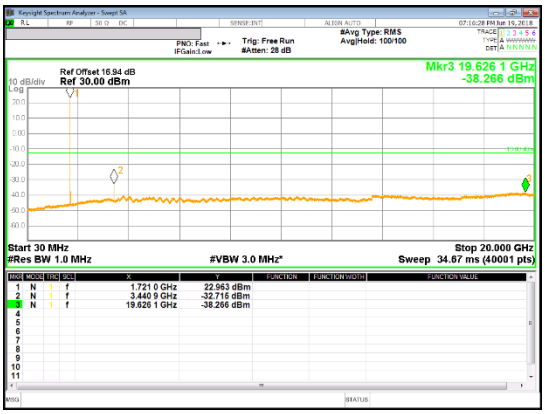
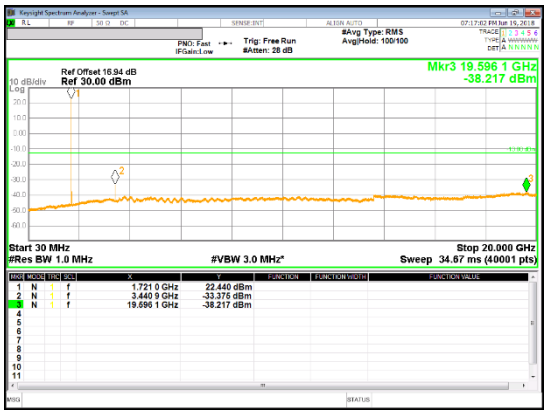
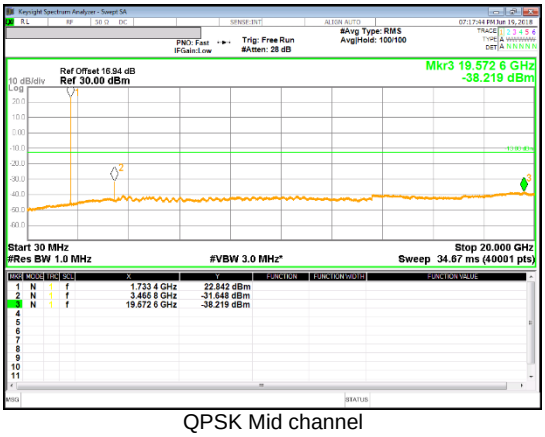
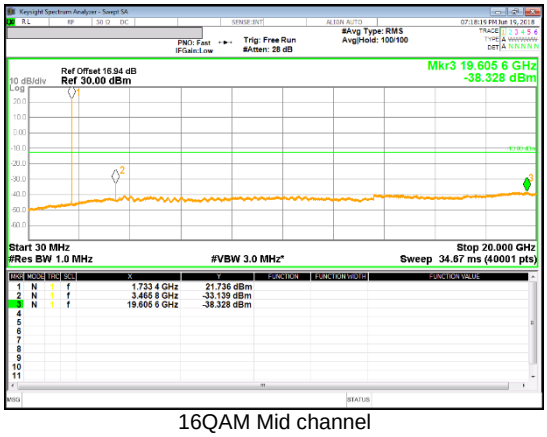
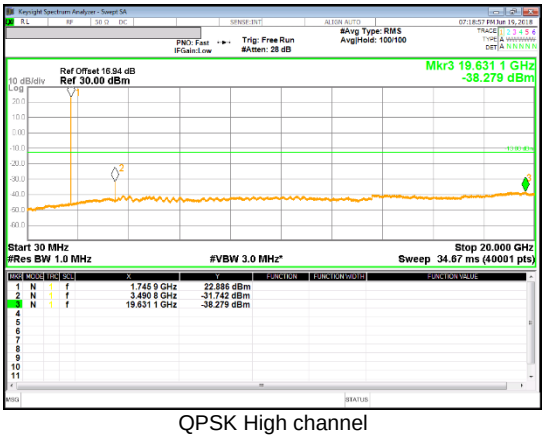
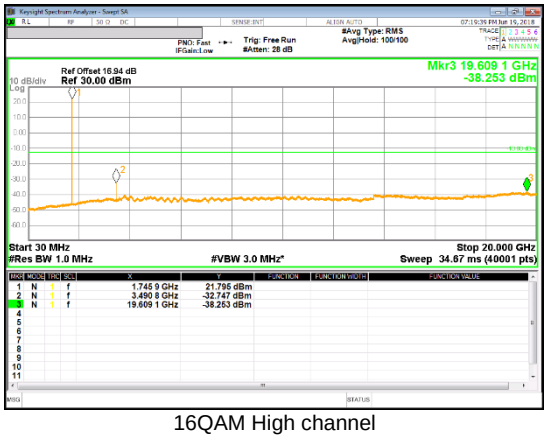
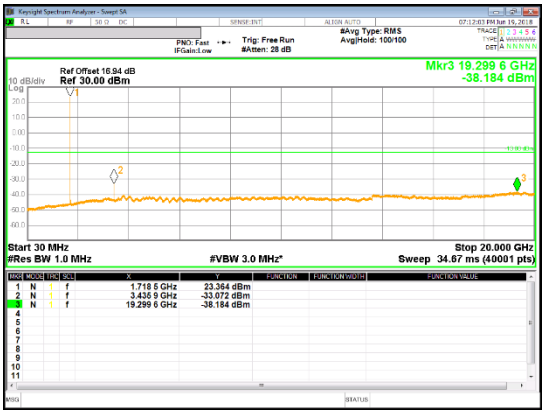
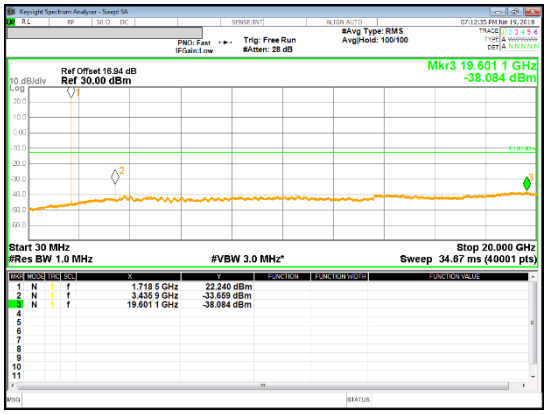
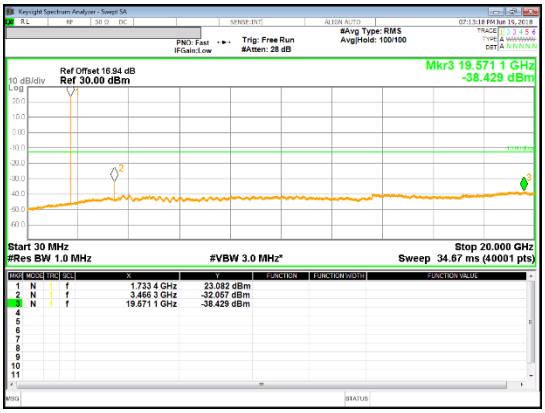
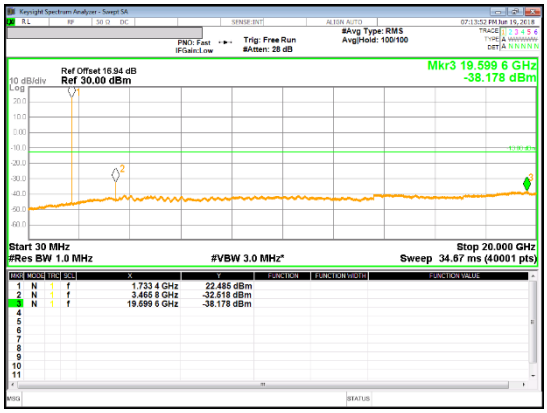
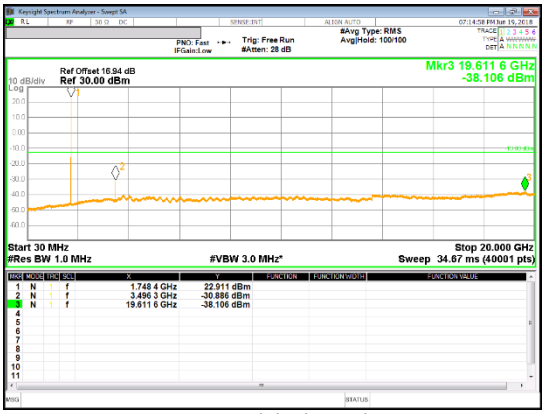
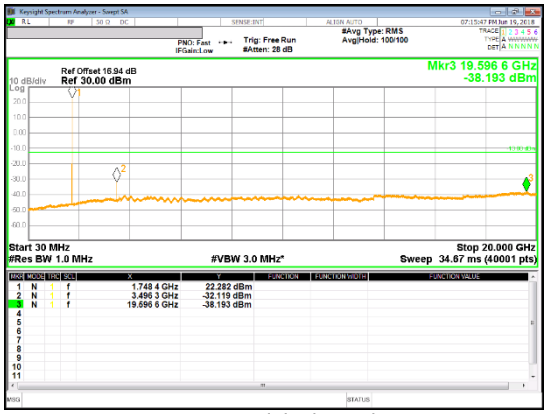
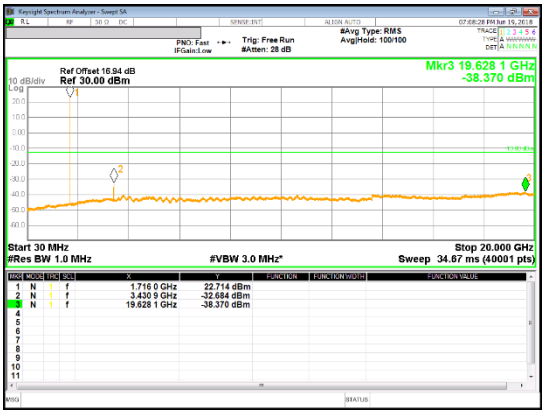
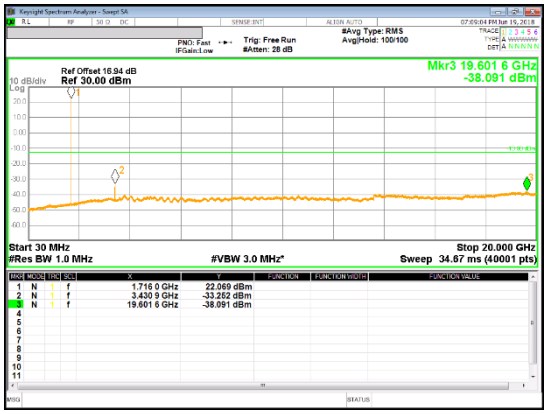
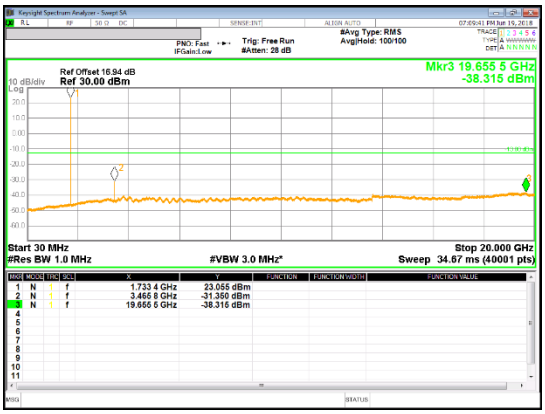
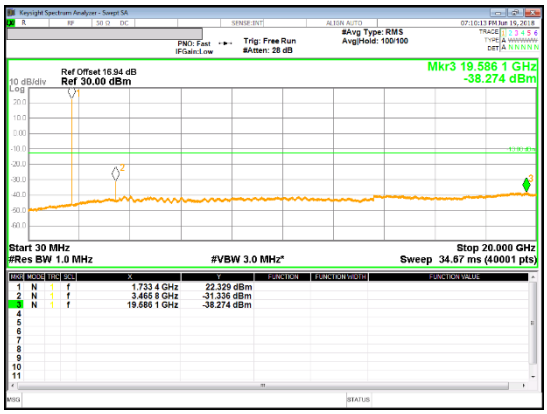
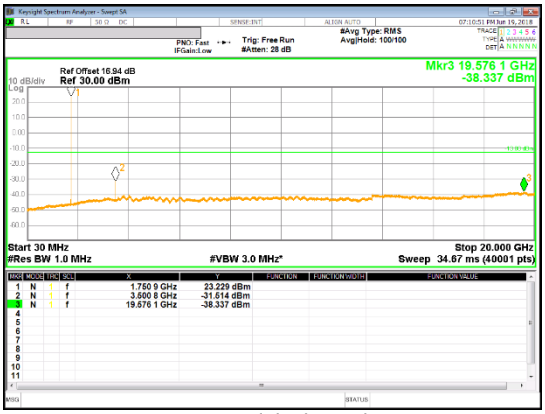
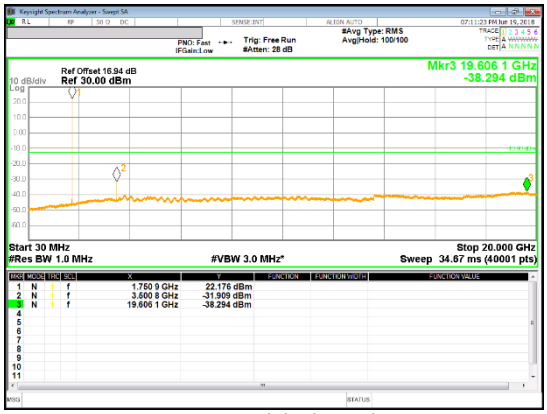
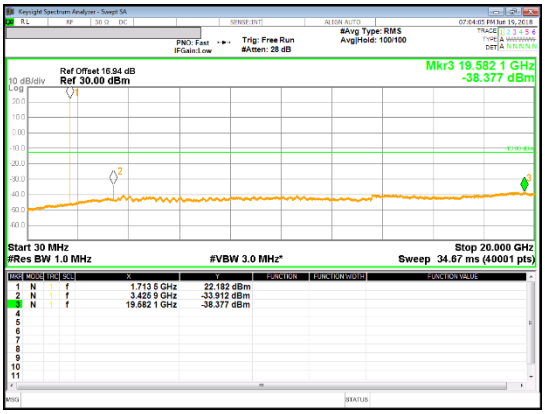
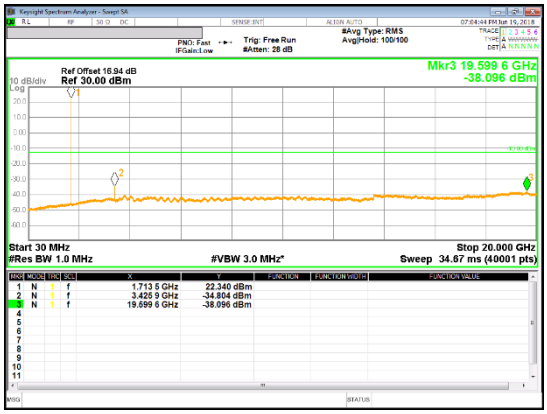
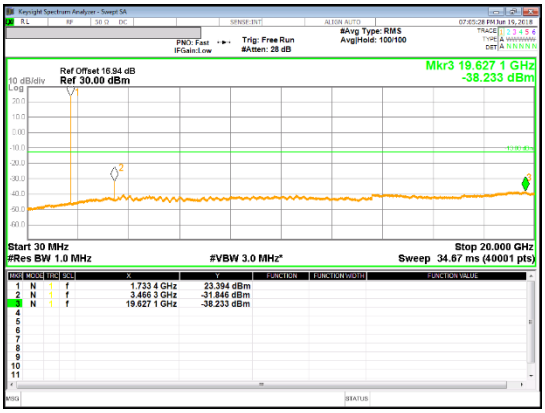
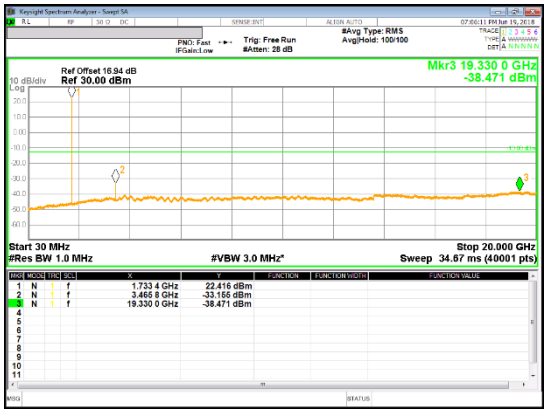
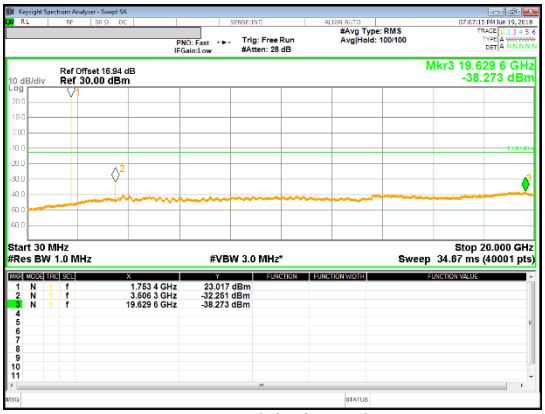
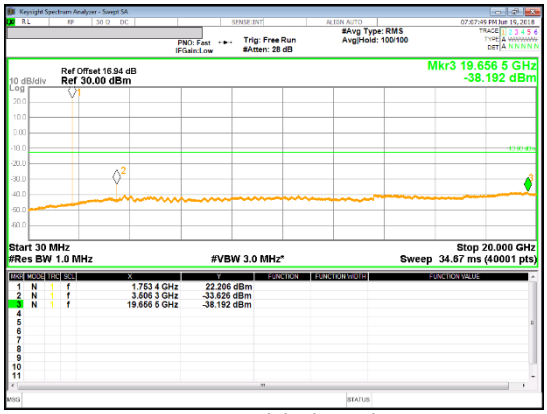
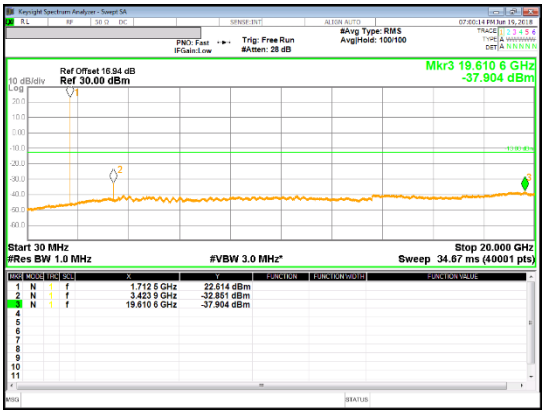
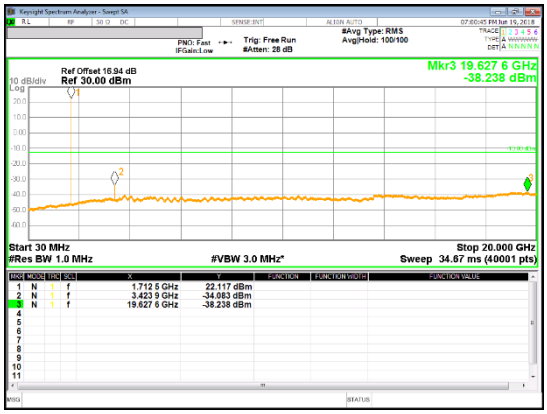
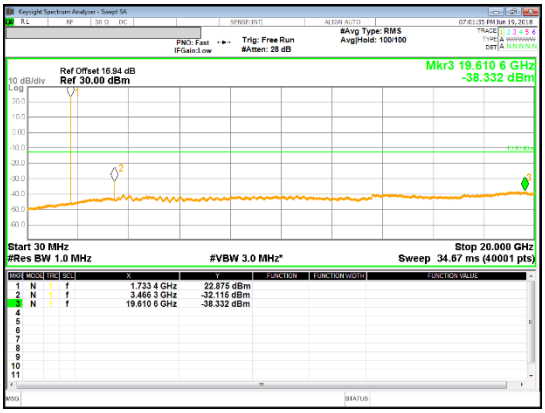
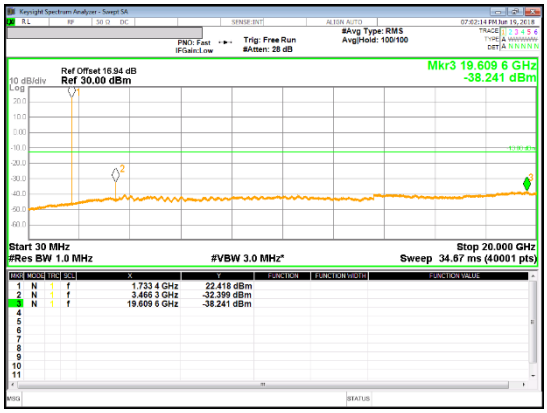
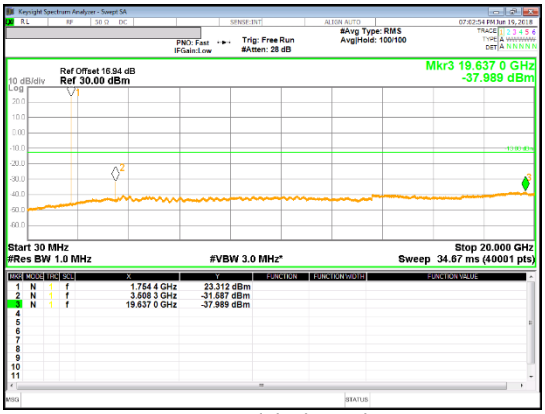
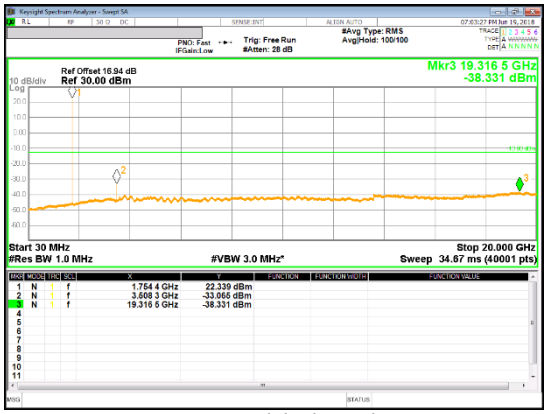
LTE Band 4

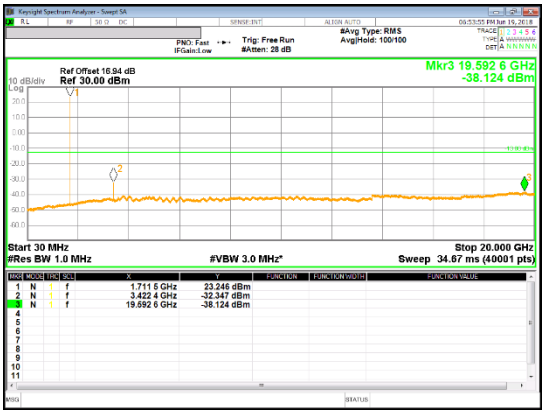
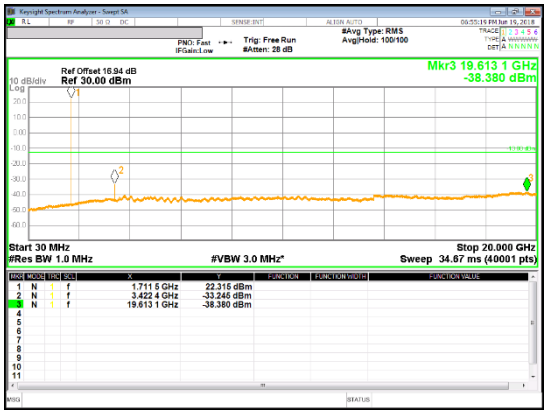
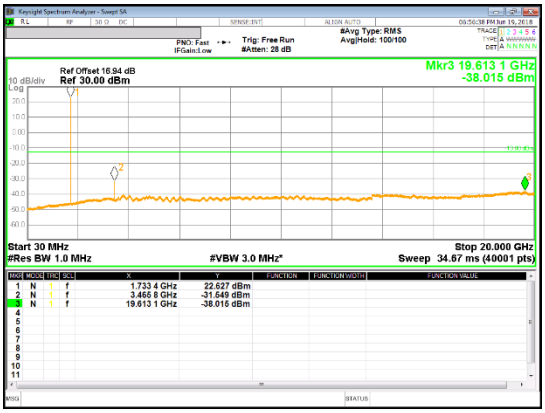
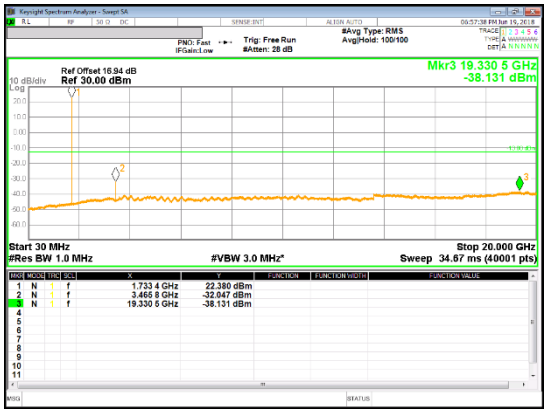
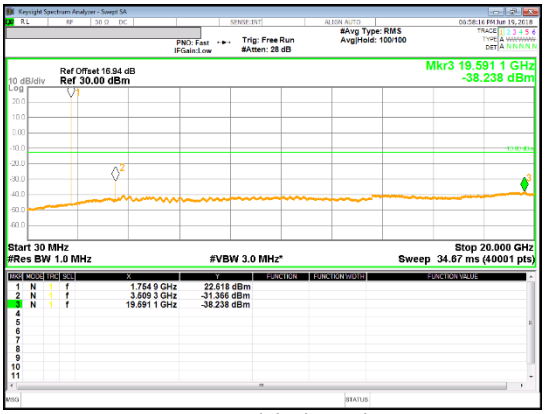
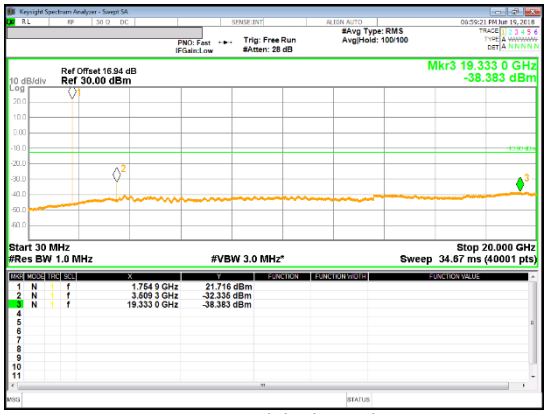
Band 4 20MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

	 QPSK Low channel	 16QAM Low channel
Band 4 15MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

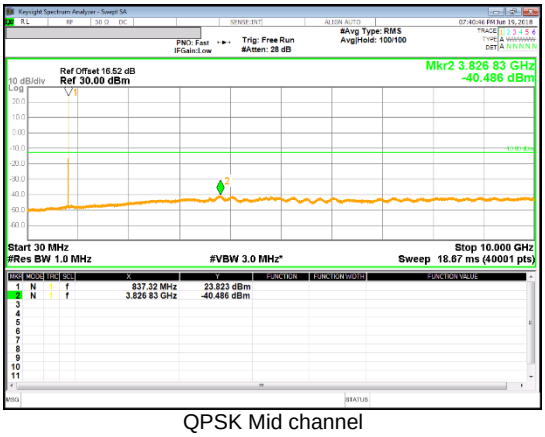
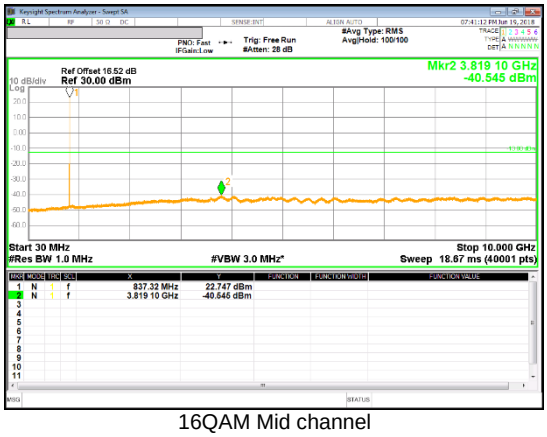
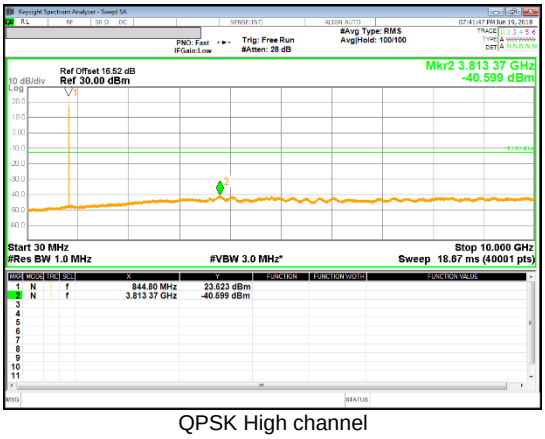
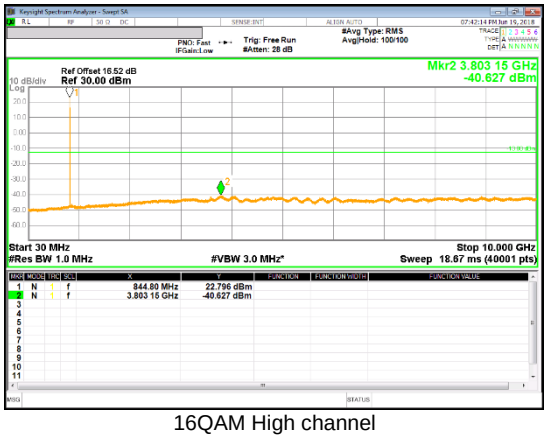
	 QPSK Low channel	 16QAM Low channel
Band 4 10MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

Band 4 5MHz	 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 4 3MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

Band 4 1.4MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM 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

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

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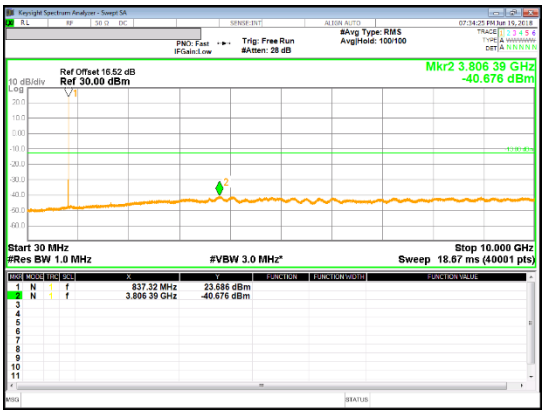
Band 5 3MHz	 QPSK Low channel	 16QAM Low channel
	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

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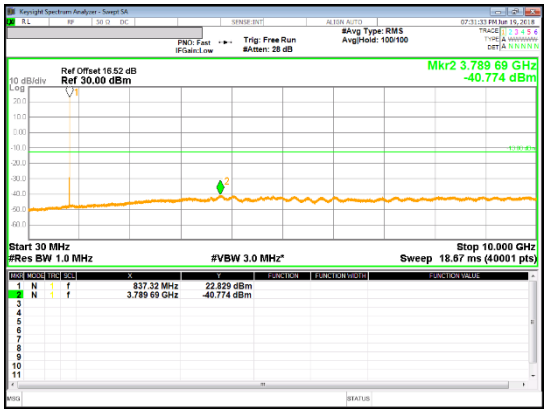
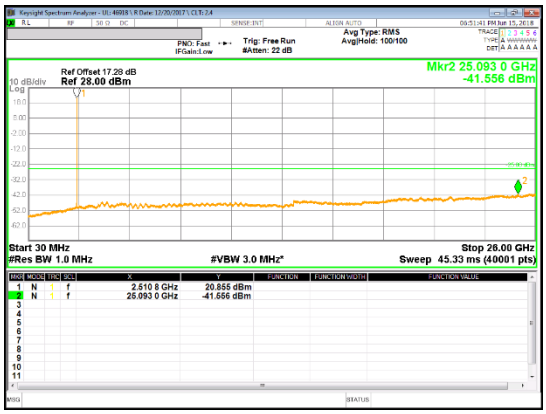
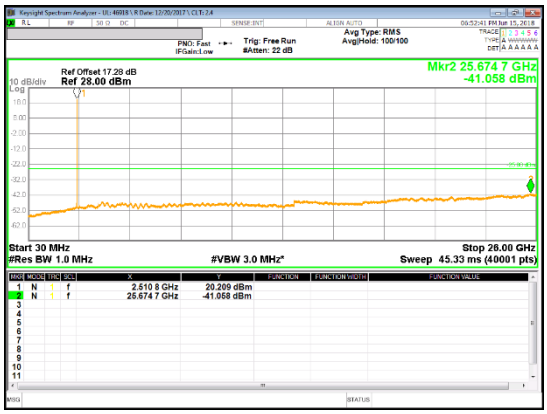
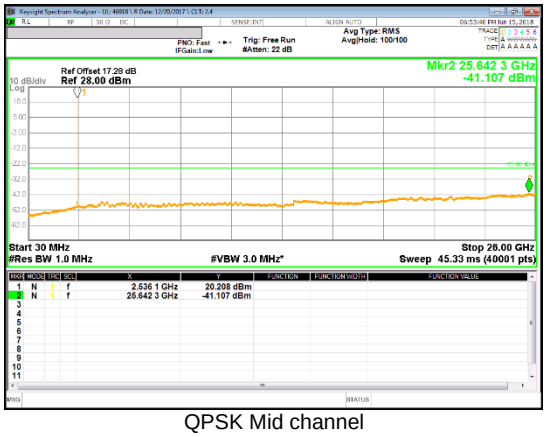
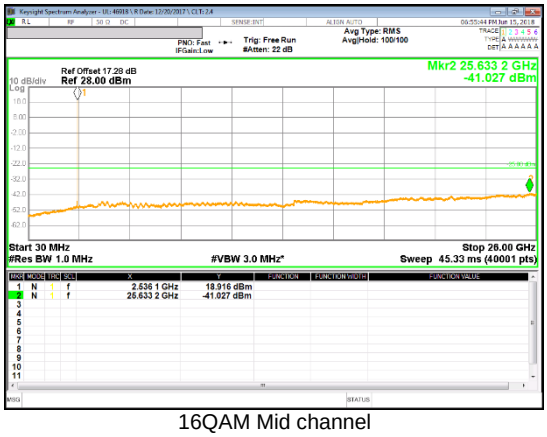
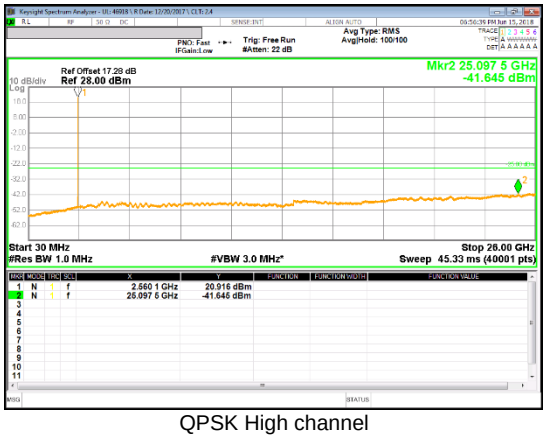
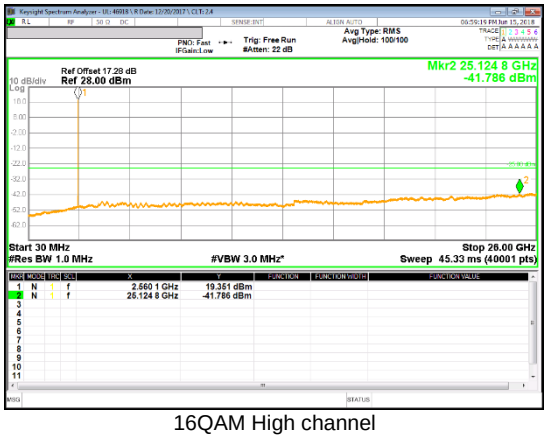
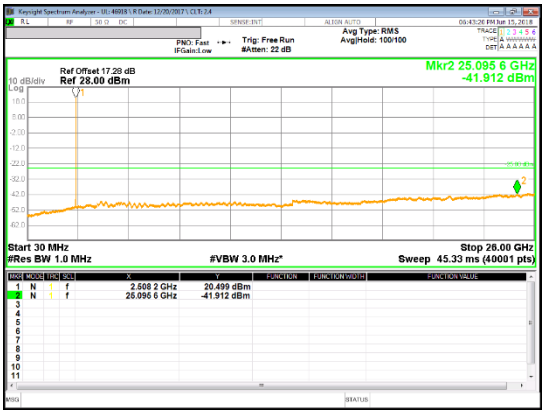
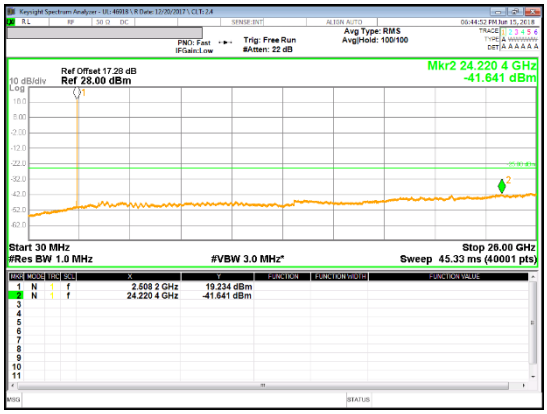
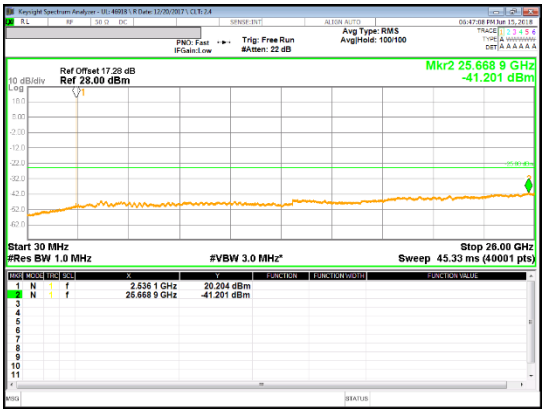
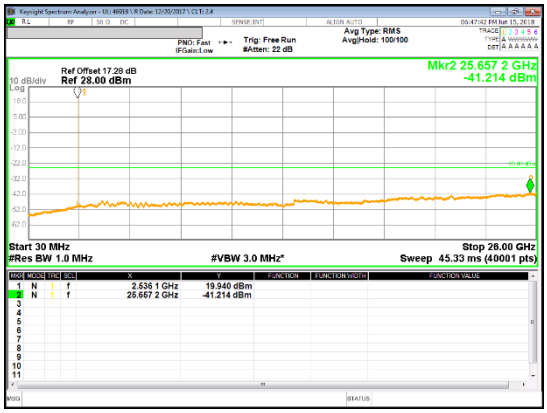
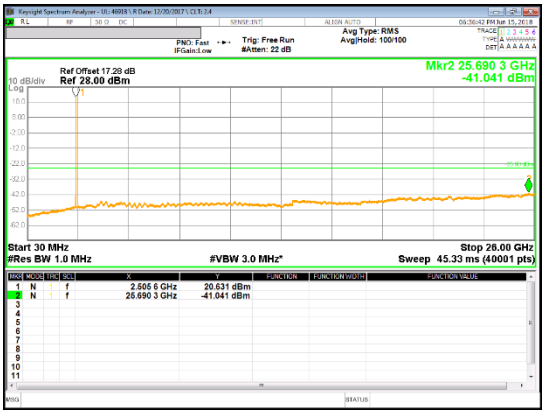
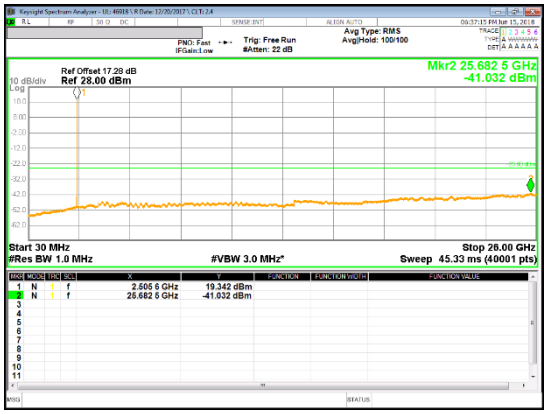
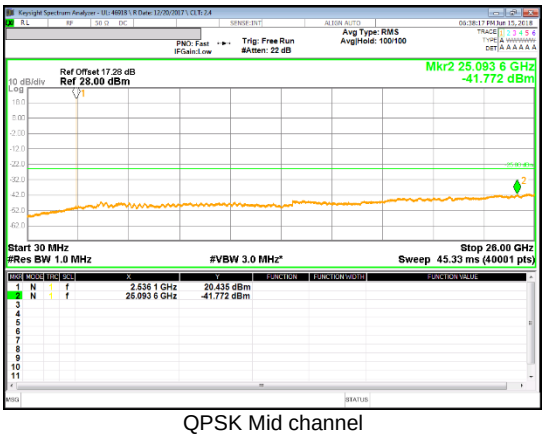
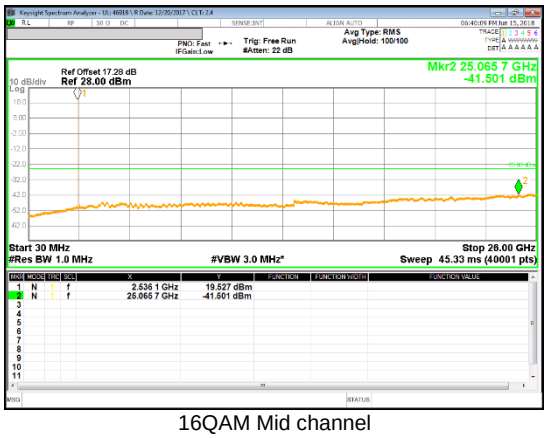
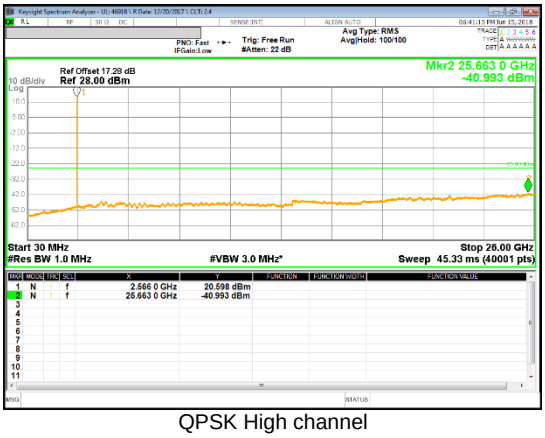
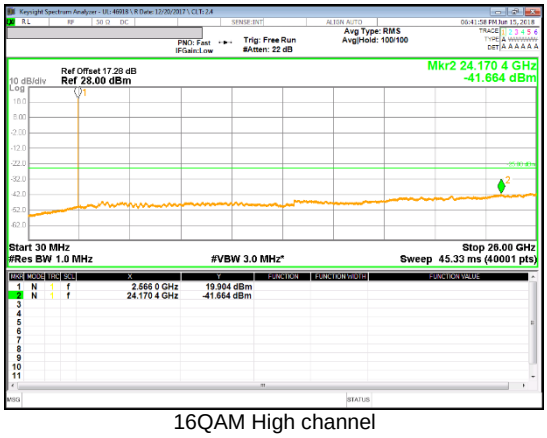
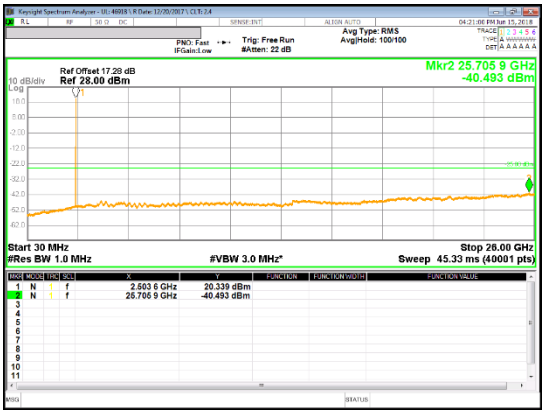
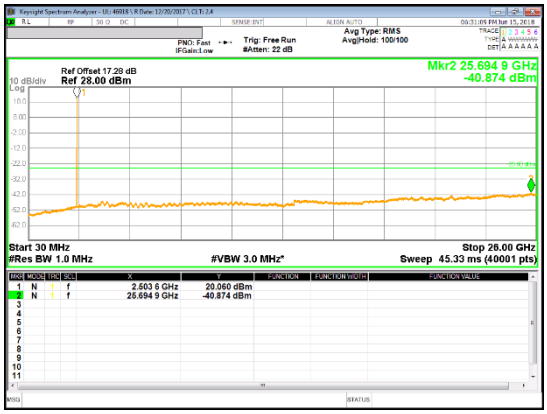
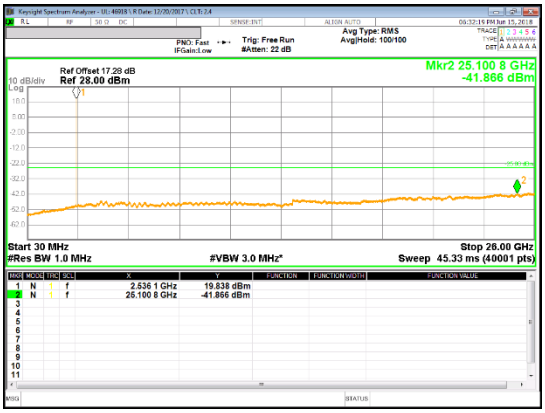
	 QPSK Low channel	 16QAM Low channel
Band 5 1.4MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

LTE Band 7

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

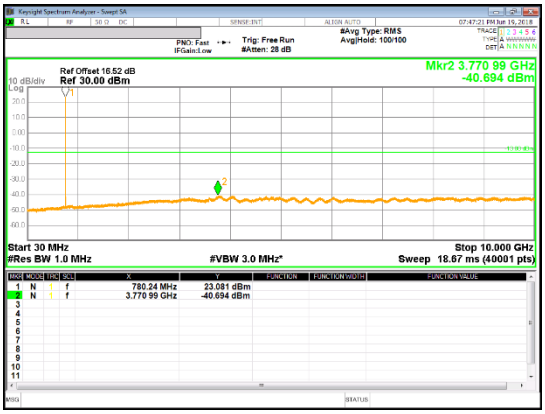
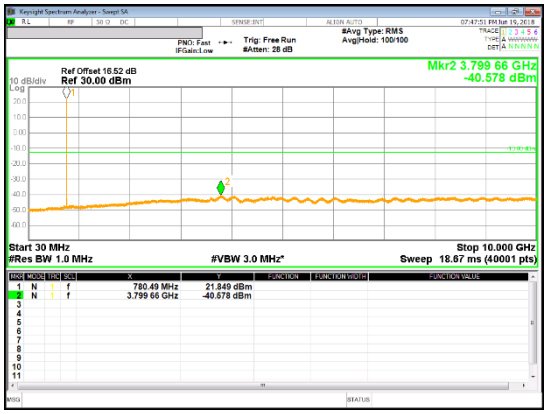
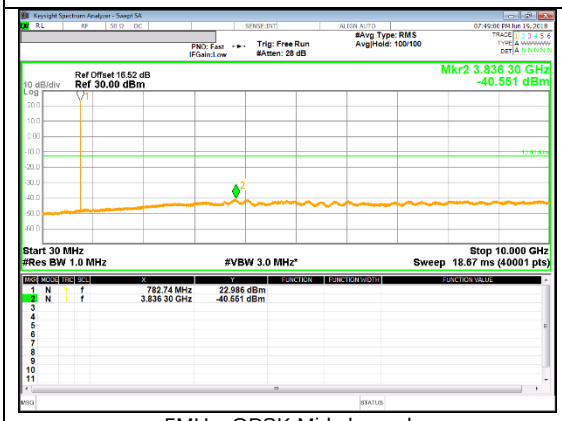
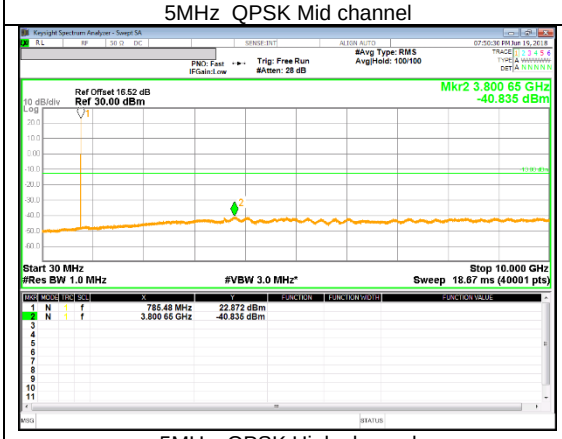
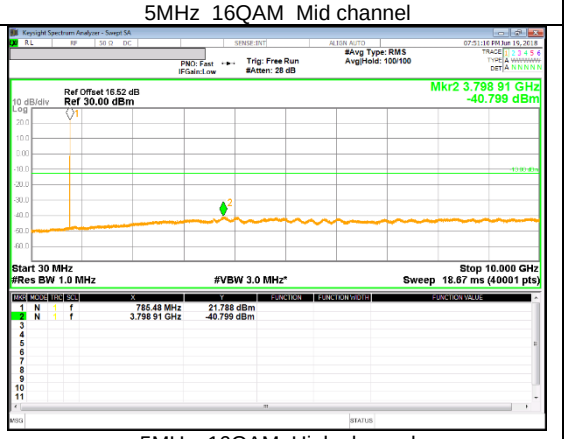
	 QPSK Low channel	 16QAM Low channel
Band 7 15MHz	 QPSK Mid channel	 16QAM Mid channel
	 QPSK High channel	 16QAM High channel

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

	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
Band 13 5MHz	 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 v03r01

RESULTS

See the following pages.

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9.4.1. FREQUENCY STABILITY RESULTS

WCDMA Band 5 (Rel 99)

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.80	50	826.39999013	-0.006	846.59998963	0.002	2.5
3.80	40	826.39998925	-0.005	846.59998784	0.004	2.5
3.80	30	826.39998537	0.000	846.59998495	0.007	2.5
3.80	***20***	***826.39998524***	***0.000***	***846.59999094***	***0.000***	***2.5***
3.80	10	826.39998115	0.005	846.59998490	0.007	2.5
3.80	0	826.39999093	-0.007	846.59998599	0.006	2.5
3.80	-10	826.39998136	0.005	846.59998773	0.004	2.5
3.80	-20	826.39998507	0.000	846.59998240	0.010	2.5
3.80	-30	826.39998251	0.003	846.59999029	0.001	2.5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000	Hz	High Channel	2116.500	Hz

Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.80	***20***	***826.39998524***	***0***	***846.59999094***	***0***	***2.5***
4.30	20	826.39999029	-0.006	846.59998914	0.002	2.5
3.40	20	826.39998195	0.004	846.59998481	0.007	2.5

WCDMA Band 2 (HSDPA)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1852.3979	1907.6021		
Extreme (50C)		1852.3979	1907.6020	-28.7	-0.015
Extreme (40C)		1852.3979	1907.6021	-22.4	-0.012
Extreme (30C)		1852.3979	1907.6020	-29.9	-0.016
Extreme (10C)		1852.3979	1907.6020	-25.1	-0.013
Extreme (0C)		1852.3979	1907.6020	-27.2	-0.014
Extreme (-10C)		1852.3979	1907.6021	-21.9	-0.012
Extreme (-20C)		1852.3979	1907.6021	-22.5	-0.012
Extreme (-30C)		1852.3979	1907.6021	-19.3	-0.010
20C	15%	1852.3979	1907.6020	-26.5	-0.014
	-15%	1852.3979	1907.6020	-29.8	-0.016
	End Point	1852.3979	1907.6020	-23.8	-0.013

LTE Band 2 (Lowest Frequency: QPSK / Highest Frequency: 16QAM)

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.6995	1909.3005		
Extreme (50C)		1850.6994	1909.3005	-24.3	-0.013
Extreme (40C)		1850.6994	1909.3005	-28.5	-0.015
Extreme (30C)		1850.6994	1909.3005	-19.2	-0.010
Extreme (10C)		1850.6994	1909.3005	-22.0	-0.012
Extreme (0C)		1850.6994	1909.3005	-22.4	-0.012
Extreme (-10C)		1850.6994	1909.3005	-28.3	-0.015
Extreme (-20C)		1850.6994	1909.3005	-27.1	-0.014
Extreme (-30C)		1850.6994	1909.3005	-28.0	-0.015
20C	15%	1850.6994	1909.3005	-20.7	-0.011
	-15%	1850.6994	1909.3005	-28.8	-0.015
	End Point	1850.6994	1909.3005	-22.7	-0.012

LTE Band 4 (Lowest Frequency: 16QAM / Highest Frequency: QPSK)

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1852.3995	1907.6005		
Extreme (50C)		1852.3994	1907.6005	-20.5	-0.012
Extreme (40C)		1852.3994	1907.6005	-24.1	-0.014
Extreme (30C)		1852.3994	1907.6005	-22.8	-0.013
Extreme (10C)		1852.3994	1907.6005	-19.8	-0.011
Extreme (0C)		1852.3994	1907.6005	-16.3	-0.009
Extreme (-10C)		1852.3994	1907.6005	-19.6	-0.011
Extreme (-20C)		1852.3994	1907.6005	-22.7	-0.013
Extreme (-30C)		1852.3994	1907.6005	-21.8	-0.013
20C	15%	1852.3994	1907.6005	-24.6	-0.014
	-15%	1852.3994	1907.6005	-23.6	-0.014
	End Point	1852.3994	1907.6005	-18.4	-0.011

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LTE Band 5 (QPSK)

Reference Frequency : LTE Band 5 Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2061.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.80	50	824.69998846	-0.002	848.29998743	0.002	2.5
3.80	40	824.69999208	-0.006	848.29999382	-0.006	2.5
3.80	30	824.69998860	-0.002	848.29999243	-0.004	2.5
3.80	***20***	***824.69998718***	***0.000***	***848.29998876***	***0.000***	***2.5***
3.80	10	824.69998607	0.001	848.29999154	-0.003	2.5
3.80	0	824.69998590	0.002	848.29998302	0.007	2.5
3.80	-10	824.69999117	-0.005	848.29999046	-0.002	2.5
3.80	-20	824.69998633	0.001	848.29999399	-0.006	2.5
3.80	-30	824.69998938	-0.003	848.29998950	-0.001	2.5

Reference Frequency : LTE Band 5 Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2061.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [*C]	Frequency Deviation Measureed with Time Elapse				
		Low Channel		High Channel		Limit [ppm]
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.80	***20***	**824.69998718**	***0***	**848.29998876**	***0***	***2.5***
4.30	20	824.69998446	0.003	848.29998947	-0.001	2.5
3.40	20	824.69999278	-0.007	848.29998742	0.002	2.5

LTE Band 7 (QPSK)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2502.4978	2567.5023		
Extreme (50C)		2502.4977	2567.5022	-27.4	-0.011
Extreme (40C)		2502.4977	2567.5022	-34.7	-0.014
Extreme (30C)		2502.4977	2567.5022	-29.3	-0.012
Extreme (10C)		2502.4977	2567.5022	-33.6	-0.013
Extreme (0C)		2502.4977	2567.5022	-25.6	-0.010
Extreme (-10C)		2502.4977	2567.5022	-30.0	-0.012
Extreme (-20C)		2502.4977	2567.5022	-24.7	-0.010
Extreme (-30C)		2502.4977	2567.5022	-25.9	-0.010
20C	15%	2502.4977	2567.5022	-30.3	-0.012
	-15%	2502.4977	2567.5022	-33.0	-0.013
	End Point	2502.4977	2567.5022	-32.0	-0.013

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LTE Band 13 (QPSK)

Limit		777	787	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	779.4978	784.5022		
Extreme (50C)		779.4977	784.5022	-14.0	-0.018
Extreme (40C)		779.4977	784.5022	-14.9	-0.019
Extreme (30C)		779.4977	784.5022	-12.5	-0.016
Extreme (10C)		779.4977	784.5022	-14.7	-0.019
Extreme (0C)		779.4977	784.5022	-5.9	-0.008
Extreme (-10C)		779.4977	784.5022	-6.8	-0.009
Extreme (-20C)		779.4977	784.5022	-8.0	-0.010
Extreme (-30C)		779.4977	784.5022	-5.8	-0.007
20C	15%	779.4977	784.5022	-8.7	-0.011
	-15%	779.4977	784.5022	-8.9	-0.011
	End Point	779.4977	784.5022	-12.5	-0.016

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(c) (10) - Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band 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.(Band 4)

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 v03r01

For radiated output 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 = rms; f) Ensure that the number of measurement points ≥ span/RBW; g) Trace mode = max hold(WCDMA), average(LTE);

TEST RESULTS

10.1.1. ERP/EIRP Results

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	**23.00**	**199.53**
		4183	836.6	22.58	181.13
		4233	846.6	22.21	166.34
	HSDPA	4132	826.4	**22.02**	**159.22**
		4183	836.6	21.43	139.00
		4233	846.6	20.96	124.74
Band 2	REL99	9262	1852.4	**24.38**	**274.16**
		9400	1880.0	23.82	240.99
		9538	1907.6	22.46	176.20
	HSDPA	9262	1852.4	**23.65**	**231.74**
		9400	1880.0	23.26	211.84
		9538	1907.6	21.09	128.53

LTE Band 2

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 2	20	QPSK	1/49	1860.0	22.68	185.35
			1/99	1880.0	22.33	171.00
			1/0	1900.0	22.41	174.18
		16QAM	1/49	1860.0	21.69	147.57
			1/99	1880.0	21.67	146.89
			1/0	1900.0	21.20	131.83
	15	QPSK	1/37	1857.5	**22.83**	**191.87**
			1/74	1880.0	22.37	172.58
			1/0	1902.5	21.55	142.89
		16QAM	1/37	1857.5	**21.96**	**157.04**
			1/74	1880.0	21.10	128.82
			1/37	1902.5	20.53	112.98
	10	QPSK	1/49	1855.0	22.55	179.89
			1/25	1880.0	22.46	176.20
			1/0	1905.0	20.85	121.62
		16QAM	1/49	1855.0	21.46	139.96
			1/25	1880.0	21.01	126.18
			1/25	1905.0	20.68	116.95
	5	QPSK	1/24	1852.5	22.37	172.58
			1/24	1880.0	22.06	160.69
			1/0	1907.5	21.36	136.77
		16QAM	1/24	1852.5	21.48	140.60
			1/24	1880.0	20.70	117.49
			1/0	1907.5	20.50	112.20
	3	QPSK	1/8	1851.5	21.89	154.53
			1/14	1880.0	21.88	154.17
			1/14	1908.5	21.38	137.40
		16QAM	1/14	1851.5	21.34	136.14
			1/14	1880.0	20.42	110.15
			1/0	1908.5	20.19	104.47
	1.4	QPSK	1/0	1850.7	21.60	144.54
			1/3	1880.0	22.09	161.81
			1/3	1909.3	21.41	138.36
		16QAM	1/3	1850.7	20.79	119.95
			1/3	1880.0	21.23	132.74
			1/3	1909.3	20.43	110.41

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LTE Band 4

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 4	20	QPSK	1/49	1720.0	24.35	272.27
			1/49	1732.5	24.88	307.61
			1/99	1745.0	24.75	298.54
		16QAM	1/99	1720.0	24.12	258.23
			1/99	1732.5	24.05	254.10
			1/49	1745.0	**24.24**	**265.46**
	15	QPSK	1/74	1717.5	24.52	283.14
			1/37	1732.5	24.62	289.73
			1/74	1747.5	25.03	318.42
		16QAM	1/74	1717.5	23.27	212.32
			1/37	1732.5	23.26	211.84
			1/74	1747.5	23.58	228.03
	10	QPSK	1/49	1715.0	24.29	268.53
			1/25	1732.5	23.78	238.78
			1/49	1750.0	23.70	234.42
		16QAM	1/0	1715.0	23.03	200.91
			1/49	1732.5	22.57	180.72
			1/49	1750.0	22.69	185.78
	5	QPSK	1/12	1712.5	21.99	158.12
			1/12	1732.5	24.14	259.42
			1/24	1752.5	24.80	302.00
		16QAM	1/0	1712.5	20.73	118.30
			1/12	1732.5	22.49	177.42
			1/24	1752.5	23.72	235.50
	3	QPSK	1/8	1711.5	24.14	259.42
			1/0	1732.5	23.37	217.27
			1/14	1753.5	23.57	227.51
		16QAM	1/8	1711.5	23.75	237.14
			1/0	1732.5	21.86	153.46
			1/14	1753.5	22.53	179.06
	1.4	QPSK	1/5	1710.7	25.26	335.74
			1/3	1732.5	24.89	308.32
			1/3	1754.3	**25.91**	**389.94**
		16QAM	1/3	1710.7	24.16	260.62
			1/0	1732.5	23.74	236.59
			1/3	1754.3	24.16	260.62

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LTE Band 5

Band	BW [MHz]	Mode	RB Size/ RB Offset	f [MHz]	ERP / EIRP [dBm]	ERP / EIRP [mW]
Band 5	10	QPSK	1/25	829.0	23.14	206.06
			1/25	836.5	23.02	200.45
			1/0	844.0	23.16	207.01
		16QAM	1/0	829.0	22.37	172.58
			1/0	836.5	21.57	143.55
			1/49	844.0	21.60	144.54
	5	QPSK	1/12	826.5	22.66	184.50
			1/12	836.5	23.84	242.10
			1/12	846.5	22.87	193.64
		16QAM	1/12	826.5	21.13	129.72
			1/0	836.5	22.41	174.18
			1/12	846.5	21.51	141.58
	3	QPSK	1/0	825.5	23.51	224.39
			1/0	836.5	23.79	239.33
			1/8	847.5	23.08	203.24
		16QAM	1/0	825.5	22.37	172.58
			1/0	836.5	22.54	179.47
			1/8	847.5	22.14	163.68
	1.4	QPSK	3/1	824.7	23.55	226.46
			3/3	836.5	**24.12**	**258.23**
			3/0	848.3	22.65	184.08
		16QAM	1/3	824.7	22.44	175.39
			3/3	836.5	**23.21**	**209.41**
			3/0	848.3	21.43	139.00

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LTE Band 7

Band	BW	Mode	RB Size/	f [MHz]	ERP / EIRP	
	[MHz]		RB Offset		[dBm]	[mW]
Band 7	20	QPSK	1/49	2510.0	21.83	152.41
			1/49	2535.0	20.48	111.69
			1/49	2560.0	20.32	107.65
		16QAM	1/0	2510.0	19.76	94.62
			1/49	2535.0	19.41	87.30
			1/49	2560.0	18.59	72.28
	15	QPSK	1/37	2507.5	**21.98**	**157.76**
			1/37	2535.0	20.17	103.99
			1/37	2562.5	19.61	91.41
		16QAM	1/0	2507.5	**20.24**	**105.68**
			1/37	2535.0	18.77	75.34
			1/37	2562.5	19.19	82.99
	10	QPSK	1/25	2505.0	21.36	136.77
			1/25	2535.0	20.35	108.39
			1/25	2565.0	19.56	90.36
		16QAM	1/25	2505.0	20.20	104.71
			1/25	2535.0	19.12	81.66
			1/25	2565.0	18.74	74.82
	5	QPSK	1/12	2502.5	20.69	117.22
			1/12	2535.0	20.69	117.22
			1/12	2567.5	19.30	85.11
		16QAM	1/0	2502.5	19.82	95.94
			1/12	2535.0	19.24	83.95
			1/12	2567.5	18.55	71.61

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LTE Band 13

Band	BW	Mode	RB size / RB Offset	f [MHz]	ERP / EIRP	
	[MHz]				[dBm]	[mW]
Band 13	10	QPSK	1/0	782.0	22.14	163.68
		16QAM	1/0	782.0	20.92	123.59
	5	QPSK	1/0	779.5	21.74	149.28
			1/0	782.0	**22.23**	**167.11**
			1/0	784.5	20.50	112.20
		16QAM	1/0	779.5	19.15	82.22
			1/0	782.0	**21.06**	**127.64**
			1/0	784.5	20.71	117.76

10.1.2. ERP/EIRP DATA

WCDMA Band 5

WCDMA

Band 5
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-19
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: Rel99 Band 5 Fundamentals

Test Equpment:
Receiving: VULB9163-750, 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	19.41	V	1.0	-1.5	16.99	38.5	-21.5	
826.40	25.42	H	1.0	-1.5	23.00	38.5	-15.5	
Mid Ch								
836.60	18.09	V	1.0	-1.4	15.71	38.5	-22.8	
836.60	24.96	H	1.0	-1.4	22.58	38.5	-15.9	
High Ch								
846.60	17.24	V	1.0	-1.4	14.89	38.5	-23.6	
846.60	24.56	H	1.0	-1.4	22.21	38.5	-16.3	

WCDMA

Band 5
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-19
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: HSDPA Band 5 Fundamentals

Test Equpment:
Receiving: VULB9163-750, 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	18.05	V	1.0	-1.5	15.63	38.5	-22.9	
826.40	24.44	H	1.0	-1.5	22.02	38.5	-16.5	
Mid Ch								
836.60	17.04	V	1.0	-1.4	14.66	38.5	-23.8	
836.60	23.81	H	1.0	-1.4	21.43	38.5	-17.1	
High Ch								
846.60	16.35	V	1.0	-1.4	14.00	38.5	-24.5	
846.60	23.31	H	1.0	-1.4	20.96	38.5	-17.5	

WCDMA Band 2

WCDMA

Band 2
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: Rel99 Band 2 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	17.60	V	4.5	9.5	22.59	33.0	-10.4	
1852.40	19.39	H	4.5	9.5	24.38	33.0	-8.6	
Mid Ch								
1880.00	18.69	V	4.5	9.2	23.37	33.0	-9.6	
1880.00	19.14	H	4.5	9.2	23.82	33.0	-9.2	
High Ch								
1907.60	16.52	V	4.6	8.9	20.86	33.0	-12.1	
1907.60	18.12	H	4.6	8.9	22.46	33.0	-10.5	

WCDMA

Band 2
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: HSDPA Band 2 Fundamentals

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.40	16.96	V	4.5	9.5	21.95	33.0	-11.1	
1852.40	18.66	H	4.5	9.5	23.65	33.0	-9.4	
Mid Ch								
1880.00	17.13	V	4.5	9.2	21.81	33.0	-11.2	
1880.00	18.58	H	4.5	9.2	23.26	33.0	-9.7	
High Ch								
1907.60	16.03	V	4.6	8.9	20.37	33.0	-12.6	
1907.60	16.75	H	4.6	8.9	21.09	33.0	-11.9	

LTE Band 2

LTE
Band 2
20MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	16.04	V	4.5	9.4	20.94	33.0	-12.1	
1860.00	17.78	H	4.5	9.4	22.68	33.0	-10.3	
Mid Ch								
1880.00	16.33	V	4.5	9.2	21.01	33.0	-12.0	
1880.00	17.65	H	4.5	9.2	22.33	33.0	-10.7	
High Ch								
1900.00	16.25	V	4.6	9.0	20.71	33.0	-12.3	
1900.00	17.95	H	4.6	9.0	22.41	33.0	-10.6	

LTE
Band 2
20MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1860.00	15.06	V	4.5	9.4	19.96	33.0	-13.0	
1860.00	16.79	H	4.5	9.4	21.69	33.0	-11.3	
Mid Ch								
1880.00	15.92	V	4.5	9.2	20.60	33.0	-12.4	
1880.00	16.99	H	4.5	9.2	21.67	33.0	-11.3	
High Ch								
1900.00	15.06	V	4.6	9.0	19.52	33.0	-13.5	
1900.00	16.74	H	4.6	9.0	21.20	33.0	-11.8	

LTE

Band 2

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	15.42	V	4.5	9.4	20.35	33.0	-12.7	
1857.50	17.90	H	4.5	9.4	22.83	33.0	-10.2	
Mid Ch								
1880.00	16.35	V	4.5	9.2	21.03	33.0	-12.0	
1880.00	17.69	H	4.5	9.2	22.37	33.0	-10.6	
High Ch								
1902.50	13.87	V	4.6	9.0	18.29	33.0	-14.7	
1902.50	17.14	H	4.6	9.0	21.55	33.0	-11.4	

LTE

Band 2

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1857.50	14.43	V	4.5	9.4	19.36	33.0	-13.6	
1857.50	17.03	H	4.5	9.4	21.96	33.0	-11.0	
Mid Ch								
1880.00	15.41	V	4.5	9.2	20.09	33.0	-12.9	
1880.00	16.42	H	4.5	9.2	21.10	33.0	-11.9	
High Ch								
1902.50	13.60	V	4.6	9.0	18.02	33.0	-15.0	
1902.50	16.12	H	4.6	9.0	20.53	33.0	-12.5	

LTE

Band 2

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	15.84	V	4.5	9.5	20.79	33.0	-12.2	
1855.00	17.59	H	4.5	9.5	22.55	33.0	-10.5	
Mid Ch								
1880.00	15.48	V	4.5	9.2	20.16	33.0	-12.8	
1880.00	17.78	H	4.5	9.2	22.46	33.0	-10.5	
High Ch								
1905.00	13.77	V	4.6	8.9	18.14	33.0	-14.9	
1905.00	16.47	H	4.6	8.9	20.85	33.0	-12.2	

LTE

Band 2

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1855.00	15.13	V	4.5	9.5	20.08	33.0	-12.9	
1855.00	16.50	H	4.5	9.5	21.46	33.0	-11.5	
Mid Ch								
1880.00	14.47	V	4.5	9.2	19.15	33.0	-13.9	
1880.00	16.33	H	4.5	9.2	21.01	33.0	-12.0	
High Ch								
1905.00	14.05	V	4.6	8.9	18.42	33.0	-14.6	
1905.00	16.30	H	4.6	8.9	20.68	33.0	-12.3	

LTE

Band 2

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	15.16	V	4.5	9.5	20.15	33.0	-12.9	
1852.50	17.38	H	4.5	9.5	22.37	33.0	-10.6	
Mid Ch								
1880.00	15.35	V	4.5	9.2	20.03	33.0	-13.0	
1880.00	17.38	H	4.5	9.2	22.06	33.0	-10.9	
High Ch								
1907.50	14.78	V	4.6	8.9	19.12	33.0	-13.9	
1907.50	17.02	H	4.6	8.9	21.36	33.0	-11.6	

LTE

Band 2

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	14.27	V	4.5	9.5	19.26	33.0	-13.7	
1852.50	16.49	H	4.5	9.5	21.48	33.0	-11.5	
Mid Ch								
1880.00	13.76	V	4.5	9.2	18.44	33.0	-14.6	
1880.00	16.02	H	4.5	9.2	20.70	33.0	-12.3	
High Ch								
1907.50	14.03	V	4.6	8.9	18.37	33.0	-14.6	
1907.50	16.16	H	4.6	8.9	20.50	33.0	-12.5	

LTE

Band 2

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	15.29	V	4.5	9.5	20.29	33.0	-12.7	
1851.50	16.89	H	4.5	9.5	21.89	33.0	-11.1	
Mid Ch								
1880.00	15.84	V	4.5	9.2	20.52	33.0	-12.5	
1880.00	17.20	H	4.5	9.2	21.88	33.0	-11.1	
High Ch								
1908.50	14.66	V	4.6	8.9	18.99	33.0	-14.0	
1908.50	17.06	H	4.6	8.9	21.38	33.0	-11.6	

LTE

Band 2

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	14.12	V	4.5	9.5	19.12	33.0	-13.9	
1851.50	16.34	H	4.5	9.5	21.34	33.0	-11.7	
Mid Ch								
1880.00	14.56	V	4.5	9.2	19.24	33.0	-13.8	
1880.00	15.74	H	4.5	9.2	20.42	33.0	-12.6	
High Ch								
1908.50	13.77	V	4.6	8.9	18.10	33.0	-14.9	
1908.50	15.87	H	4.6	8.9	20.19	33.0	-12.8	

LTE

Band 2

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	14.24	V	4.5	9.5	19.24	33.0	-13.8	
1850.70	16.59	H	4.5	9.5	21.60	33.0	-11.4	
Mid Ch								
1880.00	15.30	V	4.5	9.2	19.98	33.0	-13.0	
1880.00	17.41	H	4.5	9.2	22.09	33.0	-10.9	
High Ch								
1909.30	15.06	V	4.6	8.9	19.37	33.0	-13.6	
1909.30	17.10	H	4.6	8.9	21.41	33.0	-11.6	

LTE

Band 2

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	13.23	V	4.5	9.5	18.23	33.0	-14.8	
1850.70	15.78	H	4.5	9.5	20.79	33.0	-12.2	
Mid Ch								
1880.00	14.12	V	4.5	9.2	18.80	33.0	-14.2	
1880.00	16.55	H	4.5	9.2	21.23	33.0	-11.8	
High Ch								
1909.30	14.27	V	4.6	8.9	18.58	33.0	-14.4	
1909.30	16.12	H	4.6	8.9	20.43	33.0	-12.6	

LTE Band 4

LTE Band 4 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	16.76	V	4.3	9.5	21.93	30.0	-8.1	
1720.00	19.18	H	4.3	9.5	24.35	30.0	-5.7	
Mid Ch								
1732.50	17.13	V	4.3	9.5	22.32	30.0	-7.7	
1732.50	19.68	H	4.3	9.5	24.88	30.0	-5.1	
High Ch								
1745.00	17.39	V	4.4	9.6	22.61	30.0	-7.4	
1745.00	19.53	H	4.4	9.6	24.75	30.0	-5.2	

LTE Band 4 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1720.00	15.44	V	4.3	9.5	20.61	30.0	-9.4	
1720.00	18.95	H	4.3	9.5	24.12	30.0	-5.9	
Mid Ch								
1732.50	16.40	V	4.3	9.5	21.59	30.0	-8.4	
1732.50	18.85	H	4.3	9.5	24.05	30.0	-6.0	
High Ch								
1745.00	16.47	V	4.4	9.6	21.69	30.0	-8.3	
1745.00	19.02	H	4.4	9.6	24.24	30.0	-5.8	

LTE

Band 4

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	17.10	V	4.3	9.5	22.27	30.0	-7.7	
1717.50	19.35	H	4.3	9.5	24.52	30.0	-5.5	
Mid Ch								
1732.50	16.77	V	4.3	9.5	21.96	30.0	-8.0	
1732.50	19.44	H	4.3	9.5	24.64	30.0	-5.4	
High Ch								
1747.50	16.63	V	4.4	9.6	21.85	30.0	-8.1	
1747.50	19.80	H	4.4	9.6	25.03	30.0	-5.0	

LTE

Band 4

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1717.50	16.13	V	4.3	9.5	21.30	30.0	-8.7	
1717.50	18.10	H	4.3	9.5	23.27	30.0	-6.7	
Mid Ch								
1732.50	15.52	V	4.3	9.5	20.71	30.0	-9.3	
1732.50	18.06	H	4.3	9.5	23.26	30.0	-6.7	
High Ch								
1747.50	16.02	V	4.4	9.6	21.24	30.0	-8.8	
1747.50	18.35	H	4.4	9.6	23.58	30.0	-6.4	

LTE

Band 4

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	16.66	V	4.3	9.5	21.82	30.0	-8.2	
1715.00	19.14	H	4.3	9.5	24.29	30.0	-5.7	
Mid Ch								
1732.50	17.17	V	4.3	9.5	22.36	30.0	-7.6	
1732.50	18.58	H	4.3	9.5	23.78	30.0	-6.2	
High Ch								
1750.00	16.69	V	4.4	9.6	21.92	30.0	-8.1	
1750.00	18.47	H	4.4	9.6	23.70	30.0	-6.3	

LTE

Band 4

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1715.00	15.58	V	4.3	9.5	20.74	30.0	-9.3	
1715.00	17.88	H	4.3	9.5	23.03	30.0	-7.0	
Mid Ch								
1732.50	15.34	V	4.3	9.5	20.53	30.0	-9.5	
1732.50	17.37	H	4.3	9.5	22.57	30.0	-7.4	
High Ch								
1750.00	16.48	V	4.4	9.6	21.71	30.0	-8.3	
1750.00	17.46	H	4.4	9.6	22.69	30.0	-7.3	

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LTE

Band 4

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	15.97	V	4.3	9.5	21.12	30.0	-8.9	
1712.50	16.84	H	4.3	9.5	21.99	30.0	-8.0	
Mid Ch								
1732.50	16.65	V	4.3	9.5	21.84	30.0	-8.2	
1732.50	18.94	H	4.3	9.5	24.14	30.0	-5.9	
High Ch								
1752.50	17.18	V	4.4	9.6	22.41	30.0	-7.6	
1752.50	19.56	H	4.4	9.6	24.80	30.0	-5.2	

LTE

Band 4

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1712.50	15.04	V	4.3	9.5	20.19	30.0	-9.8	
1712.50	15.58	H	4.3	9.5	20.73	30.0	-9.3	
Mid Ch								
1732.50	15.18	V	4.3	9.5	20.37	30.0	-9.6	
1732.50	17.29	H	4.3	9.5	22.49	30.0	-7.5	
High Ch								
1752.50	16.33	V	4.4	9.6	21.56	30.0	-8.4	
1752.50	18.48	H	4.4	9.6	23.72	30.0	-6.3	

LTE

Band 4

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company:	Samsung
Project #:	4788481138
Date:	2018-06-15
Test Engineer:	47989
Configuration:	EUT / X-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 4 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	15.68	V	4.3	9.5	20.84	30.0	-9.2	
1711.50	18.99	H	4.3	9.5	24.14	30.0	-5.9	
Mid Ch								
1732.50	16.80	V	4.3	9.5	21.99	30.0	-8.0	
1732.50	18.17	H	4.3	9.5	23.37	30.0	-6.6	
High Ch								
1753.50	16.60	V	4.4	9.6	21.84	30.0	-8.2	
1753.50	18.33	H	4.4	9.6	23.57	30.0	-6.4	

LTE

Band 4

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company:	Samsung
Project #:	4788481138
Date:	2018-06-15
Test Engineer:	47989
Configuration:	EUT / X-Position
Location:	Chamber 1
Mode:	LTE_16QAM Band 4 Fundamentals, 3MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1711.50	14.94	V	4.3	9.5	20.10	30.0	-9.9	
1711.50	18.60	H	4.3	9.5	23.75	30.0	-6.2	
Mid Ch								
1732.50	15.36	V	4.3	9.5	20.55	30.0	-9.4	
1732.50	16.66	H	4.3	9.5	21.86	30.0	-8.1	
High Ch								
1753.50	15.21	V	4.4	9.6	20.45	30.0	-9.5	
1753.50	17.29	H	4.4	9.6	22.53	30.0	-7.5	

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LTE

Band 4

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	16.67	V	4.3	9.5	21.82	30.0	-8.2	
1710.70	20.11	H	4.3	9.5	25.26	30.0	-4.7	
Mid Ch								
1732.50	16.66	V	4.3	9.5	21.85	30.0	-8.1	
1732.50	19.69	H	4.3	9.5	24.89	30.0	-5.1	
High Ch								
1754.30	17.32	V	4.4	9.6	22.56	30.0	-7.4	
1754.30	20.67	H	4.4	9.6	25.91	30.0	-4.1	

LTE

Band 4

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 Fundamentals, 1.4MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1710.70	15.89	V	4.3	9.5	21.04	30.0	-9.0	
1710.70	19.01	H	4.3	9.5	24.16	30.0	-5.8	
Mid Ch								
1732.50	16.11	V	4.3	9.5	21.30	30.0	-8.7	
1732.50	18.54	H	4.3	9.5	23.74	30.0	-6.3	
High Ch								
1754.30	16.19	V	4.4	9.6	21.43	30.0	-8.6	
1754.30	18.92	H	4.4	9.6	24.16	30.0	-5.8	

LTE Band 5

LTE Band 5 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT / X-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	19.74	V	1.0	-1.5	17.33	38.5	-21.2	
829.00	25.55	H	1.0	-1.5	23.14	38.5	-15.4	
Mid Ch								
836.50	19.71	V	1.0	-1.4	17.33	38.5	-21.2	
836.50	25.40	H	1.0	-1.4	23.02	38.5	-15.5	
High Ch								
844.00	19.40	V	1.0	-1.4	17.05	38.5	-21.5	
844.00	25.52	H	1.0	-1.4	23.16	38.5	-15.3	

LTE Band 5 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT / X-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	19.60	V	1.0	-1.5	17.19	38.5	-21.3	
829.00	24.78	H	1.0	-1.5	22.37	38.5	-16.1	
Mid Ch								
836.50	17.88	V	1.0	-1.4	15.50	38.5	-23.0	
836.50	23.95	H	1.0	-1.4	21.57	38.5	-16.9	
High Ch								
844.00	18.52	V	1.0	-1.4	16.17	38.5	-22.3	
844.00	23.96	H	1.0	-1.4	21.60	38.5	-16.9	

LTE

Band 5

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT , X-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	19.27	V	1.0	-1.5	16.84	38.5	-21.7	
824.70	25.09	H	1.0	-1.5	22.66	38.5	-15.8	
Mid Ch								
836.50	20.66	V	1.0	-1.4	18.28	38.5	-20.2	
836.50	26.22	H	1.0	-1.4	23.84	38.5	-14.7	
High Ch								
848.30	19.96	V	1.0	-1.4	17.61	38.5	-20.9	
848.30	25.22	H	1.0	-1.4	22.87	38.5	-15.6	

LTE

Band 5

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT / X-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	17.90	V	1.0	-1.5	15.48	38.5	-23.0	
826.50	23.55	H	1.0	-1.5	21.13	38.5	-17.4	
Mid Ch								
836.50	19.35	V	1.0	-1.4	16.97	38.5	-21.5	
836.50	24.79	H	1.0	-1.4	22.41	38.5	-16.1	
High Ch								
846.50	18.52	V	1.0	-1.4	16.17	38.5	-22.3	
846.50	23.86	H	1.0	-1.4	21.51	38.5	-17.0	

LTE

Band 5

3MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT , X-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	21.26	V	1.0	-1.5	18.84	38.5	-19.7	
825.50	25.93	H	1.0	-1.5	23.51	38.5	-15.0	
Mid Ch								
836.50	20.73	V	1.0	-1.4	18.35	38.5	-20.2	
836.50	26.17	H	1.0	-1.4	23.79	38.5	-14.7	
High Ch								
847.50	20.36	V	1.0	-1.4	18.02	38.5	-20.5	
847.50	25.43	H	1.0	-1.4	23.08	38.5	-15.4	

LTE

Band 5

3MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT / X-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	19.98	V	1.0	-1.5	17.56	38.5	-20.9	
825.50	24.79	H	1.0	-1.5	22.37	38.5	-16.1	
Mid Ch								
836.50	19.13	V	1.0	-1.4	16.75	38.5	-21.8	
836.50	24.92	H	1.0	-1.4	22.54	38.5	-16.0	
High Ch								
847.50	19.56	V	1.0	-1.4	17.22	38.5	-21.3	
847.50	24.49	H	1.0	-1.4	22.14	38.5	-16.4	

LTE

Band 5

1.4MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT / X-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	21.08	V	1.0	-1.5	18.65	38.5	-19.8	
824.70	25.98	H	1.0	-1.5	23.55	38.5	-14.9	
Mid Ch								
836.50	18.99	V	1.0	-1.4	16.61	38.5	-21.9	
836.50	26.50	H	1.0	-1.4	24.12	38.5	-14.4	
High Ch								
848.30	20.28	V	1.0	-1.4	17.93	38.5	-20.6	
848.30	25.00	H	1.0	-1.4	22.65	38.5	-15.8	

LTE

Band 5

1.4MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 51072
Configuration: EUT / X-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	20.09	V	1.0	-1.5	17.66	38.5	-20.8	
824.70	24.87	H	1.0	-1.5	22.44	38.5	-16.1	
Mid Ch								
836.50	17.77	V	1.0	-1.4	15.39	38.5	-23.1	
836.50	25.59	H	1.0	-1.4	23.21	38.5	-15.3	
High Ch								
848.30	18.41	V	1.0	-1.4	16.06	38.5	-22.4	
848.30	23.78	H	1.0	-1.4	21.43	38.5	-17.1	

LTE Band 7

LTE Band 7 20MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2510.00	14.67	V	5.3	10.3	19.59	33.0	-13.4	
2510.00	16.90	H	5.3	10.3	21.83	33.0	-11.2	
Mid Ch								
2535.00	14.44	V	5.4	10.2	19.28	33.0	-13.7	
2535.00	15.63	H	5.4	10.2	20.48	33.0	-12.5	
High Ch								
2560.00	13.71	V	5.4	10.2	18.48	33.0	-14.5	
2560.00	15.55	H	5.4	10.2	20.32	33.0	-12.7	

LTE Band 7 20MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 20MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2510.00	13.73	V	5.3	10.3	18.65	33.0	-14.3	
2510.00	14.83	H	5.3	10.3	19.76	33.0	-13.2	
Mid Ch								
2535.00	13.28	V	5.4	10.2	18.12	33.0	-14.9	
2535.00	14.56	H	5.4	10.2	19.41	33.0	-13.6	
High Ch								
2560.00	12.59	V	5.4	10.2	17.36	33.0	-15.6	
2560.00	13.82	H	5.4	10.2	18.59	33.0	-14.4	

LTE

Band 7

15MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2507.50	14.58	V	5.3	10.3	19.52	33.0	-13.5	
2507.50	17.04	H	5.3	10.3	21.98	33.0	-11.0	
Mid Ch								
2535.00	14.56	V	5.4	10.2	19.40	33.0	-13.6	
2535.00	15.32	H	5.4	10.2	20.17	33.0	-12.8	
High Ch								
2562.50	13.99	V	5.4	10.1	18.75	33.0	-14.2	
2562.50	14.85	H	5.4	10.1	19.61	33.0	-13.4	

LTE

Band 7

15MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 15MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2507.50	14.07	V	5.3	10.3	19.01	33.0	-14.0	
2507.50	15.30	H	5.3	10.3	20.24	33.0	-12.8	
Mid Ch								
2535.00	13.59	V	5.4	10.2	18.43	33.0	-14.6	
2535.00	13.92	H	5.4	10.2	18.77	33.0	-14.2	
High Ch								
2562.50	13.71	V	5.4	10.1	18.47	33.0	-14.5	
2562.50	14.43	H	5.4	10.1	19.19	33.0	-13.8	

LTE

Band 7

10MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2505.00	14.74	V	5.3	10.3	19.69	33.0	-13.3	
2505.00	16.41	H	5.3	10.3	21.36	33.0	-11.6	
Mid Ch								
2535.00	15.00	V	5.4	10.2	19.84	33.0	-13.2	
2535.00	15.50	H	5.4	10.2	20.35	33.0	-12.7	
High Ch								
2565.00	13.67	V	5.4	10.1	18.42	33.0	-14.6	
2565.00	14.81	H	5.4	10.1	19.56	33.0	-13.4	

LTE

Band 7

10MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2505.00	14.11	V	5.3	10.3	19.06	33.0	-13.9	
2505.00	15.25	H	5.3	10.3	20.20	33.0	-12.8	
Mid Ch								
2535.00	13.42	V	5.4	10.2	18.26	33.0	-14.7	
2535.00	14.27	H	5.4	10.2	19.12	33.0	-13.9	
High Ch								
2565.00	12.89	V	5.4	10.1	17.64	33.0	-15.4	
2565.00	13.99	H	5.4	10.1	18.74	33.0	-14.3	

LTE

Band 7

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2502.50	14.53	V	5.3	10.3	19.48	33.0	-13.5	
2502.50	15.73	H	5.3	10.3	20.69	33.0	-12.3	
Mid Ch								
2535.00	14.68	V	5.4	10.2	19.52	33.0	-13.5	
2535.00	15.84	H	5.4	10.2	20.69	33.0	-12.3	
High Ch								
2567.50	13.43	V	5.4	10.1	18.18	33.0	-14.8	
2567.50	14.56	H	5.4	10.1	19.30	33.0	-13.7	

LTE

Band 7

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables
Substitution: Horn 3115[00161451], 3m N-type Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
2502.50	13.02	V	5.3	10.3	17.97	33.0	-15.0	
2502.50	14.86	H	5.3	10.3	19.82	33.0	-13.2	
Mid Ch								
2535.00	13.08	V	5.4	10.2	17.92	33.0	-15.1	
2535.00	14.39	H	5.4	10.2	19.24	33.0	-13.8	
High Ch								
2567.50	12.48	V	5.4	10.1	17.23	33.0	-15.8	
2567.50	13.81	H	5.4	10.1	18.55	33.0	-14.4	

LTE Band 13

LTE Band 13 10MHz QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, 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
Mid Ch								
782.00	19.38	V	0.9	-1.6	16.89	34.8	-17.9	
782.00	24.63	H	0.9	-1.6	22.14	34.8	-12.6	

LTE Band 13 10MHz 16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, 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
Mid Ch								
782.00	17.29	V	0.9	-1.6	14.80	34.8	-20.0	
782.00	23.41	H	0.9	-1.6	20.92	34.8	-13.9	

LTE

Band 13

5MHz

QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, 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								
779.50	17.93	V	0.9	-1.6	15.44	34.8	-19.3	
779.50	24.23	H	0.9	-1.6	21.74	34.8	-13.0	
Mid Ch								
782.00	18.05	V	0.9	-1.6	15.56	34.8	-19.2	
782.00	24.72	H	0.9	-1.6	22.23	34.8	-12.5	
High Ch								
784.50	17.54	V	0.9	-1.6	15.04	34.8	-19.7	
784.50	22.99	H	0.9	-1.6	20.50	34.8	-14.3	

LTE

Band 13

5MHz

16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / X-Ppsition
Location: Chamber 1
Mode: LTE_16QAM Band 13 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: VULB9163-750, 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								
779.50	16.04	V	0.9	-1.6	13.55	34.8	-21.2	
779.50	21.64	H	0.9	-1.6	19.15	34.8	-15.6	
Mid Ch								
782.00	17.04	V	0.9	-1.6	14.55	34.8	-20.2	
782.00	23.55	H	0.9	-1.6	21.06	34.8	-13.7	
High Ch								
784.50	16.73	V	0.9	-1.6	14.23	34.8	-20.5	
784.50	23.20	H	0.9	-1.6	20.71	34.8	-14.1	

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMIT

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

Part 27.53 (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

Part 27.53 (h) AWS emission limits—the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (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 = rms;
f) Ensure that the number of measurement points ≥ span/RBW;
g) Trace mode = average(WCDMA, LTE);

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

See the following pages.

10.2.1. SPURIOUS RADIATION PLOTS

WCDMA Band 5

WCDMA

Band 5
REL99

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-19
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
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	-21.1	V	3.0	43.6	1.0	-63.6	-13.0	-50.6	
2479.20	-15.9	V	3.0	43.4	1.0	-58.3	-13.0	-45.3	
3305.60	-21.3	V	3.0	43.6	1.0	-63.9	-13.0	-50.9	
1652.80	-19.7	H	3.0	43.6	1.0	-62.2	-13.0	-49.2	
2479.20	-2.9	H	3.0	43.4	1.0	-45.4	-13.0	-32.4	
3305.60	-20.8	H	3.0	43.6	1.0	-63.5	-13.0	-50.5	
Mid Ch, 836.6MHz									
1673.20	-21.1	V	3.0	43.6	1.0	-63.7	-13.0	-50.7	
2509.80	-8.3	V	3.0	43.4	1.0	-50.8	-13.0	-37.8	
3346.40	-21.6	V	3.0	43.6	1.0	-64.2	-13.0	-51.2	
1673.20	-18.2	H	3.0	43.6	1.0	-60.7	-13.0	-47.7	
2509.80	-1.0	H	3.0	43.4	1.0	-43.5	-13.0	-30.5	
3346.40	-20.9	H	3.0	43.6	1.0	-63.6	-13.0	-50.6	
High Ch, 846.6MHz									
1693.20	-22.7	V	3.0	43.6	1.0	-65.2	-13.0	-52.2	
2539.80	-5.7	V	3.0	43.4	1.0	-48.2	-13.0	-35.2	
3386.40	-21.9	V	3.0	43.7	1.0	-64.6	-13.0	-51.6	
1693.20	-19.6	H	3.0	43.6	1.0	-62.1	-13.0	-49.1	
2539.80	-1.6	H	3.0	43.4	1.0	-44.1	-13.0	-31.1	
3386.40	-21.2	H	3.0	43.7	1.0	-63.9	-13.0	-50.9	

WCDMA

Band 5
HSDPA

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-19
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
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	-21.0	V	3.0	43.6	1.0	-63.6	-13.0	-50.6	
2479.20	-17.9	V	3.0	43.4	1.0	-60.4	-13.0	-47.4	
3305.60	-21.3	V	3.0	43.6	1.0	-63.9	-13.0	-50.9	
1652.80	-19.6	H	3.0	43.6	1.0	-62.2	-13.0	-49.2	
2479.20	-10.1	H	3.0	43.4	1.0	-52.5	-13.0	-39.5	
3305.60	-20.9	H	3.0	43.6	1.0	-63.5	-13.0	-50.5	
Mid Ch, 836.6MHz									
1673.20	-21.7	V	3.0	43.6	1.0	-64.3	-13.0	-51.3	
2509.80	-8.6	V	3.0	43.4	1.0	-51.0	-13.0	-38.0	
3346.40	-21.5	V	3.0	43.6	1.0	-64.1	-13.0	-51.1	
1673.20	-18.4	H	3.0	43.6	1.0	-61.0	-13.0	-48.0	
2509.80	-0.4	H	3.0	43.4	1.0	-42.9	-13.0	-29.9	
3346.40	-20.9	H	3.0	43.6	1.0	-63.5	-13.0	-50.5	
High Ch, 846.6MHz									
1693.20	-22.8	V	3.0	43.6	1.0	-65.3	-13.0	-52.3	
2539.80	-7.7	V	3.0	43.4	1.0	-50.2	-13.0	-37.2	
3386.40	-21.9	V	3.0	43.7	1.0	-64.6	-13.0	-51.6	
1693.20	-19.4	H	3.0	43.6	1.0	-62.0	-13.0	-49.0	
2539.80	-2.3	H	3.0	43.4	1.0	-44.7	-13.0	-31.7	
3386.40	-21.3	H	3.0	43.7	1.0	-63.9	-13.0	-50.9	

WCDMA Band 2

WCDMA

Band 2
REL99

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 1
Mode: Rel99 Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-13.6	V	3.0	43.8	1.0	-56.4	-13.0	-43.4	
5557.20	-17.8	V	3.0	43.7	1.0	-60.5	-13.0	-47.5	
7409.60	-18.0	V	3.0	42.5	1.0	-59.5	-13.0	-46.5	
3704.80	-12.4	H	3.0	43.8	1.0	-55.1	-13.0	-42.1	
5557.20	-18.4	H	3.0	43.7	1.0	-61.1	-13.0	-48.1	
7409.60	-16.7	H	3.0	42.5	1.0	-58.2	-13.0	-45.2	
Mid Ch, 1880MHz									
3760.00	-15.6	V	3.0	43.8	1.0	-58.4	-13.0	-45.4	
5640.00	-17.4	V	3.0	43.7	1.0	-60.1	-13.0	-47.1	
7520.00	-17.2	V	3.0	42.5	1.0	-58.7	-13.0	-45.7	
3760.00	-6.8	H	3.0	43.8	1.0	-49.5	-13.0	-36.5	
5640.00	-18.0	H	3.0	43.7	1.0	-60.7	-13.0	-47.7	
7520.00	-17.1	H	3.0	42.5	1.0	-58.5	-13.0	-45.5	
High Ch, 1907.6MHz									
3815.20	-10.0	V	3.0	43.8	1.0	-52.8	-13.0	-39.8	
5722.80	-17.0	V	3.0	43.7	1.0	-59.7	-13.0	-46.7	
7630.40	-17.6	V	3.0	42.4	1.0	-59.0	-13.0	-46.0	
3815.20	-3.1	H	3.0	43.8	1.0	-45.9	-13.0	-32.9	
5722.80	-17.7	H	3.0	43.7	1.0	-60.4	-13.0	-47.4	
7630.40	-17.4	H	3.0	42.4	1.0	-58.8	-13.0	-45.8	

WCDMA

Band 2
HSDPA

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 1
Mode: HSDPA Band 2 Harmonics

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3704.80	-14.4	V	3.0	43.8	1.0	-57.2	-13.0	-44.2	
5557.20	-18.4	V	3.0	43.7	1.0	-61.1	-13.0	-48.1	
7409.60	-18.5	V	3.0	42.5	1.0	-60.0	-13.0	-47.0	
3704.80	-11.7	H	3.0	43.8	1.0	-54.5	-13.0	-41.5	
5557.20	-18.4	H	3.0	43.7	1.0	-61.1	-13.0	-48.1	
7409.60	-17.8	H	3.0	42.5	1.0	-59.3	-13.0	-46.3	
Mid Ch, 1880MHz									
3760.00	-15.0	V	3.0	43.8	1.0	-57.8	-13.0	-44.8	
5640.00	-17.9	V	3.0	43.7	1.0	-60.6	-13.0	-47.6	
7520.00	-17.7	V	3.0	42.5	1.0	-59.1	-13.0	-46.1	
3760.00	-9.4	H	3.0	43.8	1.0	-52.2	-13.0	-39.2	
5640.00	-17.6	H	3.0	43.7	1.0	-60.3	-13.0	-47.3	
7520.00	-17.2	H	3.0	42.5	1.0	-58.7	-13.0	-45.7	
High Ch, 1907.6MHz									
3815.20	-11.5	V	3.0	43.8	1.0	-54.3	-13.0	-41.3	
5722.80	-16.6	V	3.0	43.7	1.0	-59.3	-13.0	-46.3	
7630.40	-17.8	V	3.0	42.4	1.0	-59.2	-13.0	-46.2	
3815.20	-4.1	H	3.0	43.8	1.0	-46.9	-13.0	-33.9	
5722.80	-17.8	H	3.0	43.7	1.0	-60.5	-13.0	-47.5	
7630.40	-17.7	H	3.0	42.4	1.0	-59.1	-13.0	-46.1	

LTE Band 2

LTE

Band 2

20MHz

QPSK

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

Company:	Samsung
Project #:	4788481138
Date:	2018-06-15
Test Engineer:	47989
Configuration:	EUT / Adapter / Earphone, X-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 2 Harmonics, 20MHz 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, 1860MHz									
3720.00	-14.1	V	3.0	43.8	1.0	-56.9	-13.0	-43.9	
5580.00	-12.3	V	3.0	43.7	1.0	-55.0	-13.0	-42.0	
7440.00	-8.2	V	3.0	42.5	1.0	-49.7	-13.0	-36.7	
9300.00	-15.2	V	3.0	41.2	1.0	-55.4	-13.0	-42.4	
11160.00	-12.3	V	3.0	40.9	1.0	-52.2	-13.0	-39.2	
3720.00	-6.3	H	3.0	43.8	1.0	-49.1	-13.0	-36.1	
5580.00	-15.6	H	3.0	43.7	1.0	-58.4	-13.0	-45.4	
7440.00	-15.0	H	3.0	42.5	1.0	-56.5	-13.0	-43.5	
9300.00	-16.7	H	3.0	41.2	1.0	-56.9	-13.0	-43.9	
11160.00	-10.8	H	3.0	40.9	1.0	-50.7	-13.0	-37.7	
Mid Ch, 1880MHz									
3760.00	-10.8	V	3.0	43.8	1.0	-53.6	-13.0	-40.6	
5640.00	-14.7	V	3.0	43.7	1.0	-57.4	-13.0	-44.4	
7520.00	-11.7	V	3.0	42.5	1.0	-53.2	-13.0	-40.2	
9400.00	-15.6	V	3.0	41.1	1.0	-55.7	-13.0	-42.7	
11280.00	-10.3	V	3.0	41.0	1.0	-50.3	-13.0	-37.3	
3760.00	-1.0	H	3.0	43.8	1.0	-43.8	-13.0	-30.8	
5640.00	-17.4	H	3.0	43.7	1.0	-60.1	-13.0	-47.1	
7520.00	-15.8	H	3.0	42.5	1.0	-57.2	-13.0	-44.2	
9400.00	-13.9	H	3.0	41.1	1.0	-54.0	-13.0	-41.0	
11280.00	-15.7	H	3.0	41.0	1.0	-55.7	-13.0	-42.7	
High Ch, 1900MHz									
3800.00	-11.4	V	3.0	43.8	1.0	-54.2	-13.0	-41.2	
5700.00	-14.1	V	3.0	43.7	1.0	-56.8	-13.0	-43.8	
7600.00	-12.0	V	3.0	42.4	1.0	-53.4	-13.0	-40.4	
9500.00	-15.8	V	3.0	41.0	1.0	-55.8	-13.0	-42.8	
11400.00	-10.6	V	3.0	41.0	1.0	-50.6	-13.0	-37.6	
3800.00	-2.0	H	3.0	43.8	1.0	-44.8	-13.0	-31.8	
5700.00	-16.6	H	3.0	43.7	1.0	-59.3	-13.0	-46.3	
7600.00	-15.8	H	3.0	42.4	1.0	-57.2	-13.0	-44.2	
9500.00	-14.3	H	3.0	41.0	1.0	-54.4	-13.0	-41.4	
11400.00	-15.1	H	3.0	41.0	1.0	-55.1	-13.0	-42.1	

LTE

Band 2

20MHz

16QAM

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

Company:	Samsung
Project #:	4788481138
Date:	2018-06-15
Test Engineer:	47989
Configuration:	EUT / Adapter / Earphone, X-Position
Location:	Chamber 1
Mode:	LTE_QPSK Band 2 Harmonics, 20MHz 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, 1860MHz									
3720.00	-14.1	V	3.0	43.8	1.0	-56.9	-13.0	-43.9	
5580.00	-12.3	V	3.0	43.7	1.0	-55.0	-13.0	-42.0	
7440.00	-8.2	V	3.0	42.5	1.0	-49.7	-13.0	-36.7	
9300.00	-15.2	V	3.0	41.2	1.0	-55.4	-13.0	-42.4	
11160.00	-12.3	V	3.0	40.9	1.0	-52.2	-13.0	-39.2	
3720.00	-6.3	H	3.0	43.8	1.0	-49.1	-13.0	-36.1	
5580.00	-15.6	H	3.0	43.7	1.0	-58.4	-13.0	-45.4	
7440.00	-15.0	H	3.0	42.5	1.0	-56.5	-13.0	-43.5	
9300.00	-16.7	H	3.0	41.2	1.0	-56.9	-13.0	-43.9	
11160.00	-10.8	H	3.0	40.9	1.0	-50.7	-13.0	-37.7	
Mid Ch, 1880MHz									
3760.00	-10.8	V	3.0	43.8	1.0	-53.6	-13.0	-40.6	
5640.00	-14.7	V	3.0	43.7	1.0	-57.4	-13.0	-44.4	
7520.00	-11.7	V	3.0	42.5	1.0	-53.2	-13.0	-40.2	
9400.00	-15.6	V	3.0	41.1	1.0	-55.7	-13.0	-42.7	
11280.00	-10.3	V	3.0	41.0	1.0	-50.3	-13.0	-37.3	
3760.00	-1.0	H	3.0	43.8	1.0	-43.8	-13.0	-30.8	
5640.00	-17.4	H	3.0	43.7	1.0	-60.1	-13.0	-47.1	
7520.00	-15.8	H	3.0	42.5	1.0	-57.2	-13.0	-44.2	
9400.00	-13.9	H	3.0	41.1	1.0	-54.0	-13.0	-41.0	
11280.00	-15.7	H	3.0	41.0	1.0	-55.7	-13.0	-42.7	
High Ch, 1900MHz									
3800.00	-11.4	V	3.0	43.8	1.0	-54.2	-13.0	-41.2	
5700.00	-14.1	V	3.0	43.7	1.0	-56.8	-13.0	-43.8	
7600.00	-12.0	V	3.0	42.4	1.0	-53.4	-13.0	-40.4	
9500.00	-15.8	V	3.0	41.0	1.0	-55.8	-13.0	-42.8	
11400.00	-10.6	V	3.0	41.0	1.0	-50.6	-13.0	-37.6	
3800.00	-2.0	H	3.0	43.8	1.0	-44.8	-13.0	-31.8	
5700.00	-16.6	H	3.0	43.7	1.0	-59.3	-13.0	-46.3	
7600.00	-15.8	H	3.0	42.4	1.0	-57.2	-13.0	-44.2	
9500.00	-14.3	H	3.0	41.0	1.0	-54.4	-13.0	-41.4	
11400.00	-15.1	H	3.0	41.0	1.0	-55.1	-13.0	-42.1	

LTE

Band 2

15MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 Harmonics, 15MHz 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, 1857.5MHz									
3715.00	-16.4	V	3.0	43.8	1.0	-59.2	-13.0	-46.2	
5572.50	-12.5	V	3.0	43.7	1.0	-55.2	-13.0	-42.2	
7430.00	-9.4	V	3.0	42.5	1.0	-50.9	-13.0	-37.9	
9287.50	-15.7	V	3.0	41.2	1.0	-55.9	-13.0	-42.9	
11145.00	-8.6	V	3.0	40.9	1.0	-48.5	-13.0	-35.5	
3715.00	-9.4	H	3.0	43.8	1.0	-52.2	-13.0	-39.2	
5572.50	-15.6	H	3.0	43.7	1.0	-58.3	-13.0	-45.3	
7430.00	-14.0	H	3.0	42.5	1.0	-55.5	-13.0	-42.5	
9287.50	-18.8	H	3.0	41.2	1.0	-59.0	-13.0	-46.0	
11145.00	-17.0	H	3.0	40.9	1.0	-56.9	-13.0	-43.9	
Mid Ch, 1880MHz									
3760.00	-11.0	V	3.0	43.8	1.0	-53.7	-13.0	-40.7	
5640.00	-15.0	V	3.0	43.7	1.0	-57.7	-13.0	-44.7	
7520.00	-11.2	V	3.0	42.5	1.0	-52.7	-13.0	-39.7	
9400.00	-16.0	V	3.0	41.1	1.0	-56.2	-13.0	-43.2	
11280.00	-10.6	V	3.0	41.0	1.0	-50.5	-13.0	-37.5	
3760.00	-2.0	H	3.0	43.8	1.0	-44.8	-13.0	-31.8	
5640.00	-17.5	H	3.0	43.7	1.0	-60.2	-13.0	-47.2	
7520.00	-14.0	H	3.0	42.5	1.0	-55.5	-13.0	-42.5	
9400.00	-17.9	H	3.0	41.1	1.0	-58.0	-13.0	-45.0	
11280.00	-16.0	H	3.0	41.0	1.0	-56.0	-13.0	-43.0	
High Ch, 1902.5MHz									
3805.00	-11.0	V	3.0	43.8	1.0	-53.8	-13.0	-40.8	
5707.50	-13.9	V	3.0	43.7	1.0	-56.6	-13.0	-43.6	
7610.00	-12.4	V	3.0	42.4	1.0	-53.8	-13.0	-40.8	
9512.50	-15.4	V	3.0	41.0	1.0	-55.4	-13.0	-42.4	
11415.00	-12.2	V	3.0	41.0	1.0	-52.2	-13.0	-39.2	
3805.00	-1.0	H	3.0	43.8	1.0	-43.8	-13.0	-30.8	
5707.50	-16.6	H	3.0	43.7	1.0	-59.2	-13.0	-46.2	
7610.00	-14.5	H	3.0	42.4	1.0	-55.9	-13.0	-42.9	
9512.50	-17.9	H	3.0	41.0	1.0	-57.9	-13.0	-44.9	
11415.00	-16.4	H	3.0	41.0	1.0	-56.4	-13.0	-43.4	

LTE

Band 2

15MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 Harmonics, 15MHz 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, 1857.5MHz									
3715.00	-16.9	V	3.0	43.8	1.0	-59.7	-13.0	-46.7	
5572.50	-13.6	V	3.0	43.7	1.0	-56.3	-13.0	-43.3	
7430.00	-10.1	V	3.0	42.5	1.0	-51.6	-13.0	-38.6	
9287.50	-16.1	V	3.0	41.2	1.0	-56.3	-13.0	-43.3	
11145.00	-9.7	V	3.0	40.9	1.0	-49.6	-13.0	-36.6	
3715.00	-10.1	H	3.0	43.8	1.0	-52.8	-13.0	-39.8	
5572.50	-16.2	H	3.0	43.7	1.0	-58.9	-13.0	-45.9	
7430.00	-14.5	H	3.0	42.5	1.0	-56.0	-13.0	-43.0	
9287.50	-18.8	H	3.0	41.2	1.0	-59.0	-13.0	-46.0	
11145.00	-17.0	H	3.0	40.9	1.0	-56.9	-13.0	-43.9	
Mid Ch, 1880MHz									
3760.00	-11.8	V	3.0	43.8	1.0	-54.5	-13.0	-41.5	
5640.00	-15.7	V	3.0	43.7	1.0	-58.4	-13.0	-45.4	
7520.00	-12.1	V	3.0	42.5	1.0	-53.6	-13.0	-40.6	
9400.00	-16.4	V	3.0	41.1	1.0	-56.5	-13.0	-43.5	
11280.00	-11.4	V	3.0	41.0	1.0	-51.3	-13.0	-38.3	
3760.00	-3.0	H	3.0	43.8	1.0	-45.8	-13.0	-32.8	
5640.00	-17.7	H	3.0	43.7	1.0	-60.4	-13.0	-47.4	
7520.00	-14.6	H	3.0	42.5	1.0	-56.1	-13.0	-43.1	
9400.00	-17.9	H	3.0	41.1	1.0	-58.0	-13.0	-45.0	
11280.00	-16.0	H	3.0	41.0	1.0	-56.0	-13.0	-43.0	
High Ch, 1902.5MHz									
3805.00	-10.0	V	3.0	43.8	1.0	-52.8	-13.0	-39.8	
5707.50	-12.5	V	3.0	43.7	1.0	-55.2	-13.0	-42.2	
7610.00	-13.5	V	3.0	42.4	1.0	-54.9	-13.0	-41.9	
9512.50	-15.1	V	3.0	41.0	1.0	-55.1	-13.0	-42.1	
11415.00	-10.4	V	3.0	41.0	1.0	-50.4	-13.0	-37.4	
3805.00	0.0	H	3.0	43.8	1.0	-42.8	-13.0	-29.8	
5707.50	-16.1	H	3.0	43.7	1.0	-58.8	-13.0	-45.8	
7610.00	-12.5	H	3.0	42.4	1.0	-53.9	-13.0	-40.9	
9512.50	-17.6	H	3.0	41.0	1.0	-57.6	-13.0	-44.6	
11415.00	-15.6	H	3.0	41.0	1.0	-55.6	-13.0	-42.6	

LTE

Band 2

10MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 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, 1855MHz									
3710.00	-12.9	V	3.0	43.8	1.0	-55.7	-13.0	-42.7	
5565.00	-13.1	V	3.0	43.7	1.0	-55.8	-13.0	-42.8	
7420.00	-8.5	V	3.0	42.5	1.0	-50.0	-13.0	-37.0	
9275.00	-16.5	V	3.0	41.2	1.0	-56.7	-13.0	-43.7	
11130.00	-9.4	V	3.0	40.9	1.0	-49.3	-13.0	-36.3	
3710.00	-8.1	H	3.0	43.8	1.0	-50.9	-13.0	-37.9	
5565.00	-15.9	H	3.0	43.7	1.0	-58.6	-13.0	-45.6	
7420.00	-13.2	H	3.0	42.5	1.0	-54.7	-13.0	-41.7	
9275.00	-18.5	H	3.0	41.2	1.0	-58.8	-13.0	-45.8	
11130.00	-17.2	H	3.0	40.9	1.0	-57.1	-13.0	-44.1	
Mid Ch, 1880MHz									
3760.00	-12.4	V	3.0	43.8	1.0	-55.2	-13.0	-42.2	
5640.00	-14.3	V	3.0	43.7	1.0	-57.0	-13.0	-44.0	
7520.00	-10.0	V	3.0	42.5	1.0	-51.5	-13.0	-38.5	
9400.00	-16.5	V	3.0	41.1	1.0	-56.6	-13.0	-43.6	
11280.00	-10.5	V	3.0	41.0	1.0	-50.5	-13.0	-37.5	
3760.00	-4.1	H	3.0	43.8	1.0	-46.9	-13.0	-33.9	
5640.00	-17.9	H	3.0	43.7	1.0	-60.6	-13.0	-47.6	
7520.00	-14.1	H	3.0	42.5	1.0	-55.6	-13.0	-42.6	
9400.00	-18.1	H	3.0	41.1	1.0	-58.2	-13.0	-45.2	
11280.00	-16.0	H	3.0	41.0	1.0	-55.9	-13.0	-42.9	
High Ch, 1905MHz									
3810.00	-9.9	V	3.0	43.8	1.0	-52.7	-13.0	-39.7	
5715.00	-13.7	V	3.0	43.7	1.0	-56.4	-13.0	-43.4	
7620.00	-12.4	V	3.0	42.4	1.0	-53.8	-13.0	-40.8	
9525.00	-15.6	V	3.0	41.0	1.0	-55.6	-13.0	-42.6	
11430.00	-11.5	V	3.0	41.0	1.0	-51.5	-13.0	-38.5	
3810.00	0.0	H	3.0	43.8	1.0	-42.8	-13.0	-29.8	
5715.00	-16.1	H	3.0	43.7	1.0	-58.7	-13.0	-45.7	
7620.00	-14.8	H	3.0	42.4	1.0	-56.2	-13.0	-43.2	
9525.00	-17.5	H	3.0	41.0	1.0	-57.5	-13.0	-44.5	
11430.00	-15.6	H	3.0	41.0	1.0	-55.6	-13.0	-42.6	

LTE

Band 2

10MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 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, 1855MHz									
3710.00	-13.6	V	3.0	43.8	1.0	-56.4	-13.0	-43.4	
5565.00	-14.2	V	3.0	43.7	1.0	-56.9	-13.0	-43.9	
7420.00	-9.6	V	3.0	42.5	1.0	-51.1	-13.0	-38.1	
9275.00	-16.9	V	3.0	41.2	1.0	-57.2	-13.0	-44.2	
11130.00	-10.1	V	3.0	40.9	1.0	-50.0	-13.0	-37.0	
3710.00	-9.0	H	3.0	43.8	1.0	-51.8	-13.0	-38.8	
5565.00	-16.4	H	3.0	43.7	1.0	-59.1	-13.0	-46.1	
7420.00	-13.9	H	3.0	42.5	1.0	-55.4	-13.0	-42.4	
9275.00	-18.5	H	3.0	41.2	1.0	-58.8	-13.0	-45.8	
11130.00	-17.2	H	3.0	40.9	1.0	-57.1	-13.0	-44.1	
Mid Ch, 1880MHz									
3760.00	-13.3	V	3.0	43.8	1.0	-56.1	-13.0	-43.1	
5640.00	-15.3	V	3.0	43.7	1.0	-58.0	-13.0	-45.0	
7520.00	-10.8	V	3.0	42.5	1.0	-52.3	-13.0	-39.3	
9400.00	-16.9	V	3.0	41.1	1.0	-57.0	-13.0	-44.0	
11280.00	-11.7	V	3.0	41.0	1.0	-51.7	-13.0	-38.7	
3760.00	-5.0	H	3.0	43.8	1.0	-47.8	-13.0	-34.8	
5640.00	-18.1	H	3.0	43.7	1.0	-60.8	-13.0	-47.8	
7520.00	-14.8	H	3.0	42.5	1.0	-56.3	-13.0	-43.3	
9400.00	-18.0	H	3.0	41.1	1.0	-58.1	-13.0	-45.1	
11280.00	-16.1	H	3.0	41.0	1.0	-56.1	-13.0	-43.1	
High Ch, 1905MHz									
3810.00	-9.3	V	3.0	43.8	1.0	-52.1	-13.0	-39.1	
5715.00	-13.6	V	3.0	43.7	1.0	-56.3	-13.0	-43.3	
7620.00	-12.3	V	3.0	42.4	1.0	-53.7	-13.0	-40.7	
9525.00	-15.0	V	3.0	41.0	1.0	-55.0	-13.0	-42.0	
11430.00	-9.2	V	3.0	41.0	1.0	-49.2	-13.0	-36.2	
3810.00	0.0	H	3.0	43.8	1.0	-42.9	-13.0	-29.9	
5715.00	-16.4	H	3.0	43.7	1.0	-59.1	-13.0	-46.1	
7620.00	-14.9	H	3.0	42.4	1.0	-56.3	-13.0	-43.3	
9525.00	-17.7	H	3.0	41.0	1.0	-57.7	-13.0	-44.7	
11430.00	-15.6	H	3.0	41.0	1.0	-55.7	-13.0	-42.7	

LTE

Band 2

5MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 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, 1852.5MHz									
3705.00	-13.0	V	3.0	43.8	1.0	-55.8	-13.0	-42.8	
5557.50	-14.3	V	3.0	43.7	1.0	-57.0	-13.0	-44.0	
7410.00	-10.1	V	3.0	42.5	1.0	-51.6	-13.0	-38.6	
9262.50	-16.0	V	3.0	41.3	1.0	-56.2	-13.0	-43.2	
11115.00	-7.9	V	3.0	40.9	1.0	-47.8	-13.0	-34.8	
3705.00	-9.0	H	3.0	43.8	1.0	-51.7	-13.0	-38.7	
5557.50	-16.8	H	3.0	43.7	1.0	-59.5	-13.0	-46.5	
7410.00	-15.5	H	3.0	42.5	1.0	-57.0	-13.0	-44.0	
9262.50	-18.9	H	3.0	41.3	1.0	-59.1	-13.0	-46.1	
11115.00	-15.4	H	3.0	40.9	1.0	-55.3	-13.0	-42.3	
Mid Ch, 1880MHz									
3760.00	-12.3	V	3.0	43.8	1.0	-55.1	-13.0	-42.1	
5640.00	-14.8	V	3.0	43.7	1.0	-57.5	-13.0	-44.5	
7520.00	-11.6	V	3.0	42.5	1.0	-53.0	-13.0	-40.0	
9400.00	-16.9	V	3.0	41.1	1.0	-57.1	-13.0	-44.1	
11280.00	-9.8	V	3.0	41.0	1.0	-49.8	-13.0	-36.8	
3760.00	-4.5	H	3.0	43.8	1.0	-47.3	-13.0	-34.3	
5640.00	-17.7	H	3.0	43.7	1.0	-60.4	-13.0	-47.4	
7520.00	-14.6	H	3.0	42.5	1.0	-56.0	-13.0	-43.0	
9400.00	-18.0	H	3.0	41.1	1.0	-58.1	-13.0	-45.1	
11280.00	-16.2	H	3.0	41.0	1.0	-56.2	-13.0	-43.2	
High Ch, 1907.5MHz									
3815.00	-9.5	V	3.0	43.8	1.0	-52.3	-13.0	-39.3	
5722.50	-13.1	V	3.0	43.7	1.0	-55.8	-13.0	-42.8	
7630.00	-11.7	V	3.0	42.4	1.0	-53.1	-13.0	-40.1	
9537.50	-14.6	V	3.0	41.0	1.0	-54.6	-13.0	-41.6	
11445.00	-8.2	V	3.0	41.0	1.0	-48.2	-13.0	-35.2	
3815.00	0.8	H	3.0	43.8	1.0	-42.0	-13.0	-29.0	
5722.50	-16.5	H	3.0	43.7	1.0	-59.2	-13.0	-46.2	
7630.00	-14.7	H	3.0	42.4	1.0	-56.1	-13.0	-43.1	
9537.50	-17.8	H	3.0	41.0	1.0	-57.8	-13.0	-44.8	
11445.00	-15.8	H	3.0	41.0	1.0	-55.8	-13.0	-42.8	

LTE

Band 2

5MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 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, 1852.5MHz									
3705.00	-13.7	V	3.0	43.8	1.0	-56.5	-13.0	-43.5	
5557.50	-14.9	V	3.0	43.7	1.0	-57.6	-13.0	-44.6	
7410.00	-10.8	V	3.0	42.5	1.0	-52.3	-13.0	-39.3	
9262.50	-16.3	V	3.0	41.3	1.0	-56.5	-13.0	-43.5	
11115.00	-8.7	V	3.0	40.9	1.0	-48.6	-13.0	-35.6	
3705.00	-9.8	H	3.0	43.8	1.0	-52.5	-13.0	-39.5	
5557.50	-17.2	H	3.0	43.7	1.0	-59.9	-13.0	-46.9	
7410.00	-15.8	H	3.0	42.5	1.0	-57.3	-13.0	-44.3	
9262.50	-19.0	H	3.0	41.3	1.0	-59.3	-13.0	-46.3	
11115.00	-15.6	H	3.0	40.9	1.0	-55.5	-13.0	-42.5	
Mid Ch, 1880MHz									
3760.00	-12.9	V	3.0	43.8	1.0	-55.7	-13.0	-42.7	
5640.00	-15.9	V	3.0	43.7	1.0	-58.6	-13.0	-45.6	
7520.00	-13.2	V	3.0	42.5	1.0	-54.6	-13.0	-41.6	
9400.00	-17.1	V	3.0	41.1	1.0	-57.2	-13.0	-44.2	
11280.00	-12.2	V	3.0	41.0	1.0	-52.2	-13.0	-39.2	
3760.00	-5.2	H	3.0	43.8	1.0	-48.0	-13.0	-35.0	
5640.00	-18.0	H	3.0	43.7	1.0	-60.7	-13.0	-47.7	
7520.00	-15.4	H	3.0	42.5	1.0	-56.8	-13.0	-43.8	
9400.00	-18.1	H	3.0	41.1	1.0	-58.2	-13.0	-45.2	
11280.00	-16.3	H	3.0	41.0	1.0	-56.2	-13.0	-43.2	
High Ch, 1907.5MHz									
3815.00	-10.0	V	3.0	43.8	1.0	-52.8	-13.0	-39.8	
5722.50	-13.7	V	3.0	43.7	1.0	-56.4	-13.0	-43.4	
7630.00	-12.3	V	3.0	42.4	1.0	-53.7	-13.0	-40.7	
9537.50	-14.9	V	3.0	41.0	1.0	-54.8	-13.0	-41.8	
11445.00	-8.9	V	3.0	41.0	1.0	-48.9	-13.0	-35.9	
3815.00	0.4	H	3.0	43.8	1.0	-42.4	-13.0	-29.4	
5722.50	-16.8	H	3.0	43.7	1.0	-59.5	-13.0	-46.5	
7630.00	-15.0	H	3.0	42.4	1.0	-56.4	-13.0	-43.4	
9537.50	-17.9	H	3.0	41.0	1.0	-57.9	-13.0	-44.9	
11445.00	-15.8	H	3.0	41.0	1.0	-55.8	-13.0	-42.8	

LTE

Band 2

3MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 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, 1851.5MHz									
3703.00	-16.1	V	3.0	43.8	1.0	-58.8	-13.0	-45.8	
5554.50	-14.4	V	3.0	43.7	1.0	-57.2	-13.0	-44.2	
7406.00	-11.0	V	3.0	42.5	1.0	-52.5	-13.0	-39.5	
9257.50	-16.0	V	3.0	41.3	1.0	-56.2	-13.0	-43.2	
11109.00	-7.0	V	3.0	40.9	1.0	-46.9	-13.0	-33.9	
3703.00	-10.7	H	3.0	43.8	1.0	-53.4	-13.0	-40.4	
5554.50	-17.2	H	3.0	43.7	1.0	-59.9	-13.0	-46.9	
7406.00	-15.3	H	3.0	42.5	1.0	-56.8	-13.0	-43.8	
9257.50	-19.1	H	3.0	41.3	1.0	-59.3	-13.0	-46.3	
11109.00	-10.2	H	3.0	40.9	1.0	-50.1	-13.0	-37.1	
Mid Ch, 1880MHz									
3760.00	-10.3	V	3.0	43.8	1.0	-53.1	-13.0	-40.1	
5640.00	-14.5	V	3.0	43.7	1.0	-57.2	-13.0	-44.2	
7520.00	-10.8	V	3.0	42.5	1.0	-52.3	-13.0	-39.3	
9400.00	-16.6	V	3.0	41.1	1.0	-56.7	-13.0	-43.7	
11280.00	-9.8	V	3.0	41.0	1.0	-49.8	-13.0	-36.8	
3760.00	-3.4	H	3.0	43.8	1.0	-46.2	-13.0	-33.2	
5640.00	-17.9	H	3.0	43.7	1.0	-60.6	-13.0	-47.6	
7520.00	-14.3	H	3.0	42.5	1.0	-55.7	-13.0	-42.7	
9400.00	-17.0	H	3.0	41.1	1.0	-57.1	-13.0	-44.1	
11280.00	-16.1	H	3.0	41.0	1.0	-56.1	-13.0	-43.1	
High Ch, 1908.5MHz									
3817.00	-7.6	V	3.0	43.8	1.0	-50.4	-13.0	-37.4	
5725.50	-12.3	V	3.0	43.7	1.0	-55.0	-13.0	-42.0	
7634.00	-11.9	V	3.0	42.4	1.0	-53.3	-13.0	-40.3	
9542.50	-15.1	V	3.0	41.0	1.0	-55.1	-13.0	-42.1	
11451.00	-7.8	V	3.0	41.0	1.0	-47.8	-13.0	-34.8	
3817.00	4.0	H	3.0	43.8	1.0	-38.8	-13.0	-25.8	
5725.50	-15.6	H	3.0	43.7	1.0	-58.3	-13.0	-45.3	
7634.00	-14.7	H	3.0	42.4	1.0	-56.1	-13.0	-43.1	
9542.50	-18.0	H	3.0	41.0	1.0	-58.0	-13.0	-45.0	
11451.00	-15.9	H	3.0	41.0	1.0	-56.0	-13.0	-43.0	

LTE

Band 2

3MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 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, 1851.5MHz									
3703.00	-15.0	V	3.0	43.8	1.0	-57.8	-13.0	-44.8	
5554.50	-15.3	V	3.0	43.7	1.0	-58.0	-13.0	-45.0	
7406.00	-11.3	V	3.0	42.5	1.0	-52.8	-13.0	-39.8	
9257.50	-16.6	V	3.0	41.3	1.0	-56.8	-13.0	-43.8	
11109.00	-9.3	V	3.0	40.9	1.0	-49.2	-13.0	-36.2	
3703.00	-11.3	H	3.0	43.8	1.0	-54.0	-13.0	-41.0	
5554.50	-17.8	H	3.0	43.7	1.0	-60.6	-13.0	-47.6	
7406.00	-15.3	H	3.0	42.5	1.0	-56.8	-13.0	-43.8	
9257.50	-19.1	H	3.0	41.3	1.0	-59.4	-13.0	-46.4	
11109.00	-16.1	H	3.0	40.9	1.0	-56.0	-13.0	-43.0	
Mid Ch, 1880MHz									
3760.00	-11.2	V	3.0	43.8	1.0	-54.0	-13.0	-41.0	
5640.00	-15.5	V	3.0	43.7	1.0	-58.2	-13.0	-45.2	
7520.00	-12.2	V	3.0	42.5	1.0	-53.7	-13.0	-40.7	
9400.00	-16.9	V	3.0	41.1	1.0	-57.0	-13.0	-44.0	
11280.00	-11.6	V	3.0	41.0	1.0	-51.6	-13.0	-38.6	
3760.00	-4.6	H	3.0	43.8	1.0	-47.4	-13.0	-34.4	
5640.00	-18.1	H	3.0	43.7	1.0	-60.8	-13.0	-47.8	
7520.00	-14.9	H	3.0	42.5	1.0	-56.3	-13.0	-43.3	
9400.00	-18.0	H	3.0	41.1	1.0	-58.1	-13.0	-45.1	
11280.00	-16.1	H	3.0	41.0	1.0	-56.1	-13.0	-43.1	
High Ch, 1908.5MHz									
3817.00	-9.7	V	3.0	43.8	1.0	-52.5	-13.0	-39.5	
5725.50	-12.9	V	3.0	43.7	1.0	-55.6	-13.0	-42.6	
7634.00	-12.0	V	3.0	42.4	1.0	-53.4	-13.0	-40.4	
9542.50	-15.0	V	3.0	41.0	1.0	-55.0	-13.0	-42.0	
11451.00	-9.7	V	3.0	41.0	1.0	-49.7	-13.0	-36.7	
3817.00	1.0	H	3.0	43.8	1.0	-41.8	-13.0	-28.8	
5725.50	-16.0	H	3.0	43.7	1.0	-58.7	-13.0	-45.7	
7634.00	-15.1	H	3.0	42.4	1.0	-56.5	-13.0	-43.5	
9542.50	-18.0	H	3.0	41.0	1.0	-57.9	-13.0	-44.9	
11451.00	-15.9	H	3.0	41.0	1.0	-55.9	-13.0	-42.9	

LTE

Band 2

1.4MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 2 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, 1850.7MHz									
3701.40	-15.5	V	3.0	43.8	1.0	-58.2	-13.0	-45.2	
5552.10	-15.1	V	3.0	43.7	1.0	-57.9	-13.0	-44.9	
7402.80	-12.0	V	3.0	42.5	1.0	-53.5	-13.0	-40.5	
9253.50	-16.5	V	3.0	41.3	1.0	-56.7	-13.0	-43.7	
11104.20	-8.3	V	3.0	40.9	1.0	-48.2	-13.0	-35.2	
3701.40	-9.5	H	3.0	43.8	1.0	-52.3	-13.0	-39.3	
5552.10	-15.8	H	3.0	43.7	1.0	-58.5	-13.0	-45.5	
7402.80	-14.9	H	3.0	42.5	1.0	-56.4	-13.0	-43.4	
9253.50	-17.9	H	3.0	41.3	1.0	-58.2	-13.0	-45.2	
11104.20	-8.7	H	3.0	40.9	1.0	-48.6	-13.0	-35.6	
Mid Ch, 1880MHz									
3760.00	-13.1	V	3.0	43.8	1.0	-55.9	-13.0	-42.9	
5640.00	-13.6	V	3.0	43.7	1.0	-56.3	-13.0	-43.3	
7520.00	-9.7	V	3.0	42.5	1.0	-51.2	-13.0	-38.2	
9400.00	-16.5	V	3.0	41.1	1.0	-56.6	-13.0	-43.6	
11280.00	-9.6	V	3.0	41.0	1.0	-49.5	-13.0	-36.5	
3760.00	-3.4	H	3.0	43.8	1.0	-46.1	-13.0	-33.1	
5640.00	-16.4	H	3.0	43.7	1.0	-59.1	-13.0	-46.1	
7520.00	-14.1	H	3.0	42.5	1.0	-55.6	-13.0	-42.6	
9400.00	-15.2	H	3.0	41.1	1.0	-55.4	-13.0	-42.4	
11280.00	-13.6	H	3.0	41.0	1.0	-53.6	-13.0	-40.6	
High Ch, 1909.3MHz									
3818.60	-4.7	V	3.0	43.8	1.0	-47.5	-13.0	-34.5	
5727.90	-12.2	V	3.0	43.7	1.0	-54.9	-13.0	-41.9	
7637.20	-11.2	V	3.0	42.4	1.0	-52.6	-13.0	-39.6	
9546.50	-15.9	V	3.0	41.0	1.0	-55.9	-13.0	-42.9	
11455.80	-6.8	V	3.0	41.0	1.0	-46.8	-13.0	-33.8	
3818.60	3.1	H	3.0	43.8	1.0	-39.7	-13.0	-26.7	
5727.90	-15.3	H	3.0	43.7	1.0	-58.0	-13.0	-45.0	
7637.20	-15.0	H	3.0	42.4	1.0	-56.4	-13.0	-43.4	
9546.50	-14.6	H	3.0	41.0	1.0	-54.5	-13.0	-41.5	
11455.80	-13.2	H	3.0	41.0	1.0	-53.2	-13.0	-40.2	

LTE

Band 2

1.4MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-08
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 2 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, 1850.7MHz									
3701.40	-15.0	V	3.0	43.8	1.0	-57.7	-13.0	-44.7	
5552.10	-14.7	V	3.0	43.7	1.0	-57.5	-13.0	-44.5	
7402.80	-11.4	V	3.0	42.5	1.0	-52.9	-13.0	-39.9	
9253.50	-16.3	V	3.0	41.3	1.0	-56.5	-13.0	-43.5	
11104.20	-9.1	V	3.0	40.9	1.0	-49.0	-13.0	-36.0	
3701.40	-9.9	H	3.0	43.8	1.0	-52.6	-13.0	-39.6	
5552.10	-16.7	H	3.0	43.7	1.0	-59.4	-13.0	-46.4	
7402.80	-15.5	H	3.0	42.5	1.0	-57.0	-13.0	-44.0	
9253.50	-18.9	H	3.0	41.3	1.0	-59.1	-13.0	-46.1	
11104.20	-14.8	H	3.0	40.9	1.0	-54.7	-13.0	-41.7	
Mid Ch, 1880MHz									
3760.00	-13.8	V	3.0	43.8	1.0	-56.6	-13.0	-43.6	
5640.00	-14.4	V	3.0	43.7	1.0	-57.1	-13.0	-44.1	
7520.00	-11.2	V	3.0	42.5	1.0	-52.6	-13.0	-39.6	
9400.00	-16.8	V	3.0	41.1	1.0	-56.9	-13.0	-43.9	
11280.00	-10.6	V	3.0	41.0	1.0	-50.5	-13.0	-37.5	
3760.00	-4.3	H	3.0	43.8	1.0	-47.1	-13.0	-34.1	
5640.00	-17.0	H	3.0	43.7	1.0	-59.7	-13.0	-46.7	
7520.00	-14.7	H	3.0	42.5	1.0	-56.2	-13.0	-43.2	
9400.00	-15.7	H	3.0	41.1	1.0	-55.8	-13.0	-42.8	
11280.00	-14.1	H	3.0	41.0	1.0	-54.0	-13.0	-41.0	
High Ch, 1909.3MHz									
3818.60	-5.4	V	3.0	43.8	1.0	-48.3	-13.0	-35.3	
5727.90	-13.0	V	3.0	43.7	1.0	-55.7	-13.0	-42.7	
7637.20	-12.2	V	3.0	42.4	1.0	-53.6	-13.0	-40.6	
9546.50	-16.3	V	3.0	41.0	1.0	-56.3	-13.0	-43.3	
11455.80	-8.0	V	3.0	41.0	1.0	-48.0	-13.0	-35.0	
3818.60	2.4	H	3.0	43.8	1.0	-40.4	-13.0	-27.4	
5727.90	-15.9	H	3.0	43.7	1.0	-58.6	-13.0	-45.6	
7637.20	-15.5	H	3.0	42.4	1.0	-56.8	-13.0	-43.8	
9546.50	-15.0	H	3.0	41.0	1.0	-55.0	-13.0	-42.0	
11455.80	-13.9	H	3.0	41.0	1.0	-53.9	-13.0	-40.9	

LTE Band 4

LTE

Band 4

20MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / AC Adapter / Craddle, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 Harmonics, 20MHz 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, 1720MHz									
3440.00	0.4	V	3.0	43.7	1.0	-42.2	-13.0	-29.2	
5160.00	-19.5	V	3.0	43.8	1.0	-62.3	-13.0	-49.3	
6880.00	-14.5	V	3.0	42.8	1.0	-56.4	-13.0	-43.4	
8600.00	-19.0	V	3.0	41.8	1.0	-59.8	-13.0	-46.8	
10320.00	-18.2	V	3.0	40.7	1.0	-57.8	-13.0	-44.8	
3440.00	5.3	H	3.0	43.7	1.0	-37.3	-13.0	-24.3	
5160.00	-20.1	H	3.0	43.8	1.0	-62.9	-13.0	-49.9	
6880.00	-16.1	H	3.0	42.8	1.0	-57.9	-13.0	-44.9	
8600.00	-18.3	H	3.0	41.8	1.0	-59.1	-13.0	-46.1	
10320.00	-18.7	H	3.0	40.7	1.0	-58.4	-13.0	-45.4	
Mid Ch, 1732.5MHz									
3465.00	1.1	V	3.0	43.7	1.0	-41.6	-13.0	-28.6	
5197.50	-18.2	V	3.0	43.8	1.0	-60.9	-13.0	-47.9	
6930.00	-13.9	V	3.0	42.8	1.0	-55.7	-13.0	-42.7	
8662.50	-18.5	V	3.0	41.7	1.0	-59.3	-13.0	-46.3	
10395.00	-18.7	V	3.0	40.7	1.0	-58.3	-13.0	-45.3	
3465.00	6.4	H	3.0	43.7	1.0	-36.2	-13.0	-23.2	
5197.50	-18.9	H	3.0	43.8	1.0	-61.7	-13.0	-48.7	
6930.00	-16.3	H	3.0	42.8	1.0	-58.1	-13.0	-45.1	
8662.50	-18.3	H	3.0	41.7	1.0	-59.1	-13.0	-46.1	
10395.00	-18.6	H	3.0	40.7	1.0	-58.2	-13.0	-45.2	
High Ch, 1745MHz									
3490.00	-3.2	V	3.0	43.7	1.0	-45.9	-13.0	-32.9	
5235.00	-18.6	V	3.0	43.8	1.0	-61.4	-13.0	-48.4	
6980.00	-14.4	V	3.0	42.7	1.0	-56.1	-13.0	-43.1	
8725.00	-19.2	V	3.0	41.7	1.0	-59.8	-13.0	-46.8	
10470.00	-16.9	V	3.0	40.7	1.0	-56.6	-13.0	-43.6	
3490.00	4.6	H	3.0	43.7	1.0	-38.1	-13.0	-25.1	
5235.00	-18.9	H	3.0	43.8	1.0	-61.6	-13.0	-48.6	
6980.00	-16.9	H	3.0	42.7	1.0	-58.6	-13.0	-45.6	
8725.00	-19.0	H	3.0	41.7	1.0	-59.7	-13.0	-46.7	
10470.00	-18.9	H	3.0	40.7	1.0	-58.6	-13.0	-45.6	

LTE

Band 4

20MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 47989
Configuration: EUT / AC Adapter / Craddle, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 Harmonics, 20MHz 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, 1720MHz									
3440.00	-3.9	V	3.0	43.7	1.0	-46.6	-13.0	-33.6	
5160.00	-19.8	V	3.0	43.8	1.0	-62.5	-13.0	-49.5	
6880.00	-17.6	V	3.0	42.8	1.0	-59.4	-13.0	-46.4	
8600.00	-19.3	V	3.0	41.8	1.0	-60.1	-13.0	-47.1	
10320.00	-19.1	V	3.0	40.7	1.0	-58.8	-13.0	-45.8	
3440.00	1.0	H	3.0	43.7	1.0	-41.7	-13.0	-28.7	
5160.00	-20.2	H	3.0	43.8	1.0	-62.9	-13.0	-49.9	
6880.00	-17.0	H	3.0	42.8	1.0	-58.9	-13.0	-45.9	
8600.00	-18.7	H	3.0	41.8	1.0	-59.5	-13.0	-46.5	
10320.00	-19.2	H	3.0	40.7	1.0	-58.9	-13.0	-45.9	
Mid Ch, 1732.5MHz									
3465.00	-0.2	V	3.0	43.7	1.0	-42.8	-13.0	-29.8	
5197.50	-18.3	V	3.0	43.8	1.0	-61.1	-13.0	-48.1	
6930.00	-15.3	V	3.0	42.8	1.0	-57.1	-13.0	-44.1	
8662.50	-19.2	V	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10395.00	-17.1	V	3.0	40.7	1.0	-56.7	-13.0	-43.7	
3465.00	5.4	H	3.0	43.7	1.0	-37.3	-13.0	-24.3	
5197.50	-18.6	H	3.0	43.8	1.0	-61.4	-13.0	-48.4	
6930.00	-17.7	H	3.0	42.8	1.0	-59.5	-13.0	-46.5	
8662.50	-17.9	H	3.0	41.7	1.0	-58.7	-13.0	-45.7	
10395.00	-17.2	H	3.0	40.7	1.0	-56.9	-13.0	-43.9	
High Ch, 1745MHz									
3490.00	-4.0	V	3.0	43.7	1.0	-46.7	-13.0	-33.7	
5235.00	-18.6	V	3.0	43.8	1.0	-61.3	-13.0	-48.3	
6980.00	-14.7	V	3.0	42.7	1.0	-56.5	-13.0	-43.5	
8725.00	-19.5	V	3.0	41.7	1.0	-60.2	-13.0	-47.2	
10470.00	-17.3	V	3.0	40.7	1.0	-57.0	-13.0	-44.0	
3490.00	3.1	H	3.0	43.7	1.0	-39.6	-13.0	-26.6	
5235.00	-18.9	H	3.0	43.8	1.0	-61.6	-13.0	-48.6	
6980.00	-17.1	H	3.0	42.7	1.0	-58.8	-13.0	-45.8	
8725.00	-19.1	H	3.0	41.7	1.0	-59.8	-13.0	-46.8	
10470.00	-18.9	H	3.0	40.7	1.0	-58.6	-13.0	-45.6	

LTE

Band 4

15MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 Harmonics, 15MHz 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, 1717.5MHz									
3435.00	-7.9	V	3.0	43.7	1.0	-50.6	-13.0	-37.6	
5152.50	-20.0	V	3.0	43.8	1.0	-62.8	-13.0	-49.8	
6870.00	-17.3	V	3.0	42.8	1.0	-59.1	-13.0	-46.1	
8587.50	-19.6	V	3.0	41.8	1.0	-60.4	-13.0	-47.4	
10305.00	-19.2	V	3.0	40.6	1.0	-58.9	-13.0	-45.9	
3435.00	1.4	H	3.0	43.7	1.0	-41.3	-13.0	-28.3	
5152.50	-20.4	H	3.0	43.8	1.0	-63.2	-13.0	-50.2	
6870.00	-16.9	H	3.0	42.8	1.0	-58.8	-13.0	-45.8	
8587.50	-19.0	H	3.0	41.8	1.0	-59.8	-13.0	-46.8	
10305.00	-19.2	H	3.0	40.6	1.0	-58.8	-13.0	-45.8	
Mid Ch, 1732.5MHz									
3465.00	-5.9	V	3.0	43.7	1.0	-48.5	-13.0	-35.5	
5197.50	-19.0	V	3.0	43.8	1.0	-61.7	-13.0	-48.7	
6930.00	-17.2	V	3.0	42.8	1.0	-59.0	-13.0	-46.0	
8662.50	-19.2	V	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10395.00	-18.6	V	3.0	40.7	1.0	-58.3	-13.0	-45.3	
3465.00	4.2	H	3.0	43.7	1.0	-38.5	-13.0	-25.5	
5197.50	-19.3	H	3.0	43.8	1.0	-62.1	-13.0	-49.1	
6930.00	-17.2	H	3.0	42.8	1.0	-59.0	-13.0	-46.0	
8662.50	-18.8	H	3.0	41.7	1.0	-59.6	-13.0	-46.6	
10395.00	-19.2	H	3.0	40.7	1.0	-58.8	-13.0	-45.8	
High Ch, 1747.5MHz									
3495.00	-6.7	V	3.0	43.7	1.0	-49.4	-13.0	-36.4	
5242.50	-18.3	V	3.0	43.8	1.0	-61.0	-13.0	-48.0	
6990.00	-13.8	V	3.0	42.7	1.0	-55.5	-13.0	-42.5	
8737.50	-19.8	V	3.0	41.7	1.0	-60.5	-13.0	-47.5	
10485.00	-16.6	V	3.0	40.7	1.0	-56.3	-13.0	-43.3	
3495.00	2.0	H	3.0	43.7	1.0	-40.7	-13.0	-27.7	
5242.50	-18.7	H	3.0	43.8	1.0	-61.5	-13.0	-48.5	
6990.00	-17.8	H	3.0	42.7	1.0	-59.6	-13.0	-46.6	
8737.50	-19.2	H	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10485.00	-18.2	H	3.0	40.7	1.0	-57.9	-13.0	-44.9	

LTE

Band 4

15MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 Harmonics, 15MHz 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, 1717.5MHz									
3435.00	-8.5	V	3.0	43.7	1.0	-51.2	-13.0	-38.2	
5152.50	-20.0	V	3.0	43.8	1.0	-62.8	-13.0	-49.8	
6870.00	-17.3	V	3.0	42.8	1.0	-59.2	-13.0	-46.2	
8587.50	-19.5	V	3.0	41.8	1.0	-60.3	-13.0	-47.3	
10305.00	-19.2	V	3.0	40.6	1.0	-58.9	-13.0	-45.9	
3435.00	0.4	H	3.0	43.7	1.0	-42.3	-13.0	-29.3	
5152.50	-20.3	H	3.0	43.8	1.0	-63.1	-13.0	-50.1	
6870.00	-16.9	H	3.0	42.8	1.0	-58.7	-13.0	-45.7	
8587.50	-19.1	H	3.0	41.8	1.0	-59.8	-13.0	-46.8	
10305.00	-19.3	H	3.0	40.6	1.0	-59.0	-13.0	-46.0	
Mid Ch, 1732.5MHz									
3465.00	-7.3	V	3.0	43.7	1.0	-50.0	-13.0	-37.0	
5197.50	-19.0	V	3.0	43.8	1.0	-61.8	-13.0	-48.8	
6930.00	-17.4	V	3.0	42.8	1.0	-59.2	-13.0	-46.2	
8662.50	-19.3	V	3.0	41.7	1.0	-60.0	-13.0	-47.0	
10395.00	-19.0	V	3.0	40.7	1.0	-58.7	-13.0	-45.7	
3465.00	2.3	H	3.0	43.7	1.0	-40.4	-13.0	-27.4	
5197.50	-19.3	H	3.0	43.8	1.0	-62.1	-13.0	-49.1	
6930.00	-17.2	H	3.0	42.8	1.0	-59.0	-13.0	-46.0	
8662.50	-19.0	H	3.0	41.7	1.0	-59.7	-13.0	-46.7	
10395.00	-19.1	H	3.0	40.7	1.0	-58.8	-13.0	-45.8	
High Ch, 1747.5MHz									
3495.00	-8.0	V	3.0	43.7	1.0	-50.7	-13.0	-37.7	
5242.50	-18.3	V	3.0	43.8	1.0	-61.1	-13.0	-48.1	
6990.00	-15.2	V	3.0	42.7	1.0	-56.9	-13.0	-43.9	
8737.50	-19.8	V	3.0	41.7	1.0	-60.5	-13.0	-47.5	
10485.00	-17.2	V	3.0	40.7	1.0	-56.9	-13.0	-43.9	
3495.00	1.0	H	3.0	43.7	1.0	-41.7	-13.0	-28.7	
5242.50	-18.8	H	3.0	43.8	1.0	-61.5	-13.0	-48.5	
6990.00	-17.8	H	3.0	42.7	1.0	-59.6	-13.0	-46.6	
8737.50	-19.2	H	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10485.00	-18.2	H	3.0	40.7	1.0	-57.9	-13.0	-44.9	

LTE

Band 4

10MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 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, 1715MHz									
3430.00	-5.6	V	3.0	43.7	1.0	-48.2	-13.0	-35.2	
5145.00	-19.9	V	3.0	43.8	1.0	-62.6	-13.0	-49.6	
6860.00	-17.6	V	3.0	42.9	1.0	-59.4	-13.0	-46.4	
8575.00	-19.5	V	3.0	41.8	1.0	-60.3	-13.0	-47.3	
10290.00	-18.9	V	3.0	40.6	1.0	-58.6	-13.0	-45.6	
3430.00	3.1	H	3.0	43.7	1.0	-39.5	-13.0	-26.5	
5145.00	-20.2	H	3.0	43.8	1.0	-62.9	-13.0	-49.9	
6860.00	-16.9	H	3.0	42.9	1.0	-58.7	-13.0	-45.7	
8575.00	-18.9	H	3.0	41.8	1.0	-59.7	-13.0	-46.7	
10290.00	-19.0	H	3.0	40.6	1.0	-58.7	-13.0	-45.7	
Mid Ch, 1732.5MHz									
3465.00	-4.8	V	3.0	43.7	1.0	-47.5	-13.0	-34.5	
5197.50	-19.0	V	3.0	43.8	1.0	-61.7	-13.0	-48.7	
6930.00	-15.2	V	3.0	42.8	1.0	-57.0	-13.0	-44.0	
8662.50	-19.1	V	3.0	41.7	1.0	-59.8	-13.0	-46.8	
10395.00	-18.4	V	3.0	40.7	1.0	-58.0	-13.0	-45.0	
3465.00	2.9	H	3.0	43.7	1.0	-39.8	-13.0	-26.8	
5197.50	-19.2	H	3.0	43.8	1.0	-62.0	-13.0	-49.0	
6930.00	-17.5	H	3.0	42.8	1.0	-59.3	-13.0	-46.3	
8662.50	-18.9	H	3.0	41.7	1.0	-59.7	-13.0	-46.7	
10395.00	-19.2	H	3.0	40.7	1.0	-58.9	-13.0	-45.9	
High Ch, 1750MHz									
3500.00	-5.8	V	3.0	43.7	1.0	-48.5	-13.0	-35.5	
5250.00	-17.1	V	3.0	43.8	1.0	-59.9	-13.0	-46.9	
7000.00	-14.3	V	3.0	42.7	1.0	-56.1	-13.0	-43.1	
8750.00	-19.9	V	3.0	41.7	1.0	-60.6	-13.0	-47.6	
10500.00	-16.5	V	3.0	40.7	1.0	-56.2	-13.0	-43.2	
3500.00	1.9	H	3.0	43.7	1.0	-40.8	-13.0	-27.8	
5250.00	-18.5	H	3.0	43.8	1.0	-61.3	-13.0	-48.3	
7000.00	-17.7	H	3.0	42.7	1.0	-59.5	-13.0	-46.5	
8750.00	-19.2	H	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10500.00	-18.4	H	3.0	40.7	1.0	-58.1	-13.0	-45.1	

LTE

Band 4

10MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 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, 1715MHz									
3430.00	-6.8	V	3.0	43.7	1.0	-49.5	-13.0	-36.5	
5145.00	-19.8	V	3.0	43.8	1.0	-62.6	-13.0	-49.6	
6860.00	-17.1	V	3.0	42.9	1.0	-59.0	-13.0	-46.0	
8575.00	-18.8	V	3.0	41.8	1.0	-59.5	-13.0	-46.5	
10290.00	-18.6	V	3.0	40.6	1.0	-58.2	-13.0	-45.2	
3430.00	1.8	H	3.0	43.7	1.0	-40.9	-13.0	-27.9	
5145.00	-20.2	H	3.0	43.8	1.0	-63.0	-13.0	-50.0	
6860.00	-16.8	H	3.0	42.9	1.0	-58.7	-13.0	-45.7	
8575.00	-19.0	H	3.0	41.8	1.0	-59.8	-13.0	-46.8	
10290.00	-19.0	H	3.0	40.6	1.0	-58.6	-13.0	-45.6	
Mid Ch, 1732.5MHz									
3465.00	-6.6	V	3.0	43.7	1.0	-49.3	-13.0	-36.3	
5197.50	-18.9	V	3.0	43.8	1.0	-61.7	-13.0	-48.7	
6930.00	-17.8	V	3.0	42.8	1.0	-59.6	-13.0	-46.6	
8662.50	-19.0	V	3.0	41.7	1.0	-59.7	-13.0	-46.7	
10395.00	-18.8	V	3.0	40.7	1.0	-58.5	-13.0	-45.5	
3465.00	0.8	H	3.0	43.7	1.0	-41.9	-13.0	-28.9	
5197.50	-19.1	H	3.0	43.8	1.0	-61.9	-13.0	-48.9	
6930.00	-17.5	H	3.0	42.8	1.0	-59.3	-13.0	-46.3	
8662.50	-19.0	H	3.0	41.7	1.0	-59.7	-13.0	-46.7	
10395.00	-19.2	H	3.0	40.7	1.0	-58.8	-13.0	-45.8	
High Ch, 1750MHz									
3500.00	-6.5	V	3.0	43.7	1.0	-49.2	-13.0	-36.2	
5250.00	-17.6	V	3.0	43.8	1.0	-60.4	-13.0	-47.4	
7000.00	-15.4	V	3.0	42.7	1.0	-57.1	-13.0	-44.1	
8750.00	-19.9	V	3.0	41.7	1.0	-60.6	-13.0	-47.6	
10500.00	-16.9	V	3.0	40.7	1.0	-56.6	-13.0	-43.6	
3500.00	1.1	H	3.0	43.7	1.0	-41.6	-13.0	-28.6	
5250.00	-18.5	H	3.0	43.8	1.0	-61.3	-13.0	-48.3	
7000.00	-17.8	H	3.0	42.7	1.0	-59.5	-13.0	-46.5	
8750.00	-19.2	H	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10500.00	-18.4	H	3.0	40.7	1.0	-58.1	-13.0	-45.1	

LTE

Band 4

5MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 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, 1712.5MHz									
3425.00	-5.3	V	3.0	43.7	1.0	-47.9	-13.0	-34.9	
5137.50	-19.7	V	3.0	43.8	1.0	-62.4	-13.0	-49.4	
6850.00	-16.6	V	3.0	42.9	1.0	-58.5	-13.0	-45.5	
8562.50	-18.9	V	3.0	41.8	1.0	-59.7	-13.0	-46.7	
10275.00	-18.1	V	3.0	40.6	1.0	-57.7	-13.0	-44.7	
3425.00	3.9	H	3.0	43.7	1.0	-38.7	-13.0	-25.7	
5137.50	-19.8	H	3.0	43.8	1.0	-62.6	-13.0	-49.6	
6850.00	-16.7	H	3.0	42.9	1.0	-58.6	-13.0	-45.6	
8562.50	-18.8	H	3.0	41.8	1.0	-59.6	-13.0	-46.6	
10275.00	-18.8	H	3.0	40.6	1.0	-58.4	-13.0	-45.4	
Mid Ch, 1732.5MHz									
3465.00	1.5	V	3.0	43.7	1.0	-41.2	-13.0	-28.2	
5197.50	-19.1	V	3.0	43.8	1.0	-61.8	-13.0	-48.8	
6930.00	-17.0	V	3.0	42.8	1.0	-58.7	-13.0	-45.7	
8662.50	-19.2	V	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10395.00	-18.8	V	3.0	40.7	1.0	-58.5	-13.0	-45.5	
3465.00	3.6	H	3.0	43.7	1.0	-39.1	-13.0	-26.1	
5197.50	-19.3	H	3.0	43.8	1.0	-62.0	-13.0	-49.0	
6930.00	-17.4	H	3.0	42.8	1.0	-59.2	-13.0	-46.2	
8662.50	-18.9	H	3.0	41.7	1.0	-59.6	-13.0	-46.6	
10395.00	-19.2	H	3.0	40.7	1.0	-58.9	-13.0	-45.9	
High Ch, 1752.5MHz									
3505.00	-5.3	V	3.0	43.7	1.0	-48.0	-13.0	-35.0	
5257.50	-17.6	V	3.0	43.8	1.0	-60.4	-13.0	-47.4	
7010.00	-14.8	V	3.0	42.7	1.0	-56.5	-13.0	-43.5	
8762.50	-19.4	V	3.0	41.7	1.0	-60.1	-13.0	-47.1	
10515.00	-16.4	V	3.0	40.7	1.0	-56.1	-13.0	-43.1	
3505.00	1.6	H	3.0	43.7	1.0	-41.1	-13.0	-28.1	
5257.50	-18.5	H	3.0	43.8	1.0	-61.3	-13.0	-48.3	
7010.00	-17.8	H	3.0	42.7	1.0	-59.6	-13.0	-46.6	
8762.50	-19.4	H	3.0	41.7	1.0	-60.1	-13.0	-47.1	
10515.00	-18.4	H	3.0	40.7	1.0	-58.1	-13.0	-45.1	

LTE

Band 4

5MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 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, 1712.5MHz									
3425.00	-7.9	V	3.0	43.7	1.0	-50.6	-13.0	-37.6	
5137.50	-19.6	V	3.0	43.8	1.0	-62.3	-13.0	-49.3	
6850.00	-17.2	V	3.0	42.9	1.0	-59.0	-13.0	-46.0	
8562.50	-18.8	V	3.0	41.8	1.0	-59.6	-13.0	-46.6	
10275.00	-18.4	V	3.0	40.6	1.0	-58.0	-13.0	-45.0	
3425.00	1.3	H	3.0	43.7	1.0	-41.4	-13.0	-28.4	
5137.50	-19.9	H	3.0	43.8	1.0	-62.7	-13.0	-49.7	
6850.00	-16.8	H	3.0	42.9	1.0	-58.7	-13.0	-45.7	
8562.50	-18.6	H	3.0	41.8	1.0	-59.5	-13.0	-46.5	
10275.00	-18.7	H	3.0	40.6	1.0	-58.4	-13.0	-45.4	
Mid Ch, 1732.5MHz									
3465.00	-0.5	V	3.0	43.7	1.0	-43.2	-13.0	-30.2	
5197.50	-19.0	V	3.0	43.8	1.0	-61.8	-13.0	-48.8	
6930.00	-17.3	V	3.0	42.8	1.0	-59.1	-13.0	-46.1	
8662.50	-19.4	V	3.0	41.7	1.0	-60.1	-13.0	-47.1	
10395.00	-19.1	V	3.0	40.7	1.0	-58.8	-13.0	-45.8	
3465.00	1.4	H	3.0	43.7	1.0	-41.3	-13.0	-28.3	
5197.50	-19.3	H	3.0	43.8	1.0	-62.1	-13.0	-49.1	
6930.00	-17.5	H	3.0	42.8	1.0	-59.3	-13.0	-46.3	
8662.50	-18.9	H	3.0	41.7	1.0	-59.7	-13.0	-46.7	
10395.00	-19.2	H	3.0	40.7	1.0	-58.9	-13.0	-45.9	
High Ch, 1752.5MHz									
3505.00	-6.5	V	3.0	43.7	1.0	-49.2	-13.0	-36.2	
5257.50	-17.7	V	3.0	43.8	1.0	-60.5	-13.0	-47.5	
7010.00	-15.1	V	3.0	42.7	1.0	-56.8	-13.0	-43.8	
8762.50	-19.5	V	3.0	41.7	1.0	-60.2	-13.0	-47.2	
10515.00	-16.9	V	3.0	40.7	1.0	-56.6	-13.0	-43.6	
3505.00	0.6	H	3.0	43.7	1.0	-42.1	-13.0	-29.1	
5257.50	-18.5	H	3.0	43.8	1.0	-61.2	-13.0	-48.2	
7010.00	-17.8	H	3.0	42.7	1.0	-59.5	-13.0	-46.5	
8762.50	-19.4	H	3.0	41.7	1.0	-60.1	-13.0	-47.1	
10515.00	-18.4	H	3.0	40.7	1.0	-58.1	-13.0	-45.1	

LTE

Band 4

3MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 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, 1711.5MHz									
3423.00	-6.0	V	3.0	43.7	1.0	-48.6	-13.0	-35.6	
5134.50	-19.4	V	3.0	43.8	1.0	-62.2	-13.0	-49.2	
6846.00	-16.7	V	3.0	42.9	1.0	-58.6	-13.0	-45.6	
8557.50	-18.6	V	3.0	41.8	1.0	-59.5	-13.0	-46.5	
10269.00	-17.8	V	3.0	40.6	1.0	-57.4	-13.0	-44.4	
3423.00	3.1	H	3.0	43.7	1.0	-39.5	-13.0	-26.5	
5134.50	-19.7	H	3.0	43.8	1.0	-62.5	-13.0	-49.5	
6846.00	-16.7	H	3.0	42.9	1.0	-58.6	-13.0	-45.6	
8557.50	-18.7	H	3.0	41.8	1.0	-59.5	-13.0	-46.5	
10269.00	-18.2	H	3.0	40.6	1.0	-57.9	-13.0	-44.9	
Mid Ch, 1732.5MHz									
3465.00	-0.4	V	3.0	43.7	1.0	-43.1	-13.0	-30.1	
5197.50	-18.9	V	3.0	43.8	1.0	-61.6	-13.0	-48.6	
6930.00	-17.2	V	3.0	42.8	1.0	-59.0	-13.0	-46.0	
8662.50	-19.4	V	3.0	41.7	1.0	-60.1	-13.0	-47.1	
10395.00	-18.4	V	3.0	40.7	1.0	-58.1	-13.0	-45.1	
3465.00	2.5	H	3.0	43.7	1.0	-40.1	-13.0	-27.1	
5197.50	-19.1	H	3.0	43.8	1.0	-61.9	-13.0	-48.9	
6930.00	-17.1	H	3.0	42.8	1.0	-58.9	-13.0	-45.9	
8662.50	-18.5	H	3.0	41.7	1.0	-59.3	-13.0	-46.3	
10395.00	-18.8	H	3.0	40.7	1.0	-58.4	-13.0	-45.4	
High Ch, 1753.5MHz									
3507.00	-6.2	V	3.0	43.7	1.0	-48.9	-13.0	-35.9	
5260.50	-17.8	V	3.0	43.8	1.0	-60.6	-13.0	-47.6	
7014.00	-13.6	V	3.0	42.7	1.0	-55.3	-13.0	-42.3	
8767.50	-18.9	V	3.0	41.7	1.0	-59.5	-13.0	-46.5	
10521.00	-16.8	V	3.0	40.7	1.0	-56.5	-13.0	-43.5	
3507.00	1.4	H	3.0	43.7	1.0	-41.3	-13.0	-28.3	
5260.50	-18.1	H	3.0	43.8	1.0	-60.9	-13.0	-47.9	
7014.00	-13.6	H	3.0	42.7	1.0	-55.3	-13.0	-42.3	
8767.50	-19.3	H	3.0	41.7	1.0	-60.0	-13.0	-47.0	
10521.00	-18.2	H	3.0	40.7	1.0	-57.9	-13.0	-44.9	

LTE

Band 4

3MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 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, 1711.5MHz									
3423.00	-6.6	V	3.0	43.7	1.0	-49.2	-13.0	-36.2	
5134.50	-19.4	V	3.0	43.8	1.0	-62.1	-13.0	-49.1	
6846.00	-17.3	V	3.0	42.9	1.0	-59.1	-13.0	-46.1	
8557.50	-18.9	V	3.0	41.8	1.0	-59.7	-13.0	-46.7	
10269.00	-17.9	V	3.0	40.6	1.0	-57.5	-13.0	-44.5	
3423.00	2.2	H	3.0	43.7	1.0	-40.5	-13.0	-27.5	
5134.50	-19.7	H	3.0	43.8	1.0	-62.4	-13.0	-49.4	
6846.00	-16.8	H	3.0	42.9	1.0	-58.7	-13.0	-45.7	
8557.50	-18.5	H	3.0	41.8	1.0	-59.3	-13.0	-46.3	
10269.00	-18.3	H	3.0	40.6	1.0	-58.0	-13.0	-45.0	
Mid Ch, 1732.5MHz									
3465.00	-2.1	V	3.0	43.7	1.0	-44.8	-13.0	-31.8	
5197.50	-18.8	V	3.0	43.8	1.0	-61.6	-13.0	-48.6	
6930.00	-17.3	V	3.0	42.8	1.0	-59.1	-13.0	-46.1	
8662.50	-19.3	V	3.0	41.7	1.0	-60.0	-13.0	-47.0	
10395.00	-18.9	V	3.0	40.7	1.0	-58.5	-13.0	-45.5	
3465.00	0.7	H	3.0	43.7	1.0	-42.0	-13.0	-29.0	
5197.50	-19.1	H	3.0	43.8	1.0	-61.9	-13.0	-48.9	
6930.00	-17.2	H	3.0	42.8	1.0	-58.9	-13.0	-45.9	
8662.50	-18.7	H	3.0	41.7	1.0	-59.4	-13.0	-46.4	
10395.00	-18.7	H	3.0	40.7	1.0	-58.4	-13.0	-45.4	
High Ch, 1753.5MHz									
3507.00	-7.0	V	3.0	43.7	1.0	-49.7	-13.0	-36.7	
5260.50	-18.1	V	3.0	43.8	1.0	-60.9	-13.0	-47.9	
7014.00	-14.8	V	3.0	42.7	1.0	-56.6	-13.0	-43.6	
8767.50	-19.2	V	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10521.00	-17.3	V	3.0	40.7	1.0	-57.0	-13.0	-44.0	
3507.00	0.3	H	3.0	43.7	1.0	-42.4	-13.0	-29.4	
5260.50	-18.4	H	3.0	43.8	1.0	-61.2	-13.0	-48.2	
7014.00	-13.5	H	3.0	42.7	1.0	-55.2	-13.0	-42.2	
8767.50	-19.3	H	3.0	41.7	1.0	-60.0	-13.0	-47.0	
10521.00	-18.2	H	3.0	40.7	1.0	-57.9	-13.0	-44.9	

LTE

Band 4

1.4MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 4 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, 1710.7MHz									
3421.40	-5.9	V	3.0	43.7	1.0	-48.6	-13.0	-35.6	
5132.10	-19.4	V	3.0	43.8	1.0	-62.2	-13.0	-49.2	
6842.80	-17.3	V	3.0	42.9	1.0	-59.2	-13.0	-46.2	
8553.50	-18.5	V	3.0	41.8	1.0	-59.3	-13.0	-46.3	
10264.20	-18.2	V	3.0	40.6	1.0	-57.9	-13.0	-44.9	
3421.40	3.3	H	3.0	43.7	1.0	-39.4	-13.0	-26.4	
5132.10	-19.8	H	3.0	43.8	1.0	-62.6	-13.0	-49.6	
6842.80	-17.0	H	3.0	42.9	1.0	-58.8	-13.0	-45.8	
8553.50	-18.6	H	3.0	41.8	1.0	-59.4	-13.0	-46.4	
10264.20	-18.6	H	3.0	40.6	1.0	-58.3	-13.0	-45.3	
Mid Ch, 1732.5MHz									
3465.00	1.8	V	3.0	43.7	1.0	-40.9	-13.0	-27.9	
5197.50	-18.8	V	3.0	43.8	1.0	-61.6	-13.0	-48.6	
6930.00	-16.0	V	3.0	42.8	1.0	-57.8	-13.0	-44.8	
8662.50	-19.0	V	3.0	41.7	1.0	-59.8	-13.0	-46.8	
10395.00	-18.4	V	3.0	40.7	1.0	-58.1	-13.0	-45.1	
3465.00	3.0	H	3.0	43.7	1.0	-39.6	-13.0	-26.6	
5197.50	-19.3	H	3.0	43.8	1.0	-62.0	-13.0	-49.0	
6930.00	-17.3	H	3.0	42.8	1.0	-59.1	-13.0	-46.1	
8662.50	-18.9	H	3.0	41.7	1.0	-59.7	-13.0	-46.7	
10395.00	-18.7	H	3.0	40.7	1.0	-58.3	-13.0	-45.3	
High Ch, 1754.3MHz									
3508.60	-3.1	V	3.0	43.7	1.0	-45.8	-13.0	-32.8	
5262.90	-17.9	V	3.0	43.8	1.0	-60.6	-13.0	-47.6	
7017.20	-12.6	V	3.0	42.7	1.0	-54.4	-13.0	-41.4	
8771.50	-18.7	V	3.0	41.7	1.0	-59.3	-13.0	-46.3	
10525.80	-15.8	V	3.0	40.7	1.0	-55.5	-13.0	-42.5	
3508.60	1.5	H	3.0	43.7	1.0	-41.2	-13.0	-28.2	
5262.90	-18.4	H	3.0	43.8	1.0	-61.2	-13.0	-48.2	
7017.20	-16.9	H	3.0	42.7	1.0	-58.6	-13.0	-45.6	
8771.50	-18.9	H	3.0	41.7	1.0	-59.6	-13.0	-46.6	
10525.80	-18.1	H	3.0	40.7	1.0	-57.8	-13.0	-44.8	

LTE

Band 4

1.4MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-15
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 4 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, 1710.7MHz									
3421.40	-6.4	V	3.0	43.7	1.0	-49.1	-13.0	-36.1	
5132.10	-18.7	V	3.0	43.8	1.0	-61.4	-13.0	-48.4	
6842.80	-15.3	V	3.0	42.9	1.0	-57.2	-13.0	-44.2	
8553.50	-17.9	V	3.0	41.8	1.0	-58.8	-13.0	-45.8	
10264.20	-17.9	V	3.0	40.6	1.0	-57.5	-13.0	-44.5	
3421.40	3.6	H	3.0	43.7	1.0	-39.1	-13.0	-26.1	
5132.10	-19.5	H	3.0	43.8	1.0	-62.3	-13.0	-49.3	
6842.80	-16.7	H	3.0	42.9	1.0	-58.6	-13.0	-45.6	
8553.50	-18.2	H	3.0	41.8	1.0	-59.1	-13.0	-46.1	
10264.20	-18.3	H	3.0	40.6	1.0	-58.0	-13.0	-45.0	
Mid Ch, 1732.5MHz									
3465.00	-7.0	V	3.0	43.7	1.0	-49.7	-13.0	-36.7	
5197.50	-18.7	V	3.0	43.8	1.0	-61.5	-13.0	-48.5	
6930.00	-15.5	V	3.0	42.8	1.0	-57.2	-13.0	-44.2	
8662.50	-19.1	V	3.0	41.7	1.0	-59.9	-13.0	-46.9	
10395.00	-18.5	V	3.0	40.7	1.0	-58.1	-13.0	-45.1	
3465.00	1.8	H	3.0	43.7	1.0	-40.9	-13.0	-27.9	
5197.50	-19.1	H	3.0	43.8	1.0	-61.9	-13.0	-48.9	
6930.00	-16.8	H	3.0	42.8	1.0	-58.5	-13.0	-45.5	
8662.50	-18.4	H	3.0	41.7	1.0	-59.2	-13.0	-46.2	
10395.00	-17.8	H	3.0	40.7	1.0	-57.4	-13.0	-44.4	
High Ch, 1754.3MHz									
3508.60	-4.8	V	3.0	43.7	1.0	-47.5	-13.0	-34.5	
5262.90	-18.0	V	3.0	43.8	1.0	-60.7	-13.0	-47.7	
7017.20	-13.2	V	3.0	42.7	1.0	-54.9	-13.0	-41.9	
8771.50	-18.8	V	3.0	41.7	1.0	-59.5	-13.0	-46.5	
10525.80	-16.8	V	3.0	40.7	1.0	-56.5	-13.0	-43.5	
3508.60	0.0	H	3.0	43.7	1.0	-42.7	-13.0	-29.7	
5262.90	-18.3	H	3.0	43.8	1.0	-61.1	-13.0	-48.1	
7017.20	-17.4	H	3.0	42.7	1.0	-59.2	-13.0	-46.2	
8771.50	-18.8	H	3.0	41.7	1.0	-59.5	-13.0	-46.5	
10525.80	-18.2	H	3.0	40.7	1.0	-57.9	-13.0	-44.9	

LTE Band 5

LTE

Band 5

10MHz

QPSK

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

Company:	Samsung
Project #:	4788481138
Date:	2018-06-18
Test Engineer:	51072
Configuration:	EUT / Adapter / Earphone , X-position
Location:	Chamber 2
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	-17.8	V	3.0	38.2	1.0	-55.0	-13.0	-42.0	
2487.00	-4.1	V	3.0	38.8	1.0	-41.9	-13.0	-28.9	
3316.00	-22.3	V	3.0	39.4	1.0	-60.7	-13.0	-47.7	
4145.00	-18.9	V	3.0	39.8	1.0	-57.7	-13.0	-44.7	
4974.00	-20.0	V	3.0	39.8	1.0	-58.8	-13.0	-45.8	
1658.00	-19.1	H	3.0	38.2	1.0	-56.3	-13.0	-43.3	
2487.00	-1.2	H	3.0	38.8	1.0	-39.0	-13.0	-26.0	
3316.00	-22.0	H	3.0	39.4	1.0	-60.5	-13.0	-47.5	
4145.00	-20.4	H	3.0	39.8	1.0	-59.2	-13.0	-46.2	
4974.00	-20.7	H	3.0	39.8	1.0	-59.5	-13.0	-46.5	
Mid Ch, 836.5MHz									
1673.00	-17.9	V	3.0	38.2	1.0	-55.1	-13.0	-42.1	
2509.50	-2.2	V	3.0	38.8	1.0	-40.0	-13.0	-27.0	
3346.00	-21.3	V	3.0	39.5	1.0	-59.8	-13.0	-46.8	
4182.50	-18.6	V	3.0	39.8	1.0	-57.4	-13.0	-44.4	
5019.00	-19.4	V	3.0	39.8	1.0	-58.2	-13.0	-45.2	
1673.00	-18.0	H	3.0	38.2	1.0	-55.2	-13.0	-42.2	
2509.50	0.9	H	3.0	38.8	1.0	-36.9	-13.0	-23.9	
3346.00	-25.1	H	3.0	39.5	1.0	-63.6	-13.0	-50.6	
4182.50	-20.5	H	3.0	39.8	1.0	-59.3	-13.0	-46.3	
5019.00	-21.1	H	3.0	39.8	1.0	-59.9	-13.0	-46.9	
High Ch, 844MHz									
1688.00	-18.9	V	3.0	38.2	1.0	-56.2	-13.0	-43.2	
2532.00	1.8	V	3.0	38.9	1.0	-36.1	-13.0	-23.1	
3376.00	-19.6	V	3.0	39.5	1.0	-58.1	-13.0	-45.1	
4220.00	-16.7	V	3.0	39.8	1.0	-55.5	-13.0	-42.5	
5064.00	-17.3	V	3.0	39.8	1.0	-56.1	-13.0	-43.1	
1688.00	-17.9	H	3.0	38.2	1.0	-55.2	-13.0	-42.2	
2532.00	-0.7	H	3.0	38.9	1.0	-38.5	-13.0	-25.5	
3376.00	-24.0	H	3.0	39.5	1.0	-62.5	-13.0	-49.5	
4220.00	-17.8	H	3.0	39.8	1.0	-56.6	-13.0	-43.6	
5064.00	-18.4	H	3.0	39.8	1.0	-57.2	-13.0	-44.2	

LTE

Band 5

10MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone , X-position
Location: Chamber 2
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	-17.8	V	3.0	38.2	1.0	-55.1	-13.0	-42.1	
2487.00	-28.6	V	3.0	38.8	1.0	-66.4	-13.0	-53.4	
3316.00	-22.9	V	3.0	39.4	1.0	-61.4	-13.0	-48.4	
4145.00	-19.1	V	3.0	39.8	1.0	-57.9	-13.0	-44.9	
4974.00	-16.7	V	3.0	39.8	1.0	-55.4	-13.0	-42.4	
1658.00	-19.2	H	3.0	38.2	1.0	-56.4	-13.0	-43.4	
2487.00	-28.9	H	3.0	38.8	1.0	-66.7	-13.0	-53.7	
3316.00	-25.4	H	3.0	39.4	1.0	-63.9	-13.0	-50.9	
4145.00	-20.8	H	3.0	39.8	1.0	-59.6	-13.0	-46.6	
4974.00	-20.4	H	3.0	39.8	1.0	-59.2	-13.0	-46.2	
Mid Ch, 836.5MHz									
1673.00	-19.2	V	3.0	38.2	1.0	-56.4	-13.0	-43.4	
2509.50	-4.0	V	3.0	38.8	1.0	-41.8	-13.0	-28.8	
3346.00	-23.3	V	3.0	39.5	1.0	-61.7	-13.0	-48.7	
4182.50	-19.6	V	3.0	39.8	1.0	-58.4	-13.0	-45.4	
5019.00	-19.8	V	3.0	39.8	1.0	-58.6	-13.0	-45.6	
1673.00	-19.3	H	3.0	38.2	1.0	-56.5	-13.0	-43.5	
2509.50	-0.8	H	3.0	38.8	1.0	-38.7	-13.0	-25.7	
3346.00	-25.6	H	3.0	39.5	1.0	-64.1	-13.0	-51.1	
4182.50	-21.2	H	3.0	39.8	1.0	-60.0	-13.0	-47.0	
5019.00	-21.6	H	3.0	39.8	1.0	-60.4	-13.0	-47.4	
High Ch, 844MHz									
1688.00	-24.5	V	3.0	38.2	1.0	-61.8	-13.0	-48.8	
2532.00	-6.2	V	3.0	38.9	1.0	-44.0	-13.0	-31.0	
3376.00	-20.3	V	3.0	39.5	1.0	-58.8	-13.0	-45.8	
4220.00	-19.6	V	3.0	39.8	1.0	-58.4	-13.0	-45.4	
5064.00	-18.6	V	3.0	39.8	1.0	-57.4	-13.0	-44.4	
1688.00	-19.7	H	3.0	38.2	1.0	-56.9	-13.0	-43.9	
2532.00	-0.2	H	3.0	38.9	1.0	-38.0	-13.0	-25.0	
3376.00	-23.6	H	3.0	39.5	1.0	-62.1	-13.0	-49.1	
4220.00	-18.4	H	3.0	39.8	1.0	-57.2	-13.0	-44.2	
5064.00	-20.0	H	3.0	39.8	1.0	-58.8	-13.0	-45.8	

LTE

Band 5

5MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone , X-position
Location: Chamber 2
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	-19.0	V	3.0	38.2	1.0	-56.3	-13.0	-43.3	
2479.50	-9.2	V	3.0	38.8	1.0	-47.0	-13.0	-34.0	
3306.00	-21.1	V	3.0	39.4	1.0	-59.6	-13.0	-46.6	
4132.50	-16.5	V	3.0	39.8	1.0	-55.4	-13.0	-42.4	
4959.00	-16.7	V	3.0	39.8	1.0	-55.5	-13.0	-42.5	
1653.00	-19.5	H	3.0	38.2	1.0	-56.8	-13.0	-43.8	
2479.50	-9.9	H	3.0	38.8	1.0	-47.7	-13.0	-34.7	
3306.00	-21.8	H	3.0	39.4	1.0	-60.2	-13.0	-47.2	
4132.50	-19.5	H	3.0	39.8	1.0	-58.3	-13.0	-45.3	
4959.00	-20.3	H	3.0	39.8	1.0	-59.0	-13.0	-46.0	
Mid Ch, 836.5MHz									
1673.00	-21.8	V	3.0	38.2	1.0	-59.1	-13.0	-46.1	
2509.50	-0.6	V	3.0	38.8	1.0	-38.4	-13.0	-25.4	
3346.00	-22.1	V	3.0	39.5	1.0	-60.6	-13.0	-47.6	
4182.50	-17.6	V	3.0	39.8	1.0	-56.4	-13.0	-43.4	
5019.00	-18.9	V	3.0	39.8	1.0	-57.7	-13.0	-44.7	
1673.00	-17.9	H	3.0	38.2	1.0	-55.1	-13.0	-42.1	
2509.50	0.9	H	3.0	38.8	1.0	-37.0	-13.0	-24.0	
3346.00	-24.7	H	3.0	39.5	1.0	-63.2	-13.0	-50.2	
4182.50	-20.2	H	3.0	39.8	1.0	-59.0	-13.0	-46.0	
5019.00	-21.2	H	3.0	39.8	1.0	-60.0	-13.0	-47.0	
High Ch, 846.5MHz									
1693.00	-24.7	V	3.0	38.2	1.0	-61.9	-13.0	-48.9	
2539.50	1.1	V	3.0	38.9	1.0	-36.7	-13.0	-23.7	
3386.00	-21.4	V	3.0	39.5	1.0	-59.9	-13.0	-46.9	
4232.50	-17.2	V	3.0	39.8	1.0	-56.0	-13.0	-43.0	
5079.00	-17.0	V	3.0	39.8	1.0	-55.7	-13.0	-42.7	
1693.00	-19.5	H	3.0	38.2	1.0	-56.8	-13.0	-43.8	
2539.50	1.0	H	3.0	38.9	1.0	-36.9	-13.0	-23.9	
3386.00	-24.8	H	3.0	39.5	1.0	-63.3	-13.0	-50.3	
4232.50	-17.1	H	3.0	39.8	1.0	-55.9	-13.0	-42.9	
5079.00	-19.8	H	3.0	39.8	1.0	-58.6	-13.0	-45.6	

LTE

Band 5

5MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone , X-position
Location: Chamber 2
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	-20.1	V	3.0	38.2	1.0	-57.3	-13.0	-44.3	
2479.50	-11.4	V	3.0	38.8	1.0	-49.2	-13.0	-36.2	
3306.00	-22.0	V	3.0	39.4	1.0	-60.5	-13.0	-47.5	
4132.50	-18.4	V	3.0	39.8	1.0	-57.2	-13.0	-44.2	
4959.00	-17.8	V	3.0	39.8	1.0	-56.6	-13.0	-43.6	
1653.00	-20.5	H	3.0	38.2	1.0	-57.7	-13.0	-44.7	
2479.50	-12.7	H	3.0	38.8	1.0	-50.6	-13.0	-37.6	
3306.00	-23.0	H	3.0	39.4	1.0	-61.4	-13.0	-48.4	
4132.50	-20.8	H	3.0	39.8	1.0	-59.6	-13.0	-46.6	
4959.00	-21.4	H	3.0	39.8	1.0	-60.2	-13.0	-47.2	
Mid Ch, 836.5MHz									
1673.00	-25.9	V	3.0	38.2	1.0	-63.1	-13.0	-50.1	
2509.50	-4.6	V	3.0	38.8	1.0	-42.4	-13.0	-29.4	
3346.00	-24.8	V	3.0	39.5	1.0	-63.3	-13.0	-50.3	
4182.50	-20.5	V	3.0	39.8	1.0	-59.3	-13.0	-46.3	
5019.00	-17.5	V	3.0	39.8	1.0	-56.3	-13.0	-43.3	
1673.00	-19.8	H	3.0	38.2	1.0	-57.0	-13.0	-44.0	
2509.50	-1.8	H	3.0	38.8	1.0	-39.6	-13.0	-26.6	
3346.00	-24.6	H	3.0	39.5	1.0	-63.1	-13.0	-50.1	
4182.50	-22.5	H	3.0	39.8	1.0	-61.4	-13.0	-48.4	
5019.00	-20.9	H	3.0	39.8	1.0	-59.7	-13.0	-46.7	
High Ch, 846.5MHz									
1693.00	-25.4	V	3.0	38.2	1.0	-62.7	-13.0	-49.7	
2539.50	-1.3	V	3.0	38.9	1.0	-39.2	-13.0	-26.2	
3386.00	-22.3	V	3.0	39.5	1.0	-60.8	-13.0	-47.8	
4232.50	-18.6	V	3.0	39.8	1.0	-57.4	-13.0	-44.4	
5079.00	-18.3	V	3.0	39.8	1.0	-57.1	-13.0	-44.1	
1693.00	-20.7	H	3.0	38.2	1.0	-58.0	-13.0	-45.0	
2539.50	-0.1	H	3.0	38.9	1.0	-37.9	-13.0	-24.9	
3386.00	-25.4	H	3.0	39.5	1.0	-63.8	-13.0	-50.8	
4232.50	-18.4	H	3.0	39.8	1.0	-57.2	-13.0	-44.2	
5079.00	-20.8	H	3.0	39.8	1.0	-59.6	-13.0	-46.6	

LTE

Band 5

3MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone , X-position
Location: Chamber 2
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	-17.4	V	3.0	38.2	1.0	-54.7	-13.0	-41.7	
2476.50	-28.4	V	3.0	38.8	1.0	-66.2	-13.0	-53.2	
3302.00	-24.3	V	3.0	39.4	1.0	-62.7	-13.0	-49.7	
4127.50	-21.5	V	3.0	39.8	1.0	-60.3	-13.0	-47.3	
4953.00	-19.0	V	3.0	39.8	1.0	-57.8	-13.0	-44.8	
1651.00	-18.9	H	3.0	38.2	1.0	-56.1	-13.0	-43.1	
2476.50	-29.0	H	3.0	38.8	1.0	-66.8	-13.0	-53.8	
3302.00	-26.2	H	3.0	39.4	1.0	-64.6	-13.0	-51.6	
4127.50	-23.0	H	3.0	39.8	1.0	-61.8	-13.0	-48.8	
4953.00	-21.7	H	3.0	39.8	1.0	-60.5	-13.0	-47.5	
Mid Ch, 836.5MHz									
1673.00	-19.3	V	3.0	38.2	1.0	-56.6	-13.0	-43.6	
2509.50	-1.9	V	3.0	38.8	1.0	-39.8	-13.0	-26.8	
3346.00	-22.9	V	3.0	39.5	1.0	-61.3	-13.0	-48.3	
4182.50	-21.3	V	3.0	39.8	1.0	-60.1	-13.0	-47.1	
5019.00	-21.6	V	3.0	39.8	1.0	-60.4	-13.0	-47.4	
1673.00	-17.8	H	3.0	38.2	1.0	-55.0	-13.0	-42.0	
2509.50	0.0	H	3.0	38.8	1.0	-37.8	-13.0	-24.8	
3346.00	-25.2	H	3.0	39.5	1.0	-63.7	-13.0	-50.7	
4182.50	-22.4	H	3.0	39.8	1.0	-61.2	-13.0	-48.2	
5019.00	-22.0	H	3.0	39.8	1.0	-60.8	-13.0	-47.8	
High Ch, 847.5MHz									
1695.00	-22.1	V	3.0	38.2	1.0	-59.3	-13.0	-46.3	
2542.50	-1.4	V	3.0	38.9	1.0	-39.2	-13.0	-26.2	
3390.00	-21.4	V	3.0	39.5	1.0	-59.9	-13.0	-46.9	
4237.50	-19.7	V	3.0	39.8	1.0	-58.5	-13.0	-45.5	
5085.00	-19.0	V	3.0	39.8	1.0	-57.7	-13.0	-44.7	
1695.00	-17.5	H	3.0	38.2	1.0	-54.7	-13.0	-41.7	
2542.50	4.9	H	3.0	38.9	1.0	-32.9	-13.0	-19.9	
3390.00	-24.0	H	3.0	39.5	1.0	-62.5	-13.0	-49.5	
4237.50	-20.8	H	3.0	39.8	1.0	-59.6	-13.0	-46.6	
5085.00	-22.0	H	3.0	39.8	1.0	-60.8	-13.0	-47.8	

LTE

Band 5

3MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone , X-position
Location: Chamber 2
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	-18.2	V	3.0	38.2	1.0	-55.4	-13.0	-42.4	
2476.50	-28.8	V	3.0	38.8	1.0	-66.6	-13.0	-53.6	
3302.00	-24.6	V	3.0	39.4	1.0	-63.1	-13.0	-50.1	
4127.50	-22.2	V	3.0	39.8	1.0	-61.0	-13.0	-48.0	
4953.00	-19.8	V	3.0	39.8	1.0	-58.6	-13.0	-45.6	
1651.00	-19.4	H	3.0	38.2	1.0	-56.7	-13.0	-43.7	
2476.50	-29.1	H	3.0	38.8	1.0	-66.9	-13.0	-53.9	
3302.00	-26.3	H	3.0	39.4	1.0	-64.8	-13.0	-51.8	
4127.50	-23.5	H	3.0	39.8	1.0	-62.3	-13.0	-49.3	
4953.00	-22.1	H	3.0	39.8	1.0	-60.9	-13.0	-47.9	
Mid Ch, 836.5MHz									
1673.00	-20.8	V	3.0	38.2	1.0	-58.0	-13.0	-45.0	
2509.50	-3.4	V	3.0	38.8	1.0	-41.2	-13.0	-28.2	
3346.00	-23.8	V	3.0	39.5	1.0	-62.3	-13.0	-49.3	
4182.50	-22.1	V	3.0	39.8	1.0	-60.9	-13.0	-47.9	
5019.00	-22.4	V	3.0	39.8	1.0	-61.1	-13.0	-48.1	
1673.00	-18.8	H	3.0	38.2	1.0	-56.0	-13.0	-43.0	
2509.50	-1.0	H	3.0	38.8	1.0	-38.8	-13.0	-25.8	
3346.00	-25.7	H	3.0	39.5	1.0	-64.2	-13.0	-51.2	
4182.50	-23.3	H	3.0	39.8	1.0	-62.1	-13.0	-49.1	
5019.00	-22.7	H	3.0	39.8	1.0	-61.5	-13.0	-48.5	
High Ch, 847.5MHz									
1695.00	-23.0	V	3.0	38.2	1.0	-60.2	-13.0	-47.2	
2542.50	-2.0	V	3.0	38.9	1.0	-39.9	-13.0	-26.9	
3390.00	-22.3	V	3.0	39.5	1.0	-60.8	-13.0	-47.8	
4237.50	-20.3	V	3.0	39.8	1.0	-59.1	-13.0	-46.1	
5085.00	-19.7	V	3.0	39.8	1.0	-58.5	-13.0	-45.5	
1695.00	-18.4	H	3.0	38.2	1.0	-55.7	-13.0	-42.7	
2542.50	2.2	H	3.0	38.9	1.0	-35.7	-13.0	-22.7	
3390.00	-24.8	H	3.0	39.5	1.0	-63.3	-13.0	-50.3	
4237.50	-21.3	H	3.0	39.8	1.0	-60.1	-13.0	-47.1	
5085.00	-22.5	H	3.0	39.8	1.0	-61.3	-13.0	-48.3	

LTE

Band 5

1.4MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone , X-position
Location: Chamber 2
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	-18.0	V	3.0	38.2	1.0	-55.3	-13.0	-42.3	
2474.10	-27.9	V	3.0	38.8	1.0	-65.7	-13.0	-52.7	
3298.80	-23.1	V	3.0	39.4	1.0	-61.6	-13.0	-48.6	
4123.50	-21.6	V	3.0	39.8	1.0	-60.5	-13.0	-47.5	
4948.20	-19.0	V	3.0	39.8	1.0	-57.8	-13.0	-44.8	
1649.40	-19.2	H	3.0	38.2	1.0	-56.4	-13.0	-43.4	
2474.10	-29.0	H	3.0	38.8	1.0	-66.8	-13.0	-53.8	
3298.80	-24.0	H	3.0	39.4	1.0	-62.4	-13.0	-49.4	
4123.50	-24.0	H	3.0	39.8	1.0	-62.8	-13.0	-49.8	
4948.20	-22.0	H	3.0	39.8	1.0	-60.8	-13.0	-47.8	
Mid Ch, 836.5MHz									
1673.00	-17.5	V	3.0	38.2	1.0	-54.8	-13.0	-41.8	
2509.50	0.3	V	3.0	38.8	1.0	-37.6	-13.0	-24.6	
3346.00	-22.1	V	3.0	39.5	1.0	-60.6	-13.0	-47.6	
4182.50	-20.0	V	3.0	39.8	1.0	-58.8	-13.0	-45.8	
5019.00	-21.0	V	3.0	39.8	1.0	-59.8	-13.0	-46.8	
1673.00	-17.1	H	3.0	38.2	1.0	-54.4	-13.0	-41.4	
2509.50	-0.2	H	3.0	38.8	1.0	-38.1	-13.0	-25.1	
3346.00	-25.5	H	3.0	39.5	1.0	-63.9	-13.0	-50.9	
4182.50	-21.2	H	3.0	39.8	1.0	-60.0	-13.0	-47.0	
5019.00	-21.2	H	3.0	39.8	1.0	-60.0	-13.0	-47.0	
High Ch, 848.3MHz									
1696.60	-21.9	V	3.0	38.2	1.0	-59.1	-13.0	-46.1	
2544.90	-0.7	V	3.0	38.9	1.0	-38.6	-13.0	-25.6	
3393.20	-19.5	V	3.0	39.5	1.0	-58.0	-13.0	-45.0	
4241.50	-19.6	V	3.0	39.8	1.0	-58.4	-13.0	-45.4	
5089.80	-18.7	V	3.0	39.8	1.0	-57.5	-13.0	-44.5	
1696.60	-16.6	H	3.0	38.2	1.0	-53.9	-13.0	-40.9	
2544.90	0.5	H	3.0	38.9	1.0	-37.4	-13.0	-24.4	
3393.20	-22.8	H	3.0	39.5	1.0	-61.2	-13.0	-48.2	
4241.50	-21.5	H	3.0	39.8	1.0	-60.3	-13.0	-47.3	
5089.80	-21.4	H	3.0	39.8	1.0	-60.2	-13.0	-47.2	

LTE

Band 5

1.4MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 51072
Configuration: EUT / Adapter / Earphone , X-position
Location: Chamber 2
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	-19.0	V	3.0	38.2	1.0	-56.2	-13.0	-43.2	
2474.10	-28.4	V	3.0	38.8	1.0	-66.2	-13.0	-53.2	
3298.80	-23.6	V	3.0	39.4	1.0	-62.1	-13.0	-49.1	
4123.50	-22.7	V	3.0	39.8	1.0	-61.6	-13.0	-48.6	
4948.20	-20.3	V	3.0	39.8	1.0	-59.1	-13.0	-46.1	
1649.40	-20.0	H	3.0	38.2	1.0	-57.2	-13.0	-44.2	
2474.10	-29.3	H	3.0	38.8	1.0	-67.2	-13.0	-54.2	
3298.80	-24.7	H	3.0	39.4	1.0	-63.1	-13.0	-50.1	
4123.50	-24.7	H	3.0	39.8	1.0	-63.5	-13.0	-50.5	
4948.20	-22.6	H	3.0	39.8	1.0	-61.4	-13.0	-48.4	
Mid Ch, 836.5MHz									
1673.00	-18.2	V	3.0	38.2	1.0	-55.5	-13.0	-42.5	
2509.50	-0.1	V	3.0	38.8	1.0	-37.9	-13.0	-24.9	
3346.00	-22.4	V	3.0	39.5	1.0	-60.8	-13.0	-47.8	
4182.50	-20.5	V	3.0	39.8	1.0	-59.3	-13.0	-46.3	
5019.00	-21.1	V	3.0	39.8	1.0	-59.8	-13.0	-46.8	
1673.00	-18.4	H	3.0	38.2	1.0	-55.6	-13.0	-42.6	
2509.50	-1.6	H	3.0	38.8	1.0	-39.4	-13.0	-26.4	
3346.00	-25.7	H	3.0	39.5	1.0	-64.2	-13.0	-51.2	
4182.50	-21.1	H	3.0	39.8	1.0	-59.9	-13.0	-46.9	
5019.00	-21.6	H	3.0	39.8	1.0	-60.4	-13.0	-47.4	
High Ch, 848.3MHz									
1696.60	-22.6	V	3.0	38.2	1.0	-59.9	-13.0	-46.9	
2544.90	-1.2	V	3.0	38.9	1.0	-39.1	-13.0	-26.1	
3393.20	-20.5	V	3.0	39.5	1.0	-59.0	-13.0	-46.0	
4241.50	-20.4	V	3.0	39.8	1.0	-59.2	-13.0	-46.2	
5089.80	-19.3	V	3.0	39.8	1.0	-58.1	-13.0	-45.1	
1696.60	-17.5	H	3.0	38.2	1.0	-54.7	-13.0	-41.7	
2544.90	-0.3	H	3.0	38.9	1.0	-38.2	-13.0	-25.2	
3393.20	-23.5	H	3.0	39.5	1.0	-61.9	-13.0	-48.9	
4241.50	-22.0	H	3.0	39.8	1.0	-60.8	-13.0	-47.8	
5089.80	-21.8	H	3.0	39.8	1.0	-60.6	-13.0	-47.6	

LTE Band 7

LTE

Band 7

20MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Harmonics, 20MHz 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, 2510MHz									
5020.00	-14.6	V	3.0	43.8	1.0	-57.4	-25.0	-32.4	
7530.00	-11.8	V	3.0	42.4	1.0	-53.3	-25.0	-28.3	
10040.00	-17.3	V	3.0	40.6	1.0	-56.9	-25.0	-31.9	
12550.00	-7.0	V	3.0	41.7	1.0	-47.7	-25.0	-22.7	
5020.00	-8.3	H	3.0	43.8	1.0	-51.1	-25.0	-26.1	
7530.00	-7.9	H	3.0	42.4	1.0	-49.4	-25.0	-24.4	
10040.00	-14.0	H	3.0	40.6	1.0	-53.6	-25.0	-28.6	
12550.00	-4.0	H	3.0	41.7	1.0	-44.6	-25.0	-19.6	
Mid Ch, 2535MHz									
5070.00	-13.7	V	3.0	43.8	1.0	-56.5	-25.0	-31.5	
7605.00	-1.9	V	3.0	42.4	1.0	-43.3	-25.0	-18.3	
10140.00	-18.0	V	3.0	40.6	1.0	-57.6	-25.0	-32.6	
12675.00	-6.6	V	3.0	41.8	1.0	-47.3	-25.0	-22.3	
5070.00	-5.8	H	3.0	43.8	1.0	-48.6	-25.0	-23.6	
7605.00	-11.8	H	3.0	42.4	1.0	-53.3	-25.0	-28.3	
10140.00	-13.4	H	3.0	40.6	1.0	-53.0	-25.0	-28.0	
12675.00	-4.0	H	3.0	41.8	1.0	-44.8	-25.0	-19.8	
High Ch, 2560MHz									
5120.00	-13.1	V	3.0	43.8	1.0	-55.9	-25.0	-30.9	
7680.00	-10.4	V	3.0	42.4	1.0	-51.7	-25.0	-26.7	
10240.00	-15.4	V	3.0	40.6	1.0	-55.0	-25.0	-30.0	
12800.00	-8.4	V	3.0	41.9	1.0	-49.3	-25.0	-24.3	
5120.00	-7.2	H	3.0	43.8	1.0	-50.0	-25.0	-25.0	
7680.00	-8.6	H	3.0	42.4	1.0	-50.0	-25.0	-25.0	
10240.00	-10.3	H	3.0	40.6	1.0	-49.9	-25.0	-24.9	
12800.00	-6.5	H	3.0	41.9	1.0	-47.4	-25.0	-22.4	

LTE

Band 7

20MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 45585
Configuration: EUT / Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Harmonics, 20MHz 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, 2510MHz									
5020.00	-14.7	V	3.0	43.8	1.0	-57.5	-25.0	-32.5	
7530.00	-12.9	V	3.0	42.4	1.0	-54.3	-25.0	-29.3	
10040.00	-18.4	V	3.0	40.6	1.0	-57.9	-25.0	-32.9	
12550.00	-6.9	V	3.0	41.7	1.0	-47.5	-25.0	-22.5	
5020.00	-6.8	H	3.0	43.8	1.0	-49.6	-25.0	-24.6	
7530.00	-9.3	H	3.0	42.4	1.0	-50.7	-25.0	-25.7	
10040.00	-14.7	H	3.0	40.6	1.0	-54.3	-25.0	-29.3	
12550.00	-2.9	H	3.0	41.7	1.0	-43.6	-25.0	-18.6	
Mid Ch, 2535MHz									
5070.00	-14.8	V	3.0	43.8	1.0	-57.6	-25.0	-32.6	
7605.00	-3.8	V	3.0	42.4	1.0	-45.2	-25.0	-20.2	
10140.00	-18.3	V	3.0	40.6	1.0	-57.9	-25.0	-32.9	
12675.00	-7.1	V	3.0	41.8	1.0	-47.8	-25.0	-22.8	
5070.00	-7.1	H	3.0	43.8	1.0	-49.9	-25.0	-24.9	
7605.00	-13.3	H	3.0	42.4	1.0	-54.8	-25.0	-29.8	
10140.00	-14.5	H	3.0	40.6	1.0	-54.1	-25.0	-29.1	
12675.00	-4.9	H	3.0	41.8	1.0	-45.6	-25.0	-20.6	
High Ch, 2560MHz									
5120.00	-13.9	V	3.0	43.8	1.0	-56.6	-25.0	-31.6	
7680.00	-11.1	V	3.0	42.4	1.0	-52.5	-25.0	-27.5	
10240.00	-17.1	V	3.0	40.6	1.0	-56.7	-25.0	-31.7	
12800.00	-9.3	V	3.0	41.9	1.0	-50.2	-25.0	-25.2	
5120.00	-7.9	H	3.0	43.8	1.0	-50.7	-25.0	-25.7	
7680.00	-9.9	H	3.0	42.4	1.0	-51.2	-25.0	-26.2	
10240.00	-12.0	H	3.0	40.6	1.0	-51.6	-25.0	-26.6	
12800.00	-7.7	H	3.0	41.9	1.0	-48.5	-25.0	-23.5	

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 7

15MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 Harmonics, 15MHz 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, 2507.5MHz									
5015.00	-13.4	V	3.0	43.8	1.0	-56.2	-25.0	-31.2	
7522.50	-11.1	V	3.0	42.5	1.0	-52.5	-25.0	-27.5	
10030.00	-17.9	V	3.0	40.6	1.0	-57.4	-25.0	-32.4	
12537.50	-5.2	V	3.0	41.6	1.0	-45.8	-25.0	-20.8	
5015.00	-7.8	H	3.0	43.8	1.0	-50.5	-25.0	-25.5	
7522.50	-9.4	H	3.0	42.5	1.0	-50.9	-25.0	-25.9	
10030.00	-14.1	H	3.0	40.6	1.0	-53.7	-25.0	-28.7	
12537.50	-2.3	H	3.0	41.6	1.0	-42.9	-25.0	-17.9	
Mid Ch, 2535MHz									
5070.00	-13.4	V	3.0	43.8	1.0	-56.1	-25.0	-31.1	
7605.00	-12.0	V	3.0	42.4	1.0	-53.4	-25.0	-28.4	
10140.00	-16.5	V	3.0	40.6	1.0	-56.1	-25.0	-31.1	
12675.00	-5.5	V	3.0	41.8	1.0	-46.3	-25.0	-21.3	
5070.00	-6.5	H	3.0	43.8	1.0	-49.2	-25.0	-24.2	
7605.00	-10.5	H	3.0	42.4	1.0	-51.9	-25.0	-26.9	
10140.00	-13.4	H	3.0	40.6	1.0	-53.0	-25.0	-28.0	
12675.00	-2.3	H	3.0	41.8	1.0	-43.1	-25.0	-18.1	
High Ch, 2562.5MHz									
5125.00	-12.4	V	3.0	43.8	1.0	-55.2	-25.0	-30.2	
7687.50	-11.3	V	3.0	42.4	1.0	-52.6	-25.0	-27.6	
10250.00	-15.4	V	3.0	40.6	1.0	-55.1	-25.0	-30.1	
12812.50	-8.9	V	3.0	41.9	1.0	-49.8	-25.0	-24.8	
5125.00	-7.9	H	3.0	43.8	1.0	-50.7	-25.0	-25.7	
7687.50	-9.8	H	3.0	42.4	1.0	-51.1	-25.0	-26.1	
10250.00	-9.4	H	3.0	40.6	1.0	-49.0	-25.0	-24.0	
12812.50	-6.0	H	3.0	41.9	1.0	-46.9	-25.0	-21.9	

LTE

Band 7

15MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 Harmonics, 15MHz 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, 2507.5MHz									
5015.00	-14.2	V	3.0	43.8	1.0	-56.9	-25.0	-31.9	
7522.50	-11.9	V	3.0	42.5	1.0	-53.4	-25.0	-28.4	
10030.00	-18.0	V	3.0	40.6	1.0	-57.6	-25.0	-32.6	
12537.50	-6.2	V	3.0	41.6	1.0	-46.8	-25.0	-21.8	
5015.00	-8.5	H	3.0	43.8	1.0	-51.3	-25.0	-26.3	
7522.50	-10.9	H	3.0	42.5	1.0	-52.3	-25.0	-27.3	
10030.00	-14.9	H	3.0	40.6	1.0	-54.4	-25.0	-29.4	
12537.50	-2.7	H	3.0	41.6	1.0	-43.4	-25.0	-18.4	
Mid Ch, 2535MHz									
5070.00	-14.5	V	3.0	43.8	1.0	-57.3	-25.0	-32.3	
7605.00	-13.2	V	3.0	42.4	1.0	-54.6	-25.0	-29.6	
10140.00	-17.1	V	3.0	40.6	1.0	-56.7	-25.0	-31.7	
12675.00	-6.0	V	3.0	41.8	1.0	-46.7	-25.0	-21.7	
5070.00	-7.5	H	3.0	43.8	1.0	-50.3	-25.0	-25.3	
7605.00	-12.5	H	3.0	42.4	1.0	-53.9	-25.0	-28.9	
10140.00	-13.9	H	3.0	40.6	1.0	-53.5	-25.0	-28.5	
12675.00	-3.5	H	3.0	41.8	1.0	-44.2	-25.0	-19.2	
High Ch, 2562.5MHz									
5125.00	-12.7	V	3.0	43.8	1.0	-55.5	-25.0	-30.5	
7687.50	-10.4	V	3.0	42.4	1.0	-51.8	-25.0	-26.8	
10250.00	-16.1	V	3.0	40.6	1.0	-55.7	-25.0	-30.7	
12812.50	-9.5	V	3.0	41.9	1.0	-50.4	-25.0	-25.4	
5125.00	-8.0	H	3.0	43.8	1.0	-50.8	-25.0	-25.8	
7687.50	-10.5	H	3.0	42.4	1.0	-51.9	-25.0	-26.9	
10250.00	-10.1	H	3.0	40.6	1.0	-49.8	-25.0	-24.8	
12812.50	-6.4	H	3.0	41.9	1.0	-47.3	-25.0	-22.3	

LTE

Band 7

10MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 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, 2505MHz									
5010.00	-13.7	V	3.0	43.8	1.0	-56.5	-25.0	-31.5	
7515.00	-10.2	V	3.0	42.5	1.0	-51.6	-25.0	-26.6	
10020.00	-17.8	V	3.0	40.6	1.0	-57.4	-25.0	-32.4	
12525.00	-5.5	V	3.0	41.6	1.0	-46.1	-25.0	-21.1	
5010.00	-8.9	H	3.0	43.8	1.0	-51.7	-25.0	-26.7	
7515.00	-9.2	H	3.0	42.5	1.0	-50.7	-25.0	-25.7	
10020.00	-14.2	H	3.0	40.6	1.0	-53.7	-25.0	-28.7	
12525.00	-1.9	H	3.0	41.6	1.0	-42.5	-25.0	-17.5	
Mid Ch, 2535MHz									
5070.00	-13.3	V	3.0	43.8	1.0	-56.0	-25.0	-31.0	
7605.00	-11.5	V	3.0	42.4	1.0	-52.9	-25.0	-27.9	
10140.00	-18.1	V	3.0	40.6	1.0	-57.7	-25.0	-32.7	
12675.00	-3.7	V	3.0	41.8	1.0	-44.5	-25.0	-19.5	
5070.00	-6.7	H	3.0	43.8	1.0	-49.5	-25.0	-24.5	
7605.00	-11.0	H	3.0	42.4	1.0	-52.4	-25.0	-27.4	
10140.00	-13.2	H	3.0	40.6	1.0	-52.8	-25.0	-27.8	
12675.00	-2.5	H	3.0	41.8	1.0	-43.3	-25.0	-18.3	
High Ch, 2565MHz									
5130.00	-12.0	V	3.0	43.8	1.0	-54.8	-25.0	-29.8	
7695.00	-9.0	V	3.0	42.4	1.0	-50.4	-25.0	-25.4	
10260.00	-14.3	V	3.0	40.6	1.0	-53.9	-25.0	-28.9	
12825.00	-8.2	V	3.0	41.9	1.0	-49.0	-25.0	-24.0	
5130.00	-7.4	H	3.0	43.8	1.0	-50.1	-25.0	-25.1	
7695.00	-9.0	H	3.0	42.4	1.0	-50.3	-25.0	-25.3	
10260.00	-9.9	H	3.0	40.6	1.0	-49.6	-25.0	-24.6	
12825.00	-5.1	H	3.0	41.9	1.0	-46.0	-25.0	-21.0	

LTE

Band 7

10MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 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, 2505MHz									
5010.00	-14.2	V	3.0	43.8	1.0	-57.0	-25.0	-32.0	
7515.00	-11.5	V	3.0	42.5	1.0	-52.9	-25.0	-27.9	
10020.00	-17.5	V	3.0	40.6	1.0	-57.1	-25.0	-32.1	
12525.00	-6.0	V	3.0	41.6	1.0	-46.6	-25.0	-21.6	
5010.00	-9.2	H	3.0	43.8	1.0	-52.0	-25.0	-27.0	
7515.00	-10.2	H	3.0	42.5	1.0	-51.6	-25.0	-26.6	
10020.00	-14.9	H	3.0	40.6	1.0	-54.4	-25.0	-29.4	
12525.00	-2.9	H	3.0	41.6	1.0	-43.6	-25.0	-18.6	
Mid Ch, 2535MHz									
5070.00	-13.5	V	3.0	43.8	1.0	-56.3	-25.0	-31.3	
7605.00	-12.1	V	3.0	42.4	1.0	-53.5	-25.0	-28.5	
10140.00	-18.1	V	3.0	40.6	1.0	-57.7	-25.0	-32.7	
12675.00	-4.4	V	3.0	41.8	1.0	-45.1	-25.0	-20.1	
5070.00	-7.5	H	3.0	43.8	1.0	-50.3	-25.0	-25.3	
7605.00	-12.7	H	3.0	42.4	1.0	-54.1	-25.0	-29.1	
10140.00	-14.0	H	3.0	40.6	1.0	-53.6	-25.0	-28.6	
12675.00	-3.4	H	3.0	41.8	1.0	-44.1	-25.0	-19.1	
High Ch, 2565MHz									
5130.00	-13.0	V	3.0	43.8	1.0	-55.7	-25.0	-30.7	
7695.00	-10.2	V	3.0	42.4	1.0	-51.5	-25.0	-26.5	
10260.00	-15.7	V	3.0	40.6	1.0	-55.4	-25.0	-30.4	
12825.00	-9.7	V	3.0	41.9	1.0	-50.6	-25.0	-25.6	
5130.00	-7.8	H	3.0	43.8	1.0	-50.6	-25.0	-25.6	
7695.00	-10.2	H	3.0	42.4	1.0	-51.6	-25.0	-26.6	
10260.00	-12.9	H	3.0	40.6	1.0	-52.5	-25.0	-27.5	
12825.00	-6.6	H	3.0	41.9	1.0	-47.5	-25.0	-22.5	

LTE

Band 7

5MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_QPSK Band 7 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, 2502.5MHz									
5005.00	-14.5	V	3.0	43.8	1.0	-57.3	-25.0	-32.3	
7507.50	-11.1	V	3.0	42.5	1.0	-52.5	-25.0	-27.5	
10010.00	-18.1	V	3.0	40.6	1.0	-57.7	-25.0	-32.7	
12512.50	-5.8	V	3.0	41.6	1.0	-46.4	-25.0	-21.4	
5005.00	-7.1	H	3.0	43.8	1.0	-49.9	-25.0	-24.9	
7507.50	-7.8	H	3.0	42.5	1.0	-49.3	-25.0	-24.3	
10010.00	-14.2	H	3.0	40.6	1.0	-53.7	-25.0	-28.7	
12512.50	-1.9	H	3.0	41.6	1.0	-42.5	-25.0	-17.5	
Mid Ch, 2535MHz									
5070.00	-15.4	V	3.0	43.8	1.0	-58.2	-25.0	-33.2	
7605.00	-12.7	V	3.0	42.4	1.0	-54.1	-25.0	-29.1	
10140.00	-16.7	V	3.0	40.6	1.0	-56.3	-25.0	-31.3	
12675.00	-5.2	V	3.0	41.8	1.0	-45.9	-25.0	-20.9	
5070.00	-5.9	H	3.0	43.8	1.0	-48.7	-25.0	-23.7	
7605.00	-11.5	H	3.0	42.4	1.0	-52.9	-25.0	-27.9	
10140.00	-13.0	H	3.0	40.6	1.0	-52.6	-25.0	-27.6	
12675.00	-2.9	H	3.0	41.8	1.0	-43.6	-25.0	-18.6	
High Ch, 2567.5MHz									
5135.00	-12.4	V	3.0	43.8	1.0	-55.1	-25.0	-30.1	
7702.50	-9.2	V	3.0	42.4	1.0	-50.6	-25.0	-25.6	
10270.00	-14.1	V	3.0	40.6	1.0	-53.7	-25.0	-28.7	
12837.50	-7.3	V	3.0	41.9	1.0	-48.1	-25.0	-23.1	
5135.00	-5.7	H	3.0	43.8	1.0	-48.4	-25.0	-23.4	
7702.50	-10.4	H	3.0	42.4	1.0	-51.8	-25.0	-26.8	
10270.00	-7.1	H	3.0	40.6	1.0	-46.7	-25.0	-21.7	
12837.50	-4.1	H	3.0	41.9	1.0	-45.0	-25.0	-20.0	

LTE

Band 7

5MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-18
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, Z-Position
Location: Chamber 1
Mode: LTE_16QAM Band 7 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, 2502.5MHz									
5005.00	-15.0	V	3.0	43.8	1.0	-57.8	-25.0	-32.8	
7507.50	-12.0	V	3.0	42.5	1.0	-53.5	-25.0	-28.5	
10010.00	-18.2	V	3.0	40.6	1.0	-57.8	-25.0	-32.8	
12512.50	-6.3	V	3.0	41.6	1.0	-46.9	-25.0	-21.9	
5005.00	-7.6	H	3.0	43.8	1.0	-50.4	-25.0	-25.4	
7507.50	-9.3	H	3.0	42.5	1.0	-50.8	-25.0	-25.8	
10010.00	-14.7	H	3.0	40.6	1.0	-54.2	-25.0	-29.2	
12512.50	-2.4	H	3.0	41.6	1.0	-43.0	-25.0	-18.0	
Mid Ch, 2535MHz									
5070.00	-16.3	V	3.0	43.8	1.0	-59.1	-25.0	-34.1	
7605.00	-14.4	V	3.0	42.4	1.0	-55.8	-25.0	-30.8	
10140.00	-17.3	V	3.0	40.6	1.0	-56.9	-25.0	-31.9	
12675.00	-6.1	V	3.0	41.8	1.0	-46.8	-25.0	-21.8	
5070.00	-7.1	H	3.0	43.8	1.0	-49.9	-25.0	-24.9	
7605.00	-13.3	H	3.0	42.4	1.0	-54.7	-25.0	-29.7	
10140.00	-14.1	H	3.0	40.6	1.0	-53.7	-25.0	-28.7	
12675.00	-3.3	H	3.0	41.8	1.0	-44.0	-25.0	-19.0	
High Ch, 2567.5MHz									
5135.00	-13.6	V	3.0	43.8	1.0	-56.3	-25.0	-31.3	
7702.50	-11.0	V	3.0	42.4	1.0	-52.3	-25.0	-27.3	
10270.00	-16.1	V	3.0	40.6	1.0	-55.7	-25.0	-30.7	
12837.50	-10.7	V	3.0	41.9	1.0	-51.6	-25.0	-26.6	
5135.00	-6.8	H	3.0	43.8	1.0	-49.5	-25.0	-24.5	
7702.50	-12.5	H	3.0	42.4	1.0	-53.9	-25.0	-28.9	
10270.00	-11.0	H	3.0	40.6	1.0	-50.6	-25.0	-25.6	
12837.50	-8.1	H	3.0	41.9	1.0	-48.9	-25.0	-23.9	

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 13

LTE Band 13 10MHz QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 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
Mid Ch, 782MHz									
1564.00	-13.4	V	3.0	43.7	1.0	-56.1	-40.0	-16.1	
2346.00	-22.2	V	3.0	43.4	1.0	-64.6	-13.0	-51.6	
3128.00	-20.3	V	3.0	43.6	1.0	-62.9	-13.0	-49.9	
3910.00	-12.8	V	3.0	43.8	1.0	-55.6	-13.0	-42.6	
4692.00	-10.1	V	3.0	43.8	1.0	-53.0	-13.0	-40.0	
1564.00	-15.7	H	3.0	43.7	1.0	-58.4	-40.0	-18.4	
2346.00	-22.0	H	3.0	43.4	1.0	-64.4	-13.0	-51.4	
3128.00	-19.6	H	3.0	43.6	1.0	-62.2	-13.0	-49.2	
3910.00	-14.8	H	3.0	43.8	1.0	-57.7	-13.0	-44.7	
4692.00	-14.9	H	3.0	43.8	1.0	-57.7	-13.0	-44.7	

LTE Band 13 10MHz 16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 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
Mid Ch, 782MHz									
1564.00	-14.7	V	3.0	43.7	1.0	-57.3	-40.0	-17.3	
2346.00	-22.0	V	3.0	43.4	1.0	-64.4	-13.0	-51.4	
3128.00	-19.9	V	3.0	43.6	1.0	-62.5	-13.0	-49.5	
3910.00	-14.3	V	3.0	43.8	1.0	-57.1	-13.0	-44.1	
4692.00	-11.6	V	3.0	43.8	1.0	-54.4	-13.0	-41.4	
1564.00	-17.1	H	3.0	43.7	1.0	-59.7	-40.0	-19.7	
2346.00	-22.4	H	3.0	43.4	1.0	-64.8	-13.0	-51.8	
3128.00	-20.1	H	3.0	43.6	1.0	-62.7	-13.0	-49.7	
3910.00	-16.5	H	3.0	43.8	1.0	-59.3	-13.0	-46.3	
4692.00	-15.5	H	3.0	43.8	1.0	-58.3	-13.0	-45.3	

LTE

Band 13

5MHz

QPSK

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 13 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, 779.5MHz									
1559.00	-12.7	V	3.0	43.7	1.0	-55.4	-40.0	-15.4	
2338.50	-22.1	V	3.0	43.4	1.0	-64.5	-13.0	-51.5	
3118.00	-19.1	V	3.0	43.6	1.0	-61.6	-13.0	-48.6	
3897.50	-13.1	V	3.0	43.8	1.0	-55.9	-13.0	-42.9	
4677.00	-8.4	V	3.0	43.8	1.0	-51.2	-13.0	-38.2	
1559.00	-18.7	H	3.0	43.7	1.0	-61.4	-40.0	-21.4	
2338.50	-19.2	H	3.0	43.4	1.0	-61.6	-13.0	-48.6	
3118.00	-18.2	H	3.0	43.6	1.0	-60.8	-13.0	-47.8	
3897.50	-15.3	H	3.0	43.8	1.0	-58.1	-13.0	-45.1	
4677.00	-14.9	H	3.0	43.8	1.0	-57.8	-13.0	-44.8	
Mid Ch, 782MHz									
1564.00	-15.0	V	3.0	43.7	1.0	-57.7	-40.0	-17.7	
2346.00	-21.5	V	3.0	43.4	1.0	-63.9	-13.0	-50.9	
3128.00	-18.4	V	3.0	43.6	1.0	-60.9	-13.0	-47.9	
3910.00	-12.9	V	3.0	43.8	1.0	-55.8	-13.0	-42.8	
4692.00	-10.8	V	3.0	43.8	1.0	-53.7	-13.0	-40.7	
1564.00	-15.8	H	3.0	43.7	1.0	-58.5	-40.0	-18.5	
2346.00	-22.4	H	3.0	43.4	1.0	-64.8	-13.0	-51.8	
3128.00	-20.3	H	3.0	43.6	1.0	-62.8	-13.0	-49.8	
3910.00	-15.4	H	3.0	43.8	1.0	-58.2	-13.0	-45.2	
4692.00	-16.0	H	3.0	43.8	1.0	-58.9	-13.0	-45.9	
High Ch, 784.5MHz									
1569.00	-15.2	V	3.0	43.7	1.0	-57.8	-40.0	-17.8	
2353.50	-22.2	V	3.0	43.4	1.0	-64.5	-13.0	-51.5	
3138.00	-16.6	V	3.0	43.6	1.0	-59.2	-13.0	-46.2	
3922.50	-10.4	V	3.0	43.8	1.0	-53.2	-13.0	-40.2	
4707.00	-9.2	V	3.0	43.8	1.0	-52.0	-13.0	-39.0	
1569.00	-16.9	H	3.0	43.7	1.0	-59.5	-40.0	-19.5	
2353.50	-22.7	H	3.0	43.4	1.0	-65.1	-13.0	-52.1	
3138.00	-18.1	H	3.0	43.6	1.0	-60.6	-13.0	-47.6	
3922.50	-15.2	H	3.0	43.8	1.0	-58.1	-13.0	-45.1	
4707.00	-15.0	H	3.0	43.8	1.0	-57.8	-13.0	-44.8	

LTE

Band 13

5MHz

16QAM

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

Company: Samsung
Project #: 4788481138
Date: 2018-06-16
Test Engineer: 47989
Configuration: EUT / AC Adapter / Earphone, X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 13 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, 779.5MHz									
1559.00	-15.2	V	3.0	43.7	1.0	-57.8	-40.0	-17.8	
2338.50	-21.9	V	3.0	43.4	1.0	-64.3	-13.0	-51.3	
3118.00	-18.8	V	3.0	43.6	1.0	-61.3	-13.0	-48.3	
3897.50	-14.1	V	3.0	43.8	1.0	-57.0	-13.0	-44.0	
4677.00	-9.8	V	3.0	43.8	1.0	-52.6	-13.0	-39.6	
1559.00	-17.4	H	3.0	43.7	1.0	-60.0	-40.0	-20.0	
2338.50	-22.6	H	3.0	43.4	1.0	-65.0	-13.0	-52.0	
3118.00	-19.2	H	3.0	43.6	1.0	-61.7	-13.0	-48.7	
3897.50	-15.9	H	3.0	43.8	1.0	-58.7	-13.0	-45.7	
4677.00	-15.9	H	3.0	43.8	1.0	-58.7	-13.0	-45.7	
Mid Ch, 782MHz									
1564.00	-15.7	V	3.0	43.7	1.0	-58.4	-40.0	-18.4	
2346.00	-21.7	V	3.0	43.4	1.0	-64.1	-13.0	-51.1	
3128.00	-19.0	V	3.0	43.6	1.0	-61.6	-13.0	-48.6	
3910.00	-14.0	V	3.0	43.8	1.0	-56.8	-13.0	-43.8	
4692.00	-11.6	V	3.0	43.8	1.0	-54.4	-13.0	-41.4	
1564.00	-16.7	H	3.0	43.7	1.0	-59.3	-40.0	-19.3	
2346.00	-22.6	H	3.0	43.4	1.0	-65.0	-13.0	-52.0	
3128.00	-19.1	H	3.0	43.6	1.0	-61.7	-13.0	-48.7	
3910.00	-14.5	H	3.0	43.8	1.0	-57.4	-13.0	-44.4	
4692.00	-16.3	H	3.0	43.8	1.0	-59.1	-13.0	-46.1	
High Ch, 784.5MHz									
1569.00	-17.9	V	3.0	43.7	1.0	-60.5	-40.0	-20.5	
2353.50	-22.5	V	3.0	43.4	1.0	-64.9	-13.0	-51.9	
3138.00	-17.5	V	3.0	43.6	1.0	-60.0	-13.0	-47.0	
3922.50	-11.3	V	3.0	43.8	1.0	-54.1	-13.0	-41.1	
4707.00	-10.1	V	3.0	43.8	1.0	-52.9	-13.0	-39.9	
1569.00	-16.8	H	3.0	43.7	1.0	-59.5	-40.0	-19.5	
2353.50	-22.8	H	3.0	43.4	1.0	-65.2	-13.0	-52.2	
3138.00	-18.5	H	3.0	43.6	1.0	-61.1	-13.0	-48.1	
3922.50	-14.0	H	3.0	43.8	1.0	-56.8	-13.0	-43.8	
4707.00	-15.2	H	3.0	43.8	1.0	-58.0	-13.0	-45.0	