

LTE Band 5

LTE

Band 5

10MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

2017-12-18

Test Engineer:

45585

Configuration:

EUT

Location:

Chamber 2

Mode:

LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: VULB9163-749, and Chamber 2 SMA Cables

Substitution: Dipole 3121_DB4, 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	14.72	V	1.0	-1.5	12.31	38.5	-26.2	
829.00	19.33	H	1.0	-1.5	16.92	38.5	-21.6	
Mid Ch								
836.50	14.08	V	1.0	-1.4	11.70	38.5	-26.8	
836.50	19.68	H	1.0	-1.4	17.30	38.5	-21.2	
High Ch								
844.00	13.29	V	1.0	-1.4	10.94	38.5	-27.6	
844.00	20.13	H	1.0	-1.4	17.77	38.5	-20.7	

LTE

Band 5

10MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

2017-12-18

Test Engineer:

45585

Configuration:

EUT

Location:

Chamber 2

Mode:

LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

Test Equipment:

Receiving: VULB9163-749, and Chamber 2 SMA Cables

Substitution: Dipole 3121_DB4, 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	14.72	V	1.0	-1.5	12.31	38.5	-26.2	
829.00	19.34	H	1.0	-1.5	16.93	38.5	-21.6	
Mid Ch								
836.50	14.07	V	1.0	-1.4	11.69	38.5	-26.8	
836.50	19.67	H	1.0	-1.4	17.29	38.5	-21.2	
High Ch								
844.00	13.33	V	1.0	-1.4	10.98	38.5	-27.5	
844.00	20.14	H	1.0	-1.4	17.78	38.5	-20.7	

LTE Band 5 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
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LTE Band 5 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement																																																																																																	
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LTE

Band 5

1.4MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

2017-12-18

Test Engineer:

45585

Configuration:

EUT

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, 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	14.90	V	1.0	-1.5	12.47	38.5	-26.0	
824.70	19.55	H	1.0	-1.5	17.12	38.5	-21.4	
Mid Ch								
836.50	14.28	V	1.0	-1.4	11.90	38.5	-26.6	
836.50	19.17	H	1.0	-1.4	16.79	38.5	-21.7	
High Ch								
848.30	11.20	V	1.0	-1.4	8.85	38.5	-29.6	
848.30	20.44	H	1.0	-1.4	18.09	38.5	-20.4	

LTE

Band 5

1.4MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

2017-12-18

Test Engineer:

45585

Configuration:

EUT

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, 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	14.84	V	1.0	-1.5	12.41	38.5	-26.1	
824.70	19.48	H	1.0	-1.5	17.05	38.5	-21.4	
Mid Ch								
836.50	14.18	V	1.0	-1.4	11.80	38.5	-26.7	
836.50	19.07	H	1.0	-1.4	16.69	38.5	-21.8	
High Ch								
848.30	11.22	V	1.0	-1.4	8.87	38.5	-29.6	
848.30	20.40	H	1.0	-1.4	18.05	38.5	-20.4	

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMIT

Part 22.917(a) & Part 24.238(a) & Part 27.53(g) - 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

ANSI / TIA / EIA 603E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03

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 = peak (RMS for average measurement);
- f) Ensure that the number of measurement points $\geq$ span/RBW;
- g) Trace mode = max hold;

RESULTS

10.2.1. SPURIOUS RADIATION PLOTS

GSM 1900

GSM

GSM1900

GPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

01-03-18

Test Engineer:

45585

Configuration:

EUT / AC Adapter / Earphone / X Position

Mode:

GPRS 1900 MHz

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

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, 1850.2MHz									
3.7004	-12.6	V	3.0	39.7	1.0	-51.2	-13.0	-38.2	
5.5506	-10.6	V	3.0	39.9	1.0	-49.5	-13.0	-36.5	
7.4008	-10.3	V	3.0	39.4	1.0	-48.7	-13.0	-35.7	
3.7000	-12.6	H	3.0	39.7	1.0	-51.2	-13.0	-38.2	
5.5500	-10.7	H	3.0	39.9	1.0	-49.6	-13.0	-36.6	
7.4000	-9.7	H	3.0	39.4	1.0	-48.1	-13.0	-35.1	
Mid Ch, 1880.0MHz									
3.7600	-13.6	V	3.0	39.7	1.0	-52.3	-13.0	-39.3	
5.6400	-8.9	V	3.0	40.0	1.0	-47.8	-13.0	-34.8	
7.5200	-8.8	V	3.0	39.4	1.0	-47.1	-13.0	-34.1	
3.7600	-11.4	H	3.0	39.7	1.0	-50.1	-13.0	-37.1	
5.6400	-10.3	H	3.0	40.0	1.0	-49.3	-13.0	-36.3	
7.5200	-9.1	H	3.0	39.4	1.0	-47.5	-13.0	-34.5	
High Ch, 1909.8 MHz									
3.8196	-12.6	V	3.0	39.7	1.0	-51.3	-13.0	-38.3	
5.7294	-9.6	V	3.0	40.0	1.0	-48.6	-13.0	-35.6	
7.6392	-9.8	V	3.0	39.3	1.0	-48.2	-13.0	-35.2	
3.8196	-12.3	H	3.0	39.7	1.0	-51.0	-13.0	-38.0	
5.7294	-9.4	H	3.0	40.0	1.0	-48.3	-13.0	-35.3	
7.6392	-9.5	H	3.0	39.3	1.0	-47.8	-13.0	-34.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

GSM

GSM1900

EGPRS

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

01-03-18

Test Engineer:

45585

Configuration:

EUT / AC Adapter / Earphone / X Position

Mode:

EGPRS 1900 MHz

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

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, 1850.2MHz									
3.7004	-13.7	V	3.0	39.7	1.0	-52.4	-13.0	-39.4	
5.5506	-10.1	V	3.0	39.9	1.0	-49.1	-13.0	-36.1	
7.4008	-10.3	V	3.0	39.4	1.0	-48.7	-13.0	-35.7	
3.7000	-13.6	H	3.0	39.7	1.0	-52.2	-13.0	-39.2	
5.5500	-10.5	H	3.0	39.9	1.0	-49.4	-13.0	-36.4	
7.4000	-10.1	H	3.0	39.4	1.0	-48.6	-13.0	-35.6	
Mid Ch, 1880.0MHz									
3.7600	-13.5	V	3.0	39.7	1.0	-52.1	-13.0	-39.1	
5.6400	-10.7	V	3.0	40.0	1.0	-49.7	-13.0	-36.7	
7.5200	-8.8	V	3.0	39.4	1.0	-47.1	-13.0	-34.1	
3.7600	-12.4	H	3.0	39.7	1.0	-51.1	-13.0	-38.1	
5.6400	-10.3	H	3.0	40.0	1.0	-49.3	-13.0	-36.3	
7.5200	-8.8	H	3.0	39.4	1.0	-47.2	-13.0	-34.2	
High Ch, 1909.8 MHz									
3.8196	-12.8	V	3.0	39.7	1.0	-51.5	-13.0	-38.5	
5.7294	-10.9	V	3.0	40.0	1.0	-49.9	-13.0	-36.9	
7.6392	-9.9	V	3.0	39.3	1.0	-48.2	-13.0	-35.2	
3.8196	-12.5	H	3.0	39.7	1.0	-51.2	-13.0	-38.2	
5.7294	-11.5	H	3.0	40.0	1.0	-50.4	-13.0	-37.4	
7.6392	-9.1	H	3.0	39.3	1.0	-47.5	-13.0	-34.5	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

WCDMA Band 5

WCDMA

Band 5

REL99

Company: Samsung

Project #: 4788269334

Date: 01-03-18

Test Engineer: 45585

Configuration: EUT / AC Adapter / Earphone / X Position

Mode: Tx, REL99,850MHz

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-12.9	V	3.0	38.2	1.0	-50.1	-13.0	-37.1	
2.4790	-14.2	V	3.0	38.8	1.0	-52.0	-13.0	-39.0	
3.3056	-14.3	V	3.0	39.4	1.0	-52.7	-13.0	-39.7	
1.6520	-11.6	H	3.0	38.2	1.0	-48.8	-13.0	-35.8	
2.4790	-13.3	H	3.0	38.8	1.0	-51.1	-13.0	-38.1	
3.3056	-14.4	H	3.0	39.4	1.0	-52.8	-13.0	-39.8	
Mid Ch, 836.6MHz									
1.6732	-13.3	V	3.0	38.2	1.0	-50.5	-13.0	-37.5	
2.5098	-13.7	V	3.0	38.8	1.0	-51.6	-13.0	-38.6	
3.3464	-14.7	V	3.0	39.5	1.0	-53.1	-13.0	-40.1	
1.6732	-11.8	H	3.0	38.2	1.0	-49.1	-13.0	-36.1	
2.5098	-13.9	H	3.0	38.8	1.0	-51.8	-13.0	-38.8	
3.3464	-13.9	H	3.0	39.5	1.0	-52.3	-13.0	-39.3	
High Ch, 846.6MHz									
1.6932	-11.8	V	3.0	38.2	1.0	-49.1	-13.0	-36.1	
2.5390	-14.3	V	3.0	38.9	1.0	-52.2	-13.0	-39.2	
3.3860	-14.1	V	3.0	39.5	1.0	-52.6	-13.0	-39.6	
1.6932	-11.9	H	3.0	38.2	1.0	-49.1	-13.0	-36.1	
2.5390	-13.4	H	3.0	38.9	1.0	-51.2	-13.0	-38.2	
3.3860	-14.0	H	3.0	39.5	1.0	-52.5	-13.0	-39.5	

Rev. 03.03.09

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

WCDMA

Band 5

HSDPA

Company: Samsung

Project #: 4788269334

Date: 01-03-18

Test Engineer: 45585

Configuration: EUT / AC Adapter / Earphone / X Position

Mode: Tx, HSDPA,850MHz

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-12.4	V	3.0	38.2	1.0	-49.7	-13.0	-36.7	
2.4790	-14.4	V	3.0	38.8	1.0	-52.2	-13.0	-39.2	
3.3056	-14.0	V	3.0	39.4	1.0	-52.5	-13.0	-39.5	
1.6520	-10.8	H	3.0	38.2	1.0	-48.1	-13.0	-35.1	
2.4790	-12.7	H	3.0	38.8	1.0	-50.5	-13.0	-37.5	
3.3056	-14.2	H	3.0	39.4	1.0	-52.6	-13.0	-39.6	
Mid Ch, 836.6MHz									
1.6732	-13.2	V	3.0	38.2	1.0	-50.4	-13.0	-37.4	
2.5098	-13.7	V	3.0	38.8	1.0	-51.5	-13.0	-38.5	
3.3464	-13.5	V	3.0	39.5	1.0	-52.0	-13.0	-39.0	
1.6732	-11.9	H	3.0	38.2	1.0	-49.1	-13.0	-36.1	
2.5098	-13.1	H	3.0	38.8	1.0	-50.9	-13.0	-37.9	
3.3464	-14.2	H	3.0	39.5	1.0	-52.6	-13.0	-39.6	
High Ch, 846.6MHz									
1.6932	-11.4	V	3.0	38.2	1.0	-48.7	-13.0	-35.7	
2.5390	-15.0	V	3.0	38.9	1.0	-52.8	-13.0	-39.8	
3.3860	-13.4	V	3.0	39.5	1.0	-51.9	-13.0	-38.9	
1.6932	-12.1	H	3.0	38.2	1.0	-49.3	-13.0	-36.3	
2.5390	-13.4	H	3.0	38.9	1.0	-51.2	-13.0	-38.2	
3.3860	-13.6	H	3.0	39.5	1.0	-52.1	-13.0	-39.1	

Rev. 03.03.09

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

WCDMA Band 2

WCDMA

Band 2

REL99

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4788269334

Date: 01-02-18

Test Engineer: 47989

Configuration: EUT / AC Adapter / Earphone / X Position

Mode: Tx, REL99,1900MHz

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

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									
3.7048	-4.8	V	3.0	39.7	1.0	-43.4	-13.0	-30.4	
5.5572	-12.4	V	3.0	39.9	1.0	-51.3	-13.0	-38.3	
7.4096	-9.8	V	3.0	39.4	1.0	-48.3	-13.0	-35.3	
3.7048	-5.3	H	3.0	39.7	1.0	-44.0	-13.0	-31.0	
5.5572	-11.6	H	3.0	39.9	1.0	-50.5	-13.0	-37.5	
7.4096	-9.3	H	3.0	39.4	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1880MHz									
3.7600	-8.7	V	3.0	39.7	1.0	-47.4	-13.0	-34.4	
5.6400	-12.9	V	3.0	40.0	1.0	-51.9	-13.0	-38.9	
7.5200	-9.1	V	3.0	39.4	1.0	-47.5	-13.0	-34.5	
3.7600	-11.3	H	3.0	39.7	1.0	-50.0	-13.0	-37.0	
5.6400	-12.8	H	3.0	40.0	1.0	-51.7	-13.0	-38.7	
7.5200	-8.8	H	3.0	39.4	1.0	-47.2	-13.0	-34.2	
High Ch, 1907.6MHz									
3.8152	-7.9	V	3.0	39.7	1.0	-46.6	-13.0	-33.6	
5.7228	-12.6	V	3.0	40.0	1.0	-51.6	-13.0	-38.6	
7.6304	-8.1	V	3.0	39.3	1.0	-46.4	-13.0	-33.4	
3.8152	-11.9	H	3.0	39.7	1.0	-50.6	-13.0	-37.6	
5.7228	-12.7	H	3.0	40.0	1.0	-51.7	-13.0	-38.7	
7.6304	-8.9	H	3.0	39.3	1.0	-47.2	-13.0	-34.2	

Rev. 03.03.09

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

WCDMA

Band 2

HSDPA

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung

Project #: 4788269334

Date: 01-02-18

Test Engineer: 47989

Configuration: EUT / AC Adapter / Earphone / X Position

Mode: Tx, HSDPA,1900MHz

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

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									
3.7048	-4.5	V	3.0	39.7	1.0	-43.1	-13.0	-30.1	
5.5572	-13.0	V	3.0	39.9	1.0	-52.0	-13.0	-39.0	
7.4096	-10.1	V	3.0	39.4	1.0	-48.6	-13.0	-35.6	
3.7048	-5.4	H	3.0	39.7	1.0	-44.0	-13.0	-31.0	
5.5572	-11.6	H	3.0	39.9	1.0	-50.6	-13.0	-37.6	
7.4096	-9.4	H	3.0	39.4	1.0	-47.8	-13.0	-34.8	
Mid Ch, 1880MHz									
3.7600	-7.3	V	3.0	39.7	1.0	-46.0	-13.0	-33.0	
5.6400	-13.0	V	3.0	40.0	1.0	-51.9	-13.0	-38.9	
7.5200	-9.1	V	3.0	39.4	1.0	-47.5	-13.0	-34.5	
3.7600	-10.1	H	3.0	39.7	1.0	-48.8	-13.0	-35.8	
5.6400	-11.9	H	3.0	40.0	1.0	-50.9	-13.0	-37.9	
7.5200	-9.1	H	3.0	39.4	1.0	-47.5	-13.0	-34.5	
High Ch, 1907.6MHz									
3.8152	-7.9	V	3.0	39.7	1.0	-46.6	-13.0	-33.6	
5.7228	-13.3	V	3.0	40.0	1.0	-52.3	-13.0	-39.3	
7.6304	-8.5	V	3.0	39.3	1.0	-46.8	-13.0	-33.8	
3.8152	-12.1	H	3.0	39.7	1.0	-50.8	-13.0	-37.8	
5.7228	-12.7	H	3.0	40.0	1.0	-51.7	-13.0	-38.7	
7.6304	-9.7	H	3.0	39.3	1.0	-48.0	-13.0	-35.0	

Rev. 03.03.09

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

LTE Band 17

LTE Band 17 10MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788269334 Date: 12-28-17 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X Position Mode: TX, LTE BAND 17, 10MHz BW, QPSK									
	Chamber Chamber 2 Pre-amplifier AFS42 Filter Filter 1 Limit FCC Part 27									
	f GHz	SGreading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (709MHz)									
	1.4180	-10.5	V	3.0	38.1	1.0	-47.6	-13.0	-34.6	
	2.1270	-14.9	V	3.0	38.5	1.0	-52.4	-13.0	-39.4	
	2.8360	-14.0	V	3.0	39.1	1.0	-52.1	-13.0	-39.1	
	1.4180	-8.6	H	3.0	38.1	1.0	-45.7	-13.0	-32.7	
	2.1270	-16.1	H	3.0	38.5	1.0	-53.6	-13.0	-40.6	
	2.8360	-13.7	H	3.0	39.1	1.0	-51.9	-13.0	-38.9	
	Mid Channel (710MHz)									
	1.4200	-11.8	V	3.0	38.1	1.0	-48.9	-13.0	-35.9	
	2.1300	-15.2	V	3.0	38.5	1.0	-52.7	-13.0	-39.7	
	2.8400	-14.5	V	3.0	39.1	1.0	-52.6	-13.0	-39.6	
	1.4200	-10.3	H	3.0	38.1	1.0	-47.4	-13.0	-34.4	
	2.1300	-15.9	H	3.0	38.5	1.0	-53.4	-13.0	-40.4	
	2.8400	-13.1	H	3.0	39.1	1.0	-51.2	-13.0	-38.2	
	High Channel (711MHz)									
	1.4220	-12.5	V	3.0	38.1	1.0	-49.7	-13.0	-36.7	
	2.1330	-15.3	V	3.0	38.5	1.0	-52.8	-13.0	-39.8	
	2.8440	-13.3	V	3.0	39.1	1.0	-51.4	-13.0	-38.4	
	1.4220	-11.3	H	3.0	38.1	1.0	-48.4	-13.0	-35.4	
	2.1330	-16.3	H	3.0	38.5	1.0	-53.8	-13.0	-40.8	
	2.8440	-12.8	H	3.0	39.1	1.0	-50.9	-13.0	-37.9	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

LTE Band 17 10MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788269334 Date: 12-28-17 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X Position Mode: TX, LTE BAND 17, 10MHz BW, 16QAM									
	Chamber Chamber 2 Pre-amplifier AFS42 Filter Filter 1 Limit FCC Part 27									
	f GHz	SGreading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (709MHz)									
	1.4180	-10.5	V	3.0	38.1	1.0	-47.6	-13.0	-34.6	
	2.1270	-15.3	V	3.0	38.5	1.0	-52.8	-13.0	-39.8	
	2.8360	-14.4	V	3.0	39.1	1.0	-52.5	-13.0	-39.5	
	1.4180	-9.5	H	3.0	38.1	1.0	-46.6	-13.0	-33.6	
	2.1270	-15.9	H	3.0	38.5	1.0	-53.4	-13.0	-40.4	
	2.8360	-13.7	H	3.0	39.1	1.0	-51.8	-13.0	-38.8	
	Mid Channel (710MHz)									
	1.4200	-12.9	V	3.0	38.1	1.0	-50.0	-13.0	-37.0	
	2.1300	-16.0	V	3.0	38.5	1.0	-53.5	-13.0	-40.5	
	2.8400	-14.9	V	3.0	39.1	1.0	-53.0	-13.0	-40.0	
	1.4200	-10.5	H	3.0	38.1	1.0	-47.6	-13.0	-34.6	
	2.1300	-15.7	H	3.0	38.5	1.0	-53.2	-13.0	-40.2	
	2.8400	-12.8	H	3.0	39.1	1.0	-50.9	-13.0	-37.9	
	High Channel (711MHz)									
	1.4220	-12.6	V	3.0	38.1	1.0	-49.7	-13.0	-36.7	
	2.1330	-15.9	V	3.0	38.5	1.0	-53.4	-13.0	-40.4	
	2.8440	-13.3	V	3.0	39.1	1.0	-51.4	-13.0	-38.4	
	1.4220	-11.5	H	3.0	38.1	1.0	-48.6	-13.0	-35.6	
	2.1330	-16.2	H	3.0	38.5	1.0	-53.7	-13.0	-40.7	
	2.8440	-12.7	H	3.0	39.1	1.0	-50.8	-13.0	-37.8	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

LTE Band 17 5MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement																																																																																																																																																																																																																																				
	Company: Samsung																																																																																																																																																																																																																																				
	Project #: 4788269334																																																																																																																																																																																																																																				
	Date: 12-28-17																																																																																																																																																																																																																																				
	Test Engineer: 47989																																																																																																																																																																																																																																				
	Configuration: EUT / AC Adapter / Earphone, XPosition																																																																																																																																																																																																																																				
	Mode: TX, LTE BAND 17, 5MHz BW, QPSK																																																																																																																																																																																																																																				
	Chamber		Pre-amplifier		Filter		Limit																																																																																																																																																																																																																														
	Chamber 2		AFS42		Filter 1		FCC Part 27																																																																																																																																																																																																																														
<table><tr><th>f GHz</th><th>SGreading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Distance (m)</th><th>Preamp (dB)</th><th>Filter (dB)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="10">Low Channel (706.5MHz)</td></tr><tr><td>1.4130</td><td>-11.3</td><td>V</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-48.5</td><td>-13.0</td><td>-35.5</td><td></td></tr><tr><td>2.1195</td><td>-16.0</td><td>V</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-53.5</td><td>-13.0</td><td>-40.5</td><td></td></tr><tr><td>2.8260</td><td>-16.0</td><td>V</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-54.1</td><td>-13.0</td><td>-41.1</td><td></td></tr><tr><td>1.4130</td><td>-9.0</td><td>H</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-46.1</td><td>-13.0</td><td>-33.1</td><td></td></tr><tr><td>2.1195</td><td>-16.5</td><td>H</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-54.0</td><td>-13.0</td><td>-41.0</td><td></td></tr><tr><td>2.8260</td><td>-15.7</td><td>H</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-53.8</td><td>-13.0</td><td>-40.8</td><td></td></tr><tr><td colspan="10">Mid Channel (710MHz)</td></tr><tr><td>1.4200</td><td>-11.0</td><td>V</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-48.1</td><td>-13.0</td><td>-35.1</td><td></td></tr><tr><td>2.1300</td><td>-14.5</td><td>V</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-52.0</td><td>-13.0</td><td>-39.0</td><td></td></tr><tr><td>2.8400</td><td>-12.6</td><td>V</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-50.8</td><td>-13.0</td><td>-37.8</td><td></td></tr><tr><td>1.4200</td><td>-10.5</td><td>H</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-47.6</td><td>-13.0</td><td>-34.6</td><td></td></tr><tr><td>2.1300</td><td>-15.5</td><td>H</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-53.0</td><td>-13.0</td><td>-40.0</td><td></td></tr><tr><td>2.8400</td><td>-12.3</td><td>H</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-50.4</td><td>-13.0</td><td>-37.4</td><td></td></tr><tr><td colspan="10">High Channel (713.5MHz)</td></tr><tr><td>1.4270</td><td>-12.2</td><td>V</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-49.3</td><td>-13.0</td><td>-36.3</td><td></td></tr><tr><td>2.1405</td><td>-16.0</td><td>V</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-53.5</td><td>-13.0</td><td>-40.5</td><td></td></tr><tr><td>2.8540</td><td>-14.4</td><td>V</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-52.6</td><td>-13.0</td><td>-39.6</td><td></td></tr><tr><td>1.4270</td><td>-10.1</td><td>H</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-47.2</td><td>-13.0</td><td>-34.2</td><td></td></tr><tr><td>2.1405</td><td>-15.8</td><td>H</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-53.3</td><td>-13.0</td><td>-40.3</td><td></td></tr><tr><td>2.8540</td><td>-13.6</td><td>H</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-51.8</td><td>-13.0</td><td>-38.8</td><td></td></tr></table>										f GHz	SGreading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Channel (706.5MHz)										1.4130	-11.3	V	3.0	38.1	1.0	-48.5	-13.0	-35.5		2.1195	-16.0	V	3.0	38.5	1.0	-53.5	-13.0	-40.5		2.8260	-16.0	V	3.0	39.1	1.0	-54.1	-13.0	-41.1		1.4130	-9.0	H	3.0	38.1	1.0	-46.1	-13.0	-33.1		2.1195	-16.5	H	3.0	38.5	1.0	-54.0	-13.0	-41.0		2.8260	-15.7	H	3.0	39.1	1.0	-53.8	-13.0	-40.8		Mid Channel (710MHz)										1.4200	-11.0	V	3.0	38.1	1.0	-48.1	-13.0	-35.1		2.1300	-14.5	V	3.0	38.5	1.0	-52.0	-13.0	-39.0		2.8400	-12.6	V	3.0	39.1	1.0	-50.8	-13.0	-37.8		1.4200	-10.5	H	3.0	38.1	1.0	-47.6	-13.0	-34.6		2.1300	-15.5	H	3.0	38.5	1.0	-53.0	-13.0	-40.0		2.8400	-12.3	H	3.0	39.1	1.0	-50.4	-13.0	-37.4		High Channel (713.5MHz)										1.4270	-12.2	V	3.0	38.1	1.0	-49.3	-13.0	-36.3		2.1405	-16.0	V	3.0	38.5	1.0	-53.5	-13.0	-40.5		2.8540	-14.4	V	3.0	39.1	1.0	-52.6	-13.0	-39.6		1.4270	-10.1	H	3.0	38.1	1.0	-47.2	-13.0	-34.2		2.1405	-15.8	H	3.0	38.5	1.0	-53.3	-13.0	-40.3		2.8540	-13.6	H	3.0	39.1	1.0	-51.8	-13.0	-38.8	
f GHz	SGreading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																																																																																																																																																												
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1.4130	-11.3	V	3.0	38.1	1.0	-48.5	-13.0	-35.5																																																																																																																																																																																																																													
2.1195	-16.0	V	3.0	38.5	1.0	-53.5	-13.0	-40.5																																																																																																																																																																																																																													
2.8260	-16.0	V	3.0	39.1	1.0	-54.1	-13.0	-41.1																																																																																																																																																																																																																													
1.4130	-9.0	H	3.0	38.1	1.0	-46.1	-13.0	-33.1																																																																																																																																																																																																																													
2.1195	-16.5	H	3.0	38.5	1.0	-54.0	-13.0	-41.0																																																																																																																																																																																																																													
2.8260	-15.7	H	3.0	39.1	1.0	-53.8	-13.0	-40.8																																																																																																																																																																																																																													
Mid Channel (710MHz)																																																																																																																																																																																																																																					
1.4200	-11.0	V	3.0	38.1	1.0	-48.1	-13.0	-35.1																																																																																																																																																																																																																													
2.1300	-14.5	V	3.0	38.5	1.0	-52.0	-13.0	-39.0																																																																																																																																																																																																																													
2.8400	-12.6	V	3.0	39.1	1.0	-50.8	-13.0	-37.8																																																																																																																																																																																																																													
1.4200	-10.5	H	3.0	38.1	1.0	-47.6	-13.0	-34.6																																																																																																																																																																																																																													
2.1300	-15.5	H	3.0	38.5	1.0	-53.0	-13.0	-40.0																																																																																																																																																																																																																													
2.8400	-12.3	H	3.0	39.1	1.0	-50.4	-13.0	-37.4																																																																																																																																																																																																																													
High Channel (713.5MHz)																																																																																																																																																																																																																																					
1.4270	-12.2	V	3.0	38.1	1.0	-49.3	-13.0	-36.3																																																																																																																																																																																																																													
2.1405	-16.0	V	3.0	38.5	1.0	-53.5	-13.0	-40.5																																																																																																																																																																																																																													
2.8540	-14.4	V	3.0	39.1	1.0	-52.6	-13.0	-39.6																																																																																																																																																																																																																													
1.4270	-10.1	H	3.0	38.1	1.0	-47.2	-13.0	-34.2																																																																																																																																																																																																																													
2.1405	-15.8	H	3.0	38.5	1.0	-53.3	-13.0	-40.3																																																																																																																																																																																																																													
2.8540	-13.6	H	3.0	39.1	1.0	-51.8	-13.0	-38.8																																																																																																																																																																																																																													
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.																																																																																																																																																																																																																																					
LTE Band 17 5MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement																																																																																																																																																																																																																																				
	Company: Samsung																																																																																																																																																																																																																																				
	Project #: 4788269334																																																																																																																																																																																																																																				
	Date: 12-28-17																																																																																																																																																																																																																																				
	Test Engineer: 47989																																																																																																																																																																																																																																				
	Configuration: EUT / AC Adapter / Earphone, XPosition																																																																																																																																																																																																																																				
	Mode: TX, LTE BAND 17, 5MHz BW, 16QAM																																																																																																																																																																																																																																				
	Chamber		Pre-amplifier		Filter		Limit																																																																																																																																																																																																																														
	Chamber 2		AFS42		Filter 1		FCC Part 27																																																																																																																																																																																																																														
<table><tr><th>f GHz</th><th>SGreading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Distance (m)</th><th>Preamp (dB)</th><th>Filter (dB)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="10">Low Channel (706.5MHz)</td></tr><tr><td>1.4130</td><td>-11.7</td><td>V</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-48.8</td><td>-13.0</td><td>-35.8</td><td></td></tr><tr><td>2.1195</td><td>-16.1</td><td>V</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-53.6</td><td>-13.0</td><td>-40.6</td><td></td></tr><tr><td>2.8260</td><td>-15.6</td><td>V</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-53.7</td><td>-13.0</td><td>-40.7</td><td></td></tr><tr><td>1.4130</td><td>-9.6</td><td>H</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-46.7</td><td>-13.0</td><td>-33.7</td><td></td></tr><tr><td>2.1195</td><td>-17.1</td><td>H</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-54.6</td><td>-13.0</td><td>-41.6</td><td></td></tr><tr><td>2.8260</td><td>-15.6</td><td>H</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-53.7</td><td>-13.0</td><td>-40.7</td><td></td></tr><tr><td colspan="10">Mid Channel (710MHz)</td></tr><tr><td>1.4200</td><td>-11.5</td><td>V</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-48.6</td><td>-13.0</td><td>-35.6</td><td></td></tr><tr><td>2.1300</td><td>-14.5</td><td>V</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-52.0</td><td>-13.0</td><td>-39.0</td><td></td></tr><tr><td>2.8400</td><td>-13.2</td><td>V</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-51.3</td><td>-13.0</td><td>-38.3</td><td></td></tr><tr><td>1.4200</td><td>-10.0</td><td>H</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-47.2</td><td>-13.0</td><td>-34.2</td><td></td></tr><tr><td>2.1300</td><td>-15.7</td><td>H</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-53.3</td><td>-13.0</td><td>-40.3</td><td></td></tr><tr><td>2.8400</td><td>-13.0</td><td>H</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-51.1</td><td>-13.0</td><td>-38.1</td><td></td></tr><tr><td colspan="10">High Channel (713.5MHz)</td></tr><tr><td>1.4270</td><td>-11.8</td><td>V</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-48.9</td><td>-13.0</td><td>-35.9</td><td></td></tr><tr><td>2.1405</td><td>-16.6</td><td>V</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-54.1</td><td>-13.0</td><td>-41.1</td><td></td></tr><tr><td>2.8540</td><td>-14.8</td><td>V</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-52.9</td><td>-13.0</td><td>-39.9</td><td></td></tr><tr><td>1.4270</td><td>-10.4</td><td>H</td><td>3.0</td><td>38.1</td><td>1.0</td><td>-47.5</td><td>-13.0</td><td>-34.5</td><td></td></tr><tr><td>2.1405</td><td>-15.3</td><td>H</td><td>3.0</td><td>38.5</td><td>1.0</td><td>-52.8</td><td>-13.0</td><td>-39.8</td><td></td></tr><tr><td>2.8540</td><td>-14.0</td><td>H</td><td>3.0</td><td>39.1</td><td>1.0</td><td>-52.2</td><td>-13.0</td><td>-39.2</td><td></td></tr></table>										f GHz	SGreading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Channel (706.5MHz)										1.4130	-11.7	V	3.0	38.1	1.0	-48.8	-13.0	-35.8		2.1195	-16.1	V	3.0	38.5	1.0	-53.6	-13.0	-40.6		2.8260	-15.6	V	3.0	39.1	1.0	-53.7	-13.0	-40.7		1.4130	-9.6	H	3.0	38.1	1.0	-46.7	-13.0	-33.7		2.1195	-17.1	H	3.0	38.5	1.0	-54.6	-13.0	-41.6		2.8260	-15.6	H	3.0	39.1	1.0	-53.7	-13.0	-40.7		Mid Channel (710MHz)										1.4200	-11.5	V	3.0	38.1	1.0	-48.6	-13.0	-35.6		2.1300	-14.5	V	3.0	38.5	1.0	-52.0	-13.0	-39.0		2.8400	-13.2	V	3.0	39.1	1.0	-51.3	-13.0	-38.3		1.4200	-10.0	H	3.0	38.1	1.0	-47.2	-13.0	-34.2		2.1300	-15.7	H	3.0	38.5	1.0	-53.3	-13.0	-40.3		2.8400	-13.0	H	3.0	39.1	1.0	-51.1	-13.0	-38.1		High Channel (713.5MHz)										1.4270	-11.8	V	3.0	38.1	1.0	-48.9	-13.0	-35.9		2.1405	-16.6	V	3.0	38.5	1.0	-54.1	-13.0	-41.1		2.8540	-14.8	V	3.0	39.1	1.0	-52.9	-13.0	-39.9		1.4270	-10.4	H	3.0	38.1	1.0	-47.5	-13.0	-34.5		2.1405	-15.3	H	3.0	38.5	1.0	-52.8	-13.0	-39.8		2.8540	-14.0	H	3.0	39.1	1.0	-52.2	-13.0	-39.2	
f GHz	SGreading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																																																																																																																																																												
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2.1195	-16.1	V	3.0	38.5	1.0	-53.6	-13.0	-40.6																																																																																																																																																																																																																													
2.8260	-15.6	V	3.0	39.1	1.0	-53.7	-13.0	-40.7																																																																																																																																																																																																																													
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Mid Channel (710MHz)																																																																																																																																																																																																																																					
1.4200	-11.5	V	3.0	38.1	1.0	-48.6	-13.0	-35.6																																																																																																																																																																																																																													
2.1300	-14.5	V	3.0	38.5	1.0	-52.0	-13.0	-39.0																																																																																																																																																																																																																													
2.8400	-13.2	V	3.0	39.1	1.0	-51.3	-13.0	-38.3																																																																																																																																																																																																																													
1.4200	-10.0	H	3.0	38.1	1.0	-47.2	-13.0	-34.2																																																																																																																																																																																																																													
2.1300	-15.7	H	3.0	38.5	1.0	-53.3	-13.0	-40.3																																																																																																																																																																																																																													
2.8400	-13.0	H	3.0	39.1	1.0	-51.1	-13.0	-38.1																																																																																																																																																																																																																													
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1.4270	-11.8	V	3.0	38.1	1.0	-48.9	-13.0	-35.9																																																																																																																																																																																																																													
2.1405	-16.6	V	3.0	38.5	1.0	-54.1	-13.0	-41.1																																																																																																																																																																																																																													
2.8540	-14.8	V	3.0	39.1	1.0	-52.9	-13.0	-39.9																																																																																																																																																																																																																													
1.4270	-10.4	H	3.0	38.1	1.0	-47.5	-13.0	-34.5																																																																																																																																																																																																																													
2.1405	-15.3	H	3.0	38.5	1.0	-52.8	-13.0	-39.8																																																																																																																																																																																																																													
2.8540	-14.0	H	3.0	39.1	1.0	-52.2	-13.0	-39.2																																																																																																																																																																																																																													
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.																																																																																																																																																																																																																																					

LTE Band 5

LTE Band 5 10MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788269334 Date: 12-27-17 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X Position Mode: TX, LTE BAND 5, 10MHz BW, QPSK									
	Chamber Pre-amplifier Filter Limit Chamber 2 AFS42 Filter 1 Part 22									
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (829MHz)									
	1.6580	-7.0	V	3.0	38.2	1.0	-44.3	-13.0	-31.3	
	2.4870	-8.4	V	3.0	38.8	1.0	-46.3	-13.0	-33.3	
	3.3160	-13.4	V	3.0	39.4	1.0	-51.9	-13.0	-38.9	
	1.6580	-4.1	H	3.0	38.2	1.0	-41.3	-13.0	-28.3	
	2.4870	-7.1	H	3.0	38.8	1.0	-44.9	-13.0	-31.9	
	3.3160	-14.0	H	3.0	39.4	1.0	-52.5	-13.0	-39.5	
	Mid Channel (836.5MHz)									
	1.6730	-3.9	V	3.0	38.2	1.0	-41.1	-13.0	-28.1	
	2.5090	-6.8	V	3.0	38.8	1.0	-44.6	-13.0	-31.6	
	3.3460	-14.0	V	3.0	39.5	1.0	-52.4	-13.0	-39.4	
	1.6730	-3.5	H	3.0	38.2	1.0	-40.7	-13.0	-27.7	
	2.5090	-5.4	H	3.0	38.8	1.0	-43.2	-13.0	-30.2	
	3.3460	-13.9	H	3.0	39.5	1.0	-52.3	-13.0	-39.3	
	High Channel (844MHz)									
	1.6880	-10.1	V	3.0	38.2	1.0	-47.3	-13.0	-34.3	
	2.5320	-8.1	V	3.0	38.9	1.0	-46.0	-13.0	-33.0	
	3.3760	-14.5	V	3.0	39.5	1.0	-53.0	-13.0	-40.0	
	1.6880	-4.1	H	3.0	38.2	1.0	-41.3	-13.0	-28.3	
	2.5320	-6.4	H	3.0	38.9	1.0	-44.2	-13.0	-31.2	
	3.3760	-14.4	H	3.0	39.5	1.0	-52.8	-13.0	-39.8	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									
LTE Band 5 10MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788269334 Date: 12-27-17 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X Position Mode: TX, LTE BAND 5, 10MHz BW, 16QAM									
	Chamber Pre-amplifier Filter Limit Chamber 2 AFS42 Filter 1 Part 22									
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (829MHz)									
	1.6580	-6.9	V	3.0	38.2	1.0	-44.1	-13.0	-31.1	
	2.4870	-8.8	V	3.0	38.8	1.0	-46.6	-13.0	-33.6	
	3.3160	-13.7	V	3.0	39.4	1.0	-52.1	-13.0	-39.1	
	1.6580	-4.2	H	3.0	38.2	1.0	-41.4	-13.0	-28.4	
	2.4870	-7.2	H	3.0	38.8	1.0	-45.0	-13.0	-32.0	
	3.3160	-12.9	H	3.0	39.4	1.0	-51.4	-13.0	-38.4	
	Mid Channel (836.5MHz)									
	1.6730	-3.7	V	3.0	38.2	1.0	-40.9	-13.0	-27.9	
	2.5090	-6.4	V	3.0	38.8	1.0	-44.3	-13.0	-31.3	
	3.3460	-14.4	V	3.0	39.5	1.0	-52.8	-13.0	-39.8	
	1.6730	-3.5	H	3.0	38.2	1.0	-40.7	-13.0	-27.7	
	2.5090	-5.1	H	3.0	38.8	1.0	-43.0	-13.0	-30.0	
	3.3460	-15.0	H	3.0	39.5	1.0	-53.5	-13.0	-40.5	
	High Channel (844MHz)									
	1.6880	-9.4	V	3.0	38.2	1.0	-46.6	-13.0	-33.6	
	2.5320	-8.2	V	3.0	38.9	1.0	-46.0	-13.0	-33.0	
	3.3760	-14.4	V	3.0	39.5	1.0	-52.9	-13.0	-39.9	
	1.6880	-3.9	H	3.0	38.2	1.0	-41.1	-13.0	-28.1	
	2.5320	-6.9	H	3.0	38.9	1.0	-44.8	-13.0	-31.8	
	3.3760	-14.5	H	3.0	39.5	1.0	-53.0	-13.0	-40.0	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

LTE

Band 5

5MHz

QPSK

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

12-27-17

Test Engineer:

45585

Configuration:

EUT / AC Adapter / Earphone, X Position

Mode:

TX, LTE BAND 5, 5MHz BW, QPSK

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (826.5MHz)									
1.6530	-4.3	V	3.0	38.2	1.0	-41.6	-13.0	-28.6	
2.4790	-12.2	V	3.0	38.8	1.0	-50.0	-13.0	-37.0	
3.3060	-13.6	V	3.0	39.4	1.0	-52.0	-13.0	-39.0	
1.6530	-3.3	H	3.0	38.2	1.0	-40.5	-13.0	-27.5	
2.4790	-7.2	H	3.0	38.8	1.0	-45.0	-13.0	-32.0	
3.3060	-14.4	H	3.0	39.4	1.0	-52.8	-13.0	-39.8	
Mid Channel (836.5MHz)									
1.6730	-7.6	V	3.0	38.2	1.0	-44.8	-13.0	-31.8	
2.5090	-6.7	V	3.0	38.8	1.0	-44.5	-13.0	-31.5	
3.3460	-14.5	V	3.0	39.5	1.0	-53.0	-13.0	-40.0	
1.6730	-3.9	H	3.0	38.2	1.0	-41.2	-13.0	-28.2	
2.5090	-1.3	H	3.0	38.8	1.0	-39.2	-13.0	-26.2	
3.3460	-14.5	H	3.0	39.5	1.0	-52.9	-13.0	-39.9	
High Channel (846.5MHz)									
1.6930	-10.3	V	3.0	38.2	1.0	-47.6	-13.0	-34.6	
2.5390	-10.7	V	3.0	38.9	1.0	-48.6	-13.0	-35.6	
3.3860	-14.0	V	3.0	39.5	1.0	-52.4	-13.0	-39.4	
1.6930	-7.1	H	3.0	38.2	1.0	-44.3	-13.0	-31.3	
2.5390	-5.6	H	3.0	38.9	1.0	-43.5	-13.0	-30.5	
3.3860	-14.3	H	3.0	39.5	1.0	-52.8	-13.0	-39.8	

Rev. 03.03.09

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

LTE

Band 5

5MHz

16QAM

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company:

Samsung

Project #:

4788269334

Date:

12-27-17

Test Engineer:

45585

Configuration:

EUT / AC Adapter / Earphone, X Position

Mode:

TX, LTE BAND 5, 5MHz BW, 16QAM

Chamber

Chamber 2

Pre-amplifier

AFS42

Filter

Filter 1

Limit

Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (826.5MHz)									
1.6530	-4.0	V	3.0	38.2	1.0	-41.3	-13.0	-28.3	
2.4790	-12.5	V	3.0	38.8	1.0	-50.3	-13.0	-37.3	
3.3060	-14.2	V	3.0	39.4	1.0	-52.6	-13.0	-39.6	
1.6530	-3.0	H	3.0	38.2	1.0	-40.2	-13.0	-27.2	
2.4790	-7.5	H	3.0	38.8	1.0	-45.3	-13.0	-32.3	
3.3060	-13.9	H	3.0	39.4	1.0	-52.3	-13.0	-39.3	
Mid Channel (836.5MHz)									
1.6730	-7.5	V	3.0	38.2	1.0	-44.7	-13.0	-31.7	
2.5090	-6.7	V	3.0	38.8	1.0	-44.5	-13.0	-31.5	
3.3460	-14.1	V	3.0	39.5	1.0	-52.6	-13.0	-39.6	
1.6730	-3.8	H	3.0	38.2	1.0	-41.1	-13.0	-28.1	
2.5090	-1.1	H	3.0	38.8	1.0	-39.0	-13.0	-26.0	
3.3460	-14.7	H	3.0	39.5	1.0	-53.1	-13.0	-40.1	
High Channel (846.5MHz)									
1.6930	-10.2	V	3.0	38.2	1.0	-47.4	-13.0	-34.4	
2.5390	-10.4	V	3.0	38.9	1.0	-48.3	-13.0	-35.3	
3.3860	-14.2	V	3.0	39.5	1.0	-52.6	-13.0	-39.6	
1.6930	-6.9	H	3.0	38.2	1.0	-44.1	-13.0	-31.1	
2.5390	-5.2	H	3.0	38.9	1.0	-43.1	-13.0	-30.1	
3.3860	-13.9	H	3.0	39.5	1.0	-52.4	-13.0	-39.4	

Rev. 03.03.09

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

UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788269334 Date: 12-27-17 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X Position Mode: TX, LTE BAND 5, 1.4MHz BW, QPSK										
LTE Band 5 1.4MHz QPSK	Chamber Chamber 2				Pre-amplifier AFS42		Filter Filter 1		Limit Part 22	
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (824.7MHz)									
	1.6494	-3.6	V	3.0	38.2	1.0	-40.8	-13.0	-27.8	
	2.4741	-12.6	V	3.0	38.8	1.0	-50.4	-13.0	-37.4	
	3.2988	-14.8	V	3.0	39.4	1.0	-53.2	-13.0	-40.2	
	1.6494	-2.2	H	3.0	38.2	1.0	-39.4	-13.0	-26.4	
	2.4741	-7.9	H	3.0	38.8	1.0	-45.7	-13.0	-32.7	
	3.2988	-14.1	H	3.0	39.4	1.0	-52.5	-13.0	-39.5	
	Mid Channel (836.5MHz)									
	1.6730	-4.7	V	3.0	38.2	1.0	-42.0	-13.0	-29.0	
	2.5090	-10.9	V	3.0	38.8	1.0	-48.8	-13.0	-35.8	
	3.3460	-14.6	V	3.0	39.5	1.0	-53.1	-13.0	-40.1	
	1.6730	-4.1	H	3.0	38.2	1.0	-41.3	-13.0	-28.3	
	2.5090	-5.9	H	3.0	38.8	1.0	-43.8	-13.0	-30.8	
	3.3460	-14.2	H	3.0	39.5	1.0	-52.6	-13.0	-39.6	
	High Channel (848.3MHz)									
	1.6966	-5.6	V	3.0	38.2	1.0	-42.9	-13.0	-29.9	
	2.5449	-10.6	V	3.0	38.9	1.0	-48.5	-13.0	-35.5	
	3.3932	-13.3	V	3.0	39.5	1.0	-51.8	-13.0	-38.8	
	1.6966	-3.0	H	3.0	38.2	1.0	-40.2	-13.0	-27.2	
	2.5449	-5.9	H	3.0	38.9	1.0	-43.8	-13.0	-30.8	
	3.3932	-13.5	H	3.0	39.5	1.0	-52.0	-13.0	-39.0	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									
LTE Band 5 1.4MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788269334 Date: 12-27-17 Test Engineer: 45585 Configuration: EUT / AC Adapter / Earphone, X Position Mode: TX, LTE BAND 5, 1.4MHz BW, 16QAM									
	Chamber Chamber 2				Pre-amplifier AFS42		Filter Filter 1		Limit Part 22	
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Channel (824.7MHz)									
	1.6494	-3.8	V	3.0	38.2	1.0	-41.0	-13.0	-28.0	
	2.4741	-12.4	V	3.0	38.8	1.0	-50.2	-13.0	-37.2	
	3.2988	-14.5	V	3.0	39.4	1.0	-52.9	-13.0	-39.9	
	1.6494	-2.4	H	3.0	38.2	1.0	-39.6	-13.0	-26.6	
	2.4741	-8.6	H	3.0	38.8	1.0	-46.5	-13.0	-33.5	
	3.2988	-14.4	H	3.0	39.4	1.0	-52.8	-13.0	-39.8	
	Mid Channel (836.5MHz)									
	1.6730	-4.4	V	3.0	38.2	1.0	-41.7	-13.0	-28.7	
	2.5090	-10.5	V	3.0	38.8	1.0	-48.3	-13.0	-35.3	
	3.3460	-14.7	V	3.0	39.5	1.0	-53.2	-13.0	-40.2	
	1.6730	-3.6	H	3.0	38.2	1.0	-40.8	-13.0	-27.8	
	2.5090	-5.7	H	3.0	38.8	1.0	-43.6	-13.0	-30.6	
	3.3460	-14.4	H	3.0	39.5	1.0	-52.9	-13.0	-39.9	
	High Channel (848.3MHz)									
	1.6966	-6.2	V	3.0	38.2	1.0	-43.4	-13.0	-30.4	
	2.5449	-10.2	V	3.0	38.9	1.0	-48.1	-13.0	-35.1	
	3.3932	-14.3	V	3.0	39.5	1.0	-52.8	-13.0	-39.8	
	1.6966	-2.9	H	3.0	38.2	1.0	-40.2	-13.0	-27.2	
	2.5449	-7.2	H	3.0	38.9	1.0	-45.1	-13.0	-32.1	
	3.3932	-14.0	H	3.0	39.5	1.0	-52.5	-13.0	-39.5	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									