

LTE Band 5 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2018-12-20 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	21.60	V	3.0	-1.5	17.12	38.5	-21.4	
	824.70	9.31	H	3.0	-1.5	4.82	38.5	-33.7	
	Mid Ch								
	836.50	21.97	V	3.0	-1.4	17.51	38.5	-21.0	
	836.50	8.19	H	3.0	-1.4	3.72	38.5	-34.8	
High Ch									
848.30	22.52	V	3.1	-1.4	18.08	38.5	-20.4		
848.30	9.34	H	3.1	-1.4	4.90	38.5	-33.6		
LTE Band 5 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2018-12-20 Test Engineer: 45585 Configuration: EUT, Z-Position Location: Chamber 2 Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	20.27	V	3.0	-1.5	15.79	38.5	-22.7	
	824.70	7.75	H	3.0	-1.5	3.26	38.5	-35.2	
	Mid Ch								
	836.50	20.11	V	3.0	-1.4	15.65	38.5	-22.9	
	836.50	7.14	H	3.0	-1.4	2.67	38.5	-35.8	
High Ch									
848.30	21.43	V	3.1	-1.4	16.99	38.5	-21.5		
848.30	8.06	H	3.1	-1.4	3.62	38.5	-34.9		

LTE Band 12

LTE Band 12 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 47989 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
	704.00	13.64	V	2.8	-1.6	9.26	34.8	-25.5	
	704.00	20.50	H	2.8	-1.6	16.11	34.8	-18.7	
	Mid Ch								
	707.50	10.35	V	2.8	-1.6	5.97	34.8	-28.8	
	707.50	22.14	H	2.8	-1.6	17.76	34.8	-17.0	
High Ch									
711.00	10.04	V	2.8	-1.6	5.64	34.8	-29.2		
711.00	21.16	H	2.8	-1.6	16.76	34.8	-18.0		
LTE Band 12 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 47989 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
	704.00	9.09	V	2.8	-1.6	4.71	34.8	-30.1	
	704.00	19.33	H	2.8	-1.6	14.94	34.8	-19.9	
	Mid Ch								
	707.50	9.05	V	2.8	-1.6	4.67	34.8	-30.1	
	707.50	21.40	H	2.8	-1.6	17.02	34.8	-17.8	
High Ch									
711.00	9.69	V	2.8	-1.6	5.29	34.8	-29.5		
711.00	20.46	H	2.8	-1.6	16.06	34.8	-18.7		

LTE Band 12 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 47989 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
	701.50	10.13	V	2.8	-1.6	5.75	34.8	-29.0	
	701.50	20.12	H	2.8	-1.6	15.74	34.8	-19.1	
	Mid Ch								
	707.50	10.43	V	2.8	-1.6	6.05	34.8	-28.8	
	707.50	21.60	H	2.8	-1.6	17.22	34.8	-17.6	
High Ch									
713.50	11.44	V	2.8	-1.6	7.04	34.8	-27.8		
713.50	22.39	H	2.8	-1.6	18.00	34.8	-16.8		
LTE Band 12 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 47989 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
	701.50	9.73	V	2.8	-1.6	5.35	34.8	-29.4	
	701.50	19.00	H	2.8	-1.6	14.62	34.8	-20.2	
	Mid Ch								
	707.50	9.85	V	2.8	-1.6	5.47	34.8	-29.3	
	707.50	21.25	H	2.8	-1.6	16.87	34.8	-17.9	
High Ch									
713.50	9.57	V	2.8	-1.6	5.17	34.8	-29.6		
713.50	21.47	H	2.8	-1.6	17.08	34.8	-17.7		

LTE Band 12 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 47989 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	9.79	V	2.8	-1.6	5.41	34.8	-29.4	
	700.50	20.09	H	2.8	-1.6	15.71	34.8	-19.1	
	Mid Ch								
	707.50	10.42	V	2.8	-1.6	6.04	34.8	-28.8	
	707.50	21.33	H	2.8	-1.6	16.95	34.8	-17.9	
High Ch									
714.50	11.58	V	2.8	-1.6	7.18	34.8	-27.6		
714.50	22.66	H	2.8	-1.6	18.26	34.8	-16.5		
LTE Band 12 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 47989 Configuration: EUT, X-Position Location: Chamber 2 Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	9.13	V	2.8	-1.6	4.75	34.8	-30.0	
	700.50	19.19	H	2.8	-1.6	14.81	34.8	-20.0	
	Mid Ch								
	707.50	9.42	V	2.8	-1.6	5.04	34.8	-29.8	
	707.50	20.51	H	2.8	-1.6	16.13	34.8	-18.7	
High Ch									
714.50	9.99	V	2.8	-1.6	5.59	34.8	-29.2		
714.50	20.95	H	2.8	-1.6	16.55	34.8	-18.2		

LTE Band 12 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	11.03	V	2.8	-1.6	6.65	34.8	-28.2	
	699.70	20.10	H	2.8	-1.6	15.73	34.8	-19.1	
	Mid Ch								
	707.50	10.46	V	2.8	-1.6	6.08	34.8	-28.7	
	707.50	21.53	H	2.8	-1.6	17.15	34.8	-17.7	
High Ch									
715.30	12.02	V	2.8	-1.6	7.62	34.8	-27.2		
715.30	22.43	H	2.8	-1.6	18.03	34.8	-16.8		
LTE Band 12 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-07 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	10.04	V	2.8	-1.6	5.66	34.8	-29.1	
	699.70	19.07	H	2.8	-1.6	14.70	34.8	-20.1	
	Mid Ch								
	707.50	9.78	V	2.8	-1.6	5.40	34.8	-29.4	
	707.50	20.53	H	2.8	-1.6	16.15	34.8	-18.7	
High Ch									
715.30	11.07	V	2.8	-1.6	6.67	34.8	-28.1		
715.30	21.63	H	2.8	-1.6	17.23	34.8	-17.6		

LTE Band 13

LTE Band 13 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																											
	Company: Samsung Project #: 4788805413 Date: 2019-01-08 Test Engineer: 47989 Configuration: EUT, Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth																											
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 2.5m SMA-type Cable																											
	<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>782.00 Mid Ch</td> <td>21.14</td> <td>V</td> <td>2.9</td> <td>-1.6</td> <td>16.64</td> <td>34.8</td> <td>-18.1</td> <td></td> </tr> <tr> <td>782.00</td> <td>4.16</td> <td>H</td> <td>2.9</td> <td>-1.6</td> <td>-0.34</td> <td>34.8</td> <td>-35.1</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	782.00 Mid Ch	21.14	V	2.9	-1.6	16.64	34.8	-18.1		782.00	4.16	H	2.9	-1.6	-0.34	34.8	-35.1	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																				
782.00 Mid Ch	21.14	V	2.9	-1.6	16.64	34.8	-18.1																					
782.00	4.16	H	2.9	-1.6	-0.34	34.8	-35.1																					
LTE Band 13 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement																											
	Company: Samsung Project #: 4788805413 Date: 2019-01-08 Test Engineer: 47989 Configuration: EUT, Z-Position Location: Chamber 2 Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth																											
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 2.5m SMA-type Cable																											
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f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																				
782.00 Mid Ch	20.12	V	2.9	-1.6	15.62	34.8	-19.2																					
782.00	3.88	H	2.9	-1.6	-0.62	34.8	-35.4																					

LTE Band 13 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-08 Test Engineer: 47989 Configuration: EUT, Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	21.56	V	2.9	-1.6	17.06	34.8	-17.7	
	779.50	5.63	H	2.9	-1.6	1.13	34.8	-33.6	
	Mid Ch								
	782.00	21.20	V	2.9	-1.6	16.70	34.8	-18.1	
	782.00	7.03	H	2.9	-1.6	2.53	34.8	-32.2	
High Ch									
784.50	20.96	V	2.9	-1.6	16.46	34.8	-18.3		
784.50	4.22	H	2.9	-1.6	-0.29	34.8	-35.1		
LTE Band 13 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-08 Test Engineer: 47989 Configuration: EUT, Z-Position Location: Chamber 2 Mode: LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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	20.54	V	2.9	-1.6	16.04	34.8	-18.7	
	779.50	4.53	H	2.9	-1.6	0.03	34.8	-34.7	
	Mid Ch								
	782.00	20.79	V	2.9	-1.6	16.29	34.8	-18.5	
	782.00	6.59	H	2.9	-1.6	2.09	34.8	-32.7	
High Ch									
784.50	19.97	V	2.9	-1.6	15.47	34.8	-19.3		
784.50	2.77	H	2.9	-1.6	-1.74	34.8	-36.5		

LTE Band 26

LTE Band 26 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-09 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
	821.50	20.60	V	3.0	-1.5	16.10	50.0	-33.9	Part 90
	821.50	6.33	H	3.0	-1.5	1.83	50.0	-48.2	Part 90
	Mid Ch								
	831.50	21.17	V	3.0	-1.4	16.70	38.5	-21.8	
	831.50	7.71	H	3.0	-1.4	3.23	38.5	-35.3	
High Ch									
841.50	21.73	V	3.0	-1.4	17.27	38.5	-21.2		
841.50	6.57	H	3.0	-1.4	2.12	38.5	-36.4		
LTE Band 26 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-09 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth								
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
	821.50	19.84	V	3.0	-1.5	15.34	50.0	-34.7	Part 90
	821.50	5.71	H	3.0	-1.5	1.21	50.0	-48.8	Part 90
	Mid Ch								
	831.50	20.33	V	3.0	-1.4	15.86	38.5	-22.6	
	831.50	6.79	H	3.0	-1.4	2.31	38.5	-36.2	
High Ch									
841.50	20.97	V	3.0	-1.4	16.51	38.5	-22.0		
841.50	6.09	H	3.0	-1.4	1.64	38.5	-36.9		

UL Verification Services, Inc. High Frequency Substitution Measurement										
LTE Band 26 10MHz QPSK	Company: Samsung Project #: 4788805413 Date: 2019-01-09 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth									
	Test Equipment: Receiving: VULB9163-749, and Chamber 2 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									
	819.00	20.37	V	3.0	-1.5	15.87	50.0	-34.1	Part 90	
	819.00	6.38	H	3.0	-1.5	1.88	50.0	-48.1	Part 90	
	Mid Ch									
	831.50	21.23	V	3.0	-1.4	16.76	38.5	-21.7		
	831.50	7.44	H	3.0	-1.4	2.96	38.5	-35.5		
	High Ch									
844.00	21.39	V	3.1	-1.4	16.94	38.5	-21.6			
844.00	6.78	H	3.1	-1.4	2.33	38.5	-36.2			
UL Verification Services, Inc. High Frequency Substitution Measurement										
Company: Samsung Project #: 4788805413 Date: 2019-02-01 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 26 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	22.22	V	3.0	-1.5	17.74	50.0	-32.3	Part 90		
829.00	7.33	H	3.0	-1.5	2.85	50.0	-47.2	Part 90		

UL Verification Services, Inc. High Frequency Substitution Measurement								
Company:		Samsung						
Project #:		4788805413						
Date:		2019-01-09						
Test Engineer:		45585						
Configuration:		EUT / Z-Position						
Location:		Chamber 2						
Mode:		LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth						
<u>Test Equipment:</u>								
Receiving: VULB9163-749, and Chamber 2 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								
819.00	19.58	V	3.0	-1.5	15.08	50.0	-34.9	Part 90
819.00	5.87	H	3.0	-1.5	1.37	50.0	-48.6	Part 90
Mid Ch								
831.50	20.26	V	3.0	-1.4	15.79	38.5	-22.7	
831.50	6.36	H	3.0	-1.4	1.88	38.5	-36.6	
High Ch								
844.00	20.63	V	3.1	-1.4	16.18	38.5	-22.3	
844.00	5.82	H	3.1	-1.4	1.37	38.5	-37.1	
LTE Band 26 10MHz 16QAM								
UL Verification Services, Inc. High Frequency Substitution Measurement								
Company:		Samsung						
Project #:		4788805413						
Date:		2019-02-01						
Test Engineer:		47989						
Configuration:		EUT / Z-Position						
Location:		Chamber 1						
Mode:		LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth						
<u>Test Equipment:</u>								
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	20.86	V	3.0	-1.5	16.38	50.0	-33.6	Part 90
829.00	6.34	H	3.0	-1.5	1.86	50.0	-48.1	Part 90

UL Verification Services, Inc. High Frequency Substitution Measurement										
LTE Band 26 5MHz QPSK	Company: Samsung Project #: 4788805413 Date: 2019-01-09 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth <u>Test Equipment:</u> Receiving: VULB9163-749, and Chamber 2 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									
	816.50	20.53	V	3.0	-1.5	16.03	50.0	-34.0	Part 90	
	816.50	6.25	H	3.0	-1.5	1.74	50.0	-48.3	Part 90	
	Mid Ch									
	831.50	21.24	V	3.0	-1.4	16.77	38.5	-21.7		
	831.50	7.33	H	3.0	-1.4	2.85	38.5	-35.6		
	High Ch									
	846.50	21.21	V	3.1	-1.4	16.76	38.5	-21.7		
846.50	6.93	H	3.1	-1.4	2.48	38.5	-36.0			
UL Verification Services, Inc. High Frequency Substitution Measurement										
Company: Samsung Project #: 4788805413 Date: 2019-02-01 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth <u>Test Equipment:</u> 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										
821.50	21.95	V	3.0	-1.5	17.45	50.0	-32.5	Part 90		
821.50	7.25	H	3.0	-1.5	2.76	50.0	-47.2	Part 90		
Mid Ch										
826.50	22.07	V	3.0	-1.5	17.59	38.5	-20.9			
826.50	7.27	H	3.0	-1.5	2.79	38.5	-35.7			

		UL Verification Services, Inc. High Frequency Substitution Measurement								
LTE Band 26 5MHz 16QAM		Company: Samsung Project #: 4788805413 Date: 2019-01-09 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth								
		Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
		816.50	19.43	V	3.0	-1.5	14.93	50.0	-35.1	Part 90
		816.50	5.39	H	3.0	-1.5	0.88	50.0	-49.1	Part 90
		Mid Ch								
		831.50	19.91	V	3.0	-1.4	15.44	38.5	-23.1	
		831.50	6.60	H	3.0	-1.4	2.12	38.5	-36.4	
		High Ch								
846.50	20.71	V	3.1	-1.4	16.26	38.5	-22.2			
846.50	6.26	H	3.1	-1.4	1.81	38.5	-36.7			
		UL Verification Services, Inc. High Frequency Substitution Measurement								
		Company: Samsung Project #: 4788805413 Date: 2019-02-01 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 26 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								
		821.50	20.87	V	3.0	-1.5	16.37	50.0	-33.6	Part 90
		821.50	5.97	H	3.0	-1.5	1.48	50.0	-48.5	Part 90
		Mid Ch								
		826.50	20.64	V	3.0	-1.5	16.16	38.5	-22.3	
		826.50	5.98	H	3.0	-1.5	1.50	38.5	-37.0	

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 26 3MHz QPSK	Company:		Samsung						
	Project #:		4788805413						
	Date:		2019-01-09						
	Test Engineer:		45585						
	Configuration:		EUT / Z-Position						
	Location:		Chamber 2						
	Mode:		LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth						
	<u>Test Equipment:</u>		Receiving: VULB9163-749, and Chamber 2 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								
815.50	20.47	V	3.0	-1.5	15.96	50.0	-34.0	Part 90	
815.50	6.34	H	3.0	-1.5	1.84	50.0	-48.2	Part 90	
Mid Ch									
831.50	20.85	V	3.0	-1.4	16.38	38.5	-22.1		
831.50	6.84	H	3.0	-1.4	2.36	38.5	-36.1		
High Ch									
847.50	21.38	V	3.1	-1.4	16.94	38.5	-21.6		
847.50	7.23	H	3.1	-1.4	2.79	38.5	-35.7		
		UL Verification Services, Inc. High Frequency Substitution Measurement							
Company:		Samsung							
Project #:		4788805413							
Date:		2019-02-01							
Test Engineer:		47989							
Configuration:		EUT / Z-Position							
Location:		Chamber 1							
Mode:		LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth							
<u>Test Equipment:</u>		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									
822.50	21.71	V	3.0	-1.5	17.22	50.0	-32.8	Part 90	
822.50	6.74	H	3.0	-1.5	2.25	50.0	-47.8	Part 90	
Mid Ch									
825.50	22.13	V	3.0	-1.5	17.65	38.5	-20.9		
825.50	6.86	H	3.0	-1.5	2.38	38.5	-36.1		

		UL Verification Services, Inc. High Frequency Substitution Measurement							
LTE Band 26 3MHz 16QAM	Company:		Samsung						
	Project #:		4788805413						
	Date:		2019-01-09						
	Test Engineer:		45585						
	Configuration:		EUT / Z-Position						
	Location:		Chamber 2						
	Mode:		LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth						
	<u>Test Equipment:</u>		Receiving: VULB9163-749, and Chamber 2 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								
815.50	19.44	V	3.0	-1.5	14.93	50.0	-35.1	Part 90	
815.50	5.45	H	3.0	-1.5	0.95	50.0	-49.1	Part 90	
Mid Ch									
831.50	19.75	V	3.0	-1.4	15.28	38.5	-23.2		
831.50	6.14	H	3.0	-1.4	1.66	38.5	-36.8		
High Ch									
847.50	20.71	V	3.1	-1.4	16.27	38.5	-22.2		
847.50	6.41	H	3.1	-1.4	1.97	38.5	-36.5		
		UL Verification Services, Inc. High Frequency Substitution Measurement							
Company:		Samsung							
Project #:		4788805413							
Date:		2019-02-01							
Test Engineer:		47989							
Configuration:		EUT / Z-Position							
Location:		Chamber 1							
Mode:		LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth							
<u>Test Equipment:</u>		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									
822.50	20.16	V	3.0	-1.5	15.67	50.0	-34.3	Part 90	
822.50	6.24	H	3.0	-1.5	1.75	50.0	-48.3	Part 90	
Mid Ch									
825.50	21.11	V	3.0	-1.5	16.63	38.5	-21.9		
825.50	6.35	H	3.0	-1.5	1.87	38.5	-36.6		

		UL Verification Services, Inc. High Frequency Substitution Measurement								
LTE Band 26 1.4MHz QPSK		Company: Samsung Project #: 4788805413 Date: 2019-01-09 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth								
		Test Equipment: Receiving: VULB9163-749, and Chamber 2 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								
		814.70	20.59	V	3.0	-1.5	16.08	50.0	-33.9	Part 90
		814.70	6.36	H	3.0	-1.5	1.85	50.0	-48.2	Part 90
		Mid Ch								
		831.50	20.77	V	3.0	-1.4	16.30	38.5	-22.2	
		831.50	6.92	H	3.0	-1.4	2.44	38.5	-36.1	
		High Ch								
848.30	21.26	V	3.1	-1.4	16.82	38.5	-21.7			
848.30	6.84	H	3.1	-1.4	2.40	38.5	-36.1			
		UL Verification Services, Inc. High Frequency Substitution Measurement								
		Company: Samsung Project #: 4788805413 Date: 2019-02-01 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 26 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								
		823.30	21.84	V	3.0	-1.5	17.35	50.0	-32.6	Part 90
		823.30	6.70	H	3.0	-1.5	2.21	50.0	-47.8	Part 90
		Mid Ch								
		824.70	21.64	V	3.0	-1.5	17.15	38.5	-21.3	
		824.70	6.94	H	3.0	-1.5	2.45	38.5	-36.0	

		UL Verification Services, Inc. High Frequency Substitution Measurement								
LTE Band 26 1.4MHz 16QAM		Company: Samsung Project #: 4788805413 Date: 2019-01-09 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth <u>Test Equipment:</u> Receiving: VULB9163-749, and Chamber 2 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								
		814.70	19.41	V	3.0	-1.5	14.90	50.0	-35.1	Part 90
		814.70	5.34	H	3.0	-1.5	0.83	50.0	-49.2	Part 90
		Mid Ch								
		831.50	19.73	V	3.0	-1.4	15.26	38.5	-23.2	
		831.50	5.92	H	3.0	-1.4	1.44	38.5	-37.1	
		High Ch								
		848.30	20.58	V	3.1	-1.4	16.14	38.5	-22.4	
848.30	6.05	H	3.1	-1.4	1.61	38.5	-36.9			
		UL Verification Services, Inc. High Frequency Substitution Measurement								
		Company: Samsung Project #: 4788805413 Date: 2019-02-01 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth <u>Test Equipment:</u> 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								
		823.30	20.78	V	3.0	-1.5	16.29	50.0	-33.7	Part 90
		823.30	5.92	H	3.0	-1.5	1.43	50.0	-48.6	Part 90
		Mid Ch								
		824.70	20.67	V	3.0	-1.5	16.18	38.5	-22.3	
		824.70	6.32	H	3.0	-1.5	1.83	38.5	-36.7	

LTE Band 41

LTE Band 41 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 41 Fundamentals, 20MHz 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								
	2506.00	8.70	V	5.2	9.9	13.37	33.0	-19.6	
	2506.00	19.30	H	5.2	9.9	23.97	33.0	-9.0	
	Mid Ch								
	2593.00	12.31	V	5.3	9.8	16.77	33.0	-16.2	
	2593.00	19.86	H	5.3	9.8	24.33	33.0	-8.7	
	High Ch								
	2680.00	17.36	V	5.4	9.8	21.73	33.0	-11.3	
2680.00	18.15	H	5.4	9.8	22.52	33.0	-10.5		
LTE Band 41 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 41 Fundamentals, 20MHz 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								
	2506.00	17.46	V	5.2	9.9	22.13	33.0	-10.9	
	2506.00	18.62	H	5.2	9.9	23.29	33.0	-9.7	
	Mid Ch								
	2593.00	10.00	V	5.3	9.8	14.46	33.0	-18.5	
	2593.00	18.72	H	5.3	9.8	23.19	33.0	-9.8	
	High Ch								
	2680.00	16.75	V	5.4	9.8	21.12	33.0	-11.9	
2680.00	17.46	H	5.4	9.8	21.83	33.0	-11.2		

LTE Band 41 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 41 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								
	2503.50	17.69	V	5.2	9.9	22.37	33.0	-10.6	
	2503.50	19.00	H	5.2	9.9	23.67	33.0	-9.3	
	Mid Ch								
	2593.00	12.54	V	5.3	9.8	17.00	33.0	-16.0	
	2593.00	19.64	H	5.3	9.8	24.11	33.0	-8.9	
High Ch									
2682.50	17.10	V	5.4	9.8	21.48	33.0	-11.5		
2682.50	16.67	H	5.4	9.8	21.04	33.0	-12.0		
LTE Band 41 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 41 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								
	2503.50	16.94	V	5.2	9.9	21.62	33.0	-11.4	
	2503.50	18.04	H	5.2	9.9	22.71	33.0	-10.3	
	Mid Ch								
	2593.00	11.51	V	5.3	9.8	15.97	33.0	-17.0	
	2593.00	18.49	H	5.3	9.8	22.96	33.0	-10.0	
High Ch									
2682.50	15.85	V	5.4	9.8	20.23	33.0	-12.8		
2682.50	17.64	H	5.4	9.8	22.01	33.0	-11.0		

LTE Band 41 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 41 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								
	2501.00	17.49	V	5.2	9.9	22.18	33.0	-10.8	
	2501.00	18.96	H	5.2	9.9	23.64	33.0	-9.4	
	Mid Ch								
	2593.00	13.33	V	5.3	9.8	17.79	33.0	-15.2	
	2593.00	19.61	H	5.3	9.8	24.08	33.0	-8.9	
High Ch									
2685.00	13.93	V	5.4	9.8	18.30	33.0	-14.7		
2685.00	17.35	H	5.4	9.8	21.71	33.0	-11.3		
LTE Band 41 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 41 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								
	2501.00	17.23	V	5.2	9.9	21.92	33.0	-11.1	
	2501.00	18.75	H	5.2	9.9	23.43	33.0	-9.6	
	Mid Ch								
	2593.00	13.57	V	5.3	9.8	18.03	33.0	-15.0	
	2593.00	19.61	H	5.3	9.8	24.08	33.0	-8.9	
High Ch									
2685.00	13.65	V	5.4	9.8	18.02	33.0	-15.0		
2685.00	17.17	H	5.4	9.8	21.53	33.0	-11.5		

LTE Band 41 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 41 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								
	2498.50	17.86	V	5.2	9.9	22.55	33.0	-10.5	
	2498.50	19.08	H	5.2	9.9	23.77	33.0	-9.2	
	Mid Ch								
	2593.00	15.56	V	5.3	9.8	20.02	33.0	-13.0	
	2593.00	19.29	H	5.3	9.8	23.76	33.0	-9.2	
High Ch									
2687.50	17.34	V	5.4	9.8	21.71	33.0	-11.3		
2687.50	17.70	H	5.4	9.8	22.07	33.0	-10.9		
LTE Band 41 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805451 Date: 2019-01-22 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 41 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								
	2498.50	16.97	V	5.2	9.9	21.66	33.0	-11.3	
	2498.50	18.46	H	5.2	9.9	23.15	33.0	-9.9	
	Mid Ch								
	2593.00	16.01	V	5.3	9.8	20.47	33.0	-12.5	
	2593.00	18.07	H	5.3	9.8	22.54	33.0	-10.5	
High Ch									
2687.50	17.43	V	5.4	9.8	21.80	33.0	-11.2		
2687.50	18.05	H	5.4	9.8	22.42	33.0	-10.6		

LTE Band 66

LTE Band 66 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 20MHz 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								
	1720.00	12.04	V	4.3	9.4	17.14	30.0	-12.9	
	1720.00	16.29	H	4.3	9.4	21.40	30.0	-8.6	
	Mid Ch								
	1745.00	10.32	V	4.4	9.5	15.48	30.0	-14.5	
	1745.00	17.36	H	4.4	9.5	22.53	30.0	-7.5	
High Ch									
1770.00	8.82	V	4.4	9.6	13.99	30.0	-16.0		
1770.00	18.09	H	4.4	9.6	23.26	30.0	-6.7		
LTE Band 66 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 20MHz 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								
	1720.00	11.01	V	4.3	9.4	16.11	30.0	-13.9	
	1720.00	14.60	H	4.3	9.4	19.71	30.0	-10.3	
	Mid Ch								
	1745.00	9.39	V	4.4	9.5	14.55	30.0	-15.4	
	1745.00	16.09	H	4.4	9.5	21.26	30.0	-8.7	
High Ch									
1770.00	7.48	V	4.4	9.6	12.65	30.0	-17.4		
1770.00	16.85	H	4.4	9.6	22.02	30.0	-8.0		

LTE Band 66 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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	8.36	V	4.3	9.4	13.46	30.0	-16.5	
	1717.50	15.09	H	4.3	9.4	20.19	30.0	-9.8	
	Mid Ch								
	1745.00	12.50	V	4.4	9.5	17.66	30.0	-12.3	
	1745.00	16.85	H	4.4	9.5	22.02	30.0	-8.0	
High Ch									
1772.50	10.78	V	4.4	9.6	15.95	30.0	-14.0		
1772.50	18.37	H	4.4	9.6	23.54	30.0	-6.5		
LTE Band 66 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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	7.07	V	4.3	9.4	12.17	30.0	-17.8	
	1717.50	16.65	H	4.3	9.4	21.75	30.0	-8.3	
	Mid Ch								
	1745.00	11.15	V	4.4	9.5	16.31	30.0	-13.7	
	1745.00	15.79	H	4.4	9.5	20.96	30.0	-9.0	
High Ch									
1772.50	9.42	V	4.4	9.6	14.59	30.0	-15.4		
1772.50	17.04	H	4.4	9.6	22.21	30.0	-7.8		

LTE Band 66 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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	9.87	V	4.3	9.4	14.96	30.0	-15.0	
	1715.00	17.29	H	4.3	9.4	22.39	30.0	-7.6	
	Mid Ch								
	1745.00	6.05	V	4.4	9.5	11.21	30.0	-18.8	
	1745.00	17.45	H	4.4	9.5	22.62	30.0	-7.4	
High Ch									
1775.00	12.23	V	4.4	9.6	17.40	30.0	-12.6		
1775.00	18.73	H	4.4	9.6	23.90	30.0	-6.1		
LTE Band 66 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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	11.10	V	4.3	9.4	16.19	30.0	-13.8	
	1715.00	15.25	H	4.3	9.4	20.35	30.0	-9.7	
	Mid Ch								
	1745.00	6.66	V	4.4	9.5	11.82	30.0	-18.2	
	1745.00	15.68	H	4.4	9.5	20.85	30.0	-9.2	
High Ch									
1775.00	11.41	V	4.4	9.6	16.58	30.0	-13.4		
1775.00	17.60	H	4.4	9.6	22.77	30.0	-7.2		

LTE Band 66 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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 MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1712.50	11.64	V	4.3	9.4	16.73	30.0	-13.3	
	1712.50	16.22	H	4.3	9.4	21.31	30.0	-8.7	
	Mid Ch								
	1745.00	14.26	V	4.4	9.5	19.42	30.0	-10.6	
	1745.00	17.51	H	4.4	9.5	22.68	30.0	-7.3	
High Ch									
1777.50	12.57	V	4.4	9.6	17.74	30.0	-12.3		
1777.50	18.51	H	4.4	9.6	23.68	30.0	-6.3		
LTE Band 66 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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 MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1712.50	10.74	V	4.3	9.4	15.83	30.0	-14.2	
	1712.50	15.20	H	4.3	9.4	20.29	30.0	-9.7	
	Mid Ch								
	1745.00	13.92	V	4.4	9.5	19.08	30.0	-10.9	
	1745.00	16.15	H	4.4	9.5	21.32	30.0	-8.7	
High Ch									
1777.50	11.02	V	4.4	9.6	16.19	30.0	-13.8		
1777.50	17.36	H	4.4	9.6	22.53	30.0	-7.5		

LTE Band 66 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 Test Engineer: 45585 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	14.33	V	4.3	9.4	19.42	30.0	-10.6	
	1711.50	15.19	H	4.3	9.4	20.28	30.0	-9.7	
	Mid Ch								
	1745.00	8.54	V	4.4	9.5	13.70	30.0	-16.3	
	1745.00	17.49	H	4.4	9.5	22.66	30.0	-7.3	
High Ch									
1778.50	13.85	V	4.4	9.6	19.02	30.0	-11.0		
1778.50	18.41	H	4.4	9.6	23.58	30.0	-6.4		
LTE Band 66 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 Test Engineer: 45585 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	13.26	V	4.3	9.4	18.35	30.0	-11.7	
	1711.50	14.22	H	4.3	9.4	19.31	30.0	-10.7	
	Mid Ch								
	1745.00	11.14	V	4.4	9.5	16.30	30.0	-13.7	
	1745.00	13.85	H	4.4	9.5	19.02	30.0	-11.0	
High Ch									
1778.50	11.72	V	4.4	9.6	16.89	30.0	-13.1		
1778.50	17.37	H	4.4	9.6	22.54	30.0	-7.5		

LTE Band 66 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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 MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1710.70	12.33	V	4.3	9.4	17.41	30.0	-12.6	
	1710.70	16.04	H	4.3	9.4	21.12	30.0	-8.9	
	Mid Ch								
	1745.00	8.15	V	4.4	9.5	13.31	30.0	-16.7	
	1745.00	17.53	H	4.4	9.5	22.70	30.0	-7.3	
High Ch									
1779.30	12.48	V	4.4	9.6	17.65	30.0	-12.3		
1779.30	18.07	H	4.4	9.6	23.24	30.0	-6.8		
LTE Band 66 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement								
	Company: Samsung Project #: 4788805413 Date: 2019-01-11 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 MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch								
	1710.70	10.93	V	4.3	9.4	16.01	30.0	-14.0	
	1710.70	14.45	H	4.3	9.4	19.53	30.0	-10.5	
	Mid Ch								
	1745.00	7.21	V	4.4	9.5	12.37	30.0	-17.6	
	1745.00	16.60	H	4.4	9.5	21.77	30.0	-8.2	
High Ch									
1779.30	11.08	V	4.4	9.6	16.25	30.0	-13.7		
1779.30	17.17	H	4.4	9.6	22.34	30.0	-7.7		

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and §90.691

LIMIT

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

Part 27.53:

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

(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.

Part 90.691(a):

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

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

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

TEST PROCEDURE

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

For peak power measurement with a ESU40:

- a) Set the RBW = 100 KHz for emission below 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW $\geq 3 \times$ 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 #:		4788805451							
Date:		2019-01-15							
Test Engineer:		47989							
Configuration:		EUT / AC Adapter / Earphone, X-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	-8.7	V	3.0	43.6	1.0	-51.3	-13.0	-38.3	
2472.60	-6.1	V	3.0	43.4	1.0	-48.5	-13.0	-35.5	
3296.80	-9.6	V	3.0	43.6	1.0	-52.2	-13.0	-39.2	
1648.40	-8.1	H	3.0	43.6	1.0	-50.7	-13.0	-37.7	
2472.60	-4.5	H	3.0	43.4	1.0	-46.9	-13.0	-33.9	
3296.80	-9.6	H	3.0	43.6	1.0	-52.2	-13.0	-39.2	
Mid Ch, 836.6MHz									
1673.20	-7.0	V	3.0	43.6	1.0	-49.6	-13.0	-36.6	
2509.80	-5.3	V	3.0	43.4	1.0	-47.8	-13.0	-34.8	
3346.40	-9.6	V	3.0	43.6	1.0	-52.2	-13.0	-39.2	
1673.20	-8.1	H	3.0	43.6	1.0	-50.7	-13.0	-37.7	
2509.80	-6.1	H	3.0	43.4	1.0	-48.5	-13.0	-35.5	
3346.40	-9.5	H	3.0	43.6	1.0	-52.1	-13.0	-39.1	
High Ch, 848.8MHz									
1697.60	-9.7	V	3.0	43.6	1.0	-52.3	-13.0	-39.3	
2546.40	-8.4	V	3.0	43.4	1.0	-50.8	-13.0	-37.8	
3395.20	-9.1	V	3.0	43.7	1.0	-51.7	-13.0	-38.7	
1697.60	-7.5	H	3.0	43.6	1.0	-50.1	-13.0	-37.1	
2546.40	-5.4	H	3.0	43.4	1.0	-47.8	-13.0	-34.8	
3395.20	-9.0	H	3.0	43.7	1.0	-51.7	-13.0	-38.7	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788805451							
Date:		2019-01-15							
Test Engineer:		47989							
Configuration:		EUT / AC Adapter / Earphone, X-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	-13.9	V	3.0	43.6	1.0	-56.5	-13.0	-43.5	
2472.60	-11.3	V	3.0	43.4	1.0	-53.7	-13.0	-40.7	
3296.80	-9.5	V	3.0	43.6	1.0	-52.1	-13.0	-39.1	
1648.40	-14.4	H	3.0	43.6	1.0	-57.0	-13.0	-44.0	
2472.60	-11.7	H	3.0	43.4	1.0	-54.1	-13.0	-41.1	
3296.80	-9.8	H	3.0	43.6	1.0	-52.5	-13.0	-39.5	
Mid Ch, 836.6MHz									
1673.20	-11.3	V	3.0	43.6	1.0	-53.9	-13.0	-40.9	
2509.80	-11.5	V	3.0	43.4	1.0	-53.9	-13.0	-40.9	
3346.40	-9.5	V	3.0	43.6	1.0	-52.1	-13.0	-39.1	
1673.20	-14.2	H	3.0	43.6	1.0	-56.7	-13.0	-43.7	
2509.80	-12.0	H	3.0	43.4	1.0	-54.4	-13.0	-41.4	
3346.40	-9.8	H	3.0	43.6	1.0	-52.5	-13.0	-39.5	
High Ch, 848.8MHz									
1697.60	-13.8	V	3.0	43.6	1.0	-56.3	-13.0	-43.3	
2546.40	-11.4	V	3.0	43.4	1.0	-53.9	-13.0	-40.9	
3395.20	-8.8	V	3.0	43.7	1.0	-51.5	-13.0	-38.5	
1697.60	-14.2	H	3.0	43.6	1.0	-56.8	-13.0	-43.8	
2546.40	-11.8	H	3.0	43.4	1.0	-54.2	-13.0	-41.2	
3395.20	-9.2	H	3.0	43.7	1.0	-51.8	-13.0	-38.8	

GSM1900

UL Verification Services, Inc.									
Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788805451							
Date:		2019-01-15							
Test Engineer:		47989							
Configuration:		EUT / AC Adpater / Earphone, X-Position							
Location:		Chamber 1							
Mode:		GPRS 1900 MHz Harmonics							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-8.9	V	3.0	43.8	1.0	-51.7	-13.0	-38.7	
5550.60	-7.3	V	3.0	43.7	1.0	-50.0	-13.0	-37.0	
7400.80	-5.0	V	3.0	42.5	1.0	-46.5	-13.0	-33.5	
3700.40	-6.4	H	3.0	43.8	1.0	-49.2	-13.0	-36.2	
5550.60	-7.4	H	3.0	43.7	1.0	-50.2	-13.0	-37.2	
7400.80	-4.9	H	3.0	42.5	1.0	-46.4	-13.0	-33.4	
Mid Ch, 1880MHz									
3760.00	-7.9	V	3.0	43.8	1.0	-50.7	-13.0	-37.7	
5640.00	-7.4	V	3.0	43.7	1.0	-50.1	-13.0	-37.1	
7520.00	-4.8	V	3.0	42.5	1.0	-46.2	-13.0	-33.2	
3760.00	-7.2	H	3.0	43.8	1.0	-50.0	-13.0	-37.0	
5640.00	-7.5	H	3.0	43.7	1.0	-50.2	-13.0	-37.2	
7520.00	-4.9	H	3.0	42.5	1.0	-46.4	-13.0	-33.4	
High Ch, 1909.8MHz									
3819.60	-7.3	V	3.0	43.8	1.0	-50.2	-13.0	-37.2	
5729.40	-7.3	V	3.0	43.7	1.0	-50.0	-13.0	-37.0	
7639.20	-5.0	V	3.0	42.4	1.0	-46.4	-13.0	-33.4	
3819.60	-4.7	H	3.0	43.8	1.0	-47.5	-13.0	-34.5	
5729.40	-7.8	H	3.0	43.7	1.0	-50.5	-13.0	-37.5	
7639.20	-5.0	H	3.0	42.4	1.0	-46.4	-13.0	-33.4	

UL Verification Services, Inc.									
Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788805451							
Date:		2019-01-15							
Test Engineer:		47989							
Configuration:		EUT / AC Adapter / Earphone, X-Position							
Location:		Chamber 1							
Mode:		EGPRS 1900 MHz Harmonics							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-10.5	V	3.0	43.8	1.0	-53.2	-13.0	-40.2	
5550.60	-7.5	V	3.0	43.7	1.0	-50.2	-13.0	-37.2	
7400.80	-4.9	V	3.0	42.5	1.0	-46.4	-13.0	-33.4	
3700.40	-9.7	H	3.0	43.8	1.0	-52.4	-13.0	-39.4	
5550.60	-7.5	H	3.0	43.7	1.0	-50.3	-13.0	-37.3	
7400.80	-4.8	H	3.0	42.5	1.0	-46.3	-13.0	-33.3	
Mid Ch, 1880MHz									
3760.00	-9.7	V	3.0	43.8	1.0	-52.5	-13.0	-39.5	
5640.00	-7.0	V	3.0	43.7	1.0	-49.7	-13.0	-36.7	
7520.00	-4.7	V	3.0	42.5	1.0	-46.1	-13.0	-33.1	
3760.00	-9.5	H	3.0	43.8	1.0	-52.3	-13.0	-39.3	
5640.00	-7.8	H	3.0	43.7	1.0	-50.5	-13.0	-37.5	
7520.00	-4.8	H	3.0	42.5	1.0	-46.3	-13.0	-33.3	
High Ch, 1909.8MHz									
3819.60	-9.2	V	3.0	43.8	1.0	-52.0	-13.0	-39.0	
5729.40	-7.3	V	3.0	43.7	1.0	-50.0	-13.0	-37.0	
7639.20	-5.1	V	3.0	42.4	1.0	-46.5	-13.0	-33.5	
3819.60	-8.4	H	3.0	43.8	1.0	-51.2	-13.0	-38.2	
5729.40	-7.4	H	3.0	43.7	1.0	-50.1	-13.0	-37.1	
7639.20	-5.4	H	3.0	42.4	1.0	-46.7	-13.0	-33.7	

WCDMA Band 5

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
WCDMA Band 5 REL99		Company: Samsung Project #: 4788805451 Date: 2019-01-15 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 1 Mode: Rel99 Band 5 Harmonics										
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
		Low Ch, 826.4MHz										
		1652.80	-14.6	V	3.0	43.6	1.0	-57.2	-13.0	-44.2		
		2479.20	-12.0	V	3.0	43.4	1.0	-54.4	-13.0	-41.4		
		3305.60	-10.5	V	3.0	43.6	1.0	-53.1	-13.0	-40.1		
		1652.80	-15.8	H	3.0	43.6	1.0	-58.4	-13.0	-45.4		
		2479.20	-12.6	H	3.0	43.4	1.0	-55.0	-13.0	-42.0		
		3305.60	-10.9	H	3.0	43.6	1.0	-53.5	-13.0	-40.5		
		Mid Ch, 836.6MHz										
		1673.20	-14.6	V	3.0	43.6	1.0	-57.2	-13.0	-44.2		
		2509.80	-12.0	V	3.0	43.4	1.0	-54.5	-13.0	-41.5		
		3346.40	-10.4	V	3.0	43.6	1.0	-53.1	-13.0	-40.1		
		1673.20	-15.2	H	3.0	43.6	1.0	-57.8	-13.0	-44.8		
		2509.80	-12.9	H	3.0	43.4	1.0	-55.3	-13.0	-42.3		
3346.40	-9.8	H	3.0	43.6	1.0	-52.5	-13.0	-39.5				
High Ch, 846.6MHz												
1693.20	-14.3	V	3.0	43.6	1.0	-56.8	-13.0	-43.8				
2539.80	-12.2	V	3.0	43.4	1.0	-54.7	-13.0	-41.7				
3386.40	-10.2	V	3.0	43.7	1.0	-52.8	-13.0	-39.8				
1693.20	-14.1	H	3.0	43.6	1.0	-56.6	-13.0	-43.6				
2539.80	-13.1	H	3.0	43.4	1.0	-55.6	-13.0	-42.6				
3386.40	-10.3	H	3.0	43.7	1.0	-53.0	-13.0	-40.0				
		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
WCDMA Band 5 HSDPA		Company: Samsung Project #: 4788805451 Date: 2015-01-15 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 1 Mode: HSDPA Band 5 Harmonics										
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
		Low Ch, 826.4MHz										
		1652.80	-15.2	V	3.0	43.6	1.0	-57.8	-13.0	-44.8		
		2479.20	-11.6	V	3.0	43.4	1.0	-54.1	-13.0	-41.1		
		3305.60	-10.7	V	3.0	43.6	1.0	-53.4	-13.0	-40.4		
		1652.80	-15.8	H	3.0	43.6	1.0	-58.4	-13.0	-45.4		
		2479.20	-13.3	H	3.0	43.4	1.0	-55.7	-13.0	-42.7		
		3305.60	-10.6	H	3.0	43.6	1.0	-53.2	-13.0	-40.2		
		Mid Ch, 836.6MHz										
		1673.20	-14.3	V	3.0	43.6	1.0	-56.8	-13.0	-43.8		
		2509.80	-12.2	V	3.0	43.4	1.0	-54.7	-13.0	-41.7		
		3346.40	-10.7	V	3.0	43.6	1.0	-53.4	-13.0	-40.4		
		1673.20	-15.0	H	3.0	43.6	1.0	-57.6	-13.0	-44.6		
		2509.80	-12.8	H	3.0	43.4	1.0	-55.2	-13.0	-42.2		
3346.40	-10.0	H	3.0	43.6	1.0	-52.7	-13.0	-39.7				
High Ch, 846.6MHz												
1693.20	-14.3	V	3.0	43.6	1.0	-56.8	-13.0	-43.8				
2539.80	-12.1	V	3.0	43.4	1.0	-54.5	-13.0	-41.5				
3386.40	-10.2	V	3.0	43.7	1.0	-52.8	-13.0	-39.8				
1693.20	-14.3	H	3.0	43.6	1.0	-56.8	-13.0	-43.8				
2539.80	-12.5	H	3.0	43.4	1.0	-54.9	-13.0	-41.9				
3386.40	-9.8	H	3.0	43.7	1.0	-52.4	-13.0	-39.4				

WCDMA Band 4

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788805413							
Date:		2019-01-11							
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	-9.5	V	3.0	39.5	1.0	-48.0	-13.0	-35.0	
5137.20	-9.0	V	3.0	39.8	1.0	-47.8	-13.0	-34.8	
6849.60	-6.2	V	3.0	39.7	1.0	-44.9	-13.0	-31.9	
8562.00	-5.3	V	3.0	39.0	1.0	-43.3	-13.0	-30.3	
10274.40	-1.9	V	3.0	38.6	1.0	-39.5	-13.0	-26.5	
3424.80	-8.0	H	3.0	39.5	1.0	-46.5	-13.0	-33.5	
5137.20	-9.7	H	3.0	39.8	1.0	-48.5	-13.0	-35.5	
6849.60	-7.2	H	3.0	39.7	1.0	-45.8	-13.0	-32.8	
8562.00	-6.0	H	3.0	39.0	1.0	-44.0	-13.0	-31.0	
10274.40	-1.8	H	3.0	38.6	1.0	-39.4	-13.0	-26.4	
Mid Ch, 1732.6MHz									
3465.20	-9.3	V	3.0	39.5	1.0	-47.8	-13.0	-34.8	
5197.80	-8.8	V	3.0	39.8	1.0	-47.6	-13.0	-34.6	
6930.40	-6.0	V	3.0	39.7	1.0	-44.7	-13.0	-31.7	
8663.00	-5.2	V	3.0	38.9	1.0	-43.1	-13.0	-30.1	
10395.60	-2.1	V	3.0	38.6	1.0	-39.6	-13.0	-26.6	
3465.20	-8.1	H	3.0	39.5	1.0	-46.6	-13.0	-33.6	
5197.80	-6.6	H	3.0	39.8	1.0	-45.4	-13.0	-32.4	
6930.40	-7.2	H	3.0	39.7	1.0	-45.9	-13.0	-32.9	
8663.00	-6.0	H	3.0	38.9	1.0	-43.9	-13.0	-30.9	
10395.60	-2.0	H	3.0	38.6	1.0	-39.6	-13.0	-26.6	
High Ch, 1752.6MHz									
3505.20	-8.6	V	3.0	39.5	1.0	-47.2	-13.0	-34.2	
5257.80	-9.0	V	3.0	39.8	1.0	-47.8	-13.0	-34.8	
7010.40	-6.0	V	3.0	39.6	1.0	-44.6	-13.0	-31.6	
8763.00	-5.0	V	3.0	38.9	1.0	-42.9	-13.0	-29.9	
10515.60	-1.5	V	3.0	38.6	1.0	-39.0	-13.0	-26.0	
3505.20	-8.7	H	3.0	39.5	1.0	-47.2	-13.0	-34.2	
5257.80	-9.5	H	3.0	39.8	1.0	-48.3	-13.0	-35.3	
7010.40	-7.1	H	3.0	39.6	1.0	-45.7	-13.0	-32.7	
8763.00	-5.7	H	3.0	38.9	1.0	-43.6	-13.0	-30.6	
10515.60	-1.3	H	3.0	38.6	1.0	-38.8	-13.0	-25.8	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788805413							
Date:		2019-01-11							
Test Engineer:		45585							
Configuration:		EUT / AC Adapter / Earphone							
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	-9.6	V	3.0	39.5	1.0	-48.1	-13.0	-35.1	
5137.20	-9.1	V	3.0	39.8	1.0	-47.9	-13.0	-34.9	
6849.60	-6.2	V	3.0	39.7	1.0	-44.9	-13.0	-31.9	
8562.00	-5.4	V	3.0	39.0	1.0	-43.4	-13.0	-30.4	
10274.40	-1.9	V	3.0	38.6	1.0	-39.5	-13.0	-26.5	
3424.80	-8.4	H	3.0	39.5	1.0	-46.9	-13.0	-33.9	
5137.20	-9.7	H	3.0	39.8	1.0	-48.5	-13.0	-35.5	
6849.60	-7.2	H	3.0	39.7	1.0	-45.9	-13.0	-32.9	
8562.00	-6.2	H	3.0	39.0	1.0	-44.1	-13.0	-31.1	
10274.40	-1.8	H	3.0	38.6	1.0	-39.3	-13.0	-26.3	
Mid Ch, 1732.6MHz									
3465.20	-9.3	V	3.0	39.5	1.0	-47.8	-13.0	-34.8	
5197.80	-8.8	V	3.0	39.8	1.0	-47.6	-13.0	-34.6	
6930.40	-6.2	V	3.0	39.7	1.0	-44.8	-13.0	-31.8	
8663.00	-5.1	V	3.0	38.9	1.0	-43.0	-13.0	-30.0	
10395.60	-2.1	V	3.0	38.6	1.0	-39.7	-13.0	-26.7	
3465.20	-8.0	H	3.0	39.5	1.0	-46.5	-13.0	-33.5	
5197.80	-9.3	H	3.0	39.8	1.0	-48.2	-13.0	-35.2	
6930.40	-7.2	H	3.0	39.7	1.0	-45.8	-13.0	-32.8	
8663.00	-5.9	H	3.0	38.9	1.0	-43.9	-13.0	-30.9	
10395.60	-2.0	H	3.0	38.6	1.0	-39.6	-13.0	-26.6	
High Ch, 1752.6MHz									
3505.20	-8.6	V	3.0	39.5	1.0	-47.1	-13.0	-34.1	
5257.80	-8.8	V	3.0	39.8	1.0	-47.7	-13.0	-34.7	
7010.40	-5.9	V	3.0	39.6	1.0	-44.6	-13.0	-31.6	
8763.00	-4.8	V	3.0	38.9	1.0	-42.7	-13.0	-29.7	
10515.60	-1.5	V	3.0	38.6	1.0	-39.0	-13.0	-26.0	
3505.20	-9.0	H	3.0	39.5	1.0	-47.5	-13.0	-34.5	
5257.80	-9.1	H	3.0	39.8	1.0	-47.9	-13.0	-34.9	
7010.40	-6.8	H	3.0	39.6	1.0	-45.4	-13.0	-32.4	
8763.00	-5.7	H	3.0	38.9	1.0	-43.6	-13.0	-30.6	
10515.60	-1.4	H	3.0	38.6	1.0	-39.0	-13.0	-26.0	

WCDMA Band 2

		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		Company:	Samsung								
		Project #:	4788805451								
		Date:	2019-01-15								
		Test Engineer:	47989								
		Configuration:	EUT / AC Adapter / Earphone, X-Position								
		Location:	Chamber 1								
		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
WCDMA Band 2 REL99	Low Ch, 1852.4MHz										
	3704.80	-10.0	V	3.0	43.8	1.0	-52.7	-13.0	-39.7		
	5557.20	-8.4	V	3.0	43.7	1.0	-51.1	-13.0	-38.1		
	7409.60	-6.0	V	3.0	42.5	1.0	-47.5	-13.0	-34.5		
	3704.80	-7.2	H	3.0	43.8	1.0	-49.9	-13.0	-36.9		
	5557.20	-8.8	H	3.0	43.7	1.0	-51.5	-13.0	-38.5		
	7409.60	-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	-47.4	-13.0	-34.4		
	3760.00	-10.0	H	3.0	43.8	1.0	-52.8	-13.0	-39.8		
	5640.00	-8.7	H	3.0	43.7	1.0	-51.4	-13.0	-38.4		
	7520.00	-5.9	H	3.0	42.5	1.0	-47.3	-13.0	-34.3		
	High Ch, 1907.6MHz										
	3815.20	-11.5	V	3.0	43.8	1.0	-54.3	-13.0	-41.3		
	5722.80	-8.3	V	3.0	43.7	1.0	-51.0	-13.0	-38.0		
	7630.40	-5.8	V	3.0	42.4	1.0	-47.2	-13.0	-34.2		
	3815.20	-11.4	H	3.0	43.8	1.0	-54.2	-13.0	-41.2		
	5722.80	-8.4	H	3.0	43.7	1.0	-51.1	-13.0	-38.1		
	7630.40	-6.1	H	3.0	42.4	1.0	-47.5	-13.0	-34.5		
		UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		Company:	Samsung								
		Project #:	4788805451								
		Date:	2019-01-15								
		Test Engineer:	47989								
		Configuration:	EUT / AC Adapter / Earphone								
		Location:	Chamber 1								
		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
WCDMA Band 2 HSDPA	Low Ch, 1852.4MHz										
	3704.80	-11.5	V	3.0	43.8	1.0	-54.3	-13.0	-41.3		
	5557.20	-8.4	V	3.0	43.7	1.0	-51.1	-13.0	-38.1		
	7409.60	-6.0	V	3.0	42.5	1.0	-47.5	-13.0	-34.5		
	3704.80	-6.9	H	3.0	43.8	1.0	-49.7	-13.0	-36.7		
	5557.20	-8.7	H	3.0	43.7	1.0	-51.4	-13.0	-38.4		
	7409.60	-5.9	H	3.0	42.5	1.0	-47.4	-13.0	-34.4		
	Mid Ch, 1880MHz										
	3760.00	-11.0	V	3.0	43.8	1.0	-53.8	-13.0	-40.8		
	5640.00	-8.4	V	3.0	43.7	1.0	-51.1	-13.0	-38.1		
	7520.00	-6.0	V	3.0	42.5	1.0	-47.5	-13.0	-34.5		
	3760.00	-9.9	H	3.0	43.8	1.0	-52.7	-13.0	-39.7		
	5640.00	-8.6	H	3.0	43.7	1.0	-51.3	-13.0	-38.3		
	7520.00	-5.8	H	3.0	42.5	1.0	-47.3	-13.0	-34.3		
	High Ch, 1907.6MHz										
	3815.20	-11.5	V	3.0	43.8	1.0	-54.3	-13.0	-41.3		
	5722.80	-8.3	V	3.0	43.7	1.0	-51.0	-13.0	-38.0		
	7630.40	-5.9	V	3.0	42.4	1.0	-47.2	-13.0	-34.2		
	3815.20	-11.3	H	3.0	43.8	1.0	-54.1	-13.0	-41.1		
	5722.80	-8.5	H	3.0	43.7	1.0	-51.2	-13.0	-38.2		
	7630.40	-5.7	H	3.0	42.4	1.0	-47.1	-13.0	-34.1		

LTE Band 2

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
LTE Band 2 3MHz QPSK		Company: Samsung Project #: 4788805413 Date: 2019-01-14 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 1 Mode: LTE_QPSK Band 2 Harmonics, 3MHz Bandwidth									
		f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
		Low Ch, 1851.5MHz									
		3703.00	-11.3	V	3.0	43.8	1.0	-54.1	-13.0	-41.1	
		5554.50	-8.5	V	3.0	43.7	1.0	-51.3	-13.0	-38.3	
		7406.00	-6.0	V	3.0	42.5	1.0	-47.5	-13.0	-34.5	
		3703.00	-11.2	H	3.0	43.8	1.0	-54.0	-13.0	-41.0	
		5554.50	-8.3	H	3.0	43.7	1.0	-51.0	-13.0	-38.0	
		7406.00	-5.8	H	3.0	42.5	1.0	-47.3	-13.0	-34.3	
		Mid Ch, 1880MHz									
3760.00	-11.3	V	3.0	43.8	1.0	-54.1	-13.0	-41.1			
5640.00	-8.6	V	3.0	43.7	1.0	-51.3	-13.0	-38.3			
7520.00	-6.1	V	3.0	42.5	1.0	-47.5	-13.0	-34.5			
3760.00	-11.2	H	3.0	43.8	1.0	-54.0	-13.0	-41.0			
5640.00	-8.7	H	3.0	43.7	1.0	-51.4	-13.0	-38.4			
7520.00	-6.0	H	3.0	42.5	1.0	-47.5	-13.0	-34.5			
High Ch, 1908.5MHz											
3817.00	-11.4	V	3.0	43.8	1.0	-54.2	-13.0	-41.2			
5725.50	-8.3	V	3.0	43.7	1.0	-51.0	-13.0	-38.0			
7634.00	-5.6	V	3.0	42.4	1.0	-47.0	-13.0	-34.0			
3817.00	-11.2	H	3.0	43.8	1.0	-54.0	-13.0	-41.0			
5725.50	-8.5	H	3.0	43.7	1.0	-51.2	-13.0	-38.2			
7634.00	-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 #:		4788805451							
Date:		2018-12-21							
Test Engineer:		45585							
Configuration:		EUT / AC Adapter / Earphone, Z-Position							
Location:		Chamber 2							
Mode:		LTE_QPSK Band 5 Harmonics, 1.4MHz 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, 824.7MHz									
1649.40	-15.2	V	3.0	38.2	1.0	-52.4	-13.0	-39.4	
2474.10	-12.4	V	3.0	38.8	1.0	-50.2	-13.0	-37.2	
3298.80	-10.1	V	3.0	39.4	1.0	-48.6	-13.0	-35.6	
4123.50	-10.3	V	3.0	39.8	1.0	-49.1	-13.0	-36.1	
4948.20	-9.0	V	3.0	39.8	1.0	-47.8	-13.0	-34.8	
1649.40	-16.0	H	3.0	38.2	1.0	-53.2	-13.0	-40.2	
2474.10	-13.2	H	3.0	38.8	1.0	-51.0	-13.0	-38.0	
3298.80	-10.3	H	3.0	39.4	1.0	-48.7	-13.0	-35.7	
4123.50	-10.6	H	3.0	39.8	1.0	-49.4	-13.0	-36.4	
4948.20	-9.6	H	3.0	39.8	1.0	-48.4	-13.0	-35.4	
Mid Ch, 836.5MHz									
1673.00	-15.1	V	3.0	38.2	1.0	-52.3	-13.0	-39.3	
2509.50	-12.4	V	3.0	38.8	1.0	-50.2	-13.0	-37.2	
3346.00	-10.0	V	3.0	39.5	1.0	-48.5	-13.0	-35.5	
4182.50	-10.0	V	3.0	39.8	1.0	-48.9	-13.0	-35.9	
5019.00	-8.7	V	3.0	39.8	1.0	-47.5	-13.0	-34.5	
1673.00	-16.1	H	3.0	38.2	1.0	-53.3	-13.0	-40.3	
2509.50	-13.0	H	3.0	38.8	1.0	-50.8	-13.0	-37.8	
3346.00	-10.3	H	3.0	39.5	1.0	-48.7	-13.0	-35.7	
4182.50	-10.3	H	3.0	39.8	1.0	-49.1	-13.0	-36.1	
5019.00	-9.4	H	3.0	39.8	1.0	-48.2	-13.0	-35.2	
High Ch, 848.3MHz									
1696.60	-15.0	V	3.0	38.2	1.0	-52.3	-13.0	-39.3	
2544.90	-12.2	V	3.0	38.9	1.0	-50.1	-13.0	-37.1	
3393.20	-9.4	V	3.0	39.5	1.0	-47.9	-13.0	-34.9	
4241.50	-10.1	V	3.0	39.8	1.0	-48.9	-13.0	-35.9	
5089.80	-8.8	V	3.0	39.8	1.0	-47.6	-13.0	-34.6	
1696.60	-15.8	H	3.0	38.2	1.0	-53.1	-13.0	-40.1	
2544.90	-12.7	H	3.0	38.9	1.0	-50.6	-13.0	-37.6	
3393.20	-9.6	H	3.0	39.5	1.0	-48.1	-13.0	-35.1	
4241.50	-10.3	H	3.0	39.8	1.0	-49.1	-13.0	-36.1	
5089.80	-9.4	H	3.0	39.8	1.0	-48.2	-13.0	-35.2	

LTE
 Band 5
 1.4MHz
 QPSK

LTE Band 12

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
LTE Band 12 3MHz QPSK		Company: Samsung							
		Project #: 4788805413							
		Date: 2019-01-07							
		Test Engineer: 47989							
		Configuration: EUT / AC Adapter / Earphone, X-Position							
		Location: Chamber 2							
		Mode: LTE_QPSK Band 12 Harmonics, 3MHz Bandwidth							
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 700.5MHz									
1401.00	-16.4	V	3.0	38.1	1.0	-53.5	-13.0	-40.5	
2101.50	-13.5	V	3.0	38.5	1.0	-50.9	-13.0	-37.9	
2802.00	-11.7	V	3.0	39.1	1.0	-49.8	-13.0	-36.8	
3502.50	-8.6	V	3.0	39.5	1.0	-47.1	-13.0	-34.1	
4203.00	-10.1	V	3.0	39.8	1.0	-48.9	-13.0	-35.9	
1401.00	-17.6	H	3.0	38.1	1.0	-54.7	-13.0	-41.7	
2101.50	-12.6	H	3.0	38.5	1.0	-50.1	-13.0	-37.1	
2802.00	-12.0	H	3.0	39.1	1.0	-50.1	-13.0	-37.1	
3502.50	-8.8	H	3.0	39.5	1.0	-47.3	-13.0	-34.3	
4203.00	-10.4	H	3.0	39.8	1.0	-49.2	-13.0	-36.2	
Mid Ch, 707.5MHz									
1415.00	-16.3	V	3.0	38.1	1.0	-53.4	-13.0	-40.4	
2122.50	-13.5	V	3.0	38.5	1.0	-51.0	-13.0	-38.0	
2830.00	-11.5	V	3.0	39.1	1.0	-49.6	-13.0	-36.6	
3537.50	-8.4	V	3.0	39.6	1.0	-47.0	-13.0	-34.0	
4245.00	-10.2	V	3.0	39.8	1.0	-49.0	-13.0	-36.0	
1415.00	-17.2	H	3.0	38.1	1.0	-54.4	-13.0	-41.4	
2122.50	-13.1	H	3.0	38.5	1.0	-50.6	-13.0	-37.6	
2830.00	-11.9	H	3.0	39.1	1.0	-50.0	-13.0	-37.0	
3537.50	-8.7	H	3.0	39.6	1.0	-47.3	-13.0	-34.3	
4245.00	-10.4	H	3.0	39.8	1.0	-49.2	-13.0	-36.2	
High Ch, 714.5MHz									
1429.00	-16.0	V	3.0	38.1	1.0	-53.1	-13.0	-40.1	
2143.50	-13.3	V	3.0	38.5	1.0	-50.8	-13.0	-37.8	
2858.00	-11.4	V	3.0	39.1	1.0	-49.5	-13.0	-36.5	
3572.50	-7.9	V	3.0	39.6	1.0	-46.5	-13.0	-33.5	
4287.00	-9.8	V	3.0	39.8	1.0	-48.6	-13.0	-35.6	
1429.00	-18.6	H	3.0	38.1	1.0	-55.7	-13.0	-42.7	
2143.50	-12.7	H	3.0	38.5	1.0	-50.2	-13.0	-37.2	
2858.00	-11.9	H	3.0	39.1	1.0	-50.0	-13.0	-37.0	
3572.50	-8.2	H	3.0	39.6	1.0	-46.8	-13.0	-33.8	
4287.00	-10.2	H	3.0	39.8	1.0	-49.0	-13.0	-36.0	

LTE Band 13

LTE Band 13 10MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement																																																																																																																																	
	Company: Samsung																																																																																																																																	
	Project #: 4788805413																																																																																																																																	
	Date: 2019-01-08																																																																																																																																	
	Test Engineer: 47989																																																																																																																																	
	Configuration: EUT / AC Adapter / Earphone, Y-Position																																																																																																																																	
	Location: Chamber 2																																																																																																																																	
	Mode: LTE_QPSK Band 13 Hamonics, 10MHz Bandwidth																																																																																																																																	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Distance (m)</th> <th>Preamp (dB)</th> <th>Filter (dB)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="10">Mid Ch, 782MHz</td> </tr> <tr> <td>1564.00</td> <td>-14.2</td> <td>V</td> <td>3.0</td> <td>38.2</td> <td>1.0</td> <td>-51.4</td> <td>-40.0</td> <td>-11.4</td> <td></td> </tr> <tr> <td>2346.00</td> <td>-10.4</td> <td>V</td> <td>3.0</td> <td>38.7</td> <td>1.0</td> <td>-48.1</td> <td>-13.0</td> <td>-35.1</td> <td></td> </tr> <tr> <td>3128.00</td> <td>-10.5</td> <td>V</td> <td>3.0</td> <td>39.3</td> <td>1.0</td> <td>-48.8</td> <td>-13.0</td> <td>-35.8</td> <td></td> </tr> <tr> <td>3910.00</td> <td>-10.8</td> <td>V</td> <td>3.0</td> <td>39.8</td> <td>1.0</td> <td>-49.6</td> <td>-13.0</td> <td>-36.6</td> <td></td> </tr> <tr> <td>4692.00</td> <td>-9.4</td> <td>V</td> <td>3.0</td> <td>39.8</td> <td>1.0</td> <td>-48.2</td> <td>-13.0</td> <td>-35.2</td> <td></td> </tr> <tr> <td>1564.00</td> <td>-11.9</td> <td>H</td> <td>3.0</td> <td>38.2</td> <td>1.0</td> <td>-49.1</td> <td>-40.0</td> <td>-9.1</td> <td></td> </tr> <tr> <td>2346.00</td> <td>-10.7</td> <td>H</td> <td>3.0</td> <td>38.7</td> <td>1.0</td> <td>-48.4</td> <td>-13.0</td> <td>-35.4</td> <td></td> </tr> <tr> <td>3128.00</td> <td>-10.9</td> <td>H</td> <td>3.0</td> <td>39.3</td> <td>1.0</td> <td>-49.2</td> <td>-13.0</td> <td>-36.2</td> <td></td> </tr> <tr> <td>3910.00</td> <td>-10.9</td> <td>H</td> <td>3.0</td> <td>39.8</td> <td>1.0</td> <td>-49.7</td> <td>-13.0</td> <td>-36.7</td> <td></td> </tr> <tr> <td>4692.00</td> <td>-9.9</td> <td>H</td> <td>3.0</td> <td>39.8</td> <td>1.0</td> <td>-48.7</td> <td>-13.0</td> <td>-35.7</td> <td></td> </tr> </tbody> </table>										f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Mid Ch, 782MHz										1564.00	-14.2	V	3.0	38.2	1.0	-51.4	-40.0	-11.4		2346.00	-10.4	V	3.0	38.7	1.0	-48.1	-13.0	-35.1		3128.00	-10.5	V	3.0	39.3	1.0	-48.8	-13.0	-35.8		3910.00	-10.8	V	3.0	39.8	1.0	-49.6	-13.0	-36.6		4692.00	-9.4	V	3.0	39.8	1.0	-48.2	-13.0	-35.2		1564.00	-11.9	H	3.0	38.2	1.0	-49.1	-40.0	-9.1		2346.00	-10.7	H	3.0	38.7	1.0	-48.4	-13.0	-35.4		3128.00	-10.9	H	3.0	39.3	1.0	-49.2	-13.0	-36.2		3910.00	-10.9	H	3.0	39.8	1.0	-49.7	-13.0	-36.7		4692.00	-9.9	H	3.0	39.8	1.0	-48.7	-13.0	-35.7	
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