

80MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
	<p> Company: Samsung Project #: 4789893923 Date: 2021-05-20 Test Engineer: 20881 Configuration: EUT, Y-Position Location: Chamber 1 Mode: NR_QPSK n77 Fundamentals, 80MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>3740.01</td> <td>15.34</td> <td>V</td> <td>6.5</td> <td>10.8</td> <td>19.63</td> <td>30.0</td> <td>-10.4</td> <td></td> </tr> <tr> <td>3740.01</td> <td>17.47</td> <td>H</td> <td>6.5</td> <td>10.8</td> <td>21.76</td> <td>30.0</td> <td>-8.2</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>3840.00</td> <td>22.37</td> <td>V</td> <td>6.6</td> <td>10.6</td> <td>26.45</td> <td>30.0</td> <td>-3.6</td> <td></td> </tr> <tr> <td>3840.00</td> <td>19.82</td> <td>H</td> <td>6.6</td> <td>10.6</td> <td>23.90</td> <td>30.0</td> <td>-6.1</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>3939.99</td> <td>22.76</td> <td>V</td> <td>6.7</td> <td>10.6</td> <td>26.73</td> <td>30.0</td> <td>-3.3</td> <td></td> </tr> <tr> <td>3939.99</td> <td>18.51</td> <td>H</td> <td>6.7</td> <td>10.6</td> <td>22.48</td> <td>30.0</td> <td>-7.5</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3740.01	15.34	V	6.5	10.8	19.63	30.0	-10.4		3740.01	17.47	H	6.5	10.8	21.76	30.0	-8.2		Mid Ch									3840.00	22.37	V	6.6	10.6	26.45	30.0	-3.6		3840.00	19.82	H	6.6	10.6	23.90	30.0	-6.1		High Ch									3939.99	22.76	V	6.7	10.6	26.73	30.0	-3.3		3939.99	18.51	H	6.7	10.6	22.48	30.0	-7.5
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	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	3730.02	14.38	V	6.5	10.8	18.69	30.0	-11.3	
	3730.02	17.09	H	6.5	10.8	21.40	30.0	-8.6	
	Mid Ch								
	3840.00	22.07	V	6.6	10.6	26.15	30.0	-3.9	
	3840.00	19.51	H	6.6	10.6	23.59	30.0	-6.4	
	High Ch								
	3949.98	23.08	V	6.7	10.6	27.03	30.0	-3.0	
	3949.98	18.71	H	6.7	10.6	22.67	30.0	-7.3	
60MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
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	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	3730.02	14.67	V	6.5	10.8	18.98	30.0	-11.0	
	3730.02	16.54	H	6.5	10.8	20.85	30.0	-9.2	
	Mid Ch								
	3840.00	21.89	V	6.6	10.6	25.97	30.0	-4.0	
	3840.00	19.34	H	6.6	10.6	23.42	30.0	-6.6	
	High Ch								
	3949.98	22.46	V	6.7	10.6	26.41	30.0	-3.6	
	3949.98	18.14	H	6.7	10.6	22.10	30.0	-7.9	

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	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	3720.00	17.84	V	6.5	10.8	22.17	30.0	-7.8	
	3720.00	17.26	H	6.5	10.8	21.59	30.0	-8.4	
	Mid Ch								
	3840.00	21.64	V	6.6	10.6	25.72	30.0	-4.3	
	3840.00	19.42	H	6.6	10.6	23.50	30.0	-6.5	
	High Ch								
	3960.00	23.05	V	6.7	10.6	27.00	30.0	-3.0	
	3960.00	18.51	H	6.7	10.6	22.46	30.0	-7.5	
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	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	3720.00	17.23	V	6.5	10.8	21.56	30.0	-8.4	
	3720.00	16.58	H	6.5	10.8	20.91	30.0	-9.1	
	Mid Ch								
	3840.00	20.73	V	6.6	10.6	24.81	30.0	-5.2	
	3840.00	19.25	H	6.6	10.6	23.33	30.0	-6.7	
	High Ch								
	3960.00	22.47	V	6.7	10.6	26.42	30.0	-3.6	
	3960.00	18.51	H	6.7	10.6	22.46	30.0	-7.5	

20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
	<p> Company: Samsung Project #: 4789893923 Date: 2021-05-20 Test Engineer: 20881 Configuration: EUT, Y-Position Location: Chamber 1 Mode: NR_QPSK n77 Fundamentals, 20MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>3710.01</td> <td>16.51</td> <td>V</td> <td>6.5</td> <td>10.8</td> <td>20.86</td> <td>30.0</td> <td>-9.1</td> <td></td> </tr> <tr> <td>3710.01</td> <td>18.83</td> <td>H</td> <td>6.5</td> <td>10.8</td> <td>23.18</td> <td>30.0</td> <td>-6.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>3840.00</td> <td>22.24</td> <td>V</td> <td>6.6</td> <td>10.6</td> <td>26.32</td> <td>30.0</td> <td>-3.7</td> <td></td> </tr> <tr> <td>3840.00</td> <td>19.92</td> <td>H</td> <td>6.6</td> <td>10.6</td> <td>24.00</td> <td>30.0</td> <td>-6.0</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>3969.99</td> <td>23.21</td> <td>V</td> <td>6.7</td> <td>10.6</td> <td>27.15</td> <td>30.0</td> <td>-2.8</td> <td></td> </tr> <tr> <td>3969.99</td> <td>19.19</td> <td>H</td> <td>6.7</td> <td>10.6</td> <td>23.14</td> <td>30.0</td> <td>-6.9</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3710.01	16.51	V	6.5	10.8	20.86	30.0	-9.1		3710.01	18.83	H	6.5	10.8	23.18	30.0	-6.8		Mid Ch									3840.00	22.24	V	6.6	10.6	26.32	30.0	-3.7		3840.00	19.92	H	6.6	10.6	24.00	30.0	-6.0		High Ch									3969.99	23.21	V	6.7	10.6	27.15	30.0	-2.8		3969.99	19.19	H	6.7	10.6	23.14	30.0	-6.9
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20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
<p> Company: Samsung Project #: 4789893923 Date: 2021-05-20 Test Engineer: 20881 Configuration: EUT, Y-Position Location: Chamber 1 Mode: NR_16QAM n77 Fundamentals, 20MHz Bandwidth </p> <p> Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 8.5m SMA-type Cable </p> <table border="1"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>3710.01</td> <td>15.96</td> <td>V</td> <td>6.5</td> <td>10.8</td> <td>20.31</td> <td>30.0</td> <td>-9.7</td> <td></td> </tr> <tr> <td>3710.01</td> <td>17.14</td> <td>H</td> <td>6.5</td> <td>10.8</td> <td>21.49</td> <td>30.0</td> <td>-8.5</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>3840.00</td> <td>21.91</td> <td>V</td> <td>6.6</td> <td>10.6</td> <td>25.99</td> <td>30.0</td> <td>-4.0</td> <td></td> </tr> <tr> <td>3840.00</td> <td>19.36</td> <td>H</td> <td>6.6</td> <td>10.6</td> <td>23.44</td> <td>30.0</td> <td>-6.6</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>3969.99</td> <td>22.73</td> <td>V</td> <td>6.7</td> <td>10.6</td> <td>26.67</td> <td>30.0</td> <td>-3.3</td> <td></td> </tr> <tr> <td>3969.99</td> <td>18.21</td> <td>H</td> <td>6.7</td> <td>10.6</td> <td>22.16</td> <td>30.0</td> <td>-7.8</td> <td></td> </tr> </tbody> </table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									3710.01	15.96	V	6.5	10.8	20.31	30.0	-9.7		3710.01	17.14	H	6.5	10.8	21.49	30.0	-8.5		Mid Ch									3840.00	21.91	V	6.6	10.6	25.99	30.0	-4.0		3840.00	19.36	H	6.6	10.6	23.44	30.0	-6.6		High Ch									3969.99	22.73	V	6.7	10.6	26.67	30.0	-3.3		3969.99	18.21	H	6.7	10.6	22.16	30.0	-7.8	
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9.6. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53

LIMIT

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

Part 27.53:

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

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

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

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

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

TEST PROCEDURE

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

For peak power measurement with a ESU40:

- a) Set the RBW = 100 kHz for emission below 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW $\geq 3 \times$ RBW;
- c) Sweep time = auto couple;
- d) Detector = rms;
- e) Ensure that the number of measurement points \geq span/RBW;
- f) Trace mode = average(FDD), Max hold(TDD);

NOTE

5GNR: All waveforms(CP-OFDM vs DFT-OFDM) were investigated to determine the worst case configuration. All mode of operation were investigated and the worst case configuration results are reported in tis section.

RESULTS

See the following pages.

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

9.6.1. SPURIOUS RADIATION PLOTS

WCDMA

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
		Company:	Samsung									
		Project #:	4789893923									
		Date:	2021-05-18									
		Test Engineer:	19227									
		Configuration:	EUT / AC Adapter, X-Position									
		Location:	Chamber 2									
		Mode:	Rel99 Band 5 Harmonics									
		Test Voltage:	AC 120 V, 60 Hz									
Band 5 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, 826.4MHz											
		1652.80	-15.7	V	3.0	40.7	1.0	-55.4	-13.0	-42.4		
		2479.20	-12.4	V	3.0	41.3	1.0	-52.7	-13.0	-39.7		
		3305.60	-9.9	V	3.0	42.1	1.0	-51.0	-13.0	-38.0		
		1652.80	-15.7	H	3.0	40.7	1.0	-55.4	-13.0	-42.4		
		2479.20	-12.7	H	3.0	41.3	1.0	-53.0	-13.0	-40.0		
		3305.60	-10.2	H	3.0	42.1	1.0	-51.3	-13.0	-38.3		
	Mid Ch, 836.6MHz											
		1673.20	-15.6	V	3.0	40.7	1.0	-55.3	-13.0	-42.3		
		2509.80	-12.8	V	3.0	41.4	1.0	-53.1	-13.0	-40.1		
		3346.40	-9.5	V	3.0	42.1	1.0	-50.6	-13.0	-37.6		
		1673.20	-15.7	H	3.0	40.7	1.0	-55.3	-13.0	-42.3		
		2509.80	-12.6	H	3.0	41.4	1.0	-53.0	-13.0	-40.0		
		3346.40	-10.3	H	3.0	42.1	1.0	-51.4	-13.0	-38.4		
	High Ch, 846.6MHz											
		1693.20	-15.5	V	3.0	40.7	1.0	-55.1	-13.0	-42.1		
		2539.80	-12.7	V	3.0	41.4	1.0	-53.1	-13.0	-40.1		
		3386.40	-9.9	V	3.0	42.1	1.0	-50.9	-13.0	-37.9		
		1693.20	-15.6	H	3.0	40.7	1.0	-55.3	-13.0	-42.3		
		2539.80	-12.4	H	3.0	41.4	1.0	-52.8	-13.0	-39.8		
		3386.40	-9.9	H	3.0	42.1	1.0	-51.0	-13.0	-38.0		
			UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
			Company:	Samsung								
		Project #:	4789893923									
		Date:	2021-05-18									
		Test Engineer:	19227									
		Configuration:	EUT / AC Adapter, X-Position									
		Location:	Chamber 2									
		Mode:	HSDPA Band 5 Harmonics									
		Test Voltage:	AC 120 V, 60 Hz									
Band 5 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, 826.4MHz											
		1652.80	-14.4	V	3.0	40.7	1.0	-54.1	-13.0	-41.1		
		2479.20	-12.4	V	3.0	41.3	1.0	-52.7	-13.0	-39.7		
		3305.60	-9.6	V	3.0	42.1	1.0	-50.7	-13.0	-37.7		
		1652.80	-15.3	H	3.0	40.7	1.0	-55.0	-13.0	-42.0		
		2479.20	-12.1	H	3.0	41.3	1.0	-52.4	-13.0	-39.4		
		3305.60	-9.6	H	3.0	42.1	1.0	-50.7	-13.0	-37.7		
	Mid Ch, 836.6MHz											
		1673.20	-14.9	V	3.0	40.7	1.0	-54.6	-13.0	-41.6		
		2509.80	-12.3	V	3.0	41.4	1.0	-52.7	-13.0	-39.7		
		3346.40	-9.5	V	3.0	42.1	1.0	-50.6	-13.0	-37.6		
		1673.20	-15.4	H	3.0	40.7	1.0	-55.1	-13.0	-42.1		
		2509.80	-11.8	H	3.0	41.4	1.0	-52.2	-13.0	-39.2		
		3346.40	-9.5	H	3.0	42.1	1.0	-50.6	-13.0	-37.6		
	High Ch, 846.6MHz											
		1693.20	-15.7	V	3.0	40.7	1.0	-55.4	-13.0	-42.4		
		2539.80	-12.7	V	3.0	41.4	1.0	-53.1	-13.0	-40.1		
		3386.40	-9.3	V	3.0	42.1	1.0	-50.4	-13.0	-37.4		
		1693.20	-15.2	H	3.0	40.7	1.0	-54.9	-13.0	-41.9		
		2539.80	-11.8	H	3.0	41.4	1.0	-52.2	-13.0	-39.2		
		3386.40	-9.4	H	3.0	42.1	1.0	-50.5	-13.0	-37.5		

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		Company: Samsung Project #: 4789893923 Date: 2021-04-30 Test Engineer: 19568 Configuration: EUT / AC adapter, X-Position Location: Chamber 2 Mode: Rel99 Band 4 Harmonics Test Votage: AC 120 V, 60 Hz									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
Band 4											
REL99											
Low Ch, 1712.4MHz											
3424.80	-9.8	V	3.0	42.1	1.0	-50.8	-13.0	-37.8			
5137.20	-9.0	V	3.0	42.8	1.0	-50.9	-13.0	-37.9			
6849.60	-6.5	V	3.0	42.7	1.0	-48.3	-13.0	-35.3			
3424.80	-8.2	H	3.0	42.1	1.0	-49.3	-13.0	-36.3			
5137.20	-7.7	H	3.0	42.8	1.0	-49.5	-13.0	-36.5			
6849.60	-6.6	H	3.0	42.7	1.0	-48.3	-13.0	-35.3			
Mid Ch, 1732.6MHz											
3465.20	-9.3	V	3.0	42.1	1.0	-50.4	-13.0	-37.4			
5197.80	-8.9	V	3.0	42.8	1.0	-50.8	-13.0	-37.8			
6930.40	-6.6	V	3.0	42.7	1.0	-48.3	-13.0	-35.3			
3465.20	-9.3	H	3.0	42.1	1.0	-50.3	-13.0	-37.3			
5197.80	-8.6	H	3.0	42.8	1.0	-50.4	-13.0	-37.4			
6930.40	-6.6	H	3.0	42.7	1.0	-48.4	-13.0	-35.4			
High Ch, 1752.6MHz											
3505.20	-8.9	V	3.0	42.1	1.0	-50.0	-13.0	-37.0			
5257.80	-9.0	V	3.0	42.8	1.0	-50.9	-13.0	-37.9			
7010.40	-6.3	V	3.0	42.7	1.0	-48.0	-13.0	-35.0			
3505.20	-8.8	H	3.0	42.1	1.0	-49.8	-13.0	-36.8			
5257.80	-8.7	H	3.0	42.8	1.0	-50.6	-13.0	-37.6			
7010.40	-6.5	H	3.0	42.7	1.0	-48.2	-13.0	-35.2			
		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		Company: Samsung Project #: 4789893923 Date: 2021-04-30 Test Engineer: 19568 Configuration: EUT / AC adapter, X-Position Location: Chamber 2 Mode: HSDPA Band 4 Harmonics Test Votage: AC 120 V, 60 Hz									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
Band 4											
HSDPA											
Low Ch, 1712.4MHz											
3424.80	-9.3	V	3.0	42.1	1.0	-50.4	-13.0	-37.4			
5137.20	-8.8	V	3.0	42.8	1.0	-50.6	-13.0	-37.6			
6849.60	-6.3	V	3.0	42.7	1.0	-48.1	-13.0	-35.1			
3424.80	-9.3	H	3.0	42.1	1.0	-50.4	-13.0	-37.4			
5137.20	-8.7	H	3.0	42.8	1.0	-50.5	-13.0	-37.5			
6849.60	-6.4	H	3.0	42.7	1.0	-48.1	-13.0	-35.1			
Mid Ch, 1732.6MHz											
3465.20	-8.9	V	3.0	42.1	1.0	-50.0	-13.0	-37.0			
5197.80	-8.5	V	3.0	42.8	1.0	-50.3	-13.0	-37.3			
6930.40	-6.3	V	3.0	42.7	1.0	-48.1	-13.0	-35.1			
3465.20	-8.9	H	3.0	42.1	1.0	-50.0	-13.0	-37.0			
5197.80	-8.3	H	3.0	42.8	1.0	-50.1	-13.0	-37.1			
6930.40	-6.5	H	3.0	42.7	1.0	-48.2	-13.0	-35.2			
High Ch, 1752.6MHz											
3505.20	-8.5	V	3.0	42.1	1.0	-49.6	-13.0	-36.6			
5257.80	-8.7	V	3.0	42.8	1.0	-50.6	-13.0	-37.6			
7010.40	-6.0	V	3.0	42.7	1.0	-47.7	-13.0	-34.7			
3505.20	-8.1	H	3.0	42.1	1.0	-49.2	-13.0	-36.2			
5257.80	-8.4	H	3.0	42.8	1.0	-50.2	-13.0	-37.2			
7010.40	-6.2	H	3.0	42.7	1.0	-47.9	-13.0	-34.9			

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: Samsung Project #: 4789893923 Date: 2021-05-03 Test Engineer: 20882 Configuration: EUT / AC Adapter, X-Position Location: Chamber 2 Mode: Rel99 Band 2 Harmonics Test Votage: AC 120 V, 60 Hz										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Band 2 REL99										
Low Ch, 1852.4MHz										
3704.80	-11.7	V	3.0	42.1	1.0	-52.8	-13.0	-39.8		
5557.20	-8.3	V	3.0	42.9	1.0	-50.2	-13.0	-37.2		
7409.60	-6.4	V	3.0	42.5	1.0	-47.9	-13.0	-34.9		
3704.80	-11.8	H	3.0	42.1	1.0	-52.9	-13.0	-39.9		
5557.20	-8.1	H	3.0	42.9	1.0	-50.0	-13.0	-37.0		
7409.60	-6.5	H	3.0	42.5	1.0	-48.0	-13.0	-35.0		
Mid Ch, 1880MHz										
3760.00	-11.8	V	3.0	42.1	1.0	-52.9	-13.0	-39.9		
5640.00	-7.9	V	3.0	42.9	1.0	-49.9	-13.0	-36.9		
7520.00	-6.6	V	3.0	42.4	1.0	-48.0	-13.0	-35.0		
3760.00	-11.6	H	3.0	42.1	1.0	-52.6	-13.0	-39.6		
5640.00	-7.7	H	3.0	42.9	1.0	-49.6	-13.0	-36.6		
7520.00	-6.6	H	3.0	42.4	1.0	-48.0	-13.0	-35.0		
High Ch, 1907.6MHz										
3815.20	-11.7	V	3.0	42.1	1.0	-52.7	-13.0	-39.7		
5722.80	-8.1	V	3.0	42.9	1.0	-50.1	-13.0	-37.1		
7630.40	-6.6	V	3.0	42.4	1.0	-48.0	-13.0	-35.0		
3815.20	-11.7	H	3.0	42.1	1.0	-52.8	-13.0	-39.8		
5722.80	-8.1	H	3.0	42.9	1.0	-50.0	-13.0	-37.0		
7630.40	-6.6	H	3.0	42.4	1.0	-48.0	-13.0	-35.0		
UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company: Samsung Project #: 4789893923 Date: 2021-05-03 Test Engineer: 20882 Configuration: EUT / AC Adapter, X-Position Location: Chamber 2 Mode: HSDPA Band 2 Harmonics Test Votage: AC 120 V, 60 Hz										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Band 2 HSDPA										
Low Ch, 1852.4MHz										
3704.80	-11.8	V	3.0	42.1	1.0	-52.8	-13.0	-39.8		
5557.20	-8.4	V	3.0	42.9	1.0	-50.3	-13.0	-37.3		
7409.60	-6.5	V	3.0	42.5	1.0	-47.9	-13.0	-34.9		
3704.80	-11.7	H	3.0	42.1	1.0	-52.7	-13.0	-39.7		
5557.20	-8.0	H	3.0	42.9	1.0	-50.0	-13.0	-37.0		
7409.60	-6.6	H	3.0	42.5	1.0	-48.1	-13.0	-35.1		
Mid Ch, 1880MHz										
3760.00	-11.5	V	3.0	42.1	1.0	-52.6	-13.0	-39.6		
5640.00	-8.0	V	3.0	42.9	1.0	-49.9	-13.0	-36.9		
7520.00	-6.5	V	3.0	42.4	1.0	-47.9	-13.0	-34.9		
3760.00	-11.5	H	3.0	42.1	1.0	-52.6	-13.0	-39.6		
5640.00	-7.8	H	3.0	42.9	1.0	-49.7	-13.0	-36.7		
7520.00	-6.6	H	3.0	42.4	1.0	-48.1	-13.0	-35.1		
High Ch, 1907.6MHz										
3815.20	-11.7	V	3.0	42.1	1.0	-52.7	-13.0	-39.7		
5722.80	-8.2	V	3.0	42.9	1.0	-50.1	-13.0	-37.1		
7630.40	-6.4	V	3.0	42.4	1.0	-47.8	-13.0	-34.8		
3815.20	-11.5	H	3.0	42.1	1.0	-52.6	-13.0	-39.6		
5722.80	-8.0	H	3.0	42.9	1.0	-50.0	-13.0	-37.0		
7630.40	-6.6	H	3.0	42.4	1.0	-48.0	-13.0	-35.0		

LTE Band 2

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-04-27							
Test Engineer:		19568							
Configuration:		EUT / AC Adapter, X-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 2 Harmonics, 5MHz Bandwidth							
Test Votage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5MHz									
3705.00	-11.5	V	3.0	42.1	1.0	-52.6	-13.0	-39.6	
5557.50	-8.0	V	3.0	42.9	1.0	-49.9	-13.0	-36.9	
7410.00	-6.2	V	3.0	42.5	1.0	-47.7	-13.0	-34.7	
3705.00	-11.4	H	3.0	42.1	1.0	-52.4	-13.0	-39.4	
5557.50	-7.8	H	3.0	42.9	1.0	-49.8	-13.0	-36.8	
7410.00	-6.3	H	3.0	42.5	1.0	-47.8	-13.0	-34.8	
Mid Ch, 1880MHz									
3760.00	-11.3	V	3.0	42.1	1.0	-52.3	-13.0	-39.3	
5640.00	-7.7	V	3.0	42.9	1.0	-49.6	-13.0	-36.6	
7520.00	-6.3	V	3.0	42.4	1.0	-47.7	-13.0	-34.7	
3760.00	-11.3	H	3.0	42.1	1.0	-52.4	-13.0	-39.4	
5640.00	-7.5	H	3.0	42.9	1.0	-49.4	-13.0	-36.4	
7520.00	-6.4	H	3.0	42.4	1.0	-47.8	-13.0	-34.8	
High Ch, 1907.5MHz									
3815.00	-11.3	V	3.0	42.1	1.0	-52.4	-13.0	-39.4	
5722.50	-8.0	V	3.0	42.9	1.0	-50.0	-13.0	-37.0	
7630.00	-6.0	V	3.0	42.4	1.0	-47.4	-13.0	-34.4	
3815.00	-11.3	H	3.0	42.1	1.0	-52.4	-13.0	-39.4	
5722.50	-7.8	H	3.0	42.9	1.0	-49.7	-13.0	-36.7	
7630.00	-6.4	H	3.0	42.4	1.0	-47.8	-13.0	-34.8	

LTE Band 5

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-05-17							
Test Engineer:		22943							
Configuration:		EUT / AC Adapter, X-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 5 Harmonics, 5MHz Bandwidth							
Test Votage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.5MHz									
1653.00	-15.8	V	3.0	40.7	1.0	-55.5	-13.0	-42.5	
2479.50	-13.0	V	3.0	41.3	1.0	-53.3	-13.0	-40.3	
3306.00	-10.3	V	3.0	42.1	1.0	-51.3	-13.0	-38.3	
1653.00	-15.8	H	3.0	40.7	1.0	-55.5	-13.0	-42.5	
2479.50	-12.5	H	3.0	41.3	1.0	-52.8	-13.0	-39.8	
3306.00	-10.2	H	3.0	42.1	1.0	-51.2	-13.0	-38.2	
Mid Ch, 836.5MHz									
1673.00	-15.8	V	3.0	40.7	1.0	-55.5	-13.0	-42.5	
2509.50	-12.8	V	3.0	41.4	1.0	-53.2	-13.0	-40.2	
3346.00	-10.1	V	3.0	42.1	1.0	-51.1	-13.0	-38.1	
1673.00	-15.5	H	3.0	40.7	1.0	-55.2	-13.0	-42.2	
2509.50	-12.6	H	3.0	41.4	1.0	-52.9	-13.0	-39.9	
3346.00	-10.1	H	3.0	42.1	1.0	-51.1	-13.0	-38.1	
High Ch, 846.5MHz									
1693.00	-15.6	V	3.0	40.7	1.0	-55.3	-13.0	-42.3	
2539.50	-12.8	V	3.0	41.4	1.0	-53.2	-13.0	-40.2	
3386.00	-10.0	V	3.0	42.1	1.0	-51.0	-13.0	-38.0	
1693.00	-15.6	H	3.0	40.7	1.0	-55.3	-13.0	-42.3	
2539.50	-12.6	H	3.0	41.4	1.0	-53.0	-13.0	-40.0	
3386.00	-9.8	H	3.0	42.1	1.0	-50.9	-13.0	-37.9	

LTE Band 7

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company:	Samsung							
		Project #:	4789893923							
		Date:	2021-04-28							
		Test Engineer:	20881							
		Configuration:	EUT / AC Adapter, X-Position							
		Location:	Chamber 2							
		Mode:	LTE_QPSK Band 7 Harmonics, 5MHz Bandwidth							
		Test Voltage:	AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
5MHz										
QPSK										
Low Ch, 2502.5MHz										
5005.00	-18.5	V	3.0	42.8	1.0	-60.3	-25.0	-35.3		
7507.50	-13.8	V	3.0	42.4	1.0	-55.2	-25.0	-30.2		
10010.00	-16.8	V	3.0	40.9	1.0	-56.6	-25.0	-31.6		
5005.00	-18.5	H	3.0	42.8	1.0	-60.3	-25.0	-35.3		
7507.50	-14.2	H	3.0	42.4	1.0	-55.6	-25.0	-30.6		
10010.00	-16.7	H	3.0	40.9	1.0	-56.5	-25.0	-31.5		
Mid Ch, 2535MHz										
5070.00	-19.1	V	3.0	42.8	1.0	-60.9	-25.0	-35.9		
7605.00	-8.6	V	3.0	42.4	1.0	-50.0	-25.0	-25.0		
10140.00	-16.4	V	3.0	40.9	1.0	-56.3	-25.0	-31.3		
5070.00	-20.6	H	3.0	42.8	1.0	-62.4	-25.0	-37.4		
7605.00	-11.4	H	3.0	42.4	1.0	-52.8	-25.0	-27.8		
10140.00	-16.3	H	3.0	40.9	1.0	-56.2	-25.0	-31.2		
High Ch, 2567.5MHz										
5135.00	-21.6	V	3.0	42.8	1.0	-63.4	-25.0	-38.4		
7702.50	-14.0	V	3.0	42.3	1.0	-55.3	-25.0	-30.3		
10270.00	-16.2	V	3.0	41.0	1.0	-56.2	-25.0	-31.2		
5135.00	-21.2	H	3.0	42.8	1.0	-63.0	-25.0	-38.0		
7702.50	-14.6	H	3.0	42.3	1.0	-55.9	-25.0	-30.9		
10270.00	-16.0	H	3.0	41.0	1.0	-56.0	-25.0	-31.0		

LTE Band 12

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement								
		Company:	Samsung							
		Project #:	4789893923							
		Date:	2021-05-17							
		Test Engineer:	22943							
		Configuration:	EUT / AC Adapter, X-Position							
		Location:	Chamber 2							
		Mode:	LTE_QPSK Band 12 Harmonics, 10MHz Bandwidth							
		Test Voltage:	AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
10MHz										
QPSK										
Low Ch, 704MHz										
1408.00	-16.7	V	3.0	40.7	1.0	-56.5	-13.0	-43.5		
2112.00	-14.3	V	3.0	40.8	1.0	-54.1	-13.0	-41.1		
2816.00	-11.8	V	3.0	41.8	1.0	-52.6	-13.0	-39.6		
1408.00	-17.1	H	3.0	40.7	1.0	-56.8	-13.0	-43.8		
2112.00	-14.0	H	3.0	40.8	1.0	-53.8	-13.0	-40.8		
2816.00	-11.6	H	3.0	41.8	1.0	-52.4	-13.0	-39.4		
Mid Ch, 707.5MHz										
1415.00	-16.9	V	3.0	40.7	1.0	-56.6	-13.0	-43.6		
2122.50	-14.3	V	3.0	40.8	1.0	-54.1	-13.0	-41.1		
2830.00	-11.9	V	3.0	41.8	1.0	-52.7	-13.0	-39.7		
1415.00	-16.9	H	3.0	40.7	1.0	-56.7	-13.0	-43.7		
2122.50	-14.1	H	3.0	40.8	1.0	-53.9	-13.0	-40.9		
2830.00	-11.7	H	3.0	41.8	1.0	-52.5	-13.0	-39.5		
High Ch, 711MHz										
1422.00	-16.8	V	3.0	40.7	1.0	-56.6	-13.0	-43.6		
2133.00	-14.4	V	3.0	40.8	1.0	-54.2	-13.0	-41.2		
2844.00	-11.7	V	3.0	41.8	1.0	-52.5	-13.0	-39.5		
1422.00	-17.1	H	3.0	40.7	1.0	-56.8	-13.0	-43.8		
2133.00	-14.0	H	3.0	40.8	1.0	-53.8	-13.0	-40.8		
2844.00	-11.6	H	3.0	41.8	1.0	-52.4	-13.0	-39.4		

LTE Band 13

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-05-17							
Test Engineer:		22943							
Configuration:		EUT / AC Adapter, X-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
5MHz QPSK									
Low Ch, 779.5MHz									
1559.00	-29.7	V	3.0	40.7	1.0	-69.4	-40.0	-29.4	
2338.50	-13.3	V	3.0	41.1	1.0	-53.5	-13.0	-40.5	
3118.00	-10.6	V	3.0	42.1	1.0	-51.6	-13.0	-38.6	
1559.00	-27.0	H	3.0	40.7	1.0	-66.7	-40.0	-26.7	
2338.50	-13.1	H	3.0	41.1	1.0	-53.2	-13.0	-40.2	
3118.00	-10.3	H	3.0	42.1	1.0	-51.4	-13.0	-38.4	
Mid Ch, 782MHz									
1564.00	-28.6	V	3.0	40.7	1.0	-68.3	-40.0	-28.3	
2346.00	-13.4	V	3.0	41.1	1.0	-53.5	-13.0	-40.5	
3128.00	-10.4	V	3.0	42.1	1.0	-51.5	-13.0	-38.5	
1564.00	-27.6	H	3.0	40.7	1.0	-67.3	-40.0	-27.3	
2346.00	-13.0	H	3.0	41.1	1.0	-53.1	-13.0	-40.1	
3128.00	-10.3	H	3.0	42.1	1.0	-51.4	-13.0	-38.4	
High Ch, 784.5MHz									
1569.00	-28.5	V	3.0	40.7	1.0	-68.2	-40.0	-28.2	
2353.50	-13.3	V	3.0	41.1	1.0	-53.4	-13.0	-40.4	
3138.00	-10.5	V	3.0	42.1	1.0	-51.6	-13.0	-38.6	
1569.00	-28.1	H	3.0	40.7	1.0	-67.8	-40.0	-27.8	
2353.50	-13.1	H	3.0	41.1	1.0	-53.2	-13.0	-40.2	
3138.00	-10.4	H	3.0	42.1	1.0	-51.5	-13.0	-38.5	

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

LTE Band 14

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-05-17							
Test Engineer:		19227							
Configuration:		EUT / AC Adapter, X-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 14 Harmonics, 5MHz Bandwidth							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
5MHz QPSK									
Low Ch, 790.5MHz									
1581.00	-30.7	V	3.0	40.7	1.0	-70.4	-40.0	-30.4	
2371.50	-9.5	V	3.0	41.2	1.0	-49.6	-13.0	-36.6	
3162.00	-6.3	V	3.0	42.1	1.0	-47.3	-13.0	-34.3	
1581.00	-29.5	H	3.0	40.7	1.0	-69.2	-40.0	-29.2	
2371.50	-28.8	H	3.0	41.2	1.0	-69.0	-13.0	-56.0	
3162.00	-27.4	H	3.0	42.1	1.0	-68.5	-13.0	-55.5	
Mid Ch, 793MHz									
1586.00	-30.6	V	3.0	40.7	1.0	-70.3	-40.0	-30.3	
2379.00	-9.4	V	3.0	41.2	1.0	-49.6	-13.0	-36.6	
3172.00	-6.3	V	3.0	42.1	1.0	-47.4	-13.0	-34.4	
1586.00	-28.2	H	3.0	40.7	1.0	-67.9	-40.0	-27.9	
2379.00	-9.1	H	3.0	41.2	1.0	-49.3	-13.0	-36.3	
3172.00	-6.1	H	3.0	42.1	1.0	-47.2	-13.0	-34.2	
High Ch, 795.5MHz									
1591.00	-29.8	V	3.0	40.7	1.0	-69.5	-40.0	-29.5	
2386.50	-9.4	V	3.0	41.2	1.0	-49.6	-13.0	-36.6	
3182.00	-6.4	V	3.0	42.1	1.0	-47.4	-13.0	-34.4	
1591.00	-30.0	H	3.0	40.7	1.0	-69.7	-40.0	-29.7	
2386.50	-9.1	H	3.0	41.2	1.0	-49.3	-13.0	-36.3	
3182.00	-6.3	H	3.0	42.1	1.0	-47.3	-13.0	-34.3	

LTE Band 66

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-04-28							
Test Engineer:		19568							
Configuration:		EUT / AC Adpater, X-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 66 Harmonics, 3MHz Bandwidth							
Test Votage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5MHz									
3423.00	-9.0	V	3.0	42.1	1.0	-50.1	-13.0	-37.1	
5134.50	-8.9	V	3.0	42.8	1.0	-50.7	-13.0	-37.7	
6846.00	-6.2	V	3.0	42.7	1.0	-47.9	-13.0	-34.9	
3423.00	-9.1	H	3.0	42.1	1.0	-50.2	-13.0	-37.2	
5134.50	-8.3	H	3.0	42.8	1.0	-50.1	-13.0	-37.1	
6846.00	-6.6	H	3.0	42.7	1.0	-48.4	-13.0	-35.4	
Mid Ch, 1745MHz									
3490.00	-8.5	V	3.0	42.1	1.0	-49.6	-13.0	-36.6	
5235.00	-8.8	V	3.0	42.8	1.0	-50.7	-13.0	-37.7	
6980.00	-6.2	V	3.0	42.7	1.0	-47.9	-13.0	-34.9	
3490.00	-8.2	H	3.0	42.1	1.0	-49.3	-13.0	-36.3	
5235.00	-8.3	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	-7.4	V	3.0	42.1	1.0	-48.4	-13.0	-35.4	
5335.50	-8.4	V	3.0	42.9	1.0	-50.3	-13.0	-37.3	
7114.00	-6.0	V	3.0	42.6	1.0	-47.6	-13.0	-34.6	
3557.00	-7.9	H	3.0	42.1	1.0	-49.0	-13.0	-36.0	
5335.50	-8.0	H	3.0	42.9	1.0	-49.9	-13.0	-36.9	
7114.00	-6.1	H	3.0	42.6	1.0	-47.8	-13.0	-34.8	

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.

NR Band 2

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
20MHz DFT-s QPSK		Company: Samsung Project #: 4789893923 Date: 2021-05-03 Test Engineer: 20882 Configuration: EUT / AC Adapter, Y-Position Location: Chamber 1 Mode: LTE_QPSK NR n2 Harmonics, 20MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
		f	SG reading	Ant. Pol.	Distance	Preamp	Filter	EIRP	Limit	Delta	Notes
		MHz	(dBm)	(H/V)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)	
		Low Ch, 1860MHz									
		3720.00	-11.4	V	3.0	45.5	1.0	-55.9	-13.0	-42.9	
		5580.00	-8.9	V	3.0	45.4	1.0	-53.3	-13.0	-40.3	
		7440.00	-6.0	V	3.0	44.2	1.0	-49.2	-13.0	-36.2	
		3720.00	-10.9	H	3.0	45.5	1.0	-55.4	-13.0	-42.4	
		5580.00	-8.7	H	3.0	45.4	1.0	-53.1	-13.0	-40.1	
		7440.00	-6.1	H	3.0	44.2	1.0	-49.3	-13.0	-36.3	
Mid Ch, 1880MHz											
3760.00	-11.2	V	3.0	45.5	1.0	-55.7	-13.0	-42.7			
5640.00	-8.7	V	3.0	45.4	1.0	-53.1	-13.0	-40.1			
7520.00	-6.2	V	3.0	44.1	1.0	-49.4	-13.0	-36.4			
3760.00	-10.9	H	3.0	45.5	1.0	-55.4	-13.0	-42.4			
5640.00	-8.6	H	3.0	45.4	1.0	-53.0	-13.0	-40.0			
7520.00	-6.0	H	3.0	44.1	1.0	-49.2	-13.0	-36.2			
High Ch, 1900MHz											
3800.00	-11.2	V	3.0	45.5	1.0	-55.7	-13.0	-42.7			
5700.00	-8.6	V	3.0	45.4	1.0	-52.9	-13.0	-39.9			
7600.00	-5.9	V	3.0	44.1	1.0	-49.0	-13.0	-36.0			
3800.00	-10.8	H	3.0	45.5	1.0	-55.3	-13.0	-42.3			
5700.00	-8.6	H	3.0	45.4	1.0	-53.0	-13.0	-40.0			
7600.00	-5.8	H	3.0	44.1	1.0	-48.9	-13.0	-35.9			

NR Band 5

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
20MHz DFT-s QPSK		Company: Samsung Project #: 4789893923 Date: 2021-05-17 Test Engineer: 19568 Configuration: EUT / AC Adapter, X-Position Location: Chamber 1 Mode: LTE_QPSK NR n5 Harmonics, 20MHz Bandwidth Test Votage: AC 120 V, 60 Hz									
		f	SG reading	Ant. Pol.	Distance	Preamp	Filter	EIRP	Limit	Delta	Notes
		MHz	(dBm)	(H/V)	(m)	(dB)	(dB)	(dBm)	(dBm)	(dB)	
		Low Ch, 834MHz									
		1668.00	-13.7	V	3.0	45.3	1.0	-58.0	-13.0	-45.0	
		2502.00	-11.0	V	3.0	45.1	1.0	-55.1	-13.0	-42.1	
		3336.00	-9.5	V	3.0	45.3	1.0	-53.8	-13.0	-40.8	
		1668.00	-15.4	H	3.0	45.3	1.0	-59.6	-13.0	-46.6	
		2502.00	-11.7	H	3.0	45.1	1.0	-55.8	-13.0	-42.8	
		3336.00	-9.4	H	3.0	45.3	1.0	-53.8	-13.0	-40.8	
Mid Ch, 836.5MHz											
1673.00	-13.5	V	3.0	45.3	1.0	-57.8	-13.0	-44.8			
2509.50	-11.0	V	3.0	45.1	1.0	-55.1	-13.0	-42.1			
3346.00	-9.6	V	3.0	45.3	1.0	-53.9	-13.0	-40.9			
1673.00	-15.5	H	3.0	45.3	1.0	-59.7	-13.0	-46.7			
2509.50	-11.6	H	3.0	45.1	1.0	-55.7	-13.0	-42.7			
3346.00	-9.2	H	3.0	45.3	1.0	-53.5	-13.0	-40.5			
High Ch, 839MHz											
1678.00	-13.6	V	3.0	45.2	1.0	-57.8	-13.0	-44.8			
2517.00	-11.1	V	3.0	45.1	1.0	-55.2	-13.0	-42.2			
3356.00	-9.2	V	3.0	45.3	1.0	-53.5	-13.0	-40.5			
1678.00	-15.2	H	3.0	45.2	1.0	-59.4	-13.0	-46.4			
2517.00	-11.7	H	3.0	45.1	1.0	-55.8	-13.0	-42.8			
3356.00	-9.4	H	3.0	45.3	1.0	-53.7	-13.0	-40.7			

NR Band 66

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-05-03							
Test Engineer:		19227							
Configuration:		EUT / AC Adapter, X-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK NR n66 Harmonics, 15MHz Bandwidth							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5MHz									
3435.00	-9.0	V	3.0	45.4	1.0	-53.4	-13.0	-40.4	
5152.50	-9.7	V	3.0	45.5	1.0	-54.2	-13.0	-41.2	
6870.00	-6.6	V	3.0	44.5	1.0	-50.2	-13.0	-37.2	
3435.00	-8.7	H	3.0	45.4	1.0	-53.0	-13.0	-40.0	
5152.50	-9.3	H	3.0	45.5	1.0	-53.7	-13.0	-40.7	
6870.00	-6.4	H	3.0	44.5	1.0	-49.9	-13.0	-36.9	
Mid Ch, 1745MHz									
3490.00	-8.8	V	3.0	45.4	1.0	-53.1	-13.0	-40.1	
5235.00	-9.3	V	3.0	45.4	1.0	-53.8	-13.0	-40.8	
6980.00	-6.5	V	3.0	44.4	1.0	-50.0	-13.0	-37.0	
3490.00	-8.5	H	3.0	45.4	1.0	-52.9	-13.0	-39.9	
5235.00	-9.0	H	3.0	45.4	1.0	-53.5	-13.0	-40.5	
6980.00	-6.2	H	3.0	44.4	1.0	-49.7	-13.0	-36.7	
High Ch, 1772.5MHz									
3545.00	-8.6	V	3.0	45.4	1.0	-53.0	-13.0	-40.0	
5317.50	-9.3	V	3.0	45.4	1.0	-53.7	-13.0	-40.7	
7090.00	-6.3	V	3.0	44.4	1.0	-49.7	-13.0	-36.7	
3545.00	-8.3	H	3.0	45.4	1.0	-52.7	-13.0	-39.7	
5317.50	-9.0	H	3.0	45.4	1.0	-53.4	-13.0	-40.4	
7090.00	-6.0	H	3.0	44.4	1.0	-49.4	-13.0	-36.4	

NR Band 77(Lower)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-05-28							
Test Engineer:		19568							
Configuration:		EUT / AC Adapter, Y-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK NR n77 Harmonics, 20MHz Bandwidth							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 3460.02MHz									
6920.04	-4.9	V	3.0	44.5	1.0	-48.4	-13.0	-31.3	
10380.06	-0.5	V	3.0	42.4	1.0	-41.8	-13.0	-28.3	
13840.08	2.8	V	3.0	44.4	1.0	-40.6	-13.0	-30.0	
6920.04	-4.9	H	3.0	44.5	1.0	-48.4	-13.0	-31.3	
10380.06	-0.8	H	3.0	42.4	1.0	-42.1	-13.0	-28.3	
13840.08	3.0	H	3.0	44.4	1.0	-40.4	-13.0	-30.0	
Mid Ch, 3499.98MHz									
6999.96	-5.8	V	3.0	44.4	1.0	-49.2	-13.0	-30.2	
10499.94	-1.1	V	3.0	42.4	1.0	-42.5	-13.0	-28.6	
13999.92	3.0	V	3.0	44.5	1.0	-40.5	-13.0	-31.4	
6999.96	-5.4	H	3.0	44.4	1.0	-48.8	-13.0	-30.2	
10499.94	-1.1	H	3.0	42.4	1.0	-42.5	-13.0	-28.6	
13999.92	3.4	H	3.0	44.5	1.0	-40.1	-13.0	-31.4	
High Ch, 3540MHz									
7080.00	-5.5	V	3.0	44.4	1.0	-48.8	-13.0	-29.7	
10620.00	-0.8	V	3.0	42.4	1.0	-42.2	-13.0	-29.2	
14160.00	3.0	V	3.0	44.7	1.0	-40.7	-13.0	-29.5	
7080.00	-5.1	H	3.0	44.4	1.0	-48.5	-13.0	-29.7	
10620.00	-0.7	H	3.0	42.4	1.0	-42.2	-13.0	-29.2	
14160.00	3.1	H	3.0	44.7	1.0	-40.6	-13.0	-29.5	

NR Band 77(Upper)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4789893923							
Date:		2021-05-21							
Test Engineer:		22943							
Configuration:		EUT / AC Adapter, Y-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK NR n77 Harmonics, 20MHz Bandwidth							
Test Voltage:		AC 120 V, 60 Hz							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 3710.01MHz									
7420.02	-6.3	V	3.0	44.2	1.0	-49.5	-13.0	-31.3	
11130.03	-0.8	V	3.0	42.6	1.0	-42.4	-13.0	-28.3	
14840.04	3.3	V	3.0	45.2	1.0	-41.0	-13.0	-30.0	
7420.02	-6.1	H	3.0	44.2	1.0	-49.3	-13.0	-31.3	
11130.03	-0.9	H	3.0	42.6	1.0	-42.5	-13.0	-28.3	
14840.04	3.2	H	3.0	45.2	1.0	-41.0	-13.0	-30.0	
Mid Ch, 3840MHz									
7680.00	-6.2	V	3.0	44.1	1.0	-49.3	-13.0	-30.2	
11520.00	-0.1	V	3.0	42.7	1.0	-41.9	-13.0	-28.6	
15360.00	3.7	V	3.0	45.0	1.0	-40.3	-13.0	-31.4	
7680.00	-6.1	H	3.0	44.1	1.0	-49.1	-13.0	-30.2	
11520.00	-0.2	H	3.0	42.7	1.0	-41.9	-13.0	-28.6	
15360.00	3.6	H	3.0	45.0	1.0	-40.3	-13.0	-31.4	
High Ch, 3969.99MHz									
7939.98	-6.1	V	3.0	43.9	1.0	-49.0	-13.0	-29.7	
11909.97	0.2	V	3.0	42.8	1.0	-41.6	-13.0	-29.2	
15879.96	4.1	V	3.0	44.3	1.0	-39.3	-13.0	-29.5	
7939.98	-6.0	H	3.0	43.9	1.0	-48.9	-13.0	-29.7	
11909.97	0.3	H	3.0	42.8	1.0	-41.5	-13.0	-29.2	
15879.96	4.8	H	3.0	44.3	1.0	-38.5	-13.0	-29.5	

20MHz
DFT-s
QPSK

END OF TEST REPORT