

LTE Band 12

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789219881							
Date:		2019-11-25							
Test Engineer:		20882							
Configuration:		EUT / AC Adapter, Z-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	-16.4	V	3.0	45.4	1.0	-60.8	-13.0	-47.8	
2112.00	-11.6	V	3.0	45.0	1.0	-55.5	-13.0	-42.5	
2816.00	-10.3	V	3.0	45.1	1.0	-54.4	-13.0	-41.4	
1408.00	-15.3	H	3.0	45.4	1.0	-59.7	-13.0	-46.7	
2112.00	-11.1	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
2816.00	-10.6	H	3.0	45.1	1.0	-54.7	-13.0	-41.7	
Mid Ch, 707.5MHz									
1415.00	-16.4	V	3.0	45.4	1.0	-60.7	-13.0	-47.7	
2122.50	-12.2	V	3.0	45.0	1.0	-56.1	-13.0	-43.1	
2830.00	-10.1	V	3.0	45.1	1.0	-54.2	-13.0	-41.2	
1415.00	-15.9	H	3.0	45.4	1.0	-60.3	-13.0	-47.3	
2122.50	-11.0	H	3.0	45.0	1.0	-55.0	-13.0	-42.0	
2830.00	-10.1	H	3.0	45.1	1.0	-54.2	-13.0	-41.2	
High Ch, 711MHz									
1422.00	-16.1	V	3.0	45.4	1.0	-60.5	-13.0	-47.5	
2133.00	-12.7	V	3.0	45.0	1.0	-56.6	-13.0	-43.6	
2844.00	-11.0	V	3.0	45.1	1.0	-55.1	-13.0	-42.1	
1422.00	-15.6	H	3.0	45.4	1.0	-60.0	-13.0	-47.0	
2133.00	-10.9	H	3.0	45.0	1.0	-54.9	-13.0	-41.9	
2844.00	-10.7	H	3.0	45.1	1.0	-54.8	-13.0	-41.8	

LTE Band 13

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789219881							
Date:		2019-11-25							
Test Engineer:		20882							
Configuration:		EUT / AC Adapter, X-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 779.5MHz									
1559.00	-24.3	V	3.0	45.3	1.0	-68.6	-40.0	-28.6	
2338.50	-0.3	V	3.0	45.0	1.0	-44.3	-13.0	-31.3	
3118.00	-9.9	V	3.0	45.2	1.0	-54.1	-13.0	-41.1	
1559.00	-22.4	H	3.0	45.3	1.0	-66.7	-40.0	-26.7	
2338.50	6.8	H	3.0	45.0	1.0	-37.2	-13.0	-24.2	
3118.00	-10.0	H	3.0	45.2	1.0	-54.2	-13.0	-41.2	
Mid Ch, 782MHz									
1564.00	-24.7	V	3.0	45.3	1.0	-69.0	-40.0	-29.0	
2346.00	2.4	V	3.0	45.0	1.0	-41.6	-13.0	-28.6	
3128.00	-9.6	V	3.0	45.2	1.0	-53.8	-13.0	-40.8	
1564.00	-23.2	H	3.0	45.3	1.0	-67.5	-40.0	-27.5	
2346.00	8.4	H	3.0	45.0	1.0	-35.6	-13.0	-22.6	
3128.00	-9.5	H	3.0	45.2	1.0	-53.7	-13.0	-40.7	
High Ch, 784.5MHz									
1569.00	-14.8	V	3.0	45.3	1.0	-59.1	-40.0	-19.1	
2353.50	2.0	V	3.0	45.0	1.0	-42.0	-13.0	-29.0	
3138.00	-8.4	V	3.0	45.2	1.0	-52.5	-13.0	-39.5	
1569.00	-14.3	H	3.0	45.3	1.0	-58.6	-40.0	-18.6	
2353.50	7.4	H	3.0	45.0	1.0	-36.6	-13.0	-23.6	
3138.00	-9.6	H	3.0	45.2	1.0	-53.8	-13.0	-40.8	

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 #:		4789219881								
Date:		2019-11-22								
Test Engineer:		20882								
Configuration:		EUT / AC Adapter, Z-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	-10.2	V	3.0	45.4	1.0	-54.6	-13.0	-41.6	
	5554.50	-7.2	V	3.0	45.3	1.0	-51.5	-13.0	-38.5	
	7406.00	-5.2	V	3.0	44.1	1.0	-48.3	-13.0	-35.3	
	3703.00	-10.7	H	3.0	45.4	1.0	-55.1	-13.0	-42.1	
	5554.50	-7.9	H	3.0	45.3	1.0	-52.2	-13.0	-39.2	
	7406.00	-5.2	H	3.0	44.1	1.0	-48.4	-13.0	-35.4	
	Mid Ch, 1882.5MHz									
	3765.00	-10.2	V	3.0	45.4	1.0	-54.7	-13.0	-41.7	
	5647.50	-7.4	V	3.0	45.3	1.0	-51.7	-13.0	-38.7	
	7530.00	-4.9	V	3.0	44.1	1.0	-48.0	-13.0	-35.0	
	3765.00	-11.0	H	3.0	45.4	1.0	-55.4	-13.0	-42.4	
	5647.50	-7.4	H	3.0	45.3	1.0	-51.7	-13.0	-38.7	
	7530.00	-5.2	H	3.0	44.1	1.0	-48.3	-13.0	-35.3	
	High Ch, 1913.5MHz									
	3827.00	-10.4	V	3.0	45.4	1.0	-54.9	-13.0	-41.9	
	5740.50	-7.1	V	3.0	45.3	1.0	-51.4	-13.0	-38.4	
	7654.00	-4.9	V	3.0	44.0	1.0	-47.9	-13.0	-34.9	
	3827.00	-10.5	H	3.0	45.4	1.0	-55.0	-13.0	-42.0	
	5740.50	-7.5	H	3.0	45.3	1.0	-51.8	-13.0	-38.8	
	7654.00	-4.9	H	3.0	44.0	1.0	-47.9	-13.0	-34.9	

LTE Band 26

LTE Band 26 3MHz / 5MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4789219881 Date: 2019-11-25 Test Engineer: 20881 Configuration: EUT / AC Adapter, X-Position Location: Chamber 1 Mode: LTE_QPSK Band 26 Harmonics, 3MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 815.5MHz									
	1631.00	-15.0	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
	2446.50	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
	3262.00	-9.8	V	3.0	45.2	1.0	-54.0	-13.0	-41.0	
	1631.00	-14.1	H	3.0	45.2	1.0	-58.4	-13.0	-45.4	
	2446.50	-11.0	H	3.0	45.0	1.0	-55.0	-13.0	-42.0	
	3262.00	-10.0	H	3.0	45.2	1.0	-54.2	-13.0	-41.2	
	Mid Ch, 822.5MHz									
	1645.00	-15.0	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
	2467.50	-11.6	V	3.0	45.0	1.0	-55.6	-13.0	-42.6	
	3290.00	-9.5	V	3.0	45.3	1.0	-53.7	-13.0	-40.7	
	1645.00	-14.0	H	3.0	45.2	1.0	-58.2	-13.0	-45.2	
	2467.50	-10.9	H	3.0	45.0	1.0	-55.0	-13.0	-42.0	
	3290.00	-9.7	H	3.0	45.3	1.0	-53.9	-13.0	-40.9	
	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4789219881 Date: 2019-11-25 Test Engineer: 20881 Configuration: EUT / AC Adapter, X-Position Location: Chamber 1 Mode: LTE_QPSK Band 26 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, 826.5MHz									
	1653.00	-15.0	V	3.0	45.2	1.0	-59.2	-13.0	-46.2	
	2479.50	-12.0	V	3.0	45.0	1.0	-56.0	-13.0	-43.0	
	3306.00	-10.0	V	3.0	45.3	1.0	-54.3	-13.0	-41.3	
	1653.00	-14.1	H	3.0	45.2	1.0	-58.3	-13.0	-45.3	
	2479.50	-11.3	H	3.0	45.0	1.0	-55.4	-13.0	-42.4	
	3306.00	-9.5	H	3.0	45.3	1.0	-53.7	-13.0	-40.7	
	Mid Ch, 831.5MHz									
	1663.00	-14.9	V	3.0	45.2	1.0	-59.0	-13.0	-46.0	
	2494.50	-11.7	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
	3326.00	-9.4	V	3.0	45.3	1.0	-53.6	-13.0	-40.6	
	1663.00	-12.3	H	3.0	45.2	1.0	-56.5	-13.0	-43.5	
	2494.50	-11.0	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
	3326.00	-9.5	H	3.0	45.3	1.0	-53.8	-13.0	-40.8	
	High Ch, 846.5MHz									
	1693.00	-14.7	V	3.0	45.2	1.0	-58.8	-13.0	-45.8	
	2539.50	-11.6	V	3.0	45.0	1.0	-55.7	-13.0	-42.7	
	3386.00	-9.1	V	3.0	45.3	1.0	-53.4	-13.0	-40.4	
	1693.00	-13.8	H	3.0	45.2	1.0	-57.9	-13.0	-44.9	
	2539.50	-11.0	H	3.0	45.0	1.0	-55.1	-13.0	-42.1	
	3386.00	-9.3	H	3.0	45.3	1.0	-53.6	-13.0	-40.6	

LTE Band 41(PC2)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789219881							
Date:		2019-11-29							
Test Engineer:		20881							
Configuration:		EUT / AC Adapter, Z-Position							
Location:		Chamber 1							
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	-10.0	V	3.0	45.3	1.0	-54.3	-25.0	-29.3	
7495.50	-14.9	V	3.0	44.1	1.0	-58.0	-25.0	-33.0	
9994.00	-12.6	V	3.0	42.2	1.0	-53.8	-25.0	-28.8	
12492.50	-7.8	V	3.0	43.2	1.0	-50.0	-25.0	-25.0	
14991.00	-1.5	V	3.0	45.3	1.0	-45.9	-25.0	-20.9	
4997.00	-11.3	H	3.0	45.3	1.0	-55.6	-25.0	-30.6	
7495.50	-14.5	H	3.0	44.1	1.0	-57.6	-25.0	-32.6	
9994.00	-12.5	H	3.0	42.2	1.0	-53.7	-25.0	-28.7	
12492.50	-8.0	H	3.0	43.2	1.0	-50.2	-25.0	-25.2	
14991.00	-1.2	H	3.0	45.3	1.0	-45.5	-25.0	-20.5	
Mid Ch, 2593MHz									
5186.00	-7.6	V	3.0	45.3	1.0	-51.9	-25.0	-26.9	
7779.00	-13.0	V	3.0	43.9	1.0	-55.9	-25.0	-30.9	
10372.00	-11.8	V	3.0	42.3	1.0	-53.1	-25.0	-28.1	
12965.00	-10.1	V	3.0	43.6	1.0	-52.8	-25.0	-27.8	
15558.00	0.3	V	3.0	44.7	1.0	-43.4	-25.0	-18.4	
5186.00	-10.0	H	3.0	45.3	1.0	-54.3	-25.0	-29.3	
7779.00	-11.9	H	3.0	43.9	1.0	-54.8	-25.0	-29.8	
10372.00	-9.5	H	3.0	42.3	1.0	-50.8	-25.0	-25.8	
12965.00	-10.1	H	3.0	43.6	1.0	-52.8	-25.0	-27.8	
15558.00	0.4	H	3.0	44.7	1.0	-43.3	-25.0	-18.3	
High Ch, 2687.5MHz									
5375.00	-8.0	V	3.0	45.3	1.0	-52.2	-25.0	-27.2	
8062.50	-11.3	V	3.0	43.8	1.0	-54.1	-25.0	-29.1	
10750.00	-10.5	V	3.0	42.4	1.0	-51.9	-25.0	-26.9	
13437.50	-9.4	V	3.0	44.0	1.0	-52.4	-25.0	-27.4	
16125.00	3.8	V	3.0	44.0	1.0	-39.2	-25.0	-14.2	
5375.00	-11.2	H	3.0	45.3	1.0	-55.4	-25.0	-30.4	
8062.50	-12.8	H	3.0	43.8	1.0	-55.5	-25.0	-30.5	
10750.00	-5.2	H	3.0	42.4	1.0	-46.6	-25.0	-21.6	
13437.50	-9.1	H	3.0	44.0	1.0	-52.1	-25.0	-27.1	
16125.00	3.9	H	3.0	44.0	1.0	-39.1	-25.0	-14.1	

LTE Band 66

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789219881							
Date:		2019-11-26							
Test Engineer:		20896							
Configuration:		EUT / AC Adapter, Y-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 66 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, 1717.5MHz									
3435.00	-9.3	V	3.0	42.0	1.0	-50.4	-13.0	-37.4	
5152.50	-8.9	V	3.0	42.8	1.0	-50.7	-13.0	-37.7	
6870.00	-6.5	V	3.0	42.7	1.0	-48.2	-13.0	-35.2	
3435.00	-9.2	H	3.0	42.0	1.0	-50.2	-13.0	-37.2	
5152.50	-8.9	H	3.0	42.8	1.0	-50.7	-13.0	-37.7	
6870.00	-6.4	H	3.0	42.7	1.0	-48.1	-13.0	-35.1	
Mid Ch, 1745MHz									
3490.00	-8.5	V	3.0	42.0	1.0	-49.6	-13.0	-36.6	
5235.00	-8.6	V	3.0	42.8	1.0	-50.4	-13.0	-37.4	
6980.00	-6.5	V	3.0	42.7	1.0	-48.2	-13.0	-35.2	
3490.00	-8.5	H	3.0	42.0	1.0	-49.5	-13.0	-36.5	
5235.00	-8.6	H	3.0	42.8	1.0	-50.4	-13.0	-37.4	
6980.00	-6.4	H	3.0	42.7	1.0	-48.1	-13.0	-35.1	
High Ch, 1772.5MHz									
3545.00	-8.2	V	3.0	42.0	1.0	-49.2	-13.0	-36.2	
5317.50	-8.5	V	3.0	42.8	1.0	-50.3	-13.0	-37.3	
7090.00	-6.5	V	3.0	42.6	1.0	-48.1	-13.0	-35.1	
3545.00	-8.1	H	3.0	42.0	1.0	-49.1	-13.0	-36.1	
5317.50	-8.3	H	3.0	42.8	1.0	-50.2	-13.0	-37.2	
7090.00	-6.4	H	3.0	42.6	1.0	-48.0	-13.0	-35.0	

LTE Band 2

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

LTE Band 4

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

LTE Band 5

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

LTE Band 17

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

LTE Band41(PC3)

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

END OF REPORT