GSM1900

GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT, X-Position
Location: Chamber 2
Mode: GPRS 1900 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	14.74	V	4.5	9.4	19.66	33.0	-13.3	
1850.20	21.29	H	4.5	9.4	26.21	33.0	-6.8	
Mid Ch								
1880.00	14.14	V	4.5	9.2	18.80	33.0	-14.2	
1880.00	22.15	H	4.5	9.2	26.82	33.0	-6.2	
High Ch								
1909.80	13.34	V	4.6	8.9	17.70	33.0	-15.3	
1909.80	23.14	H	4.6	8.9	27.50	33.0	-5.5	

GSM1900

EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT, X-Position
Location: Chamber 2
Mode: EGPRS 1900 MHz Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.20	13.55	V	4.5	9.4	18.47	33.0	-14.5	
1850.20	20.20	H	4.5	9.4	25.12	33.0	-7.9	
Mid Ch								
1880.00	12.85	V	4.5	9.2	17.51	33.0	-15.5	
1880.00	20.14	H	4.5	9.2	24.81	33.0	-8.2	
High Ch								
1909.80	11.98	V	4.6	8.9	16.34	33.0	-16.7	
1909.80	20.88	H	4.6	8.9	25.24	33.0	-7.8	

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WCDMA Band 5

WCDMA

Band 5
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: Rel99 Band 5 Fundamentals

Test Equipment:
Receiving: VULB9163-749, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	21.80	V	3.0	-1.5	17.32	38.5	-21.2	
826.40	8.68	H	3.0	-1.5	4.20	38.5	-34.3	
Mid Ch								
836.60	22.17	V	3.0	-1.4	17.71	38.5	-20.8	
836.60	8.61	H	3.0	-1.4	4.15	38.5	-34.4	
High Ch								
846.60	21.12	V	3.1	-1.4	16.68	38.5	-21.8	
846.60	7.97	H	3.1	-1.4	3.53	38.5	-35.0	

WCDMA

Band 5
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-13
Test Engineer: 45585
Configuration: EUT, Z-Position
Location: Chamber 2
Mode: HSDPA Band 5 Fundamentals

Test Equipment:
Receiving: VULB9163-749, and Chamber 2 SMA Cables
Substitution: Dipole 3121_DB4, 2.5m SMA-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	20.91	V	3.0	-1.5	16.43	38.5	-22.1	
826.40	6.45	H	3.0	-1.5	1.97	38.5	-36.5	
Mid Ch								
836.60	21.03	V	3.0	-1.4	16.57	38.5	-21.9	
836.60	6.05	H	3.0	-1.4	1.59	38.5	-36.9	
High Ch								
846.60	18.86	V	3.1	-1.4	14.42	38.5	-24.1	
846.60	4.32	H	3.1	-1.4	-0.12	38.5	-38.6	

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WCDMA Band 2

WCDMA

Band 2
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-08
Test Engineer: 45585
Configuration: EUT, X-Position
Location: Chamber 2
Mode: Rel99 Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	7.11	V	4.5	9.4	12.01	33.0	-21.0	
1852.40	15.74	H	4.5	9.4	20.64	33.0	-12.4	
Mid Ch								
1880.00	6.56	V	4.5	9.2	11.22	33.0	-21.8	
1880.00	17.44	H	4.5	9.2	22.11	33.0	-10.9	
High Ch								
1907.60	5.52	V	4.6	9.0	9.91	33.0	-23.1	
1907.60	16.76	H	4.6	9.0	21.15	33.0	-11.8	

WCDMA

Band 2
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-08
Test Engineer: 45585
Configuration: EUT, X-Position
Location: Chamber 2
Mode: HSDPA Band 2 Fundamentals

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	6.77	V	4.5	9.4	11.67	33.0	-21.3	
1852.40	15.44	H	4.5	9.4	20.34	33.0	-12.7	
Mid Ch								
1880.00	7.98	V	4.5	9.2	12.64	33.0	-20.4	
1880.00	17.44	H	4.5	9.2	22.11	33.0	-10.9	
High Ch								
1907.60	5.28	V	4.6	9.0	9.67	33.0	-23.3	
1907.60	16.57	H	4.6	9.0	20.96	33.0	-12.0	

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LTE Band 5

LTE Band 5 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	17.29	V	3.0	-1.5	12.81	38.5	-25.7	
829.00	24.00	H	3.0	-1.5	19.52	38.5	-19.0	
Mid Ch								
836.50	14.78	V	3.0	-1.4	10.32	38.5	-28.2	
836.50	22.57	H	3.0	-1.4	18.11	38.5	-20.4	
High Ch								
844.00	13.85	V	3.1	-1.4	9.40	38.5	-29.1	
844.00	22.62	H	3.1	-1.4	18.17	38.5	-20.3	

LTE Band 5 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

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

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

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Band 5

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

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

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	14.59	V	3.0	-1.5	10.11	38.5	-28.4	
826.50	23.79	H	3.0	-1.5	19.31	38.5	-19.2	
Mid Ch								
836.50	14.71	V	3.0	-1.4	10.25	38.5	-28.3	
836.50	24.07	H	3.0	-1.4	19.61	38.5	-18.9	
High Ch								
846.50	13.53	V	3.1	-1.4	9.08	38.5	-29.4	
846.50	19.85	H	3.1	-1.4	15.40	38.5	-23.1	

LTE

Band 5

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

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

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	13.42	V	3.0	-1.5	8.94	38.5	-29.6	
826.50	22.49	H	3.0	-1.5	18.01	38.5	-20.5	
Mid Ch								
836.50	13.45	V	3.0	-1.4	8.99	38.5	-29.5	
836.50	22.81	H	3.0	-1.4	18.35	38.5	-20.2	
High Ch								
846.50	12.16	V	3.1	-1.4	7.71	38.5	-30.8	
846.50	19.12	H	3.1	-1.4	14.67	38.5	-23.8	

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Band 5

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

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

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

LTE

Band 5

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-01
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	12.89	V	3.0	-1.5	8.41	38.5	-30.1	
825.50	21.67	H	3.0	-1.5	17.19	38.5	-21.3	
Mid Ch								
836.50	12.41	V	3.0	-1.4	7.95	38.5	-30.6	
836.50	21.58	H	3.0	-1.4	17.12	38.5	-21.4	
High Ch								
847.50	11.27	V	3.1	-1.4	6.83	38.5	-31.7	
847.50	21.10	H	3.1	-1.4	16.65	38.5	-21.8	

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Band 5

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

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

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

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

LTE

Band 5

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

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

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	13.00	V	3.0	-1.5	8.51	38.5	-30.0	
824.70	22.14	H	3.0	-1.5	17.65	38.5	-20.8	
Mid Ch								
836.50	13.01	V	3.0	-1.4	8.55	38.5	-30.0	
836.50	21.83	H	3.0	-1.4	17.37	38.5	-21.1	
High Ch								
848.30	10.83	V	3.1	-1.4	6.39	38.5	-32.1	
848.30	21.28	H	3.1	-1.4	16.84	38.5	-21.7	

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LTE Band 41

LTE Band 41 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

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

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

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

LTE Band 41 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

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

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2506.00	14.12	V	5.2	10.1	18.95	33.0	-14.1	
2506.00	16.35	H	5.2	10.1	21.18	33.0	-11.8	
Mid Ch								
2593.00	15.99	V	5.3	10.0	20.63	33.0	-12.4	
2593.00	16.78	H	5.3	10.0	21.42	33.0	-11.6	
High Ch								
2680.00	13.90	V	5.4	10.0	18.49	33.0	-14.5	
2680.00	14.78	H	5.4	10.0	19.37	33.0	-13.6	

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LTE

Band 41

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	16.99	V	5.2	10.1	21.82	33.0	-11.2	
2503.50	16.52	H	5.2	10.1	21.35	33.0	-11.6	
Mid Ch								
2593.00	15.19	V	5.3	10.0	19.83	33.0	-13.2	
2593.00	17.54	H	5.3	10.0	22.18	33.0	-10.8	
High Ch								
2682.50	15.97	V	5.4	10.0	20.57	33.0	-12.4	
2682.50	15.37	H	5.4	10.0	19.97	33.0	-13.0	

LTE

Band 41

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 15MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2503.50	16.20	V	5.2	10.1	21.03	33.0	-12.0	
2503.50	15.74	H	5.2	10.1	20.57	33.0	-12.4	
Mid Ch								
2593.00	14.96	V	5.3	10.0	19.60	33.0	-13.4	
2593.00	17.66	H	5.3	10.0	22.30	33.0	-10.7	
High Ch								
2682.50	15.79	V	5.4	10.0	20.39	33.0	-12.6	
2682.50	15.16	H	5.4	10.0	19.76	33.0	-13.2	

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LTE

Band 41

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	17.55	V	5.2	10.1	22.39	33.0	-10.6	
2501.00	17.17	H	5.2	10.1	22.01	33.0	-11.0	
Mid Ch								
2593.00	15.52	V	5.3	10.0	20.16	33.0	-12.8	
2593.00	17.23	H	5.3	10.0	21.87	33.0	-11.1	
High Ch								
2685.00	15.71	V	5.4	10.0	20.30	33.0	-12.7	
2685.00	15.06	H	5.4	10.0	19.65	33.0	-13.4	

LTE

Band 41

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 10MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2501.00	16.58	V	5.2	10.1	21.42	33.0	-11.6	
2501.00	16.16	H	5.2	10.1	21.00	33.0	-12.0	
Mid Ch								
2593.00	14.72	V	5.3	10.0	19.36	33.0	-13.6	
2593.00	17.04	H	5.3	10.0	21.68	33.0	-11.3	
High Ch								
2685.00	15.98	V	5.4	10.0	20.57	33.0	-12.4	
2685.00	15.28	H	5.4	10.0	19.87	33.0	-13.1	

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LTE

Band 41

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_QPSK Band 41 Fundamentals, 5MHz Bandwidth

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2498.50	16.30	V	5.2	10.1	21.14	33.0	-11.9	
2498.50	17.15	H	5.2	10.1	21.99	33.0	-11.0	
Mid Ch								
2593.00	15.82	V	5.3	10.0	20.46	33.0	-12.5	
2593.00	17.36	H	5.3	10.0	22.00	33.0	-11.0	
High Ch								
2687.50	15.65	V	5.4	10.0	20.25	33.0	-12.8	
2687.50	15.91	H	5.4	10.0	20.51	33.0	-12.5	

LTE

Band 41

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: LTE_16QAM Band 41 Fundamentals, 5MHz Bandwidth

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

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

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10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238 and §27. 53

LIMIT

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

Part 27.53:
(m) (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE

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

For peak power measurement with a ESU40:
a) Set the RBW = 100 KHz for emission below 1GHz and 1MHz for emissions above 1GHz
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = auto couple;
e) Detector = rms;
f) Ensure that the number of measurement points ≥ span/RBW;
g) Trace mode = average(WCDMA, LTE), Maxhold(GSM, LTE Band41);;

RESULTS

See the following pages.

NOTE : Please refer to section 5.4 for bandwidth and RB setting about LTE bands.

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10.2.1. SPURIOUS RADIATION PLOTS

GSM850

GSM850

GPRS

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-13
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: GPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1648.40	4.9	V	3.0	43.6	1.0	-37.7	-13.0	-24.7	
2472.60	-4.3	V	3.0	43.4	1.0	-46.7	-13.0	-33.7	
3296.80	-8.6	V	3.0	43.6	1.0	-51.2	-13.0	-38.2	
1648.40	4.2	H	3.0	43.6	1.0	-38.4	-13.0	-25.4	
2472.60	-2.7	H	3.0	43.4	1.0	-45.1	-13.0	-32.1	
3296.80	-8.0	H	3.0	43.6	1.0	-50.7	-13.0	-37.7	
Mid Ch, 836.6MHz									
1673.20	5.5	V	3.0	43.6	1.0	-37.1	-13.0	-24.1	
2509.80	-5.8	V	3.0	43.4	1.0	-48.2	-13.0	-35.2	
3346.40	-9.1	V	3.0	43.6	1.0	-51.7	-13.0	-38.7	
1673.20	3.9	H	3.0	43.6	1.0	-38.7	-13.0	-25.7	
2509.80	-4.1	H	3.0	43.4	1.0	-46.5	-13.0	-33.5	
3346.40	-7.8	H	3.0	43.6	1.0	-50.5	-13.0	-37.5	
High Ch, 848.8MHz									
1697.60	7.6	V	3.0	43.6	1.0	-35.0	-13.0	-22.0	
2546.40	-5.8	V	3.0	43.4	1.0	-48.3	-13.0	-35.3	
3395.20	-9.0	V	3.0	43.7	1.0	-51.6	-13.0	-38.6	
1697.60	8.8	H	3.0	43.6	1.0	-33.8	-13.0	-20.8	
2546.40	-4.0	H	3.0	43.4	1.0	-46.4	-13.0	-33.4	
3395.20	-7.3	H	3.0	43.7	1.0	-50.0	-13.0	-37.0	

GSM850

EGPRS

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-13
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: EGPRS 850 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1648.40	-2.8	V	3.0	43.6	1.0	-45.4	-13.0	-32.4	
2472.60	-11.2	V	3.0	43.4	1.0	-53.6	-13.0	-40.6	
3296.80	-9.7	V	3.0	43.6	1.0	-52.4	-13.0	-39.4	
1648.40	-1.3	H	3.0	43.6	1.0	-43.9	-13.0	-30.9	
2472.60	-12.0	H	3.0	43.4	1.0	-54.4	-13.0	-41.4	
3296.80	-9.8	H	3.0	43.6	1.0	-52.4	-13.0	-39.4	
Mid Ch, 836.6MHz									
1673.20	-2.8	V	3.0	43.6	1.0	-45.4	-13.0	-32.4	
2509.80	-11.2	V	3.0	43.4	1.0	-53.6	-13.0	-40.6	
3346.40	-9.6	V	3.0	43.6	1.0	-52.3	-13.0	-39.3	
1673.20	-4.9	H	3.0	43.6	1.0	-47.5	-13.0	-34.5	
2509.80	-11.2	H	3.0	43.4	1.0	-53.7	-13.0	-40.7	
3346.40	-9.7	H	3.0	43.6	1.0	-52.4	-13.0	-39.4	
High Ch, 848.8MHz									
1697.60	-2.5	V	3.0	43.6	1.0	-45.1	-13.0	-32.1	
2546.40	-11.1	V	3.0	43.4	1.0	-53.5	-13.0	-40.5	
3395.20	-8.9	V	3.0	43.7	1.0	-51.6	-13.0	-38.6	
1697.60	-3.6	H	3.0	43.6	1.0	-46.2	-13.0	-33.2	
2546.40	-12.1	H	3.0	43.4	1.0	-54.5	-13.0	-41.5	
3395.20	-8.9	H	3.0	43.7	1.0	-51.5	-13.0	-38.5	

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GSM1900

GSM1900

GPRS

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 2
Mode: GPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-6.0	V	3.0	39.7	1.0	-44.7	-13.0	-31.7	
5550.60	-7.3	V	3.0	39.9	1.0	-46.2	-13.0	-33.2	
7400.80	-5.2	V	3.0	39.4	1.0	-43.7	-13.0	-30.7	
3700.40	-6.0	H	3.0	39.7	1.0	-44.7	-13.0	-31.7	
5550.60	-7.5	H	3.0	39.9	1.0	-46.5	-13.0	-33.5	
7400.80	-6.2	H	3.0	39.4	1.0	-44.7	-13.0	-31.7	
Mid Ch, 1880MHz									
3760.00	-4.0	V	3.0	39.7	1.0	-42.7	-13.0	-29.7	
5640.00	-6.6	V	3.0	40.0	1.0	-45.6	-13.0	-32.6	
7520.00	-5.3	V	3.0	39.4	1.0	-43.7	-13.0	-30.7	
3760.00	-4.5	H	3.0	39.7	1.0	-43.2	-13.0	-30.2	
5640.00	-7.2	H	3.0	40.0	1.0	-46.2	-13.0	-33.2	
7520.00	-5.9	H	3.0	39.4	1.0	-44.3	-13.0	-31.3	
High Ch, 1909.8MHz									
3819.60	-3.6	V	3.0	39.7	1.0	-42.3	-13.0	-29.3	
5729.40	-7.2	V	3.0	40.0	1.0	-46.2	-13.0	-33.2	
7639.20	-5.2	V	3.0	39.3	1.0	-43.6	-13.0	-30.6	
3819.60	-5.1	H	3.0	39.7	1.0	-43.8	-13.0	-30.8	
5729.40	-7.3	H	3.0	40.0	1.0	-46.3	-13.0	-33.3	
7639.20	-6.2	H	3.0	39.3	1.0	-44.5	-13.0	-31.5	

GSM1900

EGPRS

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-12
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earphone, Y-Position
Location: Chamber 2
Mode: EGPRS 1900 MHz Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3700.40	-7.4	V	3.0	39.7	1.0	-46.0	-13.0	-33.0	
5550.60	-5.8	V	3.0	39.9	1.0	-44.8	-13.0	-31.8	
7400.80	-3.4	V	3.0	39.4	1.0	-41.8	-13.0	-28.8	
3700.40	-4.5	H	3.0	39.7	1.0	-43.1	-13.0	-30.1	
5550.60	-6.3	H	3.0	39.9	1.0	-45.2	-13.0	-32.2	
7400.80	-4.2	H	3.0	39.4	1.0	-42.6	-13.0	-29.6	
Mid Ch, 1880MHz									
3760.00	-7.6	V	3.0	39.7	1.0	-46.3	-13.0	-33.3	
5640.00	-5.1	V	3.0	40.0	1.0	-44.1	-13.0	-31.1	
7520.00	-3.4	V	3.0	39.4	1.0	-41.8	-13.0	-28.8	
3760.00	-2.5	H	3.0	39.7	1.0	-41.2	-13.0	-28.2	
5640.00	-5.4	H	3.0	40.0	1.0	-44.4	-13.0	-31.4	
7520.00	-4.2	H	3.0	39.4	1.0	-42.6	-13.0	-29.6	
High Ch, 1909.8MHz									
3819.60	-8.2	V	3.0	39.7	1.0	-47.0	-13.0	-34.0	
5729.40	-5.6	V	3.0	40.0	1.0	-44.6	-13.0	-31.6	
7639.20	-3.9	V	3.0	39.3	1.0	-42.2	-13.0	-29.2	
3819.60	-6.0	H	3.0	39.7	1.0	-44.7	-13.0	-31.7	
5729.40	-5.8	H	3.0	40.0	1.0	-44.8	-13.0	-31.8	
7639.20	-4.7	H	3.0	39.3	1.0	-43.0	-13.0	-30.0	

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WCDMA Band 5

WCDMA

Band 5
REL99

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-13
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earhpone
Location: Chamber 2
Mode: Rel99 Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1652.80	-13.8	V	3.0	38.2	1.0	-51.0	-13.0	-38.0	
2479.20	-12.8	V	3.0	38.8	1.0	-50.6	-13.0	-37.6	
3305.60	-10.2	V	3.0	39.4	1.0	-48.6	-13.0	-35.6	
1652.80	-11.8	H	3.0	38.2	1.0	-49.0	-13.0	-36.0	
2479.20	-13.4	H	3.0	38.8	1.0	-51.2	-13.0	-38.2	
3305.60	-10.5	H	3.0	39.4	1.0	-48.9	-13.0	-35.9	
Mid Ch, 836.6MHz									
1673.20	-13.9	V	3.0	38.2	1.0	-51.2	-13.0	-38.2	
2509.80	-12.8	V	3.0	38.8	1.0	-50.6	-13.0	-37.6	
3346.40	-10.3	V	3.0	39.5	1.0	-48.7	-13.0	-35.7	
1673.20	-11.9	H	3.0	38.2	1.0	-49.1	-13.0	-36.1	
2509.80	-13.3	H	3.0	38.8	1.0	-51.2	-13.0	-38.2	
3346.40	-10.5	H	3.0	39.5	1.0	-48.9	-13.0	-35.9	
High Ch, 846.6MHz									
1693.20	-14.7	V	3.0	38.2	1.0	-52.0	-13.0	-39.0	
2539.80	-12.6	V	3.0	38.9	1.0	-50.5	-13.0	-37.5	
3386.40	-10.0	V	3.0	39.5	1.0	-48.5	-13.0	-35.5	
1693.20	-12.7	H	3.0	38.2	1.0	-50.0	-13.0	-37.0	
2539.80	-13.2	H	3.0	38.9	1.0	-51.0	-13.0	-38.0	
3386.40	-10.3	H	3.0	39.5	1.0	-48.8	-13.0	-35.8	

WCDMA

Band 5
HSDPA

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-13
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earhpone, X-Position
Location: Chamber 2
Mode: HSDPA Band 5 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1652.80	-15.0	V	3.0	38.2	1.0	-52.2	-13.0	-39.2	
2479.20	-12.9	V	3.0	38.8	1.0	-50.7	-13.0	-37.7	
3305.60	-10.3	V	3.0	39.4	1.0	-48.7	-13.0	-35.7	
1652.80	-13.4	H	3.0	38.2	1.0	-50.6	-13.0	-37.6	
2479.20	-13.3	H	3.0	38.8	1.0	-51.1	-13.0	-38.1	
3305.60	-10.5	H	3.0	39.4	1.0	-48.9	-13.0	-35.9	
Mid Ch, 836.6MHz									
1673.20	-13.2	V	3.0	38.2	1.0	-50.5	-13.0	-37.5	
2509.80	-12.5	V	3.0	38.8	1.0	-50.4	-13.0	-37.4	
3346.40	-9.9	V	3.0	39.5	1.0	-48.4	-13.0	-35.4	
1673.20	-12.2	H	3.0	38.2	1.0	-49.5	-13.0	-36.5	
2509.80	-13.3	H	3.0	38.8	1.0	-51.1	-13.0	-38.1	
3346.40	-10.1	H	3.0	39.5	1.0	-48.6	-13.0	-35.6	
High Ch, 846.6MHz									
1693.20	-15.2	V	3.0	38.2	1.0	-52.4	-13.0	-39.4	
2539.80	-12.7	V	3.0	38.9	1.0	-50.5	-13.0	-37.5	
3386.40	-10.0	V	3.0	39.5	1.0	-48.5	-13.0	-35.5	
1693.20	-14.5	H	3.0	38.2	1.0	-51.7	-13.0	-38.7	
2539.80	-12.9	H	3.0	38.9	1.0	-50.8	-13.0	-37.8	
3386.40	-10.2	H	3.0	39.5	1.0	-48.7	-13.0	-35.7	

WCDMA Band 2

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WCDMA

Band 2
REL99

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-08
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 2
Mode: Rel99 Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-11.5	V	3.0	39.7	1.0	-50.1	-13.0	-37.1	
5557.20	-8.4	V	3.0	39.9	1.0	-47.3	-13.0	-34.3	
7409.60	-6.2	V	3.0	39.4	1.0	-44.6	-13.0	-31.6	
9262.00	-4.0	V	3.0	38.8	1.0	-41.7	-13.0	-28.7	
11114.40	0.0	V	3.0	38.5	1.0	-37.6	-13.0	-24.6	
3704.80	-11.7	H	3.0	39.7	1.0	-50.4	-13.0	-37.4	
5557.20	-8.7	H	3.0	39.9	1.0	-47.7	-13.0	-34.7	
7409.60	-7.1	H	3.0	39.4	1.0	-45.6	-13.0	-32.6	
9262.00	-4.8	H	3.0	38.8	1.0	-42.6	-13.0	-29.6	
11114.40	0.0	H	3.0	38.5	1.0	-37.5	-13.0	-24.5	
Mid Ch, 1880MHz									
3760.00	-11.0	V	3.0	39.7	1.0	-49.6	-13.0	-36.6	
5640.00	-8.0	V	3.0	40.0	1.0	-47.0	-13.0	-34.0	
7520.00	-6.2	V	3.0	39.4	1.0	-44.6	-13.0	-31.6	
9400.00	-3.8	V	3.0	38.7	1.0	-41.5	-13.0	-28.5	
11280.00	0.5	V	3.0	38.5	1.0	-37.0	-13.0	-24.0	
3760.00	-11.4	H	3.0	39.7	1.0	-50.1	-13.0	-37.1	
5640.00	-8.4	H	3.0	40.0	1.0	-47.4	-13.0	-34.4	
7520.00	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4	
9400.00	-4.3	H	3.0	38.7	1.0	-42.1	-13.0	-29.1	
11280.00	0.4	H	3.0	38.5	1.0	-37.1	-13.0	-24.1	
High Ch, 1907.6MHz									
3815.20	-11.0	V	3.0	39.7	1.0	-49.7	-13.0	-36.7	
5722.80	-8.2	V	3.0	40.0	1.0	-47.1	-13.0	-34.1	
7630.40	-6.2	V	3.0	39.3	1.0	-44.6	-13.0	-31.6	
9538.00	-2.6	V	3.0	38.7	1.0	-40.2	-13.0	-27.2	
11445.60	0.8	V	3.0	38.5	1.0	-36.7	-13.0	-23.7	
3815.20	-11.5	H	3.0	39.7	1.0	-50.2	-13.0	-37.2	
5722.80	-8.3	H	3.0	40.0	1.0	-47.3	-13.0	-34.3	
7630.40	-7.0	H	3.0	39.3	1.0	-45.3	-13.0	-32.3	
9538.00	-3.7	H	3.0	38.7	1.0	-41.4	-13.0	-28.4	
11445.60	0.8	H	3.0	38.5	1.0	-36.7	-13.0	-23.7	

WCDMA

Band 2
HSDPA

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

Company: Samsung
Project #: 4788869685
Date: 2019-02-08
Test Engineer: 45585
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 2
Mode: HSDPA Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-11.3	V	3.0	39.7	1.0	-50.0	-13.0	-37.0	
5557.20	-8.5	V	3.0	39.9	1.0	-47.4	-13.0	-34.4	
7409.60	-6.3	V	3.0	39.4	1.0	-44.8	-13.0	-31.8	
9262.00	-4.1	V	3.0	38.8	1.0	-41.8	-13.0	-28.8	
11114.40	-0.7	V	3.0	38.5	1.0	-38.2	-13.0	-25.2	
3704.80	-11.8	H	3.0	39.7	1.0	-50.5	-13.0	-37.5	
5557.20	-8.8	H	3.0	39.9	1.0	-47.7	-13.0	-34.7	
7409.60	-7.2	H	3.0	39.4	1.0	-45.6	-13.0	-32.6	
9262.00	-4.9	H	3.0	38.8	1.0	-42.7	-13.0	-29.7	
11114.40	-0.1	H	3.0	38.5	1.0	-37.6	-13.0	-24.6	
Mid Ch, 1880MHz									
3760.00	-10.9	V	3.0	39.7	1.0	-49.6	-13.0	-36.6	
5640.00	-8.1	V	3.0	40.0	1.0	-47.0	-13.0	-34.0	
7520.00	-6.3	V	3.0	39.4	1.0	-44.7	-13.0	-31.7	
9400.00	-3.5	V	3.0	38.7	1.0	-41.3	-13.0	-28.3	
11280.00	0.4	V	3.0	38.5	1.0	-37.1	-13.0	-24.1	
3760.00	-11.3	H	3.0	39.7	1.0	-50.0	-13.0	-37.0	
5640.00	-8.1	H	3.0	40.0	1.0	-47.0	-13.0	-34.0	
7520.00	-7.0	H	3.0	39.4	1.0	-45.4	-13.0	-32.4	
9400.00	-4.4	H	3.0	38.7	1.0	-42.1	-13.0	-29.1	
11280.00	0.3	H	3.0	38.5	1.0	-37.2	-13.0	-24.2	
High Ch, 1907.6MHz									
3815.20	-11.3	V	3.0	39.7	1.0	-50.0	-13.0	-37.0	
5722.80	-8.4	V	3.0	40.0	1.0	-47.3	-13.0	-34.3	
7630.40	-6.5	V	3.0	39.3	1.0	-44.8	-13.0	-31.8	
9538.00	-3.3	V	3.0	38.7	1.0	-41.0	-13.0	-28.0	
11445.60	0.6	V	3.0	38.5	1.0	-36.9	-13.0	-23.9	
3815.20	-11.5	H	3.0	39.7	1.0	-50.2	-13.0	-37.2	
5722.80	-8.4	H	3.0	40.0	1.0	-47.4	-13.0	-34.4	
7630.40	-7.2	H	3.0	39.3	1.0	-45.5	-13.0	-32.5	
9538.00	-3.8	H	3.0	38.7	1.0	-41.5	-13.0	-28.5	
11445.60	0.5	H	3.0	38.5	1.0	-37.0	-13.0	-24.0	

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LTE Band 5

LTE

Band 5

5MHz

QPSK

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

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.5MHz									
1653.00	-6.0	V	3.0	43.6	1.0	-48.6	-13.0	-35.6	
2479.50	-12.4	V	3.0	43.4	1.0	-54.8	-13.0	-41.8	
3306.00	-10.6	V	3.0	43.6	1.0	-53.3	-13.0	-40.3	
1653.00	-5.0	H	3.0	43.6	1.0	-47.6	-13.0	-34.6	
2479.50	-13.1	H	3.0	43.4	1.0	-55.5	-13.0	-42.5	
3306.00	-10.8	H	3.0	43.6	1.0	-53.5	-13.0	-40.5	
Mid Ch, 836.5MHz									
1673.00	-7.9	V	3.0	43.6	1.0	-50.5	-13.0	-37.5	
2509.50	-12.5	V	3.0	43.4	1.0	-54.9	-13.0	-41.9	
3346.00	-10.7	V	3.0	43.6	1.0	-53.3	-13.0	-40.3	
1673.00	-6.8	H	3.0	43.6	1.0	-49.4	-13.0	-36.4	
2509.50	-13.1	H	3.0	43.4	1.0	-55.5	-13.0	-42.5	
3346.00	-10.7	H	3.0	43.6	1.0	-53.4	-13.0	-40.4	
High Ch, 846.5MHz									
1693.00	-7.4	V	3.0	43.6	1.0	-49.9	-13.0	-36.9	
2539.50	-12.4	V	3.0	43.4	1.0	-54.8	-13.0	-41.8	
3386.00	-10.1	V	3.0	43.7	1.0	-52.7	-13.0	-39.7	
1693.00	-7.2	H	3.0	43.6	1.0	-49.7	-13.0	-36.7	
2539.50	-12.8	H	3.0	43.4	1.0	-55.3	-13.0	-42.3	
3386.00	-10.1	H	3.0	43.7	1.0	-52.8	-13.0	-39.8	

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LTE Band 41

LTE

Band 41

10MHz

QPSK

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

Company:	Samsung
Project #:	4788869685
Date:	2019-02-12
Test Engineer:	45585
Configuration:	EUT / AC Adapter / Earphone / X-Position
Location:	Chamber 2
Mode:	LTE_QPSK Band 41 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 2501MHz									
5002.00	-14.8	V	3.0	39.8	1.0	-53.5	-25.0	-28.5	
7503.00	-5.9	V	3.0	39.4	1.0	-44.3	-25.0	-19.3	
10004.00	-11.8	V	3.0	38.6	1.0	-49.3	-25.0	-24.3	
12505.00	-3.3	V	3.0	39.0	1.0	-41.3	-25.0	-16.3	
15006.00	-5.9	V	3.0	41.3	1.0	-46.2	-25.0	-21.2	
5002.00	-15.8	H	3.0	39.8	1.0	-54.6	-25.0	-29.6	
7503.00	-6.4	H	3.0	39.4	1.0	-44.8	-25.0	-19.8	
10004.00	-11.7	H	3.0	38.6	1.0	-49.3	-25.0	-24.3	
12505.00	-7.7	H	3.0	39.0	1.0	-45.6	-25.0	-20.6	
15006.00	-6.4	H	3.0	41.3	1.0	-46.7	-25.0	-21.7	
Mid Ch, 2593MHz									
5186.00	-12.7	V	3.0	39.8	1.0	-51.6	-25.0	-26.6	
7779.00	-2.9	V	3.0	39.3	1.0	-41.2	-25.0	-16.2	
10372.00	-5.3	V	3.0	38.6	1.0	-42.8	-25.0	-17.8	
12965.00	4.6	V	3.0	39.4	1.0	-33.8	-25.0	-8.8	
15558.00	-1.8	V	3.0	41.1	1.0	-41.9	-25.0	-16.9	
5186.00	-13.0	H	3.0	39.8	1.0	-51.8	-25.0	-26.8	
7779.00	-2.3	H	3.0	39.3	1.0	-40.5	-25.0	-15.5	
10372.00	-5.8	H	3.0	38.6	1.0	-43.4	-25.0	-18.4	
12965.00	-4.7	H	3.0	39.4	1.0	-43.1	-25.0	-18.1	
15558.00	-6.2	H	3.0	41.1	1.0	-46.3	-25.0	-21.3	
High Ch, 2685MHz									
5370.00	-8.8	V	3.0	39.9	1.0	-47.7	-25.0	-22.7	
8055.00	-3.9	V	3.0	39.2	1.0	-42.0	-25.0	-17.0	
10740.00	-4.1	V	3.0	38.5	1.0	-41.7	-25.0	-16.7	
13425.00	-4.4	V	3.0	39.8	1.0	-43.2	-25.0	-18.2	
16110.00	-5.2	V	3.0	40.9	1.0	-45.1	-25.0	-20.1	
5370.00	-11.6	H	3.0	39.9	1.0	-50.5	-25.0	-25.5	
8055.00	-6.6	H	3.0	39.2	1.0	-44.7	-25.0	-19.7	
10740.00	-9.8	H	3.0	38.5	1.0	-47.3	-25.0	-22.3	
13425.00	-8.0	H	3.0	39.8	1.0	-46.8	-25.0	-21.8	
16110.00	-5.4	H	3.0	40.9	1.0	-45.3	-25.0	-20.3	

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