

10.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §24.238, §27.53 (g)

LIMITS

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

Part 27.53(g) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

RESULTS

GSM

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
GSM1900	GPRS	Lower	1849.985	-25.360	-13.000
		Upper	1910.007	-25.488	
	EGPRS	Lower	1849.982	-32.674	
		Upper	1910.010	-33.126	

WCDMA

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
Band 5	REL99	Lower	824.000	-31.428	-13.000
		Upper	849.000	-38.332	
	HSDPA	Lower	824.000	-32.750	
		Upper	849.000	-38.329	
Band 2	REL99	Lower	1850.000	-30.573	
		Upper	1910.000	-29.884	
	HSDPA	Lower	1850.000	-38.197	
		Upper	1910.000	-35.625	

LTE 41

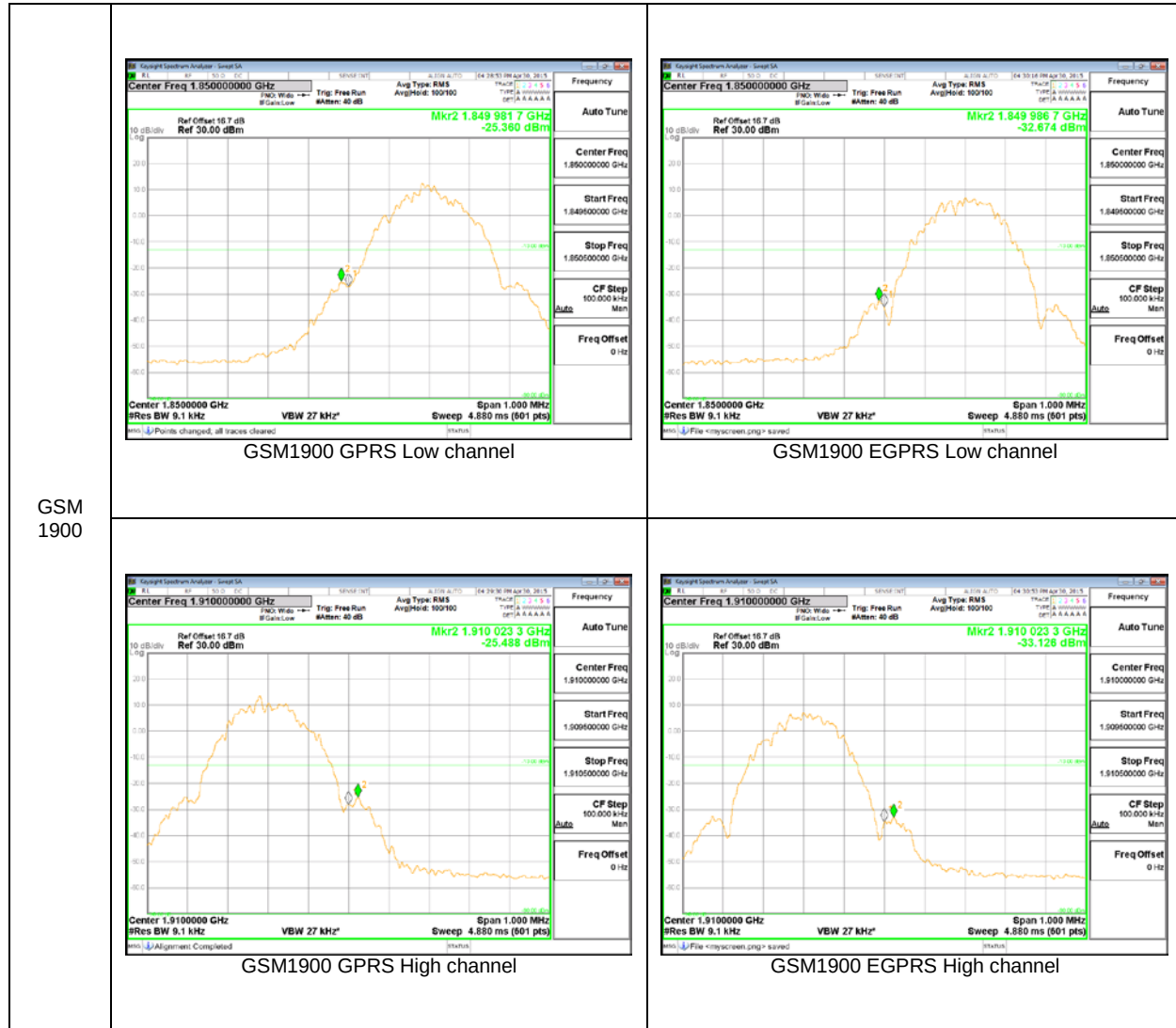
Bandwidth	Mode	f [MHz]	RB Status	Side Trace	Level [dBm]	Limit [dBm]
20 MHz	QPSK	2565.0	1RB	Lower Trace 1	-30.30	-13.00
				Lower Trace 2	-40.86	-25.00
			FRB	Lower Trace 1	-23.36	-13.00
				Lower Trace 2	-27.68	-25.00
		2625.0	1RB	Upper Trace 1	-43.97	-10.00
				Upper Trace 2	-44.21	-13.00
				Upper Trace 3	-44.36	-25.00
			FRB	Upper Trace 1	-23.65	-10.00
				Upper Trace 2	-29.55	-13.00
				Upper Trace 3	-38.77	-25.00
	16QAM	2565.0	1RB	Lower Trace 1	-30.10	-13.00
				Lower Trace 2	-41.31	-25.00
			FRB	Lower Trace 1	-25.07	-13.00
				Lower Trace 2	-28.78	-25.00
		2625.0	1RB	Upper Trace 1	-44.17	-10.00
				Upper Trace 2	-44.27	-13.00
				Upper Trace 3	-44.37	-25.00
			FRB	Upper Trace 1	-25.91	-10.00
				Upper Trace 2	-30.00	-13.00
				Upper Trace 3	-39.92	-25.00
15 MHz	QPSK	2562.5	1RB	Lower Trace 1	-29.03	-13.00
				Lower Trace 2	-39.89	-25.00
			FRB	Lower Trace 1	-22.58	-13.00
				Lower Trace 2	-26.89	-25.00
		2627.5	1RB	Upper Trace 1	-41.78	-10.00
				Upper Trace 2	-43.98	-13.00
				Upper Trace 3	-44.37	-25.00
			FRB	Upper Trace 1	-21.29	-10.00
				Upper Trace 2	-25.54	-13.00
				Upper Trace 3	-37.72	-25.00
	16QAM	2562.5	1RB	Lower Trace 1	-26.72	-13.00
				Lower Trace 2	-40.09	-25.00
			FRB	Lower Trace 1	-24.26	-13.00
				Lower Trace 2	-28.59	-25.00
		2627.5	1RB	Upper Trace 1	-43.11	-10.00
				Upper Trace 2	-44.12	-13.00
				Upper Trace 3	-44.41	-25.00
			FRB	Upper Trace 1	-22.60	-10.00
				Upper Trace 2	-26.78	-13.00
				Upper Trace 3	-38.61	-25.00

LTE 41 (continued)

Bandwidth	Mode	f [MHz]	RB Status	Side Trace	Level [dBm]	Limit [dBm]
10 MHz	QPSK	2660.0	1RB	Lower Trace 1	-26.93	-13.00
				Lower Trace 2	-39.07	-25.00
			FRB	Lower Trace 1	-24.01	-13.00
				Lower Trace 2	-32.20	-25.00
		2630.0	1RB	Upper Trace 1	-42.46	-10.00
				Upper Trace 2	-43.13	-13.00
				Upper Trace 3	-44.29	-25.00
			FRB	Upper Trace 1	-19.42	-10.00
				Upper Trace 2	-47.02	-13.00
				Upper Trace 3	-37.20	-25.00
	16QAM	2660.0	1RB	Lower Trace 1	-31.09	-13.00
				Lower Trace 2	-40.17	-25.00
			FRB	Lower Trace 1	-25.94	-13.00
				Lower Trace 2	-33.03	-25.00
		2630.0	1RB	Upper Trace 1	-42.67	-10.00
				Upper Trace 2	-43.21	-13.00
				Upper Trace 3	-44.41	-25.00
			FRB	Upper Trace 1	-21.17	-10.00
				Upper Trace 2	-28.70	-13.00
				Upper Trace 3	-39.35	-25.00
5 MHz	QPSK	2557.5	1RB	Lower Trace 1	-21.69	-13.00
				Lower Trace 2	-43.65	-25.00
			FRB	Lower Trace 1	-23.00	-13.00
				Lower Trace 2	-39.29	-25.00
		2632.5	1RB	Upper Trace 1	-41.26	-10.00
				Upper Trace 2	-44.15	-13.00
				Upper Trace 3	-44.16	-25.00
			FRB	Upper Trace 1	-16.44	-10.00
				Upper Trace 2	-37.46	-13.00
				Upper Trace 3	-37.29	-25.00
	16QAM	2557.5	1RB	Lower Trace 1	-23.35	-13.00
				Lower Trace 2	-43.97	-25.00
			FRB	Lower Trace 1	-24.26	-13.00
				Lower Trace 2	-39.78	-25.00
		2632.5	1RB	Upper Trace 1	-41.09	-10.00
				Upper Trace 2	-44.10	-13.00
				Upper Trace 3	-44.13	-25.00
			FRB	Upper Trace 1	-18.40	-10.00
				Upper Trace 2	-39.10	-13.00
				Upper Trace 3	-39.38	-25.00

10.2.1. BAND EDGE PLOTS

GSM

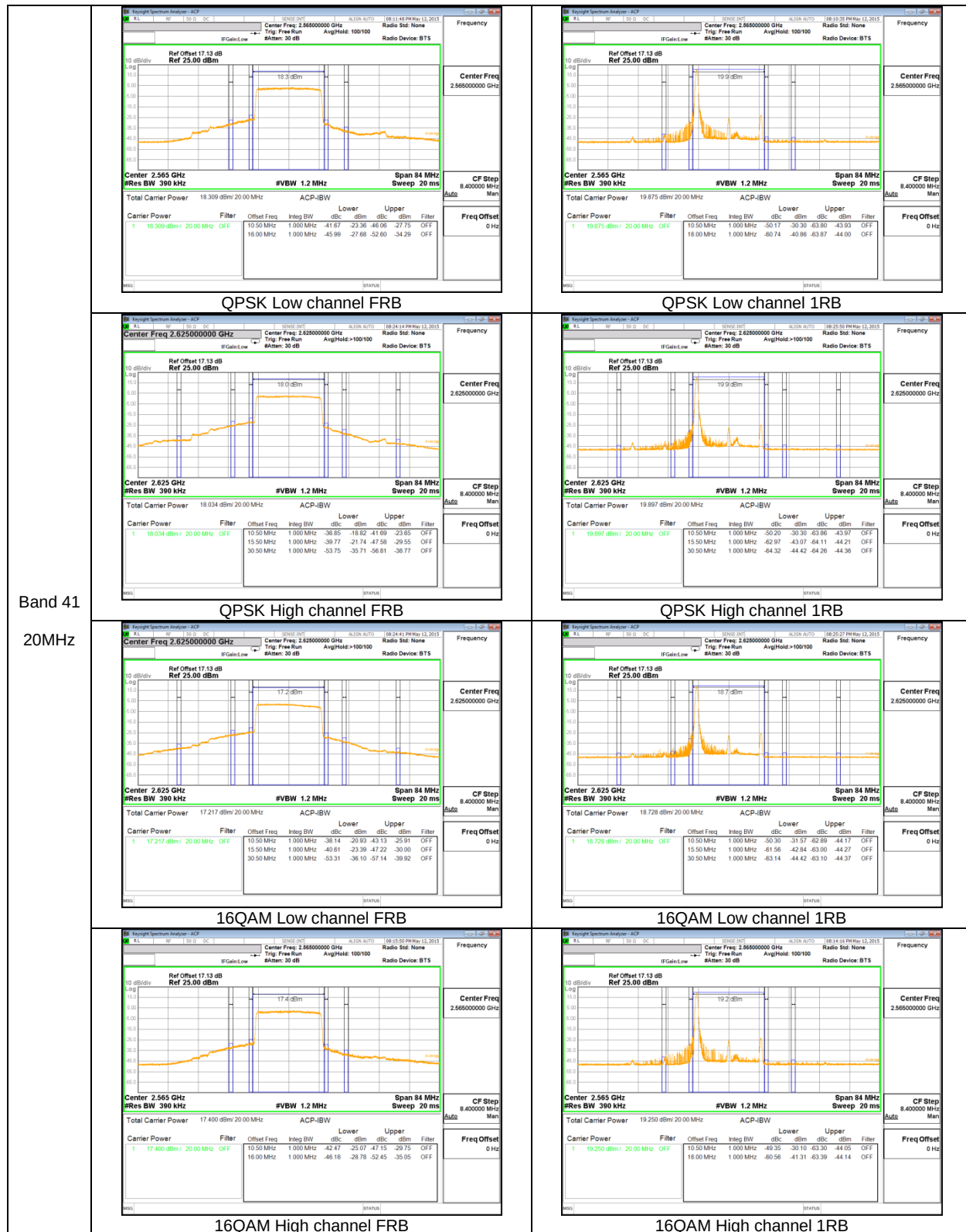


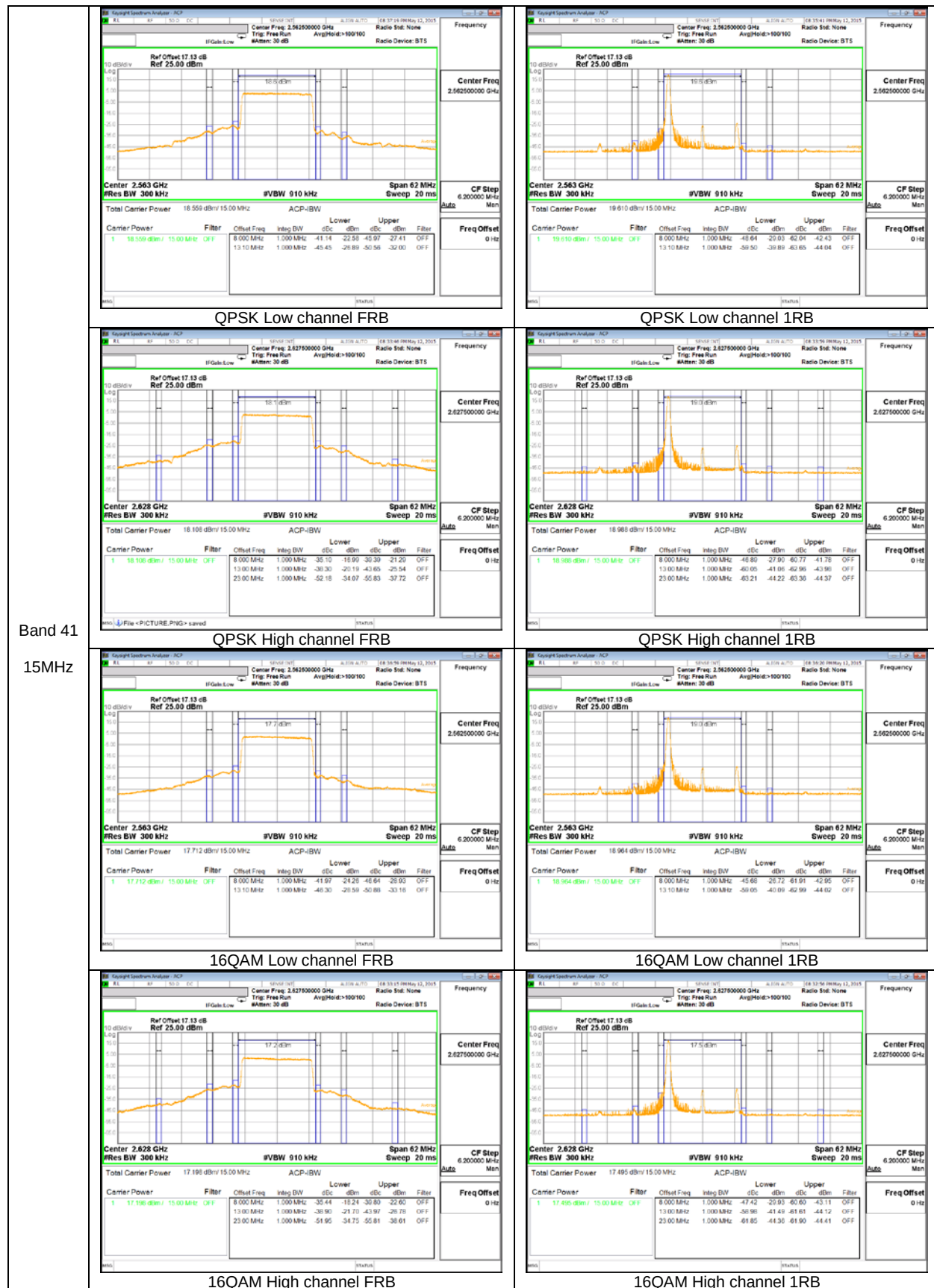
WCDMA

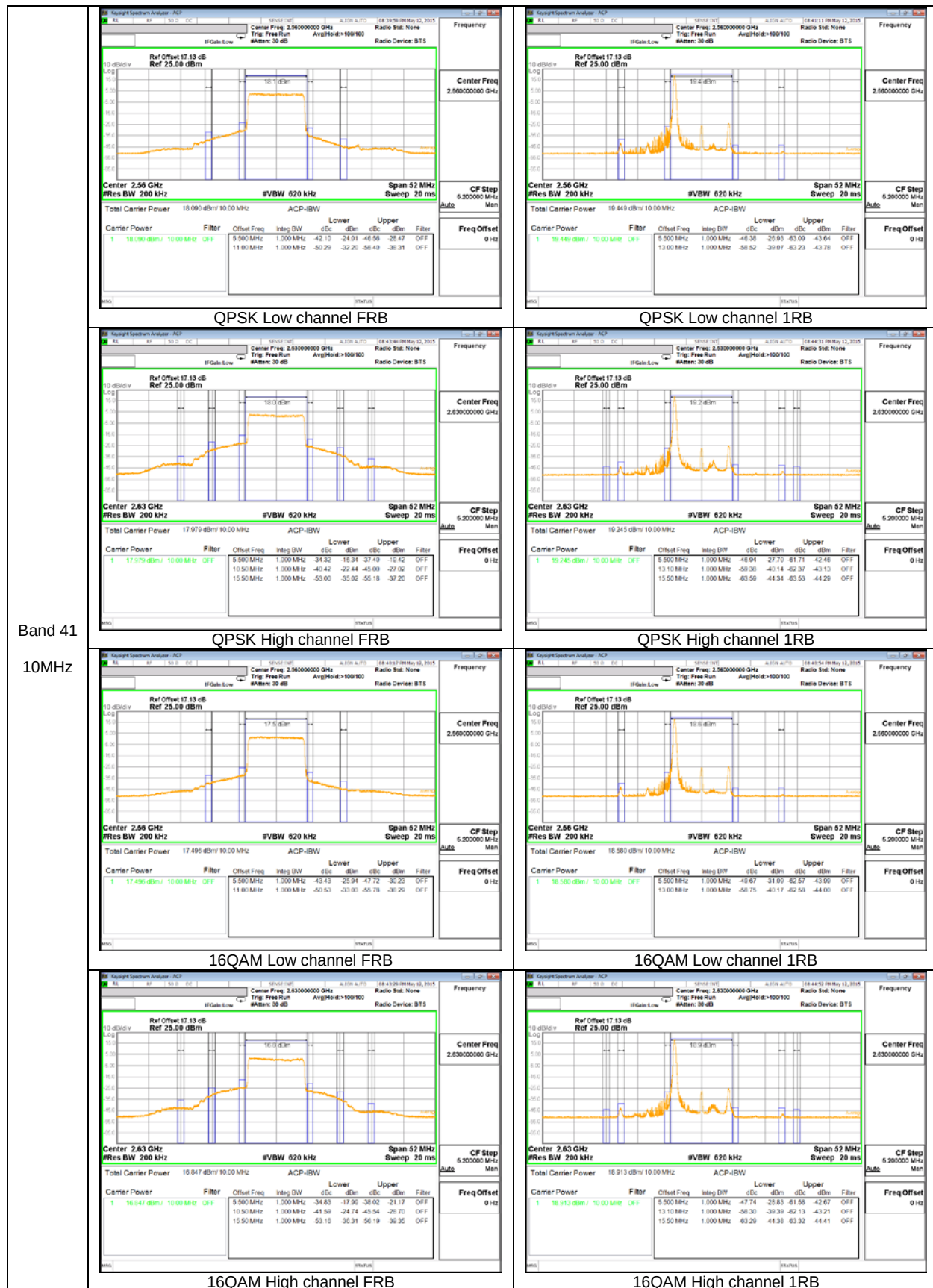


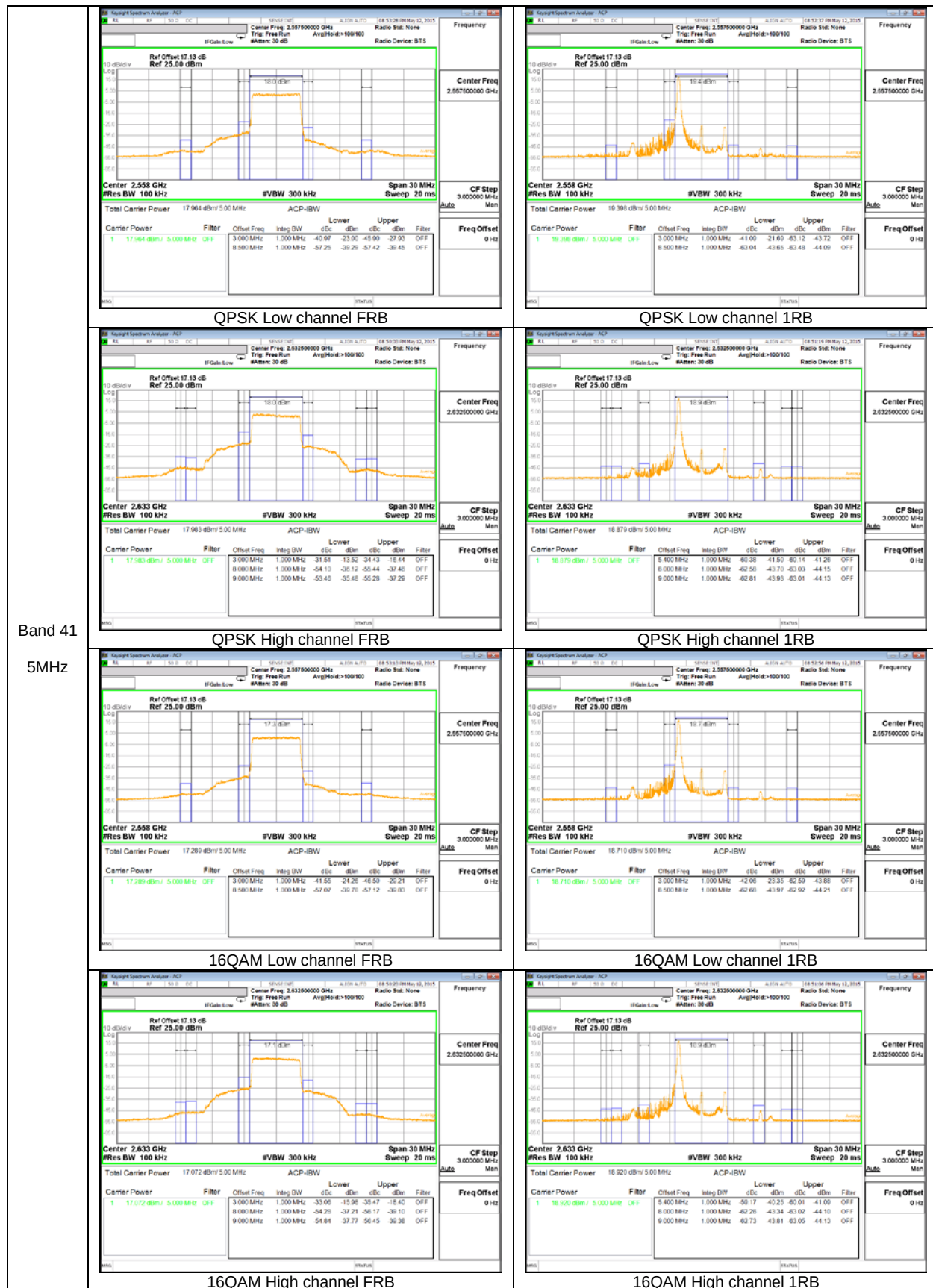
10.2.2. EMISSION MASK PLOTS

LTE Band 41









10.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53 (g)

LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic.

Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

RESULTS

10.3.1. OUT OF BAND EMISSIONS RESULT

GSM

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
GSM1900	GPRS	1850.2	-22.07	-13.00	9.07
		1880.0	-21.93		8.93
		1909.8	-22.10		9.10
	EGPRS	1850.2	-22.11		9.11
		1880.0	-22.44		9.44
		1909.8	-22.06		9.06

WCDMA

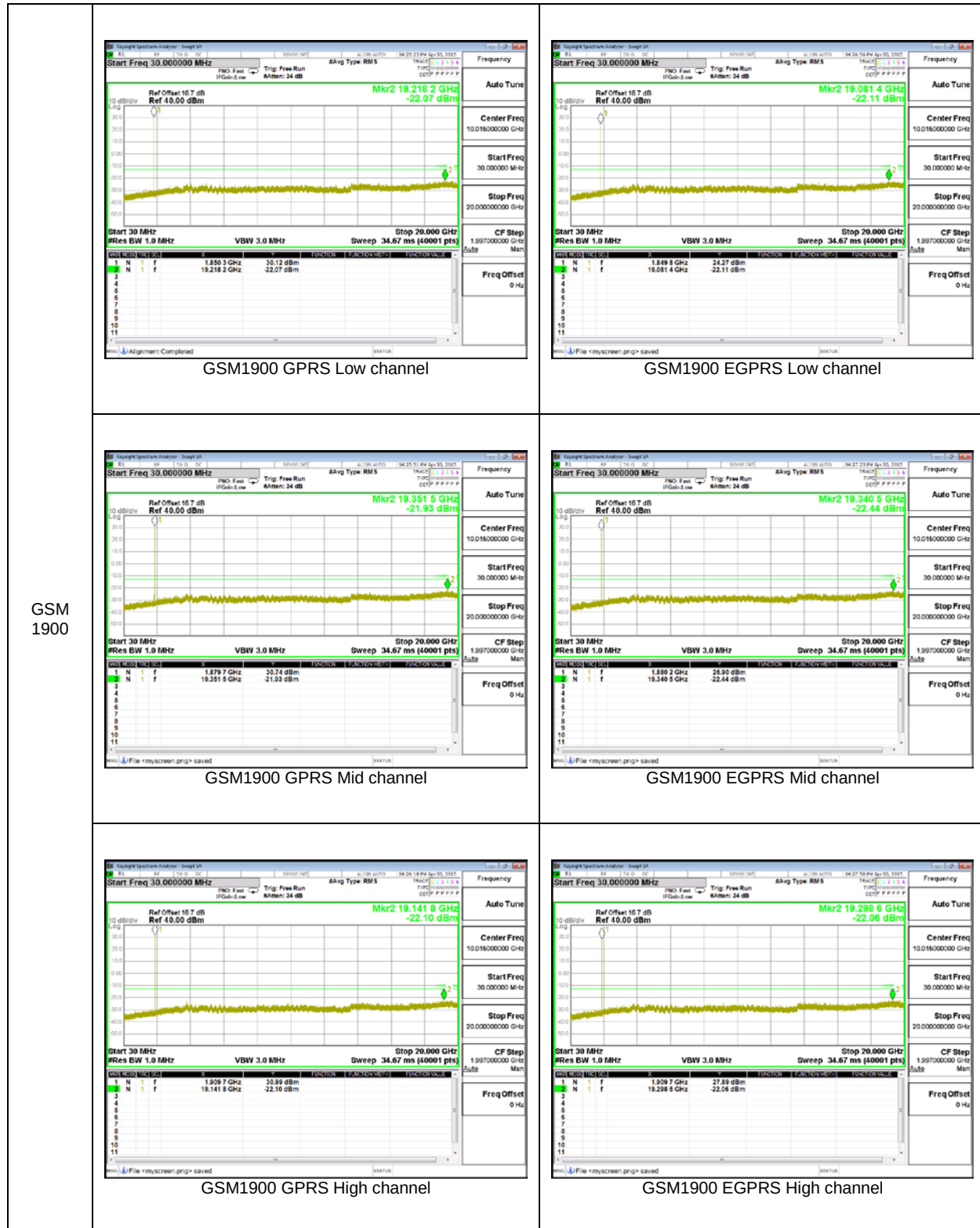
Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
Band 5	REL99	826.4	-33.35	-13.00	20.35
		836.6	-33.31		20.31
		846.6	-32.17		19.17
	HSDPA	826.4	-32.70		19.70
		836.6	-32.30		19.30
		846.6	-32.89		19.89
Band 2	REL99	1852.4	-32.23		19.23
		1880.0	-32.98		19.98
		1907.6	-32.75		19.75
	HSDPA	1852.4	-32.72		19.72
		1880.0	-33.16		20.16
		1907.6	-32.15		19.15

LTE 41

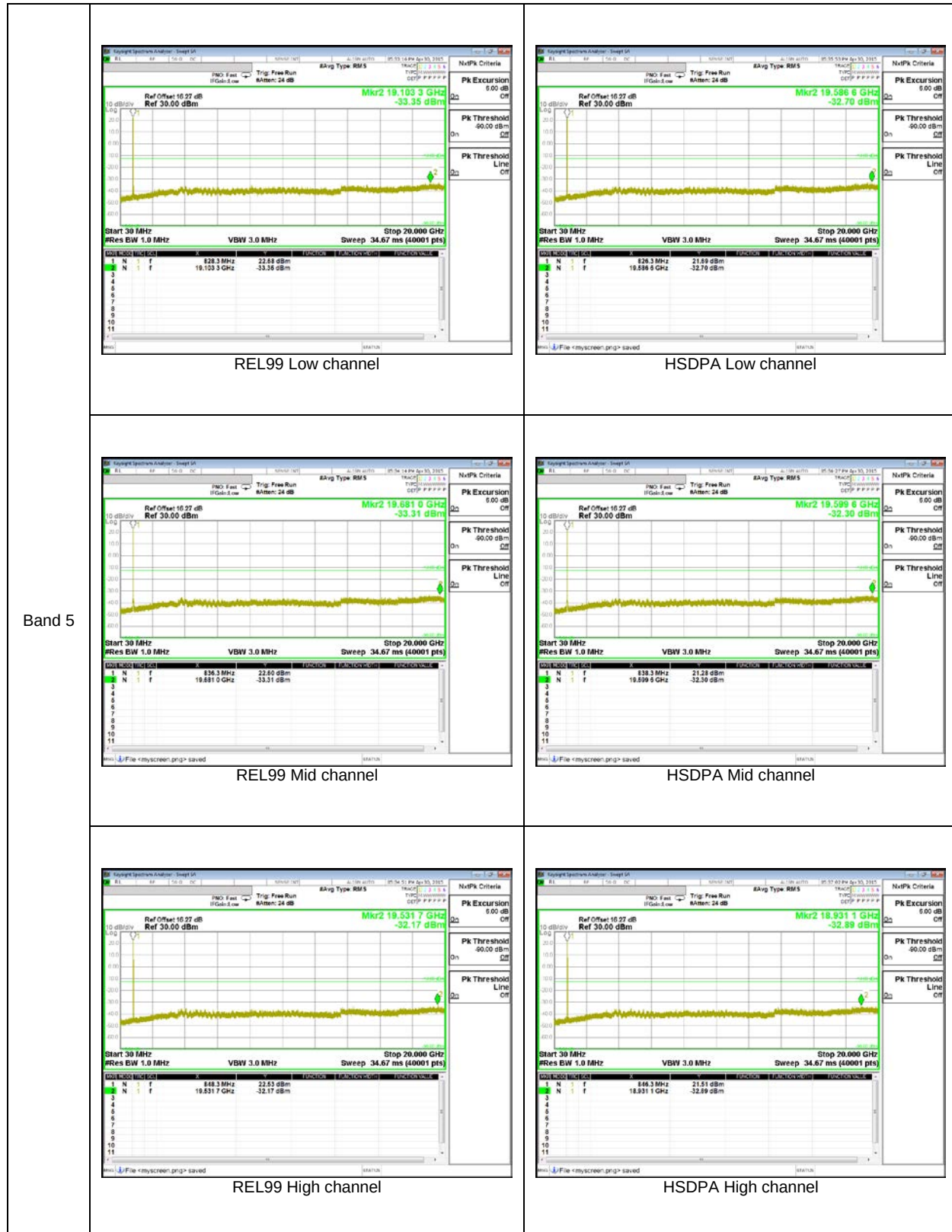
Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
20 MHz	QPSK	2565.0	-30.24	-25.00	5.24
		2593.0	-31.30		6.30
		2625.0	-30.67		5.67
	16QAM	2565.0	-30.25		5.25
		2593.0	-30.82		5.82
		2625.0	-31.22		6.22
15 MHz	QPSK	2562.5	-30.93		5.93
		2593.0	-30.21		5.21
		2627.5	-30.96		5.96
	16QAM	2562.5	-32.52		7.52
		2593.0	-32.95		7.95
		2627.5	-30.67		5.67
10 MHz	QPSK	2660.0	-31.14		6.14
		2593.0	-30.85		5.85
		2630.0	-30.79		5.79
	16QAM	2660.0	-33.37		8.37
		2593.0	-31.66		6.66
		2630.0	-30.82		5.82
5 MHz	QPSK	2557.5	-30.22		5.22
		2593.0	-30.68		5.68
		2632.5	-30.84		5.84
	16QAM	2557.5	-30.76		5.76
		2593.0	-31.57		6.57
		2632.5	-33.03		8.03

10.3.2. OUT OF BAND EMISSIONS PLOTS

GSM 1900



WCDMA Band 5



WCDMA Band 2



LTE Band 41









10.1. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

RESULTS

See the following pages.

10.1.1. FREQUENCY STABILITY RESULTS

WCDMA Band 5, Channel 4183, Frequency 836.6 MHz

Reference Frequency: WCDMA Band5 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)
3.80	50	836.59997748	0.049	2.5
3.80	40	836.59997698	0.049	2.5
3.80	30	836.59998387	0.041	2.5
3.80	20	836.60001810	0	2.5
3.80	10	836.59998483	0.040	2.5
3.80	0	836.59996677	0.061	2.5
3.80	-10	836.59998527	0.039	2.5
3.80	-20	836.59998509	0.039	2.5
3.80	-30	836.59997650	0.050	2.5

Reference Frequency: WCDMA Band5 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)
3.80	20	836.60001810	0	2.5
4.20	20	836.59996669	0.061	2.5
3.40	20	836.60002637	-0.010	2.5

WCDMA Band 2, Channel 9400, Frequency 1880.0 MHz

GSM 1900, Channel 661, Frequency 1880.0 MHz

Reference Frequency: WCDMA Band2 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)
3.80	50	1879.99997429	0.036	2.5
3.80	40	1879.99997508	0.036	2.5
3.80	30	1879.99998240	0.032	2.5
3.80	20	1880.00004239	0	2.5
3.80	10	1879.99998726	0.029	2.5
3.80	0	1879.99997572	0.035	2.5
3.80	-10	1880.00004708	-0.002	2.5
3.80	-20	1879.99998624	0.030	2.5
3.80	-30	1880.00004416	-0.001	2.5

Reference Frequency: WCDMA Band2 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)
3.80	20	1880.00004239	0	2.5
4.20	20	1880.00004257	0.000	2.5
3.40	20	1880.00002372	0.010	2.5

LTE Band 41, Channel 20620, Frequency 2593.0 MHz

Reference Frequency: LTE Band41 Mid Channel 2593 MHz @ 20°C Limit: ± 2.5 ppm = 6482.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	2593.00002877	-0.003	2.5
3.80	40	2593.00001918	0.001	2.5
3.80	30	2593.00003389	-0.005	2.5
3.80	20	2593.00002209	0	2.5
3.80	10	2593.00002174	0.000	2.5
3.80	0	2593.00002372	-0.001	2.5
3.80	-10	2593.00002541	-0.001	2.5
3.80	-20	2592.99997601	0.018	2.5
3.80	-30	2592.99996740	0.021	2.5

Reference Frequency: LTE Band41 Mid Channel 2593 MHz @ 20°C Limit: ± 2.5 ppm = 6482.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	2593.00002209	0	2.5
4.20	20	2593.00002702	-0.002	2.5
3.40	20	2593.00004611	-0.009	2.5

11. RADIATED TEST RESULTS

11.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS

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

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

27.50(h) - (2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.(LTE B417)

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

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17; MXA setting reference to 971168 D01 v02r02

For peak power measurement with a MXA:

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 MXA:

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

11.1.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
GSM1900	GPRS	512	1850.2	24.99	315.4
		661	1880.0	27.37	545.8
		810	1909.8	26.60	457.4
	EGPRS	512	1850.2	20.92	123.5
		661	1880.0	23.23	210.4
		810	1909.8	21.92	155.7

WCDMA

Band	Mode	Channel	f [MHz]	ERP / EIRP	
				[dBm]	[mW]
Band 5	REL99	4132	826.4	15.43	34.9
		4183	836.6	15.95	39.3
		4233	846.6	15.85	38.4
	HSDPA	4132	826.4	14.50	28.2
		4183	836.6	14.92	31.0
		4233	846.6	14.79	30.1
Band 2	REL99	9262	1852.4	17.30	53.7
		9400	1880.0	16.34	43.1
		9538	1907.6	17.53	56.7
	HSDPA	9262	1852.4	18.22	66.3
		9400	1880.0	18.36	68.5
		9538	1907.6	17.51	56.4

LTE Band 41

Band	BW [MHz]	Mode	RB/RB Size	f [MHz]	ERP / EIRP	
			Full RB		[dBm]	[mW]
Band 41	20	QPSK	1/0	2565.0	20.64	115.8
			1/0	2593.0	22.23	166.9
			1/0	2625.0	21.70	148.0
		16QAM	1/0	2565.0	20.64	115.8
			1/0	2593.0	20.19	104.4
			1/0	2625.0	21.26	133.8
	15	QPSK	1/0	2562.5	20.92	123.5
			1/0	2593.0	22.55	179.7
			1/0	2627.5	21.12	129.5
		16QAM	1/0	2562.5	20.70	117.4
			1/0	2593.0	19.61	91.3
			1/0	2627.5	20.72	118.1
	10	QPSK	1/0	2660.0	21.85	153.0
			1/0	2593.0	23.30	213.6
			1/0	2630.0	21.77	150.5
		16QAM	1/0	2660.0	19.46	88.3
			1/0	2593.0	21.31	135.1
			1/0	2630.0	21.32	135.6
	5	QPSK	1/0	2557.5	21.39	137.7
			1/0	2593.0	20.63	115.5
			1/0	2632.5	18.36	68.6
		16QAM	1/0	2557.5	20.97	125.0
			1/0	2593.0	21.73	148.8
			1/0	2632.5	22.06	160.8

11.1.2. ERP/EIRP DATA

GSM 1900

GSM GSM1900 GPRS	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 04-29-15 Test Engineer: Steven Kim Configuration: EUT ONLY, X Position Mode: GPRS 1900MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <table><tr><th>f GHz</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>12.1</td><td>V</td><td>1.60</td><td>9.12</td><td>19.62</td><td>33.0</td><td>-13.4</td></tr><tr><td>1850.20</td><td>17.5</td><td>H</td><td>1.60</td><td>9.12</td><td>24.99</td><td>33.0</td><td>-8.0</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>15.8</td><td>V</td><td>1.62</td><td>8.98</td><td>23.12</td><td>33.0</td><td>-9.9</td></tr><tr><td>1880.00</td><td>20.0</td><td>H</td><td>1.62</td><td>8.98</td><td>27.37</td><td>33.0</td><td>-5.6</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>10.9</td><td>V</td><td>1.63</td><td>8.83</td><td>18.10</td><td>33.0</td><td>-14.9</td></tr><tr><td>1909.80</td><td>19.4</td><td>H</td><td>1.63</td><td>8.83</td><td>26.60</td><td>33.0</td><td>-6.4</td></tr></table> Rev. 3.17.11									f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								1850.20	12.1	V	1.60	9.12	19.62	33.0	-13.4	1850.20	17.5	H	1.60	9.12	24.99	33.0	-8.0	Mid Ch								1880.00	15.8	V	1.62	8.98	23.12	33.0	-9.9	1880.00	20.0	H	1.62	8.98	27.37	33.0	-5.6	High Ch								1909.80	10.9	V	1.63	8.83	18.10	33.0	-14.9	1909.80	19.4	H	1.63	8.83	26.60	33.0	-6.4
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
	Low Ch																																																																																									
	1850.20	12.1	V	1.60	9.12	19.62	33.0	-13.4																																																																																		
	1850.20	17.5	H	1.60	9.12	24.99	33.0	-8.0																																																																																		
	Mid Ch																																																																																									
	1880.00	15.8	V	1.62	8.98	23.12	33.0	-9.9																																																																																		
	1880.00	20.0	H	1.62	8.98	27.37	33.0	-5.6																																																																																		
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	1909.80	10.9	V	1.63	8.83	18.10	33.0	-14.9																																																																																		
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GSM GSM1900 EGPRS	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 04-30-15 Test Engineer: Steven Kim Configuration: EUT ONLY, X Position Mode: EGPRS 1900MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <table><tr><th>f GHz</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>8.4</td><td>V</td><td>1.60</td><td>9.12</td><td>15.96</td><td>33.0</td><td>-17.0</td></tr><tr><td>1850.20</td><td>13.4</td><td>H</td><td>1.60</td><td>9.12</td><td>20.92</td><td>33.0</td><td>-12.1</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1880.00</td><td>7.8</td><td>V</td><td>1.62</td><td>8.98</td><td>15.12</td><td>33.0</td><td>-17.9</td></tr><tr><td>1880.00</td><td>15.9</td><td>H</td><td>1.62</td><td>8.98</td><td>23.23</td><td>33.0</td><td>-9.8</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>8.4</td><td>V</td><td>1.63</td><td>8.83</td><td>15.56</td><td>33.0</td><td>-17.4</td></tr><tr><td>1909.80</td><td>14.7</td><td>H</td><td>1.63</td><td>8.83</td><td>21.92</td><td>33.0</td><td>-11.1</td></tr></table> Rev. 3.17.11									f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch								1850.20	8.4	V	1.60	9.12	15.96	33.0	-17.0	1850.20	13.4	H	1.60	9.12	20.92	33.0	-12.1	Mid Ch								1880.00	7.8	V	1.62	8.98	15.12	33.0	-17.9	1880.00	15.9	H	1.62	8.98	23.23	33.0	-9.8	High Ch								1909.80	8.4	V	1.63	8.83	15.56	33.0	-17.4	1909.80	14.7	H	1.63	8.83	21.92	33.0	-11.1
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes																																																																																	
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	1909.80	8.4	V	1.63	8.83	15.56	33.0	-17.4																																																																																		
1909.80	14.7	H	1.63	8.83	21.92	33.0	-11.1																																																																																			

WCDMA Band 5

WCDMA Band 5 REL99	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 04-30-15 Test Engineer: Steven.Kim Configuration: EUT ONLY, Z Position Mode: Rel 99_850 MHz Test Equipment: Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. <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>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>826.40</td><td>18.04</td><td>V</td><td>1.1</td><td>-1.5</td><td>15.43</td><td>38.5</td><td>-23.0</td><td></td></tr><tr><td>826.40</td><td>3.79</td><td>H</td><td>1.1</td><td>-1.5</td><td>1.18</td><td>38.5</td><td>-37.3</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.60</td><td>18.44</td><td>V</td><td>1.1</td><td>-1.4</td><td>15.95</td><td>38.5</td><td>-22.5</td><td></td></tr><tr><td>836.60</td><td>4.69</td><td>H</td><td>1.1</td><td>-1.4</td><td>2.20</td><td>38.5</td><td>-36.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>846.60</td><td>18.23</td><td>V</td><td>1.1</td><td>-1.3</td><td>15.85</td><td>38.5</td><td>-22.6</td><td></td></tr><tr><td>846.60</td><td>5.66</td><td>H</td><td>1.1</td><td>-1.3</td><td>3.28</td><td>38.5</td><td>-35.2</td><td></td></tr></table> Rev. 3.17.11									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									826.40	18.04	V	1.1	-1.5	15.43	38.5	-23.0		826.40	3.79	H	1.1	-1.5	1.18	38.5	-37.3		Mid Ch									836.60	18.44	V	1.1	-1.4	15.95	38.5	-22.5		836.60	4.69	H	1.1	-1.4	2.20	38.5	-36.3		High Ch									846.60	18.23	V	1.1	-1.3	15.85	38.5	-22.6		846.60	5.66	H	1.1	-1.3	3.28	38.5	-35.2	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	826.40	18.04	V	1.1	-1.5	15.43	38.5	-23.0																																																																																											
	826.40	3.79	H	1.1	-1.5	1.18	38.5	-37.3																																																																																											
	Mid Ch																																																																																																		
	836.60	18.44	V	1.1	-1.4	15.95	38.5	-22.5																																																																																											
	836.60	4.69	H	1.1	-1.4	2.20	38.5	-36.3																																																																																											
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846.60	5.66	H	1.1	-1.3	3.28	38.5	-35.2																																																																																												
WCDMA Band 5 HSDPA	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 04-30-15 Test Engineer: Steven Kim Configuration: EUT ONLY, Z Position Mode: HSDPA_850 Mhz Test Equipment: Receiving: VULB9163-750, and 3m Chamber N-type Cable (Setup this one for testing EUT) Substitution: Dipole S/N: 00164753, 3m SMA Cable Warehouse. <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>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>826.40</td><td>17.11</td><td>V</td><td>1.1</td><td>-1.5</td><td>14.50</td><td>38.5</td><td>-24.0</td><td></td></tr><tr><td>826.40</td><td>2.74</td><td>H</td><td>1.1</td><td>-1.5</td><td>0.13</td><td>38.5</td><td>-38.3</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>836.60</td><td>17.41</td><td>V</td><td>1.1</td><td>-1.4</td><td>14.92</td><td>38.5</td><td>-23.5</td><td></td></tr><tr><td>836.60</td><td>3.66</td><td>H</td><td>1.1</td><td>-1.4</td><td>1.17</td><td>38.5</td><td>-37.3</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>846.60</td><td>17.17</td><td>V</td><td>1.1</td><td>-1.3</td><td>14.79</td><td>38.5</td><td>-23.7</td><td></td></tr><tr><td>846.60</td><td>4.53</td><td>H</td><td>1.1</td><td>-1.3</td><td>2.15</td><td>38.5</td><td>-36.3</td><td></td></tr></table> Rev. 3.17.11									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									826.40	17.11	V	1.1	-1.5	14.50	38.5	-24.0		826.40	2.74	H	1.1	-1.5	0.13	38.5	-38.3		Mid Ch									836.60	17.41	V	1.1	-1.4	14.92	38.5	-23.5		836.60	3.66	H	1.1	-1.4	1.17	38.5	-37.3		High Ch									846.60	17.17	V	1.1	-1.3	14.79	38.5	-23.7		846.60	4.53	H	1.1	-1.3	2.15	38.5	-36.3	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
	Low Ch																																																																																																		
	826.40	17.11	V	1.1	-1.5	14.50	38.5	-24.0																																																																																											
	826.40	2.74	H	1.1	-1.5	0.13	38.5	-38.3																																																																																											
	Mid Ch																																																																																																		
	836.60	17.41	V	1.1	-1.4	14.92	38.5	-23.5																																																																																											
	836.60	3.66	H	1.1	-1.4	1.17	38.5	-37.3																																																																																											
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	846.60	17.17	V	1.1	-1.3	14.79	38.5	-23.7																																																																																											
846.60	4.53	H	1.1	-1.3	2.15	38.5	-36.3																																																																																												

WCDMA Band 2

WCDMA Band 2 REL99	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 2015.04.29 Test Engineer: Steven.Kim Configuration: EUT ONLY, X Position Mode: REL99_1900 MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <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>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.40</td><td>3.58</td><td>V</td><td>1.60</td><td>9.12</td><td>11.10</td><td>33.0</td><td>-21.9</td><td></td></tr><tr><td>1852.40</td><td>9.78</td><td>H</td><td>1.60</td><td>9.12</td><td>17.30</td><td>33.0</td><td>-15.7</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>5.83</td><td>V</td><td>1.62</td><td>8.98</td><td>13.19</td><td>33.0</td><td>-19.8</td><td></td></tr><tr><td>1880.00</td><td>8.98</td><td>H</td><td>1.62</td><td>8.98</td><td>16.34</td><td>33.0</td><td>-16.7</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1907.60</td><td>8.90</td><td>V</td><td>1.63</td><td>8.83</td><td>16.10</td><td>33.0</td><td>-16.9</td><td></td></tr><tr><td>1907.60</td><td>10.33</td><td>H</td><td>1.63</td><td>8.83</td><td>17.53</td><td>33.0</td><td>-15.5</td><td></td></tr></table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									1852.40	3.58	V	1.60	9.12	11.10	33.0	-21.9		1852.40	9.78	H	1.60	9.12	17.30	33.0	-15.7		Mid Ch									1880.00	5.83	V	1.62	8.98	13.19	33.0	-19.8		1880.00	8.98	H	1.62	8.98	16.34	33.0	-16.7		High Ch									1907.60	8.90	V	1.63	8.83	16.10	33.0	-16.9		1907.60	10.33	H	1.63	8.83	17.53	33.0	-15.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
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	1852.40	3.58	V	1.60	9.12	11.10	33.0	-21.9																																																																																											
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	1880.00	5.83	V	1.62	8.98	13.19	33.0	-19.8																																																																																											
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	1907.60	8.90	V	1.63	8.83	16.10	33.0	-16.9																																																																																											
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WCDMA Band 2 HSDPA	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 04-30-15 Test Engineer: Steven Kim Configuration: EUT ONLY, X Position Mode: HSDPA_1900 MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <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>Margin (dB)</th><th>Notes</th></tr><tr><td colspan="9">Low Ch</td></tr><tr><td>1852.40</td><td>0.24</td><td>V</td><td>1.60</td><td>9.12</td><td>7.76</td><td>33.0</td><td>-25.2</td><td></td></tr><tr><td>1852.40</td><td>10.70</td><td>H</td><td>1.60</td><td>9.12</td><td>18.22</td><td>33.0</td><td>-14.8</td><td></td></tr><tr><td colspan="9">Mid Ch</td></tr><tr><td>1880.00</td><td>6.08</td><td>V</td><td>1.62</td><td>8.98</td><td>13.44</td><td>33.0</td><td>-19.6</td><td></td></tr><tr><td>1880.00</td><td>11.00</td><td>H</td><td>1.62</td><td>8.98</td><td>18.36</td><td>33.0</td><td>-14.6</td><td></td></tr><tr><td colspan="9">High Ch</td></tr><tr><td>1907.60</td><td>8.01</td><td>V</td><td>1.63</td><td>8.83</td><td>15.21</td><td>33.0</td><td>-17.8</td><td></td></tr><tr><td>1907.60</td><td>10.31</td><td>H</td><td>1.63</td><td>8.83</td><td>17.51</td><td>33.0</td><td>-15.5</td><td></td></tr></table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									1852.40	0.24	V	1.60	9.12	7.76	33.0	-25.2		1852.40	10.70	H	1.60	9.12	18.22	33.0	-14.8		Mid Ch									1880.00	6.08	V	1.62	8.98	13.44	33.0	-19.6		1880.00	11.00	H	1.62	8.98	18.36	33.0	-14.6		High Ch									1907.60	8.01	V	1.63	8.83	15.21	33.0	-17.8		1907.60	10.31	H	1.63	8.83	17.51	33.0	-15.5	
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																										
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	1852.40	10.70	H	1.60	9.12	18.22	33.0	-14.8																																																																																											
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	1880.00	6.08	V	1.62	8.98	13.44	33.0	-19.6																																																																																											
	1880.00	11.00	H	1.62	8.98	18.36	33.0	-14.6																																																																																											
	High Ch																																																																																																		
	1907.60	8.01	V	1.63	8.83	15.21	33.0	-17.8																																																																																											
1907.60	10.31	H	1.63	8.83	17.51	33.0	-15.5																																																																																												

LTE Band 41

LTE Band 41 20MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1								
	Company: Samsung Project #: 15K20599 Date: 05-08-15 Test Engineer: Steven Kim Configuration: EUT / X-Position Mode: LTE Band 41, QPSK, 20MHz								
	Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	2565.00	9.26	V	1.9	10.3	17.70	33.0	-15.3	
	2565.00	12.20	H	1.9	10.3	20.64	33.0	-12.4	
	Mid Ch								
	2593.00	3.39	V	1.9	10.3	11.82	33.0	-21.2	
	2593.00	13.80	H	1.9	10.3	22.23	33.0	-10.8	
	High Ch								
	2645.00	3.84	V	1.9	10.3	12.25	33.0	-20.7	
	2645.00	13.29	H	1.9	10.3	21.70	33.0	-11.3	
	Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm								
LTE Band 41 20MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1								
	Company: Samsung Project #: 15K20599 Date: 05-08-15 Test Engineer: Steven Kim Configuration: EUT / X-Position Mode: LTE Band 41 16QAM, 10MHz								
	Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	2560.00	8.72	V	1.9	10.3	17.16	33.0	-15.8	
	2560.00	11.02	H	1.9	10.3	19.46	33.0	-13.5	
	Mid Ch								
	2593.00	10.81	V	1.9	10.3	19.24	33.0	-13.8	
	2593.00	12.88	H	1.9	10.3	21.31	33.0	-11.7	
	High Ch								
	2650.00	7.29	V	1.9	10.3	15.70	33.0	-17.3	
	2650.00	12.91	H	1.9	10.3	21.32	33.0	-11.7	
	Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm								

LTE Band 41 15MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 05-08-15 Test Engineer: Steven Kim Configuration: EUT / X-position Mode: LTE Band 41, QPSK, 15MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <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>Margin (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>2562.50</td><td>8.81</td><td>V</td><td>1.9</td><td>10.3</td><td>17.25</td><td>33.0</td><td>-15.8</td></tr><tr><td>2562.50</td><td>12.48</td><td>H</td><td>1.9</td><td>10.3</td><td>20.92</td><td>33.0</td><td>-12.1</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2593.00</td><td>11.30</td><td>V</td><td>1.9</td><td>10.3</td><td>19.73</td><td>33.0</td><td>-13.3</td></tr><tr><td>2593.00</td><td>14.12</td><td>H</td><td>1.9</td><td>10.3</td><td>22.55</td><td>33.0</td><td>-10.5</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2647.50</td><td>-0.03</td><td>V</td><td>1.9</td><td>10.3</td><td>8.38</td><td>33.0</td><td>-24.6</td></tr><tr><td>2647.50</td><td>12.71</td><td>H</td><td>1.9</td><td>10.3</td><td>21.12</td><td>33.0</td><td>-11.9</td></tr></table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch								2562.50	8.81	V	1.9	10.3	17.25	33.0	-15.8	2562.50	12.48	H	1.9	10.3	20.92	33.0	-12.1	Mid Ch								2593.00	11.30	V	1.9	10.3	19.73	33.0	-13.3	2593.00	14.12	H	1.9	10.3	22.55	33.0	-10.5	High Ch								2647.50	-0.03	V	1.9	10.3	8.38	33.0	-24.6	2647.50	12.71	H	1.9	10.3	21.12	33.0	-11.9
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																	
	Low Ch																																																																																									
	2562.50	8.81	V	1.9	10.3	17.25	33.0	-15.8																																																																																		
	2562.50	12.48	H	1.9	10.3	20.92	33.0	-12.1																																																																																		
	Mid Ch																																																																																									
	2593.00	11.30	V	1.9	10.3	19.73	33.0	-13.3																																																																																		
	2593.00	14.12	H	1.9	10.3	22.55	33.0	-10.5																																																																																		
	High Ch																																																																																									
	2647.50	-0.03	V	1.9	10.3	8.38	33.0	-24.6																																																																																		
2647.50	12.71	H	1.9	10.3	21.12	33.0	-11.9																																																																																			
LTE Band 41 15MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 05-08-15 Test Engineer: Steven Kim Configuration: EUT / X-Position Mode: LTE Band 41, 16QAM, 15MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <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>Margin (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>2562.50</td><td>7.32</td><td>V</td><td>1.9</td><td>10.3</td><td>15.76</td><td>33.0</td><td>-17.2</td></tr><tr><td>2562.50</td><td>12.26</td><td>H</td><td>1.9</td><td>10.3</td><td>20.70</td><td>33.0</td><td>-12.3</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2593.00</td><td>10.32</td><td>V</td><td>1.9</td><td>10.3</td><td>18.75</td><td>33.0</td><td>-14.3</td></tr><tr><td>2593.00</td><td>11.18</td><td>H</td><td>1.9</td><td>10.3</td><td>19.61</td><td>33.0</td><td>-13.4</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2647.50</td><td>9.93</td><td>V</td><td>1.9</td><td>10.3</td><td>18.34</td><td>33.0</td><td>-14.7</td></tr><tr><td>2647.50</td><td>12.31</td><td>H</td><td>1.9</td><td>10.3</td><td>20.72</td><td>33.0</td><td>-12.3</td></tr></table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch								2562.50	7.32	V	1.9	10.3	15.76	33.0	-17.2	2562.50	12.26	H	1.9	10.3	20.70	33.0	-12.3	Mid Ch								2593.00	10.32	V	1.9	10.3	18.75	33.0	-14.3	2593.00	11.18	H	1.9	10.3	19.61	33.0	-13.4	High Ch								2647.50	9.93	V	1.9	10.3	18.34	33.0	-14.7	2647.50	12.31	H	1.9	10.3	20.72	33.0	-12.3
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																	
	Low Ch																																																																																									
	2562.50	7.32	V	1.9	10.3	15.76	33.0	-17.2																																																																																		
	2562.50	12.26	H	1.9	10.3	20.70	33.0	-12.3																																																																																		
	Mid Ch																																																																																									
	2593.00	10.32	V	1.9	10.3	18.75	33.0	-14.3																																																																																		
	2593.00	11.18	H	1.9	10.3	19.61	33.0	-13.4																																																																																		
	High Ch																																																																																									
	2647.50	9.93	V	1.9	10.3	18.34	33.0	-14.7																																																																																		
2647.50	12.31	H	1.9	10.3	20.72	33.0	-12.3																																																																																			

LTE Band 41 10MHz QPSK	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 05-08-15 Test Engineer: Steven Kim Configuration: EUT / X-Position Mode: LTE Band 41, QPSK, 10MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <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>Margin (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>2560.00</td><td>1.79</td><td>V</td><td>1.9</td><td>10.3</td><td>10.23</td><td>33.0</td><td>-22.8</td></tr><tr><td>2560.00</td><td>13.41</td><td>H</td><td>1.9</td><td>10.3</td><td>21.85</td><td>33.0</td><td>-11.2</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2593.00</td><td>5.41</td><td>V</td><td>1.9</td><td>10.3</td><td>13.84</td><td>33.0</td><td>-19.2</td></tr><tr><td>2593.00</td><td>14.87</td><td>H</td><td>1.9</td><td>10.3</td><td>23.30</td><td>33.0</td><td>-9.7</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2650.00</td><td>11.54</td><td>V</td><td>1.9</td><td>10.3</td><td>19.95</td><td>33.0</td><td>-13.0</td></tr><tr><td>2650.00</td><td>13.36</td><td>H</td><td>1.9</td><td>10.3</td><td>21.77</td><td>33.0</td><td>-11.2</td></tr></table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch								2560.00	1.79	V	1.9	10.3	10.23	33.0	-22.8	2560.00	13.41	H	1.9	10.3	21.85	33.0	-11.2	Mid Ch								2593.00	5.41	V	1.9	10.3	13.84	33.0	-19.2	2593.00	14.87	H	1.9	10.3	23.30	33.0	-9.7	High Ch								2650.00	11.54	V	1.9	10.3	19.95	33.0	-13.0	2650.00	13.36	H	1.9	10.3	21.77	33.0	-11.2
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																	
	Low Ch																																																																																									
	2560.00	1.79	V	1.9	10.3	10.23	33.0	-22.8																																																																																		
	2560.00	13.41	H	1.9	10.3	21.85	33.0	-11.2																																																																																		
	Mid Ch																																																																																									
	2593.00	5.41	V	1.9	10.3	13.84	33.0	-19.2																																																																																		
	2593.00	14.87	H	1.9	10.3	23.30	33.0	-9.7																																																																																		
	High Ch																																																																																									
	2650.00	11.54	V	1.9	10.3	19.95	33.0	-13.0																																																																																		
2650.00	13.36	H	1.9	10.3	21.77	33.0	-11.2																																																																																			
LTE Band 41 10MHz 16QAM	High Frequency Substitution Measurement UL Korea, Ltd. Suwon Laboratory Chamber 1 Company: Samsung Project #: 15K20599 Date: 05-08-15 Test Engineer: Steven Kim Configuration: EUT / X-Position Mode: LTE Band 41 16QAM, 10MHz Test Equipment: Receiving: 3117, and Chamber 1 SMA Cables Substitution: 3115 Substitution, 3m SMA Cable Warehouse <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>Margin (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>2560.00</td><td>8.72</td><td>V</td><td>1.9</td><td>10.3</td><td>17.16</td><td>33.0</td><td>-15.8</td></tr><tr><td>2560.00</td><td>11.02</td><td>H</td><td>1.9</td><td>10.3</td><td>19.46</td><td>33.0</td><td>-13.5</td></tr><tr><td>Mid Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2593.00</td><td>10.81</td><td>V</td><td>1.9</td><td>10.3</td><td>19.24</td><td>33.0</td><td>-13.8</td></tr><tr><td>2593.00</td><td>12.88</td><td>H</td><td>1.9</td><td>10.3</td><td>21.31</td><td>33.0</td><td>-11.7</td></tr><tr><td>High Ch</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2650.00</td><td>7.29</td><td>V</td><td>1.9</td><td>10.3</td><td>15.70</td><td>33.0</td><td>-17.3</td></tr><tr><td>2650.00</td><td>12.91</td><td>H</td><td>1.9</td><td>10.3</td><td>21.32</td><td>33.0</td><td>-11.7</td></tr></table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch								2560.00	8.72	V	1.9	10.3	17.16	33.0	-15.8	2560.00	11.02	H	1.9	10.3	19.46	33.0	-13.5	Mid Ch								2593.00	10.81	V	1.9	10.3	19.24	33.0	-13.8	2593.00	12.88	H	1.9	10.3	21.31	33.0	-11.7	High Ch								2650.00	7.29	V	1.9	10.3	15.70	33.0	-17.3	2650.00	12.91	H	1.9	10.3	21.32	33.0	-11.7
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																	
	Low Ch																																																																																									
	2560.00	8.72	V	1.9	10.3	17.16	33.0	-15.8																																																																																		
	2560.00	11.02	H	1.9	10.3	19.46	33.0	-13.5																																																																																		
	Mid Ch																																																																																									
	2593.00	10.81	V	1.9	10.3	19.24	33.0	-13.8																																																																																		
	2593.00	12.88	H	1.9	10.3	21.31	33.0	-11.7																																																																																		
	High Ch																																																																																									
	2650.00	7.29	V	1.9	10.3	15.70	33.0	-17.3																																																																																		
2650.00	12.91	H	1.9	10.3	21.32	33.0	-11.7																																																																																			

LTE
Band 41
5 MHz
QPSK

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 1

Company: Samsung
Project #: 15K20599
Date: 05-08-15
Test Engineer: Steven Kim
Configuration: EUT / X-Position
Mode: LTE Band 41, QPSK , 5MHz

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2552.50	-3.45	V	1.9	10.3	4.99	33.0	-28.0	
2552.50	12.95	H	1.9	10.3	21.39	33.0	-11.6	
Mid Ch								
2593.00	5.61	V	1.9	10.3	14.04	33.0	-19.0	
2593.00	12.20	H	1.9	10.3	20.63	33.0	-12.4	
High Ch								
2652.50	-0.95	V	1.9	10.3	7.46	33.0	-25.5	
2652.50	9.95	H	1.9	10.3	18.36	33.0	-14.6	

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

LTE
Band 41
5 MHz
16QAM

High Frequency Substitution Measurement
UL Korea, Ltd. Suwon Laboratory Chamber 1

Company: Samsung
Project #: 15K20599
Date: 05-08-15
Test Engineer: Steven Kim
Configuration: EUT / X-Position
Mode: LTE Band 41 16QAM, 5MHz

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
2552.50	6.18	V	1.9	10.3	14.62	33.0	-18.4	
2552.50	12.53	H	1.9	10.3	20.97	33.0	-12.0	
Mid Ch								
2593.00	6.55	V	1.9	10.3	14.98	33.0	-18.0	
2593.00	13.30	H	1.9	10.3	21.73	33.0	-11.3	
High Ch								
2652.50	10.33	V	1.9	10.3	18.74	33.0	-14.3	
2652.50	13.65	H	1.9	10.3	22.06	33.0	-10.9	

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

11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53

LIMIT

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

Part 27.53(g) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

RESULTS

11.2.1. SPURIOUS RADIATION PLOTS

GSM 1900

GSM GSM1900 GPRS	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement																																																																																																																																																																																																																																				
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3.8196	-8.2	V	3.0	39.0	1.0	-46.2	-13.0	-33.2																																																																																																																																																																																																																													
5.7294	-5.8	V	3.0	39.9	1.0	-44.7	-13.0	-31.7																																																																																																																																																																																																																													
7.6392	-10.8	V	3.0	39.1	1.0	-48.9	-13.0	-35.9																																																																																																																																																																																																																													
3.8196	-13.5	H	3.0	39.0	1.0	-51.5	-13.0	-38.5																																																																																																																																																																																																																													
5.7294	-3.4	H	3.0	39.9	1.0	-42.3	-13.0	-29.3																																																																																																																																																																																																																													
7.6392	-11.4	H	3.0	39.1	1.0	-49.5	-13.0	-36.5																																																																																																																																																																																																																													
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.																																																																																																																																																																																																																																					

WCDMA Band 5

WCDMA

Band 5

REL99

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

15K20599

05-08-15

Steven Kim

EUT / AC Adapter / Earphone / Z Position

Tx, REL99,850MHz

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-11.6	V	3.0	40.2	1.0	-50.8	-13.0	-37.8	
2.4790	-20.0	V	3.0	40.1	1.0	-59.1	-13.0	-46.1	
3.3056	-23.0	V	3.0	39.6	1.0	-61.6	-13.0	-48.6	
1.6520	-14.9	H	3.0	40.2	1.0	-54.1	-13.0	-41.1	
2.4790	-20.7	H	3.0	40.1	1.0	-59.8	-13.0	-46.8	
3.3056	-23.3	H	3.0	39.6	1.0	-61.9	-13.0	-48.9	
Mid Ch, 836.6MHz									
1.6732	-10.4	V	3.0	40.2	1.0	-49.6	-13.0	-36.6	
2.5098	-17.1	V	3.0	40.1	1.0	-56.2	-13.0	-43.2	
3.3464	-21.7	V	3.0	39.6	1.0	-60.2	-13.0	-47.2	
1.6732	-14.7	H	3.0	40.2	1.0	-53.9	-13.0	-40.9	
2.5098	-19.4	H	3.0	40.1	1.0	-58.5	-13.0	-45.5	
3.3464	-21.9	H	3.0	39.6	1.0	-60.5	-13.0	-47.5	
High Ch, 846.6MHz									
1.6932	-9.3	V	3.0	40.2	1.0	-48.4	-13.0	-35.4	
2.5390	-20.1	V	3.0	40.1	1.0	-59.2	-13.0	-46.2	
3.3860	-21.5	V	3.0	39.5	1.0	-60.0	-13.0	-47.0	
1.6932	-17.6	H	3.0	40.2	1.0	-56.8	-13.0	-43.8	
2.5390	-21.3	H	3.0	40.1	1.0	-60.3	-13.0	-47.3	
3.3860	-21.9	H	3.0	39.5	1.0	-60.4	-13.0	-47.4	

Rev. 03.03.09

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

WCDMA

Band 5

HSDPA

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

15K20599

05-08-15

Steven Kim

EUT / AC Adapter / Earphone / Z Position

Tx, HSDPA,850MHz

Chamber

Pre-amplifier

Filter

Limit

Chamber 1

AFS42

Filter 1

Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.40MHz									
1.6520	-15.6	V	3.0	40.2	1.0	-54.8	-13.0	-41.8	
2.4790	-20.2	V	3.0	40.1	1.0	-59.3	-13.0	-46.3	
3.3056	-23.2	V	3.0	39.6	1.0	-61.8	-13.0	-48.8	
1.6520	-21.6	H	3.0	40.2	1.0	-60.7	-13.0	-47.7	
2.4790	-20.8	H	3.0	40.1	1.0	-59.8	-13.0	-46.8	
3.3056	-23.2	H	3.0	39.6	1.0	-61.8	-13.0	-48.8	
Mid Ch, 836.6MHz									
1.6732	-10.5	V	3.0	40.2	1.0	-49.7	-13.0	-36.7	
2.5098	-20.8	V	3.0	40.1	1.0	-59.9	-13.0	-46.9	
3.3464	-22.0	V	3.0	39.6	1.0	-60.5	-13.0	-47.5	
1.6732	-14.3	H	3.0	40.2	1.0	-53.5	-13.0	-40.5	
2.5098	-21.6	H	3.0	40.1	1.0	-60.7	-13.0	-47.7	
3.3464	-22.1	H	3.0	39.6	1.0	-60.7	-13.0	-47.7	
High Ch, 846.6MHz									
1.6932	-9.1	V	3.0	40.2	1.0	-48.3	-13.0	-35.3	
2.5390	-20.5	V	3.0	40.1	1.0	-59.6	-13.0	-46.6	
3.3860	-21.6	V	3.0	39.5	1.0	-60.1	-13.0	-47.1	
1.6932	-19.0	H	3.0	40.2	1.0	-58.2	-13.0	-45.2	
2.5390	-21.1	H	3.0	40.1	1.0	-60.2	-13.0	-47.2	
3.3860	-21.9	H	3.0	39.5	1.0	-60.4	-13.0	-47.4	

Rev. 03.03.09

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

WCDMA Band 2

WCDMA Band 2 REL99	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 15K20599 Date: 04-30-15 Test Engineer: Steven Kim Configuration: EUT / AC Adapter / Earphone / X Position Mode: Tx, REL99,1900MHz Chamber Pre-amplifier Filter Limit Chamber 1 AFS42 Filter 1 Part 24									
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz										
	3.7050	-5.9	V	3.0	39.2	1.0	-44.0	-13.0	-31.0	
	5.5570	-10.3	V	3.0	40.0	1.0	-49.3	-13.0	-36.3	
	7.4090	-10.4	V	3.0	39.2	1.0	-48.5	-13.0	-35.5	
	3.7050	-6.0	H	3.0	39.2	1.0	-44.2	-13.0	-31.2	
	5.5570	-10.3	H	3.0	40.0	1.0	-49.3	-13.0	-36.3	
	7.4090	-10.1	H	3.0	39.2	1.0	-48.2	-13.0	-35.2	
Mid Ch, 1880MHz										
	3.7600	-6.6	V	3.0	39.1	1.0	-44.7	-13.0	-31.7	
	5.6400	-13.3	V	3.0	39.9	1.0	-52.2	-13.0	-39.2	
	7.5200	-10.5	V	3.0	39.1	1.0	-48.7	-13.0	-35.7	
	3.7600	-5.3	H	3.0	39.1	1.0	-43.4	-13.0	-30.4	
	5.6400	-13.6	H	3.0	39.9	1.0	-52.5	-13.0	-39.5	
	7.5200	-9.8	H	3.0	39.1	1.0	-48.0	-13.0	-35.0	
High Ch, 1907.6MHz										
	3.8150	-4.5	V	3.0	39.0	1.0	-42.5	-13.0	-29.5	
	5.7230	-12.1	V	3.0	39.9	1.0	-51.0	-13.0	-38.0	
	7.6300	-10.2	V	3.0	39.1	1.0	-48.3	-13.0	-35.3	
	3.8150	-4.0	H	3.0	39.0	1.0	-42.0	-13.0	-29.0	
	5.7230	-12.5	H	3.0	39.9	1.0	-51.4	-13.0	-38.4	
	7.6300	-9.7	H	3.0	39.1	1.0	-47.9	-13.0	-34.9	
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										
WCDMA Band 2 HSDPA	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 15K20599 Date: 04-30-15 Test Engineer: Steven Kim Configuration: EUT / AC Adapter / Earphone / X Position Mode: Tx, HSDPA,1900MHz Chamber Pre-amplifier Filter Limit Chamber 1 AFS42 Filter 1 Part 24									
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz										
	3.7050	-6.9	V	3.0	39.2	1.0	-45.1	-13.0	-32.1	
	5.5570	-11.7	V	3.0	40.0	1.0	-50.7	-13.0	-37.7	
	7.4090	-10.5	V	3.0	39.2	1.0	-48.7	-13.0	-35.7	
	3.7050	-7.5	H	3.0	39.2	1.0	-45.7	-13.0	-32.7	
	5.5570	-11.6	H	3.0	40.0	1.0	-50.6	-13.0	-37.6	
	7.4090	-10.0	H	3.0	39.2	1.0	-48.2	-13.0	-35.2	
Mid Ch, 1880MHz										
	3.7600	-7.6	V	3.0	39.1	1.0	-45.7	-13.0	-32.7	
	5.6400	-13.5	V	3.0	39.9	1.0	-52.5	-13.0	-39.5	
	7.5200	-10.2	V	3.0	39.1	1.0	-48.4	-13.0	-35.4	
	3.7600	-6.6	H	3.0	39.1	1.0	-44.7	-13.0	-31.7	
	5.6400	-13.7	H	3.0	39.9	1.0	-52.6	-13.0	-39.6	
	7.5200	-10.0	H	3.0	39.1	1.0	-48.2	-13.0	-35.2	
High Ch, 1907.6MHz										
	3.8150	-5.8	V	3.0	39.0	1.0	-43.9	-13.0	-30.9	
	5.7230	-12.9	V	3.0	39.9	1.0	-51.7	-13.0	-38.7	
	7.6300	-10.1	V	3.0	39.1	1.0	-48.2	-13.0	-35.2	
	3.8150	-5.3	H	3.0	39.0	1.0	-43.3	-13.0	-30.3	
	5.7230	-12.9	H	3.0	39.9	1.0	-51.8	-13.0	-38.8	
	7.6300	-9.9	H	3.0	39.1	1.0	-48.0	-13.0	-35.0	
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

LTE Band 41

LTE Band 41 20MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 15K20599 Date: 05-10-15 Test Engineer: Steven.Kim Configuration: EUT / AC Adapter / Ear Phone / X-Position Mode: TX, LTE BAND 41, 20MHz BW, QPSK									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch. (2565 MHz)									
	5.1300	-4.7	V	3.0	40.0	1.0	-43.7	-25.0	-18.7	
	7.6950	-10.1	V	3.0	39.1	1.0	-48.2	-25.0	-23.2	
	10.2600	4.4	V	3.0	38.5	1.0	-33.1	-25.0	-8.1	
	5.1300	-19.9	H	3.0	40.0	1.0	-58.9	-25.0	-33.9	
	7.6950	-13.7	H	3.0	39.1	1.0	-51.8	-25.0	-26.8	
	10.2600	-9.9	H	3.0	38.5	1.0	-47.3	-25.0	-22.3	
	Mid Ch. (2593 MHz)									
	5.1860	1.3	V	3.0	40.1	1.0	-37.8	-25.0	-12.8	
	7.7790	-13.2	V	3.0	39.1	1.0	-51.2	-25.0	-26.2	
	10.3720	3.3	V	3.0	38.6	1.0	-34.3	-25.0	-9.3	
	5.1860	1.5	H	3.0	40.1	1.0	-37.6	-25.0	-12.6	
	7.7790	-12.5	H	3.0	39.1	1.0	-50.5	-25.0	-25.5	
	10.3720	-11.4	H	3.0	38.6	1.0	-49.0	-25.0	-24.0	
	High Ch. (2625 MHz)									
	5.2500	-8.4	V	3.0	40.1	1.0	-47.5	-25.0	-22.5	
	7.8750	-12.7	V	3.0	39.0	1.0	-50.7	-25.0	-25.7	
	10.5000	-0.6	V	3.0	38.7	1.0	-38.3	-25.0	-13.3	
	5.2500	-1.2	H	3.0	40.1	1.0	-40.3	-25.0	-15.3	
	7.8750	-4.5	H	3.0	39.0	1.0	-42.5	-25.0	-17.5	
	10.5000	-5.2	H	3.0	38.7	1.0	-42.9	-25.0	-17.9	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									
LTE Band 41 20MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement Company: Samsung Project #: 15K20599 Date: 05-10-15 Test Engineer: Steven.Kim Configuration: EUT / AC Adapter / Ear Phone / X-Position Mode: TX, LTE BAND 41, 20MHz BW, 16QAM									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch. (2565 MHz)									
	5.1300	-5.2	V	3.0	40.0	1.0	-44.2	-25.0	-19.2	
	7.6950	-11.2	V	3.0	39.1	1.0	-49.3	-25.0	-24.3	
	10.2600	3.8	V	3.0	38.5	1.0	-33.6	-25.0	-8.6	
	5.1300	-20.2	H	3.0	40.0	1.0	-59.2	-25.0	-34.2	
	7.6950	-15.1	H	3.0	39.1	1.0	-53.2	-25.0	-28.2	
	10.2600	-11.2	H	3.0	38.5	1.0	-48.7	-25.0	-23.7	
	Mid Ch. (2593 MHz)									
	5.1860	0.7	V	3.0	40.1	1.0	-38.4	-25.0	-13.4	
	7.7790	-13.6	V	3.0	39.1	1.0	-51.6	-25.0	-26.6	
	10.3720	2.1	V	3.0	38.6	1.0	-35.5	-25.0	-10.5	
	5.1860	0.6	H	3.0	40.1	1.0	-38.5	-25.0	-13.5	
	7.7790	-13.3	H	3.0	39.1	1.0	-51.3	-25.0	-26.3	
	10.3720	-13.2	H	3.0	38.6	1.0	-50.8	-25.0	-25.8	
	High Ch. (2625 MHz)									
	5.2500	-9.0	V	3.0	40.1	1.0	-48.1	-25.0	-23.1	
	7.8750	-13.4	V	3.0	39.0	1.0	-51.4	-25.0	-26.4	
	10.5000	-1.5	V	3.0	38.7	1.0	-39.2	-25.0	-14.2	
	5.2500	-1.9	H	3.0	40.1	1.0	-41.0	-25.0	-16.0	
	7.8750	-4.1	H	3.0	39.0	1.0	-42.1	-25.0	-17.1	
	10.5000	-6.2	H	3.0	38.7	1.0	-43.9	-25.0	-18.9	
	Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

LTE Band 41 15MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 15K20599									
	Date: 05-10-15									
	Test Engineer: Steven.Kim									
	Configuration: EUT / AC Adapter / Ear Phone / X-Position									
	Mode: TX, LTE BAND 41, 15MHz BW,QPSK									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (2562.5 MHz)									
	5.1250	-7.4	V	3.0	40.0	1.0	-46.4	-25.0	-21.4	
	7.6875	-13.2	V	3.0	39.1	1.0	-51.3	-25.0	-26.3	
	10.2500	2.8	V	3.0	38.5	1.0	-34.6	-25.0	-9.6	
	5.1250	-7.5	H	3.0	40.0	1.0	-46.5	-25.0	-21.5	
	7.6875	-12.5	H	3.0	39.1	1.0	-50.6	-25.0	-25.6	
	10.2500	-3.6	H	3.0	38.5	1.0	-41.1	-25.0	-16.1	
	Mid Ch, (2593 MHz)									
	5.1860	-2.1	V	3.0	40.1	1.0	-41.2	-25.0	-16.2	
	7.7790	-10.9	V	3.0	39.1	1.0	-48.9	-25.0	-23.9	
	10.3720	3.4	V	3.0	38.6	1.0	-34.2	-25.0	-9.2	
	5.1860	-1.0	H	3.0	40.1	1.0	-40.1	-25.0	-15.1	
	7.7790	-15.6	H	3.0	39.1	1.0	-53.6	-25.0	-28.6	
	10.3720	-9.9	H	3.0	38.6	1.0	-47.4	-25.0	-22.4	
	High Ch, (2627.5 MHz)									
	5.2550	-2.9	V	3.0	40.1	1.0	-41.9	-25.0	-16.9	
7.8825	-7.7	V	3.0	39.0	1.0	-45.7	-25.0	-20.7		
10.5100	-4.7	V	3.0	38.7	1.0	-42.4	-25.0	-17.4		
5.2550	-3.0	H	3.0	40.1	1.0	-42.1	-25.0	-17.1		
7.8825	-5.0	H	3.0	39.0	1.0	-43.1	-25.0	-18.1		
10.5100	-4.6	H	3.0	38.7	1.0	-42.2	-25.0	-17.2		
Rev. 03.03.09										
Note: No other emissions were detected above the system noise floor.										
LTE Band 41 15MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 15K20599									
	Date: 05-10-15									
	Test Engineer: Steven.Kim									
	Configuration: EUT / AC Adapter / Ear Phone / X-Position									
	Mode: TX, LTE BAND 41, 15MHz BW,16QAM									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (2562.5 MHz)									
	5.1250	-8.3	V	3.0	40.0	1.0	-47.4	-25.0	-22.4	
	7.6875	-14.1	V	3.0	39.1	1.0	-52.1	-25.0	-27.1	
	10.2500	2.0	V	3.0	38.5	1.0	-35.5	-25.0	-10.5	
	5.1250	-9.0	H	3.0	40.0	1.0	-48.0	-25.0	-23.0	
	7.6875	-14.2	H	3.0	39.1	1.0	-52.3	-25.0	-27.3	
	10.2500	-5.2	H	3.0	38.5	1.0	-42.7	-25.0	-17.7	
	Mid Ch, (2593 MHz)									
	5.1860	-3.0	V	3.0	40.1	1.0	-42.1	-25.0	-17.1	
	7.7790	-12.3	V	3.0	39.1	1.0	-50.3	-25.0	-25.3	
	10.3720	2.3	V	3.0	38.6	1.0	-35.3	-25.0	-10.3	
	5.1860	-2.3	H	3.0	40.1	1.0	-41.4	-25.0	-16.4	
	7.7790	-16.6	H	3.0	39.1	1.0	-54.7	-25.0	-29.7	
	10.3720	-10.4	H	3.0	38.6	1.0	-48.0	-25.0	-23.0	
	High Ch, (2627.5 MHz)									
	5.2550	-3.7	V	3.0	40.1	1.0	-42.8	-25.0	-17.8	
7.8825	-8.8	V	3.0	39.0	1.0	-46.8	-25.0	-21.8		
10.5100	-5.4	V	3.0	38.7	1.0	-43.1	-25.0	-18.1		
5.2550	-4.5	H	3.0	40.1	1.0	-43.6	-25.0	-18.6		
7.8825	-6.0	H	3.0	39.0	1.0	-44.0	-25.0	-19.0		
10.5100	-5.5	H	3.0	38.7	1.0	-43.2	-25.0	-18.2		
Rev. 03.03.09										
Note: No other emissions were detected above the system noise floor.										

LTE Band 41 10MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 15K20599									
	Date: 05-10-15									
	Test Engineer: Steven.Kim									
	Configuration: EUT / AC Adapter / Ear Phone / X-Position									
	Mode: TX, LTE BAND 41, 10MHz BW, QPSK									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (2560 MHz)									
	5.1200	-7.4	V	3.0	40.0	1.0	-46.4	-25.0	-21.4	
	7.6800	-12.2	V	3.0	39.1	1.0	-50.3	-25.0	-25.3	
	10.2400	-3.9	V	3.0	38.5	1.0	-41.3	-25.0	-16.3	
	5.1200	-5.0	H	3.0	40.0	1.0	-44.0	-25.0	-19.0	
	7.6800	-10.5	H	3.0	39.1	1.0	-48.6	-25.0	-23.6	
	10.2400	-4.2	H	3.0	38.5	1.0	-41.6	-25.0	-16.6	
	Mid Ch, (2593 MHz)									
	5.1860	1.6	V	3.0	40.1	1.0	-37.5	-25.0	-12.5	
	7.7790	-12.9	V	3.0	39.1	1.0	-51.0	-25.0	-26.0	
	10.3720	4.6	V	3.0	38.6	1.0	-33.0	-25.0	-8.0	
	5.1860	1.8	H	3.0	40.1	1.0	-37.3	-25.0	-12.3	
	7.7790	-13.6	H	3.0	39.1	1.0	-51.6	-25.0	-26.6	
	10.3720	-11.4	H	3.0	38.6	1.0	-49.0	-25.0	-24.0	
	High Ch, (2630 MHz)									
	5.2600	-4.4	V	3.0	40.1	1.0	-43.5	-25.0	-18.5	
7.8900	-6.3	V	3.0	39.0	1.0	-44.4	-25.0	-19.4		
10.5200	-7.2	V	3.0	38.7	1.0	-44.9	-25.0	-19.9		
5.2600	-2.3	H	3.0	40.1	1.0	-41.4	-25.0	-16.4		
7.8900	-7.0	H	3.0	39.0	1.0	-45.0	-25.0	-20.0		
10.5200	-7.4	H	3.0	38.7	1.0	-45.1	-25.0	-20.1		
Rev. 03.03.09										
Note: No other emissions were detected above the system noise floor.										
LTE Band 41 10MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 15K20599									
	Date: 05-10-15									
	Test Engineer: Steven.Kim									
	Configuration: EUT / AC Adapter / Ear Phone / X-Position									
	Mode: TX, LTE BAND 41, 10MHz BW, 16QAM									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (2560 MHz)									
	5.1200	-6.8	V	3.0	40.0	1.0	-45.9	-25.0	-20.9	
	7.6800	-12.8	V	3.0	39.1	1.0	-50.9	-25.0	-25.9	
	10.2400	-5.3	V	3.0	38.5	1.0	-42.7	-25.0	-17.7	
	5.1200	-5.5	H	3.0	40.0	1.0	-44.5	-25.0	-19.5	
	7.6800	-11.4	H	3.0	39.1	1.0	-49.5	-25.0	-24.5	
	10.2400	-5.2	H	3.0	38.5	1.0	-42.6	-25.0	-17.6	
	Mid Ch, (2593 MHz)									
	5.1860	0.7	V	3.0	40.1	1.0	-38.4	-25.0	-13.4	
	7.7790	-13.6	V	3.0	39.1	1.0	-51.6	-25.0	-26.6	
	10.3720	4.1	V	3.0	38.6	1.0	-33.5	-25.0	-8.5	
	5.1860	0.2	H	3.0	40.1	1.0	-38.9	-25.0	-13.9	
	7.7790	-14.2	H	3.0	39.1	1.0	-52.3	-25.0	-27.3	
	10.3720	-13.2	H	3.0	38.6	1.0	-50.8	-25.0	-25.8	
	High Ch, (2630 MHz)									
	5.2600	-4.9	V	3.0	40.1	1.0	-44.0	-25.0	-19.0	
7.8900	-7.4	V	3.0	39.0	1.0	-45.4	-25.0	-20.4		
10.5200	-7.5	V	3.0	38.7	1.0	-45.2	-25.0	-20.2		
5.2600	-3.1	H	3.0	40.1	1.0	-42.2	-25.0	-17.2		
7.8900	-8.0	H	3.0	39.0	1.0	-46.0	-25.0	-21.0		
10.5200	-8.4	H	3.0	38.7	1.0	-46.0	-25.0	-21.0		
Rev. 03.03.09										
Note: No other emissions were detected above the system noise floor.										

LTE Band 41 5MHz QPSK	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 15K20599									
	Date: 05-09-15									
	Test Engineer: Steven.Kim									
	Configuration: EUT / AC Adapter / Ear Phone / X-Position									
	Mode: TX, LTE BAND 41, 5MHz BW, QPSK									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (2557.5 MHz)									
	5.1150	-3.1	V	3.0	40.0	1.0	-42.1	-25.0	-17.1	
	7.6725	-7.5	V	3.0	39.1	1.0	-45.5	-25.0	-20.5	
	10.2300	-5.4	V	3.0	38.4	1.0	-42.8	-25.0	-17.8	
	5.1150	-1.4	H	3.0	40.0	1.0	-40.5	-25.0	-15.5	
	7.6725	-8.1	H	3.0	39.1	1.0	-46.2	-25.0	-21.2	
	10.2300	-3.5	H	3.0	38.4	1.0	-41.0	-25.0	-16.0	
	Mid Ch, (2593 MHz)									
	5.1860	-4.0	V	3.0	40.1	1.0	-43.1	-25.0	-18.1	
	7.7790	-8.3	V	3.0	39.1	1.0	-46.3	-25.0	-21.3	
	10.3720	0.4	V	3.0	38.6	1.0	-37.2	-25.0	-12.2	
	5.1860	-3.4	H	3.0	40.1	1.0	-42.5	-25.0	-17.5	
	7.7790	-9.6	H	3.0	39.1	1.0	-47.6	-25.0	-22.6	
	10.3720	-5.4	H	3.0	38.6	1.0	-43.0	-25.0	-18.0	
	High Ch, (2652.5 MHz)									
	5.2464	-3.7	V	3.0	40.1	1.0	-42.8	-25.0	-17.8	
7.8696	-10.1	V	3.0	39.0	1.0	-48.1	-25.0	-23.1		
10.4928	2.6	V	3.0	38.7	1.0	-35.1	-25.0	-10.1		
5.2464	-4.2	H	3.0	40.1	1.0	-43.3	-25.0	-18.3		
7.8696	-8.4	H	3.0	39.0	1.0	-46.4	-25.0	-21.4		
10.4928	-7.4	H	3.0	38.7	1.0	-45.1	-25.0	-20.1		
Rev. 03.03.09										
Note: No other emissions were detected above the system noise floor.										
LTE Band 41 5MHz 16QAM	UL Korea, Ltd Suwon Laboratory Above 1GHz High Frequency Substitution Measurement									
	Company: Samsung									
	Project #: 15K20599									
	Date: 05-09-15									
	Test Engineer: Steven.Kim									
	Configuration: EUT / AC Adapter / Ear Phone / X-Position									
	Mode: TX, LTE BAND 41, 5MHz BW, 16QAM									
	Chamber		Pre-amplifier		Filter		Limit			
	Chamber 1		AFS42		Filter 1		FCC Part 22			
	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (2557.5 MHz)									
	5.1150	-4.1	V	3.0	40.0	1.0	-43.1	-25.0	-18.1	
	7.6725	-8.1	V	3.0	39.1	1.0	-46.2	-25.0	-21.2	
	10.2300	-6.2	V	3.0	38.4	1.0	-43.6	-25.0	-18.6	
	5.1150	-2.4	H	3.0	40.0	1.0	-41.5	-25.0	-16.5	
	7.6725	-9.8	H	3.0	39.1	1.0	-47.9	-25.0	-22.9	
	10.2300	-4.0	H	3.0	38.4	1.0	-41.5	-25.0	-16.5	
	Mid Ch, (2593 MHz)									
	5.1860	-5.0	V	3.0	40.1	1.0	-44.1	-25.0	-19.1	
	7.7790	-9.3	V	3.0	39.1	1.0	-47.4	-25.0	-22.4	
	10.3720	-1.0	V	3.0	38.6	1.0	-38.5	-25.0	-13.5	
	5.1860	-4.2	H	3.0	40.1	1.0	-43.3	-25.0	-18.3	
	7.7790	-10.2	H	3.0	39.1	1.0	-48.3	-25.0	-23.3	
	10.3720	-4.8	H	3.0	38.6	1.0	-42.3	-25.0	-17.3	
	High Ch, (2652.5 MHz)									
	5.2464	-5.0	V	3.0	40.1	1.0	-44.1	-25.0	-19.1	
7.8696	-10.7	V	3.0	39.0	1.0	-48.8	-25.0	-23.8		
10.4928	1.2	V	3.0	38.7	1.0	-36.4	-25.0	-11.4		
5.2464	-4.7	H	3.0	40.1	1.0	-43.8	-25.0	-18.8		
7.8696	-2.5	H	3.0	39.0	1.0	-40.5	-25.0	-15.5		
10.4928	-8.5	H	3.0	38.7	1.0	-46.1	-25.0	-21.1		
Rev. 03.03.09										
Note: No other emissions were detected above the system noise floor.										