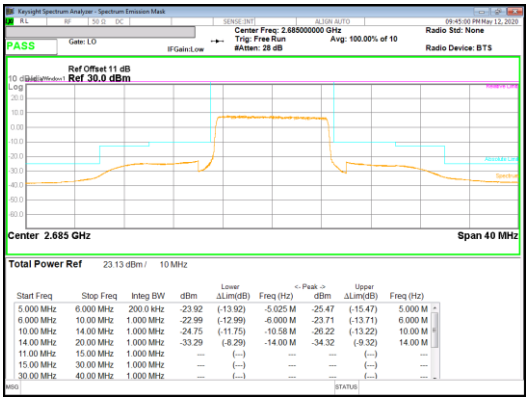
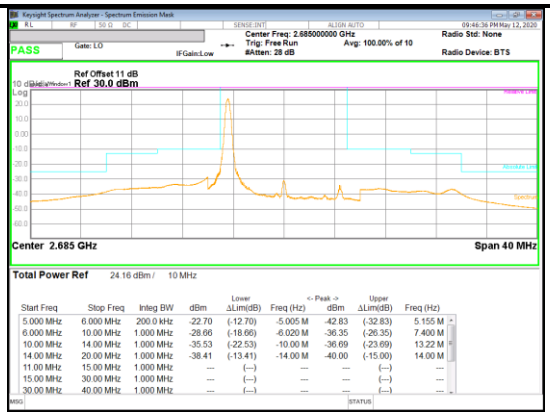
Band 41

10MHz

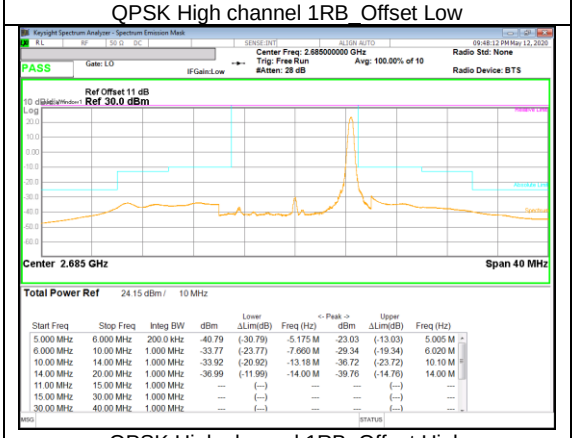
QPSK



QPSK High channel FRB



QPSK High channel 1RB_Offset Low

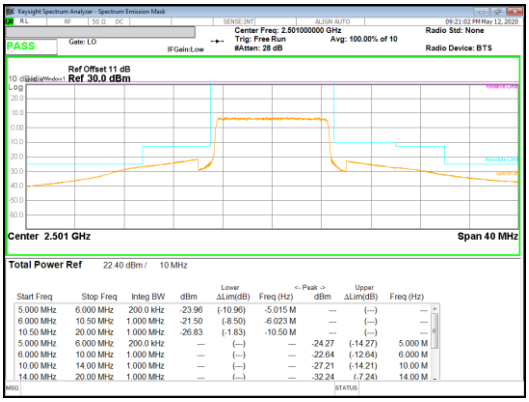


QPSK High channel 1RB_Offset High

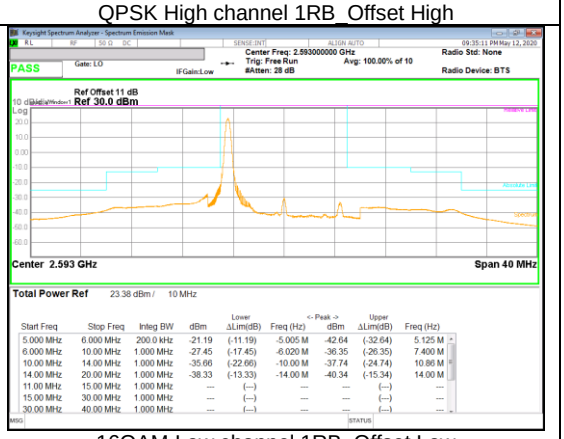
Band 41

10MHz

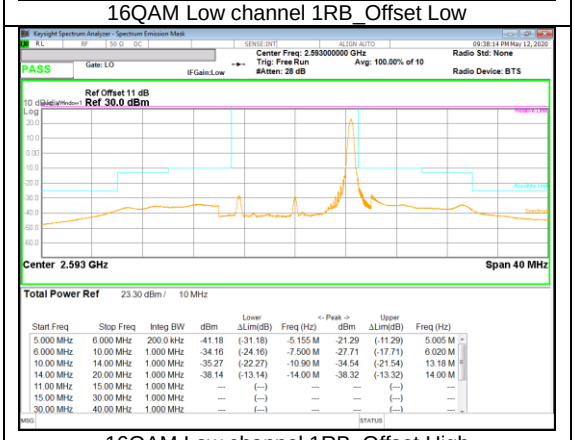
16QAM



16QAM Low channel FRB



16QAM Low channel 1RB_Offset Low



16QAM Low channel 1RB_Offset High

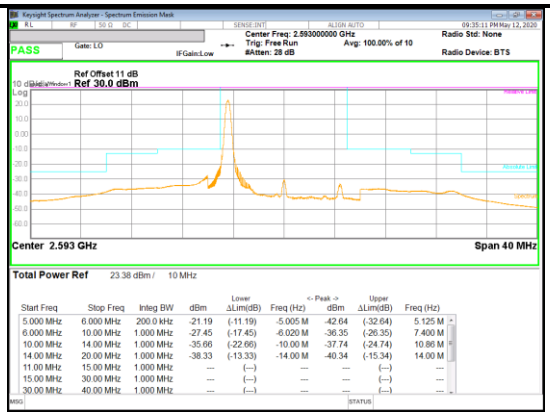
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 41

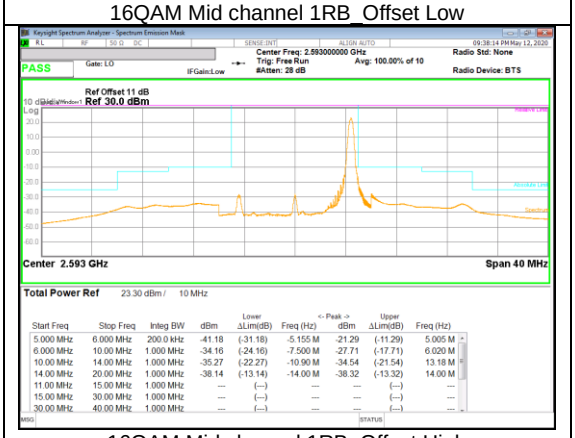
10MHz

16QAM

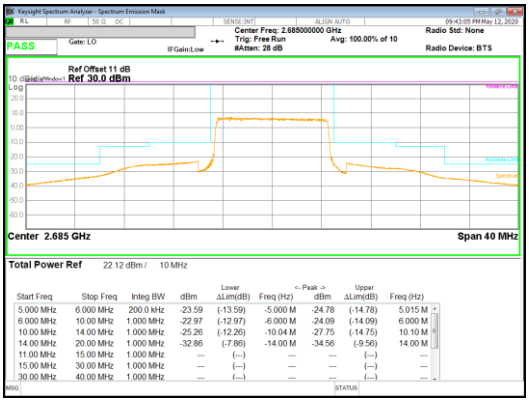
16QAM Mid channel FRB



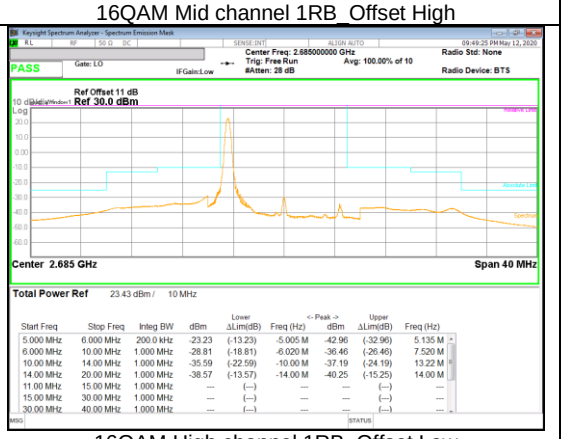
16QAM Mid channel 1RB_Offset Low



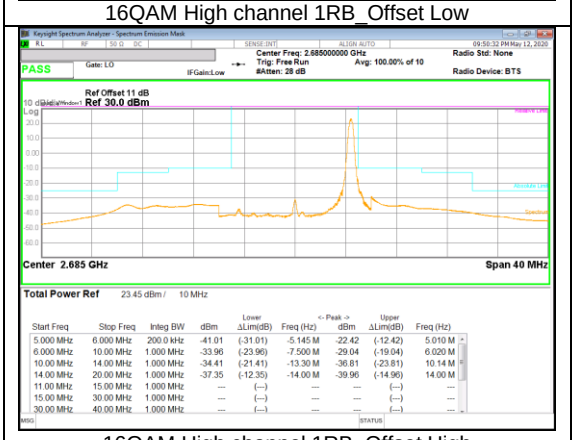
16QAM Mid channel 1RB_Offset High



16QAM High channel FRB



16QAM High channel 1RB_Offset Low



16QAM High channel 1RB_Offset High

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

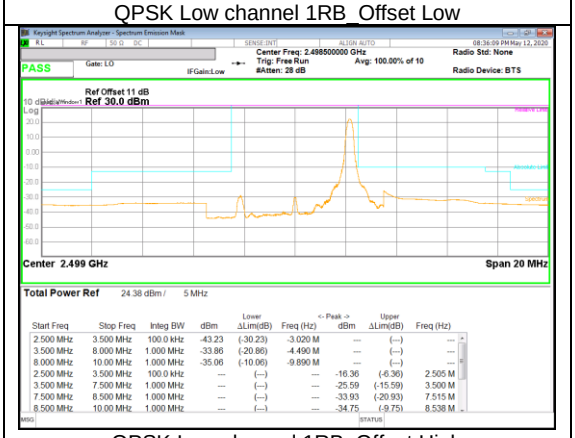
Band 41

5MHz

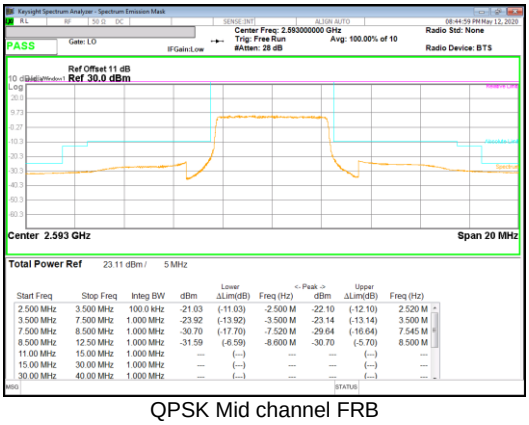
QPSK

QPSK Low channel FRB

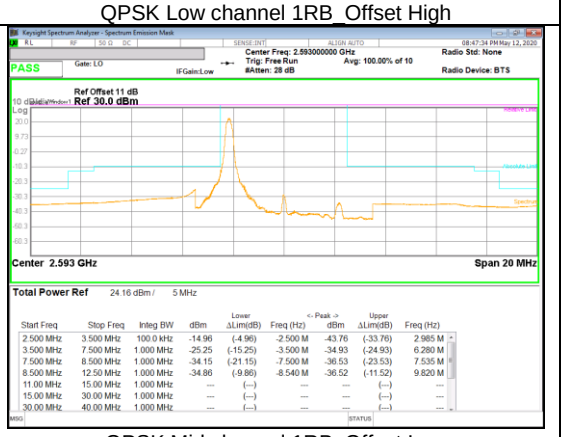
QPSK Low channel 1RB_Offset Low



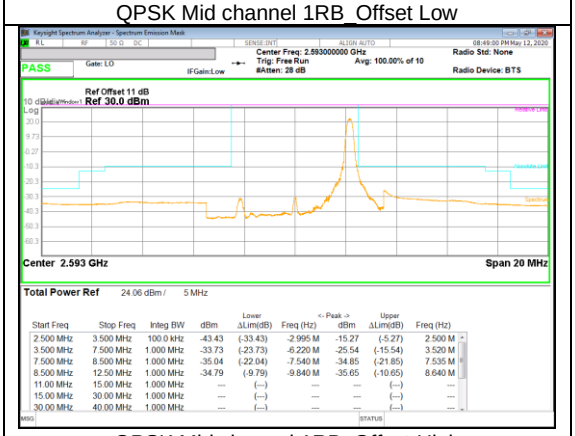
QPSK Low channel 1RB_Offset High



QPSK Mid channel FRB



QPSK Mid channel 1RB_Offset Low



QPSK Mid channel 1RB_Offset High

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

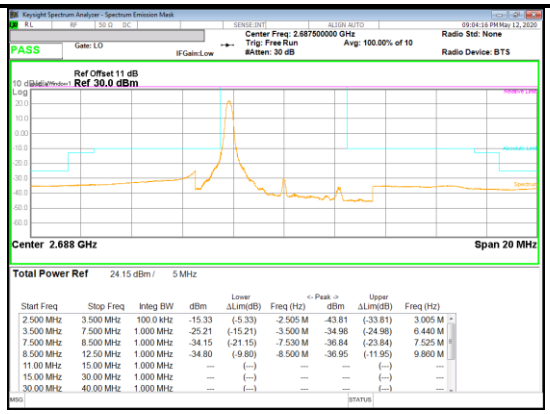
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

Band 41

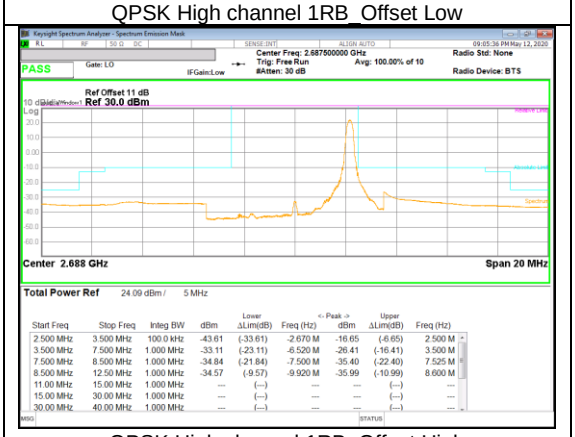
5MHz

QPSK

QPSK High channel FRB



QPSK High channel 1RB_Offset Low

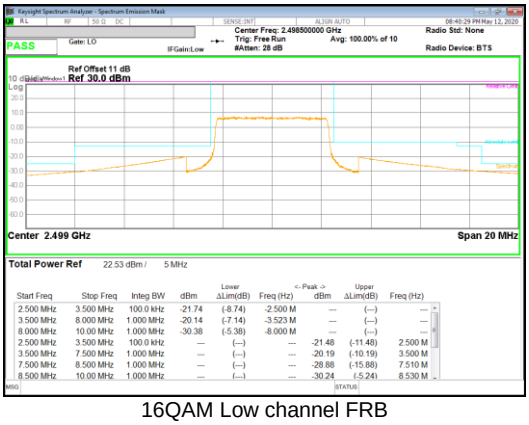


QPSK High channel 1RB_Offset High

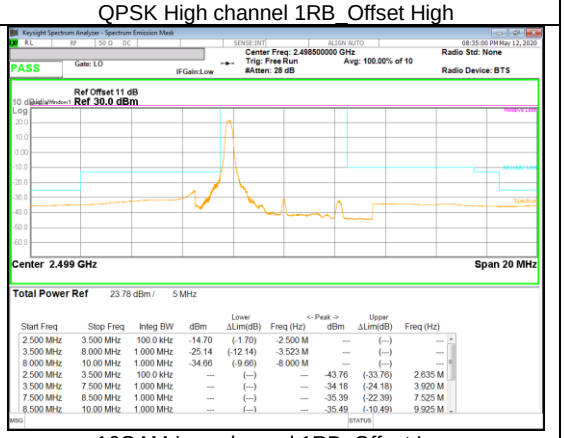
Band 41

5MHz

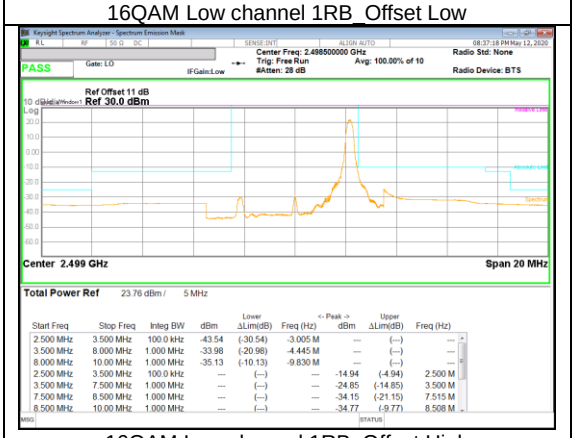
16QAM



16QAM Low channel FRB



16QAM Low channel 1RB_Offset Low



16QAM Low channel 1RB_Offset High

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

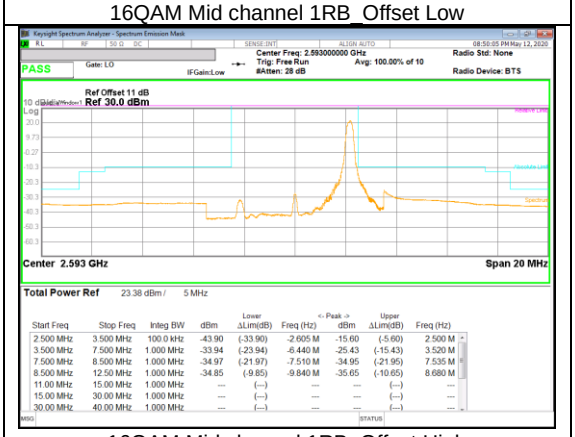
Band 41

5MHz

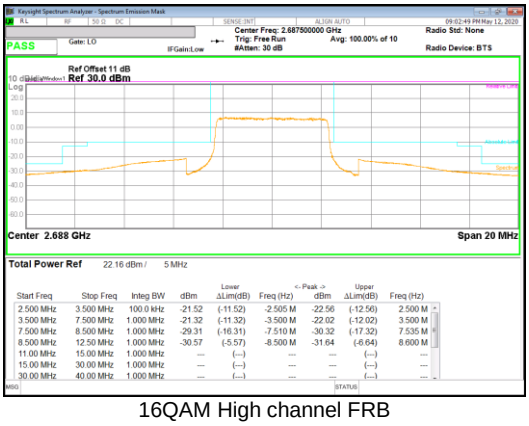
16QAM

16QAM Mid channel FRB

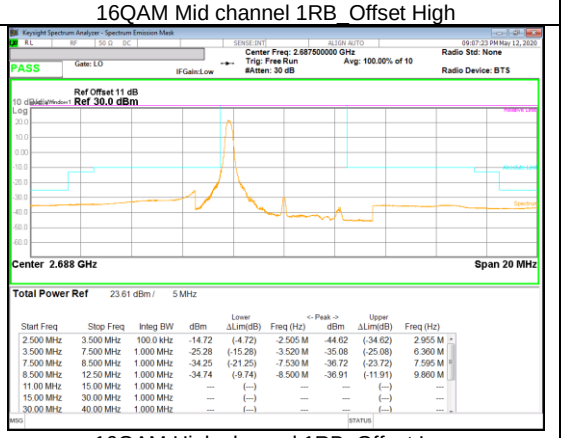
16QAM Mid channel 1RB_Offset Low



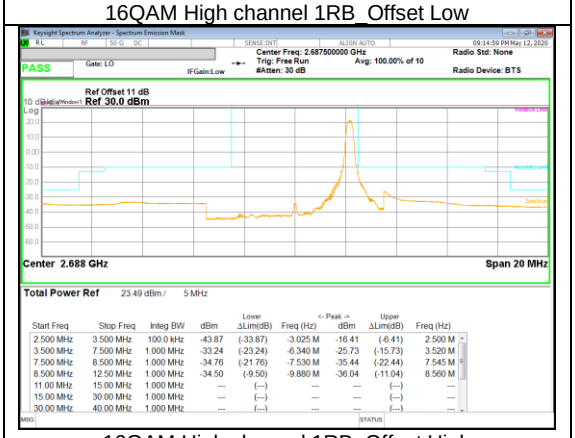
16QAM Mid channel 1RB_Offset High



16QAM High channel FRB



16QAM High channel 1RB_Offset Low



16QAM High channel 1RB_Offset High

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 2

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

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

LTE Band 5

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

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

LTE Band41(PC3)

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §27.53 and 90.691

LIMITS

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

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.

(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.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

a) Set the RBW = 100kHz for emission below 1GHz and 1MHz for emissions above 1GHz (Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)

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 = Max (40001);

g) Trace mode = Average(WCDMA, LTE), Max hold(GSM, LTE Band41);

RESULTS

See the following pages.

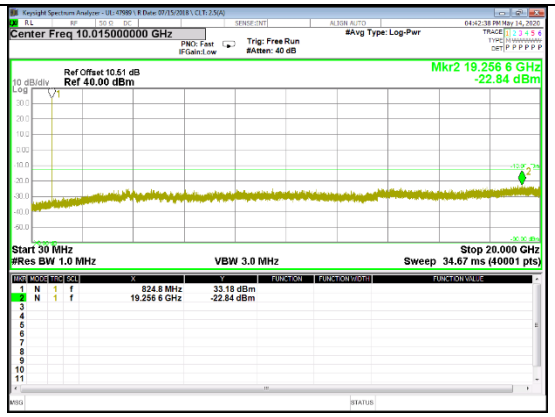
NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

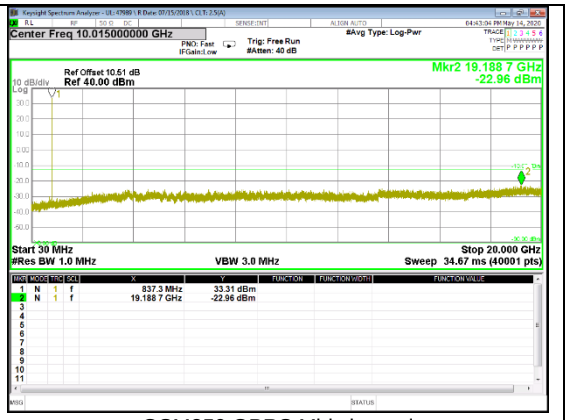
9.3.1. OUT OF BAND EMISSIONS RESULT

GSM 850

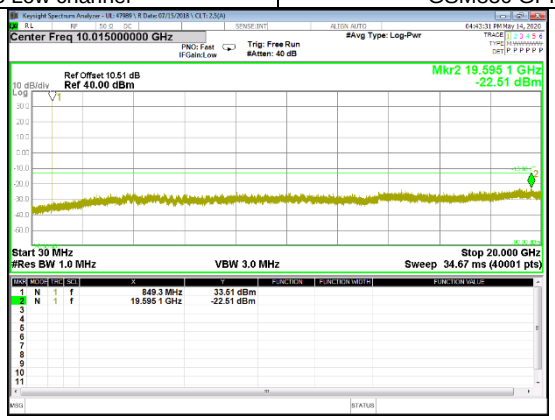
GSM 850



GSM850 GPRS Low channel



GSM850 GPRS Mid channel

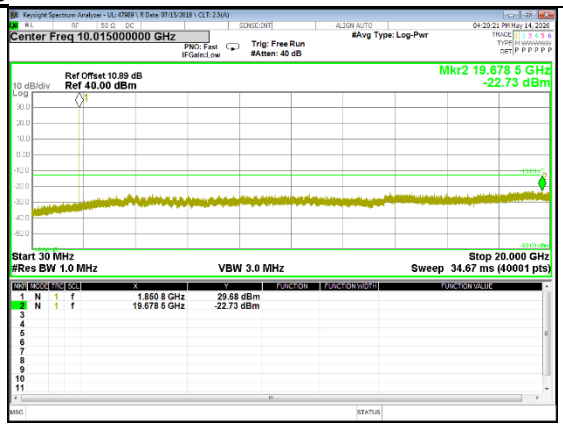


GSM850 GPRS High channel

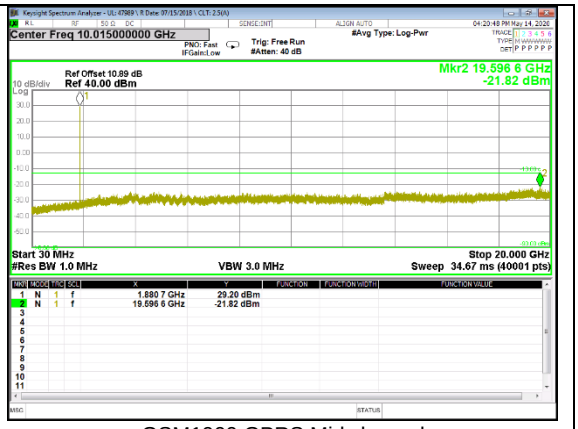
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

GSM 1900

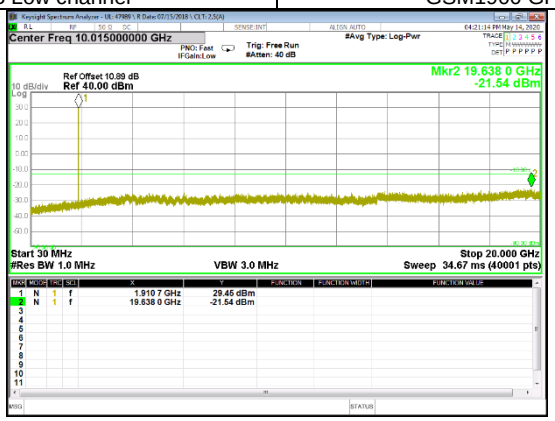
GSM 1900



GSM1900 GPRS Low channel



GSM1900 GPRS Mid channel



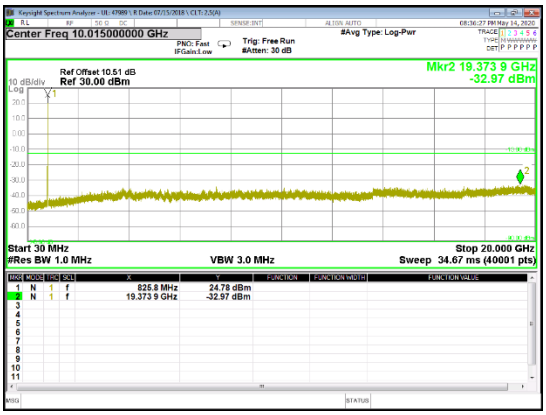
GSM1900 GPRS High channel

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

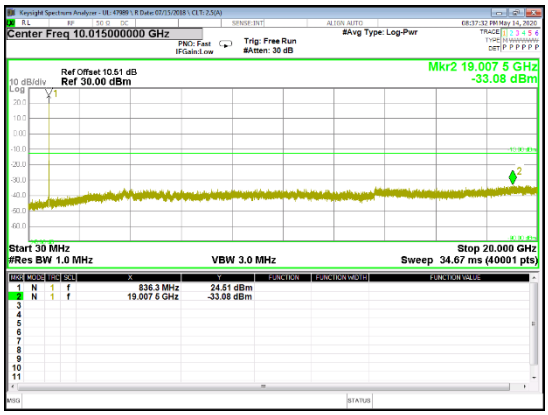
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 5

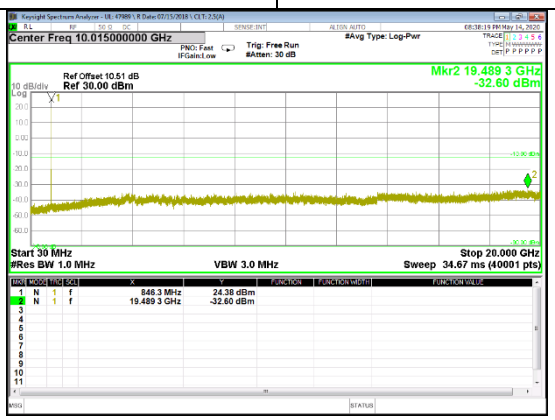
Band 5



REL99 Low channel



REL99 Mid channel

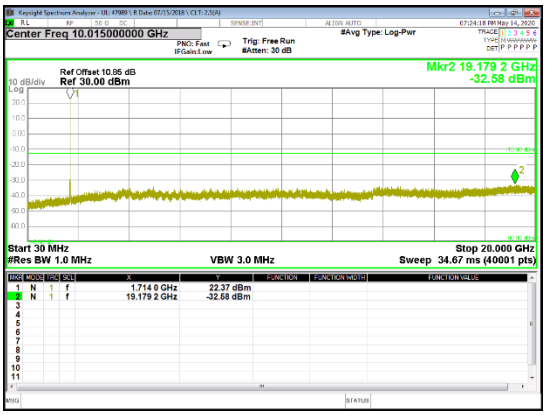
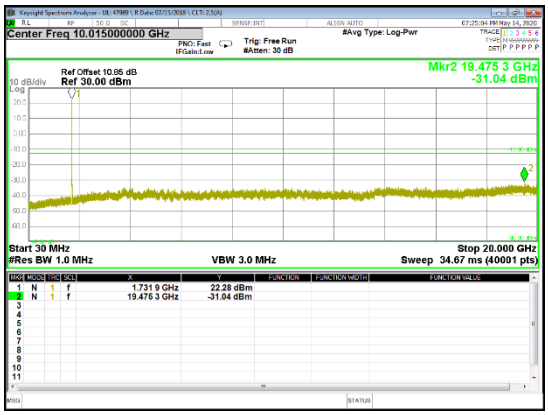
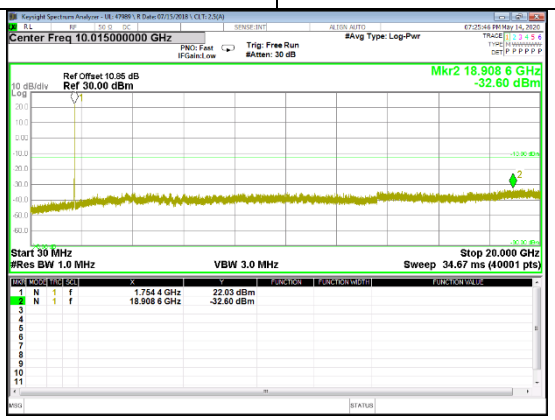


REL99 High channel

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

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

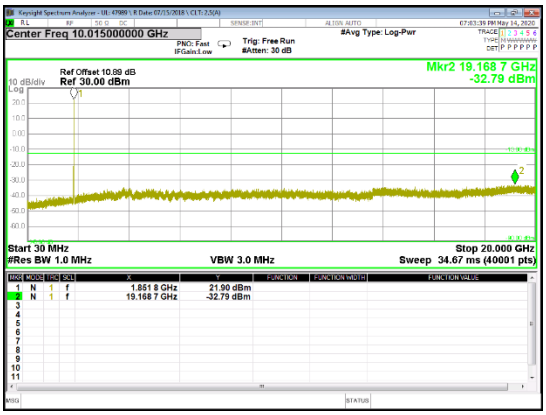
WCDMA Band 4

Band 4	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

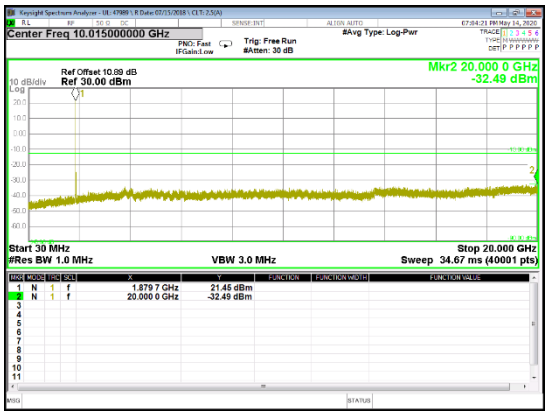
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 2

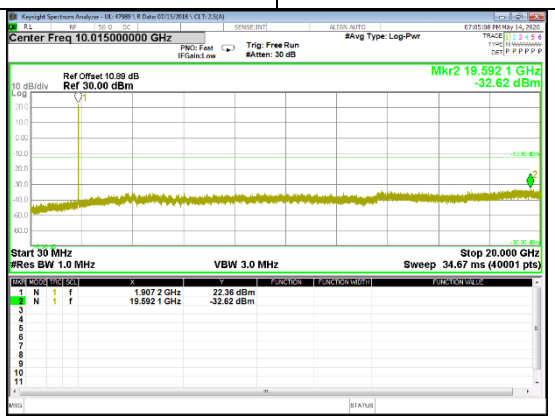
Band 2



REL99 Low channel



REL99 Mid channel

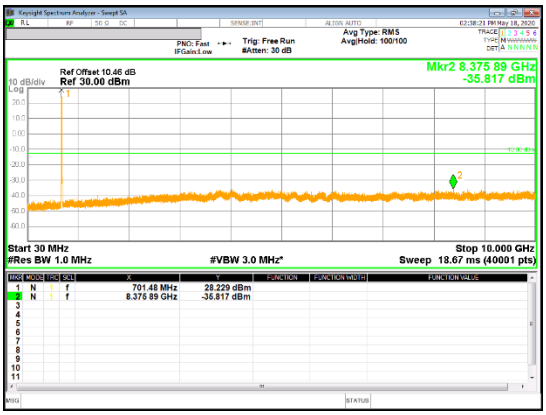
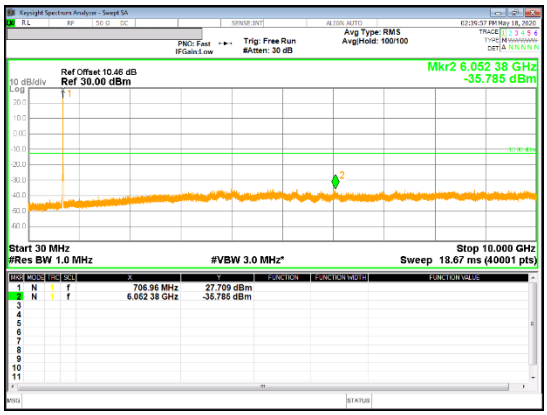


REL99 High channel

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

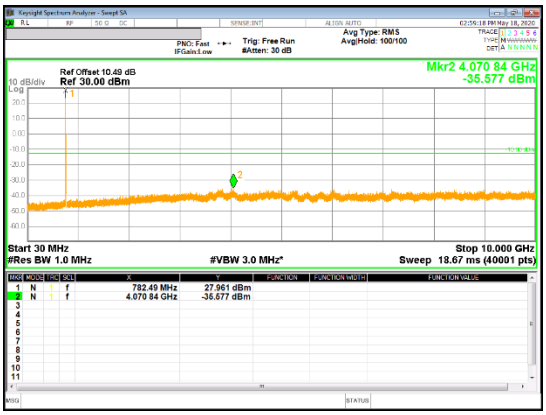
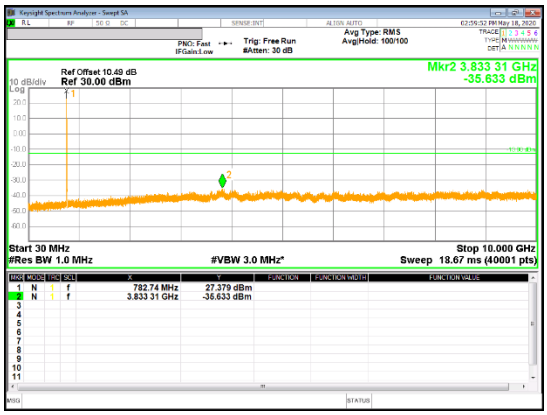
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 12

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

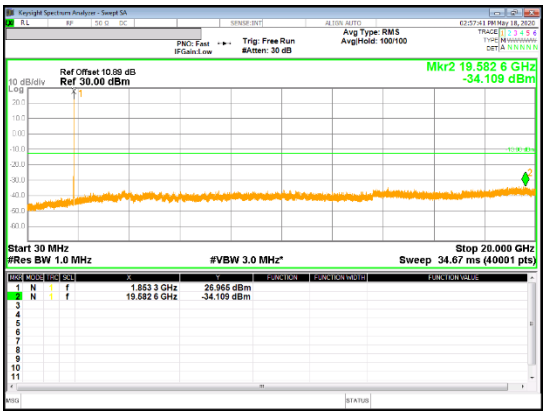
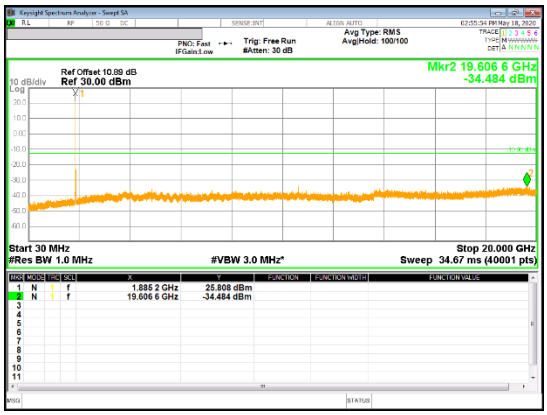
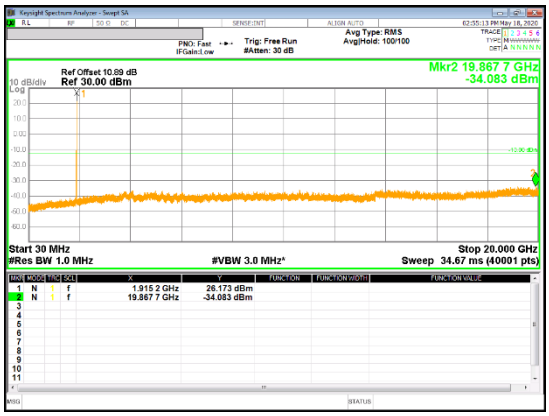
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 13

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

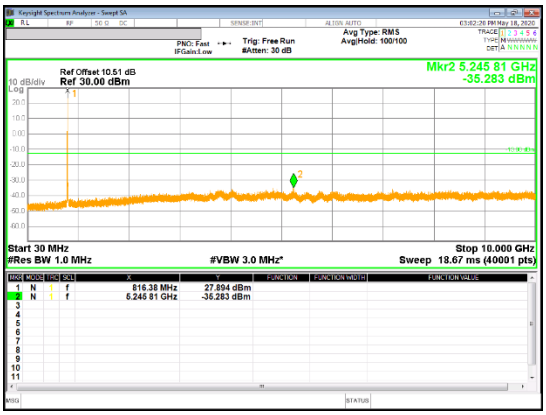
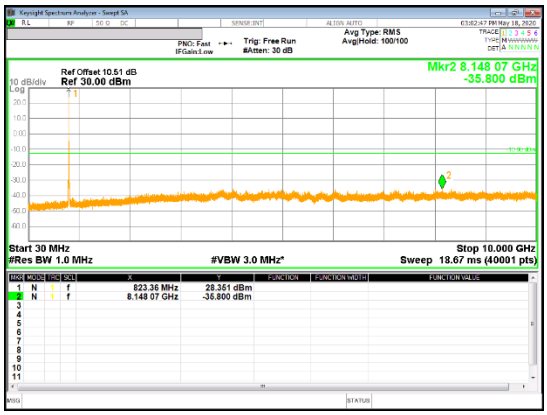
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 25

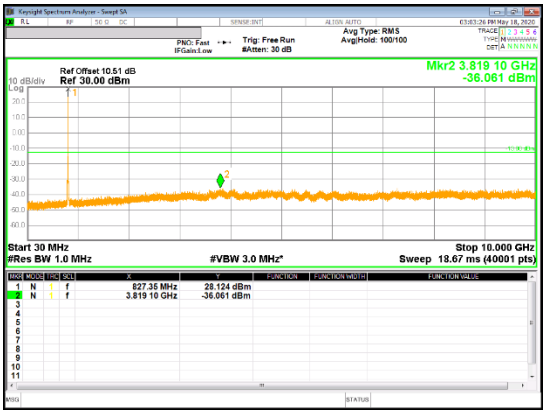
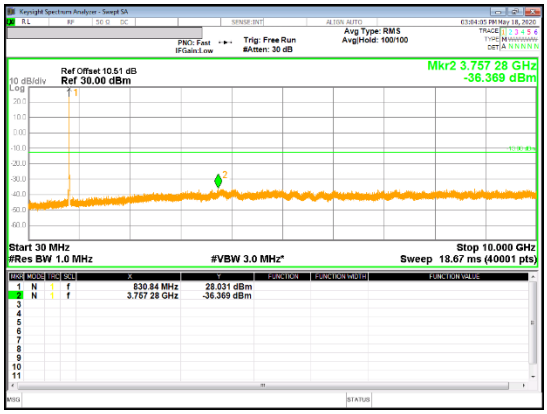
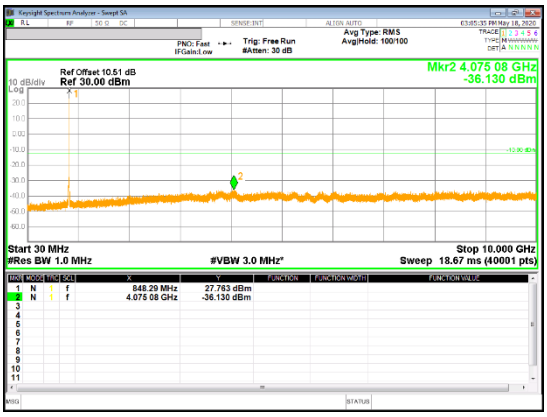
Band 25 5MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 26(Part90)

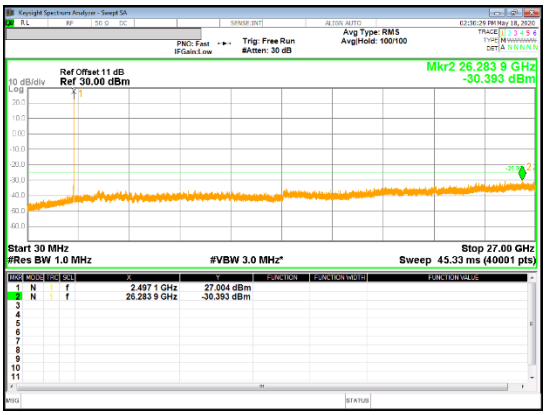
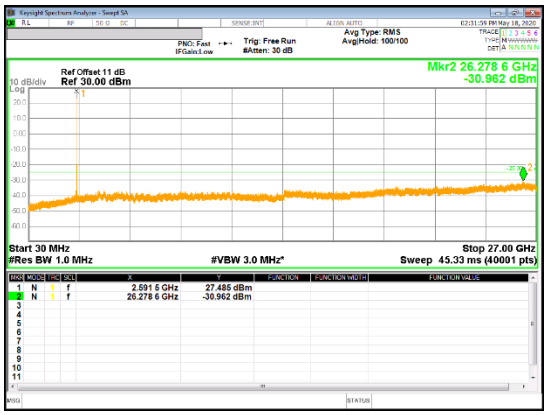
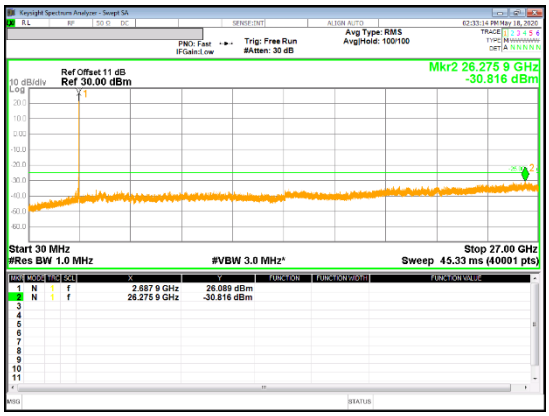
Band 26 (Part90) 3MHz	 QPSK Low channel	 QPSK High channel

LTE Band 26(Part22)

Band 26 (Part90) 3MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

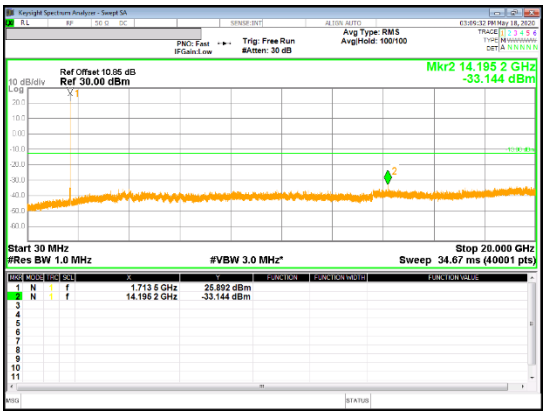
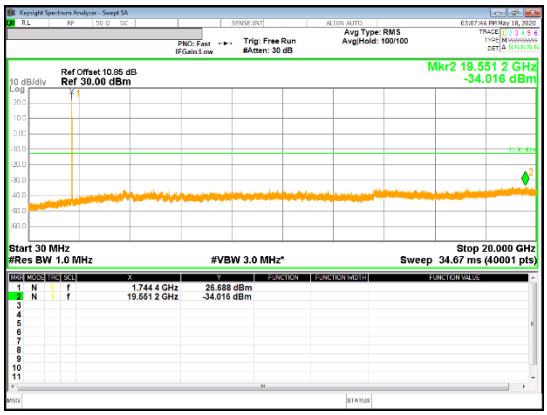
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 41(PC2)

Band 40 5MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 66

Band 66 3MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 2

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

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

LTE Band 5

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

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

LTE Band41(PC3)

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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						
Limit: +- 2.5 ppm =	Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	50	824.20017063	0.010	848.80018340	-0.006	2.5
3.88	40	824.20015497	0.029	848.80017705	0.001	2.5
3.88	30	824.20016844	0.012	848.80019614	-0.021	2.5
3.88	***20***	***824.20017854***	***0.000***	***848.80017799***	***0.000***	***2.5***
3.88	10	824.20014609	0.039	848.80015665	0.025	2.5
3.88	0	824.20014403	0.042	848.80015571	0.026	2.5
3.88	-10	824.20013415	0.054	848.80013479	0.051	2.5
3.88	-20	824.20018687	-0.010	848.80014596	0.038	2.5
3.88	-30	824.20015646	0.027	848.80014580	0.038	2.5

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2060.500	Hz	High Channel	2122.000	Hz
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**824.20017854**	***0***	**848.80017799**	***0***	***2.5***
4.47	20	824.20018726	-0.011	848.80019633	-0.022	2.5
3.60	20	824.20018991	-0.014	848.80017996	-0.002	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	1850.0758	1909.9227		
Extreme (50C)		1850.0759	1909.9228	101.5	0.054
Extreme (40C)		1850.0759	1909.9228	112.3	0.060
Extreme (30C)		1850.0759	1909.9229	134.2	0.071
Extreme (10C)		1850.0759	1909.9228	90.6	0.048
Extreme (0C)		1850.0759	1909.9228	100.5	0.053
Extreme (-10C)		1850.0759	1909.9228	114.2	0.061
Extreme (-20C)		1850.0759	1909.9228	98.5	0.052
Extreme (-30C)		1850.0758	1909.9228	84.2	0.045
20C	15%	1850.0759	1909.9228	90.2	0.048
	-15%	1850.0759	1909.9229	117.0	0.062
	End Point	1850.0759	1909.9228	96.1	0.051

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	50	826.40000526	-0.002	846.60000592	-0.001	2.5
3.88	40	826.40000335	0.000	846.60000445	0.000	2.5
3.88	30	826.40000409	-0.001	846.60000502	0.000	2.5
3.88	***20***	***826.40000365***	***0.000***	***846.60000484***	***0.000***	***2.5***
3.88	10	826.40000433	-0.001	846.60000460	0.000	2.5
3.88	0	826.40000419	-0.001	846.60000499	0.000	2.5
3.88	-10	826.40000515	-0.002	846.60000378	0.001	2.5
3.88	-20	826.40000632	-0.003	846.60000461	0.000	2.5
3.88	-30	826.40000539	-0.002	846.60000406	0.001	2.5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**826.40000365**	***0***	**846.60000484**	***0***	***2.5***
4.47	20	826.40000270	0.001	846.60000534	-0.001	2.5
3.60	20	826.40000303	0.001	846.60000583	-0.001	2.5

WCDMA Band 4

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	1710.3157	1754.6838		
Extreme (50C)		1710.3157	1754.6838	5.3	0.003
Extreme (40C)		1710.3157	1754.6838	6.1	0.004
Extreme (30C)		1710.3157	1754.6838	6.1	0.004
Extreme (10C)		1710.3157	1754.6838	6.8	0.004
Extreme (0C)		1710.3157	1754.6838	5.7	0.003
Extreme (-10C)		1710.3157	1754.6838	7.2	0.004
Extreme (-20C)		1710.3157	1754.6838	6.8	0.004
Extreme (-30C)		1710.3157	1754.6838	5.7	0.003
20C	15%	1710.3157	1754.6838	4.3	0.003
	-15%	1710.3157	1754.6838	5.3	0.003
	End Point	1710.3157	1754.6838	4.3	0.002

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 2 (Lowest Frequency: Rel99 / 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	1850.3123	1909.6945		
Extreme (50C)		1850.3123	1909.6945	5.9	0.003
Extreme (40C)		1850.3123	1909.6945	6.0	0.003
Extreme (30C)		1850.3123	1909.6945	6.0	0.003
Extreme (10C)		1850.3123	1909.6945	6.9	0.004
Extreme (0C)		1850.3123	1909.6945	6.2	0.003
Extreme (-10C)		1850.3123	1909.6945	6.2	0.003
Extreme (-20C)		1850.3123	1909.6945	6.5	0.003
Extreme (-30C)		1850.3123	1909.6945	6.1	0.003
20C	15%	1850.3123	1909.6945	4.5	0.002
	-15%	1850.3123	1909.6945	5.0	0.003
	End Point	1850.3123	1909.6945	4.5	0.002

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	699.1557	715.8451		
Extreme (50C)		699.1557	715.8451	26.3	0.037
Extreme (40C)		699.1557	715.8451	38.4	0.054
Extreme (30C)		699.1557	715.8451	23.0	0.033
Extreme (10C)		699.1557	715.8451	39.3	0.056
Extreme (0C)		699.1557	715.8451	43.3	0.061
Extreme (-10C)		699.1557	715.8451	24.5	0.035
Extreme (-20C)		699.1557	715.8451	29.4	0.042
Extreme (-30C)		699.1557	715.8451	20.4	0.029
20C	15%	699.1557	715.8451	10.5	0.015
	-15%	699.1557	715.8451	10.6	0.015
	End Point	699.1557	715.8451	8.9	0.013

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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

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	777.2561	786.7536		
Extreme (50C)		777.2561	786.7536	27.9	0.036
Extreme (40C)		777.2561	786.7536	33.7	0.043
Extreme (30C)		777.2561	786.7536	41.3	0.053
Extreme (10C)		777.2561	786.7536	42.8	0.055
Extreme (0C)		777.2561	786.7536	37.3	0.048
Extreme (-10C)		777.2561	786.7536	38.5	0.049
Extreme (-20C)		777.2561	786.7536	38.1	0.049
Extreme (-30C)		777.2561	786.7536	36.6	0.047
20C	15%	777.2561	786.7536	9.5	0.012
	-15%	777.2561	786.7536	9.8	0.012
	End Point	777.2561	786.7536	10.0	0.013

LTE Band 25 (Lowest Frequency:16QAM / 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	1850.1556	1914.8432		
Extreme (50C)		1850.1556	1914.8432	31.0	0.016
Extreme (40C)		1850.1556	1914.8432	26.2	0.014
Extreme (30C)		1850.1556	1914.8432	23.2	0.012
Extreme (10C)		1850.1556	1914.8432	37.4	0.020
Extreme (0C)		1850.1556	1914.8432	40.0	0.021
Extreme (-10C)		1850.1556	1914.8432	31.4	0.017
Extreme (-20C)		1850.1556	1914.8432	36.2	0.019
Extreme (-30C)		1850.1556	1914.8432	29.6	0.016
20C	15%	1850.1556	1914.8432	11.0	0.006
	-15%	1850.1556	1914.8432	11.7	0.006
	End Point	1850.1556	1914.8432	11.6	0.006

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 26 (Lowest Frequency:QPSK / Highest Frequency: 16QAM)

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	814.70003656	-0.022	848.30003232	-0.009	2.5
3.85	40	814.70002745	-0.010	848.30002432	0.000	2.5
3.85	30	814.70001935	-0.001	848.30002612	-0.002	2.5
3.85	***20***	***814.70001891***	***0.000***	***848.30002446***	***0.000***	***2.5***
3.85	10	814.70002872	-0.012	848.30004765	-0.027	2.5
3.85	0	814.70003098	-0.015	848.30003180	-0.009	2.5
3.85	-10	814.70002335	-0.005	848.30002485	0.000	2.5
3.85	-20	814.70002751	-0.011	848.30002880	-0.005	2.5
3.85	-30	814.70002496	-0.007	848.30002670	-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***	**814.70001891**	***0***	**848.30002446**	***0***	***2.5***
4.47	20	814.70000823	0.013	848.30000960	0.018	2.5
3.60	20	814.70001034	0.011	848.30001039	0.017	2.5

LTE Band 41 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

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	2494.0001	2692.0046		
Extreme (50C)		2494.0001	2692.0046	44.8	0.017
Extreme (40C)		2494.0001	2692.0046	42.7	0.016
Extreme (30C)		2494.0001	2692.0046	41.8	0.016
Extreme (10C)		2494.0001	2692.0046	26.4	0.010
Extreme (0C)		2494.0001	2692.0046	28.9	0.011
Extreme (-10C)		2494.0001	2692.0046	33.1	0.013
Extreme (-20C)		2494.0001	2692.0046	38.3	0.015
Extreme (-30C)		2494.0001	2692.0046	42.7	0.016
20C	15%	2494.0001	2692.0046	11.7	0.005
	-15%	2494.0001	2692.0046	11.0	0.004
	End Point	2494.0001	2692.0046	12.2	0.005

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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

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	26.0	0.015
Extreme (40C)		1710.6995	1779.3006	27.3	0.016
Extreme (30C)		1710.6995	1779.3006	25.8	0.015
Extreme (10C)		1710.6995	1779.3006	20.0	0.011
Extreme (0C)		1710.6995	1779.3006	29.3	0.017
Extreme (-10C)		1710.6995	1779.3006	28.2	0.016
Extreme (-20C)		1710.6995	1779.3006	38.9	0.022
Extreme (-30C)		1710.6995	1779.3006	41.8	0.024
20C	15%	1710.6995	1779.3006	10.5	0.006
	-15%	1710.6995	1779.3006	11.8	0.007
	End Point	1710.6995	1779.3006	11.3	0.006

LTE Band 2

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

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

LTE Band 5

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

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

LTE Band41(PC3)

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

9.5.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	128	824.2	28.74	748.17
		190	836.6	29.48	887.16
		251	848.8	**29.86**	**968.28**
	EGPRS	128	824.2	23.22	209.89
		190	836.6	24.13	258.82
		251	848.8	**24.28**	**267.92**
GSM1900	GPRS	512	1850.2	29.25	841.40
		661	1880	27.50	562.34
		810	1909.8	**29.72**	**937.56**
	EGPRS	512	1850.2	25.32	340.41
		661	1880	24.99	315.50
		810	1909.8	**26.02**	**399.94**

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	18.22	66.37
		4183	836.6	**19.61**	**91.41**
		4233	846.6	18.86	76.91
	HSDPA	4132	826.4	16.83	48.19
		4183	836.6	**18.20**	**66.07**
		4233	846.6	17.40	54.95
Band 4	REL99	1312	1712.4	23.86	243.22
		1413	1732.6	**24.10**	**257.04**
		1513	1752.6	23.24	210.86
	HSDPA	1312	1712.4	22.79	190.11
		1413	1732.6	**22.97**	**198.15**
		1513	1752.6	22.33	171.00
Band 2	REL99	9262	1852.4	21.48	140.60
		9400	1880.0	21.52	141.91
		9538	1907.6	**23.14**	**206.06**
	HSDPA	9262	1852.4	21.52	141.91
		9400	1880.0	21.69	147.57
		9538	1907.6	**23.20**	**208.93**

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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	17.84	60.81
			1/0	707.5	**17.99**	**62.95**
			1/0	711.0	17.95	62.37
		16QAM	1/0	704.0	16.79	47.75
			1/49	707.5	16.68	46.56
			1/0	711.0	**16.88**	**48.75**
	5	QPSK	1/24	701.5	17.74	59.43
			1/12	707.5	17.78	59.98
			1/12	713.5	**17.82**	**60.53**
		16QAM	1/12	701.5	16.59	45.60
			1/24	707.5	16.59	45.60
			1/24	713.5	**16.74**	**47.21**
	3	QPSK	1/8	700.5	18.36	68.55
			1/0	707.5	**18.43**	**69.66**
			1/8	714.5	18.32	67.92
		16QAM	1/8	700.5	**17.52**	**56.49**
			1/0	707.5	17.37	54.58
			1/14	714.5	17.36	54.45
	1.4	QPSK	1/0	699.7	17.47	55.85
			1/5	707.5	17.72	59.16
			1/5	715.3	**18.05**	**63.83**
		16QAM	1/5	699.7	16.18	41.50
			1/5	707.5	16.65	46.24
			1/0	715.3	**16.98**	**49.89**

LTE Band 13

Band	BW [MHz]	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 13	10	QPSK	1/0	782.0	**21.63**	**145.55**
		16QAM	1/0	782.0	20.37	108.89
	5	QPSK	1/24	779.5	**21.99**	**158.12**
			1/12	782.0	21.72	148.59
			1/12	784.5	21.77	150.31
		16QAM	1/12	779.5	20.38	109.14
			1/24	782.0	20.46	111.17
			1/24	784.5	**20.65**	**116.14**

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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	23.12	205.12
			1/0	1882.5	22.27	168.66
			1/0	1905.0	**24.84**	**304.79**
		16QAM	1/0	1860.0	22.13	163.31
			1/0	1882.5	21.26	133.66
			1/0	1905.0	**23.50**	**223.87**
	15	QPSK	1/0	1857.5	22.49	177.42
			1/0	1882.5	22.22	166.72
			1/37	1907.5	**24.90**	**309.03**
		16QAM	1/0	1857.5	21.24	133.05
			1/37	1882.5	21.14	130.02
			1/0	1907.5	**23.77**	**238.23**
	10	QPSK	1/49	1855.0	22.02	159.22
			1/0	1882.5	22.12	162.93
			1/0	1910.0	**23.92**	**246.60**
		16QAM	1/49	1855.0	20.94	124.17
			1/0	1882.5	21.20	131.83
			1/49	1910.0	**22.08**	**161.44**
	5	QPSK	1/24	1852.5	21.99	158.12
			1/12	1882.5	21.90	154.88
			1/24	1912.5	**23.60**	**229.09**
		16QAM	1/12	1852.5	20.77	119.40
			1/12	1882.5	20.79	119.95
			1/12	1912.5	**22.51**	**178.24**
	3	QPSK	1/14	1851.5	21.90	154.88
			1/0	1882.5	22.64	183.65
			1/8	1913.5	**23.57**	**227.51**
		16QAM	1/14	1851.5	20.76	119.12
			1/0	1882.5	21.25	133.35
			1/8	1913.5	**22.42**	**174.58**
	1.4	QPSK	1/0	1850.7	22.17	164.82
			1/5	1882.5	21.87	153.82
			1/5	1914.3	**23.51**	**224.39**
		16QAM	1/5	1850.7	20.78	119.67
			1/3	1882.5	20.90	123.03
			1/0	1914.3	**22.43**	**174.98**

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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	19.07	80.72
			1/0	831.5	**20.85**	**121.62**
			1/37	841.5	19.46	88.31
		16QAM	1/37	821.5	18.02	63.39
			1/0	831.5	**19.89**	**97.50**
			1/37	841.5	18.04	63.68
	10	QPSK	1/49	819.0	18.95	78.52
			1/0	829.0	20.71	117.76
			1/0	831.5	**20.83**	**121.06**
			1/49	844.0	19.00	79.43
		16QAM	1/49	819.0	18.08	64.27
			1/49	829.0	18.60	72.44
			1/0	831.5	**19.83**	**96.16**
			1/49	844.0	17.83	60.67
	5	QPSK	1/24	816.5	19.38	86.70
			1/24	821.5	18.89	77.45
			1/12	826.5	**20.47**	**111.43**
			1/12	831.5	20.13	103.04
			1/12	846.5	18.90	77.62
		16QAM	1/12	816.5	18.36	68.55
			1/12	821.5	17.83	60.67
			1/0	826.5	**19.39**	**86.90**
			1/24	831.5	19.09	81.10
			1/24	846.5	17.80	60.26
	3	QPSK	1/8	815.5	19.88	97.27
			1/8	822.5	19.09	81.10
			1/14	825.5	18.73	74.64
			1/0	831.5	**20.38**	**109.14**
			1/8	847.5	19.06	80.54
		16QAM	1/14	815.5	18.41	69.34
			1/14	822.5	17.96	62.52
			1/0	825.5	17.94	62.23
			1/0	831.5	**19.27**	**84.53**
			1/8	847.5	18.02	63.39
	1.4	QPSK	1/0	814.7	19.82	95.94
			1/5	823.3	18.76	75.16
			1/5	824.7	18.73	74.64
			1/5	831.5	**19.97**	**99.31**
			1/0	848.3	18.89	77.45
		16QAM	1/3	814.7	18.78	75.51
			1/0	823.3	18.01	63.24
			1/3	824.7	17.74	59.43
			1/0	831.5	**18.88**	**77.27**
			1/5	848.3	17.84	60.81

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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	26.16	413.05
			1/99	2593.0	**26.75**	**473.15**
			1/0	2680.0	24.86	306.20
		16QAM	1/0	2506.0	25.57	360.58
			1/0	2593.0	**26.39**	**435.51**
			1/0	2680.0	24.30	269.15
	15	QPSK	1/0	2503.5	26.28	424.62
			1/0	2593.0	**26.88**	**487.53**
			1/0	2682.5	25.43	349.14
		16QAM	1/0	2503.5	25.56	359.75
			1/0	2593.0	**26.28**	**424.62**
			1/0	2682.5	24.04	253.51
	10	QPSK	1/25	2501.0	26.41	437.52
			1/0	2593.0	**27.18**	**522.40**
			1/25	2685.0	25.21	331.89
		16QAM	1/25	2501.0	26.64	461.32
			1/0	2593.0	**27.66**	**583.45**
			1/0	2685.0	24.22	264.24
	5	QPSK	1/0	2498.5	25.88	387.26
			1/0	2593.0	**27.85**	**609.54**
			1/12	2687.5	24.03	252.93
		16QAM	1/0	2498.5	26.36	432.51
			1/0	2593.0	**27.52**	**564.94**
			1/24	2687.5	23.89	244.91

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

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	24.32	270.40
			1/0	1745.0	**24.44**	**277.97**
			1/0	1770.0	23.84	242.10
		16QAM	1/99	1720.0	23.37	217.27
			1/0	1745.0	**23.59**	**228.56**
			1/99	1770.0	22.49	177.42
	15	QPSK	1/0	1717.5	**24.45**	**278.61**
			1/0	1747.5	23.84	242.10
			1/37	1772.5	22.13	163.31
		16QAM	1/74	1717.5	**22.75**	**188.36**
			1/74	1747.5	21.98	157.76
			1/0	1772.5	21.13	129.72
	10	QPSK	1/49	1715.0	**24.35**	**272.27**
			1/0	1745.0	24.22	264.24
			1/0	1775.0	21.84	152.76
		16QAM	1/49	1715.0	**23.23**	**210.38**
			1/0	1745.0	23.10	204.17
			1/49	1775.0	20.86	121.90
	5	QPSK	1/24	1712.5	11.61	14.49
			1/12	1745.0	**24.00**	**251.19**
			1/24	1777.5	22.97	198.15
		16QAM	1/12	1712.5	11.74	14.93
			1/24	1745.0	**22.97**	**198.15**
			1/24	1777.5	22.07	161.06
	3	QPSK	1/14	1711.5	22.91	195.43
			1/0	1745.0	24.04	253.51
			1/14	1778.5	**24.18**	**261.82**
		16QAM	1/8	1711.5	22.69	185.78
			1/8	1745.0	**23.00**	**199.53**
			1/8	1778.5	22.20	165.96
	1.4	QPSK	1/5	1710.7	23.50	223.87
			1/5	1745.0	**23.64**	**231.21**
			1/5	1779.3	23.01	199.99
		16QAM	1/5	1710.7	22.35	171.79
			1/5	1745.0	**22.41**	**174.18**
			1/3	1779.3	22.13	163.31

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 2

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

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

LTE Band 5

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

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

LTE Band41(PC3)

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

9.5.2. ERP/EIRP DATA

GSM850

GSM850

GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: GPRS 850 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	32.71	V	3.0	-1.0	28.74	38.5	-9.8	
824.20	24.26	H	3.0	-1.0	20.29	38.5	-18.2	
Mid Ch								
836.60	33.42	V	3.0	-0.9	29.48	38.5	-9.0	
836.60	24.69	H	3.0	-0.9	20.75	38.5	-17.7	
High Ch								
848.80	33.77	V	3.1	-0.9	29.86	38.5	-8.6	
848.80	26.00	H	3.1	-0.9	22.09	38.5	-16.4	

GSM850

EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: EGPRS 850 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	27.19	V	3.0	-1.0	23.22	38.5	-15.3	
824.20	18.76	H	3.0	-1.0	14.79	38.5	-23.7	
Mid Ch								
836.60	28.07	V	3.0	-0.9	24.13	38.5	-14.4	
836.60	19.46	H	3.0	-0.9	15.52	38.5	-23.0	
High Ch								
848.80	28.19	V	3.1	-0.9	24.28	38.5	-14.2	
848.80	20.36	H	3.1	-0.9	16.45	38.5	-22.1	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

GSM1900

GSM1900

GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-19
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: GPRS 1900 MHz Fundamentals

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	17.34	V	4.5	9.4	22.26	33.0	-10.7	
1850.20	24.33	H	4.5	9.4	29.25	33.0	-3.8	
Mid Ch								
1880.00	18.62	V	4.5	9.2	23.28	33.0	-9.7	
1880.00	22.84	H	4.5	9.2	27.50	33.0	-5.5	
High Ch								
1909.80	19.26	V	4.6	8.9	23.62	33.0	-9.4	
1909.80	25.36	H	4.6	8.9	29.72	33.0	-3.3	

GSM1900

EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-19
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: EGPRS 1900 MHz Fundamentals

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	14.97	V	4.5	9.4	19.89	33.0	-13.1	
1850.20	20.40	H	4.5	9.4	25.32	33.0	-7.7	
Mid Ch								
1880.00	16.54	V	4.5	9.2	21.20	33.0	-11.8	
1880.00	20.33	H	4.5	9.2	24.99	33.0	-8.0	
High Ch								
1909.80	15.76	V	4.6	8.9	20.12	33.0	-12.9	
1909.80	21.66	H	4.6	8.9	26.02	33.0	-7.0	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 5

WCDMA

Band 5
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: Rel99 Band 5 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	15.36	V	3.0	-0.9	11.40	38.5	-27.1	
826.40	22.18	H	3.0	-0.9	18.22	38.5	-20.3	
Mid Ch								
836.60	17.04	V	3.0	-0.9	13.10	38.5	-25.4	
836.60	23.55	H	3.0	-0.9	19.61	38.5	-18.9	
High Ch								
846.60	16.03	V	3.1	-0.9	12.11	38.5	-26.4	
846.60	22.77	H	3.1	-0.9	18.86	38.5	-19.6	

WCDMA

Band 5
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: HSDPA Band 5 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	13.97	V	3.0	-0.9	10.01	38.5	-28.5	
826.40	20.79	H	3.0	-0.9	16.83	38.5	-21.7	
Mid Ch								
836.60	15.63	V	3.0	-0.9	11.69	38.5	-26.8	
836.60	22.14	H	3.0	-0.9	18.20	38.5	-20.3	
High Ch								
846.60	14.52	V	3.1	-0.9	10.60	38.5	-27.9	
846.60	21.31	H	3.1	-0.9	17.40	38.5	-21.1	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 4

WCDMA

Band 4
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: Rel99 Band 4 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	13.78	V	4.3	9.4	18.86	30.0	-11.1	
1712.40	18.78	H	4.3	9.4	23.86	30.0	-6.1	
Mid Ch								
1732.60	15.04	V	4.3	9.5	20.17	30.0	-9.8	
1732.60	18.97	H	4.3	9.5	24.10	30.0	-5.9	
High Ch								
1752.60	13.52	V	4.4	9.5	18.70	30.0	-11.3	
1752.60	18.06	H	4.4	9.5	23.24	30.0	-6.8	

WCDMA

Band 4
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: HSDPA Band 4 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	12.84	V	4.3	9.4	17.92	30.0	-12.1	
1712.40	17.71	H	4.3	9.4	22.79	30.0	-7.2	
Mid Ch								
1732.60	14.08	V	4.3	9.5	19.21	30.0	-10.8	
1732.60	17.84	H	4.3	9.5	22.97	30.0	-7.0	
High Ch								
1752.60	12.53	V	4.4	9.5	17.71	30.0	-12.3	
1752.60	17.15	H	4.4	9.5	22.33	30.0	-7.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 2

WCDMA

Band 2
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: Rel99 Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	13.06	V	4.5	9.5	18.05	33.0	-14.9	
1852.40	16.50	H	4.5	9.5	21.48	33.0	-11.5	
Mid Ch								
1880.00	12.46	V	4.5	9.3	17.23	33.0	-15.8	
1880.00	16.75	H	4.5	9.3	21.52	33.0	-11.5	
High Ch								
1907.60	12.56	V	4.6	9.1	17.08	33.0	-15.9	
1907.60	18.62	H	4.6	9.1	23.14	33.0	-9.9	

WCDMA

Band 2
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: HSDPA Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	13.00	V	4.5	9.5	17.99	33.0	-15.0	
1852.40	16.54	H	4.5	9.5	21.52	33.0	-11.5	
Mid Ch								
1880.00	12.66	V	4.5	9.3	17.43	33.0	-15.6	
1880.00	16.92	H	4.5	9.3	21.69	33.0	-11.3	
High Ch								
1907.60	12.54	V	4.6	9.1	17.06	33.0	-15.9	
1907.60	18.68	H	4.6	9.1	23.20	33.0	-9.8	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 12

LTE

Band 12

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth

Test Equipment:
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								
704.00	21.68	V	2.8	-1.1	17.84	34.8	-17.0	
704.00	7.56	H	2.8	-1.1	3.72	34.8	-31.1	
Mid Ch								
707.50	21.83	V	2.8	-1.1	17.99	34.8	-16.8	
707.50	7.84	H	2.8	-1.1	4.00	34.8	-30.8	
High Ch								
711.00	21.80	V	2.8	-1.1	17.95	34.8	-16.9	
711.00	8.09	H	2.8	-1.1	4.24	34.8	-30.6	

LTE

Band 12

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth

Test Equipment:
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								
704.00	20.63	V	2.8	-1.1	16.79	34.8	-18.0	
704.00	6.24	H	2.8	-1.1	2.40	34.8	-32.4	
Mid Ch								
707.50	20.52	V	2.8	-1.1	16.68	34.8	-18.1	
707.50	6.96	H	2.8	-1.1	3.12	34.8	-31.7	
High Ch								
711.00	20.73	V	2.8	-1.1	16.88	34.8	-17.9	
711.00	6.96	H	2.8	-1.1	3.11	34.8	-31.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 12

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth

Test Equipment:
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								
701.50	21.58	V	2.8	-1.1	17.74	34.8	-17.1	
701.50	7.76	H	2.8	-1.1	3.93	34.8	-30.9	
Mid Ch								
707.50	21.62	V	2.8	-1.1	17.78	34.8	-17.0	
707.50	7.73	H	2.8	-1.1	3.89	34.8	-30.9	
High Ch								
713.50	21.68	V	2.8	-1.1	17.82	34.8	-17.0	
713.50	7.93	H	2.8	-1.1	4.07	34.8	-30.7	

LTE

Band 12

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth

Test Equipment:
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								
701.50	20.43	V	2.8	-1.1	16.59	34.8	-18.2	
701.50	6.48	H	2.8	-1.1	2.65	34.8	-32.2	
Mid Ch								
707.50	20.43	V	2.8	-1.1	16.59	34.8	-18.2	
707.50	6.79	H	2.8	-1.1	2.95	34.8	-31.9	
High Ch								
713.50	20.60	V	2.8	-1.1	16.74	34.8	-18.1	
713.50	6.85	H	2.8	-1.1	2.99	34.8	-31.8	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 12

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth

Test Equipment:
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								
700.50	22.19	V	2.8	-1.1	18.36	34.8	-16.4	
700.50	7.58	H	2.8	-1.1	3.75	34.8	-31.1	
Mid Ch								
707.50	22.27	V	2.8	-1.1	18.43	34.8	-16.4	
707.50	7.06	H	2.8	-1.1	3.22	34.8	-31.6	
High Ch								
714.50	22.18	V	2.8	-1.1	18.32	34.8	-16.5	
714.50	7.93	H	2.8	-1.1	4.07	34.8	-30.7	

LTE

Band 12

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth

Test Equipment:
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								
700.50	21.35	V	2.8	-1.1	17.52	34.8	-17.3	
700.50	6.76	H	2.8	-1.1	2.93	34.8	-31.9	
Mid Ch								
707.50	21.21	V	2.8	-1.1	17.37	34.8	-17.4	
707.50	6.10	H	2.8	-1.1	2.26	34.8	-32.5	
High Ch								
714.50	21.22	V	2.8	-1.1	17.36	34.8	-17.4	
714.50	7.19	H	2.8	-1.1	3.33	34.8	-31.5	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 12

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
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								
699.70	21.31	V	2.8	-1.1	17.47	34.8	-17.3	
699.70	7.02	H	2.8	-1.1	3.19	34.8	-31.6	
Mid Ch								
707.50	21.56	V	2.8	-1.1	17.72	34.8	-17.1	
707.50	7.91	H	2.8	-1.1	4.07	34.8	-30.7	
High Ch								
715.30	21.92	V	2.8	-1.1	18.05	34.8	-16.7	
715.30	7.90	H	2.8	-1.1	4.03	34.8	-30.8	

LTE

Band 12

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
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								
699.70	20.02	V	2.8	-1.1	16.18	34.8	-18.6	
699.70	6.27	H	2.8	-1.1	2.44	34.8	-32.4	
Mid Ch								
707.50	20.49	V	2.8	-1.1	16.65	34.8	-18.2	
707.50	6.82	H	2.8	-1.1	2.98	34.8	-31.8	
High Ch								
715.30	20.85	V	2.8	-1.1	16.98	34.8	-17.8	
715.30	6.89	H	2.8	-1.1	3.02	34.8	-31.8	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 13

LTE

Band 13

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	25.62	V	2.9	-1.1	21.63	34.8	-13.1	
782.00	15.42	H	2.9	-1.1	11.43	34.8	-23.3	

LTE

Band 13

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	24.36	V	2.9	-1.1	20.37	34.8	-14.4	
782.00	14.38	H	2.9	-1.1	10.39	34.8	-24.4	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 13

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-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	25.97	V	2.9	-1.1	21.99	34.8	-12.8	
779.50	15.46	H	2.9	-1.1	11.48	34.8	-23.3	
Mid Ch								
782.00	25.71	V	2.9	-1.1	21.72	34.8	-13.0	
782.00	15.36	H	2.9	-1.1	11.37	34.8	-23.4	
High Ch								
784.50	25.76	V	2.9	-1.1	21.77	34.8	-13.0	
784.50	15.64	H	2.9	-1.1	11.65	34.8	-23.1	

LTE

Band 13

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT, Z-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	24.36	V	2.9	-1.1	20.38	34.8	-14.4	
779.50	13.62	H	2.9	-1.1	9.64	34.8	-25.1	
Mid Ch								
782.00	24.45	V	2.9	-1.1	20.46	34.8	-14.3	
782.00	14.32	H	2.9	-1.1	10.33	34.8	-24.4	
High Ch								
784.50	24.64	V	2.9	-1.1	20.65	34.8	-14.1	
784.50	14.46	H	2.9	-1.1	10.47	34.8	-24.3	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 25

LTE Band 25 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-21
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 20MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	10.18	V	4.5	9.4	15.11	33.0	-17.9	
1860.00	18.20	H	4.5	9.4	23.12	33.0	-9.9	
Mid Ch								
1882.50	13.61	V	4.5	9.3	18.36	33.0	-14.6	
1882.50	17.52	H	4.5	9.3	22.27	33.0	-10.7	
High Ch								
1905.00	13.96	V	4.6	9.1	18.51	33.0	-14.5	
1905.00	20.29	H	4.6	9.1	24.84	33.0	-8.2	

LTE Band 25 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-21
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 20MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	9.04	V	4.5	9.4	13.97	33.0	-19.0	
1860.00	17.21	H	4.5	9.4	22.13	33.0	-10.9	
Mid Ch								
1882.50	12.76	V	4.5	9.3	17.51	33.0	-15.5	
1882.50	16.51	H	4.5	9.3	21.26	33.0	-11.7	
High Ch								
1905.00	12.96	V	4.6	9.1	17.51	33.0	-15.5	
1905.00	18.95	H	4.6	9.1	23.50	33.0	-9.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 25

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-21
Test Engineer: 20881
Configuration: EUT, X-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	11.19	V	4.5	9.5	16.14	33.0	-16.9	
1857.50	17.54	H	4.5	9.5	22.49	33.0	-10.5	
Mid Ch								
1882.50	13.84	V	4.5	9.3	18.59	33.0	-14.4	
1882.50	17.47	H	4.5	9.3	22.22	33.0	-10.8	
High Ch								
1907.50	14.28	V	4.6	9.1	18.80	33.0	-14.2	
1907.50	20.38	H	4.6	9.1	24.90	33.0	-8.1	

LTE

Band 25

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-21
Test Engineer: 20881
Configuration: EUT, X-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	9.96	V	4.5	9.5	14.91	33.0	-18.1	
1857.50	16.29	H	4.5	9.5	21.24	33.0	-11.8	
Mid Ch								
1882.50	12.73	V	4.5	9.3	17.48	33.0	-15.5	
1882.50	16.39	H	4.5	9.3	21.14	33.0	-11.9	
High Ch								
1907.50	13.19	V	4.6	9.1	17.71	33.0	-15.3	
1907.50	19.25	H	4.6	9.1	23.77	33.0	-9.2	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 25

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-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	12.67	V	4.5	9.5	17.64	33.0	-15.4	
1855.00	17.05	H	4.5	9.5	22.02	33.0	-11.0	
Mid Ch								
1882.50	13.43	V	4.5	9.3	18.18	33.0	-14.8	
1882.50	17.37	H	4.5	9.3	22.12	33.0	-10.9	
High Ch								
1910.00	14.39	V	4.6	9.1	18.87	33.0	-14.1	
1910.00	19.43	H	4.6	9.1	23.92	33.0	-9.1	

LTE

Band 25

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-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	11.63	V	4.5	9.5	16.60	33.0	-16.4	
1855.00	15.97	H	4.5	9.5	20.94	33.0	-12.1	
Mid Ch								
1882.50	12.35	V	4.5	9.3	17.10	33.0	-15.9	
1882.50	16.45	H	4.5	9.3	21.20	33.0	-11.8	
High Ch								
1910.00	13.20	V	4.6	9.1	17.68	33.0	-15.3	
1910.00	17.59	H	4.6	9.1	22.08	33.0	-10.9	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 25

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	13.39	V	4.5	9.5	18.38	33.0	-14.6	
1852.50	17.00	H	4.5	9.5	21.99	33.0	-11.0	
Mid Ch								
1882.50	13.36	V	4.5	9.3	18.11	33.0	-14.9	
1882.50	17.15	H	4.5	9.3	21.90	33.0	-11.1	
High Ch								
1912.50	12.79	V	4.6	9.0	17.25	33.0	-15.8	
1912.50	19.14	H	4.6	9.0	23.60	33.0	-9.4	

LTE

Band 25

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	12.42	V	4.5	9.5	17.41	33.0	-15.6	
1852.50	15.78	H	4.5	9.5	20.77	33.0	-12.2	
Mid Ch								
1882.50	12.32	V	4.5	9.3	17.07	33.0	-15.9	
1882.50	16.04	H	4.5	9.3	20.79	33.0	-12.2	
High Ch								
1912.50	11.98	V	4.6	9.0	16.44	33.0	-16.6	
1912.50	18.05	H	4.6	9.0	22.51	33.0	-10.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 25

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	13.38	V	4.5	9.5	18.38	33.0	-14.6	
1851.50	16.90	H	4.5	9.5	21.90	33.0	-11.1	
Mid Ch								
1882.50	13.12	V	4.5	9.3	17.87	33.0	-15.1	
1882.50	17.89	H	4.5	9.3	22.64	33.0	-10.4	
High Ch								
1913.50	14.64	V	4.6	9.0	19.08	33.0	-13.9	
1913.50	19.13	H	4.6	9.0	23.57	33.0	-9.4	

LTE

Band 25

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	11.94	V	4.5	9.5	16.94	33.0	-16.1	
1851.50	15.76	H	4.5	9.5	20.76	33.0	-12.2	
Mid Ch								
1882.50	12.35	V	4.5	9.3	17.10	33.0	-15.9	
1882.50	16.50	H	4.5	9.3	21.25	33.0	-11.8	
High Ch								
1913.50	13.51	V	4.6	9.0	17.95	33.0	-15.0	
1913.50	17.98	H	4.6	9.0	22.42	33.0	-10.6	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 25

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	13.54	V	4.5	9.5	18.54	33.0	-14.5	
1850.70	17.17	H	4.5	9.5	22.17	33.0	-10.8	
Mid Ch								
1882.50	13.34	V	4.5	9.3	18.09	33.0	-14.9	
1882.50	17.12	H	4.5	9.3	21.87	33.0	-11.1	
High Ch								
1914.30	12.87	V	4.6	9.0	17.30	33.0	-15.7	
1914.30	19.08	H	4.6	9.0	23.51	33.0	-9.5	

LTE

Band 25

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 25 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	12.22	V	4.5	9.5	17.22	33.0	-15.8	
1850.70	15.78	H	4.5	9.5	20.78	33.0	-12.2	
Mid Ch								
1882.50	12.16	V	4.5	9.3	16.91	33.0	-16.1	
1882.50	16.15	H	4.5	9.3	20.90	33.0	-12.1	
High Ch								
1914.30	11.72	V	4.6	9.0	16.15	33.0	-16.9	
1914.30	18.00	H	4.6	9.0	22.43	33.0	-10.6	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 26

LTE

Band 26
(Part 90)
15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
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	15.80	V	3.0	-1.0	11.83	50.0	-38.2	Part 90
821.50	23.04	H	3.0	-1.0	19.07	50.0	-30.9	Part 90

LTE

Band 26
(Part 22)
15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
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
Mid Ch								
831.50	18.08	V	3.0	-0.9	14.14	38.5	-24.4	
831.50	24.80	H	3.0	-0.9	20.85	38.5	-17.7	
High Ch								
841.50	16.53	V	3.0	-0.9	12.61	38.5	-25.9	
841.50	23.38	H	3.0	-0.9	19.46	38.5	-19.0	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
821.50	14.95	V	3.0	-1.0	10.98	50.0	-39.0	Part 90
821.50	21.99	H	3.0	-1.0	18.02	50.0	-32.0	Part 90

LTE

Band 26
(Part 22)
15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
831.50	17.07	V	3.0	-0.9	13.13	38.5	-25.4	
831.50	23.84	H	3.0	-0.9	19.89	38.5	-18.6	
High Ch								
841.50	15.12	V	3.0	-0.9	11.20	38.5	-27.3	
841.50	21.96	H	3.0	-0.9	18.04	38.5	-20.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
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	15.47	V	3.0	-1.0	11.49	50.0	-38.5	Part 90
819.00	22.93	H	3.0	-1.0	18.95	50.0	-31.1	Part 90

LTE

Band 26
(Part 22)
10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
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								
829.00	17.93	V	3.0	-0.9	13.97	50.0	-36.0	
829.00	24.66	H	3.0	-0.9	20.71	50.0	-29.3	
Mid Ch								
831.50	18.03	V	3.0	-0.9	14.09	38.5	-24.4	
831.50	24.78	H	3.0	-0.9	20.83	38.5	-17.7	
High Ch								
844.00	15.87	V	3.0	-0.9	11.95	38.5	-26.6	
844.00	22.92	H	3.0	-0.9	19.00	38.5	-19.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	14.43	V	3.0	-1.0	10.45	50.0	-39.5	Part 90
819.00	22.06	H	3.0	-1.0	18.08	50.0	-31.9	Part 90

LTE

Band 26
(Part 22)
10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	15.25	V	3.0	-0.9	11.29	50.0	-38.7	
829.00	22.55	H	3.0	-0.9	18.60	50.0	-31.4	
Mid Ch								
831.50	16.88	V	3.0	-0.9	12.94	38.5	-25.6	
831.50	23.78	H	3.0	-0.9	19.83	38.5	-18.7	
High Ch								
844.00	14.91	V	3.0	-0.9	10.99	38.5	-27.5	
844.00	21.75	H	3.0	-0.9	17.83	38.5	-20.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 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	16.52	V	3.0	-1.0	12.54	50.0	-37.5	Part 90
816.50	23.36	H	3.0	-1.0	19.38	50.0	-30.6	Part 90
Mid Ch								
821.50	18.02	V	3.0	-1.0	14.05	38.5	-24.4	Part 90
821.50	22.86	H	3.0	-1.0	18.89	38.5	-19.6	Part 90

LTE

Band 26
(Part 22)
5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	17.40	V	3.0	-0.9	13.44	50.0	-36.6	
826.50	24.43	H	3.0	-0.9	20.47	50.0	-29.5	
Mid Ch								
831.50	17.20	V	3.0	-0.9	13.26	38.5	-25.2	
831.50	24.08	H	3.0	-0.9	20.13	38.5	-18.4	
High Ch								
846.50	15.81	V	3.0	-0.9	11.89	38.5	-26.6	
846.50	22.82	H	3.0	-0.9	18.90	38.5	-19.6	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
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	15.74	V	3.0	-1.0	11.76	50.0	-38.2	Part 90
816.50	22.34	H	3.0	-1.0	18.36	50.0	-31.6	Part 90
Mid Ch								
821.50	14.81	V	3.0	-1.0	10.84	38.5	-27.7	Part 90
821.50	21.80	H	3.0	-1.0	17.83	38.5	-20.7	Part 90

LTE

Band 26
(Part 22)
5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
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								
826.50	16.41	V	3.0	-0.9	12.45	50.0	-37.5	
826.50	23.35	H	3.0	-0.9	19.39	50.0	-30.6	
Mid Ch								
831.50	15.93	V	3.0	-0.9	11.99	38.5	-26.5	
831.50	23.04	H	3.0	-0.9	19.09	38.5	-19.4	
High Ch								
846.50	14.46	V	3.0	-0.9	10.54	38.5	-28.0	
846.50	21.72	H	3.0	-0.9	17.80	38.5	-20.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	16.84	V	3.0	-1.0	12.85	50.0	-37.1	Part 90
815.50	23.86	H	3.0	-1.0	19.88	50.0	-30.1	Part 90
Mid Ch								
822.50	16.10	V	3.0	-1.0	12.13	38.5	-26.4	Part 90
822.50	23.05	H	3.0	-1.0	19.09	38.5	-19.4	Part 90

LTE

Band 26
(Part 22)
3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	15.67	V	3.0	-0.9	11.71	50.0	-38.3	
825.50	22.69	H	3.0	-0.9	18.73	50.0	-31.3	
Mid Ch								
831.50	17.67	V	3.0	-0.9	13.73	38.5	-24.8	
831.50	24.33	H	3.0	-0.9	20.38	38.5	-18.1	
High Ch								
847.50	16.06	V	3.1	-0.9	12.15	38.5	-26.3	
847.50	22.97	H	3.1	-0.9	19.06	38.5	-19.4	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	15.81	V	3.0	-1.0	11.82	50.0	-38.2	Part 90
815.50	22.39	H	3.0	-1.0	18.41	50.0	-31.6	Part 90
Mid Ch								
822.50	14.47	V	3.0	-1.0	10.50	38.5	-28.0	Part 90
822.50	21.92	H	3.0	-1.0	17.96	38.5	-20.5	Part 90

LTE

Band 26
(Part 22)
3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	14.78	V	3.0	-0.9	10.82	50.0	-39.2	
825.50	21.90	H	3.0	-0.9	17.94	50.0	-32.1	
Mid Ch								
831.50	16.45	V	3.0	-0.9	12.51	38.5	-26.0	
831.50	23.22	H	3.0	-0.9	19.27	38.5	-19.2	
High Ch								
847.50	14.87	V	3.1	-0.9	10.96	38.5	-27.5	
847.50	21.93	H	3.1	-0.9	18.02	38.5	-20.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	16.97	V	3.0	-1.0	12.99	50.0	-37.0	Part 90
814.70	23.81	H	3.0	-1.0	19.82	50.0	-30.2	Part 90
Mid Ch								
823.30	15.74	V	3.0	-1.0	11.77	38.5	-26.7	Part 90
823.30	22.73	H	3.0	-1.0	18.76	38.5	-19.7	Part 90

LTE

Band 26
(Part 22)
1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	15.57	V	3.0	-1.0	11.60	50.0	-38.4	
824.70	22.69	H	3.0	-1.0	18.73	50.0	-31.3	
Mid Ch								
831.50	17.00	V	3.0	-0.9	13.06	38.5	-25.4	
831.50	23.92	H	3.0	-0.9	19.97	38.5	-18.5	
High Ch								
848.30	15.60	V	3.0	-0.9	11.69	38.5	-26.8	
848.30	22.80	H	3.0	-0.9	18.89	38.5	-19.6	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 26
(Part 90)
1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	15.92	V	3.0	-1.0	11.94	50.0	-38.1	Part 90
814.70	22.77	H	3.0	-1.0	18.78	50.0	-31.2	Part 90
Mid Ch								
823.30	14.56	V	3.0	-1.0	10.59	38.5	-27.9	Part 90
823.30	21.98	H	3.0	-1.0	18.01	38.5	-20.5	Part 90

LTE

Band 26
(Part 22)
1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	14.56	V	3.0	-1.0	10.59	38.5	-27.9	
824.70	21.70	H	3.0	-1.0	17.74	38.5	-20.8	
Mid Ch								
831.50	16.00	V	3.0	-0.9	12.06	38.5	-26.4	
831.50	22.83	H	3.0	-0.9	18.88	38.5	-19.6	
High Ch								
848.30	13.39	V	3.0	-0.9	9.48	38.5	-29.0	
848.30	21.75	H	3.0	-0.9	17.84	38.5	-20.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 41

LTE Band 41 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	19.02	V	5.2	10.1	23.85	33.0	-9.2	
2506.00	21.33	H	5.2	10.1	26.16	33.0	-6.8	
Mid Ch								
2593.00	18.47	V	5.3	10.0	23.10	33.0	-9.9	
2593.00	22.12	H	5.3	10.0	26.75	33.0	-6.2	
High Ch								
2680.00	14.80	V	5.4	10.0	19.38	33.0	-13.6	
2680.00	20.28	H	5.4	10.0	24.86	33.0	-8.1	

LTE Band 41 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 20MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	18.66	V	5.2	10.1	23.49	33.0	-9.5	
2506.00	20.74	H	5.2	10.1	25.57	33.0	-7.4	
Mid Ch								
2593.00	19.29	V	5.3	10.0	23.92	33.0	-9.1	
2593.00	21.76	H	5.3	10.0	26.39	33.0	-6.6	
High Ch								
2680.00	14.85	V	5.4	10.0	19.43	33.0	-13.6	
2680.00	19.72	H	5.4	10.0	24.30	33.0	-8.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 41

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	18.99	V	5.2	10.1	23.82	33.0	-9.2	
2503.50	21.45	H	5.2	10.1	26.28	33.0	-6.7	
Mid Ch								
2593.00	20.19	V	5.3	10.0	24.82	33.0	-8.2	
2593.00	22.25	H	5.3	10.0	26.88	33.0	-6.1	
High Ch								
2682.50	15.43	V	5.4	10.0	20.01	33.0	-13.0	
2682.50	20.84	H	5.4	10.0	25.43	33.0	-7.6	

LTE

Band 41

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	18.61	V	5.2	10.1	23.44	33.0	-9.6	
2503.50	20.73	H	5.2	10.1	25.56	33.0	-7.4	
Mid Ch								
2593.00	19.56	V	5.3	10.0	24.19	33.0	-8.8	
2593.00	21.65	H	5.3	10.0	26.28	33.0	-6.7	
High Ch								
2682.50	14.90	V	5.4	10.0	19.48	33.0	-13.5	
2682.50	19.45	H	5.4	10.0	24.04	33.0	-9.0	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 41

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	19.61	V	5.2	10.1	24.45	33.0	-8.5	
2501.00	21.57	H	5.2	10.1	26.41	33.0	-6.6	
Mid Ch								
2593.00	19.95	V	5.3	10.0	24.58	33.0	-8.4	
2593.00	22.55	H	5.3	10.0	27.18	33.0	-5.8	
High Ch								
2685.00	15.61	V	5.5	10.0	20.19	33.0	-12.8	
2685.00	20.63	H	5.5	10.0	25.21	33.0	-7.8	

LTE

Band 41

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	19.43	V	5.2	10.1	24.27	33.0	-8.7	
2501.00	21.80	H	5.2	10.1	26.64	33.0	-6.4	
Mid Ch								
2593.00	20.01	V	5.3	10.0	24.64	33.0	-8.4	
2593.00	23.03	H	5.3	10.0	27.66	33.0	-5.3	
High Ch								
2685.00	15.25	V	5.5	10.0	19.83	33.0	-13.2	
2685.00	19.64	H	5.5	10.0	24.22	33.0	-8.8	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 41

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	18.31	V	5.2	10.1	23.15	33.0	-9.8	
2498.50	21.04	H	5.2	10.1	25.88	33.0	-7.1	
Mid Ch								
2593.00	19.33	V	5.3	10.0	23.96	33.0	-9.0	
2593.00	23.22	H	5.3	10.0	27.85	33.0	-5.1	
High Ch								
2687.50	16.25	V	5.5	10.0	20.84	33.0	-12.2	
2687.50	19.45	H	5.5	10.0	24.03	33.0	-9.0	

LTE

Band 41

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 8.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	17.96	V	5.2	10.1	22.80	33.0	-10.2	
2498.50	21.52	H	5.2	10.1	26.36	33.0	-6.6	
Mid Ch								
2593.00	19.10	V	5.3	10.0	23.73	33.0	-9.3	
2593.00	22.89	H	5.3	10.0	27.52	33.0	-5.5	
High Ch								
2687.50	15.69	V	5.5	10.0	20.28	33.0	-12.7	
2687.50	19.31	H	5.5	10.0	23.89	33.0	-9.1	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 66

LTE Band 66 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 20MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	19.23	V	4.3	9.4	24.32	30.0	-5.7	
1720.00	14.26	H	4.3	9.4	19.36	30.0	-10.6	
Mid Ch								
1745.00	19.27	V	4.4	9.5	24.44	30.0	-5.6	
1745.00	13.39	H	4.4	9.5	18.55	30.0	-11.4	
High Ch								
1770.00	18.67	V	4.4	9.6	23.84	30.0	-6.2	
1770.00	12.18	H	4.4	9.6	17.35	30.0	-12.7	

LTE Band 66 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 20MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	18.28	V	4.3	9.4	23.37	30.0	-6.6	
1720.00	13.26	H	4.3	9.4	18.36	30.0	-11.6	
Mid Ch								
1745.00	18.42	V	4.4	9.5	23.59	30.0	-6.4	
1745.00	12.41	H	4.4	9.5	17.57	30.0	-12.4	
High Ch								
1770.00	17.32	V	4.4	9.6	22.49	30.0	-7.5	
1770.00	11.15	H	4.4	9.6	16.32	30.0	-13.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 66

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
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	19.35	V	4.3	9.4	24.45	30.0	-5.6	
1717.50	12.11	H	4.3	9.4	17.20	30.0	-12.8	
Mid Ch								
1745.00	18.67	V	4.4	9.5	23.84	30.0	-6.2	
1745.00	14.53	H	4.4	9.5	19.69	30.0	-10.3	
High Ch								
1772.50	16.95	V	4.4	9.6	22.13	30.0	-7.9	
1772.50	11.53	H	4.4	9.6	16.70	30.0	-13.3	

LTE

Band 66

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
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	17.65	V	4.3	9.4	22.75	30.0	-7.3	
1717.50	11.71	H	4.3	9.4	16.80	30.0	-13.2	
Mid Ch								
1745.00	16.81	V	4.4	9.5	21.98	30.0	-8.0	
1745.00	12.04	H	4.4	9.5	17.20	30.0	-12.8	
High Ch								
1772.50	15.95	V	4.4	9.6	21.13	30.0	-8.9	
1772.50	10.41	H	4.4	9.6	15.58	30.0	-14.4	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 66

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
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	19.26	V	4.3	9.4	24.35	30.0	-5.7	
1715.00	14.34	H	4.3	9.4	19.43	30.0	-10.6	
Mid Ch								
1745.00	19.05	V	4.4	9.5	24.22	30.0	-5.8	
1745.00	13.85	H	4.4	9.5	19.01	30.0	-11.0	
High Ch								
1775.00	16.66	V	4.4	9.6	21.84	30.0	-8.2	
1775.00	12.90	H	4.4	9.6	18.08	30.0	-11.9	

LTE

Band 66

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
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	18.14	V	4.3	9.4	23.23	30.0	-6.8	
1715.00	13.35	H	4.3	9.4	18.44	30.0	-11.6	
Mid Ch								
1745.00	17.93	V	4.4	9.5	23.10	30.0	-6.9	
1745.00	12.50	H	4.4	9.5	17.66	30.0	-12.3	
High Ch								
1775.00	15.68	V	4.4	9.6	20.86	30.0	-9.1	
1775.00	11.16	H	4.4	9.6	16.34	30.0	-13.7	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 66

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	6.53	V	4.3	9.4	11.61	30.0	-18.4	
1712.50	4.69	H	4.3	9.4	9.77	30.0	-20.2	
Mid Ch								
1745.00	18.83	V	4.4	9.5	24.00	30.0	-6.0	
1745.00	13.31	H	4.4	9.5	18.47	30.0	-11.5	
High Ch								
1777.50	17.80	V	4.4	9.6	22.97	30.0	-7.0	
1777.50	12.70	H	4.4	9.6	17.87	30.0	-12.1	

LTE

Band 66

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	6.66	V	4.3	9.4	11.74	30.0	-18.3	
1712.50	5.07	H	4.3	9.4	10.15	30.0	-19.9	
Mid Ch								
1745.00	17.80	V	4.4	9.5	22.97	30.0	-7.0	
1745.00	12.01	H	4.4	9.5	17.17	30.0	-12.8	
High Ch								
1777.50	16.90	V	4.4	9.6	22.07	30.0	-7.9	
1777.50	11.67	H	4.4	9.6	16.84	30.0	-13.2	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 66

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
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	17.83	V	4.3	9.4	22.91	30.0	-7.1	
1711.50	12.84	H	4.3	9.4	17.92	30.0	-12.1	
Mid Ch								
1745.00	18.87	V	4.4	9.5	24.04	30.0	-6.0	
1745.00	13.74	H	4.4	9.5	18.90	30.0	-11.1	
High Ch								
1778.50	19.00	V	4.4	9.6	24.18	30.0	-5.8	
1778.50	13.80	H	4.4	9.6	18.98	30.0	-11.0	

LTE

Band 66

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
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	17.61	V	4.3	9.4	22.69	30.0	-7.3	
1711.50	12.36	H	4.3	9.4	17.44	30.0	-12.6	
Mid Ch								
1745.00	17.83	V	4.4	9.5	23.00	30.0	-7.0	
1745.00	12.43	H	4.4	9.5	17.59	30.0	-12.4	
High Ch								
1778.50	17.02	V	4.4	9.6	22.20	30.0	-7.8	
1778.50	11.21	H	4.4	9.6	16.39	30.0	-13.6	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE

Band 66

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	18.43	V	4.3	9.4	23.50	30.0	-6.5	
1710.70	13.23	H	4.3	9.4	18.31	30.0	-11.7	
Mid Ch								
1745.00	18.47	V	4.4	9.5	23.64	30.0	-6.4	
1745.00	13.29	H	4.4	9.5	18.45	30.0	-11.5	
High Ch								
1779.30	17.84	V	4.4	9.6	23.01	30.0	-7.0	
1779.30	12.86	H	4.4	9.6	18.04	30.0	-12.0	

LTE

Band 66

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	17.28	V	4.3	9.4	22.35	30.0	-7.6	
1710.70	12.31	H	4.3	9.4	17.39	30.0	-12.6	
Mid Ch								
1745.00	17.24	V	4.4	9.5	22.41	30.0	-7.6	
1745.00	12.10	H	4.4	9.5	17.26	30.0	-12.7	
High Ch								
1779.30	16.96	V	4.4	9.6	22.13	30.0	-7.9	
1779.30	11.58	H	4.4	9.6	16.76	30.0	-13.2	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

9.6. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

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.

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), Max hold(GSM, LTE Band41);;

RESULTS

See the following pages.
NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

9.6.1. SPURIOUS RADIATION PLOTS

GSM850

GSM850

GPRS

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: GPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1648.40	-14.0	V	3.0	45.2	1.0	-58.2	-13.0	-45.2	
2472.60	-7.6	V	3.0	45.0	1.0	-51.6	-13.0	-38.6	
3296.80	-8.6	V	3.0	45.3	1.0	-52.9	-13.0	-39.9	
1648.40	-12.9	H	3.0	45.2	1.0	-57.1	-13.0	-44.1	
2472.60	-6.3	H	3.0	45.0	1.0	-50.3	-13.0	-37.3	
3296.80	-8.8	H	3.0	45.3	1.0	-53.1	-13.0	-40.1	
Mid Ch, 836.6MHz									
1673.20	-13.4	V	3.0	45.2	1.0	-57.6	-13.0	-44.6	
2509.80	-7.0	V	3.0	45.0	1.0	-51.0	-13.0	-38.0	
3346.40	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
1673.20	-12.7	H	3.0	45.2	1.0	-56.9	-13.0	-43.9	
2509.80	-3.1	H	3.0	45.0	1.0	-47.2	-13.0	-34.2	
3346.40	-9.0	H	3.0	45.3	1.0	-53.2	-13.0	-40.2	
High Ch, 848.8MHz									
1697.60	-13.7	V	3.0	45.2	1.0	-57.9	-13.0	-44.9	
2546.40	-6.7	V	3.0	45.1	1.0	-50.7	-13.0	-37.7	
3395.20	-8.2	V	3.0	45.3	1.0	-52.5	-13.0	-39.5	
1697.60	-13.1	H	3.0	45.2	1.0	-57.2	-13.0	-44.2	
2546.40	-2.9	H	3.0	45.1	1.0	-47.0	-13.0	-34.0	
3395.20	-8.1	H	3.0	45.3	1.0	-52.4	-13.0	-39.4	

GSM850

EGPRS

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: EGPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1648.40	-14.1	V	3.0	45.2	1.0	-58.3	-13.0	-45.3	
2472.60	-10.6	V	3.0	45.0	1.0	-54.7	-13.0	-41.7	
3296.80	-8.7	V	3.0	45.3	1.0	-53.0	-13.0	-40.0	
1648.40	-13.2	H	3.0	45.2	1.0	-57.4	-13.0	-44.4	
2472.60	-10.0	H	3.0	45.0	1.0	-54.1	-13.0	-41.1	
3296.80	-8.9	H	3.0	45.3	1.0	-53.2	-13.0	-40.2	
Mid Ch, 836.6MHz									
1673.20	-14.1	V	3.0	45.2	1.0	-58.3	-13.0	-45.3	
2509.80	-10.8	V	3.0	45.0	1.0	-54.8	-13.0	-41.8	
3346.40	-8.2	V	3.0	45.3	1.0	-52.4	-13.0	-39.4	
1673.20	-13.2	H	3.0	45.2	1.0	-57.4	-13.0	-44.4	
2509.80	-9.1	H	3.0	45.0	1.0	-53.1	-13.0	-40.1	
3346.40	-8.3	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
High Ch, 848.8MHz									
1697.60	-13.9	V	3.0	45.2	1.0	-58.0	-13.0	-45.0	
2546.40	-10.7	V	3.0	45.1	1.0	-54.8	-13.0	-41.8	
3395.20	-8.2	V	3.0	45.3	1.0	-52.4	-13.0	-39.4	
1697.60	-13.0	H	3.0	45.2	1.0	-57.1	-13.0	-44.1	
2546.40	-9.5	H	3.0	45.1	1.0	-53.5	-13.0	-40.5	
3395.20	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

GSM1900

GSM1900

GPRS

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-19
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 2
Mode: GPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.6	V	3.0	42.0	1.0	-51.6	-13.0	-38.6	
5550.60	-6.9	V	3.0	42.9	1.0	-48.8	-13.0	-35.8	
7400.80	-5.4	V	3.0	42.5	1.0	-46.9	-13.0	-33.9	
3700.40	-11.4	H	3.0	42.0	1.0	-52.4	-13.0	-39.4	
5550.60	-6.9	H	3.0	42.9	1.0	-48.8	-13.0	-35.8	
7400.80	-5.3	H	3.0	42.5	1.0	-46.7	-13.0	-33.7	
Mid Ch, 1880MHz									
3760.00	-10.2	V	3.0	42.1	1.0	-51.3	-13.0	-38.3	
5640.00	-6.7	V	3.0	42.9	1.0	-48.6	-13.0	-35.6	
7520.00	-5.6	V	3.0	42.4	1.0	-47.0	-13.0	-34.0	
3760.00	-10.5	H	3.0	42.1	1.0	-51.6	-13.0	-38.6	
5640.00	-6.8	H	3.0	42.9	1.0	-48.7	-13.0	-35.7	
7520.00	-5.7	H	3.0	42.4	1.0	-47.1	-13.0	-34.1	
High Ch, 1909.8MHz									
3819.60	-10.3	V	3.0	42.1	1.0	-51.4	-13.0	-38.4	
5729.40	-6.6	V	3.0	42.9	1.0	-48.5	-13.0	-35.5	
7639.20	-5.2	V	3.0	42.3	1.0	-46.6	-13.0	-33.6	
3819.60	-11.2	H	3.0	42.1	1.0	-52.3	-13.0	-39.3	
5729.40	-7.0	H	3.0	42.9	1.0	-48.9	-13.0	-35.9	
7639.20	-5.6	H	3.0	42.3	1.0	-47.0	-13.0	-34.0	

GSM1900

EGPRS

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-19
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 2
Mode: EGPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.5	V	3.0	42.0	1.0	-51.5	-13.0	-38.5	
5550.60	-7.0	V	3.0	42.9	1.0	-48.9	-13.0	-35.9	
7400.80	-5.5	V	3.0	42.5	1.0	-47.0	-13.0	-34.0	
3700.40	-10.6	H	3.0	42.0	1.0	-51.6	-13.0	-38.6	
5550.60	-6.8	H	3.0	42.9	1.0	-48.6	-13.0	-35.6	
7400.80	-5.3	H	3.0	42.5	1.0	-46.8	-13.0	-33.8	
Mid Ch, 1880MHz									
3760.00	-10.1	V	3.0	42.1	1.0	-51.2	-13.0	-38.2	
5640.00	-6.8	V	3.0	42.9	1.0	-48.6	-13.0	-35.6	
7520.00	-5.4	V	3.0	42.4	1.0	-46.8	-13.0	-33.8	
3760.00	-10.1	H	3.0	42.1	1.0	-51.2	-13.0	-38.2	
5640.00	-6.8	H	3.0	42.9	1.0	-48.7	-13.0	-35.7	
7520.00	-5.6	H	3.0	42.4	1.0	-47.0	-13.0	-34.0	
High Ch, 1909.8MHz									
3819.60	-10.3	V	3.0	42.1	1.0	-51.4	-13.0	-38.4	
5729.40	-6.9	V	3.0	42.9	1.0	-48.8	-13.0	-35.8	
7639.20	-5.5	V	3.0	42.3	1.0	-46.8	-13.0	-33.8	
3819.60	-10.1	H	3.0	42.1	1.0	-51.2	-13.0	-38.2	
5729.40	-7.2	H	3.0	42.9	1.0	-49.1	-13.0	-36.1	
7639.20	-5.5	H	3.0	42.3	1.0	-46.9	-13.0	-33.9	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 5

WCDMA

Band 5
REL99

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: Rel99 Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1652.80	-14.9	V	3.0	45.2	1.0	-59.1	-13.0	-46.1	
2479.20	-11.6	V	3.0	45.0	1.0	-55.6	-13.0	-42.6	
3305.60	-9.5	V	3.0	45.3	1.0	-53.8	-13.0	-40.8	
1652.80	-13.7	H	3.0	45.2	1.0	-57.9	-13.0	-44.9	
2479.20	-11.0	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
3305.60	-9.6	H	3.0	45.3	1.0	-53.9	-13.0	-40.9	
Mid Ch, 836.6MHz									
1673.20	-14.8	V	3.0	45.2	1.0	-59.0	-13.0	-46.0	
2509.80	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
3346.40	-9.0	V	3.0	45.3	1.0	-53.3	-13.0	-40.3	
1673.20	-14.0	H	3.0	45.2	1.0	-58.2	-13.0	-45.2	
2509.80	-10.9	H	3.0	45.0	1.0	-55.0	-13.0	-42.0	
3346.40	-9.1	H	3.0	45.3	1.0	-53.4	-13.0	-40.4	
High Ch, 846.6MHz									
1693.20	-14.7	V	3.0	45.2	1.0	-58.9	-13.0	-45.9	
2539.80	-11.4	V	3.0	45.0	1.0	-55.5	-13.0	-42.5	
3386.40	-8.9	V	3.0	45.3	1.0	-53.2	-13.0	-40.2	
1693.20	-13.8	H	3.0	45.2	1.0	-57.9	-13.0	-44.9	
2539.80	-11.1	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
3386.40	-9.1	H	3.0	45.3	1.0	-53.4	-13.0	-40.4	

WCDMA

Band 5
HSDPA

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: HSDPA Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1652.80	-14.9	V	3.0	45.2	1.0	-59.1	-13.0	-46.1	
2479.20	-11.5	V	3.0	45.0	1.0	-55.5	-13.0	-42.5	
3305.60	-9.5	V	3.0	45.3	1.0	-53.8	-13.0	-40.8	
1652.80	-13.9	H	3.0	45.2	1.0	-58.1	-13.0	-45.1	
2479.20	-10.9	H	3.0	45.0	1.0	-55.0	-13.0	-42.0	
3305.60	-9.6	H	3.0	45.3	1.0	-53.8	-13.0	-40.8	
Mid Ch, 836.6MHz									
1673.20	-14.8	V	3.0	45.2	1.0	-59.0	-13.0	-46.0	
2509.80	-11.6	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
3346.40	-9.0	V	3.0	45.3	1.0	-53.2	-13.0	-40.2	
1673.20	-14.0	H	3.0	45.2	1.0	-58.2	-13.0	-45.2	
2509.80	-11.0	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
3346.40	-9.0	H	3.0	45.3	1.0	-53.3	-13.0	-40.3	
High Ch, 846.6MHz									
1693.20	-14.7	V	3.0	45.2	1.0	-58.9	-13.0	-45.9	
2539.80	-11.5	V	3.0	45.0	1.0	-55.5	-13.0	-42.5	
3386.40	-8.9	V	3.0	45.3	1.0	-53.2	-13.0	-40.2	
1693.20	-13.8	H	3.0	45.2	1.0	-58.0	-13.0	-45.0	
2539.80	-11.0	H	3.0	45.0	1.0	-55.0	-13.0	-42.0	
3386.40	-9.1	H	3.0	45.3	1.0	-53.4	-13.0	-40.4	

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 4

WCDMA

Band 4
REL99

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: Rel99 Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4MHz									
3424.80	-12.0	V	3.0	45.3	1.0	-56.3	-13.0	-43.3	
5137.20	-6.8	V	3.0	45.3	1.0	-51.1	-13.0	-38.1	
6849.60	-5.5	V	3.0	44.5	1.0	-49.0	-13.0	-36.0	
3424.80	-8.8	H	3.0	45.3	1.0	-53.1	-13.0	-40.1	
5137.20	-8.1	H	3.0	45.3	1.0	-52.4	-13.0	-39.4	
6849.60	-5.6	H	3.0	44.5	1.0	-49.1	-13.0	-36.1	
Mid Ch, 1732.6MHz									
3465.20	-7.9	V	3.0	45.3	1.0	-52.3	-13.0	-39.3	
5197.80	-7.5	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
6930.40	-5.5	V	3.0	44.4	1.0	-48.9	-13.0	-35.9	
3465.20	-8.1	H	3.0	45.3	1.0	-52.4	-13.0	-39.4	
5197.80	-7.9	H	3.0	45.3	1.0	-52.2	-13.0	-39.2	
6930.40	-5.6	H	3.0	44.4	1.0	-49.0	-13.0	-36.0	
High Ch, 1752.6MHz									
3505.20	-7.6	V	3.0	45.3	1.0	-51.9	-13.0	-38.9	
5257.80	-7.6	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7010.40	-5.2	V	3.0	44.4	1.0	-48.6	-13.0	-35.6	
3505.20	-7.8	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
5257.80	-7.9	H	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7010.40	-5.2	H	3.0	44.4	1.0	-48.5	-13.0	-35.5	

WCDMA

Band 4
HSDPA

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: HSDPA Band 4 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4MHz									
3424.80	-11.7	V	3.0	45.3	1.0	-56.0	-13.0	-43.0	
5137.20	-7.8	V	3.0	45.3	1.0	-52.1	-13.0	-39.1	
6849.60	-5.4	V	3.0	44.5	1.0	-48.9	-13.0	-35.9	
3424.80	-8.7	H	3.0	45.3	1.0	-53.0	-13.0	-40.0	
5137.20	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
6849.60	-5.5	H	3.0	44.5	1.0	-49.0	-13.0	-36.0	
Mid Ch, 1732.6MHz									
3465.20	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
5197.80	-7.5	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
6930.40	-5.4	V	3.0	44.4	1.0	-48.9	-13.0	-35.9	
3465.20	-8.1	H	3.0	45.3	1.0	-52.4	-13.0	-39.4	
5197.80	-7.8	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
6930.40	-5.5	H	3.0	44.4	1.0	-49.0	-13.0	-36.0	
High Ch, 1752.6MHz									
3505.20	-7.5	V	3.0	45.3	1.0	-51.9	-13.0	-38.9	
5257.80	-7.5	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7010.40	-5.1	V	3.0	44.4	1.0	-48.5	-13.0	-35.5	
3505.20	-7.7	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
5257.80	-7.9	H	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7010.40	-5.2	H	3.0	44.4	1.0	-48.5	-13.0	-35.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

WCDMA Band 2

WCDMA

Band 2
REL99

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: Rel99 Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-10.5	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
5557.20	-7.7	V	3.0	45.3	1.0	-52.0	-13.0	-39.0	
7409.60	-5.1	V	3.0	44.1	1.0	-48.3	-13.0	-35.3	
3704.80	-10.8	H	3.0	45.4	1.0	-55.2	-13.0	-42.2	
5557.20	-7.9	H	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7409.60	-5.1	H	3.0	44.1	1.0	-48.3	-13.0	-35.3	
Mid Ch, 1880MHz									
3760.00	-10.4	V	3.0	45.4	1.0	-54.8	-13.0	-41.8	
5640.00	-7.5	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7520.00	-5.2	V	3.0	44.1	1.0	-48.3	-13.0	-35.3	
3760.00	-10.7	H	3.0	45.4	1.0	-55.1	-13.0	-42.1	
5640.00	-7.6	H	3.0	45.3	1.0	-51.9	-13.0	-38.9	
7520.00	-5.1	H	3.0	44.1	1.0	-48.2	-13.0	-35.2	
High Ch, 1907.6MHz									
3815.20	-10.5	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
5722.80	-7.6	V	3.0	45.3	1.0	-51.9	-13.0	-38.9	
7630.40	-5.1	V	3.0	44.0	1.0	-48.1	-13.0	-35.1	
3815.20	-10.8	H	3.0	45.4	1.0	-55.2	-13.0	-42.2	
5722.80	-7.8	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
7630.40	-5.0	H	3.0	44.0	1.0	-48.0	-13.0	-35.0	

WCDMA

Band 2
HSDPA

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-14
Test Engineer: 20881
Configuration: EUT / AC Adapter
Location: Chamber 1
Mode: HSDPA Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-10.6	V	3.0	45.4	1.0	-55.0	-13.0	-42.0	
5557.20	-7.7	V	3.0	45.3	1.0	-52.0	-13.0	-39.0	
7409.60	-5.3	V	3.0	44.1	1.0	-48.4	-13.0	-35.4	
3704.80	-10.8	H	3.0	45.4	1.0	-55.2	-13.0	-42.2	
5557.20	-7.9	H	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7409.60	-5.1	H	3.0	44.1	1.0	-48.2	-13.0	-35.2	
Mid Ch, 1880MHz									
3760.00	-10.4	V	3.0	45.4	1.0	-54.8	-13.0	-41.8	
5640.00	-7.5	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7520.00	-5.3	V	3.0	44.1	1.0	-48.4	-13.0	-35.4	
3760.00	-10.7	H	3.0	45.4	1.0	-55.1	-13.0	-42.1	
5640.00	-7.6	H	3.0	45.3	1.0	-51.9	-13.0	-38.9	
7520.00	-5.1	H	3.0	44.1	1.0	-48.2	-13.0	-35.2	
High Ch, 1907.6MHz									
3815.20	-10.4	V	3.0	45.4	1.0	-54.8	-13.0	-41.8	
5722.80	-7.6	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7630.40	-5.0	V	3.0	44.0	1.0	-48.1	-13.0	-35.1	
3815.20	-10.9	H	3.0	45.4	1.0	-55.3	-13.0	-42.3	
5722.80	-7.8	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
7630.40	-4.9	H	3.0	44.0	1.0	-47.9	-13.0	-34.9	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 12

LTE

Band 12

3MHz

QPSK

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT / AC Adapter
Location: Chamber 2
Mode: LTE_QPSK Band 12 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 700.5MHz									
1401.00	-15.8	V	3.0	40.7	1.0	-55.5	-13.0	-42.5	
2101.50	-13.4	V	3.0	40.7	1.0	-53.2	-13.0	-40.2	
2802.00	-11.1	V	3.0	41.7	1.0	-51.9	-13.0	-38.9	
1401.00	-17.0	H	3.0	40.7	1.0	-56.8	-13.0	-43.8	
2101.50	-13.6	H	3.0	40.7	1.0	-53.3	-13.0	-40.3	
2802.00	-10.9	H	3.0	41.7	1.0	-51.7	-13.0	-38.7	
Mid Ch, 707.5MHz									
1415.00	-15.3	V	3.0	40.7	1.0	-55.0	-13.0	-42.0	
2122.50	-13.5	V	3.0	40.8	1.0	-53.3	-13.0	-40.3	
2830.00	-11.0	V	3.0	41.8	1.0	-51.8	-13.0	-38.8	
1415.00	-16.5	H	3.0	40.7	1.0	-56.2	-13.0	-43.2	
2122.50	-12.7	H	3.0	40.8	1.0	-52.5	-13.0	-39.5	
2830.00	-10.6	H	3.0	41.8	1.0	-51.4	-13.0	-38.4	
High Ch, 714.5MHz									
1429.00	-15.7	V	3.0	40.7	1.0	-55.4	-13.0	-42.4	
2143.50	-13.3	V	3.0	40.8	1.0	-53.1	-13.0	-40.1	
2858.00	-10.5	V	3.0	41.8	1.0	-51.4	-13.0	-38.4	
1429.00	-16.6	H	3.0	40.7	1.0	-56.3	-13.0	-43.3	
2143.50	-13.3	H	3.0	40.8	1.0	-53.1	-13.0	-40.1	
2858.00	-10.0	H	3.0	41.8	1.0	-50.8	-13.0	-37.8	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 13

LTE

Band 13

5MHz

QPSK

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20881
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 779.5MHz									
1559.00	-24.8	V	3.0	45.3	1.0	-69.1	-40.0	-29.1	
2338.50	-12.2	V	3.0	45.0	1.0	-56.2	-13.0	-43.2	
3118.00	-10.0	V	3.0	45.2	1.0	-54.2	-13.0	-41.2	
1559.00	-23.8	H	3.0	45.3	1.0	-68.0	-40.0	-28.0	
2338.50	-11.5	H	3.0	45.0	1.0	-55.5	-13.0	-42.5	
3118.00	-10.2	H	3.0	45.2	1.0	-54.4	-13.0	-41.4	
Mid Ch, 782MHz									
1564.00	-24.7	V	3.0	45.3	1.0	-69.0	-40.0	-29.0	
2346.00	-12.3	V	3.0	45.0	1.0	-56.3	-13.0	-43.3	
3128.00	-9.9	V	3.0	45.2	1.0	-54.1	-13.0	-41.1	
1564.00	-24.0	H	3.0	45.3	1.0	-68.3	-40.0	-28.3	
2346.00	-11.6	H	3.0	45.0	1.0	-55.6	-13.0	-42.6	
3128.00	-10.1	H	3.0	45.2	1.0	-54.3	-13.0	-41.3	
High Ch, 784.5MHz									
1569.00	-24.8	V	3.0	45.3	1.0	-69.1	-40.0	-29.1	
2353.50	-12.2	V	3.0	45.0	1.0	-56.2	-13.0	-43.2	
3138.00	-10.0	V	3.0	45.2	1.0	-54.2	-13.0	-41.2	
1569.00	-24.0	H	3.0	45.3	1.0	-68.3	-40.0	-28.3	
2353.50	-11.5	H	3.0	45.0	1.0	-55.5	-13.0	-42.5	
3138.00	-10.0	H	3.0	45.2	1.0	-54.2	-13.0	-41.2	

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

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 25

LTE

Band 25

3MHz
QPSK

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-21
Test Engineer: 20881
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5MHz									
3703.00	-10.7	V	3.0	45.4	1.0	-55.0	-13.0	-42.0	
5554.50	-7.7	V	3.0	45.3	1.0	-52.0	-13.0	-39.0	
7406.00	-5.3	V	3.0	44.1	1.0	-48.4	-13.0	-35.4	
3703.00	-10.9	H	3.0	45.4	1.0	-55.3	-13.0	-42.3	
5554.50	-8.0	H	3.0	45.3	1.0	-52.3	-13.0	-39.3	
7406.00	-5.2	H	3.0	44.1	1.0	-48.3	-13.0	-35.3	
Mid Ch, 1882.5MHz									
3765.00	-10.4	V	3.0	45.4	1.0	-54.8	-13.0	-41.8	
5647.50	-7.5	V	3.0	45.3	1.0	-51.7	-13.0	-38.7	
7530.00	-5.2	V	3.0	44.1	1.0	-48.3	-13.0	-35.3	
3765.00	-10.7	H	3.0	45.4	1.0	-55.2	-13.0	-42.2	
5647.50	-7.8	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
7530.00	-5.2	H	3.0	44.1	1.0	-48.3	-13.0	-35.3	
High Ch, 1913.5MHz									
3827.00	-10.6	V	3.0	45.4	1.0	-55.1	-13.0	-42.1	
5740.50	-7.7	V	3.0	45.3	1.0	-51.9	-13.0	-38.9	
7654.00	-5.2	V	3.0	44.0	1.0	-48.2	-13.0	-35.2	
3827.00	-10.9	H	3.0	45.4	1.0	-55.3	-13.0	-42.3	
5740.50	-7.8	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
7654.00	-5.0	H	3.0	44.0	1.0	-48.0	-13.0	-35.0	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 26

LTE

Band 26
(Part 90)

3MHz
QPSK

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 815.5MHz									
1651.00	-14.6	V	3.0	45.2	1.0	-58.8	-13.0	-45.8	
2476.50	-11.4	V	3.0	45.0	1.0	-55.4	-13.0	-42.4	
3302.00	-9.8	V	3.0	45.3	1.0	-54.1	-13.0	-41.1	
1651.00	-14.1	H	3.0	45.2	1.0	-58.3	-13.0	-45.3	
2476.50	-11.0	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
3302.00	-9.7	H	3.0	45.3	1.0	-54.0	-13.0	-41.0	
Mid CH, 822.5MHz									
1645.00	-15.0	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
2467.50	-11.7	V	3.0	45.0	1.0	-55.8	-13.0	-42.8	
3290.00	-9.7	V	3.0	45.3	1.0	-53.9	-13.0	-40.9	
1645.00	-14.2	H	3.0	45.2	1.0	-58.4	-13.0	-45.4	
2467.50	-10.7	H	3.0	45.0	1.0	-54.8	-13.0	-41.8	
3290.00	-9.9	H	3.0	45.3	1.0	-54.1	-13.0	-41.1	

LTE

Band 26
(Part 22)

3MHz
QPSK

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-11
Test Engineer: 20882
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low CH, 825.5MHz									
1651.00	-15.2	V	3.0	45.2	1.0	-59.4	-13.0	-46.4	
2476.50	-12.0	V	3.0	45.0	1.0	-56.0	-13.0	-43.0	
3302.00	-9.4	V	3.0	45.3	1.0	-53.7	-13.0	-40.7	
1651.00	-14.4	H	3.0	45.2	1.0	-58.6	-13.0	-45.6	
2476.50	-11.1	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
3302.00	-9.8	H	3.0	45.3	1.0	-54.1	-13.0	-41.1	
Mid Ch, 831.5MHz									
1663.00	-15.4	V	3.0	45.2	1.0	-59.6	-13.0	-46.6	
2494.50	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
3326.00	-9.5	V	3.0	45.3	1.0	-53.7	-13.0	-40.7	
1663.00	-14.5	H	3.0	45.2	1.0	-58.7	-13.0	-45.7	
2494.50	-10.3	H	3.0	45.0	1.0	-54.4	-13.0	-41.4	
3326.00	-9.6	H	3.0	45.3	1.0	-53.9	-13.0	-40.9	
High Ch, 847.5MHz									
1695.00	-15.1	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
2542.50	-11.8	V	3.0	45.0	1.0	-55.8	-13.0	-42.8	
3390.00	-8.8	V	3.0	45.3	1.0	-53.1	-13.0	-40.1	
1695.00	-14.3	H	3.0	45.2	1.0	-58.5	-13.0	-45.5	
2542.50	-11.4	H	3.0	45.0	1.0	-55.5	-13.0	-42.5	
3390.00	-9.3	H	3.0	45.3	1.0	-53.5	-13.0	-40.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 41 (PC2)

LTE

Band 41

5MHz
QPSK

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-12
Test Engineer: 20881
Configuration: EUT/ AC Adapter, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2498.5MHz									
4997.00	-18.0	V	3.0	42.7	1.0	-59.8	-25.0	-34.8	
7495.50	-17.1	V	3.0	42.4	1.0	-58.5	-25.0	-33.5	
9994.00	-14.2	V	3.0	40.8	1.0	-54.0	-25.0	-29.0	
4997.00	-18.1	H	3.0	42.7	1.0	-59.8	-25.0	-34.8	
7495.50	-17.2	H	3.0	42.4	1.0	-58.6	-25.0	-33.6	
9994.00	-14.4	H	3.0	40.8	1.0	-54.2	-25.0	-29.2	
Mid Ch, 2593MHz									
5186.00	-17.1	V	3.0	42.8	1.0	-58.9	-25.0	-33.9	
7779.00	-17.4	V	3.0	42.3	1.0	-58.7	-25.0	-33.7	
10372.00	-13.3	V	3.0	41.0	1.0	-53.3	-25.0	-28.3	
5186.00	-16.6	H	3.0	42.8	1.0	-58.4	-25.0	-33.4	
7779.00	-17.2	H	3.0	42.3	1.0	-58.5	-25.0	-33.5	
10372.00	-14.5	H	3.0	41.0	1.0	-54.5	-25.0	-29.5	
High Ch, 2687.5MHz									
5375.00	-17.7	V	3.0	42.8	1.0	-59.5	-25.0	-34.5	
8062.50	-16.7	V	3.0	42.1	1.0	-57.8	-25.0	-32.8	
10750.00	-12.8	V	3.0	41.2	1.0	-53.0	-25.0	-28.0	
5375.00	-17.5	H	3.0	42.8	1.0	-59.3	-25.0	-34.3	
8062.50	-17.4	H	3.0	42.1	1.0	-58.6	-25.0	-33.6	
10750.00	-13.1	H	3.0	41.2	1.0	-53.3	-25.0	-28.3	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 66

LTE

Band 66

3MHz
QPSK

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

Company: Samsung
Project #: 4789468331
Date: 2020-05-20
Test Engineer: 20881
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5MHz									
3423.00	-8.7	V	3.0	45.3	1.0	-53.0	-13.0	-40.0	
5134.50	-7.8	V	3.0	45.3	1.0	-52.1	-13.0	-39.1	
6846.00	-5.5	V	3.0	44.5	1.0	-49.0	-13.0	-36.0	
3423.00	-9.0	H	3.0	45.3	1.0	-53.3	-13.0	-40.3	
5134.50	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
6846.00	-5.6	H	3.0	44.5	1.0	-49.1	-13.0	-36.1	
Mid Ch, 1745MHz									
3490.00	-8.1	V	3.0	45.3	1.0	-52.5	-13.0	-39.5	
5235.00	-7.6	V	3.0	45.3	1.0	-51.8	-13.0	-38.8	
6980.00	-5.4	V	3.0	44.4	1.0	-48.7	-13.0	-35.7	
3490.00	-8.3	H	3.0	45.3	1.0	-52.6	-13.0	-39.6	
5235.00	-7.8	H	3.0	45.3	1.0	-52.1	-13.0	-39.1	
6980.00	-5.2	H	3.0	44.4	1.0	-48.6	-13.0	-35.6	
High Ch, 1778.5MHz									
3557.00	-7.1	V	3.0	45.3	1.0	-51.4	-13.0	-38.4	
5335.50	-7.2	V	3.0	45.3	1.0	-51.5	-13.0	-38.5	
7114.00	-5.1	V	3.0	44.3	1.0	-48.4	-13.0	-35.4	
3557.00	-7.4	H	3.0	45.3	1.0	-51.8	-13.0	-38.8	
5335.50	-7.5	H	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7114.00	-5.2	H	3.0	44.3	1.0	-48.5	-13.0	-35.5	

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LTE Band 2

LTE Band 2(Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

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

LTE Band 5

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

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

LTE Band41(PC3)

LTE Band 41(PC3, Frequency range : 2496-2690 MHz) is covered by LTE Band 41(PC2) (Frequency range: 2496-2690 MHz) due to same frequency range, same channel bandwidth and maximum tune-up limit is higher than LTE Band41(PC3).

END OF TEST REPORT

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.