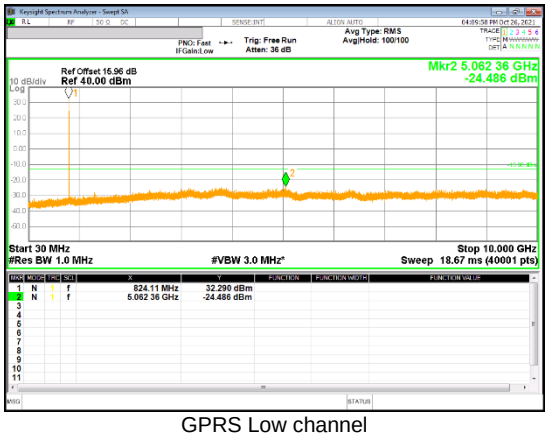
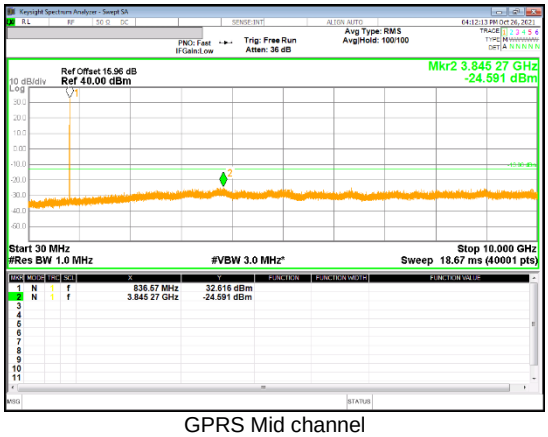
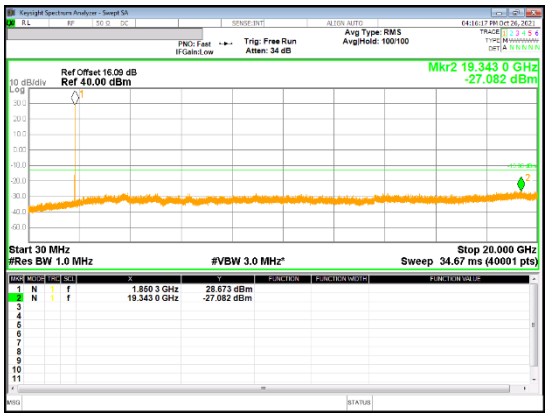
9.3.1. OUT OF BAND EMISSIONS RESULT

GSM 850

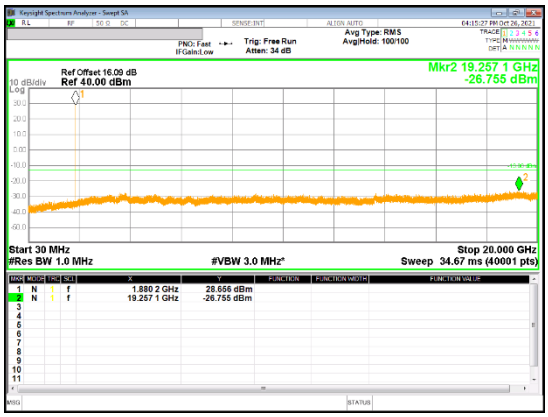
GSM 850	 GPRS Low channel	 GPRS Mid channel
	 GPRS High channel	

GSM 1900

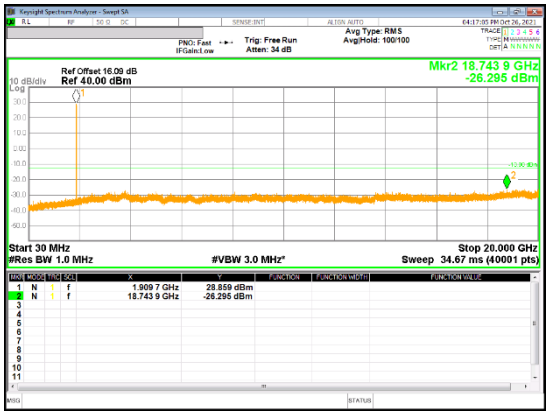
GSM 1900



GPRS Low channel



GPRS Mid channel

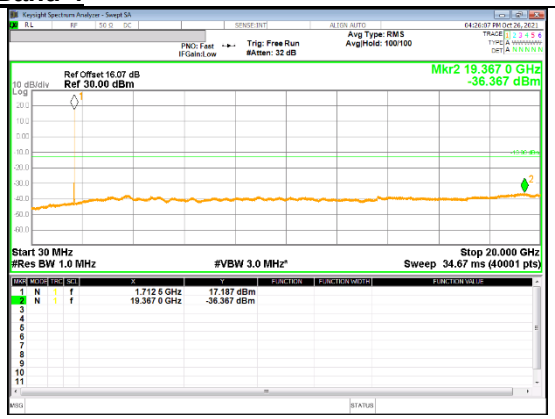
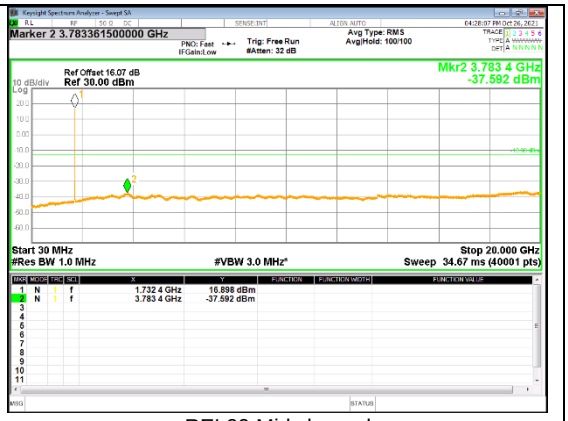


GPRS High channel

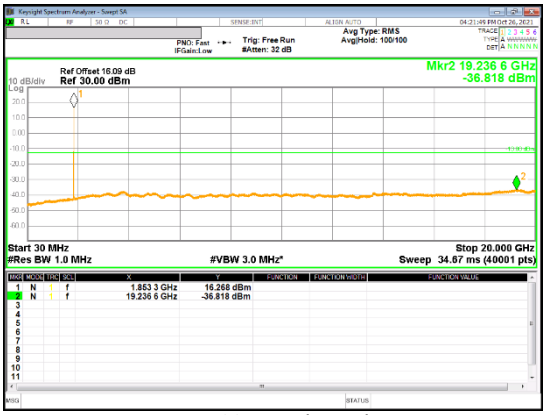
WCDMA Band 5

Band 5	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

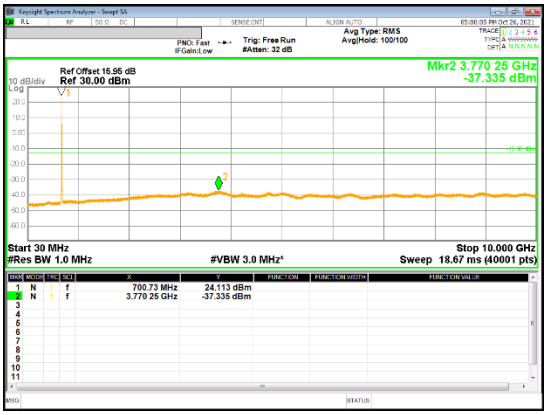
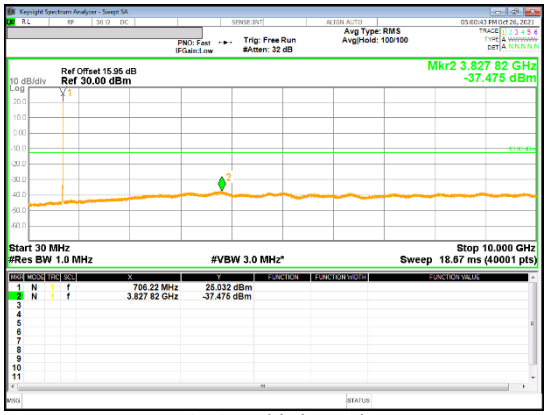
WCDMA Band 4

Band 4	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

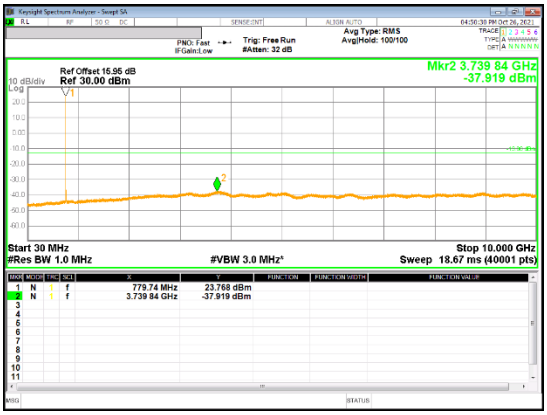
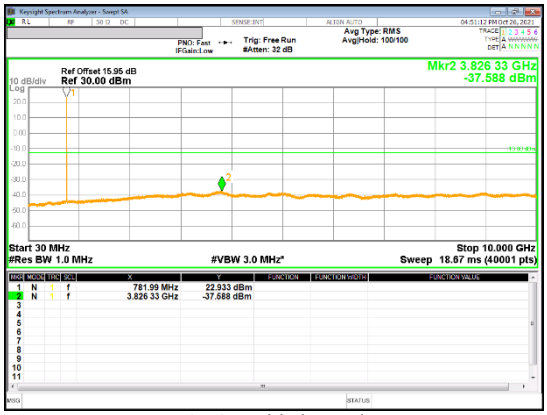
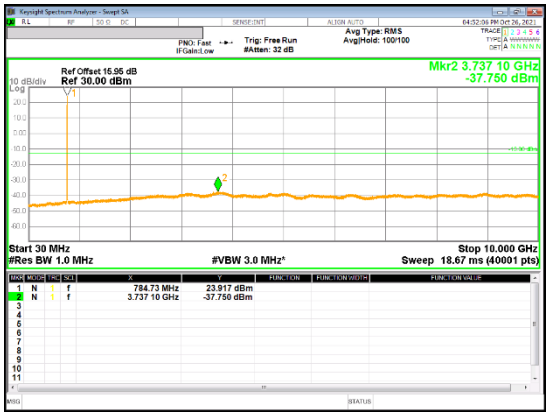
WCDMA Band 2

Band 2	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

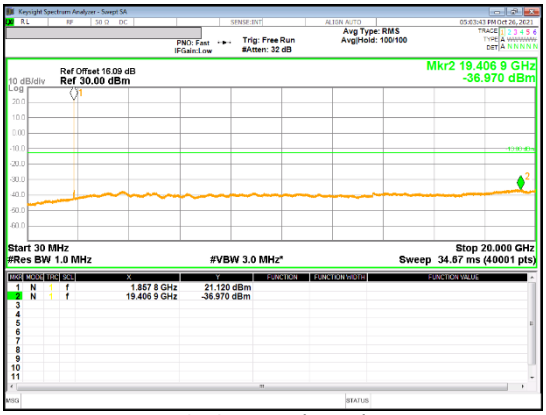
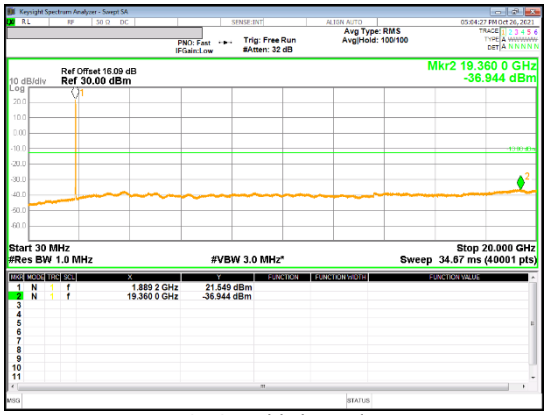
LTE Band 12

LTE Band 12 3MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

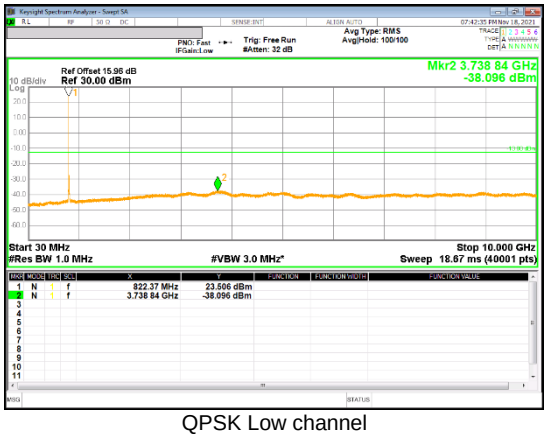
LTE Band 13

LTE Band 13 5MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

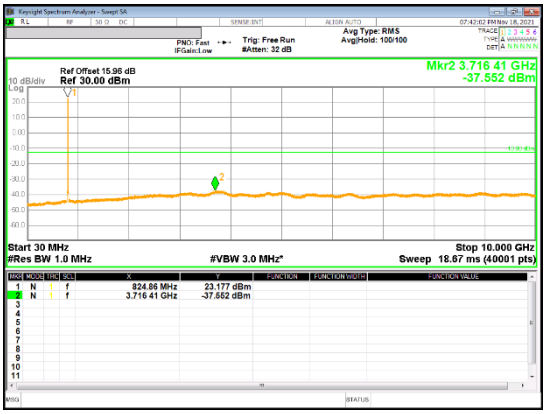
LTE Band 25

LTE Band 25 15MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

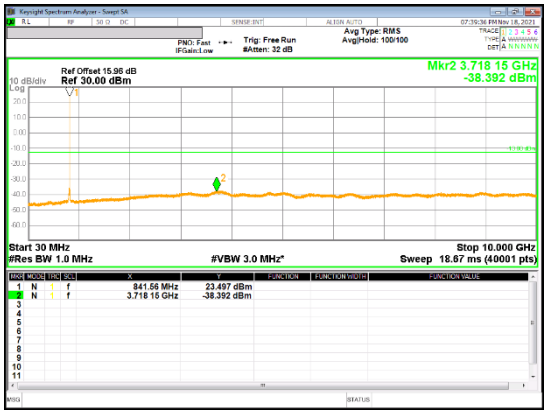
LTE Band 26(Part 90)

LTE Band 26 (Part90) 15MHz	 QPSK Low channel	

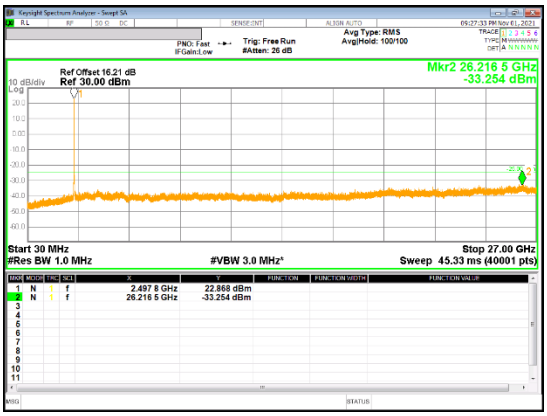
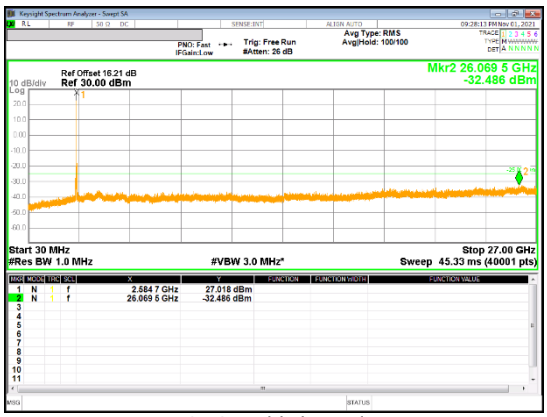
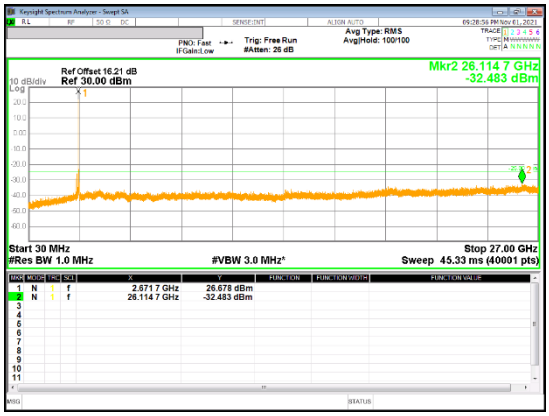
LTE Band 26 (Straddle)

LTE Band 26 (Straddle) 15MHz	 QPSK High channel

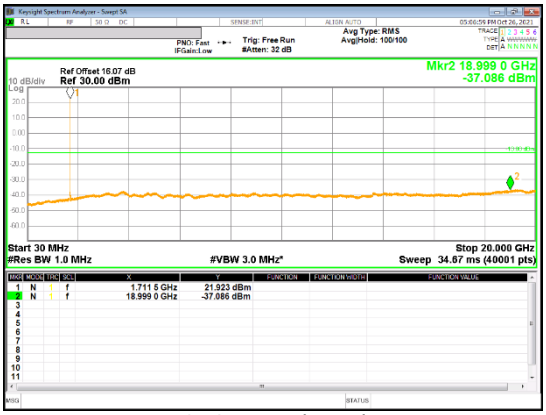
LTE Band 26 (Part 22)

LTE Band 26 (Part 22) 15MHz	 QPSK Mid channel	 QPSK High channel

LTE Band 41 (PC2)

LTE Band 41 20MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 66

LTE Band 66 3MHz	 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 and §90.213

LIMITS

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

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

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

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

NOTE : Test were performed each lowest or highest frequency on the modulation condition of more wide bandwidth.(Please refer to section 9.1.1 OBW results)

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27/90(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9.4.1. FREQUENCY STABILITY RESULTS

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

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20ºC					
Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
	Low Channel		High Channel		Limit [ppm]
	[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
50	824.20002042	-0.009	848.80001980	-0.009	2.5
40	824.20001058	0.003	848.80001318	-0.001	2.5
30	824.20001310	0.000	848.80001204	0.000	2.5
20	***824.20001316***	***0.000***	***848.80001196***	***0.000***	***2.5***
10	824.20001428	-0.001	848.80001350	-0.002	2.5
0	824.20001538	-0.003	848.80001285	-0.001	2.5
-10	824.20002060	-0.009	848.80001314	-0.001	2.5
-20	824.20002106	-0.010	848.80001508	-0.004	2.5
-30	824.20002479	-0.014	848.80001426	-0.003	2.5

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20ºC					
Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
	Low Channel		High Channel		Limit [ppm]
	[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
20	**824.20001316**	***0***	**848.80001196**	***0***	***2.5***
20	824.20000000	0.016	848.80000000	0.014	2.5
20	824.20000000	0.016	848.80000000	0.014	2.5

GSM 1900, Channel 512/810, Frequency 1850.0/1910.0 MHz (Lowest Frequency:EGPRS / Highest Frequency: GPRS)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0803	1909.9233		
Extreme (50C)		1850.0804	1909.9233	34.8	0.019
Extreme (40C)		1850.0804	1909.9233	33.9	0.018
Extreme (30C)		1850.0804	1909.9233	31.1	0.017
Extreme (10C)		1850.0804	1909.9233	34.4	0.018
Extreme (0C)		1850.0804	1909.9233	34.1	0.018
Extreme (-10C)		1850.0804	1909.9233	33.4	0.018
Extreme (-20C)		1850.0804	1909.9233	32.3	0.017
Extreme (-30C)		1850.0804	1909.9233	33.5	0.018
20C	15%	1850.0804	1909.9233	21.7	0.012
	-15%	1850.0804	1909.9233	23.0	0.012
	End Point	1850.0804	1909.9233	19.4	0.010

WCDMA Band 5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC					
Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
	Low Channel		High Channel		Limit [ppm]
	[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
50	826.40000531	-0.003	846.60000513	0.000	2.5
40	826.40000330	0.000	846.60000483	0.001	2.5
30	826.40000406	-0.001	846.60000496	0.000	2.5
20	***826.40000306***	***0.000***	***846.60000538***	***0.000***	***2.5***
10	826.40000441	-0.002	846.60000413	0.001	2.5
0	826.40000288	0.000	846.60000558	0.000	2.5
-10	826.40000627	-0.004	846.60000604	-0.001	2.5
-20	826.40000540	-0.003	846.60000580	0.000	2.5
-30	826.40000528	-0.003	846.60000609	-0.001	2.5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC					
Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
	Low Channel		High Channel		Limit [ppm]
	[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
20	**826.40000306**	***0***	**846.60000538**	***0***	***2.5***
20	826.40000700	-0.005	846.60000583	-0.001	2.5
20	826.40000484	-0.002	846.60000513	0.000	2.5

WCDMA Band 4 (Lowest Frequency:HSDPA / Highest Frequency: 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	1710.2934	1754.7076		
Extreme (50C)		1710.2934	1754.7076	4.4	0.003
Extreme (40C)		1710.2934	1754.7076	4.0	0.002
Extreme (30C)		1710.2934	1754.7076	5.1	0.003
Extreme (10C)		1710.2934	1754.7076	5.0	0.003
Extreme (0C)		1710.2934	1754.7076	4.6	0.003
Extreme (-10C)		1710.2934	1754.7076	5.2	0.003
Extreme (-20C)		1710.2934	1754.7076	5.6	0.003
Extreme (-30C)		1710.2934	1754.7076	5.7	0.003
20C	15%	1710.2934	1754.7076	4.5	0.003
	-15%	1710.2934	1754.7076	7.2	0.004
	End Point	1710.2934	1754.7076	7.5	0.004

WCDMA Band 2 (Lowest Frequency: HSDPA / Highest Frequency: 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	1850.2714	1909.7085		
Extreme (50C)		1850.2714	1909.7085	10.6	0.006
Extreme (40C)		1850.2714	1909.7085	7.5	0.004
Extreme (30C)		1850.2714	1909.7085	13.1	0.007
Extreme (10C)		1850.2714	1909.7085	8.9	0.005
Extreme (0C)		1850.2714	1909.7085	10.2	0.005
Extreme (-10C)		1850.2714	1909.7085	9.6	0.005
Extreme (-20C)		1850.2714	1909.7085	14.4	0.008
Extreme (-30C)		1850.2714	1909.7085	14.1	0.007
20C	15%	1850.2714	1909.7085	5.7	0.003
	-15%	1850.2714	1909.7085	6.4	0.003
	End Point	1850.2714	1909.7085	12.6	0.007

LTE Band 12 (Lowest Frequency: 16QAM / Highest Frequency: 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	699.1558	715.8466		
Extreme (50C)		699.1558	715.8466	10.3	0.015
Extreme (40C)		699.1558	715.8466	11.6	0.016
Extreme (30C)		699.1558	715.8466	9.8	0.014
Extreme (10C)		699.1558	715.8466	10.2	0.014
Extreme (0C)		699.1558	715.8466	9.4	0.013
Extreme (-10C)		699.1558	715.8466	11.9	0.017
Extreme (-20C)		699.1558	715.8466	10.3	0.015
Extreme (-30C)		699.1558	715.8466	11.1	0.016
20C	15%	699.1558	715.8466	23.8	0.034
	-15%	699.1558	715.8466	23.4	0.033
	End Point	699.1558	715.8466	21.9	0.031

LTE Band 13 (Lowest Frequency: 16QAM / Highest Frequency: 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	777.2546	786.7506		
Extreme (50C)		777.2546	786.7506	27.5	0.035
Extreme (40C)		777.2546	786.7506	26.3	0.034
Extreme (30C)		777.2546	786.7506	26.2	0.034
Extreme (10C)		777.2546	786.7506	26.8	0.034
Extreme (0C)		777.2546	786.7506	25.4	0.032
Extreme (-10C)		777.2546	786.7506	26.9	0.034
Extreme (-20C)		777.2546	786.7506	25.6	0.033
Extreme (-30C)		777.2546	786.7506	28.1	0.036
20C	15%	777.2546	786.7506	23.6	0.030
	-15%	777.2546	786.7506	22.9	0.029
	End Point	777.2546	786.7506	23.9	0.031

LTE Band 25 (Lowest Frequency: QPSK / Highest Frequency: 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	1850.1564	1914.8450		
Extreme (50C)		1850.1564	1914.8450	11.3	0.006
Extreme (40C)		1850.1564	1914.8450	12.1	0.006
Extreme (30C)		1850.1564	1914.8450	11.2	0.006
Extreme (10C)		1850.1564	1914.8450	10.9	0.006
Extreme (0C)		1850.1564	1914.8450	11.1	0.006
Extreme (-10C)		1850.1564	1914.8450	11.8	0.006
Extreme (-20C)		1850.1564	1914.8450	11.2	0.006
Extreme (-30C)		1850.1564	1914.8450	11.4	0.006
20C	15%	1850.1564	1914.8450	52.3	0.028
	-15%	1850.1564	1914.8450	51.9	0.028
	End Point	1850.1564	1914.8450	53.0	0.028

LTE Band 26

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				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.85	50	814.70003697	0.000	848.30005704	-0.008	2.5
3.85	40	814.70003825	-0.001	848.30005118	-0.001	2.5
3.85	30	814.70003918	-0.003	848.30004601	0.005	2.5
3.85	***20***	***814.70003705***	***0.000***	***848.30005026***	***0.000***	***2.5***
3.85	10	814.70003618	0.001	848.30004149	0.010	2.5
3.85	0	814.70003846	-0.002	848.30004086	0.011	2.5
3.85	-10	814.70003815	-0.001	848.30004901	0.001	2.5
3.85	-20	814.70003770	-0.001	848.30004722	0.004	2.5
3.85	-30	814.70003882	-0.002	848.30004747	0.003	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				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**814.70003705**	***0***	**848.30005026**	***0***	***2.5***
4.47	20	814.70003929	-0.003	848.30004178	0.010	2.5
3.60	20	814.70004189	-0.006	848.30004085	0.011	2.5

LTE Band 41 PC2 (Lowest Frequency:QPSK / Highest Frequency: 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	2691.2444	2692.2442		
Extreme (50C)		2691.2444	2692.2442	12.7	0.005
Extreme (40C)		2691.2444	2692.2442	12.3	0.005
Extreme (30C)		2691.2444	2692.2442	12.4	0.005
Extreme (10C)		2691.2444	2692.2442	11.2	0.004
Extreme (0C)		2691.2444	2692.2442	13.2	0.005
Extreme (-10C)		2691.2444	2692.2442	13.2	0.005
Extreme (-20C)		2691.2444	2692.2442	14.1	0.005
Extreme (-30C)		2691.2444	2692.2442	13.8	0.005
20C	15%	2691.2444	2692.2442	38.0	0.015
	-15%	2691.2444	2692.2442	21.2	0.008
	End Point	2691.2444	2692.2442	20.9	0.008

LTE Band 66 (Lowest Frequency: QPSK / Highest Frequency: 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	40.1	0.023
Extreme (40C)		1710.6995	1779.3006	35.8	0.021
Extreme (30C)		1710.6995	1779.3006	39.4	0.023
Extreme (10C)		1710.6995	1779.3006	36.1	0.021
Extreme (0C)		1710.6995	1779.3006	37.6	0.022
Extreme (-10C)		1710.6995	1779.3006	38.2	0.022
Extreme (-20C)		1710.6995	1779.3006	34.6	0.020
Extreme (-30C)		1710.6995	1779.3006	33.1	0.019
20C	15%	1710.6995	1779.3006	47.0	0.027
	-15%	1710.6995	1779.3006	46.2	0.026
	End Point	1710.6995	1779.3006	45.8	0.026

9.5. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50, §27.53 and §90.635

LIMITS

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

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

27.50:

(b)(10) Portable stations (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) The following power limits shall apply in the BRS and EBS:

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

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

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(GSM, WCDMA), average(LTE);

TEST RESULTS

9.5.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	128	824.2	28.03	635.33
		190	836.6	**29.54**	**899.50**
		251	848.8	29.52	895.36
	EGPRS	128	824.2	22.56	180.30
		190	836.6	**24.97**	**314.05**
		251	848.8	23.71	234.96
GSM1900	GPRS	512	1850.2	30.68	1169.50
		661	1880	**30.81**	**1205.04**
		810	1909.8	30.28	1066.60
	EGPRS	512	1850.2	**27.29**	**535.80**
		661	1880	26.80	478.63
		810	1909.8	26.49	445.66

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	**21.02**	**126.47**
		4183	836.6	20.96	124.74
		4233	846.6	20.55	113.50
	HSDPA	4132	826.4	**19.53**	**89.74**
		4183	836.6	19.22	83.56
		4233	846.6	19.05	80.35
Band 4	REL99	1312	1712.4	23.23	210.38
		1413	1732.6	23.38	217.77
		1513	1752.6	**23.51**	**224.39**
	HSDPA	1312	1712.4	21.86	153.46
		1413	1732.6	21.81	151.71
		1513	1752.6	**22.37**	**172.58**
Band 2	REL99	9262	1852.4	21.69	147.57
		9400	1880.0	22.14	163.68
		9538	1907.6	**22.26**	**168.27**
	HSDPA	9262	1852.4	20.86	121.90
		9400	1880.0	**21.21**	**132.13**
		9538	1907.6	21.07	127.94

LTE Band 12

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 12	10	QPSK	1/0	704.0	19.10	81.28
			1/0	707.5	**19.42**	**87.50**
			1/49	711.0	18.90	77.62
		16QAM	1/0	704.0	17.84	60.81
			1/0	707.5	**18.52**	**71.12**
			1/0	711.0	17.84	60.81
	5	QPSK	1/24	701.5	**19.60**	**91.20**
			1/12	707.5	19.18	82.79
			1/12	713.5	17.72	59.16
		16QAM	1/24	701.5	17.39	54.83
			1/12	707.5	**18.14**	**65.16**
			1/24	713.5	17.60	57.54
	3	QPSK	1/8	700.5	18.98	79.07
			1/0	707.5	**19.19**	**82.99**
			1/8	714.5	19.04	80.17
		16QAM	1/8	700.5	18.10	64.57
			1/0	707.5	**18.44**	**69.82**
			1/8	714.5	17.86	61.09
	1.4	QPSK	1/0	699.7	18.75	74.99
			1/5	707.5	**19.09**	**81.10**
			1/5	715.3	18.97	78.89
		16QAM	1/5	699.7	17.73	59.29
			1/5	707.5	**17.97**	**62.66**
			1/5	715.3	17.69	58.75

LTE Band 13

Band	BW [MHz]	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 13	10	QPSK	1/49	782.0	**20.41**	**109.90**
		16QAM	1/49	782.0	19.37	86.50
	5	QPSK	1/12	779.5	**20.73**	**118.30**
			1/12	782.0	20.53	112.98
			1/12	784.5	20.28	106.66
		16QAM	1/24	779.5	**19.62**	**91.62**
			1/24	782.0	19.53	89.74
			1/24	784.5	19.34	85.90

LTE Band 25

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 25	20	QPSK	1/0	1860.0	22.41	174.18
			1/0	1882.5	**22.61**	**182.39**
			1/0	1905.0	22.07	161.06
		16QAM	1/0	1860.0	21.06	127.64
			1/0	1882.5	**21.45**	**139.64**
			1/0	1905.0	20.83	121.06
	15	QPSK	1/37	1857.5	**22.05**	**160.32**
			1/74	1882.5	22.00	158.49
			1/37	1907.5	21.43	139.00
		16QAM	1/37	1857.5	20.81	120.50
			1/37	1882.5	**21.39**	**137.72**
			1/37	1907.5	20.14	103.28
	10	QPSK	1/49	1855.0	22.15	164.06
			1/0	1882.5	**22.29**	**169.43**
			1/49	1910.0	21.65	146.22
		16QAM	1/49	1855.0	20.88	122.46
			1/0	1882.5	**21.05**	**127.35**
			1/49	1910.0	20.42	110.15
	5	QPSK	1/12	1852.5	**22.38**	**172.98**
			1/12	1882.5	21.28	134.28
			1/24	1912.5	21.61	144.88
		16QAM	1/12	1852.5	**21.51**	**141.58**
			1/24	1882.5	19.92	98.17
			1/0	1912.5	20.31	107.40
	3	QPSK	1/8	1851.5	**22.50**	**177.83**
			1/0	1882.5	22.30	169.82
			1/8	1913.5	21.65	146.22
		16QAM	1/8	1851.5	**21.26**	**133.66**
			1/0	1882.5	21.20	131.83
			1/8	1913.5	20.44	110.66
	1.4	QPSK	1/5	1850.7	**22.35**	**171.79**
			1/5	1882.5	21.81	151.71
			1/0	1914.3	21.29	134.59
		16QAM	1/5	1850.7	**21.15**	**130.32**
			1/5	1882.5	20.51	112.46
			1/0	1914.3	20.05	101.16

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	20.29	106.91
			1/0	831.5	**20.58**	**114.29**
			1/37	841.5	20.25	105.93
		16QAM	1/37	821.5	19.33	85.70
			1/0	831.5	19.30	85.11
			1/37	841.5	**19.32**	**85.51**
	10	QPSK	1/0	819.0	20.11	102.57
			1/0	829.0	**20.41**	**109.90**
			1/0	831.5	20.24	105.68
			1/49	844.0	20.25	105.93
		16QAM	1/49	819.0	19.00	79.43
			1/49	829.0	18.81	76.03
			1/0	831.5	**19.56**	**90.36**
			1/49	844.0	19.11	81.47
	5	QPSK	1/24	816.5	**20.18**	**104.23**
			1/24	821.5	20.11	102.57
			1/24	826.5	19.99	99.77
			1/12	831.5	19.99	99.77
			1/12	846.5	20.16	103.75
		16QAM	1/12	816.5	19.14	82.04
			1/0	821.5	19.25	84.14
			1/24	826.5	18.88	77.27
			1/24	831.5	18.65	73.28
			1/24	846.5	**19.32**	**85.51**
	3	QPSK	1/8	815.5	20.11	102.57
			1/14	822.5	**20.44**	**110.66**
			1/14	825.5	20.25	105.93
			1/0	831.5	20.30	107.15
			1/8	847.5	20.24	105.68
		16QAM	1/8	815.5	18.78	75.51
			1/14	822.5	19.21	83.37
			1/14	825.5	**19.25**	**84.14**
			1/0	831.5	19.09	81.10
			1/8	847.5	19.03	79.98
	1.4	QPSK	1/5	814.7	19.85	96.61
			1/5	823.3	20.10	102.33
			1/3	824.7	**20.43**	**110.41**
			1/5	831.5	19.80	95.50
			1/5	848.3	20.12	102.80
		16QAM	1/5	814.7	18.81	76.03
			1/3	823.3	19.16	82.41
			1/0	824.7	19.04	80.17
			1/5	831.5	18.62	72.78
			1/0	848.3	**19.18**	**82.79**

LTE Band 26(Straddle)

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP/EIRP [dBm]	ERP/EIRP [mW]
Band 26 Straddle	15	QPSK	1/0	824	20.47	111.43
		16QAM	1/0		19.15	82.22
	10	QPSK	1/0	824	20.73	118.30
		16QAM	1/25		19.47	88.51
	5	QPSK	1/24	824	20.28	106.66
		16QAM	1/24		19.16	82.41
	3	QPSK	1/0	824	20.40	109.65
		16QAM	1/8		19.09	81.10
	1.4	QPSK	1/3	824	20.36	108.64
		16QAM	1/3		19.24	83.95

LTE Band 41 (PC2)

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 41	20	QPSK	1/0	2506.0	**24.63**	**290.40**
			1/0	2593.0	24.33	271.02
			1/0	2680.0	24.58	287.08
		16QAM	1/0	2506.0	**24.46**	**279.25**
			1/0	2593.0	23.96	248.89
			1/99	2680.0	23.82	240.99
	15	QPSK	1/0	2503.5	24.05	254.10
			1/0	2593.0	**24.48**	**280.54**
			1/0	2682.5	23.76	237.68
		16QAM	1/0	2503.5	**23.38**	**217.77**
			1/37	2593.0	23.21	209.41
			1/0	2682.5	22.97	198.15
	10	QPSK	1/25	2501.0	**24.29**	**268.53**
			1/0	2593.0	23.82	240.99
			1/25	2685.0	23.71	234.96
		16QAM	1/25	2501.0	**23.82**	**240.99**
			1/0	2593.0	23.50	223.87
			1/25	2685.0	23.08	203.24
	5	QPSK	1/0	2498.5	**24.50**	**281.84**
			1/12	2593.0	23.84	242.10
			1/0	2687.5	23.70	234.42
		16QAM	1/0	2498.5	**23.98**	**250.03**
			1/24	2593.0	23.34	215.77
			1/24	2687.5	23.10	204.17

LTE Band 66

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 66	20	QPSK	1/0	1720.0	**23.66**	**232.27**
			1/0	1745.0	22.77	189.23
			1/0	1770.0	22.40	173.78
		16QAM	1/0	1720.0	**22.34**	**171.40**
			1/0	1745.0	21.92	155.60
			1/0	1770.0	21.14	130.02
	15	QPSK	1/37	1717.5	**23.90**	**245.47**
			1/0	1747.5	23.51	224.39
			1/37	1772.5	21.45	139.64
		16QAM	1/37	1717.5	**23.05**	**201.84**
			1/74	1747.5	21.08	128.23
			1/37	1772.5	20.24	105.68
	10	QPSK	1/49	1715.0	**23.96**	**248.89**
			1/0	1745.0	23.16	207.01
			1/0	1775.0	22.16	164.44
		16QAM	1/49	1715.0	**22.86**	**193.20**
			1/0	1745.0	21.89	154.53
			1/49	1775.0	20.83	121.06
	5	QPSK	1/12	1712.5	**23.82**	**240.99**
			1/24	1745.0	23.27	212.32
			1/12	1777.5	21.15	130.32
		16QAM	1/24	1712.5	**22.94**	**196.79**
			1/12	1745.0	21.69	147.57
			1/24	1777.5	19.83	96.16
	3	QPSK	1/8	1711.5	**23.65**	**231.74**
			1/0	1745.0	22.93	196.34
			1/8	1778.5	21.08	128.23
		16QAM	1/8	1711.5	**22.46**	**176.20**
			1/0	1745.0	22.25	167.88
			1/8	1778.5	20.00	100.00
	1.4	QPSK	1/5	1710.7	**23.68**	**233.35**
			1/5	1745.0	22.96	197.70
			1/5	1779.3	20.76	119.12
		16QAM	1/5	1710.7	**22.52**	**178.65**
			1/5	1745.0	21.85	153.11
			1/5	1779.3	19.76	94.62

9.5.2. ERP/EIRP DATA

GSM850

GSM850

GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/31/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: GPRS 850 MHz Fundamentals

Test Equpment:
Receiving: VULB9163-749, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	32.38	V	3.0	-1.3	28.03	38.5	-10.5	
824.20	23.03	H	3.0	-1.3	18.68	38.5	-19.8	
Mid Ch								
836.60	33.79	V	3.0	-1.2	29.54	38.5	-9.0	
836.60	24.50	H	3.0	-1.2	20.25	38.5	-18.2	
High Ch								
848.80	33.68	V	3.1	-1.1	29.52	38.5	-9.0	
848.80	24.80	H	3.1	-1.1	20.63	38.5	-17.9	

GSM850

EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/31/2021
Test Engineer: 19227
Configuration: EUT, Z- Position
Location: Chamber 2
Mode: EGPRS 850 MHz Fundamentals

Test Equpment:
Receiving: VULB9163-749, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	26.91	V	3.0	-1.3	22.56	38.5	-15.9	
824.20	19.72	H	3.0	-1.3	15.37	38.5	-23.1	
Mid Ch								
836.60	29.22	V	3.0	-1.2	24.97	38.5	-13.5	
836.60	18.78	H	3.0	-1.2	14.53	38.5	-24.0	
High Ch								
848.80	27.87	V	3.1	-1.1	23.71	38.5	-14.8	
848.80	20.26	H	3.1	-1.1	16.09	38.5	-22.4	

GSM1900

GSM1900

GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, X-Position
Location: Chamber 1
Mode: GPRS 1900 MHz Fundamentals

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	19.91	V	4.5	9.6	25.04	33.0	-8.0	
1850.20	25.55	H	4.5	9.6	30.68	33.0	-2.3	
Mid Ch								
1880.00	21.12	V	4.5	9.4	26.00	33.0	-7.0	
1880.00	25.93	H	4.5	9.4	30.81	33.0	-2.2	
High Ch								
1909.80	21.19	V	4.5	9.1	25.77	33.0	-7.2	
1909.80	25.70	H	4.5	9.1	30.28	33.0	-2.7	

GSM1900

EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, X-Position
Location: Chamber 1
Mode: EGPRS 1900 MHz Fundamentals

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	16.78	V	4.5	9.6	21.91	33.0	-11.1	
1850.20	22.16	H	4.5	9.6	27.29	33.0	-5.7	
Mid Ch								
1880.00	17.50	V	4.5	9.4	22.38	33.0	-10.6	
1880.00	21.92	H	4.5	9.4	26.80	33.0	-6.2	
High Ch								
1909.80	17.00	V	4.5	9.1	21.58	33.0	-11.4	
1909.80	21.91	H	4.5	9.1	26.49	33.0	-6.5	

WCDMA Band 5

Band 5 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/1/2021
Test Engineer: 20882
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: Rel99 Band 5 Fundamentals

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	25.34	V	3.0	-1.3	21.02	38.5	-17.5	
826.40	15.31	H	3.0	-1.3	10.99	38.5	-27.5	
Mid Ch								
836.60	25.21	V	3.0	-1.2	20.96	38.5	-17.5	
836.60	15.40	H	3.0	-1.2	11.15	38.5	-27.3	
High Ch								
846.60	24.72	V	3.0	-1.1	20.55	38.5	-18.0	
846.60	16.05	H	3.0	-1.1	11.87	38.5	-26.6	

Band 5 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/1/2021
Test Engineer: 20882
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: HSDPA Band 5 Fundamentals

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	23.85	V	3.0	-1.3	19.53	38.5	-19.0	
826.40	13.85	H	3.0	-1.3	9.53	38.5	-29.0	
Mid Ch								
836.60	23.47	V	3.0	-1.2	19.22	38.5	-19.3	
836.60	13.70	H	3.0	-1.2	9.45	38.5	-29.0	
High Ch								
846.60	23.22	V	3.0	-1.1	19.05	38.5	-19.5	
846.60	14.39	H	3.0	-1.1	10.21	38.5	-28.3	

WCDMA Band 4

Band 4 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/30/2021
Test Engineer: 19227
Configuration: EUT, Z- Position
Location: Chamber 2
Mode: Rel99 Band 4 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00161451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	13.76	V	4.3	9.6	19.05	30.0	-11.0	
1712.40	17.95	H	4.3	9.6	23.23	30.0	-6.8	
Mid Ch								
1732.60	13.43	V	4.3	9.6	18.76	30.0	-11.2	
1732.60	18.06	H	4.3	9.6	23.38	30.0	-6.6	
High Ch								
1752.60	13.68	V	4.3	9.7	19.04	30.0	-11.0	
1752.60	18.16	H	4.3	9.7	23.51	30.0	-6.5	

Band 4 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/1/2021
Test Engineer: 22943
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: HSDPA Band 4 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00161451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	12.90	V	4.3	9.6	18.19	30.0	-11.8	
1712.40	16.58	H	4.3	9.6	21.86	30.0	-8.1	
Mid Ch								
1732.60	12.76	V	4.3	9.6	18.09	30.0	-11.9	
1732.60	16.49	H	4.3	9.6	21.81	30.0	-8.2	
High Ch								
1752.60	12.99	V	4.3	9.7	18.35	30.0	-11.6	
1752.60	17.02	H	4.3	9.7	22.37	30.0	-7.6	

WCDMA Band 2

Band 2 REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/30/2021
Test Engineer: 19227
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], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	12.17	V	4.5	9.6	17.32	33.0	-15.7	
1852.40	16.53	H	4.5	9.6	21.69	33.0	-11.3	
Mid Ch								
1880.00	12.82	V	4.5	9.4	17.69	33.0	-15.3	
1880.00	17.27	H	4.5	9.4	22.14	33.0	-10.9	
High Ch								
1907.60	13.58	V	4.5	9.1	18.14	33.0	-14.9	
1907.60	17.70	H	4.5	9.1	22.26	33.0	-10.7	

Band 2 HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/30/2021
Test Engineer: 19227
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], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	11.40	V	4.5	9.6	16.55	33.0	-16.5	
1852.40	15.70	H	4.5	9.6	20.86	33.0	-12.1	
Mid Ch								
1880.00	11.91	V	4.5	9.4	16.78	33.0	-16.2	
1880.00	16.34	H	4.5	9.4	21.21	33.0	-11.8	
High Ch								
1907.60	11.83	V	4.5	9.1	16.39	33.0	-16.6	
1907.60	16.51	H	4.5	9.1	21.07	33.0	-11.9	

LTE Band 12

LTE Band 12

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	23.25	V	2.8	-1.4	19.10	34.8	-15.7	
704.00	6.98	H	2.8	-1.4	2.84	34.8	-31.9	
Mid Ch								
707.50	23.58	V	2.8	-1.4	19.42	34.8	-15.4	
707.50	7.15	H	2.8	-1.4	2.98	34.8	-31.8	
High Ch								
711.00	23.07	V	2.8	-1.4	18.90	34.8	-15.9	
711.00	8.72	H	2.8	-1.4	4.55	34.8	-30.2	

LTE Band 12

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	21.99	V	2.8	-1.4	17.84	34.8	-16.9	
704.00	5.91	H	2.8	-1.4	1.77	34.8	-33.0	
Mid Ch								
707.50	22.68	V	2.8	-1.4	18.52	34.8	-16.3	
707.50	6.06	H	2.8	-1.4	1.89	34.8	-32.9	
High Ch								
711.00	22.01	V	2.8	-1.4	17.84	34.8	-16.9	
711.00	6.29	H	2.8	-1.4	2.12	34.8	-32.7	

LTE Band 12

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	23.73	V	2.8	-1.4	19.60	34.8	-15.2	
701.50	6.89	H	2.8	-1.4	2.76	34.8	-32.0	
Mid Ch								
707.50	23.34	V	2.8	-1.4	19.18	34.8	-15.6	
707.50	7.73	H	2.8	-1.4	3.56	34.8	-31.2	
High Ch								
713.50	21.91	V	2.8	-1.4	17.72	34.8	-17.0	
713.50	8.49	H	2.8	-1.4	4.31	34.8	-30.5	

LTE Band 12

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	21.52	V	2.8	-1.4	17.39	34.8	-17.4	
701.50	5.86	H	2.8	-1.4	1.73	34.8	-33.0	
Mid Ch								
707.50	22.30	V	2.8	-1.4	18.14	34.8	-16.6	
707.50	6.60	H	2.8	-1.4	2.43	34.8	-32.3	
High Ch								
713.50	21.79	V	2.8	-1.4	17.60	34.8	-17.2	
713.50	7.38	H	2.8	-1.4	3.20	34.8	-31.6	

LTE Band 12

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
700.50	23.12	V	2.8	-1.4	18.98	34.8	-15.8	
700.50	6.54	H	2.8	-1.4	2.40	34.8	-32.4	
Mid Ch								
707.50	23.35	V	2.8	-1.4	19.19	34.8	-15.6	
707.50	6.62	H	2.8	-1.4	2.45	34.8	-32.3	
High Ch								
714.50	23.23	V	2.8	-1.4	19.04	34.8	-15.7	
714.50	8.40	H	2.8	-1.4	4.21	34.8	-30.6	

LTE Band 12

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
700.50	22.24	V	2.8	-1.4	18.10	34.8	-16.7	
700.50	5.58	H	2.8	-1.4	1.44	34.8	-33.3	
Mid Ch								
707.50	22.60	V	2.8	-1.4	18.44	34.8	-16.3	
707.50	6.27	H	2.8	-1.4	2.10	34.8	-32.7	
High Ch								
714.50	22.05	V	2.8	-1.4	17.86	34.8	-16.9	
714.50	7.20	H	2.8	-1.4	3.01	34.8	-31.8	

LTE Band 12

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
699.70	22.88	V	2.8	-1.4	18.75	34.8	-16.0	
699.70	6.09	H	2.8	-1.4	1.96	34.8	-32.8	
Mid Ch								
707.50	23.25	V	2.8	-1.4	19.09	34.8	-15.7	
707.50	7.13	H	2.8	-1.4	2.96	34.8	-31.8	
High Ch								
715.30	23.16	V	2.8	-1.4	18.97	34.8	-15.8	
715.30	8.21	H	2.8	-1.4	4.02	34.8	-30.7	

LTE Band 12

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
699.70	21.86	V	2.8	-1.4	17.73	34.8	-17.0	
699.70	4.94	H	2.8	-1.4	0.81	34.8	-34.0	
Mid Ch								
707.50	22.13	V	2.8	-1.4	17.97	34.8	-16.8	
707.50	6.02	H	2.8	-1.4	1.85	34.8	-32.9	
High Ch								
715.30	21.88	V	2.8	-1.4	17.69	34.8	-17.1	
715.30	6.93	H	2.8	-1.4	2.74	34.8	-32.0	

LTE Band 13

LTE Band 13

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company:	Samsung
Project #:	4790136523
Date:	10/28/2021
Test Engineer:	19227
Configuration:	EUT, X-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	18.09	V	2.9	-1.5	13.64	34.8	-21.1	
782.00	24.86	H	2.9	-1.5	20.41	34.8	-14.4	

LTE Band 13

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company:	Samsung
Project #:	4790136523
Date:	10/28/2021
Test Engineer:	19227
Configuration:	EUT, X-Position
Location:	Chamber 1
Mode:	LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	16.89	V	2.9	-1.5	12.44	34.8	-22.3	
782.00	23.82	H	2.9	-1.5	19.37	34.8	-15.4	

LTE Band 13 5MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
779.50	18.61	V	2.9	-1.5	14.17	34.8	-20.6	
779.50	25.16	H	2.9	-1.5	20.73	34.8	-14.0	
Mid Ch								
782.00	18.33	V	2.9	-1.5	13.88	34.8	-20.9	
782.00	24.98	H	2.9	-1.5	20.53	34.8	-14.2	
High Ch								
784.50	18.38	V	2.9	-1.5	13.92	34.8	-20.8	
784.50	24.74	H	2.9	-1.5	20.28	34.8	-14.5	

LTE Band 13 5MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
779.50	17.60	V	2.9	-1.5	13.16	34.8	-21.6	
779.50	24.05	H	2.9	-1.5	19.62	34.8	-15.2	
Mid Ch								
782.00	17.07	V	2.9	-1.5	12.62	34.8	-22.1	
782.00	23.98	H	2.9	-1.5	19.53	34.8	-15.2	
High Ch								
784.50	17.45	V	2.9	-1.5	12.99	34.8	-21.8	
784.50	23.80	H	2.9	-1.5	19.34	34.8	-15.4	

LTE Band 25

LTE Band 25

20MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	12.79	V	4.5	9.5	17.83	33.0	-15.2	
1860.00	17.36	H	4.5	9.5	22.41	33.0	-10.6	
Mid Ch								
1882.50	12.88	V	4.5	9.4	17.74	33.0	-15.3	
1882.50	17.75	H	4.5	9.4	22.61	33.0	-10.4	
High Ch								
1905.00	13.53	V	4.5	9.2	18.18	33.0	-14.8	
1905.00	17.42	H	4.5	9.2	22.07	33.0	-10.9	

LTE Band 25

20MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	11.50	V	4.5	9.5	16.54	33.0	-16.5	
1860.00	16.01	H	4.5	9.5	21.06	33.0	-11.9	
Mid Ch								
1882.50	11.79	V	4.5	9.4	16.65	33.0	-16.3	
1882.50	16.59	H	4.5	9.4	21.45	33.0	-11.5	
High Ch								
1905.00	12.31	V	4.5	9.2	16.96	33.0	-16.0	
1905.00	16.18	H	4.5	9.2	20.83	33.0	-12.2	

LTE Band 25

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	12.43	V	4.5	9.5	17.50	33.0	-15.5	
1857.50	16.98	H	4.5	9.5	22.05	33.0	-10.9	
Mid Ch								
1882.50	12.96	V	4.5	9.4	17.82	33.0	-15.2	
1882.50	17.14	H	4.5	9.4	22.00	33.0	-11.0	
High Ch								
1907.50	12.20	V	4.5	9.2	16.82	33.0	-16.2	
1907.50	16.82	H	4.5	9.2	21.43	33.0	-11.6	

LTE Band 25

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	11.54	V	4.5	9.5	16.61	33.0	-16.4	
1857.50	15.74	H	4.5	9.5	20.81	33.0	-12.2	
Mid Ch								
1882.50	11.77	V	4.5	9.4	16.63	33.0	-16.4	
1882.50	16.53	H	4.5	9.4	21.39	33.0	-11.6	
High Ch								
1907.50	10.86	V	4.5	9.2	15.48	33.0	-17.5	
1907.50	15.53	H	4.5	9.2	20.14	33.0	-12.9	

LTE Band 25

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	12.47	V	4.5	9.6	17.56	33.0	-15.4	
1855.00	17.06	H	4.5	9.6	22.15	33.0	-10.8	
Mid Ch								
1882.50	12.79	V	4.5	9.4	17.65	33.0	-15.3	
1882.50	17.43	H	4.5	9.4	22.29	33.0	-10.7	
High Ch								
1910.00	12.26	V	4.5	9.1	16.84	33.0	-16.2	
1910.00	17.07	H	4.5	9.1	21.65	33.0	-11.4	

LTE Band 25

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	11.24	V	4.5	9.6	16.33	33.0	-16.7	
1855.00	15.79	H	4.5	9.6	20.88	33.0	-12.1	
Mid Ch								
1882.50	11.55	V	4.5	9.4	16.41	33.0	-16.6	
1882.50	16.19	H	4.5	9.4	21.05	33.0	-11.9	
High Ch								
1910.00	11.00	V	4.5	9.1	15.58	33.0	-17.4	
1910.00	15.84	H	4.5	9.1	20.42	33.0	-12.6	

LTE Band 25

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	12.51	V	4.5	9.6	17.62	33.0	-15.4	
1852.50	17.27	H	4.5	9.6	22.38	33.0	-10.6	
Mid Ch								
1882.50	12.52	V	4.5	9.4	17.38	33.0	-15.6	
1882.50	16.42	H	4.5	9.4	21.28	33.0	-11.7	
High Ch								
1912.50	12.63	V	4.5	9.1	17.18	33.0	-15.8	
1912.50	17.06	H	4.5	9.1	21.61	33.0	-11.4	

LTE Band 25

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	11.24	V	4.5	9.6	16.35	33.0	-16.6	
1852.50	16.40	H	4.5	9.6	21.51	33.0	-11.5	
Mid Ch								
1882.50	11.38	V	4.5	9.4	16.24	33.0	-16.8	
1882.50	15.06	H	4.5	9.4	19.92	33.0	-13.1	
High Ch								
1912.50	11.67	V	4.5	9.1	16.22	33.0	-16.8	
1912.50	15.76	H	4.5	9.1	20.31	33.0	-12.7	

LTE Band 25

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	12.82	V	4.5	9.6	17.94	33.0	-15.1	
1851.50	17.37	H	4.5	9.6	22.50	33.0	-10.5	
Mid Ch								
1882.50	12.13	V	4.5	9.4	16.99	33.0	-16.0	
1882.50	17.44	H	4.5	9.4	22.30	33.0	-10.7	
High Ch								
1913.50	13.93	V	4.5	9.1	18.47	33.0	-14.5	
1913.50	17.11	H	4.5	9.1	21.65	33.0	-11.4	

LTE Band 25

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	11.53	V	4.5	9.6	16.65	33.0	-16.4	
1851.50	16.13	H	4.5	9.6	21.26	33.0	-11.7	
Mid Ch								
1882.50	10.94	V	4.5	9.4	15.80	33.0	-17.2	
1882.50	16.34	H	4.5	9.4	21.20	33.0	-11.8	
High Ch								
1913.50	12.64	V	4.5	9.1	17.18	33.0	-15.8	
1913.50	15.90	H	4.5	9.1	20.44	33.0	-12.6	

LTE Band 25

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	12.75	V	4.5	9.6	17.88	33.0	-15.1	
1850.70	17.22	H	4.5	9.6	22.35	33.0	-10.7	
Mid Ch								
1882.50	13.19	V	4.5	9.4	18.05	33.0	-14.9	
1882.50	16.95	H	4.5	9.4	21.81	33.0	-11.2	
High Ch								
1914.30	12.85	V	4.5	9.1	17.37	33.0	-15.6	
1914.30	16.76	H	4.5	9.1	21.29	33.0	-11.7	

LTE Band 25

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT, Z-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	11.50	V	4.5	9.6	16.63	33.0	-16.4	
1850.70	16.02	H	4.5	9.6	21.15	33.0	-11.9	
Mid Ch								
1882.50	11.96	V	4.5	9.4	16.82	33.0	-16.2	
1882.50	15.65	H	4.5	9.4	20.51	33.0	-12.5	
High Ch								
1914.30	11.10	V	4.5	9.1	15.62	33.0	-17.4	
1914.30	15.52	H	4.5	9.1	20.05	33.0	-12.9	

LTE Band 26 (Part 90)

LTE Band 26

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
821.50	18.62	V	3.0	-1.4	14.25	50.0	-35.7	Part 90
821.50	24.66	H	3.0	-1.4	20.29	50.0	-29.7	Part 90

LTE Band 26

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
821.50	17.63	V	3.0	-1.4	13.26	50.0	-36.7	Part 90
821.50	23.70	H	3.0	-1.4	19.33	50.0	-30.7	Part 90

LTE Band 26

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	18.91	V	3.0	-1.4	14.53	50.0	-35.5	Part 90
819.00	24.49	H	3.0	-1.4	20.11	50.0	-29.9	Part 90

LTE Band 26

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	17.00	V	3.0	-1.4	12.62	50.0	-37.4	Part 90
819.00	23.38	H	3.0	-1.4	19.00	50.0	-31.0	Part 90

LTE Band 26

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	18.32	V	3.0	-1.4	13.92	50.0	-36.1	Part 90
816.50	24.58	H	3.0	-1.4	20.18	50.0	-29.8	Part 90
Mid Ch								
821.50	18.72	V	3.0	-1.4	14.35	50.0	-35.6	Part 90
821.50	24.48	H	3.0	-1.4	20.11	50.0	-29.9	Part 90

LTE Band 26

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	17.14	V	3.0	-1.4	12.74	50.0	-37.3	Part 90
816.50	23.54	H	3.0	-1.4	19.14	50.0	-30.9	Part 90
Mid Ch								
821.50	17.67	V	3.0	-1.4	13.30	50.0	-36.7	Part 90
821.50	23.62	H	3.0	-1.4	19.25	50.0	-30.7	Part 90

LTE Band 26

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	17.99	V	3.0	-1.4	13.58	50.0	-36.4	Part 90
815.50	24.51	H	3.0	-1.4	20.11	50.0	-29.9	Part 90
Mid Ch								
822.50	18.74	V	3.0	-1.3	14.39	50.0	-35.6	Part 90
822.50	24.80	H	3.0	-1.3	20.44	50.0	-29.6	Part 90

LTE Band 26

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	17.19	V	3.0	-1.4	12.78	50.0	-37.2	Part 90
815.50	23.18	H	3.0	-1.4	18.78	50.0	-31.2	Part 90
Mid Ch								
822.50	17.76	V	3.0	-1.3	13.41	50.0	-36.6	Part 90
822.50	23.57	H	3.0	-1.3	19.21	50.0	-30.8	Part 90

LTE Band 26

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	18.09	V	3.0	-1.4	13.68	50.0	-36.3	Part 90
814.70	24.26	H	3.0	-1.4	19.85	50.0	-30.1	Part 90
Mid Ch								
823.30	18.85	V	3.0	-1.3	14.50	50.0	-35.5	Part 90
823.30	24.45	H	3.0	-1.3	20.10	50.0	-29.9	Part 90

LTE Band 26

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	17.06	V	3.0	-1.4	12.65	50.0	-37.3	Part 90
814.70	23.22	H	3.0	-1.4	18.81	50.0	-31.2	Part 90
Mid Ch								
823.30	17.91	V	3.0	-1.3	13.56	50.0	-36.4	Part 90
823.30	23.51	H	3.0	-1.3	19.16	50.0	-30.8	Part 90
High Ch								

LTE Band 26 (Part 22)

LTE Band 26

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	19.39	V	3.0	-1.3	15.05	38.5	-23.4	
824.00	24.81	H	3.0	-1.3	20.47	38.5	-18.0	
Mid Ch								
831.50	19.02	V	3.0	-1.3	14.73	38.5	-23.8	
831.50	24.87	H	3.0	-1.3	20.58	38.5	-17.9	
High Ch								
841.50	17.26	V	3.0	-1.2	13.05	38.5	-25.4	
841.50	24.46	H	3.0	-1.2	20.25	38.5	-18.3	

LTE Band 26

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	18.07	V	3.0	-1.3	13.73	38.5	-24.8	
824.00	23.49	H	3.0	-1.3	19.15	38.5	-19.4	
Mid Ch								
831.50	17.83	V	3.0	-1.3	13.54	38.5	-25.0	
831.50	23.59	H	3.0	-1.3	19.30	38.5	-19.2	
High Ch								
841.50	16.07	V	3.0	-1.2	11.86	38.5	-26.6	
841.50	23.53	H	3.0	-1.2	19.32	38.5	-19.2	

LTE Band 26

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	19.40	V	3.0	-1.3	15.06	38.5	-23.4	
824.00	25.07	H	3.0	-1.3	20.73	38.5	-17.8	
Low Ch								
829.00	19.12	V	3.0	-1.3	14.81	38.5	-23.7	
829.00	24.72	H	3.0	-1.3	20.41	38.5	-18.1	
Mid Ch								
831.50	19.02	V	3.0	-1.3	14.73	38.5	-23.8	
831.50	24.53	H	3.0	-1.3	20.24	38.5	-18.3	
High Ch								
844.00	17.51	V	3.0	-1.2	13.31	38.5	-25.2	
844.00	24.45	H	3.0	-1.2	20.25	38.5	-18.3	

LTE Band 26

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	18.39	V	3.0	-1.3	14.05	38.5	-24.4	
824.00	23.81	H	3.0	-1.3	19.47	38.5	-19.0	
Low Ch								
829.00	17.04	V	3.0	-1.3	12.73	38.5	-25.8	
829.00	23.12	H	3.0	-1.3	18.81	38.5	-19.7	
Mid Ch								
831.50	17.73	V	3.0	-1.3	13.44	38.5	-25.1	
831.50	23.85	H	3.0	-1.3	19.56	38.5	-18.9	
High Ch								
844.00	16.34	V	3.0	-1.2	12.14	38.5	-26.4	
844.00	23.31	H	3.0	-1.2	19.11	38.5	-19.4	

LTE Band 26

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	18.81	V	3.0	-1.3	14.47	38.5	-24.0	
824.00	24.62	H	3.0	-1.3	20.28	38.5	-18.2	
Low Ch								
826.50	18.58	V	3.0	-1.3	14.26	38.5	-24.2	
826.50	24.32	H	3.0	-1.3	19.99	38.5	-18.5	
Mid Ch								
831.50	18.35	V	3.0	-1.3	14.06	38.5	-24.4	
831.50	24.28	H	3.0	-1.3	19.99	38.5	-18.5	
High Ch								
846.50	17.43	V	3.0	-1.1	13.25	38.5	-25.2	
846.50	24.34	H	3.0	-1.1	20.16	38.5	-18.3	

LTE Band 26

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	17.73	V	3.0	-1.3	13.39	38.5	-25.1	
824.00	23.50	H	3.0	-1.3	19.16	38.5	-19.3	
Low Ch								
826.50	17.50	V	3.0	-1.3	13.18	38.5	-25.3	
826.50	23.21	H	3.0	-1.3	18.88	38.5	-19.6	
Mid Ch								
831.50	17.09	V	3.0	-1.3	12.80	38.5	-25.7	
831.50	22.94	H	3.0	-1.3	18.65	38.5	-19.8	
High Ch								
846.50	16.36	V	3.0	-1.1	12.18	38.5	-26.3	
846.50	23.50	H	3.0	-1.1	19.32	38.5	-19.2	

LTE Band 26

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	19.22	V	3.0	-1.3	14.88	38.5	-23.6	
824.00	24.74	H	3.0	-1.3	20.40	38.5	-18.1	
Low Ch								
825.50	19.09	V	3.0	-1.3	14.76	38.5	-23.7	
825.50	24.58	H	3.0	-1.3	20.25	38.5	-18.2	
Mid Ch								
831.50	18.55	V	3.0	-1.3	14.26	38.5	-24.2	
831.50	24.59	H	3.0	-1.3	20.30	38.5	-18.2	
High Ch								
847.50	17.56	V	3.0	-1.1	13.39	38.5	-25.1	
847.50	24.41	H	3.0	-1.1	20.24	38.5	-18.3	

LTE Band 26

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	17.58	V	3.0	-1.3	13.24	38.5	-25.3	
824.00	23.43	H	3.0	-1.3	19.09	38.5	-19.4	
Low Ch								
825.50	17.87	V	3.0	-1.3	13.54	38.5	-25.0	
825.50	23.58	H	3.0	-1.3	19.25	38.5	-19.2	
Mid Ch								
831.50	17.33	V	3.0	-1.3	13.04	38.5	-25.5	
831.50	23.38	H	3.0	-1.3	19.09	38.5	-19.4	
High Ch								
847.50	16.25	V	3.0	-1.1	12.08	38.5	-26.4	
847.50	23.20	H	3.0	-1.1	19.03	38.5	-19.5	

LTE Band 26

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	19.01	V	3.0	-1.3	14.67	38.5	-23.8	
824.00	24.70	H	3.0	-1.3	20.36	38.5	-18.1	
Low Ch								
824.70	19.02	V	3.0	-1.3	14.68	38.5	-23.8	
824.70	24.76	H	3.0	-1.3	20.43	38.5	-18.1	
Mid Ch								
831.50	18.36	V	3.0	-1.3	14.07	38.5	-24.4	
831.50	24.09	H	3.0	-1.3	19.80	38.5	-18.7	
High Ch								
848.30	17.49	V	3.1	-1.1	13.32	38.5	-25.2	
848.30	24.29	H	3.1	-1.1	20.12	38.5	-18.4	

LTE Band 26

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/29/2021
Test Engineer: 20882
Configuration: EUT, X-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, 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch								
824.00	18.16	V	3.0	-1.3	13.82	38.5	-24.7	
824.00	23.58	H	3.0	-1.3	19.24	38.5	-19.3	
Low Ch								
824.70	17.80	V	3.0	-1.3	13.46	38.5	38.5	
824.70	23.37	H	3.0	-1.3	19.04	38.5	38.5	
Mid Ch								
831.50	17.11	V	3.0	-1.3	12.82	38.5	-25.7	
831.50	22.91	H	3.0	-1.3	18.62	38.5	-19.9	
High Ch								
848.30	16.23	V	3.1	-1.1	12.06	38.5	-26.4	
848.30	23.35	H	3.1	-1.1	19.18	38.5	-19.3	

LTE Band 41 (PC2)

LTE Band 41

20MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/3/2021
Test Engineer: 19227
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	15.89	V	5.2	10.2	20.81	33.0	-12.2	
2506.00	19.71	H	5.2	10.2	24.63	33.0	-8.4	
Mid Ch								
2593.00	15.18	V	5.3	10.0	19.88	33.0	-13.1	
2593.00	19.64	H	5.3	10.0	24.33	33.0	-8.7	
High Ch								
2680.00	17.78	V	5.4	10.1	22.40	33.0	-10.6	
2680.00	19.96	H	5.4	10.1	24.58	33.0	-8.4	

LTE Band 41

20MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/3/2021
Test Engineer: 19227
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	15.68	V	5.2	10.2	20.60	33.0	-12.4	
2506.00	19.54	H	5.2	10.2	24.46	33.0	-8.5	
Mid Ch								
2593.00	8.08	V	5.3	10.0	12.78	33.0	-20.2	
2593.00	19.27	H	5.3	10.0	23.96	33.0	-9.0	
High Ch								
2680.00	17.26	V	5.4	10.1	21.88	33.0	-11.1	
2680.00	19.20	H	5.4	10.1	23.82	33.0	-9.2	

LTE Band 41

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/4/2021
Test Engineer: 20882
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	15.76	V	5.2	10.2	20.68	33.0	-12.3	
2503.50	19.12	H	5.2	10.2	24.05	33.0	-8.9	
Mid Ch								
2593.00	15.09	V	5.3	10.0	19.79	33.0	-13.2	
2593.00	19.79	H	5.3	10.0	24.48	33.0	-8.5	
High Ch								
2682.50	18.01	V	5.4	10.1	22.63	33.0	-10.4	
2682.50	19.14	H	5.4	10.1	23.76	33.0	-9.2	

LTE Band 41

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/4/2021
Test Engineer: 20882
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	15.06	V	5.2	10.2	19.98	33.0	-13.0	
2503.50	18.45	H	5.2	10.2	23.38	33.0	-9.6	
Mid Ch								
2593.00	13.86	V	5.3	10.0	18.56	33.0	-14.4	
2593.00	18.52	H	5.3	10.0	23.21	33.0	-9.8	
High Ch								
2682.50	17.42	V	5.4	10.1	22.04	33.0	-11.0	
2682.50	18.35	H	5.4	10.1	22.97	33.0	-10.0	

LTE Band 41

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/4/2021
Test Engineer: 20882
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	15.85	V	5.2	10.2	20.79	33.0	-12.2	
2501.00	19.35	H	5.2	10.2	24.29	33.0	-8.7	
Mid Ch								
2593.00	14.64	V	5.3	10.0	19.34	33.0	-13.7	
2593.00	19.13	H	5.3	10.0	23.82	33.0	-9.2	
High Ch								
2685.00	17.32	V	5.4	10.1	21.94	33.0	-11.1	
2685.00	19.09	H	5.4	10.1	23.71	33.0	-9.3	

LTE Band 41

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/4/2021
Test Engineer: 20882
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	15.42	V	5.2	10.2	20.36	33.0	-12.6	
2501.00	18.88	H	5.2	10.2	23.82	33.0	-9.2	
Mid Ch								
2593.00	14.29	V	5.3	10.0	18.99	33.0	-14.0	
2593.00	18.81	H	5.3	10.0	23.50	33.0	-9.5	
High Ch								
2685.00	16.62	V	5.4	10.1	21.24	33.0	-11.8	
2685.00	18.46	H	5.4	10.1	23.08	33.0	-9.9	

LTE Band 41

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/4/2021
Test Engineer: 20882
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	15.67	V	5.2	10.2	20.61	33.0	-12.4	
2498.50	19.56	H	5.2	10.2	24.50	33.0	-8.5	
Mid Ch								
2593.00	15.00	V	5.3	10.0	19.70	33.0	-13.3	
2593.00	19.15	H	5.3	10.0	23.84	33.0	-9.2	
High Ch								
2687.50	17.14	V	5.4	10.1	21.76	33.0	-11.2	
2687.50	19.08	H	5.4	10.1	23.70	33.0	-9.3	

LTE Band 41

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 11/4/2021
Test Engineer: 20882
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	15.19	V	5.2	10.2	20.13	33.0	-12.9	
2498.50	19.04	H	5.2	10.2	23.98	33.0	-9.0	
Mid Ch								
2593.00	14.83	V	5.3	10.0	19.53	33.0	-13.5	
2593.00	18.65	H	5.3	10.0	23.34	33.0	-9.7	
High Ch								
2687.50	16.29	V	5.4	10.1	20.91	33.0	-12.1	
2687.50	18.48	H	5.4	10.1	23.10	33.0	-9.9	

LTE Band 66

LTE Band 66

20MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	18.37	V	4.3	9.6	23.66	30.0	-6.3	
1720.00	12.45	H	4.3	9.6	17.74	30.0	-12.3	
Mid Ch								
1745.00	17.42	V	4.3	9.7	22.77	30.0	-7.2	
1745.00	12.29	H	4.3	9.7	17.64	30.0	-12.4	
High Ch								
1770.00	17.07	V	4.4	9.7	22.40	30.0	-7.6	
1770.00	12.69	H	4.4	9.7	18.03	30.0	-12.0	

LTE Band 66

20MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	17.05	V	4.3	9.6	22.34	30.0	-7.7	
1720.00	11.39	H	4.3	9.6	16.68	30.0	-13.3	
Mid Ch								
1745.00	16.57	V	4.3	9.7	21.92	30.0	-8.1	
1745.00	11.41	H	4.3	9.7	16.76	30.0	-13.2	
High Ch								
1770.00	15.81	V	4.4	9.7	21.14	30.0	-8.9	
1770.00	11.29	H	4.4	9.7	16.63	30.0	-13.4	

LTE Band 66

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	18.61	V	4.3	9.6	23.90	30.0	-6.1	
1717.50	10.83	H	4.3	9.6	16.12	30.0	-13.9	
Mid Ch								
1745.00	18.16	V	4.3	9.7	23.51	30.0	-6.5	
1745.00	12.55	H	4.3	9.7	17.90	30.0	-12.1	
High Ch								
1772.50	16.12	V	4.4	9.7	21.45	30.0	-8.5	
1772.50	11.91	H	4.4	9.7	17.24	30.0	-12.8	

LTE Band 66

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	17.76	V	4.3	9.6	23.05	30.0	-7.0	
1717.50	9.89	H	4.3	9.6	15.18	30.0	-14.8	
Mid Ch								
1745.00	15.73	V	4.3	9.7	21.08	30.0	-8.9	
1745.00	11.09	H	4.3	9.7	16.44	30.0	-13.6	
High Ch								
1772.50	14.91	V	4.4	9.7	20.24	30.0	-9.8	
1772.50	10.73	H	4.4	9.7	16.06	30.0	-13.9	

LTE Band 66

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	18.68	V	4.3	9.6	23.96	30.0	-6.0	
1715.00	12.66	H	4.3	9.6	17.94	30.0	-12.1	
Mid Ch								
1745.00	17.81	V	4.3	9.7	23.16	30.0	-6.8	
1745.00	12.17	H	4.3	9.7	17.52	30.0	-12.5	
High Ch								
1775.00	16.83	V	4.4	9.7	22.16	30.0	-7.8	
1775.00	12.14	H	4.4	9.7	17.47	30.0	-12.5	

LTE Band 66

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	17.58	V	4.3	9.6	22.86	30.0	-7.1	
1715.00	11.61	H	4.3	9.6	16.89	30.0	-13.1	
Mid Ch								
1745.00	16.54	V	4.3	9.7	21.89	30.0	-8.1	
1745.00	11.05	H	4.3	9.7	16.40	30.0	-13.6	
High Ch								
1775.00	15.50	V	4.4	9.7	20.83	30.0	-9.2	
1775.00	10.95	H	4.4	9.7	16.28	30.0	-13.7	

LTE Band 66

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	18.54	V	4.3	9.6	23.82	30.0	-6.2	
1712.50	11.56	H	4.3	9.6	16.84	30.0	-13.2	
Mid Ch								
1745.00	17.92	V	4.3	9.7	23.27	30.0	-6.7	
1745.00	12.23	H	4.3	9.7	17.58	30.0	-12.4	
High Ch								
1777.50	15.82	V	4.4	9.7	21.15	30.0	-8.8	
1777.50	11.78	H	4.4	9.7	17.11	30.0	-12.9	

LTE Band 66

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	17.66	V	4.3	9.6	22.94	30.0	-7.1	
1712.50	10.30	H	4.3	9.6	15.58	30.0	-14.4	
Mid Ch								
1745.00	16.34	V	4.3	9.7	21.69	30.0	-8.3	
1745.00	10.73	H	4.3	9.7	16.08	30.0	-13.9	
High Ch								
1777.50	14.50	V	4.4	9.7	19.83	30.0	-10.2	
1777.50	10.64	H	4.4	9.7	15.97	30.0	-14.0	

LTE Band 66

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	18.38	V	4.3	9.6	23.65	30.0	-6.3	
1711.50	11.79	H	4.3	9.6	17.06	30.0	-12.9	
Mid Ch								
1745.00	17.58	V	4.3	9.7	22.93	30.0	-7.1	
1745.00	12.09	H	4.3	9.7	17.44	30.0	-12.6	
High Ch								
1778.50	15.75	V	4.4	9.7	21.08	30.0	-8.9	
1778.50	11.86	H	4.4	9.7	17.19	30.0	-12.8	

LTE Band 66

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	17.19	V	4.3	9.6	22.46	30.0	-7.5	
1711.50	10.69	H	4.3	9.6	15.96	30.0	-14.0	
Mid Ch								
1745.00	16.90	V	4.3	9.7	22.25	30.0	-7.8	
1745.00	11.01	H	4.3	9.7	16.36	30.0	-13.6	
High Ch								
1778.50	14.67	V	4.4	9.7	20.00	30.0	-10.0	
1778.50	10.77	H	4.4	9.7	16.10	30.0	-13.9	

LTE Band 66

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	18.41	V	4.3	9.6	23.68	30.0	-6.3	
1710.70	12.00	H	4.3	9.6	17.27	30.0	-12.7	
Mid Ch								
1745.00	17.61	V	4.3	9.7	22.96	30.0	-7.0	
1745.00	11.74	H	4.3	9.7	17.09	30.0	-12.9	
High Ch								
1779.30	15.43	V	4.4	9.7	20.76	30.0	-9.2	
1779.30	11.95	H	4.4	9.7	17.27	30.0	-12.7	

LTE Band 66

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 20882
Configuration: EUT, Y-Position
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[00167211], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	17.25	V	4.3	9.6	22.52	30.0	-7.5	
1710.70	10.79	H	4.3	9.6	16.06	30.0	-13.9	
Mid Ch								
1745.00	16.50	V	4.3	9.7	21.85	30.0	-8.2	
1745.00	10.92	H	4.3	9.7	16.27	30.0	-13.7	
High Ch								
1779.30	14.43	V	4.4	9.7	19.76	30.0	-10.2	
1779.30	10.59	H	4.4	9.7	15.91	30.0	-14.1	

9.6. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27. 53 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:
(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.

(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.

(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.

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

(m) (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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 v03r01

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(GSM, LTE Band41);;

RESULTS

See the following pages.

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

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9.6.1. SPURIOUS RADIATION PLOTS

GSM850

GSM850

GPRS

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

Company: Samsung
Project #: 4790136523
Date: 11/1/2021
Test Engineer: 20882
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: GPRS 850 MHz Harmonics
Test Votage: AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1648.40	-14.2	V	3.0	45.6	1.0	-58.8	-13.0	-45.8	
2472.60	-11.1	V	3.0	45.4	1.0	-55.5	-13.0	-42.5	
3296.80	-8.7	V	3.0	45.7	1.0	-53.3	-13.0	-40.3	
1648.40	-15.2	H	3.0	45.6	1.0	-59.9	-13.0	-46.9	
2472.60	-11.6	H	3.0	45.4	1.0	-56.1	-13.0	-43.1	
3296.80	-8.5	H	3.0	45.7	1.0	-53.2	-13.0	-40.2	
Mid Ch, 836.6MHz									
1673.20	-13.3	V	3.0	45.6	1.0	-57.9	-13.0	-44.9	
2509.80	-6.1	V	3.0	45.5	1.0	-50.6	-13.0	-37.6	
3346.40	-8.3	V	3.0	45.7	1.0	-53.0	-13.0	-40.0	
1673.20	-2.8	H	3.0	45.6	1.0	-47.4	-13.0	-34.4	
2509.80	-6.6	H	3.0	45.5	1.0	-51.1	-13.0	-38.1	
3346.40	-8.3	H	3.0	45.7	1.0	-53.0	-13.0	-40.0	
High Ch, 848.8MHz									
1697.60	-13.6	V	3.0	45.6	1.0	-58.2	-13.0	-45.2	
2546.40	-6.6	V	3.0	45.5	1.0	-51.0	-13.0	-38.0	
3395.20	-7.8	V	3.0	45.7	1.0	-52.5	-13.0	-39.5	
1697.60	-13.2	H	3.0	45.6	1.0	-57.8	-13.0	-44.8	
2546.40	-6.2	H	3.0	45.5	1.0	-50.6	-13.0	-37.6	
3395.20	-8.2	H	3.0	45.7	1.0	-52.9	-13.0	-39.9	

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

Company:	Samsung
Project #:	4790136523
Date:	11/1/2021
Test Engineer:	20882
Configuration:	EUT / AC Adapter, X-Position
Location:	Chamber 1
Mode:	EGPRS 850 MHz Harmonics
Test Votage:	AC 120 V, 60 Hz

GSM850

EGPRS

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1648.40	-14.2	V	3.0	45.6	1.0	-58.9	-13.0	-45.9	
2472.60	-10.8	V	3.0	45.4	1.0	-55.2	-13.0	-42.2	
3296.80	-8.7	V	3.0	45.7	1.0	-53.3	-13.0	-40.3	
1648.40	-15.4	H	3.0	45.6	1.0	-60.0	-13.0	-47.0	
2472.60	-11.4	H	3.0	45.4	1.0	-55.8	-13.0	-42.8	
3296.80	-8.7	H	3.0	45.7	1.0	-53.4	-13.0	-40.4	
Mid Ch, 836.6MHz									
1673.20	-14.2	V	3.0	45.6	1.0	-58.8	-13.0	-45.8	
2509.80	-10.3	V	3.0	45.5	1.0	-54.8	-13.0	-41.8	
3346.40	-8.5	V	3.0	45.7	1.0	-53.2	-13.0	-40.2	
1673.20	-15.1	H	3.0	45.6	1.0	-59.7	-13.0	-46.7	
2509.80	-11.2	H	3.0	45.5	1.0	-55.7	-13.0	-42.7	
3346.40	-8.3	H	3.0	45.7	1.0	-53.0	-13.0	-40.0	
High Ch, 848.8MHz									
1697.60	-13.9	V	3.0	45.6	1.0	-58.5	-13.0	-45.5	
2546.40	-10.8	V	3.0	45.5	1.0	-55.3	-13.0	-42.3	
3395.20	-8.0	V	3.0	45.7	1.0	-52.7	-13.0	-39.7	
1697.60	-15.0	H	3.0	45.6	1.0	-59.6	-13.0	-46.6	
2546.40	-11.1	H	3.0	45.5	1.0	-55.6	-13.0	-42.6	
3395.20	-8.0	H	3.0	45.7	1.0	-52.7	-13.0	-39.7	

GSM1900

GSM1900
GPRS

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

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: GPRS 1900 MHz Harmonics
Test Votage: AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.3	V	3.0	45.8	1.0	-55.1	-13.0	-42.1	
5550.60	-7.9	V	3.0	45.7	1.0	-52.6	-13.0	-39.6	
7400.80	-5.0	V	3.0	44.6	1.0	-48.5	-13.0	-35.5	
3700.40	-10.5	H	3.0	45.8	1.0	-55.3	-13.0	-42.3	
5550.60	-7.9	H	3.0	45.7	1.0	-52.7	-13.0	-39.7	
7400.80	-5.1	H	3.0	44.6	1.0	-48.6	-13.0	-35.6	
Mid Ch, 1880MHz									
3760.00	-10.0	V	3.0	45.8	1.0	-54.8	-13.0	-41.8	
5640.00	-7.5	V	3.0	45.7	1.0	-52.3	-13.0	-39.3	
7520.00	-5.0	V	3.0	44.5	1.0	-48.5	-13.0	-35.5	
3760.00	-10.0	H	3.0	45.8	1.0	-54.9	-13.0	-41.9	
5640.00	-7.8	H	3.0	45.7	1.0	-52.6	-13.0	-39.6	
7520.00	-5.0	H	3.0	44.5	1.0	-48.5	-13.0	-35.5	
High Ch, 1909.8MHz									
3819.60	-9.9	V	3.0	45.8	1.0	-54.7	-13.0	-41.7	
5729.40	-7.7	V	3.0	45.7	1.0	-52.4	-13.0	-39.4	
7639.20	-4.8	V	3.0	44.4	1.0	-48.3	-13.0	-35.3	
3819.60	-10.0	H	3.0	45.8	1.0	-54.9	-13.0	-41.9	
5729.40	-7.5	H	3.0	45.7	1.0	-52.2	-13.0	-39.2	
7639.20	-4.9	H	3.0	44.4	1.0	-48.3	-13.0	-35.3	

GSM1900
EGPRS

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

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: EGPRS 1900 MHz Harmonics
Test Votage: AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.1	V	3.0	45.8	1.0	-54.9	-13.0	-41.9	
5550.60	-7.7	V	3.0	45.7	1.0	-52.4	-13.0	-39.4	
7400.80	-5.0	V	3.0	44.6	1.0	-48.5	-13.0	-35.5	
3700.40	-10.5	H	3.0	45.8	1.0	-55.3	-13.0	-42.3	
5550.60	-8.0	H	3.0	45.7	1.0	-52.8	-13.0	-39.8	
7400.80	-5.0	H	3.0	44.6	1.0	-48.6	-13.0	-35.6	
Mid Ch, 1880MHz									
3760.00	-10.1	V	3.0	45.8	1.0	-54.9	-13.0	-41.9	
5640.00	-7.7	V	3.0	45.7	1.0	-52.5	-13.0	-39.5	
7520.00	-5.0	V	3.0	44.5	1.0	-48.5	-13.0	-35.5	
3760.00	-10.2	H	3.0	45.8	1.0	-55.1	-13.0	-42.1	
5640.00	-7.8	H	3.0	45.7	1.0	-52.5	-13.0	-39.5	
7520.00	-5.1	H	3.0	44.5	1.0	-48.6	-13.0	-35.6	
High Ch, 1909.8MHz									
3819.60	-10.0	V	3.0	45.8	1.0	-54.8	-13.0	-41.8	
5729.40	-7.5	V	3.0	45.7	1.0	-52.2	-13.0	-39.2	
7639.20	-4.9	V	3.0	44.4	1.0	-48.4	-13.0	-35.4	
3819.60	-10.1	H	3.0	45.8	1.0	-54.9	-13.0	-41.9	
5729.40	-7.7	H	3.0	45.7	1.0	-52.4	-13.0	-39.4	
7639.20	-5.0	H	3.0	44.4	1.0	-48.4	-13.0	-35.4	

WCDMA Band 5

Band 5 REL99

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

Company: Samsung
Project #: 4790136523
Date: 11/2/2021
Test Engineer: 20882
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: Rel99 Band 5 Harmonics
Test Votage: AC 120 V, 60 Hz

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	-15.1	V	3.0	45.6	1.0	-59.7	-13.0	-46.7	
2479.20	-11.6	V	3.0	45.5	1.0	-56.1	-13.0	-43.1	
3305.60	-9.5	V	3.0	45.7	1.0	-54.2	-13.0	-41.2	
1652.80	-16.3	H	3.0	45.6	1.0	-60.9	-13.0	-47.9	
2479.20	-12.3	H	3.0	45.5	1.0	-56.7	-13.0	-43.7	
3305.60	-9.5	H	3.0	45.7	1.0	-54.2	-13.0	-41.2	
Mid Ch, 836.6MHz									
1673.20	-15.1	V	3.0	45.6	1.0	-59.7	-13.0	-46.7	
2509.80	-11.9	V	3.0	45.5	1.0	-56.3	-13.0	-43.3	
3346.40	-9.0	V	3.0	45.7	1.0	-53.7	-13.0	-40.7	
1673.20	-16.0	H	3.0	45.6	1.0	-60.6	-13.0	-47.6	
2509.80	-12.1	H	3.0	45.5	1.0	-56.6	-13.0	-43.6	
3346.40	-9.2	H	3.0	45.7	1.0	-53.9	-13.0	-40.9	
High Ch, 846.6MHz									
1693.20	-14.9	V	3.0	45.6	1.0	-59.5	-13.0	-46.5	
2539.80	-11.8	V	3.0	45.5	1.0	-56.3	-13.0	-43.3	
3386.40	-8.9	V	3.0	45.7	1.0	-53.7	-13.0	-40.7	
1693.20	-15.8	H	3.0	45.6	1.0	-60.4	-13.0	-47.4	
2539.80	-12.0	H	3.0	45.5	1.0	-56.5	-13.0	-43.5	
3386.40	-9.0	H	3.0	45.7	1.0	-53.7	-13.0	-40.7	

Band 5 HSDPA

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

Company: Samsung
Project #: 4790136523
Date: 11/2/2021
Test Engineer: 20882
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: HSDPA Band 5 Harmonics
Test Votage: AC 120 V, 60 Hz

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	-15.1	V	3.0	45.6	1.0	-59.7	-13.0	-46.7	
2479.20	-11.7	V	3.0	45.5	1.0	-56.1	-13.0	-43.1	
3305.60	-9.5	V	3.0	45.7	1.0	-54.2	-13.0	-41.2	
1652.80	-16.2	H	3.0	45.6	1.0	-60.8	-13.0	-47.8	
2479.20	-12.2	H	3.0	45.5	1.0	-56.7	-13.0	-43.7	
3305.60	-9.5	H	3.0	45.7	1.0	-54.2	-13.0	-41.2	
Mid Ch, 836.6MHz									
1673.20	-15.1	V	3.0	45.6	1.0	-59.7	-13.0	-46.7	
2509.80	-11.9	V	3.0	45.5	1.0	-56.4	-13.0	-43.4	
3346.40	-9.2	V	3.0	45.7	1.0	-53.9	-13.0	-40.9	
1673.20	-16.0	H	3.0	45.6	1.0	-60.6	-13.0	-47.6	
2509.80	-12.3	H	3.0	45.5	1.0	-56.7	-13.0	-43.7	
3346.40	-9.3	H	3.0	45.7	1.0	-54.0	-13.0	-41.0	
High Ch, 846.6MHz									
1693.20	-14.9	V	3.0	45.6	1.0	-59.5	-13.0	-46.5	
2539.80	-11.7	V	3.0	45.5	1.0	-56.2	-13.0	-43.2	
3386.40	-9.0	V	3.0	45.7	1.0	-53.8	-13.0	-40.8	
1693.20	-15.7	H	3.0	45.6	1.0	-60.3	-13.0	-47.3	
2539.80	-12.1	H	3.0	45.5	1.0	-56.5	-13.0	-43.5	
3386.40	-9.0	H	3.0	45.7	1.0	-53.7	-13.0	-40.7	

WCDMA Band 4

Band 4 REL99

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

Company: Samsung
Project #: 4790136523
Date: 10/31/2021
Test Engineer: 19227
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 2
Mode: Rel99 Band 4 Harmonics
Test Votage: AC 120 V, 60 Hz

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	-9.5	V	3.0	42.3	1.0	-50.8	-13.0	-37.8	
5137.20	-9.2	V	3.0	43.1	1.0	-51.3	-13.0	-38.3	
6849.60	-6.4	V	3.0	43.0	1.0	-48.4	-13.0	-35.4	
3424.80	-9.2	H	3.0	42.3	1.0	-50.5	-13.0	-37.5	
5137.20	-8.8	H	3.0	43.1	1.0	-50.8	-13.0	-37.8	
6849.60	-6.1	H	3.0	43.0	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1732.6MHz									
3465.20	-8.9	V	3.0	42.3	1.0	-50.2	-13.0	-37.2	
5197.80	-8.9	V	3.0	43.1	1.0	-51.0	-13.0	-38.0	
6930.40	-6.4	V	3.0	43.0	1.0	-48.3	-13.0	-35.3	
3465.20	-8.8	H	3.0	42.3	1.0	-50.1	-13.0	-37.1	
5197.80	-8.8	H	3.0	43.1	1.0	-50.9	-13.0	-37.9	
6930.40	-6.2	H	3.0	43.0	1.0	-48.1	-13.0	-35.1	
High Ch, 1752.6MHz									
3505.20	-9.0	V	3.0	42.3	1.0	-50.3	-13.0	-37.3	
5257.80	-8.9	V	3.0	43.1	1.0	-51.0	-13.0	-38.0	
7010.40	-6.3	V	3.0	42.9	1.0	-48.2	-13.0	-35.2	
3505.20	-8.8	H	3.0	42.3	1.0	-50.1	-13.0	-37.1	
5257.80	-8.8	H	3.0	43.1	1.0	-50.9	-13.0	-37.9	
7010.40	-6.0	H	3.0	42.9	1.0	-47.9	-13.0	-34.9	

Band 4 HSDPA

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

Company: Samsung
Project #: 4790136523
Date: 10/31/2021
Test Engineer: 19227
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 2
Mode: HSDPA Band 4 Harmonics
Test Votage: AC 120 V, 60 Hz

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	-9.2	V	3.0	42.3	1.0	-50.5	-13.0	-37.5	
5137.20	-9.2	V	3.0	43.1	1.0	-51.2	-13.0	-38.2	
6849.60	-6.3	V	3.0	43.0	1.0	-48.3	-13.0	-35.3	
3424.80	-9.3	H	3.0	42.3	1.0	-50.6	-13.0	-37.6	
5137.20	-9.0	H	3.0	43.1	1.0	-51.0	-13.0	-38.0	
6849.60	-6.1	H	3.0	43.0	1.0	-48.1	-13.0	-35.1	
Mid Ch, 1732.6MHz									
3465.20	-8.8	V	3.0	42.3	1.0	-50.1	-13.0	-37.1	
5197.80	-9.0	V	3.0	43.1	1.0	-51.1	-13.0	-38.1	
6930.40	-6.3	V	3.0	43.0	1.0	-48.2	-13.0	-35.2	
3465.20	-8.6	H	3.0	42.3	1.0	-50.0	-13.0	-37.0	
5197.80	-8.6	H	3.0	43.1	1.0	-50.7	-13.0	-37.7	
6930.40	-6.0	H	3.0	43.0	1.0	-48.0	-13.0	-35.0	
High Ch, 1752.6MHz									
3505.20	-9.0	V	3.0	42.3	1.0	-50.3	-13.0	-37.3	
5257.80	-8.8	V	3.0	43.1	1.0	-50.9	-13.0	-37.9	
7010.40	-6.1	V	3.0	42.9	1.0	-48.0	-13.0	-35.0	
3505.20	-8.6	H	3.0	42.3	1.0	-49.9	-13.0	-36.9	
5257.80	-8.7	H	3.0	43.1	1.0	-50.8	-13.0	-37.8	
7010.40	-6.1	H	3.0	42.9	1.0	-48.1	-13.0	-35.1	

WCDMA Band 2

Band 2 REL99

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

Company: Samsung
Project #: 4790136523
Date: 10/30/2021
Test Engineer: 19227
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 2
Mode: Rel99 Band 2 Harmonics
Test Votage: AC 120 V, 60 Hz

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	-12.4	V	3.0	42.3	1.0	-53.8	-13.0	-40.8	
5557.20	-8.4	V	3.0	43.1	1.0	-50.6	-13.0	-37.6	
7409.60	-6.4	V	3.0	42.7	1.0	-48.2	-13.0	-35.2	
3704.80	-11.5	H	3.0	42.3	1.0	-52.8	-13.0	-39.8	
5557.20	-8.5	H	3.0	43.1	1.0	-50.6	-13.0	-37.6	
7409.60	-6.4	H	3.0	42.7	1.0	-48.1	-13.0	-35.1	
Mid Ch, 1880MHz									
3760.00	-11.5	V	3.0	42.3	1.0	-52.8	-13.0	-39.8	
5640.00	-8.1	V	3.0	43.2	1.0	-50.3	-13.0	-37.3	
7520.00	-6.6	V	3.0	42.7	1.0	-48.2	-13.0	-35.2	
3760.00	-11.3	H	3.0	42.3	1.0	-52.7	-13.0	-39.7	
5640.00	-8.2	H	3.0	43.2	1.0	-50.3	-13.0	-37.3	
7520.00	-6.5	H	3.0	42.7	1.0	-48.2	-13.0	-35.2	
High Ch, 1907.6MHz									
3815.20	-11.5	V	3.0	42.3	1.0	-52.8	-13.0	-39.8	
5722.80	-8.3	V	3.0	43.2	1.0	-50.5	-13.0	-37.5	
7630.40	-6.5	V	3.0	42.6	1.0	-48.1	-13.0	-35.1	
3815.20	-11.3	H	3.0	42.3	1.0	-52.6	-13.0	-39.6	
5722.80	-8.3	H	3.0	43.2	1.0	-50.5	-13.0	-37.5	
7630.40	-6.5	H	3.0	42.6	1.0	-48.1	-13.0	-35.1	

Band 2 HSDPA

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

Company: Samsung
Project #: 4790136523
Date: 10/30/2021
Test Engineer: 19227
Configuration: EUT/ AC Adpater, X-Position
Location: Chamber 2
Mode: HSDPA Band 2 Harmonics
Test Votage: AC 120 V, 60 Hz

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	-12.2	V	3.0	42.3	1.0	-53.5	-13.0	-40.5	
5557.20	-8.5	V	3.0	43.1	1.0	-50.6	-13.0	-37.6	
7409.60	-6.2	V	3.0	42.7	1.0	-47.9	-13.0	-34.9	
3704.80	-11.5	H	3.0	42.3	1.0	-52.8	-13.0	-39.8	
5557.20	-8.3	H	3.0	43.1	1.0	-50.4	-13.0	-37.4	
7409.60	-6.2	H	3.0	42.7	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1880MHz									
3760.00	-11.3	V	3.0	42.3	1.0	-52.6	-13.0	-39.6	
5640.00	-7.1	V	3.0	43.2	1.0	-49.3	-13.0	-36.3	
7520.00	-6.5	V	3.0	42.7	1.0	-48.1	-13.0	-35.1	
3760.00	-11.1	H	3.0	42.3	1.0	-52.5	-13.0	-39.5	
5640.00	-8.1	H	3.0	43.2	1.0	-50.2	-13.0	-37.2	
7520.00	-6.4	H	3.0	42.7	1.0	-48.1	-13.0	-35.1	
High Ch, 1907.6MHz									
3815.20	-11.5	V	3.0	42.3	1.0	-52.9	-13.0	-39.9	
5722.80	-8.1	V	3.0	43.2	1.0	-50.3	-13.0	-37.3	
7630.40	-6.3	V	3.0	42.6	1.0	-47.9	-13.0	-34.9	
3815.20	-11.1	H	3.0	42.3	1.0	-52.4	-13.0	-39.4	
5722.80	-8.2	H	3.0	43.2	1.0	-50.4	-13.0	-37.4	
7630.40	-6.0	H	3.0	42.6	1.0	-47.6	-13.0	-34.6	

LTE Band 12

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

Company: Samsung
Project #: 4790136523
Date: 11/1/2021
Test Engineer: 20882
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Harmonics, 3MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

LTE Band 12

3MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 700.5MHz									
1401.00	-16.4	V	3.0	45.8	1.0	-61.3	-13.0	-48.3	
2101.50	-12.8	V	3.0	45.4	1.0	-57.2	-13.0	-44.2	
2802.00	-10.7	V	3.0	45.5	1.0	-55.2	-13.0	-42.2	
1401.00	-17.4	H	3.0	45.8	1.0	-62.3	-13.0	-49.3	
2101.50	-13.7	H	3.0	45.4	1.0	-58.0	-13.0	-45.0	
2802.00	-10.9	H	3.0	45.5	1.0	-55.4	-13.0	-42.4	
Mid Ch, 707.5MHz									
1415.00	-16.6	V	3.0	45.8	1.0	-61.4	-13.0	-48.4	
2122.50	-12.6	V	3.0	45.4	1.0	-57.0	-13.0	-44.0	
2830.00	-10.5	V	3.0	45.5	1.0	-55.1	-13.0	-42.1	
1415.00	-17.2	H	3.0	45.8	1.0	-62.0	-13.0	-49.0	
2122.50	-13.6	H	3.0	45.4	1.0	-58.0	-13.0	-45.0	
2830.00	-10.9	H	3.0	45.5	1.0	-55.4	-13.0	-42.4	
High Ch, 714.5MHz									
1429.00	-15.8	V	3.0	45.8	1.0	-60.6	-13.0	-47.6	
2143.50	-12.9	V	3.0	45.4	1.0	-57.2	-13.0	-44.2	
2858.00	-10.4	V	3.0	45.5	1.0	-55.0	-13.0	-42.0	
1429.00	-17.3	H	3.0	45.8	1.0	-62.1	-13.0	-49.1	
2143.50	-13.5	H	3.0	45.4	1.0	-57.8	-13.0	-44.8	
2858.00	-10.6	H	3.0	45.5	1.0	-55.2	-13.0	-42.2	

LTE Band 13

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

Company: Samsung
Project #: 4790136523
Date: 11/1/2021
Test Engineer: 20882
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

LTE Band 13

5MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 779.5MHz									
1559.00	-25.2	V	3.0	45.7	1.0	-69.9	-40.0	-29.9	
2338.50	-12.1	V	3.0	45.4	1.0	-56.6	-13.0	-43.6	
3118.00	-10.2	V	3.0	45.6	1.0	-54.8	-13.0	-41.8	
1559.00	-26.3	H	3.0	45.7	1.0	-71.0	-40.0	-31.0	
2338.50	-12.7	H	3.0	45.4	1.0	-57.1	-13.0	-44.1	
3118.00	-10.1	H	3.0	45.6	1.0	-54.7	-13.0	-41.7	
Mid Ch, 782MHz									
1564.00	-25.5	V	3.0	45.7	1.0	-70.1	-40.0	-30.1	
2346.00	-12.1	V	3.0	45.4	1.0	-56.5	-13.0	-43.5	
3128.00	-10.1	V	3.0	45.6	1.0	-54.7	-13.0	-41.7	
1564.00	-26.4	H	3.0	45.7	1.0	-71.1	-40.0	-31.1	
2346.00	-12.7	H	3.0	45.4	1.0	-57.1	-13.0	-44.1	
3128.00	-10.0	H	3.0	45.6	1.0	-54.6	-13.0	-41.6	
High Ch, 784.5MHz									
1569.00	-25.3	V	3.0	45.7	1.0	-70.0	-40.0	-30.0	
2353.50	-11.8	V	3.0	45.4	1.0	-56.3	-13.0	-43.3	
3138.00	-10.0	V	3.0	45.6	1.0	-54.6	-13.0	-41.6	
1569.00	-26.5	H	3.0	45.7	1.0	-71.2	-40.0	-31.2	
2353.50	-12.7	H	3.0	45.4	1.0	-57.2	-13.0	-44.2	
3138.00	-10.1	H	3.0	45.6	1.0	-54.7	-13.0	-41.7	

Note : No narrowband emissions so only applied the -70dBW/MHz (-40dBm/MHz) wideband emission limit for the 1559-1610 MHz band

LTE Band 25

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

Company: Samsung
Project #: 4790136523
Date: 10/24/2021
Test Engineer: 47989
Configuration: EUT/ AC Adapter, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Harmonics, 15MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

LTE Band 25

15MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1857.5MHz									
3715.00	-11.1	V	3.0	45.8	1.0	-55.9	-13.0	-42.9	
5572.50	-8.9	V	3.0	45.7	1.0	-53.6	-13.0	-40.6	
7430.00	-6.0	V	3.0	44.5	1.0	-49.6	-13.0	-36.6	
3715.00	-11.2	H	3.0	45.8	1.0	-56.0	-13.0	-43.0	
5572.50	-8.9	H	3.0	45.7	1.0	-53.7	-13.0	-40.7	
7430.00	-6.1	H	3.0	44.5	1.0	-49.7	-13.0	-36.7	
Mid Ch, 1882.5MHz									
3765.00	-11.1	V	3.0	45.8	1.0	-56.0	-13.0	-43.0	
5647.50	-8.5	V	3.0	45.7	1.0	-53.2	-13.0	-40.2	
7530.00	-6.0	V	3.0	44.5	1.0	-49.5	-13.0	-36.5	
3765.00	-11.2	H	3.0	45.8	1.0	-56.1	-13.0	-43.1	
5647.50	-8.6	H	3.0	45.7	1.0	-53.3	-13.0	-40.3	
7530.00	-6.0	H	3.0	44.5	1.0	-49.5	-13.0	-36.5	
High Ch, 1907.5MHz									
3815.00	-11.0	V	3.0	45.8	1.0	-55.9	-13.0	-42.9	
5722.50	-8.5	V	3.0	45.7	1.0	-53.3	-13.0	-40.3	
7630.00	-6.0	V	3.0	44.4	1.0	-49.4	-13.0	-36.4	
3815.00	-11.1	H	3.0	45.8	1.0	-56.0	-13.0	-43.0	
5722.50	-8.7	H	3.0	45.7	1.0	-53.4	-13.0	-40.4	
7630.00	-5.9	H	3.0	44.4	1.0	-49.4	-13.0	-36.4	

LTE Band 26 (Part 90)

LTE Band 26

15MHz

QPSK

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

Company:	Samsung
Project #:	4790136523
Date:	11/1/2021
Test Engineer:	20882
Configuration:	EUT / AC Adapter, X-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth
Test Votage:	AC 120 V, 60 Hz

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	-15.0	V	3.0	45.6	1.0	-59.7	-13.0	-46.7	
2464.50	-11.7	V	3.0	45.4	1.0	-56.2	-13.0	-43.2	
3286.00	-9.5	V	3.0	45.7	1.0	-54.2	-13.0	-41.2	
1643.00	-15.9	H	3.0	45.6	1.0	-60.5	-13.0	-47.5	
2464.50	-12.3	H	3.0	45.4	1.0	-56.7	-13.0	-43.7	
3286.00	-9.6	H	3.0	45.7	1.0	-54.2	-13.0	-41.2	

LTE Band 26 (Straddle)

LTE Band 26

15MHz

QPSK

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

Company:	Samsung
Project #:	4790136523
Date:	11/1/2021
Test Engineer:	20882
Configuration:	EUT / AC Adapter, X-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth
Test Votage:	AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Straddle Ch, 824MHz									
1648.00	-15.0	V	3.0	45.6	1.0	-59.6	-13.0	-46.6	
2472.00	-11.7	V	3.0	45.4	1.0	-56.1	-13.0	-43.1	
3296.00	-9.5	V	3.0	45.7	1.0	-54.1	-13.0	-41.1	
1648.00	-15.9	H	3.0	45.6	1.0	-60.5	-13.0	-47.5	
2472.00	-12.3	H	3.0	45.4	1.0	-56.7	-13.0	-43.7	
3296.00	-9.5	H	3.0	45.7	1.0	-54.2	-13.0	-41.2	

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LTE Band 26 (Part 22)

LTE Band 26

15MHz

QPSK

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

Company: Samsung
Project #: 4790136523
Date: 11/1/2021
Test Engineer: 20882
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, 831.5MHz									
1663.00	-15.1	V	3.0	45.6	1.0	-59.7	-13.0	-46.7	
2494.50	-11.7	V	3.0	45.5	1.0	-56.1	-13.0	-43.1	
3326.00	-9.2	V	3.0	45.7	1.0	-53.9	-13.0	-40.9	
1663.00	-16.0	H	3.0	45.6	1.0	-60.6	-13.0	-47.6	
2494.50	-12.3	H	3.0	45.5	1.0	-56.8	-13.0	-43.8	
3326.00	-9.1	H	3.0	45.7	1.0	-53.8	-13.0	-40.8	
High Ch, 841.5MHz									
1683.00	-14.8	V	3.0	45.6	1.0	-59.4	-13.0	-46.4	
2524.50	-11.7	V	3.0	45.5	1.0	-56.2	-13.0	-43.2	
3366.00	-8.9	V	3.0	45.7	1.0	-53.6	-13.0	-40.6	
1683.00	-16.0	H	3.0	45.6	1.0	-60.6	-13.0	-47.6	
2524.50	-12.3	H	3.0	45.5	1.0	-56.8	-13.0	-43.8	
3366.00	-9.2	H	3.0	45.7	1.0	-53.9	-13.0	-40.9	

LTE Band 41 (PC2)

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

Company:	Samsung
Project #:	4790136523
Date:	11/4/2021
Test Engineer:	20882
Configuration:	EUT / AC Adapter, X-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 41 Harmonics, 20MHz Bandwidth
Test Votage:	AC 120 V, 60 Hz

LTE Band 41 (PC3)

20MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2506MHz									
5012.00	-20.0	V	3.0	45.8	1.0	-64.8	-25.0	-39.8	
7518.00	-18.3	V	3.0	44.5	1.0	-61.8	-25.0	-36.8	
10024.00	-15.1	V	3.0	42.6	1.0	-56.7	-25.0	-31.7	
5012.00	-20.0	H	3.0	45.8	1.0	-64.8	-25.0	-39.8	
7518.00	-18.3	H	3.0	44.5	1.0	-61.8	-25.0	-36.8	
10024.00	-15.3	H	3.0	42.6	1.0	-56.9	-25.0	-31.9	
Mid Ch, 2593MHz									
5186.00	-19.6	V	3.0	45.8	1.0	-64.4	-25.0	-39.4	
7779.00	-18.0	V	3.0	44.4	1.0	-61.3	-25.0	-36.3	
10372.00	-15.0	V	3.0	42.7	1.0	-56.7	-25.0	-31.7	
5186.00	-19.7	H	3.0	45.8	1.0	-64.4	-25.0	-39.4	
7779.00	-18.0	H	3.0	44.4	1.0	-61.4	-25.0	-36.4	
10372.00	-15.0	H	3.0	42.7	1.0	-56.7	-25.0	-31.7	
High Ch, 2680MHz									
5360.00	-19.0	V	3.0	45.8	1.0	-63.8	-25.0	-38.8	
8040.00	-18.3	V	3.0	44.2	1.0	-61.5	-25.0	-36.5	
10720.00	-14.7	V	3.0	42.8	1.0	-56.5	-25.0	-31.5	
5360.00	-19.1	H	3.0	45.8	1.0	-63.9	-25.0	-38.9	
8040.00	-18.2	H	3.0	44.2	1.0	-61.4	-25.0	-36.4	
10720.00	-14.8	H	3.0	42.8	1.0	-56.6	-25.0	-31.6	

LTE Band 66

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

Company: Samsung
Project #: 4790136523
Date: 10/28/2021
Test Engineer: 19227
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Harmonics, 3MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

LTE Band 66

3MHz

QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5MHz									
3423.00	-7.2	V	3.0	45.7	1.0	-52.0	-13.0	-39.0	
5134.50	-9.2	V	3.0	45.8	1.0	-54.0	-13.0	-41.0	
6846.00	-5.9	V	3.0	44.9	1.0	-49.8	-13.0	-36.8	
3423.00	-12.3	H	3.0	45.7	1.0	-57.0	-13.0	-44.0	
5134.50	-9.1	H	3.0	45.8	1.0	-53.9	-13.0	-40.9	
6846.00	-6.1	H	3.0	44.9	1.0	-50.0	-13.0	-37.0	
Mid Ch, 1745MHz									
3490.00	-6.9	V	3.0	45.7	1.0	-51.6	-13.0	-38.6	
5235.00	-8.7	V	3.0	45.8	1.0	-53.5	-13.0	-40.5	
6980.00	-5.5	V	3.0	44.8	1.0	-49.3	-13.0	-36.3	
3490.00	-6.9	H	3.0	45.7	1.0	-51.6	-13.0	-38.6	
5235.00	-8.7	H	3.0	45.8	1.0	-53.5	-13.0	-40.5	
6980.00	-5.6	H	3.0	44.8	1.0	-49.4	-13.0	-36.4	
High Ch, 1778.5MHz									
3557.00	-6.4	V	3.0	45.8	1.0	-51.2	-13.0	-38.2	
5335.50	-8.4	V	3.0	45.8	1.0	-53.2	-13.0	-40.2	
7114.00	-5.4	V	3.0	44.7	1.0	-49.1	-13.0	-36.1	
3557.00	-6.4	H	3.0	45.8	1.0	-51.2	-13.0	-38.2	
5335.50	-8.4	H	3.0	45.8	1.0	-53.2	-13.0	-40.2	
7114.00	-5.5	H	3.0	44.7	1.0	-49.3	-13.0	-36.3	

END OF REPORT

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