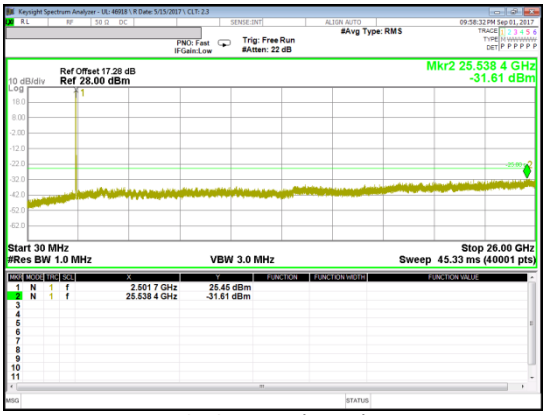
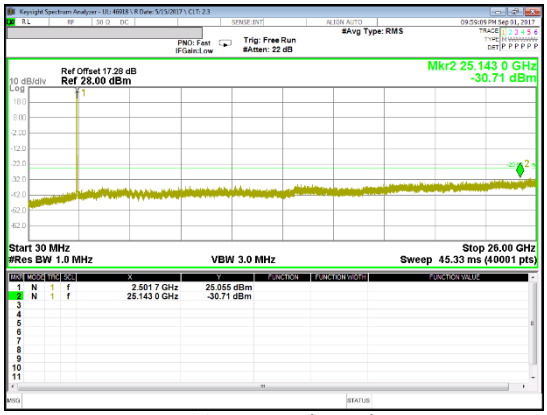
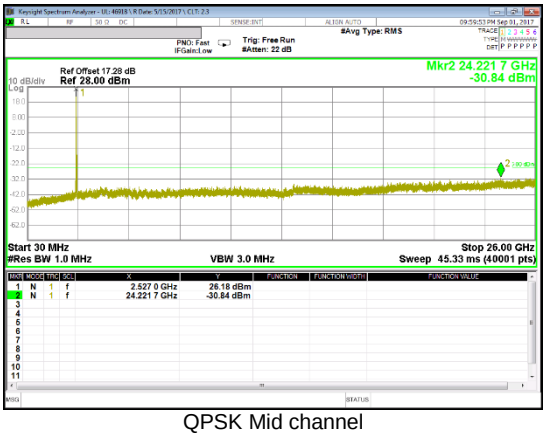
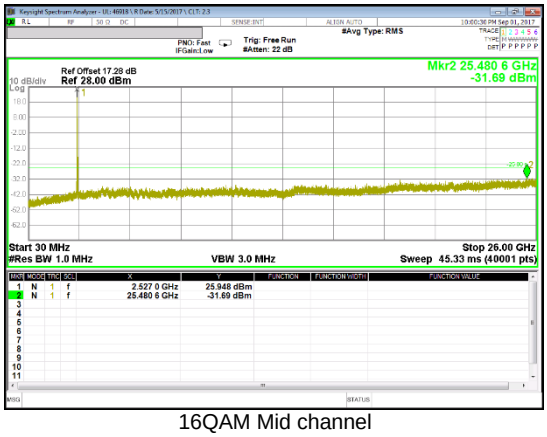
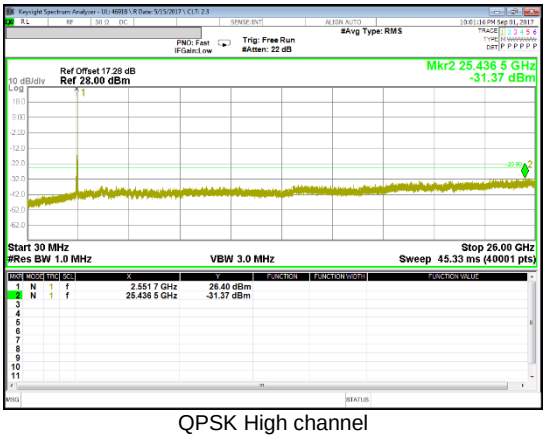
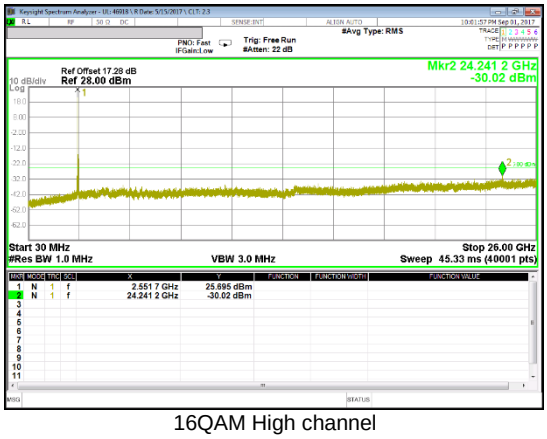
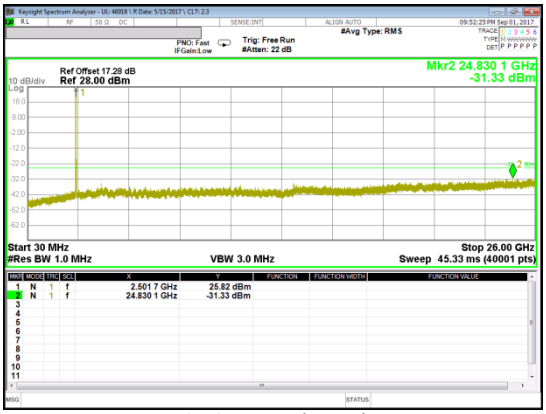
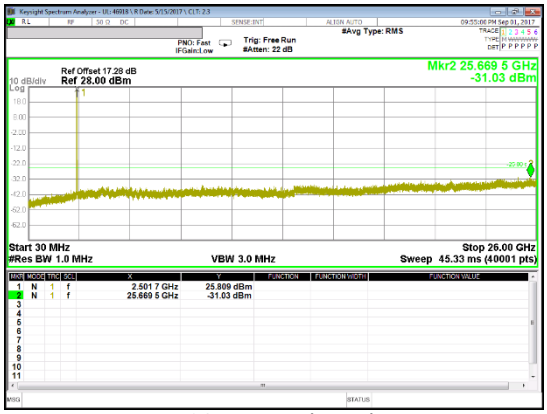
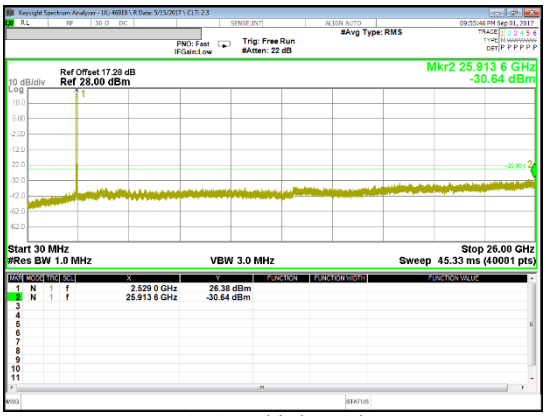
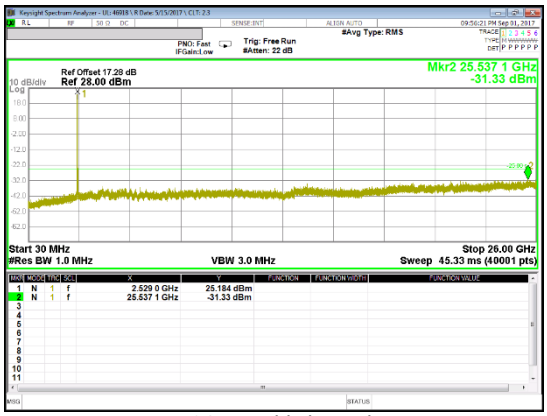
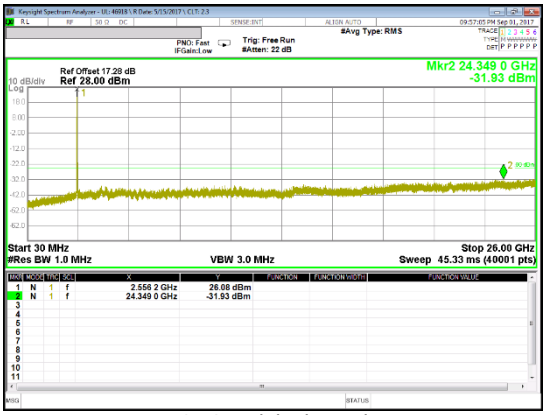
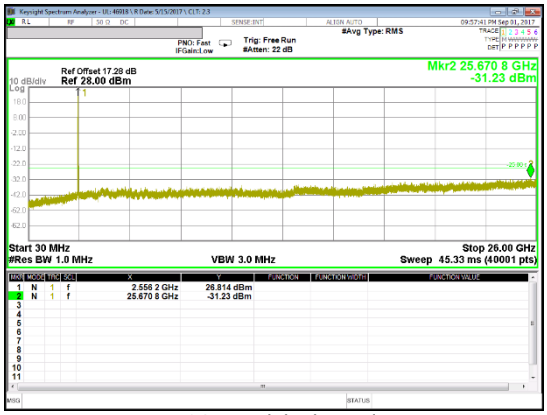
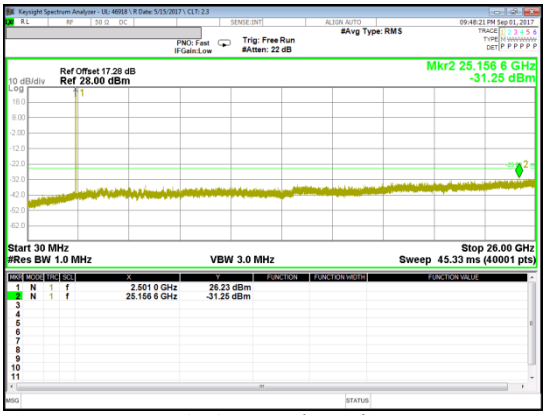
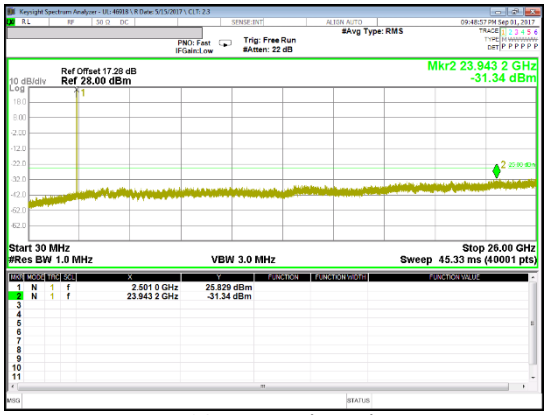
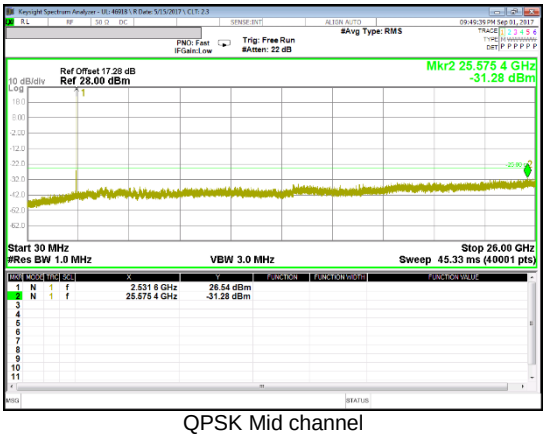
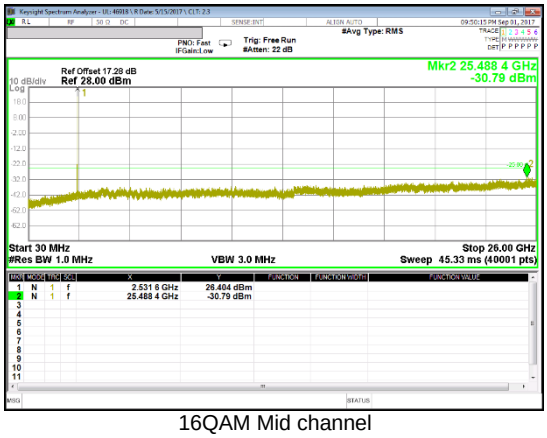
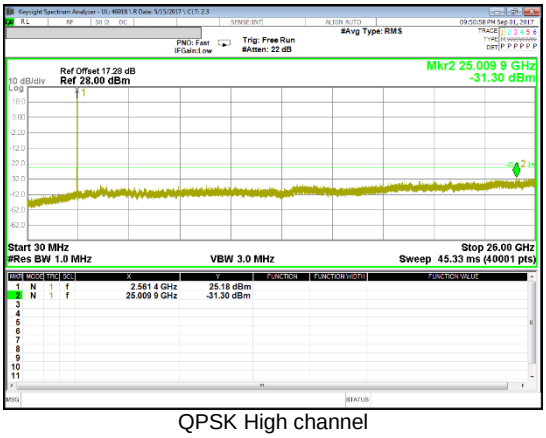
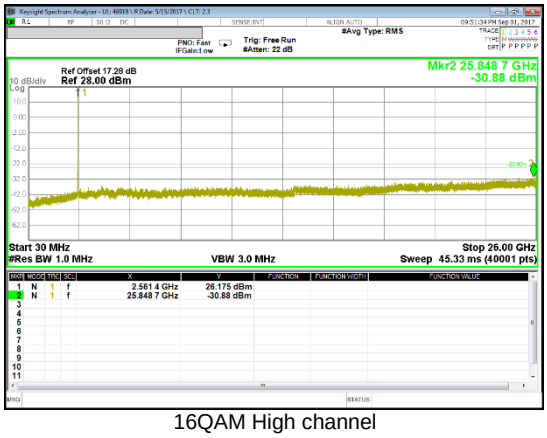
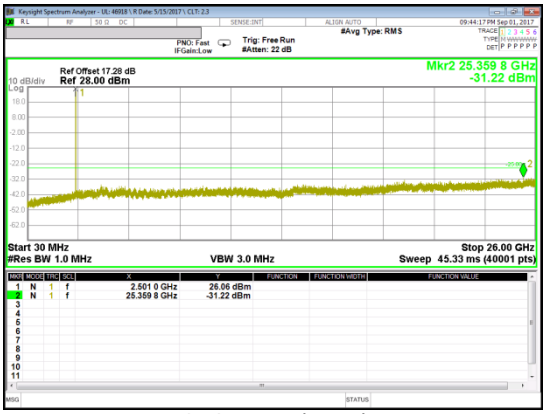
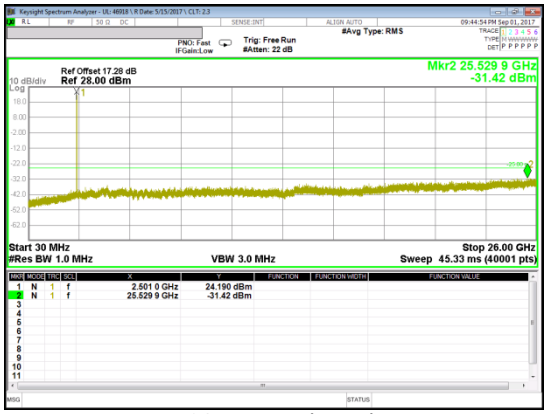
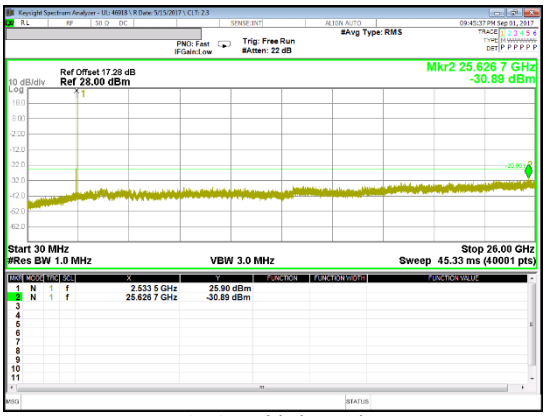
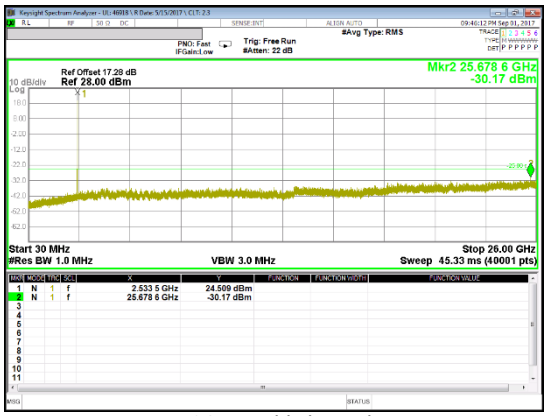
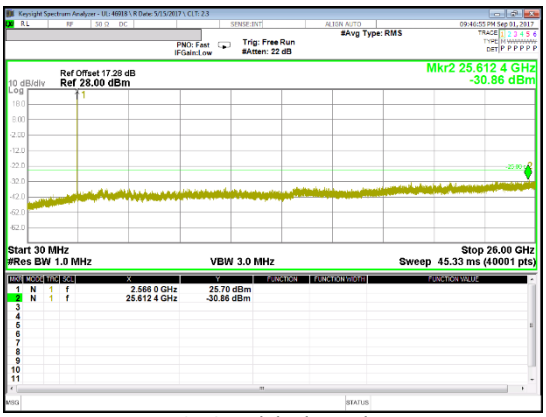
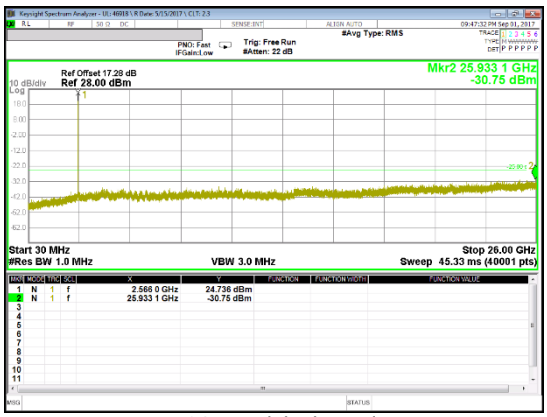
LTE Band 7

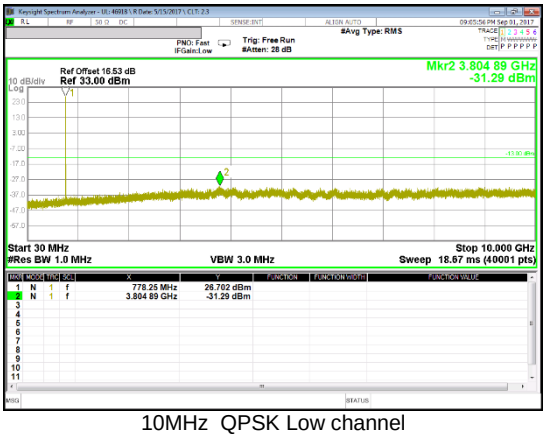
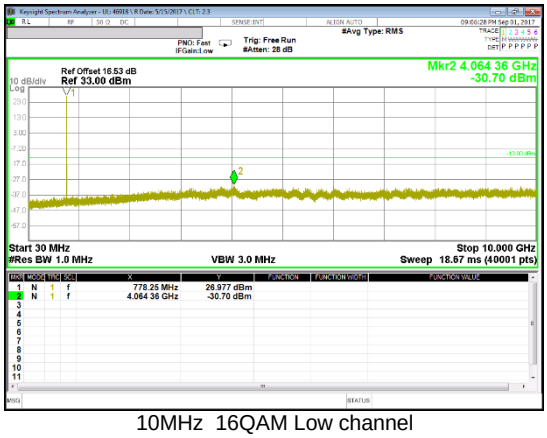
Band 7 20MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

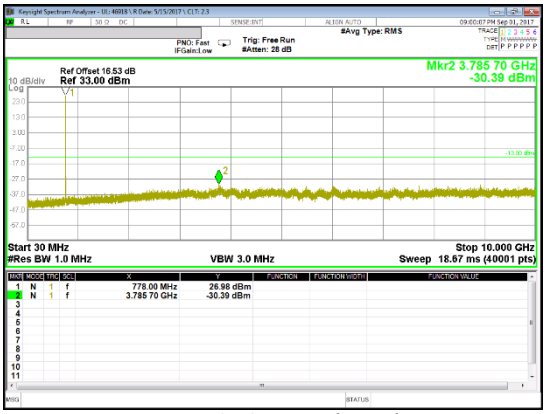
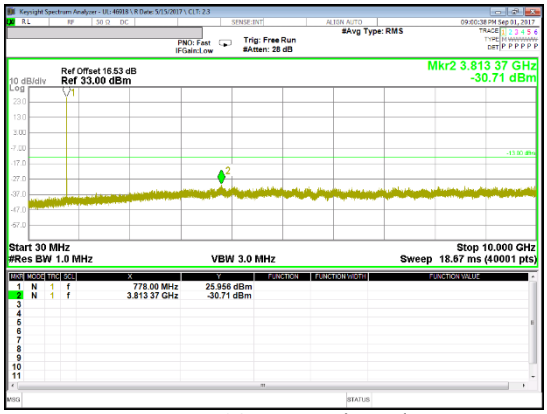
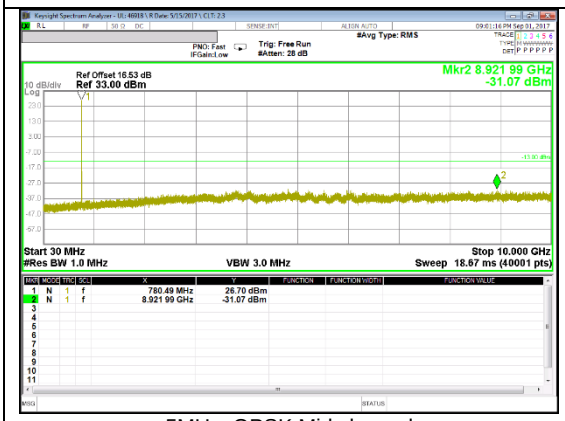
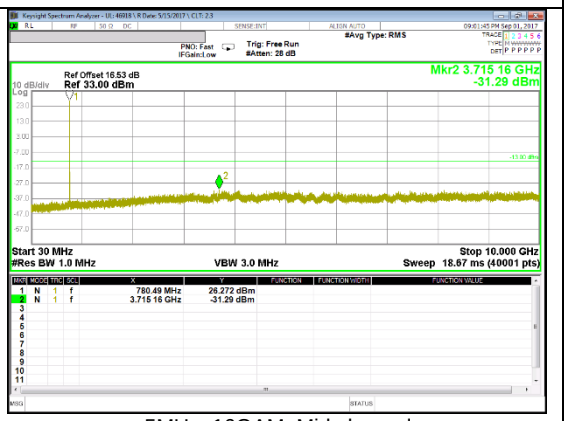
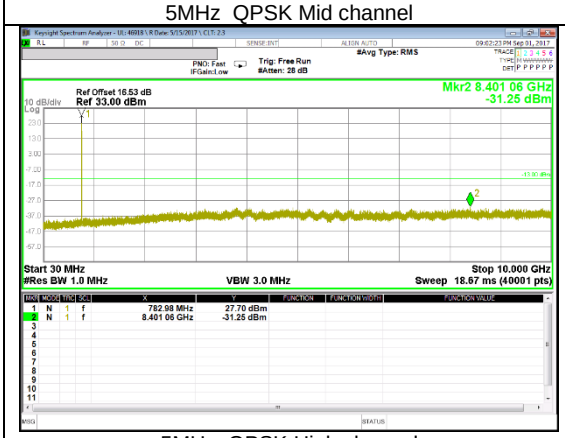
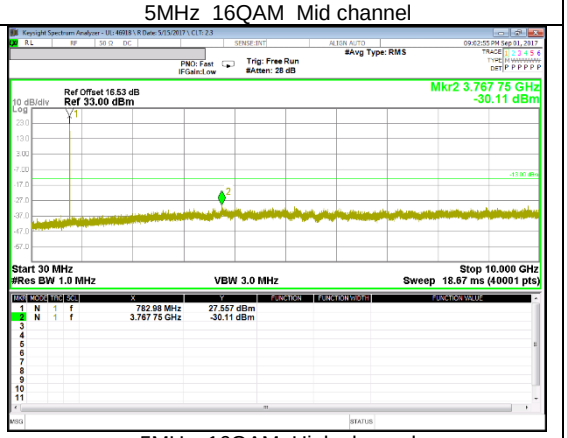
	 QPSK Low channel	 16QAM Low channel
Band 7 15MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

Band 7 10MHz	 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 7 5MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

LTE Band 13

Band 13 10MHz	 10MHz QPSK Low channel	 10MHz 16QAM Low channel

Band 13 5MHz	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
	 5MHz QPSK Mid channel	 5MHz 16QAM Mid channel
	 5MHz QPSK High channel	 5MHz 16QAM High channel

9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235 and §27.54

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.

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

RESULTS

See the following pages.

9.4.1. FREQUENCY STABILITY RESULTS

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]
3.80	50	836.60000408	0.000	2.5
3.80	40	836.60000500	-0.001	2.5
3.80	30	836.60000395	0.000	2.5
3.80	***20***	836.60000430	***0***	***2.5***
3.80	10	836.60000570	-0.002	2.5
3.80	0	836.60000473	-0.001	2.5
3.80	-10	836.60000468	0.000	2.5
3.80	-20	836.60000508	-0.001	2.5
3.80	-30	836.60000628	-0.002	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]
3.80	***20***	**836.60000430**	***0***	***2.5***
4.30	20	836.60000512	-0.001	2.5
3.60	20	836.60000451	0.000	2.5

WCDMA Band 2 , Channel 9400, Frequency 1880.0 MHz

Reference Frequency: WCDMA Band 2 Mid Channel 1880.0 MHz @ 20ºC Limit: +- 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	1879.99999339	0.000	2.5
3.80	40	1879.99999449	-0.001	2.5
3.80	30	1879.99999412	-0.001	2.5
3.80	***20***	1879.99999291	***0***	***2.5***
3.80	10	1879.99999419	-0.001	2.5
3.80	0	1879.99999587	-0.002	2.5
3.80	-10	1879.99999353	0.000	2.5
3.80	-20	1879.99999428	-0.001	2.5
3.80	-30	1879.99999373	0.000	2.5

Reference Frequency: WCDMA Band 2 Mid Channel 1880.0 MHz @ 20ºC Limit: +- 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***	**1879.99999291**	***0***	***2.5***
4.30	20	1879.99999389	-0.001	2.5
3.60	20	1879.99999257	0.000	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]**
3.80	50	836.50001511	-0.002	2.5
3.80	40	836.50001448	-0.001	2.5
3.80	30	836.50001504	-0.002	2.5
3.80	***20***	836.50001349	***0***	***2.5***
3.80	10	836.50001469	-0.001	2.5
3.80	0	836.50001227	0.001	2.5
3.80	-10	836.50001569	-0.003	2.5
3.80	-20	836.50001591	-0.003	2.5
3.80	-30	836.50001373	0.000	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]**
3.80	***20***	**836.50001349**	***0***	***2.5***
4.30	20	836.50001505	-0.002	2.5
3.60	20	836.50001469	-0.001	2.5

LTE Band 4, Channel 20174, Frequency 1732.5 MHz

Reference Frequency: LTE Band 4 Mid Channel 1732.5 MHz @ 20ºC Limit: +- 2.5 ppm = 4331.250 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.80	50	1732.50002053	-0.002	2.5
3.80	40	1732.50001715	0.000	2.5
3.80	30	1732.50001674	0.000	2.5
3.80	***20***	1732.50001732	***0***	***2.5***
3.80	10	1732.50001761	0.000	2.5
3.80	0	1732.50001427	0.002	2.5
3.80	-10	1732.50001352	0.002	2.5
3.80	-20	1732.50001679	0.000	2.5
3.80	-30	1732.50001928	-0.001	2.5

Reference Frequency: LTE Band 4 Mid Channel 1732.5 MHz @ 20ºC Limit: +- 2.5 ppm = 4331.250 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.80	***20***	**1732.50001732**	***0***	***2.5***
4.30	20	1732.50001824	-0.001	2.5
3.60	20	1732.50001599	0.001	2.5

LTE Band 2, Channel 18900, Frequency 1880.0 MHz

Reference Frequency: LTE Band 2 Mid Channel 1880 MHz @ 20ºC Limit: +- 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	1880.00001988	0.000	2.5
3.80	40	1880.00002135	-0.001	2.5
3.80	30	1880.00001860	0.001	2.5
3.80	***20***	1880.00002008	***0***	***2.5***
3.80	10	1880.00001753	0.001	2.5
3.80	0	1880.00001820	0.001	2.5
3.80	-10	1880.00001921	0.000	2.5
3.80	-20	1880.00002125	-0.001	2.5
3.80	-30	1880.00001960	0.000	2.5

Reference Frequency: LTE Band 2 Mid Channel 1880 MHz @ 20ºC Limit: +- 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***	**1880.00002008**	***0***	***2.5***
4.30	20	1880.00001649	0.002	2.5
3.60	20	1880.00002050	0.000	2.5

LTE Band 7, Channel 21100, Frequency 2535.0 MHz

Reference Frequency: LTE Band 7 Mid Channel 2535 MHz @ 20ºC Limit: +- 2.5 ppm = 6337.500 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.80	50	2535.00001940	-0.001	2.5
3.80	40	2535.00001724	0.000	2.5
3.80	30	2535.00001881	-0.001	2.5
3.80	***20***	2535.00001748	***0***	***2.5***
3.80	10	2535.00001891	-0.001	2.5
3.80	0	2535.00001914	-0.001	2.5
3.80	-10	2535.00002020	-0.001	2.5
3.80	-20	2535.00001881	-0.001	2.5
3.80	-30	2535.00002030	-0.001	2.5

Reference Frequency: LTE Band 7 Mid Channel 2535 MHz @ 20ºC Limit: +- 2.5 ppm = 6337.500 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.80	***20***	**2535.00001748**	***0***	***2.5***
4.30	20	2535.00001790	0.000	2.5
3.60	20	2535.00001954	-0.001	2.5

LTE Band 13, Channel 23230, Frequency 782.0 MHz

Reference Frequency: LTE Band 13 Mid Channel 782 MHz @ 20ºC Limit: +- 2.5 ppm = 1955.000 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.80	50	782.00001076	-0.001	2.5
3.80	40	782.00000963	0.001	2.5
3.80	30	782.00001155	-0.002	2.5
3.80	***20***	782.00001032	***0***	***2.5***
3.80	10	782.00001147	-0.001	2.5
3.80	0	782.00001194	-0.002	2.5
3.80	-10	782.00001016	0.000	2.5
3.80	-20	782.00001074	-0.001	2.5
3.80	-30	782.00001147	-0.001	2.5

Reference Frequency: LTE Band 13 Mid Channel 782 MHz @ 20ºC Limit: +- 2.5 ppm = 1955.000 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
[Vdc]	**Temperature [*C]**	**[MHz]**	**Delta [ppm]**	**Limit [ppm]**
3.80	***20***	**782.00001032**	***0***	***2.5***
4.30	20	782.00001059	0.000	2.5
3.60	20	782.00001098	-0.001	2.5

10. RADIATED TEST RESULTS

10.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232 and §27.50

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.

27.50(h) - (2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

27.50(b) (10) - Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

27.50(d) - (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

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 v02r02

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 B41)

TEST RESULTS

10.1.1. ERP/EIRP Results

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	21.50	141.25
		4183	836.6	**21.63**	145.55
		4233	846.6	20.82	120.78
	HSDPA	4132	826.4	**21.56**	143.22
		4183	836.6	20.51	112.46
		4233	846.6	19.95	98.86
Band 2	REL99	9262	1852.4	**23.75**	237.14
		9400	1880.0	23.66	232.27
		9538	1907.6	23.30	213.80
	HSDPA	9262	1852.4	**24.13**	258.82
		9400	1880.0	23.66	232.27
		9538	1907.6	23.28	212.81

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	**20.82**	120.78
			50/0	836.5	20.72	118.03
			50/0	844.0	19.68	92.90
		16QAM	50/0	829.0	**19.86**	96.83
			50/0	836.5	19.81	95.72
			50/0	844.0	18.70	74.13
	5	QPSK	25/0	826.5	20.66	116.41
			25/0	836.5	20.35	108.39
			25/0	846.5	18.60	72.44
		16QAM	25/0	826.5	19.75	94.41
			25/0	836.5	19.36	86.30
			25/0	846.5	18.06	63.97
	3	QPSK	15/0	825.5	20.52	112.72
			15/0	836.5	20.59	114.55
			15/0	847.5	19.17	82.60
		16QAM	15/0	825.5	19.53	89.74
			15/0	836.5	19.61	91.41
			15/0	847.5	18.69	73.96
	1.4	QPSK	6/0	824.7	18.51	70.96
			6/0	836.5	17.96	62.52
			6/0	848.3	17.19	52.36
		16QAM	6/0	824.7	17.60	57.54
			6/0	836.5	17.05	50.70
			6/0	848.3	16.75	47.32

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LTE Band 4

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 4	20	QPSK	100/0	1720.0	**23.84**	242.10
			100/0	1732.5	21.88	154.17
			100/0	1745.0	22.05	160.32
		16QAM	100/0	1720.0	**22.85**	192.75
			100/0	1732.5	20.83	121.06
			100/0	1745.0	21.07	127.94
	15	QPSK	75/0	1717.5	23.92	246.60
			75/0	1732.5	23.93	247.17
			75/0	1747.5	23.83	241.55
		16QAM	75/0	1717.5	22.92	195.88
			75/0	1732.5	22.90	194.98
			75/0	1747.5	22.82	191.43
	10	QPSK	50/0	1715.0	20.61	115.08
			50/0	1732.5	22.94	196.79
			50/0	1750.0	24.56	285.76
		16QAM	50/0	1715.0	19.60	91.20
			50/0	1732.5	21.94	156.31
			50/0	1750.0	23.58	228.03
	5	QPSK	25/0	1712.5	24.86	306.20
			25/0	1732.5	**25.23**	333.43
			25/0	1752.5	23.81	240.44
		16QAM	25/0	1712.5	23.86	243.22
			25/0	1732.5	**24.25**	266.07
			25/0	1752.5	22.80	190.55
	3	QPSK	15/0	1711.5	19.60	91.20
			15/0	1732.5	21.01	126.18
			15/0	1753.5	18.94	78.34
		16QAM	15/0	1711.5	18.65	73.28
			15/0	1732.5	19.90	97.72
			15/0	1753.5	17.85	60.95
	1.4	QPSK	6/0	1710.7	18.46	70.15
			6/0	1732.5	18.11	64.71
			6/0	1754.3	19.52	89.54
		16QAM	6/0	1710.7	17.53	56.62
			6/0	1732.5	17.14	51.76
			6/0	1754.3	18.34	68.23

LTE Band 2

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 2	20	QPSK	100/0	1860.0	**23.98**	250.03
			100/0	1880.0	23.56	226.99
			100/0	1900.0	22.87	193.64
		16QAM	100/0	1860.0	**23.00**	199.53
			100/0	1880.0	22.73	187.50
			100/0	1900.0	21.94	156.31
	15	QPSK	75/0	1857.5	**24.43**	277.33
			75/0	1880.0	23.46	221.82
			75/0	1902.5	21.26	133.66
		16QAM	75/0	1857.5	**23.45**	221.31
			75/0	1880.0	22.45	175.79
			75/0	1902.5	20.31	107.40
	10	QPSK	50/0	1855.0	22.21	166.34
			50/0	1880.0	23.29	213.30
			50/0	1905.0	22.52	178.65
		16QAM	50/0	1855.0	21.26	133.66
			50/0	1880.0	23.27	212.32
			50/0	1905.0	21.59	144.21
	5	QPSK	25/0	1852.5	22.59	181.55
			25/0	1880.0	23.17	207.49
			25/0	1907.5	22.47	176.60
		16QAM	25/0	1852.5	21.64	145.88
			25/0	1880.0	22.21	166.34
			25/0	1907.5	21.55	142.89
	3	QPSK	15/0	1851.5	23.88	244.34
			15/0	1880.0	23.65	231.74
			15/0	1908.5	22.36	172.19
		16QAM	15/0	1851.5	22.86	193.20
			15/0	1880.0	22.68	185.35
			15/0	1908.5	21.95	156.68
	1.4	QPSK	6/0	1850.7	20.97	125.03
			6/0	1880.0	21.78	150.66
			6/0	1909.3	20.84	121.34
		16QAM	6/0	1850.7	20.05	101.16
			6/0	1880.0	20.81	120.50
			6/0	1909.3	19.88	97.27

LTE Band 13

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 17	10	QPSK	50/0	782.0	**18.65**	73.28
		16QAM	50/0	782.0	**17.71**	59.02
	5	QPSK	25/0	779.5	18.22	66.37
			25/0	782.0	18.50	70.79
			25/0	784.5	18.53	71.29
		16QAM	25/0	779.5	17.27	53.33
			25/0	782.0	17.59	57.41
			25/0	784.5	**18.05**	63.83

LTE Band 7

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 7	20	QPSK	100/0	2510.0	17.83	60.67
			100/0	2535.0	18.69	73.96
			100/0	2560.0	**19.19**	82.99
		16QAM	100/0	2510.0	17.13	51.64
			100/0	2535.0	17.66	58.34
			100/0	2560.0	**18.22**	66.37
	15	QPSK	75/0	2507.5	17.64	58.08
			75/0	2535.0	17.77	59.84
			75/0	2562.5	18.28	67.30
		16QAM	75/0	2507.5	16.59	45.60
			75/0	2535.0	16.76	47.42
			75/0	2562.5	17.26	53.21
	10	QPSK	50/0	2505.0	17.58	57.28
			50/0	2535.0	18.85	76.74
			50/0	2565.0	18.53	71.29
		16QAM	50/0	2505.0	16.53	44.98
			50/0	2535.0	17.88	61.38
			50/0	2565.0	17.54	56.75
	5	QPSK	25/0	2502.5	18.13	65.01
			25/0	2535.0	**19.51**	89.33
			25/0	2567.5	18.51	70.96
		16QAM	25/0	2502.5	17.05	50.70
			25/0	2535.0	18.03	63.53
			25/0	2567.5	17.61	57.68

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10.1.2. ERP/EIRP DATA

WCDMA Band 5

WCDMA

Band 5
REL99

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-07-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: Rel 99_850 MHz

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	19.15	V	1.1	-1.5	16.54	38.5	-21.9	
826.40	24.11	H	1.1	-1.5	21.50	38.5	-17.0	
Mid Ch								
836.60	18.30	V	1.1	-1.4	15.81	38.5	-22.6	
836.60	24.12	H	1.1	-1.4	21.63	38.5	-16.8	
High Ch								
846.60	17.15	V	1.1	-1.3	14.77	38.5	-23.7	
846.60	23.20	H	1.1	-1.3	20.82	38.5	-17.6	

Rev. 3.17.11

WCDMA

Band 5
HSDPA

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-07-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: HSDPA_850 MHz

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	18.95	V	1.1	-1.5	16.34	38.5	-22.1	
826.40	24.17	H	1.1	-1.5	21.56	38.5	-16.9	
Mid Ch								
836.60	17.91	V	1.1	-1.4	15.42	38.5	-23.0	
836.60	23.00	H	1.1	-1.4	20.51	38.5	-17.9	
High Ch								
846.60	16.70	V	1.1	-1.3	14.32	38.5	-24.1	
846.60	22.33	H	1.1	-1.3	19.95	38.5	-18.5	

Rev. 3.17.11

WCDMA Band 2

WCDMA

Band 2
REL99

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-01-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: REL99_1900 MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.40	13.72	V	1.60	8.79	20.91	33.0	-12.1	
1852.40	16.56	H	1.60	8.79	23.75	33.0	-9.3	
Mid Ch								
1880.00	12.24	V	1.62	8.62	19.24	33.0	-13.8	
1880.00	16.66	H	1.62	8.62	23.66	33.0	-9.3	
High Ch								
1907.60	15.06	V	1.63	8.45	21.88	33.0	-11.1	
1907.60	16.48	H	1.63	8.45	23.30	33.0	-9.7	

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

WCDMA

Band 2
HSDPA

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-01-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: HSDPA_1900 MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.40	13.71	V	1.60	8.79	20.90	33.0	-12.1	
1852.40	16.94	H	1.60	8.79	24.13	33.0	-8.9	
Mid Ch								
1880.00	12.14	V	1.62	8.62	19.14	33.0	-13.9	
1880.00	16.66	H	1.62	8.62	23.66	33.0	-9.3	
High Ch								
1907.60	15.05	V	1.63	8.45	21.87	33.0	-11.1	
1907.60	16.46	H	1.63	8.45	23.28	33.0	-9.7	

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

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LTE Band 5

LTE Band 5 10MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: TX, LTE BAND 5, 10MHz BW,QPSK

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
829.00	18.19	V	1.1	-1.5	15.61	38.5	-22.8	
829.00	23.40	H	1.1	-1.5	20.82	38.5	-17.6	
Mid Ch								
836.50	18.00	V	1.1	-1.4	15.51	38.5	-22.9	
836.50	23.21	H	1.1	-1.4	20.72	38.5	-17.7	
High Ch								
844.00	17.09	V	1.1	-1.3	14.70	38.5	-23.8	
844.00	22.10	H	1.1	-1.3	19.68	38.5	-18.8	

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

LTE Band 5 10MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: LTE5 10MHz FUND 16QAM

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
829.00	17.24	V	1.1	-1.5	14.66	38.5	-23.8	
829.00	22.44	H	1.1	-1.5	19.86	38.5	-18.6	
Mid Ch								
836.50	17.07	V	1.1	-1.4	14.56	38.5	-23.9	
836.50	22.32	H	1.1	-1.4	19.81	38.5	-18.6	
High Ch								
844.00	16.14	V	1.1	-1.3	13.72	38.5	-24.7	
844.00	21.12	H	1.1	-1.3	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

LTE Band 5 5MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: LTE5 5MHz FUND QPSK

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	17.90	V	1.1	-1.5	15.30	38.5	-23.2	
826.50	23.26	H	1.1	-1.5	20.66	38.5	-17.8	
Mid Ch								
836.50	17.67	V	1.1	-1.4	15.18	38.5	-23.3	
836.50	22.84	H	1.1	-1.4	20.35	38.5	-18.1	
High Ch								
846.50	16.57	V	1.6	-1.3	13.69	38.5	-24.8	
846.50	21.48	H	1.6	-1.3	18.60	38.5	-19.8	

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

LTE Band 5 5MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: LTE5 5MHz FUND 16QAM

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	16.97	V	1.1	-1.5	14.37	38.5	-24.1	
826.50	22.35	H	1.1	-1.5	19.75	38.5	-18.7	
Mid Ch								
836.50	16.82	V	1.1	-1.4	14.33	38.5	-24.1	
836.50	21.85	H	1.1	-1.4	19.36	38.5	-19.1	
High Ch								
846.50	15.64	V	1.1	-1.3	13.26	38.5	-25.2	
846.50	20.44	H	1.1	-1.3	18.06	38.5	-20.4	

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

LTE Band 5 3MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: LTE5 3MHz FUND QPSK

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	16.44	V	1.1	-1.5	13.84	38.5	-24.6	
825.50	23.12	H	1.1	-1.5	20.52	38.5	-17.9	
Mid Ch								
836.50	16.67	V	1.1	-1.4	14.18	38.5	-24.3	
836.50	23.08	H	1.1	-1.4	20.59	38.5	-17.9	
High Ch								
847.50	16.04	V	1.6	-1.3	13.16	38.5	-25.3	
847.50	22.05	H	1.6	-1.3	19.17	38.5	-19.3	

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

LTE Band 5 3MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: LTE5 3MHz FUND 16QAM

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	15.54	V	1.1	-1.5	12.94	38.5	-25.5	
825.50	22.13	H	1.1	-1.5	19.53	38.5	-18.9	
Mid Ch								
836.50	16.35	V	1.1	-1.4	13.86	38.5	-24.6	
836.50	22.10	H	1.1	-1.4	19.61	38.5	-18.8	
High Ch								
847.50	15.05	V	1.1	-1.3	12.67	38.5	-25.8	
847.50	21.07	H	1.1	-1.3	18.69	38.5	-19.8	

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

LTE Band 5 1.4MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: LTE5 1.4MHz FUND QPSK

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	15.84	V	1.1	-1.5	13.24	38.5	-25.2	
824.70	21.11	H	1.1	-1.5	18.51	38.5	-19.9	
Mid Ch								
836.50	14.57	V	1.1	-1.4	12.08	38.5	-26.4	
836.50	20.45	H	1.1	-1.4	17.96	38.5	-20.5	
High Ch								
848.30	13.57	V	1.6	-1.3	10.69	38.5	-27.8	
848.30	20.07	H	1.6	-1.3	17.19	38.5	-21.3	

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

LTE Band 5 1.4MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-21-17
Test Engineer: YH Lim
Configuration: EUT ONLY, X Position
Mode: LTE5 1.4MHz FUND 16QAM

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	14.80	V	1.1	-1.5	12.20	38.5	-26.3	
824.70	20.20	H	1.1	-1.5	17.60	38.5	-20.9	
Mid Ch								
836.50	13.68	V	1.1	-1.4	11.19	38.5	-27.3	
836.50	19.54	H	1.1	-1.4	17.05	38.5	-21.4	
High Ch								
848.30	12.61	V	1.1	-1.3	10.23	38.5	-28.2	
848.30	19.13	H	1.1	-1.3	16.75	38.5	-21.7	

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

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LTE Band 4

LTE Band 4 20MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4, QPSK, 20MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1720.00	14.01	V	1.54	9.12	21.59	30.0	-8.4	
1720.00	16.26	H	1.54	9.12	23.84	30.0	-6.2	
Mid Ch								
1732.50	11.53	V	1.55	9.31	19.29	30.0	-10.7	
1732.50	14.12	H	1.55	9.31	21.88	30.0	-8.1	
High Ch								
1745.00	12.81	V	1.56	9.37	20.62	30.0	-9.4	
1745.00	14.24	H	1.56	9.37	22.05	30.0	-8.0	

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

LTE Band 4 20MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4, 16QAM, 20MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1720.00	13.03	V	1.54	9.12	20.61	30.0	-9.4	
1720.00	15.27	H	1.54	9.12	22.85	30.0	-7.2	
Mid Ch								
1732.50	10.55	V	1.55	9.31	18.31	30.0	-11.7	
1732.50	13.07	H	1.55	9.31	20.83	30.0	-9.2	
High Ch								
1745.00	11.81	V	1.56	9.37	19.62	30.0	-10.4	
1745.00	13.26	H	1.56	9.37	21.07	30.0	-8.9	

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

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LTE Band 4 15MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4, QPSK, 15MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1717.50	12.85	V	1.54	9.12	20.43	30.0	-9.6	
1717.50	16.34	H	1.54	9.12	23.92	30.0	-6.1	
Mid Ch								
1732.50	11.79	V	1.55	9.31	19.55	30.0	-10.5	
1732.50	16.17	H	1.55	9.31	23.93	30.0	-6.1	
High Ch								
1747.50	13.77	V	1.56	9.39	21.60	30.0	-8.4	
1747.50	16.00	H	1.56	9.39	23.83	30.0	-6.2	

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

LTE Band 4 15MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4, 16QAM, 15MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1717.50	11.84	V	1.54	9.12	19.42	30.0	-10.6	
1717.50	15.34	H	1.54	9.12	22.92	30.0	-7.1	
Mid Ch								
1732.50	10.78	V	1.55	9.31	18.54	30.0	-11.5	
1732.50	15.14	H	1.55	9.31	22.90	30.0	-7.1	
High Ch								
1747.50	12.78	V	1.56	9.39	20.61	30.0	-9.4	
1747.50	14.99	H	1.56	9.39	22.82	30.0	-7.2	

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

LTE Band 4 10MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4, QPSK, 10MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1715.00	11.99	V	1.54	9.12	19.57	30.0	-10.4	
1715.00	13.03	H	1.54	9.12	20.61	30.0	-9.4	
Mid Ch								
1732.50	14.62	V	1.55	9.31	22.38	30.0	-7.6	
1732.50	15.18	H	1.55	9.31	22.94	30.0	-7.1	
High Ch								
1750.00	16.72	V	1.56	9.40	24.56	30.0	-5.4	
1750.00	16.33	H	1.56	9.40	24.17	30.0	-5.8	

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

LTE Band 4 10MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4 16QAM, 10MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1715.00	11.00	V	1.54	9.12	18.58	30.0	-11.4	
1715.00	12.02	H	1.54	9.12	19.60	30.0	-10.4	
Mid Ch								
1732.50	13.64	V	1.55	9.31	21.40	30.0	-8.6	
1732.50	14.18	H	1.55	9.31	21.94	30.0	-8.1	
High Ch								
1750.00	15.74	V	1.56	9.40	23.58	30.0	-6.4	
1750.00	15.33	H	1.56	9.40	23.17	30.0	-6.8	

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

LTE Band 4 5MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4, QPSK , 5MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1712.50	15.49	V	1.54	9.12	23.07	30.0	-6.9	
1712.50	17.28	H	1.54	9.12	24.86	30.0	-5.1	
Mid Ch								
1732.50	12.89	V	1.55	9.31	20.65	30.0	-9.4	
1732.50	17.47	H	1.55	9.31	25.23	30.0	-4.8	
High Ch								
1752.50	14.19	V	1.56	9.39	22.02	30.0	-8.0	
1752.50	15.98	H	1.56	9.39	23.81	30.0	-6.2	

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

LTE Band 4 5MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4 16QAM, 5MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1712.50	14.46	V	1.54	9.12	22.04	30.0	-8.0	
1712.50	16.28	H	1.54	9.12	23.86	30.0	-6.1	
Mid Ch								
1732.50	11.89	V	1.55	9.31	19.65	30.0	-10.4	
1732.50	16.49	H	1.55	9.31	24.25	30.0	-5.8	
High Ch								
1752.50	13.15	V	1.56	9.39	20.98	30.0	-9.0	
1752.50	14.97	H	1.56	9.39	22.80	30.0	-7.2	

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

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LTE Band 4 3MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4, QPSK , 3MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1711.50	10.18	V	1.54	9.12	17.76	30.0	-12.2	
1711.50	12.02	H	1.54	9.12	19.60	30.0	-10.4	
Mid Ch								
1732.50	8.10	V	1.55	9.31	15.86	30.0	-14.1	
1732.50	13.25	H	1.55	9.31	21.01	30.0	-9.0	
High Ch								
1753.50	7.47	V	1.56	9.38	15.29	30.0	-14.7	
1753.50	11.12	H	1.56	9.38	18.94	30.0	-11.1	

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

LTE Band 4 3MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4 16QAM, 3MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1711.50	9.16	V	1.54	9.12	16.74	30.0	-13.3	
1711.50	11.07	H	1.54	9.12	18.65	30.0	-11.4	
Mid Ch								
1732.50	7.10	V	1.55	9.31	14.86	30.0	-15.1	
1732.50	12.14	H	1.55	9.31	19.90	30.0	-10.1	
High Ch								
1753.50	6.41	V	1.56	9.38	14.23	30.0	-15.8	
1753.50	10.03	H	1.56	9.38	17.85	30.0	-12.2	

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

LTE Band 4 1.4MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4 QPSK, 1.4MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1710.70	10.17	V	1.54	9.12	17.75	30.0	-12.3	
1710.70	10.88	H	1.54	9.12	18.46	30.0	-11.5	
Mid Ch								
1732.50	10.25	V	1.55	9.31	18.01	30.0	-12.0	
1732.50	10.35	H	1.55	9.31	18.11	30.0	-11.9	
High Ch								
1754.30	8.95	V	1.56	9.37	16.76	30.0	-13.2	
1754.30	11.71	H	1.56	9.37	19.52	30.0	-10.5	

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

LTE Band 4 1.4MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-17-17
Test Engineer: JH Park
Configuration: EUT / Z-Position
Mode: LTE Band 4 16QAM, 1.4MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1710.70	9.17	V	1.54	9.12	16.75	30.0	-13.3	
1710.70	9.95	H	1.54	9.12	17.53	30.0	-12.5	
Mid Ch								
1732.50	9.19	V	1.55	9.31	16.95	30.0	-13.1	
1732.50	9.38	H	1.55	9.31	17.14	30.0	-12.9	
High Ch								
1754.30	7.81	V	1.56	9.37	15.62	30.0	-14.4	
1754.30	10.53	H	1.56	9.37	18.34	30.0	-11.7	

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

LTE Band 2

LTE Band 2 20MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 QPSK, 20MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1860.00	15.66	V	1.60	9.12	23.18	33.0	-9.8	
1860.00	16.46	H	1.60	9.12	23.98	33.0	-9.0	
Mid Ch								
1880.00	15.73	V	1.62	8.62	22.73	33.0	-10.3	
1880.00	16.56	H	1.62	8.62	23.56	33.0	-9.4	
High Ch								
1900.00	15.95	V	1.63	8.50	22.82	33.0	-10.2	
1900.00	16.00	H	1.63	8.50	22.87	33.0	-10.1	

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

LTE Band 2 20MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 16QAM, 20MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1860.00	14.72	V	1.60	9.12	22.24	33.0	-10.8	
1860.00	15.48	H	1.60	9.12	23.00	33.0	-10.0	
Mid Ch								
1880.00	15.73	V	1.62	8.62	22.73	33.0	-10.3	
1880.00	15.57	H	1.62	8.62	22.57	33.0	-10.4	
High Ch								
1900.00	15.01	V	1.63	8.50	21.88	33.0	-11.1	
1900.00	15.07	H	1.63	8.50	21.94	33.0	-11.1	

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

LTE Band 2 15MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 QPSK, 15MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1857.50	16.91	V	1.60	9.12	24.43	33.0	-8.6	
1857.50	15.57	H	1.60	9.12	23.09	33.0	-9.9	
Mid Ch								
1880.00	16.46	V	1.62	8.62	23.46	33.0	-9.5	
1880.00	15.35	H	1.62	8.62	22.35	33.0	-10.6	
High Ch								
1902.50	14.08	V	1.63	8.49	20.94	33.0	-12.1	
1902.50	14.40	H	1.63	8.49	21.26	33.0	-11.7	

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

LTE Band 2 15MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 16QAM, 15MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1857.50	15.93	V	1.60	9.12	23.45	33.0	-9.6	
1857.50	14.54	H	1.60	9.12	22.06	33.0	-10.9	
Mid Ch								
1880.00	15.45	V	1.62	8.62	22.45	33.0	-10.5	
1880.00	14.40	H	1.62	8.62	21.40	33.0	-11.6	
High Ch								
1902.50	13.25	V	1.63	8.49	20.11	33.0	-12.9	
1902.50	13.45	H	1.63	8.49	20.31	33.0	-12.7	

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

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

LTE Band 2 10MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 QPSK, 10MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1855.00	14.69	V	1.60	9.12	22.21	33.0	-10.8	
1855.00	14.58	H	1.60	9.12	22.10	33.0	-10.9	
Mid Ch								
1880.00	14.77	V	1.62	8.62	21.77	33.0	-11.2	
1880.00	16.29	H	1.62	8.62	23.29	33.0	-9.7	
High Ch								
1905.00	13.82	V	1.63	8.47	20.66	33.0	-12.3	
1905.00	15.68	H	1.63	8.47	22.52	33.0	-10.5	

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

LTE Band 2 10MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 16QAM, 10MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1855.00	13.74	V	1.60	9.12	21.26	33.0	-11.7	
1855.00	13.66	H	1.60	9.12	21.18	33.0	-11.8	
Mid Ch								
1880.00	13.84	V	1.62	8.62	20.84	33.0	-12.2	
1880.00	16.27	H	1.62	8.62	23.27	33.0	-9.7	
High Ch								
1905.00	12.97	V	1.63	8.47	19.81	33.0	-13.2	
1905.00	14.75	H	1.63	8.47	21.59	33.0	-11.4	

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

LTE Band 2 5MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 QPSK, 5MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.50	14.63	V	1.60	9.12	22.15	33.0	-10.9	
1852.50	15.07	H	1.60	9.12	22.59	33.0	-10.4	
Mid Ch								
1880.00	14.71	V	1.62	8.62	21.71	33.0	-11.3	
1880.00	16.17	H	1.62	8.62	23.17	33.0	-9.8	
High Ch								
1907.50	14.84	V	1.63	8.46	21.67	33.0	-11.3	
1907.50	15.64	H	1.63	8.46	22.47	33.0	-10.5	

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

LTE Band 2 5MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 16QAM, 5MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.50	13.68	V	1.60	9.12	21.20	33.0	-11.8	
1852.50	14.12	H	1.60	9.12	21.64	33.0	-11.4	
Mid Ch								
1880.00	13.74	V	1.62	8.62	20.74	33.0	-12.3	
1880.00	15.21	H	1.62	8.62	22.21	33.0	-10.8	
High Ch								
1907.50	13.90	V	1.63	8.46	20.73	33.0	-12.3	
1907.50	14.72	H	1.63	8.46	21.55	33.0	-11.4	

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

LTE Band 2 3MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 QPSK, 3MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1851.50	16.36	V	1.60	9.12	23.88	33.0	-9.1	
1851.50	15.62	H	1.60	9.12	23.14	33.0	-9.9	
Mid Ch								
1880.00	14.80	V	1.62	8.62	21.80	33.0	-11.2	
1880.00	16.65	H	1.62	8.62	23.65	33.0	-9.3	
High Ch								
1908.50	15.12	V	1.63	8.45	21.94	33.0	-11.1	
1908.50	15.54	H	1.63	8.45	22.36	33.0	-10.6	

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

LTE Band 2 3MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 16QAM, 3MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1851.50	15.34	V	1.60	9.12	22.86	33.0	-10.1	
1851.50	14.68	H	1.60	9.12	22.20	33.0	-10.8	
Mid Ch								
1880.00	13.83	V	1.62	8.62	20.83	33.0	-12.2	
1880.00	15.68	H	1.62	8.62	22.68	33.0	-10.3	
High Ch								
1908.50	15.13	V	1.63	8.45	21.95	33.0	-11.0	
1908.50	14.76	H	1.63	8.45	21.58	33.0	-11.4	

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

LTE Band 2 1.4MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 QPSK, 1.4MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1850.70	12.45	V	1.60	9.12	19.97	33.0	-13.0	
1850.70	13.45	H	1.60	9.12	20.97	33.0	-12.0	
Mid Ch								
1880.00	13.26	V	1.62	8.62	20.26	33.0	-12.7	
1880.00	14.78	H	1.62	8.62	21.78	33.0	-11.2	
High Ch								
1909.30	13.60	V	1.63	8.44	20.41	33.0	-12.6	
1909.30	14.03	H	1.63	8.44	20.84	33.0	-12.2	

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

LTE Band 2 1.4MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-16-17
Test Engineer: YH Lim
Configuration: EUT / Z-Position
Mode: LTE Band 2 16QAM, 1.4MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
1850.70	11.52	V	1.60	9.12	19.04	33.0	-14.0	
1850.70	12.53	H	1.60	9.12	20.05	33.0	-13.0	
Mid Ch								
1880.00	12.34	V	1.62	8.62	19.34	33.0	-13.7	
1880.00	13.81	H	1.62	8.62	20.81	33.0	-12.2	
High Ch								
1909.30	12.59	V	1.63	8.44	19.40	33.0	-13.6	
1909.30	13.07	H	1.63	8.44	19.88	33.0	-13.1	

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

LTE Band 13

LTE Band 13 10MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-31-17
Test Engineer: Chan Park
Configuration: EUT ONLY, X Position
Mode: TX, LTE BAND 13, 10MHz BW,QPSK

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Mid Ch								
782.00	16.52	V	1.1	-1.4	14.03	34.8	-20.7	
782.00	21.14	H	1.1	-1.4	18.65	34.8	-16.1	

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

LTE Band 13 10MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-31-17
Test Engineer: Chan Park
Configuration: EUT ONLY, X Position
Mode: LTE13 10MHz FUND 16QAM

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Mid Ch								
782.00	15.59	V	1.1	-1.4	13.08	34.8	-21.7	
782.00	20.22	H	1.1	-1.4	17.71	34.8	-17.1	

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

LTE Band 13 5MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-31-17
Test Engineer: Chan Park
Configuration: EUT ONLY, X Position
Mode: LTE13 5MHz FUND QPSK

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	16.46	V	1.1	-1.5	13.86	34.8	-20.9	
779.50	20.82	H	1.1	-1.5	18.22	34.8	-16.6	
Mid Ch								
782.00	17.01	V	1.1	-1.4	14.52	34.8	-20.3	
782.00	20.99	H	1.1	-1.4	18.50	34.8	-16.3	
High Ch								
784.50	17.25	V	1.6	-1.3	14.37	34.8	-20.4	
784.50	21.41	H	1.6	-1.3	18.53	34.8	-16.2	

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

LTE Band 13 5MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 08-31-17
Test Engineer: Chan Park
Configuration: EUT ONLY, X Position
Mode: LTE13 5MHz FUND 16QAM

Test Equipment:
Receiving: VULB9163-749, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
779.50	15.53	V	1.1	-1.5	12.93	34.8	-21.8	
779.50	19.87	H	1.1	-1.5	17.27	34.8	-17.5	
Mid Ch								
782.00	16.05	V	1.1	-1.4	13.56	34.8	-21.2	
782.00	20.08	H	1.1	-1.4	17.59	34.8	-17.2	
High Ch								
784.50	16.32	V	1.1	-1.3	13.94	34.8	-20.8	
784.50	20.43	H	1.1	-1.3	18.05	34.8	-16.7	

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

LTE Band 7

LTE Band 7 20MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7, QPSK, 20MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2510.00	8.94	V	1.9	9.1	16.20	33.0	-16.8	
2510.00	10.57	H	1.9	9.1	17.83	33.0	-15.2	
Mid Ch								
2535.00	8.59	V	1.9	10.4	17.08	33.0	-15.9	
2535.00	10.20	H	1.9	10.4	18.69	33.0	-14.3	
High Ch								
2560.00	7.20	V	1.9	10.3	15.64	33.0	-17.4	
2560.00	10.75	H	1.9	10.3	19.19	33.0	-13.8	

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

LTE Band 7 20MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7, 16QAM, 20MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2510.00	7.91	V	1.9	9.1	15.17	33.0	-17.8	
2510.00	9.87	H	1.9	9.1	17.13	33.0	-15.9	
Mid Ch								
2535.00	7.69	V	1.9	10.4	16.18	33.0	-16.8	
2535.00	9.17	H	1.9	10.4	17.66	33.0	-15.3	
High Ch								
2560.00	6.25	V	1.9	10.3	14.69	33.0	-18.3	
2560.00	9.78	H	1.9	10.3	18.22	33.0	-14.8	

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

LTE Band 7 15MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7, QPSK, 15MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2507.50	6.99	V	1.9	9.1	14.25	33.0	-18.8	
2507.50	10.38	H	1.9	9.1	17.64	33.0	-15.4	
Mid Ch								
2535.00	8.48	V	1.9	10.4	16.97	33.0	-16.0	
2535.00	9.28	H	1.9	10.4	17.77	33.0	-15.2	
High Ch								
2562.50	7.54	V	1.9	10.3	15.98	33.0	-17.0	
2562.50	9.84	H	1.9	10.3	18.28	33.0	-14.7	

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

LTE Band 7 15MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7, 16QAM, 15MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2507.50	5.92	V	1.9	9.1	13.18	33.0	-19.8	
2507.50	9.33	H	1.9	9.1	16.59	33.0	-16.4	
Mid Ch								
2535.00	7.46	V	1.9	10.4	15.95	33.0	-17.1	
2535.00	8.27	H	1.9	10.4	16.76	33.0	-16.2	
High Ch								
2562.50	6.57	V	1.9	10.3	15.01	33.0	-18.0	
2562.50	8.82	H	1.9	10.3	17.26	33.0	-15.7	

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

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LTE Band 7 10MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7, QPSK, 10MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2505.00	7.61	V	1.9	9.1	14.87	33.0	-18.1	
2505.00	10.32	H	1.9	9.1	17.58	33.0	-15.4	
Mid Ch								
2535.00	7.91	V	1.9	10.4	16.40	33.0	-16.6	
2535.00	10.36	H	1.9	10.4	18.85	33.0	-14.2	
High Ch								
2565.00	9.69	V	1.9	10.3	18.13	33.0	-14.9	
2565.00	10.09	H	1.9	10.3	18.53	33.0	-14.5	

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

LTE Band 7 10MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7 16QAM, 10MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2505.00	6.57	V	1.9	9.1	13.83	33.0	-19.2	
2505.00	9.27	H	1.9	9.1	16.53	33.0	-16.5	
Mid Ch								
2535.00	7.00	V	1.9	10.4	15.49	33.0	-17.5	
2535.00	9.39	H	1.9	10.4	17.88	33.0	-15.1	
High Ch								
2565.00	8.70	V	1.9	10.3	17.14	33.0	-15.9	
2565.00	9.10	H	1.9	10.3	17.54	33.0	-15.5	

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

LTE Band 7 5MHz QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7, QPSK , 5MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2502.50	6.24	V	1.9	9.1	13.50	33.0	-19.5	
2502.50	10.87	H	1.9	9.1	18.13	33.0	-14.9	
Mid Ch								
2535.00	8.20	V	1.9	10.4	16.69	33.0	-16.3	
2535.00	11.02	H	1.9	10.4	19.51	33.0	-13.5	
High Ch								
2567.50	5.82	V	1.9	10.3	14.26	33.0	-18.7	
2567.50	10.07	H	1.9	10.3	18.51	33.0	-14.5	

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

LTE Band 7 5MHz 16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 2

Company: Samsung
Project #: 4788103295
Date: 09-04-17
Test Engineer: YH Lim
Configuration: EUT / X-Position
Mode: LTE Band 7, 16QAM, 5MHz

Test Equipment:
Receiving: 3117[00168724] and Chamber 1 SMA Cables
Substitution: 3115[00161451] Substitution, 3m 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								
2502.50	5.22	V	1.9	9.1	12.48	33.0	-20.5	
2502.50	9.79	H	1.9	9.1	17.05	33.0	-16.0	
Mid Ch								
2535.00	7.38	V	1.9	10.4	15.87	33.0	-17.1	
2535.00	9.54	H	1.9	10.4	18.03	33.0	-15.0	
High Ch								
2567.50	4.95	V	1.9	10.3	13.39	33.0	-19.6	
2567.50	9.17	H	1.9	10.3	17.61	33.0	-15.4	

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

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: (m)(4) For mobile station, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and (55 + 10 log (P)dB) at the 5.5 MHz from the channel edges.

Part 27.53(f) - For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Part 27.53(c) (2) - On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v02r02

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;

RESULTS

10.2.1. SPURIOUS RADIATION PLOTS

WCDMA Band 5

WCDMA

Band 5
REL99

UL Korea, Ltd Suwon Laboratory
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4788103295
Date: 09-01-17
Test Engineer: Chan Park
Configuration: EUT / AC Adapter / Earphone / X Position
Mode: Tx, REL99,850MHz

Chamber	Pre-amplifer	Filter	Limit
Chamber 2	AFS42	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-4.2	V	3.0	38.2	1.0	-41.4	-13.0	-28.4	
2.4790	-15.6	V	3.0	38.8	1.0	-53.4	-13.0	-40.4	
3.3056	-14.5	V	3.0	39.4	1.0	-53.0	-13.0	-40.0	
1.6520	-14.4	H	3.0	38.2	1.0	-51.6	-13.0	-38.6	
2.4790	-12.7	H	3.0	38.8	1.0	-50.5	-13.0	-37.5	
3.3056	-14.6	H	3.0	39.4	1.0	-53.1	-13.0	-40.1	
Mid Ch, 836.6MHz									
1.6732	-4.5	V	3.0	38.2	1.0	-41.8	-13.0	-28.8	
2.5098	-11.4	V	3.0	38.8	1.0	-49.2	-13.0	-36.2	
3.3464	-13.3	V	3.0	39.5	1.0	-51.8	-13.0	-38.8	
1.6732	-15.3	H	3.0	38.2	1.0	-52.5	-13.0	-39.5	
2.5098	-12.8	H	3.0	38.8	1.0	-50.6	-13.0	-37.6	
3.3464	-13.7	H	3.0	39.5	1.0	-52.2	-13.0	-39.2	
High Ch, 846.6MHz									
1.6932	-5.0	V	3.0	38.2	1.0	-42.3	-13.0	-29.3	
2.5390	-13.2	V	3.0	38.9	1.0	-51.0	-13.0	-38.0	
3.3860	-13.7	V	3.0	39.5	1.0	-52.1	-13.0	-39.1	
1.6932	-15.6	H	3.0	38.2	1.0	-52.9	-13.0	-39.9	
2.5390	-13.9	H	3.0	38.9	1.0	-51.7	-13.0	-38.7	
3.3860	-12.2	H	3.0	39.5	1.0	-50.7	-13.0	-37.7	

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

WCDMA

Band 5
HSDPA

UL Korea, Ltd Suwon Laboratory
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4788103295
Date: 09-01-17
Test Engineer: Chan Park
Configuration: EUT / AC Adapter / Earphone / X Position
Mode: Tx, HSDPA,850MHz

Chamber	Pre-amplifer	Filter	Limit
Chamber 2	AFS42	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-2.6	V	3.0	38.2	1.0	-39.9	-13.0	-26.9	
2.4790	-15.5	V	3.0	38.8	1.0	-53.3	-13.0	-40.3	
3.3056	-14.4	V	3.0	39.4	1.0	-52.8	-13.0	-39.8	
1.6520	-14.0	H	3.0	38.2	1.0	-51.3	-13.0	-38.3	
2.4790	-12.7	H	3.0	38.8	1.0	-50.5	-13.0	-37.5	
3.3056	-14.7	H	3.0	39.4	1.0	-53.1	-13.0	-40.1	
Mid Ch, 836.6MHz									
1.6732	-2.8	V	3.0	38.2	1.0	-40.0	-13.0	-27.0	
2.5098	-10.9	V	3.0	38.8	1.0	-48.8	-13.0	-35.8	
3.3464	-13.3	V	3.0	39.5	1.0	-51.8	-13.0	-38.8	
1.6732	-15.3	H	3.0	38.2	1.0	-52.5	-13.0	-39.5	
2.5098	-12.4	H	3.0	38.8	1.0	-50.2	-13.0	-37.2	
3.3464	-13.8	H	3.0	39.5	1.0	-52.2	-13.0	-39.2	
High Ch, 846.6MHz									
1.6932	-3.7	V	3.0	38.2	1.0	-40.9	-13.0	-27.9	
2.5390	-13.0	V	3.0	38.9	1.0	-50.9	-13.0	-37.9	
3.3860	-9.8	V	3.0	39.5	1.0	-48.3	-13.0	-35.3	
1.6932	-15.8	H	3.0	38.2	1.0	-53.0	-13.0	-40.0	
2.5390	-13.8	H	3.0	38.9	1.0	-51.6	-13.0	-38.6	
3.3860	-12.3	H	3.0	39.5	1.0	-50.8	-13.0	-37.8	

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

WCDMA Band 2

WCDMA

Band 2
REL99

UL Korea, Ltd Suwon Laboratory
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4788103295
Date: 09-01-17
Test Engineer: Chan Park
Configuration: EUT / AC Adapter / Earphone / Z Position
Mode: Tx, REL99,1900MHz

Chamber	Pre-amplifer	Filter	Limit
Chamber 2	AFS42	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3.7048	-10.8	V	3.0	39.7	1.0	-49.5	-13.0	-36.5	
5.5572	-11.1	V	3.0	39.9	1.0	-50.0	-13.0	-37.0	
7.4096	-9.6	V	3.0	39.4	1.0	-48.0	-13.0	-35.0	
3.7048	-11.3	H	3.0	39.7	1.0	-50.0	-13.0	-37.0	
5.5572	-12.3	H	3.0	39.9	1.0	-51.2	-13.0	-38.2	
7.4096	-10.0	H	3.0	39.4	1.0	-48.4	-13.0	-35.4	
Mid Ch, 1880MHz									
3.7600	-3.6	V	3.0	39.7	1.0	-42.2	-13.0	-29.2	
5.6400	-8.9	V	3.0	40.0	1.0	-47.8	-13.0	-34.8	
7.5200	-9.7	V	3.0	39.4	1.0	-48.0	-13.0	-35.0	
3.7600	-6.2	H	3.0	39.7	1.0	-44.9	-13.0	-31.9	
5.6400	-10.9	H	3.0	40.0	1.0	-49.9	-13.0	-36.9	
7.5200	-9.7	H	3.0	39.4	1.0	-48.1	-13.0	-35.1	
High Ch, 1907.6MHz									
3.8152	-3.0	V	3.0	39.7	1.0	-41.7	-13.0	-28.7	
5.7228	-10.3	V	3.0	40.0	1.0	-49.3	-13.0	-36.3	
7.6304	-7.7	V	3.0	39.3	1.0	-46.0	-13.0	-33.0	
3.8152	-5.7	H	3.0	39.7	1.0	-44.4	-13.0	-31.4	
5.7228	-11.3	H	3.0	40.0	1.0	-50.3	-13.0	-37.3	
7.6304	-9.1	H	3.0	39.3	1.0	-47.4	-13.0	-34.4	

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

WCDMA

Band 2
HSDPA

UL Korea, Ltd Suwon Laboratory
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4788103295
Date: 09-01-17
Test Engineer: Chan Park
Configuration: EUT / AC Adapter / Earphone / Z Position
Mode: Tx, HSDPA,1900MHz

Chamber	Pre-amplifer	Filter	Limit
Chamber 2	AFS42	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3.7048	-10.6	V	3.0	39.7	1.0	-49.2	-13.0	-36.2	
5.5572	-11.3	V	3.0	39.9	1.0	-50.3	-13.0	-37.3	
7.4096	-9.3	V	3.0	39.4	1.0	-47.7	-13.0	-34.7	
3.7048	-11.4	H	3.0	39.7	1.0	-50.0	-13.0	-37.0	
5.5572	-12.4	H	3.0	39.9	1.0	-51.4	-13.0	-38.4	
7.4096	-9.9	H	3.0	39.4	1.0	-48.4	-13.0	-35.4	
Mid Ch, 1880MHz									
3.7600	-3.3	V	3.0	39.7	1.0	-42.0	-13.0	-29.0	
5.6400	-9.6	V	3.0	40.0	1.0	-48.5	-13.0	-35.5	
7.5200	-9.0	V	3.0	39.4	1.0	-47.4	-13.0	-34.4	
3.7600	-6.2	H	3.0	39.7	1.0	-44.9	-13.0	-31.9	
5.6400	-11.2	H	3.0	40.0	1.0	-50.2	-13.0	-37.2	
7.5200	-10.0	H	3.0	39.4	1.0	-48.4	-13.0	-35.4	
High Ch, 1907.6MHz									
3.8152	-3.2	V	3.0	39.7	1.0	-41.9	-13.0	-28.9	
5.7228	-10.2	V	3.0	40.0	1.0	-49.2	-13.0	-36.2	
7.6304	-7.4	V	3.0	39.3	1.0	-45.7	-13.0	-32.7	
3.8152	-6.0	H	3.0	39.7	1.0	-44.7	-13.0	-31.7	
5.7228	-11.4	H	3.0	40.0	1.0	-50.4	-13.0	-37.4	
7.6304	-8.6	H	3.0	39.3	1.0	-46.9	-13.0	-33.9	

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

LTE Band 5

LTE
Band 5
10MHz
QPSK

UL Korea, Ltd Suwon Laboratory
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4788103295
Date: 08-22-17
Test Engineer: Chan Park
Configuration: EUT / AC Adapter / Earphone, X Position
Mode: TX, LTE BAND 5, 10MHz BW,QPSK

Chamber	Pre-amplifer	Filter	Limit
Chamber 2	AFS42	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (829MHz)									
1.6580	-16.5	V	3.0	38.2	1.0	-53.7	-13.0	-40.7	
2.4870	-5.7	V	3.0	38.8	1.0	-43.6	-13.0	-30.6	
3.3160	-10.8	V	3.0	39.4	1.0	-49.3	-13.0	-36.3	
4.1450	-11.9	V	3.0	39.8	1.0	-50.7	-13.0	-37.7	
1.6580	-15.5	H	3.0	38.2	1.0	-52.7	-13.0	-39.7	
2.4870	-5.9	H	3.0	38.8	1.0	-43.7	-13.0	-30.7	
3.3160	-9.2	H	3.0	39.4	1.0	-47.7	-13.0	-34.7	
4.1450	-10.9	H	3.0	39.8	1.0	-49.7	-13.0	-36.7	
Mid Channel (836.5MHz)									
1.6730	-14.0	V	3.0	38.2	1.0	-51.2	-13.0	-38.2	
2.5090	-1.6	V	3.0	38.8	1.0	-39.5	-13.0	-26.5	
3.3460	-10.5	V	3.0	39.5	1.0	-49.0	-13.0	-36.0	
4.1825	-9.2	V	3.0	39.8	1.0	-48.0	-13.0	-35.0	
1.6730	-13.9	H	3.0	38.2	1.0	-51.1	-13.0	-38.1	
2.5090	-4.6	H	3.0	38.8	1.0	-42.5	-13.0	-29.5	
3.3460	-7.4	H	3.0	39.5	1.0	-45.9	-13.0	-32.9	
4.1825	-9.5	H	3.0	39.8	1.0	-48.3	-13.0	-35.3	
High Channel (844MHz)									
1.6880	-13.9	V	3.0	38.2	1.0	-51.1	-13.0	-38.1	
2.5320	-7.8	V	3.0	38.9	1.0	-45.7	-13.0	-32.7	
3.3760	-10.1	V	3.0	39.5	1.0	-48.5	-13.0	-35.5	
4.2200	-9.5	V	4.0	39.8	2.0	-44.8	-13.0	-31.8	
1.6880	-12.4	H	3.0	38.2	1.0	-49.7	-13.0	-36.7	
2.5320	-7.4	H	3.0	38.9	1.0	-45.2	-13.0	-32.2	
3.3760	-7.4	H	3.0	39.5	1.0	-45.9	-13.0	-32.9	
4.2200	-10.7	H	3.0	39.8	1.0	-49.5	-13.0	-36.5	

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

LTE

Band 5

10MHz

16QAM

UL Korea, Ltd Suwon Laboratory

Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4788103295
Date: 08-22-17
Test Engineer: Chan Park
Configuration: EUT / AC Adapter / Earphone, X Position
Mode: TX, LTE BAND 5, 10MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
Chamber 2	AFS42	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (829MHz)									
1.6580	-16.7	V	3.0	38.2	1.0	-53.9	-13.0	-40.9	
2.4870	-6.2	V	3.0	38.8	1.0	-44.0	-13.0	-31.0	
3.3160	-11.1	V	3.0	39.4	1.0	-49.6	-13.0	-36.6	
4.1450	-11.8	V	3.0	39.8	1.0	-50.7	-13.0	-37.7	
1.6580	-15.5	H	3.0	38.2	1.0	-52.7	-13.0	-39.7	
2.4870	-6.6	H	3.0	38.8	1.0	-44.5	-13.0	-31.5	
3.3160	-9.6	H	3.0	39.4	1.0	-48.0	-13.0	-35.0	
4.1450	-10.9	H	3.0	39.8	1.0	-49.7	-13.0	-36.7	
Mid Channel (836.5MHz)									
1.6730	-13.9	V	3.0	38.2	1.0	-51.2	-13.0	-38.2	
2.5090	-2.0	V	3.0	38.8	1.0	-39.8	-13.0	-26.8	
3.3460	-10.9	V	3.0	39.5	1.0	-49.3	-13.0	-36.3	
4.1825	-9.3	V	3.0	39.8	1.0	-48.1	-13.0	-35.1	
1.6730	-13.8	H	3.0	38.2	1.0	-51.1	-13.0	-38.1	
2.5090	-5.3	H	3.0	38.8	1.0	-43.1	-13.0	-30.1	
3.3460	-7.6	H	3.0	39.5	1.0	-46.0	-13.0	-33.0	
4.1825	-9.6	H	3.0	39.8	1.0	-48.4	-13.0	-35.4	
High Channel (844MHz)									
1.6880	-13.9	V	3.0	38.2	1.0	-51.2	-13.0	-38.2	
2.5320	-8.3	V	3.0	38.9	1.0	-46.2	-13.0	-33.2	
3.3760	-10.4	V	3.0	39.5	1.0	-48.8	-13.0	-35.8	
4.2200	-9.5	V	4.0	39.8	2.0	-44.9	-13.0	-31.9	
1.6880	-12.4	H	3.0	38.2	1.0	-49.7	-13.0	-36.7	
2.5320	-7.8	H	3.0	38.9	1.0	-45.7	-13.0	-32.7	
3.3760	-7.5	H	3.0	39.5	1.0	-46.0	-13.0	-33.0	
4.2200	-10.8	H	3.0	39.8	1.0	-49.6	-13.0	-36.6	

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