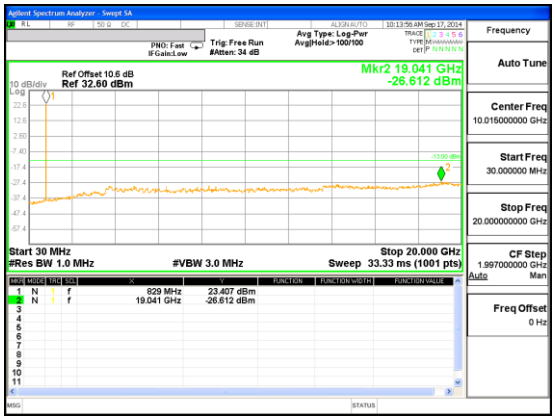
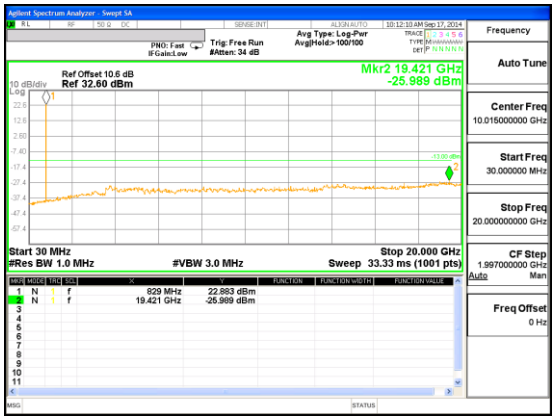
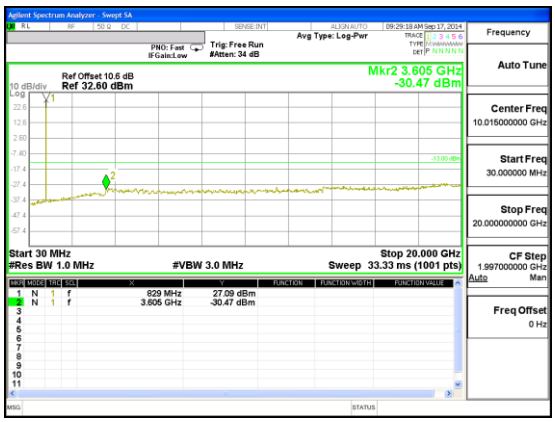
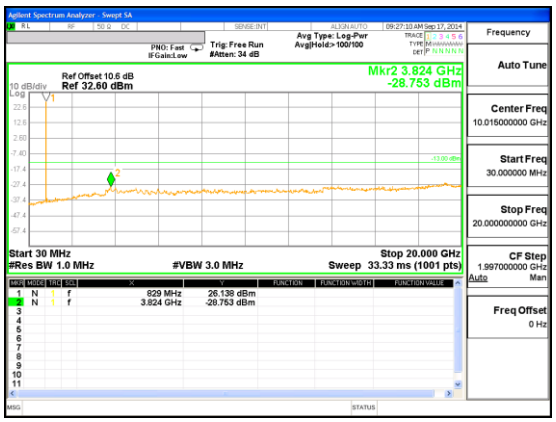
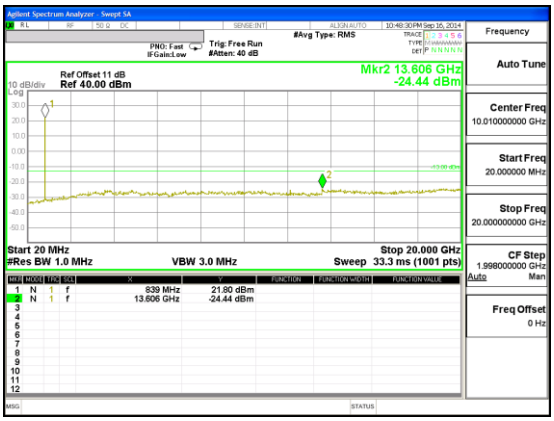
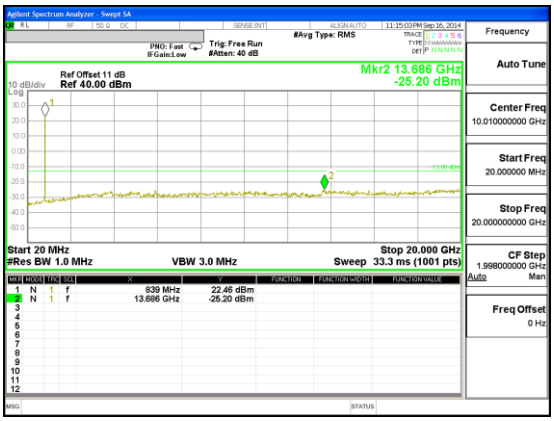
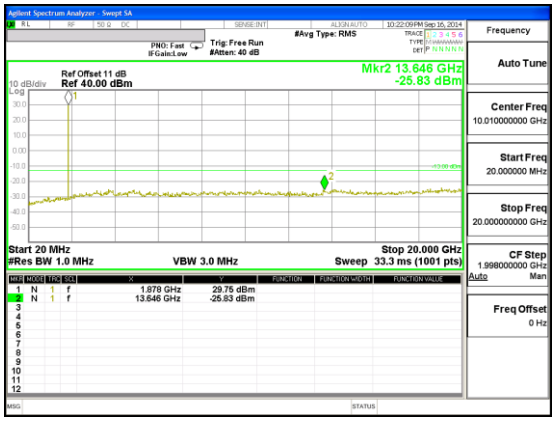
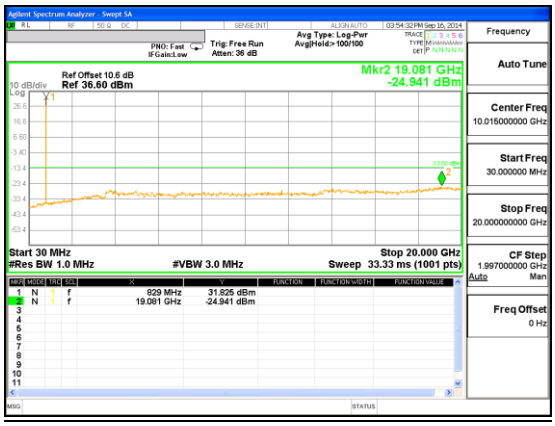
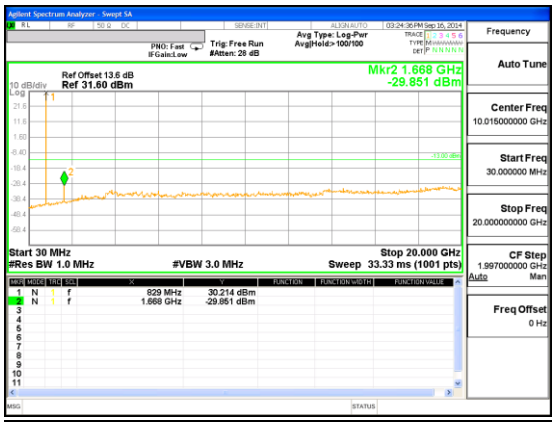
Band LTE5 3MHz	 Band LTE5 3MHz CSE 16QAM Mid channel	 Band LTE5 3MHz CSE QPSK Mid channel
Band LTE5 1.4MHz	 Band LTE5 1.4MHz CSE 16QAM Mid channel	 Band LTE5 1.4MHz CSE QPSK Mid channel

Band Band 5 HSDPA	 Band WCDMA B5 HSDPA CSE	 Band WCDMA B5 REL99 CSE

Band GSM1900	 Band GSM1900 EGPRS CSE Mid channel	 Band GSM1900 GPRS CSE Mid channel
Band GSM850	 Band GSM850 EGPRS CSE Mid channel	 Band GSM850 GPRS CSE Mid channel

10.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r01

RESULTS

See the following pages.

10.4.1. FREQUENCY STABILITY RESULTS

GPRS 1900, Channel 661 Freq: 1880MHz– MID CHANNEL

Reference Frequency: PCS Mid Channel		1880	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4700.000	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.999971	-0.001	2.5
3.80	40	1879.999966	0.002	2.5
3.80	30	1879.999972	-0.002	2.5
3.80	***20***	1879.999969	**0**	***2.5***
3.80	10	1879.999969	0.000	2.5
3.80	0	1879.999967	0.001	2.5
3.80	-10	1879.999968	0.001	2.5
3.80	-20	1879.999966	0.002	2.5
3.80	-30	1879.999964	0.003	2.5

Reference Frequency: PCS Mid Channel		1880	MHz @ 20°C	
Limit: to stay +- 2.5 ppm =		4700.000	Hz	
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***1879.999969***	***0***	***2.5***
4.30	20	1879.999968	*0.000*	2.5
3.20	20	1879.999974	*-0.002*	2.5

GPRS 850 CELL BAND, – MID CHANNEL190, Frequency 836.6MHz

Reference Frequency: Cell Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.600011	0.002	2.5
3.80	40	836.600015	-0.002	2.5
3.80	30	836.600014	-0.001	2.5
3.80	***20***	836.600013	***0***	***2.5***
3.80	10	836.600018	-0.005	2.5
3.80	0	836.600017	-0.005	2.5
3.80	-10	836.600015	-0.002	2.5
3.80	-20	836.600013	0.000	2.5
3.80	-30	836.600013	0.001	2.5

Reference Frequency: Cell Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
			Delta (ppm)	Limit (ppm)
3.80	***20***	***836.600013***	***0.00000***	***2.5***
4.30	20	836.600014	*-0.00062*	2.5
3.20	20	836.600022	*-0.01032*	2.5

11. RADIATED TEST RESULTS

11.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17; PSA setting reference to 971168 D01 v02r01

For peak power measurement with a PSA:

a) Set the RBW ≥ OBW; b) Set VBW ≥ 3 × RBW; c) Set span ≥ 2 x RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points ≥ span/RBW; g) Trace mode = max hold;

For average power measurement with a PSA:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW ≥ 3 x RBW; d) Set number of points in sweep ≥ 2 × span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 98; h) Use trigger to capture bursts If burst duty cycle < 98; i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.

TEST RESULTS

11.1.1. ERP/EIRP Results

Band	Mode	Channel	f(MHz)	ERP	
				dBm	mW
Band 5	REL99	4132	826.4	17.061	50.83
		4183	836.6	16.951	49.56
		4233	846.6	18.201	66.08
	HSDPA	4132	826.4	15.951	39.36
		4183	836.6	15.921	39.09
		4233	846.6	17.221	52.74

Band	Mode	Channel	f(MHz)	EIRP	
				dBm	mW
GSM1900	GPRS	512	1850.2	27.53	566.24
		661	1880	28.85	767.36
		810	1909.8	27.84	608.14
	EGPRS	512	1850.2	24.26	266.69
		661	1880	25.88	387.26
		810	1909.8	24.84	304.79

Band	Mode	Channel	f(MHz)	ERP	
				dBm	mW
GSM850	GPRS	128	824.2	28.316	678.58
		190	836.6	27.805	603.25
		251	848.8	28.194	659.78
	EGPRS	128	824.2	25.369	344.27
		190	836.6	25.087	322.63
		251	848.8	25.607	363.66

11.1.2. LTE ERP/EIRP Results

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP	
					dBm	mW
LTE5	10	QPSK	1/0	829	17.771	59.85
			1/0	836.5	18.441	69.84
			1/0	844	18.701	74.15
		16QAM	1/0	829	16.881	48.76
			1/0	836.5	17.551	56.9
			1/0	844	17.721	59.17

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP	
					dBm	mW
LTE5	5	QPSK	1/0	826.5	17.621	57.82
			1/0	836.5	18.381	68.88
			1/0	846.5	18.561	71.8
		16QAM	1/0	826.5	16.901	48.99
			1/0	836.5	17.231	52.86
			1/0	846.5	17.471	55.86

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP	
					dBm	mW
LTE5	3	QPSK	1/0	825.5	18.111	64.73
			1/0	836.5	18.481	70.49
			1/0	847.5	18.711	74.32
		16QAM	1/0	825.5	17.271	53.35
			1/0	836.5	17.361	54.46
			1/0	847.5	17.521	56.51

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP	
					dBm	mW
LTE5	1.4	QPSK	1/0	824.7	17.891	61.53
			1/0	836.5	18.161	65.48
			1/0	848.3	18.911	77.82
		16QAM	1/0	824.7	16.711	46.89
			1/0	836.5	17.191	52.37
			1/0	848.3	17.881	61.39

11.1.3. ERP/EIRP PLOTS

Band

LTE5

10MHz

16QAM

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: R. Alegre/Gavin C.
Configuration: EUT only, x-pos
Mode: LTE5 10MHz 16QAM

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
829.00	7.29	V	0.9	0.0	6.39	38.5	-32.1	
829.00	17.78	H	0.9	0.0	16.88	38.5	-21.6	
Mid Ch								
836.50	7.78	V	0.9	0.0	6.88	38.5	-31.6	
836.50	18.45	H	0.9	0.0	17.55	38.5	-20.9	
High Ch								
844.00	7.16	V	0.9	0.0	6.26	38.5	-32.2	
844.00	18.62	H	0.9	0.0	17.72	38.5	-20.7	

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

Band

LTE5

10MHz

QPSK

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: R. Alegre/Gavin C.
Configuration: EUT only, x-pos
Mode: LTE5 10MHz QPSK

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
829.00	8.11	V	0.9	0.0	7.21	38.5	-31.2	
829.00	18.67	H	0.9	0.0	17.77	38.5	-20.7	
Mid Ch								
836.50	8.57	V	0.9	0.0	7.67	38.5	-30.8	
836.50	19.34	H	0.9	0.0	18.44	38.5	-20.0	
High Ch								
844.00	8.02	V	0.9	0.0	7.12	38.5	-31.3	
844.00	19.60	H	0.9	0.0	18.70	38.5	-19.7	

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

Band

LTE5

5MHz

16QAM

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: R. Alegre/Gavin C.
Configuration: EUT only, x-pos
Mode: LTE5 5MHz 16QAM

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
826.50	7.72	V	0.9	0.0	6.87	38.5	-31.6	
826.50	17.75	H	0.9	0.0	16.90	38.5	-21.5	
Mid Ch								
836.50	8.01	V	0.9	0.0	7.16	38.5	-31.3	
836.50	18.08	H	0.9	0.0	17.23	38.5	-21.2	
High Ch								
846.50	7.31	V	0.9	0.0	6.46	38.5	-32.0	
846.50	18.32	H	0.9	0.0	17.47	38.5	-21.0	

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

Band

LTE5

5MHz

QPSK

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: R. Alegre/Gavin C.
Configuration: EUT only, x-pos
Mode: LTE5 5MHz QPSK

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
826.50	8.83	V	0.9	0.0	7.98	38.5	-30.5	
826.50	18.47	H	0.9	0.0	17.62	38.5	-20.8	
Mid Ch								
836.50	8.78	V	0.9	0.0	7.93	38.5	-30.5	
836.50	19.23	H	0.9	0.0	18.38	38.5	-20.1	
High Ch								
846.50	8.29	V	0.9	0.0	7.44	38.5	-31.0	
846.50	19.41	H	0.9	0.0	18.56	38.5	-19.9	

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

Band

LTE5

3MHz

16QAM

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

Company:	Samsung
Project #:	14I18853
Date:	09/17/14
Test Engineer:	R. Alegre/Gavin C.
Configuration:	EUT only, x-pos
Mode:	LTE5 3MHz 16QAM

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
825.50	7.57	V	0.9	0.0	6.67	38.5	-31.8	
825.50	18.17	H	0.9	0.0	17.27	38.5	-21.2	
Mid Ch								
836.50	8.40	V	0.9	0.0	7.50	38.5	-30.9	
836.50	18.26	H	0.9	0.0	17.36	38.5	-21.1	
High Ch								
847.50	7.41	V	0.9	0.0	6.51	38.5	-31.9	
847.50	18.42	H	0.9	0.0	17.52	38.5	-20.9	

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

Band

LTE5

3MHz

QPSK

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: R. Alegre/Gavin C.
Configuration: EUT only, x-pos
Mode: LTE5 3MHz QPSK

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
825.50	8.58	V	0.9	0.0	7.68	38.5	-30.8	
825.50	19.01	H	0.9	0.0	18.11	38.5	-20.3	
Mid Ch								
836.50	8.67	V	0.9	0.0	7.77	38.5	-30.7	
836.50	19.38	H	0.9	0.0	18.48	38.5	-20.0	
High Ch								
847.50	8.64	V	0.9	0.0	7.74	38.5	-30.7	
847.50	19.61	H	0.9	0.0	18.71	38.5	-19.7	

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

Band

LTE5

1.4MHz

16QAM

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: R. Alegre/Gavin C.
Configuration: EUT only, x-pos
Mode: LTE5 1.4 16QAM

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
824.70	6.98	V	0.9	0.0	6.13	38.5	-32.3	
824.70	17.56	H	0.9	0.0	16.71	38.5	-21.7	
Mid Ch								
836.50	7.49	V	0.9	0.0	6.64	38.5	-31.8	
836.50	18.04	H	0.9	0.0	17.19	38.5	-21.3	
High Ch								
848.30	7.67	V	0.9	0.0	6.82	38.5	-31.6	
848.30	18.73	H	0.9	0.0	17.88	38.5	-20.6	

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

Band

LTE5

1.4MHz

QPSK

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: R. Alegre/Gavin C.
Configuration: EUT only, x-pos
Mode: LTE5 1.4 QPSK

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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								
824.70	8.28	V	0.9	0.0	7.43	38.5	-31.0	
824.70	18.74	H	0.9	0.0	17.89	38.5	-20.6	
Mid Ch								
836.50	8.61	V	0.9	0.0	7.76	38.5	-30.7	
836.50	19.01	H	0.9	0.0	18.16	38.5	-20.3	
High Ch								
848.30	8.60	V	0.9	0.0	7.75	38.5	-30.7	
848.30	19.76	H	0.9	0.0	18.91	38.5	-19.5	

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

Band

Band 5

HSDPA

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: Gavin C.
Configuration: Y-position EUT only (Sample 1958413)
Mode: WCDMA_HSDPA_850

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	14.74	V	0.9	0.0	13.84	38.5	-24.6	
826.40	16.85	H	0.9	0.0	15.95	38.5	-22.5	
Mid Ch								
836.60	15.13	V	0.9	0.0	14.23	38.5	-24.2	
836.60	16.82	H	0.9	0.0	15.92	38.5	-22.5	
High Ch								
846.60	14.43	V	0.9	0.0	13.53	38.5	-24.9	
846.60	18.12	H	0.9	0.0	17.22	38.5	-21.2	

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

Band

Band 5

REL99

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: Gavin C.
Configuration: Y-position EUT only (Sample 1958413)
Mode: WCDMA_Rel99_850

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	13.76	V	0.9	0.0	12.86	38.5	-25.6	
826.40	17.96	H	0.9	0.0	17.06	38.5	-21.4	
Mid Ch								
836.60	14.47	V	0.9	0.0	13.57	38.5	-24.9	
836.60	17.85	H	0.9	0.0	16.95	38.5	-21.5	
High Ch								
846.60	14.45	V	0.9	0.0	13.55	38.5	-24.9	
846.60	19.10	H	0.9	0.0	18.20	38.5	-20.2	

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

Band

GSM1900

EGPRS

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

Company: Samsung
Project #: 14I18853
Date: 09/16/14
Test Engineer: R. Alegre
Configuration: EUT only
Mode: GPRS 1900

Test Equipment:
Receiving: Horn T345, and Chamber B 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	13.68	V	0.9	7.9	20.68	33.0	-12.3	
1850.20	17.26	H	0.9	7.9	24.26	33.0	-8.7	
Mid Ch								
1880.00	16.32	V	0.9	7.9	23.32	33.0	-9.7	
1880.00	18.88	H	0.9	7.9	25.88	33.0	-7.1	
High Ch								
1909.80	15.34	V	0.9	7.9	22.39	33.0	-10.6	
1909.80	17.79	H	0.9	7.9	24.84	33.0	-8.2	

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

Band

GSM1900

GPRS

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

Company: Samsung
Project #: 14I18853
Date: 09/16/14
Test Engineer: R. Alegre
Configuration: EUT only
Mode: GPRS 1900

Test Equipment:
Receiving: Horn T345, and Chamber B 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	16.91	V	0.9	7.9	23.91	33.0	-9.1	
1850.20	20.53	H	0.9	7.9	27.53	33.0	-5.5	
Mid Ch								
1880.00	18.56	V	0.9	7.9	25.56	33.0	-7.4	
1880.00	21.85	H	0.9	7.9	28.85	33.0	-4.2	
High Ch								
1909.80	18.11	V	0.9	7.9	25.16	33.0	-7.8	
1909.80	20.79	H	0.9	7.9	27.84	33.0	-5.2	

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

Band

GSM850

EGPRS

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

Company: Samsung
Project #: 14I18853
Date: 09/16/14
Test Engineer: L. Lara
Configuration: X- position EUT only (Sample 1958413)
Mode: EGPRS 850MHz

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	16.02	V	0.9	0.0	15.17	38.5	-23.3	
824.20	26.22	H	0.9	0.0	25.37	38.5	-13.1	
Mid Ch								
836.60	15.78	V	0.9	0.0	14.93	38.5	-23.5	
836.60	25.94	H	0.9	0.0	25.09	38.5	-13.4	
High Ch								
848.80	15.76	V	0.9	0.0	14.91	38.5	-23.5	
848.80	26.46	H	0.9	0.0	25.61	38.5	-12.8	

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

Band

GSM850

GPRS

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

Company: Samsung
Project #: 14I18853
Date: 09/16/14
Test Engineer: L. Lara
Configuration: X- position EUT only (Sample 1958413)
Mode: GPRS 850MHz

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	18.92	V	0.9	0.0	18.02	38.5	-20.4	
824.20	29.22	H	0.9	0.0	28.32	38.5	-10.1	
Mid Ch								
836.60	18.44	V	0.9	0.0	17.55	38.5	-20.9	
836.60	28.70	H	0.9	0.0	27.81	38.5	-10.6	
High Ch								
848.80	18.29	V	0.9	0.0	17.40	38.5	-21.1	
848.80	29.09	H	0.9	0.0	28.19	38.5	-10.3	

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

11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238

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

11.2.1. SPURIOUS RADIATION PLOTS

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

Company:	Samsung
Project #:	14I18853
Date:	09/17/14
Test Engineer:	L. Lara
Configuration:	EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode:	LTE5 16QAM 10MHz Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	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
LTE5	Low Ch, 829MHz									
10MHz	1.658	-29.0	V	3.0	37.4	1.0	-65.4	-13.0	-52.4	
16QAM	2.487	-13.4	V	3.0	36.4	1.0	-48.8	-13.0	-35.8	
	3.316	-22.3	V	3.0	35.8	1.0	-57.1	-13.0	-44.1	
	1.658	-25.1	H	3.0	37.4	1.0	-61.4	-13.0	-48.4	
	2.487	-26.6	H	3.0	36.4	1.0	-61.9	-13.0	-48.9	
	3.316	-23.5	H	3.0	35.8	1.0	-58.3	-13.0	-45.3	
	Mid Ch, 836.5MHz									
	1.673	-27.6	V	3.0	37.3	1.0	-63.9	-13.0	-50.9	
	2.510	-25.1	V	3.0	36.4	1.0	-60.5	-13.0	-47.5	
	3.346	-22.6	V	3.0	35.8	1.0	-57.4	-13.0	-44.4	
	1.673	-27.9	H	3.0	37.3	1.0	-64.2	-13.0	-51.2	
	2.510	-26.0	H	3.0	36.4	1.0	-61.3	-13.0	-48.3	
	3.346	-23.6	H	3.0	35.8	1.0	-58.3	-13.0	-45.3	
	High Ch, 844MHz									
	1.688	-29.0	V	3.0	37.3	1.0	-65.3	-13.0	-52.3	
	2.532	-25.0	V	3.0	36.3	1.0	-60.3	-13.0	-47.3	
	3.376	-23.3	V	3.0	35.7	1.0	-58.0	-13.0	-45.0	
	1.688	-21.4	H	3.0	37.3	1.0	-57.7	-13.0	-44.7	
	2.532	-26.4	H	3.0	36.3	1.0	-61.8	-13.0	-48.8	
	3.376	-22.7	H	3.0	35.7	1.0	-57.4	-13.0	-44.4	

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

Band: LTE5 10MHz QPSK

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: L. Lara
Configuration: EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode: LTE5 QPSK 10MHz Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	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 Ch, 829MHz									
1.658	-28.8	V	3.0	37.4	1.0	-65.2	-13.0	-52.2	
2.487	-10.2	V	3.0	36.4	1.0	-45.6	-13.0	-32.6	
3.316	-23.1	V	3.0	35.8	1.0	-57.9	-13.0	-44.9	
1.658	-29.0	H	3.0	37.4	1.0	-65.4	-13.0	-52.4	
2.487	-20.5	H	3.0	36.4	1.0	-55.9	-13.0	-42.9	
3.316	-22.8	H	3.0	35.8	1.0	-57.6	-13.0	-44.6	
Mid Ch, 836.5MHz									
1.673	-28.9	V	3.0	37.3	1.0	-65.2	-13.0	-52.2	
2.510	-23.9	V	3.0	36.4	1.0	-59.3	-13.0	-46.3	
3.346	-23.1	V	3.0	35.8	1.0	-57.9	-13.0	-44.9	
1.673	-26.0	H	3.0	37.3	1.0	-62.3	-13.0	-49.3	
2.510	-26.4	H	3.0	36.4	1.0	-61.7	-13.0	-48.7	
3.346	-22.8	H	3.0	35.8	1.0	-57.5	-13.0	-44.5	
High Ch, 844MHz									
1.688	-28.3	V	3.0	37.3	1.0	-64.6	-13.0	-51.6	
2.532	-25.2	V	3.0	36.3	1.0	-60.6	-13.0	-47.6	
3.376	-22.2	V	3.0	35.7	1.0	-56.9	-13.0	-43.9	
1.688	-28.0	H	3.0	37.3	1.0	-64.3	-13.0	-51.3	
2.532	-26.8	H	3.0	36.3	1.0	-62.2	-13.0	-49.2	
3.376	-23.0	H	3.0	35.7	1.0	-57.7	-13.0	-44.7	

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

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: L. Lara
Configuration: EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode: LTE5 16QAM 5MHz Harm

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

Band: LTE5 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, 826.5MHz									
1.653	-24.0	V	3.0	37.4	1.0	-60.4	-13.0	-47.4	
2.480	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
3.306	-15.9	V	3.0	35.8	1.0	-50.7	-13.0	-37.7	
1.653	-22.6	H	3.0	37.4	1.0	-58.9	-13.0	-45.9	
2.480	-22.3	H	3.0	36.4	1.0	-57.6	-13.0	-44.6	
3.306	-17.2	H	3.0	35.8	1.0	-52.0	-13.0	-39.0	
Mid Ch, 836.5MHz									
1.673	-25.5	V	3.0	37.3	1.0	-61.9	-13.0	-48.9	
2.510	-20.7	V	3.0	36.4	1.0	-56.1	-13.0	-43.1	
3.346	-19.7	V	3.0	35.8	1.0	-54.4	-13.0	-41.4	
1.673	-22.6	H	3.0	37.3	1.0	-58.9	-13.0	-45.9	
2.510	-20.3	H	3.0	36.4	1.0	-55.7	-13.0	-42.7	
3.346	-19.8	H	3.0	35.8	1.0	-54.6	-13.0	-41.6	
High Ch, 846.5MHz									
1.693	-25.4	V	3.0	37.3	1.0	-61.7	-13.0	-48.7	
2.540	-21.4	V	3.0	36.3	1.0	-56.8	-13.0	-43.8	
3.386	-17.1	V	3.0	35.7	1.0	-51.8	-13.0	-38.8	
1.693	-23.2	H	3.0	37.3	1.0	-59.5	-13.0	-46.5	
2.540	-22.1	H	3.0	36.3	1.0	-57.5	-13.0	-44.5	
3.386	-18.3	H	3.0	35.7	1.0	-53.0	-13.0	-40.0	

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

Band

LTE5

5MHz

QPSK

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: L. Lara
Configuration: EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode: LTE5 QPSK 5MHz Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	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 Ch, 826.5MHz									
1.653	-23.8	V	3.0	37.4	1.0	-60.2	-13.0	-47.2	
2.480	-22.0	V	3.0	36.4	1.0	-57.4	-13.0	-44.4	
3.306	-16.9	V	3.0	35.8	1.0	-51.7	-13.0	-38.7	
1.653	-21.6	H	3.0	37.4	1.0	-57.9	-13.0	-44.9	
2.480	-21.9	H	3.0	36.4	1.0	-57.3	-13.0	-44.3	
3.306	-16.4	H	3.0	35.8	1.0	-51.2	-13.0	-38.2	
Mid Ch, 836.5MHz									
1.673	-25.6	V	3.0	37.3	1.0	-62.0	-13.0	-49.0	
2.510	-21.0	V	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3.346	-19.3	V	3.0	35.8	1.0	-54.1	-13.0	-41.1	
1.673	-22.1	H	3.0	37.3	1.0	-58.4	-13.0	-45.4	
2.510	-20.4	H	3.0	36.4	1.0	-55.8	-13.0	-42.8	
3.346	-19.1	H	3.0	35.8	1.0	-53.9	-13.0	-40.9	
High Ch, 846.5MHz									
1.693	-25.5	V	3.0	37.3	1.0	-61.8	-13.0	-48.8	
2.540	-21.6	V	3.0	36.3	1.0	-56.9	-13.0	-43.9	
3.386	-16.7	V	3.0	35.7	1.0	-51.4	-13.0	-38.4	
1.693	-23.9	H	3.0	37.3	1.0	-60.2	-13.0	-47.2	
2.540	-21.2	H	3.0	36.3	1.0	-56.5	-13.0	-43.5	
3.386	-18.3	H	3.0	35.7	1.0	-53.0	-13.0	-40.0	

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

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: L. Lara
Configuration: EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode: LTE5 16QAM 3MHz Harm

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

Band: LTE5 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, 825.5MHz									
1.651	-24.1	V	3.0	37.4	1.0	-60.5	-13.0	-47.5	
2.477	-21.1	V	3.0	36.4	1.0	-56.5	-13.0	-43.5	
3.302	-16.2	V	3.0	35.8	1.0	-51.0	-13.0	-38.0	
1.651	-21.0	H	3.0	37.4	1.0	-57.4	-13.0	-44.4	
2.477	-20.7	H	3.0	36.4	1.0	-56.1	-13.0	-43.1	
3.302	-15.7	H	3.0	35.8	1.0	-50.5	-13.0	-37.5	
Mid Ch, 836.5MHz									
1.673	-24.9	V	3.0	37.3	1.0	-61.2	-13.0	-48.2	
2.510	-21.2	V	3.0	36.4	1.0	-56.5	-13.0	-43.5	
3.346	-19.4	V	3.0	35.8	1.0	-54.2	-13.0	-41.2	
1.673	-20.8	H	3.0	37.3	1.0	-57.2	-13.0	-44.2	
2.510	-20.0	H	3.0	36.4	1.0	-55.4	-13.0	-42.4	
3.346	-19.5	H	3.0	35.8	1.0	-54.2	-13.0	-41.2	
High Ch, 847.5MHz									
1.695	-25.6	V	3.0	37.3	1.0	-61.9	-13.0	-48.9	
2.543	-22.1	V	3.0	36.3	1.0	-57.4	-13.0	-44.4	
3.390	-17.7	V	3.0	35.7	1.0	-52.4	-13.0	-39.4	
1.695	-24.1	H	3.0	37.3	1.0	-60.4	-13.0	-47.4	
2.543	-20.6	H	3.0	36.3	1.0	-55.9	-13.0	-42.9	
3.390	-18.5	H	3.0	35.7	1.0	-53.2	-13.0	-40.2	

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

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

Company:	Samsung
Project #:	14I18853
Date:	09/17/14
Test Engineer:	L. Lara
Configuration:	EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode:	LTE5 QPSK 3MHz Harm

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

Band: LTE5 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, 825.5MHz									
1.651	-23.7	V	3.0	37.4	1.0	-60.0	-13.0	-47.0	
2.477	-20.7	V	3.0	36.4	1.0	-56.1	-13.0	-43.1	
3.302	-16.1	V	3.0	35.8	1.0	-50.9	-13.0	-37.9	
1.651	-21.2	H	3.0	37.4	1.0	-57.6	-13.0	-44.6	
2.477	-19.6	H	3.0	36.4	1.0	-55.0	-13.0	-42.0	
3.302	-15.7	H	3.0	35.8	1.0	-50.5	-13.0	-37.5	
Mid Ch, 836.5MHz									
1.673	-24.3	V	3.0	37.3	1.0	-60.6	-13.0	-47.6	
2.510	-21.4	V	3.0	36.4	1.0	-56.8	-13.0	-43.8	
3.346	-18.9	V	3.0	35.8	1.0	-53.7	-13.0	-40.7	
1.673	-21.5	H	3.0	37.3	1.0	-57.8	-13.0	-44.8	
2.510	-19.9	H	3.0	36.4	1.0	-55.3	-13.0	-42.3	
3.346	-19.3	H	3.0	35.8	1.0	-54.0	-13.0	-41.0	
High Ch, 847.5MHz									
1.695	-25.8	V	3.0	37.3	1.0	-62.1	-13.0	-49.1	
2.543	-21.7	V	3.0	36.3	1.0	-57.0	-13.0	-44.0	
3.390	-17.4	V	3.0	35.7	1.0	-52.1	-13.0	-39.1	
1.695	-25.1	H	3.0	37.3	1.0	-61.4	-13.0	-48.4	
2.543	-19.6	H	3.0	36.3	1.0	-54.9	-13.0	-41.9	
3.390	-18.5	H	3.0	35.7	1.0	-53.2	-13.0	-40.2	

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

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: L. Lara
Configuration: EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode: LTE5 1.4MHz 16QAM HARM

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

Band: LTE5 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, 824.7MHz									
1.649	-24.6	V	3.0	37.4	1.0	-61.0	-13.0	-48.0	
2.474	-22.0	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
3.299	-16.3	V	3.0	35.8	1.0	-51.1	-13.0	-38.1	
1.649	-21.4	H	3.0	37.4	1.0	-57.8	-13.0	-44.8	
2.474	-22.2	H	3.0	36.4	1.0	-57.6	-13.0	-44.6	
3.299	-15.2	H	3.0	35.8	1.0	-50.0	-13.0	-37.0	
Mid Ch, 836.5MHz									
1.673	-23.8	V	3.0	37.3	1.0	-60.2	-13.0	-47.2	
2.510	-21.8	V	3.0	36.4	1.0	-57.1	-13.0	-44.1	
3.346	-18.8	V	3.0	35.8	1.0	-53.6	-13.0	-40.6	
1.673	-20.7	H	3.0	37.3	1.0	-57.0	-13.0	-44.0	
2.510	-20.8	H	3.0	36.4	1.0	-56.1	-13.0	-43.1	
3.346	-19.3	H	3.0	35.8	1.0	-54.0	-13.0	-41.0	
High Ch, 848.3MHz									
1.697	-25.5	V	3.0	37.3	1.0	-61.8	-13.0	-48.8	
2.545	-21.3	V	3.0	36.3	1.0	-56.6	-13.0	-43.6	
3.393	-18.3	V	3.0	35.7	1.0	-53.0	-13.0	-40.0	
1.697	-25.0	H	3.0	37.3	1.0	-61.3	-13.0	-48.3	
2.545	-20.1	H	3.0	36.3	1.0	-55.4	-13.0	-42.4	
3.393	-18.9	H	3.0	35.7	1.0	-53.6	-13.0	-40.6	

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

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

Company:	Samsung
Project #:	14I18853
Date:	09/17/14
Test Engineer:	L. Lara
Configuration:	EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode:	LTE5 1.4MHz QPSK HARM

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

Band: LTE5 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, 824.7MHz									
1.649	-23.0	V	3.0	37.4	1.0	-59.4	-13.0	-46.4	
2.474	-21.0	V	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3.299	-16.3	V	3.0	35.8	1.0	-51.1	-13.0	-38.1	
1.649	-21.0	H	3.0	37.4	1.0	-57.4	-13.0	-44.4	
2.474	-19.8	H	3.0	36.4	1.0	-55.2	-13.0	-42.2	
3.299	-15.1	H	3.0	35.8	1.0	-49.9	-13.0	-36.9	
Mid Ch, 836.5MHz									
1.673	-23.5	V	3.0	37.3	1.0	-59.8	-13.0	-46.8	
2.510	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
3.346	-18.3	V	3.0	35.8	1.0	-53.1	-13.0	-40.1	
1.673	-20.5	H	3.0	37.3	1.0	-56.9	-13.0	-43.9	
2.510	-20.4	H	3.0	36.4	1.0	-55.8	-13.0	-42.8	
3.346	-19.0	H	3.0	35.8	1.0	-53.8	-13.0	-40.8	
High Ch, 848.3MHz									
1.697	-25.3	V	3.0	37.3	1.0	-61.6	-13.0	-48.6	
2.545	-21.5	V	3.0	36.3	1.0	-56.8	-13.0	-43.8	
3.393	-18.4	V	3.0	35.7	1.0	-53.1	-13.0	-40.1	
1.697	-23.9	H	3.0	37.3	1.0	-60.2	-13.0	-47.2	
2.545	-21.8	H	3.0	36.3	1.0	-57.2	-13.0	-44.2	
3.393	-19.4	H	3.0	35.7	1.0	-54.1	-13.0	-41.1	

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

Band

Band 5

HSDPA

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

Company: Samsung
Project #: 14I18853
Date: 09/16/14
Test Engineer: L. Lara
Configuration: Y-Pos EUT w/ AC Charger + HS
Mode: HSDPA_B5

Chamber	Pre-amplifer	Filter	Limit
3m Chamber B	T34 8449B	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 Ch, 826.4MHz									
1.653	-26.3	V	3.0	37.4	1.0	-62.7	-13.0	-49.7	
2.479	-22.2	V	3.0	36.4	1.0	-57.6	-13.0	-44.6	
3.306	-20.1	V	3.0	35.8	1.0	-54.9	-13.0	-41.9	
1.653	-25.9	H	3.0	37.4	1.0	-62.3	-13.0	-49.3	
2.479	-23.5	H	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3.306	-21.1	H	3.0	35.8	1.0	-55.8	-13.0	-42.8	
Mid Ch, 836.6MHz									
1.673	-25.7	V	3.0	37.3	1.0	-62.1	-13.0	-49.1	
2.510	-21.7	V	3.0	36.4	1.0	-57.1	-13.0	-44.1	
3.346	-20.3	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
1.673	-26.0	H	3.0	37.3	1.0	-62.3	-13.0	-49.3	
2.510	-22.6	H	3.0	36.4	1.0	-58.0	-13.0	-45.0	
3.346	-19.8	H	3.0	35.8	1.0	-54.6	-13.0	-41.6	
High Ch, 846.6MHz									
1.693	-25.5	V	3.0	37.3	1.0	-61.8	-13.0	-48.8	
2.540	-22.3	V	3.0	36.3	1.0	-57.6	-13.0	-44.6	
3.386	-20.3	V	3.0	35.7	1.0	-55.0	-13.0	-42.0	
1.693	-26.2	H	3.0	37.3	1.0	-62.5	-13.0	-49.5	
2.540	-23.2	H	3.0	36.3	1.0	-58.5	-13.0	-45.5	
3.386	-19.6	H	3.0	35.7	1.0	-54.3	-13.0	-41.3	

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

Band

Band 5

REL99

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14I18853
Date: 09/16/14
Test Engineer: L. Lara
Configuration: Y-Pos EUT w/ AC Charger + HS
Mode: REL99_B5

Chamber	Pre-amplifer	Filter	Limit
3m Chamber B	T34 8449B	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 Ch, 826.4MHz									
1.653	-26.1	V	3.0	37.4	1.0	-62.4	-13.0	-49.4	
2.479	-21.7	V	3.0	36.4	1.0	-57.1	-13.0	-44.1	
3.306	-19.9	V	3.0	35.8	1.0	-54.6	-13.0	-41.6	
1.653	-24.1	H	3.0	37.4	1.0	-60.5	-13.0	-47.5	
2.479	-23.2	H	3.0	36.4	1.0	-58.6	-13.0	-45.6	
3.306	-19.8	H	3.0	35.8	1.0	-54.6	-13.0	-41.6	
Mid Ch, 836.6MHz									
1.673	-25.7	V	3.0	37.3	1.0	-62.0	-13.0	-49.0	
2.510	-21.0	V	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3.346	-20.0	V	3.0	35.8	1.0	-54.8	-13.0	-41.8	
1.673	-25.5	H	3.0	37.3	1.0	-61.8	-13.0	-48.8	
2.510	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	
3.346	-20.0	H	3.0	35.8	1.0	-54.7	-13.0	-41.7	
High Ch, 846.6MHz									
1.693	-25.0	V	3.0	37.3	1.0	-61.3	-13.0	-48.3	
2.540	-21.6	V	3.0	36.3	1.0	-56.9	-13.0	-43.9	
3.386	-19.4	V	3.0	35.7	1.0	-54.1	-13.0	-41.1	
1.693	-25.3	H	3.0	37.3	1.0	-61.6	-13.0	-48.6	
2.540	-22.2	H	3.0	36.3	1.0	-57.6	-13.0	-44.6	
3.386	-19.5	H	3.0	35.7	1.0	-54.2	-13.0	-41.2	

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

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: D. Sblendorio
Configuration: X-Pos EUT w/ AC charger, headset
Mode: EGPRS1900

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

Band

GSM1900

EGPRS

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									
3.700	-7.0	V	3.0	35.4	1.0	-41.4	-13.0	-28.4	
5.551	-11.3	V	3.0	34.7	1.0	-45.0	-13.0	-32.0	
7.401	-9.4	V	3.0	34.9	1.0	-43.4	-13.0	-30.4	
3.700	-8.7	H	3.0	35.4	1.0	-43.1	-13.0	-30.1	
5.551	-5.6	H	3.0	34.7	1.0	-39.4	-13.0	-26.4	
7.401	-8.2	H	3.0	34.9	1.0	-42.1	-13.0	-29.1	
Mid Ch, 1880MHz									
3.760	-8.2	V	3.0	35.3	1.0	-42.6	-13.0	-29.6	
5.640	-6.3	V	3.0	34.7	1.0	-40.0	-13.0	-27.0	
7.520	-8.0	V	3.0	34.9	1.0	-41.9	-13.0	-28.9	
3.760	-6.9	H	3.0	35.3	1.0	-41.3	-13.0	-28.3	
5.640	-8.7	H	3.0	34.7	1.0	-42.4	-13.0	-29.4	
7.520	-6.9	H	3.0	34.9	1.0	-40.8	-13.0	-27.8	
High Ch, 1909.8MHz									
3.820	-5.6	V	3.0	35.3	1.0	-39.9	-13.0	-26.9	
5.729	-5.5	V	3.0	34.7	1.0	-39.2	-13.0	-26.2	
7.639	-8.3	V	3.0	35.0	1.0	-42.2	-13.0	-29.2	
3.820	-6.2	H	3.0	35.3	1.0	-40.4	-13.0	-27.4	
5.729	-0.8	H	3.0	34.7	1.0	-34.6	-13.0	-21.6	
7.639	-4.4	H	3.0	35.0	1.0	-38.3	-13.0	-25.3	

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

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: D. Sblendorio
Configuration: X-Pos EUT w/ AC charger, headset
Mode: GPRS1900

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

Band: GSM1900 GPRS

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									
3.700	-7.1	V	3.0	35.4	1.0	-41.5	-13.0	-28.5	
5.551	-11.5	V	3.0	34.7	1.0	-45.3	-13.0	-32.3	
7.401	-8.9	V	3.0	34.9	1.0	-42.8	-13.0	-29.8	
3.700	-5.5	H	3.0	35.4	1.0	-39.9	-13.0	-26.9	
5.551	-2.1	H	3.0	34.7	1.0	-35.8	-13.0	-22.8	
7.401	-7.5	H	3.0	34.9	1.0	-41.4	-13.0	-28.4	
Mid Ch, 1880MHz									
3.760	-6.4	V	3.0	35.3	1.0	-40.8	-13.0	-27.8	
5.640	-7.8	V	3.0	34.7	1.0	-41.6	-13.0	-28.6	
7.520	-9.8	V	3.0	34.9	1.0	-43.7	-13.0	-30.7	
3.760	-8.7	H	3.0	35.3	1.0	-43.0	-13.0	-30.0	
5.640	-0.3	H	3.0	34.7	1.0	-34.0	-13.0	-21.0	
7.520	-7.9	H	3.0	34.9	1.0	-41.9	-13.0	-28.9	
High Ch, 1909.8MHz									
3.820	-2.9	V	3.0	35.3	1.0	-37.1	-13.0	-24.1	
5.729	-5.0	V	3.0	34.7	1.0	-38.7	-13.0	-25.7	
7.639	-9.1	V	3.0	35.0	1.0	-43.1	-13.0	-30.1	
3.820	-5.0	H	3.0	35.3	1.0	-39.2	-13.0	-26.2	
5.729	-8.1	H	3.0	34.7	1.0	-41.8	-13.0	-28.8	
7.639	-5.1	H	3.0	35.0	1.0	-39.0	-13.0	-26.0	

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

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: L. Lara
Configuration: EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode: EGPRS850

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	1.648	-20.7	V	3.0	37.4	1.0	-57.1	-13.0	-44.1	
	2.473	-22.0	V	3.0	36.4	1.0	-57.4	-13.0	-44.4	
	3.297	-22.4	V	3.0	35.8	1.0	-57.2	-13.0	-44.2	
	1.648	-14.2	H	3.0	37.4	1.0	-50.6	-13.0	-37.6	
EGPRS	2.473	-24.5	H	3.0	36.4	1.0	-59.9	-13.0	-46.9	
	3.297	-22.6	H	3.0	35.8	1.0	-57.4	-13.0	-44.4	
	Mid Ch, 836.6MHz									
	1.673	-13.3	V	3.0	37.3	1.0	-49.6	-13.0	-36.6	
	2.510	-24.3	V	3.0	36.4	1.0	-59.6	-13.0	-46.6	
	3.346	-22.0	V	3.0	35.8	1.0	-56.8	-13.0	-43.8	
	1.673	-10.1	H	3.0	37.3	1.0	-46.4	-13.0	-33.4	
	2.510	-22.4	H	3.0	36.4	1.0	-57.8	-13.0	-44.8	
	3.346	-21.2	H	3.0	35.8	1.0	-55.9	-13.0	-42.9	
	High Ch, 848.8MHz									
	1.698	-13.1	V	3.0	37.3	1.0	-49.4	-13.0	-36.4	
	2.546	-24.3	V	3.0	36.3	1.0	-59.6	-13.0	-46.6	
	3.395	-22.7	V	3.0	35.7	1.0	-57.5	-13.0	-44.5	
	1.698	-5.8	H	3.0	37.3	1.0	-42.1	-13.0	-29.1	
	2.546	-21.8	H	3.0	36.3	1.0	-57.1	-13.0	-44.1	
	3.395	-23.0	H	3.0	35.7	1.0	-57.7	-13.0	-44.7	

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

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

Company: Samsung
Project #: 14I18853
Date: 09/17/14
Test Engineer: L. Lara
Configuration: EUT w/ AC Adaptor + HS, X-pos (SN: 1958414)
Mode: GPRS850

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

Band: GSM850 GPRS

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									
1.648	-16.8	V	3.0	37.4	1.0	-53.2	-13.0	-40.2	
2.473	-19.5	V	3.0	36.4	1.0	-54.9	-13.0	-41.9	
3.297	-21.4	V	3.0	35.8	1.0	-56.2	-13.0	-43.2	
1.648	-15.0	H	3.0	37.4	1.0	-51.4	-13.0	-38.4	
2.473	-14.6	H	3.0	36.4	1.0	-50.0	-13.0	-37.0	
3.297	-23.9	H	3.0	35.8	1.0	-58.7	-13.0	-45.7	
Mid Ch, 836.6MHz									
1.673	-12.9	V	3.0	37.3	1.0	-49.3	-13.0	-36.3	
2.510	-22.8	V	3.0	36.4	1.0	-58.1	-13.0	-45.1	
3.346	-23.4	V	3.0	35.8	1.0	-58.2	-13.0	-45.2	
1.673	-7.0	H	3.0	37.3	1.0	-43.3	-13.0	-30.3	
2.510	-22.3	H	3.0	36.4	1.0	-57.6	-13.0	-44.6	
3.346	-22.2	H	3.0	35.8	1.0	-56.9	-13.0	-43.9	
High Ch, 848.8MHz									
1.698	-12.8	V	3.0	37.3	1.0	-49.1	-13.0	-36.1	
2.546	-22.5	V	3.0	36.3	1.0	-57.8	-13.0	-44.8	
3.395	-21.8	V	3.0	35.7	1.0	-56.5	-13.0	-43.5	
1.698	-8.6	H	3.0	37.3	1.0	-44.9	-13.0	-31.9	
2.546	-18.9	H	3.0	36.3	1.0	-54.2	-13.0	-41.2	
3.395	-23.5	H	3.0	35.7	1.0	-58.2	-13.0	-45.2	

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