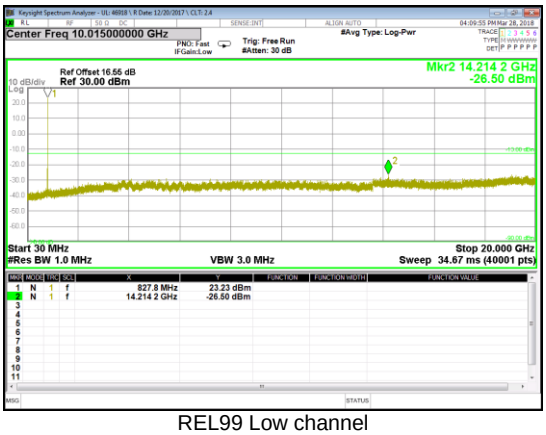
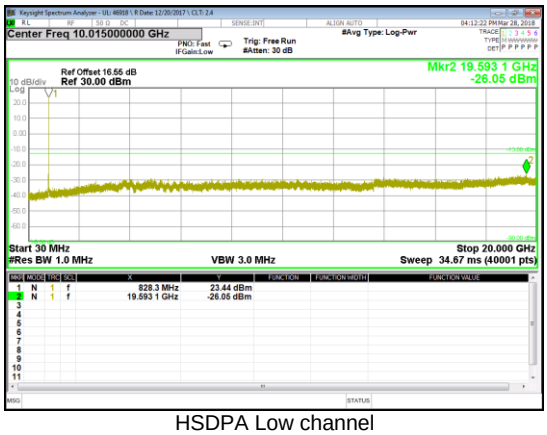
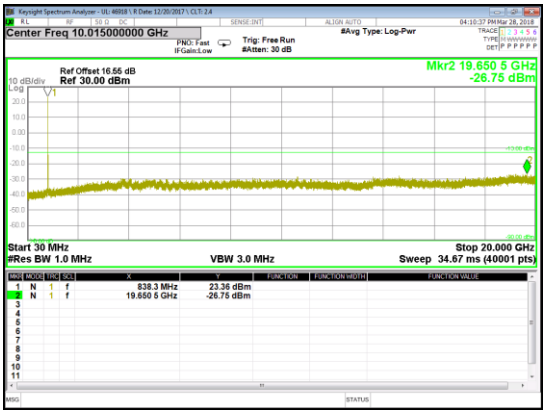
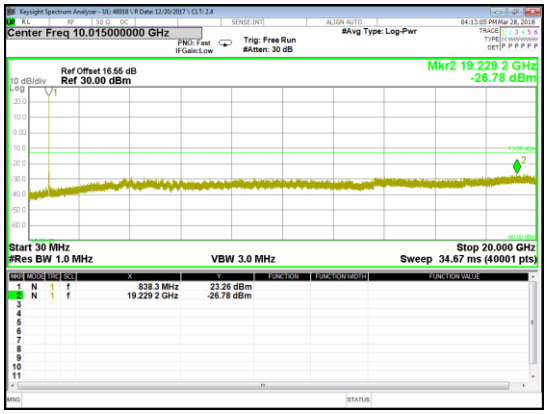
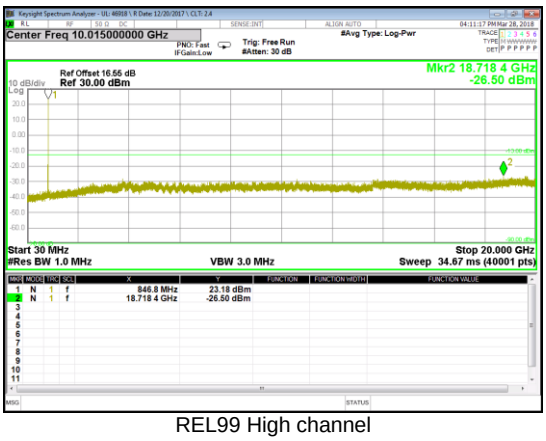
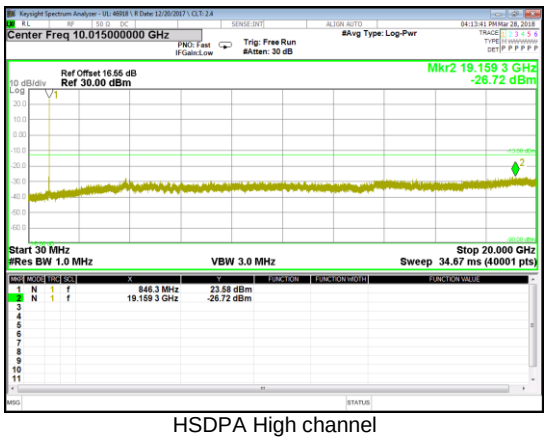
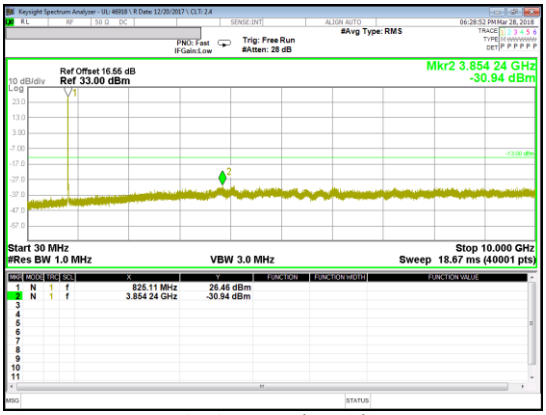
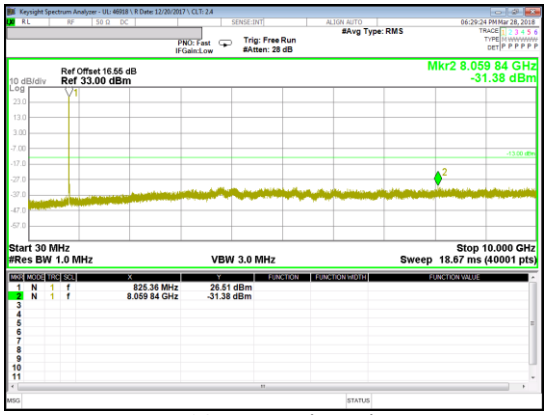
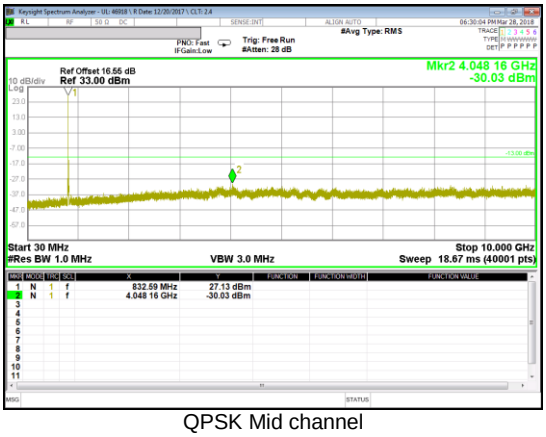
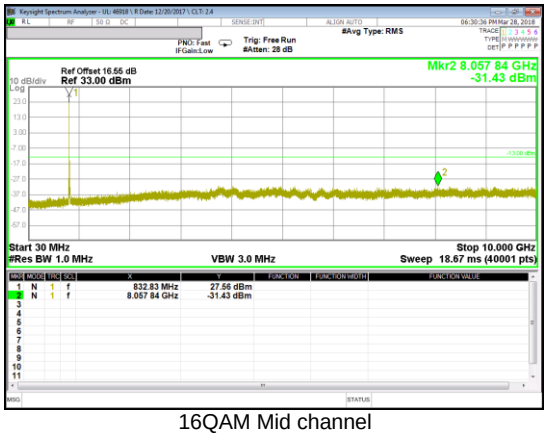
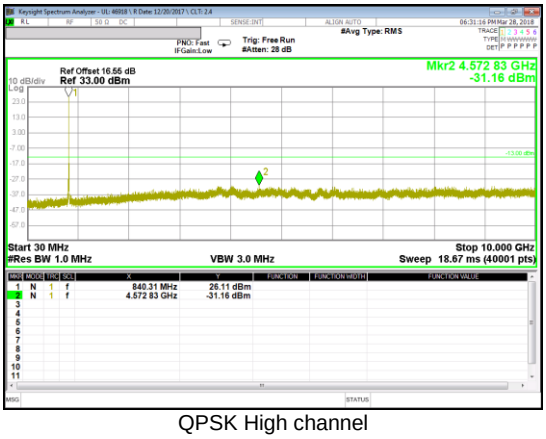
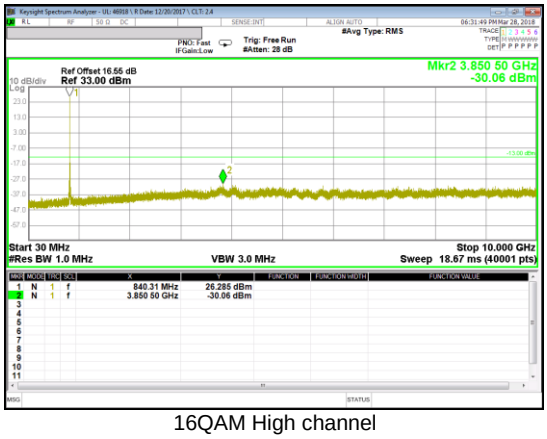
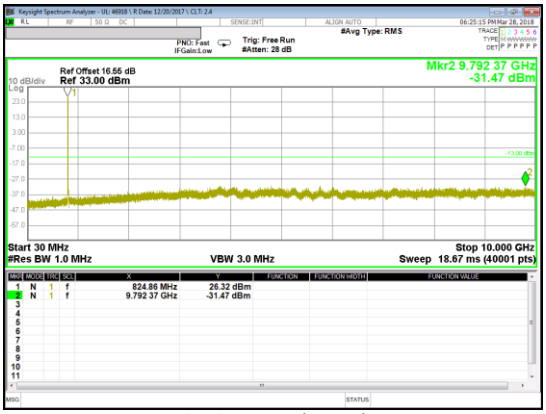
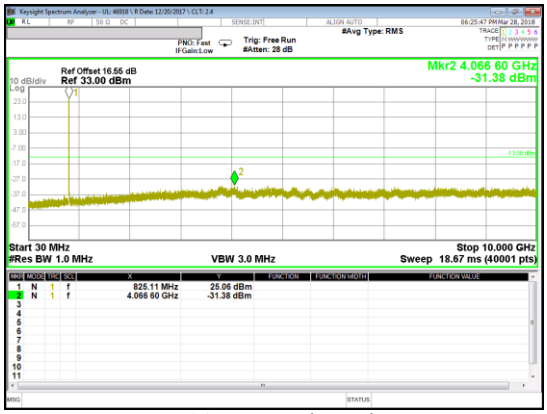
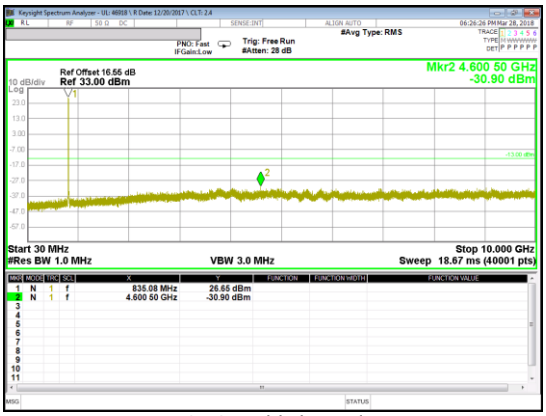
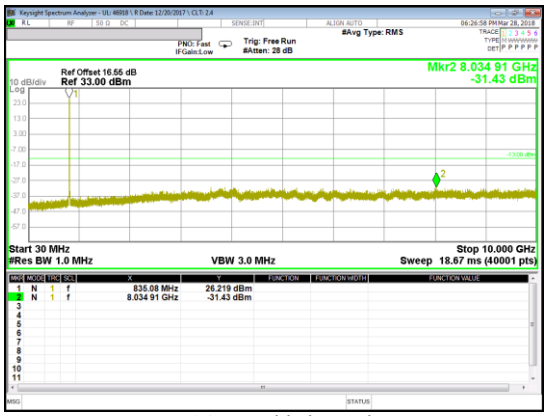
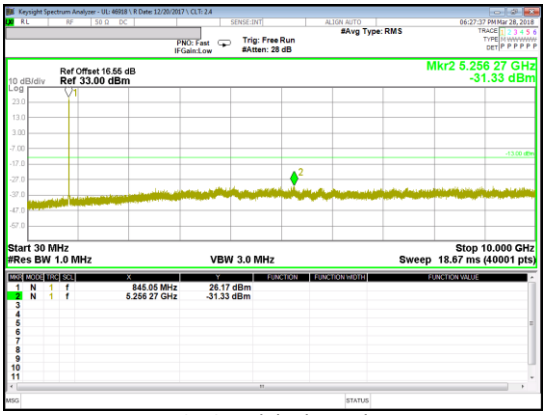
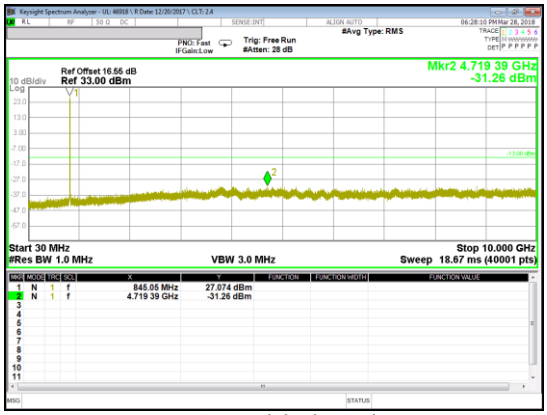
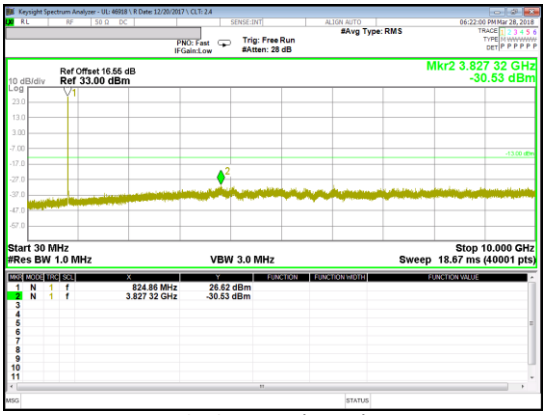
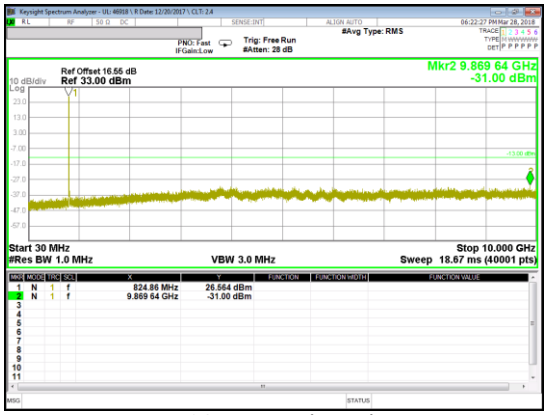
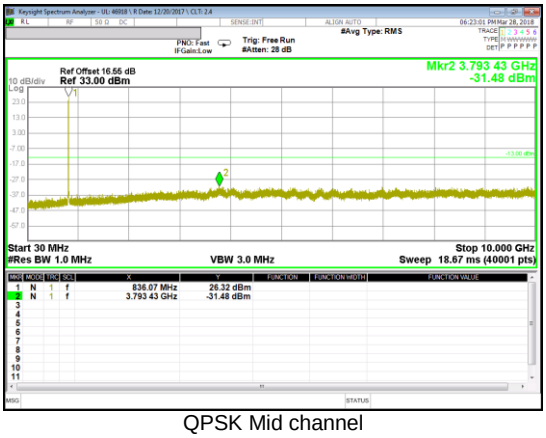
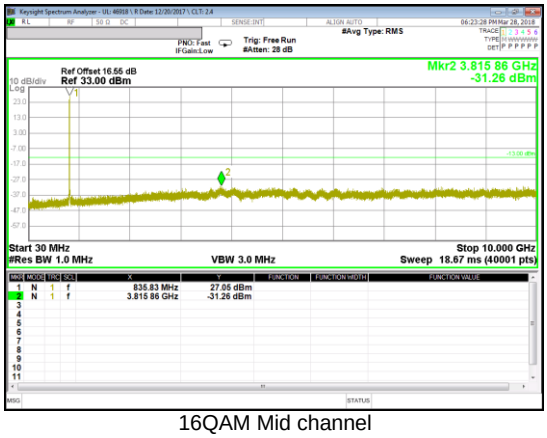
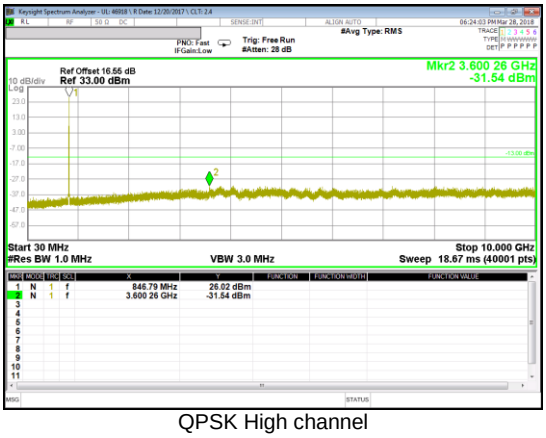
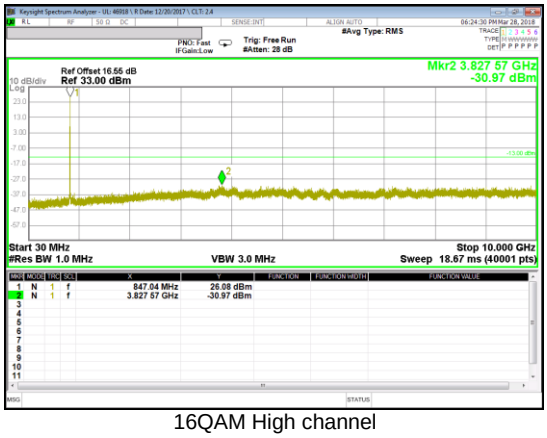
WCDMA Band 5

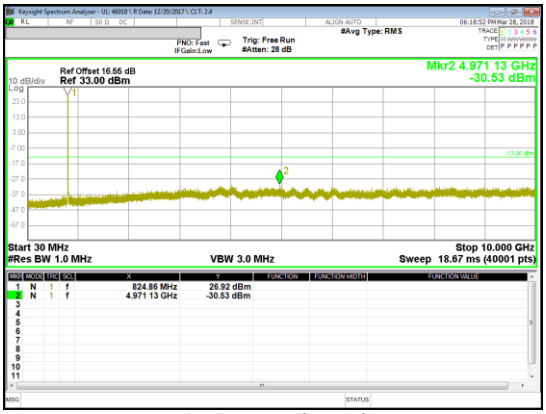
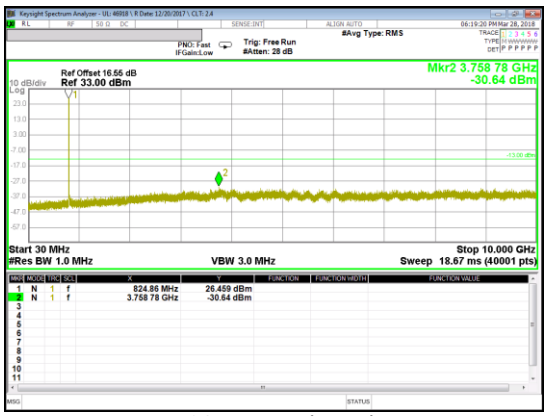
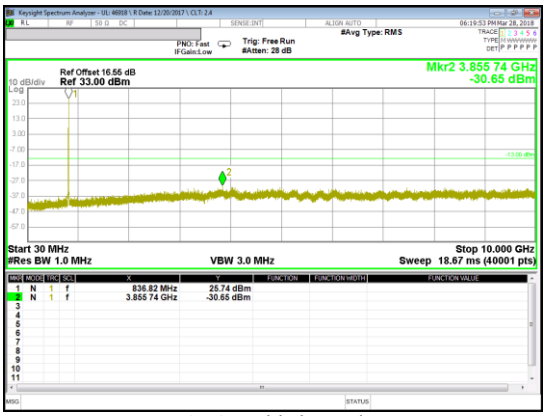
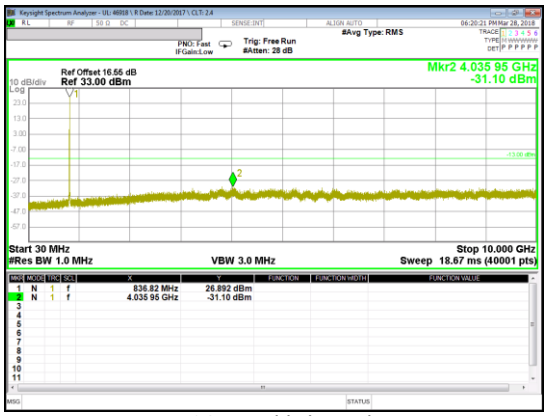
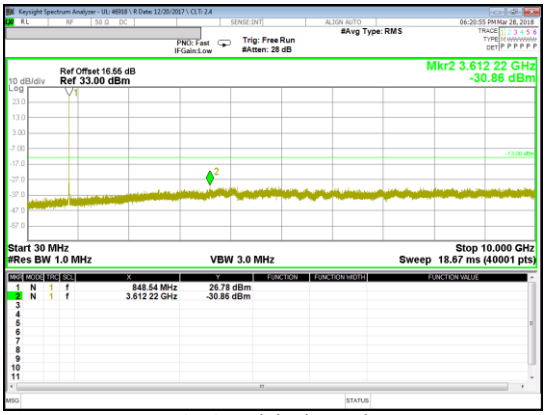
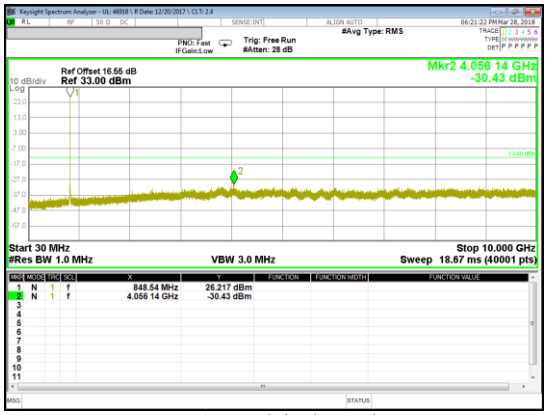
Band 5	 REL99 Low channel	 HSDPA Low channel
	 REL99 Mid channel	 HSDPA Mid channel
	 REL99 High channel	 HSDPA High channel

LTE Band 5

Band 5 10MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

Band 5 5MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

Band 5 3MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

	 QPSK Low channel	 16QAM Low channel
Band 5 1.4MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03

RESULTS

See the following pages.

9.4.1. FREQUENCY STABILITY RESULTS

GSM 850, Channel 190, Frequency 836.6 MHz

Reference Frequency : GSM850 Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
[Vdc]	Temperature [*C]	[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	836.59997103	-0.002	2.5
3.85	40	836.59997757	-0.010	2.5
3.85	30	836.59997579	-0.008	2.5
3.85	***20***	836.59996921	***0***	***2.5***
3.85	10	836.59997109	-0.002	2.5
3.85	0	836.59996676	0.003	2.5
3.85	-10	836.59997363	-0.005	2.5
3.85	-20	836.59996743	0.002	2.5
3.85	-30	836.59997308	-0.005	2.5

Reference Frequency : GSM850 Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
[Vdc]	Temperature [*C]	[MHz]	Delta [ppm]	Limit [ppm]
3.85	***20***	**836.59996921**	***0***	***2.5***
4.40	20	836.59996737	0.002	2.5
3.60	20	836.59997040	-0.001	2.5

WCDMA Band 5 , Channel 4183, Frequency 836.6 MHz

Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.85	50	836.59998232	0.006	2.5
3.85	40	836.59997993	0.009	2.5
3.85	30	836.59998573	0.002	2.5
3.85	***20***	836.59998762	***0***	***2.5***
3.85	10	836.59997710	0.013	2.5
3.85	0	836.59998555	0.002	2.5
3.85	-10	836.59998644	0.001	2.5
3.85	-20	836.59998488	0.003	2.5
3.85	-30	836.59998170	0.007	2.5

Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.85	***20***	**836.59998762**	***0***	***2.5***
4.40	20	836.59997787	0.012	2.5
3.60	20	836.59998073	0.008	2.5

LTE Band 5 , Channel 20524, Frequency 836.5 MHz

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.250 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.85	50	836.49998294	0.002	2.5
3.85	40	836.49998426	0.001	2.5
3.85	30	836.49998214	0.003	2.5
3.85	***20***	836.49998478	***0***	***2.5***
3.85	10	836.49998422	0.001	2.5
3.85	0	836.49998445	0.000	2.5
3.85	-10	836.49998355	0.001	2.5
3.85	-20	836.49997567	0.011	2.5
3.85	-30	836.49997622	0.010	2.5

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.250 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.85	***20***	**836.49998478**	***0***	***2.5***
4.40	20	836.49998256	0.003	2.5
3.60	20	836.49997764	0.009	2.5

10. RADIATED TEST RESULTS

10.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913

LIMITS

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

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 603 E Clause 2.2.17; ESU40 setting reference to 971168 D01 v03

For peak power measurement with a ESU40:

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 ESU40:

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. (RBW/VBW are automatically set for LTE)

TEST RESULTS

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.1.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	512	824.2	28.87	770.90
		661	836.6	28.40	691.83
		810	848.8	27.46	557.19
	EGPRS	512	824.2	23.86	243.22
		661	836.6	23.57	227.51
		810	848.8	23.55	226.46

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	18.30	67.61
		4183	836.6	17.89	61.52
		4233	846.6	17.46	55.72
	HSDPA	4132	826.4	18.32	67.92
		4183	836.6	17.70	58.88
		4233	846.6	17.13	51.64

LTE Band 5

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 5	10	QPSK	50/0	829.0	16.98	49.89
			50/0	836.5	16.36	43.25
			50/0	844.0	16.37	43.35
		16QAM	50/0	829.0	15.92	39.08
			50/0	836.5	15.31	33.96
			50/0	844.0	15.34	34.20
	5	QPSK	25/0	826.5	16.47	44.36
			25/0	836.5	16.05	40.27
			25/0	846.5	15.94	39.26
		16QAM	25/0	826.5	15.43	34.91
			25/0	836.5	15.16	32.81
			25/0	846.5	14.86	30.62
	3	QPSK	15/0	825.5	16.71	46.88
			15/0	836.5	15.73	37.41
			15/0	847.5	15.87	38.64
		16QAM	15/0	825.5	15.68	36.98
			15/0	836.5	14.66	29.24
			15/0	847.5	14.73	29.72
	1.4	QPSK	6/0	824.7	14.37	27.35
			6/0	836.5	13.60	22.91
			6/0	848.3	13.21	20.94
		16QAM	6/0	824.7	13.36	21.68
			6/0	836.5	12.54	17.95
			6/0	848.3	12.06	16.07

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_22/24/27
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.1.2. ERP/EIRP DATA

GSM 850

GSM

GSM850
GPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: GPRS 850 MHz Fundamentals

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	25.01	V	1.0	-1.5	22.58	38.5	-15.9	
824.20	31.30	H	1.0	-1.5	28.87	38.5	-9.6	
Mid Ch								
836.60	24.33	V	1.0	-1.4	21.95	38.5	-16.5	
836.60	30.78	H	1.0	-1.4	28.40	38.5	-10.1	
High Ch								
848.80	25.26	V	1.0	-1.4	22.91	38.5	-15.6	
848.80	29.81	H	1.0	-1.4	27.46	38.5	-11.0	

GSM

GSM850
EGPRS

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: EGPRS 850 MHz Fundamentals

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	20.28	V	1.0	-1.5	17.85	38.5	-20.6	
824.20	26.29	H	1.0	-1.5	23.86	38.5	-14.6	
Mid Ch								
836.60	20.06	V	1.0	-1.4	17.68	38.5	-20.8	
836.60	25.95	H	1.0	-1.4	23.57	38.5	-14.9	
High Ch								
848.80	21.63	V	1.0	-1.4	19.28	38.5	-19.2	
848.80	25.90	H	1.0	-1.4	23.55	38.5	-14.9	

WCDMA Band 5

WCDMA

Band 5
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: Rel99 Band 5 Fundamentals

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	15.79	V	1.0	-1.5	13.37	38.5	-25.1	
826.40	20.72	H	1.0	-1.5	18.30	38.5	-20.2	
Mid Ch								
836.60	14.82	V	1.0	-1.4	12.44	38.5	-26.1	
836.60	20.27	H	1.0	-1.4	17.89	38.5	-20.6	
High Ch								
846.60	15.22	V	1.0	-1.4	12.87	38.5	-25.6	
846.60	19.81	H	1.0	-1.4	17.46	38.5	-21.0	

WCDMA

Band 5
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: HSDPA Band 5 Fundamentals

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	15.53	V	1.0	-1.5	13.11	38.5	-25.4	
826.40	20.74	H	1.0	-1.5	18.32	38.5	-20.2	
Mid Ch								
836.60	14.91	V	1.0	-1.4	12.53	38.5	-26.0	
836.60	20.08	H	1.0	-1.4	17.70	38.5	-20.8	
High Ch								
846.60	15.49	V	1.0	-1.4	13.14	38.5	-25.4	
846.60	19.48	H	1.0	-1.4	17.13	38.5	-21.4	

LTE Band 5

LTE Band 5 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-03-31
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	10.36	V	1.0	-1.5	7.95	38.5	-30.5	
829.00	19.39	H	1.0	-1.5	16.98	38.5	-21.5	
Mid Ch								
836.50	13.09	V	1.0	-1.4	10.71	38.5	-27.8	
836.50	18.74	H	1.0	-1.4	16.36	38.5	-22.1	
High Ch								
844.00	13.77	V	1.0	-1.4	11.42	38.5	-27.1	
844.00	18.73	H	1.0	-1.4	16.37	38.5	-22.1	

LTE Band 5 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-03-31
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
829.00	12.69	V	1.0	-1.5	10.28	38.5	-28.2	
829.00	18.33	H	1.0	-1.5	15.92	38.5	-22.6	
Mid Ch								
836.50	12.10	V	1.0	-1.4	9.72	38.5	-28.8	
836.50	17.69	H	1.0	-1.4	15.31	38.5	-23.2	
High Ch								
844.00	12.73	V	1.0	-1.4	10.38	38.5	-28.1	
844.00	17.70	H	1.0	-1.4	15.34	38.5	-23.2	

LTE
Band 5
5MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-03-31
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	12.76	V	1.0	-1.5	10.34	38.5	-28.2	
826.50	18.89	H	1.0	-1.5	16.47	38.5	-22.0	
Mid Ch								
836.50	12.78	V	1.0	-1.4	10.40	38.5	-28.1	
836.50	18.43	H	1.0	-1.4	16.05	38.5	-22.5	
High Ch								
846.50	13.79	V	1.0	-1.4	11.44	38.5	-27.1	
846.50	18.29	H	1.0	-1.4	15.94	38.5	-22.6	

LTE
Band 5
5MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-03-31
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.50	11.65	V	1.0	-1.5	9.23	38.5	-29.3	
826.50	17.85	H	1.0	-1.5	15.43	38.5	-23.1	
Mid Ch								
836.50	11.72	V	1.0	-1.4	9.34	38.5	-29.2	
836.50	17.54	H	1.0	-1.4	15.16	38.5	-23.3	
High Ch								
846.50	12.71	V	1.0	-1.4	10.36	38.5	-28.1	
846.50	17.21	H	1.0	-1.4	14.86	38.5	-23.6	

LTE
Band 5
3MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	13.17	V	1.0	-1.5	10.75	38.5	-27.7	
825.50	19.13	H	1.0	-1.5	16.71	38.5	-21.8	
Mid Ch								
836.50	12.87	V	1.0	-1.4	10.49	38.5	-28.0	
836.50	18.11	H	1.0	-1.4	15.73	38.5	-22.8	
High Ch								
847.50	13.80	V	1.0	-1.4	11.46	38.5	-27.0	
847.50	18.22	H	1.0	-1.4	15.87	38.5	-22.6	

LTE
Band 5
3MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
825.50	12.19	V	1.0	-1.5	9.77	38.5	-28.7	
825.50	18.10	H	1.0	-1.5	15.68	38.5	-22.8	
Mid Ch								
836.50	11.76	V	1.0	-1.4	9.38	38.5	-29.1	
836.50	17.04	H	1.0	-1.4	14.66	38.5	-23.8	
High Ch								
847.50	12.69	V	1.0	-1.4	10.35	38.5	-28.2	
847.50	17.08	H	1.0	-1.4	14.73	38.5	-23.8	

LTE

Band 5

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	11.14	V	1.0	-1.5	8.71	38.5	-29.8	
824.70	16.80	H	1.0	-1.5	14.37	38.5	-24.1	
Mid Ch								
836.50	10.58	V	1.0	-1.4	8.20	38.5	-30.3	
836.50	15.98	H	1.0	-1.4	13.60	38.5	-24.9	
High Ch								
848.30	11.59	V	1.0	-1.4	9.24	38.5	-29.3	
848.30	15.56	H	1.0	-1.4	13.21	38.5	-25.3	

LTE

Band 5

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788404029
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / Y-Position
Location: Chamber 2
Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.70	10.06	V	1.0	-1.5	7.63	38.5	-30.9	
824.70	15.79	H	1.0	-1.5	13.36	38.5	-25.1	
Mid Ch								
836.50	9.57	V	1.0	-1.4	7.19	38.5	-31.3	
836.50	14.92	H	1.0	-1.4	12.54	38.5	-26.0	
High Ch								
848.30	10.47	V	1.0	-1.4	8.12	38.5	-30.4	
848.30	14.41	H	1.0	-1.4	12.06	38.5	-26.4	

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917

LIMIT

Part 22.917(a) 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 603 E 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 ≥ 3 × RBW;

c) Set span ≥ 1.5 times the OBW;

d) Sweep time = auto couple;

e) Detector = peak;

f) Ensure that the number of measurement points ≥ span/RBW;

g) Trace mode = max hold;

NOTE : Radiated spurious emissions were investigated below 30MHz, 30MHz – 1GHz and above 1GHz. There were no emissions found on below 30MHz and 30MHz – 1GHz.

RESULTS

10.2.1. SPURIOUS RADIATION PLOTS

GSM 850

GSM

GSM850
GPRS

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-07
Test Engineer:	47989
Configuration:	EUT / AC Adapter / Earphone, Y-Position
Location:	Chamber 2
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	-7.4	V	3.0	38.2	1.0	-44.6	-13.0	-31.6	
2472.60	-8.9	V	3.0	38.8	1.0	-46.7	-13.0	-33.7	
3296.80	-14.6	V	3.0	39.4	1.0	-53.1	-13.0	-40.1	
1648.40	-6.7	H	3.0	38.2	1.0	-43.9	-13.0	-30.9	
2472.60	-7.3	H	3.0	38.8	1.0	-45.1	-13.0	-32.1	
3296.80	-14.7	H	3.0	39.4	1.0	-53.1	-13.0	-40.1	
Mid Ch, 836.6MHz									
1673.20	-7.7	V	3.0	38.2	1.0	-45.0	-13.0	-32.0	
2509.80	-8.5	V	3.0	38.8	1.0	-46.3	-13.0	-33.3	
3346.40	-14.9	V	3.0	39.5	1.0	-53.3	-13.0	-40.3	
1673.20	-8.8	H	3.0	38.2	1.0	-46.1	-13.0	-33.1	
2509.80	-8.0	H	3.0	38.8	1.0	-45.8	-13.0	-32.8	
3346.40	-13.5	H	3.0	39.5	1.0	-52.0	-13.0	-39.0	
High Ch, 848.8MHz									
1697.60	-6.1	V	3.0	38.2	1.0	-43.4	-13.0	-30.4	
2546.40	-9.4	V	3.0	38.9	1.0	-47.3	-13.0	-34.3	
3395.20	-14.2	V	3.0	39.5	1.0	-52.6	-13.0	-39.6	
1697.60	-8.3	H	3.0	38.2	1.0	-45.5	-13.0	-32.5	
2546.40	-8.8	H	3.0	38.9	1.0	-46.7	-13.0	-33.7	
3395.20	-14.0	H	3.0	39.5	1.0	-52.5	-13.0	-39.5	

GSM

GSM850
EGPRS

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-07
Test Engineer:	47989
Configuration:	EUT / AC Adapter / Earphone, Y-Position
Location:	Chamber 2
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	-11.0	V	3.0	38.2	1.0	-48.3	-13.0	-35.3	
2472.60	-13.1	V	3.0	38.8	1.0	-50.9	-13.0	-37.9	
3296.80	-13.7	V	3.0	39.4	1.0	-52.2	-13.0	-39.2	
1648.40	-11.1	H	3.0	38.2	1.0	-48.3	-13.0	-35.3	
2472.60	-11.6	H	3.0	38.8	1.0	-49.4	-13.0	-36.4	
3296.80	-15.0	H	3.0	39.4	1.0	-53.4	-13.0	-40.4	
Mid Ch, 836.6MHz									
1673.20	-10.5	V	3.0	38.2	1.0	-47.8	-13.0	-34.8	
2509.80	-12.8	V	3.0	38.8	1.0	-50.6	-13.0	-37.6	
3346.40	-14.6	V	3.0	39.5	1.0	-53.1	-13.0	-40.1	
1673.20	-11.7	H	3.0	38.2	1.0	-48.9	-13.0	-35.9	
2509.80	-11.7	H	3.0	38.8	1.0	-49.5	-13.0	-36.5	
3346.40	-14.6	H	3.0	39.5	1.0	-53.0	-13.0	-40.0	
High Ch, 848.8MHz									
1697.60	-9.0	V	3.0	38.2	1.0	-46.2	-13.0	-33.2	
2546.40	-11.4	V	3.0	38.9	1.0	-49.3	-13.0	-36.3	
3395.20	-13.9	V	3.0	39.5	1.0	-52.4	-13.0	-39.4	
1697.60	-12.4	H	3.0	38.2	1.0	-49.6	-13.0	-36.6	
2546.40	-12.4	H	3.0	38.9	1.0	-50.3	-13.0	-37.3	
3395.20	-14.5	H	3.0	39.5	1.0	-52.9	-13.0	-39.9	

WCDMA Band 5

WCDMA

Band 5
REL99

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

Company: Samsung
Project #: 4788404029
Date: 2018-04-07
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Y-Position
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	-18.1	V	3.0	38.2	1.0	-55.3	-13.0	-42.3	
2479.20	-16.1	V	3.0	38.8	1.0	-53.9	-13.0	-40.9	
3305.60	-14.0	V	3.0	39.4	1.0	-52.4	-13.0	-39.4	
1652.80	-17.9	H	3.0	38.2	1.0	-55.1	-13.0	-42.1	
2479.20	-15.9	H	3.0	38.8	1.0	-53.7	-13.0	-40.7	
3305.60	-14.7	H	3.0	39.4	1.0	-53.2	-13.0	-40.2	
Mid Ch, 836.6MHz									
1673.20	-17.2	V	3.0	38.2	1.0	-54.5	-13.0	-41.5	
2509.80	-16.0	V	3.0	38.8	1.0	-53.9	-13.0	-40.9	
3346.40	-14.6	V	3.0	39.5	1.0	-53.1	-13.0	-40.1	
1673.20	-17.9	H	3.0	38.2	1.0	-55.1	-13.0	-42.1	
2509.80	-16.3	H	3.0	38.8	1.0	-54.2	-13.0	-41.2	
3346.40	-14.5	H	3.0	39.5	1.0	-53.0	-13.0	-40.0	
High Ch, 846.6MHz									
1693.20	-17.5	V	3.0	38.2	1.0	-54.8	-13.0	-41.8	
2539.80	-16.3	V	3.0	38.9	1.0	-54.1	-13.0	-41.1	
3386.40	-14.3	V	3.0	39.5	1.0	-52.7	-13.0	-39.7	
1693.20	-17.8	H	3.0	38.2	1.0	-55.1	-13.0	-42.1	
2539.80	-16.0	H	3.0	38.9	1.0	-53.9	-13.0	-40.9	
3386.40	-14.8	H	3.0	39.5	1.0	-53.3	-13.0	-40.3	

WCDMA

Band 5
HSDPA

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

Company: Samsung
Project #: 4788404029
Date: 2018-04-07
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Y-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	-17.9	V	3.0	38.2	1.0	-55.1	-13.0	-42.1	
2479.20	-16.6	V	3.0	38.8	1.0	-54.4	-13.0	-41.4	
3305.60	-14.6	V	3.0	39.4	1.0	-53.0	-13.0	-40.0	
1652.80	-18.2	H	3.0	38.2	1.0	-55.4	-13.0	-42.4	
2479.20	-16.2	H	3.0	38.8	1.0	-54.0	-13.0	-41.0	
3305.60	-15.1	H	3.0	39.4	1.0	-53.6	-13.0	-40.6	
Mid Ch, 836.6MHz									
1673.20	-17.6	V	3.0	38.2	1.0	-54.8	-13.0	-41.8	
2509.80	-15.1	V	3.0	38.8	1.0	-52.9	-13.0	-39.9	
3346.40	-14.3	V	3.0	39.5	1.0	-52.7	-13.0	-39.7	
1673.20	-18.3	H	3.0	38.2	1.0	-55.5	-13.0	-42.5	
2509.80	-15.6	H	3.0	38.8	1.0	-53.5	-13.0	-40.5	
3346.40	-14.5	H	3.0	39.5	1.0	-53.0	-13.0	-40.0	
High Ch, 846.6MHz									
1693.20	-17.5	V	3.0	38.2	1.0	-54.8	-13.0	-41.8	
2539.80	-16.9	V	3.0	38.9	1.0	-54.7	-13.0	-41.7	
3386.40	-14.1	V	3.0	39.5	1.0	-52.6	-13.0	-39.6	
1693.20	-18.6	H	3.0	38.2	1.0	-55.8	-13.0	-42.8	
2539.80	-15.6	H	3.0	38.9	1.0	-53.5	-13.0	-40.5	
3386.40	-14.9	H	3.0	39.5	1.0	-53.4	-13.0	-40.4	

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LTE Band 5

LTE Band 5 10MHz QPSK

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
Mode:	LTE_QPSK Band 5 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, 829MHz									
1658.00	-8.9	V	3.0	41.8	1.0	-49.7	-13.0	-36.7	
2487.00	-14.7	V	3.0	41.7	1.0	-55.4	-13.0	-42.4	
3316.00	-15.3	V	3.0	41.1	1.0	-55.4	-13.0	-42.4	
4145.00	-6.8	V	3.0	40.6	1.0	-46.4	-13.0	-33.4	
1658.00	-11.8	H	3.0	41.8	1.0	-52.7	-13.0	-39.7	
2487.00	-13.8	H	3.0	41.7	1.0	-54.5	-13.0	-41.5	
3316.00	-16.3	H	3.0	41.1	1.0	-56.4	-13.0	-43.4	
4145.00	-13.6	H	3.0	40.6	1.0	-53.2	-13.0	-40.2	
Mid Ch, 836.5MHz									
1673.00	-8.8	V	3.0	41.8	1.0	-49.6	-13.0	-36.6	
2509.50	-14.0	V	3.0	41.7	1.0	-54.7	-13.0	-41.7	
3346.00	-15.8	V	3.0	41.1	1.0	-55.9	-13.0	-42.9	
4182.50	-7.7	V	3.0	40.6	1.0	-47.3	-13.0	-34.3	
1673.00	-13.0	H	3.0	41.8	1.0	-53.8	-13.0	-40.8	
2509.50	-12.9	H	3.0	41.7	1.0	-53.6	-13.0	-40.6	
3346.00	-10.6	H	3.0	41.1	1.0	-50.7	-13.0	-37.7	
4182.50	-5.3	H	3.0	40.6	1.0	-44.9	-13.0	-31.9	
High Ch, 844MHz									
1688.00	-11.1	V	3.0	41.8	1.0	-51.9	-13.0	-38.9	
2532.00	-15.5	V	3.0	41.7	1.0	-56.1	-13.0	-43.1	
3376.00	-15.3	V	3.0	41.1	1.0	-55.4	-13.0	-42.4	
4220.00	-7.1	V	3.0	40.6	1.0	-46.7	-13.0	-33.7	
1688.00	-11.8	H	3.0	41.8	1.0	-52.6	-13.0	-39.6	
2532.00	-13.9	H	3.0	41.7	1.0	-54.5	-13.0	-41.5	
3376.00	-15.0	H	3.0	41.1	1.0	-55.1	-13.0	-42.1	
4220.00	-5.1	H	3.0	40.6	1.0	-44.7	-13.0	-31.7	

LTE Band 5 10MHz 16QAM

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
Mode:	LTE_16QAM Band 5 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, 829MHz									
1658.00	-10.8	V	3.0	41.8	1.0	-51.6	-13.0	-38.6	
2487.00	-13.0	V	3.0	41.7	1.0	-53.7	-13.0	-40.7	
3316.00	-14.8	V	3.0	41.1	1.0	-54.9	-13.0	-41.9	
4145.00	-5.8	V	3.0	40.6	1.0	-45.3	-13.0	-32.3	
1658.00	-14.2	H	3.0	41.8	1.0	-55.0	-13.0	-42.0	
2487.00	-15.3	H	3.0	41.7	1.0	-56.0	-13.0	-43.0	
3316.00	-15.4	H	3.0	41.1	1.0	-55.5	-13.0	-42.5	
4145.00	-7.8	H	3.0	40.6	1.0	-47.4	-13.0	-34.4	
Mid Ch, 836.5MHz									
1673.00	-11.7	V	3.0	41.8	1.0	-52.6	-13.0	-39.6	
2509.50	-12.9	V	3.0	41.7	1.0	-53.5	-13.0	-40.5	
3346.00	-14.8	V	3.0	41.1	1.0	-54.9	-13.0	-41.9	
4182.50	-5.4	V	3.0	40.6	1.0	-45.0	-13.0	-32.0	
1673.00	-14.1	H	3.0	41.8	1.0	-54.9	-13.0	-41.9	
2509.50	-15.4	H	3.0	41.7	1.0	-56.1	-13.0	-43.1	
3346.00	-14.9	H	3.0	41.1	1.0	-55.0	-13.0	-42.0	
4182.50	-7.5	H	3.0	40.6	1.0	-47.1	-13.0	-34.1	
High Ch, 844MHz									
1688.00	-14.3	V	3.0	41.8	1.0	-55.2	-13.0	-42.2	
2532.00	-14.3	V	3.0	41.7	1.0	-54.9	-13.0	-41.9	
3376.00	-14.2	V	3.0	41.1	1.0	-54.2	-13.0	-41.2	
4220.00	-5.4	V	3.0	40.6	1.0	-45.0	-13.0	-32.0	
1688.00	-14.2	H	3.0	41.8	1.0	-55.0	-13.0	-42.0	
2532.00	-13.5	H	3.0	41.7	1.0	-54.1	-13.0	-41.1	
3376.00	-14.3	H	3.0	41.1	1.0	-54.4	-13.0	-41.4	
4220.00	-7.5	H	3.0	40.6	1.0	-47.1	-13.0	-34.1	

LTE Band 5 5MHz QPSK

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
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	-11.5	V	3.0	41.8	1.0	-52.3	-13.0	-39.3	
2479.50	-17.8	V	3.0	41.7	1.0	-58.5	-13.0	-45.5	
3306.00	-15.4	V	3.0	41.1	1.0	-55.5	-13.0	-42.5	
4132.50	-5.6	V	3.0	40.6	1.0	-45.2	-13.0	-32.2	
1653.00	-13.4	H	3.0	41.8	1.0	-54.2	-13.0	-41.2	
2479.50	-15.1	H	3.0	41.7	1.0	-55.8	-13.0	-42.8	
3306.00	-16.0	H	3.0	41.1	1.0	-56.1	-13.0	-43.1	
4132.50	-6.6	H	3.0	40.6	1.0	-46.2	-13.0	-33.2	
Mid Ch, 836.5MHz									
1673.00	-12.3	V	3.0	41.8	1.0	-53.1	-13.0	-40.1	
2509.50	-13.1	V	3.0	41.7	1.0	-53.8	-13.0	-40.8	
3346.00	-14.9	V	3.0	41.1	1.0	-55.0	-13.0	-42.0	
4182.50	-5.8	V	3.0	40.6	1.0	-45.4	-13.0	-32.4	
1673.00	-14.5	H	3.0	41.8	1.0	-55.3	-13.0	-42.3	
2509.50	-15.8	H	3.0	41.7	1.0	-56.4	-13.0	-43.4	
3346.00	-15.5	H	3.0	41.1	1.0	-55.6	-13.0	-42.6	
4182.50	-7.4	H	3.0	40.6	1.0	-47.0	-13.0	-34.0	
High Ch, 846.5MHz									
1693.00	-13.9	V	3.0	41.8	1.0	-54.7	-13.0	-41.7	
2539.50	-13.7	V	3.0	41.6	1.0	-54.3	-13.0	-41.3	
3386.00	-14.1	V	3.0	41.1	1.0	-54.1	-13.0	-41.1	
4232.50	-5.3	V	3.0	40.5	1.0	-44.9	-13.0	-31.9	
1693.00	-15.4	H	3.0	41.8	1.0	-56.2	-13.0	-43.2	
2539.50	-15.2	H	3.0	41.6	1.0	-55.8	-13.0	-42.8	
3386.00	-14.1	H	3.0	41.1	1.0	-54.2	-13.0	-41.2	
4232.50	-7.2	H	3.0	40.5	1.0	-46.7	-13.0	-33.7	

LTE Band 5 5MHz 16QAM

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
Mode:	LTE_16QAM 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	-11.6	V	3.0	41.8	1.0	-52.4	-13.0	-39.4	
2479.50	-13.1	V	3.0	41.7	1.0	-53.8	-13.0	-40.8	
3306.00	-15.1	V	3.0	41.1	1.0	-55.2	-13.0	-42.2	
4132.50	-5.9	V	3.0	40.6	1.0	-45.5	-13.0	-32.5	
1653.00	-13.8	H	3.0	41.8	1.0	-54.6	-13.0	-41.6	
2479.50	-15.2	H	3.0	41.7	1.0	-55.9	-13.0	-42.9	
3306.00	-16.0	H	3.0	41.1	1.0	-56.1	-13.0	-43.1	
4132.50	-7.6	H	3.0	40.6	1.0	-47.2	-13.0	-34.2	
Mid Ch, 836.5MHz									
1673.00	-11.8	V	3.0	41.8	1.0	-52.7	-13.0	-39.7	
2509.50	-13.5	V	3.0	41.7	1.0	-54.2	-13.0	-41.2	
3346.00	-14.9	V	3.0	41.1	1.0	-55.0	-13.0	-42.0	
4182.50	-8.9	V	3.0	40.6	1.0	-48.5	-13.0	-35.5	
1673.00	-14.9	H	3.0	41.8	1.0	-55.8	-13.0	-42.8	
2509.50	-14.8	H	3.0	41.7	1.0	-55.5	-13.0	-42.5	
3346.00	-15.3	H	3.0	41.1	1.0	-55.4	-13.0	-42.4	
4182.50	-7.6	H	3.0	40.6	1.0	-47.2	-13.0	-34.2	
High Ch, 846.5MHz									
1693.00	-18.8	V	3.0	41.8	1.0	-59.6	-13.0	-46.6	
2539.50	-14.0	V	3.0	41.6	1.0	-54.7	-13.0	-41.7	
3386.00	-14.0	V	3.0	41.1	1.0	-54.0	-13.0	-41.0	
4232.50	-4.9	V	3.0	40.5	1.0	-44.4	-13.0	-31.4	
1693.00	-16.3	H	3.0	41.8	1.0	-57.1	-13.0	-44.1	
2539.50	-14.5	H	3.0	41.6	1.0	-55.1	-13.0	-42.1	
3386.00	-14.6	H	3.0	41.1	1.0	-54.6	-13.0	-41.6	
4232.50	-7.8	H	3.0	40.5	1.0	-47.3	-13.0	-34.3	

LTE Band 5 3MHz QPSK

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
Mode:	LTE_QPSK Band 5 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 825.5MHz									
1651.00	-13.0	V	3.0	41.8	1.0	-53.8	-13.0	-40.8	
2476.50	-13.5	V	3.0	41.7	1.0	-54.2	-13.0	-41.2	
3302.00	-14.6	V	3.0	41.1	1.0	-54.8	-13.0	-41.8	
4127.50	-4.3	V	3.0	40.6	1.0	-43.9	-13.0	-30.9	
1651.00	-15.2	H	3.0	41.8	1.0	-56.1	-13.0	-43.1	
2476.50	-15.5	H	3.0	41.7	1.0	-56.2	-13.0	-43.2	
3302.00	-15.9	H	3.0	41.1	1.0	-56.0	-13.0	-43.0	
4127.50	-6.8	H	3.0	40.6	1.0	-46.4	-13.0	-33.4	
Mid Ch, 836.5MHz									
1673.00	-12.9	V	3.0	41.8	1.0	-53.7	-13.0	-40.7	
2509.50	-13.3	V	3.0	41.7	1.0	-54.0	-13.0	-41.0	
3346.00	-15.0	V	3.0	41.1	1.0	-55.1	-13.0	-42.1	
4182.50	-5.7	V	3.0	40.6	1.0	-45.3	-13.0	-32.3	
1673.00	-14.6	H	3.0	41.8	1.0	-55.5	-13.0	-42.5	
2509.50	-15.6	H	3.0	41.7	1.0	-56.2	-13.0	-43.2	
3346.00	-14.9	H	3.0	41.1	1.0	-55.0	-13.0	-42.0	
4182.50	-7.5	H	3.0	40.6	1.0	-47.1	-13.0	-34.1	
High Ch, 847.5MHz									
1695.00	-13.8	V	3.0	41.8	1.0	-54.7	-13.0	-41.7	
2542.50	-14.7	V	3.0	41.6	1.0	-55.3	-13.0	-42.3	
3390.00	-13.2	V	3.0	41.1	1.0	-53.2	-13.0	-40.2	
4237.50	-5.6	V	3.0	40.5	1.0	-45.2	-13.0	-32.2	
1695.00	-14.9	H	3.0	41.8	1.0	-55.8	-13.0	-42.8	
2542.50	-15.4	H	3.0	41.6	1.0	-56.1	-13.0	-43.1	
3390.00	-14.1	H	3.0	41.1	1.0	-54.2	-13.0	-41.2	
4237.50	-7.2	H	3.0	40.5	1.0	-46.8	-13.0	-33.8	

LTE Band 5 3MHz 16QAM

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
Mode:	LTE_16QAM Band 5 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 825.5MHz									
1651.00	-14.1	V	3.0	41.8	1.0	-54.9	-13.0	-41.9	
2476.50	-14.3	V	3.0	41.7	1.0	-55.0	-13.0	-42.0	
3302.00	-15.1	V	3.0	41.1	1.0	-55.3	-13.0	-42.3	
4127.50	-5.5	V	3.0	40.6	1.0	-45.1	-13.0	-32.1	
1651.00	-17.7	H	3.0	41.8	1.0	-58.6	-13.0	-45.6	
2476.50	-15.9	H	3.0	41.7	1.0	-56.6	-13.0	-43.6	
3302.00	-15.8	H	3.0	41.1	1.0	-55.9	-13.0	-42.9	
4127.50	-6.2	H	3.0	40.6	1.0	-45.8	-13.0	-32.8	
Mid Ch, 836.5MHz									
1673.00	-13.9	V	3.0	41.8	1.0	-54.7	-13.0	-41.7	
2509.50	-14.0	V	3.0	41.7	1.0	-54.6	-13.0	-41.6	
3346.00	-15.0	V	3.0	41.1	1.0	-55.1	-13.0	-42.1	
4182.50	-5.9	V	3.0	40.6	1.0	-45.5	-13.0	-32.5	
1673.00	-15.7	H	3.0	41.8	1.0	-56.6	-13.0	-43.6	
2509.50	-15.0	H	3.0	41.7	1.0	-55.7	-13.0	-42.7	
3346.00	-15.8	H	3.0	41.1	1.0	-55.9	-13.0	-42.9	
4182.50	-7.0	H	3.0	40.6	1.0	-46.5	-13.0	-33.5	
High Ch, 847.5MHz									
1695.00	-13.9	V	3.0	41.8	1.0	-54.7	-13.0	-41.7	
2542.50	-14.9	V	3.0	41.6	1.0	-55.6	-13.0	-42.6	
3390.00	-14.6	V	3.0	41.1	1.0	-54.7	-13.0	-41.7	
4237.50	-5.8	V	3.0	40.5	1.0	-45.4	-13.0	-32.4	
1695.00	-15.4	H	3.0	41.8	1.0	-56.3	-13.0	-43.3	
2542.50	-16.5	H	3.0	41.6	1.0	-57.1	-13.0	-44.1	
3390.00	-14.4	H	3.0	41.1	1.0	-54.5	-13.0	-41.5	
4237.50	-8.0	H	3.0	40.5	1.0	-47.5	-13.0	-34.5	

LTE Band 5 1.4MHz QPSK

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
Mode:	LTE_QPSK Band 5 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.7MHz									
1649.40	-13.8	V	3.0	41.8	1.0	-54.6	-13.0	-41.6	
2474.10	-10.9	V	3.0	41.7	1.0	-51.6	-13.0	-38.6	
3298.80	-14.4	V	3.0	41.1	1.0	-54.6	-13.0	-41.6	
4123.50	-5.4	V	3.0	40.6	1.0	-45.0	-13.0	-32.0	
1649.40	-17.7	H	3.0	41.8	1.0	-58.5	-13.0	-45.5	
2474.10	-16.0	H	3.0	41.7	1.0	-56.7	-13.0	-43.7	
3298.80	-14.9	H	3.0	41.1	1.0	-55.0	-13.0	-42.0	
4123.50	-6.1	H	3.0	40.6	1.0	-45.7	-13.0	-32.7	
Mid Ch, 836.5MHz									
1673.00	-14.2	V	3.0	41.8	1.0	-55.1	-13.0	-42.1	
2509.50	-14.4	V	3.0	41.7	1.0	-55.0	-13.0	-42.0	
3346.00	-14.8	V	3.0	41.1	1.0	-54.9	-13.0	-41.9	
4182.50	-6.2	V	3.0	40.6	1.0	-45.8	-13.0	-32.8	
1673.00	-16.1	H	3.0	41.8	1.0	-57.0	-13.0	-44.0	
2509.50	-15.8	H	3.0	41.7	1.0	-56.5	-13.0	-43.5	
3346.00	-15.9	H	3.0	41.1	1.0	-56.0	-13.0	-43.0	
4182.50	-7.3	H	3.0	40.6	1.0	-46.9	-13.0	-33.9	
High Ch, 848.3MHz									
1696.60	-14.7	V	3.0	41.8	1.0	-55.5	-13.0	-42.5	
2544.90	-14.7	V	3.0	41.6	1.0	-55.4	-13.0	-42.4	
3393.20	-14.6	V	3.0	41.1	1.0	-54.7	-13.0	-41.7	
4241.50	-6.0	V	3.0	40.5	1.0	-45.5	-13.0	-32.5	
1696.60	-16.3	H	3.0	41.8	1.0	-57.1	-13.0	-44.1	
2544.90	-16.5	H	3.0	41.6	1.0	-57.1	-13.0	-44.1	
3393.20	-14.4	H	3.0	41.1	1.0	-54.5	-13.0	-41.5	
4241.50	-8.1	H	3.0	40.5	1.0	-47.6	-13.0	-34.6	

LTE Band 5 1.4MHz 16QAM

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

Company:	Samsung
Project #:	4788404029
Date:	2018-04-06
Test Engineer:	45585
Configuration:	EUT / Adapter / Earphone, Y-Position
Location:	Chamber 3
Mode:	LTE_16QAM Band 5 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.7MHz									
1649.40	-14.5	V	3.0	41.8	1.0	-55.3	-13.0	-42.3	
2474.10	-14.6	V	3.0	41.7	1.0	-55.3	-13.0	-42.3	
3298.80	-14.5	V	3.0	41.1	1.0	-54.6	-13.0	-41.6	
4123.50	-5.0	V	3.0	40.6	1.0	-44.6	-13.0	-31.6	
1649.40	-17.0	H	3.0	41.8	1.0	-57.9	-13.0	-44.9	
2474.10	-15.3	H	3.0	41.7	1.0	-56.0	-13.0	-43.0	
3298.80	-15.7	H	3.0	41.1	1.0	-55.8	-13.0	-42.8	
4123.50	-5.7	H	3.0	40.6	1.0	-45.3	-13.0	-32.3	
Mid Ch, 836.5MHz									
1673.00	-12.8	V	3.0	41.8	1.0	-53.6	-13.0	-40.6	
2509.50	-14.9	V	3.0	41.7	1.0	-55.6	-13.0	-42.6	
3346.00	-14.9	V	3.0	41.1	1.0	-55.0	-13.0	-42.0	
4182.50	-6.1	V	3.0	40.6	1.0	-45.7	-13.0	-32.7	
1673.00	-16.1	H	3.0	41.8	1.0	-56.9	-13.0	-43.9	
2509.50	-15.8	H	3.0	41.7	1.0	-56.4	-13.0	-43.4	
3346.00	-15.8	H	3.0	41.1	1.0	-55.9	-13.0	-42.9	
4182.50	-7.2	H	3.0	40.6	1.0	-46.7	-13.0	-33.7	
High Ch, 848.3MHz									
1696.60	-14.9	V	3.0	41.8	1.0	-55.8	-13.0	-42.8	
2544.90	-15.3	V	3.0	41.6	1.0	-56.0	-13.0	-43.0	
3393.20	-14.1	V	3.0	41.1	1.0	-54.1	-13.0	-41.1	
4241.50	-6.3	V	3.0	40.5	1.0	-45.8	-13.0	-32.8	
1696.60	-15.9	H	3.0	41.8	1.0	-56.7	-13.0	-43.7	
2544.90	-17.0	H	3.0	41.6	1.0	-57.6	-13.0	-44.6	
3393.20	-15.0	H	3.0	41.1	1.0	-55.1	-13.0	-42.1	
4241.50	-8.0	H	3.0	40.5	1.0	-47.6	-13.0	-34.6	