

WCDMA Band 2

WCDMA
Band 2
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869688
Date: 2019-04-16
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: Rel99 Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	8.75	V	4.5	9.4	13.65	33.0	-19.3	
1852.40	13.42	H	4.5	9.4	18.32	33.0	-14.7	
Mid Ch								
1880.00	13.42	V	4.5	9.2	18.08	33.0	-14.9	
1880.00	16.70	H	4.5	9.2	21.37	33.0	-11.6	
High Ch								
1907.60	8.13	V	4.6	9.0	12.52	33.0	-20.5	
1907.60	17.16	H	4.6	9.0	21.55	33.0	-11.4	

WCDMA
Band 2
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869688
Date: 2019-04-16
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: HSDPA Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	8.35	V	4.5	9.4	13.25	33.0	-19.7	
1852.40	13.14	H	4.5	9.4	18.04	33.0	-15.0	
Mid Ch								
1880.00	13.05	V	4.5	9.2	17.71	33.0	-15.3	
1880.00	16.19	H	4.5	9.2	20.86	33.0	-12.1	
High Ch								
1907.60	7.61	V	4.6	9.0	12.00	33.0	-21.0	
1907.60	16.81	H	4.6	9.0	21.20	33.0	-11.8	

LTE Band 2

LTE Band 2 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-01-28 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable <table><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><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1860.00</td><td>13.71</td><td>V</td><td>4.5</td><td>9.4</td><td>18.65</td><td>33.0</td><td>-14.4</td><td></td></tr><tr><td>1860.00</td><td>16.81</td><td>H</td><td>4.5</td><td>9.4</td><td>21.74</td><td>33.0</td><td>-11.3</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>14.61</td><td>V</td><td>4.5</td><td>9.3</td><td>19.39</td><td>33.0</td><td>-13.6</td><td></td></tr><tr><td>1880.00</td><td>18.19</td><td>H</td><td>4.5</td><td>9.3</td><td>22.96</td><td>33.0</td><td>-10.0</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1900.00</td><td>13.02</td><td>V</td><td>4.6</td><td>9.2</td><td>17.63</td><td>33.0</td><td>-15.4</td><td></td></tr><tr><td>1900.00</td><td>17.88</td><td>H</td><td>4.6</td><td>9.2</td><td>22.50</td><td>33.0</td><td>-10.5</td><td></td></tr></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									1860.00	13.71	V	4.5	9.4	18.65	33.0	-14.4		1860.00	16.81	H	4.5	9.4	21.74	33.0	-11.3		Mid Ch									1880.00	14.61	V	4.5	9.3	19.39	33.0	-13.6		1880.00	18.19	H	4.5	9.3	22.96	33.0	-10.0		High Ch									1900.00	13.02	V	4.6	9.2	17.63	33.0	-15.4		1900.00	17.88	H	4.6	9.2	22.50	33.0	-10.5	
	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	13.71	V	4.5	9.4	18.65	33.0	-14.4																																																																																											
	1860.00	16.81	H	4.5	9.4	21.74	33.0	-11.3																																																																																											
	Mid Ch																																																																																																		
	1880.00	14.61	V	4.5	9.3	19.39	33.0	-13.6																																																																																											
	1880.00	18.19	H	4.5	9.3	22.96	33.0	-10.0																																																																																											
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LTE Band 2 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-01-28 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable <table><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><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1860.00</td><td>11.48</td><td>V</td><td>4.5</td><td>9.4</td><td>16.42</td><td>33.0</td><td>-16.6</td><td></td></tr><tr><td>1860.00</td><td>15.13</td><td>H</td><td>4.5</td><td>9.4</td><td>20.06</td><td>33.0</td><td>-12.9</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>7.22</td><td>V</td><td>4.5</td><td>9.3</td><td>12.00</td><td>33.0</td><td>-21.0</td><td></td></tr><tr><td>1880.00</td><td>17.81</td><td>H</td><td>4.5</td><td>9.3</td><td>22.58</td><td>33.0</td><td>-10.4</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1900.00</td><td>11.93</td><td>V</td><td>4.6</td><td>9.2</td><td>16.54</td><td>33.0</td><td>-16.5</td><td></td></tr><tr><td>1900.00</td><td>17.06</td><td>H</td><td>4.6</td><td>9.2</td><td>21.68</td><td>33.0</td><td>-11.3</td><td></td></tr></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									1860.00	11.48	V	4.5	9.4	16.42	33.0	-16.6		1860.00	15.13	H	4.5	9.4	20.06	33.0	-12.9		Mid Ch									1880.00	7.22	V	4.5	9.3	12.00	33.0	-21.0		1880.00	17.81	H	4.5	9.3	22.58	33.0	-10.4		High Ch									1900.00	11.93	V	4.6	9.2	16.54	33.0	-16.5		1900.00	17.06	H	4.6	9.2	21.68	33.0	-11.3	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	1860.00	11.48	V	4.5	9.4	16.42	33.0	-16.6																																																																																											
	1860.00	15.13	H	4.5	9.4	20.06	33.0	-12.9																																																																																											
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	1880.00	7.22	V	4.5	9.3	12.00	33.0	-21.0																																																																																											
	1880.00	17.81	H	4.5	9.3	22.58	33.0	-10.4																																																																																											
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	1900.00	11.93	V	4.6	9.2	16.54	33.0	-16.5																																																																																											
1900.00	17.06	H	4.6	9.2	21.68	33.0	-11.3																																																																																												

LTE

Band 2

15MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788869685

Date:

2019-01-28

Test Engineer:

47989

Configuration:

EUT / X-Position

Location:

Chamber 1

Mode:

LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables

Substitution: Horn 3115[00167211], 2.5m 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	8.93	V	4.5	9.5	13.88	33.0	-19.1	
1857.50	15.54	H	4.5	9.5	20.49	33.0	-12.5	
Mid Ch								
1880.00	14.44	V	4.5	9.3	19.22	33.0	-13.8	
1880.00	18.54	H	4.5	9.3	23.31	33.0	-9.7	
High Ch								
1902.50	12.49	V	4.6	9.1	17.08	33.0	-15.9	
1902.50	18.02	H	4.6	9.1	22.60	33.0	-10.4	

LTE

Band 2

15MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788869685

Date:

2019-01-28

Test Engineer:

47989

Configuration:

EUT / X-Position

Location:

Chamber 1

Mode:

LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables

Substitution: Horn 3115[00167211], 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	9.61	V	4.5	9.5	14.56	33.0	-18.4	
1857.50	15.05	H	4.5	9.5	20.00	33.0	-13.0	
Mid Ch								
1880.00	13.59	V	4.5	9.3	18.37	33.0	-14.6	
1880.00	17.42	H	4.5	9.3	22.19	33.0	-10.8	
High Ch								
1902.50	11.54	V	4.6	9.1	16.13	33.0	-16.9	
1902.50	16.93	H	4.6	9.1	21.51	33.0	-11.5	

LTE

Band 2

10MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788869685

Date:

2019-01-28

Test Engineer:

47989

Configuration:

EUT / X-Position

Location:

Chamber 1

Mode:

LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables

Substitution: Horn 3115[00167211], 2.5m 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	9.20	V	4.5	9.5	14.17	33.0	-18.8	
1855.00	15.61	H	4.5	9.5	20.58	33.0	-12.4	
Mid Ch								
1880.00	12.90	V	4.5	9.3	17.68	33.0	-15.3	
1880.00	17.59	H	4.5	9.3	22.36	33.0	-10.6	
High Ch								
1905.00	13.27	V	4.6	9.1	17.82	33.0	-15.2	
1905.00	18.24	H	4.6	9.1	22.79	33.0	-10.2	

LTE

Band 2

10MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788869685

Date:

2019-01-28

Test Engineer:

47989

Configuration:

EUT / X-Position

Location:

Chamber 1

Mode:

LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables

Substitution: Horn 3115[00167211], 2.5m 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	8.46	V	4.5	9.5	13.43	33.0	-19.6	
1855.00	14.69	H	4.5	9.5	19.66	33.0	-13.3	
Mid Ch								
1880.00	12.10	V	4.5	9.3	16.88	33.0	-16.1	
1880.00	16.59	H	4.5	9.3	21.36	33.0	-11.6	
High Ch								
1905.00	12.39	V	4.6	9.1	16.94	33.0	-16.1	
1905.00	17.16	H	4.6	9.1	21.71	33.0	-11.3	

LTE

Band 2

5MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-01-29

47989

EUT / X-Position

Chamber 1

LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables

Substitution: Horn 3115[00167211], 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	13.09	V	4.5	9.5	18.09	33.0	-14.9	
1852.50	16.48	H	4.5	9.5	21.48	33.0	-11.5	
Mid Ch								
1880.00	14.34	V	4.5	9.3	19.12	33.0	-13.9	
1880.00	18.63	H	4.5	9.3	23.40	33.0	-9.6	
High Ch								
1907.50	13.97	V	4.6	9.1	18.49	33.0	-14.5	
1907.50	17.64	H	4.6	9.1	22.16	33.0	-10.8	

LTE

Band 2

5MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-01-29

47989

EUT / X-Position

Chamber 1

LTE_16QAM Band 2 Fundamentals, 5MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables

Substitution: Horn 3115[00167211], 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	11.92	V	4.5	9.5	16.92	33.0	-16.1	
1852.50	15.52	H	4.5	9.5	20.52	33.0	-12.5	
Mid Ch								
1880.00	13.27	V	4.5	9.3	18.05	33.0	-15.0	
1880.00	17.64	H	4.5	9.3	22.41	33.0	-10.6	
High Ch								
1907.50	13.19	V	4.6	9.1	17.71	33.0	-15.3	
1907.50	16.70	H	4.6	9.1	21.22	33.0	-11.8	

LTE Band 2 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-01-29 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable <table><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><tr><td colspan="9">Low Ch</td></tr><tr><td>1851.50</td><td>10.09</td><td>V</td><td>4.5</td><td>9.5</td><td>15.10</td><td>33.0</td><td>-17.9</td><td></td></tr><tr><td>1851.50</td><td>16.35</td><td>H</td><td>4.5</td><td>9.5</td><td>21.35</td><td>33.0</td><td>-11.6</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>16.31</td><td>V</td><td>4.5</td><td>9.3</td><td>21.09</td><td>33.0</td><td>-11.9</td><td></td></tr><tr><td>1880.00</td><td>18.84</td><td>H</td><td>4.5</td><td>9.3</td><td>23.61</td><td>33.0</td><td>-9.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1908.50</td><td>14.37</td><td>V</td><td>4.6</td><td>9.1</td><td>18.88</td><td>33.0</td><td>-14.1</td><td></td></tr><tr><td>1908.50</td><td>18.83</td><td>H</td><td>4.6</td><td>9.1</td><td>23.33</td><td>33.0</td><td>-9.7</td><td></td></tr></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									1851.50	10.09	V	4.5	9.5	15.10	33.0	-17.9		1851.50	16.35	H	4.5	9.5	21.35	33.0	-11.6		Mid Ch									1880.00	16.31	V	4.5	9.3	21.09	33.0	-11.9		1880.00	18.84	H	4.5	9.3	23.61	33.0	-9.4		High Ch									1908.50	14.37	V	4.6	9.1	18.88	33.0	-14.1		1908.50	18.83	H	4.6	9.1	23.33	33.0	-9.7	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	1851.50	10.09	V	4.5	9.5	15.10	33.0	-17.9																																																																																											
	1851.50	16.35	H	4.5	9.5	21.35	33.0	-11.6																																																																																											
	Mid Ch																																																																																																		
	1880.00	16.31	V	4.5	9.3	21.09	33.0	-11.9																																																																																											
	1880.00	18.84	H	4.5	9.3	23.61	33.0	-9.4																																																																																											
	High Ch																																																																																																		
	1908.50	14.37	V	4.6	9.1	18.88	33.0	-14.1																																																																																											
1908.50	18.83	H	4.6	9.1	23.33	33.0	-9.7																																																																																												
LTE Band 2 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-01-29 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable <table><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><tr><td colspan="9">Low Ch</td></tr><tr><td>1851.50</td><td>9.74</td><td>V</td><td>4.5</td><td>9.5</td><td>14.75</td><td>33.0</td><td>-18.3</td><td></td></tr><tr><td>1851.50</td><td>15.36</td><td>H</td><td>4.5</td><td>9.5</td><td>20.36</td><td>33.0</td><td>-12.6</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>15.26</td><td>V</td><td>4.5</td><td>9.3</td><td>20.04</td><td>33.0</td><td>-13.0</td><td></td></tr><tr><td>1880.00</td><td>17.81</td><td>H</td><td>4.5</td><td>9.3</td><td>22.58</td><td>33.0</td><td>-10.4</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1908.50</td><td>11.41</td><td>V</td><td>4.6</td><td>9.1</td><td>15.92</td><td>33.0</td><td>-17.1</td><td></td></tr><tr><td>1908.50</td><td>16.20</td><td>H</td><td>4.6</td><td>9.1</td><td>20.70</td><td>33.0</td><td>-12.3</td><td></td></tr></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									1851.50	9.74	V	4.5	9.5	14.75	33.0	-18.3		1851.50	15.36	H	4.5	9.5	20.36	33.0	-12.6		Mid Ch									1880.00	15.26	V	4.5	9.3	20.04	33.0	-13.0		1880.00	17.81	H	4.5	9.3	22.58	33.0	-10.4		High Ch									1908.50	11.41	V	4.6	9.1	15.92	33.0	-17.1		1908.50	16.20	H	4.6	9.1	20.70	33.0	-12.3	
	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	9.74	V	4.5	9.5	14.75	33.0	-18.3																																																																																											
	1851.50	15.36	H	4.5	9.5	20.36	33.0	-12.6																																																																																											
	Mid Ch																																																																																																		
	1880.00	15.26	V	4.5	9.3	20.04	33.0	-13.0																																																																																											
	1880.00	17.81	H	4.5	9.3	22.58	33.0	-10.4																																																																																											
	High Ch																																																																																																		
	1908.50	11.41	V	4.6	9.1	15.92	33.0	-17.1																																																																																											
1908.50	16.20	H	4.6	9.1	20.70	33.0	-12.3																																																																																												

LTE
Band 2
1.4MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-01-29
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 2.5m 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	10.63	V	4.5	9.5	15.64	33.0	-17.4	
1850.70	16.02	H	4.5	9.5	21.03	33.0	-12.0	
Mid Ch								
1880.00	16.09	V	4.5	9.3	20.87	33.0	-12.1	
1880.00	18.78	H	4.5	9.3	23.55	33.0	-9.4	
High Ch								
1909.30	14.70	V	4.6	9.1	19.19	33.0	-13.8	
1909.30	18.02	H	4.6	9.1	22.51	33.0	-10.5	

LTE
Band 2
1.4MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-01-29
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00167211], 2.5m 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	9.91	V	4.5	9.5	14.92	33.0	-18.1	
1850.70	14.99	H	4.5	9.5	20.00	33.0	-13.0	
Mid Ch								
1880.00	15.01	V	4.5	9.3	19.79	33.0	-13.2	
1880.00	17.80	H	4.5	9.3	22.57	33.0	-10.4	
High Ch								
1909.30	13.88	V	4.6	9.1	18.37	33.0	-14.6	
1909.30	17.24	H	4.6	9.1	21.73	33.0	-11.3	

LTE Band 5

LTE

Band 5

10MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-01

47989

EUT / X-Position

Chamber 1

LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables

Substitution: Dipole 3121_DB4, 2.5m 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	17.29	V	3.0	-1.5	12.81	38.5	-25.7	
829.00	24.00	H	3.0	-1.5	19.52	38.5	-19.0	
Mid Ch								
836.50	14.78	V	3.0	-1.4	10.32	38.5	-28.2	
836.50	22.57	H	3.0	-1.4	18.11	38.5	-20.4	
High Ch								
844.00	13.85	V	3.1	-1.4	9.40	38.5	-29.1	
844.00	22.62	H	3.1	-1.4	18.17	38.5	-20.3	

LTE

Band 5

10MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-01

47989

EUT / X-Position

Chamber 1

LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables

Substitution: Dipole 3121_DB4, 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	15.86	V	3.0	-1.5	11.38	38.5	-27.1	
829.00	22.59	H	3.0	-1.5	18.11	38.5	-20.4	
Mid Ch								
836.50	13.45	V	3.0	-1.4	8.99	38.5	-29.5	
836.50	21.61	H	3.0	-1.4	17.15	38.5	-21.4	
High Ch								
844.00	12.27	V	3.1	-1.4	7.82	38.5	-30.7	
844.00	22.56	H	3.1	-1.4	18.11	38.5	-20.4	

LTE
Band 5
5MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 2.5m 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	14.59	V	3.0	-1.5	10.11	38.5	-28.4	
826.50	23.79	H	3.0	-1.5	19.31	38.5	-19.2	
Mid Ch								
836.50	14.71	V	3.0	-1.4	10.25	38.5	-28.3	
836.50	24.07	H	3.0	-1.4	19.61	38.5	-18.9	
High Ch								
846.50	13.53	V	3.1	-1.4	9.08	38.5	-29.4	
846.50	19.85	H	3.1	-1.4	15.40	38.5	-23.1	

LTE
Band 5
5MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 2.5m 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	13.42	V	3.0	-1.5	8.94	38.5	-29.6	
826.50	22.49	H	3.0	-1.5	18.01	38.5	-20.5	
Mid Ch								
836.50	13.45	V	3.0	-1.4	8.99	38.5	-29.5	
836.50	22.81	H	3.0	-1.4	18.35	38.5	-20.2	
High Ch								
846.50	12.16	V	3.1	-1.4	7.71	38.5	-30.8	
846.50	19.12	H	3.1	-1.4	14.67	38.5	-23.8	

LTE

Band 5

3MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-01

47989

EUT / X-Position

Chamber 1

LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables

Substitution: Dipole 3121_DB4, 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	14.38	V	3.0	-1.5	9.90	38.5	-28.6	
825.50	23.19	H	3.0	-1.5	18.71	38.5	-19.8	
Mid Ch								
836.50	13.83	V	3.0	-1.4	9.37	38.5	-29.1	
836.50	23.00	H	3.0	-1.4	18.54	38.5	-20.0	
High Ch								
847.50	12.31	V	3.1	-1.4	7.87	38.5	-30.6	
847.50	22.23	H	3.1	-1.4	17.78	38.5	-20.7	

LTE

Band 5

3MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-01

47989

EUT / X-Position

Chamber 1

LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables

Substitution: Dipole 3121_DB4, 2.5m 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	12.89	V	3.0	-1.5	8.41	38.5	-30.1	
825.50	21.67	H	3.0	-1.5	17.19	38.5	-21.3	
Mid Ch								
836.50	12.41	V	3.0	-1.4	7.95	38.5	-30.6	
836.50	21.58	H	3.0	-1.4	17.12	38.5	-21.4	
High Ch								
847.50	11.27	V	3.1	-1.4	6.83	38.5	-31.7	
847.50	21.10	H	3.1	-1.4	16.65	38.5	-21.8	

LTE
Band 5
1.4MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	14.28	V	3.0	-1.5	9.79	38.5	-28.7	
824.70	23.33	H	3.0	-1.5	18.84	38.5	-19.7	
Mid Ch								
836.50	14.47	V	3.0	-1.4	10.01	38.5	-28.5	
836.50	23.34	H	3.0	-1.4	18.88	38.5	-19.6	
High Ch								
848.30	12.25	V	3.1	-1.4	7.81	38.5	-30.7	
848.30	22.30	H	3.1	-1.4	17.86	38.5	-20.6	

LTE
Band 5
1.4MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

Receiving: VULB9163-750, and Chamber 1 SMA Cables
Substitution: Dipole 3121_DB4, 2.5m 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	13.00	V	3.0	-1.5	8.51	38.5	-30.0	
824.70	22.14	H	3.0	-1.5	17.65	38.5	-20.8	
Mid Ch								
836.50	13.01	V	3.0	-1.4	8.55	38.5	-30.0	
836.50	21.83	H	3.0	-1.4	17.37	38.5	-21.1	
High Ch								
848.30	10.83	V	3.1	-1.4	6.39	38.5	-32.1	
848.30	21.28	H	3.1	-1.4	16.84	38.5	-21.7	

LTE Band 17

LTE
Band 17
10MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869688
Date: 2019-04-10
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 17 Fundamentals, 10MHz Bandwidth

Test Equipment:

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	14.10	V	2.8	-1.6	9.71	34.8	-25.1	
709.00	21.62	H	2.8	-1.6	17.23	34.8	-17.5	
Mid Ch								
710.00	14.12	V	2.8	-1.6	9.73	34.8	-25.0	
710.00	21.53	H	2.8	-1.6	17.14	34.8	-17.6	
High Ch								
711.00	13.98	V	2.8	-1.6	9.58	34.8	-25.2	
711.00	21.52	H	2.8	-1.6	17.13	34.8	-17.6	

LTE
Band 17
10MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869688
Date: 2019-04-10
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 17 Fundamentals, 10MHz Bandwidth

Test Equipment:

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
709.00	13.04	V	2.8	-1.6	8.65	34.8	-26.1	
709.00	20.29	H	2.8	-1.6	15.90	34.8	-18.9	
Mid Ch								
710.00	12.89	V	2.8	-1.6	8.50	34.8	-26.3	
710.00	20.39	H	2.8	-1.6	16.00	34.8	-18.8	
High Ch								
711.00	12.89	V	2.8	-1.6	8.49	34.8	-26.3	
711.00	20.02	H	2.8	-1.6	15.63	34.8	-19.1	

LTE
Band 17
5MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869688
Date: 2019-04-10
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 17 Fundamentals, 5MHz Bandwidth

Test Equipment:

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	13.88	V	2.8	-1.6	9.50	34.8	-25.3	
706.50	21.15	H	2.8	-1.6	16.77	34.8	-18.0	
Mid Ch								
710.00	14.16	V	2.8	-1.6	9.77	34.8	-25.0	
710.00	21.65	H	2.8	-1.6	17.26	34.8	-17.5	
High Ch								
713.50	13.31	V	2.8	-1.6	8.91	34.8	-25.9	
713.50	21.08	H	2.8	-1.6	16.68	34.8	-18.1	

LTE
Band 17
5MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869688
Date: 2019-04-10
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 17 Fundamentals, 5MHz Bandwidth

Test Equipment:

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
706.50	12.51	V	2.8	-1.6	8.13	34.8	-26.6	
706.50	20.02	H	2.8	-1.6	15.64	34.8	-19.1	
Mid Ch								
710.00	13.05	V	2.8	-1.6	8.66	34.8	-26.1	
710.00	20.27	H	2.8	-1.6	15.88	34.8	-18.9	
High Ch								
713.50	11.83	V	2.8	-1.6	7.43	34.8	-27.3	
713.50	19.63	H	2.8	-1.6	15.23	34.8	-19.5	

LTE Band 41

LTE
Band 41
20MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 20MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	15.02	V	5.2	10.1	19.85	33.0	-13.2	
2506.00	17.25	H	5.2	10.1	22.08	33.0	-10.9	
Mid Ch								
2593.00	16.52	V	5.3	10.0	21.16	33.0	-11.8	
2593.00	17.28	H	5.3	10.0	21.92	33.0	-11.1	
High Ch								
2680.00	15.43	V	5.4	10.0	20.02	33.0	-13.0	
2680.00	15.23	H	5.4	10.0	19.82	33.0	-13.2	

LTE
Band 41
20MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 20MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables
Substitution: Horn 3115[00167451], 2.5m 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	14.12	V	5.2	10.1	18.95	33.0	-14.1	
2506.00	16.35	H	5.2	10.1	21.18	33.0	-11.8	
Mid Ch								
2593.00	15.99	V	5.3	10.0	20.63	33.0	-12.4	
2593.00	16.78	H	5.3	10.0	21.42	33.0	-11.6	
High Ch								
2680.00	13.90	V	5.4	10.0	18.49	33.0	-14.5	
2680.00	14.78	H	5.4	10.0	19.37	33.0	-13.6	

LTE

Band 41

15MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-12

45585

EUT / X-Position

Chamber 2

LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00167451], 2.5m 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	16.99	V	5.2	10.1	21.82	33.0	-11.2	
2503.50	16.52	H	5.2	10.1	21.35	33.0	-11.6	
Mid Ch								
2593.00	15.19	V	5.3	10.0	19.83	33.0	-13.2	
2593.00	17.54	H	5.3	10.0	22.18	33.0	-10.8	
High Ch								
2682.50	15.97	V	5.4	10.0	20.57	33.0	-12.4	
2682.50	15.37	H	5.4	10.0	19.97	33.0	-13.0	

LTE

Band 41

15MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-12

45585

EUT / X-Position

Chamber 2

LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00167451], 2.5m 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	16.20	V	5.2	10.1	21.03	33.0	-12.0	
2503.50	15.74	H	5.2	10.1	20.57	33.0	-12.4	
Mid Ch								
2593.00	14.96	V	5.3	10.0	19.60	33.0	-13.4	
2593.00	17.66	H	5.3	10.0	22.30	33.0	-10.7	
High Ch								
2682.50	15.79	V	5.4	10.0	20.39	33.0	-12.6	
2682.50	15.16	H	5.4	10.0	19.76	33.0	-13.2	

LTE Band 41 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 2.5m SMA-type Cable <table><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><tr><td colspan="9">Low Ch</td></tr><tr><td>2501.00</td><td>17.55</td><td>V</td><td>5.2</td><td>10.1</td><td>22.39</td><td>33.0</td><td>-10.6</td><td></td></tr><tr><td>2501.00</td><td>17.17</td><td>H</td><td>5.2</td><td>10.1</td><td>22.01</td><td>33.0</td><td>-11.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>2593.00</td><td>15.52</td><td>V</td><td>5.3</td><td>10.0</td><td>20.16</td><td>33.0</td><td>-12.8</td><td></td></tr><tr><td>2593.00</td><td>17.23</td><td>H</td><td>5.3</td><td>10.0</td><td>21.87</td><td>33.0</td><td>-11.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>2685.00</td><td>15.71</td><td>V</td><td>5.4</td><td>10.0</td><td>20.30</td><td>33.0</td><td>-12.7</td><td></td></tr><tr><td>2685.00</td><td>15.06</td><td>H</td><td>5.4</td><td>10.0</td><td>19.65</td><td>33.0</td><td>-13.4</td><td></td></tr></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									2501.00	17.55	V	5.2	10.1	22.39	33.0	-10.6		2501.00	17.17	H	5.2	10.1	22.01	33.0	-11.0		Mid Ch									2593.00	15.52	V	5.3	10.0	20.16	33.0	-12.8		2593.00	17.23	H	5.3	10.0	21.87	33.0	-11.1		High Ch									2685.00	15.71	V	5.4	10.0	20.30	33.0	-12.7		2685.00	15.06	H	5.4	10.0	19.65	33.0	-13.4	
	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	17.55	V	5.2	10.1	22.39	33.0	-10.6																																																																																											
	2501.00	17.17	H	5.2	10.1	22.01	33.0	-11.0																																																																																											
	Mid Ch																																																																																																		
	2593.00	15.52	V	5.3	10.0	20.16	33.0	-12.8																																																																																											
	2593.00	17.23	H	5.3	10.0	21.87	33.0	-11.1																																																																																											
	High Ch																																																																																																		
	2685.00	15.71	V	5.4	10.0	20.30	33.0	-12.7																																																																																											
2685.00	15.06	H	5.4	10.0	19.65	33.0	-13.4																																																																																												
LTE Band 41 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 2.5m SMA-type Cable <table><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><tr><td colspan="9">Low Ch</td></tr><tr><td>2501.00</td><td>16.58</td><td>V</td><td>5.2</td><td>10.1</td><td>21.42</td><td>33.0</td><td>-11.6</td><td></td></tr><tr><td>2501.00</td><td>16.16</td><td>H</td><td>5.2</td><td>10.1</td><td>21.00</td><td>33.0</td><td>-12.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>2593.00</td><td>14.72</td><td>V</td><td>5.3</td><td>10.0</td><td>19.36</td><td>33.0</td><td>-13.6</td><td></td></tr><tr><td>2593.00</td><td>17.04</td><td>H</td><td>5.3</td><td>10.0</td><td>21.68</td><td>33.0</td><td>-11.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>2685.00</td><td>15.98</td><td>V</td><td>5.4</td><td>10.0</td><td>20.57</td><td>33.0</td><td>-12.4</td><td></td></tr><tr><td>2685.00</td><td>15.28</td><td>H</td><td>5.4</td><td>10.0</td><td>19.87</td><td>33.0</td><td>-13.1</td><td></td></tr></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									2501.00	16.58	V	5.2	10.1	21.42	33.0	-11.6		2501.00	16.16	H	5.2	10.1	21.00	33.0	-12.0		Mid Ch									2593.00	14.72	V	5.3	10.0	19.36	33.0	-13.6		2593.00	17.04	H	5.3	10.0	21.68	33.0	-11.3		High Ch									2685.00	15.98	V	5.4	10.0	20.57	33.0	-12.4		2685.00	15.28	H	5.4	10.0	19.87	33.0	-13.1	
	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	16.58	V	5.2	10.1	21.42	33.0	-11.6																																																																																											
	2501.00	16.16	H	5.2	10.1	21.00	33.0	-12.0																																																																																											
	Mid Ch																																																																																																		
	2593.00	14.72	V	5.3	10.0	19.36	33.0	-13.6																																																																																											
	2593.00	17.04	H	5.3	10.0	21.68	33.0	-11.3																																																																																											
	High Ch																																																																																																		
	2685.00	15.98	V	5.4	10.0	20.57	33.0	-12.4																																																																																											
2685.00	15.28	H	5.4	10.0	19.87	33.0	-13.1																																																																																												

LTE

Band 41

5MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-12

45585

EUT / X-Position

Chamber 2

LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00167451], 2.5m 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	16.30	V	5.2	10.1	21.14	33.0	-11.9	
2498.50	17.15	H	5.2	10.1	21.99	33.0	-11.0	
Mid Ch								
2593.00	15.82	V	5.3	10.0	20.46	33.0	-12.5	
2593.00	17.36	H	5.3	10.0	22.00	33.0	-11.0	
High Ch								
2687.50	15.65	V	5.4	10.0	20.25	33.0	-12.8	
2687.50	15.91	H	5.4	10.0	20.51	33.0	-12.5	

LTE

Band 41

5MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869685

2019-02-12

45585

EUT / X-Position

Chamber 2

LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth

Test Equipment:

Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables

Substitution: Horn 3115[00167451], 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	15.04	V	5.2	10.1	19.88	33.0	-13.1	
2498.50	15.83	H	5.2	10.1	20.67	33.0	-12.3	
Mid Ch								
2593.00	15.06	V	5.3	10.0	19.70	33.0	-13.3	
2593.00	16.61	H	5.3	10.0	21.25	33.0	-11.8	
High Ch								
2687.50	14.76	V	5.4	10.0	19.36	33.0	-13.6	
2687.50	15.00	H	5.4	10.0	19.60	33.0	-13.4	

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238 and §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:

(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.

(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) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points $\geq$ 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.

GSM1900

Page 104 of 120

WCDMA Band 5

WCDMA Band 5 REL99	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788869688 Date: 2019-02-13 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone Location: Chamber 2 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
WCDMA Band 5 HSDPA	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788869688 Date: 2019-02-13 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 2 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
WCDMA Band 5 REL99	Low Ch, 826.4MHz									
	1652.80	-13.8	V	3.0	38.2	1.0	-51.0	-13.0	-38.0	
WCDMA Band 5 HSDPA	Low Ch, 826.4MHz									
	2479.20	-12.8	V	3.0	38.8	1.0	-50.6	-13.0	-37.6	
WCDMA Band 5 REL99	Mid Ch, 836.6MHz									
	3305.60	-10.2	V	3.0	39.4	1.0	-48.6	-13.0	-35.6	
WCDMA Band 5 HSDPA	Mid Ch, 836.6MHz									
	1652.80	-11.8	H	3.0	38.2	1.0	-49.0	-13.0	-36.0	
WCDMA Band 5 REL99	High Ch, 846.6MHz									
	2479.20	-13.4	H	3.0	38.8	1.0	-51.2	-13.0	-38.2	
WCDMA Band 5 HSDPA	High Ch, 846.6MHz									
	3305.60	-10.5	H	3.0	39.4	1.0	-48.9	-13.0	-35.9	
WCDMA Band 5 REL99	Low Ch, 826.4MHz									
	1673.20	-13.9	V	3.0	38.2	1.0	-51.2	-13.0	-38.2	
WCDMA Band 5 HSDPA	Low Ch, 826.4MHz									
	2509.80	-12.8	V	3.0	38.8	1.0	-50.6	-13.0	-37.6	
WCDMA Band 5 REL99	Mid Ch, 836.6MHz									
	3346.40	-10.3	V	3.0	39.5	1.0	-48.7	-13.0	-35.7	
WCDMA Band 5 HSDPA	Mid Ch, 836.6MHz									
	1673.20	-11.9	H	3.0	38.2	1.0	-49.1	-13.0	-36.1	
WCDMA Band 5 REL99	High Ch, 846.6MHz									
	2509.80	-13.3	H	3.0	38.8	1.0	-51.2	-13.0	-38.2	
WCDMA Band 5 HSDPA	High Ch, 846.6MHz									
	3346.40	-10.5	H	3.0	39.5	1.0	-48.9	-13.0	-35.9	
WCDMA Band 5 REL99	Low Ch, 826.4MHz									
	1693.20	-14.7	V	3.0	38.2	1.0	-52.0	-13.0	-39.0	
WCDMA Band 5 HSDPA	Low Ch, 826.4MHz									
	2539.80	-12.6	V	3.0	38.9	1.0	-50.5	-13.0	-37.5	
WCDMA Band 5 REL99	Mid Ch, 836.6MHz									
	3386.40	-10.0	V	3.0	39.5	1.0	-48.5	-13.0	-35.5	
WCDMA Band 5 HSDPA	Mid Ch, 836.6MHz									
	1693.20	-12.7	H	3.0	38.2	1.0	-50.0	-13.0	-37.0	
WCDMA Band 5 REL99	High Ch, 846.6MHz									
	2539.80	-13.2	H	3.0	38.9	1.0	-51.0	-13.0	-38.0	
WCDMA Band 5 HSDPA	High Ch, 846.6MHz									
	3386.40	-10.3	H	3.0	39.5	1.0	-48.8	-13.0	-35.8	

WCDMA Band 2

WCDMA

Band 2

REL99

UL Verification Services, Inc.

Above 1GHz High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869688

2019-04-16

45585

EUT / AC Adapter / Earphone, X-Position

Chamber 2

Rel99 Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-11.2	V	3.0	39.7	1.0	-49.9	-13.0	-36.9	
5557.20	-8.3	V	3.0	39.9	1.0	-47.2	-13.0	-34.2	
7409.60	-6.2	V	3.0	39.4	1.0	-44.6	-13.0	-31.6	
3704.80	-11.4	H	3.0	39.7	1.0	-50.1	-13.0	-37.1	
5557.20	-8.6	H	3.0	39.9	1.0	-47.5	-13.0	-34.5	
7409.60	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4	
Mid Ch, 1880MHz									
3760.00	-10.8	V	3.0	39.7	1.0	-49.5	-13.0	-36.5	
5640.00	-7.9	V	3.0	40.0	1.0	-46.8	-13.0	-33.8	
7520.00	-6.3	V	3.0	39.4	1.0	-44.7	-13.0	-31.7	
3760.00	-11.2	H	3.0	39.7	1.0	-49.8	-13.0	-36.8	
5640.00	-8.2	H	3.0	40.0	1.0	-47.1	-13.0	-34.1	
7520.00	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4	
High Ch, 1907.6MHz									
3815.20	-11.0	V	3.0	39.7	1.0	-49.8	-13.0	-36.8	
5722.80	-8.1	V	3.0	40.0	1.0	-47.1	-13.0	-34.1	
7630.40	-6.2	V	3.0	39.3	1.0	-44.5	-13.0	-31.5	
3815.20	-11.2	H	3.0	39.7	1.0	-50.0	-13.0	-37.0	
5722.80	-8.3	H	3.0	40.0	1.0	-47.3	-13.0	-34.3	
7630.40	-7.0	H	3.0	39.3	1.0	-45.3	-13.0	-32.3	

WCDMA

Band 2

HSDPA

UL Verification Services, Inc.

Above 1GHz High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788869688

2019-04-16

45585

EUT / AC Adapter / Earphone, X-Position

Chamber 2

HSDPA Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-11.2	V	3.0	39.7	1.0	-49.8	-13.0	-36.8	
5557.20	-8.3	V	3.0	39.9	1.0	-47.2	-13.0	-34.2	
7409.60	-6.1	V	3.0	39.4	1.0	-44.5	-13.0	-31.5	
3704.80	-11.5	H	3.0	39.7	1.0	-50.2	-13.0	-37.2	
5557.20	-8.6	H	3.0	39.9	1.0	-47.5	-13.0	-34.5	
7409.60	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4	
Mid Ch, 1880MHz									
3760.00	-10.8	V	3.0	39.7	1.0	-49.5	-13.0	-36.5	
5640.00	-7.9	V	3.0	40.0	1.0	-46.8	-13.0	-33.8	
7520.00	-6.2	V	3.0	39.4	1.0	-44.6	-13.0	-31.6	
3760.00	-11.1	H	3.0	39.7	1.0	-49.7	-13.0	-36.7	
5640.00	-8.2	H	3.0	40.0	1.0	-47.1	-13.0	-34.1	
7520.00	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4	
High Ch, 1907.6MHz									
3815.20	-10.9	V	3.0	39.7	1.0	-49.6	-13.0	-36.6	
5722.80	-8.1	V	3.0	40.0	1.0	-47.1	-13.0	-34.1	
7630.40	-6.3	V	3.0	39.3	1.0	-44.6	-13.0	-31.6	
3815.20	-11.2	H	3.0	39.7	1.0	-49.9	-13.0	-36.9	
5722.80	-8.4	H	3.0	40.0	1.0	-47.4	-13.0	-34.4	
7630.40	-6.9	H	3.0	39.3	1.0	-45.3	-13.0	-32.3	

LTE Band 2

LTE Band 2 20MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-02-01 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 1 Mode: LTE_QPSK Band 2 Harmonics, 20MHz 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, 1860MHz										
	3720.00	-11.6	V	3.0	43.8	1.0	-54.4	-13.0	-41.4	
	5580.00	-8.6	V	3.0	43.7	1.0	-51.3	-13.0	-38.3	
	7440.00	-6.0	V	3.0	42.5	1.0	-47.5	-13.0	-34.5	
	3720.00	-11.6	H	3.0	43.8	1.0	-54.3	-13.0	-41.3	
	5580.00	-8.7	H	3.0	43.7	1.0	-51.4	-13.0	-38.4	
	7440.00	-6.0	H	3.0	42.5	1.0	-47.5	-13.0	-34.5	
Mid Ch, 1880MHz										
	3760.00	-11.4	V	3.0	43.8	1.0	-54.2	-13.0	-41.2	
	5640.00	-8.5	V	3.0	43.7	1.0	-51.2	-13.0	-38.2	
	7520.00	-6.0	V	3.0	42.5	1.0	-47.5	-13.0	-34.5	
	3760.00	-11.3	H	3.0	43.8	1.0	-54.1	-13.0	-41.1	
	5640.00	-8.6	H	3.0	43.7	1.0	-51.3	-13.0	-38.3	
	7520.00	-5.9	H	3.0	42.5	1.0	-47.4	-13.0	-34.4	
High Ch, 1900MHz										
	3800.00	-11.3	V	3.0	43.8	1.0	-54.1	-13.0	-41.1	
	5700.00	-8.2	V	3.0	43.7	1.0	-50.9	-13.0	-37.9	
	7600.00	-6.0	V	3.0	42.4	1.0	-47.4	-13.0	-34.4	
	3800.00	-11.3	H	3.0	43.8	1.0	-54.1	-13.0	-41.1	
	5700.00	-8.4	H	3.0	43.7	1.0	-51.1	-13.0	-38.1	
	7600.00	-5.9	H	3.0	42.4	1.0	-47.3	-13.0	-34.3	

LTE Band 5

LTE Band 5 5MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788869685 Date: 2019-02-01 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 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	-6.0	V	3.0	43.6	1.0	-48.6	-13.0	-35.6	
	2479.50	-12.4	V	3.0	43.4	1.0	-54.8	-13.0	-41.8	
	3306.00	-10.6	V	3.0	43.6	1.0	-53.3	-13.0	-40.3	
	1653.00	-5.0	H	3.0	43.6	1.0	-47.6	-13.0	-34.6	
	2479.50	-13.1	H	3.0	43.4	1.0	-55.5	-13.0	-42.5	
	3306.00	-10.8	H	3.0	43.6	1.0	-53.5	-13.0	-40.5	
Mid Ch, 836.5MHz										
	1673.00	-7.9	V	3.0	43.6	1.0	-50.5	-13.0	-37.5	
	2509.50	-12.5	V	3.0	43.4	1.0	-54.9	-13.0	-41.9	
	3346.00	-10.7	V	3.0	43.6	1.0	-53.3	-13.0	-40.3	
	1673.00	-6.8	H	3.0	43.6	1.0	-49.4	-13.0	-36.4	
	2509.50	-13.1	H	3.0	43.4	1.0	-55.5	-13.0	-42.5	
	3346.00	-10.7	H	3.0	43.6	1.0	-53.4	-13.0	-40.4	
High Ch, 846.5MHz										
	1693.00	-7.4	V	3.0	43.6	1.0	-49.9	-13.0	-36.9	
	2539.50	-12.4	V	3.0	43.4	1.0	-54.8	-13.0	-41.8	
	3386.00	-10.1	V	3.0	43.7	1.0	-52.7	-13.0	-39.7	
	1693.00	-7.2	H	3.0	43.6	1.0	-49.7	-13.0	-36.7	
	2539.50	-12.8	H	3.0	43.4	1.0	-55.3	-13.0	-42.3	
	3386.00	-10.1	H	3.0	43.7	1.0	-52.8	-13.0	-39.8	

LTE Band 17

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788869688							
Date:		2019-04-10							
Test Engineer:		45585							
Configuration:		EUT / AC Adapter / Earphone, X-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK Band 17 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, 709MHz									
1418.00	-16.2	V	3.0	43.8	1.0	-59.0	-13.0	-46.0	
2127.00	-13.7	V	3.0	43.3	1.0	-56.1	-13.0	-43.1	
2836.00	-11.7	V	3.0	43.5	1.0	-54.2	-13.0	-41.2	
3545.00	-7.6	V	3.0	43.7	1.0	-50.4	-13.0	-37.4	
1418.00	-15.2	H	3.0	43.8	1.0	-58.0	-13.0	-45.0	
2127.00	-14.7	H	3.0	43.3	1.0	-57.0	-13.0	-44.0	
2836.00	-12.0	H	3.0	43.5	1.0	-54.5	-13.0	-41.5	
3545.00	-6.1	H	3.0	43.7	1.0	-48.9	-13.0	-35.9	
Mid Ch, 710MHz									
1420.00	-16.2	V	3.0	43.8	1.0	-58.9	-13.0	-45.9	
2130.00	-13.8	V	3.0	43.3	1.0	-56.1	-13.0	-43.1	
2840.00	-11.5	V	3.0	43.5	1.0	-54.0	-13.0	-41.0	
3550.00	-6.5	V	3.0	43.7	1.0	-49.2	-13.0	-36.2	
1420.00	-15.1	H	3.0	43.8	1.0	-57.9	-13.0	-44.9	
2130.00	-14.5	H	3.0	43.3	1.0	-56.9	-13.0	-43.9	
2840.00	-12.0	H	3.0	43.5	1.0	-54.5	-13.0	-41.5	
3550.00	-5.8	H	3.0	43.7	1.0	-48.6	-13.0	-35.6	
High Ch, 711MHz									
1422.00	-16.1	V	3.0	43.8	1.0	-58.9	-13.0	-45.9	
2133.00	-13.6	V	3.0	43.3	1.0	-56.0	-13.0	-43.0	
2844.00	-11.5	V	3.0	43.5	1.0	-54.0	-13.0	-41.0	
3555.00	-7.9	V	3.0	43.7	1.0	-50.6	-13.0	-37.6	
1422.00	-15.5	H	3.0	43.8	1.0	-58.3	-13.0	-45.3	
2133.00	-14.5	H	3.0	43.3	1.0	-56.9	-13.0	-43.9	
2844.00	-11.8	H	3.0	43.5	1.0	-54.3	-13.0	-41.3	
3555.00	-6.9	H	3.0	43.7	1.0	-49.6	-13.0	-36.6	

LTE Band 41

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788869685							
Date:		2019-02-12							
Test Engineer:		45585							
Configuration:		EUT / AC Adapter / Earphone / X-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 41 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, 2501MHz									
5002.00	-14.8	V	3.0	39.8	1.0	-53.5	-25.0	-28.5	
7503.00	-5.9	V	3.0	39.4	1.0	-44.3	-25.0	-19.3	
10004.00	-11.8	V	3.0	38.6	1.0	-49.3	-25.0	-24.3	
12505.00	-3.3	V	3.0	39.0	1.0	-41.3	-25.0	-16.3	
15006.00	-5.9	V	3.0	41.3	1.0	-46.2	-25.0	-21.2	
5002.00	-15.8	H	3.0	39.8	1.0	-54.6	-25.0	-29.6	
7503.00	-6.4	H	3.0	39.4	1.0	-44.8	-25.0	-19.8	
10004.00	-11.7	H	3.0	38.6	1.0	-49.3	-25.0	-24.3	
12505.00	-7.7	H	3.0	39.0	1.0	-45.6	-25.0	-20.6	
15006.00	-6.4	H	3.0	41.3	1.0	-46.7	-25.0	-21.7	
Mid Ch, 2593MHz									
5186.00	-12.7	V	3.0	39.8	1.0	-51.6	-25.0	-26.6	
7779.00	-2.9	V	3.0	39.3	1.0	-41.2	-25.0	-16.2	
10372.00	-5.3	V	3.0	38.6	1.0	-42.8	-25.0	-17.8	
12965.00	4.6	V	3.0	39.4	1.0	-33.8	-25.0	-8.8	
15558.00	-1.8	V	3.0	41.1	1.0	-41.9	-25.0	-16.9	
5186.00	-13.0	H	3.0	39.8	1.0	-51.8	-25.0	-26.8	
7779.00	-2.3	H	3.0	39.3	1.0	-40.5	-25.0	-15.5	
10372.00	-5.8	H	3.0	38.6	1.0	-43.4	-25.0	-18.4	
12965.00	-4.7	H	3.0	39.4	1.0	-43.1	-25.0	-18.1	
15558.00	-6.2	H	3.0	41.1	1.0	-46.3	-25.0	-21.3	
High Ch, 2685MHz									
5370.00	-8.8	V	3.0	39.9	1.0	-47.7	-25.0	-22.7	
8055.00	-3.9	V	3.0	39.2	1.0	-42.0	-25.0	-17.0	
10740.00	-4.1	V	3.0	38.5	1.0	-41.7	-25.0	-16.7	
13425.00	-4.4	V	3.0	39.8	1.0	-43.2	-25.0	-18.2	
16110.00	-5.2	V	3.0	40.9	1.0	-45.1	-25.0	-20.1	
5370.00	-11.6	H	3.0	39.9	1.0	-50.5	-25.0	-25.5	
8055.00	-6.6	H	3.0	39.2	1.0	-44.7	-25.0	-19.7	
10740.00	-9.8	H	3.0	38.5	1.0	-47.3	-25.0	-22.3	
13425.00	-8.0	H	3.0	39.8	1.0	-46.8	-25.0	-21.8	
16110.00	-5.4	H	3.0	40.9	1.0	-45.3	-25.0	-20.3	