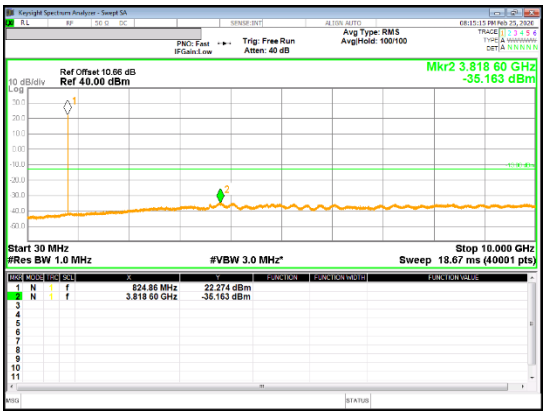
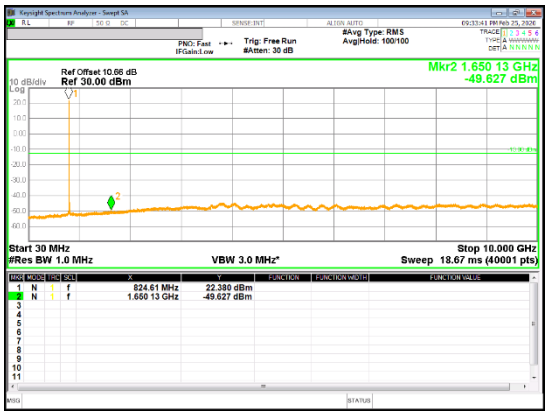
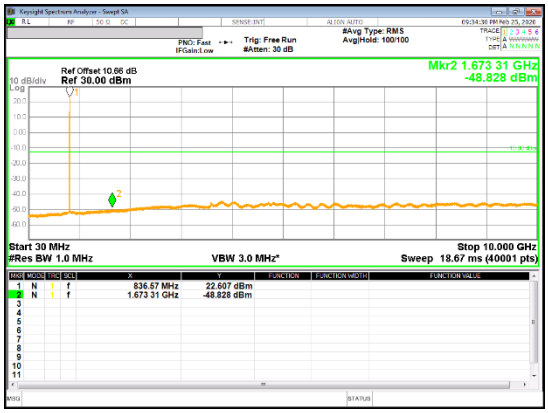
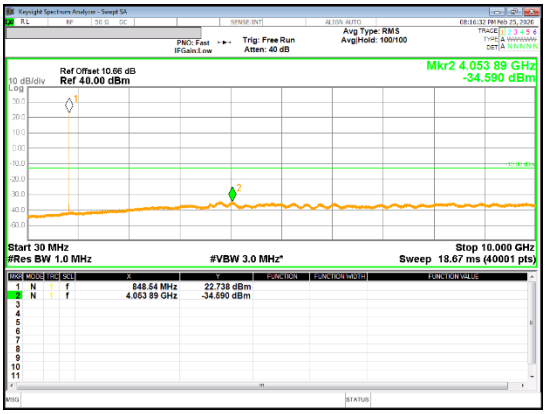
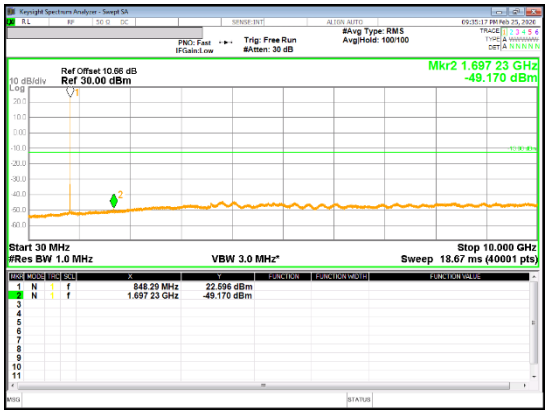
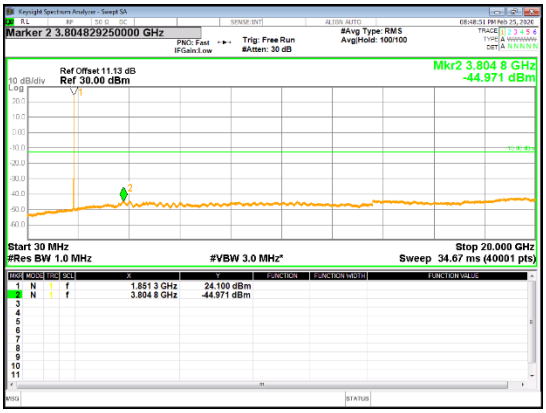
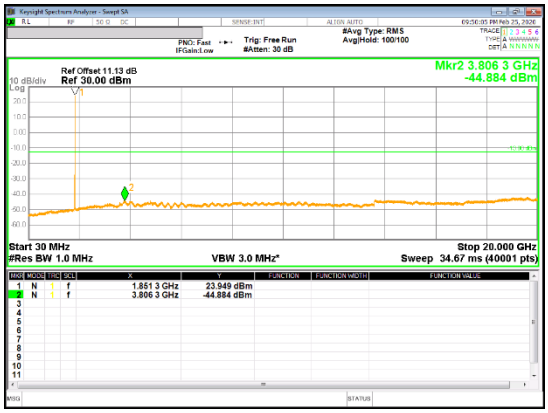
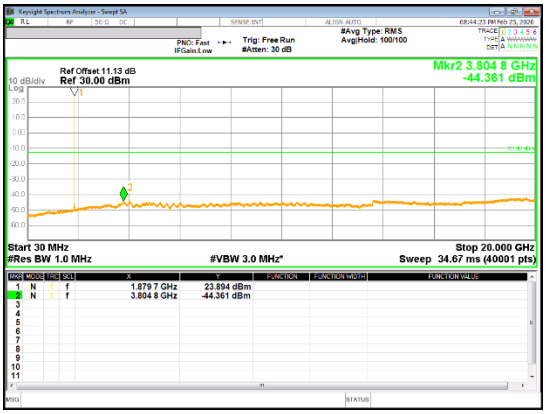
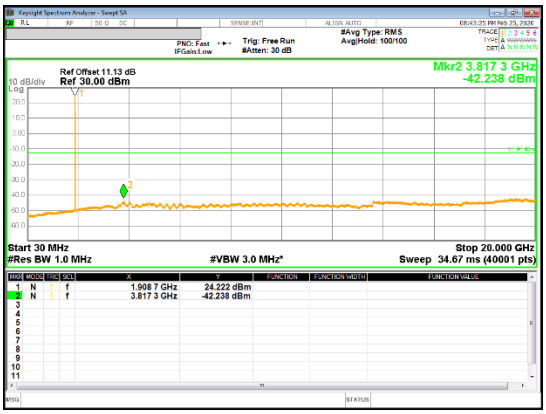
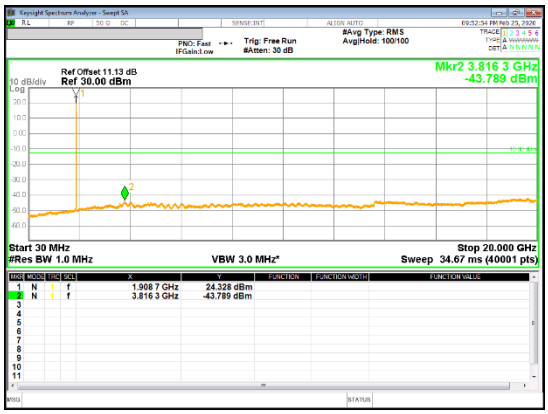
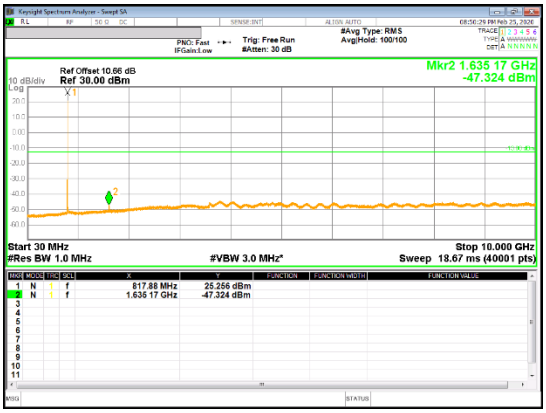
9.3.1. OUT OF BAND EMISSIONS RESULT

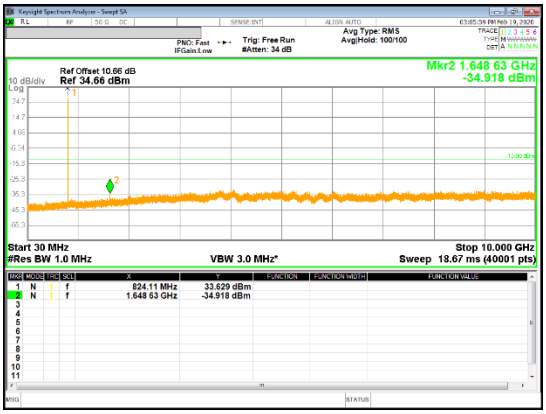
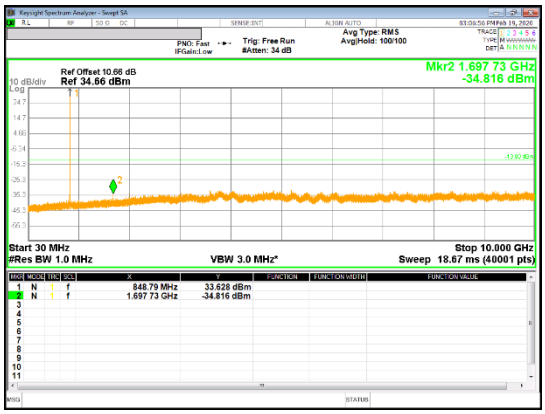
CDMA

BC0	 Band BC0 1xRTT Low channel	 Band BC0 EVDO Rel.0 Low channel
	 Band BC0 1xRTT Mid channel	 Band BC0 EVDO Rel.0 Mid channel
	 Band BC0 1xRTT High channel	 Band BC0 EVDO Rel.0 High channel

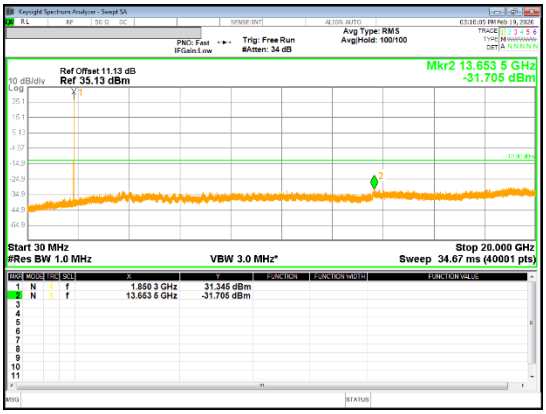
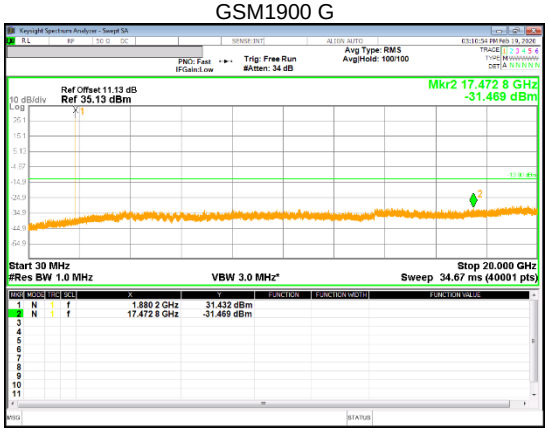
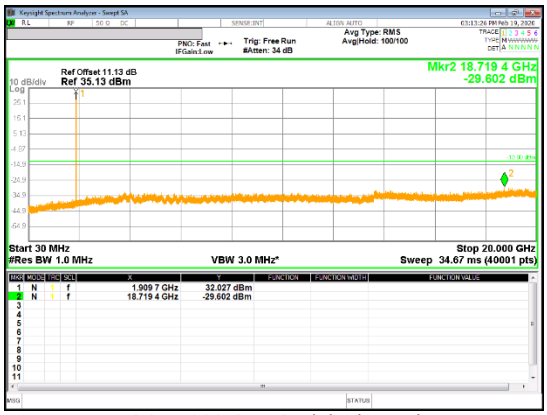
BC1	 Band BC1 1xRTT Low channel	 Band BC1 EVDO Rel.0 Low channel
	 Band BC1 1xRTT Mid channel	 Band BC1 EVDO Rel.0 Mid channel
	 Band BC1 1xRTT High channel	 Band BC1 EVDO Rel.0 High channel

BC10	 Band BC10 1xRTT Low channel
	 Band BC10 1xRTT Mid channel
	 Band BC10 1xRTT High channel

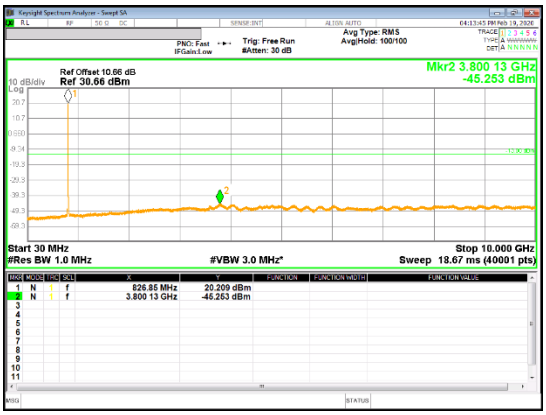
GSM 850

GSM 850	 GSM850 GPRS Low channel	 GSM850 GPRS Mid channel
	 GSM850 GPRS High channel	

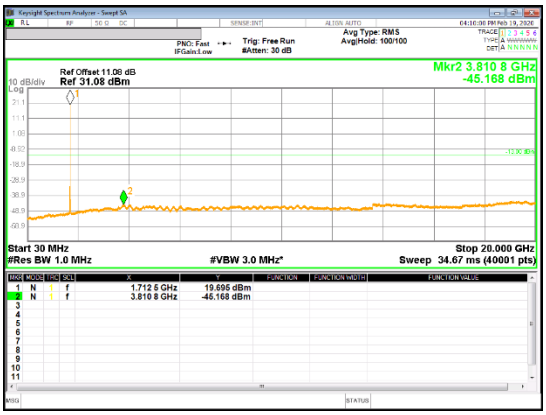
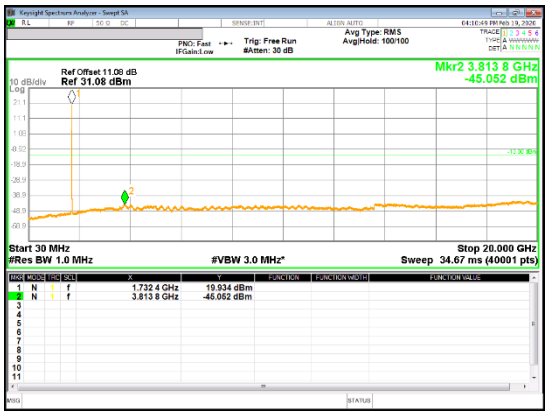
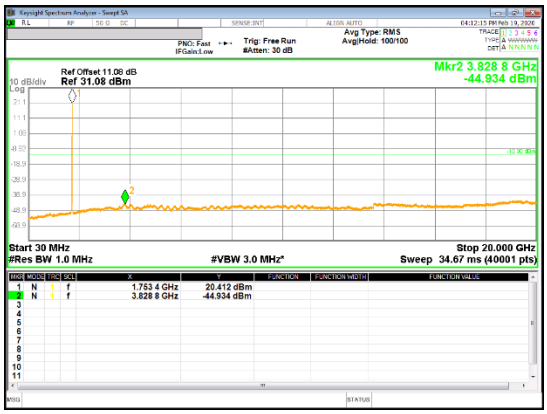
GSM 1900

GSM 1900	 GSM1900 GPRS Low channel	GSM1900 G  PRS Mid channel
	 GSM1900 GPRS High channel	

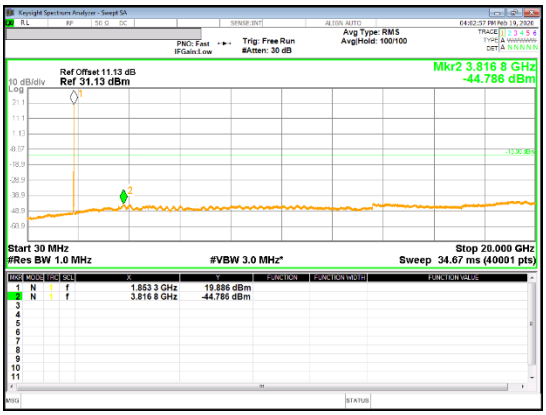
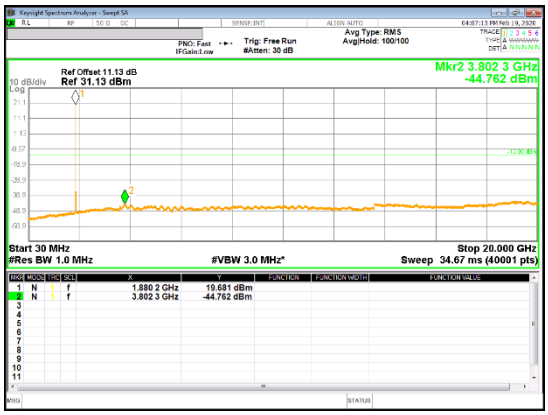
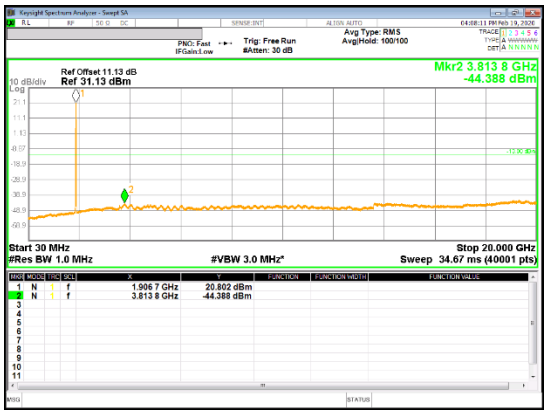
WCDMA Band 5

Band 5	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

WCDMA Band 4

Band 4	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

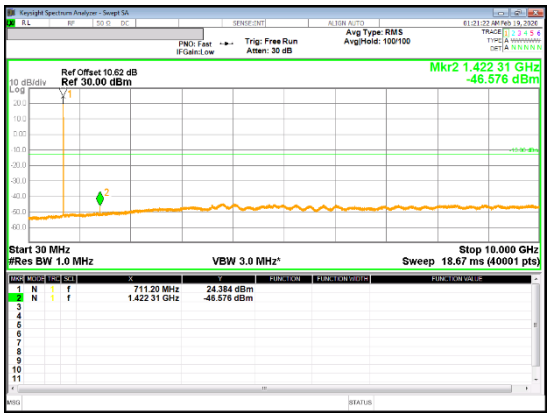
WCDMA Band 2

Band 2	 REL99 Low channel	 REL99 Mid channel
	 REL99 High channel	

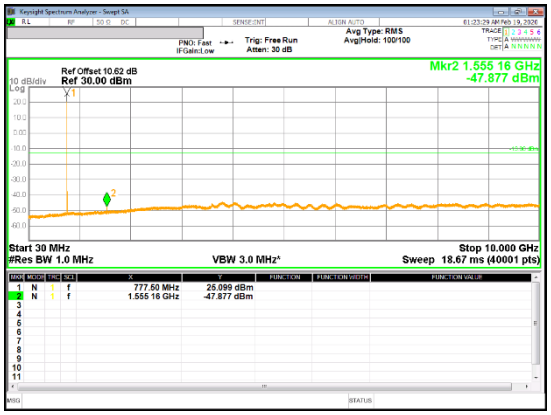
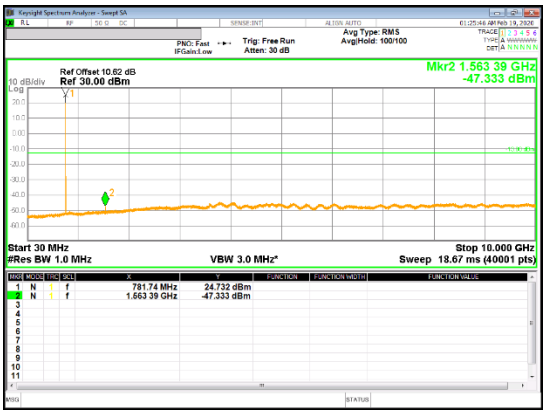
LTE Band 7

Band 7 20MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

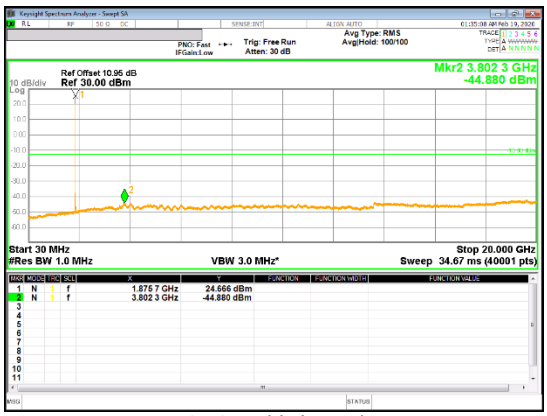
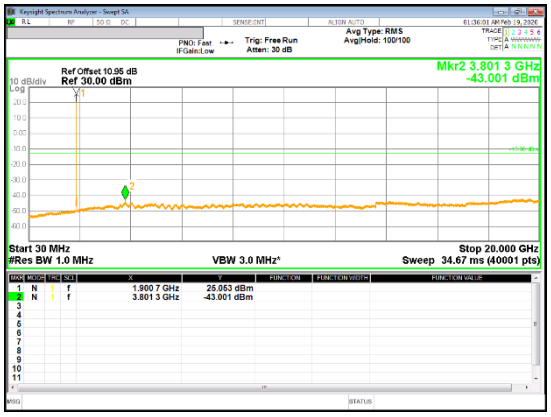
LTE Band 12

Band 12 10MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

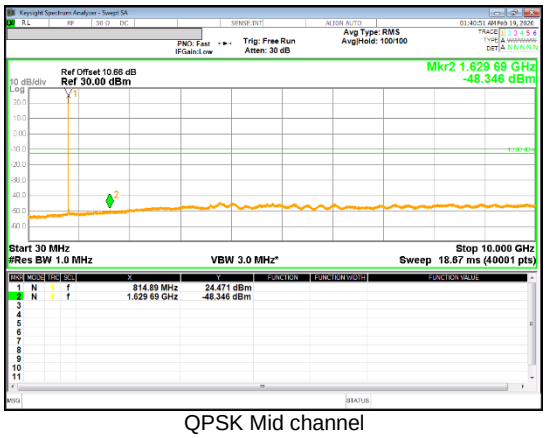
LTE Band 13

Band 13 10MHz	 QPSK Mid channel	
Band 13 5MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

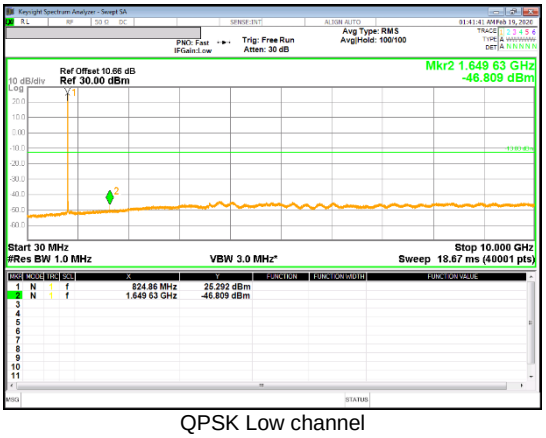
LTE Band 25

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

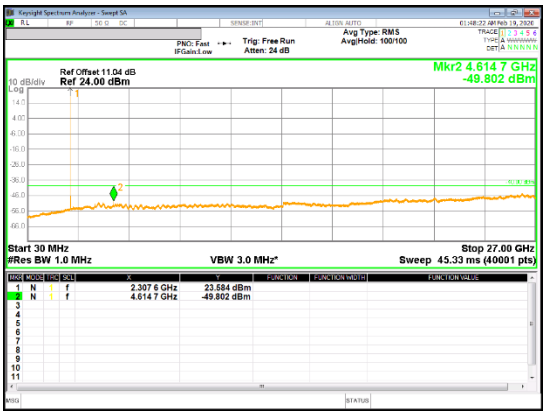
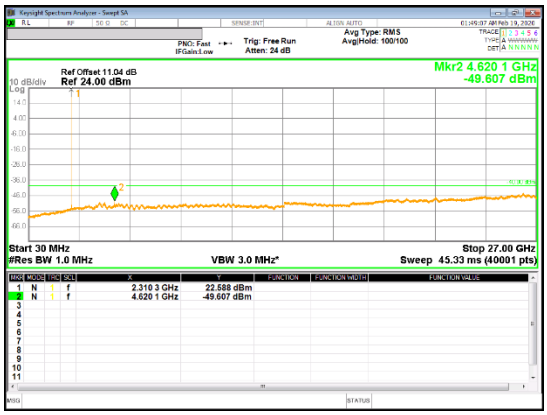
LTE Band 26(Part 90)

Band 26 15MHz	 QPSK Mid channel

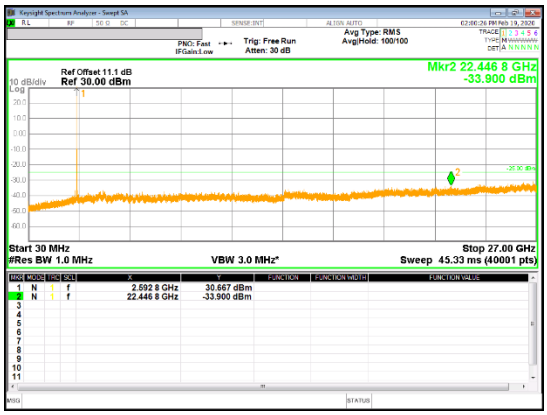
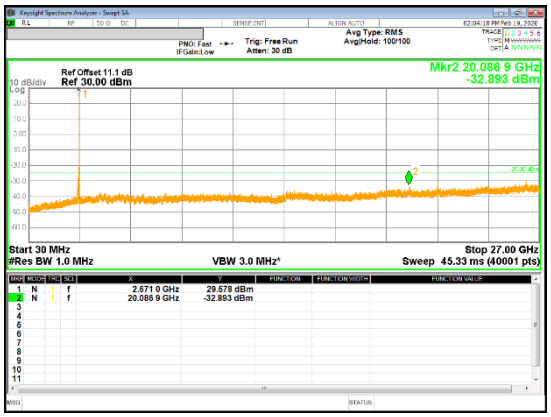
LTE Band 26(Part 22)

Band 26 15MHz	 QPSK Low channel	 QPSK High channel

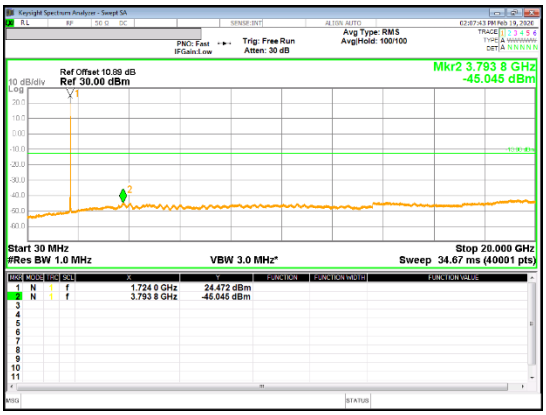
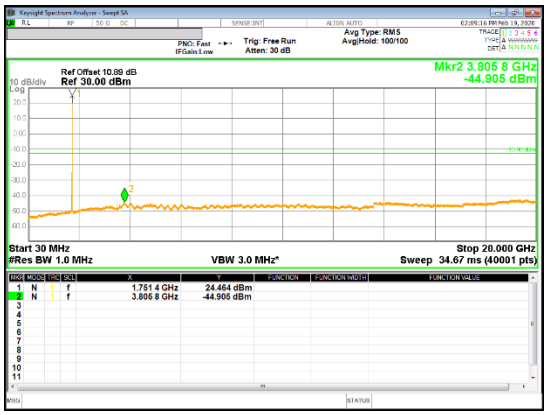
LTE Band 30

Band 30 5MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 41(PC2)

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

LTE Band 66

Band 66 15MHz	 QPSK Low channel	 QPSK Mid channel
	 QPSK High channel	

LTE Band 71

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

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 Band 38

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

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).

9.4. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

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

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

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

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27/90(03)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9.4.1. FREQUENCY STABILITY RESULTS

CDMA BC0 1xRTT

Reference Frequency : CDMA BC0 Low Channel 824.7 MHz / High Channel 848.31 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2061.750	Hz	High Channel	2120.775	Hz

Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.80	50	824.69998726	-0.004	848.30998648	0.002	2.5
3.80	40	824.69999157	-0.009	848.30999264	-0.005	2.5
3.80	30	824.69998368	0.000	848.30998275	0.006	2.5
3.80	***20***	***824.69998403***	***0.000***	***848.30998816***	***0.000***	***2.5***
3.80	10	824.69998578	-0.002	848.30999018	-0.002	2.5
3.80	0	824.69998143	0.003	848.30998325	0.006	2.5
3.80	-10	824.69998679	-0.003	848.30998112	0.008	2.5
3.80	-20	824.69998772	-0.004	848.30998641	0.002	2.5
3.80	-30	824.69998890	-0.006	848.30998936	-0.001	2.5

Reference Frequency : CDMA BC0 Low Channel 824.7 MHz / High Channel 848.31 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2061.750	Hz	High Channel	2120.775	Hz

Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.80	***20***	**824.69998403**	***0***	**848.30998816**	***0***	***2.5***
4.30	20	824.69998158	0.003	848.30998248	0.007	2.5
3.40	20	824.69997994	0.005	848.30998337	0.006	2.5

CDMA BC1 EVDO

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	1850.6987	1914.3013		
Extreme (50C)		1850.6987	1914.3013	-23.5	-0.012
Extreme (40C)		1850.6987	1914.3013	-25.6	-0.014
Extreme (30C)		1850.6987	1914.3013	-18.5	-0.010
Extreme (10C)		1850.6987	1914.3013	-19.9	-0.011
Extreme (0C)		1850.6987	1914.3013	-24.2	-0.013
Extreme (-10C)		1850.6987	1914.3013	-23.4	-0.012
Extreme (-20C)		1850.6987	1914.3013	-20.5	-0.011
Extreme (-30C)		1850.6987	1914.3013	-21.1	-0.011
20C	15%	1850.6987	1914.3013	-19.6	-0.010
	-15%	1850.6987	1914.3013	-17.6	-0.009
	End Point	1850.6987	1914.3013	-21.4	-0.011

CDMA BC10 1xRTT

Reference Frequency : CDMA BC10 Low Channel 817.9 MHz / High Channel 823.1 MHz @ 20°C						
Limit: +- 2.5 ppm =	Low Channel	2044.750	Hz	High Channel	2057.750	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]	
3.80	50	817.89998883	0.002	823.09998337	0.000	2.5
3.80	40	817.89998437	0.007	823.09998108	0.003	2.5
3.80	30	817.89998176	0.010	823.09998258	0.001	2.5
3.80	***20***	***817.89999033***	***0.000***	***823.09998352***	***0.000***	***2.5***
3.80	10	817.89998543	0.006	823.09998876	-0.006	2.5
3.80	0	817.89998361	0.008	823.09998788	-0.005	2.5
3.80	-10	817.89998120	0.011	823.09998258	0.001	2.5
3.80	-20	817.89998228	0.010	823.09998635	-0.003	2.5
3.80	-30	817.89998370	0.008	823.09998457	-0.001	2.5

Reference Frequency : CDMA BC10 Low Channel 817.9 MHz / High Channel 823.1 MHz @ 20°C						
Limit: +- 2.5 ppm =	Low Channel	2044.750	Hz	High Channel	2057.750	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]	
3.80	***20***	**817.89999033**	***0***	**823.09998352**	***0***	***2.5***
4.30	20	817.89998882	0.002	823.09998635	-0.003	2.5
3.40	20	817.89998713	0.004	823.09998232	0.001	2.5

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]	
3.85	50	824.19998968	0.000	848.79999052	0.007	2.5
3.85	40	824.19998635	0.004	848.79998746	0.011	2.5
3.85	30	824.19998852	0.002	848.79998906	0.009	2.5
3.85	***20***	***824.19999005***	***0.000***	***848.79999642***	***0.000***	***2.5***
3.85	10	824.19998636	0.004	848.79998558	0.013	2.5
3.85	0	824.19998716	0.004	848.79998307	0.016	2.5
3.85	-10	824.19998242	0.009	848.79998215	0.017	2.5
3.85	-20	824.19998101	0.011	848.79998644	0.012	2.5
3.85	-30	824.19997969	0.013	848.79998545	0.013	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]	
3.85	***20***	***824.19999005***	***0***	***848.79999642***	***0***	***2.5***
4.35	20	824.19998653	0.004	848.79998853	0.009	2.5
3.75	20	824.19999104	-0.001	848.79998621	0.012	2.5

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

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0803	1909.9211		
Extreme (50C)		1850.0802	1909.9211	-18.5	-0.010
Extreme (40C)		1850.0802	1909.9211	-15.4	-0.008
Extreme (30C)		1850.0802	1909.9211	-15.9	-0.008
Extreme (10C)		1850.0802	1909.9211	-11.3	-0.006
Extreme (0C)		1850.0802	1909.9211	-20.3	-0.011
Extreme (-10C)		1850.0802	1909.9211	-18.6	-0.010
Extreme (-20C)		1850.0802	1909.9211	-17.4	-0.009
Extreme (-30C)		1850.0802	1909.9211	-18.6	-0.010
20C	15%	1850.0802	1909.9211	-12.9	-0.007
	-15%	1850.0802	1909.9211	-11.4	-0.006
	End Point	1850.0802	1909.9211	-15.6	-0.008

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				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.85	50	826.39998652	0.006	846.59998853	-0.005	2.5
3.85	40	826.39998899	0.003	846.59998742	-0.004	2.5
3.85	30	826.39999068	0.001	846.59999239	-0.010	2.5
3.85	***20***	***826.39999135***	***0.000***	***846.59998411***	***0.000***	***2.5***
3.85	10	826.39998592	0.007	846.59998258	0.002	2.5
3.85	0	826.39998313	0.010	846.59998348	0.001	2.5
3.85	-10	826.39998366	0.009	846.59998445	0.000	2.5
3.85	-20	826.39998075	0.013	846.59998037	0.004	2.5
3.85	-30	826.39997867	0.015	846.59998275	0.002	2.5

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

Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.85	***20***	***826.39999135***	***0***	***846.59998411***	***0***	***2.5***
4.35	20	826.39999036	0.001	846.59998953	-0.006	2.5
3.75	20	826.39998864	0.003	846.59998649	-0.003	2.5

WCDMA Band 4 (Lowest Frequency:Rel99 / Highest Frequency: Rel99)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1712.3979	1752.6021		
Extreme (50C)		1712.3979	1752.6021	-26.5	-0.015
Extreme (40C)		1712.3979	1752.6021	-22.1	-0.013
Extreme (30C)		1712.3979	1752.6021	-20.1	-0.012
Extreme (10C)		1712.3979	1752.6021	-26.6	-0.015
Extreme (0C)		1712.3979	1752.6021	-24.4	-0.014
Extreme (-10C)		1712.3979	1752.6020	-27.7	-0.016
Extreme (-20C)		1712.3979	1752.6020	-28.3	-0.016
Extreme (-30C)		1712.3979	1752.6021	-22.6	-0.013
20C	15%	1712.3979	1752.6021	-25.1	-0.014
	-15%	1712.3979	1752.6021	-22.5	-0.013
	End Point	1712.3979	1752.6021	-23.7	-0.014

WCDMA Band 2 (Lowest Frequency:HSDPA / Highest Frequency: Rel99)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1852.3979	1907.6021		
Extreme (50C)		1852.3979	1907.6021	-23.0	-0.012
Extreme (40C)		1852.3979	1907.6021	-24.0	-0.013
Extreme (30C)		1852.3979	1907.6021	-25.0	-0.013
Extreme (10C)		1852.3979	1907.6021	-24.4	-0.013
Extreme (0C)		1852.3979	1907.6021	-21.9	-0.012
Extreme (-10C)		1852.3979	1907.6021	-19.6	-0.010
Extreme (-20C)		1852.3979	1907.6021	-17.7	-0.009
Extreme (-30C)		1852.3979	1907.6021	-23.7	-0.013
20C	15%	1852.3979	1907.6021	-22.1	-0.012
	-15%	1852.3979	1907.6021	-20.6	-0.011
	End Point	1852.3979	1907.6021	-19.8	-0.011

LTE Band 7 (QPSK)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2502.4978	2567.5022		
Extreme (50C)		2502.4977	2567.5022	-20.2	-0.008
Extreme (40C)		2502.4977	2567.5022	-28.5	-0.011
Extreme (30C)		2502.4977	2567.5022	-26.9	-0.011
Extreme (10C)		2502.4977	2567.5022	-24.3	-0.010
Extreme (0C)		2502.4977	2567.5022	-21.5	-0.008
Extreme (-10C)		2502.4977	2567.5022	-19.7	-0.008
Extreme (-20C)		2502.4977	2567.5022	-25.9	-0.010
Extreme (-30C)		2502.4977	2567.5022	-24.7	-0.010
20C	15%	2502.4977	2567.5022	-26.4	-0.010
	-15%	2502.4977	2567.5022	-25.9	-0.010
	End Point	2502.4977	2567.5022	-24.5	-0.010

LTE Band 12 (Lowest Frequency:16QAM / Highest Frequency: QPSK)

Limit		699	716	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	699.6995	715.3005		
Extreme (50C)		699.6994	715.3005	-13.5	-0.019
Extreme (40C)		699.6994	715.3005	-18.9	-0.027
Extreme (30C)		699.6994	715.3005	-15.2	-0.022
Extreme (10C)		699.6994	715.3005	-17.3	-0.024
Extreme (0C)		699.6994	715.3005	-16.3	-0.023
Extreme (-10C)		699.6994	715.3005	-19.8	-0.028
Extreme (-20C)		699.6994	715.3005	-11.5	-0.016
Extreme (-30C)		699.6994	715.3005	-13.3	-0.019
20C	15%	699.6994	715.3005	-18.3	-0.026
	-15%	699.6994	715.3005	-15.5	-0.022
	End Point	699.6994	715.3005	-17.2	-0.024

LTE Band 13 (QPSK)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	777.2576	786.7426		
Extreme (50C)		777.2575	786.7426	-16.3	-0.021
Extreme (40C)		777.2575	786.7426	-20.0	-0.026
Extreme (30C)		777.2575	786.7426	-12.1	-0.016
Extreme (10C)		777.2575	786.7426	-11.2	-0.014
Extreme (0C)		777.2575	786.7426	-14.8	-0.019
Extreme (-10C)		777.2575	786.7426	-16.3	-0.021
Extreme (-20C)		777.2575	786.7426	-15.7	-0.020
Extreme (-30C)		777.2575	786.7426	-11.3	-0.014
20C	15%	777.2575	786.7426	-17.5	-0.022
	-15%	777.2575	786.7426	-10.7	-0.014
	End Point	777.2575	786.7426	-15.9	-0.020

LTE Band 25 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

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	1850.1578	1914.8482		
Extreme (50C)		1850.1577	1914.8481	-29.0	-0.015
Extreme (40C)		1850.1577	1914.8481	-26.5	-0.014
Extreme (30C)		1850.1577	1914.8481	-28.3	-0.015
Extreme (10C)		1850.1577	1914.8481	-32.2	-0.017
Extreme (0C)		1850.1577	1914.8481	-30.1	-0.016
Extreme (-10C)		1850.1577	1914.8481	-29.5	-0.016
Extreme (-20C)		1850.1577	1914.8481	-24.5	-0.013
Extreme (-30C)		1850.1577	1914.8481	-27.6	-0.015
20C	15%	1850.1577	1914.8481	-26.3	-0.014
	-15%	1850.1577	1914.8481	-25.7	-0.014
	End Point	1850.1577	1914.8481	-21.0	-0.011

LTE Band 26

Reference Frequency : LTE Band 26 Low Channel 814.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2036.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.85	50	814.69998706	0.008	848.29998667	0.006	2.5
3.85	40	814.69999164	0.002	848.29998453	0.009	2.5
3.85	30	814.69998158	0.015	848.29998336	0.010	2.5
3.85	***20***	***814.69999347***	***0.000***	***848.29999175***	***0.000***	***2.5***
3.85	10	814.69999112	0.003	848.29999009	0.002	2.5
3.85	0	814.69999658	-0.004	848.29999542	-0.004	2.5
3.85	-10	814.69999001	0.004	848.29998646	0.006	2.5
3.85	-20	814.69998431	0.011	848.29998247	0.011	2.5
3.85	-30	814.69998117	0.015	848.29998008	0.014	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]	
3.85	***20***	**814.69999347**	***0***	**848.29999175**	***0***	***2.5***
4.35	20	814.69999552	-0.003	848.29999113	0.001	2.5
3.75	20	814.69999036	0.004	848.29999309	-0.002	2.5

LTE Band 30 (Lowest Frequency:QPSK / Highest Frequency: 16QAM)

Limit		2305	2315	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2307.4978	2312.5022		
Extreme (50C)		2307.4977	2312.5022	-30.1	-0.013
Extreme (40C)		2307.4977	2312.5022	-32.5	-0.014
Extreme (30C)		2307.4977	2312.5022	-31.7	-0.014
Extreme (10C)		2307.4977	2312.5022	-32.3	-0.014
Extreme (0C)		2307.4977	2312.5022	-33.5	-0.015
Extreme (-10C)		2307.4977	2312.5022	-30.9	-0.013
Extreme (-20C)		2307.4977	2312.5022	-34.1	-0.015
Extreme (-30C)		2307.4977	2312.5022	-32.2	-0.014
20C	15%	2307.4977	2312.5022	-25.5	-0.011
	-15%	2307.4977	2312.5022	-25.9	-0.011
	End Point	2307.4977	2312.5022	-20.2	-0.009

LTE Band 41 PC2 (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	2498.4955	2687.5045		
Extreme (50C)		2498.4955	2687.5044	-23.0	-0.009
Extreme (40C)		2498.4955	2687.5045	-14.5	-0.006
Extreme (30C)		2498.4955	2687.5044	-21.9	-0.008
Extreme (10C)		2498.4955	2687.5045	-10.5	-0.004
Extreme (0C)		2498.4955	2687.5045	-11.0	-0.004
Extreme (-10C)		2498.4955	2687.5044	-25.2	-0.010
Extreme (-20C)		2498.4955	2687.5044	-36.1	-0.014
Extreme (-30C)		2498.4955	2687.5044	-26.6	-0.010
20C	15%	2498.4955	2687.5044	-19.9	-0.008
	-15%	2498.4955	2687.5045	-11.3	-0.004
	End Point	2498.4955	2687.5045	-12.5	-0.005

LTE Band 66 (16QAM)

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.6995	1779.3005		
Extreme (50C)		1710.6994	1779.3005	-28.6	-0.016
Extreme (40C)		1710.6994	1779.3005	-30.1	-0.017
Extreme (30C)		1710.6994	1779.3005	-32.8	-0.019
Extreme (10C)		1710.6994	1779.3005	-24.6	-0.014
Extreme (0C)		1710.6994	1779.3005	-28.9	-0.017
Extreme (-10C)		1710.6994	1779.3005	-30.2	-0.017
Extreme (-20C)		1710.6994	1779.3005	-27.5	-0.016
Extreme (-30C)		1710.6994	1779.3005	-30.6	-0.018
20C	15%	1710.6994	1779.3005	-25.8	-0.015
	-15%	1710.6994	1779.3005	-21.2	-0.012
	End Point	1710.6994	1779.3005	-21.1	-0.012

LTE Band 71 (QPSK)

Limit		663	698	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	665.4978	695.5022		
Extreme (50C)		665.4978	695.5022	-9.5	-0.014
Extreme (40C)		665.4978	695.5022	-11.4	-0.017
Extreme (30C)		665.4977	695.5022	-16.3	-0.024
Extreme (10C)		665.4978	695.5022	-10.6	-0.016
Extreme (0C)		665.4977	695.5022	-12.3	-0.018
Extreme (-10C)		665.4977	695.5022	-15.3	-0.022
Extreme (-20C)		665.4977	695.5022	-14.2	-0.021
Extreme (-30C)		665.4977	695.5022	-16.9	-0.025
20C	15%	665.4978	695.5022	-18.8	-0.028
	-15%	665.4978	695.5022	-14.3	-0.021
	End Point	665.4977	695.5022	-11.5	-0.017

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 Band 38

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

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).

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RADIATED TEST RESULTS

9.5. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS

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

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

27.50:

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

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

(d) (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

(h) The following power limits shall apply in the BRS and EBS:

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

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

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.17; ESU40 setting reference to 971168 D01 v03r01

For radiated output power measurement with a ESU40:

a) Set the RBW ≥ OBW;

b) Set VBW ≥ 3 × RBW;

c) Set span ≥ 2 x RBW;

d) Sweep time = auto couple;

e) Detector = rms; f) Ensure that the number of measurement points ≥ span/RBW;

g) Trace mode = max hold(GSM, WCDMA), average(LTE);

TEST RESULTS

9.5.1. ERP/EIRP Results

CDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
BC0	1xRTT	1013	824.7	19.91	97.95
		384	836.52	**20.39**	**109.40**
		777	848.31	19.24	83.95
	EVDO Rel.0	1013	824.7	20.01	100.23
		384	836.52	**20.51**	**112.46**
		777	848.31	19.38	86.70
	EVDO Rev.A	1013	824.7	19.98	99.54
		384	836.52	**20.07**	**101.62**
		777	848.31	19.55	90.16
BC1	1xRTT	25	1851.25	24.69	294.44
		600	1880.00	25.90	389.05
		1175	1908.75	**26.78**	**476.43**
	EVDO Rel.0	25	1851.25	25.94	392.64
		600	1880.00	27.35	543.25
		1175	1908.75	**27.91**	**618.02**
	EVDO Rev.A	25	1851.25	26.56	452.90
		600	1880.00	27.56	570.16
		1175	1908.75	**28.25**	**668.34**
BC10	1xRTT	450	817.9	23.70	234.42
		560	820.5	**23.81**	**240.44**
		670	823.1	22.56	180.30

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	128	824.2	28.71	743.02
		190	836.6	**29.29**	**849.18**
		251	848.8	28.56	717.79
	EGPRS	128	824.2	22.50	177.83
		190	836.6	**23.41**	**219.28**
		251	848.8	22.69	185.78
GSM1900	GPRS	512	1850.2	28.45	699.84
		661	1880	29.51	893.31
		810	1909.8	**31.68**	**1472.31**
	EGPRS	512	1850.2	23.19	208.45
		661	1880	24.90	309.03
		810	1909.8	**26.25**	**421.70**

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	19.27	84.53
		4183	836.6	**21.01**	**126.18**
		4233	846.6	19.15	82.22
	HSDPA	4132	826.4	18.86	76.91
		4183	836.6	**19.34**	**85.90**
		4233	846.6	18.37	68.71
Band 4	REL99	1312	1712.4	24.05	254.10
		1413	1732.6	24.46	279.25
		1513	1752.6	**24.82**	**303.39**
	HSDPA	1312	1712.4	23.15	206.54
		1413	1732.6	23.56	226.99
		1513	1752.6	**24.00**	**251.19**
Band 2	REL99	9262	1852.4	22.49	177.42
		9400	1880.0	23.90	245.47
		9538	1907.6	**24.53**	**283.79**
	HSDPA	9262	1852.4	21.54	142.56
		9400	1880.0	22.19	165.58
		9538	1907.6	**24.02**	**252.35**

LTE Band 7

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 7	20	QPSK	1 / 0	2510.0	20.70	117.49
			1 / 0	2535.0	20.88	122.46
			1 / 0	2560.0	**22.81**	**190.99**
		16QAM	1 / 0	2510.0	19.57	90.57
			1 / 0	2535.0	19.60	91.20
			1 / 0	2560.0	**21.89**	**154.53**
	15	QPSK	1 / 0	2507.5	20.62	115.35
			1 / 0	2535.0	21.09	128.53
			1 / 0	2562.5	**22.84**	**192.31**
		16QAM	1 / 0	2507.5	19.43	87.70
			1 / 0	2535.0	20.20	104.71
			1 / 0	2562.5	**22.31**	**170.22**
	10	QPSK	1 / 0	2505.0	20.52	112.72
			1 / 49	2535.0	21.02	126.47
			1 / 49	2565.0	**23.08**	**203.24**
		16QAM	1 / 0	2505.0	19.33	85.70
			1 / 49	2535.0	20.18	104.23
			1 / 49	2565.0	**21.86**	**153.46**
	5	QPSK	1 / 12	2502.5	19.50	89.13
			1 / 12	2535.0	21.14	130.02
			1 / 24	2567.5	**22.56**	**180.30**
		16QAM	1 / 24	2502.5	18.61	72.61
			1 / 24	2535.0	19.70	93.33
			1 / 24	2567.5	**21.72**	**148.59**

LTE Band 12

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 12	10	QPSK	1 / 49	704.0	17.07	50.93
			1 / 49	707.5	**17.98**	**62.81**
			1 / 25	711.0	17.92	61.94
		16QAM	1 / 49	704.0	15.91	38.99
			1 / 25	707.5	16.06	40.36
			1 / 0	711.0	**16.29**	**42.56**
	5	QPSK	1 / 24	701.5	16.86	48.53
			1 / 24	707.5	17.57	57.15
			1 / 24	713.5	**18.55**	**71.61**
		16QAM	1 / 12	701.5	15.88	38.73
			1 / 12	707.5	16.94	49.43
			1 / 24	713.5	**17.63**	**57.94**
	3	QPSK	1 / 14	700.5	16.58	45.50
			1 / 14	707.5	17.99	62.95
			1 / 14	714.5	**18.71**	**74.30**
		16QAM	1 / 8	700.5	15.62	36.48
			1 / 8	707.5	16.67	46.45
			1 / 8	714.5	**17.64**	**58.08**
	1.4	QPSK	1 / 3	699.7	16.28	42.46
			1 / 3	707.5	17.56	57.02
			1 / 3	715.3	**18.82**	**76.21**
		16QAM	1 / 3	699.7	15.13	32.58
			1 / 3	707.5	16.47	44.36
			1 / 3	715.3	**17.76**	**59.70**

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	**21.55**	**142.89**
		16QAM	1 / 0	782.0	20.35	108.39
	5	QPSK	1 / 24	779.5	**21.99**	**158.12**
			1 / 12	782.0	21.92	155.60
			1 / 0	784.5	21.81	151.71
		16QAM	1 / 24	779.5	20.88	122.46
			1 / 12	782.0	**20.99**	**125.60**
			1 / 0	784.5	20.62	115.35

LTE Band 25

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 25	20	QPSK	1 / 99	1860.0	23.76	237.68
			1 / 0	1882.5	23.24	210.86
			1 / 0	1905.0	**23.88**	**244.34**
		16QAM	1 / 0	1860.0	22.81	190.99
			1 / 99	1882.5	22.66	184.50
			1 / 0	1905.0	**22.86**	**193.20**
	15	QPSK	1 / 74	1857.5	23.88	244.34
			1 / 0	1882.5	22.83	191.87
			1 / 0	1907.5	**24.07**	**255.27**
		16QAM	1 / 37	1857.5	22.69	185.78
			1 / 0	1882.5	21.83	152.41
			1 / 0	1907.5	**22.84**	**192.31**
	10	QPSK	1 / 0	1855.0	23.75	237.14
			1 / 0	1882.5	23.40	218.78
			1 / 0	1910.0	**24.17**	**261.22**
		16QAM	1 / 25	1855.0	22.39	173.38
			1 / 0	1882.5	22.14	163.68
			1 / 49	1910.0	**23.22**	**209.89**
	5	QPSK	1 / 24	1852.5	23.55	226.46
			1 / 24	1882.5	22.35	171.79
			1 / 12	1912.5	**24.03**	**252.93**
		16QAM	1 / 12	1852.5	22.69	185.78
			1 / 24	1882.5	21.42	138.68
			1 / 12	1912.5	**23.11**	**204.64**
	3	QPSK	1 / 8	1851.5	**23.94**	**247.74**
			1 / 14	1882.5	23.44	220.80
			1 / 8	1913.5	23.67	232.81
		16QAM	1 / 8	1851.5	22.62	182.81
			1 / 8	1882.5	22.22	166.72
			1 / 8	1913.5	**22.76**	**188.80**
	1.4	QPSK	1 / 3	1850.7	23.65	231.74
			1 / 3	1882.5	23.10	204.17
			1 / 0	1914.3	**23.86**	**243.22**
		16QAM	1 / 3	1850.7	22.38	172.98
			1 / 3	1882.5	21.92	155.60
			1 / 3	1914.3	**22.66**	**184.50**

LTE Band 26

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP/EIRP [dBm]	ERP/EIRP [mW]
Band 26	15	QPSK	1 / 0	821.5	20.84	121.34
			1 / 0	831.5	**20.77**	**119.40**
			1 / 0	841.5	19.41	87.30
		16QAM	1 / 0	821.5	19.95	98.86
			1 / 0	831.5	**19.79**	**95.28**
			1 / 0	841.5	18.52	71.12
	10	QPSK	1 / 0	819.0	20.63	115.61
			1 / 0	829.0	**20.86**	**121.90**
			1 / 0	831.5	20.79	119.95
			1 / 0	844.0	19.43	87.70
		16QAM	1 / 0	819.0	19.72	93.76
			1 / 0	829.0	19.62	91.62
			1 / 0	831.5	**19.68**	**92.90**
			1 / 0	844.0	18.63	72.95
	5	QPSK	1 / 12	816.5	**20.84**	**121.34**
			1 / 12	821.5	20.60	114.82
			1 / 0	826.5	20.37	108.89
			1 / 12	831.5	20.07	101.62
			1 / 0	846.5	19.15	82.22
		16QAM	1 / 24	816.5	**19.54**	**89.95**
			1 / 24	821.5	19.34	85.90
			1 / 12	826.5	19.14	82.04
			1 / 12	831.5	18.90	77.62
			1 / 12	846.5	18.28	67.30
	3	QPSK	1 / 8	815.5	**20.74**	**118.58**
			1 / 8	822.5	20.60	114.82
			1 / 14	825.5	20.53	112.98
			1 / 14	831.5	19.86	96.83
			1 / 0	847.5	19.18	82.79
		16QAM	1 / 8	815.5	**19.69**	**93.11**
			1 / 8	822.5	19.43	87.70
			1 / 8	825.5	19.26	84.33
			1 / 8	831.5	19.13	81.85
			1 / 0	847.5	18.05	63.83
	1.4	QPSK	1 / 3	814.7	**21.00**	**125.89**
			1 / 0	823.3	20.64	115.88
			1 / 3	824.7	20.34	108.14
			1 / 3	831.5	20.01	100.23
			1 / 3	848.3	19.28	84.72
		16QAM	1 / 3	814.7	**19.83**	**96.16**
			1 / 3	823.3	19.51	89.33
			1 / 3	824.7	19.05	80.35
			1 / 3	831.5	18.72	74.47
			1 / 3	848.3	18.30	67.61

LTE Band 30

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 30	10	QPSK	1 / 0	2310.0	**22.28**	**169.04**
		16QAM	1 / 0	2310.0	**21.22**	**132.43**
	5	QPSK	1 / 12	2307.5	22.29	169.43
			1 / 12	2310.0	**22.89**	**194.54**
			1 / 0	2312.5	22.64	183.65
		16QAM	1 / 12	2307.5	21.32	135.52
			1 / 12	2310.0	21.44	139.32
			1 / 0	2312.5	**21.70**	**147.91**

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 / 99	2506.0	**26.49**	**445.66**
			1 / 49	2593.0	25.17	328.85
			1 / 0	2680.0	25.82	381.94
		16QAM	1 / 99	2506.0	**26.90**	**489.78**
			1 / 99	2593.0	23.83	241.55
			1 / 0	2680.0	24.89	308.32
	15	QPSK	1 / 74	2503.5	**27.09**	**511.68**
			1 / 37	2593.0	25.38	345.14
			1 / 0	2682.5	26.53	449.78
		16QAM	1 / 74	2503.5	**26.94**	**494.31**
			1 / 74	2593.0	24.81	302.69
			1 / 74	2682.5	24.35	272.27
	10	QPSK	1 / 49	2501.0	**25.71**	**372.39**
			1 / 25	2593.0	24.90	309.03
			1 / 0	2685.0	25.52	356.45
		16QAM	1 / 49	2501.0	**24.98**	**314.77**
			1 / 25	2593.0	24.38	274.16
			1 / 0	2685.0	24.37	273.53
	5	QPSK	1 / 0	2498.5	**26.63**	**460.26**
			1 / 12	2593.0	24.78	300.61
			1 / 0	2687.5	25.80	380.19
		16QAM	1 / 24	2498.5	**25.53**	**357.27**
			1 / 24	2593.0	24.07	255.27
			1 / 12	2687.5	25.23	333.43

LTE Band 66

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 66	20	QPSK	1 / 99	1720.0	24.09	256.45
			1 / 99	1745.0	24.82	303.39
			1 / 0	1770.0	**24.85**	**305.49**
		16QAM	1 / 99	1720.0	23.05	201.84
			1 / 49	1745.0	22.53	179.06
			1 / 0	1770.0	**23.60**	**229.09**
	15	QPSK	1 / 74	1717.5	24.06	254.68
			1 / 74	1747.5	**24.62**	**289.73**
			1 / 0	1772.5	24.58	287.08
		16QAM	1 / 74	1717.5	22.77	189.23
			1 / 0	1747.5	23.12	205.12
			1 / 0	1772.5	**23.52**	**224.91**
	10	QPSK	1 / 49	1715.0	23.94	247.74
			1 / 25	1745.0	23.63	230.67
			1 / 0	1775.0	**24.26**	**266.69**
		16QAM	1 / 49	1715.0	22.70	186.21
			1 / 25	1745.0	22.55	179.89
			1 / 0	1775.0	**22.89**	**194.54**
	5	QPSK	1 / 24	1712.5	23.75	237.14
			1 / 24	1745.0	24.05	254.10
			1 / 24	1777.5	**24.35**	**272.27**
		16QAM	1 / 24	1712.5	22.55	179.89
			1 / 24	1745.0	22.92	195.88
			1 / 24	1777.5	**23.02**	**200.45**
	3	QPSK	1 / 8	1711.5	23.56	226.99
			1 / 14	1745.0	23.65	231.74
			1 / 14	1778.5	**24.21**	**263.63**
		16QAM	1 / 14	1711.5	22.37	172.58
			1 / 14	1745.0	22.74	187.93
			1 / 8	1778.5	**23.08**	**203.24**
	1.4	QPSK	1 / 3	1710.7	23.51	224.39
			1 / 3	1745.0	23.76	237.68
			1 / 3	1779.3	**24.48**	**280.54**
		16QAM	1 / 3	1710.7	22.31	170.22
			1 / 3	1745.0	22.73	187.50
			1 / 3	1779.3	**23.34**	**215.77**

LTE Band 71

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 71	20	QPSK	1 / 99	673.0	16.33	42.95
			1 / 49	680.5	**16.53**	**44.98**
			1 / 0	688.0	13.88	24.43
		16QAM	1 / 49	673.0	**15.55**	**35.89**
			1 / 0	680.5	15.43	34.91
			1 / 0	688.0	13.03	20.09
	15	QPSK	1 / 0	670.5	**17.90**	**61.66**
			1 / 0	680.5	16.48	44.46
			1 / 0	690.5	15.05	31.99
		16QAM	1 / 37	670.5	15.35	34.28
			1 / 0	680.5	**15.70**	**37.15**
			1 / 0	690.5	14.00	25.12
	10	QPSK	1 / 0	668.0	**17.53**	**56.62**
			1 / 0	680.5	16.46	44.26
			1 / 0	693.0	15.65	36.73
		16QAM	1 / 25	668.0	**15.52**	**35.65**
			1 / 0	680.5	15.43	34.91
			1 / 0	693.0	14.43	27.73
	5	QPSK	1 / 24	665.5	16.36	43.25
			1 / 12	680.5	**16.51**	**44.77**
			1 / 24	695.5	16.45	44.16
		16QAM	1 / 24	665.5	**15.85**	**38.46**
			1 / 24	680.5	15.64	36.64
			1 / 24	695.5	15.21	33.19

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 Band 38

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

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_22/24/27/90(03)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9.5.2. ERP/EIRP DATA

CDMA BC0

BC0
1xRTT

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-21
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: RTT BC0 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	23.87	V	3.0	-1.0	19.91	38.5	-18.6	
824.70	14.03	H	3.0	-1.0	10.06	38.5	-28.4	
Mid Ch								
836.52	24.32	V	3.0	-0.9	20.39	38.5	-18.1	
836.52	13.27	H	3.0	-0.9	9.33	38.5	-29.2	
High Ch								
848.31	23.14	V	3.1	-0.9	19.24	38.5	-19.3	
848.31	12.55	H	3.1	-0.9	8.65	38.5	-29.9	

BC0
EVDO Rel.0

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-21
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: EVDO BC0 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	23.97	V	3.0	-1.0	20.01	38.5	-18.5	
824.70	13.67	H	3.0	-1.0	9.70	38.5	-28.8	
Mid Ch								
836.52	24.44	V	3.0	-0.9	20.51	38.5	-18.0	
836.52	13.09	H	3.0	-0.9	9.15	38.5	-29.3	
High Ch								
848.31	23.28	V	3.1	-0.9	19.38	38.5	-19.1	
848.31	12.61	H	3.1	-0.9	8.71	38.5	-29.8	

BC0
EVDO Rel.A

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-21
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: EVDO BC0 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	23.94	V	3.0	-1.0	19.98	38.5	-18.5	
824.70	13.63	H	3.0	-1.0	9.66	38.5	-28.8	
Mid Ch								
836.52	24.00	V	3.0	-0.9	20.07	38.5	-18.4	
836.52	12.82	H	3.0	-0.9	8.88	38.5	-29.6	
High Ch								
848.31	23.45	V	3.1	-0.9	19.55	38.5	-19.0	
848.31	12.32	H	3.1	-0.9	8.42	38.5	-30.1	

CDMA BC1

BC1
1xRTT

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: RTT BC1 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.25	19.69	V	4.5	9.5	24.69	33.0	-8.3	
1851.25	14.62	H	4.5	9.5	19.62	33.0	-13.4	
Mid Ch								
1880.00	21.13	V	4.5	9.3	25.90	33.0	-7.1	
1880.00	15.64	H	4.5	9.3	20.41	33.0	-12.6	
High Ch								
1908.75	22.28	V	4.6	9.1	26.78	33.0	-6.2	
1908.75	16.90	H	4.6	9.1	21.40	33.0	-11.6	

BC1
EVDO Rel.0

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: EVDO BC1 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.25	20.94	V	4.5	9.5	25.94	33.0	-7.1	
1851.25	15.88	H	4.5	9.5	20.88	33.0	-12.1	
Mid Ch								
1880.00	22.58	V	4.5	9.3	27.35	33.0	-5.6	
1880.00	16.43	H	4.5	9.3	21.20	33.0	-11.8	
High Ch								
1908.75	23.41	V	4.6	9.1	27.91	33.0	-5.1	
1908.75	17.88	H	4.6	9.1	22.38	33.0	-10.6	

BC1
EVDO Rel.A

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT, Y-Position
Location: Chamber 1
Mode: EVDO BC1 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.25	21.56	V	4.5	9.5	26.56	33.0	-6.4	
1851.25	16.52	H	4.5	9.5	21.52	33.0	-11.5	
Mid Ch								
1880.00	22.79	V	4.5	9.3	27.56	33.0	-5.4	
1880.00	17.10	H	4.5	9.3	21.87	33.0	-11.1	
High Ch								
1908.75	23.75	V	4.6	9.1	28.25	33.0	-4.8	
1908.75	18.45	H	4.6	9.1	22.95	33.0	-10.0	

CDMA BC10

BC10
1xRTT

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: RTT BC10 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
817.90	19.94	V	3.0	-1.0	15.96	38.5	-22.5	
817.90	27.68	H	3.0	-1.0	23.70	38.5	-14.8	
Mid Ch								
820.50	20.02	V	3.0	-1.0	16.05	38.5	-22.5	
820.50	27.78	H	3.0	-1.0	23.81	38.5	-14.7	
High Ch								
823.10	19.20	V	3.0	-1.0	15.23	38.5	-23.3	
823.10	26.53	H	3.0	-1.0	22.56	38.5	-15.9	

GSM850

GSM850

GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: GPRS 850 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	32.68	V	3.0	-1.0	28.71	38.5	-9.8	
824.20	23.16	H	3.0	-1.0	19.19	38.5	-19.3	
Mid Ch								
836.60	33.23	V	3.0	-0.9	29.29	38.5	-9.2	
836.60	23.19	H	3.0	-0.9	19.25	38.5	-19.2	
High Ch								
848.80	32.47	V	3.1	-0.9	28.56	38.5	-9.9	
848.80	21.75	H	3.1	-0.9	17.84	38.5	-20.7	

GSM850

EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: EGPRS 850 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	26.47	V	3.0	-1.0	22.50	38.5	-16.0	
824.20	17.20	H	3.0	-1.0	13.23	38.5	-25.3	
Mid Ch								
836.60	27.35	V	3.0	-0.9	23.41	38.5	-15.1	
836.60	18.38	H	3.0	-0.9	14.44	38.5	-24.1	
High Ch								
848.80	26.60	V	3.1	-0.9	22.69	38.5	-15.8	
848.80	15.35	H	3.1	-0.9	11.44	38.5	-27.1	

GSM1900

GSM1900

GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20896
Configuration: EUT, Z-position
Location: Chamber 1
Mode: GPRS 1900 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	20.51	V	4.5	9.5	25.52	33.0	-7.5	
1850.20	23.44	H	4.5	9.5	28.45	33.0	-4.5	
Mid Ch								
1880.00	21.02	V	4.5	9.3	25.79	33.0	-7.2	
1880.00	24.74	H	4.5	9.3	29.51	33.0	-3.5	
High Ch								
1909.80	24.19	V	4.6	9.1	28.68	33.0	-4.3	
1909.80	27.20	H	4.6	9.1	31.68	33.0	-1.3	

GSM1900

EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20896
Configuration: EUT, Z-position
Location: Chamber 1
Mode: EGPRS 1900 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	15.14	V	4.5	9.5	20.15	33.0	-12.9	
1850.20	18.18	H	4.5	9.5	23.19	33.0	-9.8	
Mid Ch								
1880.00	17.08	V	4.5	9.3	21.85	33.0	-11.1	
1880.00	20.13	H	4.5	9.3	24.90	33.0	-8.1	
High Ch								
1909.80	19.35	V	4.6	9.1	23.84	33.0	-9.2	
1909.80	21.77	H	4.6	9.1	26.25	33.0	-6.7	

WCDMA Band 5

WCDMA

Band 5
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: Rel99 Band 5 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	23.23	V	3.0	-0.9	19.27	38.5	-19.2	
826.40	14.74	H	3.0	-0.9	10.78	38.5	-27.7	
Mid Ch								
836.60	24.95	V	3.0	-0.9	21.01	38.5	-17.5	
836.60	15.13	H	3.0	-0.9	11.19	38.5	-27.3	
High Ch								
846.60	23.07	V	3.1	-0.9	19.15	38.5	-19.3	
846.60	14.32	H	3.1	-0.9	10.41	38.5	-28.1	

WCDMA

Band 5
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: HSDPA Band 5 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	22.82	V	3.0	-0.9	18.86	38.5	-19.6	
826.40	13.89	H	3.0	-0.9	9.93	38.5	-28.6	
Mid Ch								
836.60	23.28	V	3.0	-0.9	19.34	38.5	-19.2	
836.60	13.13	H	3.0	-0.9	9.19	38.5	-29.3	
High Ch								
846.60	22.29	V	3.1	-0.9	18.37	38.5	-20.1	
846.60	13.23	H	3.1	-0.9	9.32	38.5	-29.2	

WCDMA Band 4

WCDMA

Band 4
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-10
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: Rel99 Band 4 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	16.39	V	4.3	9.3	21.40	30.0	-8.6	
1712.40	19.04	H	4.3	9.3	24.05	30.0	-5.9	
Mid Ch								
1732.60	15.97	V	4.3	9.4	21.02	30.0	-9.0	
1732.60	19.41	H	4.3	9.4	24.46	30.0	-5.5	
High Ch								
1752.60	16.59	V	4.4	9.5	21.69	30.0	-8.3	
1752.60	19.71	H	4.4	9.5	24.82	30.0	-5.2	

WCDMA

Band 4
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-10
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: HSDPA Band 4 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	15.43	V	4.3	9.3	20.44	30.0	-9.6	
1712.40	18.14	H	4.3	9.3	23.15	30.0	-6.8	
Mid Ch								
1732.60	14.96	V	4.3	9.4	20.01	30.0	-10.0	
1732.60	18.51	H	4.3	9.4	23.56	30.0	-6.4	
High Ch								
1752.60	15.17	V	4.4	9.5	20.27	30.0	-9.7	
1752.60	18.89	H	4.4	9.5	24.00	30.0	-6.0	

WCDMA Band 2

WCDMA

Band 2
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: Rel99 Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	14.81	V	4.5	9.5	19.80	33.0	-13.2	
1852.40	17.51	H	4.5	9.5	22.49	33.0	-10.5	
Mid Ch								
1880.00	15.54	V	4.5	9.3	20.31	33.0	-12.7	
1880.00	19.13	H	4.5	9.3	23.90	33.0	-9.1	
High Ch								
1907.60	16.99	V	4.6	9.1	21.51	33.0	-11.5	
1907.60	20.01	H	4.6	9.1	24.53	33.0	-8.5	

WCDMA

Band 2
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: HSDPA Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	14.09	V	4.5	9.5	19.08	33.0	-13.9	
1852.40	16.56	H	4.5	9.5	21.54	33.0	-11.5	
Mid Ch								
1880.00	14.42	V	4.5	9.3	19.19	33.0	-13.8	
1880.00	17.42	H	4.5	9.3	22.19	33.0	-10.8	
High Ch								
1907.60	16.53	V	4.6	9.1	21.05	33.0	-12.0	
1907.60	19.50	H	4.6	9.1	24.02	33.0	-9.0	

LTE Band 7

LTE Band 7 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 7 Fundamentals, 20MHz 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								
2510.00	13.48	V	5.3	10.1	18.29	33.0	-14.7	
2510.00	15.88	H	5.3	10.1	20.70	33.0	-12.3	
Mid Ch								
2535.00	16.10	V	5.3	10.0	20.86	33.0	-12.1	
2535.00	16.12	H	5.3	10.0	20.88	33.0	-12.1	
High Ch								
2560.00	15.66	V	5.3	10.0	20.36	33.0	-12.6	
2560.00	18.11	H	5.3	10.0	22.81	33.0	-10.2	

LTE Band 7 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 7 Fundamentals, 20MHz 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								
2510.00	12.18	V	5.3	10.1	16.99	33.0	-16.0	
2510.00	14.75	H	5.3	10.1	19.57	33.0	-13.4	
Mid Ch								
2535.00	14.53	V	5.3	10.0	19.29	33.0	-13.7	
2535.00	14.84	H	5.3	10.0	19.60	33.0	-13.4	
High Ch								
2560.00	14.24	V	5.3	10.0	18.94	33.0	-14.1	
2560.00	17.19	H	5.3	10.0	21.89	33.0	-11.1	

LTE
Band 7
15MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 7 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								
2507.50	13.49	V	5.3	10.1	18.31	33.0	-14.7	
2507.50	15.80	H	5.3	10.1	20.62	33.0	-12.4	
Mid Ch								
2535.00	16.33	V	5.3	10.0	21.09	33.0	-11.9	
2535.00	16.08	H	5.3	10.0	20.84	33.0	-12.2	
High Ch								
2562.50	15.84	V	5.3	10.0	20.53	33.0	-12.5	
2562.50	18.14	H	5.3	10.0	22.84	33.0	-10.2	

LTE
Band 7
15MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 7 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								
2507.50	12.17	V	5.3	10.1	16.99	33.0	-16.0	
2507.50	14.61	H	5.3	10.1	19.43	33.0	-13.6	
Mid Ch								
2535.00	15.44	V	5.3	10.0	20.20	33.0	-12.8	
2535.00	14.74	H	5.3	10.0	19.50	33.0	-13.5	
High Ch								
2562.50	15.32	V	5.3	10.0	20.01	33.0	-13.0	
2562.50	17.61	H	5.3	10.0	22.31	33.0	-10.7	

LTE
Band 7
10MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 7 Fundamentals, 10MHz 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								
2505.00	13.01	V	5.2	10.1	17.84	33.0	-15.2	
2505.00	15.69	H	5.2	10.1	20.52	33.0	-12.5	
Mid Ch								
2535.00	16.09	V	5.3	10.0	20.85	33.0	-12.2	
2535.00	16.26	H	5.3	10.0	21.02	33.0	-12.0	
High Ch								
2565.00	17.62	V	5.3	10.0	22.32	33.0	-10.7	
2565.00	18.38	H	5.3	10.0	23.08	33.0	-9.9	

LTE
Band 7
10MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 7 Fundamentals, 10MHz 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								
2505.00	11.98	V	5.2	10.1	16.81	33.0	-16.2	
2505.00	14.50	H	5.2	10.1	19.33	33.0	-13.7	
Mid Ch								
2535.00	15.02	V	5.3	10.0	19.78	33.0	-13.2	
2535.00	15.42	H	5.3	10.0	20.18	33.0	-12.8	
High Ch								
2565.00	16.67	V	5.3	10.0	21.37	33.0	-11.6	
2565.00	17.16	H	5.3	10.0	21.86	33.0	-11.1	

LTE

Band 7

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20890
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 7 Fundamentals, 5MHz 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								
2502.50	12.51	V	5.2	10.1	17.34	33.0	-15.7	
2502.50	14.66	H	5.2	10.1	19.50	33.0	-13.5	
Mid Ch								
2535.00	16.38	V	5.3	10.0	21.14	33.0	-11.9	
2535.00	15.60	H	5.3	10.0	20.36	33.0	-12.6	
High Ch								
2567.50	17.68	V	5.3	10.0	22.36	33.0	-10.6	
2567.50	17.87	H	5.3	10.0	22.56	33.0	-10.4	

LTE

Band 7

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20890
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 7 Fundamentals, 5MHz 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								
2502.50	11.77	V	5.2	10.1	16.60	33.0	-16.4	
2502.50	13.77	H	5.2	10.1	18.61	33.0	-14.4	
Mid Ch								
2535.00	14.84	V	5.3	10.0	19.60	33.0	-13.4	
2535.00	14.94	H	5.3	10.0	19.70	33.0	-13.3	
High Ch								
2567.50	16.79	V	5.3	10.0	21.47	33.0	-11.5	
2567.50	17.03	H	5.3	10.0	21.72	33.0	-11.3	

LTE Band 12

LTE Band 12 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	13.66	V	2.8	-1.1	9.82	34.8	-25.0	
704.00	20.91	H	2.8	-1.1	17.07	34.8	-17.7	
Mid Ch								
707.50	13.63	V	2.8	-1.1	9.79	34.8	-25.0	
707.50	21.83	H	2.8	-1.1	17.98	34.8	-16.8	
High Ch								
711.00	14.15	V	2.8	-1.1	10.29	34.8	-24.5	
711.00	21.78	H	2.8	-1.1	17.92	34.8	-16.9	

LTE Band 12 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
704.00	12.54	V	2.8	-1.1	8.70	34.8	-26.1	
704.00	19.75	H	2.8	-1.1	15.91	34.8	-18.9	
Mid Ch								
707.50	12.49	V	2.8	-1.1	8.65	34.8	-26.2	
707.50	19.91	H	2.8	-1.1	16.06	34.8	-18.7	
High Ch								
711.00	12.53	V	2.8	-1.1	8.67	34.8	-26.1	
711.00	20.15	H	2.8	-1.1	16.29	34.8	-18.5	

LTE

Band 12

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	12.83	V	2.8	-1.1	9.00	34.8	-25.8	
701.50	20.70	H	2.8	-1.1	16.86	34.8	-17.9	
Mid Ch								
707.50	13.99	V	2.8	-1.1	10.15	34.8	-24.7	
707.50	21.42	H	2.8	-1.1	17.57	34.8	-17.2	
High Ch								
713.50	14.38	V	2.8	-1.1	10.51	34.8	-24.3	
713.50	22.41	H	2.8	-1.1	18.55	34.8	-16.3	

LTE

Band 12

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
701.50	11.60	V	2.8	-1.1	7.77	34.8	-27.0	
701.50	19.72	H	2.8	-1.1	15.88	34.8	-18.9	
Mid Ch								
707.50	12.18	V	2.8	-1.1	8.34	34.8	-26.5	
707.50	20.79	H	2.8	-1.1	16.94	34.8	-17.9	
High Ch								
713.50	13.31	V	2.8	-1.1	9.44	34.8	-25.4	
713.50	21.49	H	2.8	-1.1	17.63	34.8	-17.2	

LTE

Band 12

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
700.50	12.60	V	2.8	-1.1	8.77	34.8	-26.0	
700.50	20.41	H	2.8	-1.1	16.58	34.8	-18.2	
Mid Ch								
707.50	13.76	V	2.8	-1.1	9.92	34.8	-24.9	
707.50	21.84	H	2.8	-1.1	17.99	34.8	-16.8	
High Ch								
714.50	14.32	V	2.8	-1.1	10.46	34.8	-24.3	
714.50	22.57	H	2.8	-1.1	18.71	34.8	-16.1	

LTE

Band 12

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
700.50	11.31	V	2.8	-1.1	7.48	34.8	-27.3	
700.50	19.45	H	2.8	-1.1	15.62	34.8	-19.2	
Mid Ch								
707.50	12.51	V	2.8	-1.1	8.67	34.8	-26.1	
707.50	20.52	H	2.8	-1.1	16.67	34.8	-18.1	
High Ch								
714.50	13.71	V	2.8	-1.1	9.85	34.8	-25.0	
714.50	21.50	H	2.8	-1.1	17.64	34.8	-17.2	

LTE

Band 12

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
699.70	12.20	V	2.8	-1.1	8.37	34.8	-26.4	
699.70	20.12	H	2.8	-1.1	16.28	34.8	-18.5	
Mid Ch								
707.50	13.64	V	2.8	-1.1	9.80	34.8	-25.0	
707.50	21.41	H	2.8	-1.1	17.56	34.8	-17.2	
High Ch								
715.30	14.35	V	2.8	-1.1	10.49	34.8	-24.3	
715.30	22.68	H	2.8	-1.1	18.82	34.8	-16.0	

LTE

Band 12

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20896
Configuration: EUT
Location: Chamber 1
Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
699.70	11.00	V	2.8	-1.1	7.17	34.8	-27.6	
699.70	18.97	H	2.8	-1.1	15.13	34.8	-19.7	
Mid Ch								
707.50	12.36	V	2.8	-1.1	8.52	34.8	-26.3	
707.50	20.32	H	2.8	-1.1	16.47	34.8	-18.3	
High Ch								
715.30	13.19	V	2.8	-1.1	9.33	34.8	-25.5	
715.30	21.62	H	2.8	-1.1	17.76	34.8	-17.0	

LTE Band 13

LTE Band 13 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	25.54	V	2.9	-1.1	21.55	34.8	-13.2	
782.00	11.38	H	2.9	-1.1	7.39	34.8	-27.4	

LTE Band 13 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
782.00	24.34	V	2.9	-1.1	20.35	34.8	-14.4	
782.00	10.42	H	2.9	-1.1	6.43	34.8	-28.3	

LTE

Band 13

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
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	11.29	H	2.9	-1.1	7.31	34.8	-27.5	
Mid Ch								
782.00	25.91	V	2.9	-1.1	21.92	34.8	-12.8	
782.00	11.58	H	2.9	-1.1	7.59	34.8	-27.2	
High Ch								
784.50	25.80	V	2.9	-1.1	21.81	34.8	-13.0	
784.50	11.45	H	2.9	-1.1	7.46	34.8	-27.3	

LTE

Band 13

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
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	24.86	V	2.9	-1.1	20.88	34.8	-13.9	
779.50	10.10	H	2.9	-1.1	6.12	34.8	-28.6	
Mid Ch								
782.00	24.98	V	2.9	-1.1	20.99	34.8	-13.8	
782.00	10.34	H	2.9	-1.1	6.35	34.8	-28.4	
High Ch								
784.50	24.61	V	2.9	-1.1	20.62	34.8	-14.1	
784.50	10.50	H	2.9	-1.1	6.51	34.8	-28.3	

LTE Band 25

LTE Band 25 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20890
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 25 Fundamentals, 20MHz 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								
1860.00	15.14	V	4.5	9.3	19.97	33.0	-13.0	
1860.00	18.93	H	4.5	9.3	23.76	33.0	-9.2	
Mid Ch								
1882.50	14.53	V	4.5	9.2	19.17	33.0	-13.8	
1882.50	18.60	H	4.5	9.2	23.24	33.0	-9.8	
High Ch								
1905.00	15.11	V	4.6	9.0	19.54	33.0	-13.5	
1905.00	19.45	H	4.6	9.0	23.88	33.0	-9.1	

LTE Band 25 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20890
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 25 Fundamentals, 20MHz 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								
1860.00	14.62	V	4.5	9.3	19.45	33.0	-13.5	
1860.00	17.98	H	4.5	9.3	22.81	33.0	-10.2	
Mid Ch								
1882.50	13.38	V	4.5	9.2	18.02	33.0	-15.0	
1882.50	18.02	H	4.5	9.2	22.66	33.0	-10.3	
High Ch								
1905.00	13.80	V	4.6	9.0	18.23	33.0	-14.8	
1905.00	18.43	H	4.6	9.0	22.86	33.0	-10.1	

LTE

Band 25

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20890
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 25 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								
1857.50	15.43	V	4.5	9.4	20.28	33.0	-12.7	
1857.50	19.03	H	4.5	9.4	23.88	33.0	-9.1	
Mid Ch								
1882.50	14.72	V	4.5	9.2	19.36	33.0	-13.6	
1882.50	18.19	H	4.5	9.2	22.83	33.0	-10.2	
High Ch								
1907.50	14.92	V	4.6	9.0	19.31	33.0	-13.7	
1907.50	19.68	H	4.6	9.0	24.07	33.0	-8.9	

LTE

Band 25

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20890
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 25 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								
1857.50	14.63	V	4.5	9.4	19.48	33.0	-13.5	
1857.50	17.84	H	4.5	9.4	22.69	33.0	-10.3	
Mid Ch								
1882.50	14.05	V	4.5	9.2	18.69	33.0	-14.3	
1882.50	17.19	H	4.5	9.2	21.83	33.0	-11.2	
High Ch								
1907.50	13.90	V	4.6	9.0	18.29	33.0	-14.7	
1907.50	18.45	H	4.6	9.0	22.84	33.0	-10.2	

LTE

Band 25

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 25 Fundamentals, 10MHz 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								
1855.00	15.96	V	4.5	9.4	20.83	33.0	-12.2	
1855.00	18.87	H	4.5	9.4	23.75	33.0	-9.3	
Mid Ch								
1882.50	15.14	V	4.5	9.2	19.78	33.0	-13.2	
1882.50	18.76	H	4.5	9.2	23.40	33.0	-9.6	
High Ch								
1910.00	16.32	V	4.6	8.9	20.67	33.0	-12.3	
1910.00	19.82	H	4.6	8.9	24.17	33.0	-8.8	

LTE

Band 25

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 25 Fundamentals, 10MHz 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								
1855.00	14.33	V	4.5	9.4	19.20	33.0	-13.8	
1855.00	17.51	H	4.5	9.4	22.39	33.0	-10.6	
Mid Ch								
1882.50	13.78	V	4.5	9.2	18.42	33.0	-14.6	
1882.50	17.50	H	4.5	9.2	22.14	33.0	-10.9	
High Ch								
1910.00	14.79	V	4.6	8.9	19.14	33.0	-13.9	
1910.00	18.87	H	4.6	8.9	23.22	33.0	-9.8	

LTE

Band 25

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 25 Fundamentals, 5MHz 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								
1852.50	15.11	V	4.5	9.4	20.01	33.0	-13.0	
1852.50	18.65	H	4.5	9.4	23.55	33.0	-9.5	
Mid Ch								
1882.50	14.88	V	4.5	9.2	19.52	33.0	-13.5	
1882.50	17.71	H	4.5	9.2	22.35	33.0	-10.6	
High Ch								
1912.50	16.02	V	4.6	8.9	20.35	33.0	-12.7	
1912.50	19.70	H	4.6	8.9	24.03	33.0	-9.0	

LTE

Band 25

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-04
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 25 Fundamentals, 5MHz 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								
1852.50	14.78	V	4.5	9.4	19.68	33.0	-13.3	
1852.50	17.79	H	4.5	9.4	22.69	33.0	-10.3	
Mid Ch								
1882.50	14.31	V	4.5	9.2	18.95	33.0	-14.0	
1882.50	16.78	H	4.5	9.2	21.42	33.0	-11.6	
High Ch								
1912.50	14.98	V	4.6	8.9	19.31	33.0	-13.7	
1912.50	18.78	H	4.6	8.9	23.11	33.0	-9.9	

LTE

Band 25

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20890
Configuration: EUT / Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 25 Fundamentals, 3MHz 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								
1851.50	15.69	V	4.5	9.4	20.60	33.0	-12.4	
1851.50	19.04	H	4.5	9.4	23.94	33.0	-9.1	
Mid Ch								
1882.50	15.52	V	4.5	9.2	20.16	33.0	-12.8	
1882.50	18.80	H	4.5	9.2	23.44	33.0	-9.6	
High Ch								
1913.50	16.33	V	4.6	8.9	20.64	33.0	-12.4	
1913.50	19.36	H	4.6	8.9	23.67	33.0	-9.3	

LTE

Band 25

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20890
Configuration: EUT / Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 25 Fundamentals, 3MHz 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								
1851.50	14.59	V	4.5	9.4	19.50	33.0	-13.5	
1851.50	17.72	H	4.5	9.4	22.62	33.0	-10.4	
Mid Ch								
1882.50	14.93	V	4.5	9.2	19.57	33.0	-13.4	
1882.50	17.58	H	4.5	9.2	22.22	33.0	-10.8	
High Ch								
1913.50	15.15	V	4.6	8.9	19.46	33.0	-13.5	
1913.50	18.45	H	4.6	8.9	22.76	33.0	-10.2	

LTE
Band 25
1.4MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20890
Configuration: EUT / Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 25 Fundamentals, 1.4MHz 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								
1850.70	15.55	V	4.5	9.4	20.47	33.0	-12.5	
1850.70	18.73	H	4.5	9.4	23.65	33.0	-9.4	
Mid Ch								
1882.50	15.71	V	4.5	9.2	20.35	33.0	-12.6	
1882.50	18.46	H	4.5	9.2	23.10	33.0	-9.9	
High Ch								
1914.30	16.42	V	4.6	8.9	20.72	33.0	-12.3	
1914.30	19.56	H	4.6	8.9	23.86	33.0	-9.1	

LTE
Band 25
1.4MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20890
Configuration: EUT / Z-Position
Location: Chamber 2
Mode: LTE_16QAM Band 25 Fundamentals, 1.4MHz 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								
1850.70	14.39	V	4.5	9.4	19.31	33.0	-13.7	
1850.70	17.46	H	4.5	9.4	22.38	33.0	-10.6	
Mid Ch								
1882.50	14.65	V	4.5	9.2	19.29	33.0	-13.7	
1882.50	17.28	H	4.5	9.2	21.92	33.0	-11.1	
High Ch								
1914.30	15.50	V	4.6	8.9	19.80	33.0	-13.2	
1914.30	18.36	H	4.6	8.9	22.66	33.0	-10.3	

LTE Band 26

LTE

Band 26

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
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	17.56	V	3.0	-1.0	13.59	50.0	-36.4	Part 90
821.50	24.81	H	3.0	-1.0	20.84	50.0	-29.2	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20881
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	17.37	V	3.0	-0.9	13.43	38.5	-25.1	
831.50	24.72	H	3.0	-0.9	20.77	38.5	-17.7	
High Ch								
841.50	16.47	V	3.0	-0.9	12.55	38.5	-25.9	
841.50	23.33	H	3.0	-0.9	19.41	38.5	-19.1	

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LTE

Band 26

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
821.50	16.48	V	3.0	-1.0	12.51	50.0	-37.5	Part 90
821.50	23.92	H	3.0	-1.0	19.95	50.0	-30.1	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch								
831.50	16.26	V	3.0	-0.9	12.32	38.5	-26.2	
831.50	23.74	H	3.0	-0.9	19.79	38.5	-18.7	
High Ch								
841.50	15.24	V	3.0	-0.9	11.32	38.5	-27.2	
841.50	22.44	H	3.0	-0.9	18.52	38.5	-20.0	

LTE

Band 26

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
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	17.18	V	3.0	-1.0	13.20	50.0	-36.8	Part 90
819.00	24.61	H	3.0	-1.0	20.63	50.0	-29.4	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
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	17.55	V	3.0	-0.9	13.59	50.0	-36.4	
829.00	24.81	H	3.0	-0.9	20.86	50.0	-29.1	
Mid Ch								
831.50	17.23	V	3.0	-0.9	13.29	38.5	-25.2	
831.50	24.74	H	3.0	-0.9	20.79	38.5	-17.7	
High Ch								
844.00	16.91	V	3.0	-0.9	12.99	38.5	-25.5	
844.00	23.35	H	3.0	-0.9	19.43	38.5	-19.1	

LTE

Band 26

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	16.08	V	3.0	-1.0	12.10	50.0	-37.9	Part 90
819.00	23.70	H	3.0	-1.0	19.72	50.0	-30.3	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	16.36	V	3.0	-0.9	12.40	50.0	-37.6	
829.00	23.57	H	3.0	-0.9	19.62	50.0	-30.4	
Mid Ch								
831.50	15.78	V	3.0	-0.9	11.84	38.5	-26.7	
831.50	23.63	H	3.0	-0.9	19.68	38.5	-18.8	
High Ch								
844.00	16.03	V	3.0	-0.9	12.11	38.5	-26.4	
844.00	22.55	H	3.0	-0.9	18.63	38.5	-19.9	

LTE

Band 26

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	17.46	V	3.0	-1.0	13.48	50.0	-36.5	Part 90
816.50	24.82	H	3.0	-1.0	20.84	50.0	-29.2	Part 90
Mid Ch								
821.50	17.06	V	3.0	-1.0	13.09	38.5	-25.4	Part 90
821.50	24.57	H	3.0	-1.0	20.60	38.5	-17.9	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	16.94	V	3.0	-0.9	12.98	50.0	-37.0	
826.50	24.33	H	3.0	-0.9	20.37	50.0	-29.6	
Mid Ch								
831.50	17.07	V	3.0	-0.9	13.13	38.5	-25.4	
831.50	24.02	H	3.0	-0.9	20.07	38.5	-18.4	
High Ch								
846.50	16.45	V	3.0	-0.9	12.53	38.5	-26.0	
846.50	23.07	H	3.0	-0.9	19.15	38.5	-19.3	

LTE

Band 26

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
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	16.33	V	3.0	-1.0	12.35	50.0	-37.7	Part 90
816.50	23.52	H	3.0	-1.0	19.54	50.0	-30.5	Part 90
Mid Ch								
821.50	15.68	V	3.0	-1.0	11.71	38.5	-26.8	Part 90
821.50	23.31	H	3.0	-1.0	19.34	38.5	-19.2	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
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	15.66	V	3.0	-0.9	11.70	50.0	-38.3	
826.50	23.10	H	3.0	-0.9	19.14	50.0	-30.9	
Mid Ch								
831.50	15.76	V	3.0	-0.9	11.82	38.5	-26.7	
831.50	22.85	H	3.0	-0.9	18.90	38.5	-19.6	
High Ch								
846.50	15.52	V	3.0	-0.9	11.60	38.5	-26.9	
846.50	22.20	H	3.0	-0.9	18.28	38.5	-20.2	

LTE

Band 26

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	17.47	V	3.0	-1.0	13.48	50.0	-36.5	Part 90
815.50	24.72	H	3.0	-1.0	20.74	50.0	-29.3	Part 90
Mid Ch								
822.50	17.12	V	3.0	-1.0	13.15	38.5	-25.3	Part 90
822.50	24.56	H	3.0	-1.0	20.60	38.5	-17.9	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	16.65	V	3.0	-0.9	12.69	50.0	-37.3	
825.50	24.49	H	3.0	-0.9	20.53	50.0	-29.5	
Mid Ch								
831.50	16.67	V	3.0	-0.9	12.73	38.5	-25.8	
831.50	23.81	H	3.0	-0.9	19.86	38.5	-18.6	
High Ch								
847.50	16.47	V	3.1	-0.9	12.56	38.5	-25.9	
847.50	23.09	H	3.1	-0.9	19.18	38.5	-19.3	

LTE

Band 26

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	16.37	V	3.0	-1.0	12.38	50.0	-37.6	Part 90
815.50	23.67	H	3.0	-1.0	19.69	50.0	-30.3	Part 90
Mid Ch								
825.50	16.13	V	3.0	-0.9	12.17	38.5	-26.3	Part 90
825.50	23.39	H	3.0	-0.9	19.43	38.5	-19.1	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	15.70	V	3.0	-0.9	11.74	50.0	-38.3	
825.50	23.22	H	3.0	-0.9	19.26	50.0	-30.7	
Mid Ch								
831.50	15.59	V	3.0	-0.9	11.65	38.5	-26.9	
831.50	23.08	H	3.0	-0.9	19.13	38.5	-19.4	
High Ch								
847.50	15.35	V	3.1	-0.9	11.44	38.5	-27.1	
847.50	21.96	H	3.1	-0.9	18.05	38.5	-20.5	

LTE

Band 26

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	17.34	V	3.0	-1.0	13.36	50.0	-36.6	Part 90
814.70	24.99	H	3.0	-1.0	21.00	50.0	-29.0	Part 90
Mid Ch								
823.30	17.08	V	3.0	-1.0	13.11	38.5	-25.4	Part 90
823.30	24.61	H	3.0	-1.0	20.64	38.5	-17.9	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	16.94	V	3.0	-1.0	12.97	50.0	-37.0	
824.70	24.30	H	3.0	-1.0	20.34	50.0	-29.7	
Mid Ch								
831.50	16.93	V	3.0	-0.9	12.99	38.5	-25.5	
831.50	23.96	H	3.0	-0.9	20.01	38.5	-18.5	
High Ch								
848.30	16.58	V	3.0	-0.9	12.67	38.5	-25.8	
848.30	23.19	H	3.0	-0.9	19.28	38.5	-19.2	

LTE

Band 26

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	16.30	V	3.0	-1.0	12.32	50.0	-37.7	Part 90
814.70	23.82	H	3.0	-1.0	19.83	50.0	-30.2	Part 90
Mid Ch								
823.30	15.94	V	3.0	-1.0	11.97	38.5	-26.5	Part 90
823.30	23.48	H	3.0	-1.0	19.51	38.5	-19.0	Part 90

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-17
Test Engineer: 20882
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	15.70	V	3.0	-1.0	11.73	50.0	-38.3	
824.70	23.01	H	3.0	-1.0	19.05	50.0	-31.0	
Mid Ch								
831.50	15.75	V	3.0	-0.9	11.81	38.5	-26.7	
831.50	22.67	H	3.0	-0.9	18.72	38.5	-19.8	
High Ch								
848.30	15.56	V	3.0	-0.9	11.65	38.5	-26.9	
848.30	22.21	H	3.0	-0.9	18.30	38.5	-20.2	

LTE Band 30

LTE Band 30 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20882
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 30 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
Mid Ch								
2310.00	13.52	V	5.0	9.7	18.14	24.0	-5.9	
2310.00	17.66	H	5.0	9.7	22.28	24.0	-1.7	

LTE Band 30 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20882
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 30 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
Mid Ch								
2310.00	12.74	V	5.0	9.7	17.36	24.0	-6.6	
2310.00	16.60	H	5.0	9.7	21.22	24.0	-2.8	

LTE

Band 30

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20881
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 30 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[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								
2307.50	12.74	V	5.0	9.6	17.35	24.0	-6.6	
2307.50	17.68	H	5.0	9.6	22.29	24.0	-1.7	
Mid Ch								
2310.00	13.86	V	5.0	9.7	18.48	24.0	-5.5	
2310.00	18.27	H	5.0	9.7	22.89	24.0	-1.1	
High Ch								
2312.50	12.59	V	5.0	9.7	17.21	24.0	-6.8	
2312.50	18.01	H	5.0	9.7	22.64	24.0	-1.4	

LTE

Band 30

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-07
Test Engineer: 20882
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 30 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[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								
2307.50	12.74	V	5.0	9.6	17.35	24.0	-6.6	
2307.50	16.71	H	5.0	9.6	21.32	24.0	-2.7	
Mid Ch								
2310.00	11.55	V	5.0	9.7	16.17	24.0	-7.8	
2310.00	16.82	H	5.0	9.7	21.44	24.0	-2.6	
High Ch								
2312.50	11.90	V	5.0	9.7	16.52	24.0	-7.5	
2312.50	17.07	H	5.0	9.7	21.70	24.0	-2.3	

LTE Band 41(PC2)

LTE Band 41 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	21.42	V	5.2	9.9	26.09	33.0	-6.9	
2506.00	21.82	H	5.2	9.9	26.49	33.0	-6.5	
Mid Ch								
2593.00	20.14	V	5.3	9.8	24.60	33.0	-8.4	
2593.00	20.70	H	5.3	9.8	25.17	33.0	-7.8	
High Ch								
2680.00	20.30	V	5.4	9.8	24.66	33.0	-8.3	
2680.00	21.46	H	5.4	9.8	25.82	33.0	-7.2	

LTE Band 41 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 20MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	22.23	V	5.2	9.9	26.90	33.0	-6.1	
2506.00	21.61	H	5.2	9.9	26.28	33.0	-6.7	
Mid Ch								
2593.00	19.17	V	5.3	9.8	23.63	33.0	-9.4	
2593.00	19.36	H	5.3	9.8	23.83	33.0	-9.2	
High Ch								
2680.00	19.15	V	5.4	9.8	23.51	33.0	-9.5	
2680.00	20.53	H	5.4	9.8	24.89	33.0	-8.1	

LTE

Band 41

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	22.42	V	5.2	9.9	27.09	33.0	-5.9	
2503.50	22.21	H	5.2	9.9	26.89	33.0	-6.1	
Mid Ch								
2593.00	20.55	V	5.3	9.8	25.01	33.0	-8.0	
2593.00	20.91	H	5.3	9.8	25.38	33.0	-7.6	
High Ch								
2682.50	20.46	V	5.4	9.8	24.82	33.0	-8.2	
2682.50	22.17	H	5.4	9.8	26.53	33.0	-6.5	

LTE

Band 41

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-11
Test Engineer: 20881
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	22.02	V	5.2	9.9	26.69	33.0	-6.3	
2503.50	22.26	H	5.2	9.9	26.94	33.0	-6.1	
Mid Ch								
2593.00	19.91	V	5.3	9.8	24.37	33.0	-8.6	
2593.00	20.34	H	5.3	9.8	24.81	33.0	-8.2	
High Ch								
2682.50	18.91	V	5.4	9.8	23.27	33.0	-9.7	
2682.50	19.99	H	5.4	9.8	24.35	33.0	-8.7	

LTE
Band 41
10MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-12
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	21.03	V	5.2	9.9	25.71	33.0	-7.3	
2501.00	20.46	H	5.2	9.9	25.14	33.0	-7.9	
Mid Ch								
2593.00	20.33	V	5.3	9.8	24.79	33.0	-8.2	
2593.00	20.43	H	5.3	9.8	24.90	33.0	-8.1	
High Ch								
2685.00	18.77	V	5.5	9.8	23.13	33.0	-9.9	
2685.00	21.16	H	5.5	9.8	25.52	33.0	-7.5	

LTE
Band 41
10MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-12
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	20.30	V	5.2	9.9	24.98	33.0	-8.0	
2501.00	19.82	H	5.2	9.9	24.50	33.0	-8.5	
Mid Ch								
2593.00	19.91	V	5.3	9.8	24.37	33.0	-8.6	
2593.00	19.91	H	5.3	9.8	24.38	33.0	-8.6	
High Ch								
2685.00	17.66	V	5.5	9.8	22.02	33.0	-11.0	
2685.00	20.01	H	5.5	9.8	24.37	33.0	-8.6	

LTE

Band 41

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-12
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	21.94	V	5.2	9.9	26.63	33.0	-6.4	
2498.50	20.92	H	5.2	9.9	25.60	33.0	-7.4	
Mid Ch								
2593.00	20.17	V	5.3	9.8	24.63	33.0	-8.4	
2593.00	20.31	H	5.3	9.8	24.78	33.0	-8.2	
High Ch								
2687.50	20.02	V	5.5	9.8	24.38	33.0	-8.6	
2687.50	21.44	H	5.5	9.8	25.80	33.0	-7.2	

LTE

Band 41

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-12
Test Engineer: 20896
Configuration: EUT, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	20.47	V	5.2	9.9	25.16	33.0	-7.8	
2498.50	20.85	H	5.2	9.9	25.53	33.0	-7.5	
Mid Ch								
2593.00	18.87	V	5.3	9.8	23.33	33.0	-9.7	
2593.00	19.60	H	5.3	9.8	24.07	33.0	-8.9	
High Ch								
2687.50	19.66	V	5.5	9.8	24.02	33.0	-9.0	
2687.50	20.87	H	5.5	9.8	25.23	33.0	-7.8	

LTE Band 66

LTE Band 66 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 Fundamentals, 20MHz 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								
1720.00	19.07	V	4.3	9.4	24.09	30.0	-5.9	
1720.00	14.05	H	4.3	9.4	19.07	30.0	-10.9	
Mid Ch								
1745.00	19.73	V	4.4	9.4	24.82	30.0	-5.2	
1745.00	13.47	H	4.4	9.4	18.56	30.0	-11.4	
High Ch								
1770.00	19.75	V	4.4	9.5	24.85	30.0	-5.2	
1770.00	13.25	H	4.4	9.5	18.35	30.0	-11.7	

LTE Band 66 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 66 Fundamentals, 20MHz 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								
1720.00	18.03	V	4.3	9.4	23.05	30.0	-6.9	
1720.00	12.80	H	4.3	9.4	17.82	30.0	-12.2	
Mid Ch								
1745.00	17.44	V	4.4	9.4	22.53	30.0	-7.5	
1745.00	10.85	H	4.4	9.4	15.94	30.0	-14.1	
High Ch								
1770.00	18.50	V	4.4	9.5	23.60	30.0	-6.4	
1770.00	12.11	H	4.4	9.5	17.21	30.0	-12.8	

LTE

Band 66

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 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								
1717.50	19.04	V	4.3	9.3	24.06	30.0	-5.9	
1717.50	13.30	H	4.3	9.3	18.32	30.0	-11.7	
Mid Ch								
1745.00	19.53	V	4.4	9.4	24.62	30.0	-5.4	
1745.00	13.83	H	4.4	9.4	18.92	30.0	-11.1	
High Ch								
1772.50	19.49	V	4.4	9.5	24.58	30.0	-5.4	
1772.50	14.05	H	4.4	9.5	19.14	30.0	-10.9	

LTE

Band 66

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 66 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								
1717.50	17.75	V	4.3	9.3	22.77	30.0	-7.2	
1717.50	12.43	H	4.3	9.3	17.45	30.0	-12.6	
Mid Ch								
1745.00	18.03	V	4.4	9.4	23.12	30.0	-6.9	
1745.00	13.38	H	4.4	9.4	18.47	30.0	-11.5	
High Ch								
1772.50	18.43	V	4.4	9.5	23.52	30.0	-6.5	
1772.50	12.72	H	4.4	9.5	17.81	30.0	-12.2	

LTE

Band 66

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 Fundamentals, 10MHz 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								
1715.00	18.93	V	4.3	9.3	23.94	30.0	-6.1	
1715.00	12.70	H	4.3	9.3	17.71	30.0	-12.3	
Mid Ch								
1745.00	18.54	V	4.4	9.4	23.63	30.0	-6.4	
1745.00	12.03	H	4.4	9.4	17.12	30.0	-12.9	
High Ch								
1775.00	19.16	V	4.4	9.5	24.26	30.0	-5.7	
1775.00	14.00	H	4.4	9.5	19.10	30.0	-10.9	

LTE

Band 66

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 66 Fundamentals, 10MHz 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								
1715.00	17.69	V	4.3	9.3	22.70	30.0	-7.3	
1715.00	11.43	H	4.3	9.3	16.44	30.0	-13.6	
Mid Ch								
1745.00	17.46	V	4.4	9.4	22.55	30.0	-7.5	
1745.00	11.01	H	4.4	9.4	16.10	30.0	-13.9	
High Ch								
1775.00	17.79	V	4.4	9.5	22.89	30.0	-7.1	
1775.00	12.58	H	4.4	9.5	17.68	30.0	-12.3	

LTE

Band 66

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 Fundamentals, 5MHz 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								
1712.50	18.75	V	4.3	9.3	23.75	30.0	-6.2	
1712.50	10.17	H	4.3	9.3	15.17	30.0	-14.8	
Mid Ch								
1745.00	18.96	V	4.4	9.4	24.05	30.0	-6.0	
1745.00	12.01	H	4.4	9.4	17.10	30.0	-12.9	
High Ch								
1777.50	19.25	V	4.4	9.5	24.35	30.0	-5.7	
1777.50	13.64	H	4.4	9.5	18.74	30.0	-11.3	

LTE

Band 66

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 66 Fundamentals, 5MHz 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								
1712.50	17.55	V	4.3	9.3	22.55	30.0	-7.4	
1712.50	9.19	H	4.3	9.3	14.19	30.0	-15.8	
Mid Ch								
1745.00	17.83	V	4.4	9.4	22.92	30.0	-7.1	
1745.00	11.13	H	4.4	9.4	16.22	30.0	-13.8	
High Ch								
1777.50	17.92	V	4.4	9.5	23.02	30.0	-7.0	
1777.50	12.27	H	4.4	9.5	17.37	30.0	-12.6	

LTE

Band 66

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 Fundamentals, 3MHz 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								
1711.50	18.55	V	4.3	9.3	23.56	30.0	-6.4	
1711.50	9.47	H	4.3	9.3	14.48	30.0	-15.5	
Mid Ch								
1745.00	18.56	V	4.4	9.4	23.65	30.0	-6.4	
1745.00	12.04	H	4.4	9.4	17.13	30.0	-12.9	
High Ch								
1778.50	19.11	V	4.4	9.5	24.21	30.0	-5.8	
1778.50	13.60	H	4.4	9.5	18.70	30.0	-11.3	

LTE

Band 66

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 66 Fundamentals, 3MHz 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								
1711.50	17.36	V	4.3	9.3	22.37	30.0	-7.6	
1711.50	8.75	H	4.3	9.3	13.76	30.0	-16.2	
Mid Ch								
1745.00	17.65	V	4.4	9.4	22.74	30.0	-7.3	
1745.00	11.14	H	4.4	9.4	16.23	30.0	-13.8	
High Ch								
1778.50	17.98	V	4.4	9.5	23.08	30.0	-6.9	
1778.50	12.68	H	4.4	9.5	17.78	30.0	-12.2	

LTE

Band 66

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT, Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 Fundamentals, 1.4MHz 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								
1710.70	18.51	V	4.3	9.3	23.51	30.0	-6.5	
1710.70	8.81	H	4.3	9.3	13.81	30.0	-16.2	
Mid Ch								
1745.00	18.67	V	4.4	9.4	23.76	30.0	-6.2	
1745.00	12.20	H	4.4	9.4	17.29	30.0	-12.7	
High Ch								
1779.30	19.38	V	4.4	9.5	24.48	30.0	-5.5	
1779.30	12.33	H	4.4	9.5	17.43	30.0	-12.6	

LTE

Band 66

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-06
Test Engineer: 20890
Configuration: EUT, Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 66 Fundamentals, 1.4MHz 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								
1710.70	17.31	V	4.3	9.3	22.31	30.0	-7.7	
1710.70	7.53	H	4.3	9.3	12.53	30.0	-17.5	
Mid Ch								
1745.00	17.64	V	4.4	9.4	22.73	30.0	-7.3	
1745.00	11.19	H	4.4	9.4	16.28	30.0	-13.7	
High Ch								
1779.30	18.24	V	4.4	9.5	23.34	30.0	-6.7	
1779.30	11.34	H	4.4	9.5	16.44	30.0	-13.6	

LTE Band 71

LTE Band 71 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Fundamentals, 20MHz 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								
673.00	12.21	V	2.7	-1.2	8.33	33.0	-24.7	
673.00	20.22	H	2.7	-1.2	16.33	33.0	-16.7	
Mid Ch								
680.50	13.27	V	2.7	-1.1	9.40	33.0	-23.6	
680.50	20.40	H	2.7	-1.1	16.53	33.0	-16.5	
High Ch								
687.90	10.08	V	2.8	-1.1	6.22	33.0	-26.8	
687.90	17.73	H	2.8	-1.1	13.88	33.0	-19.1	

LTE Band 71 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 71 Fundamentals, 20MHz 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								
673.00	11.77	V	2.7	-1.2	7.89	33.0	-25.1	
673.00	19.44	H	2.7	-1.2	15.55	33.0	-17.4	
Mid Ch								
680.50	11.88	V	2.7	-1.1	8.01	33.0	-25.0	
680.50	19.30	H	2.7	-1.1	15.43	33.0	-17.6	
High Ch								
687.90	8.98	V	2.8	-1.1	5.12	33.0	-27.9	
687.90	16.88	H	2.8	-1.1	13.03	33.0	-20.0	

LTE
Band 71
15MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 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								
670.50	13.28	V	2.7	-1.2	9.39	33.0	-23.6	
670.50	21.79	H	2.7	-1.2	17.90	33.0	-15.1	
Mid Ch								
680.50	12.60	V	2.7	-1.1	8.73	33.0	-24.3	
680.50	20.35	H	2.7	-1.1	16.48	33.0	-16.5	
High Ch								
690.40	10.83	V	2.8	-1.1	6.98	33.0	-26.0	
690.40	18.91	H	2.8	-1.1	15.05	33.0	-17.9	

LTE
Band 71
15MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-05
Test Engineer: 20881
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 71 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 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								
670.50	10.80	V	2.7	-1.2	6.91	33.0	-26.1	
670.50	19.24	H	2.7	-1.2	15.35	33.0	-17.6	
Mid Ch								
680.50	11.61	V	2.7	-1.1	7.74	33.0	-25.3	
680.50	19.57	H	2.7	-1.1	15.70	33.0	-17.3	
High Ch								
690.40	9.63	V	2.8	-1.1	5.78	33.0	-27.2	
690.40	17.86	H	2.8	-1.1	14.00	33.0	-19.0	

LTE
Band 71
10MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-10
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 71 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								
668.00	12.79	V	2.7	-1.2	8.89	33.0	-24.1	
668.00	21.43	H	2.7	-1.2	17.53	33.0	-15.5	
Mid Ch								
680.50	12.80	V	2.7	-1.1	8.93	33.0	-24.1	
680.50	20.33	H	2.7	-1.1	16.46	33.0	-16.5	
High Ch								
692.90	11.33	V	2.8	-1.1	7.49	33.0	-25.5	
692.90	19.49	H	2.8	-1.1	15.65	33.0	-17.4	

LTE
Band 71
10MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-10
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 71 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								
668.00	10.76	V	2.7	-1.2	6.86	33.0	-26.1	
668.00	19.42	H	2.7	-1.2	15.52	33.0	-17.5	
Mid Ch								
680.50	11.77	V	2.7	-1.1	7.90	33.0	-25.1	
680.50	19.30	H	2.7	-1.1	15.43	33.0	-17.6	
High Ch								
692.90	10.26	V	2.8	-1.1	6.42	33.0	-26.6	
692.90	18.27	H	2.8	-1.1	14.43	33.0	-18.6	

LTE

Band 71

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-10
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 71 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 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								
665.50	11.45	V	2.7	-1.2	7.55	33.0	-25.4	
665.50	20.26	H	2.7	-1.2	16.36	33.0	-16.6	
Mid Ch								
680.50	12.91	V	2.7	-1.1	9.04	33.0	-24.0	
680.50	20.38	H	2.7	-1.1	16.51	33.0	-16.5	
High Ch								
695.40	12.55	V	2.8	-1.1	8.71	33.0	-24.3	
695.40	20.29	H	2.8	-1.1	16.45	33.0	-16.6	

LTE

Band 71

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4789354138
Date: 2020-02-10
Test Engineer: 20896
Configuration: EUT, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 71 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 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								
665.50	10.79	V	2.7	-1.2	6.89	33.0	-26.1	
665.50	19.75	H	2.7	-1.2	15.85	33.0	-17.2	
Mid Ch								
680.50	11.70	V	2.7	-1.1	7.83	33.0	-25.2	
680.50	19.51	H	2.7	-1.1	15.64	33.0	-17.4	
High Ch								
695.40	11.30	V	2.8	-1.1	7.46	33.0	-25.5	
695.40	19.05	H	2.8	-1.1	15.21	33.0	-17.8	

9.6. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27. 53 and §90.691

LIMIT

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

Part 27.53:
(c)(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

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

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

Part 90.691(a):

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

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

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

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03r01

For peak power measurement with a ESU40:
a) Set the RBW = 100 kHz for emission below 1GHz and 1MHz for emissions above 1GHz
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = auto couple;
e) Detector = rms;
f) Ensure that the number of measurement points ≥ span/RBW;
g) Trace mode = average(WCDMA, LTE), Maxhold(GSM, LTE Band41);;

RESULTS

See the following pages.

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

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9.6.1. SPURIOUS RADIATION PLOTS

CDMA BC0

BC0
1xRTT

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

Company: Samsung
Project #: 4789354138
Date: 2020-02-21
Test Engineer: 20881
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 2
Mode: RTT BC0 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, 824.7MHz									
1649.40	-15.3	V	3.0	40.7	1.0	-55.0	-13.0	-42.0	
2474.10	-12.5	V	3.0	41.3	1.0	-52.8	-13.0	-39.8	
3298.80	-9.9	V	3.0	42.0	1.0	-51.0	-13.0	-38.0	
1649.40	-16.1	H	3.0	40.7	1.0	-55.7	-13.0	-42.7	
2474.10	-12.5	H	3.0	41.3	1.0	-52.7	-13.0	-39.7	
3298.80	-9.8	H	3.0	42.0	1.0	-50.9	-13.0	-37.9	
Mid Ch, 836.52MHz									
1673.04	-15.1	V	3.0	40.7	1.0	-54.8	-13.0	-41.8	
2509.56	-12.4	V	3.0	41.3	1.0	-52.7	-13.0	-39.7	
3346.08	-10.1	V	3.0	42.0	1.0	-51.2	-13.0	-38.2	
1673.04	-15.9	H	3.0	40.7	1.0	-55.6	-13.0	-42.6	
2509.56	-12.5	H	3.0	41.3	1.0	-52.8	-13.0	-39.8	
3346.08	-9.7	H	3.0	42.0	1.0	-50.7	-13.0	-37.7	
High Ch, 848.31MHz									
1696.62	-15.0	V	3.0	40.7	1.0	-54.7	-13.0	-41.7	
2544.93	-12.4	V	3.0	41.4	1.0	-52.8	-13.0	-39.8	
3393.24	-9.6	V	3.0	42.0	1.0	-50.6	-13.0	-37.6	
1696.62	-15.8	H	3.0	40.7	1.0	-55.5	-13.0	-42.5	
2544.93	-12.2	H	3.0	41.4	1.0	-52.6	-13.0	-39.6	
3393.24	-9.4	H	3.0	42.0	1.0	-50.4	-13.0	-37.4	

BC0
EVDO Rel.0

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

Company: Samsung
Project #: 4789354138
Date: 2020-02-21
Test Engineer: 20881
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 2
Mode: EVDO BC0 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, 824.7MHz									
1649.40	-15.3	V	3.0	40.7	1.0	-55.0	-13.0	-42.0	
2474.10	-12.6	V	3.0	41.3	1.0	-52.9	-13.0	-39.9	
3298.80	-10.2	V	3.0	42.0	1.0	-51.2	-13.0	-38.2	
1649.40	-16.1	H	3.0	40.7	1.0	-55.7	-13.0	-42.7	
2474.10	-13.0	H	3.0	41.3	1.0	-53.2	-13.0	-40.2	
3298.80	-10.7	H	3.0	42.0	1.0	-51.7	-13.0	-38.7	
Mid Ch, 836.52MHz									
1673.04	-15.1	V	3.0	40.7	1.0	-54.8	-13.0	-41.8	
2509.56	-12.6	V	3.0	41.3	1.0	-52.9	-13.0	-39.9	
3346.08	-10.1	V	3.0	42.0	1.0	-51.1	-13.0	-38.1	
1673.04	-16.0	H	3.0	40.7	1.0	-55.7	-13.0	-42.7	
2509.56	-12.5	H	3.0	41.3	1.0	-52.8	-13.0	-39.8	
3346.08	-9.8	H	3.0	42.0	1.0	-50.9	-13.0	-37.9	
High Ch, 848.31MHz									
1696.62	-15.2	V	3.0	40.7	1.0	-54.8	-13.0	-41.8	
2544.93	-12.6	V	3.0	41.4	1.0	-53.0	-13.0	-40.0	
3393.24	-9.8	V	3.0	42.0	1.0	-50.8	-13.0	-37.8	
1696.62	-15.8	H	3.0	40.7	1.0	-55.5	-13.0	-42.5	
2544.93	-12.3	H	3.0	41.4	1.0	-52.7	-13.0	-39.7	
3393.24	-9.5	H	3.0	42.0	1.0	-50.6	-13.0	-37.6	

BC0
EVDO Rel.A

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

Company: Samsung
Project #: 4789354138
Date: 2020-02-21
Test Engineer: 20881
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 2
Mode: EVDO BC0 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, 824.7MHz									
1649.40	-15.2	V	3.0	40.7	1.0	-54.8	-13.0	-41.8	
2474.10	-12.6	V	3.0	41.3	1.0	-52.9	-13.0	-39.9	
3298.80	-10.2	V	3.0	42.0	1.0	-51.3	-13.0	-38.3	
1649.40	-16.1	H	3.0	40.7	1.0	-55.8	-13.0	-42.8	
2474.10	-12.5	H	3.0	41.3	1.0	-52.8	-13.0	-39.8	
3298.80	-9.8	H	3.0	42.0	1.0	-50.8	-13.0	-37.8	
Mid Ch, 836.52MHz									
1673.04	-15.0	V	3.0	40.7	1.0	-54.7	-13.0	-41.7	
2509.56	-12.6	V	3.0	41.3	1.0	-52.9	-13.0	-39.9	
3346.08	-10.0	V	3.0	42.0	1.0	-51.0	-13.0	-38.0	
1673.04	-15.8	H	3.0	40.7	1.0	-55.4	-13.0	-42.4	
2509.56	-12.5	H	3.0	41.3	1.0	-52.8	-13.0	-39.8	
3346.08	-9.7	H	3.0	42.0	1.0	-50.7	-13.0	-37.7	
High Ch, 848.31MHz									
1696.62	-15.0	V	3.0	40.7	1.0	-54.7	-13.0	-41.7	
2544.93	-12.3	V	3.0	41.4	1.0	-52.7	-13.0	-39.7	
3393.24	-9.7	V	3.0	42.0	1.0	-50.7	-13.0	-37.7	
1696.62	-15.8	H	3.0	40.7	1.0	-55.5	-13.0	-42.5	
2544.93	-12.3	H	3.0	41.4	1.0	-52.7	-13.0	-39.7	
3393.24	-9.5	H	3.0	42.0	1.0	-50.5	-13.0	-37.5	

CDMA BC1

BC1
1xRTT

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

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: RTT BC1 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, 1851.25MHz									
3702.50	-10.5	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
5553.75	-6.8	V	3.0	45.3	1.0	-51.0	-13.0	-38.0	
7405.00	-5.0	V	3.0	44.1	1.0	-48.2	-13.0	-35.2	
3702.50	-10.0	H	3.0	45.4	1.0	-54.4	-13.0	-41.4	
5553.75	-7.5	H	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7405.00	-4.7	H	3.0	44.1	1.0	-47.8	-13.0	-34.8	
Mid Ch, 1880MHz									
3760.00	-9.5	V	3.0	45.4	1.0	-54.0	-13.0	-41.0	
5640.00	-7.7	V	3.0	45.3	1.0	-52.0	-13.0	-39.0	
7520.00	-5.2	V	3.0	44.1	1.0	-48.3	-13.0	-35.3	
3760.00	-9.2	H	3.0	45.4	1.0	-53.6	-13.0	-40.6	
5640.00	-8.0	H	3.0	45.3	1.0	-52.3	-13.0	-39.3	
7520.00	-5.2	H	3.0	44.1	1.0	-48.3	-13.0	-35.3	
High Ch, 1908.75MHz									
3817.50	-10.5	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
5726.25	-9.1	V	3.0	45.3	1.0	-53.4	-13.0	-40.4	
7635.00	-6.9	V	3.0	44.0	1.0	-49.9	-13.0	-36.9	
3817.50	-10.7	H	3.0	45.4	1.0	-55.1	-13.0	-42.1	
5726.25	-9.3	H	3.0	45.3	1.0	-53.6	-13.0	-40.6	
7635.00	-6.7	H	3.0	44.0	1.0	-49.8	-13.0	-36.8	

BC1
EVDO Rel.0

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

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: EVDO BC1 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, 1851.25MHz									
3702.50	-11.0	V	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5553.75	-7.3	V	3.0	45.3	1.0	-51.5	-13.0	-38.5	
7405.00	-5.0	V	3.0	44.1	1.0	-48.1	-13.0	-35.1	
3702.50	-11.2	H	3.0	45.4	1.0	-55.6	-13.0	-42.6	
5553.75	-7.4	H	3.0	45.3	1.0	-51.6	-13.0	-38.6	
7405.00	-4.9	H	3.0	44.1	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1880MHz									
3760.00	-10.6	V	3.0	45.4	1.0	-55.0	-13.0	-42.0	
5640.00	-7.3	V	3.0	45.3	1.0	-51.6	-13.0	-38.6	
7520.00	-5.1	V	3.0	44.1	1.0	-48.2	-13.0	-35.2	
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	-4.9	H	3.0	44.1	1.0	-48.0	-13.0	-35.0	
High Ch, 1908.75MHz									
3817.50	-10.6	V	3.0	45.4	1.0	-55.1	-13.0	-42.1	
5726.25	-7.4	V	3.0	45.3	1.0	-51.7	-13.0	-38.7	
7635.00	-5.3	V	3.0	44.0	1.0	-48.3	-13.0	-35.3	
3817.50	-10.9	H	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5726.25	-7.9	H	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7635.00	-4.7	H	3.0	44.0	1.0	-47.7	-13.0	-34.7	

BC1
EVDO Rel.A

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

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: EVDO BC1 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, 1851.25MHz									
3702.50	-11.0	V	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5553.75	-7.1	V	3.0	45.3	1.0	-51.4	-13.0	-38.4	
7405.00	-5.1	V	3.0	44.1	1.0	-48.2	-13.0	-35.2	
3702.50	-11.1	H	3.0	45.4	1.0	-55.5	-13.0	-42.5	
5553.75	-7.7	H	3.0	45.3	1.0	-51.9	-13.0	-38.9	
7405.00	-4.8	H	3.0	44.1	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1880MHz									
3760.00	-10.7	V	3.0	45.4	1.0	-55.1	-13.0	-42.1	
5640.00	-7.3	V	3.0	45.3	1.0	-51.6	-13.0	-38.6	
7520.00	-5.2	V	3.0	44.1	1.0	-48.2	-13.0	-35.2	
3760.00	-10.6	H	3.0	45.4	1.0	-55.0	-13.0	-42.0	
5640.00	-7.7	H	3.0	45.3	1.0	-52.0	-13.0	-39.0	
7520.00	-4.7	H	3.0	44.1	1.0	-47.8	-13.0	-34.8	
High Ch, 1908.75MHz									
3817.50	-10.6	V	3.0	45.4	1.0	-55.0	-13.0	-42.0	
5726.25	-7.3	V	3.0	45.3	1.0	-51.6	-13.0	-38.6	
7635.00	-4.8	V	3.0	44.0	1.0	-47.8	-13.0	-34.8	
3817.50	-10.9	H	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5726.25	-7.5	H	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7635.00	-4.7	H	3.0	44.0	1.0	-47.7	-13.0	-34.7	

CDMA BC10

BC10
1xRTT

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

Company: Samsung
Project #: 4789354138
Date: 2020-02-18
Test Engineer: 20882
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: RTT BC10 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, 817.9MHz									
1635.80	-15.0	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
2453.70	-10.6	V	3.0	45.0	1.0	-54.6	-13.0	-41.6	
3271.60	-8.6	V	3.0	45.2	1.0	-52.9	-13.0	-39.9	
1635.80	-13.4	H	3.0	45.2	1.0	-57.6	-13.0	-44.6	
2453.70	-10.3	H	3.0	45.0	1.0	-54.4	-13.0	-41.4	
3271.60	-9.1	H	3.0	45.2	1.0	-53.3	-13.0	-40.3	
Mid Ch, 820.5MHz									
1641.00	-14.2	V	3.0	45.2	1.0	-58.4	-13.0	-45.4	
2461.50	-11.4	V	3.0	45.0	1.0	-55.5	-13.0	-42.5	
3282.00	-8.5	V	3.0	45.2	1.0	-52.8	-13.0	-39.8	
1641.00	-13.3	H	3.0	45.2	1.0	-57.5	-13.0	-44.5	
2461.50	-10.0	H	3.0	45.0	1.0	-54.0	-13.0	-41.0	
4102.50	-9.7	H	3.0	45.5	1.0	-54.2	-13.0	-41.2	
4923.00	-7.6	H	3.0	45.3	1.0	-51.9	-13.0	-38.9	
High Ch, 823.1MHz									
1646.20	-14.4	V	3.0	45.2	1.0	-58.6	-13.0	-45.6	
2469.30	-10.7	V	3.0	45.0	1.0	-54.7	-13.0	-41.7	
3292.40	-8.8	V	3.0	45.3	1.0	-53.1	-13.0	-40.1	
1646.20	-13.4	H	3.0	45.2	1.0	-57.6	-13.0	-44.6	
2469.30	-10.0	H	3.0	45.0	1.0	-54.0	-13.0	-41.0	
3292.40	-8.8	H	3.0	45.3	1.0	-53.0	-13.0	-40.0	

GSM850

GSM850
GPRS

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-20
Test Engineer: 20896
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 2
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	-12.3	V	3.0	40.7	1.0	-51.9	-13.0	-38.9	
2472.60	2.1	V	3.0	41.3	1.0	-38.2	-13.0	-25.2	
3296.80	-9.3	V	3.0	42.0	1.0	-50.3	-13.0	-37.3	
1648.40	-9.7	H	3.0	40.7	1.0	-49.4	-13.0	-36.4	
2472.60	-1.3	H	3.0	41.3	1.0	-41.5	-13.0	-28.5	
3296.80	-8.9	H	3.0	42.0	1.0	-49.9	-13.0	-36.9	
Mid Ch, 836.6MHz									
1673.20	-13.1	V	3.0	40.7	1.0	-52.7	-13.0	-39.7	
2509.80	-4.3	V	3.0	41.3	1.0	-44.6	-13.0	-31.6	
3346.40	-8.8	V	3.0	42.0	1.0	-49.8	-13.0	-36.8	
1673.20	-5.8	H	3.0	40.7	1.0	-45.4	-13.0	-32.4	
2509.80	2.9	H	3.0	41.3	1.0	-37.4	-13.0	-24.4	
3346.40	-8.7	H	3.0	42.0	1.0	-49.7	-13.0	-36.7	
High Ch, 848.8MHz									
1697.60	-13.6	V	3.0	40.7	1.0	-53.2	-13.0	-40.2	
2546.40	-7.4	V	3.0	41.4	1.0	-47.8	-13.0	-34.8	
3395.20	-8.7	V	3.0	42.0	1.0	-49.7	-13.0	-36.7	
1697.60	-10.6	H	3.0	40.7	1.0	-50.2	-13.0	-37.2	
2546.40	-7.1	H	3.0	41.4	1.0	-47.5	-13.0	-34.5	
3395.20	-8.4	H	3.0	42.0	1.0	-49.4	-13.0	-36.4	

GSM850
EGPRS

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-20
Test Engineer: 20896
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 2
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	-14.3	V	3.0	40.7	1.0	-54.0	-13.0	-41.0	
2472.60	-2.9	V	3.0	41.3	1.0	-43.2	-13.0	-30.2	
3296.80	-9.5	V	3.0	42.0	1.0	-50.5	-13.0	-37.5	
1648.40	-15.0	H	3.0	40.7	1.0	-54.7	-13.0	-41.7	
2472.60	-5.3	H	3.0	41.3	1.0	-45.5	-13.0	-32.5	
3296.80	-9.2	H	3.0	42.0	1.0	-50.2	-13.0	-37.2	
Mid Ch, 836.6MHz									
1673.20	-14.3	V	3.0	40.7	1.0	-54.0	-13.0	-41.0	
2509.80	-3.2	V	3.0	41.3	1.0	-43.5	-13.0	-30.5	
3346.40	-8.9	V	3.0	42.0	1.0	-49.9	-13.0	-36.9	
1673.20	-13.9	H	3.0	40.7	1.0	-53.6	-13.0	-40.6	
2509.80	-1.0	H	3.0	41.3	1.0	-41.3	-13.0	-28.3	
3346.40	-8.8	H	3.0	42.0	1.0	-49.8	-13.0	-36.8	
High Ch, 848.8MHz									
1697.60	-14.2	V	3.0	40.7	1.0	-53.8	-13.0	-40.8	
2546.40	-11.7	V	3.0	41.4	1.0	-52.1	-13.0	-39.1	
3395.20	-9.0	V	3.0	42.0	1.0	-50.0	-13.0	-37.0	
1697.60	-14.5	H	3.0	40.7	1.0	-54.2	-13.0	-41.2	
2546.40	-8.7	H	3.0	41.4	1.0	-49.1	-13.0	-36.1	
3395.20	-8.4	H	3.0	42.0	1.0	-49.5	-13.0	-36.5	

GSM1900

GSM1900

GPRS

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-20
Test Engineer: 20882
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 1
Mode: GPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	0.4	V	3.0	45.4	1.0	-44.0	-13.0	-31.0	
5550.60	-0.3	V	3.0	45.3	1.0	-44.5	-13.0	-31.5	
7400.80	-4.5	V	3.0	44.1	1.0	-47.7	-13.0	-34.7	
3700.40	2.8	H	3.0	45.4	1.0	-41.6	-13.0	-28.6	
5550.60	0.2	H	3.0	45.3	1.0	-44.0	-13.0	-31.0	
7400.80	-4.4	H	3.0	44.1	1.0	-47.6	-13.0	-34.6	
Mid Ch, 1880MHz									
3760.00	-0.1	V	3.0	45.4	1.0	-44.5	-13.0	-31.5	
5640.00	-0.6	V	3.0	45.3	1.0	-44.8	-13.0	-31.8	
7520.00	-4.5	V	3.0	44.1	1.0	-47.6	-13.0	-34.6	
3760.00	4.7	H	3.0	45.4	1.0	-39.7	-13.0	-26.7	
5640.00	3.2	H	3.0	45.3	1.0	-41.1	-13.0	-28.1	
7520.00	-4.4	H	3.0	44.1	1.0	-47.5	-13.0	-34.5	
High Ch, 1909.8MHz									
3819.60	-2.7	V	3.0	45.4	1.0	-47.1	-13.0	-34.1	
5729.40	0.9	V	3.0	45.3	1.0	-43.4	-13.0	-30.4	
7639.20	-4.5	V	3.0	44.0	1.0	-47.5	-13.0	-34.5	
3819.60	-0.6	H	3.0	45.4	1.0	-45.1	-13.0	-32.1	
5729.40	0.9	H	3.0	45.3	1.0	-43.4	-13.0	-30.4	
7639.20	-4.1	H	3.0	44.0	1.0	-47.1	-13.0	-34.1	

GSM1900

EGPRS

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-20
Test Engineer: 20882
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 1
Mode: EGPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-4.1	V	3.0	45.4	1.0	-48.5	-13.0	-35.5	
5550.60	-5.2	V	3.0	45.3	1.0	-49.4	-13.0	-36.4	
7400.80	-4.6	V	3.0	44.1	1.0	-47.7	-13.0	-34.7	
3700.40	-1.3	H	3.0	45.4	1.0	-45.7	-13.0	-32.7	
5550.60	-6.6	H	3.0	45.3	1.0	-50.8	-13.0	-37.8	
7400.80	-4.6	H	3.0	44.1	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1880MHz									
3760.00	-5.3	V	3.0	45.4	1.0	-49.8	-13.0	-36.8	
5640.00	-5.8	V	3.0	45.3	1.0	-50.0	-13.0	-37.0	
7520.00	-4.6	V	3.0	44.1	1.0	-47.7	-13.0	-34.7	
3760.00	-4.1	H	3.0	45.4	1.0	-48.5	-13.0	-35.5	
5640.00	-4.9	H	3.0	45.3	1.0	-49.2	-13.0	-36.2	
7520.00	-4.5	H	3.0	44.1	1.0	-47.6	-13.0	-34.6	
High Ch, 1909.8MHz									
3819.60	-9.3	V	3.0	45.4	1.0	-53.8	-13.0	-40.8	
5729.40	-2.2	V	3.0	45.3	1.0	-46.5	-13.0	-33.5	
7639.20	-4.4	V	3.0	44.0	1.0	-47.4	-13.0	-34.4	
3819.60	-8.7	H	3.0	45.4	1.0	-53.2	-13.0	-40.2	
5729.40	-2.5	H	3.0	45.3	1.0	-46.8	-13.0	-33.8	
7639.20	-4.2	H	3.0	44.0	1.0	-47.2	-13.0	-34.2	

WCDMA Band 5

WCDMA

Band 5
REL99

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-20
Test Engineer: 20890
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: Rel99 Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1652.80	-15.1	V	3.0	45.2	1.0	-59.3	-13.0	-46.3	
2479.20	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
3305.60	-9.4	V	3.0	45.3	1.0	-53.7	-13.0	-40.7	
1652.80	-14.0	H	3.0	45.2	1.0	-58.2	-13.0	-45.2	
2479.20	-10.8	H	3.0	45.0	1.0	-54.8	-13.0	-41.8	
3305.60	-9.6	H	3.0	45.3	1.0	-53.9	-13.0	-40.9	
Mid Ch, 836.6MHz									
1673.20	-15.0	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
2509.80	-11.8	V	3.0	45.0	1.0	-55.8	-13.0	-42.8	
3346.40	-9.4	V	3.0	45.3	1.0	-53.7	-13.0	-40.7	
1673.20	-14.2	H	3.0	45.2	1.0	-58.4	-13.0	-45.4	
2509.80	-11.3	H	3.0	45.0	1.0	-55.3	-13.0	-42.3	
3346.40	-9.6	H	3.0	45.3	1.0	-53.8	-13.0	-40.8	
High Ch, 846.6MHz									
1693.20	-14.7	V	3.0	45.2	1.0	-58.9	-13.0	-45.9	
2539.80	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
3386.40	-9.3	V	3.0	45.3	1.0	-53.6	-13.0	-40.6	
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	-55.2	-13.0	-42.2	
3386.40	-9.4	H	3.0	45.3	1.0	-53.7	-13.0	-40.7	

WCDMA

Band 5
HSDPA

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-20
Test Engineer: 20890
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 1
Mode: HSDPA Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1652.80	-15.2	V	3.0	45.2	1.0	-59.4	-13.0	-46.4	
2479.20	-11.7	V	3.0	45.0	1.0	-55.8	-13.0	-42.8	
3305.60	-9.5	V	3.0	45.3	1.0	-53.8	-13.0	-40.8	
1652.80	-14.2	H	3.0	45.2	1.0	-58.4	-13.0	-45.4	
2479.20	-10.8	H	3.0	45.0	1.0	-54.8	-13.0	-41.8	
3305.60	-9.3	H	3.0	45.3	1.0	-53.6	-13.0	-40.6	
Mid Ch, 836.6MHz									
1673.20	-15.0	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
2509.80	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
3346.40	-9.3	V	3.0	45.3	1.0	-53.6	-13.0	-40.6	
1673.20	-14.1	H	3.0	45.2	1.0	-58.3	-13.0	-45.3	
2509.80	-11.1	H	3.0	45.0	1.0	-55.2	-13.0	-42.2	
3346.40	-9.6	H	3.0	45.3	1.0	-53.9	-13.0	-40.9	
High Ch, 846.6MHz									
1693.20	-14.7	V	3.0	45.2	1.0	-58.9	-13.0	-45.9	
2539.80	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
3386.40	-9.2	V	3.0	45.3	1.0	-53.5	-13.0	-40.5	
1693.20	-13.9	H	3.0	45.2	1.0	-58.1	-13.0	-45.1	
2539.80	-11.2	H	3.0	45.0	1.0	-55.2	-13.0	-42.2	
3386.40	-9.3	H	3.0	45.3	1.0	-53.6	-13.0	-40.6	

WCDMA Band 4

WCDMA

Band 4
REL99

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20896
Configuration: EUT / AC Adapter, X-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	-8.7	V	3.0	45.3	1.0	-53.0	-13.0	-40.0	
5137.20	-8.2	V	3.0	45.3	1.0	-52.4	-13.0	-39.4	
6849.60	-5.8	V	3.0	44.5	1.0	-49.3	-13.0	-36.3	
3424.80	-9.0	H	3.0	45.3	1.0	-53.3	-13.0	-40.3	
5137.20	-8.5	H	3.0	45.3	1.0	-52.8	-13.0	-39.8	
6849.60	-5.8	H	3.0	44.5	1.0	-49.3	-13.0	-36.3	
Mid Ch, 1732.6MHz									
3465.20	-8.9	V	3.0	45.3	1.0	-53.2	-13.0	-40.2	
5197.80	-7.8	V	3.0	45.3	1.0	-52.1	-13.0	-39.1	
6930.40	-5.8	V	3.0	44.4	1.0	-49.2	-13.0	-36.2	
3465.20	-9.2	H	3.0	45.3	1.0	-53.5	-13.0	-40.5	
5197.80	-8.3	H	3.0	45.3	1.0	-52.6	-13.0	-39.6	
6930.40	-5.8	H	3.0	44.4	1.0	-49.3	-13.0	-36.3	
High Ch, 1752.6MHz									
3505.20	-7.9	V	3.0	45.3	1.0	-52.3	-13.0	-39.3	
5257.80	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7010.40	-5.2	V	3.0	44.4	1.0	-48.5	-13.0	-35.5	
3505.20	-8.0	H	3.0	45.3	1.0	-52.4	-13.0	-39.4	
5257.80	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
7010.40	-5.5	H	3.0	44.4	1.0	-48.8	-13.0	-35.8	

WCDMA

Band 4
HSDPA

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20896
Configuration: EUT / AC Adapter, X-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	-8.6	V	3.0	45.3	1.0	-52.9	-13.0	-39.9	
5137.20	-8.2	V	3.0	45.3	1.0	-52.5	-13.0	-39.5	
6849.60	-5.9	V	3.0	44.5	1.0	-49.4	-13.0	-36.4	
3424.80	-8.9	H	3.0	45.3	1.0	-53.2	-13.0	-40.2	
5137.20	-8.6	H	3.0	45.3	1.0	-52.9	-13.0	-39.9	
6849.60	-5.9	H	3.0	44.5	1.0	-49.4	-13.0	-36.4	
Mid Ch, 1732.6MHz									
3465.20	-8.6	V	3.0	45.3	1.0	-52.9	-13.0	-39.9	
5197.80	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
6930.40	-5.9	V	3.0	44.4	1.0	-49.3	-13.0	-36.3	
3465.20	-8.9	H	3.0	45.3	1.0	-53.2	-13.0	-40.2	
5197.80	-8.3	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
6930.40	-5.9	H	3.0	44.4	1.0	-49.3	-13.0	-36.3	
High Ch, 1752.6MHz									
3505.20	-7.8	V	3.0	45.3	1.0	-52.1	-13.0	-39.1	
5257.80	-8.0	V	3.0	45.3	1.0	-52.3	-13.0	-39.3	
7010.40	-5.5	V	3.0	44.4	1.0	-48.9	-13.0	-35.9	
3505.20	-8.0	H	3.0	45.3	1.0	-52.3	-13.0	-39.3	
5257.80	-8.3	H	3.0	45.3	1.0	-52.6	-13.0	-39.6	
7010.40	-5.6	H	3.0	44.4	1.0	-48.9	-13.0	-35.9	

WCDMA Band 2

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20896
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: Rel99 Band 2 Harmonics

WCDMA

Band 2
REL99

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	-10.9	V	3.0	45.4	1.0	-55.3	-13.0	-42.3	
5557.20	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7409.60	-5.7	V	3.0	44.1	1.0	-48.9	-13.0	-35.9	
3704.80	-11.3	H	3.0	45.4	1.0	-55.7	-13.0	-42.7	
5557.20	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
7409.60	-5.6	H	3.0	44.1	1.0	-48.8	-13.0	-35.8	
Mid Ch, 1880MHz									
3760.00	-10.4	V	3.0	45.4	1.0	-54.8	-13.0	-41.8	
5640.00	-8.0	V	3.0	45.3	1.0	-52.3	-13.0	-39.3	
7520.00	-5.7	V	3.0	44.1	1.0	-48.8	-13.0	-35.8	
3760.00	-11.0	H	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5640.00	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
7520.00	-5.6	H	3.0	44.1	1.0	-48.7	-13.0	-35.7	
High Ch, 1907.6MHz									
3815.20	-10.4	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
5722.80	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7630.40	-5.6	V	3.0	44.0	1.0	-48.6	-13.0	-35.6	
3815.20	-11.0	H	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5722.80	-8.1	H	3.0	45.3	1.0	-52.4	-13.0	-39.4	
7630.40	-5.5	H	3.0	44.0	1.0	-48.5	-13.0	-35.5	

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20896
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: HSDPA Band 2 Harmonics

WCDMA

Band 2
HSDPA

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	-11.0	V	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5557.20	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7409.60	-5.7	V	3.0	44.1	1.0	-48.9	-13.0	-35.9	
3704.80	-11.4	H	3.0	45.4	1.0	-55.8	-13.0	-42.8	
5557.20	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
7409.60	-5.6	H	3.0	44.1	1.0	-48.8	-13.0	-35.8	
Mid Ch, 1880MHz									
3760.00	-10.4	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
5640.00	-8.0	V	3.0	45.3	1.0	-52.3	-13.0	-39.3	
7520.00	-5.7	V	3.0	44.1	1.0	-48.8	-13.0	-35.8	
3760.00	-11.0	H	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5640.00	-8.2	H	3.0	45.3	1.0	-52.5	-13.0	-39.5	
7520.00	-5.6	H	3.0	44.1	1.0	-48.7	-13.0	-35.7	
High Ch, 1907.6MHz									
3815.20	-10.5	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
5722.80	-7.9	V	3.0	45.3	1.0	-52.1	-13.0	-39.1	
7630.40	-5.7	V	3.0	44.0	1.0	-48.7	-13.0	-35.7	
3815.20	-10.9	H	3.0	45.4	1.0	-55.4	-13.0	-42.4	
5722.80	-8.1	H	3.0	45.3	1.0	-52.4	-13.0	-39.4	
7630.40	-5.5	H	3.0	44.0	1.0	-48.5	-13.0	-35.5	

LTE Band 12

LTE
Band 12
10MHz
QPSK

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20882
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 12 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 704MHz									
1408.00	-15.9	V	3.0	45.4	1.0	-60.3	-13.0	-47.3	
2112.00	-11.3	V	3.0	45.0	1.0	-55.2	-13.0	-42.2	
2816.00	-10.2	V	3.0	45.1	1.0	-54.3	-13.0	-41.3	
1408.00	-15.4	H	3.0	45.4	1.0	-59.8	-13.0	-46.8	
2112.00	-8.0	H	3.0	45.0	1.0	-52.0	-13.0	-39.0	
2816.00	-10.2	H	3.0	45.1	1.0	-54.3	-13.0	-41.3	
Mid Ch, 707.5MHz									
1415.00	-16.1	V	3.0	45.4	1.0	-60.5	-13.0	-47.5	
2122.50	-12.4	V	3.0	45.0	1.0	-56.3	-13.0	-43.3	
2830.00	-10.4	V	3.0	45.1	1.0	-54.5	-13.0	-41.5	
1415.00	-14.2	H	3.0	45.4	1.0	-58.6	-13.0	-45.6	
2122.50	-9.1	H	3.0	45.0	1.0	-53.1	-13.0	-40.1	
2830.00	-10.4	H	3.0	45.1	1.0	-54.5	-13.0	-41.5	
High Ch, 711MHz									
1422.00	-15.9	V	3.0	45.4	1.0	-60.3	-13.0	-47.3	
2133.00	-10.7	V	3.0	45.0	1.0	-54.7	-13.0	-41.7	
2844.00	-10.2	V	3.0	45.1	1.0	-54.4	-13.0	-41.4	
1422.00	-15.1	H	3.0	45.4	1.0	-59.4	-13.0	-46.4	
2133.00	-7.4	H	3.0	45.0	1.0	-51.3	-13.0	-38.3	
2844.00	-10.2	H	3.0	45.1	1.0	-54.4	-13.0	-41.4	

LTE Band 13

LTE
Band 13
10MHz
QPSK

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20882
Configuration: EUT / AC Adapter, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, 782MHz									
1564.00	-23.6	V	3.0	45.3	1.0	-67.8	-40.0	-27.8	
2346.00	-7.8	V	3.0	45.0	1.0	-51.8	-13.0	-38.8	
3128.00	-8.9	V	3.0	45.2	1.0	-53.1	-13.0	-40.1	
1564.00	-19.4	H	3.0	45.3	1.0	-63.6	-40.0	-23.6	
2346.00	-6.2	H	3.0	45.0	1.0	-50.2	-13.0	-37.2	
3128.00	-9.0	H	3.0	45.2	1.0	-53.2	-13.0	-40.2	

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

LTE Band 25

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-20
Test Engineer: 20882
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 1
Mode: LTE_QPSK Band 25 Harmonics, 3MHz Bandwidth

LTE
Band 25
3MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5MHz									
3703.00	-6.4	V	3.0	45.4	1.0	-50.8	-13.0	-37.8	
5554.50	-7.1	V	3.0	45.3	1.0	-51.4	-13.0	-38.4	
7406.00	-4.8	V	3.0	44.1	1.0	-47.9	-13.0	-34.9	
3703.00	-4.7	H	3.0	45.4	1.0	-49.1	-13.0	-36.1	
5554.50	-6.4	H	3.0	45.3	1.0	-50.7	-13.0	-37.7	
7406.00	-4.5	H	3.0	44.1	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1882.5MHz									
3765.00	-8.7	V	3.0	45.4	1.0	-53.1	-13.0	-40.1	
5647.50	-7.9	V	3.0	45.3	1.0	-52.2	-13.0	-39.2	
7530.00	-5.7	V	3.0	44.1	1.0	-48.8	-13.0	-35.8	
3765.00	-6.5	H	3.0	45.4	1.0	-51.0	-13.0	-38.0	
5647.50	-7.6	H	3.0	45.3	1.0	-51.8	-13.0	-38.8	
7530.00	-4.9	H	3.0	44.1	1.0	-48.0	-13.0	-35.0	
High Ch, 1913.5MHz									
3827.00	-10.7	V	3.0	45.4	1.0	-55.1	-13.0	-42.1	
5740.50	-7.2	V	3.0	45.3	1.0	-51.5	-13.0	-38.5	
7654.00	-4.6	V	3.0	44.0	1.0	-47.6	-13.0	-34.6	
3827.00	-9.7	H	3.0	45.4	1.0	-54.1	-13.0	-41.1	
5740.50	-7.4	H	3.0	45.3	1.0	-51.7	-13.0	-38.7	
7654.00	-4.7	H	3.0	44.0	1.0	-47.7	-13.0	-34.7	

LTE Band 26

LTE

Band 26

15MHz

QPSK

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20881
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 821.5MHz									
1643.00	-13.8	V	3.0	40.7	1.0	-53.5	-13.0	-40.5	
2464.50	-10.9	V	3.0	41.3	1.0	-51.1	-13.0	-38.1	
3286.00	-10.4	V	3.0	42.0	1.0	-51.5	-13.0	-38.5	
1643.00	-15.2	H	3.0	40.7	1.0	-54.9	-13.0	-41.9	
2464.50	-10.9	H	3.0	41.3	1.0	-51.1	-13.0	-38.1	
3286.00	-10.1	H	3.0	42.0	1.0	-51.2	-13.0	-38.2	

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

Company: Samsung
Project #: 4789230288
Date: 2019-12-03
Test Engineer: 20881
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Mid Ch, 831.5MHz									
1663.00	-13.5	V	3.0	40.7	1.0	-53.1	-13.0	-40.1	
2494.50	-8.9	V	3.0	41.3	1.0	-49.2	-13.0	-36.2	
3326.00	-10.2	V	3.0	42.0	1.0	-51.2	-13.0	-38.2	
1663.00	-15.2	H	3.0	40.7	1.0	-54.8	-13.0	-41.8	
2494.50	-11.2	H	3.0	41.3	1.0	-51.5	-13.0	-38.5	
3326.00	-10.0	H	3.0	42.0	1.0	-51.0	-13.0	-38.0	
High Ch, 841.5MHz									
1683.00	-13.8	V	3.0	40.7	1.0	-53.5	-13.0	-40.5	
2524.50	-10.3	V	3.0	41.3	1.0	-50.7	-13.0	-37.7	
3366.00	-9.9	V	3.0	42.0	1.0	-51.0	-13.0	-38.0	
1683.00	-15.5	H	3.0	40.7	1.0	-55.2	-13.0	-42.2	
2524.50	-10.4	H	3.0	41.3	1.0	-50.7	-13.0	-37.7	
3366.00	-9.8	H	3.0	42.0	1.0	-50.8	-13.0	-37.8	

LTE Band 41(PC2)

LTE

Band 41 (PC2)

5MHz

QPSK

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-21
Test Engineer: 20896
Configuration: EUT / AC Adapter, Y-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	-15.0	V	3.0	42.7	1.0	-56.8	-25.0	-31.8	
7495.50	-16.7	V	3.0	42.4	1.0	-58.1	-25.0	-33.1	
9994.00	-7.0	V	3.0	40.8	1.0	-46.8	-25.0	-21.8	
12492.50	-1.9	V	3.0	42.0	1.0	-42.9	-25.0	-17.9	
14991.00	8.0	V	3.0	43.6	1.0	-34.7	-25.0	-9.7	
4997.00	-16.9	H	3.0	42.7	1.0	-58.6	-25.0	-33.6	
7495.50	-16.1	H	3.0	42.4	1.0	-57.5	-25.0	-32.5	
9994.00	-9.7	H	3.0	40.8	1.0	-49.5	-25.0	-24.5	
12492.50	-8.6	H	3.0	42.0	1.0	-49.6	-25.0	-24.6	
14991.00	2.2	H	3.0	43.6	1.0	-40.4	-25.0	-15.4	
Mid Ch, 2593MHz									
5186.00	-17.8	V	3.0	42.8	1.0	-59.6	-25.0	-34.6	
7779.00	-17.0	V	3.0	42.3	1.0	-58.2	-25.0	-33.2	
10372.00	-8.2	V	3.0	41.0	1.0	-48.2	-25.0	-23.2	
12965.00	-6.1	V	3.0	42.3	1.0	-47.4	-25.0	-22.4	
15558.00	8.9	V	3.0	43.5	1.0	-33.5	-25.0	-8.5	
5186.00	-15.6	H	3.0	42.8	1.0	-57.4	-25.0	-32.4	
7779.00	-15.6	H	3.0	42.3	1.0	-56.9	-25.0	-31.9	
10372.00	-12.1	H	3.0	41.0	1.0	-52.1	-25.0	-27.1	
12965.00	-8.9	H	3.0	42.3	1.0	-50.2	-25.0	-25.2	
15558.00	3.6	H	3.0	43.5	1.0	-38.9	-25.0	-13.9	
High Ch, 2687.5MHz									
5375.00	-3.2	V	3.0	42.8	1.0	-45.1	-25.0	-20.1	
8062.50	-9.7	V	3.0	42.1	1.0	-50.8	-25.0	-25.8	
10750.00	-3.9	V	3.0	41.2	1.0	-44.0	-25.0	-19.0	
13437.50	-2.6	V	3.0	42.6	1.0	-44.3	-25.0	-19.3	
16125.00	11.5	V	3.0	43.3	1.0	-30.8	-25.0	-5.8	
5375.00	-6.8	H	3.0	42.8	1.0	-48.7	-25.0	-23.7	
8062.50	-10.3	H	3.0	42.1	1.0	-51.4	-25.0	-26.4	
10750.00	-8.8	H	3.0	41.2	1.0	-48.9	-25.0	-23.9	
13437.50	-6.3	H	3.0	42.6	1.0	-47.9	-25.0	-22.9	
16125.00	8.1	H	3.0	43.3	1.0	-34.3	-25.0	-9.3	

LTE Band 66

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

Company: Samsung
Project #: 4789230288
Date: 2019-11-26
Test Engineer: 20890
Configuration: EUT / AC Adapter, Z-Position
Location: Chamber 2
Mode: LTE_QPSK Band 66 Harmonics, 3MHz Bandwidth

LTE

Band 66

3MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5MHz									
3423.00	-8.9	V	3.0	42.0	1.0	-49.9	-13.0	-36.9	
5134.50	-8.8	V	3.0	42.8	1.0	-50.6	-13.0	-37.6	
6846.00	-6.4	V	3.0	42.7	1.0	-48.1	-13.0	-35.1	
3423.00	-8.7	H	3.0	42.0	1.0	-49.7	-13.0	-36.7	
5134.50	-8.7	H	3.0	42.8	1.0	-50.4	-13.0	-37.4	
6846.00	-6.2	H	3.0	42.7	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1745MHz									
3490.00	-8.1	V	3.0	42.0	1.0	-49.1	-13.0	-36.1	
5235.00	-8.5	V	3.0	42.8	1.0	-50.3	-13.0	-37.3	
6980.00	-6.2	V	3.0	42.7	1.0	-47.9	-13.0	-34.9	
3490.00	-7.9	H	3.0	42.0	1.0	-49.0	-13.0	-36.0	
5235.00	-8.4	H	3.0	42.8	1.0	-50.2	-13.0	-37.2	
6980.00	-6.2	H	3.0	42.7	1.0	-47.9	-13.0	-34.9	
High Ch, 1778.5MHz									
3557.00	-7.8	V	3.0	42.0	1.0	-48.8	-13.0	-35.8	
5335.50	-8.2	V	3.0	42.8	1.0	-50.0	-13.0	-37.0	
7114.00	-6.2	V	3.0	42.6	1.0	-47.8	-13.0	-34.8	
3557.00	-7.7	H	3.0	42.0	1.0	-48.8	-13.0	-35.8	
5335.50	-8.1	H	3.0	42.8	1.0	-49.9	-13.0	-36.9	
7114.00	-6.1	H	3.0	42.6	1.0	-47.7	-13.0	-34.7	

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 Band 38

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

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

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