Band

LTE4

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: LTE_16QAM Band 4 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

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	10.07	V	0.9	8.2	17.41	30.0	-12.6	
1712.50	16.97	H	0.9	8.2	24.31	30.0	-5.7	
Mid Ch								
1732.50	9.96	V	0.9	8.2	17.23	30.0	-12.8	
1732.50	17.71	H	0.9	8.2	24.98	30.0	-5.0	
High Ch								
1752.50	10.17	V	0.9	8.1	17.37	30.0	-12.6	
1752.50	17.66	H	0.9	8.1	24.86	30.0	-5.1	

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Band

LTE4

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: LTE_QPSK Band 4 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

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	10.96	V	0.9	8.2	18.30	30.0	-11.7	
1712.50	17.83	H	0.9	8.2	25.17	30.0	-4.8	
Mid Ch								
1732.50	10.92	V	0.9	8.2	18.19	30.0	-11.8	
1732.50	18.62	H	0.9	8.2	25.89	30.0	-4.1	
High Ch								
1752.50	10.93	V	0.9	8.1	18.13	30.0	-11.9	
1752.50	18.64	H	0.9	8.1	25.84	30.0	-4.2	

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Band

LTE4

3MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: LTE_16QAM Band 4 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

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	10.05	V	0.9	8.2	17.40	30.0	-12.6	
1711.50	16.98	H	0.9	8.2	24.33	30.0	-5.7	
Mid Ch								
1732.50	9.90	V	0.9	8.2	17.17	30.0	-12.8	
1732.50	17.69	H	0.9	8.2	24.96	30.0	-5.0	
High Ch								
1753.50	9.87	V	0.9	8.1	17.06	30.0	-12.9	
1753.50	17.68	H	0.9	8.1	24.87	30.0	-5.1	

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Band

LTE4

3MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: LTE_QPSK Band 4 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

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	10.96	V	0.9	8.2	18.31	30.0	-11.7	
1711.50	17.84	H	0.9	8.2	25.19	30.0	-4.8	
Mid Ch								
1732.50	10.89	V	0.9	8.2	18.16	30.0	-11.8	
1732.50	18.61	H	0.9	8.2	25.88	30.0	-4.1	
High Ch								
1753.50	10.96	V	0.9	8.1	18.15	30.0	-11.8	
1753.50	18.67	H	0.9	8.1	25.86	30.0	-4.1	

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Band

LTE4

1.4MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: LTE_16QAM Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

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	9.88	V	0.9	8.2	17.15	30.0	-12.8	
1710.70	16.98	H	0.9	8.2	24.25	30.0	-5.7	
Mid Ch								
1732.50	9.87	V	0.9	8.2	17.14	30.0	-12.9	
1732.50	17.66	H	0.9	8.2	24.93	30.0	-5.1	
High Ch								
1754.30	10.14	V	0.9	8.1	17.33	30.0	-12.7	
1754.30	17.78	H	0.9	8.1	24.97	30.0	-5.0	

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Band

LTE4

1.4MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: LTE_QPSK Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

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	10.79	V	0.9	8.2	18.06	30.0	-11.9	
1710.70	17.67	H	0.9	8.2	24.94	30.0	-5.1	
Mid Ch								
1732.50	10.75	V	0.9	8.2	18.02	30.0	-12.0	
1732.50	18.63	H	0.9	8.2	25.90	30.0	-4.1	
High Ch								
1754.30	11.08	V	0.9	8.1	18.27	30.0	-11.7	
1754.30	18.63	H	0.9	8.1	25.82	30.0	-4.2	

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Band

Band 2

HSDPA

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/26/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: HSDPA B2

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.40	2.78	V	0.9	8.0	9.94	33.0	-23.1	
1852.40	17.47	H	0.9	8.0	24.63	33.0	-8.4	
Mid Ch								
1880.00	2.75	V	0.9	8.0	9.91	33.0	-23.1	
1880.00	17.38	H	0.9	8.0	24.54	33.0	-8.5	
High Ch								
1907.60	2.70	V	0.9	8.0	9.86	33.0	-23.1	
1907.60	17.36	H	0.9	8.0	24.52	33.0	-8.5	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

Band 2

REL99

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/26/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: REL99 B2

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.40	2.76	V	0.9	8.0	9.92	33.0	-23.1	
1852.40	17.60	H	0.9	8.0	24.76	33.0	-8.2	
Mid Ch								
1880.00	2.77	V	0.9	8.0	9.93	33.0	-23.1	
1880.00	17.40	H	0.9	8.0	24.56	33.0	-8.4	
High Ch								
1907.60	2.66	V	0.9	8.0	9.82	33.0	-23.2	
1907.60	17.39	H	0.9	8.0	24.55	33.0	-8.5	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

Band 5

HSDPA

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/25/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: HSDPA B5 FUND

Test Equipment:
Receiving: Sunol T130, and 3m Chamber A N-type Cable
Substitution: Dipole T273, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	14.77	V	0.9	0.0	13.87	38.5	-24.6	
826.40	22.04	H	0.9	0.0	21.14	38.5	-17.3	
Mid Ch								
836.60	13.57	V	0.9	0.0	12.67	38.5	-25.8	
836.60	22.10	H	0.9	0.0	21.20	38.5	-17.2	
High Ch								
846.60	13.73	V	0.9	0.0	12.83	38.5	-25.6	
846.60	22.10	H	0.9	0.0	21.20	38.5	-17.2	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

Band 5

REL99

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/25/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: REL99 B5 FUND

Test Equipment:
Receiving: Sunol T130, and 3m Chamber A N-type Cable
Substitution: Dipole T273, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	15.65	V	0.9	0.0	14.75	38.5	-23.7	
826.40	22.88	H	0.9	0.0	21.98	38.5	-16.5	
Mid Ch								
836.60	14.60	V	0.9	0.0	13.70	38.5	-24.7	
836.60	22.35	H	0.9	0.0	21.45	38.5	-17.0	
High Ch								
846.60	13.93	V	0.9	0.0	13.03	38.5	-25.4	
846.60	22.57	H	0.9	0.0	21.67	38.5	-16.8	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

Band 4

HSDPA

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: HSDPA Band 4 Fundamentals

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	10.20	V	0.9	8.3	17.55	30.0	-12.4	
1712.40	17.15	H	0.9	8.3	24.50	30.0	-5.5	
Mid Ch								
1732.60	10.22	V	0.9	8.2	17.49	30.0	-12.5	
1732.60	18.10	H	0.9	8.2	25.37	30.0	-4.6	
High Ch								
1752.60	10.51	V	0.9	8.1	17.70	30.0	-12.3	
1752.60	18.30	H	0.9	8.1	25.49	30.0	-4.5	

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Band

Band 4

REL99

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 2/27/2015
Test Engineer: R.Alegre
Configuration: EUT Only
Location: Chamber A
Mode: Rel99 Band 4 Fundamentals

Test Equpment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.40	10.52	V	0.9	8.3	17.87	30.0	-12.1	
1712.40	17.34	H	0.9	8.3	24.69	30.0	-5.3	
Mid Ch								
1732.60	10.69	V	0.9	8.2	17.96	30.0	-12.0	
1732.60	18.27	H	0.9	8.2	25.54	30.0	-4.5	
High Ch								
1752.60	10.67	V	0.9	8.1	17.86	30.0	-12.1	
1752.60	18.11	H	0.9	8.1	25.30	30.0	-4.7	

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Band

GSM1900

EGPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/26/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: EGPRS 1900

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	16.71	V	0.9	8.0	23.87	33.0	-9.1	
1850.20	21.60	H	0.9	8.0	28.76	33.0	-4.2	
Mid Ch								
1880.00	15.91	V	0.9	8.0	23.07	33.0	-9.9	
1880.00	21.70	H	0.9	8.0	28.86	33.0	-4.1	
High Ch								
1909.80	16.15	V	0.9	8.0	23.31	33.0	-9.7	
1909.80	21.40	H	0.9	8.0	28.56	33.0	-4.4	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

GSM1900

GPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/26/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: GPRS 1900

Test Equipment:
Receiving: Horn T711, and Chamber A SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1850.20	18.16	V	0.9	8.0	25.32	33.0	-7.7	
1850.20	25.39	H	0.9	8.0	32.55	33.0	-0.5	
Mid Ch								
1880.00	18.33	V	0.9	8.0	25.49	33.0	-7.5	
1880.00	25.04	H	0.9	8.0	32.20	33.0	-0.8	
High Ch								
1909.80	18.13	V	0.9	8.0	25.29	33.0	-7.7	
1909.80	24.53	H	0.9	8.0	31.69	33.0	-1.3	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

GSM850

EGPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/25/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: EGPRS850

Test Equipment:
Receiving: Hybrid T130, and Chamber A N-type Cable
Substitution: Dipole T273, 8ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.20	23.90	V	0.9	0.0	23.00	38.5	-15.4	
824.20	29.72	H	0.9	0.0	28.82	38.5	-9.6	
Mid Ch								
836.60	23.20	V	0.9	0.0	22.30	38.5	-16.1	
836.60	29.63	H	0.9	0.0	28.73	38.5	-9.7	
High Ch								
848.80	23.94	V	0.9	0.0	23.04	38.5	-15.4	
848.80	29.68	H	0.9	0.0	28.78	38.5	-9.7	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

GSM850

GPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber A

Company: Samsung
Project #: 15I20033
Date: 2/25/2015
Test Engineer: R. Alegre
Configuration: EUT only
Mode: GPRS850

Test Equipment:
Receiving: Hybrid T130, and Chamber A N-type Cable
Substitution: Dipole T273, 8ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.20	26.20	V	0.9	0.0	25.30	38.5	-13.1	
824.20	33.58	H	0.9	0.0	32.68	38.5	-5.8	
Mid Ch								
836.60	25.62	V	0.9	0.0	24.72	38.5	-13.7	
836.60	33.60	H	0.9	0.0	32.70	38.5	-5.7	
High Ch								
848.80	26.45	V	0.9	0.0	25.55	38.5	-12.9	
848.80	33.62	H	0.9	0.0	32.72	38.5	-5.7	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMIT

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.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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11.2.1. SPURIOUS RADIATION DATA

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_20M_16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band

LTE2

20MHz

16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1860MHz									
3.720	-18.5	V	3.0	35.4	1.0	-52.9	-13.0	-39.9	
5.580	-15.2	V	3.0	34.7	1.0	-49.0	-13.0	-36.0	
7.440	-12.8	V	3.0	34.9	1.0	-46.7	-13.0	-33.7	
3.720	-13.2	H	3.0	35.4	1.0	-47.5	-13.0	-34.5	
5.580	-15.2	H	3.0	34.7	1.0	-48.9	-13.0	-35.9	
7.440	-12.1	H	3.0	34.9	1.0	-46.0	-13.0	-33.0	
Mid Ch, 1880.0MHz									
3.760	-17.1	V	3.0	35.3	1.0	-51.4	-13.0	-38.4	
5.640	-16.0	V	3.0	34.7	1.0	-49.7	-13.0	-36.7	
7.520	-11.4	V	3.0	34.9	1.0	-45.4	-13.0	-32.4	
3.760	-14.1	H	3.0	35.3	1.0	-48.5	-13.0	-35.5	
5.640	-15.0	H	3.0	34.7	1.0	-48.8	-13.0	-35.8	
7.520	-12.6	H	3.0	34.9	1.0	-46.5	-13.0	-33.5	
High Ch, 1900 MHz									
3.800	-14.5	V	3.0	35.3	1.0	-48.8	-13.0	-35.8	
5.700	-15.4	V	3.0	34.7	1.0	-49.1	-13.0	-36.1	
7.600	-13.9	V	3.0	34.9	1.0	-47.9	-13.0	-34.9	
3.800	-15.3	H	3.0	35.3	1.0	-49.6	-13.0	-36.6	
5.700	-15.0	H	3.0	34.7	1.0	-48.7	-13.0	-35.7	
7.600	-12.5	H	3.0	34.9	1.0	-46.4	-13.0	-33.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_20M_QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band: LTE2 20MHz QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1860MHz									
3.720	-17.2	V	3.0	35.4	1.0	-51.6	-13.0	-38.6	
5.580	-14.8	V	3.0	34.7	1.0	-48.5	-13.0	-35.5	
7.440	-13.5	V	3.0	34.9	1.0	-47.4	-13.0	-34.4	
3.720	-11.9	H	3.0	35.4	1.0	-46.3	-13.0	-33.3	
5.580	-13.9	H	3.0	34.7	1.0	-47.6	-13.0	-34.6	
7.440	-12.4	H	3.0	34.9	1.0	-46.3	-13.0	-33.3	
Mid Ch, 1880.0MHz									
3.760	-16.0	V	3.0	35.3	1.0	-50.3	-13.0	-37.3	
5.640	-15.4	V	3.0	34.7	1.0	-49.1	-13.0	-36.1	
7.520	-11.9	V	3.0	34.9	1.0	-45.9	-13.0	-32.9	
3.760	-11.7	H	3.0	35.3	1.0	-46.0	-13.0	-33.0	
5.640	-14.7	H	3.0	34.7	1.0	-48.4	-13.0	-35.4	
7.520	-11.9	H	3.0	34.9	1.0	-45.9	-13.0	-32.9	
High Ch, 1900 MHz									
3.800	-13.4	V	3.0	35.3	1.0	-47.7	-13.0	-34.7	
5.700	-15.0	V	3.0	34.7	1.0	-48.7	-13.0	-35.7	
7.600	-13.1	V	3.0	34.9	1.0	-47.1	-13.0	-34.1	
3.800	-11.2	H	3.0	35.3	1.0	-45.5	-13.0	-32.5	
5.700	-14.7	H	3.0	34.7	1.0	-48.4	-13.0	-35.4	
7.600	-12.3	H	3.0	34.9	1.0	-46.3	-13.0	-33.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_15M_16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band
LTE2
15MHz
16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1857.5MHz									
3.715	-17.3	V	3.0	35.4	1.0	-51.7	-13.0	-38.7	
5.572	-14.7	V	3.0	34.7	1.0	-48.4	-13.0	-35.4	
7.424	-9.9	V	3.0	34.9	1.0	-43.8	-13.0	-30.8	
3.715	-10.4	H	3.0	35.4	1.0	-44.8	-13.0	-31.8	
5.572	-17.0	H	3.0	34.7	1.0	-50.7	-13.0	-37.7	
7.424	-12.9	H	3.0	34.9	1.0	-46.8	-13.0	-33.8	
Mid Ch, 1880.0MHz									
3.760	-16.4	V	3.0	35.3	1.0	-50.7	-13.0	-37.7	
5.640	-16.2	V	3.0	34.7	1.0	-49.9	-13.0	-36.9	
7.520	-15.3	V	3.0	34.9	1.0	-49.3	-13.0	-36.3	
3.760	-6.0	H	3.0	35.3	1.0	-40.3	-13.0	-27.3	
5.640	-17.3	H	3.0	34.7	1.0	-51.0	-13.0	-38.0	
7.520	-15.1	H	3.0	34.9	1.0	-49.0	-13.0	-36.0	
High Ch, 1902.5 MHz									
3.805	-10.3	V	3.0	35.3	1.0	-44.6	-13.0	-31.6	
5.707	-15.2	V	3.0	34.7	1.0	-49.0	-13.0	-36.0	
7.610	-12.1	V	3.0	34.9	1.0	-46.0	-13.0	-33.0	
3.805	-12.9	H	3.0	35.3	1.0	-47.2	-13.0	-34.2	
5.707	-14.8	H	3.0	34.7	1.0	-48.6	-13.0	-35.6	
7.610	-11.7	H	3.0	34.9	1.0	-45.7	-13.0	-32.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_15M_QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band: LTE2 15MHz QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1857.5MHz									
3.715	-14.7	V	3.0	35.4	1.0	-49.0	-13.0	-36.0	
5.572	-14.3	V	3.0	34.7	1.0	-48.0	-13.0	-35.0	
7.424	-11.1	V	3.0	34.9	1.0	-45.0	-13.0	-32.0	
3.715	-10.3	H	3.0	35.4	1.0	-44.7	-13.0	-31.7	
5.572	-16.8	H	3.0	34.7	1.0	-50.5	-13.0	-37.5	
7.424	-14.8	H	3.0	34.9	1.0	-48.7	-13.0	-35.7	
Mid Ch, 1880.0MHz									
3.760	-20.2	V	3.0	35.3	1.0	-54.5	-13.0	-41.5	
5.640	-15.9	V	3.0	34.7	1.0	-49.6	-13.0	-36.6	
7.520	-16.2	V	3.0	34.9	1.0	-50.2	-13.0	-37.2	
3.760	-6.3	H	3.0	35.3	1.0	-40.6	-13.0	-27.6	
5.640	-15.7	H	3.0	34.7	1.0	-49.4	-13.0	-36.4	
7.520	-14.4	H	3.0	34.9	1.0	-48.4	-13.0	-35.4	
High Ch, 1902.5 MHz									
3.805	-10.6	V	3.0	35.3	1.0	-44.9	-13.0	-31.9	
5.707	-14.8	V	3.0	34.7	1.0	-48.5	-13.0	-35.5	
7.610	-13.3	V	3.0	34.9	1.0	-47.2	-13.0	-34.2	
3.805	-14.8	H	3.0	35.3	1.0	-49.1	-13.0	-36.1	
5.707	-14.5	H	3.0	34.7	1.0	-48.3	-13.0	-35.3	
7.610	-12.0	H	3.0	34.9	1.0	-46.0	-13.0	-33.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_10M_16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band

LTE2

10MHz

16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855.0MHz									
3.710	-17.4	V	3.0	35.4	1.0	-51.8	-13.0	-38.8	
5.565	-17.9	V	3.0	34.7	1.0	-51.6	-13.0	-38.6	
7.420	-14.3	V	3.0	34.9	1.0	-48.2	-13.0	-35.2	
3.710	-19.7	H	3.0	35.4	1.0	-54.1	-13.0	-41.1	
5.565	-15.7	H	3.0	34.7	1.0	-49.5	-13.0	-36.5	
7.420	-13.9	H	3.0	34.9	1.0	-47.8	-13.0	-34.8	
Mid Ch, 1880.0MHz									
3.760	-15.2	V	3.0	35.3	1.0	-49.6	-13.0	-36.6	
5.640	-18.1	V	3.0	34.7	1.0	-51.8	-13.0	-38.8	
7.520	-16.6	V	3.0	34.9	1.0	-50.5	-13.0	-37.5	
3.760	-14.0	H	3.0	35.3	1.0	-48.3	-13.0	-35.3	
5.640	-17.3	H	3.0	34.7	1.0	-51.1	-13.0	-38.1	
7.520	-15.0	H	3.0	34.9	1.0	-49.0	-13.0	-36.0	
High Ch, 1905 MHz									
3.810	-15.5	V	3.0	35.3	1.0	-49.8	-13.0	-36.8	
5.715	-17.4	V	3.0	34.7	1.0	-51.2	-13.0	-38.2	
7.620	-15.8	V	3.0	34.9	1.0	-49.8	-13.0	-36.8	
3.810	-18.0	H	3.0	35.3	1.0	-52.3	-13.0	-39.3	
5.715	-16.6	H	3.0	34.7	1.0	-50.4	-13.0	-37.4	
7.620	-14.7	H	3.0	34.9	1.0	-48.6	-13.0	-35.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_10M_QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 22

Band LTE2 10MHz QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855.0MHz									
3.710	-16.1	V	3.0	35.4	1.0	-50.5	-13.0	-37.5	
5.565	-17.4	V	3.0	34.7	1.0	-51.1	-13.0	-38.1	
7.420	-9.9	V	3.0	34.9	1.0	-43.8	-13.0	-30.8	
3.710	-19.0	H	3.0	35.4	1.0	-53.3	-13.0	-40.3	
5.565	-17.6	H	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.420	-14.7	H	3.0	34.9	1.0	-48.6	-13.0	-35.6	
Mid Ch, 1880.0MHz									
3.760	-16.7	V	3.0	35.3	1.0	-51.0	-13.0	-38.0	
5.640	-16.0	V	3.0	34.7	1.0	-49.8	-13.0	-36.8	
7.520	-15.5	V	3.0	34.9	1.0	-49.4	-13.0	-36.4	
3.760	-14.5	H	3.0	35.3	1.0	-48.8	-13.0	-35.8	
5.640	-17.6	H	3.0	34.7	1.0	-51.4	-13.0	-38.4	
7.520	-14.5	H	3.0	34.9	1.0	-48.4	-13.0	-35.4	
High Ch, 1905 MHz									
3.810	-17.1	V	3.0	35.3	1.0	-51.4	-13.0	-38.4	
5.715	-17.7	V	3.0	34.7	1.0	-51.4	-13.0	-38.4	
7.620	-14.6	V	3.0	34.9	1.0	-48.5	-13.0	-35.5	
3.810	-19.0	H	3.0	35.3	1.0	-53.3	-13.0	-40.3	
5.715	-16.8	H	3.0	34.7	1.0	-50.5	-13.0	-37.5	
7.620	-14.0	H	3.0	34.9	1.0	-48.0	-13.0	-35.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_5M_16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band LTE2 5MHz 16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5MHz									
3.705	-20.6	V	3.0	35.4	1.0	-55.0	-13.0	-42.0	
5.557	-17.6	V	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.410	-14.8	V	3.0	34.9	1.0	-48.7	-13.0	-35.7	
3.705	-12.8	H	3.0	35.4	1.0	-47.2	-13.0	-34.2	
5.557	-17.7	H	3.0	34.7	1.0	-51.4	-13.0	-38.4	
7.410	-14.2	H	3.0	34.9	1.0	-48.2	-13.0	-35.2	
Mid Ch, 1880.0MHz									
3.760	-14.2	V	3.0	35.3	1.0	-48.5	-13.0	-35.5	
5.640	-17.8	V	3.0	34.7	1.0	-51.5	-13.0	-38.5	
7.520	-13.5	V	3.0	34.9	1.0	-47.4	-13.0	-34.4	
3.760	-9.8	H	3.0	35.3	1.0	-44.1	-13.0	-31.1	
5.640	-18.1	H	3.0	34.7	1.0	-51.8	-13.0	-38.8	
7.520	-15.5	H	3.0	34.9	1.0	-49.4	-13.0	-36.4	
High Ch, 1907.5 MHz									
3.815	-10.7	V	3.0	35.3	1.0	-45.0	-13.0	-32.0	
5.722	-16.4	V	3.0	34.7	1.0	-50.2	-13.0	-37.2	
7.630	-15.0	V	3.0	34.9	1.0	-49.0	-13.0	-36.0	
3.815	-12.0	H	3.0	35.3	1.0	-46.3	-13.0	-33.3	
5.722	-17.6	H	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.630	-14.8	H	3.0	34.9	1.0	-48.8	-13.0	-35.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_5M_QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band LTE2 5MHz QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5MHz									
3.705	-18.9	V	3.0	35.4	1.0	-53.3	-13.0	-40.3	
5.557	-18.0	V	3.0	34.7	1.0	-51.7	-13.0	-38.7	
7.410	-14.3	V	3.0	34.9	1.0	-48.2	-13.0	-35.2	
3.705	-12.5	H	3.0	35.4	1.0	-46.9	-13.0	-33.9	
5.557	-17.0	H	3.0	34.7	1.0	-50.7	-13.0	-37.7	
7.410	-15.7	H	3.0	34.9	1.0	-49.6	-13.0	-36.6	
Mid Ch, 1880.0MHz									
3.760	-12.9	V	3.0	35.3	1.0	-47.3	-13.0	-34.3	
5.640	-17.6	V	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.520	-13.8	V	3.0	34.9	1.0	-47.7	-13.0	-34.7	
3.760	-13.8	H	3.0	35.3	1.0	-48.1	-13.0	-35.1	
5.640	-17.3	H	3.0	34.7	1.0	-51.1	-13.0	-38.1	
7.520	-14.6	H	3.0	34.9	1.0	-48.5	-13.0	-35.5	
High Ch, 1907.5 MHz									
3.815	-11.0	V	3.0	35.3	1.0	-45.3	-13.0	-32.3	
5.722	-16.8	V	3.0	34.7	1.0	-50.5	-13.0	-37.5	
7.630	-16.0	V	3.0	34.9	1.0	-50.0	-13.0	-37.0	
3.815	-11.7	H	3.0	35.3	1.0	-46.0	-13.0	-33.0	
5.722	-16.6	H	3.0	34.7	1.0	-50.4	-13.0	-37.4	
7.630	-13.9	H	3.0	34.9	1.0	-47.9	-13.0	-34.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_3M_HARM_16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band
LTE2
3MHz
16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5MHz									
3.703	-14.6	V	3.0	35.4	1.0	-49.0	-13.0	-36.0	
5.554	-18.4	V	3.0	34.7	1.0	-52.1	-13.0	-39.1	
7.406	-14.6	V	3.0	34.9	1.0	-48.5	-13.0	-35.5	
3.703	-19.6	H	3.0	35.4	1.0	-54.0	-13.0	-41.0	
5.554	-16.8	H	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.406	-14.7	H	3.0	34.9	1.0	-48.7	-13.0	-35.7	
Mid Ch, 1880.0MHz									
3.760	-12.3	V	3.0	35.3	1.0	-46.7	-13.0	-33.7	
5.640	-17.7	V	3.0	34.7	1.0	-51.5	-13.0	-38.5	
7.520	-16.4	V	3.0	34.9	1.0	-50.3	-13.0	-37.3	
3.760	-9.3	H	3.0	35.3	1.0	-43.6	-13.0	-30.6	
5.640	-17.5	H	3.0	34.7	1.0	-51.2	-13.0	-38.2	
7.520	-14.8	H	3.0	34.9	1.0	-48.7	-13.0	-35.7	
High Ch, 1908.5 MHz									
3.817	-14.9	V	3.0	35.3	1.0	-49.2	-13.0	-36.2	
5.725	-16.8	V	3.0	34.7	1.0	-50.5	-13.0	-37.5	
7.634	-10.0	V	3.0	34.9	1.0	-44.0	-13.0	-31.0	
3.817	-9.9	H	3.0	35.3	1.0	-44.2	-13.0	-31.2	
5.725	-16.1	H	3.0	34.7	1.0	-49.8	-13.0	-36.8	
7.634	-13.7	H	3.0	34.9	1.0	-47.7	-13.0	-34.7	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_3M_HARM_QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band
LTE2
3MHz
QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5MHz									
3.703	-15.4	V	3.0	35.4	1.0	-49.8	-13.0	-36.8	
5.554	-17.6	V	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.406	-15.6	V	3.0	34.9	1.0	-49.5	-13.0	-36.5	
3.703	-18.2	H	3.0	35.4	1.0	-52.6	-13.0	-39.6	
5.554	-17.2	H	3.0	34.7	1.0	-50.9	-13.0	-37.9	
7.406	-14.9	H	3.0	34.9	1.0	-48.8	-13.0	-35.8	
Mid Ch, 1880.0MHz									
3.760	-13.0	V	3.0	35.3	1.0	-47.4	-13.0	-34.4	
5.640	-16.8	V	3.0	34.7	1.0	-50.5	-13.0	-37.5	
7.520	-16.4	V	3.0	34.9	1.0	-50.4	-13.0	-37.4	
3.760	-12.3	H	3.0	35.3	1.0	-46.7	-13.0	-33.7	
5.640	-17.2	H	3.0	34.7	1.0	-50.9	-13.0	-37.9	
7.520	-14.2	H	3.0	34.9	1.0	-48.2	-13.0	-35.2	
High Ch, 1908.5 MHz									
3.817	-16.6	V	3.0	35.3	1.0	-50.8	-13.0	-37.8	
5.725	-17.5	V	3.0	34.7	1.0	-51.2	-13.0	-38.2	
7.634	-10.9	V	3.0	34.9	1.0	-44.9	-13.0	-31.9	
3.817	-9.9	H	3.0	35.3	1.0	-44.2	-13.0	-31.2	
5.725	-16.8	H	3.0	34.7	1.0	-50.5	-13.0	-37.5	
7.634	-14.6	H	3.0	34.9	1.0	-48.6	-13.0	-35.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_1.4M_HARM_16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band

LTE2

1.4MHz

16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.7MHz									
3.701	-13.2	V	3.0	35.4	1.0	-47.6	-13.0	-34.6	
5.552	-15.1	V	3.0	34.7	1.0	-48.8	-13.0	-35.8	
7.403	-12.9	V	3.0	34.9	1.0	-46.8	-13.0	-33.8	
3.701	-7.5	H	3.0	35.4	1.0	-41.9	-13.0	-28.9	
5.552	-16.6	H	3.0	34.7	1.0	-50.3	-13.0	-37.3	
7.403	-15.0	H	3.0	34.9	1.0	-48.9	-13.0	-35.9	
Mid Ch, 1880.0MHz									
3.760	-14.4	V	3.0	35.3	1.0	-48.7	-13.0	-35.7	
5.640	-17.9	V	3.0	34.7	1.0	-51.6	-13.0	-38.6	
7.520	-15.6	V	3.0	34.9	1.0	-49.5	-13.0	-36.5	
3.760	-6.5	H	3.0	35.3	1.0	-40.9	-13.0	-27.9	
5.640	-17.2	H	3.0	34.7	1.0	-51.0	-13.0	-38.0	
7.520	-13.8	H	3.0	34.9	1.0	-47.8	-13.0	-34.8	
High Ch, 1909.3 MHz									
3.819	-16.1	V	3.0	35.3	1.0	-50.4	-13.0	-37.4	
5.728	-17.4	V	3.0	34.7	1.0	-51.2	-13.0	-38.2	
7.637	-13.1	V	3.0	35.0	1.0	-47.0	-13.0	-34.0	
3.819	-9.5	H	3.0	35.3	1.0	-43.8	-13.0	-30.8	
5.728	-17.7	H	3.0	34.7	1.0	-51.4	-13.0	-38.4	
7.637	-13.3	H	3.0	35.0	1.0	-47.2	-13.0	-34.2	

Rev. 03.03.09

Note: No other emissions were detected above the system noise floor.

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: LTE2_1.4M_HARM_QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band
LTE2
1.4MHz
QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.7MHz									
3.701	-15.7	V	3.0	35.4	1.0	-50.1	-13.0	-37.1	
5.552	-16.6	V	3.0	34.7	1.0	-50.4	-13.0	-37.4	
7.403	-14.9	V	3.0	34.9	1.0	-48.8	-13.0	-35.8	
3.701	-12.5	H	3.0	35.4	1.0	-46.9	-13.0	-33.9	
5.552	-18.4	H	3.0	34.7	1.0	-52.1	-13.0	-39.1	
7.403	-15.1	H	3.0	34.9	1.0	-49.0	-13.0	-36.0	
Mid Ch, 1880.0MHz									
3.760	-14.6	V	3.0	35.3	1.0	-48.9	-13.0	-35.9	
5.640	-17.9	V	3.0	34.7	1.0	-51.6	-13.0	-38.6	
7.520	-15.2	V	3.0	34.9	1.0	-49.1	-13.0	-36.1	
3.760	-10.9	H	3.0	35.3	1.0	-45.2	-13.0	-32.2	
5.640	-17.1	H	3.0	34.7	1.0	-50.9	-13.0	-37.9	
7.520	-15.0	H	3.0	34.9	1.0	-49.0	-13.0	-36.0	
High Ch, 1909.3 MHz									
3.819	-15.3	V	3.0	35.3	1.0	-49.5	-13.0	-36.5	
5.728	-17.1	V	3.0	34.7	1.0	-50.9	-13.0	-37.9	
7.637	-15.3	V	3.0	35.0	1.0	-49.2	-13.0	-36.2	
3.819	-9.9	H	3.0	35.3	1.0	-44.1	-13.0	-31.1	
5.728	-17.6	H	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.637	-14.5	H	3.0	35.0	1.0	-48.4	-13.0	-35.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_16QAM Band 4 Harmonics, 20MHz Bandwidth

Band
LTE4
20MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1720									
3440.00	-16.5	V	3.0	36.0	1.0	-51.6	-13.0	-38.6	
5160.00	-13.8	V	3.0	35.4	1.0	-48.2	-13.0	-35.2	
6880.00	-12.9	V	3.0	35.7	1.0	-47.5	-13.0	-34.5	
3440.00	-16.8	H	3.0	36.0	1.0	-51.8	-13.0	-38.8	
5160.00	-12.9	H	3.0	35.4	1.0	-47.3	-13.0	-34.3	
6880.00	-11.1	H	3.0	35.7	1.0	-45.7	-13.0	-32.7	
Mid Ch, 1732.5									
3465.00	-16.5	V	3.0	36.0	1.0	-51.5	-13.0	-38.5	
5197.50	-13.7	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6930.00	-12.6	V	3.0	35.7	1.0	-47.2	-13.0	-34.2	
3465.00	-17.0	H	3.0	36.0	1.0	-52.1	-13.0	-39.1	
5197.50	-12.5	H	3.0	35.4	1.0	-46.9	-13.0	-33.9	
6930.00	-11.5	H	3.0	35.7	1.0	-46.2	-13.0	-33.2	
High Ch, 1745									
3490.00	-16.7	V	3.0	36.0	1.0	-51.7	-13.0	-38.7	
5235.00	-13.5	V	3.0	35.4	1.0	-47.9	-13.0	-34.9	
6980.00	-12.5	V	3.0	35.7	1.0	-47.2	-13.0	-34.2	
3490.00	-16.9	H	3.0	36.0	1.0	-51.9	-13.0	-38.9	
5235.00	-12.4	H	3.0	35.4	1.0	-46.8	-13.0	-33.8	
6980.00	-11.9	H	3.0	35.7	1.0	-46.5	-13.0	-33.5	

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_QPSK Band 4 Harmonics, 20MHz Bandwidth

Band
LTE4
20MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1720									
3440.00	-16.3	V	3.0	36.0	1.0	-51.3	-13.0	-38.3	
5160.00	-13.6	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6880.00	-12.2	V	3.0	35.7	1.0	-46.9	-13.0	-33.9	
3440.00	-17.0	H	3.0	36.0	1.0	-52.0	-13.0	-39.0	
5160.00	-13.0	H	3.0	35.4	1.0	-47.4	-13.0	-34.4	
6880.00	-11.0	H	3.0	35.7	1.0	-45.7	-13.0	-32.7	
Mid Ch, 1732.5									
3465.00	-17.4	V	3.0	36.0	1.0	-52.4	-13.0	-39.4	
5197.50	-13.6	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6930.00	-13.2	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
3465.00	-16.7	H	3.0	36.0	1.0	-51.7	-13.0	-38.7	
5197.50	-12.4	H	3.0	35.4	1.0	-46.8	-13.0	-33.8	
6930.00	-11.4	H	3.0	35.7	1.0	-46.0	-13.0	-33.0	
High Ch, 1745									
3490.00	-17.1	V	3.0	36.0	1.0	-52.1	-13.0	-39.1	
5235.00	-12.7	V	3.0	35.4	1.0	-47.1	-13.0	-34.1	
6980.00	-13.2	V	3.0	35.7	1.0	-47.9	-13.0	-34.9	
3490.00	-16.1	H	3.0	36.0	1.0	-51.2	-13.0	-38.2	
5235.00	-12.6	H	3.0	35.4	1.0	-47.0	-13.0	-34.0	
6980.00	-10.9	H	3.0	35.7	1.0	-45.6	-13.0	-32.6	

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_16QAM Band 4 Harmonics, 15MHz Bandwidth

Band
LTE4
15MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5									
3435.00	-16.7	V	3.0	36.1	1.0	-51.7	-13.0	-38.7	
5152.50	-12.9	V	3.0	35.4	1.0	-47.4	-13.0	-34.4	
6870.00	-11.7	V	3.0	35.7	1.0	-46.4	-13.0	-33.4	
3435.00	-16.8	H	3.0	36.1	1.0	-51.8	-13.0	-38.8	
5152.50	-11.4	H	3.0	35.4	1.0	-45.9	-13.0	-32.9	
6870.00	0.0	H	3.0	35.7	1.0	-34.7	-13.0	-21.7	
Mid Ch, 1732.5									
3465.00	-16.0	V	3.0	36.0	1.0	-51.0	-13.0	-38.0	
5197.50	-13.5	V	3.0	35.4	1.0	-47.9	-13.0	-34.9	
6930.00	-12.4	V	3.0	35.7	1.0	-47.1	-13.0	-34.1	
3465.00	-15.8	H	3.0	36.0	1.0	-50.8	-13.0	-37.8	
5197.50	-13.3	H	3.0	35.4	1.0	-47.7	-13.0	-34.7	
6930.00	-11.0	H	3.0	35.7	1.0	-45.7	-13.0	-32.7	
High Ch, 1747.5									
3495.00	-16.1	V	3.0	36.0	1.0	-51.1	-13.0	-38.1	
5242.50	-13.6	V	3.0	35.4	1.0	-48.0	-13.0	-35.0	
6990.00	-12.4	V	3.0	35.7	1.0	-47.1	-13.0	-34.1	
3495.00	-16.7	H	3.0	36.0	1.0	-51.7	-13.0	-38.7	
5242.50	-12.9	H	3.0	35.4	1.0	-47.4	-13.0	-34.4	
6990.00	-11.0	H	3.0	35.7	1.0	-45.7	-13.0	-32.7	

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_QPSK Band 4 Harmonics, 15MHz Bandwidth

Band
LTE4
15MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1717.5									
3435.00	-16.1	V	3.0	36.1	1.0	-51.1	-13.0	-38.1	
5152.50	-13.6	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6870.00	-12.1	V	3.0	35.7	1.0	-46.7	-13.0	-33.7	
3435.00	-16.4	H	3.0	36.1	1.0	-51.4	-13.0	-38.4	
5152.50	-12.6	H	3.0	35.4	1.0	-47.0	-13.0	-34.0	
6870.00	-9.7	H	3.0	35.7	1.0	-44.3	-13.0	-31.3	
Mid Ch, 1732.5									
3465.00	-16.8	V	3.0	36.0	1.0	-51.8	-13.0	-38.8	
5197.50	-13.3	V	3.0	35.4	1.0	-47.7	-13.0	-34.7	
6930.00	-11.3	V	3.0	35.7	1.0	-46.0	-13.0	-33.0	
3465.00	-16.5	H	3.0	36.0	1.0	-51.5	-13.0	-38.5	
5197.50	-12.9	H	3.0	35.4	1.0	-47.3	-13.0	-34.3	
6930.00	-10.0	H	3.0	35.7	1.0	-44.7	-13.0	-31.7	
High Ch, 1747.5									
3495.00	-16.7	V	3.0	36.0	1.0	-51.7	-13.0	-38.7	
5242.50	-13.4	V	3.0	35.4	1.0	-47.8	-13.0	-34.8	
6990.00	-12.3	V	3.0	35.7	1.0	-47.0	-13.0	-34.0	
3495.00	-16.1	H	3.0	36.0	1.0	-51.1	-13.0	-38.1	
5242.50	-12.7	H	3.0	35.4	1.0	-47.2	-13.0	-34.2	
6990.00	-10.9	H	3.0	35.7	1.0	-45.6	-13.0	-32.6	

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Configuration: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_16QAM Band 4 Harmonics, 10MHz Bandwidth

Band
LTE4
10MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1715									
3430.00	-17.2	V	3.0	36.1	1.0	-52.2	-13.0	-39.2	
5145.00	-13.2	V	3.0	35.4	1.0	-47.7	-13.0	-34.7	
6860.00	-12.7	V	3.0	35.7	1.0	-47.4	-13.0	-34.4	
3430.00	-17.4	H	3.0	36.1	1.0	-52.4	-13.0	-39.4	
5145.00	-13.6	H	3.0	35.4	1.0	-48.0	-13.0	-35.0	
6860.00	-11.6	H	3.0	35.7	1.0	-46.3	-13.0	-33.3	
Mid Ch, 1732.5									
3465.00	-16.8	V	3.0	36.0	1.0	-51.8	-13.0	-38.8	
5197.50	-13.6	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6930.00	-12.4	V	3.0	35.7	1.0	-47.1	-13.0	-34.1	
3465.00	-16.6	H	3.0	36.0	1.0	-51.6	-13.0	-38.6	
5197.50	-13.2	H	3.0	35.4	1.0	-47.6	-13.0	-34.6	
6930.00	-11.4	H	3.0	35.7	1.0	-46.1	-13.0	-33.1	
High Ch, 1750									
3500.00	-16.7	V	3.0	36.0	1.0	-51.7	-13.0	-38.7	
5250.00	-13.4	V	3.0	35.4	1.0	-47.8	-13.0	-34.8	
7000.00	-12.4	V	3.0	35.7	1.0	-47.1	-13.0	-34.1	
3500.00	-17.2	H	3.0	36.0	1.0	-52.2	-13.0	-39.2	
5250.00	-11.7	H	3.0	35.4	1.0	-46.2	-13.0	-33.2	
7000.00	-11.5	H	3.0	35.7	1.0	-46.2	-13.0	-33.2	

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Configuration: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_QPSK Band 4 Harmonics, 10MHz Bandwidth

Band
LTE4
10MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1715									
3430.00	-17.1	V	3.0	36.1	1.0	-52.2	-13.0	-39.2	
5145.00	-13.9	V	3.0	35.4	1.0	-48.3	-13.0	-35.3	
6860.00	-12.8	V	3.0	35.7	1.0	-47.4	-13.0	-34.4	
3430.00	-17.1	H	3.0	36.1	1.0	-52.2	-13.0	-39.2	
5145.00	-13.5	H	3.0	35.4	1.0	-47.9	-13.0	-34.9	
6860.00	-11.2	H	3.0	35.7	1.0	-45.8	-13.0	-32.8	
Mid Ch, 1732.5									
3465.00	-16.4	V	3.0	36.0	1.0	-51.4	-13.0	-38.4	
5197.50	-13.9	V	3.0	35.4	1.0	-48.3	-13.0	-35.3	
6930.00	-14.2	V	3.0	35.7	1.0	-48.9	-13.0	-35.9	
3465.00	-16.6	H	3.0	36.0	1.0	-51.6	-13.0	-38.6	
5197.50	-13.0	H	3.0	35.4	1.0	-47.4	-13.0	-34.4	
6930.00	-11.8	H	3.0	35.7	1.0	-46.5	-13.0	-33.5	
High Ch, 1750									
3500.00	-16.9	V	3.0	36.0	1.0	-51.9	-13.0	-38.9	
5250.00	-13.5	V	3.0	35.4	1.0	-47.9	-13.0	-34.9	
7000.00	-13.2	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
3500.00	-16.2	H	3.0	36.0	1.0	-51.2	-13.0	-38.2	
5250.00	-13.1	H	3.0	35.4	1.0	-47.5	-13.0	-34.5	
7000.00	-11.1	H	3.0	35.7	1.0	-45.7	-13.0	-32.7	

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_16QAM Band 4 Harmonics, 5MHz Bandwidth

Band
LTE4
5MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.5									
3425.00	-15.2	V	3.0	36.1	1.0	-50.2	-13.0	-37.2	
5137.50	-14.2	V	3.0	35.4	1.0	-48.6	-13.0	-35.6	
6850.00	-12.8	V	3.0	35.7	1.0	-47.5	-13.0	-34.5	
3425.00	-12.8	H	3.0	36.1	1.0	-47.8	-13.0	-34.8	
5137.50	-13.4	H	3.0	35.4	1.0	-47.8	-13.0	-34.8	
6850.00	-11.2	H	3.0	35.7	1.0	-45.9	-13.0	-32.9	
Mid Ch, 1732.5									
3465.00	-16.6	V	3.0	36.0	1.0	-51.6	-13.0	-38.6	
5197.50	-13.3	V	3.0	35.4	1.0	-47.7	-13.0	-34.7	
6930.00	-13.1	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
3465.00	-14.2	H	3.0	36.0	1.0	-49.3	-13.0	-36.3	
5197.50	-13.0	H	3.0	35.4	1.0	-47.5	-13.0	-34.5	
6930.00	-11.5	H	3.0	35.7	1.0	-46.2	-13.0	-33.2	
High Ch, 1752.5									
3505.00	-17.0	V	3.0	36.0	1.0	-52.0	-13.0	-39.0	
5257.50	-14.0	V	3.0	35.4	1.0	-48.4	-13.0	-35.4	
7010.00	-13.2	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
3505.00	-13.9	H	3.0	36.0	1.0	-48.9	-13.0	-35.9	
5257.50	-12.9	H	3.0	35.4	1.0	-47.4	-13.0	-34.4	
7010.00	-11.0	H	3.0	35.7	1.0	-45.7	-13.0	-32.7	

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_QPSK Band 4 Harmonics, 5MHz Bandwidth

Band
LTE4
5MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.5									
3425.00	-14.4	V	3.0	36.1	1.0	-49.5	-13.0	-36.5	
5137.50	-13.7	V	3.0	35.4	1.0	-48.2	-13.0	-35.2	
6850.00	-12.8	V	3.0	35.7	1.0	-47.5	-13.0	-34.5	
3425.00	-13.8	H	3.0	36.1	1.0	-48.9	-13.0	-35.9	
5137.50	-13.6	H	3.0	35.4	1.0	-48.0	-13.0	-35.0	
6850.00	-10.5	H	3.0	35.7	1.0	-45.2	-13.0	-32.2	
Mid Ch, 1732.5									
3465.00	-13.8	V	3.0	36.0	1.0	-48.8	-13.0	-35.8	
5197.50	-14.0	V	3.0	35.4	1.0	-48.4	-13.0	-35.4	
6930.00	-12.7	V	3.0	35.7	1.0	-47.4	-13.0	-34.4	
3465.00	-14.3	H	3.0	36.0	1.0	-49.4	-13.0	-36.4	
5197.50	-13.1	H	3.0	35.4	1.0	-47.5	-13.0	-34.5	
6930.00	-11.2	H	3.0	35.7	1.0	-45.8	-13.0	-32.8	
High Ch, 1752.5									
3505.00	-16.7	V	3.0	36.0	1.0	-51.7	-13.0	-38.7	
5257.50	-13.6	V	3.0	35.4	1.0	-48.0	-13.0	-35.0	
7010.00	-13.2	V	3.0	35.7	1.0	-47.9	-13.0	-34.9	
3505.00	-14.5	H	3.0	36.0	1.0	-49.6	-13.0	-36.6	
5257.50	-13.8	H	3.0	35.4	1.0	-48.2	-13.0	-35.2	
7010.00	-11.8	H	3.0	35.7	1.0	-46.5	-13.0	-33.5	

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_16QAM Band 4 Harmonics, 3MHz Bandwidth

Band
LTE4
3MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5									
3423.00	-17.0	V	3.0	36.1	1.0	-52.0	-13.0	-39.0	
5134.50	-14.8	V	3.0	35.4	1.0	-49.2	-13.0	-36.2	
6846.00	-11.4	V	3.0	35.7	1.0	-46.1	-13.0	-33.1	
3423.00	-12.4	H	3.0	36.1	1.0	-47.5	-13.0	-34.5	
5134.50	-14.0	H	3.0	35.4	1.0	-48.5	-13.0	-35.5	
6846.00	-11.2	H	3.0	35.7	1.0	-45.9	-13.0	-32.9	
Mid Ch, 1732.5									
3465.00	-17.2	V	3.0	36.0	1.0	-52.2	-13.0	-39.2	
5197.50	-13.2	V	3.0	35.4	1.0	-47.6	-13.0	-34.6	
6930.00	-12.7	V	3.0	35.7	1.0	-47.3	-13.0	-34.3	
3465.00	-16.5	H	3.0	36.0	1.0	-51.6	-13.0	-38.6	
5197.50	-13.7	H	3.0	35.4	1.0	-48.2	-13.0	-35.2	
6930.00	-11.3	H	3.0	35.7	1.0	-46.0	-13.0	-33.0	
High Ch, 1753.5									
3507.00	-16.6	V	3.0	36.0	1.0	-51.6	-13.0	-38.6	
5260.50	-13.1	V	3.0	35.4	1.0	-47.6	-13.0	-34.6	
7014.00	-11.8	V	3.0	35.7	1.0	-46.4	-13.0	-33.4	
3507.00	-15.0	H	3.0	36.0	1.0	-50.0	-13.0	-37.0	
5260.50	-13.3	H	3.0	35.4	1.0	-47.8	-13.0	-34.8	
7014.00	-11.3	H	3.0	35.7	1.0	-46.0	-13.0	-33.0	

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Compliance Certification Services
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Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_QPSK Band 4 Harmonics, 3MHz Bandwidth

Band
LTE4
3MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1711.5									
3423.00	-8.5	V	3.0	36.1	1.0	-43.5	-13.0	-30.5	
5134.50	-14.5	V	3.0	35.4	1.0	-48.9	-13.0	-35.9	
6846.00	-12.6	V	3.0	35.7	1.0	-47.3	-13.0	-34.3	
3423.00	-12.8	H	3.0	36.1	1.0	-47.9	-13.0	-34.9	
5134.50	-13.2	H	3.0	35.4	1.0	-47.6	-13.0	-34.6	
6846.00	-10.8	H	3.0	35.7	1.0	-45.5	-13.0	-32.5	
Mid Ch, 1732.5									
3465.00	-17.0	V	3.0	36.0	1.0	-52.0	-13.0	-39.0	
5197.50	-13.9	V	3.0	35.4	1.0	-48.4	-13.0	-35.4	
6930.00	-12.5	V	3.0	35.7	1.0	-47.1	-13.0	-34.1	
3465.00	-17.1	H	3.0	36.0	1.0	-52.1	-13.0	-39.1	
5197.50	-13.6	H	3.0	35.4	1.0	-48.0	-13.0	-35.0	
6930.00	-11.4	H	3.0	35.7	1.0	-46.1	-13.0	-33.1	
High Ch, 1753.5									
3507.00	-17.0	V	3.0	36.0	1.0	-52.0	-13.0	-39.0	
5260.50	-13.8	V	3.0	35.4	1.0	-48.2	-13.0	-35.2	
7014.00	-11.7	V	3.0	35.7	1.0	-46.4	-13.0	-33.4	
3507.00	-14.7	H	3.0	36.0	1.0	-49.7	-13.0	-36.7	
5260.50	-13.1	H	3.0	35.4	1.0	-47.5	-13.0	-34.5	
7014.00	-10.6	H	3.0	35.7	1.0	-45.3	-13.0	-32.3	

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Compliance Certification Services
bove 1GHz High Frequency Substitution Measuremer

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_16QAM Band 4 Harmonics, 1.4MHz Bandwidth

Band
LTE4
1.4MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1710.7									
3421.40	-12.3	V	3.0	36.1	1.0	-47.3	-13.0	-34.3	
5132.10	-14.5	V	3.0	35.4	1.0	-49.0	-13.0	-36.0	
6842.80	-11.2	V	3.0	35.7	1.0	-45.9	-13.0	-32.9	
3421.40	-9.0	H	3.0	36.1	1.0	-44.0	-13.0	-31.0	
5132.10	-13.9	H	3.0	35.4	1.0	-48.4	-13.0	-35.4	
6842.80	-11.8	H	3.0	35.7	1.0	-46.4	-13.0	-33.4	
Mid Ch, 1732.5									
3465.00	-14.8	V	3.0	36.0	1.0	-49.8	-13.0	-36.8	
5197.50	-14.0	V	3.0	35.4	1.0	-48.5	-13.0	-35.5	
6930.00	-11.4	V	3.0	35.7	1.0	-46.0	-13.0	-33.0	
3465.00	-10.3	H	3.0	36.0	1.0	-45.4	-13.0	-32.4	
5197.50	-13.3	H	3.0	35.4	1.0	-47.8	-13.0	-34.8	
6930.00	-11.1	H	3.0	35.7	1.0	-45.8	-13.0	-32.8	
High Ch, 1754.3									
3508.60	-15.6	V	3.0	36.0	1.0	-50.6	-13.0	-37.6	
5262.90	-12.8	V	3.0	35.4	1.0	-47.2	-13.0	-34.2	
7017.20	-9.5	V	3.0	35.7	1.0	-44.2	-13.0	-31.2	
3508.60	-15.8	H	3.0	36.0	1.0	-50.8	-13.0	-37.8	
5262.90	-12.3	H	3.0	35.4	1.0	-46.7	-13.0	-33.7	
7017.20	-10.3	H	3.0	35.7	1.0	-45.0	-13.0	-32.0	

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT , AC Adapter, Headset, X Position
Location: Chamber G
Mode: LTE_QPSK Band 4 Harmonics, 1.4MHz Bandwidth

Band
LTE4
1.4MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1710.7									
3421.40	-11.9	V	3.0	36.1	1.0	-46.9	-13.0	-33.9	
5132.10	-13.9	V	3.0	35.4	1.0	-48.4	-13.0	-35.4	
6842.80	-11.6	V	3.0	35.7	1.0	-46.3	-13.0	-33.3	
3421.40	-9.4	H	3.0	36.1	1.0	-44.4	-13.0	-31.4	
5132.10	-13.9	H	3.0	35.4	1.0	-48.3	-13.0	-35.3	
6842.80	-9.9	H	3.0	35.7	1.0	-44.5	-13.0	-31.5	
Mid Ch, 1732.5									
3465.00	-15.3	V	3.0	36.0	1.0	-50.3	-13.0	-37.3	
5197.50	-13.6	V	3.0	35.4	1.0	-48.1	-13.0	-35.1	
6930.00	-11.6	V	3.0	35.7	1.0	-46.3	-13.0	-33.3	
3465.00	-9.8	H	3.0	36.0	1.0	-44.9	-13.0	-31.9	
5197.50	-14.1	H	3.0	35.4	1.0	-48.5	-13.0	-35.5	
6930.00	-10.7	H	3.0	35.7	1.0	-45.3	-13.0	-32.3	
High Ch, 1754.3									
3508.60	-15.1	V	3.0	36.0	1.0	-50.1	-13.0	-37.1	
5262.90	-13.5	V	3.0	35.4	1.0	-48.0	-13.0	-35.0	
7017.20	-9.8	V	3.0	35.7	1.0	-44.5	-13.0	-31.5	
3508.60	-16.3	H	3.0	36.0	1.0	-51.3	-13.0	-38.3	
5262.90	-12.8	H	3.0	35.4	1.0	-47.2	-13.0	-34.2	
7017.20	-10.8	H	3.0	35.7	1.0	-45.5	-13.0	-32.5	

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Band

Band 2

HSDPA

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: HSDPA_B2

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3.705	-16.4	V	3.0	35.4	1.0	-50.8	-13.0	-37.8	
5.557	-16.4	V	3.0	34.7	1.0	-50.1	-13.0	-37.1	
7.410	-13.2	V	3.0	34.9	1.0	-47.1	-13.0	-34.1	
3.705	-17.5	H	3.0	35.4	1.0	-51.9	-13.0	-38.9	
5.557	-15.1	H	3.0	34.7	1.0	-48.8	-13.0	-35.8	
7.410	-12.0	H	3.0	34.9	1.0	-45.9	-13.0	-32.9	
Mid Ch, 1880MHz									
3.760	-17.6	V	3.0	35.3	1.0	-51.9	-13.0	-38.9	
5.640	-14.8	V	3.0	34.7	1.0	-48.6	-13.0	-35.6	
7.520	-12.9	V	3.0	34.9	1.0	-46.8	-13.0	-33.8	
3.760	-18.4	H	3.0	35.3	1.0	-52.7	-13.0	-39.7	
5.640	-15.9	H	3.0	34.7	1.0	-49.6	-13.0	-36.6	
7.520	-13.3	H	3.0	34.9	1.0	-47.2	-13.0	-34.2	
High Ch, 1907.6MHz									
3.815	-14.3	V	3.0	35.3	1.0	-48.6	-13.0	-35.6	
5.723	-15.0	V	3.0	34.7	1.0	-48.7	-13.0	-35.7	
7.630	-11.6	V	3.0	34.9	1.0	-45.6	-13.0	-32.6	
3.815	-15.1	H	3.0	35.3	1.0	-49.4	-13.0	-36.4	
5.723	-15.7	H	3.0	34.7	1.0	-49.4	-13.0	-36.4	
7.630	-10.5	H	3.0	34.9	1.0	-44.4	-13.0	-31.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 03/03/15
Test Engineer: Jude Semana
Configuration: X-pos EUT w/ AC Charger + HS
Mode: REL99_B2

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 24

Band

Band 2

REL99

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3.705	-18.2	V	3.0	35.4	1.0	-52.6	-13.0	-39.6	
5.557	-14.6	V	3.0	34.7	1.0	-48.4	-13.0	-35.4	
7.410	-11.9	V	3.0	34.9	1.0	-45.8	-13.0	-32.8	
3.705	-17.9	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
5.557	-12.9	H	3.0	34.7	1.0	-46.7	-13.0	-33.7	
7.410	-10.7	H	3.0	34.9	1.0	-44.6	-13.0	-31.6	
Mid Ch, 1880MHz									
3.760	-16.6	V	3.0	35.3	1.0	-51.0	-13.0	-38.0	
5.640	-13.5	V	3.0	34.7	1.0	-47.2	-13.0	-34.2	
7.520	-10.8	V	3.0	34.9	1.0	-44.7	-13.0	-31.7	
3.760	-17.1	H	3.0	35.3	1.0	-51.4	-13.0	-38.4	
5.640	-13.4	H	3.0	34.7	1.0	-47.1	-13.0	-34.1	
7.520	-10.0	H	3.0	34.9	1.0	-43.9	-13.0	-30.9	
High Ch, 1907.6MHz									
3.815	-16.4	V	3.0	35.3	1.0	-50.7	-13.0	-37.7	
5.723	-13.9	V	3.0	34.7	1.0	-47.7	-13.0	-34.7	
7.630	-11.0	V	3.0	34.9	1.0	-44.9	-13.0	-31.9	
3.815	-14.1	H	3.0	35.3	1.0	-48.3	-13.0	-35.3	
5.723	-12.5	H	3.0	34.7	1.0	-46.2	-13.0	-33.2	
7.630	-11.1	H	3.0	34.9	1.0	-45.1	-13.0	-32.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 02/26/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: HSDPA_B5

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 22

Band

Band 5

HSDPA

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1.653	0.2	V	3.0	37.4	1.0	-36.1	-13.0	-23.1	
2.479	-22.7	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
3.306	-29.1	V	3.0	35.8	1.0	-63.9	-13.0	-50.9	
1.653	-8.5	H	3.0	37.4	1.0	-44.9	-13.0	-31.9	
2.479	-31.0	H	3.0	36.4	1.0	-66.4	-13.0	-53.4	
3.306	-29.5	H	3.0	35.8	1.0	-64.3	-13.0	-51.3	
Mid Ch, 836.6MHz									
1.673	-16.5	V	3.0	37.3	1.0	-52.8	-13.0	-39.8	
2.510	-28.3	V	3.0	36.4	1.0	-63.7	-13.0	-50.7	
3.346	-29.1	V	3.0	35.8	1.0	-63.9	-13.0	-50.9	
1.673	-8.9	H	3.0	37.3	1.0	-45.3	-13.0	-32.3	
2.510	-32.4	H	3.0	36.4	1.0	-67.7	-13.0	-54.7	
3.346	-29.5	H	3.0	35.8	1.0	-64.3	-13.0	-51.3	
High Ch, 846.6MHz									
1.693	-2.6	V	3.0	37.3	1.0	-38.9	-13.0	-25.9	
2.540	-21.2	V	3.0	36.3	1.0	-56.5	-13.0	-43.5	
3.386	-29.0	V	3.0	35.7	1.0	-63.7	-13.0	-50.7	
1.693	-8.7	H	3.0	37.3	1.0	-45.0	-13.0	-32.0	
2.540	-29.7	H	3.0	36.3	1.0	-65.1	-13.0	-52.1	
3.386	-29.6	H	3.0	35.7	1.0	-64.3	-13.0	-51.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 02/26/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: REL99_B5

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 22

Band

Band 5

REL99

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1.653	-0.1	V	3.0	37.4	1.0	-36.5	-13.0	-23.5	
2.479	-26.0	V	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3.306	-29.1	V	3.0	35.8	1.0	-63.9	-13.0	-50.9	
1.653	-8.8	H	3.0	37.4	1.0	-45.2	-13.0	-32.2	
2.479	-31.3	H	3.0	36.4	1.0	-66.7	-13.0	-53.7	
3.306	-29.5	H	3.0	35.8	1.0	-64.3	-13.0	-51.3	
Mid Ch, 836.6MHz									
1.673	-0.2	V	3.0	37.3	1.0	-36.5	-13.0	-23.5	
2.510	-21.5	V	3.0	36.4	1.0	-56.9	-13.0	-43.9	
3.346	-29.3	V	3.0	35.8	1.0	-64.0	-13.0	-51.0	
1.673	-7.5	H	3.0	37.3	1.0	-43.9	-13.0	-30.9	
2.510	-31.5	H	3.0	36.4	1.0	-66.8	-13.0	-53.8	
3.346	-29.5	H	3.0	35.8	1.0	-64.2	-13.0	-51.2	
High Ch, 846.6MHz									
1.693	-2.2	V	3.0	37.3	1.0	-38.5	-13.0	-25.5	
2.540	-23.3	V	3.0	36.3	1.0	-58.7	-13.0	-45.7	
3.386	-29.0	V	3.0	35.7	1.0	-63.7	-13.0	-50.7	
1.693	-8.8	H	3.0	37.3	1.0	-45.1	-13.0	-32.1	
2.540	-27.8	H	3.0	36.3	1.0	-63.1	-13.0	-50.1	
3.386	-29.5	H	3.0	35.7	1.0	-64.3	-13.0	-51.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT/AC Charger/HS
Location: Chamber G
Mode: HSDPA Band 4 Harmonics

Band
Band 4
HSDPA

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4									
3424.80	-15.3	V	3.0	35.9	1.0	-50.2	-13.0	-37.2	
5137.20	-13.5	V	3.0	35.5	1.0	-48.0	-13.0	-35.0	
6849.60	-11.9	V	3.0	35.7	1.0	-46.6	-13.0	-33.6	
3424.80	-16.7	H	3.0	35.9	1.0	-51.6	-13.0	-38.6	
5137.20	-13.7	H	3.0	35.5	1.0	-48.1	-13.0	-35.1	
6849.60	-10.0	H	3.0	35.7	1.0	-44.7	-13.0	-31.7	
Mid Ch, 1732.6									
3465.20	-14.6	V	3.0	35.8	1.0	-49.4	-13.0	-36.4	
5197.80	-13.0	V	3.0	35.5	1.0	-47.5	-13.0	-34.5	
6930.04	-11.3	V	3.0	35.7	1.0	-46.1	-13.0	-33.1	
3465.20	-14.3	H	3.0	35.8	1.0	-49.1	-13.0	-36.1	
5197.80	-12.2	H	3.0	35.5	1.0	-46.7	-13.0	-33.7	
6930.04	-10.4	H	3.0	35.7	1.0	-45.2	-13.0	-32.2	
High Ch, 1752.6									
3505.20	-16.0	V	3.0	35.8	1.0	-50.8	-13.0	-37.8	
5257.80	-12.7	V	3.0	35.5	1.0	-47.2	-13.0	-34.2	
7010.40	-11.3	V	3.0	35.8	1.0	-46.1	-13.0	-33.1	
3505.20	-16.0	H	3.0	35.8	1.0	-50.8	-13.0	-37.8	
5257.80	-11.8	H	3.0	35.5	1.0	-46.3	-13.0	-33.3	
7010.40	-10.2	H	3.0	35.8	1.0	-45.0	-13.0	-32.0	

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 3/3/2015
Test Engineer: Jude Semana
Configuration: EUT/AC Charger/HS
Location: Chamber G
Mode: Rel 99 Band 4 Harmonics

Band

Band 4

REL99

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4									
3424.80	-16.7	V	3.0	35.9	1.0	-51.5	-13.0	-38.5	
5137.20	-14.3	V	3.0	35.5	1.0	-48.7	-13.0	-35.7	
6849.60	-11.3	V	3.0	35.7	1.0	-46.0	-13.0	-33.0	
3424.80	-15.1	H	3.0	35.9	1.0	-49.9	-13.0	-36.9	
5137.20	-12.9	H	3.0	35.5	1.0	-47.4	-13.0	-34.4	
6849.60	-10.1	H	3.0	35.7	1.0	-44.9	-13.0	-31.9	
Mid Ch, 1732.6									
3465.20	-16.0	V	3.0	35.8	1.0	-50.8	-13.0	-37.8	
5197.80	-12.8	V	3.0	35.5	1.0	-47.3	-13.0	-34.3	
6930.04	-10.3	V	3.0	35.7	1.0	-45.0	-13.0	-32.0	
3465.20	-13.8	H	3.0	35.8	1.0	-48.6	-13.0	-35.6	
5197.80	-12.1	H	3.0	35.5	1.0	-46.6	-13.0	-33.6	
6930.04	-10.3	H	3.0	35.7	1.0	-45.0	-13.0	-32.0	
High Ch, 1752.6									
3505.20	-16.0	V	3.0	35.8	1.0	-50.8	-13.0	-37.8	
5257.80	-13.1	V	3.0	35.5	1.0	-47.6	-13.0	-34.6	
7010.40	-10.9	V	3.0	35.8	1.0	-45.6	-13.0	-32.6	
3505.20	-15.6	H	3.0	35.8	1.0	-50.4	-13.0	-37.4	
5257.80	-12.2	H	3.0	35.5	1.0	-46.7	-13.0	-33.7	
7010.40	-9.8	H	3.0	35.8	1.0	-44.6	-13.0	-31.6	

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: GSM 1900 EGPRS

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 24

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 1850.2MHz									
GSM1900	3.700	-17.3	V	3.0	35.4	1.0	-51.7	-13.0	-38.7	
	5.551	-18.2	V	3.0	34.7	1.0	-51.9	-13.0	-38.9	
	7.401	-9.5	V	3.0	34.9	1.0	-43.4	-13.0	-30.4	
EGPRS	3.700	-6.5	H	3.0	35.4	1.0	-40.9	-13.0	-27.9	
	5.551	-21.2	H	3.0	34.7	1.0	-54.9	-13.0	-41.9	
	7.401	-10.7	H	3.0	34.9	1.0	-44.6	-13.0	-31.6	
	Mid Ch, 1880MHz									
	3.760	-12.3	V	3.0	35.3	1.0	-46.7	-13.0	-33.7	
	5.640	-16.8	V	3.0	34.7	1.0	-50.5	-13.0	-37.5	
	7.520	-8.8	V	3.0	34.9	1.0	-42.8	-13.0	-29.8	
	3.760	-5.0	H	3.0	35.3	1.0	-39.4	-13.0	-26.4	
	5.640	-21.1	H	3.0	34.7	1.0	-54.9	-13.0	-41.9	
	7.520	-12.0	H	3.0	34.9	1.0	-45.9	-13.0	-32.9	
	High Ch, 1909.8MHz									
	3.820	-11.8	V	3.0	35.3	1.0	-46.1	-13.0	-33.1	
	5.729	-23.1	V	3.0	34.7	1.0	-56.9	-13.0	-43.9	
	7.639	-13.4	V	3.0	35.0	1.0	-47.3	-13.0	-34.3	
	3.820	-18.7	H	3.0	35.3	1.0	-52.9	-13.0	-39.9	
	5.729	-23.5	H	3.0	34.7	1.0	-57.2	-13.0	-44.2	
	7.639	-18.1	H	3.0	35.0	1.0	-52.0	-13.0	-39.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 02/27/15
Test Engineer: O. Stoelting
Configuration: X-pos EUT w/ AC Charger + HS
Mode: GSM 1900 GPRS

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 24

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 1850.2MHz									
GSM1900 GPRS	3.700	-16.1	V	3.0	35.4	1.0	-50.5	-13.0	-37.5	
	5.551	-19.8	V	3.0	34.7	1.0	-53.5	-13.0	-40.5	
	7.401	-14.1	V	3.0	34.9	1.0	-48.0	-13.0	-35.0	
	3.700	-10.7	H	3.0	35.4	1.0	-45.1	-13.0	-32.1	
	5.551	-20.8	H	3.0	34.7	1.0	-54.5	-13.0	-41.5	
	7.401	-19.3	H	3.0	34.9	1.0	-53.2	-13.0	-40.2	
	Mid Ch, 1880MHz									
	3.760	-11.3	V	3.0	35.3	1.0	-45.7	-13.0	-32.7	
	5.640	-19.6	V	3.0	34.7	1.0	-53.4	-13.0	-40.4	
	7.520	-9.4	V	3.0	34.9	1.0	-43.3	-13.0	-30.3	
	3.760	-15.4	H	3.0	35.3	1.0	-49.7	-13.0	-36.7	
	5.640	-18.4	H	3.0	34.7	1.0	-52.1	-13.0	-39.1	
	7.520	-21.3	H	3.0	34.9	1.0	-55.2	-13.0	-42.2	
	High Ch, 1909.8MHz									
	3.820	-12.8	V	3.0	35.3	1.0	-47.1	-13.0	-34.1	
	5.729	-19.6	V	3.0	34.7	1.0	-53.3	-13.0	-40.3	
	7.639	-15.4	V	3.0	35.0	1.0	-49.4	-13.0	-36.4	
	3.820	-23.7	H	3.0	35.3	1.0	-58.0	-13.0	-45.0	
	5.729	-19.8	H	3.0	34.7	1.0	-53.6	-13.0	-40.6	
	7.639	-16.4	H	3.0	35.0	1.0	-50.3	-13.0	-37.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 03/18/15
Test Engineer: Jude Semana
Configuration: X-pos EUT w/ AC Charger + HS
Mode: EGPRS850 Harm

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 22

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 824.2MHz									
GSM850 EGPRS	1.648	-25.5	V	3.0	37.4	1.0	-61.9	-13.0	-48.9	
	2.473	-20.7	V	3.0	36.4	1.0	-56.1	-13.0	-43.1	
	3.297	-20.4	V	3.0	35.8	1.0	-55.2	-13.0	-42.2	
	1.648	-26.4	H	3.0	37.4	1.0	-62.7	-13.0	-49.7	
	2.473	-22.0	H	3.0	36.4	1.0	-57.4	-13.0	-44.4	
	3.297	-20.9	H	3.0	35.8	1.0	-55.7	-13.0	-42.7	
	Mid Ch, 836.6MHz									
	1.673	-24.8	V	3.0	37.3	1.0	-61.1	-13.0	-48.1	
	2.510	-21.0	V	3.0	36.4	1.0	-56.3	-13.0	-43.3	
	3.346	-20.6	V	3.0	35.8	1.0	-55.3	-13.0	-42.3	
	1.673	-26.0	H	3.0	37.3	1.0	-62.3	-13.0	-49.3	
	2.510	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	
	3.346	-20.8	H	3.0	35.8	1.0	-55.6	-13.0	-42.6	
	High Ch, 848.8MHz									
	1.698	-24.4	V	3.0	37.3	1.0	-60.7	-13.0	-47.7	
	2.547	-21.9	V	3.0	36.3	1.0	-57.3	-13.0	-44.3	
	3.395	-20.1	V	3.0	35.7	1.0	-54.8	-13.0	-41.8	
	1.698	-24.3	H	3.0	37.3	1.0	-60.6	-13.0	-47.6	
	2.547	-23.2	H	3.0	36.3	1.0	-58.6	-13.0	-45.6	
	3.395	-20.2	H	3.0	35.7	1.0	-54.9	-13.0	-41.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 15I20033
Date: 03/18/15
Test Engineer: Jude Semana
Configuration: X-pos EUT w/ AC Charger + HS
Mode: GPRS 850

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T34 8449B	Filter 1	Part 22

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 824.2MHz									
GSM850 GPRS	1.648	-26.2	V	3.0	37.4	1.0	-62.6	-13.0	-49.6	
	2.473	-20.1	V	3.0	36.4	1.0	-55.5	-13.0	-42.5	
	3.297	-20.7	V	3.0	35.8	1.0	-55.5	-13.0	-42.5	
	1.648	-26.2	H	3.0	37.4	1.0	-62.6	-13.0	-49.6	
	2.473	-22.2	H	3.0	36.4	1.0	-57.5	-13.0	-44.5	
	3.297	-20.8	H	3.0	35.8	1.0	-55.6	-13.0	-42.6	
	Mid Ch, 836.6MHz									
	1.673	-26.0	V	3.0	37.3	1.0	-62.4	-13.0	-49.4	
	2.510	-21.4	V	3.0	36.4	1.0	-56.8	-13.0	-43.8	
	3.346	-20.3	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
	1.673	-26.2	H	3.0	37.3	1.0	-62.6	-13.0	-49.6	
	2.510	-22.7	H	3.0	36.4	1.0	-58.0	-13.0	-45.0	
	3.346	-20.2	H	3.0	35.8	1.0	-54.9	-13.0	-41.9	
	High Ch, 848.8MHz									
	1.698	-25.0	V	3.0	37.3	1.0	-61.3	-13.0	-48.3	
	2.547	-21.7	V	3.0	36.3	1.0	-57.0	-13.0	-44.0	
	3.395	-19.6	V	3.0	35.7	1.0	-54.3	-13.0	-41.3	
	1.698	-25.5	H	3.0	37.3	1.0	-61.8	-13.0	-48.8	
	2.547	-23.1	H	3.0	36.3	1.0	-58.4	-13.0	-45.4	
	3.395	-19.7	H	3.0	35.7	1.0	-54.4	-13.0	-41.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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