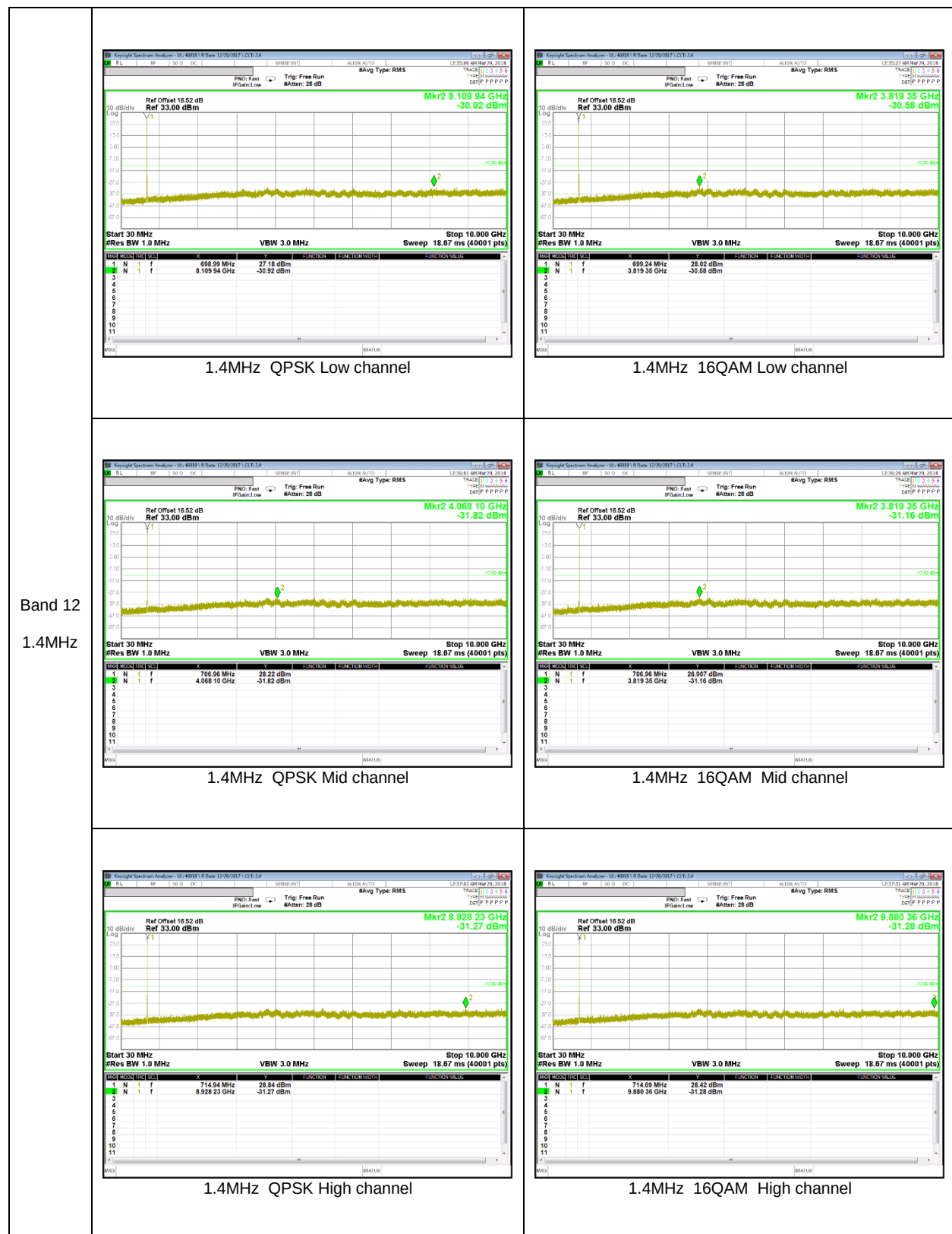




9.4. FREQUENCY STABILITY

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 v03

RESULTS

See the following pages.

9.4.1. FREQUENCY STABILITY RESULTS

GSM 850, Channel 190, Frequency 836.6 MHz

Reference Frequency : GSM850 Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	836.59998063	-0.004	2.5
3.85	40	836.59998411	-0.008	2.5
3.85	30	836.59998373	-0.007	2.5
3.85	20	836.59997763	0	2.5
3.85	10	836.59997396	0.004	2.5
3.85	0	836.59998112	-0.004	2.5
3.85	-10	836.59998324	-0.007	2.5
3.85	-20	836.59997482	0.003	2.5
3.85	-30	836.59997686	0.001	2.5

Reference Frequency : GSM850 Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	836.59997763	0	2.5
4.40	20	836.59998144	-0.005	2.5
3.60	20	836.59997316	0.005	2.5

GSM 1900, Channel 661, Frequency 1880.0 MHz

Reference Frequency: GSM1900 Mid Channel 1880.0 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	1879.99996541	0.000	2.5
3.85	40	1879.99997101	-0.003	2.5
3.85	30	1879.99996618	0.000	2.5
3.85	20	1879.99996580	0	2.5
3.85	10	1879.99996469	0.001	2.5
3.85	0	1879.99996429	0.001	2.5
3.85	-10	1879.99997367	-0.004	2.5
3.85	-20	1879.99996657	0.000	2.5
3.85	-30	1879.99996667	0.000	2.5

Reference Frequency: GSM1900 Mid Channel 1880.0 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	1879.99996580	0	2.5
4.40	20	1879.99997184	-0.003	2.5
3.60	20	1879.99996693	-0.001	2.5

WCDMA Band 5 , Channel 4183, Frequency 836.6 MHz

Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	836.59998242	0.001	2.5
3.85	40	836.59998514	-0.002	2.5
3.85	30	836.59998550	-0.003	2.5
3.85	20	836.59998334	0	2.5
3.85	10	836.59998708	-0.004	2.5
3.85	0	836.59998695	-0.004	2.5
3.85	-10	836.59997801	0.006	2.5
3.85	-20	836.59997846	0.006	2.5
3.85	-30	836.59998068	0.003	2.5

Reference Frequency: WCDMA Band 5 Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	836.59998334	0	2.5
4.40	20	836.59998520	-0.002	2.5
3.60	20	836.59997847	0.006	2.5

WCDMA Band 2 , Channel 9400, Frequency 1880.0 MHz

Reference Frequency: WCDMA Band 2 Mid Channel 1880.0 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	1879.99997192	-0.001	2.5
3.85	40	1879.99997029	0.000	2.5
3.85	30	1879.99996512	0.003	2.5
3.85	20	1879.99997035	0	2.5
3.85	10	1879.99996958	0.000	2.5
3.85	0	1879.99997125	0.000	2.5
3.85	-10	1879.99996833	0.001	2.5
3.85	-20	1879.99996973	0.000	2.5
3.85	-30	1879.99996905	0.001	2.5

Reference Frequency: WCDMA Band 2 Mid Channel 1880.0 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	1879.99997035	0	2.5
4.40	20	1879.99997349	-0.002	2.5
3.60	20	1879.99997334	-0.002	2.5

WCDMA Band 4, Channel 1413, Frequency 1732.6 MHz

Reference Frequency: WCDMA Band 4 Mid Channel 1732.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 4331.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	1732.59997643	0.002	2.5
3.85	40	1732.59998156	-0.001	2.5
3.85	30	1732.59997810	0.001	2.5
3.85	20	1732.59997903	0	2.5
3.85	10	1732.59998136	-0.001	2.5
3.85	0	1732.59997883	0.000	2.5
3.85	-10	1732.59997545	0.002	2.5
3.85	-20	1732.59998404	-0.003	2.5
3.85	-30	1732.59997713	0.001	2.5

Reference Frequency: WCDMA Band 4 Mid Channel 1732.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 4331.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	1732.59997903	0	2.5
4.40	20	1732.59997504	0.002	2.5
3.60	20	1732.59998229	-0.002	2.5

LTE Band 66, Channel 132322, Frequency 1745.0 MHz

Reference Frequency: LTE Band 66 Mid Channel 1745 MHz @ 20°C				
Limit: +- 2.5 ppm = 4362.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	1745.00001652	0.000	2.5
3.85	40	1745.00001753	0.000	2.5
3.85	30	1745.00001932	-0.001	2.5
3.85	20	1745.00001713	0	2.5
3.85	10	1745.00001912	-0.001	2.5
3.85	0	1745.00002036	-0.002	2.5
3.85	-10	1745.00002152	-0.003	2.5
3.85	-20	1745.00001681	0.000	2.5
3.85	-30	1745.00001547	0.001	2.5

Reference Frequency: LTE Band 66 Mid Channel 1745 MHz @ 20°C				
Limit: +- 2.5 ppm = 4362.500 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	1745.00001713	0	2.5
4.40	20	1745.00001455	0.001	2.5
3.60	20	1745.00001697	0.000	2.5

LTE Band 2, Channel 18900, Frequency 1880.0 MHz

Reference Frequency: LTE Band 2 Mid Channel 1880 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	1880.00002539	0.000	2.5
3.85	40	1880.00002551	0.000	2.5
3.85	30	1880.00002485	0.000	2.5
3.85	20	1880.00002477	0	2.5
3.85	10	1880.00002646	-0.001	2.5
3.85	0	1880.00002816	-0.002	2.5
3.85	-10	1880.00002640	-0.001	2.5
3.85	-20	1880.00002903	-0.002	2.5
3.85	-30	1880.00002315	0.001	2.5

Reference Frequency: LTE Band 2 Mid Channel 1880 MHz @ 20°C				
Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	1880.00002477	0	2.5
4.40	20	1880.00002956	-0.003	2.5
3.60	20	1880.00002526	0.000	2.5

LTE Band 12, Channel 23095, Frequency 707.5 MHz

Reference Frequency: LTE Band 12 Mid Channel 707.5 MHz @ 20°C				
Limit: +- 2.5 ppm = 1768.750 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	707.49997805	0.005	2.5
3.85	40	707.49998179	0.000	2.5
3.85	30	707.49997652	0.007	2.5
3.85	20	707.49998173	0	2.5
3.85	10	707.49998608	-0.006	2.5
3.85	0	707.49998036	0.002	2.5
3.85	-10	707.49997991	0.003	2.5
3.85	-20	707.49997902	0.004	2.5
3.85	-30	707.49998572	-0.006	2.5

Reference Frequency: LTE Band 12 Mid Channel 707.5 MHz @ 20°C				
Limit: +- 2.5 ppm = 1768.750 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	707.49998173	0	2.5
4.40	20	707.49997674	0.007	2.5
3.60	20	707.49997994	0.003	2.5

LTE Band 5 , Channel 20524, Frequency 836.5 MHz

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.250 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	50	836.5000000	0.000	2.5
3.85	40	836.5000000	0.000	2.5
3.85	30	836.5000000	0.000	2.5
3.85	20	836.5000000	0	2.5
3.85	10	836.5000000	0.000	2.5
3.85	0	836.5000000	0.000	2.5
3.85	-10	836.5000000	0.000	2.5
3.85	-20	836.5000000	0.000	2.5
3.85	-30	836.5000000	0.000	2.5

Reference Frequency: LTE Band 5 Mid Channel 836.5 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.250 Hz				
Power Supply [Vdc]	Environment Temperature [°C]	Frequency Deviation Measured with Time Elapse		
		[MHz]	Delta [ppm]	Limit [ppm]
3.85	20	836.5000000	0	2.5
4.40	20	836.5000000	0.000	2.5
3.60	20	836.5000000	0.000	2.5

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

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 v03

For peak power measurement with a ESU40:

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

For average power measurement with a ESU40:

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

TEST RESULTS

10.1.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM850	GPRS	512	824.2	26.31	427.56
		661	836.6	26.96	496.59
		810	848.8	27.87	612.35
	EGPRS	512	824.2	21.82	152.05
		661	836.6	22.63	183.23
		810	848.8	23.82	240.99
GSM1900	GPRS	512	1850.2	28.42	695.78
		661	1880.0	29.53	896.82
		810	1909.8	30.13	1030.39
	EGPRS	512	1850.2	26.28	425.08
		661	1880.0	26.66	463.13
		810	1909.8	27.41	550.81

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	17.09	51.22
		4183	836.6	17.45	55.64
		4233	846.6	18.04	63.68
	HSDPA	4132	826.4	13.95	24.86
		4183	836.6	14.58	28.73
		4233	846.6	15.86	38.55
Band 2	REL99	9262	1852.4	17.24	52.93
		9400	1880.0	21.53	142.23
		9538	1907.6	18.93	78.13
	HSDPA	9262	1852.4	15.26	33.55
		9400	1880.0	19.11	81.47
		9538	1907.6	17.05	50.68

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 4	REL99	1312	1712.4	20.14	103.24
		1413	1732.6	20.84	121.34
		1513	1752.6	20.02	100.49
	HSDPA	1312	1712.4	18.95	78.49
		1413	1732.6	19.84	96.38
		1513	1752.6	18.23	66.54

LTE Band 5

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 5	10	QPSK	50/0	829.0	14.96	31.30
			50/0	836.5	16.86	48.54
			50/0	844.0	17.19	52.36
		16QAM	50/0	829.0	13.96	24.86
			50/0	836.5	15.83	38.29
			50/0	844.0	16.18	41.50
	5	QPSK	25/0	826.5	15.16	32.83
			25/0	836.5	16.20	41.69
			25/0	846.5	16.63	46.03
		16QAM	25/0	826.5	14.19	26.26
			25/0	836.5	15.19	33.04
			25/0	846.5	15.67	36.90
	3	QPSK	15/0	825.5	13.18	20.81
			15/0	836.5	14.05	25.41
			15/0	847.5	16.59	45.60
		16QAM	15/0	825.5	14.32	27.06
			15/0	836.5	15.20	33.12
			15/0	847.5	15.59	36.22
	1.4	QPSK	6/0	824.7	13.29	21.31
			6/0	836.5	14.15	26.01
			6/0	848.3	14.54	28.44
		16QAM	6/0	824.7	12.24	16.74
			6/0	836.5	14.09	25.64
			6/0	848.3	13.51	22.44

LTE Band 66

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 66	20	QPSK	100/0	1720.0	21.83	152.41
			100/0	1745.0	21.50	141.31
			100/0	1770.0	20.66	116.50
		16QAM	100/0	1720.0	20.85	121.62
			100/0	1745.0	20.52	112.77
			100/0	1770.0	19.66	92.54
	15	QPSK	75/0	1717.5	22.22	166.72
			75/0	1745.0	21.96	157.10
			75/0	1772.5	21.56	143.30
		16QAM	75/0	1717.5	21.17	130.92
			75/0	1745.0	20.90	123.08
			75/0	1772.5	20.50	112.27
	10	QPSK	50/0	1715.0	21.50	141.25
			50/0	1745.0	21.12	129.47
			50/0	1775.0	20.51	112.47
		16QAM	50/0	1715.0	20.48	111.69
			50/0	1745.0	20.15	103.56
			50/0	1775.0	19.43	87.71
	5	QPSK	25/0	1712.5	20.88	122.46
			25/0	1745.0	20.77	119.45
			25/0	1777.5	20.03	100.69
		16QAM	25/0	1712.5	19.19	82.97
			25/0	1745.0	19.77	94.84
			25/0	1777.5	19.01	79.62
	3	QPSK	15/0	1711.5	20.85	121.65
			15/0	1745.0	20.97	125.03
			15/0	1778.5	19.99	99.76
		16QAM	15/0	1711.5	20.60	114.82
			15/0	1745.0	19.90	97.76
			15/0	1778.5	18.90	77.62
	1.4	QPSK	6/0	1710.7	18.29	67.42
			6/0	1745.0	19.13	81.85
			6/0	1779.3	18.14	65.12
		16QAM	6/0	1710.7	17.37	54.55
			6/0	1745.0	18.02	63.39
			6/0	1779.3	17.31	53.79

LTE Band 2

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 2	20	QPSK	100/0	1860.0	21.35	136.36
			100/0	1880.0	21.67	146.79
			100/0	1900.0	22.55	179.89
		16QAM	100/0	1860.0	20.40	109.57
			100/0	1880.0	20.65	116.07
			100/0	1900.0	21.60	144.54
	15	QPSK	75/0	1857.5	20.99	125.48
			75/0	1880.0	21.81	151.60
			75/0	1902.5	22.04	159.96
		16QAM	75/0	1857.5	19.97	99.22
			75/0	1880.0	20.79	119.87
			75/0	1902.5	21.04	127.06
	10	QPSK	50/0	1855.0	21.13	129.58
			50/0	1880.0	21.69	147.47
			50/0	1905.0	22.17	164.82
		16QAM	50/0	1855.0	20.16	103.64
			50/0	1880.0	20.70	117.41
			50/0	1905.0	21.15	130.32
	5	QPSK	25/0	1852.5	20.06	101.31
			25/0	1880.0	20.83	120.98
			25/0	1907.5	21.71	148.25
		16QAM	25/0	1852.5	19.09	81.03
			25/0	1880.0	19.81	95.65
			25/0	1907.5	20.70	117.49
	3	QPSK	15/0	1851.5	17.86	61.04
			15/0	1880.0	19.03	79.93
			15/0	1908.5	19.25	84.14
		16QAM	15/0	1851.5	16.92	49.16
			15/0	1880.0	17.89	61.48
			15/0	1908.5	18.30	67.61
	1.4	QPSK	6/0	1850.7	17.34	54.20
			6/0	1880.0	18.34	68.19
			6/0	1909.3	19.14	82.04
		16QAM	6/0	1850.7	16.25	42.17
			6/0	1880.0	17.28	53.42
			6/0	1909.3	18.22	66.37

LTE Band 12

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 12	10	QPSK	50/0	704.0	13.07	20.28
			50/0	707.5	12.17	16.47
			50/0	711.0	13.20	20.89
		16QAM	50/0	704.0	11.63	14.56
			50/0	707.5	10.78	11.96
			50/0	711.0	11.74	14.93
	5	QPSK	25/0	701.5	11.45	13.96
			25/0	707.5	12.98	19.86
			25/0	713.5	12.96	19.78
		16QAM	25/0	701.5	10.26	10.61
			25/0	707.5	11.55	14.29
			25/0	713.5	11.46	14.00
	3	QPSK	15/0	700.5	10.90	12.31
			15/0	707.5	11.52	14.18
			15/0	714.5	12.86	19.32
		16QAM	15/0	700.5	9.80	9.56
			15/0	707.5	10.18	10.42
			15/0	714.5	11.42	13.87
	1.4	QPSK	6/0	699.7	9.27	8.45
			6/0	707.5	10.53	11.29
			6/0	715.3	10.77	11.94
		16QAM	6/0	699.7	8.32	6.79
			6/0	707.5	9.28	8.47
			6/0	715.3	9.84	9.64

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

10.1.2. ERP/EIRP DATA

GSM 850

GSM GSM850 GPRS	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-03-31 Test Engineer: 51072 Configuration: EUT / Z-Position Location: Chamber 1 Mode: GPRS 850 MHz Fundamentals Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>824.20</td><td>28.74</td><td>V</td><td>1.0</td><td>-1.5</td><td>26.31</td><td>38.5</td><td>-12.2</td></tr><tr><td>824.20</td><td>17.11</td><td>H</td><td>1.0</td><td>-1.5</td><td>14.68</td><td>38.5</td><td>-23.8</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>836.60</td><td>29.34</td><td>V</td><td>1.0</td><td>-1.4</td><td>26.96</td><td>38.5</td><td>-11.5</td></tr><tr><td>836.60</td><td>17.93</td><td>H</td><td>1.0</td><td>-1.4</td><td>15.55</td><td>38.5</td><td>-23.0</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>848.80</td><td>30.21</td><td>V</td><td>1.0</td><td>-1.4</td><td>27.87</td><td>38.5</td><td>-10.6</td></tr><tr><td>848.80</td><td>18.02</td><td>H</td><td>1.0</td><td>-1.4</td><td>15.68</td><td>38.5</td><td>-22.8</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								824.20	28.74	V	1.0	-1.5	26.31	38.5	-12.2	824.20	17.11	H	1.0	-1.5	14.68	38.5	-23.8	Mid Ch								836.60	29.34	V	1.0	-1.4	26.96	38.5	-11.5	836.60	17.93	H	1.0	-1.4	15.55	38.5	-23.0	High Ch								848.80	30.21	V	1.0	-1.4	27.87	38.5	-10.6	848.80	18.02	H	1.0	-1.4	15.68	38.5	-22.8
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	824.20	28.74	V	1.0	-1.5	26.31	38.5	-12.2																																																																																		
	824.20	17.11	H	1.0	-1.5	14.68	38.5	-23.8																																																																																		
	Mid Ch																																																																																									
	836.60	29.34	V	1.0	-1.4	26.96	38.5	-11.5																																																																																		
	836.60	17.93	H	1.0	-1.4	15.55	38.5	-23.0																																																																																		
	High Ch																																																																																									
	848.80	30.21	V	1.0	-1.4	27.87	38.5	-10.6																																																																																		
848.80	18.02	H	1.0	-1.4	15.68	38.5	-22.8																																																																																			
GSM GSM850 EGPRS	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-03-31 Test Engineer: 51072 Configuration: EUT / Z-Position Location: Chamber 1 Mode: EGPRS 850 MHz Fundamentals Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>824.20</td><td>24.25</td><td>V</td><td>1.0</td><td>-1.5</td><td>21.82</td><td>38.5</td><td>-16.7</td></tr><tr><td>824.20</td><td>12.62</td><td>H</td><td>1.0</td><td>-1.5</td><td>10.19</td><td>38.5</td><td>-28.3</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>836.60</td><td>25.01</td><td>V</td><td>1.0</td><td>-1.4</td><td>22.63</td><td>38.5</td><td>-15.9</td></tr><tr><td>836.60</td><td>13.68</td><td>H</td><td>1.0</td><td>-1.4</td><td>11.30</td><td>38.5</td><td>-27.2</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>848.80</td><td>26.16</td><td>V</td><td>1.0</td><td>-1.4</td><td>23.82</td><td>38.5</td><td>-14.7</td></tr><tr><td>848.80</td><td>13.24</td><td>H</td><td>1.0</td><td>-1.4</td><td>10.90</td><td>38.5</td><td>-27.6</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								824.20	24.25	V	1.0	-1.5	21.82	38.5	-16.7	824.20	12.62	H	1.0	-1.5	10.19	38.5	-28.3	Mid Ch								836.60	25.01	V	1.0	-1.4	22.63	38.5	-15.9	836.60	13.68	H	1.0	-1.4	11.30	38.5	-27.2	High Ch								848.80	26.16	V	1.0	-1.4	23.82	38.5	-14.7	848.80	13.24	H	1.0	-1.4	10.90	38.5	-27.6
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	824.20	24.25	V	1.0	-1.5	21.82	38.5	-16.7																																																																																		
	824.20	12.62	H	1.0	-1.5	10.19	38.5	-28.3																																																																																		
	Mid Ch																																																																																									
	836.60	25.01	V	1.0	-1.4	22.63	38.5	-15.9																																																																																		
	836.60	13.68	H	1.0	-1.4	11.30	38.5	-27.2																																																																																		
	High Ch																																																																																									
	848.80	26.16	V	1.0	-1.4	23.82	38.5	-14.7																																																																																		
848.80	13.24	H	1.0	-1.4	10.90	38.5	-27.6																																																																																			

GSM 1900

GSM GSM1900 GPRS	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-03-31 Test Engineer: 51072 Configuration: EUT / X-Position Location: Chamber 1 Mode: GPRS 1900 MHz Fundamentals Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1850.20</td><td>20.75</td><td>V</td><td>4.5</td><td>9.5</td><td>25.76</td><td>33.0</td><td>-7.2</td></tr><tr><td>1850.20</td><td>23.41</td><td>H</td><td>4.5</td><td>9.5</td><td>28.42</td><td>33.0</td><td>-4.6</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>21.72</td><td>V</td><td>4.5</td><td>9.2</td><td>26.40</td><td>33.0</td><td>-6.6</td></tr><tr><td>1880.00</td><td>24.85</td><td>H</td><td>4.5</td><td>9.2</td><td>29.53</td><td>33.0</td><td>-3.5</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1909.80</td><td>23.06</td><td>V</td><td>4.6</td><td>8.9</td><td>27.36</td><td>33.0</td><td>-5.6</td></tr><tr><td>1909.80</td><td>25.83</td><td>H</td><td>4.6</td><td>8.9</td><td>30.13</td><td>33.0</td><td>-2.9</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								1850.20	20.75	V	4.5	9.5	25.76	33.0	-7.2	1850.20	23.41	H	4.5	9.5	28.42	33.0	-4.6	Mid Ch								1880.00	21.72	V	4.5	9.2	26.40	33.0	-6.6	1880.00	24.85	H	4.5	9.2	29.53	33.0	-3.5	High Ch								1909.80	23.06	V	4.6	8.9	27.36	33.0	-5.6	1909.80	25.83	H	4.6	8.9	30.13	33.0	-2.9
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	1850.20	20.75	V	4.5	9.5	25.76	33.0	-7.2																																																																																		
	1850.20	23.41	H	4.5	9.5	28.42	33.0	-4.6																																																																																		
	Mid Ch																																																																																									
	1880.00	21.72	V	4.5	9.2	26.40	33.0	-6.6																																																																																		
	1880.00	24.85	H	4.5	9.2	29.53	33.0	-3.5																																																																																		
	High Ch																																																																																									
	1909.80	23.06	V	4.6	8.9	27.36	33.0	-5.6																																																																																		
1909.80	25.83	H	4.6	8.9	30.13	33.0	-2.9																																																																																			
GSM GSM1900 EGPRS	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-03-31 Test Engineer: 51072 Configuration: EUT / X-Position Location: Chamber 1 Mode: EGPRS 1900 MHz Fundamentals Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1850.20</td><td>18.50</td><td>V</td><td>4.5</td><td>9.5</td><td>23.51</td><td>33.0</td><td>-9.5</td></tr><tr><td>1850.20</td><td>21.27</td><td>H</td><td>4.5</td><td>9.5</td><td>26.28</td><td>33.0</td><td>-6.7</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>18.86</td><td>V</td><td>4.5</td><td>9.2</td><td>23.54</td><td>33.0</td><td>-9.5</td></tr><tr><td>1880.00</td><td>21.98</td><td>H</td><td>4.5</td><td>9.2</td><td>26.66</td><td>33.0</td><td>-6.3</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1909.80</td><td>20.37</td><td>V</td><td>4.6</td><td>8.9</td><td>24.67</td><td>33.0</td><td>-8.3</td></tr><tr><td>1909.80</td><td>23.11</td><td>H</td><td>4.6</td><td>8.9</td><td>27.41</td><td>33.0</td><td>-5.6</td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								1850.20	18.50	V	4.5	9.5	23.51	33.0	-9.5	1850.20	21.27	H	4.5	9.5	26.28	33.0	-6.7	Mid Ch								1880.00	18.86	V	4.5	9.2	23.54	33.0	-9.5	1880.00	21.98	H	4.5	9.2	26.66	33.0	-6.3	High Ch								1909.80	20.37	V	4.6	8.9	24.67	33.0	-8.3	1909.80	23.11	H	4.6	8.9	27.41	33.0	-5.6
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	1850.20	18.50	V	4.5	9.5	23.51	33.0	-9.5																																																																																		
	1850.20	21.27	H	4.5	9.5	26.28	33.0	-6.7																																																																																		
	Mid Ch																																																																																									
	1880.00	18.86	V	4.5	9.2	23.54	33.0	-9.5																																																																																		
	1880.00	21.98	H	4.5	9.2	26.66	33.0	-6.3																																																																																		
	High Ch																																																																																									
	1909.80	20.37	V	4.6	8.9	24.67	33.0	-8.3																																																																																		
1909.80	23.11	H	4.6	8.9	27.41	33.0	-5.6																																																																																			

WCDMA Band 5

WCDMA Band 5 REL99	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: Rel99 Band 5 Fundamentals Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>826.40</td><td>19.51</td><td>V</td><td>1.0</td><td>-1.5</td><td>17.09</td><td>38.5</td><td>-21.4</td></tr><tr><td>826.40</td><td>6.81</td><td>H</td><td>1.0</td><td>-1.5</td><td>4.39</td><td>38.5</td><td>-34.1</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>836.60</td><td>19.83</td><td>V</td><td>1.0</td><td>-1.4</td><td>17.45</td><td>38.5</td><td>-21.0</td></tr><tr><td>836.60</td><td>7.83</td><td>H</td><td>1.0</td><td>-1.4</td><td>5.45</td><td>38.5</td><td>-33.0</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>846.60</td><td>20.39</td><td>V</td><td>1.0</td><td>-1.4</td><td>18.04</td><td>38.5</td><td>-20.5</td></tr><tr><td>846.60</td><td>8.75</td><td>H</td><td>1.0</td><td>-1.4</td><td>6.40</td><td>38.5</td><td>-32.1</td></tr></table>									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	19.51	V	1.0	-1.5	17.09	38.5	-21.4	826.40	6.81	H	1.0	-1.5	4.39	38.5	-34.1	Mid Ch								836.60	19.83	V	1.0	-1.4	17.45	38.5	-21.0	836.60	7.83	H	1.0	-1.4	5.45	38.5	-33.0	High Ch								846.60	20.39	V	1.0	-1.4	18.04	38.5	-20.5	846.60	8.75	H	1.0	-1.4	6.40	38.5	-32.1
	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	19.51	V	1.0	-1.5	17.09	38.5	-21.4																																																																																		
	826.40	6.81	H	1.0	-1.5	4.39	38.5	-34.1																																																																																		
	Mid Ch																																																																																									
	836.60	19.83	V	1.0	-1.4	17.45	38.5	-21.0																																																																																		
	836.60	7.83	H	1.0	-1.4	5.45	38.5	-33.0																																																																																		
	High Ch																																																																																									
	846.60	20.39	V	1.0	-1.4	18.04	38.5	-20.5																																																																																		
846.60	8.75	H	1.0	-1.4	6.40	38.5	-32.1																																																																																			
WCDMA Band 5 HSDPA	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: HSDPA Band 5 Fundamentals Test Equipment: Receiving: VULB9163-749, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>826.40</td><td>16.37</td><td>V</td><td>1.0</td><td>-1.5</td><td>13.95</td><td>38.5</td><td>-24.5</td></tr><tr><td>826.40</td><td>3.23</td><td>H</td><td>1.0</td><td>-1.5</td><td>0.81</td><td>38.5</td><td>-37.7</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>836.60</td><td>16.96</td><td>V</td><td>1.0</td><td>-1.4</td><td>14.58</td><td>38.5</td><td>-23.9</td></tr><tr><td>836.60</td><td>4.20</td><td>H</td><td>1.0</td><td>-1.4</td><td>1.82</td><td>38.5</td><td>-36.7</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>846.60</td><td>18.21</td><td>V</td><td>1.0</td><td>-1.4</td><td>15.86</td><td>38.5</td><td>-22.6</td></tr><tr><td>846.60</td><td>6.06</td><td>H</td><td>1.0</td><td>-1.4</td><td>3.71</td><td>38.5</td><td>-34.8</td></tr></table>									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	16.37	V	1.0	-1.5	13.95	38.5	-24.5	826.40	3.23	H	1.0	-1.5	0.81	38.5	-37.7	Mid Ch								836.60	16.96	V	1.0	-1.4	14.58	38.5	-23.9	836.60	4.20	H	1.0	-1.4	1.82	38.5	-36.7	High Ch								846.60	18.21	V	1.0	-1.4	15.86	38.5	-22.6	846.60	6.06	H	1.0	-1.4	3.71	38.5	-34.8
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
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	836.60	16.96	V	1.0	-1.4	14.58	38.5	-23.9																																																																																		
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846.60	6.06	H	1.0	-1.4	3.71	38.5	-34.8																																																																																			

WCDMA Band 4

WCDMA

Band 4
REL99

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788397760
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: Rel99 Band 4 Fundamentals

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 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								
1712.40	13.58	V	4.3	9.5	18.73	30.0	-11.3	
1712.40	14.99	H	4.3	9.5	20.14	30.0	-9.9	
Mid Ch								
1732.60	13.70	V	4.3	9.5	18.90	30.0	-11.1	
1732.60	15.65	H	4.3	9.5	20.84	30.0	-9.2	
High Ch								
1752.60	13.93	V	4.4	9.6	19.17	30.0	-10.8	
1752.60	14.78	H	4.4	9.6	20.02	30.0	-10.0	

WCDMA

Band 4
HSDPA

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788397760
Date: 2018-04-02
Test Engineer: 45585
Configuration: EUT / X-Position
Location: Chamber 2
Mode: HSDPA Band 4 Fundamentals

Test Equipment:
Receiving: Horn 3117[00168724], and Chamber 2 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								
1712.40	11.87	V	4.3	9.5	17.02	30.0	-13.0	
1712.40	13.80	H	4.3	9.5	18.95	30.0	-11.1	
Mid Ch								
1732.60	12.54	V	4.3	9.5	17.74	30.0	-12.3	
1732.60	14.65	H	4.3	9.5	19.84	30.0	-10.2	
High Ch								
1752.60	12.14	V	4.4	9.6	17.38	30.0	-12.6	
1752.60	12.99	H	4.4	9.6	18.23	30.0	-11.8	

WCDMA Band 2

WCDMA Band 2 REL99	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 45585 Configuration: EUT / X-Position Location: Chamber 2 Mode: Rel99 Band 2 Fundamentals Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1852.40</td><td>12.25</td><td>V</td><td>4.5</td><td>9.5</td><td>17.24</td><td>33.0</td><td>-15.8</td></tr><tr><td>1852.40</td><td>12.08</td><td>H</td><td>4.5</td><td>9.5</td><td>17.07</td><td>33.0</td><td>-15.9</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>13.23</td><td>V</td><td>4.5</td><td>9.2</td><td>17.91</td><td>33.0</td><td>-15.1</td></tr><tr><td>1880.00</td><td>16.85</td><td>H</td><td>4.5</td><td>9.2</td><td>21.53</td><td>33.0</td><td>-11.5</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1907.60</td><td>14.59</td><td>V</td><td>4.6</td><td>8.9</td><td>18.93</td><td>33.0</td><td>-14.1</td></tr><tr><td>1907.60</td><td>14.45</td><td>H</td><td>4.6</td><td>8.9</td><td>18.79</td><td>33.0</td><td>-14.2</td></tr></table>									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	12.25	V	4.5	9.5	17.24	33.0	-15.8	1852.40	12.08	H	4.5	9.5	17.07	33.0	-15.9	Mid Ch								1880.00	13.23	V	4.5	9.2	17.91	33.0	-15.1	1880.00	16.85	H	4.5	9.2	21.53	33.0	-11.5	High Ch								1907.60	14.59	V	4.6	8.9	18.93	33.0	-14.1	1907.60	14.45	H	4.6	8.9	18.79	33.0	-14.2
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
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	1852.40	12.08	H	4.5	9.5	17.07	33.0	-15.9																																																																																		
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	1880.00	13.23	V	4.5	9.2	17.91	33.0	-15.1																																																																																		
	1880.00	16.85	H	4.5	9.2	21.53	33.0	-11.5																																																																																		
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	1907.60	14.59	V	4.6	8.9	18.93	33.0	-14.1																																																																																		
1907.60	14.45	H	4.6	8.9	18.79	33.0	-14.2																																																																																			
WCDMA Band 2 HSDPA	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 45585 Configuration: EUT / Z-Position Location: Chamber 2 Mode: HSDPA Band 2 Fundamentals Test Equipment: Receiving: Horn 3117[00168724], and Chamber 2 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1852.40</td><td>10.27</td><td>V</td><td>4.5</td><td>9.5</td><td>15.26</td><td>33.0</td><td>-17.7</td></tr><tr><td>1852.40</td><td>9.82</td><td>H</td><td>4.5</td><td>9.5</td><td>14.81</td><td>33.0</td><td>-18.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>11.31</td><td>V</td><td>4.5</td><td>9.2</td><td>15.99</td><td>33.0</td><td>-17.0</td></tr><tr><td>1880.00</td><td>14.43</td><td>H</td><td>4.5</td><td>9.2</td><td>19.11</td><td>33.0</td><td>-13.9</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1907.60</td><td>12.71</td><td>V</td><td>4.6</td><td>8.9</td><td>17.05</td><td>33.0</td><td>-16.0</td></tr><tr><td>1907.60</td><td>12.69</td><td>H</td><td>4.6</td><td>8.9</td><td>17.03</td><td>33.0</td><td>-16.0</td></tr></table>									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	10.27	V	4.5	9.5	15.26	33.0	-17.7	1852.40	9.82	H	4.5	9.5	14.81	33.0	-18.2	Mid Ch								1880.00	11.31	V	4.5	9.2	15.99	33.0	-17.0	1880.00	14.43	H	4.5	9.2	19.11	33.0	-13.9	High Ch								1907.60	12.71	V	4.6	8.9	17.05	33.0	-16.0	1907.60	12.69	H	4.6	8.9	17.03	33.0	-16.0
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
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	1907.60	12.71	V	4.6	8.9	17.05	33.0	-16.0																																																																																		
1907.60	12.69	H	4.6	8.9	17.03	33.0	-16.0																																																																																			

LTE Band 5

LTE Band 5 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 5 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>829.00</td><td>17.37</td><td>V</td><td>1.0</td><td>-1.5</td><td>14.96</td><td>38.5</td><td>-23.5</td><td></td></tr><tr><td>829.00</td><td>3.51</td><td>H</td><td>1.0</td><td>-1.5</td><td>1.10</td><td>38.5</td><td>-37.4</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>836.50</td><td>19.24</td><td>V</td><td>1.0</td><td>-1.4</td><td>16.86</td><td>38.5</td><td>-21.6</td><td></td></tr><tr><td>836.50</td><td>5.59</td><td>H</td><td>1.0</td><td>-1.4</td><td>3.21</td><td>38.5</td><td>-35.3</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>844.00</td><td>19.55</td><td>V</td><td>1.0</td><td>-1.4</td><td>17.19</td><td>38.5</td><td>-21.3</td><td></td></tr><tr><td>844.00</td><td>6.28</td><td>H</td><td>1.0</td><td>-1.4</td><td>3.93</td><td>38.5</td><td>-34.6</td><td></td></tr></table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									829.00	17.37	V	1.0	-1.5	14.96	38.5	-23.5		829.00	3.51	H	1.0	-1.5	1.10	38.5	-37.4		Mid Ch									836.50	19.24	V	1.0	-1.4	16.86	38.5	-21.6		836.50	5.59	H	1.0	-1.4	3.21	38.5	-35.3		High Ch									844.00	19.55	V	1.0	-1.4	17.19	38.5	-21.3		844.00	6.28	H	1.0	-1.4	3.93	38.5	-34.6	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																			
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844.00	19.55	V	1.0	-1.4	17.19	38.5	-21.3																																																																																				
844.00	6.28	H	1.0	-1.4	3.93	38.5	-34.6																																																																																				
LTE Band 5 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 5 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>829.00</td><td>16.37</td><td>V</td><td>1.0</td><td>-1.5</td><td>13.96</td><td>38.5</td><td>-24.5</td><td></td></tr><tr><td>829.00</td><td>3.31</td><td>H</td><td>1.0</td><td>-1.5</td><td>0.90</td><td>38.5</td><td>-37.6</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>836.50</td><td>18.21</td><td>V</td><td>1.0</td><td>-1.4</td><td>15.83</td><td>38.5</td><td>-22.7</td><td></td></tr><tr><td>836.50</td><td>5.12</td><td>H</td><td>1.0</td><td>-1.4</td><td>2.74</td><td>38.5</td><td>-35.8</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>844.00</td><td>18.54</td><td>V</td><td>1.0</td><td>-1.4</td><td>16.18</td><td>38.5</td><td>-22.3</td><td></td></tr><tr><td>844.00</td><td>5.36</td><td>H</td><td>1.0</td><td>-1.4</td><td>3.01</td><td>38.5</td><td>-35.5</td><td></td></tr></table>	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	16.37	V	1.0	-1.5	13.96	38.5	-24.5		829.00	3.31	H	1.0	-1.5	0.90	38.5	-37.6		Mid Ch									836.50	18.21	V	1.0	-1.4	15.83	38.5	-22.7		836.50	5.12	H	1.0	-1.4	2.74	38.5	-35.8		High Ch									844.00	18.54	V	1.0	-1.4	16.18	38.5	-22.3		844.00	5.36	H	1.0	-1.4	3.01	38.5	-35.5	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																			
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LTE

Band 5

5MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-02

Test Engineer: 47989

Configuration: EUT / Z-Position

Location: Chamber 1

Mode: LTE_QPSK Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:

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								
826.50	17.58	V	1.0	-1.5	15.16	38.5	-23.3	
826.50	4.56	H	1.0	-1.5	2.14	38.5	-36.4	
Mid Ch								
836.50	18.58	V	1.0	-1.4	16.20	38.5	-22.3	
836.50	5.51	H	1.0	-1.4	3.13	38.5	-35.4	
High Ch								
846.50	18.98	V	1.0	-1.4	16.63	38.5	-21.9	
846.50	5.68	H	1.0	-1.4	3.33	38.5	-35.2	

LTE

Band 5

5MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-02

Test Engineer: 47989

Configuration: EUT / Z-Position

Location: Chamber 1

Mode: LTE_16QAM Band 5 Fundamentals, 5MHz Bandwidth

Test Equipment:

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								
826.50	16.61	V	1.0	-1.5	14.19	38.5	-24.3	
826.50	4.04	H	1.0	-1.5	1.62	38.5	-36.9	
Mid Ch								
836.50	17.57	V	1.0	-1.4	15.19	38.5	-23.3	
836.50	4.51	H	1.0	-1.4	2.13	38.5	-36.4	
High Ch								
846.50	18.02	V	1.0	-1.4	15.67	38.5	-22.8	
846.50	4.57	H	1.0	-1.4	2.22	38.5	-36.3	

LTE

Band 5

3MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-02

Test Engineer: 47989

Configuration: EUT / Z-Position

Location: Chamber 1

Mode: LTE_QPSK Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:

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								
825.50	15.61	V	1.0	-1.5	13.18	38.5	-25.3	
825.50	4.48	H	1.0	-1.5	2.06	38.5	-36.4	
Mid Ch								
836.50	16.43	V	1.0	-1.4	14.05	38.5	-24.4	
836.50	5.32	H	1.0	-1.4	2.94	38.5	-35.6	
High Ch								
847.50	18.94	V	1.0	-1.4	16.59	38.5	-21.9	
847.50	5.50	H	1.0	-1.4	3.16	38.5	-35.3	

LTE

Band 5

3MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-02

Test Engineer: 47989

Configuration: EUT / Z-Position

Location: Chamber 1

Mode: LTE_16QAM Band 5 Fundamentals, 3MHz Bandwidth

Test Equipment:

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								
825.50	16.75	V	1.0	-1.5	14.32	38.5	-24.2	
825.50	3.35	H	1.0	-1.5	0.93	38.5	-37.6	
Mid Ch								
836.50	17.58	V	1.0	-1.4	15.20	38.5	-23.3	
836.50	4.37	H	1.0	-1.4	1.99	38.5	-36.5	
High Ch								
847.50	17.94	V	1.0	-1.4	15.59	38.5	-22.9	
847.50	4.43	H	1.0	-1.4	2.09	38.5	-36.4	

LTE

Band 5

1.4MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-02

Test Engineer: 47989

Configuration: EUT / Z-Position

Location: Chamber 1

Mode: LTE_QPSK Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

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								
824.70	15.71	V	1.0	-1.5	13.29	38.5	-25.2	
824.70	2.15	H	1.0	-1.5	-0.27	38.5	-38.8	
Mid Ch								
836.50	16.53	V	1.0	-1.4	14.15	38.5	-24.3	
836.50	3.21	H	1.0	-1.4	0.83	38.5	-37.7	
High Ch								
848.30	16.88	V	1.0	-1.4	14.54	38.5	-24.0	
848.30	3.42	H	1.0	-1.4	1.08	38.5	-37.4	

LTE

Band 5

1.4MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-02

Test Engineer: 47989

Configuration: EUT / Z-Position

Location: Chamber 1

Mode: LTE_16QAM Band 5 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

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								
824.70	14.66	V	1.0	-1.5	12.24	38.5	-26.3	
824.70	1.10	H	1.0	-1.5	-1.32	38.5	-39.8	
Mid Ch								
836.50	16.47	V	1.0	-1.4	14.09	38.5	-24.4	
836.50	2.58	H	1.0	-1.4	0.20	38.5	-38.3	
High Ch								
848.30	15.85	V	1.0	-1.4	13.51	38.5	-25.0	
848.30	2.53	H	1.0	-1.4	0.19	38.5	-38.3	

LTE Band 66

LTE Band 66 20MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 20MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1720.00</td><td>12.86</td><td>V</td><td>4.3</td><td>9.5</td><td>18.03</td><td>30.0</td><td>-12.0</td></tr><tr><td>1720.00</td><td>16.66</td><td>H</td><td>4.3</td><td>9.5</td><td>21.83</td><td>30.0</td><td>-8.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1745.00</td><td>12.44</td><td>V</td><td>4.4</td><td>9.6</td><td>17.66</td><td>30.0</td><td>-12.3</td></tr><tr><td>1745.00</td><td>16.28</td><td>H</td><td>4.4</td><td>9.6</td><td>21.50</td><td>30.0</td><td>-8.5</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1770.00</td><td>11.97</td><td>V</td><td>4.4</td><td>9.6</td><td>17.21</td><td>30.0</td><td>-12.8</td></tr><tr><td>1770.00</td><td>15.43</td><td>H</td><td>4.4</td><td>9.6</td><td>20.66</td><td>30.0</td><td>-9.3</td></tr></table>									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	12.86	V	4.3	9.5	18.03	30.0	-12.0	1720.00	16.66	H	4.3	9.5	21.83	30.0	-8.2	Mid Ch								1745.00	12.44	V	4.4	9.6	17.66	30.0	-12.3	1745.00	16.28	H	4.4	9.6	21.50	30.0	-8.5	High Ch								1770.00	11.97	V	4.4	9.6	17.21	30.0	-12.8	1770.00	15.43	H	4.4	9.6	20.66	30.0	-9.3
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
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	1720.00	12.86	V	4.3	9.5	18.03	30.0	-12.0																																																																																		
	1720.00	16.66	H	4.3	9.5	21.83	30.0	-8.2																																																																																		
	Mid Ch																																																																																									
	1745.00	12.44	V	4.4	9.6	17.66	30.0	-12.3																																																																																		
	1745.00	16.28	H	4.4	9.6	21.50	30.0	-8.5																																																																																		
	High Ch																																																																																									
	1770.00	11.97	V	4.4	9.6	17.21	30.0	-12.8																																																																																		
1770.00	15.43	H	4.4	9.6	20.66	30.0	-9.3																																																																																			
LTE Band 66 20MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 20MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1720.00</td><td>11.87</td><td>V</td><td>4.3</td><td>9.5</td><td>17.04</td><td>30.0</td><td>-13.0</td></tr><tr><td>1720.00</td><td>15.68</td><td>H</td><td>4.3</td><td>9.5</td><td>20.85</td><td>30.0</td><td>-9.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1745.00</td><td>11.46</td><td>V</td><td>4.4</td><td>9.6</td><td>16.68</td><td>30.0</td><td>-13.3</td></tr><tr><td>1745.00</td><td>15.30</td><td>H</td><td>4.4</td><td>9.6</td><td>20.52</td><td>30.0</td><td>-9.5</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1770.00</td><td>10.99</td><td>V</td><td>4.4</td><td>9.6</td><td>16.23</td><td>30.0</td><td>-13.8</td></tr><tr><td>1770.00</td><td>14.43</td><td>H</td><td>4.4</td><td>9.6</td><td>19.66</td><td>30.0</td><td>-10.3</td></tr></table>									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	11.87	V	4.3	9.5	17.04	30.0	-13.0	1720.00	15.68	H	4.3	9.5	20.85	30.0	-9.2	Mid Ch								1745.00	11.46	V	4.4	9.6	16.68	30.0	-13.3	1745.00	15.30	H	4.4	9.6	20.52	30.0	-9.5	High Ch								1770.00	10.99	V	4.4	9.6	16.23	30.0	-13.8	1770.00	14.43	H	4.4	9.6	19.66	30.0	-10.3
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
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	1720.00	15.68	H	4.3	9.5	20.85	30.0	-9.2																																																																																		
	Mid Ch																																																																																									
	1745.00	11.46	V	4.4	9.6	16.68	30.0	-13.3																																																																																		
	1745.00	15.30	H	4.4	9.6	20.52	30.0	-9.5																																																																																		
	High Ch																																																																																									
	1770.00	10.99	V	4.4	9.6	16.23	30.0	-13.8																																																																																		
1770.00	14.43	H	4.4	9.6	19.66	30.0	-10.3																																																																																			

LTE Band 66 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1717.50</td><td>13.67</td><td>V</td><td>4.3</td><td>9.5</td><td>18.84</td><td>30.0</td><td>-11.2</td><td></td></tr><tr><td>1717.50</td><td>17.05</td><td>H</td><td>4.3</td><td>9.5</td><td>22.22</td><td>30.0</td><td>-7.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1745.00</td><td>13.25</td><td>V</td><td>4.4</td><td>9.6</td><td>18.47</td><td>30.0</td><td>-11.5</td><td></td></tr><tr><td>1745.00</td><td>16.74</td><td>H</td><td>4.4</td><td>9.6</td><td>21.96</td><td>30.0</td><td>-8.0</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1772.50</td><td>13.10</td><td>V</td><td>4.4</td><td>9.6</td><td>18.33</td><td>30.0</td><td>-11.7</td><td></td></tr><tr><td>1772.50</td><td>16.32</td><td>H</td><td>4.4</td><td>9.6</td><td>21.56</td><td>30.0</td><td>-8.4</td><td></td></tr></table>									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	13.67	V	4.3	9.5	18.84	30.0	-11.2		1717.50	17.05	H	4.3	9.5	22.22	30.0	-7.8		Mid Ch									1745.00	13.25	V	4.4	9.6	18.47	30.0	-11.5		1745.00	16.74	H	4.4	9.6	21.96	30.0	-8.0		High Ch									1772.50	13.10	V	4.4	9.6	18.33	30.0	-11.7		1772.50	16.32	H	4.4	9.6	21.56	30.0	-8.4	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	1745.00	13.25	V	4.4	9.6	18.47	30.0	-11.5																																																																																											
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1772.50	16.32	H	4.4	9.6	21.56	30.0	-8.4																																																																																												
LTE Band 66 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1717.50</td><td>12.61</td><td>V</td><td>4.3</td><td>9.5</td><td>17.78</td><td>30.0</td><td>-12.2</td><td></td></tr><tr><td>1717.50</td><td>16.00</td><td>H</td><td>4.3</td><td>9.5</td><td>21.17</td><td>30.0</td><td>-8.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1745.00</td><td>12.34</td><td>V</td><td>4.4</td><td>9.6</td><td>17.56</td><td>30.0</td><td>-12.4</td><td></td></tr><tr><td>1745.00</td><td>15.68</td><td>H</td><td>4.4</td><td>9.6</td><td>20.90</td><td>30.0</td><td>-9.1</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1772.50</td><td>12.13</td><td>V</td><td>4.4</td><td>9.6</td><td>17.36</td><td>30.0</td><td>-12.6</td><td></td></tr><tr><td>1772.50</td><td>15.26</td><td>H</td><td>4.4</td><td>9.6</td><td>20.50</td><td>30.0</td><td>-9.5</td><td></td></tr></table>									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	12.61	V	4.3	9.5	17.78	30.0	-12.2		1717.50	16.00	H	4.3	9.5	21.17	30.0	-8.8		Mid Ch									1745.00	12.34	V	4.4	9.6	17.56	30.0	-12.4		1745.00	15.68	H	4.4	9.6	20.90	30.0	-9.1		High Ch									1772.50	12.13	V	4.4	9.6	17.36	30.0	-12.6		1772.50	15.26	H	4.4	9.6	20.50	30.0	-9.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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	1717.50	12.61	V	4.3	9.5	17.78	30.0	-12.2																																																																																											
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	1745.00	12.34	V	4.4	9.6	17.56	30.0	-12.4																																																																																											
	1745.00	15.68	H	4.4	9.6	20.90	30.0	-9.1																																																																																											
	High Ch																																																																																																		
	1772.50	12.13	V	4.4	9.6	17.36	30.0	-12.6																																																																																											
1772.50	15.26	H	4.4	9.6	20.50	30.0	-9.5																																																																																												

LTE

Band 66

10MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 47989

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_QPSK Band 66 Fundamentals, 10MHz Bandwidth

Test Equipment:

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	13.36	V	4.3	9.5	18.52	30.0	-11.5	
1715.00	16.35	H	4.3	9.5	21.50	30.0	-8.5	
Mid Ch								
1745.00	13.38	V	4.4	9.6	18.60	30.0	-11.4	
1745.00	15.90	H	4.4	9.6	21.12	30.0	-8.9	
High Ch								
1775.00	13.03	V	4.4	9.6	18.27	30.0	-11.7	
1775.00	15.27	H	4.4	9.6	20.51	30.0	-9.5	

LTE

Band 66

10MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 47989

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_16QAM Band 66 Fundamentals, 10MHz Bandwidth

Test Equipment:

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	12.34	V	4.3	9.5	17.50	30.0	-12.5	
1715.00	15.33	H	4.3	9.5	20.48	30.0	-9.5	
Mid Ch								
1745.00	12.33	V	4.4	9.6	17.55	30.0	-12.4	
1745.00	14.93	H	4.4	9.6	20.15	30.0	-9.8	
High Ch								
1775.00	12.07	V	4.4	9.6	17.31	30.0	-12.7	
1775.00	14.19	H	4.4	9.6	19.43	30.0	-10.6	

LTE
Band 66
5MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788397760
Date: 2018-04-03
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 5MHz Bandwidth

Test Equipment:

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	12.72	V	4.3	9.5	17.87	30.0	-12.1	
1712.50	15.73	H	4.3	9.5	20.88	30.0	-9.1	
Mid Ch								
1745.00	12.08	V	4.4	9.6	17.30	30.0	-12.7	
1745.00	15.55	H	4.4	9.6	20.77	30.0	-9.2	
High Ch								
1777.50	12.40	V	4.4	9.6	17.63	30.0	-12.4	
1777.50	14.79	H	4.4	9.6	20.03	30.0	-10.0	

LTE
Band 66
5MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788397760
Date: 2018-04-03
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 5MHz Bandwidth

Test Equipment:

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	11.97	V	4.3	9.5	17.12	30.0	-12.9	
1712.50	14.04	H	4.3	9.5	19.19	30.0	-10.8	
Mid Ch								
1745.00	11.08	V	4.4	9.6	16.30	30.0	-13.7	
1745.00	14.55	H	4.4	9.6	19.77	30.0	-10.2	
High Ch								
1777.50	11.42	V	4.4	9.6	16.65	30.0	-13.3	
1777.50	13.77	H	4.4	9.6	19.01	30.0	-11.0	

LTE
Band 66
3MHz
QPSK

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788397760
Date: 2018-04-03
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_QPSK Band 66 Fundamentals, 3MHz Bandwidth

Test Equipment:

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	12.19	V	4.3	9.5	17.35	30.0	-12.7	
1711.50	15.70	H	4.3	9.5	20.85	30.0	-9.1	
Mid Ch								
1745.00	12.96	V	4.4	9.6	18.18	30.0	-11.8	
1745.00	15.75	H	4.4	9.6	20.97	30.0	-9.0	
High Ch								
1778.50	11.59	V	4.4	9.6	16.82	30.0	-13.2	
1778.50	14.75	H	4.4	9.6	19.99	30.0	-10.0	

LTE
Band 66
3MHz
16QAM

UL Verification Services, Inc.
High Frequency Substitution Measurement

Company: Samsung
Project #: 4788397760
Date: 2018-04-03
Test Engineer: 47989
Configuration: EUT / X-Position
Location: Chamber 1
Mode: LTE_16QAM Band 66 Fundamentals, 3MHz Bandwidth

Test Equipment:

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	11.21	V	4.3	9.5	16.37	30.0	-13.6	
1711.50	15.45	H	4.3	9.5	20.60	30.0	-9.4	
Mid Ch								
1745.00	11.97	V	4.4	9.6	17.19	30.0	-12.8	
1745.00	14.68	H	4.4	9.6	19.90	30.0	-10.1	
High Ch								
1778.50	10.50	V	4.4	9.6	15.73	30.0	-14.3	
1778.50	13.66	H	4.4	9.6	18.90	30.0	-11.1	

LTE Band 66 1.4MHZ QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 66 Fundamentals, 1.4MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1710.70</td><td>10.59</td><td>V</td><td>4.3</td><td>9.5</td><td>15.74</td><td>30.0</td><td>-14.3</td><td></td></tr><tr><td>1710.70</td><td>13.14</td><td>H</td><td>4.3</td><td>9.5</td><td>18.29</td><td>30.0</td><td>-11.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1745.00</td><td>10.28</td><td>V</td><td>4.4</td><td>9.6</td><td>15.50</td><td>30.0</td><td>-14.5</td><td></td></tr><tr><td>1745.00</td><td>13.91</td><td>H</td><td>4.4</td><td>9.6</td><td>19.13</td><td>30.0</td><td>-10.9</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1779.30</td><td>10.16</td><td>V</td><td>4.4</td><td>9.6</td><td>15.40</td><td>30.0</td><td>-14.6</td><td></td></tr><tr><td>1779.30</td><td>12.90</td><td>H</td><td>4.4</td><td>9.6</td><td>18.14</td><td>30.0</td><td>-11.9</td><td></td></tr></table>									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	10.59	V	4.3	9.5	15.74	30.0	-14.3		1710.70	13.14	H	4.3	9.5	18.29	30.0	-11.7		Mid Ch									1745.00	10.28	V	4.4	9.6	15.50	30.0	-14.5		1745.00	13.91	H	4.4	9.6	19.13	30.0	-10.9		High Ch									1779.30	10.16	V	4.4	9.6	15.40	30.0	-14.6		1779.30	12.90	H	4.4	9.6	18.14	30.0	-11.9	
	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	10.59	V	4.3	9.5	15.74	30.0	-14.3																																																																																											
	1710.70	13.14	H	4.3	9.5	18.29	30.0	-11.7																																																																																											
	Mid Ch																																																																																																		
	1745.00	10.28	V	4.4	9.6	15.50	30.0	-14.5																																																																																											
	1745.00	13.91	H	4.4	9.6	19.13	30.0	-10.9																																																																																											
	High Ch																																																																																																		
	1779.30	10.16	V	4.4	9.6	15.40	30.0	-14.6																																																																																											
1779.30	12.90	H	4.4	9.6	18.14	30.0	-11.9																																																																																												
LTE Band 66 1.4MHZ 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 66 Fundamentals, 1.4MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1710.70</td><td>9.51</td><td>V</td><td>4.3</td><td>9.5</td><td>14.66</td><td>30.0</td><td>-15.3</td><td></td></tr><tr><td>1710.70</td><td>12.22</td><td>H</td><td>4.3</td><td>9.5</td><td>17.37</td><td>30.0</td><td>-12.6</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1745.00</td><td>9.21</td><td>V</td><td>4.4</td><td>9.6</td><td>14.43</td><td>30.0</td><td>-15.6</td><td></td></tr><tr><td>1745.00</td><td>12.80</td><td>H</td><td>4.4</td><td>9.6</td><td>18.02</td><td>30.0</td><td>-12.0</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1779.30</td><td>8.93</td><td>V</td><td>4.4</td><td>9.6</td><td>14.17</td><td>30.0</td><td>-15.8</td><td></td></tr><tr><td>1779.30</td><td>12.07</td><td>H</td><td>4.4</td><td>9.6</td><td>17.31</td><td>30.0</td><td>-12.7</td><td></td></tr></table>									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	9.51	V	4.3	9.5	14.66	30.0	-15.3		1710.70	12.22	H	4.3	9.5	17.37	30.0	-12.6		Mid Ch									1745.00	9.21	V	4.4	9.6	14.43	30.0	-15.6		1745.00	12.80	H	4.4	9.6	18.02	30.0	-12.0		High Ch									1779.30	8.93	V	4.4	9.6	14.17	30.0	-15.8		1779.30	12.07	H	4.4	9.6	17.31	30.0	-12.7	
	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	9.51	V	4.3	9.5	14.66	30.0	-15.3																																																																																											
	1710.70	12.22	H	4.3	9.5	17.37	30.0	-12.6																																																																																											
	Mid Ch																																																																																																		
	1745.00	9.21	V	4.4	9.6	14.43	30.0	-15.6																																																																																											
	1745.00	12.80	H	4.4	9.6	18.02	30.0	-12.0																																																																																											
	High Ch																																																																																																		
	1779.30	8.93	V	4.4	9.6	14.17	30.0	-15.8																																																																																											
1779.30	12.07	H	4.4	9.6	17.31	30.0	-12.7																																																																																												

LTE Band 2

LTE

Band 2

20MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-04

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth

Test Equipment:

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	14.49	V	4.5	9.4	19.39	33.0	-13.6	
1860.00	16.45	H	4.5	9.4	21.35	33.0	-11.7	
Mid Ch								
1880.00	14.81	V	4.5	9.2	19.49	33.0	-13.5	
1880.00	16.99	H	4.5	9.2	21.67	33.0	-11.3	
High Ch								
1900.00	14.66	V	4.6	9.0	19.12	33.0	-13.9	
1900.00	18.09	H	4.6	9.0	22.55	33.0	-10.5	

LTE

Band 2

20MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-04

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_16QAM Band 2 Fundamentals, 20MHz Bandwidth

Test Equipment:

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	13.55	V	4.5	9.4	18.45	33.0	-14.6	
1860.00	15.50	H	4.5	9.4	20.40	33.0	-12.6	
Mid Ch								
1880.00	13.86	V	4.5	9.2	18.54	33.0	-14.5	
1880.00	15.97	H	4.5	9.2	20.65	33.0	-12.4	
High Ch								
1900.00	13.71	V	4.6	9.0	18.17	33.0	-14.8	
1900.00	17.14	H	4.6	9.0	21.60	33.0	-11.4	

LTE Band 2 15MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 51072 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1857.50</td><td>14.23</td><td>V</td><td>4.5</td><td>9.4</td><td>19.16</td><td>33.0</td><td>-13.8</td><td></td></tr><tr><td>1857.50</td><td>16.06</td><td>H</td><td>4.5</td><td>9.4</td><td>20.99</td><td>33.0</td><td>-12.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>15.19</td><td>V</td><td>4.5</td><td>9.2</td><td>19.87</td><td>33.0</td><td>-13.1</td><td></td></tr><tr><td>1880.00</td><td>17.13</td><td>H</td><td>4.5</td><td>9.2</td><td>21.81</td><td>33.0</td><td>-11.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1902.50</td><td>14.61</td><td>V</td><td>4.6</td><td>9.0</td><td>19.03</td><td>33.0</td><td>-14.0</td><td></td></tr><tr><td>1902.50</td><td>17.63</td><td>H</td><td>4.6</td><td>9.0</td><td>22.04</td><td>33.0</td><td>-11.0</td><td></td></tr></table>									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	14.23	V	4.5	9.4	19.16	33.0	-13.8		1857.50	16.06	H	4.5	9.4	20.99	33.0	-12.0		Mid Ch									1880.00	15.19	V	4.5	9.2	19.87	33.0	-13.1		1880.00	17.13	H	4.5	9.2	21.81	33.0	-11.2		High Ch									1902.50	14.61	V	4.6	9.0	19.03	33.0	-14.0		1902.50	17.63	H	4.6	9.0	22.04	33.0	-11.0	
	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	14.23	V	4.5	9.4	19.16	33.0	-13.8																																																																																											
	1857.50	16.06	H	4.5	9.4	20.99	33.0	-12.0																																																																																											
	Mid Ch																																																																																																		
	1880.00	15.19	V	4.5	9.2	19.87	33.0	-13.1																																																																																											
	1880.00	17.13	H	4.5	9.2	21.81	33.0	-11.2																																																																																											
	High Ch																																																																																																		
	1902.50	14.61	V	4.6	9.0	19.03	33.0	-14.0																																																																																											
1902.50	17.63	H	4.6	9.0	22.04	33.0	-11.0																																																																																												
LTE Band 2 15MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 51072 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1857.50</td><td>13.27</td><td>V</td><td>4.5</td><td>9.4</td><td>18.20</td><td>33.0</td><td>-14.8</td><td></td></tr><tr><td>1857.50</td><td>15.04</td><td>H</td><td>4.5</td><td>9.4</td><td>19.97</td><td>33.0</td><td>-13.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>14.18</td><td>V</td><td>4.5</td><td>9.2</td><td>18.86</td><td>33.0</td><td>-14.1</td><td></td></tr><tr><td>1880.00</td><td>16.11</td><td>H</td><td>4.5</td><td>9.2</td><td>20.79</td><td>33.0</td><td>-12.2</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1902.50</td><td>13.62</td><td>V</td><td>4.6</td><td>9.0</td><td>18.04</td><td>33.0</td><td>-15.0</td><td></td></tr><tr><td>1902.50</td><td>16.63</td><td>H</td><td>4.6</td><td>9.0</td><td>21.04</td><td>33.0</td><td>-12.0</td><td></td></tr></table>									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	13.27	V	4.5	9.4	18.20	33.0	-14.8		1857.50	15.04	H	4.5	9.4	19.97	33.0	-13.0		Mid Ch									1880.00	14.18	V	4.5	9.2	18.86	33.0	-14.1		1880.00	16.11	H	4.5	9.2	20.79	33.0	-12.2		High Ch									1902.50	13.62	V	4.6	9.0	18.04	33.0	-15.0		1902.50	16.63	H	4.6	9.0	21.04	33.0	-12.0	
	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	13.27	V	4.5	9.4	18.20	33.0	-14.8																																																																																											
	1857.50	15.04	H	4.5	9.4	19.97	33.0	-13.0																																																																																											
	Mid Ch																																																																																																		
	1880.00	14.18	V	4.5	9.2	18.86	33.0	-14.1																																																																																											
	1880.00	16.11	H	4.5	9.2	20.79	33.0	-12.2																																																																																											
	High Ch																																																																																																		
	1902.50	13.62	V	4.6	9.0	18.04	33.0	-15.0																																																																																											
1902.50	16.63	H	4.6	9.0	21.04	33.0	-12.0																																																																																												

LTE

Band 2

10MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth

Test Equipment:

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	14.06	V	4.5	9.5	19.01	33.0	-14.0	
1855.00	16.17	H	4.5	9.5	21.13	33.0	-11.9	
Mid Ch								
1880.00	14.53	V	4.5	9.2	19.21	33.0	-13.8	
1880.00	17.01	H	4.5	9.2	21.69	33.0	-11.3	
High Ch								
1905.00	14.86	V	4.6	8.9	19.23	33.0	-13.8	
1905.00	17.79	H	4.6	8.9	22.17	33.0	-10.8	

LTE

Band 2

10MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_16QAM Band 2 Fundamentals, 10MHz Bandwidth

Test Equipment:

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	13.11	V	4.5	9.5	18.06	33.0	-14.9	
1855.00	15.20	H	4.5	9.5	20.16	33.0	-12.8	
Mid Ch								
1880.00	13.55	V	4.5	9.2	18.23	33.0	-14.8	
1880.00	16.02	H	4.5	9.2	20.70	33.0	-12.3	
High Ch								
1905.00	13.85	V	4.6	8.9	18.22	33.0	-14.8	
1905.00	16.77	H	4.6	8.9	21.15	33.0	-11.9	

LTE

Band 2

5MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth

Test Equipment:

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	12.93	V	4.5	9.5	17.92	33.0	-15.1	
1852.50	15.07	H	4.5	9.5	20.06	33.0	-12.9	
Mid Ch								
1880.00	14.30	V	4.5	9.2	18.98	33.0	-14.0	
1880.00	16.15	H	4.5	9.2	20.83	33.0	-12.2	
High Ch								
1907.50	14.58	V	4.6	8.9	18.92	33.0	-14.1	
1907.50	17.37	H	4.6	8.9	21.71	33.0	-11.3	

LTE

Band 2

5MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_16QAM Band 2 Fundamentals, 5MHz Bandwidth

Test Equipment:

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	11.93	V	4.5	9.5	16.92	33.0	-16.1	
1852.50	14.10	H	4.5	9.5	19.09	33.0	-13.9	
Mid Ch								
1880.00	13.28	V	4.5	9.2	17.96	33.0	-15.0	
1880.00	15.13	H	4.5	9.2	19.81	33.0	-13.2	
High Ch								
1907.50	13.62	V	4.6	8.9	17.96	33.0	-15.0	
1907.50	16.36	H	4.6	8.9	20.70	33.0	-12.3	

LTE

Band 2

3MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth

Test Equipment:

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	10.87	V	4.5	9.5	15.87	33.0	-17.1	
1851.50	12.86	H	4.5	9.5	17.86	33.0	-15.1	
Mid Ch								
1880.00	12.20	V	4.5	9.2	16.88	33.0	-16.1	
1880.00	14.35	H	4.5	9.2	19.03	33.0	-14.0	
High Ch								
1908.50	12.06	V	4.6	8.9	16.39	33.0	-16.6	
1908.50	14.93	H	4.6	8.9	19.25	33.0	-13.8	

LTE

Band 2

3MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company: Samsung

Project #: 4788397760

Date: 2018-04-03

Test Engineer: 51072

Configuration: EUT / X-Position

Location: Chamber 1

Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth

Test Equipment:

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	9.85	V	4.5	9.5	14.85	33.0	-18.2	
1851.50	11.92	H	4.5	9.5	16.92	33.0	-16.1	
Mid Ch								
1880.00	11.18	V	4.5	9.2	15.86	33.0	-17.1	
1880.00	13.21	H	4.5	9.2	17.89	33.0	-15.1	
High Ch								
1908.50	11.14	V	4.6	8.9	15.47	33.0	-17.5	
1908.50	13.98	H	4.6	8.9	18.30	33.0	-14.7	

LTE Band 2 1.4MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 51072 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_QPSK Band 2 Fundamentals, 1.4MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1850.70</td><td>10.12</td><td>V</td><td>4.5</td><td>9.5</td><td>15.12</td><td>33.0</td><td>-17.9</td></tr><tr><td>1850.70</td><td>12.33</td><td>H</td><td>4.5</td><td>9.5</td><td>17.34</td><td>33.0</td><td>-15.7</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>12.09</td><td>V</td><td>4.5</td><td>9.2</td><td>16.77</td><td>33.0</td><td>-16.2</td></tr><tr><td>1880.00</td><td>13.66</td><td>H</td><td>4.5</td><td>9.2</td><td>18.34</td><td>33.0</td><td>-14.7</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1909.30</td><td>12.47</td><td>V</td><td>4.6</td><td>8.9</td><td>16.78</td><td>33.0</td><td>-16.2</td></tr><tr><td>1909.30</td><td>14.83</td><td>H</td><td>4.6</td><td>8.9</td><td>19.14</td><td>33.0</td><td>-13.9</td></tr></table>									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	10.12	V	4.5	9.5	15.12	33.0	-17.9	1850.70	12.33	H	4.5	9.5	17.34	33.0	-15.7	Mid Ch								1880.00	12.09	V	4.5	9.2	16.77	33.0	-16.2	1880.00	13.66	H	4.5	9.2	18.34	33.0	-14.7	High Ch								1909.30	12.47	V	4.6	8.9	16.78	33.0	-16.2	1909.30	14.83	H	4.6	8.9	19.14	33.0	-13.9
	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	10.12	V	4.5	9.5	15.12	33.0	-17.9																																																																																		
	1850.70	12.33	H	4.5	9.5	17.34	33.0	-15.7																																																																																		
	Mid Ch																																																																																									
	1880.00	12.09	V	4.5	9.2	16.77	33.0	-16.2																																																																																		
	1880.00	13.66	H	4.5	9.2	18.34	33.0	-14.7																																																																																		
	High Ch																																																																																									
	1909.30	12.47	V	4.6	8.9	16.78	33.0	-16.2																																																																																		
1909.30	14.83	H	4.6	8.9	19.14	33.0	-13.9																																																																																			
LTE Band 2 1.4MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-03 Test Engineer: 51072 Configuration: EUT / X-Position Location: Chamber 1 Mode: LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth Test Equipment: Receiving: Horn 3117[00168717], and Chamber 1 SMA Cables Substitution: Horn 3115[00161451], 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBi)</th><th>EIRP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1850.70</td><td>9.58</td><td>V</td><td>4.5</td><td>9.5</td><td>14.58</td><td>33.0</td><td>-18.4</td></tr><tr><td>1850.70</td><td>11.24</td><td>H</td><td>4.5</td><td>9.5</td><td>16.25</td><td>33.0</td><td>-16.7</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>11.09</td><td>V</td><td>4.5</td><td>9.2</td><td>15.77</td><td>33.0</td><td>-17.2</td></tr><tr><td>1880.00</td><td>12.60</td><td>H</td><td>4.5</td><td>9.2</td><td>17.28</td><td>33.0</td><td>-15.7</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1909.30</td><td>11.48</td><td>V</td><td>4.6</td><td>8.9</td><td>15.79</td><td>33.0</td><td>-17.2</td></tr><tr><td>1909.30</td><td>13.91</td><td>H</td><td>4.6</td><td>8.9</td><td>18.22</td><td>33.0</td><td>-14.8</td></tr></table>									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	9.58	V	4.5	9.5	14.58	33.0	-18.4	1850.70	11.24	H	4.5	9.5	16.25	33.0	-16.7	Mid Ch								1880.00	11.09	V	4.5	9.2	15.77	33.0	-17.2	1880.00	12.60	H	4.5	9.2	17.28	33.0	-15.7	High Ch								1909.30	11.48	V	4.6	8.9	15.79	33.0	-17.2	1909.30	13.91	H	4.6	8.9	18.22	33.0	-14.8
	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	9.58	V	4.5	9.5	14.58	33.0	-18.4																																																																																		
	1850.70	11.24	H	4.5	9.5	16.25	33.0	-16.7																																																																																		
	Mid Ch																																																																																									
	1880.00	11.09	V	4.5	9.2	15.77	33.0	-17.2																																																																																		
	1880.00	12.60	H	4.5	9.2	17.28	33.0	-15.7																																																																																		
	High Ch																																																																																									
	1909.30	11.48	V	4.6	8.9	15.79	33.0	-17.2																																																																																		
1909.30	13.91	H	4.6	8.9	18.22	33.0	-14.8																																																																																			

LTE Band 12

LTE Band 12 10MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>704.00</td><td>15.54</td><td>V</td><td>0.9</td><td>-1.6</td><td>13.07</td><td>34.8</td><td>-21.7</td><td></td></tr><tr><td>704.00</td><td>-0.91</td><td>H</td><td>0.9</td><td>-1.6</td><td>-3.38</td><td>34.8</td><td>-38.2</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>707.50</td><td>14.64</td><td>V</td><td>0.9</td><td>-1.6</td><td>12.17</td><td>34.8</td><td>-22.6</td><td></td></tr><tr><td>707.50</td><td>-0.68</td><td>H</td><td>0.9</td><td>-1.6</td><td>-3.15</td><td>34.8</td><td>-37.9</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>711.00</td><td>15.67</td><td>V</td><td>0.9</td><td>-1.6</td><td>13.20</td><td>34.8</td><td>-21.6</td><td></td></tr><tr><td>711.00</td><td>-1.54</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.02</td><td>34.8</td><td>-38.8</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								704.00	15.54	V	0.9	-1.6	13.07	34.8	-21.7		704.00	-0.91	H	0.9	-1.6	-3.38	34.8	-38.2		Mid Ch								707.50	14.64	V	0.9	-1.6	12.17	34.8	-22.6		707.50	-0.68	H	0.9	-1.6	-3.15	34.8	-37.9		High Ch								711.00	15.67	V	0.9	-1.6	13.20	34.8	-21.6		711.00	-1.54	H	0.9	-1.6	-4.02	34.8	-38.8	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																							
	Low Ch																																																																																															
	704.00	15.54	V	0.9	-1.6	13.07	34.8	-21.7																																																																																								
	704.00	-0.91	H	0.9	-1.6	-3.38	34.8	-38.2																																																																																								
	Mid Ch																																																																																															
	707.50	14.64	V	0.9	-1.6	12.17	34.8	-22.6																																																																																								
	707.50	-0.68	H	0.9	-1.6	-3.15	34.8	-37.9																																																																																								
	High Ch																																																																																															
	711.00	15.67	V	0.9	-1.6	13.20	34.8	-21.6																																																																																								
711.00	-1.54	H	0.9	-1.6	-4.02	34.8	-38.8																																																																																									
LTE Band 12 10MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td>Low Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>704.00</td><td>14.10</td><td>V</td><td>0.9</td><td>-1.6</td><td>11.63</td><td>34.8</td><td>-23.2</td><td></td></tr><tr><td>704.00</td><td>-2.29</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.76</td><td>34.8</td><td>-39.6</td><td></td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>707.50</td><td>13.25</td><td>V</td><td>0.9</td><td>-1.6</td><td>10.78</td><td>34.8</td><td>-24.0</td><td></td></tr><tr><td>707.50</td><td>-1.97</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.44</td><td>34.8</td><td>-39.2</td><td></td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>711.00</td><td>14.21</td><td>V</td><td>0.9</td><td>-1.6</td><td>11.74</td><td>34.8</td><td>-23.1</td><td></td></tr><tr><td>711.00</td><td>-0.02</td><td>H</td><td>0.9</td><td>-1.6</td><td>-2.50</td><td>34.8</td><td>-37.3</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								704.00	14.10	V	0.9	-1.6	11.63	34.8	-23.2		704.00	-2.29	H	0.9	-1.6	-4.76	34.8	-39.6		Mid Ch								707.50	13.25	V	0.9	-1.6	10.78	34.8	-24.0		707.50	-1.97	H	0.9	-1.6	-4.44	34.8	-39.2		High Ch								711.00	14.21	V	0.9	-1.6	11.74	34.8	-23.1		711.00	-0.02	H	0.9	-1.6	-2.50	34.8	-37.3	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																							
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LTE Band 12 5MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 5MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>701.50</td><td>13.92</td><td>V</td><td>0.9</td><td>-1.6</td><td>11.45</td><td>34.8</td><td>-23.4</td><td></td></tr><tr><td>701.50</td><td>-2.09</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.55</td><td>34.8</td><td>-39.4</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>707.50</td><td>15.45</td><td>V</td><td>0.9</td><td>-1.6</td><td>12.98</td><td>34.8</td><td>-21.8</td><td></td></tr><tr><td>707.50</td><td>-0.99</td><td>H</td><td>0.9</td><td>-1.6</td><td>-3.46</td><td>34.8</td><td>-38.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>713.50</td><td>15.44</td><td>V</td><td>0.9</td><td>-1.6</td><td>12.96</td><td>34.8</td><td>-21.8</td><td></td></tr><tr><td>713.50</td><td>-0.49</td><td>H</td><td>0.9</td><td>-1.6</td><td>-2.97</td><td>34.8</td><td>-37.8</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									701.50	13.92	V	0.9	-1.6	11.45	34.8	-23.4		701.50	-2.09	H	0.9	-1.6	-4.55	34.8	-39.4		Mid Ch									707.50	15.45	V	0.9	-1.6	12.98	34.8	-21.8		707.50	-0.99	H	0.9	-1.6	-3.46	34.8	-38.3		High Ch									713.50	15.44	V	0.9	-1.6	12.96	34.8	-21.8		713.50	-0.49	H	0.9	-1.6	-2.97	34.8	-37.8	
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LTE Band 12 5MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 5MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>701.50</td><td>12.73</td><td>V</td><td>0.9</td><td>-1.6</td><td>10.26</td><td>34.8</td><td>-24.5</td><td></td></tr><tr><td>701.50</td><td>-3.67</td><td>H</td><td>0.9</td><td>-1.6</td><td>-6.13</td><td>34.8</td><td>-40.9</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>707.50</td><td>14.02</td><td>V</td><td>0.9</td><td>-1.6</td><td>11.55</td><td>34.8</td><td>-23.3</td><td></td></tr><tr><td>707.50</td><td>-2.34</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.81</td><td>34.8</td><td>-39.6</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>713.50</td><td>13.94</td><td>V</td><td>0.9</td><td>-1.6</td><td>11.46</td><td>34.8</td><td>-23.3</td><td></td></tr><tr><td>713.50</td><td>-2.01</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.49</td><td>34.8</td><td>-39.3</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									701.50	12.73	V	0.9	-1.6	10.26	34.8	-24.5		701.50	-3.67	H	0.9	-1.6	-6.13	34.8	-40.9		Mid Ch									707.50	14.02	V	0.9	-1.6	11.55	34.8	-23.3		707.50	-2.34	H	0.9	-1.6	-4.81	34.8	-39.6		High Ch									713.50	13.94	V	0.9	-1.6	11.46	34.8	-23.3		713.50	-2.01	H	0.9	-1.6	-4.49	34.8	-39.3	
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LTE Band 12 3MHz QPSK	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_QPSK Band 12 Fundamentals, 3MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>700.50</td><td>13.37</td><td>V</td><td>0.9</td><td>-1.6</td><td>10.90</td><td>34.8</td><td>-23.9</td><td></td></tr><tr><td>700.50</td><td>-2.75</td><td>H</td><td>0.9</td><td>-1.6</td><td>-5.21</td><td>34.8</td><td>-40.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>707.50</td><td>13.99</td><td>V</td><td>0.9</td><td>-1.6</td><td>11.52</td><td>34.8</td><td>-23.3</td><td></td></tr><tr><td>707.50</td><td>-0.99</td><td>H</td><td>0.9</td><td>-1.6</td><td>-3.46</td><td>34.8</td><td>-38.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>714.50</td><td>15.33</td><td>V</td><td>0.9</td><td>-1.6</td><td>12.86</td><td>34.8</td><td>-21.9</td><td></td></tr><tr><td>714.50</td><td>-0.25</td><td>H</td><td>0.9</td><td>-1.6</td><td>-2.73</td><td>34.8</td><td>-37.5</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									700.50	13.37	V	0.9	-1.6	10.90	34.8	-23.9		700.50	-2.75	H	0.9	-1.6	-5.21	34.8	-40.0		Mid Ch									707.50	13.99	V	0.9	-1.6	11.52	34.8	-23.3		707.50	-0.99	H	0.9	-1.6	-3.46	34.8	-38.3		High Ch									714.50	15.33	V	0.9	-1.6	12.86	34.8	-21.9		714.50	-0.25	H	0.9	-1.6	-2.73	34.8	-37.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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LTE Band 12 3MHz 16QAM	UL Verification Services, Inc. High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-02 Test Engineer: 47989 Configuration: EUT / Z-Position Location: Chamber 1 Mode: LTE_16QAM Band 12 Fundamentals, 3MHz Bandwidth Test Equipment: Receiving: VULB9163-750, and Chamber 2 SMA Cables Substitution: Dipole 3121_DB4, 3m N-type Cable <table><tr><th>f MHz</th><th>SG reading (dBm)</th><th>Ant. Pol. (H/V)</th><th>Cable Loss (dB)</th><th>Antenna Gain (dBd)</th><th>ERP (dBm)</th><th>Limit (dBm)</th><th>Delta (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>700.50</td><td>12.27</td><td>V</td><td>0.9</td><td>-1.6</td><td>9.80</td><td>34.8</td><td>-25.0</td><td></td></tr><tr><td>700.50</td><td>-3.78</td><td>H</td><td>0.9</td><td>-1.6</td><td>-6.24</td><td>34.8</td><td>-41.0</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>707.50</td><td>12.65</td><td>V</td><td>0.9</td><td>-1.6</td><td>10.18</td><td>34.8</td><td>-24.6</td><td></td></tr><tr><td>707.50</td><td>-2.24</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.71</td><td>34.8</td><td>-39.5</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>714.50</td><td>13.89</td><td>V</td><td>0.9</td><td>-1.6</td><td>11.42</td><td>34.8</td><td>-23.4</td><td></td></tr><tr><td>714.50</td><td>-1.78</td><td>H</td><td>0.9</td><td>-1.6</td><td>-4.26</td><td>34.8</td><td>-39.1</td><td></td></tr></table>									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									700.50	12.27	V	0.9	-1.6	9.80	34.8	-25.0		700.50	-3.78	H	0.9	-1.6	-6.24	34.8	-41.0		Mid Ch									707.50	12.65	V	0.9	-1.6	10.18	34.8	-24.6		707.50	-2.24	H	0.9	-1.6	-4.71	34.8	-39.5		High Ch									714.50	13.89	V	0.9	-1.6	11.42	34.8	-23.4		714.50	-1.78	H	0.9	-1.6	-4.26	34.8	-39.1	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																										
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714.50	-1.78	H	0.9	-1.6	-4.26	34.8	-39.1																																																																																												

LTE

Band 12

1.4MHz

QPSK

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788397760

2018-04-02

47989

EUT / Z-Position

Chamber 1

LTE_QPSK Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

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								
699.70	11.74	V	0.9	-1.6	9.27	34.8	-25.5	
699.70	-4.50	H	0.9	-1.6	-6.97	34.8	-41.8	
Mid Ch								
707.50	13.00	V	0.9	-1.6	10.53	34.8	-24.3	
707.50	-3.53	H	0.9	-1.6	-6.00	34.8	-40.8	
High Ch								
715.30	13.25	V	0.9	-1.6	10.77	34.8	-24.0	
715.30	-2.57	H	0.9	-1.6	-5.04	34.8	-39.8	

LTE

Band 12

1.4MHz

16QAM

UL Verification Services, Inc.

High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788397760

2018-04-02

47989

EUT / Z-Position

Chamber 1

LTE_16QAM Band 12 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

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								
699.70	10.79	V	0.9	-1.6	8.32	34.8	-26.5	
699.70	-5.61	H	0.9	-1.6	-8.08	34.8	-42.9	
Mid Ch								
707.50	11.75	V	0.9	-1.6	9.28	34.8	-25.5	
707.50	-4.20	H	0.9	-1.6	-6.67	34.8	-41.5	
High Ch								
715.30	12.32	V	0.9	-1.6	9.84	34.8	-25.0	
715.30	-3.94	H	0.9	-1.6	-6.41	34.8	-41.2	

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

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 $43 + 10 \log_{10} (P)$ 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 $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = auto couple;
- e) Detector = peak;
- f) Ensure that the number of measurement points $\geq$ span/RBW;
- g) Trace mode = max hold;

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

RESULTS

10.2.1. SPURIOUS RADIATION PLOTS

GSM 850

GSM GSM850 GPRS	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-06 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, Z-Position Location: Chamber 2 Mode: GPRS 850 MHz Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
GSM GSM850 EGPRS	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-06 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, Z-Position Location: Chamber 2 Mode: EGPRS 850 MHz Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
GSM GSM850 EGPRS	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-06 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, Z-Position Location: Chamber 2 Mode: EGPRS 850 MHz Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes

GSM 1900

GSM GSM1900 GPRS	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-05 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 2 Mode: GPRS 1900 MHz Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
GSM GSM1900 EGPRS	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-05 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 2 Mode: EGPRS 1900 MHz Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
GSM GSM1900 EGPRS	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-05 Test Engineer: 47989 Configuration: EUT / AC Adapter / Earphone, X-Position Location: Chamber 2 Mode: EGPRS 1900 MHz Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes

WCDMA Band 5

WCDMA Band 5 REL99	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 4788397760									
	Date: 2018-04-05									
	Test Engineer: 45585									
	Configuration: EUT / Adapter / Earphone, Z-Position									
	Location: Chamber 3									
	Mode: Rel99 Band 5 Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 826.4MHz									
	1652.80	-18.6	V	3.0	41.8	1.0	-59.5	-13.0	-46.5	
	2479.20	-8.9	V	3.0	41.7	1.0	-49.6	-13.0	-36.6	
	3305.60	-15.1	V	3.0	41.1	1.0	-55.3	-13.0	-42.3	
	1652.80	-19.1	H	3.0	41.8	1.0	-60.0	-13.0	-47.0	
	2479.20	-7.4	H	3.0	41.7	1.0	-48.1	-13.0	-35.1	
	3305.60	-15.6	H	3.0	41.1	1.0	-55.7	-13.0	-42.7	
	Mid Ch, 836.6MHz									
	1673.20	-18.4	V	3.0	41.8	1.0	-59.3	-13.0	-46.3	
	2509.80	-5.2	V	3.0	41.7	1.0	-45.9	-13.0	-32.9	
3346.40	-15.9	V	3.0	41.1	1.0	-56.0	-13.0	-43.0		
1673.20	-19.4	H	3.0	41.8	1.0	-60.2	-13.0	-47.2		
2509.80	-0.8	H	3.0	41.7	1.0	-41.4	-13.0	-28.4		
3346.40	-16.5	H	3.0	41.1	1.0	-56.6	-13.0	-43.6		
High Ch, 846.6MHz										
1693.20	-18.9	V	3.0	41.8	1.0	-59.8	-13.0	-46.8		
2539.80	-2.7	V	3.0	41.6	1.0	-43.3	-13.0	-30.3		
3386.40	-15.9	V	3.0	41.1	1.0	-56.0	-13.0	-43.0		
1693.20	-18.7	H	3.0	41.8	1.0	-59.5	-13.0	-46.5		
2539.80	1.0	H	3.0	41.6	1.0	-39.7	-13.0	-26.7		
3386.40	-16.4	H	3.0	41.1	1.0	-56.5	-13.0	-43.5		
WCDMA Band 5 HSDPA	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 4788397760									
	Date: 2018-04-05									
	Test Engineer: 45585									
	Configuration: EUT / Adapter / Earphone, Z-Position									
	Location: Chamber 3									
	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	-20.1	V	3.0	41.8	1.0	-60.9	-13.0	-47.9	
	2479.20	-17.3	V	3.0	41.7	1.0	-58.0	-13.0	-45.0	
	3305.60	-15.4	V	3.0	41.1	1.0	-55.5	-13.0	-42.5	
	1652.80	-19.7	H	3.0	41.8	1.0	-60.6	-13.0	-47.6	
	2479.20	-17.3	H	3.0	41.7	1.0	-58.0	-13.0	-45.0	
	3305.60	-16.6	H	3.0	41.1	1.0	-56.7	-13.0	-43.7	
	Mid Ch, 836.6MHz									
	1673.20	-19.3	V	3.0	41.8	1.0	-60.2	-13.0	-47.2	
	2509.80	-17.0	V	3.0	41.7	1.0	-57.6	-13.0	-44.6	
3346.40	-16.0	V	3.0	41.1	1.0	-56.1	-13.0	-43.1		
1673.20	-19.5	H	3.0	41.8	1.0	-60.3	-13.0	-47.3		
2509.80	-17.4	H	3.0	41.7	1.0	-58.1	-13.0	-45.1		
3346.40	-16.9	H	3.0	41.1	1.0	-57.0	-13.0	-44.0		
High Ch, 846.6MHz										
1693.20	-19.0	V	3.0	41.8	1.0	-59.8	-13.0	-46.8		
2539.80	-16.5	V	3.0	41.6	1.0	-57.2	-13.0	-44.2		
3386.40	-16.0	V	3.0	41.1	1.0	-56.1	-13.0	-43.1		
1693.20	-19.7	H	3.0	41.8	1.0	-60.6	-13.0	-47.6		
2539.80	-17.0	H	3.0	41.6	1.0	-57.7	-13.0	-44.7		
3386.40	-15.6	H	3.0	41.1	1.0	-55.6	-13.0	-42.6		

WCDMA Band 2 REL99	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Project #: Date: Test Engineer: Configuration: Location: Mode: Samsung 4788397760 2018-04-05 45585 EUT / Adapter / Earphone, X-Position Chamber 3 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	-7.9	V	3.0	40.9	1.0	-47.8	-13.0	-34.8	
	5557.20	-9.0	V	3.0	40.1	1.0	-48.0	-13.0	-35.0	
	7409.60	-8.5	V	3.0	40.0	1.0	-47.5	-13.0	-34.5	
	3704.80	-4.9	H	3.0	40.9	1.0	-44.7	-13.0	-31.7	
	5557.20	-10.3	H	3.0	40.1	1.0	-49.4	-13.0	-36.4	
	7409.60	-8.8	H	3.0	40.0	1.0	-47.8	-13.0	-34.8	
	Mid Ch, 1880MHz									
	3760.00	-5.3	V	3.0	40.8	1.0	-45.2	-13.0	-32.2	
	5640.00	-10.6	V	3.0	40.0	1.0	-49.6	-13.0	-36.6	
	7520.00	-8.9	V	3.0	40.0	1.0	-48.0	-13.0	-35.0	
	3760.00	-1.6	H	3.0	40.8	1.0	-41.4	-13.0	-28.4	
	5640.00	-10.9	H	3.0	40.0	1.0	-50.0	-13.0	-37.0	
	7520.00	-9.1	H	3.0	40.0	1.0	-48.1	-13.0	-35.1	
	High Ch, 1907.6MHz									
	3815.20	-6.3	V	3.0	40.8	1.0	-46.1	-13.0	-33.1	
	5722.80	-10.9	V	3.0	40.0	1.0	-49.9	-13.0	-36.9	
	7630.40	-8.6	V	3.0	40.0	1.0	-47.7	-13.0	-34.7	
	3815.20	-5.6	H	3.0	40.8	1.0	-45.3	-13.0	-32.3	
	5722.80	-12.4	H	3.0	40.0	1.0	-51.4	-13.0	-38.4	
	7630.40	-9.4	H	3.0	40.0	1.0	-48.5	-13.0	-35.5	
WCDMA Band 2 HSDPA	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Project #: Date: Test Engineer: Configuration: Location: Mode: Samsung 4788397760 2018-04-05 45585 EUT / Adapter / Earphone, X-Position Chamber 3 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	-6.6	V	3.0	40.9	1.0	-46.4	-13.0	-33.4	
	5557.20	-10.3	V	3.0	40.1	1.0	-49.3	-13.0	-36.3	
	7409.60	-8.7	V	3.0	40.0	1.0	-47.8	-13.0	-34.8	
	3704.80	-3.1	H	3.0	40.9	1.0	-42.9	-13.0	-29.9	
	5557.20	-10.5	H	3.0	40.1	1.0	-49.6	-13.0	-36.6	
	7409.60	-8.5	H	3.0	40.0	1.0	-47.6	-13.0	-34.6	
	Mid Ch, 1880MHz									
	3760.00	-4.1	V	3.0	40.8	1.0	-43.9	-13.0	-30.9	
	5640.00	-11.5	V	3.0	40.0	1.0	-50.5	-13.0	-37.5	
	7520.00	-9.2	V	3.0	40.0	1.0	-48.2	-13.0	-35.2	
	3760.00	-1.5	H	3.0	40.8	1.0	-41.3			

WCDMA Band 4

WCDMA Band 4 REL99	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-05 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 Mode: Rel99 Band 4 Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
WCDMA Band 4 HSDPA	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 4788397760 Date: 2018-04-05 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 Mode: HSDPA Band 4 Harmonics									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes

LTE Band 5

LTE Band 5 10MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_QPSK Band 5 Harmonics, 10MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 829MHz									
	1658.00	-15.3	V	3.0	41.8	1.0	-56.1	-13.0	-43.1	
	2487.00	-17.4	V	3.0	41.7	1.0	-58.1	-13.0	-45.1	
	3316.00	-15.8	V	3.0	41.1	1.0	-55.9	-13.0	-42.9	
	1658.00	-13.7	H	3.0	41.8	1.0	-54.6	-13.0	-41.6	
	2487.00	-18.0	H	3.0	41.7	1.0	-58.7	-13.0	-45.7	
	3316.00	-16.2	H	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	Mid Ch, 836.5MHz									
	1673.00	-15.4	V	3.0	41.8	1.0	-56.3	-13.0	-43.3	
	2509.50	-17.4	V	3.0	41.7	1.0	-58.0	-13.0	-45.0	
	3346.00	-15.9	V	3.0	41.1	1.0	-56.0	-13.0	-43.0	
	1673.00	-13.7	H	3.0	41.8	1.0	-54.6	-13.0	-41.6	
	2509.50	-15.8	H	3.0	41.7	1.0	-56.5	-13.0	-43.5	
	3346.00	-16.0	H	3.0	41.1	1.0	-56.1	-13.0	-43.1	
	High Ch, 844MHz									
	1688.00	-14.4	V	3.0	41.8	1.0	-55.3	-13.0	-42.3	
	2532.00	-16.8	V	3.0	41.7	1.0	-57.5	-13.0	-44.5	
	3376.00	-16.1	V	3.0	41.1	1.0	-56.2	-13.0	-43.2	
	1688.00	-12.9	H	3.0	41.8	1.0	-53.8	-13.0	-40.8	
	2532.00	-17.6	H	3.0	41.7	1.0	-58.2	-13.0	-45.2	
	3376.00	-16.6	H	3.0	41.1	1.0	-56.6	-13.0	-43.6	
LTE Band 5 10MHz 16QAM	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_16QAM Band 5 Harmonics, 10MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 829MHz									
	1658.00	-15.0	V	3.0	41.8	1.0	-55.9	-13.0	-42.9	
	2487.00	-16.9	V	3.0	41.7	1.0	-57.6	-13.0	-44.6	
	3316.00	-16.0	V	3.0	41.1	1.0	-56.1	-13.0	-43.1	
	1658.00	-13.6	H	3.0	41.8	1.0	-54.4	-13.0	-41.4	
	2487.00	-17.6	H	3.0	41.7	1.0	-58.3	-13.0	-45.3	
	3316.00	-16.3	H	3.0	41.1	1.0	-56.4	-13.0	-43.4	
	Mid Ch, 836.5MHz									
	1673.00	-14.5	V	3.0	41.8	1.0	-55.3	-13.0	-42.3	
	2509.50	-17.4	V	3.0	41.7	1.0	-58.1	-13.0	-45.1	
	3346.00	-16.4	V	3.0	41.1	1.0	-56.5	-13.0	-43.5	
	1673.00	-14.0	H	3.0	41.8	1.0	-54.8	-13.0	-41.8	
	2509.50	-17.7	H	3.0	41.7	1.0	-58.4	-13.0	-45.4	
	3346.00	-16.2	H	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	High Ch, 844MHz									
	1688.00	-14.3	V	3.0	41.8	1.0	-55.2	-13.0	-42.2	
	2532.00	-16.6	V	3.0	41.7	1.0	-57.2	-13.0	-44.2	
	3376.00	-16.1	V	3.0	41.1	1.0	-56.2	-13.0	-43.2	
	1688.00	-13.1	H	3.0	41.8	1.0	-54.0	-13.0	-41.0	
	2532.00	-17.1	H	3.0	41.7	1.0	-57.8	-13.0	-44.8	
	3376.00	-16.6	H	3.0	41.1	1.0	-56.7	-13.0	-43.7	

LTE Band 5 5MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-06 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_QPSK Band 5 Harmonics, 3MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 825.5MHz									
	1651.00	-14.4	V	3.0	41.8	1.0	-55.2	-13.0	-42.2	
	2476.50	-15.0	V	3.0	41.7	1.0	-55.7	-13.0	-42.7	
	3302.00	-15.9	V	3.0	41.1	1.0	-56.1	-13.0	-43.1	
	1651.00	-14.2	H	3.0	41.8	1.0	-55.0	-13.0	-42.0	
	2476.50	-17.1	H	3.0	41.7	1.0	-57.8	-13.0	-44.8	
	3302.00	-15.9	H	3.0	41.1	1.0	-56.0	-13.0	-43.0	
	Mid Ch, 836.5MHz									
	1673.00	-14.0	V	3.0	41.8	1.0	-54.8	-13.0	-41.8	
	2509.50	-14.3	V	3.0	41.7	1.0	-55.0	-13.0	-42.0	
	3346.00	-16.4	V	3.0	41.1	1.0	-56.5	-13.0	-43.5	
	1673.00	-14.3	H	3.0	41.8	1.0	-55.1	-13.0	-42.1	
	2509.50	-17.0	H	3.0	41.7	1.0	-57.7	-13.0	-44.7	
	3346.00	-17.1	H	3.0	41.1	1.0	-57.2	-13.0	-44.2	
	High Ch, 847.5MHz									
	1695.00	-13.4	V	3.0	41.8	1.0	-54.2	-13.0	-41.2	
	2542.50	-13.8	V	3.0	41.6	1.0	-54.4	-13.0	-41.4	
	3390.00	-16.3	V	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	1695.00	-14.9	H	3.0	41.8	1.0	-55.7	-13.0	-42.7	
	2542.50	-16.2	H	3.0	41.6	1.0	-56.8	-13.0	-43.8	
3390.00	-16.8	H	3.0	41.1	1.0	-56.9	-13.0	-43.9		
LTE Band 5 5MHz 16QAM	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_16QAM Band 5 Harmonics, 5MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 826.5MHz									
	1653.00	-15.3	V	3.0	41.8	1.0	-56.1	-13.0	-43.1	
	2479.50	-16.4	V	3.0	41.7	1.0	-57.1	-13.0	-44.1	
	3306.00	-16.2	V	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	1653.00	-14.5	H	3.0	41.8	1.0	-55.3	-13.0	-42.3	
	2479.50	-15.7	H	3.0	41.7	1.0	-56.4	-13.0	-43.4	
	3306.00	-16.5	H	3.0	41.1	1.0	-56.6	-13.0	-43.6	
	Mid Ch, 836.5MHz									
	1673.00	-14.8	V	3.0	41.8	1.0	-55.7	-13.0	-42.7	
	2509.50	-16.8	V	3.0	41.7	1.0	-57.5	-13.0	-44.5	
	3346.00	-16.7	V	3.0	41.1	1.0	-56.8	-13.0	-43.8	
	1673.00	-14.3	H	3.0	41.8	1.0	-55.1	-13.0	-42.1	
	2509.50	-16.2	H	3.0	41.7	1.0	-56.9	-13.0	-43.9	
	3346.00	-16.3	H	3.0	41.1	1.0	-56.4	-13.0	-43.4	
	High Ch, 846.5MHz									
	1693.00	-14.8	V	3.0	41.8	1.0	-55.7	-13.0	-42.7	
	2539.50	-15.5	V	3.0	41.6	1.0	-56.2	-13.0	-43.2	
	3386.00	-16.3	V	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	1693.00	-14.1	H	3.0	41.8	1.0	-54.9	-13.0	-41.9	
	2539.50	-17.2	H	3.0	41.6	1.0	-57.8	-13.0	-44.8	
3386.00	-16.7	H	3.0	41.1	1.0	-56.7	-13.0	-43.7		

LTE Band 5 3MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-06 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_QPSK Band 5 Harmonics, 3MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 825.5MHz									
	1651.00	-13.1	V	3.0	41.8	1.0	-53.9	-13.0	-40.9	
	2476.50	-17.4	V	3.0	41.7	1.0	-58.1	-13.0	-45.1	
	3302.00	-15.6	V	3.0	41.1	1.0	-55.7	-13.0	-42.7	
	1651.00	-15.4	H	3.0	41.8	1.0	-56.2	-13.0	-43.2	
	2476.50	-17.5	H	3.0	41.7	1.0	-58.2	-13.0	-45.2	
	3302.00	-16.3	H	3.0	41.1	1.0	-56.4	-13.0	-43.4	
	Mid Ch, 836.5MHz									
	1673.00	-13.2	V	3.0	41.8	1.0	-54.0	-13.0	-41.0	
	2509.50	-16.1	V	3.0	41.7	1.0	-56.7	-13.0	-43.7	
	3346.00	-15.8	V	3.0	41.1	1.0	-55.9	-13.0	-42.9	
	1673.00	-15.9	H	3.0	41.8	1.0	-56.7	-13.0	-43.7	
	2509.50	-17.5	H	3.0	41.7	1.0	-58.1	-13.0	-45.1	
	3346.00	-16.2	H	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	High Ch, 847.5MHz									
	1695.00	-12.6	V	3.0	41.8	1.0	-53.4	-13.0	-40.4	
	2542.50	-16.0	V	3.0	41.6	1.0	-56.6	-13.0	-43.6	
	3390.00	-15.8	V	3.0	41.1	1.0	-55.9	-13.0	-42.9	
	1695.00	-15.5	H	3.0	41.8	1.0	-56.3	-13.0	-43.3	
	2542.50	-17.7	H	3.0	41.6	1.0	-58.4	-13.0	-45.4	
	3390.00	-15.8	H	3.0	41.1	1.0	-55.8	-13.0	-42.8	
LTE Band 5 3MHz 16QAM	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_16QAM Band 5 Harmonics, 3MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 825.5MHz									
	1651.00	-15.5	V	3.0	41.8	1.0	-56.3	-13.0	-43.3	
	2476.50	-17.2	V	3.0	41.7	1.0	-57.9	-13.0	-44.9	
	3302.00	-16.0	V	3.0	41.1	1.0	-56.1	-13.0	-43.1	
	1651.00	-15.6	H	3.0	41.8	1.0	-56.4	-13.0	-43.4	
	2476.50	-17.8	H	3.0	41.7	1.0	-58.5	-13.0	-45.5	
	3302.00	-16.3	H	3.0	41.1	1.0	-56.5	-13.0	-43.5	
	Mid Ch, 836.5MHz									
	1673.00	-14.8	V	3.0	41.8	1.0	-55.7	-13.0	-42.7	
	2509.50	-16.4	V	3.0	41.7	1.0	-57.1	-13.0	-44.1	
	3346.00	-16.6	V	3.0	41.1	1.0	-56.6	-13.0	-43.6	
	1673.00	-13.6	H	3.0	41.8	1.0	-54.4	-13.0	-41.4	
	2509.50	-17.9	H	3.0	41.7	1.0	-58.6	-13.0	-45.6	
	3346.00	-16.4	H	3.0	41.1	1.0	-56.5	-13.0	-43.5	
	High Ch, 847.5MHz									
	1695.00	-14.7	V	3.0	41.8	1.0	-55.5	-13.0	-42.5	
	2542.50	-15.3	V	3.0	41.6	1.0	-55.9	-13.0	-42.9	
	3390.00	-15.5	V	3.0	41.1	1.0	-55.6	-13.0	-42.6	
	1695.00	-12.9	H	3.0	41.8	1.0	-53.8	-13.0	-40.8	
	2542.50	-16.1	H	3.0	41.6	1.0	-56.7	-13.0	-43.7	
	3390.00	-16.5	H	3.0	41.1	1.0	-56.5	-13.0	-43.5	

LTE Band 5 1.4MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_QPSK Band 5 Harmonics, 1.4MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 824.7MHz									
	1649.40	-15.0	V	3.0	41.8	1.0	-55.8	-13.0	-42.8	
	2474.10	-17.9	V	3.0	41.7	1.0	-58.6	-13.0	-45.6	
	3298.80	-15.8	V	3.0	41.1	1.0	-55.9	-13.0	-42.9	
	1649.40	-16.1	H	3.0	41.8	1.0	-56.9	-13.0	-43.9	
	2474.10	-17.9	H	3.0	41.7	1.0	-58.6	-13.0	-45.6	
	3298.80	-16.7	H	3.0	41.1	1.0	-56.8	-13.0	-43.8	
	Mid Ch, 836.5MHz									
	1673.00	-15.7	V	3.0	41.8	1.0	-56.5	-13.0	-43.5	
	2509.50	-16.2	V	3.0	41.7	1.0	-56.9	-13.0	-43.9	
	3346.00	-16.2	V	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	1673.00	-13.5	H	3.0	41.8	1.0	-54.3	-13.0	-41.3	
	2509.50	-17.8	H	3.0	41.7	1.0	-58.5	-13.0	-45.5	
	3346.00	-31.2	H	3.0	41.1	1.0	-71.3	-13.0	-58.3	
	High Ch, 848.3MHz									
	1696.60	-14.6	V	3.0	41.8	1.0	-55.4	-13.0	-42.4	
	2544.90	-16.2	V	3.0	41.6	1.0	-56.8	-13.0	-43.8	
	3393.20	-15.8	V	3.0	41.1	1.0	-55.9	-13.0	-42.9	
	1696.60	-14.1	H	3.0	41.8	1.0	-55.0	-13.0	-42.0	
	2544.90	-15.8	H	3.0	41.6	1.0	-56.5	-13.0	-43.5	
	3393.20	-16.2	H	3.0	41.1	1.0	-56.3	-13.0	-43.3	
LTE Band 5 1.4MHz 16QAM	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45585 Configuration: EUT / Adapter / Earphone, Z-Position Location: Chamber 3 Mode: LTE_16QAM Band 5 Harmonics, 1.4MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 824.7MHz									
	1649.40	-14.8	V	3.0	41.8	1.0	-55.6	-13.0	-42.6	
	2474.10	-17.5	V	3.0	41.7	1.0	-58.2	-13.0	-45.2	
	3298.80	-16.2	V	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	1649.40	-15.7	H	3.0	41.8	1.0	-56.6	-13.0	-43.6	
	2474.10	-17.7	H	3.0	41.7	1.0	-58.4	-13.0	-45.4	
	3298.80	-16.4	H	3.0	41.1	1.0	-56.6	-13.0	-43.6	
	Mid Ch, 836.5MHz									
	1673.00	-15.9	V	3.0	41.8	1.0	-56.7	-13.0	-43.7	
	2509.50	-16.0	V	3.0	41.7	1.0	-56.7	-13.0	-43.7	
	3346.00	-16.5	V	3.0	41.1	1.0	-56.6	-13.0	-43.6	
	1673.00	-14.0	H	3.0	41.8	1.0	-54.8	-13.0	-41.8	
	2509.50	-17.6	H	3.0	41.7	1.0	-58.3	-13.0	-45.3	
	3346.00	-16.6	H	3.0	41.1	1.0	-56.7	-13.0	-43.7	
	High Ch, 848.3MHz									
	1696.60	-14.4	V	3.0	41.8	1.0	-55.3	-13.0	-42.3	
	2544.90	-15.4	V	3.0	41.6	1.0	-56.0	-13.0	-43.0	
	3393.20	-16.2	V	3.0	41.1	1.0	-56.3	-13.0	-43.3	
	1696.60	-13.6	H	3.0	41.8	1.0	-54.5	-13.0	-41.5	
	2544.90	-15.4	H	3.0	41.6	1.0	-56.0	-13.0	-43.0	
	3393.20	-16.2	H	3.0	41.1	1.0	-56.3	-13.0	-43.3	

LTE Band 66

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788397760							
Date:		2018-04-06							
Test Engineer:		45585							
Configuration:		EUT / Adapter / Earphone, X-Position							
Location:		Chamber 3							
Mode:		LTE_QPSK Band 66 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	-2.7	V	3.0	41.0	1.0	-42.7	-13.0	-29.7	
5160.00	-0.8	V	3.0	40.1	1.0	-39.9	-13.0	-26.9	
6880.00	-2.6	V	3.0	40.0	1.0	-41.6	-13.0	-28.6	
8600.00	-7.6	V	3.0	39.8	1.0	-46.4	-13.0	-33.4	
10320.00	-3.2	V	3.0	40.1	1.0	-42.3	-13.0	-29.3	
3440.00	0.0	H	3.0	41.0	1.0	-40.0	-13.0	-27.0	
5160.00	-3.6	H	3.0	40.1	1.0	-42.7	-13.0	-29.7	
6880.00	-4.9	H	3.0	40.0	1.0	-43.9	-13.0	-30.9	
8600.00	-7.0	H	3.0	39.8	1.0	-45.7	-13.0	-32.7	
10320.00	-5.8	H	3.0	40.1	1.0	-44.9	-13.0	-31.9	
Mid Ch, 1745MHz									
3490.00	-8.7	V	3.0	41.0	1.0	-48.7	-13.0	-35.7	
5235.00	2.5	V	3.0	40.1	1.0	-36.6	-13.0	-23.6	
6980.00	-2.5	V	3.0	40.0	1.0	-41.5	-13.0	-28.5	
8725.00	-7.6	V	3.0	39.7	1.0	-46.3	-13.0	-33.3	
10470.00	-3.8	V	3.0	40.1	1.0	-42.9	-13.0	-29.9	
3490.00	-5.1	H	3.0	41.0	1.0	-45.1	-13.0	-32.1	
5235.00	-1.0	H	3.0	40.1	1.0	-40.1	-13.0	-27.1	
6980.00	-5.4	H	3.0	40.0	1.0	-44.4	-13.0	-31.4	
8725.00	-7.8	H	3.0	39.7	1.0	-46.5	-13.0	-33.5	
10470.00	-5.0	H	3.0	40.1	1.0	-44.1	-13.0	-31.1	
High Ch, 1770MHz									
3540.00	-10.4	V	3.0	41.0	1.0	-50.3	-13.0	-37.3	
5310.00	1.8	V	3.0	40.1	1.0	-37.3	-13.0	-24.3	
7080.00	-5.6	V	3.0	40.0	1.0	-44.7	-13.0	-31.7	
8850.00	-7.6	V	3.0	39.6	1.0	-46.3	-13.0	-33.3	
10620.00	-4.4	V	3.0	40.0	1.0	-43.5	-13.0	-30.5	
3540.00	-4.5	H	3.0	41.0	1.0	-44.4	-13.0	-31.4	
5310.00	-0.7	H	3.0	40.1	1.0	-39.8	-13.0	-26.8	
7080.00	-8.2	H	3.0	40.0	1.0	-47.2	-13.0	-34.2	
8850.00	-8.0	H	3.0	39.6	1.0	-46.6	-13.0	-33.6	
10620.00	-5.4	H	3.0	40.0	1.0	-44.4	-13.0	-31.4	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788397760							
Date:		2018-04-05							
Test Engineer:		45585							
Configuration:		EUT / Adapter / Earphone, X-Position							
Location:		Chamber 3							
Mode:		LTE_QPSK Band 66 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	-1.6	V	3.0	41.0	1.0	-41.6	-13.0	-28.6	
5145.00	-0.7	V	3.0	40.1	1.0	-39.8	-13.0	-26.8	
6860.00	-1.8	V	3.0	40.0	1.0	-40.8	-13.0	-27.8	
8575.00	-8.1	V	3.0	39.8	1.0	-46.9	-13.0	-33.9	
10290.00	-4.1	V	3.0	40.1	1.0	-43.2	-13.0	-30.2	
3430.00	0.8	H	3.0	41.0	1.0	-39.2	-13.0	-26.2	
5145.00	-4.5	H	3.0	40.1	1.0	-43.6	-13.0	-30.6	
6860.00	-3.5	H	3.0	40.0	1.0	-42.5	-13.0	-29.5	
8575.00	-8.2	H	3.0	39.8	1.0	-46.9	-13.0	-33.9	
10290.00	-6.2	H	3.0	40.1	1.0	-45.3	-13.0	-32.3	
Mid Ch, 1715MHz									
3490.00	-13.4	V	3.0	41.0	1.0	-53.4	-13.0	-40.4	
5235.00	-13.4	V	3.0	40.1	1.0	-52.5	-13.0	-39.5	
6980.00	-9.5	V	3.0	40.0	1.0	-48.6	-13.0	-35.6	
8725.00	-7.5	V	3.0	39.7	1.0	-46.2	-13.0	-33.2	
10470.00	-3.0	V	3.0	40.1	1.0	-42.1	-13.0	-29.1	
3490.00	-4.4	H	3.0	41.0	1.0	-44.5	-13.0	-31.5	
5235.00	-1.1	H	3.0	40.1	1.0	-40.2	-13.0	-27.2	
6980.00	-5.5	H	3.0	40.0	1.0	-44.5	-13.0	-31.5	
8725.00	-7.9	H	3.0	39.7	1.0	-46.5	-13.0	-33.5	
10470.00	-6.1	H	3.0	40.1	1.0	-45.2	-13.0	-32.2	
High Ch, 1775MHz									
3550.00	-7.8	V	3.0	41.0	1.0	-47.8	-13.0	-34.8	
5325.00	1.5	V	3.0	40.1	1.0	-37.6	-13.0	-24.6	
7100.00	-6.1	V	3.0	40.0	1.0	-45.2	-13.0	-32.2	
8875.00	-7.2	V	3.0	39.6	1.0	-45.8	-13.0	-32.8	
10650.00	-2.3	V	3.0	40.0	1.0	-41.3	-13.0	-28.3	
3550.00	-4.9	H	3.0	41.0	1.0	-44.9	-13.0	-31.9	
5325.00	-0.3	H	3.0	40.1	1.0	-39.4	-13.0	-26.4	
7100.00	-7.6	H	3.0	40.0	1.0	-46.6	-13.0	-33.6	
8875.00	-8.0	H	3.0	39.6	1.0	-46.6	-13.0	-33.6	
10650.00	-4.9	H	3.0	40.0	1.0	-43.9	-13.0	-30.9	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4788397760							
Date:		2018-04-05							
Test Engineer:		45585							
Configuration:		EUT / Adapter / Earphone, X-Position							
Location:		Chamber 3							
Mode:		LTE_QPSK Band 66 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	-1.3	V	3.0	41.0	1.0	-41.3	-13.0	-28.3	
5137.50	-1.1	V	3.0	40.1	1.0	-40.2	-13.0	-27.2	
6850.00	-1.3	V	3.0	40.0	1.0	-40.3	-13.0	-27.3	
8562.50	-8.1	V	3.0	39.8	1.0	-46.9	-13.0	-33.9	
10275.00	-2.8	V	3.0	40.1	1.0	-41.9	-13.0	-28.9	
3425.00	0.7	H	3.0	41.0	1.0	-39.3	-13.0	-26.3	
5137.50	-4.9	H	3.0	40.1	1.0	-44.1	-13.0	-31.1	
6850.00	-3.3	H	3.0	40.0	1.0	-42.3	-13.0	-29.3	
8562.50	-7.8	H	3.0	39.8	1.0	-46.6	-13.0	-33.6	
10275.00	-5.7	H	3.0	40.1	1.0	-44.8	-13.0	-31.8	
Mid Ch, 1745MHz									
3490.00	-9.5	V	3.0	41.0	1.0	-49.5	-13.0	-36.5	
5235.00	1.9	V	3.0	40.1	1.0	-37.2	-13.0	-24.2	
6980.00	-3.1	V	3.0	40.0	1.0	-42.2	-13.0	-29.2	
8725.00	-7.6	V	3.0	39.7	1.0	-46.3	-13.0	-33.3	
10470.00	-4.1	V	3.0	40.1	1.0	-43.2	-13.0	-30.2	
3490.00	-3.8	H	3.0	41.0	1.0	-43.8	-13.0	-30.8	
5235.00	-1.4	H	3.0	40.1	1.0	-40.5	-13.0	-27.5	
6980.00	-5.2	H	3.0	40.0	1.0	-44.3	-13.0	-31.3	
8725.00	-7.7	H	3.0	39.7	1.0	-46.4	-13.0	-33.4	
10470.00	-6.3	H	3.0	40.1	1.0	-45.4	-13.0	-32.4	
High Ch, 1777.5MHz									
3555.00	-9.7	V	3.0	41.0	1.0	-49.7	-13.0	-36.7	
5332.50	1.6	V	3.0	40.1	1.0	-37.5	-13.0	-24.5	
7110.00	-6.6	V	3.0	40.0	1.0	-45.7	-13.0	-32.7	
8887.50	-7.1	V	3.0	39.6	1.0	-45.7	-13.0	-32.7	
10665.00	-2.9	V	3.0	40.0	1.0	-42.0	-13.0	-29.0	
3555.00	-6.5	H	3.0	41.0	1.0	-46.4	-13.0	-33.4	
5332.50	-1.1	H	3.0	40.1	1.0	-40.2	-13.0	-27.2	
7110.00	-8.1	H	3.0	40.0	1.0	-47.2	-13.0	-34.2	
8887.50	-8.5	H	3.0	39.6	1.0	-47.1	-13.0	-34.1	
10665.00	-4.5	H	3.0	40.0	1.0	-43.6	-13.0	-30.6	

LTE

Band 66

1.4MHz

QPSK

UL Verification Services, Inc.

Above 1GHz High Frequency Substitution Measurement

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Samsung

4788397760

2018-04-05

45585

EUT / Adapter / Earphone, X-Position

Chamber 3

LTE_QPSK Band 66 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	1.0	V	3.0	41.0	1.0	-39.0	-13.0	-26.0	
5132.10	-0.8	V	3.0	40.1	1.0	-40.0	-13.0	-27.0	
6842.80	-0.8	V	3.0	40.0	1.0	-39.8	-13.0	-26.8	
8553.50	-8.2	V	3.0	39.8	1.0	-47.0	-13.0	-34.0	
10264.20	-3.9	V	3.0	40.1	1.0	-43.0	-13.0	-30.0	
3421.40	0.9	H	3.0	41.0	1.0	-39.2	-13.0	-26.2	
5132.10	-4.7	H	3.0	40.1	1.0	-43.8	-13.0	-30.8	
6842.80	-2.6	H	3.0	40.0	1.0	-41.7	-13.0	-28.7	
8553.50	-8.4	H	3.0	39.8	1.0	-47.2	-13.0	-34.2	
10264.20	-5.8	H	3.0	40.1	1.0	-44.9	-13.0	-31.9	
Mid Ch, 1745MHz									
3490.00	-6.0	V	3.0	41.0	1.0	-46.0	-13.0	-33.0	
5235.00	2.2	V	3.0	40.1	1.0	-36.9	-13.0	-23.9	
6980.00	-2.4	V	3.0	40.0	1.0	-41.5	-13.0	-28.5	
8725.00	-7.4	V	3.0	39.7	1.0	-46.1	-13.0	-33.1	
10470.00	-3.4	V	3.0	40.1	1.0	-42.5	-13.0	-29.5	
3490.00	-3.6	H	3.0	41.0	1.0	-43.6	-13.0	-30.6	
5235.00	-1.5	H	3.0	40.1	1.0	-40.6	-13.0	-27.6	
6980.00	-6.7	H	3.0	40.0	1.0	-45.7	-13.0	-32.7	
8725.00	-7.4	H	3.0	39.7	1.0	-46.1	-13.0	-33.1	
10470.00	-4.9	H	3.0	40.1	1.0	-44.0	-13.0	-31.0	
High Ch, 1779.3MHz									
3558.60	0.0	V	3.0	41.0	1.0	-40.0	-13.0	-27.0	
5337.90	0.5	V	3.0	40.1	1.0	-38.6	-13.0	-25.6	
7117.20	-7.6	V	3.0	40.0	1.0	-46.7	-13.0	-33.7	
8896.50	-7.2	V	3.0	39.6	1.0	-45.8	-13.0	-32.8	
10675.80	-2.5	V	3.0	40.0	1.0	-41.5	-13.0	-28.5	
3558.60	-5.1	H	3.0	41.0	1.0	-45.0	-13.0	-32.0	
5337.90	-2.0	H	3.0	40.1	1.0	-41.1	-13.0	-28.1	
7117.20	-8.6	H	3.0	40.0	1.0	-47.6	-13.0	-34.6	
8896.50	-8.2	H	3.0	39.6	1.0	-46.8	-13.0	-33.8	
10675.80	-4.2	H	3.0	40.0	1.0	-43.2	-13.0	-30.2	

LTE Band 2

LTE Band 2 20MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 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	-4.2	V	3.0	40.9	1.0	-44.1	-13.0	-31.1	
	5580.00	-4.4	V	3.0	40.0	1.0	-43.5	-13.0	-30.5	
	7440.00	-9.3	V	3.0	40.0	1.0	-48.3	-13.0	-35.3	
	3720.00	2.7	H	3.0	40.9	1.0	-37.2	-13.0	-24.2	
	5580.00	-4.8	H	3.0	40.0	1.0	-43.9	-13.0	-30.9	
	7440.00	-9.6	H	3.0	40.0	1.0	-48.6	-13.0	-35.6	
	Mid Ch, 1880MHz									
	3760.00	-2.5	V	3.0	40.8	1.0	-42.3	-13.0	-29.3	
	5640.00	-6.4	V	3.0	40.0	1.0	-45.5	-13.0	-32.5	
	7520.00	-8.4	V	3.0	40.0	1.0	-47.4	-13.0	-34.4	
	3760.00	4.4	H	3.0	40.8	1.0	-35.5	-13.0	-22.5	
	5640.00	-6.4	H	3.0	40.0	1.0	-45.4	-13.0	-32.4	
	7520.00	-8.6	H	3.0	40.0	1.0	-47.6	-13.0	-34.6	
	High Ch, 1900MHz									
	3800.00	-5.5	V	3.0	40.8	1.0	-45.3	-13.0	-32.3	
	5700.00	-5.5	V	3.0	40.0	1.0	-44.5	-13.0	-31.5	
7600.00	-8.4	V	3.0	40.0	1.0	-47.4	-13.0	-34.4		
3800.00	0.1	H	3.0	40.8	1.0	-39.7	-13.0	-26.7		
5700.00	-5.9	H	3.0	40.0	1.0	-44.9	-13.0	-31.9		
7600.00	-9.9	H	3.0	40.0	1.0	-49.0	-13.0	-36.0		
LTE Band 2 20MHz 16QAM	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 Mode: LTE_16QAM 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	-4.3	V	3.0	40.9	1.0	-44.1	-13.0	-31.1	
	5580.00	-4.5	V	3.0	40.0	1.0	-43.5	-13.0	-30.5	
	7440.00	-9.2	V	3.0	40.0	1.0	-48.2	-13.0	-35.2	
	3720.00	3.5	H	3.0	40.9	1.0	-36.3	-13.0	-23.3	
	5580.00	-4.8	H	3.0	40.0	1.0	-43.9	-13.0	-30.9	
	7440.00	-9.7	H	3.0	40.0	1.0	-48.8	-13.0	-35.8	
	Mid Ch, 1880MHz									
	3760.00	-2.4	V	3.0	40.8	1.0	-42.2	-13.0	-29.2	
	5640.00	-6.2	V	3.0	40.0	1.0	-45.3	-13.0	-32.3	
	7520.00	-8.5	V	3.0	40.0	1.0	-47.5	-13.0	-34.5	
	3760.00	4.2	H	3.0	40.8	1.0	-35.6	-13.0	-22.6	
	5640.00	-6.8	H	3.0	40.0	1.0	-45.8	-13.0	-32.8	
	7520.00	-9.5	H	3.0	40.0	1.0	-48.6	-13.0	-35.6	
	High Ch, 1900MHz									
	3800.00	-5.0	V	3.0	40.8	1.0	-44.8	-13.0	-31.8	
	5700.00	-5.5	V	3.0	40.0	1.0	-44.5	-13.0	-31.5	
7600.00	-8.4	V	3.0	40.0	1.0	-47.4	-13.0	-34.4		
3800.00	0.8	H	3.0	40.8	1.0	-39.0	-13.0	-26.0		
5700.00	-5.8	H	3.0	40.0	1.0	-44.8	-13.0	-31.8		
7600.00	-10.0	H	3.0	40.0	1.0	-49.1	-13.0	-36.1		

LTE Band 2 15MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 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	-4.7	V	3.0	40.9	1.0	-44.6	-13.0	-31.6	
	5572.50	-4.6	V	3.0	40.0	1.0	-43.7	-13.0	-30.7	
	7430.00	-9.0	V	3.0	40.0	1.0	-48.0	-13.0	-35.0	
	3715.00	4.2	H	3.0	40.9	1.0	-35.7	-13.0	-22.7	
	5572.50	-5.2	H	3.0	40.0	1.0	-44.2	-13.0	-31.2	
	7430.00	-9.7	H	3.0	40.0	1.0	-48.8	-13.0	-35.8	
	Mid Ch, 1880MHz									
	3760.00	-2.3	V	3.0	40.8	1.0	-42.1	-13.0	-29.1	
	5640.00	-6.6	V	3.0	40.0	1.0	-45.7	-13.0	-32.7	
	7520.00	-8.5	V	3.0	40.0	1.0	-47.5	-13.0	-34.5	
	3760.00	4.4	H	3.0	40.8	1.0	-35.4	-13.0	-22.4	
	5640.00	-7.7	H	3.0	40.0	1.0	-46.7	-13.0	-33.7	
	7520.00	-9.5	H	3.0	40.0	1.0	-48.6	-13.0	-35.6	
	High Ch, 1902.5MHz									
	3805.00	-3.8	V	3.0	40.8	1.0	-43.6	-13.0	-30.6	
	5707.50	-6.5	V	3.0	40.0	1.0	-45.5	-13.0	-32.5	
	7610.00	-8.2	V	3.0	40.0	1.0	-47.3	-13.0	-34.3	
	3805.00	1.7	H	3.0	40.8	1.0	-38.1	-13.0	-25.1	
	5707.50	-7.6	H	3.0	40.0	1.0	-46.7	-13.0	-33.7	
	7610.00	-10.0	H	3.0	40.0	1.0	-49.0	-13.0	-36.0	
LTE Band 2 15MHz 16QAM	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 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	-4.8	V	3.0	40.9	1.0	-44.6	-13.0	-31.6	
	5572.50	-4.9	V	3.0	40.0	1.0	-43.9	-13.0	-30.9	
	7430.00	-9.0	V	3.0	40.0	1.0	-48.1	-13.0	-35.1	
	3715.00	4.6	H	3.0	40.9	1.0	-35.2	-13.0	-22.2	
	5572.50	-5.3	H	3.0	40.0	1.0	-44.4	-13.0	-31.4	
	7430.00	-9.3	H	3.0	40.0	1.0	-48.4	-13.0	-35.4	
	Mid Ch, 1880MHz									
	3760.00	-2.5	V	3.0	40.8	1.0	-42.3	-13.0	-29.3	
	5640.00	-7.3	V	3.0	40.0	1.0	-46.4	-13.0	-33.4	
	7520.00	-8.6	V	3.0	40.0	1.0	-47.7	-13.0	-34.7	
	3760.00	4.1	H	3.0	40.8	1.0	-35.8	-13.0	-22.8	
	5640.00	-7.5	H	3.0	40.0	1.0	-46.5	-13.0	-33.5	
	7520.00	-9.2	H	3.0	40.0	1.0	-48.3	-13.0	-35.3	
	High Ch, 1902.5MHz									
	3805.00	-3.7	V	3.0	40.8	1.0	-43.5	-13.0	-30.5	
	5707.50	-6.6	V	3.0	40.0	1.0	-45.6	-13.0	-32.6	
	7610.00	-8.7	V	3.0	40.0	1.0	-47.7	-13.0	-34.7	
	3805.00	1.4	H	3.0	40.8	1.0	-38.4	-13.0	-25.4	
	5707.50	-8.1	H	3.0	40.0	1.0	-47.1	-13.0	-34.1	
	7610.00	-10.0	H	3.0	40.0	1.0	-49.0	-13.0	-36.0	

LTE Band 2 10MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 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	-4.3	V	3.0	40.9	1.0	-44.2	-13.0	-31.2	
	5565.00	-4.9	V	3.0	40.0	1.0	-43.9	-13.0	-30.9	
	7420.00	-7.5	V	3.0	40.0	1.0	-46.5	-13.0	-33.5	
	3710.00	6.1	H	3.0	40.9	1.0	-33.8	-13.0	-20.8	
	5565.00	-4.7	H	3.0	40.0	1.0	-43.8	-13.0	-30.8	
	7420.00	-9.5	H	3.0	40.0	1.0	-48.5	-13.0	-35.5	
	Mid Ch, 1880MHz									
	3760.00	-1.9	V	3.0	40.8	1.0	-41.8	-13.0	-28.8	
	5640.00	-6.8	V	3.0	40.0	1.0	-45.9	-13.0	-32.9	
	7520.00	-7.7	V	3.0	40.0	1.0	-46.7	-13.0	-33.7	
	3760.00	4.7	H	3.0	40.8	1.0	-35.1	-13.0	-22.1	
	5640.00	-6.9	H	3.0	40.0	1.0	-46.0	-13.0	-33.0	
	7520.00	-9.9	H	3.0	40.0	1.0	-48.9	-13.0	-35.9	
	High Ch, 1905MHz									
	3810.00	-3.1	V	3.0	40.8	1.0	-42.9	-13.0	-29.9	
	5715.00	-6.7	V	3.0	40.0	1.0	-45.7	-13.0	-32.7	
	7620.00	-7.9	V	3.0	40.0	1.0	-47.0	-13.0	-34.0	
	3810.00	2.2	H	3.0	40.8	1.0	-37.6	-13.0	-24.6	
	5715.00	-9.6	H	3.0	40.0	1.0	-48.6	-13.0	-35.6	
	7620.00	-9.8	H	3.0	40.0	1.0	-48.9	-13.0	-35.9	
	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 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	-3.9	V	3.0	40.9	1.0	-43.7	-13.0	-30.7	
	5565.00	-4.7	V	3.0	40.0	1.0	-43.7	-13.0	-30.7	
	7420.00	-8.1	V	3.0	40.0	1.0	-47.1	-13.0	-34.1	
	3710.00	5.6	H	3.0	40.9	1.0	-34.2	-13.0	-21.2	
	5565.00	-5.1	H	3.0	40.0	1.0	-44.2	-13.0	-31.2	
	7420.00	-9.9	H	3.0	40.0	1.0	-48.9	-13.0	-35.9	
	Mid Ch, 1880MHz									
	3760.00	-2.6	V	3.0	40.8	1.0	-42.4	-13.0	-29.4	
	5640.00	-6.7	V	3.0	40.0	1.0	-45.7	-13.0	-32.7	
	7520.00	-8.6	V	3.0	40.0	1.0	-47.6	-13.0	-34.6	
	3760.00	4.0	H	3.0	40.8	1.0	-35.9	-13.0	-22.9	
	5640.00	-7.3	H	3.0	40.0	1.0	-46.3	-13.0	-33.3	
	7520.00	-10.0	H	3.0	40.0	1.0	-49.1	-13.0	-36.1	
	High Ch, 1905MHz									
	3810.00	-2.2	V	3.0	40.8	1.0	-42.0	-13.0	-29.0	
	5715.00	-6.5	V	3.0	40.0	1.0	-45.5	-13.0	-32.5	
	7620.00	-7.3	V	3.0	40.0	1.0	-46.3	-13.0	-33.3	
	3810.00	2.7	H	3.0	40.8	1.0	-37.1	-13.0	-24.1	
	5715.00	-10.2	H	3.0	40.0	1.0	-49.2	-13.0	-36.2	
	7620.00	-10.0	H	3.0	40.0	1.0	-49.1	-13.0	-36.1	

LTE Band 2 5MHz QPSK	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 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	-3.6	V	3.0	40.9	1.0	-43.4	-13.0	-30.4	
	5557.50	-5.4	V	3.0	40.1	1.0	-44.5	-13.0	-31.5	
	7410.00	-6.8	V	3.0	40.0	1.0	-45.8	-13.0	-32.8	
	3705.00	6.4	H	3.0	40.9	1.0	-33.5	-13.0	-20.5	
	5557.50	-5.2	H	3.0	40.1	1.0	-44.3	-13.0	-31.3	
	7410.00	-9.6	H	3.0	40.0	1.0	-48.6	-13.0	-35.6	
	Mid Ch, 1880MHz									
	3760.00	-2.0	V	3.0	40.8	1.0	-41.9	-13.0	-28.9	
	5640.00	-6.6	V	3.0	40.0	1.0	-45.7	-13.0	-32.7	
	7520.00	-7.9	V	3.0	40.0	1.0	-46.9	-13.0	-33.9	
	3760.00	4.6	H	3.0	40.8	1.0	-35.2	-13.0	-22.2	
	5640.00	-6.9	H	3.0	40.0	1.0	-45.9	-13.0	-32.9	
	7520.00	-9.9	H	3.0	40.0	1.0	-49.0	-13.0	-36.0	
	High Ch, 1907.5MHz									
	3815.00	-3.6	V	3.0	40.8	1.0	-43.4	-13.0	-30.4	
	5722.50	-8.3	V	3.0	40.0	1.0	-47.4	-13.0	-34.4	
	7630.00	-7.8	V	3.0	40.0	1.0	-46.9	-13.0	-33.9	
	3815.00	1.6	H	3.0	40.8	1.0	-38.2	-13.0	-25.2	
	5722.50	-9.5	H	3.0	40.0	1.0	-48.5	-13.0	-35.5	
	7630.00	-8.9	H	3.0	40.0	1.0	-47.9	-13.0	-34.9	
LTE Band 2 5MHz 16QAM	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung Project #: 4788397760 Date: 2018-04-04 Test Engineer: 45574 Configuration: EUT / Adapter / Earphone, X-Position Location: Chamber 3 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	-3.4	V	3.0	40.9	1.0	-43.3	-13.0	-30.3	
	5557.50	-5.4	V	3.0	40.1	1.0	-44.5	-13.0	-31.5	
	7410.00	-7.5	V	3.0	40.0	1.0	-46.5	-13.0	-33.5	
	3705.00	6.5	H	3.0	40.9	1.0	-33.3	-13.0	-20.3	
	5557.50	-6.1	H	3.0	40.1	1.0	-45.1	-13.0	-32.1	
	7410.00	-9.7	H	3.0	40.0	1.0	-48.8	-13.0	-35.8	
	Mid Ch, 1880MHz									
	3760.00	-2.2	V	3.0	40.8	1.0	-42.0	-13.0	-29.0	
	5640.00	-6.8	V	3.0	40.0	1.0	-45.9	-13.0	-32.9	
	7520.00	-8.2	V	3.0	40.0	1.0	-47.2	-13.0	-34.2	
	3760.00	4.5	H	3.0	40.8	1.0	-35.3	-13.0	-22.3	
	5640.00	-7.5	H	3.0	40.0	1.0	-46.6	-13.0	-33.6	
	7520.00	-9.5	H	3.0	40.0	1.0	-48.5	-13.0	-35.5	
	High Ch, 1907.5MHz									
	3815.00	-2.9	V	3.0	40.8	1.0	-42.7	-13.0	-29.7	
	5722.50	-7.8	V	3.0	40.0	1.0	-46.8	-13.0	-33.8	
	7630.00	-7.3	V	3.0	40.0	1.0	-46.3	-13.0	-33.3	
	3815.00	1.7	H	3.0	40.8	1.0	-38.1	-13.0	-25.1	
	5722.50	-10.7	H	3.0	40.0	1.0	-49.7	-13.0	-36.7	
	7630.00	-9.1	H	3.0	40.0	1.0	-48.2	-13.0	-35.2	