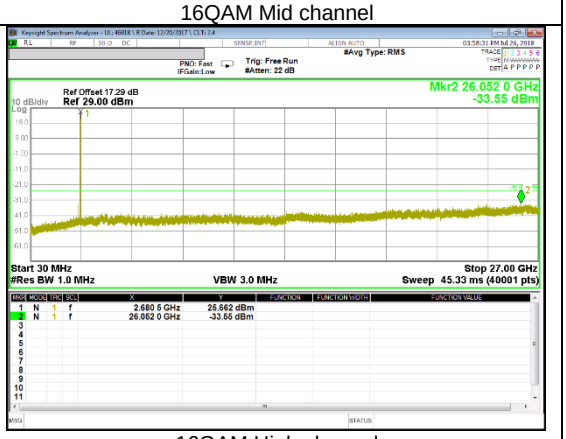
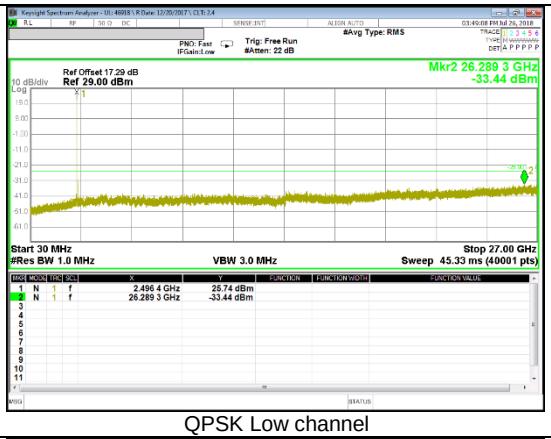
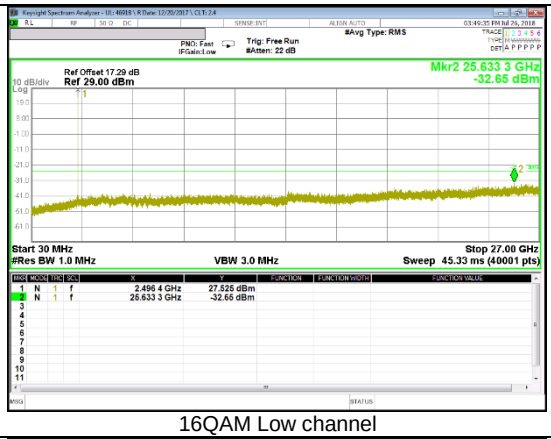
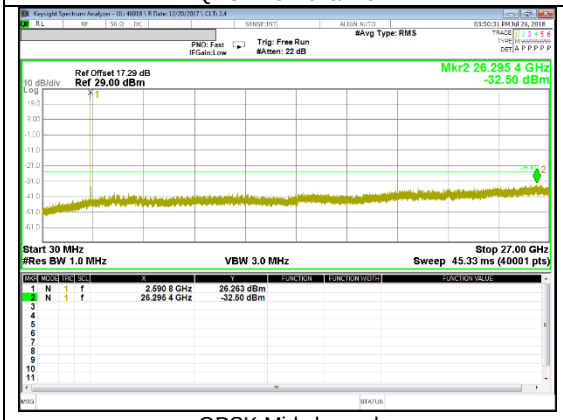
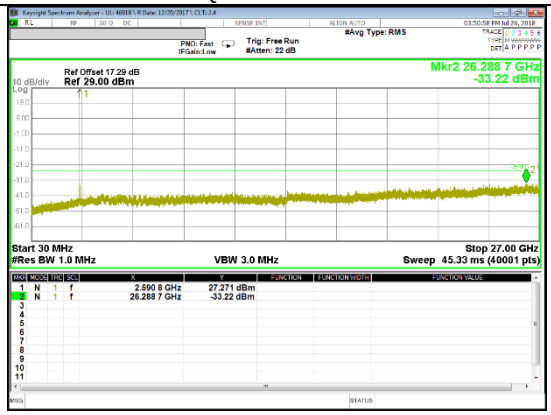
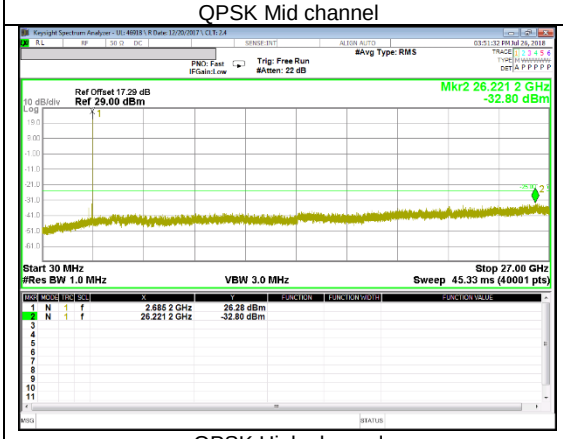
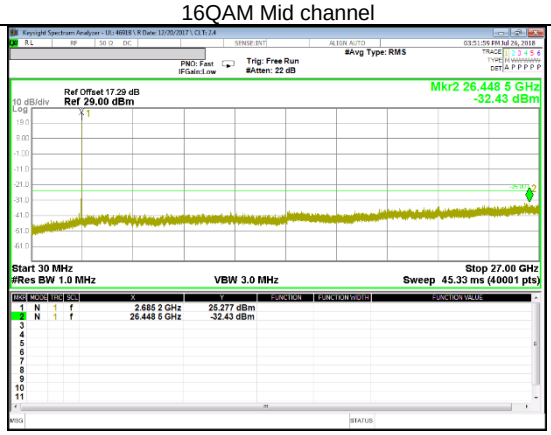
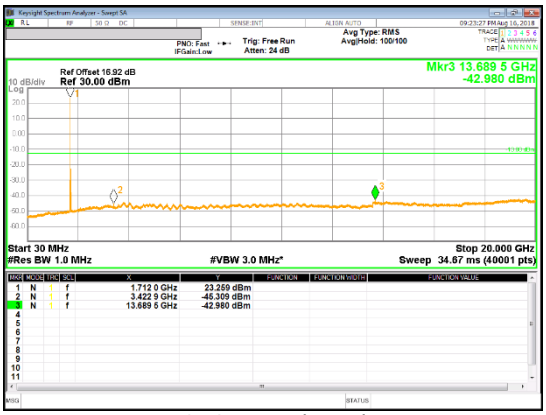
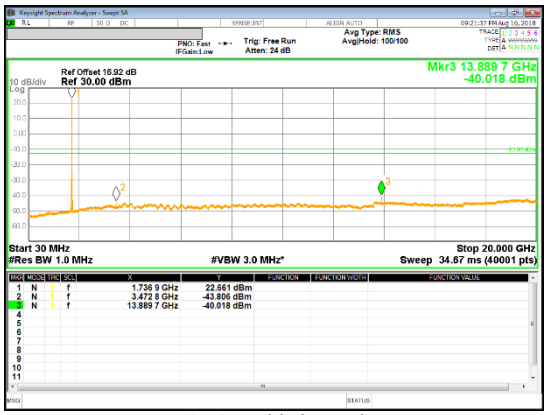
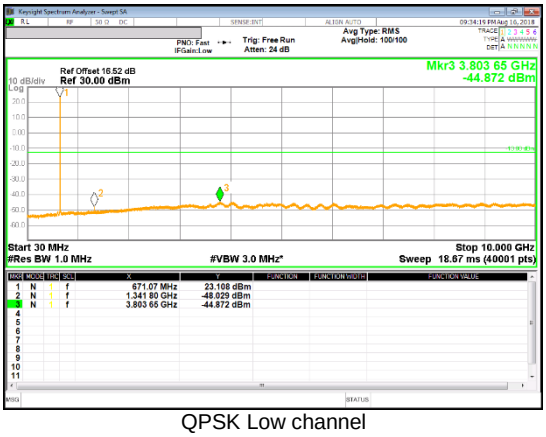
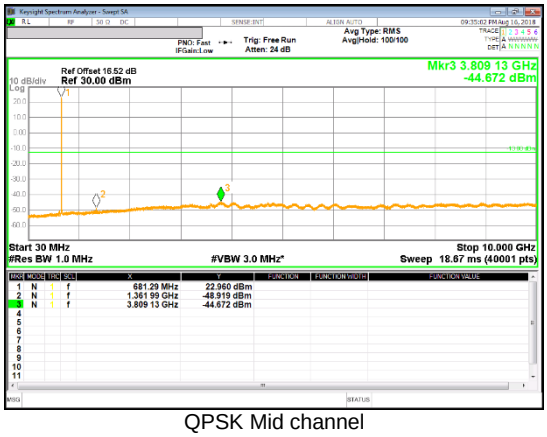
Band 41 10MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

Band 41 5MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

LTE Band 66

Band 66 20MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 71

Band 71 20MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54, §90.213 and §90.539

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

WCDMA Band 5 (Rel 99)

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
7.70	50	826.40001177	-0.007	846.60000944	-0.003	2.5
7.70	40	826.40001190	-0.008	846.60001368	-0.008	2.5
7.70	30	826.40000662	-0.001	846.60000967	-0.004	2.5
7.70	***20***	***826.40000559***	***0.000***	***846.60000668***	***0.000***	***2.5***
7.70	10	826.40001156	-0.007	846.60000752	-0.001	2.5
7.70	0	826.40000987	-0.005	846.60001544	-0.010	2.5
7.70	-10	826.40001322	-0.009	846.60001303	-0.008	2.5
7.70	-20	826.40000583	0.000	846.60000544	0.001	2.5
7.70	-30	826.40001429	-0.011	846.60001021	-0.004	2.5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
7.70	***20***	**826.40000559**	***0***	**846.60000668**	***0***	***2.5***
8.80	20	826.40001396	-0.010	846.60000526	0.002	2.5
7.35	20	826.40001002	-0.005	846.60001025	-0.004	2.5

WCDMA Band 4 (HSDPA)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1712.3979	1752.6021		
Extreme (50C)		1712.3980	1752.6021	16.4	0.009
Extreme (40C)		1712.3980	1752.6021	20.8	0.012
Extreme (30C)		1712.3980	1752.6021	16.5	0.010
Extreme (10C)		1712.3979	1752.6021	11.8	0.007
Extreme (0C)		1712.3980	1752.6021	19.8	0.011
Extreme (-10C)		1712.3979	1752.6021	13.4	0.008
Extreme (-20C)		1712.3980	1752.6021	19.1	0.011
Extreme (-30C)		1712.3979	1752.6021	13.6	0.008
20C	15%	1712.3980	1752.6021	17.6	0.010
	-15%	1712.3980	1752.6021	14.6	0.008
	End Point	1712.3980	1752.6021	18.4	0.011

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)		1852.3980	1907.6021	13.4	0.007
Extreme (40C)		1852.3980	1907.6021	22.8	0.012
Extreme (30C)		1852.3980	1907.6021	15.6	0.008
Extreme (10C)		1852.3980	1907.6021	22.4	0.012
Extreme (0C)		1852.3980	1907.6021	18.1	0.010
Extreme (-10C)		1852.3980	1907.6021	14.9	0.008
Extreme (-20C)		1852.3980	1907.6021	15.8	0.008
Extreme (-30C)		1852.3980	1907.6021	21.9	0.012
20C	15%	1852.3980	1907.6021	15.0	0.008
	-15%	1852.3980	1907.6021	17.8	0.009
	End Point	1852.3980	1907.6021	21.9	0.012

LTE Band 7 (QPSK)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2502.4978	2567.5022		
Extreme (50C)		2502.4978	2567.5023	23.2	0.009
Extreme (40C)		2502.4978	2567.5023	23.1	0.009
Extreme (30C)		2502.4978	2567.5023	30.6	0.012
Extreme (10C)		2502.4978	2567.5023	24.1	0.010
Extreme (0C)		2502.4978	2567.5023	28.4	0.011
Extreme (-10C)		2502.4978	2567.5023	23.4	0.009
Extreme (-20C)		2502.4978	2567.5023	20.1	0.008
Extreme (-30C)		2502.4978	2567.5023	30.6	0.012
20C	15%	2502.4978	2567.5023	22.2	0.009
	-15%	2502.4978	2567.5023	23.9	0.009
	End Point	2502.4978	2567.5023	30.0	0.012

LTE Band 12 (16QAM)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.6995	715.3005		
Extreme (50C)		699.6995	715.3006	12.3	0.017
Extreme (40C)		699.6995	715.3006	12.0	0.017
Extreme (30C)		699.6995	715.3006	18.5	0.026
Extreme (10C)		699.6995	715.3006	11.3	0.016
Extreme (0C)		699.6995	715.3006	13.7	0.019
Extreme (-10C)		699.6995	715.3006	12.9	0.018
Extreme (-20C)		699.6995	715.3006	11.0	0.015
Extreme (-30C)		699.6995	715.3006	12.9	0.018
20C	15%	699.6995	715.3006	13.5	0.019
	-15%	699.6995	715.3006	17.2	0.024
	End Point	699.6995	715.3006	12.0	0.017

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LTE Band 13 (QPSK)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	779.4978	784.5022		
Extreme (50C)		779.4978	784.5023	17.4	0.022
Extreme (40C)		779.4978	784.5023	20.1	0.026
Extreme (30C)		779.4978	784.5023	11.4	0.015
Extreme (10C)		779.4978	784.5023	17.2	0.022
Extreme (0C)		779.4978	784.5023	10.4	0.013
Extreme (-10C)		779.4978	784.5023	16.4	0.021
Extreme (-20C)		779.4978	784.5023	15.5	0.020
Extreme (-30C)		779.4978	784.5023	20.3	0.026
20C	15%	779.4978	784.5023	16.8	0.021
	-15%	779.4978	784.5023	12.9	0.017
	End Point	779.4978	784.5023	16.1	0.021

LTE Band 14 (QPSK)

Reference Frequency : LTE Band 14 Low Channel 790.5 MHz / High Channel 795.5 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	988.125 Hz		High Channel	994.375 Hz	
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
7.70	50	790.50001825	-0.016	795.50001499	0.002	1.25
7.70	40	790.50001035	0.004	795.50001243	0.009	1.25
7.70	30	790.50001574	-0.010	795.50001139	0.011	1.25
7.70	***20***	***790.50001192***	***0.000***	***795.50001586***	***0.000***	***1.25***
7.70	10	790.50001611	-0.011	795.50001693	-0.003	1.25
7.70	0	790.50001999	-0.020	795.50001153	0.011	1.25
7.70	-10	790.50001676	-0.012	795.50001347	0.006	1.25
7.70	-20	790.50001512	-0.008	795.50001459	0.003	1.25
7.70	-30	790.50001279	-0.002	795.50001687	-0.003	1.25

Reference Frequency : LTE Band 14 Low Channel 790.5 MHz / High Channel 795.5 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	988.125 Hz		High Channel	994.375 Hz	
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
7.70	***20***	***790.50001192***	***0***	***795.50001586***	***0***	***1.25***
8.80	20	790.50001614	-0.011	795.50001131	0.011	1.25
7.35	20	790.50002015	-0.021	795.50001027	0.014	1.25

LTE Band 25 (16QAM)

Limit		1850	1915	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.6995	1914.3005		
Extreme (50C)		1850.6995	1914.3006	16.3	0.009
Extreme (40C)		1850.6995	1914.3006	21.2	0.011
Extreme (30C)		1850.6995	1914.3006	12.4	0.007
Extreme (10C)		1850.6995	1914.3006	16.8	0.009
Extreme (0C)		1850.6995	1914.3006	19.6	0.010
Extreme (-10C)		1850.6995	1914.3006	15.4	0.008
Extreme (-20C)		1850.6995	1914.3006	22.5	0.012
Extreme (-30C)		1850.6995	1914.3006	16.7	0.009
20C	15%	1850.6995	1914.3006	21.8	0.012
	-15%	1850.6995	1914.3006	15.1	0.008
	End Point	1850.6995	1914.3006	17.3	0.009

LTE Band 26 (QPSK)

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2036.750 Hz		High Channel	2120.750 Hz	
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
7.70	50	814.70001372	-0.008	848.30001150	-0.003	2.5
7.70	40	814.70001228	-0.006	848.30001197	-0.004	2.5
7.70	30	814.70000831	-0.002	848.30001375	-0.006	2.5
7.70	***20***	***814.70000703***	***0.000***	***848.30000863***	***0.000***	***2.5***
7.70	10	814.70001351	-0.008	848.30001367	-0.006	2.5
7.70	0	814.70000748	-0.001	848.30000666	0.002	2.5
7.70	-10	814.70001275	-0.007	848.30001295	-0.005	2.5
7.70	-20	814.70000699	0.000	848.30001259	-0.005	2.5
7.70	-30	814.70001556	-0.010	848.30001244	-0.004	2.5

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2036.750 Hz		High Channel	2120.750 Hz	
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
7.70	***20***	***814.70000703***	***0***	***848.30000863***	***0***	***2.5***
8.80	20	814.70001446	-0.009	848.30001277	-0.005	2.5
7.35	20	814.70001534	-0.010	848.30001575	-0.008	2.5

LTE Band 30 (QPSK)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2307.4977	2312.5022		
Extreme (50C)		2307.4978	2312.5023	21.1	0.009
Extreme (40C)		2307.4978	2312.5023	15.2	0.007
Extreme (30C)		2307.4978	2312.5023	21.9	0.009
Extreme (10C)		2307.4978	2312.5023	19.1	0.008
Extreme (0C)		2307.4978	2312.5023	22.1	0.010
Extreme (-10C)		2307.4978	2312.5023	22.2	0.010
Extreme (-20C)		2307.4978	2312.5023	17.8	0.008
Extreme (-30C)		2307.4978	2312.5023	24.6	0.011
20C	15%	2307.4978	2312.5023	21.3	0.009
	-15%	2307.4978	2312.5023	17.1	0.007
	End Point	2307.4978	2312.5023	24.5	0.011

LTE Band 41 (16QAM)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2498.4978	2687.5022		
Extreme (50C)		2498.4978	2687.5023	24.6	0.009
Extreme (40C)		2498.4978	2687.5023	15.5	0.006
Extreme (30C)		2498.4978	2687.5023	25.8	0.010
Extreme (10C)		2498.4978	2687.5023	23.1	0.009
Extreme (0C)		2498.4978	2687.5023	20.0	0.008
Extreme (-10C)		2498.4978	2687.5023	21.6	0.008
Extreme (-20C)		2498.4978	2687.5023	18.0	0.007
Extreme (-30C)		2498.4978	2687.5023	17.4	0.007
20C	15%	2498.4978	2687.5023	21.7	0.008
	-15%	2498.4978	2687.5023	24.8	0.010
	End Point	2498.4978	2687.5023	16.3	0.006

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LTE Band 66 (16QAM)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.6995	1779.3005		
Extreme (50C)		1710.6995	1779.3006	19.8	0.011
Extreme (40C)		1710.6995	1779.3006	10.9	0.006
Extreme (30C)		1710.6995	1779.3006	14.2	0.008
Extreme (10C)		1710.6995	1779.3006	13.6	0.008
Extreme (0C)		1710.6995	1779.3006	20.0	0.011
Extreme (-10C)		1710.6995	1779.3006	12.7	0.007
Extreme (-20C)		1710.6995	1779.3006	10.1	0.006
Extreme (-30C)		1710.6995	1779.3006	18.0	0.010
20C	15%	1710.6995	1779.3006	18.4	0.011
	-15%	1710.6995	1779.3006	10.2	0.006
	End Point	1710.6995	1779.3006	16.6	0.009

LTE Band 71 (QPSK)

Limit		663	698	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	665.4978	695.5022		
Extreme (50C)		665.4978	695.5022	11.4	0.017
Extreme (40C)		665.4978	695.5022	9.9	0.015
Extreme (30C)		665.4978	695.5022	6.9	0.010
Extreme (10C)		665.4978	695.5023	15.4	0.023
Extreme (0C)		665.4978	695.5023	14.3	0.021
Extreme (-10C)		665.4978	695.5022	11.2	0.016
Extreme (-20C)		665.4978	695.5022	6.2	0.009
Extreme (-30C)		665.4978	695.5022	11.6	0.017
20C	15%	665.4978	695.5022	8.9	0.013
	-15%	665.4978	695.5022	9.0	0.013
	End Point	665.4978	695.5023	13.4	0.020

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10. RADIATED TEST RESULTS

10.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50, §90.542 and §90.635

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.

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

(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.

Part 90.542(a)(7) Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

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

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

TEST RESULTS

10.1.1. ERP/EIRP Results

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	19.68	92.90
		4183	836.6	**19.89**	**97.50**
		4233	846.6	18.75	74.99
	HSDPA	4132	826.4	18.53	71.29
		4183	836.6	**18.71**	**74.30**
		4233	846.6	17.86	61.09
Band 4	REL99	1312	1712.4	22.49	177.42
		1413	1732.6	23.17	207.49
		1513	1752.6	**23.21**	**209.41**
	HSDPA	1312	1712.4	21.57	143.55
		1413	1732.6	**22.27**	**168.66**
		1513	1752.6	21.75	149.62
Band 2	REL99	9262	1852.4	21.71	148.25
		9400	1880.0	22.04	159.96
		9538	1907.6	**22.18**	**165.20**
	HSDPA	9262	1852.4	20.32	107.65
		9400	1880.0	**20.68**	**116.95**
		9538	1907.6	20.54	113.24

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	22.17	164.82
			1/0	2535.0	22.25	167.88
			1/0	2560.0	**22.33**	**171.00**
		16QAM	1/49	2510.0	21.11	129.12
			1/0	2535.0	**21.56**	**143.22**
			1/0	2560.0	21.54	142.56
	15	QPSK	1/0	2507.5	22.08	161.44
			1/0	2535.0	**22.73**	**187.50**
			1/0	2562.5	22.20	165.96
		16QAM	1/0	2507.5	21.38	137.40
			1/0	2535.0	**21.76**	**149.97**
			1/0	2562.5	21.51	141.58
	10	QPSK	1/0	2505.0	21.71	148.25
			1/0	2535.0	22.39	173.38
			1/0	2565.0	**23.01**	**199.99**
		16QAM	1/0	2505.0	21.35	136.46
			1/0	2535.0	21.81	151.71
			1/0	2565.0	**22.07**	**161.06**
	5	QPSK	1/12	2502.5	22.56	180.30
			1/0	2535.0	22.73	187.50
			1/12	2567.5	**22.86**	**193.20**
		16QAM	1/12	2502.5	21.22	132.43
			1/0	2535.0	21.49	140.93
			1/12	2567.5	**22.03**	**159.59**

LTE Band 12

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 12	10	QPSK	1/49	704.0	17.11	51.40
			1/0	707.5	17.03	50.47
			1/49	711.0	**17.24**	**52.97**
		16QAM	1/49	704.0	16.07	40.46
			1/0	707.5	16.07	40.46
			1/49	711.0	**16.14**	**41.11**
	5	QPSK	1/24	701.5	16.95	49.55
			1/24	707.5	**17.21**	**52.60**
			1/12	713.5	17.03	50.47
		16QAM	1/24	701.5	16.11	40.83
			1/24	707.5	15.95	39.36
			1/24	713.5	**16.20**	**41.69**
	3	QPSK	1/8	700.5	17.22	52.72
			1/8	707.5	**17.76**	**59.70**
			1/8	714.5	16.85	48.42
		16QAM	1/8	700.5	16.01	39.90
			1/8	707.5	**16.21**	**41.78**
			1/8	714.5	15.91	38.99
	1.4	QPSK	1/3	699.7	17.39	54.83
			1/5	707.5	**17.44**	**55.46**
			1/3	715.3	17.41	55.08
		16QAM	1/3	699.7	16.55	45.19
			1/5	707.5	16.51	44.77
			1/3	715.3	**16.78**	**47.64**

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LTE Band 13

Band	BW [MHz]	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 13	10	QPSK	1/0	782.0	18.65	73.28
		16QAM	1/25	782.0	17.62	57.81
	5	QPSK	1/0	779.5	18.74	74.82
			1/12	782.0	**18.82**	**76.21**
			1/0	784.5	18.77	75.34
		16QAM	1/24	779.5	17.72	59.16
			1/24	782.0	18.14	65.16
			1/0	784.5	**18.20**	**66.07**

LTE Band 14

Band	BW [MHz]	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 14	10	QPSK	1/0	793.0	19.57	90.57
		16QAM	1/0	793.0	19.02	79.80
	5	QPSK	1/0	790.5	**19.15**	**82.22**
			1/24	793.0	18.74	74.82
			1/12	795.5	18.75	74.99
		16QAM	1/0	790.5	**18.33**	**68.08**
			1/24	793.0	18.23	66.53
			1/12	795.5	17.91	61.80

LTE Band 25

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 25	20	QPSK	1/0	1860.0	**22.63**	**183.23**
			1/0	1882.5	21.72	148.59
			1/0	1905.0	21.01	126.18
		16QAM	1/0	1860.0	**21.63**	**145.55**
			1/0	1882.5	20.72	118.03
			1/0	1905.0	19.91	97.95
	15	QPSK	1/0	1857.5	**21.81**	**151.71**
			1/0	1882.5	21.46	139.96
			1/0	1907.5	19.40	87.10
		16QAM	1/0	1857.5	**20.81**	**120.50**
			1/0	1882.5	20.52	112.72
			1/0	1907.5	18.50	70.79
	10	QPSK	1/0	1855.0	**21.15**	**130.32**
			1/0	1882.5	20.24	105.68
			1/0	1910.0	17.99	62.95
		16QAM	1/0	1855.0	**20.13**	**103.04**
			1/0	1882.5	19.38	86.70
			1/0	1910.0	16.91	49.09
	5	QPSK	1/24	1852.5	**20.96**	**124.74**
			1/12	1882.5	20.63	115.61
			1/0	1912.5	17.03	50.47
		16QAM	1/12	1852.5	**20.45**	**110.92**
			1/24	1882.5	17.60	57.54
			1/0	1912.5	16.01	39.90
	3	QPSK	1/8	1851.5	**23.00**	**199.53**
			1/8	1882.5	19.90	97.72
			1/8	1913.5	16.49	44.57
		16QAM	1/8	1851.5	**22.00**	**158.49**
			1/8	1882.5	19.05	80.35
			1/0	1913.5	16.84	48.31
	1.4	QPSK	1/3	1850.7	**21.60**	**144.54**
			1/5	1882.5	**21.60**	**144.54**
			1/3	1914.3	19.15	82.22
		16QAM	1/3	1850.7	**20.58**	**114.29**
			1/5	1882.5	20.56	113.76
			1/3	1914.3	18.13	65.01

LTE Band 26

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP/EIRP [dBm]	ERP/EIRP [mW]
Band 26	15	QPSK	1/37	821.5	**18.22**	**66.37**
			1/37	831.5	**19.67**	**92.68**
			1/0	841.5	19.62	91.62
		16QAM	1/37	821.5	**17.10**	**51.29**
			1/37	831.5	**18.65**	**73.28**
			1/0	841.5	18.51	70.96
	10	QPSK	1/49	819.0	**18.75**	**74.99**
			1/0	829.0	**19.68**	**92.90**
			1/0	831.5	19.12	81.66
			1/0	844.0	19.37	86.50
		16QAM	1/49	819.0	**17.94**	**62.23**
			1/25	829.0	**18.52**	**71.12**
			1/25	831.5	18.39	69.02
			1/0	844.0	18.27	67.14
	5	QPSK	1/12	816.5	17.01	50.23
			1/12	821.5	**18.20**	**66.07**
			1/12	826.5	19.04	80.17
			1/12	831.5	**19.14**	**82.04**
			1/0	846.5	19.02	79.80
		16QAM	1/24	816.5	15.83	38.28
			1/0	821.5	**17.11**	**51.40**
			1/0	826.5	**18.50**	**70.79**
			1/0	831.5	17.81	60.39
			1/0	846.5	18.13	65.01
	3	QPSK	1/14	815.5	16.74	47.21
			1/8	822.5	**18.07**	**64.12**
			1/8	825.5	**19.42**	**87.50**
			1/8	831.5	18.60	72.44
			1/8	847.5	18.71	74.30
		16QAM	1/8	815.5	15.69	37.07
			1/8	822.5	**16.94**	**49.43**
			1/8	825.5	**18.06**	**63.97**
			1/8	831.5	17.89	61.52
			1/8	847.5	17.67	58.48
	1.4	QPSK	1/3	814.7	18.13	65.01
			1/3	823.3	**18.43**	**69.66**
			1/3	824.7	18.79	75.68
			1/3	831.5	**19.13**	**81.85**
			1/3	848.3	18.99	79.25
		16QAM	1/3	814.7	16.87	48.64
			1/3	823.3	**16.97**	**49.77**
			1/3	824.7	17.84	60.81
			1/3	831.5	**18.11**	**64.71**
			1/3	848.3	17.97	62.66

LTE Band 30

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 30	10	QPSK	1/49	2310.0	14.90	30.90
		16QAM	1/0	2310.0	13.20	20.89
	5	QPSK	1/12	2307.5	15.38	34.51
			1/24	2310.0	**16.10**	**40.74**
			1/24	2312.5	15.89	38.82
		16QAM	1/0	2307.5	**15.07**	**32.14**
			1/24	2310.0	14.80	30.20
			1/24	2312.5	14.72	29.65

LTE Band 41

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 41	20	QPSK	1/0	2506.0	**24.40**	**275.42**
			1/0	2593.0	24.06	254.68
			1/0	2680.0	23.70	234.42
		16QAM	1/0	2506.0	**24.68**	**293.76**
			1/0	2593.0	23.11	204.64
			1/0	2680.0	24.60	288.40
	15	QPSK	1/0	2503.5	**25.03**	**318.42**
			1/0	2593.0	22.23	167.11
			1/0	2682.5	23.37	217.27
		16QAM	1/0	2503.5	**24.69**	**294.44**
			1/0	2593.0	22.82	191.43
			1/0	2682.5	23.85	242.66
	10	QPSK	1/0	2501.0	**24.28**	**267.92**
			1/0	2593.0	23.86	243.22
			1/0	2685.0	20.97	125.03
		16QAM	1/0	2501.0	**24.08**	**255.86**
			1/25	2593.0	23.79	239.33
			1/0	2685.0	23.68	233.35
	5	QPSK	1/0	2498.5	21.22	132.43
			1/0	2593.0	23.50	223.87
			1/12	2687.5	**24.57**	**286.42**
		16QAM	1/0	2498.5	20.84	121.34
			1/24	2593.0	22.53	179.06
			1/12	2687.5	**24.31**	**269.77**

LTE Band 66

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 66	20	QPSK	1/0	1720.0	22.46	176.20
			1/0	1745.0	22.56	180.30
			1/49	1770.0	**23.11**	**204.64**
		16QAM	1/49	1720.0	22.43	174.98
			1/0	1745.0	**23.28**	**212.81**
			1/0	1770.0	22.16	164.44
	15	QPSK	1/37	1717.5	22.78	189.67
			1/0	1747.5	22.79	190.11
			1/37	1772.5	**23.42**	**219.79**
		16QAM	1/37	1717.5	21.62	145.21
			1/0	1747.5	22.00	158.49
			1/0	1772.5	**22.53**	**179.06**
	10	QPSK	1/49	1715.0	22.53	179.06
			1/49	1745.0	22.06	160.69
			1/0	1775.0	**22.90**	**194.98**
		16QAM	1/49	1715.0	21.58	143.88
			1/49	1745.0	21.25	133.35
			1/0	1775.0	**21.71**	**148.25**
	5	QPSK	1/24	1712.5	22.27	168.66
			1/0	1745.0	22.93	196.34
			1/0	1777.5	**23.29**	**213.30**
		16QAM	1/24	1712.5	21.20	131.83
			1/24	1745.0	21.75	149.62
			1/0	1777.5	**22.28**	**169.04**
	3	QPSK	1/14	1711.5	21.63	145.55
			1/8	1745.0	22.50	177.83
			1/8	1710.7	**22.55**	**179.89**
		16QAM	1/14	1711.5	20.73	118.30
			1/8	1745.0	21.16	130.62
			1/8	1710.7	**21.50**	**141.25**
	1.4	QPSK	1/3	1710.7	21.50	141.25
			1/3	1745.0	**22.84**	**192.31**
			1/3	1779.3	22.50	177.83
		16QAM	1/5	1710.7	20.11	102.57
			1/3	1745.0	21.30	134.90
			1/3	1779.3	**21.39**	**137.72**

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LTE Band 71

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 71	20	QPSK	1/0	673.0	16.60	45.71
			1/0	680.5	**16.88**	**48.75**
			1/0	688.0	16.85	48.42
		16QAM	1/0	673.0	15.74	37.50
			1/0	680.5	**15.98**	**39.63**
			1/0	688.0	15.39	34.59
	15	QPSK	1/37	670.5	**16.49**	**44.57**
			1/37	680.5	16.25	42.17
			1/37	690.5	16.15	41.21
		16QAM	1/37	670.5	**15.48**	**35.32**
			1/0	680.5	15.46	35.16
			1/37	690.5	15.08	32.21
	10	QPSK	1/0	668.0	16.04	40.18
			1/0	680.5	**16.51**	**44.77**
			1/25	693.0	15.27	33.65
		16QAM	1/25	668.0	14.92	31.05
			1/0	680.5	**15.41**	**34.75**
			1/0	693.0	14.16	26.06
	5	QPSK	1/12	665.5	**16.18**	**41.50**
			1/0	680.5	15.91	38.99
			1/0	695.5	15.55	35.89
		16QAM	1/12	665.5	**15.42**	**34.83**
			1/0	680.5	14.86	30.62
			1/0	695.5	14.61	28.91

10.1.2. ERP/EIRP DATA

WCDMA Band 5

WCDMA

Band 5
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: Rel99 Band 5 Fundamentals

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
826.40	22.10	V	1.0	-1.5	19.68	38.5	-18.8	
826.40	16.60	H	1.0	-1.5	14.18	38.5	-24.3	
Mid Ch								
836.60	22.27	V	1.0	-1.4	19.89	38.5	-18.6	
836.60	17.53	H	1.0	-1.4	15.15	38.5	-23.4	
High Ch								
846.60	21.10	V	1.0	-1.4	18.75	38.5	-19.8	
846.60	15.89	H	1.0	-1.4	13.54	38.5	-25.0	

WCDMA

Band 5
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: HSDPA Band 5 Fundamentals

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
826.40	20.95	V	1.0	-1.5	18.53	38.5	-20.0	
826.40	15.73	H	1.0	-1.5	13.31	38.5	-25.2	
Mid Ch								
836.60	21.09	V	1.0	-1.4	18.71	38.5	-19.8	
836.60	15.92	H	1.0	-1.4	13.54	38.5	-25.0	
High Ch								
846.60	20.21	V	1.0	-1.4	17.86	38.5	-20.6	
846.60	15.04	H	1.0	-1.4	12.69	38.5	-25.8	

WCDMA Band 4

WCDMA

Band 4
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-28
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 2
Mode: Rel99 Band 4 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	17.34	V	4.3	9.5	22.49	30.0	-7.5	
1712.40	17.13	H	4.3	9.5	22.28	30.0	-7.7	
Mid Ch								
1732.60	17.97	V	4.3	9.5	23.17	30.0	-6.8	
1732.60	17.10	H	4.3	9.5	22.29	30.0	-7.7	
High Ch								
1752.60	17.97	V	4.4	9.6	23.21	30.0	-6.8	
1752.60	17.47	H	4.4	9.6	22.71	30.0	-7.3	

WCDMA

Band 4
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-28
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 2
Mode: HSDPA Band 4 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	16.16	V	4.3	9.5	21.31	30.0	-8.7	
1712.40	16.42	H	4.3	9.5	21.57	30.0	-8.4	
Mid Ch								
1732.60	15.05	V	4.3	9.5	20.25	30.0	-9.8	
1732.60	17.08	H	4.3	9.5	22.27	30.0	-7.7	
High Ch								
1752.60	14.68	V	4.4	9.6	19.92	30.0	-10.1	
1752.60	16.51	H	4.4	9.6	21.75	30.0	-8.2	

WCDMA Band 2

WCDMA

Band 2
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-28
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 2
Mode: Rel99 Band 2 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	16.65	V	4.5	9.5	21.64	33.0	-11.4	
1852.40	16.72	H	4.5	9.5	21.71	33.0	-11.3	
Mid Ch								
1880.00	17.36	V	4.5	9.2	22.04	33.0	-11.0	
1880.00	15.57	H	4.5	9.2	20.25	33.0	-12.8	
High Ch								
1907.60	17.84	V	4.6	8.9	22.18	33.0	-10.8	
1907.60	14.61	H	4.6	8.9	18.95	33.0	-14.1	

WCDMA

Band 2
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-28
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 2
Mode: HSDPA Band 2 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	15.33	V	4.5	9.5	20.32	33.0	-12.7	
1852.40	15.55	H	4.5	9.5	20.54	33.0	-12.5	
Mid Ch								
1880.00	16.00	V	4.5	9.2	20.68	33.0	-12.3	
1880.00	14.69	H	4.5	9.2	19.37	33.0	-13.6	
High Ch								
1907.60	16.20	V	4.6	8.9	20.54	33.0	-12.5	
1907.60	12.94	H	4.6	8.9	17.28	33.0	-15.7	

LTE Band 7

LTE Band 7 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2510.00	13.14	V	5.3	10.3	18.06	33.0	-14.9	
2510.00	17.24	H	5.3	10.3	22.17	33.0	-10.8	
Mid Ch								
2535.00	13.21	V	5.4	10.2	18.05	33.0	-14.9	
2535.00	17.40	H	5.4	10.2	22.25	33.0	-10.8	
High Ch								
2560.00	12.28	V	5.4	10.2	17.05	33.0	-15.9	
2560.00	17.56	H	5.4	10.2	22.33	33.0	-10.7	

LTE Band 7 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2510.00	12.45	V	5.3	10.3	17.37	33.0	-15.6	
2510.00	16.18	H	5.3	10.3	21.11	33.0	-11.9	
Mid Ch								
2535.00	12.41	V	5.4	10.2	17.25	33.0	-15.7	
2535.00	16.71	H	5.4	10.2	21.56	33.0	-11.4	
High Ch								
2560.00	11.27	V	5.4	10.2	16.04	33.0	-17.0	
2560.00	16.77	H	5.4	10.2	21.54	33.0	-11.5	

LTE

Band 7

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2507.50	13.63	V	5.3	10.3	18.57	33.0	-14.4	
2507.50	17.14	H	5.3	10.3	22.08	33.0	-10.9	
Mid Ch								
2535.00	12.92	V	5.4	10.2	17.76	33.0	-15.2	
2535.00	17.88	H	5.4	10.2	22.73	33.0	-10.3	
High Ch								
2562.50	12.88	V	5.4	10.1	17.64	33.0	-15.4	
2562.50	17.44	H	5.4	10.1	22.20	33.0	-10.8	

LTE

Band 7

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2507.50	12.22	V	5.3	10.3	17.16	33.0	-15.8	
2507.50	16.44	H	5.3	10.3	21.38	33.0	-11.6	
Mid Ch								
2535.00	12.13	V	5.4	10.2	16.97	33.0	-16.0	
2535.00	16.91	H	5.4	10.2	21.76	33.0	-11.2	
High Ch								
2562.50	11.82	V	5.4	10.1	16.58	33.0	-16.4	
2562.50	16.75	H	5.4	10.1	21.51	33.0	-11.5	

LTE

Band 7

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2505.00	13.77	V	5.3	10.3	18.72	33.0	-14.3	
2505.00	16.76	H	5.3	10.3	21.71	33.0	-11.3	
Mid Ch								
2535.00	13.05	V	5.4	10.2	17.89	33.0	-15.1	
2535.00	17.54	H	5.4	10.2	22.39	33.0	-10.6	
High Ch								
2565.00	12.71	V	5.4	10.1	17.46	33.0	-15.5	
2565.00	18.26	H	5.4	10.1	23.01	33.0	-10.0	

LTE

Band 7

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2505.00	12.63	V	5.3	10.3	17.58	33.0	-15.4	
2505.00	16.40	H	5.3	10.3	21.35	33.0	-11.7	
Mid Ch								
2535.00	12.16	V	5.4	10.2	17.00	33.0	-16.0	
2535.00	16.96	H	5.4	10.2	21.81	33.0	-11.2	
High Ch								
2565.00	11.91	V	5.4	10.1	16.66	33.0	-16.3	
2565.00	17.32	H	5.4	10.1	22.07	33.0	-10.9	

LTE

Band 7

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2502.50	13.76	V	5.3	10.3	18.71	33.0	-14.3	
2502.50	17.60	H	5.3	10.3	22.56	33.0	-10.4	
Mid Ch								
2535.00	12.63	V	5.4	10.2	17.47	33.0	-15.5	
2535.00	17.88	H	5.4	10.2	22.73	33.0	-10.3	
High Ch								
2567.50	14.64	V	5.4	10.1	19.39	33.0	-13.6	
2567.50	18.12	H	5.4	10.1	22.86	33.0	-10.1	

LTE

Band 7

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2502.50	13.12	V	5.3	10.3	18.07	33.0	-14.9	
2502.50	16.26	H	5.3	10.3	21.22	33.0	-11.8	
Mid Ch								
2535.00	11.68	V	5.4	10.2	16.52	33.0	-16.5	
2535.00	16.64	H	5.4	10.2	21.49	33.0	-11.5	
High Ch								
2567.50	14.38	V	5.4	10.1	19.13	33.0	-13.9	
2567.50	17.29	H	5.4	10.1	22.03	33.0	-11.0	

LTE Band 12

LTE Band 12 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	19.58	V	0.9	-1.6	17.11	34.8	-17.7	
704.00	18.32	H	0.9	-1.6	15.85	34.8	-18.9	
Mid Ch								
707.50	19.50	V	0.9	-1.6	17.03	34.8	-17.8	
707.50	18.48	H	0.9	-1.6	16.01	34.8	-18.8	
High Ch								
711.00	19.71	V	0.9	-1.6	17.24	34.8	-17.6	
711.00	18.97	H	0.9	-1.6	16.49	34.8	-18.3	

LTE Band 12 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	18.54	V	0.9	-1.6	16.07	34.8	-18.7	
704.00	17.49	H	0.9	-1.6	15.02	34.8	-19.8	
Mid Ch								
707.50	18.54	V	0.9	-1.6	16.07	34.8	-18.7	
707.50	17.36	H	0.9	-1.6	14.89	34.8	-19.9	
High Ch								
711.00	18.61	V	0.9	-1.6	16.14	34.8	-18.7	
711.00	17.20	H	0.9	-1.6	14.72	34.8	-20.1	

LTE

Band 12

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	19.42	V	0.9	-1.6	16.95	34.8	-17.9	
701.50	17.71	H	0.9	-1.6	15.25	34.8	-19.6	
Mid Ch								
707.50	19.68	V	0.9	-1.6	17.21	34.8	-17.6	
707.50	18.26	H	0.9	-1.6	15.79	34.8	-19.0	
High Ch								
713.50	19.51	V	0.9	-1.6	17.03	34.8	-17.8	
713.50	17.94	H	0.9	-1.6	15.46	34.8	-19.3	

LTE

Band 12

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	18.58	V	0.9	-1.6	16.11	34.8	-18.7	
701.50	16.75	H	0.9	-1.6	14.29	34.8	-20.5	
Mid Ch								
707.50	18.42	V	0.9	-1.6	15.95	34.8	-18.9	
707.50	17.42	H	0.9	-1.6	14.95	34.8	-19.8	
High Ch								
713.50	18.68	V	0.9	-1.6	16.20	34.8	-18.6	
713.50	17.29	H	0.9	-1.6	14.81	34.8	-20.0	

LTE

Band 12

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	19.69	V	0.9	-1.6	17.22	34.8	-17.6	
700.50	17.78	H	0.9	-1.6	15.32	34.8	-19.5	
Mid Ch								
707.50	20.23	V	0.9	-1.6	17.76	34.8	-17.0	
707.50	18.26	H	0.9	-1.6	15.79	34.8	-19.0	
High Ch								
714.50	19.32	V	0.9	-1.6	16.85	34.8	-18.0	
714.50	18.69	H	0.9	-1.6	16.21	34.8	-18.6	

LTE

Band 12

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	18.48	V	0.9	-1.6	16.01	34.8	-18.8	
700.50	17.21	H	0.9	-1.6	14.75	34.8	-20.1	
Mid Ch								
707.50	18.68	V	0.9	-1.6	16.21	34.8	-18.6	
707.50	17.39	H	0.9	-1.6	14.92	34.8	-19.9	
High Ch								
714.50	18.38	V	0.9	-1.6	15.91	34.8	-18.9	
714.50	17.77	H	0.9	-1.6	15.29	34.8	-19.5	

LTE

Band 12

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	19.86	V	0.9	-1.6	17.39	34.8	-17.4	
699.70	17.29	H	0.9	-1.6	14.82	34.8	-20.0	
Mid Ch								
707.50	19.91	V	0.9	-1.6	17.44	34.8	-17.4	
707.50	18.17	H	0.9	-1.6	15.70	34.8	-19.1	
High Ch								
715.30	19.89	V	0.9	-1.6	17.41	34.8	-17.4	
715.30	18.21	H	0.9	-1.6	15.74	34.8	-19.1	

LTE

Band 12

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	19.02	V	0.9	-1.6	16.55	34.8	-18.3	
699.70	16.34	H	0.9	-1.6	13.87	34.8	-20.9	
Mid Ch								
707.50	18.98	V	0.9	-1.6	16.51	34.8	-18.3	
707.50	17.14	H	0.9	-1.6	14.67	34.8	-20.1	
High Ch								
715.30	19.26	V	0.9	-1.6	16.78	34.8	-18.0	
715.30	17.21	H	0.9	-1.6	14.74	34.8	-20.1	

LTE Band 13

LTE Band 13 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-type Cable

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	15.40	V	0.9	-1.6	12.91	34.8	-21.9	
782.00	21.14	H	0.9	-1.6	18.65	34.8	-16.1	

LTE Band 13 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-type Cable

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	14.17	V	0.9	-1.6	11.68	34.8	-23.1	
782.00	20.11	H	0.9	-1.6	17.62	34.8	-17.2	

LTE

Band 13

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	14.65	V	0.9	-1.6	12.16	34.8	-22.6	
779.50	21.23	H	0.9	-1.6	18.74	34.8	-16.0	
Mid Ch								
782.00	14.59	V	0.9	-1.6	12.10	34.8	-22.7	
782.00	21.31	H	0.9	-1.6	18.82	34.8	-16.0	
High Ch								
784.50	14.51	V	0.9	-1.6	12.01	34.8	-22.8	
784.50	21.26	H	0.9	-1.6	18.77	34.8	-16.0	

LTE

Band 13

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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	14.00	V	0.9	-1.6	11.51	34.8	-23.3	
779.50	20.21	H	0.9	-1.6	17.72	34.8	-17.0	
Mid Ch								
782.00	13.39	V	0.9	-1.6	10.90	34.8	-23.9	
782.00	20.63	H	0.9	-1.6	18.14	34.8	-16.6	
High Ch								
784.50	13.88	V	0.9	-1.6	11.38	34.8	-23.4	
784.50	20.69	H	0.9	-1.6	18.20	34.8	-16.6	

LTE Band 14

LTE Band 14 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 14 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
793.00	14.22	V	0.9	-1.6	11.72	34.8	-23.0	
793.00	22.07	H	0.9	-1.6	19.57	34.8	-15.2	

LTE Band 14 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 14 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
793.00	13.71	V	0.9	-1.6	11.21	34.8	-23.6	
793.00	21.52	H	0.9	-1.6	19.02	34.8	-15.7	

LTE

Band 14

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 14 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
790.50	14.57	V	0.9	-1.6	12.07	34.8	-22.7	
790.50	21.65	H	0.9	-1.6	19.15	34.8	-15.6	
Mid Ch								
793.00	14.69	V	0.9	-1.6	12.19	34.8	-22.6	
793.00	21.24	H	0.9	-1.6	18.74	34.8	-16.0	
High Ch								
795.50	14.51	V	0.9	-1.6	12.00	34.8	-22.8	
795.50	21.26	H	0.9	-1.6	18.75	34.8	-16.0	

LTE

Band 14

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 14 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
790.50	13.67	V	0.9	-1.6	11.17	34.8	-23.6	
790.50	20.83	H	0.9	-1.6	18.33	34.8	-16.4	
Mid Ch								
793.00	13.34	V	0.9	-1.6	10.84	34.8	-23.9	
793.00	20.73	H	0.9	-1.6	18.23	34.8	-16.5	
High Ch								
795.50	14.71	V	0.9	-1.6	12.20	34.8	-22.6	
795.50	20.42	H	0.9	-1.6	17.91	34.8	-16.9	

LTE Band 25

LTE Band 25 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	14.40	V	4.5	9.4	19.30	33.0	-13.7	
1860.00	17.73	H	4.5	9.4	22.63	33.0	-10.4	
Mid Ch								
1882.50	15.07	V	4.5	9.2	19.72	33.0	-13.3	
1882.50	17.06	H	4.5	9.2	21.72	33.0	-11.3	
High Ch								
1905.00	14.21	V	4.6	8.9	18.58	33.0	-14.4	
1905.00	16.63	H	4.6	8.9	21.01	33.0	-12.0	

LTE Band 25 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	13.30	V	4.5	9.4	18.20	33.0	-14.8	
1860.00	16.73	H	4.5	9.4	21.63	33.0	-11.4	
Mid Ch								
1882.50	14.07	V	4.5	9.2	18.72	33.0	-14.3	
1882.50	16.06	H	4.5	9.2	20.72	33.0	-12.3	
High Ch								
1905.00	13.01	V	4.6	8.9	17.38	33.0	-15.6	
1905.00	15.53	H	4.6	8.9	19.91	33.0	-13.1	

LTE

Band 25

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	14.42	V	4.5	9.4	19.35	33.0	-13.7	
1857.50	16.88	H	4.5	9.4	21.81	33.0	-11.2	
Mid Ch								
1882.50	14.37	V	4.5	9.2	19.02	33.0	-14.0	
1882.50	16.80	H	4.5	9.2	21.46	33.0	-11.5	
High Ch								
1907.50	12.95	V	4.6	8.9	17.29	33.0	-15.7	
1907.50	15.06	H	4.6	8.9	19.40	33.0	-13.6	

LTE

Band 25

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	13.42	V	4.5	9.4	18.35	33.0	-14.7	
1857.50	15.88	H	4.5	9.4	20.81	33.0	-12.2	
Mid Ch								
1882.50	13.37	V	4.5	9.2	18.02	33.0	-15.0	
1882.50	15.86	H	4.5	9.2	20.52	33.0	-12.5	
High Ch								
1907.50	11.95	V	4.6	8.9	16.29	33.0	-16.7	
1907.50	14.16	H	4.6	8.9	18.50	33.0	-14.5	

LTE

Band 25

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	15.22	V	4.5	9.5	20.17	33.0	-12.8	
1855.00	16.19	H	4.5	9.5	21.15	33.0	-11.9	
Mid Ch								
1882.50	15.59	V	4.5	9.2	20.24	33.0	-12.8	
1882.50	15.57	H	4.5	9.2	20.23	33.0	-12.8	
High Ch								
1910.00	12.48	V	4.6	8.9	16.78	33.0	-16.2	
1910.00	13.69	H	4.6	8.9	17.99	33.0	-15.0	

LTE

Band 25

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	14.23	V	4.5	9.5	19.18	33.0	-13.8	
1855.00	15.17	H	4.5	9.5	20.13	33.0	-12.9	
Mid Ch								
1882.50	14.49	V	4.5	9.2	19.14	33.0	-13.9	
1882.50	14.72	H	4.5	9.2	19.38	33.0	-13.6	
High Ch								
1910.00	11.42	V	4.6	8.9	15.72	33.0	-17.3	
1910.00	12.61	H	4.6	8.9	16.91	33.0	-16.1	

LTE

Band 25

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	14.92	V	4.5	9.5	19.91	33.0	-13.1	
1852.50	15.97	H	4.5	9.5	20.96	33.0	-12.0	
Mid Ch								
1882.50	14.56	V	4.5	9.2	19.21	33.0	-13.8	
1882.50	15.97	H	4.5	9.2	20.63	33.0	-12.4	
High Ch								
1912.50	12.48	V	4.6	8.8	16.74	33.0	-16.3	
1912.50	12.78	H	4.6	8.8	17.03	33.0	-16.0	

LTE

Band 25

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	14.50	V	4.5	9.5	19.49	33.0	-13.5	
1852.50	15.46	H	4.5	9.5	20.45	33.0	-12.6	
Mid Ch								
1882.50	12.95	V	4.5	9.2	17.60	33.0	-15.4	
1882.50	12.89	H	4.5	9.2	17.55	33.0	-15.5	
High Ch								
1912.50	11.52	V	4.6	8.8	15.78	33.0	-17.2	
1912.50	11.76	H	4.6	8.8	16.01	33.0	-17.0	

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LTE

Band 25

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	15.25	V	4.5	9.5	20.25	33.0	-12.8	
1851.50	18.00	H	4.5	9.5	23.00	33.0	-10.0	
Mid Ch								
1882.50	14.49	V	4.5	9.2	19.14	33.0	-13.9	
1882.50	15.24	H	4.5	9.2	19.90	33.0	-13.1	
High Ch								
1913.50	11.82	V	4.6	8.8	16.06	33.0	-16.9	
1913.50	12.25	H	4.6	8.8	16.49	33.0	-16.5	

LTE

Band 25

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	14.19	V	4.5	9.5	19.19	33.0	-13.8	
1851.50	17.00	H	4.5	9.5	22.00	33.0	-11.0	
Mid Ch								
1882.50	13.50	V	4.5	9.2	18.15	33.0	-14.9	
1882.50	14.39	H	4.5	9.2	19.05	33.0	-14.0	
High Ch								
1913.50	9.67	V	4.6	8.8	13.91	33.0	-19.1	
1913.50	12.60	H	4.6	8.8	16.84	33.0	-16.2	

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LTE

Band 25

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	14.93	V	4.5	9.5	19.93	33.0	-13.1	
1850.70	16.59	H	4.5	9.5	21.60	33.0	-11.4	
Mid Ch								
1882.50	15.16	V	4.5	9.2	19.81	33.0	-13.2	
1882.50	16.94	H	4.5	9.2	21.60	33.0	-11.4	
High Ch								
1914.30	12.32	V	4.6	8.8	16.55	33.0	-16.5	
1914.30	14.92	H	4.6	8.8	19.15	33.0	-13.9	

LTE

Band 25

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	13.88	V	4.5	9.5	18.88	33.0	-14.1	
1850.70	15.57	H	4.5	9.5	20.58	33.0	-12.4	
Mid Ch								
1882.50	13.92	V	4.5	9.2	18.57	33.0	-14.4	
1882.50	15.90	H	4.5	9.2	20.56	33.0	-12.4	
High Ch								
1914.30	10.95	V	4.6	8.8	15.18	33.0	-17.8	
1914.30	13.90	H	4.6	8.8	18.13	33.0	-14.9	

LTE Band 26

LTE Band 26 15MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
821.50	20.65	V	0.9	-1.5	18.22	38.5	-20.3	Part 90
821.50	18.02	H	0.9	-1.5	15.59	38.5	-22.9	Part 90
Mid Ch								
831.50	22.07	V	1.0	-1.4	19.67	38.5	-18.8	
831.50	18.11	H	1.0	-1.4	15.71	38.5	-22.8	
High Ch								
841.50	21.99	V	1.0	-1.4	19.62	38.5	-18.9	
841.50	17.81	H	1.0	-1.4	15.44	38.5	-23.1	

LTE Band 26 15MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
821.50	19.53	V	0.9	-1.5	17.10	38.5	-21.4	Part 90
821.50	16.17	H	0.9	-1.5	13.74	38.5	-24.8	Part 90
Mid Ch								
831.50	21.05	V	1.0	-1.4	18.65	38.5	-19.9	
831.50	16.94	H	1.0	-1.4	14.54	38.5	-24.0	
High Ch								
841.50	20.88	V	1.0	-1.4	18.51	38.5	-20.0	
841.50	16.60	H	1.0	-1.4	14.23	38.5	-24.3	

LTE

Band 26

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
819.00	21.19	V	0.9	-1.5	18.75	50.0	-31.3	Part 90
819.00	16.75	H	0.9	-1.5	14.31	50.0	-35.7	Part 90
Mid Ch								
831.50	21.52	V	1.0	-1.4	19.12	38.5	-19.4	
831.50	17.81	H	1.0	-1.4	15.41	38.5	-23.1	
High Ch								
844.00	21.73	V	1.0	-1.4	19.37	38.5	-19.1	
844.00	17.91	H	1.0	-1.4	15.56	38.5	-22.9	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
829.00	22.09	V	1.0	-1.5	19.68	50.0	-30.3	
829.00	17.37	H	1.0	-1.5	14.96	50.0	-35.0	

LTE

Band 26

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
819.00	20.38	V	0.9	-1.5	17.94	50.0	-32.1	Part 90
819.00	15.61	H	0.9	-1.5	13.17	50.0	-36.8	Part 90
Mid Ch								
831.50	20.79	V	1.0	-1.4	18.39	38.5	-20.1	
831.50	16.77	H	1.0	-1.4	14.37	38.5	-24.1	
High Ch								
844.00	20.63	V	1.0	-1.4	18.27	38.5	-20.2	
844.00	16.86	H	1.0	-1.4	14.51	38.5	-24.0	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
829.00	20.93	V	1.0	-1.5	18.52	50.0	-31.5	
829.00	16.36	H	1.0	-1.5	13.95	50.0	-36.0	

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LTE

Band 26

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
816.50	19.45	V	0.9	-1.5	17.01	50.0	-33.0	Part 90
816.50	16.46	H	0.9	-1.5	14.01	50.0	-36.0	Part 90
Mid Ch								
831.50	21.54	V	1.0	-1.4	19.14	38.5	-19.4	
831.50	17.16	H	1.0	-1.4	14.76	38.5	-23.7	
High Ch								
846.50	21.37	V	1.0	-1.4	19.02	38.5	-19.5	
846.50	16.79	H	1.0	-1.4	14.44	38.5	-24.1	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
821.50	20.63	V	0.9	-1.5	18.20	50.0	-31.8	Part 90
821.50	16.80	H	0.9	-1.5	14.37	50.0	-35.6	Part 90
Mid Ch								
826.50	21.46	V	1.0	-1.5	19.04	38.5	-19.5	
826.50	17.58	H	1.0	-1.5	15.16	38.5	-23.3	

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LTE

Band 26

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
816.50	18.27	V	0.9	-1.5	15.83	50.0	-34.2	Part 90
816.50	15.67	H	0.9	-1.5	13.22	50.0	-36.8	Part 90
Mid Ch								
831.50	20.21	V	1.0	-1.4	17.81	38.5	-20.7	
831.50	16.02	H	1.0	-1.4	13.62	38.5	-24.9	
High Ch								
846.50	20.48	V	1.0	-1.4	18.13	38.5	-20.4	
846.50	15.63	H	1.0	-1.4	13.28	38.5	-25.2	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
821.50	19.54	V	0.9	-1.5	17.11	50.0	-32.9	Part 90
821.50	15.69	H	0.9	-1.5	13.26	50.0	-36.7	Part 90
Mid Ch								
826.50	20.92	V	1.0	-1.5	18.50	38.5	-20.0	
826.50	16.36	H	1.0	-1.5	13.94	38.5	-24.6	

LTE

Band 26

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
815.50	19.19	V	0.9	-1.5	16.74	50.0	-33.3	Part 90
815.50	16.48	H	0.9	-1.5	14.04	50.0	-36.0	Part 90
Mid Ch								
831.50	21.00	V	1.0	-1.4	18.60	38.5	-19.9	
831.50	17.04	H	1.0	-1.4	14.64	38.5	-23.9	
High Ch								
847.50	21.06	V	1.0	-1.4	18.71	38.5	-19.8	
847.50	16.83	H	1.0	-1.4	14.49	38.5	-24.0	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
822.50	20.50	V	1.0	-1.5	18.07	50.0	-31.9	Part 90
822.50	17.42	H	1.0	-1.5	14.99	50.0	-35.0	Part 90
Mid Ch								
825.50	21.84	V	1.0	-1.5	19.42	38.5	-19.1	
825.50	17.66	H	1.0	-1.5	15.24	38.5	-23.3	

LTE

Band 26

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
815.50	18.14	V	0.9	-1.5	15.69	50.0	-34.3	Part 90
815.50	15.43	H	0.9	-1.5	12.99	50.0	-37.0	Part 90
Mid Ch								
831.50	20.29	V	1.0	-1.4	17.89	38.5	-20.6	
831.50	16.13	H	1.0	-1.4	13.72	38.5	-24.8	
High Ch								
847.50	20.02	V	1.0	-1.4	17.67	38.5	-20.8	
847.50	15.65	H	1.0	-1.4	13.31	38.5	-25.2	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
822.50	19.37	V	1.0	-1.5	16.94	50.0	-33.1	Part 90
822.50	15.87	H	1.0	-1.5	13.44	50.0	-36.6	Part 90
Mid Ch								
825.50	20.48	V	1.0	-1.5	18.06	38.5	-20.4	
825.50	16.16	H	1.0	-1.5	13.74	38.5	-24.8	

LTE

Band 26

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
814.70	20.58	V	0.9	-1.5	18.13	50.0	-31.9	Part 90
814.70	16.63	H	0.9	-1.5	14.19	50.0	-35.8	Part 90
Mid Ch								
831.50	21.53	V	1.0	-1.4	19.13	38.5	-19.4	
831.50	17.96	H	1.0	-1.4	15.56	38.5	-22.9	
High Ch								
848.30	21.33	V	1.0	-1.4	18.99	38.5	-19.5	
848.30	17.79	H	1.0	-1.4	15.45	38.5	-23.1	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
823.30	20.86	V	1.0	-1.5	18.43	50.0	-31.6	Part 90
823.30	16.87	H	1.0	-1.5	14.45	50.0	-35.6	Part 90
Mid Ch								
824.70	21.21	V	1.0	-1.5	18.79	38.5	-19.7	
824.70	17.49	H	1.0	-1.5	15.06	38.5	-23.4	

LTE

Band 26

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / Z-position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
814.70	19.32	V	0.9	-1.5	16.87	50.0	-33.1	Part 90
814.70	15.72	H	0.9	-1.5	13.28	50.0	-36.7	Part 90
Mid Ch								
831.50	20.51	V	1.0	-1.4	18.11	38.5	-20.4	
831.50	17.17	H	1.0	-1.4	14.77	38.5	-23.7	
High Ch								
848.30	20.31	V	1.0	-1.4	17.97	38.5	-20.5	
848.30	16.79	H	1.0	-1.4	14.45	38.5	-24.1	

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
823.30	19.40	V	1.0	-1.5	16.97	50.0	-33.0	Part 90
823.30	16.48	H	1.0	-1.5	14.06	50.0	-35.9	Part 90
Mid Ch								
824.70	20.26	V	1.0	-1.5	17.84	38.5	-20.7	
824.70	16.04	H	1.0	-1.5	13.61	38.5	-24.9	

LTE Band 30

LTE Band 30

QPSK 10MHz

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 30 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
2310.00	2.51	V	5.1	10.0	7.44	24.0	-16.6	
2310.00	9.97	H	5.1	10.0	14.90	24.0	-9.1	

LTE Band 30

16QAM 10MHz

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 30 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
2310.00	2.71	V	5.1	10.0	7.64	24.0	-16.4	
2310.00	8.27	H	5.1	10.0	13.20	24.0	-10.8	

LTE Band 30

QPSK 5MHz

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 30 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2307.50	1.94	V	5.1	10.0	6.86	24.0	-17.1	
2307.50	10.46	H	5.1	10.0	15.38	24.0	-8.6	
Mid Ch								
2310.00	4.21	V	5.1	10.0	9.14	24.0	-14.9	
2310.00	11.17	H	5.1	10.0	16.10	24.0	-7.9	
High Ch								
2312.50	0.68	V	5.1	10.0	5.62	24.0	-18.4	
2312.50	10.95	H	5.1	10.0	15.89	24.0	-8.1	

LTE Band 30

16QAM 5MHz

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 30 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2307.50	1.22	V	5.1	10.0	6.14	24.0	-17.9	
2307.50	10.15	H	5.1	10.0	15.07	24.0	-8.9	
Mid Ch								
2310.00	3.11	V	5.1	10.0	8.04	24.0	-16.0	
2310.00	9.87	H	5.1	10.0	14.80	24.0	-9.2	
High Ch								
2312.50	-0.15	V	5.1	10.0	4.79	24.0	-19.2	
2312.50	9.78	H	5.1	10.0	14.72	24.0	-9.3	

LTE Band 41

LTE Band 41 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	13.66	V	5.3	10.3	18.60	33.0	-14.4	
2506.00	19.46	H	5.3	10.3	24.40	33.0	-8.6	
Mid Ch								
2593.00	14.69	V	5.4	10.1	19.36	33.0	-13.6	
2593.00	19.39	H	5.4	10.1	24.06	33.0	-8.9	
High Ch								
2680.00	16.85	V	5.5	10.2	21.49	33.0	-11.5	
2680.00	19.07	H	5.5	10.2	23.70	33.0	-9.3	

LTE Band 41 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	13.95	V	5.3	10.3	18.89	33.0	-14.1	
2506.00	19.74	H	5.3	10.3	24.68	33.0	-8.3	
Mid Ch								
2593.00	13.83	V	5.4	10.1	18.50	33.0	-14.5	
2593.00	18.44	H	5.4	10.1	23.11	33.0	-9.9	
High Ch								
2680.00	17.48	V	5.5	10.2	22.12	33.0	-10.9	
2680.00	19.97	H	5.5	10.2	24.60	33.0	-8.4	

LTE

Band 41

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-13
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	15.41	V	5.3	10.3	20.36	33.0	-12.6	
2503.50	20.08	H	5.3	10.3	25.03	33.0	-8.0	
Mid Ch								
2593.00	13.74	V	5.4	10.1	18.41	33.0	-14.6	
2593.00	17.56	H	5.4	10.1	22.23	33.0	-10.8	
High Ch								
2682.50	15.53	V	5.5	10.2	20.16	33.0	-12.8	
2682.50	18.73	H	5.5	10.2	23.37	33.0	-9.6	

LTE

Band 41

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-13
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	15.77	V	5.3	10.3	20.72	33.0	-12.3	
2503.50	19.74	H	5.3	10.3	24.69	33.0	-8.3	
Mid Ch								
2593.00	14.40	V	5.4	10.1	19.07	33.0	-13.9	
2593.00	18.15	H	5.4	10.1	22.82	33.0	-10.2	
High Ch								
2682.50	16.08	V	5.5	10.2	20.71	33.0	-12.3	
2682.50	19.21	H	5.5	10.2	23.85	33.0	-9.2	

LTE

Band 41

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	15.52	V	5.3	10.3	20.48	33.0	-12.5	
2501.00	19.31	H	5.3	10.3	24.28	33.0	-8.7	
Mid Ch								
2593.00	13.73	V	5.4	10.1	18.40	33.0	-14.6	
2593.00	19.19	H	5.4	10.1	23.86	33.0	-9.1	
High Ch								
2685.00	13.47	V	5.5	10.2	18.10	33.0	-14.9	
2685.00	16.34	H	5.5	10.2	20.97	33.0	-12.0	

LTE

Band 41

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	15.01	V	5.3	10.3	19.97	33.0	-13.0	
2501.00	19.11	H	5.3	10.3	24.08	33.0	-8.9	
Mid Ch								
2593.00	11.04	V	5.4	10.1	15.71	33.0	-17.3	
2593.00	19.12	H	5.4	10.1	23.79	33.0	-9.2	
High Ch								
2685.00	14.03	V	5.5	10.2	18.66	33.0	-14.3	
2685.00	19.05	H	5.5	10.2	23.68	33.0	-9.3	

LTE

Band 41

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-13
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	12.05	V	5.3	10.3	17.05	33.0	-16.0	
2498.50	16.22	H	5.3	10.3	21.22	33.0	-11.8	
Mid Ch								
2593.00	14.08	V	5.4	10.1	18.75	33.0	-14.3	
2593.00	18.83	H	5.4	10.1	23.50	33.0	-9.5	
High Ch								
2687.50	16.99	V	5.5	10.2	21.62	33.0	-11.4	
2687.50	19.94	H	5.5	10.2	24.57	33.0	-8.4	

LTE

Band 41

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-13
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	11.66	V	5.3	10.3	16.66	33.0	-16.3	
2498.50	15.84	H	5.3	10.3	20.84	33.0	-12.2	
Mid Ch								
2593.00	13.44	V	5.4	10.1	18.11	33.0	-14.9	
2593.00	17.86	H	5.4	10.1	22.53	33.0	-10.5	
High Ch								
2687.50	15.97	V	5.5	10.2	20.60	33.0	-12.4	
2687.50	19.68	H	5.5	10.2	24.31	33.0	-8.7	

LTE Band 66

LTE Band 66 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-31
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	11.90	V	4.3	9.5	17.07	30.0	-12.9	
1720.00	17.29	H	4.3	9.5	22.46	30.0	-7.5	
Mid Ch								
1745.00	13.16	V	4.4	9.6	18.38	30.0	-11.6	
1745.00	17.34	H	4.4	9.6	22.56	30.0	-7.4	
High Ch								
1770.00	12.94	V	4.4	9.6	18.18	30.0	-11.8	
1770.00	17.88	H	4.4	9.6	23.11	30.0	-6.9	

LTE Band 66 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-31
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	11.05	V	4.3	9.5	16.22	30.0	-13.8	
1720.00	17.26	H	4.3	9.5	22.43	30.0	-7.6	
Mid Ch								
1745.00	10.97	V	4.4	9.6	16.19	30.0	-13.8	
1745.00	18.06	H	4.4	9.6	23.28	30.0	-6.7	
High Ch								
1770.00	12.03	V	4.4	9.6	17.27	30.0	-12.7	
1770.00	16.93	H	4.4	9.6	22.16	30.0	-7.8	

LTE

Band 66

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	13.96	V	4.3	9.5	19.13	30.0	-10.9	
1717.50	17.61	H	4.3	9.5	22.78	30.0	-7.2	
Mid Ch								
1745.00	13.70	V	4.4	9.6	18.92	30.0	-11.1	
1745.00	17.57	H	4.4	9.6	22.79	30.0	-7.2	
High Ch								
1772.50	15.42	V	4.4	9.6	20.65	30.0	-9.3	
1772.50	18.18	H	4.4	9.6	23.42	30.0	-6.6	

LTE

Band 66

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	12.86	V	4.3	9.5	18.03	30.0	-12.0	
1717.50	16.45	H	4.3	9.5	21.62	30.0	-8.4	
Mid Ch								
1745.00	13.12	V	4.4	9.6	18.34	30.0	-11.7	
1745.00	16.78	H	4.4	9.6	22.00	30.0	-8.0	
High Ch								
1772.50	14.31	V	4.4	9.6	19.54	30.0	-10.5	
1772.50	17.29	H	4.4	9.6	22.53	30.0	-7.5	

LTE

Band 66

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	13.67	V	4.3	9.5	18.83	30.0	-11.2	
1715.00	17.38	H	4.3	9.5	22.53	30.0	-7.5	
Mid Ch								
1745.00	14.09	V	4.4	9.6	19.31	30.0	-10.7	
1745.00	16.84	H	4.4	9.6	22.06	30.0	-7.9	
High Ch								
1775.00	15.25	V	4.4	9.6	20.49	30.0	-9.5	
1775.00	17.66	H	4.4	9.6	22.90	30.0	-7.1	

LTE

Band 66

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	12.66	V	4.3	9.5	17.82	30.0	-12.2	
1715.00	16.43	H	4.3	9.5	21.58	30.0	-8.4	
Mid Ch								
1745.00	12.86	V	4.4	9.6	18.08	30.0	-11.9	
1745.00	16.03	H	4.4	9.6	21.25	30.0	-8.7	
High Ch								
1775.00	14.37	V	4.4	9.6	19.61	30.0	-10.4	
1775.00	16.47	H	4.4	9.6	21.71	30.0	-8.3	

LTE

Band 66

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	13.85	V	4.3	9.5	19.00	30.0	-11.0	
1712.50	17.12	H	4.3	9.5	22.27	30.0	-7.7	
Mid Ch								
1745.00	13.53	V	4.4	9.6	18.75	30.0	-11.2	
1745.00	17.71	H	4.4	9.6	22.93	30.0	-7.1	
High Ch								
1777.50	15.17	V	4.4	9.6	20.40	30.0	-9.6	
1777.50	18.05	H	4.4	9.6	23.29	30.0	-6.7	

LTE

Band 66

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	13.07	V	4.3	9.5	18.22	30.0	-11.8	
1712.50	16.05	H	4.3	9.5	21.20	30.0	-8.8	
Mid Ch								
1745.00	12.60	V	4.4	9.6	17.82	30.0	-12.2	
1745.00	16.53	H	4.4	9.6	21.75	30.0	-8.2	
High Ch								
1777.50	14.02	V	4.4	9.6	19.25	30.0	-10.7	
1777.50	17.04	H	4.4	9.6	22.28	30.0	-7.7	

LTE

Band 66

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	14.06	V	4.3	9.5	19.22	30.0	-10.8	
1711.50	16.48	H	4.3	9.5	21.63	30.0	-8.4	
Mid Ch								
1745.00	13.93	V	4.4	9.6	19.15	30.0	-10.8	
1745.00	17.28	H	4.4	9.6	22.50	30.0	-7.5	
High Ch								
1778.50	15.08	V	4.4	9.6	20.31	30.0	-9.7	
1778.50	17.31	H	4.4	9.6	22.55	30.0	-7.5	

LTE

Band 66

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	12.42	V	4.3	9.5	17.58	30.0	-12.4	
1711.50	15.58	H	4.3	9.5	20.73	30.0	-9.3	
Mid Ch								
1745.00	12.47	V	4.4	9.6	17.69	30.0	-12.3	
1745.00	15.94	H	4.4	9.6	21.16	30.0	-8.8	
High Ch								
1778.50	14.04	V	4.4	9.6	19.27	30.0	-10.7	
1778.50	16.26	H	4.4	9.6	21.50	30.0	-8.5	

LTE

Band 66

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	12.91	V	4.3	9.5	18.06	30.0	-11.9	
1710.70	16.36	H	4.3	9.5	21.51	30.0	-8.5	
Mid Ch								
1745.00	13.71	V	4.4	9.6	18.93	30.0	-11.1	
1745.00	17.62	H	4.4	9.6	22.84	30.0	-7.2	
High Ch								
1779.30	15.38	V	4.4	9.6	20.62	30.0	-9.4	
1779.30	17.26	H	4.4	9.6	22.50	30.0	-7.5	

LTE

Band 66

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / Keyboard
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	11.82	V	4.3	9.5	16.97	30.0	-13.0	
1710.70	14.96	H	4.3	9.5	20.11	30.0	-9.9	
Mid Ch								
1745.00	12.65	V	4.4	9.6	17.87	30.0	-12.1	
1745.00	16.08	H	4.4	9.6	21.30	30.0	-8.7	
High Ch								
1779.30	14.03	V	4.4	9.6	19.27	30.0	-10.7	
1779.30	16.15	H	4.4	9.6	21.39	30.0	-8.6	

LTE Band 71

LTE Band 71 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
673.00	10.65	V	0.9	-1.7	8.08	33.0	-24.9	
673.00	19.17	H	0.9	-1.7	16.60	33.0	-16.4	
Mid Ch								
680.50	11.66	V	0.9	-1.7	9.11	33.0	-23.9	
680.50	19.42	H	0.9	-1.7	16.88	33.0	-16.1	
High Ch								
687.90	12.09	V	0.9	-1.6	9.58	33.0	-23.4	
687.90	19.37	H	0.9	-1.6	16.85	33.0	-16.1	

LTE Band 71 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-07-26
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 71 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
673.00	9.86	V	0.9	-1.7	7.29	33.0	-25.7	
673.00	18.31	H	0.9	-1.7	15.74	33.0	-17.3	
Mid Ch								
680.50	10.54	V	0.9	-1.7	7.99	33.0	-25.0	
680.50	18.52	H	0.9	-1.7	15.98	33.0	-17.0	
High Ch								
687.90	11.21	V	0.9	-1.6	8.70	33.0	-24.3	
687.90	17.91	H	0.9	-1.6	15.39	33.0	-17.6	

LTE

Band 71

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
670.50	10.68	V	0.9	-1.7	8.10	33.0	-24.9	
670.50	19.06	H	0.9	-1.7	16.49	33.0	-16.5	
Mid Ch								
680.50	11.98	V	0.9	-1.7	9.43	33.0	-23.6	
680.50	18.79	H	0.9	-1.7	16.25	33.0	-16.8	
High Ch								
690.40	12.49	V	0.9	-1.6	9.99	33.0	-23.0	
690.40	18.65	H	0.9	-1.6	16.15	33.0	-16.9	

LTE

Band 71

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 71 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
670.50	9.70	V	0.9	-1.7	7.12	33.0	-25.9	
670.50	18.05	H	0.9	-1.7	15.48	33.0	-17.5	
Mid Ch								
680.50	11.06	V	0.9	-1.7	8.51	33.0	-24.5	
680.50	18.00	H	0.9	-1.7	15.46	33.0	-17.5	
High Ch								
690.40	11.68	V	0.9	-1.6	9.18	33.0	-23.8	
690.40	17.58	H	0.9	-1.6	15.08	33.0	-17.9	

LTE

Band 71

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
668.00	11.02	V	0.9	-1.7	8.43	33.0	-24.6	
668.00	18.63	H	0.9	-1.7	16.04	33.0	-17.0	
Mid Ch								
680.50	11.97	V	0.9	-1.7	9.42	33.0	-23.6	
680.50	19.05	H	0.9	-1.7	16.51	33.0	-16.5	
High Ch								
692.90	13.08	V	0.9	-1.6	10.59	33.0	-22.4	
692.90	17.76	H	0.9	-1.6	15.27	33.0	-17.7	

LTE

Band 71

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 47989
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_16QAM Band 71 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
668.00	9.38	V	0.9	-1.7	6.79	33.0	-26.2	
668.00	17.51	H	0.9	-1.7	14.92	33.0	-18.1	
Mid Ch								
680.50	10.85	V	0.9	-1.7	8.30	33.0	-24.7	
680.50	17.95	H	0.9	-1.7	15.41	33.0	-17.6	
High Ch								
692.90	11.97	V	0.9	-1.6	9.48	33.0	-23.5	
692.90	16.65	H	0.9	-1.6	14.16	33.0	-18.8	

LTE

Band 71

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
665.50	10.64	V	0.9	-1.7	8.05	33.0	-25.0	
665.50	18.77	H	0.9	-1.7	16.18	33.0	-16.8	
Mid Ch								
680.50	11.69	V	0.9	-1.7	9.14	33.0	-23.9	
680.50	18.45	H	0.9	-1.7	15.91	33.0	-17.1	
High Ch								
695.40	13.96	V	0.9	-1.6	11.47	33.0	-21.5	
695.40	18.04	H	0.9	-1.6	15.55	33.0	-17.4	

LTE

Band 71

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788556585
Date: 2018-08-01
Test Engineer: 51072
Configuration: EUT / X-position
Location: Chamber 1
Mode: LTE_16QAM Band 71 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 3m N-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								
665.50	9.80	V	0.9	-1.7	7.21	33.0	-25.8	
665.50	18.01	H	0.9	-1.7	15.42	33.0	-17.6	
Mid Ch								
680.50	10.84	V	0.9	-1.7	8.29	33.0	-24.7	
680.50	17.40	H	0.9	-1.7	14.86	33.0	-18.1	
High Ch								
695.40	12.96	V	0.9	-1.6	10.47	33.0	-22.5	
695.40	17.10	H	0.9	-1.6	14.61	33.0	-18.4	

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1051, §22.917, §24.238, §27.53, §90.543 and §90.691

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.

(c)(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

(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 log10 (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.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation. (Band 13)

Part 90.543:
(c) Out-of-band emission limit. On any frequency outside of the frequency ranges covered by the ACP tables in this section, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Part 90.691(a):
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log_{10}(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.(NOTE : Use 100kHz reference bandwidth)

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

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 ≥ 3 × 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 ≥ span/RBW;
g) Trace mode = average(WCDMA, LTE), Maxhold(LTE Band41);

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.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

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

WCDMA Band 5

WCDMA

Band 5
REL99

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-15
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone / X-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
Low Ch, 826.4MHz									
1652.80	-13.9	V	3.0	43.6	1.0	-56.5	-13.0	-43.5	
2479.20	1.8	V	3.0	43.4	1.0	-40.6	-13.0	-27.6	
3305.60	-8.2	V	3.0	43.6	1.0	-50.8	-13.0	-37.8	
1652.80	-12.8	H	3.0	43.6	1.0	-55.4	-13.0	-42.4	
2479.20	3.0	H	3.0	43.4	1.0	-39.4	-13.0	-26.4	
3305.60	-8.1	H	3.0	43.6	1.0	-50.7	-13.0	-37.7	
Mid Ch, 836.6MHz									
1673.20	-12.9	V	3.0	43.6	1.0	-55.4	-13.0	-42.4	
2509.80	1.6	V	3.0	43.4	1.0	-40.8	-13.0	-27.8	
3346.40	-8.1	V	3.0	43.6	1.0	-50.8	-13.0	-37.8	
1673.20	-14.8	H	3.0	43.6	1.0	-57.4	-13.0	-44.4	
2509.80	3.6	H	3.0	43.4	1.0	-38.8	-13.0	-25.8	
3346.40	-6.9	H	3.0	43.6	1.0	-49.6	-13.0	-36.6	
High Ch, 846.6MHz									
1693.20	-13.0	V	3.0	43.6	1.0	-55.6	-13.0	-42.6	
2539.80	1.2	V	3.0	43.4	1.0	-41.2	-13.0	-28.2	
3386.40	-8.1	V	3.0	43.7	1.0	-50.8	-13.0	-37.8	
1693.20	-12.4	H	3.0	43.6	1.0	-55.0	-13.0	-42.0	
2539.80	3.2	H	3.0	43.4	1.0	-39.2	-13.0	-26.2	
3386.40	-7.3	H	3.0	43.7	1.0	-50.0	-13.0	-37.0	

WCDMA

Band 5
HSDPA

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-15
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone / X-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
Low Ch, 826.4MHz									
1652.80	-14.3	V	3.0	43.6	1.0	-56.9	-13.0	-43.9	
2479.20	-0.8	V	3.0	43.4	1.0	-43.2	-13.0	-30.2	
3305.60	-8.5	V	3.0	43.6	1.0	-51.1	-13.0	-38.1	
1652.80	-13.3	H	3.0	43.6	1.0	-55.9	-13.0	-42.9	
2479.20	1.0	H	3.0	43.4	1.0	-41.4	-13.0	-28.4	
3305.60	-7.9	H	3.0	43.6	1.0	-50.5	-13.0	-37.5	
Mid Ch, 836.6MHz									
1673.20	-15.1	V	3.0	43.6	1.0	-57.7	-13.0	-44.7	
2509.80	-1.5	V	3.0	43.4	1.0	-44.0	-13.0	-31.0	
3346.40	-7.8	V	3.0	43.6	1.0	-50.5	-13.0	-37.5	
1673.20	-14.1	H	3.0	43.6	1.0	-56.6	-13.0	-43.6	
2509.80	1.6	H	3.0	43.4	1.0	-40.8	-13.0	-27.8	
3346.40	-7.7	H	3.0	43.6	1.0	-50.4	-13.0	-37.4	
High Ch, 846.6MHz									
1693.20	-13.8	V	3.0	43.6	1.0	-56.4	-13.0	-43.4	
2539.80	-2.1	V	3.0	43.4	1.0	-44.5	-13.0	-31.5	
3386.40	-7.7	V	3.0	43.7	1.0	-50.3	-13.0	-37.3	
1693.20	-13.4	H	3.0	43.6	1.0	-56.0	-13.0	-43.0	
2539.80	0.4	H	3.0	43.4	1.0	-42.1	-13.0	-29.1	
3386.40	-7.2	H	3.0	43.7	1.0	-49.9	-13.0	-36.9	

WCDMA Band 4

WCDMA

Band 4
REL99

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

Company: Samsung
Project #: 4788556585
Date: 2018-07-28
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 2
Mode: Rel99 Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4MHz									
3424.80	-7.6	V	3.0	39.5	1.0	-46.1	-13.0	-33.1	
5137.20	1.4	V	3.0	39.8	1.0	-37.4	-13.0	-24.4	
6849.60	-3.6	V	3.0	39.7	1.0	-42.3	-13.0	-29.3	
3424.80	-7.8	H	3.0	39.5	1.0	-46.3	-13.0	-33.3	
5137.20	-2.6	H	3.0	39.8	1.0	-41.4	-13.0	-28.4	
6849.60	-4.1	H	3.0	39.7	1.0	-42.8	-13.0	-29.8	
Mid Ch, 1732.6MHz									
3465.20	-7.6	V	3.0	39.5	1.0	-46.1	-13.0	-33.1	
5197.80	0.6	V	3.0	39.8	1.0	-38.3	-13.0	-25.3	
6930.40	-3.9	V	3.0	39.7	1.0	-42.6	-13.0	-29.6	
3465.20	-7.4	H	3.0	39.5	1.0	-45.9	-13.0	-32.9	
5197.80	-2.9	H	3.0	39.8	1.0	-41.7	-13.0	-28.7	
6930.40	-4.0	H	3.0	39.7	1.0	-42.7	-13.0	-29.7	
High Ch, 1752.6MHz									
3505.20	-6.7	V	3.0	39.5	1.0	-45.3	-13.0	-32.3	
5257.80	-3.1	V	3.0	39.8	1.0	-41.9	-13.0	-28.9	
7010.40	-3.5	V	3.0	39.6	1.0	-42.1	-13.0	-29.1	
3505.20	-6.8	H	3.0	39.5	1.0	-45.3	-13.0	-32.3	
5257.80	-4.7	H	3.0	39.8	1.0	-43.6	-13.0	-30.6	
7010.40	-3.8	H	3.0	39.6	1.0	-42.4	-13.0	-29.4	

WCDMA

Band 4
HSDPA

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

Company: Samsung
Project #: 4788556585
Date: 2018-07-28
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 2
Mode: HSDPA Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4MHz									
3424.80	-7.1	V	3.0	39.5	1.0	-45.6	-13.0	-32.6	
5137.20	-6.1	V	3.0	39.8	1.0	-44.9	-13.0	-31.9	
6849.60	-4.3	V	3.0	39.7	1.0	-43.0	-13.0	-30.0	
3424.80	-7.7	H	3.0	39.5	1.0	-46.2	-13.0	-33.2	
5137.20	-5.7	H	3.0	39.8	1.0	-44.5	-13.0	-31.5	
6849.60	-3.8	H	3.0	39.7	1.0	-42.5	-13.0	-29.5	
Mid Ch, 1732.6MHz									
3465.20	-7.2	V	3.0	39.5	1.0	-45.7	-13.0	-32.7	
5197.80	-1.5	V	3.0	39.8	1.0	-40.3	-13.0	-27.3	
6930.40	-4.6	V	3.0	39.7	1.0	-43.3	-13.0	-30.3	
3465.20	-8.2	H	3.0	39.5	1.0	-46.7	-13.0	-33.7	
5197.80	-3.3	H	3.0	39.8	1.0	-42.2	-13.0	-29.2	
6930.40	-4.0	H	3.0	39.7	1.0	-42.7	-13.0	-29.7	
High Ch, 1752.6MHz									
3505.20	-7.0	V	3.0	39.5	1.0	-45.5	-13.0	-32.5	
5257.80	-5.9	V	3.0	39.8	1.0	-44.8	-13.0	-31.8	
7010.40	-4.0	V	3.0	39.6	1.0	-42.6	-13.0	-29.6	
3505.20	-7.0	H	3.0	39.5	1.0	-45.5	-13.0	-32.5	
5257.80	-6.3	H	3.0	39.8	1.0	-45.1	-13.0	-32.1	
7010.40	-3.7	H	3.0	39.6	1.0	-42.3	-13.0	-29.3	

WCDMA Band 2

WCDMA

Band 2
REL99

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: Rel99 Band 2 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, 1852.4MHz									
3704.80	-9.7	V	3.0	43.8	1.0	-52.5	-13.0	-39.5	
5557.20	8.1	V	3.0	43.7	1.0	-34.6	-13.0	-21.6	
7409.60	-3.5	V	3.0	42.5	1.0	-45.1	-13.0	-32.1	
3704.80	-9.4	H	3.0	43.8	1.0	-52.1	-13.0	-39.1	
5557.20	13.7	H	3.0	43.7	1.0	-29.0	-13.0	-16.0	
7409.60	-2.9	H	3.0	42.5	1.0	-44.4	-13.0	-31.4	
Mid Ch, 1880MHz									
3760.00	-9.3	V	3.0	43.8	1.0	-52.1	-13.0	-39.1	
5640.00	10.6	V	3.0	43.7	1.0	-32.1	-13.0	-19.1	
7520.00	-2.3	V	3.0	42.5	1.0	-43.8	-13.0	-30.8	
3760.00	-8.3	H	3.0	43.8	1.0	-51.1	-13.0	-38.1	
5640.00	14.2	H	3.0	43.7	1.0	-28.5	-13.0	-15.5	
7520.00	-3.2	H	3.0	42.5	1.0	-44.7	-13.0	-31.7	
High Ch, 1907.6MHz									
3815.20	-9.2	V	3.0	43.8	1.0	-52.0	-13.0	-39.0	
5722.80	10.3	V	3.0	43.7	1.0	-32.4	-13.0	-19.4	
7630.40	-3.5	V	3.0	42.4	1.0	-44.9	-13.0	-31.9	
3815.20	-9.1	H	3.0	43.8	1.0	-51.9	-13.0	-38.9	
5722.80	12.9	H	3.0	43.7	1.0	-29.8	-13.0	-16.8	
7630.40	-2.9	H	3.0	42.4	1.0	-44.3	-13.0	-31.3	

WCDMA

Band 2
HSDPA

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-14
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: HSDPA Band 2 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, 1852.4MHz									
3704.80	-10.1	V	3.0	43.8	1.0	-52.9	-13.0	-39.9	
5557.20	-6.2	V	3.0	43.7	1.0	-48.9	-13.0	-35.9	
7409.60	-3.5	V	3.0	42.5	1.0	-45.0	-13.0	-32.0	
3704.80	-9.0	H	3.0	43.8	1.0	-51.8	-13.0	-38.8	
5557.20	-6.6	H	3.0	43.7	1.0	-49.3	-13.0	-36.3	
7409.60	-2.8	H	3.0	42.5	1.0	-44.3	-13.0	-31.3	
Mid Ch, 1880MHz									
3760.00	-9.5	V	3.0	43.8	1.0	-52.3	-13.0	-39.3	
5640.00	-5.5	V	3.0	43.7	1.0	-48.2	-13.0	-35.2	
7520.00	-2.2	V	3.0	42.5	1.0	-43.7	-13.0	-30.7	
3760.00	-10.0	H	3.0	43.8	1.0	-52.8	-13.0	-39.8	
5640.00	-6.3	H	3.0	43.7	1.0	-49.0	-13.0	-36.0	
7520.00	-2.4	H	3.0	42.5	1.0	-43.9	-13.0	-30.9	
High Ch, 1907.6MHz									
3815.20	-9.8	V	3.0	43.8	1.0	-52.6	-13.0	-39.6	
5722.80	-5.1	V	3.0	43.7	1.0	-47.8	-13.0	-34.8	
7630.40	-3.5	V	3.0	42.4	1.0	-44.9	-13.0	-31.9	
3815.20	-9.5	H	3.0	43.8	1.0	-52.4	-13.0	-39.4	
5722.80	-5.8	H	3.0	43.7	1.0	-48.5	-13.0	-35.5	
7630.40	-2.8	H	3.0	42.4	1.0	-44.2	-13.0	-31.2	

LTE Band 7

LTE

Band 7

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earphone / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 7 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2510MHz									
5020.00	-7.0	V	3.0	43.8	1.0	-49.8	-25.0	-24.8	
7530.00	-3.4	V	3.0	42.4	1.0	-44.9	-25.0	-19.9	
10040.00	-0.6	V	3.0	40.6	1.0	-40.2	-25.0	-15.2	
12550.00	4.5	V	3.0	41.7	1.0	-36.2	-25.0	-11.2	
15060.00	7.9	V	3.0	43.6	1.0	-34.7	-25.0	-9.7	
5020.00	-7.5	H	3.0	43.8	1.0	-50.3	-25.0	-25.3	
7530.00	-2.9	H	3.0	42.4	1.0	-44.4	-25.0	-19.4	
10040.00	-0.2	H	3.0	40.6	1.0	-39.7	-25.0	-14.7	
12550.00	4.9	H	3.0	41.7	1.0	-35.7	-25.0	-10.7	
15060.00	9.2	H	3.0	43.6	1.0	-33.5	-25.0	-8.5	
Mid Ch, 2535MHz									
5070.00	-7.0	V	3.0	43.8	1.0	-49.7	-25.0	-24.7	
7605.00	-3.3	V	3.0	42.4	1.0	-44.7	-25.0	-19.7	
10140.00	-0.4	V	3.0	40.6	1.0	-40.0	-25.0	-15.0	
12675.00	4.4	V	3.0	41.8	1.0	-36.4	-25.0	-11.4	
15210.00	11.8	V	3.0	43.5	1.0	-30.6	-25.0	-5.6	
5070.00	-7.3	H	3.0	43.8	1.0	-50.1	-25.0	-25.1	
7605.00	-2.8	H	3.0	42.4	1.0	-44.2	-25.0	-19.2	
10140.00	0.7	H	3.0	40.6	1.0	-38.9	-25.0	-13.9	
12675.00	4.9	H	3.0	41.8	1.0	-35.8	-25.0	-10.8	
15210.00	11.0	H	3.0	43.5	1.0	-31.4	-25.0	-6.4	
High Ch, 2560MHz									
5120.00	-7.1	V	3.0	43.8	1.0	-49.8	-25.0	-24.8	
7680.00	-3.5	V	3.0	42.4	1.0	-44.8	-25.0	-19.8	
10240.00	-0.2	V	3.0	40.6	1.0	-39.8	-25.0	-14.8	
12800.00	4.9	V	3.0	41.9	1.0	-36.0	-25.0	-11.0	
15360.00	7.6	V	3.0	43.3	1.0	-34.7	-25.0	-9.7	
5120.00	-7.5	H	3.0	43.8	1.0	-50.2	-25.0	-25.2	
7680.00	-3.0	H	3.0	42.4	1.0	-44.3	-25.0	-19.3	
10240.00	0.1	H	3.0	40.6	1.0	-39.5	-25.0	-14.5	
12800.00	5.3	H	3.0	41.9	1.0	-35.6	-25.0	-10.6	
15360.00	9.2	H	3.0	43.3	1.0	-33.1	-25.0	-8.1	

LTE Band 12

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

Company: Samsung
Project #: 4788556585
Date: 2018-07-27
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Harmonics, 5MHz Bandwidth

LTE

Band 12

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 701.5MHz									
1403.00	-17.0	V	3.0	43.8	1.0	-59.8	-13.0	-46.8	
2104.50	-9.6	V	3.0	43.3	1.0	-52.0	-13.0	-39.0	
2806.00	-10.6	V	3.0	43.5	1.0	-53.0	-13.0	-40.0	
1403.00	-16.5	H	3.0	43.8	1.0	-59.3	-13.0	-46.3	
2104.50	-8.5	H	3.0	43.3	1.0	-50.8	-13.0	-37.8	
2806.00	-10.1	H	3.0	43.5	1.0	-52.6	-13.0	-39.6	
Mid Ch, 707.5MHz									
1415.00	-17.3	V	3.0	43.8	1.0	-60.0	-13.0	-47.0	
2122.50	-9.9	V	3.0	43.3	1.0	-52.2	-13.0	-39.2	
2830.00	-10.7	V	3.0	43.5	1.0	-53.2	-13.0	-40.2	
1415.00	-16.5	H	3.0	43.8	1.0	-59.2	-13.0	-46.2	
2122.50	-5.2	H	3.0	43.3	1.0	-47.5	-13.0	-34.5	
2830.00	-10.3	H	3.0	43.5	1.0	-52.8	-13.0	-39.8	
High Ch, 713.5MHz									
1427.00	-16.7	V	3.0	43.8	1.0	-59.5	-13.0	-46.5	
2140.50	-10.1	V	3.0	43.3	1.0	-52.5	-13.0	-39.5	
2854.00	-10.4	V	3.0	43.5	1.0	-52.8	-13.0	-39.8	
1427.00	-15.8	H	3.0	43.8	1.0	-58.6	-13.0	-45.6	
2140.50	-7.5	H	3.0	43.3	1.0	-49.8	-13.0	-36.8	
2854.00	-10.3	H	3.0	43.5	1.0	-52.8	-13.0	-39.8	

LTE Band 13

LTE

Band 13

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-07-27
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 779.5MHz									
1559.00	-22.4	V	3.0	43.7	1.0	-65.0	-40.0	-25.0	
2338.50	-7.9	V	3.0	43.4	1.0	-50.3	-13.0	-37.3	
3118.00	-9.2	V	3.0	43.6	1.0	-51.8	-13.0	-38.8	
1559.00	-18.2	H	3.0	43.7	1.0	-60.8	-40.0	-20.8	
2338.50	-4.9	H	3.0	43.4	1.0	-47.3	-13.0	-34.3	
3118.00	-8.8	H	3.0	43.6	1.0	-51.3	-13.0	-38.3	
Mid Ch, 782MHz									
1564.00	-18.6	V	3.0	43.7	1.0	-61.3	-40.0	-21.3	
2346.00	-7.0	V	3.0	43.4	1.0	-49.3	-13.0	-36.3	
3128.00	-9.3	V	3.0	43.6	1.0	-51.9	-13.0	-38.9	
1564.00	-18.0	H	3.0	43.7	1.0	-60.7	-40.0	-20.7	
2346.00	-5.9	H	3.0	43.4	1.0	-48.3	-13.0	-35.3	
3128.00	-8.7	H	3.0	43.6	1.0	-51.3	-13.0	-38.3	
High Ch, 784.5MHz									
1569.00	-22.5	V	3.0	43.7	1.0	-65.1	-40.0	-25.1	
2353.50	-6.7	V	3.0	43.4	1.0	-49.1	-13.0	-36.1	
3138.00	-9.3	V	3.0	43.6	1.0	-51.9	-13.0	-38.9	
1569.00	-20.1	H	3.0	43.7	1.0	-62.7	-40.0	-22.7	
2353.50	-6.0	H	3.0	43.4	1.0	-48.4	-13.0	-35.4	
3138.00	-8.8	H	3.0	43.6	1.0	-51.4	-13.0	-38.4	

LTE Band 14

LTE

Band 14

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-07-27
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone / Keyboard
Location: Chamber 1
Mode: LTE_QPSK Band 14 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 790.5MHz									
1581.00	-21.3	V	3.0	43.6	1.0	-63.9	-40.0	-23.9	
2371.50	-3.8	V	3.0	43.4	1.0	-46.2	-13.0	-33.2	
3162.00	-9.0	V	3.0	43.6	1.0	-51.5	-13.0	-38.5	
1581.00	-22.6	H	3.0	43.6	1.0	-65.3	-40.0	-25.3	
2371.50	-1.8	H	3.0	43.4	1.0	-44.2	-13.0	-31.2	
3162.00	-8.6	H	3.0	43.6	1.0	-51.2	-13.0	-38.2	
Mid Ch, 793MHz									
1586.00	-19.7	V	3.0	43.6	1.0	-62.3	-40.0	-22.3	
2379.00	-4.0	V	3.0	43.4	1.0	-46.4	-13.0	-33.4	
3172.00	-9.2	V	3.0	43.6	1.0	-51.8	-13.0	-38.8	
1586.00	-20.7	H	3.0	43.6	1.0	-63.3	-40.0	-23.3	
2379.00	-3.6	H	3.0	43.4	1.0	-46.0	-13.0	-33.0	
3172.00	-8.7	H	3.0	43.6	1.0	-51.3	-13.0	-38.3	
High Ch, 795.5MHz									
1591.00	-22.0	V	3.0	43.6	1.0	-64.7	-40.0	-24.7	
2386.50	-3.3	V	3.0	43.4	1.0	-45.7	-13.0	-32.7	
3182.00	-9.2	V	3.0	43.6	1.0	-51.8	-13.0	-38.8	
1591.00	-24.0	H	3.0	43.6	1.0	-66.6	-40.0	-26.6	
2386.50	-0.2	H	3.0	43.4	1.0	-42.6	-13.0	-29.6	
3182.00	-8.8	H	3.0	43.6	1.0	-51.4	-13.0	-38.4	

LTE Band 25

LTE

Band 25

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1860MHz									
3720.00	-7.9	V	3.0	43.8	1.0	-50.7	-13.0	-37.7	
5580.00	-5.9	V	3.0	43.7	1.0	-48.6	-13.0	-35.6	
7440.00	-3.6	V	3.0	42.5	1.0	-45.1	-13.0	-32.1	
3720.00	-1.7	H	3.0	43.8	1.0	-44.5	-13.0	-31.5	
5580.00	-6.7	H	3.0	43.7	1.0	-49.4	-13.0	-36.4	
7440.00	-3.1	H	3.0	42.5	1.0	-44.6	-13.0	-31.6	
Mid Ch, 1882.5MHz									
3765.00	-8.8	V	3.0	43.8	1.0	-51.5	-13.0	-38.5	
5647.50	-6.2	V	3.0	43.7	1.0	-48.9	-13.0	-35.9	
7530.00	-3.5	V	3.0	42.4	1.0	-45.0	-13.0	-32.0	
3765.00	-5.1	H	3.0	43.8	1.0	-47.9	-13.0	-34.9	
5647.50	-6.4	H	3.0	43.7	1.0	-49.1	-13.0	-36.1	
7530.00	-3.0	H	3.0	42.4	1.0	-44.5	-13.0	-31.5	
High Ch, 1905MHz									
3810.00	-7.5	V	3.0	43.8	1.0	-50.4	-13.0	-37.4	
5715.00	-6.1	V	3.0	43.7	1.0	-48.8	-13.0	-35.8	
7620.00	-3.5	V	3.0	42.4	1.0	-44.9	-13.0	-31.9	
3810.00	-5.8	H	3.0	43.8	1.0	-48.6	-13.0	-35.6	
5715.00	-6.2	H	3.0	43.7	1.0	-48.9	-13.0	-35.9	
7620.00	-3.2	H	3.0	42.4	1.0	-44.6	-13.0	-31.6	

LTE Band 26

LTE

Band 26

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-07-31
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 821.5MHz									
1643.00	-15.2	V	3.0	43.6	1.0	-57.8	-13.0	-44.8	
2464.50	-0.7	V	3.0	43.4	1.0	-43.1	-13.0	-30.1	
3286.00	-9.2	V	3.0	43.6	1.0	-51.8	-13.0	-38.8	
1643.00	-14.5	H	3.0	43.6	1.0	-57.1	-13.0	-44.1	
2464.50	-3.2	H	3.0	43.4	1.0	-45.6	-13.0	-32.6	
3286.00	-8.4	H	3.0	43.6	1.0	-51.0	-13.0	-38.0	
Mid Ch, 836.5 MHz									
1673.00	-15.4	V	3.0	43.6	1.0	-58.0	-13.0	-45.0	
2509.50	2.7	V	3.0	43.4	1.0	-39.7	-13.0	-26.7	
3346.00	-9.4	V	3.0	43.6	1.0	-52.0	-13.0	-39.0	
1673.00	-13.4	H	3.0	43.6	1.0	-56.0	-13.0	-43.0	
2509.50	-1.8	H	3.0	43.4	1.0	-44.2	-13.0	-31.2	
3346.00	-8.7	H	3.0	43.6	1.0	-51.3	-13.0	-38.3	
High Ch, 841.5MHz									
1683.00	-15.1	V	3.0	43.6	1.0	-57.7	-13.0	-44.7	
2524.50	-0.4	V	3.0	43.4	1.0	-42.9	-13.0	-29.9	
3366.00	-9.0	V	3.0	43.7	1.0	-51.7	-13.0	-38.7	
1683.00	-13.3	H	3.0	43.6	1.0	-55.8	-13.0	-42.8	
2524.50	-1.9	H	3.0	43.4	1.0	-44.3	-13.0	-31.3	
3366.00	-8.5	H	3.0	43.7	1.0	-51.1	-13.0	-38.1	

LTE Band 30

LTE

Band 30

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-09-03
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 30 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2307.5MHz									
4615.00	-10.4	V	3.0	43.8	1.0	-53.3	-40.0	-13.3	
6922.50	-18.4	V	3.0	42.8	1.0	-60.2	-40.0	-20.2	
9230.00	-19.3	V	3.0	41.3	1.0	-59.6	-40.0	-19.6	
11537.50	-16.7	V	3.0	41.0	1.0	-56.7	-40.0	-16.7	
13845.00	-7.8	V	3.0	42.7	1.0	-49.5	-40.0	-9.5	
16152.50	-9.3	V	3.0	42.3	1.0	-50.7	-40.0	-10.7	
4615.00	-16.6	H	3.0	43.8	1.0	-59.4	-40.0	-19.4	
6922.50	-17.9	H	3.0	42.8	1.0	-59.7	-40.0	-19.7	
9230.00	-19.0	H	3.0	41.3	1.0	-59.2	-40.0	-19.2	
11537.50	-16.5	H	3.0	41.0	1.0	-56.5	-40.0	-16.5	
13845.00	-2.5	H	3.0	42.7	1.0	-44.2	-40.0	-4.2	
16152.50	-4.8	H	3.0	42.3	1.0	-46.1	-40.0	-6.1	
Mid Ch, 2310MHz									
4620.00	-12.6	V	3.0	43.8	1.0	-55.5	-40.0	-15.5	
6930.00	-18.7	V	3.0	42.8	1.0	-60.5	-40.0	-20.5	
9240.00	-19.8	V	3.0	41.3	1.0	-60.1	-40.0	-20.1	
11550.00	-16.8	V	3.0	41.0	1.0	-56.8	-40.0	-16.8	
13860.00	-7.0	V	3.0	42.7	1.0	-48.7	-40.0	-8.7	
16170.00	-9.4	V	3.0	42.3	1.0	-50.8	-40.0	-10.8	
4620.00	-18.2	H	3.0	43.8	1.0	-61.0	-40.0	-21.0	
6930.00	-18.1	H	3.0	42.8	1.0	-59.9	-40.0	-19.9	
9240.00	-19.0	H	3.0	41.3	1.0	-59.3	-40.0	-19.3	
11550.00	-16.1	H	3.0	41.0	1.0	-56.2	-40.0	-16.2	
13860.00	-2.6	H	3.0	42.7	1.0	-44.3	-40.0	-4.3	
16170.00	-3.8	H	3.0	42.3	1.0	-45.2	-40.0	-5.2	
High Ch, 2312.5MHz									
4625.00	-15.5	V	3.0	43.8	1.0	-58.4	-40.0	-18.4	
6937.50	-18.8	V	3.0	42.8	1.0	-60.6	-40.0	-20.6	
9250.00	-19.8	V	3.0	41.3	1.0	-60.1	-40.0	-20.1	
11562.50	-16.4	V	3.0	41.1	1.0	-56.5	-40.0	-16.5	
13875.00	-9.2	V	3.0	42.8	1.0	-50.9	-40.0	-10.9	
16187.50	-10.2	V	3.0	42.3	1.0	-51.5	-40.0	-11.5	
4625.00	-15.3	H	3.0	43.8	1.0	-58.1	-40.0	-18.1	
6937.50	-18.3	H	3.0	42.8	1.0	-60.1	-40.0	-20.1	
9250.00	-19.2	H	3.0	41.3	1.0	-59.4	-40.0	-19.4	
11562.50	-16.2	H	3.0	41.1	1.0	-56.3	-40.0	-16.3	
13875.00	-2.6	H	3.0	42.8	1.0	-44.4	-40.0	-4.4	
16187.50	-5.0	H	3.0	42.3	1.0	-46.3	-40.0	-6.3	

LTE Band 41

LTE

Band 41

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-22
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2503.5MHz									
5007.00	-6.9	V	3.0	43.8	1.0	-49.7	-25.0	-24.7	
7510.50	-10.9	V	3.0	42.5	1.0	-52.4	-25.0	-27.4	
10014.00	-9.8	V	3.0	40.6	1.0	-49.4	-25.0	-24.4	
12517.50	-6.1	V	3.0	41.6	1.0	-46.7	-25.0	-21.7	
15021.00	6.0	V	3.0	43.7	1.0	-36.7	-25.0	-11.7	
5007.00	-7.1	H	3.0	43.8	1.0	-49.9	-25.0	-24.9	
7510.50	-8.5	H	3.0	42.5	1.0	-50.0	-25.0	-25.0	
10014.00	-8.5	H	3.0	40.6	1.0	-48.0	-25.0	-23.0	
12517.50	-4.3	H	3.0	41.6	1.0	-44.9	-25.0	-19.9	
15021.00	7.5	H	3.0	43.7	1.0	-35.2	-25.0	-10.2	
Mid Ch, 2593MHz									
5186.00	-9.5	V	3.0	43.8	1.0	-52.3	-25.0	-27.3	
7779.00	-3.1	V	3.0	42.3	1.0	-44.4	-25.0	-19.4	
10372.00	-7.0	V	3.0	40.7	1.0	-46.7	-25.0	-21.7	
12965.00	-4.0	V	3.0	42.0	1.0	-45.0	-25.0	-20.0	
15558.00	0.0	V	3.0	43.0	1.0	-42.0	-25.0	-17.0	
5186.00	-9.3	H	3.0	43.8	1.0	-52.0	-25.0	-27.0	
7779.00	-1.7	H	3.0	42.3	1.0	-43.0	-25.0	-18.0	
10372.00	-3.7	H	3.0	40.7	1.0	-43.4	-25.0	-18.4	
12965.00	-1.1	H	3.0	42.0	1.0	-42.1	-25.0	-17.1	
15558.00	1.6	H	3.0	43.0	1.0	-40.5	-25.0	-15.5	
High Ch, 2682.5MHz									
5365.00	-11.3	V	3.0	43.7	1.0	-54.0	-25.0	-29.0	
8047.50	2.2	V	3.0	42.2	1.0	-39.0	-25.0	-14.0	
10730.00	-6.5	V	3.0	40.8	1.0	-46.3	-25.0	-21.3	
13412.50	-1.6	V	3.0	42.4	1.0	-42.9	-25.0	-17.9	
16095.00	-1.4	V	3.0	42.4	1.0	-42.8	-25.0	-17.8	
5365.00	-9.6	H	3.0	43.7	1.0	-52.4	-25.0	-27.4	
8047.50	1.7	H	3.0	42.2	1.0	-39.5	-25.0	-14.5	
10730.00	-8.6	H	3.0	40.8	1.0	-48.4	-25.0	-23.4	
13412.50	4.7	H	3.0	42.4	1.0	-36.7	-25.0	-11.7	
16095.00	-0.5	H	3.0	42.4	1.0	-41.9	-25.0	-16.9	

LTE Band 66

LTE

Band 66

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-08-23
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Harmonics, 20MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1720MHz									
3440.00	-3.8	V	3.0	43.7	1.0	-46.4	-13.0	-33.4	
5160.00	-6.4	V	3.0	43.8	1.0	-49.1	-13.0	-36.1	
6880.00	-3.6	V	3.0	42.8	1.0	-45.4	-13.0	-32.4	
3440.00	-4.5	H	3.0	43.7	1.0	-47.2	-13.0	-34.2	
5160.00	-4.5	H	3.0	43.8	1.0	-47.3	-13.0	-34.3	
6880.00	-3.1	H	3.0	42.8	1.0	-44.9	-13.0	-31.9	
Mid Ch, 1745MHz									
3490.00	-6.6	V	3.0	43.7	1.0	-49.3	-13.0	-36.3	
5235.00	-5.9	V	3.0	43.8	1.0	-48.7	-13.0	-35.7	
6980.00	-3.5	V	3.0	42.7	1.0	-45.3	-13.0	-32.3	
3490.00	-1.9	H	3.0	43.7	1.0	-44.6	-13.0	-31.6	
5235.00	-2.0	H	3.0	43.8	1.0	-44.7	-13.0	-31.7	
6980.00	-3.0	H	3.0	42.7	1.0	-44.7	-13.0	-31.7	
High Ch, 1770MHz									
3540.00	-2.8	V	3.0	43.7	1.0	-45.5	-13.0	-32.5	
5310.00	-4.7	V	3.0	43.7	1.0	-47.5	-13.0	-34.5	
7080.00	-3.2	V	3.0	42.7	1.0	-44.9	-13.0	-31.9	
3540.00	0.0	H	3.0	43.7	1.0	-42.8	-13.0	-29.8	
5310.00	0.7	H	3.0	43.7	1.0	-42.1	-13.0	-29.1	
7080.00	-2.6	H	3.0	42.7	1.0	-44.3	-13.0	-31.3	

LTE Band 71

LTE

Band 71

QPSK

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

Company: Samsung
Project #: 4788556585
Date: 2018-07-31
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 670.5MHz									
1341.00	-23.6	V	3.0	43.8	1.0	-66.4	-25.0	-41.4	
2011.50	-8.6	V	3.0	43.3	1.0	-50.9	-25.0	-25.9	
2682.00	-20.9	V	3.0	43.5	1.0	-63.3	-25.0	-38.3	
4023.00	-15.8	V	3.0	43.9	1.0	-58.7	-25.0	-33.7	
2011.50	-11.5	H	3.0	43.3	1.0	-53.8	-25.0	-28.8	
2682.00	-20.9	H	3.0	43.5	1.0	-63.4	-25.0	-38.4	
Mid Ch, 680.5MHz									
1361.00	-24.4	V	3.0	43.8	1.0	-67.2	-25.0	-42.2	
2041.50	-4.6	V	3.0	43.3	1.0	-46.9	-25.0	-21.9	
2722.00	-20.9	V	3.0	43.5	1.0	-63.3	-25.0	-38.3	
1361.00	-23.8	H	3.0	43.8	1.0	-66.6	-25.0	-41.6	
2041.50	-3.4	H	3.0	43.3	1.0	-45.8	-25.0	-20.8	
2722.00	-20.8	H	3.0	43.5	1.0	-63.2	-25.0	-38.2	
High Ch, 690.4MHz									
1380.80	-24.9	V	3.0	43.8	1.0	-67.7	-25.0	-42.7	
2071.20	-6.1	V	3.0	43.3	1.0	-48.4	-25.0	-23.4	
2761.60	-20.6	V	3.0	43.5	1.0	-63.1	-25.0	-38.1	
1380.80	-24.2	H	3.0	43.8	1.0	-67.0	-25.0	-42.0	
2071.20	-6.1	H	3.0	43.3	1.0	-48.4	-25.0	-23.4	
2761.60	-20.2	H	3.0	43.5	1.0	-62.7	-25.0	-37.7	