

LTE Band 12 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 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								
	700.50	13.08	V	2.8	-1.6	8.70	34.8	-26.1	
	700.50	20.31	H	2.8	-1.6	15.93	34.8	-18.9	
	Mid Ch								
	707.50	12.69	V	2.8	-1.6	8.30	34.8	-26.5	
	707.50	20.83	H	2.8	-1.6	16.45	34.8	-18.4	
High Ch									
714.50	12.16	V	2.8	-1.6	7.77	34.8	-27.0		
714.50	20.98	H	2.8	-1.6	16.58	34.8	-18.2		
LTE Band 12 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 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								
	700.50	12.08	V	2.8	-1.6	7.70	34.8	-27.1	
	700.50	19.15	H	2.8	-1.6	14.77	34.8	-20.0	
	Mid Ch								
	707.50	11.81	V	2.8	-1.6	7.42	34.8	-27.4	
	707.50	19.90	H	2.8	-1.6	15.52	34.8	-19.3	
High Ch									
714.50	10.70	V	2.8	-1.6	6.31	34.8	-28.5		
714.50	20.21	H	2.8	-1.6	15.81	34.8	-19.0		

LTE Band 12 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 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								
	699.70	13.19	V	2.8	-1.6	8.81	34.8	-26.0	
	699.70	20.25	H	2.8	-1.6	15.87	34.8	-18.9	
	Mid Ch								
	707.50	12.47	V	2.8	-1.6	8.08	34.8	-26.7	
	707.50	20.84	H	2.8	-1.6	16.46	34.8	-18.3	
High Ch									
715.30	12.28	V	2.8	-1.6	7.88	34.8	-26.9		
715.30	21.17	H	2.8	-1.6	16.77	34.8	-18.0		
LTE Band 12 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 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								
	699.70	11.76	V	2.8	-1.6	7.38	34.8	-27.4	
	699.70	19.02	H	2.8	-1.6	14.64	34.8	-20.2	
	Mid Ch								
	707.50	11.24	V	2.8	-1.6	6.85	34.8	-27.9	
	707.50	19.69	H	2.8	-1.6	15.31	34.8	-19.5	
High Ch									
715.30	11.07	V	2.8	-1.6	6.67	34.8	-28.1		
715.30	20.10	H	2.8	-1.6	15.70	34.8	-19.1		

LTE Band 13

LTE Band 13 10MHz QPSK	<p style="text-align: center;">UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p> Company: Samsung Project #: 4788869685 Date: 2019-02-13 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth </p> <p> Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 2.5m 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 (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>782.00</td> <td>13.41</td> <td>V</td> <td>2.9</td> <td>-1.6</td> <td>8.90</td> <td>34.8</td> <td>-25.9</td> <td></td> </tr> <tr> <td>782.00</td> <td>19.19</td> <td>H</td> <td>2.9</td> <td>-1.6</td> <td>14.69</td> <td>34.8</td> <td>-20.1</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									782.00	13.41	V	2.9	-1.6	8.90	34.8	-25.9		782.00	19.19	H	2.9	-1.6	14.69	34.8	-20.1	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																												
Mid Ch																																					
782.00	13.41	V	2.9	-1.6	8.90	34.8	-25.9																														
782.00	19.19	H	2.9	-1.6	14.69	34.8	-20.1																														
LTE Band 13 10MHz 16QAM	<p style="text-align: center;">UL Verification Services, Inc. High Frequency Substitution Measurement</p> <p> Company: Samsung Project #: 4788869685 Date: 2019-02-13 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth </p> <p> Test Equipment: Receiving: VULB9163-750, and Chamber 1 SMA Cables Substitution: Dipole 3121_DB4, 2.5m 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 (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>782.00</td> <td>12.12</td> <td>V</td> <td>2.9</td> <td>-1.6</td> <td>7.61</td> <td>34.8</td> <td>-27.2</td> <td></td> </tr> <tr> <td>782.00</td> <td>17.70</td> <td>H</td> <td>2.9</td> <td>-1.6</td> <td>13.20</td> <td>34.8</td> <td>-21.6</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch									782.00	12.12	V	2.9	-1.6	7.61	34.8	-27.2		782.00	17.70	H	2.9	-1.6	13.20	34.8	-21.6	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																													
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782.00	12.12	V	2.9	-1.6	7.61	34.8	-27.2																														
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LTE Band 13 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-13 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 13 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								
	779.50	13.56	V	2.9	-1.6	9.06	34.8	-25.7	
	779.50	18.85	H	2.9	-1.6	14.35	34.8	-20.4	
	Mid Ch								
	782.00	13.29	V	2.9	-1.6	8.78	34.8	-26.0	
	782.00	18.86	H	2.9	-1.6	14.36	34.8	-20.4	
High Ch									
784.50	13.55	V	2.9	-1.6	9.04	34.8	-25.7		
784.50	19.02	H	2.9	-1.6	14.51	34.8	-20.3		
LTE Band 13 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-13 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 13 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								
	779.50	12.30	V	2.9	-1.6	7.80	34.8	-27.0	
	779.50	18.39	H	2.9	-1.6	13.89	34.8	-20.9	
	Mid Ch								
	782.00	12.20	V	2.9	-1.6	7.69	34.8	-27.1	
	782.00	17.48	H	2.9	-1.6	12.98	34.8	-21.8	
High Ch									
784.50	12.42	V	2.9	-1.6	7.91	34.8	-26.9		
784.50	17.70	H	2.9	-1.6	13.19	34.8	-21.6		

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: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: 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: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: 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								
	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								
	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: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 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: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00167451], 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		

LTE Band 66

LTE Band 66 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 20MHz Bandwidth <u>Test Equipment:</u> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1720.00	15.37	V	4.3	9.4	20.47	30.0	-9.5	
	1720.00	18.83	H	4.3	9.4	23.94	30.0	-6.1	
	Mid Ch								
	1745.00	12.10	V	4.4	9.5	17.26	30.0	-12.7	
	1745.00	18.08	H	4.4	9.5	23.25	30.0	-6.8	
	High Ch								
	1770.00	15.43	V	4.4	9.6	20.60	30.0	-9.4	
	1770.00	18.24	H	4.4	9.6	23.41	30.0	-6.6	
LTE Band 66 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 20MHz Bandwidth <u>Test Equipment:</u> Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1720.00	13.91	V	4.3	9.4	19.01	30.0	-11.0	
	1720.00	17.58	H	4.3	9.4	22.69	30.0	-7.3	
	Mid Ch								
	1745.00	11.36	V	4.4	9.5	16.52	30.0	-13.5	
	1745.00	17.01	H	4.4	9.5	22.18	30.0	-7.8	
	High Ch								
	1770.00	14.15	V	4.4	9.6	19.32	30.0	-10.7	
	1770.00	16.79	H	4.4	9.6	21.96	30.0	-8.0	

LTE Band 66 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 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								
	1717.50	15.63	V	4.3	9.4	20.73	30.0	-9.3	
	1717.50	18.86	H	4.3	9.4	23.96	30.0	-6.0	
	Mid Ch								
	1745.00	15.08	V	4.4	9.5	20.24	30.0	-9.8	
	1745.00	18.21	H	4.4	9.5	23.38	30.0	-6.6	
High Ch									
1772.50	15.34	V	4.4	9.6	20.51	30.0	-9.5		
1772.50	18.05	H	4.4	9.6	23.22	30.0	-6.8		
LTE Band 66 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 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								
	1717.50	14.21	V	4.3	9.4	19.31	30.0	-10.7	
	1717.50	17.58	H	4.3	9.4	22.68	30.0	-7.3	
	Mid Ch								
	1745.00	13.89	V	4.4	9.5	19.05	30.0	-10.9	
	1745.00	17.08	H	4.4	9.5	22.25	30.0	-7.8	
High Ch									
1772.50	13.76	V	4.4	9.6	18.93	30.0	-11.1		
1772.50	16.53	H	4.4	9.6	21.70	30.0	-8.3		

LTE Band 66 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 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								
	1715.00	13.71	V	4.3	9.4	18.80	30.0	-11.2	
	1715.00	18.92	H	4.3	9.4	24.02	30.0	-6.0	
	Mid Ch								
	1745.00	14.71	V	4.4	9.5	19.87	30.0	-10.1	
	1745.00	17.81	H	4.4	9.5	22.98	30.0	-7.0	
High Ch									
1775.00	15.24	V	4.4	9.6	20.41	30.0	-9.6		
1775.00	17.71	H	4.4	9.6	22.88	30.0	-7.1		
LTE Band 66 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 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								
	1715.00	12.11	V	4.3	9.4	17.20	30.0	-12.8	
	1715.00	17.61	H	4.3	9.4	22.71	30.0	-7.3	
	Mid Ch								
	1745.00	13.68	V	4.4	9.5	18.84	30.0	-11.2	
	1745.00	16.73	H	4.4	9.5	21.90	30.0	-8.1	
High Ch									
1775.00	14.03	V	4.4	9.6	19.20	30.0	-10.8		
1775.00	16.38	H	4.4	9.6	21.55	30.0	-8.4		

LTE Band 66 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1712.50	13.41	V	4.3	9.4	18.50	30.0	-11.5	
	1712.50	19.09	H	4.3	9.4	24.18	30.0	-5.8	
	Mid Ch								
	1745.00	15.43	V	4.4	9.5	20.59	30.0	-9.4	
1745.00	18.13	H	4.4	9.5	23.30	30.0	-6.7		
High Ch									
1777.50	13.92	V	4.4	9.6	19.09	30.0	-10.9		
1777.50	18.21	H	4.4	9.6	23.38	30.0	-6.6		
LTE Band 66 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1712.50	12.13	V	4.3	9.4	17.22	30.0	-12.8	
	1712.50	17.42	H	4.3	9.4	22.51	30.0	-7.5	
	Mid Ch								
	1745.00	13.92	V	4.4	9.5	19.08	30.0	-10.9	
1745.00	17.03	H	4.4	9.5	22.20	30.0	-7.8		
High Ch									
1777.50	13.83	V	4.4	9.6	19.00	30.0	-11.0		
1777.50	17.02	H	4.4	9.6	22.19	30.0	-7.8		

LTE Band 66 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 3MHz 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								
	1711.50	14.01	V	4.3	9.4	19.10	30.0	-10.9	
	1711.50	18.79	H	4.3	9.4	23.88	30.0	-6.1	
	Mid Ch								
	1745.00	15.48	V	4.4	9.5	20.64	30.0	-9.4	
	1745.00	17.76	H	4.4	9.5	22.93	30.0	-7.1	
High Ch									
1778.50	13.99	V	4.4	9.6	19.16	30.0	-10.8		
1778.50	18.06	H	4.4	9.6	23.23	30.0	-6.8		
LTE Band 66 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 3MHz 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								
	1711.50	11.96	V	4.3	9.4	17.05	30.0	-13.0	
	1711.50	17.47	H	4.3	9.4	22.56	30.0	-7.4	
	Mid Ch								
	1745.00	14.03	V	4.4	9.5	19.19	30.0	-10.8	
	1745.00	16.55	H	4.4	9.5	21.72	30.0	-8.3	
High Ch									
1778.50	12.16	V	4.4	9.6	17.33	30.0	-12.7		
1778.50	15.53	H	4.4	9.6	20.70	30.0	-9.3		

LTE Band 66 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1710.70	14.11	V	4.3	9.4	19.19	30.0	-10.8	
	1710.70	18.90	H	4.3	9.4	23.98	30.0	-6.0	
	Mid Ch								
	1745.00	14.76	V	4.4	9.5	19.92	30.0	-10.1	
1745.00	17.40	H	4.4	9.5	22.57	30.0	-7.4		
High Ch									
1779.30	15.17	V	4.4	9.6	20.34	30.0	-9.7		
1779.30	16.27	H	4.4	9.6	21.44	30.0	-8.6		
LTE Band 66 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00167211], 2.5m SMA-type Cable								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1710.70	12.45	V	4.3	9.4	17.53	30.0	-12.5	
	1710.70	17.79	H	4.3	9.4	22.87	30.0	-7.1	
	Mid Ch								
	1745.00	14.03	V	4.4	9.5	19.19	30.0	-10.8	
1745.00	18.42	H	4.4	9.5	23.59	30.0	-6.4		
High Ch									
1779.30	14.24	V	4.4	9.6	19.41	30.0	-10.6		
1779.30	16.12	H	4.4	9.6	21.29	30.0	-8.7		

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:

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

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

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

(m) (4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less 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.

10.2.1. SPURIOUS RADIATION PLOTS

GSM850

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		Company: Samsung Project #: 4788869685 Date: 2019-02-13 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, Z-Position Location: Chamber 1 Mode: GPRS 850 MHz Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
Low Ch, 824.2MHz											
1648.40	4.9	V	3.0	43.6	1.0	-37.7	-13.0	-24.7			
2472.60	-4.3	V	3.0	43.4	1.0	-46.7	-13.0	-33.7			
3296.80	-8.6	V	3.0	43.6	1.0	-51.2	-13.0	-38.2			
1648.40	4.2	H	3.0	43.6	1.0	-38.4	-13.0	-25.4			
2472.60	-2.7	H	3.0	43.4	1.0	-45.1	-13.0	-32.1			
3296.80	-8.0	H	3.0	43.6	1.0	-50.7	-13.0	-37.7			
Mid Ch, 836.6MHz											
1673.20	5.5	V	3.0	43.6	1.0	-37.1	-13.0	-24.1			
2509.80	-5.8	V	3.0	43.4	1.0	-48.2	-13.0	-35.2			
3346.40	-9.1	V	3.0	43.6	1.0	-51.7	-13.0	-38.7			
1673.20	3.9	H	3.0	43.6	1.0	-38.7	-13.0	-25.7			
2509.80	-4.1	H	3.0	43.4	1.0	-46.5	-13.0	-33.5			
3346.40	-7.8	H	3.0	43.6	1.0	-50.5	-13.0	-37.5			
High Ch, 848.8MHz											
1697.60	7.6	V	3.0	43.6	1.0	-35.0	-13.0	-22.0			
2546.40	-5.8	V	3.0	43.4	1.0	-48.3	-13.0	-35.3			
3395.20	-9.0	V	3.0	43.7	1.0	-51.6	-13.0	-38.6			
1697.60	8.8	H	3.0	43.6	1.0	-33.8	-13.0	-20.8			
2546.40	-4.0	H	3.0	43.4	1.0	-46.4	-13.0	-33.4			
3395.20	-7.3	H	3.0	43.7	1.0	-50.0	-13.0	-37.0			

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		Company: Samsung Project #: 4788869685 Date: 2019-02-13 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, Z-Position Location: Chamber 1 Mode: EGPRS 850 MHz Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
Low Ch, 824.2MHz											
1648.40	-2.8	V	3.0	43.6	1.0	-45.4	-13.0	-32.4			
2472.60	-11.2	V	3.0	43.4	1.0	-53.6	-13.0	-40.6			
3296.80	-9.7	V	3.0	43.6	1.0	-52.4	-13.0	-39.4			
1648.40	-1.3	H	3.0	43.6	1.0	-43.9	-13.0	-30.9			
2472.60	-12.0	H	3.0	43.4	1.0	-54.4	-13.0	-41.4			
3296.80	-9.8	H	3.0	43.6	1.0	-52.4	-13.0	-39.4			
Mid Ch, 836.6MHz											
1673.20	-2.8	V	3.0	43.6	1.0	-45.4	-13.0	-32.4			
2509.80	-11.2	V	3.0	43.4	1.0	-53.6	-13.0	-40.6			
3346.40	-9.6	V	3.0	43.6	1.0	-52.3	-13.0	-39.3			
1673.20	-4.9	H	3.0	43.6	1.0	-47.5	-13.0	-34.5			
2509.80	-11.2	H	3.0	43.4	1.0	-53.7	-13.0	-40.7			
3346.40	-9.7	H	3.0	43.6	1.0	-52.4	-13.0	-39.4			
High Ch, 848.8MHz											
1697.60	-2.5	V	3.0	43.6	1.0	-45.1	-13.0	-32.1			
2546.40	-11.1	V	3.0	43.4	1.0	-53.5	-13.0	-40.5			
3395.20	-8.9	V	3.0	43.7	1.0	-51.6	-13.0	-38.6			
1697.60	-3.6	H	3.0	43.6	1.0	-46.2	-13.0	-33.2			
2546.40	-12.1	H	3.0	43.4	1.0	-54.5	-13.0	-41.5			
3395.20	-8.9	H	3.0	43.7	1.0	-51.5	-13.0	-38.5			

GSM1900

		UL Verification Services, Inc.										
		Above 1GHz High Frequency Substitution Measurement										
GSM1900 GPRS		Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, Z-Position Location: Chamber 2 Mode: GPRS 1900 MHz Harmonics										
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
		Low Ch, 1850.2MHz										
		3700.40	-6.0	V	3.0	39.7	1.0	-44.7	-13.0	-31.7		
		5550.60	-7.3	V	3.0	39.9	1.0	-46.2	-13.0	-33.2		
		7400.80	-5.2	V	3.0	39.4	1.0	-43.7	-13.0	-30.7		
		3700.40	-6.0	H	3.0	39.7	1.0	-44.7	-13.0	-31.7		
		5550.60	-7.5	H	3.0	39.9	1.0	-46.5	-13.0	-33.5		
		7400.80	-6.2	H	3.0	39.4	1.0	-44.7	-13.0	-31.7		
		Mid Ch, 1880MHz										
		3760.00	-4.0	V	3.0	39.7	1.0	-42.7	-13.0	-29.7		
		5640.00	-6.6	V	3.0	40.0	1.0	-45.6	-13.0	-32.6		
		7520.00	-5.3	V	3.0	39.4	1.0	-43.7	-13.0	-30.7		
		3760.00	-4.5	H	3.0	39.7	1.0	-43.2	-13.0	-30.2		
		5640.00	-7.2	H	3.0	40.0	1.0	-46.2	-13.0	-33.2		
7520.00	-5.9	H	3.0	39.4	1.0	-44.3	-13.0	-31.3				
High Ch, 1909.8MHz												
3819.60	-3.6	V	3.0	39.7	1.0	-42.3	-13.0	-29.3				
5729.40	-7.2	V	3.0	40.0	1.0	-46.2	-13.0	-33.2				
7639.20	-5.2	V	3.0	39.3	1.0	-43.6	-13.0	-30.6				
3819.60	-5.1	H	3.0	39.7	1.0	-43.8	-13.0	-30.8				
5729.40	-7.3	H	3.0	40.0	1.0	-46.3	-13.0	-33.3				
7639.20	-6.2	H	3.0	39.3	1.0	-44.5	-13.0	-31.5				

		UL Verification Services, Inc.										
		Above 1GHz High Frequency Substitution Measurement										
GSM1900 EGPRS		Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, Y-Position Location: Chamber 2 Mode: EGPRS 1900 MHz Harmonics										
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
		Low Ch, 1850.2MHz										
		3700.40	-7.4	V	3.0	39.7	1.0	-46.0	-13.0	-33.0		
		5550.60	-5.8	V	3.0	39.9	1.0	-44.8	-13.0	-31.8		
		7400.80	-3.4	V	3.0	39.4	1.0	-41.8	-13.0	-28.8		
		3700.40	-4.5	H	3.0	39.7	1.0	-43.1	-13.0	-30.1		
		5550.60	-6.3	H	3.0	39.9	1.0	-45.2	-13.0	-32.2		
		7400.80	-4.2	H	3.0	39.4	1.0	-42.6	-13.0	-29.6		
		Mid Ch, 1880MHz										
		3760.00	-7.6	V	3.0	39.7	1.0	-46.3	-13.0	-33.3		
		5640.00	-5.1	V	3.0	40.0	1.0	-44.1	-13.0	-31.1		
		7520.00	-3.4	V	3.0	39.4	1.0	-41.8	-13.0	-28.8		
		3760.00	-2.5	H	3.0	39.7	1.0	-41.2	-13.0	-28.2		
		5640.00	-5.4	H	3.0	40.0	1.0	-44.4	-13.0	-31.4		
7520.00	-4.2	H	3.0	39.4	1.0	-42.6	-13.0	-29.6				
High Ch, 1909.8MHz												
3819.60	-8.2	V	3.0	39.7	1.0	-47.0	-13.0	-34.0				
5729.40	-5.6	V	3.0	40.0	1.0	-44.6	-13.0	-31.6				
7639.20	-3.9	V	3.0	39.3	1.0	-42.2	-13.0	-29.2				
3819.60	-6.0	H	3.0	39.7	1.0	-44.7	-13.0	-31.7				
5729.40	-5.8	H	3.0	40.0	1.0	-44.8	-13.0	-31.8				
7639.20	-4.7	H	3.0	39.3	1.0	-43.0	-13.0	-30.0				

WCDMA Band 5

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
WCDMA Band 5 REL99	Company: Samsung Project #: 4788869685 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	
	Low Ch, 826.4MHz										
	1652.80	-13.8	V	3.0	38.2	1.0	-51.0	-13.0	-38.0		
	2479.20	-12.8	V	3.0	38.8	1.0	-50.6	-13.0	-37.6		
	3305.60	-10.2	V	3.0	39.4	1.0	-48.6	-13.0	-35.6		
	1652.80	-11.8	H	3.0	38.2	1.0	-49.0	-13.0	-36.0		
	2479.20	-13.4	H	3.0	38.8	1.0	-51.2	-13.0	-38.2		
	3305.60	-10.5	H	3.0	39.4	1.0	-48.9	-13.0	-35.9		
	Mid Ch, 836.6MHz										
	1673.20	-13.9	V	3.0	38.2	1.0	-51.2	-13.0	-38.2		
	2509.80	-12.8	V	3.0	38.8	1.0	-50.6	-13.0	-37.6		
	3346.40	-10.3	V	3.0	39.5	1.0	-48.7	-13.0	-35.7		
	1673.20	-11.9	H	3.0	38.2	1.0	-49.1	-13.0	-36.1		
	2509.80	-13.3	H	3.0	38.8	1.0	-51.2	-13.0	-38.2		
	3346.40	-10.5	H	3.0	39.5	1.0	-48.9	-13.0	-35.9		
	High Ch, 846.6MHz										
	1693.20	-14.7	V	3.0	38.2	1.0	-52.0	-13.0	-39.0		
	2539.80	-12.6	V	3.0	38.9	1.0	-50.5	-13.0	-37.5		
	3386.40	-10.0	V	3.0	39.5	1.0	-48.5	-13.0	-35.5		
	1693.20	-12.7	H	3.0	38.2	1.0	-50.0	-13.0	-37.0		
	2539.80	-13.2	H	3.0	38.9	1.0	-51.0	-13.0	-38.0		
	3386.40	-10.3	H	3.0	39.5	1.0	-48.8	-13.0	-35.8		
	WCDMA Band 5 HSDPA	Company: Samsung Project #: 4788869685 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
		Low Ch, 826.4MHz									
		1652.80	-15.0	V	3.0	38.2	1.0	-52.2	-13.0	-39.2	
		2479.20	-12.9	V	3.0	38.8	1.0	-50.7	-13.0	-37.7	
		3305.60	-10.3	V	3.0	39.4	1.0	-48.7	-13.0	-35.7	
		1652.80	-13.4	H	3.0	38.2	1.0	-50.6	-13.0	-37.6	
		2479.20	-13.3	H	3.0	38.8	1.0	-51.1	-13.0	-38.1	
		3305.60	-10.5	H	3.0	39.4	1.0	-48.9	-13.0	-35.9	
		Mid Ch, 836.6MHz									
		1673.20	-13.2	V	3.0	38.2	1.0	-50.5	-13.0	-37.5	
		2509.80	-12.5	V	3.0	38.8	1.0	-50.4	-13.0	-37.4	
3346.40		-9.9	V	3.0	39.5	1.0	-48.4	-13.0	-35.4		
1673.20		-12.2	H	3.0	38.2	1.0	-49.5	-13.0	-36.5		
2509.80		-13.3	H	3.0	38.8	1.0	-51.1	-13.0	-38.1		
3346.40		-10.1	H	3.0	39.5	1.0	-48.6	-13.0	-35.6		
High Ch, 846.6MHz											
1693.20		-15.2	V	3.0	38.2	1.0	-52.4	-13.0	-39.4		
2539.80		-12.7	V	3.0	38.9	1.0	-50.5	-13.0	-37.5		
3386.40		-10.0	V	3.0	39.5	1.0	-48.5	-13.0	-35.5		
1693.20		-14.5	H	3.0	38.2	1.0	-51.7	-13.0	-38.7		
2539.80		-12.9	H	3.0	38.9	1.0	-50.8	-13.0	-37.8		
3386.40		-10.2	H	3.0	39.5	1.0	-48.7	-13.0	-35.7		

WCDMA Band 4

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
WCDMA Band 4 REL99	Company: Samsung Project #: 4788869685 Date: 2019-02-12 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 2 Mode: Rel99 Band 4 Harmonics										
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
	Low Ch, 1712.4MHz										
	3424.80	-9.3	V	3.0	39.5	1.0	-47.8	-13.0	-34.8		
	5137.20	-8.8	V	3.0	39.8	1.0	-47.6	-13.0	-34.6		
	6849.60	-6.0	V	3.0	39.7	1.0	-44.6	-13.0	-31.6		
	3424.80	-9.1	H	3.0	39.5	1.0	-47.6	-13.0	-34.6		
	5137.20	-9.3	H	3.0	39.8	1.0	-48.1	-13.0	-35.1		
	6849.60	-6.7	H	3.0	39.7	1.0	-45.4	-13.0	-32.4		
	Mid Ch, 1732.6MHz										
	3465.20	-8.8	V	3.0	39.5	1.0	-47.3	-13.0	-34.3		
	5197.80	-8.6	V	3.0	39.8	1.0	-47.4	-13.0	-34.4		
	6930.40	-5.7	V	3.0	39.7	1.0	-44.3	-13.0	-31.3		
	3465.20	-9.2	H	3.0	39.5	1.0	-47.7	-13.0	-34.7		
	5197.80	-8.8	H	3.0	39.8	1.0	-47.6	-13.0	-34.6		
	6930.40	-6.5	H	3.0	39.7	1.0	-45.2	-13.0	-32.2		
	High Ch, 1752.6MHz										
	3505.20	-8.2	V	3.0	39.5	1.0	-46.7	-13.0	-33.7		
	5257.80	-8.6	V	3.0	39.8	1.0	-47.5	-13.0	-34.5		
	7010.40	-5.5	V	3.0	39.6	1.0	-44.1	-13.0	-31.1		
	3505.20	-8.6	H	3.0	39.5	1.0	-47.1	-13.0	-34.1		
	5257.80	-8.6	H	3.0	39.8	1.0	-47.4	-13.0	-34.4		
	7010.40	-6.8	H	3.0	39.6	1.0	-45.4	-13.0	-32.4		
	WCDMA Band 4 HSDPA	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: HSDPA Band 4 Harmonics									
f MHz		SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
Low Ch, 1712.4MHz											
3424.80		-9.1	V	3.0	39.5	1.0	-47.6	-13.0	-34.6		
5137.20		-9.0	V	3.0	39.8	1.0	-47.8	-13.0	-34.8		
6849.60		-6.0	V	3.0	39.7	1.0	-44.7	-13.0	-31.7		
8562.00		-5.2	V	3.0	39.0	1.0	-43.2	-13.0	-30.2		
10274.40		-1.8	V	3.0	38.6	1.0	-39.4	-13.0	-26.4		
3424.80		-12.9	H	3.0	39.5	1.0	-51.4	-13.0	-38.4		
5137.20		-9.3	H	3.0	39.8	1.0	-48.1	-13.0	-35.1		
6849.60		-7.0	H	3.0	39.7	1.0	-45.7	-13.0	-32.7		
8562.00		-5.9	H	3.0	39.0	1.0	-43.9	-13.0	-30.9		
10274.40		-1.7	H	3.0	38.6	1.0	-39.3	-13.0	-26.3		
Mid Ch, 1732.6MHz											
3465.20		-9.0	V	3.0	39.5	1.0	-47.5	-13.0	-34.5		
5197.80		-8.7	V	3.0	39.8	1.0	-47.5	-13.0	-34.5		
6930.40		-5.9	V	3.0	39.7	1.0	-44.6	-13.0	-31.6		
8663.00		-4.8	V	3.0	38.9	1.0	-42.8	-13.0	-29.8		
10395.60		-1.9	V	3.0	38.6	1.0	-39.4	-13.0	-26.4		
3465.20		-9.3	H	3.0	39.5	1.0	-47.8	-13.0	-34.8		
5197.80		-9.1	H	3.0	39.8	1.0	-47.9	-13.0	-34.9		
6930.40		-7.0	H	3.0	39.7	1.0	-45.7	-13.0	-32.7		
8663.00		-5.8	H	3.0	38.9	1.0	-43.7	-13.0	-30.7		
10395.60		-1.8	H	3.0	38.6	1.0	-39.4	-13.0	-26.4		
High Ch, 1752.6MHz											
3505.20		-8.2	V	3.0	39.5	1.0	-46.7	-13.0	-33.7		
5257.80		-8.7	V	3.0	39.8	1.0	-47.6	-13.0	-34.6		
7010.40		-5.5	V	3.0	39.6	1.0	-44.2	-13.0	-31.2		
8763.00		-4.5	V	3.0	38.9	1.0	-42.4	-13.0	-29.4		
10515.60		-1.2	V	3.0	38.6	1.0	-38.7	-13.0	-25.7		
3505.20		-8.6	H	3.0	39.5	1.0	-47.1	-13.0	-34.1		
5257.80		-9.1	H	3.0	39.8	1.0	-47.9	-13.0	-34.9		
7010.40		-6.3	H	3.0	39.6	1.0	-44.9	-13.0	-31.9		
8763.00		-5.8	H	3.0	38.9	1.0	-43.7	-13.0	-30.7		
10515.60		-1.0	H	3.0	38.6	1.0	-38.6	-13.0	-25.6		

WCDMA Band 2

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
WCDMA Band 2 REL99		Company: Samsung									
		Project #: 4788869685									
		Date: 2019-02-08									
		Test Engineer: 45585									
		Configuration: EUT / AC Adapter / Earphone, X-Position									
		Location: Chamber 2									
		Mode: Rel99 Band 2 Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
Low Ch, 1852.4MHz											
3704.80	-11.5	V	3.0	39.7	1.0	-50.1	-13.0	-37.1			
5557.20	-8.4	V	3.0	39.9	1.0	-47.3	-13.0	-34.3			
7409.60	-6.2	V	3.0	39.4	1.0	-44.6	-13.0	-31.6			
9262.00	-4.0	V	3.0	38.8	1.0	-41.7	-13.0	-28.7			
11114.40	0.0	V	3.0	38.5	1.0	-37.6	-13.0	-24.6			
3704.80	-11.7	H	3.0	39.7	1.0	-50.4	-13.0	-37.4			
5557.20	-8.7	H	3.0	39.9	1.0	-47.7	-13.0	-34.7			
7409.60	-7.1	H	3.0	39.4	1.0	-45.6	-13.0	-32.6			
9262.00	-4.8	H	3.0	38.8	1.0	-42.6	-13.0	-29.6			
11114.40	0.0	H	3.0	38.5	1.0	-37.5	-13.0	-24.5			
Mid Ch, 1880MHz											
3760.00	-11.0	V	3.0	39.7	1.0	-49.6	-13.0	-36.6			
5640.00	-8.0	V	3.0	40.0	1.0	-47.0	-13.0	-34.0			
7520.00	-6.2	V	3.0	39.4	1.0	-44.6	-13.0	-31.6			
9400.00	-3.8	V	3.0	38.7	1.0	-41.5	-13.0	-28.5			
11280.00	0.5	V	3.0	38.5	1.0	-37.0	-13.0	-24.0			
3760.00	-11.4	H	3.0	39.7	1.0	-50.1	-13.0	-37.1			
5640.00	-8.4	H	3.0	40.0	1.0	-47.4	-13.0	-34.4			
7520.00	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4			
9400.00	-4.3	H	3.0	38.7	1.0	-42.1	-13.0	-29.1			
11280.00	0.4	H	3.0	38.5	1.0	-37.1	-13.0	-24.1			
High Ch, 1907.6MHz											
3815.20	-11.0	V	3.0	39.7	1.0	-49.7	-13.0	-36.7			
5722.80	-8.2	V	3.0	40.0	1.0	-47.1	-13.0	-34.1			
7630.40	-6.2	V	3.0	39.3	1.0	-44.6	-13.0	-31.6			
9538.00	-2.6	V	3.0	38.7	1.0	-40.2	-13.0	-27.2			
11445.60	0.8	V	3.0	38.5	1.0	-36.7	-13.0	-23.7			
3815.20	-11.5	H	3.0	39.7	1.0	-50.2	-13.0	-37.2			
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			
9538.00	-3.7	H	3.0	38.7	1.0	-41.4	-13.0	-28.4			
11445.60	0.8	H	3.0	38.5	1.0	-36.7	-13.0	-23.7			
		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
WCDMA Band 2 HSDPA		Company: Samsung									
		Project #: 4788869685									
		Date: 2019-02-08									
		Test Engineer: 45585									
		Configuration: EUT / AC Adapter / Earphone, X-Position									
		Location: Chamber 2									
		Mode: HSDPA Band 2 Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes		
Low Ch, 1852.4MHz											
3704.80	-11.3	V	3.0	39.7	1.0	-50.0	-13.0	-37.0			
5557.20	-8.5	V	3.0	39.9	1.0	-47.4	-13.0	-34.4			
7409.60	-6.3	V	3.0	39.4	1.0	-44.8	-13.0	-31.8			
9262.00	-4.1	V	3.0	38.8	1.0	-41.8	-13.0	-28.8			
11114.40	-0.7	V	3.0	38.5	1.0	-38.2	-13.0	-25.2			
3704.80	-11.8	H	3.0	39.7	1.0	-50.5	-13.0	-37.5			
5557.20	-8.8	H	3.0	39.9	1.0	-47.7	-13.0	-34.7			
7409.60	-7.2	H	3.0	39.4	1.0	-45.6	-13.0	-32.6			
9262.00	-4.9	H	3.0	38.8	1.0	-42.7	-13.0	-29.7			
11114.40	-0.1	H	3.0	38.5	1.0	-37.6	-13.0	-24.6			
Mid Ch, 1880MHz											
3760.00	-10.9	V	3.0	39.7	1.0	-49.6	-13.0	-36.6			
5640.00	-8.1	V	3.0	40.0	1.0	-47.0	-13.0	-34.0			
7520.00	-6.3	V	3.0	39.4	1.0	-44.7	-13.0	-31.7			
9400.00	-3.5	V	3.0	38.7	1.0	-41.3	-13.0	-28.3			
11280.00	0.4	V	3.0	38.5	1.0	-37.1	-13.0	-24.1			
3760.00	-11.3	H	3.0	39.7	1.0	-50.0	-13.0	-37.0			
5640.00	-8.1	H	3.0	40.0	1.0	-47.0	-13.0	-34.0			
7520.00	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4			
9400.00	-4.4	H	3.0	38.7	1.0	-42.1	-13.0	-29.1			
11280.00	0.3	H	3.0	38.5	1.0	-37.2	-13.0	-24.2			
High Ch, 1907.6MHz											
3815.20	-11.3	V	3.0	39.7	1.0	-50.0	-13.0	-37.0			
5722.80	-8.4	V	3.0	40.0	1.0	-47.3	-13.0	-34.3			
7630.40	-6.5	V	3.0	39.3	1.0	-44.8	-13.0	-31.8			
9538.00	-3.3	V	3.0	38.7	1.0	-41.0	-13.0	-28.0			
11445.60	0.6	V	3.0	38.5	1.0	-36.9	-13.0	-23.9			
3815.20	-11.5	H	3.0	39.7	1.0	-50.2	-13.0	-37.2			
5722.80	-8.4	H	3.0	40.0	1.0	-47.4	-13.0	-34.4			
7630.40	-7.2	H	3.0	39.3	1.0	-45.5	-13.0	-32.5			
9538.00	-3.8	H	3.0	38.7	1.0	-41.5	-13.0	-28.5			
11445.60	0.5	H	3.0	38.5	1.0	-37.0	-13.0	-24.0			

LTE Band 2

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
LTE									
Band 2									
20MHz									
QPSK									
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

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	
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 12

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788869685							
Date:		2019-02-13							
Test Engineer:		47989							
Configuration:		EUT / AC Adapter / Earphone, X-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK Band 12 Harmonics, 10MHz Bandwidth							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 704MHz									
1408.00	-16.3	V	3.0	43.8	1.0	-59.1	-13.0	-46.1	
2112.00	-13.7	V	3.0	43.3	1.0	-56.0	-13.0	-43.0	
2816.00	-11.6	V	3.0	43.5	1.0	-54.1	-13.0	-41.1	
3520.00	-5.2	V	3.0	43.7	1.0	-47.9	-13.0	-34.9	
1408.00	-17.6	H	3.0	43.8	1.0	-60.4	-13.0	-47.4	
2112.00	-14.4	H	3.0	43.3	1.0	-56.8	-13.0	-43.8	
2816.00	-11.9	H	3.0	43.5	1.0	-54.4	-13.0	-41.4	
3520.00	-5.7	H	3.0	43.7	1.0	-48.4	-13.0	-35.4	
Mid Ch, 707.5MHz									
1415.00	-16.3	V	3.0	43.8	1.0	-59.1	-13.0	-46.1	
2122.50	-13.6	V	3.0	43.3	1.0	-55.9	-13.0	-42.9	
2830.00	-11.6	V	3.0	43.5	1.0	-54.1	-13.0	-41.1	
3537.50	-6.1	V	3.0	43.7	1.0	-48.8	-13.0	-35.8	
1415.00	-17.4	H	3.0	43.8	1.0	-60.2	-13.0	-47.2	
2122.50	-14.6	H	3.0	43.3	1.0	-56.9	-13.0	-43.9	
2830.00	-12.0	H	3.0	43.5	1.0	-54.4	-13.0	-41.4	
3537.50	-6.3	H	3.0	43.7	1.0	-49.0	-13.0	-36.0	
High Ch, 711MHz									
1422.00	-16.4	V	3.0	43.8	1.0	-59.1	-13.0	-46.1	
2133.00	-13.6	V	3.0	43.3	1.0	-55.9	-13.0	-42.9	
2844.00	-11.6	V	3.0	43.5	1.0	-54.1	-13.0	-41.1	
3555.00	-5.5	V	3.0	43.7	1.0	-48.2	-13.0	-35.2	
1422.00	-17.3	H	3.0	43.8	1.0	-60.1	-13.0	-47.1	
2133.00	-14.5	H	3.0	43.3	1.0	-56.9	-13.0	-43.9	
2844.00	-12.0	H	3.0	43.5	1.0	-54.5	-13.0	-41.5	
3555.00	-5.5	H	3.0	43.7	1.0	-48.2	-13.0	-35.2	

LTE
 Band 12
 10MHz
 QPSK

LTE Band 13

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788869685							
Date:		2019-02-13							
Test Engineer:		47989							
Configuration:		EUT / AC Adapter / Earphone, Y-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK Band 13 Harmonics, 5MHz Bandwidth							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 779.5MHz									
1559.00	-15.4	V	3.0	43.7	1.0	-58.0	-40.0	-18.0	
2338.50	-12.6	V	3.0	43.4	1.0	-55.0	-13.0	-42.0	
3118.00	-10.7	V	3.0	43.6	1.0	-53.2	-13.0	-40.2	
5MHz									
1559.00	-15.6	H	3.0	43.7	1.0	-58.2	-40.0	-18.2	
2338.50	-13.4	H	3.0	43.4	1.0	-55.8	-13.0	-42.8	
3118.00	-10.9	H	3.0	43.6	1.0	-53.5	-13.0	-40.5	
Mid Ch, 782MHz									
1564.00	-14.8	V	3.0	43.7	1.0	-57.4	-40.0	-17.4	
2346.00	-12.6	V	3.0	43.4	1.0	-55.0	-13.0	-42.0	
3128.00	-10.6	V	3.0	43.6	1.0	-53.2	-13.0	-40.2	
1564.00	-13.5	H	3.0	43.7	1.0	-56.2	-40.0	-16.2	
2346.00	-13.2	H	3.0	43.4	1.0	-55.6	-13.0	-42.6	
3128.00	-10.8	H	3.0	43.6	1.0	-53.4	-13.0	-40.4	
High Ch, 784.5MHz									
1569.00	-14.5	V	3.0	43.7	1.0	-57.1	-40.0	-17.1	
2353.50	-12.7	V	3.0	43.4	1.0	-55.1	-13.0	-42.1	
3138.00	-10.5	V	3.0	43.6	1.0	-53.1	-13.0	-40.1	
1569.00	-13.1	H	3.0	43.7	1.0	-55.7	-40.0	-15.7	
2353.50	-13.4	H	3.0	43.4	1.0	-55.8	-13.0	-42.8	
3138.00	-10.8	H	3.0	43.6	1.0	-53.3	-13.0	-40.3	

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	

LTE
 Band 41
 10MHz
 QPSK

LTE Band 66

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
Company:		Samsung								
Project #:		4788869685								
Date:		2019-02-13								
Test Engineer:		47989								
Configuration:		EUT / AC Adapter / Earphone, Y-Position								
Location:		Chamber 1								
Mode:		LTE_QPSK Band 66 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, 1720MHz										
3440.00	-9.5	V	3.0	43.7	1.0	-52.2	-13.0	-39.2		
5160.00	-6.5	V	3.0	43.8	1.0	-49.3	-13.0	-36.3		
6880.00	-6.1	V	3.0	42.8	1.0	-47.9	-13.0	-34.9		
3440.00	-5.6	H	3.0	43.7	1.0	-48.2	-13.0	-35.2		
5160.00	-3.3	H	3.0	43.8	1.0	-46.1	-13.0	-33.1		
6880.00	-6.1	H	3.0	42.8	1.0	-48.0	-13.0	-35.0		
Mid Ch, 1745MHz										
3490.00	-8.2	V	3.0	43.7	1.0	-50.9	-13.0	-37.9		
5235.00	-7.4	V	3.0	43.8	1.0	-50.2	-13.0	-37.2		
6980.00	-4.7	V	3.0	42.7	1.0	-46.5	-13.0	-33.5		
3490.00	-6.3	H	3.0	43.7	1.0	-49.0	-13.0	-36.0		
5235.00	-4.8	H	3.0	43.8	1.0	-47.5	-13.0	-34.5		
6980.00	-4.5	H	3.0	42.7	1.0	-46.3	-13.0	-33.3		
High Ch, 1770MHz										
3540.00	-8.1	V	3.0	43.7	1.0	-50.8	-13.0	-37.8		
5310.00	-5.4	V	3.0	43.7	1.0	-48.1	-13.0	-35.1		
7080.00	-5.9	V	3.0	42.7	1.0	-47.6	-13.0	-34.6		
3540.00	-6.5	H	3.0	43.7	1.0	-49.2	-13.0	-36.2		
5310.00	-2.3	H	3.0	43.7	1.0	-45.0	-13.0	-32.0		
7080.00	-5.7	H	3.0	42.7	1.0	-47.4	-13.0	-34.4		

LTE Band 17

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

LTE Band 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.